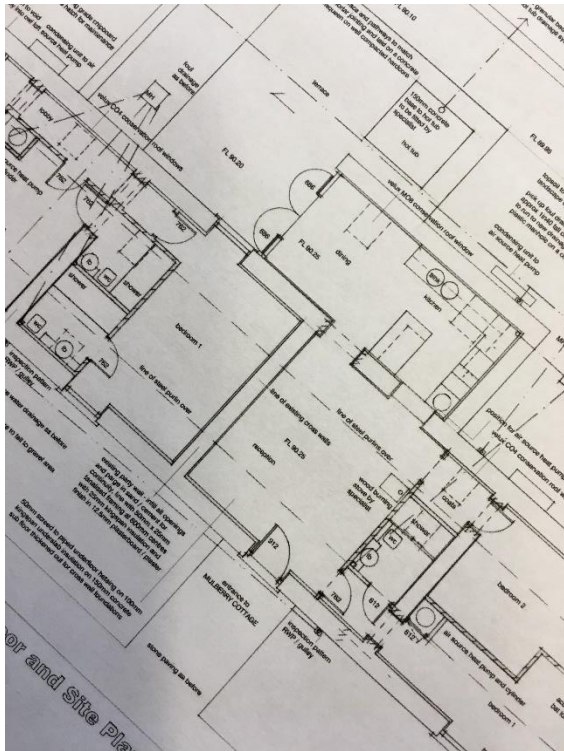


Report on Reinstated Roof



Farm Building Conversion
Thirley Cote Farm
Harwood Dale
YO13 0DR

For

Mr. P and Mrs. G Durbin



imaginative architecture + engineering design

TM **bhd**
partnership

Address: Airy Hill Manor, Whitby, North Yorkshire YO21 1QB

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NYMNP

14/03/2019

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*Front Cover picture by David R Bamford Architects

1. General Introduction

- 1.0 BHD Partnership were requested by the contractor to visit the site and view/comment on the structural integrity of the partially constructed timber roof construction.

The works relate to the conversion of a range of traditionally constructed farm buildings into Holiday Cottage accommodation.

The general layout is shown on David R Bamford Architects' Drawing D3

The roof viewed, runs from Bed 1 and 2 of Mulberry Cottage to Bed 3 of Hornbeam Cottage.

The contractor is to check dimensions on site prior to fabrication.

We understand the North York Moors National Park are involved as the Planning Authority and North Yorkshire Building Control in terms of Building Regulations, and that clients' agents are dealing with these items.

2. Current Situation

- 2.1 At the time of the inspection on the 22nd January 2019 the existing roofs had been removed. We understand these were timber constructions with tiled roofs.

New works include the positioning of timber rafters over the full length of the roof; these are 47 x 150mm at 400mm centres; they sit on a new timber wall plate. The top of the existing walls has been made good with concrete which we understand is to be replaced with more traditional lime and stone based walling to be designed by others.

The new structure over Bedrooms 1 and 2 of Mulberry Cottage also has ceiling joists positioned at wall plate level connecting the rafter feet.

A lean-to roof has been set out with rafters over the rear offshoot, which will become the Dining/Kitchen area of Mulberry Cottage.



Photo 1
Roof over Bedroom 1, Hornbeam Cottage



Photo 2
Roof/ceiling over Beds 1 and 2, Mulberry Cottage



Photo 3
Lean-to roof over Kitchen/Dining, Mulberry Cottage

3. Structural Design

- 3.1 Roof over the reception area of Mulberry Cottage to the end of the building (Bedroom 3 Hornbeam Cottage) is where only rafters have been positioned with insufficient restraint to prevent 'spread' or lateral movement.

Discussion took place around the options to provide the restraint required and utilize the rafters currently in position.

A) Ridge Beam:

Insert a steel beam, designed by a Structural Engineer, that will be positioned below the existing timber ridge board.

Rafters will need to be 47 x 150, grade C24, positioned at 400 crs to cope with the 3.1 m span from ridge to wall plate. We believe the rafters in place comply with this.

B) Timber Ceiling:

Provide timber ceiling joists spanning between and bolted to the rafters. This ceiling tie can be positioned at wall plate height or lifted higher up the rafters, to a maximum of one third rafter span, measured from the wall plate.

Rafters will need a structural calculation to confirm that the extra stress created by a ceiling tie bolted to them higher than wall plate height is acceptable.

The size of the ceiling ties will be 47 x 170 c24 for spans up to 3.9m, 47 x 195 c24 for spans up to 4.6m or 47 x 220 c24 for spans up to 5.3m.

C) Timber Truss

The rafters would be supported by and connected to timber purlins. These purlins would, in turn, need to be supported at mid span by a main truss. This truss would be designed by a Structural Engineer and formed in timber. It would allow the use of timber purlins by splitting the span between masonry cross walls.

The preference is to use the solution described in Section B. This ensures only timber is used in the proposed roof structure which, we believe, is preferred for planning reasons. It will also allow the client some flexibility when agreeing a final ceiling height.

- 3.2 The roof over Bed 1 and Bed 2 of Mulberry Cottage already has ceiling ties incorporated within the new works.

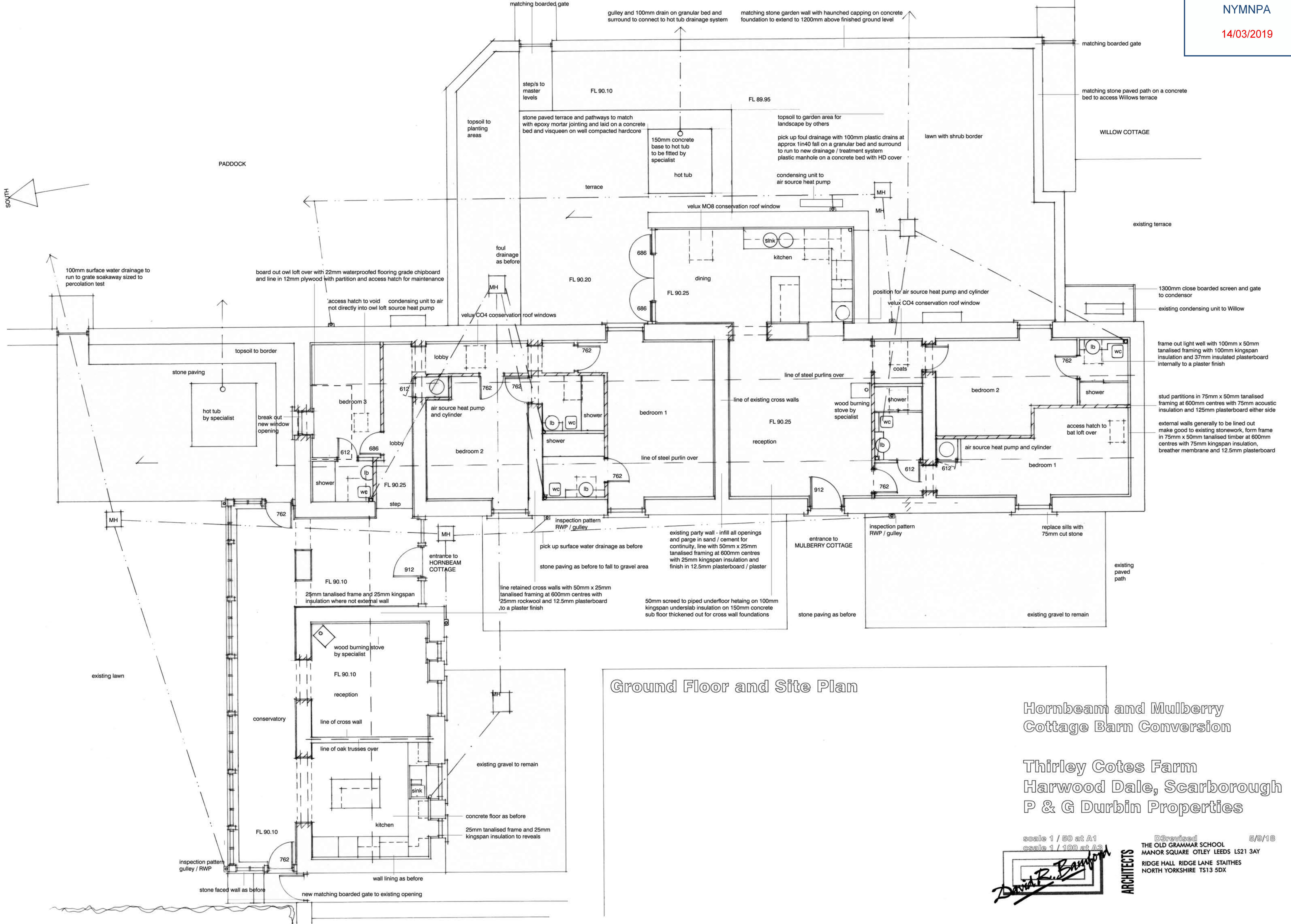
To ensure protection from lateral movement and to comply with Building Regulations, these ceiling ties need to be bolted to rafters with M12 bolts and sized at 47 x 220 c24 timber.

- 3.3 The roof formed over the rear offshoot is self-supporting and spans between 2 wall plates. The rafters for this roof which span approx. 3.3m need to be 47 x 170 c24.
- 3.4 The lean-to roof rafters connect to a series of the main roof rafters. The final design of these rafters will require this load to be taken into account.

4. Appendix

Drawing of Hornbeam and Mulberry Cottage Barn Conversion at Thirley Cote Farm, Harwood Dale for P and G Durbin by David R Bamford, Architects.

[David R Bamford Drawing](#)



Ground Floor and Site Plan

Hornbeam and Mulberry Cottage Barn Conversion

Thirley Cotes Farm
Harwood Dale, Scarborough
P & G Durbin Properties

scale 1 / 50 at A1
scale 1 / 100 at A3

David R. Bamford

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