



63 MOUNT VIEW ROAD

LONDON, N4 4SR

STRUCTURAL METHODOLOGY STATEMENT

**PREPARED FOR
Ms A Childs**

Date: APRIL 2023

**Ref: 19223
Prepared by: DO
Checked by: DG**

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1 Brief

- 1.1 The Structural Engineering design brief was to produce a structural methodology statement and a feasibility study into creation of a new basement and rear extension to an existing two storey semi-detached house at 59 Mount View Road, N4 4SR, London. The existing building is a two storey (ground and first) house. The house sits on a site which is raised slightly above the public highway to the front and which is roughly level between the front and rear of the site.



(Figure 1: Aerial view of site)

- 1.2 To the left side of the site, the house shares a party wall with 61 Mount View Road, whilst to the right side the building is separated from 65 Mount View Road by a path which gives access to the rear of the site.
- 1.3 The proposed works will involve forming a new full height basement under the footprint of the existing building as well as further ground floor extension beyond the existing footprint at the rear. Two new lightwells to the front of the house will provide light into the new basement space. The works will require structural alterations to the superstructure and support of load-bearing walls and members at upper floor levels.
- 1.4 This report is to be read in conjunction with the following reports and drawings:
- Site Analytical Services, Ref. 23/36497-2, Basement Impact Assessment, March 2023
 - Halstead Associates Drawing No. 19223/PL01, Basement Plan April 2023
 - Halstead Associates Drawing No. 19223/PL02, Proposed Ground Floor Plan April 2023
 - Halstead Associates Drawing No. 19223/PL03, Proposed Basement Sections April 2023
 - Halstead Associates Drawing No. 19223/PL04, Suggested Construction Sequence April 2023
- 1.5 A cellar area exists in the basement under a part of the footprint of the existing building and is typical in houses of this age and layout. The height of cellar is approximately 2.0 m. In order to achieve the new floor-to-ceiling height in this area, the existing walls will be underpinned and extended down to the new floor level. The existing external walls are expected to be underpinned in reinforced concrete to a suitable level to form the new basement space.

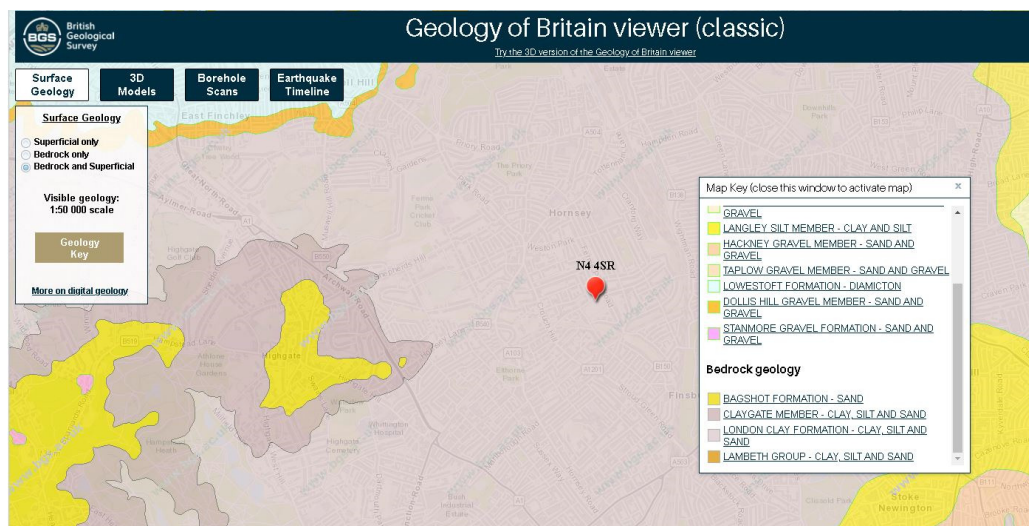
2 Screening

2.1 Structural Stability Screening Assessment

I.	Does the proposed basement involve underpinning of the existing building?	Yes
II.	Does the proposed basement extend lower than the adjacent structure to the right?	Yes
III.	Does the proposed basement extend lower than the Party Wall to the left?	Yes
IV.	Does the proposed basement extend below the Party Wall footing level to the right?	N/A
V.	Does the proposed basement extend lower than the building structure to the left?	Yes
VI.	Does the proposed basement undermine the public highway?	No

3 Site Investigation

- 3.1 This assessment has been informed by the results of a site investigation report prepared by Site Analytical Services Ltd (SAS), dated March 2023, together with a Geotechnical and Hydrological Basement Impact Assessment. These have shown that the proposed basement will not affect the existing ground water regime, and that the existing groundwater levels are expected to be below the level of the proposed basement floor with only localised pockets of surface water possible to appear following a heavy rainfall.
- 3.2 The British Geological Survey indicates that the site is directly underlain by solid deposits of the London Clay Formation, with potentially sacrificial deposits of made ground (historically shown to be up to 1.8m deep, 0.4m deep in the boreholes investigated by SAS). London Clay is suitable as a load bearing strata.



BGS extract

- 3.3 London Clay is a generally stable material and not typically prone to collapse in short term excavations. Notwithstanding, in line with good construction practice, temporary shoring would be required in all underpinning excavations below the existing building.
- 3.4 It will be feasible to support the new proposed rear extension on conventional strip footings taken down below the layer of made ground and any weak superficial deposits or soils affected by seasonal moisture content changes. According to the site investigation report, the new substructure can be designed for the allowable net ground bearing pressure of 270kN/m² at 3m below ground level and by interpolation approximately 100 kN/m² at 1.0m below ground level (rear extension footings).
- 3.5 No adverse groundwater conditions would be expected to occur which would significantly affect either construction of the basement or the completed structure. Groundwater was encountered in the borehole at 3.54m below ground level. According to the report, the water encountered was identified as surface water trapped in pockets of the less cohesive ground/ made ground. The rate of flow of any ground water encountered would likely be low and slow moving owing to the cohesive nature of London clay. Excavations for the underpinning would not, therefore, be impacted by groundwater, with any inflows being controlled by localised pumping.
- 3.6 Due to presence of soil conditions with high volume change potential, a suspended floor slab is recommended at basement level. In the proposed arrangement, (see the drawings in the Appendix) the basement slab is designed to span between the reinforced concrete foundations and the heave pressures resulting from volume change of the soil will be allowed for in the design of the slab by calculating the net pressures acting to the underside of the concrete slab.
- 3.7 Given the proximity of the adjoining properties, it is considered unlikely that the excavations could be battered back to a safe angle. A suitable temporary propping scheme will need to be proposed by the Contractor.
- 3.8 There are small trees and bushes at the rear of the property which will affect the depth of the new footings for the rear extension. The NHBC guidance chapter 4.2 should be used in estimating the required depth of the footings based on their relative position from the trees affecting the development. The depth of strip foundations is not expected to be in excess of 1.5m.

- 3.9 The basement formation at 63 Mount View Road should not adversely impact the site, providing adequate measures are taken to protect the surrounding land and properties during construction. This will be achieved by utilising the progressive underpinning type construction in narrow sections and full temporary support of the stem of the wall against the central soil mass which shall be retained for propping. Refer to drawing 18332/PL04 for the suggested sequence of the underpinning works.
- 3.10 The proposed excavations will be more than 3.0m of a public pavement, which is far enough to avoid traffic surcharge from the road or the light pavement traffic to the front cantilever retaining wall.
- 3.11 The party wall on the left hand side of the property is shared with No. 61 and will need to be underpinned with a minimum surcharge from the ground retained. On the right hand side, the footing of the adjacent building (No. 65 Mount View Road) will surcharge the stem of the right hand side retaining wall at approximately 1.2m above basement formation level. The retaining wall design will have to take account of the surcharge imposed by the existing footing. It is expected that a 250-300mm wall stem will be suitable for the expected loads.
- 3.12 The retaining walls and the individual wall pins are expected to be designed as cantilever retaining walls to resist overturning and sliding in both temporary and permanent loading condition. An allowance should be made for the water pressure from the retained ground (reduced in the temporary condition to allow for pumping any water out from the excavations during construction). The design parameters should be as indicated in the SAS report:

Stratum	Depth to top	Bulk Density (Mg/m³) (γ)	Effective Angle of Internal Friction (Φ)
London Clay Formation	0.40	2.00	23

Retaining Wall Design Parameters

- 3.13 According to the SI report, it is considered that deterioration of buried concrete due to sulphate or acid attack is likely to occur ($\text{SO}_4 > 4\text{g/l}$, corresponding to concrete class DS-4/AC-4).

4 Basement Formation

- 4.1 Given the proximity to adjacent properties, it is expected that the walls of the new basement extension will be formed in an underpinning type sequence. This will involve carrying out local excavations of around 1.0 -1.2m in width and down to the formation level of the new basement, followed by fixing of reinforcement within the excavations and then casting of concrete to form individual retaining wall sections integral with their bases.
- 4.2 The sequencing of this work would be such that no more than 20% of a single wall elevation would be excavated at any given time. At the required excavation depth, suitable shoring would be required to provide a safe working area for site operatives. Typical sequencing for the excavation of a wall section is shown on Drawing No. 19223/PL04.
- 4.3 At the expected depth required for the excavation, it is likely that temporary shoring to the retaining wall sections will be required in the short term in order to prevent overturning and/or sliding, until the basement slab has been installed.
- 4.4 Given the site constraints, this underpinning will be carried out with access gained from inside the existing cellar and ground floor of the house. As a result, the existing floor structure will have to be locally removed and replaced. Consideration will be given to removal of the floor in discrete sections in order to retain any short-term lateral propping action which may be currently provided by the floor.
- 4.5 The works will involve the installation of supporting steelwork within the ground floor and first floor to support retained loadbearing elements above. On similar projects a successful sequencing of works has involved the installation of this steel grillage prior to excavating out for the new basement.
- 4.6 At an approximately 3.00m depth down to formation level, heave forces caused by the removal of overburden are not expected to be significant as long as there are no undue delays in the construction program. Nevertheless, any theoretical heave pressures will be accounted for in the detailed design by the inclusion of anti-heave boarding under the slab or alternatively by designing the rebar in the top surface of the slab to resist these forces.
- 4.7 The Contractor will provide a method statement prior to commencement of work on site in which full details of hours, site set up and method for the formation of reinforced underpinning sections will be detailed.

5 Construction sequence

5.1 The following construction sequence is envisaged, which will be agreed with the main contractor prior to any works commencing on site:

- Local excavations down to basement level to cast isolated concrete pad footings. Install steel columns up to ground floor level. Backfill excavation.
- Install temporary propping to ground floor loadbearing walls and install steel beams spanning between internal columns and perimeter walls. Remove existing ground floor structure to suit.
- Lower internal ground level to minimise depth of excavation for underpinning. Ground to be banked down at a maximum 30 degree angle from existing footings.
- Underpin the perimeter walls in reinforced concrete, making allowance for the front elevation pins to be linked to the new lightwell retaining wall along the front property line. Limit the width of the individual pin sections to maximum 1.2m in width. Suggested hit-and-miss sequence is shown on drawing 01 in the Appendix. Shoring for each pin to be retained and propped against central earth mound.
- Install temporary propping across basement footprint to facilitate removal of central earth mound. Subject to detailed design, all perimeter RC underpins to be propped to eliminate risk of short term sliding/ overturning.
- Cast new RC slab to full footprint of basement. Slab to be tied into underpin sections to create a monolithic box.

6 Ground movement & Predicted damage category

- 6.1 Any ground works pose an elevated risk to adjacent properties. The proposed works undermines the adjacent property along the Party Wall line.
- 6.2 It is not expected that any cracking will occur during the works. However, our experience informs us that there is a risk of movement to the neighbours.
- 6.3 Whilst there is a level difference of approximate 3.0m between the foundations, the adjacent houses are in excess of 100 years old and any settlement which may have occurred due to consolidation of the founding strata would have taken place during the early years of the life of the building.
- 6.4 To reduce the risk to the development:
- Employ a reputable firm for extensive knowledge of basement works.
 - Employ suitably qualified Consultants. Halstead Associates have extensive experience with basement constructions.
 - Design the underpins to be suitably propped during construction until permanent props are in place.
 - Provide method statements for the Contractors to follow.
 - Investigate the ground
 - Record and monitor the external properties. This would be done by a condition survey under the Party Wall Act before and after the works are completed.

6.5 The maximum level of cracking anticipated is Hairline cracking which can be made good with decorative repairs by the appointed contractor. Under the Party Wall Act damage is allowed (although unwanted) to occur to a neighbouring property as long as repairs are suitably undertaken to rectify this. To mitigate this risk, the Party Wall Act is to be followed and Halstead Associates can be appointed to act in this respect.

6.6 Burland Scale:

Extract from The Institution of Structural Engineers “Subsidence of Low-Rise Buildings”
Classification of visible damage to walls with particular reference to type of repair and rectification consideration.

Category of damage	Approximate crack width	Limiting tensile strain	Definitions of cracks & repair types / considerations
0	Up to 0.1	0.0 – 0.05	HAIRLINE – Internally cracks can be filled or covered by wall covering and redecorated. Externally, cracks rarely visible & remedial works rarely justified
1	0.2 to 2	0.05 – 0.075	FINE – Internally cracks can be filled or covered by wall covering, and redecorated. Externally, cracks may be visible, sometimes repairs required for weather tightness or aesthetics. NOTE: Plaster cracks may, in time, become visible again if not covered by a wall covering.

7 Monitoring

- 7.1 Visual movement monitoring, level of monitoring and reporting strategy required are to be agreed subject to a Party Wall Surveyor's consultation before the works commence on site.

8 Waterproofing

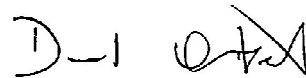
- 8.1 As this form of construction will not allow external damp proofing systems to be employed, it is envisaged that the Architect will opt for a proprietary drained cavity system to line the face of the retaining wall and slab. Any inflow of ground water which may result would then be directed to an internal sump and then pumped as necessary into the surface water system.

9 Party Walls

- 9.1 Given the proximity of adjacent buildings, Party Wall Agreements will be required with neighbouring home owners, particularly in light of the recommendations for monitoring during the works. Halstead Associates can be appointed to act on behalf of the Building Owner.

10 Temporary Works

- 10.1 A competent Contractor, experienced in this form of residential basement construction must be used, and a Temporary Works Coordinator should be employed to ensure that the stability of the ground and adjoining buildings is maintained throughout the construction process.
- 10.2 Significant propping of the existing structure will be required and as such will require careful consideration to ensure the safety of site operatives during construction.
- 10.3 Whilst suggestions have been provided with this document for the sequencing of the works, it will be the responsibility of the Contractor and Temporary Works co-ordinator to provide detailed proposals for the methodology for the Structural Engineer and design team to review.



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David Oates CEng BEng (Hons) MStructE

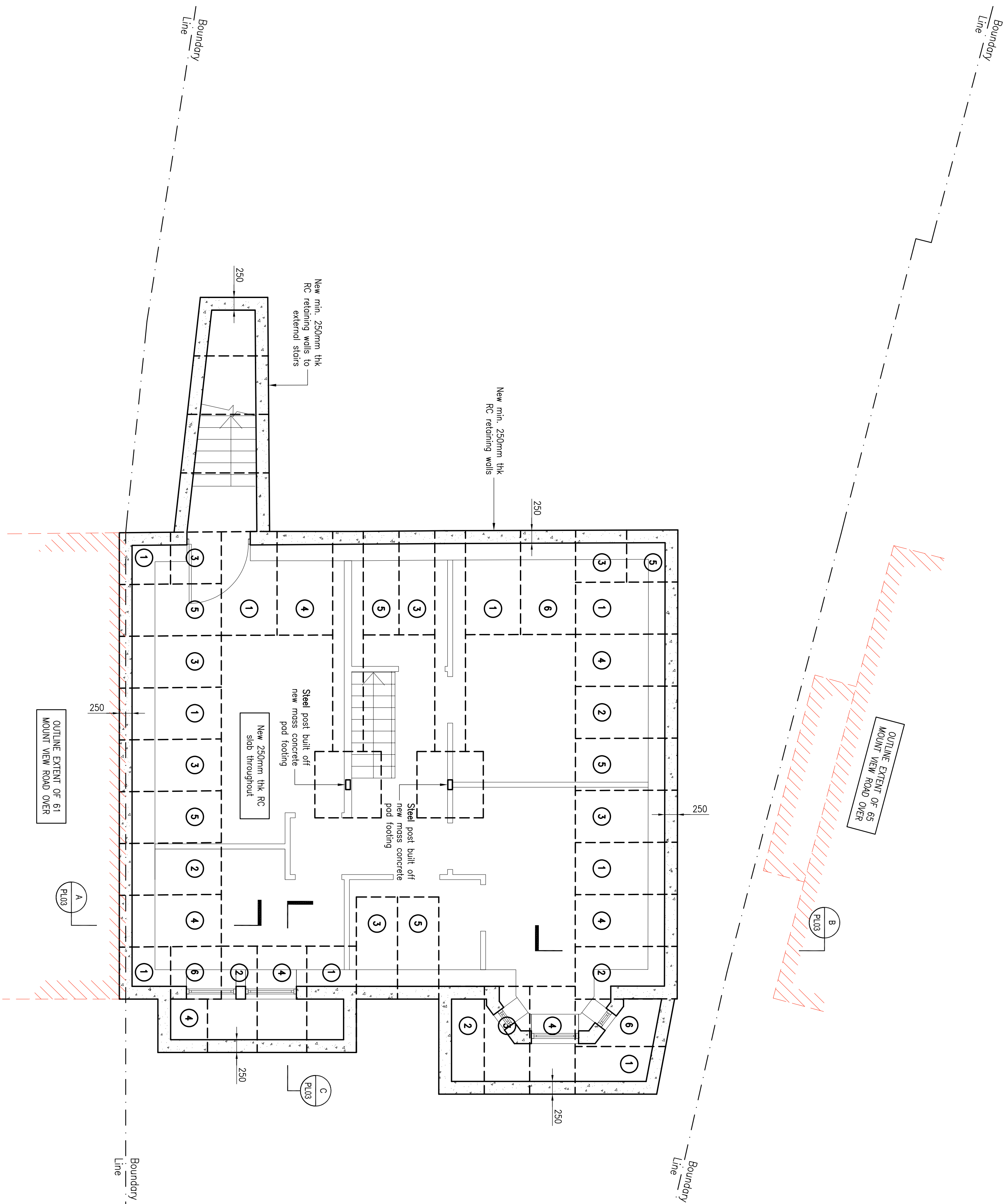
11 Appendix A - Drawings

Halstead Associates Drawing No:

- 19223/PL01 – Basement Plan
- 19223/PL02 – Ground Floor plan
- 19223/PL03 – Basement Sections
- 19223/PL04 – Suggested Sequencing of Works

ALL FINISHES, DPC, DPM AND VENTILATION ARE TO ARCHITECTS DETAILS AND SPECIFICATIONS

ALL WATERPROOFING AND TANKING DETAILS ARE TO BE PROVIDED BY WATERPROOFING SPECIALIST

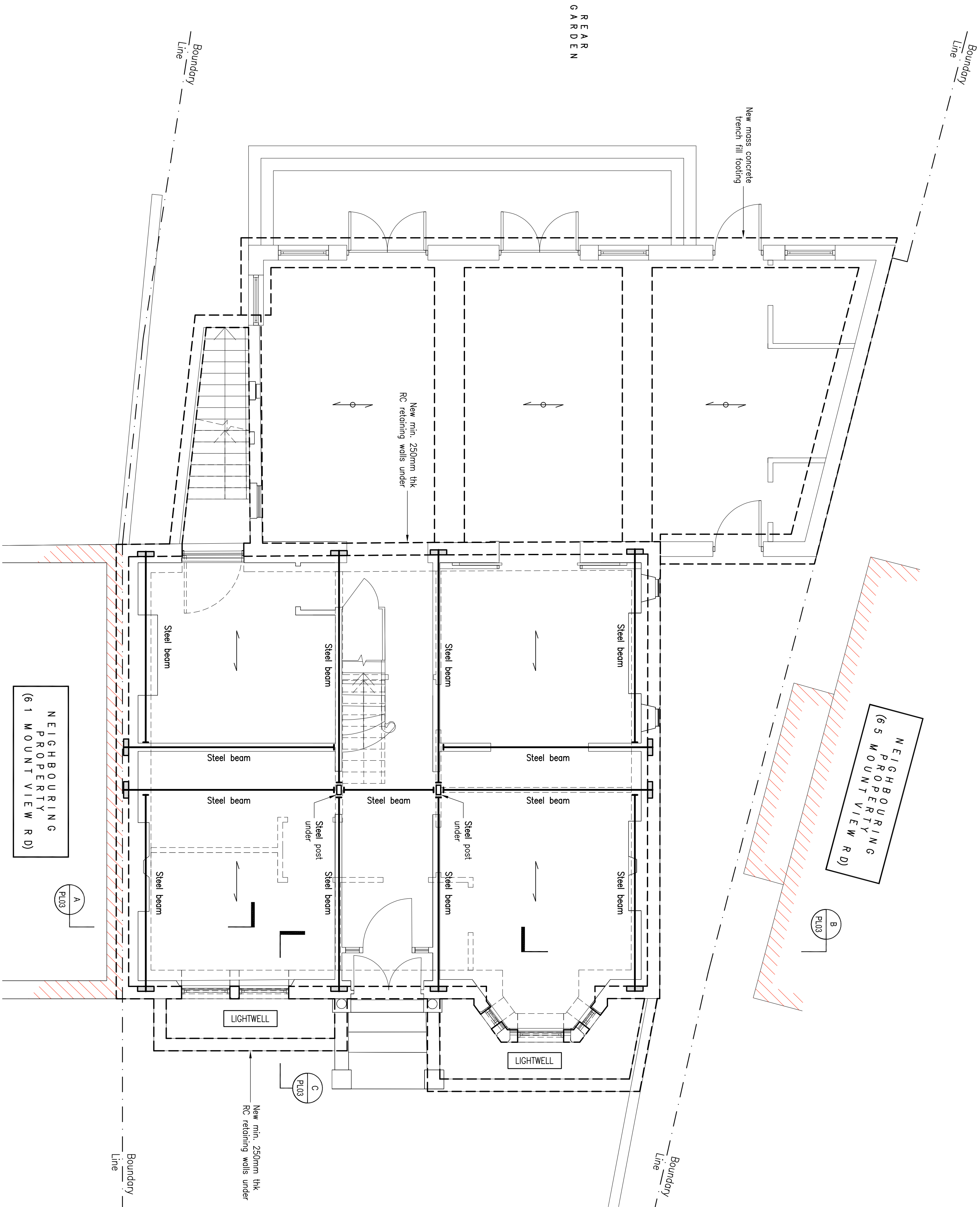


SCALE 1:50

[illegible]

TEMPORARY WORKS
ALL TEMPORARY WORKS ARE TO THE CONTRACTORS DESIGN AND DETAIL

KEY:
 Span direction of new C24 timber floor joists
 Span direction of new PC beam and block floor planks
 New steel beam (size as shown on plan)



GROUND FLOOR PLAN

SCALE 1:50

Rev.	Date	Revisions	By	Engineer	Notes
					1. The drawing is to be read in conjunction with all relevant Consultant's drawings and specifications.

Key:	1. Denotes Section
Denotes Drawing Number	X
	XX

PRELIMINARY	
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Project:	63 MOUNT VIEW ROAD, LONDON, N4 4SR	Drawn:	BA
Title:	GROUND FLOOR PLAN	By:	DO
Client:	Ms Childs	Date:	April 2023
Architect:	Dominic Lamb Architects Ltd	Scale:	AS NOTED @ A1
HALSTEADS LTD		Drawing No:	19223/PL02
CONSTRUCTION CONSULTANTS			
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office@halsteads.co.uk			
www.halsteads.co.uk			

ALL TEMPORARY WORKS ARE TO THE CONTRACTORS DESIGN AND DETAIL



SECTION C-C
SCALE 1:25

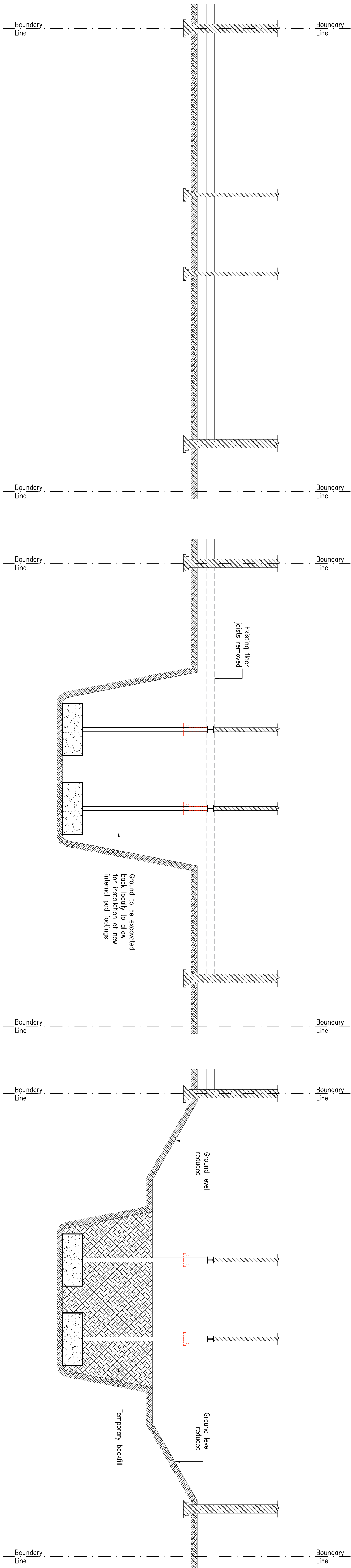
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TEMPORARY WORKS

ALL FINISHES, DPC, DPM AND VENTILATION ARE TO ARCHITECTS DETAILS AND SPECIFICATIONS

ALL WATERPROOFING AND TANKING DETAILS ARE TO BE PROVIDED BY WATERPROOFING SPECIALIST

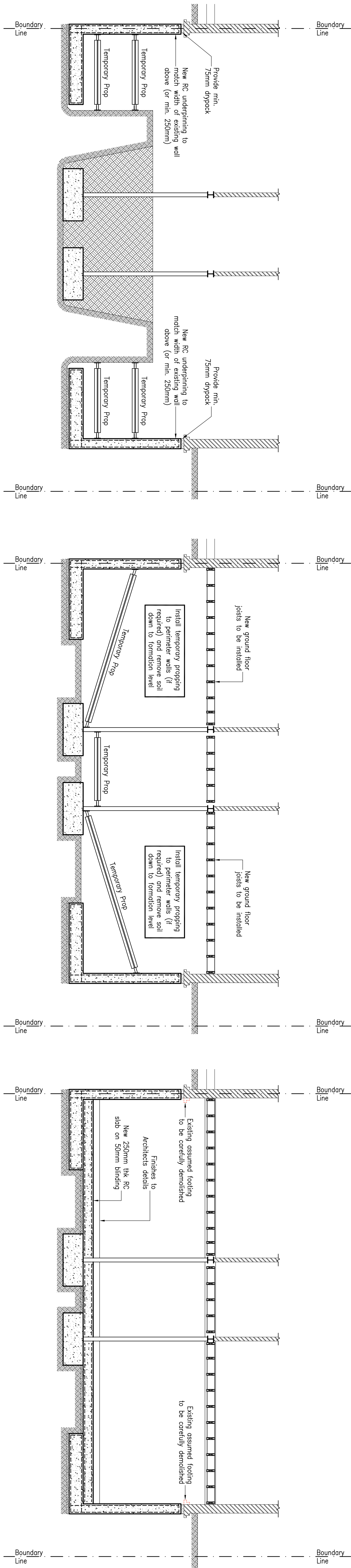
ALL TEMPORARY WORKS ARE TO THE CONTRACTORS DESIGN AND DETAIL



UNDERPINNING SECTION - AS EXISTING

UNDERPINNING SECTION - STAGE 1

UNDERPINNING SECTION - STAGE 2



UNDERPINNING SECTION - STAGE 3

UNDERPINNING SECTION - STAGE 3

UNDERPINNING SECTION - AS PROPOSED

Rev.	Date	Revisions	By	Engineer

Notes:

1. The drawing is to be read in conjunction with all relevant Consultant's drawings and specifications.

Key:

1. Denotes Section

Denotes Drawing Number

X

XX

PRELIMINARY

HALSTEADS

ARCHITECTS

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Widnes, Cheshire
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CONSTRUCTION CONSULTANTS

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www.halsteads.co.uk

Project: 63 MOUNT VIEW ROAD, LONDON, N4 4SR

Title: SUGGESTED SEQUENCE OF WORKS

Client: Ms Childs

Architect: Dominic Lamb Architects Ltd

Drawn: BA

By: DO

Date: April 2023

Scale: AS NOTED @ A1

Drawing No: 19223/PL04