

Report on a Structural Inspection of Barn Buildings

Hammonds Mill
Hassocks
West Sussex
BN5 9NB

Reinspected, reviewed and reissued 20 Feb 2025

(no material change to 2021 report)

Cassells Drummond Building Structures Consultants

The Studio The Square Findon West Sussex BN14 0TE

david@cassellsdrummond.com



1. Introduction

- 1.1 We were appointed by DJH Architectural and Planning Consultants to undertake a structural appraisal of the existing barn buildings in terms of their current structural condition and report on the ability of the structures to support any new loads associated with a future conversion to residential use.
- 1.2 A careful visual inspection of the barn buildings was carried out in July 2021. An initial review of architectural plans and specifications for proposed residential conversions was also undertaken to assess any implications for the existing structure. (reinspected February 2025)
- 1.3 As no significant structural problems were identified with the barn buildings during the inspection and an initial analysis of the impact on the structure of the proposed residential conversion works did not reveal that any structural alterations would be required, it was not considered necessary to recommend that an invasive structural survey or a full, detailed structural analysis should be undertaken.
- 1.4 The barns are not listed buildings but may be considered to lie within the setting of the listed former Mill House (known as the Farmhouse). However this is not a matter for a structural condition report and is addressed in the planning statement and heritage report prepared by DJH Architectural and Planning Consultants.
- 1.5 Although the barn buildings, which are located around a mid 20C farmyard, which itself is positioned on some of the external areas associated with the operation of the former 3 storey mill (demolished in the mid 1970s) including the mill pond overflow stream which is culverted below the yard, both the location of the former mill building and the mill pond overflow stream are sufficiently distant from the barn buildings to be considered not to have any impact on the structures that would not have been foreseen and allowed for when forming the foundations for the structural frame elements and external walls closest to the route of the culvert.
- 1.6 Although that part of the Hammonds Mill Estate closest to the Herring stream, into which the mill 'tail race' and mill pond overflow stream eventually discharge, lies within the Zone 3 Fluvial Flood Zone of the stream, flood maps show this does not extend as far as the location of the two nearest barn buildings, 3 and 4, and there is no evidence of flood damage, recent or historic, to the external walls, or the ground immediately around the barn buildings 3 and 4.
- 1.7 The notation of the barns follows that used in the planning statement. The larger barn buildings 1 and 2, partly separated by an internal wall, not full height, are formed with 'Burchett' structural steel portal frames while the smaller barn buildings, 3 and 4, separated an internal wall, are formed in 'Atcost' reinforced concrete portal frames.

2. Observations on the existing structures

2.1 The dimensions of the barns are:

Barn Building 1	30.6 metres x 12.3 metres	(5 bays)	height to ridge 7.05 metres
Barn Building 2	30.6 metres x 14.7 metres	(5 bays)	height to ridge 5.54 metres
Barn Building 3	18.4 metres x 9.2 metres	(3 bays)	height to ridge 4.05 metres
Barn Building 4	18.4 metres x 11.9 metres	(3 bays)	height to ridge 4.75 metres

It is not proposed to convert Barn Building 1 to residential use.

Barns 3 and 4

- 2.2 The structure consists of standard Atcost pre cast reinforced concrete portal frames forming two main cross bays with portal central columns supporting portal rafters spanning onto perimeter wall portal columns. The structural roof components include pre cast reinforced concrete purlins, centre and perimeter gutters.
- 2.3 The barns are three bay in length with a portal frame forming each bay,
- 2.4 External long walls and the internal separating wall are formed in 225mm concrete block work, between the portal columns with an area of vertical, corrugated asbestos cement sheet cladding, or vertical timber slats, between the top of the block work and the pre cast concrete perimeter edge beam/gutter.
- 2.5 The gable external walls of Barn Building 3 are constructed in the same way, while in Barn 4 they are partly open with precast concrete vertical columns 'framing' the end bays to create the open areas, with the block work/cladding/slatting to the infill parts.
- 2.6 The pitched roofs, formed with the portal frames have a central precast concrete gutter and are clad with corrugated or profiled asbestos cement sheeting spanning between purlins and include several clear, profiled roof light sheets. The roofs also incorporate standard asbestos cement ridge type vents.
- 2.7 Floors in Barn Building 3 are part concrete slab, part well compacted sub base as an operational surface/finish. Barn Building 2 is entirely a well compacted sub base as an operational surface/finish.

Structural Restraint

- 2.8 The primary stability is reliant on the concrete end bay members, some secondary steel framing above the block work and between concrete purlins.
- 2.9 Although most of the bays are infilled with external block work walls between the portal columns, only one bay in each longitudinal elevation needs to be restrained and therefore removal of block work forming most of the external walls would be possible without effecting the stability of the structure, as it is essentially a portal frame design that allows a lot of flexibility on whether and where external wall 'panels' are left open, or are infilled.
- 2.10 The location of the barns is sheltered and there is no evidence of any damage to roof sheeting or external wall cladding from wind loading.

Condition of Structural Members

- 2.11 The concrete portal columns/rafter beams/purlins/end bay columns and beams and connections were carefully inspected and are considered to be in a good condition with no apparent, or early signs of concrete damage or part exposure of reinforcement.
- 2.12 The external block work walls are not load bearing and are not structural elements, other than one bay on each longitudinal elevation where the block work provides lateral restraint to the frame. The block work is generally in good condition with only one sign of cracking at one of the corners of Barn 3, which can easily be repaired.

Foundations

- 2.12 The barns have concrete pad foundations at column positions and concrete strip footings below external and the internal separating walls. Although the inspection did not expose the depth of the foundations, there is no evidence of any differential settlement or indication from the adjoining ground conditions to indicate that the foundations are anything other than adequately designed and of a suitable depth for the ground conditions.

Sheet Roofing, Cladding. Non Load Bearing Walls

- 2.13 The corrugated/profiled asbestos cement roof sheeting, upper part gable end and elevation vertical cladding are in a sound condition with only some limited evidence of water leaks at side or end laps. However as the neither the roofs or walls are

insulated and asbestos cement based materials should be replaced wherever practicable in buildings, in line with Health and Safety Executive guidance, it will be unavoidable therefore that the roof sheeting and vertical cladding will need to be replaced if the barns are to be retained and converted to any alternative use that falls under Building Regulations or Health and Safety Executive control. The concrete portal frame and purlins are capable of supporting the additional load of an insulated, replacement sheet roof and insulated, replacement gable end, sheet cladding.

- 2.14 External block work walls are not insulated. It will be necessary to add insulation but this can be done on the inside face of the 225 mm block work walls without adding any significant structural loading to the walls, concrete portal frames or concrete perimeter foundations.

Ground Floors

- 2.15 Existing floors are either reinforced concrete or well compacted sub base materials that have been reasonably heavily loaded in the past and show no signs of significant cracking or breaking up. The floors are not insulated. New concrete floors could be constructed with thermal insulation below, or above slab, to provide a suitable ground slab capable of taking the relatively light loads that would arise from the installation of new partitions.

Barns 1 and 2

- 2.16 The structure consists of Burchett (Framfield) steel portal frames forming two main cross bays with portal central columns supporting portal rafters spanning onto perimeter wall portal columns. The structural roof components include steel purlins, cross bracing, eaves beams and central gutter support beams.
- 2.17 The barns are five bay in length with a steel portal frame forming each bay,
- 2.18 The external long wall to barn building 2 and the internal separating wall to barn building 1 are formed in 125mm thick timber planks fixed into vertical steel I beams subdividing the structural bays, with bands of vertical timber slats between the top of the timber beam planks and the eaves/portal gable providing good ventilation to the barns.
- 2.19 The external long elevation and one gable elevation of barn building 1 are formed in 65mm thick concrete planks set between vertical reinforced concrete posts subdividing the structural bays and the steel portal I beam section columns, also with bands of vertical slats between the top of the concrete plank walls and the eaves/portal gable providing good ventilation to the barns

- 2.20 The end gables of both barns are framed with vertical and horizontal steel beam sections forming large openings in three of the four portal gables with either vertical timber slats or vertical corrugated/profiled asbestos cement sheet cladding between the beams and the roof apexes.
- 2.21 The pitched roofs, formed with the portal frames have a central gutter and are clad with corrugated/profiled asbestos cement sheeting spanning between steel purlins and include several clear, profiled roof light sheets. The roofs also incorporate standard asbestos cement ridge type vents.
- 2.22 Floors in barn building 2 are predominantly reinforced concrete slabs, with smaller areas of well compacted sub base as an operational surface/finish. Barn building 1 floor is entirely a well compacted sub base as an operational surface/finish.

Structural Restraint

- 2.23 The primary stability is reliant on the end gable portal steel framing sections, some secondary steel framing above the timber plank and concrete plank walls and steel cross bracing between and below steel purlins.
- 2.24 Although most of the bays are infilled with external timber plank or concrete plank walls between the portal steel columns, only one bay in each longitudinal elevation needs to be restrained for structural frame stability and therefore removal of most of the timber plank or concrete plank sections and vertical timber slats forming the external walls would be possible without effecting the stability of the structure, as it is essentially a portal frame design that allows a lot of flexibility whether external wall 'panels' are left open, or are infilled.
- 2.25 The location of the barns is sheltered, the northern end of the barns perimeter margin being cut into the existing ground with a grass bank and the western perimeter margin is formed by a high, mature, conifer tree belt. There is no evidence of any damage to roof sheeting or the external walls from wind loading or ground movement.

Condition of Structural Members

- 2.26 The steel I beam section portal columns/rafter beams/purlins/end bay columns and beams and connections were carefully inspected and are considered to be in a good condition and structurally sound, with only a few areas of local rusting apparent in the lower parts of the columns which is consistent with operational damage arising from the agricultural use where equipment has been placed against the columns and damaged the protection/primer paint coats.

- 2.27 The external block timber plank and concrete plank walls are not load bearing and are not structural elements, other than one bay on each longitudinal elevation where the infill walling provides some lateral restraint to the main frame. The timber plank and concrete plank walls are generally in good condition and are sound as the building fabric for the previous use, where thermal insulation was not required.

Foundations

- 2.28 The barns have concrete pad foundations at column positions and concrete strip foundations below external and the internal separating walls. Although the inspection did not expose the depth of the foundations, there is no evidence of any differential settlement or indication from the adding ground conditions to indicate that the foundations are anything other than adequately designed and of a suitable depth for the ground conditions.

Sheet Roofing, Cladding, Non Load Bearing Walls

- 2.29 The corrugated/profiled asbestos cement roof sheeting and upper part gable end elevation vertical cladding are in a sound condition with little evidence of any significant water leaks at side or end laps. However as the neither the roofs or walls are insulated and asbestos cement based materials should be replaced wherever practicable in buildings, in line with Health and Safety Executive guidance, it will be unavoidable that the roof sheeting and vertical cladding will need to be replaced if the barns are to be retained and converted to any alternative use that falls under Building Regulations or Heath and Safety Executive control. The steel portal frame and purlins are capable of supporting the additional load of an insulated, replacement sheet roof and insulated, replacement gable end, sheet cladding.
- 2.30 External timber plank and concrete plank walls are not insulated. It will be necessary to add insulation but this can be done on the inside face of the walls, if these materials are to be retained and weathered, without adding any significant structural loading to the walls, steel portal frames or concrete perimeter foundations.

Ground Floors

- 2.31 Existing floors are either reinforced concrete or well compacted sub base materials that have been reasonably heavily loaded in the past and show no signs of significant cracking or breaking up. The floors are not insulated. New concrete floors could be constructed with thermal insulation below, or above slab, to provide a suitable ground slab capable of also taking the relatively light loads that would arise from the installation of new partitions.

3. Review of Proposed Plans and Specification for Residential Conversion, Assessment of Impact on the Existing Structure(s)

3.1 The proposals included in the Planning Statement indicate:

Replacement of the uninsulated asbestos cement sheet roofing and vertical cladding with new, insulated metal sheet roof sheeting and new insulated vertical sheet cladding.

Replacement roof lights, but only on the concealed roof slopes.

Replacement of some areas of external, non load bearing walls with full height, double glazed doors/window panels.

Internal dry lining/insulating of external walls with part external surface weathering and part external wall replacement with horizontal timber boarding, and part internal glazed panel bands behind existing vertical timber slats above infill walls.

Formation of new concrete, insulated, ground bearing floor slabs over existing well compacted sub base floors.

Introduction of timber, or metal stud, framed internal partitions forming single storey residential spaces.

3.2 All the proposed conversion works are capable of being carried out without introducing any new structural loads that will have an adverse impact on the existing structures of the barn buildings, or require any modification or changes to be made to the existing structures.

4. Conclusions (no material change from 2021 conclusions)

4.1 All the barns are structural sound, structural elements are in a good condition and as a result, the barn buildings are capable of being converted into residential dwellings to Building Regulation standards without any significant modification, alteration or addition being required to be carried out to the existing structures of the barn buildings.

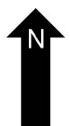
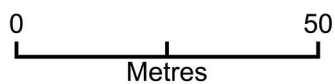
4.2 The structures of the barn buildings are essentially a mid 20C portal frame design that does not rely on load bearing external walls to transmit roof and wind loads to the frame and foundations. This gives considerable flexibility in the extent of openings that can be formed in external walls, both at the time of original construction and throughout the life span and different uses of the barns.

5. Site Plan and Photographs

5.1 The following photographs show external and internal overviews of the barns which were taken during the inspection visit in July 2021.

(Further photographs in separate document)

Hammonds Mill Farm

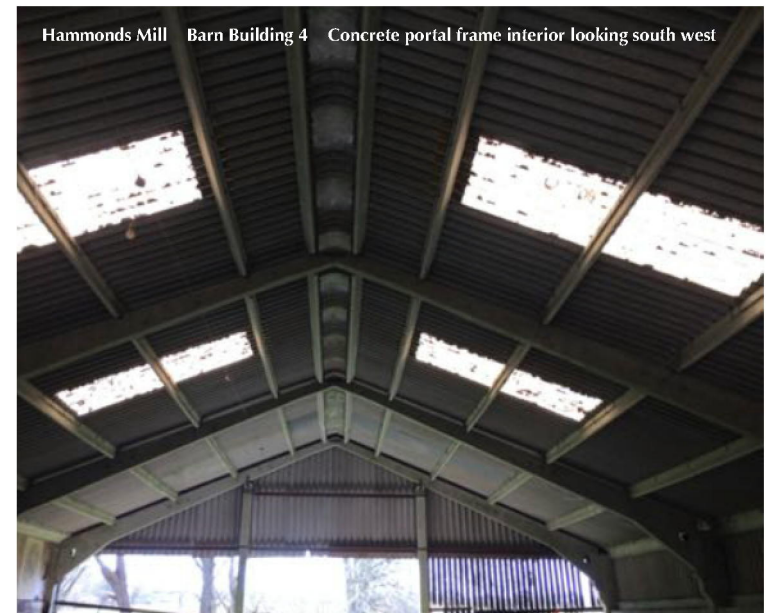


Plan Produced for: David Hutchison
Date Produced: 09 Apr 2021
Plan Reference Number: TQRQM21099151037439
Scale: 1:1250 @ A4

Location Plan

0211_100







Hammonds Mill Barn Buildings 1 and 2 Gable and Bay Elevations (south west_south east)



Hammonds Mill Barn Buildings and yard from south west