Fasteners

Fasteners and hardware are what we use to hold lumber together in projects. Nails, screws, and bolts are all types of **fasteners** that are used in carpentry.

Fasteners that are inside or internal to a building are shiny because they have no protective coating. It is extremely important to pay attention to this when you're buying fasteners because we do not want to be using the wrong, uncoated fasteners outside; projects won't last as long and can even be unsafe if indoor fasteners are used outside. Fasteners that will be exposed to the weather must be coated to resist corrosion. The two types of coatings are:

- **Zinc plated:** electroplated, a light zinc coating applied chemically. Zinc plated is the most common coating because it's the least expensive, works well for bolts and hardware, and provides the protection required for most SSP applications.
- **Hot-dip galvanized**: the heaviest coating of zinc applied by dipping fastener in molten zinc.

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Nails

Cool fact: nails are measured in the United States in pennies, which is abbreviated "**d.**" The term penny comes from the pricing of nails a long time ago. Nails were priced per 100, so a box of 100 nails which was sold for 6 pennies were said to be "6 penny nails." The bigger the nail, the higher the cost which resulted in higher penny values. Now, the penny size of a nail refers only to its length and thickness.



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Nails

Nails are measured in pennies, which is abbreviated "**d.**" The most common nail sizes used at SSP are 6d, 8d, 16d:

a) **6d** are used for installing roof sheathing; **plastic-capped 6d** nails are used to attach underlayment to sheathing on a roof.

b) **8d** are used for lumber framing

c) **16d** are used for lumber framing, as well as being toe-nailed (meaning driven in at an angle) into joist hangers. Only buy common, hot-dipped galvanized 16d nails.

d) **Common joist hanger nails** are used for installing framing hardware. Be sure to buy "common" nails, which have a larger diameter than "box" nails which are used by professional carpenters.

For lumber framing, SSP uses 8d and 16d hot-dip galvanized common nails.

a)



b/c)



d)



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Screws

Screws are best used where force is applied in the same direction (called tension or “pull out” force) as the screw (i.e. in floors and decks). Screws have threaded shanks and star heads (Phillips or square if they’re our old stock) and are driven into wood with a drill. We do not use slotted screws in wood construction because they do not work well with power drills. While screws are more expensive, they make stronger connections than nails and can be backed out more easily than nails.

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Screws

The most commonly used screws at SSP are wood, lag, and drywall screws:

a) **Wood** screws are used for decks, stairs, and ramps. We use outdoor, coated decking screws which can range from 2 ½" to 3". These are driven using a star-shaped bit. Some sites will also be sent with old screws which have square or Phillips bits, so make sure you send the correctly-shaped bits with the screws you send with teams.

b) **Lag screws** are for heavy structural connections and are tightened with wrenches or socket sets because of their hexagonal heads. Lag screws require a pilot hole with the same diameter or slightly less to be drilled the full length of the screw.

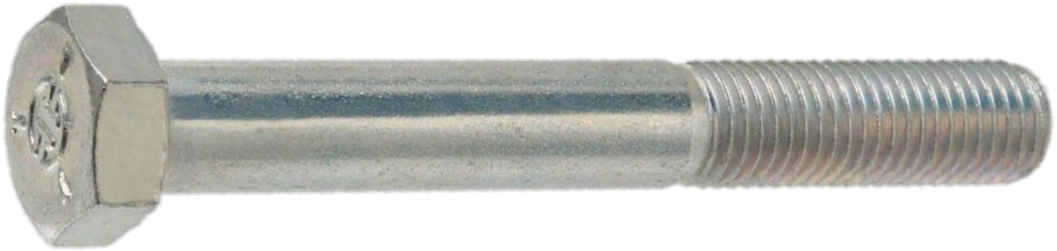
c) **Drywall Screws** have a bugle head that is designed to attach drywall to studs. These must be driven using a special drywall bit called a dimpler to prevent the screws from breaking through the paper surface on a sheet of drywall (see *Chapter 3: Tools* for a picture).

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Bolts

Bolts are for major structural connections. Bolts are threaded rods that are ¼” to 1” thick and can be any length with a hex head at one end.

Washers are used at both ends of a bolt to distribute the pressure from the head or nut pressing into the wood. Bolts are tightened with wrenches or socket sets, like lag screws.



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Hardware

Some wood connections in carpentry need **stronger** connections than fasteners like nails, screws, and bolts can provide. This is when sheet metal and metal plate framing hardware are used. For this hardware, SSP uses Simpson's zinc coated products.



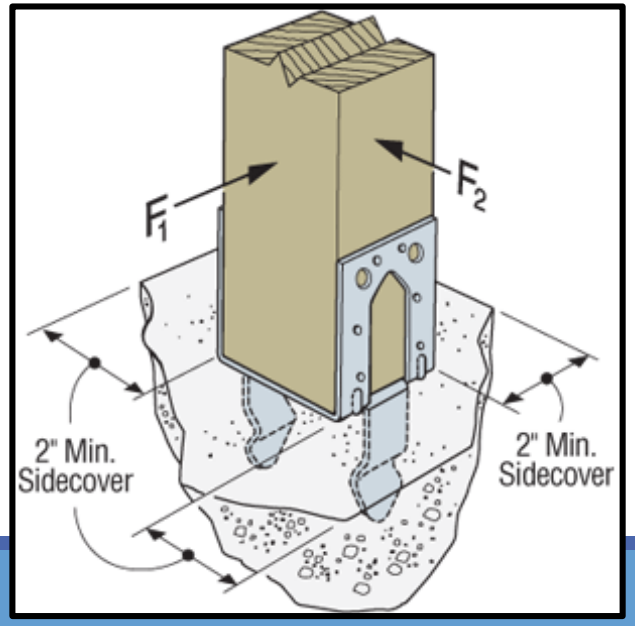
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Post Bases

Post bases (PB44Z) connect wood posts (generally 4x4s) to concrete footing. After the post base is connected to the concrete, a 4x4 post is attached to it with two ½" by 4-½" bolts and nuts (no washers needed).



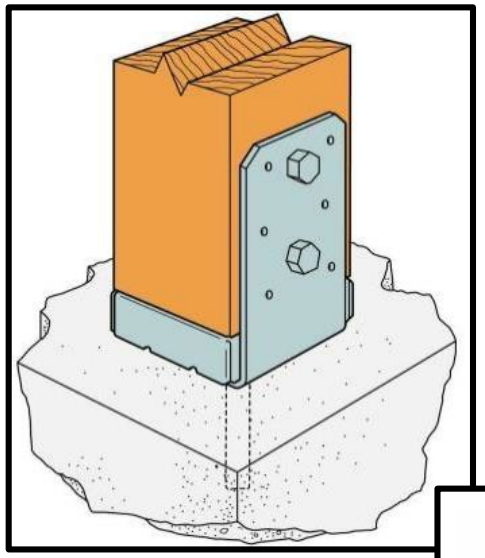
Pre-drilling holes for bolts that will attach a 4x4 post to a post base



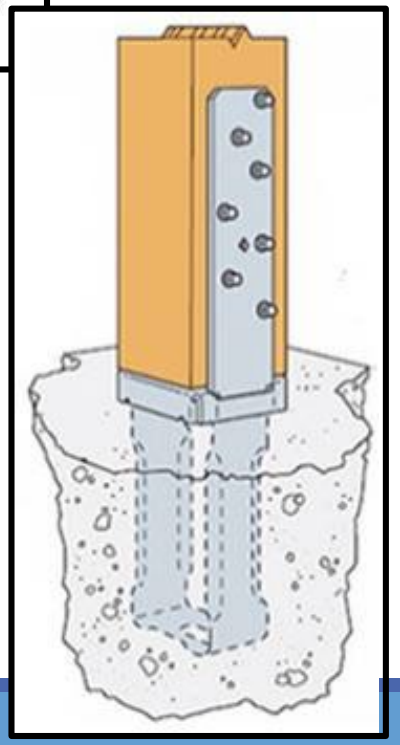
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Post Bases

Another type of post base **(ABU44Z)** is attached to existing concrete by drilling into the concrete and securing with a ½" by 3-½" wedge anchor bolt. Attach to a 4x4 post with two ½" by 4-½" bolts and nuts (no washers needed).



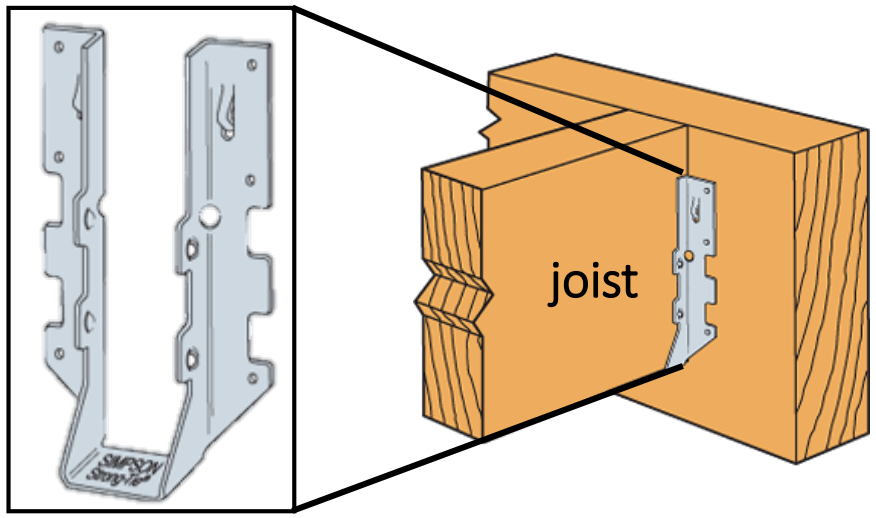
Another type of post base **(PBS44AZ)** is used for awnings because their posts extend much farther than in decks and stairs. Set these into wet concrete and attach 4x4 posts with four ½" by 4-1/2" bolts and nuts.



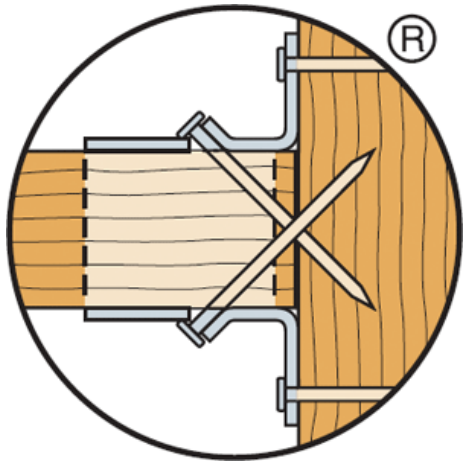
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Joist Hangers

Joist hangers (LUS24Z, LUS26Z, etc.) are used to make strong connections in floor and deck framing where 2x4s or 2x6s bear on one another at right angles.



Joist hanger

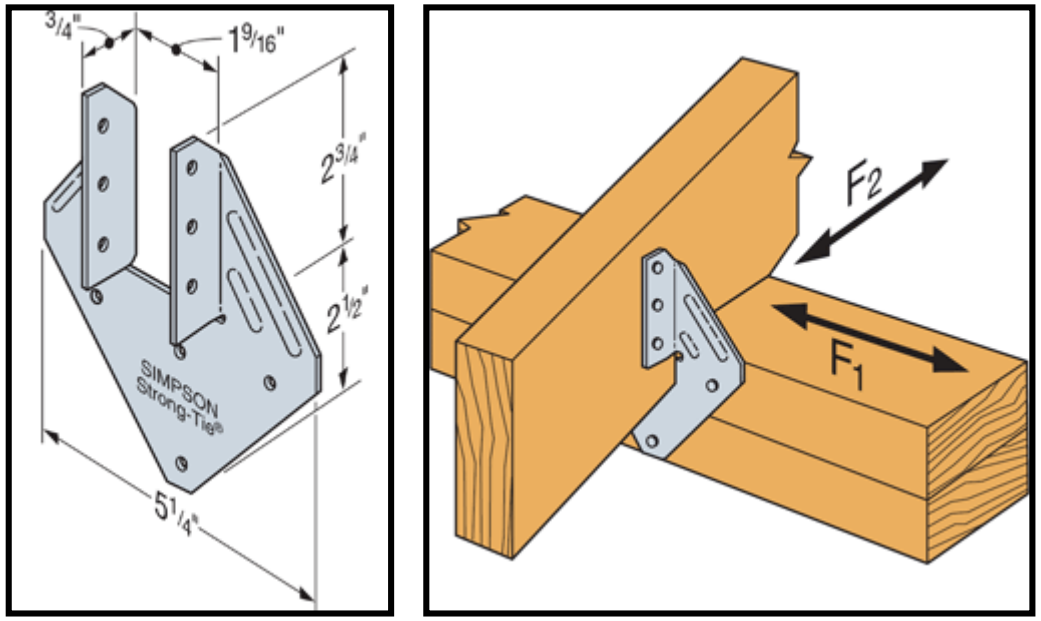


Toenailed 16d nails securing a joist hanger to a header (seen from the top)

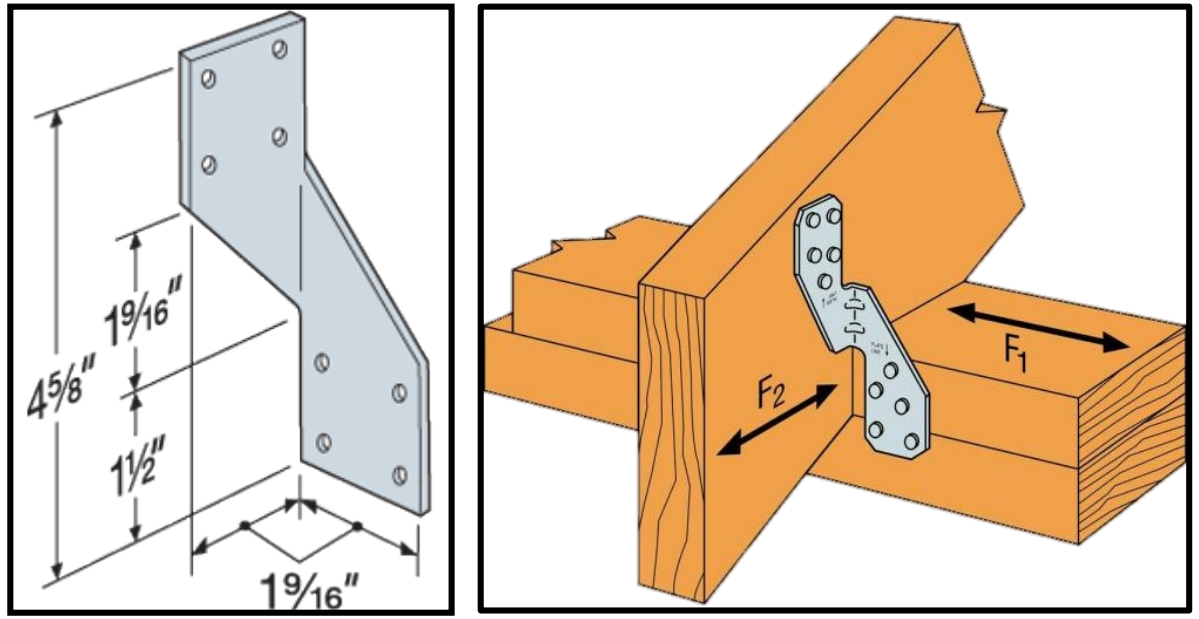
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Hurricane Ties

Hurricane ties (H1Z or H2.5Z) are used to connect rafters to beams in roofs and in awnings as well as in ramps and stairs to tie stringers to purlins. Hurricane ties are attached with common joist hanger nails. The most common type is pictured, while two H2.5Z types can be used in the same kinds of connections.



H1Z

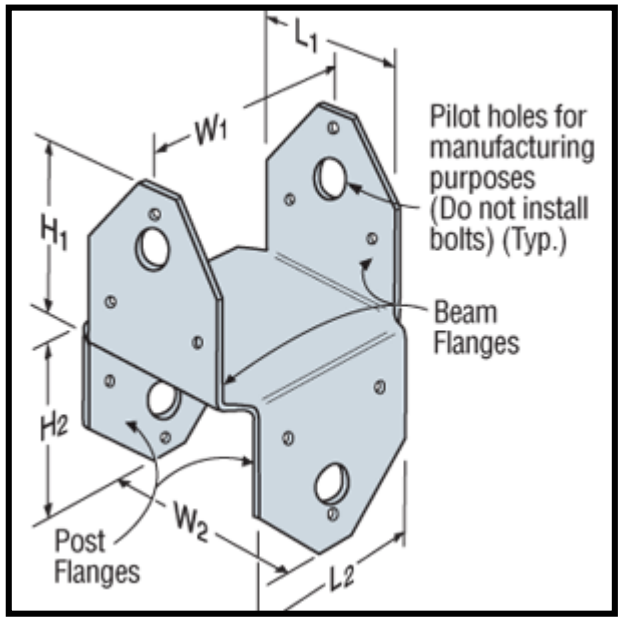


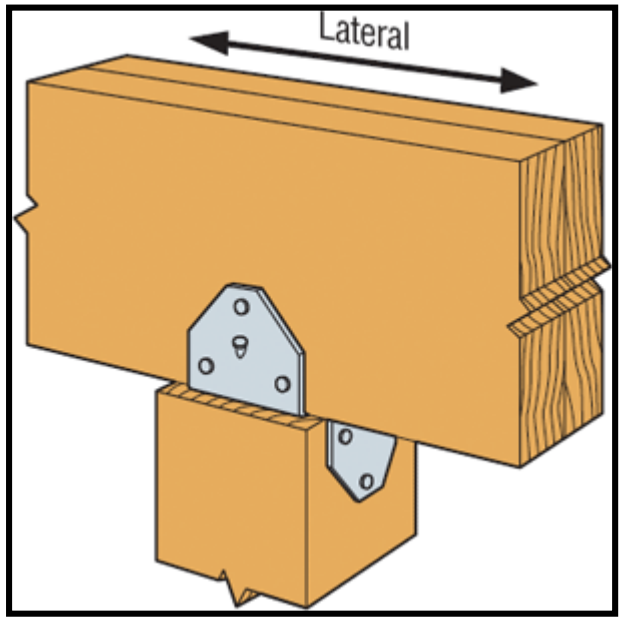
H2.5Z

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Post Caps

Post caps (BC4Z) are used when attaching a beam to a post when building an awning. They are attached with common 16d nails. Never use bolts to attach post caps; the holes are for manufacturing purposes only.





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