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23rd April 2025

By email: (j.poland@jonathan-rhind.co.uk)

Jonny Poland
Jonathan Rhind Architects
The Old Rectory
Shirwell
Barnstaple
EX31 4JU

Dear Jonny

Re: ST DUBRICIUS CHURCH, PORLOCK, MINEHEAD – NAVE ROOF

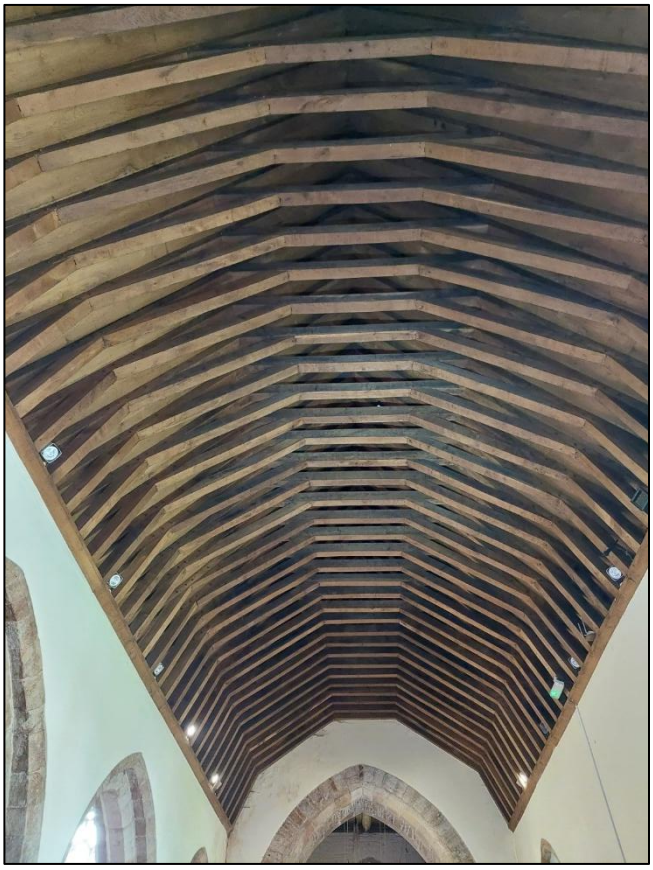
Further to our limited inspection of the nave roof on Wednesday 18th December 2024, together with our subsequent liaison, we now report as follows.

It is proposed to re-slate the south slope of the nave in combination with installing solar panels in order to reduce energy costs.

The church is Grade 1 Listed, with the earliest elements of the building probably dating back to C13. It was restored in 1892, which is the probable date of construction for the exposed nave roof structure.

This is made up of a traditional cut roof with common rafters set at approximately 300/350 c/c. and including a high level collar and two supporting struts and braces

on each side forming a faceted barrel vault appearance, with each common rafter effectively forming an arch-braced truss.



Nave roof structure as viewed looking west.

On top of the rafters is softwood boarding with battens fixed direct to the boarding and an early form of horsehair insulation set between the battens under the natural slate roof covering.

Nave roof opened up local to the east side of spire.

The condition of the slate roof covering is poor, and it has been patched in areas, with the original elements of slating very possibly dating back to the construction of the roof structure in the latter part of C19.

The general condition of the structural timbers associated with the nave roof appear to be quite good but, from the limited inspection of opening up an area of slate roof covering, it is evident that deterioration has occurred to the battens, the horsehair insulation and possibly to some of the boarding over the common rafters.

It will be important to check the construction of the valley gutter between the nave and the south aisle, together with the bearing of the rafters onto the wall plate beneath. As far as we could ascertain from our limited inspection internally, the condition of the timbers appear to be reasonable but it would be prudent to allow some repairs to rafter feet and hidden elements beneath the valley gutter.

We have undertaken a design check on the existing nave roof structure and, in theory, have found this to be structurally adequate, and practically it appears to have worked well over its lifetime.

As outlined, it is proposed to install an array of PV panels on the south slope of the roof. We have therefore undertaken a further evaluation of the roof structure and established that there is adequate capacity within the truss frameworks to support the proposed PV panels on the south slope. As would be expected, this results in an asymmetric load pattern, the effect of which is minimal with the increasing theoretical deflections within acceptable tolerances.

With the current exposed structure and no finishes sensitive to changes in deflection, we confirm that, going forward, the structure supporting the PV panels should work well. There may be some disturbance locally as part of the re-roofing works, but nothing that should cause structural concern. Any defective timber encountered during the works should be repaired or replaced as required.

We hope that the above is helpful, and attach with this report supporting check calculations. In the meantime, should you have any queries, or require any further information from ourselves, please do not hesitate to contact us.

Kind Regards

Paul B Carpenter
PCA Consulting Engineers

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