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GN GUIDELINES NO.218

ANOTHER MITEK ADVANTAGE – SEPTEMBER 2015

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Bracing our roofs for life

As I write this, the east coast of Australia is bracing for an onslaught of extremely cold weather (luckily, in North Queensland where I live, the weather never gets that cold). But unlike people, trusses do not need to brace themselves for the cold. Instead, they require bracing for stability and strength to resist the direct action of wind incoming on the roof structure.

The requirements for permanent bracing of roof trusses is clearly described in AS 4440 Installation of nailplated timber roof trusses. It sets out how much, where, and how to fix the bracing. The requirements rise incrementally with increasing truss span, roof pitch, and wind speed. All truss manufacturers supply a fixing and bracing guideline booklet with every job, with the same information to assist onsite installation. Let's look at some cases and discuss their main points.

8 TO 13 M SPANS

The bracing requirements for trusses between 8 to 13 m spans are shown in Table 1. If we have a roof in N2 wind class, 12.8 m span and 21 degrees, we see that it exceeds the 12.5 m maximum span permitted for a single SpeedBrace. However, with double SpeedBraces, trusses are capable of spanning up to 13 m. The point to note is that if a single SpeedBrace doesn't work, two will in all cases be capable of a span up to 13 m.

Roof Pitch	Wind classification		
	N3, C1	N4, C2	C3
Single brace <15°	13.0	13.0	12.0
15° to 20°	13.0	13.0	11.0
21° to 30°	12.5	10.5	8.5
31° to 35°	11.5	9.5	Not Suitable
36° to 45°	9.5	8.0	Not Suitable
Double brace up to 45°	13.0	13.0	13.0

Table 1. Truss spans between 8-13 m.

Roof Pitch	Wind classification		
	N3, C1	N4, C2	C3
Single brace <15°	16.0	15.5	Not Suitable
15° to 20°	16.0	13.0	Not Suitable
Double brace <15°	16.0	16.0	16.0
15° to 20°	16.0	16.0	15.5
21° to 30°	16.0	14.5	Not Suitable
31° to 35°	16.0	13.5	Not Suitable
36° to 45°	13.5	Not Suitable	Not Suitable

Table 2. Truss spans between 13-16 m

13 TO 16 M SPANS

Between 13 to 16 m spans, Figure 2 applies. We see that a single SpeedBrace is limited to roof pitches equal to or less than 20 degrees, and to lower wind speeds, but even the limits of double SpeedBraces are stretched, and may not be suitable at maximum roof pitches and wind speeds.

For over 13 m truss span, extra bracing bays are required over and above normal roof bracing, as shown in Figure A. These comprise of timber nogs inserted between top chords with the SpeedBrace criss-crossing across them. They are required not only for gable roofs, but also for hip roofs when the ridge is long enough to fit them. In addition, extra bracing is also required over jack trusses at hip ends of this span range, as shown in Figure B.

MORE COMPLEX ROOF SHAPES

The principles of bracing standard gable trusses with a ridge in the middle as described above may also be applied to other roof shapes, like northlight trusses and half trusses. The amount of bracing and its layout should look much the same as Figure A, even if the ridge is not in the middle, or if there is no ridge at all.

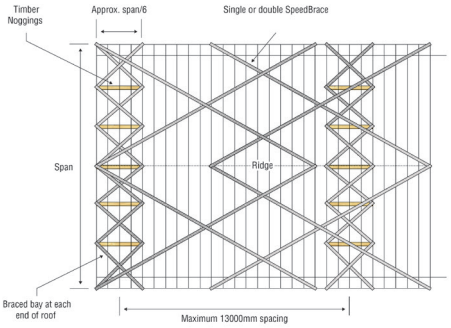

Figure A. 13-16 m span bracing bays.

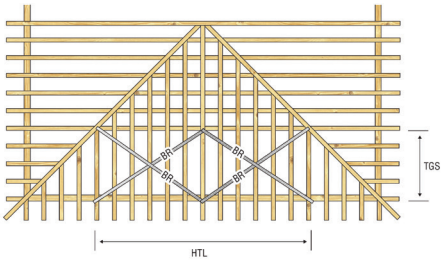

Figure B. Hip end bracing.

If any truss shape contains a vertical face, bracing is also required on the vertical face to connect the top chord bracing to the top plate. GN Guidelines 181 and 198 give examples of these situations in cut-off trusses, half trusses, and northlight trusses.

KEY POINTS

- Always check if single or double bracing is required;
- Any truss over 8 m spans must be crossed with at least four SpeedBraces;
- SpeedBrace must be tied to the top plates at both ends of the truss, including vertical faces;
- The angle of a SpeedBrace must always be between 30 to 45 degrees, to the top plate, when viewed in the plan.

For roof designs outside the limits set by AS 4440, please contact your nailplate provider. T