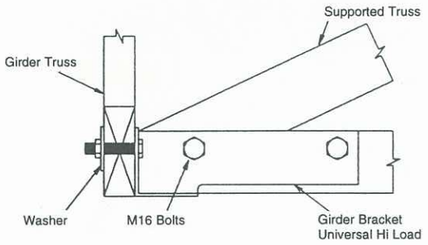
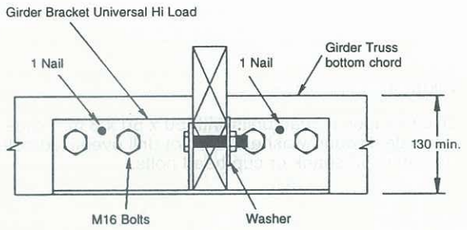
Hi-Load Girder Bracket

1. Determine location of truss to be fixed, and mark girder bottom chord.
2. Place Universal Hi-Load Girder Bracket so that cleat is at the position marked.
3. Align bottom of Universal Hi-Load Girder Bracket with bottom edge of the bottom chord.
4. Hold in position by driving 2 nails through 4 mm dia. holes provided.
5. Drill through pre-punched bolt holes and fasten with four M16 bolts. Where the head or nut bears on the timber, a washer should be used.
6. Place the truss to be supported into position on the Universal Hi-Load Girder Bracket, ensuring that it is hard against both the cleat and the vertical leg.
7. Drill through pre-punched holes and fit two M16 bolts. Where the head or nut bears on the timber, a washer should be used.

NOTE:

1. All bolts should be fitted and tightened before load is applied to trusses.
2. Do not use reduced shank or cup head bolts.
3. Girder Truss bottom chord to be min. 130 mm deep.





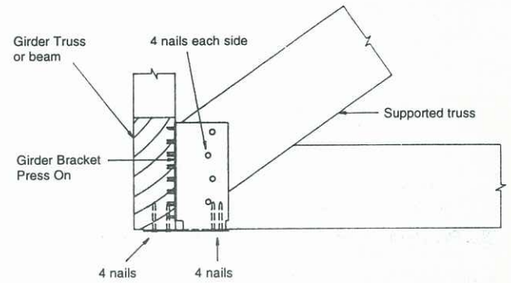
• IMPORTANT NOTE:
Use hexagonal head bolts with 57 x 57 x 4mm square or 65 mm dia. x 4 mm round washers. Do not drill oversized holes or use reduced shank or cup head bolts.

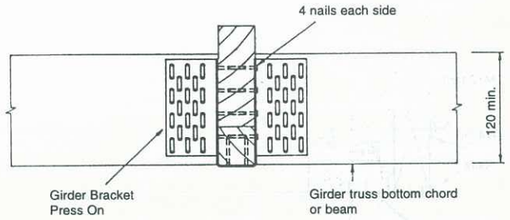
Girder Bracket Press On

1. Girder Bracket Press On can only be applied during truss manufacture using suitable equipment capable of pressing brackets without damage to bracket or timber. Maximum gap between girder truss bottom chord and Girder Bracket Press On is 1.0 mm.
2. After delivery of girder truss to site, install truss straight and plumb, applying temporary and/or permanent bracing as required by design.
3. Position standard truss in the bracket and ensure it bears tightly against the girder truss. Fix into position with 16 nails.
4. Proceed to install the remaining standard trusses.

NOTE:

1. Girder truss bottom chords to be a minimum of 120 mm deep to accommodate a Girder Bracket Press On.
2. Fix bracket with all nails before loading roof.
3. Nails where specified to be GANG-NAIL 30 x 2.8 mm galvanized reinforced head.





GANG-NAIL AUSTRALIA LTD.
A.C.N. 004 564 587

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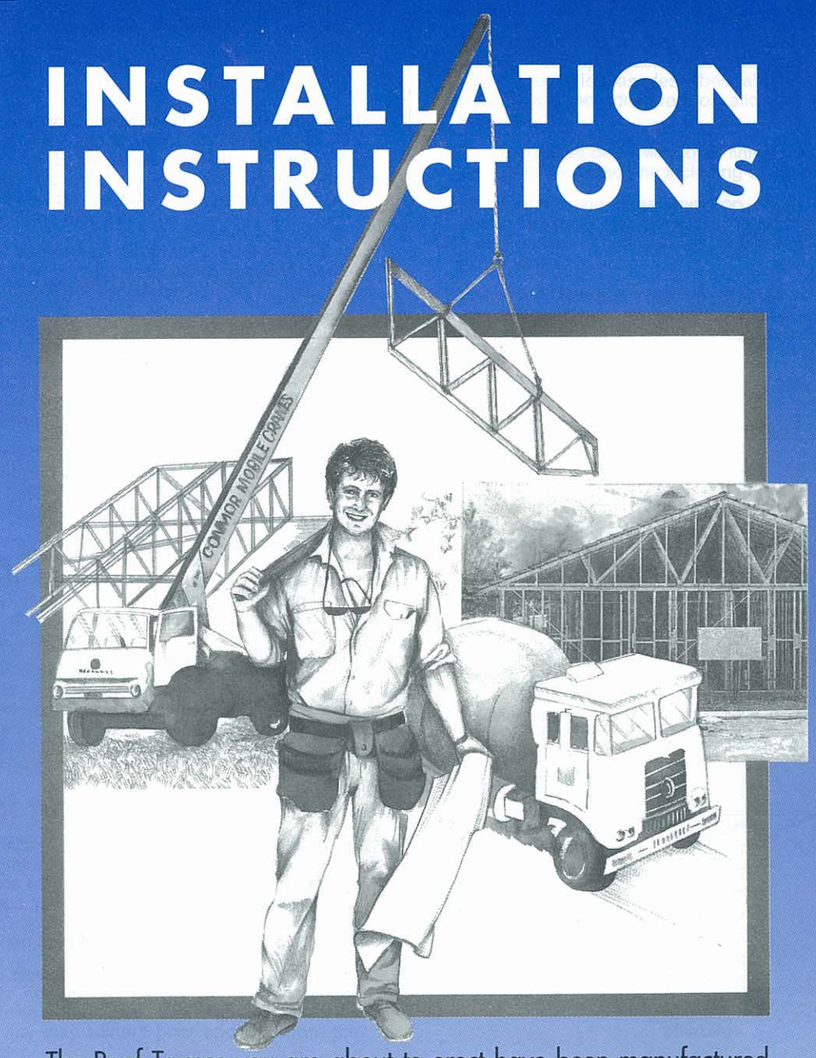
INSTALLATION INSTRUCTIONS



The Roof Trusses you are about to erect have been manufactured to engineering standards. To ensure that the trusses perform, it is essential that they be handled, erected and braced correctly.

A.A.A. ADVANCED TRUSS & WALL FRAMES
A.C.N. 074 565 530

REGISTERED OFFICE & PRODUCTION CENTRE
33 Cameron Street, Cranbourne 3977
Telephone (03) 5995 1477 Fax (03) 5995 1480

General

The Roof Trusses you are about to install have been manufactured to engineering standards. To ensure that the Trusses perform, as designed, it is essential that they be handled, erected and braced correctly. The following recommendations apply to roof . trusses on standard domestic buildings where truss design details are obtained from standard designs or DataTRUSS. Details for Commercial, Industrial and non standard domestic buildings, are to be provided by an Engineer responsible for overall building design.

Design

1. Trusses are designed for normal roof, ceiling and wind loads to suit specific jobs and conditions. Additional loading such as Solar Units, Hot Water Tanks, Air Conditioning, etc. require special consideration. Advice should be sought from truss fabricator prior to commencing construction.
2. Wall frames and beams supporting trusses must be designed for the correct roof loads. Refer AS-1684 "Timber Framing Code" for details.
3. Wind load is an important factor in the design and performance of roof trusses. Ensure that you have correctly advised the truss fabricator with regard to wind load requirements and that adequate provision has been made to fix trusses to the support structure to withstand wind uplift forces.
4. Trusses are generally designed to be supported on the outer wall with inner walls being non load bearing. Where it is necessary to use internal walls for load bearing, these will be clearly shown on layouts.
5. Before ordering trusses, ensure that your particular requirements have been provided for and that all relevant information has been supplied to the truss manufacturer. If non standard trusses are being used, ensure that erection and bracing details are known before erection commences.
6. For environments where the atmosphere may be conducive to corrosion, such as some types of industrial and agricultural buildings, or buildings near the ocean and subject to salt spray, consideration should be given to the use of GN8S stainless steel connector plates.

Important Note

1. It is the Builder's responsibility to ensure that all relevant information required for design is provided to the fabricator at time of ordering trusses, including spans, pitches, profiles, quantities and loadings. Final confirmation of details by the fabricator, with the builder is recommended prior to manufacture.
2. Trusses are designed for specific loading, geometry and support conditions. Under no circumstances should truss timber be cut, removed or trusses be modified in any way without prior approval from the truss fabricator.
3. Make sure all bracing is permanently fixed and all bolts and brackets are tightened prior to the loading of the roof.

Transport

Trusses must be fully supported when being transported in either a horizontal or vertical plane. Care must be taken when tying down, not to put strain on chords or webs.

Timber or metal right angle protectors are a satisfactory method of avoiding damage. Unloading and handling as described below.

Job Storage and Lifting

Trusses should be inspected on arrival at site. Any damaged trusses should be reported immediately and not site repaired without approval of the truss fabricator.

Where it is anticipated that trusses will be stored on site for an extended period of time before use, adequate provision should be made to protect trusses against the effects of weather. Protective covering, where used, should allow free air circulation around trusses.

Trusses when stored on the job site should be on timber billets clear of the ground and in flat position to avoid distortion.

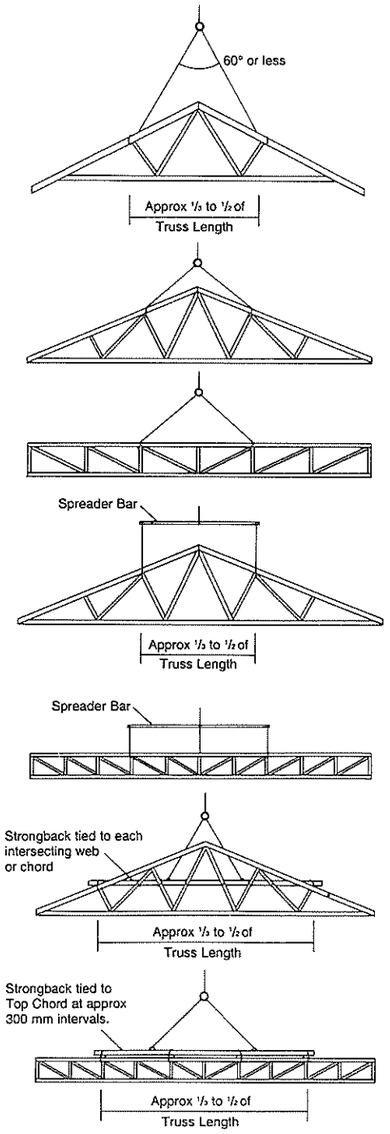
When lifting, care must be taken to avoid damaging of joints and timber. Spreader bars with attachment to the panel points should be used where span exceeds 9000 mm. Never lift by the Apex joint only.

The trusses may also be placed on the top plates by pulling them up skids, spread at 3000 mm, taking the same precaution as described above. Ensure that the trusses are not distorted or allowed to sag between supports.

The recommended method of lifting trusses will depend on a number of factors, including truss length and shape.

In general, sling truss from top chord panel points as shown below. Slings should be located at equal distance from truss centreline and be approximately ⅓ to ½ truss length apart.

The angle between sling legs should be 60° or less and where truss spans are greater than 9000 mm a spreader bar or strongback should be used. Some typical examples are shown below.

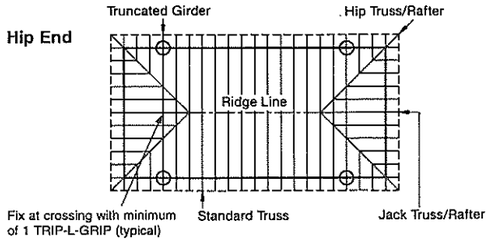


Roof Layout

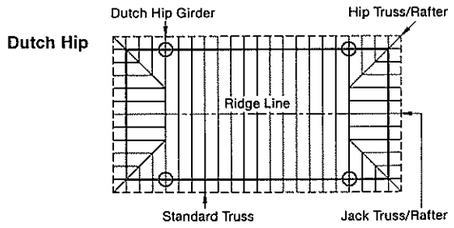
A layout for trusses must be determined before erection. If in doubt consult your truss fabricator.

Points circled on these layouts may be critical. Refer to the Wall Frame Construction Notes.

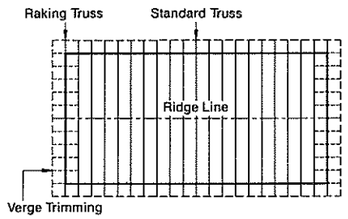
Hip End



Dutch Hip

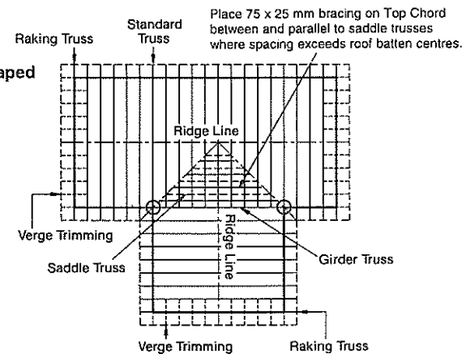


Gable

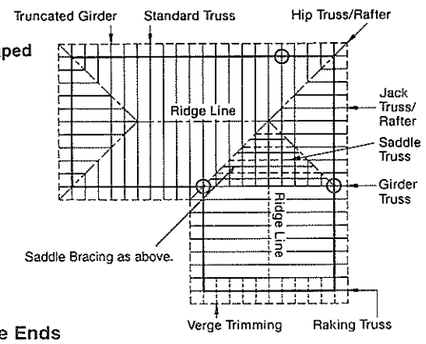


NOTE: End gable truss to be located over end wall unless otherwise advised by supplier.

T Shaped



L Shaped



Gable Ends

Where a gable end is required, consult your Truss fabricator for details of construction and erection.

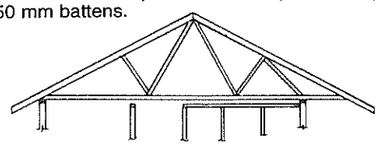
Supporting Structure

(Frame or Brick)

A structure that is not level and is out of square will result in an ugly and unsatisfactory roof line.
Time is well spent in ensuring:

1. The load bearing top plates are level.
2. The structure is the correct dimension.
3. The top plates as well as being level, are straight in their length .
4. The internal walls are set below the outer wall level by:
   Unbattened ceiling – 10 mm.
   Battened ceiling – 10 mm plus batten thickness.

Note: For 900 mm spaced trusses, plasterers prefer to use 50 mm battens.

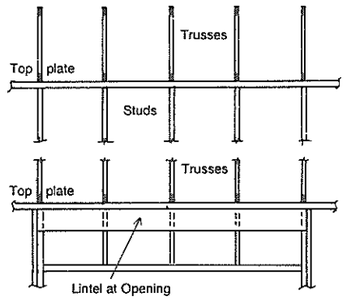


Wall Frame Construction

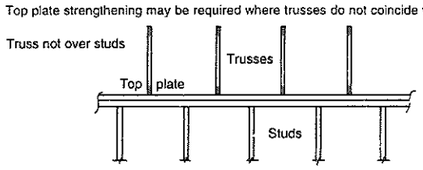
The load bearing frames should be checked for:

1. Lintel sizes suitable for truss loading. Consult AS1684 or your Truss Fabricator.
2. If trusses are not located directly over studs the top plate size must be in accordance with AS1684.
3. Girder Trusses may require the strengthening of studs at the points of support. Check the loading with your truss fabricator and refer to AS1684. Points circled on the layout notes are critical.

   The supporting structure construction must be adequate to resist wind up-lift forces.



Top plate strengthening may be required where trusses do not coincide with studs.



Frame Bracing

The frame must be fully braced, plumb, and nailed home before the erection of trusses is commenced.

Erection and Fixing

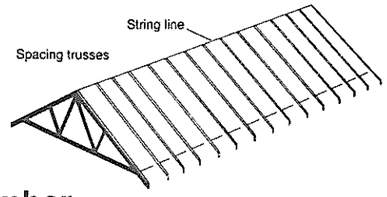
It is convenient to mark the truss position on the wall plates before lifting trusses. Use the layout drawing as your guide and note that the truss design spacing must not be exceeded.

Ensure first truss is installed carefully and within Erection Tolerances.

Gable Roofs – start with a gable truss at each end, fixing it to the top plate at the position marked. These trusses must be temporarily braced back to the ground or frame at the panel points.

Hip or Dutch Gable – start with the Dutch Girder truss or the Truncated Girder, placing it on the top plate at the position marked and temporarily bracing it back to the frame. Locate hip and jack trusses and adjust girder truss position before fixing.

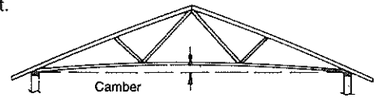
Line – Using a stringline along the Apex, place each intermediate truss and fix it to the top plate at the position marked, spacing it with gauging rods and ties.



Camber

Trusses are built with a camber in the bottom chord. The camber is designed to suit the span and load. A Girder truss will have more camber than other trusses. The camber is progressively taken up as the load from the roof covering and ceiling is applied. Under no circumstances should trusses be supported along the span (unless designed for) by blocking or propping.

If a truss has been designed to be supported internally a "SUPPORT HERE" label is affixed to the appropriate point.



Erection Bracing

The trusses must be braced during erection. If this is not done, then two problems can occur.

1. Collapse during erection
2. Erection tolerance will be exceeded, causing overloading, buckling and possible permanent damage.

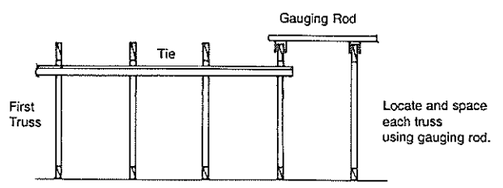
The exact details of erection bracing will, for practical purposes, differ from job to job. The following recommendations are for guidance only as the details employed are the erectors responsibility.

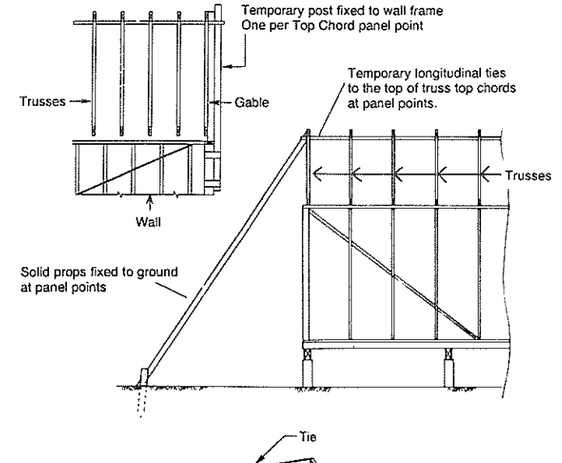
The first truss should be erected straight and plumb to erection tolerances given previously and temporarily braced to a rigid element, e.g. wall or ground as shown on diagram following.

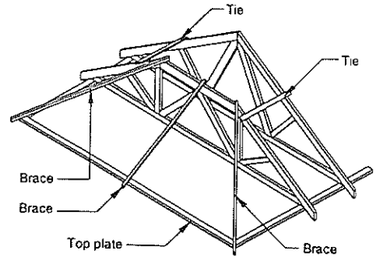
Each successive truss should be spaced using a gauging rod, then fixed back to the first truss with temporary ties at each top chord panel point. Bottom chords are to be braced at a maximum 4000 mm centres.

Use minimum 50 x 25 (F5) ties for trusses up to and including 900 centres, and 70 x 35 (F5) ties for trusses up to 1800 centres. Fix ties to each truss with one number 3.75 dia. nail. Splice by lapping over 2 adjacent trusses.

The purpose of temporary bracing is to hold trusses straight and plumb prior to fixing permanent bracing. All permanent bracing, ties, hold down, etc. must be fixed prior to loading roof.







Important Note

These recommendations are a guide only for the erection of standard Gable trusses up to 13000 mm span, and spaced at centres not exceeding 1200 mm. For trusses beyond these conditions, consult your truss fabricator.

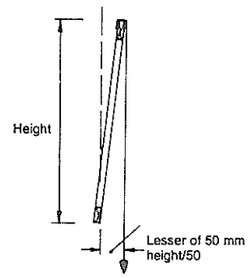
Erection Tolerances

Tolerance is critical for both a good roof line and effective bracing. A stringline, a plumb line or level should be used.

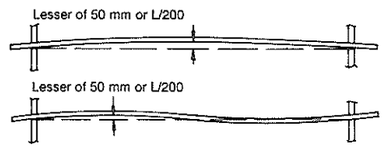
1. Trusses to be erected with overall bow or bow in any chord not to exceed the lesser of L/200 or 50 mm (L is the chord length).
2. Trusses erected with Apex not more than the lesser of span/200 mm or 50 mm from a vertical plane through the supports.
3. At any section the local out of plumb should not exceed the truss height/50 or max. 50 mm.

   Generally if a bow or tilt is evident to the eye, the truss has been erected outside the tolerances.

Plumb



Bow

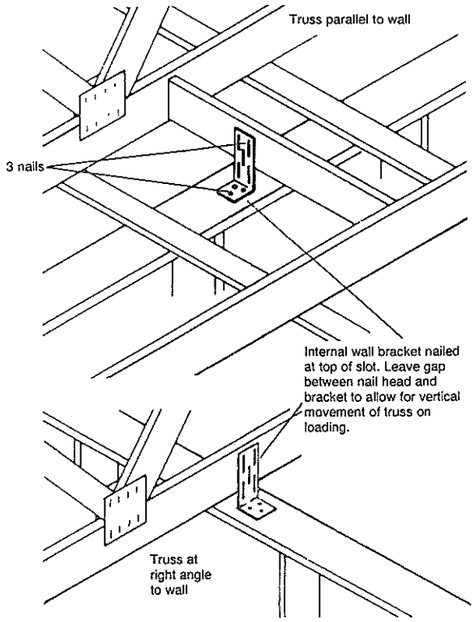


Fixing to Top Plate

Internal or Non-Load Bearing Walls.

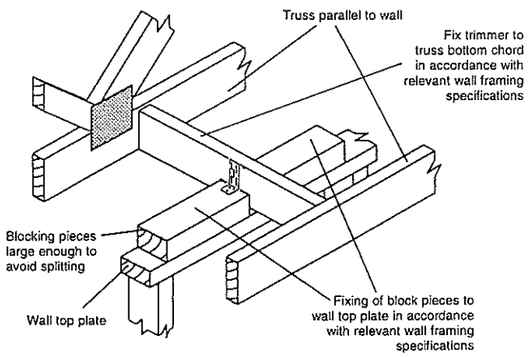
(a) Non-bracing wall

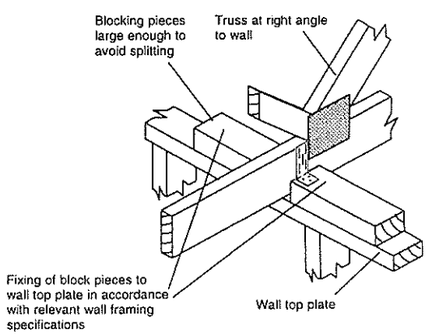
If internal or non-load bearing walls are not designed as bracing walls, fix the truss with the INTERNAL WALL BRACKET with nails at the top of the slot to allow for truss settlement as it is loaded. Brackets are fixed at 1.8 m centres along unsupported sections of the wall. Where trusses are parallel to walls, trim between the bottom chords and fix brackets to the trimmer.



(b) Bracing wall

If an internal or non-load bearing walls are designed as bracing walls, fix trusses to top plate in such a manner that it restrains the bottom chord of the truss horizontally but allows it to settle when the truss is loaded.



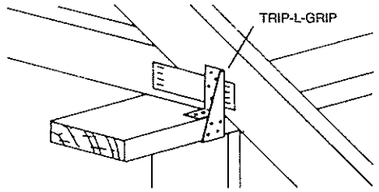


External or Load Bearing Walls.

Each end of the truss should be fixed to the top plate in accordance with Table 3 on page 13. Under the following conditions, additional hold down may be required:

1. Trusses supporting sheet roofing material.
2. Trusses greater than 12000 span.
3. Locations where the design wind velocity exceeds 33 m/s.

In the above circumstances, refer to Trip-L-Grip, Truss Grip or Cyclone Tie product brochures, or consult your Gang-Nail Licensed Fabricator for advice.



Fixing to Girder Trusses

Special Girder Brackets are available for supporting standard trusses on the bottom chords of Girder Trusses. These brackets should be fully fixed with all nails and/or bolts in accordance with details supplied by the truss fabricator prior to loading roof. (Refer page 14).

Fixing of Hip Ends

Truss to truss fixing details including Jack to Hip and Hip to Truncated Girder trusses to be in accordance with details supplied by the truss fabricator or those in AS4440.

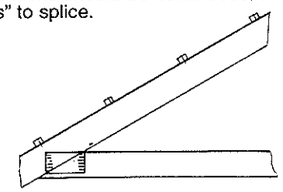
Roofing Battens

The stability of any roof system is reliant on the tile or sheeting battens. The contract with the roofer should include the following provisions:

Roofing battens should be fixed securely to all truss top chords in accordance with AS1684 unless otherwise specified by local building regulations.

Battens to be arranged so that on any truss top chord, not more than 1 in 3 battens are spliced and no two splices are adjacent.

In the areas of roof not bounded on both sides by diagonal bracing, battens should be continuous, if not use "Batten Strapnails" to splice.



Permanent Bracing

Before loading, roof trusses must be permanently braced back to the rigid building element, such as support walls, to prevent rotation or buckling of trusses under the weight of roof and ceiling material or under wind uplift.

These recommendations provide for:

a) Design Wind Speed up to 60 m/s for permissible stress method in accordance with either AS1170.2 or AS4055.
b) Walls being stable and braced in their own right.
c) Roof spans up to 8000 mm.
d) Roof spans 8000 mm to 13000 mm.
e) Maximum truss centres – 900 mm for tiled roof and 1200 mm for sheet roof.
f) Maximum roof pitch of 45°.

For conditions beyond these, consult your truss manufacturer.

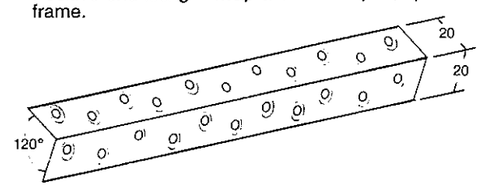
SPEEDBRACE

Speedbrace is a patented bracing system for the bracing of trussed roofs in both low wind speed and cyclone areas.

Speedbrace is a tension bracing system that uses a pre-punched shallow 'V' shaped member that is easily handled and erected. Speedbrace is applied in an 'X' or 'V' pattern to the top of the chord and braces the trusses back to the frame.

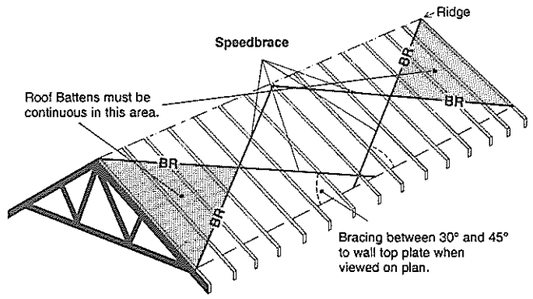
Speedbrace offers many advantages over other bracing systems.

- Applied to top of top chord – speed and simplicity.
- Pre-tension – no turnbuckles or similar device is required to tension the brace.
- Maximum load is governed by end fixing and splicing which are to be made strictly in accordance with details shown in this publication.
- Maximum load for splice Speedbrace is 4.7 kN.
- Maximum load for end fixing is 5.5 kN.
- Pre-punched – nailing made quick and easy with special 30 x 2.8 galvanized reinforced head nails.
- Uniform strength – assured performance.
- Side by side splicing for easy layout and fixing.
- Positive end fixing – wrap around at apex, splice and frame.



Top Chord Bracing

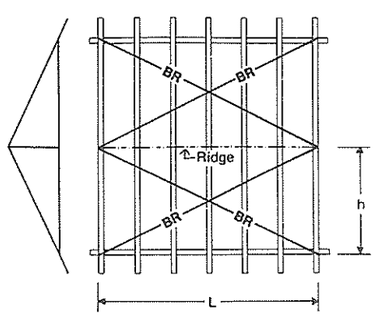
The bracing layout is related to the span and shape of the roof.



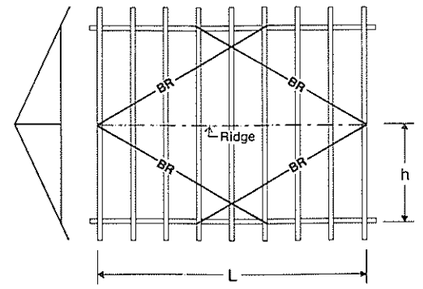
Roof spans less than 8000 mm

The forces in a roof of less than 8000 mm span are relatively low and may be restrained by the use of a single Speedbrace in a "V" configuration. The angle of Speedbrace to wall frame should be between 30° and 45°, and each truss should be crossed with a least two braces.

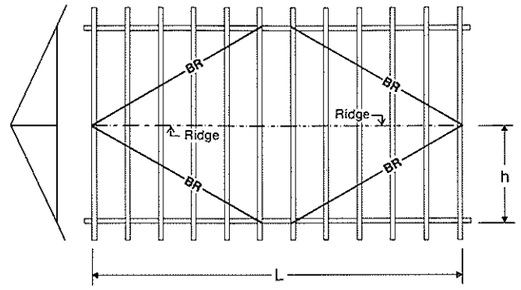
1. **Very Short Roof** – where the roof length "L" is 1 to 1½ times the half span "h" of the roof truss.



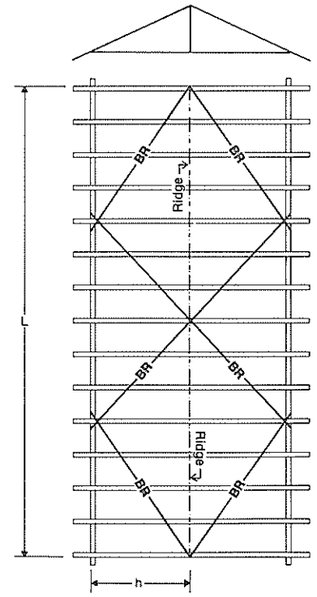
2. **Short Roof** – where the roof length "L" is 1½ to 3½ times the half span "h" of the roof truss.



3. **Long Roof** – where the roof length "L" is 3½ to 4 times the half span "h" of the roof truss.



4. **Very Long Roof** – where the roof length "L" is more than 4 times the half span "h" of the roof truss.



LEGEND

TRUSS/ SUPPORT

BRACING — BR — BR —

RIDGE LINE

Roof Spans 8000 mm to 13000 mm

The increase in span increases the forces to be restrained requiring the use of Speedbrace in an "X" configuration. The angle of the Speedbrace to the frame should be between 30° and 45°. Use a single Speedbrace with maximum overall truss length not exceeding values in Table 1.

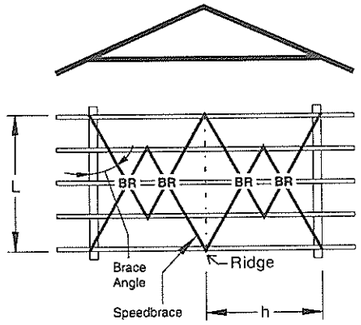
Table 1

Maximum overall truss span (m) for single Speedbrace of roof spans 8 m to 13 m

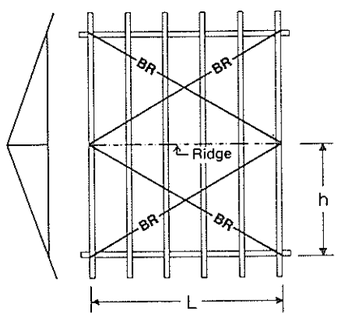
Roof pitch	Design wind speed (m/s)		
	41	50	60
< 15°	13.0	13.0	12.0
15° to 20°	13.0	13.0	11.0
20° to 30°	12.5	10.5	8.5
30° to 35°	11.5	9.5	Not Suitable
35° to 45°	9.5	8.0	Not Suitable

Each truss should be crossed with at least four braces and bracing bays should extend from the end trusses of the building unless noted otherwise below.

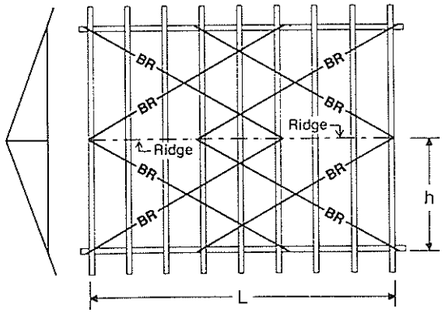
1. **Very Short Roofs.** Where the roof length "L" is very short compared to the half span "h" of the roof trusses and would result in a brace angle greater than 45°, a diagonal bracing arrangement is required each side of the ridge line as given below. Bracing bays should be spaced across roof such that the brace angle is always between 30° and 45°.



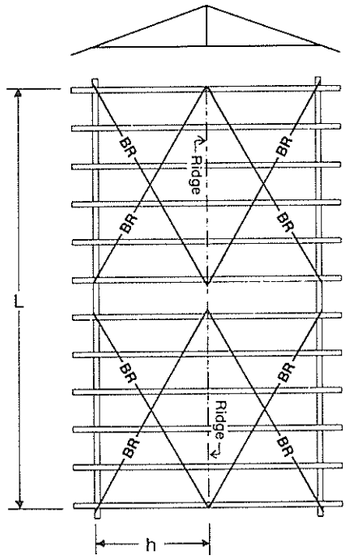
2. **Short Roofs.** Where the roof length "L" is of length to give a brace angle between 30° and 45° then only one bay of bracing is required each side of the ridge line as shown.



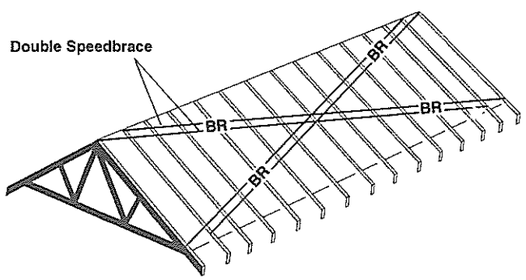
3. **Long Roofs.** Where the roof length "L" is long compared to the half span "h" of the roof trusses and would result in a brace angle less than 30°, two or more crossed bracing bays are required each side of the ridge to ensure the brace angle is between 30° and 45° as shown.



4. **Very Long Roofs.** As for long roofs, except continue bracing for length of building such that each truss is crossed with at least four braces.



For a roof with overall truss length greater than the maximum values specified in Table 1, but less than 13.0 m, use a double Speedbrace as shown below.



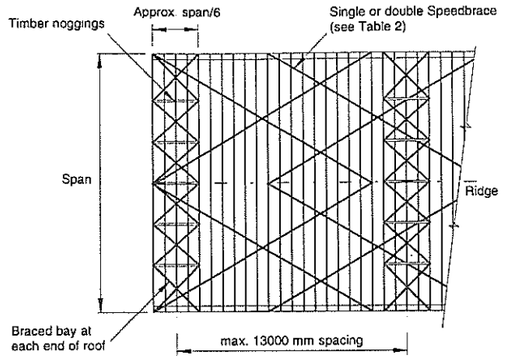
Roof Spans 13000 mm to 16000 mm

a) For standard trusses, refer to Table 2 to determine whether single or double Speedbrace can be used in an 'X' configuration over the whole roof with an additional braced bay at each end as shown.

Table 2

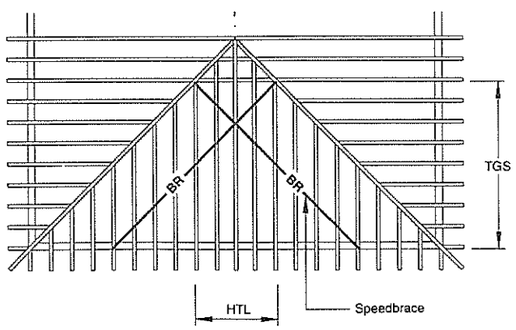
Maximum overall truss span (m) for single and double Speedbrace of roof spans 13 m to 16 m

Roof pitch	Design wind speed (m/s)		
	41	50	60
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

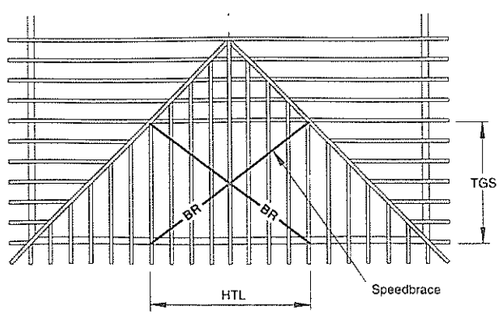


b) For jack trusses, use single Speedbrace in an 'X' configuration and the angle of Speedbrace to end wall should be between 30° and 45°.

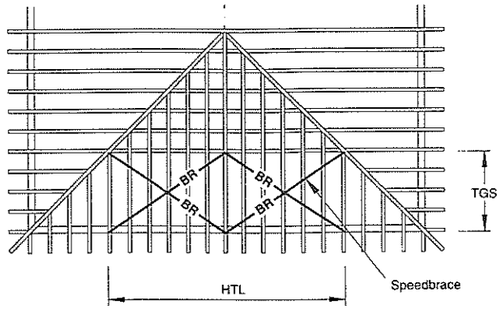
1. Where the horizontal top chord length (HTL) is less than the truncated girder station (TGS).



2. Where the horizontal top chord length (HTL) is 1 to 1.5 times the truncated girder station (TGS).



3. Where the horizontal top chord length (HTL) is longer than 1.5 times the truncated girder station (TGS).



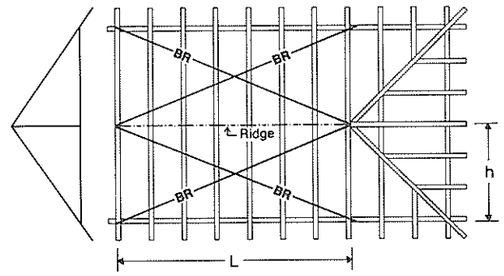
Typical Bracing Layouts

Gable Roof

Select a roof layout such that the angle between the ridge line and the brace is between 30° and 45°. There are eight basic bracing arrangements to consider depending on truss span and building length as given above. Bracing bays should extend from end trusses on the building.

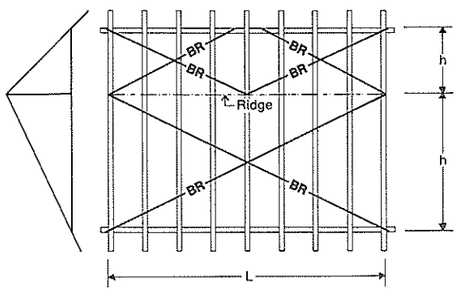
Hip Roof

For roofs on buildings of rectangular plan with trussed hip ends or dutch hip ends, bracing is required between apex of hip ends only. In such cases the roof length "L" is taken as being the distance between the intersection of hip and ridge lines at each end of the building and either of the above gable recommendations adopted.



Dual Pitched

On dual pitched roofs and cut-off roofs where the ridge line is not central on the building it may be necessary to determine bracing layout from a combination of 1, 2, 3 and 4 above. In such cases each side of the ridge shall be considered as a separate case.

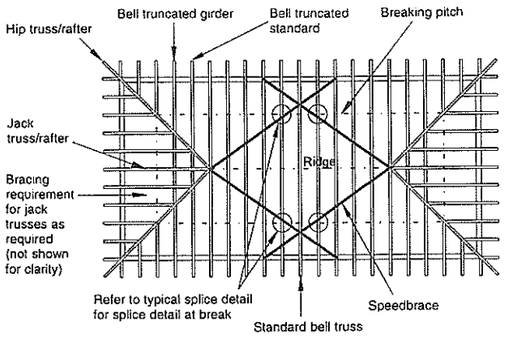


Skillion

Where the roof consists of half trusses, the span of the half truss should be taken as the half span "h" when using the above recommendations, and the apex braced to supporting structure. See section on Treatment of Internal Supports etc.

Bell Roof

Bell trusses should be braced as shown. The Speedbrace shall be spliced at bell breaks.

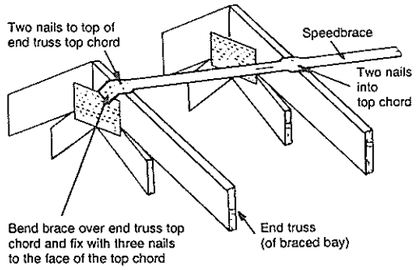


NOTE:
The previous are typical layouts for bracing. However, for special circumstances, e.g. small spans and complex roof shapes, bracing layout will be supplied.

Speedbrace Fixing Details

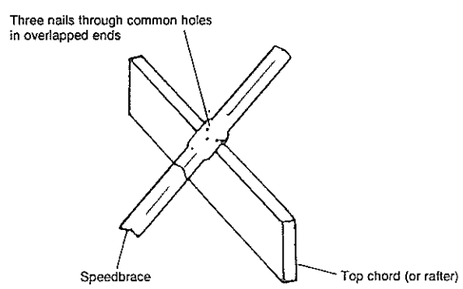
1. Always use 30 mm long x 2.8 mm dia. Galvanized Reinforced Head Nails when fixing Speedbrace.
2. At each truss, fix Speedbrace to the top of the top chord with two nails. Select nail holes most central to the timber edge. Flatten bracing while nailing to avoid interference with battens.
3. At end truss fix off the Speedbrace as shown. A pair of tinsnips will cut the brace. After fixing to top of top chord use your hammer to form a tight bend and fix to face of top chord with three nails.

Typical End Fixing Details

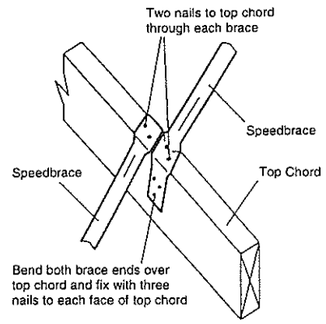


4. To splice Speedbrace, overlap or wrap around over one truss and fix with three nails. Splice to be located at least 3500 mm from heel end fixing, measured along brace.

Typical Splice Detail (Overlap Splice)



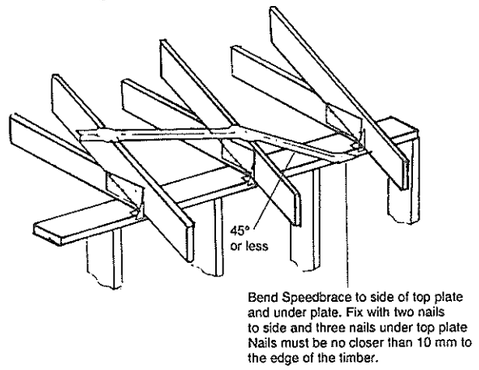
Typical Splice Detail (Wrap-around Splice)



5. At the heel, Speedbrace should be fixed in one of the following ways:-

   The simplest method, where roof geometry permits is to fix directly to the wall top plate as shown below. The brace must be kept straight between the last braced truss and wall top plate. Also the angle between the brace and the wall top plate must not exceed 45°, i.e. 1:1 slope.

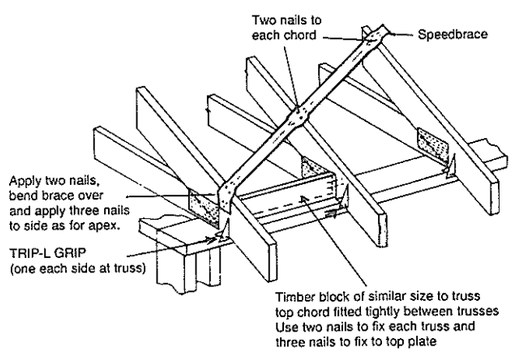
Heel End Fixing Details



CAUTION
The Speedbrace must be positively fixed to the top plate otherwise the bracing will be ineffective.

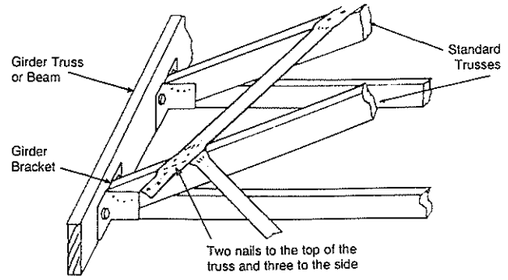
An alternative method can be used where it is desired to extend the brace to the last truss or where the angles do not permit ready fixing to the top plate. The last two trusses should be fixed to the wall top plate with a minimum of two Trip-L-Grips to each truss, and timber block between trusses as shown.

Alternative Heel End Fixing Detail



Where the standard trusses are supported by a girder truss or a beam rather than a wall top plate, fix Speedbrace at truss heel as shown following.

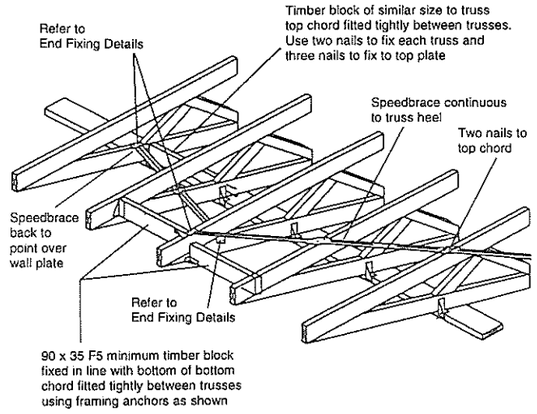
Heel End Fixing at Girder or Beam



Treatment at Cantilevers

The force in the top chord bracing must be carried through to the wall plate by diagonal bracing from the top chord to wall plate, as shown below.

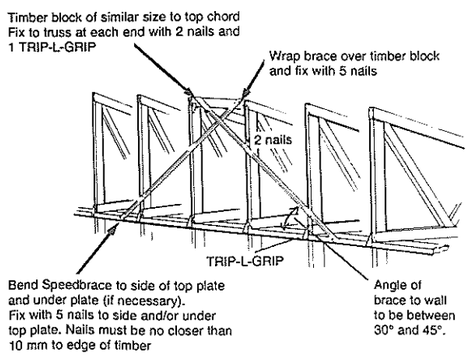
Cantilever Bracing Details

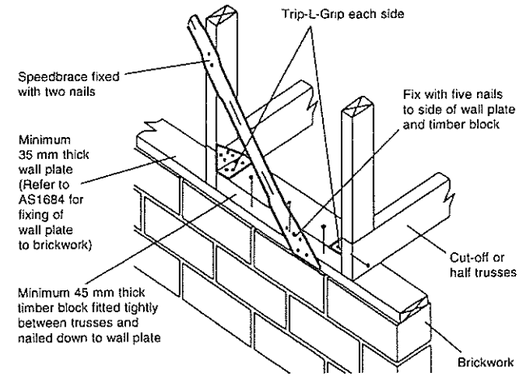


Treatment at Internal Supports, Cut-off and Half trusses

In addition to top chord bracing, cut-off and half trusses require bracing from top chord to top plate at end nearest apex. Apply one bay of diagonal bracing at each end of the run of trusses and intermediate bays at 10m centres for long runs of trusses.

End Bracing for Cut-off and Half Trusses





Bottom Chord Bracing

Permanent bottom chord bracing is required to hold truss bottom chord straight under loading.

For battened ceiling use batten sizes as required by AS1684 – "Timber Framing Code". Batten centres are not to exceed restraint centres specified on truss design drawings.

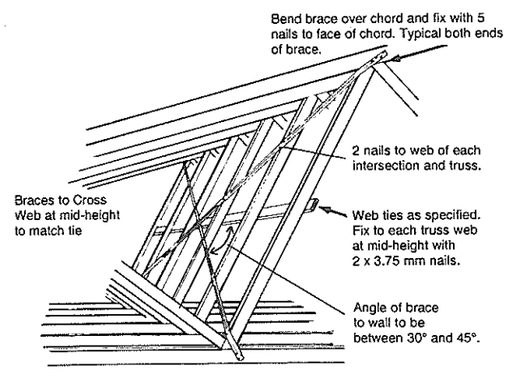
For suspended ceilings or where ceiling battens do not provide restraint to bottom chords, e.g. metal Furring Channels clipped to trusses, bottom chord ties may be required. Refer truss design drawings for size and spacing.

For trusses at close centres with ceilings fixed direct to bottom chord by either glue or nails, adopt bottom chord ties as specified under Erection Bracing.

Bottom chord ties to be fixed and/or braced back to a rigid building element.

Web Ties

Some truss designs require longitudinal ties, stiffeners or other supplementary members to be applied to webs. Where longitudinal ties are used, they should be 70 x 35 (F5) or as specified by the truss fabricator. Where longitudinal ties are used, they should be continuous and fixed to web of each truss at mid-height with 2 x 3.75 dia. nails and braced back to truss with one bay of crossed Speedbrace at each end and intermediate bay at 10m centres fixed as shown below. Ties may be spliced by lapping over 2 adjacent trusses.



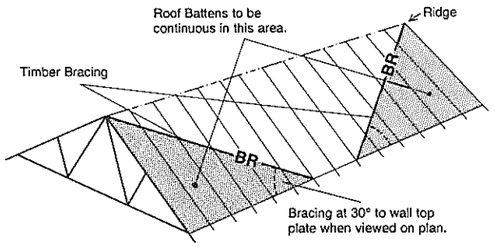
TIMBER BRACING

Suitable for Design Wind Velocities up to 60 m/sec. and other design parameters given under permanent bracing.

Top Chord Bracing

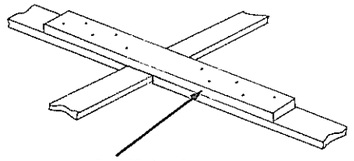
All truss top chords to be diagonally braced with minimum 70 x 35 (F5). This is to be fixed to the underside of the top chord with minimum of two 2 x 3.75 dia. nails or two Trip-L-Grips where effective nailing of the brace from below is impractical.

The brace is to lie at 30° to the top plate when viewed on plan and should run continuously from near the apex of the roof to the wall top plate where it is to be secured as shown.



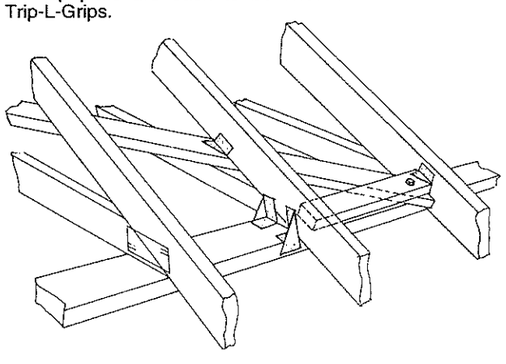
Splice Detail

The splice detail shown, should be followed for all splices and cross-overs in bracing members.



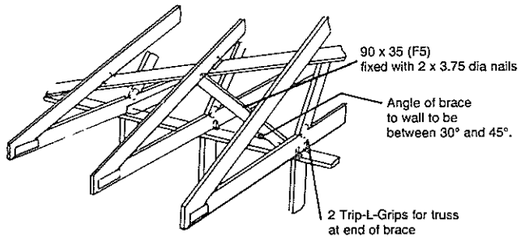
Heel End Detail

Bracing loads are to be transferred into the wall top plate. To achieve this it is necessary to bend the brace up when fitting so that it sits on top of the wall top plate and butts close up against the next truss in the region of the heel plate. A short strut 90 x 35 (F5) is fitted tightly between the two trusses and bolted to the brace with one M12 bolt. This strut is also to be fixed to each truss with one 'C' type Trip-L-Grip. The two trusses that transfer the load to the top plate are each to be fixed to same with two Trip-L-Grips.



Treatment of Cantilevers

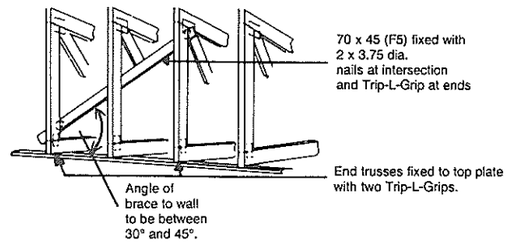
The force in the top chord bracing must be carried through to the wall plate. Figure shows how this should be achieved.



Treatment of Cut-off and Half Trusses

Figure shows the treatment for half trusses, cut-off trusses should be similarly treated.

Apply one bay of diagonal bracing at each end of the run of trusses and intermediate bays at 10 m centres for long run of trusses.



Bottom Chord Bracing

As shown for SPEEDBRACE.

Web Ties

Web ties, where required, to be as noted above for Speedbrace except diagonal timber bracing may be used to brace back to top and bottom chords as shown for Cut-off and Half trusses.

Hold-Down Details For Trusses – Cyclonic & Non-Cyclonic

Fixing types for various truss spans, spacings and roof covering are given below, using either trip-L-Grips or Cyclone Ties fixed in accordance with the following recommendations.

DESIGN DATA

The table opposite has been designed for the following criteria:

Roof materials	Steel sheet with 13 mm plasterboard ceiling fixed with battens.
	Concrete tile with 13 mm plasterboard fixed direct to truss bottom chord.
Maximum overhang	600 mm
Maximum pitch	25°
Joint group for calculating hold down	JD4

Design wind velocity	Pressure coefficient Cpe	Cpi
33 and 41 m/s Non-cyclonic	-0.9	0.2
50 and 60 m/s Cyclonic	-0.9	0.7

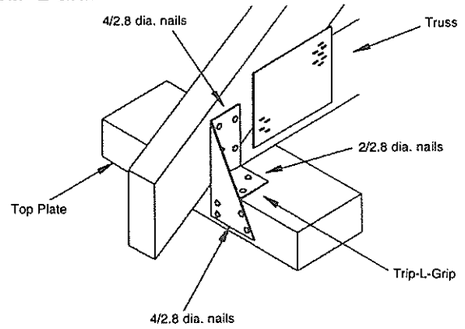
Pressure coefficients used are for the extreme case. Reductions may be achieved depending on building type, dimensions, room layout, etc.

For a more accurate assessment of hold down requirements on specific jobs, refer to truss design outputs.

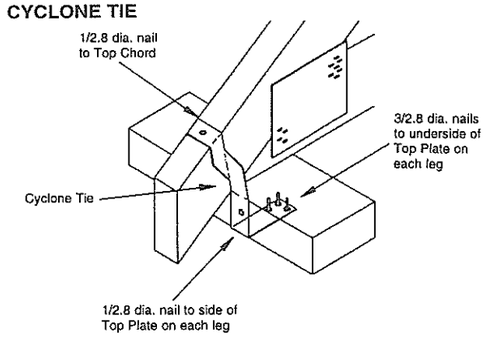
The details should be used as a guide only as hold down requirements will vary depending on the type of supporting structure. The method of hold down is the responsibility of the builder.

Details for fixing wall plates to foundations are to be provided by others. The supporting structure must also be designed by others to resist all vertical and horizontal loadings.

TRIP-L-GRIP



CYCLONE TIE



TRUSSGRIP

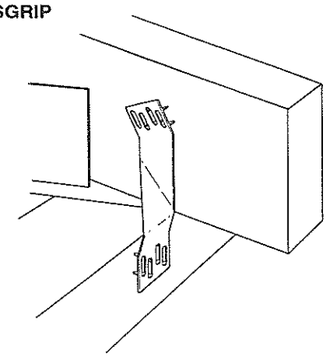


Table 3

Fixing type	Maximum truss spacing (mm)			
	Sheet		Tile	
	Maximum truss span (mm)			
	900	1200	600	900
W33 Non-cyclonic				
Nominal fixings*	1750	500	20000	20000
1 No. TrussGrip	3000	1400	20000	20000
2 No. TrussGrips	8650	5400	20000	20000
1 No. Trip-L-Grip	11200	7200	20000	20000
2 No. Trip-L-Grips	20000	17000	20000	20000
1 No. Cyclone Tie 400	20000	17000	20000	20000
2 No. Cyclone Ties 400	20000	20000	20000	20000
1 No. Cyclone Tie 600	20000	20000	20000	20000
2 No. Cyclone Ties 600	20000	20000	20000	20000
W41 Non-cyclonic				
Nominal fixings*	N/A	N/A	4000	1500
1 No. TrussGrip	500	N/A	6100	2950
2 No. TrussGrips	3200	1750	16000	9350
1 No. Trip-L-Grip	4400	2600	20000	12200
2 No. Trip-L-Grips	10950	7400	20000	20000
1 No. Cyclone Tie 400	10950	7400	20000	20000
2 No. Cyclone Ties 400	20000	17000	20000	20000
1 No. Cyclone Tie 600	20000	14800	20000	20000
2 No. Cyclone Ties 600	20000	20000	20000	20000
W50 Cyclonic				
1 No. Trip-L-Grip	1150	500	8200	5000
2 No. Trip-L-Grips	3550	2300	16800	10500
1 No. Cyclone Tie 600	7250	5050	20000	18950
2 No. Cyclone Ties 600	15800	11400	20000	20000
W60 Cyclonic				
1 No. Trip-L-Grip	NA	NA	4450	2750
2 No. Trip-L-Grips	1900	1100	9100	5800
1 No. Cyclone Tie 600	4350	2950	16250	10450
2 No. Cyclone Ties 600	10000	7100	20000	20000

*2/75 mm skew nails as per Section 2.5, NSW and TRADAC Timber Framing Manuals.
Section 4.2.2(a) TPC Timber Framing Manual.

Girder Brackets

Girder Brackets have been developed to support standard trusses on the bottom chord of Girder Trusses or beams, and may also be used to connect beams to beams. The brackets have been designed and tested to ensure that the load of the standard truss is transferred to the Girder Truss or beam without inducing rotation in the supporting member.

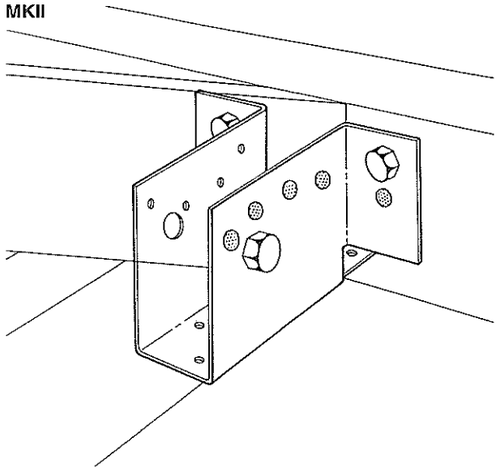
A range of standard brackets are available including:

Mark II & III Girder Bracket

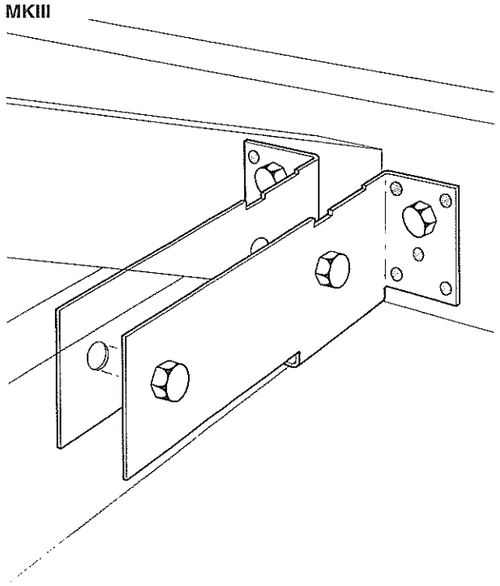
Bolted to Girder Truss bottom chord, these brackets are suitable for supporting standard trusses and small span girder and truncated girder trusses.

Features:
Do not require additional bracing to prevent rotation of girder bottom chord.

MKII



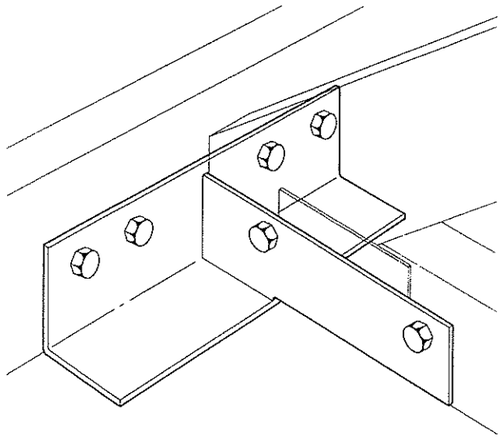
MKIII



Universal Hi-Load Girder Bracket

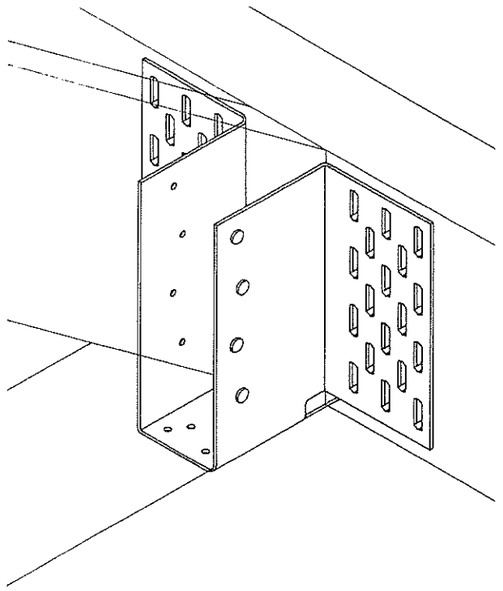
This bracket bolts to the Girder Truss bottom chord and is designed for heavier loads from Truncated Girders, Girders and large span standard trusses.

Features:
- Does not require any additional bracing to prevent rotation of the girder bottom chord.
- Suitable for supported truss thickness of 35 to 90 mm.
- Supported truss may be located on either side of cleat.



Girder Bracket Press On

Girder Brackets Press On have been designed to ensure that the load of the standard truss is transferred to the girder truss or beam without inducing rotation in the supporting member.



Determination of Bracket Type

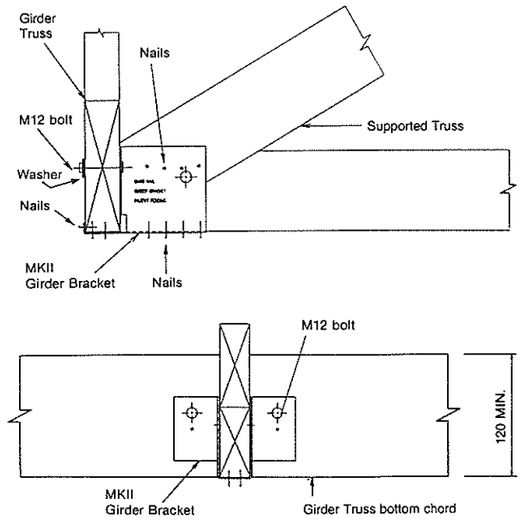
The type of bracket required will depend on the loads which it is required to carry. The selection of bracket type should be done in conjunction with your GANG-NAIL Fabricator or a Structural Engineer.

Fixing Instructions

Mark II Girder Bracket

1. Install the Girder Truss straight and plumb. Apply temporary and/or permanent bracing as required by design.
2. Locate bracket on Girder Truss bottom chord and hold with two locating nails.
3. Drill two holes into Girder Truss bottom chord to suit M12 bolts. Do not drill oversized holes.
4. Fix bracket to Girder Truss bottom chord with two M12 bolts. Where the head or nut bears on the timber, a washer should be used. DO NOT USE REDUCED SHANK OR CUP HEAD BOLTS. TIGHTEN ALL BOLTS.
5. Position Standard Truss in the bracket hard against supporting girder bottom chord or beam.
6. Fix bracket to Standard Truss with four nails to each side or alternatively use one M12 bolt. Nail underside of Girder Bracket to both trusses using all available nail holes.

   For sheet roofs in W41 wind areas, fix Standard Truss using four nails in each side in addition to M12 bolt. For sheet roofs in areas greater than W41 consult your GANG-NAIL Fabricator.
7. The secure fixing of the MKII Girder Bracket tongue is essential to prevent rotation of the Girder Truss bottom chord. For 45 mm or wider Girder Trusses, secure tongue to underside of the bottom chord with 4 nails. For 35 mm thick Girder Trusses apply 2 nails to underside of bottom chord, bend tongue around chord and fix to back face with 2 additional nails.
8. Proceed to install the other Standard Trusses.



NOTE:
1. Girder Truss bottom chords to be a minimum of 120 mm to accommodate a MKII Girder Bracket.
2. Nails, where specified, to be 30 x 2.8 diameter galvanised reinforced head.

• IMPORTANT NOTE:

Use hexagonal head bolts with 50 x 50 x 3 mm square or equivalent round washers. Do not drill oversized holes or use reduced shank or cup head bolts.

Mark III Girder Bracket

1. After Girder Truss has been plumbed and braced, MKIII Girder Brackets should be fixed into position on the Girder Truss bottom chord by nailing through the locating holes as shown in Figure 1.
2. Drill through pre-punched holes and Girder Truss bottom chord and fasten using two M12 bolts. Where the head or nut bears on the timber, a washer should be used.

   DO NOT USE REDUCED SHANK OR CUP HEAD BOLTS.
3. Position Standard Truss in bracket so that it is hard up against the Girder Truss.
4. Drill through pre-punched holes and Standard Truss and fit two M12 Bolts. See Figure 2.

NOTE: Ensure all bolts are tightened before roofing is placed on structure.

Figure 1.

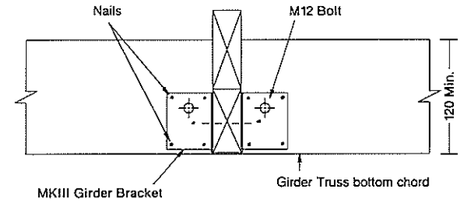
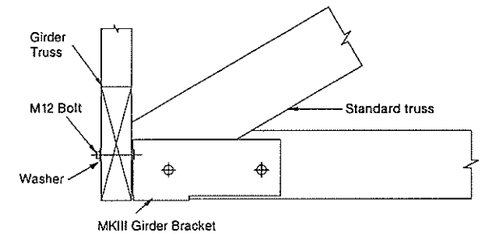


Figure 2.



• IMPORTANT NOTE:

Use hexagonal head bolts with 50 x 50 x 3 mm square or equivalent round washers. Do not drill oversized holes or use reduced shank or cup head bolts.