

P10335/23/10

STRUCTURAL INSPECTION

AT



**THE GRANARY, CHESTERTON MILL
FOR
BENCHMARK LIMITED.**



Certificate Number 14272

ISO 9001
ISO 14001
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REPORT VERIFICATION

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STRUCTURAL INSPECTION REPORT
THE GRANARY, CHESTERTON MILL.

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1 INTRODUCTION

Thomas Consulting has been commissioned by Benchmark Limited to carry out a full structural inspection of the old granary building at Chesterton Mill. The report has been commissioned to review the feasibility of converting the existing building for residential domestic use. This report will review whether structural defects are present within the property.

We have confined this inspection to those structural elements of the property which are typically associated with the structural fabric e.g. walls, floors and, where exposed, footings.

The inspection is confined to a visual inspection of the property, and we have not investigated woodwork or other parts of the structure which are covered, unexposed or inaccessible. We are therefore unable to report that any such part is free from defect.

The object of the report is to assess the effect of any defects on the structural integrity of the property. No assurances can be implied as to the effect that the reported defects may have on the current or future saleability of the property.

Defects identified in the report may not be sufficient to cause significant structural weakness of such an extent to prevent normal use of the property but could be unacceptable on aesthetic grounds. The client should therefore consider whether or not the defect is acceptable or desirable on these grounds and seek qualified advice as to the effect on the market value of the property.

Please note the appended Conditions of Inspection.

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2 GENERAL

The property is located on a sloping site 8 miles to the West of Wolverhampton City centre. The property is a two storey mill building that is cut into the existing ground slope. The building is steel framed with suspended timber 1st floor and solid ground bearing concrete floor at ground level. The roof is formed from corrugated fibre concrete cladding carried by steel angle purlins that span on to steel trusses. The steel trusses are formed from angle sections and are carried in some areas by the steel columns to the frame below and in other locations by masonry walling. The masonry walls are supported by the steel frame below. At the rear and to the left, the ground levels extend up to 1st floor level, with the perimeter walls being retaining. The retaining walls appears to have been formed from steel trusses at the base of the wall, which carry precast concrete panels.

To the right end of the building there is an old barn structure, for which some original walls still exist, however floors and roofing have been lost.

We estimate that the original granary building was constructed at some time during the late 19th Century. The dilapidated barn to the right is likely to date back to over 200 years.

The Geological Survey for England and Wales, BGS website indicates that the property is situated upon bedrock geology of Helsby Sandstone Formation - Sandstone, Pebbly (gravelly). Sedimentary Bedrock formed approximately 242 to 247 million years ago in the Triassic Period. Surface deposits are recorded as Glaciofluvial Deposits, Devensian - Sand And Gravel. Superficial Deposits formed up to 2 million years ago in the Quaternary Period.

Our inspection took place on Wednesday 1st November 2023 the weather at the time of inspection was overcast, and cool, with occasional rain.

3 SYNOPSIS

The report identifies the defects that are noted in Section 4 below. There is some areas of section loss at the bases of the steel columns. There is some spalling and cracking evident to the retaining walls at ground floor level. There is significant instability evident to the dilapidated old barn structure.

There may be observations recorded under section 4.0 of the report which are highlighted by italics. These related to defects which fall outside of our brief but have nonetheless been included as part of the inspection. No further advice may be given in respect of these items, but the Client should be aware that they may require further investigation or remedial action.

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4 OBSERVATIONS

Notation: - The terms left, right, front and rear elevations are used in respect of an observer standing in the Driveway to the West and facing the property.

The terms left and right when used in respect of other individual elements are made with respect to the observer's relative position when making the observation.

General: - All walls are covered with wallpaper, floors carpeted, and rooms furnished, unless specifically noted otherwise.

Inspection Findings:

4.1 Front Elevation

- Brickwork generally vertical.
- No significant structural cracking observed.
- Steel framing has surface corrosion generally. Frame was found to be reasonably vertical.
- There is some loss of section to webs of steel columns at the base.

4.2 Right Side Elevation

- Stone walling to the right elevation of the granary building is the left wall of the old barn, which is formed from stone block.
- The masonry wall is uneven, but reasonably vertical, with no significant structural cracking.
- There are corrugated concrete panels to the gable pike of the granary wall at the top. The panels are weathered with evidence of corrosion to fixings.

4.3 Rear Elevation

- 1st floor wall exposed only.
- Masonry is reasonably vertical and free of significant structural cracking.
- Steel pots are exposed to the outer flange and has significant surface corrosion.

4.4 Left Side Elevation

- 1st floor wall exposed only.
- Large access door to centre with masonry surround.
- Masonry found to be reasonably vertical and free of significant structural cracking.

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4.5 Internal Ground Floor

- There are longitudinal and lateral cracking to the ground floor slab at joint locations, and the slab is uneven.
- There are cracks and spalls to the precast sections that form the retaining walls to the rear and left sides. The face of the retaining walls lean back at between 1 in 10 and 1 in 5.
- All columns were found to be reasonably vertical but have significant surface corrosion.
- Timbers forming the floor above are exposed and found to be 50x75 timber members spaced at 400mm centres.
- Steel posts are 256x127RSJ and are spaced at 5025mm centres (approx.).
- Front and rear walls are supported by 356x152RSJ beams spanning between posts.
- Timber floors are supported by 305x127RSJ beams, spaced at 2.5m centres.

4.6 Internal 1st Floor

- Exposed trusses to roof have surface corrosion but are in reasonable condition.
- Trusses at some locations sit over the steel columns to the main frames but sit on masonry at other locations.
- Trusses have a 80x80RSA top chord member with the bottom chord and internal members from 60x60RSA. The truss spans 5.25m between walls.
- Purlins to the roof are 80x80RSA spaced at a maximum of 1.2m centres.
- Walls at 1st floor found to be reasonably vertical, but uneven, with no significant structural cracking.

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5 DISCUSSION

The existing steel frame to the structure is sufficient to sustain loads associated with the proposed conversion to domestica accommodation. The floor joists, however, are very lightweight and will require replacement.

We understand that the proposal is to reform the 1st floor walling in timber framing. This can be accommodated between the projecting steel columns. If the trusses are positioned and fixed to the head of the columns, it is believed that this will be sufficient to support the proposed lightweight roofing. The existing steel angle purlins, however, will require replacing.

There is some decay evident at the bases of some of the steel columns, however, this appears to be largely confined to the webs, and can be plated.

There is no evidence of foundation movement within the property. The proposed remodelling of the property will see a reduction in dead loading to the building, therefore, foundations are deemed acceptable for the conversion. The retaining walls to the left end and rear will need to be remodelled to allow for suitable inner space arrangements. Removing the existing slab and forming reinforced concrete walls to these elevations will be the best option here. The steel embedded within the rear wall will need to be reviewed for condition but could be encased within the new structural retaining wall.

The remaining masonry walling to the old barn is in poor condition. To the East, the wall is retaining the ground beyond. We understand that a new decking area is proposed at this location, the decking should therefore be used to restrain the masonry walling and assist in resisting the retaining effects. The free standing wall above the decking should be reduced to a maximum height of 2.0m.

The walls at the West side of the building are in very poor condition and lean significantly. The walls should be reduced in height to a maximum of 2.5m and lateral restraint posts be installed to provide support. This could be done by installing a new canopy frames structure to tie the walls.

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6 CONCLUSIONS

- The barn is suitable for conversion to domestic use.
- Steel will need blast cleaning, re-priming and painting.
- Trusses can be re-used for the roof support but will require remediating.
- New ground floor slab can be incorporated into new retaining walls to the front and Left.
- Foundations will be lighter loaded with the new design. No foundation movement evident, so this is acceptable.

7 RECOMMENDATIONS

- 7.1.1 Remove retaining walls to rear and right and replace with new RC walls incorporated into new ground floor slab.
- 7.1.2 Blast clean steel to bare metal. Make good localised areas of deformation. Re-prime with zinc rich materials and overpaint with weather protective paintwork.
- 7.1.3 Blast clean trusses to bare metal, re-prime and paint. Trusses to be fixed to heads of existing frame columns and are to be used to support a new lightweight roof.
- 7.1.4 Lateral restraints will be needed to the old barn walls. Any free standing height to these walls should not exceed 2.0m.

APPENDIX A

INSPECTION PHOTOGRAPHS



Typical Steel Frame to Front of Building



Steel Frame Support to 1st Floor Joists



Split Level Frame at Front Right



Steel Breakdown to Webs of Columns at Front



Secondary Steel Report to Rear Wall



Typical Trusses Supporting Existing Roof



Retaining Wall to Left Side Wall at Ground Floor Level



Void in Retaining Wall to Rear Wall



Rear Elevation at High Level



Left Elevation (North Facing) Wall



Old Barn Walls to East



Rear Old Barn Wall With Large Opening



Partial Collapse and Lean to Rear Wall of Old Barn



Old Barn Walls to West

APPENDIX B

CONDITIONS OF INSPECTION

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Instructions are in all cases (unless any variation is agreed in writing by the Company) accepted on the basis of the following conditions which shall govern the inspection and report, and any related matters.

The object of this Report is to assess the effect of the reported defect on the structural integrity of the property. No assurances can be given or can be implied as to the effect that the reported defect may have on the market value or saleability of the property.

- i) The Report is confined to an inspection of the clients specified structural elements of the property alone, i.e. foundations (if exposed), walls, floors, roof members (if accessible), and other such members providing structural support to the property, that may be deemed necessary for inspection by the Company. The report will not cover such items as damp proofing, heating and ventilation, plumbing and electrical circuits, doors, window frames, plasterwork, fitted furniture, decoration or items of general serviceability, unless expressly agreed with the Company before the inspection is undertaken.
- ii) We shall not investigate woodwork, or other parts of the structure, which are covered, unexposed or inaccessible. We are therefore unable to report that any such part is free from defects.
- iii) It must be clearly understood by the client that the degree of inspection referred to in (i) above will not reveal all defects. Defects in concealed parts such as foundations, under floor areas, and areas covered by wall coverings, plaster or render, will not be revealed. It is, of course, possible to make more detailed investigations and where there is evidence to warrant this, recommendations for further investigations will of course incur further costs and may require the lifting of floor boards, breaking out brick work or digging trial holes. When such detailed investigations are required, it is the responsibility of the client to:
 - a) give specific written instruction to this effect to the Company and
 - b) obtain the necessary permission of the owner and to indemnify the Company against liability for damage caused or rectification costs.
- iv) Externally the building will be inspected from ground level only, ladders will not be used to inspect roofs.
- v) Internally, where appropriate, exposed surfaces of rooms will be inspected as far as reasonably possible. The engineer will not move or disturb furnishings, fittings, fitted carpets or furniture, and no responsibility will be accepted for defects which are concealed.
- vi) If requested by the client or judged necessary by the Company and a trap door access exists, the roof spaces will be inspected so long as it is considered safe to do so and crawler boards, ladders etc, are available. Note that high or low confined parts of the roof space will not be inspected.
- vii) Readily visible parts of the drainage installations will be inspected, if requested by the client or judged necessary by the Company.
- viii) No inspection will be made of services such as gas, electricity and central heating. The client is advised to engage the services of a competent electrician and/or plumber if inspection is required.
- ix) Outbuildings, including detached garages, sheds, greenhouses and similar structures will not be inspected, unless expressly requested prior to the inspection.
- x) Easements, planning and other proposals by statutory authorities are outside the scope of this structural survey.
- xi) Should the client require advice upon any matter other than the structural survey, e.g. proposed additions and alterations, this must be subject of a further separate instruction.
- xii) The report is provided for the sole use of the named client and is confidential to the client and professional advisors. The Company accepts responsibility to the client alone and accepts no responsibility whatsoever to any person other than the client himself.

Thomas Consulting will consider re-issuing the report in its original format to a named third party within 3 months of the original report date provided:

 - a) We have the written permission of our original client to do so and
 - b) Upon payment of an administrative fee, currently set at 50% of the cost of the original report fee.

In any event the condition of the property is to be taken as that at the time of the inspection.