



architecture ▪ design

**Manor Barn  
Great Trill Farm  
Musbury, Axminster, Devon, EX13 8TU**

Proposed Conversion and adaptation of existing manor barn to form 1No. 4 bedroom dwelling.

**Structural Analysis of Manor Barn in connection with the proposed residential conversion to the eastern half of the barn.**



*North Elevation*

July 2021

Martin Blake Associates  
Office 184, 3 Edgar Buildings, George Street, Bath, BA1 2FJ  
tel: 07861 734218 email: mba@mba-architecture.co.uk

## INTRODUCTION

The purpose of this document is to provide an analysis of the condition of Manor Barn at Great Trill Farm, to determine its suitability for the conversion of the eastern half to a dwelling. In determining such suitability, guidance has been obtained through reference to the document: Adapting Traditional Farm Buildings - Best Practice Guidelines for Adaptive Reuse (September 2017) published by Historic England.

The principal question to be answered following analysis of the building is .... *Can the building be converted, as illustrated in the architectural scheme, without the need for substantial rebuilding or structural stabilisation?* If the answer to this question is YES, then in general, the building is likely to be structurally suitable for conversion. This report will not comment on the planning pros and cons of such a conversion, nor on the architectural design, other than its potential impact on the structure.

### Manor Barn



*West Elevation*



*East Elevation*



*North Elevation*



*South Elevation*



architecture • design

## Construction

Manor Barn is constructed of solid random rubble stone walls utilising minimally worked local stone set in a lime mortar. At the corners of the building are large roughly dressed stone quoins and to the window and door openings a combination of carved stone surrounds, brick quoins and stone quoins. The carved stone surrounds would appear to be the oldest, likely to be contemporary with the original barn. There are other elements of stone dressings including a label mould to the southern elevation and kneeler blocks to the gables. Above some of the external window, timber lintels can be found.

It is interesting and relevant to note that a previous but recent assessment of the barn undertaken by Messrs Keystone Historical Consultants, found the following:

*'...The building is the incomplete shell of a 16th C domestic building, massively altered in 19th century (between 1840-1890 on map evidence) when the west portion was widened to the rear and converted to a large threshing barn. At about the same date the building was re-roofed throughout with standard tie beam kingpost and strut roof trusses. The east portion retains an early floor and there is what appears to be the original first floor window evidence in both end walls.'*

The above corroborates the fact that the barn appears to have evolved over a significant period of time, with a major intervention occurring in the second half of the 19<sup>th</sup> century

The principle and earliest part of the structure is of a rectangular form, oriented on an east-west axis with large opposing openings in the north and south elevations, most likely threshing barn doors.

The external walls of the barn appear to be relatively plumb with no sign of significant cracking indicating structural movement. The bottom of the walls were not exposed so it is not possible to comment on the existence or type/depth of foundation, however the obvious lack of cracking over its life of some 400+ years, suggests that the structure is well founded.

The roof of the barn is slated below which are rafters supported off purlins, which in turn are supported off king post trusses at regular intervals along the length of the barn. Overall, the condition of the roof would appear to be good. All components appear to date from the late 19<sup>th</sup> century tying in with the major 19<sup>th</sup> century intervention, necessitating the need for a new roof structure to the entire barn. The structure is cut in situ with a series of king post trusses employing principal rafters and collars with king post and struts. Common rafters span between 2 purlins on each slope with additional lateral support from short collars near the ridge. No significantly historic roof timbers remain.

Roof coverings throughout the barn are slate.

To the east end of the barn, the section which will be converted to a dwelling, is a first-floor structure. This first-floor structure is a combination of primary timber beams and secondary floor joists, housed into the primary beams. A number of areas of joists would appear to be 18<sup>th</sup> C. however there is evidence of a new section of floor over the area where the kitchen and internal staircase are proposed, and these would seem 19<sup>th</sup> C. contemporary with the 19<sup>th</sup> C. roof structure. Floorboards are butt jointed softwood boards.

Martin Blake Associates

Office 184, 3 Edgar Buildings, George Street, Bath, BA1 2FJ  
tel: 07861 734218 email: mba@mba-architecture.co.uk



architecture • design

Throughout the barn, at ground floor level, the floor would appear to be an amalgam of packed earth, concrete and areas of flagstones.

### **Condition**

The structural condition of Manor Barn is generally in good order. External walls would appear to be plumb and the roof regular and sound. The bearings of the trusses require inspection when the opportunity arises to do so.

There is the need for localised repairs to the stone dressings, window/ door surrounds etc and, where missing, their reinstatement, however this is not currently to the structural detriment of the building.

Many of the external windows and doors are missing and require reinstatement with traditional/ appropriate detailing.

Internally, the first-floor structure, in places, requires repair, where the joist/ beam ends have rotted and it is suggested in the case of joists, new joists are placed alongside the existing, of similar section size and timber species. Where beam ends have rotted, new sections of timber can be provided again of a similar section size and timber species as existing, and these would be spliced to the existing timber beam using bolted steel plates.

The scheme of conversion includes for the use of the existing first floor structure as bedroom and bathroom accommodation. It is understood that this was granted planning and listed building consent under application references 89\_P0805 and 89\_P0805 and subsequent discharge of planning condition 5 as approved by the local authority in a letter dated 16<sup>th</sup> January 2013.

As part of these approvals, it was proposed that the whole of the existing roof structure be raised by approximately 900mm, and the external walls built up to suit this new roof height. The alteration has been proposed in order to facilitate sufficient headroom between the existing first floor level and the underside of the bottom of the roof trusses. It is recognised that this is a significant and unsympathetic intervention, severely affecting the character and setting of the listed building and its fabric.

Accordingly, a more sympathetic approach will be employed whereby the collars of the relatively modern roof trusses will be raised to the area over the first-floor habitable accommodation. The trusses over the remaining barn element of the building will remain as existing.

At ground floor level a new floor construction is proposed in lieu of the current packed earth and concrete.

This will comprise a limecrete slab laid over a foamed crushed glass insulation layer. This form of construction is a recognised way of introducing an insulated ground floor slab into a building such as this barn, allowing the requisite levels of insulation whilst allowing the building to breathe.

### **Martin Blake Associates**

Office 184, 3 Edgar Buildings, George Street, Bath, BA1 2FJ  
tel: 07861 734218 email: mba@mba-architecture.co.uk



architecture ▪ design

***Suitability for conversion***

There is no reason to believe that any part of Manor Barn will require substantial rebuilding or structural stabilisation to facilitate the proposed conversion to a residential dwelling. The work suggested in the paragraph above is relatively minor and will represent a more sympathetic and functional solution to converting the eastern half of the barn.

Proposed new openings are minimal and will have no structural implications on the stability of the building.

We see no reason, from a structural perspective, why this barn should not be converted.

Martin Blake Associates

Office 184, 3 Edgar Buildings, George Street, Bath, BA1 2FJ  
tel: 07861 734218 email: [mba@mba-architecture.co.uk](mailto:mba@mba-architecture.co.uk)



architecture ▪ design

**Photographs of the interior of the barn**



*Existing first floor showing low level of truss.*



*Roof structure over barn*



*Existing first floor structure*



*Existing ground floor interior*



*Interior view of west gable*



*Existing ground floor interior*