

In Search of the Perfect Screened Porch

Make the right design choices, and you'll have an outdoor room you can enjoy without battling the bugs

BY SCOTT GIBSON

Replacing a dilapidated deck on the back of our house with a new screened porch was the best renovation money I have ever spent. The outdoor space has the feel of a room, and we use it for everything from drinking coffee and reading the paper in the morning to eating supper at night. Best of all, it's free of bugs.

That, of course, is the whole point, no matter what the porch's style or size. Without this refuge, enjoying the great outdoors in summer means fighting a losing battle with creatures that bite, sting, and just plain annoy.

With increased exposure to the weather, larger-than-average wall openings, and less structural bracing than other rooms in the house, screened porches pose special construction and detailing challenges.

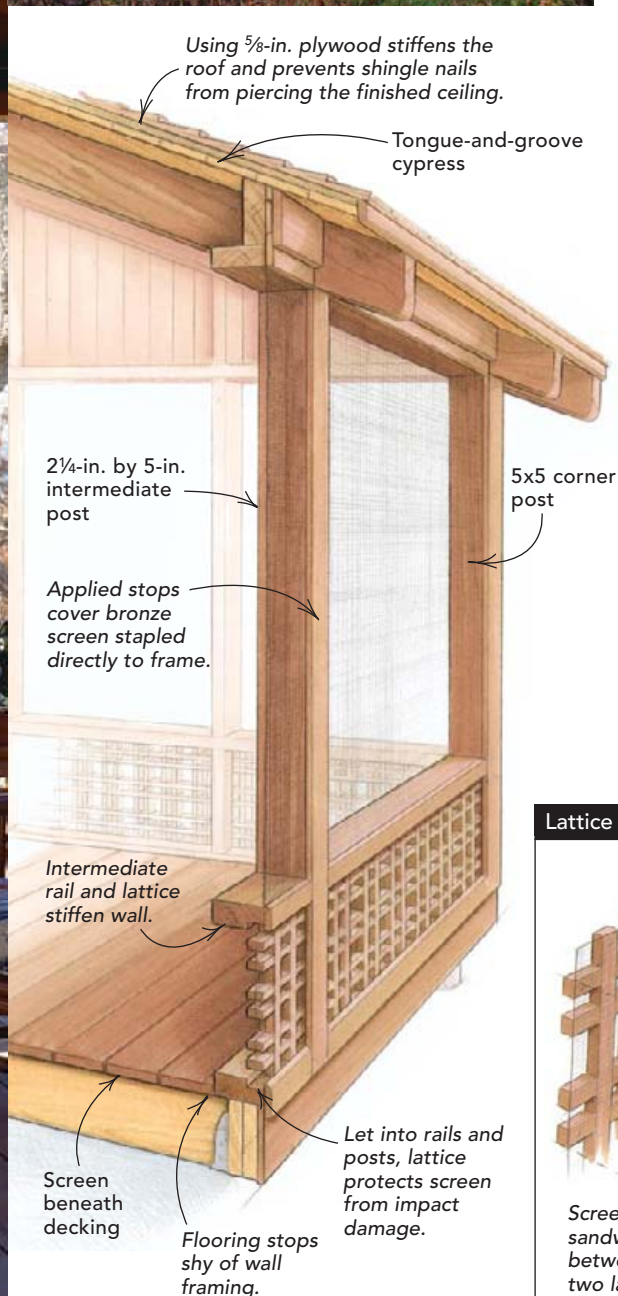
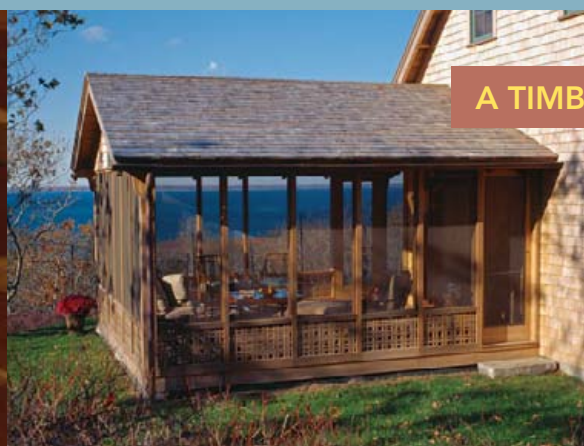
Whether the porch is designed for a shingle-style cottage on Martha's Vineyard or a contemporary lakeside house in Michigan, decisions must be made about designing the floor system, framing the walls to accommodate the screen openings, and attaching the screening. Builders and architects have approached these challenges in many ways. The best screened porches, however, are



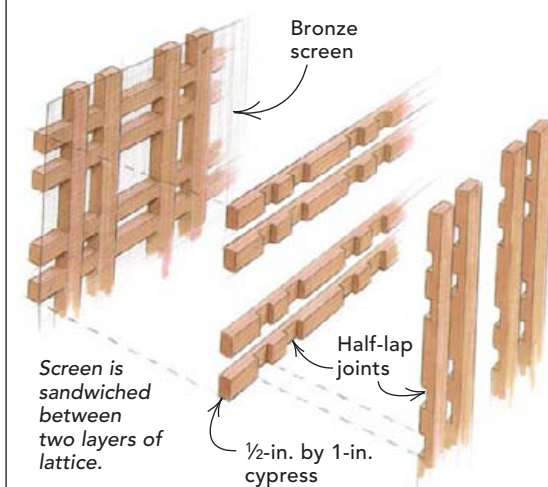
A TIMBER-FRAME PORCH

This 16-ft.-square porch overlooks the Elizabeth Islands off the western shore of Martha's Vineyard in Massachusetts. "It's a house with a wonderful view, and we wanted the porch to take advantage of that view without obstructing it," says John Abrams, whose South Mountain Company built both house and porch.

Like many of the porches South Mountain builds, this one makes ample use of salvaged lumber. Staves from old wine or beer vats are $2\frac{3}{8}$ in. thick, a nearly ideal dimension for posts. They provide plenty of structural support without obscuring too much of the view. Using a formula developed over the years, Abrams tries to keep spacing between posts 28 in. to 32 in. A characteristic detail is the lattice-work at the bottom of the porch wall, which protects the screen from kids and dogs. It's made from two layers of $\frac{1}{2}$ -in.-thick cypress that sandwich bronze screen.



Lattice detail

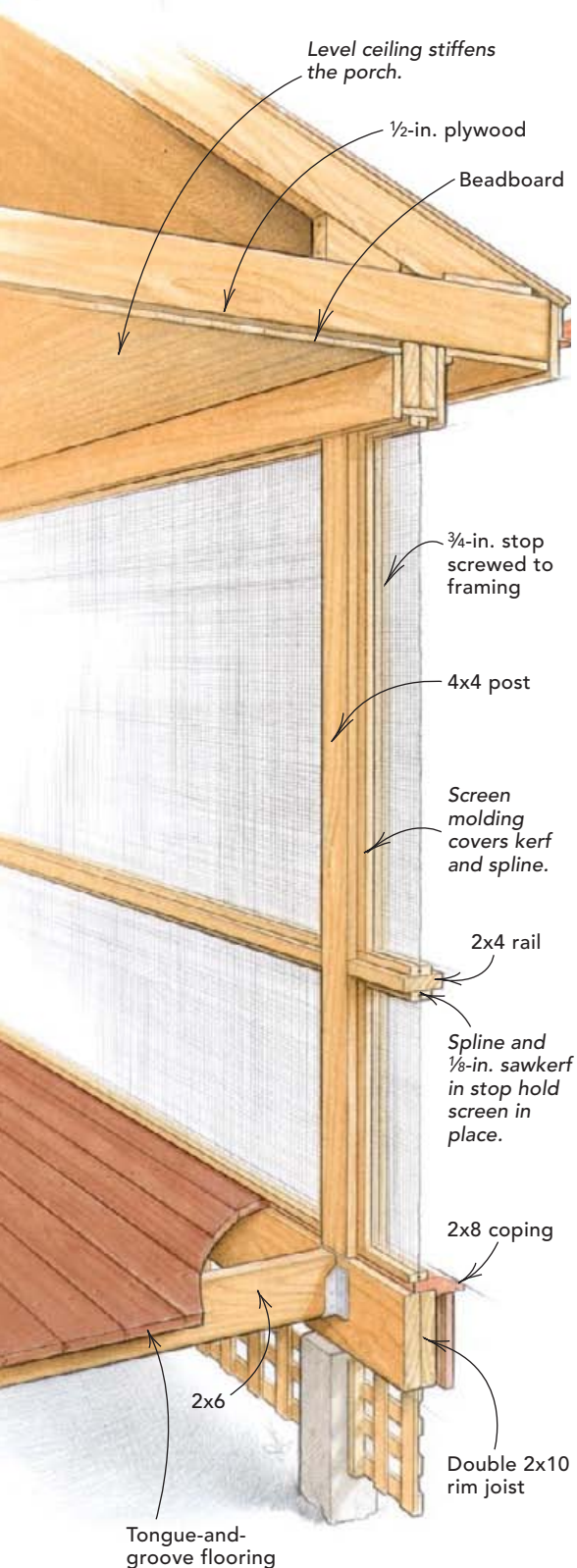


WALLS THAT PRESERVE THE VIEW

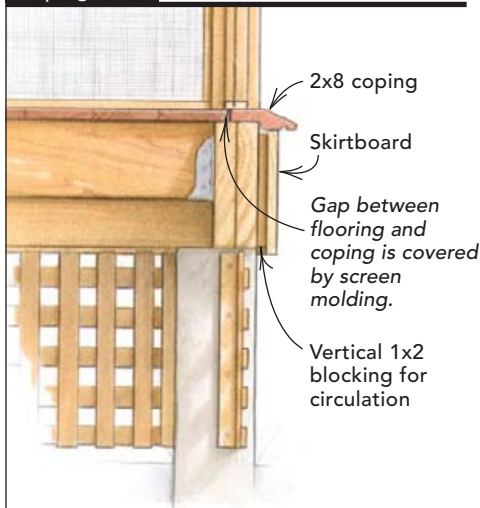
Virginia builder Scott McBride joined general contractor George Massie to build this 16-ft. by 18-ft. porch. It meets the house at the eave of a low-pitched shed roof, so the porch actually has two gable ends. That called for some fancy framing.

Worried that this tenuous connection with the house might make the porch wobbly, McBride suggested a solid porch ceiling of plywood and beadboard rather than a vaulted space with open framing. "There's no lateral bracing in the walls," he says. "The ceiling ties the porch to the house and keeps the whole thing from racking."

The porch also includes a piece of 2x8 pressure-treated lumber set atop the rim joist to support the posts. The technique keeps the structure's weight off the floorboards, making future flooring repairs less difficult. Screen is attached to stops grooved to accept a spline. At floor level, the stop covers the gap between the flooring and the coping, allowing screen to be run to the floor. "There's no base member along the bottom, so it's transparent, and kind of elegant," McBride says.



Coping detail



Graceful minimalism. The slender posts and rails are made of ipé, a richly colored, durable, and tough tropical hardwood.



easy to maintain, are bright and airy, and exhibit inspiring craftsmanship.

Frame the floor for maintenance

Most screened porches are built over wood framing and flooring, but Virginia builder Scott McBride, like others, also has built them on masonry surfaces over a concrete base. The advantage, he says, is that a stone, brick, or concrete surface is highly resistant to wear, won't decay, and is cool underfoot.

Screened porches built over wood framing raise at least one prickly maintenance problem. If porch walls are built on top of the flooring or the decking, it is difficult to replace flooring down the road when the weather takes its toll. The trick is to isolate the wall framing from the flooring material. Some common methods are adding an extra joist a few inches from the wall's bottom plate to support the ends of the flooring, connecting the posts directly to the floor framing and fitting the floor pieces around the posts (drawing p. 57), or using a 2x8 coping to support the wall, as McBride does (drawing facing page).

Level floors are fine on a porch

The roof usually shelters screened porches from the worst of the weather, especially if the overhang is greater than

Screens for every budget and need



Screen is available in a variety of materials, but aluminum and fiberglass are by far the most common. Specialty screening includes extra-heavy pet-resistant screen; screen that blocks as much as 90% of solar-heat gain; and noncorroding bronze, monel (an alloy of nickel and copper), or stainless steel for coastal installations. Prices range from about 17¢ per sq. ft. for fiberglass to as much as \$5 per sq. ft. for monel.

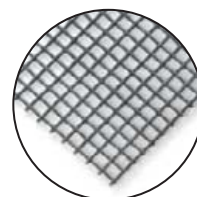
Standard door and window screen has a mesh size of 18x16, indicating that there are 18 strands per inch in one direction and 16 in the other. This screen can be used on a porch, but a mesh size of 18x14 uses a slightly larger-diameter wire, is stronger, and spans larger openings. If your area is plagued by tiny biting insects (sometimes called "no-see-ums" by their victims), 20x20 mesh may be a better choice.

Fiberglass

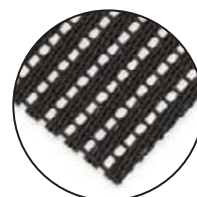
Standard fiberglass insect screen is made from vinyl-coated fiberglass threads in charcoal and silver gray. It won't crease like aluminum screening, but it's more opaque. It's also more flexible and, therefore, easier to install in an aluminum frame with a spline or in one of the proprietary screen-framing systems.

Some sun-control and pet screening is made from vinyl-coated polyester, which is stronger and heavier than fiberglass.

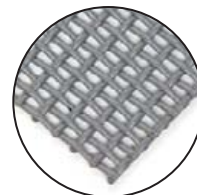
Standard fiberglass screen comes in widths up to 84 in. and costs about 17¢ per sq. ft. Pet screening is about 60¢ per sq. ft., and Phifer's Super Solar screen (205-345-2120; www.phifer.com), in charcoal and silver gray, costs \$1.53 per sq. ft.



Standard fiberglass



Sun control



Pet screening

Metal

Available in bright, charcoal, and black finishes, aluminum screening is the least visible to the eye. Aluminum, however, dents and creases fairly easily, and it can oxidize in coastal areas. It's available in widths up to 72 in. and costs about 26¢ per sq. ft.

Probably the most common of the high-performance alloy screens, bronze won't readily oxidize in salty air along the coast. It turns from a bright, coppery color to a dark brown, or even green, with age. It's available in widths up to 60 in. and costs about \$1.10 per sq. ft.

Stainless steel and monel stand up extremely well to salty air, but their durability comes at a cost—anywhere from \$2.25 to \$5 per sq. ft., depending on weave and quantity.



Aluminum

Bronze

Stainless steel

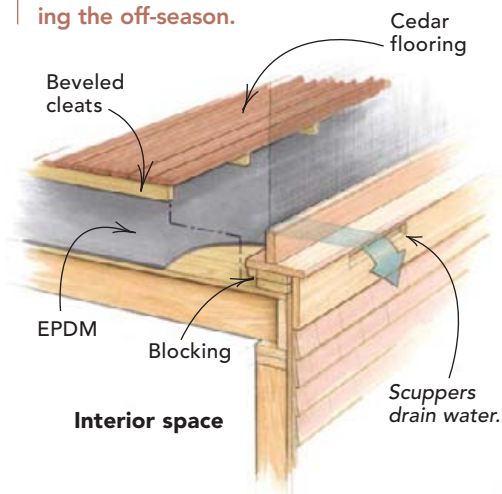


A PORCH WITH REMOVABLE FLOOR SECTIONS

Dominic Mercandante designed this 12-ft. by 16-ft. porch overlooking the water near Schoodic Point, Maine, as part of the house's living and dining areas. The porch, where the owners enjoy many of their summer meals, is actually a roof deck over a basement space. Removable cedar floor sections, called duckboards, conceal an EPDM membrane that keeps water out of the basement. The waterproof subfloor is sloped to channel the water through scuppers below the screen.

Elevated and freestanding on three sides, the porch enjoys

steady breezes throughout the day. Simple butterfly clasps hold the removable aluminum-framed screen panels in place. The screen panels can be replaced with glass panels to extend use of the porch into chilly weather or to keep out wind-driven rain and snow during the off-season.



"The best screened porches are

12 in. The insect screen also keeps at least some water from blowing inside. Still, moisture is bound to get in. Water won't pool on porches with gapped decking, of course, but what about porches that have tongue-and-groove flooring?

Some years back, McBride designed a screened porch for his own house with a floor that sloped like a shallow hip roof. The idea was that the flooring would shed water in three directions.

Bringing the inside out. The large screened openings on this elevated porch make the most of the view, while the wide frieze and wood-strip ceiling continue design elements from inside of the house.

"I don't know that I would go to that trouble again," McBride says now, "because the water that blows inside the porch is pretty much held there by surface tension. I don't think water starts to run until you get a serious amount of pitch." Most of the water that blows inside sits on the floor until it evaporates.

So build the floor flat, McBride suggests, even if you're using tongue-and-groove flooring, and don't worry too much about adding weep holes at the bottom of the wall to allow water to drain. Unless you plan to hose down the porch regularly, it would be rare that enough water could collect behind the bottom plate to make weep holes useful.

One final consideration for an open-decking floor is whether insect screen should be stapled to the tops of the joists before decking is laid. Most builders I spoke with recommend the practice, but I skipped the screen there because I thought it would create a great repository for dirt and dog hair. We haven't had any problems with insects finding their way up through the floor, perhaps because the porch deck is about 3 ft. above well-drained soil that is almost pure sand.

See-through walls need careful framing

Screened porches have less structure than conventional walls framed 16 in. or 24 in. on center. Because the whole point is leaving big spaces to admit light and air, framing members tend to be farther apart, spans are longer, and wall sheathing is frequently missing altogether. Planning the size of screened openings is a question of aesthetics as well as structure. The framing typically is on display, and it determines the view.

John Abrams, whose South Mountain Company on Martha's Vineyard builds a lot of screened porches, looks for a rhythm and symmetry in the spacing of the vertical posts that form openings for screen. He spaces posts equally along the walls, directly under roof rafters, and keeps openings to no more than 32 in. That's a convenient width for the bronze screen he uses.

For those buying material at the lumberyard, Abrams recommends ordering 3x6 lumber; the proportions are more pleasing than conventional 2x and 4x stock.

easy to maintain, are bright and airy, and exhibit inspiring craftsmanship”

With larger wall openings, the double 2x4 top plate of a conventionally framed wall has to be replaced by something heavier, either a solid beam or one made from built-up 2xs. The 5-in.-square beams Abrams often uses are strong enough for openings of 4 ft. McBride’s rule of thumb is to use a double 2x6 for openings 4 ft. wide and a double 2x8 for openings 5 ft. wide.

Abrams lets the posts into the beam at the top of the wall for an attractive and simple connection.

Most of the builders I spoke with, though, simply toenail the parts in place. This approach works fine if posts are made from 2x material that will be wrapped with 1x lumber because nail or screw heads will be hidden. If framing members are left exposed, you can conceal screw heads by using a pocket-hole jig and capping the holes with tapered wood plugs.

Posts made from heavier timbers—4x4s and up—can be notched to accept a double 2x beam, one on each side of the post. If notches are made deep enough to seat the 2x fully, what’s left is a ½-in.-thick tenon between the 2xs. The connection can be screwed, nailed, or through-bolted. This arrangement leaves the outside of the 2x in the same plane as the outside face of the posts, simplifying trim and screen installation.

Intermediate rails or kneewalls can stiffen the structure

Another decision with both structural and aesthetic consequences is whether to add an intermediate rail or even a full kneewall between posts. Intermediate rails or kneewalls offer additional bracing and can help to keep children and pets from pushing through screened openings. Rails and kneewalls also serve as a convenient shelf for a glass of iced tea.

Porches with freestanding walls on three sides gain some stiffness from an intermediate rail set in the lower third of the wall. Although the work takes some additional time, cutting a groove in the posts to accept the rails is a neat, attractive way to make the connection. If the framing will be hidden, just butt the rails to the posts and toenail from the bottom side with screws or nails.

A solid kneewall 24 in. to 30 in. high is even better insurance against racking. Typically, the outside of the



SKYLIGHTS MAKE THE PORCH BRIGHTER

John Scholz and Meg Barclay renovated his mother’s old shingle-style house to add a porch for refuge from Maine’s notorious mosquitoes and for views of the water.

Homeowners often hesitate to add an enclosed porch that might block light to existing rooms. On this project, the architects knew that a solid roof would limit sunlight to the adjoining kitchen. “It’s rather dark on the first floor,” Barclay says, “and we really wanted to be sure that the kitchen received as much natural light as possible, hence the skylights.” Four skylights in a ceiling recess 11 ft. long make the kitchen as well as the porch brighter.

The 9-ft.-wide by 21-ft.-long porch, sized for meals as well as siestas, is designed to match an open porch elsewhere on the house. Its broad screened openings are anchored by a lower railing, and the dark-green accent paint highlights the traditional post-and-railing porch construction. The mahogany screen panels are held in place with simple butterfly clasps and can be removed easily for the winter season. “Part of the reason we made these removable screens is that there’s nothing more irritating than trying to repair a torn screen in place. It’s so nice to be able to pop it out and take off the molding and staple in a new screen,” Barclay says.

kneewall is sheathed in plywood to add stiffness and is covered with siding to match the house.

South Mountain Company has developed its own system for adding lateral bracing and protecting the screen from damage (drawing p. 51). Screening is sandwiched between two ½-in.-thick lattice panels. The panels are made by cutting a series of half-lap joints in intersecting pieces. When the screen is installed and the 1-in.-thick panel is assembled, it can be screwed into a rabbet cut into porch posts below the intermediate rail. This custom-built detail protects the screen from both sides and gives the porch a distinctive appearance.

Some designers, however, want a cleaner look and choose to run screen the full distance between top and bottom plates. In this case, the porch framing may have more flex than you'd like. McBride suggests beefing up the roof by using plywood sheathing as a ceiling (sidebar p. 52), which will increase the walls' racking resistance. Similarly, metal strapping nailed to rafters across the porch in an "X" pattern helps to brace and stiffen the framing.

Screening should be easy to replace

The final step of building any screened porch is installing the screen itself. There are two key considerations: One is getting the screen taut so that it doesn't look like a bedsheet billowing in the wind. The other is anticipating how sections of screen can be replaced when they become damaged, a virtual certainty over time.

The simplest method of installing screen is to stretch it over the openings by hand, staple it directly to the outside of the framing, and then cover the staples with trim. This method has the advantage of low cost, but it's difficult to get the screen tight. In addition, the fragile screen molding often breaks when damaged screen is replaced. If you decide to staple the screen, heavier, more durable molding installed with trim-head screws will save time when screen must be replaced.

McBride borrows his approach from manufactured screen panels. He cuts a ⅛-in.-wide sawkerf in the edges of ¾-in. trim boards and fastens them to the inside of framed openings. Screen is rolled into the kerf with a screen-spline tool, then capped with a flexible vinyl spline. A separate piece of trim covers the kerf and spline.

It's possible to skip this detail work altogether and buy aluminum screen panels or proprietary screening systems that simplify installation and repair (sidebar right).

Although there are dozens of ways to handle the details of a screened porch successfully, what counts in the end is the space itself. These spaces meld inside and outside, expanding a floor plan in delightful ways. □

Scott Gibson is a contributing editor to *Fine Homebuilding*. Photos by Brian Vanden Brink, except where noted.

SCREEN PANELS FROM STOCK DOORS

Cambridge, Mass., architect John Cole designed this southeast-facing screened porch for a shingle-style house to let the owners reap the maximum possible reward from their lake-side setting.

The 3-ft. spacing of the posts was a time-saving decision by Cole. "The screened panels are actually off-the-shelf screened doors—a trick I've used often that makes life a lot easier for everybody," he says. The panels are screwed to stops at the tops and bottoms of the openings. Spaces above the panels also are covered by screen.

The 12-ft. by 15-ft. structure is reached through an informal

dining room, encouraging the homeowners to use it for eating as well as sitting. The screened porch can seat up to a half-dozen people comfortably.

The 10-ft. height of the walls helps to give the porch an airy, open feeling. "Maine, to me, is being outside," Cole says. "It's nice when you can have exposure on three sides so that you really feel as if you're outdoors, but you're protected from the sun and the bugs."

The walls are framed with 6x6 hemlock posts let into the beam at the top of the wall and pinned from above with lengths of rebar. Similarly, the hemlock headers above the screen panels are let into the posts.



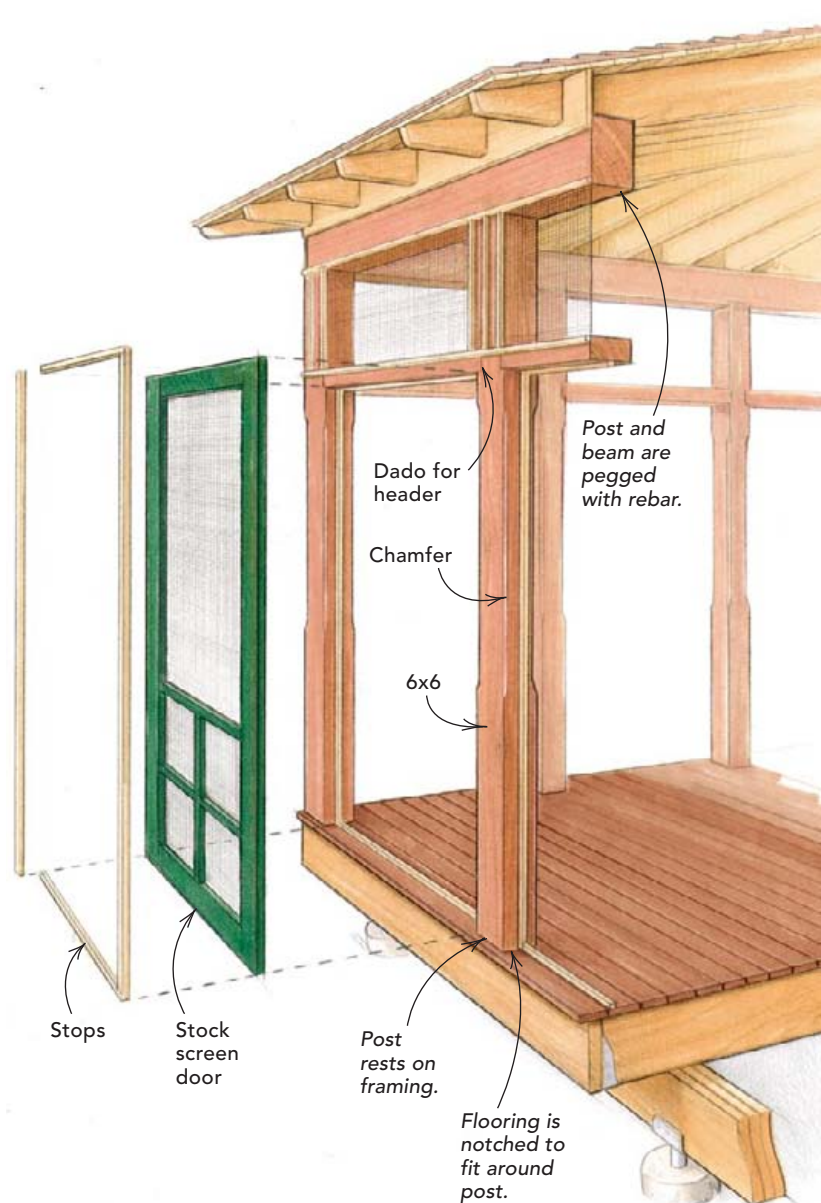
Save time with screening systems

If you're looking for something beyond the stretch-and-staple approach of installing screen, there are several alternatives.

CUSTOM PANELS

Buying premade panels of wood or aluminum, which are installed against stops applied to framed openings, is faster than installing screen yourself, and the panels can be removed and rescreened individually if they become damaged. Storm panels can be substituted for screen to extend the use of a porch into cooler weather. Connecticut Screen Works Inc. (www.connscreen.com; 203-741-0859) is one such supplier. It has made panels as large as 9 ft. by 18 ft., but the company recommends that buyers limit the maximum size to 48 in. wide by 80 in. tall. Prices for a basic panel with aluminum screen start between \$50 and \$75 per running foot, which includes a screen door and mounting hardware for the panels.





PROPRIETARY TRACK SYSTEMS

At least two companies manufacture track that is attached to the framing and holds the screen tightly in place. Both types work best with fiberglass screen, although you can use aluminum screen. These systems make screen repair a snap.

Screen Tight

800-768-7325; www.screentight.com

A plastic extrusion is attached to the framed openings, and the screen is held in place with a spline and capped with a separate extrusion. If you get the hang of using the spline tool, replacing damaged screen is relatively simple. An 8-ft.-long section of track and cap is about \$7.50.

ScreenEze

800-884-6697; www.screeneze.com

The screen is tightened as a piece of vinyl trim is snapped over an aluminum extrusion mounted to the framing. No splines are used. To replace a piece of torn screen, pull off the trim, cut a new piece of screen, and reinstall the trim. The track and cap retail for about \$2 per ft.