
Structural Methodology Statement

1.0 Existing Building Information

1.1 The Project

The proposed works to be undertaken are a full refurbishment of the existing Ramsden Building with some structural works to accommodate the new layouts and services. The development will introduce new breakout spaces, kitchen and social area, offices, quiet study, classrooms and a large events space. These are to be separated out between three clients – International Study Group (Lead Tenant), Post-Graduate Research and International Office. The building currently utilises a single pipe heating system which will need a full replacement to a more modern M&E solution to fit the purpose of the new development. This will require new services running through to each floor and additional plant equipment to be stored somewhere in the building with sufficient ventilation.

1.2 Existing Construction

As this is a historic building there is some degree of uncertainty about the existing structure. We have areas where additional load or re-distribution of existing loads and the suitability of the structure will need to be properly assessed. This will depend on the construction type, quality of masonry but also the existing foundations.

A full measured building survey was completed for the building and floor overlain to look for internal load bearing lines.

Site visits have been completed where ceiling tiles were lifted to allow the floor layout and structure to be reviewed. The structure is formed in load bearing masonry and fitch beams, with infill timber joists. The fitch beams were visible as down stands below the original ceiling level. The layout of the primary load bearing walls was established and the build-up for the floor reviewed in some isolated locations where the plaster ceiling has been damaged.

The existing floor construction in these locations is indicated below:

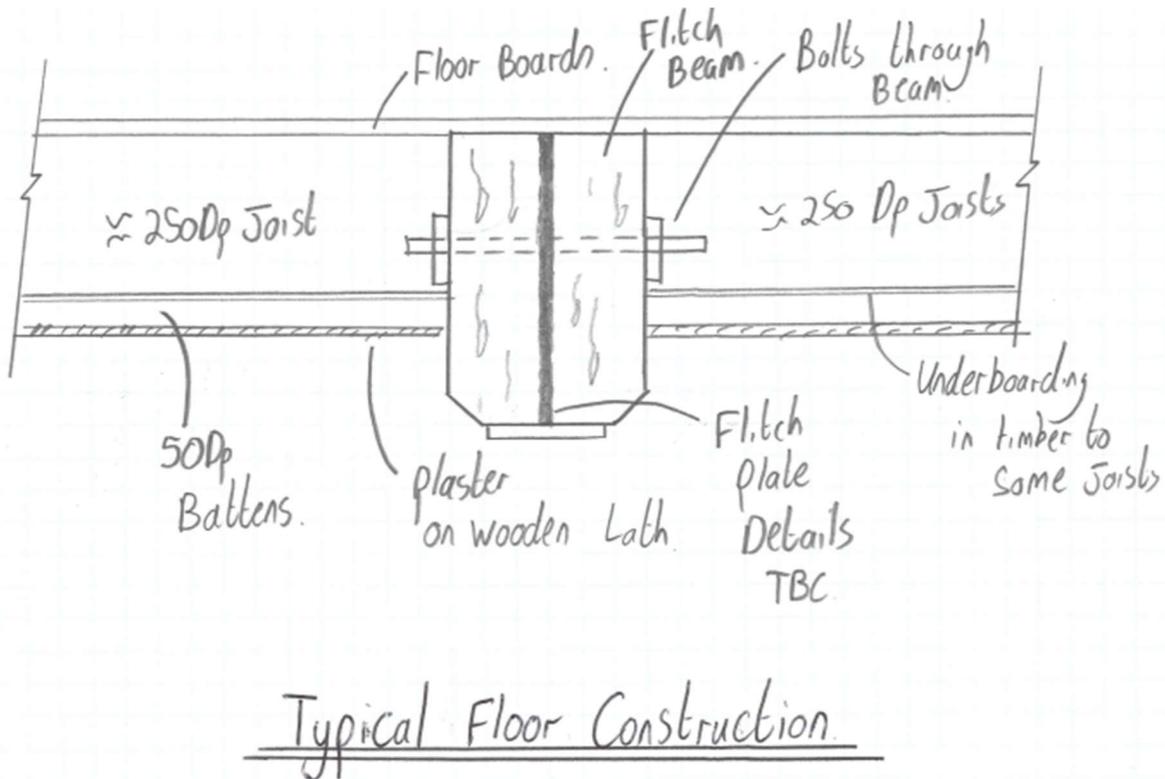


Figure 2.2.1 – Typical Floor Construction

Note: This is based on a limited visual survey and further intrusive works should be completed to confirm at all floors.

To further assist with this, existing structural plans for a later installed mezzanine were identified. These gave full detail of the new construction but also gave an idea of the original historic build in the area.

Preliminary plans of the existing structure have been completed as interpreted from the measured survey, site visual inspection and historic documentation reviewed for the project.

Basement Areas

The building has two basement areas; An area to the west that lies under part of the main entrance lobby, and a large area that lies under most of the east side of the building up to the courtyard wall line. These are best shown on the measured survey plan below:



Figure 2.2.2 – Basement Level - Measured Building Survey

2.0 Structural Engineering Methodology

2.1 Sub-Structure

It is proposed that the existing building foundations be re-used where possible with all works being completed above ground. Addition loads to any foundations will be considered and assessed on a load comparison basis.

2.2 Super-Structure

The current proposals require several aspects of structural work to be completed.

1. Wall Removal

The internal refurbishment includes the removal and replacement of numerous non-load bearing partitions. These elements should be removed and replaced with care to avoid damaging the existing floor and building structure.

There is a proposal for the removal of existing potentially load-bearing walls, This will be done utilising the existing load bearing walls to form piers either side of the opening with new steel work being provided to support the load above. These will be designed on a case-by-case basis.

Further visual and intrusive investigations will be required to confirm the details for these wall removals.

2. New Openings in Load-bearing Walls

Openings into load-bearing walls have been proposed within the inside corridor wall, and the wall to the courtyard. As these openings are relatively small, it is likely that these can be accommodated with the installation of concrete or steel lintels. Some of the opening between the corridors and the central courtyard will be formed within former window openings. All new openings are to be formed within the internal walls currently plastered and should not impact the external stonework or detailing.

3. Service Risers

With the M&E fit out there is a requirement for the introduction of service risers through the floors. To allow for this, the floor will need to be locally opened and trimmed out accordingly. The trimming will be completed in timber (where possible) to match the existing floor structure. Existing risers and structural openings are to be utilised where reasonable.

4. Plant Deck

The M&E equipment is proposed to sit on top of a plant deck within the existing courtyard. The current proposal is to remove a portion of the trussed roof within this area and provide a new structural roof capable of supporting the plant required.

The new roof area will be formed with steel beams spanning the courtyard, supported on the load bearing masonry walls either side. The steel is to bear onto padstones constructed within the existing masonry. This will be to internal walls below the proposed roof level.

The existing cast iron columns below the plant deck are to be maintained in their existing location but will no longer be load bearing elements.

5. Removal of Mezzanine

During the 70s/80s a mezzanine floor was installed in the double height lecture hall to the south-west of the building. Looking at historic drawings, it appears as though this is a space frame construction spanning from the external load bearing wall to the courtyard wall and supported by concrete lintels over openings. The proposal is for this mezzanine floor to be removed and this area returned to a double height area and used as an events space. Since the building is simply returning to the original state it is assumed that the mezzanine can be removed without being detrimental to the building's stability.

6. New Escape Stairs

It is proposed that a new stair be located within the east of the building to provide additional access and egress. An existing external window opening is to be utilised for the door. This requires the removal of the central stone column to allow for the required access width.

The stairs are to be trimmed out within the floor in timber between the fitch beams and will be contained to within an area of infill floor joists. Existing primary structure will remain unchanged.

A timber deck will be constructed to form the landing level supported off the basement floor. The structure of this floor is to be confirmed prior to design and strengthened if required.

3.0 Design Standards

The project will adhere to all relevant Eurocodes, Building Control and other relevant standards where applicable.

4.0 Materials

During Work Stage 3 Developed Design, the use of materials will be reviewed to provide the client with efficiency, form, and design integration. We will explore all forms of building technology to find the most suitable solution that achieves the client's and team's requirement to progress beyond the Concept Design Stage.

5.0 Sustainability

As part of our role in designing the built environment we have a key part to play in ensuring that the construction process and the on-going built asset performs and behaves in a suitable manner.

It may be possible for suitable site won material to be reused on the proposed site. For example, it may be possible to reuse waste stone or masonry material as engineered fill. Reuse of site won material to be investigated at the Developed Design Stage.

6.0 Required Surveys

1. **Structural Masonry Survey** - To investigate and report current defects within the masonry which may impact its proposed future use. This should include an assessment of the existing masonry strength to allow for design checks to existing masonry panels and for any load spreading padstones.
2. **Structural Timber Survey** - To investigate and report the current condition of the floors and roof for continued use.
3. **Ground Investigation** - If required by the structural design
4. **Intrusive works** - To further investigate existing structure. This is likely to be required to complete a load assessment of the existing floors for further use and confirm load bearing masonry.
5. **CCTV SURVEY** - To inspect drainage and assess suitability for continued use.