
Documentation of the Historic Meramec River Bridge at Times Beach

Bridge No. J0421
St. Louis County, I-44 Outer Road, Historic Route 66
September 2012



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Meramec River Bridge At Times Beach Bridge J0421

St. Louis County
I-44 Outer Road
Historic U. S. Route 66

MoDOT Job Number J6P2306

Historical and Photographic Documentation

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Submitted to:
State Historic Preservation Office
Jefferson City, Missouri

Prepared for:
The Federal Highway Administration
In Compliance with
Section 106 of the National Historic Preservation Act

Kevin L. Keith, Director
Missouri Department of Transportation

September 2012

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HISTORIC DOCUMENTATION
BRIDGE J0421
MERAMEC RIVER BRIDGE

Location: St. Louis County, I-44 Outer Road (historically U. S. Route 66) over Meramec River at Times Beach (Route 66 State Park).

Construction Dates: 1931-1932

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

Present Use: Highway Bridge closed to all traffic, will be removed unless transferred to another entity which will take over maintenance and liability.

Significance: The Meramec River Bridge is listed on the National Register of Historic Places under Criteria A and C for statewide significance in engineering and transportation, with a period of significance of 1932-1956. The bridge is significant in transportation for association with U. S. Route 66 and significant in engineering as an unusual rigid-connected Warren deck truss design.¹

Historian: Karen L. Daniels, Historic Preservation Section, Design Division, Missouri Department of Transportation, September 2012.

¹ Keenoy, Ruth and Terri Foley. "Meramec River U. S. 66 Bridge – J421" National Register of Historic Places Registration Form, 2009. State Historic Preservation Office, Jefferson City, Missouri, p. 8-4.

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I. Introduction

The Meramec River Bridge (J0421) is located on an outer road in Route 66 State Park in Saint Louis County, Missouri. The bridge was constructed in 1931 to carry traffic relief highway 66 and served that purpose for traffic in both directions until 1956 when new lanes to carry eastbound traffic were completed.² The bridge carried west bound traffic until 1970 when new westbound lanes for Interstate 44 were completed.³

After Interstate 44 traffic was removed the bridge served an outer road and the community of Times Beach located on the west side of the Meramec River. It served that purpose until 1983 when the community was declared a hazardous waste site and quarantined for cleanup.⁴

In 1999 the Route 66 State Park opened on the site of Times Beach with a visitor's center located on the east side of the Meramec River.⁵ The bridge serves as a connection between the Visitor's Center and the rest of the park and is a part of the original location of Route 66 through the area that is promoted to tourists.⁶

The Missouri Department of Transportation put weight limits on the bridge in 2005 and lowered them twice more between 2005 and 2009. Major rehabilitation work was done on the bridge in 2006. In October 2009 the bridge was closed to all traffic, including bicycle and pedestrian. The Missouri Department of Transportation is looking for someone to take over maintenance and liability for the bridge or it will be removed in 2012.⁷

II. History of Bridge J0421

Land use in the area and the construction of the Votaw Bridge 1824-1925

The land in the area of Bridge J0421 was agricultural until the development of Times Beach. The land on the west side of the Meramec River was granted to John Votaw in 1824 by the General

² Missouri Department of Transportation. "St. Louis County, Project History Map." Transportation Planning, Missouri Department of Transportation, Jefferson City, Missouri.

³ Ibid.

⁴ Missouri Department of Transportation. "Route 66 Meramec River Bridge: Timeline of Events." Downloaded April 21, 2011 from: http://modot.mo.gov/stlouis/major_projects/documents/timeline.pdf.

⁵ Warhover, Diane. "The Road Back to Route 66." Missouri Resources Magazine. Fall 1999. Accessed on-line April 21, 2011 at: <http://www.dnr.mo.gov/magazine/1999-fall.pdf>.

⁶ Missouri State Parks. "Route 66 State Park." Web-site. Accessed April 21, 2011 from: <http://mostateparks.com/page/54997/general-information>.

⁷ Missouri Department of Transportation. "MoDOT Fact Sheet Historic Preservation Options for the Route 66 Meramec River Bridge." Accessed on-line April 21, 2011 at: http://www.modot.mo.gov/stlouis/major_projects/documents/Route66StateParkBridgeFactSheet-September2010.pdf.

Land Office. Votaw was described as a resident of St. Louis County. The land grant included 233.05 acres.⁸

East of the Meramec River, the south half of the southeast quarter was granted to Hamilton C. Williams of St. Louis County in 1838. Williams' land grant included 20.92 acres.⁹ Jonathan Harvey, Junior was granted the 180.19 acres in several parts including the north half of the southeast quarter of Section 32. Harvey transferred his grant in 1851 to William Christy and Robert Woods.¹⁰

John Votaw died in 1834 leaving a wife and three sons Lorenzo, Silas and John Augustus.¹¹ By 1878 Lorenzo Votaw owned the land and an adjacent parcel to the north.¹² In 1860 the household included his wife, Elizabeth and two children, Alonzo and Laura. There were several farm laborers that were part of the household as well as a private teacher.¹³ In 1870 it still included several farm laborers.¹⁴

The 1878 Atlas for St. Louis City and County clearly shows a road running through the area. East of the Meramec River it was identified as Antire Road, west of the Meramec River it was Blakky Road.¹⁵

⁸ General Land Office. "Certificate No. 189." Accession Number MO0010_.197. Downloaded March 14, 2011 from: http://www.glorerecords.blm.gov/details/patent/default.aspx?accession=MO0010_.197&docClass=STA&sid=nqjwms2w.scv.

⁹ General Land Office. "Certificate No. 5404." Accession Number MO0110_.353. Downloaded April 22, 2011 from: http://www.glorerecords.blm.gov/details/patent/default.aspx?accession=MO0110_.353&docClass=STA&sid=zfiogcyl.12k

¹⁰ General Land Office. "Certificate No. 7711." Accession Number MW-1082-007. Downloaded April 22, 2011 from: <http://www.glorerecords.blm.gov/details/patent/default.aspx?accession=1082-007&docClass=MW&sid=gfdixbnv.kcu>.

¹¹ Find a Grave. "Votaw Family Cemetery." Accessed April 22, 2011 at <http://www.findagrave.com/cgi-bin/fg.cgi?page=gsr&GScid=2338687>.

¹² Pitzman, Julius. *Pitzman's New Atlas of the City and County of Saint Louis, Missouri*. Philadelphia, PA: A. B. Holcombe & Co., 1878, p. 37.

¹³ United States Bureau of the Census. "Eighth Census of the United States, Schedule 1—Free Inhabitants in Meramec Twp. in the County of St. Louis, State Of Missouri." Microfilm, Missouri State Archives, Jefferson City, Missouri.

¹⁴ Ibid. "Ninth Census of the United States, Schedule 1—Free Inhabitants in Meramec Township being the County of St. Louis, State Of Missouri." Microfilm, Missouri State Archives, Jefferson City, Missouri.

¹⁵ Pitzman.



Figure 1. Crop from 1878 Pitzman's Atlas showing area bridge J0421 would be constructed.¹⁶

In 1896 the citizens of Meramec and Bonhomme townships petitioned the St. Louis County Court to construct a bridge across the Meramec River at Votaw's Ford. The petitioners had pledged a substantial amount toward the expense of constructing a bridge. The County Court referred the petition to Edgar Rapp, the Commissioner of Roads and Bridges for an estimate of the cost of constructing a bridge in that location.¹⁷

Apparently nothing occurred, because petitioners again appeared before the St. Louis County Court in April 1899 requesting the County build a bridge across the Meramec River at Votaw's Ford. The Court received and filed the petition.¹⁸ On September 11, 1899 Judge George Horneker, Commissioner for the Second District, moved that the county should build the bridge. The Commissioner of Roads and Bridges was ordered to make an estimate of the costs at his earliest convenience.¹⁹

On September 15 the report on building a bridge at Votaw's Ford was submitted to the County Court.²⁰ On September 25 the Court ordered that the plans and specifications be approved and further awarded a contract to the St. Louis Bridge and Iron Company for \$15,000 to build the

¹⁶ Ibid.

¹⁷ St. Louis County Court. "Minutes of the Meeting held March 9, 1896." Vol. 12, p. 312. Microfilm, Missouri State Archives, Jefferson City, Missouri.

¹⁸ Ibid. "Minutes of the Meeting held April 19, 1899." Vol. 15, p. 47. Microfilm, Missouri State Archives, Jefferson City, Missouri.

¹⁹ Ibid. "Minutes of the Meeting held September 11, 1899." Vol. 15, p. 196. Microfilm, Missouri State Archives, Jefferson City, Missouri.

²⁰ Ibid. "Minutes of the Meeting held September 15, 1899." Vol. 15, p. 200. Microfilm, Missouri State Archives, Jefferson City, Missouri.

bridge.²¹ The contract was rescinded at the next meeting of the court and it was ordered that the bridge be advertised for bids.²²

On October 30, 1899 the Commissioner for Roads and Bridges, Edgar Rapp, reported that on the 28th of October he received bids for the Votaw Ford Bridge and let the bridge to William Y. Bean for the low bid of \$16,863. The court accepted the bid and ordered the county to enter into the contract.²³

The Votaw Bridge served the area until the construction of bridge J0421. It was removed at that time. One of the two truss sections was relocated to Jefferson County and served as the Klondike Road Bridge.²⁴

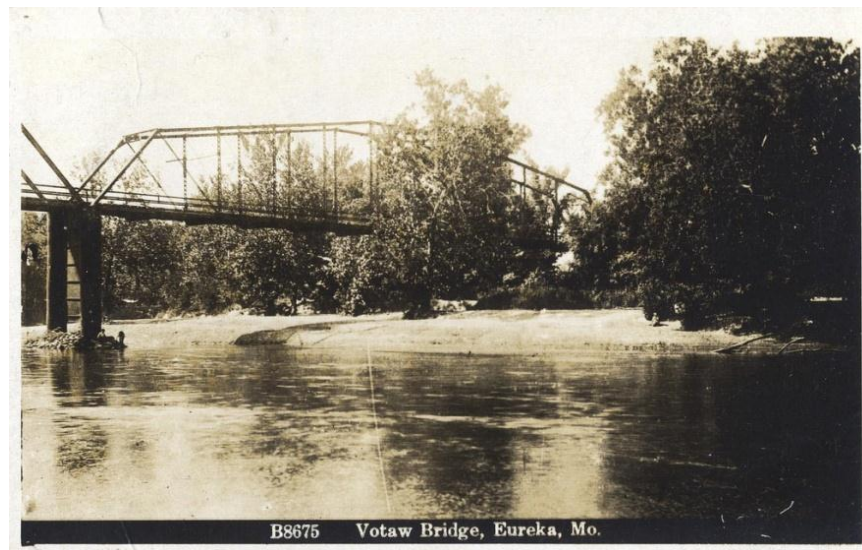


Figure 2. One span of the Votaw Bridge.²⁵

The Development of Traffic Relief Highway 66

With the passage of Proposition Number 3 in 1928 the Missouri Constitution was amended to allow for, among other things, the creation of a system of traffic relief roads in the Kansas City and St. Louis areas.²⁶

²¹ Ibid. "Minutes of the Meeting held September 25, 1899." Vol. 15, p. 204. Microfilm, Missouri State Archives, Jefferson City, Missouri.

²² Ibid. "Minutes of the Meeting held September 27, 1899." Vol. 15, p. 205. Microfilm, Missouri State Archives, Jefferson City, Missouri.

²³ Ibid. "Minutes of the Meeting held October 30, 1888." Vol. 15, p. 273. Microfilm, Missouri State Archives, Jefferson City, Missouri.

²⁴ Gage, Tom, Craig Sturdevant and John Carrel. "Klondike Road Bridge (Votaw Road Bridge)." Historic American Engineering Record. Number MO-71. Library of Congress, pp. 2-3. Downloaded February 10, 2011 from <http://memory.loc.gov/pnp/habshaer/mo/mo1200/mo1205/data/mo1205.pdf>.

²⁵ Image courtesy of Liz Castro.

On July 9, 1929 a delegation from St. Louis County appeared before the Missouri Highway Commission to make a statement that they felt the St. Louis area had been “discriminated against by the Commission in the matter of locating and constructing state roads.”²⁷ The Chief Engineer, T. H. Cutler, was called on to outline State Highway Department plans for traffic congestion relief in the vicinity of St. Louis. Among the roads discussed by Mr. Cutler was a “road leaving U. S. 50 and U. S. 66 at or near Grays Summit, thence into St. Louis over the Antire and Watson Roads.”²⁸ This road would be designated Traffic Relief 66 (TR 66) and by 1933 would be the main alignment of Route 66 through St. Louis County to Gray’s Summit, replacing the Manchester Road alignment.²⁹

The road would cross the Meramec River twice, once in the vicinity of Times Beach and again between Fenton and Sunset Hills.³⁰ A survey done for the bridge in the vicinity of Times Beach shows scattered development of cabins in the area and a proposed alignment of the road slightly north of the existing road and bridge. The survey also included a sketch of the Votaw Bridge, describing it as constructed in 1900 by the St. Louis Bridge and Iron Company, two span through truss 500 feet in length, with a steel superstructure, rock masonry abutments and with a 15 foot roadway. There was also a 50 foot long pony truss on the west end of the bridge.³¹

In the 1930 Biennial Report the Bridge Division reported that the traffic relief program had called for a number of specially designed bridges. Some of the bridges were for stream crossings, but others were for railroad grade separations and grade separations at important highway intersections. Special features included roadway widths and a special consideration given to the appearance of these structures—they were to be given a “more pleasing effect and in some cases stone facing is being used to further improve the appearance.”³²

²⁶ Missouri State Highway Commission. *Seventh Biennial Report for the State Highway Commission of Missouri for the Period Ending December First 1930*. Jefferson City, MO: Botz Printing & Stationary Co., 1930. p. 30. Proposition 3 allowed: issuance of \$75 million in bonds for the completion of the primary and secondary roads as set up in the Centennial Roads law, an additional 300 miles to be added to the state highway system, state park connectors, building traffic relief routes in Kansas City and St. Louis, and construction of 5,000 miles of supplementary state roads in the counties (these would become the lettered routes).

²⁷ Missouri State Highway Commission. “Minutes of the Meeting of the State Highway Commission, held in Jefferson City, Missouri, July 9, 1929,” p. 5. As held by the Secretary of the Commission, Missouri Department of Transportation, Jefferson City, Missouri.

²⁸ Ibid.

²⁹ Missouri State Highway Commission. “Map of Missouri Showing State Road System. Jefferson City, Missouri, 1929”; Ibid “Map of Missouri Showing State Road System.” Jefferson City, Missouri, 1932; Ibid “Map of Missouri Showing State Road System.” Jefferson City, Missouri, 1933.

³⁰ Missouri Department of Transportation. “Project History Map St. Louis County.” Transportation Planning, Missouri Department of Transportation, Jefferson City, Missouri; Ibid. “Project History Map Franklin County.”

³¹ Missouri State Highway Department. “Report of Bridge Survey.” Route 66 (Watson Road) St. Louis County, Bridge J-421. Microfiche. Bridge Division, Missouri Department of Transportation, Jefferson City, Missouri.

³² Missouri State Highway Commission. *Seventh Biennial Report of the State Highway Commission of Missouri for the Period Ending December First 1930*. Jefferson City, MO: Botz Printing & Stationary Co., 1930. pp. 255-257.

Traffic Relief 66 had started construction during this time period and one of the new bridges was highlighted in the report, the Meramec River Bridge near Kirkwood. The bridge was 1,132 feet long with a steel superstructure and reinforced concrete substructure. The cost of the bridge was \$158,122.³³

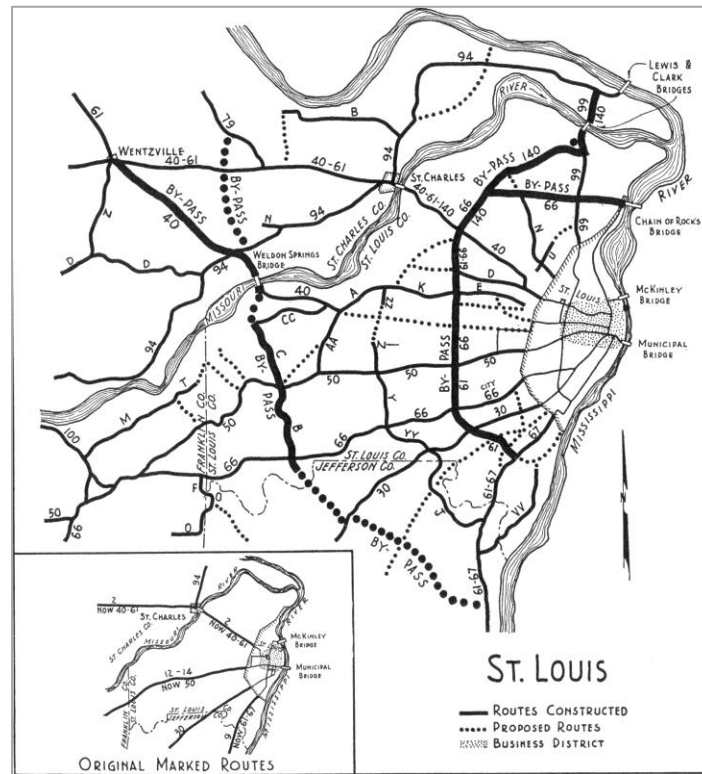


Figure 3. Map showing location of routes in St. Louis County, including relocated Highway 66.³⁴

The St. Louis County Court started to purchase right of way for the Traffic Relief Route between Vandover Road and the Votaw Bridge. By March 1930 they had acquired the right of way necessary between the two points and in that month requested reimbursement from the State Highway Commission for the expense in the amount of \$33,825.³⁵ Apparently not all the necessary right of way had been acquired because in May the Highway Commission authorized

³³ Ibid. p. 259.

³⁴ MSHC. *Tenth Biennial Report of the State Highway Commission for the Period Ending December 1, 1936*. Jefferson City, MO: Midland Printing Co., 1936, p. 41.

³⁵ Ibid. "Minutes of the Meeting of the State Highway Commission, held in Jefferson City, Missouri, April 8, 1930," pp. 39-41. As held by the Secretary of the Commission, Missouri Department of Transportation, Jefferson City, Missouri.

state negotiation for right of way along this portion of the corridor and condemnation proceedings if necessary.³⁶

Even as construction was underway for the traffic relief route east of the Votaw Bridge there were groups unhappy with the location of the route west of the crossing that tried to have the location changed. In January 1931 two delegations from Eureka appeared before the State Highway Commission. One delegation asked for the road to be located south of Eureka and crossing the Missouri Pacific Railroad tracks on a viaduct east of Allenton, the other delegation supported the location chosen by the State Highway Department which crossed the Frisco and Missouri Pacific railroads east of Eureka. The route selected by the department was shorter than the route proposed by the delegation and construction had already begun on the Missouri Pacific grade separation so changing routes would mean a delay in the project and lost money for the department. The Commission agreed to consider the alternate route, but stated they felt the original location was the correct one.³⁷

Construction of the Meramec River Bridge at Times Beach

On April 22, 1931 the State Highway Department forwarded an *Application for Approval of Plans of a Bridge to Cross Navigable Waters of the United States* to the War Department. The bridge was to be constructed across the Meramec River about 2 miles east of Eureka as part of Traffic Relief Route 66 on the State Highway System.³⁸ In the cover letter accompanying the application T. H. Cutler, the Chief Engineer, added that the bridge was 830 feet below the present bridge, known as the Votaw Crossing, and stated that the Department was “very anxious to place this bridge under contract.”³⁹

In May 1931 the Commission authorized the Chief Engineer to negotiate with the War Department for approval of plans for a new bridge over the Meramec River at Times Beach. War Department approval was necessary for the bridge since the river was considered a navigable waterway and all bridges over such waters required the approval of the War Department.⁴⁰ The approval was forthcoming on June 2, 1931 provided that “all parts of the existing bridge not

³⁶ Ibid. “Minutes of the Meeting of the State Highway Commission, held in Jefferson City, Missouri, May 13, 1930,” pp. 105-106. As held by the Secretary of the Commission, Missouri Department of Transportation, Jefferson City, Missouri.

³⁷ Ibid. “Minutes of the Meeting of the State Highway Commission, held in Jefferson City, Missouri, January 13, 1931,” pp. 1-2. As held by the Secretary of the Commission, Missouri Department of Transportation, Jefferson City, Missouri.

³⁸ Missouri State Highway Department. “Application for Approval of Plans of a Bridge to Cross Navigable Waters of the United States.” April 22, 1931, Microfiche, Bridge Division, Missouri Department of Transportation, Jefferson City, Missouri.

³⁹ Letter, T. H. Cutler to John C. Cotwals, Corp of Engineers, War Department. Microfiche, Bridge Division, Missouri Department of Transportation, Jefferson City, Missouri.

⁴⁰ Missouri State Highway Commission. “Minutes of the Meeting of the State Highway Commission, held in Jefferson City, Missouri, May 13, 1931,” p. 5. As held by the Secretary of the Commission, Missouri Department of Transportation, Jefferson City, Missouri.

utilized for the new structure be removed down to the natural stream bottom and channel cleared within ninety days.”⁴¹

On July 31, 1931 bids for the construction of the Meramec River Bridge at Times Beach were received. The low bidder for the project was the St. Louis based Frazier-Davis Construction Company with a bid of \$134,928.09.⁴²

Work started on the bridge on August 15, 1931 and it was anticipated that the bridge would be completed by September 30, 1932. By early September work was started on the substructure of the bridge with excavation for bents 2 and 4 underway and excavation for bent 3 completed. In addition to the excavation for bent 3 forms were being built and about 40% of the concrete for the bent had been poured.⁴³ The Daily Diary Record attached to the Weekly Report indicated that 2 foremen and between 31 and 37 people worked on the site (most of them local); they made good progress. The weather conditions were variable. On September 1 a tornado passed near the project site, but did no damage.⁴⁴

Late September found the crews working on the footing for abutment 1 and on bents 2 and 4.⁴⁵ In October they were working on abutment 1 and piers 4, 5, 8, 9 and 12.⁴⁶ By late September they were driving pilings, which they continued to do throughout October.⁴⁷

The bridge was completed on May 23, 1932, and the final inspection occurred that same day.⁴⁸ Frazier-Davis received their final payment in December 1932. Although the original estimate of the cost of the bridge was \$146,952.28, the bridge was constructed for \$135,299.07.⁴⁹ The

⁴¹ War Department. “Approval of location and plans of bridge.” June 2, 1931. Microfiche, Bridge Division, Missouri Department of Transportation, Jefferson City, Missouri.

⁴² Missouri State Highway Commission. “Minutes of the Meeting of the State Highway Commission, held in Jefferson City, Missouri, August 11, 1931,” p. 49. As held by the Secretary of the Commission, Missouri Department of Transportation, Jefferson City, Missouri.

⁴³ Anderson, H. B. “Project Engineers “Weekly Report, Week ending September 3, 1931.” p. 1. Microfiche, Bridge Division, Missouri Department of Transportation, Jefferson City, Missouri.

⁴⁴ Ibid. p. 2.

⁴⁵ Anderson, H. B. “Project Engineers Weekly Report, Week Ending September 28, 1931.” Microfiche, Bridge Division, Missouri Department of Transportation, Jefferson City, Missouri.

⁴⁶ Anderson, H. B. “Project Engineers Weekly Report, Week Ending October 28, 1931.” Microfiche, Bridge Division, Missouri Department of Transportation, Jefferson City, Missouri.

⁴⁷ “Pile Driving Data.” Microfiche, Bridge Division, Missouri Department of Transportation, Jefferson City, Missouri.

⁴⁸ Letter. T. H. Cutler to S. M. Rudder, May 28, 1932. Microfiche, Bridge Division, Missouri Department of Transportation, Jefferson City, Missouri.

⁴⁹ Missouri State Highway Commission. “Minutes of the Meeting of the State Highway Commission, held in Jefferson City, on Tuesday, January 10, 1933,” p. 60. As held by the Secretary to the Commission, Missouri Department of Transportation, Jefferson City, Missouri.

significant cost under run was due to two factors—an original high estimate for materials (saved \$3770.94) and the contractors non-use of the 10% contingency fund (\$6382.27).⁵⁰

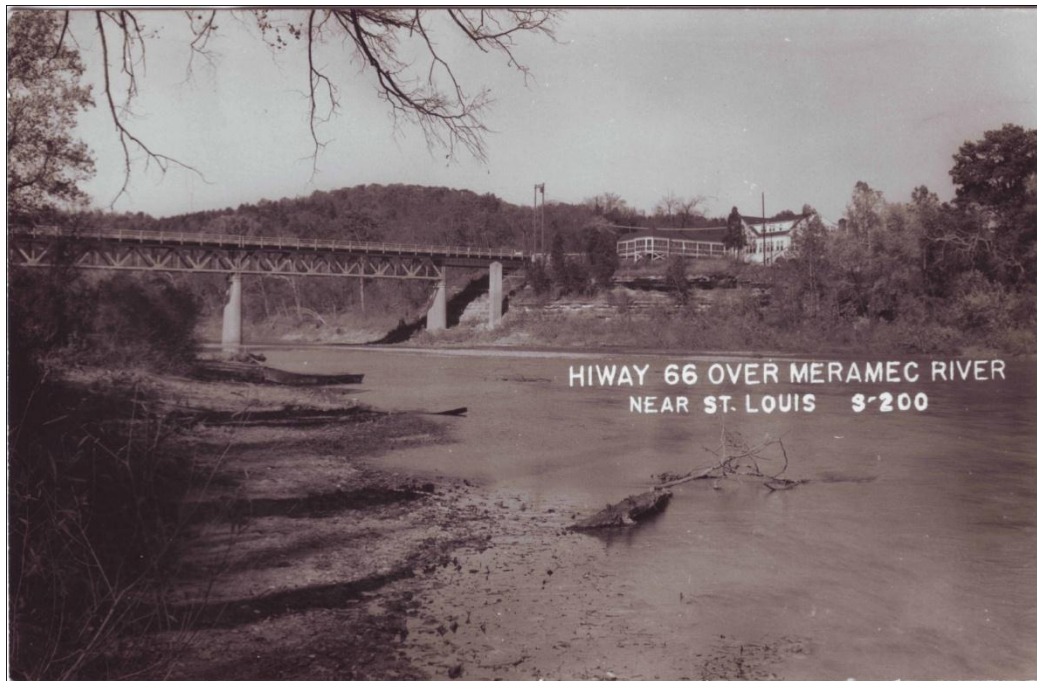


Figure 4. A postcard showing bridge J0421.⁵¹

The traffic relief highway was shown as completed from St. Louis to the Times Beach area on the 1932 Map of Missouri published by the State Highway Commission, which showed the state of the highway system as of January 1 of the year.⁵² By January 1, 1933, the highway was shown as completed to Gray's Summit.⁵³

The highway carried increasing traffic on through the mid-1950s when the road could no longer carry the traffic load. In 1953 a planned four lane expansion of highway 66 was surveyed and construction began in 1955, with the original pavement in this area carrying the west bound lanes and new pavement carrying east bound lanes. A new bridge was constructed over the Meramec River in 1955-1956 to carry the east bound lanes.⁵⁴

⁵⁰ Ibid. p. 62.

⁵¹ Image courtesy of Joe Sonderman.

⁵² Missouri State Highway Commission. "Map of Missouri Showing State Road System." Jefferson City, MO: State Highway Department, 1932.

⁵³ Missouri State Highway Commission. "Map of Missouri Showing State Road System." Jefferson City, MO: State Highway Department, 1933.

⁵⁴ Missouri State Highway Commission. "Plan and Profile of Proposed State Road Federal Aid Project 66TR-IN-608(10), St. Louis County." 1956. Microfilm, Design Division, Missouri Department of Transportation, Jefferson City, Missouri.

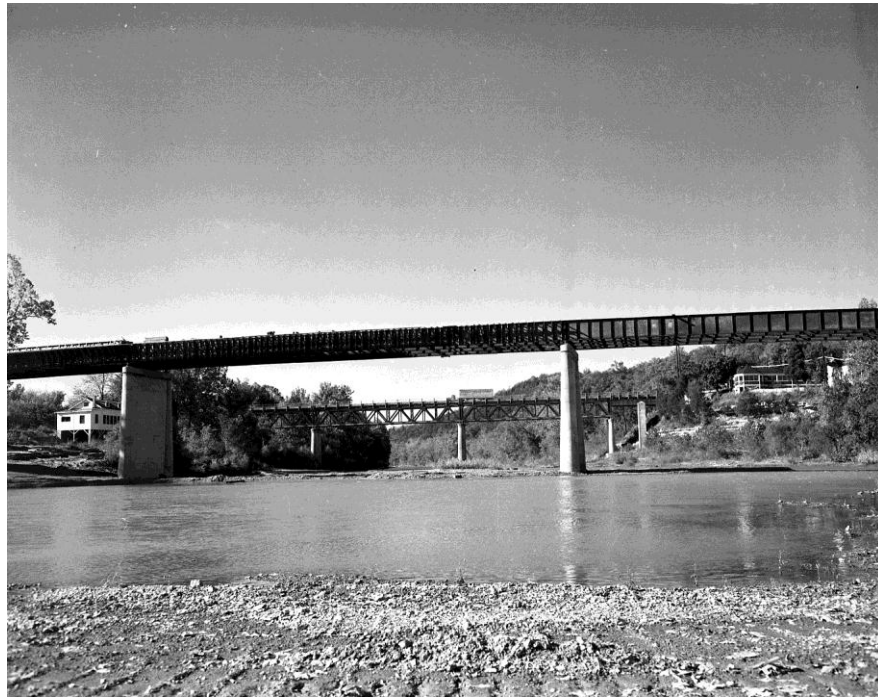


Figure 5. Bridge J0421 in background during construction of eastbound bridge in 1955.⁵⁵

New westbound lanes were planned in the late 1960s and construction began in 1970. These lanes were placed between the eastbound lanes constructed in 1956 and the original alignment constructed in 1932. The original alignment became an outer road serving the community of Times Beach.⁵⁶

Times Beach

In August 1925 the *St. Louis Times* newspaper platted a summer resort community in Section 32 of Township 44 Range 4. They named the community Times Beach and offered lots for \$67.50 and offered terms of \$10 down and \$2.50 month until paid, the only other stipulation being that to be eligible to purchase a lot the prospective owner had to subscribe to the paper for six months. The purchase price entitled the buyer to one building lot, equal use (with other lot owners) of the river front park and beaches, membership in the community lodge (which the *St. Louis Times* was building), and free use of bath houses and docks (which the *St. Louis Times* was also building). Two of the three photographs in the advertisement included the Votaw Bridge.⁵⁷

⁵⁵ Missouri Department of Transportation. Negative collection 1274. 1955. Missouri State Archives, Missouri Department of Transportation Collection, Jefferson City, Missouri.

⁵⁶ Missouri State Highway Commission. "Plan and Profile of Proposed State Road Federal Aid Project I-44-I-IG-44-4(15), St. Louis County." 1970. Microfilm, Design Division, Missouri Department of Transportation, Jefferson City, Missouri.

⁵⁷ "Greatest Subscription Offer Ever Made." *The St. Louis Times*, 12 August 1925, p.1. Microfilm, State Historical Society of Missouri, Columbia, Missouri.

During the post-World War II era, the housing shortage caused many of the weekend cottages to be brought into permanent use and many new homes were constructed as well. Since flooding appeared to have diminished these new homes were not constructed on stilts like the early cottages had been.⁶² The population of the area grew steadily, and by 1960 the town of Times Beach had incorporated and had a population of 986 residents.⁶³

In 1970 the population had grown to 1265.⁶⁴ The residents were living in numerous small houses and two growing mobile home parks. The community had dirt roads, because the town was unable to afford to pave them. In 1972 and 1973 the community contracted with a waste oil hauler, Russell Bliss, to spray the roads with oil. This was affordable and would keep the dust down.⁶⁵

Late in 1982 the town heard the first rumors that the oil Bliss had used to spray their streets a decade before may have been contaminated with dioxin.⁶⁶ Dioxin refers to a family of chemicals now known to cause cancers in humans. The most toxic in the family is the compound 2, 3, 7, 8-tetrachlorodibenzo-para-dioxin (TCDD)⁶⁷ which is what had been sprayed on the roads in Times Beach.⁶⁸

In December 1982 low lying areas along the Meramec River were warned of the potential for flooding. On December 5 flood waters in Times Beach crested at 42.88 feet, well over the flood stage of 18.5 feet. On December 23, 1982 residents who had evacuated because of the flooding were advised not to return to the town, and those who had remained were advised to leave.⁶⁹

On February 22, 1983 the Environmental Protection Agency announced a joint federal/state agreement to buy-out and relocate residents of Times Beach. Over \$33 million in Superfund site monies had been set aside for the relocation. The EPA announced that post-flood samples taken

⁶² Ibid.

⁶³ U. S. Department of Commerce, Bureau of the Census. *Census of Population: 1960 Vol. 1 Characteristics of the Population, Part 27. Missouri*. Washington, DC: U. S. Government Printing Office, 1963. p. 27-22. Incorporation between 1950 and 1960 is assumed because the population table shows a break out of Times Beach population for 1960 but not for 1940 or 1950.

⁶⁴ U. S. Department of Commerce, Bureau of the Census. *1980 Census of Population Part 27. Number of Inhabitants of Missouri*. Washington, DC: U. S. Government Printing Office, 1981, p. 27-23.

⁶⁵ Leistner.

⁶⁶ Ibid.

⁶⁷ National Institute of Health. "Dioxins." 2011. Downloaded April 21, 2011 from: <http://www.niehs.nih.gov/health/topics/agents/dioxins/index.cfm>.

⁶⁸ Environmental Protection Agency. "Explanation of Significant Differences: Times Beach EPA ID: MOD980685226 OU 02, Times Beach, MO 07/18/1990." P. 2. Accessed on-line April 20, 2011 from: <http://www.epa.gov/superfund/sites/rods/fulltext/e0790509.pdf>.

⁶⁹ Leistner.

in yards and house showed some level of contamination; the streets, ditches and right of way showed high levels of contamination.⁷⁰

Work on the buy-out progressed slowly, with residents in the community feeling the offers they were being given were too low. However, the buyouts proceeded and the property was acquired by the State of Missouri, as called for in the joint agreement.⁷¹ In 1985 the Town of Times Beach was officially and formally unincorporated.⁷²

The Environmental Protection Agency produced an Environmental Impact Statement to study the best ways to remedy the contamination. The Record of Decision was signed in September 1988 and the decision was to incinerate the soil from the roads and right of way, invert the top twelve inches of soil in the remainder of the community and demolish the buildings and associated features of the community and dispose of them by burying them on the site.⁷³

In 1990 it was announced that Syntex would handle the cleanup of the Times Beach superfund site. They constructed an incinerator to destroy dioxin contaminated soils and when the project was completed would dismantle the incinerator and all ancillary buildings.⁷⁴

The cleanup ended in June 1997. The incinerator had cleaned 265,000 tons of dioxin contaminated soil from Times Beach and 27 nearby areas. By fall the site was ready for productive use.⁷⁵ Since the State of Missouri owned the land and there was a desire for green space along the Meramec River the state decided to convert the property into a park.⁷⁶

⁷⁰ Environmental Protection Agency. "Joint Federal/State Action Taken to Relocate Times Beach Residents." February 22, 1983. Accessed April 20, 2011 from: <http://www.epa.gov/history/topics/times/02.htm>.

⁷¹ Leistner.

⁷² Ashcroft, John. "Executive Order No. 85-09" April 2, 1985. Access on-line April 21, 2011 from: http://www.sos.mo.gov/library/reference/orders/1985/eo1985_009.asp.

⁷³ Environmental Protection Agency. "Explanation of Significant Differences: Times Beach EPA ID: MOD980685226 OU 02, Times Beach, MO 07/18/1990." p. 2-3. Accessed on-line April 20, 2011 from: <http://www.epa.gov/superfund/sites/rods/fulltext/e0790509.pdf>. Environmental Protection Agency. "Times Beach Record of Decision Signed." September 30, 1988. Accessed on-line April 20, 2011 from: <http://www.epa.gov/history/topics/times/03.htm>.

⁷⁴ Environmental Protection Agency. "Times Beach Settlement Reached." July 20, 1990. Accessed on-line April 20, 2011 from: <http://www.epa.gov/history/topics/times/01.htm>.

⁷⁵ Environmental Protection Agency. "Times Beach One-Page Summary." Accessed on-line April 20, 2011 from: http://www.epa.gov/superfund/programs/recycle_old/success/1-pagers/timesbch.htm.

⁷⁶ "St. Louis Spanning the Middle of America." *Lay of the Land*. Winter 2006, p. 10.

Route 66 State Park

The first section of the Route 66 State Park opened in September 1999. The State Park provides natural areas with trails, boat docks and the opportunities to view wildlife in the area; it also connects with the regional greenways system along the Meramec River. The park was dedicated to Route 66, and included reconstructing the original highway route through the park and providing a visitors center with interpretation.⁷⁷

The Meramec River Bridge is an integral part of the Route 66 State Park and connects the visitor's center on the east side of the Meramec River with the natural areas on the west side of the river. It also allows Route 66 enthusiasts the opportunity to cruise on a bridge historically associated with the highway.⁷⁸

In 2004 the Missouri Department of Transportation (MoDOT) started working with the Missouri Department of Natural Resources/State Parks and the East West Gateway Metropolitan Planning Organization to identify funding sources for rehabilitation of the bridge or for the transfer of the bridge to State Parks. Since the bridge was no longer connecting parts of the state highway system and only carried an average 400 cars daily it was a low maintenance priority for MoDOT.⁷⁹

In 2005 MoDOT placed a 15 ton weight limit on the bridge. Significant repairs were made to the bridge in 2006 but the weight limit remained. In 2007 the weight limit was further reduced to 10 tons and it was restricted to one lane traffic. In 2009 the weight limit was further reduced to 5 tons and in October 2009 the bridge was closed to all traffic, including pedestrian and bicycles.⁸⁰

III. Builder and Fabricator

Frazier-Davis Construction Company—St. Louis, Missouri

The Frazier-Davis Construction Company was formed on February 13, 1917 in the City of St. Louis with \$2000 of capital stock, divided into 100 shares worth \$20 each. The incorporators were Adrian W. Frazier (59 shares), E. C. Davis (40 shares) and George L. Frazier (1 share), who formed the first Board of Directors of the Company. The company was formed to conduct “a general construction business and to do a general business of civil and mechanical engineering and to build, erect and construct improvements of every kind and character.”⁸¹

⁷⁷ Warhover.

⁷⁸ Ibid.

⁷⁹ Missouri Department of Transportation. “Route 66 Meramec River Bridge: Timeline of Events.” Accessed on-line April 21, 2011 at: http://www.modot.mo.gov/stlouis/major_projects/documents/timeline.pdf.

⁸⁰ Missouri Department of Transportation. “MoDOT Fact Sheet Historic Preservation Options for the Route 66 Meramec River Bridge.” Accessed on-line April 21, 2011 at: http://www.modot.mo.gov/stlouis/major_projects/documents/Route66StateParkBridgeFactSheet-September2010.pdf.

⁸¹ Frazier-Davis Construction Company. “Creation Filing.” Charter 33426. Missouri Secretary of State, Corporations Division. Downloaded February 15, 2011 from <https://www.sos.mo.gov/BusinessEntity/soskb/Corp.asp?32149>

The first job the Frazier-Davis Construction Company was awarded was a concrete bridge in Marshall, Texas. They also did extensive work at the Rock Island Arsenal for the sewer and gas lines and building foundations. In 1923 the company was awarded a million dollar contract to construct a new water plant for St. Louis along the Missouri River, and in 1925 constructed the reservoir for the water plant. The Frazier-Davis Construction Company was described by *The Explosives Engineer* as “one of the leading construction firms of the country.”⁸²

In 1940 the company voted to increase capital stock for the first time, from the 2,000 shares to 75,000 shares, each worth \$20.00. The assets of the corporation were valued at over \$2 million at the time; real estate holdings included several building lots in the St. Louis area, many in the Pasadena Hills subdivision, and half-interest in the Pasadena Hills Subdivision.⁸³

Adrian Frazier remained the primary stockholder with 13,500 shares and was the Trustee for the stocks held by his wife, Helen (12,000 shares). By this time Edward Davis (12,000 shares) and his children had moved to Delaware. Leta Davis’ shares had passed to their children, Sarah Davis Green and Edward C. Davis, junior (each had 6,000 shares of the corporation), with Edward Davis acting as their Trustee. W. J. Wells, the Secretary of the Corporation, was a minority shareholder, having 500 shares of the company once the increase was accomplished.⁸⁴

The Frazier-Davis Construction Company was dissolved on December 29, 1941 by unanimous vote of its stockholders.⁸⁵

On April 8, 1948 the Company was reincorporated with three shareholders Adrian W. Frazier (12,999 shares), E. C. Davis (12,000 shares) and G. Carroll Stribling (1 share) and five members on the Board of Directors: Adrian W. Frazier, E. C. Davis, Grant Wyatt, E. C. Davis, Jr., and George D. Frazier.⁸⁶

The reincorporated company had a wider scope of purpose than the original company. It included among its purposes: conducting and carrying on “a business of builders and contractors for the purpose of building, erecting, altering, repairing or doing any other work in connection with any and all classes of building and improvements of any kind and nature whatsoever, including the building of houses, factories, buildings, works of erections of every kind and

⁸² “Adrian W. Frazier.” *The Explosives Engineer* 14 (1936), p. 225.

⁸³ Frazier-Davis Construction Company. “Statement of Increase of Capital Stock of Frazier-Davis Construction Company.” Missouri Secretary of State, Corporations Division. Downloaded February 15, 2011 from <https://www.sos.mo.gov/BusinessEntity/soskb/Corp.asp?32149>

⁸⁴ Ibid.

⁸⁵ Ibid. “Affidavit of Dissolution.” Missouri Secretary of State, Corporations Division. Downloaded February 15, 2011 from <https://www.sos.mo.gov/BusinessEntity/soskb/Corp.asp?32149>.

⁸⁶ Ibid. “Creation Filing.” Charter 72418. Corporations Division, Missouri Secretary of State, Jefferson City, Missouri. Downloaded February 15, 2011 from <https://www.sos.mo.gov/BusinessEntity/soskb/Filings.asp?70585#>.

description, including the locating and laying out and constructing of roads, avenues, docks, slips, sewers, bridges, wells, walls, canals, railroads or street railways, power plants, and generally in all classes of buildings, erections and works both public and private.”⁸⁷ In addition the company would manufacture, buy, sell and process building materials, including cement, and hold patents.⁸⁸

In an affidavit filed the same day as the papers reincorporating the business, the board of directors stated they would commence business with the “construction equipment formerly owned by the Frazier-Davis Construction Company, a partnership, consisting of four (4) No. 6 Northwestern Cranes; six (6) passenger automobiles; four (4) concrete mixing trucks, and miscellaneous other equipment regularly used in the past by Frazier-Davis Construction Company.”⁸⁹

Adrian W. Frazier died on January 4, 1967 at the age of 78.⁹⁰ In February 1967, his son, George D. Frazier was elected Chairman of the Board of Directors and the number of Directors was increased from five to seven.⁹¹ The company continued on for several more years. In 1974 they filed to begin dissolving the business which was completed in 1977.⁹²

In 1988 a third iteration of the Frazier-Davis Construction Company was incorporated by Marc B. Fried. This company had a focus of “making estimates and bids on and erecting and constructing buildings, docks, wharves, sidewalks, roadways, swimming pools, tennis courts, and any and all similar types of construction.”⁹³ Other than sharing the name, the company has no historical ties with the company that constructed the Meramec River Bridge.

⁸⁷ Ibid, p. 3.

⁸⁸ Ibid. pp. 3-4.

⁸⁹ Ibid. “Affidavit of Recording of Articles of Incorporation and Payment of Capital with Which the Corporation will Commence Business.” Charter 72418. Corporations Division, Missouri Secretary of State, Jefferson City, Missouri. Downloaded February 15, 2011 from <https://www.sos.mo.gov/BusinessEntity/soskb/Filings.asp?70585#>.

⁹⁰ “Adrian W. Frazier Memorial Service.” *St. Louis Post Dispatch*. January 5, 1967, p. 12A. Microfilm, State Historical Society of Missouri, Columbia, Missouri.

⁹¹ Frazier-Davis Construction Company. “Certificate of Amendment of Articles of Incorporation of Frazier-Davis Construction Company.” Charter 72418. Dated February 1, 1967. Corporations Division, Missouri Secretary of State, Jefferson City, Missouri. Downloaded February 15, 2011 from <https://www.sos.mo.gov/BusinessEntity/soskb/Filings.asp?70585#>.

⁹² Ibid. “Articles of Dissolution by Voluntary Action Pursuant to Unanimous Consent of Shareholders.” Charter 72418. Corporations Division, Missouri Secretary of State, Jefferson City, Missouri. Downloaded February 15, 2011 from <https://www.sos.mo.gov/BusinessEntity/soskb/Filings.asp?70585#>; Ibid. “Articles of Liquidation.” Charter 72418. Corporations Division, Missouri Secretary of State, Jefferson City, Missouri. Downloaded February 15, 2011 from <https://www.sos.mo.gov/BusinessEntity/soskb/Filings.asp?70585#>.

⁹³ Ibid. “Articles of Incorporation.” Charter 310522. Corporations Division, Missouri Secretary of State, Jefferson City, Missouri. Downloaded February 15, 2011 from <https://www.sos.mo.gov/BusinessEntity/soskb/Filings.asp?276366#>.

IV. Physical Description of Bridge J0421

This description is based on the plans for a Bridge over Meramec River (J-421) developed by the Bridge Division of the State Highway Department in 1931 (a copy is attached to this report)⁹⁴ and on photographs taken of the bridge on February 24, 2010.

The Meramec River Bridge (J0421) is composed of three 130' 12-panel, rigid-connected Warren deck trusses, nine 60' deck girder spans, and three 20' deck girder spans. It is of steel and reinforced concrete construction.

Abutment 1 is located on the eastern side of the Meramec River. The base of the footing is at an elevation of 488 feet above median sea level. The abutment stem is 5.03' high, 33' 6" wide and 6' 3" thick to the bridge seat. The back wall is 12" thick and 9.38' tall and the bridge seat is 18" deep. The wing walls are 16' 7.125" long and 12" thick on footings that taper from 6' thick to 4' thick. On the bridge seat are two expansion bearing plates.

Pier 2 is a dumbbell pier on the edge of the Meramec River; it has a stepped footing sunk to solid rock at elevations of 445.46 and 448.46 feet above median sea level. The footings are 9' square and 8' deep at the deepest side. Atop each footing is a column that tapers from 5' 10" across at the base to 4' 2" across at the cap. A 4" thick web wall runs between the two columns from the footings to the cap. The pier cap is two tiered and overlaps the outer edges of the column by 3" for the first tier and 4" for the second (top) tier. Atop each column are two fixed bearing plates.

Pier 3 is a dumbbell pier in the Meramec River; it has footings at an elevation of 429.15 feet above median sea level. The footings are 10' square and 12" deep. Atop each footing is a column that tapers from 7' 2" at the base to 4' 10" at the cap. A 4" thick web wall runs 40' 5" from the cap to the footings. The pier cap is two tiered and overlaps the outer edges of the column by 3" for the first tier and 4" for the second (top) tier. Atop each column are two expansion bearing plates.

Pier 4 is a dumbbell pier; it has footings at a base elevation of 419 and 417.50 feet above median sea level. The footings are 10' 9" square and 10' deep for the right footing and 11' 6" deep for the left footing. The top elevations are at 429 feet above median sea level. Atop each footing is a column that tapers from 7' 10" at the base to 4' 10" at the cap. A 4" thick web wall runs 39' 3.5" down from the cap; there is solid shaft without the web wall for 12' 1.75" to the footings. The pier cap is 3' thick and is two tiered and overlaps the outer edges of the column by 3" for the first tier and 4" for the second (top) tier. Atop each column are one fixed bearing plate and one expansion bearing plate.

Pier 5 is a dumbbell pier; it has footings at a base elevation of 415.9 and 416.65 feet above median sea level. The footings are 10' 3" square and 10' 11" deep for the right footing and 10' 2" deep for the left footing. The top elevations are at 426 feet above median sea level. Atop each footing is a column that tapers from 7' 3" at the base to 4' 10" at the cap. A 4" thick web wall runs 34' down from the cap; there is solid shaft without the web wall for 15' 6" to the footings.

⁹⁴ Missouri State Highway Department. "Bridge over Meramec River, St. Louis County, J-421" Microfiche. Bridge Division, Missouri Department of Transportation, Jefferson City, Missouri.

The pier cap is 3' thick and is two tiered and overlaps the outer edges of the column by 3" for the first tier and 4" for the second (top) tier. Atop each column are one fixed bearing plate and one expansion bearing plate.

Bent 6 has twelve pilings under each footing. The footings are laid with a base elevation at 447.5 feet above median sea level. The footings have three stepped tiers; the bottom tiers are 9' wide and 12' thick, the middle tiers are 3' 6" wide and 8' 6" thick and the top tier is 3' wide and 5' 6" thick; each tier is 2' 6" deep. The two shafts are stepped in 16" from the sides of the top tier of the footing; the shafts are 3' square and rise 30' 2" to the bottom of the bent cap. A 2' wide strut is located 16' 6" above the footing, the strut collars into each shaft. The shafts collar into the bent cap, which is 3' deep and extends over the edges of the struts 3" on each side. Atop each shaft are two expansion bearing plates.

Bent 7 has twelve pilings under each footing. The footings are laid with a base elevation at 451.5 feet above median sea level. The footings have three stepped tiers; the bottom tiers are 9' wide and 12' thick, the middle tiers are 3' 6" wide and 8' 6" thick and the top tier is 3' wide and 5' 6" thick; each tier is 2' 6" deep. The two shafts are stepped in 16" from the sides of the top tier of the footing; the shafts are 3' square and rise 24' 10.25" to the bottom of the bent cap. A 2' wide strut is located 12' 10.25" above the footing, the strut collars into each shaft. The shafts collar into the bent cap, which is 3' deep and extends over the edges of the struts 3" on each side. Atop each shaft are two tied rocker bearings.

Bent 9 has twelve pilings under each footing. The footings are laid with a base elevation at 451.5 feet above median sea level. The footings have three stepped tiers; the bottom tiers are 9' wide and 12' thick, the middle tiers are 5' 6" wide and 8' 6" thick and the top tier is 3' wide and 5' 6" thick; all the tiers are 2' 6" deep. The two shafts are stepped in 16" from the side of the top tier of the footing; the shafts are 3' square and rise 21' 9" to the bottom of the bent cap. The shafts collar into the bent cap, which is 3' deep and extends over the edges of the struts 3" on each side. Atop each shaft are two expansion bearing plates.

Bent 10 has twelve pilings under each footing. The footings are laid with a base elevation at 451.5 feet above median sea level. The footings have three stepped tiers; the bottom tiers are 9' wide and 12' thick, the middle tiers are 5' 6" wide and 8' 6" thick and the top tier is 3' wide and 5' 6" thick; all the tiers are 2' 6" deep. The two shafts are stepped in 16" from the side of the top tier of the footing; the shafts are 3' square and rise 20' 5" to the bottom of the bent cap. The shafts collar into the bent cap, which is 3' deep and extends over the edges of the struts 3" on each side. Atop each shaft are two tied rocker bearings.

Bent 12 has twelve pilings under each footing. The footings are laid with a base elevation at 451.5 feet above median sea level. The footings have three stepped tiers; the bottom tiers are 9' wide and 12' thick, the middle tiers are 5' 6" wide and 8' 6" thick and the top tier is 3' wide and 5' 6" thick; all the tiers are 2' 6" deep. The two shafts are stepped in 16" from the side of the top tier of the footing; the shafts are 3' square and rise 17' 3.75" to the bottom of the bent cap. The shafts collar into the bent cap, which is 3' deep and extends over the edges of the struts 3" on each side. Atop each shaft are two expansion bearing plates.

Bents 8, 11 and 13 are tower bents comprised of four connected shafts formed into a square and connected at the bent caps. They are located under the 20' deck plate girder spans.

Bent 8 has four footings each with nine pilings under each footing. The footings are laid with a base elevation at 451.5 feet above median sea level. The footings are each two tiers with the bottom tier being 9' square and the top tier being 5' 6" square. Each shaft is 2' 9" square and rises 25' 7.25" from the footing to the bent cap. The shafts shoulder into the bent caps. The bent caps are 3' thick and 2' wide. The bent cap overhangs each shaft by 3 inches on the outside surfaces. Atop each shaft on the eastern pair of shafts are fixed bearing plates, atop each shaft on the western pair of shafts are one expansion plate and one fixed bearing plate.

Bent 11 has four footings each with nine pilings under each footing. The footings are laid with a base elevation at 451.5 feet above median sea level. The footings are each two tiers with the bottom tier being 9' square and the top tier being 5' 6" square. Each shaft is 2' 9" square and rises 21' 2" from the footing to the bent cap. The shafts shoulder into the bent caps. The bent caps are 3' thick and 2' wide. The bent cap overhangs each shaft by 3 inches on the outside surfaces. Atop each shaft on the eastern pair of shafts are fixed bearing plates, atop each shaft on the western pair of shafts are one expansion plate and one fixed bearing plate.

Bent 13 includes the western abutment for the bridge. The footings are laid with a base elevation of 453.5 feet above median sea level. The eastern half of the bent has two footings with nine pilings under each footing; under the western two footings are six piling under each footing. The eastern footings are three tiers with the bottom tier being 9' square, the middle tier being 6' wide and 5' 6" long; the two lower tiers are each 2' 6" deep. The upper tier is 4' 6" wide and 2' 9" long and 2' deep; it is not centered on the middle tier but the back edge is even with the back edge of the middle tier. Shafts rise from each footing for 14' 4.75" shouldering into the bent cap. The bent cap is 3' wide and 2' 9" thick. The western footings are three tiers with the bottom tier being 9' wide and 9' 4" long, the middle tier is 5' 6" square and the top tier is 3' 6" wide and 3' 9" long; each tier is 2' 6" deep and all have their back edges aligned. A 3' 6" wide shaft rises from each footing for 13' 6.75 feet ending in the cap beam of the abutment. Fixed plate bearings are located atop the eastern two shafts and the bridge seat on the abutment. The backwall is 12' 4.5" high. The backwall is 30' wide and the sidewalls extend another 5' beyond tapering 4' 5.75" high at the ends. A light stone revetment extends in front and to the sides of bent 13.

The three Warren trusses have a built up bottom chord of two channels with short plates on top and bottom. The bottom lateral bracing is two crossed angles joined where they cross with rivets. The bottom struts are two back to back angles riveted together. The end verticals are I-beams and the diagonals alternate between built up members of two channels with short bar cross lacing or two channels with small plates. The verticals are I-beams. The sway bracing is two crossed angles riveted where they cross. The top chord is a built up member of two channels with short bar cross lacing on top and bottom. The top lateral bracing is two crossed angles riveted where they cross. The floor beams are I-beams that cantilever over the edges of the deck truss.

The deck girder spans consist of two built-up plate girders, composed of a steel central plate with a solid cover plate on the top attached with riveted angles on both sides, and a short batten plate on the bottom, attached with riveted angles on both sides; there are vertical stiffener angles

riveted to the girder and struts and sway bracing at the top and bottom. The struts are two angles riveted back to back, the sway bracing is two crossed angled connected at the center with a riveted plate. The floor beams cantilever on the top of the I-beams.

The deck is a 10.75" concrete slab with an asphalt wearing surface. The bridge has concrete curbs and gutters. The standards for the handrail are formed of a pair of tee angles joined side to side with their long faces toward the bridge. There is a standard connected to each floor beam. The back of each standard has been beveled. The handrail consists of two gas pipe rails connected to the posts with U-bolts. There are collars where pipe sections join. At the ends of the bridge the handrail has a vertical piece of gas pipe in the collar to form a closed end.

V. Photographic Methods and Processing

The archival photographs accompanying this documentation were taken and processed according to the standards for photographs accompanying National Register of Historic Places (NRHP) documentation.⁹⁵ Randall Dawdy took photographs on February 24, 2010 using a Canon G10 digital 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 Policy⁹⁶ and burned onto a Delkin Archival Gold compact disc, which was provided to the State Historic Preservation Office along with this report.

Prints were made on Epson Premium Glossy Photo Paper and used Epson Matte Black Ultra Chrome K3 Ink, both identified as "best" practices by the NRHP photo policy, and which Epson identifies as having 85-year permanence under glass.⁹⁷ 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 photographs and .tiff images on an archival compact disc will also be maintained by the MoDOT Historic Preservation Section.

⁹⁵ National Park Service, "Proposed Updated Photographic Policy National Register of Historic Places." Downloaded 8 June 2008 from: www.nps.gov/history/nr/policyexpansion.html.

⁹⁶ Ibid.

⁹⁷ Ibid, "Draft of a Proposed New National Register Photographic Imaging Policy." Downloaded 26 March 2009 from: www.nps.gov/history/nr/policyexpansion.html; Epson. "Permanence ratings from Wilhelm Imaging Research." Downloaded 30 April 2009 from www.epson.com/pdf/LightfastCPD_15334R2.pdf.

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Photo Index and Photo Plates of Archival Photographs

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**Meramec River Bridge at Times Beach (Bridge No. J0421)
I-44 Outer Road, Historic Route 66,
St. Louis County, Missouri**

Photographer: Randall Dawdy, Missouri Department of Transportation

Date: February 24, 2010

Location of Digital Images: Missouri State Historic Preservation Office

Photo Index:

- #1 of 49. Bridge J0421. Spans 1, 2 and 3. View to northeast.
- #2 of 49. Bridge J0421. East end. View to northeast.
- #3 of 49. Bridge J0421. Pier 2. View to northeast.
- #4 of 49. Bridge J0421. Pier 3. View to northeast.
- #5 of 49. Bridge J0421. Span 2. View to northeast.
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- #9 of 49. Bridge J0421. Span 3. View to northeast.
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#21 of 49. Bridge J0421. Bent 8. View to northeast.

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#29 of 49. Bridge J0421. Bent 12. View to east.

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#36 of 49. Bridge J0421. Deck and roadway. View to east.

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#41 of 49. Bridge J0421. Span 4. View to northwest.

#42 of 49. Bridge J0421. Span 3. View to northwest.

#43 of 49. Bridge J0421. Span 2. View to northwest.

#44 of 49. Bridge J0421. Pier 3. View to northwest.

#45 of 49. Bridge J0421. Pier 2. View to north.

#46 of 49. Bridge J0421. East approach. View to west.

#47 of 49. Bridge J0421. Deck and roadway. View to southwest.

#48 of 49. Bridge J0421. Deck and roadway. View to northwest.

#49 of 49. Bridge J0421. Deck and roadway. View to west.

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#1 of 49. Bridge J0421. Spans 1, 2 and 3. View to northeast.



#2 of 49. Bridge J0421. East end. View to northeast.



#3 of 49. Bridge J0421. Pier 2. View to northeast.



#4 of 49. Bridge J0421. Pier 3. View to northeast.



#5 of 49. Bridge J0421. Span 2. View to northeast.



#6 of 49. Bridge J0421. Piers 2 and 3. View to northeast.



#7 of 49. Bridge J0421. Spans 2 and 3. View to northeast.



#8 of 49. Bridge J0421. Piers 2, 3 and 4. View to northeast.



#9 of 49. Bridge J0421. Span 3. View to northeast.



#10 of 49. Bridge J0421. Pier 4 detail. View to northeast.



#11 of 49. Bridge J0421. Span 4 detail. View to north.



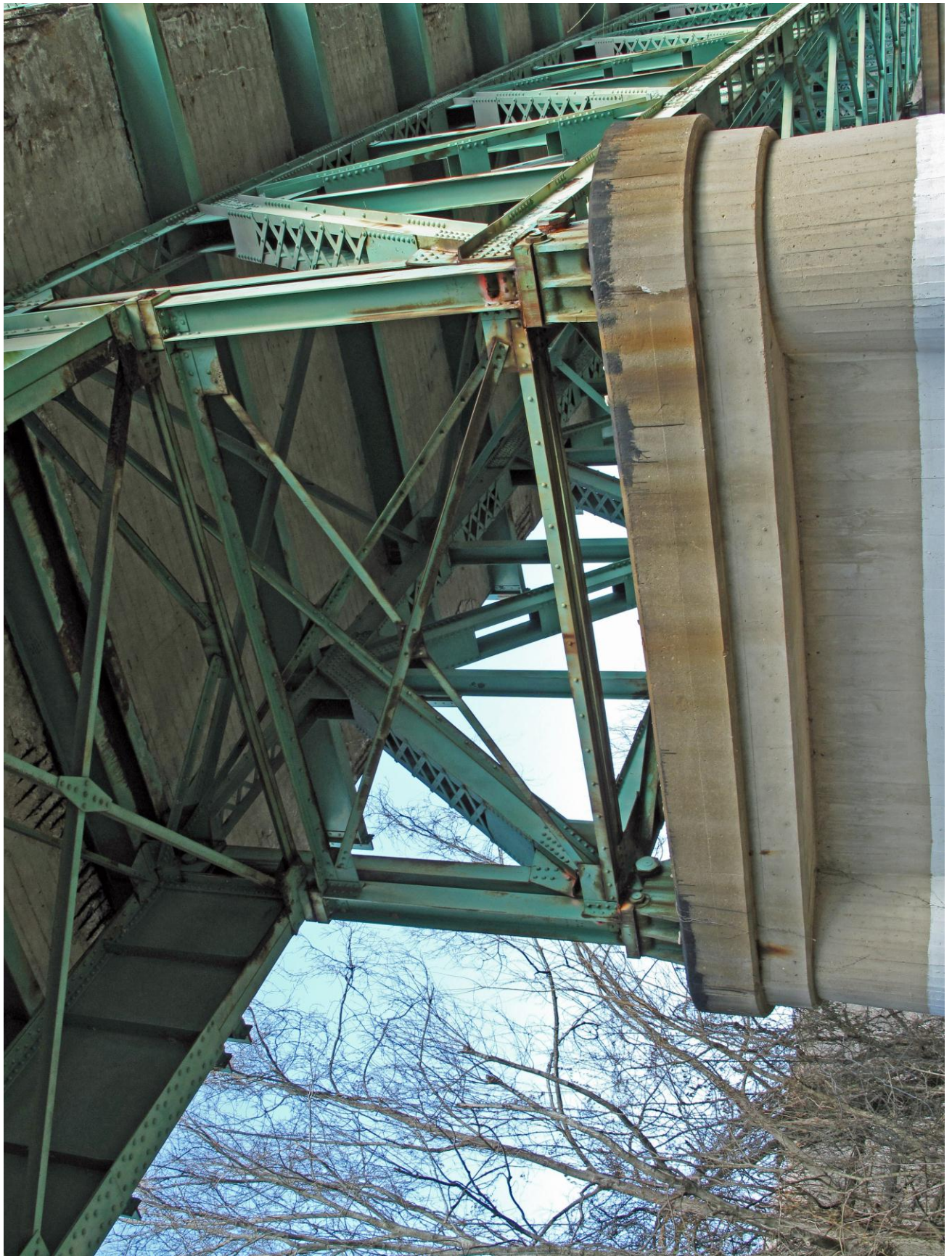
#12 of 49. Bridge J0421. Span 4 sub-deck. View to east.



#13 of 49. Bridge J0421. Sub-deck at Pier 4. View to east.



#14 of 49. Bridge J0421. Pier 5. View to northeast.



#15 of 49. Bridge J0421. Pier 5 detail. View to northeast.



#16 of 49. Bridge J0421. Span 5 sub-deck. View to east.



#17 of 49. Bridge J0421. West approach spans. View to northwest.



#18 of 49. Bridge J0421. Span 5. View to northwest.



#19 of 49. Bridge J0421. Bent 6. View to northwest.



#20 of 49. Bridge J0421. Bent 6 detail. View to northwest.



#21 of 49. Bridge J0421. Bent 8. View to northeast.



#22 of 49. Bridge J0421. Bent 8 detail. View to northeast.



#23 of 49. Bridge J0421. Bents 6, 7 and 8. View to northeast.



#24 of 49. Bridge J0421. Bent 11. View to northwest.



#25 of 49. Bridge J0421. West end. View to northwest.



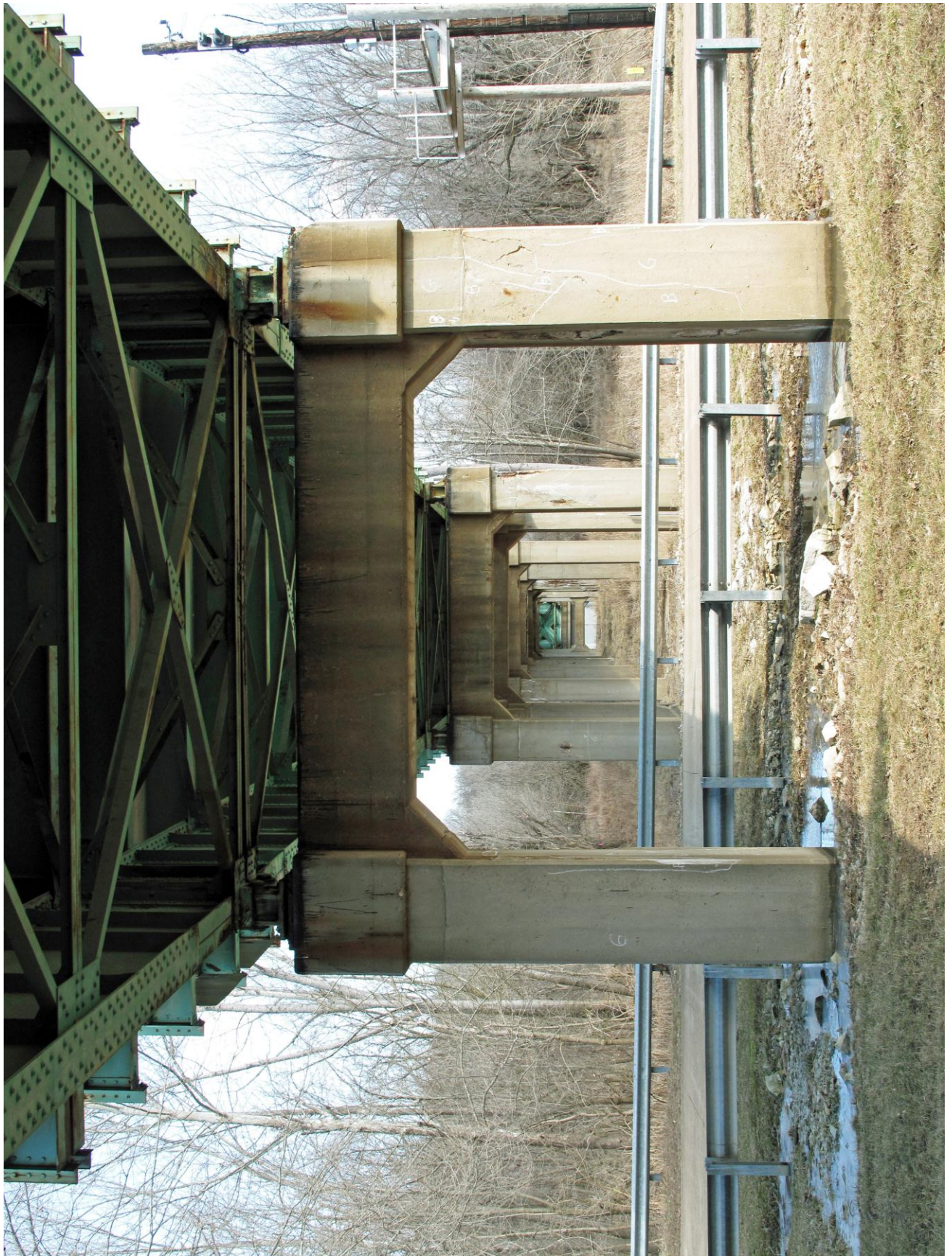
#26 of 49. Bridge J0421. Bent 13. View to northwest.



#27 of 49. Bridge J0421. Sub-deck at Bent 13. View to west.



#28 of 49. Bridge J0421. Bent 13. View to west.



#29 of 49. Bridge J0421. Bent 12. View to east.



#30 of 49. Bridge J0421. West end. View to north.



#31 of 49. Bridge J0421. Bents 11 and 12. View to north.



#32 of 49. Bridge J0421. Bent 12. View to north.



#33 of 49. Bridge J0421. Bent 12 detail. View to north.



#34 of 49. Bridge J0421. Bearings at Bent 12. View to north.



#35 of 49. Bridge J0421. West approach. View to east.



#36 of 49. Bridge J0421. Deck and roadway. View to east.



#37 of 49. Bridge J0421. Deck and roadway. View to northeast.



#38 of 49. Bridge J0421. Deck and roadway. View to southeast.



#39 of 49. Bridge J0421. Deck and roadway. View to southeast.



#40 of 49. Bridge J0421. South side. View to northwest.



#41 of 49. Bridge J0421. Span 4. View to northwest.



#42 of 49. Bridge J0421. Span 3. View to northwest.



#43 of 49. Bridge J0421. Span 2. View to northwest.



#44 of 49. Bridge J0421. Pier 3. View to northwest.



#45 of 49. Bridge J0421. Pier 2. View to north.



#46 of 49. Bridge J0421. East approach. View to west.



#47 of 49. Bridge J0421. Deck and roadway. View to southwest.



#48 of 49. Bridge J0421. Deck and roadway. View to northwest.

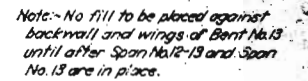


#49 of 49. Bridge J0421. Deck and roadway. View to west.

Plans for Original Bridge Construction

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FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.	U.S. 66 TR -56	16		



1. General Elevation and Floor.
2. Bill of Reinforcing Steel.
3. Abut. No. 1, Anchor Bulk Plan, Handrail Details.
4. Piers No. 2, 3, 4 and 5.
5. Bents No. 6, 7, 9, 10 and 12.
6. Bents No. 8, 11 and 13.
7. 130' Span Cross Sections, and Roadway Expansion Device.
8. 130' Span Trusses.
9. Deck Plate Girders.
10. Cast Steel Shoes.

All excavation except for Piers No. 2 to 5 inclusive, to be paid for as Class I excavation. For payment of excavation for Piers No. 2 to 5 inclusive, see Special Provisions. Estimated quantities for timber piles include 4 in. ft per pile as allowance for metal shoes in accordance with specifications.

BENCH MARK:-
B.M. #67 Elev. 463.10 Spike in Trunk of 30" Sycamore 225' Lt. Sta. 88+00.
Note:- Datum for above B.M. is assumed. Subtract 31.23' to convert elevation to mean sea level.

STATE ROAD FROM VICTOR GROSSING TO ALLENTON
ABOUT 2.25 MILES EAST OF EUREKA
PROJECT NO. U.S. 36 T.R.-56 STA 885+09.73

SUBMITTED BY *W.R. Jack* DATE *7/18/31*
APPROVED BY *D. Butler* RANGE ENGINEER
DATE *7/18/31*
CITY ENGINEER

LOCATION SKETCH
Scale 1" = 2000'



Drawn June 1931 By H.E.C.
Traced June 1931 By H.E.C.
Checked July 1931 By R.A. (Except Quantities) Quantities Checked July 1931 By R.A. and F.W.H.

Sheet No. 101

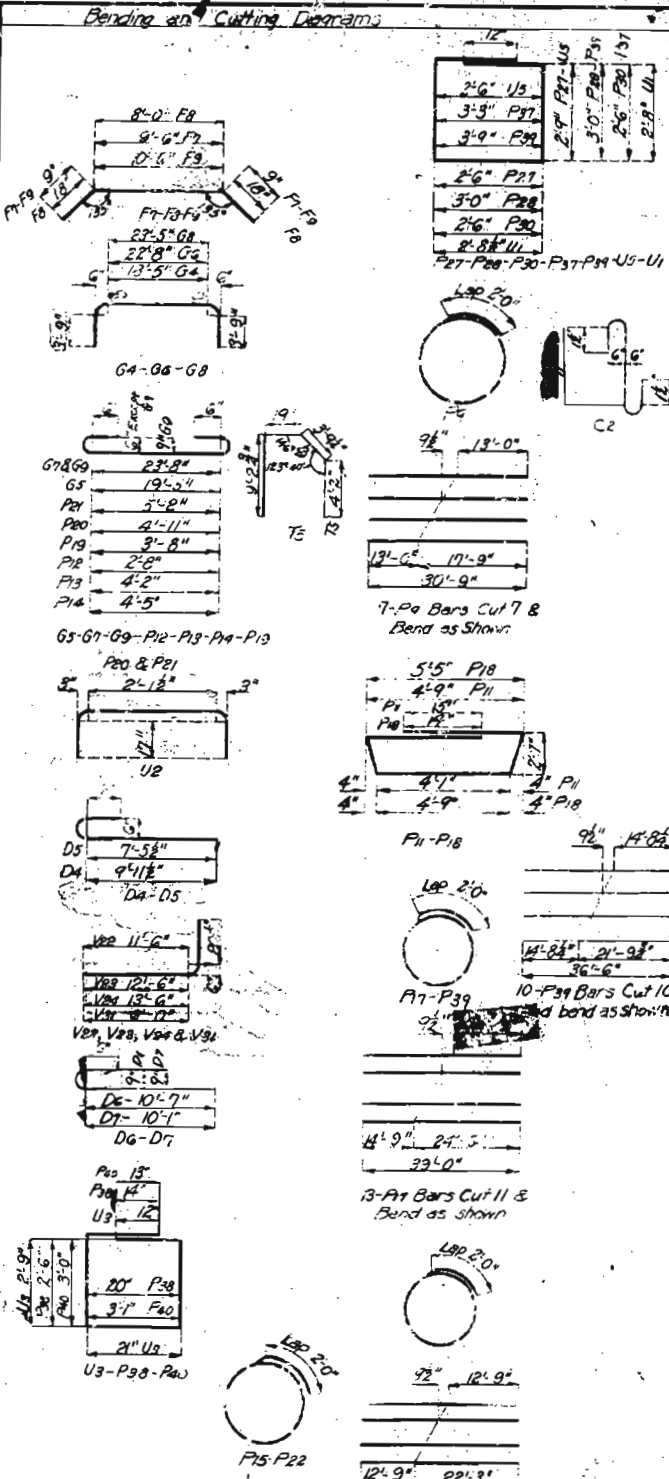
J-421

MISSOURI STATE HIGHWAY

FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
U.S. 66-77	19	15	15

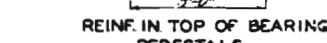
COMPLETE BILL OF REINFORCING STEEL

No.	Size	Length	Mark	Location	No.	Size	Length	Mark	Location
Abutment No. 1									
33	3/4"	6'-0"	F1	Footring					
15	3/4"	9'-6"	F2	"					
8	3/4"	5'-9"	F3	"	16	1"	10'-0"	D3	Footring
8	3/4"	4'-9"	F4	"	36	3/4"	17'-0"	H1	Web
10	3/4"	12'-0"	F5	"	4	1"	17'-0"	H2	Web
10	3/4"	20'-0"	F6	"	32	1"	22'-0"	P2	Shaft
16	3/4"	17'-9"	H3	Wing Wall	10	3/4"	36'-6"	P3	"
4	3/4"	13'-9"	H4	"	12	3/4"	17'-0"	P10	Cap
4	3/4"	7'-9"	H5	"	6	3/4"	16'-6"	P12	"
4	3/4"	11'-6"	H6	"	8	3/4"	6'-3"	P19	"
2	3/4"	6'-6"	H7	"	8	3/4"	7'-6"	P20	"
7	3/4"	32'-9"	H8	Front Wall	2	3/4"	7'-9"	P21	"
2	3/4"	26'-5"	H22	"	2	3/4"	19'-3"	P22	"
7	3/4"	36'-3"	H23	"	28	3/4"	21'-0"	V2	Web
4	3/4"	16'-0"	T1	Wing Wall					
6	3/4"	11'-9"	U1	Pedestal					
12	3/4"	5'-9"	U2	"	Pier No. 4				
3	3/4"	10'-0"	V5	Front Wall	16	1"	10'-0"	D3	Footring
19	3/4"	11'-0"	V6	"	34	3/4"	17'-0"	H1	Web
2	3/4"	12'-0"	V7	"	4	1"	17'-0"	H2	"
2	3/4"	11'-0"	V8	Wing Wall	32	1"	27'-0"	P23	Shaft
2	3/4"	18'-0"	V7	"	13	3/4"	39'-0"	P27	"
2	3/4"	15'-0"	V10	"	12	3/4"	17'-0"	P6	Cap
2	3/4"	10'-5"	V10	"	6	3/4"	16'-3"	P8	"
2	3/4"	17'-0"	V20	"	2	3/4"	6'-3"	P9	"
2	3/4"	12'-0"	V21	"	6	3/4"	7'-6"	P22	"
5	3/4"	14'-0"	V22	Front Wall	4	3/4"	7'-9"	P21	"
27	3/4"	15'-0"	V23	"	2	3/4"	19'-3"	P22	"
2	3/4"	16'-0"	V24	"	28	3/4"	20'-0"	V5	Web
2	3/4"	29'-0"	V25	Wing Wall					
4	3/4"	24'-9"	V26	"					
4	3/4"	20'-0"	V27	"	Pier No. 5				
2	3/4"	31'-0"	V28	"	32	1"	10'-0"	D3	Footring
4	3/4"	25'-9"	V25	"	32	3/4"	17'-0"	H1	Web
3	3/4"	21'-0"	V30	"	4	1"	17'-0"	H2	"
32	3/4"	8'-6"	V31	"	48	1"	28'-0"	P25	Shaft
					13	3/4"	55'-0"	P25	"
					12	3/4"	17'-0"	P10	Cap
					6	3/4"	15'-3"	P11	"
					9	3/4"	5'-3"	P12	"
					8	3/4"	6'-9"	P13	"
					4	3/4"	7'-0"	P14	"
					2	3/4"	16'-9"	P15	"
					32	3/4"	19'-6"	V4	Web
					Bent No. 6				
					20	1"	11'-3"	D4	Footring
					8	1"	11'-0"	F7	Haunch
					16	1"	11'-0"	F8	"
					4	1"	27'-6"	G4	Beam
					16	1"	22'-0"	G5	"
					20	3/4"	32'-9"	P26	Column
					66	3/4"	11'-6"	P27	"
					6	3/4"	13'-0"	P28	Cap
					8	3/4"	21'-3"	T9	Tie Beam
					8	3/4"	10'-0"	U9	Beam
					9	3/4"	5'-0"	U2	Tie Beam
Pier No. 2					Bent No. 7				
24	1"	8'-0"	D2	Footring	20	1"	11'-3"	D4	Footring
2	3/4"	17'-0"	H1	Web	8	1"	11'-0"	F7	Haunch
24	1"	29'-3"	P8	Shaft	16	1"	11'-0"	F8	"
7	3/4"	30'-9"	P9	"	4	1"	27'-6"	G4	Beam
12	3/4"	17'-0"	P10	Cap	6	1"	22'-0"	G5	"
6	3/4"	15'-3"	P11	"	20	3/4"	32'-9"	P26	Column
8	3/4"	5'-3"	P12	"	66	3/4"	11'-6"	P27	"
8	3/4"	6'-9"	P13	"	6	3/4"	13'-0"	P28	Cap
4	3/4"	7'-0"	P14	"	8	3/4"	21'-3"	T9	Tie Beam
2	3/4"	16'-9"	P15	"	8	3/4"	10'-0"	U9	Beam
16	3/4"	29'-0"	V1	Web	9	3/4"	5'-0"	U2	Tie Beam



No.	Size	Length	Mark	Location	No.	Size	Length	Mark	Location
Tower Bent No. 8									
56	1"ø	8'-9"	D5	Footring	2	3/4"	18'-3"	H5	Backwall
36	1"ø	11'-0"	G7	Haunch	2	3/4"	19'-0"	H16	"
8	1"ø	27'-6"	G4	Beam	2	3/4"	19'-9"	H17	"
12	1"ø	22'-0"	G5	"	2	3/4"	20'-5"	H18	"
10	1"ø	9'-9"	G6	"	2	3/4"	21'-3"	H19	"
14	1"ø	26'-3"	G8	"	16	3/4"	21'-6"	H20	"
36	1"ø	28'-3"	F1	Column	6	3/4"	17'-0"	H25	"
104	3"ø	11'-0"	F2	"	20	1"ø	17'-0"	P25	Column
2	3"ø	13'-0"	F28	Cap	2	3"ø	12'-6"	P26	"
36	3"ø	10'-0"	U3	Beam	24	3"ø	12'-6"	P27	"
					18	3"ø	9'-6"	P28	BK Wall Co
					8	3"ø	10'-0"	U3	Trans Beam
					18	2"ø	17'-6"	U5	Long Beam
Bent No. 9					14	1"ø	12'-3"	M9	BK Wall
20	1"ø	11'-3"	D4	Footring	26	1"ø	12'-0"	M10	"
8	1"ø	11'-0"	F7	Haunch	2	3"ø	11'-6"	M1	Wing Wall
4	1"ø	27'-6"	G4	Beam	2	3"ø	10'-6"	M2	"
6	1"ø	22'-0"	G5	"	2	3"ø	9'-6"	M3	"
20	1"ø	28'-6"	P22	Column	2	3"ø	8'-3"	M4	"
44	3"ø	11'-0"	P30	"	2	3"ø	6'-3"	M5	"
6	3"ø	13'-9"	P28	Cap	36	1"ø	16'-3"	P41	Col.
8	3"ø	10'-0"	U3	Beam	4	3"ø	18'-0"	T5	"
					6	3"ø	14'-5"	P39	Cap
					6	3"ø	13'-3"	P40	Cap
					4	3"ø	15'-5"	H21	BK Wall
20	1"ø	11'-3"	D4	Footring					
8	1"ø	11'-0"	F7	Haunch	Superstructure				
4	1"ø	27'-6"	G4	Beam	60"ø Girders				
6	1"ø	22'-0"	G5	"	1134	3"ø	10'-9"	S1	Slabbing End
20	1"ø	23'-9"	P33	Column	567	3"ø	26'-8"	S2	Slabbing End
40	3"ø	11'-0"	P32	"	1136	3"ø	24'-0"	S3	" " End
6	3"ø	13'-3"	P23	Cap	567	3"ø	19'-3"	S4	" " Inter
8	3"ø	10'-0"	U3	Beam	512	3"ø	3'-8"	S5	Side Tunnel
					216	3"ø	22'-0"	C1	Curb, long
					702	3"ø	2'-9"	C2	Curb, down
Tower Bent No. 11					20'ø Girder Spans				
36	1"ø	8'-9"	D5	Footring	189	3"ø	21'-0"	S6	Slab long
36	1"ø	11'-0"	F7	Haunch	189	3"ø	21'-0"	S7	" "
8	1"ø	27'-6"	G4	Beam	69	3"ø	31'-9"	S5	" trans
12	1"ø	22'-0"	G5	"	84	3"ø	3'-4"	C3	Curb down
10	1"ø	31'-9"	G6	"	24	3"ø	21'-0"	C4	" long
14	1"ø	26'-3"	G8	"					
36	1"ø	23'-9"	P34	Column					
84	3"ø	11'-0"	P30	"					
12	3"ø	13'-0"	P28	Cap					
36	3"ø	10'-0"	U3	Beam					
					Truss Spans				
					564	3"ø	14'-3"	S8	Two long End Panel
Bent No. 12					564	3"ø	12'-0"	S9	Bottom long End Panel
20	1"ø	11'-3"	D4	Footring	1140	3"ø	24'-3"	S12	Two long End Panel
8	1"ø	11'-0"	F7	Haunch	1140	3"ø	24'-9"	S13	Bottom long End Panel
4	1"ø	27'-6"	G4	Beam	432	3"ø	31'-9"	S5	Slab trans
6	1"ø	22'-0"	G5	Beam	576	3"ø	2'-9"	C2	Curb down
20	1"ø	20'-0"	P35	Column	126	3"ø	28'-0"	C5	Curb long
30	3"ø	11'-0"	P30	"					
6	3"ø	13'-0"	P28	"					
8	3"ø	10'-0"	U3	Beam					
Tower Bent No. 13									
12	1"ø	12'-3"	D6	3k Fly					
16	1"ø	11'-9"	D7	F. Fly					
20	1"ø	12'-0"	F9	"					
4	1"ø	27'-6"	G4	Trans Bm					
16	1"ø	22'-0"	G5	"					
16	1"ø	32'-6"	G8	Long Bm					
14	1"ø	27'-0"	G9	"					
11	3"ø	20'-0"	H9	Backwall					
1	3"ø	20'-6"	H10	"					
1	3"ø	24'-3"	H11	"					
1	3"ø	27'-3"	H12	"					
1	3"ø	30'-3"	H13	"					

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEET
5	MO.	125467R 36	10		



METALLIC EDGE MouldING

Metallic edge moulding is to be in one piece for full width of roadway, and shall be pre-formed to the crown of roadway. Provision shall be made to hold the moulding securely in position until the concrete is in place and has attained its final set.

GENERAL SUBSTRUCTURE NOTES:-

1. All substructure concrete to be 1:2-4 mix Class "B"
Exposed edges shall be beveled $\frac{3}{4}$ " where no other bevel is noted.
Provide substantial keys at all construction joints.
Lap splices in reinforcing bars 48 diameters except as otherwise noted.
Bends, except hooks, shall have a radius of not less than 16 diameters. Hooks, as shown, $\frac{1}{4}$ " 36 diameters, unless otherwise noted.
All footings on rock shall be carried at least $\frac{1}{4}$ " into solid rock. Rock to be capable of carrying a foundation load of 15 tons per square foot. See Special Provisions.
All caissons bracing which interferes with shafts or webs, is to be removed as the shafts or webs are concreted. No bracing shall be placed against any of the completed portions until they have attained sufficient strength. All caissons to be removed before final acceptance of work.
Care shall be taken in placing reinforcing steel in bent caps and pier capings to clear the location of anchor bolt wells.
Changes may be made in construction of Piers No. 2, 3, 4 and 5 below top of bases providing the minimum distance from the centerline of shaft to edge of concrete is not less than $\frac{1}{4}$ the base diameter shown on the plan. If any changes are made from the details shown on the plans, complete working drawings and an outline of the working methods shall be submitted to the Missouri State Highway Department before construction of the same begins.



STATE ROAD FROM VOTOM CROSSING TO ALLENTON
ABOUT 2.25 MILES EAST OF EUREKA
PROJECT NO. U.S. 66 T.R. - 56 STA 083+09.73

ST. LOUIS COUNTY

SUBMITTED BY *M.R. Lark* DATE *2/18/13*

T.H. Lark BRIDGE ENGINEER

BY *T.H. Lark* DATE *2/18/13*

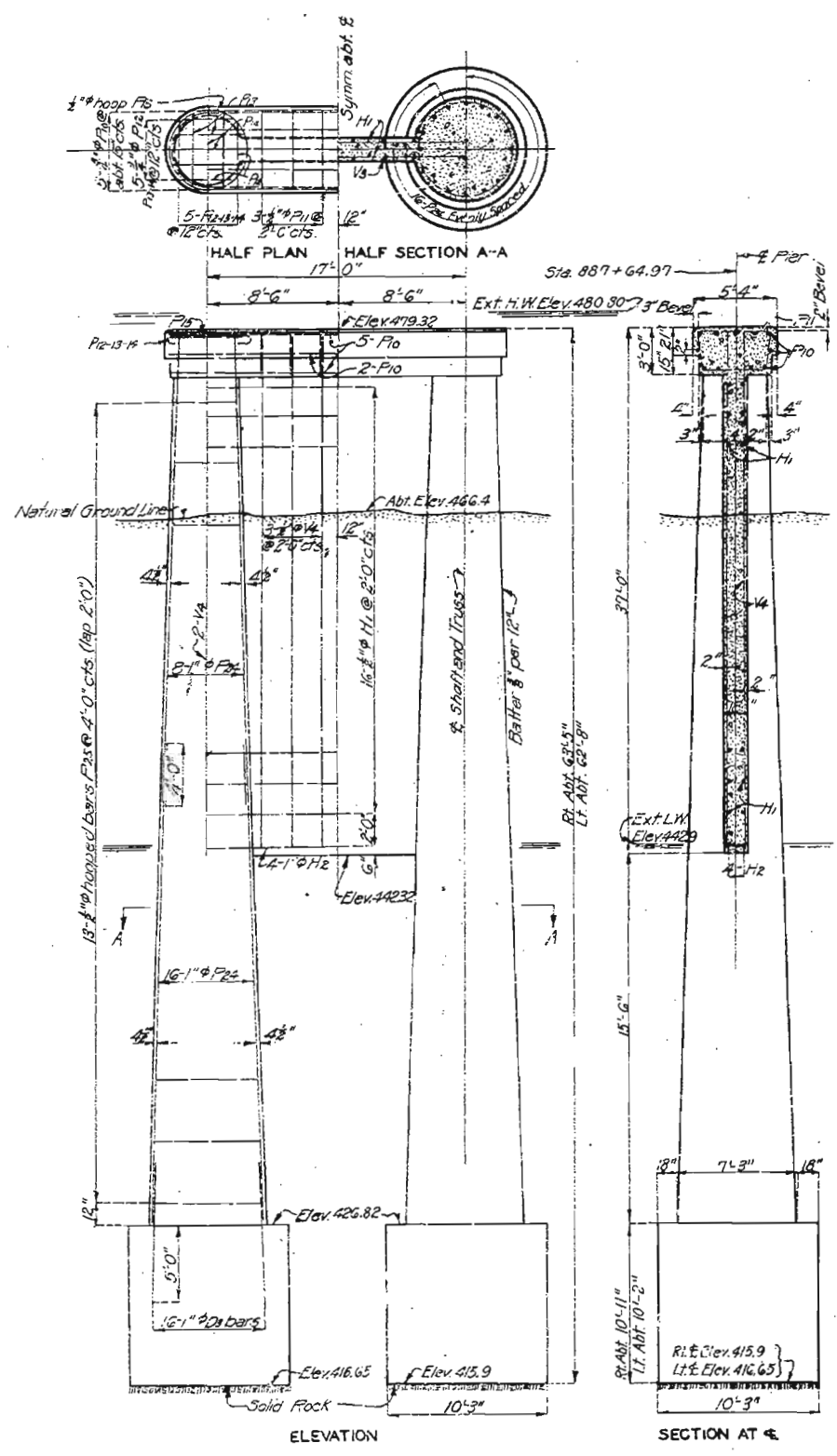
CHECKED PROBABLY

Designed June 1931 By F.W.H.
Drawn June 1931 By H.E.C.
Traced June 1931 By H.E.C.
checked July 1931 By R.A. and L.H.

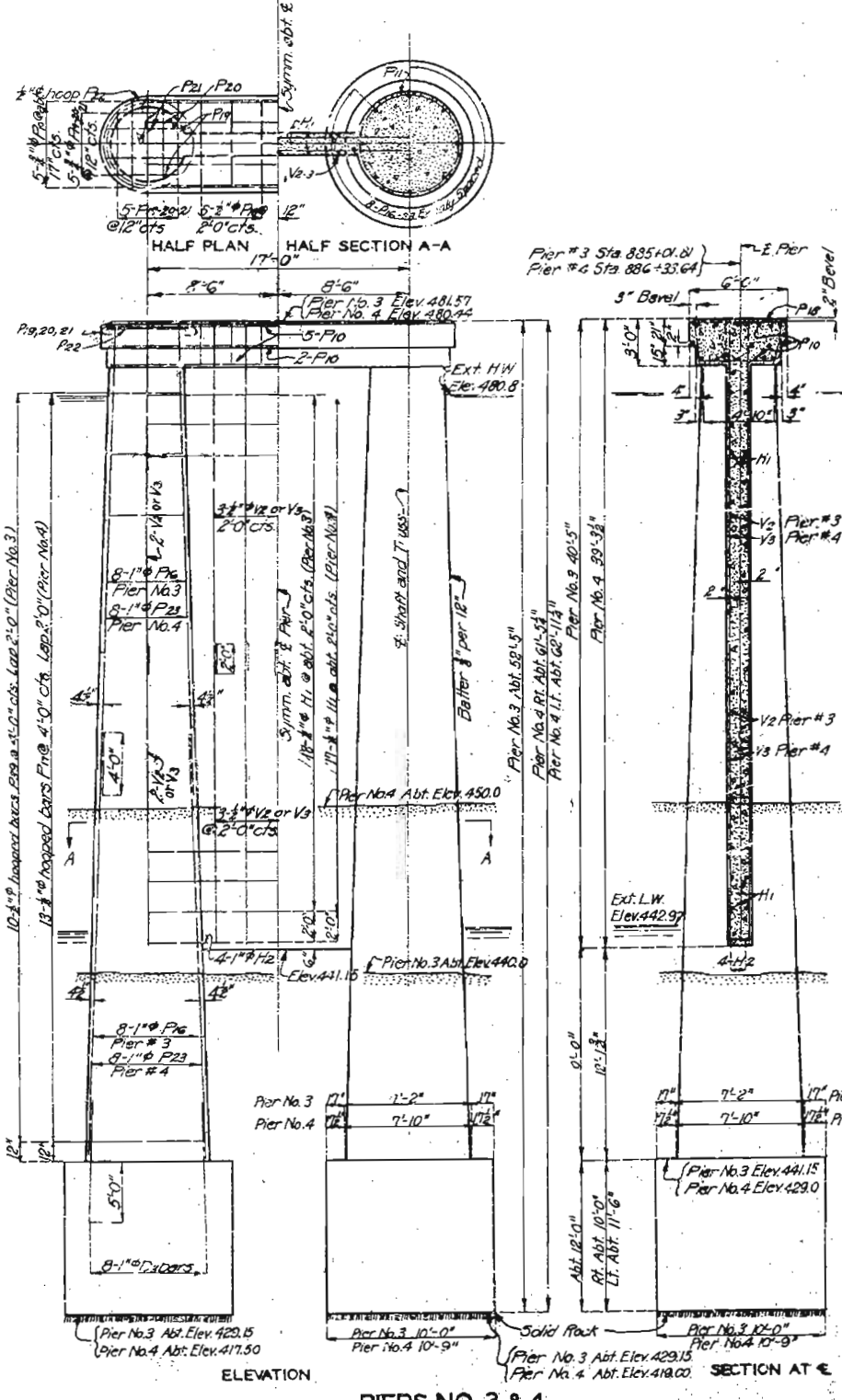
Sheet No 3 of 10

MISSOURI STATE HIGHWAY DEPARTMENT

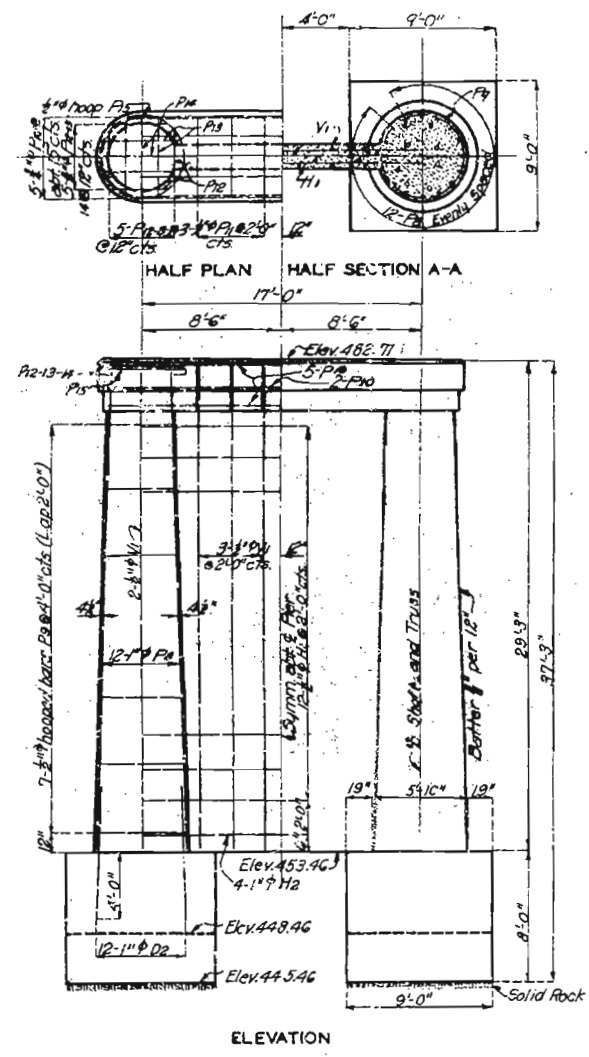
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.	U.S. 66 TR-56	19		



PIER NO. 5



PIERS NO. 3 & 4



PIER NO. 2

Notes: -
For general notes see Sheet No. 3.
All pier cupings under shoes are to be built to elevation and finished in accordance with instructions on anchor bolt plan, sheet No. 3.

BRIDGE OVER MERAMEC RIVER

STATE ROAD FROM VOTOW CROSSING TO ALLENTON

ABOUT 2.25 MILES EAST OF EUREKA

PROJECT NO. U.S. 66 TR-56 STA. 883+09.73

ST. LOUIS COUNTY

APPROVED BY: *[Signature]* DATE: 7/18/31
CHIEF ENGINEER

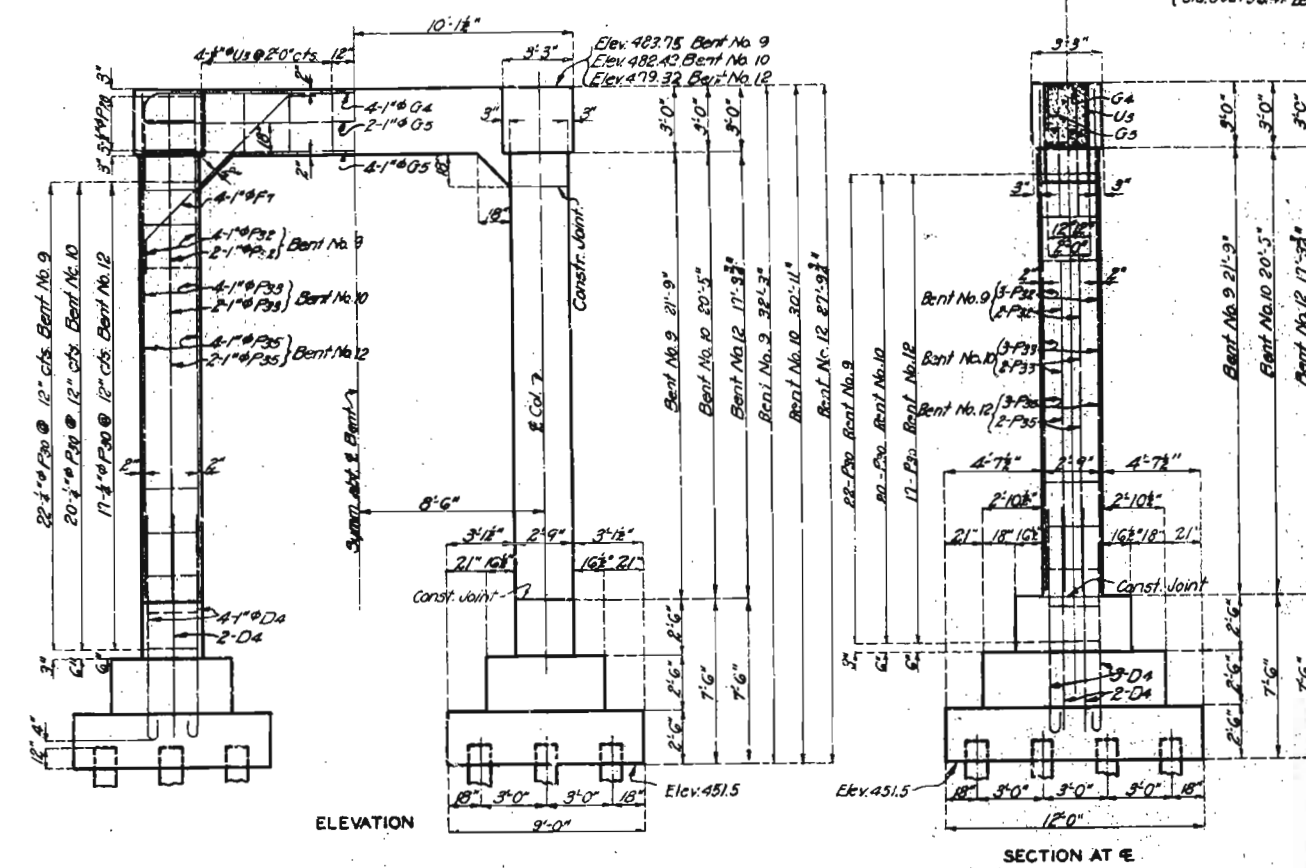
Note: - Bases of Piers 3, 4 and 5 may be made square with sides equal to diameters shown. For payment of concrete in bases and for payment of excavation for bases, see FINISHED Special Provisions.

Note: - This drawing is not to scale. Follow dimensions.

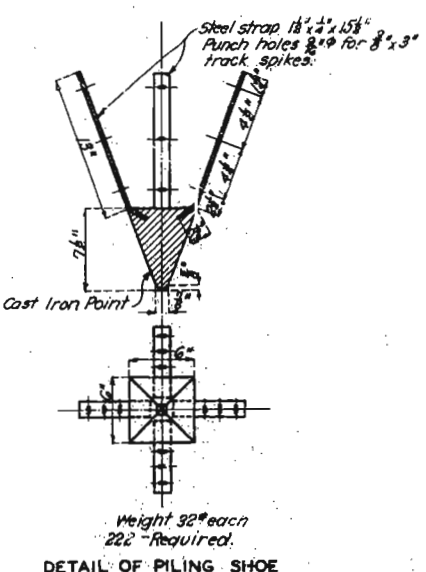
Revised June 1931 By F.W.H.
Designed June 1930 By F.W.H.
Drawn July 1930 By H.E.C.
Traced July 1930 By H.W.H.
Checked July 1931 By R.R.

723

Sta. 890+31.46 Bent No. 9
Sta. 890+32.69 Bent No. 10
Sta. 892+55.41 Bent No. 12



General Notes for Sheet No 5 and 6:-
For general notes see Sheet #3
All column caps are to be built to elevation and finished in accordance with instructions on anchor bolt plan, Sheet No. 3
All piling to be constructed, shod with pile points (or pile shoes) made of chilled cast iron, of approved design; and driven to minimum penetration of 30'-0" and to a bearing of 25 tons per pile.
No piling to be ordered until authorized by the Engineer in writing.



DETAILS OF BENTS NO. 6 & 7

DETAILS OF BENTS NO. 9, 10 & 12

BRIDGE OVER MERAMEC RIVER

STATE ROAD FROM VOTOW CROSSING TO ALLENTON

ABOUT 2.25 MILES EAST OF EUREKA

PROJECT NO. U.S. 66 TR-56 STA. 883+09.73

ST LOUIS COUNTY

SUBMITTED BY *J. W. Baker* DATE *7/18/31*
T. H. Carter BRIDGE ENGINEER
 APPROVED BY *T. H. Carter* DATE *7/18/31*
CHIEF ENGINEER

FINISHED

FINISHED

Revised June 1931 By F.W.H.
Designed June 1930 By F.W.H.
Drawn July 1930 By H.E.C.
Trace Aug. 1930 By H.W.H.
Checked July 1931 By P.C.

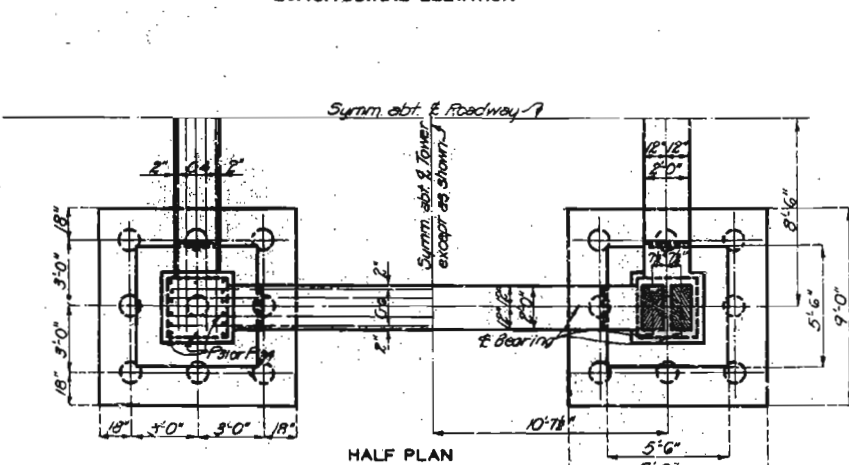
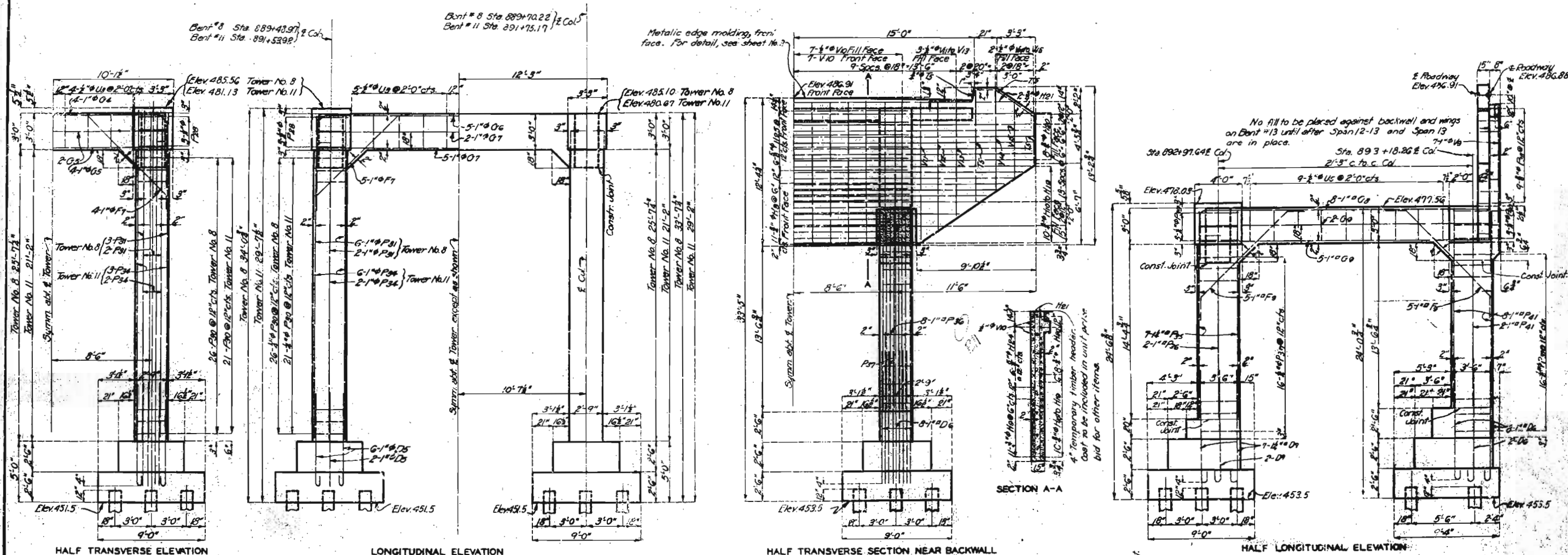
Sheet No. 5

FINISHED

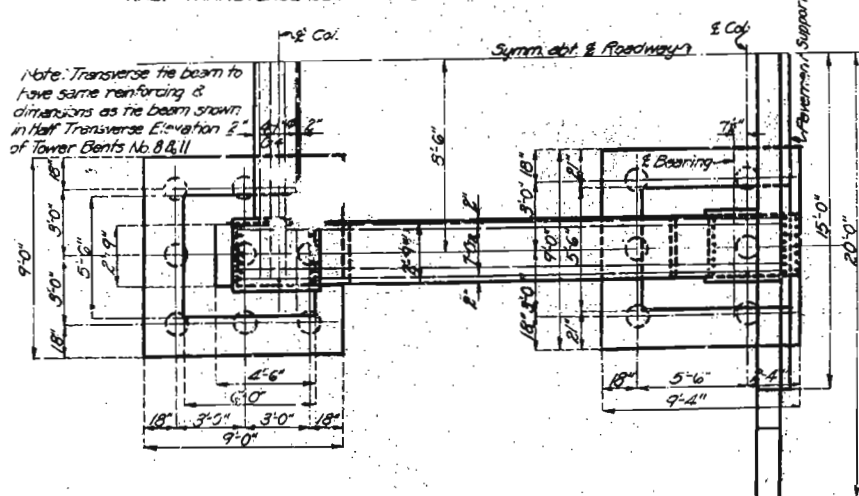
J-42

MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID FISC. YEAR	FISC. YEAR	SHEET NO.	TOTAL SHEETS
5	MO.	U.S. 66 TR-56	19		



DETAILS OF TOWER BENTS NO. 8 & 11



DETAILS OF TOWER BENT NO. 13

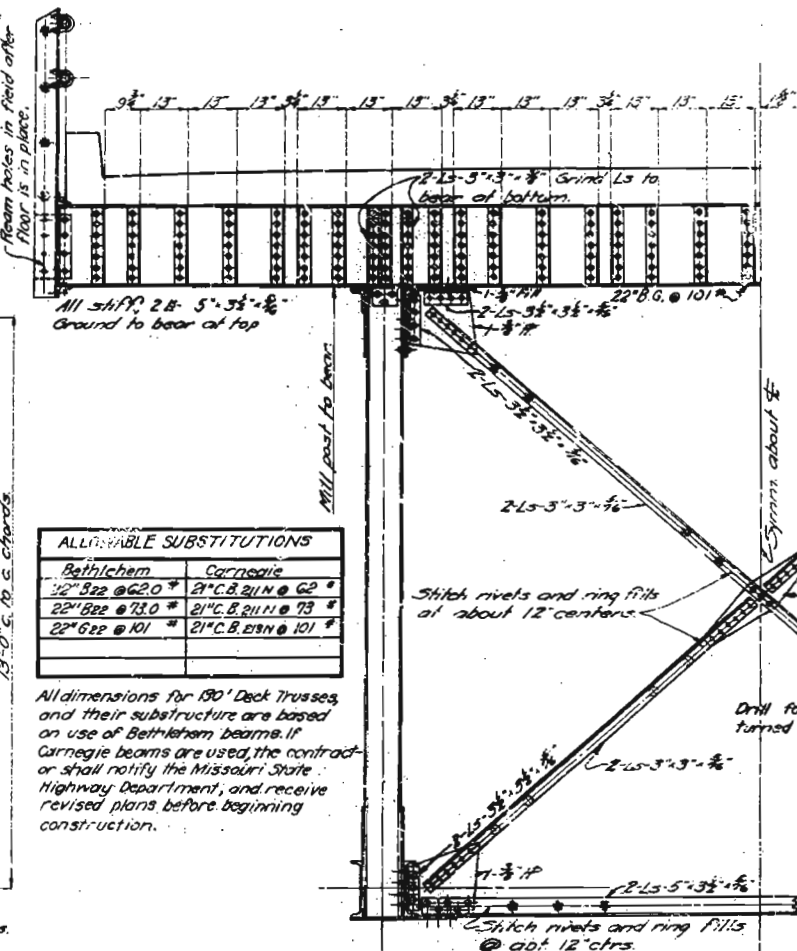
Notes:
 For general notes see Sheet #3
 All column caps are to be built to elevation and finished in accordance with instructions on anchor bolt plan, Sheet #3
 All piling to be creosoted; shod with pile points (or pile shoes) made of chilled cast iron of approved design; and driven to minimum penetration of 30'-0"; and to a bearing of 25 tons per pile.
 No piling to be ordered until authorized by the Engineer in writing.
 For detail of Metal Shoe for timber piles see Sheet No. 5

BRIDGE OVER MERAMEC RIVER
 STATE ROAD FROM VOTOW CROSSING TO ALLENTON
 ABOUT 2.25 MILES EAST OF EUREKA
 PROJECT NO. U.S. 66 TR-56 STA. 883+09.73
 ST. LOUIS COUNTY

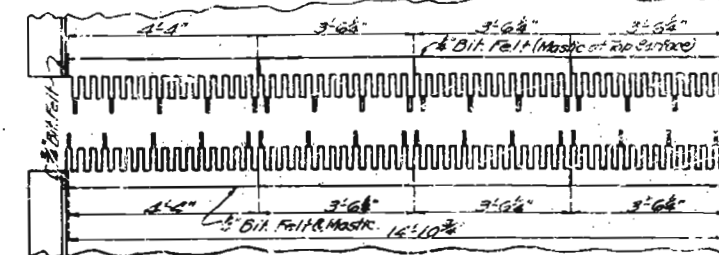
DESIGNED BY: [Signature] DATE: 7/18/31
 CHECKED BY: [Signature] DATE: 7/18/31
 APPROVED BY: [Signature] DATE: 7/18/31

Revised June 1931 By F.W.H.
 Designed June 1930 By F.W.H.
 Drawn July 1930 By H.E.C.
 Traced Aug. 1930 By H.W.H.
 Checked July 1931 By [Signature]

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.	U.S. 60 TR -52	19		



All dimensions for 190' Deck Trusses, and their substructure are based on use of Bethlehem beams. If Carnegie beams are used, the contractor shall notify the Missouri State Highway Department, and receive revised plans, before beginning construction.



Technical drawing of a wellhead assembly. The drawing shows a cross-section of the wellhead with various dimensions and components labeled.

Dimensions:

- Overall height: 19 3/8"
- Normal height: 15"
- Min. height: 14 1/2"
- Max. height: 2 1/2"
- Normal height: 1 1/2"
- Min. height: 1 1/2"

Components and Materials:

- Bit. Mastic
- Bit. Mastic
- Bit. Fell
- Coar. Wash
- 1/2" Kernal Bolt

Notes:

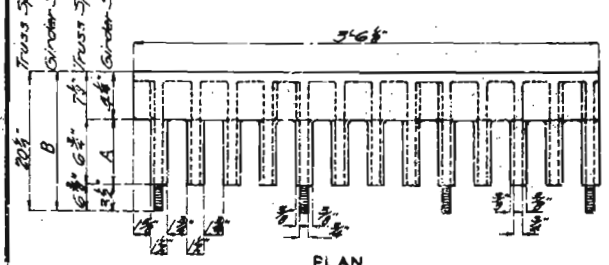
- Increase these dimensions 3" over Bent No. 6
- At top of flr. brn. increase these dimensions 3" over Bent No. 6

Additional Dimensions:

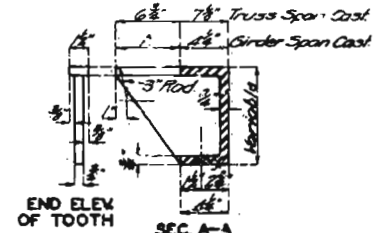
- 16 1/2" Max.
- 15" Normal
- 13 1/2" Min.

Technical drawing of a rectangular box. Dimensions: 4'-11" (length), 2" (width), 5'-9" @ 12" o/c (height), 1'-5" (width), 3'-8" (height). Material: 1/2" x 1/2" x 1/2" (indicated by a small box).

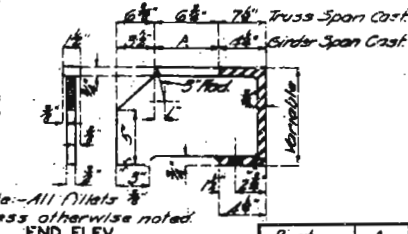
HALF CROSS SECTION 130' TRUSS SPAN
INTERMEDIATE PANEL



FLAN



END ELEV
OF TOOTH



SEC. 9-B

Bent	A	B
3 and 12	$5\frac{1}{2}''$	$13\frac{3}{4}''$
6	$6\frac{1}{2}''$	$14''$

TYPICAL DETAILS OF CASTING UNIT FOR TRUSS AND GIRDER SPANS

SCALE = 1/4" = 1'-0"

Note:- Teeth on castings shall be straightened so that tops of teeth lie in a true plane, after annealing and before bottom surfaces are machined, or the top surfaces shall be machined so that tops of teeth lie in true plane and the teeth have a minimum flange thickness of $\frac{3}{4}$ " as shown.

Specifications - Design by modified A.A.S.H.O. Conference Specifications for Steel Highway Bridges of 1929.

Loading - Dead load as computed from detail drawings. Live load; H-20 A.A.S.H.O. 1929, except equivalent uniform load of 680 lbs. per linear foot on a 9 foot lane, with 10,000 lbs. concentrated load for moment, and 20,000 lbs. conc. load for shear. (Concentrated loads on 9 ft. lane). Wind load combined with dead load - Transverse, 30 lbs. per sq. ft. on the vertical projection of 2 trusses (or girders), 2 handrails, and one floor. Wind loads combined with dead load, live load, and impact, to be 50% of above.

Impact - Trusses and girders, impact factor = $50 \div \text{dead loaded length in ft.}$, but not to exceed 30%. Stringers and floor beams, 30%. End floor beams 60%.

Design unit stresses - Tension, 16,000 lbs. per sq. inch. Compression, $16,000 \div (1 + \frac{1000 L}{R^2})$, but not to exceed 13,000 lbs. per sq. inch. Figures indicated thus @ on trusses, indicate total number of holes deducted for net section of tension members.

Rivets - All rivets in trusses, girders, and floor system, to be $\frac{3}{4}$ " unless otherwise noted. All rivets in bracing members $\frac{3}{8}$ " unless otherwise noted. Maximum pitch of rivets as per Art. 1504. Pitch in ends of compression members as per Art. 1503. Stitch rivets as per Art. 1505. Article references are to A.A.S.H.O. Specifications of 1929.

Shop Practice - Detail shop drawings for all structural and cast steel shall be submitted to the State Highway Department in duplicate and shall be approved before steel is fabricated. Punching, reaming, and other shop requirements shall be in accordance with the specifications. These requirements shall be clearly noted on shop drawings to avoid oversight.

Concrete - Concrete in roadway slab to be 1:1 $\frac{1}{2}$: 3 mix. Exposed edges shall be benched $\frac{3}{4}$ " where no other bend is noted. Floor slab to be brought to grade and dead load deflection at beam and girder spans shall be taken care of by increasing slab thickness. Where bituminous felt is used in expansion or partition joints in slab, stitch felt securely to one face of concrete with copper wire.

Paint - Shop paint - None. Field paint - Surfaces inaccessible after erection; four coats of red lead. No other paint is to be applied by contractor. All paint will be furnished by the Missouri State Highway Department. Pins, pin bearings, and machine expansion plates, to be protected until installed by a coat of white lead and tallow.

Normal Dimensions - Where dimensions are given in terms of "Normal", the dimensions are to be taken as occur at 60° Fahrenheit, and with uncambered truss and girder dimensions.

Revised June 1931 by F.W.H.
Designed June 1930 by F.W.H.
Drawn Aug. 1930 by H.E.C.
Traced Aug. 1950 by C.A.E.
Checked July 1931 by P.C.

Sheet No. 7 of 10

STATE ROAD FROM VOTOW CROSSING TO ALLENTON
ABOUT 2.25 MILES EAST OF EUREKA
PROJECT NO. U.S. 56 TR-S6 STA. 883+09.73 FINISHED

ST. LOUIS COUNTY

SUBMITTED BY *W. B. Dick* DATE: 7/18/31

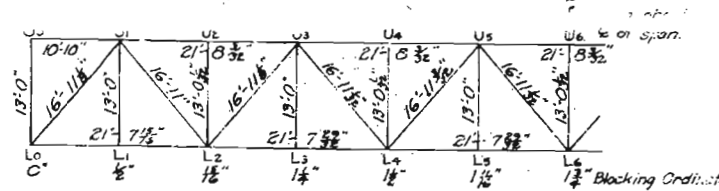
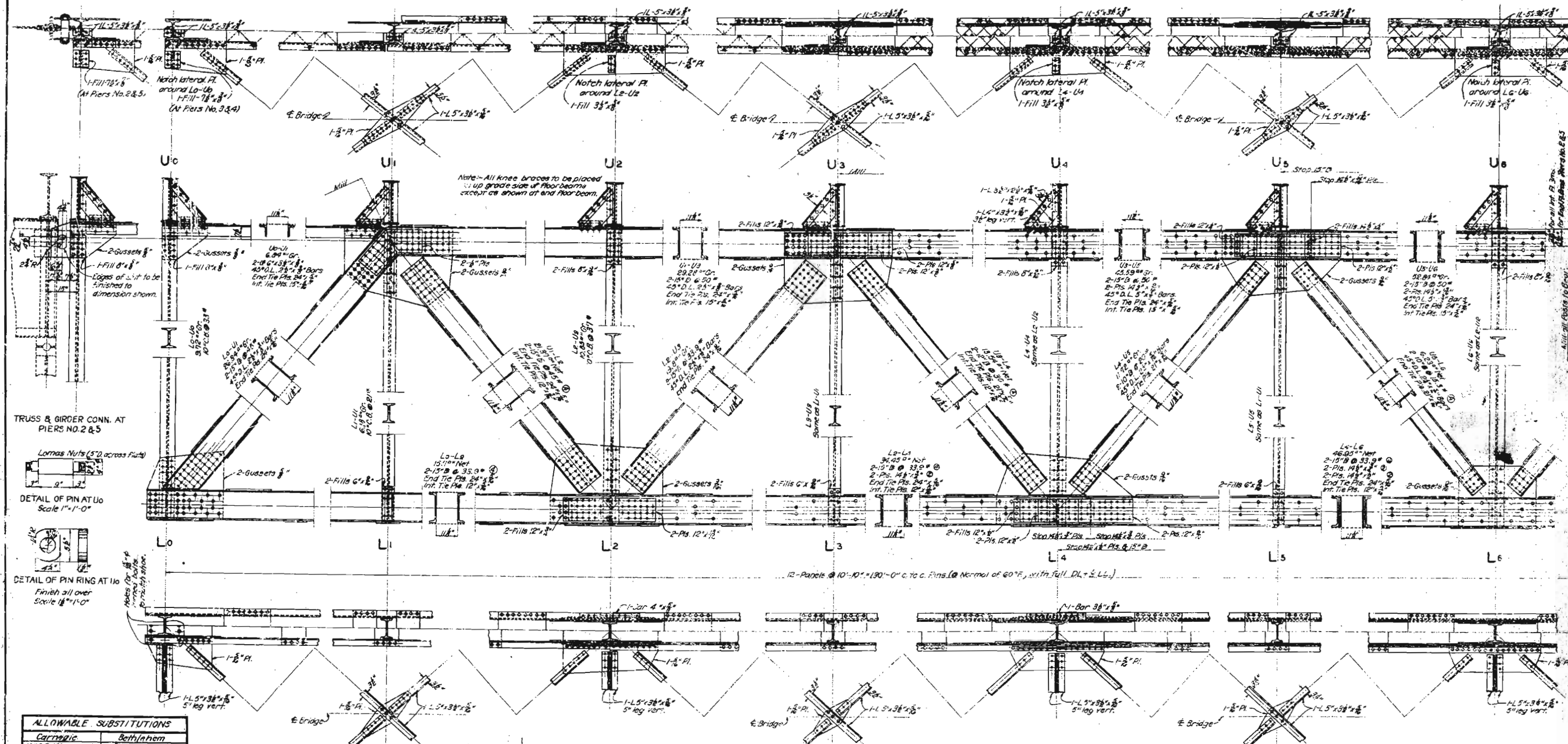
APPROVED BY *T. A. Butler* BRIDGE NUMBER: 7/18/31

CHEF ENGINEER

J-421

MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.	U.S. 66 TR-56	19		



Revised June 1931 By F.W.H.
Designed June 1930 By F.W.H.
Drawn July 1930 By H.E.C.
Traced Aug. 1930 By H.E.C.
Checked July 1931 By H.E.C.

CAMBER DIAGRAM

NOTES.

For general superstructure notes, see sheet No. 7.

For sway frames, roadway sections, and expansion devices, see sheet No. 7.

All intermediate tie plates to be at not to exceed 4'-0" centers.

For shoes see Sheet No. 10.

Rivets in flanges of chord members shall stagger with those in web. Where flange rivets foul with splice plates, the erector shall use a sequence of erection that will secure satisfactory and properly driven rivets.

BRIDGE OVER MERAMEC RIVER

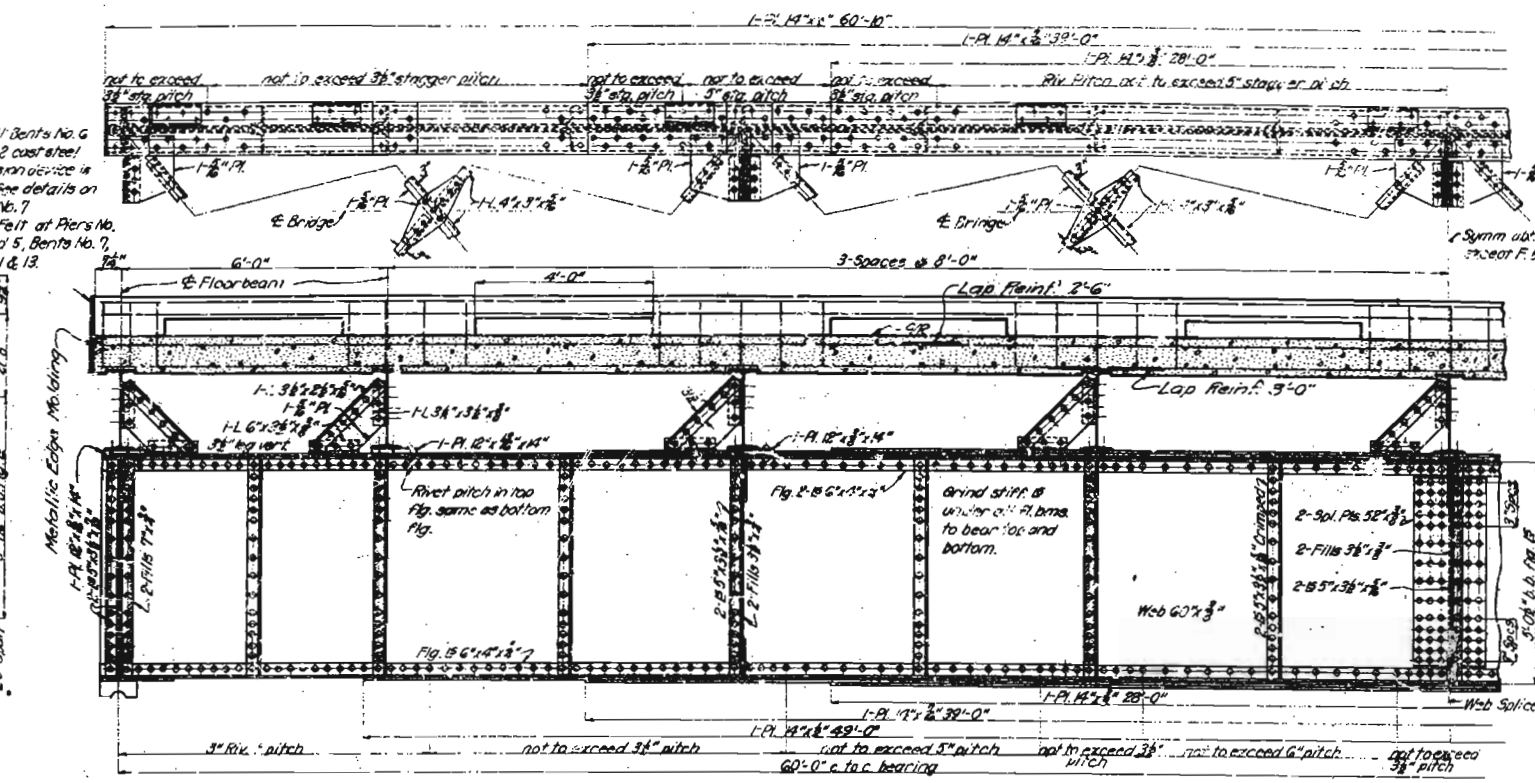
STATE ROAD FROM VOTOW CROSSING TO ALLENTON
ABOUT 2.25 MILES EAST OF EUREKA

PROJECT NO. U.S. 66 TR-56 STA. 883+09.73

ST LOUIS COUNTY

SUBMITTED BY *W. R. B. B.* DATE 7/18/31
APPROVED BY *T. A. B. B.* DATE 7/18/31
CHIEF ENGINEER

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO	U.S.G.G.R. -56	56		



Note:-
Build in three sections.
At splice points use 3" strap to connect
to both sides.
Field connection of sections with 2" x 4" csk.
head bolts.
All rivets 3/4".

Holes for 1/2" turner bolts

Normal

SECT. THRU END F.B.S.
AL BENTS G & 9

Metallic Edge Molding
For detail see sheet No. 3

Bent No. 16

Floor beam

Symm. abt. except F.B. brucke

Riv. pitch in top Flg. same as bottom flg.

Fig. 2-B 6' x 3' 1/8"

Fig. 2-B 6' x 3' 1/8"

Fig. 2-B 6' x 3' 1/8"

End stiffener angles ground to bear top and bottom

Riv. pitch not to exceed 0"

not to exceed 3/8" pitch

not to exceed 6" pitch

Drill for 1/2" turner bolts

Bridge

4" ϕ Pin Hole

2" ϕ s. 12" \times 3/4"

1" Fill 12" \times 3/4"

Diagram of a continuous beam with five supports. The beam is divided into four spans. The first span has a length of 8' - 14". The second span has a length of 11' - 11". The third span has a length of 12' - 6". The fourth span has a length of 11' - 11". The beam is supported by five supports. The first support is a fixed support. The second, third, and fourth supports are roller supports. The fifth support is a fixed support. The beam is labeled "Summ. abt. 8'" at the right end.

DETAIL OF SPAN 5-8
 Details same as shown for 60' girder except fills
 filled. Handrail posts will be detailed so rail will
 parallel with curb.

STATE ROAD FROM VOTOW CROSSING TO ALLENTON
ABOUT 2.25 MILES EAST OF EUREKA

SUBMITTED BY *W. J. [Signature]* DATE *7/18/31*
APPROVED BY *J. H. [Signature]* BRIDGE ENGINEER *7/18/31*

J-421

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