

Roof framing defect

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Roof framing – an example of a defect that was picked up in a pre-purchase inspection

Ever wondered what those cables are running under the underpurlins in your roof?

In a conventional roof frame (ie not a truss roof frame system) the framing is generally set up with underpurlins that support the rafters. The rafters are the long timbers that go between the ridge and (usually) the tops of the perimeter walls. The underpurlins really do a lot of work by supporting around half the weight of the roof, sometimes more depending on the set up of the framing. And if it is a tiled roof, there is a lot of weight to be held up for a very long time.

The underpurlins can be supported in a number of ways, the most common is by struts (short posts) that commonly go down to the walls or wall framing. A strut can be supported in other ways including by a strutting beam that transfers the loads to walls either side of the strut.

When you see sags in a tiled roof, it is often because the underpurlins have sagged. A bit of sag is not necessarily a big deal – timbers “creep” under load over time. But anything more than minor sag needs to be checked out!

In some roof systems, the underpurlins are strengthened by a bracing system that comprises a couple of steel cables and a compression post. The cables are tightened by a fitting that is screwed down by the roof carpenter and the tension in the cables can be adjusted if necessary to get the alignment of the roof right.





Example of the tensioning mechanism – the roof carpenter simply screws down the nut to tension the pair of cables



Example of the connection point for the cables

The advantage of this cable and compression post bracing system is that lighter and less costly underpurlins can be used, it is easier for the roof carpenter to install the lighter timbers and the system can be adjusted so there is no noticeable sag in the roofing. Also, over time, the cables can be re-adjusted (ie tightened or loosened but usually tightened) if necessary.

The disadvantage of the system is that sometimes the bracing is not installed correctly by being misaligned, it can be under or over tensioned and like any roofing components, they can be prone to inappropriate modifications.

Below is an example of what was done to a connection, presumably by the installer of an evaporative air conditioning system: This was noted during a routine pre-purchase inspection of the home for a prospective purchaser.



The ends of the cables have been removed from their bolted connection and have been held on one side of the underpurlin by a nail. This renders the underpurlin bracing system useless.

The recommendation to the prospective purchaser was to have a first fix roof carpenter re-fit the swaged cables to a standard bolted connection through metal gang nail plates as per the previous photo.

In addition it was noted that a number of the cable braces elsewhere in this roofing system were loose so there was a further recommendation for the first fix roof carpenter to tension those braces.

Had the defect not been identified, the underpurlin could have been subject to failure, putting the structural integrity of the roof at risk.

Just one of the myriad of issues that can be picked up in a pre-purchase inspection!

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