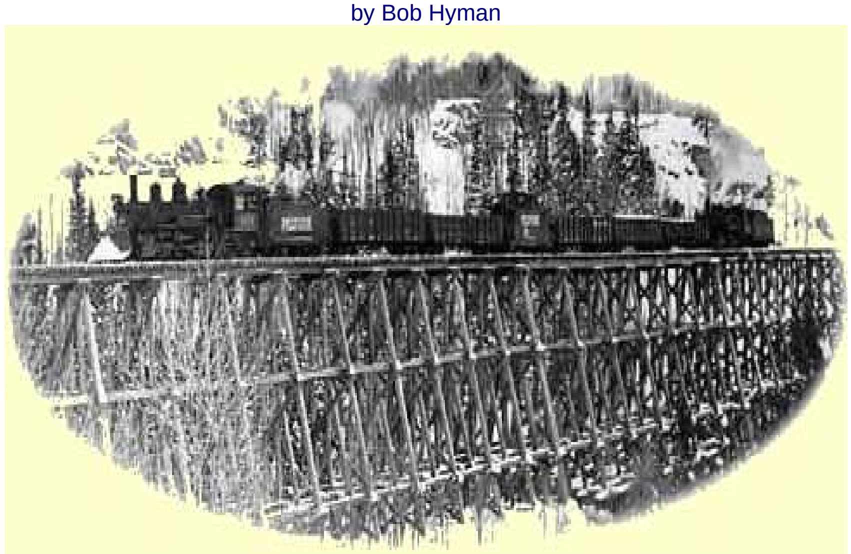
Trestles - RGS Style

Wooden Trestle Construction on the Rio Grande Southern Railroad

by Bob Hyman



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INTRODUCTION

When completed, the Rio Grande Southern Railroad had 142 bridges scattered along its 162 miles of track. Almost all of the original bridges were rebuilt or replaced at one time or another. The early Howe truss bridges were replaced with simple open deck trestles, and many of the smaller bridges were replaced with earthen fills and culverts. By the end of operations, 111 bridges were left on the railroad; virtually none were original. The reasons for replacing a bridge were many, but for the most part, the arrival of heavier motive power or damage caused by weather and high water resulted in replacement.

At first glance, most of the trestles appear to be similar. However, a closer look shows that all differ in detail. The RGS bu its bridges following accepted and proven engineering practices, but did not adhere to strict standardization. Thus, all of the bridges look similar in overall design, but still have individual characteristics. Some detail differences in the bridges occurred due to unusual circumstances in placement or geography. Other differences were due to the availability of materials and the financial status of the line when repairs were made. Changes also occurred depending on what practices were in favor when the bridges were repaired. Thus, over time, all of the bridges slowly changed.

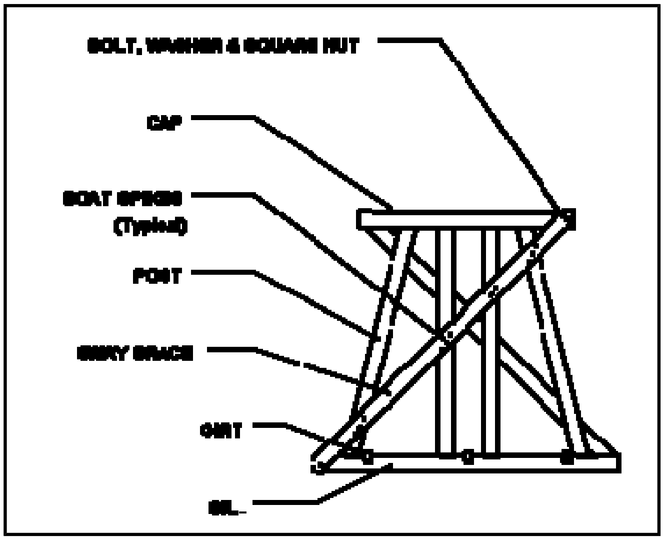
This handout details some of the basic design standards and building techniques that the trestles adhered to, no matter their differences in detail. It explores some of the more obvious differences, particularly on the large timber trestles on the high line over Lizard Head Pass between Vance Junction and Rico. In addition to explaining prototype construction methods, techniques are presented for building accurate scale models of these trestles.

BASIC TRESTLE COMPONENTS

A trestle is composed of an open, braced wooden framework that supports the railroad above ground level. It consists of a series of identical (or nearly so) vertical supports holding up a succession of short spans. All wood portions of a trestle are designed to be in compression and never in tension.

BENTS

The deck of a trestle is supported by vertical structures called bents. There are two types of bents. The pile bent has roun posts, usually twelve inches in diameter, which are driven directly into the ground. The frame bent has square posts sittin on a horizontal bottom support member called a sill. The sill usually rests on a separate foundation. Both types of bents have a horizontal cap resting on top of the posts. The cap equally distributes the load from the bridge deck above to the posts below. The space between two adjacent bents is called a panel.



There are a minimum of four posts in a bent - two (sometimes three) inner posts and two outer posts. The inner posts are usually (but not always) vertical. The outer posts are angled 2" to 3" per foot. This angle is called batter. Additional intermediate posts may be present in the bent between the inner and outer posts. These are also battered, either at the same angle as the outer posts, or at some lesser angle. Batter is expressed as a ratio of spread to height, e.g., 2 in 12 or 3 in 12.

Pile bents were not made higher than thirty feet due to the length of available wood material (generally no longer than 60 feet). This is because each pile is a single piece, and a sizeable portion of it must be driven into the ground. Also, the round configuration is not easily adapted to the construction of tall trestles. Piles were always driven with the narrow diameter down.

Frame bents were typically built from around five to a maximum of thirty feet tall, also due to the length of available posts. If a taller trestle was required, the bents were divided into stories, separated by horizontal intermediate 12"-square sills. In normal practice, the bent heights varied as necessary for the bridge to fit into the terrain. For heights under 16 to 20 feet, one story was used. For heights over this, anywhere from two to five stories would be used; the upper stories were normally the full height and the bottom one was adjusted to fit as necessary.

BRACING

Most bents have diagonal sway bracing for reinforcement. These sway braces are lengths of 3" x 10" or 3" by 12" lumber attached to the cap, posts and sill at an angle somewhere between 30 and 60 degrees. Sway bracing typically runs from upper-right to lower-left, although many reversed examples are found. The ends of the sway braces were sometimes cut at an angle to match the ends of the caps and sills; others were left as normal perpendicular cross cuts. If the distance from corner to corner of the bent was longer than the available bracing boards, two boards would be used. The RGS bridge crews were very resourceful when it came to using whatever material was available to get the job done!

Occasionally, bents have horizontal 3" x 12" braces on each side of the bent about halfway between the cap and the sill. These horizontal braces are called sashes. Although sash bracing is common on pile bents, it is rarely used on frame bents. Bridge 58-A, the Meadow Creek Trestle, is a notable exception.

To make a trestle rigid along the length, horizontal timbers called girts are placed on top of the sills or sashes, and connect each bent to the next. When extra longitudinal stiffness is required, the bents are connected with wall bracing. This bracing lies parallel to the sides of the trestle and connects the posts of adjacent bents with crossed pieces. Wall bracing is generally the same size as sway bracing. The RGS did not use wall bracing often; again, a notable exception is found on Bridge 58-A.

FOUNDATIONS

The bottom sill of a frame bent is called a mud sill. It may rest on a variety of foundations. Some trestles had the mud sill attached to the tops of piles driven into the ground. Others rested on blocks of used bridge timbers, typically 8" x 18" x 3'. Occasionally a mud sill would rest directly on the ground. In the later years, poured concrete was common. Here are three examples: Wooden blocks at Bridge 57-A, poured concrete at 46-D, and poured concrete at 45-A.

DECK

The deck of a trestle starts with wooden stringers set on top of the bent caps. The bents were generally placed 16 feet apart, with stringers of 8 x 18 inches. If the bents needed to be farther apart, stringer size was increased to 8 x 24 inches. Standard 8" x 18" stringers were 32 feet long and spanned two panels. Three stringers were bolted together into a single beam, leaving a 1 ½" space between the individual stringers for ventilation. Two beams were placed side-by-side, about two feet apart, on the caps. Bridge ties were laid on the stringers, and guard timbers ran the length of the deck at the tie ends. The guard timbers were usually notched to fit over the tie ends and hold them in alignment. Galvanized sheet metal was placed on the tops of the bent caps and on the tops of the stringers to protect the wood from falling cinders. Running rails, gauged at three feet, were spiked to every tie. Guard rails, when used, were generally spiked to every fourth tie. Initially, the guard rails were located inside of the running rails. Later, they were moved outside of the running rails, probably to provide clearance for blade flangers.

DESIGN AND MATERIALS

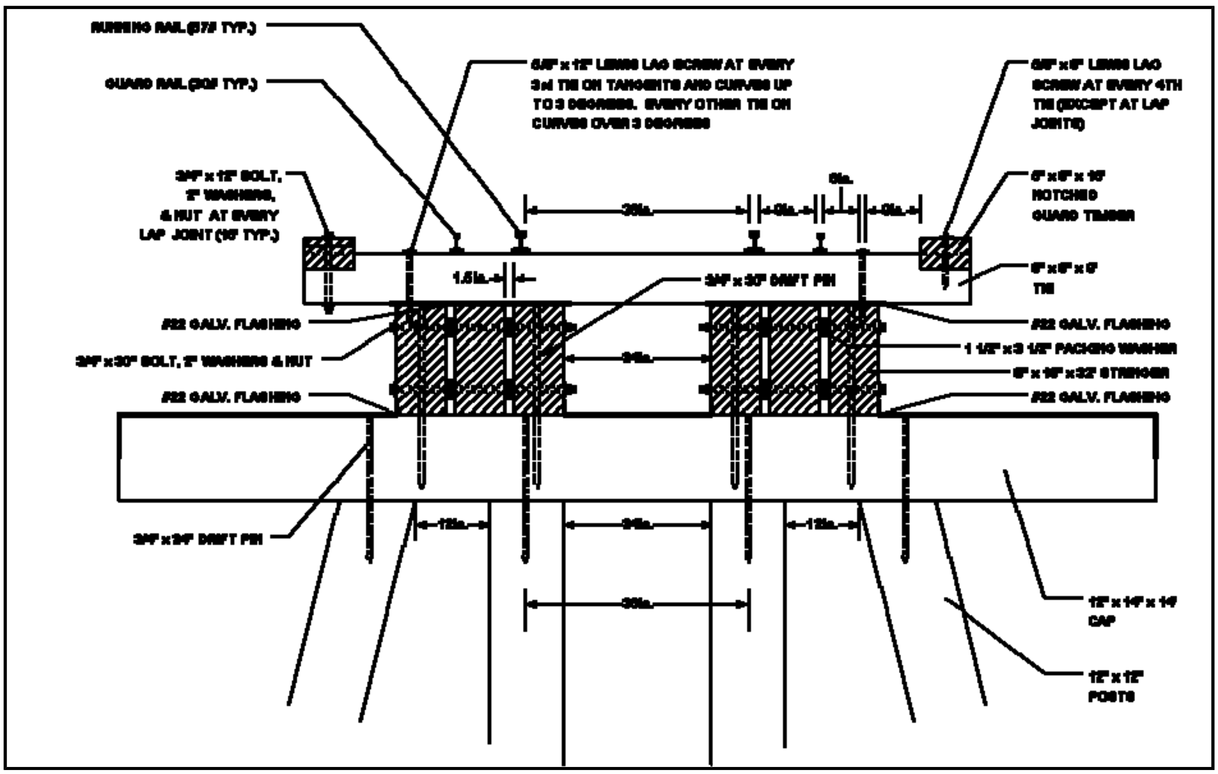
The drawings in this handout represent typical multi-story bents from curved, tangent and compound (both curved and tangent) RGS trestles. Tangent trestles were generally built with a batter, or slope, of 2 in 12 on the outer posts, while curved trestles had a batter of 3 in 12. The drawings show the height of each story. Two major styles of trestle bents were used on the RGS. One style used two vertical posts in the center and the other used three. Some trestle bents were built without vertical posts, and used 1 in 12 batter for the inner posts.

CONSTRUCTION DETAILS

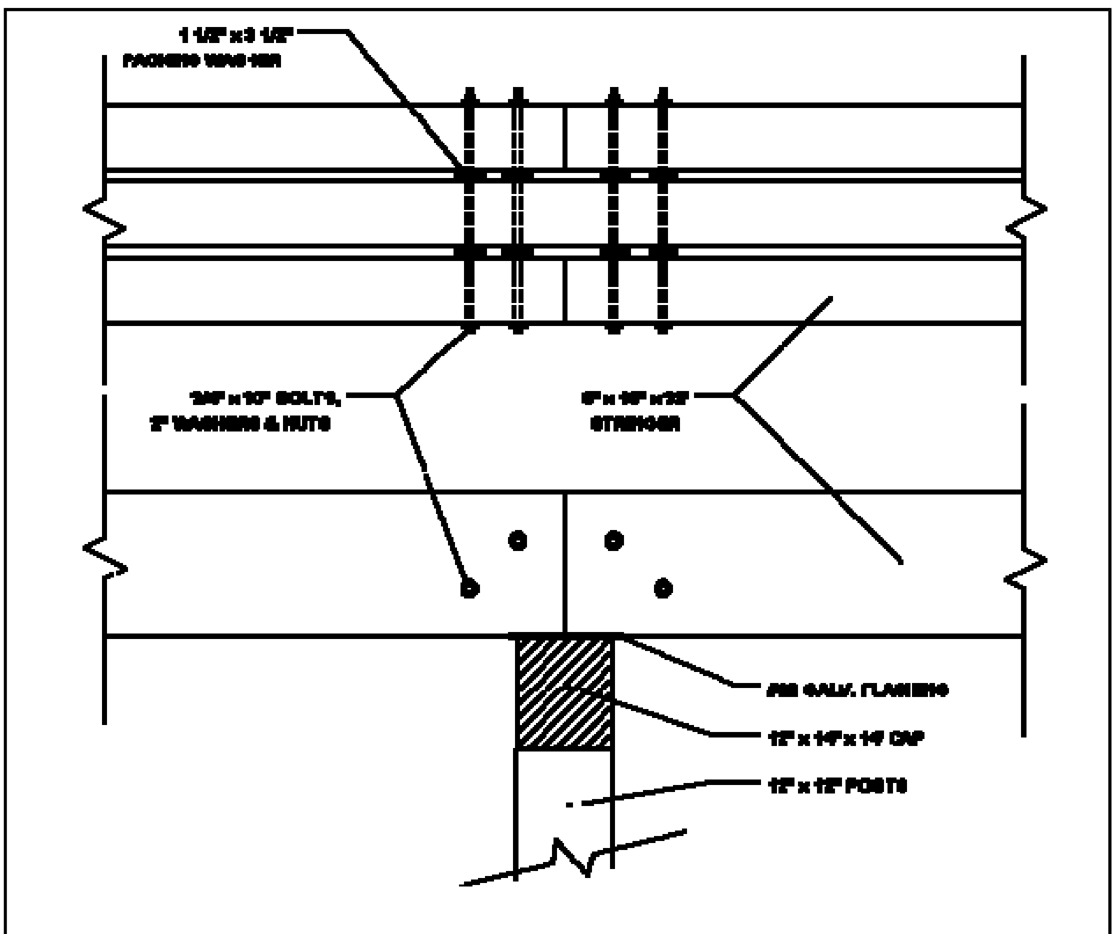
The trestle photos in this handout are mostly of the Trout Lake trestle deck. Other photos show timber remnants from other trestle sites. Trout Lake is the only one of the large Rio Grande Southern trestles still standing. It was maintained for a while after abandonment by the state of Colorado, but for the most part, it exists today just as it did when the RGS ran trains over it. The dimensions of the wooden members of this bridge are consistent with normal railroad practice, and the metal hardware used to tie the bridge together is basically the same as observed in the remains of many other bridges.

CONSTRUCTION METHODS

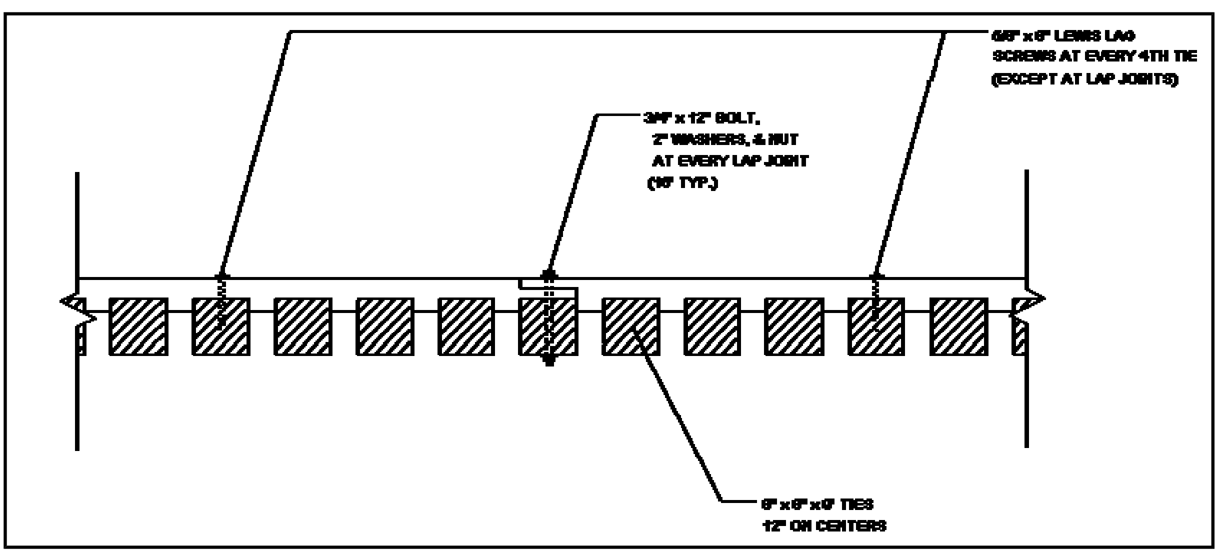
The following figure shows the method generally used by the RGS to tie trestle components together. This style of construction has been observed at some of the major bridge sites on the railroad that contain enough material for examination. It is also evident in the water towers still standing.



The cap was attached to the posts underneath it by driving a round 3/4" diameter x 24" long steel drift pin down through the cap and into the post. This was done for each post and for each story of every bent. The deck beams were attached to the caps by driving a round 3/4" diameter x 30" long steel drift pin down through the stringers and into the cap.


1 1/2" x 3 1/2"
12" x 14" x 14' CAP
12" x 12" POSTS

The individual stringers making up each beam were bolted together with 3/4" diameter x 30" long bolts, 2" washers and nuts. 1 1/2" x 3 1/2" packing washers were placed on the bolts between the stringers to maintain spacing. These stringers were typically 32 feet long and spanned two panels. The ends of the stringers were staggered as shown. The ties were typically attached to the beams with 5/8" diameter x 12" long Lewis lag screws. The screws were placed in every third tie on tangents and curves up to 3 degrees, and in every other tie on curves over 3 degrees.



The notched guard timbers were typically screwed to every fourth tie with 5/8" diameter x 8" long Lewis lag screws, except at lap joints where two guard timbers were spliced together. At lap joints, the two guard timbers were attached to the tie with a 3/4" diameter x 12" bolt, 2" washer and nut. Here is a close-up photo of the guard timbers on Bridge 51-A.

Anywhere from one to three small bridge nails (8" or 9" long with 3/8" shaft) were used to attach the sway braces to the posts. These are often called boat spikes. They are found with both circular and square cross-sections. The sway braces usually ran from the lower left to upper right. This unit or story was often assembled off to the side and then moved into position on the bridge.

Each story was attached to the one below by toe nailing several full sized bridge nails through the post and into the cap of the story underneath. In the bottom story, the mud sill would probably be attached before the story was moved into place. As each story was positioned and attached to the story below, girts were added between the bents to stabilize them. When finished these bridges were strong and stable. The bridge at Ames, (43A), which was built in a very precarious location, stood for almost thirty years after abandonment with no maintenance whatsoever.

This photo shows a close-up of a sill from the Butterfly Trestle (44-A) remains. Note how two pieces were lap-joined together. The two boat spikes are where a vertical post was toe-nailed to the sill.

MATERIALS USED

- Howe Truss Bridges - Red Spruce
- Pilings, Guard Timbers, Sway Bracing, Cross Bracing, Girts - Yellow Pine
- Posts, Caps, Sills, Stringers, Ties - Oregon Fir
- Packing Washers - 1½" thick x 3½" diameter cast iron
- Flashing - 22 gauge galvanized iron, 3' x 8' sheets
- Drift Pins - ¾" dia., 24" and 30" lengths
- Boat Spikes - 3/8" x 8" or 9"
- Lewis Lag Screws - 5/8" dia., 8" and 12" lengths, 7/8" square head, 3/16" x 1 7/8" washer
- Bolts - ¾" dia., 12" and 30" lengths, with 1/4" x 2" washers and square nuts
- Running Rail - 57# (typical). Originally, 30#. Later, upgraded to #40 or #57.
- Guard Rail - 30# (typical). Originally 9" inside of running rails. Later, 9" outside of running rails (to allow flanger blade clearance).

TRESTLE CONSTRUCTION AND UPGRADE HIGHLIGHTS

- **Original Construction (**1890-1891) - 30# rail (used). 142 bridges.
- **Rail Upgrade (**1892) - Replacement of twenty-nine miles of original 30# rail with new 57# rail between Vance Junction and Rico. Greer Patented Spike used on this rail - in later years, also called "Jeffery" spikes. Guard rails on bridges moved to outside.
- **Wrecks** - Upper Gallagher Trestle totally rebuilt after collapse in Aug 1906 that killed conductor A.K. Brown.

Major repairs to Butterfly Trestle after Jan 1910 wreck. Bilk Trestle rebuilt in late 1909, then soon collapsed in wreck that killed engineer Al Bickford in Jan 1910, and was rebuilt again.

- **Major Floods** (1908, 1909, 1911, 1920, 1927, throughout the 1940's, especially 1949, & 1951) - During the flood of September 1909, the Telluride Power company dams at Trout Lake and Middle Lake burst. Track and bridges between Vance Junction and Placerville were destroyed. Butterfly Trestle was severely damaged. Heavy flooding occurred on south side of Lizard Head Pass along Delores River. During the flood of October 1911, fifty miles of track and bridges were washed out in the Delores River Valley between Lizard Head Pass and Delores. In the San Miguel Valley, damage was almost as bad.
- **World War I (**1914-1918) - Numerous general bridge upgrades and increase in traffic / revenues due to USRA administration. Heavier, new locomotives (#20, #22, #25, #40, #41, & #42) acquired. Major bridge rebuilding, including removal of many Howe timber truss spans.
- **Post-War Era** (1918-1929) - Revenues continued to rise, but barely met cost of operation. Absentee management by D&RGW at Alamosa. Bridge maintenance only as required with no major upgrades.
- **The Miller Years** (1929-1938) - Operation on a "shoe-string" budget. Bridge maintenance as required with no major upgrades.
- **The Herrington Years** (1938-1948) - Ownership by the Reconstruction Finance Corporation (Defense Supplies Corporation) and government loans keep the line operating. Some modest bridge upgrades to support heavier leased locomotives.
- **Twilight** (1949-1951) - Bridge maintenance nearly non-existent. Rotary #2 blows up; line over Lizard Head Pass closed for entire winter. Zinc prices fall - most mines close. Spring rains wash out portions of the line and bridges above Delores. Truck traffic increases due to surcharge instituted after WWII. Mail contract ends. Line abandoned and dismantled. Most trestles destroyed.

MODEL TRESTLES

There are two different approaches to building a model trestle. The first is to build a trestle to cross an existing opening in the layout scenery. This is similar to the task faced by the prototype bridge engineer. Each bent and panel must be designed to fit the existing terrain. The second approach is to build the trestle first, based on your personal desires, and then to build the layout scenery base up to the bottom of the trestle bents. Of the two approaches, the latter is my preferred method, although in either case, the basic construction sequence is the same.

Unlike the prototypes, we generally build model trestles from the top down. This means that the trestle deck is fabricated first, and then the individual bents are placed under it. Building the deck first allows the modeler to easily incorporate features such as compound curves, mixed curved and tangent segments, and varying grades into the finished trestle.
THE PROCESS
Trestle building is a process composed of the following steps:

- Plans
- Jigs
- Materials
- Components
- Minor subassemblies
- Major subassemblies
- Assembly
- Details

PLANS

The plans used for the trestle may be from an actual prototype structure or a proto-lanced design based on your own personal preferences and constraints. "Proto-lanced" means a freelanced design based on prototype practices. In either case, you need a scale-sized set of plans for each component, minor subassembly, and major subassembly in the trestle. If you do not have a set of plans to work from, they are easy to do on a personal computer.
One of the most puzzling terms a modeler runs into is "Degree of Curvature". If you are modeling a trestle on a 20 degree curve, just what does that mean? How do we translate that into a real radius for our model? Imagine that points A and B represent the ends of a hypothetical trestle on a 20 degree curve. To compute the actual prototype radius in feet, simply divide the number 50 by the Sine of one half of the degree of curvature. In our example, the prototype radius

works out to about 288 feet (50 divided by the Sine of 10 degrees). All 20 degree prototype curves have a radius of 288 feet, no matter how far apart A and B actually are. To find the radius for your model trestle, simply divide the prototype radius by your scale. In S scale (3/16" to the foot, or 1 to 64), dividing 288 feet by 64 yields 4.5 feet. So, in S scale, a prototype 20 degree curve is about a 54 inch model radius. In F scale (15mm to the foot, or 1 to 20.32), dividing 288 feet by 20.32 yields a model radius of about 14 feet two inches.

This explanation of curvature may come as a bit of a shock to those of you trying to model in S scale with a 36 inch (or smaller) minimum radius. The sharpest curve on the RGS, at the Ophir Loop, was 22 degrees. This works out to slightly over 4 feet actual model radius (about 49 inches). The roofs of duckbill coaches actually touched going around this curve. I can't imagine a real train trying to negotiate a modeler's 36 inch radius curve. This would have represented slightly over a 30 degree prototype curve -- a physical impossibility for most equipment. Although you may have to "cheat" a bit on your curves, don't try it on a trestle. The distortion is amplified, and becomes quite noticeable to your viewers.

JIGS

I have found that jigs make most parts of trestle construction a whole lot simpler. A jig is a temporary fixture that allows you to easily build and assemble the various trestle components. There are two types of jigs -- fabrication jigs and assembly jigs. A fabrication jig is a tool that simplifies the making of a particular component. It allows you to make multiple copies of a component and guarantees that all parts made with a given jig will be identical and interchangeable. An assembly jig is a tool used in the trestle assembly process. It provides uniform spacing and positioning of the components into subassemblies, and of the subassemblies into the completed trestle. I typically make my fabrication and assembly jigs from acrylic (Plexiglas) or styrene, although some special-purpose jigs are made from wood. As a general rule, a jig is appropriate anytime you need to make more than one of anything. I often create a jig even if I only plan on making one of something. Jigs do not have to be pretty or neat -- no one will see them but you. They do have to be accurate. The finished product is only as good as the jigs it was built with.

MATERIALS

Trestles involve massive amounts of scale-sized timbers. For the smaller scales (up to 1:64), I generally use commercially available basswood dimensional lumber. For the larger scales, I find it much more economical to cut my own timber from basswood, redwood or cedar on a table saw. Sheet metal is easy to replicate with heavy-duty aluminum foil. Rail is commercially available in all sizes. The 1:20.3 trestle sections prepared for this clinic feature Llagas Creek code 250 and code 215 rail (see sources at end of handout). Plastic or metal NBW castings are also available in many different sizes from multiple commercial sources.

The first task in material preparation is to add the appropriate wood grain to the timber components. Commercially available strip wood is too perfect and needs to be distressed. For the smaller scales, I usually dress each side of the timbers with a razor saw or wire brush to add the grain texture. In the larger scales, where I have cut my own timbers, the edges are usually okay just as they come from the table saw. Minor touch-up with a rasp or coarse file is sometimes required to remove traces of the saw blade cutting marks. Also, the pieces of aluminum foil used to represent metal sheathing need to be aged and weathered. I have had good luck using Radio Shack Circuit Board Etchant to remove the sheen from aluminum foil. Be sure to follow good safety precautions when using the etchant.

Raw untreated bridge timbers are typically various shades of whitish-yellow, light yellow-brown or reddish-pink when first cut. Various species of lumber appear differently when freshly cut. In old photos that show Howe truss spans in trestles, the color of the wood in the trusses is noticeably different from the color of the other trestle components. Most wood timbers weather to a common medium brown or orange-brown shade after a few short years of exposure to sunlight and water. Over a longer time span -- maybe thirty years or so -- this brownish color gradually turns darker, with grayish-black tones. Eventually -- after around fifty to seventy-five years -- the dark timbers will weather to a lighter silvery-gray color. At higher altitudes, perhaps above 9,000 feet or so, the orange-reddish hues will become more predominant over time. This probably has something to do with the strength of the ultraviolet radiation.

Bridge timbers were untreated on the RGS bridges, so no creosote effects are needed. Rust stains are appropriate where metal parts are attached. Most trestles were brown or brownish-orange shades during the years of operation. Don't color your trestle timbers based on what the wooden remains look like today!

MINOR SUBASSEMBLIES

A minor subassembly is something made from two or more individual components. It is first assembled by itself, and then later added to other subassemblies to create a major subassembly. A good example of a minor subassembly is the first story of a bent. This minor subassembly may be common to several different bents. Once we have the design for one, we can build as many copies as we need for all the bents.

MAJOR SUBASSEMBLIES

A major subassembly is something made from two or more individual minor subassemblies. Like the minor subassembly, it is first assembled by itself, and then later added to other major subassemblies to create the trestle. The major subassemblies of a trestle include the deck and the individual bents.

ASSEMBLY

The major subassemblies are combined to form the trestle. I usually start by temporarily securing the deck subassembly to the deck jig; then I place the deck subassembly into position across the opening to be bridged. I then add the individual bents to the deck, starting at one end and working across the bridge. If the trestle deck is level (not likely), the bents are perpendicular to the deck. If the trestle is on a grade, then the top of each bent must be slightly angled so that the bent is vertical to the ground. I accomplish this with the aid of a bent installation jig.

DETAILS

Some components are best left out from the subassembly process. These are things like bent footings or foundations, girts, wall bracing and fire barrel platforms. It is usually easier to add these details to the trestle after all of the other major subassemblies have been assembled.

MAKING AND USING JIGS

The type and quantity of jigs necessary depends on several factors: the complexity of the trestle itself, the degree of accuracy desired, and the type of tools used to fabricate the parts. The scale of the model does not affect the need for jigs.

I fabricate model trestles using a small table saw. My particular variety is a Dremel 4" Table Saw. Most of my fabrication jigs are made to fit onto the saw. I use the guide slots on the table to position the jigs. I start by cutting a quantity of .093 inch thick Plexiglas strips to fit into the guide slots. I then attach these strips to Plexiglas sheets with Elmer's Polystyrene glue so that the strip rides in the guide slot with the edge of the sheet flush against the saw blade. The Plexiglas sheets are available in various sizes (8" x 10", 11" x 14", or larger).

First, print out (or draw) the plans in the desired scale. If the plan is larger than a single sheet of paper, print it on multiple sheets, and align the sheets using registration marks on the plans. Assemble the multi-sheet plans together with a child's "Glue-stick", available in any craft store. Attach the plan to the Plexiglas sheet with spray adhesive. Align the bottom edge of the plan cut line with the edge of the Plexiglas sheet that touches the saw blade. Then, glue small pieces of Plexiglas strip (or strip wood) to the plan along the component lines. It is better to use small pieces spread out along the component line rather than one long continuous strip.

The most important jig that you can make is the Batter Jig. This jig has positions for cutting the end of a timber at one of four angles: perpendicular, 1 in 12, 2 in 12, or 3 in 12. This single jig will be used to cut nearly every timber used in the trestle. I also make a stop block to fit onto the perpendicular cut position of the jig. This allows me to make any number of identical length timbers.

Story jigs are made for each story of every bent in the trestle. The process for making a bent story is as follows:

- Cut the top end of the desired number of posts to the proper angle using the batter jig. Pieces must be long enough to fit flush against the cap and overhang the bottom edge cut line of the story jig.
- Cut sway braces to required length.
- Drop a cap (or sill) into the story jig.
- Apply glue to the cut end of each post and drop into story jig.
- Push posts tight against the cap, insuring that uncut ends of posts overhang the bottom edge cut line of the story jig.
- Glue sway braces to exposed side of story. Note: sway bracing on other side of story is not added until all stories of a bent have been assembled together.
- After glue is dry, place story jig onto table saw and cut all posts along the cut line.
- Remove story from story jig.

After all stories for a bent are fabricated, they are assembled together and the sway bracing is added to the other side of the bent. I usually design my 2nd story jigs so that the upper 1st story can be glued to the top sill. Similarly, the 3rd (and subsequent) story jig holds the previously prepared upper stories. In these cases, the jig serves dual purposes; it is both a fabrication jig and an assembly jig.

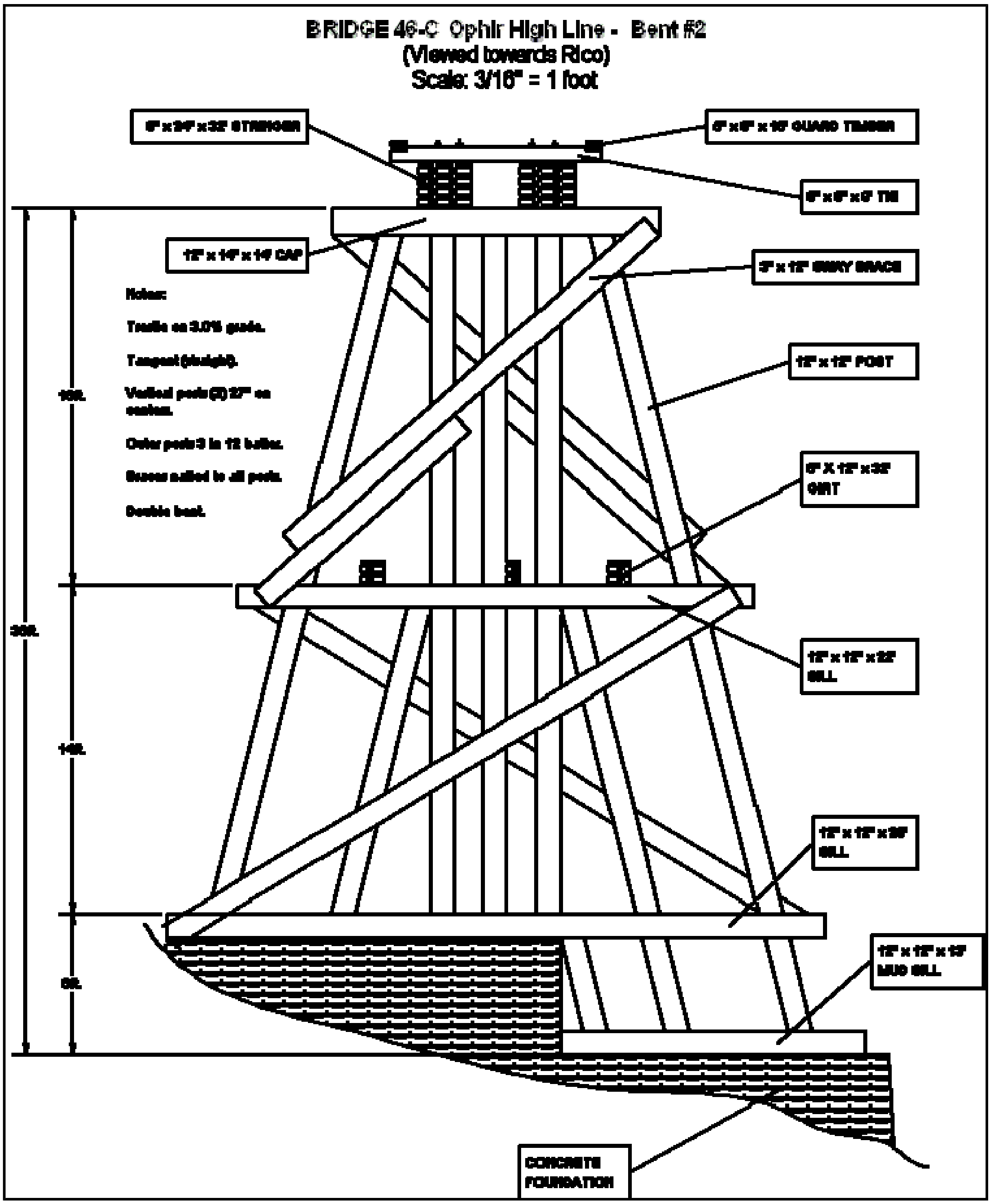
Another valuable jig is the Guard Timber Notch Jig. As explained earlier in the prototype trestle section of this handout, the guard timbers were typically notched to fit over the ties. This is a difficult and time consuming detail to model, but the results are well worth the effort. The task is greatly simplified by using the Notch Jig. The notch Jig is a special type of stop block made to fit on the left side of the table. The saw blade is adjusted to a 2" scale cutting depth. A 5" x 8" timber is paced on the perpendicular line of the batter jig, on the right side of the table. Starting at the bottom of the Notch Jig, the guard timber is repeatedly run through the saw. After each pass, the timber is moved to the next higher position on the Notch Jig. The jig allows the modeler to quickly make a series of perfectly spaced, 2" deep cuts across the timber at 8" and 4" intervals. After all of the interval cuts are made, the Notch Jig is removed from the table. The area between the 8" cuts is then removed by making a series of passes across the saw blade. With each pass, a portion of wood equal to the width of the blade (about 3/64") is removed. The notched guard timber is further sized to create the lap joints as explained in the prototype section.

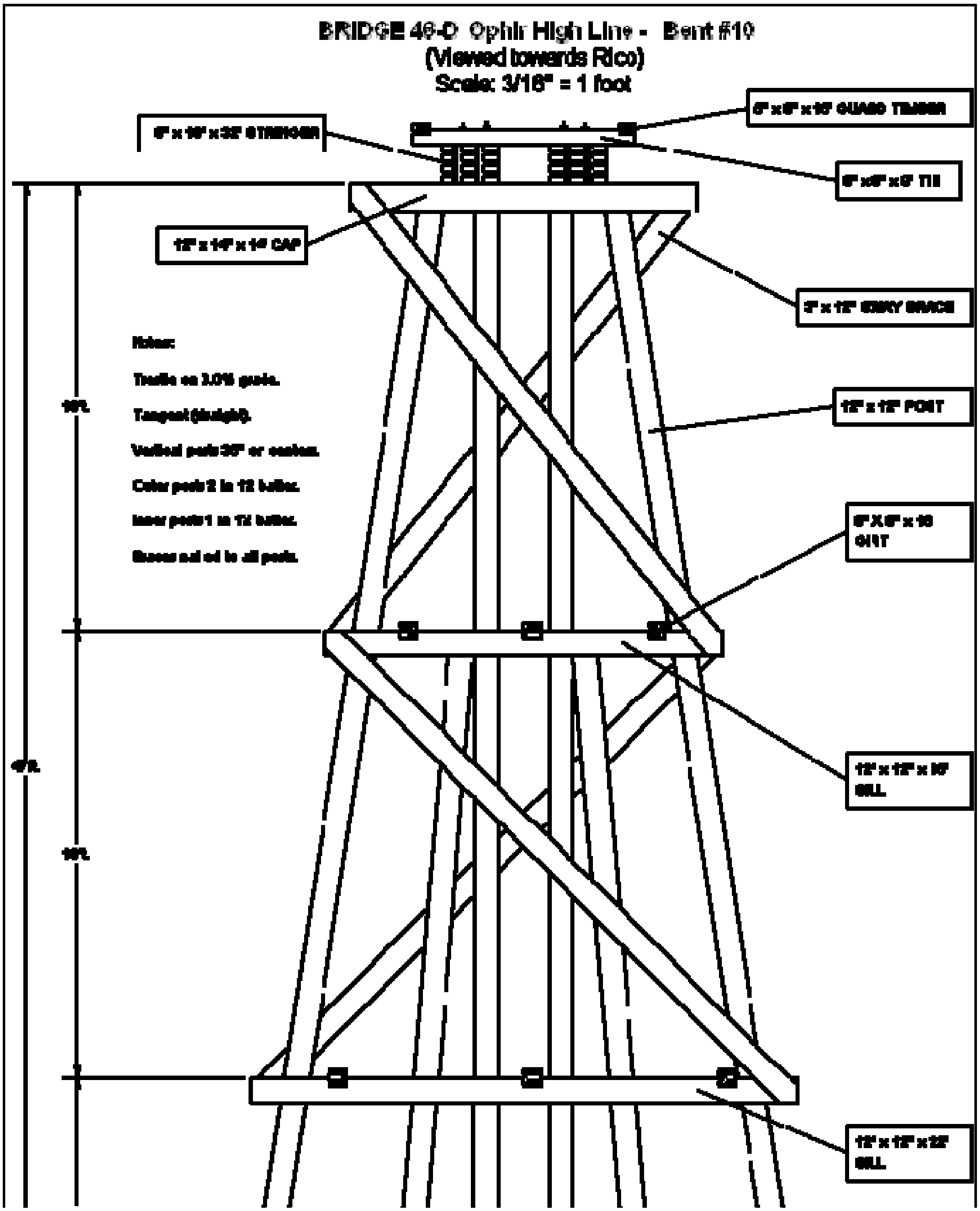
REFERENCES AND SOURCES

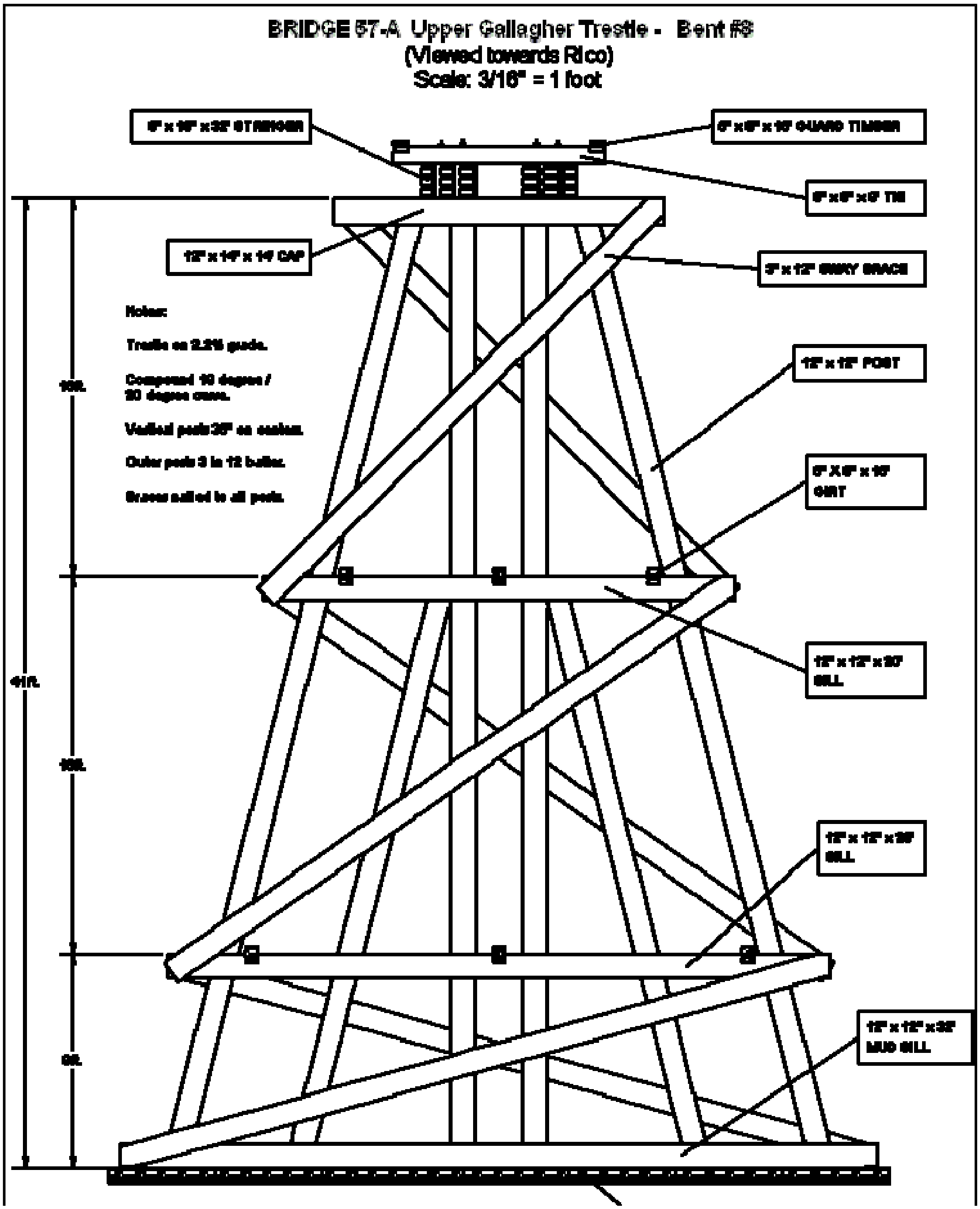
- "The RGS Story, Volume IV - Over the Bridges… Ophir Loop to Rico"; Collman, R; McCoy, D.A.; and Graves, W.A.; Sundance Books; Denver, Colorado; 1994.
- "Silver San Juan - The Rio Grande Southern"; Ferrell, M.H.; Pruett Publishing Co.; Boulder, Colorado; 1973.
- Bill White's Internet Web Site: http://www.orci.com/~bdwhite. See Bill's site, titled Rio Grande Southern Technical Information Page - in particular, Volume One - September 1997, "Typical Bridge Building Practices on the RGS". Special thanks to Bill, and to all of his site contributors, for the inspiration and many of the details to prepare this clinic.
- D.R. Manley; California & Oregon Coast Railway; P.O. Box 57; Rogue River, Oregon; 97537. Phone: (800) 866-8635 (orders) or (541) 582-4104 (questions). Darrell provided the Llagas Creek Railways code 250 and code 215 rail used in the fabrication of the 1:20.3 scale trestle samples for the clinic.
- Bob Hyman; e-mail address: Sn3nut@aol.com for questions or comments about this handout.

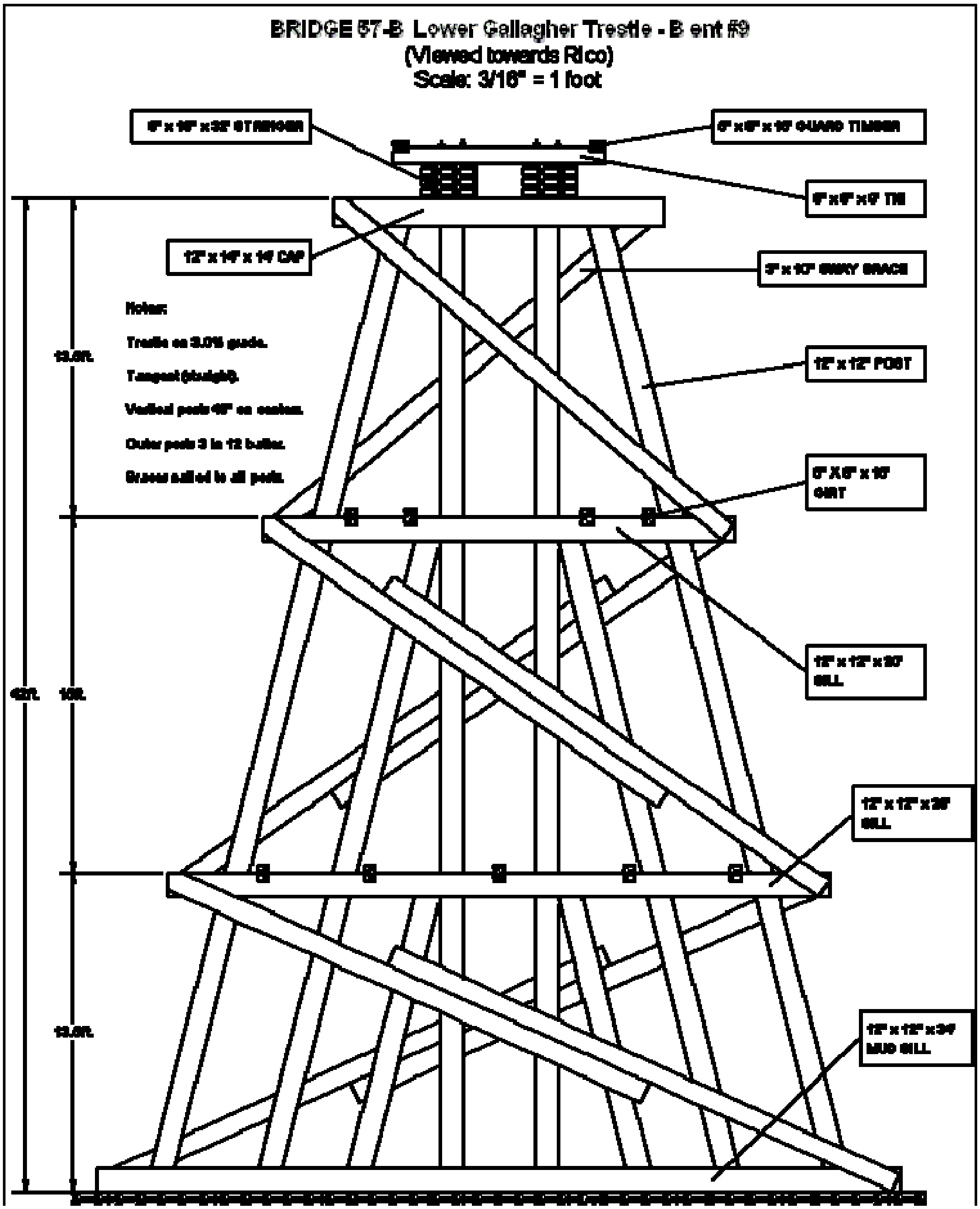
PLANS AND PHOTOGRAPHS

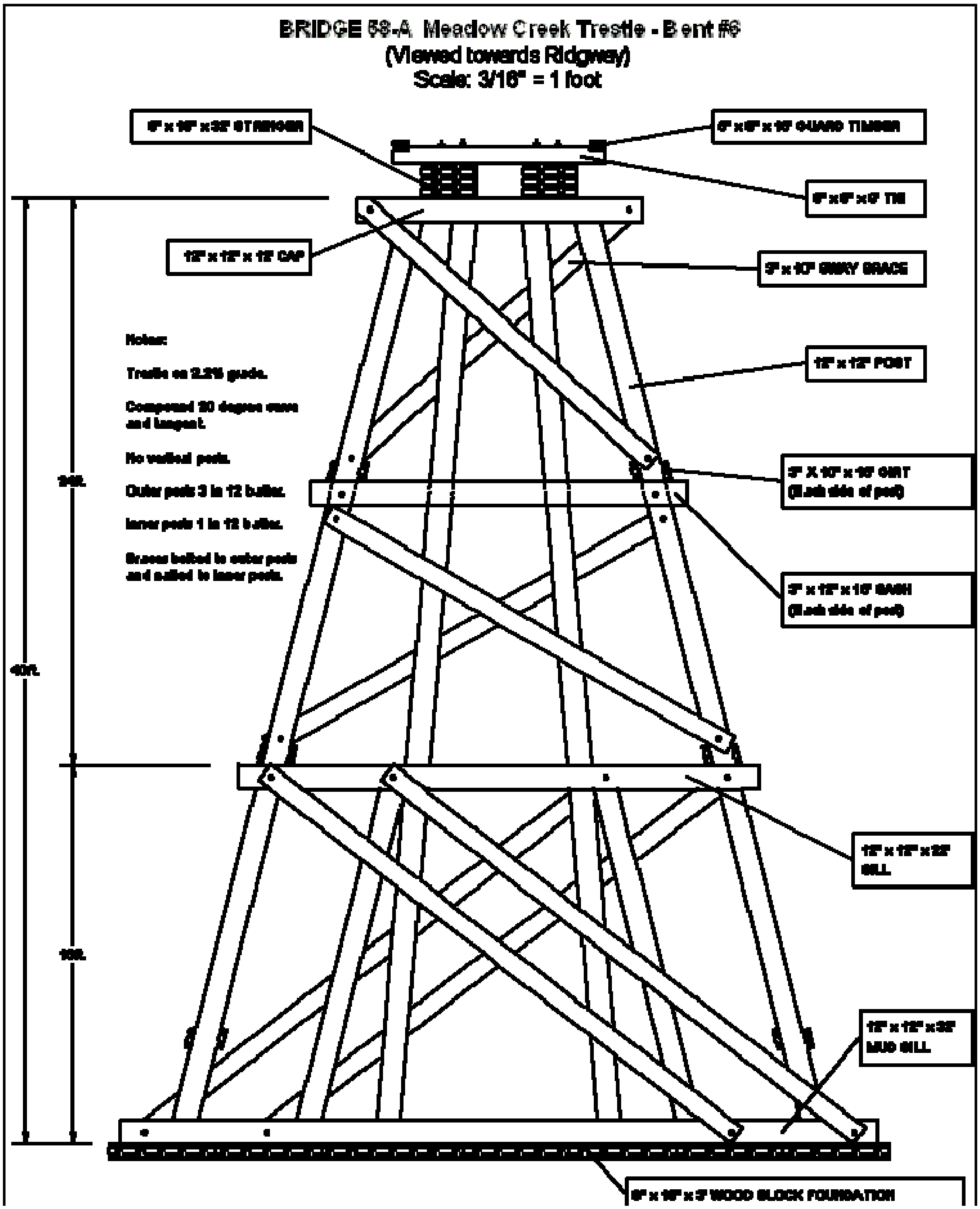
The following drawings show various bents from several of the larger RGS trestles between Vance Junction and Rico. They are drawn fullsize for S gauge in 1:64 scale.


BRIDGE 46-C Ophir High Line - Bent #2
(Viewed towards Rico)
Scale: 3/16" = 1 foot
CAP
POST
GIRT
SILL
SILL
MUD SILL
CONCRETE
FOUNDATION


BRIDGE 46-D Ophir High Line - Bent #10
(Viewed towards Rico)
Scale: 3/16" = 1 foot


BRIDGE 57-A Upper Gallagher Trestle - Bent #8
(Viewed towards Rico)
Scale: 3/16" = 1 foot


BRIDGE 57-B Lower Gallagher Trestle - Bent #9
(Viewed towards Rico)
Scale: 3/16" = 1 foot
12" x 14" x 14' CAP
12" x 12" POST
Notes:
Tangent (straight).


BRIDGE 58-A Meadow Creek Trestle - Bent #6
(Viewed towards Ridgway)
Scale: 3/16" = 1 foot

[For more information visit Bob's Web site]