

Wolsey Mews Garages, London

Structural Engineer's Report Stage C

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Job Number: **24712**

Date	Version	Notes / Amendments / Issue Purpose
4.4.2016	1	Stage C structural report
7.4.2016	2	Corrections regarding building purpose
22.7.2016	3	Camden Planning department comments addressed

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1 The Site

The proposed building will be residential and will include two storeys above ground plus basement in Kentish Town, London.

The existing site is largely under developed, but includes three single storey precast concrete garages, an unreinforced ground bearing slab and some surface water gully's, all of which will need to be removed in order to facilitate the proposals.

The site is bounded by Wolsey Mews Road to the West, a three storey building to the north, a two storey building to the south, and the land to the east is currently undeveloped.

2 Ground Conditions

A geotechnical report was produced by 'Chelmer Site Investigations' in May 2016. The report included the results of 2no trial pits, 2 bore holes and a window sample. From these investigations it can be seen that between 1.2-1.8m of made ground is present over 0.5-0.6m River Terrace Deposits/Made Ground (predominantly clays and gravels). In the window sample a band of 0.2m deep Gravel was found beneath the River Terrace Deposits. Below the River Terrace Deposits and band of Gravel is the Weathered London Clay formation, commencing at depths of 6.0m (window sample), 7.0m (Borehole 2) and 8.0m (borehole 1). The window sample and boreholes were terminated within the Weathered London Clay formation.

In the window sample water was encountered at a depth of 2.9m below existing ground level. This happens to coincide with the level of the Gravel band between the clays, and may represent a perched water table, this will need to be addressed in the permanent design of the basement retaining wall.

Finally, the report recommends that the structural design assume a water table level at ground level. This approach will be adopted in the permanent design of the structure.

3 Proposed Structure

Substructure

The presence of the existing building structures to the north and south of the site, as well as Wolsey Mews road to the west, means that an open cut basement construction will not be possible without prior underpinning to these structures, which would add cost and increase the length of the construction programme. It is therefore proposed that a piled retaining wall be installed to the perimeter of the basement to support both vertical loads from the new building, as well as resist lateral loads from the soil and water pressures and the surcharges from the road and the adjacent building foundations. In the permanent case the piled retaining walls will be propped by the RC basement and ground floor slabs, they will also need to be carefully propped in the temporary case in order to maintain stability.

As noted above, the window sample carried out by 'Chelmer Site Investigations' revealed that water was found at 2.9m, where there is 200mm thick band of dense gravels between clay strata above and below. In anticipation of perched water being present within the gravel layer it is proposed that a 'combined contiguous/secant bored piled wall be implemented, with the male piles being taken down to full depth, and the female piles taken only as deep as required to seal out groundwater from the basement structure. This approach will help to limit the

movement of fines caused by water seeping between gaps between piles which would otherwise potentially cause voids to form beneath the adjacent foundations, and also continue to allow free movement of ground water beneath the basement structure.

The remainder of the gravity loads will be distributed to internal piles via an RC basement slab and ground beams/pile caps.

The geotechnical report advises that the structural design should assume a design water table level at ground level, this approach will be adopted in the structural design. With this in mind, a design check will be required in the later design stages to see if the self-weight of the building is greater than the buoyancy uplift force, otherwise the piles will have to be designed to resist tension forces generated as well as compression forces.

Superstructure

The superstructure will consist of an RC first floor slab supported off of the perimeter masonry walls and a masonry spine wall. The majority of the internal walls will be constructed from non-load bearing masonry to allow future flexibility of the spaces.

The main roof will be constructed from deep exposed timber rafters. Lateral thrust from the rafters will be resisted by a perimeter steel beam and steel ties as necessary.

External Works

The majority of the site is to be used for the new building, and as such the scope of the external works is small. Although the proposals have not yet been developed in detail there will be an external light well to the east of the site at basement level which is likely to include hard landscaping.

The existing ground level is to be lowered, therefore some small RC retaining walls will be required beneath the external skins to the perimeter of the building to resist lateral earth pressures due to the differences in level between the external ground and the ground floor slab.

4 Design Criteria

Codes and Standards

The structure will be designed in accordance with the appropriate British Standards and relevant codes of practice. As follows:

Loads	BS 6399
Concrete	BS 8110
Steel	BS 5950
Timber	BS 5268
Masonry	BS 5628

Loadings

Typically loadings will be taken from BS 6399.

At this stage the following live load allowances have been made:

Office spaces - 2.5kN/sqm UDL & 2.7kN PL

Residential spaces -	1.5kN/sqm UDL & 1.4kN PL
Flat Roofs - access for maintenance only -	0.75kN/sqm
Pitched Roofs -	0.6kN/sqm

Design Fire Periods

It is anticipated that much of the structure, such as the RC slab soffits, RC walls, masonry walls and the timber rafters and steel ties to the roof will be exposed as part of the architectural design. All structural elements will be sized and designed to the relevant codes cited above for a fire period of 1 hour.

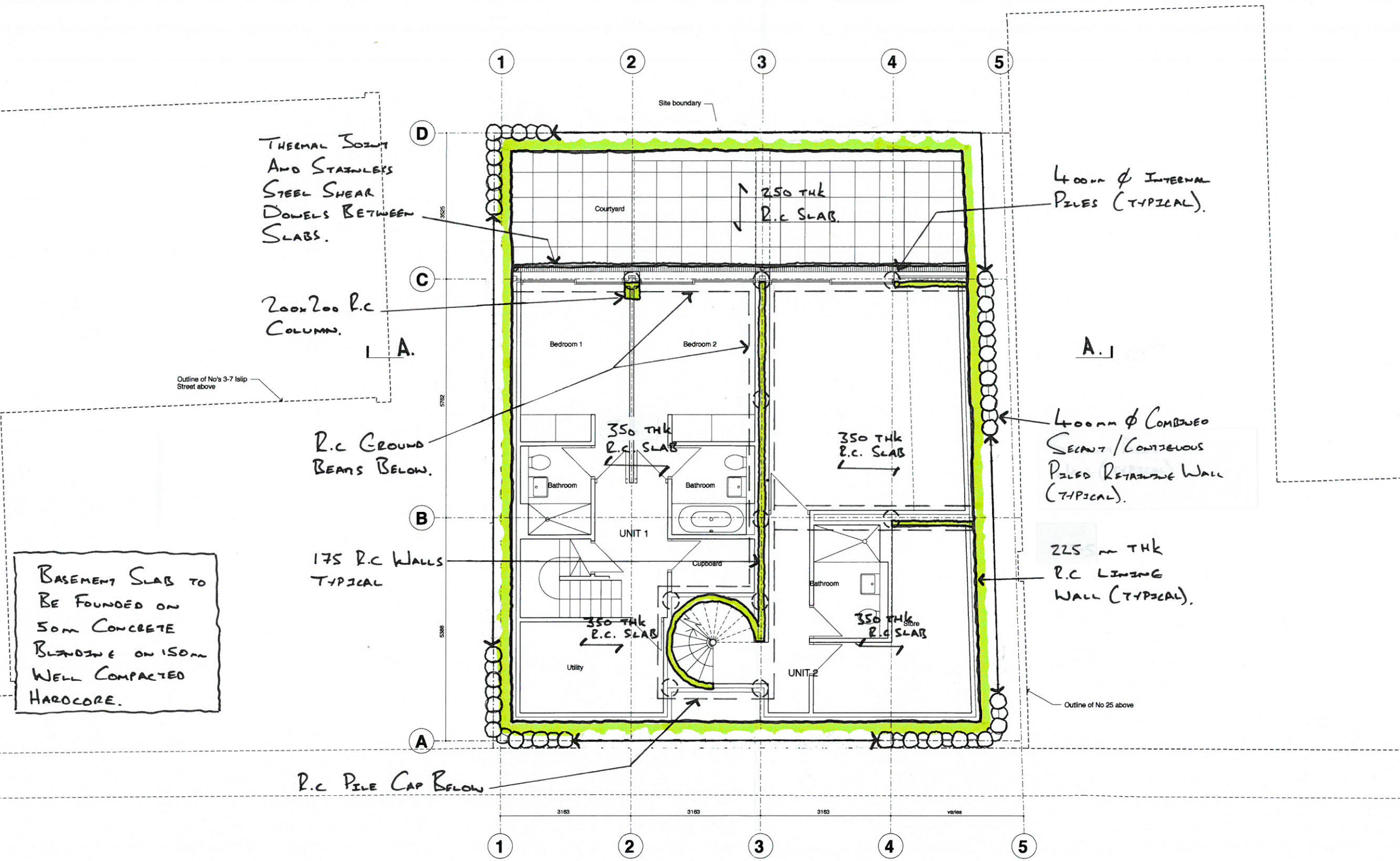
Disproportionate Collapse

The proposed structure is two storeys tall plus basement and is residential throughout. According to Part A3 of the Building Regulations the structure is class 2a and as such horizontal ties will be required between the RC slabs and masonry walls.

Appendix A
Stage C structural layout drawings

BASEMENT

1:100 @ A3



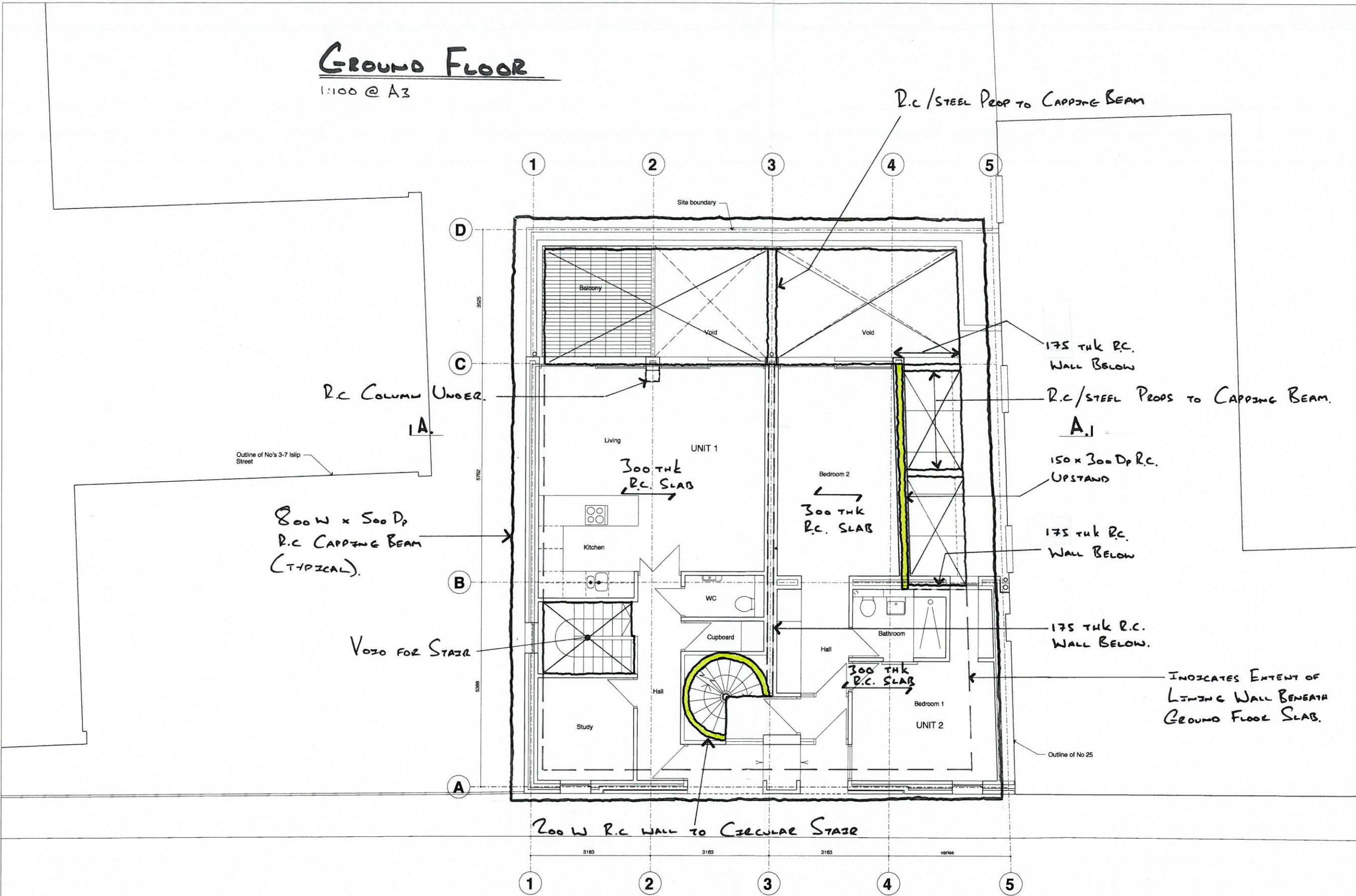
BASEMENT SLAB TO BE FOUNDED ON 500mm CONCRETE BLINDING ON 150mm WELL COMPACTED HARDCORE.

WOLSEY MEWS

Preliminary
 Basement Plan
 Wolsey Mews Garages,
 NW6 2DZ
 1590_L01_B

GROUND FLOOR

1:100 @ A3



WOLSEY MEWS

Preliminary

Ground Floor Plan
Wolsey Mews Garage,
NW5 2JX

1590_L02_B

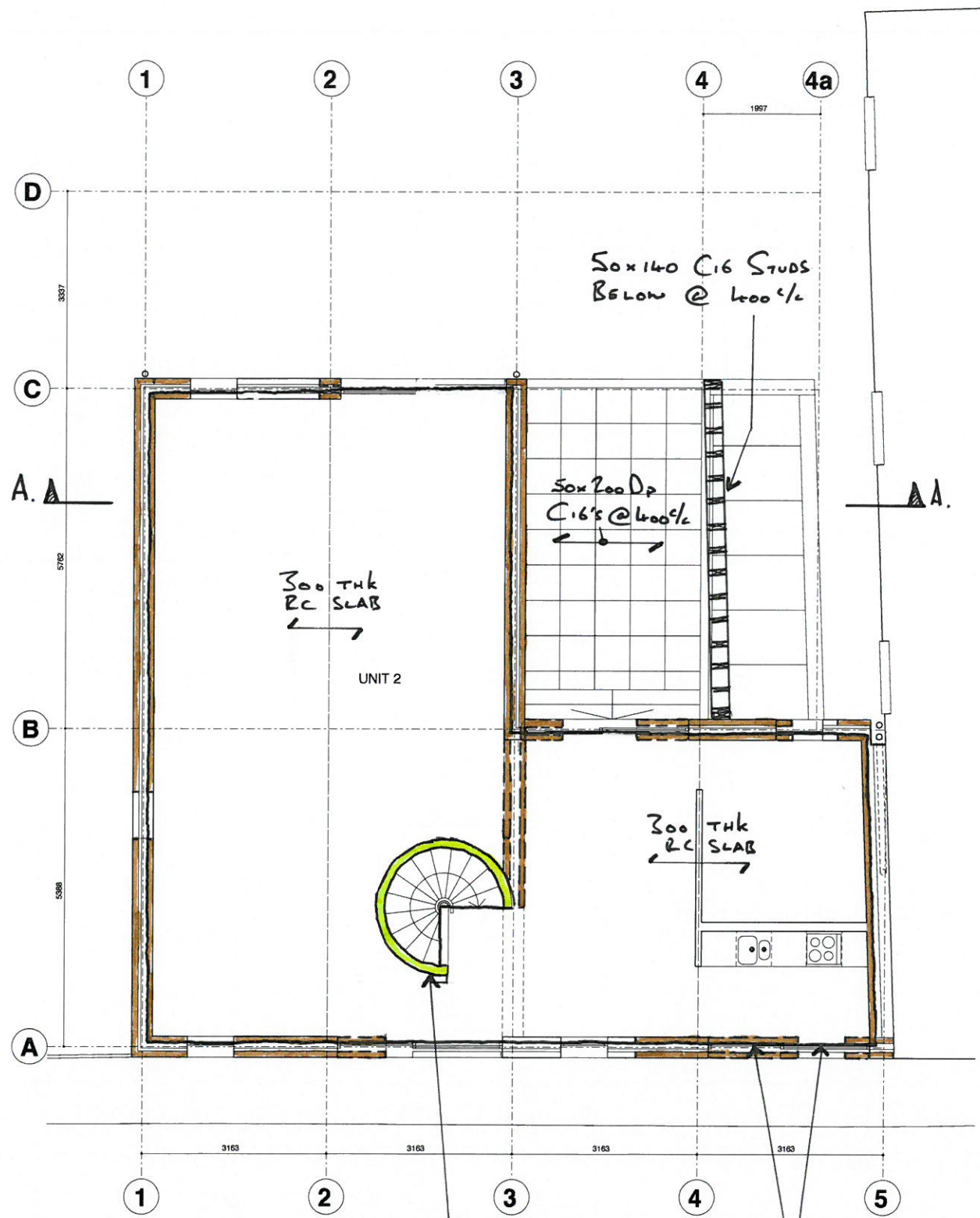
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Date MAR 16 Eng S. RILEY Chd
Job WOLSEY MEWS GARAGES, LONDON

FIRST FLOOR

1:100 @ A3



300 THK RC SLAB
UNIT 2

50x140 C16 STUDS
BELOW @ 400%L

50x200 Dp
C16's @ 400%L

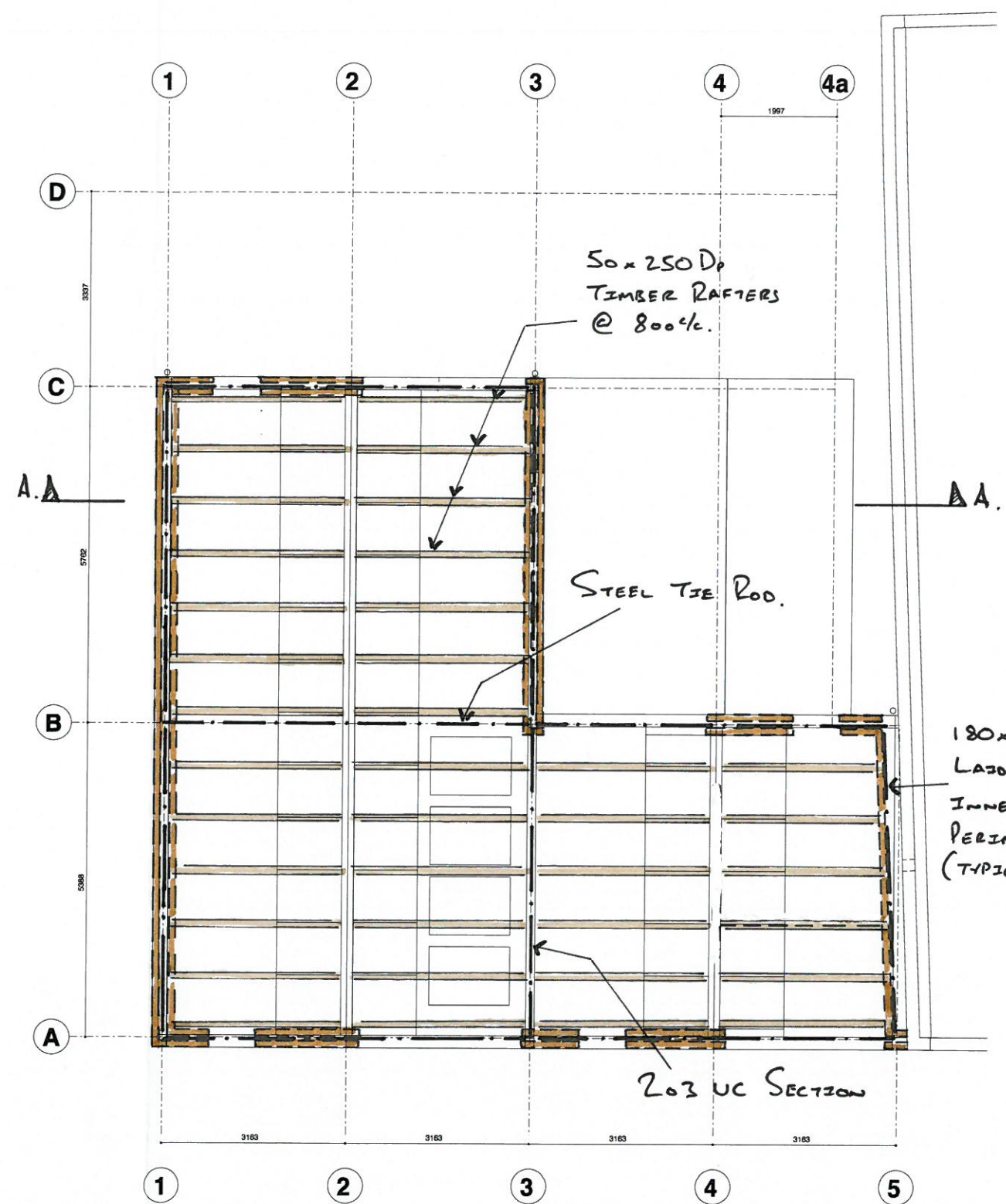
300 THK RC SLAB

200 W R.C. WALL
TO CIRCULAR STAIR

FIRST FLOOR R.C.
SLAB SUPPORTED
OFF INNER SKIN
OF CAVITY WALL.

ROOF

1:100 @ A3



50x250 Dp
TIMBER RAFTERS
@ 800%L.

STEEL TIE ROD.

180x90 PFC'S
LAYD FLAT OVER
INNER SKIN OF
PERIMETER WALLS.
(TYPICAL).

203 UC SECTION

PRICE & MYERS

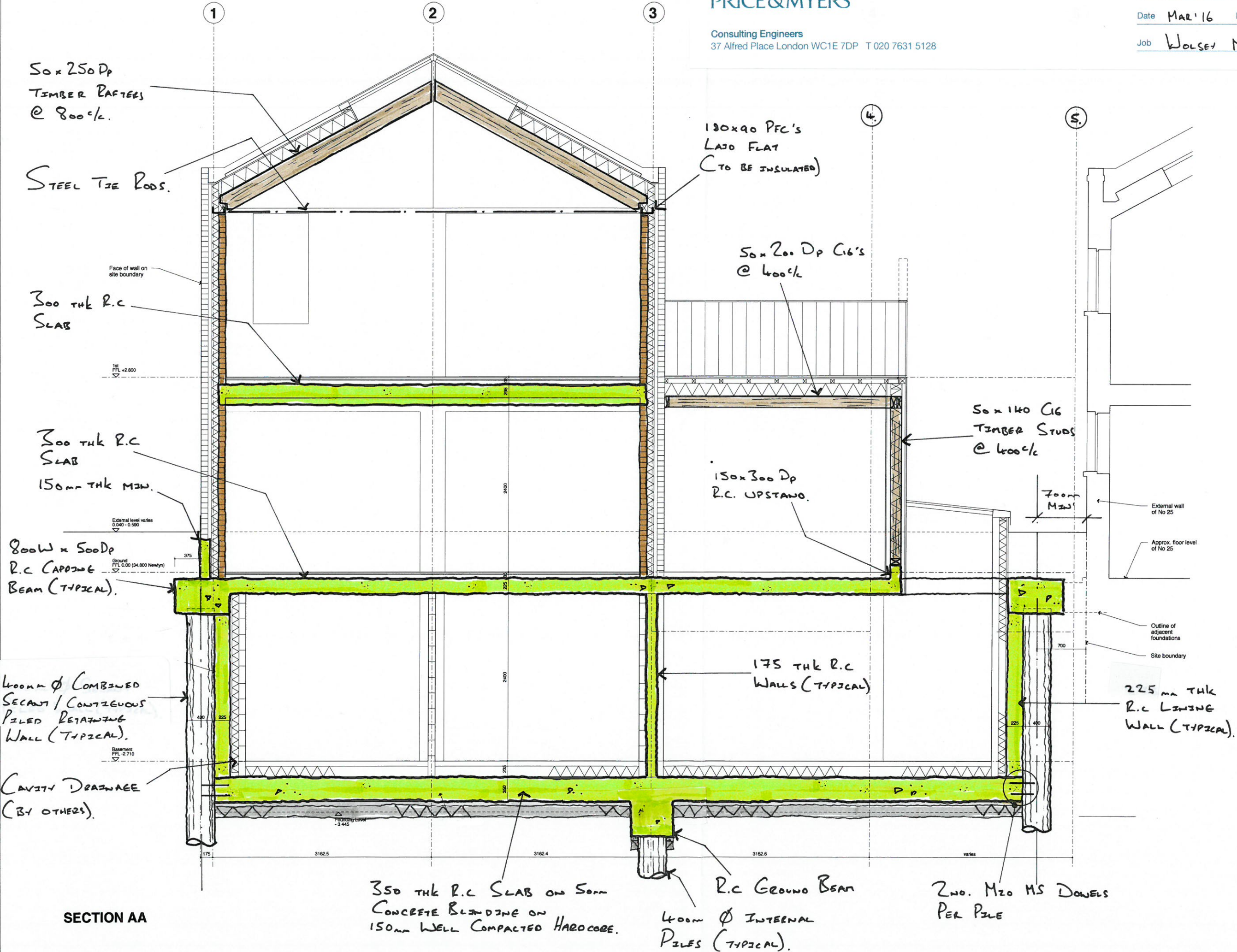
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Preliminary
First Floor & Roof Plans
Wolsey Mews Garages, NW
1590_L02_A

SECTION A-A

1:50 @ A3



SECTION AA

Preliminary

Section AA
Wolsey Mews Garages
London MAS 2DX

1590_L05_B

BHA

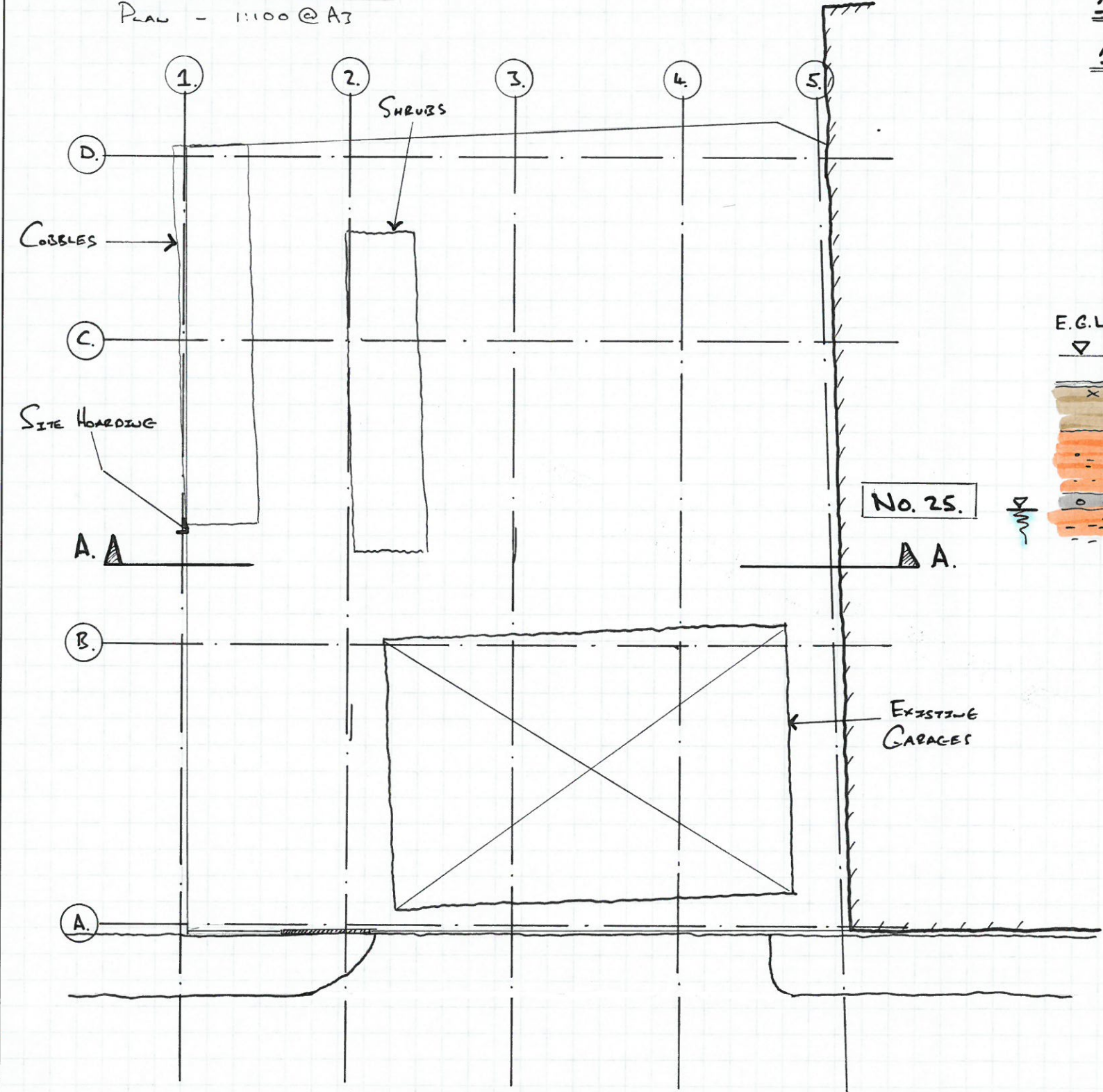
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Appendix B

Basement construction sequence

1. EXISTING LAYOUT

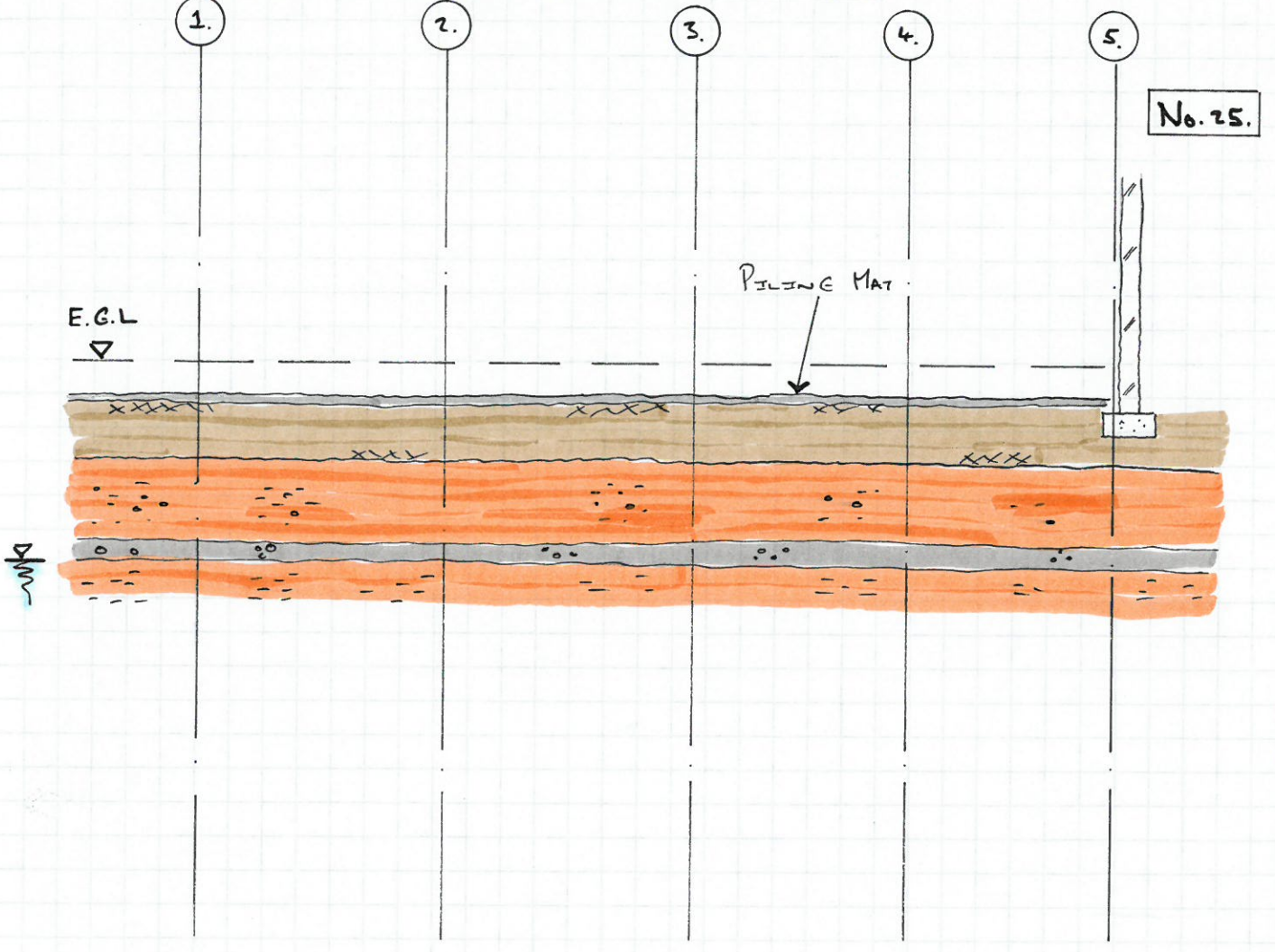
PLAN - 1:100 @ A3



WOLSEY MEWS.

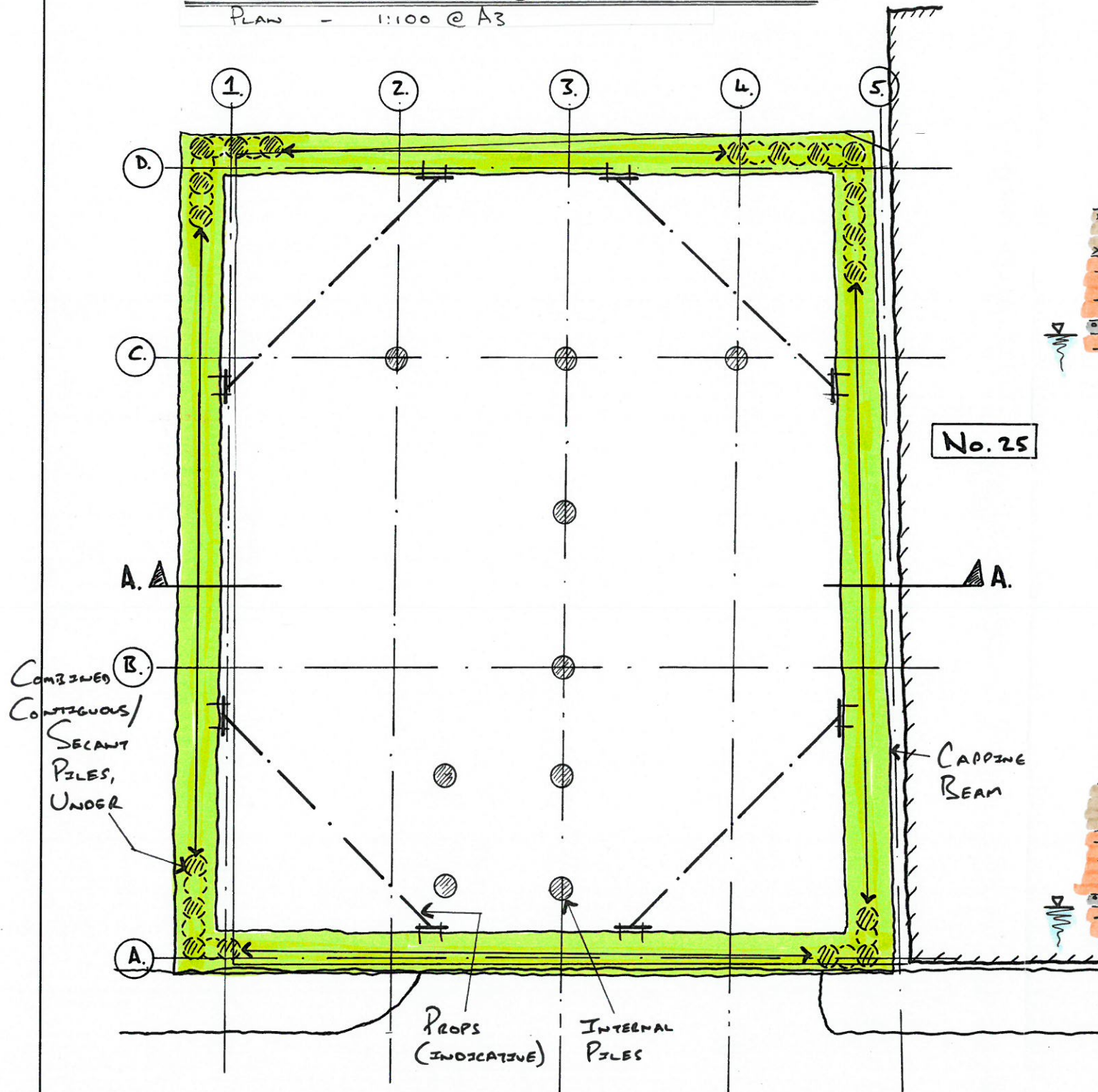
1a. REMOVE EXISTING STRUCTURES / CONCRETE SLAB + DRAINAGE.

1b. EXCAVATE AND INSTALL PILING MAT SECTION A-A - 1:100 @ A3



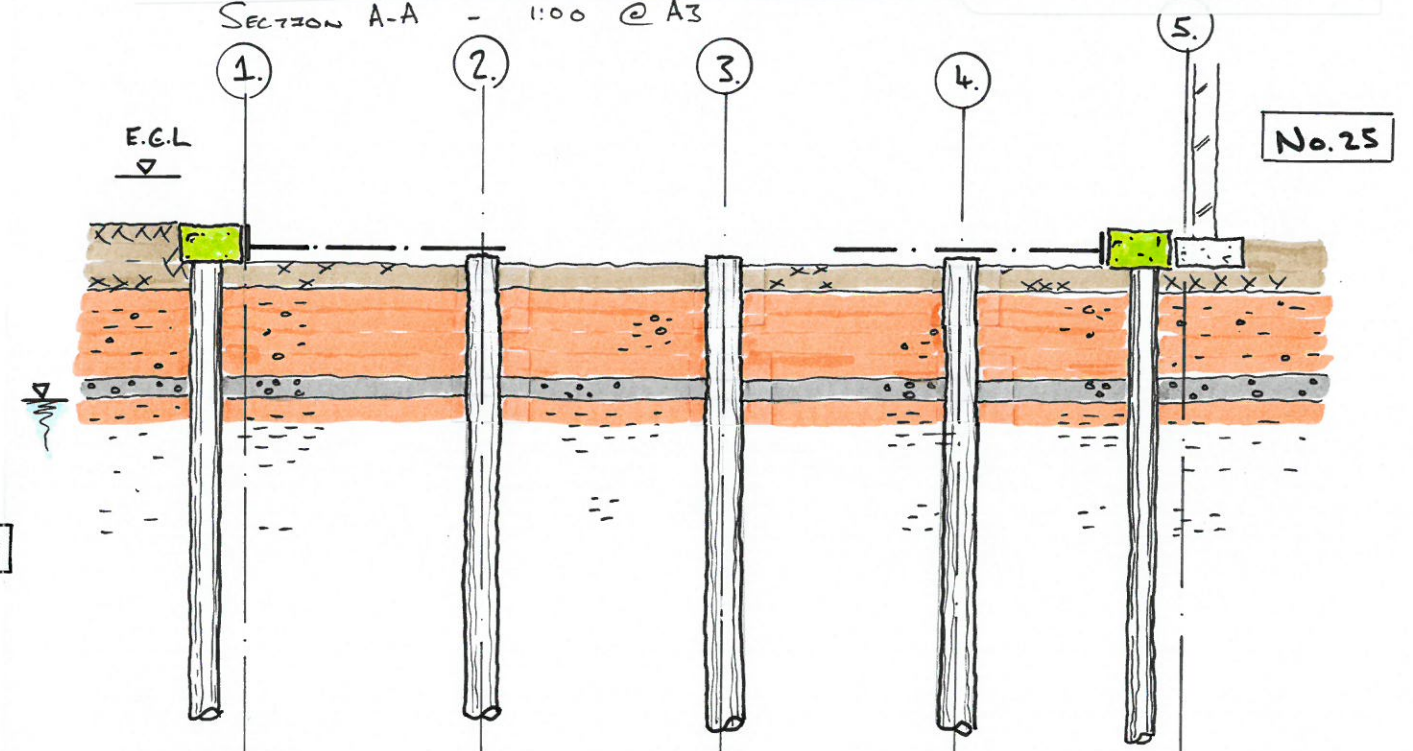
2. INSTALL PILES + COMMENCE EXCAVATION

PLAN - 1:100 @ A3



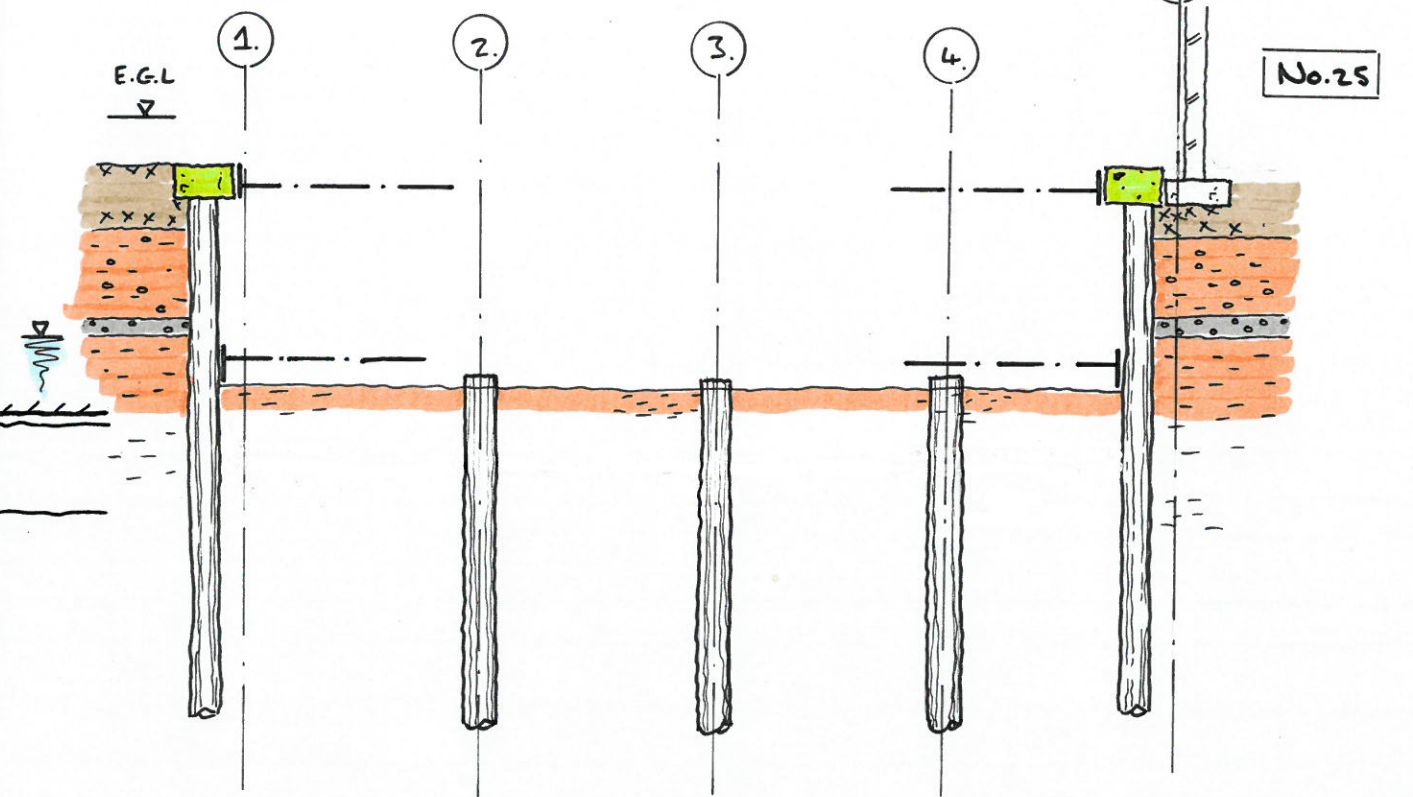
2a. INSTALL COMBINED CONTIGUOUS/SECANT PILED WALL, CAPPING BEAM, HIGH LEVEL PROPS + INTERNAL PILES

SECTION A-A - 1:100 @ A3



2b. EXCAVATE TO BASEMENT FOUNDING LEVEL + INSTALL LOW LEVEL PROPS

SECTION A-A - 1:100 @ A3



COMBINED CONTIGUOUS/SECANT PILES, UNDER

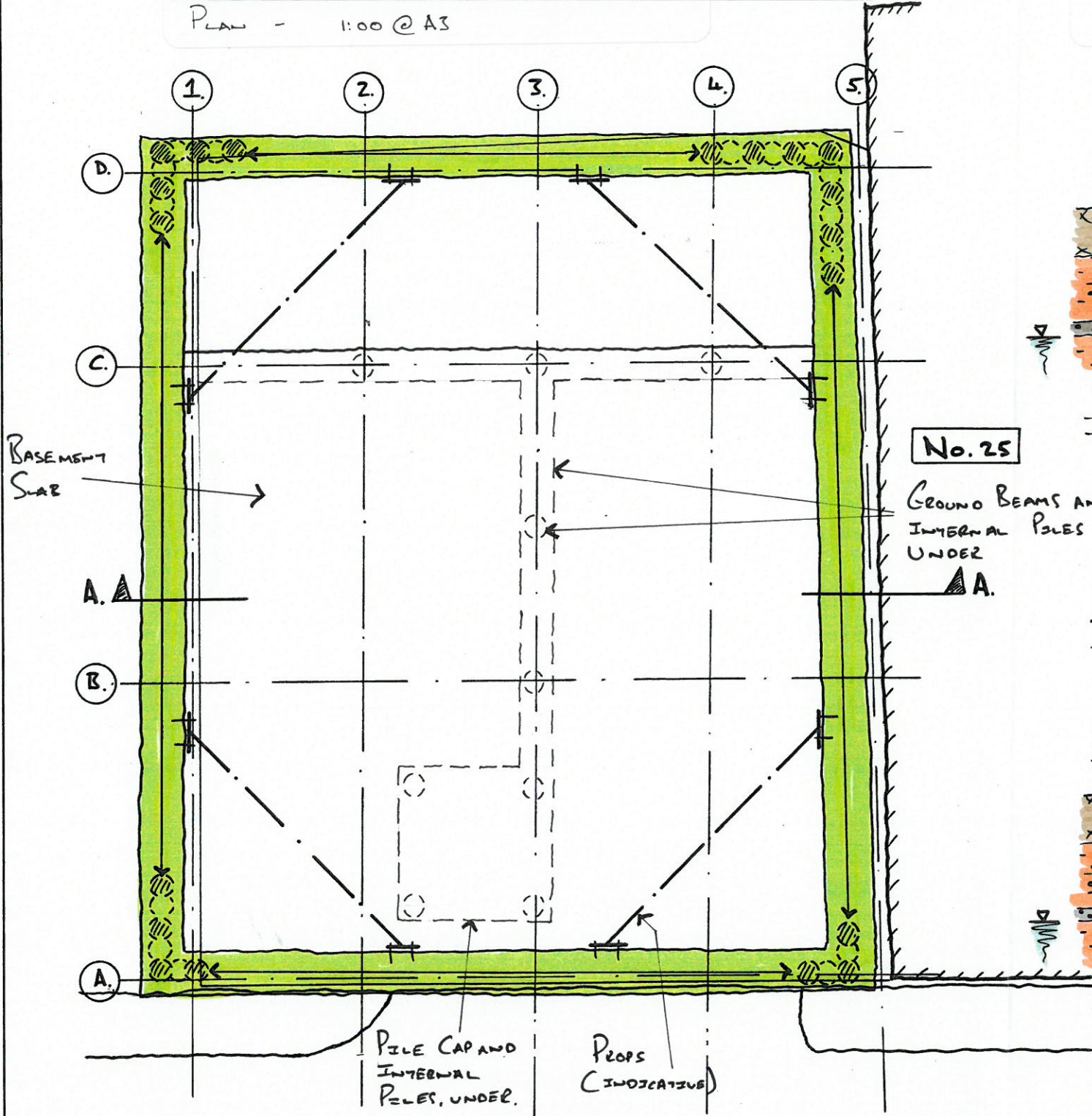
CAPPING BEAM

PROPS (INDICATIVE) INTERNAL PILES

WOLSEY MEN'S

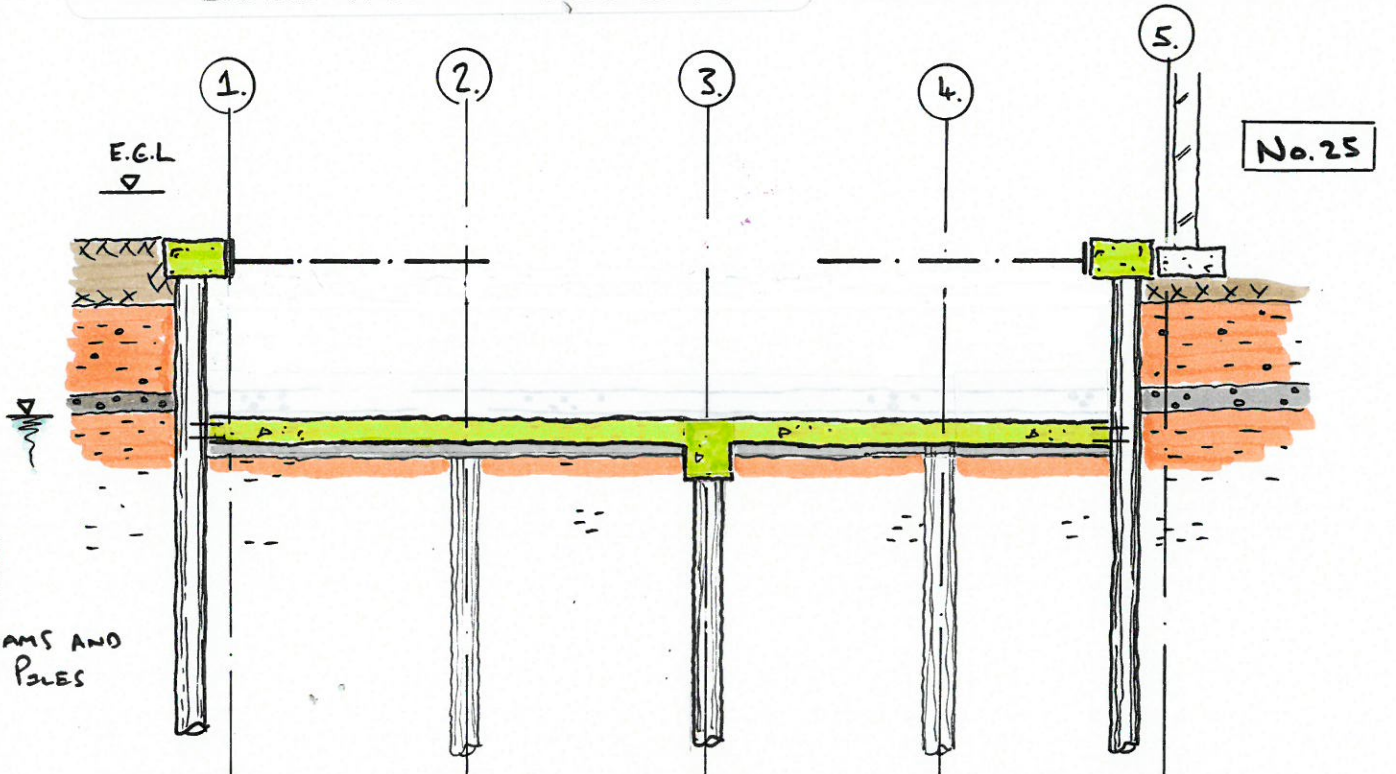
3. INSTALL SUBSTRUCTURAL ELEMENTS + BASEMENT SLAB

PLAN - 1:100 @ A3



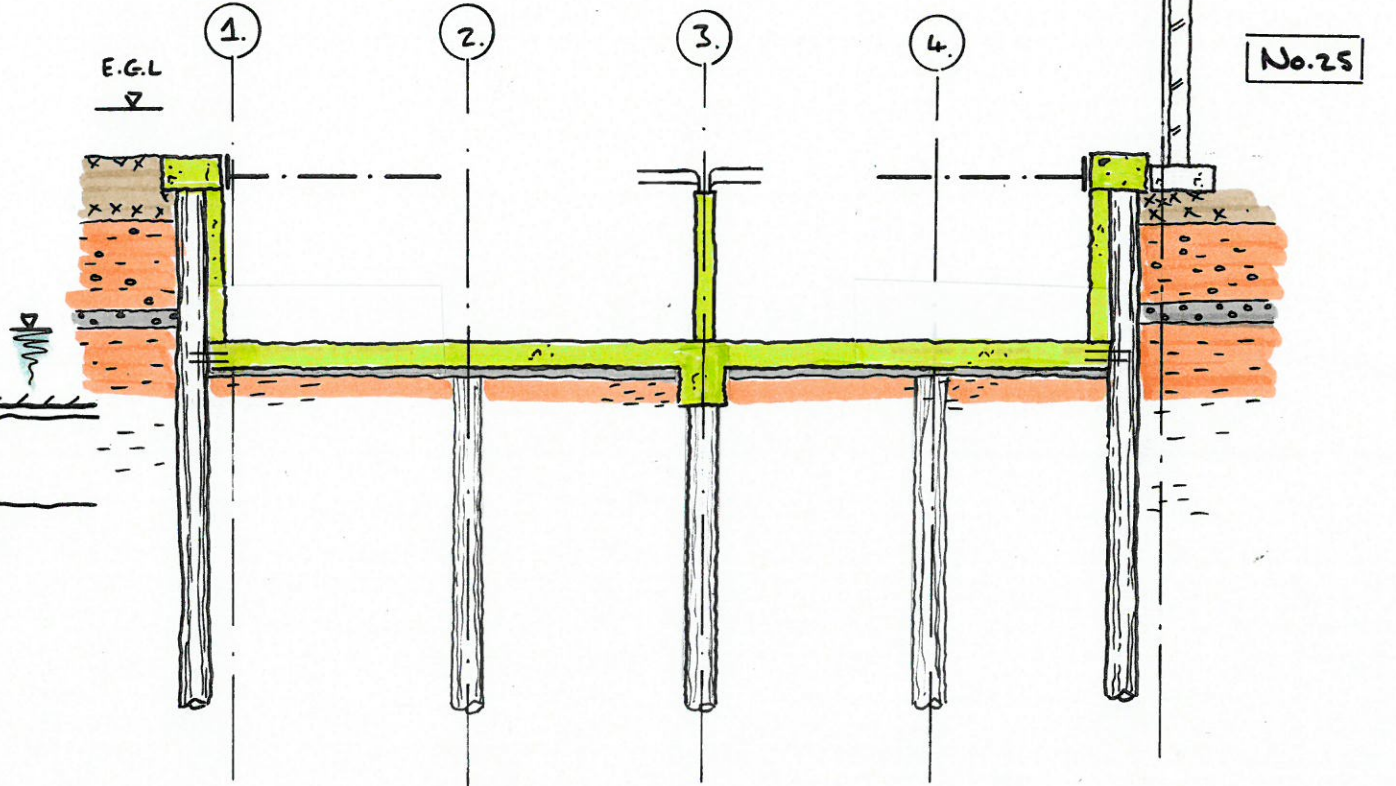
3a. INSTALL DRAINAGE, GROUND BEAMS + BASEMENT SLAB, REMOVE LOWER PROPS.

SECTION A-A - 1:100 @ A3



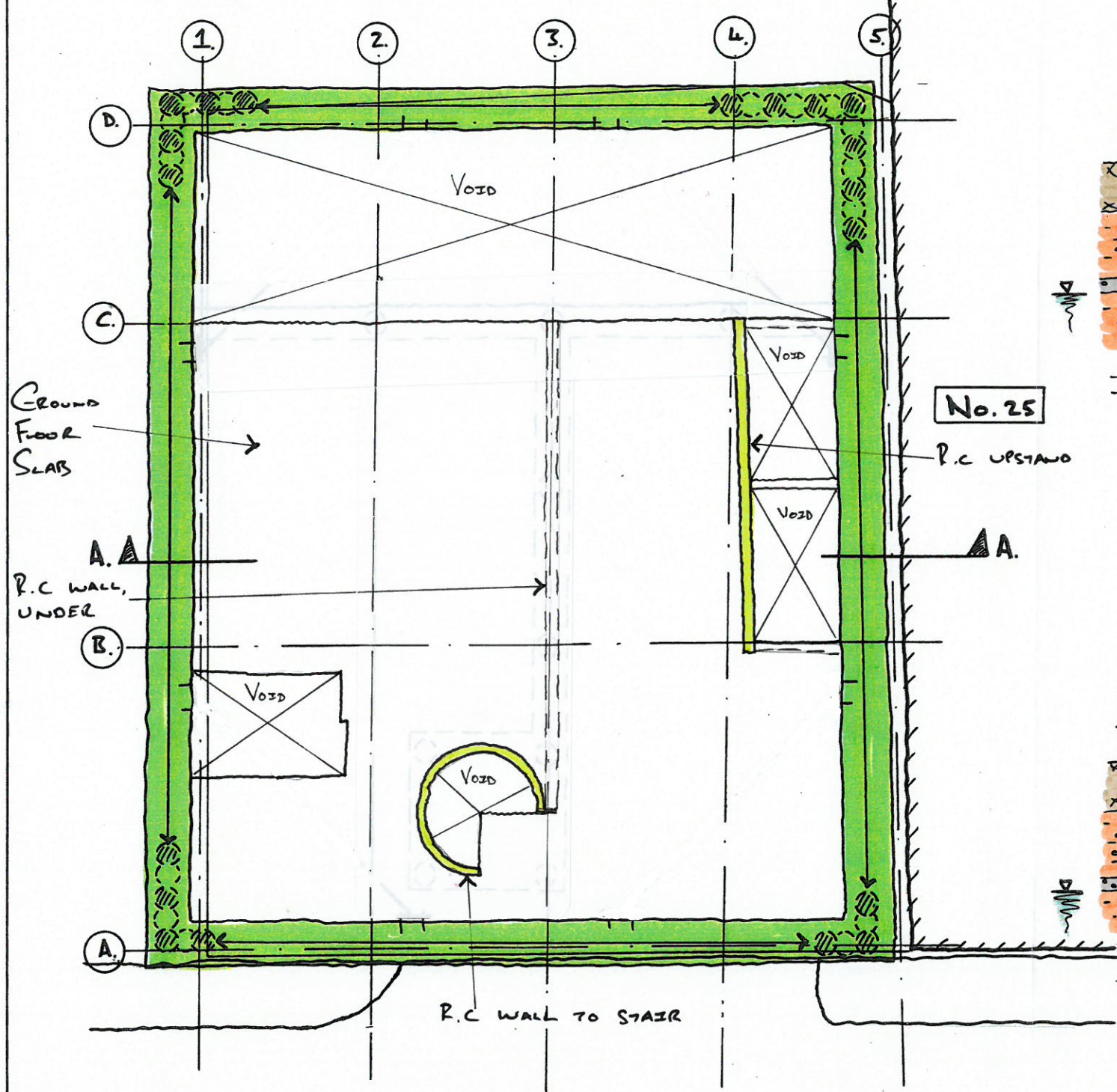
3b. INSTALL LINING WALLS + BASEMENT → GROUND P.C WALLS.

SECTION A-A - 1:100 @ A3



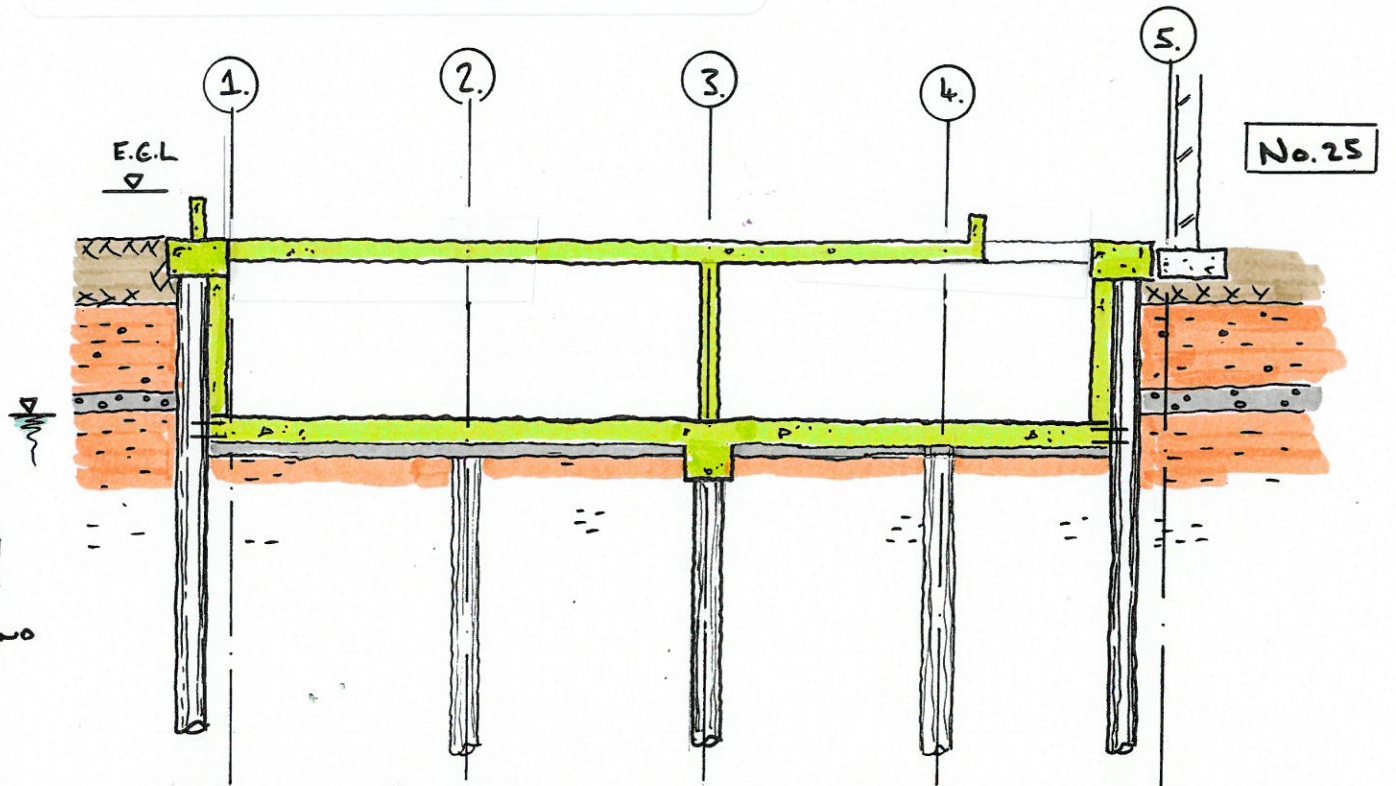
WOLSEY MENS.

4. INSTALL GROUND FLOOR SLAB STRUCTURAL ELEMENTS
 PLAN - 1:100 @ A3



WOLSEY MENS.

4a. INSTALL GROUND FLOOR STRUCTURAL ELEMENTS
 SECTION A-A - 1:100 @ A3



4b. INSTALL SUPERSTRUCTURE
 SECTION A-A - 1:100 @ A3

