

Scratchbuilding a 1/72 Scale Revetment for Large Aircraft

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I needed a revetment for my B-52D Arc Light diorama so I designed and scratchbuilt the modular sections described in the following instructions. I was unable to find any drawings or dimensions of an actual revetment so I had to depend on photos alone. Consequently, the dimensions may not be totally accurate but they are as accurate as I could make them.

If you find any errors or have any suggestions concerning this document, please email me at striker8241@yahoo.com.

Terminology

Many of the descriptive terms used for the various parts in these instructions were assigned by me in the absence of finding the correct term.

Measurements in this Document

I used metric measurements throughout this document because I find them much easier to work with. The following are the metric conversions I used for this scale:

25.4 mm = 1 in = 72 scale inches (sin) = 6 scale feet (sft)

4.2 mm = 1 scale foot (1 sft)

0.35 mm = 1 scale inch (1 sin)

All measurements are rounded to the nearest 0.5 mm

Drawings are not to scale except where noted.

Materials you will Need

- 10 sheets of Evergreen Metal Siding #4530
- 3 pkg 0.5 mm thick, 3.2 mm wide strips (Evergreen #126) or you can cut the strips from 0.5 mm styrene sheet
- 2 sheets 0.5 mm styrene sheet 180 mm x 305 mm (7" x 12") (Plastruct #91102 or equivalent)
- Cat litter or sand, depending on how you want to show your revetment filled.

Painting Your Revetment

Fortunately, you only need one color. I used Krylon Fusion Metallic Shimmer spray paint, available at Ace Hardware, Wal Mart or most hardware stores. It gives a dull metallic sheen that is close to what I remember many of the revetments looking like.

I didn't weather my revetment model as these are such large structures and so far away from the center of the aircraft that they give the impression of a uniform color. The revetments were usually medium to light gray in color when fairly new but later weathered to a dark gray or even blue-black due to humidity and blowing dust.

As you got closer, you could see vertical streaks from water runoff and different horizontal shades due to dirt and salt collecting on the ribbing. Depending on the type of rock or soil filling the revetment, these streaks and discolorations could be anything from black to light chalk in color.

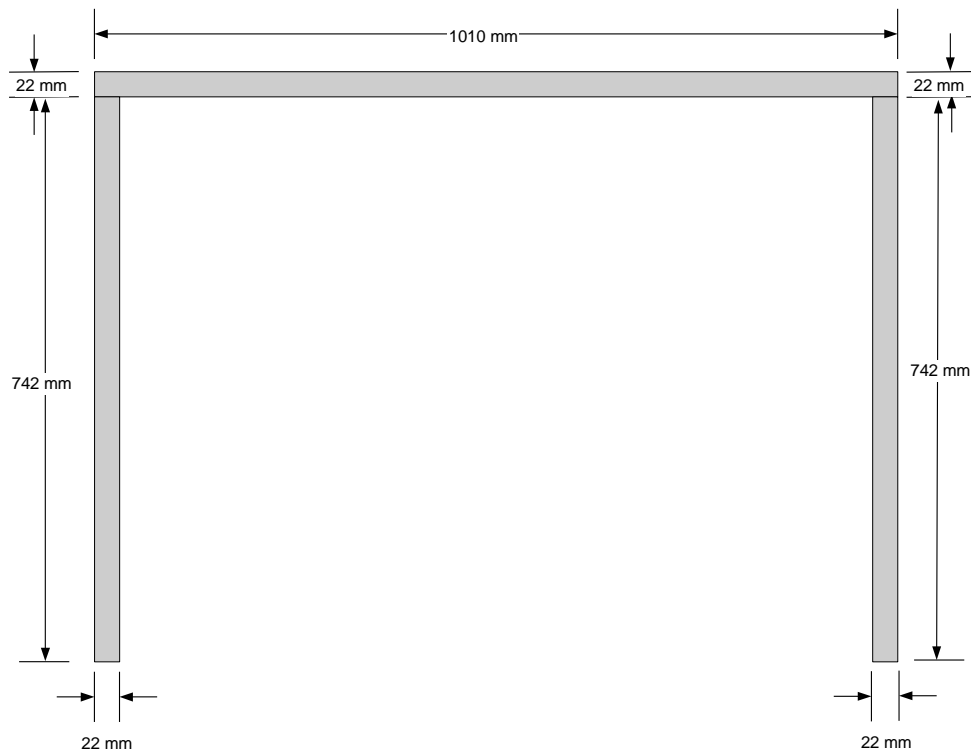
Description



© Photo courtesy of Dean R. Paulsen <http://valpam.home.netcom.com/index.htm>

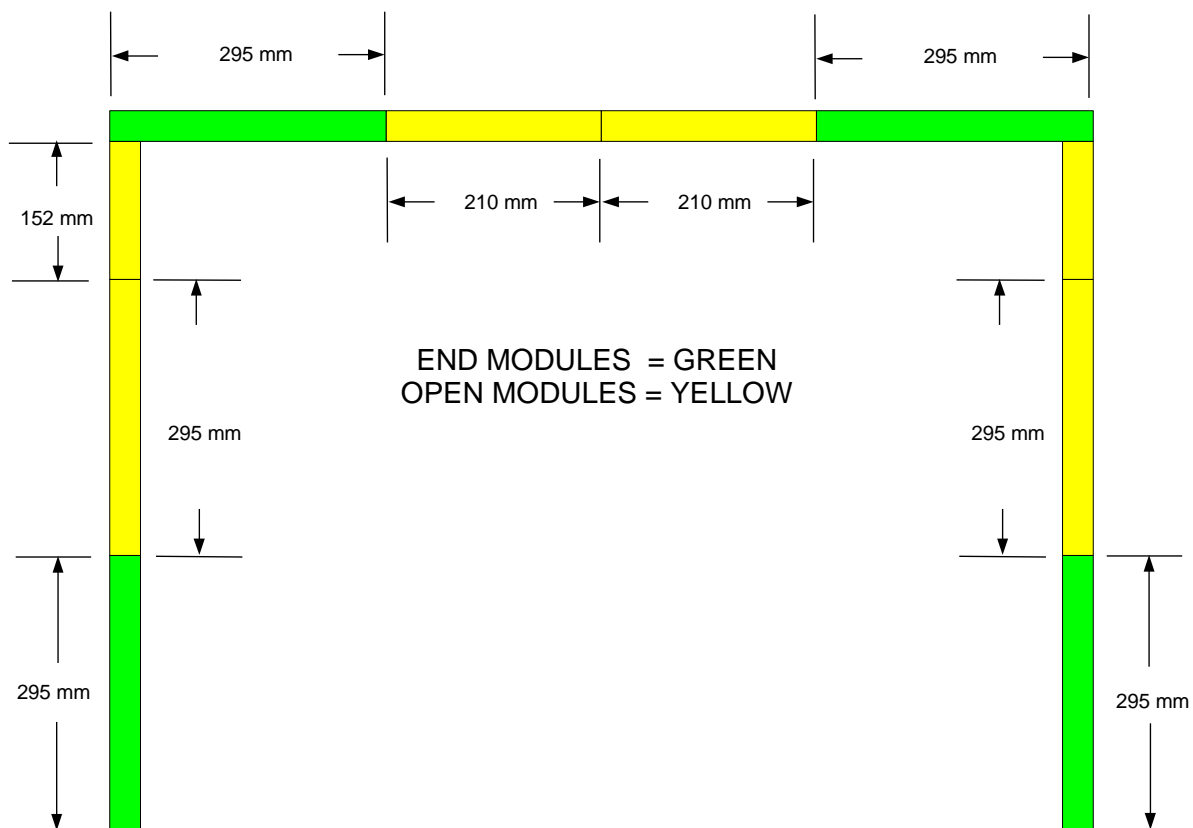
Revetments like the ones shown above were used to protect our heavy bombers and tankers from enemy sappers and mortar rounds, and to prevent an accidental explosion or fire in one aircraft from spreading to adjacent aircraft. They were constructed of heavy steel and were filled with rock, sand or dirt, or a combination of these. Some revetments later had concrete skirts added around the base because of the tendency of sand or dirt fill to wash out at the bottom.

The complete revetment model in 1/72 scale is a "U-shaped" structure 742 mm (29") on each side and 1010 mm (39.8") across the back", as shown in the drawing below. All modules are 22 mm wide (not including the vertical braces) x 65 mm tall.



These are not the true proportions of a real B-52 revetment - that would mean a model almost 5 ft square. In a real revetment there would be about 20-25 ft of separation between the wing tips and the revetment sides and about twice that between the tail and back of the revetment. I reduced the distance between the wingtips and the sides of the revetment to about 12 scale ft and the distance between the tail and the end of the revetment to about 15 scale ft.

My revetment is divided into 10 modules as shown in the drawing below. There are two types of modules: **end** and **open**. The end modules (green color) have a bulkhead across one end; the open modules (yellow color) do not. Once the modules are joined, they look like one continuous structure.



A Note about the Following Procedures

Since many of the steps in building each type of module are exactly the same, I had to choose between providing a complete build of the first type and only listing the different steps for the second type, which would have you constantly referring back to the first module for the same steps. Or I could repeat the same steps in both procedures, which results in more pages and in two sets of instructions that are very similar in both content and titles, and therefore, easily confused.

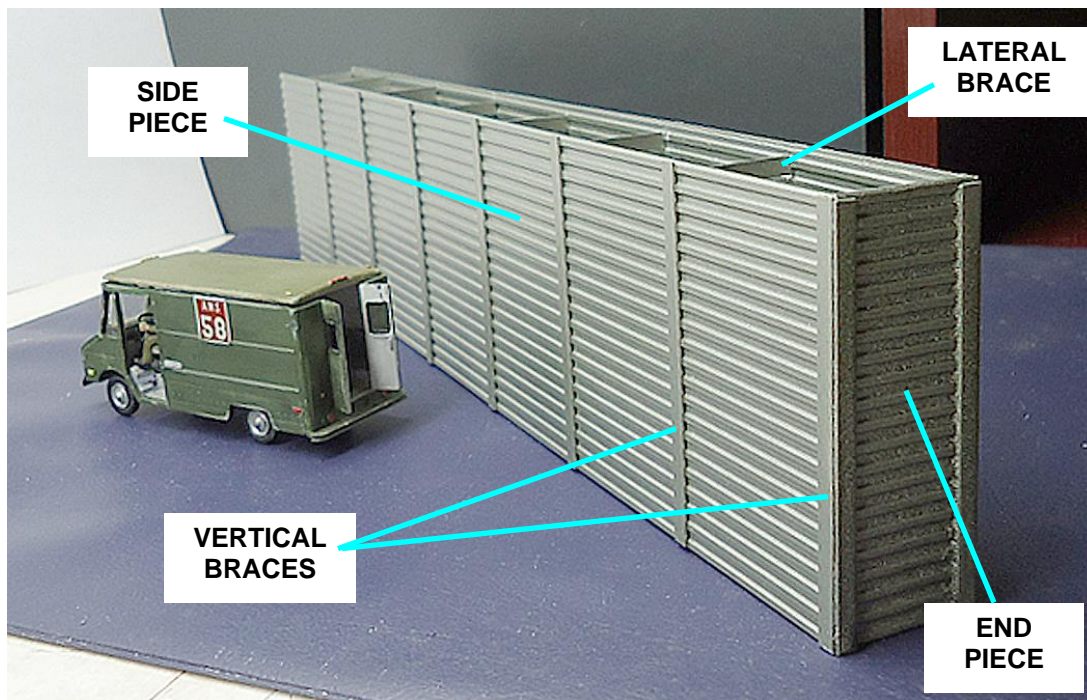
I chose to do the latter, even though it meant more pages. To avoid confusion between the two sets of procedures, I've added the words "End Module" and "Open Module" in parentheses to the titles for each.

Please be sure to note which procedure you are using.

Building an End-Type Module

There are four end-type modules in the model and each of these modules is 295 mm in total length including end bulkhead. The length of 295 mm was chosen to best make use of the entire sheet of metal siding, which comes in a length of 305 mm.

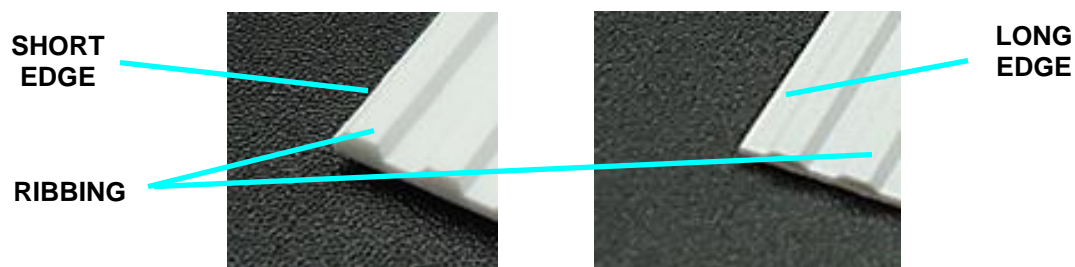
NOTE: It's important that the ribbing of the sides and end pieces match up as closely as possible so I recommend you read through these instructions at least once with the siding in hand before starting to build the modules so you understand the intent of each procedure.



Preparing the Metal Siding (End Module)

The siding is cut in a specific way to ensure that the ribbing on both side pieces matches up with the end piece and with adjacent modules.

- 1) With the ribbing up, select the short-edge side of the sheet (see images below)



- 2) Measure 65 mm down from the short edge on each end of the sheet and make a mark.
- 3) Cut the sheet lengthwise between the two marks. The first piece will have one short edge and one long edge: the second piece will have two long edges.

- 4) Select one edge of the second piece and trim off 1 mm along the entire edge. You will now have a second piece with one short edge and one long edge.
- 5) Orient the second piece with the ribbing up and the short edge at the top and measure down 65 mm on each end, then make a mark.
- 6) Cut the piece lengthwise between the two marks.
- 7) Set the left-over piece aside - this will be used to make the false bottom supports for the fill.
- 8) On each piece, with the ribbing up and the short edge at the top, measure from the left and make a mark at 292 mm, top and bottom.
- 9) Cut each piece between the marks. You should now have two pieces of siding 65 mm x 295 mm and two pieces 65 mm x 11 mm.
- 10) Place the two smaller pieces side-by-side with the ribbing up and the short edges at the top.
- 11) Glue these two pieces together, then fill and sand to remove the seam.
- 12) Paint the side and end pieces and set them aside.

Preparing a False Bottom for the Fill (End Module)

The real revetments were filled from top to bottom with sand, rock or gravel. However, unless you are totally dedicated to realism, you will not likely want to do this. The following steps will provide a false bottom for your fill about 3 mm below the top of the revetment.

- 1) Orient the left-over piece of siding so the long edge is at the top.
- 2) Measure down from the top at each end and make a mark at 6.5 mm.
- 3) Cut the piece lengthwise between the two marks.
- 4) Again, with the remaining piece oriented with the long edge at the top, measure down 6.5 mm at each end.
- 5) Cut the remaining piece between the two marks. You should have two pieces each 292 mm long x 6.5 mm wide with at least one long edge. The other edge can be long or short - it doesn't matter as it will not be seen.
- 6) Paint each support on the ribbed side and along the edges only.
- 7) From 0.5 mm plain sheet styrene, cut a piece 18.5 mm wide by 292 mm long. This piece will be the bottom plate for the fill.
- 8) Paint one side of the plate in a color that is close to the color of your fill material.

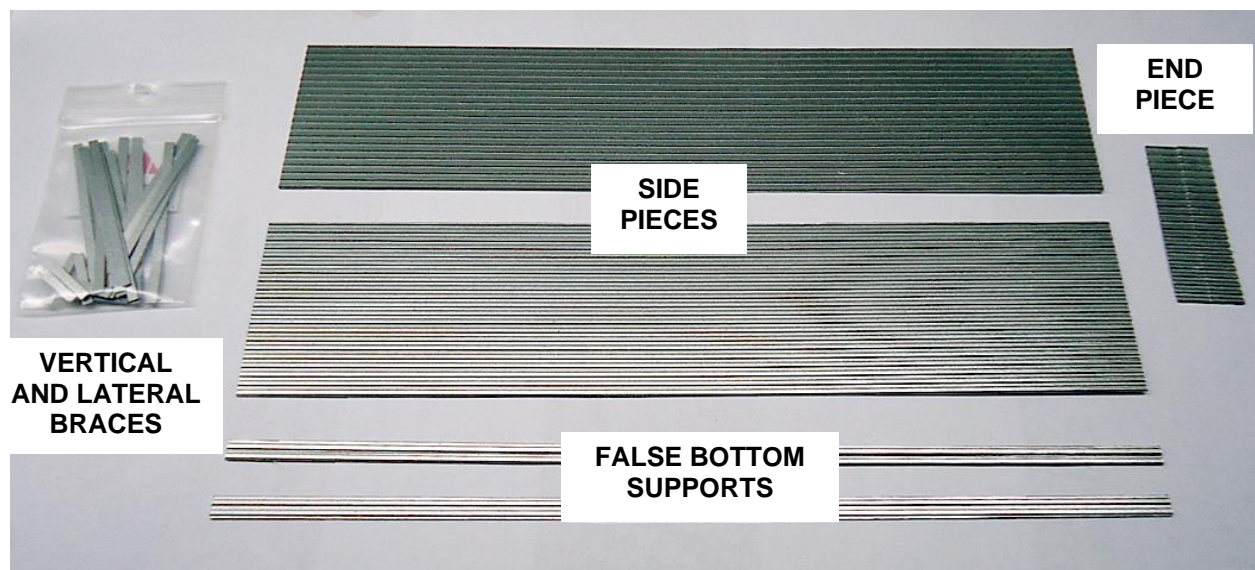
Preparing the Revetment Vertical and Lateral Braces (End Module)

Use 0.5 mm plain sheet styrene or pre-made strips such as Evergreen #126 for these braces.

- 1) Cut 18 strips, each 3 mm wide x 65 mm long, for the vertical braces.
- 2) Paint the vertical braces on only one side and along all edges.
- 3) Cut 7 strips 18 mm long to use as lateral braces at the top of the revetment.
- 4) Paint these strips on both sides and along the top and bottom edges only.

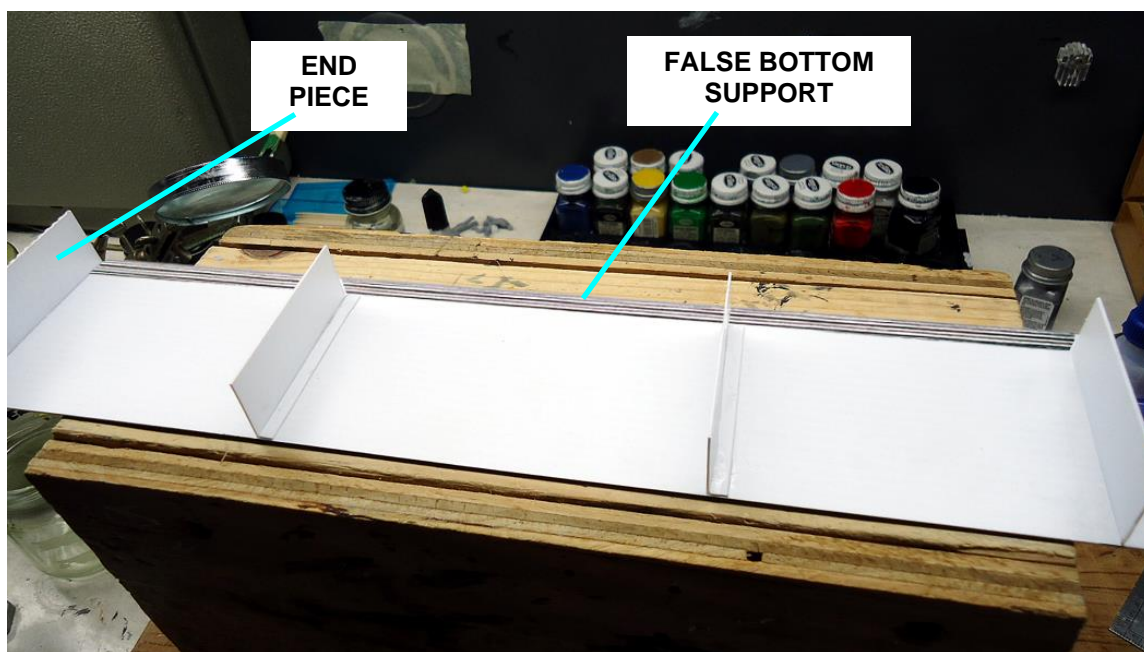
Assembling the End Module

At this point, you should have the prepared parts shown below (**NOTE:** the false bottom fill plate is not shown). You are now ready to assemble the module.



Adding the False Bottom Supports (End Module)

- 1) Place one of the module side pieces with the ribbed side down and the short edge at the top.
- 2) Orient one false bottom support with its ribbed side up and the long edge at the top.
- 3) Glue the support in place so that its top edge is even with the top edge of the side piece as shown in the picture below.
- 4) Repeat Steps 1-3 for the second side piece.



Attaching the End Piece to the Right Side Piece (End Module)

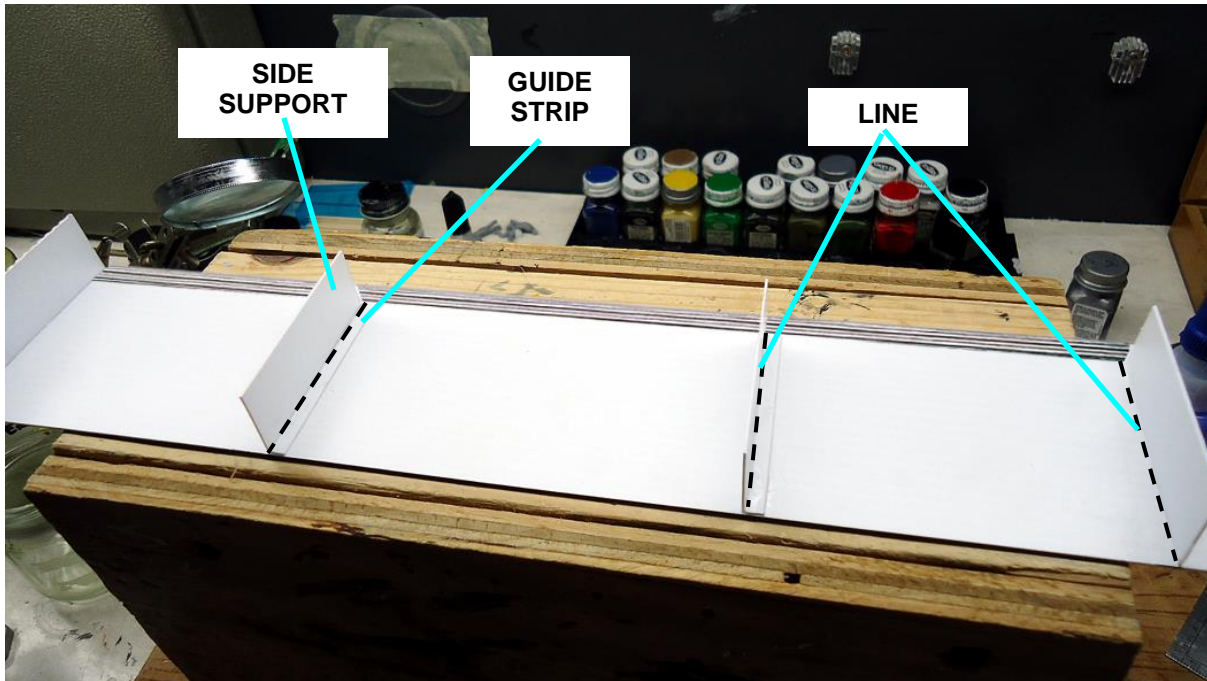
- 1) Orient one of the side pieces with ribbed side down and the short edge at the top. This piece will become the right side piece.
- 2) Orient the end piece with the ribbed side to the left and the short edge at the top. Glue the inside edge of the end piece to the left end of the side piece as shown above. **NOTE:** The ribbing of the two pieces can be off a bit - their juncture will be covered by the vertical braces.
- 3) Place the assembly upright on its bottom edges and check that the end piece and side piece are square with each other and perpendicular with the work surface.

Adding the Internal Side Supports (End Module)

NOTE: The "left" and "right" references here get a bit tedious but the purpose is to make sure the internal support pieces line up with the guide strips on the left side piece.

- 1) From a sheet of 0.5 styrene, cut out three side support pieces 20 mm x 55 mm. These pieces do not need to be painted.
- 2) Cut three guide strips 3 mm x 55 mm (any thickness). These strips will help orient the side supports. They do not need to be painted.
- 3) Measure 70 mm from each end of the side piece and make a mark below the false bottom support and at the bottom of the side piece.
- 4) From the right end, measure about 10 mm to the left and make a mark below the false bottom support and at the bottom of the side piece.
- 5) Draw a line from top to bottom between each of these three pairs of marks.
- 6) Starting from the right end, glue a guide strip along the right side of each line with the top of each strip against the bottom of the false bottom support.

- 7) Lightly tack two of the support pieces - one toward each end - against the guide strips with the support at a right angle to the module side, as shown below. Adjust the supports vertically so the bottom edge is even with the bottom edge of the side piece.
- 8) When the glue is dry, place the assembly on its base and check that it is square and perpendicular to the work surface. Adjust as necessary.
- 9) If the structure is true, permanently glue the two support pieces to their guide strips.
- 10) Insert and glue the third support piece.



Attaching the Guide Strips to the Left Side Piece (End Module)

- 1) Lay the left side piece with the ribbing down and the short edge at the top.
- 2) Measure 70 mm from each end and make a mark below the false bottom support and at the bottom of the side piece.
- 3) From the left end, measure about 10 mm to the right and make a mark below the false bottom support and at the bottom of the side piece.
- 4) Draw a line from top to bottom between each of these three pairs of marks.
- 5) Starting from the left end, glue a guide strip along the left side of each line with the top of each strip against the bottom of the false bottom support.

Attaching the Left Side Piece to the Right Side Assembly (End Module)

- 1) Place the right side assembly upright so that it rests on the bottom of the end and side piece.
- 2) Orient the left side piece with the ribbing out and the short edge at the top.
- 3) Align the left end with the end piece and the guide strips with the internal supports attached to the right side piece.

- 4) Ensure the left side piece is perpendicular with the work surface and square with the right side assembly, then glue in place.
- 5) At the open end of the module, insert the false bottom fill plate, colored side up, into the slots provided by the false bottom supports and glue in place. Allow the assembly to dry before proceeding.

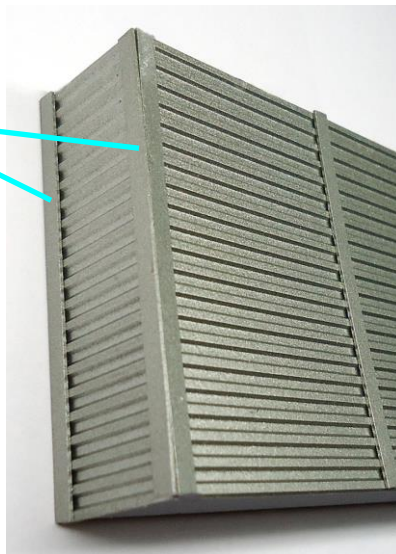
Attaching the Side and End Vertical Support Braces (End Module)

- 1) Lay the module on its side with the closed end to your left.
- 2) Starting from the top left edge, measure 42 mm and make a mark (on the side, not on the top edge). Continue until you have six marks spaced 42 mm apart.
- 3) Repeat Step 2 along the bottom.
- 4) Starting from the left end again, glue a vertical brace so that it covers the joint between the end piece and the side piece.
- 5) At each of the six pairs of marks, glue a vertical brace centered on the marks.
- 6) At the right end of the module, glue a vertical brace so that it is centered on the end of the side piece (the brace will overlap the end by 1.5 mm). The completed left side vertical braces are shown below.



- 7) Allow the assembly to dry, then turn it over lengthwise so the end piece is now to your right.
- 8) Starting from the right, repeat Steps 2-5.
- 9) At the left end of the module, glue a vertical brace so that it is centered on the end of the side piece (the brace will overlap the end by 1.5 mm).
- 10) At the end piece, glue a vertical brace along each side of the end piece so that it overlaps the edge of the first vertical side brace, as shown below.

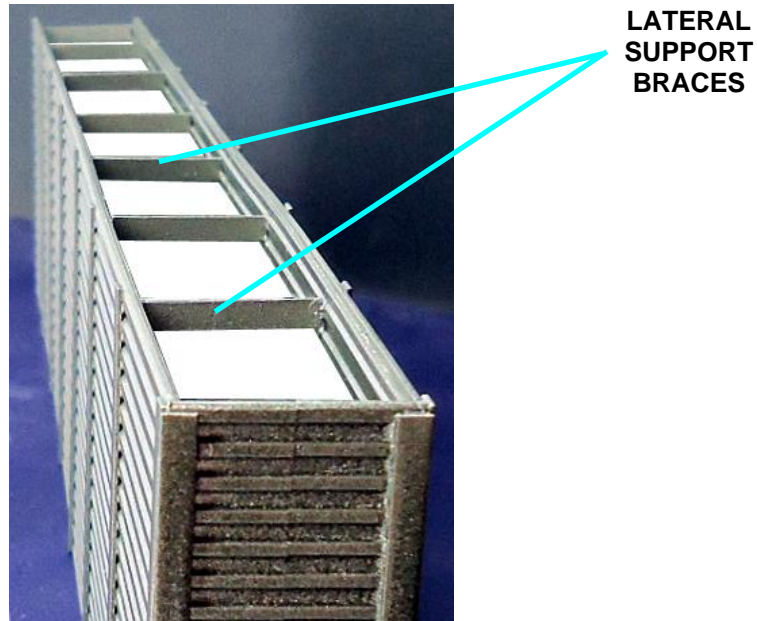
**END
VERTICAL
BRACES**



Attaching the Lateral Support Braces (End Module)

NOTE: If you plan to represent a finer material like sand or gravel for your fill, it would be better to add it before you attach the lateral supports. A coarse material like cat litter or aquarium gravel is better added after the lateral braces are installed. See "Adding Fill Material" at the end of the document.

- 1) Place the module upright.
- 2) Glue a lateral brace between the false bottom supports at each pair of side vertical braces (except at the closed end), even with the top of the module, as shown below.

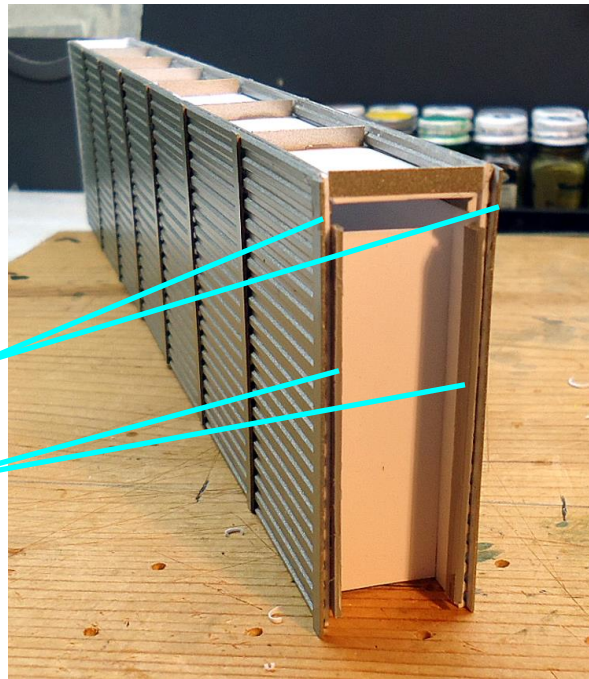


Adding the Modular Attachment Guide Strips (End Module)

All modules are designed to be connected and disconnected from each other using a simple slot arrangement. For the end modules, a slot is formed between the last vertical brace at the open end and a strip of plastic (guide piece) glued to the inside of the side piece, as shown below. The side piece of an open module fits into this slot.

**VERTICAL
BRACES**

**ATTACHMENT
GUIDE PIECES**



- 1) Cut two strips of plastic (any thickness) 4 mm wide x 55 mm long.
- 2) Draw a visible line down the middle of one side of each strip.
- 3) Glue each strip to the inside of the module, with the line marked on the strip aligned with the edge of the side piece. The bottom of the strip should be about even with the bottom of the module.
- 4) You do not need to paint the guide strips.

End Module Construction Complete

This completes the construction of the end-type module. Some suggested methods for adding fill material will be provided at the end of this document.

Mass Production

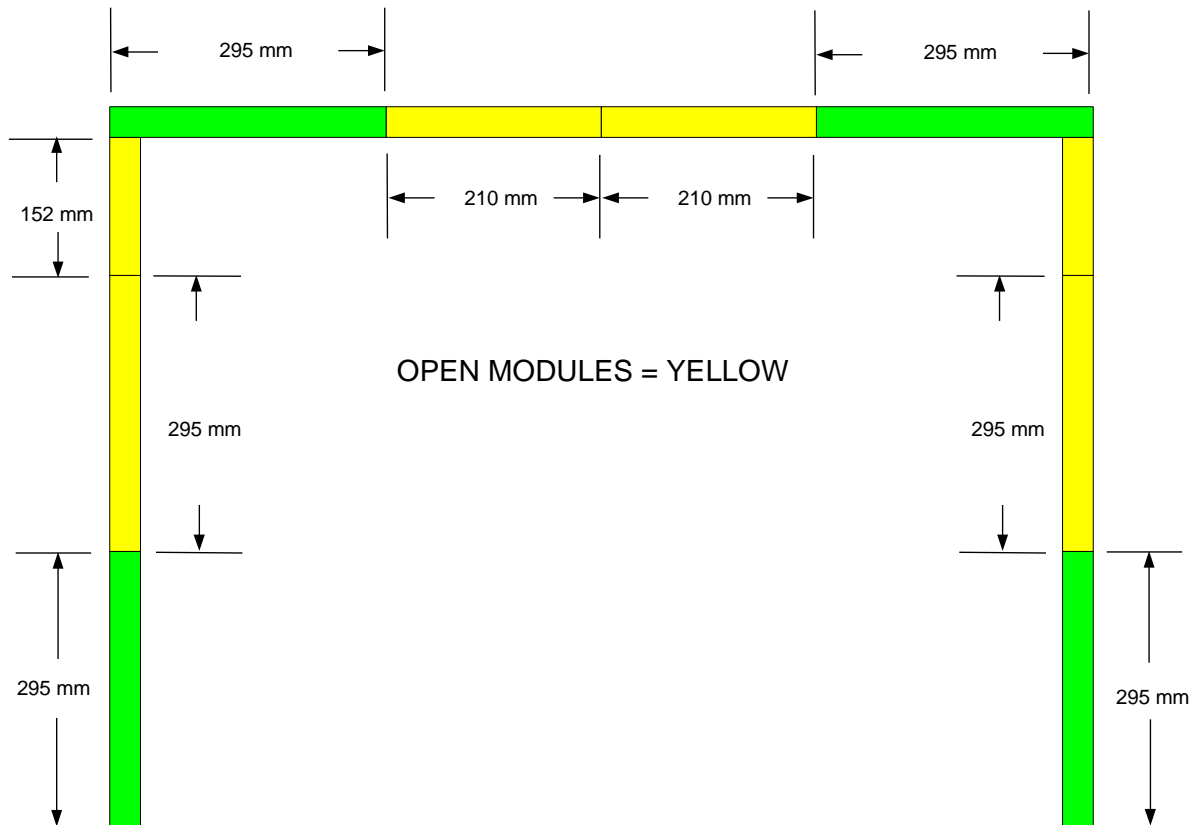
The revetment modules are not difficult to build once you understand how they go together. It's just a lot of tedious work to build enough modules for the entire revetment. At this point, you may want to consider an assembly-line approach for the remainder of the modules.

All of the modules are basically built the same way except for different lengths of siding and the fact that there is no end piece for the open-type module. All of the vertical braces, lateral braces, internal supports and guide strips, false bottom supports and module attachment guide pieces are made the same way, so you might want to cut all of these pieces at one time and go ahead and paint those that need painting. Once you determine the number and length of the module sides, you can pre-cut the sides and fill plates and paint those as well.

Building an Open-Type Module

The open-type modules are built the same way as the end-type modules except that there is no end bulkhead and there are two less vertical braces and one less lateral brace. Also, the internal supports are positioned differently (unfortunately, I didn't take a picture of one before I added the fill on mine).

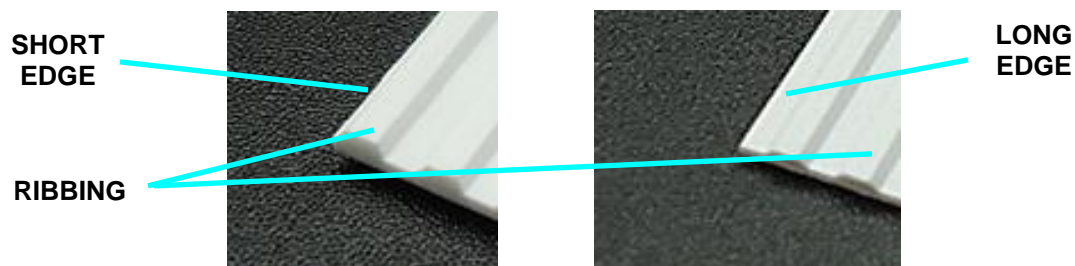
There are six open modules in three different lengths, as shown below.



Preparing the Metal Siding (Open Module)

The siding is cut in a specific way to ensure that the ribbing on both sides matches up with adjacent modules.

- 1) With the ribbing up, select the short-edge side of the sheet (see images below)



- 2) Measure 65 mm down from the short edge on each end of the sheet and make a mark.
- 3) Cut the sheet lengthwise between the two marks. The first piece will have one short edge and one long edge: the second piece will have two long edges.
- 4) Select one edge of the second piece and trim off 1 mm along the entire edge. You will now have a second piece with one short edge and one long edge.
- 5) Orient the second piece with the ribbing up and the short edge at the top and measure down 65 mm on each end, then make a mark.
- 6) Cut the piece lengthwise between the two marks.
- 7) Set the left-over piece of siding aside - this will be used to make the false bottom supports for the fill.
- 8) On each piece, with the ribbing up and the short edge at the top, measure from the left and make a mark at your required length, top and bottom.
- 9) Cut each piece between the marks.
- 10) If you desire, save the two smaller pieces to make additional bulkheads for future end modules.
- 11) Paint the side pieces and set them aside.

Preparing the False Bottom for the Fill (Open Module)

- 1) Orient the left-over piece of siding so the long edge is at the top.
- 2) Measure down from the top at each end and make a mark at 6.5 mm.
- 3) Cut the piece lengthwise between the two marks.
- 4) Again, with the remaining piece oriented with the long edge at the top, measure down 6.5 mm at each end.
- 5) Cut the remaining piece between the two marks. You should have two pieces with at least one long edge. The other edge can be long or short - it doesn't matter as it will not be seen.
- 6) Paint each support on the ribbed side and along the edges only.
- 7) From 0.5 mm plain sheet styrene, cut a piece 18.5 mm wide and the same length as the side pieces. This piece will be the bottom plate for the fill.
- 8) Paint one side of the plate in a color that is close to the color of your fill material.

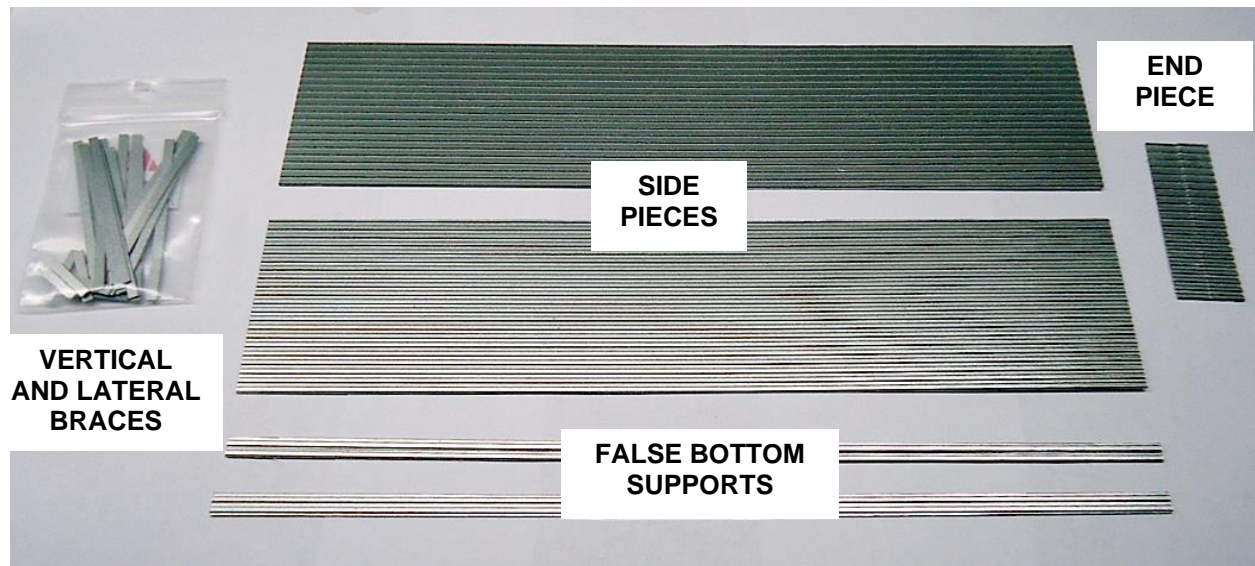
Preparing the Revetment Vertical and Lateral Braces (Open Module)

Use 0.5 mm plain sheet styrene or pre-made strips such as Evergreen #126 for these braces.

- 1) For the vertical braces, cut each strip 3 mm wide x 65 mm long. You will need a vertical brace at on both sides at one end only, and every 42 mm along each side.
- 2) Paint the vertical braces on only one side and along all edges.
- 3) For the lateral braces at the top of the revetment, cut strips 3 mm wide x 18 mm long. You will need a brace at one end and at each pair of vertical braces.
- 4) Paint these strips on both sides and along the top and bottom edges only.

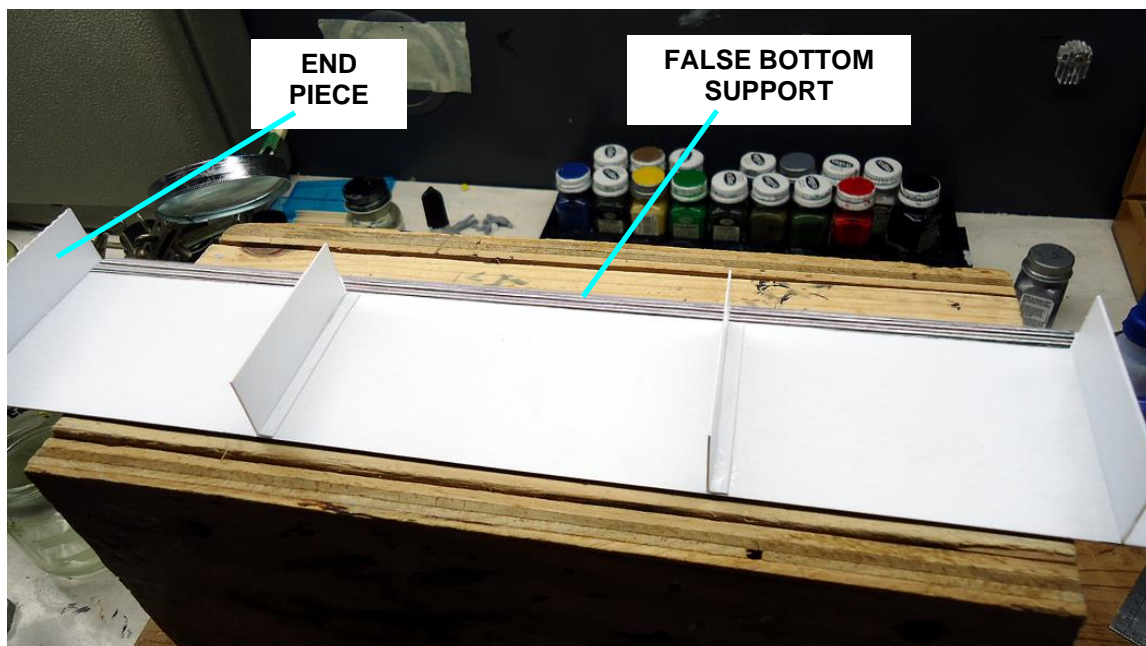
Assembling the Open Module

At this point, you should have the prepared parts shown below (**NOTE:** the false bottom fill plate is not shown). You are now ready to assemble the module.



Adding the False Bottom Supports (Open Module)

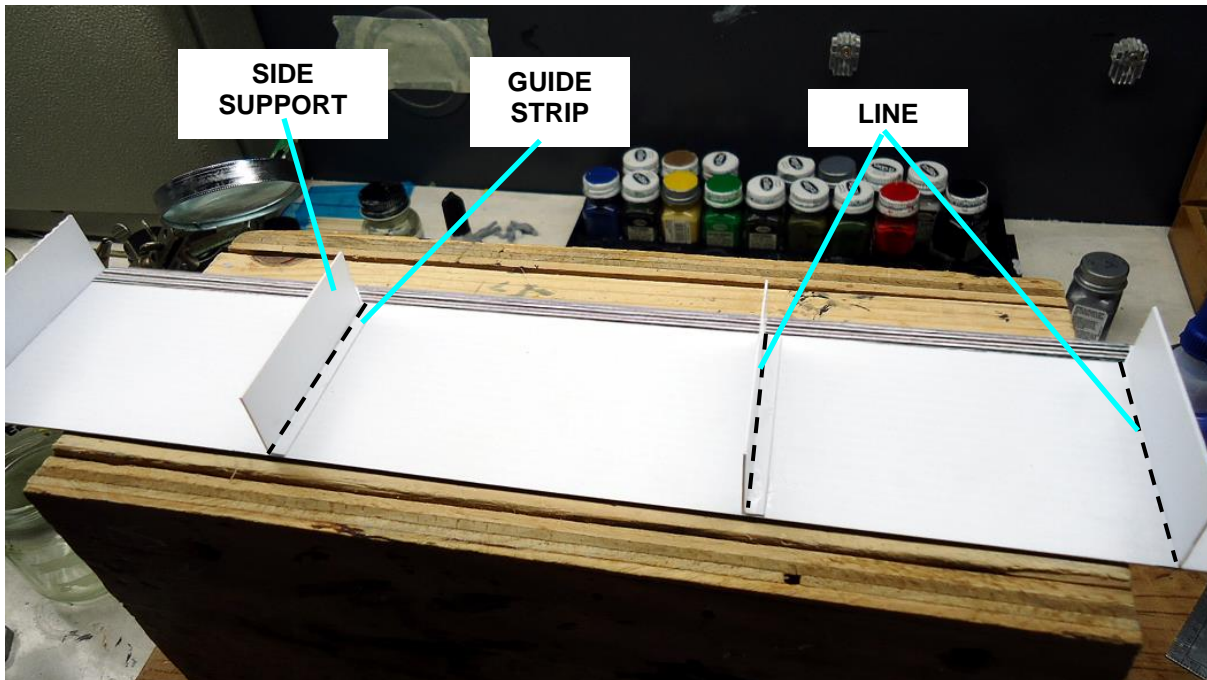
- 1) Place one of the module side pieces with the ribbed side down and the short edge at the top.
- 2) Orient one false bottom support with its ribbed side up and the long edge at the top.
- 3) Glue the support in place so that its top edge is even with the top edge of the side piece as shown in the picture below.
- 4) Repeat Steps 1-3 for the second side piece.



Adding the Internal Side Supports (Open Module)

From a sheet of 0.5 styrene, cut out three side support pieces 20 mm x 55 mm. These pieces do not need to be painted.

- 1) Cut three guide strips 3 mm x 55 mm (any thickness). These strips will help orient the side supports. They do not need to be painted.
- 2) Lay one of the side pieces ribbed side down with the short edge at the top.
- 3) Measure 10 mm from each end of the side piece and make a mark below the false bottom support and at the bottom of the side piece.
- 4) Determine the center point of the side piece and make a mark below the false bottom support and at the bottom of the side piece.
- 5) Draw a line from top to bottom between each of these three pairs of marks.
- 6) Starting from the right end, glue a guide strip along the right side of each line with the top of each strip against the bottom of the false bottom support.
- 7) Lightly tack two of the internal supports - one at each end - against the guide strips with the supports at a right angle to the module side, as shown below. Adjust the supports vertically so the bottom edges are even with the bottom edge of the siding.
- 8) When the glue is dry, place the assembly on its base and check that it is square and perpendicular to the work surface. Adjust as necessary.
- 9) When the structure is true, permanently glue the two support pieces to their guide strips.
- 10) Insert and glue the third support piece.



Adding Guide Strips to the Second Side Piece (Open Module)

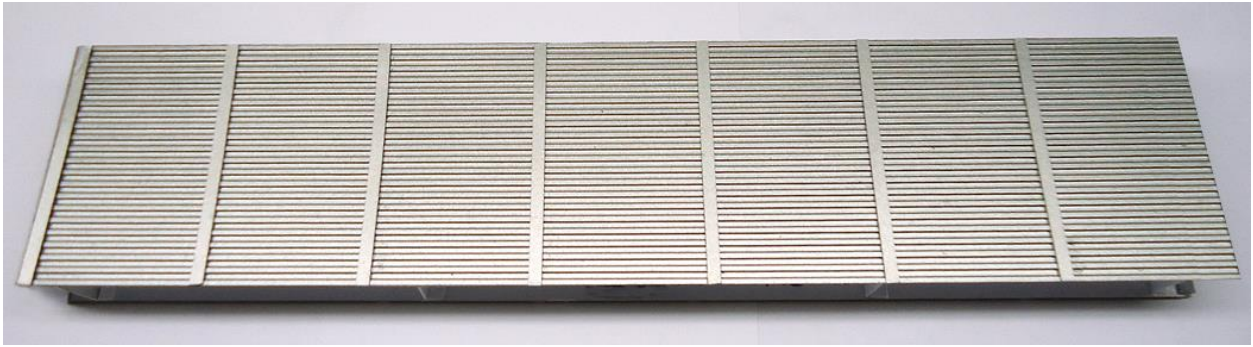
- 1) Lay the second side piece with the ribbing down and the short edge at the top.
- 2) Measure 10 mm from each end and make a mark below the false bottom support and at the bottom of the side piece.
- 3) Determine the center point of the side piece and make a mark below the false bottom support and at the bottom of the side piece.
- 4) Draw a line from top to bottom between each of these three pairs of marks.
- 5) Starting from the left end, glue a guide strip along the left side of each line with the top of each strip against the bottom of the false bottom support.

Attaching the Second Side Piece (Open Module)

- 1) Place the first side piece assembly upright so that it rests on the bottom edges.
- 2) Orient the second side piece with the ribbing out and the short edge at the top.
- 3) Align the guide strips on the second side piece with the internal supports attached to the first side piece.
- 4) Ensure the second side piece is perpendicular with the work surface and square with the first side assembly, then glue in place.
- 5) From either end of the module, insert the false bottom fill plate, colored side up, into the slots provided by the false bottom supports and glue in place. Allow the assembly to dry before proceeding.

Attaching the Vertical Support Braces (Open Module)

- 1) Lay the module on either side with the siding short edges at the top.
- 2) Determine how many vertical braces you will need on each side. You will need a vertical brace along the edges of one end and every 42 mm on both sides.
- 3) Starting from the top left edge, measure 42 mm and make a mark (on the side, not on the top edge). Continue until you have six marks spaced 42 mm apart.
- 4) Repeat Step 3 along the bottom.
- 5) Starting again at the left end, glue a vertical brace so that it is centered on the end of the side piece (the brace will overlap the end by 1.5 mm).
- 6) At each of the six pairs of marks, glue a vertical brace centered on the marks.
- 7) Do not add a brace to the right end of the side piece.



- 8) Allow the assembly to dry, then turn it over lengthwise.
- 9) Starting from the top right edge, measure 42 mm and make a mark (on the side, not on the top edge). Continue until you have six marks spaced 42 mm apart.
- 10) Repeat Step 3 along the bottom.
- 11) Starting again at the right end, glue a vertical brace so that it is centered on the end of the side piece (the brace will overlap the end by 1.5 mm).
- 12) At each of the six pairs of marks, glue a vertical brace centered on the marks and even with the top and bottom of the module.
- 13) Do not add a brace to the left end of the side piece.

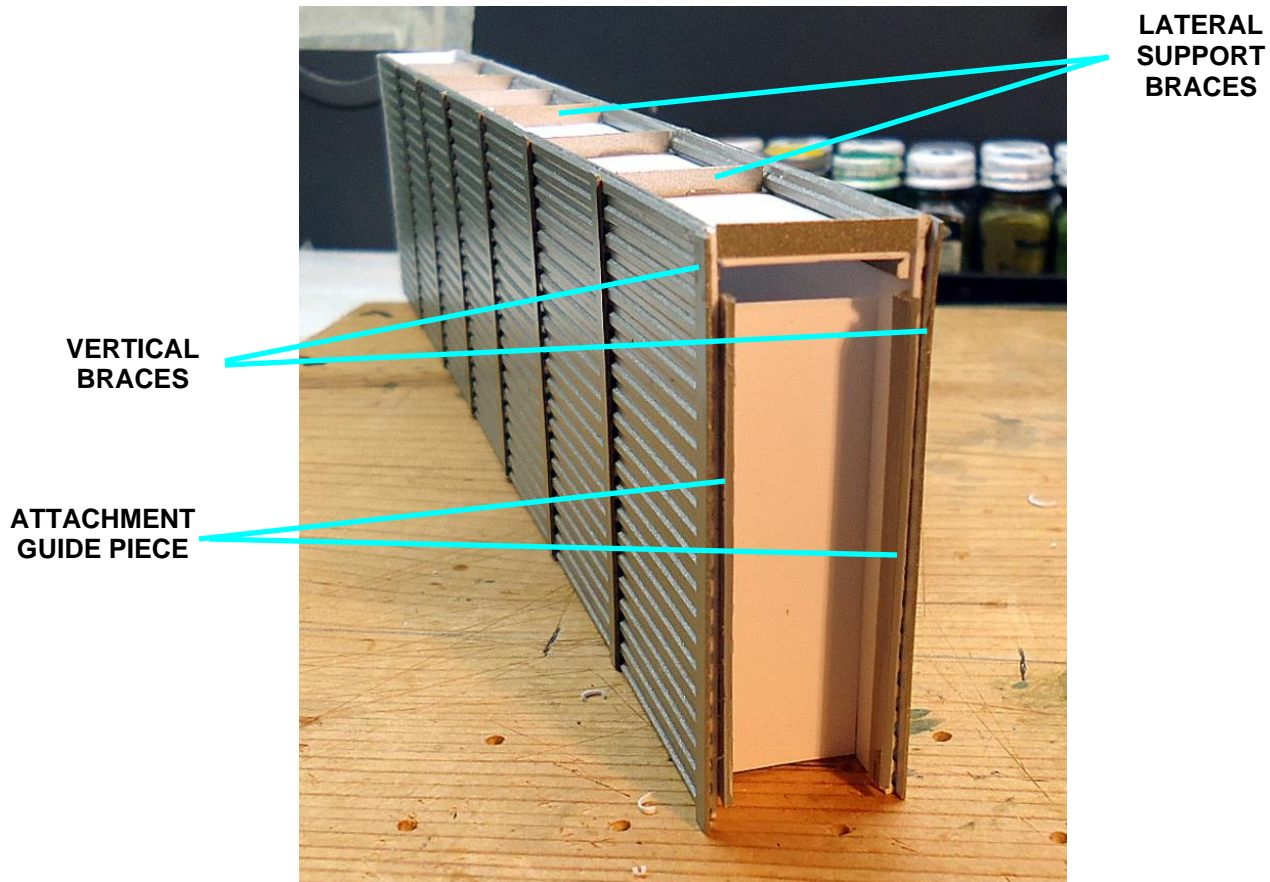
**Attaching the Lateral Support Braces (Open Module) **

- 1) Place the module upright.
- 2) Starting with the end that has vertical braces overlapping its edges, glue a lateral brace between the false bottom supports, centered on the two braces and even with the top of the module.
- 3) Do not add a lateral brace to the end with no vertical braces.

Adding the Attachment Guide Strips (Open Module)

All modules are designed to be connected and disconnected from each other using a simple slot arrangement.

For the open module, there are two open ends. On one end, a slot is formed between the vertical braces overlapping the end and strips of plastic (guide pieces) glued to the inside of the side pieces, as shown below.



- 1) Cut two strips of plastic (any thickness) 4 mm wide x 55 mm long.
- 2) Draw a visible line down the middle of one side of each strip.
- 3) Align the line with the inside edge of each side piece and glue the strips in place. The vertical position of the strips is not critical.
- 4) You do not need to paint the guide pieces.

Open Module Construction Complete

This completes the construction of the open-type module. Some suggested methods for adding fill material is provided next.

Adding Fill Material

Revetments were filled with rock, coral, gravel, sand, dirt - whatever material was readily available in the local area. Over time, the fill, including rock and coral, generally settled below the top of the revetment and was no longer visible from the ground. Rock fill took a longer time to break up and settle, but coral is softer and disintegrates much faster due to the humid and salty air.

Fill was usually mounded higher than the top of the revetment when newly added, but settled over time (including rocks) and usually ended up below the top of the revetment. I chose to use rock for my revetment because it adds a little more detail to the scene rather than a generally smooth surface.

Sand, Dirt, and Gravel

If you choose to model these finer materials, you will probably want to contour the fill a bit - even sand and dirt that had been in place for a long time still had some undulating shape to it. This can be simulated with paper towels dipped in thinned white glue and draped over cotton balls to give it shape. You can apply the sand or dirt material while the glue is still wet. Or you could carve the shapes from strips of Styrofoam and glue the material directly to the fill plates.

You could even add a few weeds or tall grass at the top as they often grew there for quite awhile before finally being sprayed with a defoliant. That was particularly true in Vietnam, where keeping the tops of revetments clear had a lower priority.

Rocks and Coral

Using cat litter, aquarium gravel or some other similar material will produce natural contours to the fill as you apply it. I used cat litter for my fill. I added larger size pieces first then dribbled a thinned mixture of white glue and water over them. Finally, I filled in the crevices and recesses with smaller pieces while the glue was still wet.

Connecting Two Modules Together

Refer to the picture below:

- 1) Hold the module with the slotted end on a flat surface.
- 2) Hold the module to be connected (non-slotted end) over the module on the table.
- 3) Lower the connecting module until the ends of the sides engage the slot.
- 4) Press the module down firmly, keeping the ends together until both modules are fully engaged.
- 5) If the slots grip the connecting module sides too tightly, use a flat emery board or sandpaper to thin the ends of the connecting module sides.



Handling the Revetment

This method of connecting the modules works pretty well as long as you don't disturb the revetment. If you plan to handle the modules often, like taking the revetment to a model show, you may want to consider gluing some of modules together in larger sections.

Project Complete!

Congratulations! I hope you enjoy your model! Please contact me if you have any questions or suggestions (striker8241@yahoo.com).