

13. Red House

13.1 Existing structure

The Red House is a three-storey Victorian building. The structure is a load bearing red-brick masonry construction with timber joist floors and timber roofs.

See sketches SK090 to SK094 in appendix A which present the existing structure of the Red House as anticipated following examination of drawings and initial site inspections.

13.2 Proposed structural alterations

The building has historically been used as classrooms and therefore the proposals will not change the loading applied to the structure. New structure will be required to the Red House where new openings are proposed through existing structural walls.

There is one wall to be removed which may be providing lateral stability. A steel moment frame at each floor comprising 203 UC 46 for columns and beams with pad foundations at ground floor should be allowed for to frame the opening. This will be considered further at the next stage. Elsewhere PCC lintels will be used to form new openings.



Extract from SK76 showing location of steel frame in Red House

14. Longley House

14.1 Existing structure

Longley House is a single storey building of loadbearing masonry construction, supporting pitched roofs which are assumed to be timber. Preliminary opening up work has been completed in Longley House which has revealed steel beams spanning over timber partitions in the east section of the building.

See sketches SK95 and SK96 in appendix A which present the existing structure of Longley House as anticipated following examination of drawings and initial site inspections.

14.2 Proposed structural alterations

The proposal is to remove internal partitions within Longley House. Initial investigations suggest that the partitions in the east section of the building are not supporting the roof structure above, and no evidence of tying was found between them and the external masonry walls. However, the partitions may still be providing some lateral restraint to the masonry and so allowance should be made for windposts where partitions are being removed. This will be considered further at the next stage.

Opening up works are required to confirm if the walls to be removed in the eastern portion of the building support the roof. A new opening through a structural wall in this area will require a new lintel over.



Extract from SK76 showing proposed structural alterations in Longley House

15. Next steps

15.1 Design

During the next stage, RIBA stage 4, the structural proposals will be developed. Progress will include:

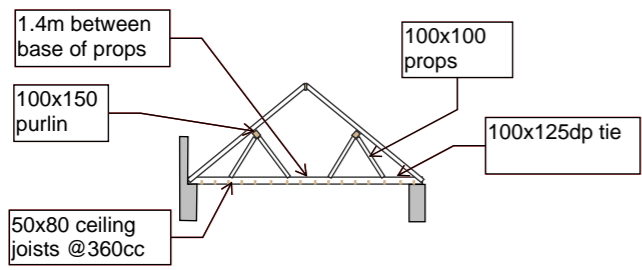
- Existing structure inspection following completion of opening up works
- Progress Stage 4 design
- Production of existing and proposed structural drawings following receipt of measured survey Revit models
- Production of outline material specifications.
- Continue assessing H&S and project risks.

15.2 Surveys and investigations

The following surveys and investigations are likely to be required for the next stage of the design and may be added to as the scheme develops:

- Site investigation including trial pits to ascertain details of the form and depth of the existing foundations. Site work completed, awaiting report.
- Site investigation to include infiltration test if appropriate. Site work completed, awaiting report.
- Opening up of areas of existing structure to confirm nature and form of construction (to be preceded by R&D asbestos survey). Commissioned, awaiting completion.
- Point cloud survey of masonry wall around the site perimeter

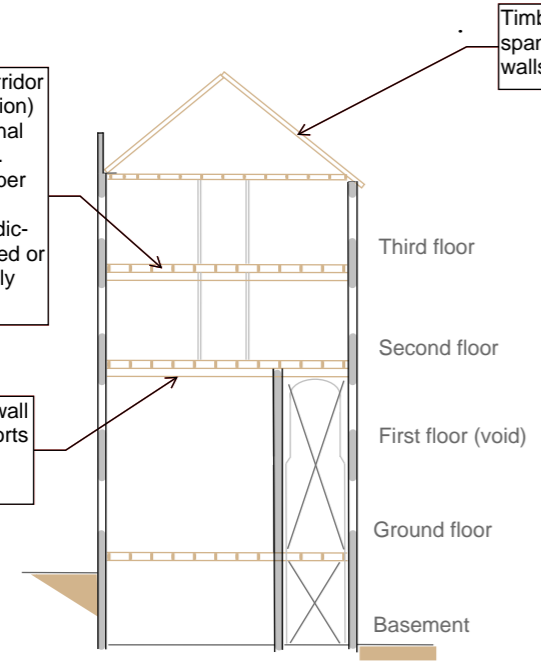
Appendix A – Existing Structure Sketches



Section A-A
 (Elevation on truss)

Beam (visible in second floor corridor ceiling at each primary pier position) assumed to span between external walls. Beam supports floor joists. Partition walls non-structural timber stud. Significant fall across corridor indicates that beam may be undersized or that internal corridor wall originally extended to u/s third floor.

Beam spans between corridor wall and external walls. Beam supports floor joists. Partition walls non-structural timber stud.

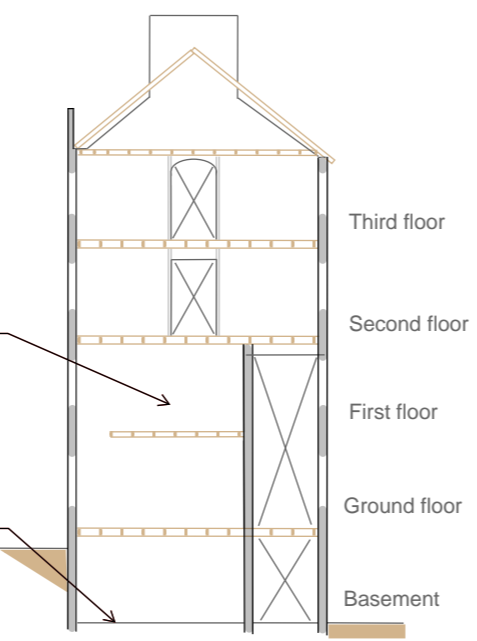


Section A-A

Timber roof structure spans between external walls

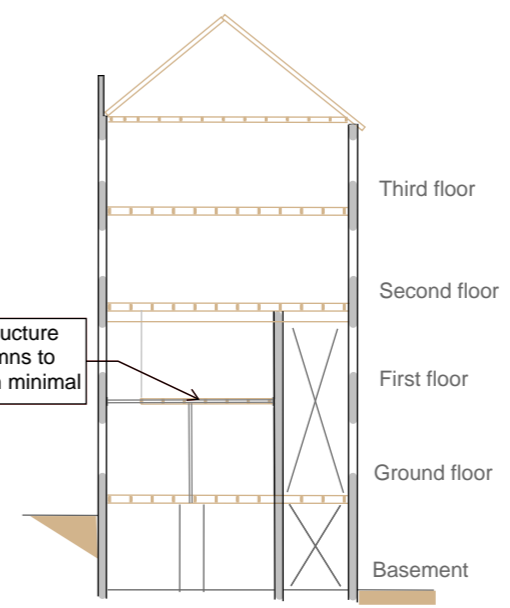
Solid masonry wall right up through building except where arches/beams have been formed at second and third floor levels

Basement appears to have reduced floor level as foundations are visible in all areas (typ)



Section B-B

1980s mezzanine structure with supporting columns to keep structural depth minimal



Section C-C

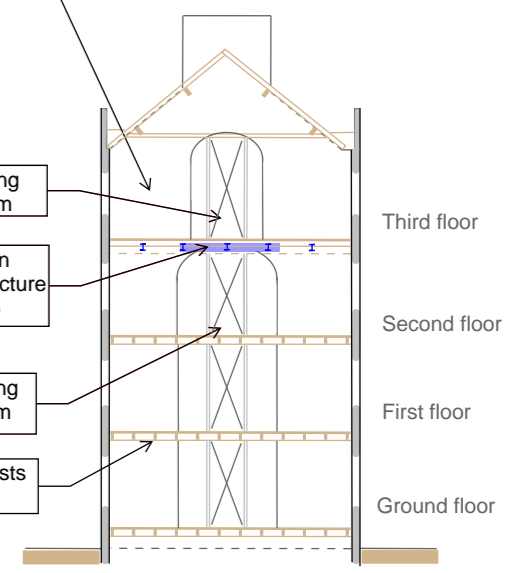
Historic research reveals that third (top) storey of wings was added in 1903.

Arch opening approx 2.5m

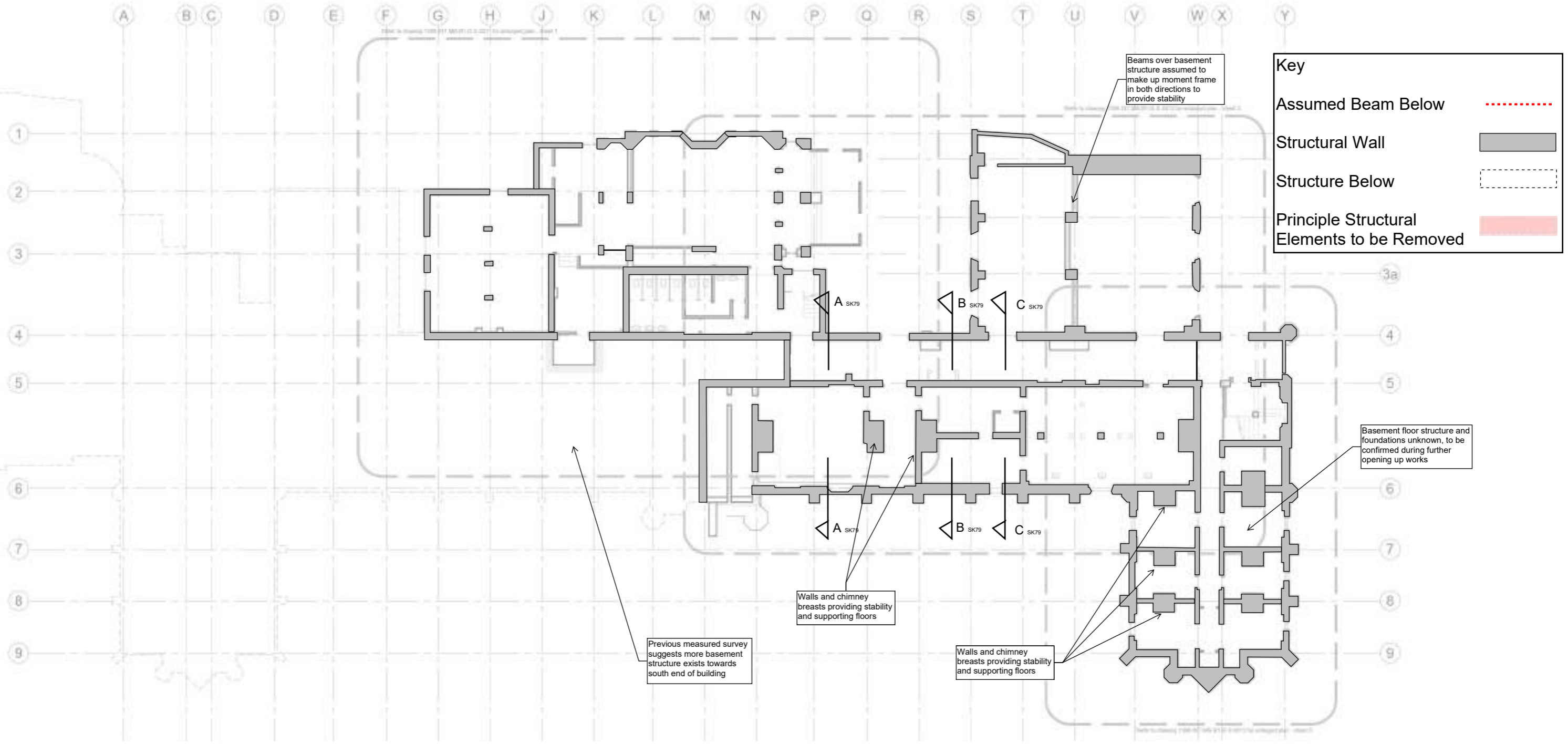
Steel beams in third floor structure (added 1903)

Arch opening approx 4.0m

Direction of joists assumed

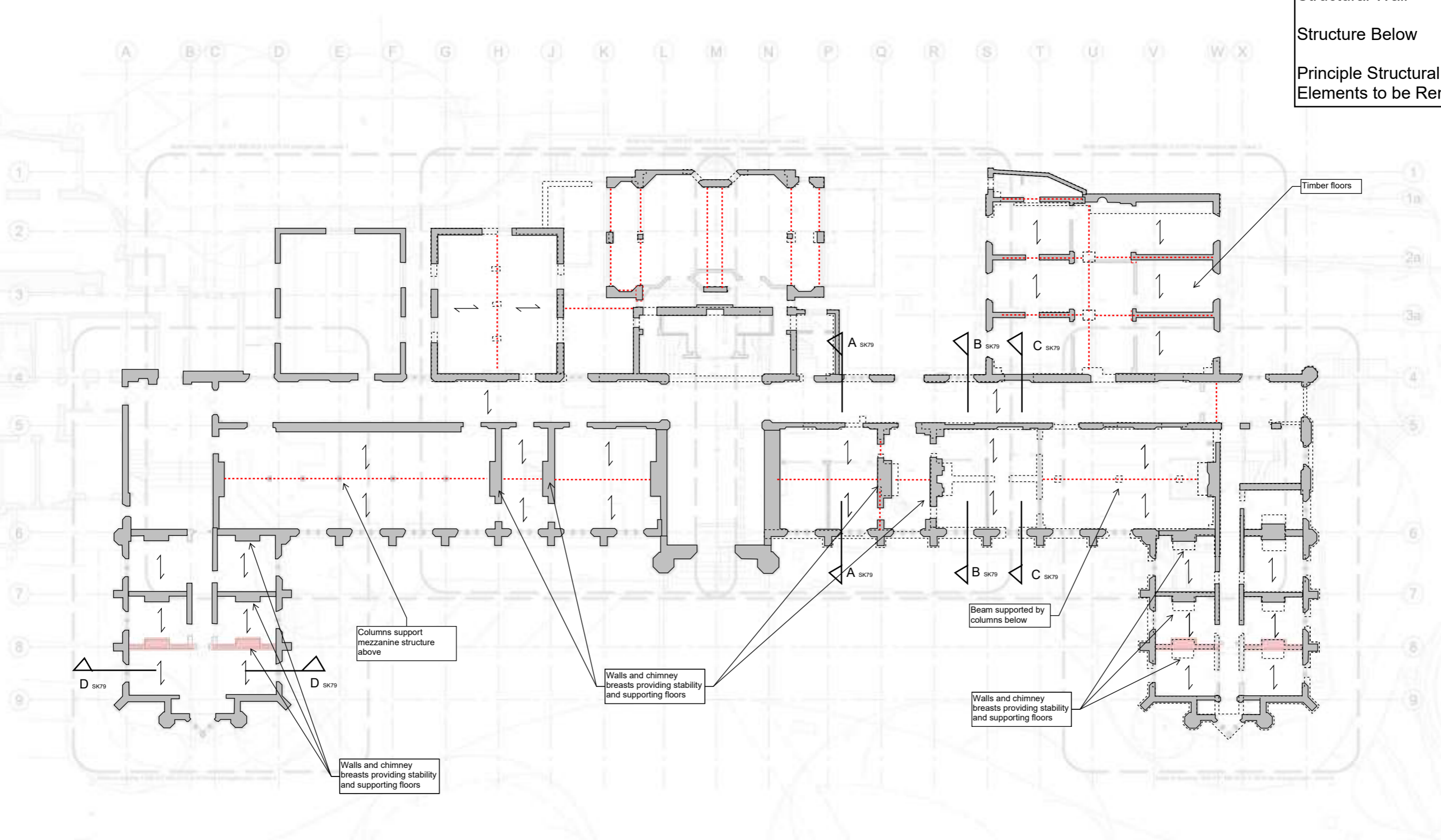


Section D-D



1399 SK80 Rev A	Richmond Hill Campus
Main Building Basement Existing Structure	Date 12/01/2024
 integral engineering design	Integral Engineering Design 84 Walcot Street Bath BA1 5BD

Key	
Assumed Beam Below
Structural Wall	█
Structure Below	- - - - -
Principle Structural Elements to be Removed	█



Columns support mezzanine structure above

Walls and chimney breasts providing stability and supporting floors

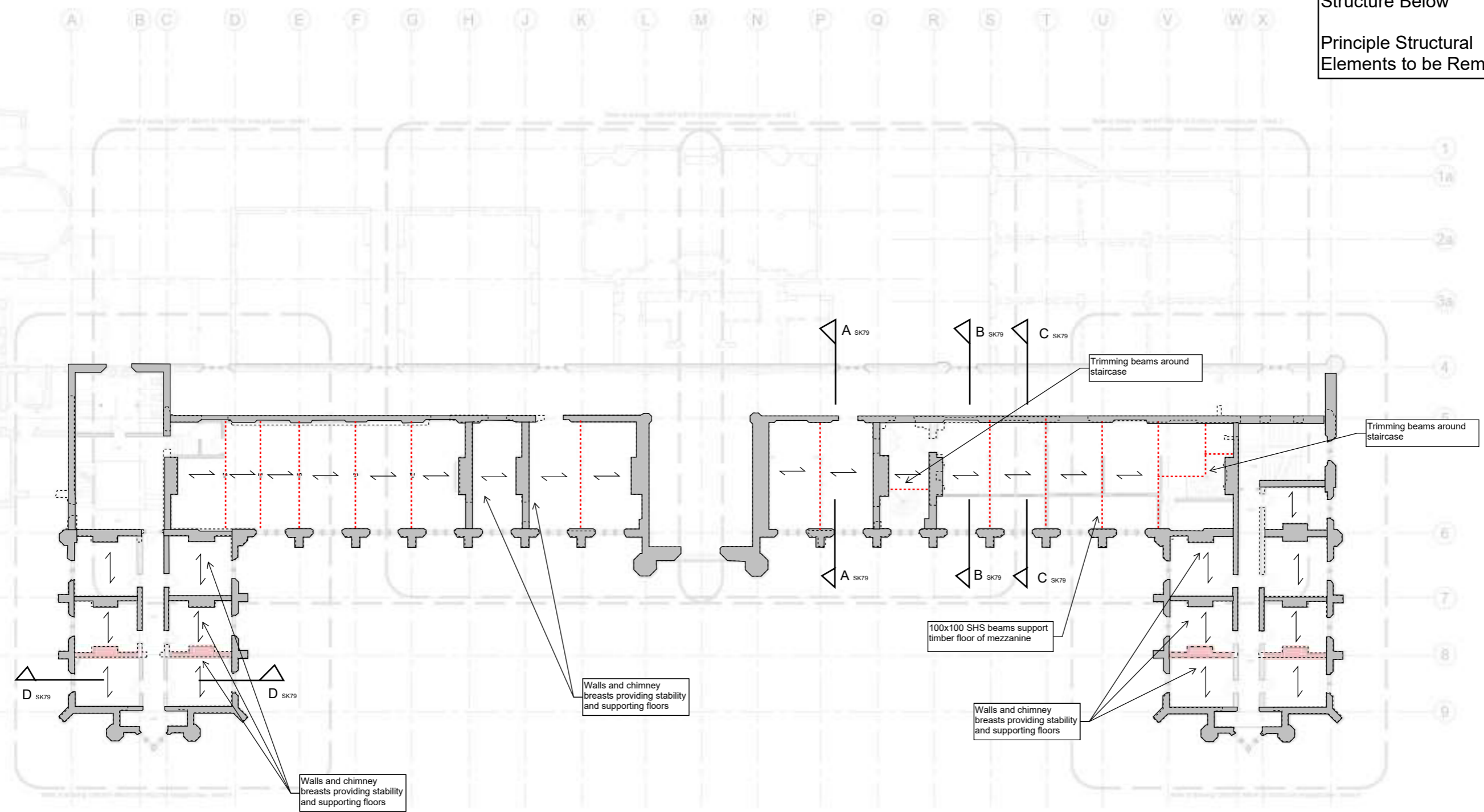
Beam supported by columns below

Walls and chimney breasts providing stability and supporting floors

Walls and chimney breasts providing stability and supporting floors

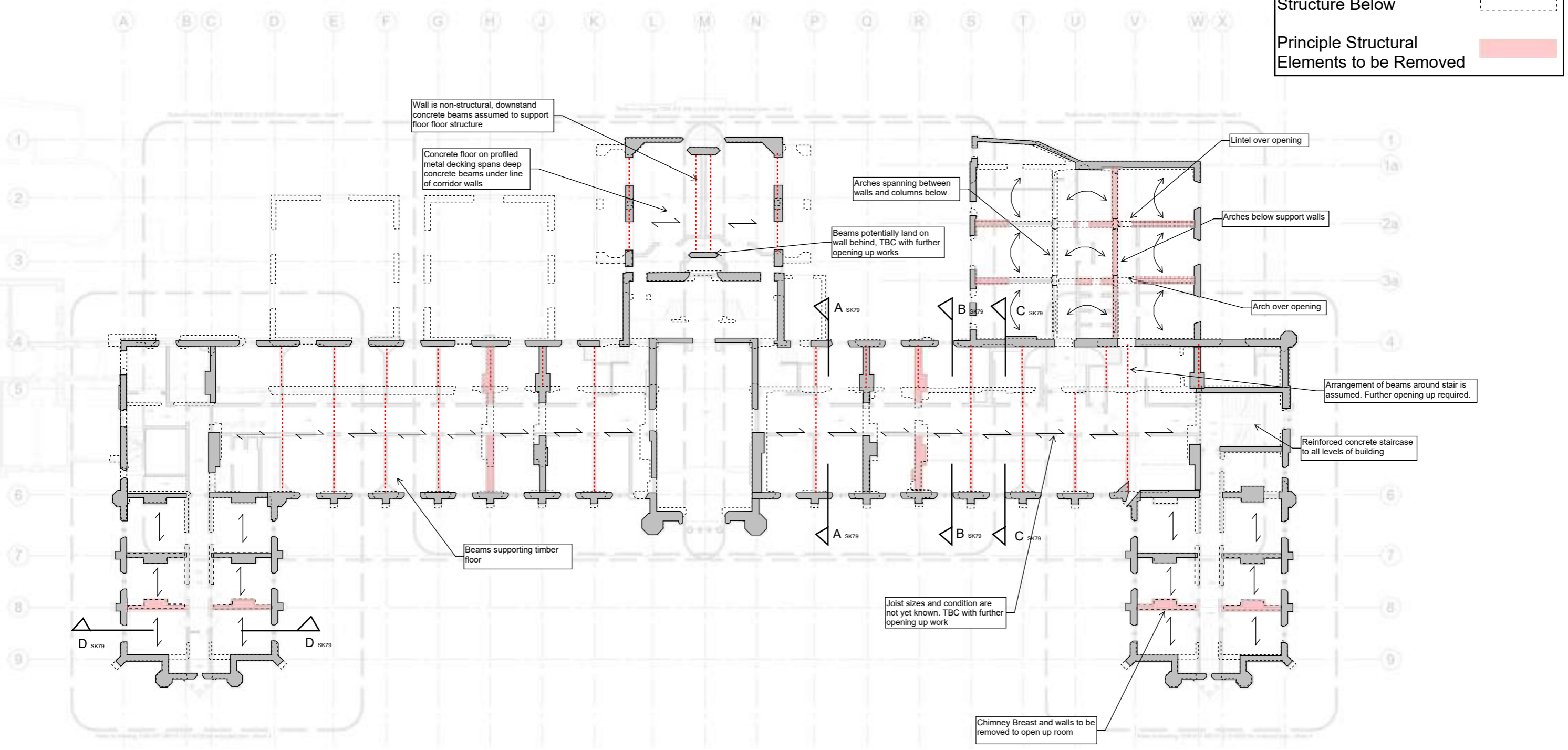
1399 SK81 Rev A	Richmond Hill Campus
Main Building Ground Floor Existing Structure	Date 12/01/2024
 integral engineering design	Integral Engineering Design 84 Walcot Street Bath BA1 5BD

Key	
Assumed Beam Below
Structural Wall	█
Structure Below	▭
Principle Structural Elements to be Removed	█



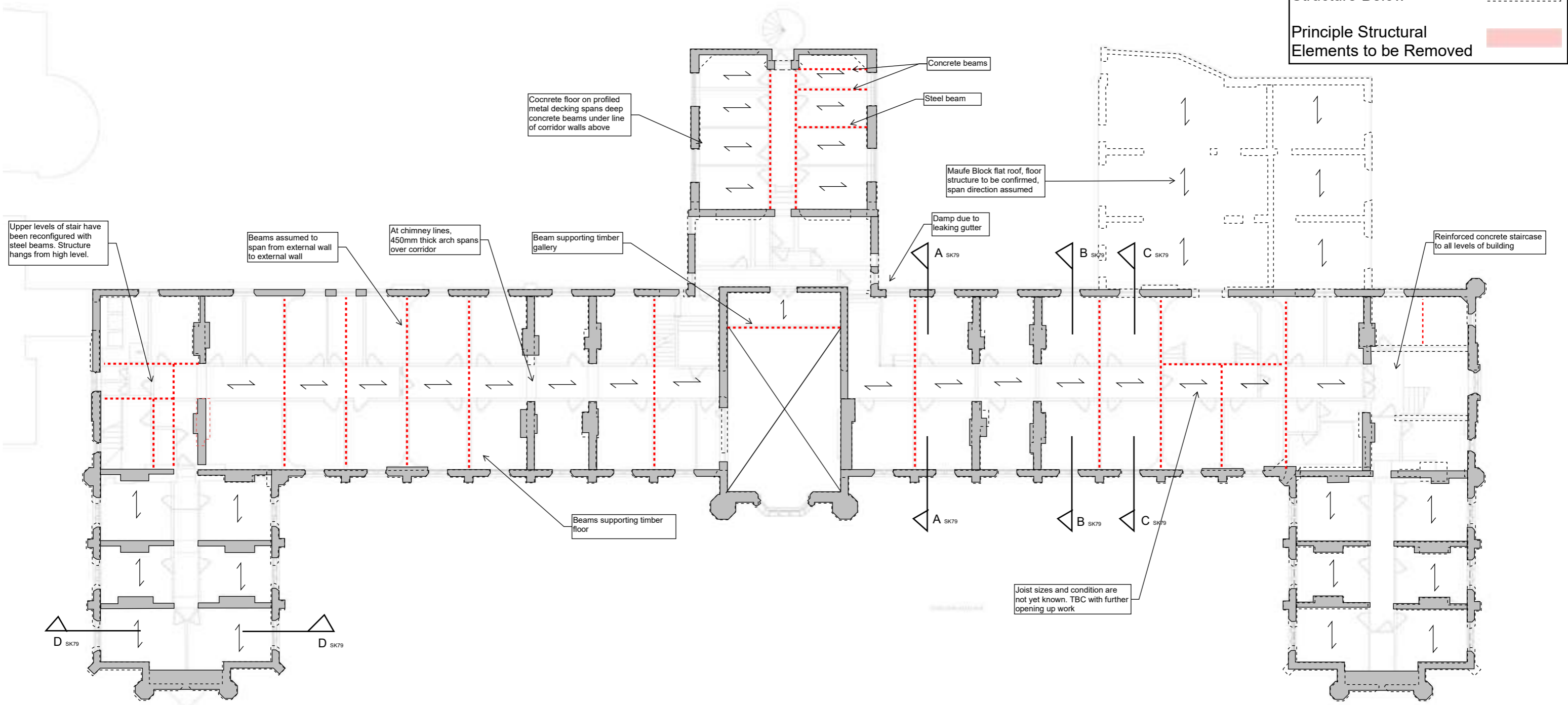
1399 SK82 Rev A	Richmond Hill Campus
Main Building First Floor Existing Structure	Date 12/01/2024
 integral engineering design	Integral Engineering Design 84 Walcot Street Bath BA1 5BD

Key	
Assumed Beam Below
Structural Wall	█
Structure Below	▭
Principle Structural Elements to be Removed	█

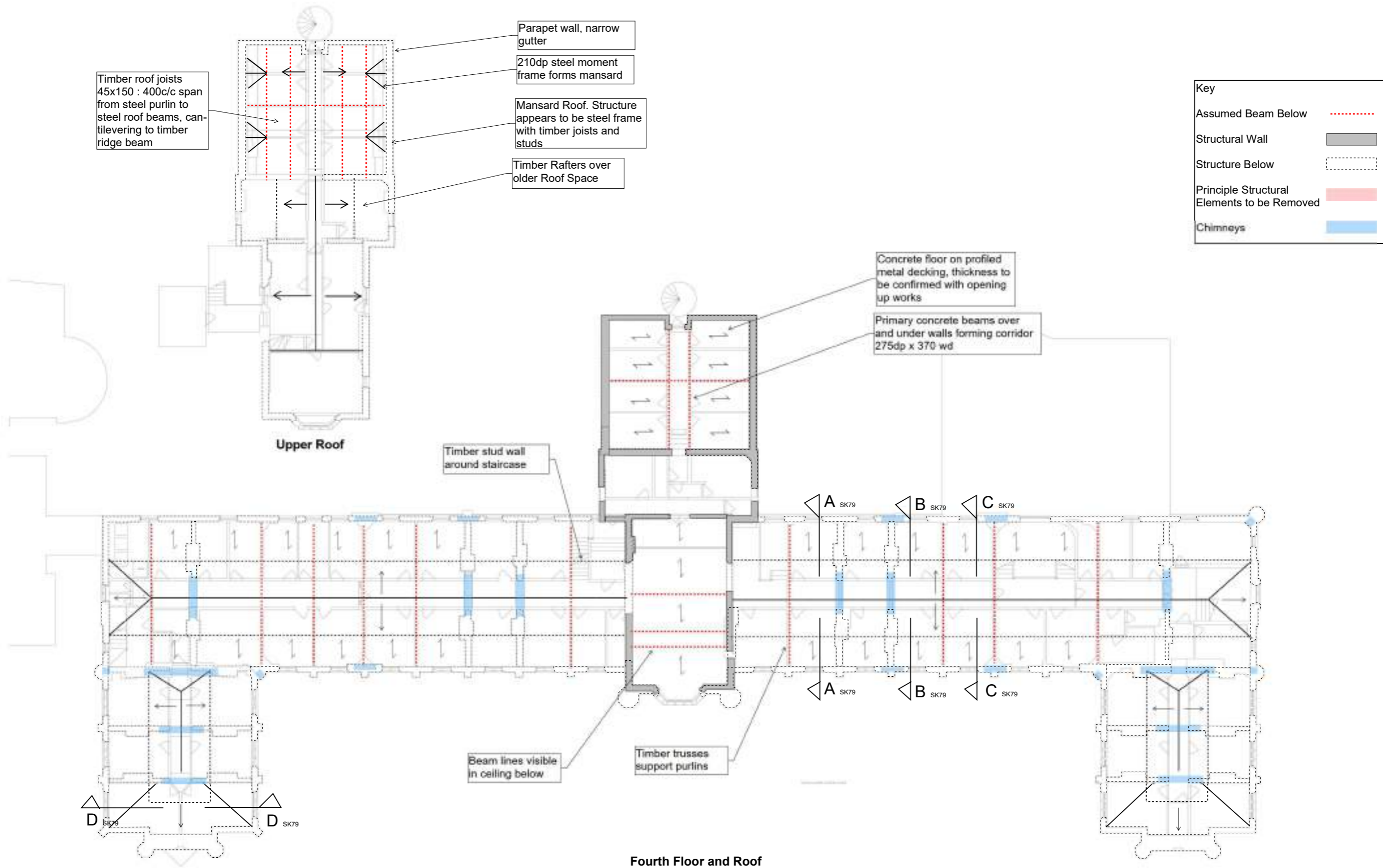


Key

- Assumed Beam Below -----
- Structural Wall
- Structure Below
- Principle Structural Elements to be Removed

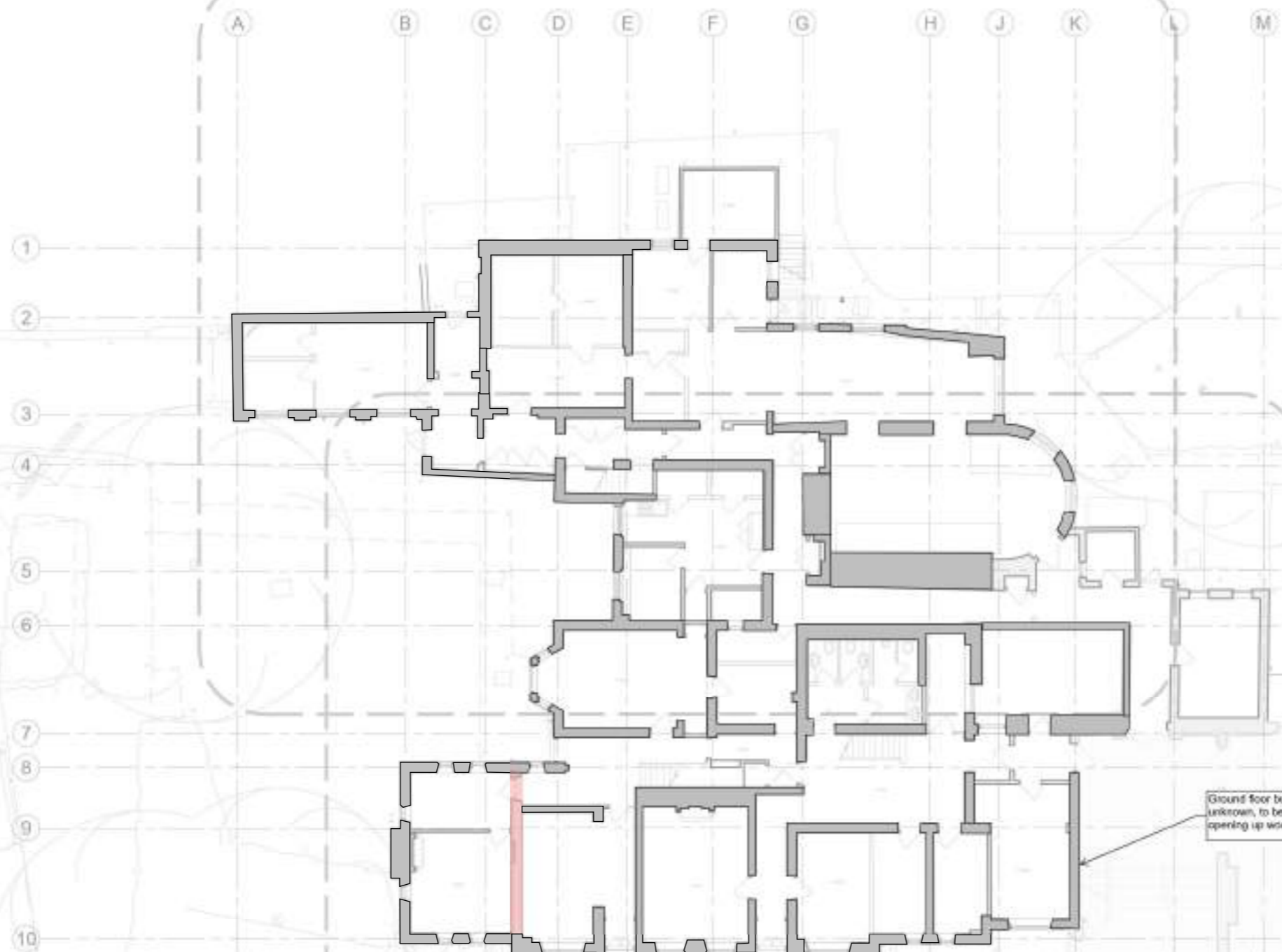


1399 SK84	Richmond Hill Campus
Main Building Third Floor Existing Structure	Date 12/01/2024
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1399 SK85	Richmond Hill Campus
Main Building Fourth Floor & Roof Existing Structure	Date 12/01/2024
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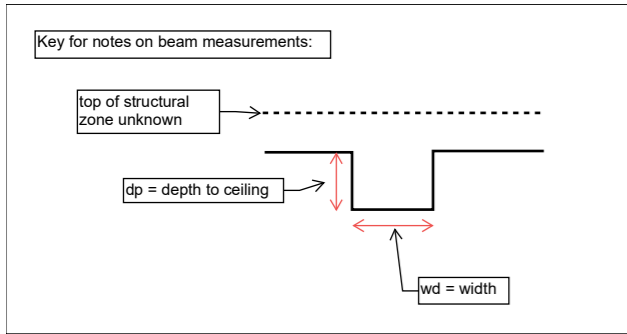
Refer to drawing 1399-SK86-01-430-D-3-012 for enlarged plan - sheet 1



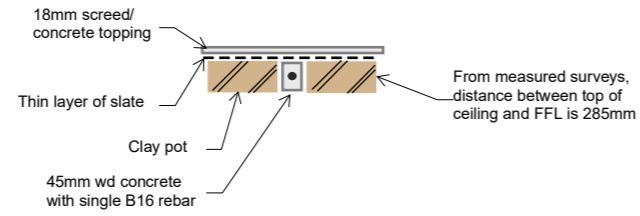
Key	
Assumed Beam Below
Structural Wall	█
Structure Below	▭
Principle Structural Elements to be Removed	█

Refer to drawing 1399-SK86-01-430-D-3-013 for enlarged plan - sheet 2

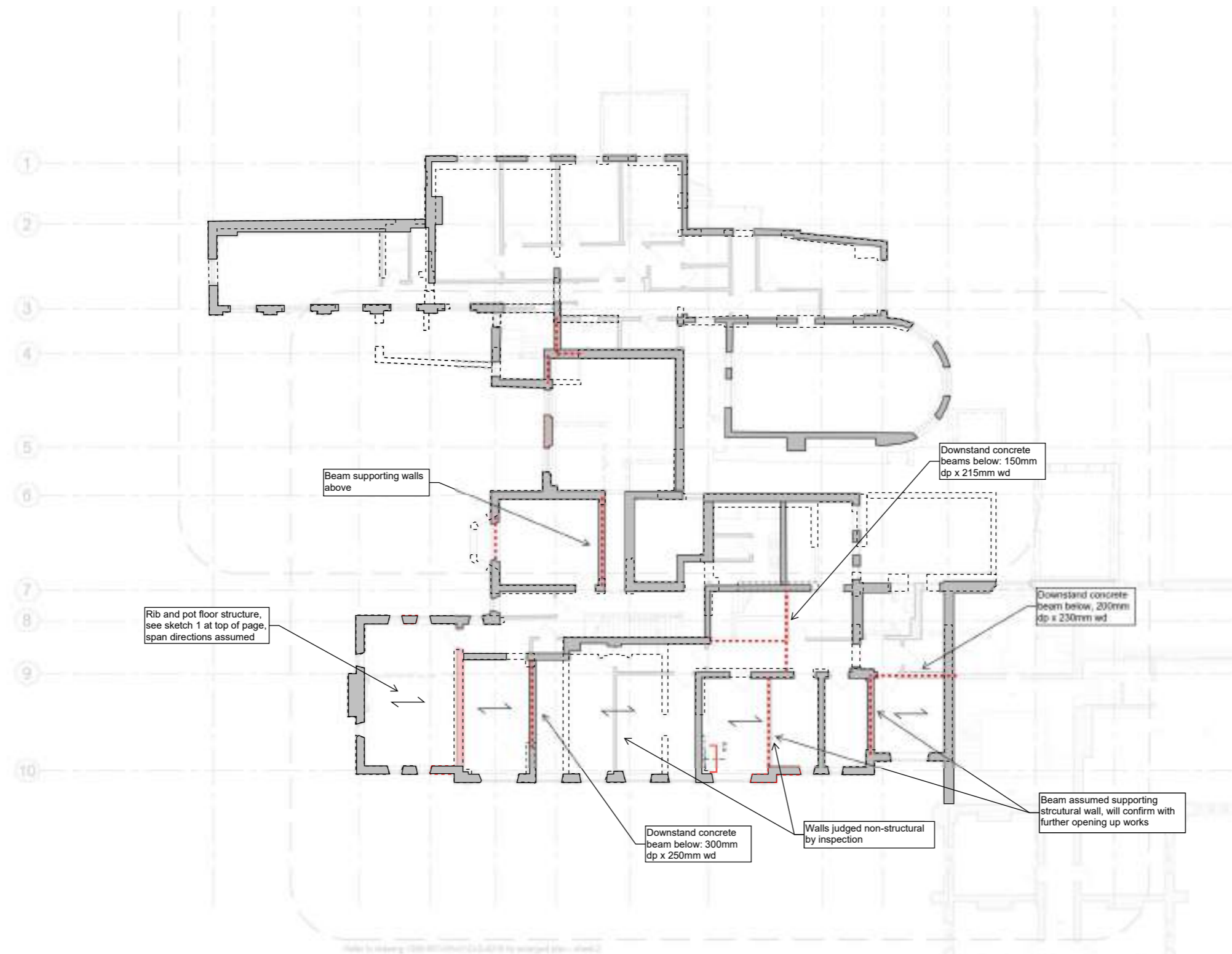
1399 SK86	Richmond Hill Campus
George House Ground Floor Existing Structure	Date 12/01/2024
 integral engineering design	Integral Engineering Design 84 Welcot Street Bath BA1 5BD

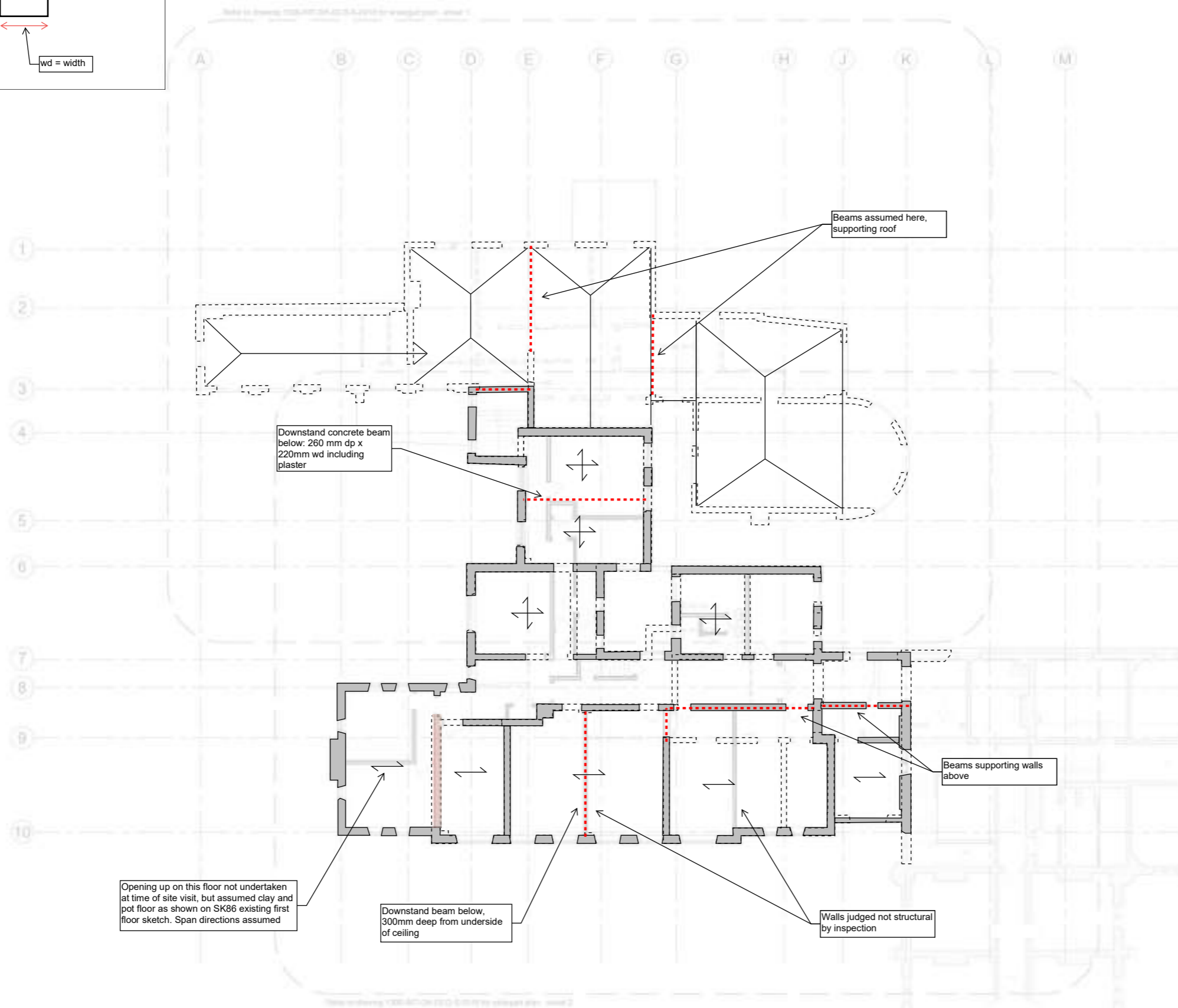
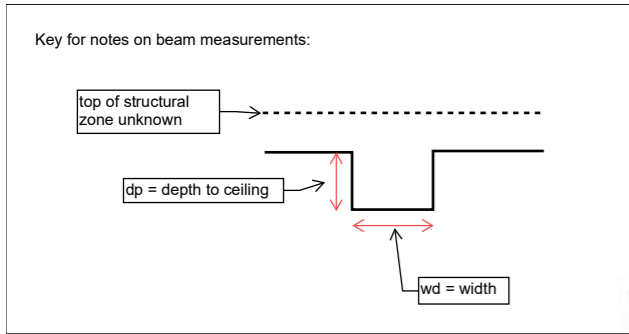


Sketch 1 Floor buildup taken from opening up at section A-A

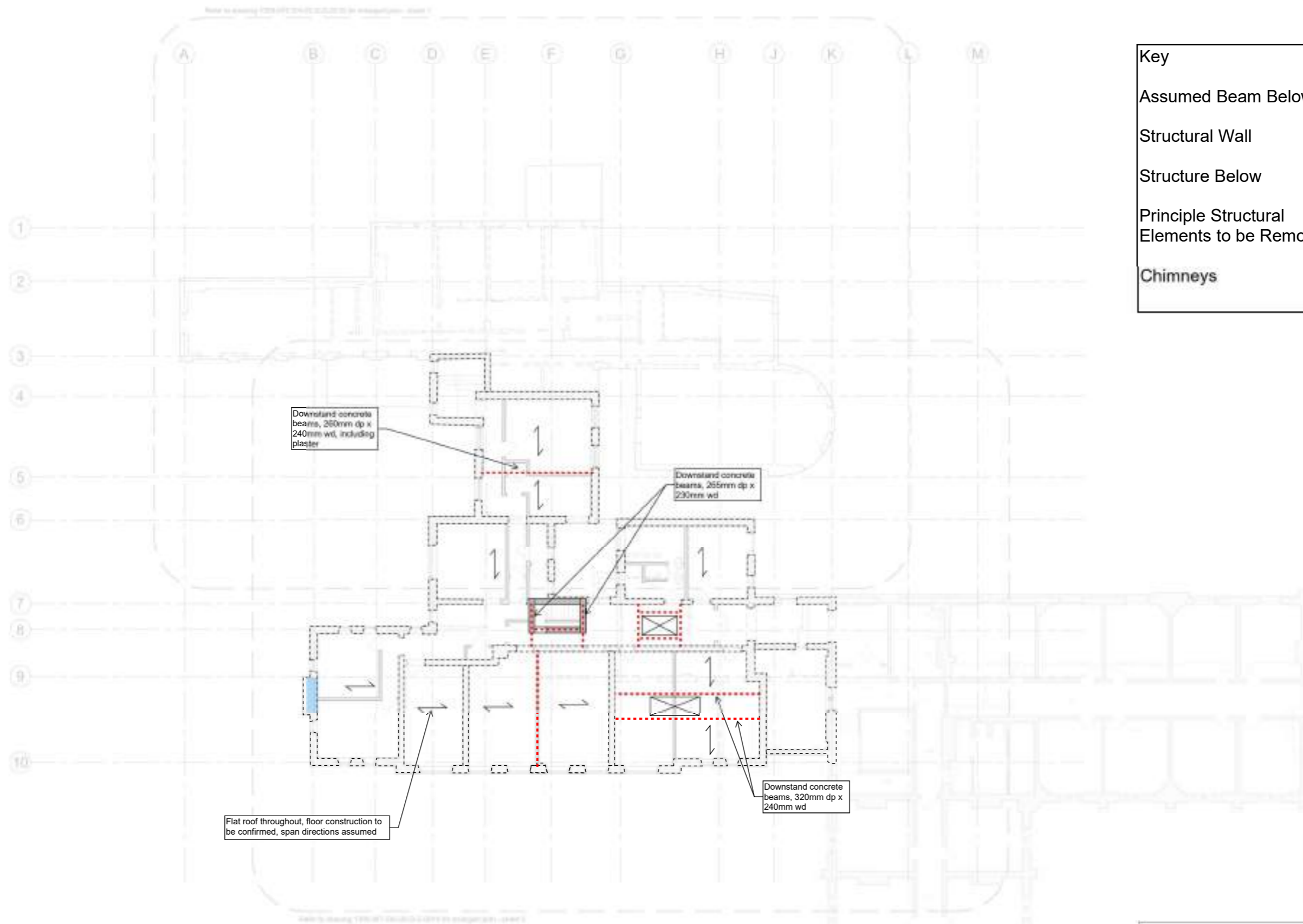


Key	
Assumed Beam Below
Structural Wall	■
Structure Below	□
Principle Structural Elements to be Removed	■

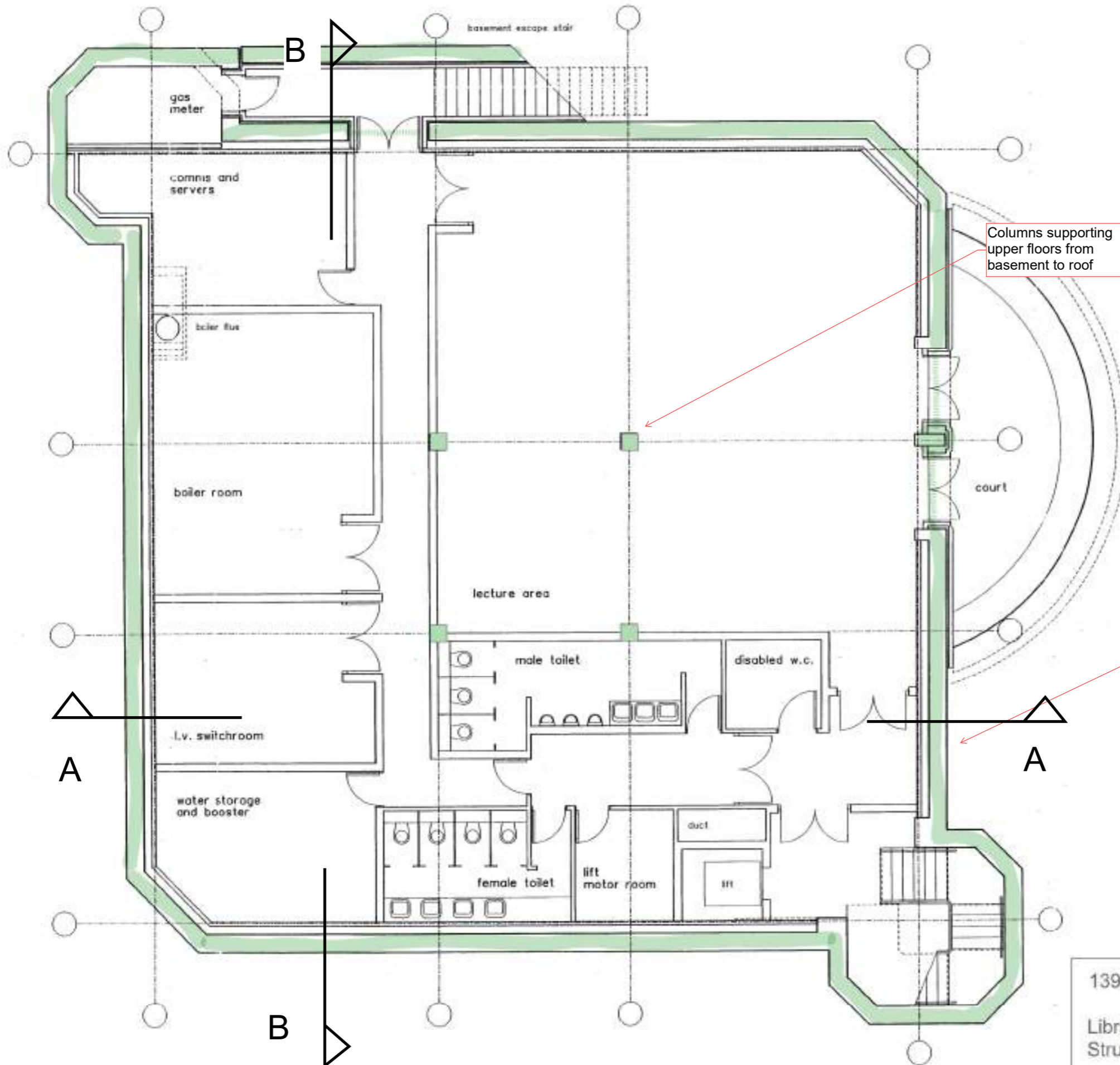




Key	
Assumed Beam Below
Structural Wall	█
Structure Below	-----
Principle Structural Elements to be Removed	█



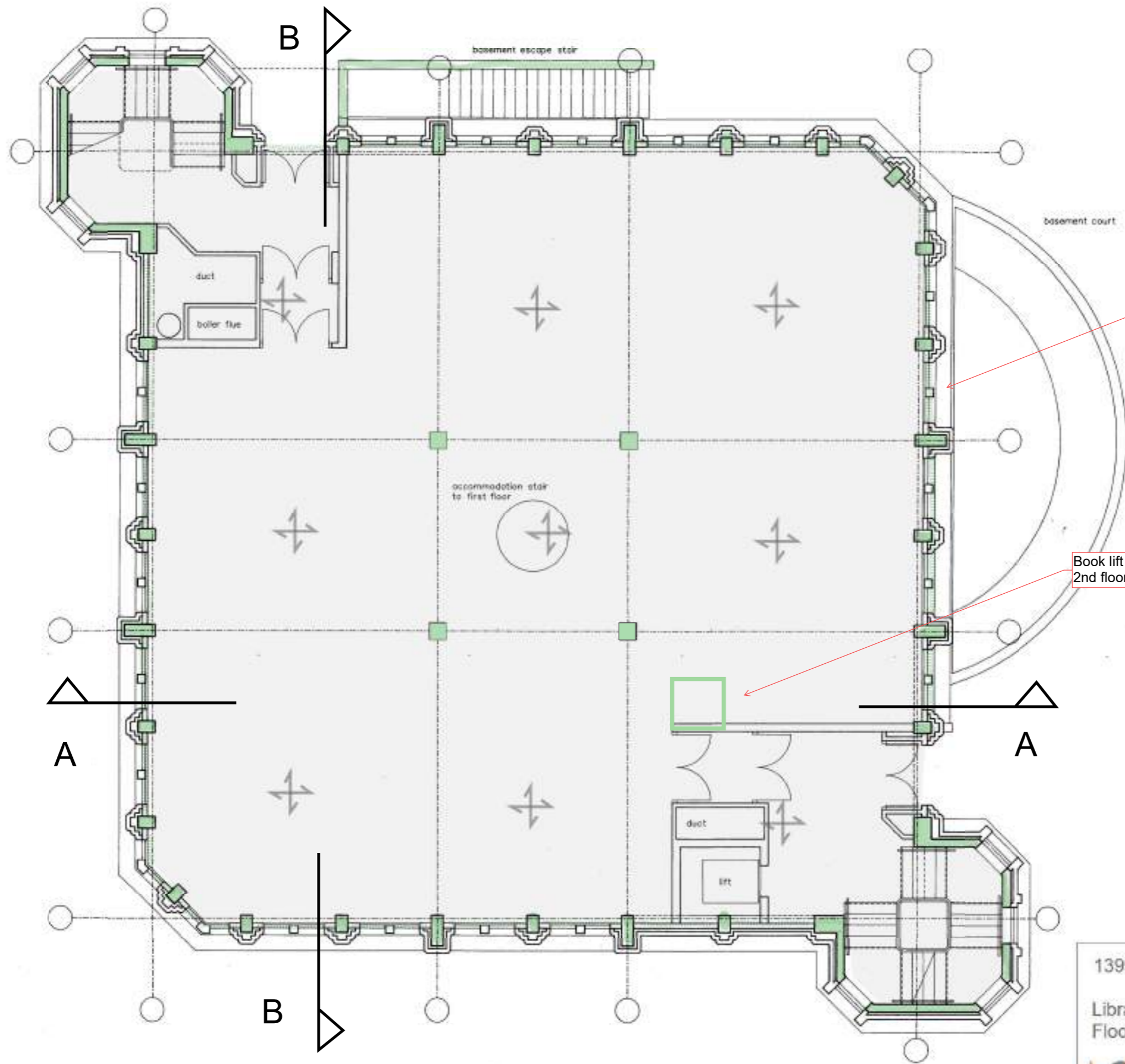
Key	
Assumed Beam Below
Structural Wall	█
Structure Below	▭
Principle Structural Elements to be Removed	█
Chimneys	█



Columns supporting upper floors from basement to roof

Basement retaining walls - from sketches look like piled walls

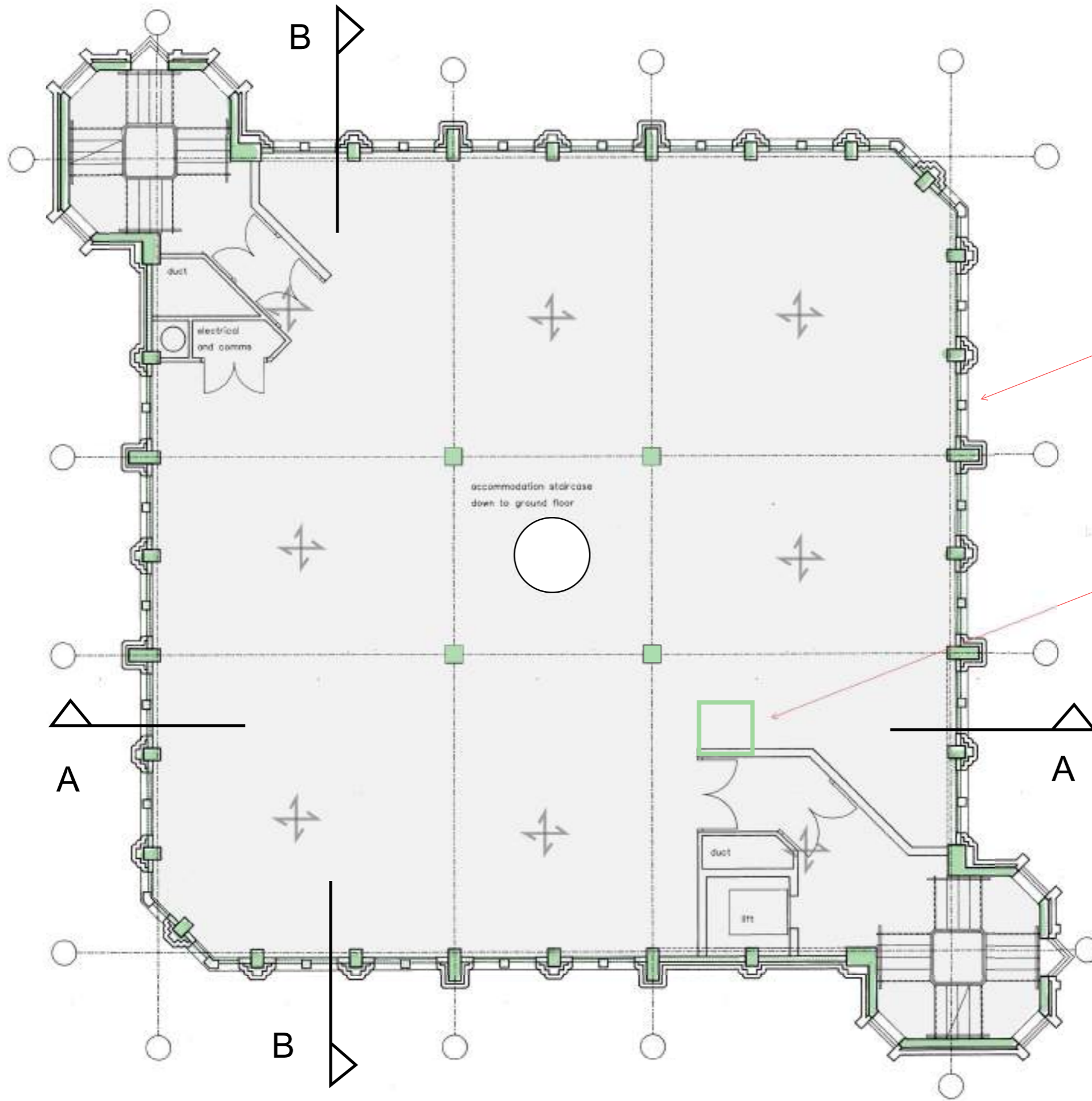
1399 SK08	Richmond Hill Campus
Library Existing Basement Structure Highlighted	Date 04/09/2023
	
Integral Engineering Design 84 Walcot Street Bath BA1 5BD	



Structural beams between windows

Book lift going up to 2nd floor

1399 SK09	Richmond Hill Campus
Library Existing Ground Floor Structure Highlighted	Date 04/09/2023
 integral engineering design	Integral Engineering Design 84 Walcot Street Bath BA1 5BD



Structural beams
between windows

Book lift going up to
2nd floor

1399 SK10

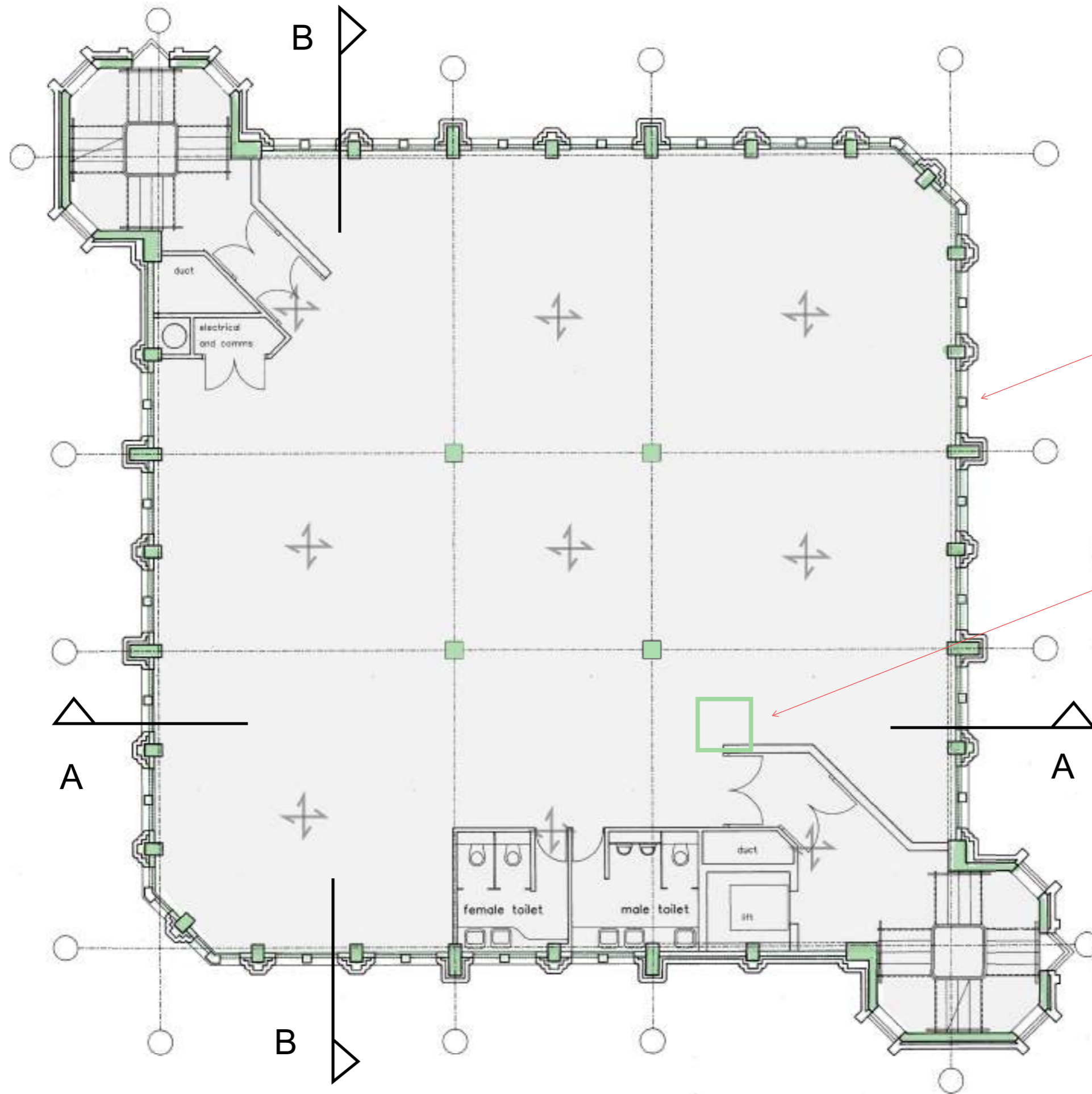
Richmond Hill
Campus

Library Existing First Floor
Structure Highlighted

Date 04/09/2023



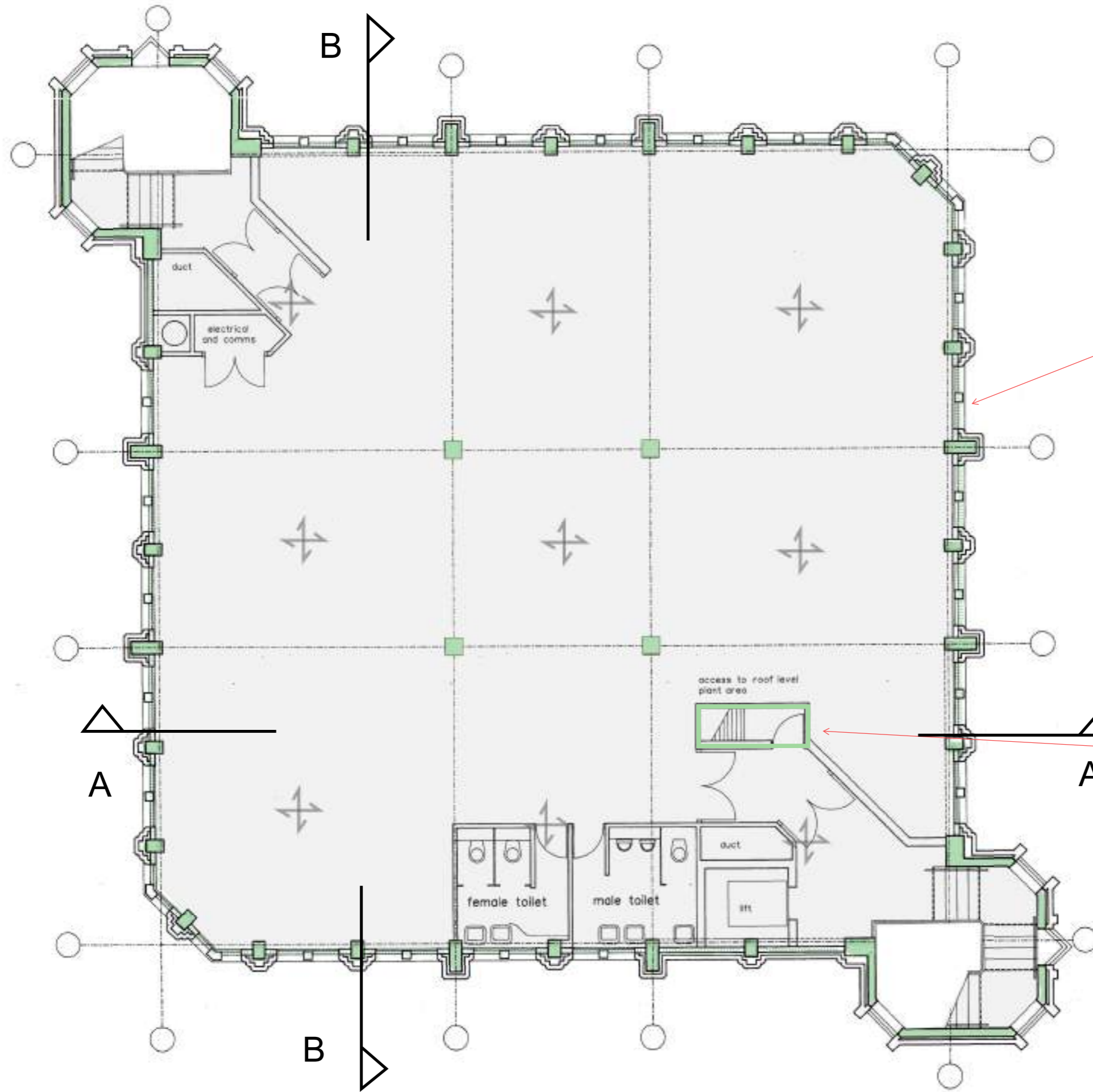
Integral Engineering Design
84 Walcot Street
Bath
BA1 5BD



Structural beams between windows

Book lift going up to 2nd floor

1399 SK11	Richmond Hill Campus
Library Existing Second Floor Structure Highlighted	Date 04/09/2023
 integral engineering design	Integral Engineering Design 84 Walcot Street Bath BA1 5BD



Structural beams
between windows

Staircase to plant
area on roofs

1399 SK12

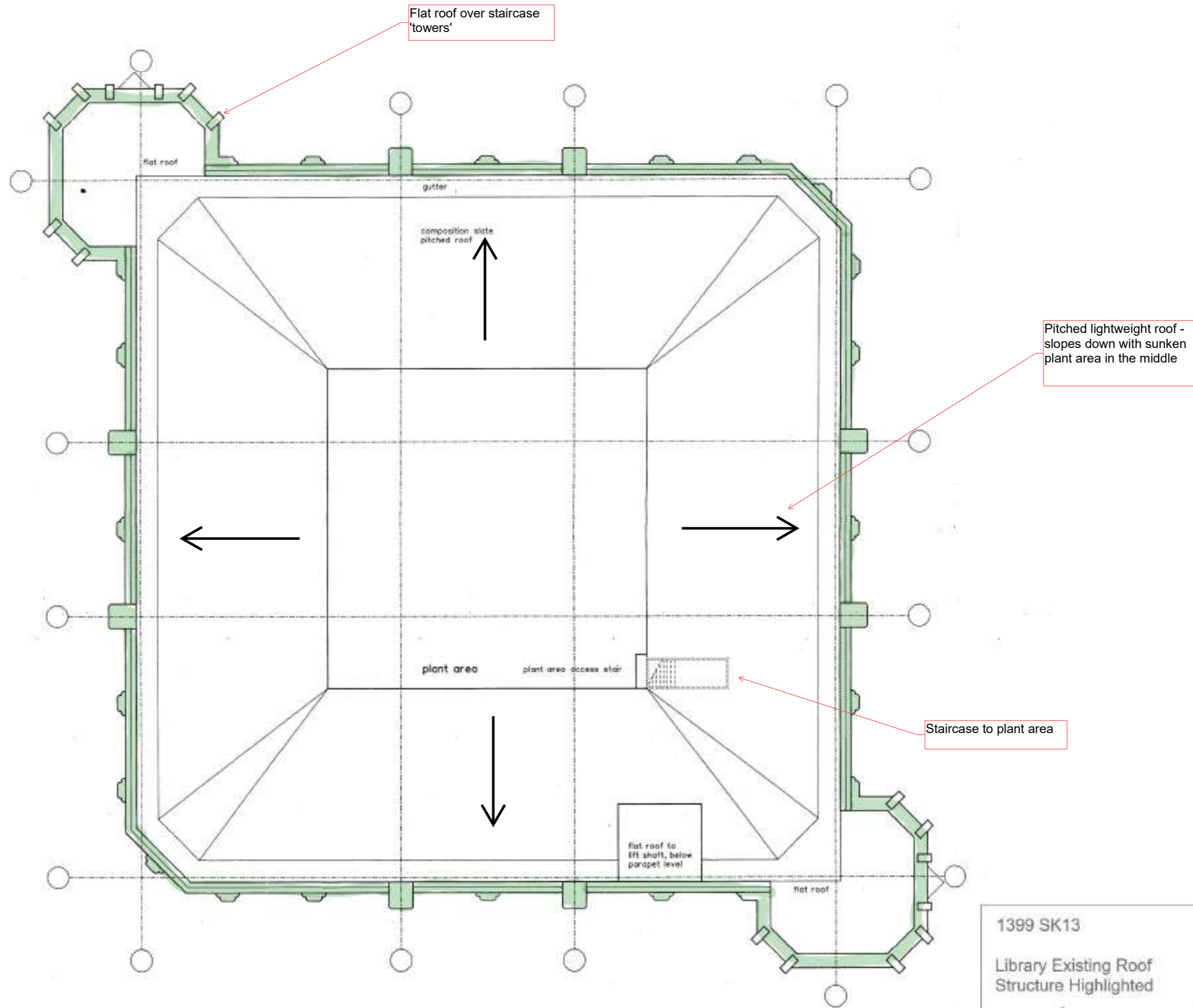
Richmond Hill
Campus

Library Existing Third Floor
Structure Highlighted

Date 04/09/2023



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BA1 5BD



1399 SK13	Richmond Hill Campus
Library Existing Roof Structure Highlighted	Date 04/09/2023
 integral engineering design	Integral Engineering Design 84 Walcot Street Bath BA1 5BD