Q&A

Q. Fire-Safe Decking

Does anyone make a fireproof deck board?

A. *Stephen Quarles, a University of California Cooperative Extension advisor in Richmond, Calif., responds:* For truly noncombustible decking, you could use an aluminum product like AridDek (ariddek.com), LastDeck (lastdeck.com), or Lock Dry (lockdry.com). But there aren't currently any wood, plastic, or wood-plastic composite deck boards that have a noncombustible rating. Keep in mind, though, that even in California, where homes built in wildfire-prone areas must comply with the state's stringent, newly adopted fire code, deck boards don't have to be "noncombustible"; they just have to meet certain minimum performance criteria (see Chapter 7A of the 2007 California Building Code).

Those standards — and the fire-test protocols used to establish them — were developed by researchers (including myself) at the University of California Forest Products Laboratory. We tested several different types of commercially available plastic and wood-plastic composite deckboards, as well as solid redwood decking. To simulate an under-deck surface fire, we exposed deck boards to an 80-kilowatt propane flame for three minutes. And to simulate burning embers landing on the deck, we used an ASTM E-108 "A" brand: a 1-square-foot, three-layer assembly of nailed-together 3/4-inch-square sticks that we set on fire and placed on the decking (the same method used to test roofing).

Our testing showed that a decking material's fire performance was largely dependent on its cross-section (solid, channeled, or hollow), the plastic component used in its construction, and the presence or absence of a fiber reinforcement. Channeled deck boards tended to perform poorly in the under-deck tests, while hollow decking typically performed poorly in the burning-brand tests. Solid decking performed best overall; it's worth noting that 2x6 heart-grade redwood, a common decking material in California, performed as well as or better than all of the plastic and composite decking products we tested.

These tests were conducted about eight years ago, and many of the plastic and composite lumber manufacturers have since modified how their deck boards are made in order to comply with the California requirements. Therefore, how any given product performed in our original testing isn't necessarily an indication of how it would perform today.

There are several decking products that now meet the performance standards established by the CBC, such as TimberTech XLM (timbertech.com), a solid PVC product with a Class A flame-spread rating, and Trex Accents Fire Defense (trex.com), a wood-polyethylene composite with a Class B flame-spread rating. Also approved for use is nominal 2-by solid-wood decking in several species, including redwood and some types of cedar.

For a list of these products and information about the compliance criteria, you can download a free handbook, "Wildland Urban Interface Products," at jlconline.com /firetested. Some of the products aren't easy to find outside of California, but they may be available through special order at your local lumberyard.

Q. Working with Paperless Drywall

My clients are concerned about mold, and want the walls and ceilings of their remodeled basement to be covered with paperless drywall instead of regular gypsum board. Are there any tricks to installing and finishing this material, or is it treated just like standard drywall?

A. *Myron Ferguson, a drywall contractor in Galway, N.Y., and moderator of the* JLC *Online drywall forum, responds:* The paperless drywall I've used — DensArmor Plus (gp.com) — cuts and fastens just like regular drywall, but instead of an organic paper face it has an inorganic fiberglass mat covering. Cutting it sends bits of fiberglass into the air and onto the skin, so I always wear a long-sleeve shirt and a dust mask when I'm hanging it.

To reduce the potential for mold growth and maintain a completely paperless wall surface, the maker recommends using fiberglass mesh joint tape with a setting-type compound for at least the first coat. Vinyl corner beads are recommended for inside corners.

Earlier versions of DensArmor Plus seemed to have a very rough surface texture. Although the new versions are smoother, they still feel a little like 200-grit sandpaper if you rub your hand across them. Applying a skim coat of joint compound over the entire surface after all

of the joints and fasteners have been taped and sanded to a Level 4 finish leaves a thin film that fills in all of the little nooks and crannies in the facing. Once everything is sanded smooth, you have a Level 5 finish.

If this sounds like a lot of extra work, keep in mind that — with both paper-faced and paperless drywall — the taping and sanding process produces a lot of different textures. Areas that are covered with compound — like seams, fasteners, and inside corners — become very smooth after sanding. Areas where the face of the drywall has been sanded (usually along the edges of taped areas) have a rougher texture, since the sanding process raises the fibers of the paper or fiberglass facing. If the sandpaper used is too coarse, the difference in textures becomes even greater. Plus there may be untouched areas of drywall, which have yet another texture and porosity. All of these differences can become much more noticeable when the walls or ceilings are finished with a paint that has some sheen, especially if the light hits it just right.

Mold-resistant paperless drywall is a specialty product that costs 10 to 15 cents per square foot more than standard drywall. Whether I'm using paperless or paper-faced drywall, I usually charge about 25 cents more per square foot to upgrade from a Level 4 to a Level 5 finish on large areas. For small jobs, I usually don't charge a premium, since it only takes a few minutes to skim-coat a sheet of drywall.

Q. Window Seats and Safety Glass

While trimming out a room during a remodeling job, the homeowner asked me to build a window seat. Does the window above the seat now have to be fitted with tempered safety glass?

A. *Lynn Underwood, an engineer, licensed contractor, and building code official in Norfolk, Va., responds:* The IRC contains a long list of hazardous locations where approved safety glazing — in the form of approved rigid plastic or laminated, tempered, heat-strengthened, or wired glass — has to be used. According to Section R308.4.7 of the 2006 IRC, the area above a window seat would be considered one of these hazardous locations for a window if *all* of the following conditions are true:

- the exposed area of an individual pane is larger than 9 square feet;
- the bottom edge of the glass is less than 18 inches above the floor;
- the top edge of the glass is more than 36 inches above the floor;
- there is at least one walking surface within 36 inches — horizontally — of the glass.

Because a window seat is typically used not as a walking surface but for sitting on, a window adjacent to a window seat probably wouldn't meet these criteria. But the intent of the building code is to minimize the potential for falling into the glass under a variety of situational conditions (such as when surfaces are wet or slippery, for example). So in some jurisdictions, where the model building code has been amended to reflect local conditions and custom, it's possible that some inspectors would require safety glass above certain window seats.

When in doubt, always check with your local building official for the final word.

Q. Insulating a Radiant Slab

How much insulation is necessary under a typical basement radiant slab?

A. *John Siegenthaler, a consulting engineer who specializes in hydronic-heating-system design in Holland Patent, N.Y., responds:* Downward heat loss from a radiant slab should not exceed 10 percent of upward heat output, a ratio derived from European installation standards for floor heating systems. It's possible to calculate the R-value needed to meet this goal while accounting for such factors as floor coverings, soil temperature, and required upward heat flux. But lately, I've begun simply specifying a minimum of 2-inch extruded polystyrene insulation under all heated slabs, even those in basements with no floor coverings. Here's why:

In my area, the cost difference between 1-inch-thick and 2-inch-thick extruded polystyrene insulation board is currently about 48 cents per square foot. Using 2-inch rather than 1-inch extruded polystyrene adds about $720 to the cost of insulating under a 1,500-square-foot slab.

To maintain a seasonal average slab temperature that is 10°F above the seasonal average soil temperature through a heating season lasting from October 1 through April 30, a slab insulated with 1 inch of foam would lose 7.1 million Btu more than a slab insulated with 2 inches of foam. Although the rates of downward heat loss from the slab differ by only about 0.93 Btu per hour per square foot, this difference translates into a lot of money over the course of the entire heating season.

Assuming heat was supplied from fuel oil purchased at $3.75 per gallon and burned in a boiler with an AFUE of 85 percent, the savings associated with the thicker insulation would be $224 per year. That makes the simple payback on the 2-inch underslab insulation about 3.2 years, which far surpasses the economic returns associated with solar energy systems, wind turbines, and quite a few other more "newsworthy" energy alternatives.