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Mr C. Budgen
Morrells Farmhouse
Lower Bognor Road
Lagness
West Sussex
PO20 1LR

By Email Only

Dear Chris,

**Morrells Farmhouse, Lagness, West Sussex
Structural Assessment Report of 2 Existing Barn Buildings.**

1 Introduction

As requested, we attended the above site on Friday 21st March to undertake a visual inspection of the 2 existing barn buildings and comment on its current structural integrity, with the view of converting the barns into domestic accommodation.

2 Barn 1 - Visual Inspection

Barn 1 was situated to the front of the site, next to the gated entrance. The barn was a single storey building with a small storage building built onto the right elevation. The external wall construction was a traditional solid 215mm brick masonry wall to the front (facing the courtyard) and side elevations. The rear elevation (facing the road) was solid stone/flint/brick wall. The roof construction was of a metal truss roof structure (at approximately 3m centres) with timber purlins, together with a metal profile sheet finish. The ground floor construction was assumed as a solid concrete ground bearing slab.

Roof

As mentioned above the roof was of a metal truss construction with timber purlins and a metal profile sheet finish. It was noted that there were PV panels situated at the left hand end of the roof at ridge level on both sides of the pitch. The metal trusses were at approximately 3.0m centres and were in good working order with no structural failures present. However, it was noted that in some areas of each truss there was a small amount of corrosion present. The metal truss were supported directly on the rear & front external walls and were built into the external walls too. Each metal truss

supported the ends of 6 timber purlins (3 on each side of the roof), and all purlins that were present seemed to be in good working order with no structural failures present (Refer to picture Nos. 01-04).

Ground Floor

The existing ground floor has been assumed as a ground bearing concrete slab. Due to various personal items within the barn not all the slab was visible. However, the floor area that was visible seemed to be in good working order with no structural failures present (Refer to picture No. 05).

External Walls

The front and side elevations were of a solid 215mm brick masonry construction, with the rear being of a mixture of stone/flint/brick wall construction at also a thickness of 215mm.

- **Front Elevation** – Externally there are various areas of the wall that have pitted bricks, mortar erosion and 1-3mm cracks within its face. All cracks that were visible were within the top 7 courses and around openings. All cracks externally were also visible internally in the same positions. Concrete lintels over all openings and concrete padstones beneath the bearing ends of the metal trusses, were visible internally & externally. In some areas the ends of the trusses were visible and exposed to the external elements and show signs of corrosion. Most of the cracks visible, we believe, are due to a combination of thermal movement with the masonry but also slight movement within the roof at eaves level. The garage door that was present within the front elevation seemed to be a later addition to the building as the existing opening concrete lintel was still in-situ above the plank lintel that was currently over the garage door. The plank lintel that was over the garage door opening was undersized and was visually bowing due to the weight-span it was supporting (Refer to picture Nos. 06-10).
- **Right Hand Side Elevation** – Externally & internally this wall was painted with white masonry paint. Various horizontal cracks were present mid height of the wall and visible internally & externally. It was evident that an existing opening at ground floor level had been bricked up, however, the existing timber lintel was still in-situ. Horizontal cracks near the timber lintel likely result from thermal movement or lintel degradation. Other cracks at this level, on either side of the existing bricked up opening, we believe are caused due to slight movement of the gable wall panel. This movement we believe is due to lack of wall restraint straps. There was also a window opening within the gable wall with visible cracks to the top corners and directly above the opening. In closer inspection we believe that these cracks were due to the lack of lintel support above the window, as it looks like the masonry above the window was built off the window frame. It was also noted at the bottom corner to the right hand side of the wall were loose and falling away together with a diagonal crack. We believe that this is caused by impact damage from a car (Refer to picture Nos. 11 & 12).
- **Left Hand Side Elevation** - Like the right hand side elevation the masonry was painted white. Part of this wall externally was covered by vegetation and a small masonry built store. There was a window within the gable wall and like the other gable wall we believe that no lintel was present above the window. Again, like the opposite side wall it was noted that an existing opening was bricked up with the existing timber lintel still in-situ above the opening. This opening was partly covered by the small store built to the side. A masonry buttress was visible to the left hand side of this elevation; size unfortunately was difficult to ascertain due to the vegetation growth around it. Also, it was not able to inspect the internal face of this wall due to a timber framed storage room that was built at this end of the building (Refer to picture Nos. 13-15).

The single storey store had solid 103mm brick masonry external walls with a timber framed inner leaf. The roof was a timber mono pitched roof with a metal profile sheet finish. There was 1 door opening which was situated within the front elevation. All were in good working order with no structural failures present (Refer to picture Nos. 14 & 15).

- **Rear Elevation** – The condition of this wall was poor. There were many cracks at varied sizes and in different directions, within the face of the wall externally. There were areas that were pitted, areas that had stone/flint/bricks missing, together with erosion of mortar in most areas. The left hand corner, as stated above, has missing bricks/stonework where we believe is due to impact damage from a car.

In our professional opinion, we believe that this elevation is in such a poor state due to a multiple of things like, slight movement in the roof at eaves level, vibration produce by vehicles on a road directly next to the wall, excessive weathering due to car spray when the road is wet and thermal movement (Refer to picture Nos. 16-19).

All external walls internally had a concrete render finish to approximately 1.60m from ground level. Most internal areas of the external walls were not inspected due to personal items within the building, and a timber framed storage room built to the left hand end of the building.

3 Barn 2 - Visual Inspection

Barn 2 was situated to the rear of the site opposite to Barn 1. The barn was in 2 parts, with a masonry brick built barn with a timber roof to the front and a concrete portal framed barn with a profile sheet roof to the rear. The front barn was a double storey building with a concrete portal framed building to the rear of the barn. The external walls of the barn were constructed using traditional solid 280mm brick masonry on all elevations. The roof structure featured a conventional king post oak truss design (approximately at 3.2m centres) with oak purlins and timber softwood rafters. The roof finish was slate. It was noted that both the front and rear walls has 900htx100wdth openings, 4 in each elevation. There was also large barn door openings in the centre of both the front and rear elevations. It was also noted that there were PV panels fixed externally to the right hand elevation.

Roof

The roof construction to the front barn was a slate tile finish on a traditional timber cut roof which was supported on timber purlins which in turn were supported on traditional king post oak trusses. When viewed from ground level, the timber rafters and purlins seemed to be in good condition with no signs of structural failures present. 2 of the 4 oak trusses present seemed to be in good condition, the other 2 oak trusses seemed to be in an ok condition. These 2 oak trusses seemed to be suffering from a little water damage to the ends of the bottom cord/cord/principal rafter feet (at the front end of the trusses). However, the overall condition of the roof is good with no apparent structural failures identified (Refer to picture Nos. 20 & 21).

The roof construction to the rear barn was cementitious profile sheets on concrete purlins. All purlins were then supported off the concrete portal frames. The roof is in very good condition with no structural failures present (Refer to picture Nos. 22 & 23).

Ground Floor

The front part of the barn was assumed as a ground bearing slab, whereas the rear part of the part had no ground floor structural finish, it was just compacted soil. The ground bearing slab that was visible to the front part of the barn seemed to be in good condition with no structural failures present (Refer to picture Nos. 24 & 25).

External Walls

The external walls to the front barn were 280mm wide solid brick masonry, with 750x380mm piers on each side of the barn openings, at corners, centre of gable walls and centre of each wall panel to the front and rear walls. The piers centred on the wall panels to the front and rear walls and on either side of the barn door openings also support the oak truss bearing ends. In between the piers to the front and rear elevations were 100mm wide x 900mm high openings (Refer to picture Nos. 26-29).

All walls internally were covered with materials so only 60% of the wall areas were visible. It was noted that above the 100x900mm opening on the front wall panel there were 2 diagonal 2-5mm cracks that emanate from the top left hand corner of the opening and terminate at roof level. We believe that these cracks were caused by past vegetation ingress. It was also noted that there was damage to the bottom of the brick pier which is to the side of the rear barn door opening. We believe that this damage was caused by impact from a vehicle. Except for the above mentioned and with that what was visible all external walls externally and internally were in good working order with no structural failures present (Refer to picture Nos. 30-38).

The rear barn, as stated above, was a concrete portal frame. Its external walls consisted of concrete rails that fixed to the portal frames and had a Cementitious profile sheet to the top 2 thirds of the wall with metal profile sheet to the bottom third of the wall. All rails that were visible and present were in good working order with no structural failures present (Refer to picture Nos. 39-42).

4 Conclusion & Recommendations of Proposed Remediation

To conclude our findings above, and in general both barn buildings, as a whole, are in a good structural condition. However, due to limited viewing of majority of the walls and floors internally because of the number of belongings within the buildings, we would advise further intrusive investigations to check the actual structural condition of these items.

The roof to Barn 1 was generally in good condition. The main metal truss supports that present were corroded especially to the bearing ends where they are built into the external wall as some were exposed to the weather externally. We suggest that the trusses are fully brushed clean of all corrosion that is present and treated with anti-rust paint but also painted additionally with bituminous paint to provide future protection against any possible corrosion. Strengthening maybe required to both metal trusses and timber purlins due to possible extra loading from additional finishing materials for the proposed conversion.

The roof to Barn 2 was also in good working order. All oak king post trusses were generally in good condition apart from 2 where their bearing ends which sit within/on the front external wall seem to have a little water damage and may require addressing. As our inspection was at ground level it was hard to depict the actual cause and severity of the damage but as a worst case the ends of the bottom cord and feet of the main principal rafter may require to be cut out and replaced.

Similar to that to Barn 1 roof, strengthening maybe required to the roof timbers and trusses due to possible extra loading from additional finishing materials for the proposed conversion. Also, as our inspection was undertaken at ground level it is advised that more intrusive investigations are undertaken to ascertain the actual condition of all structural roof members to both roofs.

The external walls to Barn 1 were majority in a good condition. There were cracks noted in the front and side elevations together with pitted brick faces and mortar erosion. We advise that the cracks are remedied with 'Helifix' bars, the pitted bricks are replaced, and all eroded mortar joints are to be re-mortared. Regarding the rear elevation (facing the road), we advise that the damaged left hand corner is rebuilt so that the masonry can be re-keyed into the existing wall so that the structural integrity of the corner is re-established. Also, the wall requires rebuilding in some places with additional strengthening provided, re-mortaring of joints but also, we advise that a waterproof finish is provided to help the longevity of the condition of the wall. It is also advised that a vehicle protection barrier is installed in front and on the corners of the barn to provide further protection against impact damage from vehicles.

The external walls to Barn 2, for its age, were in a very good condition. There were 2 areas of concern that require addressing. The first area was the small amount of cracking from/above the 100x900mm opening on the front elevation, which we believe may have occurred due to past vegetation ingress (which has now been removed). Our advice to remedy this area is to provide 'Helifix' bars across the cracks to strengthen this area. Then re-mortar where required. The second area was the bricks that were missing to the bottom of the right hand pier (as you look from inside to out) of the rear barn door opening. We believe that these bricks were missing due to impact damage from a vehicle. We advise that the pier is rebuilt locally in this area to ensure the continued structural integrity of the pier.

The ground floor to Barn 1 and the front part of Barn 2 seemed to be in good working order and was deemed as structural sound. However, in both barns the visual inspection was limited due to the number of equipment/materials present within the buildings. The ground floor to the rear part of Barn 2 was just compacted soil, so we advise that a suitably design ground bearing slab was provided for the proposed conversion works.

Our final thought of the existing barn buildings is, apart from the above mentioned, that we deem the buildings adequate for the proposed change of use and proposed alteration and conversion works that are planned.

Please note that we would also advise that our visual inspection was at ground level and was limited due to the number equipment/materials that were stored within the barn buildings. We would suggest more intrusive investigations are undertaken to confirm our assumptions/findings.

We trust that you find the above to be in order and meet with your immediate requirements. However, should you have any comments or queries please do not hesitate to contact us.

Yours sincerely
ABMH Ltd

Alun Blow (Director)



Picture No. 01



Picture No. 02



Picture No. 03



Picture No. 04



Picture No. 05



Picture No. 06



Picture No. 07



Picture No. 08



Picture No. 09



Picture No. 10



Picture No. 11



Picture No. 12



Picture No. 13



Picture No. 14



Picture No. 15



Picture No. 16



Picture No. 17



Picture No. 18



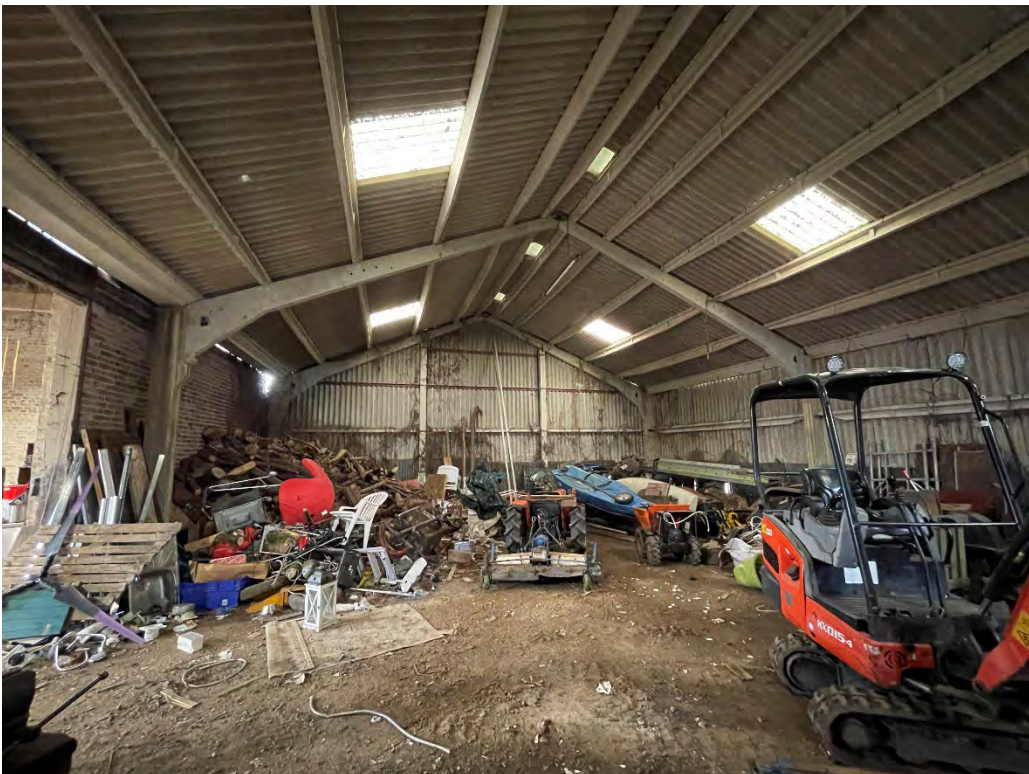
Picture No. 19



Picture No. 20



Picture No. 21



Picture No. 22



Picture No. 23



Picture No. 24



Picture No. 25



Picture No. 26



Picture No. 27



Picture No. 28



Picture No. 29



Picture No. 30



Picture No. 31



Picture No. 32



Picture No. 33



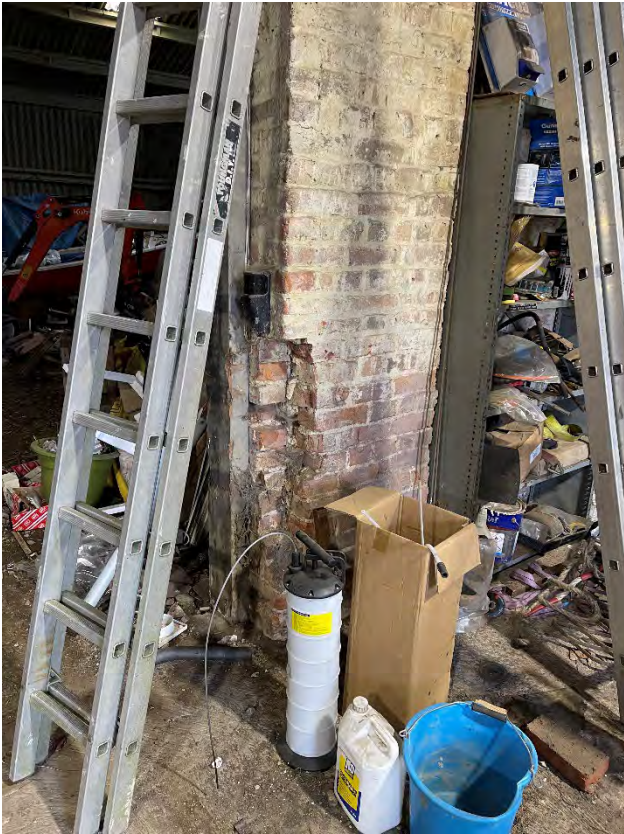
Picture No. 34



Picture No. 35



Picture No. 36



Picture No. 37



Picture No. 38



Picture No. 39



Picture No. 40



Picture No. 41



Picture No. 42