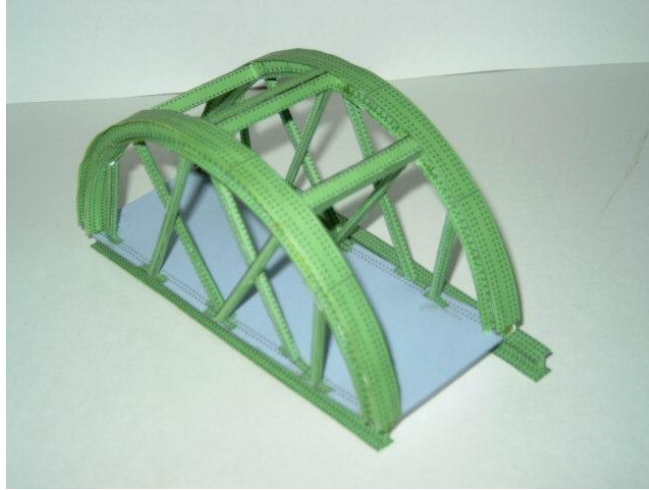




# Plate Girder Bridge



Firstly I have to say that the descriptions “Thin Card” and “Thick” card are only guidelines to indicate that some parts of the model will be easier to build if you use differing thicknesses of card. I built the original bridge, shown above, using scrap paper, old bills etc, which I printed on the blank side and I got a weight bearing structure. However it was a pig to build as the paper kept distorting despite using balsa cement as my adhesive.

This model kit comes printed on 160gsm card and you can build it using this as soon as you cut it out. If you do that you will need to use at least 2 extra sheets glued together for the parts labelled thick card and the main internal arches will need three thicknesses for each of the templates, that is to say you will end up using a LOT of card. I use breakfast cereal packets as medium card and artists mounting board as thick card, but that is only a personal choice. On the subject of breakfast cereal packet Wheatabix are the only problem causers since they impress the name from the inside and you do not get a smooth surface.

You will need some basic tools.

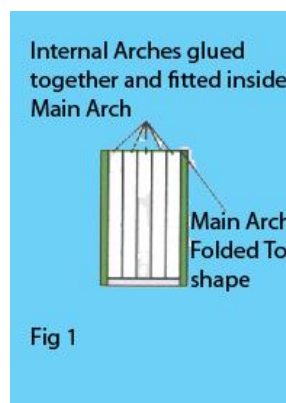
A craft knife or other sharp blade, a steel straight edge, a decent pair of scissors, glue and a cloth to wipe your fingers and tools with. You will also need a couple of fine point marker pens to colour the cut edges with. Black and grey are the minimum and something close to the colour of the model will be useful. You will also need a tin of artists spray varnish to keep any moisture out and protect the colours against fading. You can coat the cards with the varnish before cutting out and assembling. Or, you can assemble the model then apply a couple of coats of varnish. Colour the cut edges BEFORE assembly.

To assemble the model

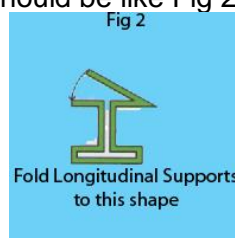
- 1) Glue card 1 on to thick card and set aside to dry.  
“Stick” type glue is ideal but you can use whatever you have available. “Superglue” is fine but it really means superfast so if you line it up wrongly you will not be able to do anything with it, and PVA or white glue can soften and tear the card. Both the latter can also bleed through and leave dark patches on the printed surface. Balsa cement for model aircraft is good as it dries quickly and does not bleed through. Gluing the template to the card simply means you will not have to cut it out twice. When dry, cut out the arches. When cutting out parts cut on the black outline only. Some of the “Angled Arch Supports” on card 6 have red lines on them. Cut these lines from the inside to the outside as they allow the square tube to have shaped ends when fitting to the arch.
- 2) Cut off the bottom section of card 2 where it says “Thick Card” and glue it to thick card. Set it aside to dry. When dry cut out the deck. If you are going to build the twin track version cut out the section on card 7 instead. Place your steel rule along the score lines of the main arch, the score lines are those sticking out from the printed sections at the ends, and run the BACK of your craft knife blade along them to provide a bending guide. It is just as good if you use a ball point pen with no ink as all you want to do is provide a guide for folding the arch up on. While you have your rule and scoring tool you should also score the cross braces. Once again check for the single or double track version before scoring or cutting. Cut out the section you need and fold along the score lines. Cut out the Main Arch. It should be a continuous ellipse and when you fold the score lines you should have two arches joined by a white section with the printed surfaces facing

outwards. If you have cut out the Cross Braces the white flap glues inside the first of the printed pieces giving you a square tube with two sides having flaps. Fold the flaps back as these will fit to the inside of the arch girders later. Repeat this with card 5.

- 3) On Card 3 score and cut out the Longitudinal Support Joists and cut out the Arch lower plates. Write the name on these lightly in pencil on the blank side. Repeat on card 4 with the Arch top Plates.
- 4) Score and cut out the Angled Arch Supports on card 6. Build as for the cross braces. Remember that on the Angled Arch Supports numbers 2 & 4 (light blue numbers) there are red cut in lines to give the correct shape to the ends of the tube.
- 5) Cut out the Arch Top Plate Underside and the Arch Lower Plate underside from Card 7.
- 6) Take the previously cut out and folded Main arch and check to see how many Internal Arches are needed to fill the gap between the two main arch sides. A little over or under is ok, but if you wish, go a little under and pack out with thinner card or paper. It is safest to glue one of the internal arches to the packing and cut round that rather than cutting it whilst on the main arch itself. When you are satisfied laminate all the Internal Arches required to form the core of the Main Arch then starting on one side glue the Main Arch onto the laminated Internal Arches taking care to line up the arch and the internal sections. Repeat for second arch. If seen end on it should look like Fig 1.

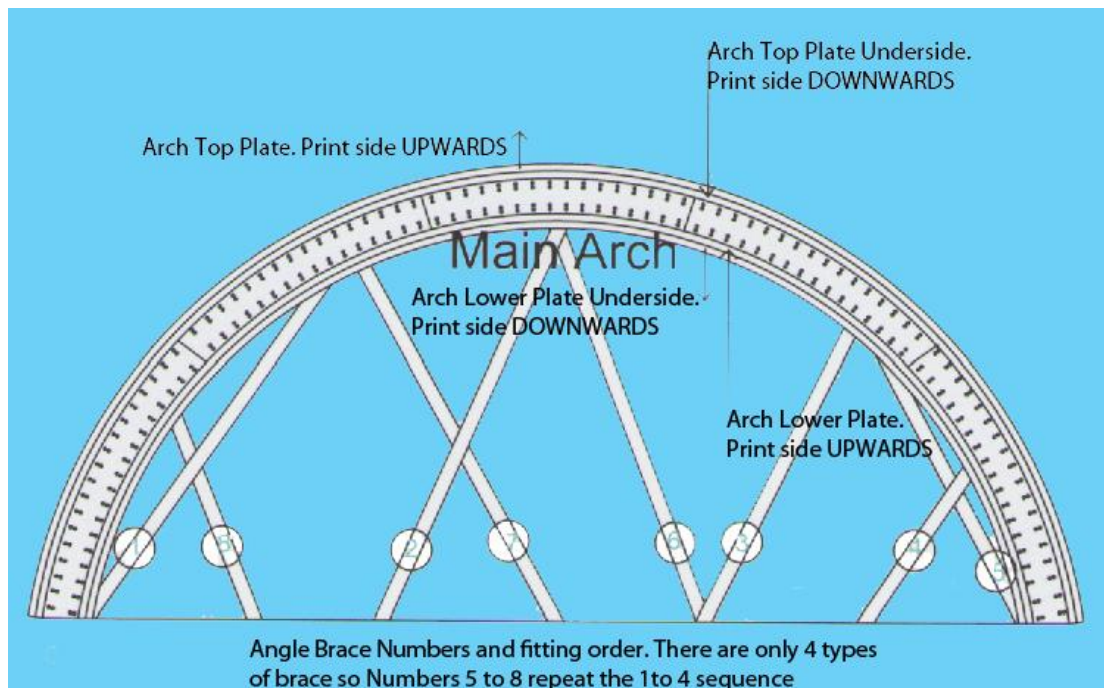


- 7) In order to form the arch there must be a series of top and bottom plates. Take an Arch Lower Plate and glue it **printed side up** centrally to the inner curve of the Main Arch assembly. This forms the upper surface of the bottom of the beam. Repeat with other arch. Take the Arch Lower Plate Underside and glue it **printed side down** to the blank face of the Arch Lower Plate. You should now have three sides of the main arch girder shape. Make the top of the arch the same way, one plate face down on the Internal Arch assembly and the other face up. Repeat for other side of the arch. The plates are longer than required, so trim to size. See Fig 3 below.
- 8) Longitudinal Support Joists. These are formed by scoring and folding the parts to form the **I** shape of a RSJ but they were built up from riveted plates. Fold and check the beams one at a time. There are four of them. Two each on cards 3 & 4. The shape should be like Fig 2.



- 9) Having chosen your width, glue one arch to the bridge Decking. It should fit exactly on the longest axis. Take a set of four of the made up angle braces and fit between the decking and the arch. Start on the left side as you look at the arch and fit the bottom end of brace No 1 into the angle between the arch and the deck with the pointed end touching the deck and the base of the arch. The top end is simply raised up until the flaps make contact with the underside of the arch. Keep the edges to the outside edge of the deck. There are faint blue lines on the deck and the following braces, 2,3,4 in order, fit between them and are then raised to meet the arch. When all four braces are in position and the glue is dry turn the arch over and repeat the procedure

with another set of braces. To build the other side of the bridge start in the same way but fit the INNER braces first. If you don't you will have difficulty fitting them in the confined space inside the bridge. See Fig 3 for a guide.

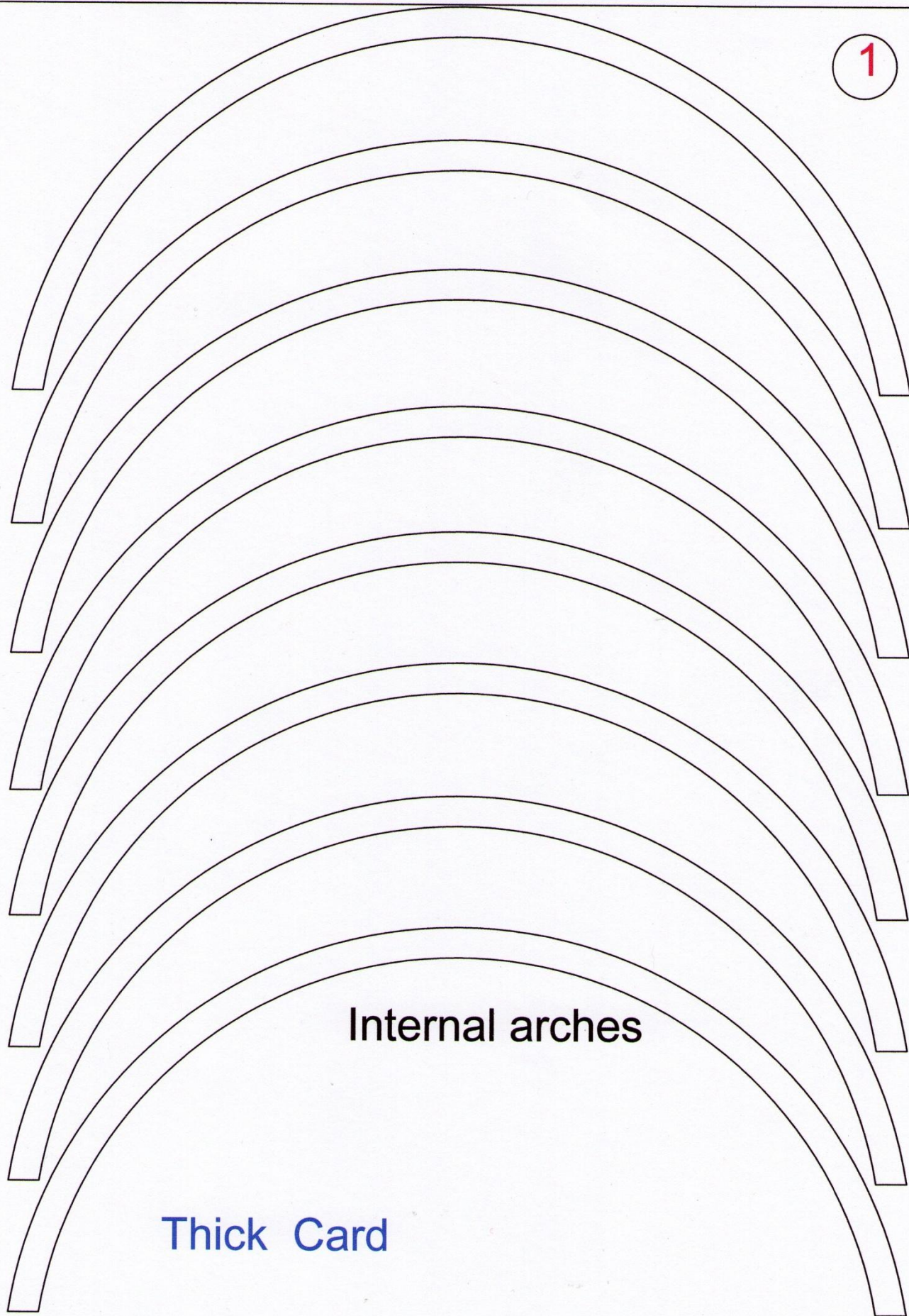


- 10) The Cross Braces are formed by making 4 folds with the print side out. The white flap is coated with glue and tucked inside the first flap. The longer ends which do not form part of the square tube are folded back and fit inside the top and bottom of the main arch. The Position of the braces are:- one in the centre of the arch and one either side of it positioned to allow your tallest loco/load to pass under.
- 11) The Longitudinal Support Joists are longer than the Bridge to allow you a choice of how to mount the bridge. You can mount them over the gap first, but, if you do make certain that the outside edges exactly match the width of the bridge deck,
- 12) You CAN build the bridge without a deck if you use all four of the Longitudinal Support Joists and run unsleepered track along the top of the joists. You will also need to use both the long and short Cross Braces cut to size. There are two full sets of braces to allow you to do this or simply to fit under the deck if you wish to add realism.
- 13) Painting. Carefully apply a couple of coats of spray varnish to seal the card and help prevent fading from bright sunlight. It also makes it easier to wipe off dust.



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Internal arches

Thick Card