

Tales from Barlow Works

Making wooden roofs for rolling stock

Materials required: Basswood..... 1.8mm thick
..... 2.4mm thick
..... 3.2mm thick
Basswood dowel..... 3.6mm thick (1/8 inch)

Cartridge paper..... 150 g sq M

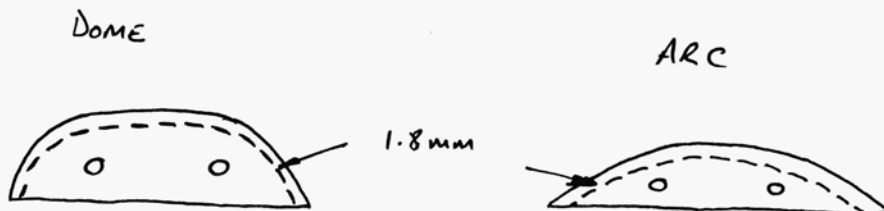
Superglue
Balsa cement
Extra tacky PVA craft glue
Double sided sticky tape

Having bought some second-hand etched coaches without roofs I needed to devise a method of making a roof to fit that had the finish of the canvas roof of the prototype. I remembered back to my days of balsa wood aeroplane modelling and that we used to make the body using strips of balsa laid onto formers. I thought that I could adopt this idea to make a wooden roof for my coaches. I wanted a roof of hollow construction so I could fit lighting at a later date if required.

There appears to be two basic roof shapes, the arc roof with the roof overhanging the sides and the dome roof where the roof meets the side of the coach and there is usually a gutter on the coach side. There are numerous refinements of these styles such as the clerestory roof and the dome ended roof but this article will deal with the two basic shapes, the construction method is similar for both types.

Roof profile template

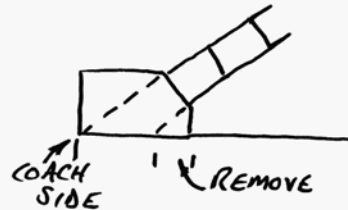
To get the correct shape of the roof we will require a roof profile template. To do this I use a piece of 60 thou plasticard, cut to fit between the coach sides and mark the profile of the coach end onto this. If the plasticard is coated in permanent marker and the profile is marked using a fine pointed tool an accurate profile can be obtained. Most etched coach sides have an etched strip on the top that is bent over to give strength to the side and somewhere to attach the roof too. I tend to remove this strip and solder a length of bullhead rail along the top edge to give extra strength to the coach side. The profile template is made to fit between the rail/etched strip and will be used to mark out the roof formers but the roof formers will eventually be cut with a flat bottom to fit across the top of the rail/etched strip. Strips of basswood will then be glued to the bottom of the finished roof so it locates between the rail/etched strip. This makes roof construction a lot easier. Once the profile pattern has been cut out mark the thickness of the basswood roof strip (1.8mm thick) along the roof edge of the profile pattern and remove it to give the final pattern shape. This will then give the correct roof shape when the basswood roof strip is fixed to the former (see the section on arc roofs before cutting the roof profile back as it will need to be modified). Drill two holes in the template so we can mark for holes to locate the dowels.



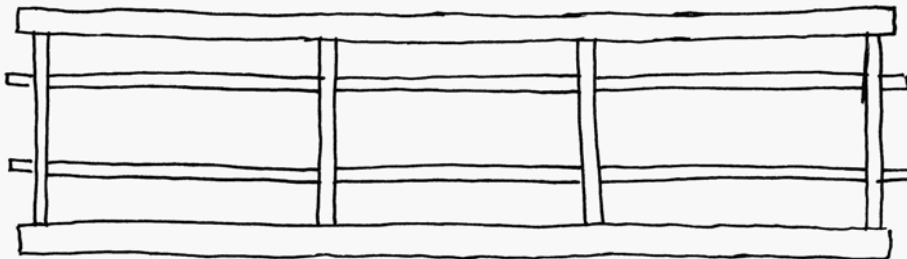
Here the construction of the two types of roof differs slightly so the template for the arc roof will have to be modified slightly. I will deal with this type of roof construction first.

Arc roofs

Because the arc roof overhangs the side and the overhang will be formed by the cartridge paper, the roof shape needs to be sanded to a featheredge at the side of the coach. We need to fit a thicker piece of basswood (2.4mm thick) to the edge of the roof so it is easier to sand down than the normal roof thickness of basswood and lies flat on the coach side. We need to know how much to remove from the end of the roof template to allow for this. As arc roofs vary from company to company it is best to use the roof template to draw out the required shape on paper. Draw round the roof template on paper, then remove the thickness of the basswood roof (1.8mm thick), and draw round the template again. Take the thicker basswood for the edge and lay it on the paper so its edge is level with the outer edge of one side of the original template and draw round it. This will show that there is a triangular area that will eventually be removed. If you draw a line down from the point where the edge basswood touches the finished roof outline then that will show how much has to be removed from the end of the template and also the width that the side pieces need to be. Repeat for the other side. I know this sounds complicated but the diagram should make it clear.



Using the template cut out enough formers for the whole roof out of the 3.2mm basswood allowing 3 to 4 inches between formers and allowing for one at each end. Remember to let the grain in the wood run along the length of the former, if it goes across the former the roof will eventually warp. Mark the holes and drill 3.6 for the basswood dowels. At this point I usually clamp the formers together and sand the top edge so they all have the same profile.

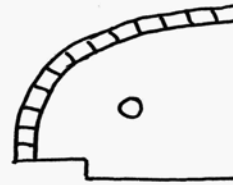


Find a flat surface and mark on it the dimensions to the outside of the coach body and the inside of the ends making sure that it is square. Stick a couple of lengths of double-sided tape onto this outline to hold the formers in place. Cut two lengths of dowel slightly longer than required and thread on the formers. Fit the formers in position and glue the dowel in place using balsa cement. Fit the two end spacers right to the ends so that the roof will be a tight fit in the carriage. Cut the thicker side pieces to width and slightly long and fit to the sides of the outline and glue to the formers on the ends. Cut lengths of 1.8mm basswood about 2mm wide and slightly long and starting from one side build up the roof shape by gluing to the formers with balsa cement. When near the centre start from the other side and finally cut a piece to fill the gap in the centre. When dry carefully remove from the sticky tape and flood the underside with superglue. This soaks into the wood and when dry will eventually give a solid roof. When dry, sand the top smooth and the side pieces down to the coach sides and trim the roof to length to be a tight fit

between the ends. When the roof is finished cut two lengths of basswood and glue to the base to hold the roof between the rail/etched strip.

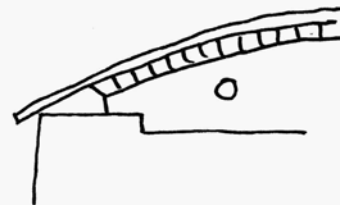
Dome roofs

With dome roofs the thicker edge pieces are not required and the formers do not need cutting short. The 2mm strips are laid from the bottom of the former and are taken up the side just like the arc roof. When complete the roof is again sanded smooth and trimmed to length and the strips are again glued on the bottom.



Canvas roof covering

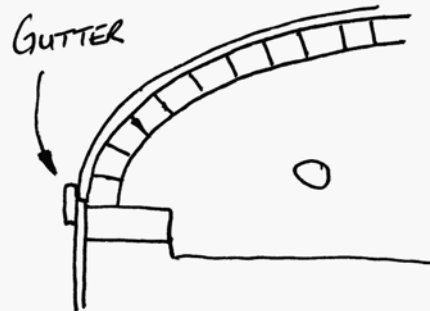
We use the cartridge paper to represent the canvas of the prototype. For the arc roof the paper is cut oversize and glued to the roof with the tacky PVA craft glue. When dry the edges of the cartridge paper are flooded with superglue and when it dries it will be rock hard and be able to be trimmed to size using a very sharp craft knife.



For the dome roof the paper is also cut oversize and covered with glue, the cartridge paper is then rolled round the roof and underneath and is allowed to dry while stuck to the bottom of the roof. When dry the cartridge paper is cut level with the bottom of the roof and carefully removed from bottom. The ends are again flooded with superglue as before. When this has gone hard the ends are cut to length with a slight overhang over the ends.

Gutters and rainstrips

With dome roofs the carriage would usually have a gutter. It is better if the gutter strip can be fixed to the carriage side during construction so the roof can sit down between the gutters. If not the gutter can be stuck to the bottom edge of the roof but is not as solid. Arc roof carriage roofs overhang the sides so have rain strips instead of gutters. These can be made of plastic strip and can be quite easily stuck to the roof using MEK PAC etc. Roof detail can be fitted through pre drilled holes and glued from underneath with superglue.



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