

CIVIC

Marlsbro House

Structural Commentary to LBC Application

April 2026

PREPARED FOR

Aclo Assets Ltd

Structural Commentary to LBC Application

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1. Introduction

This report outlines the philosophy and approach that Civic has taken when dealing with the existing building in respect to the structural repairs and interventions required to bring the building back into use as offices, restaurant and bar.

Marlsbro House is a Grade II-listed building located in central Manchester, on the corner of Newton Street and Hilton Street. The site was first fully developed c.1811 and used as a spinning mill and cotton factory. In 1823 the cotton factory was destroyed by a fire, following which the site was quickly re-developed with the construction of the building which stands on the site today.

The structure comprises a six-storey (four plus basement and attic) 19th century building, originally used as a cotton mill. It was sold and altered to become an iron manufacturers in 1830, and then a series of light industrial/commercial uses from 1850. It was extensively altered in 1960 which includes the addition of a cement-based render to the existing external walls, new entrance foyer and other substantial internal and external alterations.

2. The Client's brief

The proposals comprise change of use to bar and listening lounge, recording studios and sound engineering rooms, restaurant, offices, amenity lounge and private event space; together with external alterations including removal of existing render to all elevations; reinstatement of entrance archway on Newton Street, formation of new entrance archway to rear courtyard; roof alterations including external terraces; installation of covered structure within the rear courtyard to provide seating area associated with restaurant; new external staircase; new bin store; plant; and, associated works.

3. Approach to dealing with the existing building

As a Listed building, the structure is afforded legal protection to preserve its significance, and as such, any modifications or interventions to the building require careful consideration.

This report provides a summary of the assessments undertaken, and the evidence gathered, that demonstrates that the works are structurally necessary or otherwise justified to bring the building back into use and secure the buildings future.

The structural assessment has been undertaken from a basis that the heritage assets of significance are to be retained, unless there is risk of structural collapse or harm to third parties.

The proposed interventions do not fundamentally change the building's stability system or alter existing vertical or lateral load-paths through the building. The majority of the structural interventions proposed have arisen from a need to address structural defects and inadequate structural capacity to carry the required loads. Further interventions are proposed, primarily at basement, ground, and roof level, to improve the internal layout of the building and allow it to be brought back into use.

The philosophy for the structural interventions is as follows:

- Interventions to be minimised where possible, and introduced only where structurally necessary
- The existing fabric is to be retained wherever feasible to do so
- Interventions are to be obvious and readable as such

- Where possible, interventions are to be reversible.

Each intervention which affects the structure is discussed in further detail in the following sections of this report.

3.1.1. Qualifications, experience and competency of Engineers undertaking the assessment

James Bruce – Project Director

James is a chartered engineer with a passion in the built environment and has a multi-discipline background, having worked in the industry since 2006. James has wide-ranging experience across multiple sectors. He is experienced in leading teams involved in the successful transformation of historic and listed buildings, with his work restoring and refurbishing a number of Listed buildings in Manchester being shortlisted for regional awards

Education and Qualifications

- MEng (Hons) Civil and Structural Engineering, University of Durham
- CEng Chartered Engineer
- Member of the Institute of Civil Engineers
- Member of the Institute of Structural Engineers

James's CV including relevant project experience can be found in Appendix A of this report.

Hannah Keighley – Project Engineer

Hannah is a Chartered Engineer with over 15 years' experience in civil and structural engineering consultancy across a wide range of sectors including heritage, commercial, industrial, leisure, residential, health and education. She is experienced in leading project design and delivery from inception through to completion, including value engineering, project management, and complex analysis. She has a keen interest in historically significant and listed buildings, enjoying unlocking their full potential and updating them to modern standards in keeping with their prestige and legacy.

Education and Qualifications

- MEng (Hons) Civil and Structural Engineering, University of Newcastle upon Tyne
- CEng Chartered Engineer
- Member of the Institute of Civil Engineers
- Member of the Institute of Structural Engineers

Hannah's CV including relevant project experience can be found in Appendix A of this report.

3.2. Basis of assessment

Donald Insall Associates has been appointed to the design team as Heritage Consultant. Reference should be made to the Heritage Impact Assessment for full details of the historical background, and assessment of significance.

3.2.1. Designation

Heritage Category: Listed Building

Grade: II

List Entry Number: 1466846

Date first listed: 18-Nov-2019

List Entry Name: Marlsbro House

Statutory Address: 52-54 Newton Street, Manchester, M1 1ED

3.2.2. Significance

A full statement of heritage significance can be found with the Heritage Impact Assessment report provided by Donald Insall Associates. The salient points relating to the structural fabric are summarised below:

The building is of **high** historical value as an early-19th century factory in the centre of the world's first industrial city, outside the clusters of mills in the suburbs of Ancoats and Chorlton-on-Medlock. The building is of **high aesthetic or architectural values**:

- as a rare early example of heavy-timber floor construction, a concept providing both robustness and fire-resistance which appears to have originated in Manchester and which strongly influenced the mid-C19 design of industrial buildings in the USA, in particular New England;
- for its unusual variation of a roof designed using both iron and timber elements, in this case including a cast-iron clerestory running the full length of both sides;
- unusually for its date also incorporating iron ring-beams in the walls, to which the timber cross-beams and the heavy floorboards are fixed; with little alteration to the technologically interesting structural fabric

Of **high significance** and particularly sensitive to change are:

- The building's overall external form, including its roof; although the raised south gable conceals the building's roof form and detracts;
- The original open plan form, which is discernible but currently obscured by modern partitions;
- The building's original brick, timber and iron construction, including:
    - cast iron columns,
    - external red brick walls with arched openings (recently uncovered),
    - iron wall plates,
    - hybrid iron and timber roof structure,
    - timber plank floors;
- Victorian timber staircase, although altered and part blocked, including a once glazed timber screen at first floor;

Of **moderate significance** and therefore less sensitive to change are:

- Slate roof coverings (although they are currently concealed and so their contribution to significance can only be presumed at this stage);

- Two late-Victorian fire escape stairs, including timber-panelled access corridors from the fourth floor;
- Timber roof sarking;
- Early-20th century timber panelling at fourth floor level – concealing the eaves storage and WC areas, lining out the roof;
- Timber framed clerestory windows at attic level, of a variety of dates, are of moderate to low significance;
- Interwar 'cold room';
- Probable early-20th century hoist shaft, lift car and mechanism at fourth floor (its age / provenance will be reviewed properly once asbestos removal works have taken place).

Of **low significance** and therefore less sensitive to change are:

- The signage on the elevations dates from 1960s and is of low historic, communal and aesthetic value;
- The chequerboard render distinguishes this building from others in the area and makes it a local landmark. The render itself is of low historic, evidential and aesthetic value. This render conceals and has physically damaged the original brick beneath, which detracts;
- Timber stair within 1960 rear entrance extension, probably made in part with reused historic fabric;

3.2.3. Survey data

The following information has been used in the assessment of the structure;

- Donald Insall Associates (2021). Heritage Impact Assessment
- Robertson Elliot (2025) Measured Building Survey. Project Ref 203
- SOCOTEC (2026) Intrusive Structural Inspection. Ref. STR3522_002
- Hutton + Rostron (2025) Masonry moisture survey
- Hutton + Rostron (2025) Timber condition survey
- Hutton + Rostron (2026) Visual timber strength grading of select floor beams
- LK Group (2026) Exploratory Trial Pits and Window Sampling
- WSFT (2025) Fire Strategy Document Version 1

3.2.4. Civic reports

Civic has knowledge of the building from previous involvement under a previous client, which has been drawn upon for the current proposals. The following reports are referenced in conjunction with this report.

- CIVIC (2025) Structural Appraisal Report
- CIVIC (2026) Structural Capacity Appraisal

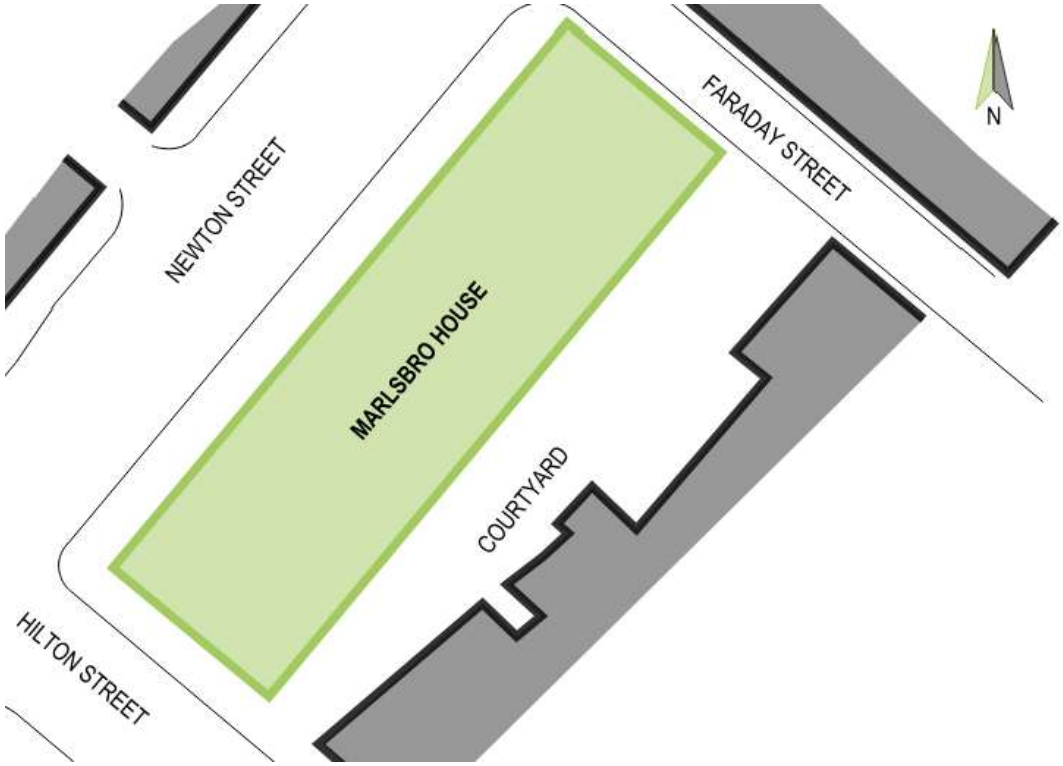


Figure 1 - Building key plan

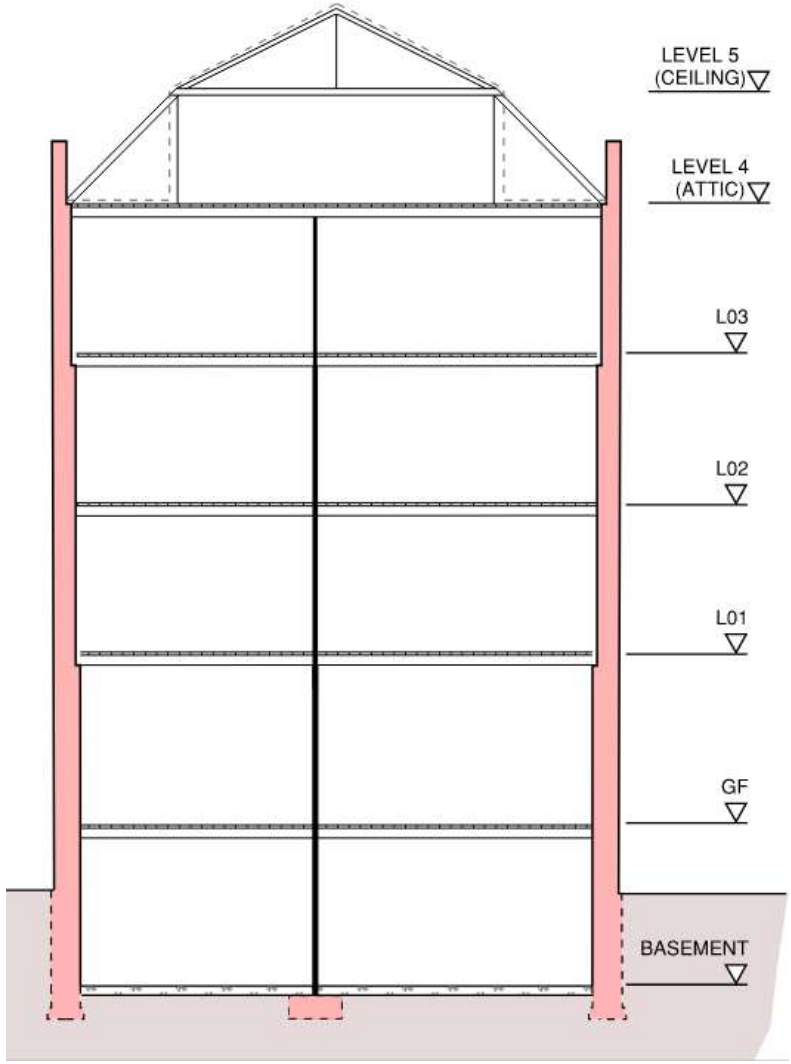


Figure 2 - Building key section

4. Proposed works and interventions to the existing structure

4.1. General defect repairs

4.1.1. Condition

Timber

Refer to Hutton + Rostron Timber Condition Survey. Defects to the floor structure generally comprise:

- Decayed timber caused by water penetration leading to both wet-rot and dry-rot and action by wood-boring weevil causing loss of structural capacity.
- Damp, but not yet decayed timbers. No loss of capacity yet, but at risk of decay if remedial action is not taken.
- Various degrees of charring due to historical fire damage leading to section-loss in the timber, and therefore reduced load-carrying capacity.

Masonry

Refer to Hutton + Rostron Masonry Condition Survey. Defects to the masonry structure generally comprise:

- External walls were generally dry but there were localised areas of concentrated water penetration
- Where tested, the majority of samples identified elevated levels of moisture and these areas generally correlated with where external moisture sources were identified
- Some areas of cracking has been identified, typically below beam bearings and around windows.

4.1.2. Floors

Beams

Where existing original timber beams (**high significance**) are rotted at their bearing-ends, these are to be strengthened with new PFC sections, which will be installed to both sides of the existing timber beam and bolted-though. This detail allows for as much of the existing fabric to be retained as possible, the repair is readable as an intervention and can be removed in the future if needed.

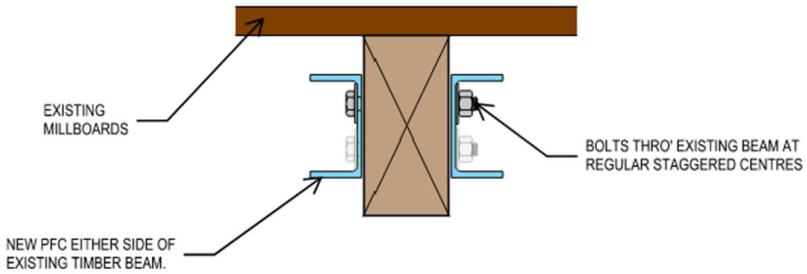


Figure 3 - Typical strengthening detail to existing timber floor beams (ground floor to third floor)

Throughout the building, the bearing of the existing timber beams onto the column-heads were assessed to have **insufficient structural capacity**. A range of options has been explored, and a remedial detail has been proposed to enhance the bearing. This detail requires the removal of a minimal amount of material from the timber beam at the bearing. See Figure 4.

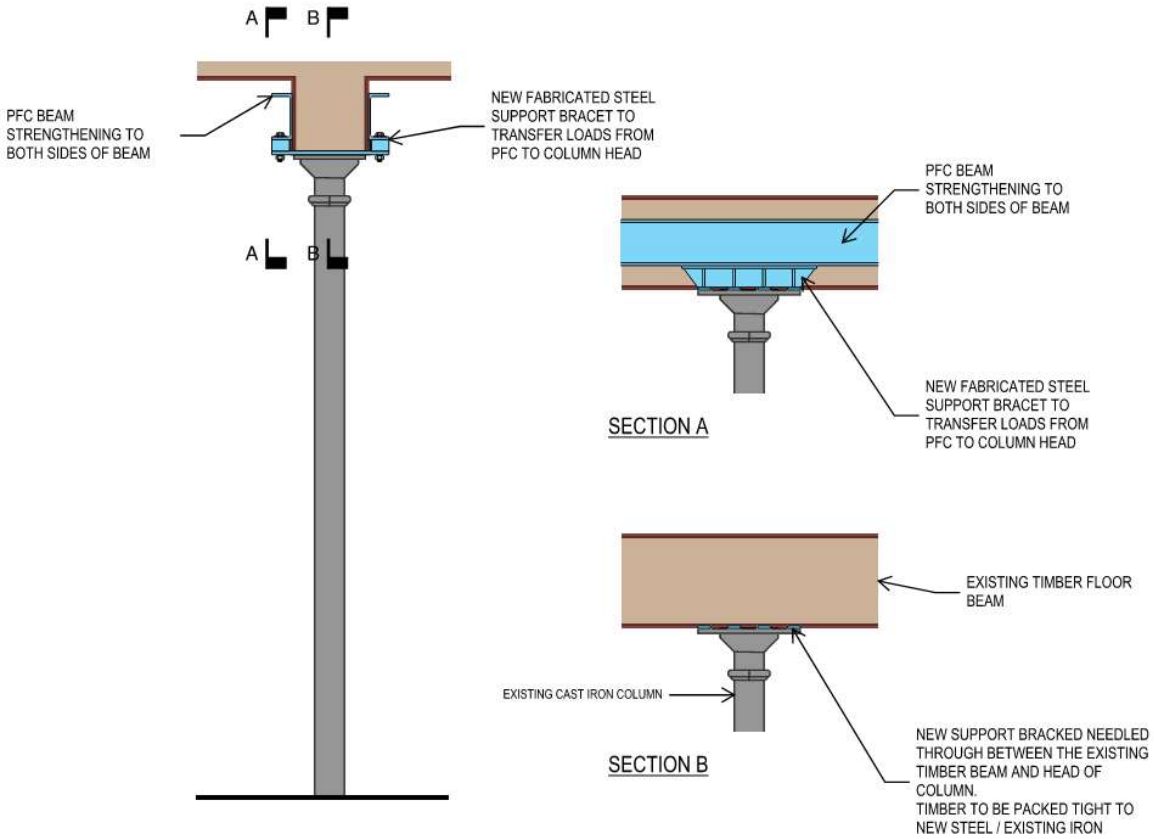


Figure 4 - Typical strengthening detail to existing timber floor beam at column bearing.

Millboards

Defects to the existing millboards (**high significance**) are generally relatively small in number and area. Screeds and any secondary layers of boarding are to be removed from all millboards. The decayed and defective millboard spans are to be carefully removed and replaced with boards on a like-for-like basis. The existing metal tongues should be salvaged from decayed millboards and reinstated within grooves in the new millboards.

4.1.3. Walls

Brickwork

Defect repairs to brickwork (**high significance**) are expected to compose local stitching of cracks, and strengthening and re-setting of brick-arch lintels, and replacement of broken lintels on a like-for-like basis.

4.2. Basement

4.2.1. Summary of proposals

The primary use of the basement would be as a bar and listening lounge which would be open to the public, accessed from Newton Street. The basement would also accommodate a recording studio, sound engineer room, and ancillary office space

4.2.2. Condition

Refer to Civic drawing 1698-CIV-XX-B1-D-S-10010 for extent of defects.

The basement is positioned partially below ground level with the lower 2-2.5m of the basement walls earth retaining and susceptible to damp.

According to Hutton + Rostron's Masonry Condition survey report:

> *"These walls have been finished with a hard 20mm thick sand-cement 'tanking' plaster from basement floor level to the underside of the ground floor. The plaster was entrapping moisture and inhibiting vaporation through the brickwork. This will be exacerbating the rate of deterioration in the exterior brick masonry walls where moisture has accumulated"*

Where Hutton + Rostron undertook masonry moisture profiling within the basement, all samples were 'saturated', as is typical of below ground earth-retaining walls.

Hutton & Rostron recommendations

Their recommendation is for existing cementitious 'tanking' to be carefully removed. As the proposals include for the basement to be used as habitable space, then waterproofing will be required to meet the requirement of the Building Regulations and to ensure dry internal finishes on refurbishment.

Trial pitting undertaken by LK Group indicates perched water sitting above the clay strata in the made ground below the existing basement floor.

4.2.3. Proposed works

Refer to Civic drawing 1698-CIV-XX-B1-D-S-10110 for extent of demolition works

Refer to Civic drawing 1698-CIV-XX-B1-D-S-80010 for extent of proposed works and interventions

Removal of Non-loadbearing Internal Partitions

Non-structural partitions (**neutral significance**) to toilets are to be demolished. Their removal has no effect on the structural integrity of the building.

Removal of Loadbearing Internal Walls

Some existing, original internal brick masonry walls (**moderate significance**) are to be demolished in order to accommodate changes to the internal layouts.

The walls removed at the southern end of the building will not unduly affect the structural stability of the building. The proposed interventions to the ground floor above this area require a new support structure to be introduced, which resulting in these walls no longer serving a structural function.

At the northern end of the building, the non-original internal partition walls (**moderate significance**) are to be removed. This does not adversely affect the structure, as the floors above are supported by timber beams, which are to be retained. Structure above new openings formed in existing and original external walls will be supported by the introduction of new lintel beams.

Refer to Section 4.7 for proposed works to the existing lift shafts

New Basement Floor Slab

Trial pitting has shown that the floor to the basement is formed of a nominal (c.30mm) concrete “slab” (**neutral significance**). This slab is non-original, and does not have the structural capacity to withstand the proposed loading, and therefore it is proposed to be removed and replaced with a new reinforced concrete floor slab, which also forms part of the basement tanking system (see next section).

Installation of a new floor slab also provides the opportunity to install ground slab insulation, improving the thermal performance of the basement.

Basement Tanking

The masonry condition survey, and trial pitting investigations have both demonstrated ongoing moisture ingress into the basement. The source of the moisture is water within the ground, comprising surface water percolating through from street-level, and groundwater. The clay soils just below the basement floor level presents a barrier to further infiltration, allowing the water to accumulate above this layer.

The solid masonry walls, and nominal concrete slab to the basement do not provide a barrier to water ingress into the building.

It is not possible to address the source of the moisture, as the building is located at the edge of the public highway on three sides, and adjacent to a sewer easement and other existing structures on the rear elevation. It is not practical to excavate to introduce drainage or tanking systems on the external side of the wall.

In this case, a cavity drainage system is most appropriate as they cause little damage to existing fabric. All waterproofing to basement walls and floors should be fully in accordance with the requirements of BS 8102:2009 and Civic has proposed that a Type C internal drained cavity system is introduced to the inside face of the external walls; designed and installed by a specialist qualified contractor. Any water seeping through the external walls and floor is drained to a sump via an internal cavity and pumped or drained away.

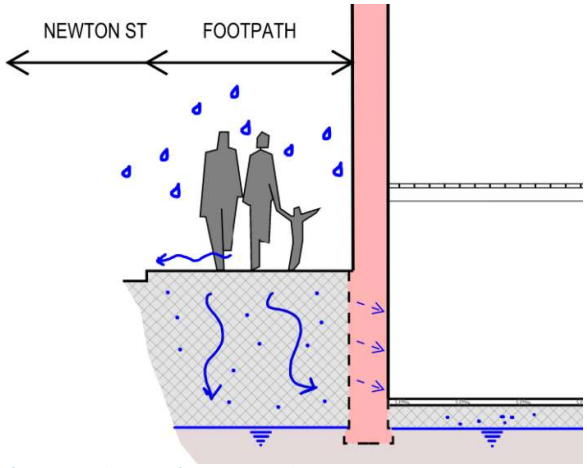


Figure 5 – Current basement water ingress route

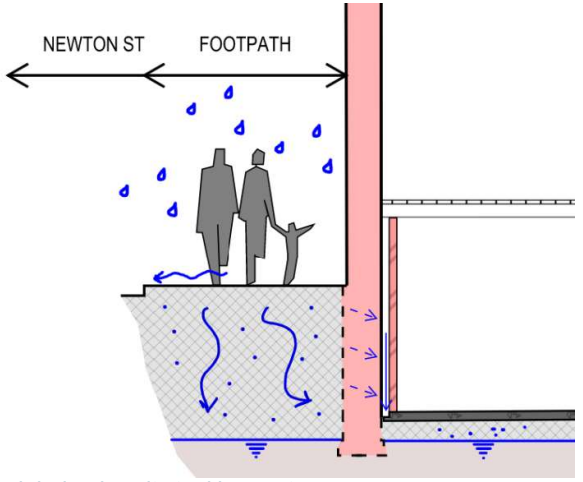


Figure 6 – Proposed drained cavity tanking system

New changing room, plant room and stair to ground floor

These areas will be formed in the northern corner of the building. Currently, this corner of the building is infilled with made ground, which will be excavated to the same floor level as the rest of the basement. The new floor slab and wall/floor tanking system will extend into this area.

4.3. Ground Floor

4.3.1. Summary of proposals

The main use of the ground floor will be a restaurant, also with amenity lounge/coworking lounge space which can be used by those with a membership scheme associated with the office space. The main entrance will be via the restored archway on Newton Street. Access will also be established to the rear courtyard through a new archway. The external courtyard space will include a covered area which will provide an opportunity for dining associated with the restaurant.

4.3.2. Condition

Refer to Civic drawing 1698-CIV-XX-00-D-S-10000 for extent of defects.

The ground floor is generally above external footpath level, with a lowered entrance area at the southern end of the building. At this end of the building, original timber beam and millboards have been removed and replaced with a concrete floor at the south-west entrance lobby. Midway along the length of the building, steels have been installed alongside the beams and the original sunken internal entrance has been levelled with joists and floorboards

According to Hutton + Rostron's Masonry Condition survey report, there is evidence of water penetration though the rear entrance extension, and at various other points around the exterior walls.

As presented in Hutton + Rostron's Timber Condition survey report,

> *"The majority of the beams were damp or decayed where embedded in the masonry and decay was also present in the timber pads. Decay was primarily caused by wet rot fungi and wood-boring weevil which had primarily been caused by the addition of a cementitious plaster which had impeded normal seasonal evaporation of residual moisture through the walls. The entrapped moisture had increased the moisture content of the embedded timbers, making them highly susceptible to insect infestation and decay. The deep moisture contents of the beams were generally between 12-30 per cent w/w"*

There was also partial decay to a relatively small number of millboards, typically where they have been subject to moisture penetrating through the external walls, or ingress down through the building from the upper levels.

4.3.3. Proposed works

Refer to Civic drawing 1698-CIV-XX-00-D-S-10100 for extent of demolition works

Refer to Civic drawing 1698-CIV-XX-00-D-S-80000 for extent of proposed works and interventions

Defect repairs

Structurally necessary defect repairs to timber floor beams and millboards (both **high significance**) as per section 4.1 of this report.

Rotted timber wall plates are to be removed and replaced with new.

Rotted timber padstones are to be replaced with new padstones in precast concrete.

Structural strengthening works

Existing timber millboards have been assessed and have largely been found to have sufficient structural capacity to carry the proposed loads, except where they have been identified to have defects

Existing timber beams of Grade SS (C24) have been assessed and have been found to have **adequate structural capacity** to carry the proposed loads, except where they have been identified to have defects, where large items of plant are proposed to be supported from below, or where they have been strength-graded at GS (C16). Local strengthening works are proposed to existing timber beams where they are to support MVHR. These beams are to be strengthened with new PFC sections, which will be installed to both sides of the existing timber beam and bolted-though. This detail allows for as much of the existing fabric to be retained as possible, the method of strengthening is readable as an intervention, and can be removed in the future if needed. See Figure 3.

New front and rear entrances

See Civic drawing 1698-CIV-XX-00-D-S-80400.

A former arched entrance is to be re-formed at the front of the building to enable access from Newton Street. This area of the building has been subject to previous alterations, including infill of the original arched opening. The former arched opening remains visible from within the building and is to be reinstated back to its original arrangement, which will require removal of existing but non-original brickwork. This opening will be mirrored on the rear elevation, where a new arched opening is to be formed. This will require removal of existing, original brickwork.

Modifications are required to the ground floor structure to allow for level-access into the building from Newton Street and the rear courtyard.

Against Newton Street, previously installed interventions will be replaced with new to suit the proposed new stairs.

At the courtyard elevation, the timber stair with rear entrance extension (**low significance**) will be demolished.

The works will necessitate removal of some millboards (**high significance**), which can be used elsewhere in the building to replace defective millboards where suitable.

The works will also require the removal of two short lengths of one of the timber beams (**high significance**) (c.2m) at Newton Street elevation and at the courtyard elevation to form the recess in the floor. The shortened timber beam, and the beams retained either side will be strengthened with new steel beams which will also support the new lower floor area. At the courtyard elevation, the end of the beam proposed to be cut-back was recorded to be decayed up to 400mm from the end.



Figure 7 - Extent of timber beam to be removed at Newton Street elevation (similar at courtyard elevation)

New basement access

See Civic drawing 1698-CIV-XX-ZZ-D-S-80100

The corner of the building at the intersection of Newton Street and Faraday street is an infilled area as opposed to the rest of the floor which is of suspended timber floor construction. The floor construction in this area is a nominal 40mm concrete slab overlying made ground. The proposals include removal of the concrete slab (**neutral significance**) and excavation of this area down to basement level. These works do not require any demolition of the highly-significant original timber floor construction.

A new floor structure at ground-floor will be constructed, supported from the existing solid brick masonry walls.

New office side entrance

See Civic drawing 1698-CIV-XX-00-D-S-80200

This area of the building comprises the former lobby has been subjected to extensive previous alterations which were undertaken around 1960. The existing lobby with steps and ramp is deemed to be of neutral significance.

The proposals involve the removal of the existing ramp (**neutral significance**) and timber floor (**high significance**) to provide an entrance lobby with level-access from Newton Street. This will be replaced with a new floor slab construction, which will be supported by existing loadbearing masonry walls, and a new column and foundation.

4.4. First Floor, Second Floor and Third Floor

4.4.1. Summary of proposals

The first floor is proposed to be used as offices with ancillary meeting rooms and lounge areas

4.4.2. Condition

Refer to Civic drawings 1698-CIV-XX-01-D-S-10001, 1698-CIV-XX-02-D-S-10002 and 1698-CIV-XX-03-D-S-10003 for extent of defects.

As presented in Hutton + Rostron's Timber Condition survey report,

> *There were a total of 6 no. decayed bearing ends with decay ranging from the bearing end up to ~900mm at Beam 10 to the Third floor soffit. Decay at the north-west wall was caused by dry rot fungus and decay at the south-east wall was caused by wet rot fungi and common furniture beetle. The deep moisture contents of decayed beams were generally elevated at between 12-25 per cent w/w. Many additional beams were damp at their bearing ends and vulnerable to decay. In addition to the decay, there was some deflection/bowing noted to the Second floor beams and fire damage. Fire damage and mechanical removal of surface charring had reduced the cross-sectional area of Second floor Beam 3 by approximately 17.85% for ~4.55m. Surface charring to First floor Beam 8 had reduced cross-sectional area by 10.51% for ~1m but charring to First floor Beam 9 was minor and damage was superficial*

4.4.3. Proposed works

Refer to Civic drawing 1698-CIV-XX-01-D-S-10101, 1698-CIV-XX-02-D-S-10102 and 1698-CIV-XX-03-D-S-10103 for extent of demolition works

Refer to Civic drawing 1698-CIV-XX-00-D-S-80000 for extent of proposed works and interventions

Defect Repairs

Structurally necessary defect repairs to timber floor beams and millboards (both **high significance**) as per section 4.1 of this report.

Rotted timber wall plates are to be removed and replaced with new.

Rotted timber padstones are to be replaced with new padstones in precast concrete, or natural stone.

Structural Strengthening

Existing timber millboards have been assessed and have been found to have sufficient structural capacity to carry the proposed loads, except where they have been identified to have defects, where they are to be replaced.

Existing timber beams have been assessed and have generally been found to have **insufficient structural capacity** to carry the proposed loads across the middle section of the beam . Refer to Civic Existing Structure Capacity Appraisal for full details of the assessment. Strengthening works are proposed to existing timber beams. These beams are to be strengthened with new PFC sections, which will be installed to both sides of the existing timber beam and bolted-though. This detail allows for as much of the existing fabric to be retained as possible, the method of strengthening is readable as an intervention, and can be removed in the future if needed. See Figure 3.

The bearing of the existing timber beams onto the column-heads below were assessed to have **insufficient structural capacity**. A range of options has been explored, and a remedial detail has been proposed to enhance the bearing. This detail requires the removal of a minimal amount of material from the timber beam at the bearing. See Figure 4.

Proposed new risers

Two new riser openings are proposed to be formed in the floor construction. This will necessitate the removal of some millboards (**high significance**) but not timber beams. New steelwork will be installed to trim the openings and support the edge of the floor.

4.5. Fourth Floor (Attic)

4.5.1. Summary of proposals

The fourth floor is to be used as ancillary office space, primarily as a lounge with a roof terrace.

4.5.2. Condition

Refer to Civic drawing 1698-CIV-XX-04-D-S-10004 for extent of known defects.

The attic floor comprises softwood truss tie beams that span across the building The beams are supported at midspan from non-original steel posts. Non-original softwood joists, struts and props have also been installed. The floorboards at this level are judged to be non-original as they differ in form and species from the millboards at lower levels.

As presented in Hutton + Rostron's Timber Condition survey report,

> *"There was a total of 11 no. decayed bearing ends with decay ranging from the bearing end (i.e. decayed within the wall) up to ~1m from the wall at Beam 2. Decay at the north-west wall was caused by dry rot fungus (Serpula lacrymans) and decay at the south-east wall was caused by wet rot fungi (multiple species) and common furniture beetle (Anobium punctatum). The deep moisture contents of decayed beams were generally elevated at between 12-30 per cent w/w. These areas were subject to active water penetration and timbers in these areas were vulnerable to progressive decay. However, the deep moisture content in the decayed bearing ends to Beams 5, 12 and 13 were below 12 per cent w/w which was too low for decay to progress. These areas may have been subject to historical or intermittent water penetration. Additional beams were damp at their bearing ends and vulnerable to decay".*

4.5.3. Proposed works

Refer to Civic drawing 1698-CIV-XX-04-D-S-10104 for extent of demolition works

Refer to Civic drawing 1698-CIV-XX-04-D-S-80004 for extent of proposed works and interventions

Defect Repairs

Structurally necessary defect repairs to timber floor beams (both **high significance**) as per section 4.1 of this report.

Rotted timber wall plates are to be removed and replaced with new.

Rotted timber padstones are to be replaced with new padstones in precast concrete, or natural stone.

Structural Strengthening

Existing (non-original) timber floorboards (**moderate significance – TBC**) have been assessed and have been found to have **insufficient structural capacity** to carry the proposed loads. It is proposed that they be replaced will millboards, similar to the originals at lower floor levels.

Existing non-original timber joists (**moderate significance – TBC**) are to be removed to alleviate load from the floor. They offer negligible benefit to the floor structure.

Existing timber beams have been assessed and have generally been found to have **insufficient structural capacity** to carry the proposed loads. Refer to Civic Existing Structure Capacity Appraisal for full details of the assessment. Strengthening works are proposed to existing timber beams (**high significance**). These beams are to be strengthened with new PFC sections, which will be installed to both sides of the existing timber beam. This detail allows for as much of the existing fabric to be retained as possible, the method of strengthening is readable as an intervention, and can be removed in the future if needed. This detail differs from the strengthening detail at lower floor levels, in that the steel sections are designed to carry all the loads from the fourth floor to alleviate load from the existing beams, which then function primarily as the bottom chord to the roof truss.

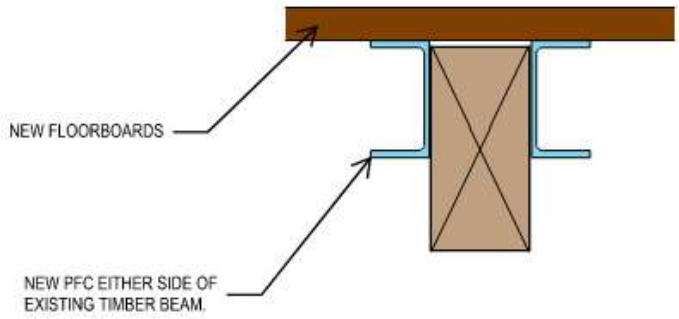


Figure 8 - Typical strengthening detail to existing timber floor beams (fourth floor)

The bearing of the existing timber beams onto the column-heads below were assessed to have **insufficient structural capacity**. A range of options has been explored, and a remedial detail has been proposed to enhance the bearing. This detail requires the removal of a minimal amount of material from the timber beam at the bearing. See Figure 4.

4.6. Roof

4.6.1. Summary of proposals

Proposals for the roof incorporate forming two external terrace areas. External plant will be introduced, and rooflights along the apex of the roof.

4.6.2. Condition

Due to the presence of asbestos, it has not been possible to undertake detailed condition surveys and assessments for the roof. The general condition has been determined from previous surveys, undertaken c. 2016-17.

The structural condition is discussed within Civic's Structural Appraisal Report. Additional photographs are provided below.

Slates

Although the roof covering was originally natural slates, these have been covered with a bituminous roofing membrane (images R011, R012)

Timber common rafters

Generally, these have been subject to ongoing moisture ingress. Where sarking boards are not present, photos from 2016 and 2017 show obvious damp patches and some mould/mildew (images R001, R003, R006, R008).

A full condition survey is to be undertaken following removal of the asbestos, but it is anticipated that the majority of the timber rafters will have significant structural defects which will have weakened the rafters to the point where they require replacement.

Sarking boards

Generally these have been subject to ongoing moisture ingress. In 2016 and 2017 many of the sarking boards had warped with numerous boards having detached from the underside of the common rafters. As no roofing works have been undertaken since, their condition is expected to have worsened (images R002, R004, R005, R006, R007, R008).

A full condition survey is to be undertaken following removal of the asbestos, but it is anticipated that the majority of the timber sarking boards will have significant structural defects which will have weakened them to the point where they require replacement.

Principal trusses

The principal trusses comprise a hybrid of iron and timber elements in a modified queen-post truss arrangement. The bottom chord of the truss comprises the existing floor structure to fourth floor which is discussed earlier in this report.

The extent of defects to the timber ceiling tie (Figure 9) is unknown at this stage, but the principals for addressing defects will be similar as for the timber floor beams.

It can be seen that there is a degree of corrosion to the (presumed) cast iron rafters (image R001, R003, R008, R010, R011) and (presumed) wrought iron tension rods (image R002, R004, R005, R007).

A full condition survey is to be undertaken following removal of the asbestos, but it is proposed that all elements forming the primary truss will be retained and repaired, or strengthened with additional structure as needed.

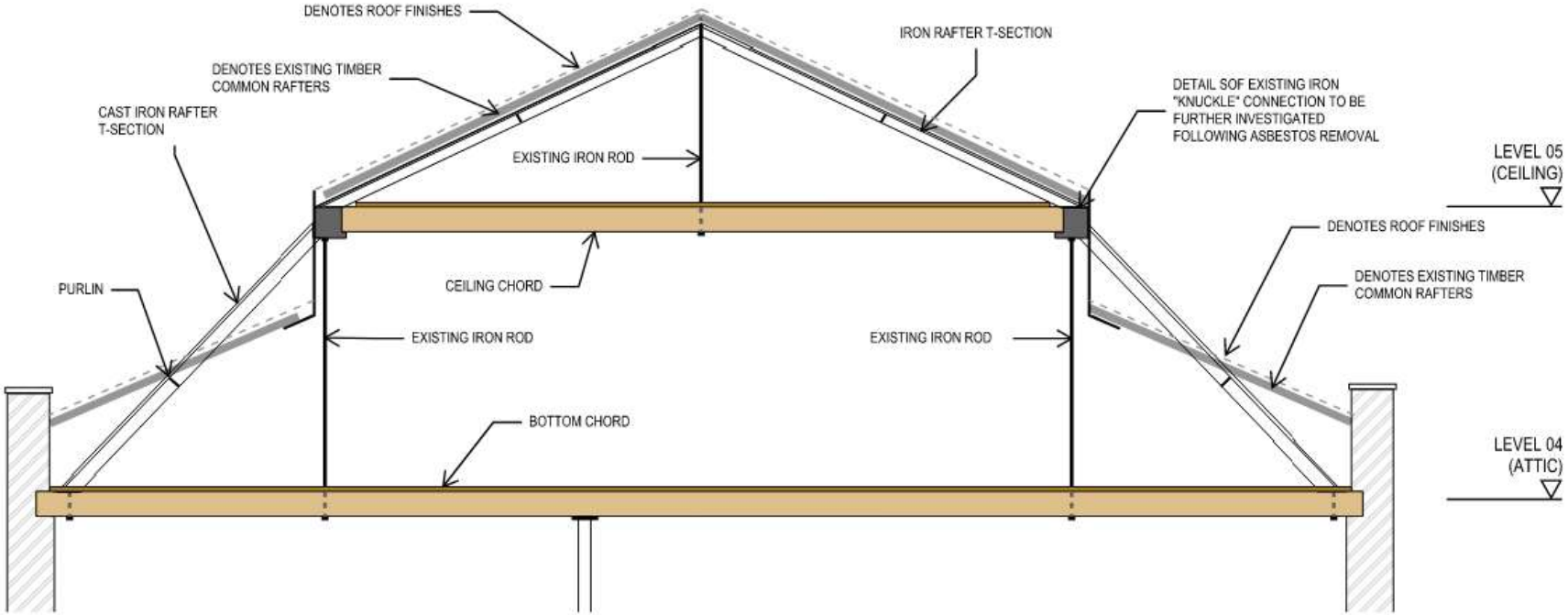


Figure 9 - Typical roof structure section



R001 (2016)



R002 (2016)



R003 (2017)



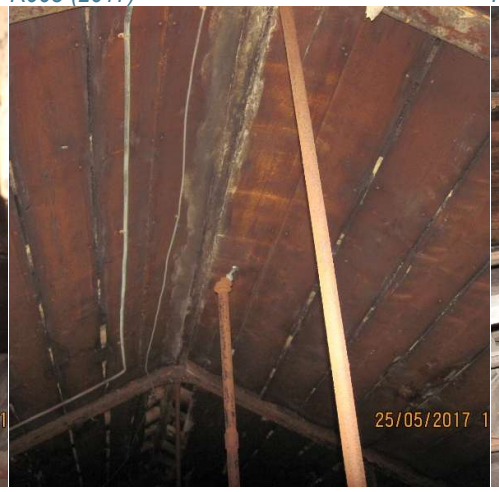
R004 (2017)



R005 (2017)



R006 (2017)

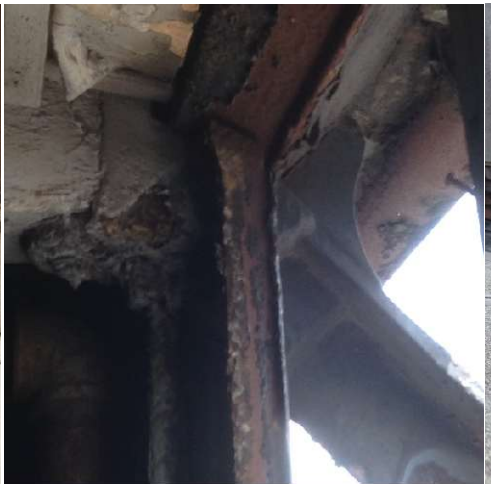


R007 (2017)



R008 (2017)


R009 (2017)


R010 (2017)


R011 (2017)


R012 (2017)

4.6.3. Proposed works

Refer to Civic drawing 1698-CIV-XX-04-D-S-10104 for extent of anticipated demolition works

Refer to Civic drawing 1698-CIV-XX-04-D-S-80004 for extent of anticipated proposed works and interventions

Defect Repairs

Based on photographic evidence, it is anticipated that the majority of the existing timber sarking boards and common rafters (both **moderate significance - TBC**) have decayed beyond fitness for re-use and will be replaced on a like-for-like basis. Any elements which are not structurally decayed are to be retained for re-use in-situ, or elsewhere in the roof.

Structural Strengthening

It is proposed that the roof finishes will be replaced on a like-for-like basis and therefore it is expected that extensive strengthening works to the secondary elements of the roof (rafters and purlins) will not require strengthening.

Strengthening is required to the principal trusses to strengthen (see Section 4.5) and address inherent flaws in the structural arrangement (this is discussed in detail within the Structural Appraisal report). It is proposed to supplement the truss arrangement with additional members, leaving all original elements in-situ.

Proposed roof terraces

To form the roof terraces, it will be necessary to remove some secondary elements of the roof structure, including the timber common rafters and sarking boards **(moderate significance**). It is anticipated that the vast majority of these will require replacement anyway, but any sections which are suitable for re-used are to be salvaged for re-use elsewhere in the roof.

Where terraces are to be formed, iron purlins (**high significance**) are to be re-positioned lower down the principal rafters, below the proposed terrace floor level.

Proposed Roof Lights

To form the roof lights it will be necessary to remove some secondary elements of the roof structure, including the timber common rafters and sarking boards **(moderate significance**). It is anticipated that the vast majority of these will require replacement anyway, but any sections which are suitable for re-used are to be salvaged for re-use elsewhere in the roof.

To allow light to penetrate to the top floor level of the building, it is also proposed to remove the ceiling joists and boards AT

4.7. External Escape Stair

4.7.1. Summary of proposals

It is proposed to replace the existing external north and replaced with a new external stair structure.

4.7.2. Condition

Both external stairs exhibit signs of extensive corrosion and section-loss. Although a detailed assessment of the structural capacity has not been undertaken at this stage, from a visual inspection it is considered highly unlikely that the existing stairs would adequately support the required imposed and barrier loads required for the stairs to serve as a means of escape.

The stair proposed to be retained should not be used either for building access/egress, or for general maintenance.

4.7.3. Proposed works

A secondary stair is required to provide a compliant level of escape from the upper floor levels. This stair is required to be of fire-resistance construction, have a minimum width of 1100mm, and is required to be protected from adverse weather.

Currently, the existing stair does not meet any of the above criteria for a compliant means of egress from the building. The proposal is to retain the southern stair and replace the norther stair with a new staircase which meets the criteria for a safe means of escape from the building.

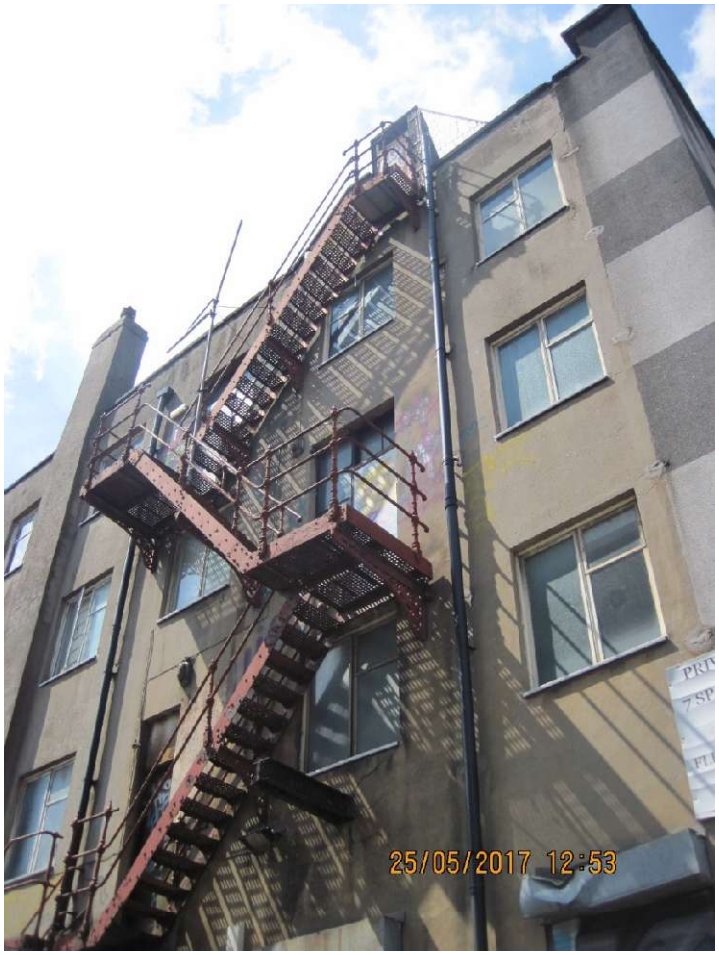


Figure 10 - External stair proposed to be removed

4.8. Lifts

4.8.1. Summary of proposals

Proposals are to enlarge the lift to allow the installation of modern DDA compliant lifts

4.8.2. Condition

The structure of the lift shafts is of reasonable condition and deemed suitable for re-used, subject to receipt of guide-rail load checks once received.

4.8.3. Proposed works

Following a survey of the existing lift shafts, it is anticipated that the lift shafts will require enlarging in order to provide DDA compliant lifts. To expand the lift shafts (**moderate significance**), one wall of each lift shaft will need to be demolished, along with a small area of existing millboards (**high significance**). It has been assumed that new lifting beams at the head of the lift shafts will be required.

4.9. Façade

4.9.1. Summary of proposals

Existing render will be removed from all elevations. The original two-bar archway to Newton Street will be reinstated, along with a two-bay new archway to the rear courtyard elevation.

4.9.2. Condition

Refer to Civic drawing 1698-CIV-XX-ZZ-D-S-13001 for extent of defects identified to date. Note that a further survey is to be undertaken post render-removal which may reveal further defects.

According to Hutton + Rostron's Masonry Condition survey report:

> *External walls were generally dry but there were localised areas of concentrated water penetration where sampling was concentrated. Where tested, the majority of samples identified elevated levels of moisture and these areas generally correlated with where external moisture sources were identified. Samples with the highest levels of elevated moisture were generally to the south-east/rear elevation. All samples taken at Basement level were 'saturated' and this is typical of below ground earth-retaining walls.*
>
> *"The internal brick face to the external walls is mostly concealed behind paintwork, however there are areas at first floor level where sandblasting has been undertaken to reveal the brick finish. Whilst the walls are considered to be generally structurally sound, the majority of the brickwork is in reasonably poor condition with areas of missing bricks, poor pointing and localised cracking or damaged bricks. There is evidence of previous remedial works having been undertaken in areas such as window cills where different brick type and age is observed. The moisture within the brickwork, and extent of wet/dry rot has been determined through specialist surveys and testing undertaken by Hutton + Rostron in October 2025."*

4.9.3. Proposed works

Refer to Civic drawing 1698-CIV-XX-ZZ-D-S-13101 for extent of demolition works

Refer to Civic drawing 1698-CIV-XX-ZZ-D-S-83001 for extent of proposed works and interventions

Defect Repairs

The main structural works to the façade (**high significance**) will comprise localised defect repairs such as crack-stitching, re-setting and stitching of brick-arched lintels, and the replacement of broken stone lintels and cills on a like-for-like basis.

It is expected that the full elevations will require re-pointing in lime mortar, with mix-composition to match the existing (historic).

Newton Street Arch

The former arch on Newton Street will be reinstated back to its original form. Envisaged structural interventions include removal of the infill masonry (**moderate significance - TBC**) stabilisation of the brick-arch, likely incorporating stitching and anchoring including the installation of heli-bar or Cintec type anchors, or similar. Some replacement of the brickwork is anticipated, utilising reclaimed bricks to match existing. The full extent of works will be determined once the render has been removed.

Courtyard Arch

A new arch is to be formed in the rear elevation to mirror the arch in the Newton Street elevation. This will require removal of two-bays of original brickwork (**high significance**) from ground floor to just above first floor level.

New external stair

The proposed new external stair will require support from the existing building which will require padstones to be inserted into the external walls (**high significance**)

Appendix A

Engineer CVs





AVRO Brownsfield Mill, Manchester

James Bruce

Director

MEng (Hons), CEng, MICE, MIStructE

James is a chartered engineer with 19 years' experience based in our Manchester Studio. As Director he is responsible for co-directing the growth and success of the Manchester and Leeds studio as well as having oversight of structural engineering led projects for the North. He has a passion for the built environment and has a multi-discipline background.

James has wide-ranging experience across multiple sectors. He is currently leading teams on education projects, large-scale commercial and residential developments, theatres, culture, and music venues. On several occasions he has been involved in the successful transformation of historic or listed buildings, with his work restoring and refurbishing a number of Listed buildings in Manchester being shortlisted for regional awards.

Project Experience

Goods Yard, Stoke-on-Trent, Capital & Centric: The joint venture between developers Capital & Centric and Stoke-on-Trent City Council aimed to revolutionise the historic Goods Yard site and turn it into a community destination that will include a mix of residential homes, a hotel, commercial office and leisure space. The site was a historical Goods Yard for freight via the railway and was used as a transition site for freight being transferred between the railway and the canal. The development included the design of a new 10 storey residential building providing 174 homes as well as a new public and market space, with mezzanines and events space within an existing two storey fan vaulted arch basement. The existing industrial shed has been demolished and replaced with a new two-storey commercial pavilion with public realm at ground level connecting the hub and the residential buildings, as well as providing a connecting route to the nearby station. James was the Project Director overseeing the design and construction of the project.

Mackie Mayor, Manchester, Market Operations Limited: James led the structural team who helped convert the Grade II listed former meat market. Manchester's newest foodie destination has undergone careful refurbishment and alteration. The brief was to make as little intervention as possible to maintain as much of the original feel. The new large central staircase needed to accommodate the circulation of people in the building, whilst also complementing the character of the listed building fabric and providing a feature of its own right in a prominent space in the building.

AVRO Mill, Manchester, Town Centre Securities/Urban Splash: A grade II* listed Brownsfield mill building refurbishment and residential conversion maintaining the heritage of the existing building whilst providing a modern and comfortable living environment. The owners decided to decant the tenants and undertake sufficient repairs to arrest any further decay and protect the historic features and character of the building. The scope involved complete refurbishment of the brick envelope, including chimney stack, strip and refit the entire roof and replace all windows. We were then appointed to Urban Splash for the redevelopment and fit out of the building into apartments.

Band on the Wall Manchester, Band on the Wall: James was the Project Director for the Band on the Wall, "Keep on Moving" project, a £3.5m extension of Manchester's iconic Band on the Wall venue and the restoration of the neighbouring Cocozza Building, jointly funded by the National Lottery Heritage Fund (NLHF) and Arts Council England (ACE). The works also included the provision of flexible studio classroom and rehearsal space, a second smaller performance space and the relocation of the existing entrance and glass frontage of the Picturehouse. Structural engineering aspects of the restoration of the derelict Cocozza building incorporated the threading of a new structural steel frame behind the retained and fragile masonry façade as well as proving the existing masonry corbelled foundations for

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reuse for the change in building use.

Chancery House, Liverpool, Chancery House: Grade II listed building located in the heart of Liverpool, a £6 million refurbishment of the existing building. The original structure was built in 1899 and located on Paradise Street in Liverpool city centre. Chancery House was the former home of the Gordon Smith Institute for Seamen. The main accommodations is apartments with a commercial space spread over the ground and mezzanine with a two-storey braced steel frame extension at roof level, and a new six-storey steel frame link building.

Hotspur Press, Manchester, Manner: Hotspur Press, which dates back to the 19th century as a waterside textile mill, is a five-storey building with split-level basement, with load bearing brick masonry facade. The building is a key asset in the heart of Manchester city centre, and Manner propose to construct a 36 storey tower providing purpose built student residential accommodation, whilst retaining the prominent Grade Listed masonry façade of the existing building. There will be a new basement constructed to accommodate amenity space over 2 levels. Planning was submitted in December 2023. James is the Project Director leading our structural engineering input and has been involved through the concept design stage when the project changed from residential apartments to PBSA.

Prudential Building Oldham, Oldham Metropolitan Borough Council: The refurbishment and reuse of the historic Grade II listed building, formally the home of Prudential Insurance in Oldham Town Centre into a revitalised Innovation Centre and landmark destination for Oldham Council in the town centre. The building is vacant and in a state of significant disrepair. It is proposed to restore, refurbish and redevelop the Prudential to facilitate a new workspace use. The workspace provision will be flexible and adaptable, comprising the opening up (in part) to the current cellular spatial arrangement. James is the Director overseeing delivery of the civil and structural engineering design.

Stonyhurst College, Lancashire, Stonyhurst College: James is the Project Director for Stonyhurst College. This project involves a structural appraisal of the Grade II Listed Old Infirmary Building, along with the conversion of use to student accommodation. James has ensured close liaison with the school, particularly the Estates Manager, to understand the school's timetable and to review the school's archive of information to identify and existing information that could be reused to save money on surveys. Initial commission which has led to a number of further projects across the college estate.

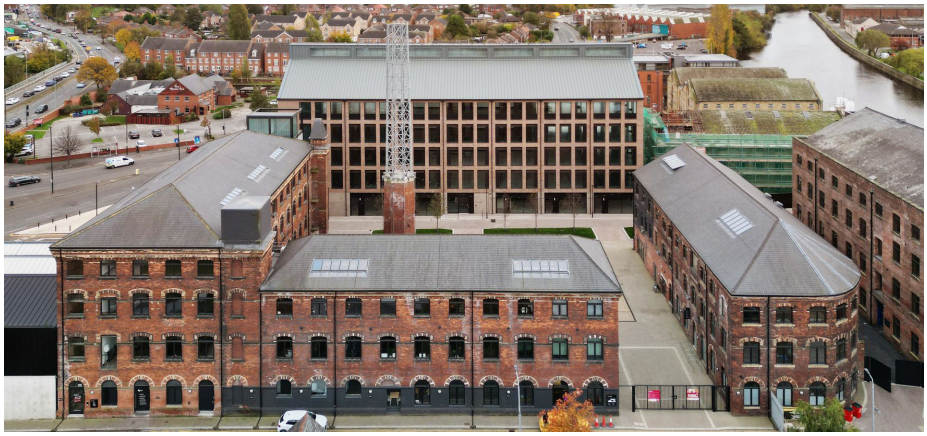
Caernarfon Island Site Redevelopment, Caernarfon, Gwynedd Council: The regeneration of Caernarfon's historic waterfront buildings, which incorporates the Grade II* listed Harbour Masters Office Building. The site was refurbished and re-developed to create an artisan quarter, celebrating the site's manufacturing history through a series of work spaces for small scale artisan design, manufacture and retail occupiers, together with a small number of holiday apartments. The site falls partly within flood zone C2. Flood risk to the final occupants of the artisan workshops, and more importantly, the holiday lets that are categorized as 'highly vulnerable'.

Accrington LUF Projects, MAC Construction Consultants: James is leading the civil and structural engineering team on the refurbishment of several historical buildings (RIBA Stage 2 to 5). Including the Grade II Listed Accrington Market Hall, Burton Chambers and Market Chambers. The scope includes facilitation of a temporary decant market and drainage advice.



Chancery House, Liverpool





Tileyard North, Wakefield

Hannah Keighley

Senior Associate

MEng (Hons), CEng, MICE, MIStructE

Hannah is a Chartered Engineer with over 14 years' experience in civil and structural engineering consultancy across a wide range of sectors including commercial, industrial, leisure, residential, health and education. She is experienced in leading project design and delivery from inception through to completion, including value engineering, project management, and complex analysis. She has keen interest in historically significant and listed buildings, enjoying unlocking their full potential and updating them to modern standards in keeping with their prestige and legacy.

Her technical skills extend across a wide range of materials and solutions. She has completed designs in steel, in-situ and precast concrete, composite steel and concrete, masonry and timber. Hannah has comprehensive experience on new-build braced and moment frames, extensions, alterations and refurbishments across a wide range of sectors.

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Project Experience

Aire Street Workshops, Leeds: Civic was commissioned by Workwell Offices, to undertake a study relating to the site at 30-34 Aire Street, Leeds and provide a summary report which explored the feasibility of proposed structural alterations an interventions such as a vertical extension of one or two storeys, the addition of an external circulation core, and alterations to the internal layouts. Hannah led the structural appraisal, which considered the key design considerations, constraints and risks, the nature, quantum and extent of investigatory works to develop proposals, and the anticipated level of structural interventions required, allowing the Client to make informed decisions regarding which aspects of the works were viable to take forwards. The appraisal considered the impact of proposal alterations on the vertical and lateral stability of the structure, a quantitative assessment of load increases to the existing structure, and therefore the expected extent of any strengthening works required.

Cocoa Works – Library, Pavilion and Convenience Store, York, Clarion Housing Group: The project comprises RIBA Stage 3 design for a new standalone pavilion and extension to an existing Grade II Listed library. The pavilion has a striking architectural design which celebrates and exposes the structure of the building, requiring considered design of the structural elements and connections. The external walls to the pavilion are principally glazed, requiring tight control of structural deflections and deformations. The library extension also heavily utilises glazing to the wall and roof structure. Centrally within the library extension a cocoa tree is proposed within a sunken area which sits within an existing underpass which is accessed from the rear of the existing library and extends under the library itself, below the highway and up to the hospital opposite. The existing underpasses adds a challenging element to the project as it is partially used to form the sunken area to the library extension, and in part as use as a plant room. Civic also provided input into the refurbishment and retrofit of the existing library and undertaking a structural condition appraisal of the listed structure. Hannah is project Lead at Civic and is the key point of contact for the client and design team. Hannah is overseeing the engineering design and production of structural deliverables including drawings and reports.

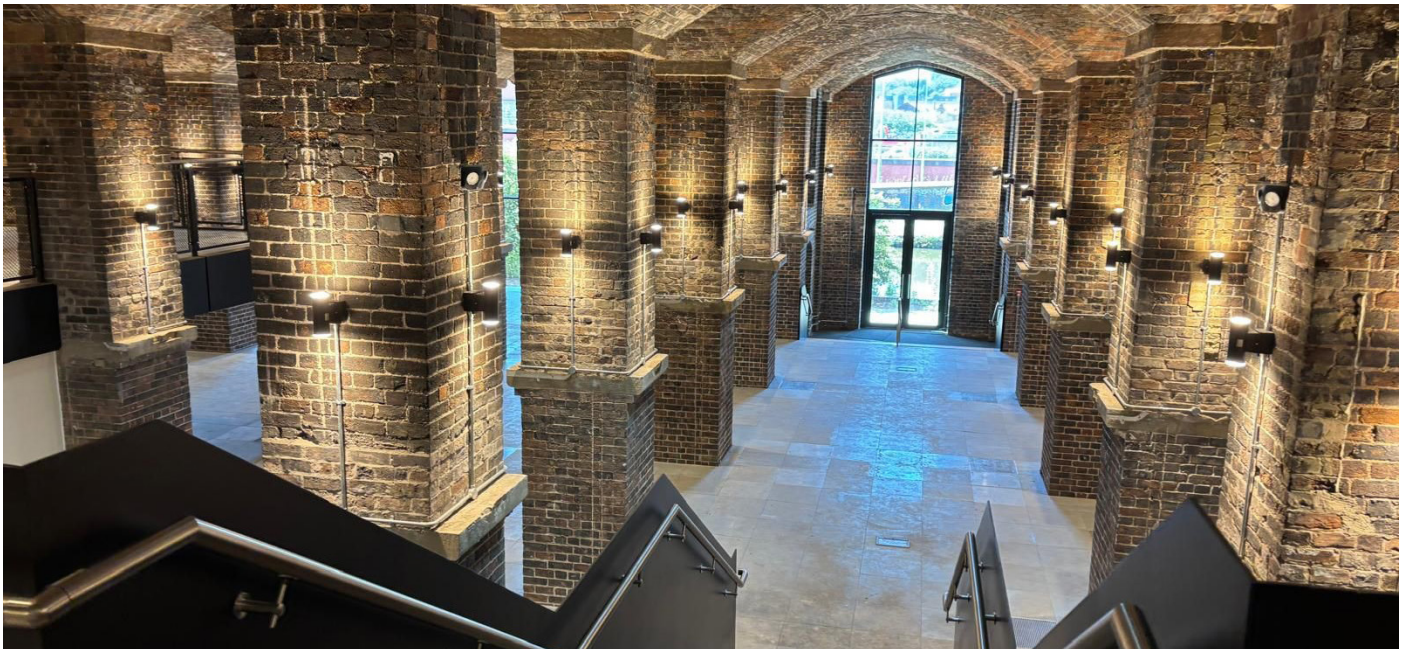
Tileyard North, Wakefield, City & Provincial: A 1200m2 mixed-use regeneration of Rutland Mills, a Grade II* listed complex at the edge of the River Calder. The overall vision of City and Provincial Properties is to repurpose Rutland Mills to create a rich, vibrant, mixed-use sustainable creative quarter, 'Tileyard', at the heart of Wakefield Waterfront. The formation of a new creative quarter requires imaginative and flexible re-use of heritage assets along with significant investment in new public realm to create an external environment that is as attractive as the internal environment. Alongside the retention, re-use and re-invention of 8 key Grade II* listed buildings and the formation of a large open-air events space in the heart of the mill complex with access to and views of the river. Hannah's involvement on the project

extends across a number of the buildings and structures on the site, including Building 6, which is the repair and retro-fit of an existing four-storey mill building comprising solid masonry walls, iron and timber floors and steel trussed roof. The works required an assessment of the existing building frame to accept revised loading for its new use as a hotel. Modifications to the existing building as part of the shell works included the formation of new openings and additional insulation to the roof structure. Hannah also oversaw the design of a new circulation core structure external to the building to provide a secondary stair and lift access to the building. The Building 6 works also incorporated a range of external works including a new bar area, completion of the river deck structure over the River Calder including the addition of a new access stair and ramp.

Goods Yard, Stoke-on-Trent, Capital & Centric: The site includes a new build ten-storey concrete frame residential building providing 174 homes, for which we developed the structural design. The structural design for the residential building comprises insitu reinforced concrete (RC) flat slabs, 250mm thick, supported vertically by insitu RC columns. Further vertical support is provided by an insitu RC core. The existing vaulted basement of the Goods Yard is retained and the previous industrial shed above demolished and replaced with a new single storey commercial pavilion, with 17,000sq ft commercial space. The basement was redeveloped into commercial and market space, with mezzanines and events space. Hannah was responsible for initial fact-finding investigation and loading study on an existing rail good yard. Through a range of investigative techniques, Hannah explored the age and history of the structure, and carried out a high-level initial feasibility study to determine the capability of the building to accommodate loadings from the proposed development and set limits upon what could be achieved.

Trinity House Buoy Shed, Hull: As part of Hull East Bank Village Regeneration, Civic was commission by Muse to undertake a structural appraisal of the former Trinity House Buoy Shed (the Buoy Shed), and the Tubular Crane in Hull. Civic undertook an initial site visit and non-intrusive inspection of the Buoy Shed and Tubular Crane to evaluate the overall condition of the structures, and to determine the requirements for any further specialist surveys and testing. Hannah led the appraisal of the existing structure(s) and was responsible for reporting on the condition, and for outlining the scope of initial structural works required to stabilise the existing building and prevent further deterioration. This assessment looked to minimise the extent of intervention where possible, and where interventions were required, these were specified following best-practice conservation; retaining as much of the original structural fabric as possible, and detailed to be reversible where feasible. The structural appraisal and initial proposed works were submitted as part of the Listed Building Consent application, which is currently under determination.

Stooperdale Offices Refurbishment, Darlington, Railpen: We are providing structural engineering for Railpen's planned refurbishment of their Stooperdale offices, located in a Grade II listed Baroque Revival building in Darlington originally built in 1911 for the North Eastern Railway Company. Hannah is leading the appraisal of various building components with a non-intrusive structural inspection, specialist surveys and desk-based study, as well as intrusive investigations to produce a structural appraisal report. While Civic was not appointed to undertake any formal RAAC surveys, Hannah identified suspected RAAC during a site inspection and informed the owner of its possible presence in three extensions that were constructed at the same time circa 1970. She directed precautions to avoid deterioration in case the material is RAAC and proposed further assessment and possible remediation strategies.



Goods Yard, Stoke-on-Trent

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