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DRAFT

# Building B
# Chestnut Farm,
# Church Lane
# Dauntsey
# Nr. Chippenham
# SN15 4HW

## Report on Structural Aspects of the Feasibility of Conversion of a single storey Barn into a Residential Property




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# Building B, Chestnut Farm, Church Lane, Dauntsey, Chippenham, Wiltshire SN15 4HW

**Report on the Structural Aspects of the feasibility of conversion of a single storey barn (reference Building B) at Chestnut Farm, Church Lane, Dauntsey**

## Purpose of the Report

Structural Solutions was commissioned to carry out an investigation into the feasibility of converting a single storey barn (ref. Building B) at Chestnut Farm in Dauntsey into a residential property. This report considers the current condition of the structure of the barn and the likely work required as part of the conversion. This is an updated report following the successful planning application under class Q and the Client's decision to submit a full planning application. The main differences between the proposals are the introduction of a mezzanine floor and the replacement of wall and roof cladding.

## Introduction

Barn B is rectangular in plan approximately 13m x 8.5m with a small store attached to one corner. The building is constructed with concrete block walls with piers along the longer elevation dividing it into three bays 4.5m width each. The walls are rendered and the roof is duo-pitched with tubular steel trusses supporting steel purlins and profiled metal sheet roof.

## Investigation

Our investigation is based on a visual walk over only

Barn B

The existing building is currently an agricultural structure comprised of two structural tubular steel roof trusses supported by rendered concrete blockwork walls on all elevations. The roof covering is a profiled metal sheet supported by steel purlins spanning between the roof trusses and end gable walls. There are piers built into the longer elevations that correspond with the roof trusses referred to above. To one corner of the building, there is a small external store similarly constructed with rendered concrete block walls support a profiled metal sheet roof on purlins.

The building has a concrete slab throughout and this looks to be sound and no significant cracking was seen indicating that the formation below is likely to be good. There are steps in the slab which is common for cattle barns which we understand this barn was used for.

**Discussion**

We understand from the Client that the proposed conversion work of each of the barn will maintain the basic plan of the building including retention of the existing roof profiles.

Generally, the structure can be incorporated into a conversion of the barn without any structural alterations. External walls are of 'heavyweight' rendered blockwork and are in a generally good condition and can easily be modified in order to introduce windows and doors as shown on the architectural drawings without compromising the integrity of the existing structure. The revised planning proposal intends to upgrade external roof cladding but retain the rendered wall cladding.

Based on our inspection, the existing concrete floor can be re-used with the introduction of a damp proof membrane, insulation and floor finishes above the concrete.

**Conclusion**

This report is not intended to be a full and detailed structural survey. Its purpose is to establish in structural terms whether the conversion of the agricultural barn into a usable property is feasible without modification of the main structure. In brief, the existing roof structure, walls and foundations of the barn can be incorporated into a conversion into residential use without modification.

Insulation and breather membrane to achieve appropriate residential standards would be carried by a non-structural non-load bearing partition located inside the existing external walls constructed using a softwood timber frame or lightweight cold-formed metal stud system.

**Outline Schedule of Works**

The following is an outline Schedule of Works for Plot 3 identifying anticipated elements of construction that will be retained and elements that will need to be constructed as new.

**Plot 3 (Building B)**
Elements for Retention

- Foundation of external walls (100%)
- Main external walls (c.95% - allowing for new openings)
- Main structural steel roof trusses and purlins
- Concrete floor – modified to become one level

Proposed Works/Modification

- Profiled metal roof covering on existing purlins
- Non-load bearing wall panels to the inside face of the external walls to carry insulation and breather membrane.

- Non-load bearing internal partitions to form internal 'rooms' as shown on the Architect's drawings.
- Windows and doors
- Floor insulation and screed finish

Repairs/ Extent of Remedial Works

Walls

- Inspect all masonry walls including render. Allow for localised repairs to render and repaint.

Roof

- Internally, inspect and thoroughly clean existing roof 'truss' of arched roof and paint with zinc rich primer (e.g. Galvafroid). Top coat finish to be to Architect's specification. (Ensure compatibility with primer). (100% of roof truss to be treated and painted).

- Internally, inspect and thoroughly clean existing all steel purlins (i.e. rolled steel angles) and paint with zinc rich primer (e.g. Galvafroid). Top coat finish to be to Architect's specification. (Ensure compatibility with primer). (100% of roof truss to be treated and painted).

Floor

- Inspect existing concrete floor slab and allow for localised repairs using either small aggregate concrete RC20 mix or proprietary concrete repair compound depending on size of repair (100% to be inspected, 10% requires attention)

New Internal Works

- New non-load bearing timber stud partitions to be constructed using 50x100 C16 grade softwood timber studs @ 600mm c/c's (or equivalent lightweight cold formed metal stud system). Partitions adjacent to existing external walls to have breather membrane and 9mm ply or OSB sheeting to external face and be insulated internally to the Architect's specification. Partitions to be constructed onto a 'dolly' block course of dense concrete masonry off the new ground bearing slabs to ensure no timber below finished floor level. Note: Window and door openings to be introduced in accordance with the Architect's elevations. New precast prestressed concrete lintels used to span window and door openings.

- New flat ceiling to be constructed using 50x100 C16 joists @ 400mm c/c's with plasterboard and skim attached to the underside to be supported by new timber stud partitions.

- New mezzanine floor to be constructed using 50x225 C24 grade softwood timber joists @ 400mm c/c's supported by new timber stud partitions built of existing concrete floor slab

- Services, e.g. electricity, plumbing, drainage as well as new architectural finishes to be coordinated as part of the overall conversion. No anticipated structural affect.

- All walls and ceilings to be insulated to the Architect's specification.

Appendix A




Barn B – External north east elevation




Barn B – External south east elevation




Barn B – Internal view of building showing steel roof truss




Barn B – Internal view of building showing steel roof truss bearing onto wall

# Appendix B – Existing Site Plan with Barn References




EXISTING SITE PLAN
SCALE 1:250 @ A1