

Stuart Thomas Associates Ltd

Structural And Civil Engineers Consulting Engineers

6 Osborns Court
Olney
Bucks
MK46 4LA

Tel 01234 712010
Email mail@staltld.net

Structural Appraisal Of Removal Of Roof Covering

To

Existing Corner & Threshing Timber Barns

At

Highover Farm
Highover Way
Hitchin
Herts
SG4 0RQ

For

Gill Hudson Homes Ltd

Project 7219

Introduction & Report Brief

Stuart Thomas Associates Ltd are appointed as Consulting Engineers for the redevelopment of Highover Farm where existing agricultural buildings are being converted for residential use.

There are two timber framed barns which are to be over-framed with a modern steel framed structure which will form the final structural fabric of the building, providing support and restraint to the original timber framing which will be retained and exposed as far as possible within.

The original hand-cut slates will need to be removed for re-use. There are many slipped and dislodged tiles that will need timely removal to avoid damage to both slates and potential injury.

There is a requirement to re-cover the buildings to prevent water ingress in order to protect the existing timberwork.

This report brief is to assess the structural impact of the removal of the tiles, to suggest a safe means of carrying out the works, and to consider the structural ability of the existing frame to carry the new roofing loads.

Existing Building Form

There are two buildings to be considered for the purposes of this report.

Units 3 & 4 : Threshing Barn

The threshing barn is a large Grade 2 listed timber framed structure with low level brickwork plinth walls. It is 'T' shaped on plan with a dual pitched roof. The rear slope is extended down as a 'catslide' roof.

Stuart Thomas Associates Ltd have carried out a walkover survey of the barn, there is an extensive condition report previously prepared by Heritage Consulting Chartered Surveyors.

The barn is clad in close board timber above masonry plinth level, and the roof finished with slates supported on tile battens.

The oak main structure is formed with substantial columns supporting 'A' frame trusses with a high-level collar. There are substantial eaves-level tie beams running between truss lines. The columns, truss bottom chords and ties are all laterally and transversely braced with diagonal knee struts.

The trusses carry oak purlins, in turn supporting hand cut rafters. There is no sarking board or felting between the rafters and slate battens. There are numerous holes in the roof covering and missing boards to the side walls.

The Heritage Consulting report recommends limited replacement of rotten timbers and further survey of others. The principal structural members are all in surprisingly good condition.

There is a general sway of the whole building towards the farm central courtyard.



Figure 1 - Threshing Barn Front Elevation



Figure 2 - Threshing Barn Front Elevation



Figure 3 -Threshing Barn Rear Roof Slope



Figure 4 - Threshing Barn Internal

Unit 2 : Smaller Barn

Unit 2 follows the same geometry and structural form as the threshing barn, but smaller in all dimensions.

STA Ltd have carried out a walkover survey of the barn, the principal members are in good condition, there will be local replacement or splicing of rafters and wall plates where water ingress has led to rot, and also to some elevational studs where cladding boards have become displaced and missing.

There are numerous holes in the roof where tiles have slipped slightly or fallen entirely. The left hand verge has numerous tiles at risk of falling



Figure 5 - Unit 2 Front Elevation



Figure 6 - Unit 2 Rear Roof Slope



Figure 7 - Unit 2 Interior

Structural Impact of Removal of Slates

The overall structural stability of both barns is via portal action, with vertical and horizontal knee braces acting as haunches.

Both barns have external low-level masonry outer walls, with the timber board cladding adding very nominal racking resistance.

Unit 2 has an internal timber frame on the column line with brick infill and diagonal bracing.

Both buildings have a pronounced lean away from the catslide roof, with the additional weight of the catslide being a contributing factor in terms of vertical weight and wind drag.

The entire slate covering of both roofs are to be removed. The slates offer no formal racking resistance to the roof, being simply nailed through holes in the slate and free to slide over each other.

The removal of the slates will therefore have no adverse effect on the performance on the stability of the frame. The removal of the slates will also lower the vertical load on all members.

The new roof covering is to be tarpaulin or plastic sheeting to protect the underlying timber work. This will see a reduction of 20-25kg/m² over the existing slate weight.

The new temporary sheeting will be nailed to the existing battens with new over-battens.

Method of Slate Removal

The developer has a large telescopic mobile access platform on site. This has sufficient reach to access the ridge of both buildings whilst allowing a safe clear working distance to the buildings.

Slates should carefully be removed by hand from the access platform with a safe sterile zone around the building in case of broken tiles falling. Slates should naturally be removed from ridge to eaves. Should removal not be possible in one continuous phase, slates should be removed in vertical lines and sheeted to the full slope of the building.

Malcolm Thomas

For

Stuart Thomas Associates Ltd

27/08/2025