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## **VISUAL STRUCTURAL INSPECTION**

**OF THE**

**BARNS ADJACENT TO  
PETERSBURGH FARM  
BECKERMET  
CUMBRIA**

**FOR**

**MR SHERWEN**

**Reference - WDS/05/8935/REP01**

**Date - 07/10/2024**

## **1.0 BRIEF**

- 1.1** WDS Limited were instructed by Mr Sherwen to carry out a structural inspection of the Barns Adjacent to Petersburgh Farm, Beckermeth. The purpose of the inspection was to verify whether the existing structures are generally adequate to convert into a dwelling. The survey was limited to a visual, non disruptive inspection of the buildings.
- 1.2** Three separate barns have been considered as part of the survey. These comprise Barns 1-3 as shown on the attached plan sketch. Barns 1 and 2 comprise two storey attached buildings constructed from a combination of rubble filled random stone, clay brick and concrete block masonry walls which support a traditional timber truss and purlin roof. The first floors comprise timber joists. The ground floors comprise a combination of stone flags and concrete slabs. Barn 3 comprises a single storey detached structure of similar construction to the barns noted above. The barn conversion is to be split into 5 units. Barn 1 will comprise units 1 & 2, Barn 2 will comprise units 3 & 4 and Barn 3 will be unit 5. In this report the barns will be referred to as Barns 1 -3.
- 1.3** The barns are excess of 100 years old.
- 1.4** The inspection was carried out on the 20<sup>th</sup> September 2024. On the day of the inspection the weather was clear and dry.
- 1.5** It should be noted that there may be faults with the buildings which are masked or hidden by finishes that are not normally identified during a non disruptive inspection.
- 1.6** The foundations to the properties were not exposed at the time of this inspection therefore no comment can be made as to their condition at this time.
- 1.7** For the purposes of this report the properties will be orientated as noted on the attached sketch.

## **2.0 OBSERVATIONS**

- 2.1** Barn 1 has a significant lean to its South wall. Patress plates with tie rods have been fixed through the building at its West end to prevent further movement. There are also a number of cracks to the West gable end caused by the movement of the South wall. Further cracking is evident midway along the barns North Elevation. We inspected the property in 2013 and note that since then the condition of the wall has not worsened. The barn corners and internal wall interfaces are inadequately tied in and appear to be butt jointed in some instances.
- 2.2** The lean-to annexes to the North elevation of Barn 1 are inadequately tied into the main barn. Some of the walls which abut the main barn have been locally rebuilt after collapse. The carport to the East of the lean to has been partly rebuilt in concrete block masonry in the past 20 years; this has been impact damaged with localised cracking apparent. The roofs to both the lean-to and carport will need replaced as part of any conversion scheme.
- 2.3** The roof structure to Barns 1 -3, if to be retained, will need inspected by a timber specialist to check for infestation/rot. The purlins are undersized to modern design standards and will need replaced or strengthened as part of the conversion works. The main trusses appear robust. We understand that the first floor structure will be totally renewed as part of the conversion works and hence no further comment will be made in this report regarding its condition.
- 2.4** There is an inward lean to the North wall to Barn 2. The East wall has also a slight inward bulge. There is cracking to the internal corners of the barn, the abutting walls are inadequately tied in.
- 2.5** Barn 3 appears to be in an adequate structural condition throughout with only general building refurbishment works necessary.
- 2.6** The foundations to the barns were not exposed during this inspection however considering the use of the building we see no issue with the existing wall and foundation structures supporting the loading associated with a domestic property. We would however recommend that trial holes are excavated at the corners of each barn to expose the depth of the footing. This is required to ensure that the new floor slab specification can be provided such that undermining of the walls is prevented during construction.
- 2.7** The link arch between Barn 1 lean to and Barn 3 is in a poor condition. The timber lintel has deteriorated and is inadequate; the wall/arch needs locally removed.

### **3.0 DISCUSSION/RECOMMENDATIONS**

- 3.1** Barn 1 needs the South Wall, where leaning, locally rebuilt plumb with the corners re-tied. The cracked masonry noted to the West Gable and North elevation will also need re-tied. Furthermore if the lean-to annexes to the North Elevation are to be included in the conversion then these will need their walls fully tied into the main barn walls where they abut.
- 3.2** The North wall to Barn 2 needs locally rebuilt where it is significantly out of plumb and re-tied into the return East and West walls. The slight lean to the East wall is not deemed significant at this stage.
- 3.3** As noted, Barn 3 is in an adequate general structural condition, no significant structural remedial works are deemed necessary at present.
- 3.4** The roof structures, if to be retained, will need inspected by a timber specialist to check for infestation and rot and treated accordingly. It is likely that only the main trusses will be structurally suitable to be retained as the rafters and purlins are not in accordance with current standards. Depending on the findings of the timber specialist the purlins may be strengthened, this will need checked by a structural Engineer as part of the building design phase
- 3.5** The masonry corners to the Barns need retied as part of any conversion scheme. There are numerous areas of loose masonry which will need rebuilt/pointed. In addition, there are numerous masonry cracks which will need re-tied as part of the general building refurbishment works.
- 3.6** The timber lintels and inserts throughout the building will need replaced with precast concrete or steel sections to suit spans and loadings.
- 3.7** We recommend that a trial hole is excavated at each corner of the barns to expose the base level of the wall such that the ground floor slab and insulation detail can be specified to ensure that undermining of the wall does not occur during construction.

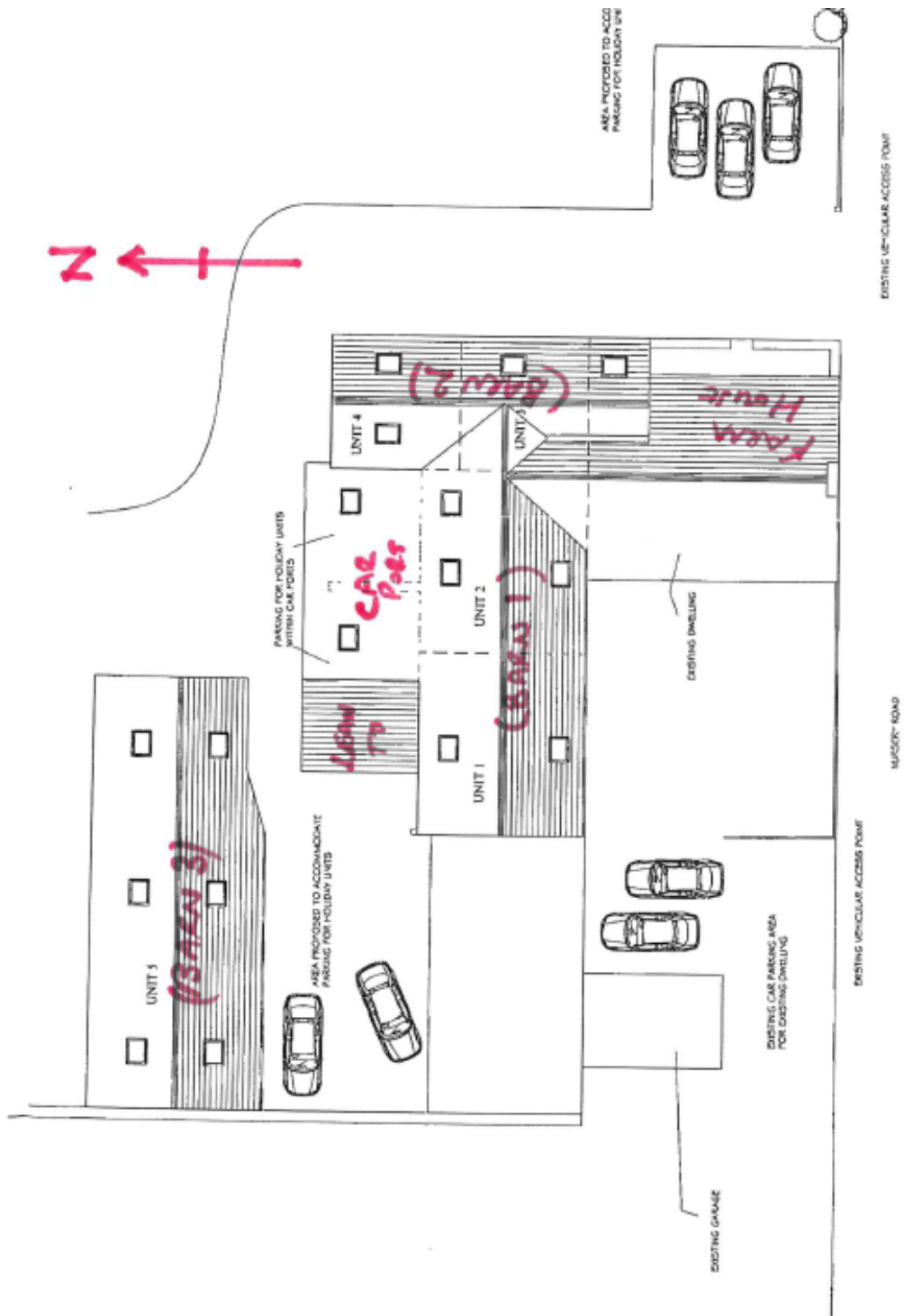
### **4.0 CONCLUSION**

- 4.1** The barns are generally in an adequate structural condition with some re-building (less than 25% of the existing wall areas) and general refurbishment of the masonry walls necessary. It is our opinion that following the completion of the remedial works outlined above the barns will be structurally suitable to

be converted into a domestic property. The conversion of the property into a dwelling will remedy all current faults and strengthen the building thus securing its long-term retention as a heritage asset.

For and on behalf of WDS Limited

Tom Short BEng (Hons) CEng MICE



SITE PLAN