

INTRODUCTION

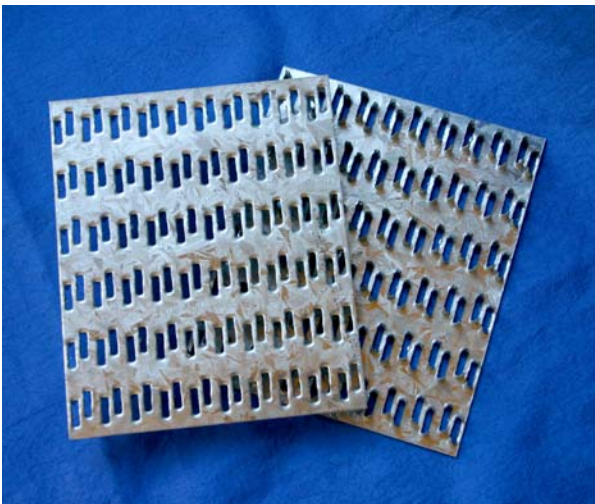
MiTek Australia Ltd revolutionised house construction in Australia when it introduced the use of Gang-Nail multi-tooth connectors for the manufacture of prefabricated timber trusses in the 1960's.

Before Gang-Nail trusses were available, all house carpentry was carried out on site. Timber has always been a "craft" material with scantling sizes and joints based on established carpentry practice. The post-war building boom demanded a more efficient use of materials and labour.

The Gang-Nail System of roof trusses was the first major component of a house to be prefabricated. Wall frames followed, and now floor frames in the form of PosiSTRUT® trusses are also manufactured off-site. The prefabrication of components for houses enables quicker construction schedules, better quality control and reduces construction costs.

The Gang-Nail System allows the principles of structural engineering to be applied to house building. The science of Timber Engineering has also come of age since the introduction of the Gang-Nail System.

The Gang-Nail Truss System is based on the Gang-Nail timber connector which is a steel plate with multiple spikes or nails projecting from one face. The connectors are pressed into the surface of the timber using large hydraulic presses, causing the nails to embed in the timber. Timber elements can be joined together with strength and ease to make trusses and other structural timber components.



The ease of installation and effectiveness as a timber connector make Gang-Nail connectors ideal for the prefabrication industry where speed and reliability are paramount. The name "Gang-Nail truss" has now become synonymous with quality prefabricated timber roof truss.

As the benefits of lightweight timber roof trusses became apparent, their use spread to industrial and commercial projects as a viable alternative to traditional steel structures.

The Gang-Nail System has also spawned a whole range of ancillary connectors for timber, such as Trip-L-Grips, Joist Hangers and Tylok plates, as well as built-up solid members such as the Gang-Nail ConstructaBEAM Floor Joists, Rafters and Purlins.

MiTek Australia Ltd does not actually manufacture trusses. The company manufactures the steel connector plates and ancillary items which are supplied to a select national network of independent, licensed truss fabricators. Each of these companies has been chosen as a MiTek licensee because of their high standards of management and for their professionalism within the building materials industry.

The supply of connectors is only a small part of MiTek Australia Ltd's activities. It is the technical support provided to MiTek's licensees which is the true strength of the Gang-Nail System.

Technical support starts with the state-of-the-art connector plate design and includes MiTek's commitment to research and development both within Australia and internationally.

A rigid program of quality control is applied during manufacture. This ensures that the steel used in the manufacture, and the finished product, meets the highest standards. In recognition of this, MiTek Australia Ltd. at Lyndhurst, Victoria, has been certified as a Quality Endorsed Company to ISO 9001.



MiTek Australia Ltd. has an engineering design office to assist MiTek licensed fabricators with truss designs, and to provide engineering details on unusual roofing designs. Over the years, computer programs developed for this truss design service have evolved into sophisticated programs, which MiTek licensed fabricators can use themselves to prepare quotations and to design and detail roof trusses and wall frames. These programs – MiTek20/20, DataTRUSS®, RoofFAB and Panel – also provide the MiTek licensed fabricator with a means of stock control, production scheduling and performance overview.

MiTek Australia Ltd. also provides training to its licensed fabricator staff in all aspects of truss fabrication and truss plant operation.

Today it is this innovative and extensive technical support which maintains MiTek Australia Ltd's leadership in roof truss and associated industries.

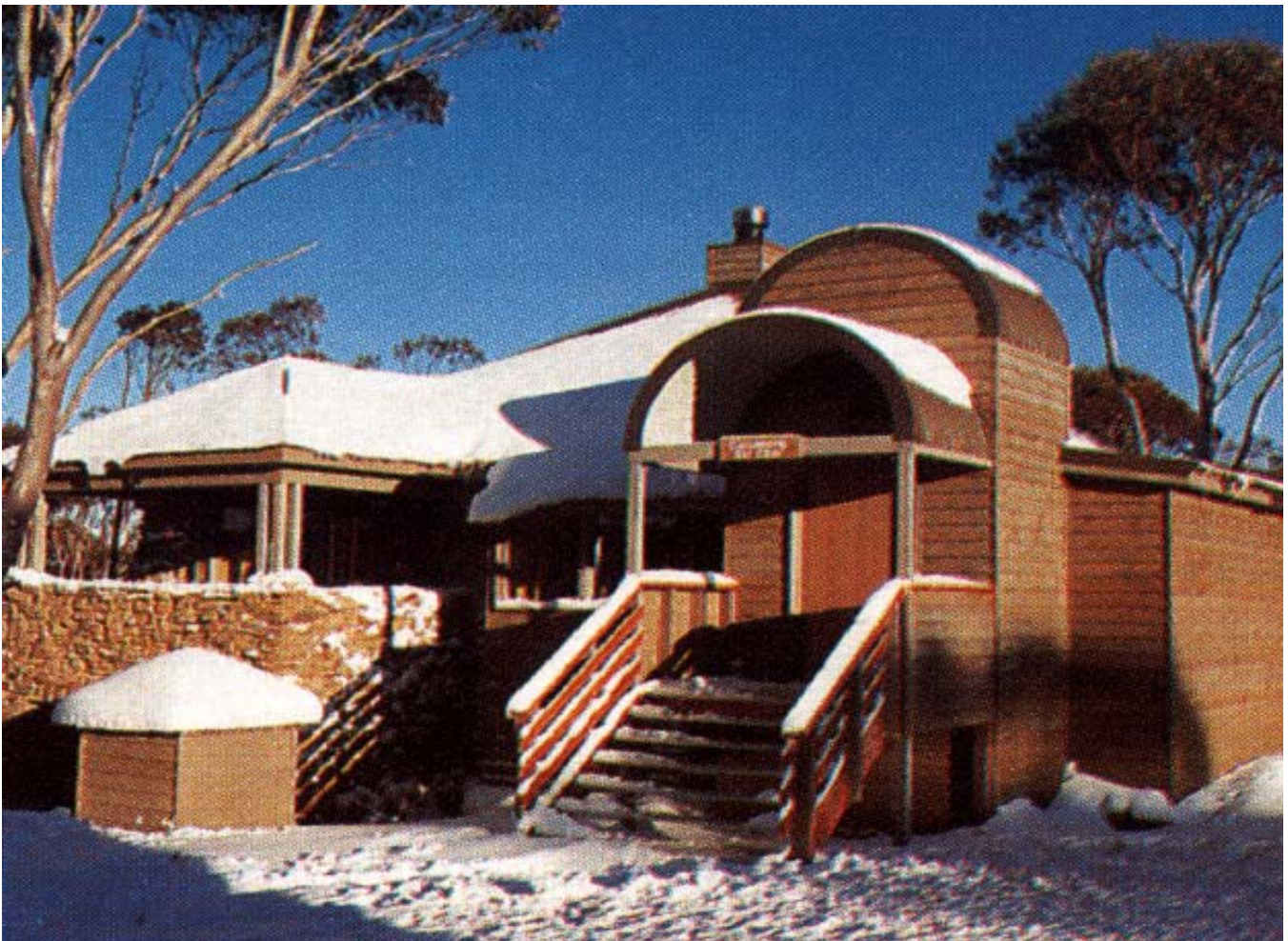
Advantages of Gang-Nail Roof and Floor Trusses

Prefabricated timber roof and floor trusses offer greater design freedom, guaranteed strength and improved project cost control.

Almost any shape of truss is practicable and economical. Intricate roof surfaces and ceiling profiles can be achieved, and trusses can be designed for a variety of roof loadings – ranging from cyclonic winds to snow loads – with spans up to 30 metres. Visually, the bold patterns of exposed structural truss elements can be used to architectural advantage.

Gang-Nail trusses meet the Australian Standards for Timber Structures, Dead loads, Live loads and Wind loads. The timber specified for each truss element is described by both size and Stress Grade. Gang-Nail connector plate sizes specified for each truss joint are determined by the forces being transmitted and the nail-holding capacity of the type of timber in the truss.

Prefabricated trusses are cost-effective – trusses use the inherent strength of timber efficiently and factory automation brings the economies of scale to even the shortest production run. Site labour and supervision are greatly reduced and the effects of the weather on construction programs are minimised.



TRUSS TERMINOLOGY

Technical terms used in the truss industry may not be familiar. Some of the more common are listed below and are illustrated on pages 8 & 9.

Apex:

The highest point on a truss.

Barge:

Trim along the edge of roofing at a gable end. Slopes at roof pitch. It is fixed to ends of battens, purlins or verge rafters.

Batten:

Roofing battens or ceiling battens. Usually timber members fixed at right angles to the truss chords to support roof tiles or ceiling material. Also provides lateral restraint to the truss.

Bearing/Support point:

Point at which the truss is supported. A truss must have two or more supports located at truss panel points.

Bottom chord:

Truss member forming bottom edge of truss.

Butt joint Splice:

End-to-end joint between two pieces of timber.

Camber:

Vertical displacement built into a truss to compensate for the downward movement expected when truss is fully loaded.

Cantilever:

That part of a truss that projects beyond an external main support, not including top chord extensions or overhangs.

Chord:

The truss members forming the top and bottom edges of the truss.

Clear span:

Horizontal distance between inner edges of supports.

Concentrated load:

A load applied at a specific position. e.g. load applied by an intersecting truss.

Connector:

Light gauge steel plates with teeth projecting from one face. When pressed into intersecting timber members the plate connects the members in a rigid joint.

Creep:

Movement resulting from long-term application of load to a timber member.

Cut-off:

Description of a truss based on standard shape but which is cut-off short of its full span.

Dead Load:

Permanent loads due to the weight of materials and truss self-weight.

Deflection:

Vertical and horizontal movement in a truss due to the applied load.

Design Loads:

The various loads that a truss is designed to support.

Distributed Load:

Loads spread evenly along truss member.

Fascia:

Trim along the edge of the eaves.

Gable Truss:

Standard triangular shaped truss.

Girder Truss:

Truss designed to support one or more trusses.

Heel Joint:

The joint on a truss where the top and bottom chords meet.

Heel Point:

The position on a truss where the bottom edge of the bottom chord meets the top chord. Used for setting up production jigs

Hip:

Intersection of two roof surfaces over an external corner of a building.

Hip Roof:

Roof constructed with rafters or trusses pitched over all perimeter walls.

Joint Strength Group:

Classification of timber according to its ability to perform with fasteners such as bolts, nails and Gang-Nail connectors. The grouping depends on timber species and moisture content.

King Post:

Vertical web at the centre of a gable truss, or the vertical web at the end of a half gable truss.

Lateral Brace:

Bracing restraint applied at right angles to web or chord to prevent buckling.

Longitudinal Tie:

Bracing restraint applied at right angles to web or chord to prevent buckling.

Live Load:

Temporary load due to traffic, construction, maintenance etc.

Overall Length:

Length of truss excluding overhangs.

Overhang:

Extension of top chord beyond support. Provision of eaves on gable trusses.

Nominal Span:

The horizontal distance between supports of a truss.

Panel-point:

The point where several truss members meet to form a joint.

Panel-point Splice:

Splice joint in a chord coinciding with web intersection.

Pitch:

Angular slope of truss chord measured in degrees.

Purlin:

Roofing purlins. Usually timber members fixed at right angles to the truss chords to support roof sheeting. Also provides lateral restraint to truss. Similar to battens except more widely spaced.

Rafter:

A roof member supporting roofing battens or roofing purlins in conventional construction. Rafters employ only the bending strength of the timber. A roof truss may also be called a trussed rafter.

Ridge:

The highest point on a gable roof.

Span:

The horizontal distance between the outer edges of the truss supports.

Span Carried:

The span of standard trusses that are supported by a girder truss

Stress Grade:

Strength classification of timber. Based on species, seasoning and frequency of defects such as knots and sloping grain. Alternatively based on actual mechanical testing of each piece.

Station:

The position of a truss measured from the outside face of the end wall. Usually used to describe the position of truncated Girder and Standard trusses in a Hip End.

Strut:

Structural member subject to axial compression. In the context of truss, this term is used for compression webs.

Symmetrical Truss:

Truss with symmetrical configuration and design loading.

Top Chord:

Truss member forming top edge of truss.

Truss:

Trussed rafter. Triangulated, self-supporting framework of chords and webs that supports applied loads by a combination of the bending strength of the chords and the axial compressive and tensile strength of the chords and webs.

Valley:

Intersection of two roof surfaces over an internal corner of a building.

Verge:

Roof overhang at a gable-end.

Verge Rafter:

Rafter projecting from gable end to support verge.

Waling Plate:

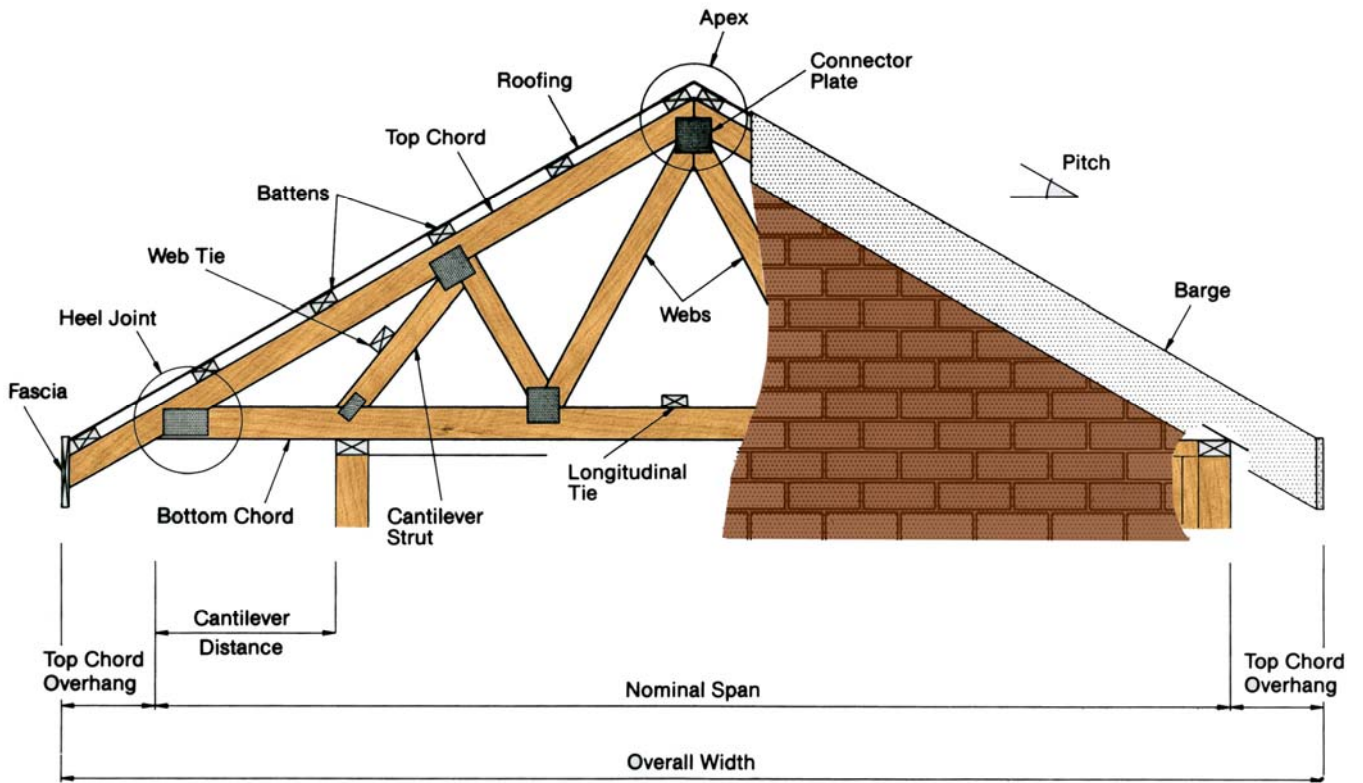
Timber member bolted to the face of a truss to support intersecting rafters or trusses. May also be used to support intersecting battens or purlins.

Web:

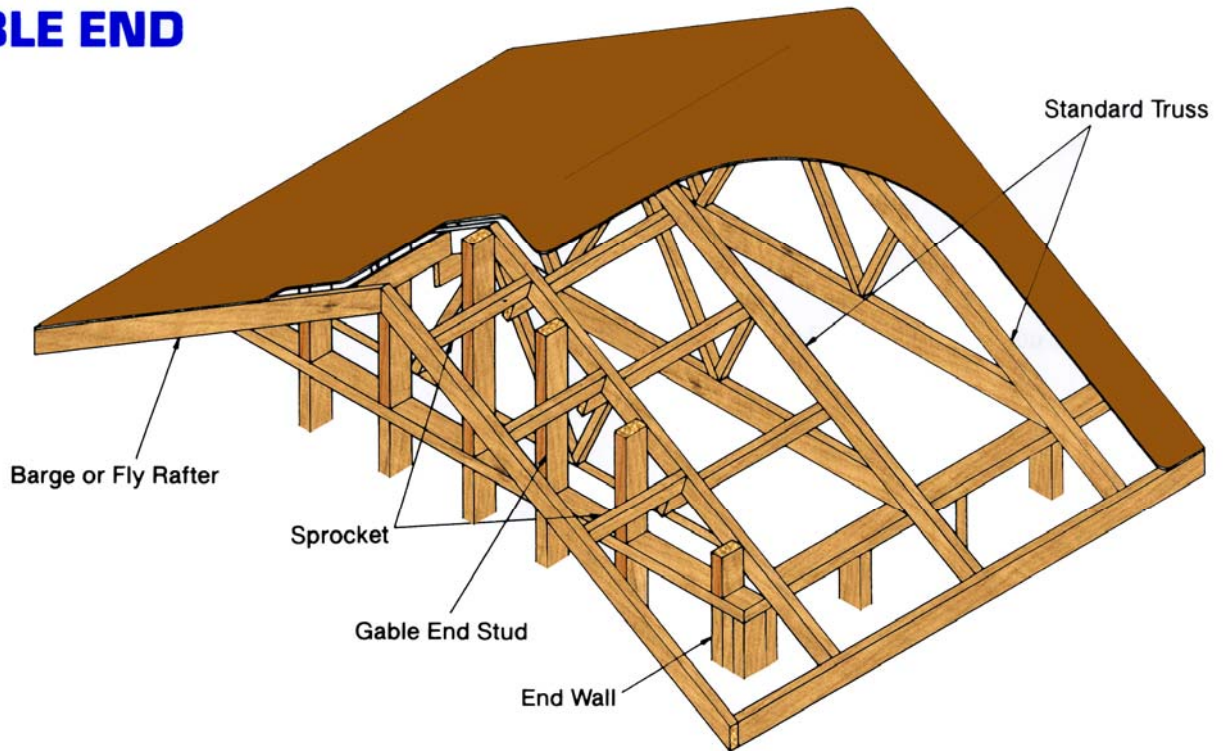
The internal members of a truss. Usually only subject to axial loads due to truss action.

Wind Load:

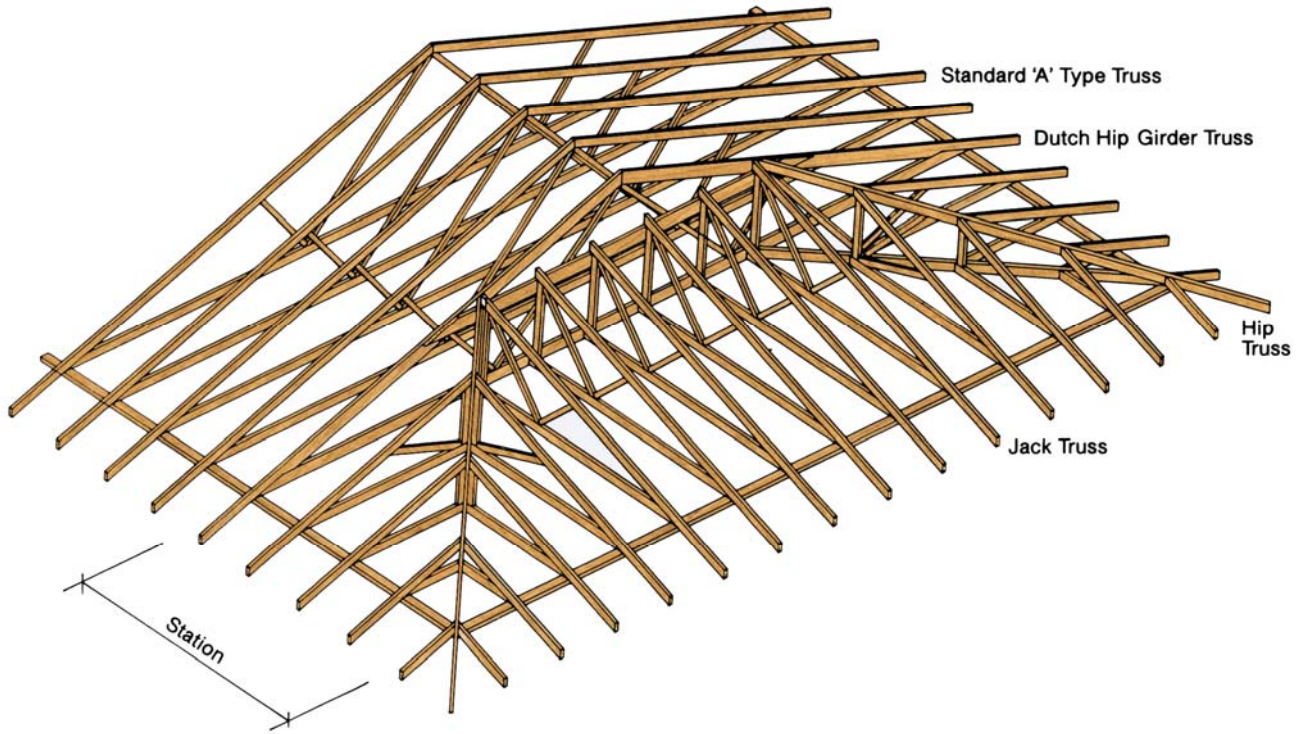
Load applied to the roof by the wind.



GABLE END



DUTCH HIP END



HIP END

