

## **ENGINEERS REPORT**

**Report on a visual inspection of a Barn at :**

WOODSIDE FARM

HEATH ROAD

BAGWORTH

LEICESTERSHIRE

LE67 1DG

Prepared for :

BILL WYE

DATE: 8 APRIL 2025

### **KSA Consulting Engineers Limited**

CONSULTING CIVIL AND STRUCTURAL ENGINEERS

1 Central Road, Hugglescote, Leicestershire, LE7 2FH

Tel: 01530 560575

Fax: 01530 831674

**E Mail: [admin@ksa.uk.com](mailto:admin@ksa.uk.com)**

25S01/02 April 2025

## INTRODUCTION

This report has been prepared at the request of Bill Wye, to comment on the condition of a steel portal framed barn structure at Woodside Farm, Heath Road, Bagworth, LE67 1DG.

All descriptions relating to position in this report assume that the structure is being viewed from outside the front (south elevation) of the building.

The building was inspected on 26 March 2025. Our inspection of the building 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 his professional advisors, and it should not be relied upon by others without the prior written agreement of this firm.



**Figure 1:** Building from the south west

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 building were free from defects or not.

This report has not investigated the possibility of asbestos being present in the building 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 building.



**Figure 2:** West elevation

The purpose of our survey was to inspect the condition of the existing structure, in order to produce a report to accompany an application for planning purposes.

### **DESCRIPTION OF THE BUILDING**

The building was a detached agricultural barn.

It is understood the building was constructed sometime around 1989.

The building comprised a steel portal framed structure with a corrugated fibre cement sheeted roof. The walls comprised concrete blockwork, built between the portal frames and gable posts.

The building was around 19m long and 8.5m wide.

The building had a large door in the front elevation wall with personal access doors in the right-hand side elevation wall.

There were a series of 5 portal frames at approximately 4.66m centers.

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

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

Stability bracing had been provided to the roof in the rear bay.

Racking resistance was provided by the blockwork walls built between the main portal frames.



**Figure 3:** North elevation



**Figure 4:** East elevation

## **TOPOGRAPHY**

The building was located on a gently sloping site, with the surrounding ground levels sloping downwards gradually towards the south east.

## **GEOLOGY AND PAST COAL MINING ACTIVITY**

The geological records for this area show that the Superficial Deposits beneath the site comprise Glaciofluvial Deposits. These comprise sand and gravel formed during the Quarternary period.

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

Local boreholes show the Superficial Deposits are present to a depth of around 30m.

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 is no evidence of any deep coal mining activity within the support area of the site.



**Figure 5:** Internal





**Figure 6:** Internal rooms

### **TRIAL HOLES**

No trial holes have been excavated as part of this investigation. However, the geological records do not suggest that there will be any particular difficulties with the local ground conditions.



**Figure 7:** Portal frame ridge haunch



**Figure 8:** Damp staining on west wall





**Figure 9:** Roof bracing

### **OBSERVATIONS**

The building is thought to be around 36 years old.

The portal frame columns and rafters comprised 203 x 133 x 25UB sections, haunched at the eaves and ridge.

There were 2 No gable posts on each of the gable ends. The gable posts comprised 203 x 133 x 25 UB's.

The roof stability bracing comprised 70 x 70 x 5 RSA sections.

The roof purlins comprised 63mm x 180mm timber sections.

There were four such purlins on each roof slope.

There was no evidence of any excessive deflection of the timber roof purlins.

The general condition of the steelwork was good, with only minor surface corrosion present.

There were no signs of significant corrosion, section loss or delamination of the steelwork.

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

The concrete floor appeared to be in good condition with no signs of excessive settlement or cracking.

The external walls of the building comprised 200mm thick hollow blockwork in which some of the cores appear to have been concrete filled. These walls were built in between the portal frames and gable posts which has effectively split the wall panels to manageable sizes to prevent dimensional movements in the wall, leading to fractures forming.



**Figure 10:** Timber purlins

The general condition of the blockwork was good.

There was no evidence of any significant fracturing in the blockwork walls.

The gable walls comprise 200mm thick concrete blockwork walls, with the wall thickness reducing to 100mm into the apex of the wall.

The floor is understood to consist of a 200mm thick concrete slab, with two layers of steel reinforcing mesh.

There were no signs of any significant differential foundation movement of the building.

The internal dividing walls appear to have been built on the concrete floor slab, and these all appeared to be in a satisfactory condition.

The eaves connection between the rafters and the portal column comprised 6No M16 bolts.

The ridge connection also contained 6No M6 bolts.



**Figure 11:** Internal wall

## **CONCLUSIONS AND RECOMMENDATIONS**

### **CONCLUSIONS**

The building was a steel portal framed structure which is understood to be around 36 years old.

The structure comprised 5No portal frames with haunched eaves and ridge connections. The fibre cement sheeted roof was supported by timber purlins spanning between the main portal frames.

Stability bracing for the roof was provided in the rear bay of the building. Racking resistance of the steel frames was provided by the blockwork walls.

The gable end frames were full portal frames with 2No gable posts.

The condition of the structural steelwork was generally good, with only localised light surface corrosion. These areas will require surface preparation and repainting. This work should be considered routine maintenance.

The roof sheeting also appeared to be in good condition.

The timber purlins generally appeared to be in a satisfactory condition.

The building was generally found to be in good condition, and it is considered to be suitable for conversion to residential use.

Portal frames are very flexible structures which undergo significant deflections under imposed and wind loading. Therefore, it is important that this is taken into account in the design of any conversion work.

As part of the conversion work it is important that the existing structure is not required to support any additional loads.

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

## **RECOMMENDATIONS**

The following remedial work is recommended:

- Surface preparation and providing corrosion protection to the steel frame.
- Provide additional 50 x 50 x 5 RSA rafter stays.

Signed by:



Date:

8 April 2025

**Kevin Saxton BSc (Hons) CEng MICE**  
**KSA Consulting Engineers Limited**