DETAIL

SITE-BUILT Storm Doors

by David Frane

This pair of combination storm doors replace a set of 1960s-era aluminum doors (inset), which looked out of place on the 1880s Victorian house. The finished opening measured 54x88 inches, so it was faster to custom-build the new doors than to special-order manufactured units.

Last fall I did some repair work on a 110-year-old house. Installing new hardware in the double entry doors was pretty straightforward; replacing the ancient aluminum storm doors wasn't. The opening was 54x88 inches, requiring two narrow but extra-tall storm doors, so a special order would be expensive and take a long time to get.

I told the customers I could build and install a pair of wood doors for about the same price as custom-made aluminum doors. That way, they could get the size they needed and the color they wanted without having to wait a long time.

Use an adjustable square to tick off dowel locations on stiles and rails. Number or letter corresponding door parts.

Self-centering doweling jigs ensure that dowel holes are straight and properly aligned. Use a stop collar or a piece of tape to gauge the depth of the dowel holes.

Epoxy is a good choice for exterior door joints because it sets slowly, bridges gaps, and is waterproof. Wear disposable gloves to protect your skin.

Door Frame Materials

Standard wood combination storm doors are made from 5/4-pine, with interchangeable glass and screen panels. I wasn't equipped to make the stiles and rails by applying veneer to glued-up wood strips, which manufacturers do to increase stability. Instead, I used clear vertical grain fir 2x4s, because fir is hard and relatively stable. It was also readily available, and my local lumberyard let me pick through the pile to find the straightest pieces.

The glass panels needed to be nearly full height so they would not hide the entry doors. I was a little worried about supporting all that glass with only a top and bottom rail, but I figured the narrowness of the doors made up for it.

The final design called for $3\frac{1}{4}$-inch stiles and top rails, with $8\frac{1}{2}$-inch bottom rails. I selected the straightest, flattest stock for the stiles; for the wide bottom rails, I edge-glued the fir offcuts. I used Titebond II because it's waterproof, cures quickly, and it's inexpensive. After the glue set, I ran all the stock through a portable thickness planer to bring it down to a thickness of $1\frac{1}{8}$ inches.

The design called for a profile on the inner edges of the stiles and rails. A millwork shop would cut the profile right on the edges of the stock and cope the ends of the rails to match. Since I was building the doors in the client's backyard, it was easier to fasten a separate molding to the inside edges of the door. This low-tech approach also allowed me to butt the rails to the stiles.

Joinery

At one time, all stiles and rails were joined by mortise and tenon, but these days, doors are held together with wood dowels or biscuits and glue. I used dowels because I think they're stronger. More dowels will fit in the space occupied by a single biscuit, and dowels penetrate deeper into the stiles and rails. If you use enough dowels, the doors will be very strong.

I laid out three $\frac{1}{2}$x$2\frac{1}{2}$-inch dowels on the ends of the top rails, and six on the bottom, then butted the rails to the stiles to check fit and to transfer the dowel layout. Use a doweling jig to drill holes for all of the dowels. A stop collar or a piece of tape on the bit ensures that you drill the holes deep enough so the dowels don't bottom out and hold the joints open.

Door Assembly

To assemble the doors, spread glue on the ends of the stiles and sides of the rails; use a flux brush to put glue in the dowel holes and on the dowels. I used epoxy, because it's waterproof and holds well even when the joint doesn't fit perfectly. It's expensive, however, and dries slowly.

Insert the dowels in the holes and press the door parts together with pipe clamps. (If the rail cuts are out of square, no amount of prying or racking will do any good.) Sand everything after the glue sets.

Panel Inserts

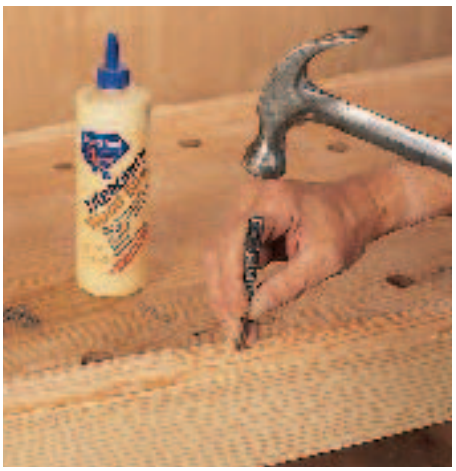
Once the frames were glued together, I measured the openings for glass and screen panels. The glass company was able to provide the same size aluminum frame stock for both the tempered glass panels and the screens, making the storm and screen panels perfectly interchangeable.

Glue and nail the molding around the openings, leaving an offset that matches the thickness of the panel frames. This will allow the panels to lay flush with the face of the doors. I used a router to make my own moldings, but you may find a stock molding that fits your design. Use plastic or aluminum clips to hold the combination panels in place.

Wood, glue, and other materials for a pair of doors cost $125. The screens and tempered glass in aluminum frames were $225. It took about 8 hours to fabricate the doors.

David Frane *is a carpenter in Wakefield, Mass., and an associate editor of the* Journal of Light Construction.

The dowels will self-align if properly centered and drilled. Use a pair of pipe clamps on a flat surface to glue up the door.



If you're not equipped to mill a profiled glass stop, a glued-and-nailed molding around the inside of the door frame is a low-tech alternative.

Readily available plastic or aluminum clips do a good job of holding the storm or screen panels in place.