Letters

Raising Rafter Ties

Jordan Truesdell's answer to the question about raising ceiling joists (*Q&A,* 10/08) was very informative. I see a lot of houses where carpenters have raised the ties several feet to create a high ceiling or attic room, but they don't realize that the dimension of the rafters may need to be increased. When a tie is raised above the lower ends of a pair of rafters, the bending moment (the amount of flexural force) in each rafter increases.

So, for the 4/12 roof in the example, the rafter bending moment when the tie is at the top plate is 1,440 foot-pounds. But when the tie is raised to 16 inches above the wall, the bending moment in the rafter reaches 3,200 foot-pounds. This is important, because bending moment is what governs the size of the rafters. So, for example, according to the IRC, a No. 2 southern pine 2x8 could safely resist the 1,440 foot-pound moment in the rafter when the tie is at the top plate. However, if a carpenter raises the tie, the resulting 3,200 foot-pound moment would exceed the 2x8's capacity by more than 70 percent.

Ashton B. Avegno Jr., P.E.
New Orleans

Author Jordan Truesdell responds: That's a good point. According to IRC Table R802.5.1(3), for rafters on 24-inch centers, a No. 2 southern pine 2x8 can span 13 feet 2 inches at any allowable pitch. But according to the footnotes to the table, if the rafter tie is moved up one-third the distance to the ridge, the allowable span must be multiplied by a 0.67 reduction factor. As a result, the maximum span for the 2x8 would be 8 feet 10 inches — far short of the 12-foot span in the example.

You would have to go all the way up to a No. 2 southern pine 2x12 to make this application work (18 feet 5 inches allowable span for 2x12 × 0.67 = 12 feet 4 inches).

Computer Help

I recently reread "Builder CAD for Less than $1,000" (2/07). I found it helpful but not exactly what I need. I've been designing residential and commercial projects for 61 years, so I'm old school: T-square and triangle. I have a Dell computer that I don't understand. Having spent many dollars on books, I realize I need something that comes before "Computers for Dummies." Can you suggest a workable system? I mostly need ease of use and the flexibility to create objects on the fly, but I also need to create precise working drawings.

Paul Coykendall
Stockton, Calif.

Author Joe Stoddard responds: You'll need to get more comfortable with the machinery before CAD or any other business application will be of much value. Computer books tend to be very similar in approach, and I can't recommend a book that's going to be much better than the "Dummies" series. Since you've gone the book route and found it unsatisfactory, I think you'd benefit from taking a class. Find an adult-outreach computer basics course, perhaps at a community center, a community college, or your local library. (The Cesar Chavez Central Library near you lists various free-of-charge computer classes on its Web site.) A small-group setting — no more than 10 students, five is better — is ideal, especially at the beginning, because you have the benefit of a live instructor as well as the other people in the class who are in the same boat as you. You can make progress together as a group, and you can get extra one-on-one help if you need it. Once you get some of the basics under your belt, you'll find additional training materials online, and application software of every kind will start to make more sense to you.

Remember Venting

Regarding "Waterproofing a Rooftop Deck" (9/08): My Duradek distributor tells us we need to vent the roof when it's installed over a conditioned living space. We've had to come up with some creative ways to accomplish this.

Dwight Stonerook
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Leesburg, Va.

KEEP 'EM COMING!

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