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# Documentation of the Historic Saline Creek Bridge

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Bridge No. H0119  
Miller County, Route 17  
January 2012



# Historic Saline Creek Bridge

MoDOT Bridge No. H0119

Route 17, Miller County, Missouri  
MoDOT Project No. J5P0928

## Historical and Photographic Documentation

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Submitted to:

State Historic Preservation Office

Missouri Department of Natural Resources

Prepared for:

Federal Highway Administration

In compliance with Section 106 of the National Historic Preservation Act

Kevin L. Keith, Director

Missouri Department of Transportation

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## **Abstract**

The Missouri Department of Transportation (MoDOT) proposes to improve Route 17 in Miller County by replacing Bridge No. H0119 over Saline Creek. The bridge is located about 3.2 miles northeast of the Route 52 intersection near Tuscumbia, Missouri. The bridge, built in 1925, consists of three steel spans, two 83' approach pony trusses and a 121' through truss main span. The bridge is one of the older surviving examples of this type in the state.

The bridge has been determined eligible for listing on the National Register of Historic Places (NRHP) under Criterion C in the area of Engineering, and the proposed project will have an “adverse effect” on the historic structure. In consultation with the Missouri State Historic Preservation Office and the National Advisory Council on Historic Preservation, a Memorandum of Agreement (MOA) for mitigation of the adverse effect was developed and signed by the Federal Highway Administration on September 27, 2011. This report fulfills Stipulation I of the MOA.

## **Historic Documentation**

### **Bridge H0119**

### **Saline Creek Bridge**

#### **Introduction**

Location: Highway bridge carrying Missouri State Route 17 over Saline Creek approximately 3.2 miles northeast of the junction with Route 52 near Tuscumbia, Missouri.

Construction Date: 1925

Present owner: Missouri Department of Transportation, Jefferson City, Missouri

Present use: Currently open to traffic. Highway bridge to be replaced by a new structure in 2012.

Significance: The Saline Creek Bridge is a six panel Pratt through truss with a Warren pony truss approach span at each end. It is one of the older surviving members of this truss type in the state, and only 12 older currently exist. The bridge is considered a good example of Missouri State Highway Department truss design in the 1920s, and is considered to be eligible for inclusion to the National Register of Historic Places (NRHP) under Criterion C in the area of Engineering (Dawdy 2011).

Historian: Terrell Martin, Historic Preservation Section, Design Division, Missouri Department of Transportation, January 2011.

Route 17 Bridge No. H0119 spans Saline Creek in north-central Miller County approximately 3.7 miles northeast of Tuscumbia, the county seat of Miller County (Figures 1 and 2). MoDOT proposes to improve the safety and efficiency of Route 17 by replacing the existing bridge with a new structure (A7854) at the same location. Route 17 extends north and south through central and southern Missouri. Its northern terminus begins at Route 54 at a point about 8.5 miles north of the bridge. The southern terminus is at the Arkansas State line where it continues into Arkansas as Highway 395. The Saline Creek Bridge is a rigid-connected, six-panel Pratt through truss with a Warren pony truss approach span at each end. The Missouri Historic Bridge Inventory lists 90 bridges of this type built in the state prior to 1951 (Fraser 1996a). By 2008 that number had decreased to 55 through attrition, and several more have been replaced since then.

#### **History of the Saline Creek Bridge**

During February of 1925, Chief Engineer B. H. Piepmeier of the Missouri State Highway Commission reported the highway department was contemplating improvements to Route 17 from Tuscumbia to Eugene which included the bridge over Saline Creek (Miller County Autogram 1925a:1). This segment of road, which extends for about 11.5 miles, was to be graded and have culverts installed. This portion of Route 17 would remain an earthen graded road, and the closest segment with hard surface was at Crocker, about 23 miles to the southeast (Missouri

State Highway Commission 1926a). A second segment of the road improvement plan consisted of widening the road to 20' from Tuscumbia to the concrete road in Waynesville located to the southeast of the Saline Creek project (Miller County Autogram 1925g:1).

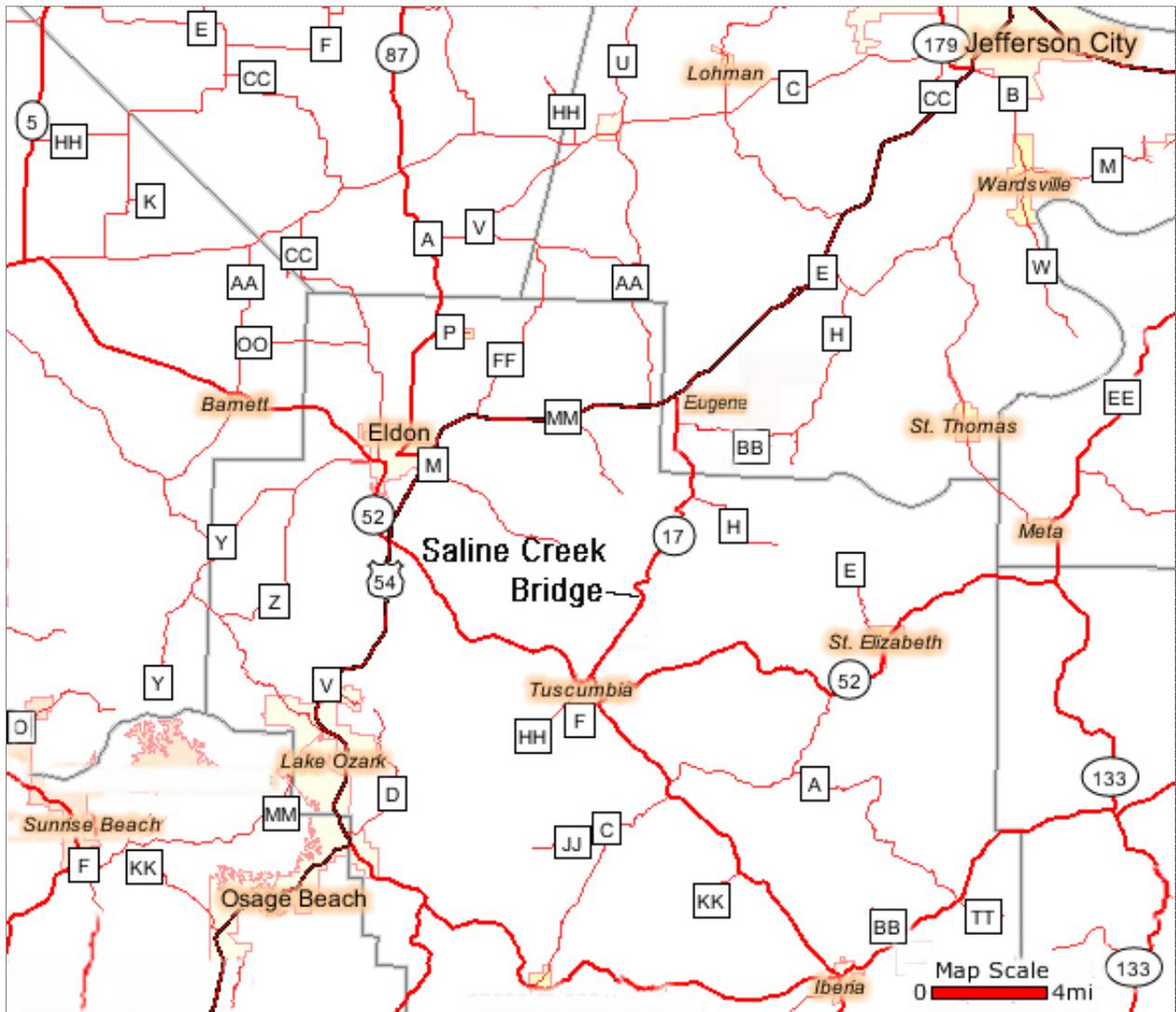


Figure 1. Vicinity map of Saline Creek Bridge.

The new bridge was to replace a “suspension bridge” located about one-half mile downstream near the outfall of the creek valley into the Osage River bottoms (Miller County Autogram 1925b:1). The old bridge was described in a bridge report on October 30, 1924 as having a suspension system that was in very bad condition and a substructure of timber towers and concrete footings that was in poor condition (Missouri Highway Commission 1924). During a meeting with highway department representatives and the Miller County Court, local farmers requested that the old bridge be left open until the new bridge could accommodate traffic. An agreement was reached between those concerned. Removal of the old suspension bridge did not occur until around March 1, 1926 (Miller County Autogram 1926b:1). Apparently the highway department officials and the local farmers agreed that a temporary crossing would be built.

During April of 1925 and prior to the letting of the contract for the bridge replacement, a low-water crossing was constructed over Saline Creek near the old bridge (Miller County Autogram 1925c:1). The crossing, which was built with donated labor and money pledges, was constructed with reinforced concrete and had a gravel surface. It was reported that many cars became stuck in the gravel at this low water crossing.

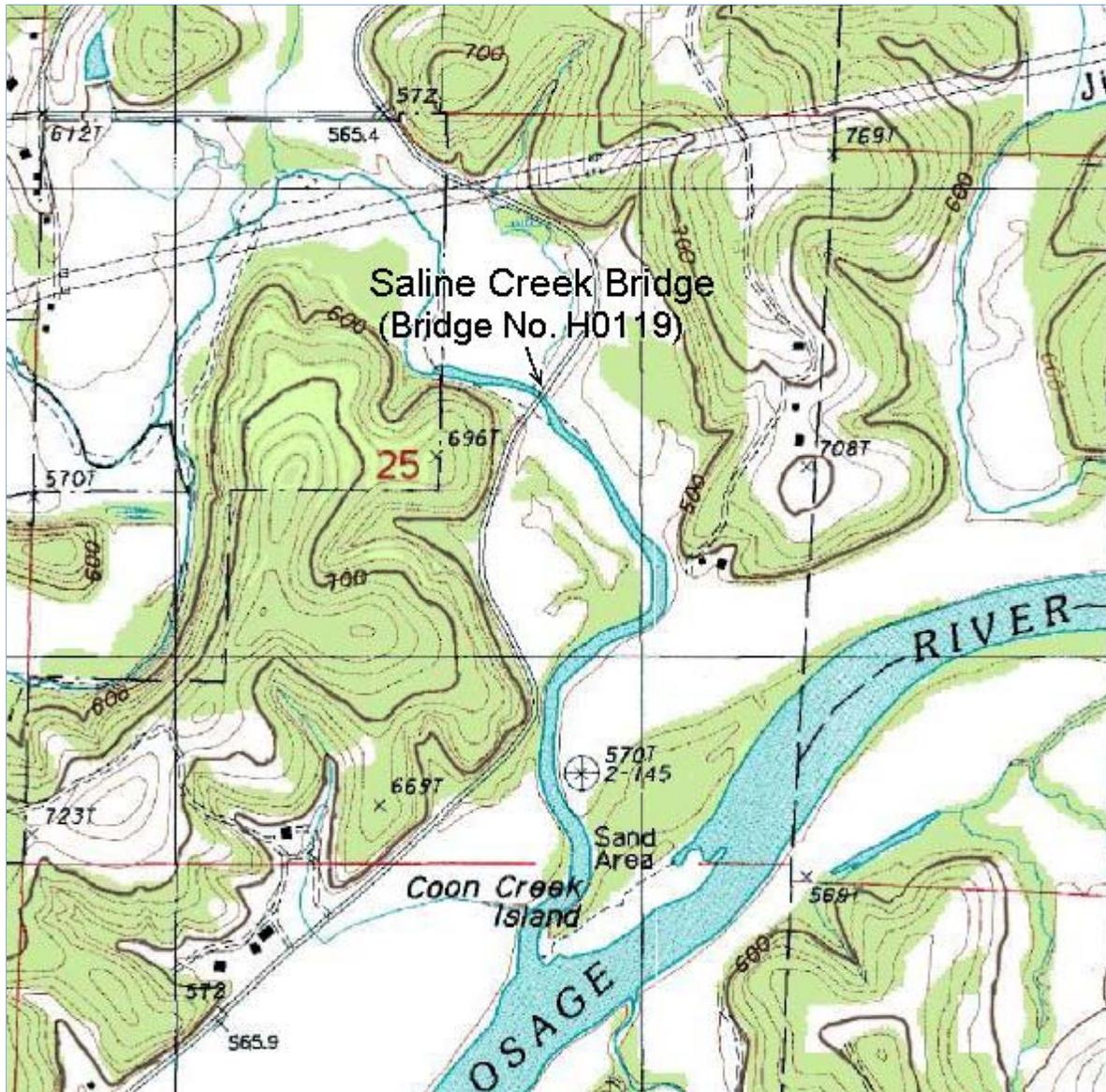


Figure 2. Topographic Map (Eugene, Missouri 1987) showing location of Saline Creek Bridge.

Contracts for the Route 17 improvements were awarded on May 22, 1925 and Fogelman and Davidson of Eugene, Missouri was selected to construct the bridge over Saline Creek as well as about one mile of grading on each side of the bridge including the approaches (Miller County Autogram 1925d:1 and Missouri State Highway Commission 1925b:7). The contract award was for \$66,585.44 which included 50,000 cubic yards of grade fill in the Saline Creek valley. A contract of \$38,280.21 was awarded to T. J. Gambill Construction Company of Bloomsdale,

Missouri for the remaining grading work for the project (Missouri State Highway Commission 1925b:7). A contract was reportedly issued to T. Thompson for building the piers (Miller County Autogram 1925e:1) but no record was found in minutes of the Missouri State Highway Department of this award.

A series of contract changes later transpired. The grading contract awarded to Fogelman and Davidson was then reportedly sold to Haller and Emerson of Boonville, Missouri (Miller County Autogram 1925e:1). The contract awarded to W. T. Thompson for building the piers was reportedly sold to Pioneer Construction Company which already had obtained the contract for the structural iron work (Miller County Autogram 1925e:1). The Miller County Autogram commented on the change of events by stating that the “Pioneer Construction Company, one of the best contracting concerns in the state, now has the entire contract for the Saline creek bridge” (1925e:1). The Pioneer Construction Company, also referred to as the Pioneer Construction Company of Kansas City (Fraser 1996a), had recently completed a small project in Bollinger County, Missouri (Missouri State Highway Commission 1925a:7).

It is worth noting that several sources list Fogelman and Davidson instead of Pioneer Construction Company as the builder of the Route 17 Bridge over Saline Creek. Fraser’s *Missouri Historic Bridge Inventory* (1996a) lists Fogelman and Davidson as the bridge contractor. They are also listed as the builder of the Saline Creek Bridge in historic bridge summaries provided by Bridgehunter.com and HistoricBridges.org.

However, after the project was completed, the final inspection report lists Pioneer Construction Company as the builder and commented that quality of workmanship was less than Pioneer Construction Company usually delivers (Missouri State Highway Department 1926). And later, when the final payment was authorized by the highway Commission, Pioneer Construction Company was listed as the bridge contractor and Fogelman and Davison as a contractor for road construction (Missouri State Highway Commission 1926b).

Work commenced on the Route 17 project during late June 1925 when the T. J. Gambill Construction Company began the grading work at the Cole County line running southward to near the Saline Creek Bridge (Miller County Autogram 1925e:1). On July 16, 1925, the bridge work by Pioneer Construction Company was under way (Figure 3) with pits being excavated for the piers (Miller County Autogram 1925f:1). On August 6, bridge pilings were being driven into a solid foundation, some to a depth of 40 feet (Miller County Autogram 1925g:1). The huge timber pilings were being driven by a 2800-lb hammer. Five or six pilings were being placed daily. Hundreds of visitors watched as the bridge was being constructed.



Figure 3: Bridge plate showing year of construction.

Haller and Emerson had completed two large culverts on each side of the bridge. The timber in the right-of-way was cut and stumps were removed in preparation for grading. A 58,000-lb shovel and an elevator grader were to be used for grade construction. The Gambill Construction Company established a camp with a crew of 25 “colored” laborers that arrived on August 3 in preparation for grading a four-mile segment of Route 17. The company reportedly had just purchased a \$20,000 shovel for use on the project (Miller County Autogram 1925g:1).

During September 2005, Haller and Emerson moved rock and dirt from the right of way on the hill slope to the north at a rate of about 3 cubic yards of dirt per minute (Miller County Autogram 1925i:1). The material was moved with a “caterpillar” shovel and used as grade fill for the approaches to the bridge. Rock was loosened by explosives discharged in 10-foot deep holes drilled with an air-compressor drill. The ultimate plan was to widen the Route 17 roadbed to 20 feet from the Miller County line south to Tusculumbia (Miller County Autogram 1925h:1).

In October and November of 1925, heavy rains hindered the progress of the bridge construction (Miller County Autogram k 1926a:2). By early January of 1926, the Pioneer Construction Company had completed the erection of the structural steel for the bridge and was preparing to lay the concrete deck. The bridge deck was approximately 5 feet above the highest flood level recorded for the Osage River in that portion of Miller County.

Although no official record of the Saline Creek Bridge opening was found, the bridge was finished by March 1, 1926 and the removal of the old suspension bridge had begun (Miller County Autogram 1926b:1). Late May of 1926 was the target date for allowing traffic over the new Route 17 on to the Saline Creek Bridge. By May 27, 1926 traffic was moving over the bridge (Miller County Autogram 1926 d:1). The Miller County Autogram reported “This section of State Highway on No. 17 is the most picturesque piece of state highway in Miller County...and judging from the smiles on the faces....everyone was delighted” (Miller County Autogram 1926 c:1). However, it was recommended to avoid using the new section of Route 17 after a rain because of patches of slick clay.

The Route 17 improvements were not accomplished without some mishaps. Roy Alverson, an employee of one of the contractors, was severely injured on May 1926 (Miller County Autogram 1926e:3). He was struck on the jaw by the handle of a four-horse scraper and found lying in the ditch bleeding.

After the bridge was built the final Inspection Report, dated May 25, 1926, provides a less than glowing report on the quality of the work:

The bridge as a whole presents only a fair piece of work and does not show the quality of workmanship that the Pioneer Construction usually gets. The concrete in the piers and bents has a poor appearance due to the fact that the forms used have been too light and have not been properly lined up. The Steel work as a whole is good, especially so the milled joints and riveting on the high middle span. The Painting as a whole is an exceedingly poor piece of work, mostly due to the fact that the paint has not been strained before being applied [Missouri Highway Department 1926:1].

The fill round the bents was described as done well and the “rip rap as a whole was a fair piece of work.” At the south end bent, the concrete slab was extending three inches over the back

wall and rockers, which was believed to be the result of loose piles or the poor condition of the concrete above the piles. At the end of the summer, highway department crews would correct the problem by sheering off the anchor bolts flush with the concrete, moving the shoes and installing new anchor bolts (Missouri Highway Department 1926b:1-2).

On November 19, 1926 the Missouri Highway Commission approved the final payment for the three contractors involved in the Saline Creek Bridge project. Pioneer Bridge Company was paid \$30,309.01 for the bridge portion of the project (no estimated cost was provided). For the road portion of the project Gambill Bros. had an actual cost of \$39,790.78 (estimated cost was \$38,515.52) and Fogelman, Thompson and Davidson had an actual cost of 42,565.50 (estimated cost was \$67,877) (Missouri Missouri State Highway Commission 1926a:35).

Pioneer Construction Company was officially incorporated in the State of Missouri on May 1, 1918 (Missouri Secretary of State 1918). Records indicate the company constructed bridges throughout the United States and in Missouri from 1918 to at least 1926 (Fraser 1996a; Library of Congress 2011a). In 1918, the County Court of Greene County, Missouri contracted with Pioneer Construction Company to build bridges for farm roads to carry traffic over the Sac River and Wilson Creek as well as four smaller bridges (Fraser 1996b). The Sac River Bridge (No. 128003.9), located about 7 miles southeast of Ash Grove, is a concrete-filled spandrel arch with a 45' span. The Wilson Creek Bridge, located in the Springfield vicinity, has a 48' span. The bridge "is a short span filled spandrel arch bridge. This concrete span has a relatively early construction date and a high degree of physical integrity" (Library of Congress 2011b).

The Pioneer Construction Company also built four bridges in Christian County, Missouri including the Howard Ford Bridge, spanning the James River near Nixa (Library of Congress 2011c). The bridge, which was built in 1920-1921, represents one of longest examples (157') of a single span Pratt through truss bridge in Missouri. The McCracken Street Bridge over the Finley River, built in 1923, is located on the north edge of Ozark (Fraser 1996b) The bridge, which has two 100' spans, is a rare example of an experimental truss design by the Missouri State Highway Department. The Roberts Ford Bridge, located near Sparta, was built in 1919 and represents a common bridge type, a 5-panel Pratt Pony Truss (Fraser 1996a). The bridge has two 80' spans. Pioneer Construction Company is listed as the "probable" contractor for the Reed Fork Bridge which carries Route 8 over the Finley River near Sparta (Fraser 1996a). The bridge, which has a 140' span was built in 1920 and is considered a typical example of another common bridge type, an eight-panel Pratt through truss.

The "Articles of Incorporation" for Pioneer Construction Company indicate that the Board of Directors was comprised of three shareholders: Fred R. Hoover with 998 capital stock shares and J. J. Vineyard and Frank A. Boys with one share each (Missouri Secretary of State 1918). The board members were all from Kansas City, Missouri. The company was dissolved on December 23, 1952 as recorded in the "Articles of Dissolution by Voluntary Action of the Corporation" (Missouri Secretary of State 1952a). At the time of dissolution, Fred R. Hoover and Arthur Mag of Kansas City, Missouri were listed as the directors of the company with Hoover reported as president and holding all stock shares. The "Articles of Dissolution and Articles of Liquidation" were issued by Walter H. Toberman, Secretary of State, on December 30, 1952 (Secretary of State 1952b).

On April 21, 1951 Articles of Incorporation were issued to Anderson-Dunham-Kansas City Bridge Company, an enterprise with the same address as Pioneer Construction Company (201 First National Bank Building, Kansas City, Missouri) (Missouri Secretary of State 1951a). On May 16, 1951 a Certificate of Amendment was issued that changed the name of the company to B. S. Bullwinkle Enterprises LTD (Missouri Secretary of State 1951b). On May 25, 1951 another Certificate of Amendment was issued that changed the name of the company to Pioneer Construction Company (Missouri Secretary of State 1951c). Robert M. Hoover was listed as President of the corporation and P. C. Roof the secretary. The second Pioneer Construction Company was dissolved on May 17, 1961 as recorded in the “Articles of Dissolution and Articles of Liquidation” signed by Warren E. Hearnese, Secretary of State (Secretary of State 1961). At the time of dissolution and during the existence of the second Pioneer Construction Company, Fred R. Hoover was listed as the president of the corporation.

A final observation is made regarding the importance of the bridge to the community. The local newspaper, the Miller County Autogram, reported in detail on activities relating to the project and its progress. The bridge was stated to be “by far the most beautiful and substantial steel highway bridge in Miller County” (Miller County Autogram 1925a:1). The bridge was expected to improve the local quality of life and greatly improve access to places to the north like Jefferson City and areas to the south such as Waynesville. The local newspaper noted that on some days hundreds of people were visiting the construction site (Miller County Autogram 1925g:1).

### **Description of the Saline Creek Bridge**

Saline Creek Bridge (H0119) is a steel, rigid-connected, six-panel Pratt through truss main span with two rigid connected Warren pony truss approach spans. The substructure consists of steel reinforced concrete abutments, wing walls, end bents and dumbbell piers.

The main span is 121' 4" long with a 16' vertical clearance over the deck (Missouri Department of Transportation 2011). The two pony trusses are each 83' in length. The overall length is 287', while the roadway width is 20' curb-to-curb with a 4.9 percent climbing grade from south to north. The approach roadway is 23' 11" in width. The bridge has concrete decking over I-beam steel stringers, and steel pipe guard rails. The following detailed description is derived largely from the original design plans and examination of photographs taken in the field. Other sources of information are the plans for the Standard Truss Design No. S880 for the approach spans and Standard Truss Design No. S8120 for the main span (Missouri State Highway Commission 1926c and 1926d).

The substructure consists of two end bents (numbered 1 and 4) and two piers (numbered 2 and 3) (Figures. 4-6). The bents, located at the north and south ends of the bridge, are two-column open bents with wing walls that extend to a width of 40' 1". The rectangular columns are 3' wide and 28' 10 1/2" high. Lengthwise the columns are 9' at the base and 3' 3" at the top with a 3" per 12" batter. Columns rest on rectangular concrete footings that are 12' by 6', 2' 6" high and are centered on the footing with an 18" inset. The footings are supported by eight 25'-long piles of untreated timber that are spaced 3' apart from centerline to centerline. The base of the footings

is at an elevation of 672.0 feet above sea level. Riprap was piled against both bents at a 1½:1 slope and firmly backed.

Piers 2 and 3 are reinforced concrete dumbbell piers. The circular columns are connected by an 18” thick concrete web wall. Columns are 7’ 1” in diameter at the base and 4’ 2 ½” in diameter at the top with a batter of ½” per 12”. Each footing is supported by twelve 25’-long piles of untreated timber that are spaced 3’ apart from centerline to centerline. The base of the footings is 665.0 feet above sea level. Each truss is supported on the pier caps with a fixed bearing on one end and a rocker bearing on the other. The rocker bearings rest on 12” by 20” bearing plates and the fixed bearings rest on 12” by 24” pedestals.

The design of the *main span* is based on Standard Truss Design No. S8120 (Missouri State Highway Commission 1926c). The vertical clearance over the deck is 16’. The total weight of the two trusses in the main span is 51,460 lbs.

The two top cords of the main span are standard channels placed back to back and connected with single lacing on the bottom and flat plates on the top. The top plate serves to keep out moisture. The top cords are 80’ in length. The upper struts are I-beams that intersect the top chords at right angles. The top lateral bracing is composed of angles that crisscross diagonally and connect at the upper panel points.



Figure 4. Photograph of end bent showing men that are believed to be construction workers (Miller County Museum and Historical Society).



Figure 5. Construction of north End Bent No. 1 in trees (Photo facing northeast) (Miller County Museum and Historical Society).

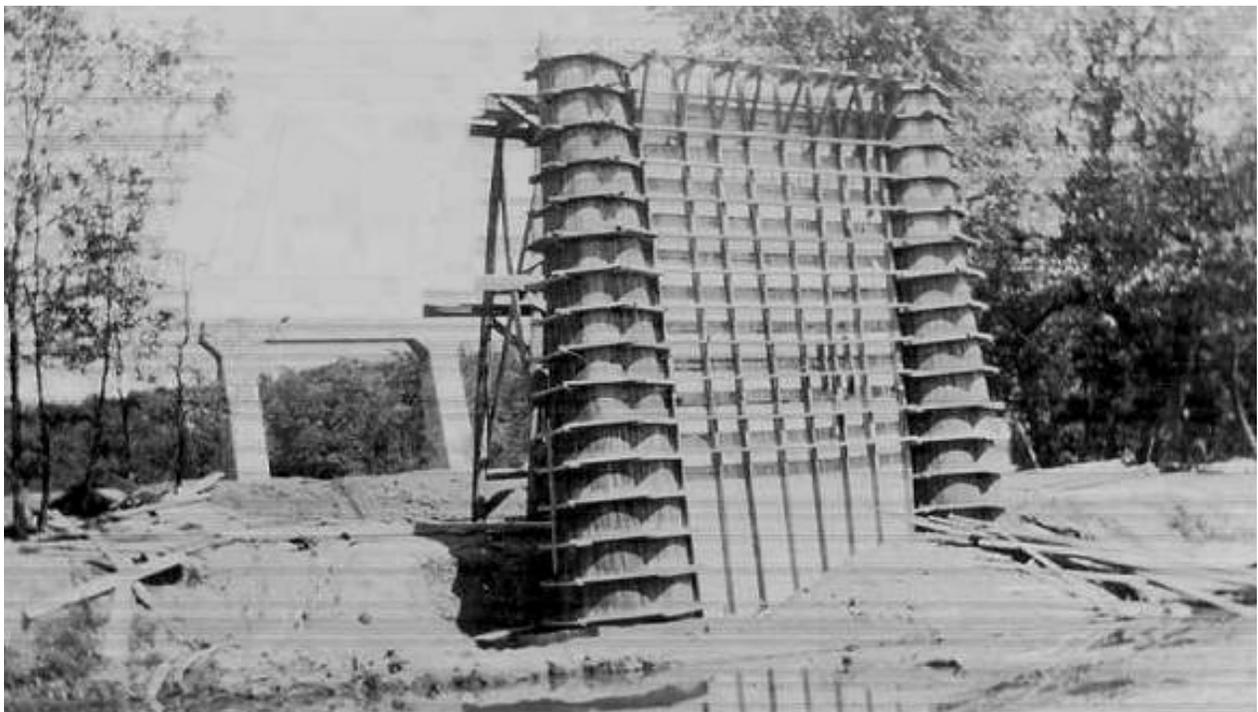


Figure 6. Construction pier (foreground) and end bent (photo facing northeast) (Miller County Museum and Historical Society).

The inclined end posts are similar to the top chords with standard channels placed back to back and connected with single lacing on the inside and flat plates on the outside. The inclined end posts are 23' 10 5/16" in length. The vertical members are formed by four angles, connected back to back by single-bar lace connections. The vertical members are 20' in length. The diagonals are two angles connected by flat plates.

The bottom cords of the main span are comprised of two I-beams connected on the top and bottom by flat plates. The bottom cords are 121' 6" long. The floor beams and stringers are I-beams. The bottom lateral bracing is composed of angles that crisscross diagonally and connect at the lower panel points.

The design of the two *approach spans* is based on Standard Truss Design No. S880 (Missouri State Highway Commission 1926d). The total weight of the two trusses in each approach span is 28,960 lbs.

Each top cord and inclined end post are standard channels placed back to back and connected with single lacing on the inside and flat plates on the outside. The top cords are 60' in length and the inclined end posts are 13' 5 1/2". The vertical members are formed by four angles, connected back to back by single-bar lace connections. The vertical members are 9' in length. The diagonals are two angles connected by flat plates.

The bottom cords of the approach spans are composed of two I-beams connected on the top and bottom by flat plates. The bottom cords are 81' 2 1/2" long. The floor beams and stringers are I-beams. The bottom lateral bracing is composed of angles that crisscross diagonally and connect at the lower panel points.

The concrete deck on the bridge has a curb-to-curb width of 20', an out-to-out width of 20' 11" and an approach roadway width of 23' 11." The curbs on the approach spans have eight drainage outlets per side and twelve outlets per side on the main span. The guardrails are made from 2" gas pipe. The four end posts are vertical 2 1/2" gas pipes with ornamental balls.

Currently the 20-foot wide roadway is too narrow and has caused several sideswipe accidents. The deck is in deteriorated condition in critical stress areas that could affect load capacity. With a condition rating of 3 (serious), the deck has severe edge deterioration with 100% saturation along with transverse cracks, extensive map cracking and numerous full-depth patches. The superstructure also has a rating of 3 with holes in the girders caused by pack rust, and the bottom cord gusset plates have significant section loss. Significant pack rust was reported between the gussets, and vertical and diagonal members. The substructure is rated 5 (fair), although the beam caps have random cracking and the timber piles are at risk of exposure from scouring during flooding. The piers are presently in satisfactory condition but suffer from scaling and cracking.

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**Saline Creek Bridge (Bridge No. H0119)  
Route 17, Miller County, Missouri**

Photographer: Randall Dawdy, Missouri Department of Transportation

Date: March 4, 2010

Location of Negatives: Digital Images Provided to  
Missouri State Historic Preservation Office

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#35 of 37. Bridge H0119. Main span detail. View to west.

#36 of 37. Bridge H0119. Main span and Pier 2. View to west.

#37 of 37. Bridge H0119. East side. View to west.

### **Photographic Methods and Processing:**

The archival photographs were taken and processed according to the standards for photographs accompanying NRHP documentation (NPS 2008). Randall Dawdy took the photographs on March 4, 2010 using a digital single lens reflex camera. Images were captured in a raw (nef) format, which was manipulated for light contrast before being converted to a tagged image file format (.tiff) and printed. Images were numbered according to the NRHP Photographic Imaging Policy (NPS 2008) and burned onto compact discs, which were provided to the SHPO along with this report.

Prints were made on Epson Premium Glossy Photo Paper and used Epson Matte Black UltraChrome K3 Ink, both identified as “best” practices by the NRHP photo policy, and which Epson identifies as having an 85-year permanence under glass (NHRP 2009, Epson 2009). Kept in archival conditions the materials will exceed the 75 year permanence standard for the NRHP, which is the standard being used for this project. A copy of the Epson rating is attached.

The .tiff images were burned onto Delkin Archival Gold compact discs, and provided to the SHPO in that format. In addition, a copy of the .tiff file will be maintained by the MODOT Environmental and Historic Preservation Section, and a copy will be provided to the Miller County Historical Society.

Permanence rating for Epson prints framed under glass

MEDIA	6-Color Photo Dye Inks		DURABrite® Ink	PictureMate™ Ink	UltraChrome™ Ink	UltraChrome Hi-Gloss™ Inks
	Epson Stylus Photo 825/925/960/1280	Epson Stylus Photo R200/R300/R320/RX500/RX600	Epson Stylus C64/C66/C84/C86/CX4600/CX6400/CX6600	PictureMate Personal Photo Lab	Epson Stylus Photo 2200	Epson Stylus Photo R1800/R800
<b>EPSON PREMIUM PHOTO PAPERS</b>						
Premium Glossy Photo Paper		23 years			85 years	104 years
Premium Luster Photo Paper – Cut Sheet		22 years			71 years	64 years
Premium Semigloss Photo Paper		22 years			77 years	In progress
<b>EPSON MATTE PAPERS</b>						
Double-Sided Matte Paper	15 years					
Enhanced Matte Paper			71 years		76 years	110 years
Matte Paper Heavyweight	18 years	30 years	105 years			Over 150 years
Photo Quality Ink Jet Paper		8 years				In progress
PremierArt™ Matte Scrapbook Photo Paper for Epson			94 years		108 years	In progress
Premium Bright White Paper		5 years	74 years			In progress
<b>EPSON FINE ART PAPERS</b>						
UltraSmooth Fine Art Paper					108 years	
Epson Velvet Fine Art Paper					61 years	
Watercolor Paper Radiant White					92 years	
PremierArt Water-Resistant Canvas for Epson					75 years	
<b>EPSON GLOSSY PAPERS</b>						
ColorLife™ Photo Paper	27 years	36 years				
DURABrite Ink Glossy Photo Paper			55 years			
PictureMate Photo Paper				104 years		
Semigloss Scrapbook Photo Paper	27 years	36 years				

\* Lightfastness ratings are based on accelerated testing of prints on specialty media displayed indoors, under glass. Actual print stability will vary according to media, printed image, display conditions, light intensity and atmospheric conditions. Lightfastness ratings do not measure paper deterioration, such as yellowing. Epson does not guarantee the longevity of prints. For maximum print life display all prints under glass or lamination or properly store them. Ratings based on testing conducted by Epson and Wilhelm Imaging Research [www.wilhelm-research.com](http://www.wilhelm-research.com)

\*\*Testing currently in progress. Projected time estimated on current progress of test.

As with traditional photos, proper care will maximize display life. For indoor display, Epson recommends that prints be framed under glass or in a protective plastic sleeve to protect the prints from atmospheric contaminants like humidity, cigarette smoke, and high levels of ozone. And, as with all photographs, the prints should be kept out of direct sunlight. For proper storage, Epson recommends that your prints be stored in a photo album (or plastic photo storage box or museum storage box) in acid free, archival sleeves commonly available from most camera shops and other retailers. By taking these steps to protect prints from direct sunlight and contaminants, you can preserve your photos for many years.



#1 of 37. Bridge H0119. North nameplate. View to south.



#2 of 37. Bridge H0119. North approach. View to south.



#3 of 37. Bridge H0119. North portal. View to south.



#4 of 37. Bridge H0119. South portal. View to south.



#5 of 37. Bridge H0119. South approach span. View to south.



#6 of 37. Bridge H0119. South approach span detail. View to west.



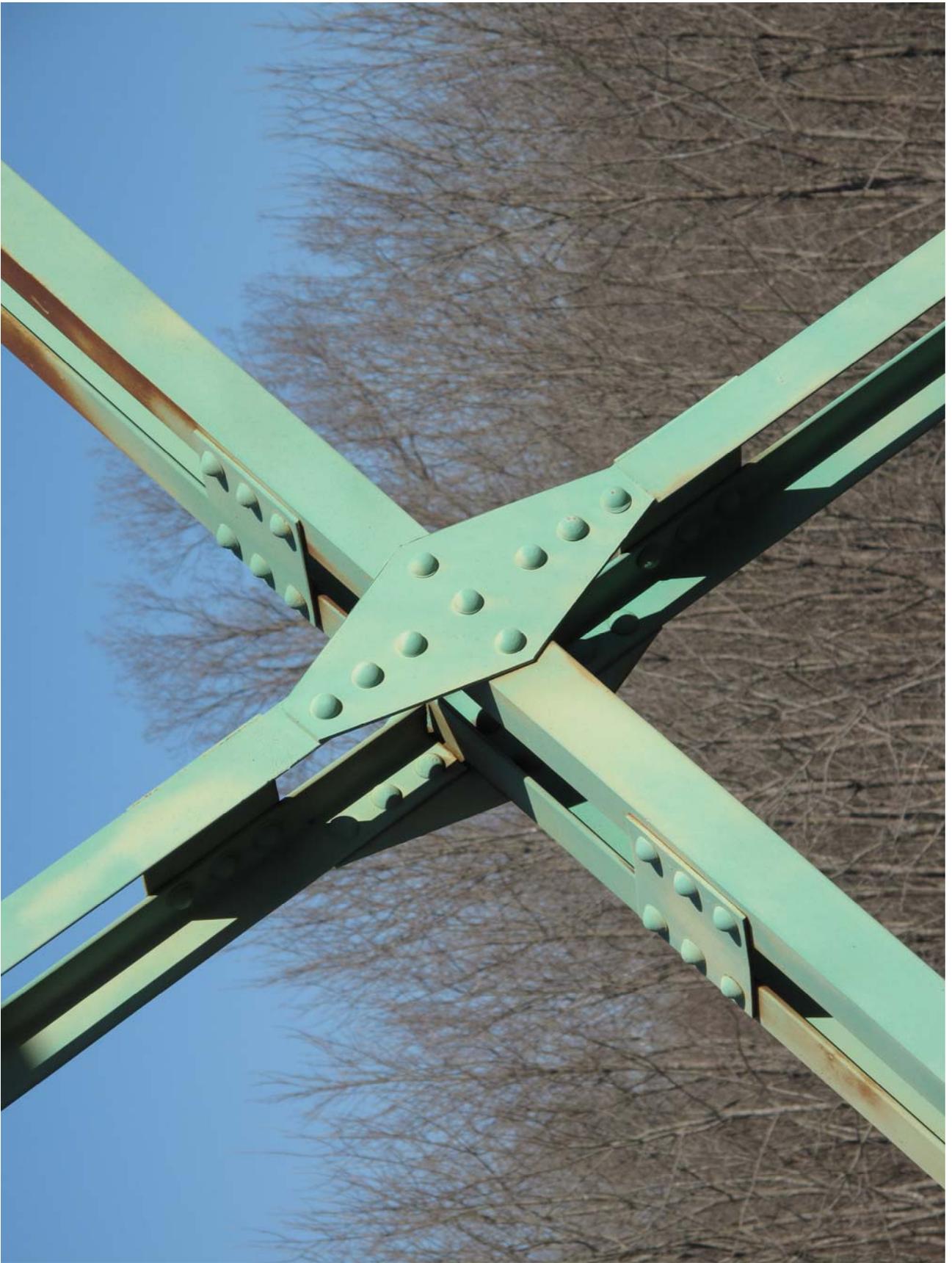
#7 of 37. Bridge H0119. South approach span. View to northwest.



#8 of 37. Bridge H0119. Main span. View to northwest.



#9 of 37. Bridge H0119. Main span detail. View to west.



#10 of 37. Bridge H0119. Diagonal detail. View to west.



#11 of 37. Bridge H0119. Upper panel connection. View to west.



#12 of 37. Bridge H0119. Upper panel connection. View to west.



#13 of 37. Bridge H0119. Upper panel connection. View to west.



#14 of 37. Bridge H0119. South portal. View to north.



#15 of 37. Bridge H0119. South approach span. View to north.



#16 of 37. Bridge H0119. South approach span detail. View to north.



#17 of 37. Bridge H0119. East side. View to north.



#18 of 37. Bridge H0119. South approach. View to northwest.



#19 of 37. Bridge H0119. South approach. View to north.



#20 of 37. Bridge H0119. South nameplate. View to north.



#21 of 37. Bridge H0119. East side. View to northwest.



#22 of 37. Bridge H0119. Main span. View to northwest.



#23 of 37. Bridge H0119. Pier 3 detail. View to west.



#24 of 37. Bridge H0119. North end. View to northwest.



#25 of 37. Bridge H0119. Pier 2. View to northwest.



#26 of 37. Bridge H0119. End Bent 1. View to northwest.



#27 of 37. Bridge H0119. Main span sub-deck. View to northeast.



#28 of 37. Bridge H0119. Piers 2 and 3. View to southeast.



#29 of 37. Bridge H0119. South end. View to southwest.



#30 of 37. Bridge H0119. Pier 3. View to southwest.



#31 of 37. Bridge H0119. Pier 3 and main span. View to southwest.



#32 of 37. Bridge H0119. Main span. View to southwest.



#33 of 37. Bridge H0119. Main span. View to southwest.



#34 of 37. Bridge H0119. Main span. View to west.



#35 of 37. Bridge H0119. Main span detail. View to west.



#36 of 37. Bridge H0119. Main span and Pier 2. View to west.



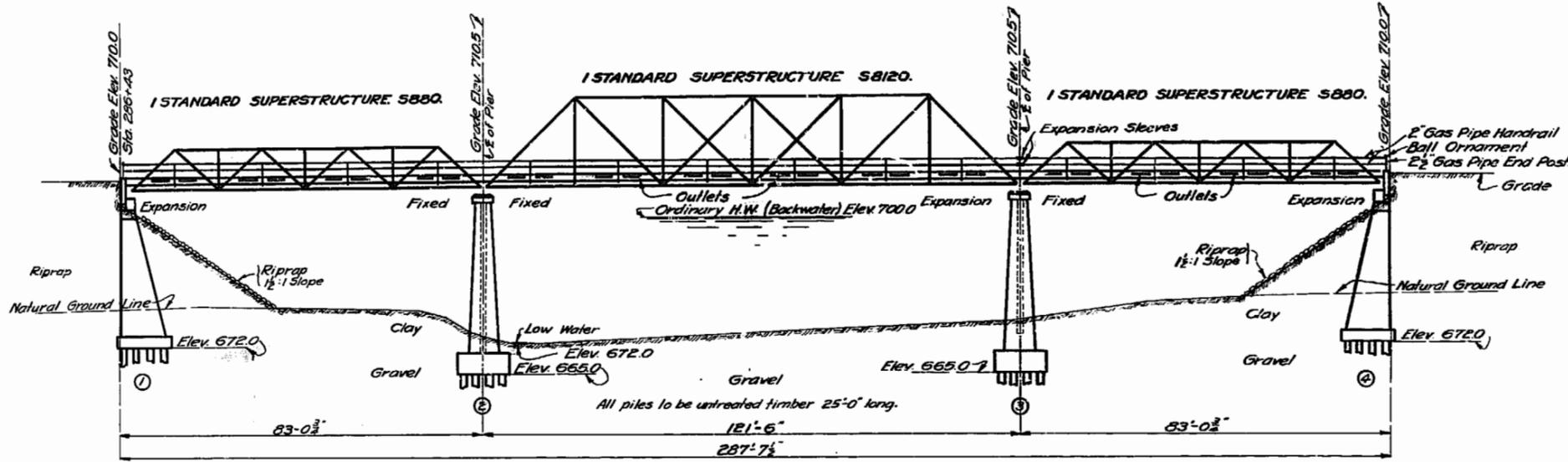
#37 of 37. Bridge H0119. East side. View to west.

**Bridge Plans and Standard Sheets**

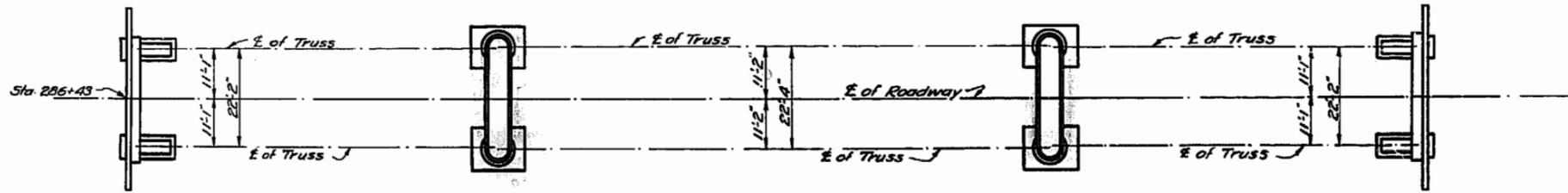
**Saline Creek Bridge (Bridge No. H0119)  
Route 17, Miller County, Missouri**

# MISSOURI STATE HIGHWAY DEPARTMENT

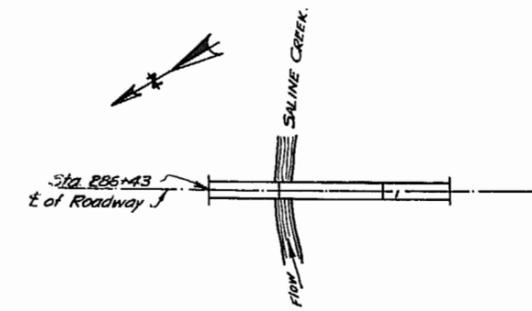
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	Mo.	R-7-54	1925		



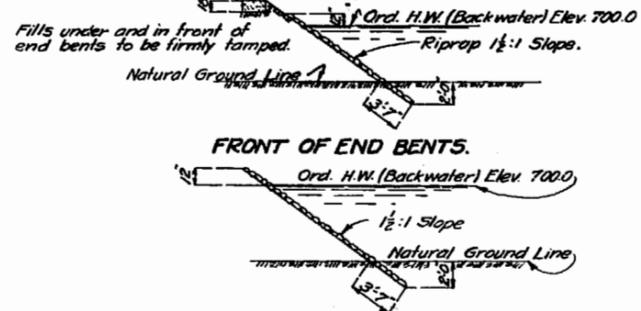
**GENERAL ELEVATION.**



**PLAN.**



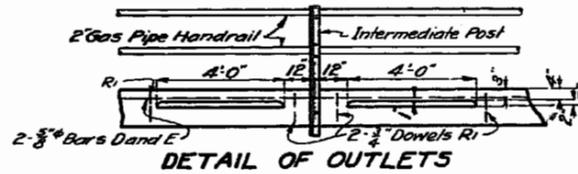
**LOCATION SKETCH.**



**FRONT OF END BENTS.**

**SIDE SLOPES OF FILLS.**  
Riprap fills in front of and 20'-0" back from end bents from Elev. 701.0 to a point below the natural ground line as shown in sketches. Approximately 1060 Sq. Yds. of riprap work included in road contract.

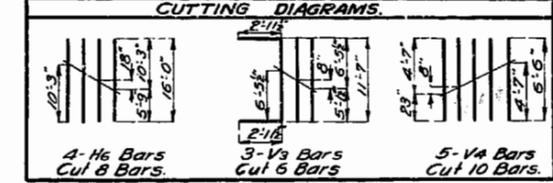
**RIPRAP SKETCHES.**



**DETAIL OF OUTLETS**

ESTIMATED QUANTITIES			
ITEM	SUBSTRUCTURE	SUPERSTRUCTURE	TOTAL
Excavation Cu. Yds.	420		420
Timber Piles Lin. Ft.	2000		2000
Pile Culoffs Lin. Ft.	240		240
1:2:3 1/2 Concrete Cu. Yds.		136.4	136.4
1:2:4 Concrete Cu. Yds.	420.0		420.0
Reinforcing Steel Lbs.	11190	25760	36950
Fab. Struct. Steel Lbs.	230800		230800
Cast Steel Lbs.		2680	2680
Gas Pipe Rail Lin. Ft.		1157	1157

BILL OF REINFORCING S. EFL.			
NO.	SIZE	LENGTH	BENDING SKETCHES
8	3/4"	27'-9"	H1
8	3/4"	27'-9"	H2
8	3/4"	21'-0"	H3
4	3/4"	9'-6"	H4
4	3/4"	9'-6"	H5
8	1/2"	15'-0"	H6
8	1"	22'-3"	H7
6	1"	24'-0"	H8
64	1/2"	24'-0"	H9
44	2"	8'-6"	V1
4	1/2"	9'-6"	V2
6	1/2"	17'-6"	V3
10	1/2"	6'-6"	V4
24	3/4"	31'-9"	V5
16	3/4"	9'-0"	V6
16	3/4"	10'-0"	V7
22	1/2"	36'-0"	V8
32	1"	36'-0"	V9
22	1/2"	32'-0"	V10
8	3/4"	23'-9"	T1
88	3/4"	7'-9"	P1
24	3/4"	5'-3"	D1
32	1"	8'-3"	D2
224	3/4"	9"	R1



Note: For superstructure bars A-B-C-D-E see Std. 57.

**GENERAL NOTES:**  
Piles to be driven to sustain a load of 20 tons per pile.  
Concrete in floor slab to be 1:2:3 1/2 mix.  
Concrete in substructure to be 1:2:4 mix.  
Exposed edges to be beveled 3/8" where no other bevel is shown.  
Camber entire bridge as shown by grade elevations.  
Omit pipe drains shown on Std. 57 and substitute curb, outlets as shown in detail sketch.

B.M. Elev. 68411. On roof of Hackberry, 50' Left of Sta 285+00.

## BRIDGE OVER SALINE CREEK.

STATE ROAD FROM EUGENE TO TUSCUMBIA.  
ABOUT 7 MILES S.W. OF EUGENE.  
PROJECT NO. R17-54 STA. 286+43.  
RT. 17

**MILLER COUNTY**

SUBMITTED BY: *[Signature]* DATE: May 6, 1925  
APPROVED BY: *[Signature]* DATE: May 7, 1925  
BRIDGE ENGINEER  
CHIEF ENGINEER

STD. 57
STD. 518
STD. 519
H 119

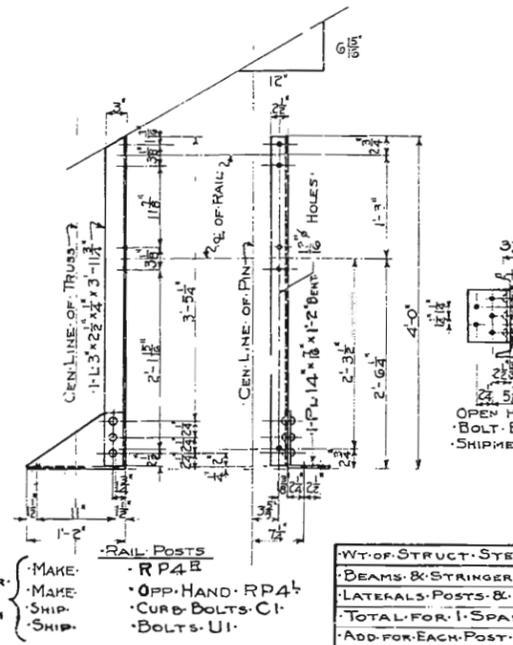
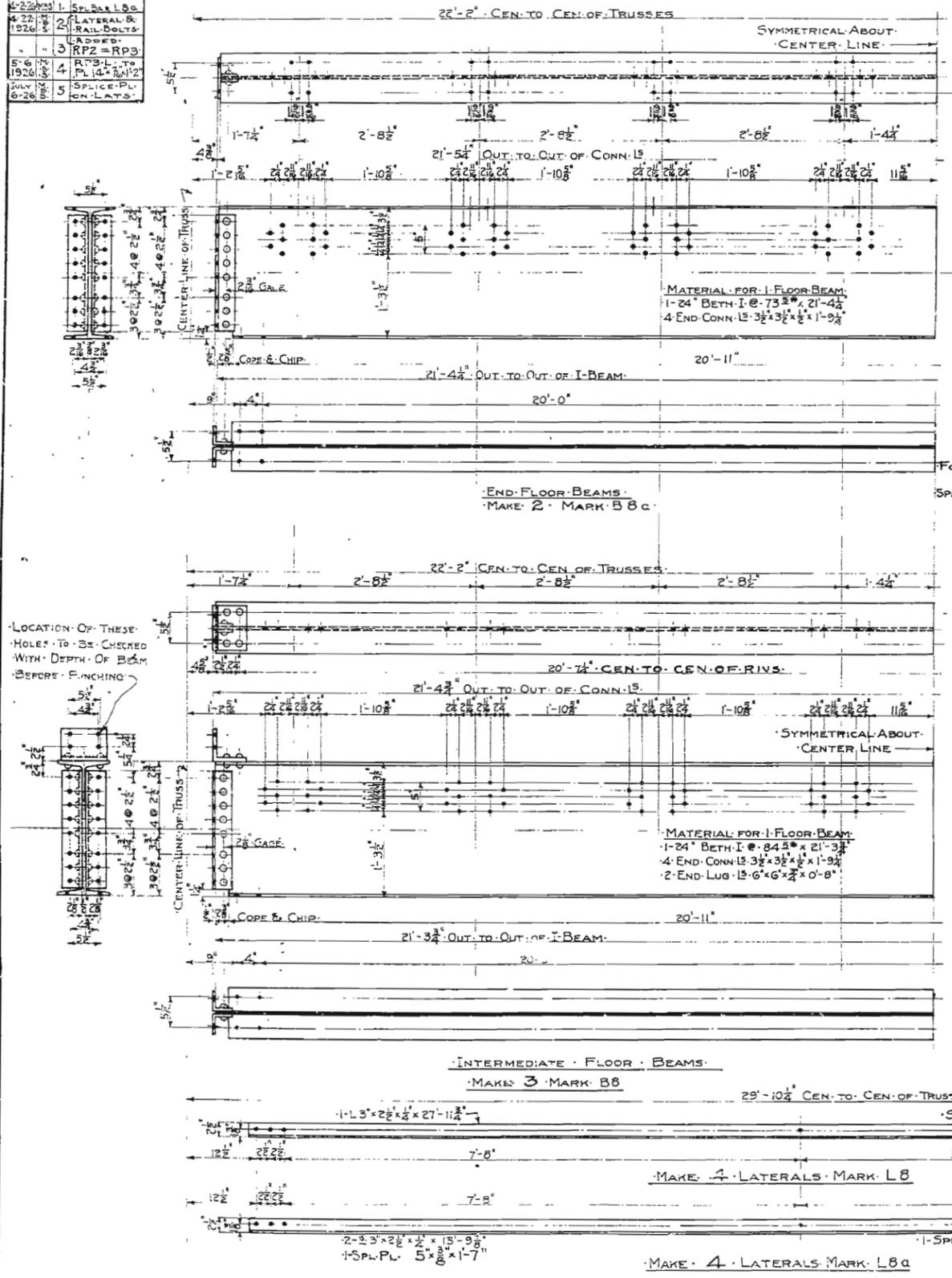




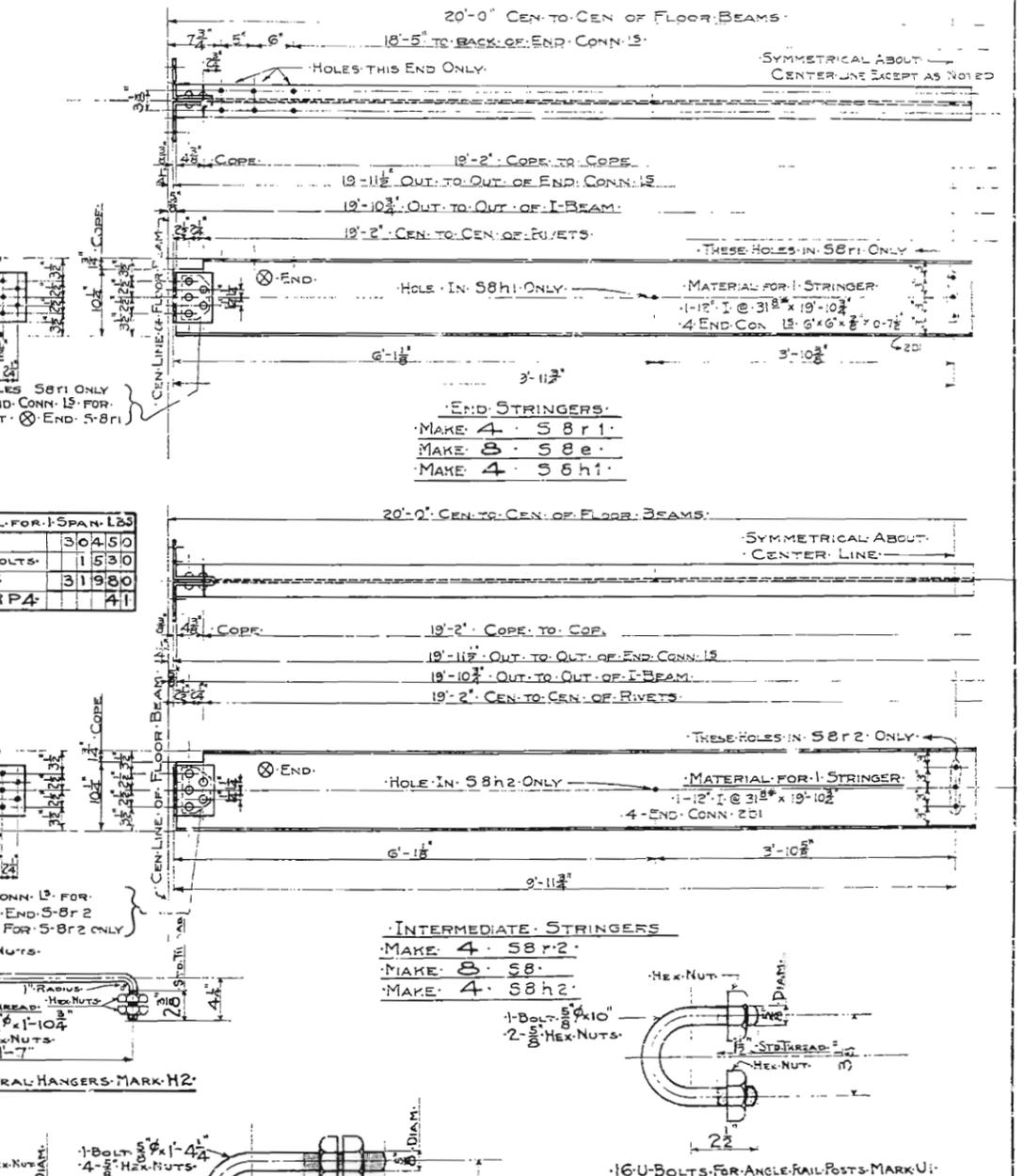
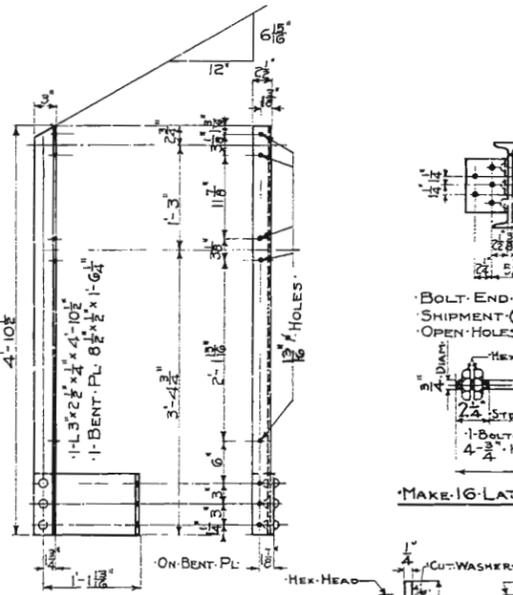
# MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJECT NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	Mo.				

DATE	BY	NO.	DESCRIPTION
4-22-26	W.S.	1	FIELD RIVETING
5-22-26	W.S.	2	SP. BEAM L.B.
5-22-26	W.S.	3	LATERAL & RAIL BOLTS
5-22-26	W.S.	4	COPE & RPZ = RP3
5-6-26	W.S.	5	RP3 L. TO PL. 14" x 1/2"
5-6-26	W.S.	6	SPLICE PL. ON LATS.



WT. OF STRUCT. STEEL FOR 1 SPAN L.B.	
BEAMS & STRINGERS	304.50
LATERALS, POSTS & BOLTS	1530
TOTAL FOR 1 SPAN	31980
ADD FOR EACH POST RP4	41



LOCATION OF THESE HOLES TO BE CHECKED WITH DEPTH OF BEAM BEFORE PUNCHING

**GENERAL NOTES:**  
 RIVETS 3/4" DIAMETER  
 HOLES 7/8" DIAMETER  
 FIELD CONNECTIONS RIVETED  
 SHOP PAINT NONE

EDGE DISTANCE 1/4" EXCEPT AS NOTED  
 STRUCTURAL STEEL TO BE SUBPUNCH  
 BEAMED - SEE SPECIFIC  
 MATERIAL LISTED FOR 1 SPAN  
 SPAN REQUIRED

**SHOP DETAILS**  
 80' STANDARD PONY TRUSS  
 CONCRETE FLOOR 20'-0" ROADWAY

OCT 1926  
 W. R. Sack 1/3/29  
 APPROVED BY  
 T. H. Kelly  
 CIVIL ENGINEER

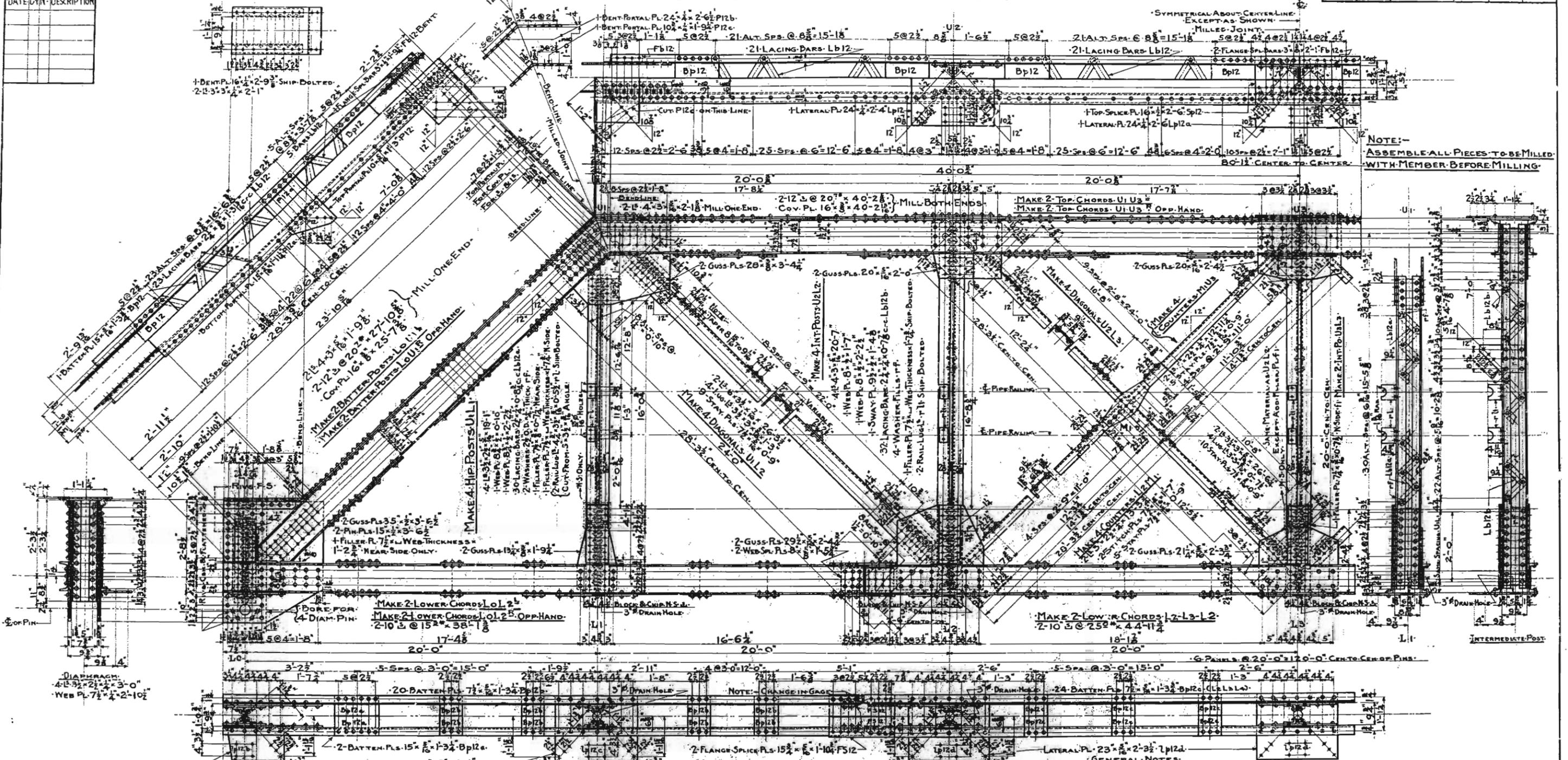
MADE JAN 1926 BY M.S.S.  
 TRACED FEB 1926 BY W.S.  
 CHECKED FEB 1926 BY W.S.

470

REVISIONS
DATE BY DESCRIPTION

# MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJECT NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	Mo.				



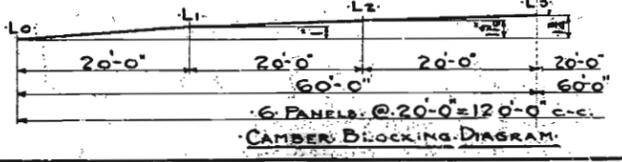
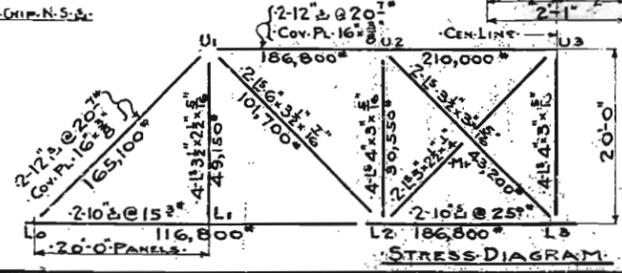
**NOTE:**  
ASSEMBLE ALL PIECES TO BE MILLED WITH MEMBER BEFORE MILLING.

**GENERAL NOTES:**  
 - STRUCTURAL STEEL TO BE SUBPUNCHED, MATCH-MARKED AND REAMED. SEE SPECIFICATIONS.  
 - TRUSSES TO BE ASSEMBLED COMPLETE IN SHOP FOR INSPECTION. SEE SPECIAL PROVISIONS.  
 - RIVETS 3/4" DIAMETER.  
 - HOLES 1/8" DIAMETER.  
 - FIELD CONNECTIONS RIVETED.  
 - SHOP PAINT NONE.

**SHOP DETAILS**  
 FOR  
 120'-0" STANDARD HIGH TRUSS  
 CONCRETE FLOOR 20'-0" ROADWAY

OCT. 1926  
 SUBMITTED BY: *W. P. Chen* 1/3/29  
 BRIDGE ENGINEER

APPROVED BY: *W. P. Chen*  
 CHIEF ENGINEER



TOTAL WT. OF 2 TRUSSES = 51,460#

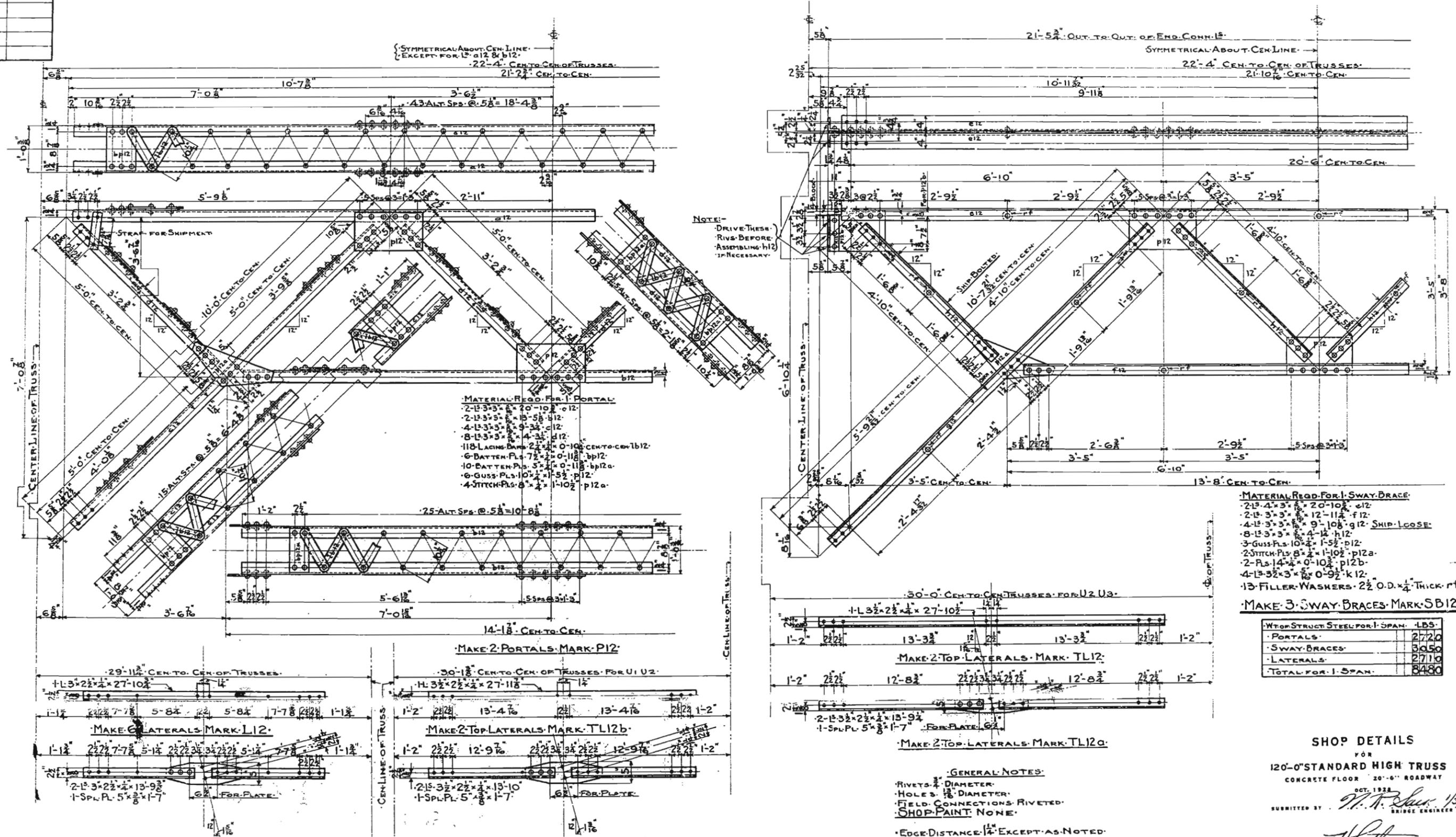
MADE MAY 1926 BY M.B.S.  
 TRACED MAY 1926 BY M.B.S.  
 CHECKED JUNE 1926 BY *[Signature]*

SH. NO. 1 OF 3  
 S 8120

# MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJECT NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	Mo.				

REVISIONS	DATE	BY	NO.	DESCRIPTION



**NOTE:**  
 DRIVE THESE RIVETS BEFORE ASSEMBLING IN NECESSARY.

- MATERIAL REQ. FOR 1 PORTAL:**
- 2-15-3/8" x 20'-10 1/2" c12
  - 2-15-3/8" x 15'-5 1/2" h12
  - 4-15-3/8" x 9'-3 1/2" c12
  - 8-15-3/8" x 4'-3 1/2" d12
  - 118 LAGS DIA. 2 1/2" x 0-10" CEN TO CEN 7b12
  - 6 BATTEN PLS. 7 1/2" x 0-11 1/2" bp12
  - 10 BATTEN PLS. 5 1/2" x 0-11 1/2" bp12a
  - 6 GUSS PLS. 10 1/2" x 1-5 1/2" p12
  - 4 STITCH PLS. 8" x 1-10 1/2" p12a

- MATERIAL REQ. FOR 1 SWAY BRACE:**
- 2-15-3/8" x 20'-10 1/2" c12
  - 2-15-3/8" x 12'-11 1/2" f12
  - 4-15-3/8" x 9'-10 1/2" g12 SHIP LOOSE
  - 8-15-3/8" x 4'-12" h12
  - 3 GUSS PLS. 10 1/2" x 1-5 1/2" p12
  - 2 STITCH PLS. 8" x 1-10 1/2" p12a
  - 2 PLS. 14 1/2" x 0-10 1/2" p12b
  - 4-15-3/8" x 0-9 1/2" k12
  - 13 FILLER WASHERS 2 1/2" O.D. x 1/4" THICK PF

**MAKE 3 SWAY BRACES MARK SB12**

TOP STRUCT. STEEL FOR 1 SPAN	LBS.
• PORTALS	2720
• SWAY BRACES	3050
• LATERALS	2710
<b>TOTAL FOR 1 SPAN</b>	<b>8480</b>

**SHOP DETAILS**  
 FOR  
 120'-0" STANDARD HIGH TRUSS  
 CONCRETE FLOOR 20'-6" ROADWAY  
 OCT. 1924

SUBMITTED BY *W. T. Shaw* 1/3/29  
 BRIDGE ENGINEER

APPROVED BY *A. H. Kelly*  
 CHIEF ENGINEER

- GENERAL NOTES:**
- RIVETS 3/4" DIAMETER
  - HOLES 5/8" DIAMETER
  - FIELD CONNECTIONS RIVETED
  - SHOP PAINT NONE
  - EDGE DISTANCE 1 1/4" EXCEPT AS NOTED

MADE MAY 1926 BY M.B.S.  
 TRACED MAY 1926 BY M.B.S.  
 CHECKED JUNE 1926 BY

**MATERIAL LISTED FOR 1 SPAN**  
 SPAN REQUIRED

SHEET OF

SH. NO. 2 OF 3  
**S 8120**

