Ask the EXPERTS

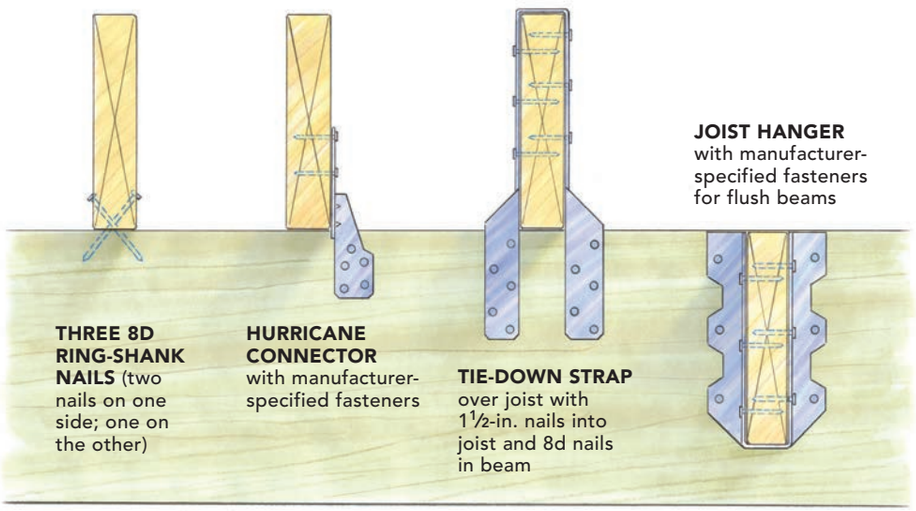
YOUR QUESTIONS // PRO ANSWERS

Uplift protection for decks

I've been asked several times lately about connecting deck joists to underlying beams. My normal go-to for deck construction, the American Wood Council's Prescriptive Residential Wood Deck Construction Guide (DCA 6), suggests toenails or hurricane ties for connecting deck joists to beams. Nails are easy and inexpensive compared to hurricane ties, but I usually recommend hurricane ties because I've seen how they help rafters and trusses resist uplift during high winds. What do you recommend?

—MIKE GUERTIN
East Greenwich, R.I.

Loren Ross, a structural engineer with Altenloh, Brinck & Co., replies: To answer if a structural connection is sufficient, we first have to consider the load. Then we need to determine if the load is less than the connection's ability to resist it along with a sufficient safety factor. In this case, the load is how much uplift is being applied to the deck with wind rushing over it, which of course depends on the maximum wind speed. The standard that structural engineers use to calculate uplift does not have an easy or well-defined method for decks. The problem with these calculations is that they neglect the gaps between boards, which reduce the uplift by equalizing the pressure above and below the boards. You can imagine how this reduces uplift by considering an aircraft wing riddled with holes. Using the closest engineering calculations we have and my best guess, the uplift force on a deck is probably around 200 lb. per joist for typical decks in most of the United States.



STRONG DECK-JOIST CONNECTIONS

Although the spaces between deck boards means decks are subject to less uplift than roofs, they must be able to withstand high winds. Toenails offer the least uplift resistance. Hurricane ties provide more uplift resistance, while straps that wrap over the joists provide the most.

As far as a joist-to-beam connection that can resist the load, toenails will be the weakest with a design capacity of around 230 lb. when using size 3d to 8d threaded nails as described in DCA 6. Most hurricane ties will have a capacity of more than 500 lb. each, which seems sufficient for even the windiest parts of the U.S. As further evidence, I'd point out that you seldom hear about deck uplift failures, even when deck collapses seem to be regular news.

Furthermore, these values are misleading because decks won't uplift from individual connections. The deck boards tie all the joists together so that an uplift failure would be a failure of the whole assembly. Also, wood is stronger against short-term loads like wind than it is under longer-term loads like hot tubs and people.

So structurally, you can make a strong case that both toenails and hurricane ties have sufficient uplift resistance for most decks in areas of the U.S. with typical wind speeds. If you live in one of these areas and you want to go to the trouble, a local engineer could likely design a deck with hurricane ties every other or every third joist, depending on the local wind speed. Most contractors conclude that a hurricane tie on every joist is an easier and less-expensive option. If you want more uplift resistance—if you're building in a place with high winds, such as the south of Florida, or for a rooftop deck—I recommend hurricane straps that wrap over the joist. These connect the joist to the beam and reinforce the joist. If you're wondering how this works, imagine trying to split a log with a metal band around it.

Hodge-podge housewrap

I've been watching a house in my neighborhood undergo a major renovation. The con-

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Wrapper's delight. *You can use different brands of mechanically fastened WRB on one home—in order to use up partial rolls, for example—provided you follow the manufacturer's instructions for each product.*

tractor used at least three different brands of housewrap. It doesn't appear that there's any rhyme or reason for the locations of the different types, but it has me wondering if it's OK to mix and match—and if there could be a reason to use different wraps on different parts of a house?

—LARRY KEAR
Evanston, Ill.

Editorial advisor Mike Guertin replies: There's no problem using different types of mechanically attached housewrap on a house other than for warranty coverage. I suspect the various manufacturers would point fingers at each other should there be a leak in a wall where two or three different wraps are present. There could also be compatibility problems if the tape's adhesive doesn't match the housewrap. However, if the patchwork wraps are installed according to their respective installation guides, there shouldn't be a problem.

I've used a couple different brands of housewrap when I'm buying from different building-material dealers who stock different brands or when I run short during a job and finish with a saved roll from my stock. One good reason to install different types of housewrap is when matching the housewrap to different claddings on the same house. For instance, a section with hollow-back vinyl siding would be fine with a basic flat housewrap, a section clad with fiber-cement lap siding may warrant a drainable wrap for better water management, and a section with open-gap siding over furring would need an unobtrusive, unbranded dark-colored wrap with UV protection.

Prevent bubbles in joint compound

A recent drywall patch revealed a weird phenomenon that I've experienced in the past. When I apply compound over a previously painted surface, little air bubbles, about the size of soda bubbles, appear in the compound. If my patch combines new and painted drywall, the bubbles only appear over the painted part. I've experimented with both ready-mixed and easy-sand setting-type compound and the bubbles happen with both. What causes this? Is there a way to prevent it?

—JAMIE OZOLEK
Wexford, Pa.

Myron Ferguson, author of Drywall: Professional Techniques for Great Results *(The Taunton Press, 2012), replies:* I'll start out by saying that I don't know what causes air bubbles to come through the joint compound during repairs over painted surfaces. I've also had it happen when applying drying compound over setting-type compound. My theory is that compounds are formulated for the paper face of drywall, so the compound reacts differently when it's applied over a painted surface or over heavy layers of setting compound.

The biggest frustration with the bubbles is that they keep reappearing, even after a third or fourth coat. Fortunately, a few years ago I discovered a technique that eliminates nearly all the air bubbles. I was doing an extensive repair to a plaster wall in a church basement. I had put on thick coat of setting compound the day before, and after rolling on a fairly heavy layer of a lightweight compound, I went outside to get my taping tools and had a conversation with the church's general contractor. It was 20 to 30 minutes later when I went back to the basement and started smoothing the compound with a wide finishing knife. There were almost no bubbles.

My solution is to apply a fairly heavy coat of USG Plus 3 drying-type compound over the setting compound or painted surface and wait. Do something else for at least 20 minutes and then try smoothing with a drywall knife. If you start working the compound and you're still seeing bubbles, wait 10 minutes more.

This technique eliminates 90% of the air bubbles. If I'm making multiple repairs over painted surfaces, I'll apply drying-type compound to some or all of the repairs before I start smoothing. After the compound on the patches has had 20 to 30 minutes to rest, I smooth out the patches in the same order that I applied the compound. The secret in both scenarios is patience.

Bubble buster. *Joint compound applied to painted surfaces often develops bubbles that complicate finishing. To fix the issue, apply a heavy coat of lightweight compound and let it dry for 30 minutes before smoothing it down.*

Photos: top, courtesy of Larry Kear; bottom, Patrick McCombe.