Historic Bridge Management Plan for the Lea Joyner Bridge

Recall Number: 024400
Structure Number: 05370010918151
Parish: Ouachita
Route: US 80
Crossing Description: Ouachita River

Prepared for

Louisiana Department of Transportation and Development

Prepared by

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Executive Summary

The Lea Joyner Bridge (Recall No. 024400) is located in Ouachita Parish, Louisiana, and is owned by the State of Louisiana. The bridge was completed in 1936 and had recent rehabilitation projects in 2008 and 2013; it was determined eligible for the National Register of Historic Places (National Register) in 2013. Its significance is demonstrated by the presence of distinctive engineering and design features of the double-leaf trunnion bascule bridge type, which is characterized by two opposing leaves that rotate around trunnions, racks and pinions for moving each span, counterweights that descend into enclosed pits, and locking mechanisms that enable the cantilevered spans to withstand live loads and remain stable when in a closed position.

The bridge carries four lanes of U.S. Highway (US) 80 (locally Louisville Avenue) across the Ouachita River in Ouachita Parish. The 1,170-foot, 2-inch-long crossing consists of reinforced-concrete deck girder spans, steel deck truss spans, I-beam counterweight spans, and a double-leaf bascule span. Concrete bridge rail with endposts and two rails is connected to the sidewalk and bridge deck with a concrete curb. Metal barriers are located on the edge of the sidewalk next to the travel lanes. The substructure for the reinforced-concrete deck girder approach spans consists of reinforced-concrete abutments and reinforced-concrete cap and column intermediate bents, both founded on precast concrete piles. The bridge has a total of four houses, two on each side of the bridge: one operator's house and one generator house, and two houses used for storage that were once restrooms. A timber fender system for the waterway navigation extends into the waterway north and south of the bascule span. The bridge is classified as fracture critical because it contains steel members in tension, whose failure would probably cause a portion of the bridge, or the entire bridge, to collapse.

The bridge was rehabilitated in 1950, 2008, and 2013. It is in overall satisfactory condition and appears to adequately serve its purpose of carrying vehicular and pedestrian traffic over the waterway. 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 water staining discoloration, spalling and cracking in the concrete substructure units, missing or sheared bolts on the connection plates in spans 4, 10, and 11, and unpainted areas on the steel bracing under the deck in span 10. With proper maintenance and rehabilitation, the Lea Joyner 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 Lea Joyner Bridge (Recall No. 024400), 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 Lea Joyner 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.

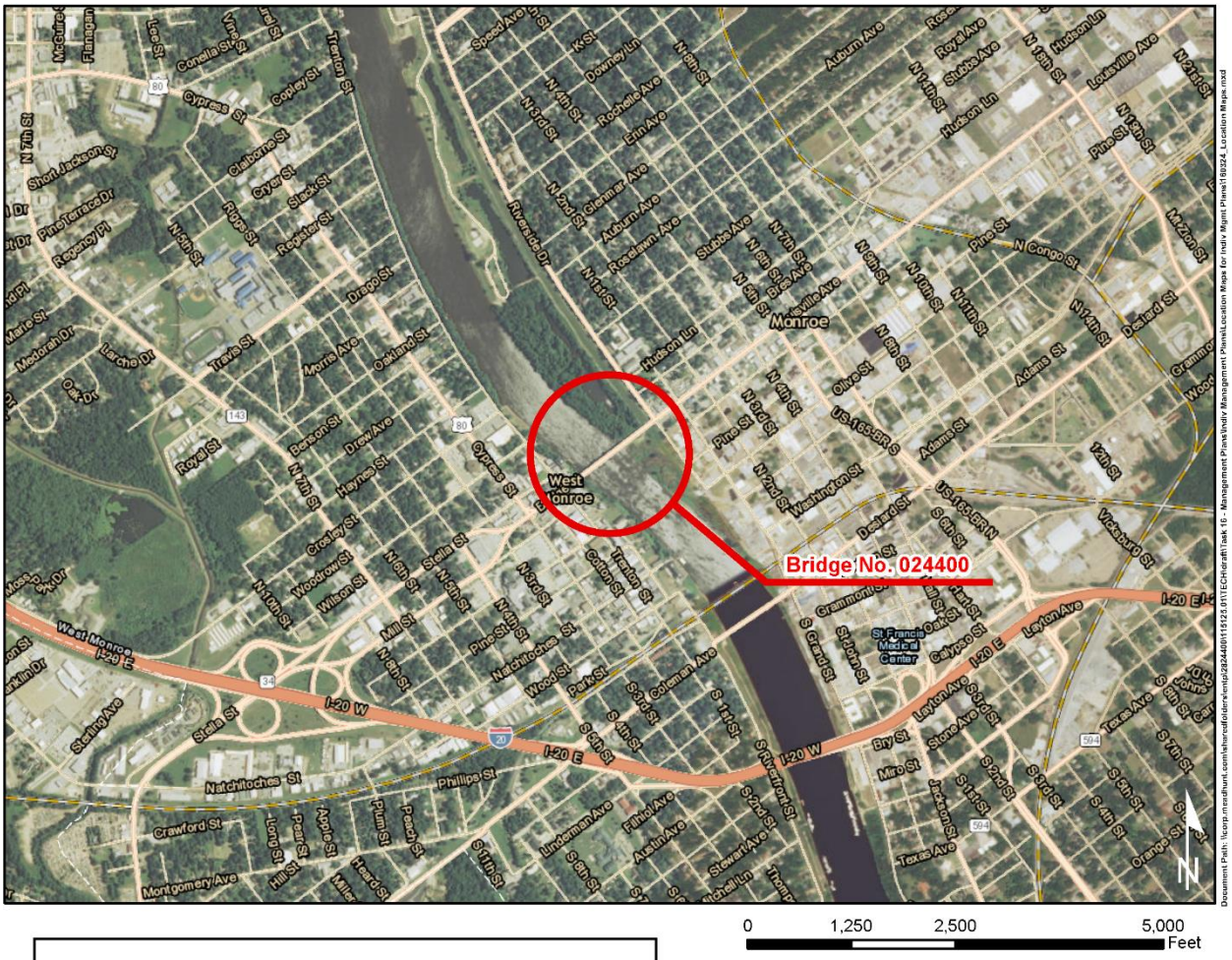
Existing bridge data sources typically available for Louisiana bridges were gathered for this Plan, and field investigation confirmed the general structural condition and character-defining features of the subject bridge. These sources include:

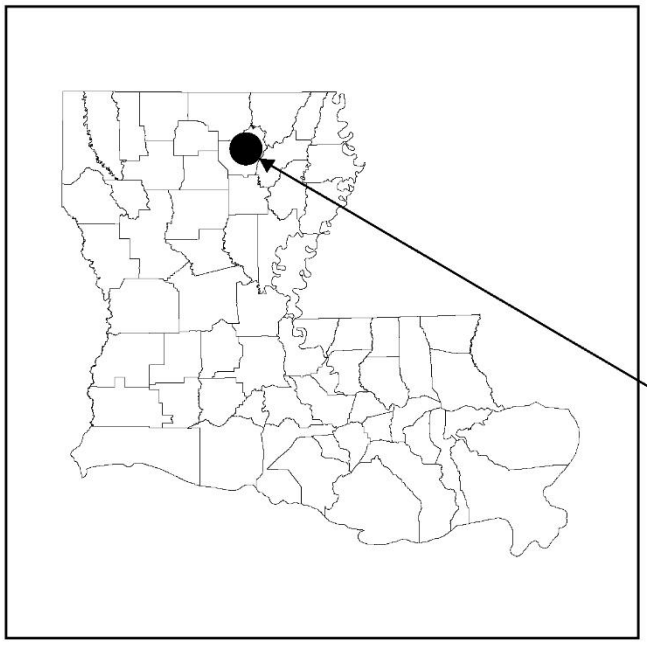
- The current LADOTD Bridge Inspection Report, and any other similar inspection reports
- Original bridge construction plans, any rehabilitation plans, and record as-built plans, as available
- Existing historical and documentary material related to the historic bridges

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





PROJECT LOCATION
Bridge Number: 024400
Stucture Number: 05370010918151
Ouachita Parish
Route: US 80
Crossing Description: Ouachita River-Louisville

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3. Historic Data

A. Identifying information

Structure Number: 05370010918151

Recall Number: 024400

LASHPO Number: 37-02382

Bridge Name: Lea Joyner Bridge

Date of Construction: 1936 (rehabilitation projects in 2008 and 2013)

Main Span Type: Movable: Bascule – Double-leaf trunnion

Contractor: Stevens Brothers, St. Paul, Minn. (construction 1931-1934)
Central Construction Co., Monroe, La. (approaches, 1934-1936)
Vincennes Bridge Co., Vincennes, La. (spans, machinery, and electrical equipment, 1934-1936)

Designer/Engineer: Louisiana Highway Commission

B. Description of bridge

The Lea Joyner Bridge carries four lanes of US 80 (locally Louisville Avenue) across the Ouachita River in Ouachita Parish. The average daily traffic (ADT) across the bridge is approximately 37,400 vehicles. The 1,170-foot, 2-inch-long crossing consists of reinforced-concrete deck girder spans, steel deck truss spans, I-beam counterweight spans, and a double-leaf bascule span. The bridge is load (weight) posted for 20 to 35 tons (20T-35T). The bridge is classified as fracture critical because it contains steel members in tension, whose failure would probably cause a portion of the bridge, or the entire bridge, to collapse.

The total length of the bridge is 1,170 feet, 2 inches. The bridge is described from west to east, which corresponds with the current bridge inspection reports but is opposite of the rehabilitation plans dated 2006 and work completed in 2008. Span 1 is a 40-foot, reinforced-concrete, deck girder span, which consists of six concrete girders. Spans 2 through 4 are 100-foot, steel, deck truss spans, which consist of nine steel stringers and six steel floorbeams per span. Span 5 is a 20-foot, I-beam, counterweight span. Span 6 is a 160-foot, double-leaf bascule span that consists of two steel plate girders, 16 steel stringers, and six steel floorbeams. Span 7 is a 20-foot, I-beam, counterweight span. Spans 8 through 10 are 100-foot, steel, deck truss spans, which consist of nine steel stringers and six floorbeams per span. Spans 11 through 18 are 40-foot, reinforced-concrete, deck girder spans, which consists of six concrete girders. The joints adjacent to the deck truss spans contribute to the remainder of the overall length not accounted for in the individual span lengths.

The bridge provides a 40-foot clear roadway width for four 10-foot traffic lanes, two lanes in each direction, with a 6-foot, 6-inch sidewalk on each side of the roadway. Concrete bridge rail with endposts and two rails are connected to the sidewalk and bridge deck with a concrete curb. This rail was removed in the bascule leaf span and replaced with metal guardrail with the same profile as the concrete rail. Metal curb railing has been added to the edge of the sidewalk next to the travel lanes along the entire bridge. The concrete approach slabs provided at each end of the bridge serve as transitions from the bridge to the roadway pavement.

The bridge features original concrete obelisks with replacement light standards on each end of the bridge. Replica historic lighting has been added to the rest of the bridge.

The substructure for the reinforced-concrete deck girder approach spans consists of reinforced-concrete abutments and reinforced-concrete cap and column intermediate bents, both founded on precast concrete piles. The steel deck truss spans are supported on reinforced-concrete web wall intermediate bents founded on untreated timber piles. The two bents supporting the double-leaf bascule span are reinforced-concrete wall bents founded on untreated timber piles. The upper portion of these bents are hollow and house the machinery, gears, counterweights, and other miscellaneous equipment for the bascule span.

The timber fender system for the waterway navigation extends into the waterway north and south of the bascule span. The timber fender system provides for a clear horizontal navigation width of 131 feet, 2 inches.

Traffic warning gates with traffic signals are located along the steel deck truss spans to the east and west of the bascule span.

There are two houses on the east side of the bascule span and two houses on the west side. These houses are original to the bridge and are essentially identical in appearance. The concrete square-shaped structures and have truncated hipped roofs clad in metal shingles that resemble clay tiles. A single door with a transom and four-light divided window provides access to each house. Fenestration consists of long, narrow window openings with stucco sills on either side of the door and on all sides of the structure. On the east side of the bascule span is the operator's house and the generator house and on the west side the two houses (former restrooms) are currently used for storage. The operator's house on the southeast side provides access to the interior of the bascule span from a spiral staircase and catwalks that lead down into the machinery of the bascule span and counterweights. Similar access to the machinery is provided on the west side of the bascule span through the house on the southwest side of the bridge.

Aesthetic treatments incorporated into the bridge include obelisk-shaped light standards constructed of concrete, the treatment of the reinforced-concrete cap and column intermediate bents of the substructure,

and the style of the four houses, which include Mediterranean Revival elements of metal shingles that resemble clay tiled roofs and concrete houses.

Extensive rehabilitation projects have been undertaken on the Lea Joyner Bridge. The first occurred in 1950 and consisted of removing the timber flooring from the bascule span and installing steel open grid flooring.

The second rehabilitation project was divided into two phases: completed in 2008 and 2013. Phase 1, the 2008 rehabilitation, included most structural repairs and repairs to the bascule span, and rehabilitation of the four houses. The renovation of the operator's house on the southeast included a new control console, control cabinet, panelboard and transformer, interior lighting and receptacles, window air conditioning unit with heater, conduit and wiring, automatic transfer switch, main circuit breaker, and motor secondary resistors. The renovation of the generator's house on the northeast included a new generator, interior lighting and receptacles, conduit and wiring, and submarine cables. The southwest and northwest house renovations included new interior lighting and receptacles and conduit and wiring. The northwest house renovation also included new submarine cables. Exterior rehabilitation consisted of replacing all doors and windows and new roof cladding.

Additional work included in the 2008 rehabilitation was the replacement of machinery in the piers to the east and west of the bascule spans, including new drive motor, sump pump, brakes, limit switches, conduit and wiring, and local disconnect switch. The work also included new pier- and span-mounted navigation lights, new center lock motor and limit switches, new traffic gates, traffic signals and conduit and wiring on both the east and west spans, timber fender repairs, and the addition of lighting on the sidewalk attached to the barrier. Structural repairs were made to the concrete substructure units and the steel and concrete superstructure. These repairs included sealing the steel span control joints, concrete span joint seals, steel span joint replacement, sidewalk joint replacement, rivet replacement, floorbeam top chord rehabilitation on the bascule span, steel span floorbeam bottom chord replacement, bascule and steel truss span stringer replacement, steel truss bottom chord replacement, steel truss splice repair, stiffener seat replacement at floorbeams, clean and paint lateral bracing connection, repair of pile cap crack, spalled concrete deck and cap repairs, concrete girder crack repairs, and bearing stiffener removal.

Phase 2, the 2013 rehabilitation, included removal and replacement of the concrete curbs in the bascule span; removal and replacement of existing steel grid deck; replacement of/shimming to the center span lock bearings and shimming the live load shoes; addition of the steel curb rail on the inside of the sidewalk; cleaning and painting of the machinery, machinery houses, and structural steel; replacement of rivets; replacement of the counterweight trunnion bearing assembly; repairs to the deck truss supplemental restraint; refurbishing gears; and replacement of support beams and machinery truss.

C. History and significance

The Lea Joyner Bridge is located in central Ouachita Parish and carries US 80 (locally Louisville Avenue) across the Ouachita River, which serves as the boundary between Monroe, Louisiana, on the east side of the bridge and West Monroe, Louisiana, on the west. US 80 was previously a major component of the

Dixie Overland Highway, a coast-to-coast named trail that stretched from Savannah, Georgia, to Los Angeles, California. In November 1926 the American Association of State Highway Officials adopted the U.S. Highways numbered plan, and the route officially became known as US 80, though the road was still referred to as the Dixie Overland Highway after this time by many, including governmental entities such as the Louisiana Highway Commission (LHC) and the City of Monroe.[1]

The bridge was constructed in 1935 to replace a former structure deemed inadequate to handle increasing traffic demand. Opinion was initially divided on where to place the new crossing, with one group advocating to keep the bridge on Louisville Avenue and the other group recommending Wood Street, just south of the existing bridge. The Louisville Avenue location ultimately won out as it was deemed a better option to handle both vehicular traffic and marine navigation.[2]

The LHC awarded the contract for construction of the bridge to Stevens Brothers of St. Paul, Minnesota, in July 1931 for $485,813.[3] Construction began in 1931 but experienced delays soon after due to high water, which required additional work to prevent scouring of the river bed, completed by contractor Ben Flynn of Alexandria, Louisiana. Construction was delayed again in 1933 when the state experienced difficulty selling bonds for the bridge.[4] In February 1934, with construction still delayed, the Monroe Chamber of Commerce, at the behest of the mayor of Monroe, wrote a letter to the LHC requesting information on the prospection of resuming work on the bridge. The letter stressed the importance of the new crossing, and the inadequacy of the former bridge, stating:

> It would seem that there can be no denying the necessity for the completion of the Monroe bridge…The [former] bridge has been improved and it has been maintained in fairly good condition during the last fifteen years, but the fact that it is inadequate, that it enters the city of Monroe at a crowded and restricted intersection, and that it is the only means of passage from the east bank of the Ouachita river to the west bank, and between the cities of Monroe and West Monroe makes it more or less of a restriction, not only to local, but to through vehicular traffic.[5]

According to the letter, at that point the substructure of the bridge was complete and the piers were standing "rather ridiculously in the bed of the Ouachita river." The letter went on to ask the LHC for any information it could provide on obtaining relief, through the LHC itself or another governmental body, to

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[1] U.S. Department of Transportation, Federal Highway Administration, "U.S. Route 80 The Dixie Overland Highway," *Highway History*, November 18, 2015, https://www.fhwa.dot.gov/infrastructure/us80.cfm; Louisiana Highway Commission, *Sixth Biennial Report of the Louisiana Highway Commission* (Baton Rouge, La.: Louisiana Highway Commission, 1932), 37; "Thanks and Appreciation from the City of Monroe…P.M. Atkins Bridge," *The Monroe News-Star – Bridge Edition*, April 30, 1936.

[2] "Opinion Well-Divided on Location of Bridge Here," *The Monroe News-Star*, September 27, 1930.

[3] "Louisiana Bridge Contracts Given to Low Bidders," *The Times-Picayune*, July 2, 1931.

[4] "New P.M. Atkins Bridge a Notable Public Achievement," *The Monroe News-Star – Bridge Edition,* April 30, 1936.

[5] "Officials Want to Know About Unfinished Bridge," *Monroe (L.A.) Morning World*, February 11, 1934.

purchase the steel needed to finish the bridge.[6] The LHC was ultimately able to finance the completion of the bridge through the sale of bonds, with a goal to complete the bridge with as little further delay as possible.[7]

In 1934, once construction resumed, it was under a new contractor as the LHC and Stevens Brothers mutually canceled their contract. The remainder of the contract was awarded to two companies: Central Construction Co. of Monroe for the approaches, and the Vincennes Bridge Co. of Vincennes, Indiana, for the spans, machinery, and electrical equipment. The final cost of the completed structure was approximately $600,000.[8]

The bridge opened to great fanfare on Friday, May 1, 1936, on a day known locally as "Bridge Day." Festivities were scheduled beginning the night before the bridge opened with a concert by the LSU band and a street dance, and continued all of the following day with parades, music, dances, and other activities, including the ribbon-cutting ceremony.[9] The *Monroe News-Star* ran a special "Bridge Edition" of its newspaper that featured articles, photographs, facts, and messages of thanks and congratulations, in addition to advertisements from local businesses touting Bridge Day sales and specials.

Photograph of the new bridge in the "Bridge Day" edition of the Monroe News-Star, April 30, 1936.

[6] "Officials Want to Know About Unfinished Bridge."

[7] Louisiana Highway Commission, *Seventh Biennial Report of the Louisiana Highway Commission* (Baton Rouge, La.: Louisiana Highway Commission, 1934), 140.

[8] "New P.M. Atkins Bridge a Notable Public Achievement."

[9] "Bridge Day Program," *The Monroe News-Star*, April 30, 1936.

The City of Monroe ran a full-page message in the "Bridge Edition" of the newspaper thanking the state government of Louisiana and the LHC for their efforts that made the bridge possible. The message touted that the new structure "will prove to be an added incentive to our continued prosperity…It is the final link of a great system of highways and bridges built throughout the state in recent years, making Louisiana one of the foremost of all the states in the Union in progressive measures of the kind for the advantage of the public at large."[10] Similar messages were published from the City of West Monroe, the Police Jury of Ouachita Parish, the Chamber of Commerce of Monroe and West Monroe, and even Louisiana Governor James A. Noe.

The bridge was dedicated as the P.M. Atkins Bridge after Colonel Prentiss M. Atkins, local business leader and one of the first to advocate for the new crossing.[11] It was officially renamed the Lea Joyner Bridge in 1985 after local pastor Lea Joyner, who was murdered in March 1985.[12]

The Lea Joyner Bridge, a double-leaf trunnion bascule bridge with steel plate girder spans, has significance as a distinctive example of the bascule type. Its significance is demonstrated by the presence of distinctive engineering and design features of the double-leaf trunnion bascule bridge type, which is characterized by two opposing leaves that rotate around trunnions, racks and pinions for moving each span, counterweights that descend into enclosed pits, and locking mechanisms that enable the cantilevered spans to withstand live loads and remain stable when in a closed position. This bridge was rehabilitated in phases in 2008 and 2013 and retains historic integrity. The structure continues to convey significant design features of the double-leaf trunnion bascule bridge type. This 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 Lea Joyner Bridge has one major character-defining feature: its movable, bascule, double-leaf trunnion span (span 6). Other elements that represent historic fabric are the I-beam counterweight spans on either side of the bascule span, the steel deck truss spans, and concrete approach spans that complete the superstructure; four houses; the concrete railing on the approach spans and endposts; and original obelisk-shaped base for the light standards on the ends of the bridge. The light standards and other lighting on the bridge, the metal railing on the bascule span, and metal curb railing along the entire bridge are not original and not considered to be historic fabric.

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[10] "Thanks and Appreciation from the City of Monroe…P.M. Atkins Bridge."

[11] "Bridge is Named After One of City's Leaders," *The Monroe News-Star*, April 30, 1936.

[12] "Rev. Lea Joyner: A Pastor for All People," *thenews star*, March 12, 2015, http://www.thenewsstar.com/story/news/local/2015/03/11/rev-lea-joyner-pastor-people/70181398/.

The following item is the character-defining feature of the bridge:

Feature 1: Design and construction of Lea Joyner Bridge bascule main span.

Character-defining Feature Photo 1: The movable bascule span in the center of the bridge.

Character-defining Feature Photo 2: The bascule main span in open position.

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: Overview of the Lea Joyner Bridge from the northwest bank of the Ouachita River. The bridge's historic fabric includes the two I-beam counterweight spans flanking the bascule span, six steel deck girder spans, and nine concrete approach spans.

Historic Fabric Photo 2: The four houses on the bridge are historic fabric including the operator's house on the southeast side of the bridge, which provides access to the bridge substructure.

Historic Fabric Photo 3: Detail view of the operator house, on the southeast side of the bridge, which provides access to the bridge substructure.

Historic Fabric Photo 4: Concrete railing.

Historic Fabric Photos 5 and 6: Endposts. The northwest quadrant is engraved: "Ouachita River." The southwest endpost engraving reads "1935."

Historic Fabric Photo 7: Original concrete obelisk for light standard. A non-historic bronze plaque reads "Lea Joyner Bridge," the name of the bridge, placed in 1985 when the bridge was renamed.

4. Engineering Data

A. Existing conditions

(1) Structural observations

The Lea Joyner Bridge is in overall satisfactory condition and appears to adequately serve its purpose of carrying vehicular and pedestrian traffic over the waterway. The operation of the bridge is satisfactory, as observed in the opening-closing cycle during the field visit, and the machinery and electrical systems are adequately maintained.

The bridge is classified as fracture critical. The fracture critical members were visually inspected during the last inspection and no cracks were found. The bridge is load (weight) posted at 20 to 35 tons (20T-35T), with signs indicating this at each end of the bridge.

Approach spans (concrete deck girders, spans 1 and 11 through 18)

The superstructure is in satisfactory condition. The reinforced-concrete deck is in satisfactory condition. In span 1 the reinforced-concrete deck exhibits transverse and diagonal cracking on the underside of the deck. In spans 11 through 18 the reinforced-concrete deck exhibits transverse and diagonal cracking with scaling. The curbs in span 18 are spalled with exposed reinforcing. There are numerous spalls adjacent to joints. Additionally, there are transverse cracks with efflorescence on the underside of the deck. The reinforced-concrete beams are in fair condition. In spans 11 through 18 the bearing areas at numerous haunches are cracked and spalled. The bearing areas have been reduced up to 40 percent on some of the haunches. These areas were injected with epoxy during the 2008 rehabilitation. The metal railing and the reinforced-concrete bridge railing are both in good condition. The metal railing has minor vehicular damage in span 1. The expansion joints are in good condition with no minor or major deficiencies. The relief joint in span 1 is in good condition, although the relief joint in span 18 has been overlaid and is no longer functioning as intended. The expansion bearings are in fair condition with moderate corrosion in span 1 and medium to heavy cracking and spalling under the assemblies on numerous bearings, and moderate corrosion in spans 11 through 18.

The substructure is in satisfactory condition. The reinforced-concrete abutments are in satisfactory condition. The west abutment exhibits minor vertical and diagonal cracking on the backwall and cracking and spalls on the top of the abutment. The east abutment exhibits minor vertical and diagonal cracking with efflorescence. The reinforced-concrete pier caps are in satisfactory condition with cracking and light to moderate spalling on bents in spans 11 through 18. These areas were injected with epoxy during the 2008 rehabilitation. The reinforced-concrete pier wall is in satisfactory condition. On pier 2, the left end of the footing is cracked at the anchor bolt on the span 2 side. The reinforced-concrete pier columns are in good condition with minor cracking. The reinforced-concrete piles are in good condition with no major or minor deficiencies.

Approach spans (steel deck truss, spans 2 through 4 and 8 through 10)
The superstructure is in satisfactory condition. The reinforced-concrete deck is in satisfactory condition with transverse cracking with efflorescence on the underside of the deck and overhangs and a spall on the top of the deck in span 3. There is light to moderate spalling with exposed reinforcing in the bottom of the deck. The steel stringers have been replaced and are in good condition with no deficiencies. The steel truss, steel floorbeam, steel gusset plates, metal railing, reinforced-concrete bridge railing, and expansion joints are in good condition. The steel truss has two sheared bolts at a connection plate at bent 11 and numerous unpainted areas on the steel bracing under the deck in span 10. The steel floorbeams have two missing bolts and two sheared bolts at the connection to the bottom of the floorbeam in span 10. The joint between spans 3 and 4 is full of debris. The expansion and fixed bearings are in good condition with no deficiencies.

The substructure is in satisfactory condition. The reinforced-concrete pier walls are in satisfactory condition. Piers 3 and 4 and 9 and 10 exhibit vertical cracking and minor spalling. Additionally, piers 4 and 9 exhibit minor delaminations. The substructure units are all heavily covered in vegetation.

Approach spans (counterweight spans, spans 5 and 7)
The superstructure is in satisfactory condition. The reinforced-concrete deck is in satisfactory condition with transverse and diagonal cracking on the underside of the deck. The steel beams, stringers, and reinforced-concrete bridge railing are in good condition with no deficiencies. The expansion joint in span 7 is in satisfactory condition with silt and debris filling the joint.

The substructure is in satisfactory condition. The reinforced-concrete pier wall (pier 6) is in satisfactory condition with vertical cracking with minor spalling.

Main span (double-leaf bascule, span 6)
The superstructure is in satisfactory condition. The steel open grid deck is in satisfactory condition with missing bolts from the joint that is causing vibration. The steel deck with concrete filled grid is in good condition with no deficiencies. The two steel plate girder systems, steel trusses, and steel floorbeams are in good condition. Steel floorbeam 1, span 6 has a small hole. The steel stringers have been replaced and are in good condition. The metal railing is in good condition with no deficiencies. The counterweight and the counterweight support are in good condition with no deficiencies. The counterweight trunnion bearing assembly was replaced during the 2013 rehabilitation. The operating machinery and the control console were replaced in the 2008 rehabilitation. Both are functional and in good condition.

The substructure is in satisfactory condition. The reinforced-concrete pier wall is in satisfactory condition with vertical cracking and minor spalling.

(2) Non-structural observations

The traffic warning gates and traffic signals were replaced in the 2008 rehabilitation and are functioning properly and in good condition with no deficiencies. The operator's houses were rehabilitated in 2008; they are in good condition and well maintained, both inside and outside. The east and west reinforced-concrete approach slabs were reconstructed in 2013 and are in good condition with no deficiencies.

The timber fender system is in good condition. The fender system has been maintained to provide its function of protecting the bridge from impact loading from the river and navigation traffic. The timber fenders were repaired during the 2008 rehabilitation and appear to be in good condition.

(3) Serviceability observations

The ADT across the bridge is approximately 37,400 vehicles. The posted speed limit is 25 mph across the bridge. The bridge clear roadway width of 40 feet provides for four lanes of traffic, two in each direction, with 6-foot, 6-inch sidewalks on each side of the roadway. The bridge adequately handles this traffic volume. The horizontal and vertical geometry of the bridge is good. The railing on the bridge is concrete railing on the exterior of the sidewalk and a metal railing on the inside of the sidewalk has been added to provide a crash barrier.

The bridge is not manned, and four hours advance notification is required for bridge openings. The bridge is opened on average one time per month.

B. Sources of information

Plans available:	Yes, available at the LADOTD Bridge Section office
Inspection report date:	May 20, 2016
Fracture critical report date:	(included as part of routine inspection report)
Underwater inspection report:	December 19, 2013
Date of site visit:	September 27, 2016

Condition Photo 1: Elevation view, looking east.

Condition Photo 2: Elevation view of the bascule span, looking west.

Condition Photo 3: Underside of the floor system of the bascule span, looking west.

Condition Photo 4: Underside of the bascule span in the open position, looing west.

Condition Photo 5: The hydraulic gear house on pier 4.

Condition Photo 6: The inside of hydraulic gear house on pier 5.

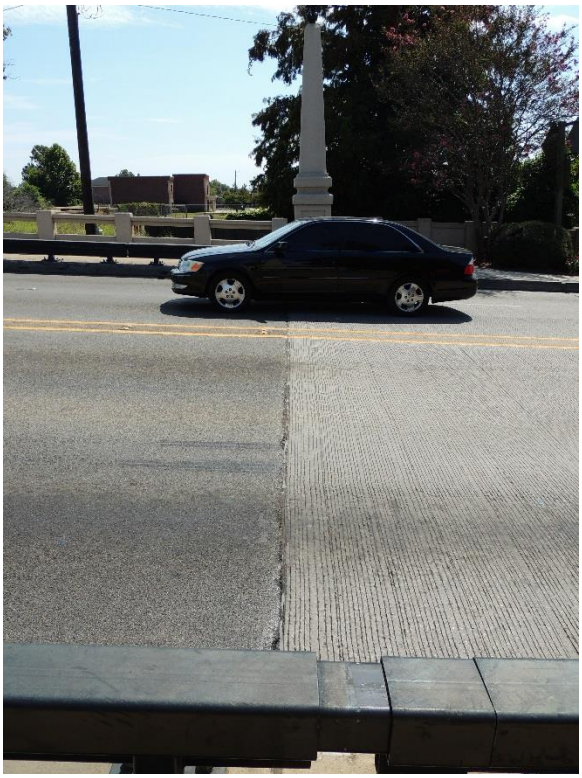
Condition Photo 7: The sump pump on pier 5.

Condition Photo 8: The counterweight for the bascule span lowering into the pier.

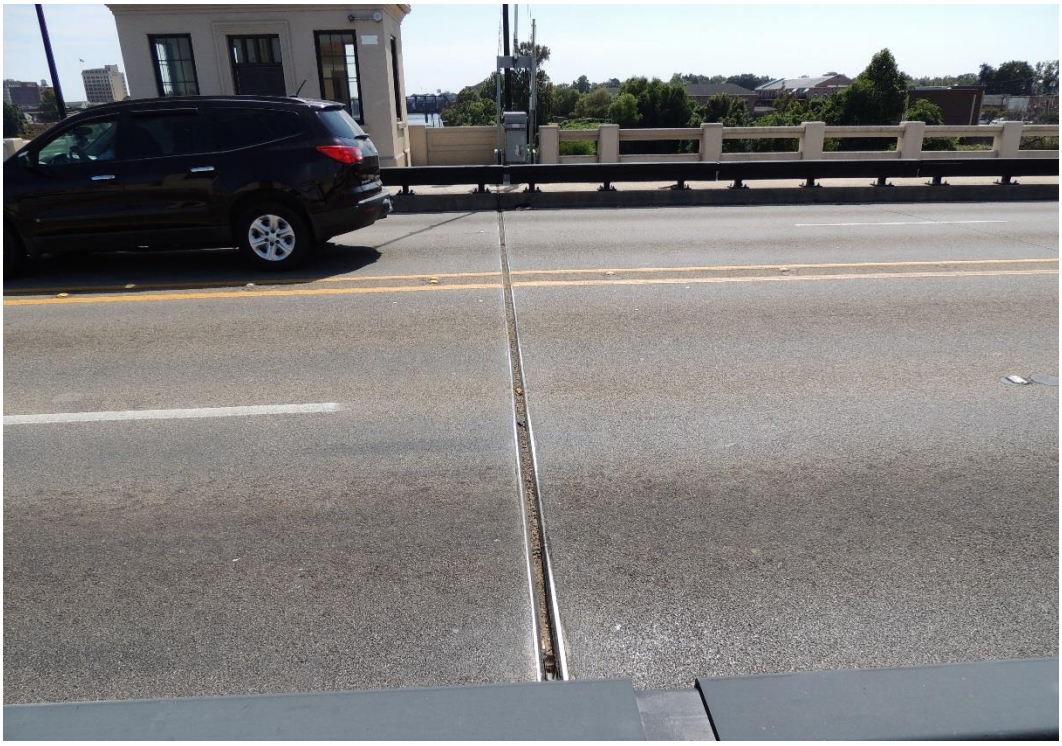
Condition Photo 9: The gears in pier 5 for the bascule span.

Condition Photo 10: The east side of the bascule span in the lift position and the traffic gates, looking west.

Condition Photo 11: The lowering of the bascule span and the locks at the end of the span, looking west.



Condition Photo 12: The relief joint between the approach span 1 and the west approach slab.



Condition Photo 13: Pier 4, compression joint full of dirt and debris, typical condition.

Condition Photo 14: The open joint and center lock for the bascule span.

Condition Photo 15: The concrete deck driving surface, typical condition.

Condition Photo 16: Steel open grid deck on the bascule span.

Condition Photo 17: Vehicular scratches/damage to the metal curb rails on the sidewalk.

Condition Photo 18: The gearing and equipment for the locking system for the bascule spans housed under the sidewalk.

Condition Photo 19: The operator's house located on the southeast side of the bridge.

Condition Photo 20: The operator's console in the operator's house.

Condition Photo 21: Generator located in the generator house on the northeast side of the bridge.

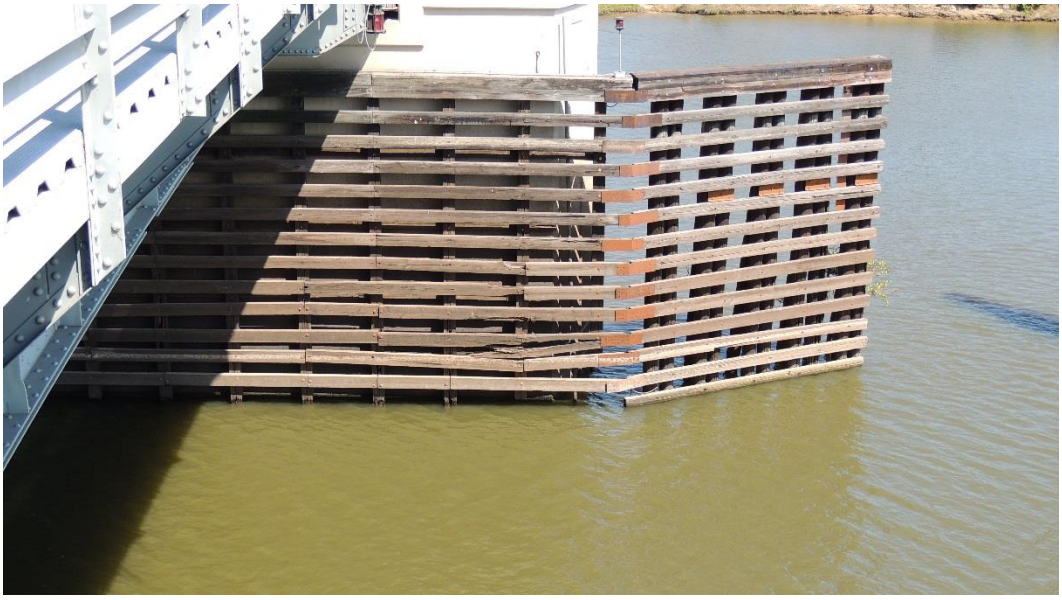
Condition Photo 22: West approach spans covered with vegetation.

Condition Photo 23: Approach spans 11 through 18, staining on bents, looking west, typical.

Condition Photo 24: Vegetation, water staining, and dirt daubers on the substructure units, typical.

Condition Photo 25: The underside of the steel truss superstructure approach spans 8 through 10.

Condition Photo 26: Typical wall-type piers.



Condition Photo 27: Damaged east timber fender system.

Condition Photo 28: Pier 5 of the bascule span and vegetation growth in the east timber fender system.

Condition Photo 29: Typical overview of the west timber fender system.

Condition Photo 30: The west timber fender system, missing members and damaged and the lowering of the bascule span, looking west.

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. Remove vegetation from substructure units regularly.
2. Clean debris from concrete deck travelling roadway surfaces, as necessary.
3. Clean the dirt and debris from the deck joints, as necessary.
4. Remove debris from truss members, as necessary.

B. Rehabilitation

The following are recommendations for rehabilitation. These activities should be performed when necessary (estimated to be within the next five years):

1. Clean the concrete substructure units to remove water staining discoloration with low pressure water spray.

2. Repair spalls and cracking in the concrete substructure units with concrete patches or epoxy injections.

3. Repair spalls and cracking on the concrete beams of spans 11 through 18 at the bearing areas, where the beams are haunched, with concrete patches and epoxy injections.

4. Replace missing and sheared bolts on the connection plates in spans 4, 10, and 11.

5. Paint the unpainted areas on the steel bracing under the deck in span 10.

6. Moveable bearing rehabilitation.

Bridge Recall No. 024400		Date:	4/24/2017	
Lea Joyner Bridge				
Opinion of Probable Costs				
Rehabilitation				
Item	**Quantity**	**Unit**	**Unit Cost**	**Total**
Clean the concrete substructure units to remove water staining discoloration with low pressure water spray	1	LS	$50,000	$50,000
Repair spalls and cracking in the concrete substructure units with concrete patches or epoxy injections	1	LS	$150,000	$150,000
Repair spalls and cracking on the concrete beams of spans 11 through 18 at the bearings areas, where the beams are haunched, with concrete patches or epoxy injections	1	LS	$150,000	$150,000
Replace missing and sheared bolts on the connection plates in spans 4, 10, and 11	6	EA	$1,000	$6,000
Paint the unpainted areas on the steel bracing under the deck in span 10	1	LS	$150,000	$150,000
Moveable bearing rehabilitation.	6	EA	$2,500	$15,000
Item Subtotal				$521,000
Contingency			10.00%	$52,100
Mobilization			7.00%	$40,117
TOTAL ESTIMATED CONSTRUCTION COST				
				$613,217
			Round to:	**$613,000**

C. Identification of any anticipated design exceptions

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

Appendix A. Historic Inventory Form

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Louisiana Historic Bridge Inventory

Recall Number: 024400 **Structure Number:** 05370010918151 **SHPO Number:** 37-02382

Bridge Name: OUACHITA R.-LOUISVILLE

Location Data:

District: 05

Parish: Ouachita

Feature Crossed: OUACHITA RIVER-LOUISVILLE

Facility Carried: US0080

Location: 1.6 MI WEST OF LA 840-6

City, Village or Town (if applicable): Monroe

Status: Open

Bridge Owner: State of Louisiana

Latitude: 32.505633

Longitude: -92.124867

Structural Data:

Bridge Type: Steel Plate Girder Bascule Span

Year Built: 1935

Main Span Configuration (if applicable): Double-leaf trunnion

Maximum Span Length (feet): 160

Number of Spans: 1

Overall Structure Length (feet): 1170

Approach Span Type (if applicable): Steel arch - deck

Posted Load: 20-35

Current ADT: 034800

Design and Construction Data:

Engineer or Builder:

Unknown

Bridge Plaque:

None

National Register of Historic Places Evaluation:

This double-leaf trunnion bascule bridge with steel plate girder spans has significance as a distinctive example of the bascule type. Its significance is demonstrated by the presence of distinctive engineering and design features of the double-leaf trunnion bascule bridge type, which is characterized by two opposing leaves that rotate around trunnions, racks and pinions for moving each span, counterweights that descend into enclosed pits, and locking mechanisms that enable the cantilevered spans to withstand live loads and remain stable when in closed position. This bridge was rehabilitated in 2007 and retains integrity. The structure continues to convey significant design features of the double-leave trunnion bascule bridge type. This bridge is eligible for listing in the National Register under *Criterion C: Design/Engineering*.

Within/Adjacent to Known Historic District: N/A

National Register Historic District Name: N/A

National Register Determination: Previously determined eligible

National Register Determination Date:

Surveyor: Mead & Hunt, Inc.

Date Surveyed: 2013

Louisiana Historic Bridge Inventory

Recall Number: 024400 **Structure Number:** 05370010918151 **Bridge Name:** OUACHITA R.-LOUISVILLE

Parish: Ouachita Bridge Owner: State of Louisiana

Feature Crossed: OUACHITA RIVER-LOUISVILLE Facility Carried: US0080

Photographs:

Appendix B. Select Plan Sheets

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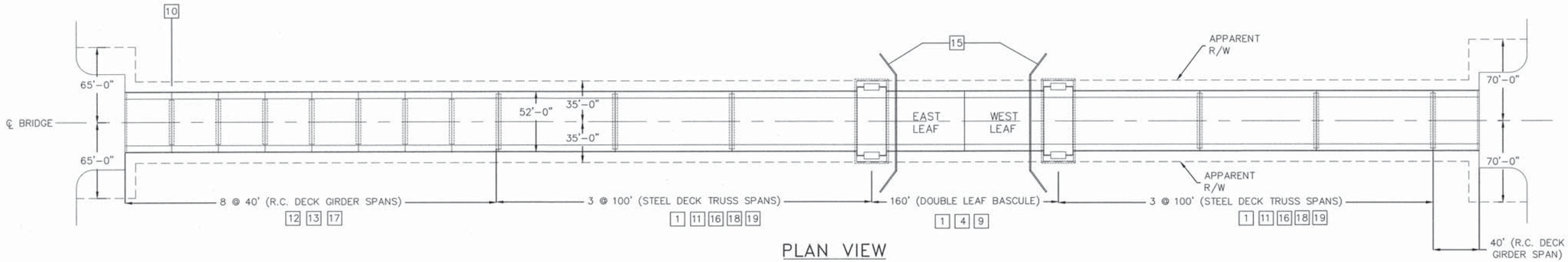
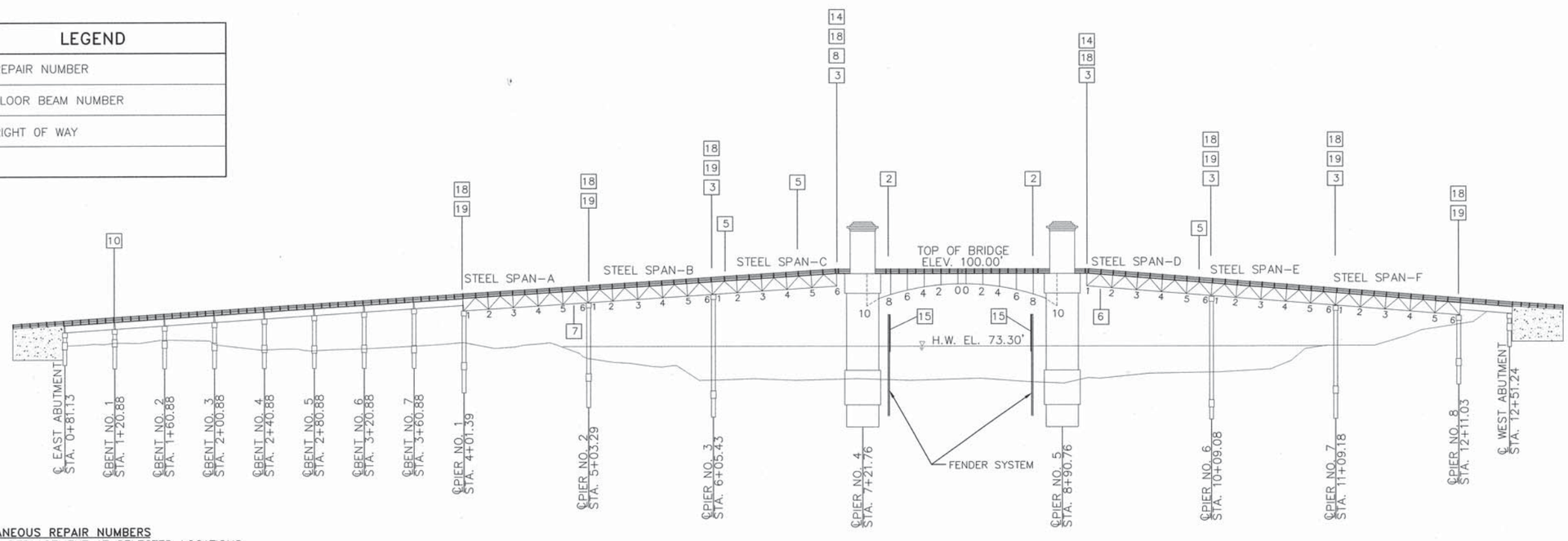


PLAN VIEW

LEGEND	
1	REPAIR NUMBER
1	FLOOR BEAM NUMBER
- - -	RIGHT OF WAY



ELEVATION

MISCELLANEOUS REPAIR NUMBERS

1. RIVET REPLACEMENT AT SELECTED LOCATIONS.
2. BASCULE FLOOR BEAM 8 TOP CHORD REHABILITATION.
3. STEEL SPAN FLOOR BEAM BOTTOM CHORD REPLACEMENT.
4. BASCULE SPAN STRINGER REPLACEMENT (EAST & WEST LEAF).
5. STEEL SPAN STRINGER REPLACEMENT.
6. STEEL TRUSS BOTTOM CHORD REPLACEMENT.
7. STEEL TRUSS SPLICE REPAIR.
8. STIFFENER SEAT REPLACEMENT AT FLOOR BEAM C6.
9. CLEAN & PAINT LATERAL BRACING CONNECTIONS.
10. PILE CAP CRACK REPAIR.
11. SPALLED CONCRETE DECK REPAIRS.
12. SPALLED CONCRETE CAP REPAIRS.
13. CONCRETE GIRDER CRACK REPAIRS.
14. BEARING STIFFENER REMOVAL.
15. TIMBER FENDER SYSTEM REPAIRS.
16. SEAL STEEL SPAN CONTROL JOINTS.
17. CONCRETE SPAN JOINT SEALS.
18. STEEL SPAN JOINT REPLACEMENT.
19. SIDEWALK JOINT REPLACEMENT.

NOTE: THE ORIGINAL 1931 BRIDGE STATIONS HAVE BEEN USED FOR THIS PROJECT. THAT STATIONING RUN EAST TO WEST.

STATE OF LOUISIANA
DAVID S. HUVAL
REG No. 9931
REGISTERED PROFESSIONAL ENGINEER IN CIVIL ENGINEERING

David S. Huval
11/22/06

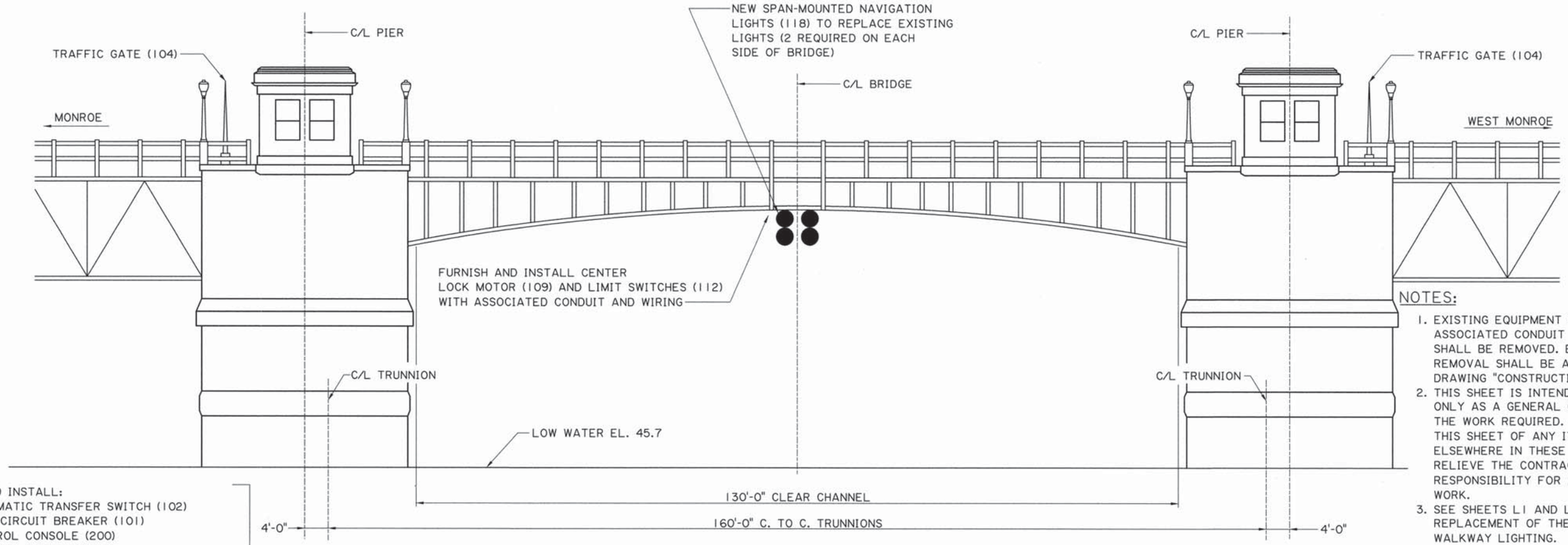
SHEET NUMBER	4
PARISH	OUACHITA
FEDERAL PROJECT	3701(516)
STATE PROJECT	001-09-0074
DESIGNED MMS / CHECKED MMS	SPT
DETAILED CHECKED	SEPT. 2006
DATE / SCALE	

REVISION DESCRIPTION | NO. | DATE | BY

LOUISVILLE BRIDGE REHABILITATION
MONROE, LOUISIANA
PHASE 1

GENERAL LAYOUT & REPAIR LAYOUT PLAN

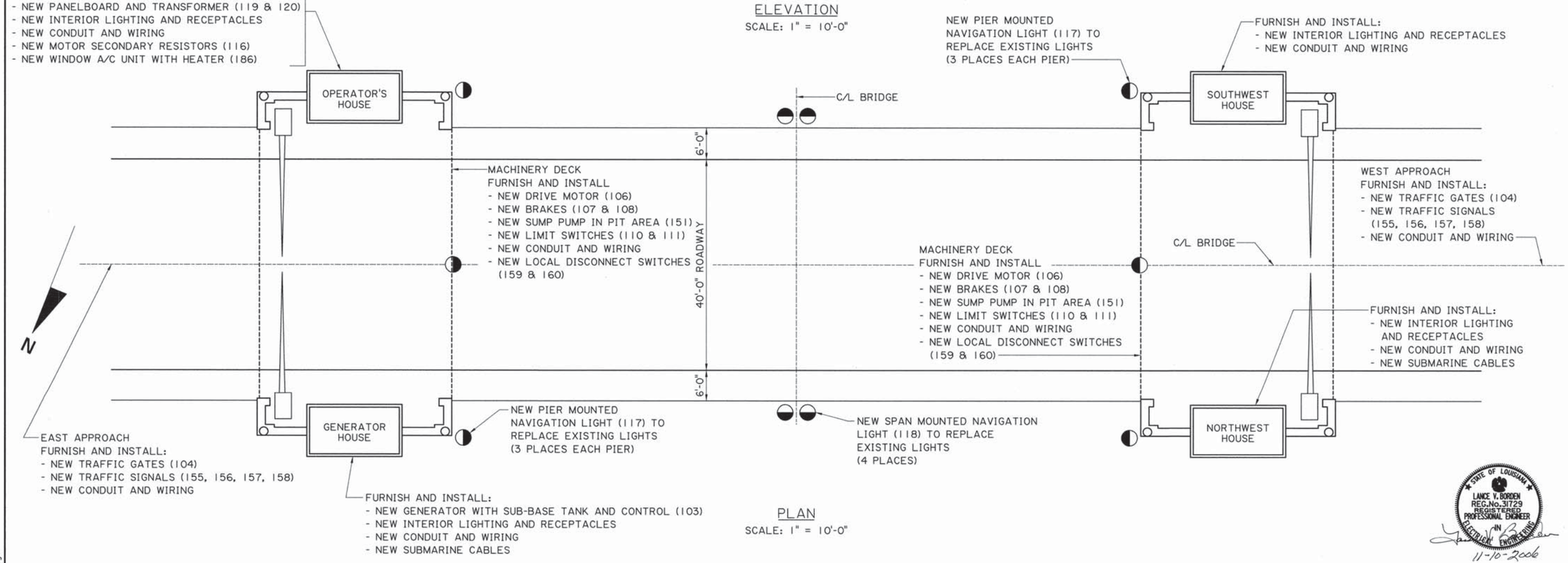
HUVAL & ASSOCIATES, INC. Consulting Engineers



ELEVATION
SCALE: 1" = 10'-0"

NOTES:

1. EXISTING EQUIPMENT ON BRIDGE WITH ASSOCIATED CONDUIT AND WIRING SHALL BE REMOVED. EQUIPMENT REMOVAL SHALL BE AS DESCRIBED ON DRAWING "CONSTRUCTION SEQUENCE".
2. THIS SHEET IS INTENDED TO SERVE ONLY AS A GENERAL OVERVIEW OF THE WORK REQUIRED. OMISSION FROM THIS SHEET OF ANY ITEM SHOWN ELSEWHERE IN THESE PLANS DOES NOT RELIEVE THE CONTRACTOR FROM RESPONSIBILITY FOR ANY ASSOCIATED WORK.
3. SEE SHEETS L1 AND L2 FOR REPLACEMENT OF THE EXISTING WALKWAY LIGHTING.



PLAN
SCALE: 1" = 10'-0"

STATE OF LOUISIANA
LANCE V. BORDEN
REG. No. 31729
REGISTERED PROFESSIONAL ENGINEER
IN ELECTRICAL ENGINEERING
11-10-2006

pe.dgn

E3 103

PARISH	OUACHITA
FEDERAL PROJECT	3701 (516)
STATE PROJECT	001-09-0074
LRBA/EA QCT	TBD QCT/EA
DESIGNED CHECKED	DETAILED CHECKED
DATE SHEET	OCTOBER 2006

NO.	DATE	REVISION DESCRIPTION	BY

LOUISVILLE STREET BRIDGE REHABILITATION
MONROE, LOUISIANA
PHASE 1
PLAN AND ELEVATION

MODJESKI and MASTERS

FINAL PLANS

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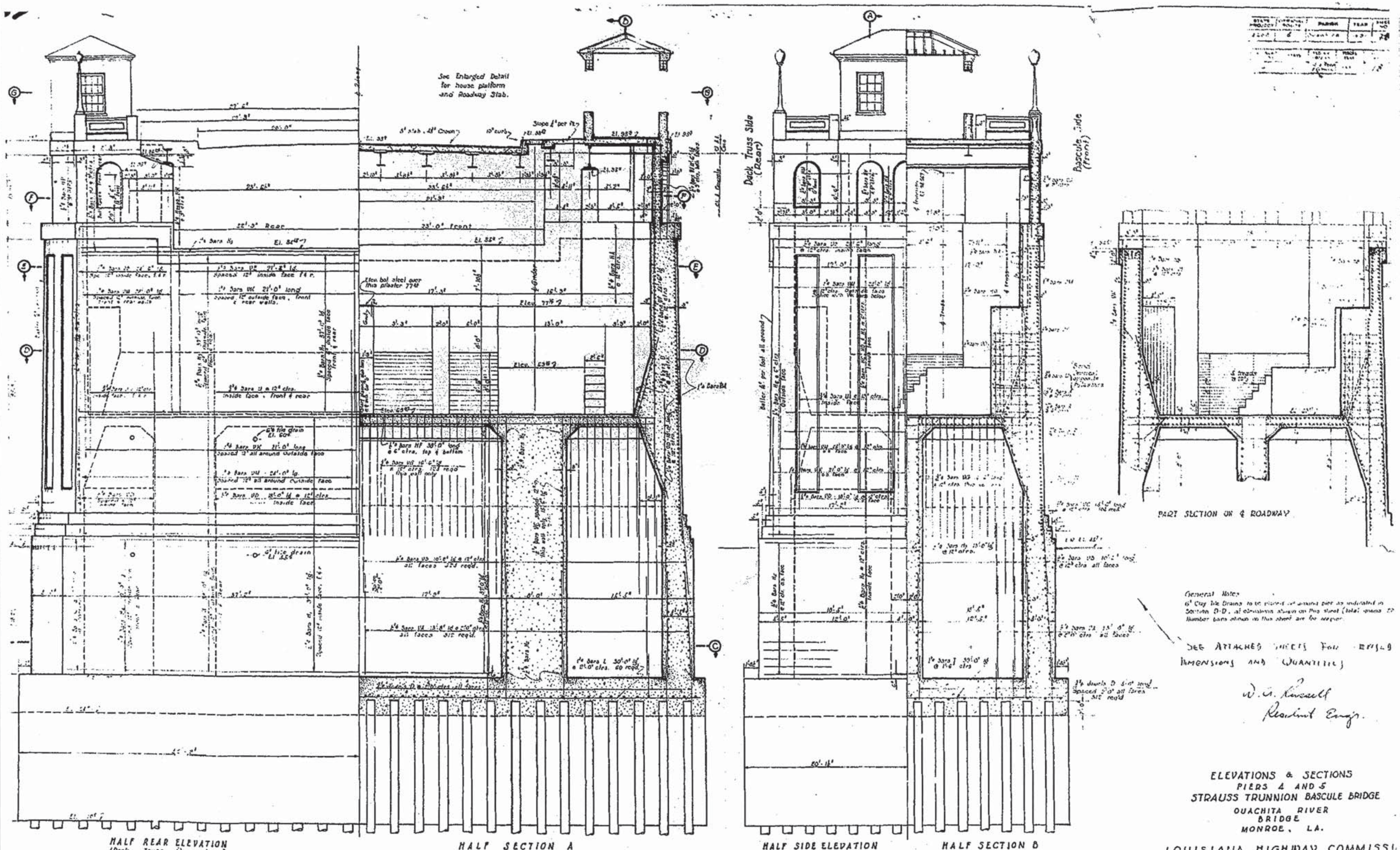

General Notes
6" Clay Tile Drains to be placed all around pier as indicated in Section D-D, at elevations shown on this sheet. (Total drains 22) Number bars shown on this sheet are for one pier.

SEE ATTACHED SHEETS FOR REVISED DIMENSIONS AND QUANTITIES

W. A. Russell
Resident Engr.

ELEVATIONS & SECTIONS
PIERS 4 AND 5
STRAUSS TRUNNION BASCULE BRIDGE
OUACHITA RIVER BRIDGE
MONROE, LA.

LOUISIANA HIGHWAY COMMISSI
BATON ROUGE, LA MAY, 19

FOR INFORMATION ONLY.

THIS SHEET IS FROM THE ORIGINAL BRIDGE PLANS.

SHEET NUMBER	52
PARISH	OUACHITA
FEDERAL PROJECT	
STATE PROJECT	001-09-0075
DESIGNED / CHECKED	
DETAILED	K. KEMP
CHECKED	
DATE	11-12-2009
SHEET	4 OF 5

NO.	DATE	REVISION DESCRIPTION	BY

CONCRETE SURFACE FINISH

FOR INFORMATION PURPOSES ONLY

LOUISVILLE BRIDGE REHABILITATION (PHASE 2)

BRIDGE AND STRUCTURAL DESIGN

FINAL PLANS

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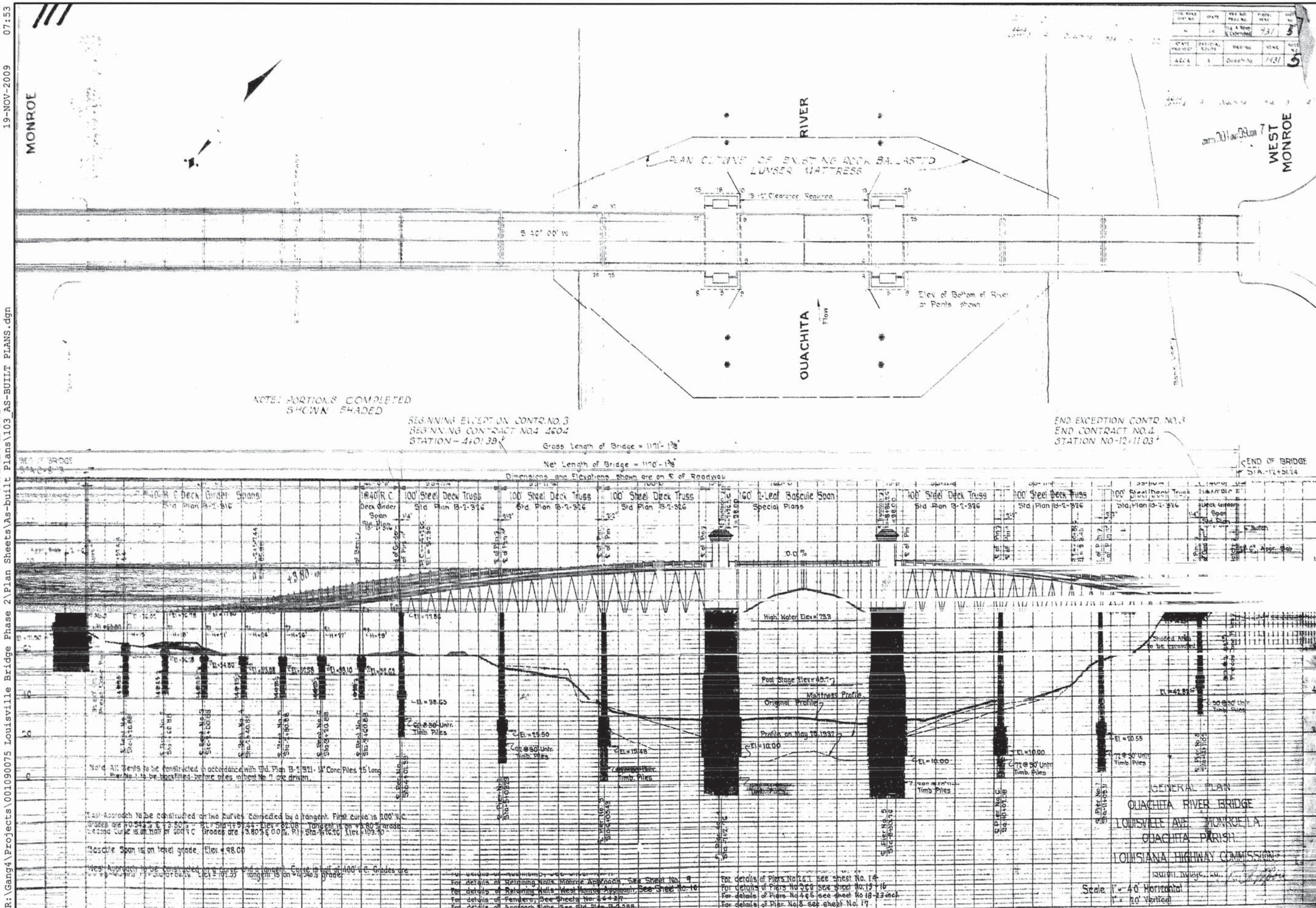

SHEET NUMBER	103
PARISH	OUACHITA
FEDERAL PROJECT	
STATE PROJECT	001-09-0075

AS-BUILT PLANS
ORIGINAL BRIDGE
FOR INFORMATION ONLY
LOUISVILLE BRIDGE REHABILITATION (PHASE 2)

BRIDGE AND STRUCTURAL DESIGN