BAYOU TECHE AT CHARENTON BRIDGE HAER No. LA-37
(Bridge Recall No. 009130)
Carries Louisiana Highway 324 (LA 324) over Bayou Teche
Charenton
St. Mary Parish
Louisiana

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

REDUCED COPIES OF MEASURED & INTERPRETIVE DRAWINGS

FIELD RECORDS

HISTORIC AMERICAN ENGINEERING RECORD
National Park Service
U.S. Department of the Interior
1849 C Street, NW
Washington, DC 20240

HISTORIC AMERICAN ENGINEERING RECORD
BAYOU TECHE AT CHARENTON BRIDGE
(Bridge Recall No. 009130)

HAER No. LA-37

Location: Carries Louisiana Highway 324 (LA 324) over Bayou Teche in Charenton, St. Mary Parish, Louisiana.

The Bayou Teche at Charenton Bridge (Bridge Recall No. 009130) is located at latitude 29.88709 north, longitude -91.52269 west.[1] The coordinate represents the center of the bridge. It was obtained in 2016 by plotting its location in Google Earth. The location has no restriction on its release to the public.

Present Owner: State of Louisiana.

Present Use: Vehicular traffic. When in its open position, the bridge allows for marine traffic on Bayou Teche.

Significance: This Warren pony truss swing bridge has significance as an example of a movable swing bridge. Its significance is demonstrated by the presence of distinctive engineering and design features of a pony truss swing bridge, which is characterized by the polygonal Warren truss configuration, center-bearing turning mechanism, pivot pier, and operator's house. This bridge was determined eligible for listing in the National Register of Historic Places (National Register) in 2013 under *Criterion C: Design/Engineering* at the state level of significance.[2]

Historian(s): Emily Pettis, Senior Cultural Resource Specialist, and Katherine Haun Schuring, Cultural Resource Specialist; Mead & Hunt, Inc. (Mead & Hunt); 2017.

Project Information: This documentation was prepared as mitigation to fulfill Stipulation IX.5 of 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*, dated August 18, 2015, and executed September 21, 2015. The Louisiana Department of Transportation and Development (LADOTD) retained Mead & Hunt to prepare this document. It was prepared by senior cultural resource specialist Emily Pettis and cultural resource specialist Katherine Haun Schuring of Mead & Hunt. Dietrich Floeter completed the photography.

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[1] For clarity, the bridge is referred to as the Charenton Bridge in this document. The bridge is also known as Structure No. 03512410209141.

[2] Mead & Hunt, Inc., *National Register Eligibility Determination Report: Pre-1971 Louisiana Highway Bridges* (prepared for the Louisiana Department of Transportation and Development, September 2013).

Part I. Historical Information

A. Physical History:

1. **Date(s) of construction:** 1945.

2. **Engineer:** Louisiana Highway Commission.

3. **Builder/Contractor/Supplier:** The Austin Bridge Company of Dallas, Texas, served as the builder/contractor for the project; Jones & Laughlin Steel Corporation of New Orleans supplied the steel; and Earle Gear & Machine Company of Philadelphia fabricated the electric motor for the swing span.

4. **Original plans and construction:** Plans available for the Charenton Bridge include as-built and shop drawings. These plans were prepared by the Louisiana Highway Commission (LHC) and are available in the General Files room at the LADOTD's Baton Rouge headquarters. As-built plans for the new swing span structure crossing Bayou Teche in Charenton are dated June 25, 1941, and signed by the State Highway Engineer, Harry Henderlite. Shop drawings date to 1941 and 1942 and include plan sets by the Jones & Laughlin Steel Corporation, steel fabricator, and the Earle Gear and Machine Company, swing span electric motor fabricator.

   The majority of the bridge's components were constructed using standard plans. The swing span conformed with standard plan S-S 55-15, "204'-0" Swing Span," which is dated July 3, 1941. Plans for the approach spans and bents (numbered 1-6) were built from standard plan S-C 51, dated April 1941. Plans for the rest piers (piers 1 and 3) are dated May 1940 with revision in February 1941. The operator's house, plan sheet T-M-18, dates to June 1941 with revision in October 1941. Only the bridge's center pivot pier and fender system were not based on a standard plan. Dated April 1941, the pivot pier was a special detail plan sheet titled "Center Pivot Pier | Charenton Bridge Over Bayou Teche." Plans for the fender system are dated May 1941 and are titled "Fender Details | Bridge over Bayou Teche Charenton, LA." The designer for both the pivot pier and fender system is illegible on plans.

5. **Alterations and additions:** Alterations to the bridge include traffic barrier installation in 2009, replacement of the timber piling below the operator's house at an unknown date, and placement of metal sheet pile on the southeast corner to prevent scour at an unknown date.

B. Historical Context:

Historical background

The Charenton Bridge carries LA 324 over Bayou Teche on the east side of Charenton in St. Mary Parish. Bayou Teche reaches 125 miles from Bayou Courtableau at Port Barre, located approximately 50 miles north of Charenton, to the Atchafalaya River at Berwick.[3] The lumber and sugar industries were prominent along this stretch of the bayou and mills for both products were historically located along it.[4] While the U.S. Army Corps of Engineers (USACE) still manages Bayou Teche as a navigable waterway, commercial traffic has significantly decreased in recent years.

The Charenton Bridge construction contract was awarded to the Austin Bridge Company of Dallas, Texas, in August 1941 under Project 913-04-84 with a contract amount of $100,073.[5] According to the 1940-1941 Biennial Report, it was one of several contracts awarded that year for swing truss bridges along the bayou. Contracts were also awarded for bridges at Iberia and Jeanerette in Iberia Parish, Sterling and Oaklawn in St. Mary Parish, and St. Martinville in St. Martin Parish.[6] Based on a review of available highway maps, bridges spanned Bayou Teche at these locations prior to 1941, including Charenton. At least two of the previous spans, Sterling and Oaklawn, were pontoon bridges.[7]

Although it is unclear why five new bridges were needed along Bayou Teche during World War II, when most other construction was suspended, contributing factors can be surmised. In August 1940 a hurricane stalled over this area of the state, resulting in substantial flooding.[8] In the years following the flooding, the USACE made improvements to Bayou Teche and the nearby Atchafalaya River basin, including a series of levees and canals. In 1941 the USACE excavated a drainage and navigation canal at Charenton, between Bayou Teche and the Atchafalaya, as part of the larger improvement project.[9] The Charenton Bridge, which is just downriver from the canal, may have been replaced in response to these improvements. Sugarcane production and transportation along the bayou may also have been a factor in the need for new crossings. The Oaklawn crossing provided access to a plantation and the Sterling crossing was located near a plantation and sugar refinery.[10]

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[3] Vincent Pizzolato, "Preliminary Case Report for the Bayou Teche Bridge at Ruth, St. Martin Parish, Ruth, Louisiana," prepared for the U.S. Department of Transportation Federal Highway Administration and the Louisiana Department of Transportation and Development Office of Highways (April 1984), 4.

[4] David C. Johnson and Elaine G. Yodis, *Geography of Louisiana* (New York: McGraw Hill, 1998), 133; "Determination of Eligibility for the Bayou Teche Bridge (Oaklawn), LA 323, St. Mary Parish, Louisiana."

[5] Louisiana Department of Highways, *Eleventh Biennial Report of the Louisiana Highway Commission* (Baton Rouge, La.: Louisiana Highway Commission, 1942), 14–15.

[6] Louisiana Department of Highways, *Eleventh Biennial Report of the Louisiana Highway Commission*, 14–15, 18–19, 30–31, 36–37.

[7] "Hearing Called on Bridge Plans," *Times-Picayune*, November 22, 1940.

[8] Gresham, Matt, "Hurricanes in Louisiana: The Last 100 Years," *The Courier*, June 2, 2002, http://www.houmatoday.com/news/20020602/hurricanes-in-louisiana-the-last-100-years.

[9] United States Army War Department, *Report of the Chief of Engineers, U.S. Army, 1941* (Washington, D.C.: United States Government Printing Office, 1942), 2152.

[10] Coastal Environments, Inc., "Determination of Eligibility for the Bayou Teche Bridge (Oaklawn), LA 323, St. Mary Parish, Louisiana," 2012; "Hearing Called on Bridge Plans."

Both the Sterling and Oaklawn bridges were completed on schedule, in time for the 1941 sugarcane harvest.[11] The Charenton and Jeanerette Bridges were delayed, likely due to wartime steel shortages. As a result, the Jeanerette bridge was not completed until 1944 and the Charenton Bridge was not complete until 1945.

The Charenton Bridge, as well as the Jeanerette, Sterling, and Oaklawn Bridges, shared a common design of swing span with polygonal Warren pony truss configurations. In fact, the Charenton and Jeanerette Bridges appear to be almost identical. The Austin Bridge Company was responsible for each of the four bridges. The Dallas-based company was founded by brothers George and Frank Austin in 1902. However, George had been working with the George E. King Bridge Company of Des Moines, Iowa, since the 1890s. Initially known as Austin Brothers Contractors, the company had fabrication plants in Dallas and Atlanta, Georgia. In 1918 company agent Charles R. Moore purchased the bridge portion of the business and subsequently changed the name to the Austin Bridge Company. The company continued to grow and is considered one of the South's leading bridge builders in the early twentieth century. The company survives today as a subsidiary of Austin Industries in Dallas.[12]

Engineering background

Louisiana has one of the largest collections of movable bridges of any state, largely due to its proliferation of navigable waterways, particularly in the southern part of the state near the Gulf of Mexico. Louisiana's movable bridges represent the three major types found throughout the country: swing-span, bascule, and vertical lift.[13] Due to their popularity and frequent use, a series of standard plans for movable bridges was developed by the LHC and Louisiana Department of Highways (LDH, predecessor to the LHC) between 1924 and 1963. Standard plans were periodically revised with small adjustments to meet site-specific needs.[14] The Charenton Bridge utilized standard plans for the major components, including the Warren polygonal pony truss swing span, six I-beam approach spans, and operator's house.

The Charenton Bridge is an example of a swing bridge with a polygonal Warren pony truss configuration and center-bearing type swing span. Swing-span bridges open by rotating (swinging) the movable span 90 degrees in a horizontal plane about a vertical axis (the central pivot pier), so the span is parallel with the navigation channel. This creates open navigation channels on one or both sides of the central pier that supports the movable span. When in the closed position (closed to marine traffic), the span is supported at three points: the two span ends and the pivot pier. The pivot pier, generally at the mid-span point, supports the weight of the swing span itself. The piers at each span end are "rest piers," which

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[11] Coastal Environments, Inc., "Determination of Eligibility for the Bayou Teche Bridge (Oaklawn), LA 323, St. Mary Parish, Louisiana."

[12] National Register of Historic Places, Multiple Property Documentation Form, "Historic Bridges of Texas, 1866-1945," Statewide, Texas, E23–24.

[13] Mead & Hunt, Inc., *Historic Context for Louisiana Bridges*, 72, 73.

[14] Mead & Hunt, Inc., *National Register Eligibility Determination Report: Pre-1971 Louisiana Highway Bridges*, 36, 40.

stabilize the span end along with the pivot pier, and also support the live load (the weight of vehicular traffic) as it passes over the bridge.[15]

The center-bearing type swing span receives its name from a large spherical thrust bearing at the center of the span. The center of gravity of the movable span is located over the bearing. The bearing supports the entire weight of the movable span and also keeps the span in proper location. Balance wheels are provided on the center-bearing swing span to prevent the span from tipping out of plane during operation. When compared to the rim-bearing type, which distributes the load over a drum, rollers, and track, the center-bearing span requires a smaller central pier. This allows for a wider and more navigable stream channel, which made it the more popular choice for smaller bayous, such as Bayou Teche.[16]

Swing-span bridges were commonly used nationally from the 1890s to the 1920s, after which they were gradually supplanted by bascule and vertical lift bridges for many applications. Although the type fell out of favor nationally, swing spans continued to be constructed in Louisiana as they were less expensive and easier to construct than the alternative bascule or vertical lift spans. The restrictive element for a swing-span bridge is the unavoidable center pier, which remains an obstruction to navigation in the waterway when the span is open. Additionally, the swinging span requires a large circle of clear space in which to operate, limiting its applicability in congested urban waterway locations.

There are 17 extant swing-span pony truss bridges in Louisiana. The earliest was constructed in 1916 and the latest was constructed in 2013. Five of these are located along Bayou Teche. In addition to the Bayou Teche at Charenton Bridge, these spans are located at Iberia (1930), Oaklawn (1941), Jeanerette (1944), and Adeline (1990).[17]

Part II. Structural/Design Information

A. General Statement:

1. **Character:** The Charenton Bridge is a swing-span pony truss bridge and is a representative example of this movable bridge type.

2. **Condition of fabric:** Good.

B. Description: The Charenton Bridge is located within Charenton, in northern St. Mary Parish, Louisiana. The bridge carries LA 324 (locally known as Convent Street) nominally east-west over Bayou Teche and connects with LA 87. The bridge is a Warren with polygonal top chord pony truss swing

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[15] Louisiana Department of Transportation and Development, *Movable Bridge Inspectors Program Workbook*, typescript (Baton Rouge: LADOTD, n.d.): II-11.

[16] Mead & Hunt, Inc., *Historic Context for Louisiana Bridges* (prepared for the Louisiana Department of Transportation and Development, December 2013), 74.

[17] Louisiana Department of Transportation and Development, *Master Structure File Database*.

bridge with I-beam approach spans. Construction on the Charenton Bridge was completed in 1945 as a part of State Project No. 913-04-84. The overall structure length is 350'-0" with a main swing span length of 210'-0". The bridge has an out-to-out width of 26'-0" with a 24'-0" steel, grated deck roadway.

Swing span

The swing span, which conforms with LHC standard plan S-S-55, titled "204'-0" Swing Span" (1941), is comprised of a steel, riveted, Warren pony truss with a polygonal top chord. The depth of the truss web gradually decreases from 15'-0" at the center to 10'-0" at the ends. The verticals, diagonals, and top and bottom chords are composed of rolled I-beam sections connected with riveted gusset plates. Three plate beam hangars extend below the center of the bottom chord: two connect the truss to pivot framework beneath the truss and the third, a large plate, connects with a live load shoe on the central pivot pier. A rub rail extends the length of the truss and is comprised of two horizontal channels mounted on I-beam posts on the inside of the spans. The rail continues on the approach spans and is mounted on brackets that are riveted to the approach span steel stringers. A ladder mounted on the north side of the truss provides access from the bridge deck to the turning mechanism and the top of the pivot pier.

The bridge has a 24'-0"-wide grated deck with a 1'-0" metal curb to either side. The deck is supported by rolled I-beam stringers that are riveted to I-beam floorbeams. Bottom laterals are comprised of angle sections connected at the center by gusset plates. The swing span is supported by three piers: a central pivot pier, discussed below with the turning mechanism, and two "rest piers." The rest piers support the swing span ends in the closed position and are composed of battered timber pilings with timber cross bracing and a reinforced-concrete cap.

Turning mechanism

In order to open the bridge for navigation on the bayou, the swing span rotates on a center-bearing turning mechanism that is set on the pivot pier. Cast-steel bearings serve as the pivot point. The turning mechanism is mounted within a structure of rolled I-beams, one of which has a variable depth, framed between the truss girders and rolled floorbeams. Four balance wheels ride on a circular steel track mounted on the top of the concrete pivot pier to keep the span in a level plane as it rotates open and closed.

When the swing span is in the closed position, a steel wedge affixed to each end of the swing span is driven into a wedge seat on each rest pier. The wedge seats provide vertical stability for the bridge. Lateral stability is created using a vertical latch pin, located at the center of each end of the truss, which is extended into a latch pocket centered on each rest pier. The power to open the bridge and engage the wedges is provided by electric motors located above the pivot pier and beneath the deck and connected to the operator's house. Details for the turning mechanism and wedge seats are included in the standard plan for the swing span.

The pivot pier, centered beneath the swing span, consists of a grid of battered timber pilings located at the side of the bayou's navigation channel. The pilings are driven to the bedrock; a poured concrete slab secures them at the river bed. A concrete cap forms the top of the pivot pier.

Approach spans
There are five rolled, I-beam approach spans on the Charenton Bridge, one to the east of the swing span and four to the west. The approach spans are based on LHC Standard Plan S-C-51 titled, “19'-31' I-Bm. Spans – 24' Roadway” (1941). Individual span lengths are undetermined as the bridge’s plans are illegible; however, the overall length of the approach spans is 140'-0". The steel rub rail extends from the swing span through the approach spans. This rail is supported by steel posts comprised of angles mounted on each span’s fascia I-beams. A guardrail is mounted to the ends of the approach spans.

The approach spans are supported on a series of six bents (numbered 1 through 6). One bent is located to the west of the swing span and the remaining five to the east. The bents are comprised of treated timber piles that are strengthened using sway bracing and are capped with concrete. Two stepped concrete endposts are located atop the end bents and are inscribed with “1945” and “Bayou Teche.”

Operator’s house
The one-story frame operator’s house is located between pier 3 and bent 2 on the southeast side of the bridge adjacent to the swing span. It is supported by four treated timber pilings that replaced the original pilings prior to 2013.[18] The operator’s house is based on LHC Standard Plan T-M-18, titled “Standard Bridge Operators House” (1941). The basic form and window and door locations match the standard plan; however, other details do not, including the roof, siding, and windows. The house has vertical wood siding and features a hip roof with wide eaves and replacement metal cladding. Windows are located on each elevation and are original, horizontally divided sash with metal storms. A multi-panel door is located on the north elevation. The operator’s house contains the controls to operate the swing span.

Fender system
A timber fender system extends upstream and downstream from the swing span to guide marine traffic through the navigation channel. The fender system is comprised of horizontally laid timber planking bolted to treated timber pilings. The fender section extends approximately 115'-0" from each side of the pivot pier.

Traffic control devices
Electrically operated traffic gates are paired on either side of the approach spans to control vehicular access when the bridge is in its open position. A more modern and larger traffic control arm is located between the traffic gates and each end of the swing span. The arm extends across the bridge deck, locking into a steel receiving unit on the opposite side of the deck when in the closed position. Both the arm and the receiving unit are mounted on cantilevered steel platforms surrounded by pipe railings.

C. Site Information: The Charenton Bridge spans the Bayou Teche in Charenton, St. Mary Parish, Louisiana. The city of Charenton is located to the west of the bridge and scattered residential development and agricultural fields are located to the east. Though formally within the city limits, the bridge is on the edge of town.

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[18] *Bridge Inspection Report* (Recall No. 009130, December 8, 2013), Available in Bridge Maintenance and Inspection Division, Louisiana Department of Transportation and Development, Baton Rouge, La.

Part III. Sources of Information

A. Primary Sources:

Coastal Environments, Inc. "Determination of Eligibility for the Bayou Teche Bridge (Oaklawn), LA 323, St. Mary Parish, Louisiana," 2012.

Gresham, Matt. "Hurricanes in Louisiana: The Last 100 Years." *The Courier*, June 2, 2002. http://www.houmatoday.com/news/20020602/hurricanes-in-louisiana-the-last-100-years.

"Hearing Called on Bridge Plans." *Times-Picayune*, November 22, 1940.

Johnson David C. and Elaine G. Yodis. *Geography of Louisiana*. New York: McGraw Hill, 1998.

Louisiana Department of Highways. *Eleventh Biennial Report of the Louisiana Highway Commission*. Baton Rouge, La.: Louisiana Highway Commission, 1942.

Louisiana Department of Transportation and Development. *Master Structure File Database*.

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B. Secondary Sources:

Bridge Inspection Report. Recall No. 009130, December 8, 2013. Available in Bridge Maintenance and Inspection Division, Louisiana Department of Transportation and Development, Baton Rouge, La.

Mead & Hunt, Inc. *Crossing the Bayou: Louisiana's Historic Bridges*. Prepared for the Louisiana Department of Transportation and Development, 2015.

Mead & Hunt, Inc. *Historic Context for Louisiana Bridges*. Prepared for the Louisiana Department of Transportation and Development, December 2013.

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(Bridge Recall No. 009130)
Carries Louisiana Highway 324 (LA 324) over Bayou Teche
Charenton
St. Mary Parish
Louisiana

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Dietrich G. Floeter, photographer, February and March 2016
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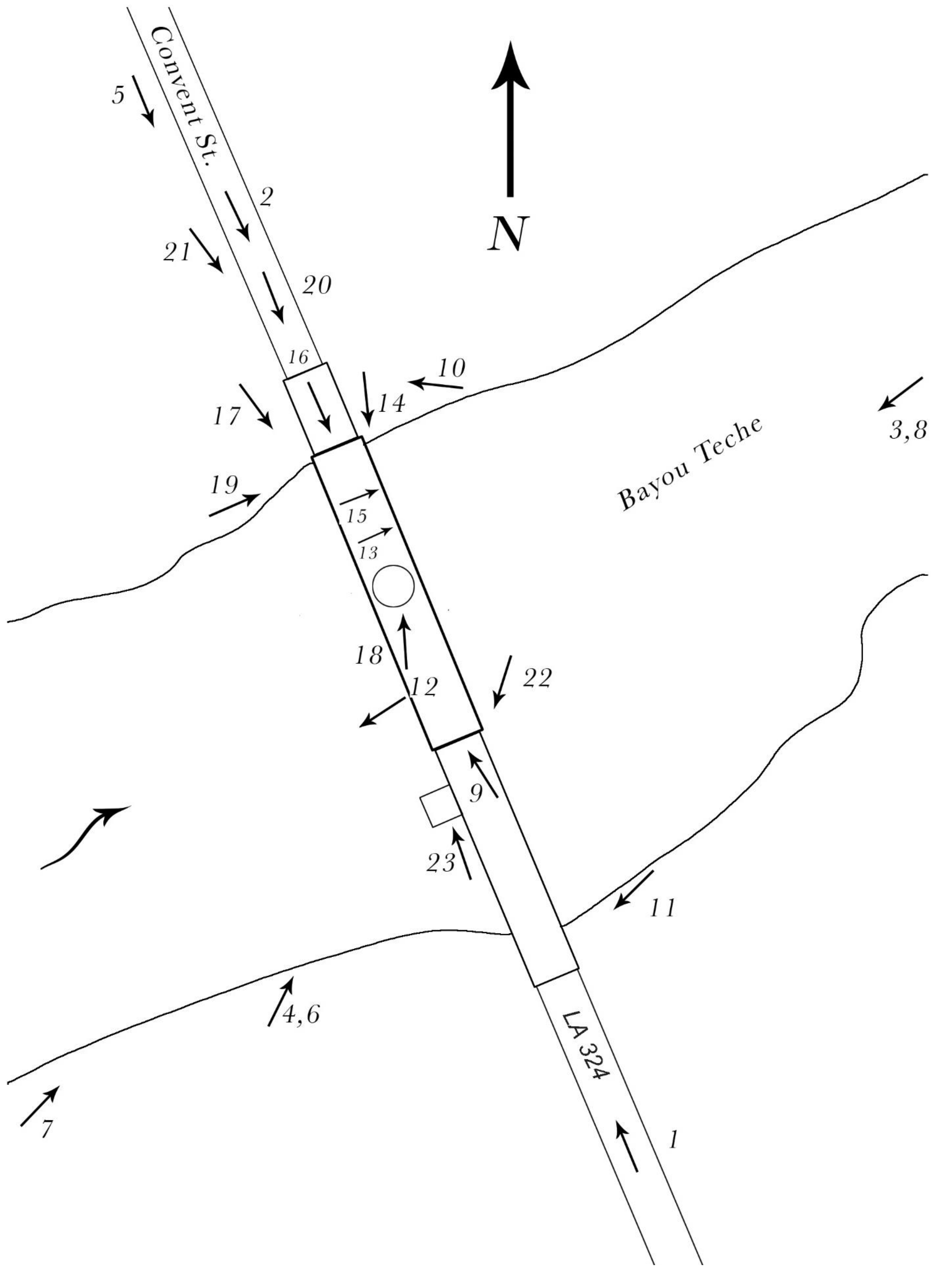
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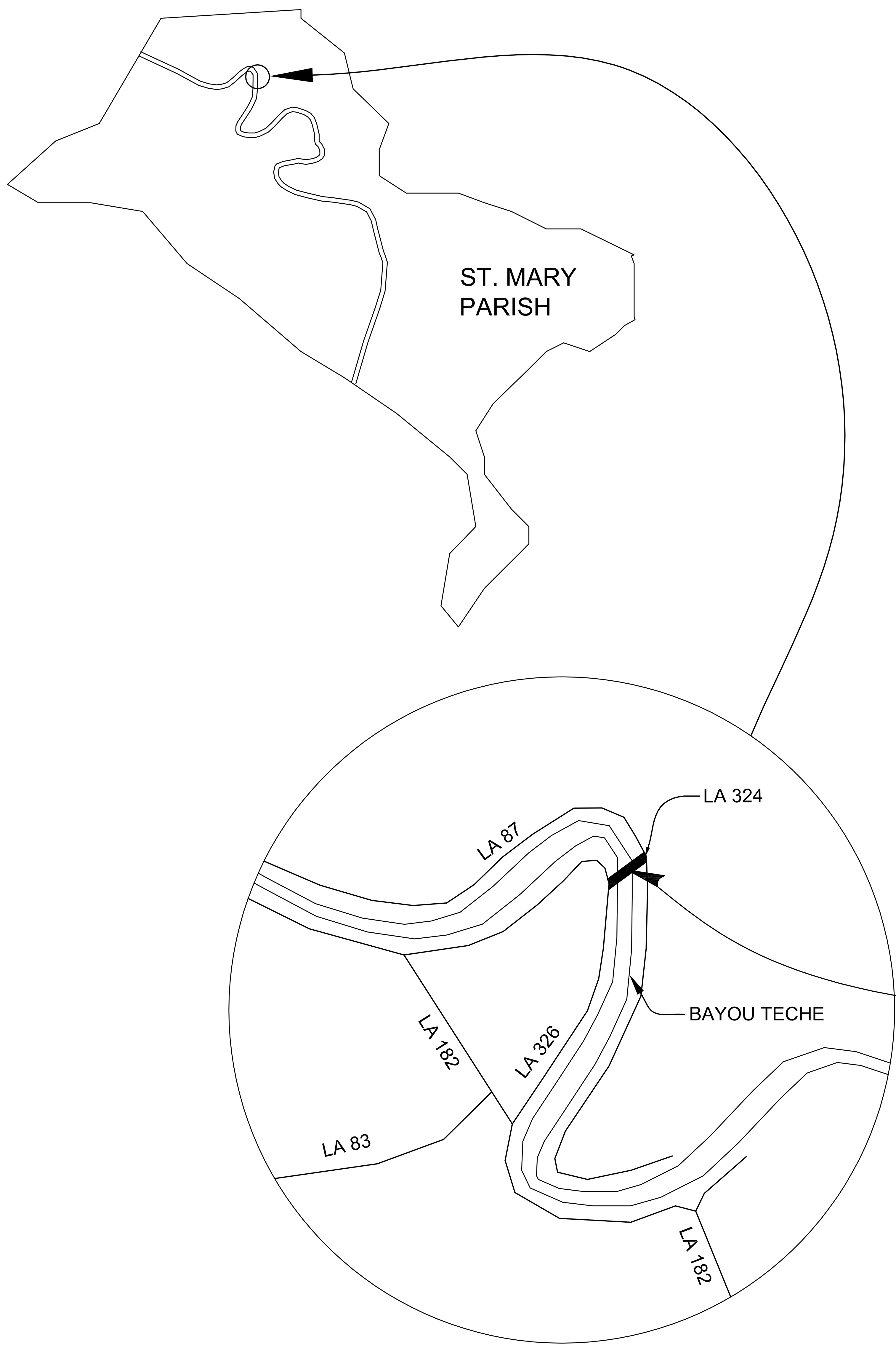
BAYOU TECHE AT CHARENTON BRIDGE

The Bayou Teche at Charenton Bridge (Bridge Recall No. 009130), designed by the Louisiana Highway Commission and constructed in 1935, is a Warren pony truss swing bridge significant as an example of a movable swing bridge. Its significance is demonstrated by the presence of distinctive engineering and design features, which is characterized by the polygonal Warren truss configuration, center-bearing turning mechanism, pivot pier, and operator's house. This bridge was determined eligible for listing in the National Register of Historic Places in 2013 under Criterion C: Design/Engineering at the state level of significance.

This documentation was prepared to fulfill Stipulation IX.5 of 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, dated August 18, 2015 and executed September 21, 2015. The Louisiana Department of Transportation and Development (LADOTD) retained Mead & Hunt to prepare this document. It was prepared by Emily Pettis and Katherine Haun Schuring, Senior Cultural Resource Specialists, of Mead & Hunt, Stephen V. Estopinal, P.E., P.L.S. and Trenton Iglehart, Geodetic Analyst, of SJB Group, LLC. Dietrich Floeter completed the photography.

These measured drawings were prepared based on a site visit to complete laser scanning of the bridge, with selective hand measuring in the field to verify measurements.



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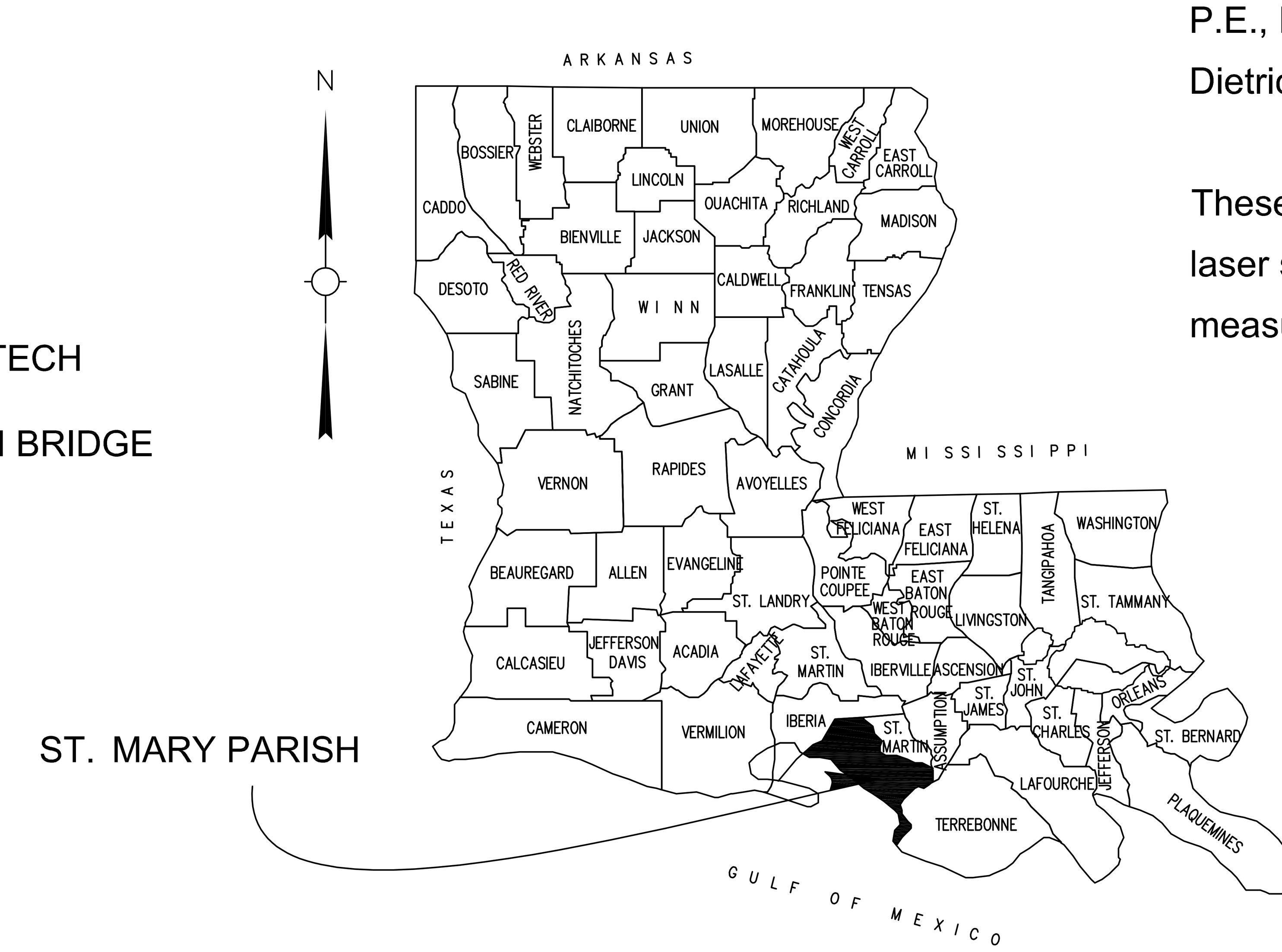

LOUISIANA

DELINEATED BY: T. IGLEHART, SJB GROUP, LLC., 2017

LOUISIANA HISTORIC BRIDGE INVENTORY
NATIONAL PARK SERVICE
UNITED STATES DEPARTMENT OF THE INTERIOR

CHARENTON

BAYOU TECHE AT CHARENTON BRIDGE
CARRIES LOUISIANA HIGHWAY 324 (LA 324) OVER BAYOU TECHE
ST. MARY PARISH

LOUISIANA

SHEET
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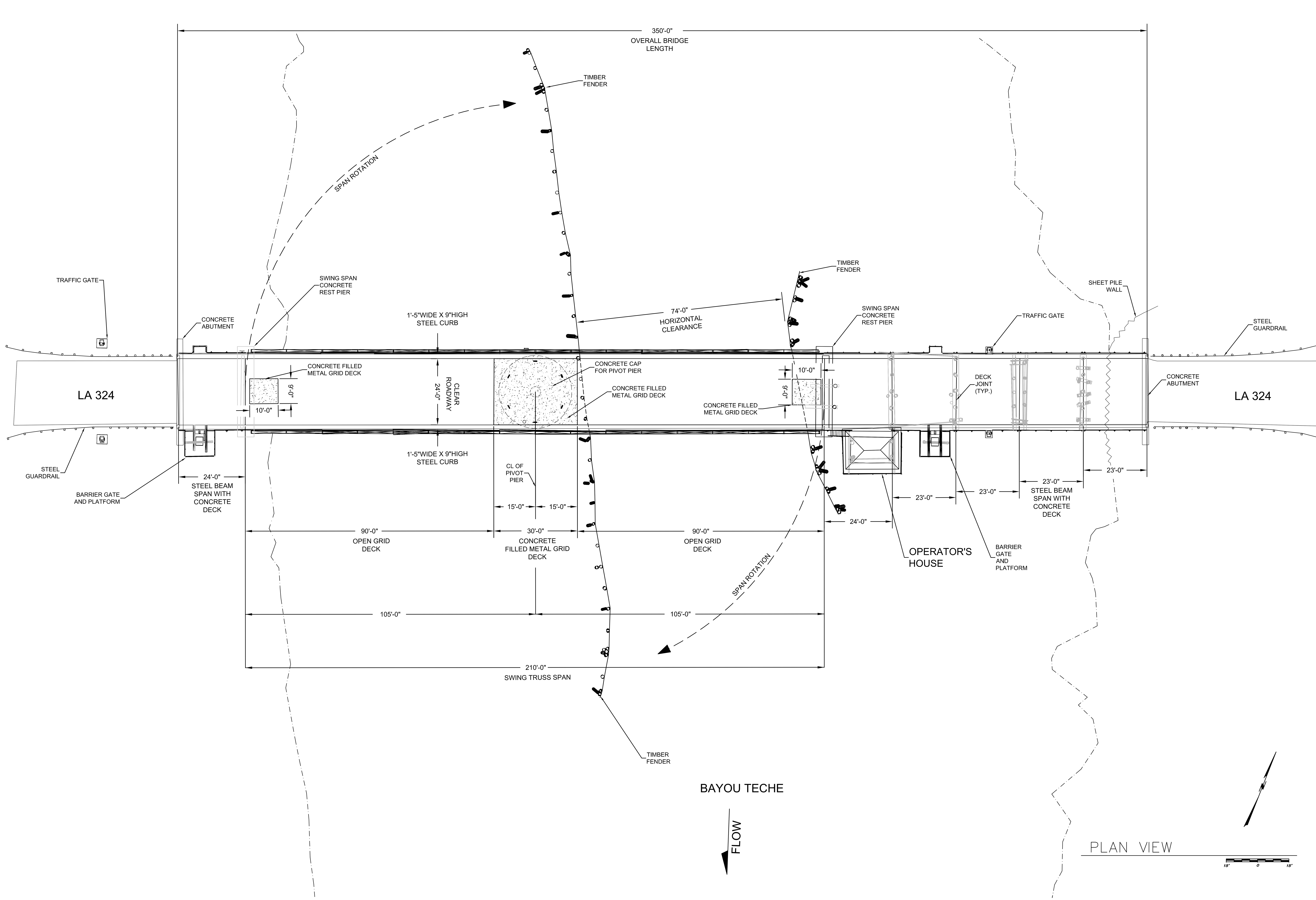

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LOUISIANA HISTORIC BRIDGE INVENTORY
NATIONAL PARK SERVICE
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BAYOU TECHE AT CHARENTON BRIDGE
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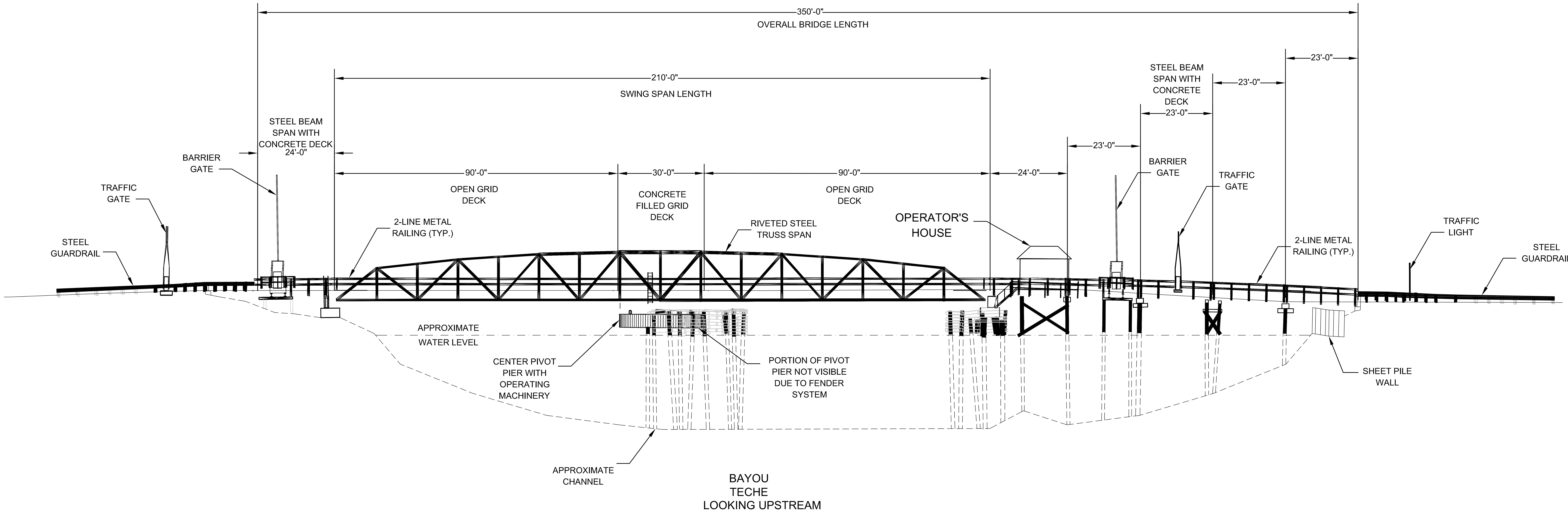


PROFILE VIEW

DELINEATED BY: T. IGLEHART, SJB GROUP, LLC., 2017

LOUISIANA HISTORIC BRIDGE INVENTORY
NATIONAL PARK SERVICE
UNITED STATES DEPARTMENT OF THE INTERIOR

CHARENTON

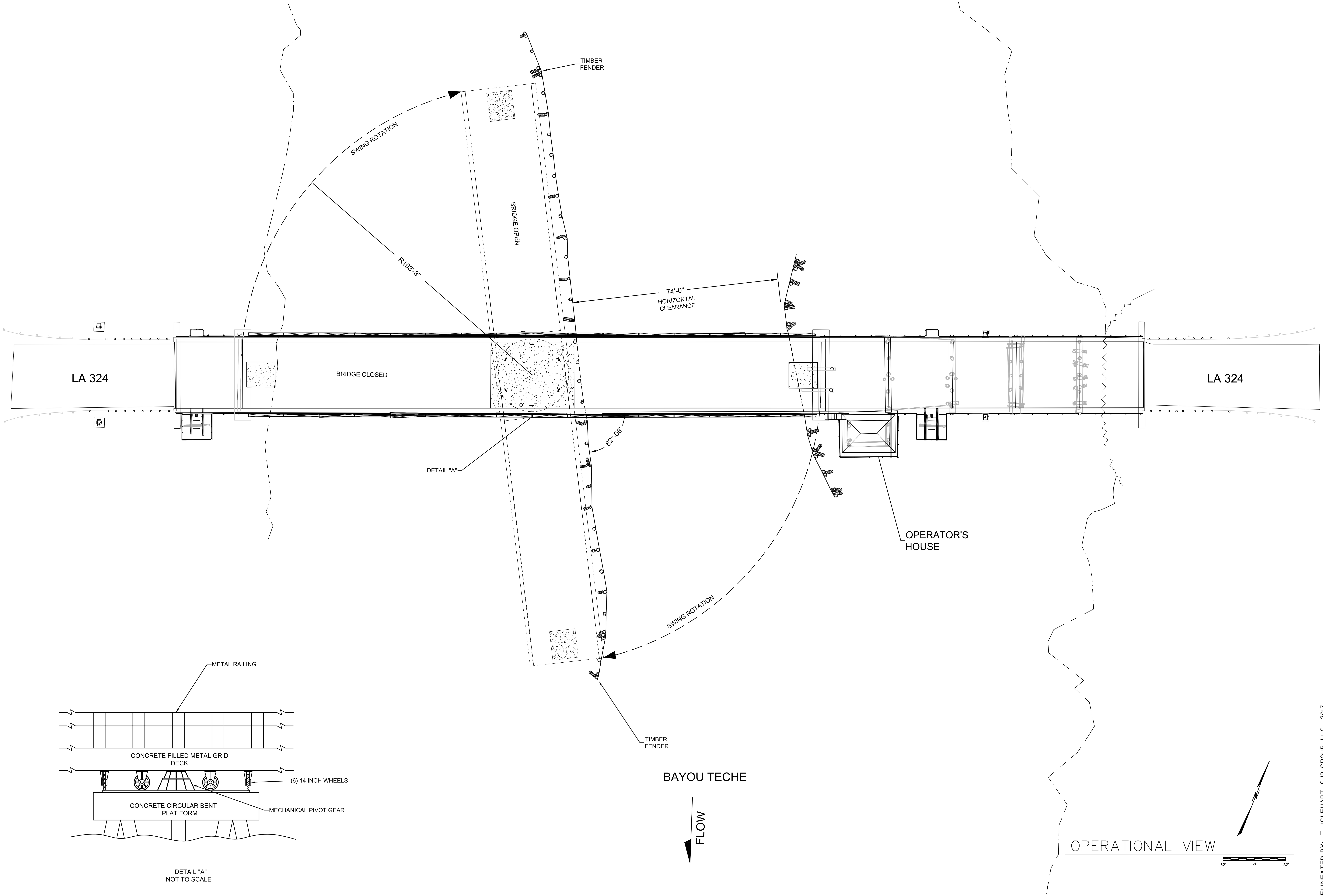
BAYOU TECHE AT CHARENTON BRIDGE
CARRIES LOUISIANA HIGHWAY 324(LA 324) OVER BAYOU TECHE
ST. MARY PARISH

LOUISIANA

SHEET 3 OF 4

HISTORIC AMERICAN ENGINEERING RECORD
LA-37

LIBRARY OF CONGRESS INDEX NUMBER



DELINEATED BY: T. IGLEHART, SJB GROUP, LLC., 2017

LOUISIANA HISTORIC BRIDGE INVENTORY
NATIONAL PARK SERVICE
UNITED STATES DEPARTMENT OF THE INTERIOR

CHARENTON

BAYOU TECHE AT CHARENTON BRIDGE
CARRIES LOUISIANA HIGHWAY 324(LA 324) OVER BAYOU TECHE
ST. MARY PARISH

LOUISIANA

SHEET 4 OF 4

HISTORIC AMERICAN ENGINEERING RECORD
LA-37

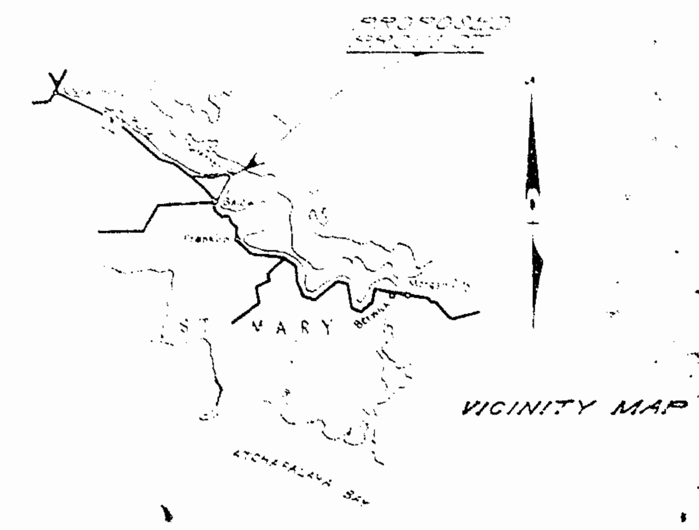
LIBRARY OF CONGRESS INDEX NUMBER

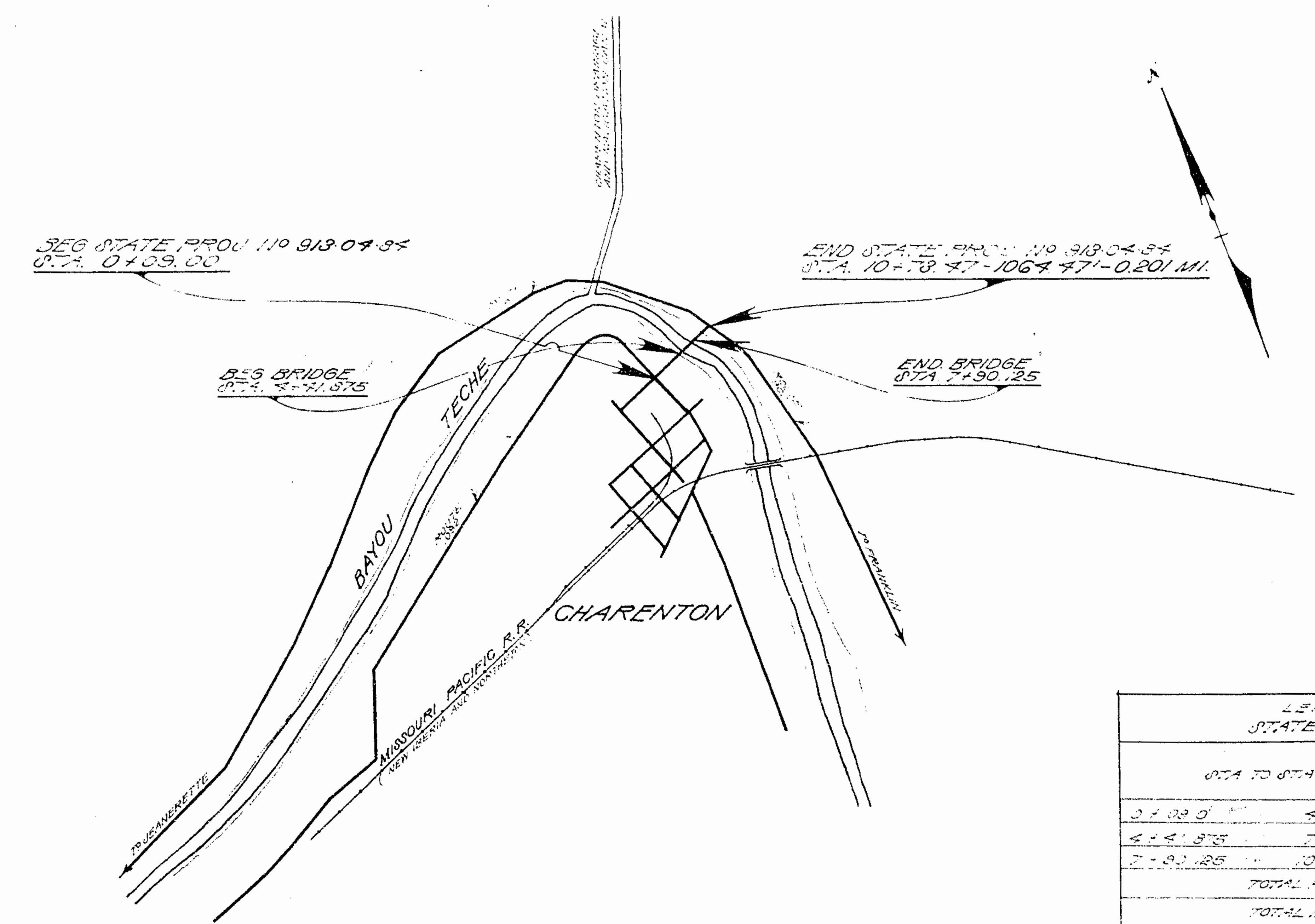
106

INDEX TO SHEETS

STATE OF LOUISIANA
DEPARTMENT OF HIGHWAYS
PLAN AND PROFILE OF PROPOSED
STATE HIGHWAY

CHARENTON BRIDGE
OVER BAYOU TECHE
CONNECTING
STATE ROUTE 1092 TO STATE ROUTE 902
AT CHARENTON
ST MARY PARISH
STATE PROJECT Nº 913-04-84
STATE ROUTE 129





FIELD BOOK 19-125

CONVENTIONAL SIGNS

Base Line
Grade Line
Ground Line
Right of Way
Traveled Roadway
Fences
Levees
Canals
Railroads
Property Lines
Section & Grant Lines
Township & Range Lines
Ward & Road Dist. Boundary Lines
Parish & State Boundary Lines
Telephone & Telegraph Lines
Boundary Lines (General)
Mile Posts-at end of mile

SURVEYED BY	
PLOTTED	
TRACED	
CHECKED	

LAYOUT MAP

SCALE: 1 INCH = 1320 FEET

LENGTH OF STATE PROJECT 913-04-84		
STA. TO STA.	ROADWAY FEET	BRIDGE FEET
0+09.0 — 4+41.875	432.875	
4+41.875 — 7+90.125		348.25
7+90.125 — 10+73.47	283.345	
TOTAL FEET	716.220	348.25
TOTAL MILES	0.135	0.066
GROSS LENGTH STATE PROJECT 913-04-84 1064.47 FEET = 0.201 MI.		

SCHEDULE OF REVISIONS

DATE	BY	DATE	BY

APPROVED
State Highway Engineer 6-25-41

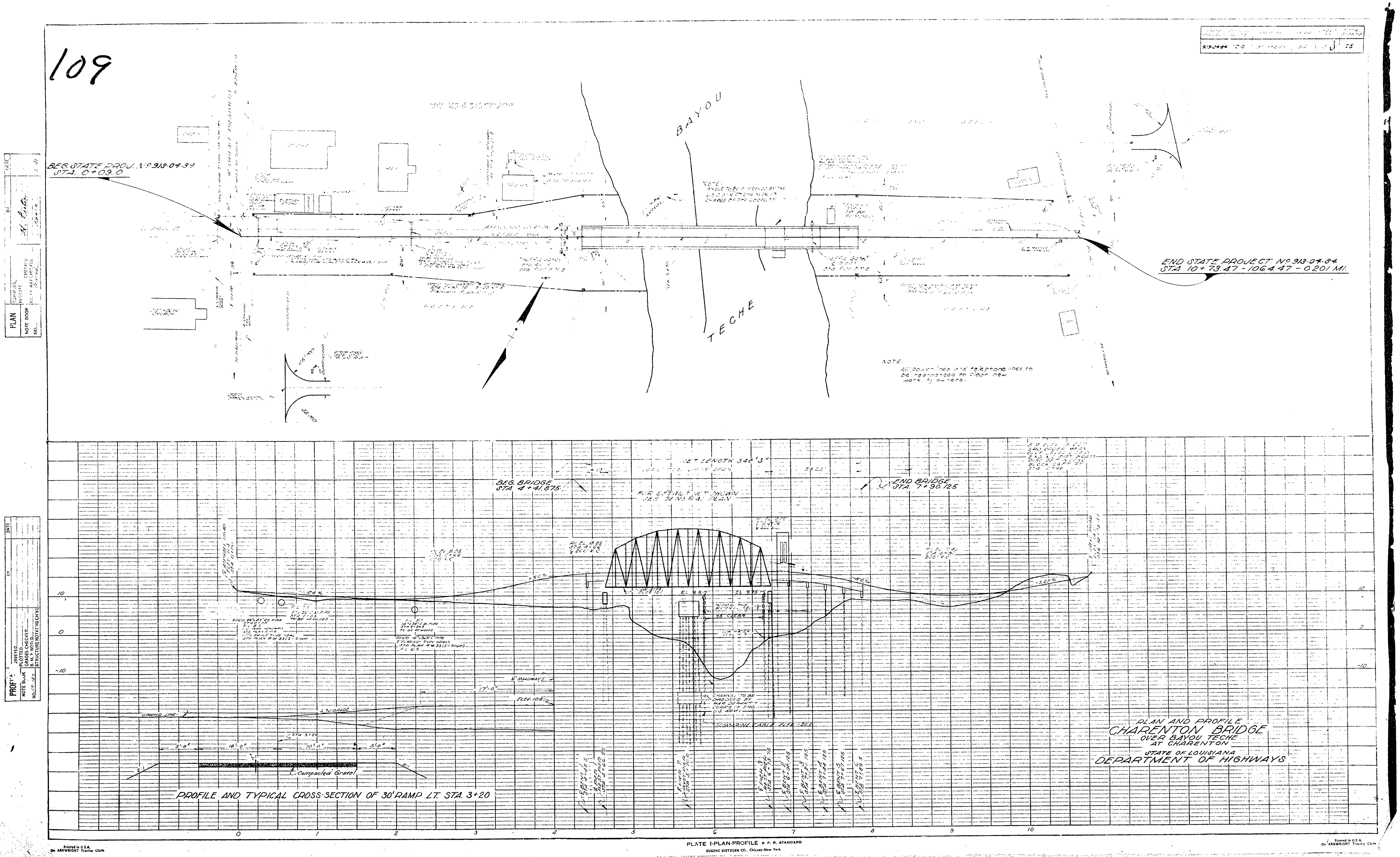
APPROVED
[redacted]

RECOMMENDED FOR APPROVAL
[redacted]
District Engineer, 4th Federal Aid District

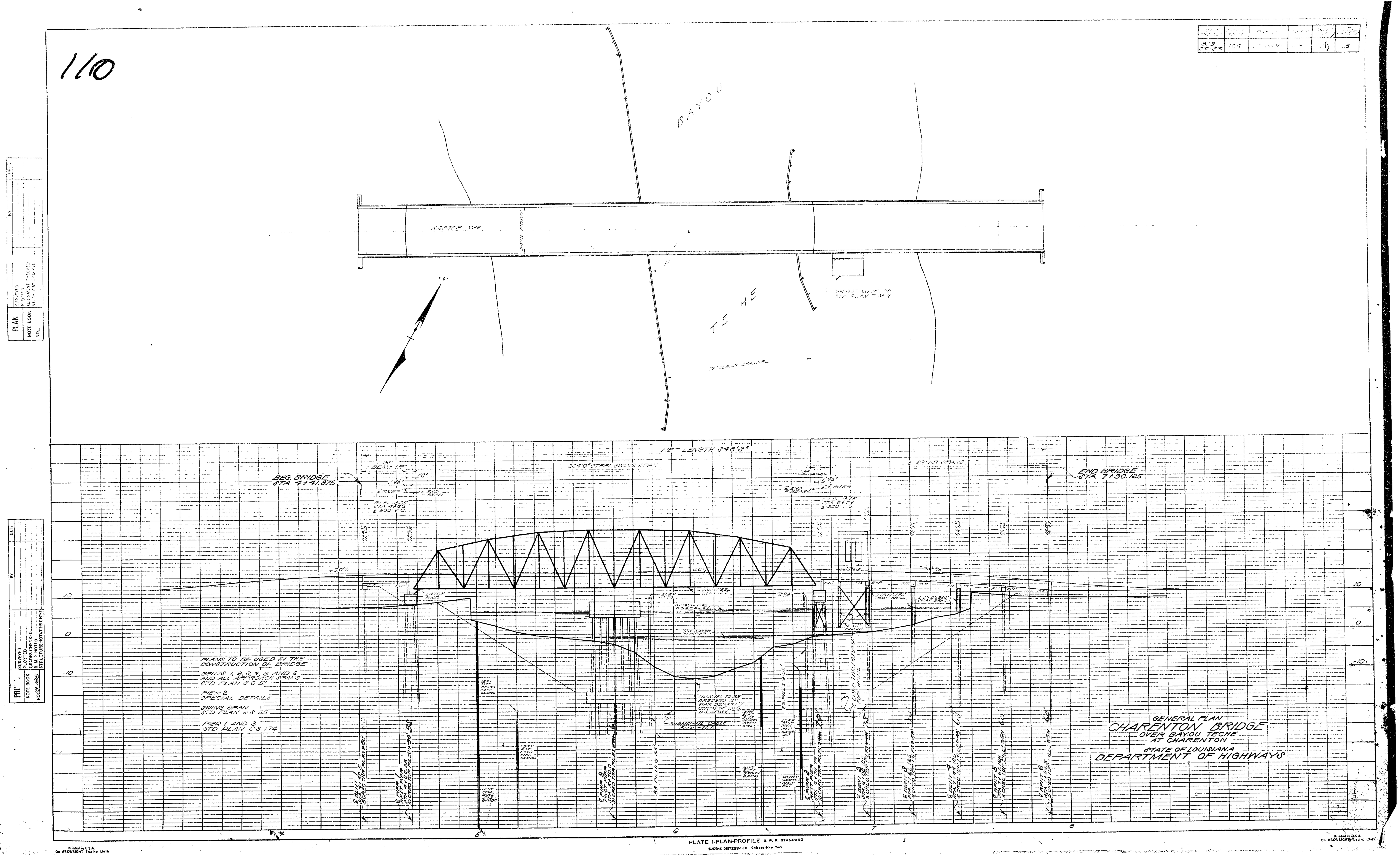
RECOMMENDED FOR APPROVAL
[redacted]
Chief Engineer Bureau of Public Roads

APPROVED
[redacted]
Director Bureau of Public Roads

AS BUILT PLANS

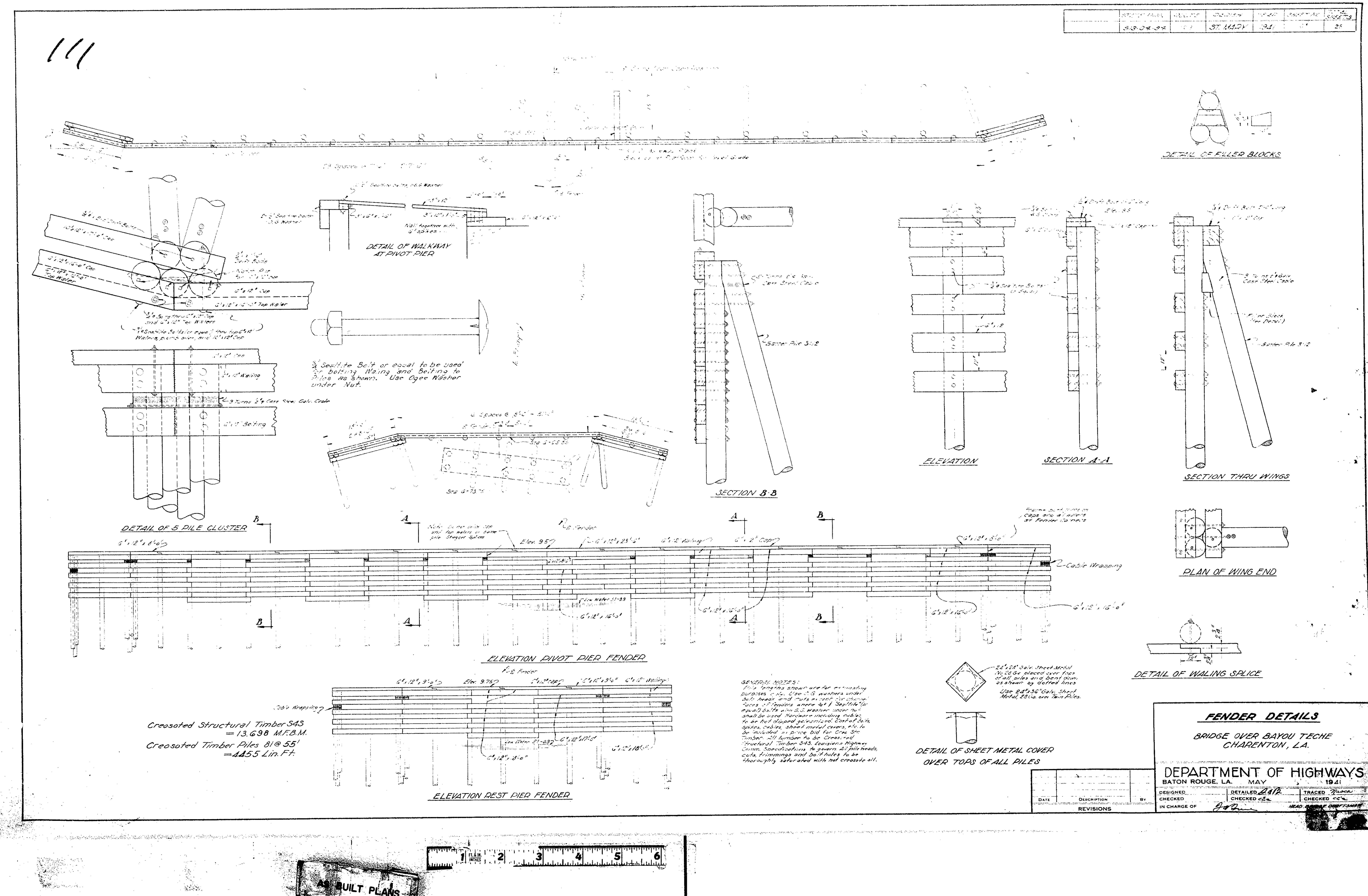


AS BUILT PLANS



AS BUILT PLANS

HAER No. LA-37



111
DETAIL OF FILLER BLOCKS
DETAIL OF WALKWAY AT PIVOT PIER
¾" Sealtite Bolt or equal to be used for bolting Waling and Belting to Piles as shown. Use Ogee Washer under Nut.
SECTION B-B
ELEVATION
SECTION A-A
SECTION THRU WINGS
DETAIL OF 5 PILE CLUSTER
PLAN OF WING END
ELEVATION PIVOT PIER FENDER
DETAIL OF WALING SPLICE
Creosoted Structural Timber S4S = 13,698 M.F.B.M.
Creosoted Timber Piles 81 @ 55' = 4455 Lin. Ft.
ELEVATION REST PIER FENDER
GENERAL NOTES:
Pile lengths shown are for estimating purposes only. Use O.G. washers under bolt heads and nuts except for channel faces of fenders where ¾" ɸ "Sealtite" (or equal) bolts with G.G. washer under nut shall be used. Hardware including cables to be hot dipped galvanized. Cost of bolts, spikes, cables, sheet metal covers, etc. to be included in price bid for Creo. Str. Timber. All lumber to be Creosoted Structural Timber S4S. Louisiana Highway Comm. Specifications to govern. All pile heads, cuts, trimmings and bolt holes to be thoroughly saturated with hot creosote oil.
DETAIL OF SHEET METAL COVER OVER TOPS OF ALL PILES
REVISIONS
FENDER DETAILS
BRIDGE OVER BAYOU TECHE
CHARENTON, LA.
DEPARTMENT OF HIGHWAYS
BATON ROUGE, LA. MAY 1941
DESIGNED
DETAILED
TRACED
CHECKED
IN CHARGE OF
HEAD DRAFTSMAN
AS BUILT PLANS

State Project	Route	Parish	Year	Sheet No.	Total Sheets
93-04-84	129	St. Mary	1941	7	25

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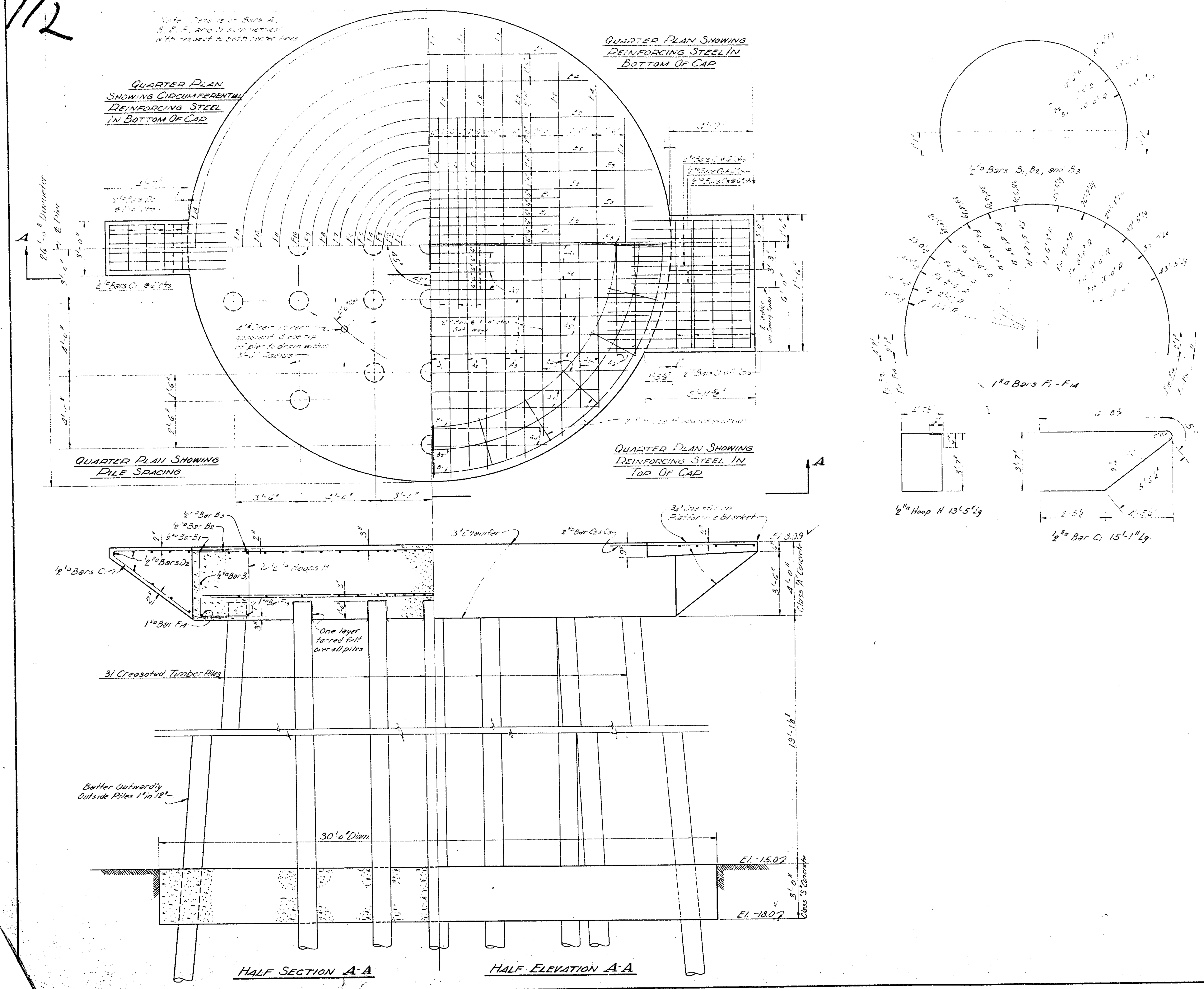

Bill Of Reinforcing Steel And Estimate Of Quantities

Mark	No.	Size	Unit Length	Total Length	Location
A1	6	1/2"	25'-6"	153'-0"	Top of Cap - Straight
A2	[illegible]		[illegible]	96'-0"	"
A3	[illegible]		[illegible]	[illegible]	"
A4	8		[illegible]	[illegible]	
A5	8		18'-0"	[illegible]	
A6	8		12'-0"	[illegible]	
A7	12		7'-0"	84'-0"	"
B1	[illegible]		41'-5"	165'-8"	Top & side of cap - Bent
B2	2		37'-6"	75'-0"	Top of cap
B3	2		33'-7"	67'-[illegible]	"
C1	12		[illegible]	[illegible]	Bracket - Bent
C2	2		6'-6"	13'-0"	Platform - Straight
C3	7		7'-9"	54'-3"	"
D1	5		7'-0"	35'-0"	Top of Bracket & Platform - Straight
D2	13		2'-8"	34'-8"	Top & Bottom of Bracket
H	24		13'-5"	322'-0"	Hoops in Cap - Bent
Total 1/2" Reinforcing Steel 1980'-9" @ 0.85 = 1684 Pounds					
E1	16	1"	[illegible]	[illegible]	Bottom of Cap - Straight
E2	16		20'-0"	320'-0"	"
E3	10		24'-0"	240'-0"	"
E4	4		17'-6"	70'-0"	"
F1	1		13'-7"	13'-7"	Bent
F2	1		16'-9"	16'-9"	"
F3	1		19'-11"	19'-11"	"
F4	1		23'-0"	23'-0"	"
F5	1		26'-2"	26'-2"	"
F6	1		29'-4"	29'-4"	"
F7	1		34'-0"	34'-0"	"
F8	1		38'-9"	38'-9"	"
F9	1		43'-5"	43'-5"	"
F10	2		26'-2"	52'-4"	"
F11	2		29'-4"	58'-8"	"
F12	2		32'-5"	64'-10"	"
F13	2		35'-7"	71'-2"	"
F14	2		43'-5"	86'-10"	"
Total 1" Reinforcing Steel 1432'-9" @ 3.4 = 4871 Pounds					

Total Reinforcing Steel = 6555 Pounds
Total Class "A" Concrete = 80.54 Cu. Yds.
Total Class "S" Concrete = 75.83 Cu. Yds.
Structural Excavation = ~~78.54~~ Cu. Yds. 83.[illegible]

Pile Loading DL+LL - 13.5 Tons

GENERAL NOTES:
Specifications - Louisiana Highway Commission, March, 1940.
Dimensions to Reinforcing Steel are to bar centers.
Cost of tar paper to be included in price bid for other items.
All exposed surfaces to have a "Rubbed" finish.

CENTER PIVOT PIER

CHARENTON BRIDGE
OVER BAYOU TECHE

DEPARTMENT OF HIGHWAYS
BATON ROUGE, LA.
April 1941

Date	Description	By
	REVISIONS	

Designed [illegible] · Detailed [illegible] · Traced [illegible]
Checked [illegible] · Checked [illegible] · Checked [illegible]
In Charge Of [illegible] · Head Bridge Draftsman

AS BUILT PLANS

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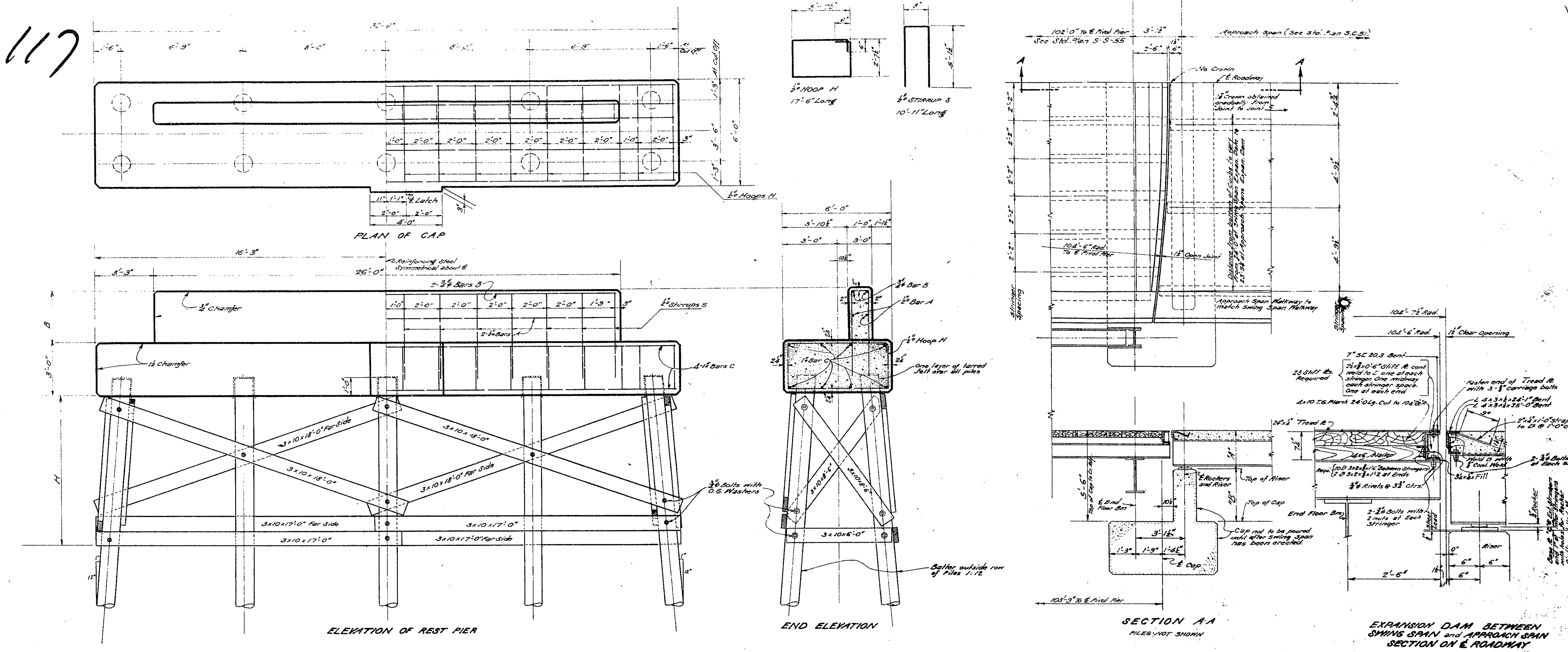

GENERAL NOTES:

Specifications: Louisiana Highway Comm., March 1940.
Dimensions to reinforcing steel are to bar centers.
All exposed surfaces to have a "Rubbed Finish.
Cost of tarred felt to be included in price bid for other items.

DIMENSIONS and QUANTITIES				
Span	Dim A	Dim. B	Dim. C	Class A Concrete
19'	1'-11⅞	3'-6⅝	1⅛"	24.80
21'	1'-11½	3'-6½	1¼"	24.79
23'	1'-11⅝	3'-6⅜	1¼"	24.78
25'	2'-1⅜	3'-4⅝	1⅛"	24.64
27'	2'-1½	3'-4½	1¼"	24.63
29'	2'-1¼	3'-4¾	1"	24.65
31'	2'-4¼	3'-1¾	1"	24.[illegible]

BILL OF REINFORCING STEEL						
Mark	No.	Size	Unit Length	Total Length	Location	
A	2	½"φ	25'-8"	51'-4"	Longitudinal in Riser,	Straight
H	18	"	17'-6"	315'-0"	Hoops in Cap,	Bent
S	14	"	10'-11"	152'-10"	Stirrups in Riser	Bent
Total ½"φ Reinforcing steel 519'-2" @0.85# = 441 Lbs.						
B	2	¾"φ	25'-8"	51'-4"	Long. in Top of Riser,	Straight
Total ¾"φ Reinforcing Steel 51' 4" @1.502# = 77 Lbs.						
C	8	1"φ	32'-2"	257'-4"	Longitudinal in Cap	Straight
Total 1"φ Reinforcing steel 257'-4" @ 3.40# = 875 Lbs.						
Total Reinforcing steel = 1393 Lbs.						

Max. Pile Loading, D.L+L.L. = 13.9 Tons

BILL OF DIAGONAL, and SASH BRACING For H = 7' To 9'				
No.	Size	Unit Length	Total Length	LOCATION
4	3 x 10	18'-0"	72'-0"	Diagonals on Sides
4	3 x 10	17'-0"	68'-0"	Sash on Sides
4	3 x 10	8'-6"	34'-0"	Diagonals on Ends
2	3 x 10	6'-0"	12'-0"	Sash on Ends
Total 3x10 Creo. Timber 186'-0" @2.5 = 465 F.B.M.				

STANDARD PLAN
REST PIER
CONCRETE CAP ON TIMBER PILES
TO BE USED WITH S-S-55 and S-C-51

STATE OF LOUISIANA
DEPARTMENT OF HIGHWAYS
BATON ROUGE, LA. May 3 194[illegible]

DESIGNED	DETAILED	TRACED
CHECKED	CHECKED	CHECKED
IN CHARGE OF		

DATE	DESCRIPTION	BY
9-2-41	Plan No. Changed from C-S-172	[illegible]

REVISIONS

AS BUILT PLANS

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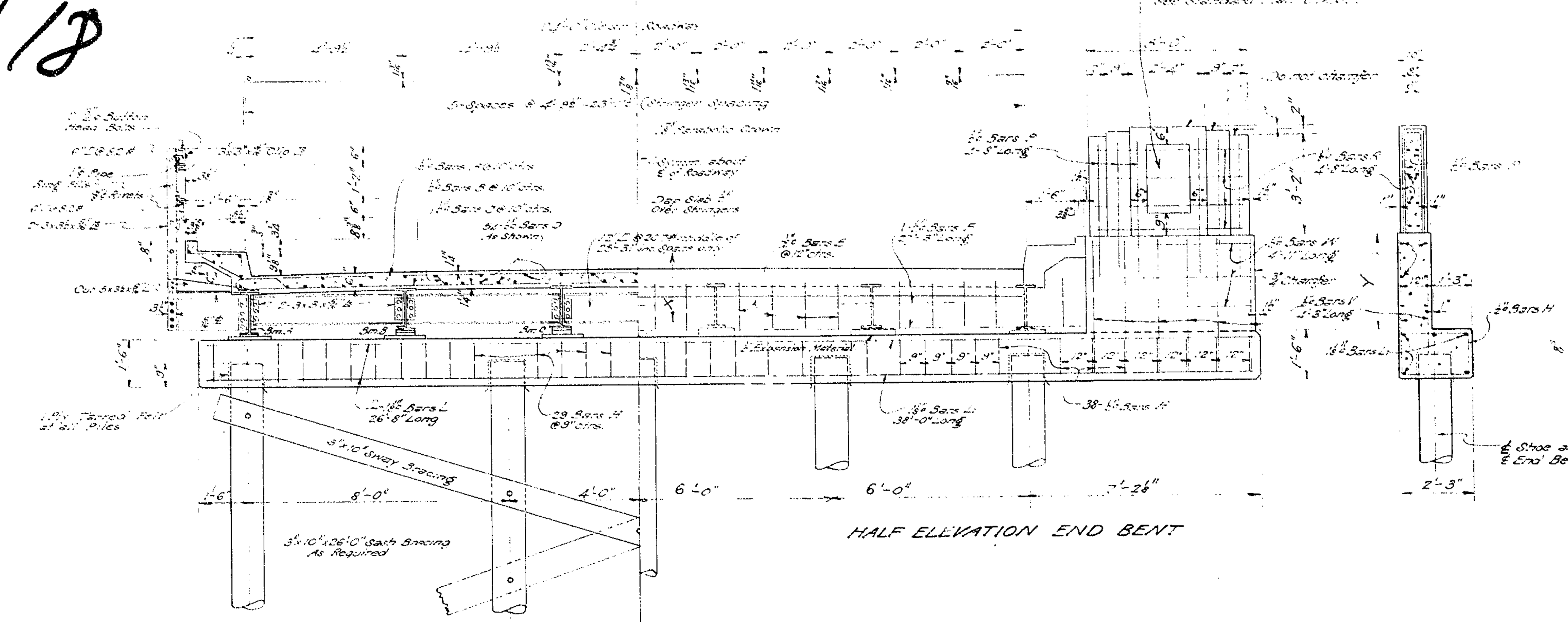
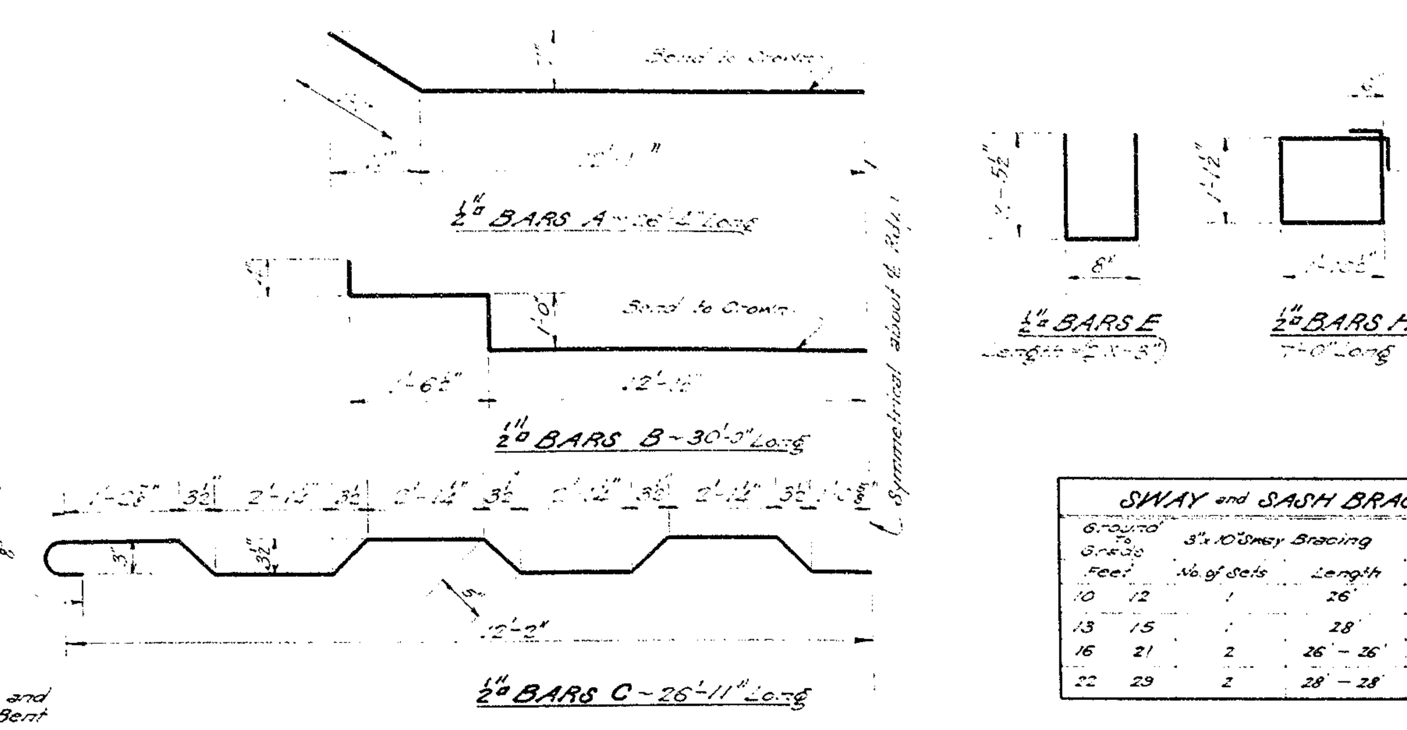


HALF CROSS SECTION SHOWING 4 PILE INTERM. BENT

HALF ELLEVATION END BENT



$\frac{1}{2}$" BARS A

$\frac{1}{2}$" BARS B ~ 30'-5" Long

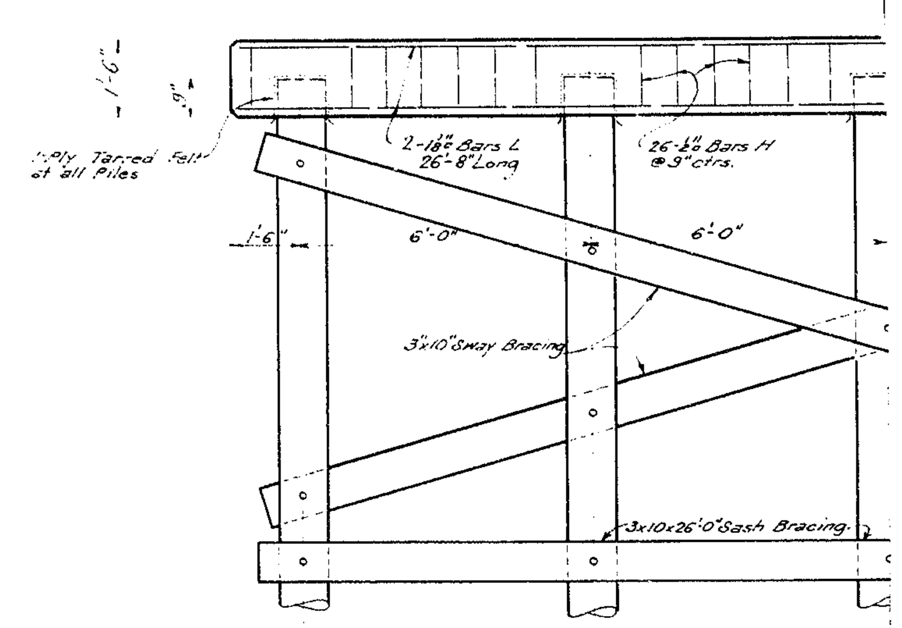
$\frac{1}{2}$" BARS C ~ 26'-11" Long

$\frac{1}{2}$" BARS E

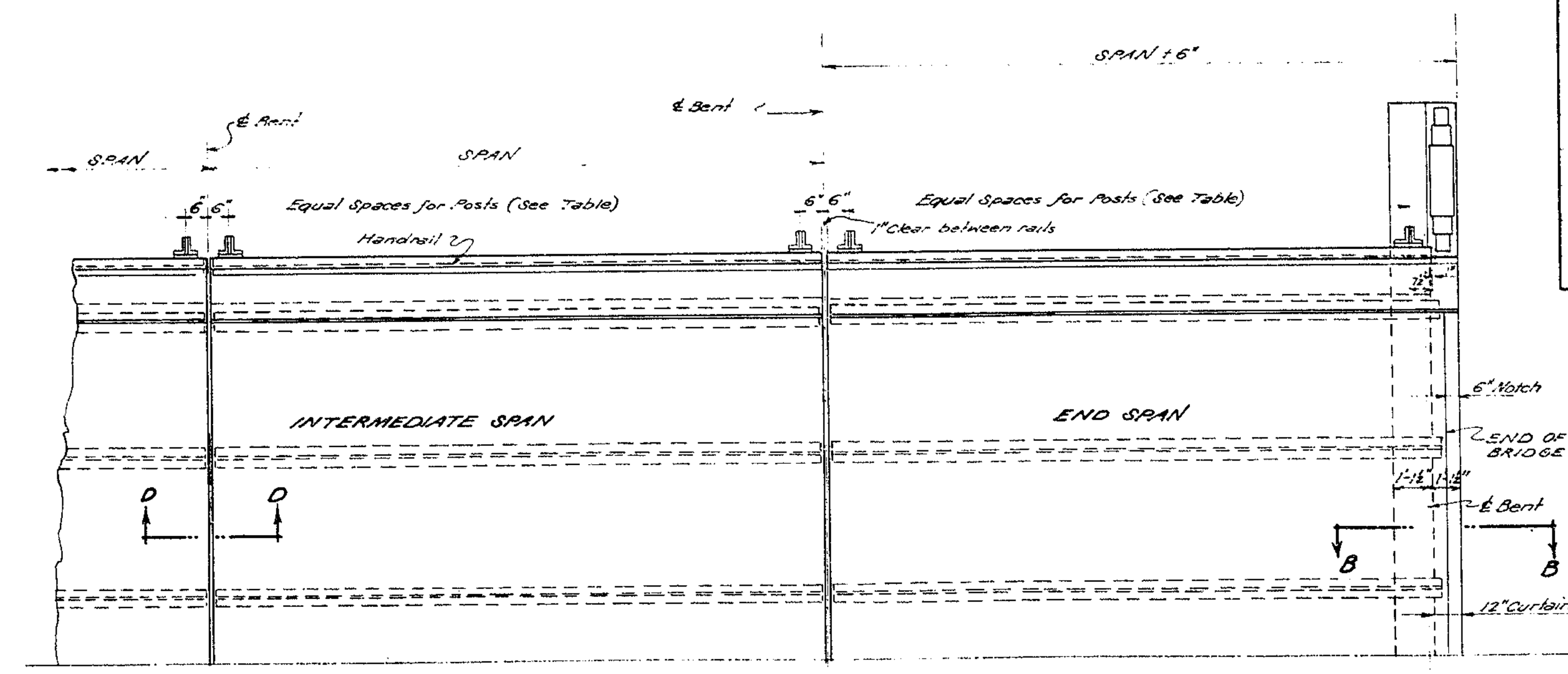
$\frac{1}{2}$" BARS H 7'-0" Long

SWAY and SASH BRACING ~ ONE BENT						
Ground to Grade		3"x10" Sway Bracing		3"x10" Sash Bracing		Creosoted Timber
Feet		No. of Sets	Length	No. of Planks	Length	M.F.B.M.
10	12	1	26'			.130
13	15	1	28'			.140
16	21	2	26' – 26'	2	26'	.390
22	29	2	28' – 28'	2	26'	.410

DIMENSIONS and QUANTITIES																			
SPAN	Handrail Spaces	SIZE OF STRINGERS			DIMENSIONS		END SPAN			INT. SPAN			END BENT		INT. BENT		Number of Piles		LOAD PER PILE	
		BEAM A		BEAM B or C	X	Y	Fab. Carbon Steel	Class A Concrete	Reinfor. Steel	Fab. Carbon Steel	Class A Concrete	Reinf. Steel	Class A Concrete	Reinf. Steel	Class A Concrete	Reinf. Steel	END BENT	INT. BENT	INT. BENT	END BENT
Ft.	No.	Ins.	Lbs.	Ins. Lbs.	Ft. Ins.	Ft. Ins.	Lbs.	Cu. Yds.	Lbs.	Lbs.	Cu. Yds.	Lbs.	Cu. Yds.	Lbs.	Cu. Yds.	Lbs.	No.	No.	Tons	Tons
19	3	16 WF	36	16 WF 40	2-1/8	3-0	7830	11.70	2615	8153	10.16	2454	6.73	1340	3.29	632	5	4	14.2	14.0
21	3	16 WF	36	16 WF 45	2-1/8	3-0	8792	12.78	2875	9098	11.24	2714	6.73	1340	3.29	632	5	4	15.0	14.3
23	4	16 WF	40	16 WF 50	2-1/4	3-0	10356	13.87	3156	10664	12.32	2995	6.73	1340	3.27	614	5	5	12.7	14.7
25	4	18 WF	47	18 WF 50	2-3/8	3-2	12069	15.11	3419	12376	13.30	3252	6.79	1340	3.27	614	5	5	13.3	15.1
27	4	18 WF	47	18 WF 55	2-3/8	3-2	13280	16.18	3652	13590	14.48	3485	6.79	1340	3.27	614	5	5	13.9	15.4
29	4	18 WF	47	18 WF 64	2-3/8	3-2	15093	17.26	3934	15223	15.56	3767	6.79	1340	3.27	614	5	5	14.6	15.8
31	5	21 WF	59	21 WF 59	2-6 1/8	3-5	16312	18.60	4200	16627	16.63	4024	6.89	1340	3.27	614	5	5	15.2	16.3

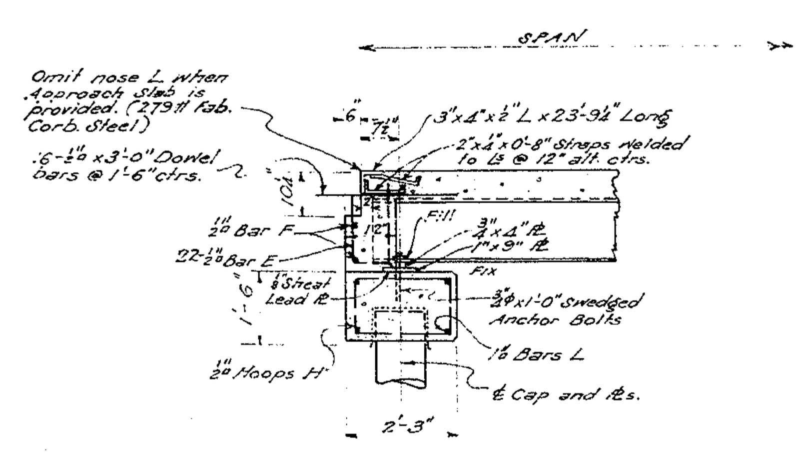


HALF ELEVATION 5 PILE INTERM. BENT

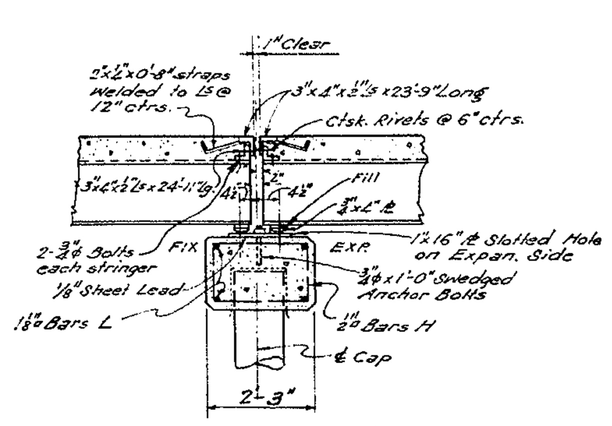


GENERAL NOTES

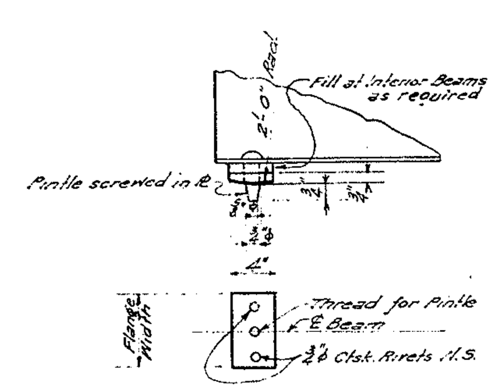
Specifications: Louisiana Highway Commission 1940. Live Load H15. Dead Load Calculated weight of material. All sway and sash bracing to be rough creosoted timber. Exposed corners of spans to have a $\frac{3}{4}$" chamfer unless noted. Exposed corners of bents to have a $1\frac{1}{2}$" chamfer unless noted. Dimensions to reinforcing steel are to bar centers. Rivets to be $\frac{3}{4}$"φ unless noted. All timber bolts to be $\frac{3}{4}$"φ with two ogee washers. Handrail not designed for specified forces. No allowance for future wearing surface. Cost of tarred felt to be included in price bid for other items.



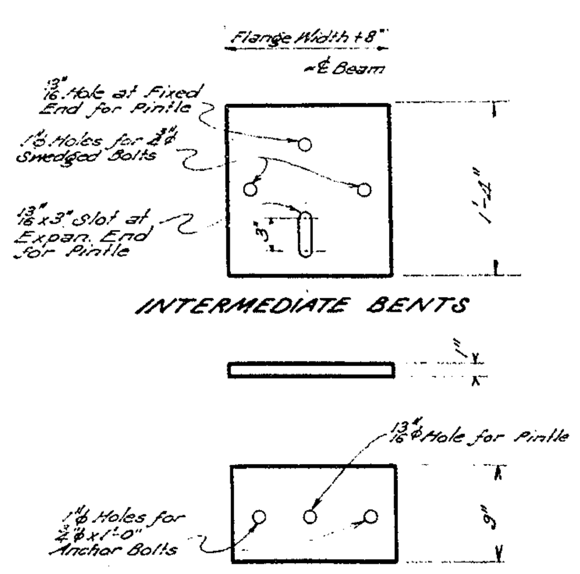
SECTION B-B END BENTS



SECTION D-D INTERMEDIATE BENTS



DETAILS OF ROCKER



INTERMEDIATE BENTS

END BENTS

BASE PLATE DETAILS

STANDARD PLAN
19'~31' I-Bm. SPANS ~ 24' ROADWAY
2-1'-6" WALKWAYS WITH STEEL RAILS
TIMBER PILES CONCRETE DECK and CAP

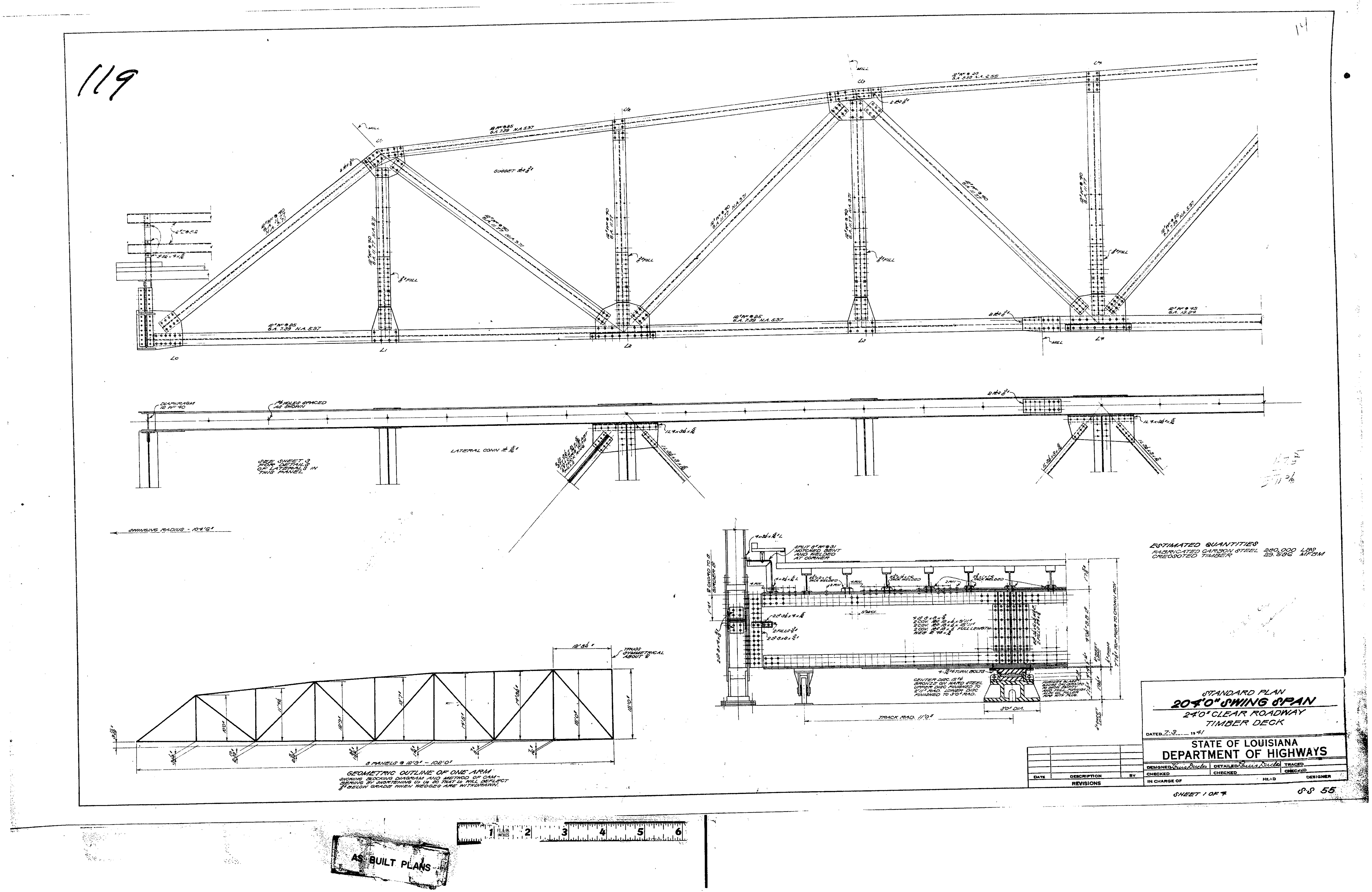
STATE OF LOUISIANA
DEPARTMENT of HIGHWAYS
BATON ROUGE, LA. APRIL 1941

DATE	DESCRIPTION	BY
REVISIONS		

DESIGNED Huey — CHECKED L. Ducote — DETAILED Huey — CHECKED L. Ducote — TRACED A.G. Wagner — CHECKED L. Ducote
IN CHARGE OF [illegible] Head Bridge Draftsman

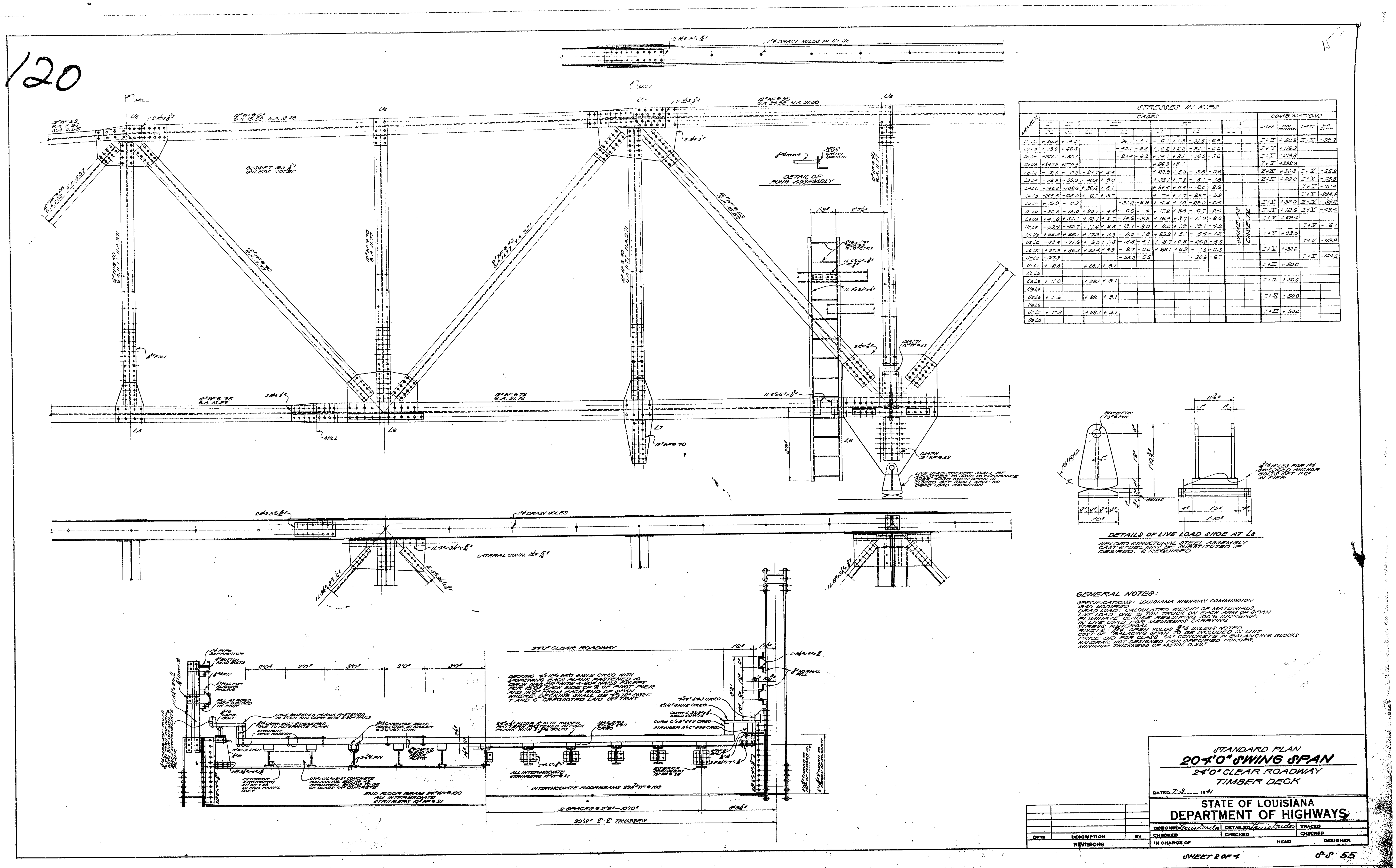
S.C. 51

AS BUILT PLANS



119
14
SWINGING RADIUS - 104'0"
LATERAL CONN ℄ 7/16"
SEE SHEET 3 FOR DETAILS OF LATERALS IN THIS PANEL
ESTIMATED QUANTITIES
FABRICATED CARBON STEEL 280,000 LBS
CREOSOTED TIMBER 29.586 MFBM
TRACK RAD. 11'0"
3'0" DIA.
FURNISH GLASS GAUGE CALIBRATED TO SHOW EMPTY AND FULL. FURNISH ALSO OIL FILLER PIPE WITH PLUG.
12'8 1/2"
TRUSS SYMMETRICAL ABOUT ℄
8 PANELS @ 12'9" - 102'0"
GEOMETRIC OUTLINE OF ONE ARM
SHOWING BLOCKING DIAGRAM AND METHOD OF CAMBERING BY SHORTENING U7 U8 SO THAT L0 WILL DEFLECT 3/8" BELOW GRADE WHEN WEDGES ARE WITHDRAWN.
STANDARD PLAN
204'0" SWING SPAN
24'0" CLEAR ROADWAY
TIMBER DECK
DATED 7-3 1941
STATE OF LOUISIANA
DEPARTMENT OF HIGHWAYS
DESIGNED Louis Duclos
DETAILED Louis Duclos
TRACED
CHECKED
CHECKED
CHECKED
IN CHARGE OF
HEAD
DESIGNER
DATE
DESCRIPTION
BY
REVISIONS
SHEET 1 OF 4
S.S. 55
AS BUILT PLANS

HAER No. LA-37



AS BUILT PLANS

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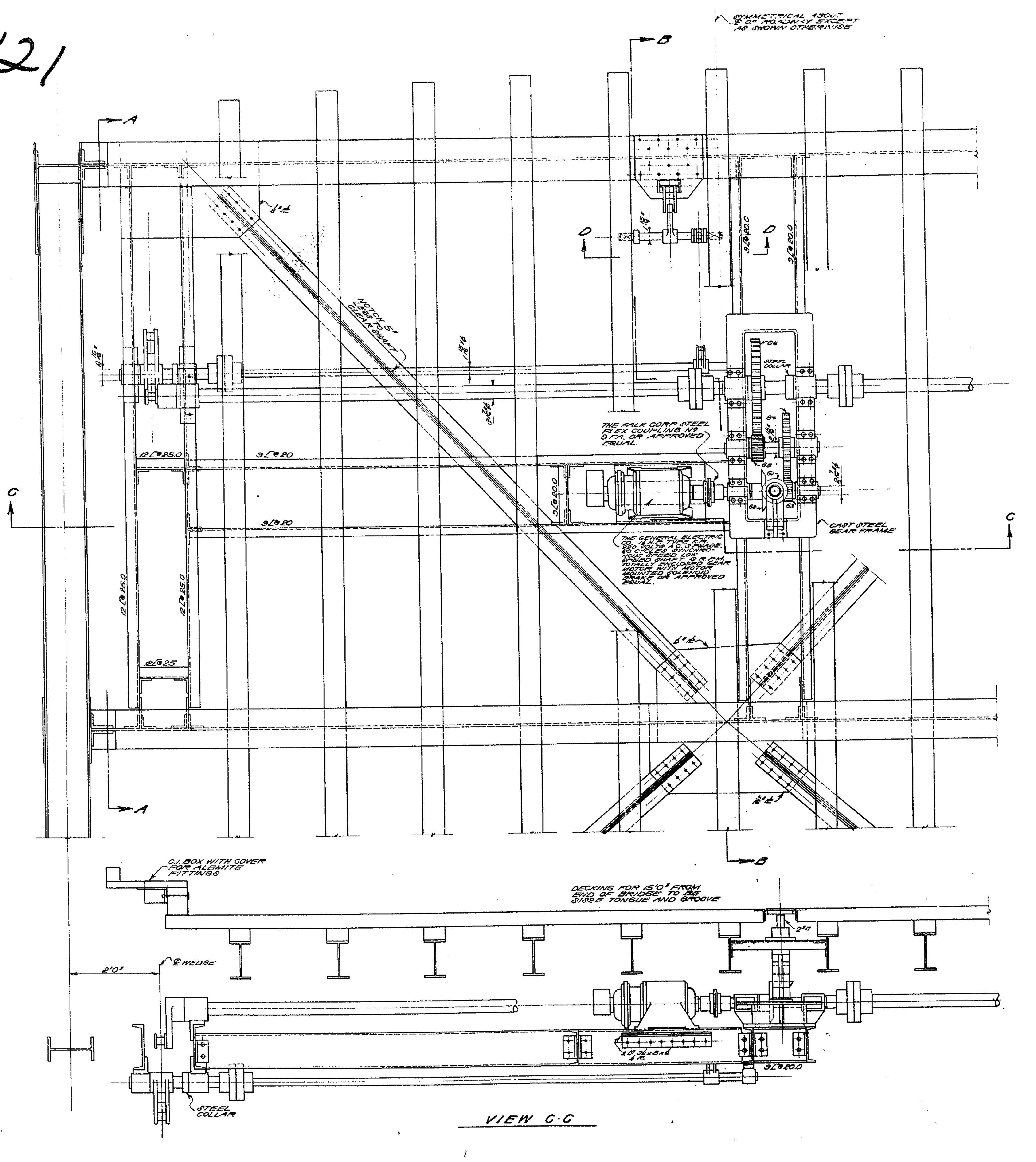
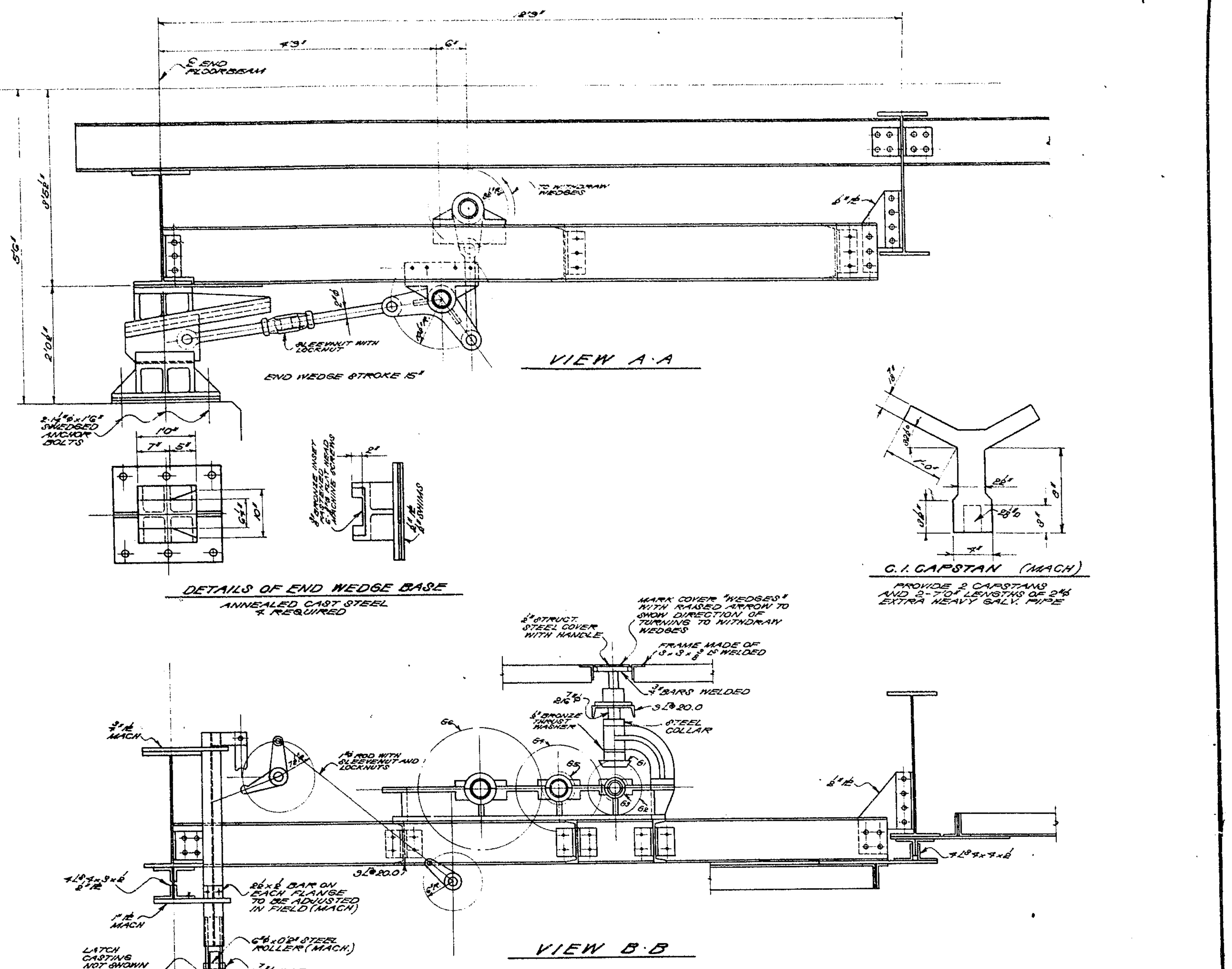




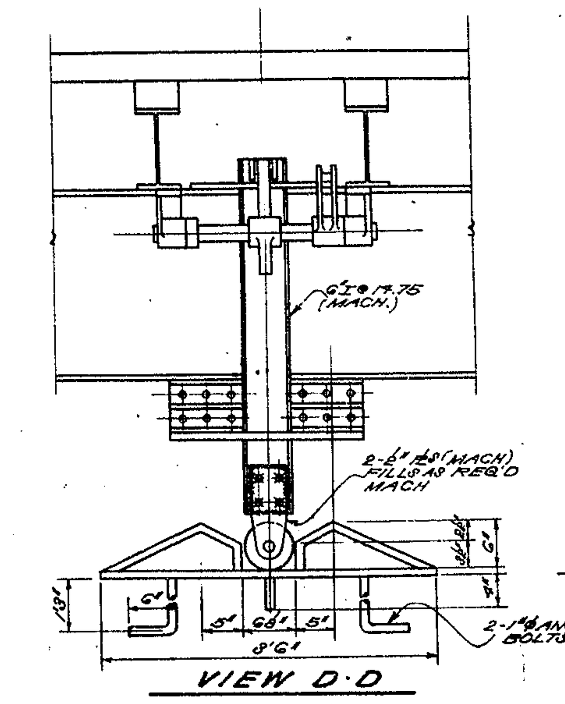
GENERAL NOTES:

END WEDGES SHALL BE ADJUSTED TO LIFT THE ENDS OF THE SPAN 3/8" WHEN ALL TRUSS MEMBERS ARE AT THE SAME TEMPERATURE.
ALL BOLTS CONNECTING MACHINERY SHALL BE DRIVING FIT TURNED BOLTS.

TABLE OF GEARS FOR END WEDGE DRIVE
ALL 20° INV. STD CUT TEETH

GEAR	NO TEETH	PITCH	PITCH DIAM'R	FACE	TYPE GEAR	MATERIAL
G1	20	3 DP	6.667"	2"	BEVEL	FORGED STEEL
G2	34	3 DP	11.333"	2"	BEVEL	CAST STEEL
G3	17	3 DP	5.667"	2½"	SPUR	FORGED STEEL
G4	54	3 DP	18.000"	2"	SPUR	CAST STEEL
G5	17	2½ DP	6.800"	3"	SPUR	FORGED STEEL
G6	64	2½ DP	25.600"	2½"	SPUR	CAST STEEL

PIPE ALL BEARINGS AND SLIDING SURFACES WITH RIGID COPPER TUBING OR FLEXIBLE COPPER HOSE, AS REQUIRED, TO ALEMITE FITTINGS IN C.I. BOXES LOCATED IN SIDEWALKS AT MOST CONVENIENT LOCATIONS.
STRUCTURAL STEEL PARTS MARKED (MACH) TO BE INCLUDED IN LUMP SUM BID FOF MACHINERY.



DATE	DESCRIPTION	BY
REVISIONS		

STANDARD PLAN
204'0" SWING SPAN
24'0" CLEAR ROADWAY
TIMBER DECK

7-3-41

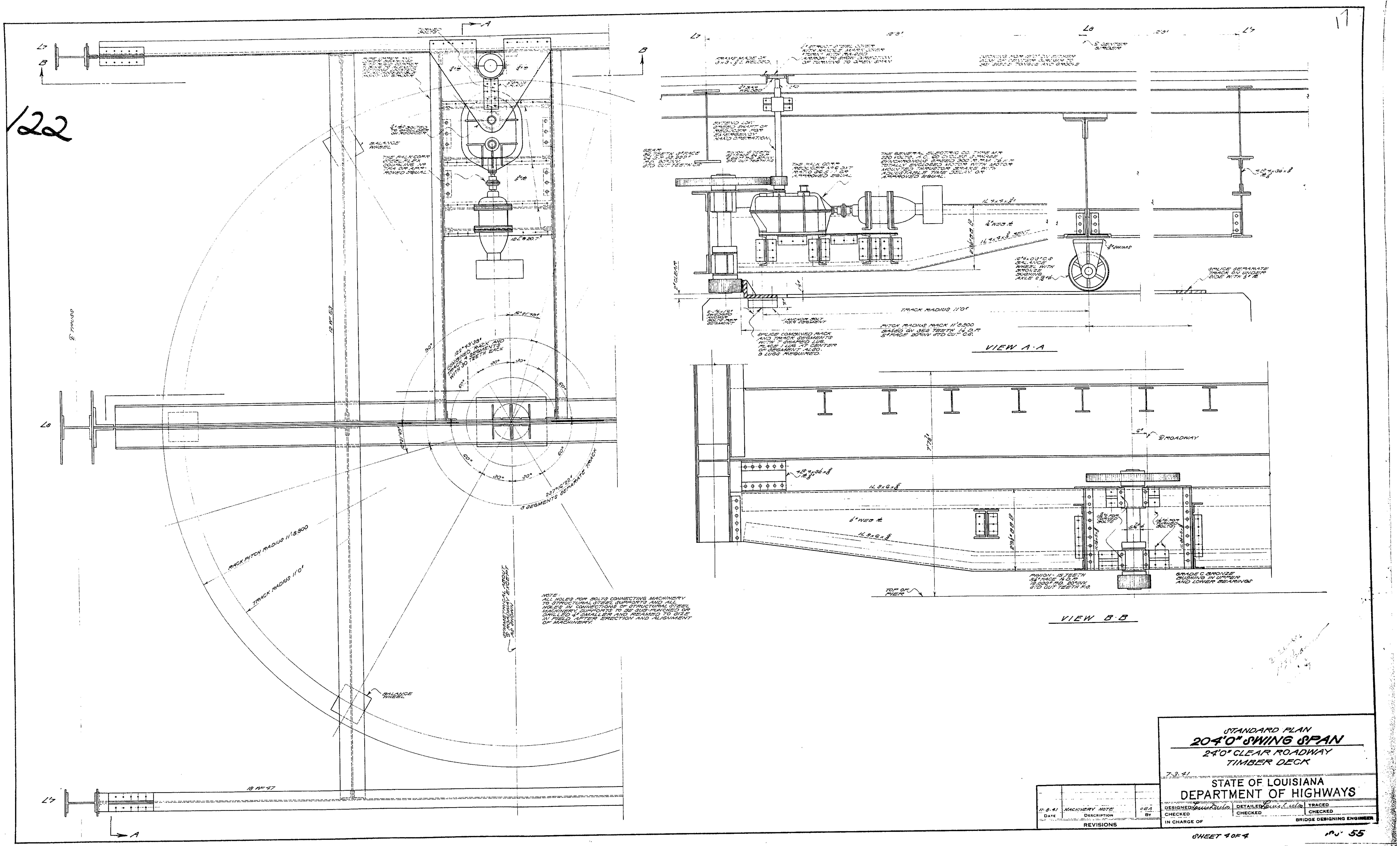
STATE OF LOUISIANA
DEPARTMENT OF HIGHWAYS

DESIGNED Louis Duclo | DETAILED Louis Duclo | TRACED
CHECKED | CHECKED | CHECKED
IN CHARGE OF | BRIDGE DESIGNING ENGINEER

SHEET 3 OF 4 S-S 55

AS BUILT PLANS

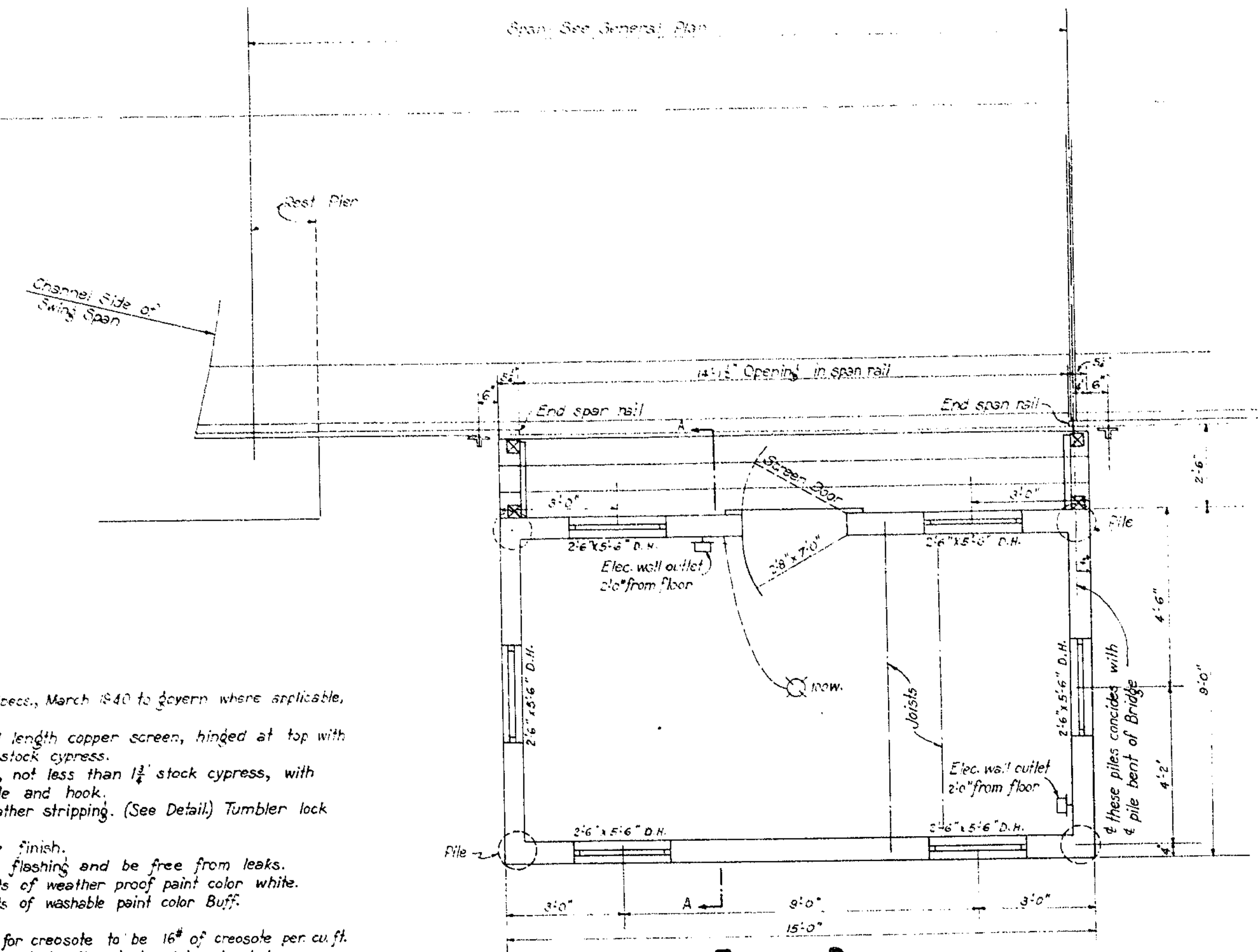
HAER No. LA-37



AS BUILT PLANS

HAER No. LA-37

128



FLOOR PLAN
Scale $\frac{3}{8}"=1'0"$

General Notes:

Louisiana Highway Commission Specs., March 1940 to govern where applicable, except as otherwise noted.

All window openings to have full length copper screen, hinged at top with hook at bottom, not less than $1\frac{1}{4}"$ stock cypress.

Screen door to be copper mesh, not less than $1\frac{3}{4}"$ stock cypress, with double spring hinges, provide handle and hook.

Main door to have Bronze weather stripping. (See Detail.) Tumbler lock to be provided for above door.

All hardware to have Bronze finish.

Roof and flue to have copper flashing and be free from leaks.

All exterior walls to have 3 coats of weather proof paint color white.

All interior walls to have 2 coats of washable paint color Buff.

Floor to be hard Oil finished.

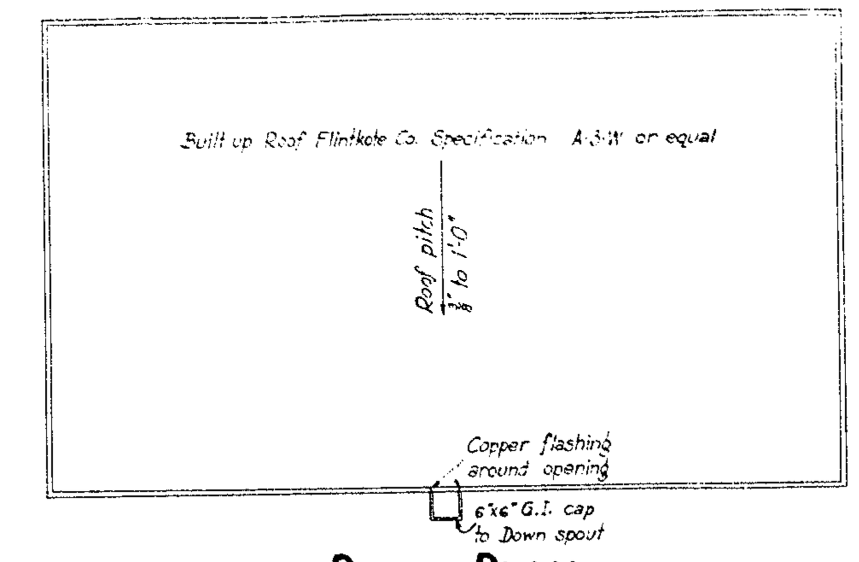
All timbers called for in plans for creosote to be 16# of creosote per cu. ft.

Provide G.I. flue with copper flashing location to be determined by contractor.

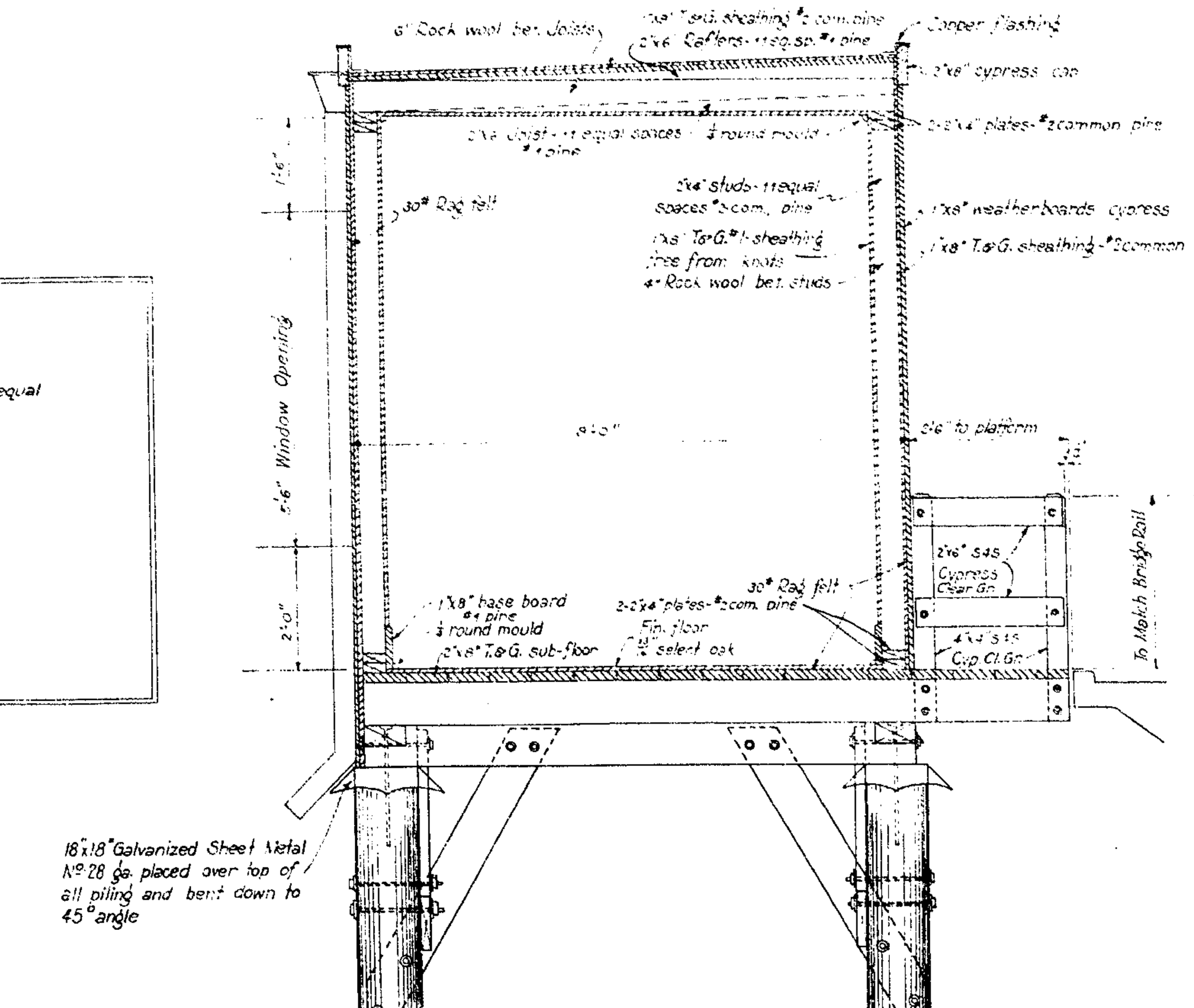
All materials required to complete Operators house to be included in lump sum bid for house except creosoted timber piles which are to be paid for at the price bid for that item.

Provide all necessary materials to complete this job if specified or not.

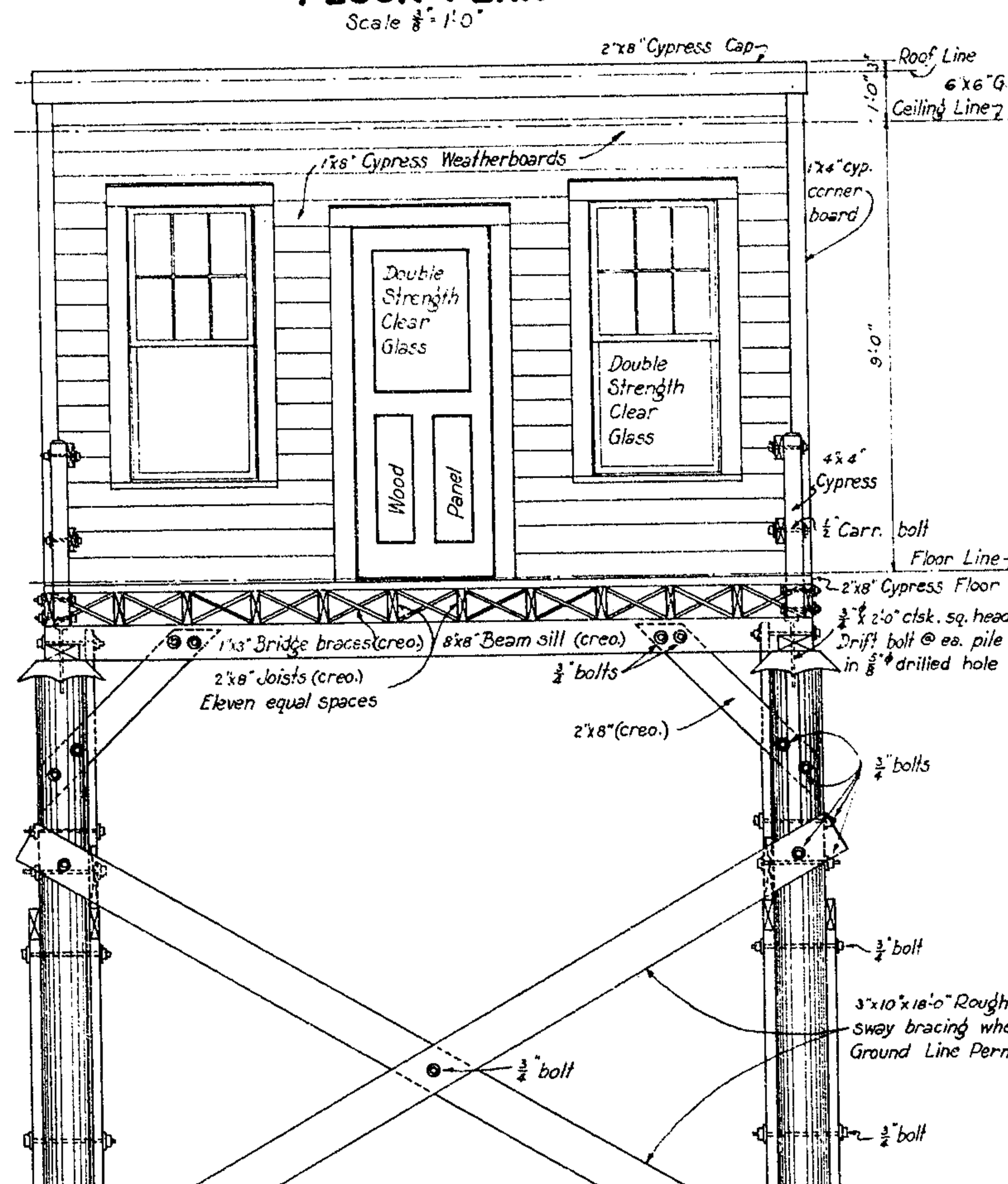
All cypress to be clear grade.



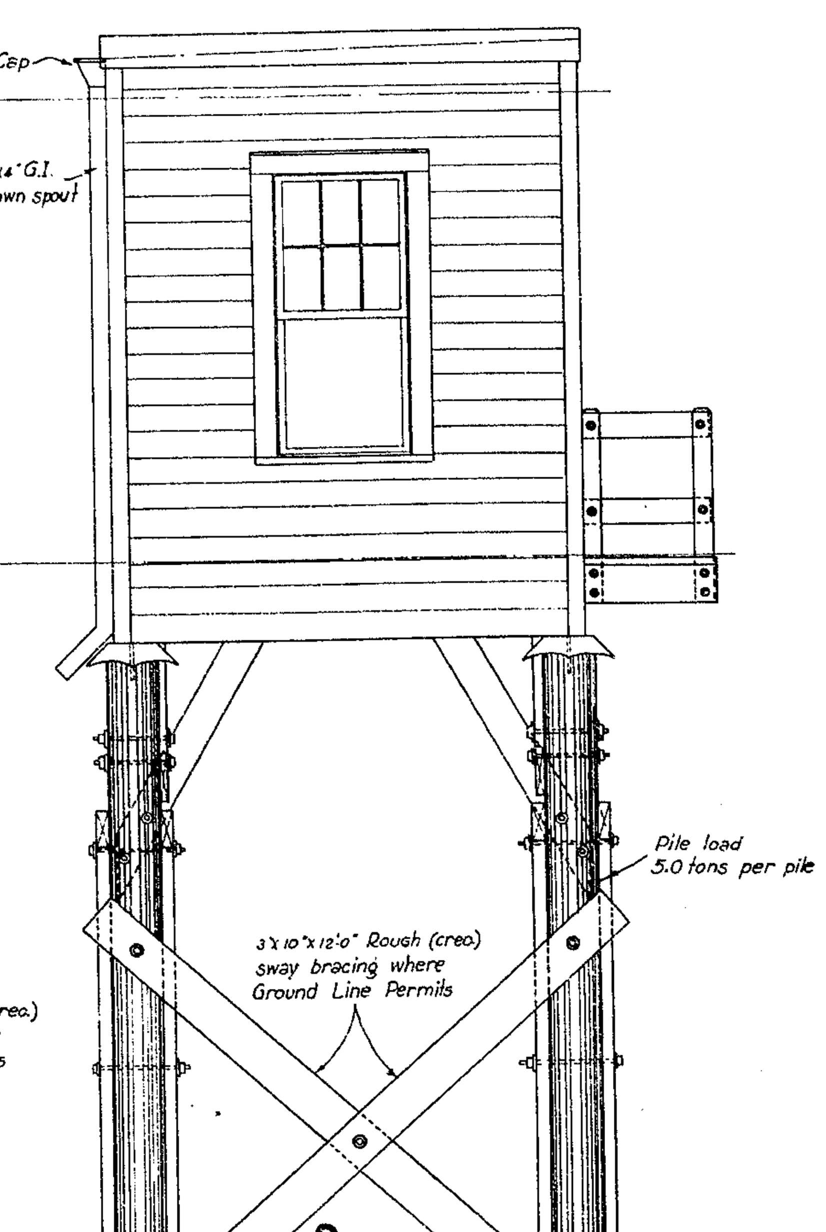
ROOF PLAN
Scale $\frac{3}{8}"=1'0"$



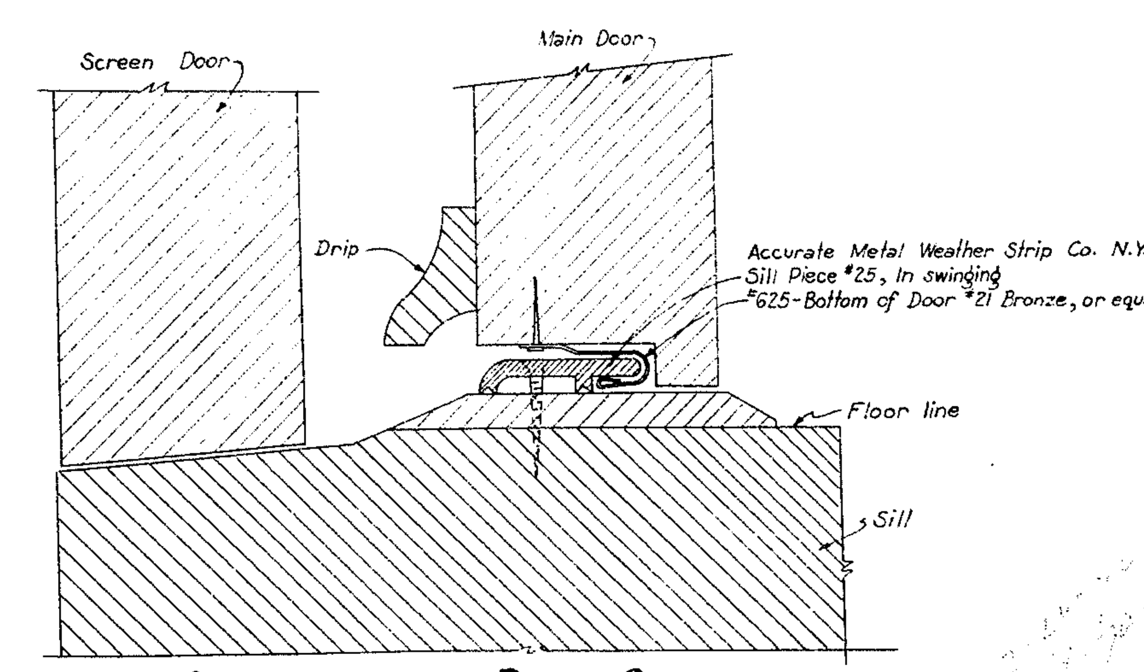
SECTION AT A-A
Scale $\frac{3}{8}"=1'0"$



FRONT ELEVATION
Scale $\frac{3}{8}"=1'0"$



SIDE ELEVATION
Scale $\frac{3}{8}"=1'0"$



SECTION THRU DOOR SILL
Scale Full Size

10-15-41	2"x8" Braces	L.T.
DATE	DESCRIPTION	BY
REVISIONS		

STANDARD BRIDGE OPERATORS HOUSE

8'x14' FRAME STRUCTURE

STATE of LOUISIANA
DEPARTMENT of HIGHWAYS

BATON ROUGE, LA. JUNE 1941

DESIGNED L. Thepagnier | DETAILED L. Thepagnier | TRACED L. Thepagnier
CHECKED Huey | CHECKED Huey | CHECKED Huey
IN CHARGE OF J.A. Bue | HEAD BRIDGE DRAFTSMAN

T-M-18

AS BUILT PLANS

31485

Bridge Scan

Base @ Morton

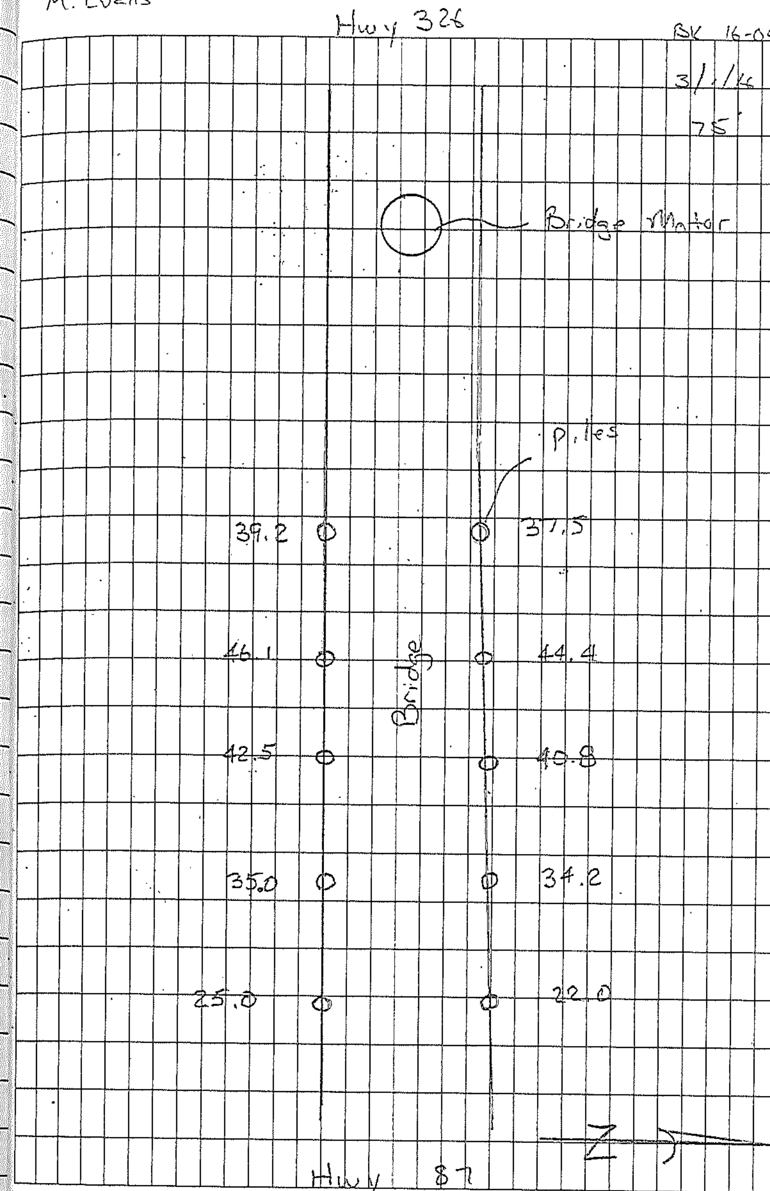
FS	Desc
109 - 110	GODset

Note

Measured from water bottom to top of rail on bridge.

A. Burns
M. Evans

Bk 16-04
3/1/16
75°



31435
~~31452~~

Scan 1 (Tripod ; Resection)
Targets 108, 103, 104, 105
(Called 108, 100 on this setup)

Scan 2 (Tripod ; Resection
Targets 108, 104, 105, 9000
9000 is a Globe

Scan 3 (Overa point ; Tripod)
Sta 105
BS ck 108, 104

Scan 4 (Overpoint ; tripod)
Sta 104
BS ck 102, 105

Scan 5 (Overpoint ; tripod)
Sta 106
BS ck 102

Scan 6 (Overpoint ; tripod)
Sta 107
BS 108

A. Burns
M. Evans

BK 16-04

3/29/16
73°

RENAME 108 TO 100 IN C.S.

LABEL PT 105 IN C.S.

" " 104 "

" " 106 "

" " 107 "

31435

Scan 1 (Over known point ; tripod)

~~Targets~~ Stn 108

BS CK 107, 105

Scan 2 (Resection ; tripod)

Targets 106, 107, 109, 110

Scan 3 (Resection ; tripod)

Targets 106, 107, 109, 110

A. Burns
J. Fontenot

BK 16-04

4/6/16

80°

LABEL PT 108 IN CONT. SPACE

SWAP 109 & 110 IN DATA (MISLABELED)

" " " " " "

100
101
102
103
104
105
106
107
108
109
110

Bridge 009130.txt 10/5/2017

Status: VALID Registration

Mean Absolute Error:

for Enabled Constraints = 0.035 ft

for Disabled Constraints = 0.000 ft
Date: 2017.10.05 10:29:52

Database name : Bridge 009130 ST MARY

ScanWorlds
FINAL CONTROL.txt (Leveled)
Station-001: SW-001 (Leveled)
Station-002: SW-002 (Leveled)
Station-003: SW-003 (Leveled)
104: SW-004 (Leveled)
105: SW-003 (Leveled)
106: SW-005 (Leveled)
107: SW-006 (Leveled)
Station-001: SW-001 (Leveled)
Station-002: SW-002 (Leveled)
108: SW-001 (Leveled)
Station-001: SW-002 (Leveled)
Station-002: SW-003 (Leveled)

Constraints

Name	ScanWorld	ScanWorld	Type	On/Off	Weight	Error	Error Vector	Horz	Vert
100	FINAL CONTROL.txt (Leveled)	Station-001: SW-001 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.089 ft	(-0.041, -0.071, -0.032) ft	0.083 ft	-0.032 ft
100	FINAL CONTROL.txt (Leveled)	Station-002: SW-002 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.082 ft	(-0.029, -0.068, -0.036) ft	0.073 ft	-0.036 ft
100	FINAL CONTROL.txt (Leveled)	Station-003: SW-003 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.088 ft	(-0.035, -0.066, -0.046) ft	0.074 ft	-0.046 ft
110	FINAL CONTROL.txt (Leveled)	Station-001: SW-002 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.060 ft	(-0.002, 0.013, 0.059) ft	0.013 ft	0.059 ft
110	FINAL CONTROL.txt (Leveled)	Station-002: SW-003 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.057 ft	(-0.002, 0.010, 0.056) ft	0.011 ft	0.056 ft
109	FINAL CONTROL.txt (Leveled)	Station-001: SW-002 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.019 ft	(0.017, -0.008, 0.002) ft	0.019 ft	0.002 ft
109	FINAL CONTROL.txt (Leveled)	Station-002: SW-003 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.018 ft	(0.015, -0.001, 0.009) ft	0.015 ft	0.009 ft
108	FINAL CONTROL.txt (Leveled)	105: SW-003 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.025 ft	(-0.015, -0.020, -0.001) ft	0.025 ft	-0.001 ft
108	FINAL CONTROL.txt (Leveled)	107: SW-006 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.026 ft	(-0.006, -0.021, 0.013) ft	0.022 ft	0.013 ft
108	FINAL CONTROL.txt (Leveled)	Station-001: SW-001 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.035 ft	(-0.016, -0.028, 0.015) ft	0.032 ft	0.015 ft
108	FINAL CONTROL.txt (Leveled)	Station-002: SW-002 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.030 ft	(-0.016, -0.022, 0.014) ft	0.027 ft	0.014 ft
108	FINAL CONTROL.txt (Leveled)	108: SW-001 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.023 ft	(0.005, -0.010, 0.021) ft	0.011 ft	0.021 ft
107	FINAL CONTROL.txt (Leveled)	107: SW-006 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.081 ft	(-0.078, -0.020, 0.009) ft	0.081 ft	0.009 ft
107	FINAL CONTROL.txt (Leveled)	108: SW-001 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.111 ft	(-0.106, -0.031, 0.012) ft	0.110 ft	0.012 ft
107	FINAL CONTROL.txt (Leveled)	Station-001: SW-002 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.106 ft	(-0.097, -0.037, 0.021) ft	0.104 ft	0.021 ft
107	FINAL CONTROL.txt (Leveled)	Station-002: SW-003 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.108 ft	(-0.100, -0.036, 0.022) ft	0.106 ft	0.022 ft
106	FINAL CONTROL.txt (Leveled)	106: SW-005 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.125 ft	(0.086, 0.049, -0.076) ft	0.099 ft	-0.076 ft
106	FINAL CONTROL.txt (Leveled)	Station-001: SW-002 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.136 ft	(0.089, 0.052, -0.089) ft	0.103 ft	-0.089 ft
106	FINAL CONTROL.txt (Leveled)	Station-002: SW-003 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.141 ft	(0.094, 0.048, -0.094) ft	0.105 ft	-0.094 ft
105	FINAL CONTROL.txt (Leveled)	105: SW-003 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.047 ft	(0.037, 0.029, 0.009) ft	0.047 ft	0.009 ft
105	FINAL CONTROL.txt (Leveled)	Station-001: SW-001 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.044 ft	(0.029, 0.032, -0.009) ft	0.043 ft	-0.009 ft
105	FINAL CONTROL.txt (Leveled)	Station-002: SW-002 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.053 ft	(0.035, 0.040, -0.005) ft	0.053 ft	-0.005 ft
105	FINAL CONTROL.txt (Leveled)	108: SW-001 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.052 ft	(0.043, 0.023, -0.016) ft	0.049 ft	-0.016 ft
104	FINAL CONTROL.txt (Leveled)	104: SW-004 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.049 ft	(0.042, -0.024, 0.005) ft	0.049 ft	0.005 ft
104	FINAL CONTROL.txt (Leveled)	Station-001: SW-001 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.053 ft	(0.027, -0.046, 0.001) ft	0.053 ft	0.001 ft
104	FINAL CONTROL.txt (Leveled)	Station-002: SW-002 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.048 ft	(0.028, -0.039, -0.003) ft	0.048 ft	-0.003 ft
103	FINAL CONTROL.txt (Leveled)	Station-001: SW-001 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.028 ft	(-0.025, -0.006, 0.011) ft	0.026 ft	0.011 ft
103	FINAL CONTROL.txt (Leveled)	Station-002: SW-002 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.033 ft	(-0.028, -0.008, 0.016) ft	0.029 ft	0.016 ft
103	FINAL CONTROL.txt (Leveled)	Station-003: SW-003 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.023 ft	(-0.010, -0.003, 0.021) ft	0.010 ft	0.021 ft
103	FINAL CONTROL.txt (Leveled)	Station-001: SW-001 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.026 ft	(-0.007, 0.022, 0.011) ft	0.023 ft	0.011 ft
102	FINAL CONTROL.txt (Leveled)	Station-001: SW-001 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.061 ft	(0.043, 0.039, 0.018) ft	0.058 ft	0.018 ft
102	FINAL CONTROL.txt (Leveled)	Station-002: SW-002 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.058 ft	(0.039, 0.037, 0.020) ft	0.054 ft	0.020 ft
102	FINAL CONTROL.txt (Leveled)	Station-003: SW-003 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.055 ft	(0.031, 0.033, 0.031) ft	0.045 ft	0.031 ft
102	FINAL CONTROL.txt (Leveled)	104: SW-004 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.029 ft	(0.010, 0.023, 0.016) ft	0.025 ft	0.016 ft
102	FINAL CONTROL.txt (Leveled)	106: SW-005 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.033 ft	(0.010, 0.017, 0.026) ft	0.020 ft	0.026 ft
101	FINAL CONTROL.txt (Leveled)	Station-001: SW-001 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.038 ft	(-0.019, 0.033, -0.002) ft	0.038 ft	-0.002 ft
101	FINAL CONTROL.txt (Leveled)	Station-002: SW-002 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.041 ft	(-0.023, 0.033, -0.008) ft	0.041 ft	-0.008 ft
101	FINAL CONTROL.txt (Leveled)	Station-003: SW-003 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.045 ft	(-0.026, 0.030, -0.020) ft	0.040 ft	-0.020 ft
103	Station-001: SW-001 (Leveled)	Station-002: SW-002 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.006 ft	(-0.002, -0.002, 0.005) ft	0.003 ft	0.005 ft

103	Station-001: SW-001 (Leveled)	Station-003: SW-003 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.019 ft	(0.015, 0.004, 0.010) ft	0.016 ft	0.010 ft
103	Station-001: SW-001 (Leveled)	Station-001: SW-001 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.034 ft	(0.019, 0.028, 0.000) ft	0.034 ft	0.000 ft
102	Station-001: SW-001 (Leveled)	Station-002: SW-002 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.005 ft	(-0.004, -0.002, 0.002) ft	0.004 ft	0.002 ft
102	Station-001: SW-001 (Leveled)	Station-003: SW-003 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.019 ft	(-0.013, -0.005, 0.013) ft	0.014 ft	0.013 ft
102	Station-001: SW-001 (Leveled)	104: SW-004 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.037 ft	(-0.033, -0.016, -0.003) ft	0.037 ft	-0.003 ft
102	Station-001: SW-001 (Leveled)	106: SW-005 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.041 ft	(-0.033, -0.022, 0.008) ft	0.040 ft	0.008 ft
101	Station-001: SW-001 (Leveled)	Station-002: SW-002 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.007 ft	(-0.004, 0.001, -0.006) ft	0.004 ft	-0.006 ft
101	Station-001: SW-001 (Leveled)	Station-003: SW-003 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.019 ft	(-0.007, -0.002, -0.018) ft	0.007 ft	-0.018 ft
100	Station-001: SW-001 (Leveled)	Station-002: SW-002 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.014 ft	(0.013, 0.004, -0.004) ft	0.013 ft	-0.004 ft
100	Station-001: SW-001 (Leveled)	Station-003: SW-003 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.016 ft	(0.006, 0.006, -0.014) ft	0.009 ft	-0.014 ft
101	Station-002: SW-002 (Leveled)	Station-003: SW-003 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.013 ft	(-0.003, -0.003, -0.012) ft	0.004 ft	-0.012 ft
100	Station-002: SW-002 (Leveled)	Station-003: SW-003 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.012 ft	(-0.006, 0.002, -0.010) ft	0.007 ft	-0.010 ft
103	Station-002: SW-002 (Leveled)	Station-003: SW-003 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.019 ft	(0.018, 0.005, 0.005) ft	0.019 ft	0.005 ft
103	Station-002: SW-002 (Leveled)	Station-001: SW-001 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.037 ft	(0.021, 0.030, -0.005) ft	0.037 ft	-0.005 ft
102	Station-002: SW-002 (Leveled)	Station-003: SW-003 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.014 ft	(-0.009, -0.004, 0.011) ft	0.009 ft	0.011 ft
102	Station-002: SW-002 (Leveled)	104: SW-004 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.033 ft	(-0.029, -0.014, -0.005) ft	0.032 ft	-0.005 ft
102	Station-002: SW-002 (Leveled)	106: SW-005 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.036 ft	(-0.029, -0.020, 0.006) ft	0.036 ft	0.006 ft
103	Station-003: SW-003 (Leveled)	Station-001: SW-001 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.027 ft	(0.003, 0.025, -0.010) ft	0.025 ft	-0.010 ft
102	Station-003: SW-003 (Leveled)	104: SW-004 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.028 ft	(-0.020, -0.011, -0.015) ft	0.023 ft	-0.015 ft
102	Station-003: SW-003 (Leveled)	106: SW-005 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.027 ft	(-0.021, -0.016, -0.005) ft	0.027 ft	-0.005 ft
102	104: SW-004 (Leveled)	106: SW-005 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.012 ft	(-0.001, -0.006, 0.011) ft	0.006 ft	0.011 ft
104	104: SW-004 (Leveled)	Station-001: SW-001 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.027 ft	(-0.016, -0.022, -0.004) ft	0.027 ft	-0.004 ft
104	104: SW-004 (Leveled)	Station-002: SW-002 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.022 ft	(-0.014, -0.015, -0.008) ft	0.020 ft	-0.008 ft
105	105: SW-003 (Leveled)	Station-001: SW-001 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.020 ft	(-0.008, 0.003, -0.018) ft	0.008 ft	-0.018 ft
105	105: SW-003 (Leveled)	Station-002: SW-002 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.019 ft	(-0.002, 0.012, -0.014) ft	0.012 ft	-0.014 ft
105	105: SW-003 (Leveled)	108: SW-001 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.027 ft	(0.006, -0.005, -0.025) ft	0.008 ft	-0.025 ft
108	105: SW-003 (Leveled)	107: SW-006 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.017 ft	(0.008, -0.001, 0.014) ft	0.008 ft	0.014 ft
108	105: SW-003 (Leveled)	Station-001: SW-001 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.018 ft	(-0.001, -0.008, 0.016) ft	0.008 ft	0.016 ft
108	105: SW-003 (Leveled)	Station-002: SW-002 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.015 ft	(-0.001, -0.002, 0.015) ft	0.002 ft	0.015 ft
108	105: SW-003 (Leveled)	108: SW-001 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.031 ft	(0.019, 0.010, 0.022) ft	0.022 ft	0.022 ft
106	106: SW-005 (Leveled)	Station-001: SW-002 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.014 ft	(0.003, 0.003, -0.013) ft	0.004 ft	-0.013 ft
106	106: SW-005 (Leveled)	Station-002: SW-003 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.019 ft	(0.008, -0.001, -0.017) ft	0.008 ft	-0.017 ft
108	107: SW-006 (Leveled)	Station-001: SW-001 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.012 ft	(-0.009, -0.007, 0.001) ft	0.012 ft	0.001 ft
108	107: SW-006 (Leveled)	Station-002: SW-002 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.009 ft	(-0.009, -0.001, 0.000) ft	0.009 ft	0.000 ft
108	107: SW-006 (Leveled)	108: SW-001 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.017 ft	(0.011, 0.011, 0.007) ft	0.015 ft	0.007 ft
107	107: SW-006 (Leveled)	108: SW-001 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.030 ft	(-0.028, -0.012, 0.003) ft	0.030 ft	0.003 ft
107	107: SW-006 (Leveled)	Station-001: SW-002 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.028 ft	(-0.019, -0.017, 0.012) ft	0.026 ft	0.012 ft
107	107: SW-006 (Leveled)	Station-002: SW-003 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.030 ft	(-0.021, -0.016, 0.013) ft	0.027 ft	0.013 ft
105	Station-001: SW-001 (Leveled)	Station-002: SW-002 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.011 ft	(0.006, 0.008, 0.004) ft	0.010 ft	0.004 ft
105	Station-001: SW-001 (Leveled)	108: SW-001 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.018 ft	(0.014, -0.008, -0.007) ft	0.017 ft	-0.007 ft
104	Station-001: SW-001 (Leveled)	Station-002: SW-002 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.008 ft	(0.002, 0.007, -0.004) ft	0.007 ft	-0.004 ft
108	Station-001: SW-001 (Leveled)	Station-002: SW-002 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.006 ft	(0.000, 0.006, -0.001) ft	0.006 ft	-0.001 ft
108	Station-001: SW-001 (Leveled)	108: SW-001 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.028 ft	(0.020, 0.018, 0.006) ft	0.027 ft	0.006 ft
108	Station-002: SW-002 (Leveled)	108: SW-001 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.024 ft	(0.020, 0.012, 0.007) ft	0.023 ft	0.007 ft
105	Station-002: SW-002 (Leveled)	108: SW-001 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.022 ft	(0.009, -0.017, -0.011) ft	0.019 ft	-0.011 ft
107	108: SW-001 (Leveled)	Station-001: SW-002 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.013 ft	(0.008, -0.005, 0.009) ft	0.010 ft	0.009 ft
107	108: SW-001 (Leveled)	Station-002: SW-003 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.012 ft	(0.006, -0.004, 0.010) ft	0.008 ft	0.010 ft
110	Station-001: SW-002 (Leveled)	Station-002: SW-003 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.003 ft	(0.000, -0.002, -0.002) ft	0.002 ft	-0.002 ft
107	Station-001: SW-002 (Leveled)	Station-002: SW-003 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.003 ft	(-0.002, 0.001, 0.001) ft	0.003 ft	0.001 ft
106	Station-001: SW-002 (Leveled)	Station-002: SW-003 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.008 ft	(0.005, -0.004, -0.004) ft	0.006 ft	-0.004 ft
109	Station-001: SW-002 (Leveled)	Station-002: SW-003 (Leveled)	Coincident: Vertex - Vertex	On	1.0000	0.010 ft	(-0.002, 0.006, 0.007) ft	0.007 ft	0.007 ft

ScanWorld Transformations
FINAL CONTROL.txt (Leveled)
translation: (0.000, 0.000, 0.000) ft
rotation: (0.0000, 1.0000, 0.0000):0.000 deg

Station-001: SW-001 (Leveled)
translation: (3220494.838, 504347.453, 20.047) ft
rotation: (-0.0000, -0.0000, -1.0000):43.973 deg

Station-002: SW-002 (Leveled)
translation: (3220628.062, 504405.260, 20.288) ft
rotation: (-0.0000, -0.0000, -1.0000):43.075 deg

Station-003: SW-003 (Leveled)
translation: (3220728.167, 504443.704, 20.162) ft
rotation: (0.0000, 0.0000, 1.0000):82.197 deg

```
104: SW-004 (Leveled)
translation: (3220864.831, 504486.634, 15.642) ft
rotation: (-0.0000, -0.0000, -1.0000):76.575 deg

105: SW-003 (Leveled)
translation: (3220828.321, 504461.762, 10.158) ft
rotation: (0.0000, 0.0000, 1.0000):-124.020 deg

106: SW-005 (Leveled)
translation: (3220807.556, 504512.250, 10.665) ft
rotation: (0.0000, 0.0000, 1.0000):59.571 deg

107: SW-006 (Leveled)
translation: (3220519.781, 504400.907, 8.633) ft
rotation: (0.0000, 0.0000, 1.0000):55.948 deg

Station-001: SW-001 (Leveled)
translation: (3220738.925, 504423.086, 19.302) ft
rotation: (0.0000, 0.0000, 1.0000):-140.179 deg

Station-002: SW-002 (Leveled)
translation: (3220755.005, 504429.389, 18.751) ft
rotation: (-0.0000, -0.0000, -1.0000):-178.013 deg

108: SW-001 (Leveled)
translation: (3220548.264, 504329.050, 8.065) ft
rotation: (-0.0000, -0.0000, -1.0000):0.634 deg

Station-001: SW-002 (Leveled)
translation: (3220614.278, 504420.512, 9.043) ft
rotation: (-0.0000, -0.0000, -1.0000):-140.444 deg

Station-002: SW-003 (Leveled)
translation: (3220614.410, 504420.218, 8.781) ft
rotation: (0.0000, 0.0000, 1.0000):-120.199 deg


Unused ControlSpace Objects
Station-001: SW-001 (Leveled):
    Vertex : unlabeled

Station-002: SW-002 (Leveled):
    Vertex : unlabeled

Station-003: SW-003 (Leveled):
    Vertex : unlabeled

Station-001: SW-001 (Leveled):
    Vertex : unlabeled

Station-002: SW-002 (Leveled):
    Vertex : unlabeled
    Sphere : TargetID : 9000

Station-001: SW-002 (Leveled):
    Vertex : unlabeled

Station-002: SW-003 (Leveled):
    Vertex : unlabeled
```

SJB GROUP, LLC
QUALITY BY DESIGN

State Project No. H.007020
Historic Bridge Inventory

SJB Group performed terrestrial laser scanning and created deliverables in accordance with HAER 4.0 Measured Drawings for six bridges throughout Louisiana. The six bridges surveyed under this contract were bridge numbers 008970, 009130, 014900, 058710, 200865 and 200896. The following sections are a description of the equipment and procedures used for this project.

Section I – Equipment

The equipment used in the establishment of the primary control network for this project was manufactured by Leica. Real-time kinematic GPS observations were collected using a Leica GS15 Smart Antenna "Performance" and CS15 3.5G Field Controller. Figure 12 is an image of the equipment used.

Figure 1: Photograph of Leica TS15 Total Station and Leica CS/GS15 GPS uni

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Below is a table of the serial numbers for the equipment used for this project.

Description	Model Number	Serial Number
Leica ScanStation	C10	1260997
Leica Base	GS15	1508955
Leica Rover	GS15	1509134
Leica Controller	CS15	25022556

Section II – Field Procedures

Marks set via real-time kinematic GPS observations were established through a series of ten (10) second observations. Each mark was occupied three (3) times throughout the day from at least two (2) different base stations for a total of six (6) observations. Primary control marks were periodically cross checked throughout the day to ensure an accurate basis of measurement.

Section III – Equipment

Scanning was performed with the Leica ScanStation C-10, serial number 120997, in conjunction with HDS 6 inch circular planar fixed height (1.472 meters) targets

Figure 2: Photograph of Leica ScanStation C10

Section IV – Field Procedures

Scanning observations were made by independent instrument locations which included a minimum of four HDS targets on Secondary Control Marks. At each scanning location the C10 collects observed data relative to the instrument and builds a data set which identifies the HDS target marks. Each data set is called a “Scan World” for the purposes of computation.

Section V – Data Processing

The separate Scan Worlds were “registered” using Leica Cyclone Version 8.0 software which merges the independent observations by resection and statistical comparison of the State Plane values associated with each of the HDS target locations. The State Plane resolution data set which merges all scanned information is presented in Appendix “E.” TopoDOT version 9.0.0.0 was used to extract features from the point cloud registered in Leica Cyclone.