TOOLS

Measuring Tools:

6” or 12” metal ruler--	Use metal instead of wooden or plastic rulers. Metal ruler can also work as straightedge
Dial or Digital Calipers--	Can measure in “1-mil” increments (1 mil = 0.001”)
Metal compass--	Used for transferring measurements or scribing arcs.

Drawing Tools:

Metal Machinist Square--	Used to draw perpendicular lines. Avoid plastic squares
Graph paper--	Used to draw your building in scale
Computer--	I use AutoCAD 2000 to draw and print 1:1 scale drawings
Modeling Magazines--	MR and RMC provide scale drawings for models

Building Tools:

Tweezers--	Used to handle small parts
Assorted files--	Used to file rough edges
Sand paper--	Used to sand wood or burnish smooth surfaces like styrene
Pin vise/Drill bits--	Used for drilling small holes
Dremel tool--	Small power tool with various attachments
Northwest Chopper	Jig tool allows multiple cuts of the same length--works with wood or styrene strips

Commercial Castings:

Tichy Train Group	http://www.tichytraingroup.com	various styrene windows and doors Fire escapes and details
Grandt Line	http://www.grandtline.com	various styrene windows and doors And details
Central Valley Models	various stairs, fences, bridges	

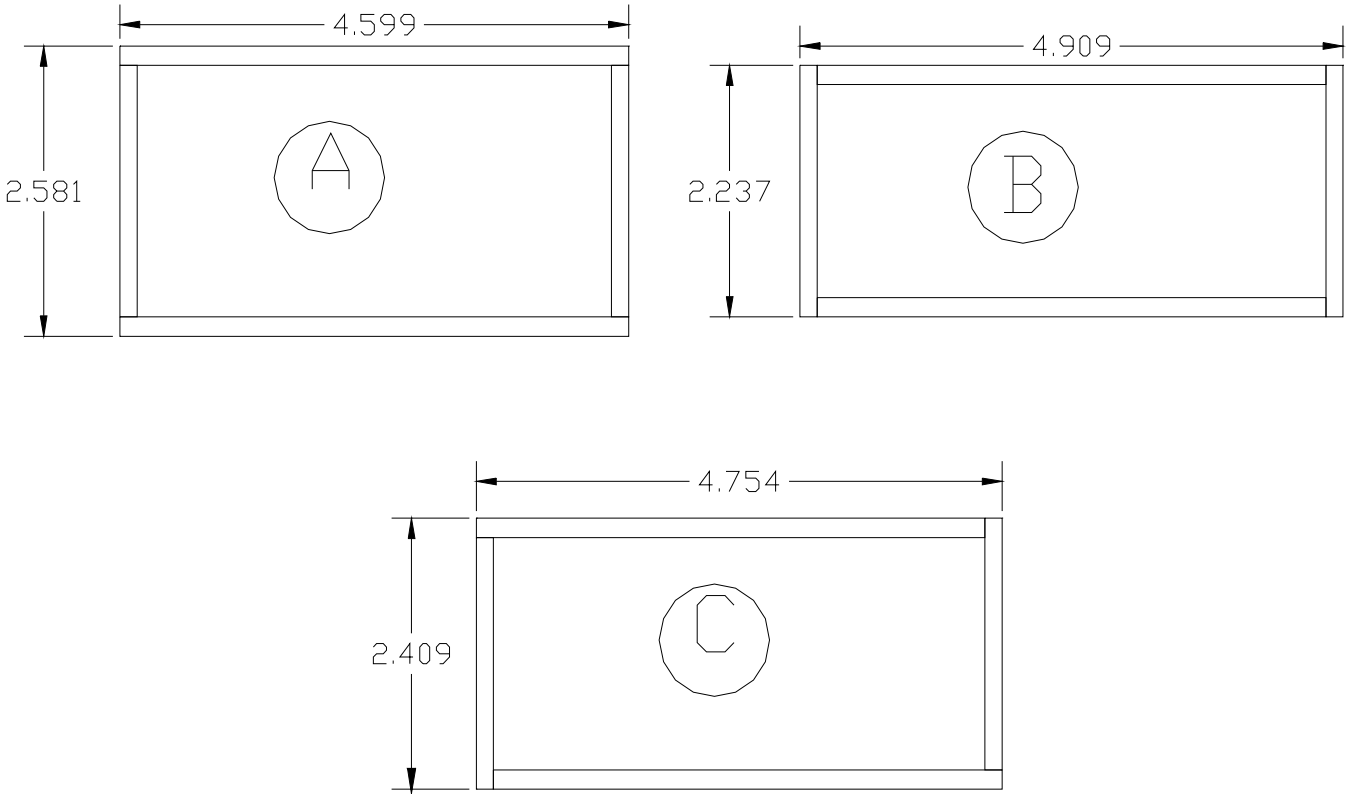
	STYRENE	WOOD	CARDSTOCK	METAL	PLASTER
TYPE	Strips and Sheets Novelty	Strips and Sheets Balsa and Bass Wood	shirt box cardboard Strathmore 3x5 index cards	Tin sheet Copper sheet	Hydrocal Plaster of Paris Sculptamold
CUTTING	Xacto #11	Single sided razor blade	Xacto #11	Xacto #11	Xacto #11/saw
ADHESIVE	MEK	Yellow carpenter glue	Yellow carpenter glue White glue	Super Glue or Solder	More plaster or Hot Melt Glue

I’ve also built buildings from “foam core” and from Sculpey Clay.

GENERAL Do's AND DON'Ts

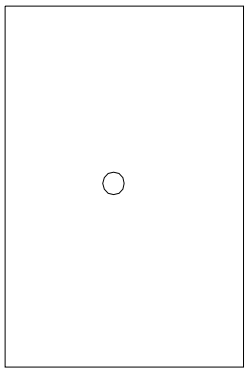
(1) Avoid cutting styrene all the way through. This will create non-perpendicular walls. Instead, make a few light passes (known as "scoring") with the Xacto knife, and then snap the styrene apart.

(2) Don't forget to take into consideration how the wall edges will overlap one another. See the figure below.

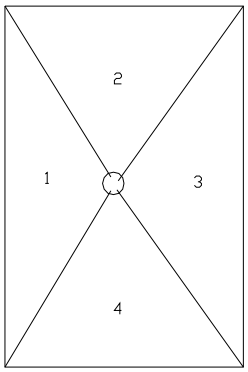


While the 3 drawings above have 4 walls of identical measurements, they each produce a building of different dimensions.

(3) To cut window openings in styrene, I make a pinhole in the styrene located in the center of the window with the point of a compass. Then I'll make 4 different cuts (from each corner of the window to the pinhole). I'll then snap out the 4 small triangles formed and file the window opening edges. See the figure at the top of the next page.



LIGHTLY SCRIBE 4 SIDES
OF WINDOW, AND DRILL
PINHOLE IN CENTER

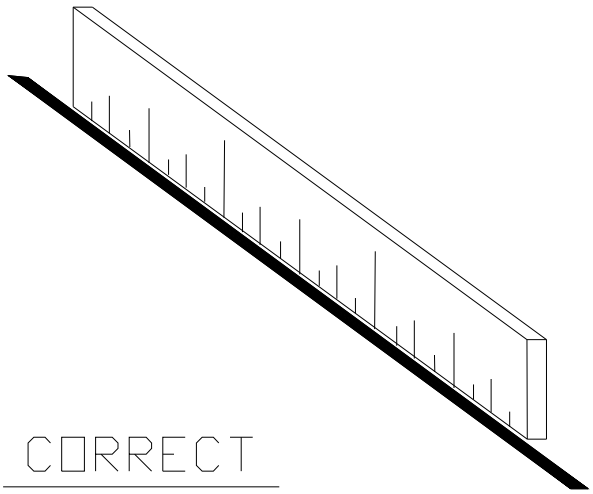


CUT ALONG 4 LINES FROM
EACH WINDOW CORNER TO
THE PINHOLE
BREAK OUT 4 TRIANGLES
(LABELED 1 TO 4

(4) When modeling brick buildings, if you are using wood frame windows, the windows should be inserted upside down from the inside of the wall. This will represent the fact that windows in brick buildings are set into the wall. Windows inserted in wood buildings are framed on the outside of the wall.

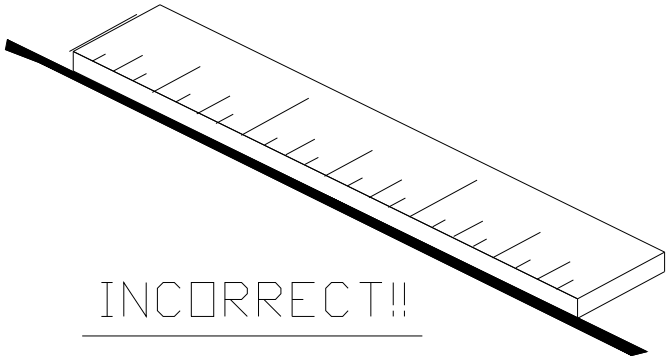
(5) When cutting styrene with the Xacto knife, place the knife edge (not the tip) at the point where you want to begin your cut. Then slide the machinist square or metal straightedge up against the side of the blade. Hold the straightedge firmly still and make 2 or 3 light passes with the knife.

(6) When measuring using a metal ruler, turn the ruler up on its side so the ruler markings are next to the line you need to measure. Avoid wood rulers because they may be warped or the edges chipped. See the figure below.



CORRECT

RULER IS ON ITS EDGE
TO MEASURE THE LINE



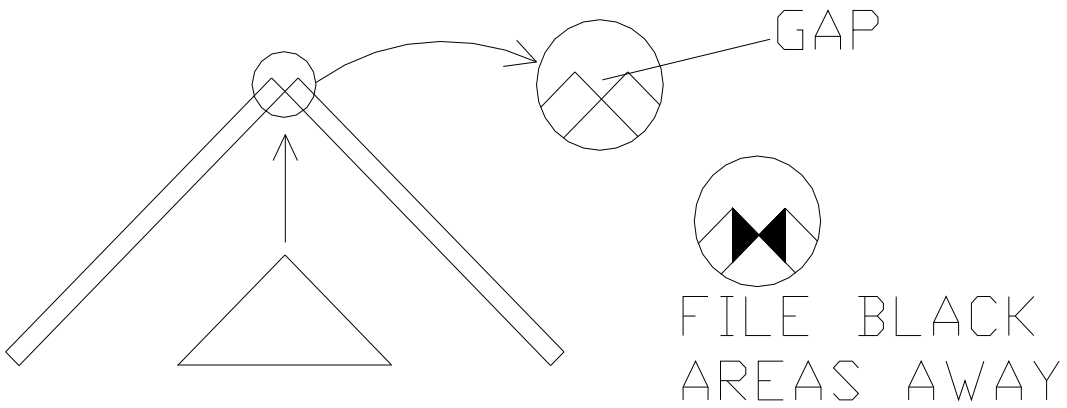
INCORRECT!!

RULER IS LAID FLAT TO
MEASURE THE LINE. THIS
CREATES OPTICAL ILLUSION.

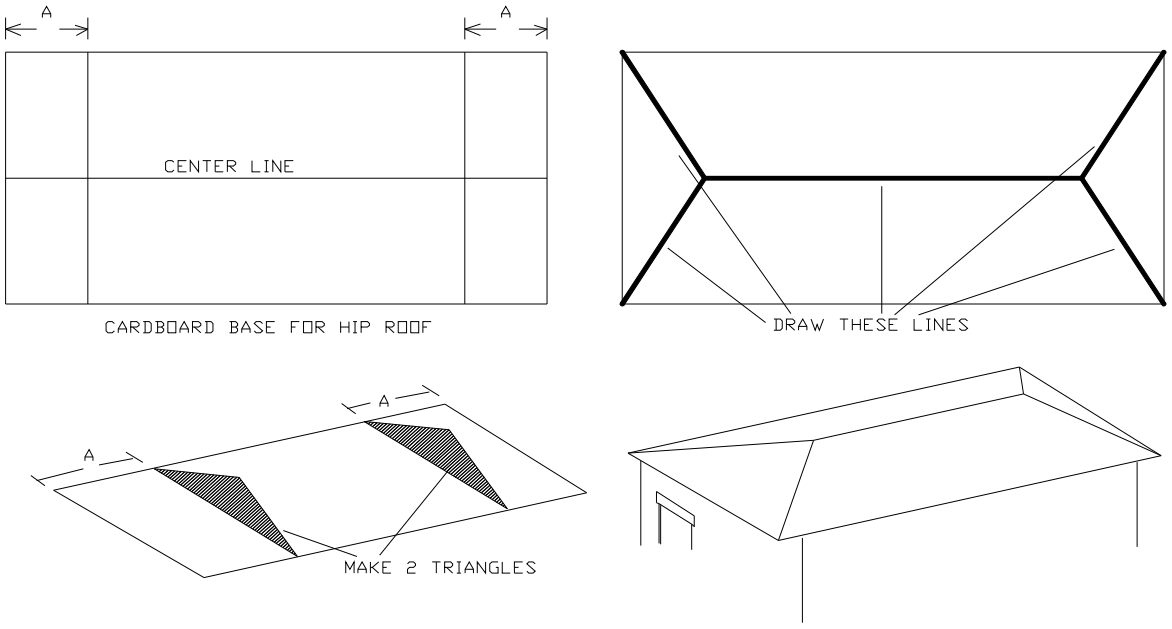
(7) To brace walls of the building, I'll cut multiple right triangles of styrene and attach them to adjacent walls on the inside to help square the structure and brace the walls.

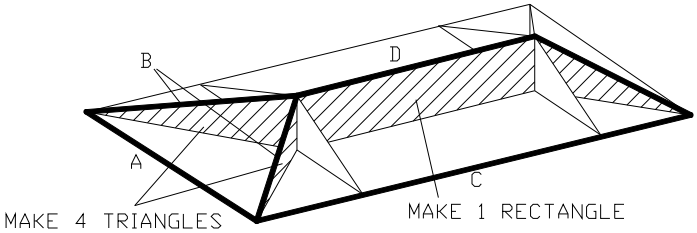
(8) When making flat roofs, I make a cardboard template of the roof. I'll glue strips on the inside of the walls approximately 3 scale feet from the top. These strips are parallel to the top, and will serve as supports for the roof. The roof is then cut using the template as a guide, and the roof is then glued in place.

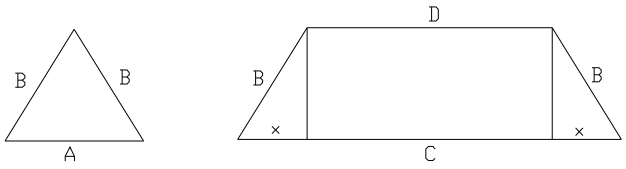
(9) When modeling peaked roofs, I cut the 2 sections of the peak. From my drawing, I'll build trusses or styrene triangles to match the peak angle. The triangles are glued to the 2 roof sections to form the peak. There will be a "gap" (see figure below) between the 2 roof sections. The only contact will be a thin mating line. Filing away the small triangles shown in black in the figure below will produce a larger mating area between the 2 roof sections. The top point of the truss or triangle will fit into the bottom point where the roof sections mate. The triangle can then be glued in place. Several trusses may be needed depending on the length of the roof. One truss every 2 to 2 ½" should provide sturdiness.



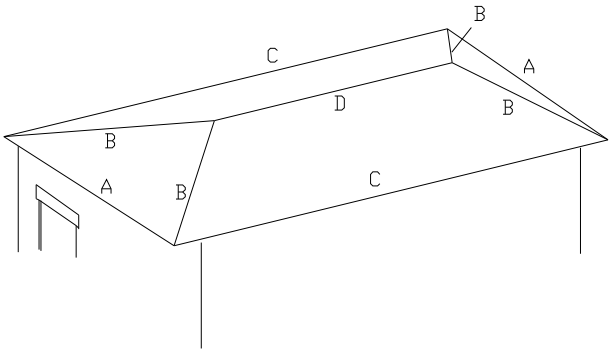
(10) When modeling hip roofs, a cardboard template comes in handy. The thinner the roof material is, the better. I sometimes revert to Strathmore or shirt cardboard for modeling hip roofs because of its thinness.







MAKE 2 EACH OF THE FIGURES ABOVE



GLUE 4 ROOF SECTIONS TO ROOF BASE

The remainder of the article pertains to painting, weathering and detailing. These subjects are only touched on briefly.

PAINTING/WEATHERING

A List of Needs:

1. Earth Tone Chalk Pastels (NOT OIL PASTELS)
2. Gray Tone Chalk Pastels or Artist Charcoal Sticks
3. India Ink and Isopropyl Alcohol
4. Eyedropper
5. A Box of Scouring Pads (Any brand will do)
6. Etchant (Ferric Chloride) sold at Radio Shack and plastic/glass containers
7. Small Acrylic Paints like “FolkArt” or “Apple Barrel” brand
8. A variety of brushes –soft bristles if possible but they don’t have to be $$$
9. Paper towels

(1) Earth Tone Chalks are used for toning down shiny models. However, try not to touch the models as fingerprints will be left, and the chalk will be removed. To keep the pastels on, spray model with Dullcote (by Testors) or Acrylic Matte Spray (by Krylon). Pastels can be used on railroad cars and locos, but be careful near wheels that need to pick up track power

(2) Gray Tone Chalks accomplish the same as (1), only are shades of grays and whites instead of earth tones (browns, rust colored, ochre)

(3) A drop or 2 of India Ink dissolved in a pint of alcohol will darken and tone down shiny models. Just mix the 2 in a jar and brush it on the model. Start light and continue repeating the brushing process until you get the model to the darkness you want. You can’t make the model lighter once it’s too dark so be careful how much ink you add.

(4) Eyedropper is required to count the number of drops of ink you use in (3).

(5) A box of cheap scouring pads can produce a lot of rust powder for rusting a roof or model. Just squeeze the soap out and let the pad dry out for awhile. You’ll have real rust. Remember it’s metal so be careful not to

get it around anything that could cause a short on the tracks.

(6) Etchant is used in photo etching and electronics, but can also speed up the natural rusting of metal. It is caustic, so use gloves if you do this process. You'll need 2 plastic or glass containers. One will hold the etchant (Ferric Chloride) and the other will hold cold water. The metal is placed in the etchant until it starts to bubble. Then remove the metal to the water to stop the reaction. Place the metal on a paper towel and pat it dry. The rusting (oxidation) process has begun.

(7) Small acrylic tubes of paint like FolkArt sell in a lot of different colors and can be used to not only brush paint models, but also to "drybrush" models. Drybrushing is when you dip the brush in a paint color, and wipe the brush dry with a paper towel. Brushing the model from top to bottom will bring out highlights on the details of the model.
Some colors I use are: Antique White, Butter Pecan, Raw Umber, Mars Black, Sap Green, Linen, Neutral Gray to name a few.

(8) A variety of brushes is required. Try to get cheap soft-bristled brushes. And keep a separate brush for the dry pastel chalks that is used only for the pastels. A filbert brush should work OK. A No.0 or liner brush can be used for thin streaks on the models. If you'll be painting trees onto a backdrop, a regular 1" brush can work, but use only 1 end of the brush and dab the paint on the backdrop, rather than stroking. Black and sap green make nice trees.

(9) Paper towels are a must

DETAILS

To finish off the model, one needs to add roof details, spouting, lighting (if you so desire) along with interior details in rooms. Buildings along the edge of the layout would need to be detailed if the windows are open, but buildings in the background require less detailing. Factory roof and wall details might include air conditioners and duct work, vacuums, guide wires on tall smoke stacks and other venting devices such as cyclone vents. Most of these can be purchased as castings or can be scratch built. RTV Molds can be made from the castings, and more identical castings can be made from the mold.