

## TRESTLE BUILDING CLINIC

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### ABSTRACT

Methods of building trestle bents and completed trestles are presented. Both pile and frame trestles are addressed. The techniques presented are appropriate for all scales in both standard and narrow gauge. Different prototypes are discussed, including Burlington-Northern, Rio Grande Southern, Denver and Rio Grande Western, and Alamogordo & Sacramento Mtns. Photographs (models and prototypes) and drawings are presented. Easy ways to add a trestle to a plywood layout, or build a trestle on a bench, are described.

### THE PARTS OF A TRESTLE

Figure 1 shows the different parts of a typical trestle and trestle bent. Notice that the naming of the legs is somewhat arbitrary: middle leg, outside leg, 2<sup>nd</sup> leg, leg #1, etc.

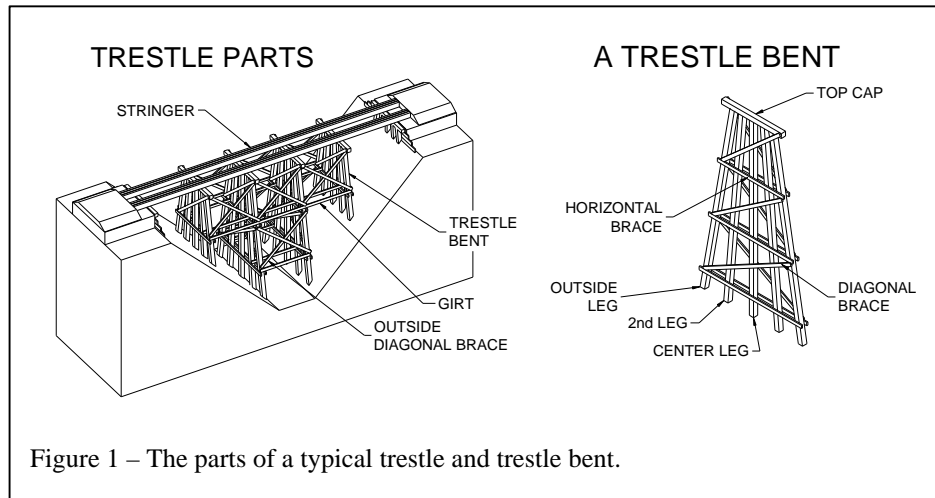


Figure 1 – The parts of a typical trestle and trestle bent.

### TYPES OF TRESTLE BENTS

Figure 2 shows the bent designs that can be constructed with Black Bear Construction Co.'s trestle jigs.

The simplest, and most prototypical for modern mainline trestles, is the 5-pole pile bent trestle. Six-pole trestles are common in new construction today. Figure 3 shows how to use a construction jig to build this type of trestle. First, the legs and top cap are cut to length and placed in the jig. Use the jig as a guide to cut the angles

on the tops of the legs. Glue the side bracing on the legs while the wood is still in the jig. Remove the bent from the jig and glue the bracing on the other side.

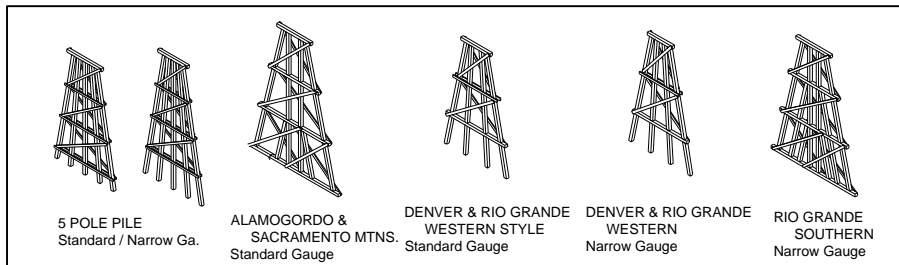


Figure 2 – Trestle bent designs available from Black Bear Construction Co, Inc.

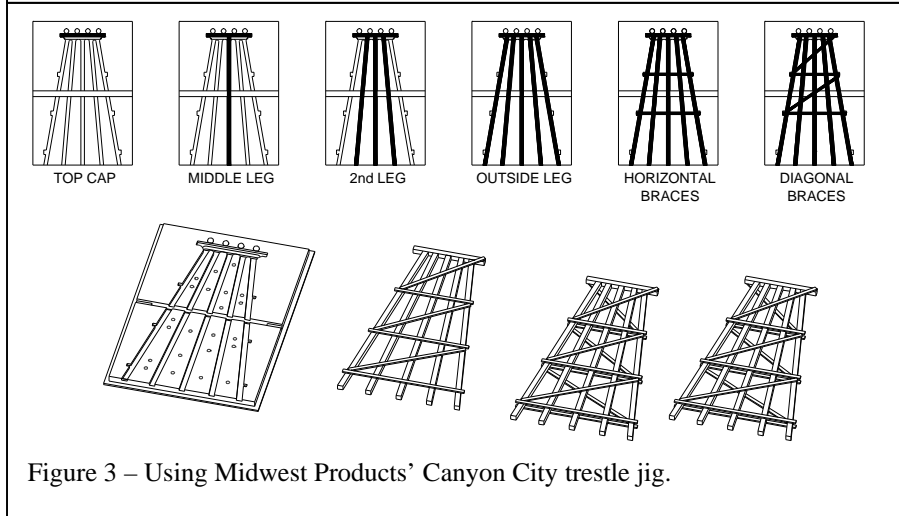


Figure 3 – Using Midwest Products’ Canyon City trestle jig.

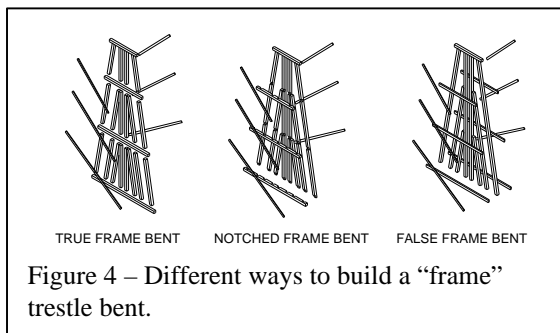


Figure 4 – Different ways to build a “frame” trestle bent.

The frame bent design was used in earlier and more rustic trestles. Figure 4 shows three ways to build frame bents. A **true frame bent** is made with sills that break the legs up into short pieces. The legs can be cut in the construction jig as shown in Figure 5. Notches can be cut in the sills and the legs to create a **notched frame bent**.

Alternatively, side braces can be placed directly on the legs to create a **false frame bent** that looks prototypical, but isn’t really.

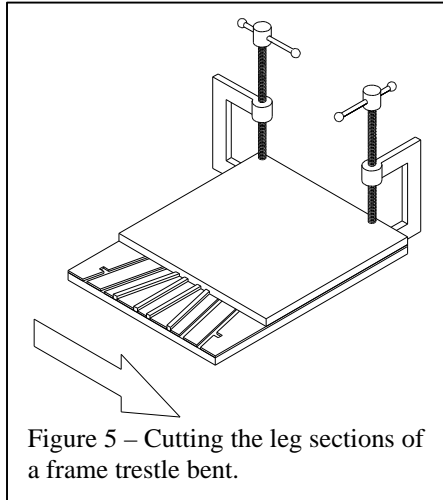


Figure 5 – Cutting the leg sections of a frame trestle bent.

### BUILDING THE TRESTLE

Even though the trestle bents have to be built first, their height, and where the braces go, are set by the design of the overall trestle. So before we can build the trestle bents, we have to design the trestle.

There are two basic ways to build a trestle. The first involves building the scenery first, then building the trestle into it. This is a great way to add a trestle onto a plywood layout. The second technique is to build a freestanding trestle on the work bench. This may be easier when it is difficult to get to the trestle location on the layout.

### Building a Trestle on a Plywood Layout

The great thing about building the trestle right into your existing layout is that you can be operating your layout while you are building the trestle.

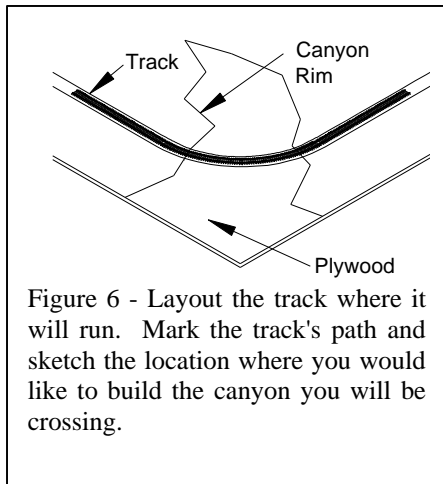


Figure 6 - Layout the track where it will run. Mark the track's path and sketch the location where you would like to build the canyon you will be crossing.

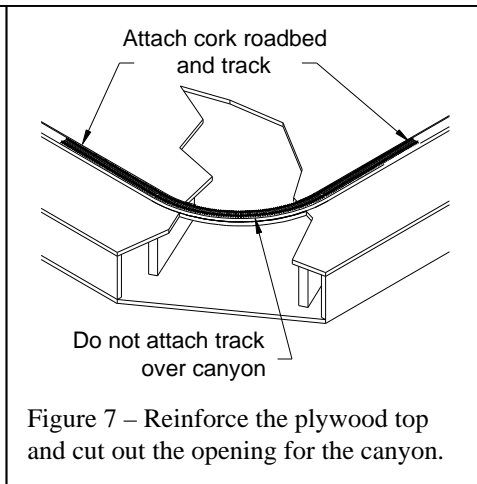


Figure 7 – Reinforce the plywood top and cut out the opening for the canyon.

The first step is to layout your track where you want it (if it is not already there). See Figure 6. Install the cork roadbed and track. Plan where your abutments and bents

will go. [Note: The Midwest Products Trestle Buddy\* is an excellent device for this step and several others that come later.]

Cut the hole for the canyon and reinforce your plywood underneath as shown in Figure 7.

Build your scenic terrain around the canyon and in the canyon floor as shown in Figure 8.

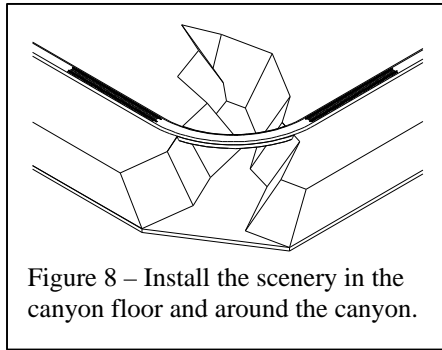


Figure 8 – Install the scenery in the canyon floor and around the canyon.

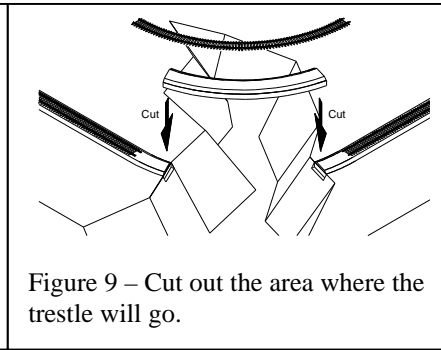


Figure 9 – Cut out the area where the trestle will go.

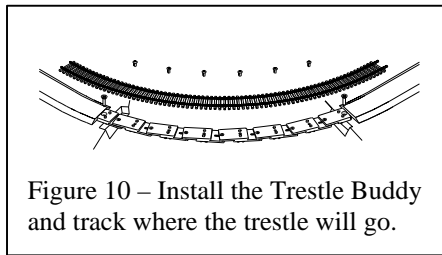


Figure 10 – Install the Trestle Buddy and track where the trestle will go.

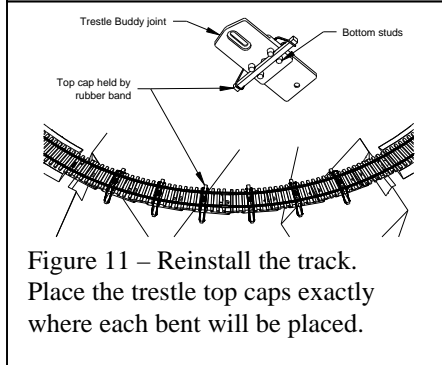


Figure 11 – Reinstall the track. Place the trestle top caps exactly where each bent will be placed.

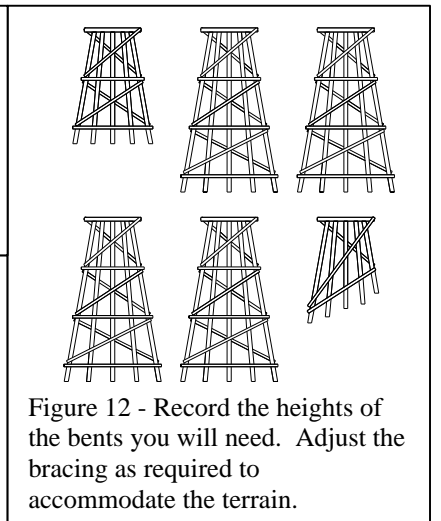


Figure 12 - Record the heights of the bents you will need. Adjust the bracing as required to accommodate the terrain.

Use the Trestle Buddy as a guide to cut out the sub-roadbed for the trestle. Cut out the cork and sub-roadbed where the abutments

\* Black Bear Construction Co. holds the patent on the Trestle Buddy.

will go as shown in Figure 9.

Install the Trestle Buddy (or guide) where the trestle will go. The guide should follow the exact path of the trestle and have a thickness equal to the cork roadbed. Attach the Trestle Buddy to the sub-roadbed with flat head screws. Re-attach the track to the Trestle Buddy. See Figure 10.

Install top caps in the Trestle Buddy joints and hold them in place with rubber bands as shown in Figure 11.

Notice that the Trestle Buddy performs these valuable functions:

- Provides a space for the stringers to be installed between the tops of the trestle bents and the bottom of the track.

- Lines up the bottom of the track with the top of the cork roadbed.

- Provides even spacing between the bents.

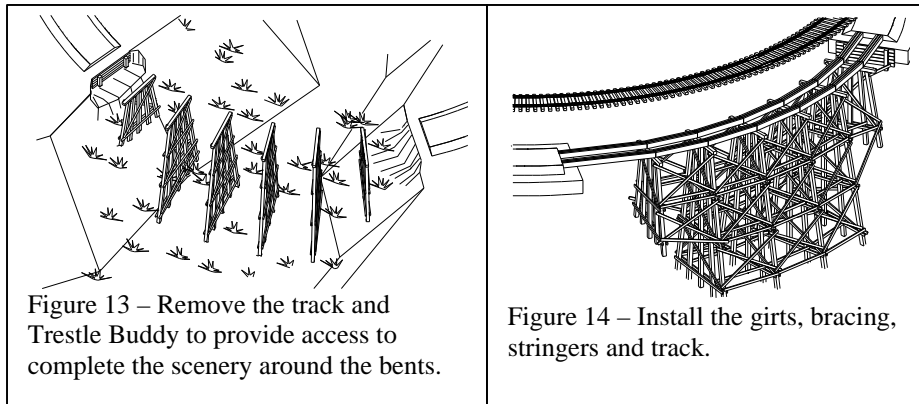
- Provides a reference surface from which to measure the heights of the bents.

- Holds the bents in place while they are anchored in the scenery.

If you are using a guide other than the Trestle Buddy, be sure that it meets these needs.

Use a torpedo level to mark the terrain in the bottom of the canyon directly under each top cap. Mark a straight line on the terrain where the trestle legs will be installed.

Measure the heights of all the bents you will need. Make a chart (see Figure 12) and adjust the spacing of the side bracing to take into account variations in the terrain.



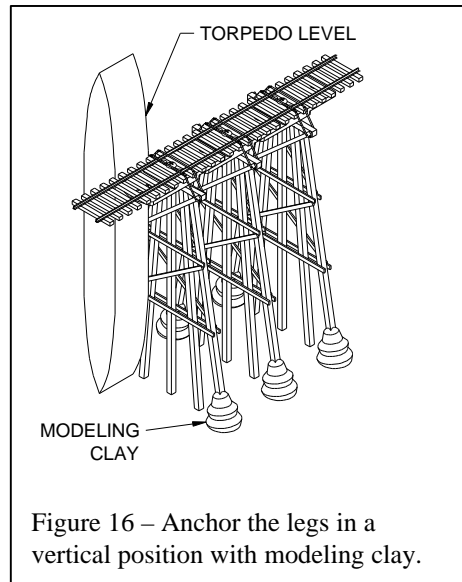
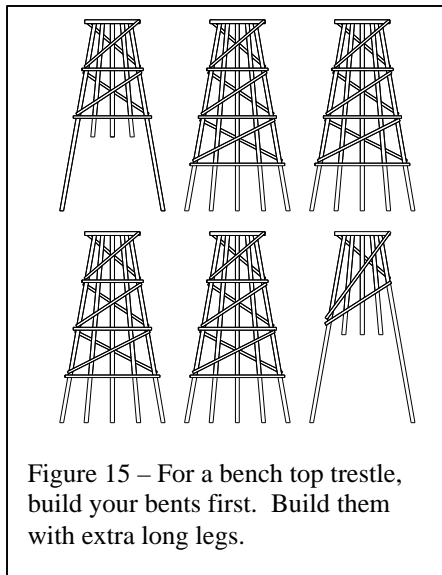
Build the trestle bents you will need according to the chart in Figure 12.

To begin installing the first bent, cut a slot in the scenery where the bent will go. Insert the legs of the bent into this slot. Insert the top cap of the bent onto the corresponding Trestle Buddy joint. Hold the bent in place with a rubber band. Use modeling clay to tack the legs in place while making sure the bent is vertical in both the front-to-back and left-to-right directions.

Tack the bent in place with Hydrocal, plaster, or other terrain material. Repeat this procedure with all the remaining bents.

Remove the track and Trestle Buddy to provide access to the terrain at the base of the bents. Install the final scenery between the bents. See Figure 13.

Now proceed with installing the girts, diagonal side bracing, stringers, and track as shown in Figure 14.



### **Building a Trestle on the Bench Top**

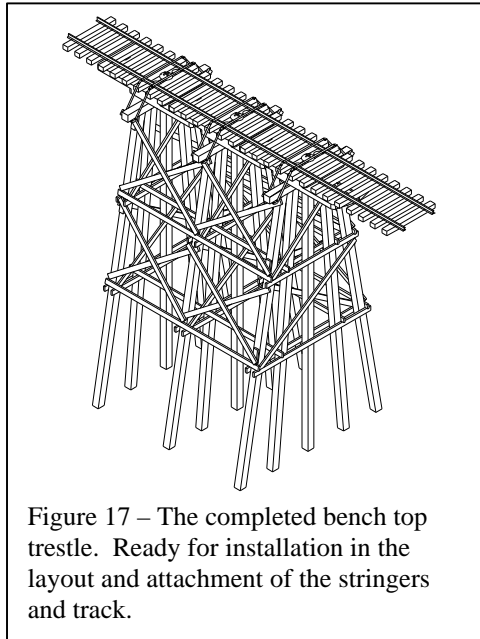
In some cases it may be easier to build a trestle on the bench top and then install it in your layout. In this case you will still need at least a rough idea of the heights of the bents required and how they will fit to the terrain.

Go ahead and build the bents you will need as shown in Figure 15. Build all the legs extra long. At least two legs on every bent should be the same length.

Use a piece of rigid track as a guide to build the trestle. The track can be sectional track that is soldered at the joints. Or it can be flex track that has been “rigidized” by wicking low viscosity CA glue between the ties and the rails.

Attach the Trestle Buddy to the piece of track. Install the bents in the Trestle Buddy and hold them in place with small rubber bands.

Stand the trestle up on a horizontal surface. Use a square or torpedo level to make sure the bents are vertical. Anchor the bottom of each bent to the horizontal surface with modeling clay. Keep fiddling with the bents until they are all vertical. See Figure 16.



Glue the girts on the outside of one side of the assembly. Turn the trestle around and glue the outside girts on the other side. Let the glue set for a while before proceeding to install the inside girts and the diagonal side bracing. See Figure 17.

Install the trestle assembly in the layout by cutting the legs off to the desired length and anchoring them in scenery plaster.

#### **CONCLUSION**

A trestle creates a lot of visual interest on a train layout. The intricate detail captures your imagination and draws you into the scene. Basic modeling skills can create a great looking trestle by using the right tools and techniques.