DEVISE ENGINEERS

CONSTRUCTION METHOD STATEMENT

10b Wavel Mews, London, NW6 3AB

Author: R Knight MEng CEng MIStructE
G Starling MEng CEng MIStructE

Date: Septeber 2017
Revision: Ii – December 2017

1.0

APPOINTMENT & INTRODUCTION

1.1 Devise Engineers have been appointed by Brickson Construction as Structural Engineers for the structural design of the proposed basement conversion at 10b Wavel Mews, in the London Borough of Camden.

1.2 This report is to outline a suitable method to construct the basement structure, and is to be read in conjunction with the planning application information submitted by Canaway Fleming Architects and the Basement Impact Assessment (BIA) undertaken by Southern Testing.

1.3 The results of the site investigation, BIA and Ground Movement Assessment (GMA) undertaken by Southern Testing; as well as visual inspections of the building and its foundations undertaken by Devise Engineers have been considered within the report.

1.4 To date no internal opening up works have been carried out within the property.

1.5 The construction method statement sets out the structural proposals and envisaged construction methods and sequencing to be undertaken by a competent building contractor.

2.0

EXISTING SITE & SURROUNDINGS

2.1 Devise visited site on 9th June 2016 to assess the existing building and overall site constraints and to inspect the trial pits carried out prior to them being inspected and recorded by Southern Testing.

2.2 10b Wavel Mews is an end of terrace two-storey dwelling located in the London Borough of Camden. The surrounding area mainly consists of residential terraced properties.

2.3 The house adjoins and shares a party wall with 10a Wavel Mews, which is located to the right hand side (south) when viewed from the front façade.

2.4 A single storey garage adjoins the property on the left hand side (north) of the house, which has now been purchased by the Client.

2.5 The existing house has a garden to the rear (east) and north of the building, which is separated by the gardens of 11 Acol Road to the east and 15 and 13 Acol Road to the north via garden fences varying in condition.

10b Wavel Mews

SITE LOCATION PLAN

2.6 The London Overground line runs approximately 300m to the south of the site and 600m to the north of the site. The Jubilee and Metropolitan London Underground lines are also circa 600 and 700m to north; and the Bakerloo line is around 500m to the south of the site.

3.0

SITE HISTORY & GEOLOGY

3.1 The house is thought to have been constructed around fifty years ago.

3.2 The closest recorded World War II bomb damage is just to the north of Acol Road where three high explosive ordnance are documented.

3.3 The British Geological Survey boreholes show the site is underlain by London Clay. This has been confirmed by the site investigation carried out by Southern Testing, which show the existing shallow foundations generally bearing onto 'slightly silty gravelly clay' above London Clay between 1.2 and 2.45m below ground level.

3.4 Ground water was not encountered during the site investigation. However, during later monitoring visits on 21st June 2016 and 5th July 2016, ground water levels were between 0.77m and 1.12m. Southern Testing's report notes that this is 'believed to be perched water within the superficial soils' though an allowance for ground water up to ground level has been assumed for the design of the basement.

3.5 The results of the site investigation are recorded in greater detail in Southern Testing's BIA Report.

4.0

EXISTING CONSTRUCTION

4.1 The building is a two-storey end of terrace house with a single storey garage adjoining the left flank wall. The garage, which was formally owned by another party, has now been purchased by the Client.

4.2 The building appears to have been constructed at the same time as the building it adjoins, as well as the adjoining garage.

4.3 Construction appears to comprise a concrete ground bearing ground floor slab and a timber first floor, though span directions could not be determined. Both the subject building and the adjoining garage have a timber flat roof.

4.4 The parapet at roof level appears to indicate that the wall construction comprises solid 230mm thick load bearing masonry. Internal walls are a thought to be a mixture of loadbearing masonry and timber stud construction.

4.5 Trial pits have confirmed the walls bear on to shallow mass concrete strip footings.

4.6 The overall stability of the building relies on the cellular nature of the walls and the diaphragm action of floors.

4.7 The existing structure is in a good state of repair with no indication of significant movement.

5.0

PROPOSED BASEMENT DESIGN & CONSTRUCTION

5.1 The proposed development involves the demolition of the existing building and the construction of a new house with a habitable basement level to the full extent of the site.

5.2 The proposed basement level is to be formed with reinforced concrete underpins which are to be constructed in stages to achieve the required depth. The underpins are to be formed in a hit and miss sequence. The underpins will generally be formed tight to the existing boundary line. The underpin sections will comprise circa 400mm thick reinforced concrete stem with a 2m long by 575mm thick reinforced concrete toe.

5.3 All reinforced concrete underpins will be designed to resist the proposed horizontal loads due to earth pressure, surcharge and hydrostatic pressure. In accordance with best practice, soil at rest pressures will be used for the design.

5.4 In line with the recommendations from Southern Testing, tension piles are to be installed to resist the potential buoyancy force from the design ground water level taken at ground level. The piles are proposed to be 350mm diameter extending circa 10m below slab level.

5.5 The central area of the basement slabs will reduce to 350mm thick to accommodate a polystyrene void former below to allow for the heave from the unloaded clay formation below.

5.6 The proposed ground floor slab is to be of reinforced concrete construction supported on the reinforced concrete underpins and providing lateral restraint to the head of the underpins.

5.7 It is proposed that the superstructure will be constructed as a steel frame with profiled concrete filled metal deck slabs. This allows for the long spans required by the architectural layout whilst providing a quick and efficient form of construction.

5.8 The waterproofing strategy is yet to be defined by the Architect, though it is expected that a combination of waterproof concrete construction and a cavity drainage system designed by a specialist sub-contractor will be adopted.

6.0

DRAINAGE

6.1 The existing drainage system is thought to run via gravity and connect into the public sewer within the footpath of Wavel Mews.

6.2 The proposed drainage system will be installed beneath the ground floor slab. Where possible gravity will be used to discharge the drain into the existing private sewer system.

6.3 Drainage from the basement level will be pumped up to discharge into the drainage system below ground floor level. It will then discharge into the existing sewer at the front of the property. A non-return valve system to specialist's design will ensure water from the private sewer system cannot enter the basement during surcharge of the mains sewer.

6.4 A separate pump for the drained cavity system will be provided, to the waterproofing specialist's design. This will also be discharged with the foul water drainage.

7.0

PARTY WALL

7.1 The proposed works development falls within the scope of the Party Walls Act 1996. Procedures under the Act will be undertaken by the Owner's Party Wall Surveyor.

7.2 The Party Wall Surveyor will serve notices under the Party Wall Act and agree Party Wall Awards with the Adjoining Owners' Surveyors in the event of disputes.

7.3 The preparation of the Awards and the resolution of party wall matters will serve to protect the interests of both the Building Owner and all Adjoining Owners.

7.4 The Contractor will also be required to provide the Party Wall Surveyor with method statements and other necessary information covering all notifiable works.

7.5 The resolution of matters under the Act and provisions of the Party Wall Awards will protect the interests of all owners.

7.6 The proposed basement structure to 10b Wavel Mews will be designed to mitigate as far as practicable movement caused to the adjoining properties. The future flexibility of adjacent buildings will be maintained by ensuring the proposed basement works will not inhibit future extension works. This will be verified by the Surveyors during the process under the Act.

8.0 MONITORING

8.1 The ground movement assessment undertaken as part of the BIA indicated the level of damage to the adjacent properties as Burland Category 0 'negligible' to each adjacent property except for the adjoining property, 10a Wavel Mews where the damage category was stated to be Burland Category 1 'very slight'.

8.2 It is recommended that the Contractor shall undertake monitoring to the party wall with 10a Wavel Mews at the time of excavation and during construction.

8.3 The Contractor will be responsible for reviewing the movement monitoring and for providing appropriate measures to mitigate against movement, by provision of the necessary temporary support. This is to be agreed with the party wall surveyors.

8.4 It is recommended that monitoring is completed as follows:

i) One week prior to any works being started to provide a base reading.
Iii) On a weekly basis during the excavation and until all underpins and the basement slab has been cast.
ii) On a fortnightly basis until completion of the notifiable works.

8.5 Suggested trigger levels are noted below and relate to the cumulative movement of survey points:

Vertical Displacement:

Amber trigger level: +/-5mm
Red trigger level: +/-7mm

8.6 The requirements of the trigger levels are set out below:

Amber Trigger Level

Should the movement reach the amber trigger levels, the contractor should increase the frequency of readings as appropriate and outline to all parties their plan to implement any emergency remedial/supporting works necessary. The Contractor must be ready to carry out these works immediately if the movement continues and approaches the red trigger values.

Red Trigger Level

Works are to cease and be made safe by providing the necessary support/shoring. The Contractor is to ensure that the movement has stopped as a result of the remedial works installed. The structural engineer and party wall surveyors are to be informed immediately and the party wall surveyors should agree any additional precautions or modifications to the proposals prior to re-commencement of the works.

9.0

ENVISAGED METHOD OF CONSTRUCTION

9.1 The following outlines a sequence of works to construct the proposed basement below the existing property.

9.2 The works are to be carried out by a competent contractor, who can demonstrate experience in undertaking works of a similar scale.

9.3 This document will assist the Contractor in the preparation of their method statement. However, the Contractor is responsible for providing the actual method statement based on how they wish to programme and sequence the project and their temporary works design.

9.4 The sequence of works can be broken down as follows:

9.4.1 STAGE 1.0 – PRE-MOBILISING, SITE SET-UP & ENABLING WORKS

- Agree and sign Party Wall Awards with adjoining owners.
- Undertake services search and survey to confirm location of below ground service and identify those requiring rerouting or capping.
- Construct hoarding around front of property, following permission from local authority.
- Provide site welfare.

9.4.2 STAGE 2.0 – DEMOLITION

- Carefully take down existing structure starting at roof level and working down.
- Ensure remaining party wall with 10a Wavel Mews is protected where structure previously bearing into the wall is removed. Demolition works to be overseen by the Contractor's temporary works engineer.

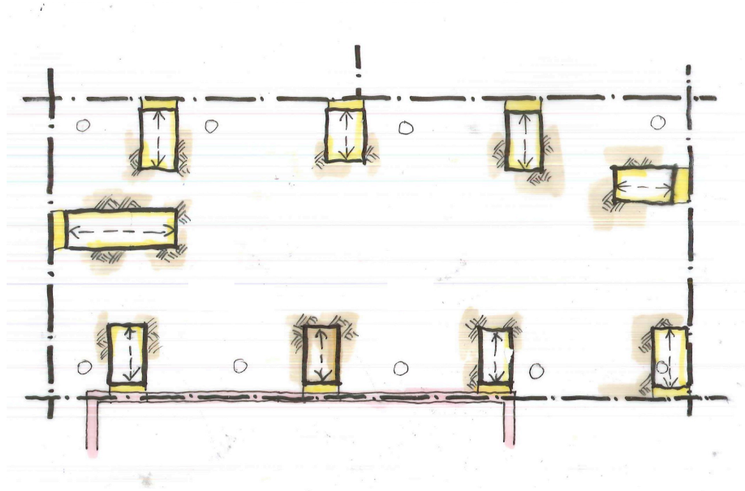
9.4.3 STAGE 3.0 – PILING

- Pile rig to commence pile from ground level
- Piles will be cast up to just above their proposed cut off level at approx. basement floor level

STAGE 3 – PILING FROM GOUND LEVEL

9.4.4 STAGE 4.0 – COMMENCE UNDERPINNING / RC WALLS

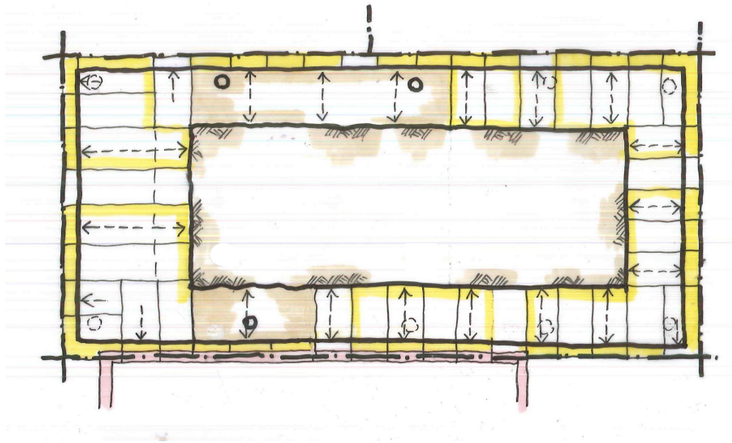
- Progress reinforced concrete walls/underpins around perimeter in a hit and miss sequence (1,3,5,24,1…) leaving each pin to cure 48 hours before dry packing up to underside of existing structure.
- Continuity to be provided by bending bars into adjacent base prior to fixing reinforcement. Protruding ends of bars to be protected in temporary case.
- Provide necessary trench sheeting and shoring during excavation and prop.
- Generally, bases are to be cast first with a kicker, before casting of the walls. It is envisaged the walls will be cast in one lift.



STAGE 4 – UNDERPINNING/RC WALLS IN HIT-AND-MISS SEQUENCE

9.4.5 STAGE 5.0 – COMPLETION OF PERIMETER UNDERPINNING/BASEMENT WALLS TO BASEMENT 1 LEVEL

- Continue to progress casting of walls/underpins in hit and miss sequence.
- Ensure all pins remain propped back to the bund or to adjacent bases. Propping to be designed by the temporary works engineer against overturning and sliding.
- Piles are to be cut down to cut-off level leaving sufficient anchorage of reinforcement prior to casting of bases above piles
- Remove soil to central bund.



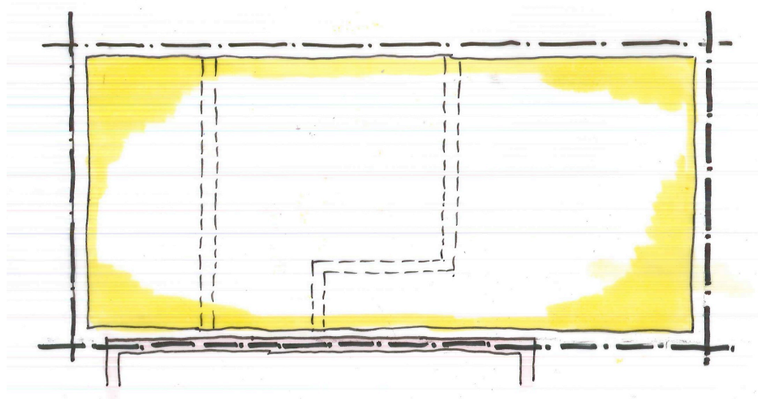
STAGE 5 – COMPLETION OF UNDERPINNING / RC WALLS

9.4.6 STAGE 6.0 – FORM BASEMENT LEVEL 1 SLAB

- Provide heave protection
- Fix reinforcement and form basement slab

9.4.7 STAGE 7.0 – FORM GROUND FLOOR SLAB

- Install formwork and falsework bearing onto basement slab and form ground floor slab to form complete RC box.
- Remove propping to basement retaining structure once slab has gained sufficient strength



STAGE 6-7 – FORM BASEMENT SLAB AND GROUND FLOOR SLAB

9.5 Nuisance Control

9.5.1 Measures will be implemented to ensure that the potential impact of the works on local residents and neighbours will be kept to a minimum.

9.5.2 Dust and dirt will be controlled by erecting panels around scaffolding to provide shelter and tarpaulins will be used when materials are being loaded onto vehicles.

9.5.3 All site accommodation and welfare facilities will be provided within the site boundary, the location of which will be moved as works progress.

10.0 APPENDIX A – PLANS

PRELIMINARY COLUMN SIZES

C1 - 100X100 SHS
C2 - 203UC
C3 - 356UC

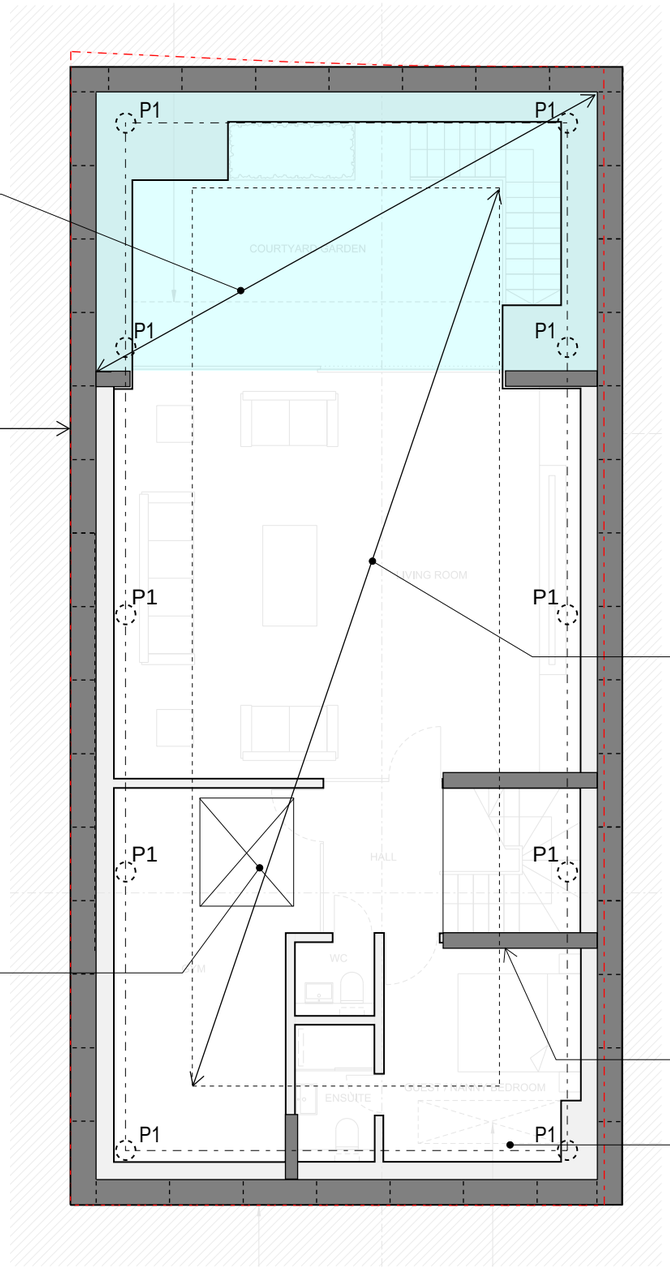
LEGEND

1 — RIBDECK S60 130MM THK - A252 MESH

2 — 150X50 C24 JOISTS AT 400MM CRS - SHEATHED WITH 2 LAYERS 18MM WBP PLYWOOD

STEEL PLATE CROSS BRACING

P1 — 350MM DIA. TENSION PILE - ALLOW FOR 10M LG BELOW SLAB LEVEL - 350KN (SLS) TENSION CAPACITY REQUIRED



BASEMENT LEVEL, 1:100

DEVISE ENGINEERS

PRELIMINARY	1:100 AT A3
10b WAVEL MEWS, LONDON, NW6	DECEMBER 2016
PROPOSED BASEMENT FLOOR PLAN	1609 | G01 | S1000 | P5

PRELIMINARY COLUMN SIZES

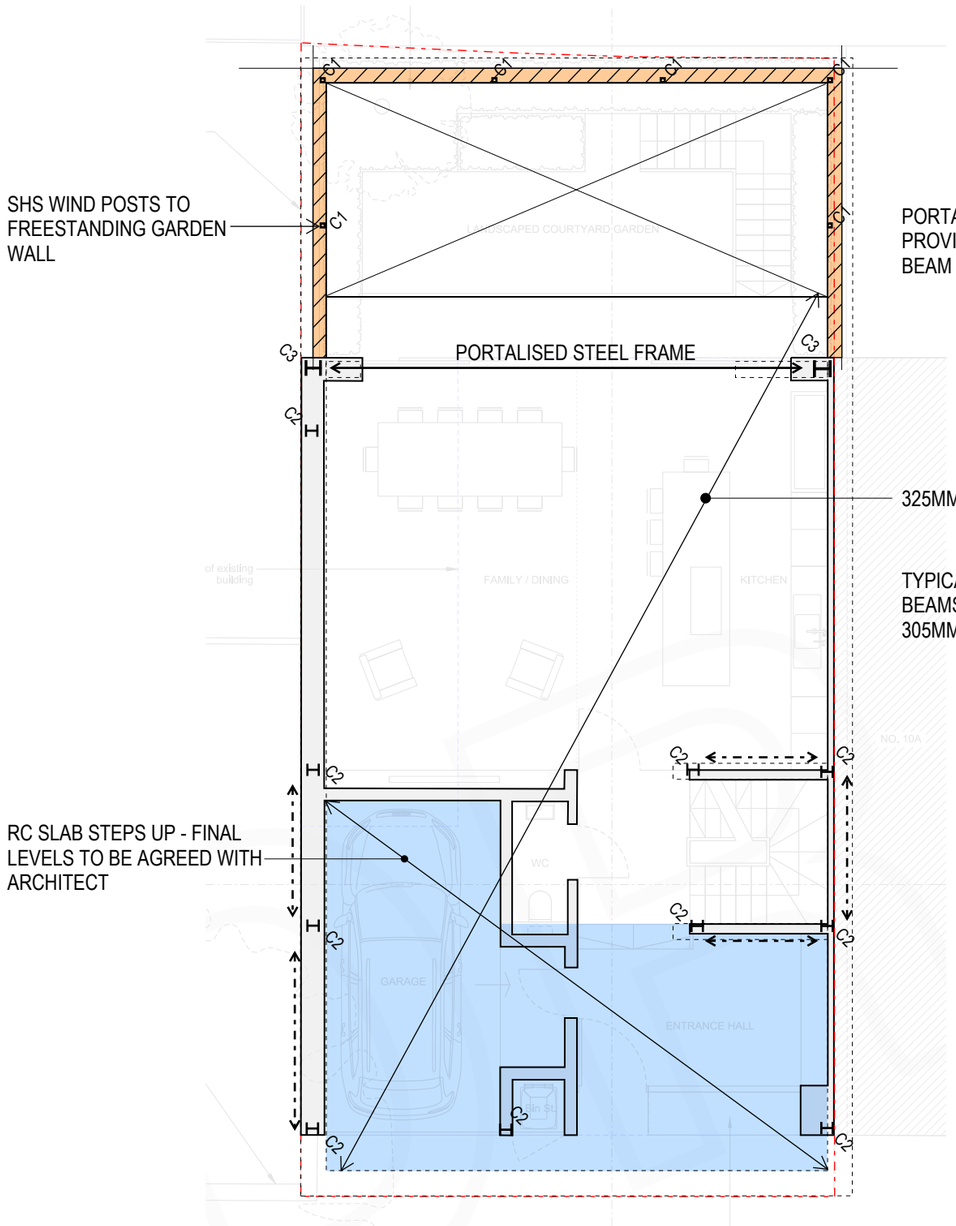
C1 - 100X100 SHS
C2 - 203UC
C3 - 356UC

LEGEND

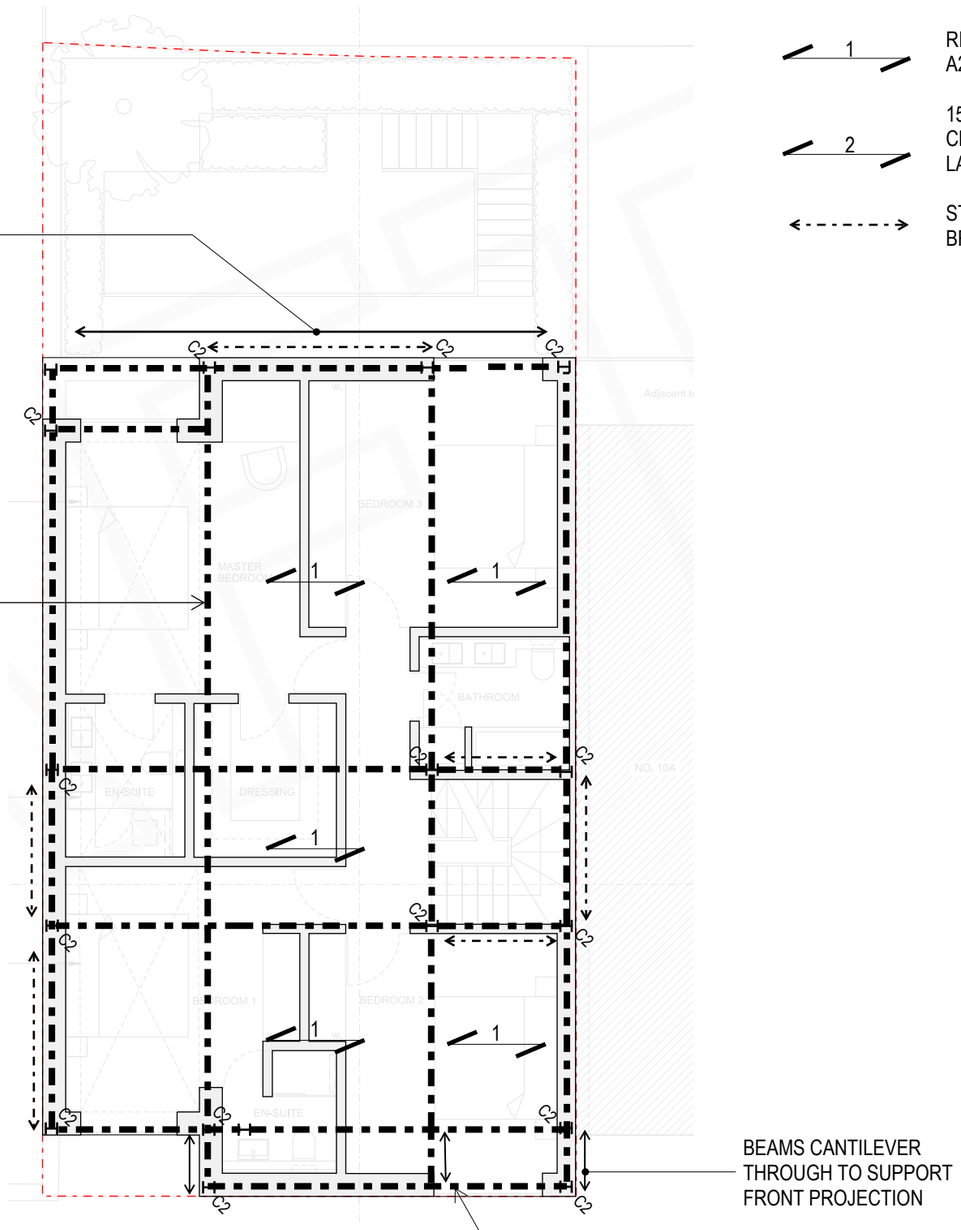
1 — RIBDECK S60 130MM THK - A252 MESH

2 — 150X50 C24 JOISTS AT 400MM CRS - SHEATHED WITH 2 LAYERS 18MM WBP PLYWOOD

STEEL PLATE CROSS BRACING



GROUND FLOOR, 1:100



FIRST FLOOR, 1:100

DEVISE ENGINEERS

PRELIMINARY	1:100 AT A3
10b WAVEL MEWS, LONDON, NW6	OCTOBER 2016
PROPOSED GROUND AND FIRST FLOOR PLANS	1609 | G01 | S1001 | P4

PRELIMINARY COLUMN SIZES

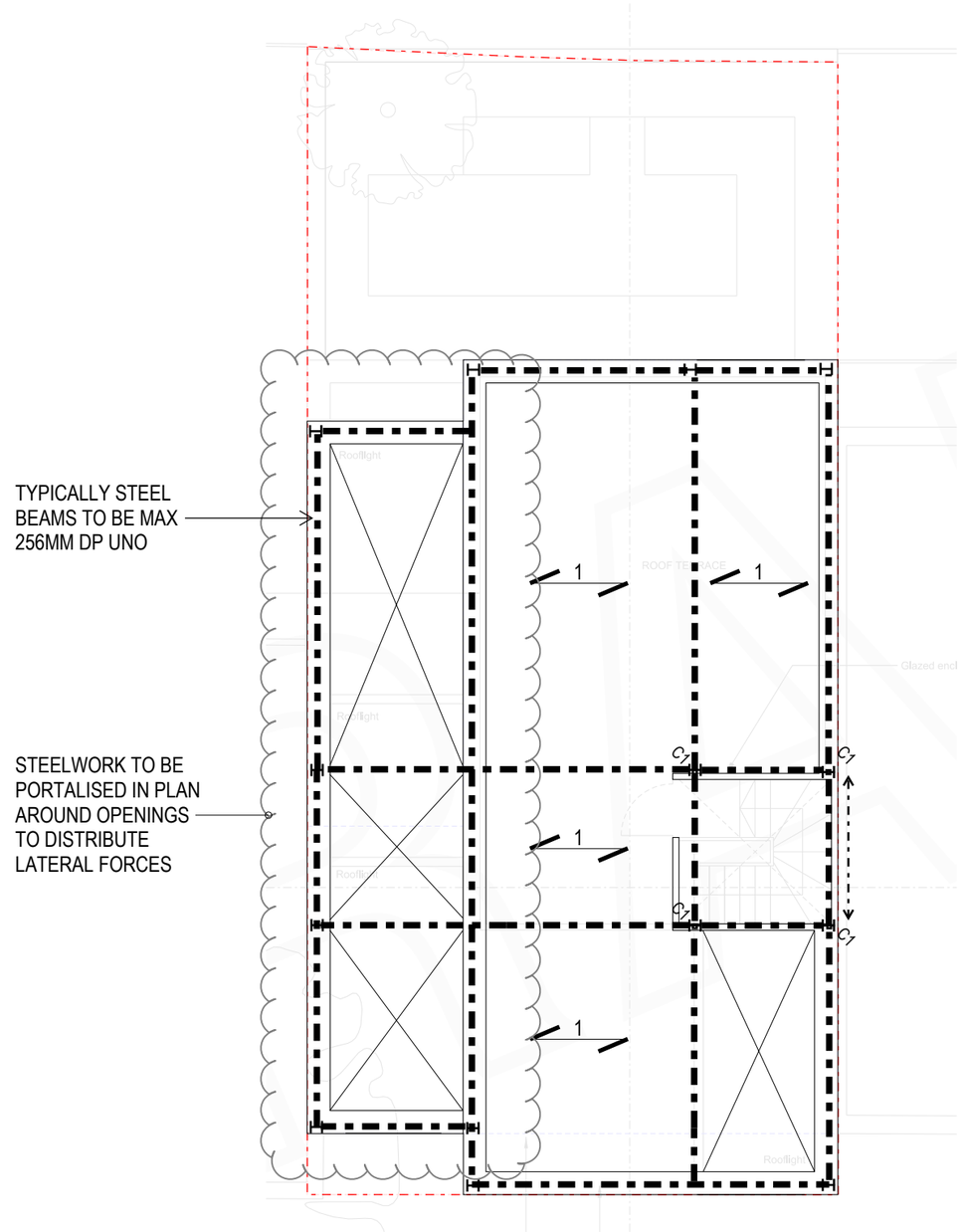
C1 - 100X100 SHS
C2 - 203UC
C3 - 356UC

LEGEND

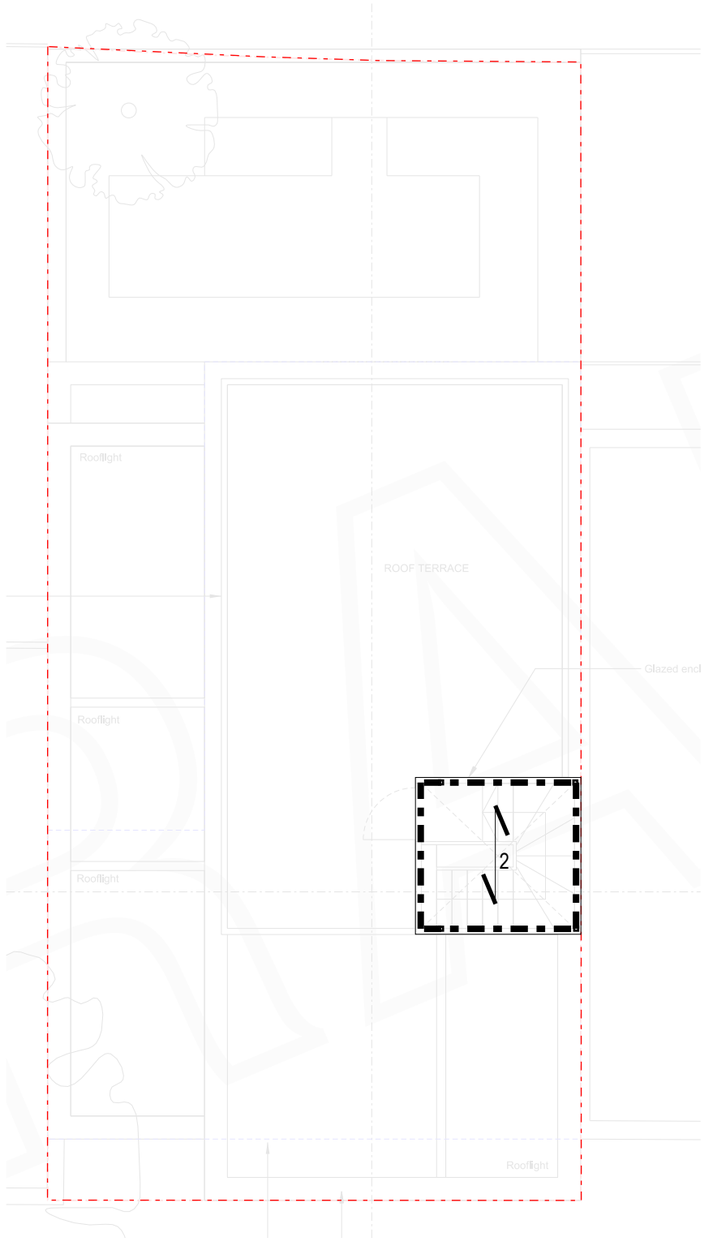
1 — RIBDECK S60 130MM THK - A252 MESH

2 — 150X50 C24 JOISTS AT 400MM CRS - SHEATHED WITH 2 LAYERS 18MM WBP PLYWOOD

STEEL PLATE CROSS BRACING



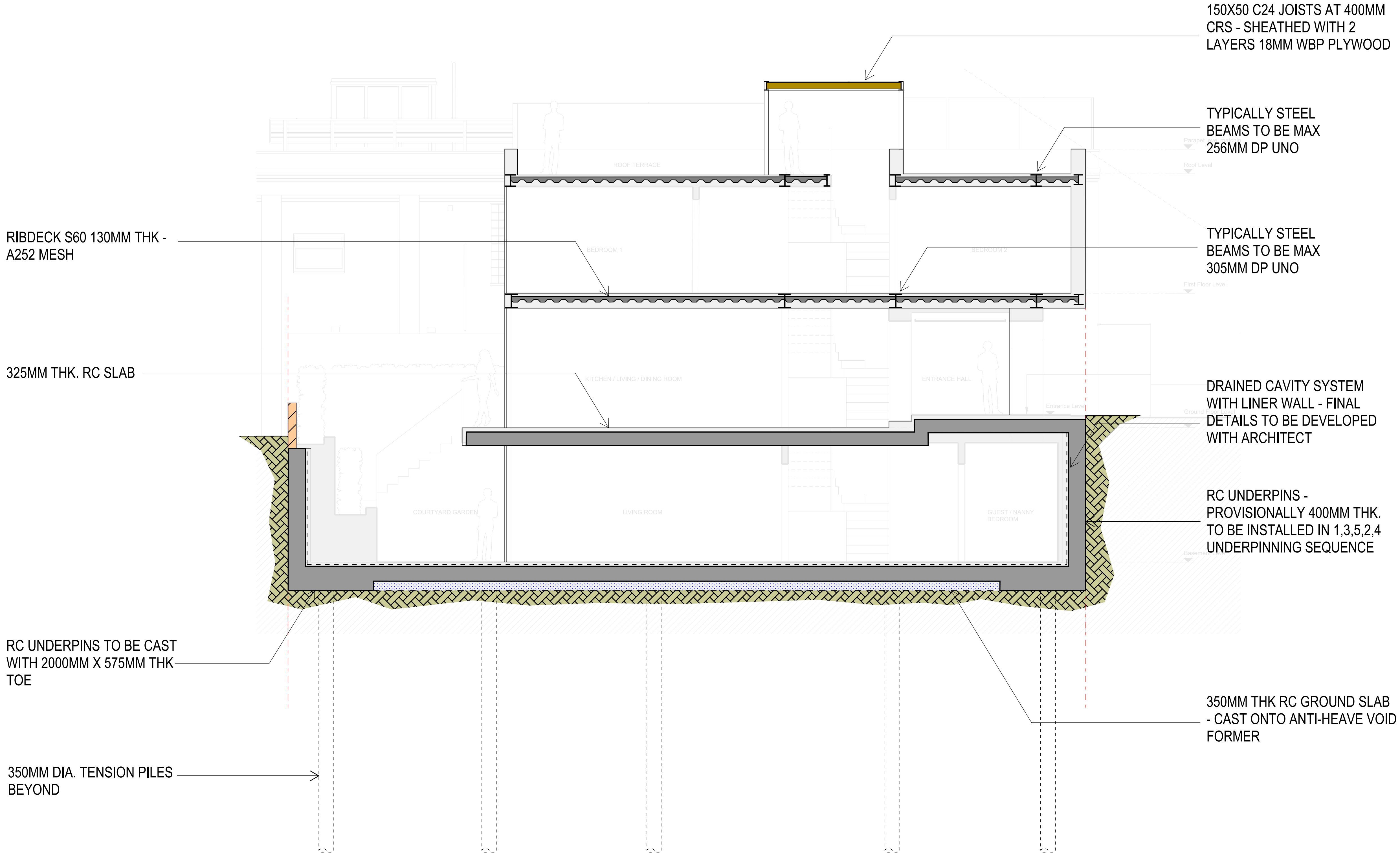
ROOF LEVEL, 1:100



UPPER ROOF LEVEL, 1:100

DEVISE ENGINEERS

	PRELIMINARY	1:100 AT A3
	10b WAVEL MEWS, LONDON, NW6	OCTOBER 2016
	PROPOSED ROOF PLANS	1609 | G01 | S1002 P4



LONGITUDINAL SECTION, 1:100

DEVISE ENGINEERS

PRELIMINARY

1:100 AT A3

10b WAVEL MEWS, LONDON, NW6

DECEMBER 2016

PROPOSED LONGITUDINAL SECTION

1609 | G01 | S2001

P2