LONDON
STRUCTURES
LAB

Denville Hall
Construction Method Statement

Rev 02 - 2022.10.27

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Contents

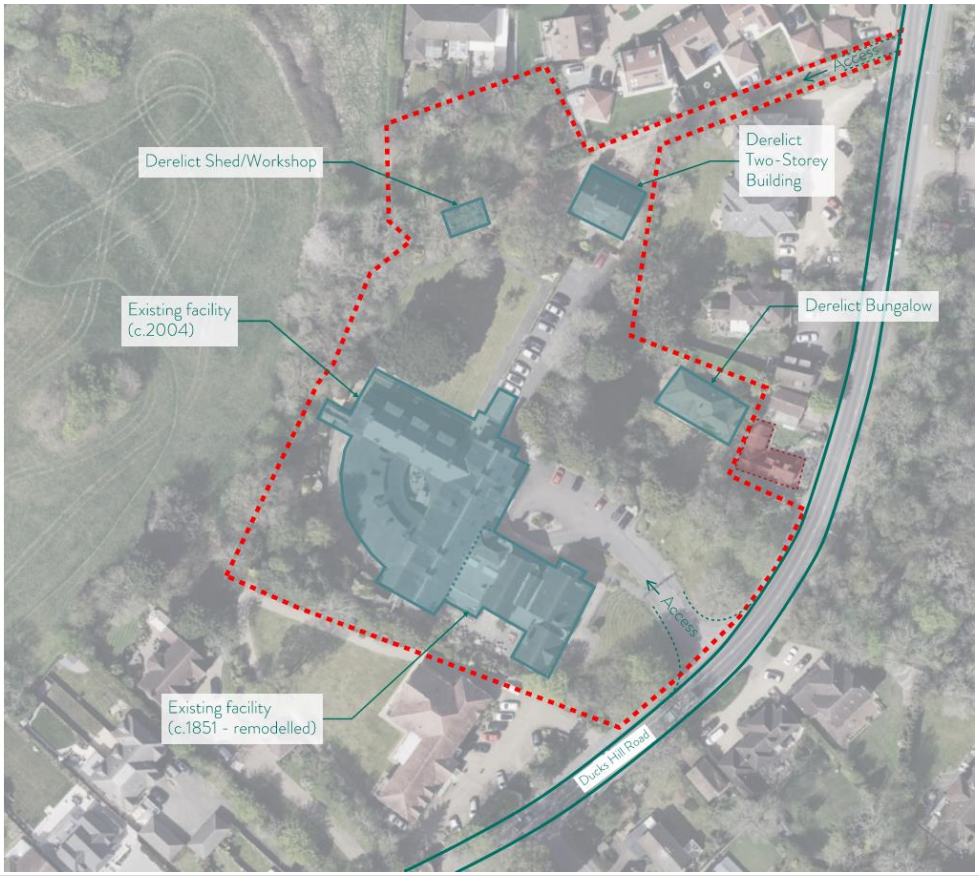
1.0 Non-Technical Summary

The following report details the outline construction method statement for the proposed development of Denville Hall. The development comprises several new buildings within the site boundary of the existing facility, providing additional care home accommodation and amenity space. The report provides a summary of the existing site, before discussing the proposed development and the structural scheme. The outline methodology demonstrates the viability of the proposals, while addressing health and safety considerations, and the logistical constraints of the site and its surroundings.

The Construction Method Statement has been prepared by the London Structures Lab, acting as the structural designer: it is anticipated that this document will be adopted and developed by a competent Principal Contractor with the necessary knowledge and experience, prior to the construction phase of this project.

2.0 Site Description

Denville Hall is located in Northwood, within the London Borough of Hillingdon. Located on the periphery of Greater London, the surrounding area is largely suburban, with a high proportion of undeveloped land.



A4180 – Duck's Hill Road provides access to the site from the east. The site is bounded by neighbouring buildings to the north and south. To the east, it is bounded by the Gravel Pits park, and by farmland to the west.

The existing care home facility comprises a mid-19th century manor house and a contemporary extension to the west. The manor house is understood to have undergone significant alteration and extension throughout the 20th century, with much of the original fabric lost or concealed. To provide addition capacity and cater for specialist dementia care, the new contemporary wing was introduced to the west of the existing hall in 2004.

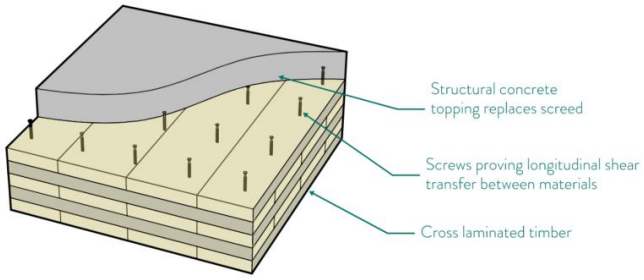
The east of the site is bordered by an existing Grade II Listed Building, thought to have been the lodge serving the larger manor house. While the historic fabric to Denville Hall lacks nationally listed status, it is locally listed by London Borough of Hillingdon. It is not subject to the statutory obligations of a full listing; however, its significance should be recognised from the perspective of planning and local heritage.

Within the north of the site, there are several existing buildings, thought to date from the early 20th century, which are no longer in use. They are understood to have fallen into disrepair and are not serviceable for the purposes of the assisted living facility.

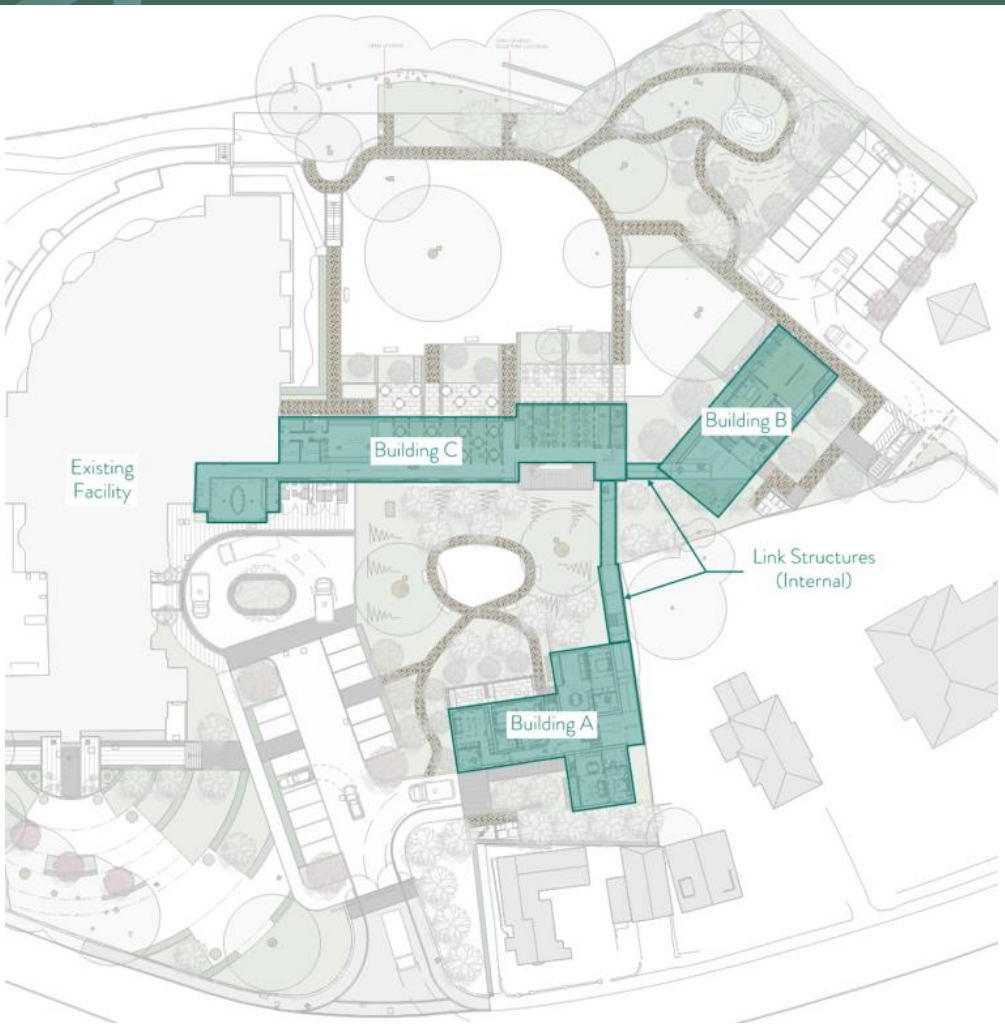
The underlying strata is likely to comprise of the Lambeth Group, which is characterised as a clay with lenses of silt and gravel. The neighbouring Gravel Pits park is consistent with this description, and it may indicate that the site is founded upon gravel-dominant strata. A ground investigation has been commissioned to confirm the ground conditions.

3.0 Proposed Development

An extension to the existing facility is proposed, comprising three distinct buildings, connected by link structures. The proposed development will expand Denville Hall's capacity, providing both care home accommodation and amenity space for the residents. A structural strategy has been developed that is appropriate to the form and scale of the proposals, while responding to the constraints identified.



The existing bungalow, two-storey building to the north and the garage to the west are no longer considered to be fit-for-purpose and it is proposed that these structures are demolished to accommodate the new facilities.



It is proposed to construct Building A and Building B in load-bearing CLT walls, with a CLT-concrete composite slab and CLT roof panels. Intermediate trimming steelwork is provided at roof level, and in locations where the edges of the slab are not supported by walls. This typology benefits from a rapid speed of construction, due to its panelised form and ease of assembly.

Building A is supported upon mass concrete strip foundations, while Building B is founded upon an in-situ concrete raft slab, at basement level. Further discussion of the proposed basement construction is provided in Section 6.0.

Building C is constructed as a series of glulam timber frames, with softwood joists forming the roof infill. Stability is provided by internal braced bays and perimeter blockwork shear walls. A beam and block floor spans between a combination of strip foundations and helical piles. Alterations to the gable end of the existing building are proposed, with openings formed to provide a connection to Building C.

Glazed link structures provide covered access between each of the proposed buildings. The link structures are framed in steelwork, which act as sway frames to provide lateral stability. Floor and

roof infill (excluding glazed areas) is provided by timber joists. Helical piles are proposed to support the superstructure, providing minimal intrusion into the root protection zones of the surrounding trees.

Reference should be made to London Structures Lab's concept design sketches, appended to this report.

4.0 Demolition Works

The proposed development involves the demolition of several existing, derelict buildings on the site. Prior to demolition, the construction site boundary shall be established, with hoarding erected to segregate members of the public and residents of the existing care home from the site. To provide access and establish site facilities, site clearance shall be undertaken in parallel with the demolition works. Prior to commencing site clearance, mature trees shall be adequately protected, with demarcation of root protection zones.

The building to be demolished are of traditional construction and they do not appear to exhibit complex load paths or load transfers. The demolition sequence may therefore follow a conventional top-down sequence.

Where demolition waste cannot be repurposed for use in the proposed development, following circular economy principles, it shall be characterised according to appropriate Waste Acceptance Criteria (WAC) before disposal. Asbestos containing materials (ACMs) have been identified within the existing buildings: these will be removed and disposed of by a specialist contractor prior to demolition, who will be required to implement a management and monitoring plan for the works.

During demolition, consideration shall be given to suppression of dust, noise and vibration – reference should be made to Section 9.0 for discussion of these items.

5.0 Outline Construction Sequence

For each of the buildings proposed in the new development, a conventional bottom-up method of construction is appropriate. To minimise the number of trades working on the site at a given time, the buildings will be progressed in close sequence as far as possible. With site clearance having been completed in the initial demolition phase, earthworks shall commence to regrade the site and prepare substructure excavations. The large area of the site provides the opportunity to stockpile spoil, minimising the number of vehicle movements required for the eventual disposal.

Upon completion of the earthworks, the substructure may be installed. Within root protection zones, helical piles are proposed to mitigate against impact to the trees. The helical piles will be hand located with the assistance of an airspade, ensuring major roots, as defined by BS 5837:2012,

are not severed. Outside of root protection areas, conventional concrete strip footing are proposed to support ground floor slabs. Discussion of the proposed basement construction to Building B is provided in Section 6.0.

Building A and Building B are constructed in CLT panels, which shall be lifted into place with the assistance of a mobile crane. It is anticipated that the crane will be located within the site boundary, and the ease-of-construction afforded by CLT will minimise the period for which it is required. A just-in-time approach to deliveries will mitigate impact to surrounding properties during this limited period of works. As Building C is formed in a framed construction with a lightweight infill, it may be constructed without the use of a mobile crane, instead using the likes of a hoist or Genie lift.

For both the panelised and the framed construction, consideration shall be given to adequate provision of temporary support. In both instances, floors provide restraint and diaphragm action to maintain planar stability in the permanent condition, which will be instated using propping in the temporary case. Building C utilises vertical braced bays in the permanent condition; similarly, temporary bracing will be provided until the permanent structure has been completed.

A new connection between Building C and the existing facility is proposed, which involved the introduction of a new opening through a masonry wall. Temporary works shall be installed to support the existing structure before the opening is formed, which will incorporate needling through the existing masonry wall and propping to the adjacent area of floor.

6.0 Basement Construction

Building B incorporates a single-storey basement, extending beneath the existing ground level. While in certain circumstances basement construction can present significant complexity, this has largely been mitigated by available space on the site allowing an open-cut construction method to be applied. The footprint of the basement has a sufficient offset from the site boundary to allow for excavation to formation level, while maintaining stable slope angles to the sides of the excavation. Deviating from this approach in the west corner of the basement, a temporary sheet pile wall will be installed to protect an adjacent Thames Water asset. A similar approach shall be applied to segregate the root protection zone of adjacent trees if the top of the excavation is found to impinge upon the RPZ.

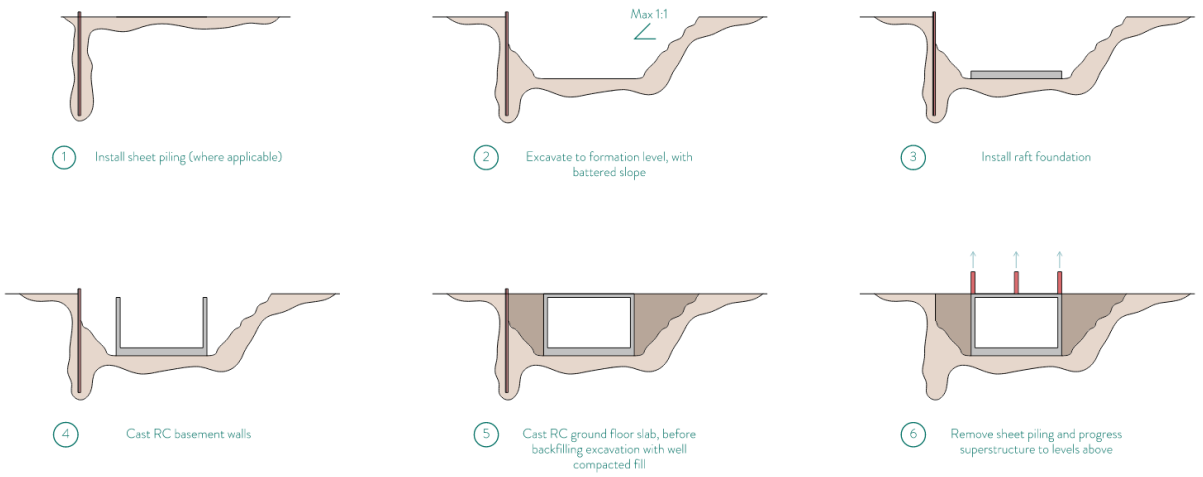
It is proposed to construct the basement as an in-situ concrete “box”, with the basement slab acting as a raft foundation. A bottom-up sequence shall be followed, using conventional concreting techniques. Upon completion of the ground floor slab, the excavation shall be back-filled with well-compacted fill, and free-draining material immediately behind the retaining walls. The walls will be

propped by the basement and ground floor slabs in the permanent case. An indicative sequencing sketch for the basement construction is appended to this report.

A ground investigation has been commissioned to confirm the existing ground conditions, including groundwater level. If groundwater is close to surface level and inflows are likely to be significant, dewatering will be required. A permit to discharge shall be sought, and steps will be taken to remove fines before discharging beyond the site boundary.

There are no existing structures within close proximity to the proposed basement, therefore a ground movement assessment and a damage monitoring regime are not required.

Basement waterproofing shall be provided using a drained cavity system, which will be pumped to the below-ground drainage network. A secondary form of waterproofing may also be applied, such as a liquid-applied membrane or structurally integral protection via the use of an admixture.



7.0 Site Access and Vehicle Movements

The site benefits from direct access from Duck's Hill Road, as well as two points of access into the site boundary at the north and the south. A one-way system for vehicle movements will be prioritised as far as reasonably, to limit reversing movements on or from the site. A phased approach to site access location may be required to maintain access to the existing facility and establish the new proposed access from Duck's Hill Road.

As a benefit of using a panelised, factory manufacturer form of construction such as CLT, vehicle movement shall be kept to a minimum.

It is not anticipated that road closures will be required during the course of the works.

8.0 Health and Safety

The Principal Contractor will receive all pre-construction information including CDM risk register, and they will be selected through a pre-qualification progress to ensure they are competent with the suitable experience and knowledge to be able to plan, manage, monitor and coordinate the entire construction phase which includes temporary works. They will be responsible in ensuring all contractors appointed are competent.

The Principal Contractor will be responsible for ensuring no unauthorised access is obtained onto site, by use of hoarding and independent site access.

As the existing care home facility will remain active throughout the works, particular consideration shall be given to ensuring the segregation of construction activities. This will be achieved through the use of site hoarding and independent site access.

9.0 Control of Dust, Noise and Vibration

In order to mitigate against adverse impact to members of the public, care home residents and neighbouring residents, measures shall be taken to suppress dust, noise and vibration. It is not anticipated that out-of-hours working shall be required during the normal course of the project; any exceptions shall be made under a Section 61 agreement.

Control of dust is likely to be most pertinent during the demolition and earthworks phases. Demolition material and spoil stockpiles shall be wetted up. Where appropriate, dust including silica will be controlled either through tools which have provisions for attaching dust extraction will be fitted and wet suppression alongside RPE to protect operatives.

Noise and vibration monitors are to be used during the construction phase to assist with managing levels, to protect residents, the public and contractors. Site operatives will be required to use appropriate PPE during noisy works. Where works may exceed the established trigger levels for sound transmission to the surrounding environment, acoustic barriers shall be deployed.

It is not anticipated that the works will generate significant vibrations that would cause an adverse impact to neighbouring residents. Adverse impacts to operatives should be mitigated by implementing best practice HSE guidance with respect to hand-arm and full-body vibration.

10.0 Conclusion

The proposed scheme can be delivered safely and without significant adverse impact to neighbouring properties or members of the wider public, through careful consideration of sequencing and logistics. A suitably experienced contractor will be appointed to develop the construction methodology, for review with the design team at a later stage of design. Due consideration must be given to progressing construction while the existing facility remains in operation; however, this equally provides the applicant with a particular interest in ensuring the construction phase is effectively managed.

Appendix 1 – Design Sketches

Building A - Ground Floor

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Landscape architect to review and eliminate retaining structure

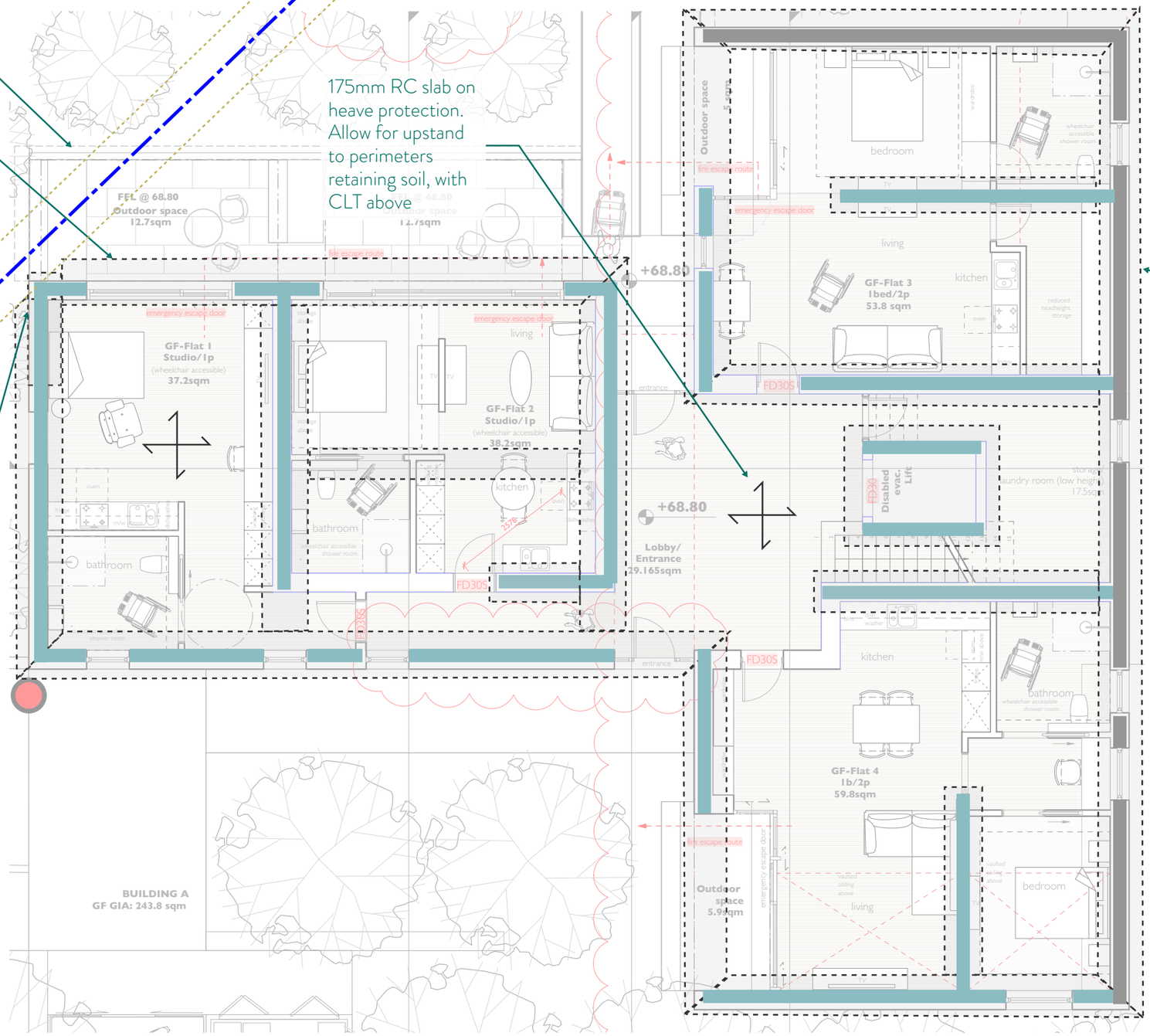
Mass concrete strip foundations typically 750mm width, depth 900-2000mm

TW sewer with 600mm exclusion either side

Reinforced ground beam embedded within mass concrete strip footing, with compressible material below

175mm RC slab on heave protection. Allow for upstand to perimeters retaining soil, with CLT above

200mm RC Retaining Wall



Notes:

Legend

- 90mm CLT Wall
- 290mm CLT Composite
- Steel Beam - 203UB UNO

Sketch

Project name	Project no.	Date
Denville Hall	1521	07.10.2022

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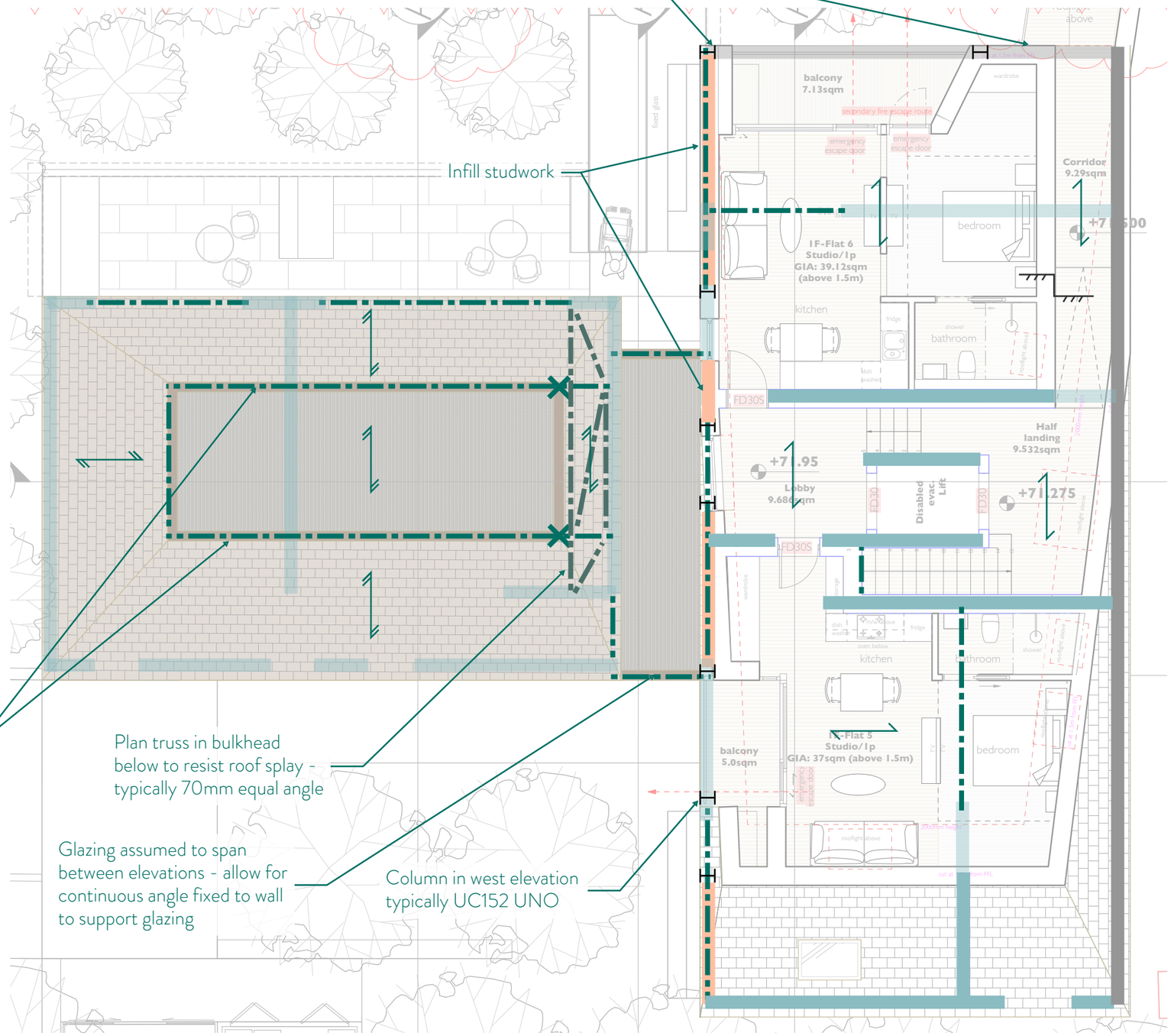
Building A - Planning Revisions	AB		3

Building A - First Floor



Notes:

Legend

- 90mm CLT Wall
- 290mm CLT Composite
- Steel Beam - 254UB UNO
- 200mm CLT Slab

Sketch

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Building A - Planning Revisions	AB		3

Building A - Roof

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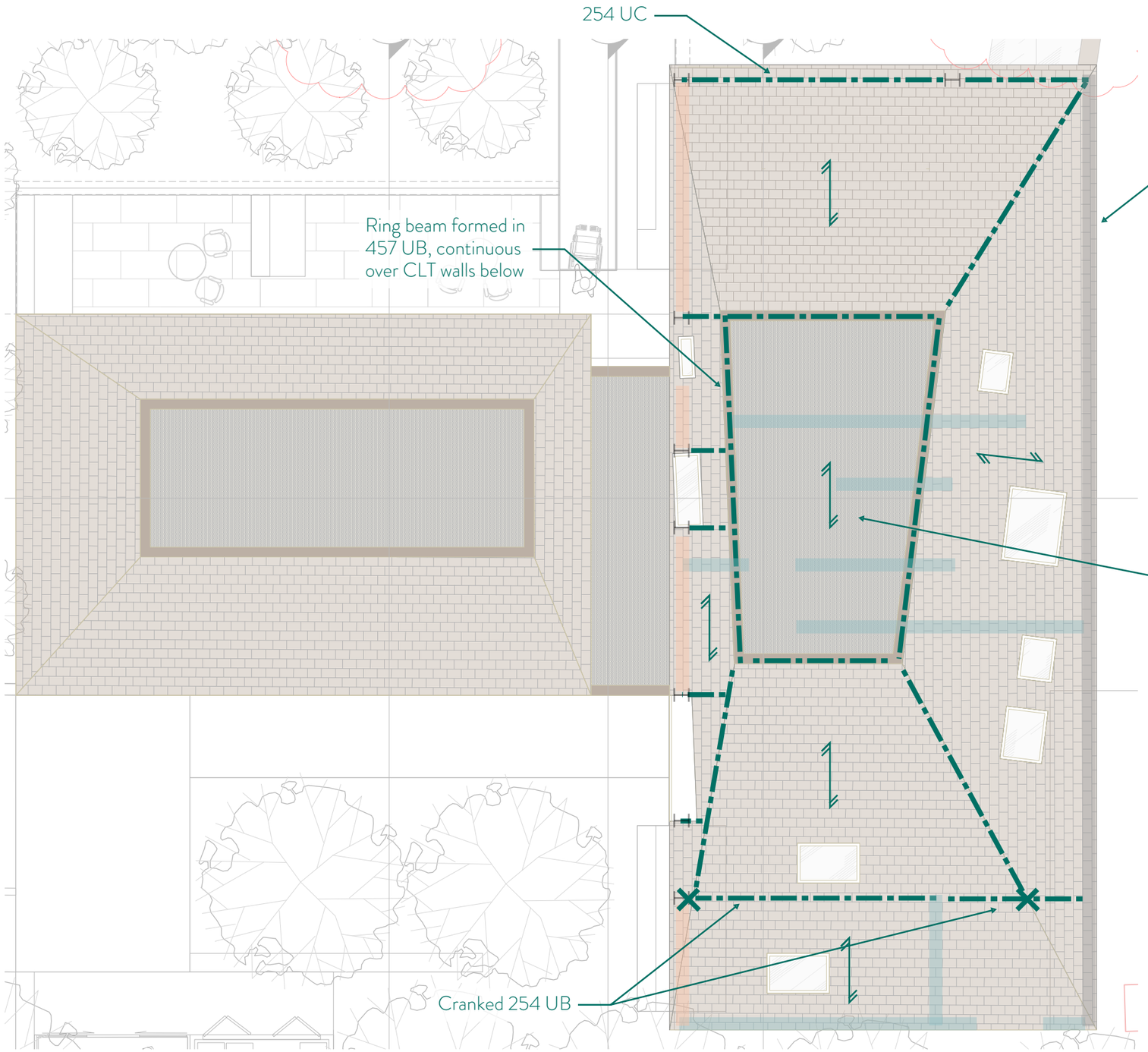

Notes:

Legend

- CLT Wall
- 200mm CLT Slab
- 203 UB UNO

Sketch

Project name	Project no.	Date
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Building A - Planning Revisions	AB		3

Building B - Basement

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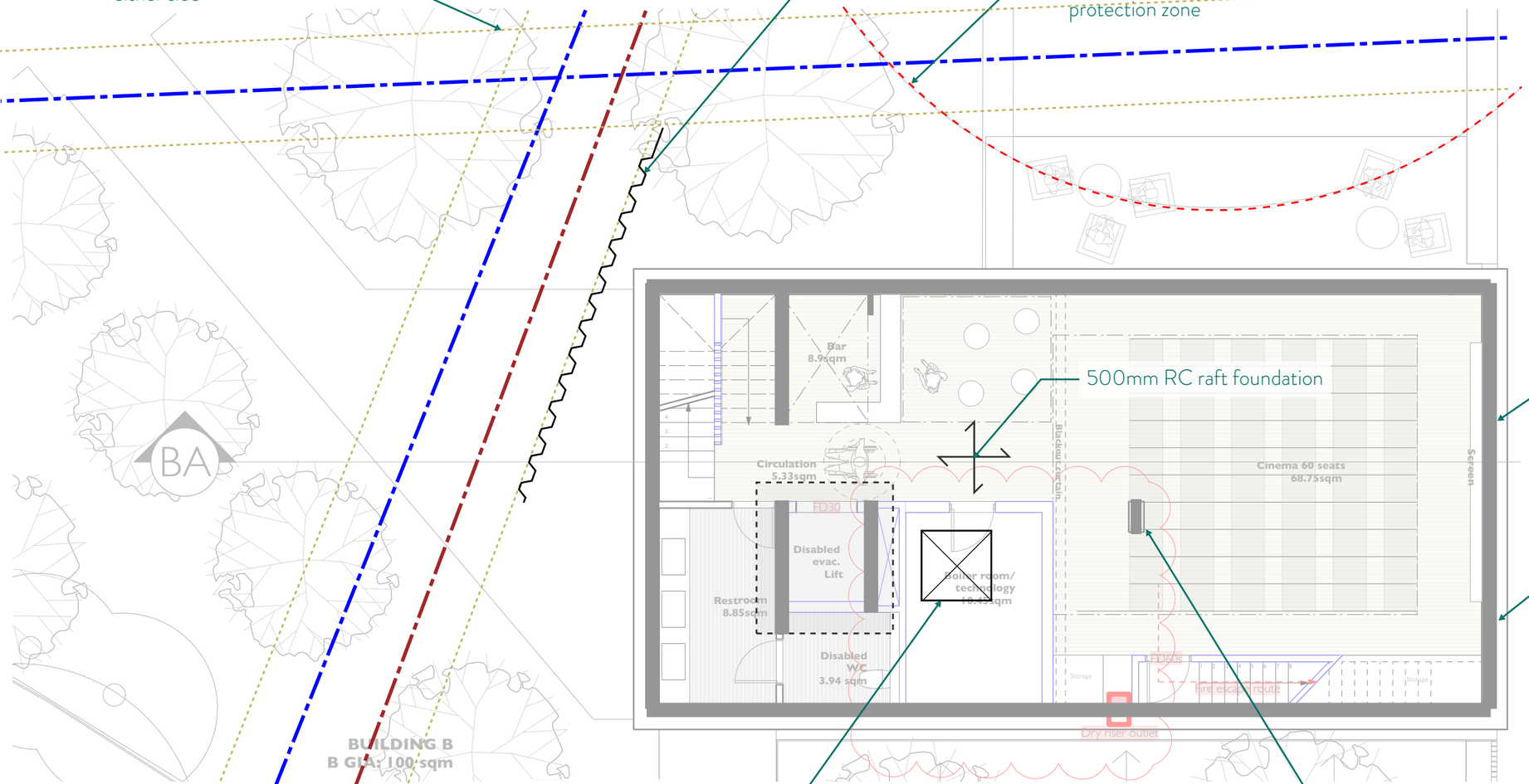
Note: Basement waterproofing strategy to be developed in consequent design stages. Allow for sump in basement slab for drained cavity pump

TW sewers with 1000mm exclusion either side

Localised sheet piling to protect Thames Water asset during construction

Arb. consultant to advise on acceptability of open-cut basement excavation with respect to root protection zone



500mm RC raft foundation

250mm RC retaining wall, propped by slab top and bottom

Basement formed in open cut, with well-compacted free draining material placed in layers behind retaining wall

Allow for sump to house pumped drainage system in basement - min. 1.0m offset from perimeter

200x600 RC column

Notes:

Legend

RC Wall/Column

Sketch

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Building B - Ground Floor

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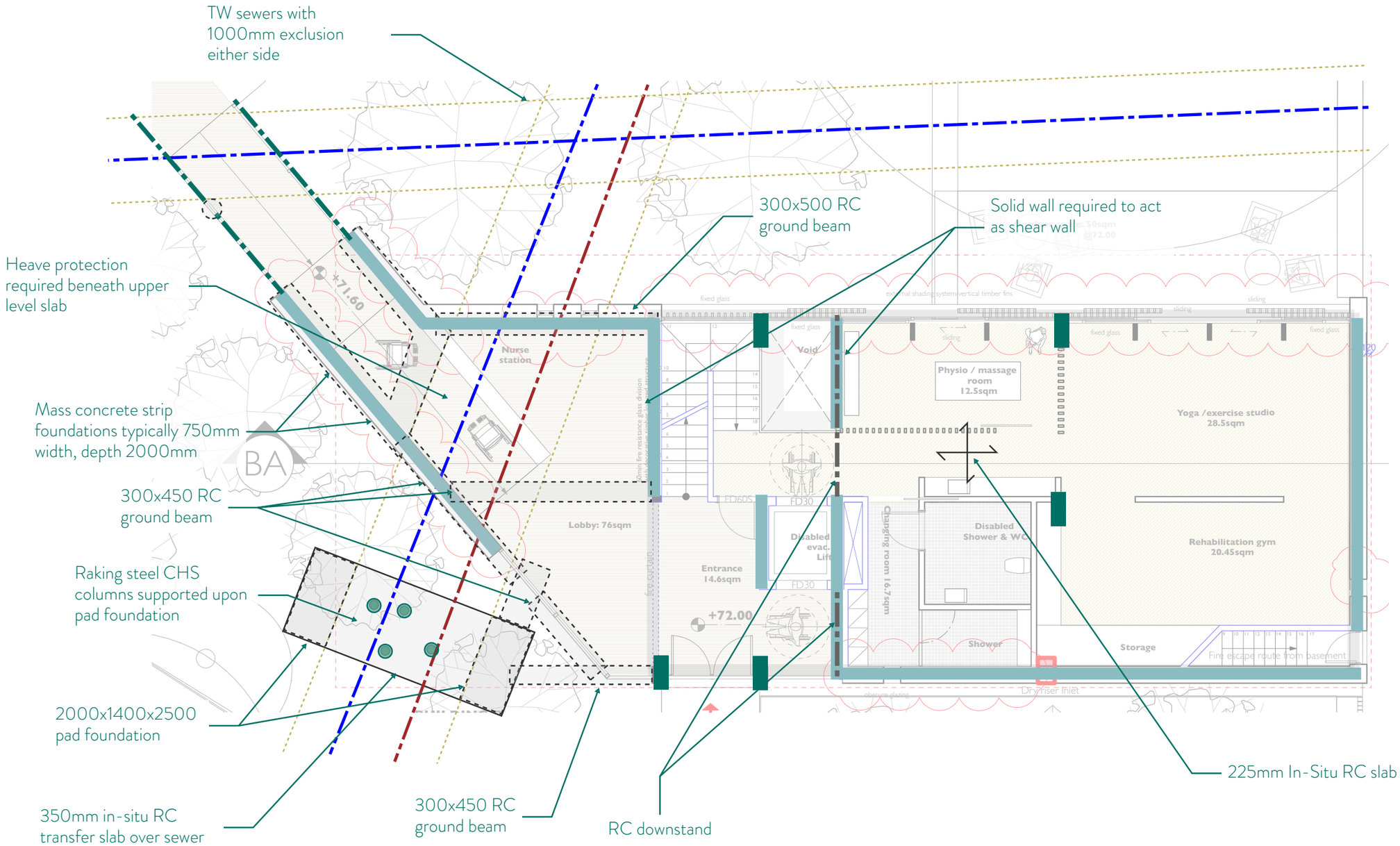

Notes:

Legend

- 90mm CLT Wall
- 290mm CLT Composite
- RC Wall/Column
- Steel Beam
- 200x100 RHS Column

Sketch

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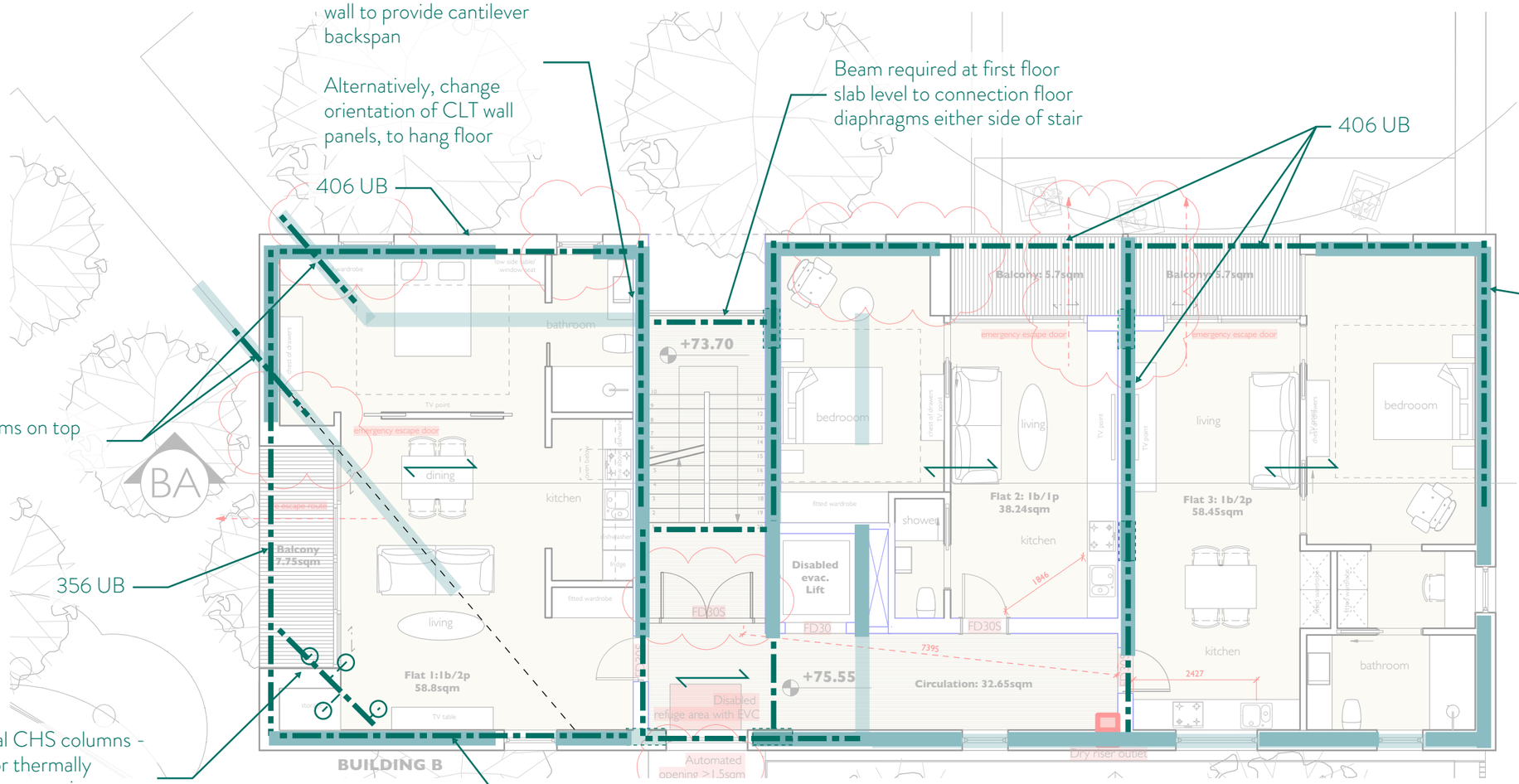
Building B - First Floor

LONDON STRUCTURES LAB



Notes:

Legend

- 90mm CLT Wall
- 290mm CLT Composite
- RC Wall/Column
- 254 UB UNO
- 200x100 RHS Column

Sketch

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Denville Hall	1521	03.08.22

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Building B - Second Floor

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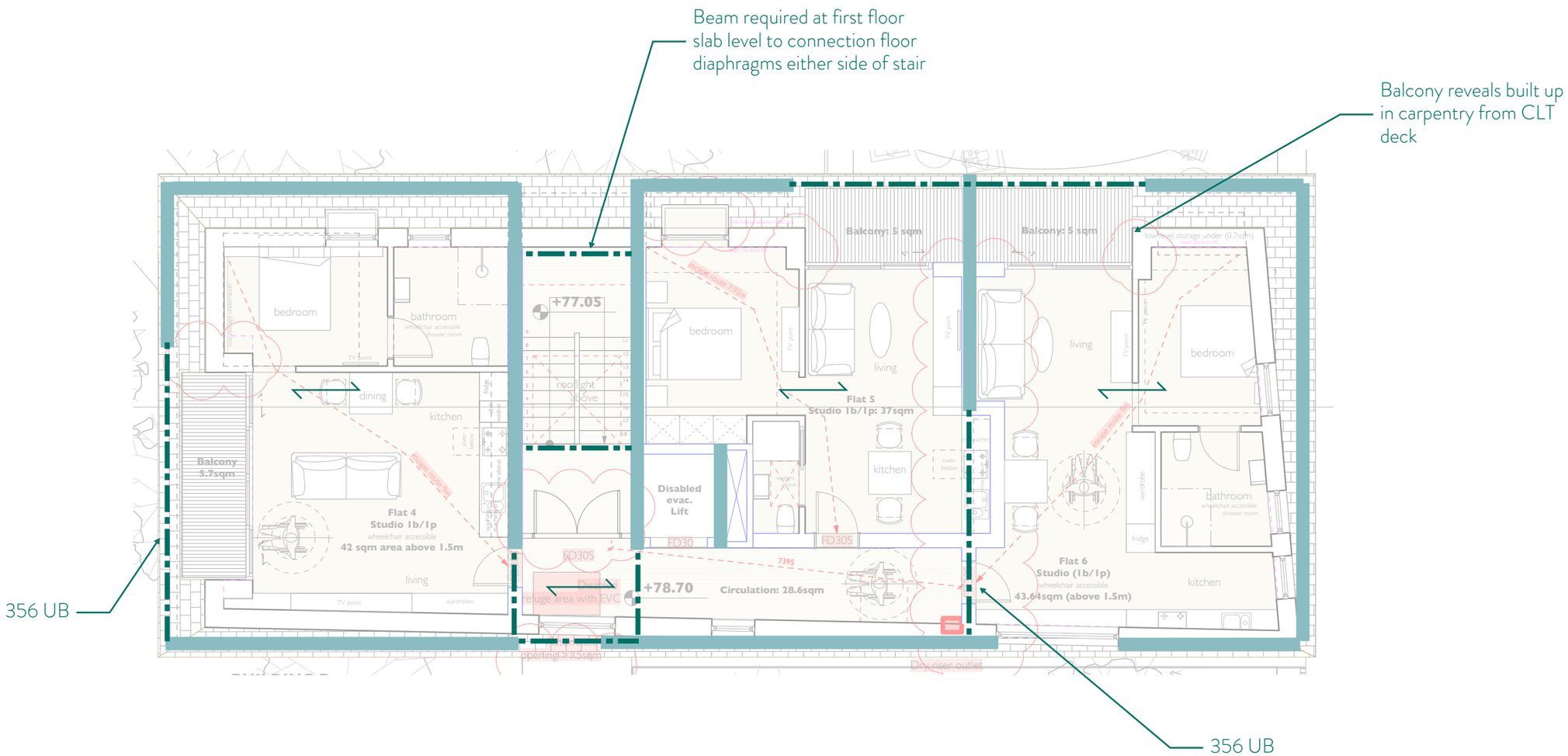

Notes:

Legend

- 90mm CLT Wall
- 290mm CLT Composite
- RC Wall/Column
- 203 UB UNO
- 200x100 RHS Column

Sketch

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Building B - Roof

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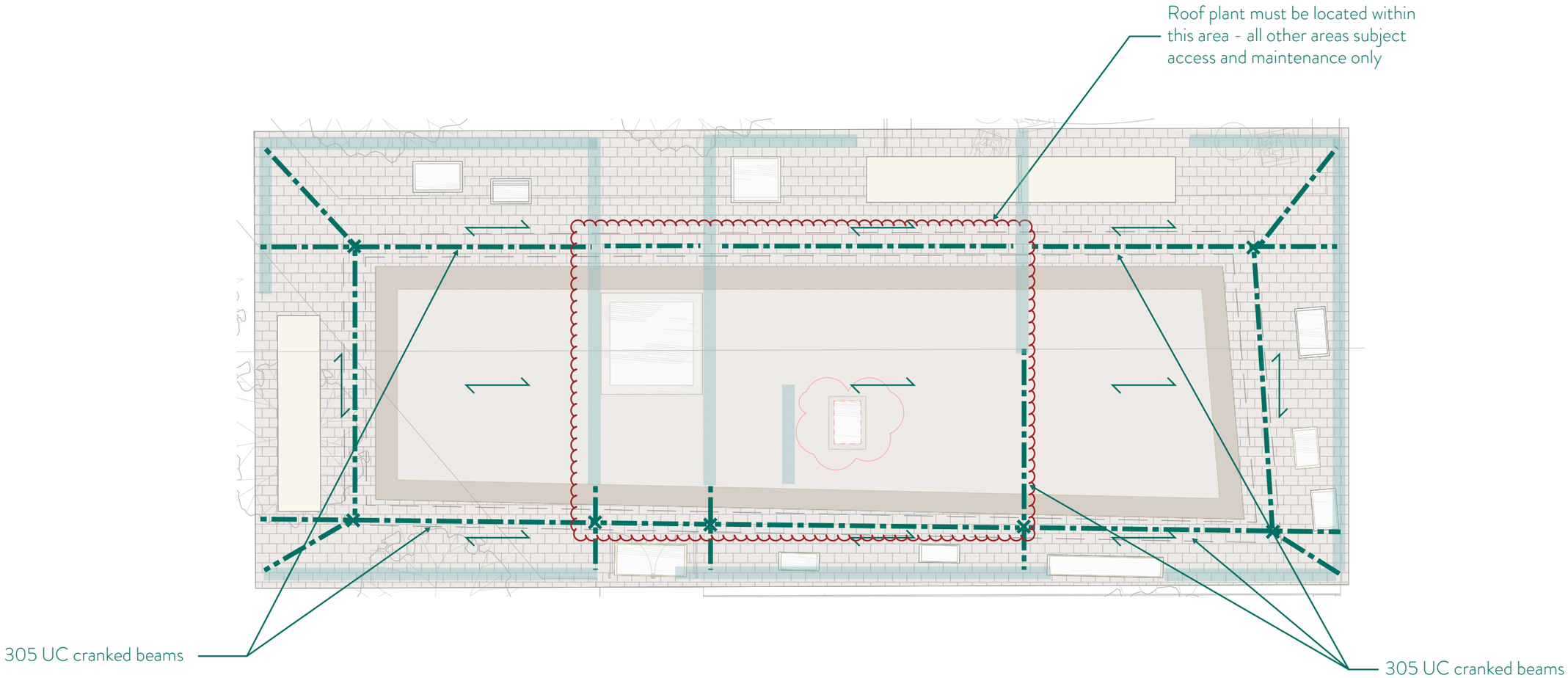

Notes:

Legend

- 90mm CLT Wall
- 200 CLT Slab
- RC Wall/Column
- 356 UB UNO
- 200x100 RHS Column

Sketch

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Building C - Ground Floor

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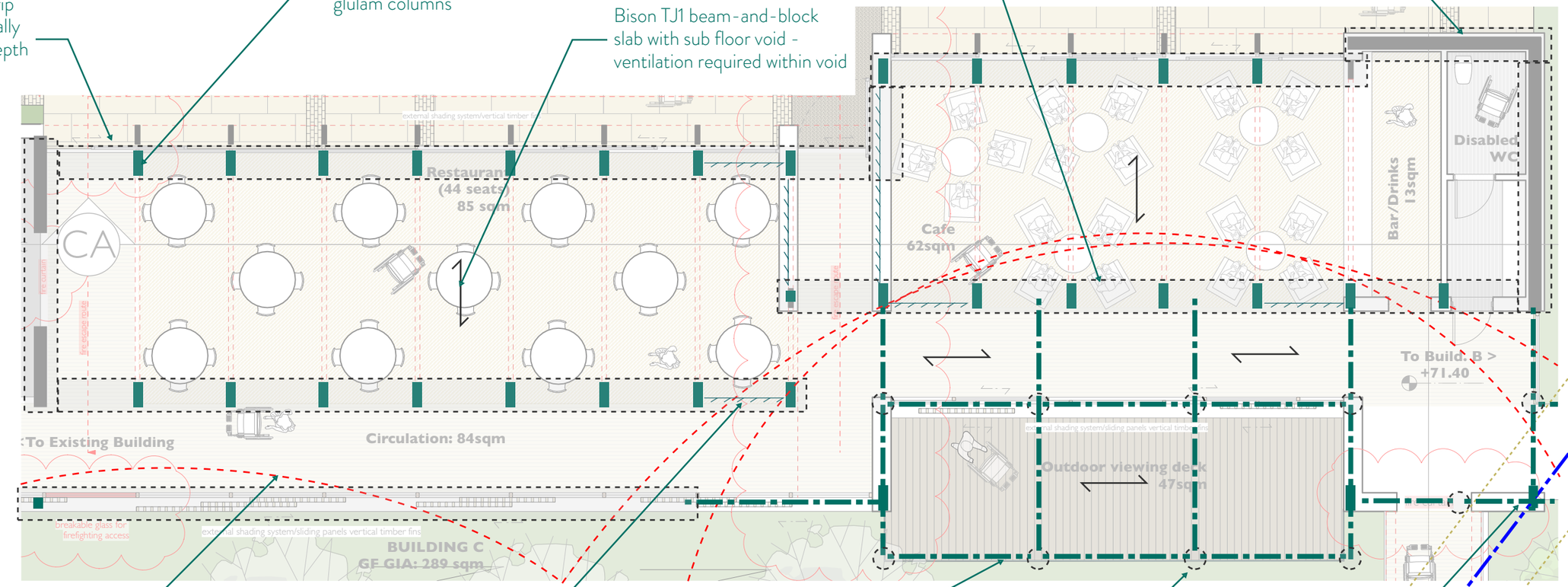
Mass concrete strip foundations typically 500mm width, depth 900-2500mm

100x360 GL28h glulam columns

Bison TJ1 beam-and-block slab with sub floor void - ventilation required within void

Foundations impinge upon RPZ - however, site topography indicates presence of roots is unlikely

140mm blockwork walls



Root protection zone

Braced bays formed in steel flats or Macalloy bars tension bars in cross-braced arrangment

Steel ground beams typically 203 UB, 254 UB if supporting large format glazing

Helical piles within RPZ located with airspade to avoid severing large roots. Location to be investigated surveyed ahead of installation with steelwork adjusted to suit

Column supported upon transfer beam

TW sewer with 1000mm exclusion either side

Notes:

Sketch

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Building C - Roof Plan

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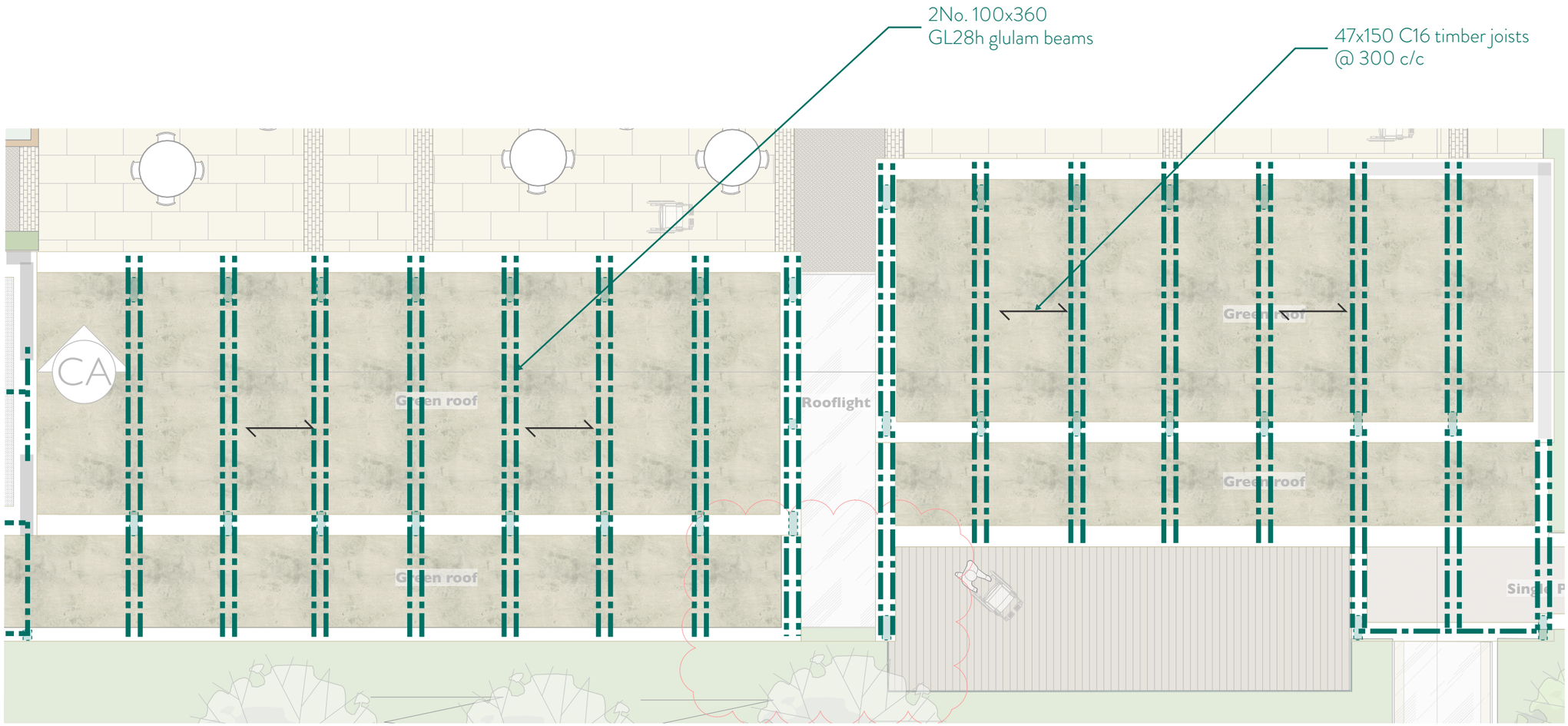

Notes:

Sketch

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Existing Building Extension - Ground Floor

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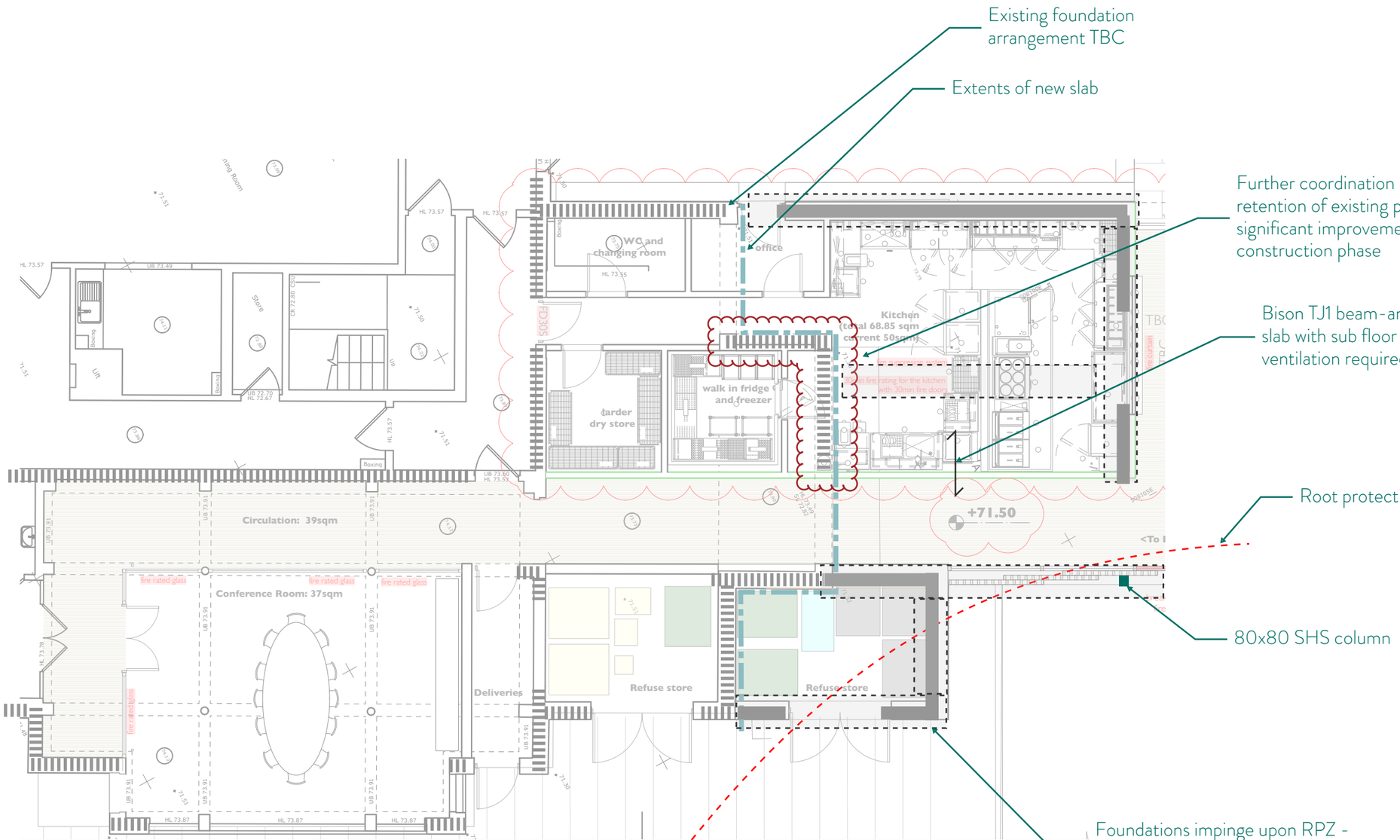

Notes:

Sketch

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Existing Building Extension - Roof Plan

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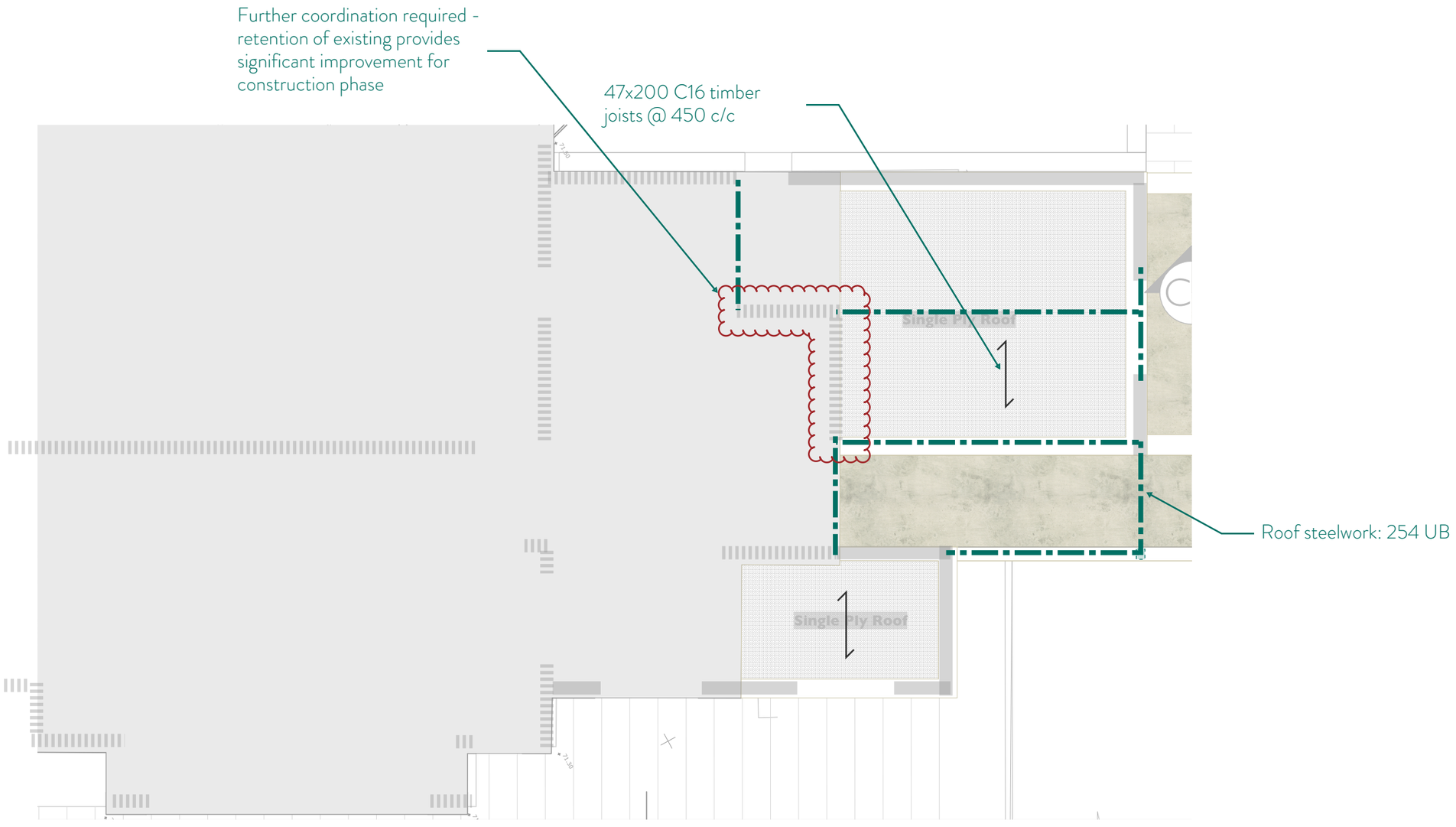

Notes:

Sketch

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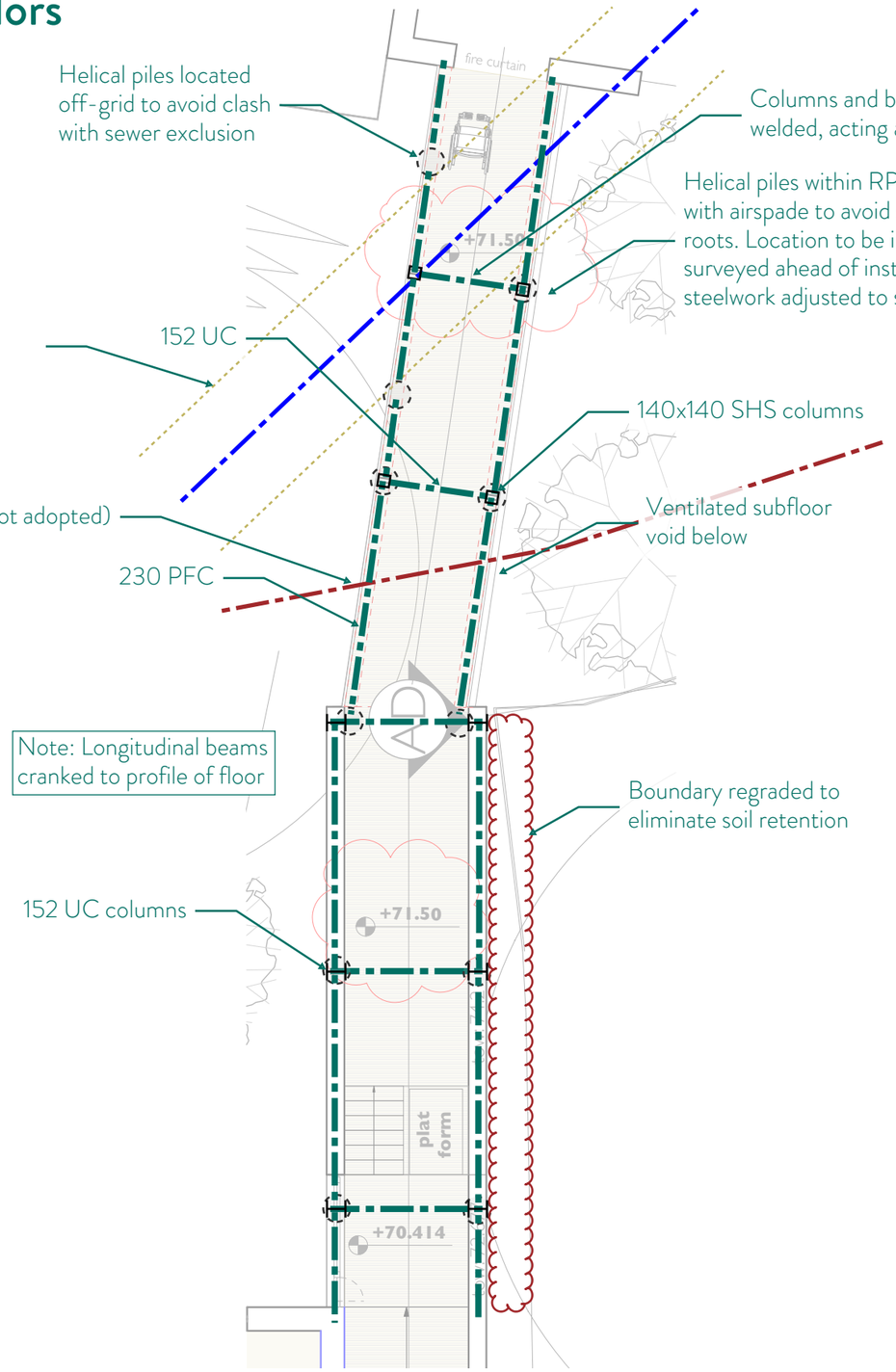
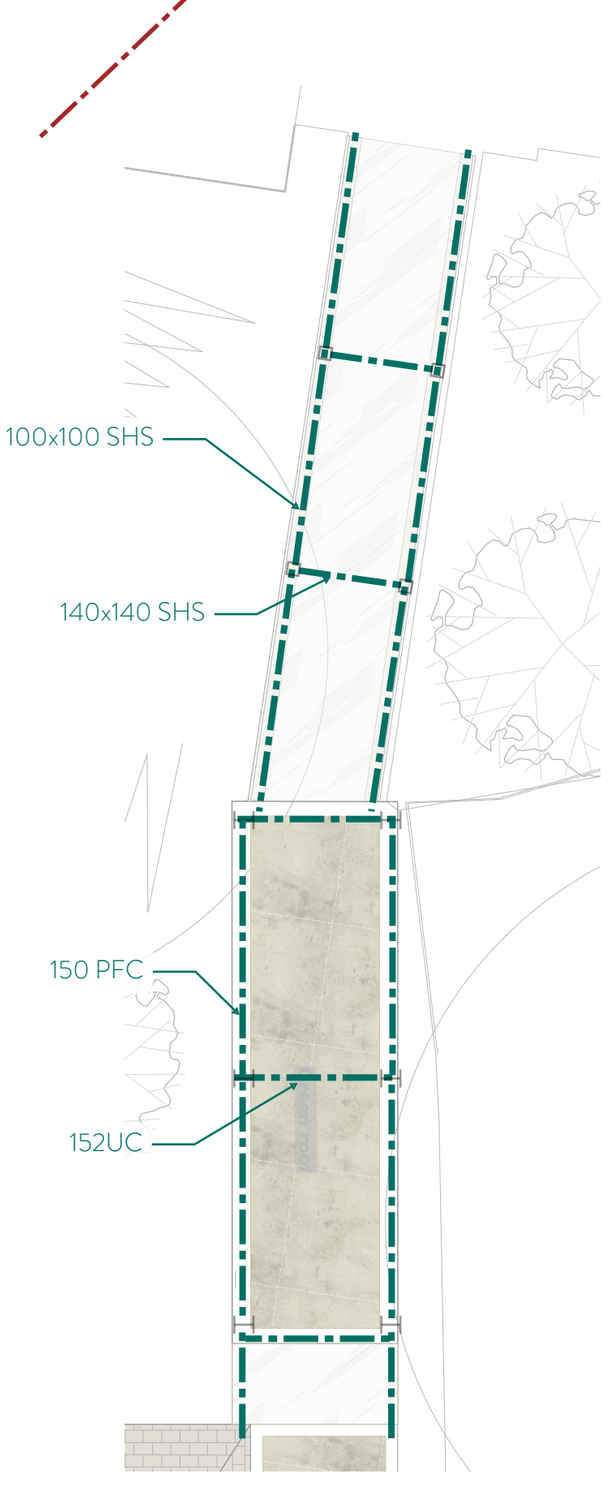
Link Corridors



Ground Floor



Roof Level

Notes:

NOTE: Alignment of bridge and level of bridge to be amended during RIBA Stage 3, to suit revised Building A arrangement. Structural philosophy to remain as currently shown.

Sketch

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Appendix 2 – Basement Construction Sequence

Open Cut Basement Construction
Indicative Sequence

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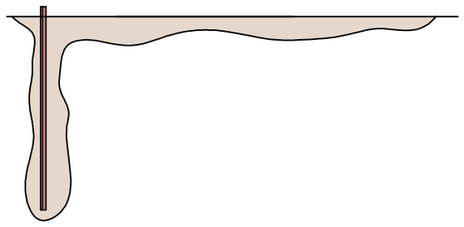
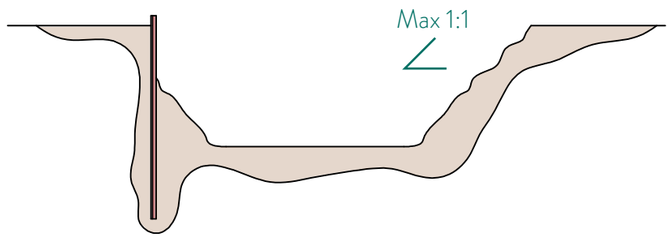
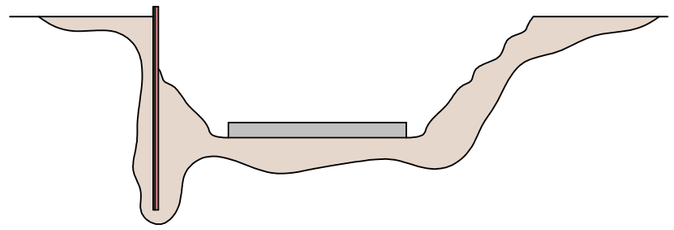


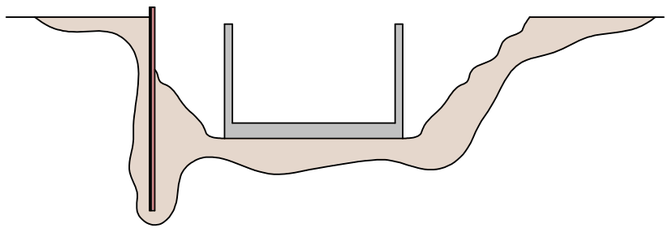
1 Install sheet piling (where applicable)



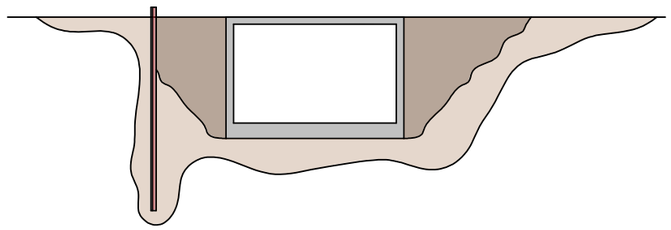
2 Excavate to formation level, with battered slope



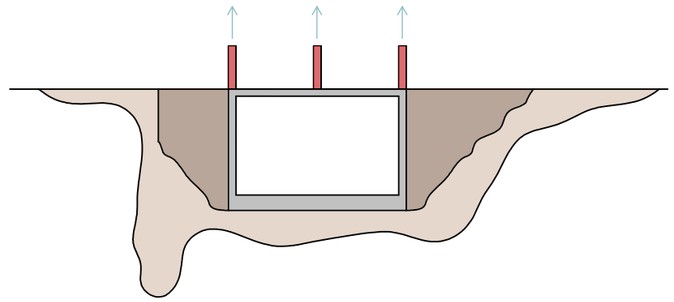
3 Install raft foundation



4 Cast RC basement walls



5 Cast RC ground floor slab, before backfilling excavation with well compacted fill



6 Remove sheet piling and progress superstructure to levels above

Notes:

Sketch

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