Paul Snape Consulting

SM Creeley

Tilecroft Barn, Old Clay Lane, Thornley with Wheatley, PR3 2NB – Agricultural Building

Structural Condition Survey for Assessing Conversion to a Residential Property

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SM Creeley
Structural Condition Survey
Tilecroft Barn

Contents

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1.0 Terms of reference

Paul Snape Consulting were appointed by SM Creeley, through PWA Planning, to carry out a visual structural inspection and produce a structural condition survey report for Tilecroft Barn, Old Clay Lane, Thornley with Wheatley, PR3 2NB.

2.0 Purpose of the survey

It is proposed to convert the building to form a residential property or properties under a Class Q planning application. The proposed layout has not been prepared and this report is intended to assist in the design process. The visual structural survey is required to confirm the current condition of the building and to assess the suitability for conversion for residential use. Photographic records of the building are included as Appendix A which are referenced throughout the report.

The drainage, foundations and electrical systems of the building have not been inspected. Therefore, we are unable to confirm that these are in a satisfactory condition.

We have not inspected parts of the structure that are covered, unexposed or inaccessible. Hence, we are unable to report if such parts of the property are free from defect.

Our inspection was undertaken on 6th August 2021 at which time the weather was dry and partly overcast.

The survey was undertaken by a Chartered Engineer, Paul Snape BEng (Hons) CEng MICE

3.0 Description of the Buildings

The existing building is essentially made up of three distinct sections. These are as follows;

1. The original stone/brick building at the south end with a mono-pitched roof. This was the original clay tile works.

2. An extension of the original building built in blockwork, added to the east of the original building.

3. A new section of the building added to the south of the original building.

The original building is constructed in traditional random-rubble stone walls with one elevation in brickwork. An extension to this has been added to the east, built in concrete blockwork. These sections have a mono-pitched, metal sheeted roof sat on steel beams and timber. The new building added to the south is constructed in concrete block with the north gable consisting of the south elevation of the original building. The roof is a duo-pitch roof with metal sheeting sitting on timber purlins and lightweight steel trusses. The buildings have concrete

floors throughout. The original building probably dates from the 18th or 19th century with the new extensions believed to have been built in the 1970's.

4.0 External and Internal Survey

External Survey

New Section of Building to the South of the Original Building

South Elevation (Photos 1 to 4)
The gable end of the building has a large steel sliding door forming the access to the building. The wall is formed from 220mm thick concrete blocks and this is in reasonable condition with limited damage to the blockwork (photo 3). The wall has a DPC approximately 300mm above ground level. This appears to be a coarse bituminous DPC (photos 3 & 5). The wall is reasonably plumb with no obvious signs of movement. There is no guttering or downspouts to this elevation.

West Elevation (Photos 5 to 14)
This elevation is constructed with 220mm thick blockwork with internal piers. It has 6 window openings and benefits from guttering and downspouts draining direct to the ground. The blockwork is plumb and in reasonable condition. The DPC noted above is also present in this elevation. The lintels above the windows are RC lintels which have signs of damage (photos 9, 11 & 13). The window frames are wooden and in poor condition cosmetically but without extensive signs of rot or infestation. Photographs 7 & 10 indicate the presence of a possible manhole or slurry tank adjacent to this elevation.

East Elevation (South End) (Photos 24 to 28)
This elevation is constructed with 220mm thick blockwork with internal piers. It has 6 smaller window openings, when compared to the west elevation, with a door opening below one of these (photo 24) and benefits from guttering and downspouts. The blockwork is plumb and in reasonable condition. The DPC noted above is also present in this elevation (photo 26). The lintels above the windows are RC lintels and these are in good condition when compared to the west elevation. The window frames are wooden and in poor condition cosmetically but without extensive signs of rot or infestation. There is a small lean-to greenhouse structure at the north end of the elevation where this section of building meets the original building.

Original Building and Extension to Original Building

West Elevation (Photos 5 to 14 and 16)

The west elevation of the original building is constructed in clay brickwork approximately 330mm thick. The remainder of this section of the building is in blockwork. The stone quoins are still in place at the north-west corner (photo 12). The elevation has two window openings and a door (photo 16). The brickwork is poor but reasonably plumb with pointing mainly intact. The window frames are in poor condition with signs of rot. The larger window has a steel lintel (photo 13) which is rusted but structurally sound. The smaller window has a stone lintel which is in good condition (photo 12). The doorway has a wooden door which is free from rot and infestation but cosmetically in poor condition. The doorway has a stone lintel in place which is in good condition. Photo 16 indicates the mono-pitch roof to this section with a wooden fascia in reasonable condition. There are no gutters or downspouts to this elevation.

North Elevation (Photos 15 and 17 to 23)

This elevation is in two parts, comprising the original stone section and the extended section in blockwork as indicated in photo 18. The stonework section is approximately 450mm thick and built with random sandstone. The wall is generally in a reasonable condition but there is some localised damage as indicated in photo 21. The stone wall is reasonably plumb with no sign of structural movement. The extended section to the east is built with 220 mm thick blockwork with a central internal pier and was probably constructed at the same time as the section of new building to the south. As with that building, there is a DPC in the blockwork but this is nearer to ground level at this location. In addition, there is a damp proof membrane present (photos 20, 22 & 23). It is not clear whether this is to the floor slab internally or part of a french drain system to this elevation. It is likely that it is part of a french drain system rather than a DPM under the internal slab.

East Elevation (North End) (Photos 28 and 30 to 33)

This elevation is constructed in 220mm thick concrete blockwork forming the gable to the extension of the original mono-pitched building. The wall has a central internal pier. The blockwork is reasonably plumb and well pointed. Areas of the elevation are covered in vegetation (photos 30 and 31). Photo 31 shows a roof beam penetrating this elevation and photos 28 & 30 indicate a chimney flue on this elevation. Photos 32 and 33 indicate structural movement in the plane of the elevation which may be ongoing. This movement is indicated internally and discussed below.

Roof (photo 32)

External inspection of the roofs indicated all the metal sheeting to be in place and in reasonable condition.

Internal Survey

Extension to Original Building (Photos 34 to 37, 39 and 54, 58, 60 & 62)

Internal inspection of this area confirmed the structural movement is the plane of the wall adjacent to the central pier on the east elevation (photos 58, 60 & 62). The movement appears to be to the north half of the wall which has rotated away from the pier. This may be due to inadequate bonding or brick ties at this location. The movement may be ongoing. Otherwise, the blockwork is well pointed and reasonably plumb in the vertical plane. The floor is of a concrete construction and in reasonable condition (photo 39). The roof is carried by a combination of steelwork and timber purlins. Photo 37 indicate some possible signs of rot to the purlins due to water ingress.

Original Building (Photos 38 and 40 to 43)

This section of the building is divided into two rooms by a 450mm thick stone and brick wall. The whole section is divided from the extension by a 600mm thick stone wall with large openings (photo 42). The walls are reasonably plumb and roughly pointed. It is clear that parts have been partially re-built or openings blocked in both stone and brick. As noted above the west gable has been re-constructed in brickwork. The room to the south has blockwork animal stalls in place (photo 40). The roof is carried by timber purlins on steel sections (photos 45 and 46). The floor is concrete and in reasonable condition (photo 43).

New Section of Building to the South of the Original Building (Photos 44 to 57, 59 and 61)

This large area runs south from the original building with the south elevation of that building forming the north gable. The blockwork elevations have equally spaced piers which provide support for the lightweight roof trusses (photo 47) as well as support to the walls. Some of the piers have slight damage at lower levels (photo 46) which may be from removal of former animal stalls. The trusses are noticeably covered in surface rust but appear to be structurally sound. They carry timber purlins which appear to have been replaced at some point, possibly when re-sheeting the roof. The north gable is the original stone/brick wall and photo 49 indicates a stranded first floor fireplace which indicates the original building may have extended south and was two storey. This wall also has evidence of damp at lower levels (photo 51). Similarly, photo 52 indicates damp penetration to the blockwork walls. Photo 61 shows the concrete floor slab which is in good condition. There is some vegetation growing internally on the blockwork as evidenced in photos 59 and 61.

5.0 Suitability for Conversion and Method of Construction

It can be seen from the survey detailed above that this building is in reasonable condition in terms of structure, with limited movement and/or damage to the walls. Further investigation of the movement to the east elevation of the extended section of the original building will be required to ensure movement is not ongoing. Remedial works may be necessary to the foundation and or bonding/ties to the pier at this location. The roof structure and roofing sheets are in a reasonable or good condition.

Proposals for the conversion have yet to be prepared. It is likely that the proposals will be for a single storey dwelling or dwellings and it is expected that the external stone and brick elevations would be retained, along with retained/new cladding to the roofs. In addition to existing internal walls, new internal walls would be provided to form the individual rooms/areas within the dwelling or dwellings.

In converting the building, it would be necessary to provide an inner skin to the existing external stone/blockwork walls, forming an insulated cavity wall. This would be built off a thickened floor slab edge detail or new/extended strip footings. Internal masonry loadbearing walls would also be provided as noted above. These walls would take the loading from new ceiling structure. The height of the building will allow the existing floor slab to be retained and a new insulated floor laid over it. Cores should be taken through the existing floor to ascertain the construction i.e. concrete depth, reinforcement details, hardcore depth and subgrade. This will provide the necessary detail to assess whether internal loadbearing walls can be built directly off the slab or whether new foundations will be necessary. If new foundations are necessary, these can be formed by cutting through the slab to the minimum width necessary. It will be essential that any new or extended foundations do not affect the existing foundations to the existing walls. Trial holes should be hand dug to ascertain the detail of the existing strip footings to the walls, prior to detailed design. It is likely that the older stone walls will have shallow foundations and any design will need to take account of this to avoid any undermining or need for underpinning.

The existing roof structures are in reasonable condition with two distinct areas. The mono-pitch roof has some poor timber sections which will need assessing and probably replacing. Similarly, the steelwork to this section will need to be assessed and possibly modified where it penetrates the gable walls. The newer lightweight trusses to the south will need cleaning and further assessment. All the roof structure will need to be assessed for the proposed loading from the roof and ceiling. Insulation to the roof will also be required and it may be possible to accommodate this within the new ceiling structure thus removing any need for further loading on the steelwork. The steelwork will need cleaning and given a protective coating as necessary. There are numerous windows and doors within the existing structure and there should be no need to introduce many more.

The existing building has a basic drainage system, comprising gutters and downspouts draining direct to ground. Any new system will need to be positively drained to soakaways or to a watercourse. The property will also require a sewage treatment plant if foul sewers are not available at this location. The manhole/tank noted adjacent to the west elevation will need further investigation work and removal/infilling.

6.0 Conclusions

Given the assessment and proposed construction options briefly outlined above, it is considered that the building is suitable for conversion to a dwelling or dwellings. When converting agricultural buildings, it is essential that the construction techniques and sequence are carefully considered by the Architect and the final design should be assessed by a Chartered Engineer.

Appendix A

Photographs

Photo 1 - South Elevation

Photo 2 - South Elevation DPC

Photo 3 – South Elevation damage

Photo 4 – South Elevation DPC

Photo 5 – West Elevation at south west corner

Photo 6 – West Elevation

Photo 7 – West Elevation

Photo 8 – Lintel on west elevation

Photo 9 – Tank or manhole adjacent to west elevation

Photo 10 – Lintel to west elevation

Photo 11 - Lintel to west elevation

Photo 12 – West elevation north end

Photo 13 - West elevation north end – steel lintel

Photo 14 - West elevation north end at north west corner

Photo 15 – North Elevation – Stone Section

Photo 16 – West Elevation – indicating mono-pitch roof

Photo 17 – North Elevation – block section to extension

Photo 18 – North Elevation – indicating original stone building and blockwork extension

Photo 19 – North Elevation – north east corner

Photo 20 – North Elevation block section showing DPC

Photo 21 – North Elevation – damage to stone

Photo 22 – North Elevation blockwork – DPC membrane

Photo 23 - North Elevation blockwork – DPC membrane

Photo 24 – East Elevation

Photo 25 – East Elevation – Window detail

Photo 26 – East Elevation DPC

Photo 27 – Large Opening to original building and extension - south elevation

Photo 28 – Blockwork to east elevation of mono-pitch extension to original building

Photo 29 – Roof sheeting to blockwork building

Photo 30 - Blockwork to east elevation of mono-pitch extension to original building

Photo 31 - East elevation of mono-pitch extension to original building indicating sheeting and penetrating I Beam

Photo 32 – East Elevation blockwork movement to extension to original building

Photo 33 - East Elevation blockwork movement to extension to original building

Photo 34 – Internal to extension of original building

Photo 35 - Internal to extension of original building

Photo 36 - Internal to extension of original building

Photo 37 - Internal to extension of original building – timber purlin and block pier

Photo 38 - Internal to original stone building

Photo 39 - Internal to extension of original building – concrete floor

Photo 40 - Internal to original building

Photo 41 - Internal to original building

Photo 42 - Internal to original building

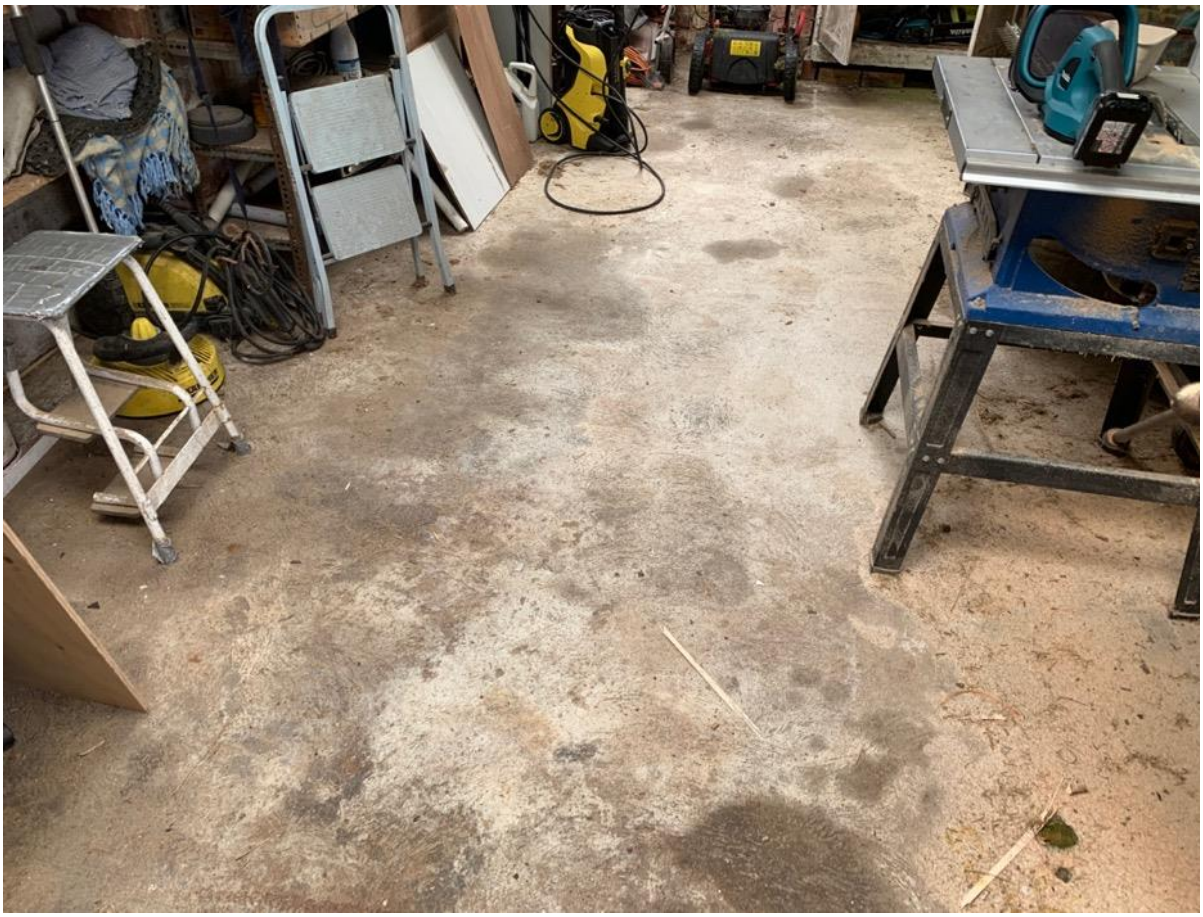

Photo 43 - Internal to original building – concrete floor

Photo 44 - Internal to newer blockwork building

Photo 45 - Internal to newer blockwork building – apex of roof trus

Photo 46 - Internal to newer blockwork building – block pier

Photo 47 - Internal to newer blockwork building – looking north to original building

Photo 48 - Internal to newer blockwork building – roof truss and purlins

Photo 49 - Internal to newer blockwork building – original building south elevation

Photo 50 - Internal to newer blockwork building – original building south elevation

Photo 51 - Internal to newer blockwork building – original building south elevation

Photo 52 - Internal to newer blockwork building – damp penetration and damage to pier

Photo 53 - Internal to newer blockwork building – original building south elevation

Photo 54 - Internal to newer blockwork building – roof sheeting

Photo 55 - Internal to newer blockwork building – roof

Photo 56 - Internal to newer blockwork building – truss apex

Photo 57 - Internal to newer blockwork building – looking north

Photo 58 - Internal to original building extension – movement adjacent to pier

Photo 59 - Internal to newer blockwork building - vegetation

Photo 60 - Internal to original building extension – movement adjacent to pier

Photo 61 - Internal to newer blockwork building - vegetation

Photo 62 - Internal to original building extension – movement adjacent to pier