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Our Ref: 6870/2

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James Forrest

By email: james@rhforrest.co.uk

Dear James

Structural assessment for conversion of a barn

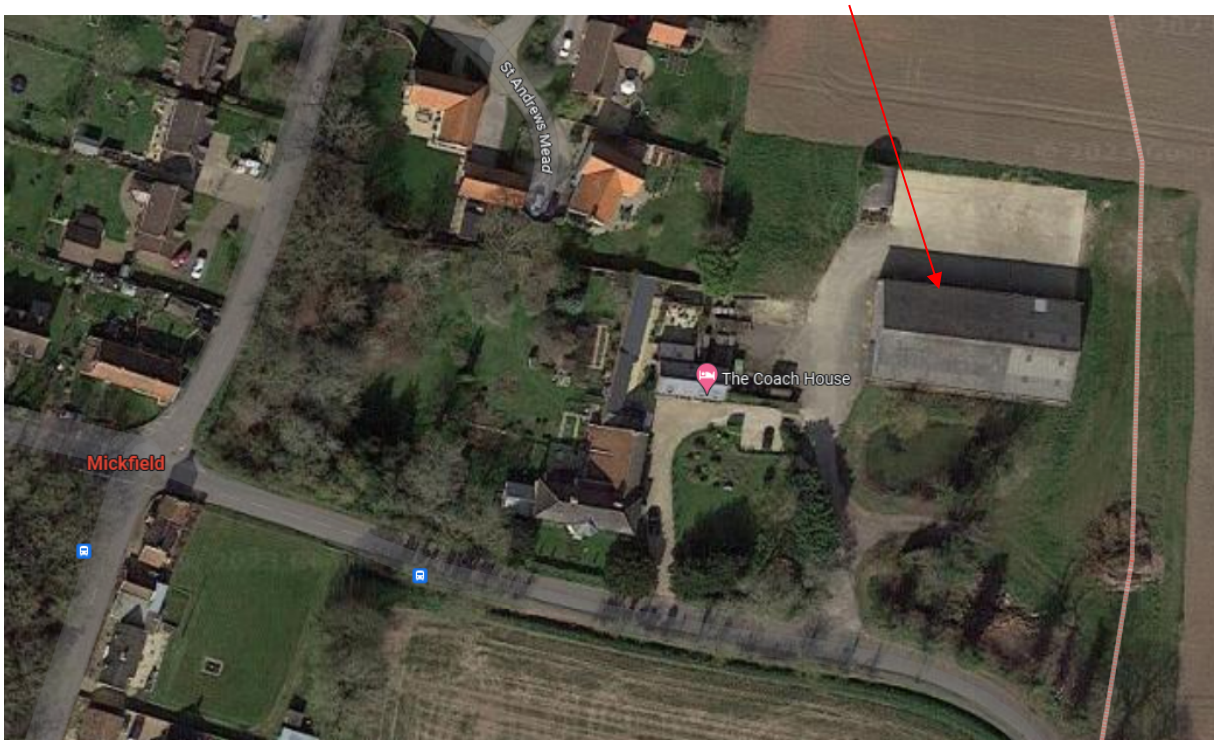
Further to your instruction to undertake an inspection of the former agricultural building at Elm Farm, I include the following notes below regarding its' structure, condition, and suitability for conversion.

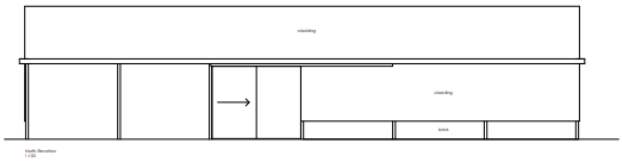
Limitations

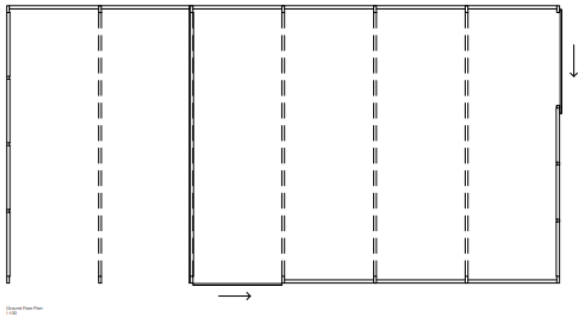
This report relates to the stand-alone barn to the east side of small settlement near to the crossroads. It is assumed that finishes are to be replaced if conversion were to be carried out and that all landscaping would be renewed.

Description

This is a large agricultural barn constructed from concrete portal frame and concrete purlin and providing the support to external cladding materials to both roof and walls with brickwork concrete blockwork to the walls at low level and a bare concrete floor slab. The barn is in a rectangular format with double pitched roof and a few open bays to the west end of the north side as well as some large sliding doors on the north and east sides.


St Andrews Mead
The Coach House
Mickfield






Mr J Forrest
Elm Farm, Mickfield
Existing Plan and Elevations
Preliminary
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Elements of the structure

The various elements of the structure and fabric of the building will be noted along with their condition in the following paragraphs of this report. The overall structural arrangement is a concrete portal frame formed in pre-cast concrete sections bolted together with steel bolts. These frames are connected by horizontal pre-cast concrete purlins, also bolted in place. This forms the principal structural arrangement.

These elements of the structure of the building form the main structural frame which currently appears in sound condition. The frame is still in good alignment with no indication of any notable movement or distortion. There are a few minor areas of damage to the concrete columns forming the portal frame. These are only light surface damage and have not impaired the integrity of the structure.

Minor deterioration to face of concrete frame section

The steel bolts and steel angle plates have been used to connect the various section of pre-cast concrete units together. Currently they all appear intact and in sound condition. There is some light surface corrosion on some of the steelwork elements but as far as I have seen this is not to the degree that has caused any notable weakness or compromise of the structural arrangement. There is no indication of any damage to the concrete as a result of corrosion to reinforcement within the pre-cast units. The main structural frame of the building appears currently in good condition and perfectly capable of being reused. Carrying out modifications to the concrete frame may however be more complex to achieve as it appears the structure is designed as one integral unit. Therefore retaining it in its existing formal arrangement would be advisable.

Roof

The concrete purlin supporting the roof finish are tapered purlins with a deeper section to the middle where there is maximum bending stress and a thinner section to the edge where there is maximum shear load and minimum bending stress. Over these purlins corrugated fibre cement roof sheets have been applied bolted down to the concrete purlins. The supporting structure to the roof finish is all in good condition as previously noted form part of the structural frame of the building. The roof finish itself is currently intact and in satisfactory condition. It has clearly been in place for a few decades but shows no obvious signs of substantial deterioration which could result in a failure of the roof finish.

Foundations

I have not carried out any excavations to expose foundations and therefore cannot confirm the details of what foundation arrangements are present. I suspect that there are concrete pads beneath the principal concrete portal frame members with concrete strip foundations beneath the intermediate walls. Whatever foundations are present they currently appear sound and in satisfactory condition as there is no indication of any structural movement to the barn above ground elements that raises any concerns or indication of foundation movement. While there is some cracking to the brickwork at low level on the south elevation to the western bay this is not due to foundation movement but some impact damage from the internal impact pushing the brickwork outwards. The foundations for the building appear sound and stable and sufficient to take the loading of the structure given the ground conditions present.

Walls

The external walls to the barn and the wall dividing the two open bays from the enclosed bays all have a brickwork section at low level up to approximately 1½ metres high. This is 9" brickwork constructed in facing bricks formed in English Bond bedded in cement mortar with a damp proof course at low level which is the same height as the floor level internally. On the south and east elevations there is some concrete blockwork visible beneath the bricks running down to below the ground. The blockwork here appears to be formed in dense concrete blocks.

The walls above the masonry walls at low level are finished with corrugated fibre cement sheeting with the cladding sheets fixed to purlins. The majority of these purlins are concrete purlins as noted previously. On the gable ends there are some steel angle sections forming the purlins at high level.

The masonry walls at low level are generally in good condition. There is some cracking to the eastern bay on the south elevation due to impact damage internally which has resulted in some vertical and horizontal cracks. The wall above the damp proof course has been slightly displaced outwards. Despite this impact and displacement movement the wall here is actually still in sound condition.

Cracks resulting from impact damage

There is no indication of any similar damage to any other bays. Generally the brickwork is in good order with very little evidence of surface deterioration to the bricks. The only area where there is a small amount is one brick course above ground level externally on the west elevation. Here the bricks are still sound but with minor surface spalling having occurred.

Minor deterioration to bricks at low level

The only other area of deterioration to the brickwork is some eroded mortar joints on the second bay in from the west end on the south side. An area of repointing is required here. The structure is still sound.

The fibre cement cladding sheets above the low level masonry walls are currently all intact and in fair condition. There are some areas of minor damage with some cracks and chips to the cladding panels. Despite these the cladding is still intact and weathertight.

The large sliding doors are steel frame doors with profile aluminium sheeting. The doors run in steel channels within the ground. They are currently all intact and all in sound condition.

Floor

The floor within the barn is a solid concrete floor formed in a number of concrete panels. There are some fine cracks through some of the panels. This has not disturbed the general level of the floor and does not indicate any structural movement. This is more likely to be thermal or shrinkage cracks. The floors are all firm, sound and generally fairly level and in good condition. Due to the agricultural use of the building designed to take the loading of heavy farm machinery it is likely that the floors here are either very thick concrete or reinforced concrete slabs. Therefore this is probably capable of taking substantial loading.

Rainwater goods

Rainwater from the roof of the building is taken away by pre-cast concrete gutter units that sit at the head of the two side walls. These have outlets to each end and at the centre of the run. These gutter units appear sound and intact. They lead to uPVC large diameter downpipes. Currently the arrangement here appears in good condition. There are no downpipes on the central outlets for the gutters. For the current use of the building this is probably not required. The pre-cast gutter units all appear intact and in satisfactory condition.

There is some below ground surface water drainage provision with two surface water gullies in the concrete area outside the north of the barn with an inspection cover on the north west corner. It is not clear where this runs to, presumably a soakaway or a pond. In addition there is a below ground surface water drainage pipe running from the downpipe on the south west corner to the pond. I cannot confirm the condition of the current arrangement here as it was not raining during the inspection.

Conclusion

This barn structure is generally in good condition. There is nothing about this structural arrangement or framework of the building that raises any concerns regarding the potential for conversion of the building. I would anticipate that external finishes would be replaced for aesthetic reasons. Generally this provides a good structurally sound building.

If there are any matters that you wish to discuss further or require additional explanation, please let me know.

Yours sincerely

Neil Cleveland BA, BSc. MRICS