

# STRUCTURAL REPORT

Upon

Kitchen Garden Barn  
Church Street  
Wadenhoe  
Peterborough  
PE8 5TE

For And On Behalf Of

The Wadenhoe Trust  
c/o The Auction Centre  
Eastwood Road  
Oundle  
Peterborough  
PE8

MRJ Structural Design Ltd.,  
Cranthorpe House  
Northfield Road  
Cransley  
Kettering  
Northants  
NN14 1PZ

# MRJ Structural Design Ltd

Cranthorpe House, Northfield Road, Cransley, Nr. Kettering, Northants NN14 1PZ

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Your ref:  
Our ref: 20095 Report  
Date: 14<sup>th</sup> September 2020

Mr P. Goldsmith  
c/o The Wadenhoe Trust  
The Auction Centre  
Eastwood Road  
Oundle  
Peterborough  
PE8 5TE

Dear Mr Goldsmith,

Re: Limited Structural Report, Workshop Barn, Wadenhoe

Further to your instructions on 17<sup>th</sup> July 2020 to, we are pleased to confirm that the above property was inspected on 30<sup>th</sup> July 2020 and we report as follows.

This survey has been based on a visual inspection of walls, floors, ceilings and roofs. I emphasise that the inspection constitutes a structural survey with limitations in that the report only contains such advice on the general repair and construction as can be readily ascertained by a visual inspection. The barn was occupied at the time of the survey.

## Description and Situation

The building comprises a single storey and part 2 storey detached barn, divided into 3 aspects by masonry cross walls. The north east end of the building is retained by the Wadenhoe Trust for use as a store and workshop. The other two parts are rented to the owners of the Cottage who use it for ancillary domestic use. The barn appears to be 1800's construction and is Grade 2 Listed. There is an attached lean to building to the north east gable end and what appears to be a later extension to the southernmost gable end.

## Site and Construction

The property is situated on slightly sloping ground. It is likely that the barn was constructed on land previously undeveloped.

There is some significant vegetation adjacent to the barn which could be affecting its foundations.

The main roof is Collyweston slate covered with traditional roof construction of timber rafters spanning from the ridge onto timber purlins onto external walls at eaves level. The purlins are propped off trusses and or masonry walls.

The first floor (where provided) is timber floor joists, which span onto masonry walls.



The ground floor is solid concrete construction cast on the ground to the middle section of the barn and Cobbels elsewhere.

The external walls are solid stonework, approximately 450mm thick. Internally, the walls are brickwork.

Windows and doors are painted soft/ hardwood throughout.

The rainwater is generally undirected.

### Observations and Discussion

#### External:

The general ridge line of the roof has undulations, suggesting undersized timber roof members (Plate 1) Tie rods have been added at some point in the past to resist roof spread, possibly as a consequence of the undersized roof members.



Plate 1 Looking East at West Elevation  
Indicating Undulating Roof Line & Tie Rods

A number of original door and window openings have been blocked up with stonework over the years (Plate 2). Some re-pointing work can also be seen present in the external stonework.



Plate 2 Looking South East Along Barn



The south western flank wall has an inward lean and bellying of stonework at wallplate level (Plate 3).



Plate 3 Looking South West Along Flank Wall at Bellying Stonework at Wallplate Level



Similarly, further along to the north of this flank wall, the stonework is bellying outwards (Plate 4). Note the bulge is worse over the window opening to the workshop.



There are no rainwater gutters to the western flank elevation meaning all rainwater disperses onto the ground level (Plate 5)



Plate 5 Looking East at Roof Structure With no Rainwater Goods Present

The south western gable elevation shows historic infilling of an original opening (Plate 6) and vertical cracking in the external stonework where bonding has been inadequate, leading to movement.



Plate 6 Looking North at Cracking to Infill Panel in Southern Gable Elevation



The north east gable end has vertical and diagonal cracking where it intersects with the eastern flank wall (Plate 7). Note the mortar joints are also weathered.



Plate 7 Looking South at Cracking in North East Gable End

The eastern flank wall abuts a garden area which is overgrown. Ivy can be seen growing up the side of the stonework in places (Plate 8).



Plate 8 Looking West at Undergrowth Abutting and Growing Up East Facing Flank Wall

There are no rainwater goods to the eastern elevation.

Some localised repair work has been undertaken to the collyweston slate roof in the past in the east facing roof (Plate 8). The unevenness in the roof structure, particularly at ridge level can also be seen in Plate 8, so too the tie rods which correspond with the western flank wall.



Lintels over most window and door openings are weathered and likely rotten (Plate 9). It can be seen that the window frames are beyond economic repair.



Plate 9 Looking South West Along Eastern Elevation at Poor Timberwork to Windows and Supporting Lintel Above

Internal:

There are vertical cracks between the west flank and internal cross walls at the southernmost gable elevation (Plate 10). Similarly, cracks exist in the cross wall abutting the western elevation wall



Plate 10 Looking East at Vertical Cracks Between Eastern Flank Wall & Cross Wall



Weathering to the internal stonework is evident around the horizontal tie member to the southernmost section of barn (Plate 11).



Plate 11 Looking West at Weathering Around Horizontal Tie Beam

Vertical and diagonal cracking can be seen in the southernmost gable wall where intersecting with east and west flank walls (Plate 12).



Plate 12 Looking South at Internal Gable Wall Where Cracking Exists Where Intersecting with Eastern Flank Wall



The lintel over the window opening in the eastern elevation wall to the workshop is deflecting excessively (Plate 12). The opening is supporting a truss above.



Plate 12 Looking East at Deflecting Lintel in Workshop Eastern Elevation Opening

Roof timbers above the Workshop appear a mix of original and replacement members (Plate 13).



Plate 13 Looking at Roof Structure above Workshop

The truss to the Workshop has lost its bearing to the westernmost elevation (Plate 14) due to the (likely) ongoing movement of the roof and walls.





Plate 14 Looking at Reduced Bearing to Truss to Workshop

Vertical and diagonal cracks are visible to the northernmost gable elevation wall (Plate 15), corresponding with those evident externally and indicated previously in Plate 7.



Plate 15 Looking North West at Vertical & Diagonal Cracking to Stonework



## Conclusions

The barn appears to have undergone limited maintenance in the past. A number of superficial repairs have been undertaken in an attempt to keep the structure watertight, particularly localised work to the roof covering.

Rainwater goods are missing throughout and as a consequence, weathering has taken effect on external stonework and external ground levels.

Attempts at arresting thrust in walls due to roof spread have been made by inserting 4 tie rods. This has not been wholly successful, leading to bellying of stonework.

Lintels have been allowed to deteriorate due to water ingress as a direct result of no rainwater goods.

## Recommendations

We recommend that gutters and downpipes be provided as a matter of urgency to prevent further damage to stonework and lintels.

A suitable number of downpipes and diameter of guttering should be provided to suit the expected flow of rainwater calculable to the surface area of the roof. This should be discharged into a relevant number of soakaways, a minimum of 5m from the building.

Any damaged or decayed timberwork should be replaced with similar section sizes. Similarly, damaged or missing roof slates and timber battens due to corroded pegs/ nails should be inspected and replaced as necessary by an experienced roofing contractor.

Roofing repairs are likely to take the form of an ongoing project due to the costly nature of replacing collyweston slates.

Stonework and brickwork should be stitched together with Helifix bars where vertical and diagonal cracking exists. A drawing should be marked up by a structural engineer to identify these locations. Stitching to be carried out strictly in accordance with manufacturers guidelines and instructions.

The bulging stonework above the window opening in the Western elevation wall to the Workshop should be taken down and rebuilt.

Weathered stonework should be repointed throughout in a lime mix as approved by Listed Building Consent.

All damaged/ ineffective lintels should be removed and replaced with hardwood lintels designed by a structural engineer.

All work should be carried out in conjunction with building regulation and Listed Building requirements by a



suitably experienced and competent building contractor.

We trust the above and enclosed satisfactorily outlines our findings and recommendations and is also comprehensive enough for your current needs.

Should you require further clarification or assistance on this project, please do not hesitate in contacting our offices.

Yours sincerely,

