

Ref 3.134

September 2015

**STRUCTURAL APPRAISAL**  
OF  
**OUTBUILDINGS**  
AT  
**REDMIRE FARM**  
**TRANMIRE, WHITBY**  
FOR  
**MR & MRS R HARRISON**

08 DEC 2015

**STRUCTURAL APPRAISAL**

Prepared by

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**STRUCTURAL APPRAISAL  
OF  
REDUNDANT OUTBUILDINGS  
AT  
REDMIRE FARM, TRANMIRE  
WHITBY, NORTH YORKSHIRE  
FOR  
MR & MRS HARRISON**

08 DEC 2015

**1.0 BRIEF:-**

This report has been prepared on the instruction of Mr & Mrs Harrison. The report is required to provide supporting information regarding a planning application to convert a redundant outbuilding into a dwelling.

The objective of this report is:-

- to provide a general appraisal of the current structural status of the outbuilding.
- to comment on the structural implications, if any, of the proposed change of use.

This report is NOT a full structural specification for carrying out the works.

We have not inspected the woodwork or other parts of the structure which are covered, unexposed or inaccessible and we are, therefore, unable to report that any such part of the property is free from defect.

Dimensions noted in this report are rough visual estimates for identification purposes only. No actual measurements have been taken at the site.

**2.0 INTRODUCTION:-**

The outbuilding that is the subject of this report is an 'L'-shaped development situated a few metres north of the main farmhouse.

The building comprises 3 former units which have probably had a variety of uses in the past including pig-sty, cart shed and general stores.

A previous report was prepared by ourselves in 2007. This report therefore represents an update to our earlier report.

**2.1 Grid Reference:-**

The Ordnance Survey grid reference is NZ 769 / 107.

## 2.2 Date of Visit:-

The site was visited for the purpose of this report on the 3<sup>rd</sup> September 2015. A previous visit and report was prepared in November 2007.

## 2.3 Weather:-

The weather was mild and damp.

## 2.4 Topography:-

The site is situated on the heart of the North York Moors.

The land slopes moderately down towards the north and is approximately 200 metres above sea level.

The buildings are sheltered to some degree by the surrounding North York Moors. We would, however, describe the site as isolated and exposed to inclement weather.

Vegetation around the building is minimal, comprising rough grass or tracks and paddocks.

## 2.5 Geology:-

The British Geological Survey one-inch series sheet 34 indicates that the subsoil should comprise glacial sands and gravels overlying shale and sandstone beds of the Lower Oolite series. Maps indicate the presence of springs in the area.

At this stage no subsoil investigations have been carried out.

## 3.0 GENERAL:-

### 3.1 Type of Building:-

The building is a traditional long single storey stone built outbuilding.

Walls are of solid stone construction typically 450mm thick.

The traditional timber purlin roofs are covered with red clay pantiles. We understand from the previous owners that the buildings were re-roofed approximately 15-18 years ago.

### 3.2 Overall Stability:-

Overall stability is generally provided by the external masonry walls. There are also at least 3 internal cross-walls to provide additional lateral stability.

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### 3.3 Past Alterations:-

Buildings of this age ( more than 60 years?) will have invariably been altered at various times in the past as requirements and needs changed. Specific structural alterations were not readily identifiable although a number of minor alterations were noted.

### 4.0 OBSERVATIONS:-

Where appropriate we have classified the visible signs of damage/movement to the building in accordance with Building Research Establishment digest no. 251 (BRE 251) "Assessment of damage to low-rise buildings". The digest has six categories '0' (negligible) to '5' (very severe).

All dimensions quoted in this report are approximate for identification purposes only.

### 4.1 South Unit :-

#### 4.1.1 South Gable:-

Large format coursed sandstone masonry. Flush, pointed verge. One central high-level opening for a window. Appears to have been re-pointed with cement mortar in recent years.

At high level towards the West there is an area of damp and moss/lichen staining.

Generally masonry appears reasonably level and plumb and did not indicate to us evidence of significant recent movement.

There did not appear to be any evidence of significant movement since our last previous visit.

In accordance with BRE 251 we would classify the visible evidence of damage on this elevation as category 0 (negligible).

#### 4.1.2 East Elevation:-

Roofs are covered with red, clay pantiles and the ridge tiles are also clay.

There are two wide stone buttresses to the wall of the Southern unit. There were reasonably minor undulations to the ridge line.

There is a vertical crack between the main wall and the southern buttress of approx 2-4mm uniform width.

The wall undulates horizontally and there is a noticeable lean out of approximately 75+mm at eaves level. There certainly has been significant past movement due to lateral spread of the roof. This was very probably why

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buttresses were constructed a long time ago and more recently why the roof was re-covered. Internally it was noted that support to the principal truss was moving and therefore this would need to be stabilised.

At high level, under the gutter at the northern end of the southern unit, there were some holes and displaced stones that were the result of some local damage.

Generally masonry was in need of re-pointing.

We did not feel the external elevation showed much evidence of significant recent movement (particularly since our last visit in 2007) and that past movement, the tendency for lateral spread at the eaves, could be stabilised utilising new internal ceiling joists etc (see recommendations).

In accordance with BRE 251 we would classify the visible evidence of damage on this elevation as category 3 (moderate) for which the digest remarks "...these cracks require some opening up and can be patched by a mason. ...Repointing of external brickwork and possibly a small amount of brickwork to be replaced...".

#### 4.1.3 West Elevation:-

Proportions are similar to the east elevation. There is only one central opening for a door.

This elevation has benefited from weather protection due to an adjacent shed.

Pointing appears in reasonable condition and did not indicate to us evidence of significant recent movement. Some localised damage internally however did suggest that some movement was on-going (see notes later).

The lintel to the small window facing into the agricultural shed is missing it's lintel.

In accordance with BRE 251 we would classify the visible evidence of damage on this elevation as category 0 (negligible).

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#### 4.1.4 Internal - Southern Unit:-

The roof has been recovered in recent years and now incorporates roofing felt. Common rafters are approximately 75 x 75 timbers. These are supported at mid-span on each slope by a timber purlin, (approximately 150 x 150mm). Central within the building is one large open timber truss.

There is localised cracking to the masonry around the support points for the truss due to lateral spread of the common rafters.



On the Northern party wall several long vertical cracks were visible below purlin positions due to rotation of the purlins (also due to lateral spread of the roof).

There is a flimsy timber lintel over an old blocked up opening to the Northern party wall. There are vertical cracks to the sides of this blocked up opening.

This northern party wall also appears to lean outwards by approximately 300mm.

There is a vertical crack approximately 15-20mm wide at the junction of the party wall with the Eastern elevation.

The masonry to the South has recently been covered with a cement render.

There is a metal channel or angle lintel over the door to the Western elevation which will need replacing with a more suitable material.

The concrete floor has a number of minor cracks.

In accordance with BRE 251 we would classify the visible evidence of damage over this area as category 3 (moderate) for which the digest remarks are as already noted.

#### 4.2 Central Unit :-

##### 4.2.1 East Elevation:-

Timber lintels on the central unit were flimsy and had deteriorated due to damp and insect infestation etc. Currently the northern opening is propped by a timber telegraph pole. These timber lintels will need replacing.

There is evidence of movement of the central support pillar which is resulting in deteriorating support to the principal truss. This was noted previously in 2007. As then, we feel that conversion of the outbuilding would provide a good opportunity to rebuild the central masonry column.

In accordance with BRE 251 we would classify the visible evidence of damage over this area as category 3 (moderate) for which the digest remarks are as already noted.

##### 4.2.2 Northern Gable:-

Generally needs re-pointing.

At eaves level on the Western side there was localised cracking and some vegetation growth.

Minor vertical cracks were also noted at eaves level on the Eastern side.

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Generally damage appeared very much as our previous report.

In accordance with BRE 251 we would classify the visible evidence of damage over this area as category 3 (moderate) for which the digest remarks are as already noted.

#### 4.2.3 Internal - Central Unit:-

Recently felted roof and recently replaced common rafters (approximately 75 x 75mm).

There is also a central principal truss with larger section timbers. The truss is of 'king-post' design, but the diagonal struts to support purlins are missing.

The roof over the two large openings to the East elevation is supported by flimsy timber lintels (see comments earlier in this report).

Timbers to the principal truss and also the lintels to the East elevation have been affected by wet rot and wood worm infestation.

There is a flimsy timber lintel built into the masonry over a former opening on the Southern party wall.

Vertical cracks are visible in both party walls below purlin positions. This is the result of lateral spread of the main roof and corresponding rotation of the timber purlins. Much of the damage is very old, movement since our inspection in 2007 is relatively minor.

The Northern party wall leans outwards and so does the Northern gable wall.

In the far North East corner there is a vertical crack at the junction of the perimeter walls.

The wall adjoining the Southern unit leans out, but is now buttressed by the building of the Southern unit.

There are a few small holes noticeable in the roofing felt at various locations.

Works to convert the outbuilding could easily incorporate measures to stabilise the roof and walls.

In accordance with BRE 251 we would classify the visible evidence of damage over this area as category 3 (moderate) for which the digest remarks are as already noted.

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#### 4.3 Northern Unit:-

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##### 4.3.1 South Elevation:-

The roof is covered with clay pantiles and a clay ridge. There are mild undulations to the level of the ridge suggesting that there has been some slight lateral spread of the roof.

There is a small, unglazed roof light to the slope that is allowing the weather to penetrate.

Much of the elevation is taken up by the 3 door openings and feeding troughs.

At the Western end the low level eaves incorporates a flimsy timber lintel.

Recent re-pointing is heavy and untidy, but did not indicate evidence of significant recent movement.

There is a slight lean-out at eaves level due to past lateral spread of the roof, (this is much more noticeable internally).

In accordance with BRE 251 we would classify the visible evidence of damage on this elevation as category 2 (slight) for which the digest remarks are as noted earlier.

##### 4.3.2 East Gable:-

Flush verge.

Visually masonry appears reasonably level and plumb.

Old pointing did not indicate evidence of significant recent movement.

There is a metal angle being used as a lintel over the central high level window, which will need to be replaced with something more durable.

In accordance with BRE 251 we would classify the visible evidence of damage on this elevation as category 0 (negligible).

##### 4.3.3 North Elevation:-

There is a minor vertical crack in the wall near the eastern end (and rain water downpipe).

Moss/lichen growth on roof tiles.

Mild horizontal undulations to the masonry wall, but no evidence of significant recent movement.

Masonry appears damp.

The Western gable wall of the Northern unit leans noticeably inwards.

In accordance with BRE 251 we would classify the visible evidence of recent movement on this elevation as category 0 (negligible).



#### 4.3.4 Internal – Northern Unit:-

The Western gable wall leans inwards. A timber insert to the masonry in the South East corner is rotting.

The Eastern section of this unit has recently been covered with cement render. The Southern wall leans out very noticeably.

Internally the dividing wall has a very significant lean. The relatively recent rendering to the walls suggested to us that the movement was generally quite old.

There are a few small holes visible to the roofing felt.

#### 5.0 CONCLUSIONS:-

The buildings are effectively complete and intact.

Taking into account the age and past use of the building, we would describe the essential structure as being in a reasonably repairable condition.

There has been significant movement in the past, in particular the building has suffered from lateral spread of the roof. We understand that the buildings were re-roofed approximately 15 to 18 years ago.

Evidence of further movement since our visit in 2007 appears to be quite minor. It is never the less, important that proposed conversion works incorporate measures to provide improved stability to the structure of the buildings.

Other original timbers have been affected to varying degrees by wet rot and insect infestation.

Party and gable walls have vertical cracks under purlins, which are typical damage resulting from lateral spread of the roofs. Much of the movement is old. Proposed conversion works could easily incorporate measures to improve the stability of the structure in general.

Generally the more severe damage recorded on these buildings could be classified as category 3 (moderate) for which the digest BRE digest 251 remarks "*...these cracks require some opening up and can be patched by a mason. ...Repointing of external brickwork and possibly a small amount of masonry to be replaced...*".

The building has stocky proportions with few and modest openings and, therefore, overall stability characteristics may be described as inherently good.

The proposed domestic use of the building is unlikely to produce loadings in excess of those that the building has already been subjected to.

## 6.0 RECOMMENDATIONS:-

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### 6.1 Roof:-

- To stabilise the roof and external walls, all rafters should either be tied to new ceiling joists at eaves level or a steel ridge beam should be designed by a Chartered Structural Engineer.
- New flashings and an overhaul/replacement of rainwater goods.
- Treat timbers generally. Existing principal trusses will need either repair or replacement.
- Provide and fix 30 x 5 x 1200 mm long galvanised restraint straps at approx 1200mm centres along eaves and verge to all roofs.
- Some loose tiles to be re-fixed or replaced.
- Clean moss/lichen of roofs.

### 6.2 Walls:-

- General re-pointing: externally rake out all joints to a depth of 15mm and re-point with a mortar no stronger than 1:2:9 cement:lime:sand.
- Install suitable dpc course e.g. chemical injection system by a specialist contractor able to provide an appropriate guarantee.
- Flimsy timber lintels to be replaced with more appropriate stone, concrete or steel, depending on location, (i.e. stone external, concrete or steel internal).
- Recent metal lintels to be replaced.
- Remove deteriorating redundant timber lintel to north wall southern unit.
- Remove rotting timber insert to SW corner northern unit.
- Rebuild isolate masonry column to east elevation central unit and construct new concrete pad foundation.
- Rebuild internal partition wall to southern leg.
- Stainless steel helical bars required to the following locations:
  - Southern unit – Allow 10nr. Evenly distributed at vertical cracking below purlins north party wall.
  - Central unit – Allow 20 nr. Internal to vertical cracks below purlins.
  - Central unit – Allow 4nr. External to cracks at eaves level.

Brief specification for above: Cut out horizontal bed in masonry 50 mm deep. Afford min 48 hours notice for inspection by the contract administrator. Fix 6 mm diameter stainless steel 'helfix' resin anchor bars 100mm long or similar approved. Repoint with gauged mortar to match existing.



**6.3 Floors:-**

- Replace existing rough floors with new concrete slab on dpm on hardcore bed.

Signed for  
**Richard Agar Associates Limited,**

Eur Ing RICHARD AGAR  
BSc(Hons) MSc CEng MStructE MICE MCS MCI Arb FConsE  
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