(*Issue No 2*)

Structural Appraisal Report

on

Proposed Renovation

of

The Royal Oak,

Monk Soham IP13 7EX

for

Mrs Sue Bagnall

Project No : **G050** Date : **20th February 2021**

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1.0 BRIEF

1.01 Instructions

Instructions were received from Jordan Marsh of Whitworth Architects on behalf of the property owner Mrs Sue Bagnall, to undertake a structural inspection and appraisal of the existing house at The Royal Oak, The Green, Monk Soham, Woodbridge IP13 7EX.

It is proposed to fully renovate the existing house.

1.02 Scope and purpose of inspection and appraisal

This structural appraisal was undertaken to inspect and provide advice on the structural integrity and suitability of the existing house construction, in respect of its proposed renovation.

1.03 Date of Inspection

Thursday 11th February 2021

1.04 Weather

The weather at the time of the survey was cold, sunny and bright, with minimal winds. Ground surface was covered by recent snow fall.

2.0 THE EXISTING HOUSE

2.01 General Description

The Royal Oak is a period property which is listed as Grade II, indicating a property of architectural or historical importance. As the name suggests it was once a public house, believed to have been in operation until 1970 and some elements of that time still remain. It is fair to say the house is now in need of an overall scheme of renovation and general repair, to make it habitable to modern standards.

The existing building is a two storey detached property. The main roof covering is thatch, which is supported by a traditional duo-pitched hand cut roof, comprising longitudinal battens supported by regularly spaced rafters, which are in-turn supported by mid height timber purlins and the walls to the front and rear elevations. Regularly spaced timber ceiling joists are also supported of the perimeter head plate, with additional support provided at mid span by timber beams. The ceilings are generally lath and plaster.

The walls of the main house are traditional timber framed walls, comprising strategically located main frame, between which are regularly spaced vertical timber stud, supporting timber head plates and beams. The external face of the perimeter walls is rendered, whilst the inside face general has a lath and plaster finish. The ground floor storey has more recent masonry interventions within the timber framing, presumably constructed as a repair sometime in the past. It is not clear at this time how much of the original ground floor storey timber framing remains as the structure is covered by internal and external finishes.

The suspended first floor is supported by regular spaced timber joists and beams, again typical for the age of the property.

The ground floor generally is a oversite ground bearing concrete slab, although some areas of traditional brick flooring remain.

A small one and a half storey wing exists off the front elevation of the main house. This element of the house has a shallow pitched duo-pitched roof, supporting a clay pantile covering. The roof structure could not be inspected due to internal finishes present.

The perimeter walls are constructed from ‘clay lump’, supporting a timber suspended first floor. A brickwork chimney is present in the centre of the gable end clay lump wall.

The ground floor is timber battens over a concrete oversite slab.

A single storey lean-to store exists off the rear elevation of the main house.

The mono-pitched roof is covered by clay pantiles, supported by timber rafters and purlins.

The perimeter walls are a mix of traditional timber framing and loadbearing masonry construction.

An isolated masonry pier exists in the middle of the internal space and it is presumed that it supports a longitudinal timber roof purlin.

The store has a concrete ground bearing oversite floor.

Fig 1 – The Royal Oak, viewed from front garden area.
Also showing small one and a half storey wing off left-hand end

Fig 2 – The Royal Oak, viewed from rear garden.
Showing single storey lean-to rear store

3No trial pits were excavated by hand at strategic positions to investigate the form of construction of the existing foundations. Refer to trial pit logs in appendix A of this report. Samples of the underlying sub-soil were retrieved from all three pits, for geological testing. A visual inspection at the time of the visit confirmed the sub-soil to be Lowestoft Formation (Glacial Till) as anticipated from a desktop study of Geological mapping. It was

noted that the sub-soil in trial pit No3 contained a much higher sand content, compared with the sub-soil in trial pits Nos 1 and 2. The foundations in all cases were found to be relatively shallow by modern standards, but of a traditional brick and lime bound cobble from, typical for buildings of the period when constructed.

A number of trees are present in relatively close proximity to the property, including a mature Horse Chestnut tree in the rear garden, approximately 11m from the rear elevation of the house.

2.02 Structural condition and integrity

i) General timber frame structure to the main house

In general the visible elements of the timber frame structure are in a reasonably good condition. It is anticipated however that there will need to be some repairs and reinstatements required, but these will be attended to in the overall renovation of the property. It is recommended that a timber preservation specialist is appointed to inspect and provide advice on any timber treatments required as part of the renovation to add longevity to the timber elements. It is understood that the external render finishes are removed and replaced with lime render throughout. This will allow the outermost face of the timber frame to be fully inspected and its condition to be assessed.

ii) Roof over the main house

The main roof structure has not been fully inspected as safe access is not yet available, however a visual inspection through the loft hatch revealed one of the knee braces to the main roof purlin at the gable end wall to be broken/displaced.

Fig 3 – View of timber roof structure

iii) First floor to the main house

The timber first floor to the main house has a robust feel, despite it being noticeably out of level and having significant slopes to some areas. Generally the visible timber beam and posts which provide support to the floor are in good condition. No significant structural works to the first floor construction of the main house are anticipated.

iv) Ground floor storey walls to the main house.

At the time of writing this report the construction of the ground floor storey of the main house has not been fully investigated and therefore not fully defined.

It is very likely that the original walls would have been timber framed, constructed off a timber sole plate, but through time have been replaced in part by masonry (brickwork).

The current wall construction will need to be investigated. It is understood that the external rendered finishes will be replaced as part of the renovation works. This will provide opportunity for the condition of the ground floor walls, be they timber or masonry, to be fully inspected.

v) Ground floor slabs throughout the property

The ground floor slabs are concrete ground bearing slabs which appear to have been laid down in a somewhat piece meal fashion to replace the original flooring which may have been brick/tile floors. In addition to the usual signs of wearing, a number of significant cracks are present. It is understood that the concrete floors may be removed as part of the overall renovation and this will provide the opportunity to install a suitable replacement ground floor. The choice of replacement floor will need to acknowledge the depths of the existing foundations, to ensure the current founding levels are not undermined and thus requiring underpinning.

vi) Foundations throughout the property.

The 3No trial pits excavated revealed the existing foundations to be relatively shallow, founded in Lowestoft Formation (Glacial Till) in all cases. Whilst this material is generally considered to be suitable material to support foundations, it is by its nature a cohesive material which can be subject to volume change with variations in moisture content. Trees and shrubs will draw water from the ground and their water demand is dependent on their species. Trees/shrubs fall into HIGH, MEDIUM or LOW water demand categories.

The volume change potential will vary depending on the physical makeup of the Glacial Till and Geotechnical laboratory testing is used to determine whether the volume change potential is classed as HIGH, MEDIUM or LOW. Samples of the ground are currently undergoing Geotechnical testing to determine the shrinkage potential.

A significant Horse Chestnut tree exists within the rear garden along with a bank of trees of mixed species in close proximity to the front of the building. It is probable that the trees have had an effect on the ground around the property, the results of the geotechnical testing are required to provide a definitive assessment. That said, the majority of the foundations to the house do not appear to be detrimentally effected by the presence of the trees.

Trial pits records are attached to the rear of this report.

Fig 4 – Trial Pit No1

Fig 5 – Trial Pit No2

Fig 6 – Trial Pit No3

vii) One and a half storey wing off the front elevation of main house

it was clear from entering this part of the building that it has been allowed to deteriorate to the point where a number of significant structural defects have severely affected the structural integrity of this part of the building. Whilst the roof structure has not yet been fully inspected, it can be seen that it has not afforded weather protection to this part of the building for a considerable length of time, which has promoted a number of significant structural issues and defects.

The walls are constructed as clay lump walls and the tops of the side walls have been allowed to lean outwards, which in turn has allowed the raised collar roof to spread at eaves wall plate level. The magnitude of the lean is beyond that which can be considered as safe or repairable. A brickwork chimney structure is present within the centre of the gable end clay lump wall. The chimney is possibly a later addition within the clay lump wall. The clay lump wall has become fully detached from the chimney brickwork, where clear separation can be seen and this loss of integrity has in turn led to the promotion of a significant full height vertical crack at the junction between the gable end wall and the side walls. The structural integrity of the clay lump walls has therefore been significantly compromised. The first floor to this section of the building also exhibits a ‘springy’ feel when walking across the floor. This is very likely due to the bearing of the floor joist having been compromised by the wall movements previously described. This part of the building will need a significant structural intervention if it is to be part of the overall renovation of the property. Consideration should be given to the full demolition and re-building of this part of the building.

Fig 7 – Internal view of clay lump gable end wall with central brick chimney, also showing cracking due to spreading of roof structure and outwards leaning side walls

Fig 8 – Internal view of separation of clay lump gable end wall away from central brick chimney, with daylight clearly visible through significant cracking

Fig 9 – External view of full height crack separation of clay lump gable end and side wall

Fig 10 – Close-up of full height crack separation of clay lump gable end and side wall

2.03 Conclusions & Recommendations

Whilst it is clear that for the existing building to function as residential use to modern expected standards, it will need to undergo a regime of extensive refurbishment, the overall building structure is considered to have the required structural integrity to be capable of forming a sound basis for proposed renovation. Section 2.02 of this report outlines the structural condition of the various parts of the building.

The following points will need to be considered as part of the renovation works.

i) The existing timber frame elements should be inspected by a timber preservation specialist to determine the scope of any treatments against insect attack and resolve any damp proofing issues.

ii) The timber roof structure should be inspected when safe access is available and again should also be inspected by a timber preservation specialist to determine the scope of any treatments against insect attack. The broken/displaced knee brace to the longitudinal rear mid-height roof purlin will need to be reinstated.

iii) The replacement render materials should be selected to allow the building to breath naturally, thus preserving the exiting timber frame elements.

iv) The form of construction of the replacement ground floor should be carefully selected to avoid overall construction depths which would require the existing shallow foundations to be underpinned.

v) It is the opinion of this report that the structural condition of the one and a half storey front wing is beyond that which can be repaired and consideration must be given to its demolition and rebuilding.

vi) All new foundations and substructures must acknowledge the underlying ground conditions in conjunction with the presence of the existing trees in close proximity to the property. The depths of the new foundations should be designed acknowledging the volume change potential of the Glacial Till subsoil.

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Managing Director

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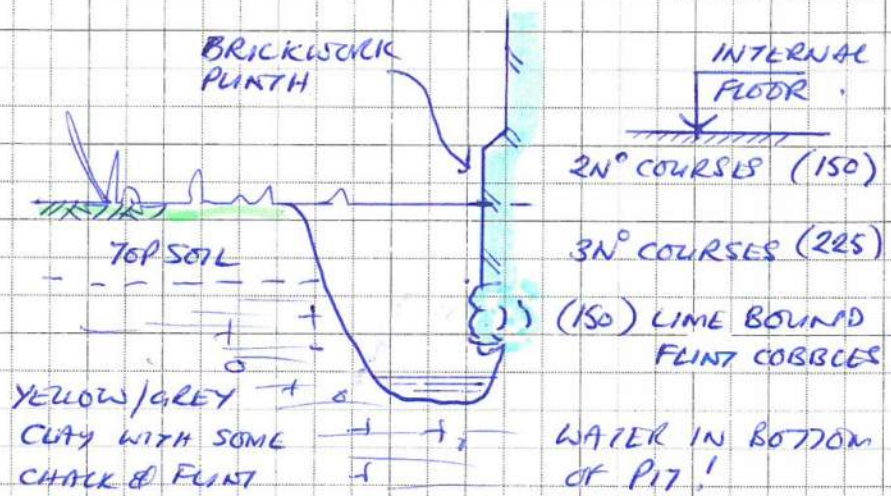
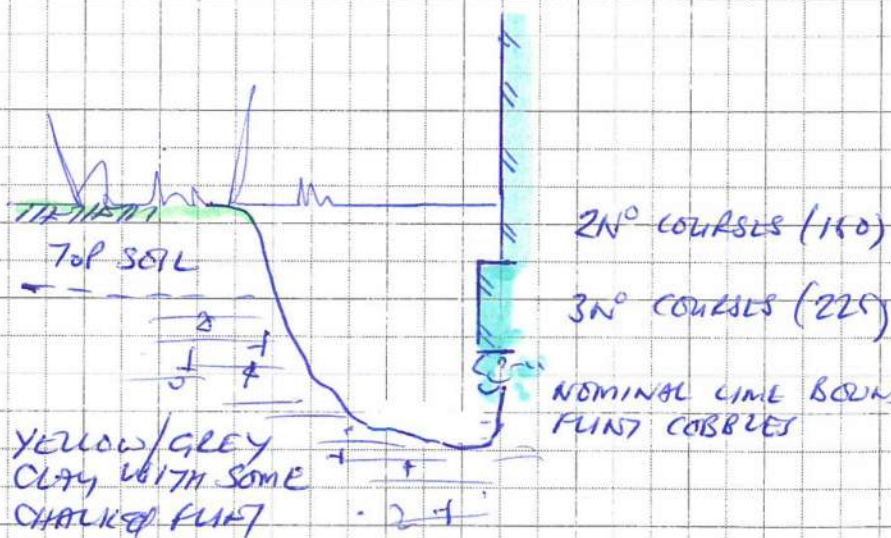
PROJECT THE ROYAL OAK, MONK SOHAM.

TRIAL PIT LOGS.

TRIAL PIT N° 1 (REAR OF MAIN HOUSE).



TRIAL PIT N° 2 (GABLE END OF MAIN HOUSE)



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PROJECT THE ROYAL OAK, MONK SOHAM.

TRIAL PIT N°3 (CABLE END OF SMALL WING, OFF FRONT ELEVATION)