HORIZON
STRUCTURES

DJC/DS/6405

21 December 2021

Mrs M Clarkson
Oak Tree Farm
Kenton
Stowmarket
Suffolk
IP14 6JZ

For the attention of Mrs M Clarkson

Dear Madam,

BARNS A AND B, OAK TREE FARM, KENTON – STRUCTURAL INSPECTION REPORT

1. BRIEF

Horizon Structures were appointed by Beech Architects on behalf of yourself to undertake a visual structural inspection of the two barns at the above property and report on its suitability for conversion to domestic accommodation. We have therefore limited our inspection and report accordingly.

2. DATE OF INSPECTION

Wednesday 2nd December 2020.

3. DESCRIPTION OF PROPERTIES

The two barns are located on the north side of a farmyard complex. See Layout A.

Barn A is a single storey agricultural building constructed from a low level masonry plinth with principal timber trusses and posts over and infill studwork partitions. To the front of this barn, a reverse lean to pitch spans between the front elevation and circular hollow column sections supporting a significant steel frame. The front structure is due to be demolished and falls outside the scope of this report. See Photograph 1 and 2.

Barn B is a single storey agricultural building constructed from solid masonry with a cut pitch roof constructed from principal rafters and purlins overclad in clay pantiles. See Photograph 3.

The British geological survey shows that the properties are founded upon the Lowestoft formation consisting of boulder clay with sand and gravel.

4. INSPECTION

4.1 Barn A

An inspection of Barn A generally reveals that the main rear structure has been formed from a low level masonry plinth with a timber post and truss structure over. The infill panels between the posts have been formed from timber studwork.

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The front lean to structure has been constructed from hot rolled steel angles and circular hollow section posts supporting corrugated cement sheeting. The substantial steel framed structure to the front of this is to be demolished.

4.2 Barn A External Inspection
An inspection of the left gable reveals that the front timber corner post has been exposed to the elements and has deteriorated at low level. To the rear of this, a door opening appears to have been bricked up without any tying to the existing masonry and this has now subsequently started to fall out. See Photographs 4 and 5.

An inspection of the rear elevation revealed no significant damage to the wall structure, however several of the rafter feet are exposed to the elements and have begun to rot. It was noted that the external soil level is approximately 300mm higher than the slab level internally.

The major steel frame in the front of the target building has circular hollow section columns supporting the roof. The lean to structure to the target building has been formed by spanning steel equal angle between the timber structure of the target building and the steel columns of the front building. The steel angles have been bolted to the posts to the rear and a combination of welding and bolting to the circular hollow sections to the front. One post has been removed at low level and a steel goal post installed to support the post at high level. See Photograph 6.

An inspection of the roof reveals no undue distortions or deflections.

4.3 Barn A Internal Inspection
An inspection internally reveals that, generally the principal support posts extend down to slab level with masonry infills on either side. Exposure to moisture has led to deterioration of these posts. The majority of the posts have suffered from surface rot but when penetrated the underlying material was hard, however two posts within the rear wall have totally disintegrated and one of the front timber posts has also partially disintegrated. An inspection of the low level walls throughout the property revealed no significant structural defects. See Photograph 7.

Access to the roof space was limited, however where able the timber structure appears to be in relatively good condition however to the high moisture content woodworm was present throughout.

4.4 Barn B
An inspection of the external elevations of this property revealed that the front elevation originally appeared to be open and has subsequently been enclosed using timber doors and aluminium cladding. The end gables and rear elevation is mainly constructed from historic solid brickwork with lime mortar, with sections of modern blockwork infills.

4.5 Barn B External Inspection
An inspection of the right gable wall reveals that a vertical crack extends from ground level through to roof level varying in width between hairline at ground level through to 1.5mm wide at roof level. See Photograph 8.

An inspection of the rear elevation reveals that there appears to have been an impact at mid height of the wall halfway along its length, leading an indention of approximately 30mm. See Photograph 9. To the left of this location, washout of the mortar joints appears to have occurred in a 1m stretch of the masonry. Towards the left hand end of the rear elevation, the mortar plinth has been damaged exposing the flintwork beneath. The mortar joint into this flintwork has weathered leading to cutback. See Photograph 10.

An inspection of the left gable revealed no significant damage.

An inspection of the front elevation revealed no significant damage to the cladding.

An inspection of the roof structure revealed no undue distortions or deflections, with the ridge line being approximately level throughout its length.

4.6 Barn B Internal Inspection

An inspection within the left room revealed that the masonry is exposed on the left gable wall and the rear elevation. Inspecting the left gable wall reveals no significant defects. Inspecting the rear elevation reveals a hairline crack at the junction between the modern blockwork and the historic masonry. See Photograph 11. Centrally within this room, the impact observed externally is present. This is evident in a 30mm bulge in the brickwork with associated cracking, varying in width between 1 – 5mm. See Photograph 12 and 13.

The right internal wall has been formed using a studwork partition which showed no significant defects.

The eaves member along the front elevation shows evidence of surface rot on the top face, indicative of standing water. Staining is also present on some of the rafter feet. See Photograph 14 and 15.

An inspection of the roof structure reveals no undue distortions or deflections. However, moisture staining was present in isolated locations and light woodworm was present throughout.

An inspection of the front steel support posts reveals that these appear to be in good condition, with no significant rust present.

5. LIMITATIONS CLAUSE

This report consists of a visual survey of the building and does not include any intrusive investigative work or testing in inaccessible areas and we are therefore unable to report that any such part of the building is free from defect.

6. CONCLUSIONS AND RECOMMENDATIONS

We consider that there is no evidence on site that either building is suffering from significant foundation movement such as subsidence or settlement. Both structures are suffering from a degree of lack of maintenance and elevated moisture content leading to beetle infestation.

6.1 Barn A

We consider that there is no reason why this property is not suitable for conversion into domestic accommodation when the following maintenance items have been completed.

1. Carefully cut out the damaged timber to the post bases and reform using a sympathetic material with a waterproof detail to prevent rot.
2. Once the property is made watertight, the timber should be treated to prevent any further rot or woodworm.
3. We recommend that the build up of soil behind the rear wall is removed down to its natural level to prevent damp penetrating through the wall.
4. We recommend that where the ad-hoc adjustment of the circular hollow steel support columns has been undertaken, a review of this layout completed prior to any renovation works.

6.2 Barn B

We consider that Barn B is suitable for conversion to domestic dwellings once the following maintenance items are completed.

1. Impact damage to the rear wall should be restitched using traditional methods to ensure the stability of the individual masonry elements.
2. The crack damage to the right gable wall should be repaired using traditional methods and once complete, Helibar reinforcement should be installed extending 500mm either side of the crack location at 450mm vertical centres.
3. The property should be made watertight and the timber structure treated for rot and beetle infestation.

We trust the above is self-explanatory, however, should you have any further queries please do not hesitate to contact the undersigned.

Yours faithfully,

David Cook
Civil and Structural Engineer
B.Eng C.Eng FICE MCGI
Horizon Structures Limited

Layout A

Photograph 1

Photograph 2

Photograph 3

Photograph 4

Photograph 5

Photograph 6

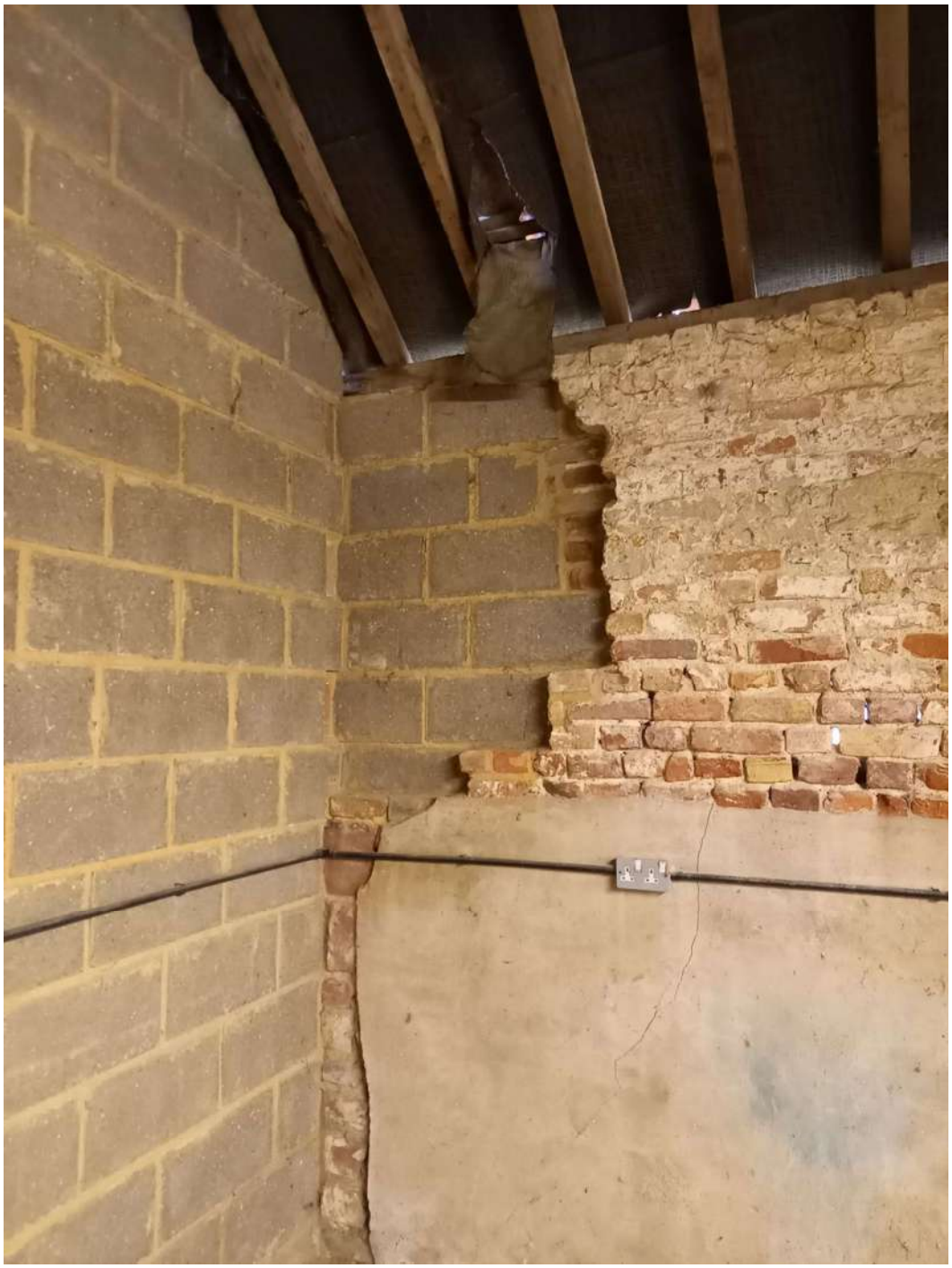
Photograph 7

Photograph 8

Photograph 9

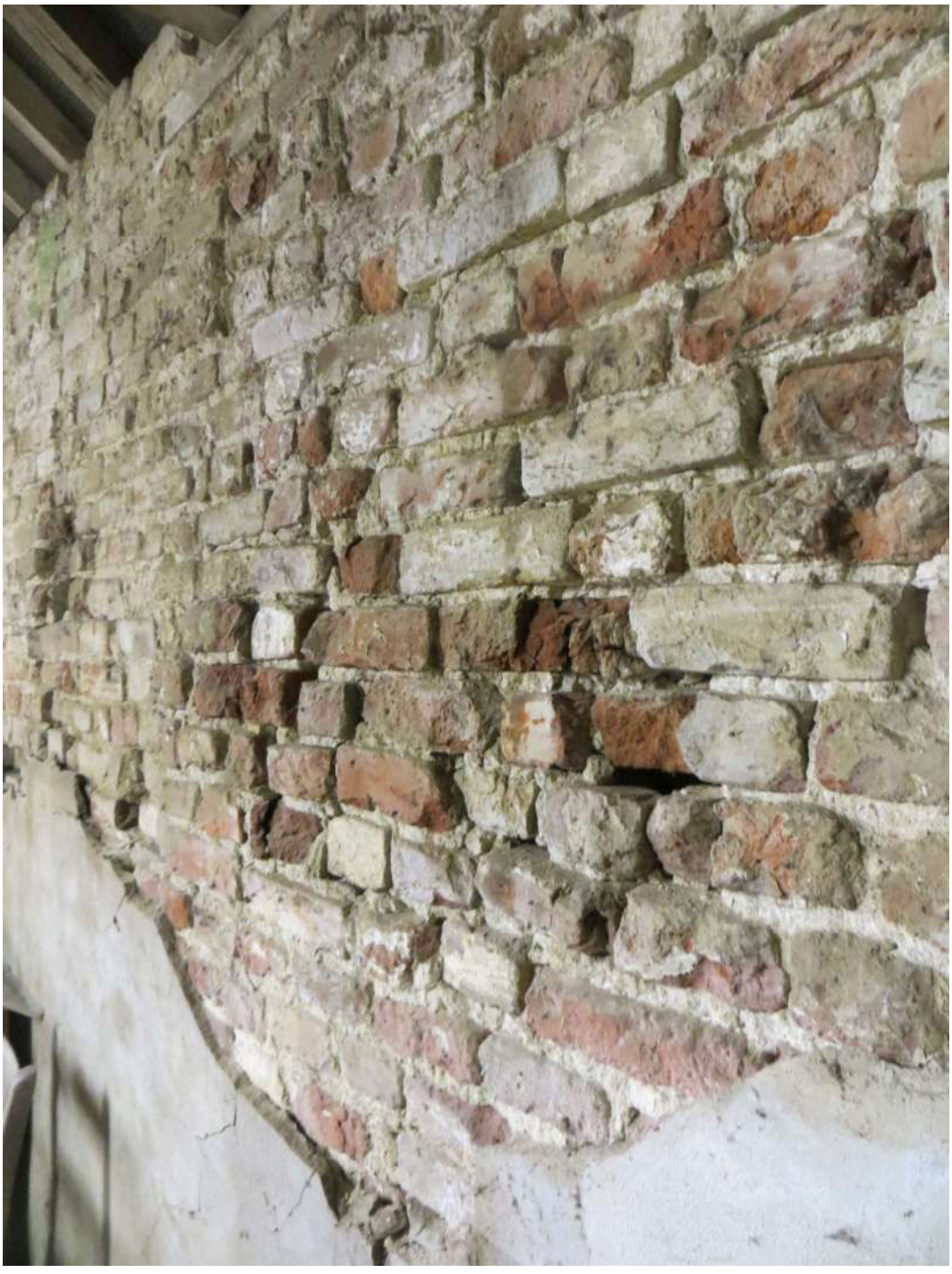
Photograph 10

Photograph 11

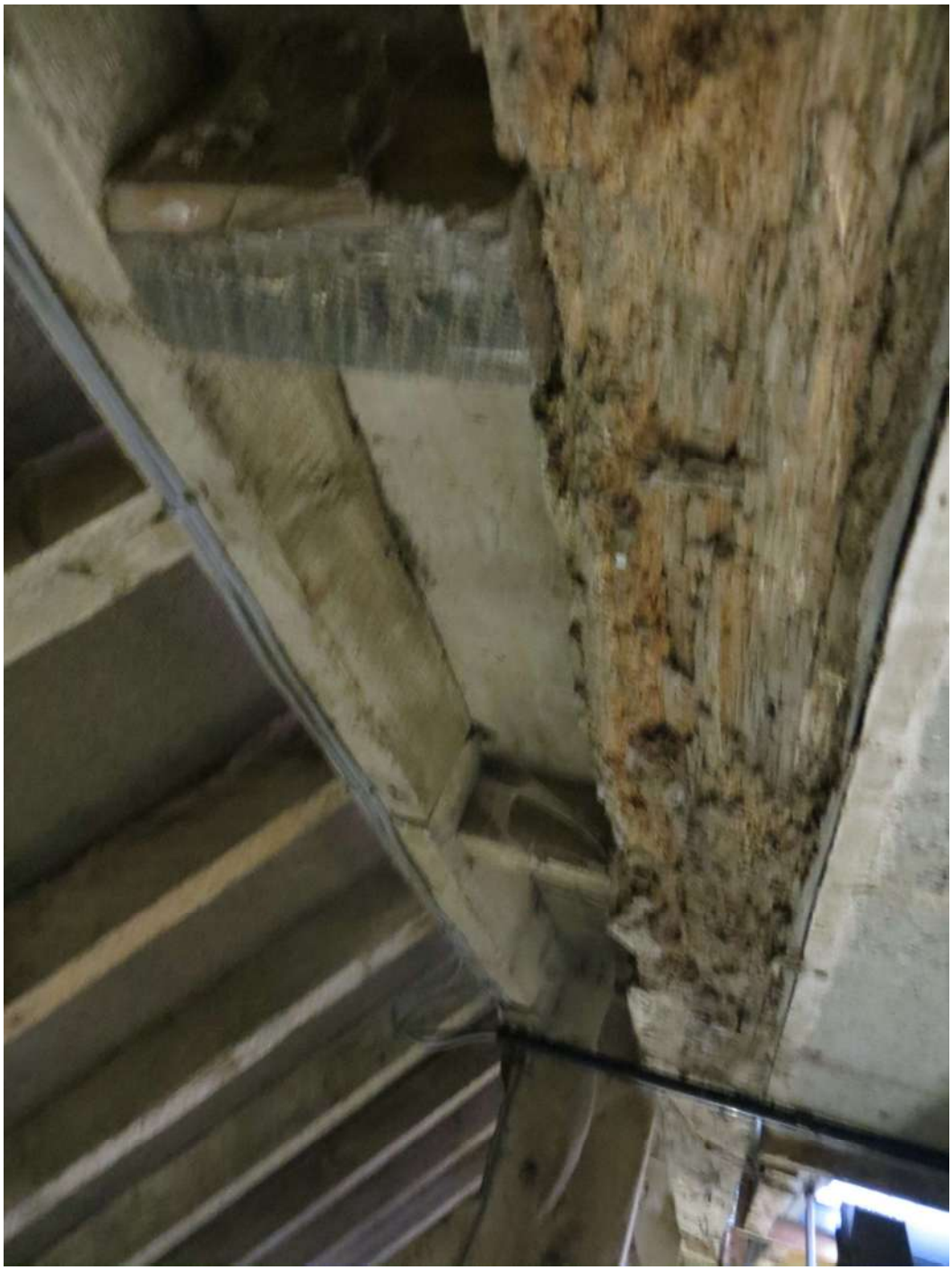


Photograph 12

Photograph 13



Photograph 14



Photograph 15