

# LIVERPOOL ROAD HOTEL, MANCHESTER EXISTING BUILDING REFURBISHMENT STRUCTURAL SUMMARY



Rev: P01  
Date: 04.07.2023

## SCOPE

This report provides a summary of the proposed structural works for the existing building being carried out as part of the refurbishment and extension of 123-125 Liverpool Road in Manchester. Reference should be made to the Stage 4 drawings for the proposed works to the existing building superstructure as well as the structural condition survey report for full details of the works and their purpose.

The full list of Stage 4 drawings issued is as follows:

- LRH-REN-XX-GF-DR-S-01100 – Ground Floor Plan
- LRH-REN-XX-01-DR-S-01110 – 1<sup>st</sup> Floor Plan
- LRH-REN-XX-02-DR-S-01120 – 2<sup>nd</sup> Floor Plan
- LRH-REN-XX-03-DR-S-01130 – 3<sup>rd</sup> Floor Plan
- LRH-REN-XX-04-DR-S-01140 – 4<sup>th</sup> Floor Plan
- LRH-REN-XX-ZZ-DR-S-03300 – Existing Building Refurbishment Details Sheet 1
- LRH-REN-XX-ZZ-DR-S-03301 – Existing Building Refurbishment Details Sheet 2
- LRH-REN-XX-ZZ-DR-S-03302 – Existing Building Refurbishment Details Sheet 3
- LRH-REN-XX-XX-DR-S-09100 – Floor Strengthening Isometric Views

Structural works may also be required at basement level of the existing building. However, these will be addressed separately once the proposals for the basement have been developed further.

## PROPOSED REMEDIAL WORKS

The proposed remedial works shown on the Stage 4 drawings are based on the recommendations from the structural condition survey report (reference: LRH-REN-XX-XX-RP-S-00002). The key items being addressed are highlighted below.

### ***Reinstatement of Collapse Zone within No. 123***

To reinstate the sections of ground, 1<sup>st</sup> and 2<sup>nd</sup> floor that have collapsed within the eastern part of 123 Liverpool Road and support the end of the roof truss above this area, a new steel frame is to be installed supporting the timber floor infills. The new sections of floor will be tied into the external wall on Old Medlock Street and rigid boarding will be glued and screwed across the joists to ensure that lateral loads acting on the wall can be transferred back into the load-bearing walls providing lateral stability for the building. Drawings LRH-REN-XX-ZZ-DR-S-90006 to LRH-REN-XX-ZZ-DR-S-90008 show the full details of these works and a statement has been produced as justification for the principles of the works when considered within the context of the listed building (reference: LRH-REN-XX-XX-RP-S-00003).

### ***Restraint of External Wall on Woollam Place***

Due to the visible bow to the external wall on the west elevation of 125 Liverpool Road adjacent to Woollam Place, remedial ties are proposed to be installed along the elevation at 1<sup>st</sup> and 2<sup>nd</sup> floor. The existing deteriorated floorboards are also proposed to be replaced with new rigid boarding glued and screwed across the existing joists adjacent to the wall to ensure that any lateral load can be transferred into the adjacent load-bearing walls and act as restraint against any further movement. A Helifix tie rod detail is proposed to be used so that the visual impact on the external elevation is minimal. Refer to the Stage 4 drawings for further details of these works.

### ***Repair of Deteriorated Masonry***

Where areas of masonry have deteriorated within the building, the intention is to re-build these with new brickwork on a like-for-like basis fully bonded into the existing walls. Where cracking has occurred, Helifix repair details are proposed to act as restraint against any further movement whilst minimising the visual impact. Refer to the Stage 4 drawings for further details of where these works are to be carried out within the building.

### ***Repair of Decayed Timber Elements***

Where timber elements have decayed within the building, repair details have been prepared and included on the Stage 4 drawings. These have been developed as traditional timber carpentry repairs where possible to ensure minimum intervention and compatibility with the historic construction materials.

### ***Remedial Works to Pavement Lights***

The infilled pavement lights around the perimeter of the basement are generally in poor condition with significant water ingress and the lintels supporting the openings decayed or cracked. To ensure the integrity of these areas of the structure and avoid further deterioration of adjacent elements, it is proposed to remove the existing infills and lintels to allow them to be replaced with new concrete slabs and lintels as per detail 319 on the drawing LRH-REN-XX-ZZ-DR-S-03302.

### ***Remedial Works to Rear Section of No. 123***

The rear section of 123 Liverpool Road is currently inaccessible due to the area of structural collapse noted above. From the vantage points available within the building, it appears that the roof has dropped and the timber floors are in poor condition. As such, remedial works are expected to be required here as well. Timber floors will be retained where possible but in areas, these are likely to require either strengthening or replacement. The external walls will also need tying back into the internal structure with diaphragm action being introduced by installing rigid boarding glued and screwed to the floor joists. Due to the apparent condition of the roof, this is likely to need replacement. The details of these works will be developed once access is available into the rear of No. 123. For an indication of potential works required to the gable wall of this part of the building where it abuts the current rear extension, reference should be made to drawing LRH-REN-XX-ZZ-DR-S-03310.

## **PROPOSED WORKS TO ALLOW FOR NEW USE**

As well as the remedial works to the building, other structural interventions are required to accommodate the proposed use of the building as a hotel and the architectural intent of the floor plates. The key interventions are highlighted below.

### ***Floor Strengthening***

The main aspect of the proposed works is to refurbish and extend the existing building for use as a hotel. Although parts of the building have been historically used as a hotel or offices, some of the areas at the upper floors have only been used for residential purposes.

To ensure the floor construction is suitable for current fire and acoustic requirements, an increased build-up is also required to be supported by the existing floor joists over and above what has been in place previously.

An assessment of the existing joists' capability to support the additional dead and imposed load noted above which has resulted in areas of floor requiring to be strengthened.

In most parts of the building, this has been achieved by installing rigid boarding glued and screwed to the joists to allow them to act compositely as a stress-skin diaphragm. This is deemed as a minimum intervention option given that the existing floorboards are in poor condition and in need of replacement with new boarding and the joists themselves will be retained in their existing condition where possible. For the full specification, refer to detail 314 on drawing LRH-REN-XX-ZZ-DR-S-03301.

In certain areas where joists are picking up the trimming around riser openings/chimneys or new partition walls above, the installation of boarding alone is not sufficient to provide adequate capacity. In these

instances, the joists are proposed to be strengthened either by sistering with new joists or the installation of steel flitch plates. Reference should be made to the Stage 4 GA plans as well as details 311 and 312 on drawing LRH-REN-XX-ZZ-DR-S-03301 for the locations and full specification of these strengthening works.

#### ***Removal of Stairs within No. 123***

The existing stairs from basement to 2<sup>nd</sup> floor within 123 Liverpool Road are proposed to be removed with floor openings infilled. The openings are to be infilled with timber joists sized to match the depth of the existing joists and to suit the proposed loading requirements. Refer to the Stage 4 drawings for further details of these works and where they are to be carried out.

#### ***Removal of Load-Bearing Walls within No. 125***

Existing load-bearing walls are proposed to be removed at 1<sup>st</sup> and 2<sup>nd</sup> floor within 125 Liverpool Road to suit the intended architectural layouts. This is to be achieved by propping existing joists spanning onto these walls allowing them to be carefully demolished. The existing joists are then to be supported by new steel beams sized to sit within the depth of the new ceilings to minimise the impact on the aesthetic of the listed building. Refer to the Stage 4 drawings for further details of these works and where they are to be carried out.

Author: Philip Whitesmith

MIStructE, CEng, MEng

Checked: Kevin Gilsenan

Conservation Accredited Engineer  
FIStructE, CEng, BEng, MSc, DIC