CONSTANT

20035/R1/BC/RevP9

Friday, 08 March 2024

13 Kemplay Road, NW3

Basement impact assessment & Structural Method Statement

Constant Structural Design

This report has been prepared for the sole benefit, use, and information for the client. The liability of Constant Structural Design Limited (CSD) with respect to the information contained in the report will not extend to any third party. Our report is provided for the sole use of the named client and is confidential to the client and his professional advisors. All parts of the property that were covered, unexposed or inaccessible were not inspected and therefore we are unable to report that such parts are free from defects.
It should be read in conjunction with all other Consultants reports and specifications and CSD drawings.

AUTHOR	SIGNATURE	DATE
Thomas Ashton MEng (hons) CEng MIStructE Senior Engineer		08/03/2024

REVIEWED	SIGNATURE	DATE
Brian Constant BEng CEng MIStructE MIEI Director		08/03/2024

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1 Non technical summary

With good workmanship, the basement to 13 Kemplay Road can be constructed safely, without imposing more than negligible damage to the neighbouring buildings.

A possible structural sequence of works (and temporary propping), has been outlined in this report. Movement monitoring is recommended as a precaution to ensure that works stop, and issues are rectified should the movement exceed what has been predicted.

The proposed development will not increase flood risk at the site or in the surrounding area

More detailed non-technical summaries for the Ground Movement Assessment and Hydrogeological Impact Assessment are included in section 7.

For screening and scoping assessments for surface water/groundwater flooding, refer to the separate report issued by H Fraser Ltd.

For the screening and scoping assessment for slope stability, refer to the separate report issued by Ground and Project Ltd.

Qualification for assessments
Land stability
Mike Sumersgill (MICE) (refer to Land stability assessment for signature)
Jon Smithson (CGeol) (refer to Land stability assessment for signature)
Assessments made in coordination with Chartered Geologist overseeing the ground investigation/hydrogeological impact assessment.

Surface flow and flooding
Hannah Fraser (CGeol FGS) – Hydrogeologist (refer to Hydrogeological assessment for signature)

Subterranean (groundwater) flow
Hannah Fraser (CGeol FGS) – Hydrogeologist (refer to Hydrogeological assessment for signature)

SMS
Thomas Ashton (MIStructE)
Thomas Ashton is chartered with the Institution of Structural Engineers. He has 15 years of experience working on civil and structural engineering projects, including geotechnical design and basement insertions in Central London designing both the temporary and permanent structural works.

2 Introduction

Constant Structural Design has been to provide structural advice and a report to accompany their planning submission for proposed new build end of terrace property.

This report is to be read in conjunction with the Basement Impact Assessment by H Fraser Consulting, which includes a desk study, screening and scoping exercise concluding in an impact assessment of the proposed basement excavation and construction.

The purpose of this report is to outline in more detail the proposed permanent structure of the basement. It also includes outline sequencing and temporary works required for the excavation.

A basement impact assessment has previously been submitted for the site by Fairhurst (planning application ref. 2015/4373/P). This was for a scheme with a basement of similar area but approximately 1.5m shallower. The construction of the basement has now changed from a sheet piled retaining wall to a secant piled retaining wall with underpinning below the party wall. The impact of the deeper excavation has been assessed in the new report issued by H Fraser Consulting.

Figure 2.1 – Aerial view

3 Desk study

This desk study was carried out as part of the structural review. A more detailed desk study should be referred to in the report by H Fraser Consulting.

3.1 Site history & existing structure

The site is within a conservation area.
There is a slight slope up the terrace to the west.
The end of terrace house appears to have been built in the 1960's.

3.2 Neighbouring structure

13 Kemplay Road is an end of terrace house and shares a party wall with 15 Kemplay Road.
Rosslyn Hill Chapel is to the South East of the site.

3.3 Ground conditions

According to British Geological Survey (BGS) mapping, the local ground conditions are assumed to be London Clay with overlying Claygate Member and made ground.

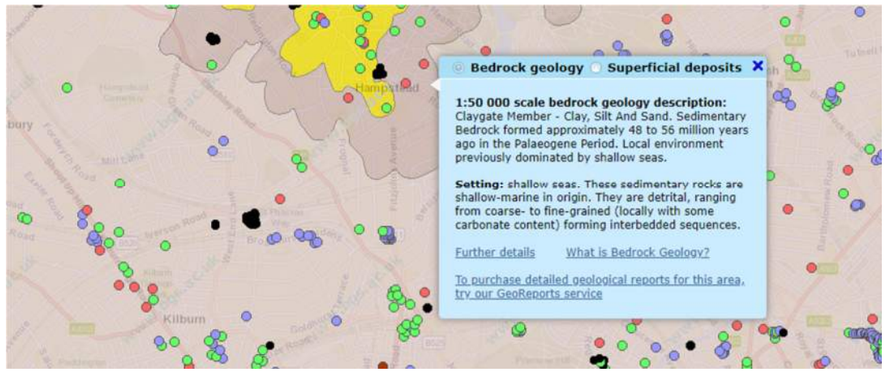


Figure 3.1 – BGS map extract

Intrusive soil survey has been carried out by LMB Geosolutions. The following summarises the report:
Summary of investigation:

- The made ground is underlain by the Claygate Member, which gradually increases in stiffness until classed as London Clay.
- The borehole struck water at 4m and 5.3m bgl. Later monitoring recorded a rise to around 2m bgl.
- The trial pits confirmed the existing footings extended to between 1.35m and 1.5m bgl into the Claygate Member.
- The Claygate Member allowable bearing capacities range between 20-75kPa. The London Clay values range from 120+.

3.4 Flooding risk

Environment agency mapping indicates Very Low risk of river/tidal flooding.
A more detailed Flood Risk Assessment is therefore not required.

Environment agency mapping indicates Very Low risk of surface water flooding.

Figure 3.2 – Environment Agency surface water mapping extract

The Camden SFRA indicates the site is in an area at risk of sewer flooding (zone NW3 1).

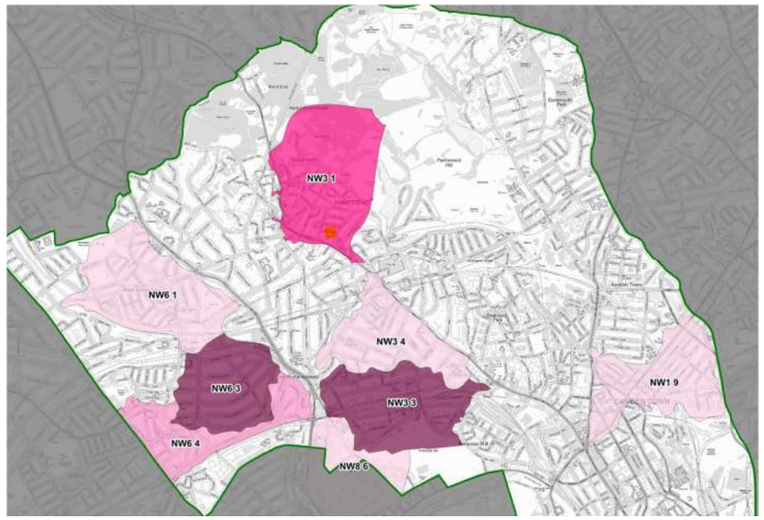


Figure 3.3 – Camden SFRA extract – Internal sewer flooding

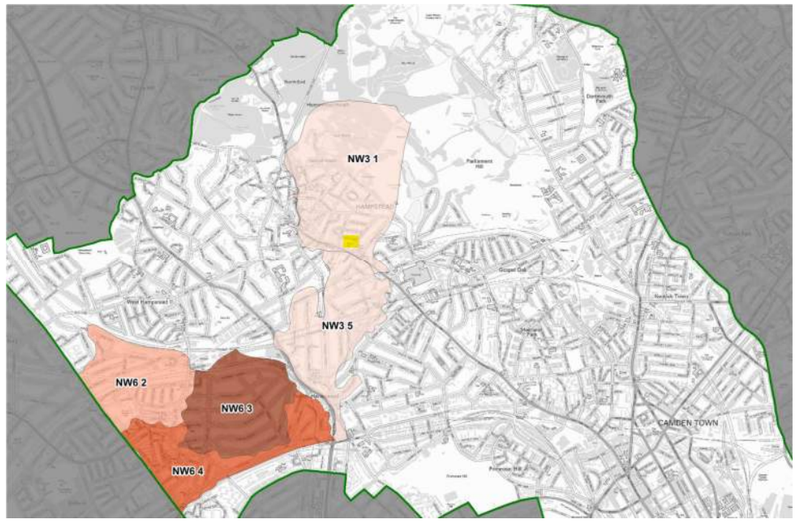


Figure 3.4 – Camden SFRA extract – External sewer flooding

The site is within critical drainage area Group 3_010.

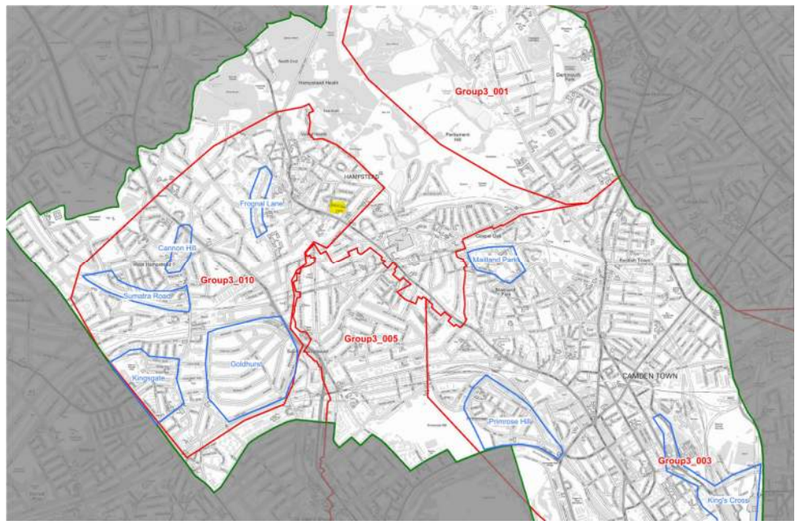


Figure 3.5 – Camden SFRA extract – Critical drainage areas

The only surface water feature within 500m is Hampstead Heath's Number 1 Pond 460m east of the site at c.70m aOD.

The lost river Fleet runs approximately 400m east of the site.

3.5 Underground infrastructure

According to transit mapping there are no London Underground tunnels local to the site. Any existing services local to the excavation will be confirmed prior to construction.

3.6 Trees

A tree survey report was carried out by Tretec in December 2021.

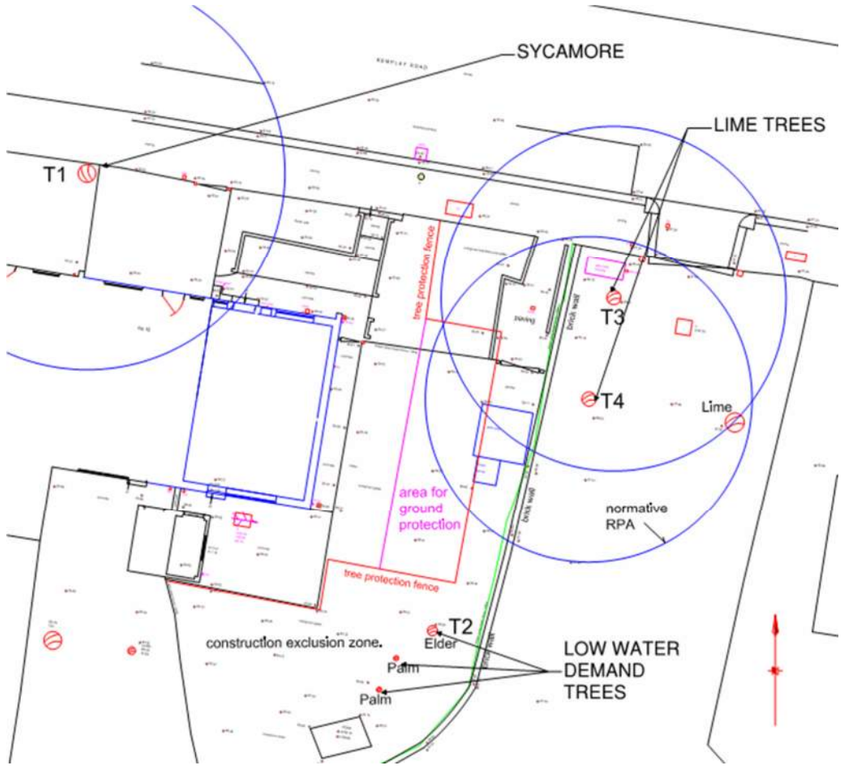


Figure 3.6 – Extract from tree survey report

4 Outline proposals

The existing 2 storey end of terrace house will be demolished back to the party wall.

The new 3 storey end of terrace house will have a full plan basement.

The basement will extend out below the garden with an external rear terrace.

Figure 4.1 – Site plan

The basement retaining walls will typically be piled. This piled wall will be designed to cantilever in the temporary condition.

The party wall will be extended down by underpinning in mass concrete, with waling beams and props installed as the basement in excavated. The reinforced concrete basement box will form the retaining structure in the permanent condition, with the ground floor slab acting as a lateral prop.

Tension piles will be installed below the basement box to design against buoyancy, and heave protection below the basement raft will allow for overburden relief.

As a result, the retained party wall vertical loads will be directed into the ground directly below through underpinning. The new build house loads will be directed into the new piled raft foundation. A vertical movement joint between the two walls will minimise the risk of damage to the neighbouring structure during construction.

5 Structural method statement

5.1 Brief sequence of works

The following method statement outlines one possible sequence of works. This will be superseded by the information submitted by the contractor prior to construction.

1. Erect site hoarding and demolish the existing house back to party wall.

2. Carry out a reduced level dig over the proposed building footprint down to the formation level of the party wall.

3. Construct a piling mat and carry out the piling. Tension piles cast up to basement raft level only.

4. Cast a reinforced concrete capping beam.

5. Cast pad foundations for temporary props.

6. Underpin the party wall.

These pins would generally be formed in short sections of no more than a metre width. Each pin is to be completed and dry-packed, and a minimum of 48 hours must pass before an adjacent excavation can begin.

Seepage is likely to be encountered into the excavations, with local dewatering required. The contractor is to investigate the flow of water to determine whether bentonite injections are required.

7. Install temporary props and waling beams.

8. Excavate the remaining spoil down to basement formation level.

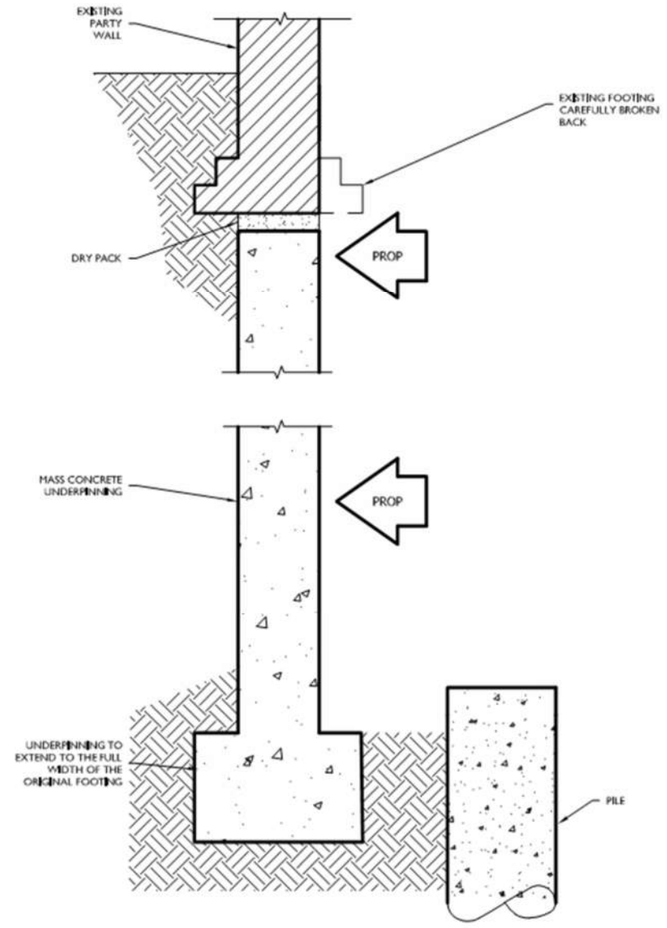


Figure 5.1 – Propped mass concrete underpinning to party wall

9. Install below ground drainage and raft heave protection.

10. Break down the tension piles to cut-off level and cast the new reinforced concrete basement raft.

11. Cast the retaining walls.

The retaining wall adjacent to the party wall will be cast in 3 pours allowing the temporary propping to be moved from the underpinned wall to the new retaining wall.

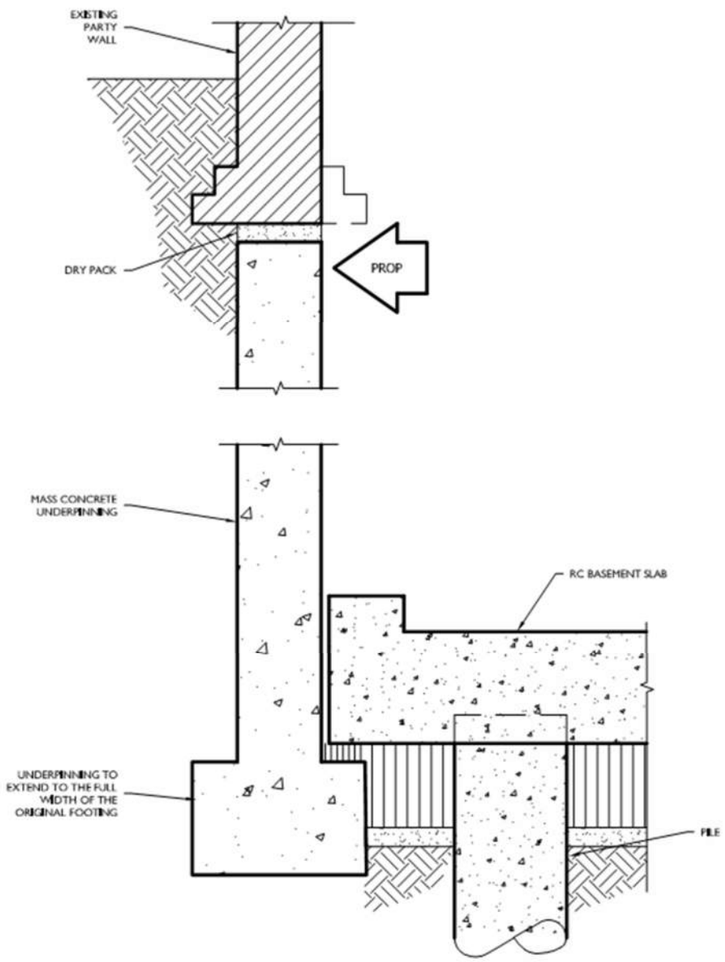


Figure 5.2 – Basement raft kicker before reinforced concrete retaining wall is cast in levels

12. Cast the ground floor slab and remove temporary propping.

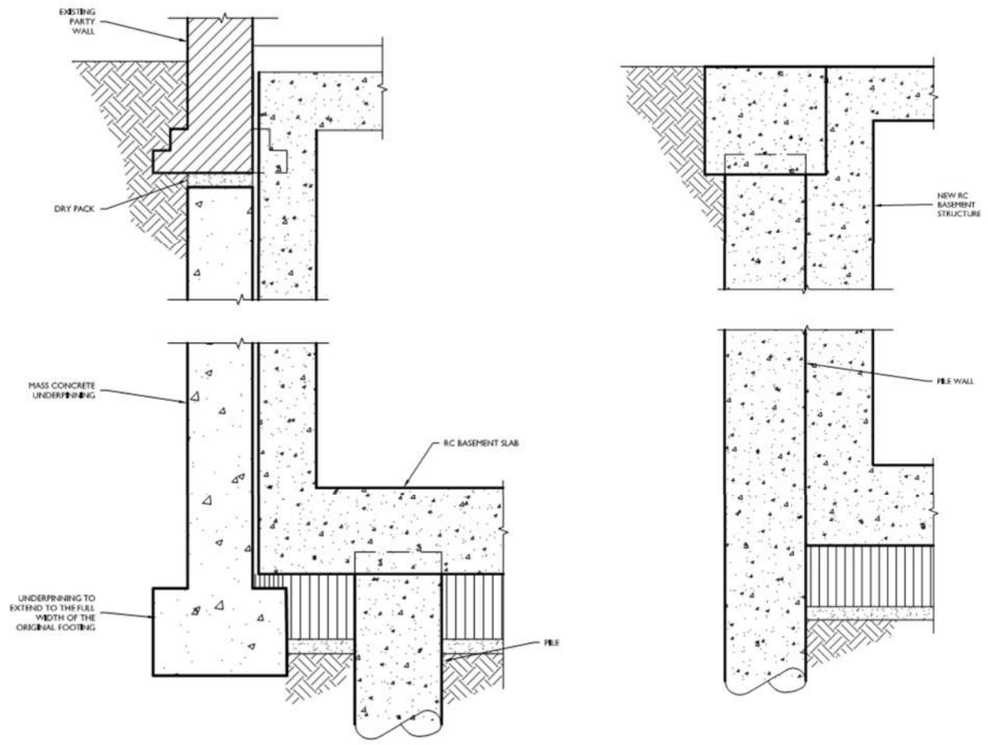


Figure 5.3 – Retaining wall sections

13. Install trench shoring to allow for perimeter drainage trenches to be excavated and filled.

5.2 Impact of retained trees on the proposed substructure

The ground investigation typically found clay with medium volume change potential. The basement extends below the zone of influence, and for the perimeter footings of the kitchen annex, the following required depths have been calculated.

TREE	NHBC SUGGESTED FOOTING DEPTH
Sycamore	1.5 m
Lime	1.5 m
Lime	1.75 m

Table 5.1 – Tree influence on foundation depth

For the impact of the basement excavation on the retained trees the arboriculturalist report submitted with this application should be referred to.

5.3 Superstructure framing

The 3 storey building over will be constructed with timber joist floors, isolated steelwork and load bearing masonry.

Stability will be ensured through the perimeter masonry shear walls and the internal shear wall adjacent to the stair.

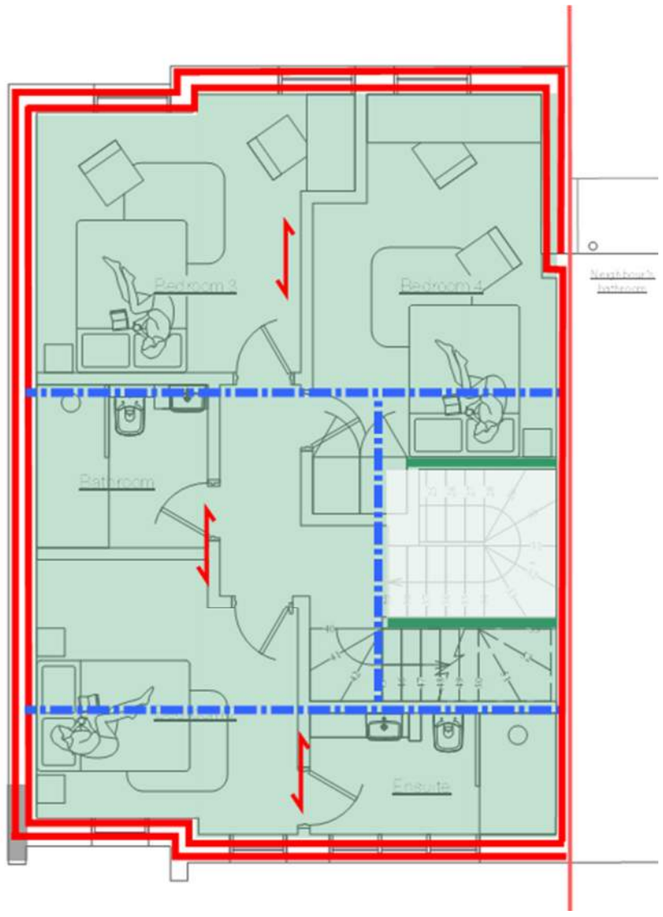


Figure 5.4 – 1st floor plan

5.4 Temporary works proposals

As the piled retaining wall will be designed to cantilever in the temporary condition, the main temporary works required will be to the underpinned party wall.

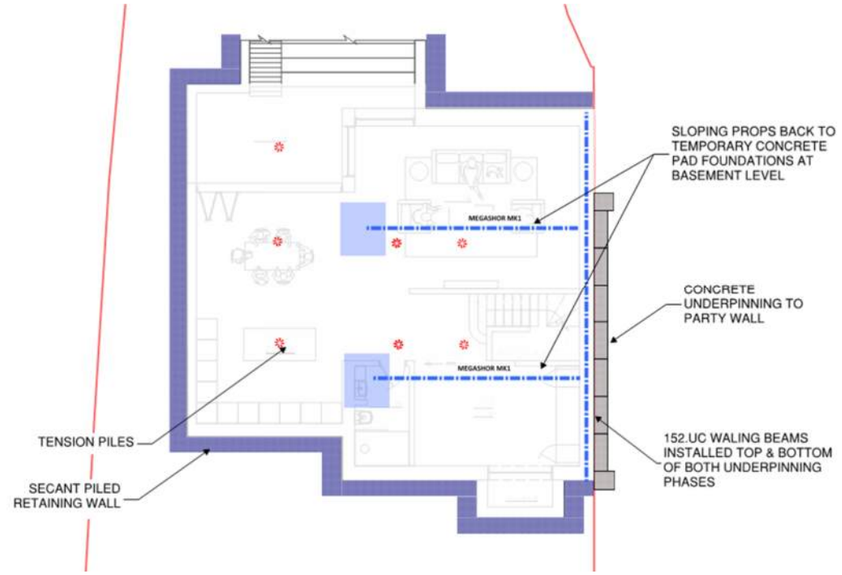


Figure 5.5 – Temporary propping plan to the underpinned party wall

Excavations will allow the raking props concrete pads to be installed at basement level.

The sloping props and waling beams will then be installed top and bottom of each underpinning phase.

Casting the basement raft will allow the bottom props to be removed. The mid-level props will be transferred to the reinforced retaining wall as it cures. Finally, once the ground floor slab and internal basement walls are cast the remaining props can be removed.

5.5 Basement waterproofing and drainage

The reinforced concrete walls forming the basement are designed to resist the water pressure and the reinforcement is designed to have maximum crack widths less than the acceptable values from the codes. The water tightness of the basement will be in accordance with BS8102. A Grade 3 performance level should be adhered to.

GRADE OF BASEMENT*	USAGE*	PERFORMANCE LEVEL*	PERFORMANCE LEVEL**	
			RELATIVE HUMIDITY**	DAMPNESS
1 (Basic utility)	Car parking Plant rooms (excluding electrical equipment) Workshops	Some leakage and damp areas tolerable. Local drainage may be required	> 65% normal UK external range	Visible damp patches may be acceptable
2 (Better utility)	Workshops and plant rooms	No water penetration but damp areas tolerable***	35–50%	No visible damp patches***
3 (Habitable)	Ventilated residential and commercial areas	Dry environment. No water penetration. Additional ventilation, dehumidification or air conditioning appropriate to intended use	40–60% 55–60% for restaurants in summer	None acceptable. Active measures to control internal humidity may be necessary

* Based on Table 2 of BS 8102[16].

** Based on Table 2.2 of CIRIA Report R140[20].

*** A damp area is defined under BS 8102 as an area which, when touched, might leave a light film of moisture on the hand but no droplets of water (i.e. beading). 'Damp areas tolerable' may be considered to be inconsistent with 'no visible damp patches' to CIRIA R140. Where needed, clarification of expectation should be sought from the client.

Table 5.2 – Basement grade

Achieving the required grade of performance in the grade 3 spaces will be ensured through adoption of a type C drained cavity system. In addition to this either a type A or a type B integral waterproofing system will be adopted, with a waterproof concrete mix and water bars installed at all joints in the reinforced concrete box.

The below ground drainage will pump up from basement level to retain the existing connection into the sewer.

A one-way valve will be used when connecting to the existing sewer to prevent the sewer flooding the property.

6 Construction management

6.1 Contractor qualifications

The client should appoint a contractor with suitable experience in basement construction within the London area. They should be a member of the Considerate Contractors Scheme.

The underpinning contractor should be a registered member of the Association of Specialist Underpinning Contractors.

6.2 Construction waste and traffic management

Access for materials and removal of spoil will be from the front of the property on Kemplay Road. The frequency of skip removal trucks during the demolition and excavation, and the concrete mixers during the construction, will be confirmed by the contractor for approval prior to works starting onsite.

Details will be included in the Contractor's Site Waste Management Plan.

6.3 Noise, vibration and dust

The demolition will take place within a hoarded area. Any scaffolding will be clad in monarflex to limit noise and the spread of dust.

All concrete and masonry demolition work will be regularly watered down to reduce airborne dust. The pavement adjacent to the site will be cleaned daily.

Concrete to be broken out using non percussive techniques.

Working hours to be restricted as required by the Local Authority.

6.4 Construction monitoring

The following monitoring is recommended during the construction period:

Contractor to allow for weekly monitoring of 6 locations on the neighbour's front and rear façades throughout the basement excavation works. Final regime/locations to be confirmed with SE.

- Monitoring to be carried out by an approved independent monitoring company.
- Readings to be taken at the same time of day.
- Superstructure movement of +/- 4mm recorded at any of the predefined locations to be communicated to SE immediately.
- Superstructure movement of +/- 8mm recorded to result in the works stopping and being made safe. SE to be notified immediately.

7 Basement impact assessment

7.1 Ground movement assessment

Referring to the separate Ground Movement Assessment, the risk of movement and damage to the development and surrounding buildings is low.

A damage category of 1 has been determined in accordance with the Burland scale.

The party wall foundation will be extended down into stiff London Clay. The resulting differential depth in footings for no 15 Kemplay Road has been taken into account.

Refer to separate report for full screening and scoping according to Camden BIA proforma.

7.2 Hydrogeology assessment

The Claygate Member is designated a secondary aquifer, with sandy lenses, whilst the London Clay below is an unproductive strata. There is a low risk of groundwater flooding at the surface.

The proposed basement will extend below the water table, likely requiring dewatering.

Base on available evidence, there are no significant impacts predicted to the wider hydrogeological environment, including cumulative impacts.

The site is mapped as having negligible risk of groundwater flooding.

Refer to separate report for full screening and scoping according to Camden BIA proforma.

7.3 Flood risk, river and tidal flooding

The site is located within Environment Agency flood zone 1. As the site is below 1 hectare in size a Flood Risk Assessment is not recommended.

7.4 Surface water and sewer flooding

There will be a small increase in the proportion of hardstanding across the site. Refer to H Fraser report.

Mapping indicates the site is at risk of sewer flooding, which will be taken into account in the below ground drainage design.

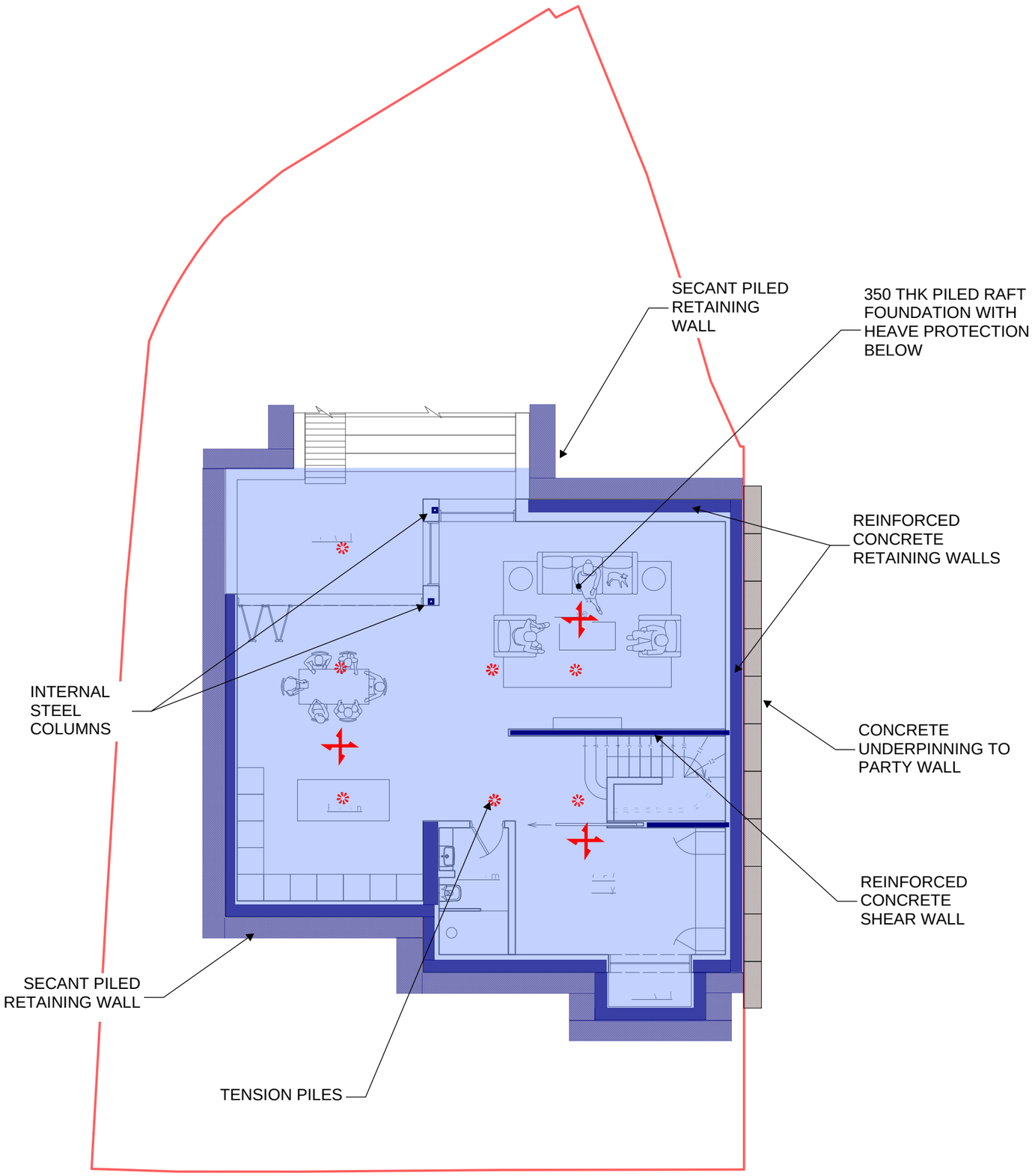
7.5 Trees

The tree survey report recommendations have been taken into account by the architect in the design of the basement footprint.

The tree protection measures and proposed methodology in the report should be adhered to.

Appendices

Appendix A – Stage 3 structural drawings



NOTES

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4. WATERPROOFING TO ARCHITECTS DETAILS.

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- CONTRACTOR IS TO ENGAGE A SPECIALIST TEMPORARY WORKS ENGINEER TO CARRY OUT ALL TEMPORARY WORKS DESIGN & SEQUENCING.

NOT FOR CONSTRUCTION

NOT FOR COSTING

STEEL COLUMN

LOAD BEARING STRUCTURE UNDER

RC SLAB TBD

TIMBER JOISTS/RAFTERS - 200x50 C24 JOISTS AT 400 CTRS UNO SHEATHED IN 18mm PLY

STEEL BEAM

TIMBER BEAM - ASSUME DOUBLE JOIST/RAFTER UNO

TIMBER STUDWORK - 100x75 C24 STUDS AT 400 CTRS SHEATHED IN 12mm PLY

PROPOSED SPAN DIRECTION

ASSUMED EXISTING SPAN DIRECTION

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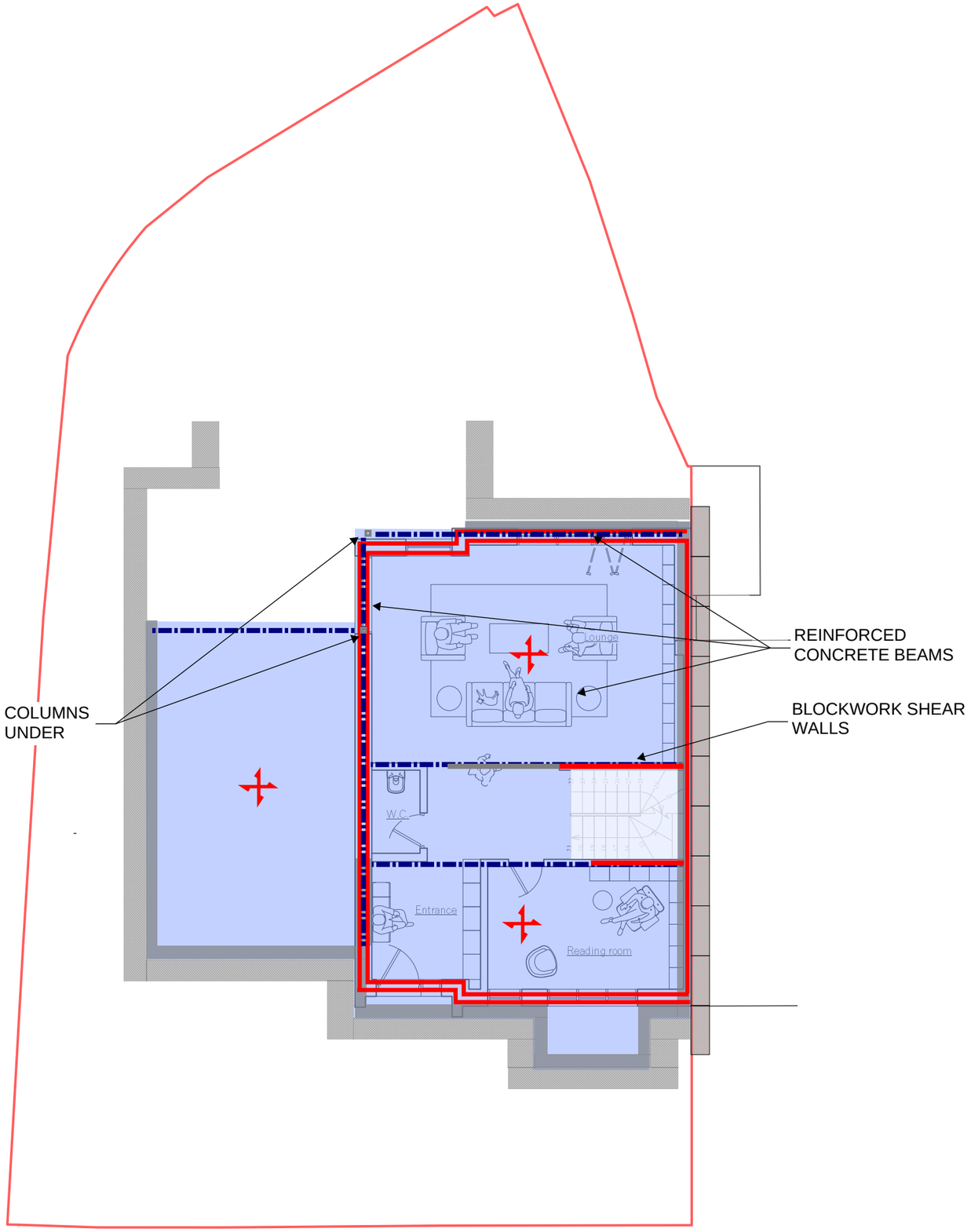
BASEMENT LEVEL



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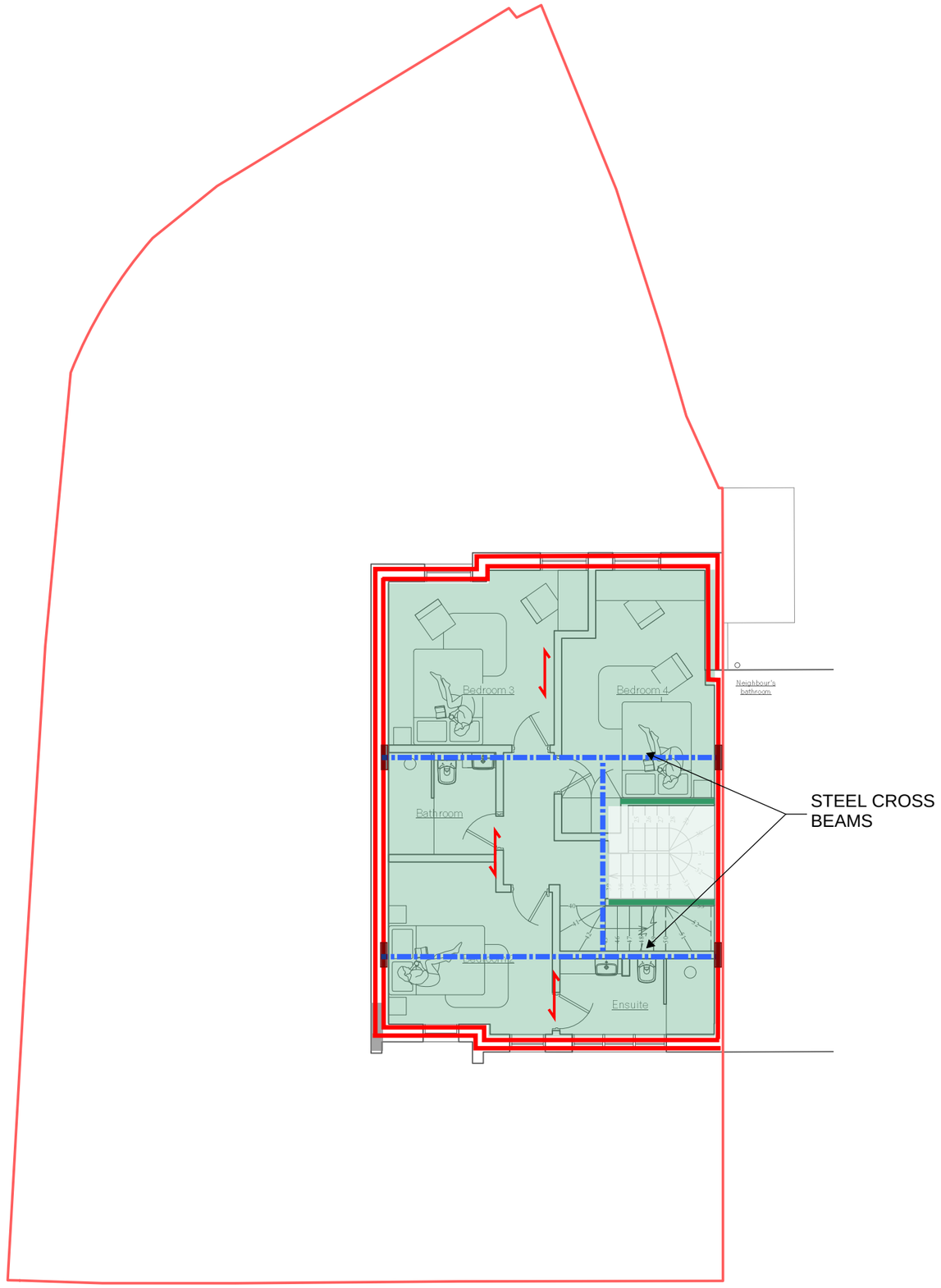
GROUND FLOOR



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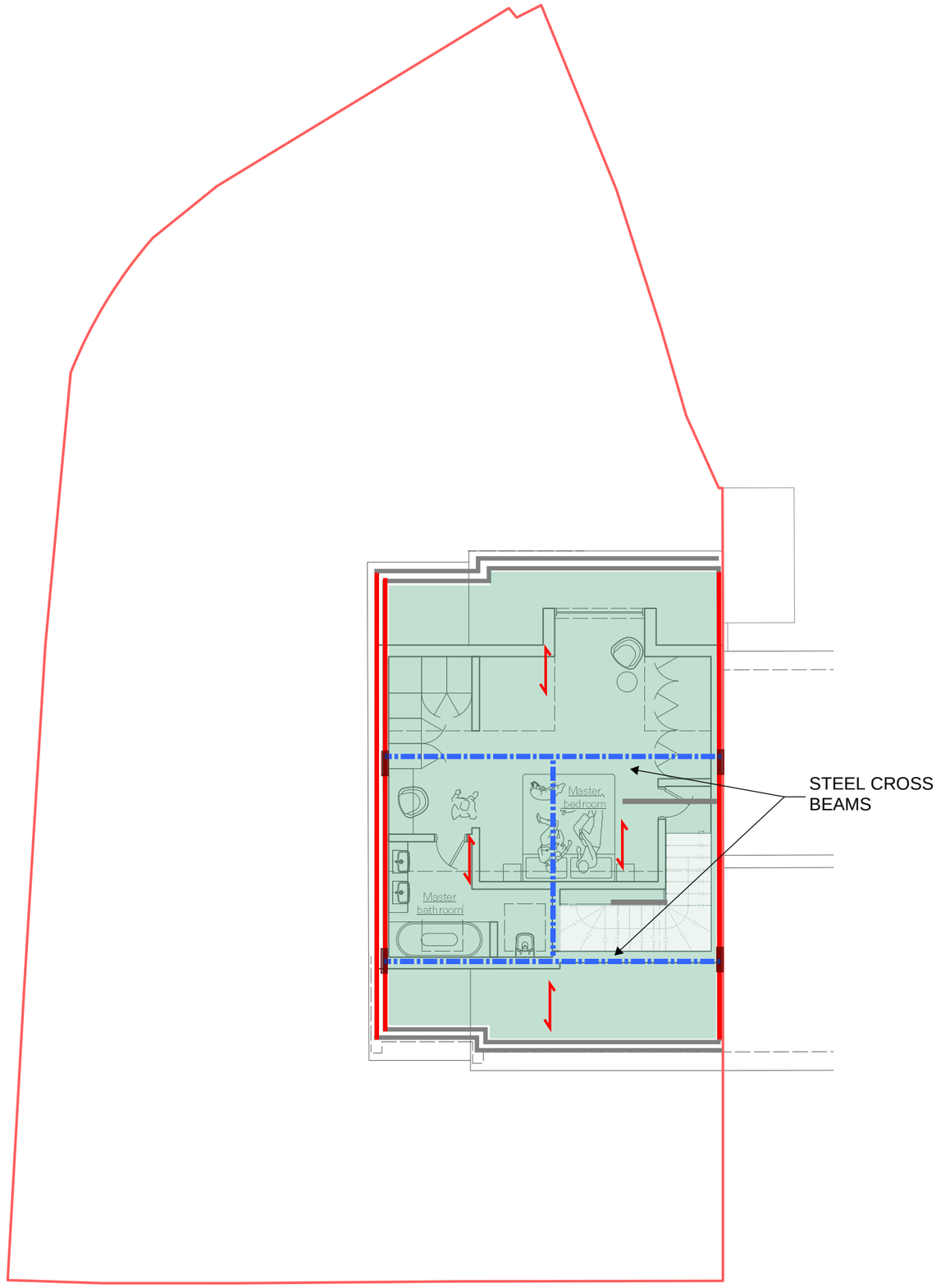

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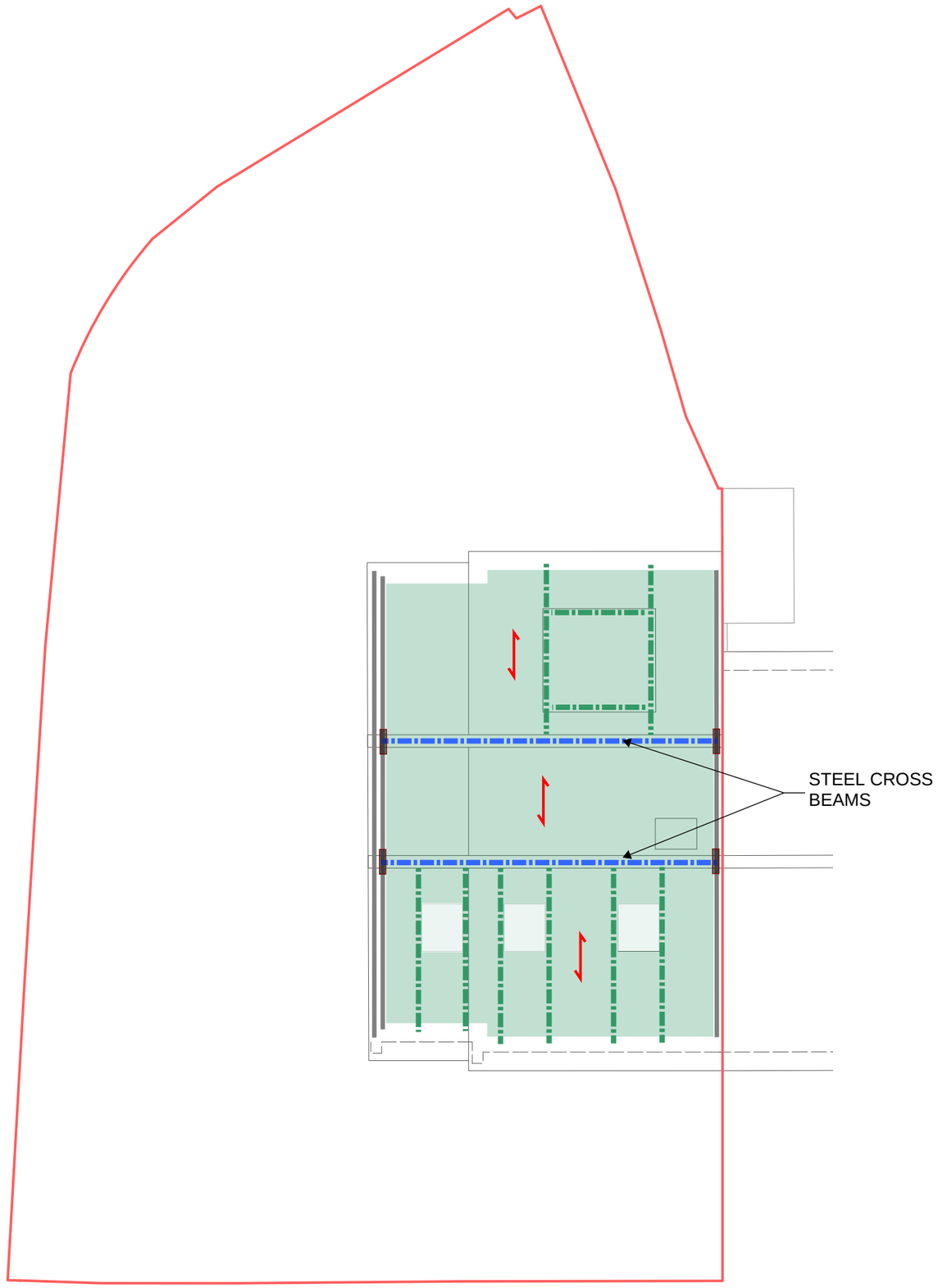

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