

ENGINEERS REPORT

Report on a visual inspection of:

TWO BARNS AT
MANOR FARM
CARLTON ROAD
BARTON IN THE BEANS
LEICESTERSHIRE
CV13 0DE

Prepared for :

SW JACKSON

DATE: 6 JANUARY 2025

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24S01/02 December 2024

INTRODUCTION

This report has been prepared at the request of Messrs. SW Jackson, to comment on the condition of two steel portal framed structures at Manor Farm, Carlton Road, Barton in the Beans, CV13 0DE.

All descriptions relating to position in this report assume that Barn A is being viewed from the West and Barn B is being viewed from the South (the open sides of each building).

The buildings were inspected on 13 December 2024. Our inspection of the buildings was limited to the parts of the structure which were visible at the time of our site inspection.

Our inspection was made from ground level with the use of binoculars where necessary.

This report has been prepared specifically for the above-named Client and their professional advisors and it should not be relied upon by others without the prior written agreement of this firm.



Figure 1: Barn A - Front elevation

Woodwork, foundations and other parts of the building which were covered, unexposed or inaccessible were not inspected and therefore it is not possible to report on whether such parts of the buildings were free from defects or not.

This report has not investigated the possibility of asbestos being present in the buildings or the presence, growth or threatened formation of fungi, moulds, spores or mycotoxins of any kind.

This report does not provide an energy assessment of the buildings.



Figure 2: Barn A - rear elevation

The purpose of our survey was to inspect the condition of the existing buildings to produce a report to accompany a Class Q application for planning purposes.

DESCRIPTION OF THE BUILDINGS

BARN A

The building was a detached agricultural barn.

It is understood that the building was constructed in the early 1970's.

No design drawings or structural calculations are available for the building.

The building was a steel portal framed structure with a corrugated asbestos cement style sheeted roof. The side cladding was a combination of precast concrete wall panels, timber cladding, with small areas of steel sheeted cladding.

The building had a concrete floor at the front. At the rear of the building the floor was soil.

The building was around 23m long and 9m wide,

The building was open on the front elevation.

There were a series of 6 portal frames at approximately 4.60m centres.

The portal frame rafters were haunched at the eaves and ridge.

Stability bracing had been provided to the main elevations by a series of knee braces, between the portal frame columns and the timber eaves beam.

The roof sheeting was supported by timber purlins spanning between the main portal frames.

The side cladding was supported by timber cladding rails spanning between the main portal frames.



Figure 3: Barn A - right hand side elevation



Figure 4: Barn A - left hand side elevation

BARN B

The building was a detached agricultural barn.

It is understood that the building was constructed in the early 2000's.

No design drawings or structural calculations are available for the building.

The building was a steel portal framed structure with a corrugated asbestos cement style sheeted roof. The side cladding was a combination of steel sheets and ventilated timber cladding, together with several precast reinforced concrete wall panels. The building had a soil floor.

The building was around 27.5m long and 8.85m wide,

The building was open along the front elevation.

There were a series of 7 portal frames at approximately 4.5m centres.

Stability bracing had been provided to the roof and the main elevations in the left-hand side bay of the building.

The roof sheeting was supported by timber purlins spanning between the main portal frames.

The wall cladding was supported by timber cladding rails spanning between the main portal frames.

TOPOGRAPHY

The building was located on a level site, with the surrounding ground levels sloping downwards very gradually towards the West.

GEOLOGY AND PAST COAL MINING ACTIVITY

The geological records for this area show that the Superficial Deposits beneath the site comprise Oadby Member. This is a Sedimentary deposit formed during the Quaternary Period. A poorly sorted grey / brown sediment characterised by rock fragments and subordinate lenses of sand and gravel, clay and silt.

The underlying Solid Geology comprises Gunthorpe Member. This is a Sedimentary Mudstone bedrock formed during the Triassic Period. A reddish / brown Mudstone with subordinate Dolomitic siltstone and fine-grained Sandstone. At shallow depth the material normally weathers to a reddish-brown silty clay of medium shrinkage potential.

There are no published borehole logs within the vicinity of the site in the British Geological Survey records.

Boreholes to the West of the site reveal topsoil underlain by sandy pebbly clay to around 3 meters below ground level, with red / grey mudstone beneath this.

To the East of the site, the borehole records show topsoil underlain by a brown stoney clay to a depth of around 3 meters. This material being underlain by a red marl with green Skerrie bands.

The interactive map of the Coal Authority Indicates that the site lies outside the coal mining reporting area.

There is no evidence of any past surface mining within the vicinity of the site.

There has, however, been extensive deep coal mining activity to the East of Nailstone. None of this historic mining activity would be expected to be affecting the stability of the ground within the support area of the site.



Figure 5: Barn A - Internal



Figure 6: Barn A - knee bracing, purlins and cladding rails

TRIAL HOLES

No trial holes have been excavated as part of this investigation. However, the geological records do not identify any problems with the local ground conditions.



Figure 7: Barn A - portal frame eaves connection



Figure 8: Barn A - Impacted column at the front left hand side corner of the building



Figure 9: Barn A - precast concrete wall units

OBSERVATIONS

BARN A

The building is thought to be around 50 years old.

The portal columns and rafters compromised 178x102 UB sections, haunched at the eaves and ridge.

The rear gable post comprised a central 178 X102UB.

There was no gable post to the front (open) elevation wall.

The stability bracing comprised RSA knee bracing to the main elevation walls.

The gable frames comprised full portal frames rather than gable framing.

The purlins comprised 75mm x 200mm timber sections spanning between the main portal frames.

The cladding rails comprised 100mmx75mm timber sections spanning between the main portal frames.

There was widespread surface rust on most of the exposed steelwork. But this is unlikely to have had a significant impact on the performance of the structure.

There had been some weathering of the top surface of the pre cast concrete bases forming part of the reinforced concrete wall panels.

The rafters will receive a degree of lateral restraint from the timber purlins, but no lateral torsional buckling restraints had been provided. This is often found in agricultural buildings and is a relatively straightforward matter to rectify.

There was evidence of impact damage to the front left hand side portal frame column.

The general condition of the steelwork was found to be satisfactory.



Figure 10: Barn B – Front elevation



Figure 11: Barn B – Right hand side elevation

BARN B

The building is thought to be around 20 years old.

The portal columns and rafters comprised 203x133x25 UB sections, haunched at the eaves and ridge.

There were two gable posts in each of the gable end walls.

The gable frames comprised full portal frames rather than gable framing.

The stability bracing comprised tubular braces in the left-hand side bay of the building.

The purlins comprised 75mm x 200mm timber sections spanning between the main portal frames.

The cladding rails comprised 75 x 100mm timber sections spanning between the main portal frames.

There was localised surface rust on small areas of the exposed steelwork. But this will not have any significant impact on the performance of the structure.

The rafters will receive a degree of lateral restraint from the timber purlins, but no lateral torsional buckling restraints had been provided. This is often found in agricultural buildings and is a relatively straightforward matter to rectify.

The general condition of the steelwork was found to be satisfactory.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

Barn A

The building was a steel framed structure which is understood to be around 50 years old.

The structure comprised 6No portal frames with haunched eaves and ridge connections. The asbestos cement roof sheeting was supported by timber purlins spanning between the main portal frames. The wall sheeting was supported by timber cladding rails spanning between the main portal frames. The pre cast concrete wall panels were self-supporting cantilevering units. Stability bracing was provided by knee bracing in the main elevation walls.

The front elevation was open.

The rear gable end frame was a full portal frame with a 203x133 UB gable post in the rear elevation.

The floor slab was of concrete construction at the front of the building, and soil at the rear. The floor sloped downwards to the front.



Figure 12: Barn B – Rear elevation (RHS)

The structural steelwork was generally found to be in a satisfactory condition with little evidence of significant delamination or section loss. Surface rusting was however widespread. This would be expected for such a structure. This will require surface preparation and painting. This work should be considered routine maintenance work, to keep the structure in a satisfactory condition. Work such as this is normally carried out as part of permitted development.

The timber purlins generally appeared to be in a satisfactory condition, however, localised repairs may be anticipated in areas where the timber has decayed. This should also be a matter of routine maintenance work.

The building was in good overall structural condition, and it is considered to be suitable for incorporation into a residential development.

The ground bearing concrete floor slab will need to be thermally upgraded if it is to form part of the proposed development.

RECOMMENDATIONS

Barn A

The following work is recommended:

- Provide additional 50x50x5 RSA rafter stays.
- Replace the front left hand side corner portal frame column with a similar sized section.
- Surface preparation and corrosion protection of the steel frame

CONCLUSIONS

Barn B

The building was a steel portal framed structure which is understood to be around 20 years old.

The structure comprised 7 No portal frames with haunched eaves and ridge connections. The asbestos cement style roof sheeting was supported by timber purlins spanning between the main portal frames. The wall sheeting was supported by timber cladding rails spanning between the main portal frames. The concrete wall panels were pre cast concrete self-supporting cantilevering units. Stability bracing was provided by knee bracing in the main elevation walls.

The front elevation was open.

The gable end frames were full portal frames with 203x133 UB gable posts.

The floor was soil.

The structural steelwork was generally found to be in good condition with little evidence of significant delamination or section loss. There were small areas with localised surface rusting. This would be expected for such a structure. This will require surface preparation and painting. This work should be considered routine maintenance work, in order to keep the structure in a satisfactory condition. Work such as this is normally carried out as part of permitted development.

The timber purlins generally appeared to be in a satisfactory condition, however, localised repairs may be anticipated in areas where the timber has decayed. This should also be considered to be routine maintenance work.

The building was in good overall structural condition, and it is considered to be suitable for incorporation into a residential development.

RECOMMENDATIONS

Barn B

The following remedial work is recommended:

- Provide additional 50x50x5 RSA rafter stays.
- Surface preparation and corrosion protection of the steel frame

GENERAL COMMENTS Barns A and B

We understand that the residential units will be designed to ensure that no additional loading will be applied to the existing structures, but that they will provide an enclosure to the new residential development. However, the existing structures will still be required to resist the environmental loadings (wind and snow) which they have in the past.

Agricultural buildings such as this were normally designed to BS5502, which allowed lower imposed loadings to be used when compared with residential buildings. This was because of the less significant consequences of any damage or failure for such buildings. This type of building was also not subject to approval under the Building Regulations. Therefore, buildings of this type should not automatically be assumed to be suitable to form part of a residential development.

The adequacy of the existing structures will need to be confirmed after carrying out a detailed structural analysis of the existing building by a suitably qualified Engineer.



Figure 13: Barn B – Left hand side elevation

Portal frames are very flexible structures which undergo significant deflections under imposed and wind loading. Therefore, it is important that the proposed internal structure is isolated from the existing portal frames to prevent such deflections damaging building finishes.



Figure 14: Barn B – Internal

Signed by:

Kevin Saxton

Date:

6 January 2025

**Kevin Saxton BSc (Hons) CEng MICE
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