

Building Barn Doors

Q. *I need to build three pairs of swinging barn doors to fit 8x7 openings. I'm looking for suggestions for a lightweight but sturdy door that won't fall apart. My approach was a sheet of 3/4-inch mdo with an applied 5/4 stile-and-rail effect. My main concern is the weight problem. Can you recommend any other approaches?*

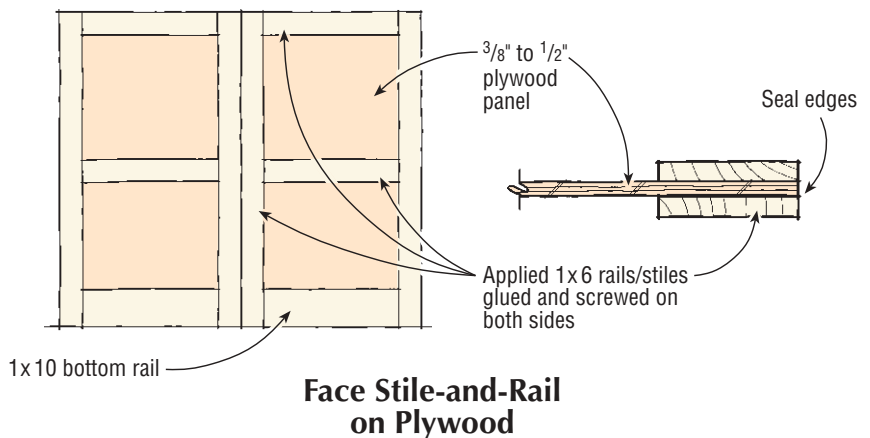
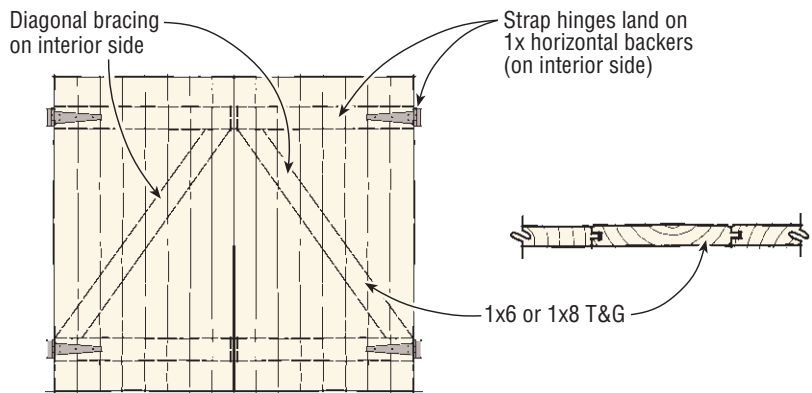
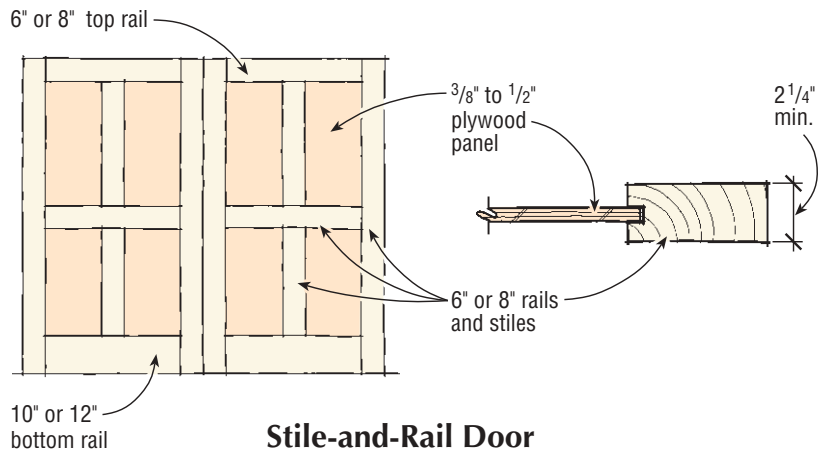
A. *Finish carpenter David Frane responds:* It's tempting to use plywood to make big doors, but, unfortunately, it (even mdo) won't stay flat when exposed to the weather. Here are three other ways to make doors the size you want:

The best way is to make real stile-and-rail doors. But that requires skill at joinery and better stock than you can get at most lumberyards. For doors this size, I'd want stiles and rails that were a minimum of 2 1/4 inches thick. You'd have to start with thick, dry material and use a jointer and planer to straighten it and bring it down to size. The panels could be 3/8- or 1/2-inch plywood. This will give you the best doors, but they'll be expensive and time consuming to build.

A simple rustic option would be to make old-fashioned shed doors out of T&G boards. Most lumberyards stock this in a #2 grade spruce or pine. The vertical face boards are fastened to horizontal backer strips. Diagonals are applied to the back side to keep the doors from sagging. The doors will be only as straight and flat as the backers. Old-time carpenters clinch-nailed the face boards, but I'd use galvanized dry-wall screws to hold them. Some of the face boards will cup, and the doors will rot if you don't do a good job of sealing and painting the edges.

If you're determined to make plywood doors, use something thinner than 3/4-inch mdo. The sheet will want to warp, and it's easier to restrain thinner material. The doors will be less

Building Barn Doors



likely to warp if you apply the fake stiles and rails to both sides of the sheet. The applied pieces should be straight, flat, and dry. For \$30 to \$40 you can get $\frac{3}{8}$ - or $\frac{1}{2}$ -inch mdo, but be sure to get the kind with paper on both faces. If it was me, I'd spring for okoume or exterior-grade birch, which are more stable than mdo because they have more plies. They come in metric thicknesses and are about twice the price of mdo.

Insulating a Foundation

Q. *To turn a small outbuilding into a living space, I plan to pour a slab floor within the existing 4-foot frostwall foundation. How much and what kind of insulation should I use for the foundation, and where should I place it — under the slab or next to the frostwall?*

A. *Moncef Krarti, professor of architectural engineering at the University of Colorado in Boulder, replies:* I suggest that you insulate the exterior surface of the foundation wall using extruded polystyrene foam boards. You can place R-5 rigid insulation (1-inch board) to the full 4-foot depth, or use R-10 rigid insulation (2-inch board) to a depth of 2 feet. These two options have almost the same thermal performance. One advantage of the full-depth treatment is that the insulation board will be supported by the footing. Insulating under the floor is not really necessary.

Either choice will save energy and cut heating bills. For a small building in New England, for example, a simple calculation (using various assumptions about energy costs and heating system performance) shows that you can expect savings ranging from \$50 to \$100 per year from that level of insulation, compared with an uninsulated foundation.

Building Details for Asthmatic Clients

Q. *I'm building a custom home for clients who have asthma and allergies.*

What building details should I pay particular attention to?

A. *Ellen Tohn of ERT Associates, an environmental consultant and a senior advisor to the Asthma Regional Council (www.asthmaregionalcouncil.org), replies:* Asthma and allergies are related — asthma is a breathing difficulty often brought on by an allergic reaction to certain triggers in the environment. There are some things you can do as a builder to help reduce asthma triggers, which can reduce the frequency and severity of attacks.

A few main allergens are responsible for most asthma attacks — chiefly, dust allergens, pet dander, pests (especially cockroaches), and mold. You should try to build in a way that helps to reduce all of those. But many asthma sufferers are particularly sensitive to specific allergens, and you should ask clients with asthma to get their doctor's recommendation for which triggers to concentrate on. The doctor can test them to identify their individual sensitivities.

If dust is the main issue, here's how you target it: You want smooth, hard surfaces that are easy to keep clean. So go for hardwood, tile, or vinyl flooring, not carpet. Keep trimwork simple so it doesn't hide dust. A central vac system can help if the exhaust is directed outdoors. Unless they have effective high-efficiency filters, regular vacuums tend to spread dust around and put it in the air, making things worse instead of better (mopping is better than vacuuming, in any case). Forced-air heating also may keep dust airborne, so radiant heat might be a preferred choice.

Two thirds of home dust is tracked in from outside. Give your clients a place to take off shoes and boots before entering the house. If they don't want to do that, a wood rack or bristly welcome mat will at least help them knock dirt off their shoes.

Humidity control also helps with

dust allergens. Dust mites, tiny insects that live on the flakes of skin that make up a part of indoor dust, thrive and grow in relative humidities of 50% or higher, and are a major asthma trigger. Relative humidity of 30% or 40% should help suppress dust mite activity. Indoor RH should be kept as low as your clients can tolerate: Give them a prominent humidity gauge for monitoring indoor conditions, and install humidistat controls on the heating and cooling systems.

You can't do much about pets — that's your clients' business. But you may be able to help with pests like cockroaches. Build the envelope tight and eliminate cracks, voids, and other "roach highways" that let bugs in and help them hide. Make it easy to keep kitchen and dining areas clean — no hard-to-sweep or hard-to-mop nooks and crannies. Low-toxicity borate insecticides are very effective against roaches, and you can treat framing and wall cavities with borate powders or sprays before enclosing them.

As for mold, it needs moisture to grow and spread. Ordinary good building practices are effective against that. Use good drainage plane and flashing details for roofs, walls, windows, and doors; that will prevent leaks. Make certain that plumbing does not leak, and place plumbing runs where they can be accessed and repaired. Avoid any thermal shortcuts or insulation defects that create cold zones on exterior walls — condensation at cold spots can harbor mold. Use good foundation drainage and put a moisture barrier between your foundation and the ground — ground moisture is a major contributor to moldy home environments. And again, control indoor air humidity — keep it as dry as your clients can stand it.

Ventilation is the final piece. Install a balanced ventilation system that filters incoming air and keeps humidity low, summer and winter. When you install a bath exhaust fan, it's worth

Q&A

running side ducts to closets. That helps flush out the mustiness and keeps any allergens that develop in the closet from spreading to living areas. And don't cut corners on fans — install quiet, effective fans (less than 2 sones) that your clients will not mind operating.

Electric Radiant Heat for a Small Space

Q. *I'm considering using electric radiant heating panels in the ceiling of a small superinsulated apartment, but I hear a lot of bias against electric heat. Can it be cost effective in this case?*

A. *Registered engineer and sustainable design consultant Marc Rosenbaum, of EnergySmiths, Inc., in Meriden, N.H., replies:* Electric radiant heat for a superinsulated small space makes a lot of sense. It gives you a low installation cost and a moderate energy cost; it's highly zonable; and there's no combustion. I assume that the hot water would also be provided by electric resistance.

An alternative might be a combination wall-hung, sealed-combustion, gas-fired water heater coupled to a wall-mounted kickspace heater or two for heat, but that would cost more to install, take up more space, be noisier, and require the location of a vent and a fuel tank.

Got a question?

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

