Geoff Holyoake Associates Ltd.

Structural & Civil Engineering Consultants

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STRUCTURAL SURVEY

OF BARN 3,

AT 251 BROADGATE,

SUTTON ST. EDMUND.

S.744/15/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.

3.1. Barn 3 is situated along the roadside boundary to 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 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.

3.3. There are no nearby significant trees.

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 foundation detail at the vertical butt joint near the centre of the farmyard elevation.

4.10. The two brickwork panels are built off different corbelled brickwork footings. The footings extend some 1.4m and 0.5m below ground level respectively.

4.11. The lower footing is founded within soft wet blue/black silty clay.

5. Defect Survey

5.1. See photographs P1 – P10.

5.2. The asbestos sheeted roof profile is slightly distorted. **See P1, P3, P4 & P5.**

5.3. The external brickwork elevations are generally weathered**. See P1.**

5.4. The stormwater system is defective. **See P2.**

5.5. A number of alterations have been made to the farmyard elevation, which is considered to be historic. **See P3 & P4.**

5.6. The external arched detail to the southern gable elevation has been infilled internally. **See P5 & P6.**

5.7. The 'open' roof structure is consistent with age and construction of the building. **See P7, P8, P9 & P10.**

5.8. The internal painted brickwork appears satisfactory with minor distortions and no evidence of significant cracking. **See P6, P7, P8, P9 & 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 the highlighted vertical butt joint between two types of construction, which is considered an inherent weakness.

6.3. The lower footings are founded within the soft silty clays and there is band of peat at lower levels.

6.4. Future movement, albeit slight, would not be acceptable within a domestic property.

6.5. 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.

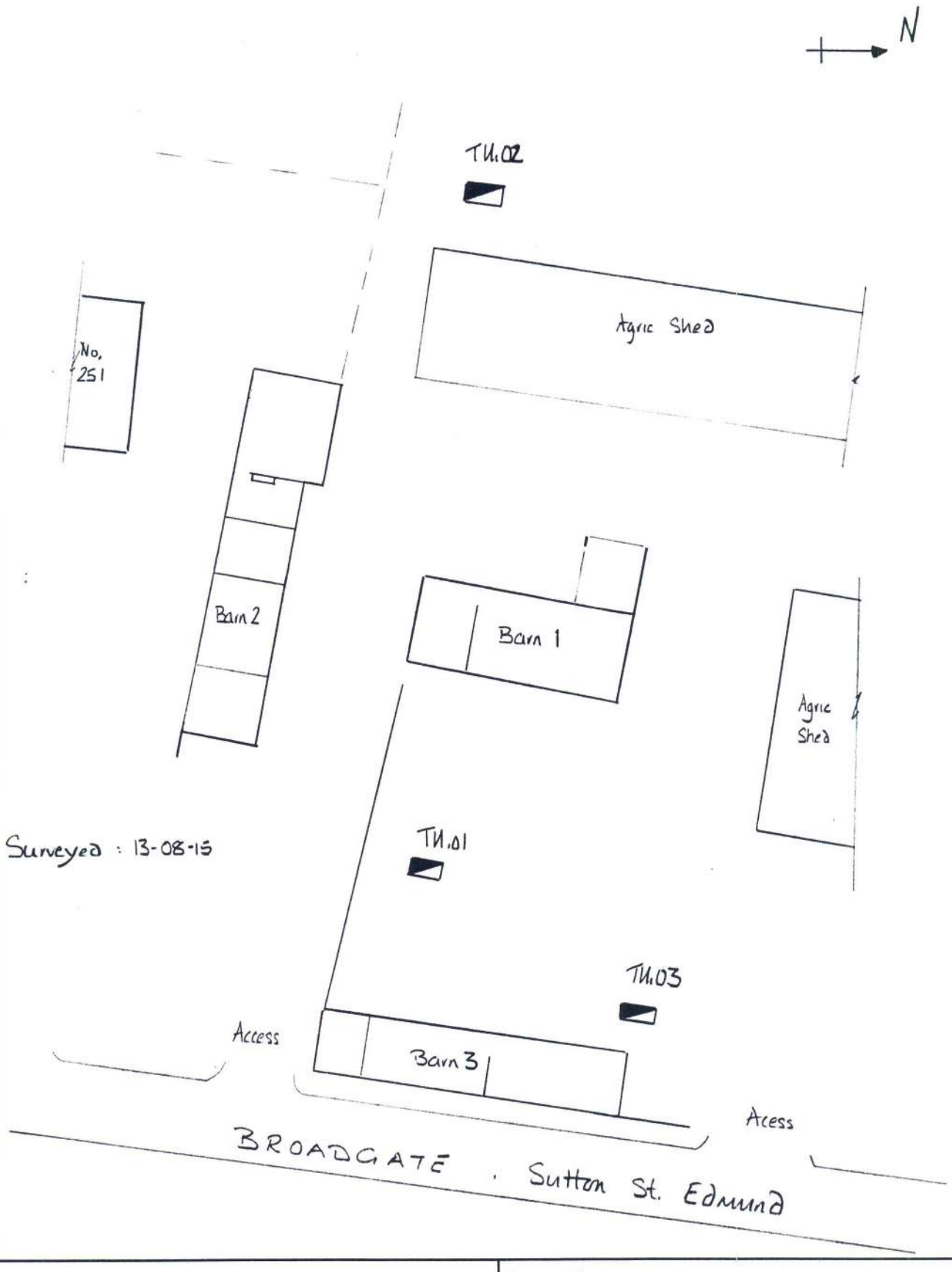
6.6. Other general recommended works should include: -

- All new roofs are to be strapped to the main walls using mild steel straps in accordance with the Building Regulations.
- All the 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.

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

G. C. Holyoake

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



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Drawing Title

LOCATION PLAN

Drawn	Date	Scale	Dwg.No
GCH	Aug'15	/	3744 15/01

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Drawing Title

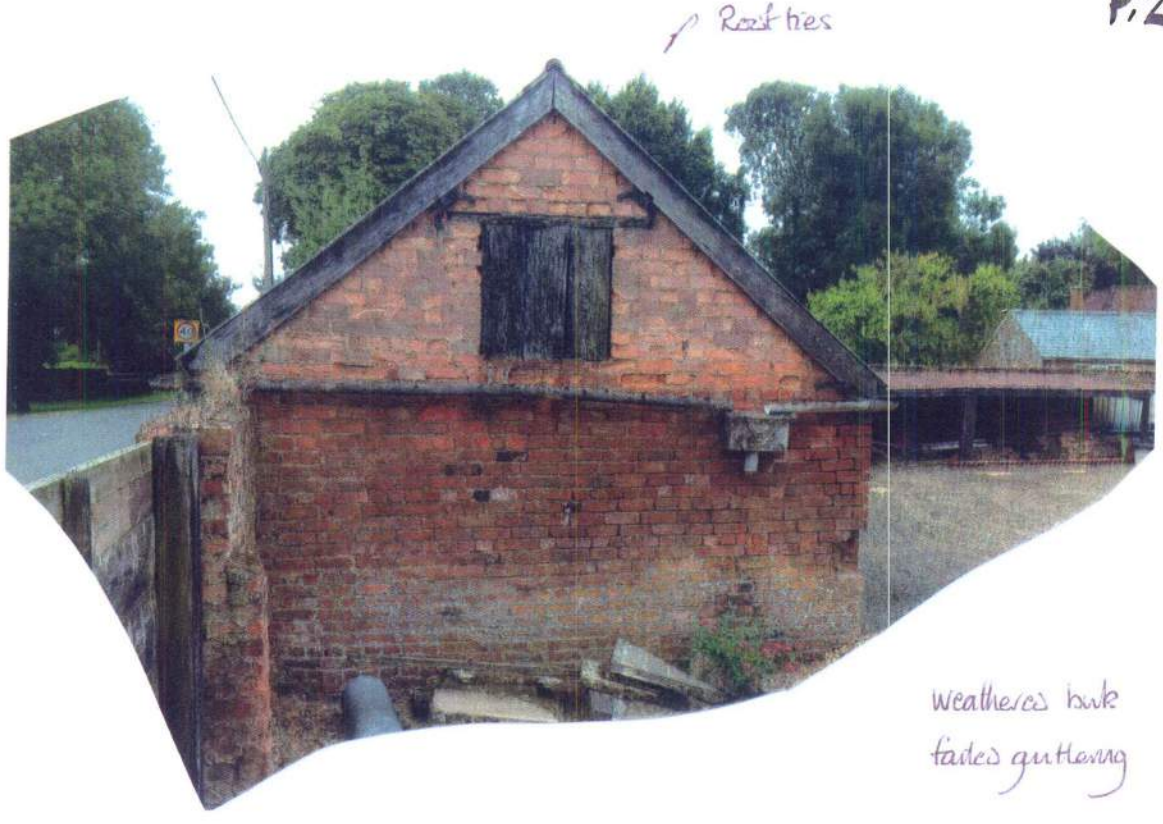
EXISTING LAYOUT

Drawn	Date	Scale	Dwg.No
GCH	AUG '15	—	S.744 15/02

P.1



P.2.



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Drawing Title
PHOTOGRAPHS P1 & P2

Drawn	Date	Scale	Dwg.No
GCH	AUG15	—	8.744 15103

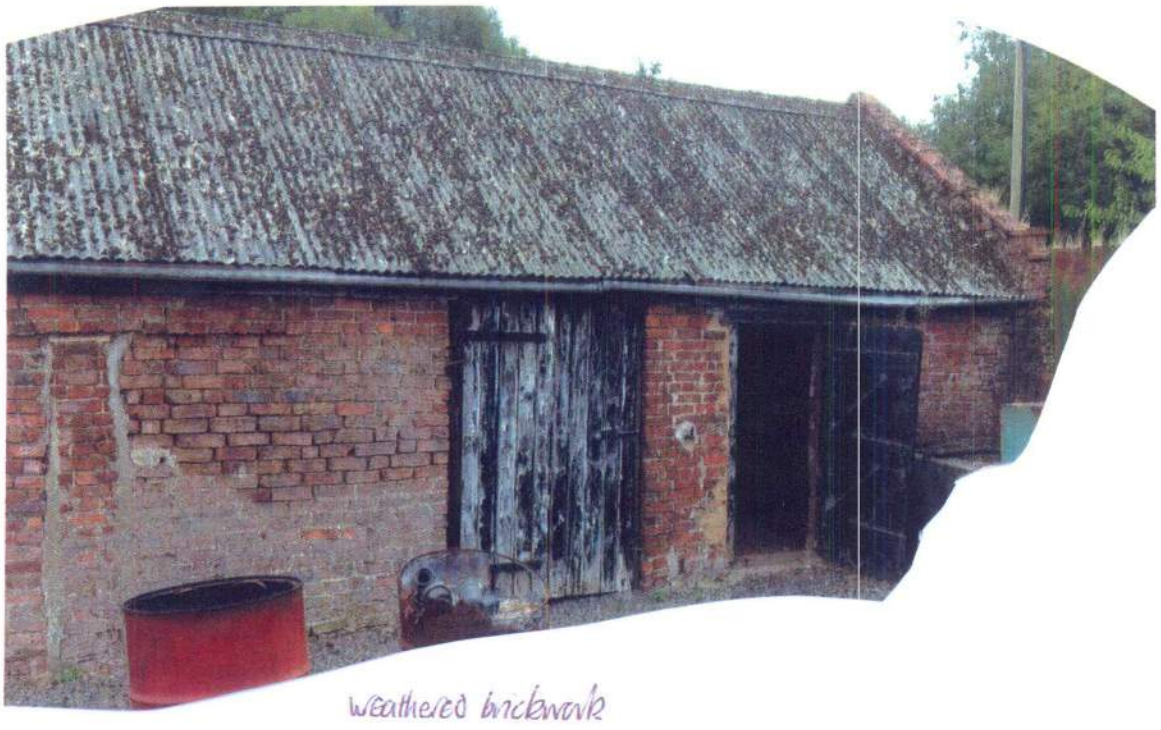
P.3



weathered brickwork
distorted timber lintels

vertical butt joint to
infill panel

P.4



weathered brickwork

repointed area

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Drawing Title

PHOTOGRAPHS P3 & P4

Drawn	Date	Scale	Dwg.No
GCH	AUG 15	—	S.744 15/104

P.5



weatherea gable with roof ties

P.6



lateral Roof tie beam

reflects extend arches detail

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		Drawn: GCH	Date: AUG 15
		Scale: —	Dwg.No: S.744 15/05

P.7



open roof structure

P.8



timber lintel

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		Drawn: GCH	Date: AUG 15
		Scale: —	Dwg.No: S.744 15/06

P.9



isolated pier supporting timber lintels

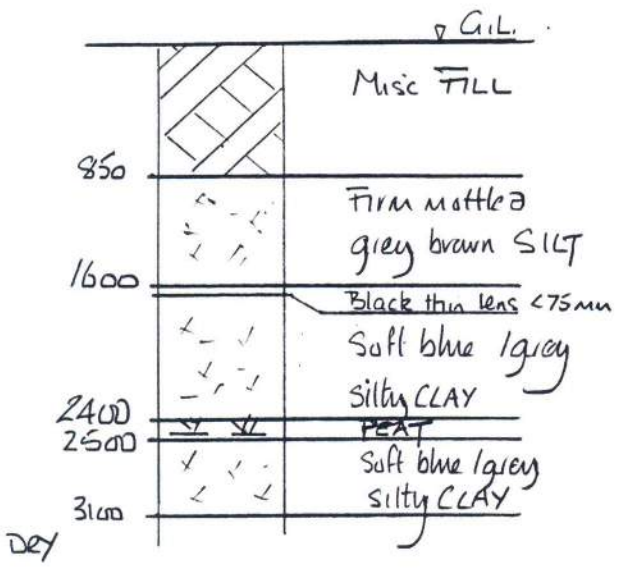
P.10



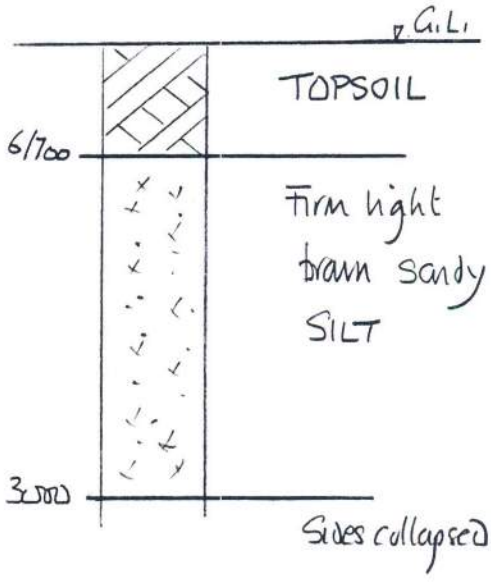
painted walls / OK

Geoff Holyoake Associates Ltd. Structural & Civil Engineering Consultants	27 Exeter Gardens Stamford Lincolnshire PE9 2RN Tel: 01780 765971	Drawing Title: PHOTOGRAPHS P9 & P.10	
		Drawn: GCH	Date: AUG 15
		Scale: —	Dwg.No: S.744 15 107

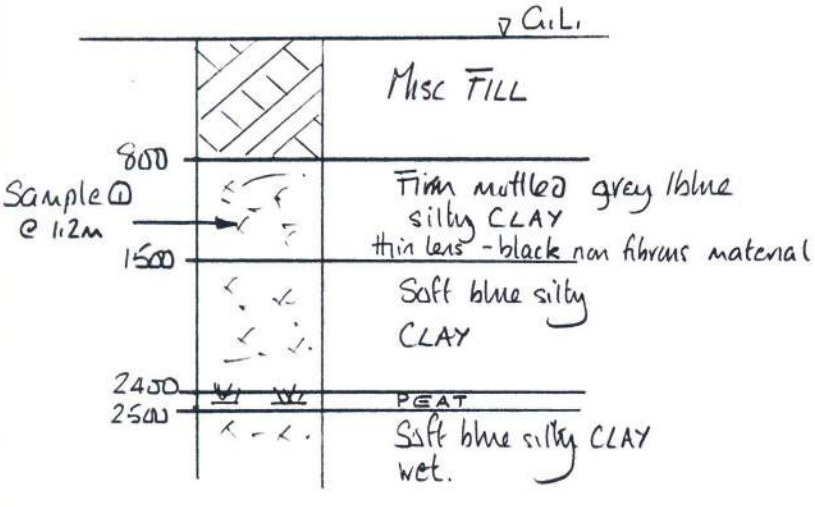
TH.01



TH.02



TH.03



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Drawing Title

TRIAL HOLE LOGS 01~03

Drawn	Date	Scale	Dwg.No
GCH	AUG '15	—	5,744/510B

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8180

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

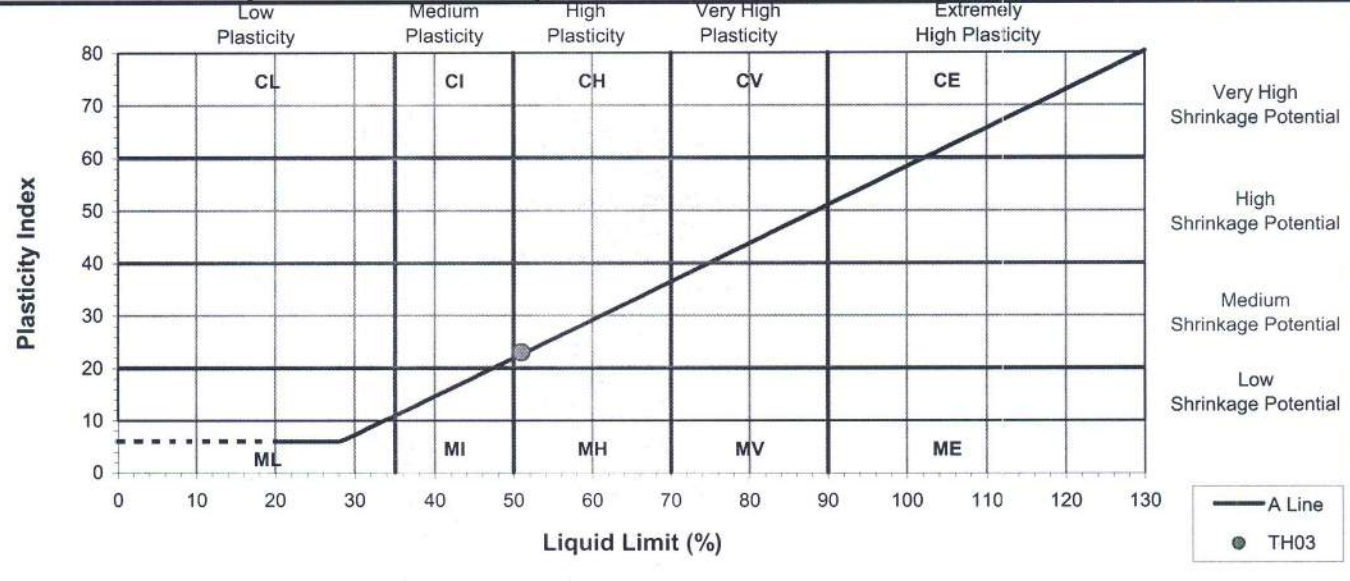
Sample Description: Firm brown dark grey silty CLAY *with slight petro-chemical odour*

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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