

## METAL BATTENS ON TIMBER TRUSSES



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In recent times, metal roof and ceiling battens have become more prevalent in housing construction, with each producer having their own batten profile and fixing system.

Questions have been raised whether these systems provide effective restraints to truss chords.

There are two factors which determine the ability of a batten system to effectively act as truss restraint, viz. the strength of the metal section to carry axial load concurrently with bending loads, and the method of fixing affecting its ability to transfer lateral buckling loads from the truss to the battens in shear.

The strength of a batten depends on its shape, the steel gauge and steel grade.

As manufacturing and material specifications may also alter from time to time, we are reliant on the producer to verify their performance for this purpose.

The method of connecting metal battens to the truss chords is as important as the strength of the batten, as poor fixing can nullify the effectiveness of an otherwise adequate batten.

The common methods of fixing steel battens are: -

1. Nail/screw fixing in the middle of the batten through the crest of the top hat;
2. Nail/screw fixing through the foot of the flange at the side of the batten; and
3. Clipping furring channels onto hanging brackets fixed to truss bottom chords.

There are a number of issues with each of the above methods that affect the performance of the batten as a bracing system.

It is my opinion that the minimum specifications necessary for providing nominal truss chord restraint are: -

- a. The batten must be fixed directly to the truss through both flanges at the base. Fasteners through the top of the cap section can easily tear the steel batten under lateral shear loads.
- b. The fasteners on the flanges must be flat head nails or hex head

screws. Jolt head or bullet head nails do not provide sufficient bearing.

- c. The head of the fixing must hold the metal flange firmly against the timber face. It must neither be too loose nor over-driven, either of which can lead to premature tearing of the metal section under load.
- d. With multi-ply trusses the fixing must be repeated on each ply, and not just applied only to one ply, or worst still into gaps in between.
- e. If required, battens should be spliced with common fixings through both overlapping members onto the truss.
- f. Clipped-on furring channels for ceilings do not provide bottom chord restraint making supplementary bracing necessary. Supplementary bottom chord bracing details can be found in section 4.4.3 of the code AS4440 "Installation of nailplated timber trusses".

In addition, for commercial buildings and buildings where truss spans exceed the limits of AS1684 parameters, a qualified engineer should be consulted regarding the suitability of using specific types of metal battens and the type of fixing to be employed.

The photographs show examples of poor fixing that resulted in dramatic failure and buckling of the truss chords.

Something we all hope to avoid.

