

HARRY SEYMOUR & ASSOCIATES

CONSULTING STRUCTURAL ENGINEERS

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Ref. 10612

STRUCTURAL APPRAISAL

on

FIRST FLOOR

WESTERN WAREHOUSE

VICTORIA WAREHOUSE

TRAFFORD WHARF ROAD

TRAFFORD PARK

MANCHESTER

for

ADAM GEOFFREY MANAGEMENT LTD

LLOYDS HOUSE

LLOYD STREET

MANCHESTER

M2 5WA

21ST SEPTEMBER 2023

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-1-

1.0 INTRODUCTION

We are to undertake a structural appraisal report on the first floor of the western warehouse at Victoria Warehouse to confirm its suitability for its use as event space, as classified in BS6399-1:1996 and BS EN 1991-1-1:2002 category C5, areas susceptible to overcrowding.

Within this assessment we will also consider the dynamic load condition as specified in A.1 of the Annex A to the above codes 'Buildings and structures with areas subjected to dancing and jumping'.

2.0 PROCEDURE

A visual inspection of the Western Warehouse to consider the condition of the existing structure and take necessary construction details and measurement to allow a full assessment to be undertaken.

Desktop assessment of the information from the inspection in conjunction with historical documents to produce structural calculations to justify the imposed (live) load capacity of the first floor.

A vibration assessment of the first floor undertaken by 'Acoustic & Engineering Consultants Limited', including calculations and 'onsite' testing to consider the dynamic load condition.

3.0 FINDINGS

The Western Warehouse is a former 4 storey warehouse with a construction date of 1925.

The warehouse is in 4no sections divided by significant masonry walls running front (N) to back (S) spaced at 14.0m centres. Within the sections the first floor is supported on beams and columns on a 4.1m by 3.5m grid pattern.

The first floor and supporting structure was inspected and found to be in a good condition.

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-2-

The inspection revealed the construction to be:

- The floor is constructed out of reinforced concrete incorporating clay pots to form ribs. The floor has an overall thickness of 260mm with 100mm ribs at 343mm centres reinforced with 4no 16mm diameter bars, 2no at 215mm down from the top of the slab and 2no at 145mm down. Between the ribs there are 243*150mm deep clay pots with approximately 20mm walls and a centre fin.
- The floor is supported on beams at 4.1m centres.
- The beam is a steel 'I' section with tapered flanges measuring 15" deep by 6" wide. The beam is fully concrete cased with the casing measuring 260mm wide and 430mm deep from the underside of the floor slab. The beam is simply supported onto the columns with support being by the use of a bracket connected to the column using 6no 18mm rivets and connected to the beam with 2no locating bolts.
- The beam is supported on columns and walls at 3.5m centres.
- The column is a steel compound stanchion with an 'I' section with tapered flanges measuring 8" deep by 6" wide and with 2no 9" wide by 5/8" thick plates, one to each flange. The column contained concrete infill from the web to the extents for the plates.
- The ground floor to underside of first floor is 4.050m.

A review of historical information with regards to potential imposed (live) loads for buildings of this type can be found in codes used prior to the construction date of the building (1927) and are indicated as follows:

- Dorman Long & Co Handbook 1895 – 120-320 lbs/sqft.(5.8-15.4 kN/m²)
- Applebys Handbook 1903 – 125-150 lbs/sqft (7.2-14.4 kN/m²)
- London County Council Act 1909 - >224 lbs/sqft (>10.8 kN/m²)

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-3-

4.0 STRUCTURAL ASSESSMENT

From the structural analysis within appendix A the findings are as follows:

- The first floor was analysed firstly using the designed imposed load of 5.0kN/m^2 . This analysis indicated that the floor was more than capable of supporting this load. On this basis the first floor was then analysed for imposed loads of 7.5kN/m^2 & 10.0kN/m^2 to assess if the floor could support these loads. Both these analyses indicated that the floor to be capable of supporting the loads.
- The first floor support beam was analysed from safe load tables to calculate the maximum floor imposed load that could be applied. The results of the analysis revealed that the beam would be capable of supporting a first floor imposed load of 18.87kN/m^2 .
- The first floor support beams connection to the support column was analysed to calculate the maximum floor imposed load that could be applied. The results of the analysis revealed that the beam support brackets would be capable of supporting a first floor imposed load of 14.16kN/m^2 .
- The beam support columns were analysed from safe load tables to calculate the maximum floor imposed load that could be applied. The analysis takes account of loads from the above structure and divides the maximum floor imposed load evenly between all floors (the maximum floor imposed load could be applied to all floors together). The results of the analysis revealed that the column would be capable of supporting a first floor imposed load of 14.08kN/m^2

5.0 VIBRATION ASSESSMENT

The vibration assessment undertaken by 'Acoustic & Engineering Consultants Limited', report reference P5051/R1/WJK is attached with appendix B.

The analysis revealed both calculated values and test values giving natural frequencies in excess of 20Hz well above frequencies that would cause resonance to be considered.

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-4-

6.0 CONCLUSIONS

The structural load assessment of the floor and supporting structure shows that it is capable of supported an imposed (live) load in excess of 10.0kN/m². This assessment would correlate with the anticipated imposed (live) load from the historical data.

As the design imposed (live) load is 5.0kN/m² we can see that there is a significant factor of safety.

The vibration assessment undertaken by 'Acoustic & Engineering Consultants Limited' shows that the natural frequencies of the floors are in excess of 20Hz. This is well above the 8.4Hz that would cause resonance to be considered.

When we consider the previous comments, we would conclude that the first floor of the Western Warehouse is suitable for use as an event space, 'category C5, areas susceptible to overcrowding'.

For Harry Seymour & Associates



M. D. Seymour, B.Eng.(Hons.), C.Eng., M.I.Struct.E.

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APPENDIX A

(Structural Analysis)

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APPENDIX B

(Vibration Assessment)

DRAFT