I-Joist Backer Blocks

Backer blocks are used to fill the rectangular space between the outside edge of the I-joist flange and the web of the I-joist. In this respect, a backer block is quite similar to a filler block; however, it is only half as thick. Unlike a filler block, the backer block does not run the full length of the I-joist. It is only as long as it needs to be. The purpose of the backer blocks is to provide a flat, flush surface by which surface- or top-mounted hangers or other structural elements can be attached to I-joists.

With **top-mounted hangers,** the backer block prevents rotation on the lower portion of the hanger by filling the void between the hanger and the web. If the top-mounted hanger does not rely on any attachment into the side of the I-joist supporting it, as with face-mounted hangers, the backer block is really only providing bearing for the bottom of the hanger and an additional backer block on the other side of the I-joist web is not required.

With **face-mounted hangers,** the backer block provides anchorage for the hanger nails. It also provides an avenue for the transferral of the hanger load to the web of the I-joist. For such applications, backer blocks on both sides of the web are almost always required.

Physical description: Backer blocks are made up of lumber, rim board, or wood structural panel materials on hand – whatever it takes to fill the space between the outside edge of the flange and the web. The minimum grade of wood structural panels is Rated Sheathing; minimum lumber grade is Utility grade SPF (south) or better. Any rim board product also works satisfactorily.

The depth of the backer block should equal the distance between the flanges of the joist minus approximately 1/8 inch. The location of this gap is always between the bottom of the block and the bottom flange. Ideally, the carpenter should cut the blocks so they fit perfectly between the flanges. However, rather than risk too tight of a fit, and damage to one or both of the flange-to-web joints, the industry recommends the slightly loose fit.

The thickness of the backer block can be critical. If the backer block extends out beyond the edge of the flange when a

FIGURE 1

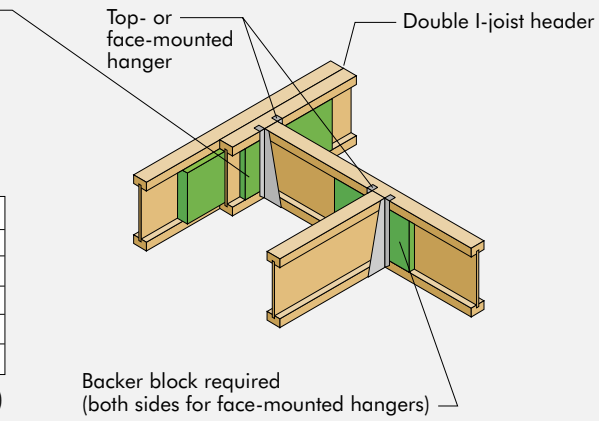
BACKER BLOCK INSTALLATION DETAILS

Backer block (use if hanger load exceeds 250 lbs.) Before installing a backer block to a double I-joist, drive 3 additional 10d nails through the webs and filler block where the backer block will fit. Clinch. Install backer tight to top flange. Use twelve 10d nails, clinched when possible. Maximum capacity for hanger for this detail = 1280 lb.

BACKER BLOCKS (Blocks must be long enough to permit required nailing without splitting)

Flange Width	Material Thickness Required*	Minimum Depth**
1-1/2"	19/32"	5-1/2"
1-3/4"	23/32"	5-1/2"
2-5/16"	1"	7-1/4"
2-1/2"	1"	5-1/2"
3-1/2"	1-1/2"	7-1/4"

* Minimum grade for backer block material shall be Utility grade SPF (south) or better for solid sawn lumber and Rated Sheathing grade for wood structural panels.
** For face-mount hangers use net joist depth minus 3-1/4" for joists with 1-1/2" thick flanges. For 1-5/16" thick flanges use net depth minus 2-7/8".



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top-mounted hanger is used, insufficient bearing on the horizontal fold of the hanger or insufficient space for the required nails can result. This may not be so critical for the **face-mounted** hanger, depending on the nailing pattern of the hanger. If the backer block is too thin, it could cause the hangers to be installed with a slight rotation toward the web. This can have a detrimental impact on the bearing surface area and/or ultimate capacity of the hanger. A plus or minus tolerance of 1/8 inch is typically considered to be acceptable. For tolerance verification and further information, please contact the hanger manufacturer.

The backer block should be long enough to fully support the flanges of the hanger and the required nailing without splitting the block. The hanger width plus 4 to 6 inches would be sufficient if wood structural panel blocking is used. If the backer block is made out of lumber, then additional length may be required to prevent it from splitting.

Recommendations for I-joists designed in accordance with APA Standard PRI-400:

1. For **top-mounted** hangers, backer blocks are **normally** required on one side of the I-joist web only.

Exceptions:

a. When the load on the top-mounted hanger exceeds 1000 lbs, a second backer block is required to act as a web stiffener.

b. When the top-mounted hanger requires additional face nails to reach full capacity, the second backer block will be required (see Recommendation 2 for face-mounted hangers below).

For **top-mounted** hangers, the backer block should be mounted tightly to the top flange. (The load is applied to the I-joist through the top flange. To prevent knife-through of the top flange by the web, the joint between the backer block and the top flange must be tight.)

2. The backer blocks should be installed to the web with three 10d nails, clinched if possible. The blocks should be fitted tightly against the top flange.

3. For **face-mounted** hangers, backer blocks are required on both sides of a single I-joist. This allows sufficient nail penetration to develop the hanger capacity. Again, the backer block should be positioned tightly against the top flange.

When using **face-mounted** hangers, care must be exercised in selecting the material used for the backer blocks. The fastening requirements specified by most hanger manufacturers are established based on a specified species or specific gravity (G) of the material receiving the fastener. If the hanger installations are based on a G of 0.50, then only OSB, Structural I plywood Douglas-fir, or southern yellow pine (SYP) lumber may be used for the backer blocks. See hanger manufacturer's literature for fastening recommendations.

In addition, when using a **face-mounted** hanger or a **top-mounted** hanger requiring additional face nails in conjunction with a double I-joist, additional fastening is required to facilitate the transfer of forces into the web of the joist. Prior to the installation of the backer block, install three additional 10d nails through the webs and filler block where the backer block will be installed. Clinch nails if possible. Install filler block tightly to top flange and use 12 additional 10d nails to install backer block. These nails should penetrate the filler block and should be clinched when possible.

4. When a piece of lumber is being nailed parallel to and up against the side of an I-joist (see Figure 3, the lumber cantilever detail, in *APA Design/Construction Guide – I-Joists for Residential Floors,* Form No. X710), the backer block is only required on the lumber-side of the I-joist when the attachment nails can be clinched.

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