



5 Firs Avenue,
N10 3LY

Structural Construction Method Statement

Job
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Revision: P3
Status: Planning
Date: March 2026

17.03.26	P3	ISSUED FOR PLANNING	
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Qualification	MSc BEng (Hons)		MEng CEng MStructE
signature:			

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1.0 Non-technical Summary

Structural Design Studio Limited were appointed by the Client, Amy La and Manh Duy Van Cao, to advise on the structural implications of constructing a new basement extension to the existing lower ground floor with a new single storey extension above at ground floor level. The following report has been prepared to help ensure that the structures on both the site and neighbouring sites are safeguarded during the works.

The report provides information in accordance with the advice provided in Haringey Council Planning Regeneration and Economy Draft Basement Development guidance notes.

A desktop study of the site has been completed to establish the site's history and a risk-based interpretation used to inform the onsite testing. As part of the Basement Impact Assessment, a site specific ground investigation comprising of trial pits and boreholes has been completed by Site Analytical Services Ltd (SAS) in September 2025 to confirm soil and groundwater conditions, as well as the size and profile of the existing foundations to the building. The results of this investigation have been used to provide information on the local ground conditions and to inform the structural scheme design.

This report supports the conclusion that should the works be completed by a competent contractor, the basement extension can be constructed without any significant adverse effect on the property, neighbouring properties, groundwater, surface water or on the stability of the adjoining ground.

Based on the Ground Movement Assessment produced by Site Analytical Services Ltd dated March 2026, if the works are carried out in accordance with our proposed design then the likelihood of damage to the property should be limited to Category 0 (Negligible) as set out in CIRIA report C580.

2.0 Description of Existing Buildings and Site

The existing building at 5 Firs Avenue is a mid terrace three-storey house located in London Borough of Haringey. The house is not Listed but is in the Muswell Hill Conservation area. The house has a lower ground floor beneath part of the existing footprint of the building which currently serves as a dining and kitchen space.



Figure 1. 5 Firs Avenue Road, Front Elevation (Google Maps, September.2025)

The main house is rectangular on plan with a frontage onto Firs Avenue. It is bounded by No.3 and No.7 Firs Avenue to the North and South respectively. There is a rear garden which bounds onto No.12 Birchwood Avenue to the rear.

The property is not listed and is assumed to have been built in the early 20th century, with the earliest maps dated 1910 showing the terraced buildings developed in the area.

The building is traditionally constructed with timber roof and floors supported on load bearing internal and perimeter walls. The floors are assumed to span between the front and rear walls and the load bearing spine walls in the centre of the building.

The overall stability of the buildings appears to be provided by the cellular layout of the masonry walls and diaphragm action of the timber floors at each level.

Access is gained to the site from the front of the property via Firs Avenue.

Prior to works commencing on site, a CCTV survey will be required to determine the location, size and condition of the existing drainage network. The survey should continue through to the connections to the public sewer network to prove connectivity.

3.0 Ground Conditions

The maps available from the British Geological Survey indicate that the site lies directly on top of superficial deposits of Diamicton (Lowestoft formation), with London Clay forming the bedrock beneath.

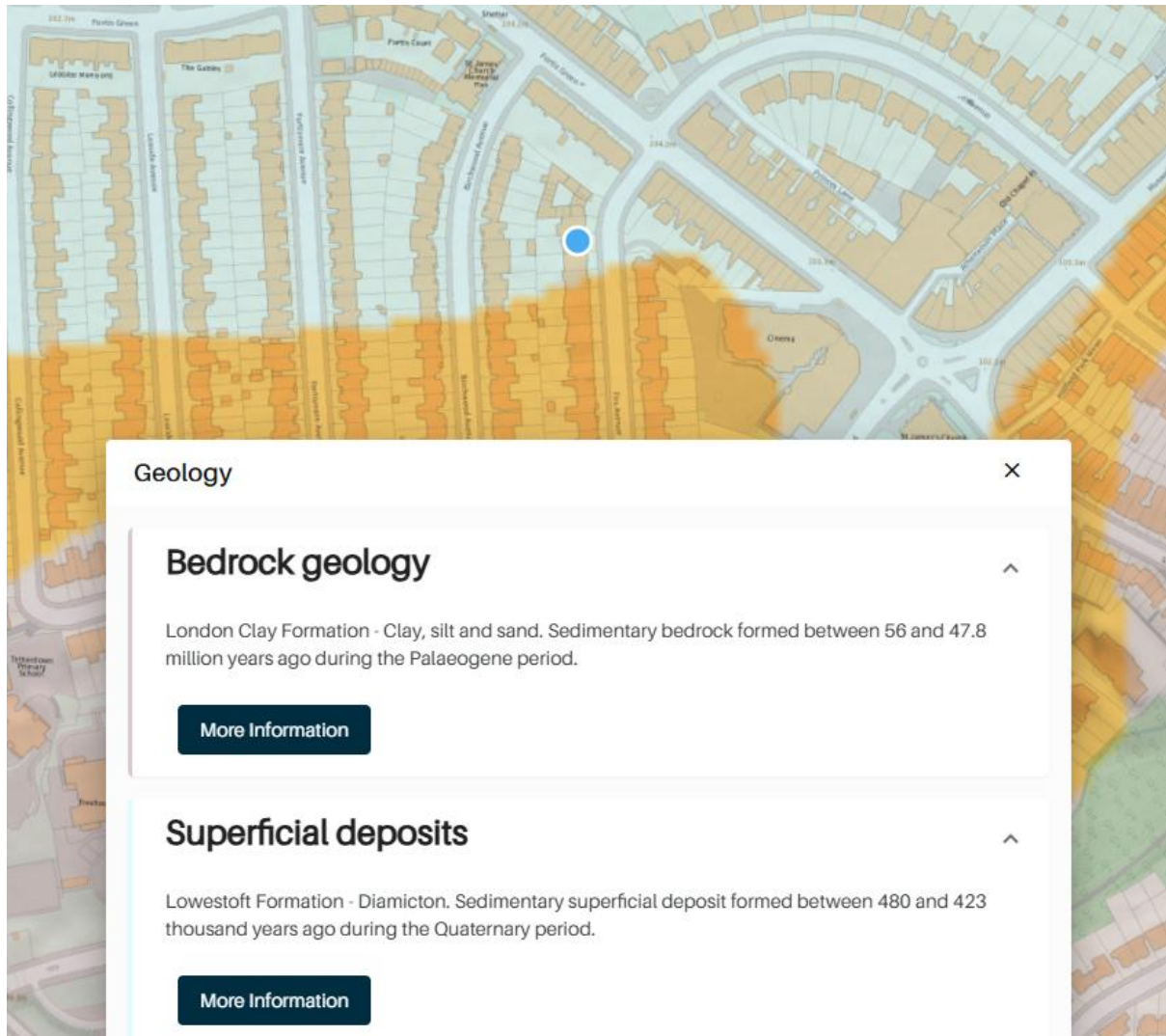


Figure 2 Excerpt of Geology of Britain Viewer (British Geological Survey, 29/09/2025)

A site specific soil investigation has been carried out by SAS Ltd (SAS) which included 2no. boreholes (in the rear and front gardens) and 2no. trial pits on the Boundary Walls. The boreholes and trial pits revealed ground conditions that were generally consistent with the geological records and comprised Made Ground up to 0.9m in thickness overlying roughly 1.8m of Stiff Clay containing occasional chalk nodules resting on London Clay formation at depth. Groundwater was not encountered in the boreholes at the time of drilling, however water was measured at 2.25m and 3.08m below ground level in boreholes BH1 and BH2 respectively. The interpretative report notes that "isolated pockets of groundwater may also be present perched within any less permeable material at shallower depth on other parts of the site, especially within any Made Ground", and the presence of water in the future could be subject to seasonal variation.

The existing formation level of the lower ground floor is at approximately 2.6m below the internal ground level and the proposed formation level for the extension is at approximately 3.42m below ground level, which means the proposed slab and foundations should bear directly onto Stiff medium brown orange silty CLAY, based on trial pit information obtained from SAS Ltd Site Investigation Works.

The site investigation has concluded that foundations should be designed with an allowable bearing pressure of 180KN/m² in accordance with NHBC standards, for high volume potential soils.

The chemical testing of the soil samples taken also concludes that the ground provides an AC-3 class environment for any buried concrete across the site, and as such the concrete used for all buried concrete structures should be designed to DS-3 class.

4.0 Desk Study Summary and Observations

The results of our desk study are as summarised below;

- The site is located within a Flood zone 1. This means it has a low probability of flooding from rivers and the sea. The site appears to be at 'very low risk' of flooding due to surface water, as shown on the latest Environment Agency Flood Maps (reference; www.environmentagency.gov.uk), as such a flood risk assessment should not be required.
- Reference to the Environment Agency's Risk of Flooding from Surface Water mapping indicates there is a very low risk of surface water flooding across the Site.
- Public Sewer records are to be obtained from Thames Water to determine whether there are any Thames Water assets located within the proposed site.
- The site does not lie within the vicinity of London Underground or railways, therefore the proposed works will not affect the railway/tube lines.
- There are no records of historical bomb dropping on Firs Avenue. (Reference, The LCC London Bomb Damage Maps 1939-1945).

5.0 Proposed Alterations

The proposed works involve extending the existing lower ground floor under the left hand side of the main house and construction of a new single storey rear extension to the existing lower ground extension which is to remain at the same level. The floor level in the existing lower ground floor utility/WC to the front of the house is to also be lowered to the same level as the new basement area.

A set of proposed structural scheme drawings can be seen in Appendix A.

L-shaped reinforced concrete underpins will be used to create the new basement floor level under the main house, as well as under some of the existing lower ground floor walls to allow the floor level in the existing utility/WC area to be lowered. An existing internal lower ground floor wall will also require underpinning with mass concrete to the new lowered floor level.

Vertical loads from the existing superstructure will be transferred to the ground by the underpins around the perimeter. The new lower ground floor extension will be supported on mass concrete foundations.

The reinforced concrete retaining wall will be designed to cantilever, supporting the surcharge from the soil and neighbouring buildings.

A suspended reinforced concrete slab will be constructed at lower ground floor level to provide permanent propping to the bases of the underpins and will deal with any heave from the London Clay.

The groundwater level will be monitored as part of the works but given the site is within a non-aquifer and no ground water was found in the boreholes, it is unlikely that inflows of groundwater will be experienced during excavation. As such, any potential inflows that may occur should not be significant.

If groundwater is experienced during excavation, suitable control of any inflows would be achieved using sump pumping. If required, a detailed method statement for this process will need to be prepared by the Contractor for comment by all relevant parties including party wall surveyors and their engineers.

Trial underpins will be dug when the contractor first starts on site to confirm the stability of the soil and to further investigate the presence of any groundwater inflows.

6.0 Basement Waterproofing

The basement waterproofing will be the responsibility of the Contractor.

We assume that the reinforced concrete retaining walls and basement slabs will be cast using water resistant concrete to form an initial barrier with an internal drained cavity system as a primary barrier against possible

water ingress. As part of the system, any water that seeps through will be collected and drained out into the main drainage system.

7.0 Party Wall Matters

The proposed works development falls within the scope of the Party Walls Act 1996. Procedures under the act will be dealt with in full by the Building Owner's Party Wall Surveyor. The Party Wall Surveyor will prepare and serve necessary notices under the provisions of the Act and agree Party Wall awards. The Contractor will be required to provide the Party Wall Surveyor with appropriate drawings, method statements and other relevant information covering the works that are notifiable under the Act. The resolution of matters under the Act and provisions of the Party Wall Awards will protect the interests of the owners.

The proposed works on the site of No. 5 Firs Avenue will be developed so as not to inhibit any works on the adjoining properties. This will be verified by the Surveyors as part of the process under the Act.

8.0 Hydrological Statement Summary

The site investigation indicates that ground water is not likely to be encountered during the excavation. Arup's Subterranean Development Scoping Study (para 5.1), June 2008, notes that the impact of subterranean development on groundwater flows is negligible as groundwater flows will find an alternative route if blocked by a subterranean structure.

A Basement Impact Assessment has been completed by SAS Ltd dated September 2025 and this has found that the proposed basement development will not cause significant change to the hard surfaced area and due to impermeable underlying Clay the effect on the existing underlying groundwater will be minimal

9.0 Impacts on Proposed Below Ground Drainage

A drainage CCTV survey will be completed to confirm the size and condition of the existing drainage prior to works commencing on site. It is proposed to maintain gravity connections at lower ground Floor level and above, where possible. It is assumed the new drainage for the lowered floor extension will be routed to a submersible pumping station which will pump waste directly to the outfalls. A non-return valve will be installed to protect against sewer surcharging. It is proposed that the rear of the property will house the pumping chambers for the foul surface/cavity water drainage.

A cavity drain system will be incorporated into the design to provide the second means of defence against water ingress. The waterproofing will be to a specialist design.

Thames Water Public Sewer Records will also be procured to ensure there are no Thames Water assets within the boundary of the property.

10.0 Ground Movement

Based on the Ground Movement Assessment carried out by SAS Ltd if the works are carried out in accordance with our proposed design and undertaken by a competent contractor then the likelihood of damage to the property should be limited to Category 0 (Negligible) as set out in CIRIA report C580.

A ground movement monitoring system will be installed to the neighbouring properties No.3 and No.7, with trigger values set based on the expected ground movement levels in the GMA, to allow the works to be controlled appropriately in the event of ground movement occurring (as outlined in section 14.0).

11.0 Conclusions

It is intended that the above measures and sequence of works are adopted for the eventual design and construction of the proposed works.

Detailed method statements and calculations for the enabling and temporary works will need to be prepared by the Contractor for comment by all relevant parties including Party Wall surveyors and their engineers. The Contractor will need to ensure that adequate supervision and monitoring is provided throughout the works particularly during the excavation and demolition stages. A specification and indication of monitoring requirements is given in Section 14.0.

To this end, SDS Ltd. will have an on-going role during the works on site to monitor that the works are being carried out generally in accordance with our design and specification. This role will typically involve fortnightly site visits during the main structural works. A written site report will be provided to the design team, Contractor and Party Wall Surveyor.

It is assumed that the above measures and sequence of works are taken into account in the eventual design and construction of the proposed works. If the works noted above are properly undertaken by suitably qualified contractors, these works should pose no significant threat to the structural stability of the house or the adjoining properties. Based on our current knowledge of the building, if the works are carried out in this manner then the likelihood of damage to the adjacent properties should be limited to Category 0 (Negligible) as set out in CIRIA report C580.

12.0 Construction Method Statement (to be read in conjunction with drawings in Appendix A)

Some of the issues that affect the sequence of works on this project are:

- The stability of the existing lower ground floor and main house structures;
- The stability of adjoining and adjacent buildings;
- Forming sensible access onto the site to minimise disruption to the neighbouring residents; and
- Providing a safe working environment.
- Providing protection to the nearby trees in accordance with specialist requirements

The proposed works involve the extension of the existing lower ground under the left of the main house above, lowering of the existing lower ground floor in the WC and utility area and a rear extension at existing lower ground floor level. It is expected that these works will be completed in a “bottom up” construction sequence.

The undertaking of such projects to existing buildings is specialist work and SDS Ltd. will be involved in the selection of an appropriate Contractor with the relevant expertise and experience for this type of project.

The Contractor is entirely responsible for maintaining the stability of all existing buildings and structures, within and adjacent to the works, and of all the works from the date of possession of the site until practical completion of the works.

A full set of temporary works drawings and calculations will be provided by the Contractor and will be reviewed by SDS Ltd. prior to works starting on site.

Please refer to section 13.0 for noise, vibration and dust assessment with proposed associated mitigation methodologies.

Stage 1 – Site Setup and Enabling Works

- All incoming services to the property are to be located and marked. Their location and depths should be communicated to the design team.
- Schedules of conditions for the adjoining properties to be completed.
- If movement monitoring has been agreed as part of the Party Wall awards this should be installed and base readings taken.
- Soft Strip of the existing building.
- Install temporary hoarding and protection to the neighbouring properties.
- Install tree protection measures in accordance with specialist recommendations

Stage 2 – Demolish the existing lower ground floor slab

- The existing slabs should be carefully cut back to allow access for the new underpinning works. Remove any existing drainage where necessary.

Stage 3 – Install Mass Concrete underpins to Existing Lower Ground Floor Walls

- Dig trial underpins for inspection by SDS Ltd. to check how well the existing soil is cemented, ground water levels and flows, and in particular the ability of the ground to “stand up” whilst the individual underpin is completed.
- The underpins to the existing internal wall in the area of lower ground floor level which is being lowered are to be formed in mass concrete. All underpins are to be taken down to proposed basement formation level.
- Dig the underpins in maximum 1 metre sections in the agreed sequence, installing localised trench sheeting and props around the perimeter of the shaft.

- Cast the underpin.
- Leave the underpin to cure for 3 days. If the underpin is under an existing wall then drypack to the underside of the wall above with 3:1 sharp sand to cement dry-pack well rammed in.
- Remove the trench sheeting and props and backfill with well compacted arisings from the excavation. This method of construction will be used to limit any horizontal ground movement associated with the construction of the underpins and limits the risk of the underpinning works on the neighbouring buildings.
- The Contractor should wait a minimum of 24 hours after drypacking before digging an adjacent underpin. The exact sequence of mass concrete underpinning will be advised by the Contractor as it will relate to their sequence of construction.

Stage 4 – Install Key Underpins for Steel Structure to be installed

- Key underpins/new pad footing will be undertaken in order to install the steelwork to support the superstructure above.
- Dig the underpins in maximum 1 metre sections installing localised trench sheeting and props around the perimeter of the shaft.
- The reinforcement in the toe of the underpin can be tied and the toe cast.
- The reinforcement in the stem of the underpin can be tied, lapping with the reinforcement from the toe and the stem cast.
- Leave the underpin to cure for 3 days and then dry-pack to the underside of the wall above (where applicable) with 3:1 sharp sand to cement dry-pack well rammed in.

Stage 5 – Install Needle props and Permanent Ground Floor Steel structure to Main House

- Remove the existing ground floor joists and install temporary lateral propping across the width of the property.
- Install steel needle props to the central spine wall and internal corridor walls so that they are temporarily supported.
- Install new steelwork onto the key underpins noted above.

Stage 6 – Install Reinforced Concrete Underpins (Left side of Main House)

- Perimeter reinforced concrete underpins under the main house can now be undertaken.
- Dig trial underpins for inspection by SDS Ltd. to check how well the existing soil is cemented, ground water levels and flows, and in particular the ability of the ground to “stand up” whilst the individual underpin is completed.
- The underpins are all full depth reinforced concrete underpins or part of the rear retaining wall that will be completed in an underpinning sequence. The underpins will be formed in a 1-4-2-5-3 sequence.
- Dig the underpins in maximum 1 metre sections in the agreed sequence, installing localised trench sheeting and props around the perimeter of the shaft.
- The reinforcement in the toe of the underpin can be tied and the toe cast.
- The reinforcement in the stem of the underpin can be tied, lapping with the reinforcement from the toe and the stem cast.
- Leave the underpin to cure for 3 days and then dry-pack to the underside of the wall above (where applicable) with 3:1 sharp sand to cement dry-pack well rammed in.
- Install temporary lateral props between the face of the underpinning and the central bund of soil. These will be removed as part of the bulk excavation. This method of construction will be used to limit any horizontal ground movement associated with the construction of the underpins and limits the risk of the underpinning works on the neighbouring buildings.

- The Contractor should wait a minimum of 24 hours after dry-packing before digging an adjacent underpin. Adjacent underpins should be dowelled together. An assumed sequence of underpinning is shown on the attached drawing however, the exact sequence of underpinning will be advised by the Contractor as it will relate to their sequence of construction.

Stage 7 – Reduce Level Dig down to New Basement Level

- Reduce level dig to allow the high level horizontal temporary props to be installed to the tops of the underpins
- Temporary propping across the basement to be provided to the underpinning to prevent sliding and overturning.
- Reduce level dig down to proposed basement level installing low level propping as required

Stage 8 – Cast the New Slab and Remove Horizontal Props

- Install the new timber floor at ground floor level
- Install the new drainage including the surface water runs and pump sumps. The drainage should be tested prior to casting the slab.
- Install the heave protection
- The Lower Ground Floor slab can be cast with reinforcement continuous with the underpin bases.
- Once the slab has cured, the bases of the RC underpins are propped by the slab, avoiding sliding and overturning in the permanent case. Hence, the basement structure is now complete and the low level horizontal temporary propping to the underpins can be removed.

Stage 9 – Construct New Extension to the Rear

- Temporarily prop up the existing rear extension at ground floor level with needle props.
- Install the new mass concrete foundations for the extension
- Install the new steelwork to support the ground floor level

Stage 10 – Superstructure Works and Fit Out

- Continue progressing with the superstructure works
- Install the new cavity drain system
- Complete the fit out

13.0 Noise, Vibration and Dust Mitigation

The Camden Planning Guidance: Basement dated January 2021 states that during the undertaking of any basement works it is necessary to provide a plan for management of noise, vibration, dust and waste to manage and mitigate the amenity of neighbouring residents during construction, as well as guide the use of the highway and minimise noise and air pollution.”

The proposed works at 5 Firs Avenue involve the extension of the existing lower ground under the footprint of the ground floor above and rear and side extension at ground floor level.

The construction works involve partial demolition of existing floor, underpinning beneath existing walls, as well as excavation and construction of the basement shell. A more detailed sequence of the works has been given in section 14.0. Those most likely to be affected by noise, dust and vibration will be the immediate neighbours at No.3 and No.7 Firs Avenue. The properties opposite and behind No.5 Firs Avenue are remote from the proposed development and are therefore less likely to be affected, however need to be considered. There may be some impact on other residents on Firs Avenue due to the related construction traffic, but this should be minimal.

Below we have described the mitigation measures that are proposed to keep noise, dust and vibration to acceptable levels.

Mitigation Measures for Demolition of Existing Lower Ground Floor

The breaking out of existing structures shall be carried out by diamond saw cutting and hydraulic bursting where possible to minimise noise and vibration to the adjacent properties. All demolition and excavation work will be undertaken in a carefully controlled sequence, taking into account the requirement to minimise vibration and noise. The contractor will need to utilise non-percussive breaking techniques where practicable.

As the property is part of a terrace, careful consideration needs to be given to minimise noise and vibration transfer to the adjoining properties. The contractor should ensure that where any slab is adjacent to the boundary the concrete slab should be diamond saw cut first along the boundary to isolate the slab from any adjoining structures.

Dust suppression equipment should be used during the demolition process to ensure that any airborne dust is kept to a minimum. Where practical, concrete should also be wetted down prior to and during breakout to further inhibit airborne dust.

Mitigation Measures for Underpinning works to the Perimeter

The underpin shafts will be excavated using hand tools where possible. At the base of the underpin shaft it may be found that compressed air tools are required due to the compaction of the ground. Care should be taken in selecting a suitable air compressor that keeps noise to a minimum. The air compressor should be located within the site and behind a hoarding to minimise noise transfer to the adjoining properties.

The spoil will be removed from the excavation using an electrically powered conveyor. The contractor will need to ensure that this is regularly serviced and inspected to ensure any noise from this is kept to a minimum. In order to minimise dust, skips and conveyors should be covered or completely enclosed to ensure that dust cannot escape.

Mitigation Measures for Bulk Excavation

It is likely that the bulk excavation will be completed by hand. The contractor should ensure that any mechanical plant is switched off when not in use and is subject to regular maintenance checks and servicing. An electrically powered conveyor will be used as detailed above for large volumes of spoil removed.

Mitigation Measures for the Construction of the Concrete Basement Shell

The contractor should ensure that any concrete pours are completed within the permitted hours for noise generating works. The contractor should allow for a contingency period to ensure that concrete pours can be completed within these hours regardless of unforeseen circumstances such as batching plant delays and traffic congestion.

The fabrication and cutting of steelwork for the reinforced concrete retaining wall and slabs shall take place off site. If any rebar needs to be trimmed on site this should be completed using hydraulic or pneumatic tools instead of angle grinders.

Dust Control

In order to reduce the amount of dust generated from the site, the contractor should ensure that any cutting, grinding and sawing should be completed off site where practicable. If cutting, grinding and sawing is being carried out on site, surfaces are to be wetted down prior to and during these types of work whenever possible. Any equipment used on site should be fitted with dust suppression or a dust collection facility.

The contractor will be responsible for ensuring good practice with regards to dust and should adopt regular sweeping, cleaning and washing down of the hoardings and scaffolding to ensure that the site is kept within good order. The Contractor selected will be a member of the Considerate Constructors Scheme. Contact details of the contractor who will be responsible for containing dust and emissions within the site will be displayed on the site boundary so that the local residents can contact the contractor to raise any concerns regarding noise and dust.

The building will be enclosed within suitable scaffold sheeting and any stockpiles of sand or dust-generating materials will be covered. Cement, fine aggregates, sand and other fine powders should be sealed after use.

14.0 Structural Monitoring Proposals

Monitoring and limits on ground movements during excavation and construction

The Contractor shall provide monitoring in line with the agreements made in the Party Wall agreements.

Monitoring shall be completed as follows:

- 1) One month prior to any works being started to provide a base reading.
- 2) Weekly readings during the excavation and until the basement slab and lining wall has been cast.
- 3) On a monthly basis thereafter for a three-month period following completion of the notifiable works.

Cumulative movement of survey points must not exceed:

a). Settlement

Code amber trigger values: $\pm 5\text{mm}$

Code red trigger values: $\pm 10\text{mm}$

b). Lateral displacement

Code amber trigger values: $\pm 5\text{mm}$

Code red trigger values: $\pm 10\text{mm}$

Movement approaching critical values:

Code amber trigger value:

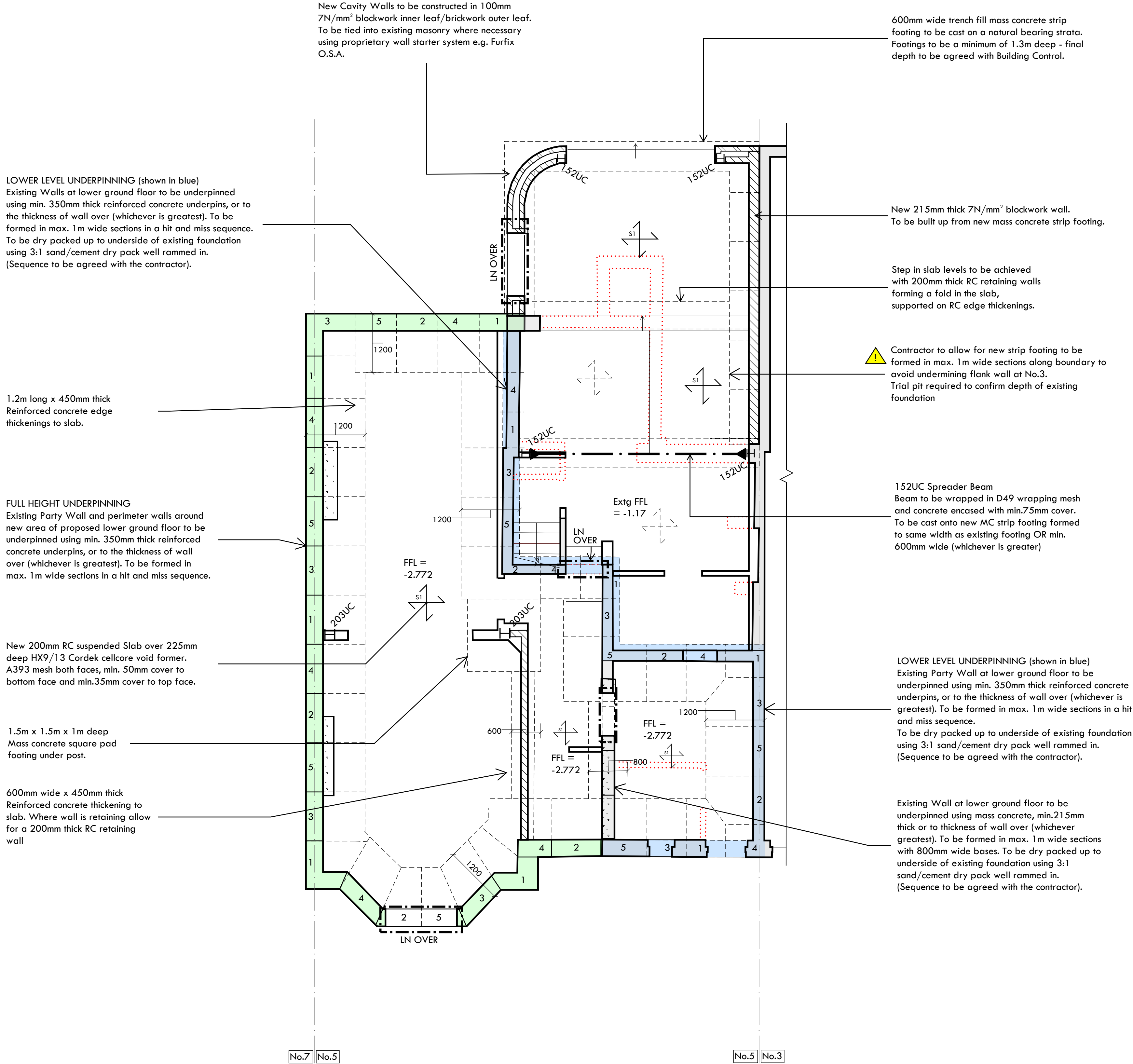
All interested parties, including the Adjoining Owner's Surveyor and their Engineer should be informed and further actions immediately agreed between two of the three Surveyors and implemented by the Building Owner. The Contractor is to ensure that he has 24 hour/7 days a week access to emergency support provision including but not limited to additional temporary props, needles, waling beams and concrete supply at the start of the excavation and prior to any likelihood of this trigger value being reached. If this value is reached the Contractor must without delay provide all interested parties with their plan to implement any emergency remedial and supporting works deemed necessary. The Contractor must be ready to carry out these works without delay if the movement continues and approaches the trigger value above.

Code red trigger value:

All interested parties including Adjoining Owner's Surveyor and Engineer will be informed immediately. Works will stop and be made safe using methods and equipment agreed at the above stage. The Contractor is to ensure that the movement has stopped as a result of the implemented remedial works designed and installed at this stage. The requirements of the Party Wall Act will also ensure that two of the three Surveyors and their advising Engineers shall then enter into an addendum Award, setting out whether or not the Building Owner's works can re-commence and when, and if so agree additional precautions or modifications to the proposals prior to re-commencement.

APPENDIX A – Proposed Structural Scheme Drawings

Key:	
	Structure under
	Structure removed
	New timber rafter/joist span (sizes and spacings as noted on plans)
	Assumed existing joist span direction. SDS to be notified if actual span differs from that shown
DJ/TJ	Double joist / Triple joist - to be bolted together as per SDS specification
	Moment Connection
PS	Mass concrete padstone
LN OVER	New Lintel over opening



All footings to be mass concrete trench fill footings cast onto suitable undisturbed ground and in accordance with Building Control Officers approval on site. Footings to be cast at least 1.3m below ground UNO, and at least as deep as existing foundations, whichever is the deeper. Anticipated Ground Conditions are - LONDON CLAY. SDS Ltd to be informed if found to be otherwise.

General notes:

1. Do not scale from this drawing
2. To be read in conjunction with all other structural drawings and the structural specification
3. To be read in conjunction with all other relevant disciplines drawings and specifications
4. All levels, setting out, waterproofing and fireproofing to be confirmed with the Architect
5. The Contractor is responsible for the temporary stability of the existing and proposed structure throughout the works. The sequencing and method of installation should be carefully considered and the temporary works should be designed and detailed by a suitably qualified person (appointed by the Contractor) prior to commencing the works
6. Contractor to request splices if required for handling purposes

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STUDIO

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Project

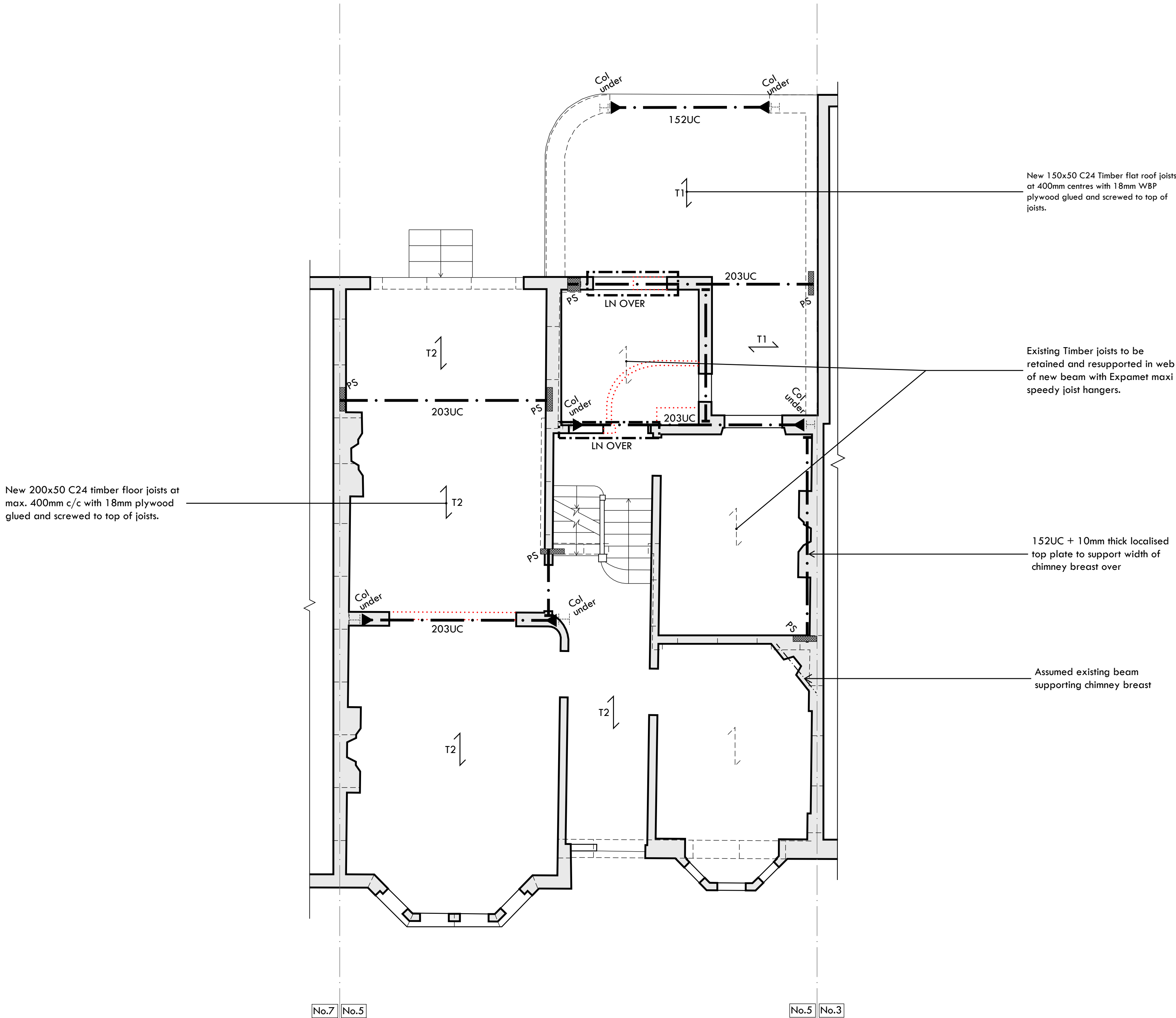
5 Firs Avenue, London, N10 3LY

Drawing Title:

Proposed Lower Ground Floor Plan

Job. No.	Drawing no.	Revision	
225267	S090	Preliminary	
Scale	Date	Drawn by	Rev. no:
1:50@A1	Sep 25	ED	P3

Key:	
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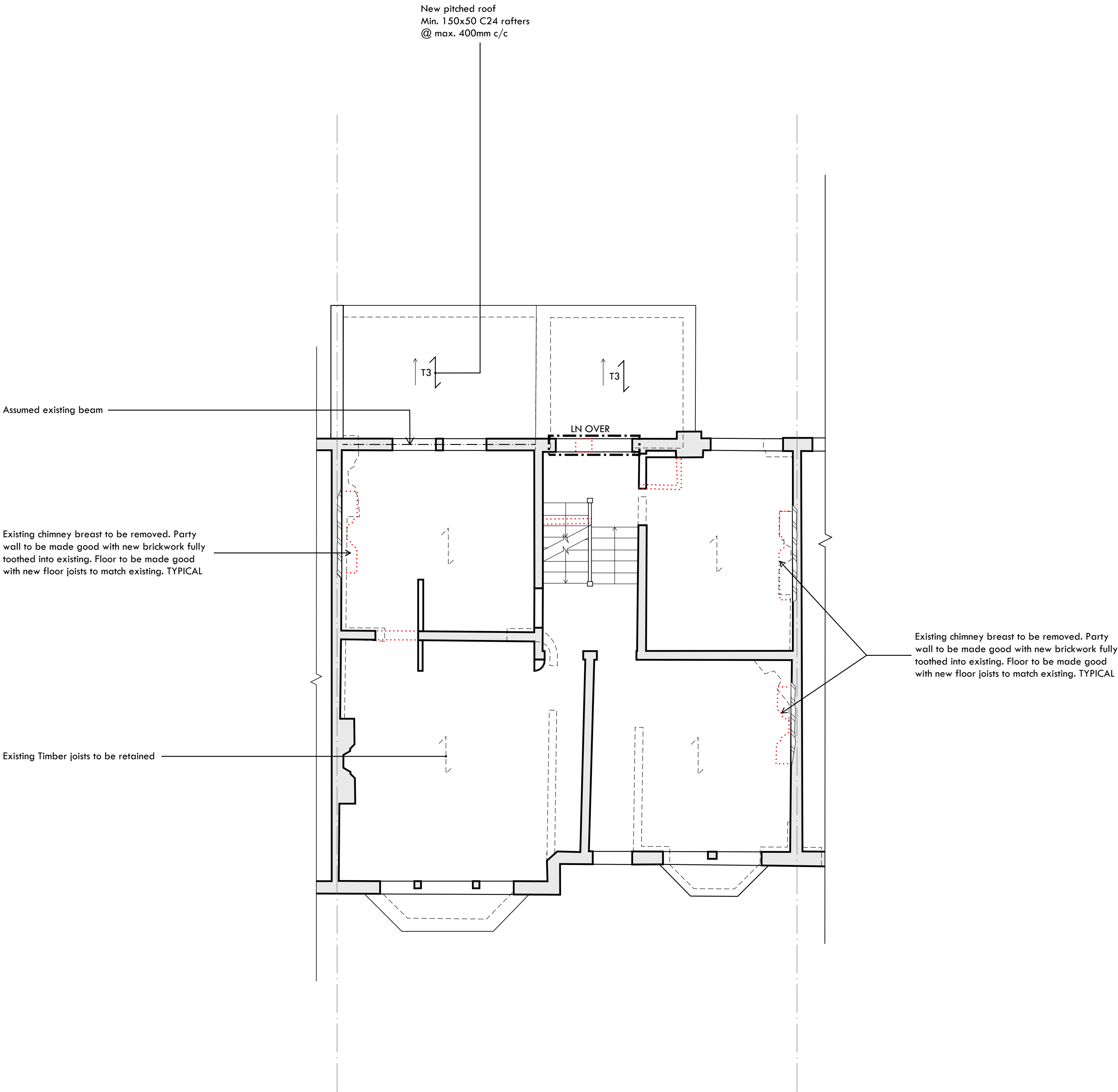


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Project			
5 Firs Avenue, London, N10 3LY			
Drawing Title:			
Proposed Ground Floor Plan			
Job. No.	Drawing no.	Revision	
225267	S100	Preliminary	
Scale	Date	Drawn by	Rev. no:
1:50@A1	Sep 25	ED	P2

Key:	
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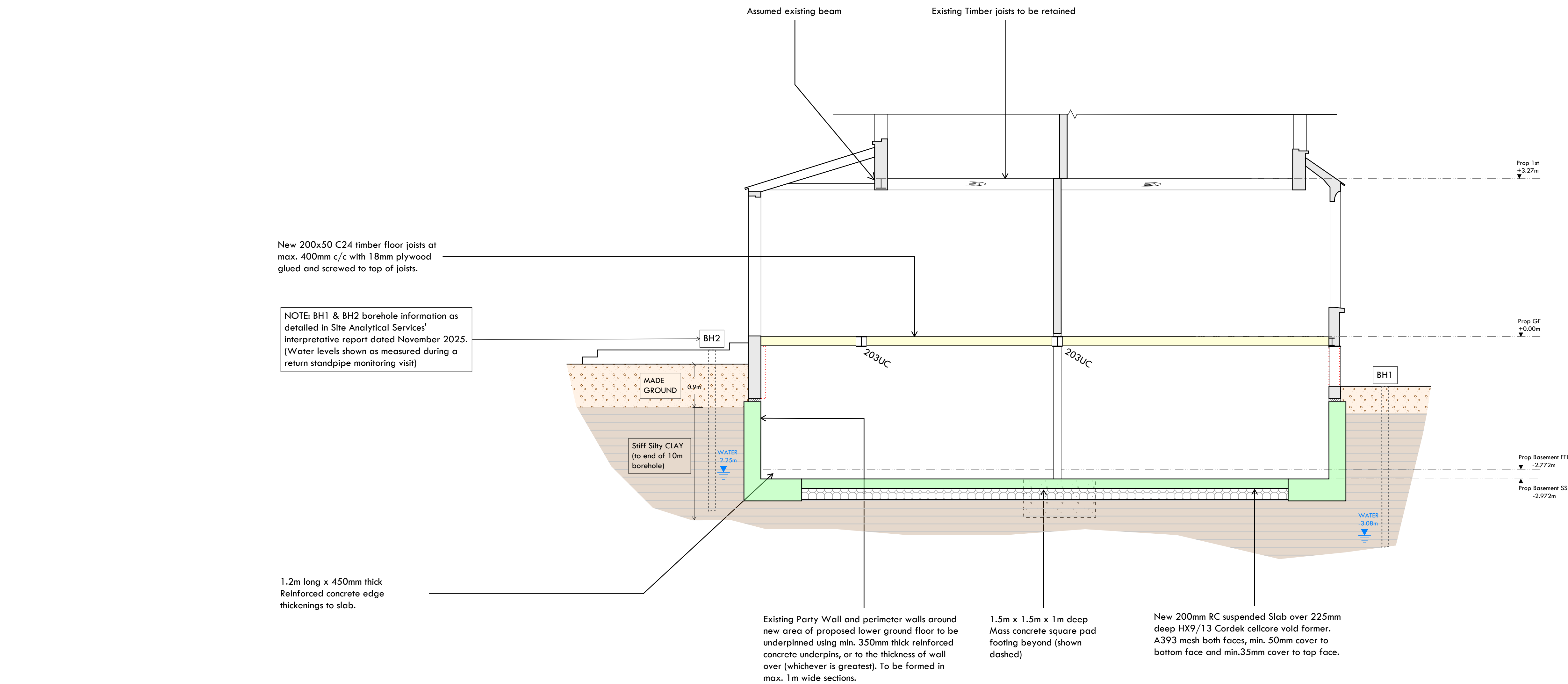
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Project			
5 Firs Avenue, London, N10 3LY			
Drawing Title:			
Proposed First Floor Plan			
Job. No.	Drawing no.	Revision	
225267	S110	Preliminary	
Scale	Date	Drawn by	Rev. no:
1:50@A1	Sep 25	ED	P1



General notes:

1. Do not scale from this drawing
2. To be read in conjunction with all other structural drawings and the structural specification
3. To be read in conjunction with all other relevant disciplines drawings and specifications
4. All levels, setting out, waterproofing and fireproofing to be confirmed with the Architect
5. The Contractor is responsible for the temporary stability of the existing and proposed structure throughout the works. The sequencing and method of installation should be carefully considered and the temporary works should be designed and detailed by a suitably qualified person (appointed by the Contractor) prior to commencing the works
6. Contractor to request splices if required for handling purposes

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Project

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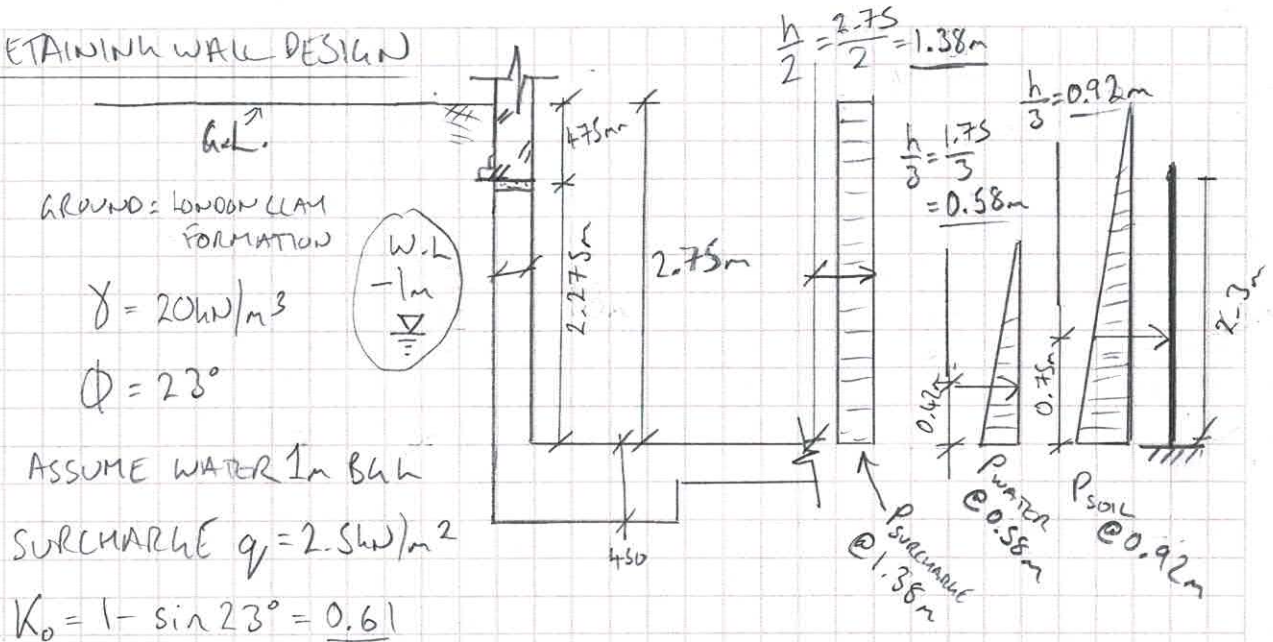
Drawing Title:

Proposed Section B-B

Job. No.	Drawing no.	Revision	
225267	S200	Preliminary	
Scale	Date	Drawn by	Rev. no:
1:50@A1	Oct 25	ED	P2

APPENDIX B– Retaining Wall Calculations

RETAINING WALL DESIGN



ANALYSIS: $P_{\text{soil}} = \frac{1}{2} \gamma h^2 = \frac{1}{2} \times 0.61 \times 20 \times 2.75^2 = 46.1 \text{ kN (WS)}, 62.3 \text{ kN (ULS)}$

$$P_{\text{WATER}} = \frac{1}{2} \rho h^2 = \frac{1}{2} \times 1040 \text{ kg/m}^3 \times 1.75^2 = 15.3 \text{ kJ (SUS & VLS)}$$

$$P_{\text{surin}} = K q_p h = 0.61 \times 2.5 \times 2.75 = 4.2 \text{ kW (SLS)}, 6.3 \text{ kW (ULS)}$$

$$M_{Ed} = (62.3 \times 0.92) + (15.3 \times 0.58) + (6.3 \times 1.38) = \underline{74.9 \text{ Nm}}$$

R.C DESIGN: ASSUME - 350mm, 75mm COVER, H16 MAIN BARS

$$\therefore d = 350 - 75 - \frac{16}{2} = 267 \text{ mm} \quad (0.95d = 253.7 \text{ mm})$$

CONCRETE: $f_{cu} = 28 \text{ N/mm}^2$, $f_{yk} = 500 \text{ N/mm}^2$

Project name: 5 FINS KUBURU

Project number: 225267

Sheet:

Revision:

Date: 6/11/25

Engineer: LD

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RC DESIGN (CONT.)

$$K = \frac{M_{ed}}{bd^2 f_{cu}} = \frac{74.9 \times 10^6}{1000 \times 267^2 \times 28} = 0.038 < K' = 0.168 \text{ OR, NO COMP. REINFT REQ'D.}$$

$$Z = \frac{d}{2} \times \left(1 + \sqrt{1 - (3.53K)}\right) = \frac{267}{2} \times \left(1 + \sqrt{1 - (3.53 \times 0.038)}\right) = 257 \text{ mm}$$

$$Z > 0.95d \therefore \text{TAKE } Z = 0.95d = (253.7 \text{ mm})$$

$$A_{s, req} = \frac{M_{ed}}{0.87 f_{yk} Z} = \frac{74.9 \times 10^6}{0.87 \times 500 \times 253.7} = 679 \text{ mm}^2/\text{m}$$

$$\therefore \text{USE H16s @ 200 c/c } (A_{s, prov} = 1005 \text{ mm}^2/\text{m})$$