

Cast your own urban structures



urban structures

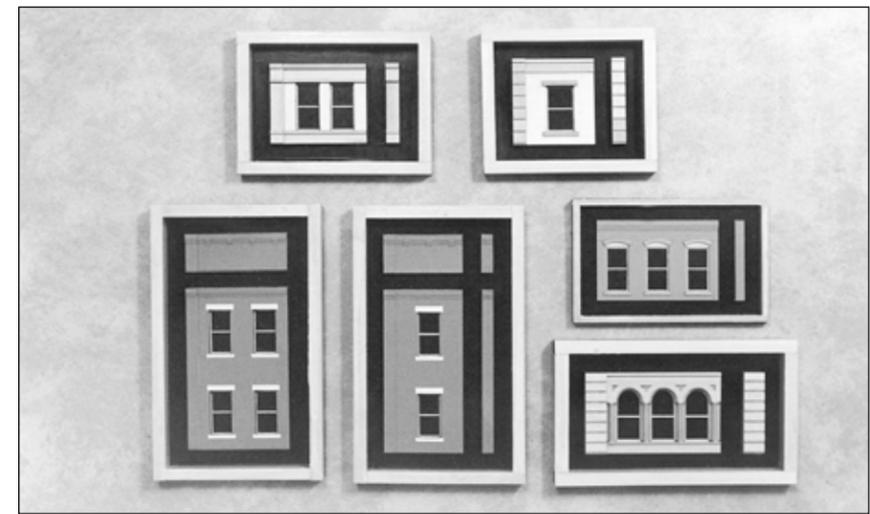


Fig. 1 PATTERNS. All of the structures in the photo at left were built using this set of patterns.

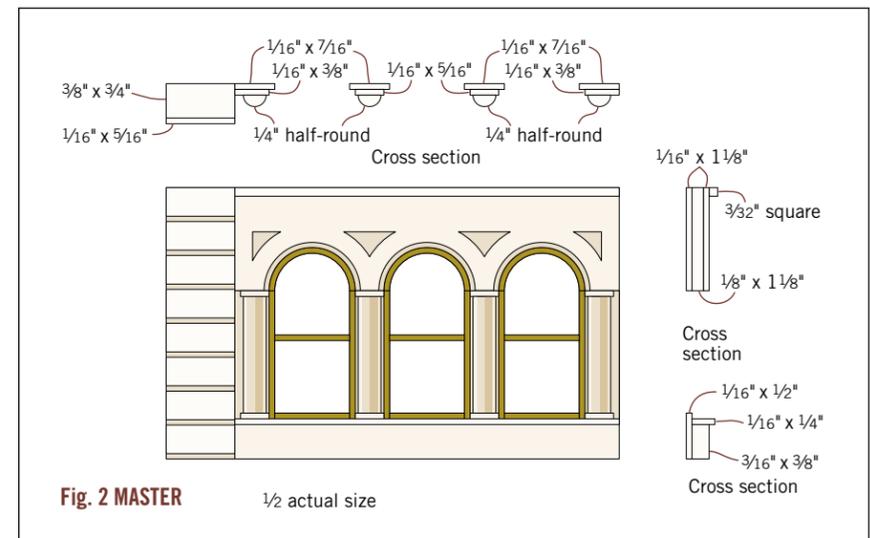


Fig. 2 MASTER 1/2 actual size

ILLUSTRATION BY RICK JOHNSON



Fig. 3 STARTING THE MOLD. Begin making the mold by applying several thin coats of liquid latex with an inexpensive paintbrush. Be sure to eliminate any air bubbles.

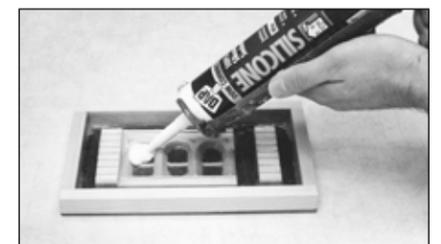


Fig. 4 SILICONE SEALANT. After the latex has cured, apply enough silicone sealant to make a layer about 1/8" thick.

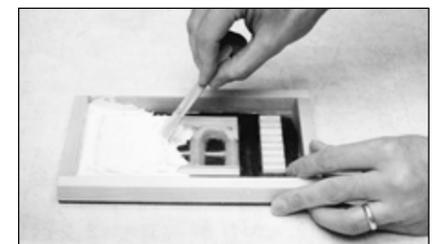


Fig. 5 SPREADING SEALANT. Use a scrap of stripwood to distribute the sealant over the pattern. Work it into all nooks and crannies.

The basics of making patterns, molds, and plaster castings

By Dick Scott
Photos by the author

I wanted to scratchbuild most of my O scale city. The challenge was finding a way to make a lot of buildings quickly and inexpensively. Because many urban facades are made up of small panels that are repeated both vertically and horizontally, to model such a building I would have to scratchbuild only one of each repeated element. Using these as patterns I could make molds, then quickly cast enough pieces for a large multistory structure.

My buildings would consist of these castings, together with scratchbuilt

components, attached to simple wood and acrylic frames.

Surprisingly enough, the project went smoothly. As the photos show, most of my structures are simply shallow flats or flats with abbreviated side walls, but these techniques work equally well for typical three-dimensional structures and they will work for other scales as well.

Patterns

To begin, you must design a convincing building or find a prototype structure that suits your needs. Books and magazine articles with period urban photographs can help.

The next step is to design the masters, or patterns. Let your building's symmetry minimize your efforts. To see how this works, compare the patterns in fig. 1 with the photos of the finished structures. All of those buildings were made from this limited set of patterns.

A northbound Louisville & Nashville local has just departed, providing a clear view of the commercial district on Richard Scott's O scale layout. All of these shallow-relief city structures have cast Hydrocal facades.

I find it helps to make sketches of my patterns before constructing them. As fig. 2 shows, these aren't complex.

I make my patterns from basswood, sheet styrene, embossed brick material, and illustration board in much the same way that I would build a wall for an ordinary structure – with a few important caveats:

- Avoid undercuts, as they make it more difficult to remove the castings from the mold. The molds are flexible enough to permit shallow undercuts, but deeper ones will be troublesome.
- Avoid thin cross-sections and delicate details. Again, this is to minimize breakage. My patterns are at least 1/8" thick except for window sash.

top of the box after each application. As fig. 6 shows, the last coat should be flush with the top of the box.

Once the last of the sealant has cured – the sealant odor should be completely gone – remove the mold. Insert a putty knife between the mold and one side of the box, then slide the knife back and forth the full length of the side. Do this on all four sides. Use the knife to pry one corner of the mold out of the box, then carefully peel the mold away from the pattern as in fig. 7.

Castings

I make castings with Hydrocal, an exceptionally strong, hard plaster made by U. S. Gypsum. Durham's Water Putty, available at hardware stores, or molding plaster can be used as well.

My patterns all have horizontal sash pieces across the window centers. These are too delicate to cast, so before each pouring I place a small piece of stripwood in the mold at these locations. The stripwood forms the sash. Figure 8 shows how these pieces extend a bit beyond the window frames so they will be held by the Hydrocal when it sets.

Fill the mold cavity with a diluted detergent and water solution, then dislodge any bubbles with a toothpick. Air bubbles are the curse of plaster castings, but I've found that they're rarely a problem if the mold is wet when the Hydrocal is poured.

Mix the Hydrocal to the consistency of thin pancake batter. It's better to put water into the container first, then add the Hydrocal gradually to get the proper consistency. As soon as the Hydrocal is thoroughly mixed pour most of the detergent solution from the mold, then pour the Hydrocal into the wet mold as in fig. 8. Slightly overfill the mold, then remove the excess as in fig. 9.

Placing a piece of plastic wrap on top of the wet Hydrocal will give the casting a smooth back. See fig. 10. Don't trap any air bubbles in the process. Smooth the plastic wrap, then place a piece of plywood or Masonite on top of it. See fig. 11. For good measure I usually place some weights atop the mold.

I let castings cure two hours before disturbing them. By waiting this long very few break when removed from their molds. Place the back of the casting on a smooth surface and carefully peel the mold away while keeping the casting pressed down as in fig. 12.

Often the castings will have some paper-thin flash around the edges and window openings. Use a hobby knife to scrape this off right away, while the Hydrocal is still damp. See fig. 13. Set

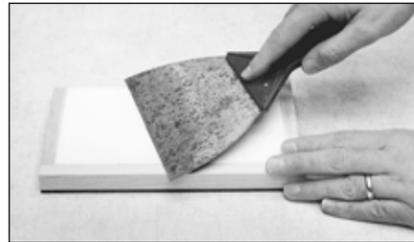


Fig. 6 SMOOTHING MOLD BACK. Smooth the final application of sealant with a drywall spatula to give the mold a flat back.



Fig. 7 REMOVING THE MOLD. After the sealant has cured, carefully peel the mold away from its pattern.



Fig. 8 POURING PLASTER. Add stripwood for the horizontal sash pieces through the window centers, then carefully pour the Hydrocal.



Fig. 9 SMOOTH PLASTER. Slightly overfill the mold, then remove the excess Hydrocal with the drywall spatula.



Fig. 10 PLASTIC BACK. Give the casting a flat back by applying a piece of plastic wrap. Don't trap any air bubbles under the plastic.



Fig. 11 ADD WEIGHT. Place a scrap of plywood or hardboard on top of the plastic wrap, then add a little weight.



Fig. 12 REMOVING CASTING. Press the rear of the casting on a smooth surface and carefully peel the mold away from the casting.

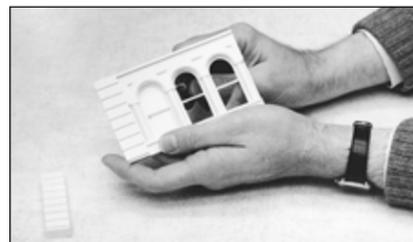


Fig. 13 CLEANING WINDOWS. Use a hobby knife to remove any flash from the casting's edges and window openings.

the castings aside to dry and cure thoroughly (about a week or so).

Painting

Hydrocal is quite porous and won't take model paints well until it has been sealed. For this I use sanding sealer, thinned with an equal amount of mineral spirits and airbrushed onto the castings. I spray each piece twice. The

first application can be quite heavy, as the castings will soak up the sealer like sponges. After a day or two I spray them again, this time with a much lighter coat.

I often paint the pieces before assembling them into structures, since many of my O scale building flats are larger than my spray booth. I also construct one- or two-story subassemblies before

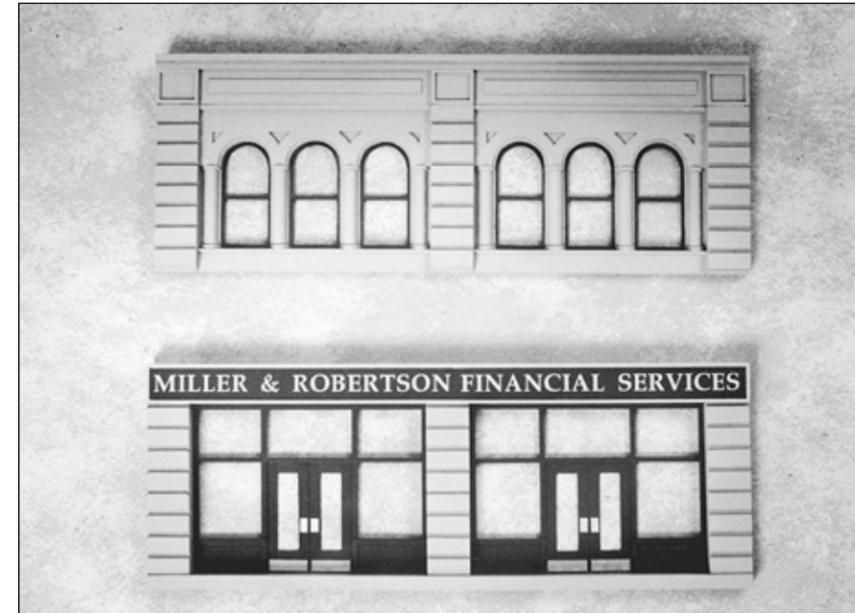


Fig. 14 WALL SUBASSEMBLIES. The top-floor subassembly is made from two panel castings, one pilaster casting, and a scratchbuilt cornice. The ground-floor subassembly is made from three pilaster castings and a lot of stripwood.



Fig. 15 STRUCTURE FRAME. The frame is 1 x 3 lumber with a Masonite hardboard back. Once the Plexiglas is in place, casting subassemblies can be attached, working upward from the ground floor. The thin side panel will be cemented to the right side of the frame later.

painting. Five-minute epoxy works well for this. Sand the casting edges lightly, if necessary, to get a good fit.

Figure 14 shows how I joined two panel castings, one pilaster casting, and a stripwood cornice into a subassembly for the structure's top floor. It also shows the ground-floor subassembly, made from three pilaster castings and assorted pieces of stripwood. I air-

brushed the subassemblies Floquil CN Gray, a pleasing color for masonry, then brush-painted the window frames with Floquil Caboose Red.

For this structure the ground floor subassembly was largely scratchbuilt. However, in many cases the castings used for the upper stories can be used for the ground floor as well, either as-is or with modifications such as enlarging

windows or converting windows into doors. With care, these castings can be filed, sanded, and cut with a razor saw.

Structure assembly

Now it's time to make the framework that will hold the walls together. As fig. 15 shows, most of it is 1 x 3 lumber. This is massive material, even for O scale, but it's sturdy and inexpensive. Paint the inside surfaces flat black, which helps hide the lack of depth when looking through the windows.

Mount a piece of thin Plexiglas to the front of the frame with silicone sealant. This will serve as the glazing for all of the windows and doors. You can usually buy scraps of Plexiglas or other clear acrylic at plastics dealers – check your Yellow Pages.

Attach the painted subassemblies to the Plexiglas starting at the bottom and working up. Do this by applying small blobs of sealant to the rears of the subassemblies. Keep the blobs far enough from the edges and window openings that the sealant doesn't ooze out when the pieces are pressed into place.

Figure 15 shows this work in progress. The Plexiglas extends about 1/2" above the framing lumber to support the cornice. The castings extend 1/8" beyond the frame's sides to accommodate the side panel that will give this building a little extra depth. The side panel is a piece of Masonite with embossed brick material cemented to it. The Masonite can be attached to the framing lumber with white glue or contact cement.

Structure mounting

Now comes the most gratifying part of all: adding the finished structure to your layout. These shallow buildings are top-heavy and really need to be anchored securely to the benchwork. My commercial buildings sit on a piece of particle board, and I attach them with wood screws from underneath. An extra pair of hands is certainly helpful for this operation.

The mold and casting process is relatively easy if you take it step by step, and it's a flexible method of creating unique structures. I hope that I've inspired you to try your hand at this type of urban scenery, and that you will be as pleased with your results as I have been with mine. ♡

Dick, a longtime modeler, has a 28 x 36-foot O scale layout based on the Louisville & Nashville. When he's not working on trains he teaches physics at Delta College in Midland, Mich.