Geoff Holyoake Associates Ltd.

Structural & Civil Engineering Consultants

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STRUCTURAL SURVEY

OF BARN 2,

AT 251 BROADGATE,

SUTTON ST. EDMUND.

S.743/15/GCH
AUGUST 2015

1. Client:

Old Hall Farm Co Ltd
The Oaks
251 Broadgate
Sutton St Edmund
Spalding
Lincolnshire

2. Brief.

2.1. To provide a structural survey of the existing barn to assess its suitability for domestic conversion.

2.2. All as per the client's instruction dated 13 August 2015.

2.3. In accordance with our standard practice, this report is for the sole use of the parties to whom it is addressed and no responsibility is accepted to any third party for the whole or any parts of its contents.

2.4. This report does not include any inspection of 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.

2.5. The following recommendations are based on the findings of the site investigation. We highlight that, other conditions may occur elsewhere on the site of which we have no knowledge and therefore cannot accept any responsibility.

2.6. Please note that, this site has not been tested for contamination.

3. Location & Background.

Barn 2

3.1. Barn 2 is a long single storey unit to the farmhouse side of the farm complex at 251 Broadgate in the Lincolnshire village of Sutton St Edmund. This area is covered by the South Holland District Council.

3.2. The mature farm house garden area contains a number of trees, including Horse Chestnut, Hazel to the western gable of the barn and Laburnum growing from the end of the brickwork garden wall which extends out from the eastern gable elevation.

3.3. There is also a miscellaneous hedge and bush growing against the garden flank wall elevation.

3.4. It is apparent that, the original barn has been extended to create the wider element to the western gable area.

3.5. The barn is considered over 100 years old and it is understood from the present owner that no structural remedial works, including repointing, have been undertaken for 10 years or more.

4. Trial Hole Investigation

4.1. See trial holes 01 – 03 and trial hole A, kpa readings and laboratory test results.

4.2. Trial holes 01 and 03 were excavated within the farmyard area and exposed a large depth of miscellaneous fill overlying firm mottled grey/brown silty clay overlying softer silty clays which contain a thin band of peat.

4.3. It is also highlighted that a thin lens (<75mm) of black non-fibrous material was encountered in both trial holes at approximately 1.5m below ground level.

4.4. The influential band of peat was approximately 100mm thick and commenced at approximately 2.4m below ground level.

4.5. The lower silty clay were wet and continued to deteriorate. However, trial hole 01 remained dry and no sulphate tests were undertaken.

4.6. A sample of the upper silty clays stratum from trial hole 03 was sent for analysis. The test results show that the clay has a plastic index of 23% and therefore can be defined as a medium shrinkable soil in accordance with the guidelines of the National House Building Council Standard 4.2.

4.7. Trail hole 02 was excavated to the rear of the site and encountered firm fenland light brown sandy silt to 3m below ground level.

4.8. Fenland silt is considered a non-shrinkable soil.

4.9. Trial hole A exposed the long original barn and later extension foundations. Both buildings are built off traditional corbelled brickwork footings.

4.10. The original barn footings extend some 600mm below ground level whereas the later extension footings are some 400mm below ground level.

4.11. Both footings are founded within the upper regions of the firm silty clay stratum and the kpa readings of 70 below the footings represent a bearing capacity in the order of 100kn/m^2 but any design capacity is reduced by the presence of peat at lower levels.

5. Defect Survey

5.1. See photographs P1 – P12.

5.2. The slightly distorted roof profile has slate covering to one side and clay pantiles to the 'garden' side. **See P1, P2, P3 & P4.**

5.3. The highlighted garden trees and bushes are very close to the building**. See P1, P2, P5 & P6.**

5.4. In general, the brickwork elevations are weathered. **See P1, P2, P3, P4, P5 & P6.**

5.5. The exposed chimney stack is distorted. **See P1 & P4.**

5.6. The butt joints to the garden side infilled openings appear satisfactory. **See P1.**

5.7. There is minor vertical cracking between the original barn and the later extension. **See P4, P5, P6, P7 & P8.**

5.8. In general, the internal brickwork walls are painted. **See P7, P8, P9, P10, P11 & P12.**

5.10. The 'open' roof structure is consistent with the age and construction of the building. **See P10.**

6. Conclusions & Recommendations.

6.1. The roof structure will require stiffening or replacement.

6.2. In general, the weathered brickwork walls are satisfactory and there are no areas of significant cracking apart from at the interface between the original barn and the later extension.

6.3. This differential movement, although historic, is evidence of an inherent weakness.

6.4. The nearby trees do not appear to have had an adverse effect on the shallow foundations, to date.

6.5. However, future growth of the trees or their removal may induce future movement. This is not an acceptable risk for a domestic property.

6.6. Consequently, it is recommended that any conversion includes underpinning the existing foundations e.g internal piled raft foundation with support 'nibs' to the external walls.

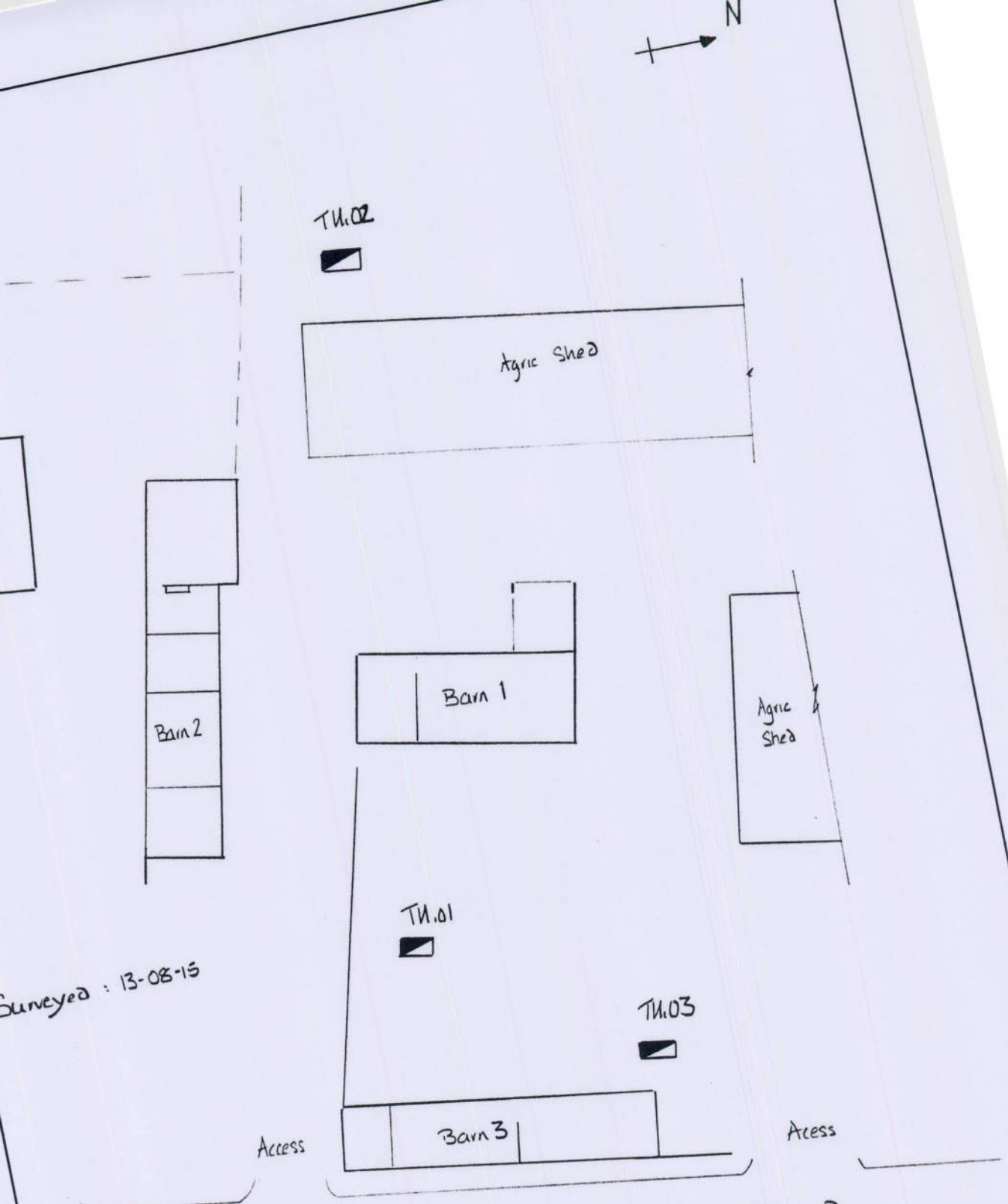
6.7. Other general recommended works should include: -

- The distorted chimney stack should be rebuilt.
- All new roofs are to be strapped to the main walls using mild steel straps in accordance with the Building Regulations.
- All walls should be checked for damp and new damproofing provided, where necessary.
- The stormwater guttering is considered ineffective and will require replacement with all associated new underground pipework and soakaways, as necessary.
- Upon completion of these works all other cracking may be repointed throughout to ensure weathertightness.

6.8. In conclusion, upon completion of the recommended remedial works the barn is considered suitable for conversion to domestic use.



Eur. Ing. G. C. Holyoake, B.Sc. C.Eng. M.I.C.E.



Drawing Title
LOCATION PLAN

Dwg.No
S742/15/01

Drawn
GCH

Date
Aug'15

Scale
/

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Drawing Title

EXISTING LAYOUT

Drawn	Date	Scale	Dwg.No
GCH	AUG 15	—	S.743 15 102

Distorted clay pantile roof profile

P.1



infilled openings →

Laburnum growing out from end of wall

?

P.2

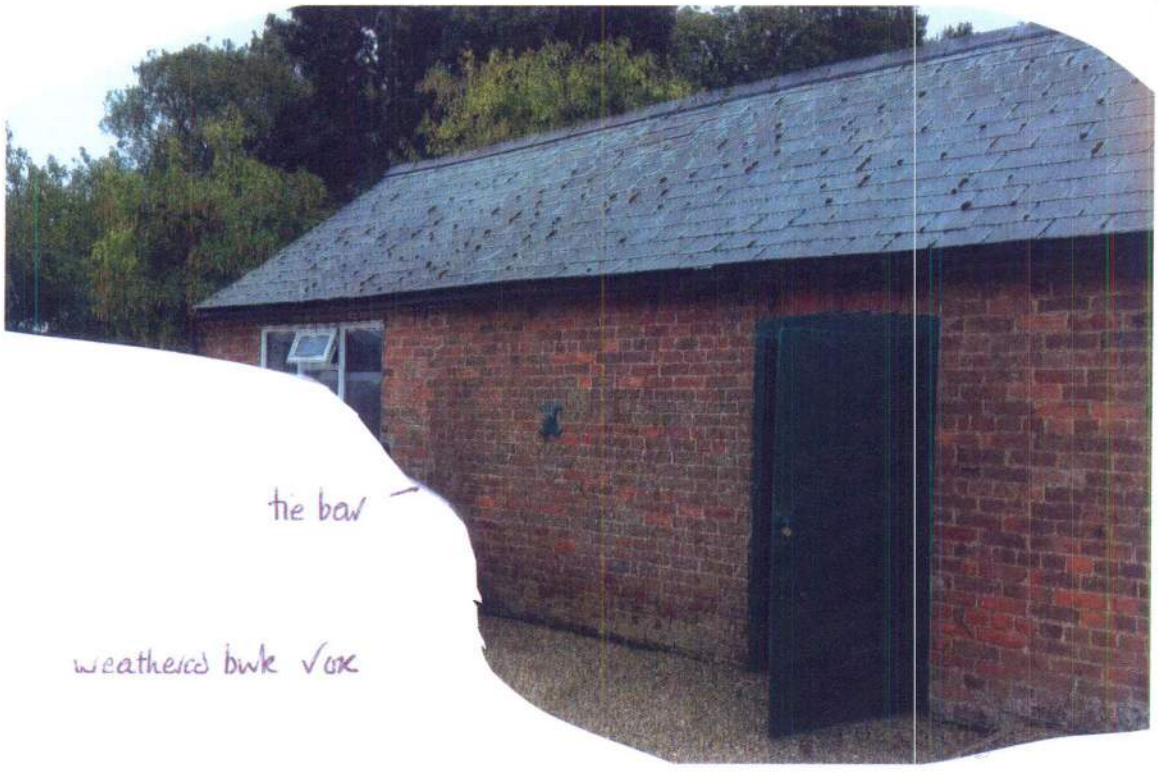
Slate covering to one side



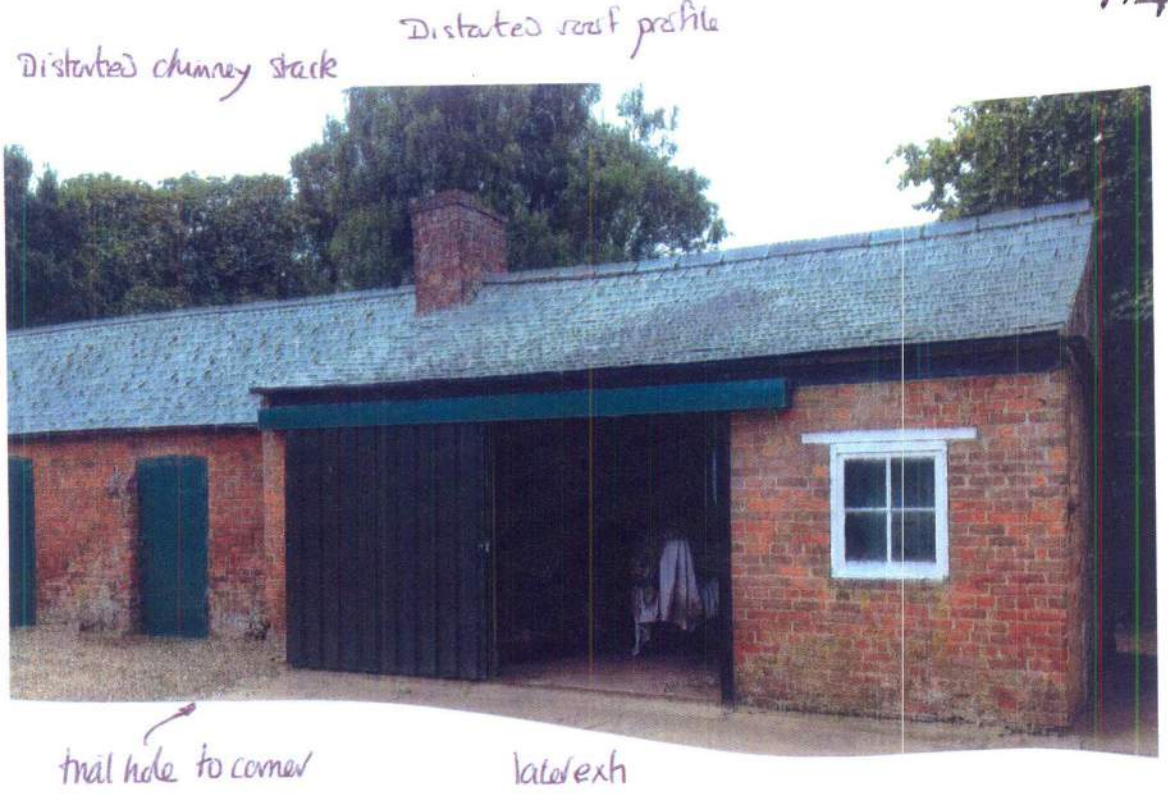
Gable weatherboard bulk rot.

Geoff Holyoake Associates Ltd. Structural & Civil Engineering Consultants	27 Exeter Gardens Stamford Lincolnshire PE9 2RN Tel: 01780 765971	Drawing Title: PHOTOGRAPHS P1 & P2	
		Drawn: GCH	Date: AUG 15
		Scale: —	Dwg.No: S.743 15 103

P.3



P.4



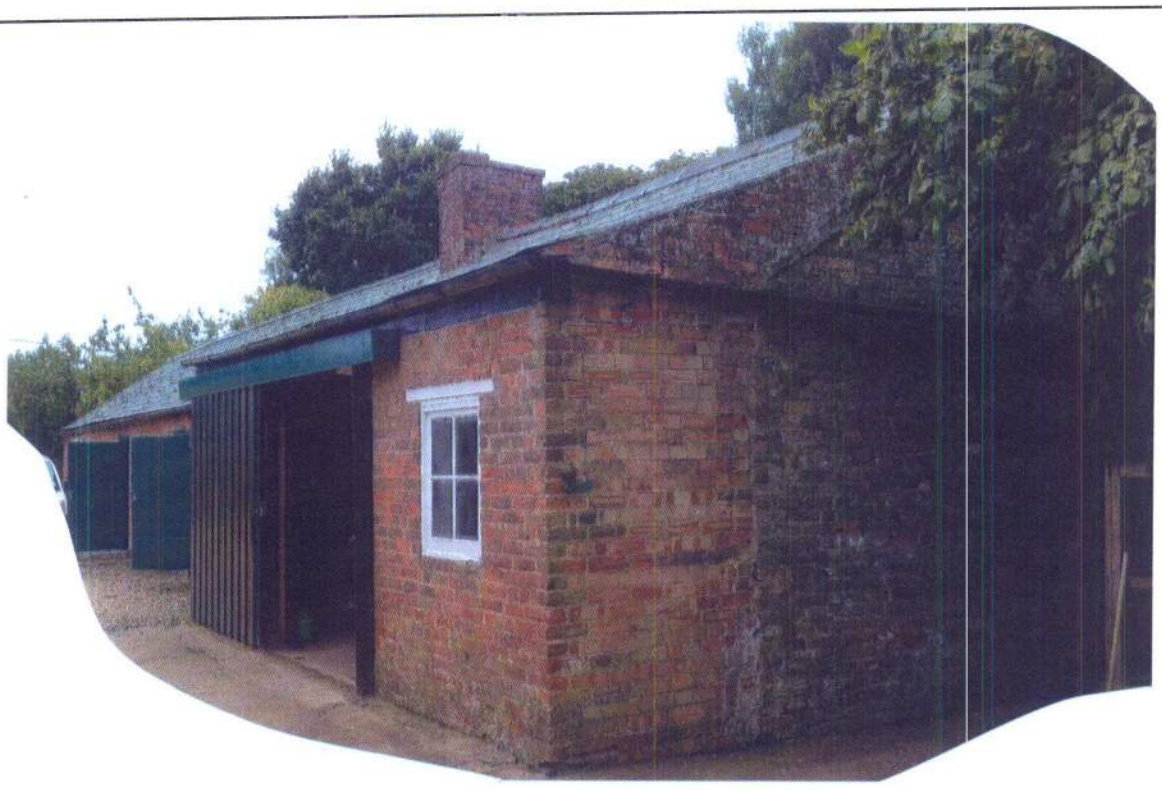
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Drawing Title
PHOTOGRAPHS P3 & P4

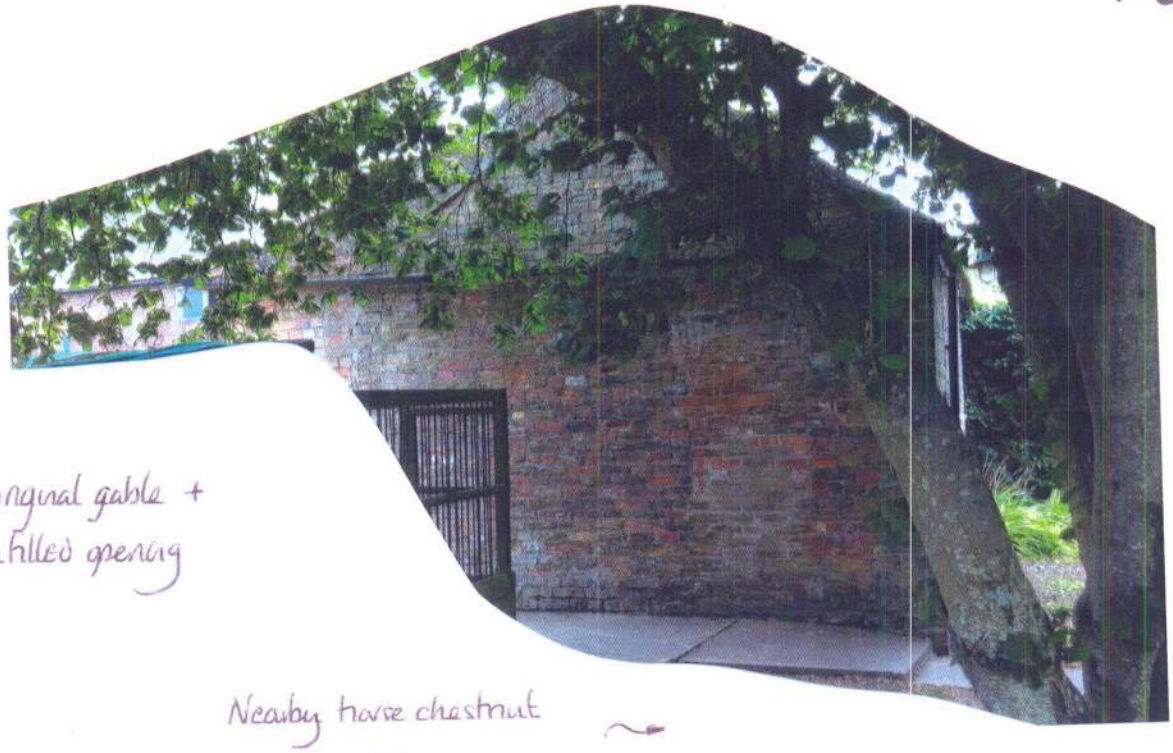
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GCH	AUG 15	—	S743 15/04

P.5



lateral extn

P.6



original gable + infilled opening

Nearby horse chestnut and hazel trees

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Drawing Title: PHOTOGRAPHS P5 + P6

Drawn	Date	Scale	Dwg.No
GCH	AUG '15	—	S.743 15/05

P.7



Vertical cracking at junction with later extn

P.8



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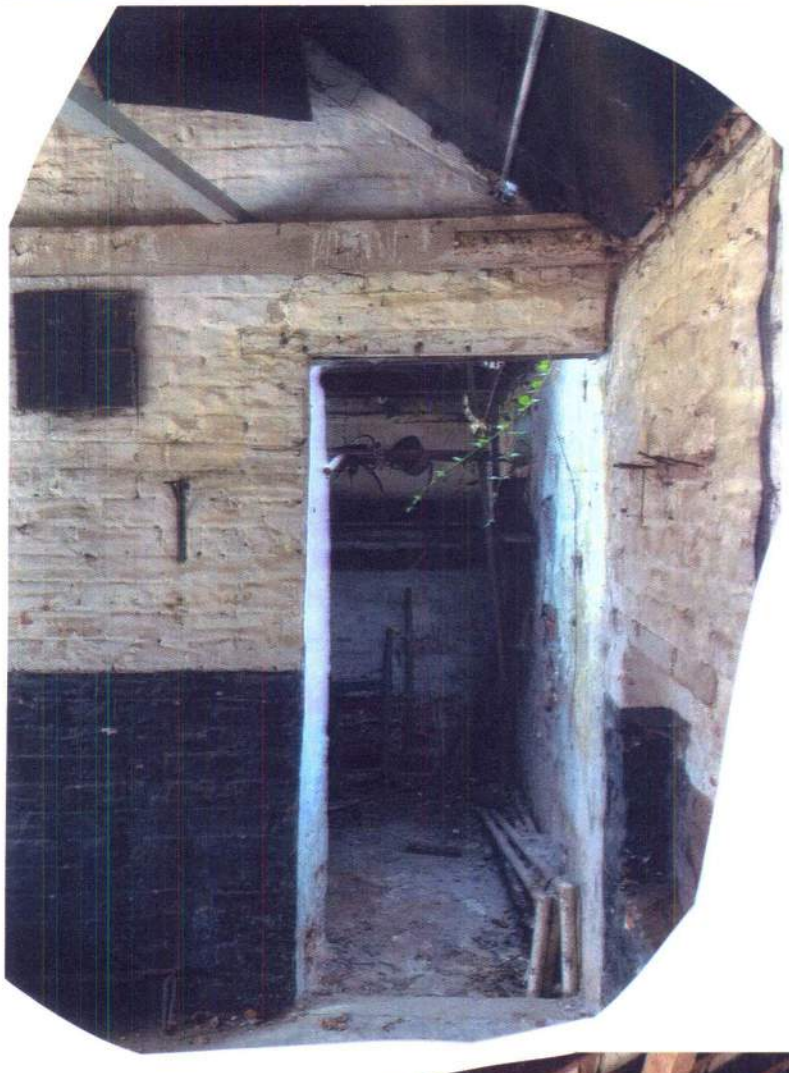
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Drawing Title

PHOTOGRAPHS P.7 & P.8

Drawn	Date	Scale	Dwg.No
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P.9



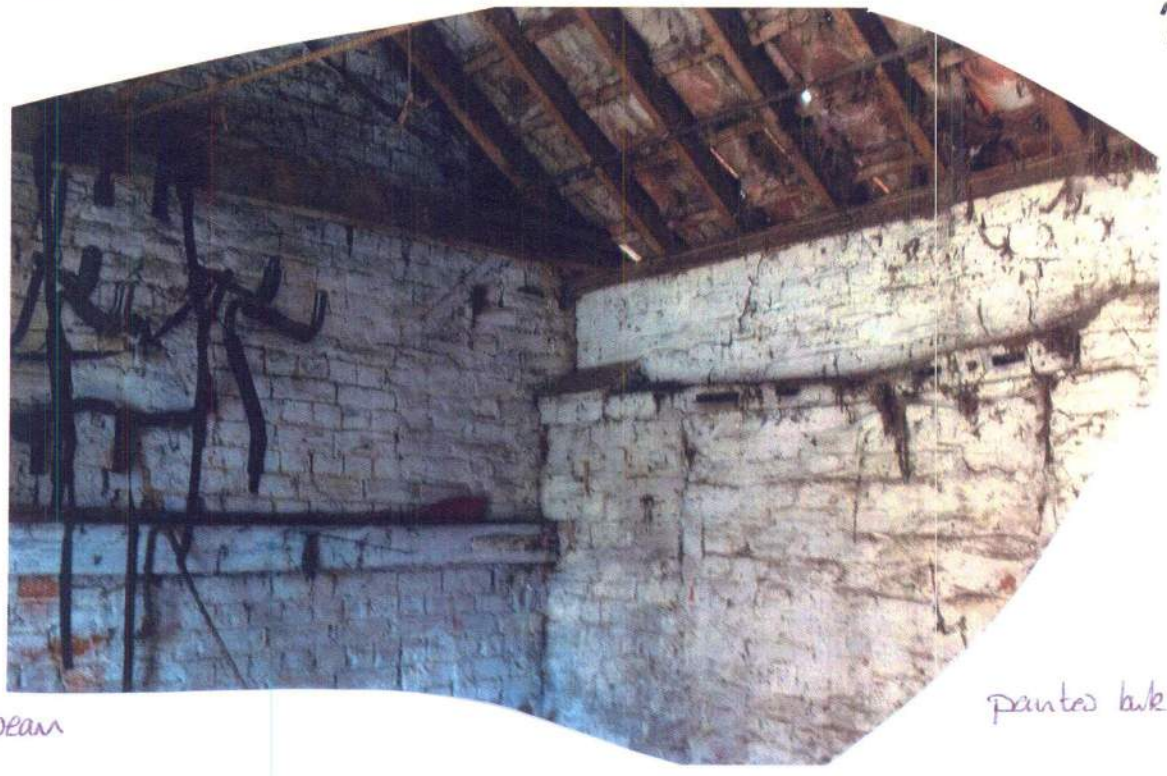
← Roof tie beam

open roof structure P.10



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		Drawn: GCH	Date: AUG '15
		Scale: —	Dwg.No: S.743 15/07

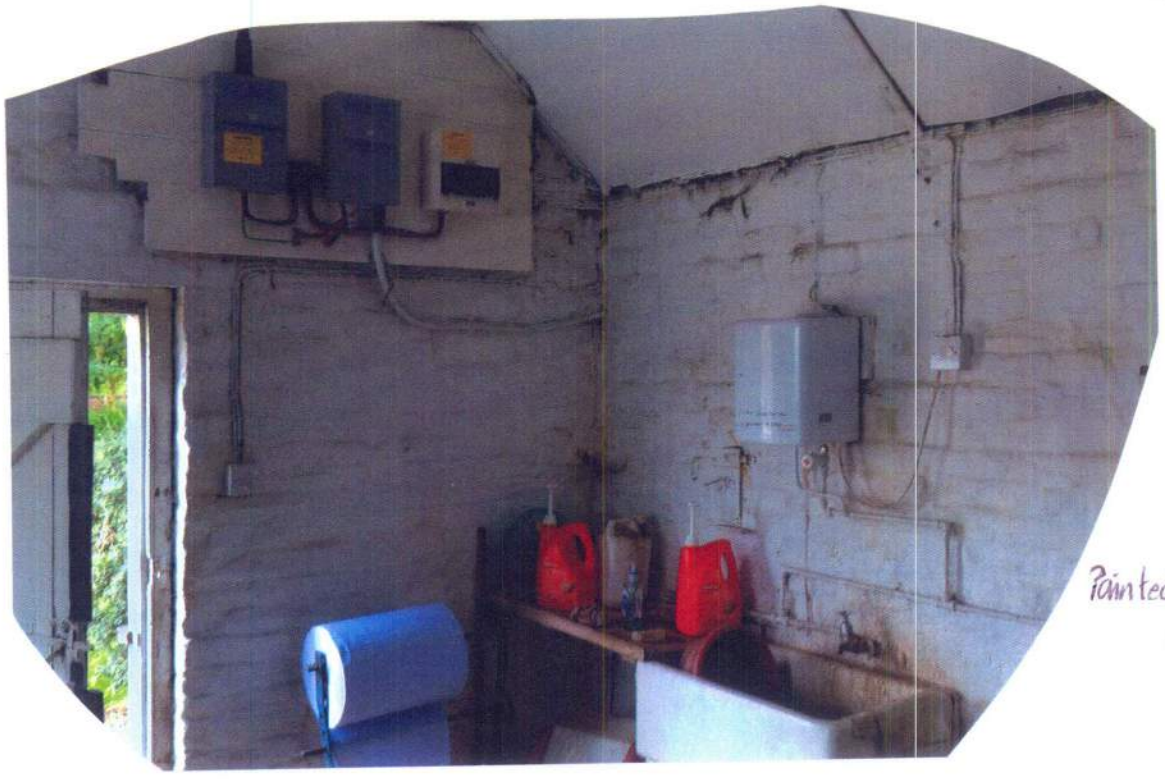
P.11



tie beam

painted bwk ✓ok

P.12



Painted bwk ✓ok

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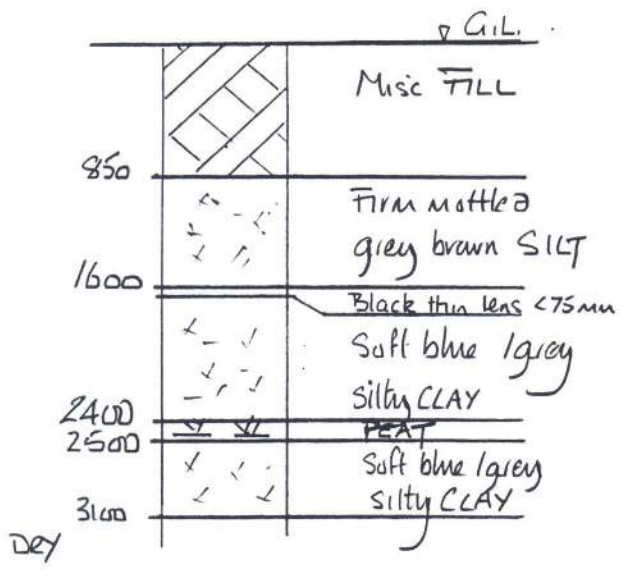
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Drawing Title

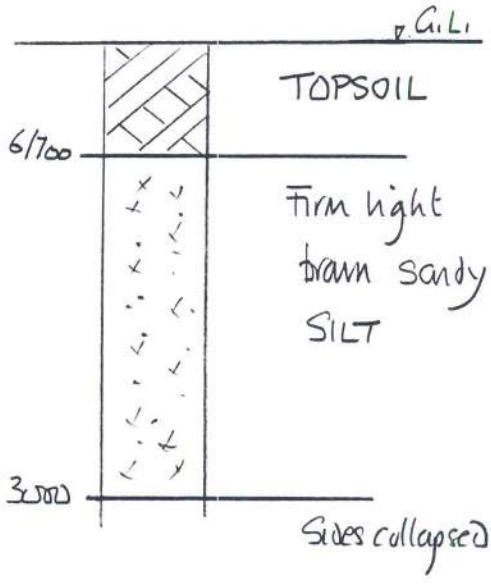
PHOTOGRAPHS P.11 & P.12

Drawn	Date	Scale	Dwg.No
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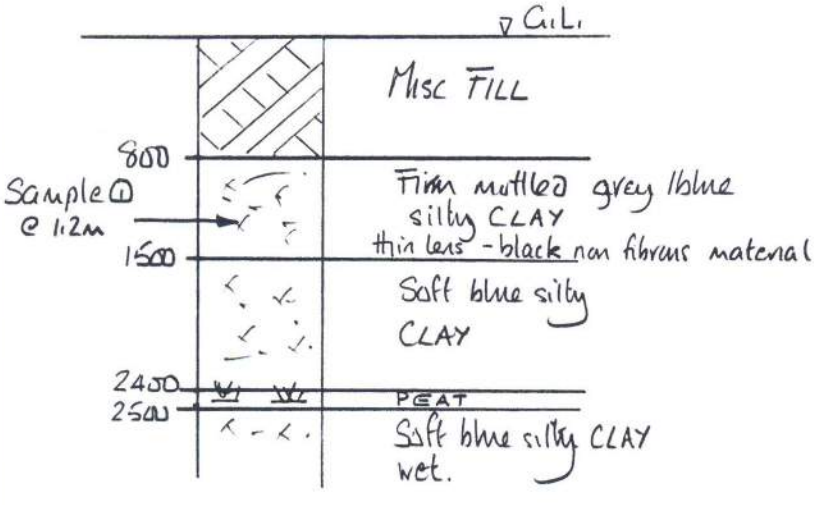
TH.01



TH.02



TH.03



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Drawing Title: TRIAL HOLE LOGS 01~03

Drawn	Date	Scale	Dwg.No
GCH	AUG '15	—	S.743 15/09

8180

GROUND ENGINEERING

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TEST CERTIFICATE

Determination of Liquid & Plastic Limits

Tested in accordance with BS 1377-2:1990: Clause 4.4 & 5: One Point Method

Client:	Geoff Holyoake Associates Ltd	Certificate Number:	PL5105-1/1/704
Client Address:	27 Exeter Gardens Stamford Lincs. PE9 2RN	Client Reference:	Not Given
		Job Number:	PL5105-1
		Date Sampled:	Unknown
Contact:	Geoff Holyoake	Date Received:	13.08.2015
		Date Tested:	25.08.2015
Site Name:	Barns at 251 Broadgate	Certificate of Sampling:	N/A
Site Address:	Sutton St Edmund	Sampling Certificate No.:	N/A
		Sampled By:	Client

Test Results:

Laboratory Reference: PL5105-1/1

Sample Reference: Sample 01

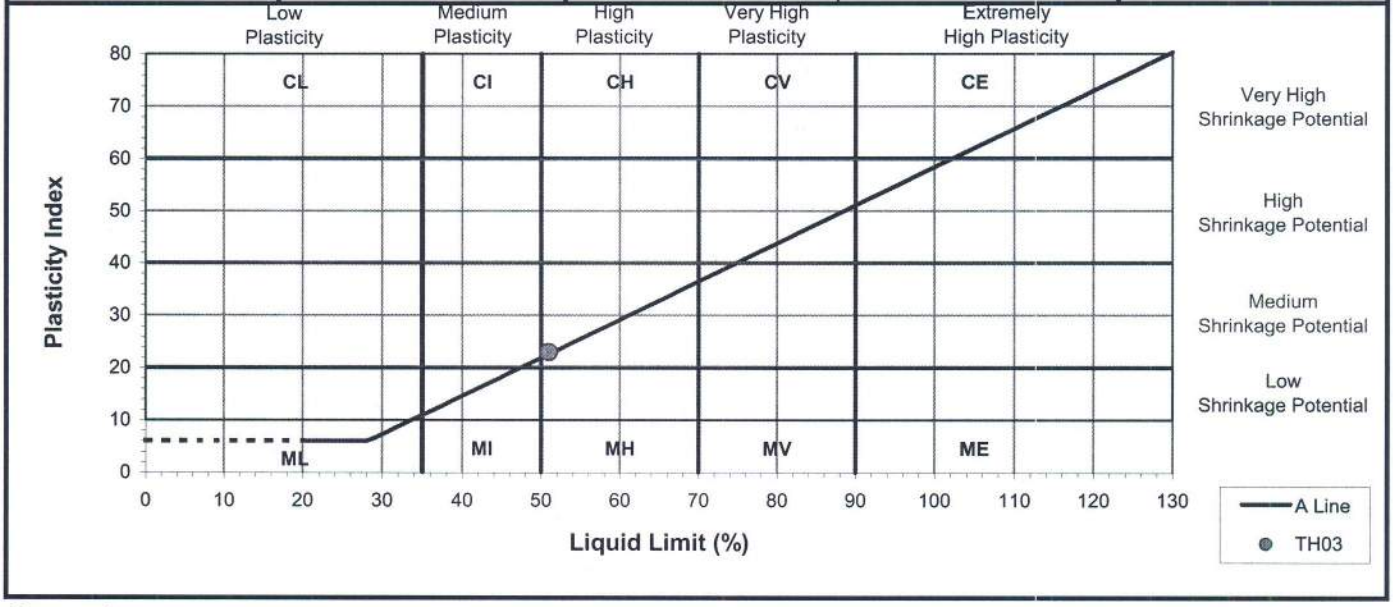
Sample Description: Firm brown dark grey silty CLAY *with slight petro-chemical odour*

Location: TH03 **Depth:** 1.20m

Sample Preparation: As Received

Estimated % Passing 425µm BS Test Sieve

Moisture Content (%)	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index	% Passing 425µm BS Test Sieve
35	51	28	23	99



Comments:

Approved Signatory: M. Hartnup - Laboratory Manager Signed:

for and on behalf of Ground Engineering Ltd

Date Reported: 26.08.2015 Page 1 of 1

Form Number: GELab/C/704 Version 40

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GROUND ENGINEERING

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TEST CERTIFICATE

Determination of Moisture Content

Tested in Accordance with BS 1377-2: 1990: Clause 3.2

Client:	Geoff Holyoake Associates Ltd	Certificate Number:	PL5105-1/1/705
Client Address:	27 Exeter Gardens Stamford Lincs. PE9 2RN	Client Reference:	Not Given
		Job Number:	PL5105-1
		Date Sampled:	Unknown
		Date Received:	13.08.2015
Contact:	Geoff Holyoake	Date Tested:	20.08.2015
		Certificate of Sampling:	N/A
Site Name:	Barns at 251 Broadgate	Sampling Certificate No.:	N/A
Site Address:	Sutton St Edmund	Sampled By:	Client

TEST RESULTS

Laboratory Reference	Sample Reference	Location	Depth Top	Depth Base	Description	Moisture Content [%]
PL5105-1/1	Sample 01	TH03	1.20m	N/A	Firm brown dark grey silty CLAY *with slight petro-chemical odour*	35

Comments:

Approved Signatory: M. Hartnup - Laboratory Manager

Signed:

for and on behalf of Ground Engineering Ltd

Date Reported: 26.08.2015

Form Number: GELab/C/705 Version 17

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