constructure

Constructure Ltd

44 Dartmouth Park Road

Construction Method Statement - Rev A

For Planning

May 2015

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1.0 Introduction

Constructure Ltd were appointed in April 2015 for structural advice on the proposed rebuilding of the existing property at 44 Dartmouth Park Road. This report has been produced to accompany the Planning Application submission by Peter Stern, describing the scope and nature of the structural works. It details the outline approach that will be taken to safeguard the integrity of adjacent buildings, highways and services.

Local ground conditions have been assessed through site investigations scheduled to ensure site conditions are well known. This assists to reliably inform the structural design and construction sequence.

2.0 The Site

The site at 44 Dartmouth Park Road is approximately 0.18 hectares and flanked by York Rise to the west and Dartmouth Park Hill to the east.

2.1 Local Geology and Hydrology

From geological maps for the area, and from site Investigations carried out, the ground conditions are known to comprise a layer of Made Ground approximately 1m thick onto approximately 6m of silty/sandy Clay, overlying weathered London Clay to depths of around 50m BGL. These strata are underlain by about 10m of the Lambeth Group, overlying 10-15m of Thanet Sand. Chalk is thought to be present at around -30mOD.

2.2 London Underground

From the extract of the LUL Route Map [Figure 1] below it can be seen that the site is sufficiently far from London Underground infrastructure, with the closest line being around 600m away. Therefore no consultation with the London Underground Asset Protection team will be necessary.

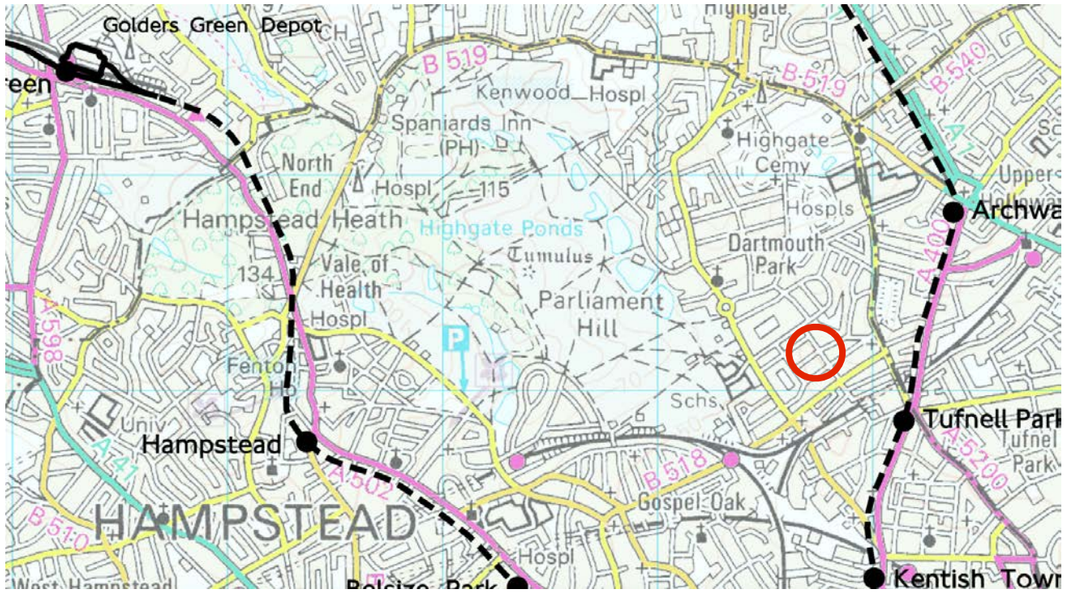


Figure 1 - Local transport tunnels

2.3 Flood Risk

From the extract of the Environment Agency's Flood Risk map in figure 2, it can be seen that the site lies within Flood Zone 1. Therefore no Flood Risk Assessment or Hydrological Reports are required to be provided as part of this application.

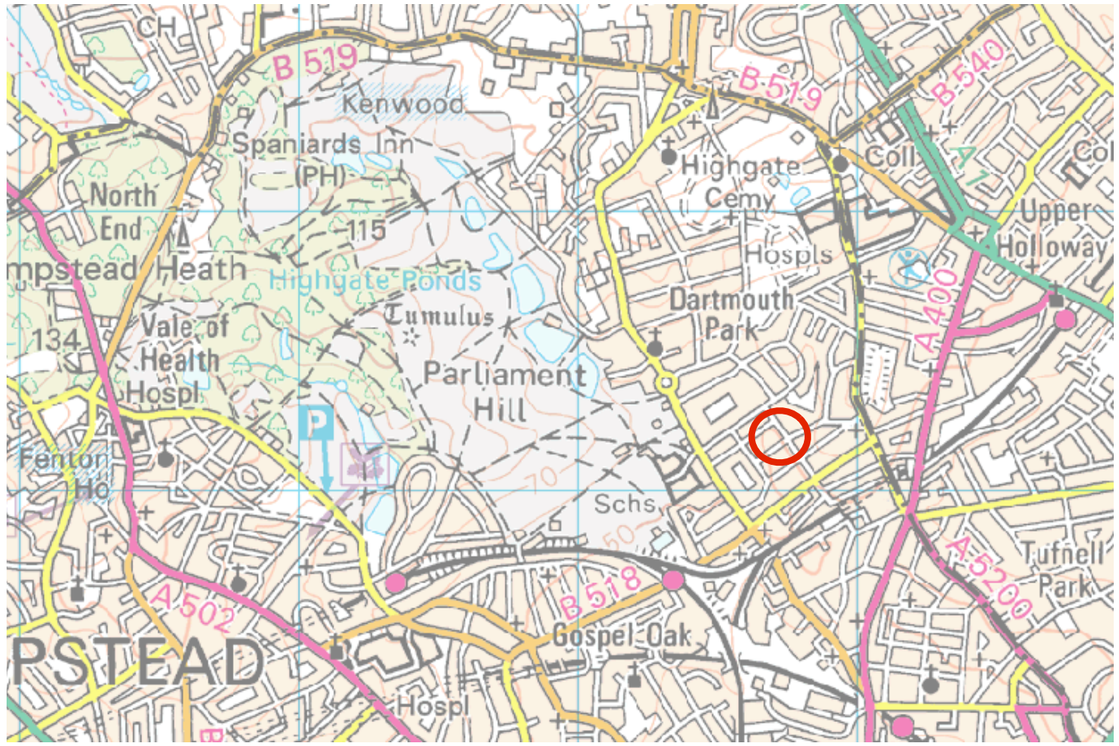


Figure 2 - Environment Agency Flood Risk Map showing site

2.4 Existing Utilities and Underground Services

Existing services including sewers and drainage runs will be identified prior to commencing the works. It is likely that most of the existing below ground drainage on the site will have to be removed due to the extent of the substructure works. Any remaining drains will be moved, as required, to suit the new drainage design. Due to the basement proposed, it may be necessary to incorporate a sump within the new basement level slab, with drainage pumped to a higher level from which it can flow into the main gravity system.

3.0 Investigation Works

3.1 Site investigation

A site investigation was carried out on the 24th April 2015 by Card Geotechnics Ltd. Preliminary results of these investigation works have been included within Appendix B attached to this report. 4no. boreholes to 6m depth were drilled using a window sampling rig, 2No. to the rear of the property and 2No. to the front of the property. The soils to the front of the property were found to be made ground about 1.0m deep upon alluvium. The alluvium was stiff and cohesive since it was significantly clayey. This material was present down to 3.5-4.5m below the ground floor level

whereupon the strata changed to a gravelly sand material. These indicated similar conditions to borehole 3 to the rear of the property.

In borehole 4 (rear of the property) a water strike was recorded at around 5.4m depth. No traces of sand were found, although sand laminations were recorded in the other 3 boreholes which may suggest sub-surface conditions arising from depositions of fines along historical underground watercourses. A full interpretative report will be supplied by the specialist to accompany this report.

3.1.1 Contamination testing

Contamination testing has been carried out during the site investigation works, and the results of these tests will be recorded in the interpretative report.

3.1.2 Groundwater

A water strike was noted within one of the window sample boreholes drilled to the rear of the main house. Due to the underlying ground conditions, it is expected that there is potential for a perched water table sitting at or near the top of the clay. For the purposes of design, it will be conservatively assumed that groundwater can be present at 1m below ground level, but is variable in nature.

3.2 Stability of Excavations

Excavations in Made Ground are likely to be unstable and so will require temporary support. Excavations within the London Clay are expected to be more stable in the short term but any excavation deeper than 1.2m and requiring entry by site personnel will still require shoring or battered sides for safety. The presence of fine sand laminations may cause localised instability, therefore the contractor will need to consider this when carrying out excavations for the underpinning.

4.0 Description of Works

It is proposed to construct a new single-level basement room under part of the existing ground floor footprint. The proposed basement, where underneath the existing structure to remain, will be formed using mass concrete underpins to re-support the existing perimeter foundations at a lower level, with a reinforced concrete liner wall to the inside face. This will be designed to perform as a propped cantilever retaining wall. Where the existing single story extension is being removed and new structure built, this section of the basement will be formed in an open excavation, with temporary works by contractor (temporary sheet piling assumed). Due to the levels across the site, this section of the works is shallower than where underpinning the existing walls, but we have assumed that some temporary retaining structures will be required. These are to be contractor designed and implemented, ensuring safe retention of the ground adjoining the existing building, boundaries and roadways at all times.

The existing upper floor levels will be altered as required and mainly retained, with additional steel support beams introduced in order to transfer the load from the proposed new light weight attic storey extension which will be constructed in timber.

5.0 Detailed Proposals and Design Considerations

5.1 Construction of Proposed Basement

Prior to any works commencing on site, party wall awards will need to be agreed, and monitoring points on adjoining buildings agreed and installed. A monitoring regime for these will be agreed with the adjoining owners, with trigger levels defined within the structural specifications, to be monitored during the works.

The basement area to the front of the property is to be constructed first. In order to achieve this, mass concrete underpins are to be cast in bays to the front edges of the flank walls, with transition pins between the deeper and shallower sections of foundation to ensure no sudden change in footing depth, thereby minimising risk of differential movement.

Following the underpinning works, the ground will be excavated to the new basement formation level, with shoring installed (to contractors design), so as to allow the excavation to progress safely (refer to Section 6.0 for detailed sequence consideration). A reinforced concrete liner wall is then to be formed against the mass concrete underpins. This RC retaining wall will perform as propped cantilever, retaining the ground behind the new basement excavation in the permanent condition. The new basement slab and reinforced liner wall will be dowelled into the underpins with hydrophilic water bars used to all construction joints.

The new reinforced slab installed at basement level will be designed to resist heave pressures (to failure load of heave mat), and hydrostatic water pressure on the basis of water present to 1m below ground level. The dowels will be designed to transfer this upward force such that the mass of the structure above can be utilised to resists this potential uplift.

A new concrete slab is to be formed at ground floor level. This will be a 140mm thick reinforced slab cast onto profiled metal decking. This floor structure will be designed to provide a rigid diaphragm that will laterally prop all of the basement walls in the permanent condition.

5.1.1 Boundary Structures

Perimeter trial pits have been carried out and demonstrate original 19th Century corbelled brick foundations to all party walls, and a modern foundation (mass concrete strip) supporting the mid-20th Century rear wall. Refer to the CGL SI report, no:CG/18249A for detailed results of these investigations.. It is understood that there are no adjoining basements on these boundaries, and no recent-age underpinning was encountered in the trial pits. The proposed perimeter underpinning is designed to avoid intrusion and influence to any future development on the other side of these boundaries, whilst ensuring that full boundary structure integrity is maintained at all times.

5.1.2 Heave Protection

The site investigation has shown that there are clay soils to significant depth beneath the proposed basement slab, which will have the potential to heave due to removal of overburden (weight) of the ground above, and any seasonal changes in moisture content. It is therefore deemed that there is a significant chance of clay heave, and as such clay-heave protection measures have been assumed to be required as part of the scheme. The thickness and specification of the proposed heave control mat is to be specified during the detailed design phase.

5.1.3 Water Pressure and Control

Initial assessments show that for a conservative assumption of ground water at 1m below ground level, the dead load of the structure is sufficient to resist uplift pressure. From the recent site investigation, it has been shown that water seepage only is experienced at about 5.4m depth below ground level. The general excavation is taken to some 4.0m below ground (front of the building, 3.5m to the rear), and so is expected to be clear of ground water encounter in the temporary condition (based on levels observed within the site investigation). However, as the ground conditions are

suitable for transient perched water, it should be assumed that some dewatering measures may be required during the excavation works, and the contractor should make suitable allowance for dealing with this.

A drainage pumping chamber is proposed to be installed (if deemed necessary by the contractor), as a concrete-encased proprietary unit, below the basement slab. A trench-sheeted shaft of around 1200mm across will need to be excavated by hand and in this case de-watering pumps employed as the digging progresses.

5.1.4 Basement Waterproofing Strategy

The basement will be designed to a minimum of Class 3 to BS8102 (see below table for an extract of the standard). The basement walls will be lined with a reinforced concrete wall to provide the retaining structure. A waterproof membrane externally to this wall and/or a drained cavity inside this wall would provide the water-proofing, optionally alongside a water-proofing additive to the reinforced concrete walls and slab. The waterproofing measures for incorporation into the basement scheme are to be selected and specified by the architect prior to the detailed design phase.

Grade	Example of use of structure[A)]	Performance level
1	Car parking; plant rooms (excluding electrical equipment); workshops	Some seepage and damp areas tolerable, dependent on the intended use[B)] Local drainage might be necessary to deal with seepage
2	Plant rooms and workshops requiring a drier environment (than Grade 1); storage areas	No water penetration acceptable Damp areas tolerable; ventilation might be required
3	Ventilated residential and commercial areas, including offices, restaurants etc.; leisure centres	No water penetration acceptable Ventilation, dehumidification or air conditioning necessary, appropriate to the intended use

Table 1 – Grades of waterproofing protection within a basement (extract taken from BS8102)

5.1.5 Highways

The front of the house is adjacent to the public highway. The surcharge used in the design is based on the Highways Agency Design Manual for Roads and Bridges Volume 1, Section 3, Part 14. Values of HB loading of 12.0kN/m^2 or HA loading of 10.0kN/m^2 to be adopted. The proposed front retaining wall will therefore be designed to resist these forces.

5.2 Superstructure

The external walls that form party structures are to be retained. The ground floor will be formed in reinforced concrete.The first floor and roof/terrace existing structures are proposed to be retained with new 203x203 UC sized primary floor beams, supporting the existing 225mm timber joists. The floor structures on all levels are to take support off existing masonry walls. Loadings are within modest limits and distribution of loads are to be managed by use of padstones, which will limit the serviceability limit state stresses into the existing masonry to <0.42N/mm^2. The new attic floor will be constructed in timber, with load-bearing walls and steel beams supporting the roof and transferring its load to the existing masonry walls.

5.3 Party Wall Matters

The proposed development falls within the scope of the Party Wall Act 1996. Procedures under the Act will be dealt with in full by the Employer's Party Wall Surveyor. The Party Wall Surveyor will prepare and serve necessary notices under the provisions of the Act and agree Party Wall Awards in the event of disputes. The Contractor will be required to provide the Party Wall Surveyor with appropriate drawings, Method Statements and other relevant information covering the works that are notifiable under the Act. The resolution of matter under the Act and provision of the Party Wall Awards will protect the interests of all owners.

The scheme for 44 Dartmouth Park Road will be developed so as not to preclude or inhibit similar, or indeed any, works on the adjoining properties. The Surveyors will verify this as part of the process under the Act.

5.4 Design Codes

The following design codes will be followed during the detailed design stage:

The Building Regulations 2010 - Approved Document A

BS 648 - Weights of building materials

BS 5950:1 - Structural use of steelwork in building

BS 6399:1 - Loadings for buildings (Dead and imposed loads)

BS 6399:2 - Loadings for buildings (Wind loads)

BS 8110:1 - Structural use of Concrete

BS 8004 - Foundations

BS 8002 - Earth retaining structures

BS 8102 - Protection of structures against water from the ground

6.0 Outline Construction Sequence

The outline construction sequence and temporary works assumed in the design and described in this report will be superseded by the Contractor's construction proposals as they are developed. The Contractor will be required to provide full proposals, method statements and calculations to the engineer prior to the commencement of any works on site and these will be considered in conjunction with the permanent structures and verified as suitable before the works are implemented.

The appointed contractor will be required to provide a detailed works sequence along with their tender submission. An outline sequence of the substructures works is likely to be as follows:

- Secure site, erect hoardings, establish welfare facilities, and divert on-site services
- Enabling works, demolition and stripping out works. Detailed sequence by specialist contractor. Remove debris from site via the highway, in accordance with agreed management plan
- Break out and remove existing ground floor (suspended timber floors/in-situ ground bearing slabs assumed)
- Excavate for mass concrete underpins in sequenced bays 1.0m wide, dewatering as necessary. Excavated material assumed to be removed by conveyor to street level
- Cast mass concrete pins in sequence as agreed with the structural engineer, terminating concrete 75mm below the underside of the existing footing, and backfilling each underpin excavation in compacted layers prior to moving to the next bays in sequence
- 24 hours after casting concrete, ram dry-pack mortar onto the gap between pre-existing footing and new underpin

- Place lateral propping at or near ground floor level (to contractors design), to temporarily laterally restrain the existing foundations/top of underpins
- Reduce dig to the required depth, dewatering as necessary
- Place and compact 150mm hardcore to provide suitable working surface
- Lay sand blinding
- Place heave mat and sub-slab membrane as required
- Arrange reinforcement for slab and starter bars for wall reinforcement on all perimeter lining walls
- Arrange reinforcement for non-liner RC walls
- Cast concrete to new basement slab
- Cast liner walls/new RC non-liner walls to the underside of the ground floor level propping
- Once walls cured and struck, move temporary propping onto face of new RC liner walls
- Install steelwork & formwork for new ground floor slab, arrange reinforcement and cast concrete
- Remove all temporary propping to main house
- Install french drainage to rear face of garden retaining walls, and connect into below ground drainage system
- Backfill to rear of freestanding RC retaining walls to rear of property, and reinstate landscaping over
- Remove all remaining propping to terrace retaining walls

7.0 Temporary Works

Temporary works design and coordination must be carried out by a suitably qualified and experienced specialist and full design details (drawings and calculations) must be submitted to the engineer for comment. This specialist will be appointed by the Contractor who will be responsible for the design, erection and maintenance of all temporary works to ensure the stability of the existing structure, excavations and adjacent structures at all times.

Short lengths of the facade to the property will be underpinned in mass concrete in lengths not exceeding 1m and in a 1,3,5,2,4 sequence. The underpins will form the new foundations for the superstructure and basement, with a reinforced concrete liner wall providing the permanent resistance to lateral loads imposed by the ground external to the new basement. Once the RC retaining walls have been constructed, and the concrete has cured, temporary props may be removed.

8.0 Potential Impact upon Adjoining Properties and Local Environment

The underpinning, temporary propping and the proposed construction method reduces the amount of potential ground movement and so minimises settlement and movement, to ensure that there will be no detriment to the structural integrity of the surrounding buildings.

Along with this, the appointed Contractor shall undertake the works using good practice in accordance with the structural design following all the agreed methods of construction and required temporary works, such as horizontal propping of the underpins. Any minor bedding-in settlement will not be permitted to cause any greater impact than ‘Category 2, aesthetic’ according to BRE Digest 251 guidelines.

The design of the works will consider the environmental forces as well as the response of the structural elements as their collective whole, and will be carefully designed to have the required stiffnesses to remain within acceptable deflection constraints. The coordination of sequencing, and the checking of compliance of temporary works will minimise potential for movement. The minimum movement that does occur will be defined by accepted limits, which would be considered as being accommodated within the elasticity of the superstructures.

This overall approach in the design and the construction considers all of the potential risks, and ensures that the excavation and construction of the proposed works will not affect the structural integrity of this property, neighbouring structures, roadways and public utilities.

8.1 Trees

We are not aware of any trees on the site which should cause adverse impact on the proposals.

8.2 Drainage

The development will create a number of flats, within the same structural envelope as the original building. Therefore, there may be an increased discharge into the existing drainage and sewage systems. Surface water will not be altered as there will be no additional hard surfaces formed.

The water seepage encountered in the borehole investigation may be be indicative of a perched water level, and it is possible that this water could be transient/occurring at higher levels at certain times of the year. Due to the relative impermeability of the soil, groundwater flows are likely to be slow, and therefore not significantly impacted by the proposed basement works.

8.3 Noise, Dust and Vibration

All demolition and construction works will be carried out by a competent and qualified contractor, who will be required to accord with the Considerate Constructors Scheme, and take all necessary measures to minimise the short term disturbances in terms of noise, vibration and dust which might impact on the local environment and the neighbouring residents and businesses.

In response to Policy CL7 (RBKC), the following measures and actions will be implemented:

Noise — Neighbours will be notified in advance of noisy activity, in particular where these are on or near boundary structures. Where there is particular sensitivity, activity will be restricted to 09:00-17:00 Monday to Friday.

In all cases where possible, electrically operation tools will be used in preference to engine driven machinery.

The use of site radios will be considered carefully in terms of their locations and volume levels, and any neighbour complaints are received, a firm prohibition of their use will be enforced.

Vibration — While the use or percussive, powered machinery upon hard construction materials in many situations will likely give rise to inevitable vibration, wherever possible and in accordance with CCS Code, unnecessary vibration will be avoided and mitigated. This will take the form of the careful planning and consideration of the hardness of the material being demolished, and the works planned and notified accordingly, and where considered particularly

unavoidable, the 09:00-17:00 working hours principle be observed. For this particular project, no shared structures are being demolished or fundamentally altered, and breaking out of concrete is generally internal and not connected to the party wall structures.

Dust — Most of the works will be internal and so can be relatively easily isolated from becoming airborne and dispersing to neighbours and the local environment. external activity shall be contained as best as possible using suitable hoardings and sheetings.

Materials stored externally would be covered or contained to avoid wind and weather disturbance to granular and particulate materials. Structural concrete will be typically mixed off-site and delivered, but where small quantities or mortar are to be site mixed, this can be done in an enclosed area to limit cement dust from becoming airborne.

Deliveries of materials shall be covered where potential for dust is prevalent. Waste skips and excavated soils to be covered whenever practicable.

For activities that generate dust, surface wetting-down, and water misting will be used to suppress dusting. Rotary cutters will use water as a dust suppressant.

Housekeeping — Shared driveways, external pavements on the site and in front of, will be regular swept, and should vehicles or windows become soiled, the constructer shall arrange cleaning as the neighbour so desires.

9.0 Summary

During construction, lateral and vertical stability of the building will be maintained by directly underpinning and temporarily propping, such that no significant adverse movement is expected.

Environmental impacts have been assessed, and the response to geotechnical and hydrological aspects have been considered. The proposals are deemed to not have any adverse impact in this respect.

Once complete, the new structure will provide a robust and secure support for both new and existing structure without detriment to the overall stability of the building or adjoining property.

None of the proposed superstructure alterations will fundamentally affect the integrity and stability of the original structures upon and adjacent the site.

Appendices

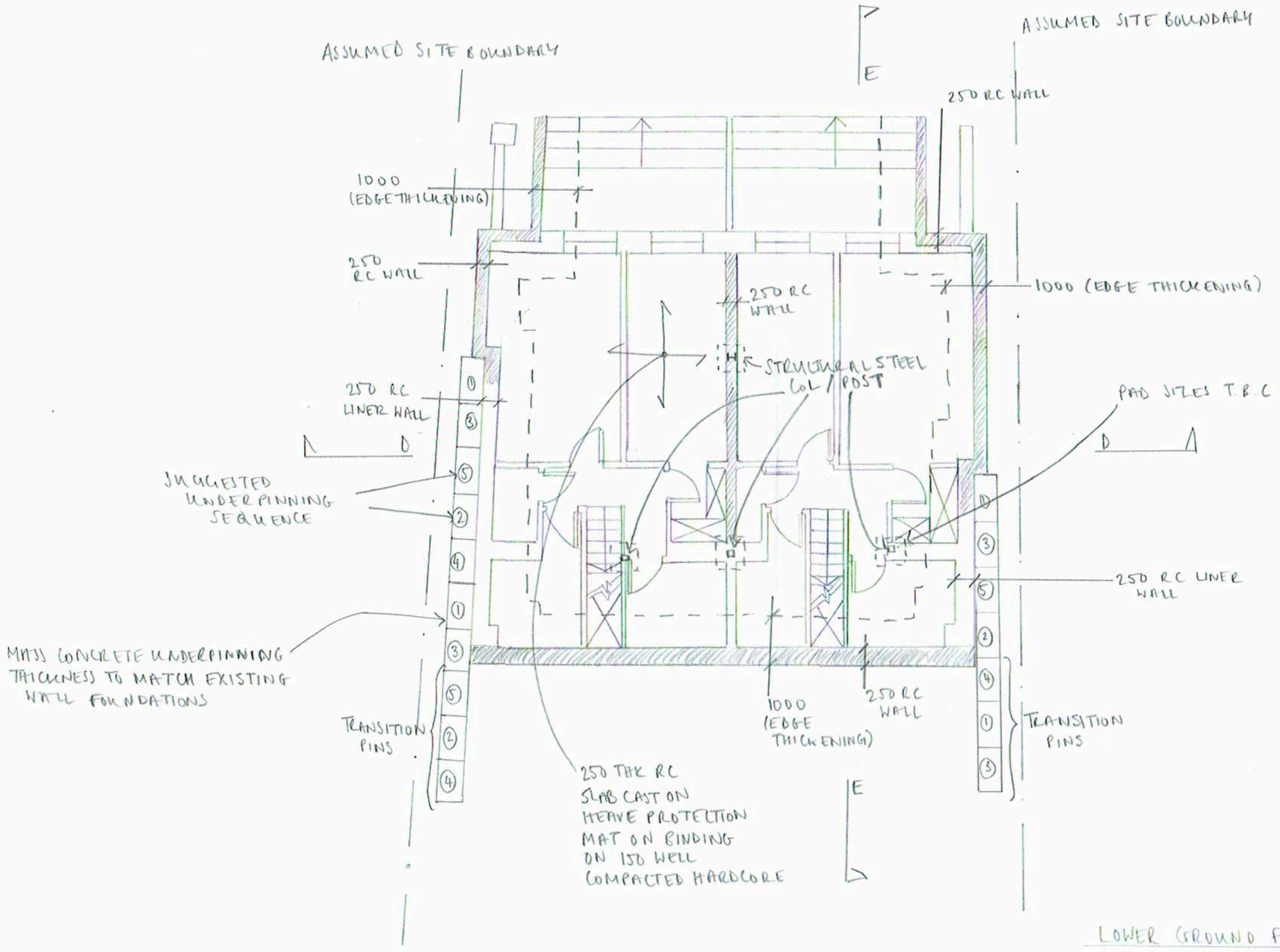
Appendix A - Sketches

1393/SK-01 - Rev A - Lower Ground Floor
1393/SK-02 - Rev A - Ground Floor
1393/SK-03 - Detail section A-A
1393/SK-04 - Rev A - Detail section C-C
1393/SK-05 - Detail section B-B
1393/SK-10 - Rev A - Section E-E
1393/SK-11 - Rev A - Section D-D

Appendix B - CGL Site Investigation

NOTES:

- TEMPORARY WORKS AND PROPPING TO CONTRACTOR'S DESIGN
- INSULATION, WATERPROOFING CAVITY DRAINAGE AND FINISHES TO ARCHITECT'S DETAILS



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LOWER GROUND FLOOR
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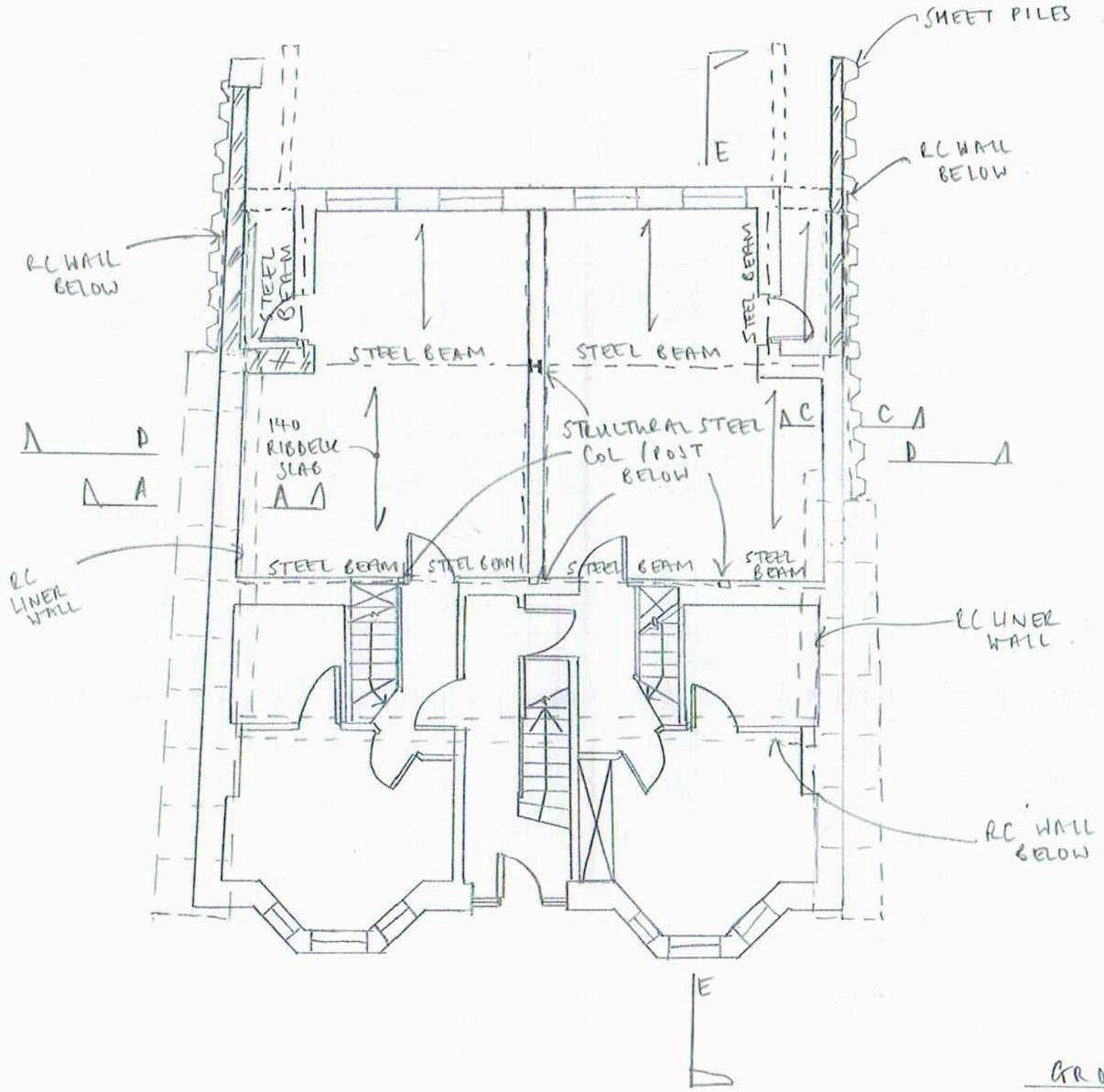

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GROUND FLOOR

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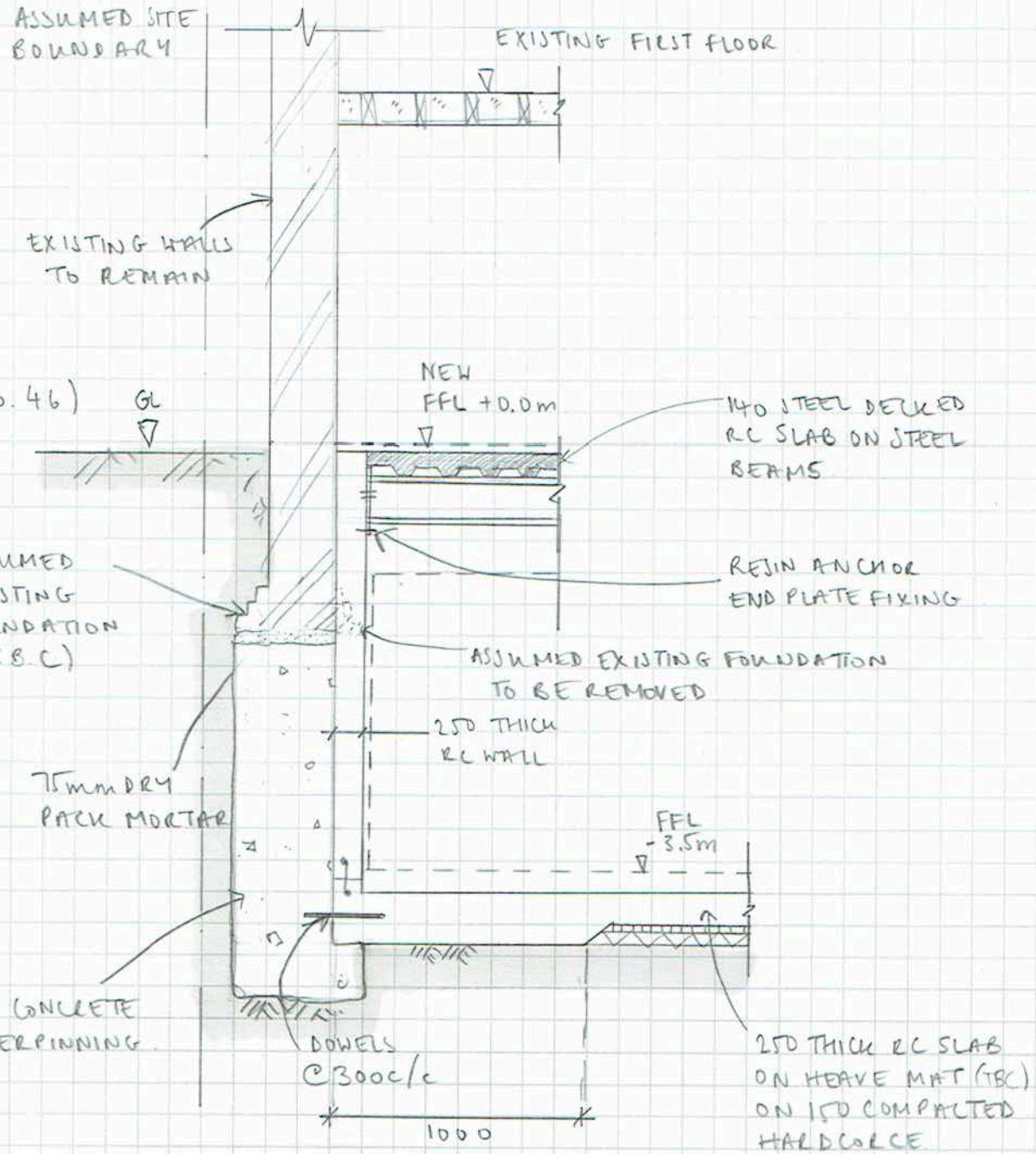

TEMPORARY WORKS AND PROPPING TO CONTRACTOR'S DESIGN

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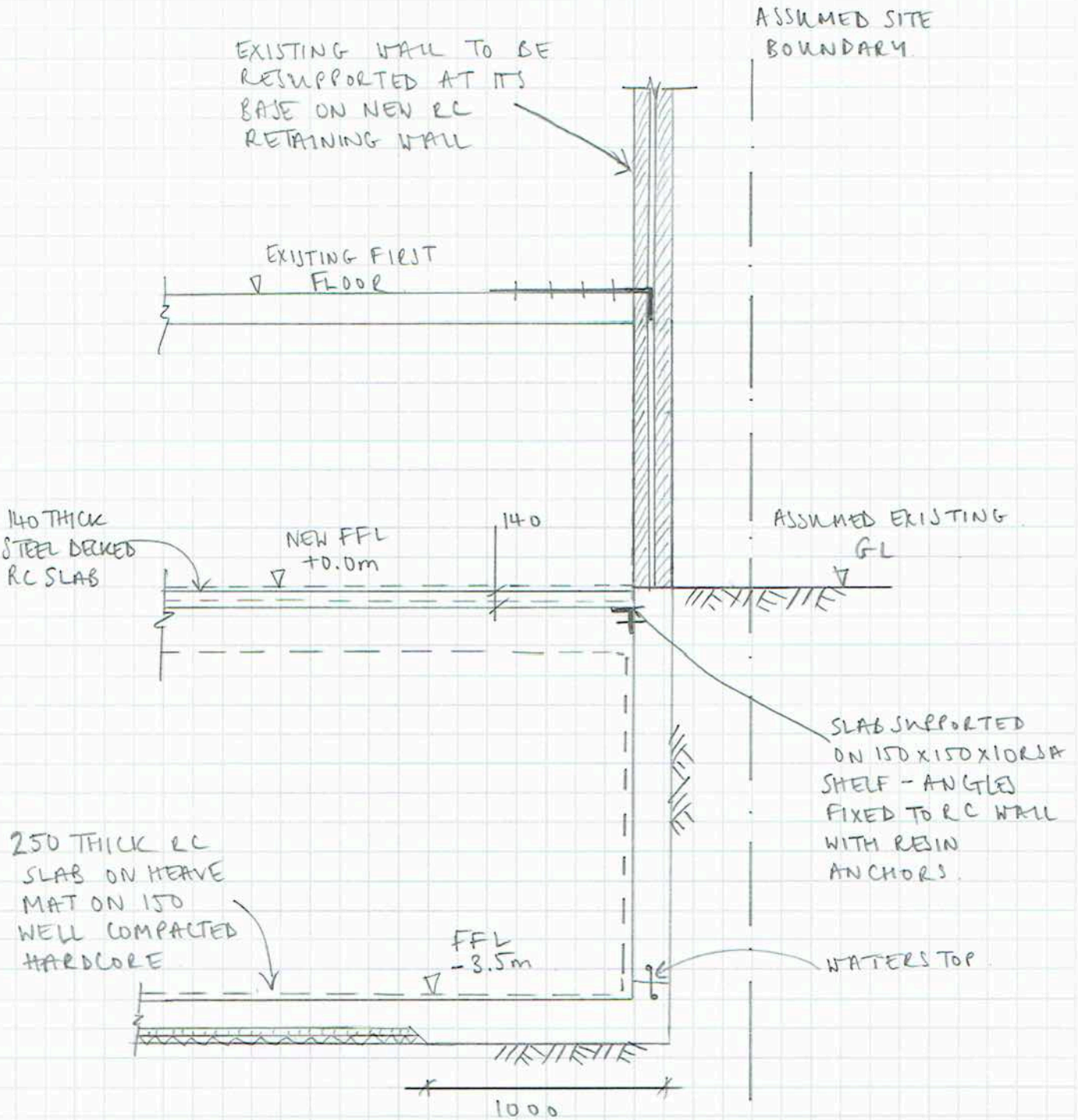
SECTION C-C



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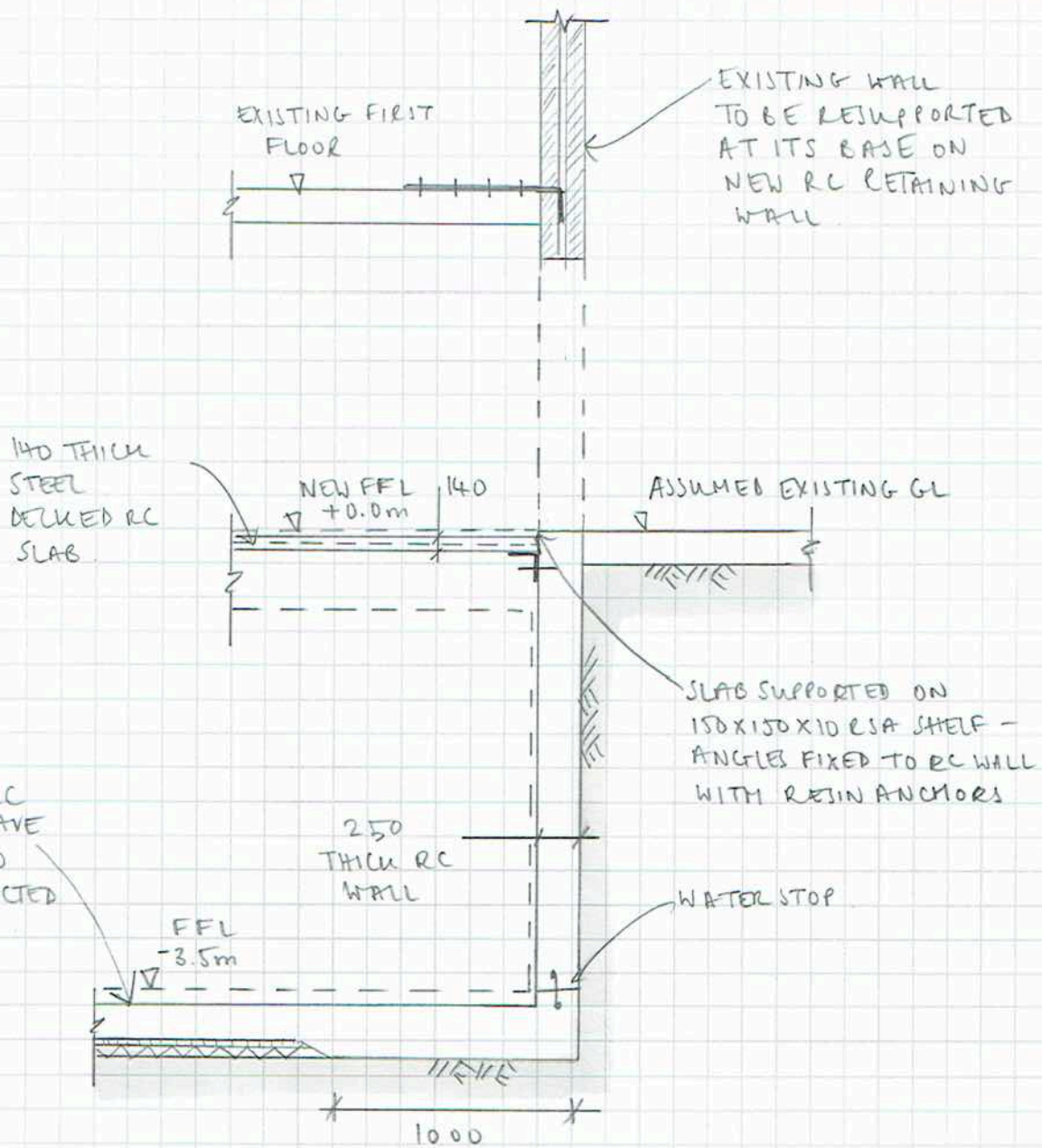
SECTION B - B



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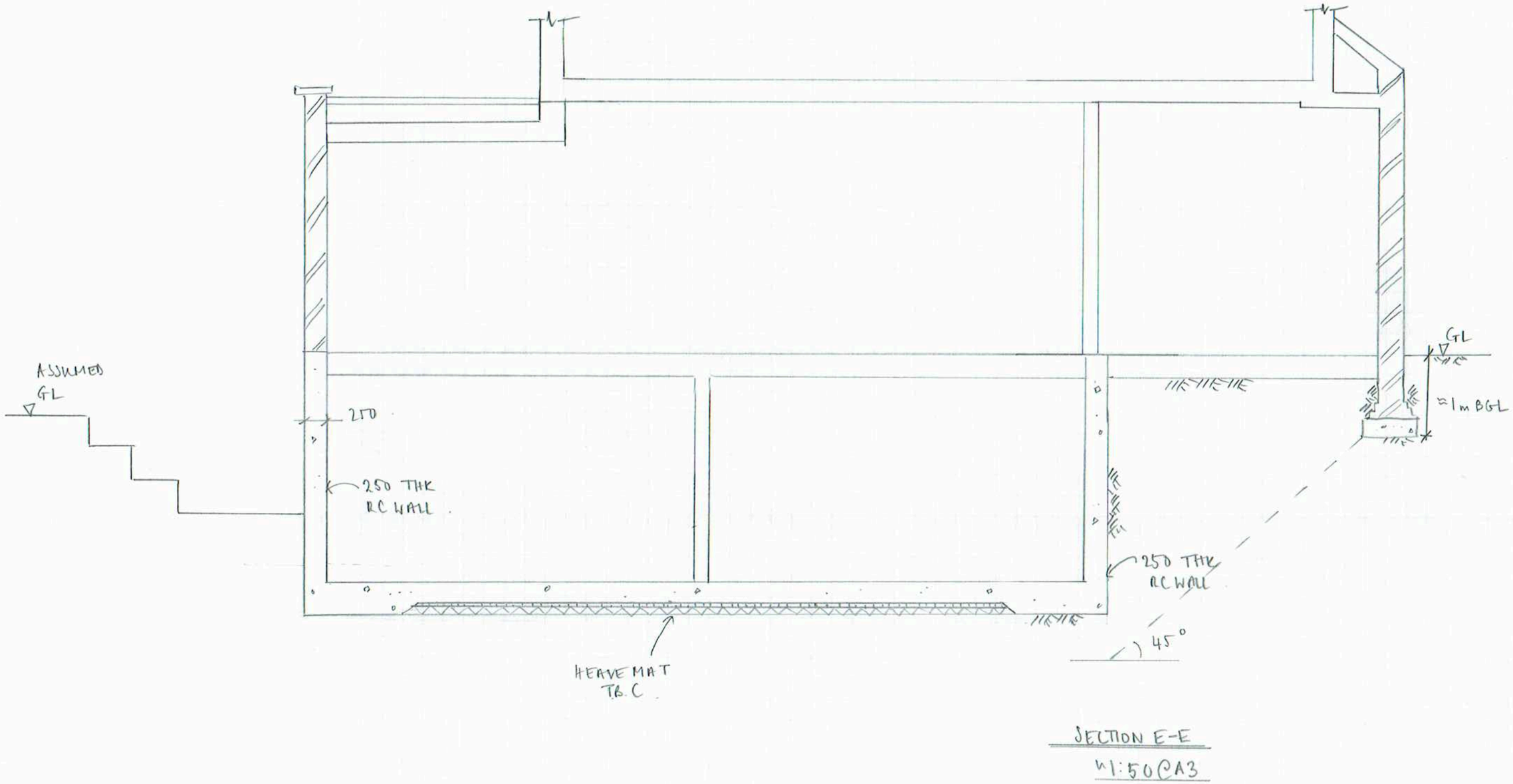

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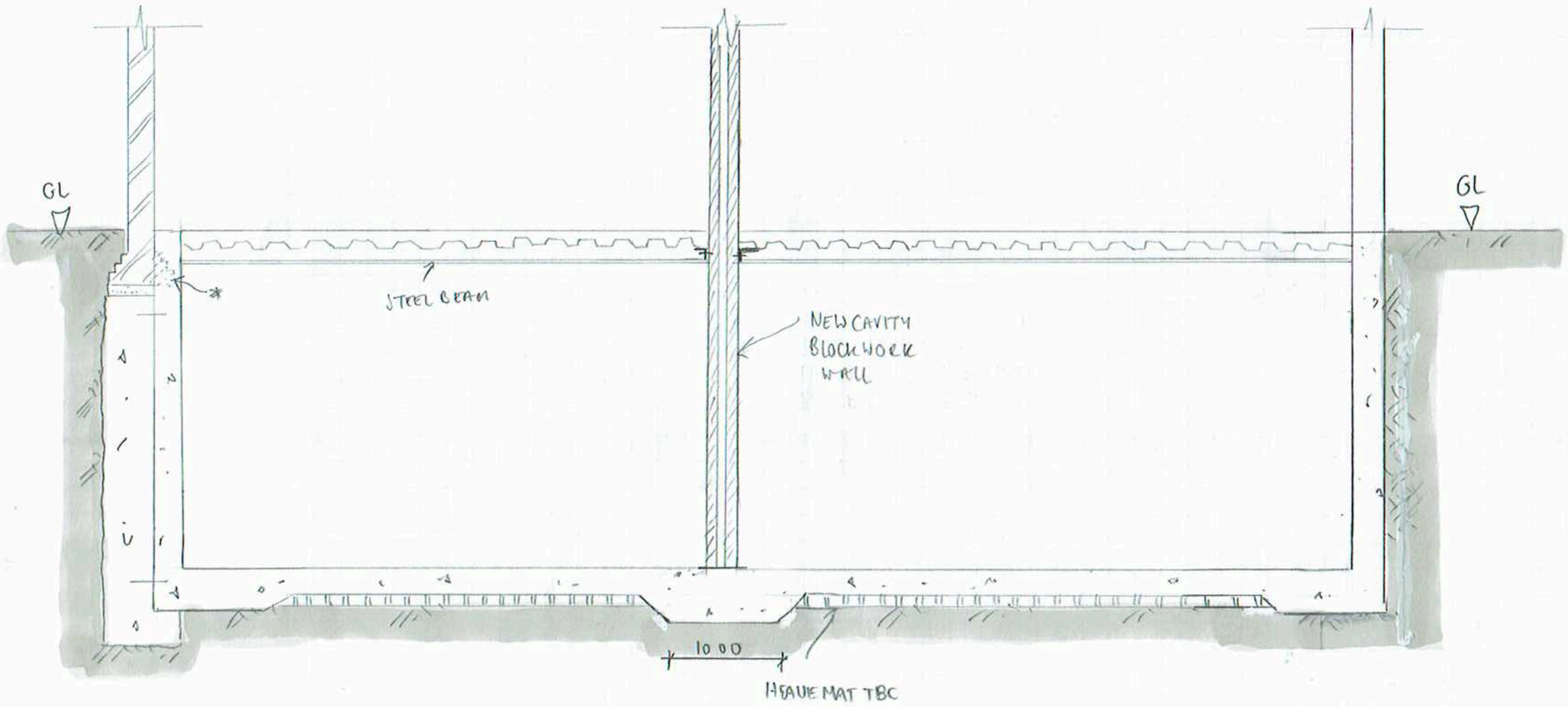

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