PCC Consultants

The Annexe,
11 Meadow Lane,
South Hykeham,
Lincoln LN6 9PF

T 01522 695 540
E petercole@pcoleconsult.co.uk
www.pcoleconsult.co.uk

Mrs Caroline Wheeler
W D Barnton and Willow Tree Potatoes Ltd
Willow Tree Farm
Main Road
Deeping St. Nicholas
Spalding
Lincolnshire, PE11 3BN

02 August 2021

Dear Mrs Wheeler

Re: 10417 Barn Survey, Fifth Drove, Gosberton. PE11 4JY



I refer to your instructions for me to undertake a structural engineer's inspection of the brick-built barn at the location indicated above. The barn is located at grid reference TF 16872 29129. I understand that you wish to incorporate this barn into a new dwelling, and a requirement of the planning permission will be to ensure that the building is in a suitable condition for conversion to a dwelling.

The building has deteriorated due to a combination of factors, and these will be described briefly within this report. The report considers a strategy to ensure that the building can be utilised to achieve a construction standard compliant with the requirements that may be expected from such a dwelling, ensuring appropriate robustness and stability for the building structure, and complying with the requirements of Part A of the Building Regulations.

A brief desk study suggests that the masonry building was constructed prior to 1888. A building is shown at this location and of a similar size to the existing structure on the 1888-1889 Ordnance Survey 1:2,500 map. The covered extensions appear to have been added between 1931 and 1978. This does indicate the building is of some age and has therefore reached a condition of structural "equilibrium" albeit that through a lack of repair and the natural processes of weathering, deterioration of the building has occurred.



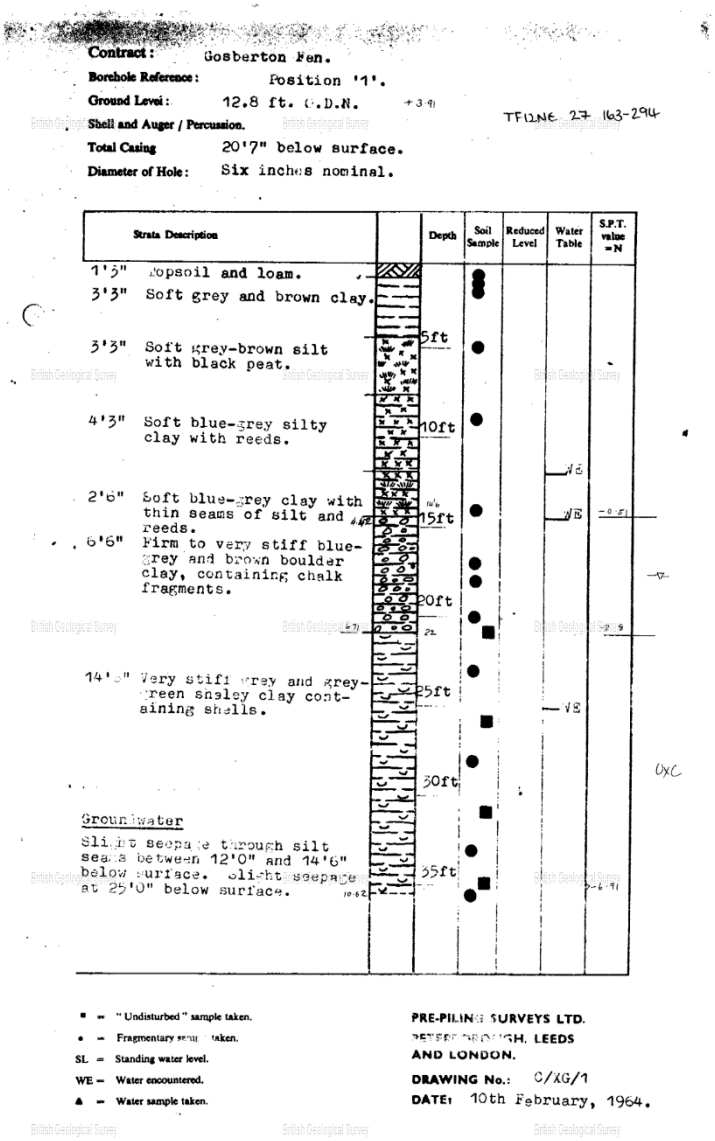
The building has suffered impact damage as well as deformation due to consolidation of the subsoils and roof "spread". The building has also suffered from weather damage to the masonry and the timber roof is affected by wet rot. Tree growth adjacent to the building has caused disturbance to the brickwork and building foundations. The adjacent photograph shows the impact damage as well as the close proximity of the tree to the north wall.

At this stage I have not carried out any testing of the building structure and there has been no investigation of the building subsoils. We do not have a site investigation at this location, but the British Geological Survey provides a means of assessing ground conditions through their online reference platform "Geology of Britain Viewer". This provides not only a description of the surface deposits and solid geology of the area but also provides very useful borehole log information that is within the public domain. Within 600 metres of this site there is a borehole formed in 1964, and although investigative information located at such a distance is not site specific, it does help to provide a typical profile of the ground conditions and may help to explain the various issues and topographical features present in the local area. The borehole log is shown on the subsequent page.

Specifically, although the land is relatively flat, there are indications that roads have undergone settlement. This is a typical characteristic of fenland areas and usually indicates that the subsoils may contain peat layers and organic clay typical of soils described variously as alluvium and tidal flat deposits. This is borne out by the borehole log that indicates the presence of peat and is included within this report. The solid geology is defined as the Oxford Clay Formation, with firm to still clay at a depth of typically 5.0 m below ground level.

Where buildings are constructed on peat and organic clay sub-soils, they will undergo settlement due to consolidation. However, this consolidation slows down with time, and as the building has been present for nearly 150 years, further settlement is considered unlikely, unless there is a significant change to the ground water level that can lead to volume changes and further consolidation.

The borehole log provides valuable information to identify what should be done to ensure the future stability of the building. Many barn structures do require some degree of underpinning to ensure that the resulting dwelling may be insured against the risk of subsidence. In this instance the use of small diameter steel cased driven piles should be utilised to support a new concrete ground floor "raft" that would be required in any event to provide an insulated floor construction with suitable damp proofing. This structurally sound new floor construction may be utilised to support the masonry walls by "toothing" into the masonry at or below floor level.



Contract: Gosberton Fen.
Borehole Reference: Position '1'.
Ground Level: 12.8 ft. O.D.N.
Shell and Auger / Percussion.
Total Casing 20'7" below surface.
Diameter of Hole: Six inches nominal.

TF12NE 27 163-294

Strata Description	Depth	Soil Sample	Reduced Level	Water Table	S.P.T. value = N
1'3" Topsoil and loam.					
3'3" Soft grey and brown clay.					
3'3" Soft grey-brown silt with black peat.	5ft				
4'3" Soft blue-grey silty clay with reeds.	10ft				
2'6" Soft blue-grey clay with thin seams of silt and reeds.	15ft				
6'6" Firm to very stiff blue-grey and brown boulder clay, containing chalk fragments.	20ft				
14'6" Very stiff grey and grey-green shaley clay containing shells.	25ft				
	30ft				
Groundwater Slight seepage through silt seams between 12'0" and 14'6" below surface. Slight seepage at 25'0" below surface.	35ft				

■ = "Undisturbed" sample taken.
• = Fragmentary sample taken.
SL = Standing water level.
WE = Water encountered.
▲ = Water sample taken.

PRE-PILING SURVEYS LTD.
PETERBOROUGH, LEEDS AND LONDON.
DRAWING No.: C/XG/1
DATE: 10th February, 1964.

OxC

It will be necessary to repair and restore the masonry by repointing using a "heritage" mortar that incorporates lime, with some localised reconstruction of the walls where erosion is more severe or where physical damage due to impact or settlement is present.

Timber restoration will also need to be undertaken. A lack of maintenance has resulted in rot affecting wall plates, rafter ends, purlins and ties, and a specialist firm such as Peter Cox should be engaged to restore those timbers that are appropriate. Other timbers where more extensive rot is present may need to be replaced to provide a robust roof construction.

Please contact me if you have any questions on this report.

Yours sincerely



Peter Cole BSc CEng MICE FIStructE
PCC Consultants Ltd