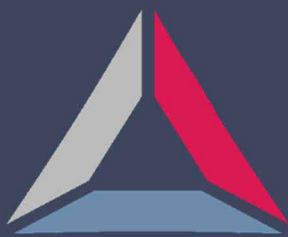




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# Structural Report

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## 1 Introduction

This report has been prepared following a request from Tyack Architects to undertake inspections of the external Hay Barn and the Cotswold Stone outbuilding at Fulford, Withington Road, Andoversford which is being considered for conversion into residential accommodation.

This report provides an assessment of the suitability for conversion as well as the likely impact of the proposed scheme. This report will also consider the feasibility of retaining the existing structural fabric of the buildings with particular considerations as to whether the elements are deemed perishable or non-perishable. The elements under consideration will include the existing roof structure, walls, floors and foundations.

The report has been compiled without the benefit of a detailed ground investigation or desktop study of the geology of the area and our instructions do not extend to undertaking any prior research of the property or review of historical records or geological maps. Therefore, the assessment will be based on likely foundation depths for buildings of this nature.

We have not had the opportunity to undertake any intrusive investigative work and the assessment is based on a simple visual inspection without having had the opportunity to study the structure over a prolonged period of time.

The report does not consider the market value of the property, rights of access, tenure or the condition of adjoining outbuildings where these do not form part of the proposed development.

## 2 The Site

Fulford Stables lies in the Cotswold Area of Outstanding Natural Beauty. It is positioned to the South of Andoversford and incorporates the main dwelling house, Cotswold Stone outbuilding and timber Hay Barn. The stables are surrounded by arable farm land with the A40 to the East, A436 to the North and an un-named road to the West and South which leads to the village of Withington.

## 3 Proposed Development

The proposed development is to comprise the conversion of the existing Cotswold Stone outbuilding as well as the possible conversion of the timber Hay Barn into habitable accommodation.

## 4 The Structures

A brief description of each of the structures that are to be converted into habitable accommodation are given below together with observations made during a visual assessment of each building, with reference to the development proposals.

### 4.1 Cotswold Stone Outbuilding

#### 4.1.1 Structural Form

This unit comprises a traditional cut timber roof consisting of rafters and purlins which are supported on intermediate trusses and load-bearing Cotswold Stone walls taken down to the ground. It is believed that foundations are likely to comprise traditional foundation stones set on the natural ground but trial pits have not been completed to confirm this. The floors comprise a mix of modern concrete slabs and traditional cobbles

#### 4.1.2 Site Observations

- Observation of external elevations was significantly obscured due to dense vegetation
- Trapezoidal single sheet cladding panels to roof
- Extensive vegetation covering South East gable which has penetrated the roof structure
- South West wall believed to be an original garden wall
- North West Cotswold Stone Wall has been repaired/stiffened at entrance
- North West Cotswold Stone Wall adjacent to entrance appears to have suffered from an impact
- North East wall is a modern concrete block wall built off a floor slab upstand
- 125 x 100 Purlins
- 125 x 100 Rafters
- A-frame trusses equally spaced throughout the roof with ply gusset plates at ridge
- Trusses strapped to wall with steel straps
- Ply sheathing to roof
- Floor slab appears to be a mixture of cobbles, concrete slab and a thin concrete leveller over bedrock

### 4.2 Timber Hay Barn

#### 4.2.1 Structural Form

This unit takes the form of a fitch timber, mono pitched portal frame with timber purlins and side rails.

#### 4.2.2 Site Observations

- 25 x 225 triple columns
- Knee braces and gusset plates provide lateral stability
- Rafters 225 x 25
- Intermediate rafters supported on transfer beams

- Box beam to form gutter
- Purlins 100 x 50 at approximately 1500mm c/c
- Two perpendicular units not tied together
- Deterioration at column bases
- Floor slabs have been subject to multiple retro fit installations with trenches visible
- Single sheet trapezoidal cladding to roof
- Timber hit and miss panelling to walls
- Horizontal boarding forming wall at base of columns up to approximately 1200mm
- Possible septic tank slab to North corner

## 5 Discussion

Having reviewed all of the units which make up the stables, generally speaking, the structures are in good condition for their age. Many of the defects are related to the natural deterioration of the timber elements where the cyclical wetting and drying exacerbates the deterioration process.

For the stone barn the roof structure appears to be suitably sized and proportioned to suit the loads imposed by the roof covering and not showing signs of excessive deflection or movement. The vegetation will need to be removed as this will be placing unnecessary additional load on the structure, which if left could cause over loading. When considering the suitability for conversion, it may be necessary to strengthen the purlins to allow the loads associated with current insulation requirements and brittle plasterboard finishes to be accommodated. However, it is thought that, subject to a detailed assessment of the trusses, much of the timber structure can be reused thus reducing the carbon impact of the conversion.

The modern blockwork wall to the North East is a single leaf 140mm block wall, the foundations of which are unknown and will need further investigation, although there does not appear to be any evidence of significant settlement/movement. Given the walls width, in accordance with current standards, its maximum height should not exceed 1.2m due to its slenderness. Therefore, as part of the conversion, additional stability will need to be built into this the scheme either through the introduction of wind posts or masonry piers.

The floor slab is in a poor condition and will need to be replaced as part of the works. Investigations into the depth of foundation to both the Cotswold stone wall and the block wall will need to be completed before the level of the new slab is agreed, as a scheme of underpinning works may be required.

When considering the timber Hay Barn the roof structure will need to be stiffened due to the purlins and rafters being slender for their span and spacing. Although not showing signs of distress currently, the additional loads associated with a conversion and wind loading applied to an impermeable wall is likely to lead to movement of the structure. Additional rails and

purlins or stiffening of the existing, will be required to support the loads. A detailed analysis of the frames will be required and although there are effectively two structures, if braced individually and tied together effectively then they could function as a single entity, providing lateral stability to each other.

The base of the columns have deteriorated and will require remedial measures as well as investigations into the supporting foundations as these are currently unknown. If the conversion scheme has a desire for a mezzanine floor within the structure then it is likely that this would need to be supported independently of the main frame with the use of load bearing walls or a lightweight steel frame.

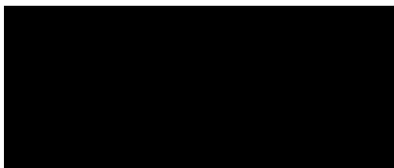
For the floor slabs, there is evidence that multiple cuts have been made to allow the trenches to be formed, possibly to facilitate the installation of underground drainage or cabling. The slab will need further investigation into its embedded reinforcement and overall thickness to confirm whether it could be reused as part of a conversion. However, given that it is likely that a level threshold will be required, the slab will need to be lowered and therefore its removal would be desirable. When considering the carbon impact of such a process, the slab could be broken up and used as hardcore for the new floor slab, thus reducing the carbon impact of the build.

## 6 Conclusion

The structures, other than the areas effected by a previous impact and general deterioration of perishable members, are generally in good condition and have sufficient capacity within the walls to accommodate the conversion into habitable accommodation.

Some of the recommendations in this report have been provided based on the current design rationale following the COP26 Summit and the resulting design guidance for achieving Net-Zero. The detail of how these recommendations are incorporated into the final design will be dealt with at detail design stage but the earlier that they are considered as part of the project the less impact the structure will have on the environment.

It is clear that the existing structures are sufficiently robust, proportioned, substantial and largely free from significant movement or deterioration which cannot be rectified. This concludes that they are suitable for conversion to habitable accommodation without compromising their integrity. The buildings lend themselves readily to the proposed conversion, which will not require a significant element of structural replacement or reconstruction.



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