

ENSURING STRONG JOINTS - REVISITED

The term 'nail-plated joint' is used widely in the truss and frame industry as a standard description for a structurally engineered timber connector with a particular tooth profile designed to withstand a designated load when joining a number of pieces of timber together.

However understanding the relationship between the nailplate, the type of timber and the way timber is connected (joints) is a little more complicated.

Timber cut to a variety of carefully calculated angles can easily be assembled but may not have any structural integrity if not done correctly.

And with the ever increasing turnover of staff both in the office and on the factory floor, the time for any form of formal training of new staff can easily be overlooked, relying simply on the 'watch and learn principle'.

While this practice is efficient, it can lead to bad habits being taught as normal practice and some good practice slowly evolving out of general use.

So let us re-visit some of the basic concepts and simple rules that govern this area of our industry so that we can be sure the jigsaw puzzle is connected together properly, in order to adequately support the roof and ceiling and resist the elements.

NAILPLATE ORIENTATION

Nailplate orientation is essential - structural connector plates have a

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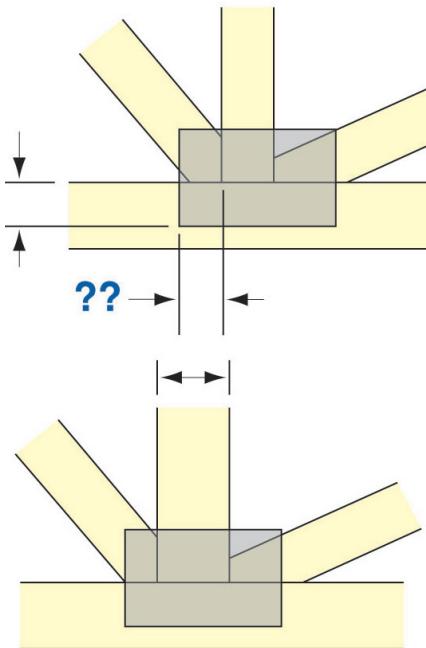
designed tooth pattern and the performance of the nailplate will vary, depending on how it is placed on the timber and the direction of the load.

Figure 1 illustrates how nailplate capacity increases with different orientations.

LOCATION

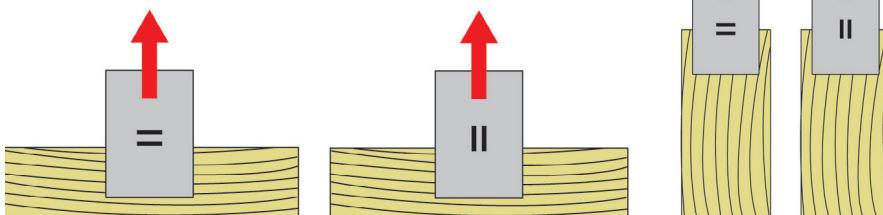
Correct nailplate location ensures the required number of teeth are in

Figure 2



Don't substitute large timbers as this creates a reduction in contact area.

Figure 1



INCREASING CAPACITY OF NAIL PLATED CONNECTION

place in each member. This is critical to maximizing capacity (see figure 2).

MATERIAL TYPE

The quality and type of timber into which the nailplate is embedded will determine the strength of the joint (See GN Guidelines 112 and 101).

In addition to the parent material, it is vital that certain timber characteristics are avoided or accounted for. For example:

Avoid sloping grain in green (unseasoned) timber. In hardwood untreated Lyctus susceptible sapwood is not permissible (See photo 1).

Brittle heart in hardwoods should be excluded (photo 2&3).

Pith is permitted in truss timber subject to compliance with current visual and mechanical grading rules. Trusses manufactured using "pith included" radiata pine shall be designed for an appropriate tooth joint group (photo 4).

Loose knots must be avoided; check carefully (see photo 5 - side one); (photo 6 - flipped over); and (photo 7 - a little pressure).

Sound, tight knots are permitted at joints provided they comply with the relevant structural grading rules for the timber grade specified (see photo 8).

In photo 9 - Best of luck finding a place for a plate; good reason for it to be in the 'reject pile'.

For trusses where timber used on its edge, wane or want is permitted at joints provided that it does not exceed more than 10mm of each face (photo 10).

For timber used on the flat, (such as floor trusses), wane or want is not permitted at nailplate joints.

If the measured wane or want is between 10-20mm on the face, the next larger plate size in width should be used for the joint to ensure the required minimum number of teeth are fully embedded in the timber.

Wane or want in excess of 20mm is unacceptable.

Continued overleaf



EMBEDMENT

Correct embedment is required to ensure proper tooth performance (See GN Guideline 80).

Regular revision of these rules with your staff will help ensure your joints continue to remain strong and fulfil their capacity as designed. If in doubt consult your nailplate supplier.

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