

DETAILS FOR ROOFTOP DECKS

by Anthony Galeota

Start with a perfect
surface, make no
penetrations, and work
ever so carefully

The best advice I can give to clients who want to convert flat roofs to outdoor living spaces is, "Avoid it if you can." In my experience as a builder and home inspector, these spaces create more problems for both the builder and homeowner than they are generally worth.

As an inspector, I often find ponded water, water penetration into the structure, and unstable deck platforms and railings. On the other hand, I have seen and built a number of these installations that have worked out well. To get satisfactory performance, I follow the guidelines explained below, many of which are largely common sense.

Rules of the Roof

Make sure the surface of the roofing is sound and in excellent condition before going any further. Regardless of the specific roofing material—whether it is rubber, vinyl, tar and gravel, bald

roof, or whatever—I would be reluctant to build on it if it is more than two to three years old. An *average* or *good* roof surface is not good enough; it must be in *excellent* condition because any slight crack may open up under the new, uneven loading caused by the deck. With some roofing materials, the sun may have been helping keep small cracks sealed.

Design the roof deck to distribute the load over a large surface area. The key to this is using large sleepers, 2x8 or larger. The load on the sleepers is not only the dead load of the materials, but also the anticipated live load of furniture, appliances, and people. If sleepers are too small, the concentrated loads can damage or penetrate the roofing surface.

Use lumber that is weather-protected. Ideally, you should use all pressure-treated lumber. Decks face harsh conditions and have a number of horizontal surfaces that will hold water and be subject to decay.

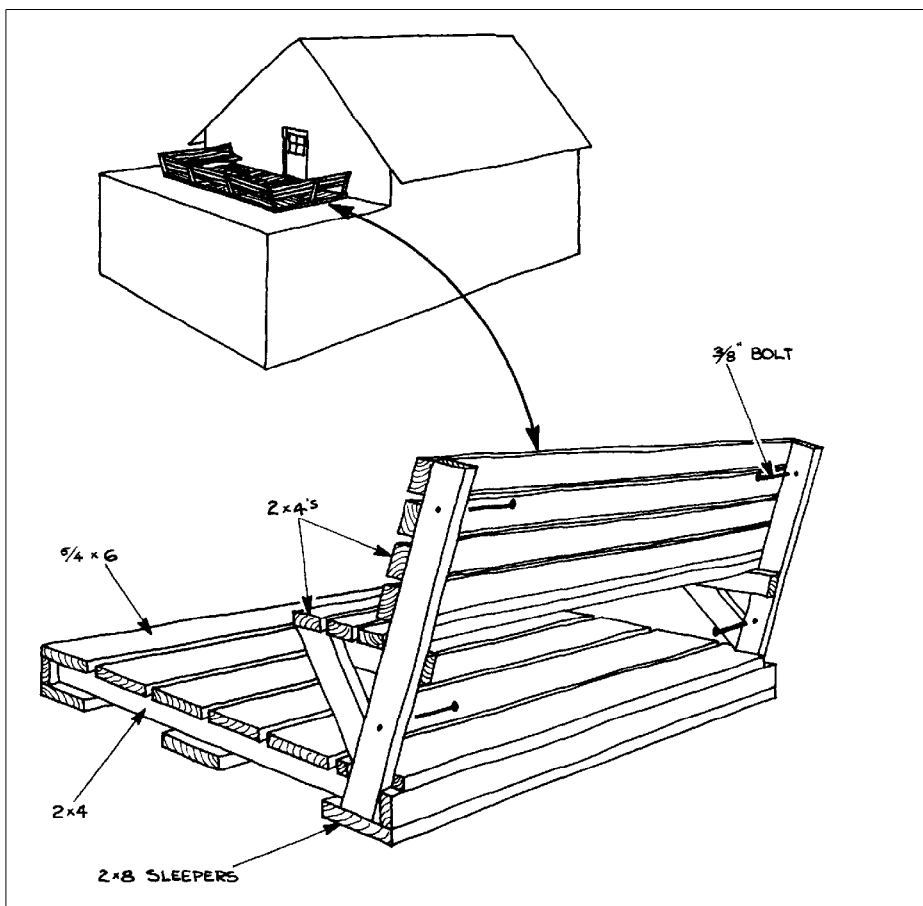
Design and build the deck in easy-to-remove sections. I recommend that the sections be no larger than about 4x4 feet. The sleepers should also be in removable pieces, and can be attached to the deck sections.

The outer deck sections should have railings solidly bolted to each section (see illustrations). The railing should also be broken into 4-foot sections, so it removes when the perimeter deck sections are removed. When installed, the railing sections should bolt one to the next as shown. This will keep the entire deck together as a unit. The height of the railing, or screen if appropriate, may vary depending on its height off the ground and the use of the deck (adult, children, or both). Consult your local code on this matter.

There are two reasons to construct a deck in easy-to-handle sections. First, the homeowner must have access to the roof surface below for cleaning. Debris is bound to collect under the deck and must be cleaned. If it is left, organic debris will lead to the deterioration of most roofing membranes. Second, access is needed to make the inevitable roof repairs. The alternative is to have to rip up nailed down decking and perhaps remove the supporting structure as well.

As part of the railing, you may desire to include benches for sitting, or table-height areas for preparation of food and drink while entertaining. The added structure of the benches also helps stiffen the railings, which may need the added support depending on the design. As a matter of safety, the deck should never, in my opinion, be built closer than 4 feet from the roof's edge.

Do not penetrate the roof surface with any of the new construction. Every penetration in the roof surface,



Deck sections should be removable and no more than 4-feet square. Perimeter sections, with integral railing, should be firmly bolted together. Built-in seating can help strengthen the railing structure.

no matter how well sealed, is a potential leak. On a flat roof, this is even more the case.

Keep the surface of the roof absolutely clean and free of all debris during construction of the deck. The reason, of course, is to prevent any penetration of the roof surface. If one loose nail gets caught under a sleeper, you've got a leak.

Work on the Ground

If at all possible, I recommend that you build the deck sections on the ground. Prefabrication of the ground is desirable, because it minimizes the amount of traffic on the roof's surface.

If you need to work on the roof, first cover the work area with sheets of plywood to protect the roofing mem-

brane. As you install the deck, it is paramount that you keep the roof surface clean and keep traffic to a minimum. These points cannot be stressed enough.

In summing up, start with an excellent roof surface, design a sectional deck that does not penetrate the roof, use quality material, keep the roof surface clean, and keep traffic on the roof to a minimum. Follow these guidelines and you can create satisfactory outdoor living areas on flat roofs. ■

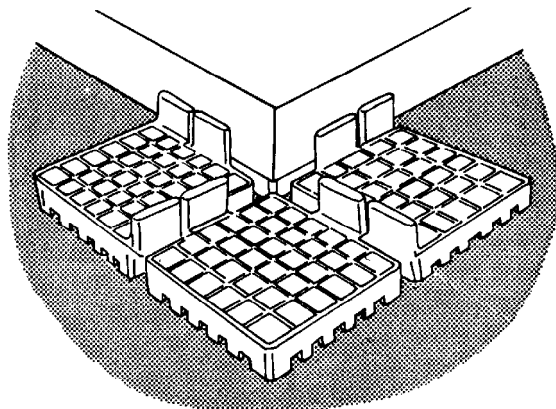
Anthony Galeota was a builder for 26 years and now owns and operates Area Home Inspection, Inc., in Harvard, Mass. He is also past president of the American Society of Home Inspectors (ASHI).

Paving the Roof

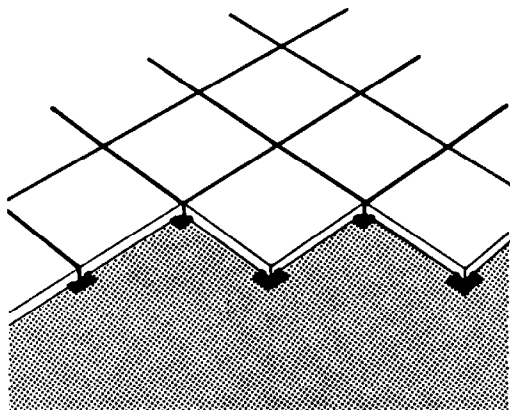
If your tastes lean more toward masonry for deck areas, you might be interested in the rooftop paving system offered by Resource Conservation Technology, Inc. For rooftop walking surfaces, the system uses 2-inch-thick concrete pavers, which are available from many masonry suppliers in 18-inch and 24-inch squares. The pavers are held 5/8 inch off the roof surface with hard, UV-stabilized plastic supports called Paver Pedestals. Small tabs in the pedestals keep the pavers evenly spaced in a grid pattern. Shims made out of the same plastic are also available to accommodate small variations in the thickness of the concrete units. Each pedestal can be broken into quarters or

halves to form supports for side or corner pavers.

The company also sells a 60-mil EPDM roofing system, which it designed for residential-scale flat roofs. Seams are made with a wide strip of butyl tape (imported from Japan). Because the EPDM is shipped without talc, cleaning the joints prior to seaming is greatly simplified, according to company president Lee Jaslow. The membrane is bonded to the roof deck with a black adhesive with a long "open time," rather than the more demanding contact adhesive typically used with EPDM. Installation is also simplified by pre-formed inside and outside corners and pipe seals. For more information, contact Resource Conservation Technology, Inc. 2633 North Calvert St., Baltimore, MD 21218; 301/366-1146. —NEB



Concrete pavers sitting on plastic pedestals.



Pavers make a durable walking surface and help protect the roofing membrane.