

AO
CONSULTING ENGINEERS

Project Number

0224

Title

0224w0001A -Structural Conversion Report, Barn at Trekennick

House

Client

Mr Walker and Ms Templeton-Walker

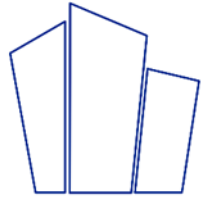


Report by

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MEng (hons), CEng, MStructE



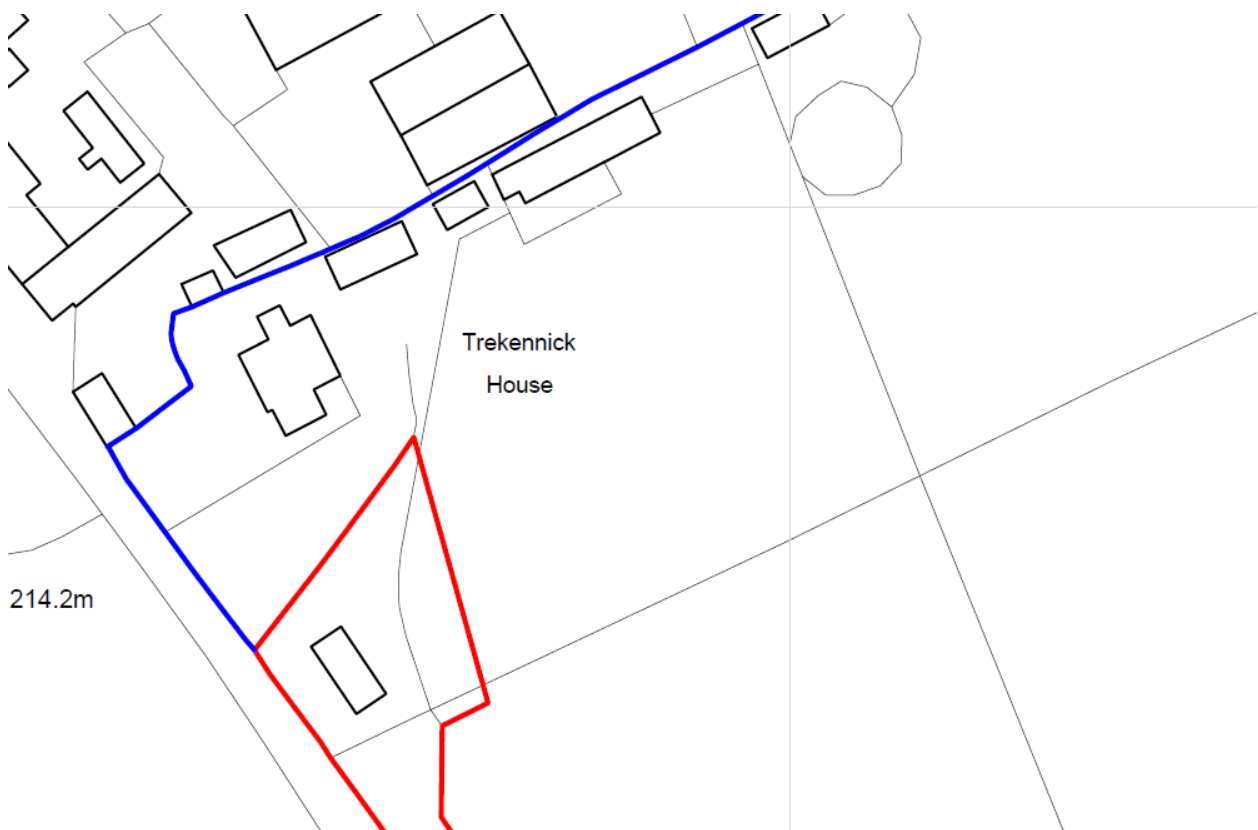
1.0 Introduction

AO-Consulting Engineers Limited were appointed to undertake a structural inspection of an existing building for conversion. The aim of this report is to provide information for planning purposes. A site survey was undertaken on the 8th of November 2020.

Trekennick House

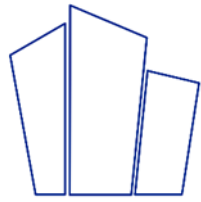
Altarnun

Cornwall



2.0 Exclusions and limitations

This is an appraisal report for suitability for conversion and does not provide construction status information. We have only commented upon items available for visual inspection at the date of this report.



3.0 The Existing Structure

The building measured approximately 5.2m x 9m on plan. The structure had a duo pitched roof with central apex.

The roof was clad with a metal trapezoidal profiled sheeting supported on 75x125dp canted timber purlins.

The purlins were in turn supported on three steel trusses (Photograph 1). The steel trusses had square hollow section top chords and internal struts with an equal angle bottom chord. The steel trusses were supported at their bearings by a 125x200dp timber post.

The walls to the building were formed using 45x100 timber studs at approximately 900 centres. A rendered masonry wall was located under stud level formed of 100thk concrete blockwork.

At ground floor level a concrete slab (minimum 125mm) supported the building including the perimeter walls. Concrete edge thickenings to the perimeter of the slab was noted (Photograph 2).

Lateral stability was provided by stud walls and blockwork walls in both major and minor directions of the building.

4.0 Anticipated future structural works for conversion

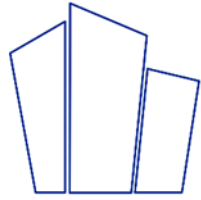
4.1 Roof

The purlins were in good condition and did not show any signs over bowing or over stress. With the addition of some timber purlins to break the longer span, the existing timbers are expected to be capable of supporting the imposed loads dictated by modern design codes.

The steel trusses were in good condition but could benefit for wire brushing and painting to remove surface corrosion and to future proof. The sizes of the principal steel members forming the trusses are expected to be adequately sized to support the upgraded roof.

4.2 Structural walls

The perimeter studs are considered of adequate cross section to support the upgraded vertical loads imposed by a modern roof. In terms of lateral stability, it is likely that the existing studs will be lined with a sheathing material as part of the conversion. This will enhance the existing racking resistance provided by the timber frame. The blockwork was in good condition and appeared adequately sized to support new vertical loads.



The six timber posts that supported the roof trusses are expected to have an adequate cross section to deal with the additional loadings from a modern roof system. One of the six timber posts was rotten at the base (Photograph 3). A simple replacement section to the bottom of post will be adequate to reinstate the original timber.

4.4 Ground floor slab

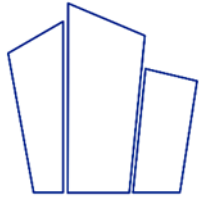
The ground floor slab was measured at 125mm thick (minimum). This will provide approximately spread onto the strata below even considering a conservative, unreinforced slab. The concrete edge thickenings will enhance load spread to the strata below. A replacement slab is not anticipated for conversion.

5.0 Conclusions and Recommendations

It is of our opinion that the existing primary structure provides an adequate basis for conversion. The timber roof structure and steel trusses are in good condition. With a limited amount of strengthening to the purlins as usually associated with these forms of conversion; the roof is considered capable of supporting the upgraded loads imposed by modern design codes of practice.

The timber / masonry walls and ground bearing slab are in good condition and these elements are considered capable of supporting the upgraded vertical loads.

Apart from the replacement of the bottom section of a single post, no elements of the structure were found to be defective or in need of removal.



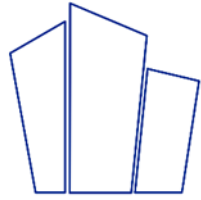
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Photograph 1. Steel trusses to roof structure



Photograph 2. Concrete slab and edge thickening



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Photograph 3. Rotten timber at bottom of post