



Jack Burgess used computer-drawn templates to make the walls and roofs of these scratchbuilt structures on his HO scale layout.

Make templates for easy scratchbuilding

Use a computer program to help build more accurate structures

By Jack Burgess • Photos by the author

Scratchbuilding a structure often begins with drawing the sides of the building onto styrene or wood sheets. Next, you add the guidelines for the window and door openings, and then you cut the sides to size.

This traditional approach has some major drawbacks, however. It requires that you plan the entire layout of each part directly on the material you're using to build the model. This method can easily lead to errors and to an accumulation of inaccuracies.

For example, when using a pencil and a scale rule to draw a structure's sides, a corner that is inadvertently drawn at 89 or 91 degrees could easily result in an out-of-square structure. In the same way, variations in the width of pencil guidelines can make it

difficult to ensure that all window openings are plumb.

Make templates first

A quick and easy solution to these potential pitfalls is to use templates. Templates can be made on a computer using a computer-aided design (CAD) program such as AutoSketch from Autodesk Inc., a vector-based drawing program like CorelDRAW or Adobe Illustrator, or a model railroad layout planning program, such as Sandia Software's CADrail.

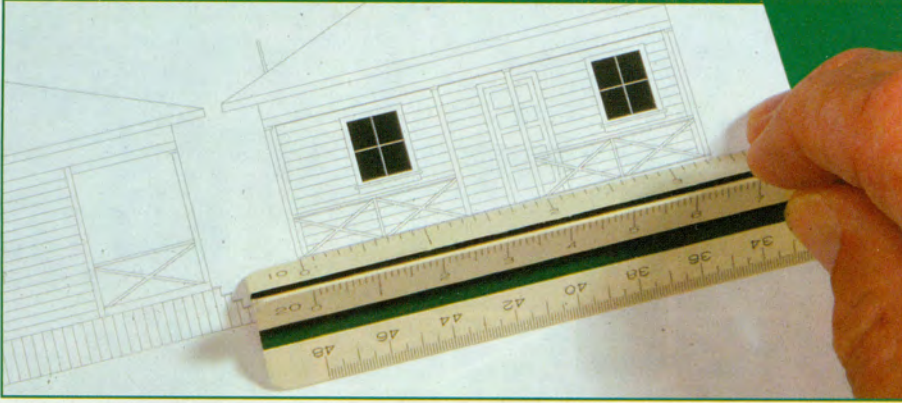
These software programs vary in complexity and price. However this project requires only a program with simple, two-dimensional vector-drawing capability, so choose the program that best fits your interests and budget. You may even want to consider using free,

open-source software, such as Inkscape or OpenOffice.org's Draw.

For my project, I used AutoSketch to draw templates for a Yosemite Valley RR employee cottage. I based the templates on scale drawings I made using photos of the cottage, measurements I took from the actual structure (which is still standing), and building dimensions from the International Code Council. Once drawn, I printed the templates and used them to cut the side and roof pieces of the structure. In 10 easy steps, I made precise parts for all three of the scratchbuilt structures.

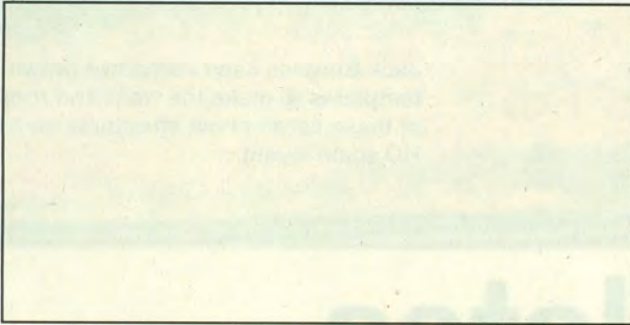
Jack Burgess is a frequent contributor to Model Railroader. He is known for his HO scale Yosemite Valley RR layout and lives in Newark, Calif.

1. Take measurements



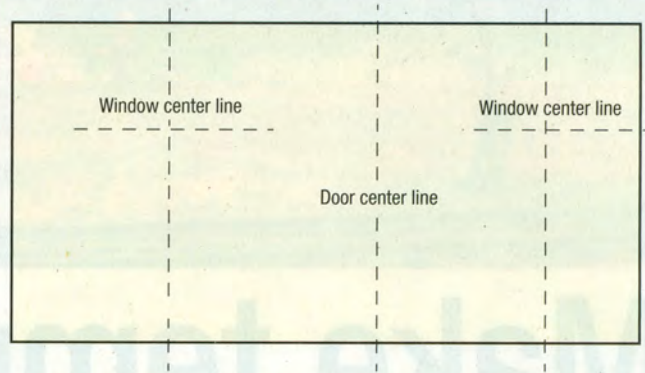
Using a **scale plan** of the structure, measure in inches the height and width of the front wall of the building. While you can use a regular rule or architect's scale that measures in sixty-fourths of an inch, I find that an engineer's scale that measures in tenths of an inch is much easier to work with.

2. Outline of structure



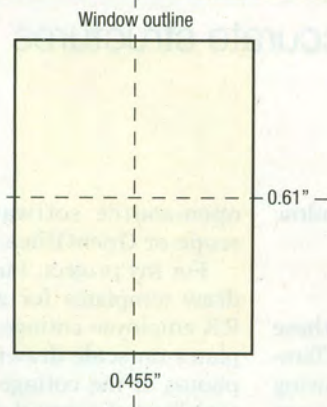
Using a **computer-aided design** (CAD) or other drawing program, begin the template by making a rectangle equal in width and height to the front of the building.

3. Add center lines



Add **centerlines for the windows** using measurements taken from the scale drawing. Next, draw a third vertical center line for the door.

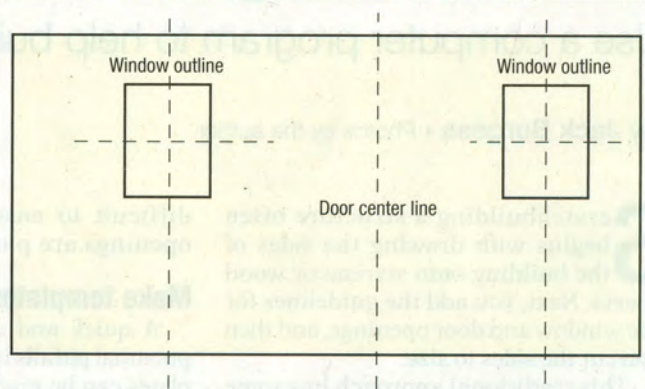
4. Draw a window outline



Unless you plan to scratchbuild the windows, you'll need to select styrene castings. For this project, Tichy Train Group's 8 x 8 double-hung windows (part no. 8071) are reasonably close to those of the prototype, though they need to have some mullions removed.

The Web sites for Grandt Line (www.grandtline.com) and Tichy Train Group (www.tichytraingroup.com) provide measurements for the openings required for their window and door castings. The opening for the no. 8071 window casting is 0.455" x 0.61". Simply draw a box to those dimensions and add center lines.

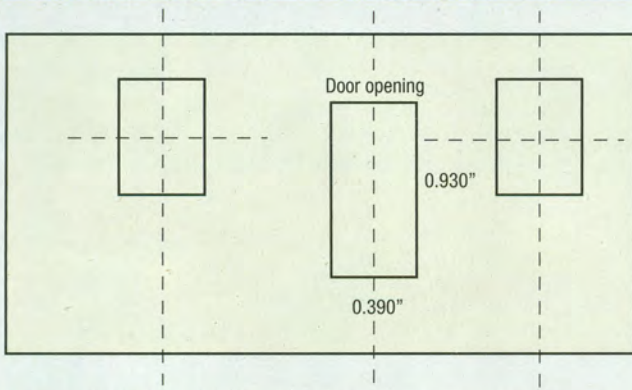
5. Add the window openings



Next, copy the outline of the first window opening and paste it in as many locations as you need to outline all of the window openings on the drawing. Here, I used the center lines to accurately position both of the openings on the cottage wall.

This method ensures that the window openings are uniform, that they're correctly positioned according to the scale drawings of the prototype, and that they'll later accommodate the Tichy Train Group castings that I chose for this project. Accuracy at this step increases the realism of the finished model.

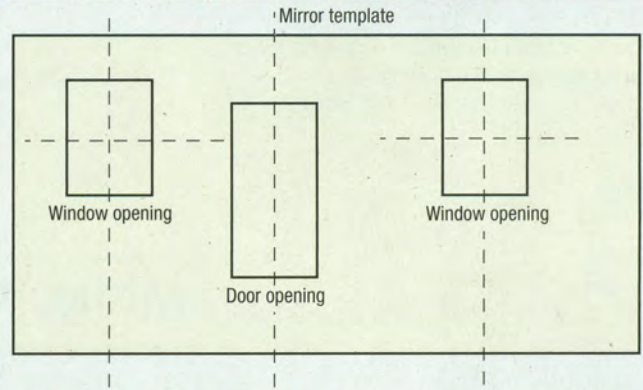
6. Make the door opening



Draw a horizontal line parallel to the top of the porch to mark the lower edge of the door opening. A 30" five-panel framed door, Grandt Line part no. 5021, closely matches the prototype. Grandt Line's Web site lists the height of the required opening for this casting as 0.930". Draw a second horizontal line 0.930" above the first to mark the top edge of the door.

The door opening's width is listed as .390". Adjust the width of the horizontal lines to this measurement, and then add a pair of vertical lines to represent the sides of the doorway. Be careful that the width of the door opening is evenly divided by the center line.

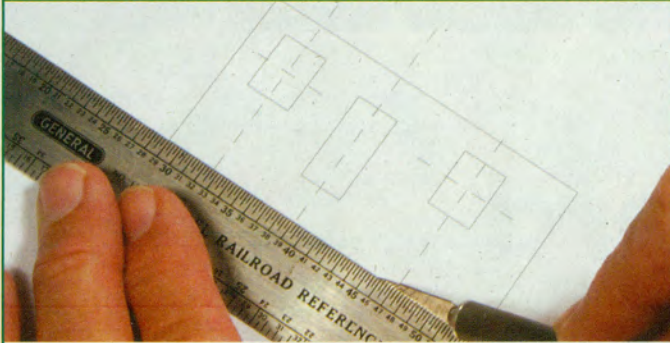
7. Final adjustments



If the sides of the structure overlap the front, move the edges of the sides inward by a distance equal to the thickness of the material being used. For my cottage, I didn't really need to make this adjustment for the front elevation. However, other structures built with thicker materials will need to be adjusted accordingly.

To avoid leaving stencil glue residue on the exterior, I recommend applying the templates to what will be the interior sides. Since the front wall isn't symmetrical, I made a mirror image of the original template. Once I'd done this, the template for the front of the cottage was complete and ready to print.

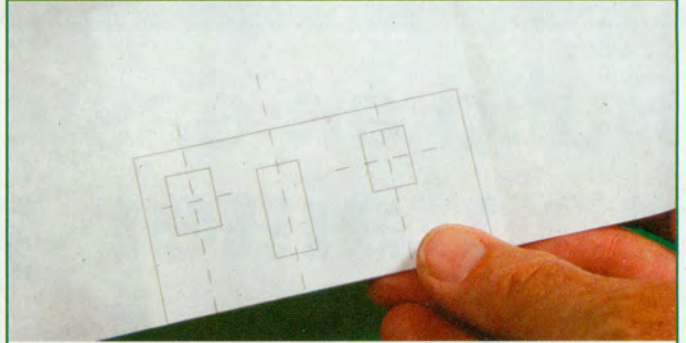
8. Prepare the template



I used scribed styrene to make the structure's exterior walls. Begin by placing the template print-out on the plain side of the styrene. Align the template so it's parallel to the scribing.

Next, cut the template along the bottom edge using a straightedge and a hobby knife. Use a fresh blade and enough pressure to cut completely through the paper.

9. Apply the template



After putting down newspapers to control overspray, I lightly sprayed the back of the template with Krylon's Easy-Tack Repositionable Adhesive, a low-tack spray available at most home improvement and craft stores. When I apply the template to the back of the styrene, I carefully align the bottom of the template with the edge of the styrene sheet.

10. Cut out the part

After letting the adhesive dry for a few minutes, I cut out the openings and along the edges of the template to make the front of the building. Then I peeled off the paper template from the accurate front wall.

Follow the same method and you can quickly and accurately cut out all of the remaining walls for your own scratchbuilt structure. **MR**

