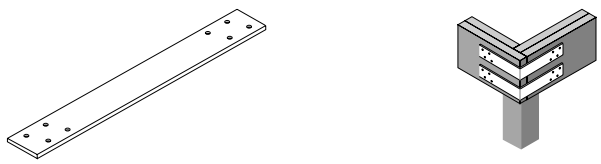
Figure 5.8
Miscellaneous Connectors

Post caps

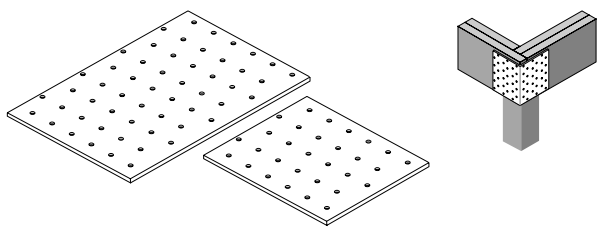
Post anchor

Sill plate anchor

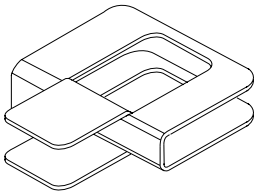
Straps

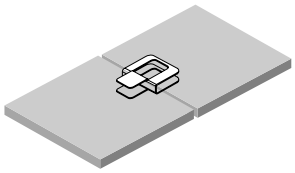


Nail-on Plates

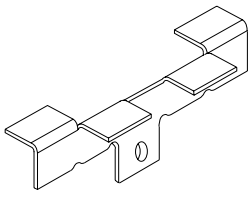


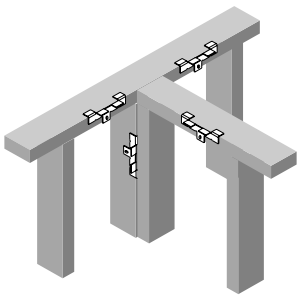
H-clip





Back-up gypsum wallboard clip





Heavy Connections

Bolts

Bolts are used with plates, washers, or, more efficiently, in conjunction with split rings or shear plates to connect wood members. They are often used in purlin to beam, beam to column, or column to base connections of wood structures. When bolts are used alone with washers or side plates as shown in Figure 5.9 (→ 242), the load transfer area of the wood is the surface area of the bolt.

Timber connectors such as split rings and shear plates are a means of distributing loads over a larger area of wood and are discussed later in this section (→ 246).

Several types of bolts as shown in Figure 5.10 (→ 243) are used for wood construction with the hexagon head type being the most common. Countersunk heads are used where a flush surface is desired. Carriage bolts can be tightened by turning the nut without holding the bolt since the shoulders under the head grip the wood.

Depending on diameter, bolts are available in lengths from 75mm (3") up to 400mm (16") with other lengths available on special order. Where long length is required, threaded rods may be used in lieu of bolts, either alone or with shear connectors.

Spacing
Placement of bolts is important in design since it can affect load carrying capacity. Minimum end distance is based on bolt diameter and wood species, while minimum edge distance and spacing requirements are based on bolt diameters.

The net section of wood members (area of wood remaining after drilling of holes) in a bolted joint must also be checked by referring to wood engineering codes.

Washers
As a minimum, standard cut washers should be used with bolts to keep a bolt head or nut from causing crushing when tightening is taking place. Where a steel plate is used, the head or nut bears directly on steel, and washers are not required.

Common types of washers are shown in Figure 5.11 (→ 243).

If square or round steel plate washers are used, they must be of adequate thickness to prevent cupping and overstressing of the steel. Round plate washers may be used instead of square plate washers for appearance reasons such as for exposed trusses. Bevelled washers are necessary where the bolts are not perpendicular to the bearing surface.