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Bowling Bank Farm, Worthenbury

Pre-Planning Structural Inspection Report

RP-100758-001

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This report takes into account the particular instructions and requirements of our client. It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

1 Executive Summary

JP Structural Design Ltd, (JPS) was appointed to undertake a pre-planning structural assessment of two existing farm buildings. The inspection was carried out on 15th April 2024 and comprised a visual inspection of the external elevations and an internal inspection of the visible structural elements.

During the visual survey, structural defects were noted including:

Building 1 –

- Rotting, potential infestation and over-deflection of timber roof structure, lintels and other structural members;
- Cracked, damaged and eroded blockwork;
- Unconventional construction of blockwork walls with hollow blocks laid flat;
- Evidence of damp;
- Corrosion of steel rafters and columns;
- Missing column to eaves beam steel ties;

Building 2 –

- Rotting, potential infestation and over-deflection of timber roof structure, lintels and other structural members;
- Cracked, damaged and eroded blockwork;
- Unconventional construction of blockwork walls with hollow blocks laid flat;
- Evidence of damp;
- Corrosion of steel beams;

None of the defects observed are likely to prevent the successful refurbishment and conversion of the buildings. Defects will require localised repairs to be undertaken as part of the refurbishment, the scope of which is outlined in sections 6 and 9 of this report.

2 Introduction

2.1 JPS was appointed to undertake a structural assessment of two existing buildings at the following address:

Bowling Bank Farm

Mulsford Lane

Worthenbury

LL13 0AW

2.2 A visual survey was undertaken on 15th April 2023 by Isaac Dale, Structural Engineer for *JP Structural Design Ltd.*

2.3 This report presents the observed defects, the high-level observations and recommendations for any remedial works to be undertaken as part of the construction works.

3 Survey Extent

3.1 The structural inspection was undertaken from ground level and 1st floor level where accessible. The survey was limited to the structural elements that were visible/ accessible. The survey focussed on the structural condition of the external elevations and the internal structural elements only and no trial pits were undertaken to expose foundations and no specialist investigations were undertaken such as timber rot/infestation surveys or asbestos materials assessment.

3.2 The survey inspection focussed on structural items only and did not include a review of non-structural items such as rainwater goods, cladding, flashings, or window/door casements.

3.3 Below are plan views depicting the extent of the buildings intended to be converted and therefore the extent of the survey.

Building 1 –

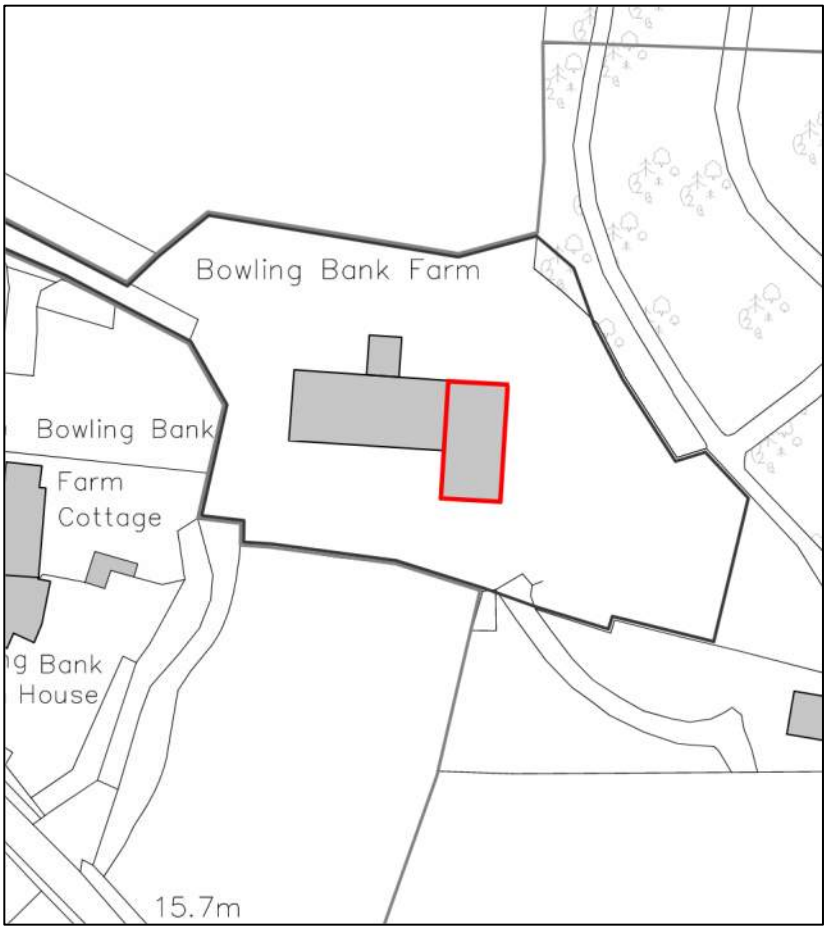


Figure: Building 1 survey extent

Building 2 –

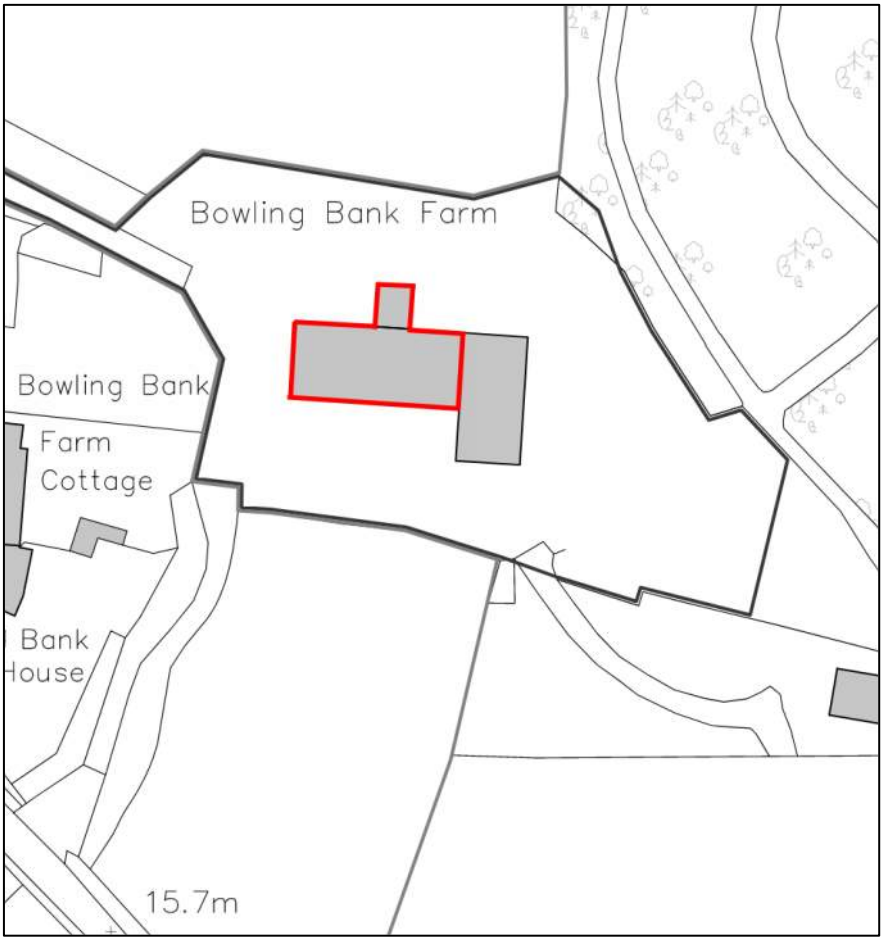


Figure: Building 2 survey extent

3.4 A visual inspection was undertaken which means that we did not take up carpets, floor coverings or floorboards, move furniture or remove the contents of cupboards. Also, we did not remove secured panels or undo electrical fittings. We inspected roofs and other surfaces on the outside of the buildings from ground level and we inspected the roof structure that was exposed and visible from within the buildings. We were not able to assess the condition of the roof structure concealed by the ceiling finishes.

3.5 Whilst this report presents the observations from the structural inspection, JP Structural Design Ltd gives no representations or warranties, express or implied, and no responsibility or liability is accepted for the accuracy or completeness of the information inserted in the document or any other written or oral information given to any interested party or its advisers. Any such liability is expressly disclaimed.

4 Building 1 - Existing Structural Form

4.1 Existing building 1 is a steel portal frame structure with block infill up to mid-height and timber cladding to eaves level. The roof is made up of corrugated panels supported off timber purlins spanning between the portal frames.

4.2 The following photos indicates the typical external elevations of the buildings surveyed:



Figure 1: View of West elevation of building



Figure2: View of South elevation of building



Figure3: View of East elevation of building



Figure 1: View of North elevation of building

5 Building 1 - Survey Observations

5.1 The building was observed to be constructed as a steel portal frame with block infill.

5.2 Timber purlins support the corrugated panel roof.

5.3 During the visual survey, several structural defects were observed, namely:

- Rotting, potential infestation and over-deflection of timber roof structure, lintels and other structural members;
- Cracked, damaged and eroded blockwork;
- Unconventional construction of blockwork walls with hollow blocks laid flat;
- Evidence of damp;
- Corrosion of steel rafters and columns;
- Missing column to eaves beam steel ties;

5.4 Structural Inspections

5.4.1 Typical defects observed during the external inspection are presented in the following photos:

	*Observation 1:* • *Rot and potential infestation to timber lintels* • *Unconventional construction of blockwork wall with hollow blocks laid flat*

	*Observation 2:* • *Unconventional construction of blockwork wall with hollow blocks laid flat* • *Erosion to blockwork*
	*Observation 3:* • *Unconventional construction of blockwork wall with hollow blocks laid flat*
	*Observation 4:* • *Broken/ cracked blockwork beneath timber lintel bearing* • *Rot and potential infestation to timber lintel*

	*Observation 5:* • *No lintel over opening* • *Erosion/ damage to blockwork around top of opening* • *Unconventional construction of blockwork wall with hollow blocks laid flat*
	*Observation 6:* • *Unconventional construction of blockwork wall with hollow blocks laid flat* • *Gaps in masonry wall at ground floor level allowing for water ingress* • *Erosion to mortar joints in blockwork* • *Loose blockwork*
	*Observation76:* • *Unconventional construction of blockwork wall with hollow blocks laid flat* • *Hole in blockwork*

	*Observation 8:* • *Weathering to external timber cladding*
	*Observation 9:* • *Slight corrosion to steel column*
	*Observation 10:* • *Unconventional construction of blockwork wall with hollow blocks laid flat* • *Hollow block holes allow for water ingress*

	*Observation 1 1:* • *Corrosion to steel column*
	*Observation 1 2:* • *Corrosion to steel column* • *Corrosion to steel rafter* • *Corrosion to steel connection* • *Damp timber eaves beam* • *Potential rot and infestation of timber eaves beam*
	*Observation 1 2:* • *Potential rot and infestation of timber purlins* • *Potential over deflection of timber purlins*

	*Observation 12:* • *Missing steel tie from column to eaves beam*

6 Building 1 - Defects Summary

6.1 Defects Summary Table and Likely Remedial Works

Typical Defect/Observation	Comments and likely remedial action
Rot and potential infestation to roof structure members	• *Evidence of potential rot and infestation to timber lintels eaves beams and purlins. If rot is localised in nature, individual rafters can be replaced.* • *Extent of repair works to timber roof structure to be defined following a specialist rot and infestation survey once floor finishes have been stripped.*
Cracked, damaged and eroded blockwork	• *Exposed* blockwork *was observed to be damaged with missing or eroded blocks in a number of locations and cracked and eroded mortar joints.* • *As part of the refurbishment works, localised repairs will be required to make good these areas of masonry.* • *Damaged, cracked or eroded mortar joints will require re-pointing.* • *Missing* blockwork *will need infilling to match existing.*
Evidence of damp	• *As part of refurbishment work, the Architect should consider repair and replacement work to rainwater goods and installation of DPM/tanking as required to address areas of damp ingress.* • *There is potential for water damage to rafters. As part of the refurbishment work, the ceiling is to be removed and rafters to be inspected as part of a specialist rot and infestation survey.*
Corrosion of steel columns and rafters	• *Evidence of corrosion in steel columns and rafters.* • *Steelwork with mild corrosion to be painted with corrosion resistant paint.* • *Steelwork with significant corrosion to be replaced.*
Unconventional construction of blockwork wall with hollow blocks laid flat	• *As part of the refurbishment works, Architect should consider water ingress through holes in blockwork and provide suitable solution.* • *As part of refurbishment works, Structural Engineer should consider structural capacity/ integrity of any load bearing hollow block walls and provide suitable solutions as necessary which may include localised demolition and*

Typical Defect/Observation	Comments and likely remedial action
	rebuilding in conventional blockwork or installation of internal loadbearing blockwork/ timber stud leaf etc.
Missing column to eaves beam steel ties	• *Missing column to eaves beam steel ties* • *Reinstall steel ties*

7 Building 2 - Existing Structural Form

7.1 The existing building is formed in load bearing masonry supporting a roof structure formed of corrugated panels over timber purlins supported between internal and external walls.

7.2 The following photos indicates the typical external elevations of the buildings surveyed:



Figure 1: View of South elevation of building



Figure2: View of North elevation of building



Figure3: View of lean-to structure on North elevation of building



Figure 1: View of North elevation of building

8 Building 2 - Survey Observations

8.1 The building was observed to be constructed with load bearing masonry, albeit in an unconventional style – hollow blocks laid flat.

8.2 Timber purlins span between load bearing walls and support the corrugated panel roof.

8.3 During the visual survey, several structural defects were observed, namely:

- Rotting, potential infestation and over-deflection of timber roof structure, lintels and other structural members;
- Cracked, damaged and eroded blockwork;
- Unconventional construction of blockwork walls with hollow blocks laid flat;
- Evidence of damp;
- Corrosion of steel beams;

8.4 Structural Inspections

8.4.1 Typical defects observed during the external inspection are presented in the following photos:

	*Observation 1:* • *Weathering of timber cladding*

	*Observation 2:* • *Weathering of timber cladding*
	*Observation 3:* • *Potential rot and infestation of timber rafters* • *Damp rafters – evidence of water ingress*
	*Observation 4:* • *Potential rot and infestation of timber lintel*

	*Observation 5:* • *Slight undulation of corrugated sheet roof*
	*Observation 6:* • *Unconventional construction of blockwork wall with hollow blocks laid flat*
	*Observation 7:* • *Hole in blockwork at ground floor level allowing for water ingress* • *Evidence of damp*

	*Observation 8:* • *Corrosion of steel beams over opening*
	*Observation 9:* • *Hole in blockwork at ground floor level allowing for water ingress* • *Unconventional construction of blockwork wall with hollow blocks laid flat* • *Holes in blockwork generally allowing for water ingress*
	*Observation 10:* • *Potential rot and infestation of timber purlins and ridge beam* • *Damp timber roof members -evidence of water ingress* • *Potential over-deflection of timber roof members*

	*Observation 11:* • *Hole in blockwork at ground floor level allowing for water ingress* • *Unconventional construction of blockwork wall with hollow blocks laid flat* • *Holes in blockwork generally allowing for water ingress*
	*Observation 12:* • *Hole in blockwork at ground floor level allowing for water ingress* • *Unconventional construction of blockwork wall with hollow blocks laid flat* • *Holes in blockwork generally allowing for water ingress*

9 Building 2 - Defects Summary

9.1 Defects Summary Table and Likely Remedial Works

Typical Defect/Observation	Comments and likely remedial action
Rot and potential infestation to roof structure members	• *Evidence of potential rot and infestation to timber lintels eaves beams and purlins. If rot is localised in nature, individual rafters can be replaced.* • *Extent of repair works to timber roof structure to be defined following a specialist rot and infestation survey once floor finishes have been stripped.*
Cracked, damaged and eroded blockwork	• *Exposed* blockwork *was observed to be damaged with missing or eroded blocks in a number of locations and cracked and eroded mortar joints.* • *As part of the refurbishment works, localised repairs will be required to make good these areas of masonry.* • *Damaged, cracked or eroded mortar joints will require re-pointing.* • *Missing* blockwork *will need infilling to match existing.*
Evidence of damp	• *As part of refurbishment work, the Architect should consider repair and replacement work to rainwater goods and installation of DPM/tanking as required to address areas of damp ingress.* • *There is potential for water damage to rafters. As part of the refurbishment work, the ceiling is to be removed and rafters to be inspected as part of a specialist rot and infestation survey.*
Corrosion of steel beams	• *Evidence of corrosion in steel beams.* • *Steelwork with mild corrosion to be painted with corrosion resistant paint.* • *Steelwork with significant corrosion to be replaced.*
Unconventional construction of blockwork wall with hollow blocks laid flat	• *As part of the refurbishment works, Architect should consider water ingress through holes in blockwork and provide suitable solution.* • *As part of refurbishment works, Structural Engineer should consider structural capacity/ integrity of any load bearing hollow block walls and provide suitable solutions as necessary.*

Typical Defect/Observation	Comments and likely remedial action
	• *Solutions may include localised demolition and rebuilding in conventional blockwork or installation of internal loadbearing blockwork/ timber stud leaf etc.*

10 Summary and Conclusions

10.1 The defects observed within the buildings are localised in nature and are not likely to necessitate large sections of demolition and rebuild.

10.2 A detailed specialist timber survey is recommended to identify and treat any rot or infestation present in the timber elements. Defective lintels or purlins will require localised replacement and it is recommended that all timbers to be retained are treated by a specialist timber survey company.

10.3 As part of the refurbishment works, calculations will be required to justify the existing roof members for the proposed use. This assessment should be carried out by a chartered engineer following strip-out works.

10.4 Cracked and eroded mortar joints will require repointing and any damaged / missing areas of blockwork will require localised repairs.

10.5 As part of the refurbishment works, Structural Engineer should consider structural capacity/ integrity of any load bearing hollow block walls and provide suitable solutions as necessary. Solutions may include localised demolition and rebuilding in conventional blockwork or installation of internal loadbearing blockwork/ timber stud leaf etc.

10.6 Steelwork with mild corrosion to be painted with corrosion resistant paint. Steelwork with significant corrosion to be replaced.

10.7 It is recommended that the remedial works presented in sections 6 and 9 of this report are implemented as part of the refurbishment works.

10.8 All observed defects can be readily addressed as part of the detailed design of the refurbishment works and none of the structural issues observed are likely to prevent the successful conversion of the buildings.