



Roof Erector's Handbook

For the installation and bracing of
pre-fabricated timber roof trusses

Published by the Institute for
Timber Construction South Africa

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Volume 1

Including large span roofs



Institute for Timber Construction

Photo/
Company Stamp

| | |
|-------------------------------|--|
| Erector's name | |
| Region | |
| Cell number | |
| Email address | |
| Certificate of Competence no. | |

Roof Erectors Handbook

FOR ERECTING PRE-FABRICATED TIMBER ROOF TRUSSES

VOLUME ONE - INTRODUCTORY LEVEL

For Category C and D Roofs (see pg 76 - 77 ITC-S A Roof Categories)

Published by the Institute for Timber Construction-S A

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International Truss Systems (Pty) Ltd.
Mitek Industries SA (Pty) Ltd.

First Edition July 2000

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FOREWORD



The primary aim of the ITC-SA (Institute for Timber Construction South Africa) is to regulate the design, manufacturing and erecting of pre-fabricated nail plated timber trusses in structural applications - set the standards - and therefore continuously research, develop and maintain the standards for the industry. The ITC-SA works closely with the SABS, SATAS, ECSA and the four systems namely Alpine Automation S. A. (Pty) Ltd, International Truss Systems (Pty) Ltd, Mitek Industries S.A. (Pty) Ltd and © 2009 Multinail Africa (Pty) Ltd who provide the engineering software which enables fabricators to design timber roof structures.

The ITC-SA achieves this through its infrastructure which recently developed a new jacket. The functional sub-brands are - **System, Engineer, Fabricator, Erector and Inspector**, which are all audited and governed by the ITC-SA and therefore carry the Certificate of Competence.



The ITC-SA heavily depends on the 4 leading **System** Suppliers to the Nail Plated Timber Roof Truss Industry in South Africa. These four system members develop and provide the software in conjunction with the nail-plate system that is used in the designing of nail plated timber roof trusses and is supplied to the respective designers and fabricators licensed by them.



The ITC-SA under this brand **Engineer** - gives recognition to Engineers with substantial experience and proven competence in timber engineering through the accolade of ITC SA Approved Engineer. In order to ensure full compliance with all the provisions of both the Building Standards Act [Section 14(2A)] and the National Building Regulations [Regulation A19], these Engineers may appoint, train and regularly re-train Inspectors to inspect erected Timber Roof Structures on their behalf.



The ITC-SA - under its sub-brand - **Fabricator** - audits licensed fabricators for the awarding of the Certificate of Competence to those companies which design, manufacture and supply pre-fabricated nail plated timber trusses to the desired standards and to ensure the continued process of re-auditing on due dates of such company operations and key personnel. Audits are carried out in conjunction with either an Independent Engineer or an authorised representative from the design software supplier.



The ITC-SA - under its sub-brand - **Erector** - researches and updates the bracing and connection rules for timber roof structures, creates awareness by means of conducting seminars and presentations to disseminate information and amendments to specifications and regulations to the players in the industry, as well as educates erectors where possible and for this reason has developed two volumes of handbooks for the erection of timber roof structures.

The ITC-SA as part of its continued development and marketing strategy is developing an electronic training programme to serve this purpose.

For safety reasons, proper erection procedures need to be followed by the Roof Erector and close attention to the interpretation of the Roof Designer's site documentation is extremely important. This attention ensures strong, stiff and safe roof structures, capable of long term stability.



The ITC-SA - under its sub-brand - **Inspector** - co-ordinates an infrastructure of professional roof inspectors who are accredited and therefore able to inspect your rationally designed timber roof structure for compliance with the National Building Regulation A19, which will enable the home owner to obtain an occupancy certificate from the local authority.

The National Building Regulations state that the Home Owner must appoint a Competent Engineer to take the overall responsibility, not only for the design of the timber roof structure but also for the complete erected roof.

Further information on the
ERECTION AND BRACING OF ROOF TRUSSES can be found
in SANS 10243 - "The Manufacture and Erection of Timber
Trusses"

INTRODUCTION

The details in this Handbook conform to the "Deemed to Satisfy" requirements of SANS 10243 "The manufacture and erection of timber trusses". However, when circumstances require, these details may be overridden by the COMPETENT PERSON (Designer/Engineer).

In the event that the Roof Truss Fabricator does not provide adequate information regarding truss erection, the erector will, by following the details shown in this Handbook, be able to comply with the requirements of SANS 10243 with confidence.

Note: As this book covers the basics of roof erection, reference should be made to ROOF ERECTOR'S HANDBOOK - VOLUME TWO for more detailed information.

TOOLS OF THE TRADE

The minimum requirement of tools needed are as follows:

Basic Tools:

- | | | |
|---------------------------------|-------------------------------|--|
| a. Nail pouch; | b. Claw hammer; | c. Ring spanners & socket (at least two needed.) |
| d. Carpet knife; | e. Crosscut hand saw; | f. Spirit level; |
| g. 30m Tape measure; | h. 5m Tape measure; | i. Chalk and plumb line; |
| j. Nylon builder's line; | k. Carpenter's pencil; | l. 12.5mm Drill bit; |
| m. Metal punch; | n. Hand drill. | |

Optional (Power) Tools:

- | | | |
|-------------------------------|-------------------------|---------------------------|
| o. Circular saw; | p. Hammer drill; | q. Safety goggles; |
| r. 50m Extension cord. | | |

TOOLS OF THE TRADE



PART ONE - THE BASIC CONNECTIONS

Each of the following details shows the correct way of connecting the different timber parts that make up the complete roof structure.

These connection details will be used in Part Two and Three to build hips, valleys, cranks and the bracing of any timber roof.

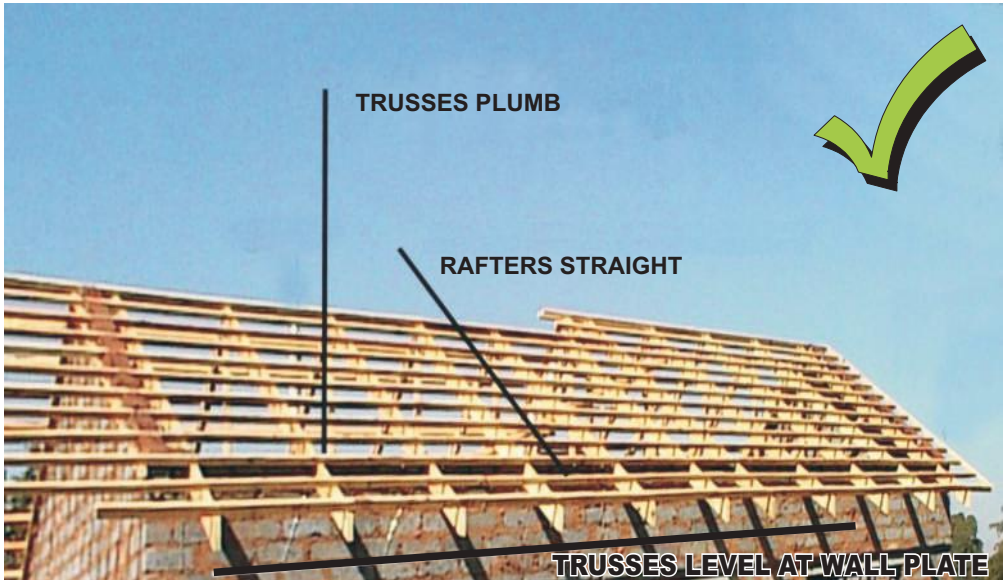


GREEN TICK = CORRECT WAY

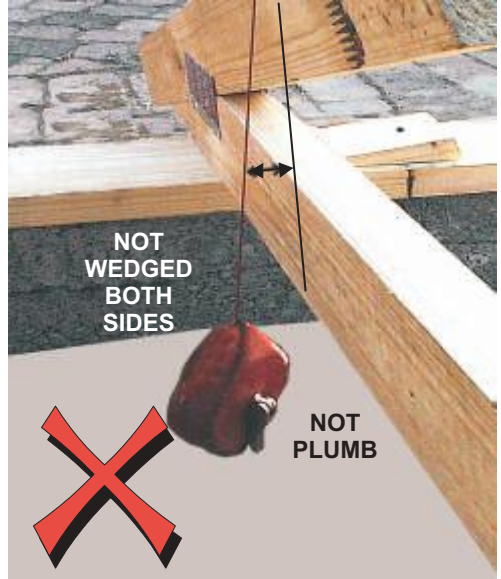
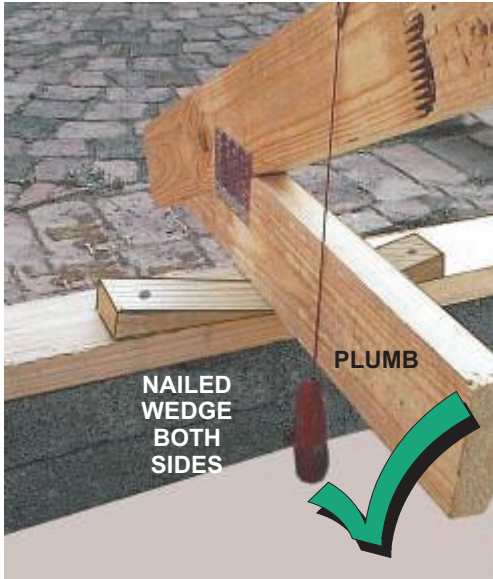


RED CROSS = INCORRECT WAY

TRUSSES MUST BE ERECTED PLUMB, STRAIGHT AND LEVEL



TRUSSES MUST BE ERECTED PLUMB AND LEVEL

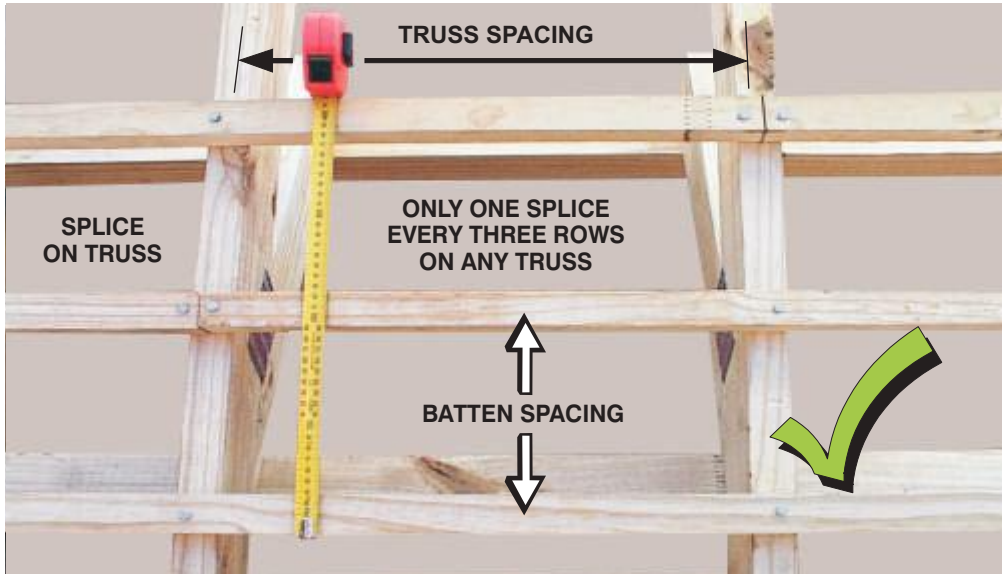


TRUSS TIE DOWN AND TRUSS LEVELLING WITH WEDGES

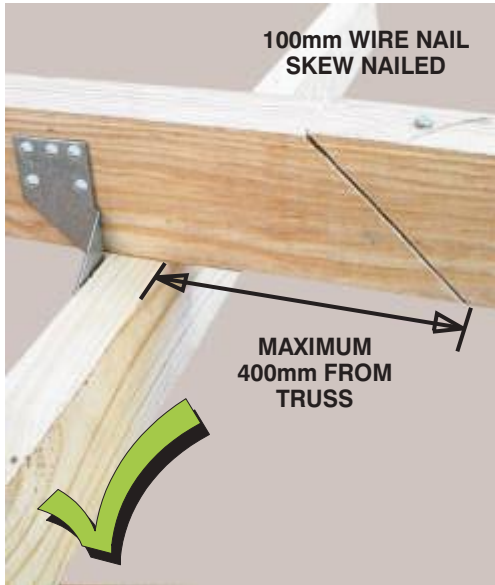


FIXING OF BATTENS

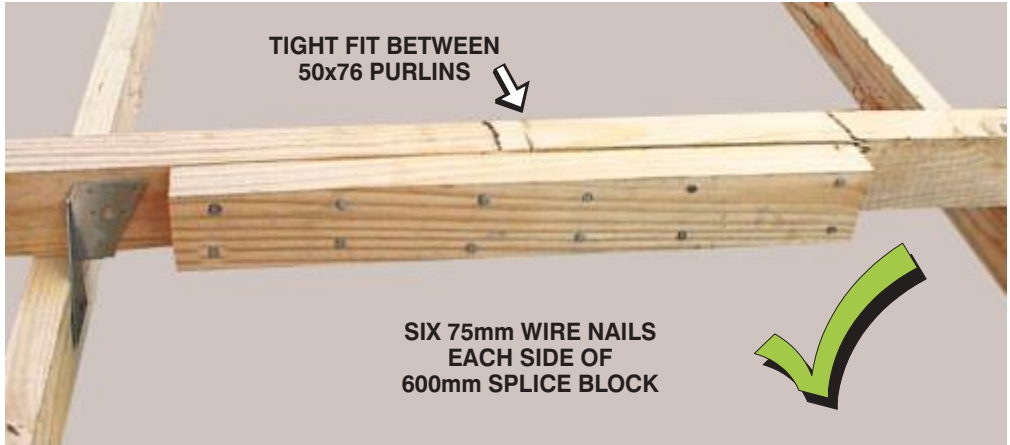
FOR 38X38 BATTENS USE 75mm WIRE NAILS
FOR 38X50 BATTENS ON EDGE USE 100mm NAILS



45 DEGREE CUT SPLICE FOR PURLINS



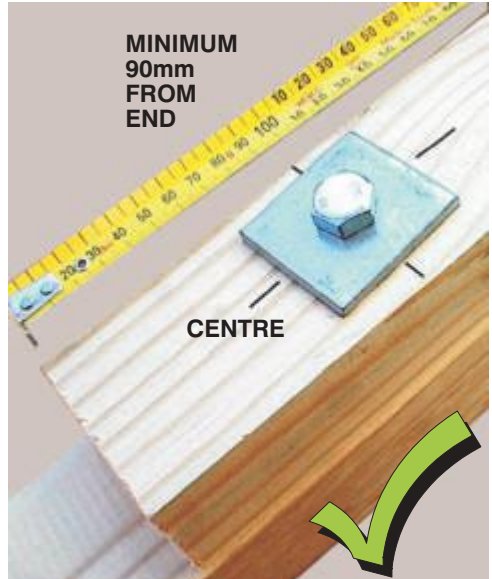
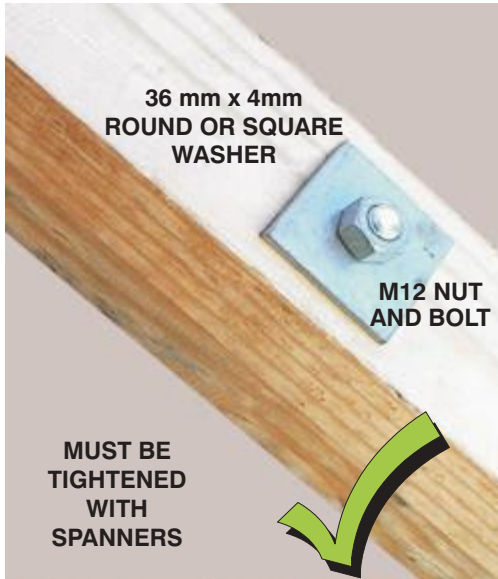
PURLIN BLOCK SPLICE - CAN BE ANYWHERE BETWEEN TRUSSES



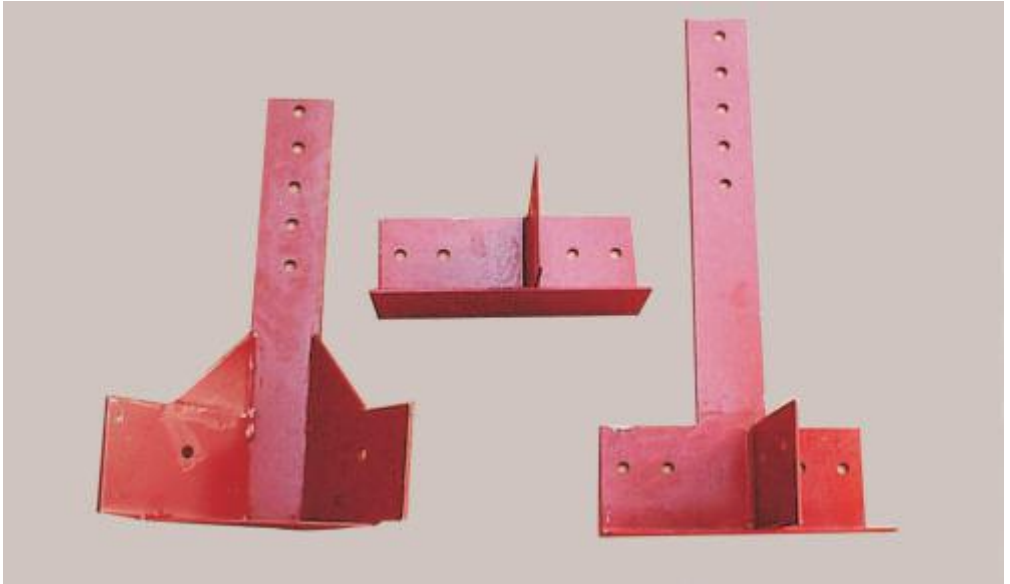
WRONG PURLIN SPLICE



BOLTED CONNECTION - M12 BOLTS & 36x4mm WASHERS



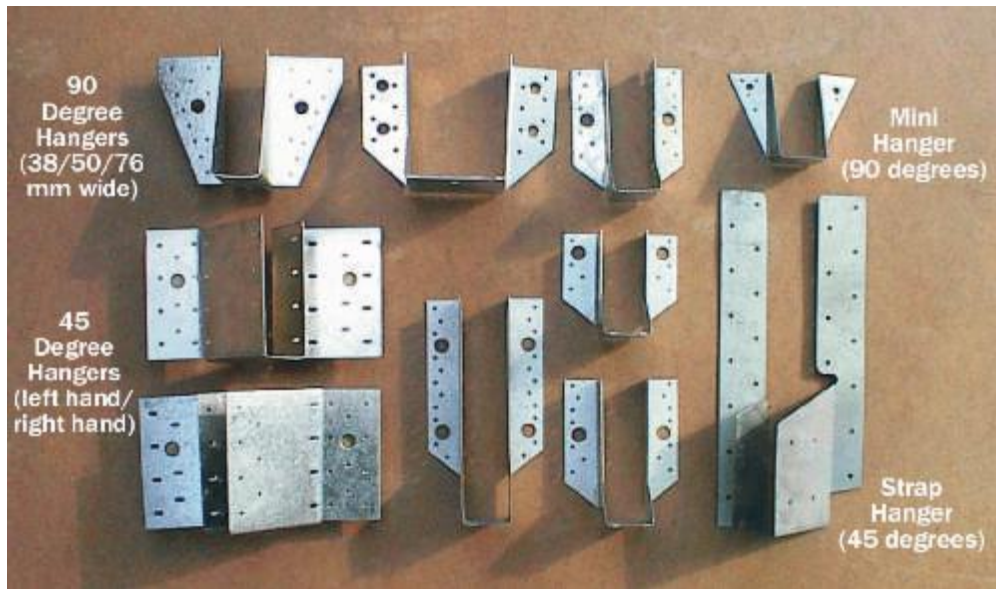
DIFFERENT TYPES AND SIZES OF MILD STEEL CLEATS



PAGE 19 - Detail 10 - Cleats

Revision: 1

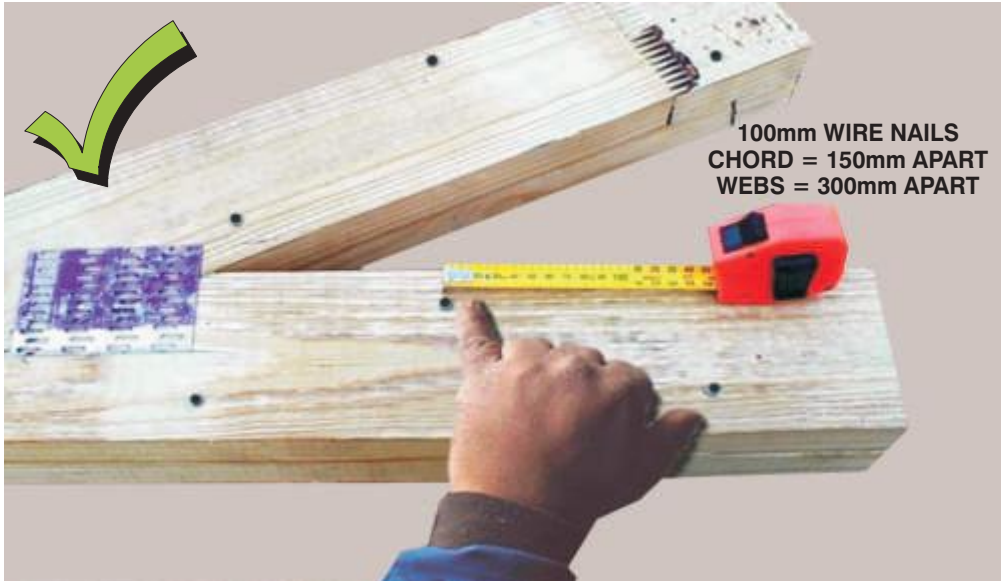
DIFFERENT TYPES AND SIZES OF TRUSS HANGERS



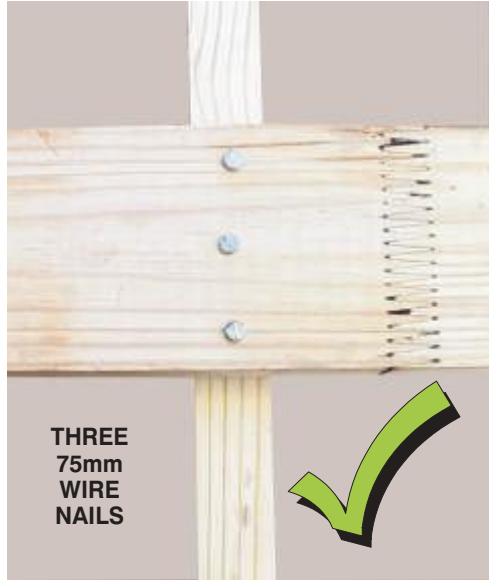
FIXING OF GALVANIZED TRUSS HANGERS



NAILING TOGETHER OF MULTIPLE PLYS OF TRUSSES & GIRDERS



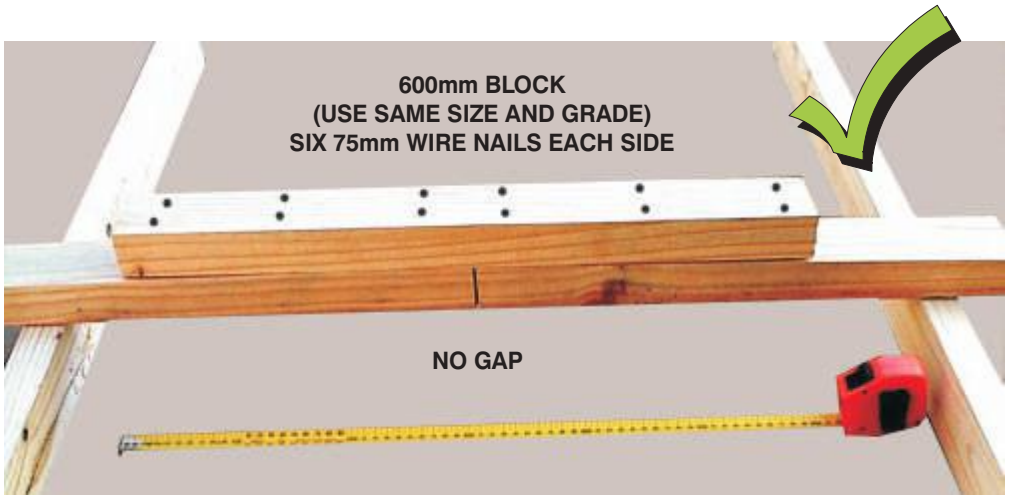
NAILING OF 38 x 114 TIMBER TO TRUSSES



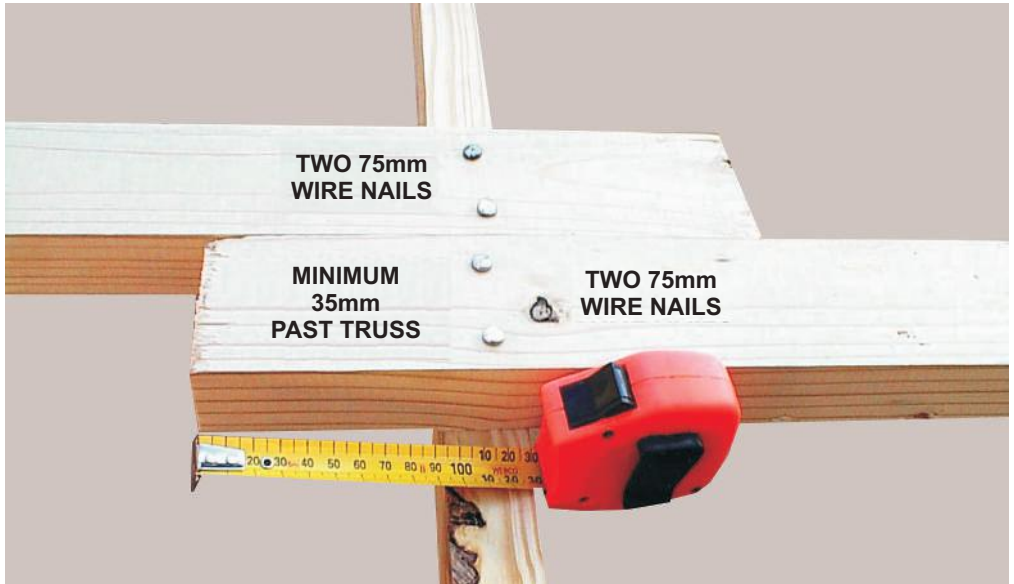
NAILING OF 38 x 76 TIMBER TO TRUSSES



BLOCK SPLICE ON RUNNERS OR DIAGONAL CROSS BRACING



FIXING AND JOINING OF RUNNERS



WRONG RUNNER SPLICES



PART TWO - HIP, VALLEY, CRANK & GEYSER DETAILS

This section shows different hip types, valley and crank construction details.

Always follow the roof plan supplied by the fabricator.

Always use the correct types of hangers and cleats as shown on the roof plan.

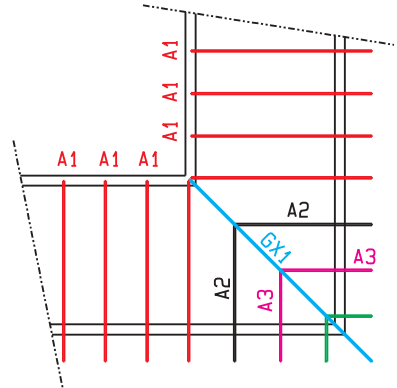
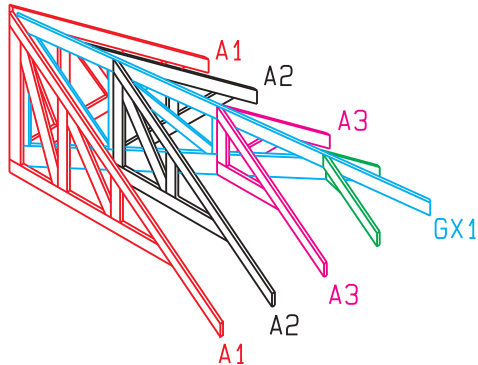
Always fully nail all hangers with 32mm clout nails.

Always put only M12 bolts in all the holes of the metal cleat.

Always fully nail two, three and four ply girders together, and bolt together as shown on the roof plan details before any load is put on the trusses supported by the girder.

When ever possible the geyser should be supported on internal walls and not the trusses.

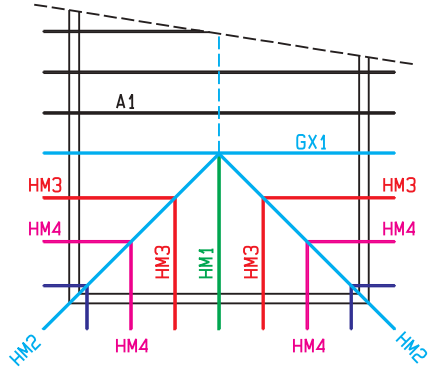
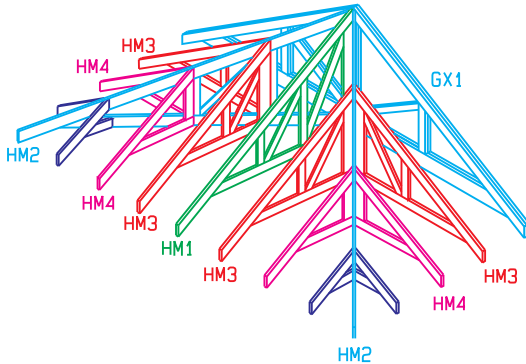
MONO-PITCH HIP - 45 DEGREE INFILL



Rules: Use all hanger and cleat types as shown on the roof plan.
All hangers to be fully nailed.
All cleats to be fully bolted.

Truss Labels for this drawing only.

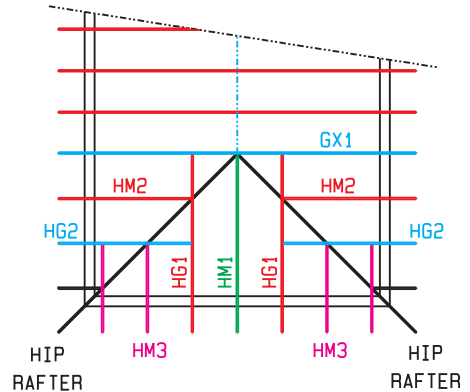
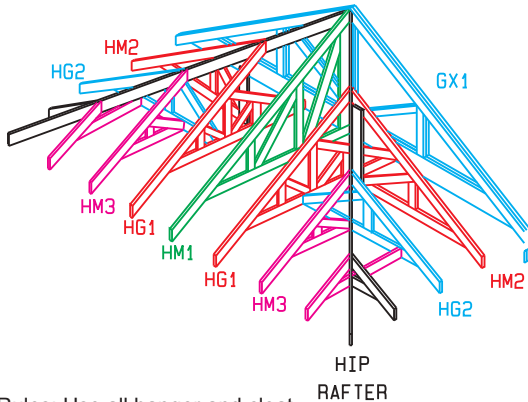
FULL HIP - 45 DEGREE INFILL



Rules: Use all hanger and cleat types as shown on the roof plan.
All hangers to be fully nailed.
All cleats to be fully bolted.

Truss Labels for this drawing only.

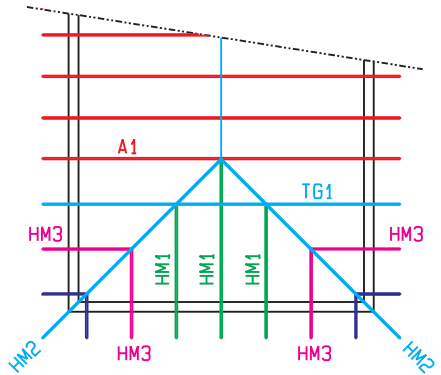
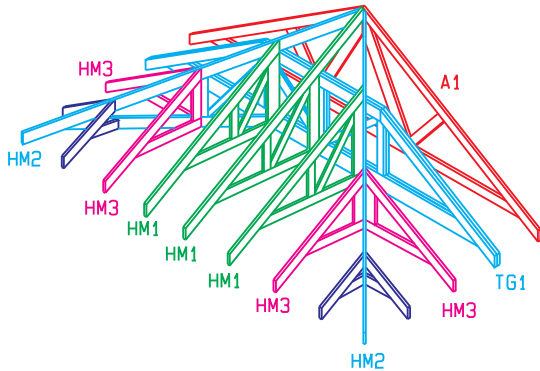
FULL HIP - 90 DEGREE INFILL



Rules: Use all hanger and cleat types as shown on the roof plan.
All hangers to be fully nailed.
All cleats to be fully bolted.

Truss Labels for this drawing only.

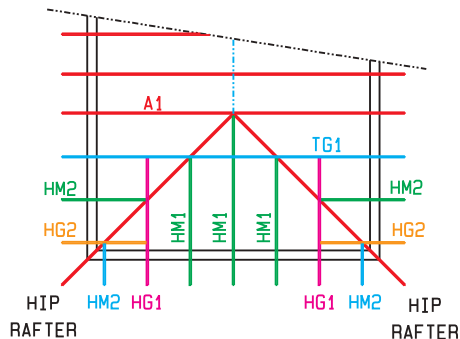
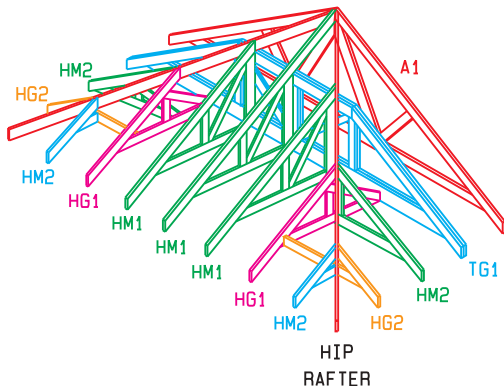
TRUNCATED HIP - 45 DEGREE INFILL



Rules: Use all hanger and cleat types as shown on the roof plan.
All hangers to be fully nailed.
All cleats to be fully bolted.
All fly rafters must be fixed to truncated trusses.

Truss Labels for this drawing only.

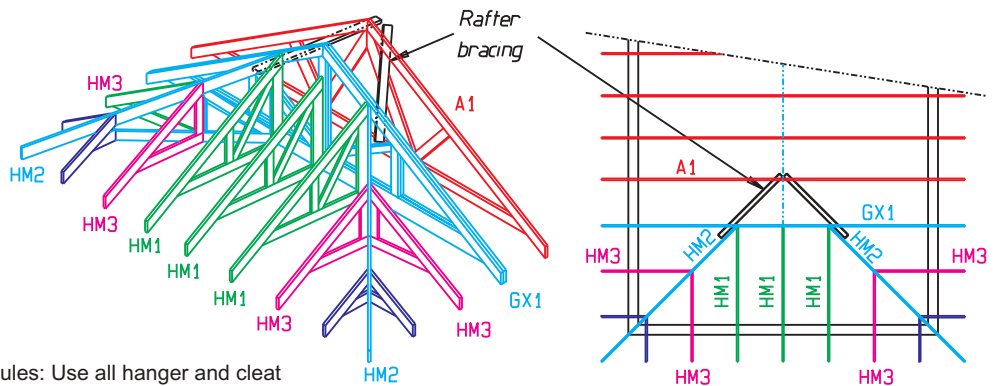
TRUNCATED HIP - 90 DEGREE INFILL



Truss Labels for this drawing only.

Rules: Use all hanger and cleat types as shown on the roof plan.
All hangers to be fully nailed.
All cleats to be fully bolted.
All fly rafters must be fixed to truncated trusses.

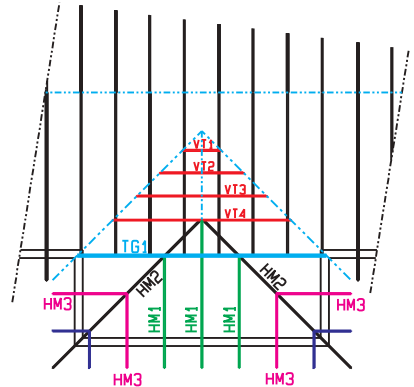
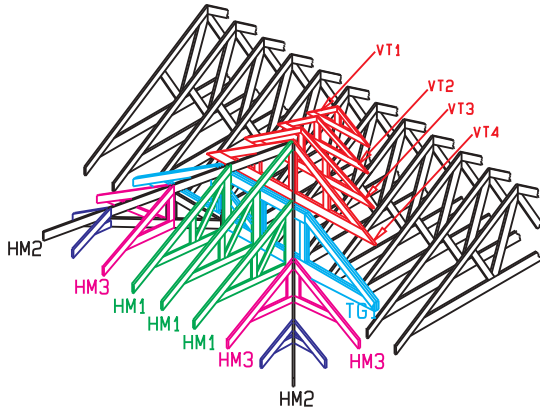
“DUTCH” HIP - 45 DEGREE INFILL



Rules: Use all hanger and cleat types as shown on the roof plan. All hangers to be fully nailed. All cleats to be fully bolted. Rafter bracing from hip girder to main truss apex must be installed.

Truss Labels for this drawing only.

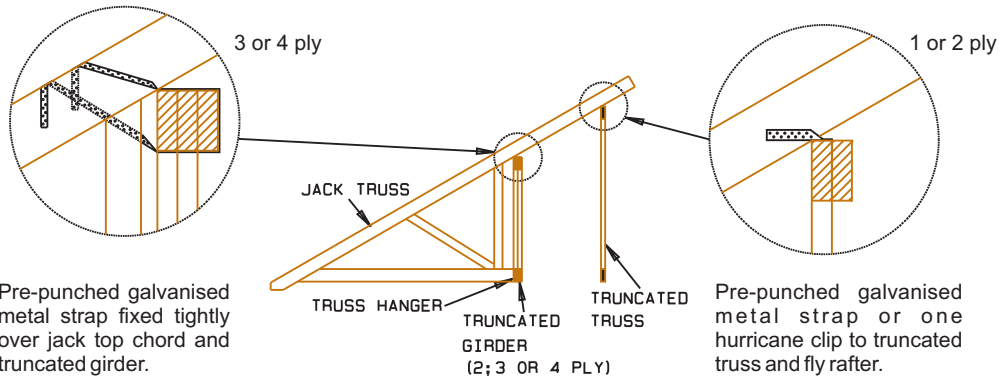
TRUNCATED HIP WITH VALLEY - 45 DEGREE INFILL



Rules: Use all hanger and cleat types as shown on the roof plan.
All hangers to be fully nailed.
All cleats to be fully bolted.
All fly rafters must be fixed to truncated trusses.

Truss Labels for this drawing only.

TRUNCATED HIP - FLY RAFTER CONNECTIONS



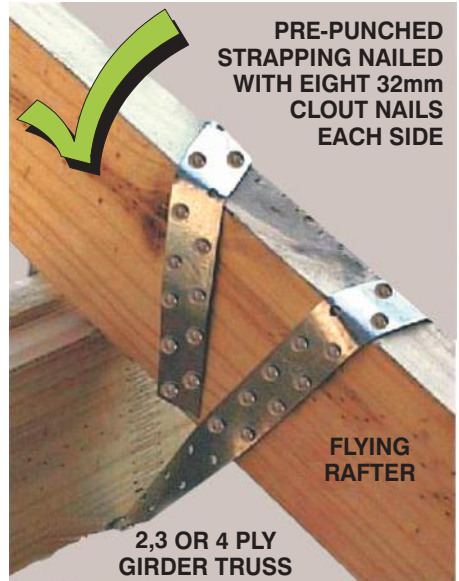
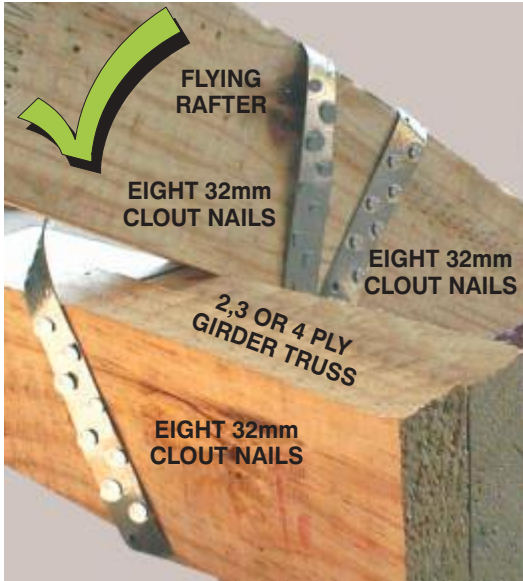
Pre-punched galvanised metal strap fixed tightly over jack top chord and truncated girder.

Eight (8) 32mm clout nails each side.

Pre-punched galvanised metal strap or one hurricane clip to truncated truss and fly rafter.

Four (4) 32mm clout nails each side.

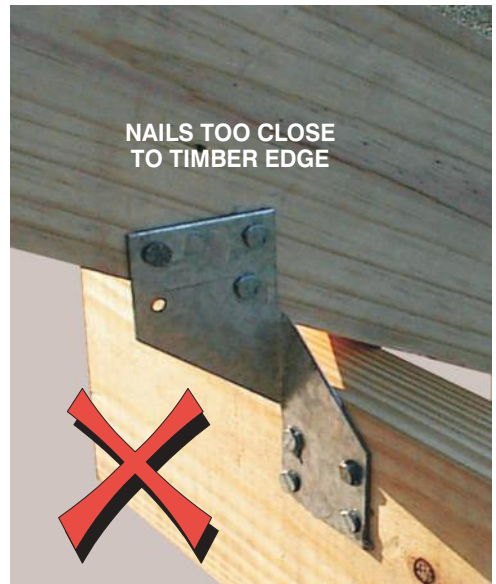
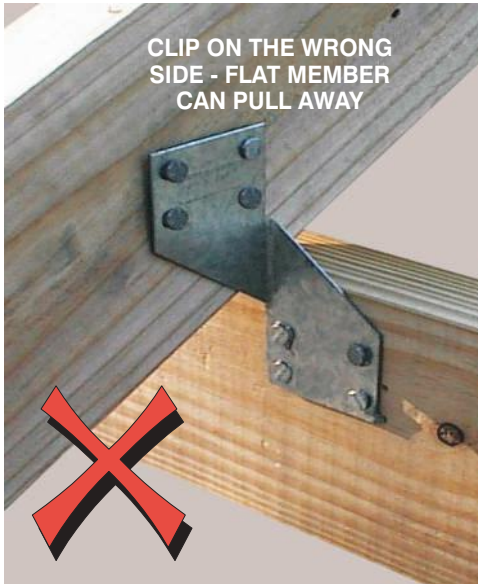
FLYING RAFTER TO MULTIPLE-PLY TRUNCATED (FLAT) TOP CHORD



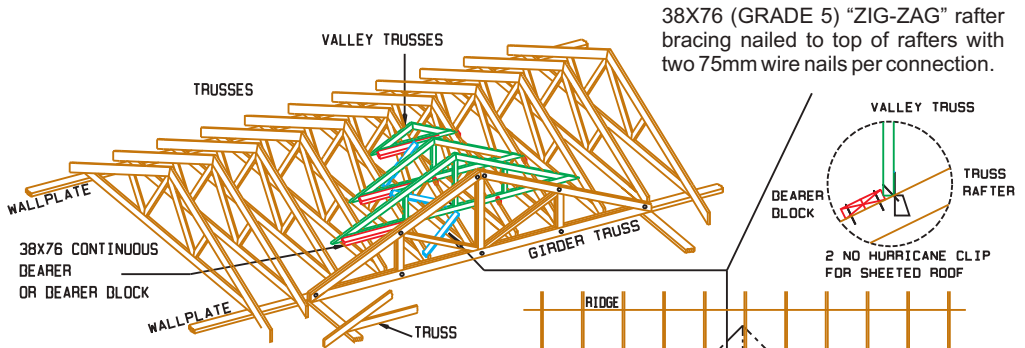
FIXING OF FLYING RAFTER TO TRUNCATED (FLAT) TOP CHORD



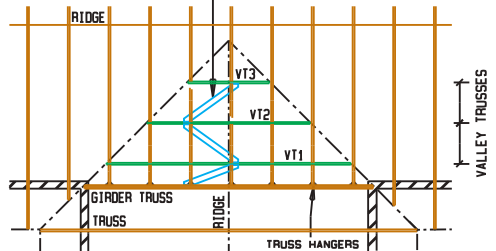
FIXING OF FLYING RAFTER TO TRUNCATED (FLAT) TOP CHORD



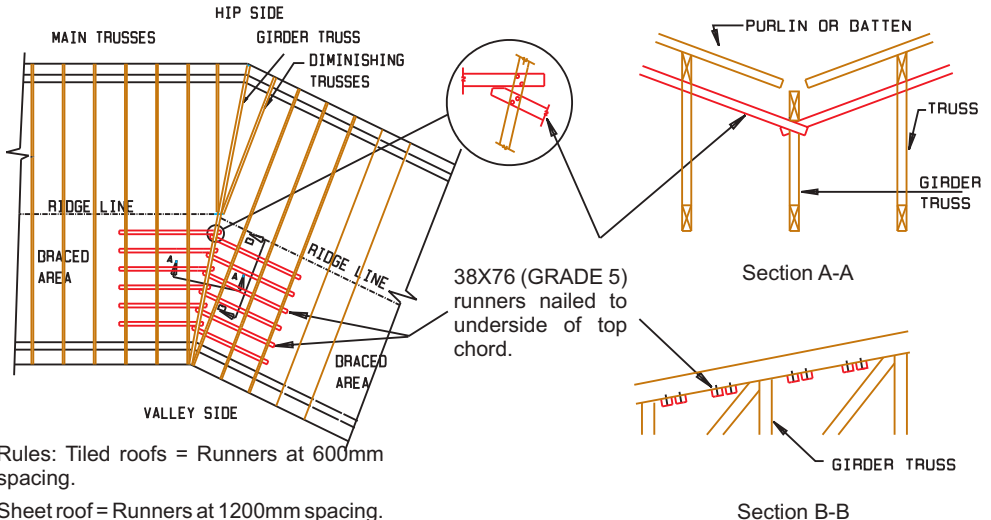
VALLEY FIXING DETAILS



Rules: Fixing of Valley Trusses.
 Valley Truss skew nailed to truss below.
 Tiled roofs = Bearer blocks nailed to main truss roof chord.
 Sheet Roof = Bearer block and 2 hurricane clips per connection.



CRANK CORNER - TOP CHORD RESTRAINTS ON VALLEY SIDE

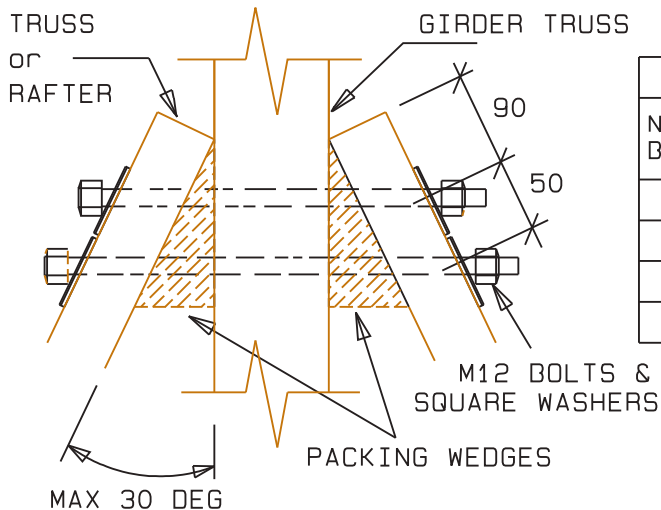


Rules: Tiled roofs = Runners at 600mm spacing.

Sheet roof = Runners at 1200mm spacing.

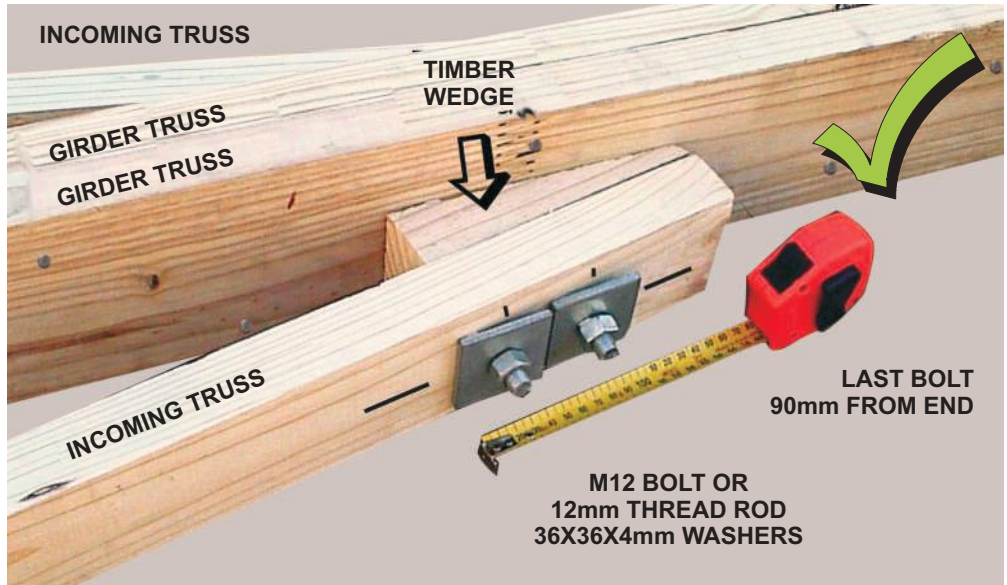
Each runner over THREE trusses.

CRANK TRUSS TO GIRDER TRUSS CONNECTION



| MAXIMUM TOTAL LOAD | | |
|--------------------|--------------|---------------|
| NO: OF BOLTS | NO: OF PLIES | FORCE IN (KN) |
| 1 | 1 | 1.7 |
| 2 | 1 | 3.4 |
| 1 | 2 | 3.4 |
| 2 | 2 | 6.8 |

TRUSS BOLTING TO HIP/VALLEY GIRDER - CRANKED BUILDING



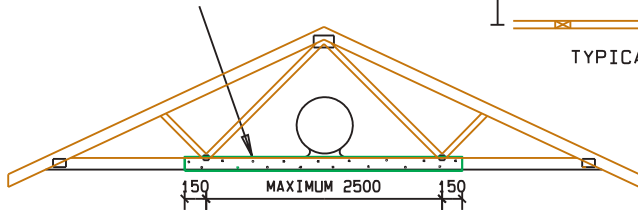
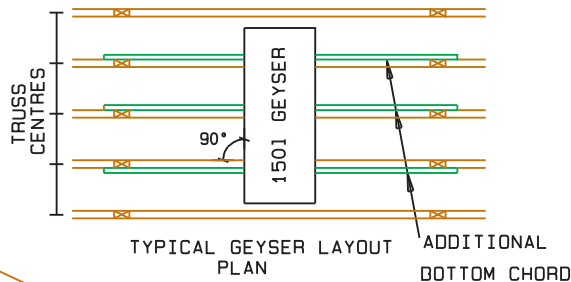
PAGE 43 - Detail 33 - Crank

Revision: 1

GEYSER PLATFORM DETAILS - UP TO 150 Litre GEYSERS ONLY - UP TO 8.0m SPAN TRUSSES ONLY

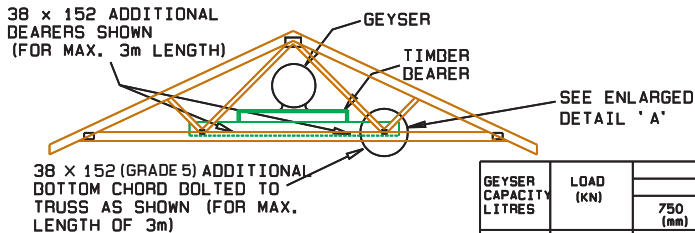
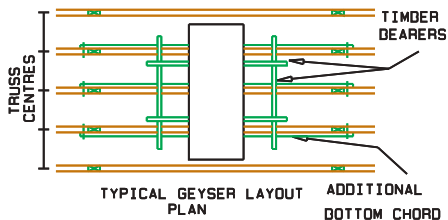
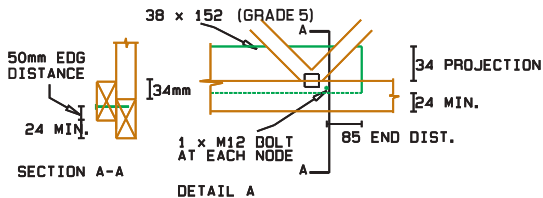
One additional bottom chord of the same size and grade nailed on with 75mm wire nails at 150mm staggered centres.

150mm overlap past the truss node at each end.



Rule: Geyser supported on two or three trusses.

GEYSER PLATFORM DETAIL - UP TO 250 Litre GEYSERS



| GEYSER CAPACITY LITRES | LOAD (KN) | SIZE OF MEMBER | | |
|------------------------|-----------|------------------------|------------------|------------------|
| | | SPAN OF TIMBER BEARERS | | |
| | | 750 (mm) | 1000 (mm) | 1500 (mm) |
| 100 | 1422 | 38x114 (GRADE 5) | 38x114 (GRADE 5) | 38x152 (GRADE 5) |
| 150 | 2200 | 38x114 (GRADE 5) | 38x114 (GRADE 5) | 38x152 (GRADE 5) |
| 200 | 2680 | 38x114 (GRADE 5) | 38x114 (GRADE 5) | 38x152 (GRADE 5) |
| 250 | 3340 | 38x152 (GRADE 5) | 38x152 (GRADE 5) | 38x152 (GRADE 5) |

Rule: Avoid supporting Geyser on trusses.
 Whenever possible use internal walls.

PART THREE - BRACING SYSTEMS

The roof is not complete without the correct bracing.

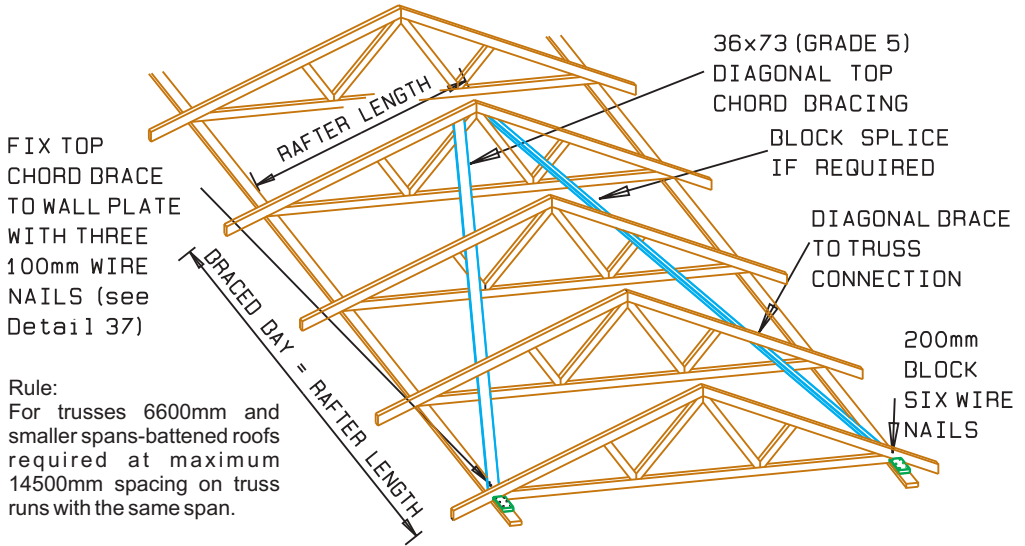
All parts of the bracing must be installed, if any part is missing or incorrect, then none of the bracing works.

All bracing connections to be built as shown in Part One.

The trusses must be straight and plumb before the bracing parts are fixed.

All bracing must be fixed before any roof covering, ceilings or other loads are put onto the roof structure.

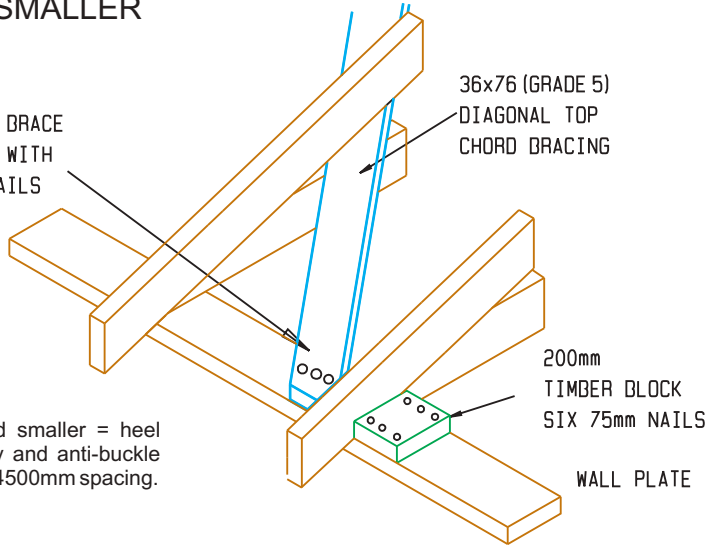
TOP CHORD STABILITY & ANTI-BUCKLE BRACING BATTENED ROOFS - 6.6m & SMALLER



TOP CHORD BRACING - BATTENED ROOFS 6.6m SPAN & SMALLER

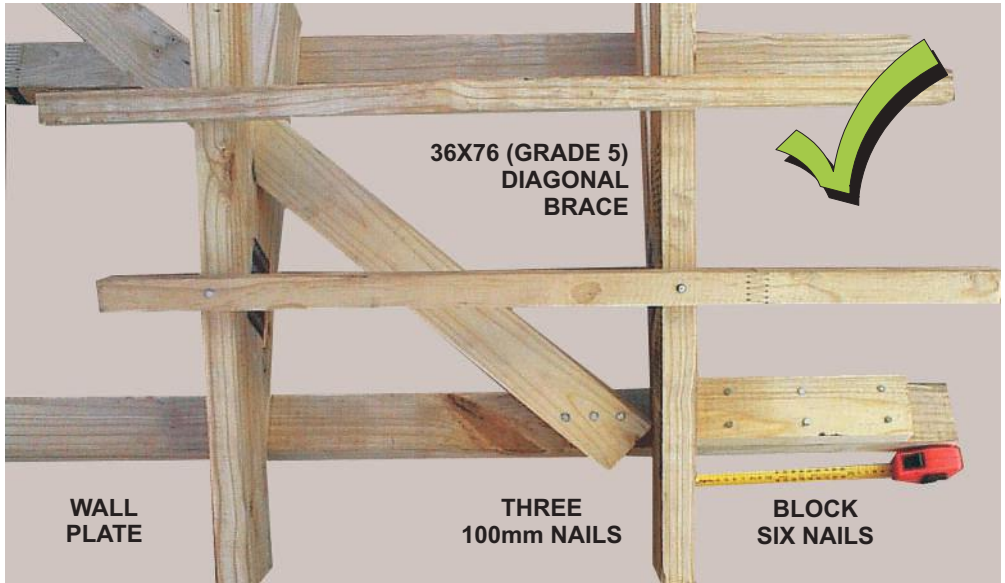
FIX TOP CHORD BRACE
TO WALL PLATE WITH
THREE 100mm NAILS

36x76 (GRADE 5)
DIAGONAL TOP
CHORD BRACING

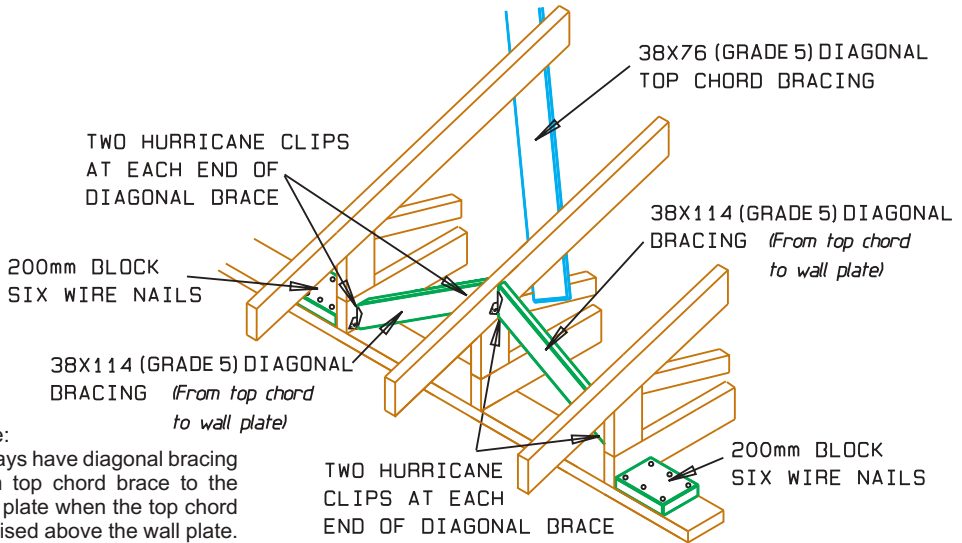


Rule:
For trusses 6.6m and smaller = heel
fixing for both stability and anti-buckle
bracing at maximum 14500mm spacing.

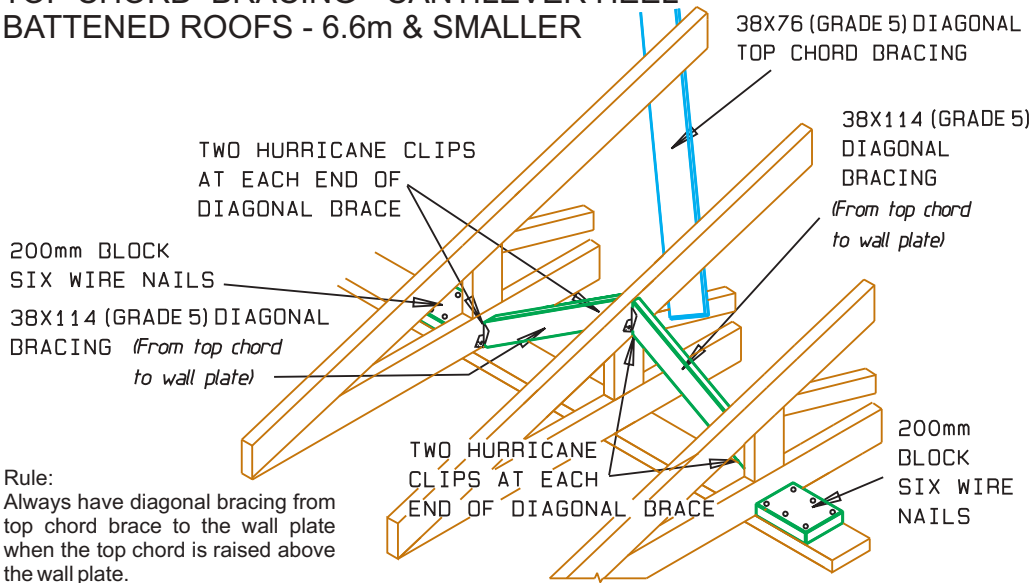
TOP CHORD BRACING AT WALL PLATE - 6.6m & SMALLER SPAN



TOP CHORD BRACING - STUB HEEL BATTENED ROOFS - 6.6m SPAN & SMALLER

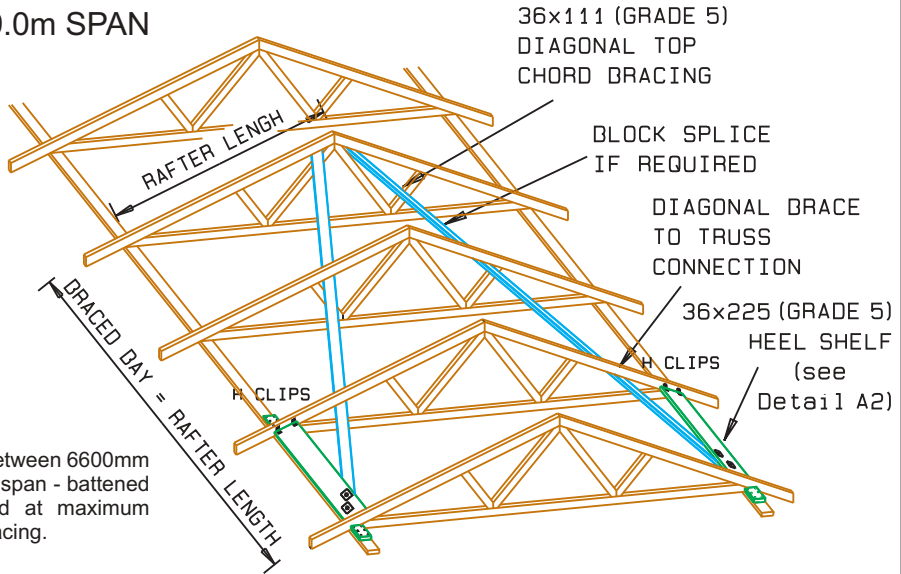


TOP CHORD BRACING - CANTILEVER HEEL BATTENED ROOFS - 6.6m & SMALLER



TOP CHORD BRACING - BATTENED ROOFS

6.6m to 9.0m SPAN

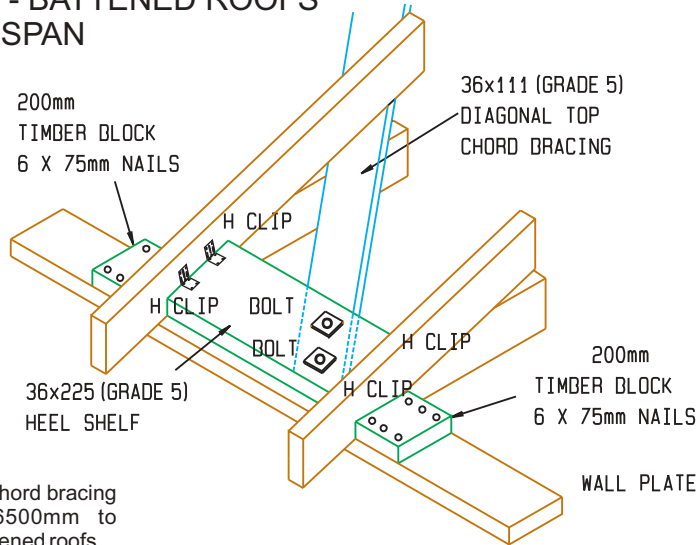


Rule:

For trusses between 6600mm and 9000mm span - batted roofs required at maximum 13500mm spacing.

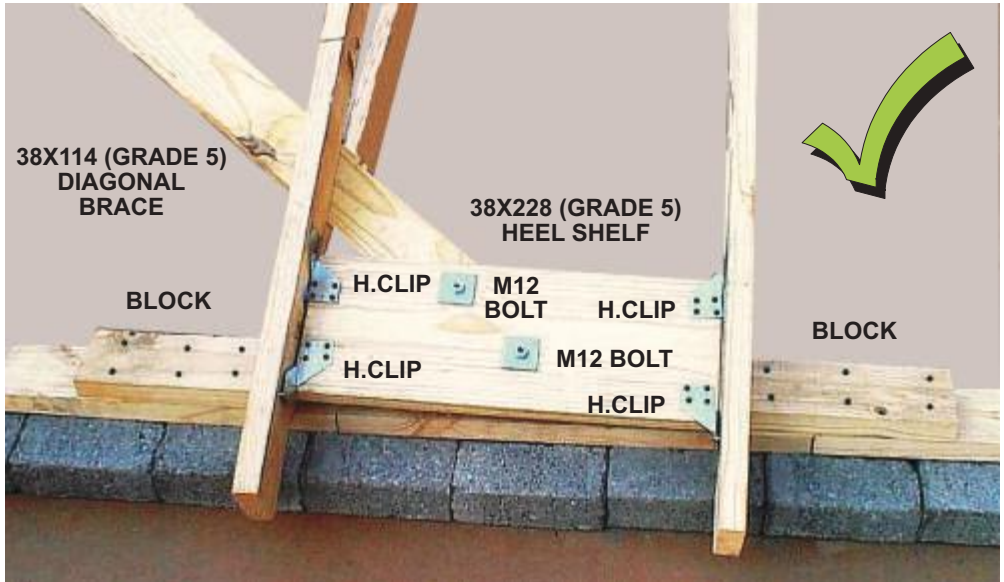
HEEL SHELF - BATTENED ROOFS

6.6m to 9.0m SPAN

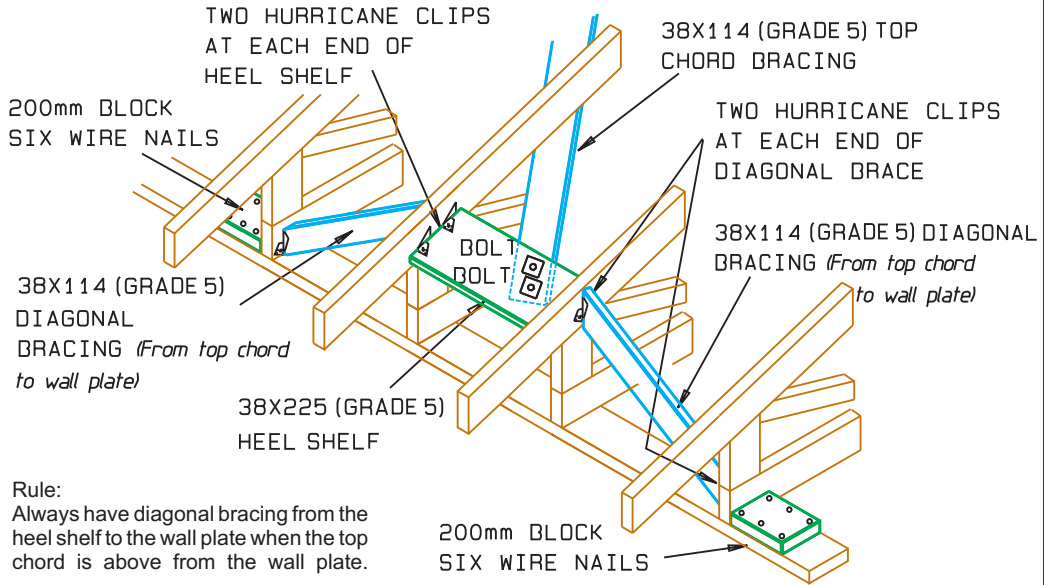


Rule:
Required on all top chord bracing
of trusses with 6500mm to
9000mm spans - batted roofs .

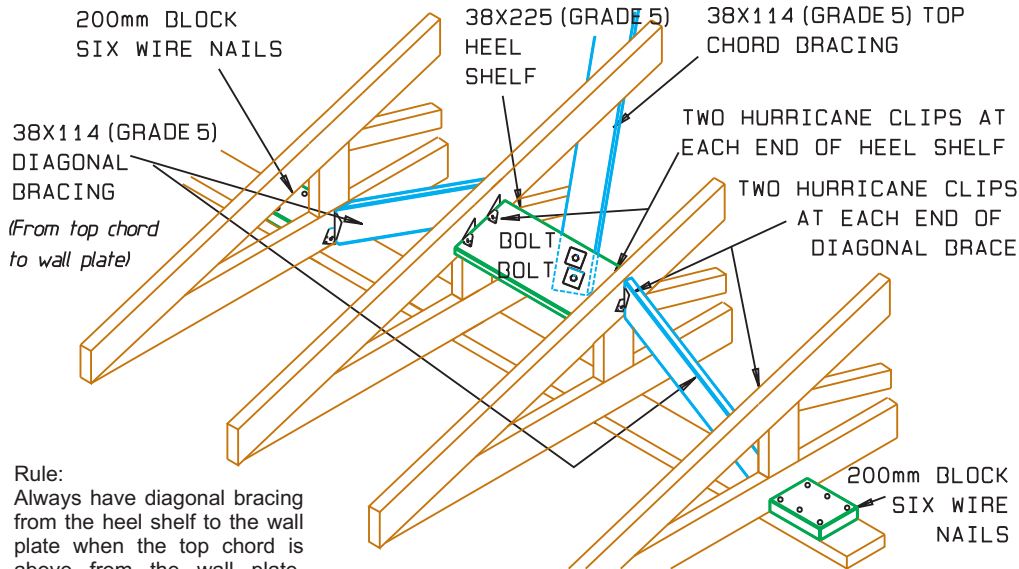
HEEL SHELF - BATTENED ROOFS - 6.6m to 9.0m SPAN



STUB HEEL SHELF - BATTENED ROOFS 6.6m to 9.0m SPAN



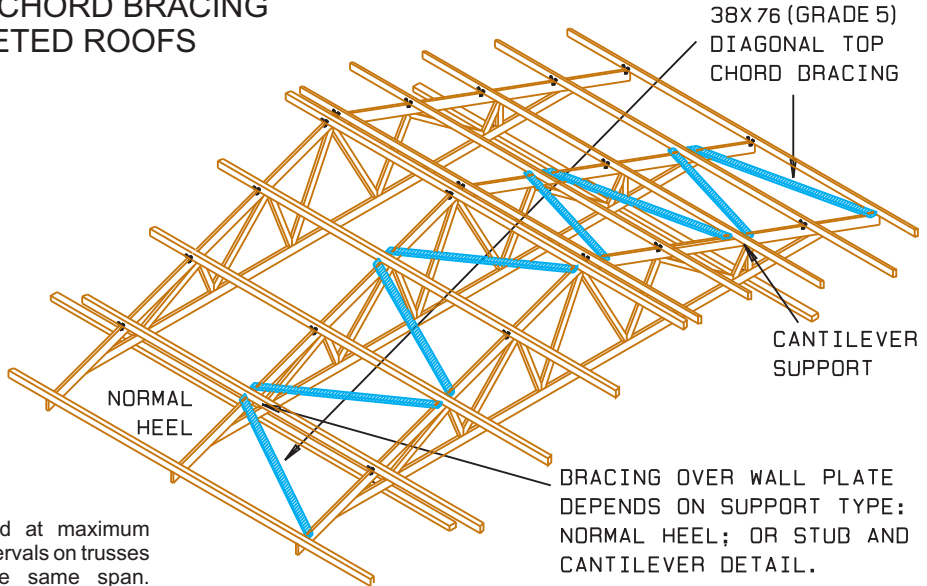
CANTILEVER HEEL SHELF - BATTENED ROOFS - 6.6m to 9.0m SPAN



Rule:

Always have diagonal bracing from the heel shelf to the wall plate when the top chord is above from the wall plate.

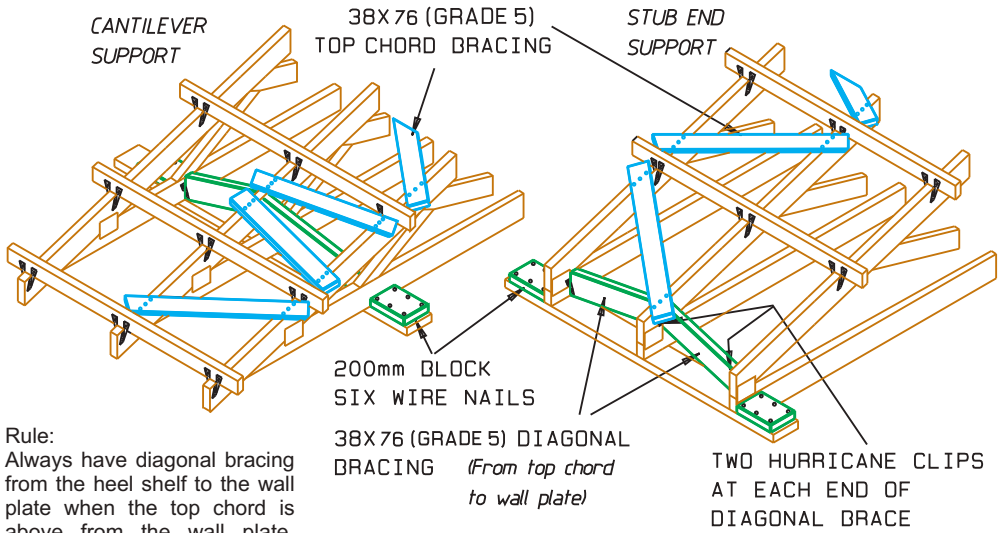
TOP CHORD BRACING SHEETED ROOFS



Rule:
Required at maximum
12m intervals on trusses
with the same span.

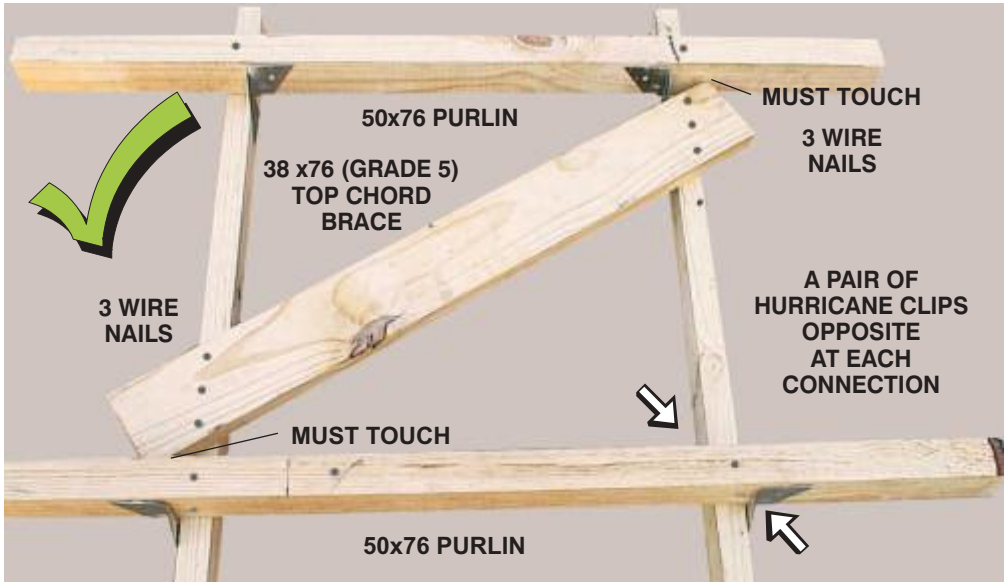
BRACING OVER WALL PLATE
DEPENDS ON SUPPORT TYPE:
NORMAL HEEL; OR STUB AND
CANTILEVER DETAIL.

CANTILEVER & STUB HEELS - SHEETED ROOFS



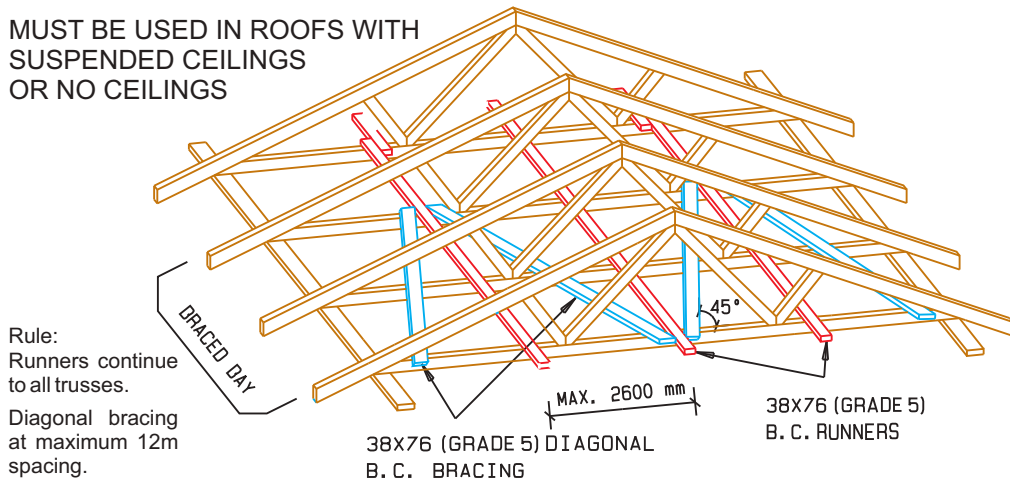
Rule:
Always have diagonal bracing from the heel shelf to the wall plate when the top chord is above from the wall plate.

TOP CHORD BRACING FOR SHEETED ROOF



BOTTOM CHORD RUNNERS & BRACING

MUST BE USED IN ROOFS WITH
SUSPENDED CEILINGS
OR NO CEILINGS

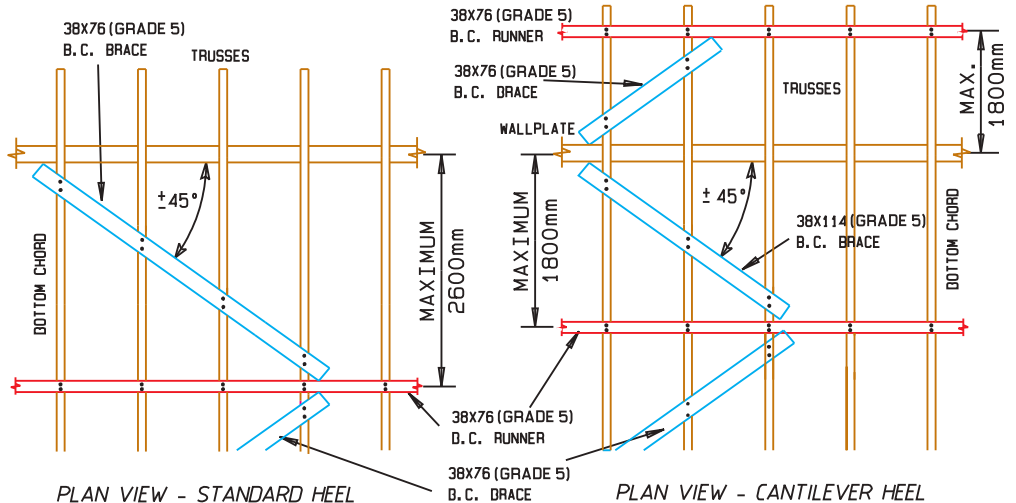


Rule:
Runners continue
to all trusses.

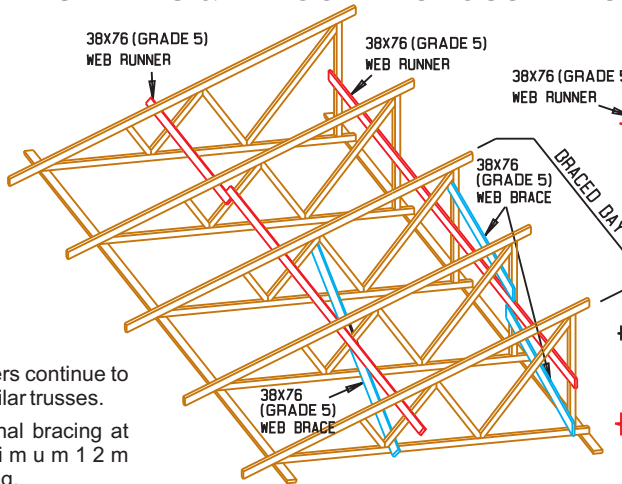
Diagonal bracing
at maximum 12m
spacing.

NB! The roof plan and truss details supplied must show when and where bottom chord runners and bracing are required for trusses.

BOTTOM CHORD RUNNERS & DIAGONAL BRACING

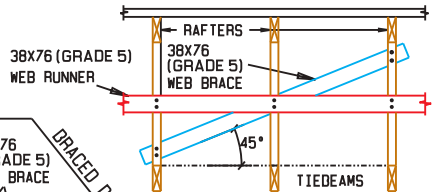


WEB RUNNERS & DIAGONAL CROSS BRACING



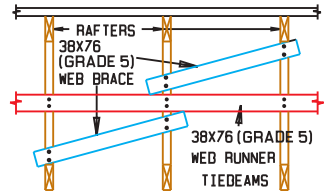
Rule:
Runners continue to all similar trusses.
Diagonal bracing at maximum 1.2 m spacing.

NB! The roof plan and truss details supplied must show when web runners and bracing are required on truss webs.



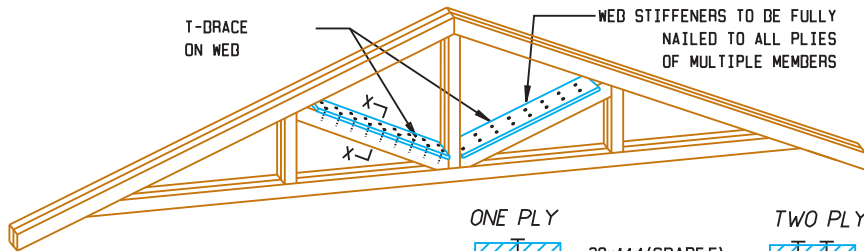
RUNNER AND BRACING ON OPPOSITE SIDE OF WEB (NORMAL)

PURLIN OR DATTEN



RUNNER AND BRACING ON SAME SIDE OF WEB (AGAINST WALL)

"T" BRACING ON TRUSS WEBS



Rule:

T-brace goes from top to bottom chord.

Nail with 75mm wire nails.

Nail distance apart = 300mm (two hands).

Nail into every ply.

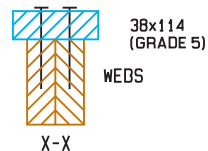
NB! The roof plan and truss details supplied must show when T-bracing is required on truss webs.

ONE PLY



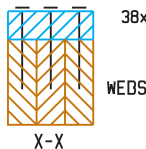
38x114 (GRADE 5)

TWO PLY



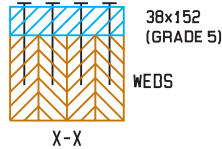
38x114 (GRADE 5)

THREE PLY



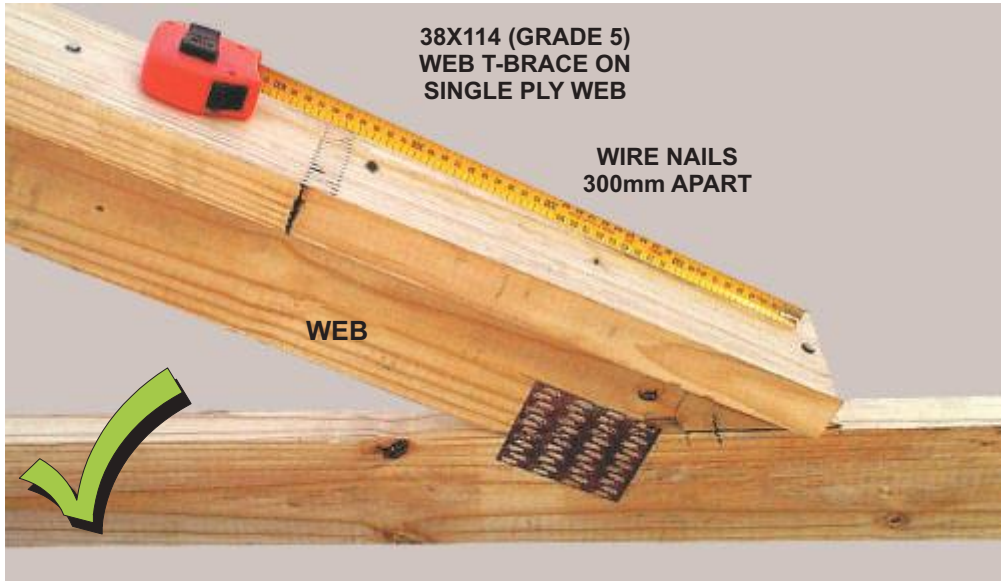
38x114 (GRADE 5)

FOUR PLY



38x152 (GRADE 5)

"T" BRACING ON WEBS - LESS THAN THREE TRUSSES IN A ROW



PART FOUR - CHECK LIST

| | PAGE REFERENCE | DONE CORRECTLY |
|--|--------------------|----------------|
| Drawings on site | | ✓ |
| Truss spacings correct | 13 | ✓ |
| Top and bottom chords straight | 11 | ✓ |
| Trusses plumb and level | 11, 12 | ✓ |
| Trusses tied down and wedges nailed | 12, 13 | ✓ |
| Girders (correct ply) and fully nailed | 22 | ✓ |
| Required bolts and washers in & tightened | 18 | ✓ |
| Hangers fully nailed | 20, 21 | ✓ |
| Battens / Purlins correctly spliced | 14 to 17 | ✓ |
| Purlins fixed with hurricane clips / wire | 58 | ✓ |
| Hips correctly installed | 29 to 39 | ✓ |
| Valleys installed | 40 | ✓ |
| Top chord bracing installed (incl. Heel shelf) | 23 to 25, 46 to 59 | ✓ |
| Bottom chord runners and bracing installed | 23 to 25, 60, 61 | ✓ |
| Web runners and bracing installed | 23 to 25, 62, 63 | ✓ |
| "T" bracing on webs installed | 64, 65 | ✓ |

GLOSSARY OF TERMS AND DEFINITIONS

- Apex:** The top of the truss where the two rafters meet. (Page 74)
- Batten:** Small timber sections (usually 38x38 or 38x50) nailed across the top chords at small spacings to carry concrete tiles, slates, metal tiles etc. (Page 14)
- Binder:** See runner.
- Block splice:** Nailed timber block used to join butting bracing members and purlins. (Page 16, 25)
- Bottom chord:** Also tie-beam. That part of the truss that forms the bottom edge, and connects the two heel joints, usually flat, and supports the ceiling. Sloped in scissor trusses. Abbreviated B.C. (Page 74)
- Braced Bay:** That section of roof where the diagonal bracing members are fixed. (Page 47, 52, 57, 60, 62)
- Bracket:** See cleat.
- Bracing:** Timber (or other) members fixed to several trusses, usually at a 45 degree angle to make the roof stable, and to prevent buckling. (Page 47, 52, 57, 60, 62)

- Branding:** Similar to battens, but fixed to the bottom chord, to which the ceiling is nailed. (Page 74)
- Cantilever:** When the truss support on the bottom chord is some distance inside the heel joint. (Page 75)
- Clear span:** The distance between the supporting walls. (See span) (Pg. 74)
- Cleat:** Mild steel heavy-duty bracket fixed with bolts and used to support large heavy trusses on a girder. (Page 19)
- Crank:** When the support wall direction change is less than 90 degrees. The roof forms a bastard hip on one side, and a valley on the other in double-pitched roofs. (Page 41)
- Clout nails:** Wire nails 32mm long, 2mm thick, with a large head used to fix hangers, hurricane clips and pre-punched strapping.
- Double pitch:** Trusses where the top chords slope up at the same angle from both ends. (Page 74)
- Dual pitch:** The top chords slope at different angles from each end.
- Dutch hip:** A hip end where the side slope does not reach the apex, but the top part of the hip forms a small gable. (Page 34)

- Fly rafter:** That part of the mono pitch jack truss top chord which extends over the truncated hip girder and trusses. (Page 32, 33, 36)
- Gable:** When the building end is vertical, the same shape as the truss, usually brickwork.
- Girder truss:** A truss (single or multiple ply) used to support other trusses.
- Hanger:** A U-shaped bracket made of thin galvanized mild steel used to support trusses on a girder, usually fixed with 32mm clout nails or similar. Sometimes also fixed with bolts and washers. (Page 20)
- Heel:** The truss end joint where the top and bottom chords connect, or where the end web joins the bottom chord in stub and mono-pitch trusses. (Page 74)
- Heel shelf:** A means of fixing the diagonal top chord bracing at the wall plate using timber, bolts and hurricane clips. (Addendum 2 to 6)
- Hip:** When the building ends in a sloped roof. (Page 29 to 35)
- Hoop iron:** Galvanized metal strips built into brickwork used to hold down trusses. (Page 13)

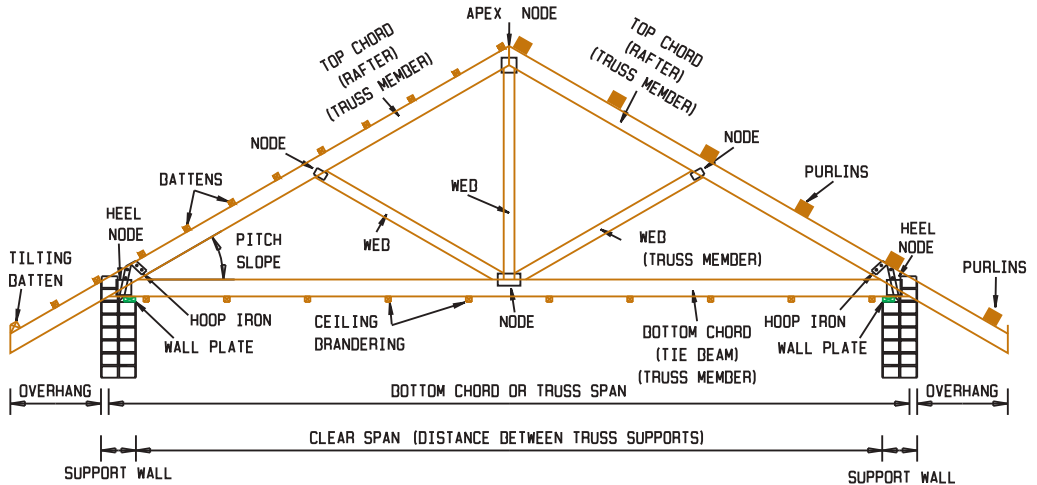
- Hurricane clip:** A thin galvanized mild steel angle bracket used to fix two timber members at 90 degrees to each other. (Page 15, 38, 50, 59)
- Jack rafter:** The smallest end part of a hip construction using only single pieces of timber. (Page 29 to 35)
- Jack truss:** The mono pitch trusses of the hip, which are supported at the high end by the hip girders. (Page 29 to 35)
- Member:** A part, or component, which together with other members make up the structure. (i.e. truss members are the top chords, bottom chords and webs which form the truss) (Page 74)
- Mono pitch:** A truss where there is only one rafter slope. (half of a double pitch truss)
- Multiple plies:** Two to four trusses nailed and bolted together to form one unit. Usually girders. (Page 22)
- Nails:** See Clout nails and Wire nails.
- Nib:** Extensions of the bottom chord past the truss end, usually to support in brickwork or on a truss hanger.

| | |
|-------------------|---|
| Node: | Also node point. The places on the truss where two or more truss members are connected to each other (but not chord splices) (Page 74) |
| Overhang: | That part of the truss top chord that extends past the truss heel. Measured horizontally from the truss heel on the truss, but also from the outside wall face on the building. (Page 74) |
| Pitch: | Also slope, the angle between the top chord and the horizontal line from the support point. (Page 74) |
| Plumb: | Trusses to be in a vertical line, i.e. 90 degrees to the floor (horizontal) level and parallel to the gable wall. (Page 12) |
| Plumb cut: | Top chord overhangs cut off vertical, i.e. Up / down. |
| Purlin: | Timber members (50x76) fixed across the top chords at up to 1.15m spacings to carry metal and fibre cement sheeting. (Page 15 to 17) |
| Rafter: | See top chord. |
| Runner: | Also binder. Bracing members that run continuously through the entire roof or set of the same trusses, to connect the same point of each truss. (Page 59 to 63) |

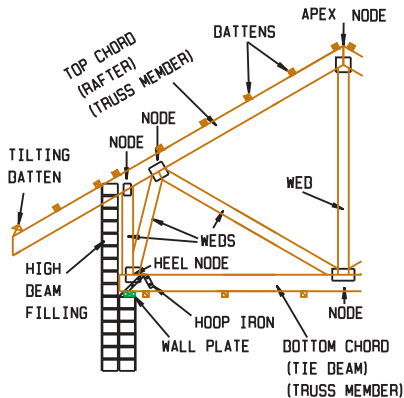
- Spacing:** The distance between the centres of two of the same elements, i.e. trusses and bracing members. (Page 14)
- Span:** Truss span is the distance along the bottom chord between the truss ends (heels) See also clear span. (Page 74)
- Stub end:** Also stub heel. Where the top and bottom chords are some distance apart and connected by the first truss web. (Page 75)
- Support:** The position where the truss is supported on the load-bearing wall, (or a beam, truss hanger or cleat), usually on a timber wall plate. There must always be a node at the support point of the truss. (Page 74)
- Top chord:** Also rafter. That part of the truss, which forms the top edge, usually at a slope, and has the battens or purlins fixed to it to carry the roof covering. Abbreviated: T.C. (Page 74)
- Truncated:** When a hip truss or girder has a part flat top chord, at a height so that the fly rafters of the jack trusses can just pass over the top. (Page 32, 33, 36 to 39)

- Truss:** A number of timber members joined together in a triangular pattern to form a sturdy frame to carry the roof covering and all other loads that it is designed for. (Page 74)
- Truss Labels:** All trusses should be labelled on the roof layout and the truss itself. Common labels are A1, TR1, GX1, TG1, HG1, HM1, etc.
- Valley:** A set of special trusses with decreasing spans which are supported on the length of the bottom chord by the trusses underneath, fixed at 90 degrees to these trusses. (Page 40)
- Valley truss:** A truss, which is supported by other trusses underneath.
- Wall plate:** A timber member laid flat over the supporting wall to level and spread the truss load onto the bearing surface. (Page 74)
- Webs:** The truss members that connect the top and bottom chords, usually in a triangular pattern. (Page 74)
- Wedges:** Triangular timber block used in pairs to level the truss. (Page 12)
- Wire Nails:** 75mm or 100mm long, 3 to 4mm thick wire nails with a head used to connect two timber members together.
- Wire ties:** Two strands of wire built into the brickwork to hold down trusses.

TYPICAL DOUBLE PITCH TRUSS

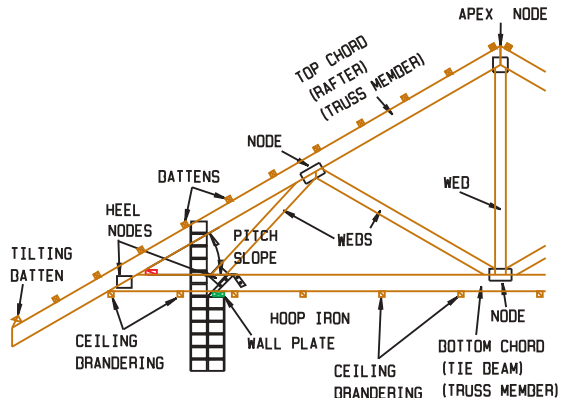


TYPICAL STUB AND CANTILEVER HEELS



SUPPORT WALL

TYPICAL STUB HEEL



SUPPORT WALL

TYPICAL CANTILEVER HEEL

ITC-SA ROOF CATEGORIES

ROOF CATEGORY A

Very Complex roofs, including

1. Scissors Trusses > 5 meters
2. Site Splicing
3. Attics and Dormers
4. Very large spans greater than 10 meters
5. Piggy Back Trusses
6. Cantilevers > 2 meters
7. Complex Industrial
8. Complex Commercial
9. Laminated Timber Roof Structures
10. Public Buildings & Schools

ROOF CATEGORY B

Complex Domestic and Simple Industrial and Commercial Roofs, including up to 10 meter span:

1. Hips and Valleys up to 10 meter span
2. Non standard Loads
3. Scissor Trusses up to 5 meters

ITC-SA ROOF CATEGORIES

ROOF CATEGORY C

Simple roofs up to and including 9.0 metre spans with standard loadings, and including the following:

1. Valleys.
2. Girders with hangers and/or metal cleats.
3. Stub ends.
4. Cantilevers up to a span of 2.0 metres.
5. Simple hips up to a span of 9.0 metres.
6. Minimum pitch 5 degrees.

ROOF CATEGORY D

Simple roofs up to and including 6.6 metre spans with standard loadings, and including the following:

1. Small valleys up to a span of 3.0 metres.
2. No hips

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Institute for Timber Construction

Information contained in this Handbook has been compiled by a Working Group with many years experience in the timber roofing industry. Their input and hard work in this regard is much appreciated. We wish to thank, Stefan Münster, Roly Adams, Victor Booth, Ken Downhams, Mike Hull, Gert de Jager, Tom Harper, Graham Retief, Eddie Bock and Ralph Sorensen.

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