Basement Impact Assessment

106 King Henry's Road
London
NW3 3SL

Issue 30/08/2017

SolidGeometry
STRUCTURAL ENGINEERS

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Report Title	Basement Impact Assessment
Project	106 King Henry's Road
Client	Gidon & Debra Katz

Contents

1.0 Introduction

This report has been prepared as a supporting document to the planning application for the proposed remodelling and basement works at 106 King Henry's Road.

The proposals include internal rearrangement and remodelling of the existing property together with the addition of a single storey 3.5m deep basement beneath the full footprint of the property, including the rear paved courtyard.

This report presents the principles of the proposed structural scheme along with the envisaged sequence of construction. Together with input from Soiltechnics Environmental & Geotechnical Consultants it also provides comprehensive ground investigation data and sections covering investigation of Ground Stability, Surface Flow and Flooding and Subterranean (Ground Water) Flow. The screening, scoping and impact assessment for each are included in order to cover the requirements of Camden Planning Guidance CPG4.

2.0 Site and Existing building

The existing building is a two storey terraced house built in the early 1970's on a relatively level site near the junction of King Henry's Road and Lower Merton Rise.

The building superstructure consists of external cavity wall construction with a ground bearing concrete ground floor, a predominantly concrete beam and block first floor and a timber flat roof. The internal walls are loadbearing blockwork at ground floor and timber studwork at first floor level. The building and the neighbouring structures appear undamaged and in generally good condition.

Based upon two trial pits at the front and rear of the property the building is founded upon concrete strip foundations approx. 300-500mm in depth.

The building has a small paved areas to the front and the rear within the footprint of the site and access to the rear to a large communal garden.

More detailed information on the site and it's history can be found in Section 5.0 and the comprehensive Ground Investigation Report submitted under separate cover.

Arial View

Streetview

Front Elevation From King Henry's Road

Rear Elevation From Communal Garden

3.0 Structural Proposals

Drawings indicating the proposed structural arrangement and details can be found in Appendix B.

The site geology consists of 0.5m-1m of made ground overlaying stiff London Clay. Geological records indicate that the permanent water table is well below the proposed excavation depth, however the contractor should have plans in place to exclude water from the excavations in the event that perched water or surface water are present.

It is proposed to underpin the perimeter walls (front wall and side/rear party walls) of the building to around 3.5m depth. The underpinning will be extended around the full perimeter of the property at the rear to include the rear courtyard, thereby creating an approximately square, reinforced concrete basement box.

Reinforced concrete underpins, reinforced in both directions, are proposed in order to limit the number of construction operations along with excavation and material volumes and potential disruption to neighbours. This form of construction will also minimise the intrusion of the new basement walls inboard of the existing ground floor walls thereby maximising available space in the new basement.

The underpinning will be carried out together with drypacking using traditional techniques in max 1m lengths in a hit and miss sequence to be agreed with the contractor. The walls of the underpinning will be 350mm thick, which is sufficient to enable a cantilevering solution, and will come inboard of the internal face of the existing cavity walls to enable a connection with the ground floor slab, sitting slightly above. Generic illustrations of the detailed sequencing to be employed for the underpinning stages can be found in Appendix C.

The base of the underpins and basement slab will be 400mm thick to provide a stiff integral connection with the underpin walls in the final condition. As with the underpins the main slab will be fully reinforced in both directions to resist any upward heave or water pressures. The basement mass will provide resistance to buoyancy when combined with the weight of the rest of the building. The underpinning walls will be propped at multiple levels throughout the construction of the basement using a specialist designed adjustable propping system until casting of the basement box is complete. This will prevent any lateral movement of the basement at all stages of the works.

It is proposed that excavation is carried out either by hand, in confined works, or micro excavator as appropriate.

Due to the extensive remodelling of the rear wall of the building it is proposed to fully demolish the existing wall to facilitate unobstructed basement construction and rebuild it using modern insulated cavity wall construction once the basement is complete.

The new ground floor slab is to be 200 thick insitu reinforced concrete construction seated on the internal edge of the underpins to avoid connection to the perimeter cavity walls and the associated disturbance to neighbours. The slab will cantilever out into the new terrace area, using thermally isolated structural joints, to form the floating terrace over the new rear lightwell.

The existing beam and block first floor is to be retained and incorporated into the new scheme. As the floor is likely to be built into the cavity perimeter walls this again will avoid the need to cut out and form bearings for a new floor system and the disturbance that would be caused by removing the beam and block and replacing with a new floor construction. The positions of the main internal loadbearing wall lines in the existing building are to be retained in the new scheme, thus facilitating this re-use.

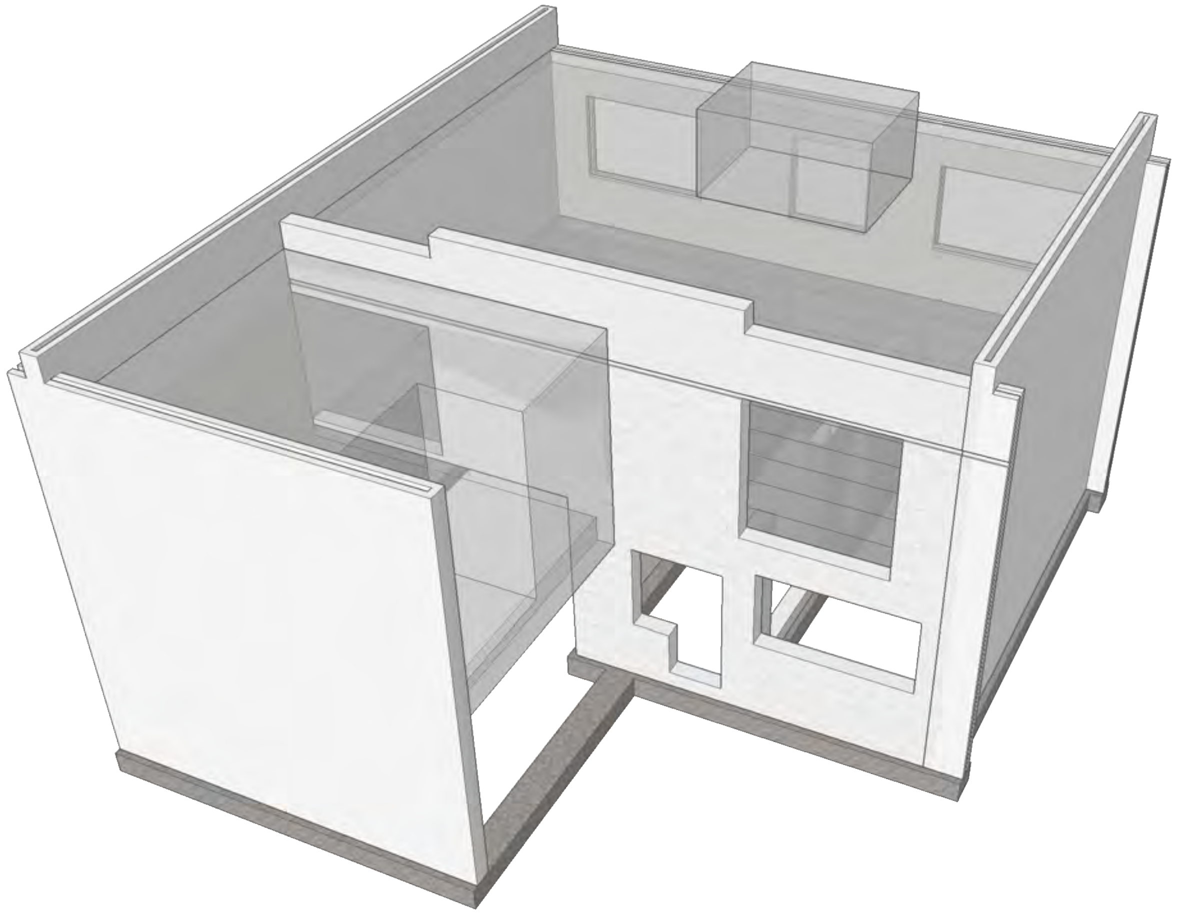
The area of first floor to the rear of the property that is currently of timber construction will remain so in the new scheme.

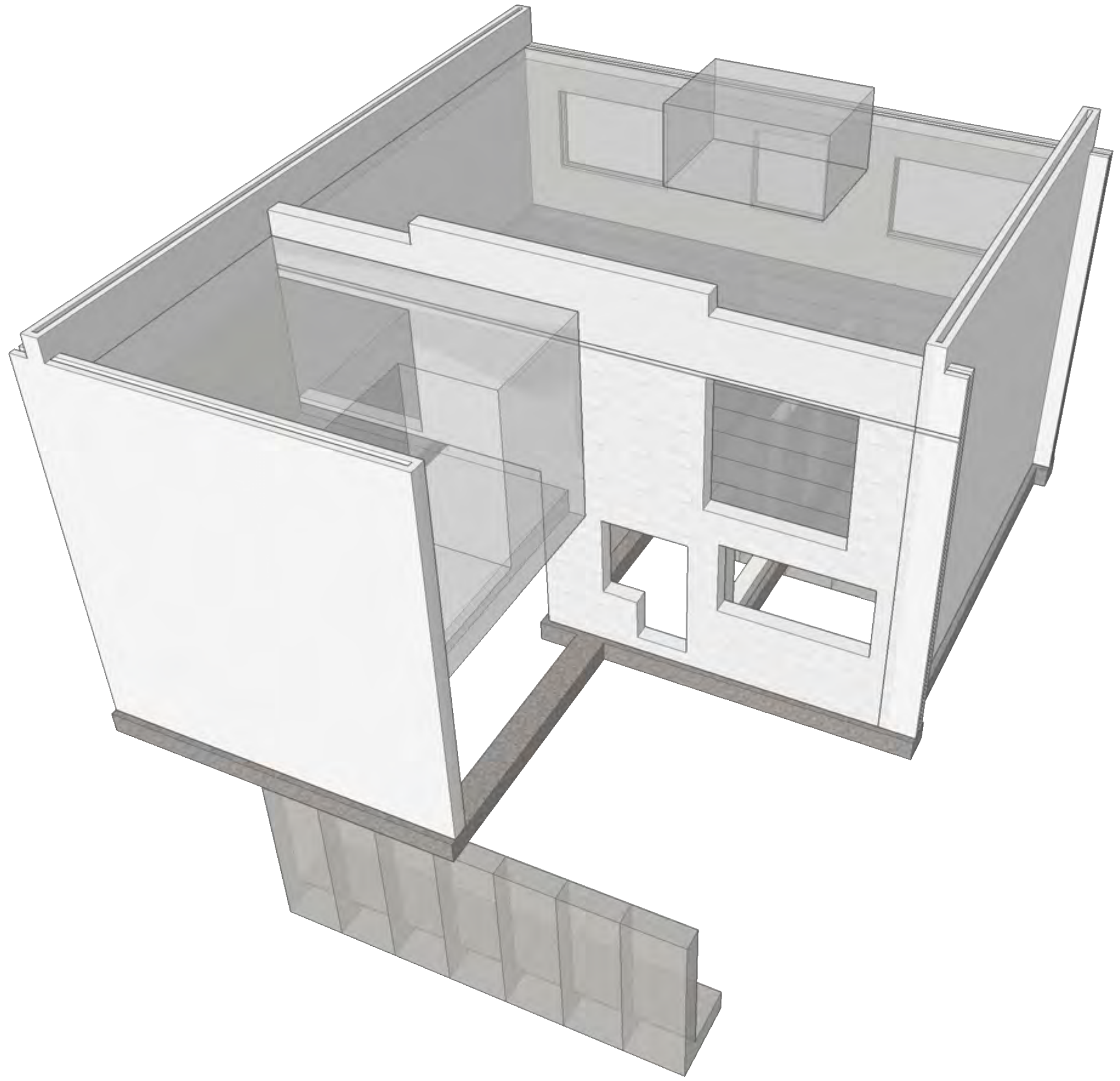
The roof will be replaced but also remain as a traditional timber joisted construction to match the existing.

Internal walls will be loadbearing blockwork below first floor level and either lightweight blockwork or timber studwork above.

4.0 Construction Sequence

The following pages set out a proposed construction sequence. As explained in section 3.0 the approach taken and proposed sequencing has been developed so as to minimise any noise and disturbance to neighbouring properties and enable as short a construction programme as possible.



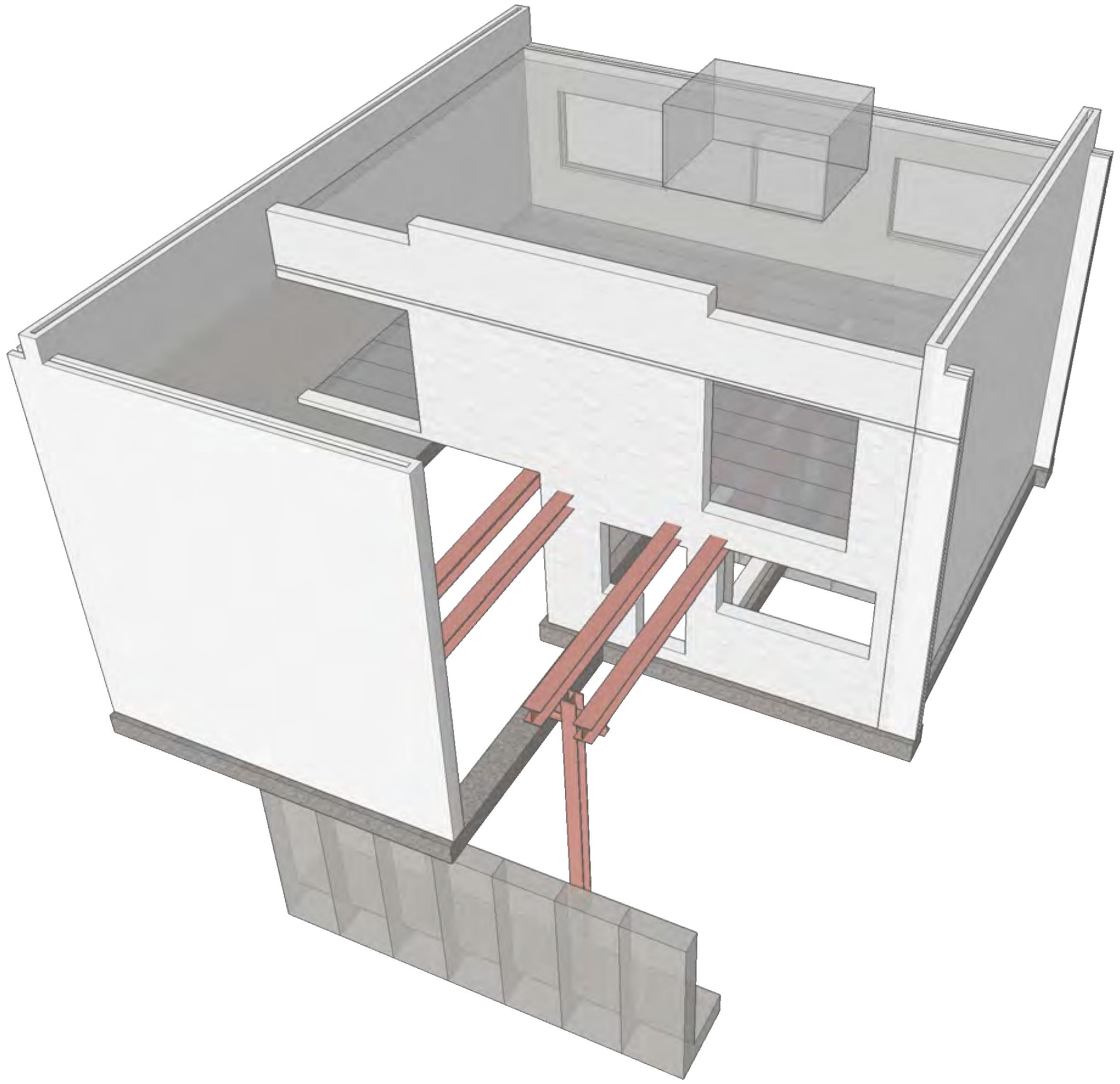


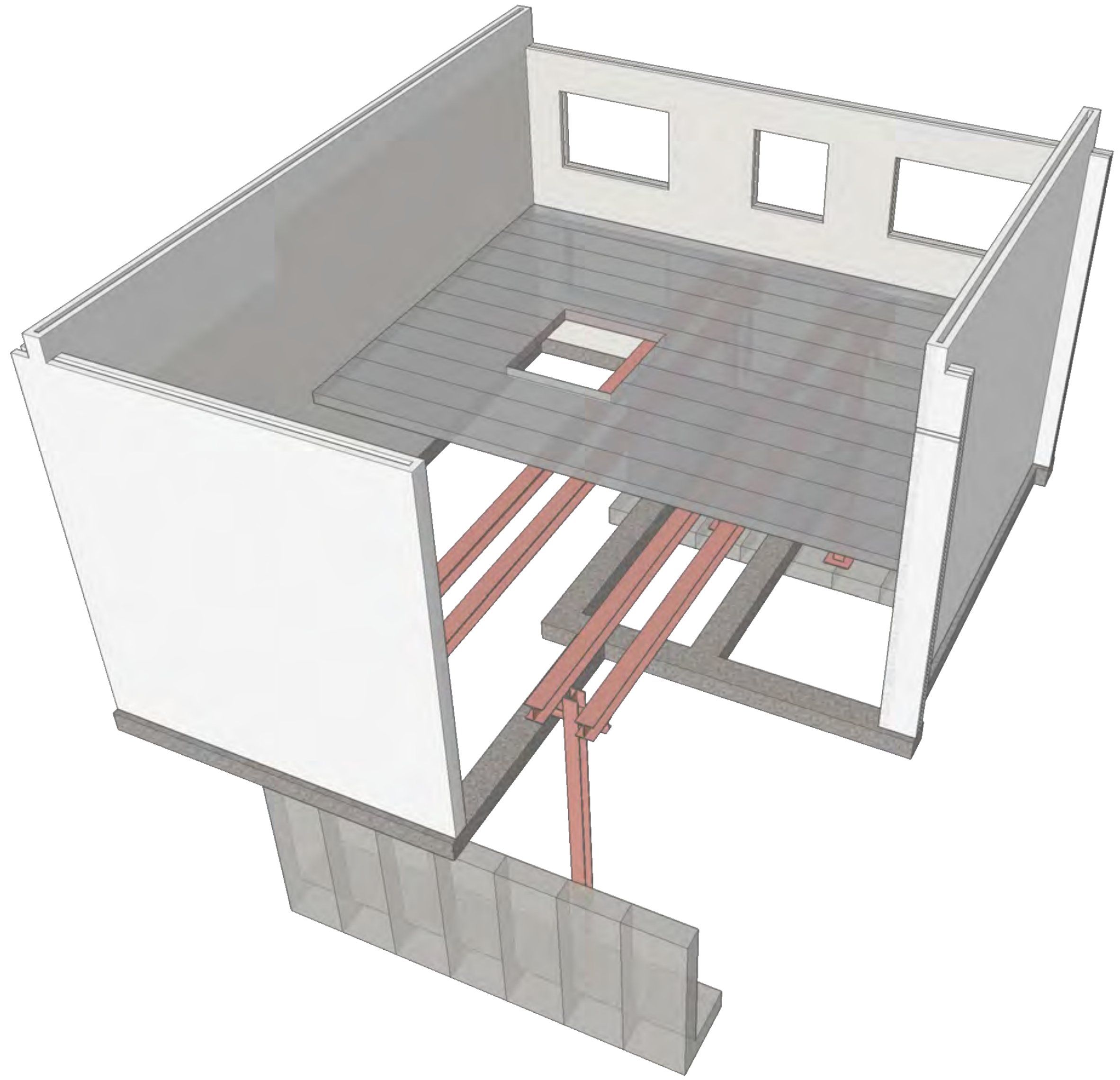
Stage 1

- Install vertical and horizontal movement monitoring system on existing building and surrounding ground.

Stage 2

- Install underpinning & drypack locally in hit & miss sequence to front and rear to provide bases for temporary steelwork.
- All excavation of underpinning bases to be by hand.



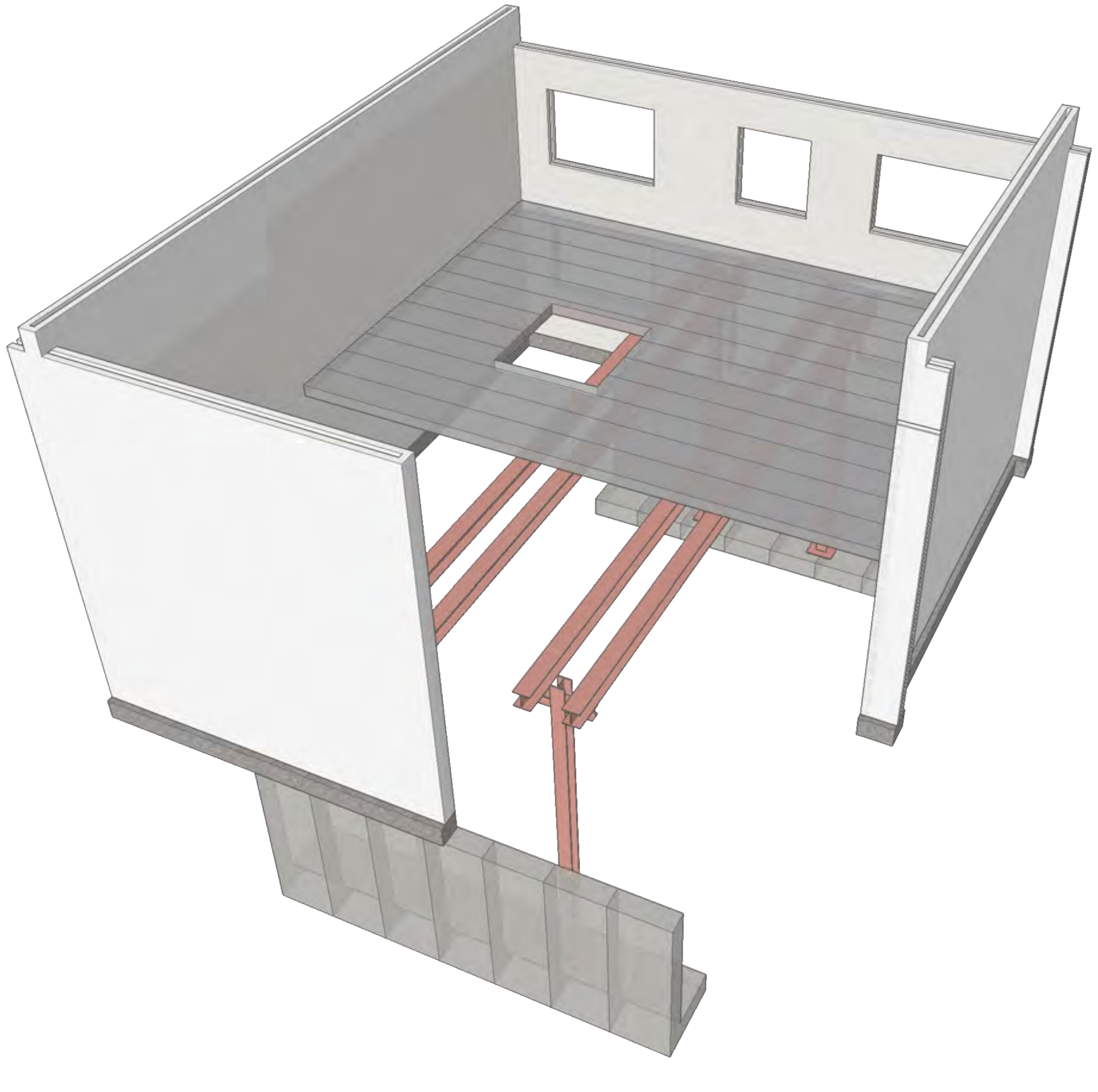


Stage 3

- Install temporary support frames beneath 1st floor beam & block floor spans.
- Remove timber and glazed structure in rear quadrant.
- Install temporary propping to rear party wall as required.

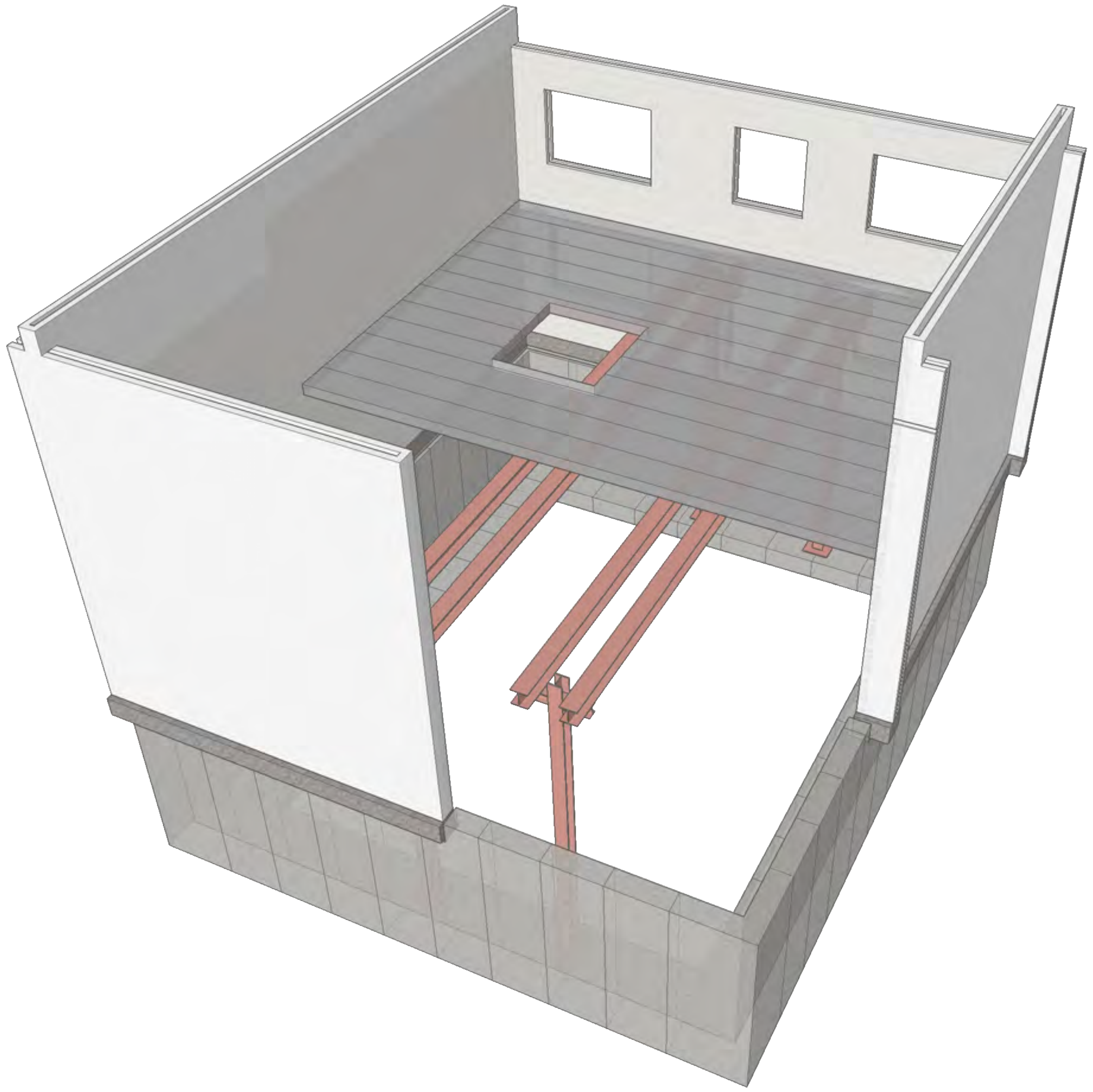
Stage 4

- Demolish main rear wall, roof and all internal walls.
- Enclose building with temporary sheeting.



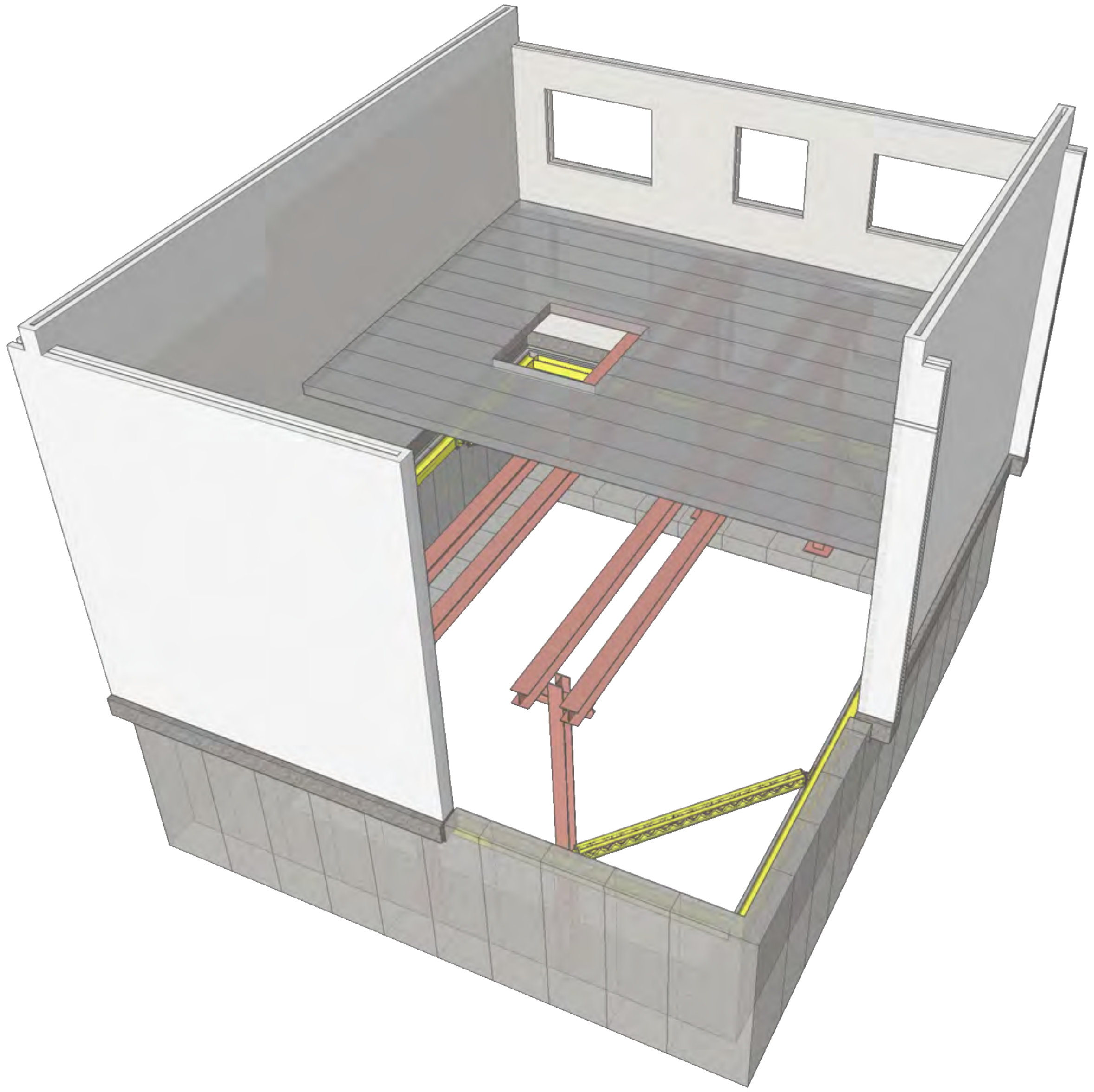
Stage 5

- Remove existing internal foundations.



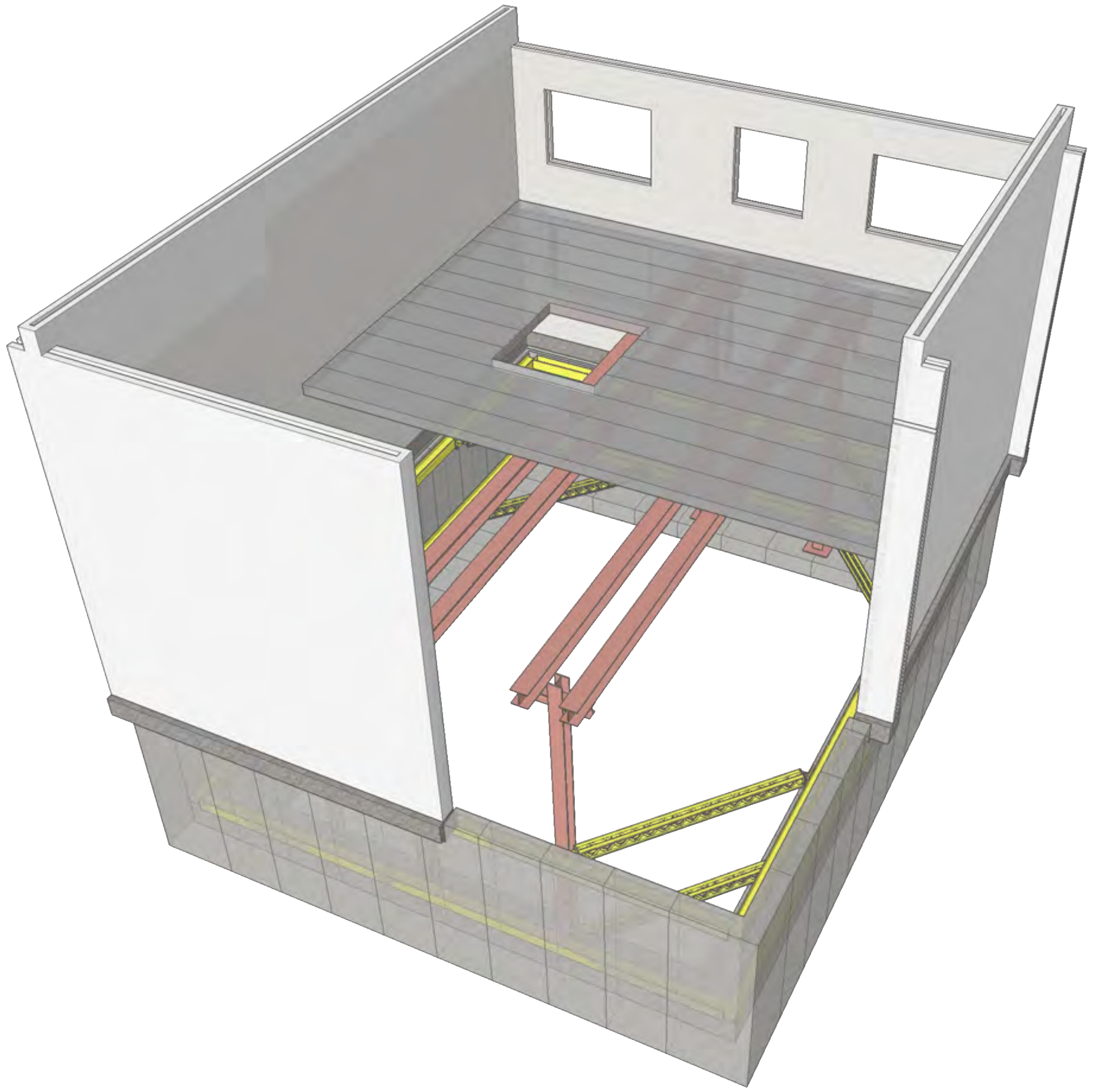
Stage 6

- Install remainder of underpinned basement wall in hit & miss sequence.



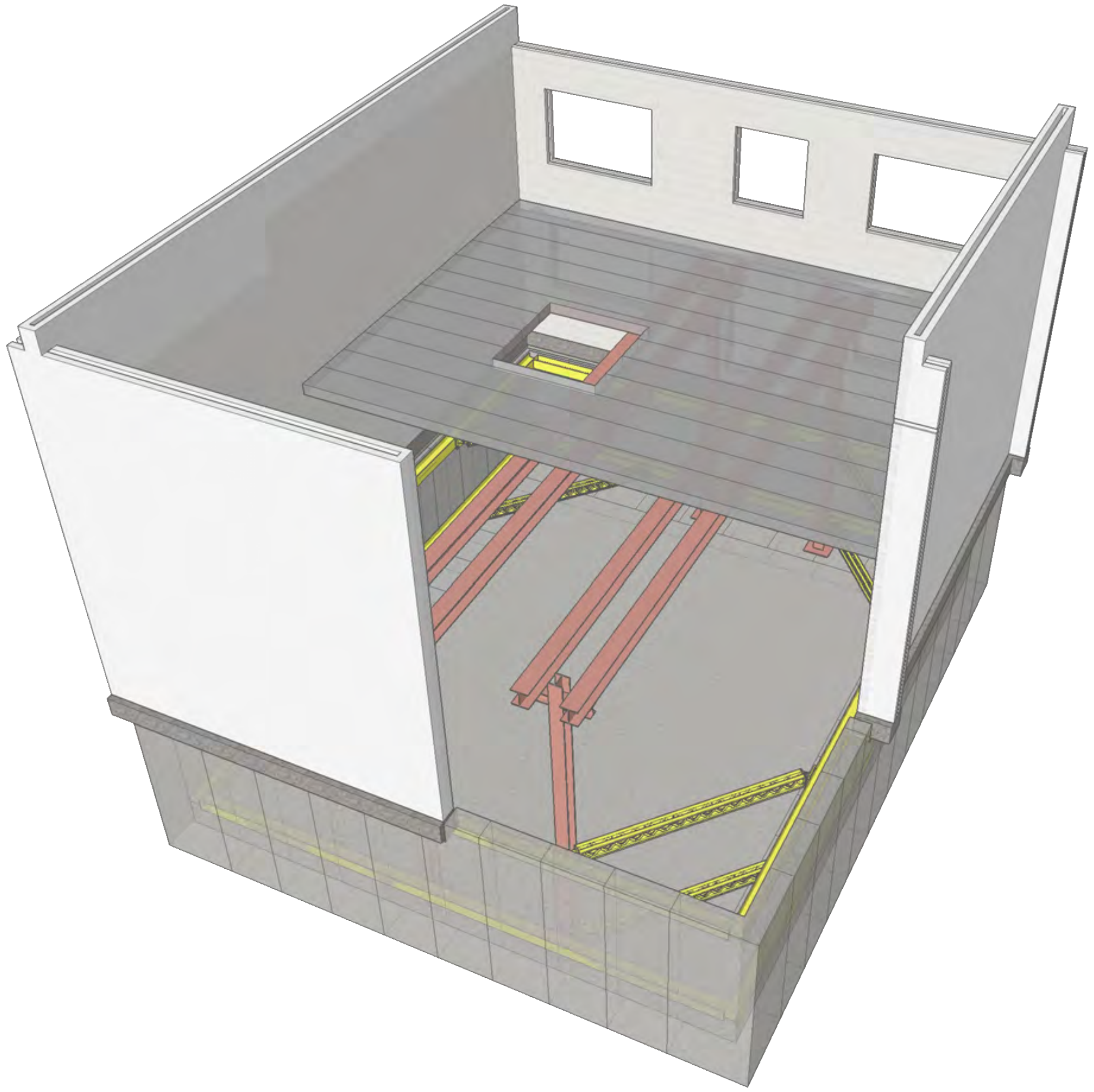
Stage 7

- Commence main basement excavation and insert 1st level of propping to top of underpins.
- Propping to be specialist designed adjustable system.
- Excavation to be carried out using micro excavators.



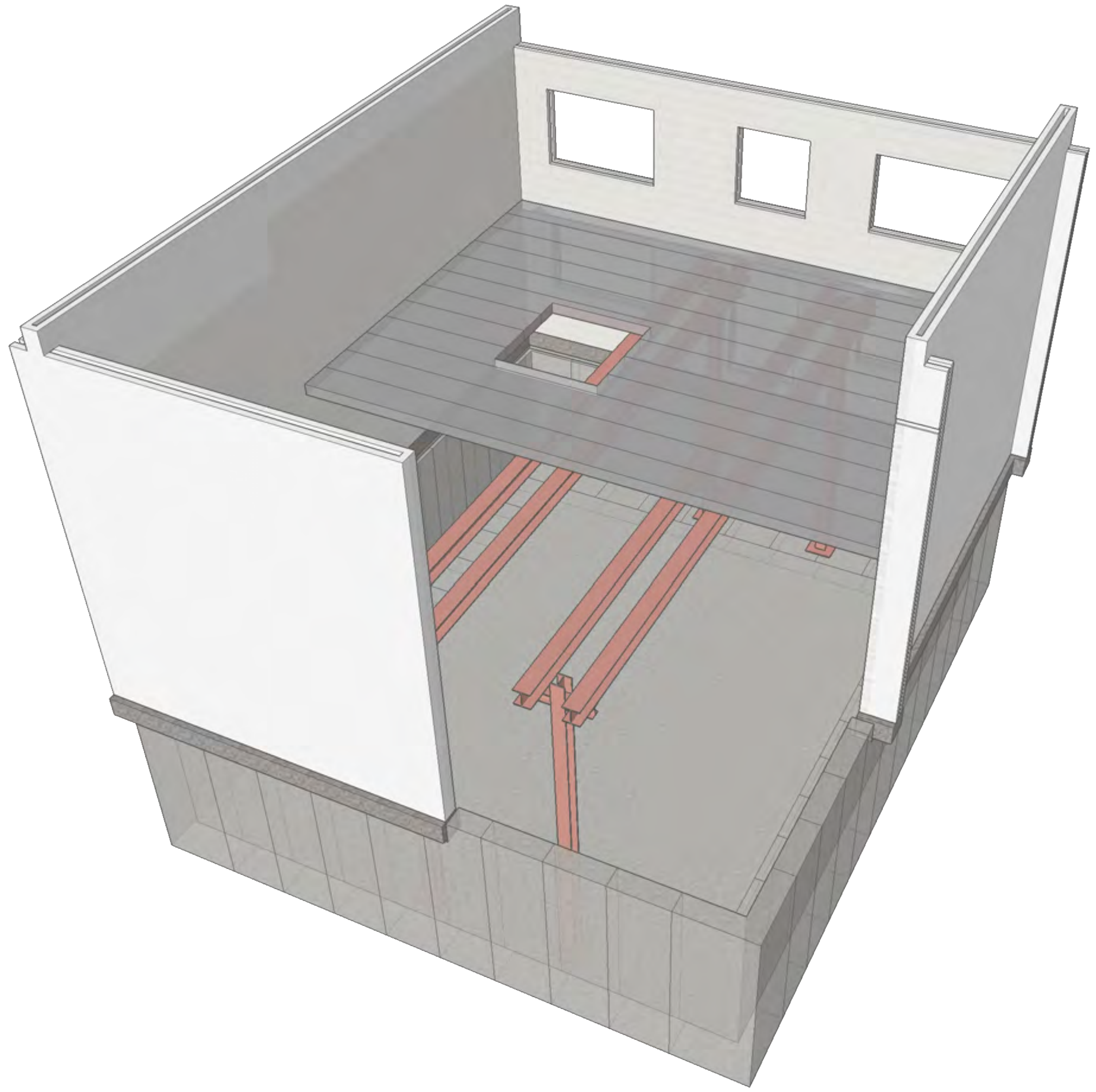
Stage 8

- Continue excavation and insert 2nd level of propping lower on underpins.



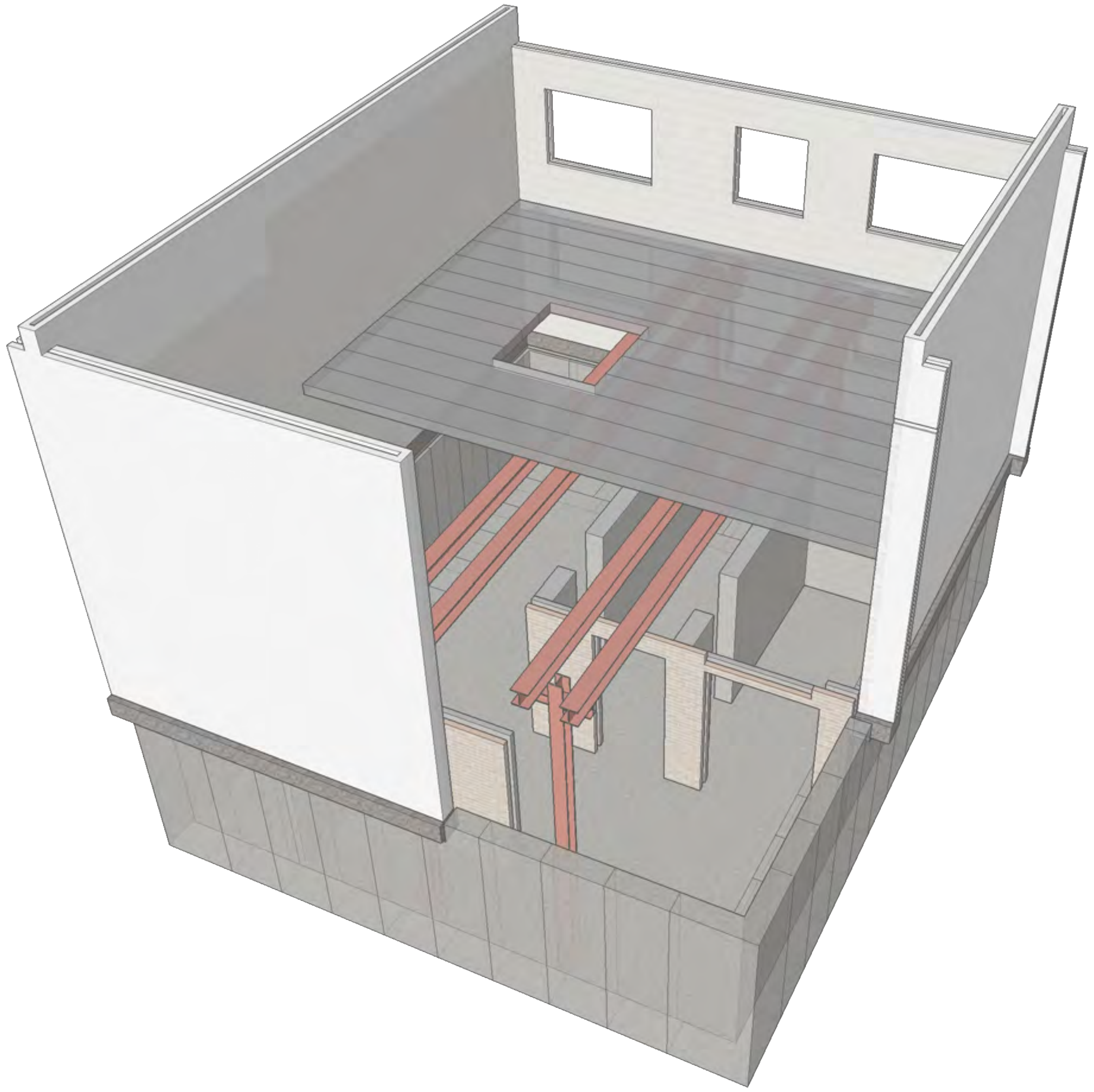
Stage 9

- Construct new basement slab.



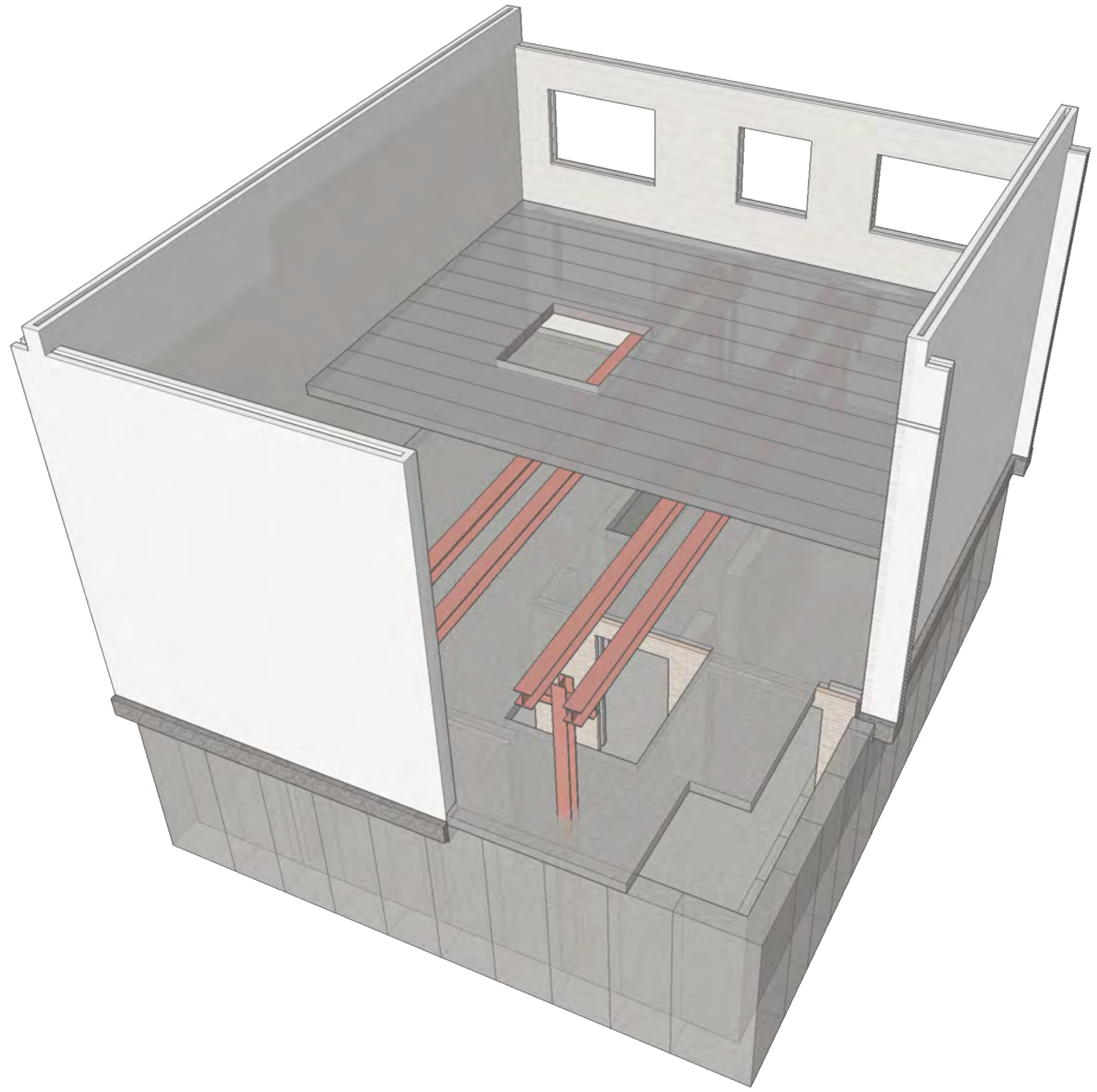
Stage 10

- Remove temporary propping.



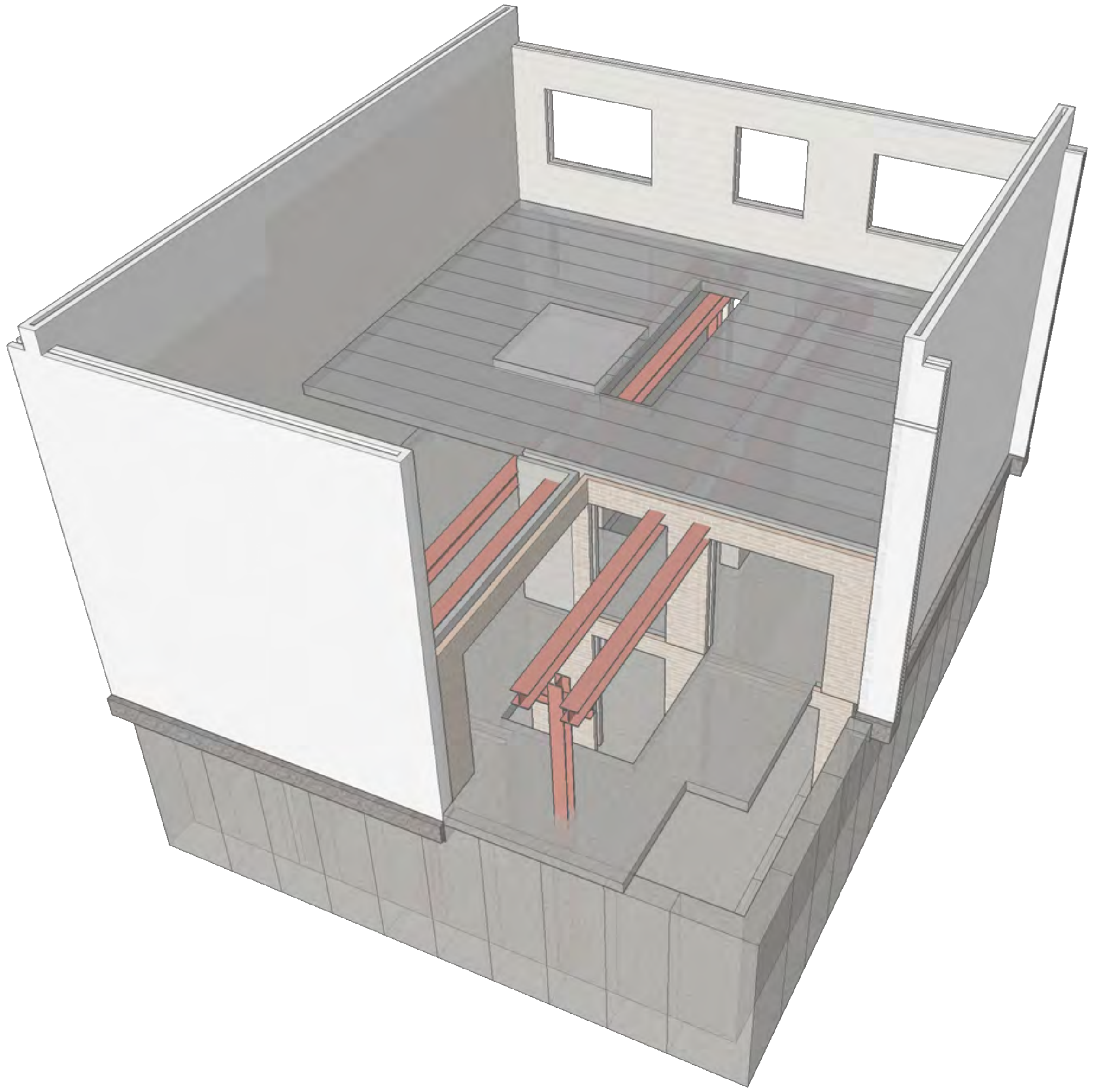
Stage 11

- Construct basement walls.



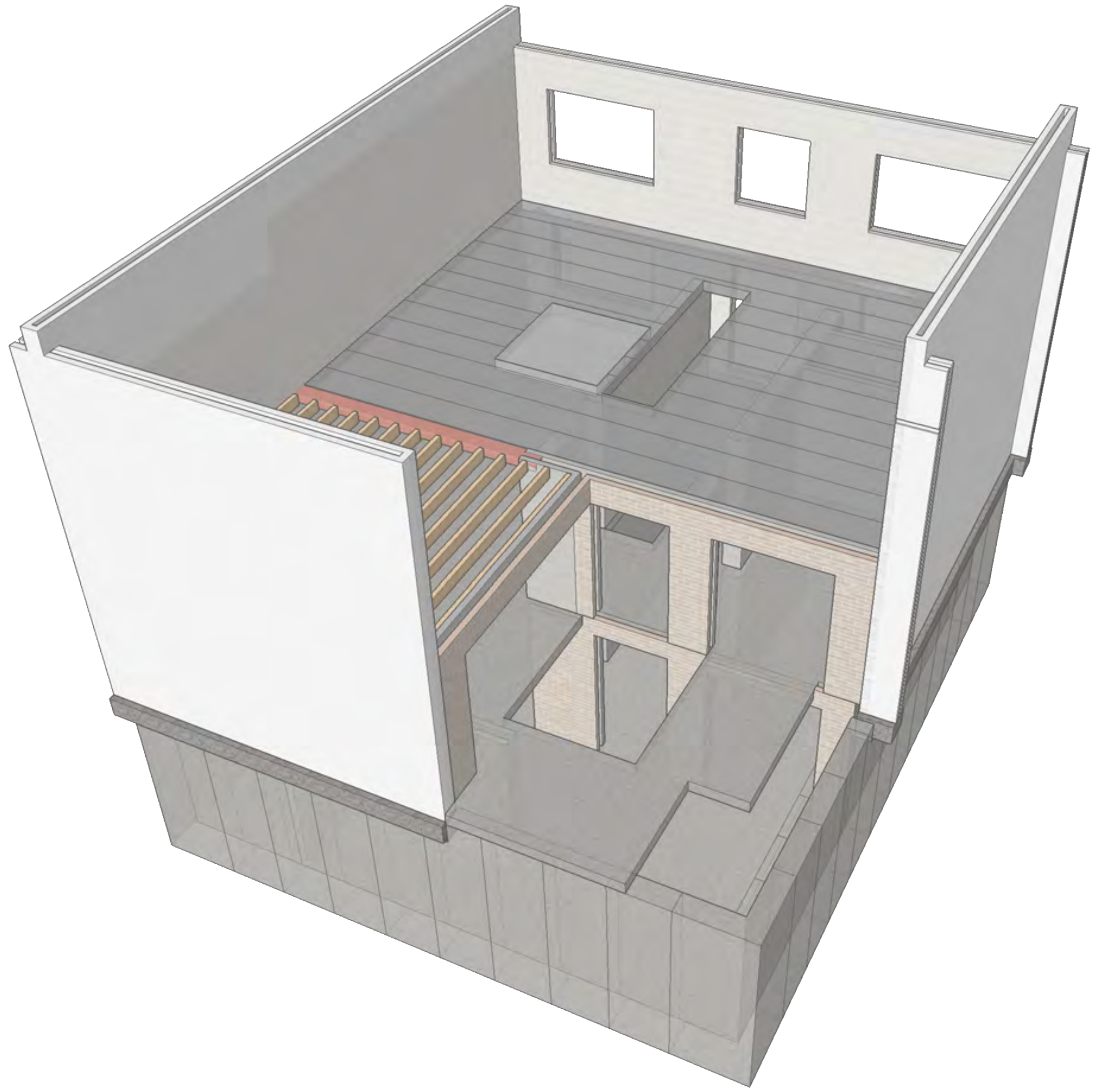
Stage 12

- Construct new ground floor slab bearing onto basement walls and underpinning.



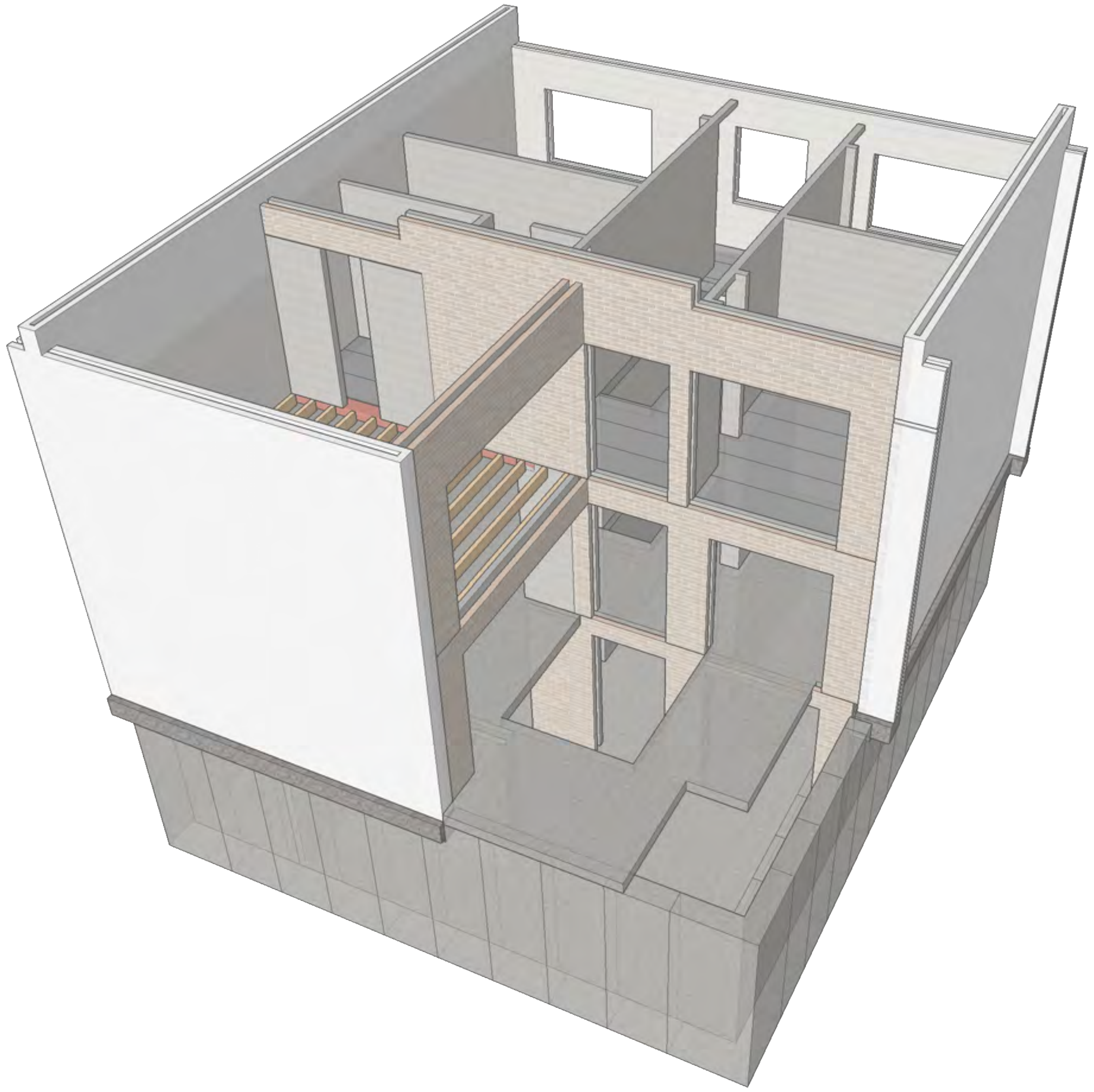
Stage 13

- Construct ground floor walls.
- Carry out modifications to 1st floor slab, including addition of new trimming steels as required.



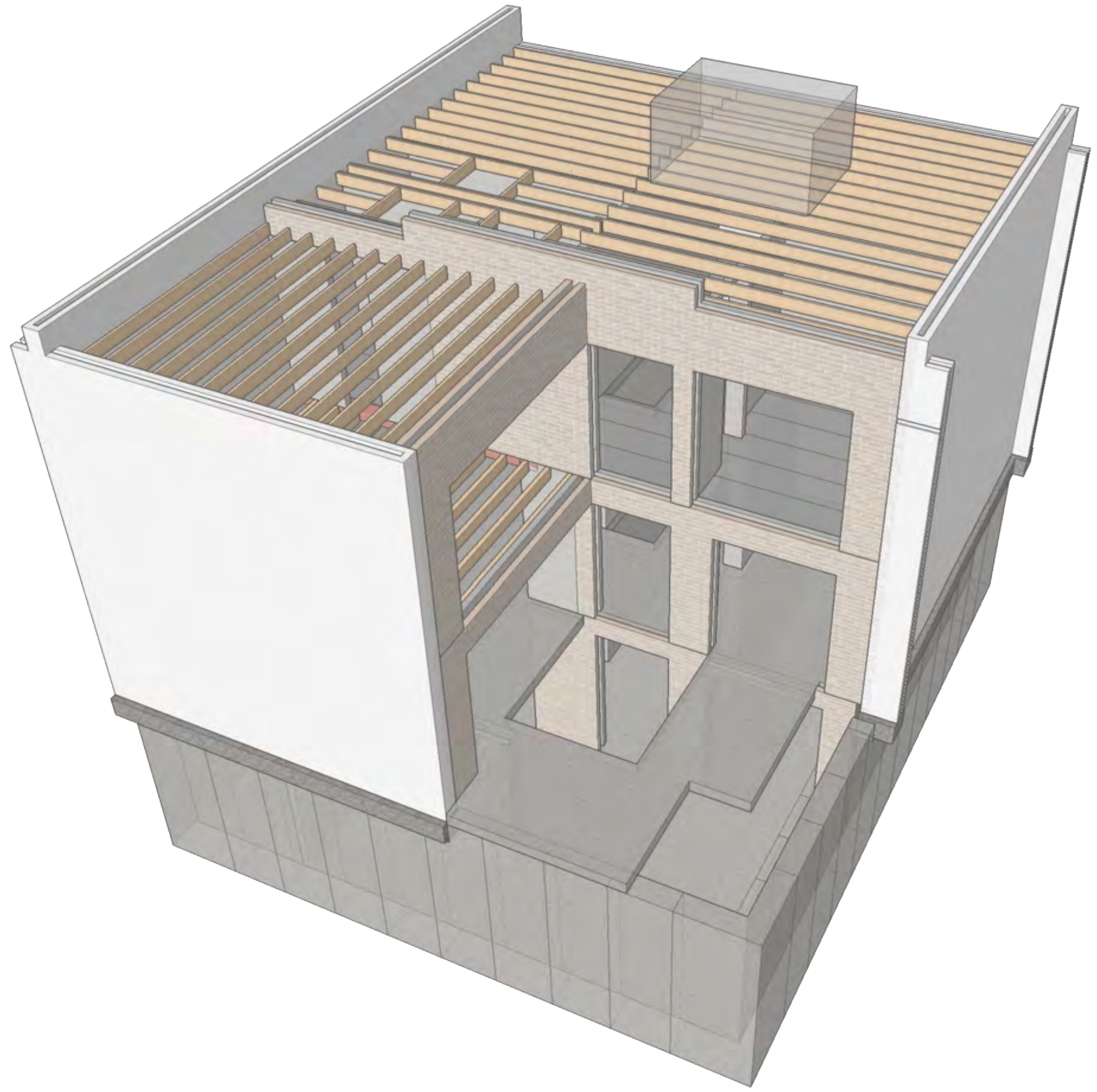
Stage 14

- Install new 1st floor steel and timber floor to rear quadrant.
- Remove temporary 1st floor support frame.



Stage 15

- Construct 1st floor walls.



Stage 16

- Construct new timber roof.

5.0 Surface Flow and Flooding, Subterranean (Groundwater) Flow and Land Stability

The following document has been prepared by Soiltechnics Environmental & Geotechnical Consultants in accordance with the requirements of CPG4. The content is as follows, giving section numbering as used within Soiltechnics's Report.

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Proposed basement
106 King Henry's Road
London
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BASEMENT IMPACT ASSESSMENT REPORT
Rev01

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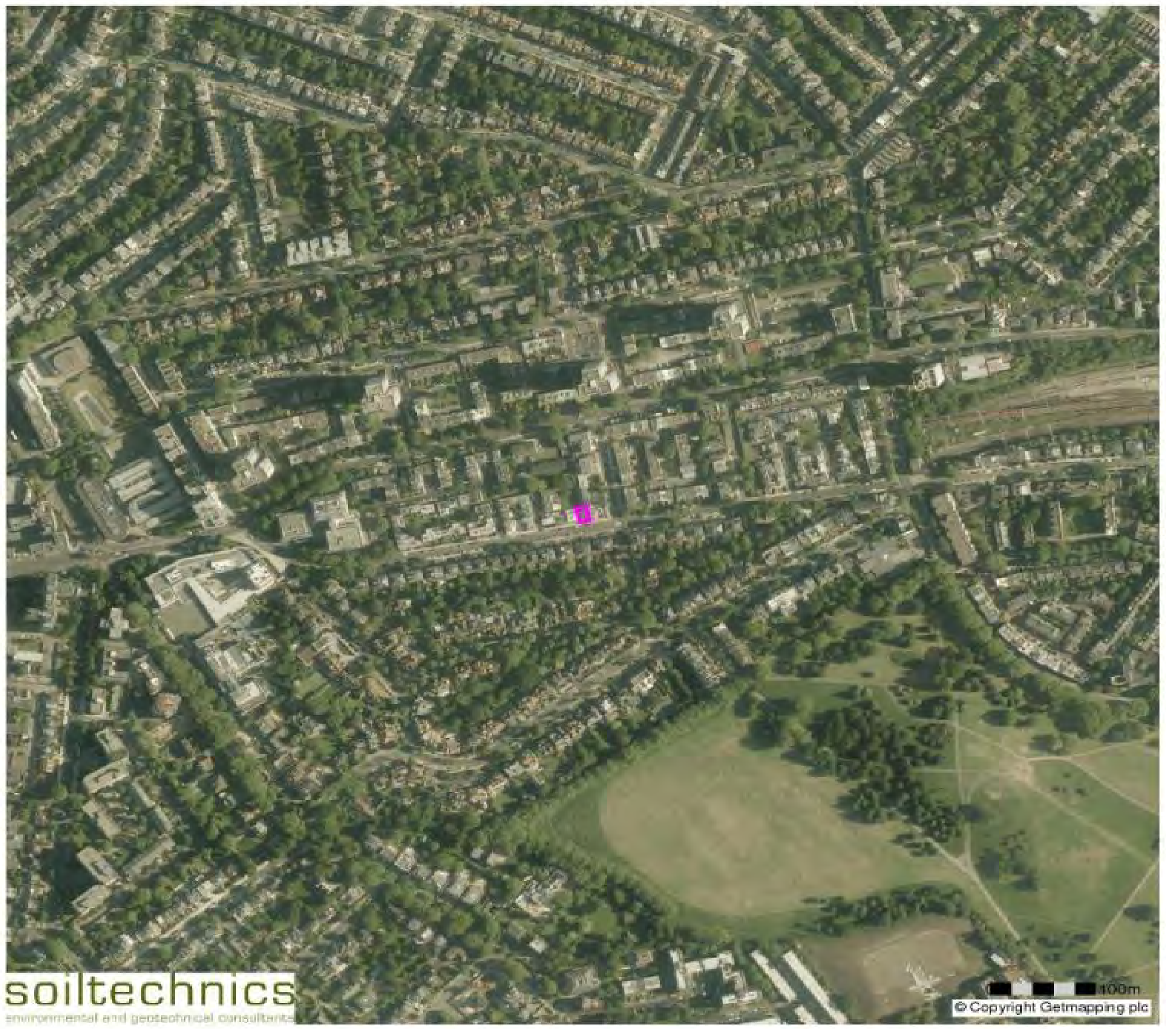
Aerial photograph of site



Report status and format

Report section	Principal coverage	Report status Revision	Comments
0	Contents page		
1	Introduction and brief		
2	Description of the property and project proposals	1	Revised following engineer comments
3	Desk study information and site observations		
4	Ground Investigations		
5	External ground movements around the basement	2	Revised following engineer comments
6	Hardened areas	1	Revised following engineer comments
7	Tree removal	1	Revised following engineer comments
8	Existing damage to adjacent buildings		
9	Railway tunnels		
10	Summary of screening		
11	Subterranean (groundwater flow) screening		
12	Stability impact identification		
13	Surface flow and flooding impact identification		
14	Summary and Conclusion	2	Revised following engineer comments

List of appendices

Appendix	Content
A	Copy of drawings illustrating proposal
B	Copy of CV of Nigel Thornton and examples of Soiltechnics commissions on basement investigations and analysis
C	Plan showing location of exploratory points (drawing 02) and borehole and trial pit records.
D	Plan showing estimated surface settlement contours as a result of basement excavations (Drawing 02A)
E	Calculations to determine strains in masonry
F	Copy of Network Rail asset plan showing location of rail tunnels in the area

1 Introduction and brief

1.1 Objectives

1.1.1 This report presents a Basement Impact Assessment (BIA) for a proposed basement at 106 King Henry's Road, London.

1.1.2 The principal objective of the assessment is to present evidence to support a planning application for the project as required by Camden Planning Guidance (CPG4) *'Basements and lightwells'*.

1.2 Client instructions and confidentiality

1.2.1 This report has been produced following instructions received from Solid Geometry on behalf of our mutual client Mr Gidon Katz.

1.2.2 This report has been prepared for the sole benefit of our above named instructing client, but this report, and its contents, remains the property of Soiltechnics Limited until payment in full of our invoices in connection with production of this report.

1.3 Author qualifications

1.3.1 This report has been reviewed by a Chartered Civil Engineer, (C.Eng., M.I.C.E) who is also a Fellow of the Geological Society (FGS) and a practising Civil Engineer with specialist experience (35 years) in geotechnical engineering (including basement construction), flood risk and drainage. A copy of a CV with examples of experience in basement construction is presented in Appendix B.

1.4 Guidance used for scoping exercise

1.4.1 As described in paragraph 1.1.2 above we have followed Camden Planning Guidance (CPG4) *'Basements and lightwells'*, and Camden geological, hydrogeological and hydrological study report *'Guidance for subterranean development,'* produced by Arup on behalf of the London Borough of Camden. We have also referred to the *'Strategic Flood Risk Assessment Report for North London'* dated August 2008 prepared by Mouchel, as well as other readily available information on websites. This report has considered all four stages of the BIA process as described in CPG4. This report has also been prepared to satisfy the following parts of Camden's policy DP27, on basements and lightwells:

a) Maintain the structural stability of the building and neighbouring properties;

b) Avoid adversely affecting drainage and run-off or causing other damage to the water environment;

c) Avoid cumulative impacts upon structural stability or the water environment in the local area;

1.4.2 In order to satisfy part a) a construction method statement has been prepared by a Structural Engineer which is separately presented.

1.5 Format of this report in relation to CPG4

1.5.1 Sections 3 to 9 of this report describes project proposals and presents desk study and investigation data, information required to answer flow chart questions posed in figures 1, 2 and 3 of CPG4. Answers for these flow chart questions are provided in sections 10 to 12.

2 Description of the property and project proposals

2.1 Description of the property

2.1.1 The site is currently occupied by a two-storey terraced dwelling within an urban area of Camden. Based on inspection of old Ordnance Survey maps the building was probably constructed in the early 1970s. The building occupies much of the central part of the property, with external paved areas to the north and south. General topographical levels fall in a southerly direction.

2.2 Project proposals

2.2.1 It is understood that the property does not have the benefit of planning permission for a lower ground floor extension beneath the development. The proposal is for a single-storey deep basement across the existing building footprint and rear paved courtyard area, the proposed scheme will adopt an open courtyard area to the rear in lieu of lightwells.

2.2.2 Underpinning will be required beneath the existing perimeter walls to enable basement excavation. Once excavation is complete a new basement floor slab will be constructed together with a new reinforced concrete ground floor slab.

2.2.3 Copies of our client's architects' drawings showing project proposals outlining development are presented in Appendix A.

3 Desk study information and site observations

3.1 Site history

3.1.1 Review of Ordnance Survey and London town maps dating back to 1870s indicate the a property was first recorded on the site on the 1896 map, the site and adjacent buildings were subsequently redeveloped in the early 1970s property concurrent to the present day layout. Extract copies of key mapping is presented below with property position defined by the red marker.

Extract copy of 1874 map

Extract copy of 1896 map

Extract copy of 1974 map

3.1.2 At this stage it is important to note there are no water courses recorded on the 1874 map close to the property, and no evidence of any opencast quarrying activities in the locality.

3.2 Geology and geohydrology of the area

3.2.1 Geology of the area

3.2.1.1 Inspection of the geological map of the area published by the British Geological Survey (BGS) indicates the following sequence of strata. The thickness of the strata has been obtained from a combination borehole record data formed within 500m of the property available on the BGS website, and geological sections shown on the BGS map.

Summary of Geology and likely aquifer containing strata

Strata	Bedrock or drift	Approximate thickness	Typical soil type	Likely permeability	Likely aquifer designation
London Clay Formation	Bedrock	85m	Clays	Low	Unproductive strata
Lambeth Group	Bedrock	15	Clays, occasionally sands	Low	Unproductive strata
Thanet Sands	Bedrock	10	Fine sands	Low/moderate	Secondary Aquifer
Chalk	Bedrock	200	Chalk	High	Principal Aquifer

Table 3.2.1.1

3.2.1.2 Soil types and assessments of permeability are based on geological memoirs, in combination with our experience of investigations in these soil types.

3.2.1.3 An extract copy of the geological map is presented below, with brown shading representing the outcrop of the London Clay Formation. The shaded dark brown represents the Claygate beds (on higher ground to the north) with the property located on London Clays (light brown shading). The property position is shown by the red marker.

3.2.1.4 Based on the above any excavations within the property will be located within London Clays.

3.2.2 Geohydrology

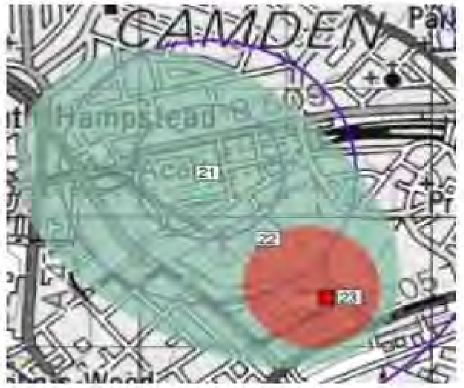
3.2.2.1 The Environment Agency website reports, the London Clay Formation deposits (bedrock) at the site are designated Unproductive strata.

3.2.2.2 Unproductive strata are defined as deposits exhibiting low permeability with negligible significance for water supply or river base flow. Unproductive Strata are generally regarded as not containing groundwater in exploitable quantities.

3.2.2.3 Chalk is classified a Principal Aquifer. Principal aquifers are defined as deposits exhibiting high permeability capable of high levels of groundwater storage. Such deposits are able to support water supply and river base flows on a strategic scale.

3.2.3 Source protection zone

3.2.3.1 The site is recorded as being located within a source protection zone 2 (outer zone) which the Environment Agency define as a 400 day travel time from a point below the water table. An extract of the plan recording source protection zones is presented below, with green shading representing outer protection zones and red inner protection zones.



3.2.3.2 This abstraction will be from the Chalk aquifer located at least 100m below the property. The basement extending to about 3.5m below lower ground floor levels in London Clays will have no influence on the Chalk aquifer.

3.3 Quarrying/mining

3.3.1 With reference to the coal mining and brine subsidence claims gazetteer for England and Wales, available on the Coal Authority web site, the area has not been subject to exploitation of coal or brine. Inspection of old Ordnance Survey maps dating back to the first editions (late 1800s) does not record any quarrying activities within 250m of the property.

Proposed basement
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3.4 Flood risk

3.4.1 Fluvial/tidal flooding

3.4.1 The Environment Agency website indicates the site is not located within a fluvial or tidal flood plain. An extract copy of the flood risk map is presented below which shows no blue shading representative of flooding. The property is located within the crosshair.

3.4.2 Flooding from Reservoirs, Canals and other Artificial Sources

3.4.2.1 The Environment Agency website indicates the site is not located within an area considered at risk of flooding from breach of reservoir containment systems. An extract copy of the flood risk map is presented below which shows no blue shading representative of flooding as a result of failure of containment systems close to the site. The property is located within the crosshair.

3.4.3 Flooding from Groundwater and surface waters

3.4.3.1 The site is underlain with a substantial thickness (85m) of relatively impermeable London Clay Formation. On this basis groundwater is not likely to be available at the site and thus is unlikely to present a risk of causing groundwater flooding.

3.4.3.2 We have viewed the Environment Agency web site which provides maps showing areas at risk of flooding from surface waters. An extract of the map is presented below. The property is located within the red square and blue shading represents areas at risk of surface water flooding. The property is located in a low risk area, shown by the light blue shaded areas.

3.4.3.3 An extract of figure 11 from the Camden Geological, Hydrogeological and Hydrological Study (referenced in Section 1.4) is presented below. The blue lines show the locations of branches of formers in the area. The property is located within the red box and seems to be within close proximity to an upper branch of the River Tyburn.

3.4.3.4 With reference to old mapping of the area described in section 3.1 above, the 1874 map (predevelopment) does not record any water courses close to or within the immediate area of the property. Development of London has resulted in original watercourses being culverted, with culverts following, in the majority of cases, road infrastructure routes.

3.4.3.5 There is a 914 x 610 culvert in King Henry's Road recorded on Thames Water Asset register, an extract copy of which is presented below. The culvert follows a westerly route from the property.

3.4.3.6 An extract of figure 15 from the Camden Geological, Hydrogeological and Hydrological Study (referenced in Section 1.4) is presented below (property marked in a red box). The map records King Henry's Road has not historically been subject to flooding or is within an area with the potential to be at risk from surface water flooding.

3.4.3.7 There is a 4" below ground water supply pipe operated by Thames Water in King Henry's Road to the south of the property and to the east parallel to Lower Merton Rise. It is considered that the property is unlikely to be at enhanced risk of flooding due to ruptures in the potable water supply system in the area.

3.4.4 Conclusions

3.4.4.1 Based on the above, in our opinion, the property is considered unlikely to be at enhanced risk of being flooded by exceedances in capacity of sewers or water supply pipes. Evidence presented above demonstrates the property is not at an enhanced risk of being affected by tidal or fluvial flooding or indeed from artificial sources. The property and indeed proposals will not be affected by groundwater flooding.

4 Ground investigations

4.1 Scope

4.1.1 Two boreholes have been excavated at the property; in the rear and front garden areas to 5m depth. Two hand dug trial pits was also excavated externally to expose foundation arrangements to both the house and boundary walls in the vicinity of the proposed basement. The scope of the investigations was determined by our Client's Structural Engineer

4.1.2 Fieldwork records are presented in Appendix C. Drawing 02 (also presented in Appendix C) shows the location of the exploratory points.

4.2 Ground conditions encountered

4.2.1 Each of the two boreholes (excavated on 28th June 2017) encountered a similar soil profile of naturally deposited London Clays capped with a thin covering of made ground extending to depths of between 0.9 and 1.1m. The London Clays essentially comprised medium to high strength brown grey silty clays. Groundwater was encountered at 4.45m depth in the rear garden area 25 minutes following completion of the borehole. A water level monitoring standpipe was installed to 5m depth in borehole DTS02 and on a return visit to site on 7th July 2017 no water was observed in the standpipe.

4.2.2 The investigations confirmed published geological maps for the near surface geology.

4.3 Existing foundations.

4.3.1 Trial pit excavations exposed shuttered concrete foundations overlying unshuttered concrete foundations which in turn overlie unshuttered brickwork foundations to the house and boundary walls to depths of between 0.25 and 1.15m below ground levels constructed on Made Ground overlying London Clays.

4.4 Summary of basement retaining wall design parameters

4.4.1 The following table provides soil parameters for foundation design purposes

Parameter	Value	Origin
Presumed bearing value for underpin L section (as proposed) assuming 1m wide base (temporary scenario)	100kN/m²	Based on undrained shear strength measurements and section of underpinning
Characteristic constant volume angle of shearing resistance (made ground and London Clays)	22°	Based on plasticity measurements and with reference to BS8002:2015
Earth pressure at rest (London Clay) K_0	1	CIRIA report C760 (over consolidated clays)
Active Earth Pressure K_a	0.5	Based on angle of shearing resistance
Earth pressure at rest (Made ground)	0.65	CIRIA report C760 (normally consolidated clays)
Characteristic weight density of soils above the groundwater table	18kN/m³	Derived from BS8002:2015

4.4.2 Either K_0 or Ka can be used for design purposed however if K_a is adopted please be any associated movement will need to be accommodated.

5 External ground movements around basement

5.1 Construction proposals

5.1.1 Proposals are for a single storey reinforced concrete basement beneath the full footprint of the existing building and rear paved courtyard, constructed using traditional sequential underpinning techniques. The basement excavation will be around 3.5m deep, with a reinforced concrete ground floor slab above.

5.2 Settlement around and inward yielding of basement excavations

5.2.1 The following analysis is based on observations of ground movements around basement excavations in clays as reported in Tomlinson 'Foundation design and construction' (seventh Edition) and CIRIA report C760 Guidance on embedded retaining wall Design.

5.2.2 It is recognised that some inward yielding of supported sides of strutted excavations and accompanying settlement of the retained ground surface adjacent to the excavation will occur even if structurally very stiff piles and props / strutting is employed. The amount of yielding for any given depth of excavation is a function of the characteristics of the supported soils and not the stiffness of the supports.

5.2.3 Following CIRIA C760, and assuming the conditions as set out in the notes therein, the basement excavation will be located in high support stiffness soils, assuming high propped walls and top-down construction the maximum yield / excavation depth (%) is 0.15. We understand the redevelopment will have an excavation depth of 3.5m. On this basis inward yield will be in the order of 3.5 x 0.15/100 x1000 = 5.25mm. Coincidental with the inward yield of the embedded wall, some settlement of the retained soils around the excavation will occur. Again, based on CIRIA C760, the ratio of surface settlement to excavation depth in high supported stiffness soils is 0.1%. Surface settlement in the order of 3.5 x 0.1/100 x 1000 = 3.5mm will occur. This settlement profile will extend for a distance of about 3.5 to 4 times the depth of excavation i.e. about 12.25m to 14m in a reasonably linear fashion. Where masonry panels are shorter than these distances the movement relative to the length of panel has been adopted.

5.2.4 Whilst it is acknowledged that settlement and inward yielding movement observations are generally for embedded piled or diaphragm retaining walls, we are not aware of any published observational data for underpinning walls and insitu concrete retaining walls, but consider a propped embedded piled wall would afford more onerous movements. The value of making a finite element analysis to determine the amount of inward yielding of excavation supports in all routine cases of basement excavations is questionable requiring estimates of soil moduli and other factors such as Poisson's ratio.

5.2.5 Engineering appraisal (Analysis of ground movements due to construction of basement and prediction of damage on adjacent (nearby) buildings)

5.2.5.1 Drawing 02A shows the radial influence of Stiff Clays, as such we have considered the effect of surface settlement (as differential settlement) on panels of masonry forming facades to adjacent properties (No104, No108 King Henry's Road and No5 Lower Merton Rise - referenced A, B and C on Drawing 02A), which are likely subject to the most significant potential movements. We have determined panel sizes from estimate measurements based on site reconnaissance. Assuming the panel of masonry is rectangular and ignoring the effects of openings, we have determined strains on the diagonal and horizontal and thus establish damage categories with reference to Burland's Table 6.4 in CIRIA report C760. Our calculations are presented in Appendix E.

Extract copy of Burland's classification of damage (extract from CIRIA report C760)

Category of damage	Description of typical damage (ease of repair is underlined)	Approximate crack width (mm)	Limiting tensile strain, ε_{lim} (%)
0 Negligible	Hairline cracks of less than about 0.1 mm are classed as negligible	<0.1	0.0 to 0.05
1 Very slight	Fine cracks that can easily be treated during normal decoration. Perhaps isolated slight fracture in building. Cracks in external brickwork visible on inspection	<1	0.05 to 0.075
2 Slight	Cracks easily filled. Redecoration probably required. Several slight fractures showing inside of building. Cracks are visible externally and some repointing may be required externally to ensure weathertightness. Doors and windows may stick slightly	<5	0.075 to 0.15
3 Moderate	The cracks require some opening up and can be patched by a mason. Recurrent cracks can be masked by suitable lining. Repointing of external brickwork and possibly a small amount of brickwork to be replaced. Doors and windows sticking. Service pipes may fracture. Weathertightness often impaired.	5 to 15 or a number of cracks >3	0.15 to 0.3
4 Severe	Extensive repair work involving breaking-out and replacing sections of walls, especially over doors and windows. Windows and frames distorted, floor sloping noticeably. Walls leaning or bulging noticeably, some loss of bearing in beams. Services pipes disrupted.	15 to 25, but also depends on number of cracks	>0.3
5 Very severe	This requires a major repair, involving partial or complete rebuilding. Beams lose bearings, walls lean badly and require shoring. Windows broken with distortion. Danger of instability.	Usually >25, but depends on numbers of cracks	

Notes
1 In assessing the degree of damage, account must be taken of its location in the building or structure.
2 Crack width is only one aspect of damage and should not be used on its own as a direct measure of it.

Proposed basement
106 King Henry's Road, London
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5.2.6 Conclusion and risk reduction

5.2.6.1 Adjacent structures and buildings may potentially be affected by basement excavations, theoretically resulting in damage that just falls into Burland Category 1.

5.2.6.2 We understand from Solid Geometry the basement excavation will be undertaken in a controlled manner using traditional techniques with a full vertical and horizontal monitoring regime and specialist designed adjustable propping system. On this basis if the propping and subsequent compensatory works are appropriately monitored and adjusted this will negate the effects of worst case inward yield movements and therefore it is unlikely that damage will exceed Burland Category 0.

6 Hardened areas

6.1 We understand there will not be an increase in hardened and drained areas.

7 Tree removal

7.1 No major vegetation will be removed to accommodate the extension of the building. Some small shrubs in the communal gardens to the south and a tree currently about 4m high close to the garden boundary. It is assumed the tree will remain post development.

7.2 It is likely that foundation arrangements to the subject property and the attached houses at 104, 108 King Henrys Road and 5 Lower Merton Rise will be similar on the basis that the houses were constructed at the same time with foundations constructed on fine grained (cohesive) soils which will exhibit plasticity. The volume of plastic soils will change with changes in water content. Changes in water content are promoted by seasonal weather conditions but also water demands of trees. Following National House Building Council (NHBC) Chapter 4.2 provides a good guide to the influence of trees on plastic soils.

7.3 Following NHBC Chapter 4.2, which provides a good guide to the influence of trees on plastic soils, adopting a medium water tree demand species, subject to confirmation by others, the theoretical root radius of such a tree is 75% of its height i.e. 0.75 x 4m = 3m. The tree is located 5m distance from the rear north facing elevation of 106, thus beyond the current influence of the root systems of the tree.

8 Existing damage to adjacent buildings

8.1 We are not aware of any subsidence damage to existing buildings.

9 Railway Tunnels

9.1 We have contacted Network Rail and obtained a plan showing the location of rail tunnels in the area. A copy of the plan is presented in Appendix F. Primrose Hill railway tunnel follows a route just to the north of the rear gardens some 28m to north of the northern extent of the proposed basement.

9.2 In addition to the above a service tunnel follows a parallel route some 15m to the north of the site.

9.3 On this basis, basement constructions will not affect rail tunnels.

10 Summary of screening

10.1 The above report sections present factual data to demonstrate there are no areas of concern which require investigation to support a planning application.

11 Subterranean (Groundwater) flow screening

11.1 General overview

11.1.1 The property is positioned on gently sloping ground (approximately 2^o) to the north west of central London. The property is outside areas considered to be at risk of being affected by tidal and fluvial flooding associated with the Thames or its tributaries, or artificial water sources (canals/reservoirs). In addition the property is not considered to be at enhanced risk of flooding from sewers or water supply pipes.

11.1.2 Geological records indicate the site is underlain by deposits of London Clay Formation extending to depths of approximately 85m. Borehole excavations within the property confirm published geological records. The property (being underlain with a substantial thickness of London Clay Formation) is not considered to be at risk of flooding from groundwater and the proposals will not affect any groundwater flows.

11.2 Responses to flow chart questions

The following provides site specific responses to questions posed in figure 1 of CPG4

Question and response		Text reference
Question 1a	**Is the site located directly above an aquifer?**	
Response.	No. The property is directly underlain by over 80m thickness of London Clays which are classified Unproductive Strata (formerly Non-Aquifer) by the Environment Agency.	3.2
Question 1b	**Will the proposed basement extend beneath the water table surface?**	
Response	No. The London Clay Formation comprises reasonably homogenous relatively impermeable clays which are not able to transmit groundwater under normal hydraulic gradients.	3.2
Question 2	**Is the site within 100m of a watercourse, well or potential spring line?**	
Response	No. Although the property is recorded to be relatively close to a tributary of the River Tybury, (based on historical maps) Ordnance Survey records of the area prior to development do not record any watercourses in the area and indeed Thames Water asset maps do not record any significant surface water sewers in the area. Additionally, the geology of the area is not	3.4.3

Question and response		Text reference
	conducive to spring lines or wells for extraction of water. Based on this there are no matters of concern.	
Question 3	**Is the site within the catchment of the pond chains on Hampstead Heath?**	
Response	No. Based on figure 14 within the Camden geological, hydrogeological and hydrological study report, the property is not within the catchment of the pond chains on Hampstead Heath. The property is located about 1.75km distance from the pond chains on Hampstead Heath	3.4.2

Question and response		Text reference
Question 4	**Will the proposed basement development result in a change in the proportion of hard surfaced/paved areas?**	
Response	No. We understand the extensions to the property will not increase the hardened area of the site.	6.1
Question 5	**As part of the site drainage, will more surface water (e.g. rainfall and run off) than present be discharged to the ground (e.g. via soakaways/SUDS)?**	
Response	No. The site is underlain by London Clays which are not amenable to disposal of stormwater using infiltration systems. It is envisaged that rainwater falling onto the garden area will be disposed of using natural absorption and natural run off (which is currently the case).	5
Question 6	**Is the lowest point of the proposed excavation (allowing for any drainage and foundation space under the basement floor) close to or lower than the mean water level in any local pond (not just the pond chains on Hampstead Heath) or spring line?**	
Response	No. The London Clay Formation comprises reasonably homogenous relatively impermeable clays which are not able to transmit groundwater under normal hydraulic gradient. Basement excavations will be formed in the London Clays. Based on this there are no matters of concern.	3.4.3

12 Stability impact identification

12.1 General overview

12.1.1 The property is positioned on gently sloping ground in the north west of central London. Ground levels in the area fall in a general southerly direction (to the south of King Henry's Road) at a slope of approximately 2 degrees.

12.1.2 No significant trees will be removed as part of the development.

12.2 Responses to flow chart questions

The following provides site specific responses to questions posed in figure 2 of CPG4

Question and response		Text reference
Question 1	**Does the existing site include slopes, natural or manmade greater than 7° (approximately 1 in 8).**	
Response	No. The topography of the area falls by about 2 degrees in a southerly direction. Based on this there are no matters of concern.	2.1
Question 2	**Will the proposed profiling of landscaping at the site change slopes at the property boundary to more than 7°?**	2.2
Response	No. The proposed basement will not change the current topographical conditions. Based on this there are no matters of concern.	
Question 3	**Does the development neighbour land including railway cuttings and the like with slopes greater than 7° (approximately 1 in 8)?**	
Response	No. The topography of the area falls by about 2 degrees in a southerly direction, and there are no manmade cuttings in the area. Based on this there are no matters of concern.	2.2
Question 4	**Is the site within a wider hillside setting in which the slope is greater than 7°?**	
Response	No. The topography of the area falls by about 2 degrees in a southerly direction with the slope (to the south of King Henry's Road) being reasonably uniform. Based on this there are no matters of concern.	2.1

Question 5	**Is the London Clay the shallowest strata at the site?**	
Response	Yes. The property is underlain with London Clays, extending to depths of over 80m in the area. Given the shallow (natural) slope angles in the area, the property is not considered to be at risk of slope instability. Based on this there are no matters of concern.	2.1

Question and response		**Text reference**
Question 6	**Will any trees be felled as part of the development and/or are there any works proposed within any tree protection zones where trees are to be retained?**	
Response	No works are proposed within tree protection zones. We understand that shrubs and a tree, (4m in height) are present within the communal gardens to the rear of no106 and no5. Following guidance in NHBC Chapter 4.2, if the tree height is less than 50% of its maximum height, then the actual height of the tree can be used. We have used assumed classing the tree as a moderate water demand tree, which influences soils a distance of 75% of its height away from the centre of the tree. Therefore, soils up to a distance of 3m away from the tree, may be affected following its removal. The tree is recorded approximately 5m from the extent of the proposed basement and is therefore not within the influence from the tree. Based on this there are no matters of concern.	7
Question 7	**Is there a history of any seasonal shrink swell subsidence in the local area and/or evidence of such effects on site?**	
Response	No. We are aware that London Clay Formation deposits exhibit shrink/swell characteristics. We are not aware of, or seen any evidence of damage attributable to subsidence either on the subject property or on adjacent properties. Based on this there are no matters of concern.	
Question 8	**Is the site within 100m of a watercourse, well or potential spring line?**	
Response	No. Although the property is recorded to be relatively close to a tributary of the River Tybury, (based on historical maps) Ordnance Survey records of the area prior to development do not record any watercourses in the area and indeed Thames Water asset maps do not record any significant surface water sewers in the area. Additionally, the geology of the area is not	3.4.3

conducive to spring lines or wells for extraction of water. Based on this there are no matters of concern.

Question and response		**Text reference**
Question 9	**Is the site within an area of previously worked ground?**	
Response	No. There is no evidence to indicate the site has been subject to quarrying activities in the area. Based on this there are no matters of concern.	3.3.1
Question 10	**Is the site located above an aquifer? If so will the proposed basement extend beneath the water table such that dewatering may be required during construction?**	
Response	No. The property is directly underlain by over 80m thickness of London Clays which are classified Unproductive Strata (formerly Non Aquifer) by the Environment Agency. The London Clay Formation comprises reasonably homogenous relatively impermeable clays which are not able to transmit groundwater under normal hydraulic gradient. New basement excavations will be formed in the London Clays. Based on this there are no matters of concern.	3.2
Question 11	**Is the site within 50m of Hampstead Heath ponds?**	
Response	No. The property is located about 1.5km to the south of the pond chain on Hampstead Heath. Based on this there are no matters of concern.	3.4.2
Question 12	**Is the site within 5m of a public highway or pedestrian right of way?**	
Response	No. The proposed basement will not be located within 5m of a public highway/footway. The basement excavation is located about 9m from the highway (back of footway).Based on this there are no matters of concern.	2.2

Question and response		Text reference
Question 13	**Will the proposed basement significantly increase the differential depth of foundations relative to adjacent properties?**	
Response	No. Traditional underpinning will be used to extend existing foundations down to proposed basement floor levels. Although there will be differences in ground / basement level floors between the new build and adjacent properties, the proposed basement construction solution will not affect neighbouring properties, and estimates of movements which may occur during the construction phase are described in section 5 which indicate acceptable levels of differential movement. Based on this there are no matters for concern. A copy of the project Engineer's drawings illustrating proposed foundations for the basement are presented in Appendix A. Tree removal will not influence the differential depth of foundations.	5
Question 14	**Is the site over (or within the exclusion zone of) any tunnels e.g. Railway lines?**	
Response	We have contacted Network Rail and obtained a plan showing the location of rail tunnels in the area. A copy of the plan is presented in Appendix G. Primrose Hill railway and a service tunnel follow a route just to the north of the rear gardens some 15 and 28m to north of the northern extent of the proposed basement. Following recommendations provided no damage will be caused by basement excavations to the railway tunnels.	9

13 Surface flow and flooding impact identification

13.1 General overview

13.1.1 We understand there will not be an increase in hardened and drained areas of the site.

13.2 Responses to flow chart questions

The following provides site specific responses to questions posed in figure 3 of CPG4

Question and response		Text reference
Question 1	**Is the site within the catchment of the pond chains on Hampstead Heath?**	
Response	No. The property is not located within the catchment of the pond chains.	3.4.2
Question 2	**As part of the site drainage, will surface water flows (e.g. rainfall and run off) be materially changed from the existing route?**	
Response	No. Proposals will not have a material impact on surface water flows.	5
Question 3	**Will the proposed basement development result in a change in the proportion of hard surfaced/paved areas?**	
Response	No. Refer 13.1 above.	13.1
Question 4	**Will the proposed basement result in changes to the profile of the inflows (instantaneous and long term) of surface water being received by adjacent properties or downstream water courses?**	
Response	No. Proposals will have no impact on surface water received by adjacent properties or downstream watercourses.	11.1
Question 5	**Will the proposed basement result in changes to the quality of surface water being received by adjacent properties or downstream water courses?**	
Response	No. Proposals will have no impact on surface water flows to adjacent properties or downstream water courses.	11.1

14 Summary and Conclusions

14.1 Proposals are to redevelop the existing development to include a single storey basement beneath the existing building footprint including the rear garden area, the proposed scheme will adopt an open courtyard area to the rear in lieu of lightwells.

14.2 Ordnance Survey mapping of the area records the site undeveloped prior to 1895, after which residential property is recorded, subsequent redevelopment occurred circa 1970 concurrent to the present-day layout.

14.3 Published BGS maps of the area record topography local to the property is formed in deposits of London Clays which probably extend depths of over 80m in the area. Borehole excavations on site confirm London Clays below a thin covering of made ground. The London clays are classified as unproductive strata by the Environment Agency. The London Clay Formation comprises reasonably homogenous relatively impermeable clays which are not able to transmit groundwater under normal hydraulic gradient. Basement excavations will be formed in the London Clays and based on the above, not affected by groundwater. Similarly, installation of the proposed basement will not affect any subterranean ground water flows.

14.4 Ground levels do fall in a southerly direction by about 2 degrees, and slope instability is not considered to present a risk. Installation of the basement will not induce any slope instability.

14.5 There is no evidence of any subsidence to any adjacent properties or indeed the existing buildings on the site.

14.6 No major vegetation will be removed to accommodate the extension of the building. Some small shrubs in the communal garden area adjacent to the rear of no106 and no5.

14.7 It is likely that foundation arrangements to the subject property and the attached house at no 104 ,108 and no5 will be similar on the basis that the houses were constructed at the same time with foundations constructed on fine grained (cohesive) soils which will exhibit plasticity. The volume of plastic soils will change with changes in water content. Changes in water content are promoted by seasonal weather conditions but also water demands of trees. Following National House Building Standards (chapter 4.2) which provides a good guide to the influence of trees on plastic soils, adopting a conservative approach of classification of medium water demand, the theoretical root radius of such a tree is 75% of its height ie 0.75 x 4m = 3m. The tree is located 5m distance from the rear north facing elevation of 106, thus beyond the current influence of the root systems of the tree.

14.8 Installation of the basement will generate some ground movement close to the perimeter of the basement excavation. The amount of movement has been predicted based on records of observed movement in other basements during construction. If both surface settlement and inward yielding movements are taken in combination there theoretically a risk that damage could fall into category 1 (very slight damage). We understand from Solid Geometry the basement excavation will be undertaken in a controlled manner using traditional techniques with a full vertical and horizontal monitoring regime and specialist designed adjustable propping system. On this basis if the propping and subsequent compensatory works are appropriately monitored and adjusted this will negate the effects of worst case inward yield movements and therefore it is unlikely that damage will exceed Burland Category 0.

14.9 The property is considered to be at no enhanced risk of being subject to flooding.

14.10 We understand there will not be an increase in hardened and drained areas resulting from the development. The property is underlain with a substantial thickness of relatively impermeable London Clays, which is not amenable to disposal of stormwater using soakaways. At this stage we have not been presented with a drainage proposal scheme for the development.

14.11 We have contacted network Rail and obtained a plan showing the location of rail tunnels in the area. A copy of the plan is presented in Appendix G. Primrose Hill railway tunnel in addition to a service tunnel follows a route to the north of the rear gardens, The service tunnel is some 15m to the north and the Primrose Hill Railway tunnel is some 28m to the north. The basement construction will not affect rail tunnels.

14.12 In overall conclusion there are no outstanding issues of concern (singularly or cumulatively) from a stability, groundwater or surface water perspective.

Curriculam Vitae
Nigel Thornton
B.Sc, C.Eng, MICE, MCIHT, FGS.

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Qualifications

- Awarded degree in Civil Engineering., City University, London in 1980
- Elected Member of the Institution of Civil Engineers in 1983 (Chartered Civil Engineer)
- Member of the Chartered Institution of Highways and Transportation since 1984
- Fellow of the Geological Society since 1986

Employment History

Northampton Borough Council	1975 - 1980
Northamptonshire County Council	1980 - 1989
The John Parkhouse Partnership	1989 - 1989
Associate Partner	1989 - 1993
Partner	1993 - 2005
JPP Consulting (Director)	2005 to date
Soiltechnics (Director)	1993 to date

Note

- In 2005, the John Parkhouse Partnership was incorporated into JPP Consulting Ltd (current complement 28 staff)
- Founding Director of Soiltechnics Ltd, a company specialising in geotechnical and geo-environmental matters. (Current complement 27 staff)

Relevant Experience

Bridgeworks	General design, contract administration and site supervision of various highway bridges and retaining structures.
Geotechnical and Geo-environmental	As Geotechnical Project Manager for Engineering Services Laboratory at NCC (ESL). (1985 - 1989) Control of ground investigations for major highway schemes for local authority including implementation of fieldwork, direction of laboratory testing and production of factual and interpretative reports, following and satisfying geotechnical certification procedures for Department of Transport (schemes up to £15m) Generally, at ESL, Soiltechnics and JPP. Design and specification of earthworks, including determination of slope stability. Investigation and remediation of unstable slopes. Control, implementation of fieldwork and production of geotechnical reports for industrial and commercial developments, housing schemes and water authority infrastructure (scheme values up to £80m). Investigations for outline designs of landfill sites. Investigations for redevelopment of chemically contaminated sites, assessment of the same, design and verification of remediation works. Production of tender and contract documents for ground investigations. Investigations into mine workings and assessment of their stability. Specifications for ground improvement works (vibrotreatment) and piling. Investigations and reporting on a wide range of basement constructions for commercial and residential buildings 1 to 4 stories deep. Producing basement impact reports. Lecturing to other professionals on the investigation assessment and remediation of contaminated land, and EPA part IIA Lectures to local ICE branch on geotechnical aspects.
Materials Management	Production of construction material specifications, primarily in concrete, aggregates and bituminous mixtures, but including masonry, timer, steel and protective systems. Control and implementation of investigations into failures of construction materials including scheduling and analysing test data, and production of technical reports providing specifications for appropriate remedial measures.
Building Structures	Structural inspections and surveys on a wide range of commercial, domestic, industrial and military buildings including direction of appropriate investigations and production of details repairs/construction specifications. Design and checking of building structures in timber, steel, concrete and masonry including supervision of works on site. Design works carried out both manually and using computerised systems following current British Standards and other recognised design standards.
Road Pavement Structures	Direction and implementation of condition surveys and investigations of road pavement using falling weight deflectometer, deflectograph bump integrator and coring. Direction of testing regimes for bituminous and cement bound and unbound pavement materials. Production of reports on condition and assessment of load carrying capacity of existing roadways and specification and structural design for new roadways for both highway and industrial use. Design of various road pavement structures (flexible and rigid) using Highways Agency guidelines and British Ports Federation guidelines.
Drainage and Flood Risk Assessments	Design of main (adoptable) and private foul and stormwater infrastructure for housing, commercial and industrial schemes, including detention basins, infiltration systems, pumping stations etc. Production of flood risk assessment reports.
Quality Assurance	Assisting in production of main laboratory procedures to obtain NAMAS accreditation for large spectrum of soils and materials testing. Geotechnical contributions to Quality Assurance Manual for Soiltechnics/JPP and implementation of procedures.
CPD and Health and Safety	Attendance of in house CPD Seminars and production of Health and Safety Plans/files for building works. Author of in house risk assessment and Practice policies.
Litigation	Acting as expert witness on numerous construction related matters.
Publications	Co-author of a book entitles 'Cracking and Building Movement' published by the Royal Institution of Chartered Surveyors, in late 2004.

Curriculam Vitae
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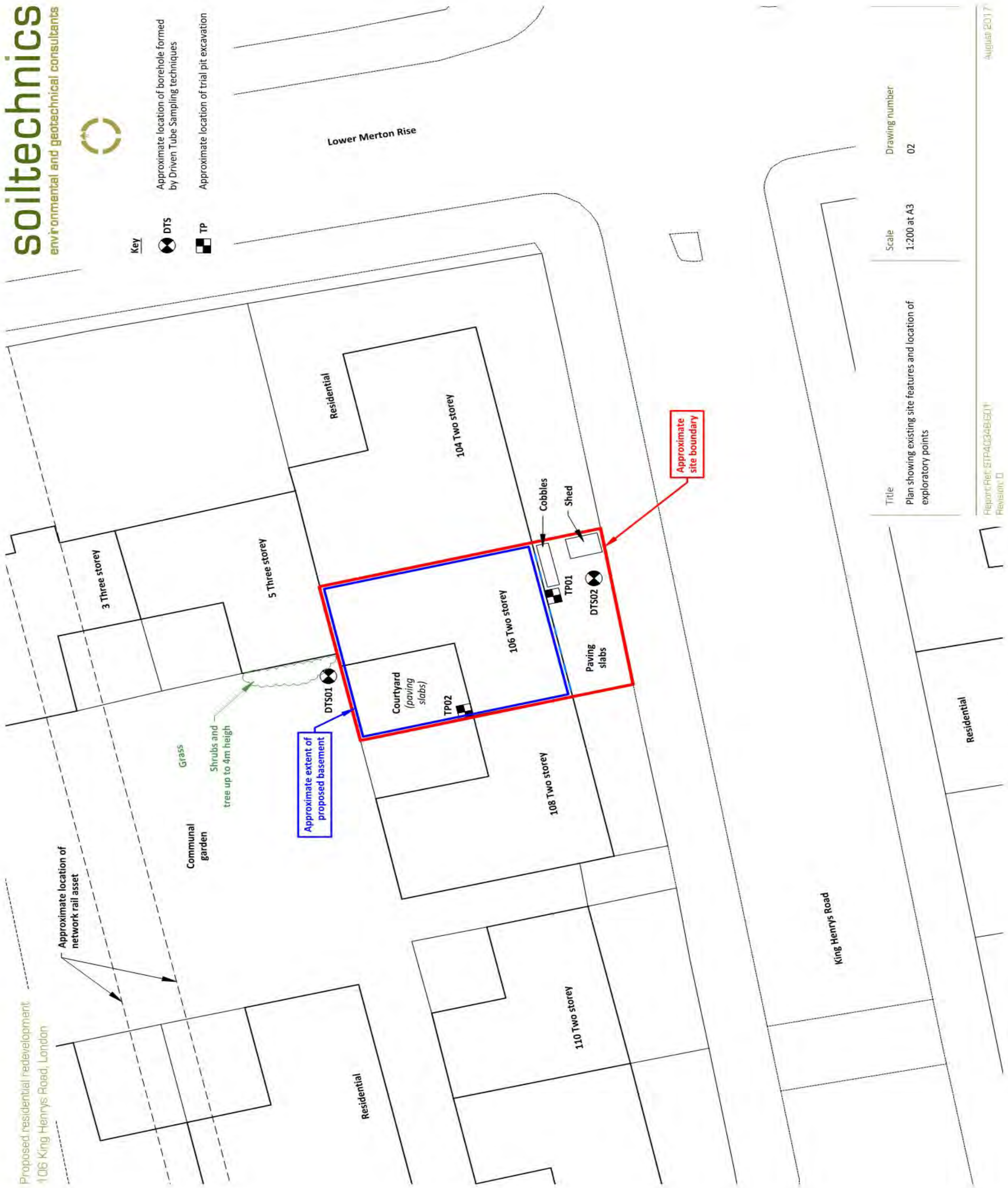

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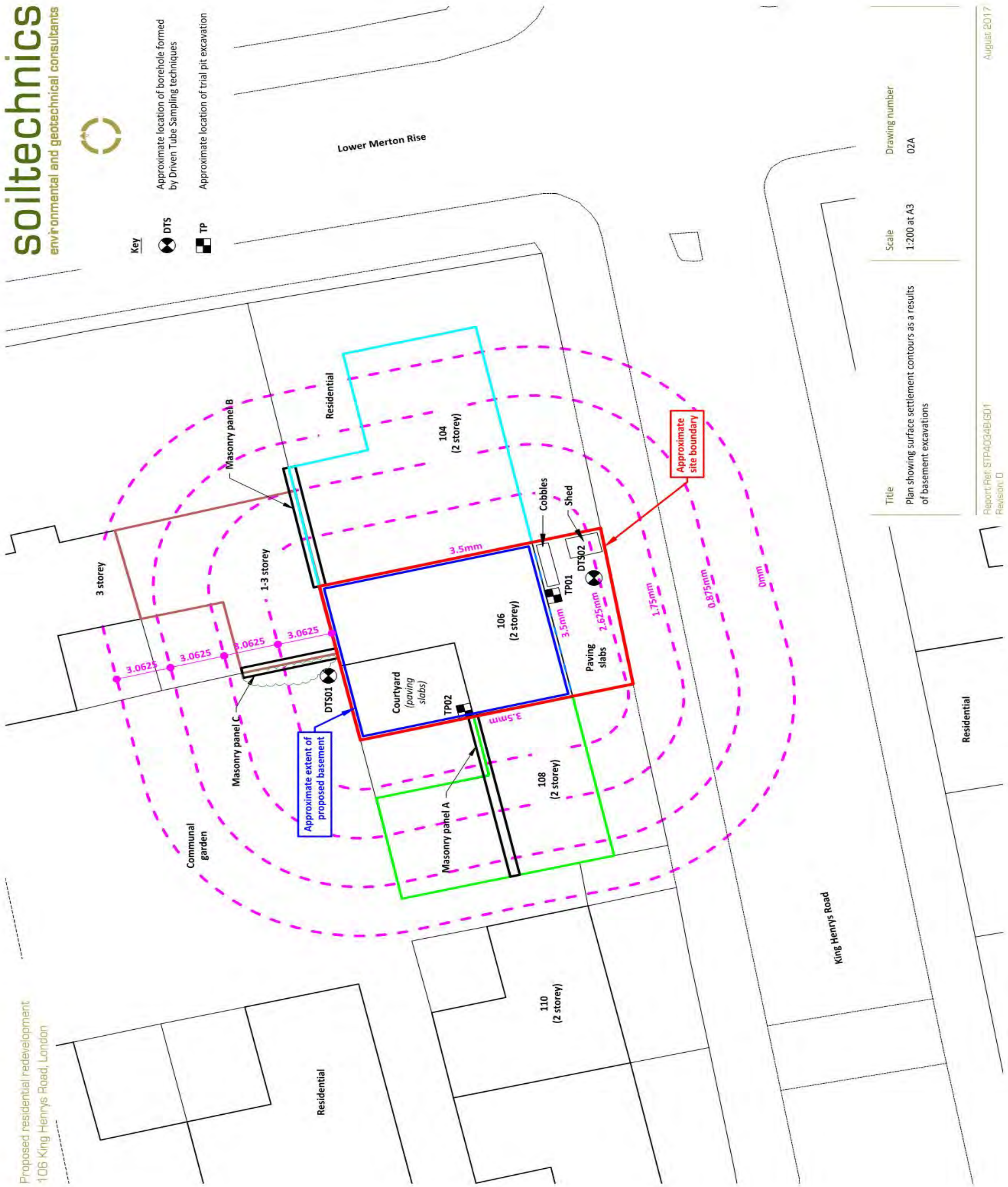
Key
DTS Approximate location of borehole formed by Driven Tube Sampling techniques
TP Approximate location of trial pit excavation
Lower Merton Rise
Residential
104 Two storey
Approximate site boundary
Cobbles
Shed
TP01
DTS02
5 Three storey
3 Three storey
106 Two storey
Paving slabs
Courtyard (paving slabs)
TP02
DTS01
Approximate extent of proposed basement
Grass
Shrubs and tree up to 4m heigh
Communal garden
108 Two storey
Approximate location of network rail asset
110 Two storey
Residential
King Henrys Road
Residential
Proposed residential redevelopment
106 King Henrys Road, London
Title
Plan showing existing site features and location of exploratory points
Scale
1:200 at A3
Drawing number
02
August 2017



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Key
DTS Approximate location of borehole formed by Driven Tube Sampling techniques
TP Approximate location of trial pit excavation
Lower Merton Rise
Residential
104 (2 storey)
Masonry panel B
Approximate site boundary
Cobbles
Shed
3 storey
1-3 storey
3.5mm
TP01
DTS02
106 (2 storey)
3.5mm
2.625mm
1.75mm
0.875mm
0mm
3.0625
3.0625
3.0625
3.0625
Masonry panel C
DTS01
Courtyard (paving slabs)
TP02
3.5mm
Paving slabs
Approximate extent of proposed basement
108 (2 storey)
Masonry panel A
Communal garden
110 (2 storey)
Residential
King Henrys Road
Residential
Proposed residential redevelopment
106 King Henrys Road, London
Title
Plan showing surface settlement contours as a results of basement excavations
Scale
1:200 at A3
Drawing number
02A
August 2017

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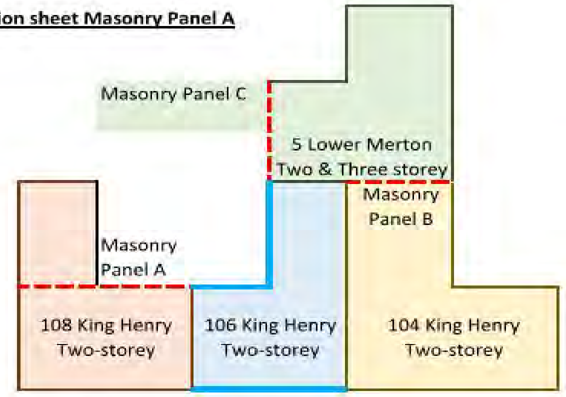
Calculation sheet Masonry Panel A



Dig depth (m)	3.5
Inward yield (mm)	5.25
Surface settlement (mm)	3.5

Vertical

Radius (m)	Settlement (mm)
0	3.5
3.0625	2.625
6.125	1.75
9.1875	0.875
12.25	0

horizontal

Radius (m)	Settlement (mm)
0	5.25
3.5	3.9375
7	2.625
10.5	1.3125
14	0

Masonry Panel A
Consider elevation of 5 Lower Merton Street - all measurements in mm

X = 11306
net settlement = 2.789714286

Tensile strain in vertical

$\frac{2.7897}{11306}$ *100 = 0.0246746 % Burland Category 0

Tensile strain in horizontal

Y = 9764.000399

$\frac{0.040}{9764}$ *100 = 0.0004082 % Burland Category 0

Tensile strain in diagonal

Z= 5.382527

$\frac{5.38}{11306}$ *100 = 0.0476077 % Burland Category 0

Tensile strain on adjusted horizontal diagonal

$\frac{5.38}{9764}$ *100 = 0.0551262 % Burland Category 1

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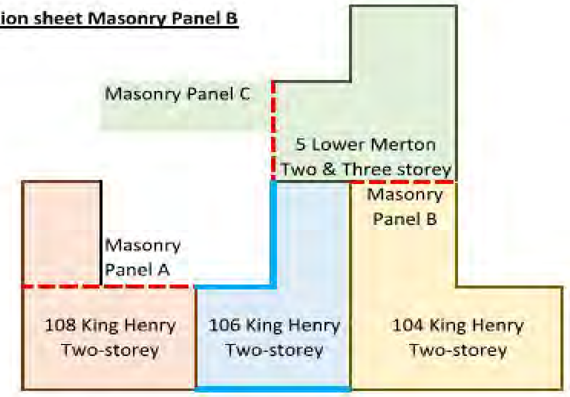
Calculation sheet Masonry Panel B



Dig depth (m)	3.5
Inward yield (mm)	5.25
Surface settlement (mm)	3.5

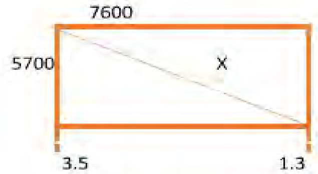
Vertical

Radius (m)	Settlement (mm)
0	3.5
3.0625	2.625
6.125	1.75
9.1875	0.875
12.25	0

horizontal

Radius (m)	Settlement (mm)
0	5.25
3.5	3.9375
7	2.625
10.5	1.3125
14	0

Masonry Panel B
Consider elevation of 5 Lower Merton Street - all measurements in mm



X = 9500
net settlement = 2.171428571

Tensile strain in vertical

$\frac{2.1714}{9500}$ *100 = 0.0228571 % Burland Category 0

Tensile strain in horizontal

Y = 7600.000310

$\frac{0.031}{7600}$ *100 = 0.0004082 % Burland Category 0

Tensile strain in diagonal

Z= 4.189595

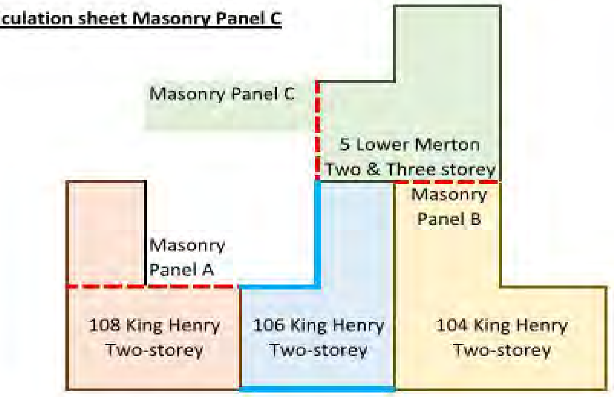
$\frac{4.19}{9500}$ *100 = 0.044101 % Burland Category 0

Tensile strain on adjusted horizontal diagonal

$\frac{4.19}{7600}$ *100 = 0.0551262 % Burland Category 1

soiltechnics
environmental and geotechnical consultants

Calculation sheet Masonry Panel C



Dig depth (m)	3.5
Inward yield (mm)	5.25
Surface settlement (mm)	3.5

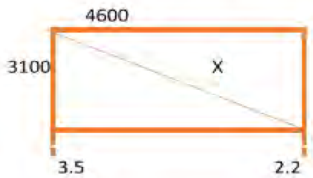
Vertical

Radius (m)	Settlement (mm)
0	3.5
3.0625	2.625
6.125	1.75
9.1875	0.875
12.25	0

horizontal

Radius (m)	Settlement (mm)
0	5.25
3.5	3.9375
7	2.625
10.5	1.3125
14	0

Masonry Panel c
Consider elevation of 5 Lower Merton Street - all measurements in mm



X = 5547
net settlement = 1.314285714

Tensile strain in vertical

$\frac{1.3143}{5547}$ *100 = 0.0236933 % Burland Category 0

Tensile strain in horizontal

Y = 4600.000188

$\frac{0.019}{4600}$ *100 = 0.0004082 % Burland Category 0

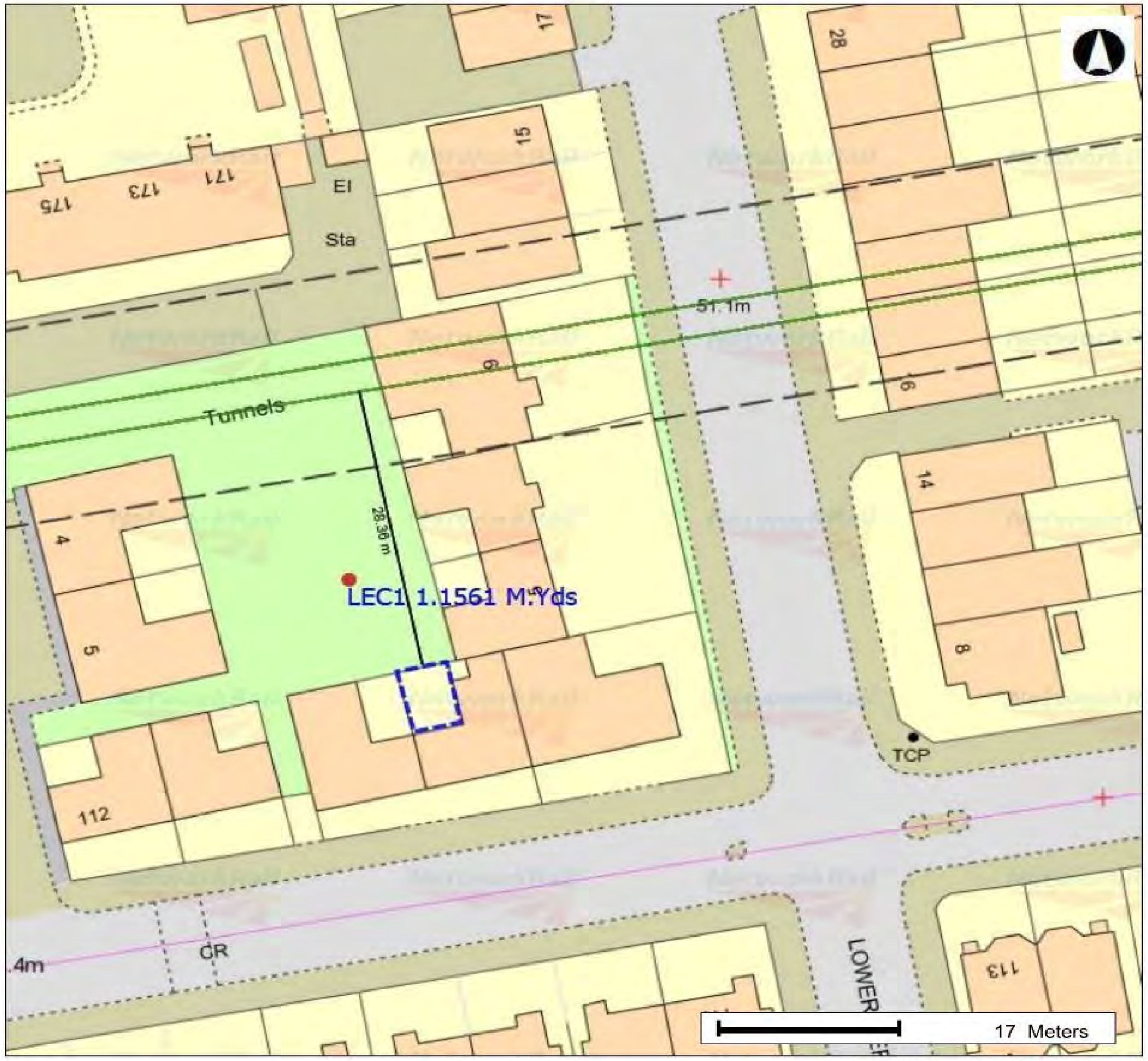
Tensile strain in diagonal

Z= 2.535807

$\frac{2.54}{5547}$ *100 = 0.0457143 % Burland Category 0

Tensile strain on adjusted horizontal diagonal

$\frac{2.54}{4600}$ *100 = 0.0551262 % Burland Category 1



Please note that this map is not suitable for legally binding documents. If you require a map for a legally binding document, please contact the land information team: landinformation@networkrail.co.uk

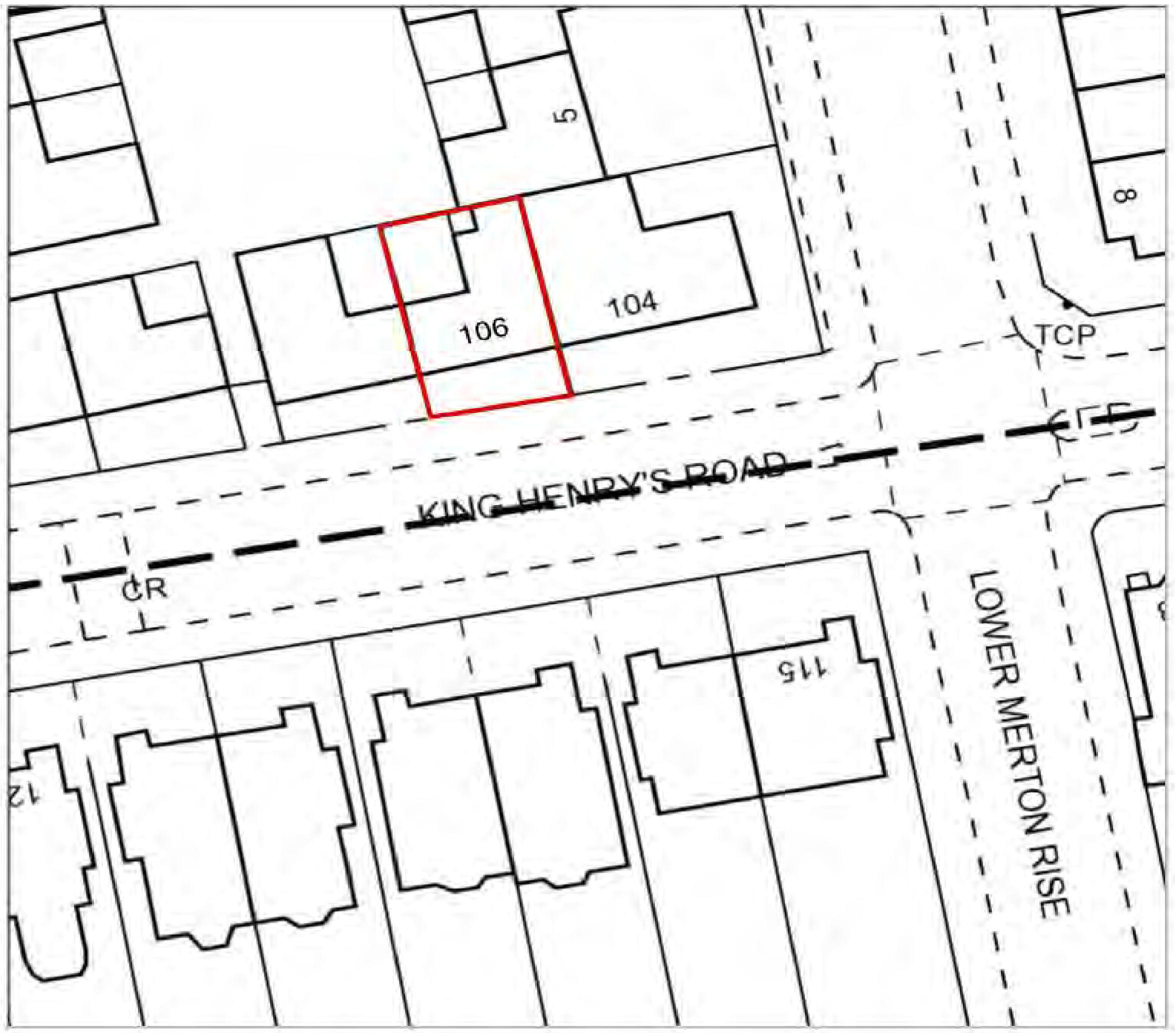
NetworkRail

106 King Henrys Rd Primrose Hill (Slow) Tunnel	
Scale	1 : 517
Plot Date	22/06/17 09:25
Printed By	

Output created from GeoRINM Viewer

Appendix A

Architect's Drawings



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revisions:
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client
Debra Tammer and Gidon Katz

project
106 King Henry's Road, London, NW3 3SL

issue
Planning Application

drawing title
Site Location Plan

date	drawn by	revision
Sep 16	EG	A
scale	**checked by**	**drawing**
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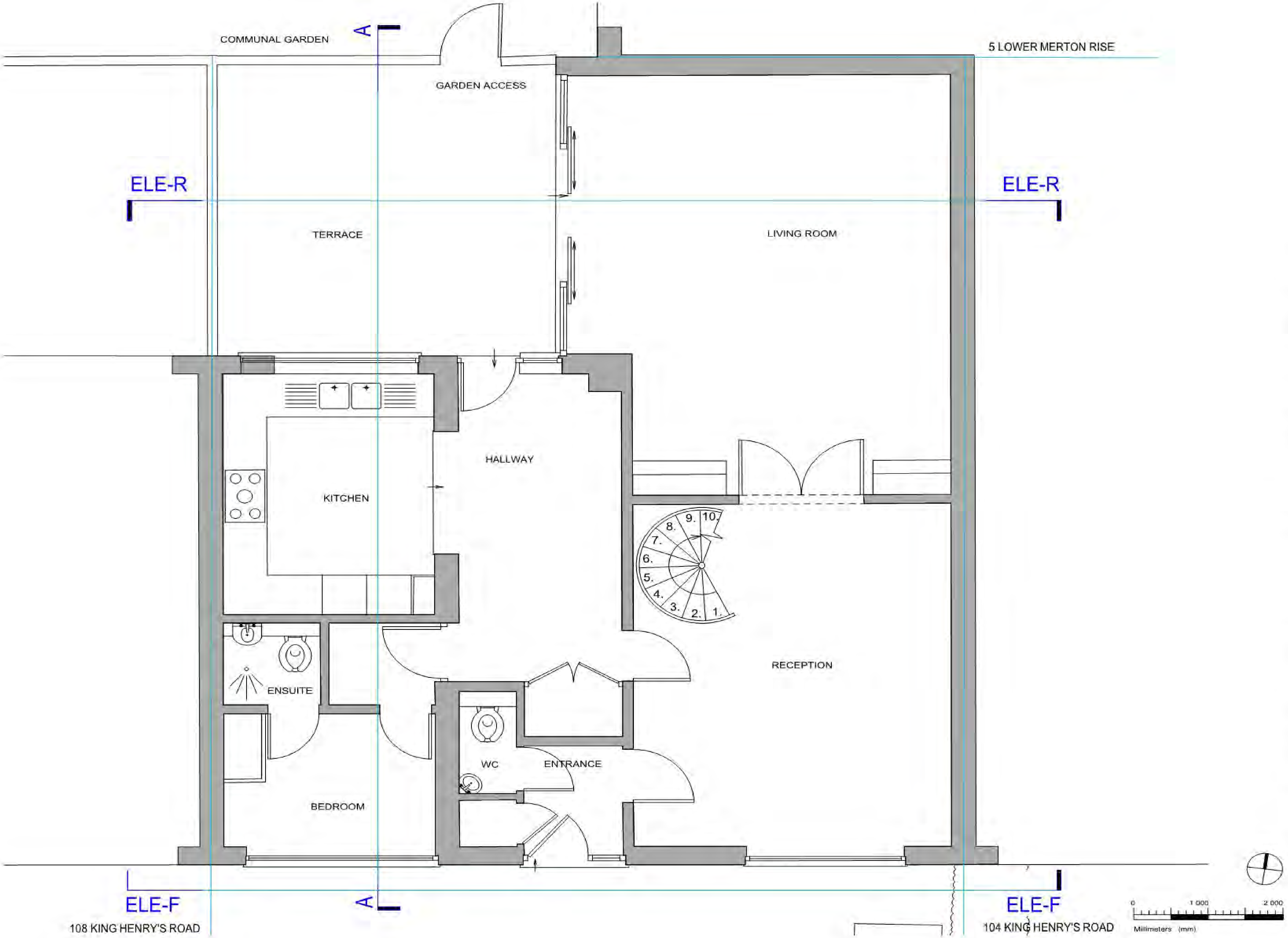

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drawing title

Ground Floor Plan Existing

date	drawn by	revision
Sep 16	EG	A
scale	checked by	drawing
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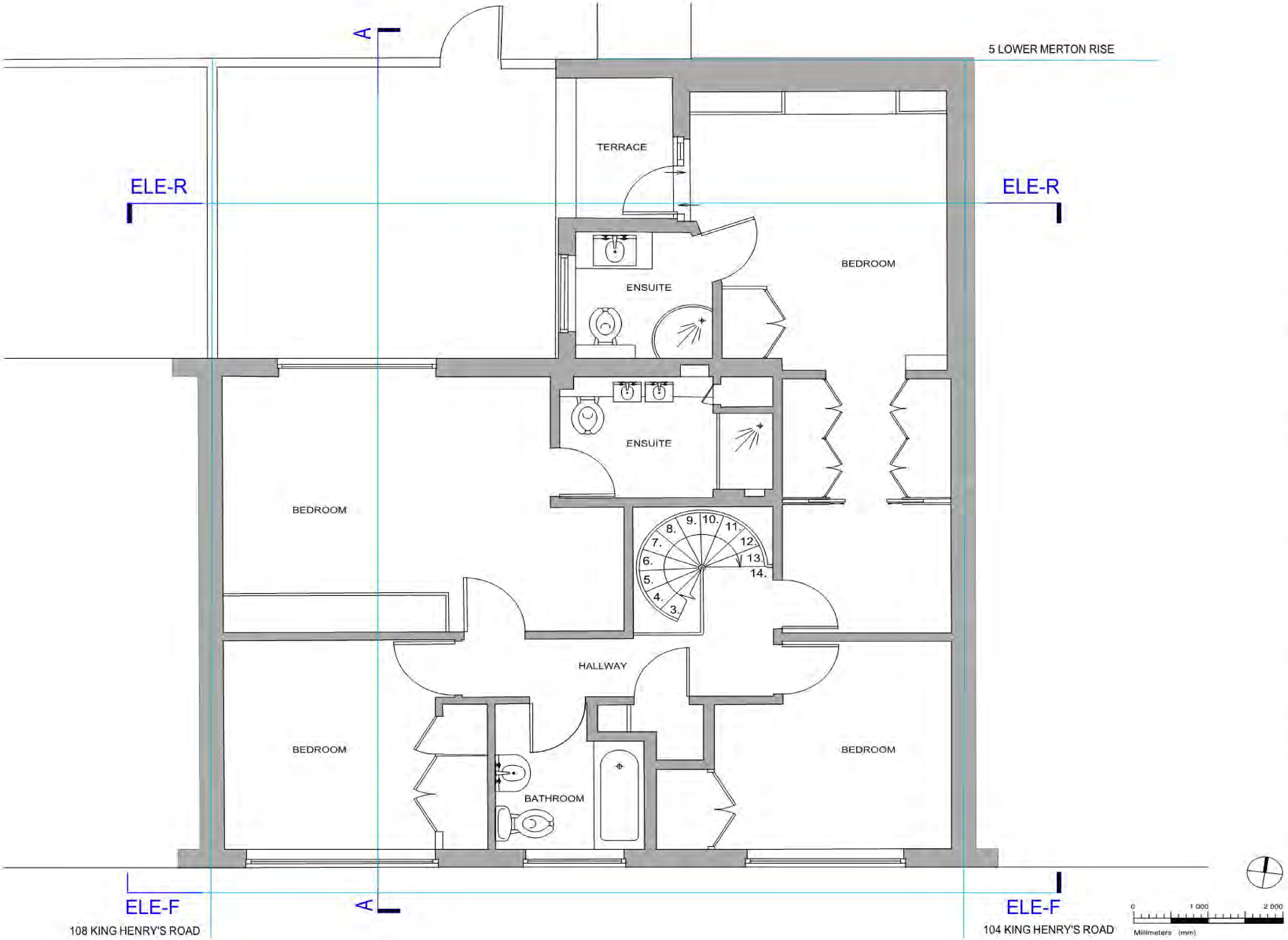

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Planning Application

drawing title
First Floor Plan Existing

date	drawn by	revision
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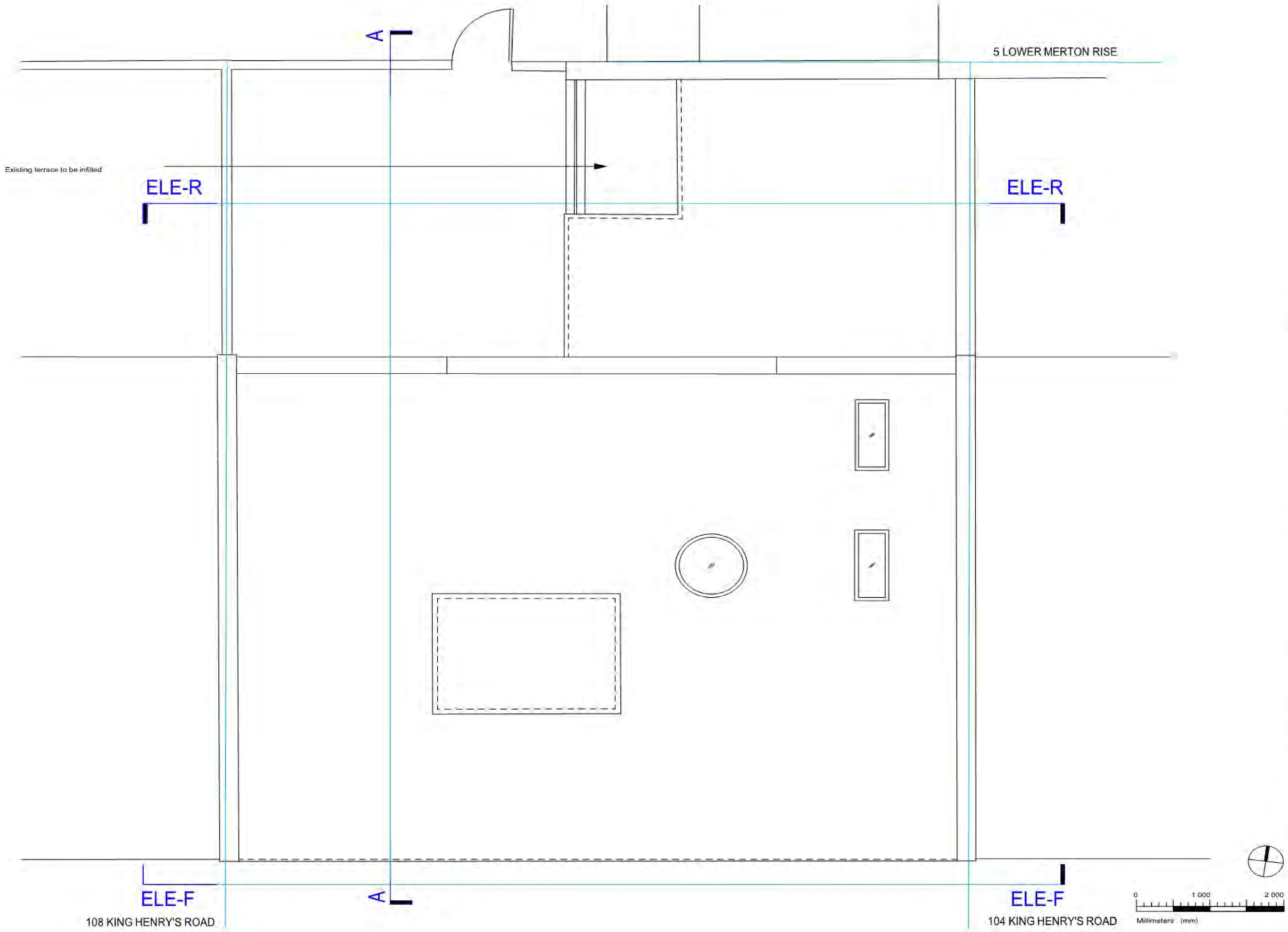

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Planning Application

drawing title

Roof Plan
Existing

date	drawn by	revision
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scale	checked by	drawing
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Planning Application

drawing title

100 EXISTING
Front Elevation

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scale	**checked by**	**drawing**
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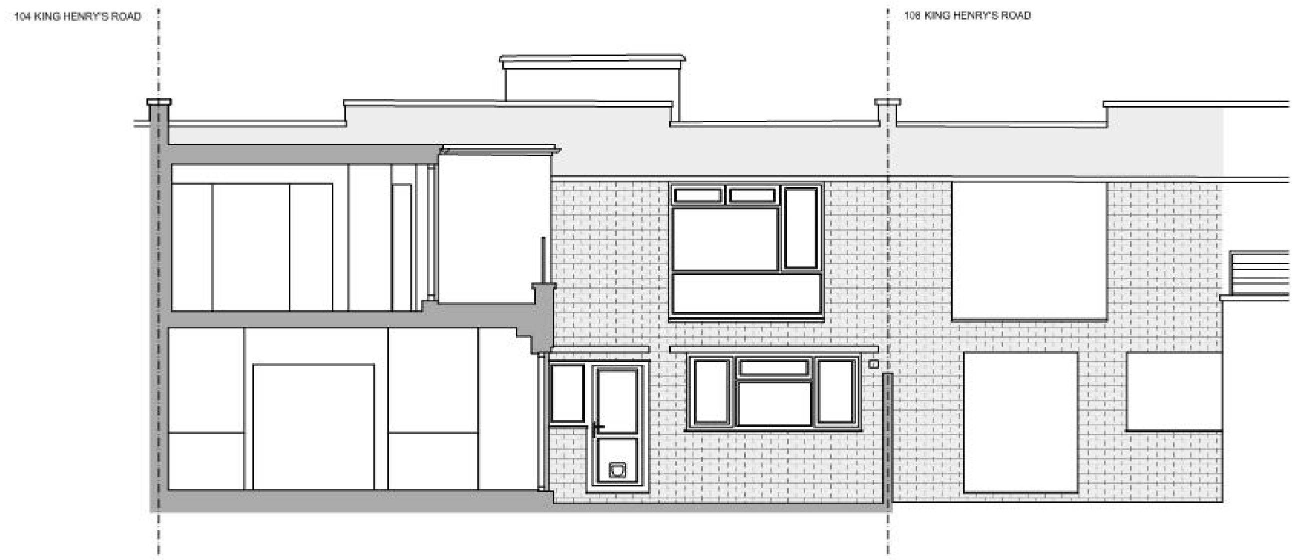

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Millimeters (mm)

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drawing title

100 EXISTING
Rear Elevation

date	drawn by	revision
Sep 16	EG	A
scale	checked by	drawing
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drawing title

100 EXISTING
Section A-A

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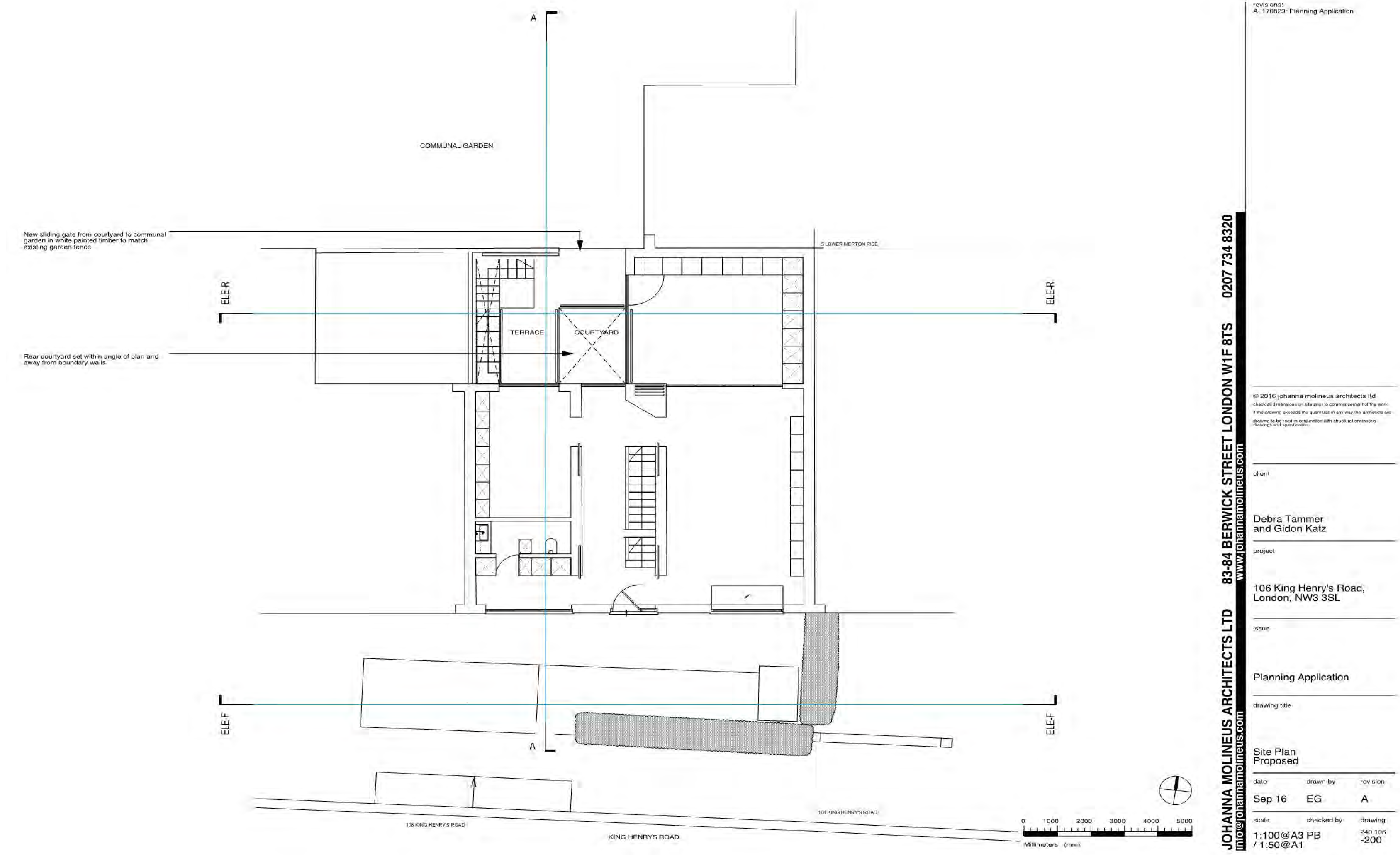

A
COMMUNAL GARDEN
New sliding gate from courtyard to communal garden in white painted timber to match existing garden fence
8 LOWER MERTON RISE
ELE-R
TERRACE
COURTYARD
Rear courtyard set within angle of plan and away from boundary walls
ELE-F
104 KING HENRY'S ROAD
108 KING HENRY'S ROAD
KING HENRYS ROAD
0 1000 2000 3000 4000 5000
Millimeters (mm)
revisions:
A: 170829: Planning Application
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project
106 King Henry's Road, London, NW3 3SL
issue
Planning Application
drawing title
Site Plan Proposed
date
Sep 16
drawn by
EG
revision
A
scale
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drawing
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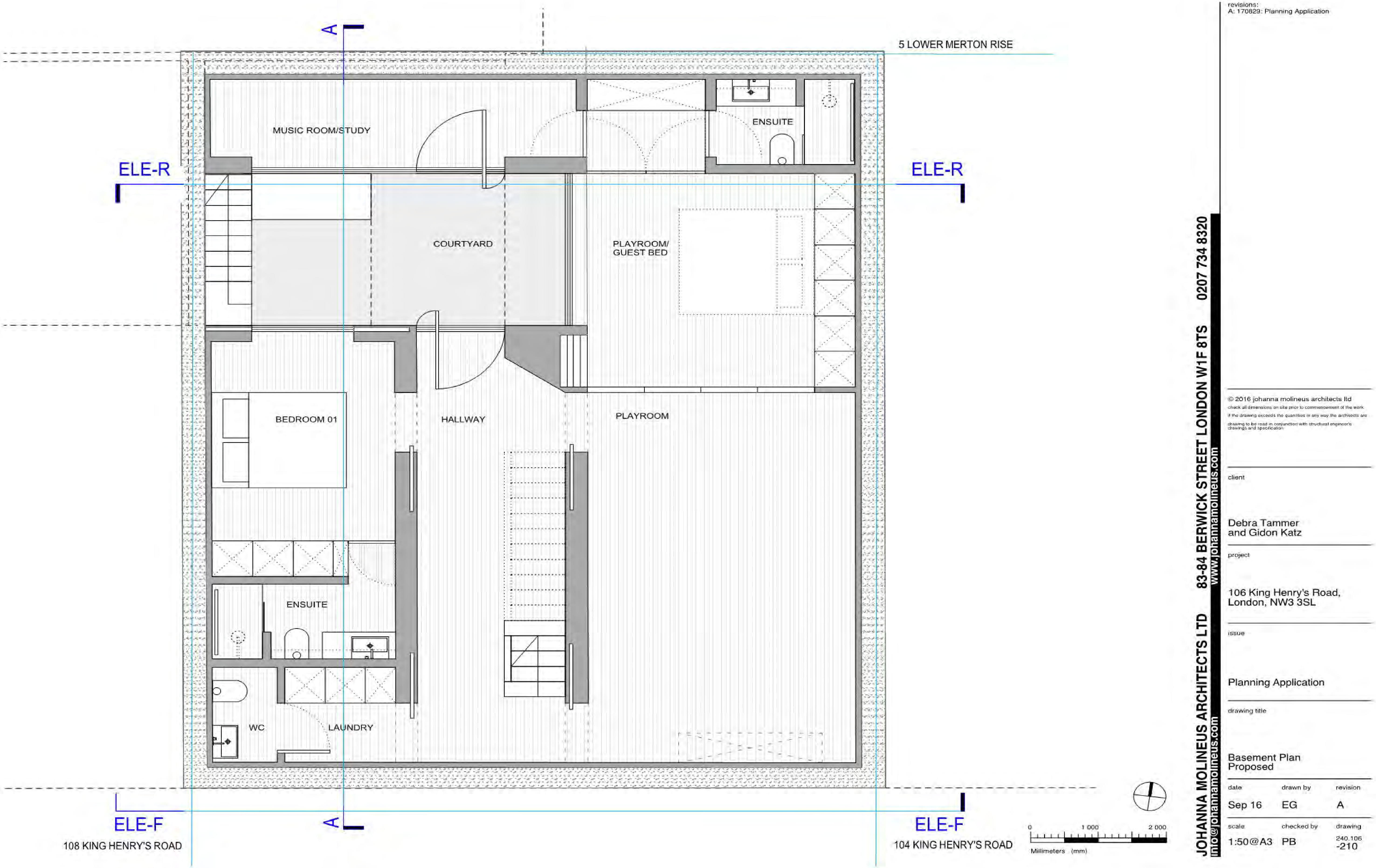
revisions:
A: 170829: Planning Application
5 LOWER MERTON RISE
ELE-R
ELE-R
A
A
MUSIC ROOM/STUDY
ENSUITE
COURTYARD
PLAYROOM/
GUEST BED
BEDROOM 01
HALLWAY
PLAYROOM
ENSUITE
WC
LAUNDRY
ELE-F
ELE-F
108 KING HENRY'S ROAD
104 KING HENRY'S ROAD
0
1 000
2 000
Millimeters (mm)
JOHANNA MOLINEUS ARCHITECTS LTD 83-84 BERWICK STREET LONDON W1F 8TS 0207 734 8320
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and Gidon Katz
project
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issue
Planning Application
drawing title
Basement Plan
Proposed
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Sep 16
drawn by
EG
revision
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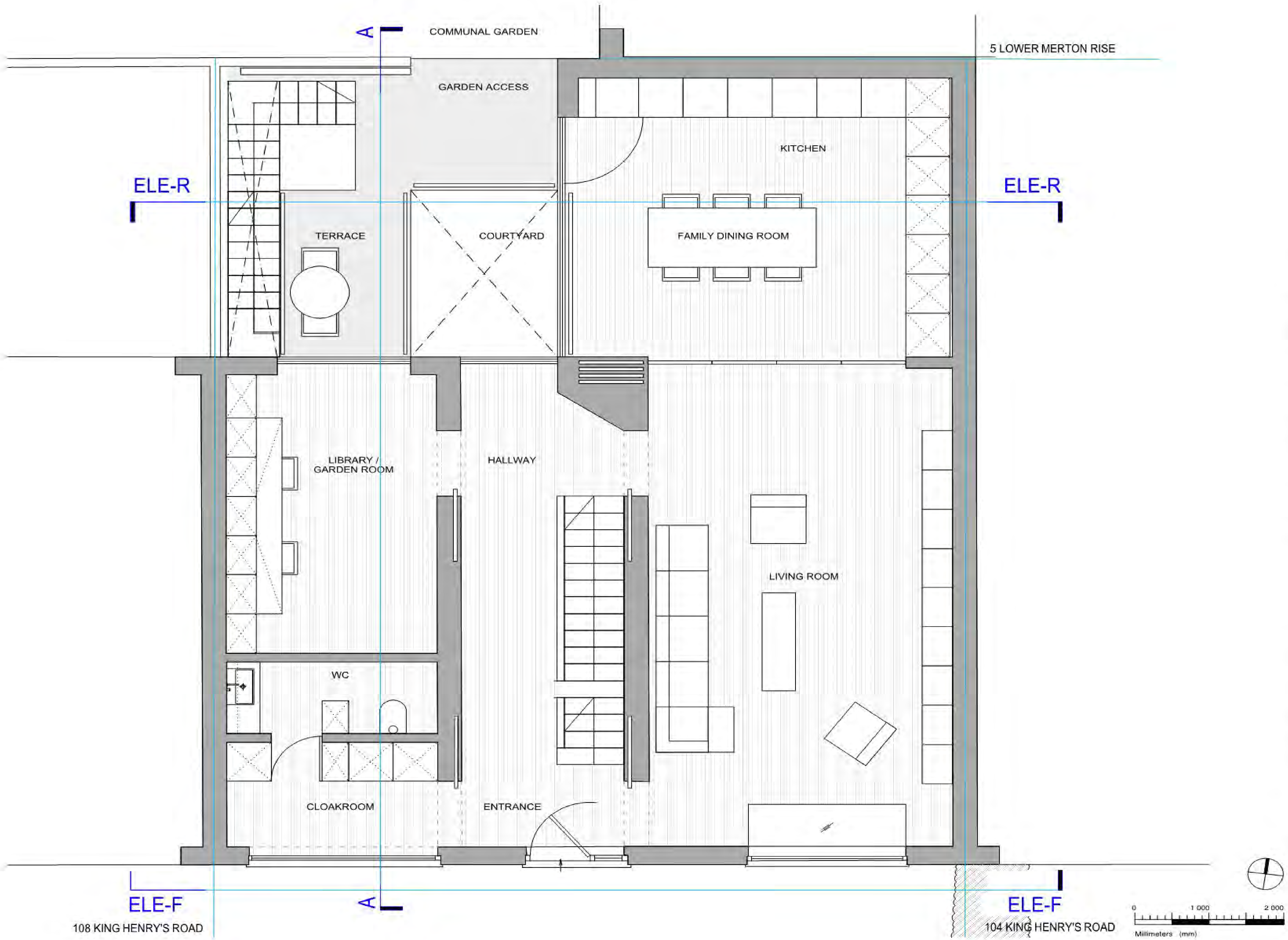

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Planning Application

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Ground Floor Plan Proposed

date	drawn by	revision
Sep 16	EG	A
scale	checked by	drawing
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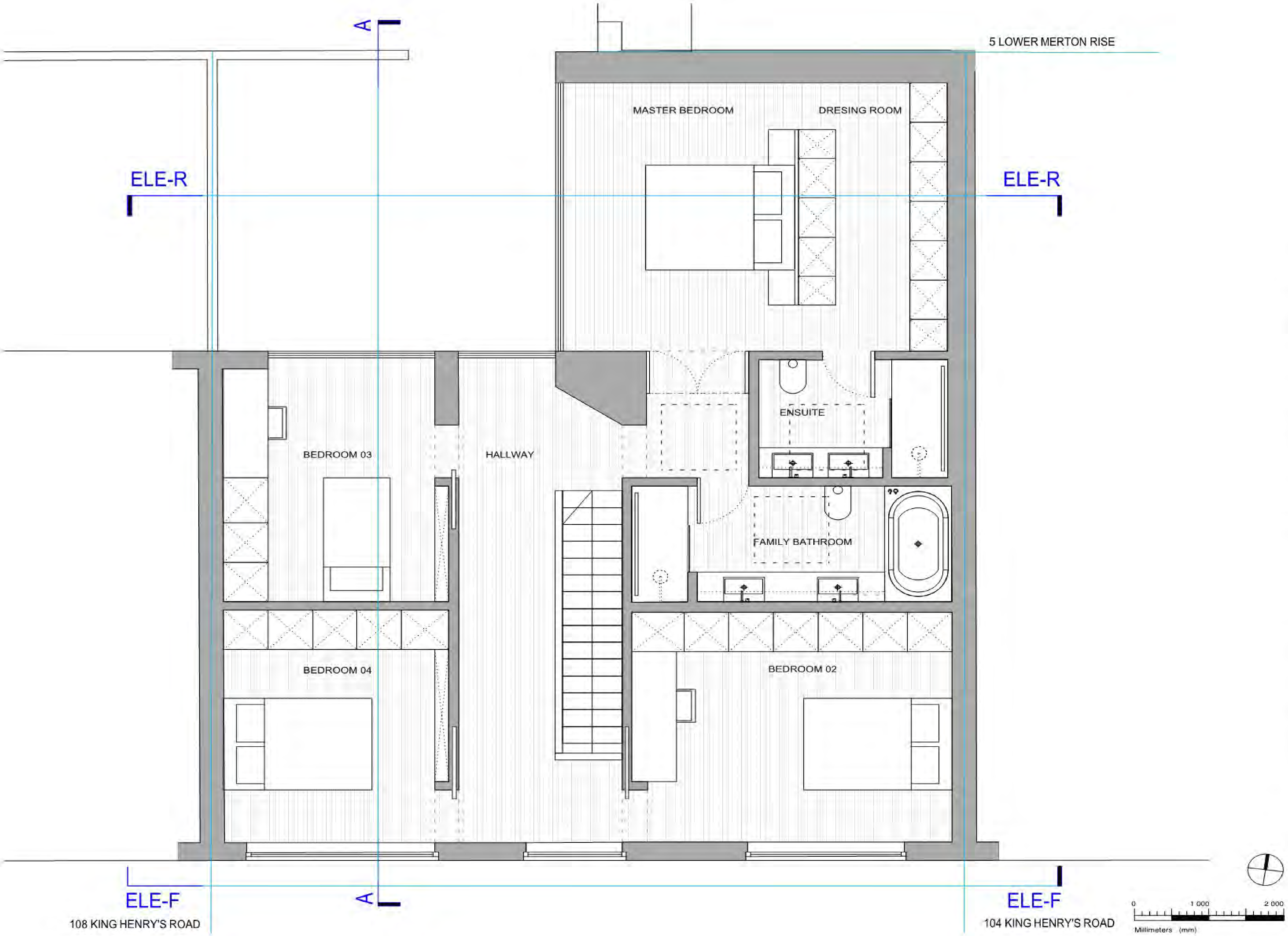

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drawing title

First Floor Plan Proposed

date	drawn by	revision
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scale	checked by	drawing
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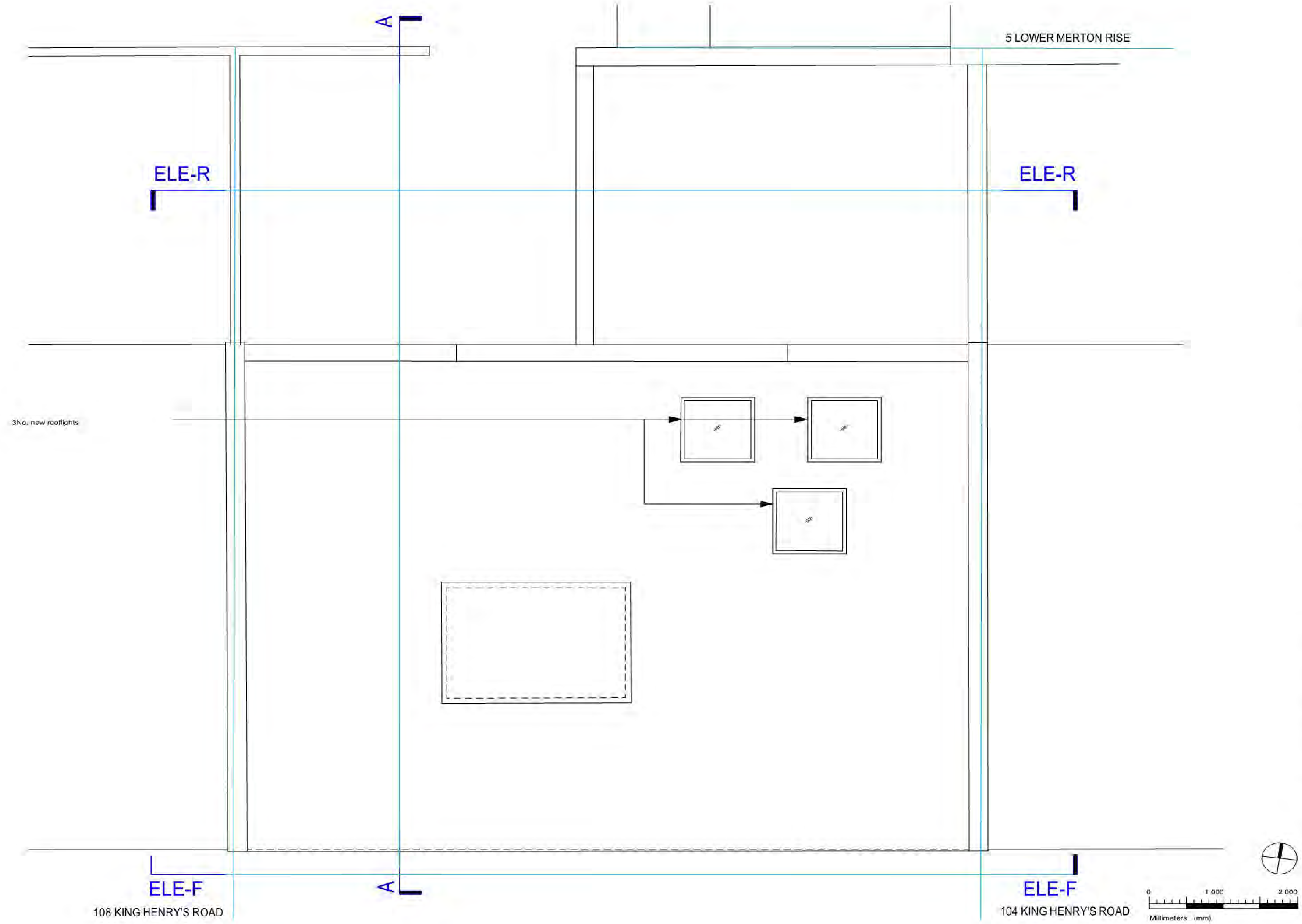

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Roof Plan Proposed

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drawing title

200 PROPOSED
Front Elevation

date	drawn by	revision
Sep 16	EG	A
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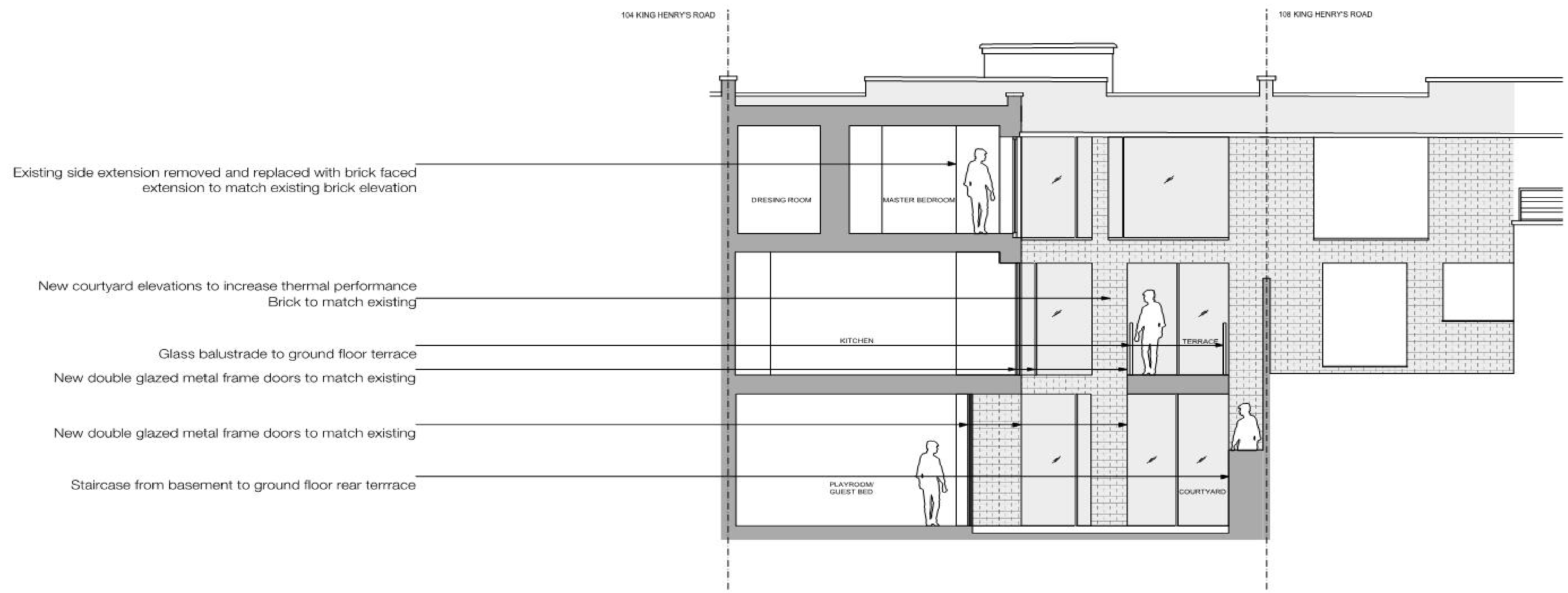

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Millimeters (mm)

revisions:
A: 170829: Planning Application

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issue

Planning Application

drawing title

200 PROPOSED
Rear Elevation

date	drawn by	revision
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scale	**checked by**	**drawing**
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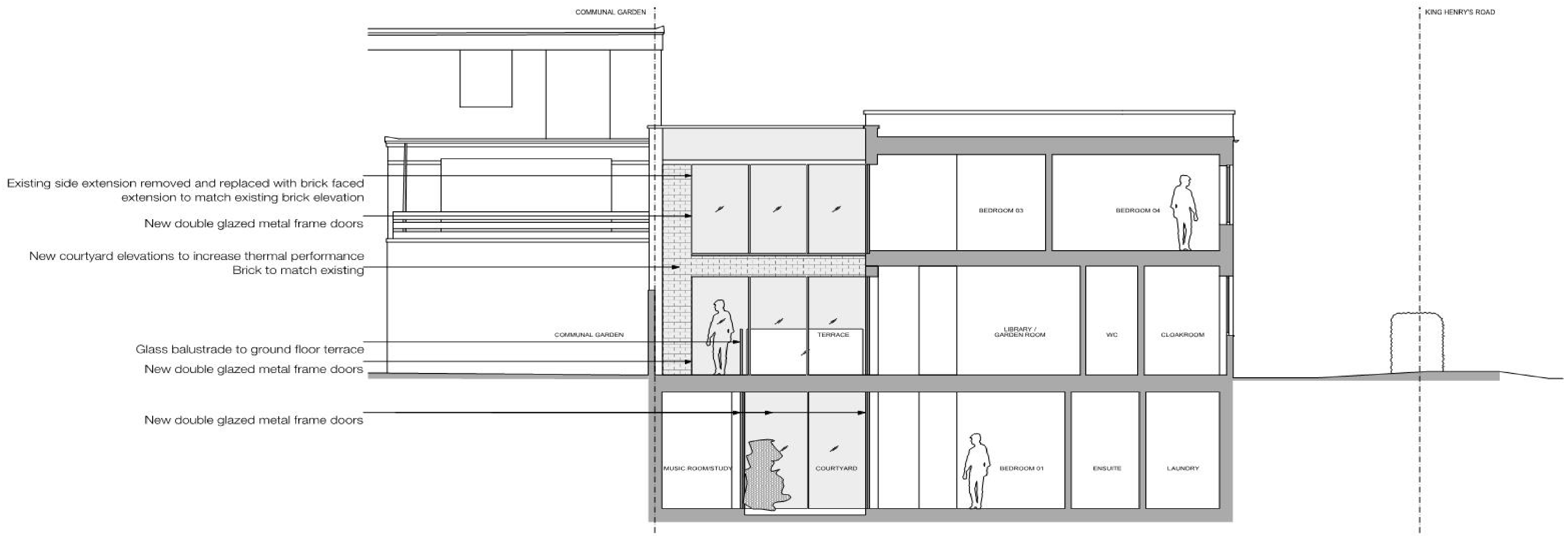

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Millimeters (mm)

revisions:
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Planning Application

drawing title

200 PROPOSED
Section A-A

date	drawn by	revision
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scale	checked by	drawing
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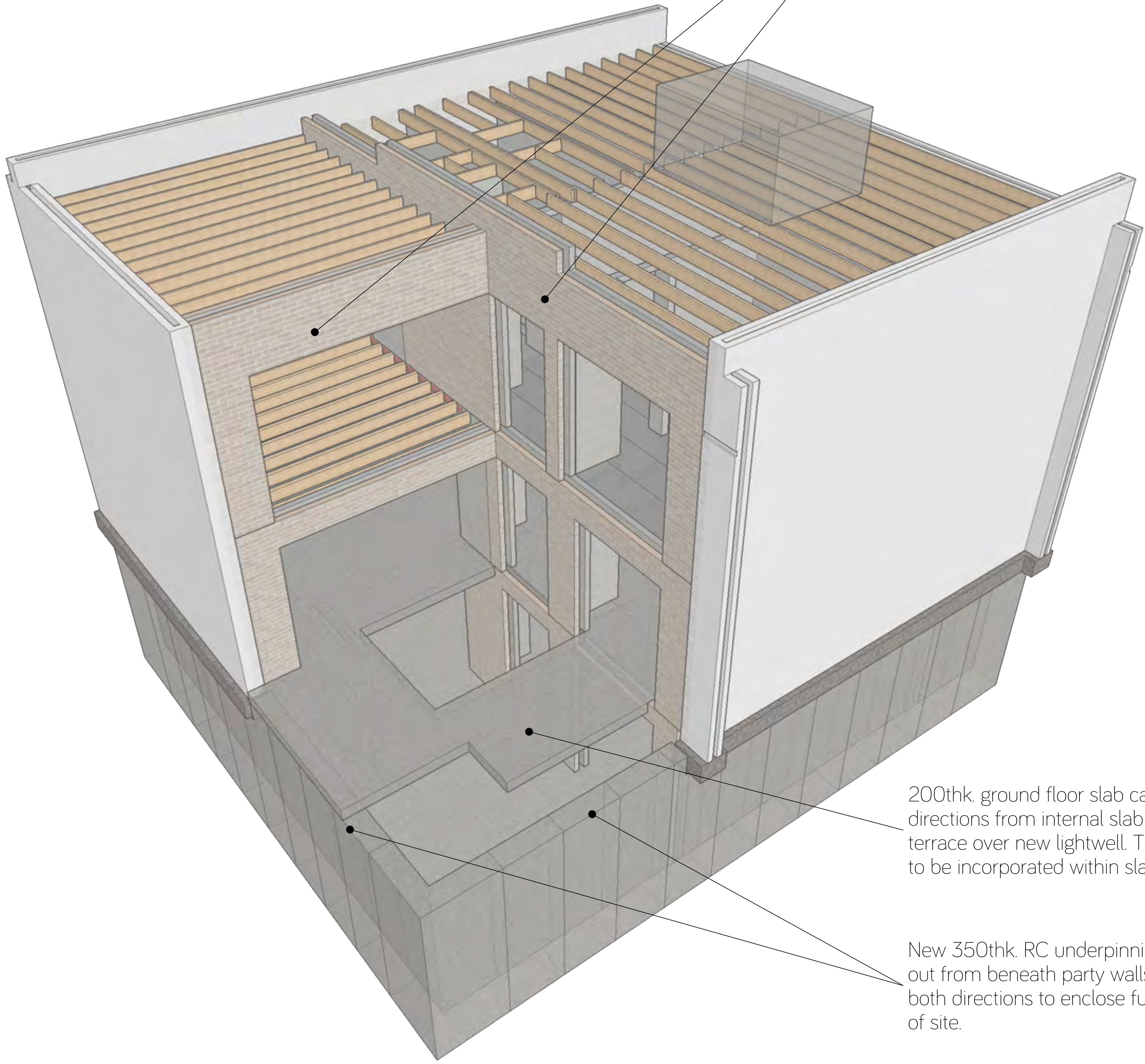
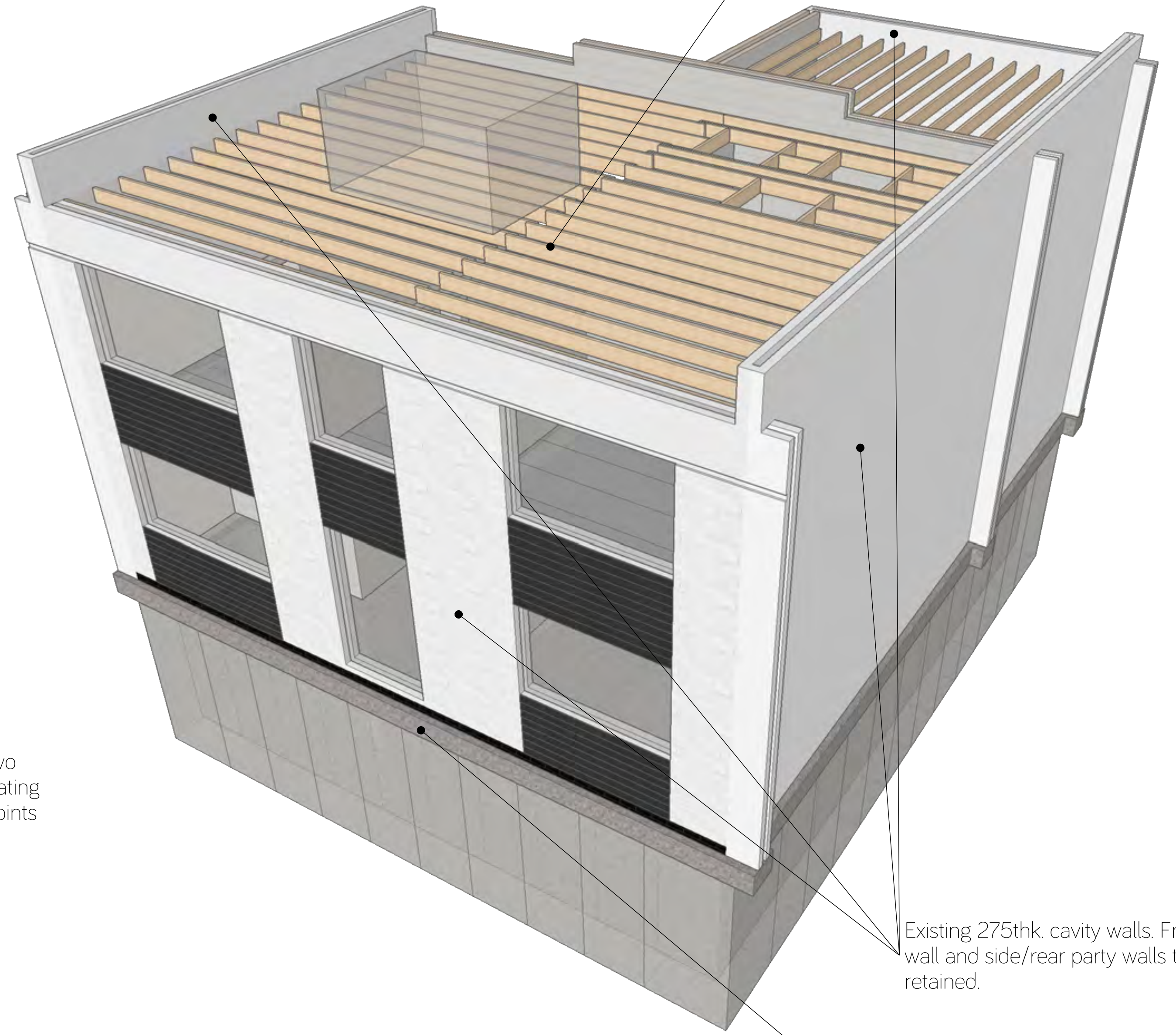
Appendix B

Structural Proposals



Rear Perspective



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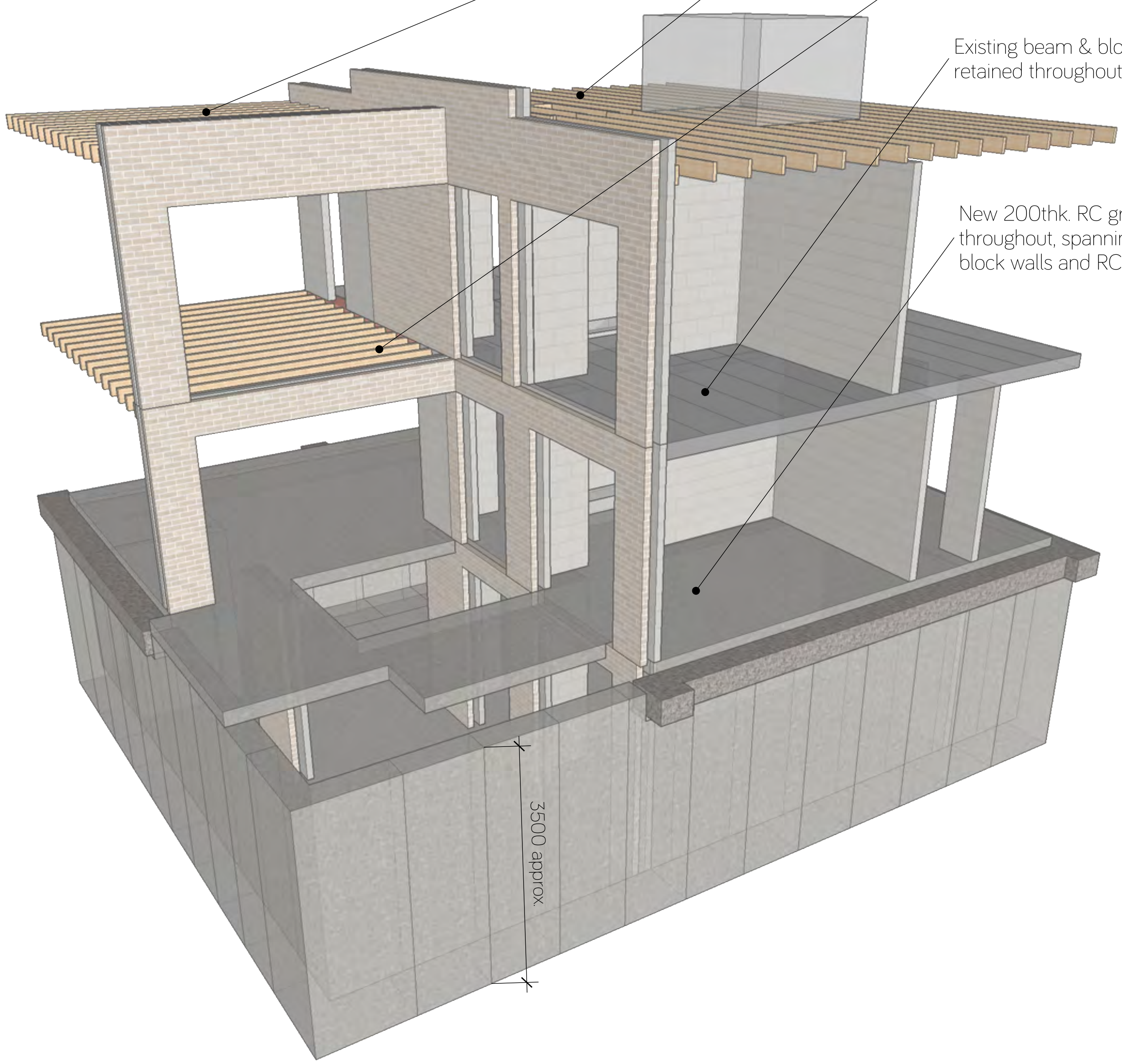
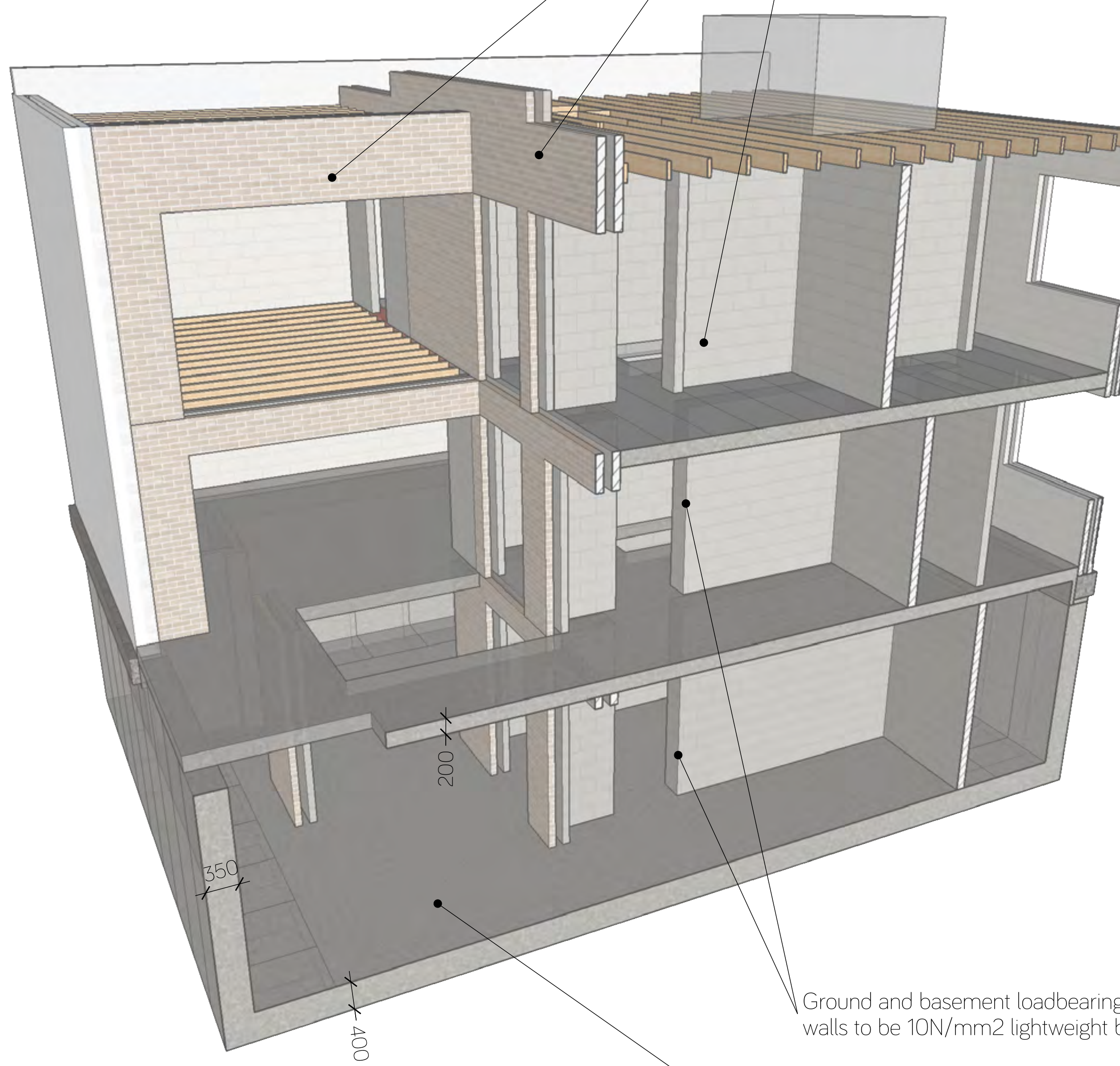
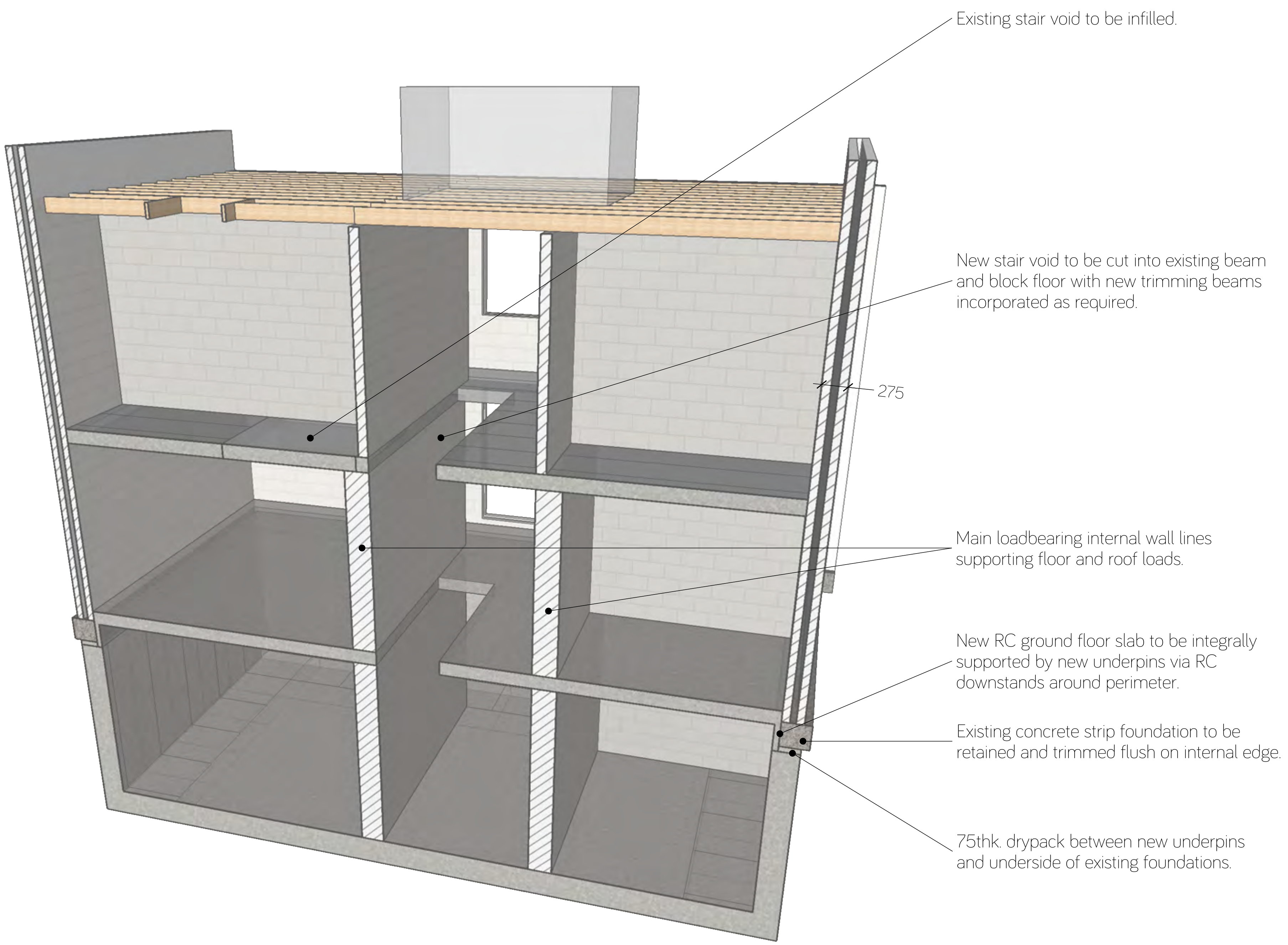


Internal Perspective
(External Walls Hidden)



Sectional Perspective 1



Sectional Perspective 2

Appendix C

Underpinning Principles

Note: The following diagrams are generic for the purpose of illustrating the sequence of operations to be employed. The existing building details and propping configuration indicated are not exactly as per 106 King Henrys Road, but the operations listed and their sequence is applicable.

Stage 1

Building Stripout

1-1. Strip out building and remove existing ground floor

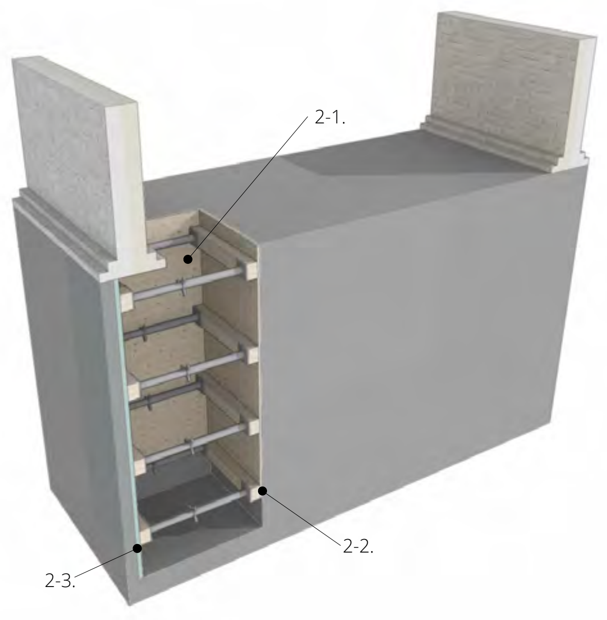
Stage 2

Excavate Underpins

2-1. Commence excavation for first stage of underpins in accordance with agreed sequence.

2-2. Install shoring and sheeting as excavation proceeds

2-3. Install de-bonded non-compressible water resistant cementitious board liner to back of underpins. Internal face of board liner to be flush with face of wall above so that concrete pin does not project into neighbouring site beyond face of existing masonry above ground level.

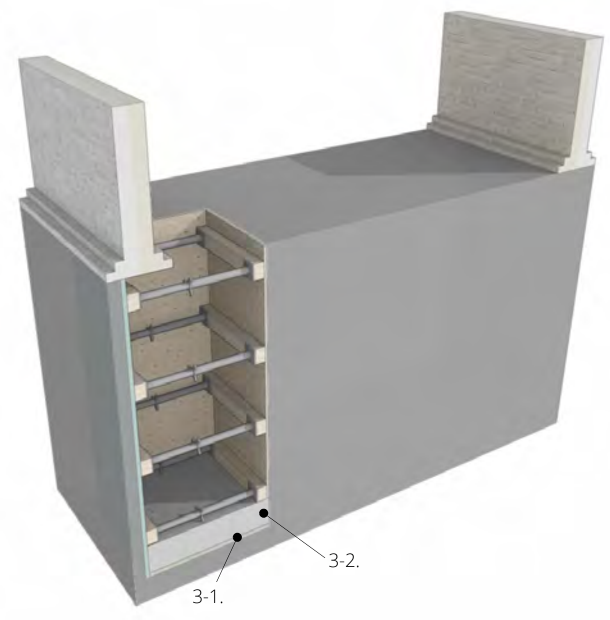


Stage 3

Cast Base to Underpin

3.1. Cast concrete blinding to first stage of underpins in accordance with agreed sequence

3-2. Fix rebar and cast bases to first stage of underpins in accordance with agreed sequence



Stage 4

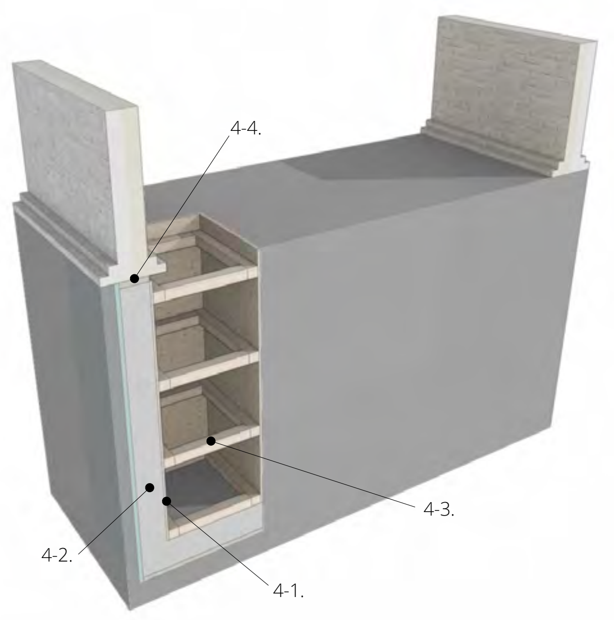
Cast Retaining Wall to Underpin

4-1. Fix rebar and erect formwork for in-situ concrete wall

4-2. Cast wall to first stage of underpins in accordance with agreed sequence

4-3. Dry-pack between top of underpin and underside of existing masonry in accordance with agreed sequence. Min. 24hrs after concreting.

4-4. Strike formwork once concrete has gained sufficient strength. Re-prop wall and excavation.

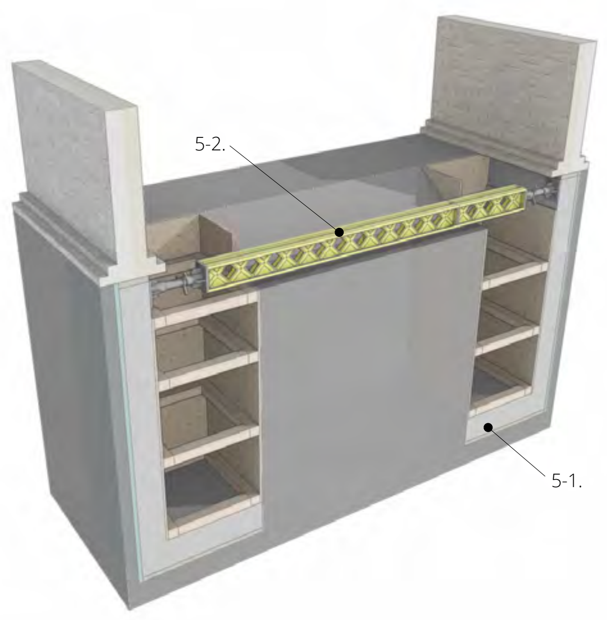


Stage 5

Install High Level Props

5-1. Repeat Stages 2 to 4 in accordance with agreed underpinning sequence

5.2. Install high level propping upon completion of opposing underpins.



Stage 6

Complete Underpinning

6-1. Complete underpinning in accordance with agreed sequence.

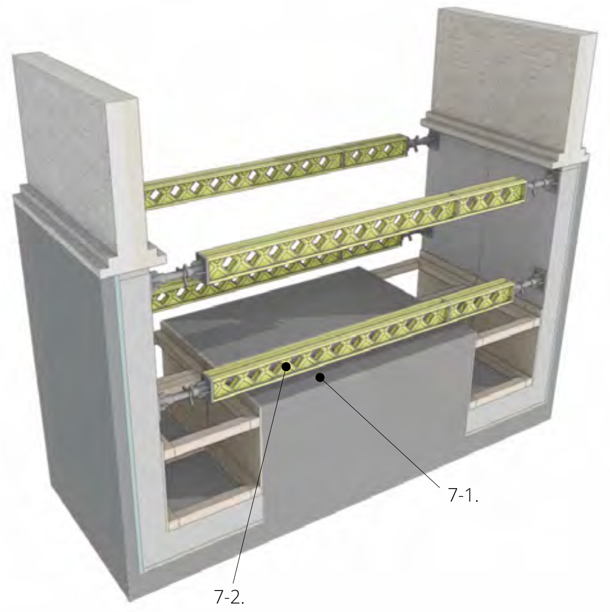
6-2. Complete installation of high-level propping

Stage 7

Reduce Central Berm

7-1. Commence excavation reducing central berm.

7-2. Install additional levels of propping in accordance with temporary works engineers requirements as excavation proceeds

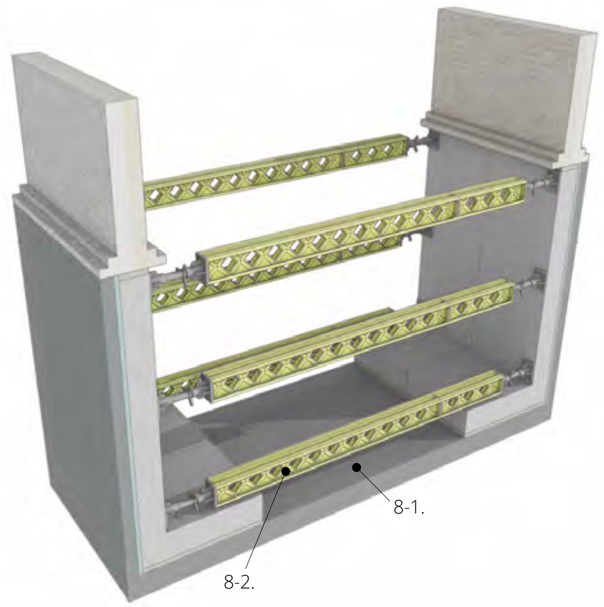


Stage 8

Complete Excavation of Central Berm

8-1. Complete excavation of central berm.

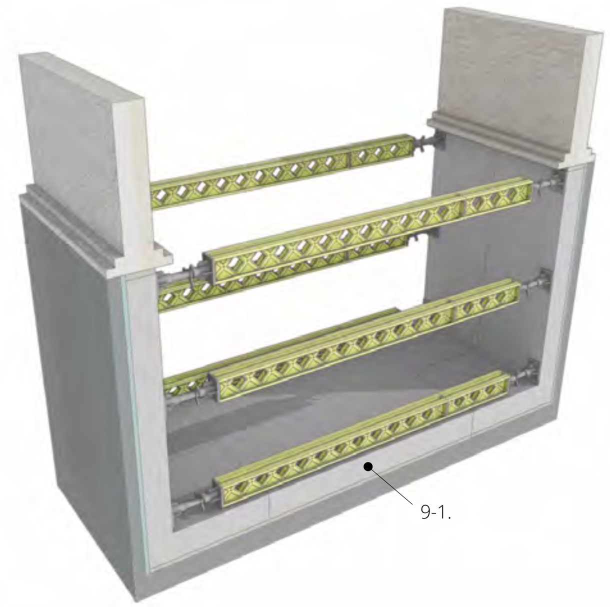
8-2. Install additional propping in accordance with temporary works engineers requirements as excavation proceeds



Stage 9

Cast Basement Slab

9-1. Cast basement slab so that rebar fully lapped and slab continuous with retaining wall



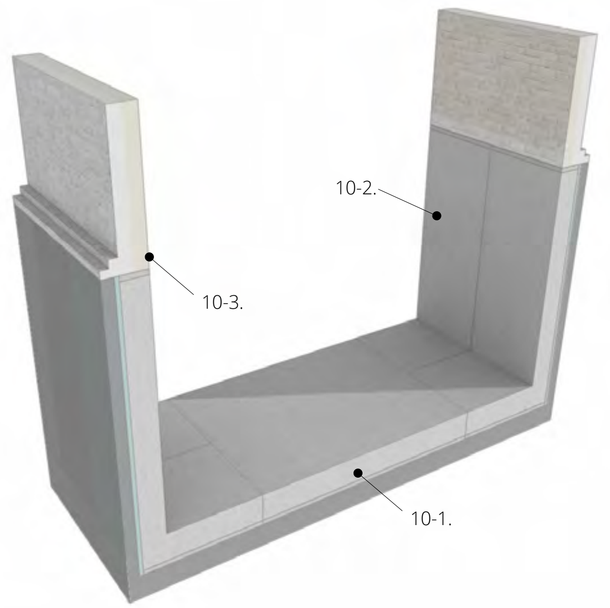
Stage 10

De-prop Retaining Walls

10-1. Allow concrete to gain sufficient strength

10-2. Remove propping to retaining walls

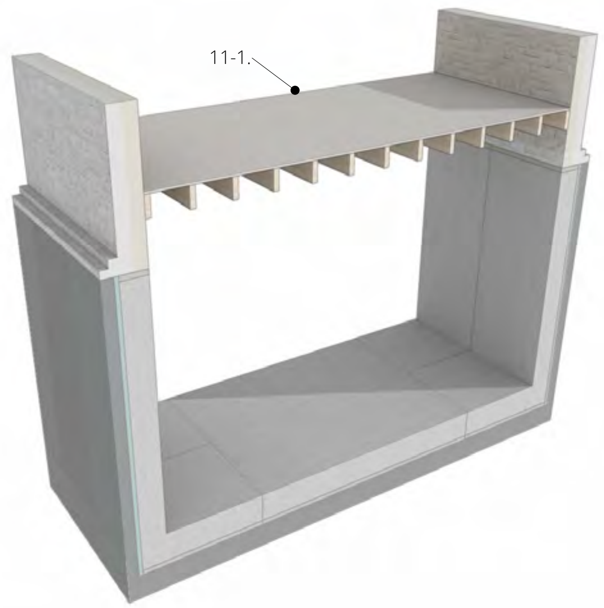
10-3. Break-back existing foundation corbels to internal face of underpin



Stage 11

Construct New Ground Floor

11-1. Install new ground floor



Notes

- The above construction sequence is provisional pending temporary works design by the contractor.

- All temporary works design and construction sequencing is the responsibility of the contractor. See general notes drawing.

Appendix D

Construction and Traffic Management Plan

(To follow)