



Historic Bridge Management Plan for the Mermentau River – Grand Chenier Bridge

Recall Number: 033700

Structure Number: 07121940200001

Parish: Cameron

Route: LA 82

Crossing Description: Mermentau River



Prepared for

**Louisiana Department of
Transportation and
Development**

Prepared by

**Mead
& Hunt**

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June 2017

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Executive Summary

The Mermentau River – Grand Chenier Bridge (Recall No. 033700) is located in Cameron Parish, Louisiana, and is owned by the State of Louisiana. The bridge was completed in 1959, rehabilitated in 2011, and determined eligible for the National Register of Historic Places (National Register) in 2013. It is significant because of its distinctive engineering and design features in a pony truss swing bridge, which is characterized by the Warren truss configuration and center-bearing turning mechanism on a pivot pier.

The bridge carries two lanes of LA 82 across the Mermentau River. The approximately 1,049-foot bridge consists of 35 total spans, with the main span being a steel pony truss swing span measuring 204 feet. The main span is flanked by seven cast-in-place concrete slab spans and four steel I-beam spans to the west, and four steel I-beam spans and 19 cast-in-place concrete slab spans to the east. The bridge is operated by a hydraulic equipment system located primarily on the center pivot pier. The hydraulic cylinders are located on all four corners of the swing span and two on the center pivot pier. An operator's house is located on a separate precast concrete piling foundation in the northwest corner of the swing span. A timber fender system for waterway navigation extends into the waterway to the north and south of the truss swing span just west of the center pivot pier and provides for a clear horizontal navigation width of 70 feet. The bridge is classified as a complex structure because it contains one steel swing truss span unit. The swing truss span is classified as fracture critical because of the two trusses supporting the span, and because of the floorbeams in the floor system of the truss span.

The bridge was rehabilitated in 2011. It is in satisfactory condition and appears to adequately serve its purpose of carrying vehicular traffic over the waterway, with the ability to open to allow water navigation traffic to pass through the bridge. The operation of the bridge is satisfactory as observed in the opening-closing cycle during the field visit, and the operating machinery is adequately maintained. The major deficiencies are cracking and spalling of the concrete approach spans, deterioration of the joints in the concrete decks, spalling of the concrete substructure units, decay and deterioration of the timber fenders, and paint system failure of stringer, floorbeam, and truss member connections in the truss swing span. With proper maintenance and rehabilitation, the Mermentau River – Grand Chenier Bridge can continue to serve in its present capacity for 20 years or longer.

Any work on the bridge should proceed according to recommendations in this Historic Bridge Management Plan (Plan), which adhere to the *Secretary of the Interior's Standards for the Treatment of Historic Properties* (Secretary's Standards), the *Management Plan for Historic Bridges Statewide* (Statewide Historic Bridge Plan), and the *Programmatic Agreement among the Federal Highway Administration, the Louisiana Department of Transportation And Development, the Advisory Council on Historic Preservation, and the Louisiana State Historic Preservation Officer Regarding Management of Historic Bridges in Louisiana* (PA).

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1. Introduction

This Plan, used in conjunction with the Statewide Historic Bridge Plan, provides guidance on the approach to preservation activities for the Mermentau River – Grand Chenier Bridge (Recall No. 033700), identified as a Preservation Priority Bridge. Completion of individual management plans for Preservation Priority Bridges and the Statewide Historic Bridge Plan fulfills terms of the PA, which was executed on September 21, 2015.

The PA provides the basis and procedures for the management of historic bridges in Louisiana and outlines the procedures for the treatment of historic bridges, including Preservation Priority Bridges. In accordance with the PA, an owner seeking state or federal funding for Preservation Priority Bridges will be required by the Louisiana Department of Transportation and Development (LADOTD), in cooperation with the Louisiana State Historic Preservation Office (LASHPO) and the Federal Highway Administration (FHWA), to follow the procedures outlined in this Plan and the Statewide Historic Bridge Plan.

The Statewide Historic Bridge Plan outlines the overall approach to bridge preservation through a discussion of the collaboration of the historian and engineer, guidance on assessing preservation needs, and resources and technical guidance on maintenance and rehabilitation activities that are broadly applicable to historic bridges. A glossary of common engineering and historical terms is included in the Statewide Historic Bridge Plan.

This Plan for the Mermentau River – Grand Chenier Bridge compiles and summarizes the specific historic and engineering information for this Preservation Priority Bridge. It documents the existing use and condition of the bridge, along with assessments of the preservation needs, including cost estimates. Preservation can be accomplished in two manners: preventative maintenance and rehabilitation. Maintenance includes cyclical or condition-based activities that, along with regular structural inspections, are directed toward continued structure serviceability. Rehabilitation activities are near- or long-term steps that need to be taken to preserve and in some cases restore a bridge's structural condition and serviceability. In assessing preservation activities for each Preservation Priority Bridge, a design life of 20 years was considered, which is consistent with the duration of the PA. This Plan provides the bridge owner, and other interested parties, with detailed information related to the historic nature of the bridge and the necessary background to make an informed planning decision. Recommendations within this Plan should be reviewed in 10 years following completion of the Plan to identify any needed updates or revisions.

Existing bridge data sources typically available for Louisiana bridges were gathered for this Plan, and field investigation confirmed the general structural condition and character-defining features of the subject bridge. These sources include:

- The current LADOTD Bridge Inspection Report, and any other similar inspection reports
- Original bridge construction plans, any rehabilitation plans, and record as-built plans, as available
- Existing historical and documentary material related to the historic bridges

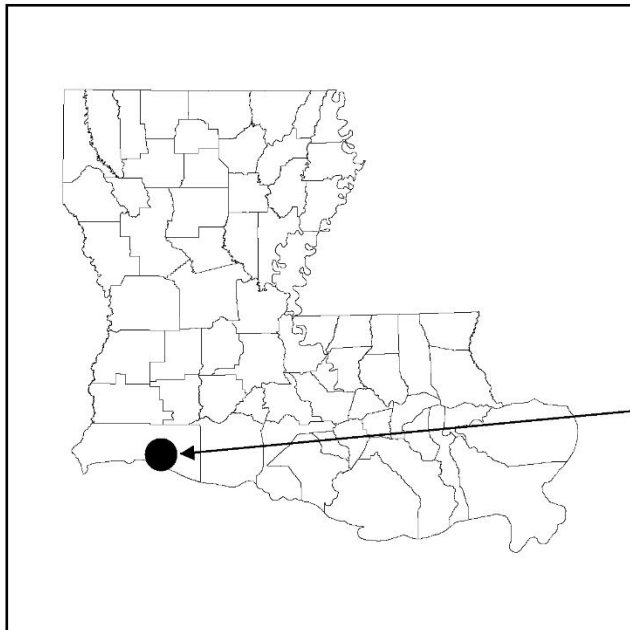
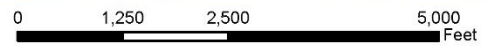
Recommendations within this Plan are consistent with the Secretary's Standards. The Secretary's Standards are basic principles created to help preserve the distinct character of a historic property and its site, while allowing for reasonable change to meet new engineering standards and codes. The Secretary's Standards recommend repairing, rather than replacing, deteriorated features whenever possible. A version of the Secretary's Standards that is specific to historic bridges is included in the Statewide Historic Bridge Plan. Following these standards is a requirement of the PA.

A bridge historian and bridge engineer from Mead & Hunt, Inc. (Mead & Hunt) jointly prepared this Plan under contract to the LADOTD. The LADOTD, FHWA, and LASHPO reviewed and provided input into the final Plan.

2. Location Map



Document Path: \\copp.mca.hunt.com\shared\blider\kemp\28442011\0325.DTI\11610108\Task 16 - Management Plan\Inventory Management Plans\Location Maps for Inair\Main Pinel\160324_Location Maps.mxd



PROJECT LOCATION
Bridge Number: 033700
Structure Number: 0712194020001
Cameron Parish
Route: LA 82
Crossing Description: Mermentau River/Grand Chenier

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3. Historic Data

A. Identifying information

Structure Number: 07121940200001

Recall Number: 033700

LASHPO Number: 12-00206

Bridge Name: Mermentau River – Grand Chenier Bridge

Date of Construction: 1959; rehabilitated in 2011

Main Span Type: Movable: Swing – Pony truss (Warren truss)

Contractor: Unknown

Designer/Engineer: Louisiana Department of Highways
Steward Machine Company, Birmingham, Al. (operating machinery)

B. Description of bridge

This bridge carries two lanes of LA 82 across the Mermentau River in Cameron Parish. The average daily traffic (ADT) across the bridge is approximately 1,990 vehicles. The 35-span structure consists of the main steel pony truss swing span, 26 concrete slab spans, and eight steel I-beam approach spans. The bridge is load (weight) posted for 15 to 25 tons (15T-25T). The bridge is classified as a complex structure because it contains one steel swing truss span unit. The swing truss span is classified as fracture critical because of the two trusses supporting the span, and because of the floorbeams in the floor system of the truss span.

The total length of this bridge is approximately 1,049 feet measured from end bent to end bent. The bridge is described as follows, from west to east. Spans 1 through 7 are cast-in-place concrete slab spans, each 20 feet long for a total length of 140 feet. Spans 8 through 11 are steel I-beam spans with cast-in-place concrete decks, each 40 feet long for a total length of 160 feet. Span 12 is the main span – a steel truss swing span – with a length of 204 feet. The distance between the centerline of joint and centerline of end floorbeam at each end of the truss span is approximately 2-foot-6-inch. Spans 13 through 16 are steel I-beam spans with cast-in-place concrete deck, each 40 feet long for a total of 160 feet. Spans 17 through 35 are cast-in-place concrete slab spans, each 20 feet long for a total length of 380 feet. Concrete approach slabs measuring 20 feet long are provided at each end of the bridge to transition from the bridge to the roadway.

The pony truss swing span includes a center-bearing turning mechanism on a pivot pier. The truss span is a 16-panel Warren pony truss measuring a total of 204 feet, including an open joint at either end of the span. The floor system of the truss swing span consists of eight lines of rolled steel stringers framing into rolled steel floorbeams. The steel stringers support an open grid steel deck. The cast-in-place, reinforced-concrete slabs for the approach spans are 12 inches thick. The I-beam approach spans consists of four lines of rolled steel beams spaced and 7 feet, 0 inches, and support a 6.5-inch-thick, cast-in-place, reinforced-concrete deck. The bridge provides a 24-foot clear roadway width with 1-foot-6-inch-wide sidewalks on each side of the roadway. On the concrete slab and steel I-beam approach spans, the sidewalks are cast-in-place reinforced concrete with 10-inch-high curbs. On the truss swing span, the walkways are constructed from checkered steel plates. The steel barrier railing consists of an angle and channel bolted to steel I-beams, which is located on the outside of the approach spans and inside of the main pony truss span.

The substructure for the approach spans consists of:

- Bents 1 and 34: cast-in-place, reinforced-concrete end bents supported on 14-inch-square precast concrete piles
- Bents 2-7 and 16-33: cast-in-place, reinforced-concrete caps supported on 14-inch-square precast concrete piles that form the columns
- Bents 8-10 and 13-15: cast-in-place, reinforced-concrete caps supported on 16-inch-square precast concrete piles that form the columns
- Bents 11 and 12: cast-in-place, reinforced-concrete caps supported on 18-inch-square precast concrete piles that form the columns

The substructure for the main swing truss span consists of:

- Piers 1 and 3: cast-in-place, reinforced-concrete caps supported on 18-inch-square precast concrete piles that form the columns
- Pier 2 (center pivot pier): cast-in-place, reinforced-concrete cap supported on 18-inch-square precast concrete plies that form the columns

The operator's house is located on a separate precast concrete piling foundation in the northwest corner of the swing span, outside of the sidewalk. The concrete operator's house has a square form and the house features an emblem of a pelican (the state bird) within the concrete wall. The building houses the electrical breakers, the control console and bypass switches, and space for the operator. The house was rehabilitated in 2011. The rehabilitation included replacement of the electrical components for the swing equipment and the installation of a new sewer plant and air compressor below the operator's house.

Additionally, the exterior of the building was painted and windows were replaced. On the interior, new flooring tile was installed.

A generator house is located at the end of the approach spans in the northwest corner of the bridge. The bridge is operated by a hydraulic equipment system located primarily on the center pivot pier. The hydraulic cylinders are located on all four corners of the swing span and two on the center pivot pier.

A timber fender system for waterway navigation extends into the waterway to the north and south of the truss swing span just west of the center pivot pier. The timber fender system provides for a clear horizontal navigation width of 70 feet.

Traffic barrier gates, traffic warning gates and traffic signals are located along the approach spans at each end of the bridge.

C. History and significance

The Mermentau River – Grand Chenier Bridge is located near Grand Chenier, Louisiana, an unincorporated community in southeastern Cameron Parish. The bridge carries LA 82/Grand Chenier Highway over the Mermentau River. The river connects Upper and Lower Mud Lakes before emptying into the Gulf of Mexico. LA 82 begins just south of Lafayette, Louisiana, and runs largely west to the Texas border. The bridge is located approximately 10 miles northwest of the western border of the Rockefeller Wildlife Refuge, an approximately 76,000-acre wildlife sanctuary.¹

The bridge replaced a previous structure that was washed away in 1957 by Hurricane Audrey, leaving an approximately 10-mile section of LA 82 inaccessible.² Plans for the bridge were prepared by the Louisiana Department of Highways and are dated November 1957 through February 1958, with approval granted on March 21, 1958. The main span of the bridge was designed using the Department of Highway's 1973 standard plan for a 204-foot swing span.³ According to Department of Highway annual reports, the cost of the bridge was just over \$900,000, with construction spanning from 1958 to 1960.⁴

The bridge possesses significance because of its distinctive engineering and design features in a pony truss swing bridge, which is characterized by the Warren truss configuration, center-bearing turning

¹ "Rockefeller Wildlife Refuge," *State of Louisiana Department of Fish and Wildlife*, <http://www.wlf.louisiana.gov/refuge/rockefeller-wildlife-refuge>.

² "Audrey Dead," *The Times-Picayune*, July 2, 1957.

³ As-built plans for Mermentau River Bridge at Grand Chenier, available at the Louisiana Department of Transportation and Development. The majority of the as-built plans are dated January 1958. Revisions to the 1973 standard plan spanned from 1941 to 1955.

⁴ Louisiana Department of Highways, *Financial and Statistical Report, Fiscal Year Ending June 30, 1958* (Baton Rouge, La.: Louisiana Department of Highways, 1958), 55; State of Louisiana, Department of Highways, *Financial and Statistical Report, Fiscal Year Ended June 30, 1959* (Baton Rouge, La.: Department of Highways, 1959), 59; State of Louisiana, Department of Highways, *Financial and Statistical Report, Fiscal Year Ended June 30, 1960* (Baton Rouge, La.: Department of Highways, 1960), 59.

mechanism on a pivot pier. The bridge exhibits alterations to the operator's house that result in a minor loss of integrity, but continues to convey significant design features of a Warren pony truss swing bridge type. The bridge is eligible for the National Register under *Criterion C: Design/Engineering*.

D. Character-defining features

Character-defining features are prominent or distinctive aspects, qualities, or characteristics of a historic property that contribute significantly to its physical character. Features may include materials, engineering design, and structural and decorative details. Elements of the bridge that are not identified as character-defining features may be historic fabric. Historic fabric is material in a bridge that was part of original construction. It is important to consider both character-defining features and the bridge's historic fabric when planning any work.

The Mermentau River – Grand Chenier Bridge has one character-defining feature: its Warren pony truss swing main span, including the center pivot pier and turning mechanism (described below). Other elements that represent historic fabric but are not considered to be character-defining are the approach spans on either side of the main span, the truss floor system, the bridge's simple steel railing, and the traffic barrier gates. The operator's house has been rehabilitated but retains its overall form and features and is therefore considered to be historic fabric.

The following items are the character-defining features of this bridge:

Feature 1: Design and construction of the truss swing span

This feature includes the 204-foot Warren pony truss swing main span. It also encompasses the bridge's center-bearing turning mechanism on a center pivot pier.



Character-defining Feature Photo 1: Design and construction of the Warren pony truss swing main span.



Character-defining Feature Photo 2: Design and construction of the Warren pony truss swing main span.



Character-defining Feature Photo 3: Design and construction of the center-bearing turning mechanism on the center pivot pier.

The following images illustrate other bridge features that are historic fabric, meaning they are part of original construction but are not considered to be character-defining features:



Historic Fabric Photo 1: Substructure and approach spans, typical of each end of the swing span.



Historic Fabric Photo 2: Approach spans on either side of the main swing span and steel railing.



Historic Fabric Photo 3: Operator's house and traffic barrier gate and towers.



Historic Fabric Photo 4: Truss floor system.

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4. Engineering Data

A. Existing conditions

(1) Structural observations

The Mermentau River – Grand Chenier Bridge was rehabilitated in 2011. The rehabilitation included patching the spalls on the concrete slab approach spans, significant remodeling of the operator's house, replacement of the electrical components for the swing span, a new sewer plant, a new air compressor, new hydraulic piping, hoses and fittings, new traffic gates, and cat walks, and hand rails on the east end of the bridge and all structural steel members, including the bridge railing, were cleaned and painted. It is in satisfactory condition and appears to adequately serve its purpose of carrying vehicular traffic over the waterway, with the ability to open to allow water navigation traffic to pass through the bridge. The operation of the bridge is satisfactory as observed in the opening-closing cycle during the field visit, and the operating machinery is adequately maintained. The major deficiencies are cracking and spalling of the concrete approach spans, deterioration of the joints in the concrete decks, spalling of the concrete substructure units, decay and deterioration of the timber fenders, and paint system failure of stringer, floorbeam, and truss member connections in the truss swing span.

The bridge is load (weight) posted at 15 to 25 tons (15T-25T), with signs indicating this at each end of the bridge.

Approach spans (spans 1-7 and 17-35)

The cast-in-place, reinforced-concrete slabs of the approach spans (spans 1 through 7 and 17 through 35) are in poor condition, exhibiting transverse and longitudinal cracks, some measuring in excess of 3/8-inch wide. These cracks are penetrating the entire slab with efflorescence on the underside. In 2011 the spalls on the underside of the slabs were patched, although they are still exhibiting cracks, delaminations, and spalls with some exposed reinforcement. The top of the deck exhibits exposed aggregate, surface wear, and scaling of the concrete deck surface. The deck joints are in good condition, although they are deteriorating, peeling, and missing in areas. The concrete substructure concrete units (bents with square precast concrete piles and reinforced-concrete caps) are in good condition, but exhibiting spalls, discoloration, waterstains, and some exposed aggregate. The concrete haunches at the abutments and the bent caps are spalling. The metal railing in spans 1 through 7 is in good condition. The metal railings in spans 1 through 7 and spans 17 through 35 were rehabilitated in 2011 and are in good condition.

Approach spans (spans 8-11 and 13-16)

The cast-in-place, reinforced-concrete slabs supported on steel I-beams of the approach spans (spans 8 through 11 and 13 through 16) are in poor condition, exhibiting transverse and longitudinal cracks, some measuring in excess of 3/8-wide. These cracks are penetrating the entire slab with efflorescence on the underside. In 2011 the spalls on the underside of the slabs were patched, although they are still exhibiting cracks, delaminations, and spalls with some

exposed reinforcement. The underside of the slabs has rust stains and surface spalls at the steel beams. The top of deck exhibits exposed aggregate, surface wear, and scaling of the concrete deck surface. The raised curb in spans 8 through 11 exhibits cracks, surface spalls, and minor exposed reinforcement on the underside. The open deck joints are in good condition, clean and free of debris. The steel I-beams exhibit minor rust on the top flange, where the beam meets the concrete deck. The steel I-beams are in good condition. In 2011 the steel I-beams in spans 13 through 16 were cleaned, primed, and painted. The bearings are exhibiting rust staining and corrosion due to paint system failure. The concrete substructure units (bents with square precast concrete piles and reinforced concrete caps) are in good condition, but exhibiting spalls, discoloration, waterstains, and some exposed aggregate. The concrete haunches at the bent caps are spalling. The metal railing in spans 8 through 11 is in good condition and the paint system condition is good. The metal railing in spans 13 through 16 was rehabilitated in 2011 and is in good condition, and the paint system condition is good.

Swing pony truss span (span 12)

The swing pony truss span is classified as fracture critical. It has an open steel grid deck and steel raised curbs. The deck and raised curbs are in good condition. The steel grid deck over the center pivot pier is filled with concrete, and is also in good condition, only exhibiting minor fading of the painted lane line striping. The steel stringers were painted during the 2011 rehabilitation, and remain in good condition, with the exception of minor paint failure and corrosion at the connections to the floorbeams. The steel trusses are in fair condition. The paint system is failing, with corrosion and section loss at the connections to the trusses. The steel trusses were painted during the 2011 rehabilitation, and are in fair condition. There is paint failure and deterioration at the steel connections and corrosion, pitting, and section loss on the rivet heads. The floorbeams are in fair condition, with paint failure and deterioration at the connections. The live load shoes, which are located at all four corners of the movable swing span, are in good condition and working properly. The concrete piers (square precast concrete piles with reinforced-concrete caps) are in good condition with minor surface spalls, discoloration of the concrete, waterstaining, and algae. Components of the operating machinery system are in good condition and functioning properly. Components of the electrical system are in good condition and functioning properly.

The steel railing on the bridge consists of a horizontal steel angle and a horizontal steel channel supported by steel I-beams bolted to the steel structure. The railing is in good condition.

(2) Non-structural observations

Traffic barrier gates at each end of the swing span are lowered when the bridge is opened, and are in good functional and structural condition. The counterweights are located in the traffic barrier tower and are in good condition.

The traffic warning gates on the east end of the bridge were replaced during the 2011 rehabilitation. Traffic signal lights at each end of the bridge are functioning and are in good condition.

The navigation lights are in good condition and working properly.

The operator's house is in good condition and fully functional. The house was rehabilitated in 2011. The rehabilitation included replacement of the electrical components for the swing equipment and the installation of a new sewer plant and air compressor below the operator's house. Additionally, the building was painted and new windows were installed. On the interior, new floor tile was installed. The hydraulic equipment, gears, and bearings are in good condition; new piping, hoses, and fittings were installed as part of the 2011 rehabilitation.

A Cummins diesel generator and transfer switch are located in the generator house. These components are in good condition.

The timber fender system is in fair condition with the original timbers heavily decayed with some measured section loss. Steel I-beams have been driven behind both timber fender systems to provide support. Catwalks have been added to the top of the fender systems to allow access to bridge components. The catwalks are in good, functional condition.

There are missing, broken, and decayed wooden railing spacer blocks on the northeast roadway approach guardrail.

The west and east approach slabs are in satisfactory condition. The west concrete approach has been partially overlaid with asphalt, which is exhibiting cracking, rutting, and minor deterioration. The east concrete approach slab has been overlaid with asphalt, which is also exhibiting cracking and rutting.

(3) Serviceability observations

The ADT across the bridge is approximately 1,990 vehicles. There are no advisory posted speed limit signs at this bridge location. The bridge clear roadway width of 24 feet provides for two lanes of traffic, one in each direction, with 1-foot-6-inch-wide raised walkways on each side of the roadway. The bridge adequately handles this traffic volume. The horizontal and vertical geometry of the bridge is good.

The bridge is manned from 6 a.m. to 6 p.m. daily and opens the most (approximately 30 times a month) during the months of March, April, and May due to shrimp season.

B. Sources of information

Plans available:	Yes, available at the LADOTD Bridge Section office
Inspection report date:	April 19, 2016
Fracture critical report date:	(included as part of routine inspection report)
Underwater inspection report:	August 13, 2012
Date of site visit:	February 2, 2016



Condition Photo 1: Looking east toward swing span from the west approach spans.



Condition Photo 2: Typical pour seal joint deterioration and vegetation growth in approach spans concrete decks.



Condition Photo 3: Typical cracking in top of concrete approach spans, longitudinal cracking, and painted lane line striping faded.



Condition Photo 4: Paint system failure and rust at pony truss connections; upper chord connection joint shown, other connection joints similar condition.



Condition Photo 5: Underside of truss span and floor system, showing paint system failure and rust at truss member connections.



Condition Photo 6: Bridge railing rust and paint system failure, typical throughout the bridge. Photo at joint between approach span and swing truss span.



Condition Photo 7: South timber fender system with catwalks.



Condition Photo 8: Operator's house exterior, rehabilitated in 2011.



Condition Photo 9: Air compressor and sewage system under the operator's house.



Condition Photo 10: Control panel in the operator's house.



Condition Photo 11: Tile, paint, and windows in the operator's house from 2011 rehabilitation.



Condition Photo 12: East approach spans looking east.



Condition Photo 13: East approach spans with tower, traffic barrier gate, and signals.



Condition Photo 14: West approach spans and west approach roadway with traffic signals and guardrail, looking east.



Condition Photo 15: Swing pony truss looking east.



Condition Photo 16: Swing pony truss opening.



Condition Photo 17: Discoloration of the approach west span bents.



Condition Photo 18: Center concrete pivot pier with operating machinery, center pivot bearing, and pivot rail and rollers.



Condition Photo 19: Overall view of bridge looking south.

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5. Recommendations

This Preservation Priority Bridge should remain in use and can meet current and projected transportation needs for the next 20 years or more. Maintenance and rehabilitation activities should be completed in a manner consistent with the long-term preservation of this historic bridge. The Statewide Historic Bridge Plan provides additional guidance and approaches to completing maintenance and rehabilitation activities that adhere to the Secretary's Standards. Work should be conducted under the supervision of a qualified professional historian, as defined in the PA. The bridge engineer, or the bridge engineer's supervising engineer, should have demonstrated expertise in historic bridge projects and must have completed the LADOTD's historic bridge training. When developing plans and specifications for a project, the bridge engineer should follow the recommendations below.

Under the terms agreed upon in the PA, the bridge owner may undertake certain activities that are considered to be best practices without additional consultation or public notification. These activities are documented in Attachment 5 of the PA and are limited to the activities specifically noted. All recommended preventative maintenance and rehabilitation activities for this bridge are included in Attachment 5 and are not expected to alter character-defining features or historic fabric of the bridge. Some cyclical or condition-based maintenance items are noted below under Rehabilitation because they are expected to be completed as part of an overall rehabilitation project for this bridge. These activities may need to be completed as conditions dictate to promote long-term preservation of this historic bridge. Recommendations within this Plan should be reviewed in 10 years following completion of the Plan to identify any needed updates or revisions.

The opinions of probable costs provided below are in 2016 dollars. The costs were developed without benefit of preliminary rehabilitation plans and are based on the above identified tasks using engineering judgment and/or gross estimates of quantities and historic unit prices and are intended to provide a programming level of estimated costs. Refinement of the probable costs is recommended once preliminary plans have been developed. The estimated preservation costs include a 10% contingency and 7% mobilization allowance of the preservation activities, excluding soft costs. Actual costs may vary significantly from those opinions of cost provided herein. Engineering design, historical consultation, and construction administration costs are not included as these may be provided by the owner or consultants.

A. Preventative maintenance

The following are recommendations for cyclical maintenance. Because these activities are routinely done, the cost is not included in the cost estimate. There are no condition-based maintenance recommendations at this time, based on the bridge condition as observed during the site visit and as documented in available information.

1. Replace decayed timber fender components that exhibit more than 50% section loss, as necessary.
2. Replace timber spacers in roadway guardrail approach system that are decaying, as necessary.
3. Lubricate all operating machinery for the bridge regularly to maintain good condition.

B. Rehabilitation

The following are recommendations for rehabilitation. These activities should be performed within the next five years:

1. Clean and paint steel I-beams and bearings of the steel approach spans in accordance with the current standard cleaning and painting specification.
2. Remove failed joint material and replace with new expansion joint material in the concrete roadway decks for approach spans.
3. Clean concrete substructure units with low pressure water wash, and patch concrete spalls.
4. Spot clean and paint steel truss connections, including floor system and bracing connections, in accordance with the current standard cleaning and painting specification for recoating previously painted steel bridges.
5. Repair the cracking in the concrete decks and patch spalls on the underside of concrete decks on approach spans.
6. Mill and overlay the asphalt on the concrete approach slabs on both ends of the bridge.

Bridge Recall No. 033700		Date:	9/30/2016	
Mermentau River - Grand Chenier Bridge				
Opinion of Probable Costs				
Rehabilitation				
Item	Quantity	Unit	Unit Cost	Total
Clean and paint steel I-beams and bearings of the steel approach spans in accordance with the current standard cleaning and painting specification.	1	LS	\$200,000	\$200,000
Remove failed joint material and replace with new expansion joint material in the concrete roadway decks for approach spans.	648	LF	\$50	\$32,400
Clean concrete substructure units with low pressure water wash, and patch concrete spalls.	1	LS	\$150,000	\$150,000
Spot clean and paint steel truss connections, including floor system and bracing connections, in accordance with the current standard cleaning and painting specification for recoating previously painted steel bridges.	1	LS	\$75,000	\$75,000
Repair cracking in the concrete decks and patch spalls on the underside of concrete decks on approach spans.	1	LS	\$100,000	\$100,000
Mill and overlay the asphalt on the concrete approach slabs on both ends of the bridge.	107	SY	\$100	\$10,700
Traffic control signage, drums and temporary pavement marking for staged construction of items listed above	1	LS	\$30,000	\$30,000
Item Subtotal				\$598,100
Contingency			10.00%	\$59,810
Mobilization			7.00%	\$46,053.70
TOTAL ESTIMATED CONSTRUCTION COST				\$703,964
Round to:				\$704,000

C. Identification of any anticipated design exceptions

No design exceptions were noted, nor are any design exceptions recommended.

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Appendix A. Historic Inventory Form

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Louisiana Historic Bridge Inventory

Recall Number: 033700

Structure Number: 07121940200001

SHPO Number: 12-00206

Bridge Name: MERMENAU R./G. CHENIER

Location Data:

District: 07

Parish: Cameron

Feature Crossed: MERMENAU R./G.CHENIER

Facility Carried: LA0082

Location: 8.25 MI. S OF INT LA1143

City, Village or Town (if applicable):

Status: Open

Bridge Owner: State of Louisiana

Latitude: 29.770389

Longitude: -93.013722

Structural Data:

Bridge Type: Steel Low Truss Swing Span

Year Built: 1959

Main Span Configuration (if applicable): Pony truss swing span (Warren)

Maximum Span Length (feet): 204

Number of Spans: 1

Overall Structure Length (feet): 1049

Approach Span Type (if applicable): Concrete - mixed design

Posted Load: 15-25

Current ADT: 001490

Design and Construction Data:

Engineer or Builder:

Unknown

Bridge Plaque:

None

National Register of Historic Places Evaluation:

This Warren pony truss swing bridge has significance as an example of a movable bridge and as a subtype. Its significance is demonstrated by the presence of distinctive engineering and design features of a pony truss swing bridge, which is characterized by the Warren truss configuration, center-bearing turning mechanism, pivot pier, and operator's house. The bridge exhibits alterations to the operator's house that result in a minor loss of integrity, but continues to convey significant design features of this subtype. The bridge is eligible for listing in the National Register under Criterion C: Design/Engineering.

No evidence was found during research or data collection activities to indicate that this bridge possesses a direct and important association with historical events or trends. This bridge does not possess significance under Criterion A.

Within/Adjacent to Known Historic District: N/A

National Register Historic District Name: N/A

National Register Determination: Eligible

National Register Determination Date: 2013

Surveyor: Mead & Hunt, Inc.

Date Surveyed: 2013



Louisiana Historic Bridge Inventory

Recall Number: 033700

Structure Number: 07121940200001

Bridge Name: MERMENAU R./G. CHENIER

Parish: Cameron

Bridge Owner: State of Louisiana

Feature Crossed: MERMENAU R./G.CHENIER

Facility Carried: LA0082

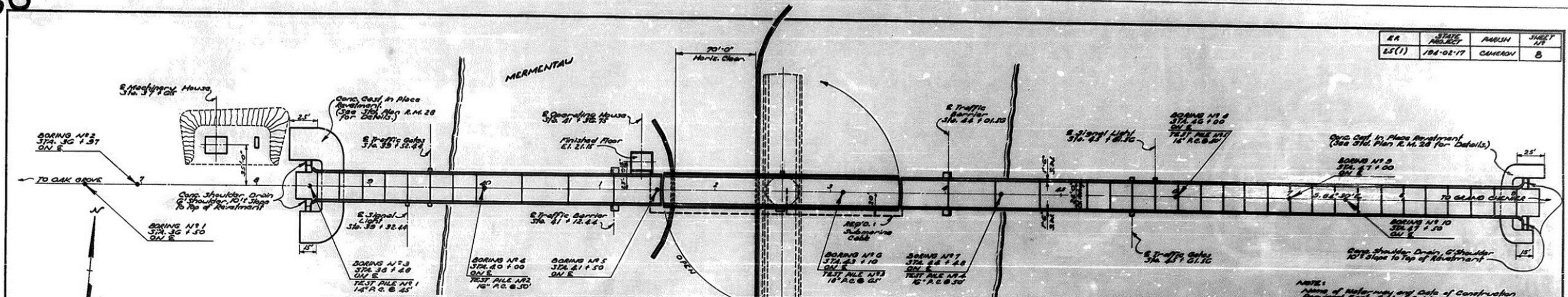
Photographs:



Appendix B. Select Plan Sheets

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EA	STATE	PAVING	SHEET
LS(1)	LA-02-17	CAMERON	5



REQUIRED ADDITIONAL BRIDGE QUANTITIES
(DUE TO ADDITION OF 12 @ 20' CONCRETE SLAB SPANS)

ITEM	4'-5'-1	4'-5'-1 X	4'-6'-1	4'-7'-1	5'-1'-2
	CLASS "A" CONCRETE	CLASS "A" CONCRETE (BEAMS)	REINFORCED CONCRETE	PRECAST CONCRETE	12" PRECAST CONCRETE PILES
LOCATION	CU. YD.	CU. YD.	POUND	POUND	LINE FT.
SPANS # 22 THRU 28		59.52	7332		2300
SPANS # 23 THRU 24	257.40		45 2/3	20784	
TOTAL	257.40	59.52	52548	20784	2300

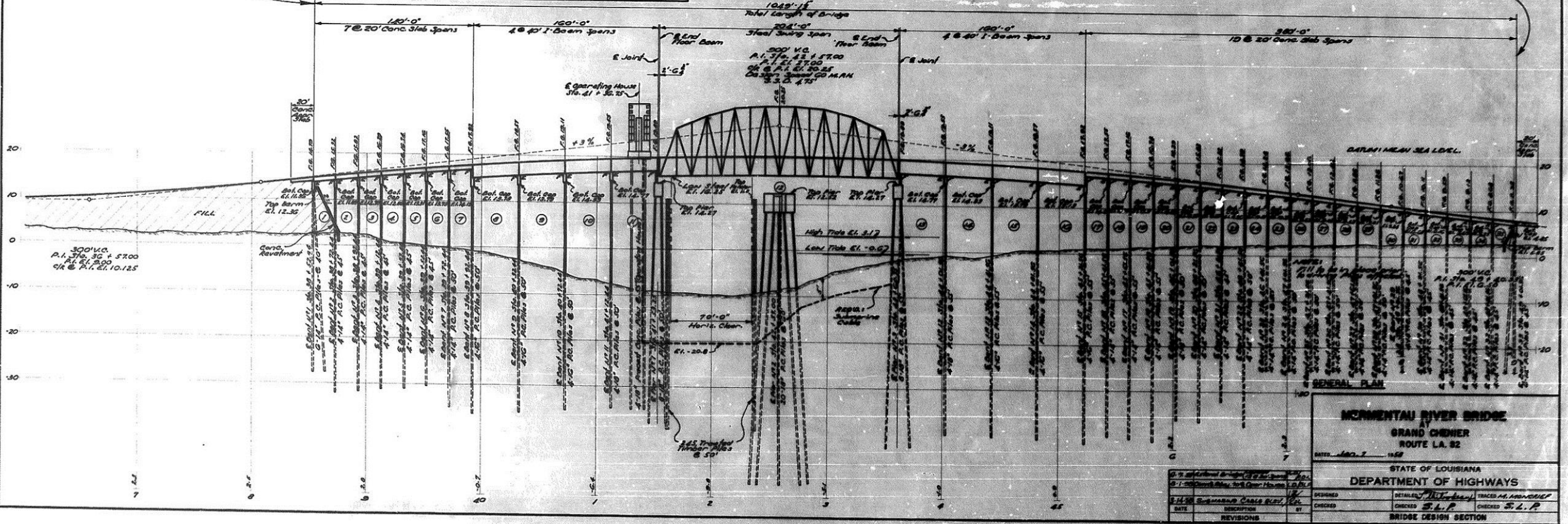
ORIGINAL BEAM # 22 CHANGED TO # 23.
ORIGINAL SPAN # 23 CHANGED TO # 25.

END ROADWAY B.E.G. BRIDGE STA. 38 + 52.44

PLANS
SPANS # 1 THRU 11 & 13 THRU 25: SPECIAL DETAILS
SPAN # 12: STD. PLAN 3.5, 3.5, 3.5
BEAMS # 1 THRU 3: SPECIAL DETAILS
PIERS # 1 & 2: STD. PLAN 3.1, 3.1
APPROACH: ALAS: STD. PLAN 3.1, 3.1
PRECAST CONCRETE PILES: STD. PLAN 3.1, 3.1
CONCRETE RETAINMENT: STD. PLAN 3.1, 3.1
CONCRETE BULKHEAD: STD. PLAN 3.1, 3.1
OPERATING HOUSE: SPECIAL DETAILS
REINFORCEMENT: SPECIAL DETAILS
PAVING SYSTEM: SPECIAL DETAILS

NOTE:
Name of Material and Date of Construction
Shown Each End of Bridge.
See 3rd Plans 3.14, 3.15 and 3.16, 3.17.

REQ'D:
Two Trailer Office Units.
Condition to be approved by P.E. Engineer.
To be paid for under Item 3.1.
(See Special Provisions for Details and Description.)



MERMENTAU RIVER BRIDGE
GRAND CHENIER
ROUTE LA 82

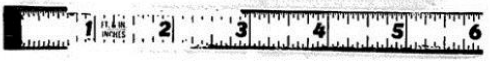
DATE: MAR 7 1958

STATE OF LOUISIANA
DEPARTMENT OF HIGHWAYS

DESIGNED	TRACED
CHECKED	CHECKED
DATE	REVISIONS

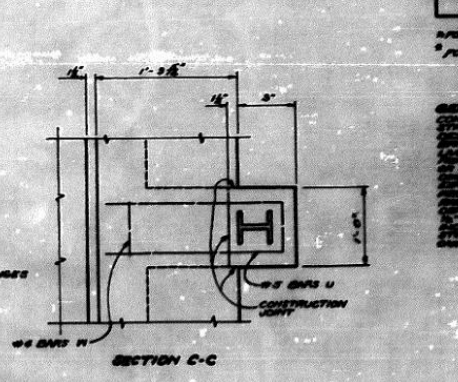
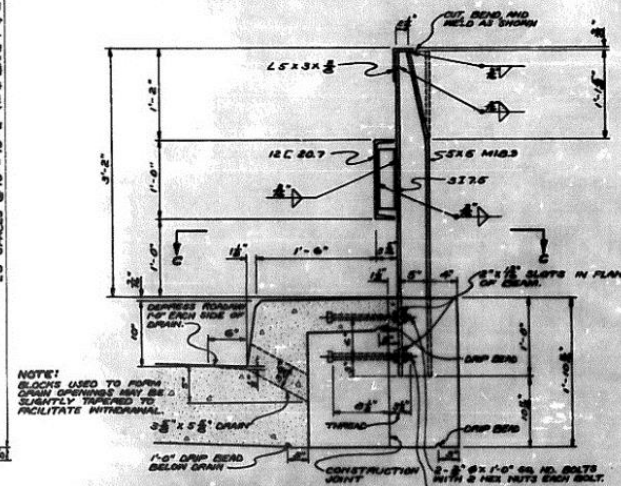
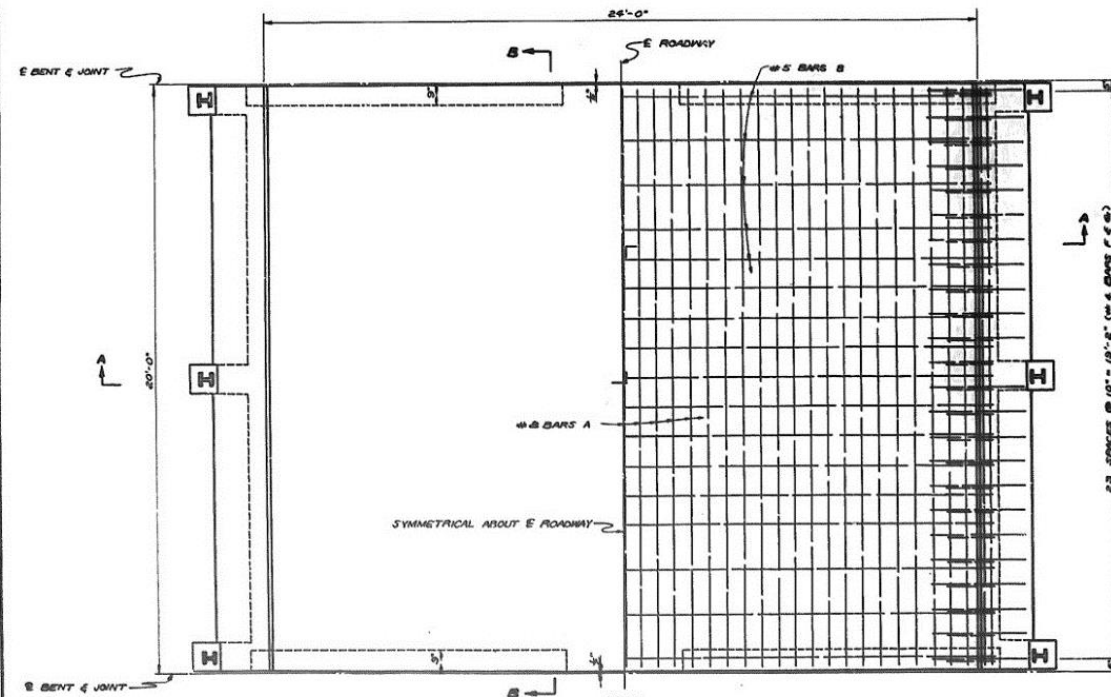
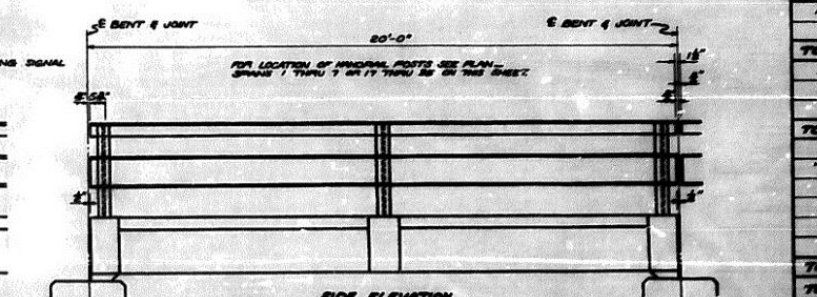
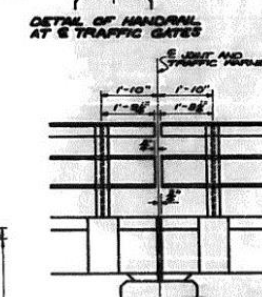
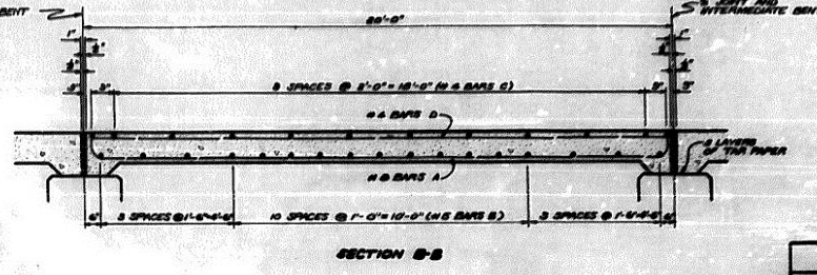
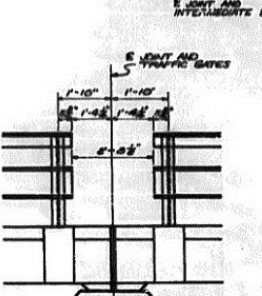
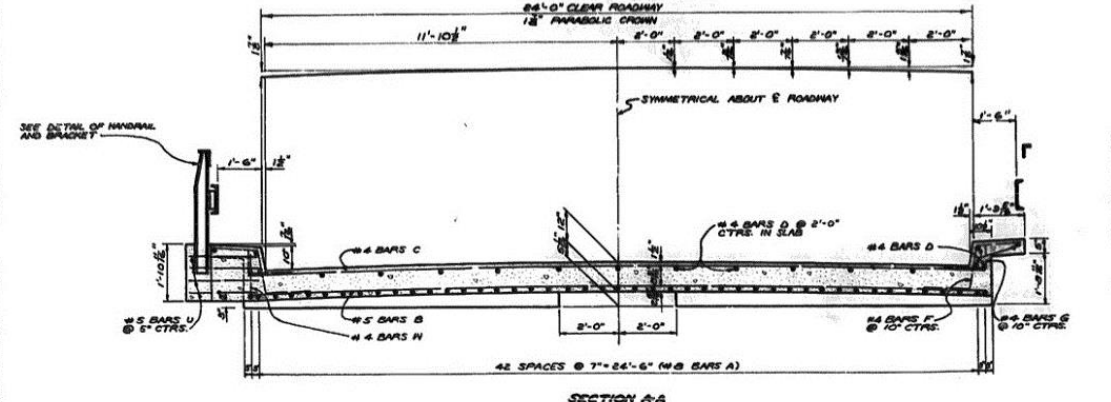
BRIDGE DESIGN SECTION

FINAL TRACINGS



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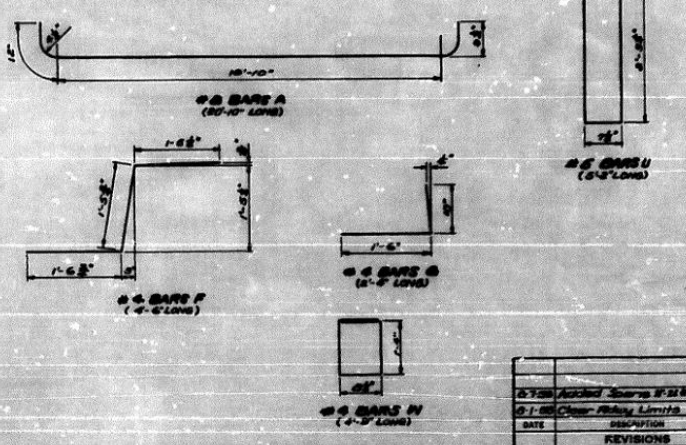
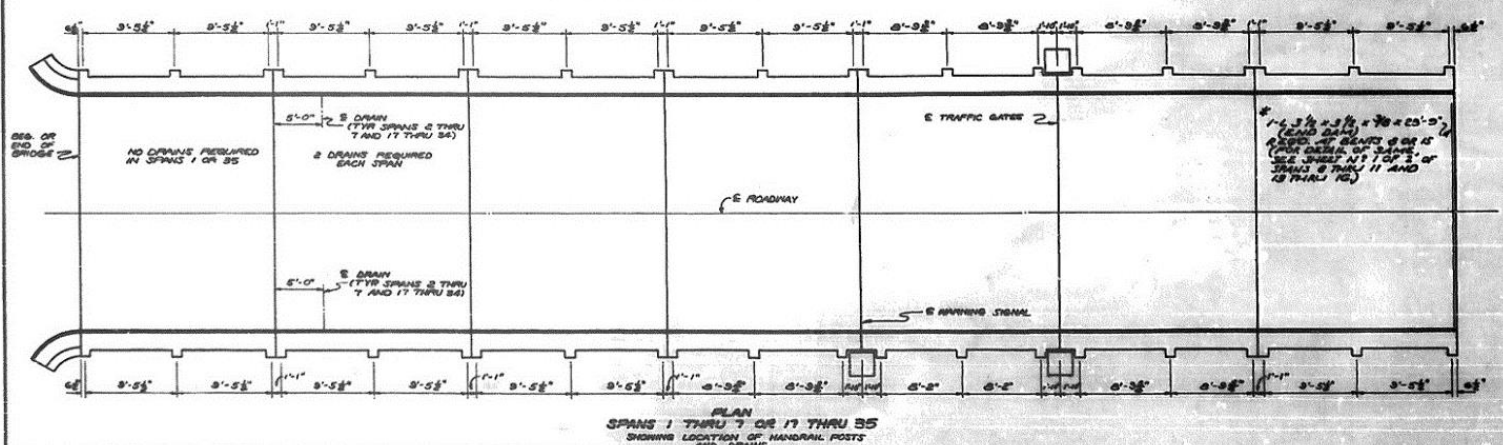
SR	STATE PROJECT	PARISH	SHEET NO.
25 (1)	194-02-17	CAMERON	13



BILL OF MATERIALS FOR ONE SPAN					
BAR	SIZE	NO	LENGTH	TOTAL LENGTH	LOCATION
A	#4	48	20'-10"	987'-8"	BOTTOM OF SLAB
B	#5	17	20'-10"	343'-10"	BOTTOM OF SLAB
U	#5	24	5'-6"	134'-0"	INTERNAL BRACKET
TOTAL #4 BARS = 987'-8" = 2000 LBS.					
TOTAL #5 BARS = 57'-10" = 676 LBS.					
C	#4	12	20'-5"	246'-0"	TOP OF SLAB
D	#4	12	18'-5"	218'-0"	TOP OF SLAB
F	#4	42	4'-6"	192'-0"	CURB AND SIDEWALK
G	#4	42	4'-6"	192'-0"	CURB
H	#4	6	20'-6"	123'-6"	HANDRAIL BRACKET
TOTAL #4 BARS = 1032'-0" = 2296 LBS.					
TOTAL REINFORCING STEEL 2766 LBS.					
TOTAL CLASS 'B' CONCRETE 21.41 CU YDS.					
TOTAL FAB. CARBON STEEL 1932 LBS.					

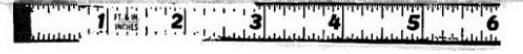
FOR SPANS 2, 3, 4, 14, AND 19 DEDUCT TOP FABRICATED CARBON STEEL EACH
 FOR SPANS 7 AND 17, AND 17'-0" FABRICATED CARBON STEEL EACH.

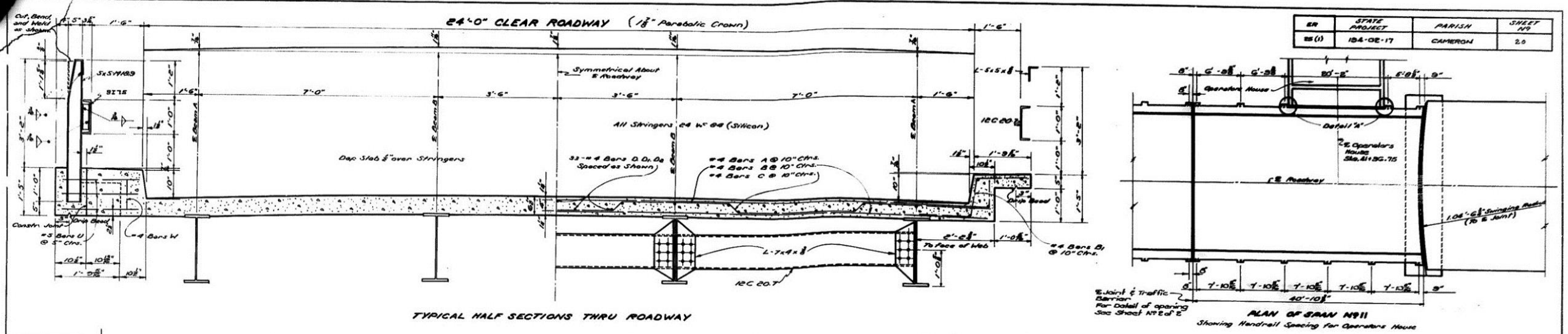
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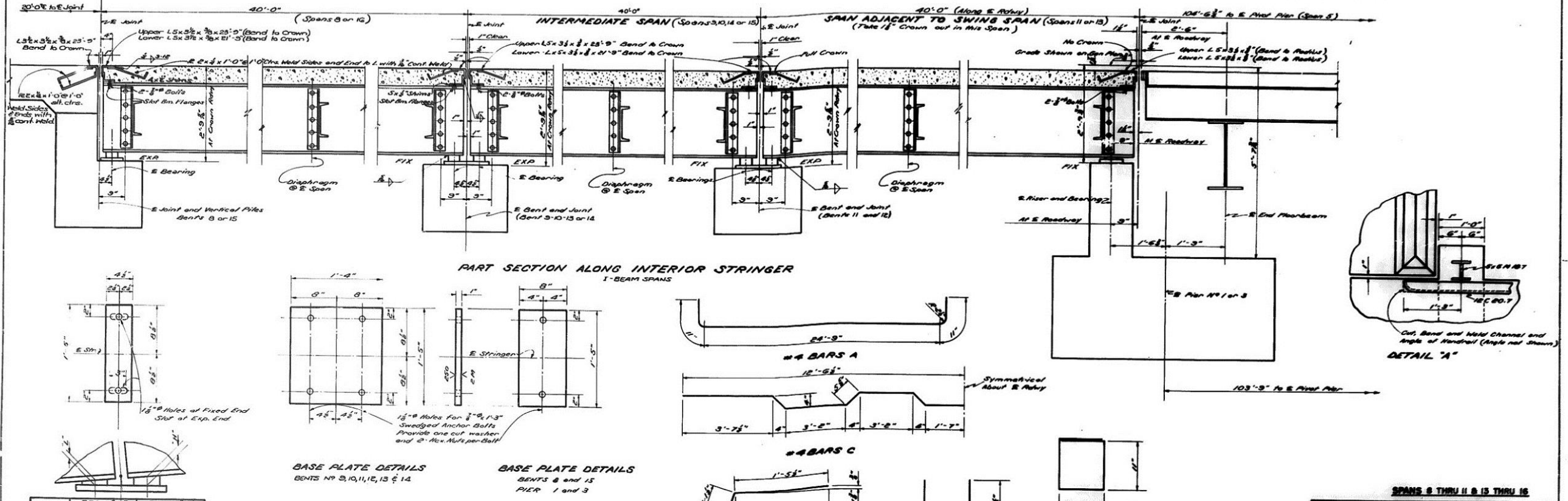
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MERMETAU RIVER BRIDGE AT GRAND CHERIER ROUTE LA. 82	
STATE OF LOUISIANA DEPARTMENT OF HIGHWAYS	
DATE: NOVEMBER 16, 1957	
DESIGNED BY: <i>[Signature]</i>	TRACED BY: <i>[Signature]</i>
CHECKED BY: <i>[Signature]</i>	CHECKED BY: <i>[Signature]</i>
BRIDGE DESIGN SECTION	

FINAL TRACINGS





BR	STATE PROJECT	PARISH	SHEET NO
11	104-02-17	CAMERON	20



BEARING PLATE DETAILS

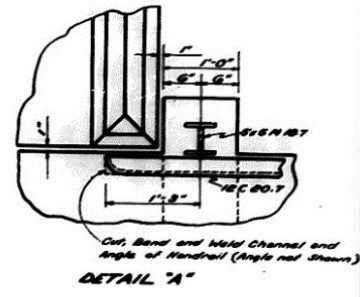
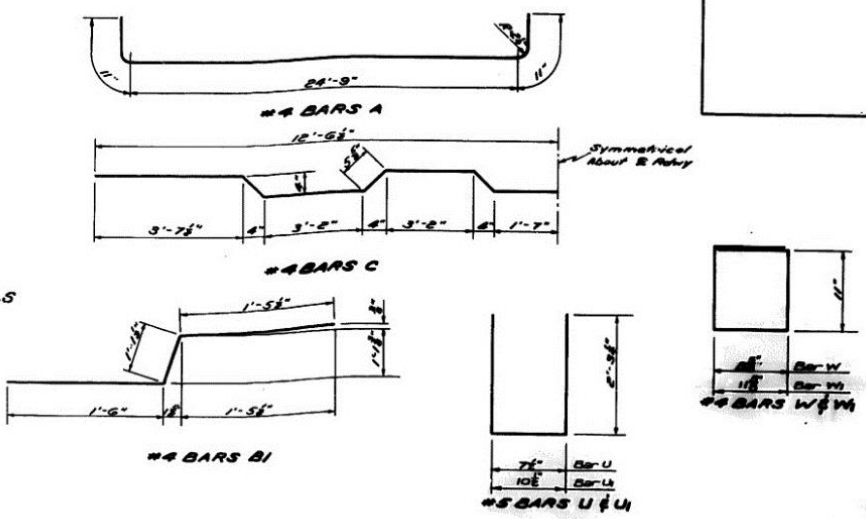
BENT NO.	BEAM A	BEAM B
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10	24	24
11	24	24
PIER N91	24	24
PIER N93	24	24
12	24	24
13	24	24
14	24	24
15	24	24

BASE PLATE DETAILS

BENTS NO 9, 10, 11, 12, 13 & 14

BASE PLATE DETAILS

BENTS 8 and 15
PIER 1 and 3



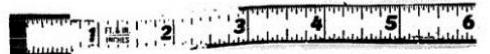
SPANS 9 THRU 11 & 13 THRU 15

MERMETAU RIVER BRIDGE
AT
GRAND CHERIE
ROUTE LA. 82

STATE OF LOUISIANA
DEPARTMENT OF HIGHWAYS

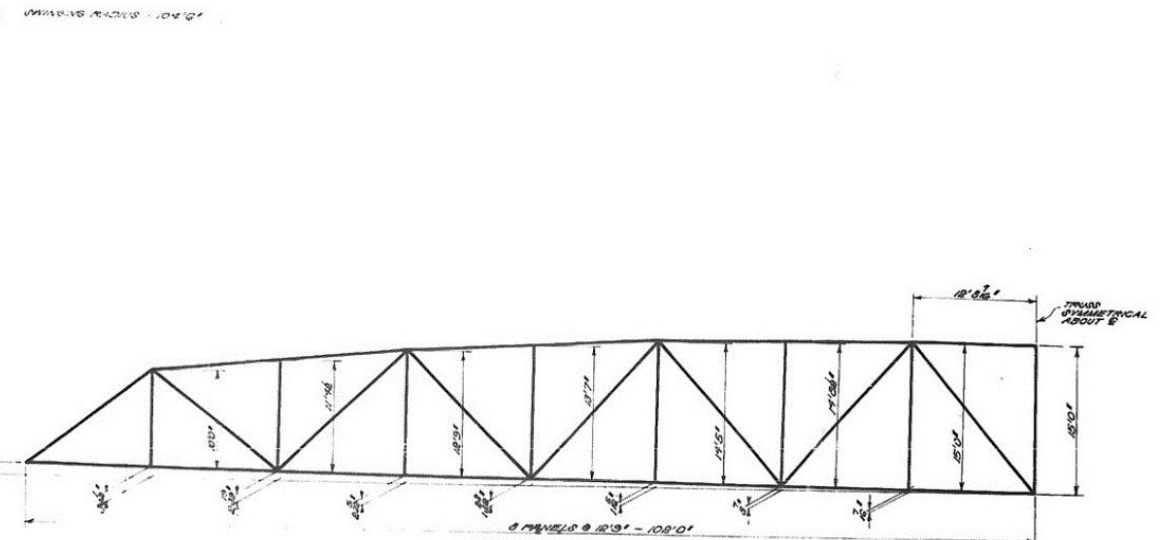
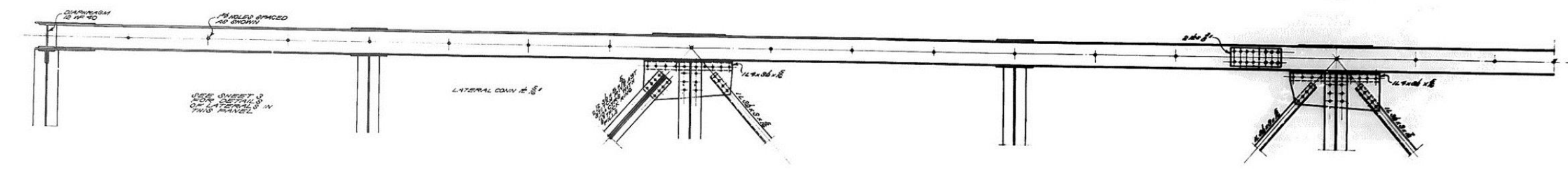
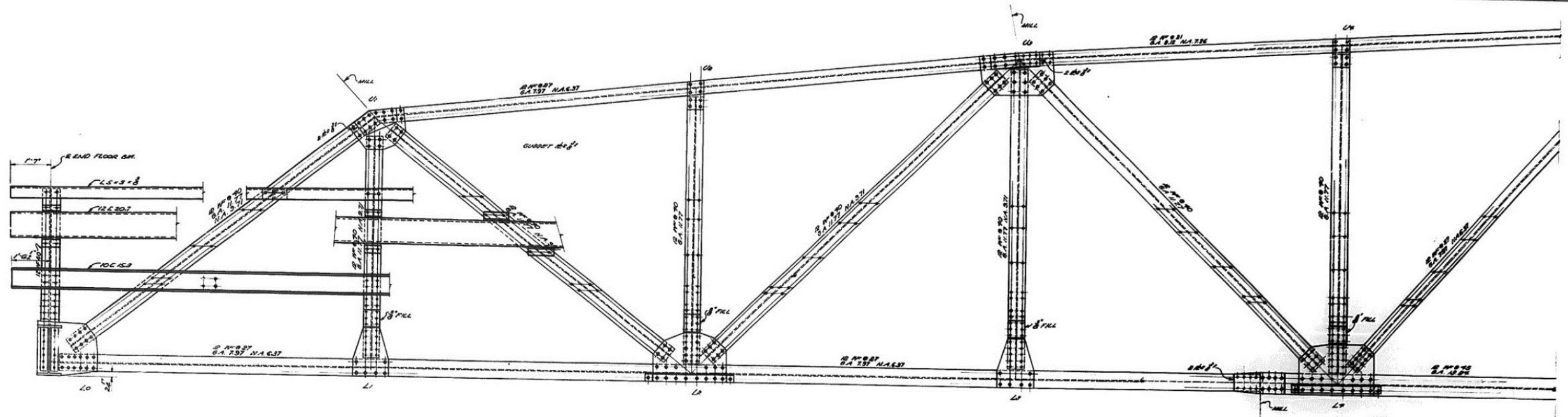
BRIDGE DESIGN SECTION

FINAL TRACINGS

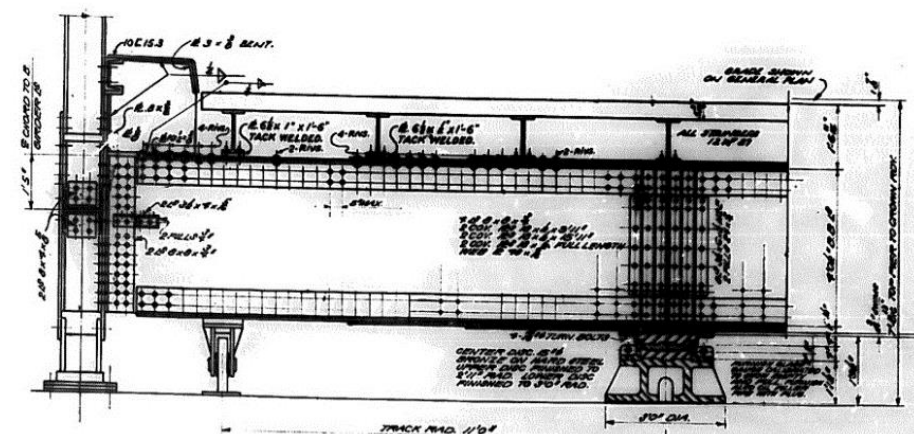


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ER	State Project	Plan	Sheet No.
28 (1)	194-02-17	CAMERON	L.L.



GEOMETRIC OUTLINE OF ONE ARM
 SHOWS JOINTS, DIMENSIONS AND METHOD OF CONSTRUCTION.
 DIMENSIONS IN FEET AND INCHES.
 ALL DIMENSIONS TO FACE UNLESS OTHERWISE SPECIFIED.
 ALL DIMENSIONS TO BE CHECKED AGAINST THE GEOMETRIC OUTLINE.



ESTIMATED QUANTITIES
 FABRICATED CARBON STEEL = 271,000 LBS
 CLASS 'A' CONCRETE = 11.35 CU YDS
 OPEN STEEL GRID FLOORING = 4984 SQ. FT.

STANDARD PLAN
2050' SWING SPAN
 24' CLEAR ROADWAY
 OPEN STEEL GRID FLOOR

STATE OF LOUISIANA
 DEPARTMENT OF HIGHWAYS

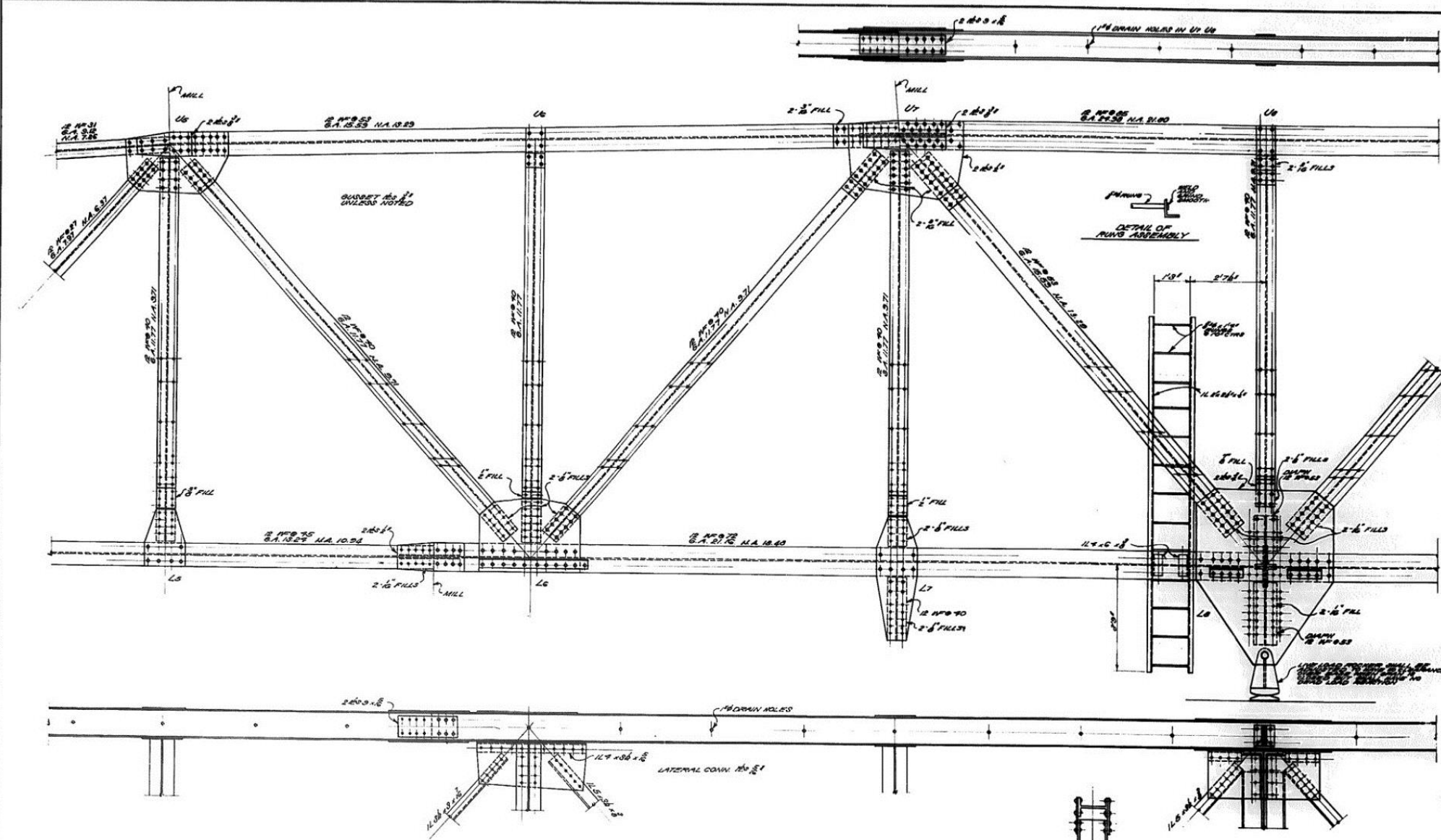
DESIGNED BY	CHECKED BY	DATE
DRAWN BY	APPROVED BY	DATE
IN CHARGE OF	SCALE	SHEET

SHEET 1 OF 1

FINAL TRACINGS

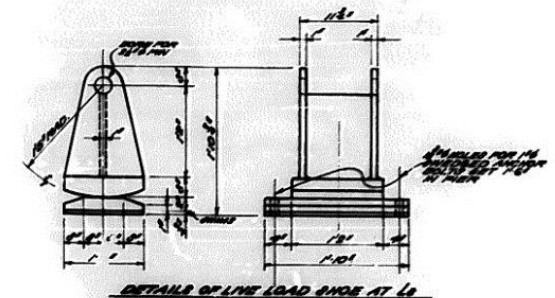


ER	State Project	Series	Sheet No.
25(1)	194-02-17	CAMERON	13

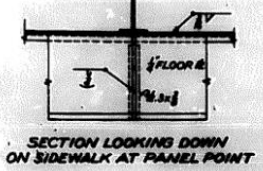
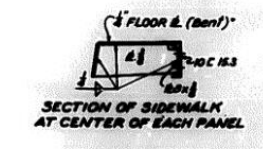
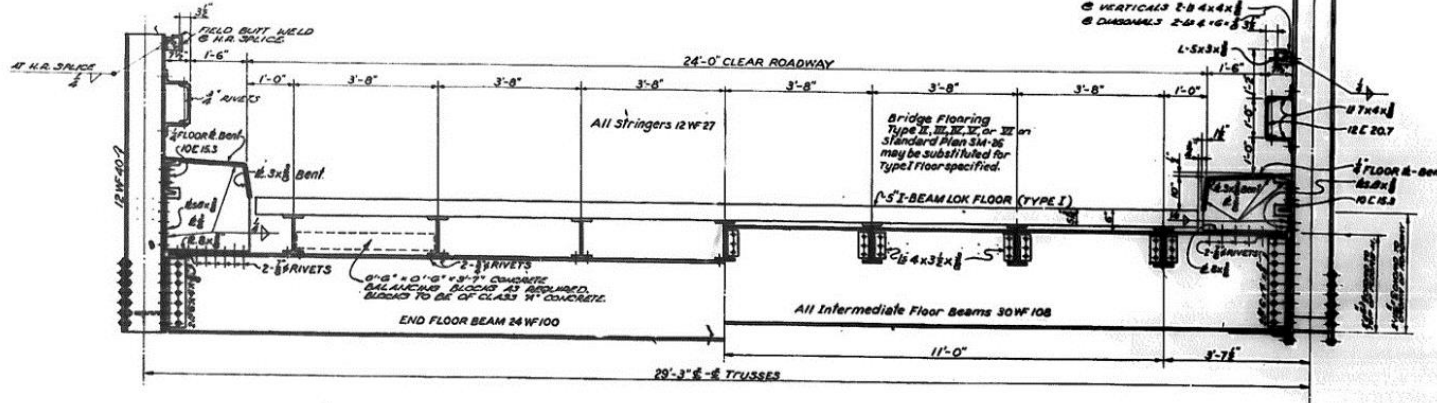


STRESSER IN KI/PS

MEMBER	CAMERON						COMBINATIONS			
	DL	LL	LL	LL	LL	LL	1+2	1+3	2+3	
U10	126.0	119.0		-86.7	8.1	6.1	1.3	-31.6	0.9	
U11	102.9	108.9		-90.7	8.8	10.8	1.8	-30.1	0.6	
U12	108.1	108.1		-88.9	6.8	18.1	1.1	-16.8	0.6	
U13	107.9	107.9				10.1				
L10	126.1	126.1		100.0	1.0	0.0	0.0			
L11	102.9	102.9		100.0	1.0	0.0	0.0			
L12	108.1	108.1		100.0	1.0	0.0	0.0			
L13	107.9	107.9				10.1				
U14	102.9	102.9		-31.6	6.9	4.4	1.0	-89.0	0.9	
U15	102.9	102.9		6.8	1.8	1.8	1.8	-10.7	0.9	
U16	102.9	102.9		10.8	0.8	1.8	1.8	-11.8	0.6	
U17	102.9	102.9		10.8	0.8	1.8	1.8	-11.8	0.6	
U18	102.9	102.9		10.8	0.8	1.8	1.8	-11.8	0.6	
U19	102.9	102.9		10.8	0.8	1.8	1.8	-11.8	0.6	
U20	102.9	102.9		10.8	0.8	1.8	1.8	-11.8	0.6	
U21	102.9	102.9		10.8	0.8	1.8	1.8	-11.8	0.6	
U22	102.9	102.9		10.8	0.8	1.8	1.8	-11.8	0.6	
U23	102.9	102.9		10.8	0.8	1.8	1.8	-11.8	0.6	
U24	102.9	102.9		10.8	0.8	1.8	1.8	-11.8	0.6	
U25	102.9	102.9		10.8	0.8	1.8	1.8	-11.8	0.6	
U26	102.9	102.9		10.8	0.8	1.8	1.8	-11.8	0.6	
U27	102.9	102.9		10.8	0.8	1.8	1.8	-11.8	0.6	
U28	102.9	102.9		10.8	0.8	1.8	1.8	-11.8	0.6	
U29	102.9	102.9		10.8	0.8	1.8	1.8	-11.8	0.6	
U30	102.9	102.9		10.8	0.8	1.8	1.8	-11.8	0.6	



GENERAL NOTES:
 Cont. Specs. - Latest Approved La. Hwy. Dept. Std. Specs.
 Cont. Specs. - Louisiana Highway Commission 1940.
 The contractor shall be responsible for the design of all steel and concrete work.
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 The contractor shall be responsible for the design of all steel and concrete work.



STANDARD PLAN
 20'-0" SWING SPAN
 24'-0" CLEAR ROADWAY
 OPEN STEEL GRID FLOOR

STATE OF LOUISIANA
 DEPARTMENT OF HIGHWAYS

DATE: 7-1-44

BY: [Signature]

CHECKED BY: [Signature]

APPROVED BY: [Signature]

FINAL TRACINGS



66

ER	STATE PROJECT	PARISH	
88(1)	104-02-17	CAMERON	2

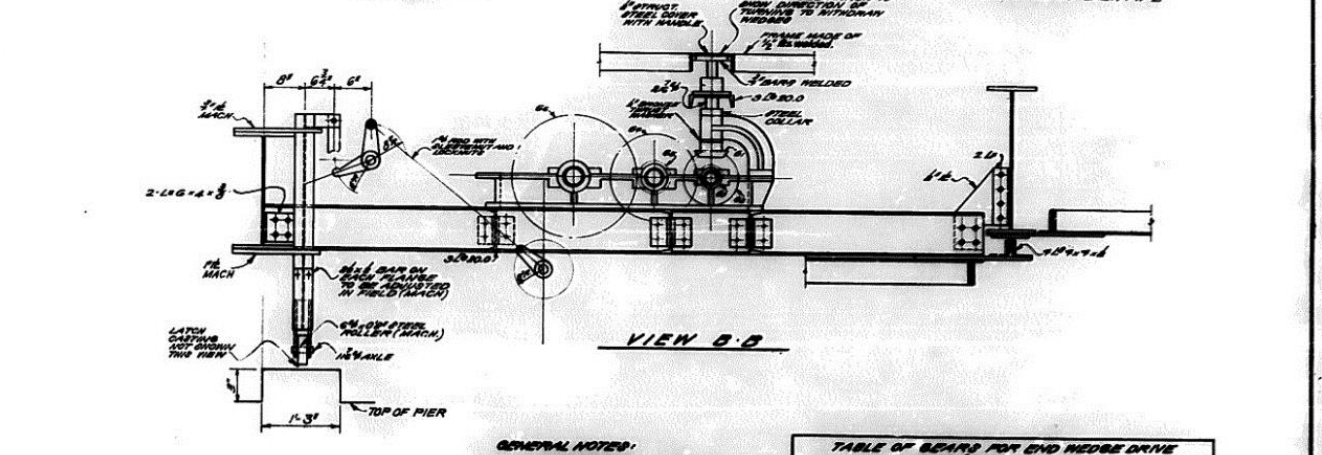
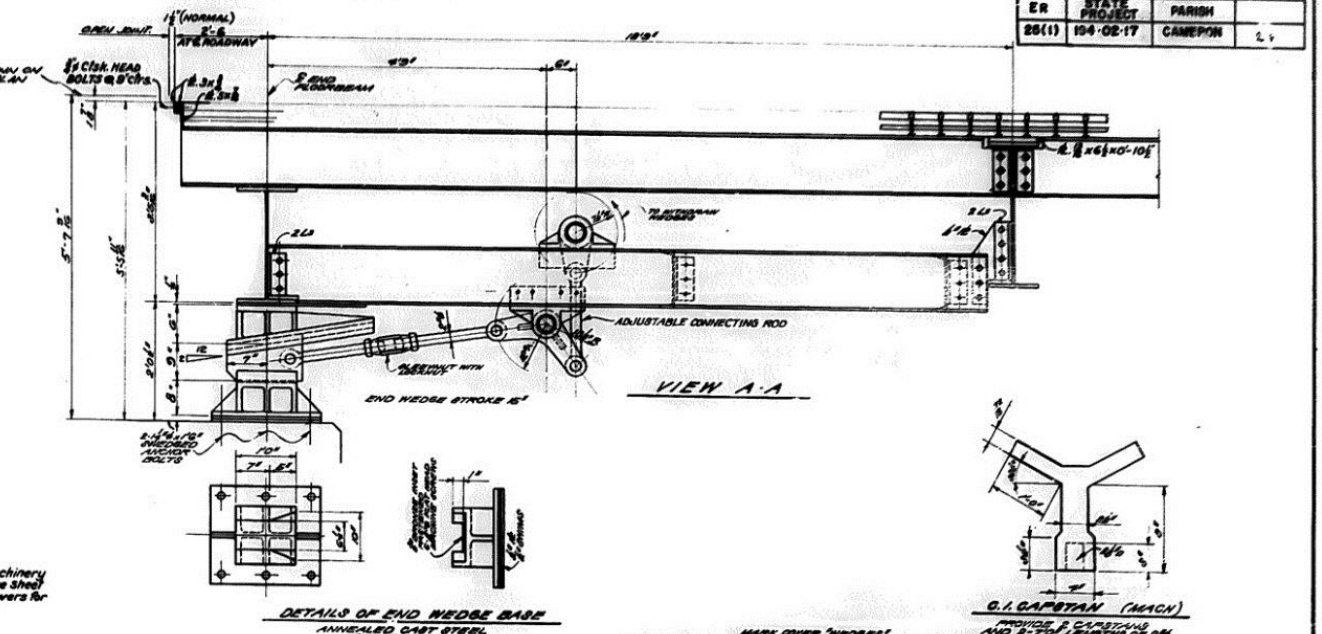
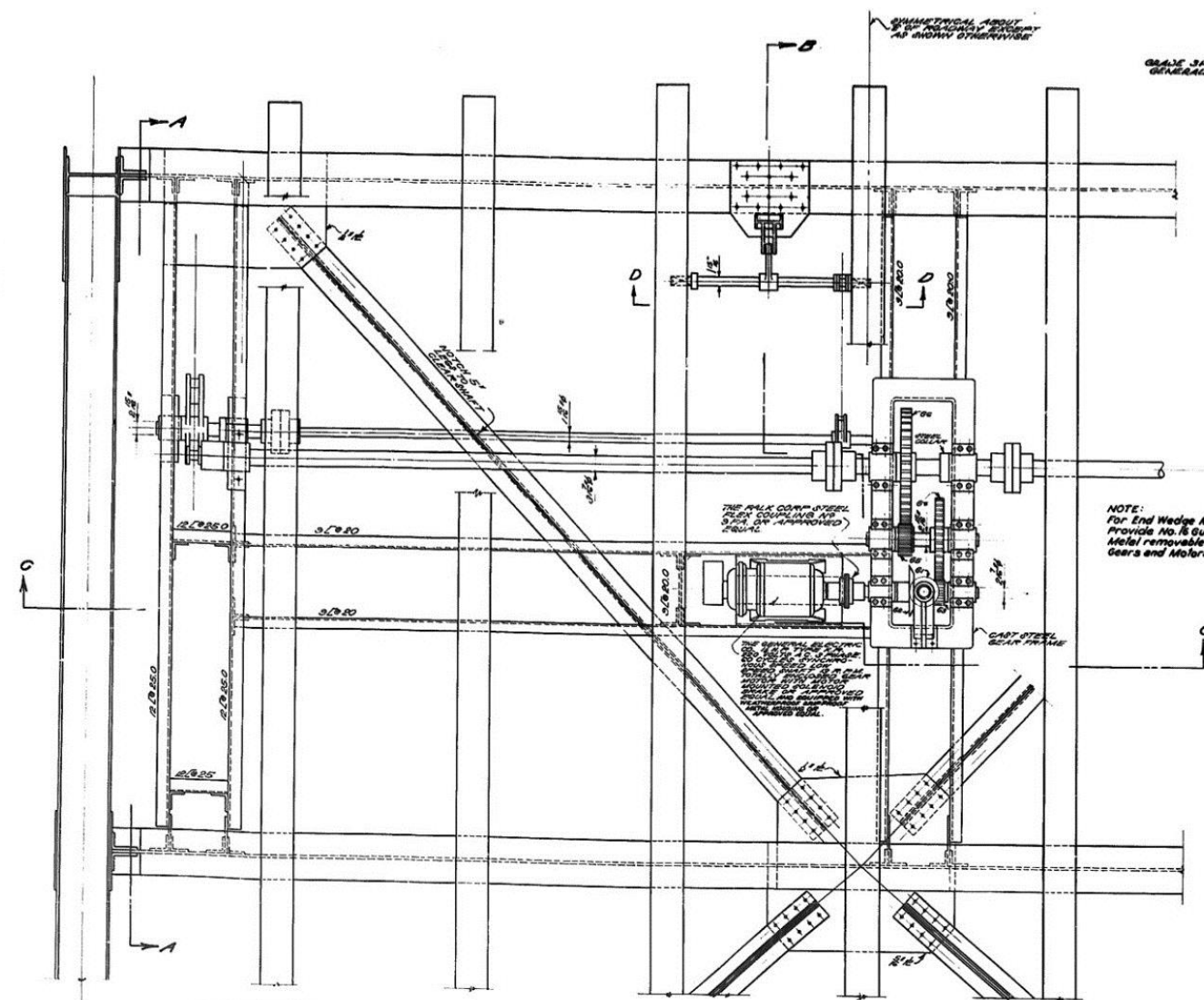
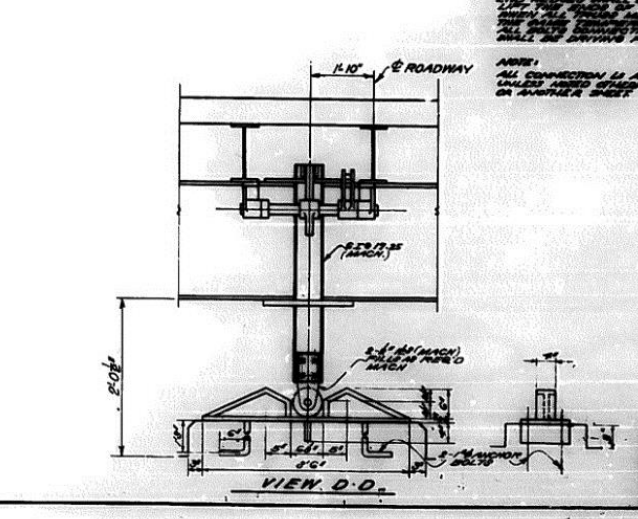


TABLE OF GEARS FOR END WEDGE DRIVE
ALL 30" DIA. 80 OUT TEETH

GEAR	NO. TEETH	PITCH	PITCH DIAMETER	FACE	TYPE	MATERIAL
G1	20	2.0"	6.667"	2"	SPUR	ANNEALED STEEL
G2	27	2.0"	11.889"	2"	SPUR	CAST STEEL
G3	17	2.0"	5.652"	2"	SPUR	FORGED STEEL
G4	27	2.0"	11.889"	2"	SPUR	CAST STEEL
G5	17	2.0"	5.652"	2"	SPUR	FORGED STEEL
G6	27	2.0"	11.889"	2"	SPUR	CAST STEEL



STANDARD PLAN
80'0" OVER SPAN
2'0" CLEAR ROADWAY
OPEN STEEL GRID FLOOR

STATE OF LOUISIANA
DEPARTMENT OF HIGHWAYS

REVISIONS

1-51	Checked	DATE	BY
2-40	Checked	DATE	BY

IN CHARGE OF

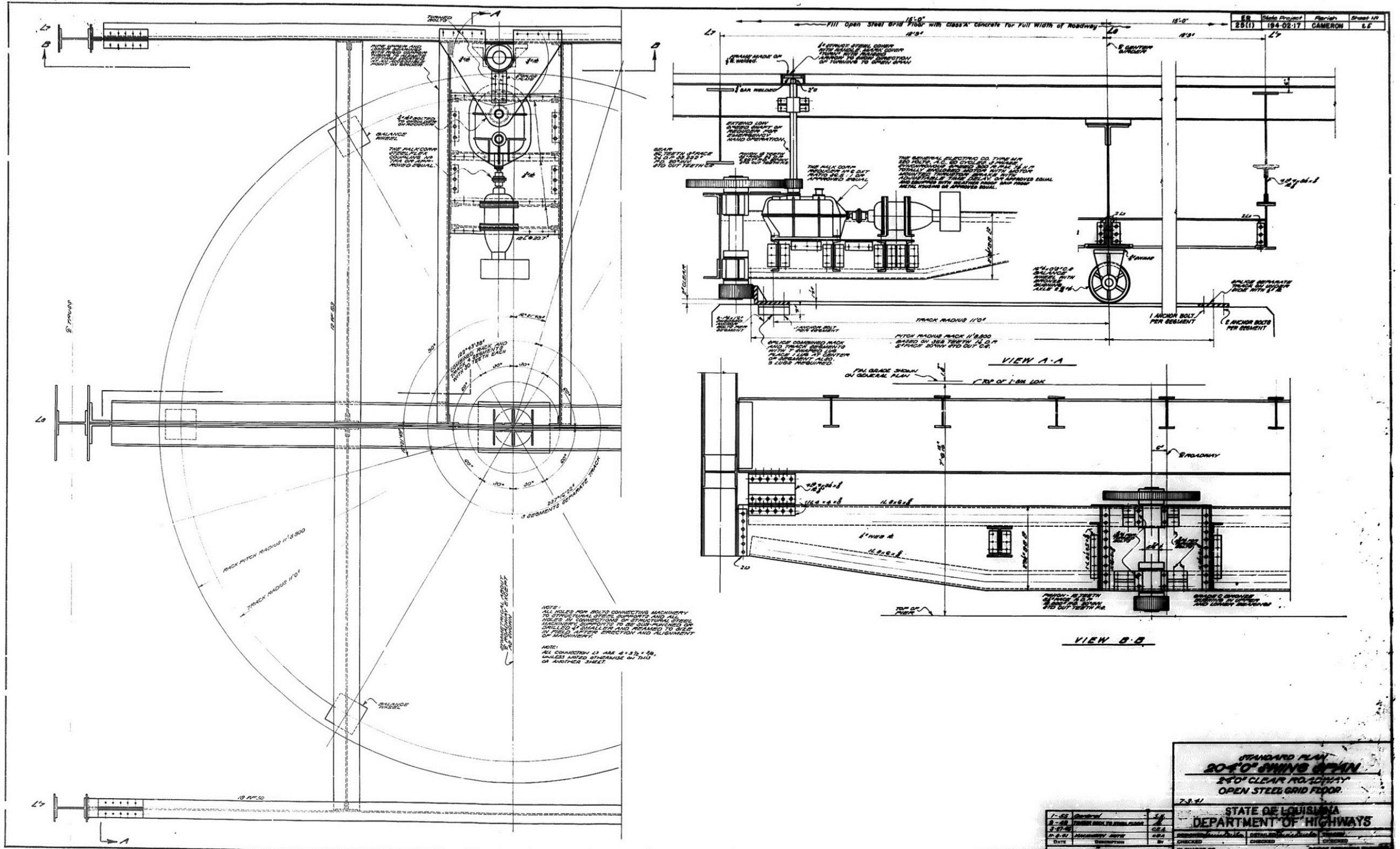
DATE

BY

FINAL TRACINGS



67



ER	Date Project	Parish	Sheet No
28(1)	194-02-17	CAMERON	25

NOTE:
ALL HOLES FOR BOLTS CONNECTING MACHINERY TO STRUCTURAL STEEL MEMBERS AND ALL HOLES IN CONNECTIONS OF STRUCTURAL STEEL MACHINERY SUPPORTS TO BE DIMENSIONED OR DRILLED 1/8" SMALLER AND REAMED TO SIZE IN FIELD, MATCH DIRECTION AND ALIGNMENT OF MACHINERY.

NOTE:
ALL CONNECTIONS ARE 3" x 3/4" x 3/8" UNLESS NOTED OTHERWISE ON THIS OR ANOTHER SHEET.

1-CE	DESIGN	1/4	
2-ER	TRUCK LOADS AND DIMENSIONS	1/4	
3-ER	MACHINERY NOTE	1/4	
DATE	DESIGNER	BY	CHECKED
			IN CHARGE OF

STANDARD PLAN
30'0" SPAN OPEN
STEEL GRID FLOOR
2'0" CLEAR ROADWAY
OPEN STEEL GRID FLOOR

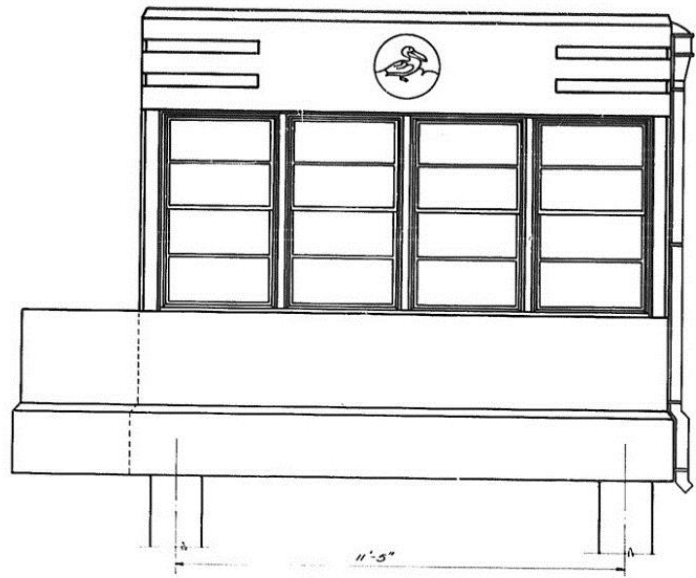
STATE OF LOUISIANA
DEPARTMENT OF HIGHWAYS

FINAL TRACINGS

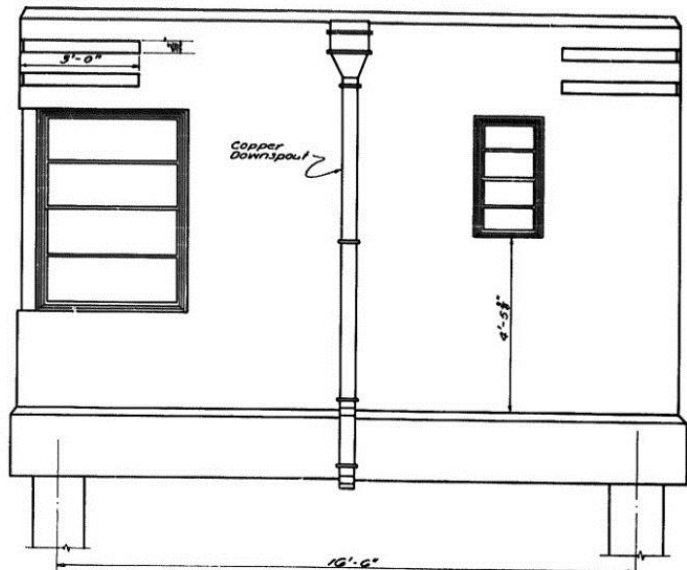


68

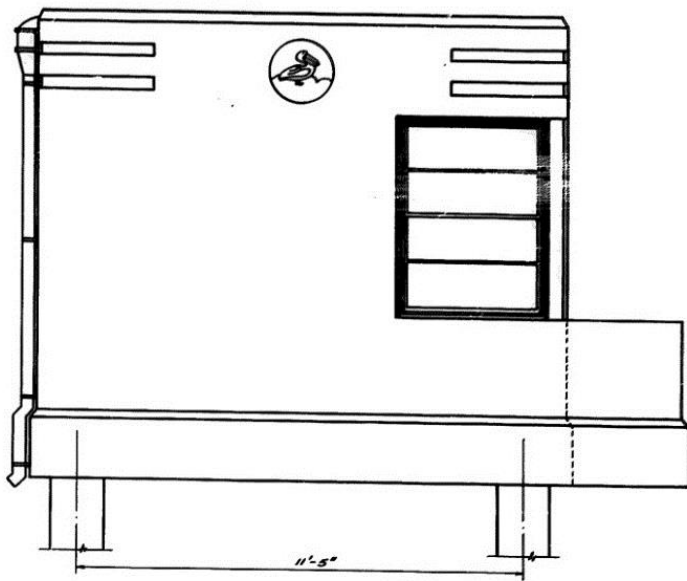
ER	STATE PROJECT	PARISH	SHEET NO.
25 (1)	194-02-17	CAMERON	26



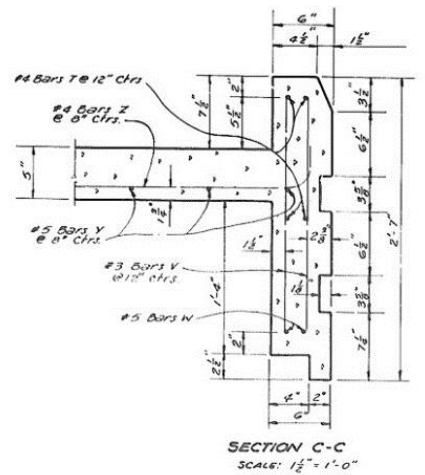
SIDE ELEVATION



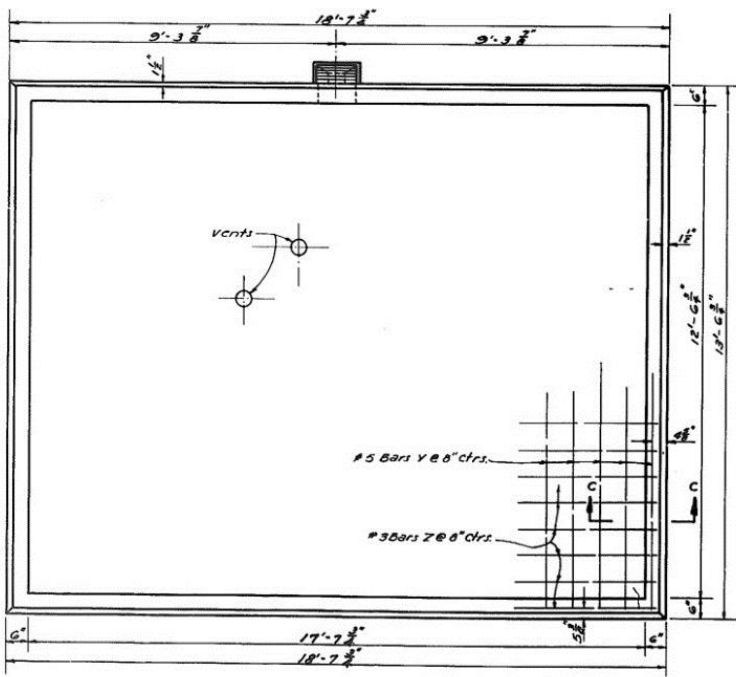
REAR ELEVATION



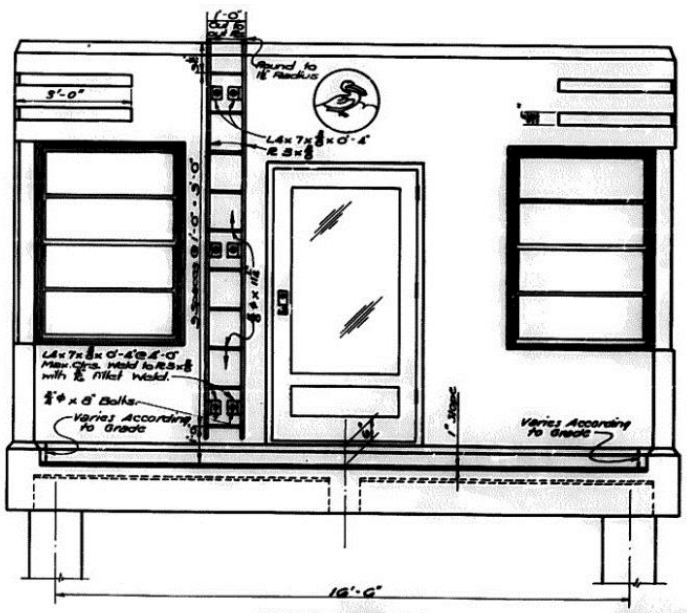
SIDE ELEVATION



SECTION C-C
SCALE: 1/2" = 1'-0"



ROOF PLAN



FRONT ELEVATION

OPERATING HOUSE

MEMMETAU RIVER BRIDGE
AT
GRAND CHENIER
ROUTE LA. 82

Jan. 12, 1945

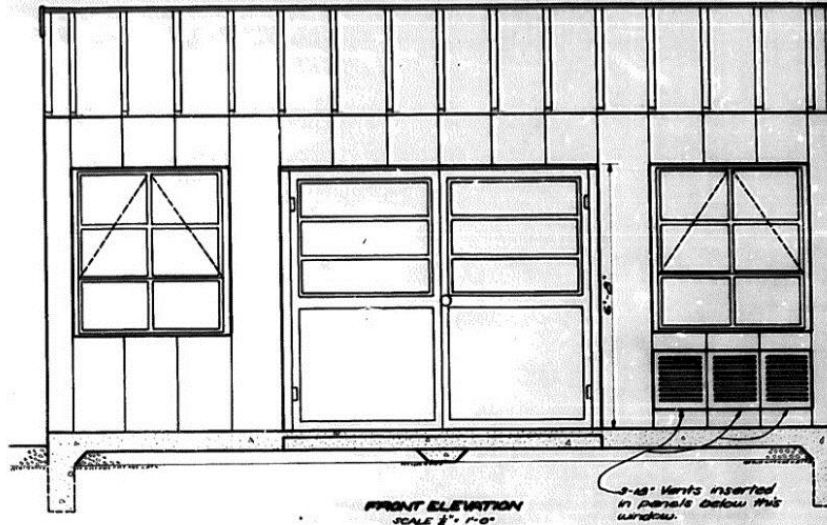
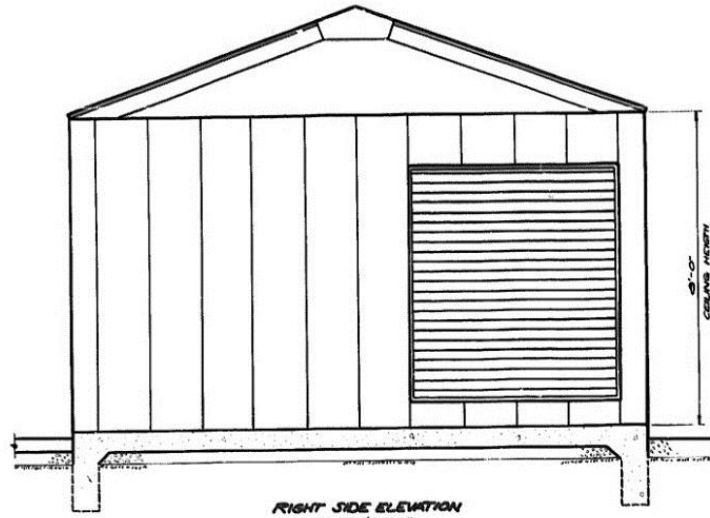
STATE OF LOUISIANA
DEPARTMENT OF HIGHWAYS

DESIGNED BY *E. C. ...*
CHECKED BY *E. C. ...*
BRIDGE DESIGN SECTION

FINAL TRACINGS



SPR	STATE PROJECT	APPROX	SHEET NO
85 00	194-08-17	Camden	50



GENERAL NOTES:

FRAMING:
Prefabricated steel panel gable roof structure with min. 20 gauge roof panels and 20 gauge wall panels. Continuous base angles to be installed for fastening structure to concrete slab. (See manufacturer's shop drawings of roof truss to be erected)

DOORS:
Entrance doors marked (D) shall be oak double hung steel with 2-1/2" glassed top panels each to be 2'-6" x 6'-6". Panels to be glassed with 1/4" plate glass. Doors will be furnished with Key-in-Pad Mortise Lock. Air door check on active leaf, and head and foot bolts on inactive leaf. Doors to have brass or bronze thresholds.

WINDOWS:
All windows marked (W) to be Series 822415, commercial projected industrial windows as manufactured by the Tricon Steel Company of Huntington, Ohio or approved equal. All openings marked (W) to be 2'-6" x 2'-0" fixed leakproof sheet metal units (screened with 1/8" mesh aluminum screen). All necessary anchors and hardware essential for window installation and operation to be furnished by the contractor.

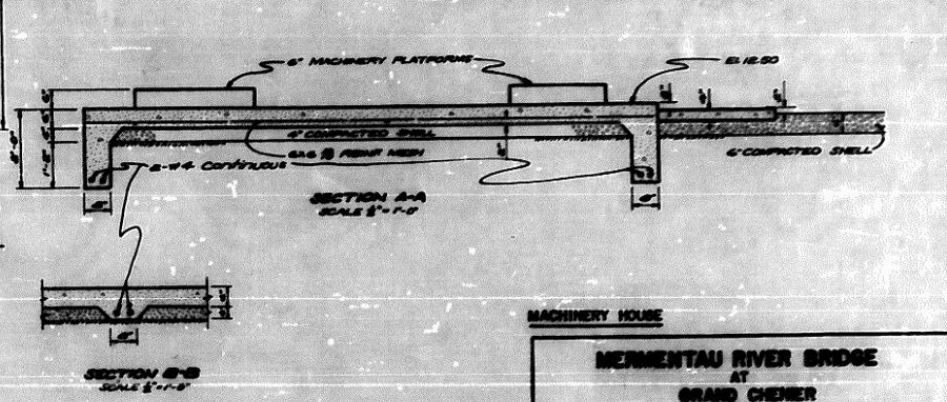
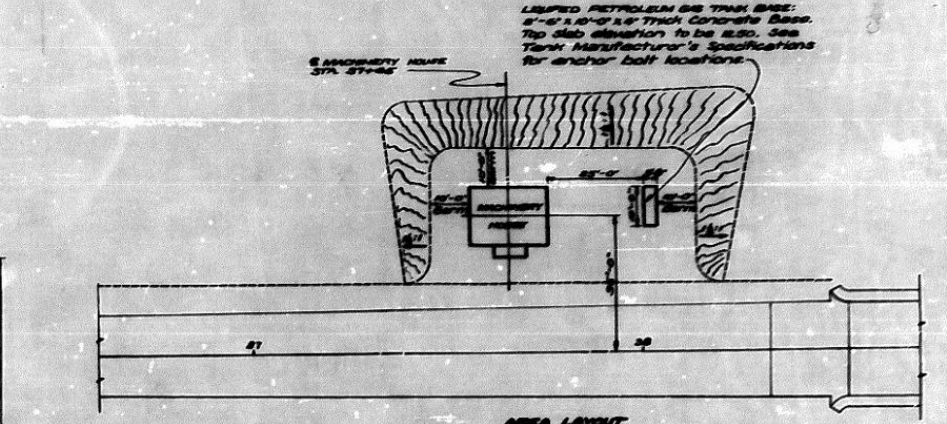
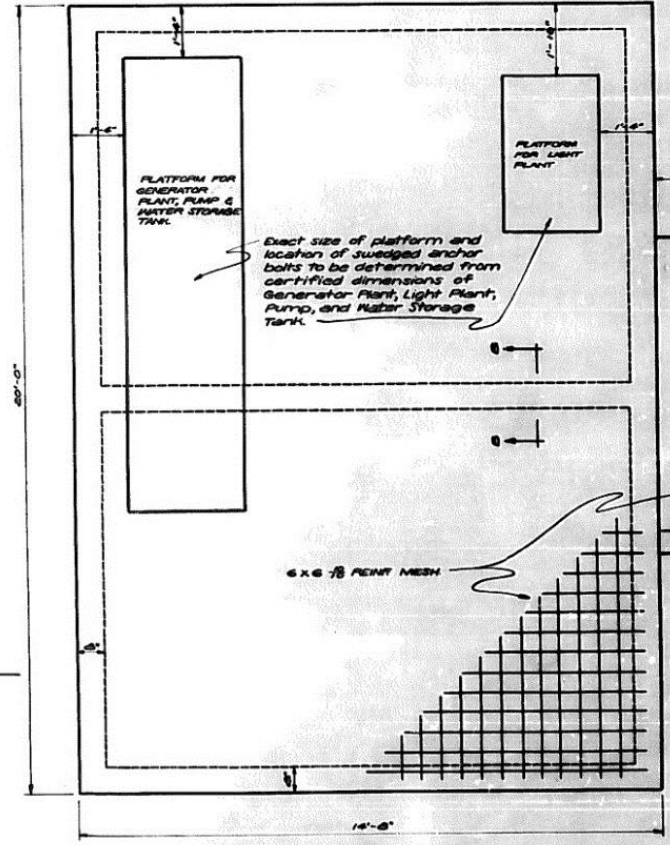
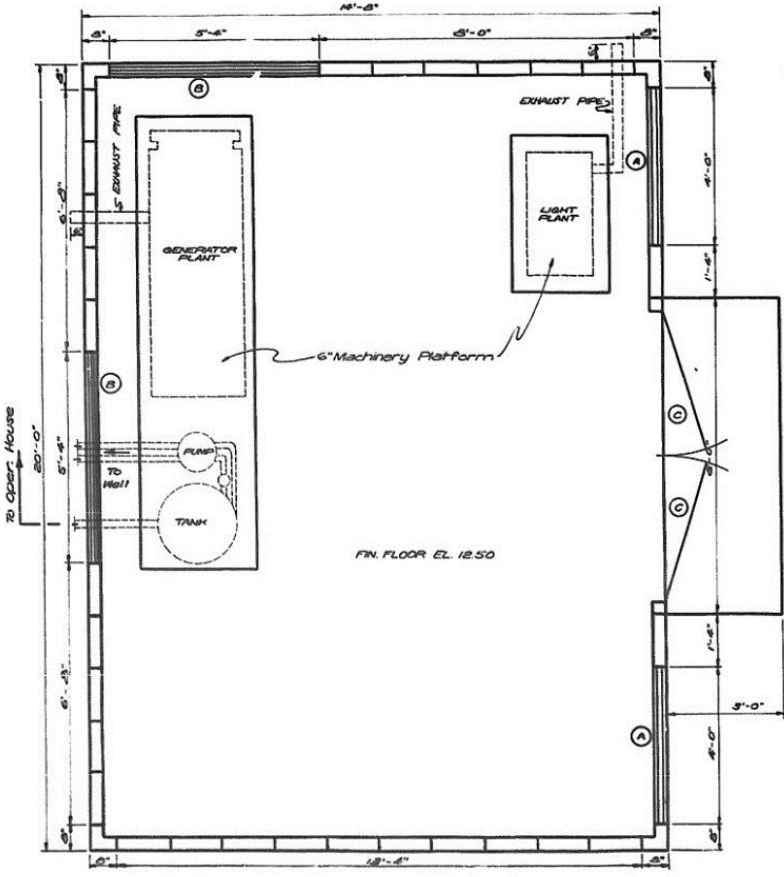
PAINTING:
All metal surfaces including ceiling, doors, windows, exterior walls and roof to have one coat of "Activated Red Lead Copar" primer (R-100), and one coat of "Activated Copar" (R-200) paint. Primer for "Activated Copar" shall be Copar Activated Spraying Thinner N-2-52. In the event that the surface to be coated is metallized or galvanized a barrier coat of "R-275 Vinyl Mesh Primer" shall be applied prior to application of the Activated Copar. This barrier coat should be allowed to dry 24 hours before the application of the Copar. The above paint to be manufactured by Coast Paint and Lacquer Co. Inc., Houston, Texas, or approved equal.

ELECTRICAL:
This item is detailed or described in the Electrical Drawings and includes all wiring and electrical and mechanical equipment to be installed within this house. All electrical work to be paid for under item 5-2-2 "Power Plant".

Water pump, and 42 gal. storage tank shall be furnished and installed under water supply system, item 5-1. Drilling of water well below El. -300 to be paid for under item 5-2.

(M)
Install a 500 gallon above ground liquified petroleum gas tank complete with metal frame and all fittings and connections to operating and machinery houses. Tank to be attached to rock in accordance with the liquified petroleum gas supplier's specifications. Tank to be mounted on 4" concrete slab. Contractor to have tank filled.

All material required to complete house including compacted shell surfacing, concrete slab base for gas tank, and liquified petroleum gas tank complete with fittings and connections as described to be paid for as "Machinery House" item 5-2-2, except for other items which are to be paid for as noted.



MACHINERY HOUSE

MENTAU RIVER BRIDGE
AT
GRAND CHENIER
ROUTE LA. 82

DATED MARCH 1968

STATE OF LOUISIANA
DEPARTMENT OF HIGHWAYS

DESIGNED	BY S. H. PARD	TRACED	BY [Signature]
CHECKED	BY S. L. P.	CHECKED	BY S. L. P.

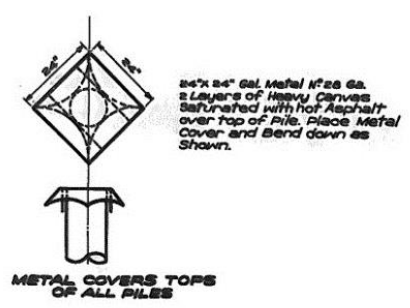
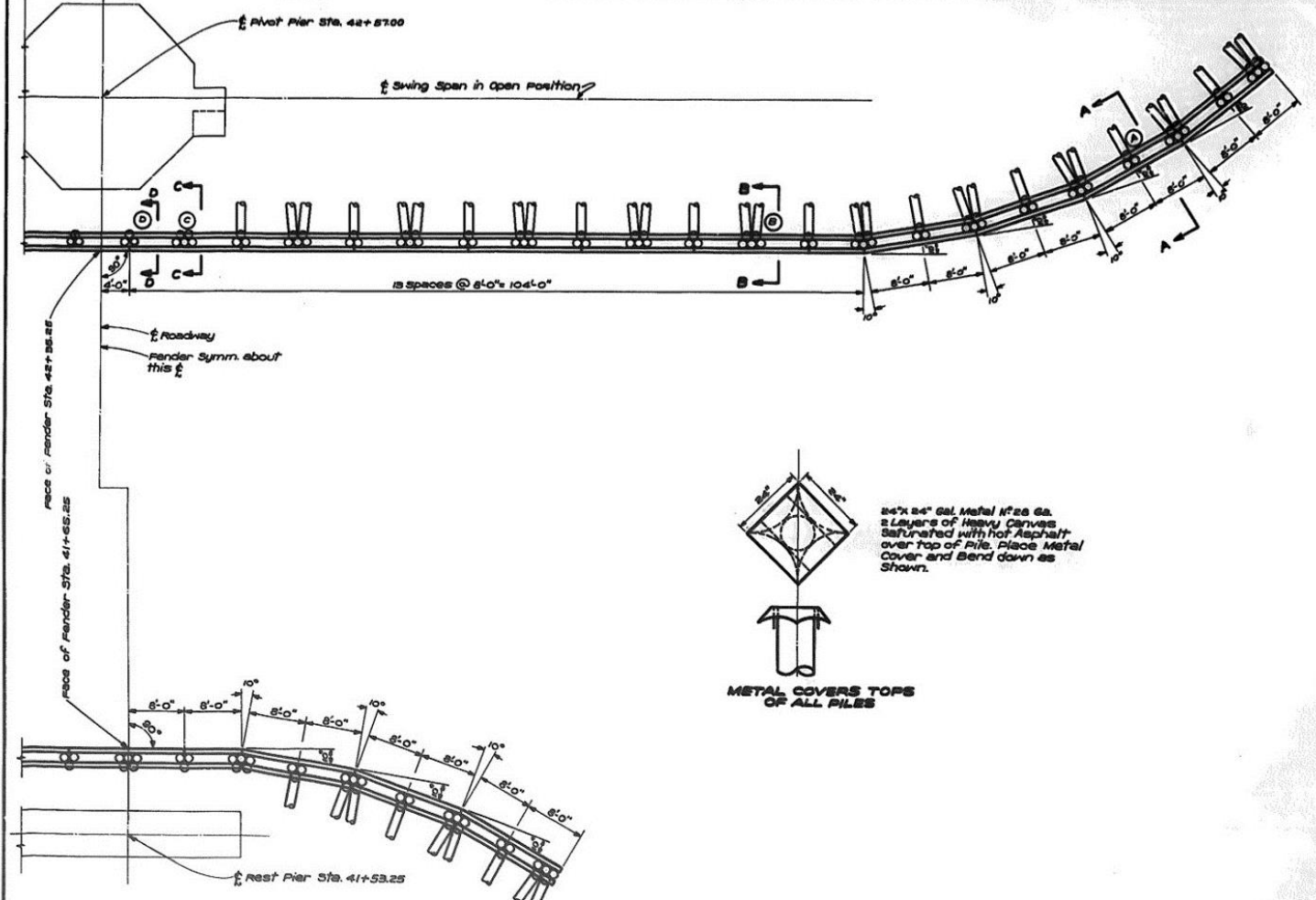
BRIDGE DESIGN SECTION

DATE	DESCRIPTION	BY

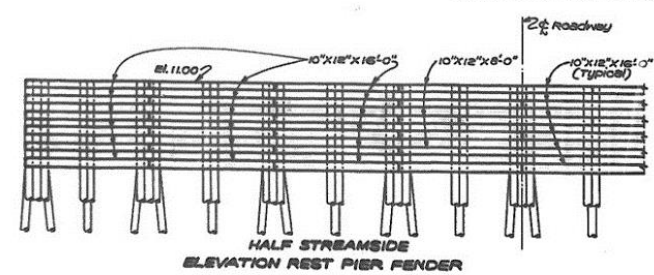
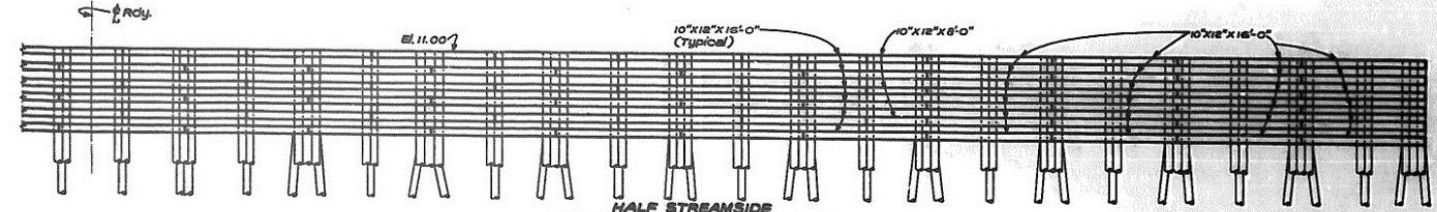
FINAL TRACINGS



BR	STATE PROJECT	PHASE	SHEET NO.
88(1)	184-08-17	CARRIAGE	31



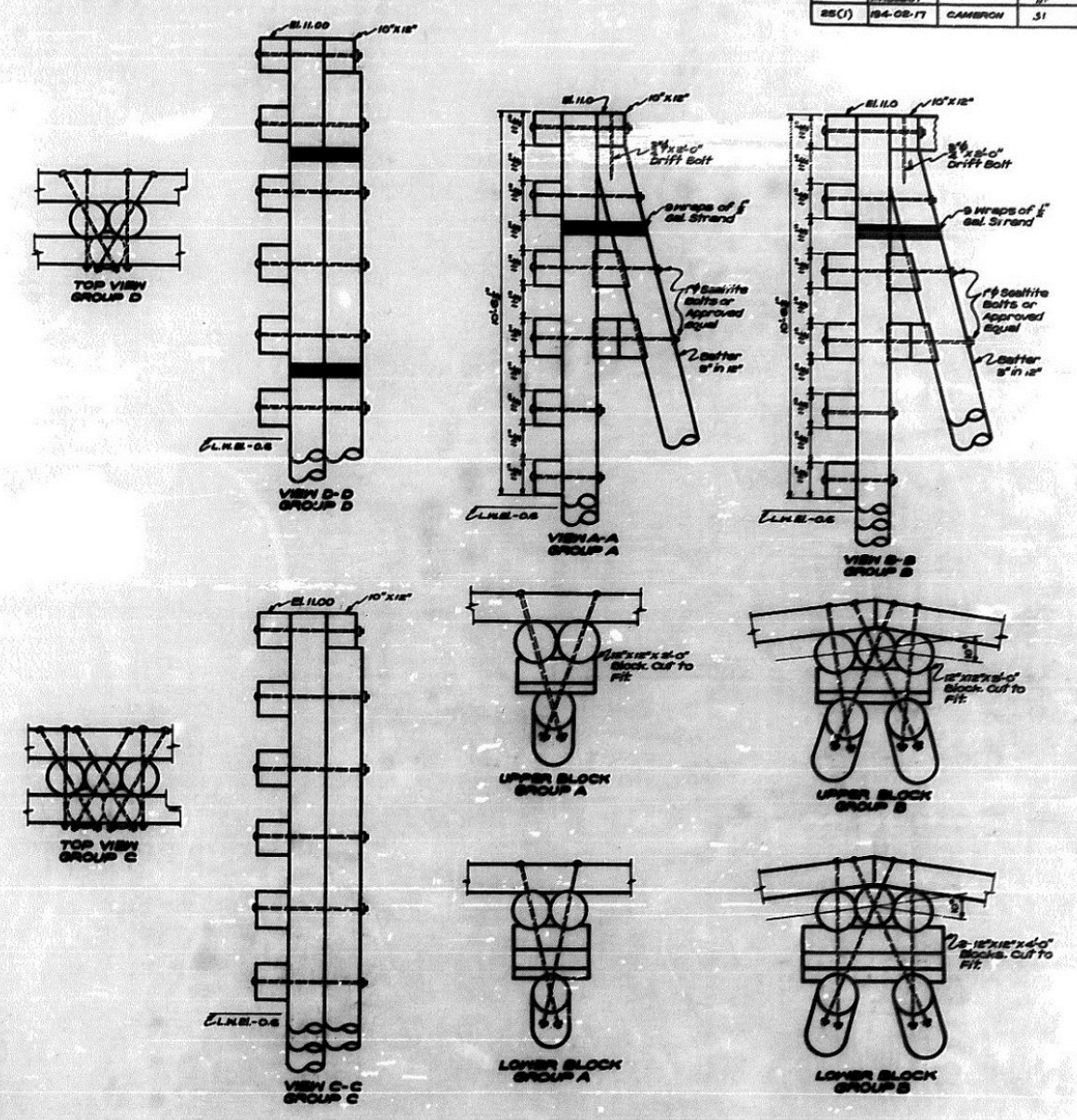
HALF PLAN FENDER SYSTEM



GENERAL NOTES:
 Construction Specs: Latest Approved La. Hwy. Dept. Std. Specs.
 All Timber to be S&S and Creosoted.
 All Piles shall be Creosoted with a 30# per cu. ft. treatment.
 All Cuts and Trimmings shall be painted with Hot Creosote Oil and Roofing Pitch.
 All Hardware to be hot dipped galvanized and shall be paid for in price bid for Creosoted Timber. All bolts to be 1" Sealrite Bolts or Approved Equal. One 1" U.S. washer each Bolt.
 Two 5/8" x 12" x 12" Connectors to be used between Piles to Timber and Pile to Pile.
 The #9 Gal. Strand shall conform with the Standard Specs. for Zinc-covered Steel Wire Strand, A.S.T.M. Designation A 122-41, Common Grade, 7 Wire, or the Contractor may use #9 6x18 Hemp Center Improved Non-Steel Wire Rope.

ESTIMATED QUANTITIES:

TREATED TIMBER	38,200 M.F.S.M.
TREATED TIMBER PILES 24" @ 50'	1,850 L.N. FT.
HARDWARE	15,000 POUNDS



FENDER SYSTEM

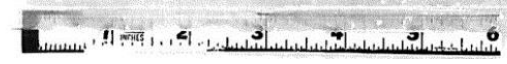
MERMENTAU RIVER BRIDGE
 AT
GRAND CHENIER
 ROUTE LA. 82

DESIGNED BY *S. L. P.* TRACED BY *A. Chabannes*
 CHECKED BY *S. L. P.* CHECKED BY *S. L. P.*

STATE OF LOUISIANA
 DEPARTMENT OF HIGHWAYS

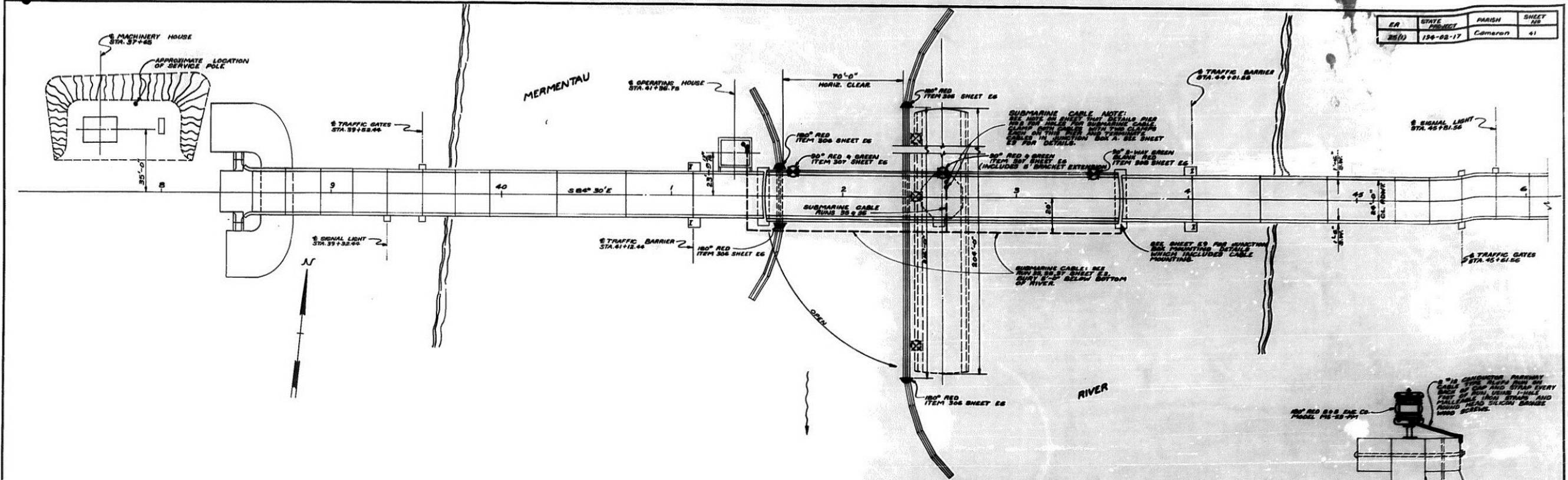
BRIDGE DESIGN SECTION

FINAL TRACINGS

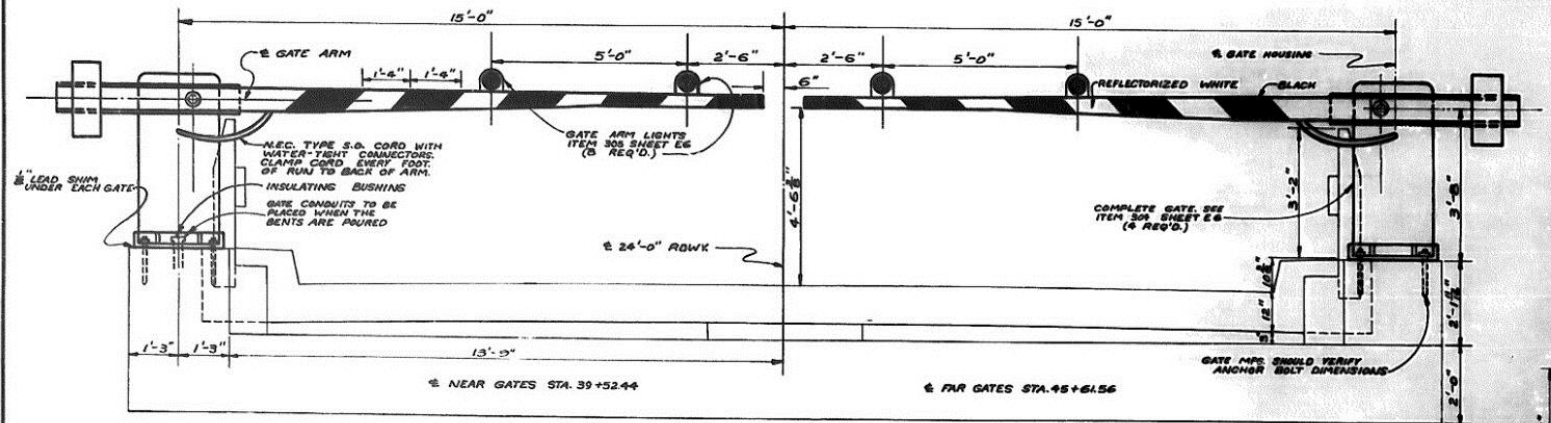


83

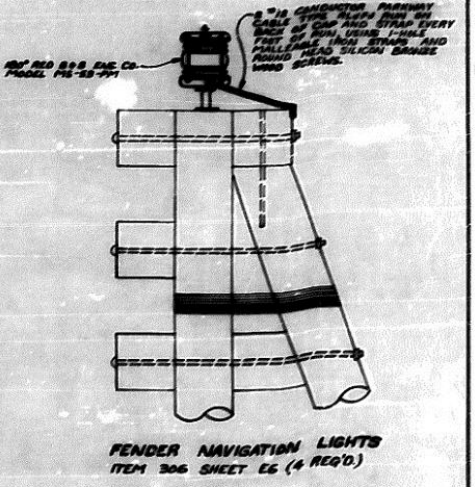
EA	STATE PROJECT	PARISH	SHEET NO.
25(1)	136-22-17	Cameron	41



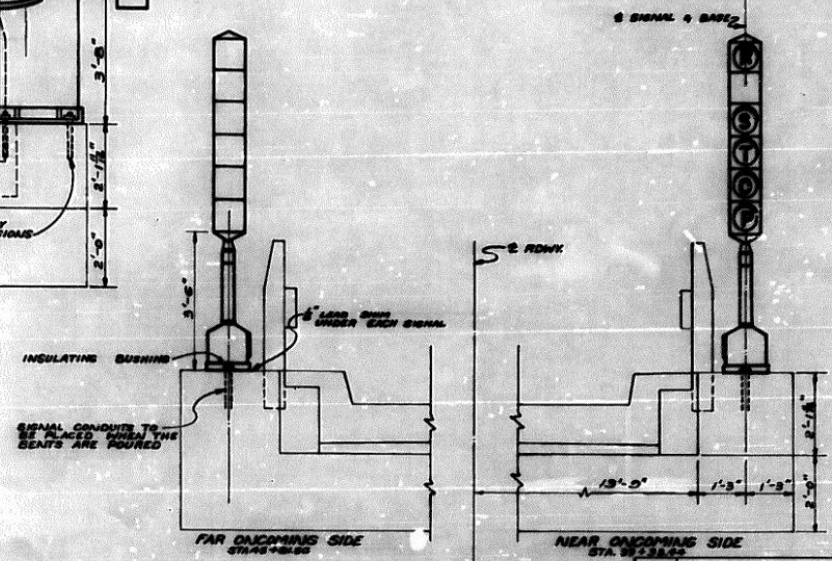
NAVIGATION LIGHT LAYOUT AND SUBMARINE CABLE INSTALLATION PLAN



TYPICAL SECTION GATES



FENDER NAVIGATION LIGHTS ITEM 306 SHEET EG (4 REQ'D)



TRAFFIC WARNING SIGNALS ITEM 306 SHEET EG (2 REQ'D)

GATE NAV. LITS. & WARNING SIG. MOUNTING DETAILS

E8

MERMENTAU RIVER BRIDGE AT GRAND CHENIER ROUTE LA. 82

DATE: Apr. 26 1958

STATE OF LOUISIANA
DEPARTMENT OF HIGHWAYS

DESIGNED	DETAILS	REVISIONS
CHECKED	CHECKED	CHECKED

BRIDGE DESIGN SECTION

FINAL TRACINGS



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