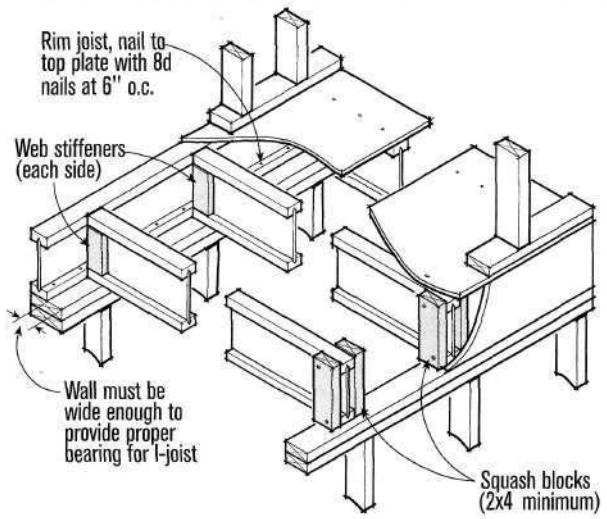
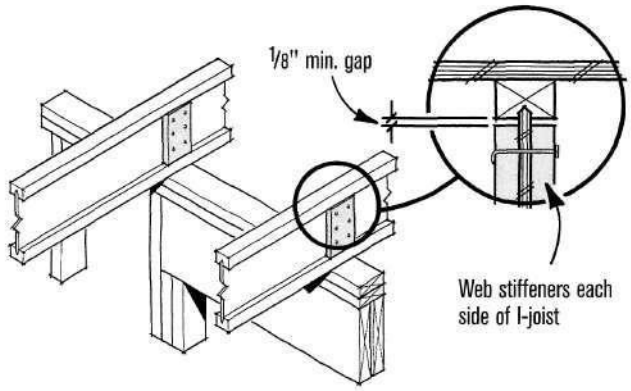
Figure 40. Rim Joists



In I-joist construction, band joists typically consist of wood I-joists, plywood, or special composite rim joist materials. Web stiffeners may be required on long spans. Squash blocks may be required with thinner rim joist materials when there is a loadbearing wall above. Check manufacturer's specifications.

Figure 41. Web Stiffeners



Web stiffeners of plywood, OSB, or 2x lumber (for large I-joists) are required at certain bearing points to transfer shear and prevent buckling of the web. Except where there is a concentrated load from above, web stiffeners should fit tight to the bottom flange with a space at the top. Web stiffeners also provide solid nailing at joist hangers. Follow manufacturers' nailing schedules.

Rim Joists for I-Joist Floors

To keep joists from twisting — and to help transfer loads from the wall above to the wall or foundation below — either attach the ends of I-joists to a full-height (band) joist or header or install blocking between the joists.

Rim Joist Materials

Acceptable rim joist materials include: the same-size I-joists as those used in the floor system; one or two layers of plywood or OSB; or an engineered lumber or metal product (**Figure 40**).

Don't mix wood I-joists with solid lumber rim joists. Not only are the two materials difficult to match in height, but also solid lumber will shrink after installation, leaving too much weight on the I-joists.

Web Stiffeners for I-Joists

Web stiffeners of plywood, OSB, or 2x are used to keep I-joist webs from buckling at bearing points or other intersections. (Thin web materials cannot transfer large shear forces.) With joist hangers, web stiffeners are often required to provide solid nailing.

Web stiffeners at bearing points should be installed tight to the top of the bottom flange. Leave a 1/8- to 1/4-in. space at the top flange to prevent the stiffener from prying the top flange off under load (**Figure 41**). One exception is

where the joists support a load from above at mid-span. In this case, install the stiffener tight to the top flange with the space at the bottom.

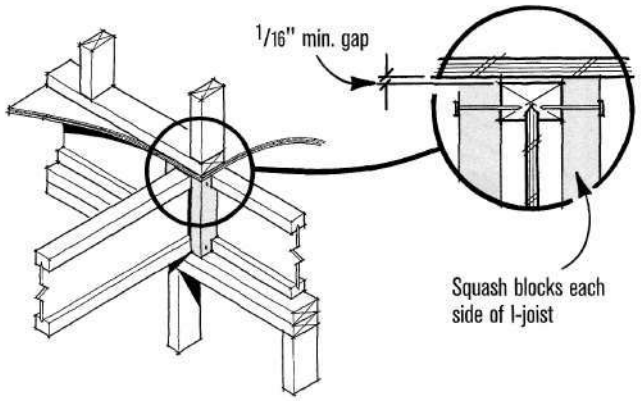
Web stiffeners go on both sides of an I-joist with the face grain parallel to the length of the joist (for plywood and OSB stiffeners). Nail plywood or OSB stiffeners from each side with three or more 8d nails, staggered and clinched at the ends. For solid 2x stiffeners, use three 16d nails (two from one side, one from the other) and clinch the ends if they penetrate. In all cases, follow manufacturers' nailing schedules.

Squash Blocks for I-Joists

Squash blocks are required under concentrated loads such as posts and, in some cases, where the joists must transfer the load from a bearing wall above to another bearing wall below.

Squash blocks should be slightly larger than the depth of the joists to ensure that they pick up the full load. Fasten blocks to the top and bottom joist flanges with 8d nails (**Figure 42**).

Figure 42. Squash Blocks

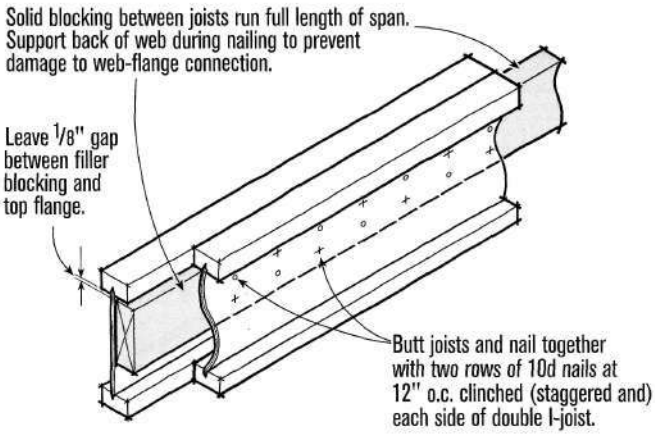


Squash blocks are required to transfer concentrated loads through the floor system at outside walls. They may be used under interior loadbearing walls instead of full-depth blocking between the I-joists.

Filler Blocks for I-Joists

Where two or more I-joists serve as a girder, the web area should be filled in with solid blocking of plywood, OSB, or dimensional lumber. The filler will ensure that both members carry the load.

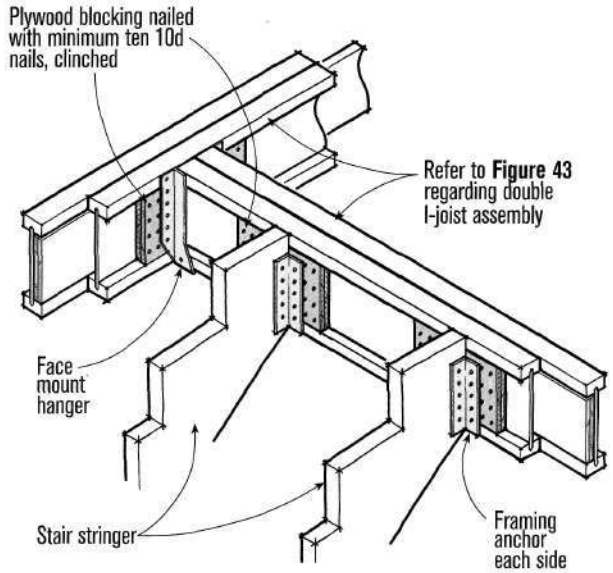
Figure 43. Filler Blocks



Leave a minimum 1/8-in. gap at the top of a filler block, which is required where two I-joists serve as a beam.

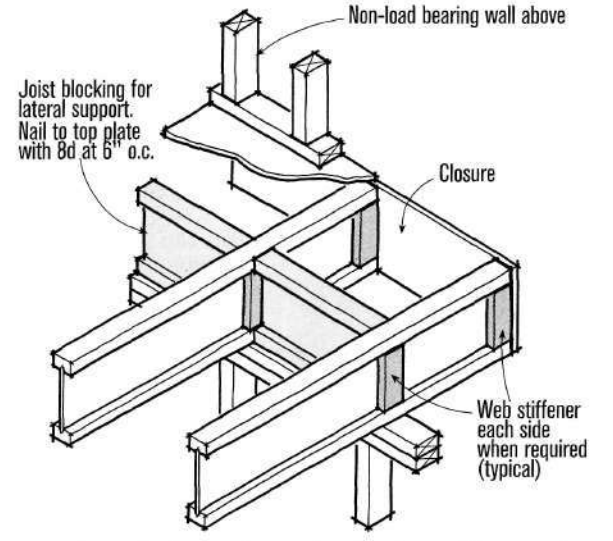
Filler pieces should be a minimum of 4 ft. long, depending on the manufacturers' specs, and should be installed with a gap at the top (**Figure 43**). Nails should be clinched to prevent pullout.

Figure 44. Backer Blocks



Backer blocks provide nailing for a joist or stair stringer that attaches at a right angle.

Figure 45. Cantilevered I-Joists



In general, manufacturers allow non-loadbearing cantilevers up to one-third the length of the joist span (to a maximum of 4 ft.). Loadbearing cantilevers are allowed up to 2 ft. However, manufacturers' guidelines for blocking and reinforcing must be strictly followed.

Floor Openings

Where a joist or stair stringer attaches to the side of an I-joist, nail backer blocks to the web to provide a nailing surface. These full-width blocks should extend 6 to 12 in. past either side of the intersecting joist or stringer and may be needed on both sides of the web (**Figure 44**). Refer to the manufacturer's literature for details.

Cantilevered I-Joists

There are several ways to frame cantilevers with I-joists. Most manufacturers permit non-loadbearing cantilevers up to one-third the length of the joist span (to a maximum of 4 ft.). Loadbearing cantilevers may be up to 2 ft. long. Since a cantilever can easily over-stress an I-joist that's not reinforced, it's important to strictly follow the manufacturer's guidelines for allowable spans and required blocking. **Figure 45** shows some sample details.

Floors: TRUSSES

Structurally, an open-web floor truss resembles an I-beam in that it puts most of its material along its top and bottom edges where stresses are greatest. To strengthen a truss, the fabricator may double its top and bottom chords, make side-by-side girder trusses, use larger truss plates or stronger wood, or use some combination of these techniques.

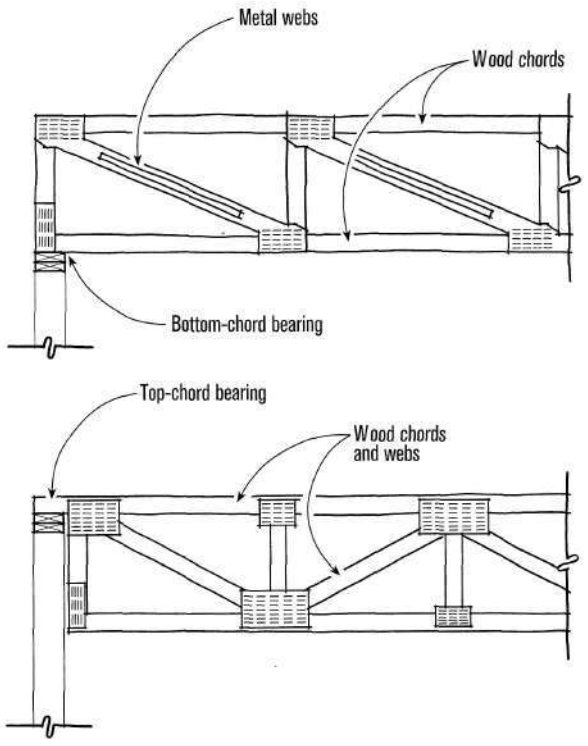
Truss Types

Floor trusses can be designed to sit on either their bottom chord or their top chord (**Figure 46**).

Handling Trusses

When receiving a truckload of trusses, reject those with excessive splits in chords or braces, those with knots close to metal plates, or those with loose or deformed plates. Also reject any that show evidence of having been damaged and repaired. Beware of warped or wet lumber, which can set up dangerous stresses as it shrinks and dries.

Figure 46. Truss Types



Floor trusses typically have either wood or metal webs. **Bottom-chord-bearing** trusses (top) sit atop a wall plate or sill like a standard floor joist. **Top-chord-bearing** trusses (bottom) hang from the top plate.

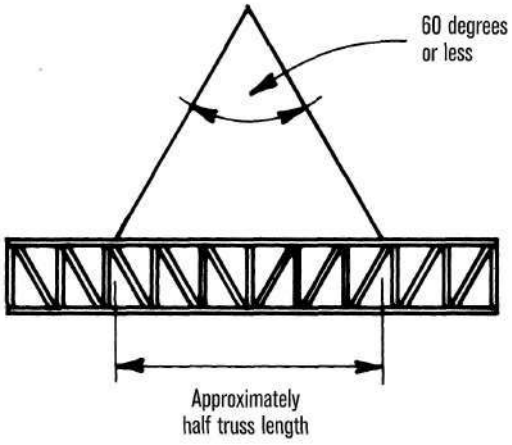
Caution: Loose Plates

Connector plates should be centered over the joint and firmly embedded in the wood. Never refasten a loose plate: The bond cannot be restored once it's been broken.

Lifting With a Crane

If you use a crane, always lift from two points (**Figure 47**) and never lift the truss sideways; the excess flexing can loosen the connector plates, causing eventual failure.

Figure 47. Lifting Floor Trusses by Crane



When lifting floor trusses with a crane, always lift from two points and never lift the truss sideways, which can loosen connector plates.

Installing Floor Trusses

Floor trusses are usually spaced 24 in. o.c., and are typically lifted by hand, rolled into place, fastened, and braced.

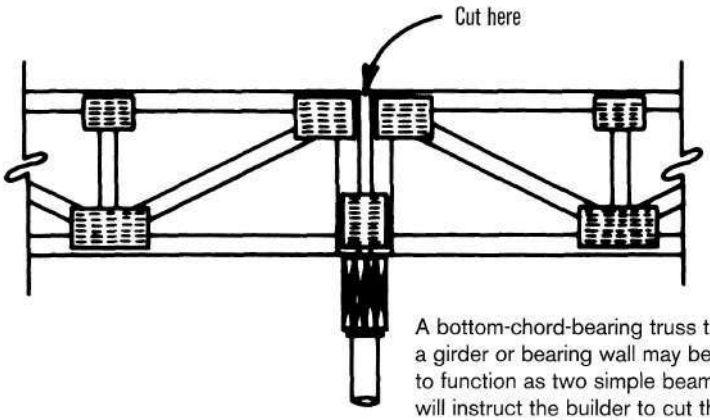
Right Side Up

It is crucial to install each truss right side up, according to the label attached to the truss. Each web member is designed to be in compression or tension, but not both.

Bearing at Center Girder

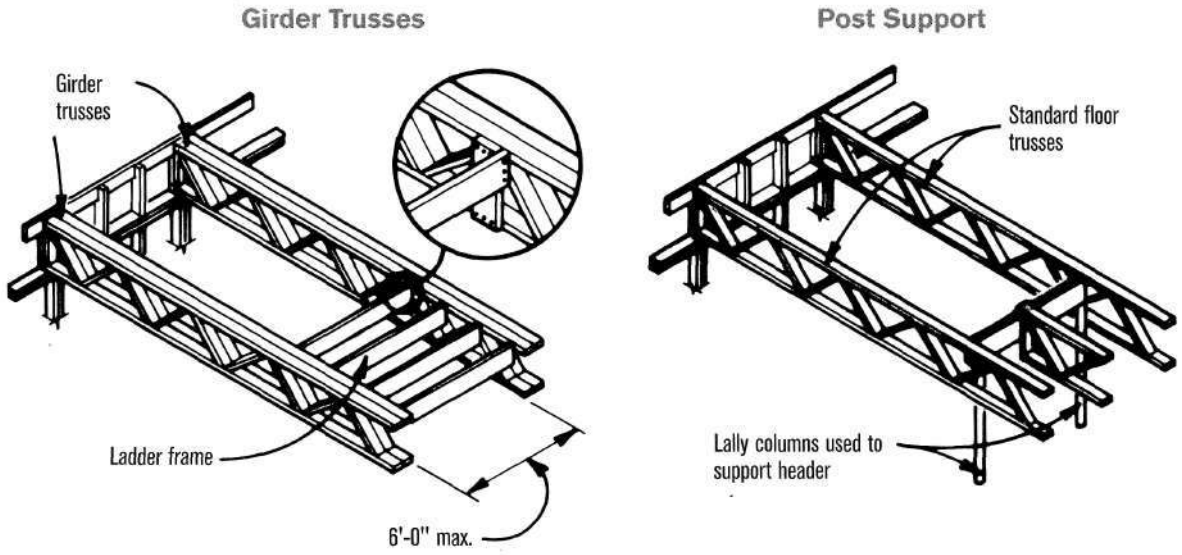
A bottom-chord-bearing truss that crosses a girder or bearing wall may be designed to function as two simple beams. In this case, a tag attached to the truss will indicate that the top chord should be cut after installation (**Figure 48**). Without this cut, a load

Figure 48. Special Field Cuts



A bottom-chord-bearing truss that crosses a girder or bearing wall may be designed to function as two simple beams. A tag will instruct the builder to cut through the top chord after installation.

Figure 49. Stairwell Openings



Double-width girder trusses are designed to support several standard floor trusses. These are often used around stairwell openings (left). Another option is to support staircase headers on posts or lally columns (right).

applied to one end of the truss will lift the other, creating a seesaw action.

Stairwell Openings

Girder trusses are designed to support several standard floor trusses. These are often used around stairwell openings (**Figure 49**).

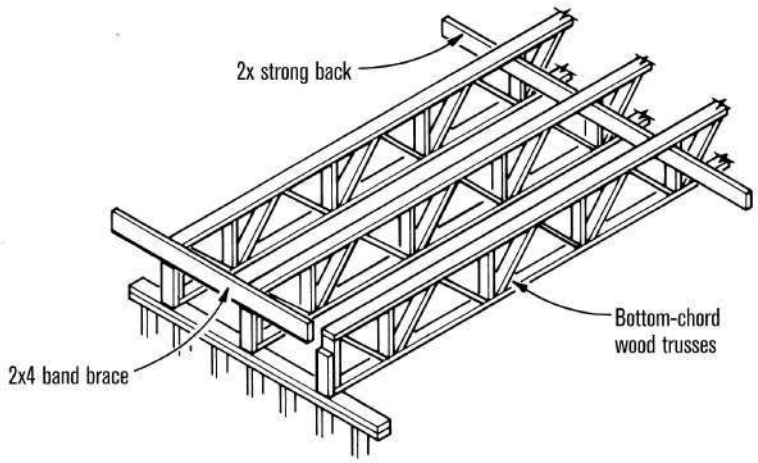
Bracing Floor Trusses

Bracing prevents trusses from bending, twisting, or otherwise deforming. On bottom-chord-bearing trusses, the ends are tied together with 2x4 ledgers that also serve as a nailing base for the perimeter of the plywood deck (**Figure 50**). Underneath, 2x6 strongbacks laid on edge should run continuously through the webs of all the trusses at 10-ft. intervals (one run for a 20-ft. truss, two runs for longer trusses). The 2x6 serves the same purpose as bridging in a standard floor, distributing concentrated loads over a wider area.

Fire-Stopping for Floor Trusses

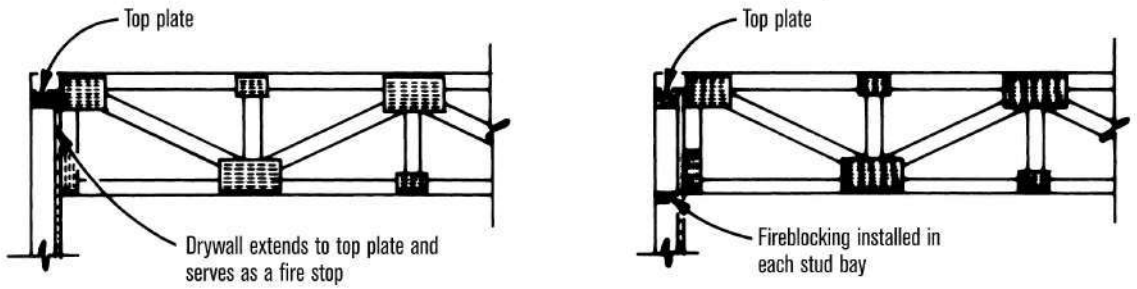
Top-chord-bearing trusses short-circuit the fire-stopping ordinarily provided by the top plate. Common solutions are to extend the drywall past the trusses to the top plate, or to insert a separate 2x4 fire stop inside each stud bay just below the bottom chord of the truss (**Figure 51**). Check with local codes for requirements in your area.

Figure 50. Bracing Bottom-Chord-Bearing Trusses



The ends of bottom-chord-bearing trusses are designed to be tied together with 2x4 ledgers that also serve as a nailing base for the perimeter of the plywood deck. In addition, install horizontal 2x6 strongbacks at 10-ft. intervals to distribute loads and prevent twisting, which can loosen truss plates.

Figure 51. Fire-Stopping for Open-Web Trusses



Many codes require fire-stopping with open-web trusses at the intersections of wall and ceiling spaces. Techniques include extending the drywall past the truss to the top plate (left), or installing a 2x4 fire-stop inside each stud bay just below the truss's bottom chord (right).