

Start Your Railing Right

Fasten posts for a deck railing you can lean on for years to come

BY MIKE GUERTIN

I must be getting old. I'm starting to take safety a lot more seriously than I did years ago, especially when it comes to building. When I'm building a deck, I focus on two points of potential failure: the ledger and the railings. Here, I'll take up the more troublesome part of the railing system: the posts.

There are a lot of ways to build a deck railing, but most have a common element in the posts, which transfer loads applied to the top rail into the framing.

Often-used methods of screwing or bolting posts to deck joists or rim joists just aren't strong enough to meet the building code's structural requirement, and here's why: Posts can act as levers. An outward force applied along the railing (someone leaning on the rail, for instance) is multiplied at the point where the post is attached to the rim joist. The force can overload the fasteners or pull away the joist connected to the posts.

One of the most secure installation methods is to mount guardrail posts to the deck frame with metal hardware that transfers the load to the deck joists. There are several pieces of hardware that are available and a fastening arrangement for just about every place where you might locate posts. I'll show you the best way to install posts, then discuss options for the hardware placement that completes the post installation.

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SECURELY MOUNT GUARDRAIL POSTS TO THE DECK FRAME WITH METAL HARDWARE



1 Holes must be straight and square. After cutting the posts to length, use a 1/4-in. plywood template to locate the bolt holes. With a nail set and a hammer, mark the locations for the drill-bit point, then mark the line that represents the top of the deck joist. A drill press is the best tool to drill the 1/8-in. pilot holes on the posts. Another method is to mark the bolt holes on both sides of the post and, with a handheld drill, bore from both sides toward the center.



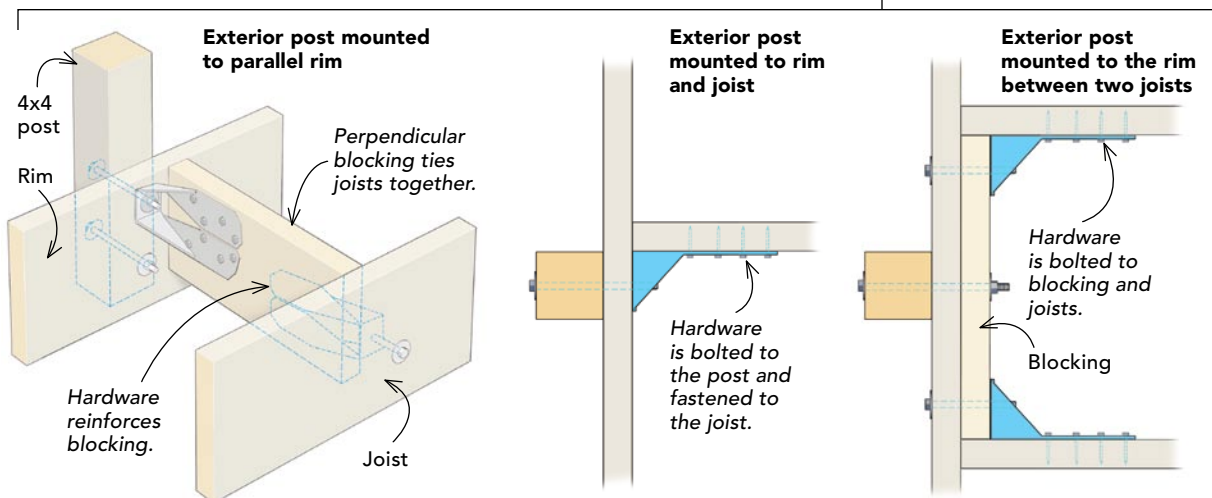
2 Clamps make post installations a one-person job. Attach a clamp just above the register mark to set the height of the post automatically. Next, use a second clamp to attach the post to the joist. A third clamp holds a 2-ft. level to the side of the post to free hands for drilling.

3 Use the post as a drilling guide. After locating and plumbing the post, follow the pilot holes, and drill through the joist. The best types of bolts to use are 1/2-in.-dia. hot-dipped galvanized hex-head bolts with washers that have a broad bearing surface. Don't overtighten the nut, because crushing the wood fibers reduces the holding power of the connection.

DETAILS DEPEND ON POST LOCATION

Exterior posts

When you lean on a post, the bottom of the post acts as the fulcrum of a lever, and the top bolt receives the greatest force. Therefore, this is the logical location for dedicated hardware that ties the post back into the joists. The specific details of hardware placement depend on the post location. Note: These illustrations show only general recommendations. Follow manufacturers' instructions for specific hardware installations.





4 Hardware completes the installation. To strengthen the post's attachment to the deck, install galvanized brackets that tie the rim joist and post to an adjacent joist. The DeckLok bracket (photo above left) is bolted to the frame and has been tested for a number of common post-to-rim-joist connections. In addition, two newer pieces of dedicated hardware (product photos center and right) became available in the fall of 2009. They mount with structural screws that are faster to install than bolts and are more cost-effective in terms of materials and labor.



5 Use a strap to reduce wobble. If you bolt on posts at the framing stage, you'll notice that the posts on parallel rim joists will have a lot more deflection than those along perpendicular joists. Once the decking is installed, the deflection diminishes. Go one step further to help stiffen these posts by nailing a 16-ga. metal strap across the top of the rim joist and the next three or four inboard joists.

Posts that pass inspection

The 2009 International Residential Code (IRC) offers performance criteria only for railing systems (table R301.5) and leaves it up to deck builders to devise a solution for mounting guardrail posts to the deck frame. Local building officials may approve or reject that solution, but most accept an engineer's stamped design or other supporting documents. One example that addresses the methods I've described here is the American Wood Council's Prescriptive Residential Deck Construction Guide (DCA #6). The current version, published in fall 2009, is based on the 2009 IRC. Code officials generally recognize the prescriptive details presented in American Forest & Paper Association (AFPA) documents. Inspectors also often accept hardware manufacturers' product-installation guides, which in some cases are backed up by ICC ES (International Code Council Evaluation Services) reports.

THE GOAL OF A FINISHED RAILING

Visit FineHomebuilding.com to see how the author finished this deck railing. Hint: You might "score" an unusual idea you can use.

Interior posts

