



STRUCTURAL REPORT DOCUMENT

Archstone Properties
58 Richmond Street
Manchester

CONFIDENTIAL

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1.0 INTRODUCTION

- 1.01 On the instructions of Archstone Properties CCS have carried out a structural assessment of the existing reinforced concrete frame at the building on 58 Richmond street Manchester. The report has been instructed following the concerns regarding defects to the structural concrete of the main building. The client has noticed extensive cracking, spalling concrete and exposed corroded reinforcing bars. We understand the developer wishes to convert the premises into a commercial/retail/residential type building along with a new build extension to the side of the property.
- 1.02 We understand the current building is a listed building built circa 1911. No original historical reports or technical information have been made available for this review by the client. It may be prudent to liaise direct with the conservation team at Manchester council before any remedial works are implemented or instructed
- 1.03 This assessment encompasses a review of the Reinforced Concrete frame only including the following:
- On site general overview of the original structural frame.
 - Facade Visual Inspection
 - Internal Visual Inspection.
 - Comments on the adequacy of the existing structural elements.
 - Recommendations for repairs/replacement of elements of structure.

2.00 DESCRIPTION OF BUILDING

- 2.01 The property is situated on Richmond street, Manchester, a residential and commercial area of the city centre in a conservation zone.
- 2.02 It is not known if the building has any documentation or warranties in force any remedial works carried out previously.
- 2.03 Generally the super-structure of the building consists of :
- Substantial concrete framed construction supporting the roof above the second floor.
 - The existing suspended upper floors (ground, first, second) are historical reinforced concrete using mild steel reinforcing bars and a typical arrangement of the time of construction.
 - The rear element of the building has a concrete sloping roof above 1st floor..
 - The front facade has a 3 storey column arrangement which supports infill spandrel panels and arch feature panels which have exposed reinforcing bars.
 - Internal supporting walls around the stair core appear to be infill masonry
 - The end gable walls are a concrete frame with masonry 275mm thick infill brickwork.
 - The building has a single storey basement with deep concrete retaining walls supporting pavement light structures at ground level externally.
 - It is assumed that the building has a traditional system of foundations under the walls and columns, although no sub structure investigations have been undertaken as part of this review.

3.00 GROUND CONDITIONS

- 3.01 A basement exists to the property. The depth to the top of the foundations cannot be seen however intrusive investigations and soils testing is outside the scope of this report.

- 3.02 No contamination testing or ground water monitoring was undertaken or samples taken.
- 3.03 No asbestos report has been provided, however the current owner should undertake an up to date asbestos survey to investigate the presence of deleterious materials within the building.
- 3.04 No CCTV drainage survey has been commissioned for the benefit of this report.

4.00 SITE FINDINGS/SURVEY

- 4.01 The site visits were undertaken during September 2016 over number of days by CCS Consulting Ltd. The weather was overcast and dry.
- 4.02 The site review was none intrusive and visual only to record all defects that could be seen. Areas that were inaccessible at the time of the survey may have further defects however these have not been recorded in this report.
- 4.03 The building has no internal partitions ceilings or plaster present therefore the structural elements were readily accessible. A contractor was in attendance to remove any loose concrete or significantly degraded reinforcing bars to enable an assessment of the "reduced" sections and strengthen.

4.04 Internal Defects (Refer to the Photo appendix)

Below is a brief description of the typical defects encountered on site. All the defects are comprehensively recorded within the photo log and the schedule of repairs in the appendices to this report.

SECOND FLOOR

- a. Exposed Gable brickwork inner leaf (photo ref 6575).
- b. Exposed re-bar to columns and spandrel panels rear elevation (photo ref 6577).
- c. Re bar exposed over arch (photo ref 6579,6581)
- d. Horizontal cracks and minor concrete cover spalling (photos 6587,6590)
- e. Main roof beams reinforcing exposed and significantly degraded (photos 6598,6599)
- f. Roof slab soffit bar exposed and minor corrosion, also water ingress can be seen through the cracks.(photos 6605, 6606)
- g. Spandrel panel over stair landing exposed and corroded re-bars (photos 6615,6616).

FIRST FLOOR

- h. Column re-bar exposed and concrete cover missing (photo 6617,6618)
- i. Serious cracking can be seen around the inverted window openings to the rear of the property (photos 6625,6626)
- j. Front Facade columns have concrete cover spalling and degraded re-bar (photo 6637,6638)
- k. Water ingress could be seen to the inside face of the facades in some areas (photo 6680)
- l. 2 main beams under the second floor have serious concrete spalling and re-bar section loss. A full calculation check is required on a "Reduced Section Size" however consideration should be given to strengthening these beams (photos 6671,6673,6674,6676)
- m. Spalling and cracking to the columns and beam junction could also be seen (photos 6683,6684)

GROUND FLOOR

- n. Stairwell and arch cracking/spalling recorded to the facade structure (photos 6687,6688)
- o. Minor spalling and corrosion to wall and column sections (photos 6704,6707)

4.05 External Photos

Below is a description of the typical defects encountered on site. All the defects are recorded within the photo log and the schedule of repairs in the appendices to this report.

4.06 External Areas (Refer to the Photo appendix)

Below is a brief description of the typical defects encountered on site. All the defects are comprehensively recorded within the photo log and the schedule of repairs in the appendices to this report. The rear elevation was only partially reviewed due to access issues.

- a. Various defects exist to the front elevation Exposed Gable brickwork inner leaf (photo ref 5078,5079).
- b. Exposed re-bar to columns and spandrel panels rear elevation (photo ref 5083,5085)
- c. Re bar exposed over arch (photo ref 5083)
- d. Horizontal cracks and minor concrete cover spalling to end elevation (photos 5088,5089)
- e. Spalling render to the lower exposed plinth detail (Photos 5091,5092)
- f. Significant corrosion to the external metal fire escape (photos 5086, 5087).
- g. Detached render is visible to the main gable elevations (photos 5094,5095).

5.0 RECOMMENDATIONS/REMEDIAL WORKS

- 5.01 A full defect schedule has been compiled to quantify the amount of remedial works necessary which should be integrated into the overall refurbishment and re modelling project.
- 5.02 We understand an extension is to be proposed on the surface level car Park to the southern Gable
- 5.03 A specification has been completed (including drawings and specifications) to issue to competent contractors for pricing purposes for the remedial works, which will be prepared as a separate document.
- 5.04 In the interim measures should be taken to temporarily prop the elements most badly affected. The building contractor should specify the required temporary works to do so.
- 5.05 The major overall building improvements to be addressed are as follows.....
 - a. Roof beams with cracked spalling concrete.
 - b. Window head and spandrel panel cracking above and below spandrel panels.
 - c. Floor members internally at 1st and 2nd floors have become overstressed, degraded and have also suffered significant section loss and corrosion of reinforcement.
It may be more practical to strengthen these beams rather than a complete break out and reinstatement option. This element of the work should be discussed with the Local Authority conservation team and an approval in principle agreed before any remedial work commences on site.
 - d. The primary R.C floor beams below ground floor are generally in reasonable condition however many areas of spalling concrete and cover to the reinforcement have been recorded and will require repairs.
 - e. Robust building detailing should be introduced to introduce "good practice" repairs to modern building standards to all facades and internal areas.
 - f. All facades display various levels of defect to the structural frame and will require remedial details as specified on the drawings and schedules.

In conclusion our opinion is on first viewing the structural defects appear to be of a major nature however with the correct remedial works design and implementation the building can be repaired to an acceptable standard.

It is envisaged that CCS consulting will be involved in the implementation of the remedial works and will provide help and advice to the developers in the completion of the works. Once the remedial works are completed to an acceptable standard the building will be suitable for conversion to a residential/commercial apartment scheme.

Report compiled by

A handwritten signature in black ink, appearing to read 'L. Smith', written in a cursive style.

Lester Smith
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APPENDIX A

PHOTOGRAPHS