

Roof Truss System

Advantages of Roof Trusses

Gang-Nail trusses are an economical construction method for all types of roofs. The Gang-Nail System also allows solutions to many problems associated with complex roofs.

Design Flexibility

In domestic construction only the perimeter walls need to be designed as load-bearing walls when roof trusses are used. Internal walls become simple partitions and can be arranged without the need to provide supports for propping beams, hanging beams, etc. The sub-floor structure is simplified as stumps and bearers don't need to be arranged under internal non load-bearing walls and where concrete slab floors are used, the arrangement of internal beams is simplified.

Strength

Trusses are designed to engineering standards with a substantial factor of safety applying to every truss in the roof. Traditional 'stick built' roofs are based on historical carpentry practices, which are conservative, and so they use much greater quantities of timber to achieve acceptable factors of safety. The strength reserve of these traditional roofs and their supporting walls is also variable and depends on the skill of the individual carpenter.

Truss roofs can be designed to resist uplift due to wind suction and can be tied down to the supporting frame with greater security than is easily obtained with traditional roofs.

With trussed roof construction only external walls are load bearing, making the design of floor structure simple and inexpensive.

Project Management

Trusses shorten the construction time. With trusses, most roofs can be installed in one working day. Delivery and erection can be coordinated with the completion of the frame. Site labour requirements are reduced, as is the impact of wet weather on the construction program. Because trusses are manufactured specifically for each project, costly pilfering is virtually eliminated.

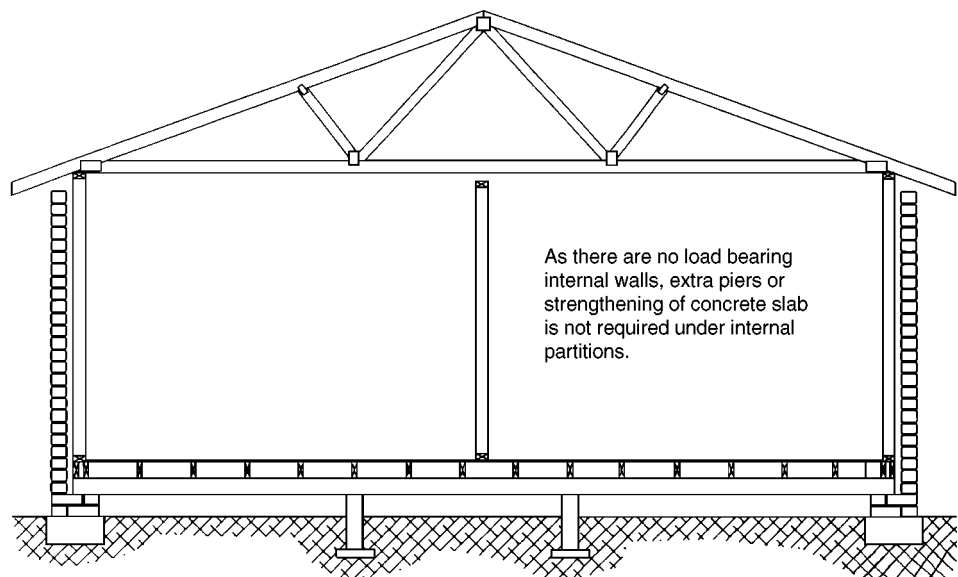
Building Permits

The Gang-Nail Truss System is a proven method of construction and is accepted by all building authorities. The MiTek network of licensed fabricators manufacture trusses in accordance with MiTek specification and design criteria. MiTek licensed fabricators can supply the necessary documentation for building permits.

Roof Layouts

Gang-Nail roof trusses allow just about any shape of roof to be constructed. However, there are a number of standard roof types that remain popular for domestic construction:

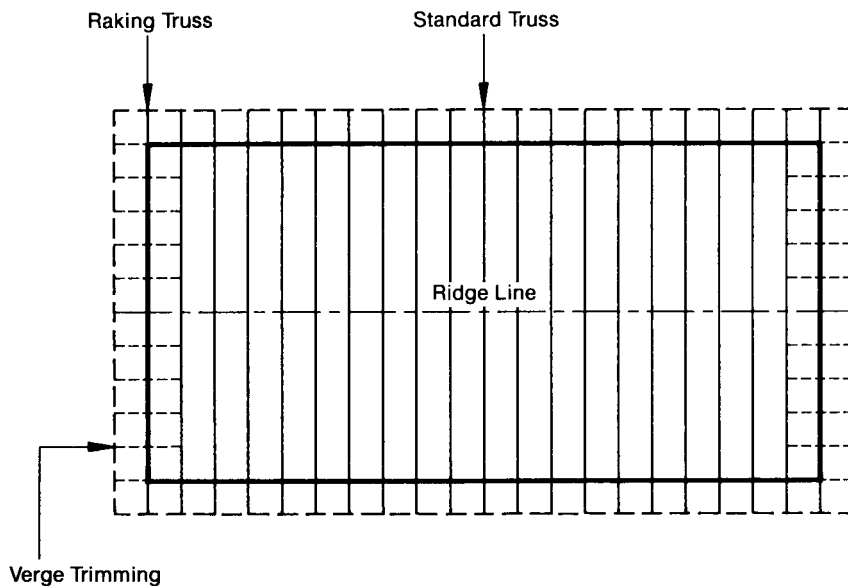
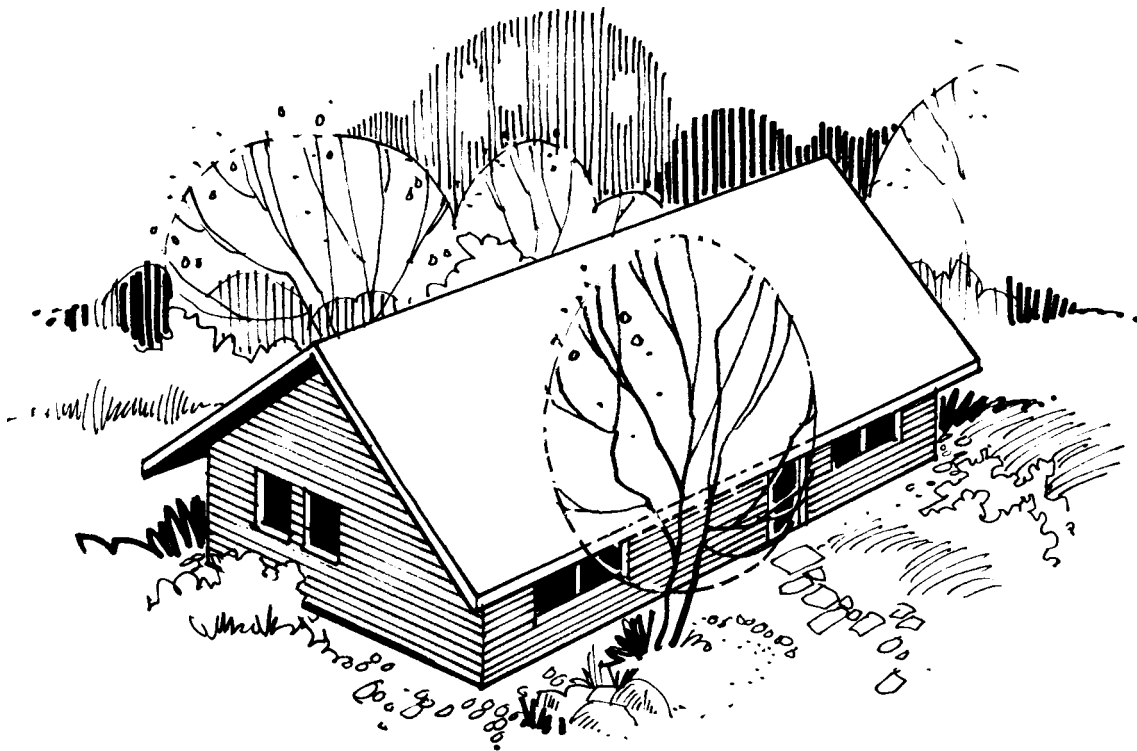
- Gable roof
- Hip roof
- Dutch hip roof
- Bell roof.



These terms refer to the shape of the roof cross section, and the detailing of the ends. All these roof types can be constructed in 'L' shapes, 'T' shapes and combinations of these with trusses of varying spans.

Gable Roof

The simplest roof shape is a Gable Roof with two roof surfaces of equal pitch meeting at a ridge along the middle of the building. The ridge runs the full length of the roof and the end walls run up to the underside of the roofing. With a simple gable roof one truss shape is required.

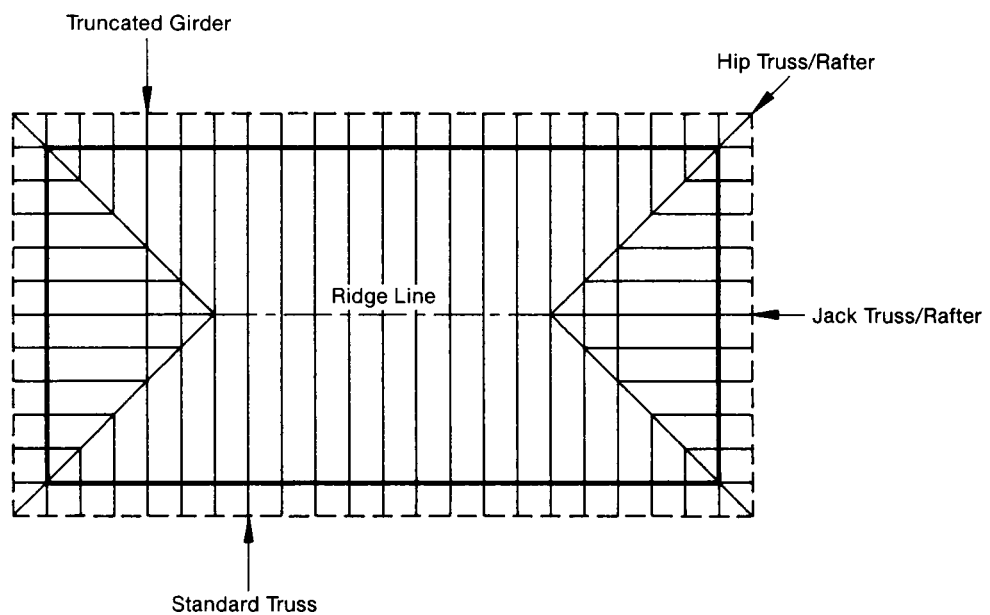
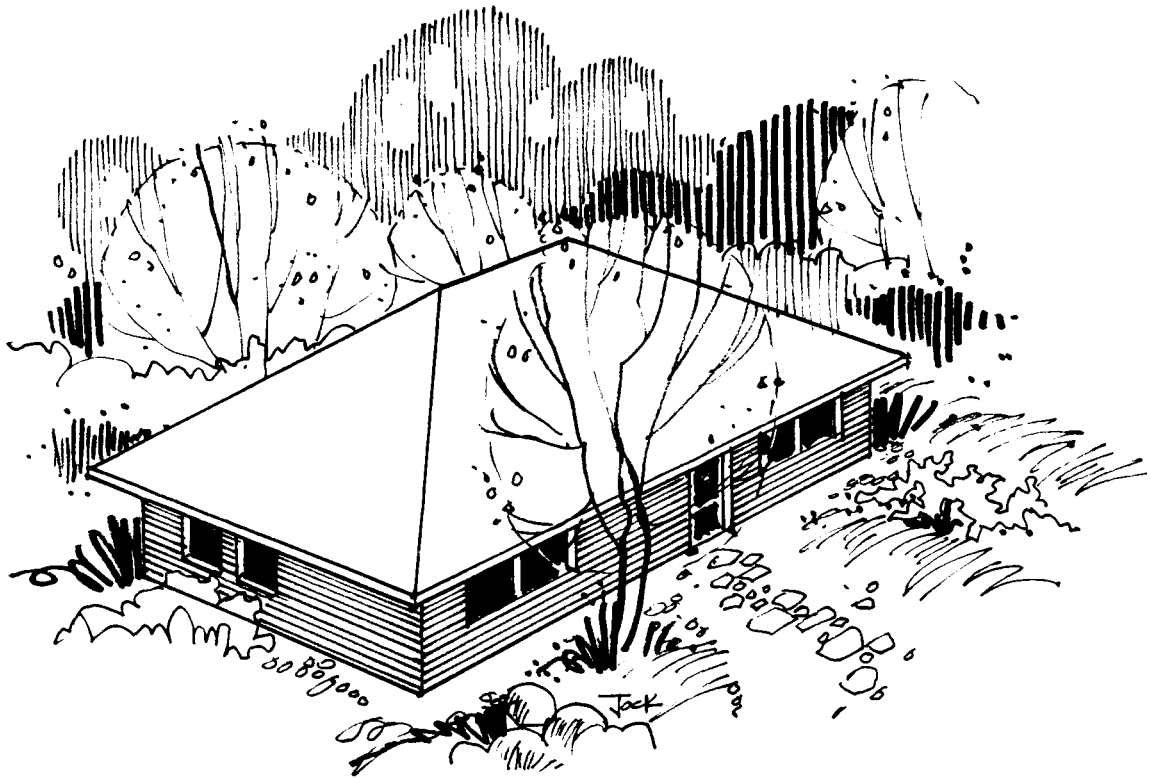


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Hip Roof

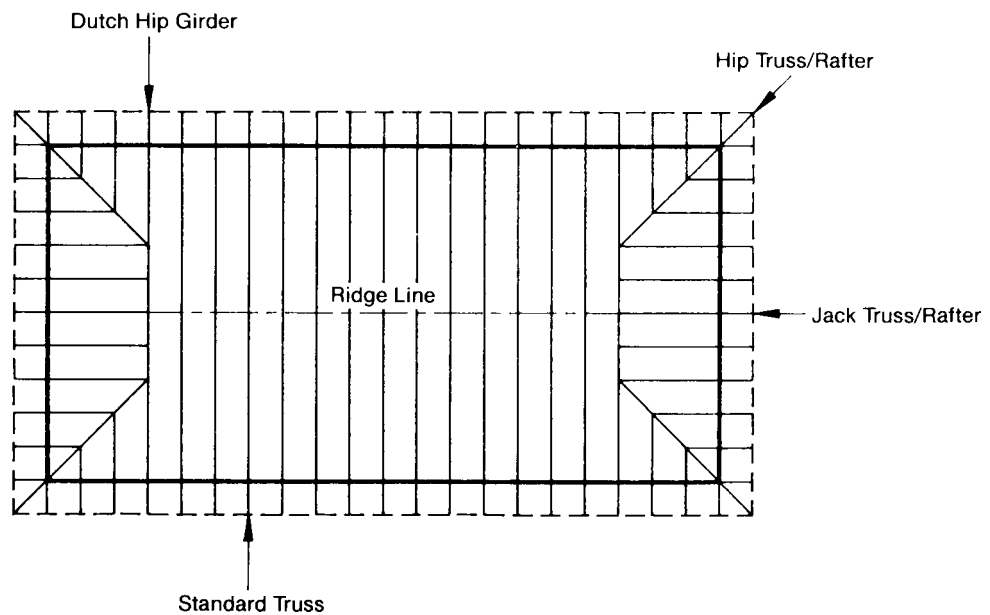
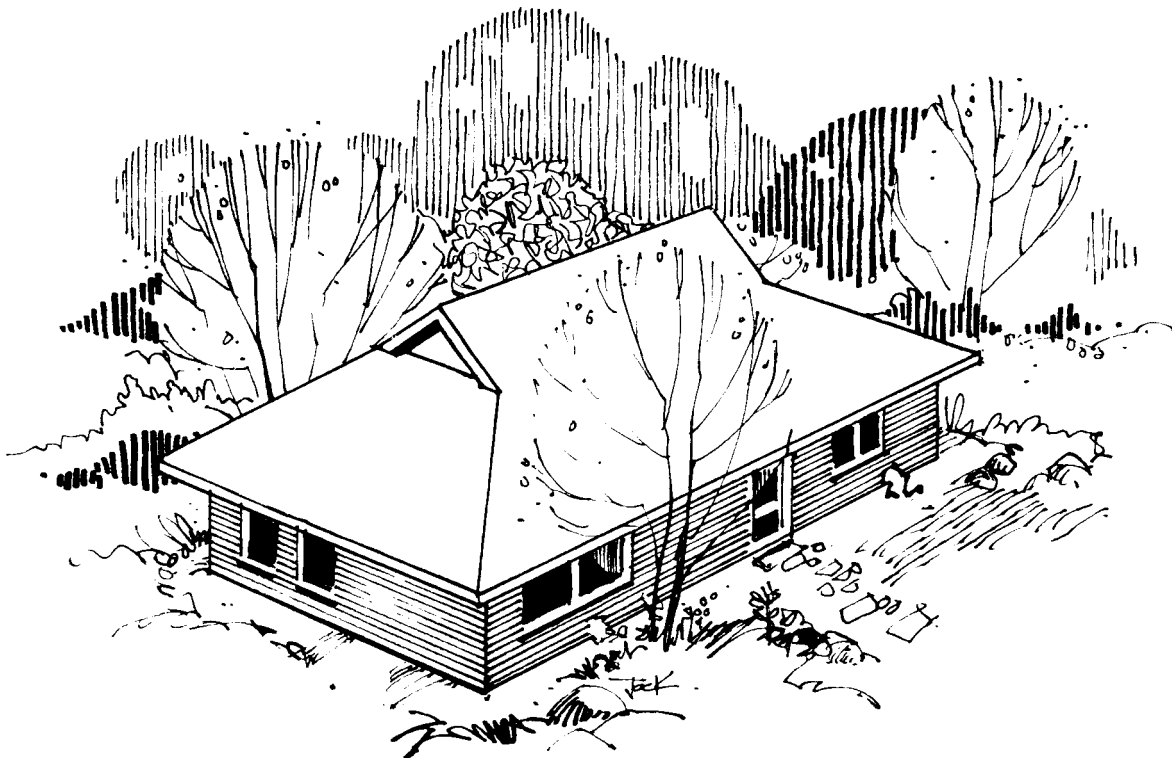
Hip roofs are a very popular roof shape and can be readily constructed using Gang-Nail trusses. A hip runs up from each corner of the roof to the ridge and a special truss, called a truncated girder truss,

is placed between the end wall and the apex of the roof. The Truncated Girder Truss supports the jack and hip trusses that form the hip end framing. This truss derives its name from the shape and because it supports other trusses.



Dutch Hip Roof

A dutch hip roof is similar to a hip roof except that there is a small gable located between the end of the building and the normal apex of the hip end near the end of the ridge. In the case of the dutch hip roof, the girder truss is a gable truss, and the hip and jack trusses are supported on a waling plate bolted to its face.

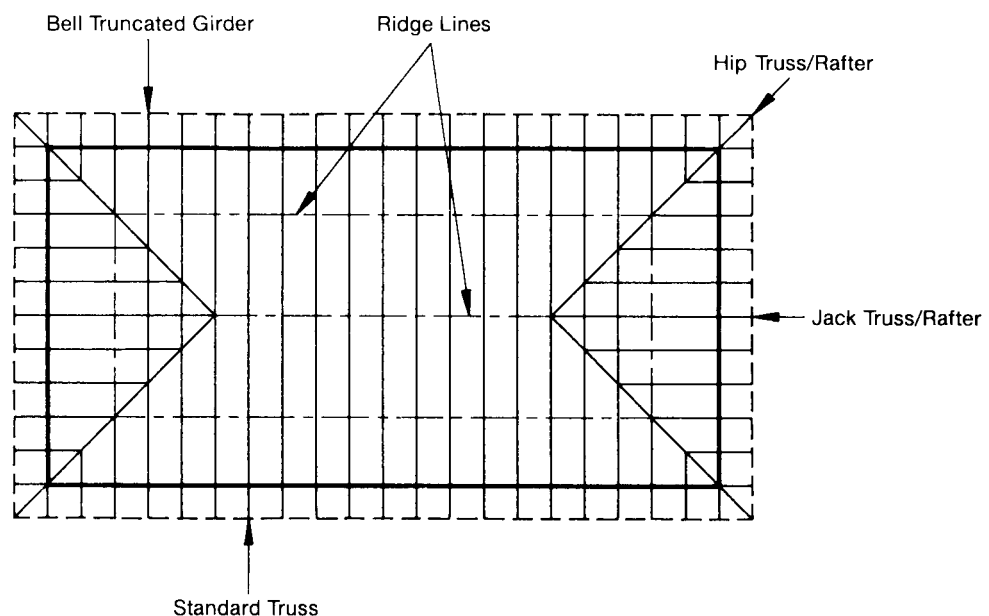
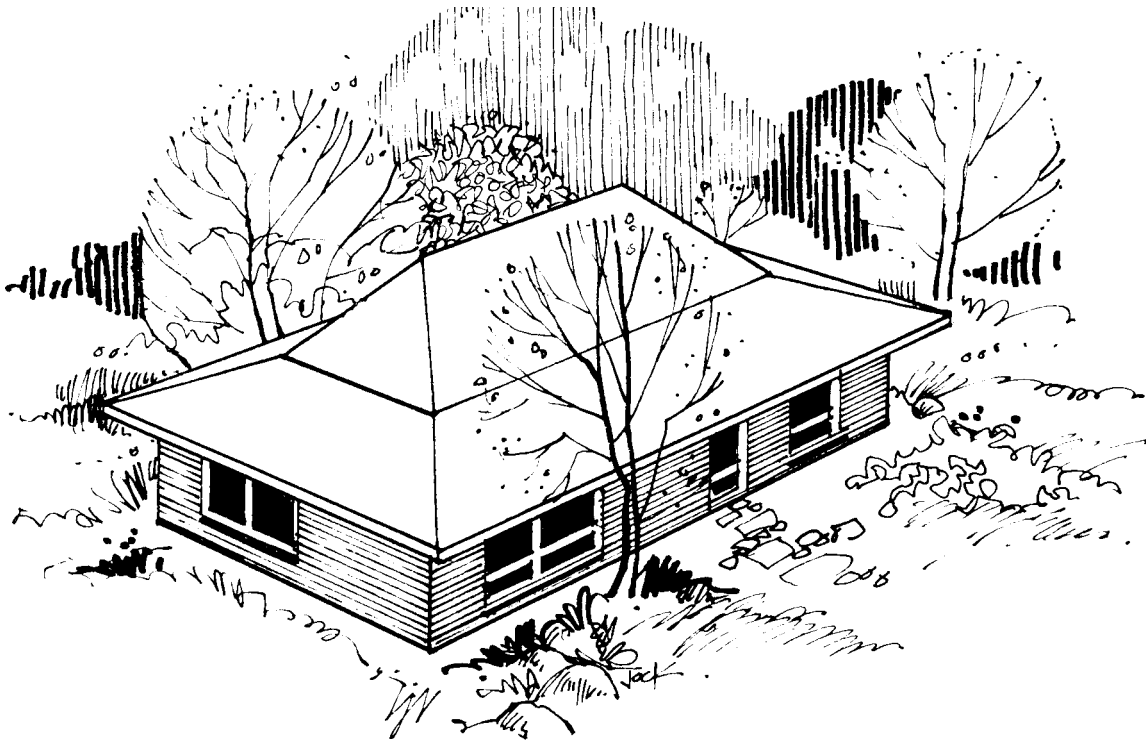


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Bell Roof

A bell roof has two different pitches on each half and is often used on Australian colonial style buildings where it is common to have a high pitched roof with a lower pitched verandah section around the perimeter. With trussed bell roofs, it is

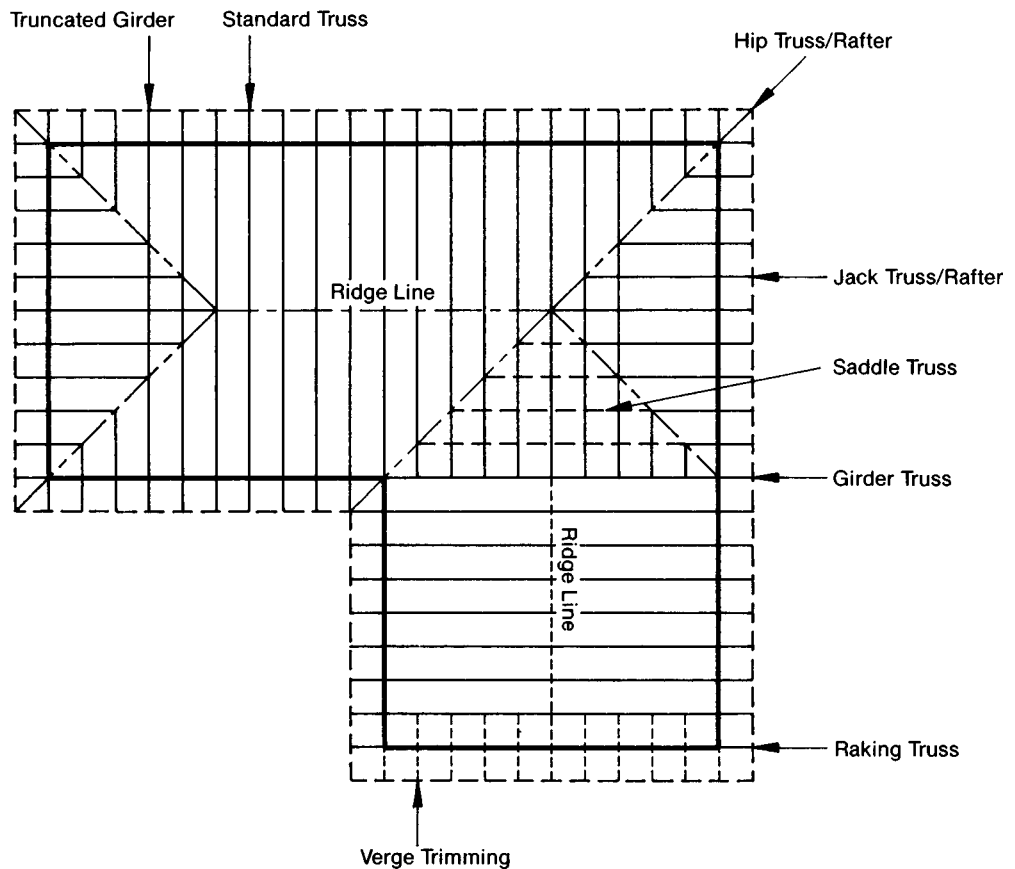
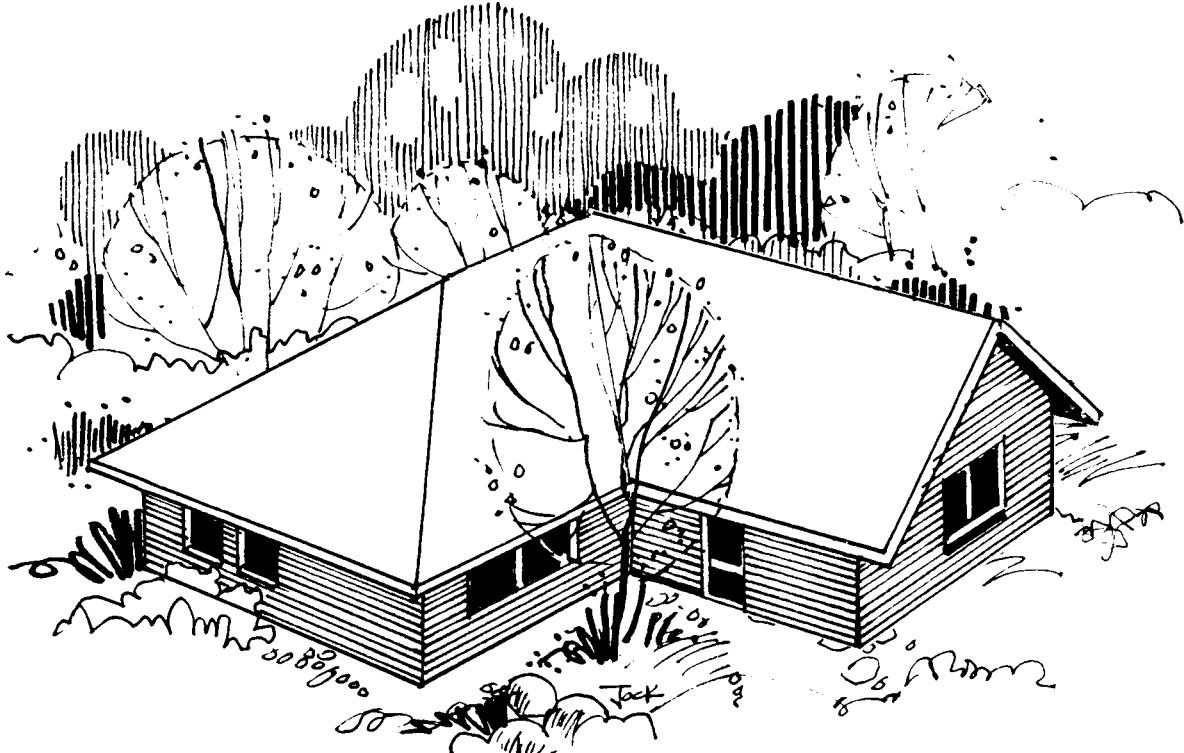
not necessary to have a support beneath the change in pitch as is required in the traditional construction. Bell roofs can have gable ends, hip ends or dutch gable ends.



'L' and 'T' Shaped Roofs

Where floor plans are arranged in 'L' or 'T' shapes some trusses may need to be supported by other trusses. The supporting truss is called a girder truss, and it is usual to place the girder over the shortest span. This truss is designed to act as a

section of supporting wall or lintel, but one that is hidden above the ceiling. Girder brackets are bolted along its specially strengthened bottom chord and these support the ends of the standard trusses.



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Framing is required above the standard trusses to support the roofing batten and special trusses called 'saddle trusses' are fixed on top of the standard truss top chords. These saddles are really

little frames and are usually made without diagonal webs as there is no requirement for them to act structurally as trusses.

