Q&A

Q. Nail Pops in Shingles

What causes nail pops in asphalt roofing shingles? Where I live, in the South, this seems to be a common occurrence. Is this an expansion/contraction problem? Are the wrong kinds of nails being used?

A. *Harrison McCampbell, a consulting architect in Nashville, Tenn., who specializes in construction defects, responds:* A nail pop — a tent-shaped blister on a shingle roof caused by a nail pushing up from below — can result from a number of factors. If the pop is caused by a shingle nail, it's often one inadvertently left in place from the last money-saving "roof-over." The pop could also be caused by a sheathing nail that was used to fasten the plywood or OSB roof deck. If coated or ring-shanked or annular-shanked nails weren't used to fasten the roof deck to the framing, a few nails could be incrementally migrating out on a daily or seasonal basis from an unstable deck.

Unfortunately, roof decks are rarely properly installed or vented, which makes pops more likely. For example, I often see decking panels butted right next to each other, rather than installed with the APA-recommended 1/8-inch gap at both ends and edges. Soffit venting is often blocked off by batt insulation in the attic, while ridge venting is often inadequate for exhausting hot, humid air from the attic.

And even if a properly sized ridge vent is used, I frequently see the opening underneath covered over with felt paper, presumably to avoid callbacks after driving rains. Panels with no room to swell and no opportunity to dry out tend to buckle against the fasteners holding them in place. A Southern climate — with its double-edged sword of high humidity and high temperatures in the summer months contrasting with the colder, drier winter months — compounds the problem.

There are no industry standards for roofing-nail length, just common sense. Some roofers will try to use the shortest nail they think they can get by with, thinking they'll save time and money and increase profits. Others use the longest nails they can, particularly when they're roofing over an existing roof and aren't sure what they're nailing into. Both situations can contribute to nail pops.

Pneumatic nailers are another piece of the puzzle. Often, gun nails are driven in at an angle, or the gun isn't set properly and either overdrives or underdrives the nail. And when they have a smooth shank, these nails don't grip the sheathing very well.

The prescription for nail pops is simple: Install and ventilate roof decking properly, use the right fasteners for both sheathing and shingles, and don't shingle blindly over an existing roof covering.

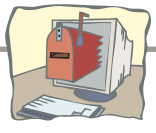
Q. Plywood vs. OSB I-Joists

Do any I-joist manufacturers still use plywood webs? At my local lumberyard, I was told that manufacturers switched from plywood to OSB webs because the plywood tended to delaminate, but I suspect the real reason is that OSB is cheaper. I'd prefer to use plywood I-joists, because I think they'd be stronger.

A. *Paul Fisette, director of Building Materials and Wood Technology at the University of Massachusetts Amherst and a* JLC *contributing*

GOT A QUESTION?

Send it to Q&A, *JLC,* 186 Allen Brook Lane, Williston, VT 05495; or e-mail to jlc-editorial@hanleywood.com.



editor, responds: While you might be able to find a small manufacturer somewhere who still makes I-joists with plywood webs, the major players do not. It may be true that OSB-web I-joists cost somewhat less to manufacture, but the main reason for the change is that OSB webs provide superior structural performance. OSB has interlocking fibers that transfer shear loads better than plywood does, making it much stronger in shear. As a result of this difference, you can cut larger holes in the OSB webs than in plywood webs, and OSB is capable of transferring greater loads to bearing points.

The OSB in I-joist webs is not the garden-variety OSB used for sheathing products. It has more wax and about 15 percent more resin, making it a very stable material. In fact, instead of being a cheaper substitute for plywood, I-joists made with OSB webs mark a significant improvement in the structural floor-framing industry.

Q. Keeping Garage Fumes at Bay

I'm building a house that has an attached 24-by-24-foot garage with a master suite above. The owner is concerned about fumes getting into the living spaces next to and above the garage. What's the best way to seal out the fumes?

A. *Bruce Harley, technical director of Conservation Services Group in Westboro, Mass., and author of* Insulate and Weatherize, *responds:* Unless the homeowners park in the driveway, there's no way to provide a guarantee against fumes, and unfortunately building codes don't address pressure boundaries and potentially unhealthy airflow at all. But there are two strategies to help reduce risk: sealing leaks between the house and garage and establishing a known direction of airflow. Once you have ensured that the garage is at a lower pressure than the house, any leaks you haven't sealed won't pull air and fumes from the garage into the house.

Your first priority should be to eliminate ductwork from the garage. Regardless of what else you do, leaks in return ducts or air handlers with leaky filter racks could draw in fumes and send them straight into the house. In an existing home, if ducts can't be eliminated, seal them with duct mastic.

Next, caulk or seal any obvious gaps in the garage walls or ceiling. Trouble spots include where the drywall meets the foundation at the bottom of the wall separating the garage from the house; electrical penetrations and other holes (such as garage-door-hanger hardware); and weather stripping on the door between the house and garage. Don't, however, seal leaks between the garage and outdoors — those are helpful.

Another sealing strategy, if the home has little or no insulation in the ceiling of the garage or in the wall between, is to blow high-density (3 to 3.5 pcf) cellulose insulation into the cavities. Sprayed insulating foam seals leaks, too, but is easier and more cost-effective to use in new construction than in existing buildings. In new construction, be sure to install blocking between joists where they cross partitions that separate the garage from the home.

The easiest way to establish an airflow pattern from the house to the garage is with a local exhaust fan that vents garage air to the outdoors. Depending on the size and leakiness of the garage, it may take between 100 and 250 cfm of air to depressurize the garage relative to the house with confidence. The fan could be wired to run full time, but that would use a fair amount of electricity. A better approach might be to use a time-delay switch that activates the fan each time the garage door is opened (if it's an automatic door) and runs it for 20 or 30 minutes after the door is closed.

The most important precaution, of course, is for the homeowners to avoid idling the car in the garage with the garage door closed. And it's always a good idea to install CO detectors in any rooms that are next to or above the garage.

A building performance consultant may be able to help you with all of these issues by using a blower door, pressure-differential tests, and duct testing or sealing. There are many Energy Star–approved HERS raters in Texas with the tools to conduct diagnostic tests and recommend a specific strategy for your home. They should also be able to test the effectiveness of the work once it's complete.