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Your Ref:

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Dear Armine

HEADLANDS FARM, WHITLEY LOWER, DEWSBURY STRUCTURAL INSPECTION

Further to previous discussions regarding the above, a visual non-disruptive structural inspection was carried out of the above property on 06.05.2025 to confirm that the existing building is structurally suitable to convert to residential accommodation without the need to demolish and rebuild. This is a requirement for planning approval under Part Q of the Planning Regulations.

We would summarise the findings from the site inspection and the following calculations/design assessment as follows:

- **Inspection:**

The existing building comprises a monopitch timber structure with a lean-to extension to one end of the building. The main building is circa 10.80 metres long x 4.40 metres wide with a height to eaves on the lower side of circa 3.00 metres and on the higher side of circa 4.00 metres. There are four structural bays over the length of the main building x circa 2.60 metres.

The main support structure to the barn is primarily a timber frame, details of which are referred to below.

The posts on the main support lines vary from 150mm diameter to 260mm diameter timber and in our opinion can be classified as a minimum of Grade C24. They appear to be in generally sound condition with very little deterioration.

Supplementary intermediate timber posts of similar size are provided on the internal frame lines. Again, a minimum grade of Grade C24.

The rafters on the main frame lines were measured at 190mm deep x 65mm wide and appeared to be in sound and robust condition where access was available.

The elevation treatment primarily consists of vertical timber boarding spanning between 260mm wide x 70mm thick timbers acting as the equivalent of sheeting rails, all above an approximately 700mm high wall in either concrete or rendered masonry.

The structural condition of the boards is varied, but generally in sound and satisfactory condition. The sheeting rail timbers are mostly in satisfactory condition with only local areas of deterioration and decay which in our view can be easily addressed by the proposed works.

The 700mm high wall appeared to be in generally satisfactory structural condition with only minor evidence of ground or foundation movement.

The roof is clad with corrugated asbestos cement roof sheeting and supported upon timbers spanning between the rafters referred to above.

The stability to the building in both lateral and longitudinal directions is provided by the perimeter wall construction. There is no current formal roof bracing at rafter level to transfer lateral loads back to columns and foundations.

No excavations have been carried out to date to determine details/dimensions of the existing foundations, the level of the foundations or the ground conditions below the foundations. This will be required at an appropriate time, however there were no obvious sign of defective foundations, inadequate ground bearing or primary structural movement.

The thickness of the existing ground slab is unknown but likely to be in the region of no greater than 100mm. It currently has two degree slope on the top face. As a new floor and insulation is to be added, this will not be problematic.

- **Calculations/Design Assessment:**

To prove the capability of the existing building under existing and proposed loads, an analysis of the existing structure was undertaken adopting "Tekla Design/Analysis Software".

Loads which were considered in this exercise included Dead/Permanent Loads, Snow Loads and Wind Loads. The conclusions of this exercise confirmed the following:

- The existing structural frame is capable of accommodating the maximum downward load comprising full DEAD plus IMPOSED LOAD.
- The existing rafter section requires the intermediate columns to be in place to enable support for permanent loads (ie roof construction) and for snow load. This is the current arrangement.
- The roof structure supporting the current asbestos cement roof sheeting will be suitable for replacement with profiled metal roof cladding/insulation. Fixings will be determined by the future design development process.
- Any elements that are locally deteriorated or decayed will need replacement or enhancement.
- The external timber columns can satisfactorily support the vertical downward load from full DEAD plus IMPOSED LOAD. Supplementary structural timber will be required to minimise horizontal and vertical deflections and to stiffen up the connection at both eaves levels.
- The internal timber columns effectively act as props and are satisfactory for the applied load.
- The perimeter sheeting rail timber sections have been checked for vertical load which can be accommodated by the existing timbers.
- The perimeter boarding acts as vertical bracing panels on all four sides and will continue to operate as such on the realistic assumption that there is load transfer between adjacent timber panels.

WIND LOAD was considered on the elevations/gables and as a potential uplift on the roof. The current wind analysis allows for the boarded nature of the elevations, whilst the proposed wind analysis has been based on the proposed architectural elevations/materials and the current walling/envelope. We have considered both scenarios and can report as follows:

- The perimeter boarding (acting as vertical bracing) can accommodate the applied wind load in each direction as long as there is load transfer between adjacent panels.
- The low level wall is satisfactory to accommodate applied wind loads.
- We would recommend that timber bracing is provided at rafter level to transfer lateral loads back to columns and foundations.
- The existing frame plus respective elevation treatments can accommodate the applied wind loading based on the above supplementary works.

The existing pad foundations are still to be determined, however as stated above there is no evidence of defective foundations, inadequate ground bearing or primary structural movement.

- **Discussion:**

As demonstrated above, the current proposals comply with the requirements of Part Q of the Planning Regulations as the existing building can be converted to a residential dwelling without demolition/rebuilding.

A trial pit investigation will be necessary to confirm level and details of the existing foundations/ground slab and to determine ground conditions below the existing foundations/ground slab.

A new internal timber frame is to be adopted to create a cavity wall in conjunction with the current external wall construction. This will most likely be supported off the existing slab, but will also provide additional stability to the building.

Internal structure will be provided to support any ceiling arrangement within the building. This will be designed to not add any additional load to the main frame/perimeter walling/foundations. This by its nature will provide additional stability to the overall building.

- **Conclusions:**

The building is in good/sound condition and shows no major signs of movement, deterioration or structural distress. The development proposals can be delivered without demolition/rebuilding thus complying with the requirements of Part Q of the Planning Regulations. The internal leaf of the perimeter wall and any internal ceiling arrangement will be accommodated on its own structural arrangement, not impacting on the existing arrangement.

Trust that the above is self-explanatory. We would be delighted to discuss further after you have had time to digest the contents of the report.

Yours sincerely

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