Steve Gilman Design Ltd
Consulting Structural & Civil Engineers

Barn 1 Conversion

Four Winds

3 Tydd Low Road

Long Sutton

PE12 9AR

Visual Structural Inspection and Report

Project No. 7106

December 2020

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Registered in England. Registration Number: 5337463 V.A.T. Registration Number: 852 7676 88

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TRADA member

The Institution of Structural Engineers

1.0 Introduction

1.01 Further to instructions received from Ms Gaby Jeffs, Steve Gilman Design Ltd undertook a visual structural inspection of Barn 1 at Four Winds, 3 Tydd Low Road, Long Sutton, PE12 9AR on the 17th November 2020.

1.02 The purpose of the inspection and report was to comment upon the present structural condition to supplement a pending planning application for conversion into living accommodation.

1.03 Our report is based only on the day's inspection and no monitoring, testing of materials or further investigations have been undertaken.

1.04 We have not commented specifically upon damp, condition of timber, and drains; specialist advice should be sought on these aspects if necessary.

1.05 There is vehicular access into the site from the east via a stone driveway off Tydd Low Road.

We estimate that the Barn was constructed early 19th C.

The appended drawings and photographs assist to describe the Barn and our observations.

2.0 Building Description

2.01 The Barn is single storey, gable ended and constructed with load bearing masonry external walls supporting a pitched roof. The roof is constructed with 4no. steel trusses supporting 3 rows of purlins to each slope which are clad with cement particle corrugated sheets. External walls are solid 13" wide brickwork laid in English bond, with several courses of 9" wide brickwork built up above original eaves level. The floor is formed with oversite concrete.

2.02 The Barn is surrounded by grassed areas and a concrete slab outside the external door to the north elevation.

2.03 Adjoining the north elevation is a steel canopy link structure connecting to the adjacent Barn 2 building, which provides a covered area outside the door.

2.04 All doors and lintels are timber; the small high-level window in the east gable is steel framed and single glazed. Rainwater goods are uPVC and cast iron; gutters are supported off irons.

2.05 The site topography is relatively level.

2.06 A fully detailed inspection was impeded by stored materials.

3.0 Ground Conditions

3.01 The British Geological survey 10-mile map of the area indicates that the underlying solid geology comprises Aluvium (clay, silt, or sand) superficial deposits overlying West Walton formation (Ampthill and Kimmeridge clay).

3.02 Whilst published geological information and local knowledge are useful in assessing any site, the precise geotechnical/geological conditions cannot be determined without undertaking such laboratory testing, trial holes, and boreholes as are necessary. The shallow trial holes undertaken confirmed that the formation of foundations was upon silty clay subsoils.

4.0 External Observations

North Elevation – Photograph 1

4.01 We noted cracking within the brickwork up to 10mm in width to the side of the external door and timber lintel. **Photograph 2**.

4.02 Above the door, the brickwork displayed an outward rotation and bulging.

4.03 Vertical cracking up to 5mm in width was noted to towards the western gable close to the uPVC downpipe.

4.04 The later addition of high-level brickwork at eaves level displayed undulations and bulging and is set back from the brickwork below.

East Elevation – Photograph 3

4.05 We noted vertical cracking between 5-10mm in width and missing bricks at low level to the northern corner. **Photograph 4**.

4.06 Above the door opening to the underside of the window, we noted a vertical crack up to 5mm in width within the later constructed brickwork. **Photograph 5**.

4.07 We noted loose brickwork and missing bricks at low level to the southern corner.

4.08 Cracking up to 10mm in width was evident from the side of the lintel bearing up to eaves level. **Photograph 6**.

4.09 General erosion of mortar joints was common throughout this elevation.

South Elevation – Photograph 7

4.10 The brickwork was found to be unlevel along the bed coursing and an outward bulge was evident at mid-height. **Photograph 8**.

4.11 Low level openings are boarded up and above the western opening a full height vertical crack up to 20mm in width was evident. **Photograph 9**.

4.12 Loose and eroded brickwork was noted to the western corner at low level. **Photograph 10**.

4.13 Isolated areas of the brickwork faces have spalled, and mortar joints were eroded.

West Elevation - Photograph 11.

4.14 Similar to the east elevation, the gable wall has been later constructed in brickwork.

4.15 We noted vertical cracking up to 10mm in width to the northern corner; loose brickwork was evident at eaves and low level. **Photographs 12 & 13**.

4.16 Isolated areas of the brickwork faces have spalled, and mortar joints were eroded.

Trial Holes - Photographs 14 & 15

4.17 Refer to location plan and sketches in Appendix 2.

5.0 Internal Observations

5.01 The roof structure is formed with steel trusses and purlins built into the gable ends. A steel tie rod and timber tie beam were noted between the eaves of the original brickwork.

5.02 We noted a vertical crack within the original brickwork to the north elevation below the tie bar. **Photograph 16**.

5.03 We noted a vertical crack within the original brickwork to the west elevation. **Photograph 17**.

5.04 A series of timber beams formed the lintel over the large door opening to the east elevation. **Photograph 18**.

6.0 Conclusions & Recommendations

6.01 We recommend that all spalled and eroded brickwork be repaired and repointed as part of the proposed conversion works to maintain integrity and weatherproofing.

6.02 All severe diagonal stepped cracking noted should be repaired with a "Helibar" or similar crack stitching technique to strengthen.

6.03 In areas, the timber and masonry has suffered from damp and moisture due to inadequate roof drainage. As part of the proposed conversion, new gutters will be installed and these need to discharge into sewers or soakaways positioned a minimum 5.0m away from the structure, in accordance with the Building Regulations.

6.04 The Ivy and vegetation found on the south elevation is to be removed.

6.05 The steel trusses and purlins are not original and may require to be strengthened or replaced to suit any new roof coverings and internal finishes. The outward bulging and rotation of brickwork may have been caused by insufficient tying and construction of the original roof. This could be stabilised with a new roof structure, designed to resist any lateral thrust and roof spread at eaves level.

6.06 We recommend that all timber, if retained, be surveyed by a specialist for decay and infestation and treated or replaced as advised in their report.

6.07 The cause of the undulations and movement with the brickwork to the south elevation is unknown. It may be necessary that some localised underpinning is required, and that the low-level openings are further investigated. The movement does appear to be historic.

6.08 It can be concluded that from the visual inspection of the Barn at Four Winds, Long Sutton that many of the aspects and defects found are common with many similar structures of this age and usage. We believe that with careful consideration of repair and strengthening that the structure is suitable for conversion into living accommodation. Further design works and specifications will need developing with the Architect as part of the proposals to ensure compliance with the Building Regulations and to maintain the integrity of the existing structural envelope for the future.

A. M. Foottit

Andrew Foottit I.Eng, A.M.I.Struct.E.
For and on behalf of Steve Gilman Design Ltd

Date: 17th December 2020

Appendices

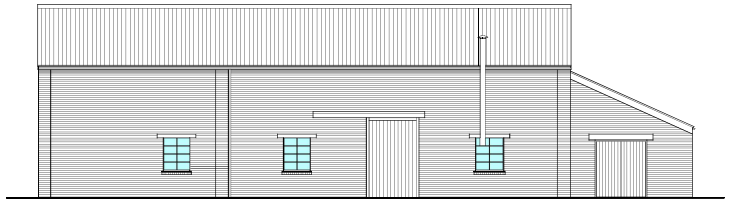
Steve Gilman Design Ltd
Consulting Structural & Civil Engineers

Appendix 1

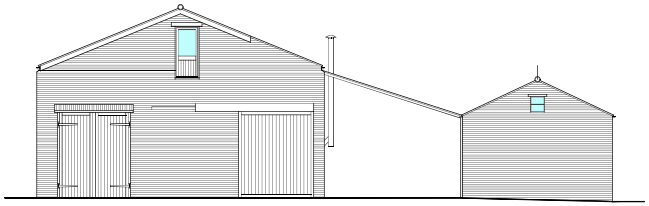
Drawings

Robert Doughty Consultancy

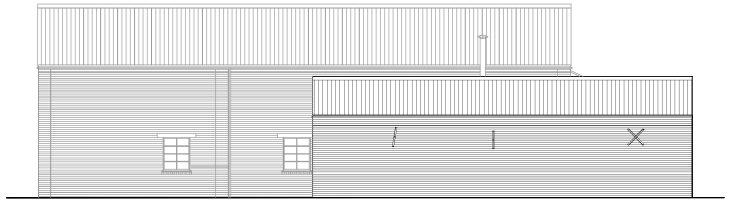
Drawing No. 1425-1_PL_GA04 – Existing Plans & Elevations Barns 1 & 2



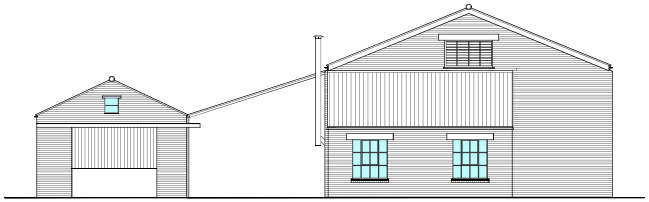
SOUTH ELEVATION



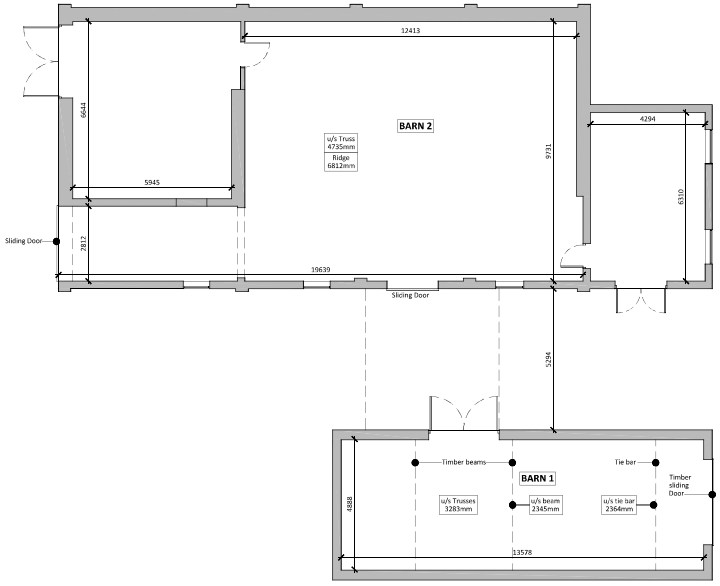
WEST ELEVATION



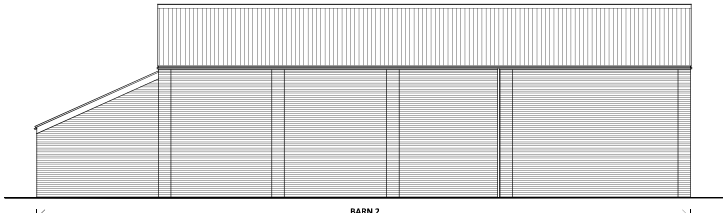
SOUTH ELEVATION



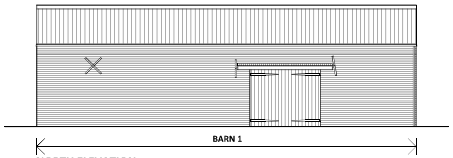
EAST ELEVATION



FLOOR PLANS



NORTH ELEVATION



NORTH ELEVATION

0 1 2 3 4 5m

Notes

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Dimensions
Use figured dimensions only. All dimensions should be checked against on site conditions and any discrepancies should be brought to the attention of Robert Doughty Consultancy Limited.

CDM 2015
This drawing is for illustrative purposes and/or obtaining the relevant planning permission only. It should not be used for construction and accordingly, risk identification under the Construction (Design & Management) Regulations 2015 has not been undertaken.

Rev	Description	Date

rdc
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Consultancy

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Client
Mr & Mrs J Jeffs

Project
Four Winds
Tydd Low Road
Long Sutton

Drawing
Existing Plans & Elevations
Barns 1 & 2

Scale @ A1	Date
1: 100	14/10/20
Drawn By	**Checked By**
MG	PSS

Job Number	Status	Purpose of Issue
1425-2	PL	Planning

Drawing No.	Rev
1425-2_PL_GA04	-

Steve Gilman Design Ltd
Consulting Structural & Civil Engineers

Appendix 2

Trial Hole Location Plan and Logs

Drawing No. 7106/01 – Existing Barn Trial Hole Location Plan

Drawing No. 7106/02 – Existing Barn Trial Holes 1 & 2

Recorded by Steve Gilman Design Ltd on 17th November 2020

Steve Gilman Design Ltd
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Carlton Le Moorland, Lincoln, LN5 9HS
Tel : 01522 788000
Email : mail@stevegilmandesign.co.uk

		Project	Four Winds, 3 Tydd Low Road, Long Sutton				
		Client	Ms G Jeffs				
Title	Existing Barn - Trial Hole Location Plan	*Date*	Dec 2020	*Scale*	1:200	*Number*	7106/01

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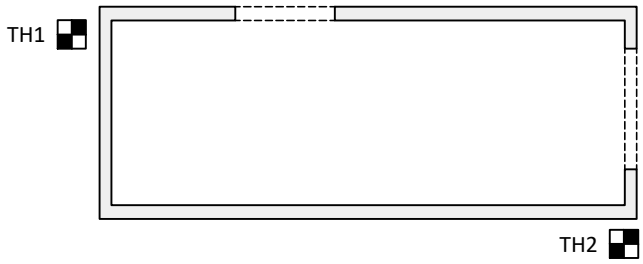

Existing Ground Floor Plan

Scale 1 : 200

Steve Gilman Design Ltd
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		Project	Four Winds, 3 Tydd Low Road, Long Sutton				
		Client	Ms G Jeffs				
Title	Existing Barn - Trial Holes 1 - 2	*Date*	Dec 2020	*Scale*	1:10	*Number*	7106/02

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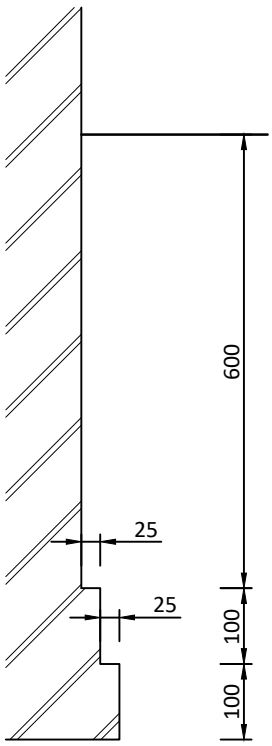
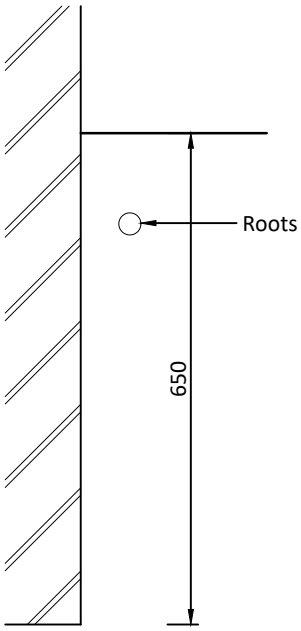


Dark brown silty/clay
(medium firm)

TH1
Scale 1 : 10



Dark brown silty/clay
(medium firm)

TH2
Scale 1 : 10

Appendix 3
Photographs

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 – Trial Hole 3

Photograph 15 – Trial Hole 4

Photograph 16

Photograph 17

Photograph 18