

Report on a Structural Inspection

Project: Proposed change of use of existing agricultural building to 2No. dwelling houses (C3) under Class Q of the GPDO

**High Walks Barn,
Stone Lane, Haddington**

For: H&J Neville & Son

Prepared by: DJ Wright BEng (Hons) CEng MIStructE

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Project No: 22-288



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Executive Summary

Site Address

High Walks Barn, Stone Lane, Haddington

Description

Two adjoining single-storey agricultural barns. The buildings are formed with steel roof trusses and columns to Barn 'A' and steel portal frames to Barn 'B', with a shared line of internal steel valley columns.

The buildings are clad in a mixture of brickwork, steel cladding panels and corrugated concrete/ asbestos cladding sheets. The roofs are clad with corrugated concrete/ asbestos cladding sheets supported on timber purlins.

Both buildings have cast in-situ concrete floor slabs as the wearing surface.

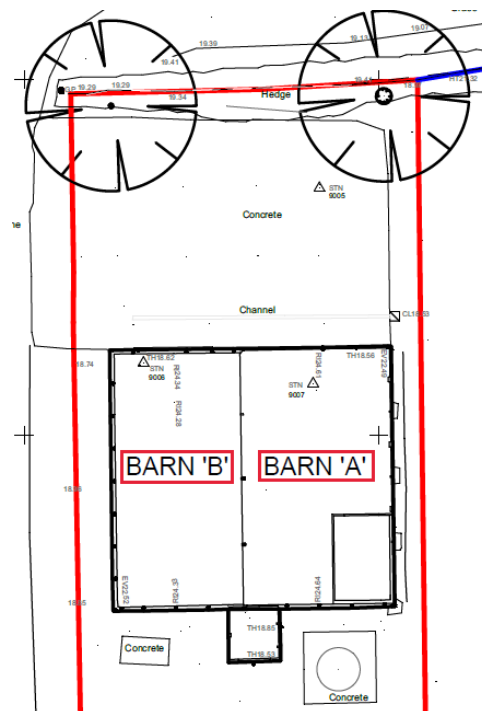
Requirement for Survey	Primary Comments
<p>The Client wishes to convert one of the existing buildings into habitable accommodation under Class Q permitted development rights.</p>	<p>The buildings are of a robust and permanent structural condition which are considered fit for retention and conversion into a dwelling.</p> <p>Minimal works are proposed to the existing building structures. The frame, and purlins can all be retained, with new insulated walls and ceilings installed around the existing structural frame.</p> <p>No significant additional loadings are intended to be placed upon the existing structure. Any additional loadings not catered for in the original frame capacity e.g. suspended ceilings and services, can be supported from below at the new first floor level.</p> <p>The proposed change of use should be regarded as a conversion of the building under Class Q.</p>

Survey conducted by:

Daniel J Wright; Director; BEng (Hons) CEng MStructE

1.0 INTRODUCTION

- 1.01 We were instructed by The Client H&J Neville & Sons to conduct a structural survey and assessment of the existing agricultural buildings with a view to converting one of the buildings into habitable accommodation.
- 1.02 The proposed works will comprise the installation of new roof and wall claddings, new insulated internal walls and ceilings, a new mezzanine first-floor, plus the insertion of windows and doors and services as reasonably required to re-use the building as a dwelling.
- 1.03 The inspection was undertaken on the 20th April 2023. The weather at the time was dry and sunny.
- 1.04 The author undertook a visual inspection during a site walk over and the main observations are noted in the following report.
- 1.05 The buildings are referred to as Barn A and Barn B for the purposes of the report.
- 1.06 Under the current proposals, Barn A would be retained for conversion whilst Barn B and an adjoining ancillary plant room would be demolished.
- 1.07 A site plan indicating the buildings is given below.



Reference Plan

- 1.08 For the extent and limitations of this report please see the 'Notes & Limitations' in Section 5.0.
- 1.09 Photographic records are contained within Section 6.0.

2.0 EXTERNAL OBSERVATIONS

2.1 Walls

- 2.1.1 The site lies within an existing farm-yard setting, with other other disused agricultural buildings to the right-hand side of the barns, with trees and vegetation to the front edge of the site.
- 2.1.2 Surrounding site levels are generally flat and covered in concrete hard standing to the front yard and generally unsurfaced elsewhere.
- 2.1.3 Both Barn A and Barn B are rectangular on plan with an adjoining small brick built lean-to plant room building to the rear.
- 2.1.4 The front elevation to Barn A comprises a large roller shutter door, with dado brickwork cladding and-high level concrete asbestos corrugated cladding sheets. The faces of the steel column flanges are visible externally through the brickwork wall. The exposed brickwork is in a good state of repair.
- 2.1.5 The front elevation to Barn B comprises a large roller shutter door, with dado profiled steel cladding fixed between the primary steel columns and-high level concrete asbestos corrugated cladding sheets.
- 2.1.6 The long side elevation to Barn A comprises dado brickwork infill panels and-high level concrete asbestos corrugated cladding sheets. The steel column flanges are exposed and externally visible through the brickwork wall. The exposed brickwork is in a good state of repair.
- 2.1.7 The long side elevation to Barn B comprises dado profiled steel cladding fixed between the primary steel columns and-high level concrete asbestos corrugated cladding sheets.
- 2.1.8 The rear elevations to Barn A and Barn B both comprise dado profiled steel cladding fixed between the primary steel columns and-high level concrete asbestos corrugated cladding sheets. An adjoining small lean-to brick plant room building is also present at the rear elevation, which would be demolished under the proposals.
- 2.1.9 One of the steel columns to the rear of Barn A appears to have a minor outward lean and we would suggest that this column is re-aligned during the conversion works.
- 2.1.10 To the long elevation of Barn A, some of the external column pad foundations were exposed to view above the ground surface. These pad foundations appear to be of an adequate size for the building, being in the order of 1.2metres wide.
- 2.1.11 To all elevations, several of the externally exposed steel column flanges have experienced minor surface rusting and we advise that these are cleaned and re-protected with steel primer paint during the conversion works.

2.2 Roof

- 2.2.1 The roof is covered in shallow profile corrugated concrete asbestos cladding sheets.
- 2.2.2 Roof guttering is present to both low sides of the roof with rainwater down-pipes located at the end of each gutter with one at the overflow for the valley gutter. Some of the guttering is broken and all guttering will require renewal.
- 2.2.3 The roof sheets appear to be generally intact as viewed from inside the buildings. However, it is not known whether the roof is fully watertight.
- 2.2.4 As part of the Class Q conversion it is expected that the roof sheeting and rainwater collection systems would be replaced with a new lightweight insulated roofing system.

3.0 INTERNAL OBSERVATIONS

3.1 Floor to Barn A and Barn B

- 3.1.1 The floors to both Barn A are laid with jointed concrete floor slabs.
- 3.1.2 The slabs have some minor cracking and surface wear to the front of each building, but these are not significant enough to warrant removal and replacement of the concrete slabs.
- 3.1.3 We would expect that that floors will be overlaid with insulation and screed finishes in order to meet with current Building Regulations requirements.

3.2 Barn A

- 3.2.1 This is the suspected earlier constructed building out of the two barn buildings.
- 3.2.2 The primary structure is formed using 5No. steel trusses to the roof, supported on steel columns at each end, along the external wall line and the roof valley line. The steel trusses support timber purlins and in turn, concrete asbestos corrugated cladding sheets.
- 3.2.3 The trusses are formed in triangulated angle steelwork.
- 3.2.4 The two trusses closest to the roller shutter door have been partially modified. We suspect that this may have been undertaken in order to improve the working headroom at the front of the building.
- 3.2.5 The condition of the steelwork appeared to be in good order, though we would advise that all steelwork is cleaned and then paint protected to preserve the condition.
- 3.2.6 The main columns within Barn A are in the order of 203x102 universal beam sections. The external columns are embedded within a 215mm solid brick dado wall up to circa 1.5metres above floor slab level. The columns to the valley line have been built between with an over-boarded timber stud wall.

- 3.2.7 The existing trusses can all be retained and embedded within the new first floor wall constructions, which will enable the existing steel frame to be retained for the support of the new lightweight roof sheeting.
- 3.2.8 The existing timber purlins can be retained for the support of the new roof sheeting.
- 3.2.9 No defined wall bracing other than dado-brickwork and steel cladding rails are present. This construction currently offers the lateral stability to the frame. Any new internal insulated stud walls will further enhance the overall lateral stability and compensate for any new windows/ doors formed within the external envelope.
- 3.2.10 No lateral roof bracing is present. We would note that some simple steel or timber roof bracing will need to be introduced during the conversion works. This work can be undertaken from within the building.
- 3.2.11 We identified a distorted/ buckled steel column along the internal valley line (mid-way along the building).
- 3.2.12 This column will need to be replaced with a new vertical column. The roof structure can be propped and then the column removed and replaced from within the building.

3.3 Barn B

- 3.3.1 Barn B is suspected add-on structure to the original Barn A. This has been bolted to the original outside columns which now forms the internal valley and party wall line.
- 3.3.2 Barn B will be demolished as part of the current proposals.
- 3.3.3 The primary structure is formed using 5No. steel portal-frame rafters, supported on steel columns along the external wall line and the roof valley line. The steel rafters support timber purlins and in turn, concrete asbestos corrugated cladding sheets.
- 3.3.4 The condition of the steelwork appears to be in good order.
- 3.3.5 The main columns within Barn B are in the order of 203x102 universal beam sections. The external columns have been internally over-clad with 110mm deep, profiled metal cladding. The steel cladding extends to a height of around 3.0metres above floor slab level.
- 3.3.6 The columns to the valley line have been built between with an over-boarded timber stud wall.
- 3.3.7 No defined wall bracing is present. However, we would note that the profiled steel cladding currently offers rigid lateral stability bracing to the frame.
- 3.3.8 No roof bracing is present.
- 3.3.9 We identified a distorted/ buckled steel column along the internal valley line (mid-way along the building).
- 3.3.10 This column is shared with Barn A and will need to be replaced with a new vertical column.
- 3.3.11 A cast concrete kerb has been used to restrain the bottom of the steel cladding above the slab.

4.0 CONCLUSIONS AND RECOMMENDATIONS

- 4.01 We were instructed by The Client H&J Neville & Sons to conduct a structural survey and assessment of the existing agricultural buildings with a view to converting one of the buildings into habitable accommodation.
- 4.02 Under the current proposals, Barn A would be retained for conversion whilst Barn B and an adjoining ancillary plant room would be demolished.
- 4.03 The proposed works will comprise the installation of new roof and wall claddings, new insulated internal walls and ceilings, a new mezzanine floor, plus the insertion of windows and doors and services as reasonably required to re-use the building as a dwelling.
- 4.04 The existing steel frame should be cleaned and then paint protected to preserve its condition.
- 4.05 A single buckled column along the valley line will need to be replaced with a new column.
- 4.06 Simple steel or timber roof bracing will need to be provided in the end roof bays, in order to provide some additional rigidity bracing to the steel roof structure.
- 4.07 The floor slab appears to be structurally sound and displays minimal signs of deterioration having previously been used for storage and the trafficking of agricultural machinery.
- 4.08 Any thermal upgrade works will comprise the provision of insulation to the building envelope, which can be undertaken around the existing structural frame.
- 4.09 The existing roof trusses can all be retained and embedded within the new first floor wall constructions, which will enable the existing steel frame to be retained for the support of the new lightweight roof sheeting.
- 4.10 The existing timber purlins can be retained for the support of the new roof sheeting.
- 4.11 New insulated walls will provide support for the new mezzanine first-floor, new ceilings and services, plus any new areas of external glazing.
- 4.12 Therefore, on the basis of our structural inspection and assessment we consider that the proposed change of use should be regarded as a conversion of the building under Class Q permitted development rights.

Survey and report prepared by:

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11th May 2023

5.0 NOTES & LIMITATIONS

The Company would be pleased to discuss and advise on any points of difficulty arising out of this appraisal.

Please note that this appraisal is presented on the basis of the following conditions.

- We were required to undertake a visual structural appraisal of the property only and prepare a report outlining our findings/observations.
- The external elevations were inspected from ground levels only. Interior ceilings and walls were inspected from floor level only.
- No inspection has taken place of lintels, floors, roof construction, etc. unless as stated in the body of this appraisal.
- No destructive testing was undertaken as part of this survey.
- We have not inspected woodwork or other parts of the structure, which are unexposed or inaccessible and are unable therefore to report that such parts of the property are free from rot, beetle or other defects.
- We have not attempted in this appraisal to establish whether or not the construction of the property complies with current Codes of Practice or Building Regulations.
- We have not exposed or tested drains, examined bearing strata or foundations or cut into the fabric of the building, except as specifically stated in the body of this appraisal.
- The areas we have appraised are those inspected in accordance with your instructions. If there are any omissions or if you believe that we have misinterpreted your brief, please let us know immediately.
- Where we have drawn your attention to items that are outside the scope of our brief, these items should be regarded as observations and not a full and complete assessment of any problems that may exist.
- This appraisal shall be for the private and confidential use of the Client for whom the appraisal is undertaken and should not be reproduced in whole or relied upon by third parties for any use without the express written authority of the Client and Engineer.

6.0 PHOTOGRAPHS

6.1 Front Elevation (Barn A left-hand side, Barn B right-hand side)



6.2 Side Elevation (Barn A)



6.3 Rear Elevation (Barn B left-hand side, Barn A right-hand side)



6.4 Side Elevation (Barn B)



6.5 Outward Leaning Rear Columns (Barn A)



6.6 Exposed Column Pad Foundation (Barn A)



6.7 Front Corner Broken Gutter (Barn A)



6.8 Front Elevation Brick Wall (Barn A)



6.9 Low-level Minor Steelwork Surface Rusting (Barn A)



6.10 Low-level Minor Steelwork Surface Rusting (Barn B)



6.11 Front Door (Barn B)



6.12 Surface Rusting to Front Door Post (Barn B)



6.13 Minor Surface Rusting to Steel Door Post (Barn B)



6.14 Internal View Towards Front Door (Barn A)



6.15 Internal View Towards Rear (Barn A)



6.16 Steel Roof Truss Amendments (Barn A)



6.17 Full Internal View Towards Front Door (Barn A)



6.18 Concrete Floor Slab Joint (Barn A)



6.19 Rear Elevation Steel Truss and Concrete/ Asbestos Cladding (Barn A)



6.20 Internal View Towards Rear (Barn B)



6.21 Rafter Haunch Connection To Valley Line (Barn B)



6.22 Distorted Steel Valley Column (Viewed from Barn B)



6.23 Junction of Internal Steel Cladding (Barn B)



6.24 Concrete Floor Slab Joint (Barn B)

