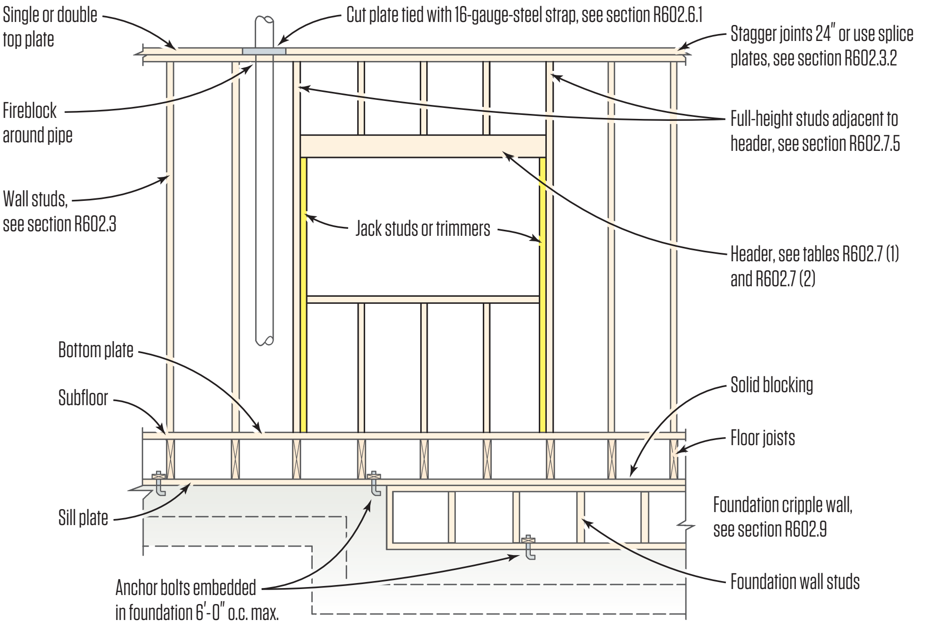
Q Is there a structural difference between full-height jacks at window openings and split jacks that fit around the rough sill?

A John Bologna, a structural engineer and president of Coastal Engineering Co., in Orleans, Mass., responds: When the jacks on a window opening are interrupted at the sill, that framing strategy is known as the "split-jack" or "split-jamb" method, and the short answer to your question is that split jacks are structurally weaker than solid jacks.

While the code does not address the issue of split jacks directly, section R602.3 Design and Construction does allude to how rough openings for windows should be framed: "Exterior walls of wood-frame construction shall be designed and constructed in accordance with the provisions of this chapter and Figures R602.3(1) and R602.3(2), or in accordance with AWC NDS." Figure R602.3(2) (re-created below) clearly shows solid jacks on either side of a framed window opening, with the sill butting into the jacks.

Most people think only in terms of the gravity load transfer—that is, floor and roof loads transmitted through the header and into the king-and-jack-stud assembly. If you've framed the walls with good kiln-dried lumber, transferring those vertical loads with split jacks should not be a problem structurally. Anecdotally, I have heard of



Code wall framing. This illustration is how the IRC presents wall framing. While not calling out solid jacks specifically, it clearly shows the jacks running in an uninterrupted line from the header to the bottom plate, with the sill butting into the jacks on both sides.

Illustration by Tim Healey

framers who used the split-jamb method with green wood, however. When the wood shrank across its thickness, the loads from above caused the opening to rack and the windows to bind.

But a window that operates poorly is just a small part of why split jacks aren't a good idea. Keep in mind that the stud wall assembly is also important for resisting lateral (wind or seismic) loads. This loading is transferred into the structural frame in two directions: longitudinally, or parallel to the wall (when acting as a shear wall), and transversely, or perpendicular to the wall, when lateral loads are applied against the wall area (as with a sail).

When you're analyzing jack requirements, this second type of loading is most relevant. In a framed wall, the studs act in concert with the cladding system, transferring horizontal wind forces into the horizontal floor and roof diaphragms. This transfer occurs in bending along the strong axis of the studs and into the deck above and below. At window and door openings, the common stud spacing is interrupted, and the wind pressure on the window is transmitted to the structural elements around all four sides of the rough opening.

On smaller openings, a single king stud and continuous jack stud are usually OK, but for larger openings, more than one king stud may be required. Think of it this way: When the common studs are removed to create an opening, king studs and jacks are asked to assume the loads that would normally be resisted by the common studs. Those loads become concentrated at the king-and-jack-stud assembly. The studs at the sides of the opening are doing the work of three or four studs missing from the opening. When jacks are split, they cannot help to resist those transverse loads, which then become concentrated mainly on the king studs.

In high-wind areas like the coast where I work, we often beef up the jack-stud assembly by installing additional king studs to form a stronger jamb assembly. In some cases, we call for engineered-lumber posts with proper connection hardware to help transfer the forces. A good rule of thumb is to add an extra stud to each jamb stud assembly for every two studs that are removed for the window. If the opening is 5 feet wide and you've taken out four studs, add two studs to the assembly on each side.

Q I recently read that wide shingles get two nails in the center as well as nails on the edges. Others say one nail in the center. Who's right?

A Chris Yerkes, a cedar-shingle installer certified by the Cedar Shake and Shingle Bureau (CSSB), and owner of Cedarworks, in Brewster, Mass., responds: The answer depends on whose guidelines you follow. If you go to the websites of both the CSSB (which has jurisdiction over red-cedar installation) and Maibec (which has white-cedar jurisdiction), you'll find they offer slightly different guidelines for installing wide shingles.

The official guidelines from the CSSB regarding red-cedar shingles are as follows: Cedar shingles up to 10 inches (254mm) wide require two corrosion-resistant nails driven 3/4 inch (19mm) from each edge and 1 inch (25mm) above the exposure line. For shingles wider than 10 inches (254mm), drive two additional nails approximately 1 inch (25mm) apart near the center. To decrease the chance of splitting the shake or shingle, fasteners should be blunted. Siding nails should be ring- or twist-shank to improve holding. A ring-shank nail will have adequate holding power if it penetrates 3/4 inch (19mm) into the wood. Corrosion-resistant nails are needed to avoid iron stains caused by extractives in the wood and corrosion by acid rain, salt air, and the like.

On the other hand, Maibec's installation guidelines for white-cedar shingles require that two fasteners per shingle, regardless of its width, be located 3/4 inch from each edge and 1 inch above the butt line of the overlapping shingle. Fasteners must penetrate solid nailable substrate (for example, plywood) a minimum of 1/2 inch.

As you can see, the nailing strategy for wide shingles differs depending on who you ask and what material you're using. Both strategies above are ways of dealing with the same simple fact about cedar shingles, regardless of the species: Wide cedar shingles are likely to bow and crack over time. As shingles absorb moisture and give it up during normal seasonal cycles, the wood tends to expand. The wider the shingle, the greater the expansion. If a wide shingle has been nailed just along the edges, the center will bow out, creating unsightly ripples in the siding.

With repeated seasonal movement, a wide shingle will eventually crack, which can compromise the integrity of the siding. If a wide shingle is attached in the middle, the bowing might seem less pronounced, but the chances of cracking or splitting over time are the same. As contractors, we can't afford to have a dissatisfied client demanding that we rip out and replace shingles that have bowed or cracked. In addition, blending in a repair might be next to impossible, especially if the shingles are prestained.

Our strategy is simple: We avoid using any shingle that is wider than about 8 inches on the wall, period. Instead, we cull any shingles wider than that as we come across them, and set them aside to be cut for the angled shingles on dormer cheeks or along gable edges. I've had some folks suggest that I just rip wide shingles into narrower widths. But ripping wide shingles is not worth the time and effort, especially with color-stained shingles because of having to go back and paint the cut edge to meet the warranty requirement. In the last few years, Maibec has started including a separate box of "wides" with each color-stain shingle order, specifically for installation along cheeks and gables. This relatively new idea seems to work and saves us the time of having to cull wide shingles from the regular stock.