

# Scout Bridge

I really built this bridge as I went along. I have converted it to plans after the fact (included later). Everything was driven by the wood. I used clear redwood. This wood is very light, which is a major factor, and it is highly weather and abuse resistant. The bridge is over 14 years old and still going after well over 2,000 kids and parents crossing it. It has been decorated in a variety of ways and used by the Local Girl Scout Troops for their bridgings. It has also been used by Kindergarten groups to bridge to first grade and was used at an 8th grade dance for pictures. I only finished the handrails to keep down splinters, though redwood is fairly fine grained anyway. I started with standard 1" X 6" X 8' boards. The planks of the bridge have the Scout Law routed into each plank. I purchased a jig from Sears that makes this easy. I used 2 ½ inch letters that I printed from my printer. You could paint them, but the routed letters will last longer. My planks are removable. I used dowel pins to hold them on. There are a few design flaws that I have fixed over time and still a few that I can't do much about.

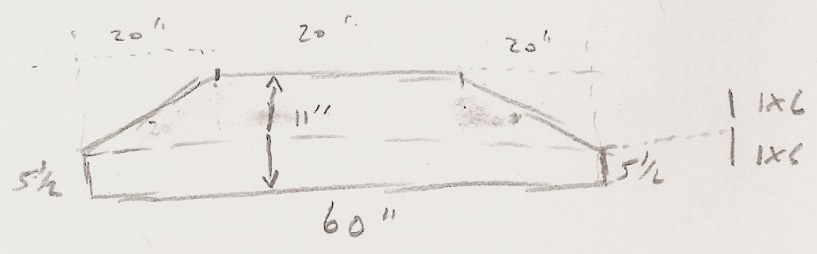
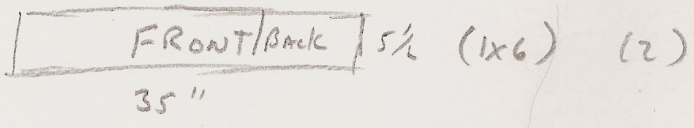
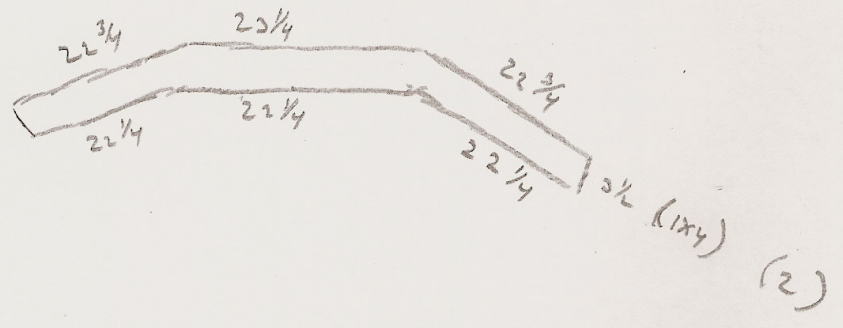
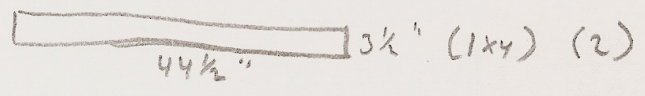
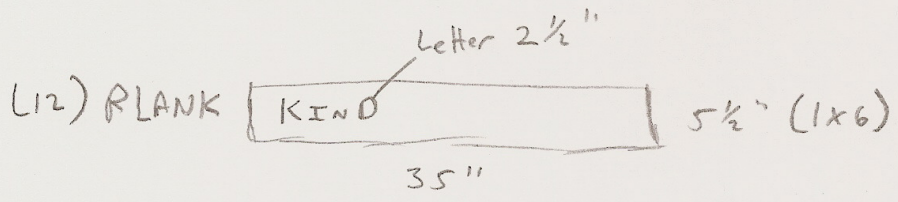
I have one continual problem with the bridge and that is that I allowed the first and last planks overhang the end. Without support all the way across the edge, a misstep on those planks and they come off. Most of the time kids step on the bridge so this is not a problem. No one has been hurt, but it is annoying. I am not sure why I designed it that way. In retrospect I would make the bridge longer so that the last plank matches up with the end of the bridge.

The bridge's handrails were originally built in 3 pieces (each side). These fit together by dowels. Eventually these loosened and the rails would come apart if grabbed and used for support. I glued them, but this never seemed to hold very long. I finally added some small brass plates across each joint, on both sides of the joint. This seems to be stable though not really strong.

In ten years I have replaced one of the posts, added some supports under the support pieces, and added the long cross brace underneath the bridge. It all remains very light. I can lift the main bridge into a car by myself. It does take a min-van or station wagon to carry the whole unit to and from bridging sites, but it easily fits through doors, etc.

I am sure a little forethought will produce an even better design. I look forward to your success. Feel free to contact me if you have any other questions. If you have a nice bridge, please send me pictures and your designs. Mine will probably have to be rebuilt some time and I would welcome new ideas.

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## Some Plan Details

Note that a 1 X 6 is really about  $\frac{3}{4}$  inch depth and 5  $\frac{1}{2}$  inches wide. They come in 8 foot lengths. A 1 X 4 is  $\frac{3}{4}$  inches in depth, and 3  $\frac{1}{2}$  inches wide. These also come in 8 foot lengths.

### The Base

The base was begun by putting two 1 X 6 boards, 5 feet long, side by side. This gave me an 11 inch height. I attached a couple of 1 X 4 cleats across the back to hold them together. A lot of fastening was done with 1 inch wood screws.

I decided I wanted the ends of the base to be a 1 X 6 high and I know that the bridge was going to have 4 level planks across the top. I measured 2 plank widths (11") from the center (30" mark) on either side of center. This set the top of the angle with the bottom set by the top of the first board of the base (5  $\frac{1}{2}$ ").

I used pieces of 1 X 4 in the inside corners so I could attach the end pieces a little further to the inside to prevent splitting. Pre-drilling holes is very important. With the inserts you should use somewhat longer screws.

The 4 cross braces are 33  $\frac{1}{2}$  inch wide 1 X 6 boards spaced evenly. To attach each one I first attached a piece of 1 X 4 on the inside and attached the brace to these cleats. I later added a piece of 1 x 4 cut to fit from the bottom of the base to the bottom of the cross piece under the cross piece so that the weight was supported by the floor as people walked across.

Several years later I added a long piece, 1 X 4, from corner to opposite corner as a brace. Things started loosening up and this really added a lot of strength.

The handles on the ends are very useful for the kids when they move the bridge around.

### If I had to do it over again

I would have increased the length of the base to 62 inches. This way the last planks wouldn't over hand.

Another change in design is to consider another way of attaching the planks. Another builder of a similar bridge added cleats to the ends of each plank and these would fit in slots (probably created with additional cleats on the inside of the base). This would mean no dowels and is more easily fixed over time (just replace cleats).

### Planks

These were the main drivers of the bridge. I used 1 X 6 planks (they come in 8 foot lengths). Each plank is 35 inches long. I used a jig I bought from Sears and a router. I didn't like the lettering that came from the kit so I created my own on the computer using an Arial Bold font. Each letter is 2  $\frac{1}{2}$  inches high and the parts of the letters are about  $\frac{1}{2}$  inch thick. I rounded off the edges of the boards with the router. I painted the inside of the letters with black paint. I originally spray painted the boards and sanded off the paint on the top. In retrospect it would have been easier to use a brush. I touched up with a black marker.

Placing the planks was not as consistent as I could have done it. I drilled the holes on the planks by eye towards the center. I used some special buttons that fit into the dowel holes than I set the boards on the bridge in their correct place and pressed down. Small points on the buttons marked where to drill for the dowels.

## **Side Rails**

These have long been a source of some trouble. I used dowels to originally connect the top pieces together so they could come apart. The dowel holes wore out and the pieces came apart when people crossed. I then glued them. This did pretty well, then the glue finally gave way. Re-gluing helped, but still it came apart. I finally added some brass plates across the breaks with little screws. This has also helped, but they are slowly working loose.

I wanted the top rail to be smooth as this is where people would grab for their step up on the bridge. I decided to finish the rail with a lacquer. This certainly was not my forte. It looked nice for a while, but the elements eventually have cracked the finish considerable and I am not set up to re-work it. It's still ok, but it really looks more worse for wear than the rest of the bridge.

I made the handrails first, then uprights afterwards.

## Handrails

These were made with 1 X 4 pieces. The angling was based upon roughly on the same angles for the bridge. I never measured the angle, but simply eye-balled it.

## Uprights

These were made with 1 X 4 pieces. The height of the top of the highest part of the rail was set at 50". Probably based eye-balling a subjective height for holding a rail for a Webelos age boy. The center piece sets the height and it connects to the level center piece so it is the easiest. It is 44 inches high. It was easy to set up its connection to the base as it goes in the center. The side pieces I measured in about 6 inches from each edge. I drilled these and connected them to the base. With the handrail built and put together, I set it on top of the center piece and measured the side pieces. Where these crossed and set the angle I needed to cut. These have now been measure at 40 ½ on the high side and 39 ½ inches on the low side.

## Possible Parts List

12	1 in X 6 in X 6 ft Redwood (Clear) (You really won't save much by getting 8 ft.)
8	1 in X 4 in X 6 ft Redwood (Clear) or 5 - 8 ft boards
12	2 in X ¼ (1/4 - 20) round head bolts, fender washers, wing nuts. (I would double this number)
Lots	1 inch wood screws