

Project ref: 0142

29 January 2026

STRUCTURAL ENGINEERING NOTE 06

Barn at Brook Farm, Cuckfield, West Sussex

Design Statement on Foundations to Stable

Introduction

The detailed design for the foundations to the barn, including the cart shed, lean to and stable have been updated following an intrusive geotechnical site investigation. This investigation has been a requirement of the structural engineering design since feasibility study stage, given the widespread failure of the existing foundations.

The Key Site Investigation Findings

The site investigation was carried out by Land Science in the summer of 2025. Their findings and geotechnical recommendations are set out in a report dated 29 July 2025, ref LS8585. The key findings are set out below:

- The natural ground is a silty sandy gravelly clay, probably forming part of the Wadhurst Clay Formation.
- This clay has been found to have a medium volume change potential. This has implications for the existing foundations of the barn since:
 - There have been trees located near to the barn and the roots from these trees will have potentially caused desiccation of the ground and subsequent settlement. The trees close by were removed after November 2022. This raises the risk that the natural ground could heave over the short-to-medium term as the roots are no longer drawing water from the ground.
 - The shallow foundations are susceptible to future seasonal moisture changes in the ground, which could cause differential settlement.
- The site investigation also highlighted the potential for soil instability which can cause soil creep. This has been highlighted by Land Science as possibly contributing to the rotation of some of the existing foundations – such as the masonry plinths supporting the Lean To.

These key findings from the site investigation indicate there is a risk of future ground movements which could affect the existing foundations of the barn through differential settlement. This risk exists both in areas where there has been a failure of the existing foundations, and where there has been no obvious sign of movement in the foundations to date. This risk has potential structural implications for the future condition of the barn structure, regardless of whether it was intended to be retained in its current use or through the proposed conversion to a dwelling.

Structural Engineering Foundation Strategy

Before the site investigation was carried out, the preliminary foundation design made allowance for rebuilding and deepening the foundations to the Cart Shed and Lean To, and to one side of the Stable. The proposals also

highlighted the need for further checks to be carried out. Now that the site investigation findings have been assessed, it is recommended the foundations to the Stable are also rebuilt and deepened.

This will address the geotechnical concerns that Land Science have highlighted and will help maintain the condition of the stable structure in future. The thinking for this approach is illustrated on drawing 0142-06 in appendix A.

Whilst these works will cause a level of disruption to the masonry plinth around the base of the Stable, it is worth recognising the masonry plinth has already collapsed in sections and experienced some previous alterations. These alterations are associated with the removal of the timber frame to at least three of the four elevations of the Stable and their replacement with brick walls and a concrete slab across the stable. In areas where the brick plinth appears to have been altered less, there are also signs of cracking within the masonry suggesting ground movements are causing further damage. This is likely to exacerbate over time given the findings of the site investigation.

Another consideration is that the masonry plinth is likely to be disturbed further when the structural repairs to the timber frame are carried out. These involve reintroducing the timber framing to the bases of the walls and is associated with the reintroduction of the sill plate and timber posts - adopting traditional carpentered joints – where it has been lost. Such work is likely to require a few brick courses of the brick plinth to be dismantled to enable the sill plate and tenoned posts to be erected before the top section of the plinth wall is repaired and made good.

These timber framed works are not only a key aspect of the structural design but are considered important in conservation terms as it reintroduces the lost framing to the superstructure of the stable – which is considered to have the most significance in historic and architectural terms.

In terms of sequence of construction, the timber frame needs to be temporary supported in any case to enable the timber framing works to be carried out. This will enable the brick walls at low level to be removed to allow the new timber elements, including the posts and sill plates, to be erected. Whilst the timber framing is temporarily supported, this will provide a good opportunity to dismantle the masonry plinth walls to allow new deeper foundations to be constructed. The dismantled masonry can then be reformed using existing materials - where practicable – to raise the plinth to the underside of the new sill plates.

Given the potential for future heave, as a result of the trees being removed, the ground floor slabs to the Cart Shed and Stable are proposed to be suspended floors. This proposal has no structural impact on the retained timber framed structure.

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Appendix A: Structural Drawing

Drawing ref: 0142-06 Design drawing – Stable Foundations and Ground Floor

LOCALISED COLLAPSES VISIBLE
IN REAR SECTION OF PLINTH.
REQUIRES REBUILDING ON
DEEPER FOOTINGS

CENTRAL SECTION OF PLINTH ALONG
REAR CONSIDERED AT HIGH RISK
OF ROTATION & COLLAPSE. REQUIRES
REBUILDING ON DEEPER FOOTINGS.

PLINTH WALLS
AT LOW LEVEL
PROBABLY ALTERED
WHEN TIMBER
FRAMING
PREVIOUSLY REMOVED
AND NEW BRICK
WALLS ADDED.

SOUTH SIDE
OF STABLE

PLAN ON FOUNDATION AS EXISTING
(~1:50)

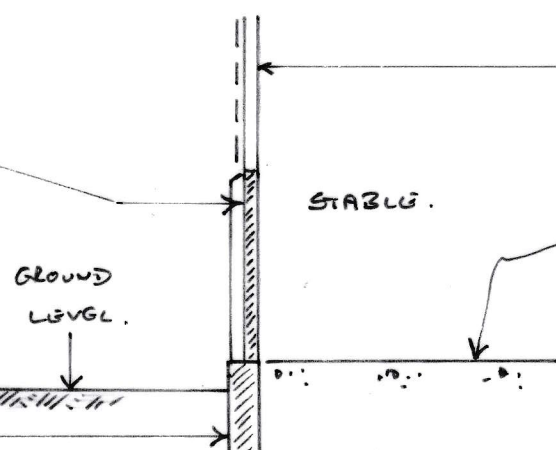
RECENT
CRACKING ON
WALL ABOVE
PLINTH IMPLIES
FOOTING WAS
ROTATED.
NEEDS TO BE
ADDRESSED.

PLINTH WALL APPEARS
INTACT BUT
WEATHERED ON TOP
FACE WHERE EXPOSED

BRICK WALL (20TH
CONSTRUCTION - HAS
REPLACED ORIGINAL
TIMBER FRAME

BRICK PLINTH.
PROBABLY ONE-BRICK
THICK. CONFIRMED AS
EXTENDING 450mm
BELOW GROUND
LEVEL, BORING ON
TO WADHURST CLAY.

BASED ON FINDINGS
OF LAND SCIENCE
SITE INVESTIGATION,
TRIAL PIT 05.



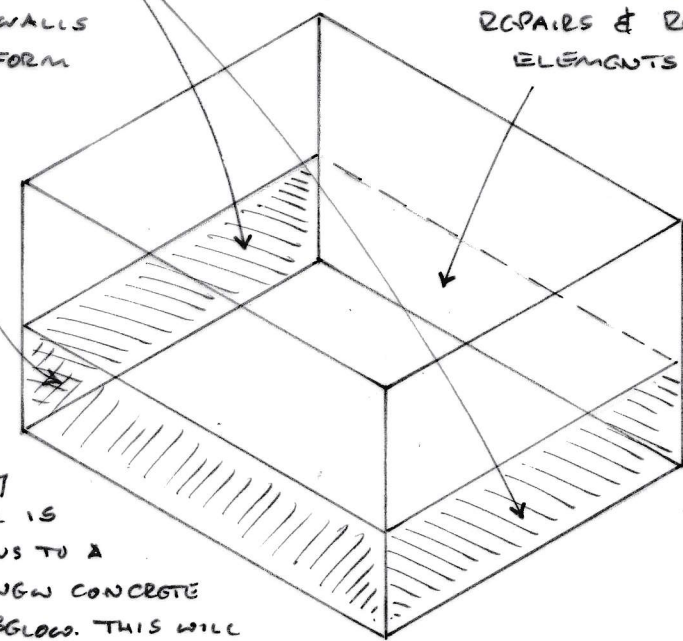
SECTION X-X. (~1:50)
(AS EXISTING)

ORIGINAL TIMBER
FRAME ABOVE.

EXISTING CONCRETE
FLOOR - (20TH
CONSTRUCTION.

(20TH BRICK WALLS REPLACED)
ORIGINAL TIMBER FRAME
AT LEAST ALONG EAST,
WEST & SOUTH WALLS.
REMOVING THESE WALLS
CREATES ROOM TO FORM
NEW FOUNDATIONS
PRIOR TO TIMBER
FRAMING BEING
REINSTATED.

GIVEN GROUND
CONDITIONS,
STATE OF EXISTING
MASONRY PLINTH, &
POTENTIAL CONCERNS
WITH SOIL INSTABILITY
NEAR SURFACE, PROPOSAL IS
TO EXTEND FOUNDATIONS TO A
GREATER DEPTH WITH NEW CONCRETE
FOOTINGS AS NOTED BELOW. THIS WILL
HELP CONSERVE THE TIMBER FRAME
INTO THE FUTURE, & PERMIT FOOTINGS
TO COMPLY WITH BUILDING REGULATIONS.

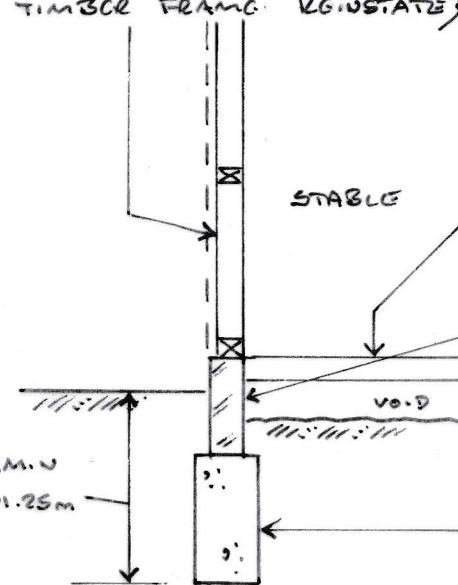


CONDITION OF TIMBER FRAME
ALONG NORTH WALL (SHARED WITH
LEAN-TO) EXPECTED TO BE POOR AT
LOW LEVEL & EXPECTED TO REQUIRE
REPAIRS & REPLACEMENT OF TIMBER
ELEMENTS.

ISOMETRIC OF EXISTING TIMBER FRAMED WALLS.

FRONT & SIDE WALLS:
BRICK WALL REMOVED AND
TIMBER FRAME REINSTATED.

TIMBER FRAME TO BE TEMPORARILY SUPPORTED
DURING WORKS TO FORM NEW FOUNDATIONS.

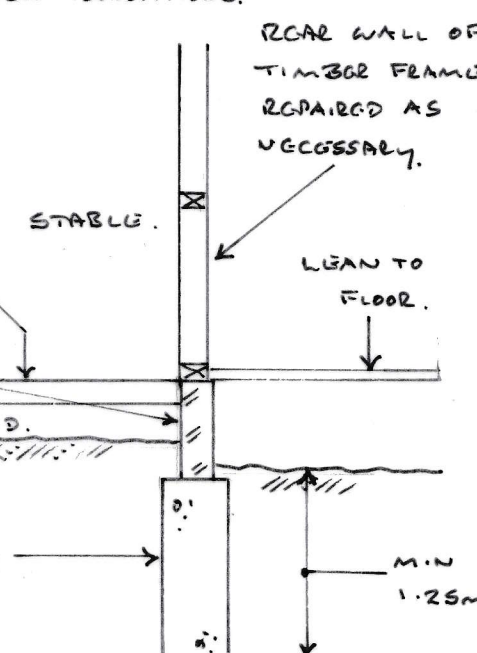


SECTION X-X: AS PROPOSED (~1:50)

NEW SUSPENDED FLOOR
ADDRESSES POTENTIAL RISK
OF HEAVE IN GROUND &
SOIL INSTABILITY
CONCERNS.

PLINTH WALLS REBUILT TO
MATCH EXISTING.

NEW CONCRETE STRIP FOOTINGS,
GIVEN CONCERNS WITH EXISTING
FOOTINGS AND NEED FOR TIMBER
FRAME TO SUPPORT DOMESTIC
FLOOR LOADS. NEW FOOTINGS
ALSO ADDRESS POTENTIAL
SOIL INSTABILITY.



SECTION Y-Y: AS PROPOSED (~1:50)

NOTES

- This drawing is to be read in conjunction with all relevant architect's and engineer's drawings and the specification.
- This drawing is based on existing plans of the building prepared by Baker Brown dated Aug 2021.
- This drawing shows the design for the foundations and ground floor of the Stable and is in response to the findings of the site investigation carried out by Land Science (report ref LS8585 dated 29 July 2025).
- This drawing is not to be used for construction.

Rev	Date	Amendment
		ISSUED FOR COMMENT

Project:	Barn at Brook Farm, Brook Street, Cuckfield	Andrew Turner Engineering
Sketch title:	Design drawing - Stable Foundations & Ground Floor	Date: Sept 2025
Sketch No:	0142 / 06	Rev: Scale: 1:100 at A3 Size (UNO)