Appendix B. Navigation Studies & USCG Correspondence

Navigation Studies

1. East Pearl River Bridge
2. East Middle Pearl River Bridge
3. Middle Middle Pearl River Bridge
4. West Middle Pearl River Bridge
5. West Pearl River Bridge

Correspondence to and from USCG in date order

Navigation Study
US 90 Crossing of the WEST PEARL RIVER

US 90 Pearl River Bridges
Environmental Assessment
St. Tammany Parish, LA and Hancock County, MS

STATE PROJECT NO. H.000284 & NO. H.000286
FEDERAL AID PROJECT NO. H000284 & NO. H000286



USCG Draft Navigation Impact Report

DOTD
LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

U.S. Department of Transportation
Federal Highway Administration

July 2019

Table of Contents

		Page
Section 1.0	Navigation Study – US 90 Crossing the West Pearl River	1
1.1	Introduction	1
1.2	Project Purpose and Need	3
1.3	Reference Datum Conversion	3
1.4	Floodplain Consideration	3
1.5	Navigation Clearance above Mean High Water	3
1.6	Establishment of the Planning Elevation	4
1.7	Current Navigational Usage	6
1.8	Recommended Clearances associated with Replacement US 90 Bridge Crossing of the West Pearl River	11
1.9	Environmental Assessment Alternatives	13
1.10	Proposed Bridge's Impacts to Existing and Potential Navigation	27
1.11	Consideration of River Hydrology in the Siting and Design for a Replacement Structure	28

Tables

Table 1	Summary of Datum Conversion Elevations	5
Table 2	Summary of West Pearl River Bridge Tender Report July 2010 – July 2011	7
Table 3	Distribution of Flows within the Pearl River Watershed	29

Figures

Figure 1	Study Area	2
Figure 2	Land Use and Zoning	9
Figure 3	Cross-section of West Pearl River	30

Engineering Plates

Fixed Span Alternative Plan View, Plates 1-3	14-16
Fixed Span Alternative Profile Views, Plates 1	17
Movable Span Alternative Plan View, Plates 1-2	19-21
Movable Span Alternative Profile Views, Plate 1	22
Single-Level Trunion Bascule Bridge Concept, Plates 1-2	23-24
Vertical Lift Bridge Concept, Plates 1-2	25-26

Appendix

Appendix A	Appendix A, Documentation of Email Correspondence with the USACE, Vicksburg District Regarding West Pearl River Navigation	31
Appendix B	West Pearl River, Excerpts of the 1999 Report Estimation of Scour and Channel Stability for Selected Highway Crossings of Rivers in the Florida Parishes, Southeastern Louisiana	32
Appendix C	Photographs of Upstream/Downstream Approaches	33
Appendix D	2013-2018 Navigation Logs	34

1.0 Navigation Study - US 90 Crossing of the West Pearl River

1.1 Introduction

The Louisiana Department of Transportation and Development (LADOTD) is preparing planning and environmental documents for the improvement of five bridge structures associated with the Pearl River system along US Highway 90 (US 90). The enclosed Study Area map, Figure 1, shows the limits of the project. The project limits extend along US 90 from US 190 in Louisiana to the US 90 intersection with Kelly Road / 7th Avenue in Pearlington, Mississippi. The existing roadway is a two lane rural arterial roadway (RA-2) with 12-foot travel lanes and 8-foot paved shoulders. Average Daily Traffic is approximately 3,000 vehicles per day.

Five bridges associated with the Pearl River system are crossed as follows:

- Structure no. 62520060705291, West Pearl River Bridge, Movable Lift Span
- Structure no. 62520060706701, West Middle Pearl River Bridge
- Structure no. 62520060707111, Middle Middle Pearl River Bridge
- Structure no. 62520060707701, East Middle Pearl River Bridge
- Structure no. 62520060800001, East Pearl River Bridge, Movable Swing Span

This Navigational Study assesses the current and anticipated future use of the Pearl River, and investigates the required clearances for the proposed bridge replacement alternatives.

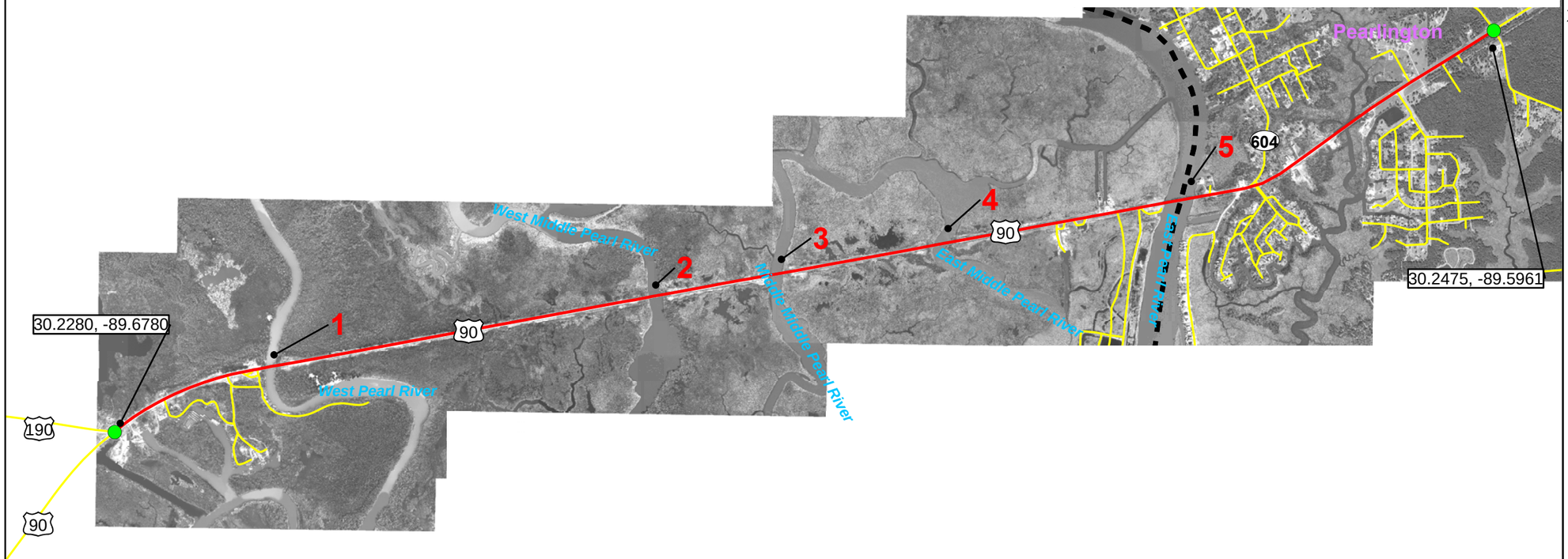
US 90 Bridge across West Pearl River
Structure Number: 62520060705291
Recall Number: 058710

The US 90 bridge across the West Pearl River was built in 1933. The structure is 24' wide, 570' long and consists of 14 reinforced concrete deck girder approach spans, 2 steel truss tower anchor spans and 1 steel truss lift span in the main navigation span. The main span must be elevated to allow passage of vessels taller than 10'. The maximum vertical clearance for vessel navigation with the main span in the raised position is 50'.

The horizontal bridge roadway width (24') and vertical clearance (15') do not meet the minimum requirements for a RA roadway. The 2017 LADOTD minimum design guidelines state that the preferable bridge width is equal to the approach travel lanes (24') and the shoulder width (8'). The bridge does not have shoulders. This bridge is classified as a "Preservation Candidate" as determined under the August 18, 2015 Programmatic Agreement (PA) regarding historic bridges

Map No.	Structure Number	Structure Type	Water Body Crossing
1	62520060705291	Movable: Lift-Span	West Pearl River
2	62520060706701	Pony Truss - Warren Truss	West Middle Pearl River
3	62520060707111	Pony Truss - Warren Truss	Middle Middle Pearl River
4	62520060707701	Pony Truss - Warren Truss	East Middle Pearl River
5	62520060800001	Movable: Swing - Through Truss (Parker Truss)	East Pearl River

NOTE: Logical Termini are the intersections of US 90 with US 190 and Kelly Rd/7th Ave and latitude and longitude data are in decimal format



Source (Citation) for 2010 six inch pixel imagery Parish Mosaics

This imagery was provided by the Louisiana Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP) as the sole source owner, and is shared with Louisiana state government agencies in the interest of good government practices.

Reproduction and distribution of the data is prohibited. Please refer any requests for data to the Deputy Director for Management, Finance and Interoperability of GOHSEP. This imagery was distributed by the Regional Planning Commission for Jefferson, Orleans, Plaquemines, St. Bernard and St. Tammany Parishes (RPC) with permission from GOHSEP.

GOHSEP and the RPC are not responsible for any errors arising from any use of alterations made to the data. Under no circumstances is resale or distribution of the data permitted.

Mosaics were produced and compressed by the Louisiana State University Coastal Studies Institute.

Imagery Information: The red, green, blue (true color) and near infrared four-band aerial imagery was captured between February 10th and April 1st of 2010 (re-flights for any corrections flown until April 28th, 2010) by Sanborn Map Company, Inc.

The imagery is projected to UTM 15 NAD 83; unit of measure is meters.
The spatial resolution is approximately a six inch pixel.
Any use of the data must be accompanied with this citation and accompanying seals and logos embedded within.

Prepared By: Neel-Schaffer, Inc.

Figure 1

Study Area

Legend

- Logical Termini
- Project Limits
- Roadway Network
- LA/MS State Boundary Line
- XX.XXX, XX.XXX Latitude, Longitude

N

1,500 750 0 1,500 Feet

H.000284 US 90: PEARL RIVER BRIDGES AND H.000286 EAST PEARL RIVER BRIDGE
ROUTE US 90
ST. TAMMANY PARISH, LA

Prepared For:

DOTD
LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

in Louisiana. The horizontal navigation clearance is 90'.

The mechanical system for the vertical lift bridge is in good condition due to continued upkeep and maintenance. For rehabilitation purposes, lubrication and painting will be required. The wire rope system is in poor condition and will need replacement. The electrical components of the vertical lift span will need complete replacement as they are in poor condition and are dated. The bridge barriers appear to be in good condition and do not need to be replaced.

1.2 Project Purpose and Need

The purposes of the proposed action, which have been approved by the Federal Highway Administration (FHWA), are:

- To maintain a system link, in the event of an incident on I-10.
- To improve the structural integrity and functionality of the bridges.
- To support hurricane evacuations

1.3 Reference Datum Conversion

Permit and as-built drawings for the US 90 bridges over the five Pearl River crossings show elevations in Mean Gulf Level (MGL), a commonly used hydrographic datum at that time. A topographic survey was performed by LADOTD survey crew in December 2015 to establish a reference bridge elevation point for each of the bridges. The reference datum allows for conversion of as-built drawing elevation to existing NAVD88 datum in feet.

1.4 Floodplain Consideration

LADOTD guidance for bridge replacements is to locate a replacement structure at not less than the 100-year floodplain plus 1 foot. The 100-year flood elevations have been determined to be significantly higher than the elevation of the existing roadway between all of the bridge sites. Based on the 2008 Preliminary Flood Insurance Rating Map (FIRM), the 100-year floodplain elevation at the US 90 crossing of the West Pearl River is elevation 18.13 NAVD88. The low chord elevation of the replacement West Pearl River Bridge using floodplain guidance is elevation 19.13 converted to NAVD88.

Additionally, LADOTD provided storm surge and wave height estimates for each bridge location. The storm surge plus wave action plus one foot elevation for the West Pearl River bridge is 10.86 NAVD88.

1.5 Navigation Clearance above Mean High Water

The United States Coast Guard (USCG) utilizes the National Oceanic and Atmospheric Administration (NOAA) derived determinations for Mean High Water

(MHW) datum to establish vertical navigation clearances for bridges. In the United States, MHW is the average of all the high water heights observed over a period of 19 years (for the East and West Pearl Rivers, 1983-2001) and is referred to as the National Tidal Datum Epoch.

NOAA determined mean high water is elevation 1.35 NAVD88 for the West Pearl River.

1.6 Establishment of the Planning Elevation for the Five Bridges

Table 1 summarizes the results of a datum conversion process undertaken to rectify the elevations provided by varying sources using differing datum to NAVD88. All elevations hereafter referenced are shown in NAVD88. The West Pearl River bridge was constructed with a low chord elevation of 12.20 feet NAVD88. The FEMA DFIRM condition controls the design elevations for the West and East Pearl Rivers. The proposed West Pearl River bridge low chord elevation using the 100-year DFIRM plus one foot criteria for the fixed span components of the movable span alternatives exceeds the existing low chord elevation by 6.93 feet.

Detailed notes on datum conversions are included below. Only two benchmarks at the West Pearl River bridge were recovered in the project area for this analysis. Assuming the rivers are hydraulically connected, the conversions for the West Pearl River were applied to the other four rivers.

Table 1: Summary of Datum Conversion Elevations

		West Pearl	West Middle Pearl	Middle Middle Pearl	East Middle Pearl	East Pearl
Existing Elevations (NAVD88) - see notes below for datum conversion						
	Mean High Water [1,2,3]	1.35	1.35	1.35	1.35	1.35
	Existing Low Chord [6]	12.20	11.37	11.37	11.37	12.22
	Clearance above Mean High Water	10.85	10.02	10.02	10.02	10.87
Design Considerations (NAVD88) - controlling condition in bold						
1	Storm Surge + Wave Height + 1 foot [4,5]	10.86	**12.51**	**13.23**	**13.31**	12.60
2	100-year + 1 foot [7]	**19.13**	20.13	21.14	21.14	**18.14**
3	Mean High Water (1.35) + Suggested Clearance (10') [1,3,8]	11.35	11.35	11.35	11.35	11.35

Source: Neel-Schaffer, Inc.

Datum Conversion Notes:

1. Per NOAA website, at West Pearl River Station the Mean High Water elevation is 3.841 meters (12.60 feet) below benchmark 141.

2. Per NOAA website, at West Pearl River Station the Mean High Water elevation is 1.413 meters (4.64 feet) below benchmark 1294 A 1980.

3. Therefore, Mean High Water elevation in NAVD88 is 13.95 - 12.60 = 1.35 using benchmark 141. Benchmark 1294 A 1980 yields similar results to within 0.05 feet. Use 1.35 as elevation of Mean High Water in NAVD88.

4. Per NOAA website, using Station Datum, Mean Sea Level is 0.28' below Mean High Water. Therefore, Mean Sea Level in NAVD88 is 1.35 - 0.28 = 1.07.

5. DOTD provided storm surge in elevations of Mean Sea Level. To convert to NAVD88, need to add 1.07 to elevations in MSL (assuming MSL elevations were provided for the W. Pearl River station).

6. DOTD-provided as-builts showing estimated bottom chord elevations of 12.83 for the West Pearl, 12.00 for the three Middle Rivers, and 12.85 for the East Pearl. No datum is specified. Finished road elevation is 14.08 at the location of Benchmark 141 (13.95 NAVD88). The benchmark is on the curb, so add 6" (14.08 + 0.50 = 14.58). Therefore, as an estimate, subtract 0.63' from as-built elevations to convert to NAVD88.

7. 100-year flood elevations were taken from the St. Tammany Parish DFIRM maps. The elevations from the map were in NGVD29, and were processed though the NGS VertCon program to obtain NAVD88 elevations. The difference in elevations ranged from 0.125 to 0.144 feet.

8. USCG–provided permit drawings show a clearance of 10.0 feet from mean high water. This agrees with the clearances calculated in the existing conditions; therefore, 10.0 feet clearance is suggested in this design condition as well.

1.7 Current Navigational Usage

This section discusses the existing navigational usage of West Pearl River impacted by the bridge replacement project. The discussion will include existing users, vessel trip frequency, and potential impact to business owners.

Channel Status

The West Pearl River Navigation Project was authorized by the River and Harbor Act of 1935. Construction was completed in 1956. The project initially provided a navigation channel from the mouth of the West Pearl River to the vicinity of Bogalusa, a distance of approximately 58 miles. The 7-foot deep channel had a bottom width of 100 feet in the river sections and 80 feet in the lateral canal sections. Three locks with inside dimensions of 54 feet by 310 feet and two sills controlled water levels.

Commercial navigation on the West Pearl River declined to the extent that maintenance of the channel dimensions could not be economically justified. The last dredging to accommodate commercial traffic was in 1973, and use of the waterway to Bogalusa is now limited to recreational traffic.

In 1995, the West Pearl River Navigation Project was placed in a caretaker status. The United States Army Corps of Engineers (USACE) was directed by Congress to use limited funds to maintain the Project in this status.

Appendix A presents documentation of email correspondence with the Vicksburg District regarding West Pearl River navigation. The USACE indicates that, except for maintenance associated with continued lock operations, there is no maintenance (dredging) performed on any section of the River, and there is none planned.

Existing Commercial Users

Figure 2 shows the land use and zoning abutting the Pearl River system in Louisiana and Mississippi. Except for out parcels as shown on Figure 2, the area between the West Pearl River and the East Pearl River is owned and managed by the Pearl River Wildlife Management Area, part of the Louisiana Department of Wildlife and Fisheries. Except for parcels as noted in Figure 2, St. Tammany Parish zoning along the West Pearl River is for residential purposes.

Table 2 provides a summary of Bridge Tender logs for a representative 1-year period. The navigation logs for 2013-2018 are included as Appendix D.

Table 2
Summary of West Pearl River - Tender Reports
Documenting Bridge Openings
July 2010 - July 2011

Date	Time Open	Time Closed	Direction	Height	Vessel
Jul. 20, 2010	745	755	N	25	Old Blue (Buddy Temple) - trawler
Jul. 30, 2010					MAINTENANCE OPENING
Aug. 1, 2010	905	915	S	25	Old Blue Shrimp Boat
Sep. 15, 2010	1105	1115	N	25	Old Blue Shrimp Boat
Sep. 16, 2010	705	715	S	25	Old Blue Shrimp Boat
Oct. 15, 2010					MAINTENANCE OPENING
Nov. 20, 2010					MAINTENANCE OPENING
Dec. 3, 2010	920	935	N	30	Small barge with backhoe (Pearl River Navigation Co.)
Jan. 11, 2011	840	850	N	15	Splash Madison yacht
Jan. 11, 2011	1020	1030	S	15	Splash Madison yacht
Feb. 3, 2011	1000	1010	S	20	Barge with backhoe
Mar. 16, 2011	919	929	S	15	Houseboat
Mar. 30, 2011					MAINTENANCE OPENING
Apr. 1, 2011	655	710	N	15	Houseboat
Apr. 25, 2011					MAINTENANCE OPENING
May 30, 2011					MAINTENANCE OPENING
Jun. 15, 2011	1515	1525	S	25	Blue Dog Shrimp Boat
Jun. 16, 2011	1600	1610	N	25	Blue Dog Shrimp Boat
Jul. 1, 2011	735	745	S	25	Blue Dog Shrimp Boat

Source: Neel-Schaffer, Inc.

The following commercial users of the West Pearl River were identified from bridge tender logs and communications with local businesses:

- Durwood Dunn Construction
- Pearl River Eco-tours
- Cajun Encounters Tours

Durwood Dunn Construction has a laydown yard along Camp Road with canal access to the West Pearl for barge storage. However, per the company, the River is too shallow upstream of the US 90 bridge for their vessels. They have no need to cross under the bridge and do not foresee a future scenario in which they would.

Pearl River Eco-tours has canal access to the West Pearl River south of US 90. Cajun Encounters Eco-tours operates from west of the West Pearl River, and launches tours of various sizes from both sides of the US 90 bridge. Both companies utilize the entire Pearl River system. The vessels used in the eco-tour businesses are longer than 21 feet and the larger vessels accommodate up to 25 persons. The vessels require a vertical navigation clearance of 8 feet.

Review of annual cargo movements

There is no cargo transported along the West Pearl River. Consequently, there is no cargo requiring disassembly to pass under the current structure.

Projected changes in waterway usage based upon anticipated waterway improvement projects

None.

Impact to vessel owners that would be precluded from transiting the waterway if a proposed bridge project is authorized

Two bridge concepts are under consideration, a fixed span structure providing 50’ vertical clearance above MHW and movable span concepts providing 50’ vertical navigation clearance in the position open for navigation.

For the movable span concepts, utilizing 100-year floodplain plus 1-foot elevation as shown in Table 1, the low chord of the bridge above the navigation channel will be set at elevation 19.3’ or higher. This elevation is at least 6.93 feet higher than the low chord elevation of the existing bridge. Therefore, none of the current vessels that use this waterway would be impacted. The increase in navigation clearance may support the use of larger vessels by the eco-tour businesses.

NOTE: Logical Termini are the intersections of US 90 with US 190 and Kelly Rd/7th Ave and latitude and longitude data are in decimal format

Stennis Space Center

Port Bienville

30.2745, -89.5961

30.2280, -89.6780

1 2 3 4 5

N

Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

Legend

- Logical Termini
- Pearl River Bridges
- Project Limits
- XX.XXX, XX.XXX Latitude, Longitude
- Stennis Buffer Zone

Zoning Classification

- Suburban (A-1 thru A-3)
- Residental (A-4 thru A-8, MD-1)
- Animal Training Housing
- Public/Community/Recreational (WMA)
- Education (Primary and Secondary)
- Commercial/Service
- Industrial
- Neighborhood Institutional
- Planned Unit Development (PUD)

Figure 2
Land Use and Zoning

8,000 4,000 0 8,000 Feet

H.000284 US 90: PEARL RIVER BRIDGES AND
H.000286 EAST PEARL RIVER BRIDGE
ROUTE US 90
ST. TAMMANY PARISH, LA

Prepared For:

DOTD
LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

Prepared By: Neel-Schaffer, Inc.

Upstream and Downstream Clearances

The existing US 90 lift span structure provides a 50-foot vertical clearance above mean high water and a 90-foot horizontal navigation channel. The existing low chord elevation is 12.20 feet NAVD88.

Overhead transmission lines cross the West Pearl River in three locations between the US 90 bridge and the I-10 bridge. From North to South:

- Entergy owns a transmission line crossing just south of I-10. The clearance of the power lines exceeds the clearance of the I-10 bridge.
- Washington-St. Tammany Electric Cooperative (WSTE) owns a line crossing at the Indian Village subdivision, where a line crosses the River to camps on the east bank. This crossing consists of a 60 foot pole on the west bank and a 70 foot pole on the east bank.
- WSTE also owns a crossing at US 90, and consists of 80 foot poles on both sides of the River.

The I-10 bridge provides vertical clearance of 35 feet above high water and a horizontal clearance of 106 feet. The 1-59 bridge also provides a 35 foot vertical clearance above high water, and a 135 foot horizontal clearance is provided.

There is a Norfolk Southern rail crossing of the West Pearl immediately upstream of I-59. The bridge originally was a swing span structure. However there has been change in permit status converting the Norfolk Southern swing span rail crossing of the West Pearl to a fixed span. The new permit allows the structure to operate as a fixed span structure with vertical clearance set at 7 feet above mean high water, elevation 16.27 NGVD 29.

Downstream of the US 90 bridge, the West Pearl River flows into the Rigolets waterway. There is a CSX Transportation swing span bridge situated within the Rigolets channel with unrestricted vertical clearance and a horizontal clearance of 153 feet. The bridge provides access to the Intracoastal Waterway.

Design Vessel

A query was made to the River Operations Branch, Operations Division, Vicksburg District, USACE to provide documentation regarding the West Pearl River Navigation Project design vessel. The USACE did not respond to this request.

Specific Vessel Transit

There is no planned levee maintenance, bridge work, channel maintenance, or emergency operations upstream of the US 90 bridge that requires certain vessels to transit the waterway. However, unless advised to the contrary by the USACE, planning for the bridge should consider navigation as may be required in support of future upstream channel maintenance or dredging.

Current "governing limitation" for navigation on the waterway

There are no downstream structures or power lines governing navigation on the waterway. The current bridge is the most restrictive structure from the Gulf of Mexico to US 90.

Upstream of the US 90 bridge, the I-10 and I-59 structures limit vertical navigation to 35’ clearance above high water. Also, there has been change in permit status converting the Norfolk Southern swing span rail crossing of the West Pearl (just upstream of I-59) to a fixed span. The lock system supporting the Pearl River Navigation upstream of I-59 limits navigation to 65-foot horizontal clearance.

What is the most restrictive horizontal clearance on the waterway? This may be bridge piers on another bridge downstream, it may be a navigational lock, it may be a man-made channel, it may be the actual width of the narrowest portion of the waterway.

The most restrictive horizontal clearance is the natural narrowing of the waterway upstream from the existing West Pearl River bridge. For navigation within the Pearl River Navigation Project locks, the 65-foot lock width is the limiting horizontal clearance.

Historic Vessel Collision Information

The National Transportation Safety Board issues a Marine Accident Report following each investigation. These reports are available online for reports issued since 1996. The reports listing is sortable by the event date, report date, city, and state at the following website.

http://www.ntsb.gov/investigations/AccidentReports/Pages/marine.aspx

The website was searched March 31, 2016, sorted by state. The Louisiana incident reports were reviewed and there were no reports associated with marine incidents on the West Pearl River.

1.8 Recommended Clearances associated with Replacement US 90 Bridge Crossing of the West Pearl River

The bridge tender logs document the very limited navigation upstream by vessels having vertical navigation requirements approaching 35 feet. Also, although the bridge tender logs do not document horizontal navigation requirements for individual vessels, the work barge was most likely the vessel requiring the widest horizontal clearance. These types of barges typically range between 40 feet to 50 feet in width.

There are restrictions on navigation upstream. These include a navigation channel that has not been maintained, 35-foot vertical clearance upstream above high water at

the I-10 and I-59 bridges, a fixed span Norfolk Southern crossing of the West Pearl just upstream of I-59, as well as a navigation lock system supporting the Pearl River Navigation Project which limits navigation to 65-foot horizontal clearance.

Finally, West Pearl River Navigation Project was placed in a caretaker status in 1995 and the USACE was directed by Congress to use limited funds to maintain the Project in this status.

Considering the legal status of the West Pearl River Navigation Project, the limited marine traffic transiting the bridge, the documented navigation requirements of the traffic during the reporting period and the upstream navigation restrictions, there are opportunities to petition the USCG to modify the current vertical navigation limits on a future bridge. There will be considerable construction cost savings to the LADOTD if less restrictive navigation clearances can be achieved.

The USCG process for requesting navigation clearances less restrictive than existing includes the issuance of a Solicitation of Views (SOV) to all upstream property owners who may be affected by a change in allowed navigation limits.

The planning for the new bridge will proceed using the existing 50-foot vertical clearance. Simultaneously, coordination with the USCG will investigate the possibility of reducing the vertical clearance to 35-feet. Considering the existing upstream navigation restrictions, 35-foot vertical clearance over high water is an appropriate target elevation.

1. Vertical navigation clearance provided will be 50 feet above mean high water (elevation 1.35 NAVD88). For movable bridge alternatives, the clearance of the bridge closed to navigation will be set at 100-year flood plus 1-foot (elevation 19 NAVD88).
2. Horizontal Clearance will be 90-foot as currently provided by the existing lift span.
3. Considering the Environmental Assessment alternatives analysis,
    a. Temporary replacement bridge alternatives will retain the minimum current 90-foot horizontal channel.
    b. Permanent fixed span replacement bridge alternatives will provide 50 foot vertical clearance above mean high water and a 90 foot horizontal clearance.
    c. Movable span structures will provide minimum low chord elevation 19 NAVD88 on their fixed span components.
    d. Replacement structures to be offset and situated within the channel as required to allow for the continued operation of the existing bridge during construction of the replacement structure.

Impacts of Proposed Bridge Clearances on Present and Prospective Upstream Commercial Activity

The proposed bridge clearances will not impact present users of the waterway. Based on Wildlife Management Area ownership of upstream properties, and residential zoning of above stream out parcels, prospective upstream commercial activities (jobs, economic growth and development) are limited to eco-tour businesses that utilize the waterway. There are no existing or planned commercial/industrial growth and developments negatively affected by the proposed clearances.

Discussions with tour companies that use the River show that, as long as the proposed clearances meet or exceed the present clearance of the existing bridge in the closed position, their businesses will not be affected. Comments were received that, should the vertical clearances be increased, larger tour boats could be built and used on the River. Applying the 100-year floodplain plus 1 foot criteria, the clearance will be increased by 6.93 feet.

There are no existing facilities on the waterway that are or could be considered critical infrastructure, key resource, or important/unique US industrial capabilities.

1.9 Environmental Assessment Alternatives

The build alternatives developed for the Environmental Assessment conform to the existing navigation clearances. However, the vertical clearance of the upstream I-10 West Pearl River span is 35 feet above high water. LADOTD may pursue adjusting the vertical clearance of the US 90 span from 50 feet to 35 feet at a later date. This decision would include future consultations with the USCG, and upstream property owners would be notified as part of the USCG consultations.

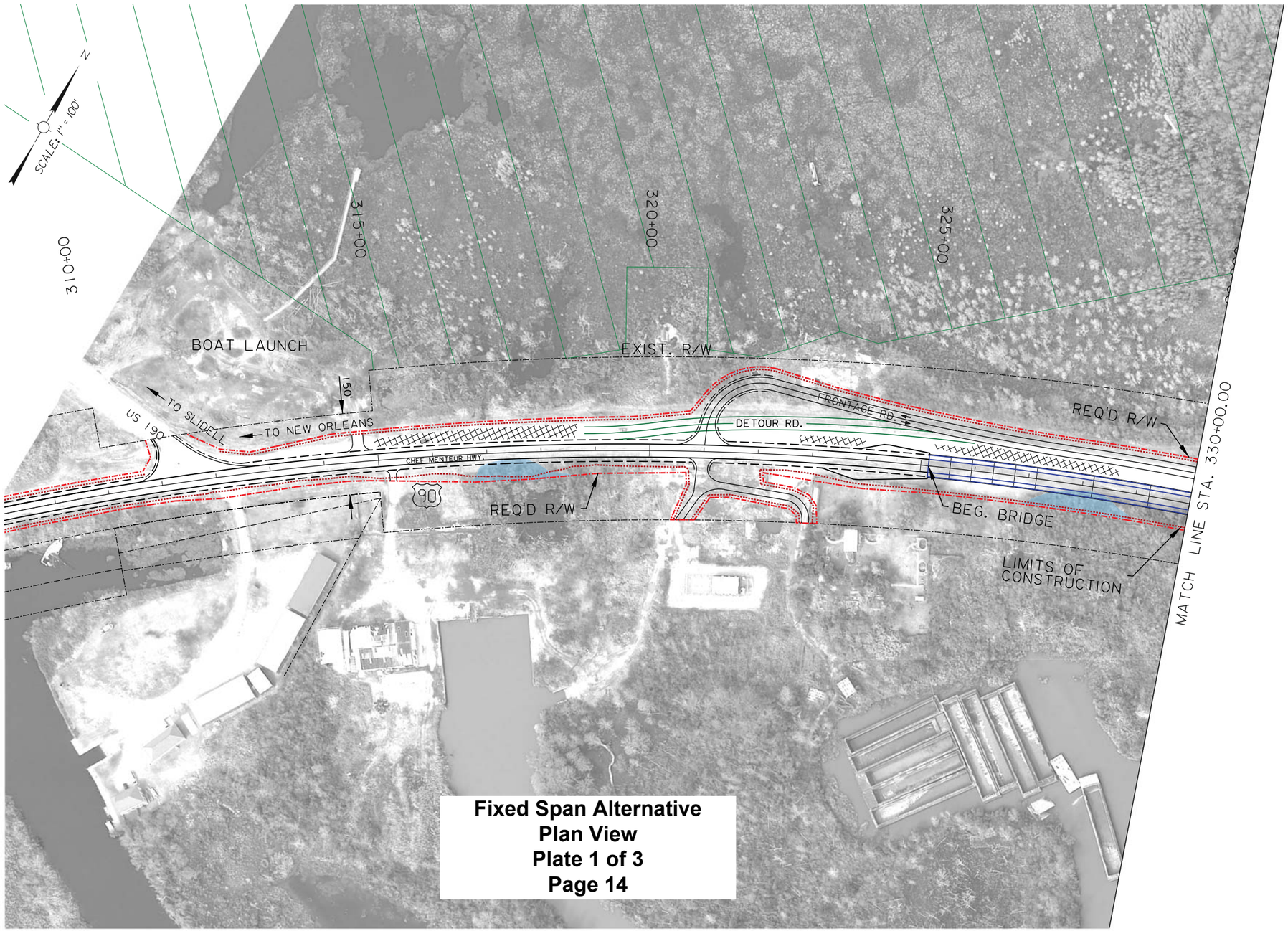
1.9.1 Fixed Span Bridge Alternative

Fixed Span Plan and Profile Sheets are enclosed. The fixed span alternative is located at a 52.5 foot offset downstream from the existing bridge centerline. The new fixed span structure will provide 50-foot vertical clearance above NOAA Mean High Water of 1.35 NAVD88. The existing 90’ wide channel will be retained.

West of the river, a new road is constructed to the north of existing US 90 which ties back to the existing US 90 centerline. This road provides continued access to the existing bridge during construction of the new fixed span bridge. Access to Camp Road remains essentially as it is in the existing condition. No additional right-of-way is required.

12/6/2016 10:07:13 AM

US 90 EA



Fixed Span Alternative
Plan View
Plate 1 of 3
Page 14

PREPARED BY NEEL-SCHAFFER, INC.

Federal Highway Administration

DOTD LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

US 90: WEST PEARL RIVER BRIDGE
FIXED SPAN BRIDGE ALTERNATIVE F-I
STATE PROJECT NO. H.000284
ST. TAMMANY PARISH, LA

LEGEND

- HISTORIC STRUCTURE
- WILDLIFE MANAGEMENT AREA
- WETLANDS (EXCLUDED WATER OF THE U.S.)
- REMOVAL
- LIMITS OF CONSTRUCTION
- REQ'D R/W

SHEET NUMBER		
PARISH	CONTROL SECTION	STATE PROJECT
ST. TAMMANY		H.000284
DESIGNED / CHECKED	DETAILED / CHECKED	DATE / SHEET
		12-05-16 / 1 OF 3

NO.	REVISION DESCRIPTION	DATE	BY

STATE OF LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT

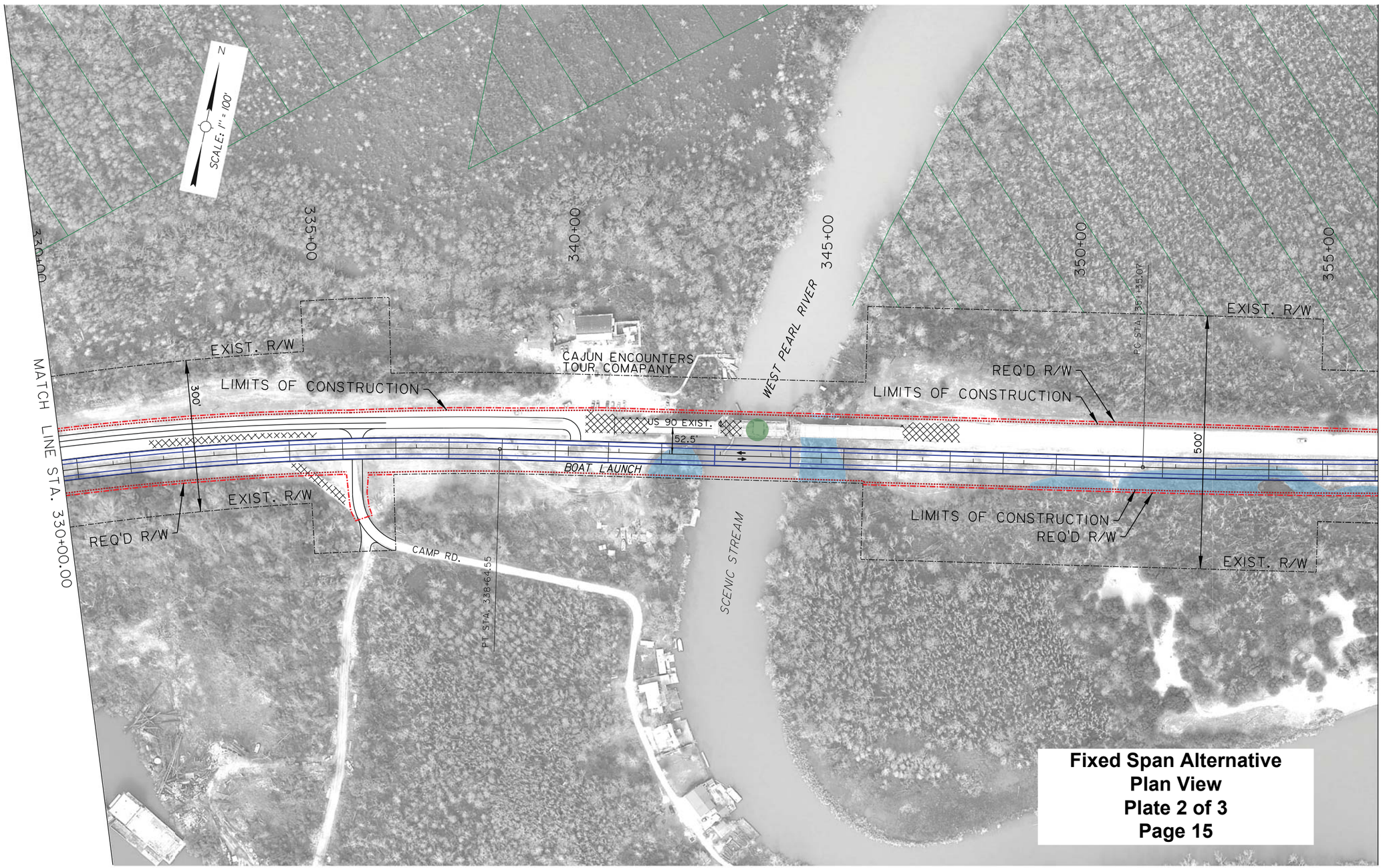
WEST PEARL RIVER BRIDGE
FIXED BRIDGE ALTERNATIVE
PLAN VIEW
US 90 BRIDGES

DOTD LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

Lay_ WP_Fix_1.dgn

12/6/2016 10:07:20 AM

US 90 EA



100 50 0 100
GRAPHIC SCALE
SCALE: 1"=100'

Fixed Span Alternative
Plan View
Plate 2 of 3
Page 15

PREPARED BY NEEL-SCHAFFER, INC.

Federal Highway Administration

DOTD LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

US 90: WEST PEARL RIVER BRIDGE
FIXED SPAN BRIDGE ALTERNATIVE F-1
STATE PROJECT NO. H.000284
ST. TAMMANY PARISH, LA

LEGEND

- HISTORIC STRUCTURE
- WILDLIFE MANAGEMENT AREA
- WETLANDS (EXCLUDED WATER OF THE U.S.)
- REMOVAL
- LIMITS OF CONSTRUCTION
- REQ'D R/W

SHEET NUMBER	
PARISH	ST. TAMMANY
CONTROL SECTION	
STATE PROJECT	H.000284
DESIGNED / CHECKED	
DETAILED / CHECKED	
DATE / SHEET	12-05-16 / 2 OF 3

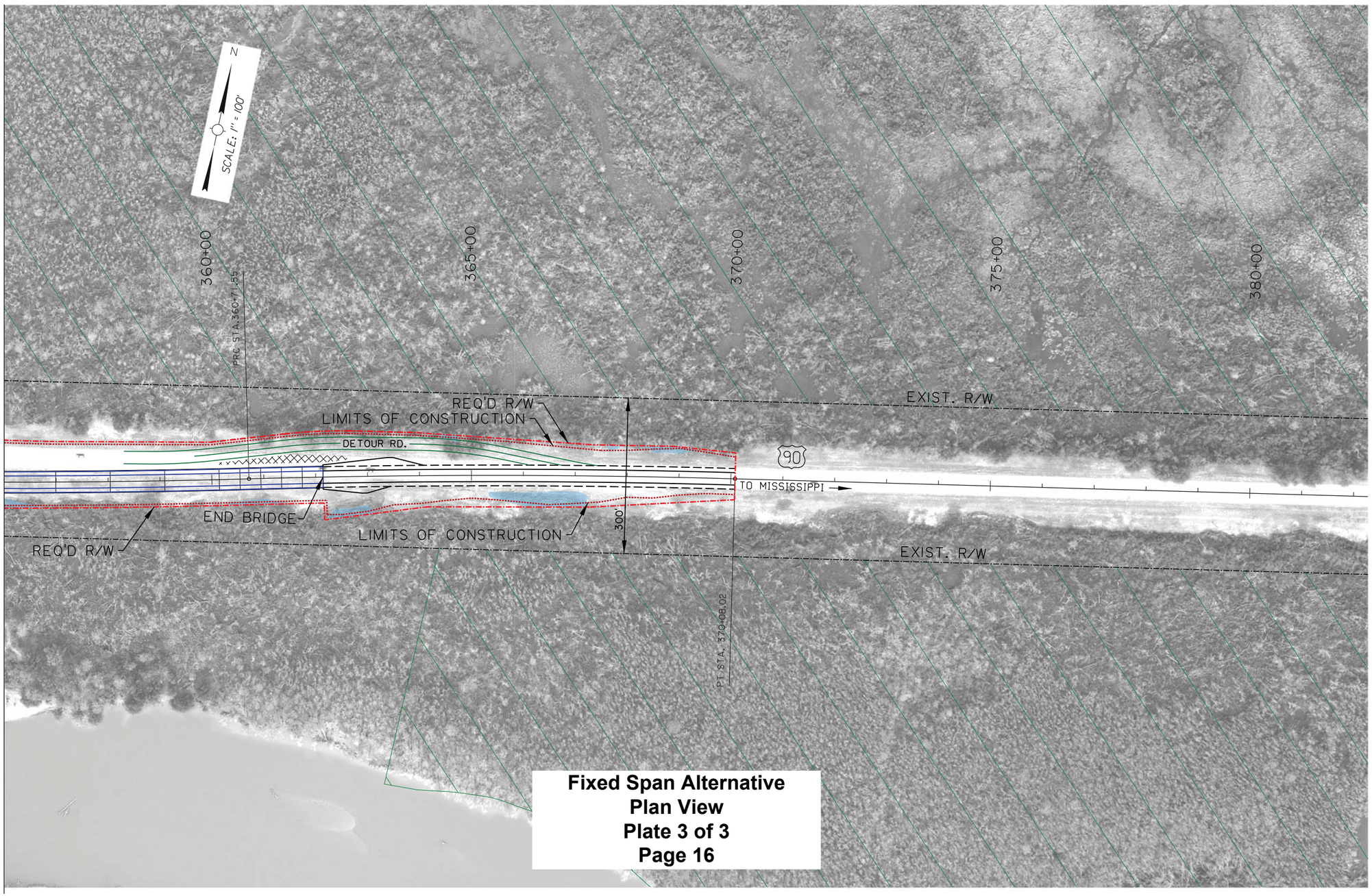
REVISION DESCRIPTION | DATE | BY

STATE OF LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT

WEST PEARL RIVER BRIDGE
FIXED BRIDGE ALTERNATIVE
PLAN VIEW
US 90 BRIDGES

Lay_ WP_Fix_2.dgn

12/6/2016 10:07:29 AM



Fixed Span Alternative
Plan View
Plate 3 of 3
Page 16

100 50 0 100
GRAPHIC SCALE
SCALE: 1"=100'

PREPARED BY NEEL-SCHAFFER, INC.

Federal Highway Administration

DOTD LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

US 90: WEST PEARL RIVER BRIDGE
FIXED SPAN BRIDGE ALTERNATIVE F-I
STATE PROJECT NO. H.000284
ST. TAMMANY PARISH, LA

LEGEND
- HISTORIC STRUCTURE
- WILDLIFE MANAGEMENT AREA
- WETLANDS (EXCLUDED WATER OF THE U.S.)
- REMOVAL
- LIMITS OF CONSTRUCTION
- REQ'D R/W

SHEET NUMBER	
PARISH	ST. TAMMANY
CONTROL SECTION	
STATE PROJECT	
DESIGNED / CHECKED	
DETAILED / CHECKED	
DATE / SHEET	12-05-16 / 3 OF 3

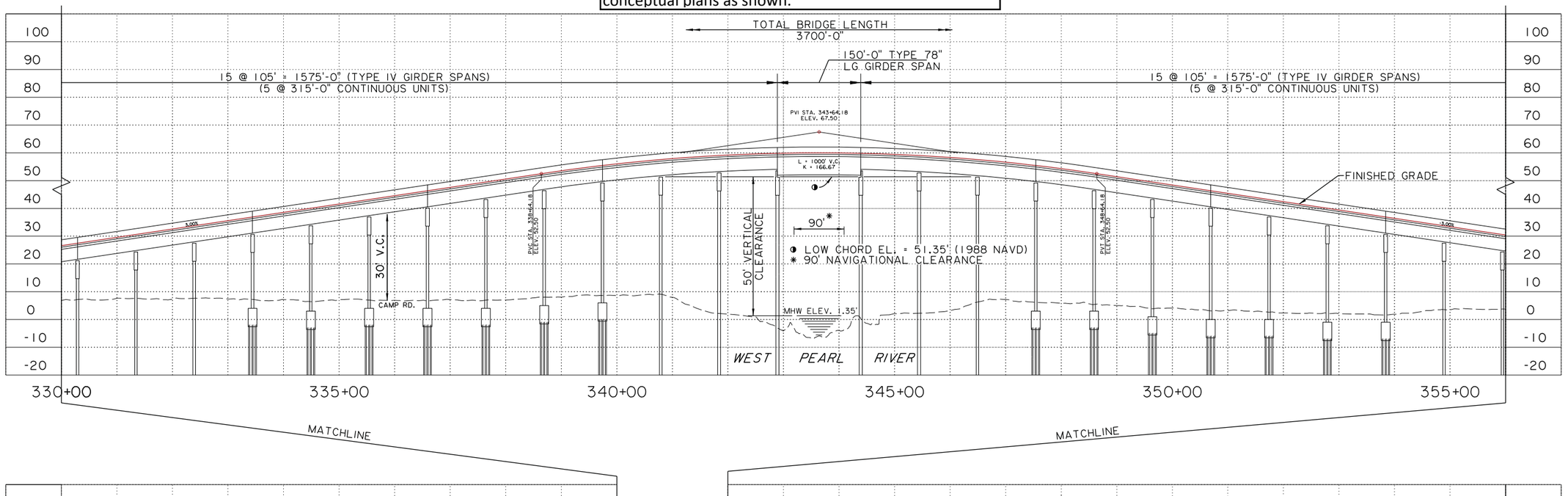
NO.	DATE	REVISION DESCRIPTION	BY

WEST PEARL RIVER BRIDGE
FIXED BRIDGE ALTERNATIVE
PLAN VIEW
US 90 BRIDGES

12/6/2016 10:07:38 AM

US 90 EA

Note 1: The bridge concepts shown (including pier placement and girder selection) are conceptual. During preliminary engineering, the types of girders and the pier placement will be finalized. The selected girders and associated pier placement may differ from the conceptual plans as shown.



PREPARED BY NEEL-SCHAFFER, INC.

Federal Highway Administration

DOTD LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

US 90: WEST PEARL RIVER BRIDGE
FIXED SPAN BRIDGE ALTERNATIVE F-1
STATE PROJECT NO. H.000284
ST. TAMMANY PARISH, LA

Fixed Span Alternative
Profile View
Plate 1 of 1
Page 17

SCALES
HORIZONTAL 1" = 100'
VERTICAL 1" = 20'

SHEET NUMBER

PARISH	CONTROL SECTION	STATE PROJECT
ST. TAMMANY	H.000284	

DESIGNED
CHECKED
DETAILED
CHECKED
DATE 12-05-16
SHEET 1 OF 1

REVISION DESCRIPTION | BY | DATE | NO.

STATE OF LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT

WEST PEARL RIVER BRIDGE
FIXED BRIDGE ALTERNATIVE
PROFILE VIEW

US 90 BRIDGES

Pro_ WP_Fix_1.dgn

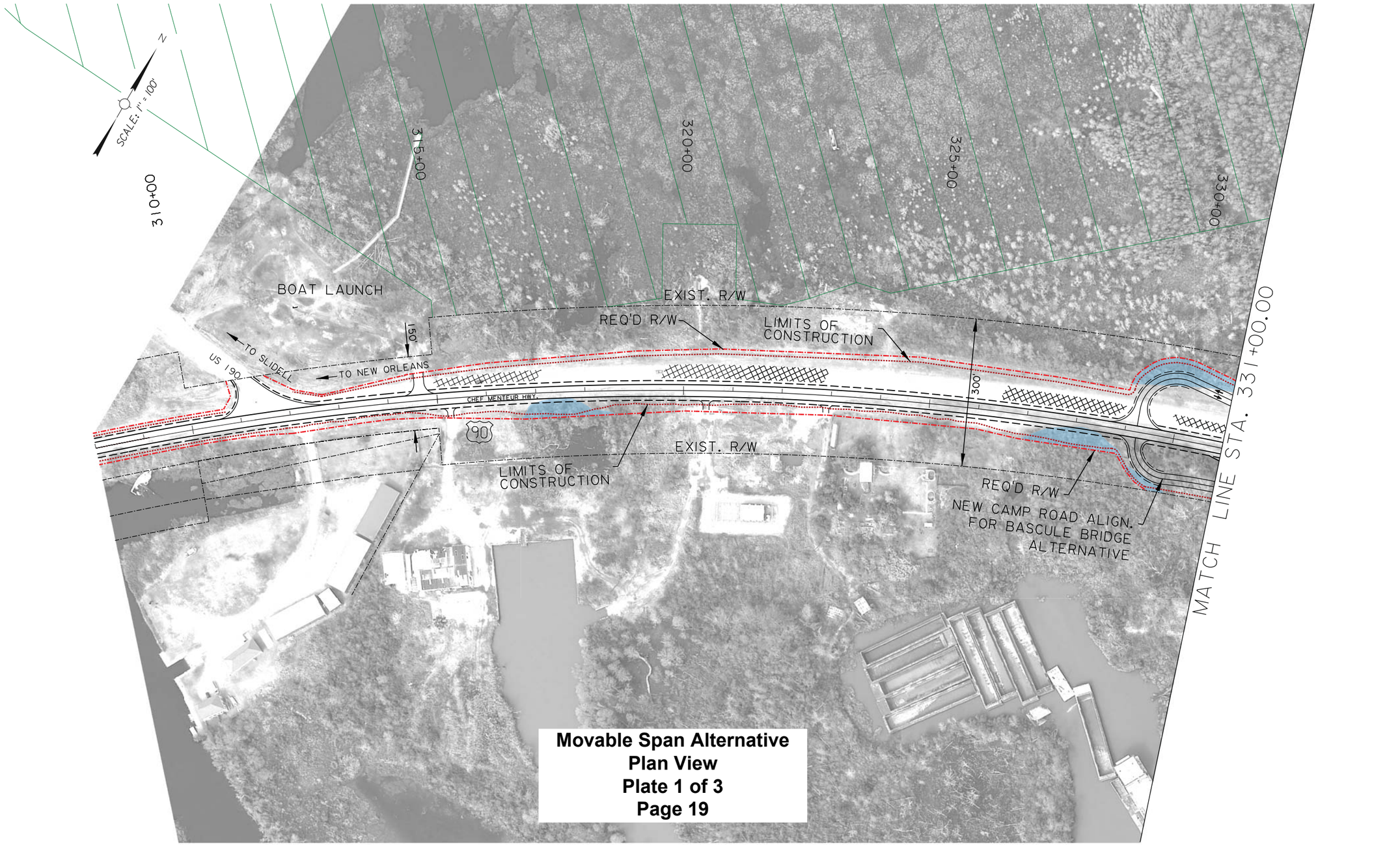
1.9.2 Movable Span Bridge Alternative

Movable span alternatives located at a 52.5 foot offset downstream from the existing bridge centerline. The navigation channel retains 90 foot clearance. The vertical clearance with the movable span in the open position is 50 feet above NOAA Mean High Water of 1.35 NAVD88. The clearance of the bridge in closed position would be at the 100-year flood plus 1-foot elevation, which is 19 NAVD88. This would place the bridge low chord clearance approximately 6.9' higher than the elevation of the existing lift span in the closed position. Both lift span and bascule span options have been developed. Movable Span Plan and Profile Sheets as well as sheets detailing each movable bridge concept are presented.

A new road is constructed to the north of existing US 90 which ties back to the existing US 90 centerline. This new road provides continued access to the existing bridge during construction of the new movable span bridge. A new road is also constructed to the south of the existing US 90 centerline to provide continued access to Camp Road. No additional right-of-way is required.

12/6/2016 10:07:39 AM

US 90 EA



Movable Span Alternative
Plan View
Plate 1 of 3
Page 19

100 50 0 100
GRAPHIC SCALE
SCALE: 1"=100'

PREPARED BY NEEL-SCHAFFER, INC.

Federal Highway Administration

DOTD LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

US 90: WEST PEARL RIVER BRIDGE
MOVABLE BRIDGE ALTERNATIVES
STATE PROJECT NO. H.000284
ST. TAMMANY PARISH, LA

LEGEND

- HISTORIC STRUCTURE
- WILDLIFE MANAGEMENT AREA
- WETLANDS (EXCLUDED WATER OF THE U.S.)
- REMOVAL
- LIMITS OF CONSTRUCTION
- REQ'D R/W

SHEET NUMBER	
PARISH	ST. TAMMANY
CONTROL SECTION	
STATE PROJECT	H.000284
DESIGNED / CHECKED	
DETAILED / CHECKED	
DATE / SHEET	12-05-16 / 1 OF 3

REVISION DESCRIPTION | DATE | BY | NO.

STATE OF LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT

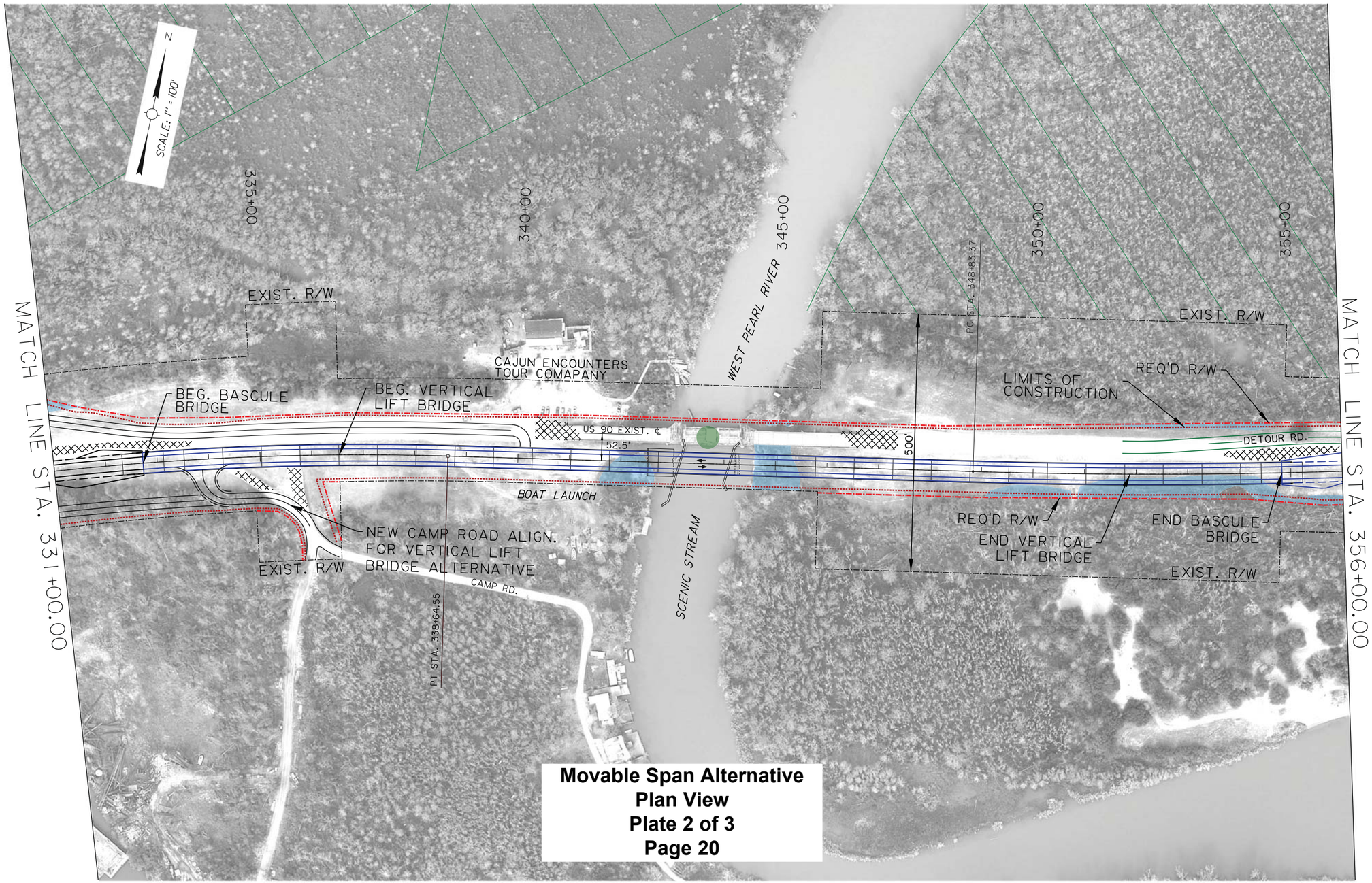
WEST PEARL RIVER BRIDGE
MOVABLE BRIDGE ALTERNATIVES
PLAN VIEW

US 90 BRIDGES

Lay_ WP_Mov_1.dgn

12/6/2016 10:07:46 AM

US 90 EA



Movable Span Alternative
Plan View
Plate 2 of 3
Page 20

PREPARED BY NEEL-SCHAFFER, INC.

Federal Highway Administration

DOTD LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

US 90: WEST PEARL RIVER BRIDGE
MOVABLE BRIDGE ALTERNATIVES
STATE PROJECT NO. H.000284
ST. TAMMANY PARISH, LA

LEGEND

- HISTORIC STRUCTURE
- WILDLIFE MANAGEMENT AREA
- WETLANDS (EXCLUDED WATER OF THE U.S.)
- REMOVAL
- LIMITS OF CONSTRUCTION
- REQ'D R/W

SHEET NUMBER	
PARISH	ST. TAMMANY
CONTROL SECTION	
STATE PROJECT	H.000284
DESIGNED / CHECKED	
DETAILED / CHECKED	
DATE / SHEET	12-05-16 / 2 OF 3

NO.	DATE	REVISION DESCRIPTION	BY

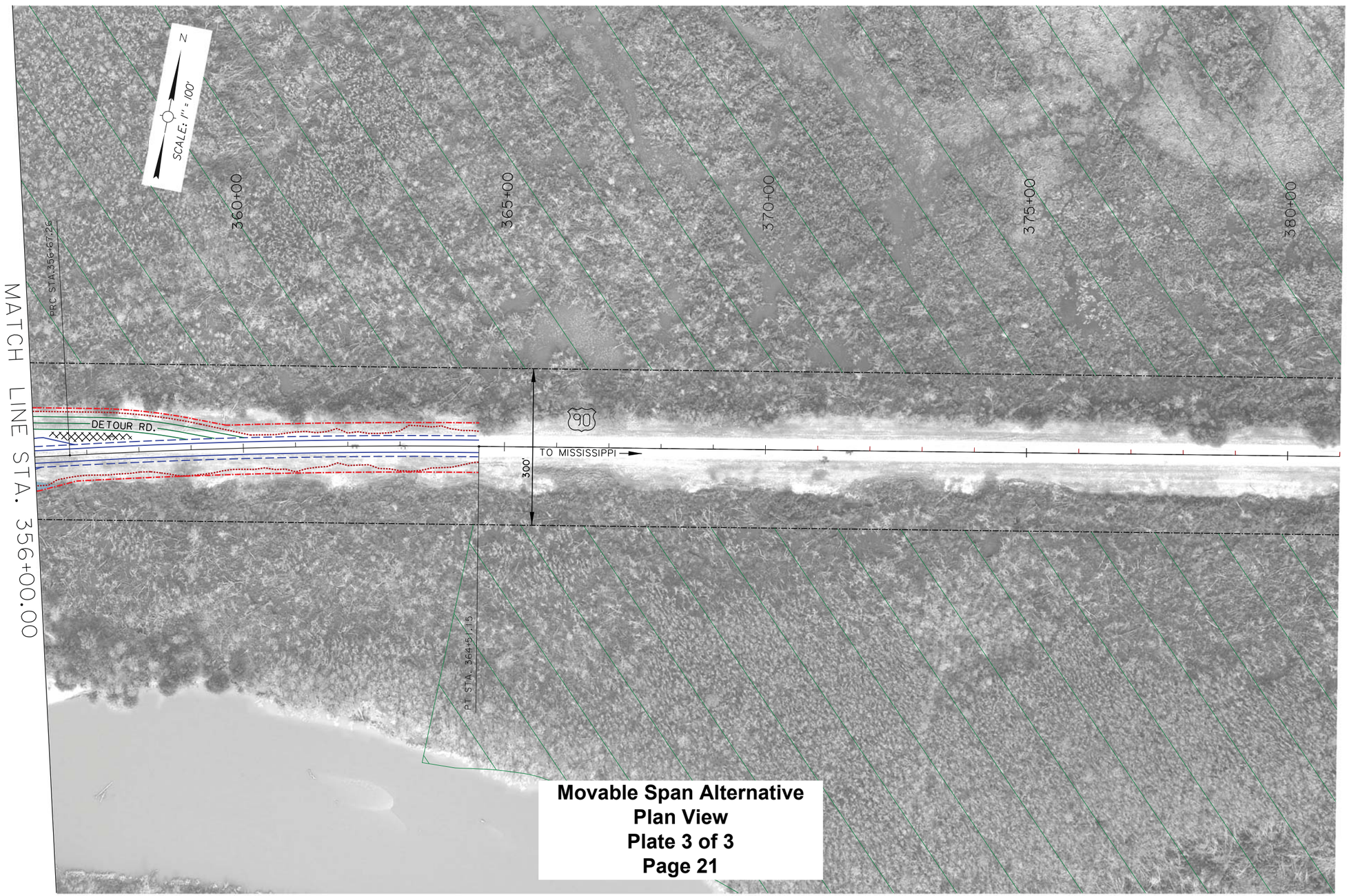
STATE OF LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT

WEST PEARL RIVER BRIDGE
MOVABLE BRIDGE ALTERNATIVES
PLAN VIEW

US 90 BRIDGES

Lay_ WP_Mov_2.dgn

12/6/2016 10:08:00 AM
US 90 EA
Lay_ WP_Mov_3.dgn



100 50 0 100
GRAPHIC SCALE
SCALE: 1"=100'

Movable Span Alternative
Plan View
Plate 3 of 3
Page 21

PREPARED BY NEEL-SCHAFFER, INC.

Federal Highway Administration

DOTD LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

US 90: WEST PEARL RIVER BRIDGE
MOVABLE BRIDGE ALTERNATIVES
STATE PROJECT NO. H.000284
ST. TAMMANY PARISH, LA

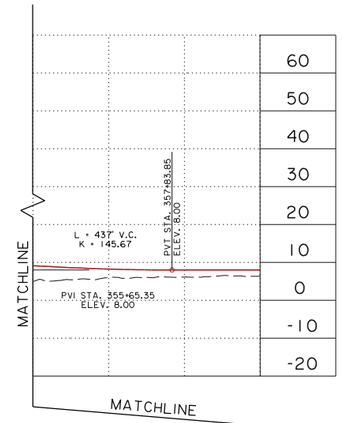
LEGEND
- HISTORIC STRUCTURE
- WILDLIFE MANAGEMENT AREA
- WETLANDS (EXCLUDED WATER OF THE U.S.)
- REMOVAL
- LIMITS OF CONSTRUCTION
- REQ'D R/W

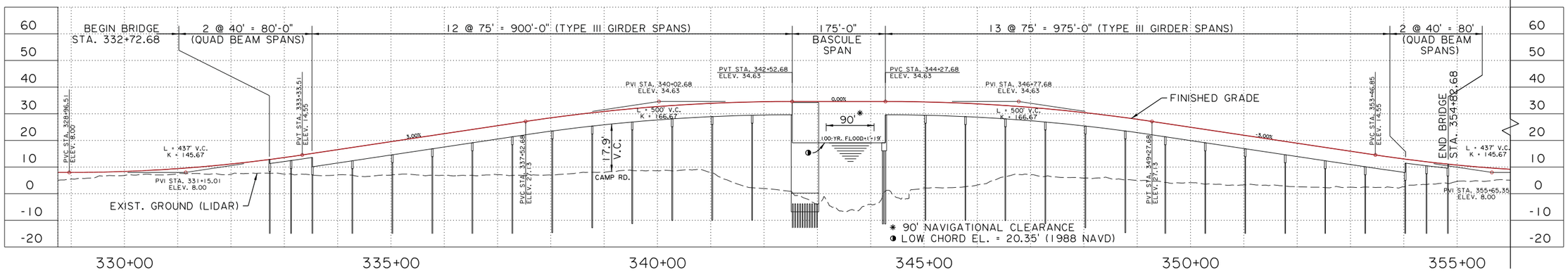
SHEET NUMBER
PARISH: ST. TAMMANY
CONTROL SECTION
STATE PROJECT
DESIGNED
CHECKED
DETAILED
CHECKED
DATE 12-05-16
SHEET 3 OF 3
NO. DATE REVISION DESCRIPTION BY

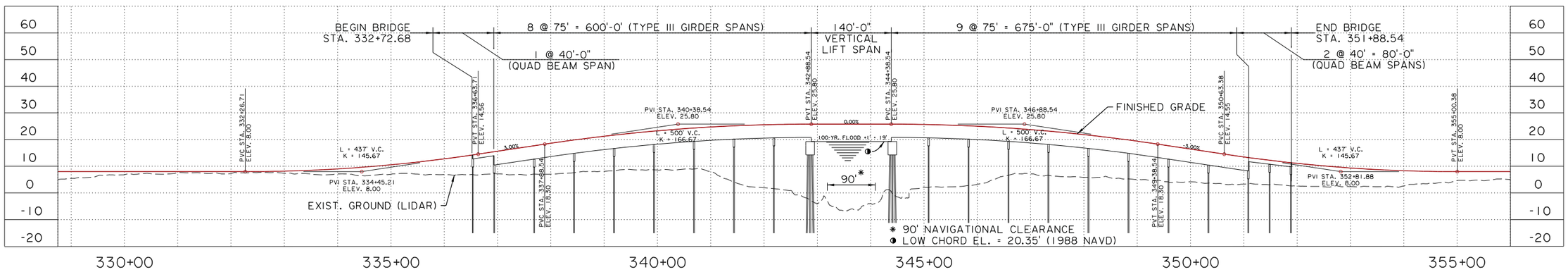
WEST PEARL RIVER BRIDGE
MOVABLE BRIDGE ALTERNATIVES
PLAN VIEW
US 90 BRIDGES

Movable Span Alternative
Profile View
Plate 1 of 1
Page 22

Note 1: The bridge concepts shown (including pier placement and girder selection) are conceptual. During preliminary engineering, the types of girders and the pier placement will be finalized. The selected girders and associated pier placement may differ from the conceptual plans as shown.







PREPARED BY NEEL-SCHAFFER, INC.

Federal Highway Administration

DOTD LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

MOVABLE BRIDGE ALTERNATIVE PROFILES

STATE PROJECT NO. H.000286
US 90: PEARL RIVER BRIDGE
ST. TAMMANY PARISH

SCALES
HORIZONTAL 1" = 100'
VERTICAL 1" = 20'

US 90 EA

Pro_ WP_Mov_2_MAI.dgn

SHEET NUMBER

PARISH: ST. TAMMANY
CONTROL SECTION
STATE PROJECT

DESIGNED
CHECKED
DETAILED
CHECKED
DATE SHEET: 12-05-16 # OF 12

NO. DATE BY REVISION DESCRIPTION

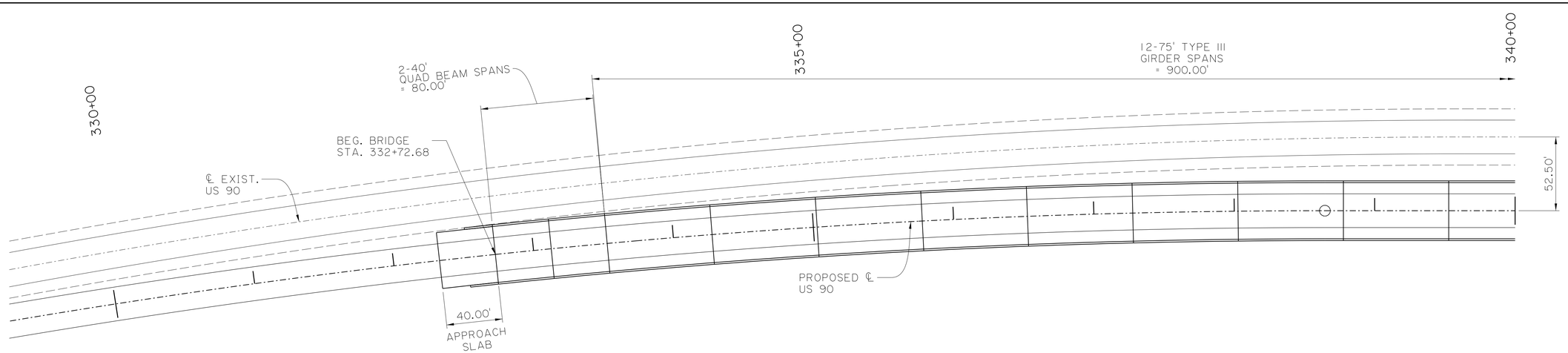
STATE OF LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

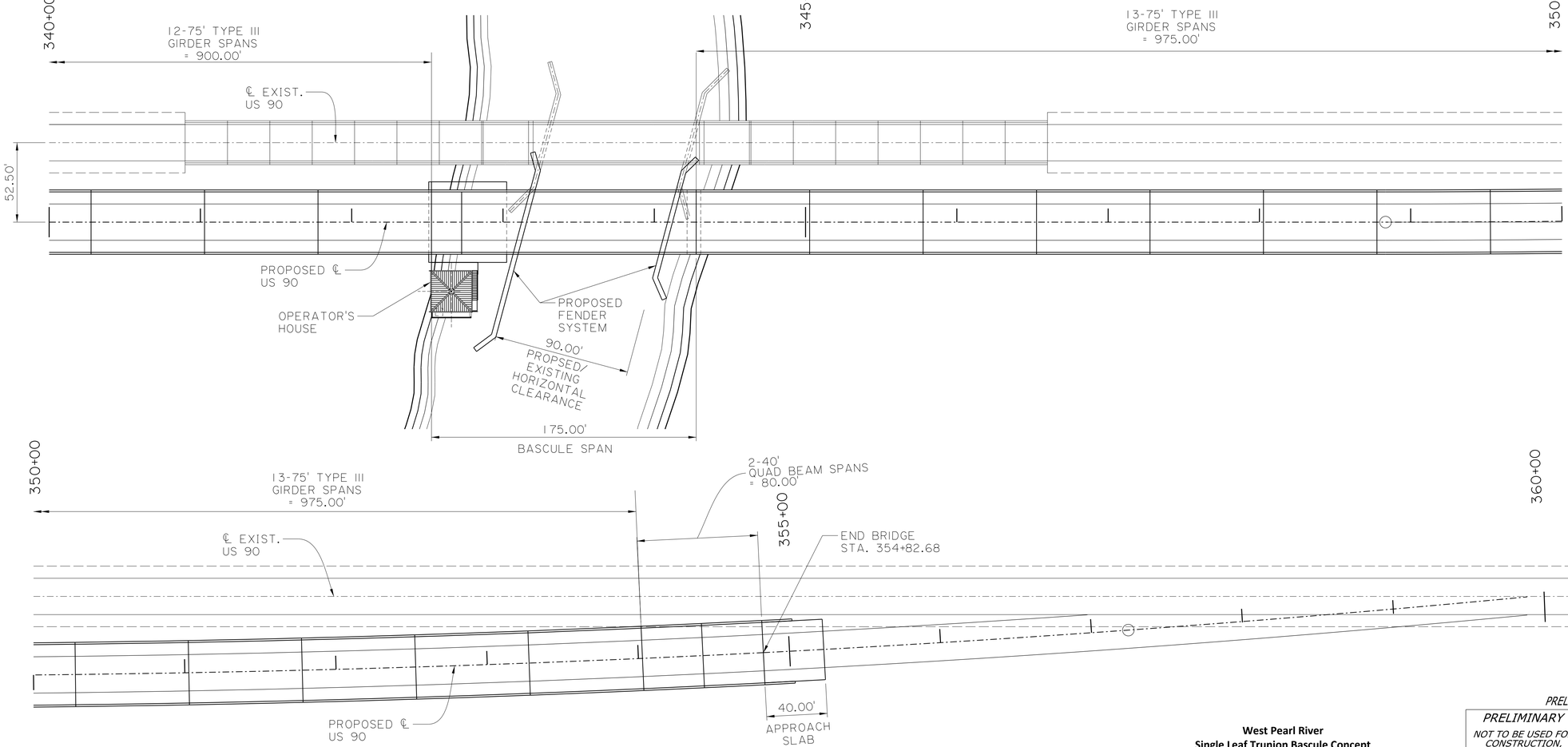
WEST PEARL BRIDGE
MOVABLE ALTERNATIVE PROFILES
US 90 BRIDGES

DOTD

PRELIMINARY PLANS

X:\HUVAL Projects\6106 (US 90 @ Pearl River EA)\05-Working Drawings\02-Border to Print\West Pearl Public Meeting\1_Bascule Plan.dgn 9/12/2016 9:21:15 A





PLAN - SINGLE LEAF TRUNION BASCULE OPTION

SCALE: 1" = 40'

West Pearl River
Single Leaf Trunion Bascule Concept
Sheet 1 of 2
Page 23

PRELIMINARY PLANS

PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION, BIDDING, RECORDATION, CONVEYANCE, SALES OR AS THE BASIS FOR THE ISSUANCE OF A PERMIT.

HUVAL & ASSOCIATES, INC.

ENGINEER: DAVID S. HUVAL
LICENSE #: 9931
DATE: 9/12/2016

SHEET NUMBER: 1

PARISH	CONTROL SECTION	STATE PROJECT
ST. TAMMANY	006-07	H.000284 & H.000286

DESIGNED	MCH	DETAILED	MCH	SERIES NUMBER	1 OF 2
CHECKED	WLH	CHECKED	TMG		

NO.	DATE	REVISION OR CHANGE ORDER DESCRIPTION	BY

SINGLE LEAF
TRUNION BASCULE PLAN
WEST PEARL RIVER
US 90 @ PEARL RIVER EA

DOTD TRANSPORTATION & DEVELOPMENT

HUVAL & ASSOCIATES, INC. Consulting Engineers

PRELIMINARY PLANS

X:\HUVAL Projects\6106 (US 90 @ Pearl River EA)\05-Working Drawings\02-Border to Print\West Pearl Public Meeting\2_Bascule Details.dgn 9/12/2016 9:24:23

340+00

345+00

110.00'
EXISTING
VERTICAL LIFT

EXISTING
FENDER SYSTEM

℄ EXIST. US 90

52.50'

53.25'

40.00'
CLR.

PROPOSED ℄
US 90

75.00'
APPROACH
SPAN
(TYP.)

BASCULE SPAN
MAIN PIER

OPERATOR'S
HOUSE

BASCULE SPAN
REST PIER

STA. 342+52.68

STA. 344+27.68

PROPOSED
FENDER SYSTEM

90.00'
PROPOSED/
EXISTING
HORIZONTAL
CLEARANCE

PLAN - SINGLE LEAF TRUNION BASCULE OPTION

SCALE: 1" = 30'

40.00'
CLR. RDWY.

STEEL GRID
FLOORING

VARIES
15.00'
TO
8.00'

VARIES

SECTION - BASCULE SPAN

SCALE: 1" = 5'

175.00'
SINGLE LEAF
BASCULE SPAN

75.00'
APPROACH
SPAN
(TYP.)

1.79'

119.28'

78.00°

50
30
10
-10

EL. 34.63'

90.00'
HORIZ.
CLR.

BASCULE SPAN
REST PIER

340+00

345+00

BASCULE SPAN
MAIN PIER

51.50'

PROP.
FENDER
SYSTEM

MIN. REQ'D
LOW CHORD
ELEVATION = 19.13'

9.00'

PROFILE - SINGLE LEAF TRUNION BASCULE OPTION

SCALE: 1" = 30'

PRELIMINARY PLANS

PRELIMINARY	*HUVAL & ASSOCIATES, INC.*
NOT TO BE USED FOR CONSTRUCTION, BIDDING, RECORDATION, CONVEYANCE, SALES OR AS THE BASIS FOR THE ISSUANCE OF A PERMIT.	*ENGINEER: DAVID S. HUVAL* *LICENSE #: 9931* *DATE: 9/12/2016*

West Pearl River
Single Leaf Trunion Bascule Concept
Sheet 2 of 2
Page 24

SHEET NUMBER	2
PARISH	ST. TAMMANY
CONTROL SECTION	006-07
STATE PROJECT	H.000284 & H.000286
DESIGNED MCH CHECKED WLH	
DETAILED MCH CHECKED TMG	
SERIES NUMBER	2 OF 2

NO.	DATE	REVISION OR CHANGE ORDER DESCRIPTION	BY

SINGLE LEAF
TRUNION BASCULE DETAILS

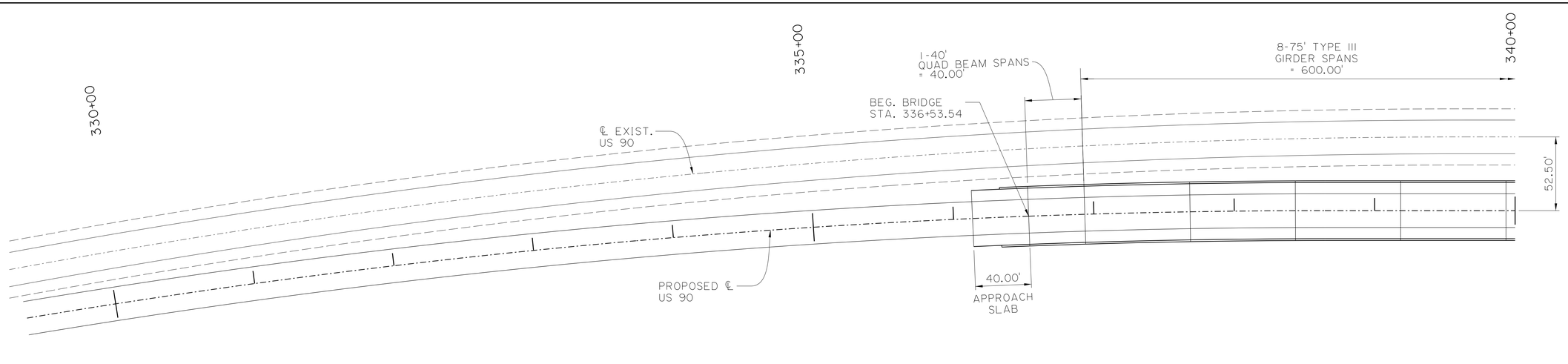
WEST PEARL RIVER

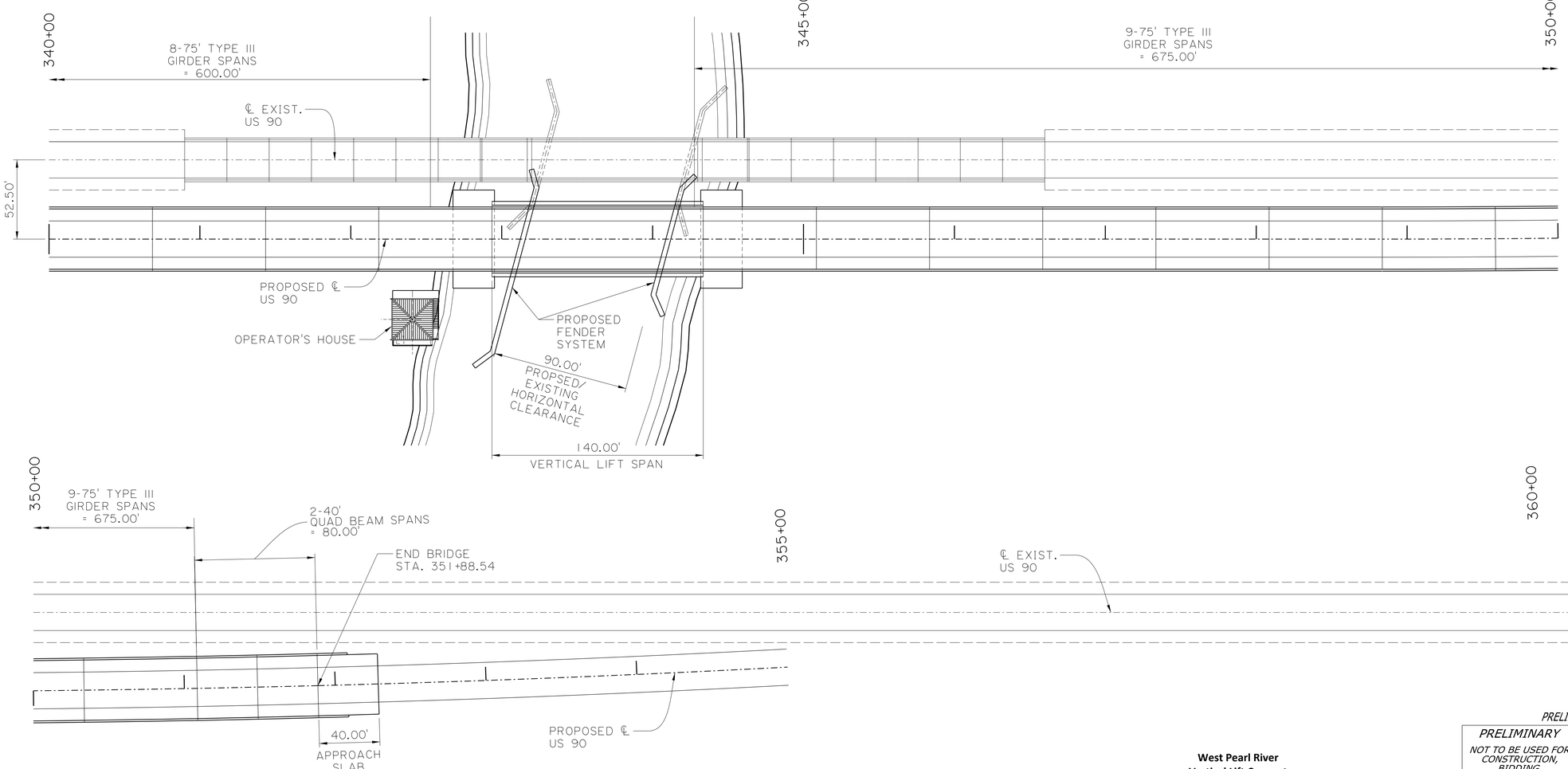
US 90 @ PEARL RIVER E.A.

DOTD
LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

HUVAL
& ASSOCIATES, INC
Consulting Engineers

PRELIMINARY PLANS
X:\HUVAL Projects\6106 (US 90 @ Pearl River EA)\05-Working Drawings\02-Border to Print\West Pearl Public Meeting\3_Vertical Lift Plan.dgn 9/12/2016 10:43:12 AM





PLAN - VERTICAL LIFT OPTION

SCALE: 1" = 40'

West Pearl River
Vertical Lift Concept
Sheet 1 of 2
Page 25

PRELIMINARY PLANS

PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION, BIDDING, RECORDATION, CONVEYANCE, SALES OR AS THE BASIS FOR THE ISSUANCE OF A PERMIT.

HUVAL & ASSOCIATES, INC.

ENGINEER: DAVID S. HUVAL
LICENSE #: 9931
DATE: 9/12/2016

SHEET NUMBER	3
PARISH	ST. TAMMANY
CONTROL SECTION	006-07
STATE PROJECT	H.000284 & H.000286
DESIGNED MCH / CHECKED WLH	
DETAILED MCH / CHECKED TMG	
SERIES NUMBER	1 OF 2

NO.	DATE	REVISION OR CHANGE ORDER DESCRIPTION	BY

VERTICAL LIFT PLAN
WEST PEARL RIVER
US 90 @ PEARL RIVER EA

DOTD TRANSPORTATION & DEVELOPMENT

HUVAL & ASSOCIATES, INC. Consulting Engineers

PRELIMINARY PLANS

X:\HUVAL Projects\6106 (US 90 @ Pearl River EA)\05-Working Drawings\02-Border to Print\West Pearl Public Meeting\4_Vertical Lift Details.dgn 9/12/2016 10:44:52

340+00

345+00

110.00'
EXISTING
VERTICAL LIFT

EXISTING
FENDER SYSTEM

℄ EXIST. US 90

52.50'

65.00'

40.00'
CLR.

PROPOSED ℄
US 90

75.00'
APPROACH
SPAN
(TYP.)

OPERATOR'S HOUSE

℄ STA. 342+93.54

PROPOSED
FENDER SYSTEM

90.00'
PROPOSED/
EXISTING
HORIZONTAL
CLEARANCE

STA. 344+33.54

PLAN - VERTICAL LIFT OPTION
SCALE: 1" = 30'

40.00'
CLR. RDWY.

115"
LIFTING
GIRDER

70"

APPROX.
STRUCTURE
DEPTH

SECTION - VERTICAL LIFT SPAN
SCALE: 1" = 5'

140.00'
VERTICAL LIFT
SPAN

VERTICAL CLEARANCE
PROVIDED ABOVE
M.H.W. = 1.35'

75.00'
APPROACH
SPAN
(TYP.)

50
30
10
-10

EL. 34.63'

50.00'

90.00'
HORIZ.
CLR.

340+00

345+00

VERTICAL
LIFT PIER
(TYP.)

PROP.
FENDER
SYSTEM

MIN. REQ'D
LOW CHORD
ELEVATION = 19.13'

PROFILE - VERTICAL LIFT OPTION
SCALE: 1" = 30'

PRELIMINARY PLANS

PRELIMINARY	*HUVAL & ASSOCIATES, INC.*
NOT TO BE USED FOR CONSTRUCTION, BIDDING, RECORDATION, CONVEYANCE, SALES OR AS THE BASIS FOR THE ISSUANCE OF A PERMIT.	*ENGINEER: DAVID S. HUVAL* *LICENSE #: 9931* *DATE: 9/12/2016*

West Pearl River
Vertical Lift Concept
Sheet 2 of 2
Page 26

SHEET NUMBER	4
PARISH	ST. TAMMANY
CONTROL SECTION	006-07
STATE PROJECT	H.000284 & H.000286
DESIGNED MCH CHECKED WLH	DETAILED MCH CHECKED TMG
SERIES NUMBER	2 OF 2

NO.	DATE	REVISION OR CHANGE ORDER DESCRIPTION	BY

VERTICAL LIFT SPAN
DETAILS
WEST PEARL RIVER
US 90 @ PEARL RIVER EA

DOTD
LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

HUVAL
& ASSOCIATES, INC.
Consulting Engineers

1.10 Proposed Bridge's Impacts to Existing and Potential Navigation

The West Pearl River borders the western side of the Pearl River Wildlife Management Area. The proposed bridge will be at or higher than the existing vertical clearance, and will maintain the existing horizontal clearance. In addition:

- Temporary replacement bridge alternatives will provide for a 50-foot vertical navigation clearance; and retain the minimum current 90-foot horizontal channel.
- Permanent replacement bridge alternatives will provide 50-foot vertical clearance above mean high water and a 90-foot horizontal clearance.
- Movable span structures will provide minimum 19 feet vertical clearance on their fixed span components. This will be 6.93 feet higher than the existing clearance.
- Replacement structures to be offset and situated within the channel as required to allow for the continued operation of the existing bridge during construction of the replacement structure.
- The proposed bridge does not completely obstruct passage of any existing waterway users or access to waterborne facilities.
- The proposed bridge does not impact present and prospective commercial activity on the waterway.
- The proposed bridge does not impact existing or planned commercial/industrial developments.
- Other than the Cajun Encounters Eco-tours, there are no commercial activities located upstream of US 90.
- The proposed bridge does not impact existing facilities on the waterway that are or could be considered critical infrastructure, key resources, or important/unique US industrial capability.
- The proposed bridge does not impact USACE ability to transit the bridge in a federal project channel.
- The bridge does not impact USCG and other government vessels' ability to transit the bridge to conduct mission essential functions.
- The proposed bridge does not impact existing and future cruise ship port-of-call/terminals, commercial freighters, or ports supporting post-panamax vessels as navigation associated with these facilities is not possible on the West Pearl River.
- The proposed bridge does not impact vessels that require helper boats/tugs.

1.11 Consideration of River Hydrology in the Siting and Design for a Replacement West Pearl River Structure

1.11.1 Introduction

There are a number of hydrology modeling investigations underway relating to the performance of the Lower Pearl River Floodplain during flood and hurricane events. In April 2019, the University of Southern Mississippi released a report documenting the Development of a Forecast Model for the Lower Pearl River Basin. The most comprehensive discussion of the performance of the US 90 bridges during high flow river conditions is a 1999 joint report issued by LADOTD and the US Geological Survey (USGS), *Estimation of Scour and Channel Stability for Selected Highway Crossings of Rivers in the Florida Parishes, Southeastern Louisiana, Louisiana Department of Transportation And Development, Water Resources Technical Report No. 67B.* The report will be hereafter referenced as the Scour Report

The following discussion utilizes the findings of the Scour Report as the basis to describe the hydraulic performance of each of the five rivers at each of the US 90 Pearl River bridge sites. The Scour Report investigates scour conditions at each bridge site assuming a 500-year storm as the base condition.

Excerpts from The Scour Report relevant to the West Pearl River are provided in Appendix B. Specific tables and figures from the Scour Report will be referenced in this narrative. Photographs of the upstream and downstream approaches to the West Pearl River bridge are included in Appendix C.

1.11.2 River Hydrology

Between the West Pearl River and the East Pearl River, the U.S. Hwy. 90 embankment of the lower Pearl River Basin spans over 4 miles of the river floodplain system. There are five openings in the embankment for the channels of the East Pearl, the East Middle, the Middle Middle, West Middle, and the West Pearl Rivers. The elevation of the roadway embankment is approximately 7-8 feet elevation throughout and floodplain elevations range from 1 to 2 feet.

Table 3 shows the distribution of the 500 year storm event through the five river channels.

Table 3 Disribution of Flows Within Pearl River Watershed		
	Flow in ft^3/sec	Percent of total flow
East Pearl River	100,002	36.6%
East Middle Pearl River	33,000	12.1%
Middle Middle Pearl River	41,000	15.0%
West Middle Pearl River	50,000	18.3%
West Pearl River	33,000	12.1%
Overflow	16,000	5.9%
Total	273,002	100.0%

Source: Neel-Schaffer, Inc.

The West Pearl River is formed as a distributary of the Pearl River approximately 24 miles upstream of the U.S. 90 embankment (upstream of both the I-10 and I-59 embankments). The only significant distributary of this reach of the river is the formation of the Middle River approximately 7 miles upstream of the U.S. 90 embankment (2 miles upstream of the I-10 embankment).

1.11.3 Waterway Layout and Geometry

The West Pearl River channel at US 90 is in a slight curve to the right and as a result the bridge crosses the river at a very slight skew. Approximately 400 feet downstream from the existing bridge the river curves sharply to the left; upstream of the existing bridge the mild curve to the right continues (Scour Report Figure 44). Figure 44 also shows river flow, which is roughly from north to south.

1.11.4 Waterway Depth and Elevation Fluctuations

As shown in Scour Report Figure 45, channel depth in proximity to the existing bridge has varied with the channel deepening slightly over time due to scour. In 1993 the main channel was approximately at elevation -15. MHW elevation for the West Pearl River at US 90 has been documented at elevation 1.35. The NOAA Mean Low Water (MLW) is elevation 0.74, which indicates that there is a relatively small range of elevation fluctuations affecting navigation. Figure 3 presents a recently taken cross-section approximately 19 feet downstream of the bridge. When compared to cross-sections shown in Appendix B Scour Report, it is indicates that the River has undergone significant siltation. This has been confirmed in discussions with local navigation interests.

1.11.5 Channel and Waterway Alignment

The existing West Pearl River bridge is at very slight skew to the river. Bridge replacement alternatives located new structures downstream from the existing bridge. Alternatives were also considered locating new structures along the existing alignment. In those situations a temporary by pass structure maintaining navigation clearances as described herein would be provided. The centerline of the replacement

structure will be 52.5 feet from the centerline of the existing bridge. The existing 90-foot horizontal channel will be maintained in alignment with the existing fixed span; so there will be no change in the navigation geometry.

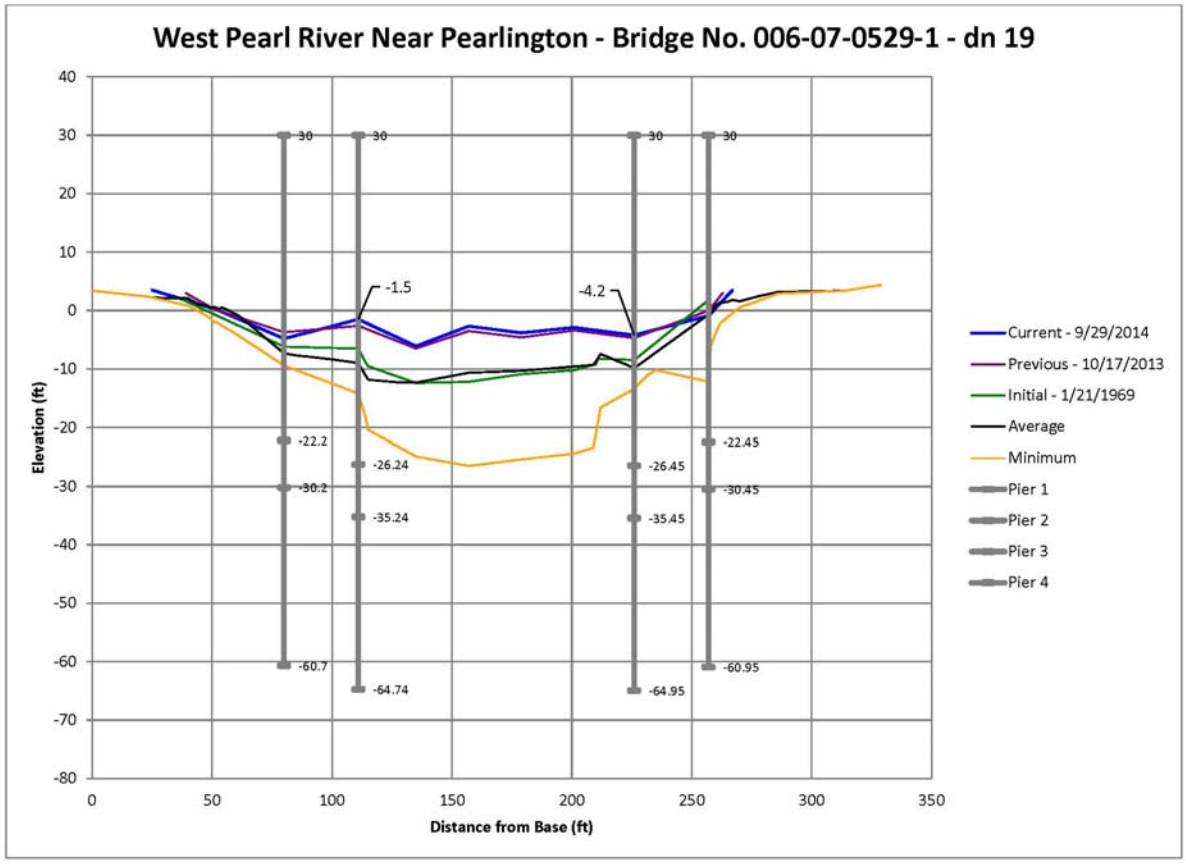
1.11.6 Current Speed and Direction

Simulation of the 500-year event indicated West Pearl River flow velocities ranging from approximately 2 feet/second near the channel bank to approximately 6 feet/second at center channel (Scour Report Table 23). As noted in Table 3, estimated flow at the bridge was approximately 33,000 feet^3/second.

1.11.7 Natural Flow of Waterway including Currents, Water Velocity, Water Direction and Velocity Fluctuations that Might Affect Navigation

Replacement bridge alternatives are situated in proximity to the existing bridge, maintaining the 90-foot horizontal channel width and relative channel alignment. Forecast river velocities under extreme navigation conditions (during a 500-year event) are approximately 6 feet/second. MHW and MLW elevations fluctuations are 0.65 feet. There is no indication that the natural flow of waterway including currents, water velocity, water direction and velocity fluctuations might affect navigation.

Figure 3 – LADOTD Cross-section of West Pearl River (19' Downstream of Bridge)



Appendix A
Documentation of Email Correspondence with the USACE, Vicksburg District Regarding West Pearl River Navigation

Barry Brupbacher

From: Hengst, Thomas L MVK <Thomas.L.Hengst@usace.army.mil>
Sent: Thursday, March 31, 2016 1:18 PM
To: Barry Brupbacher
Subject: Re: [EXTERNAL] CONTRACT NO. 4400005579, H.000284 US 90: PEARL RIVER BRIDGES AND H.000286 EAST PEARL RIVER BRIDGE

I probably should have said no maintenance on any of the Pearl River channel. We do perform minimal maintenance on the three Locks.

TH

Sent from my BlackBerry 10 smartphone.

From: Barry Brupbacher
Sent: Thursday, March 31, 2016 1:14 PM
To: Hengst, Thomas L MVK
Subject: RE: [EXTERNAL] CONTRACT NO. 4400005579, H.000284 US 90: PEARL RIVER BRIDGES AND H.000286 EAST PEARL RIVER BRIDGE

Thanks

Barry Brupbacher
Senior Project Manager

Neel-Schaffer, Inc.
Phone: 985.674.9820
Cell: 985-778-3105
FAX: 985.674.9822
Website: *Blockedwww.neel-schaffer.com*

From: Hengst, Thomas L MVK [mailto:Thomas.L.Hengst@usace.army.mil]
Sent: Thursday, March 31, 2016 1:13 PM
To: Barry Brupbacher <barry.brupbacher@neel-schaffer.com>
Cc: Catherine Mastin <Catherine.Mastin@LA.GOV>
Subject: Re: [EXTERNAL] CONTRACT NO. 4400005579, H.000284 US 90: PEARL RIVER BRIDGES AND H.000286 EAST PEARL RIVER BRIDGE

There is no maintenance performed on any of the Pearl River and there are no plans for such.

TH

Sent from my BlackBerry 10 smartphone.

From: Barry Brupbacher
Sent: Thursday, March 31, 2016 12:51 PM
To: Hengst, Thomas L MVK
Cc: Catherine Mastin

Subject: [EXTERNAL] CONTRACT NO. 4400005579, H.000284 US 90: PEARL RIVER BRIDGES AND H.000286 EAST PEARL RIVER BRIDGE

Thomas,

My understanding is that in 1995, the West Pearl River Navigation Project was placed in a caretaker status. The Corps was directed by Congress to use limited funds to maintain the Project in this status.

1. Is the West Pearl River channel maintained for navigation downstream of I-10?
2. If so, to what depth?
3. Are there any plans to improve navigation of the West Pearl downstream of I-10?

Thanks,

Barry Brupbacher
Senior Project Manager

Neel-Schaffer, Inc.
Phone: 985.674.9820
Cell: 985-778-3105
FAX: 985.674.9822
Website: *BlockedBlockedwww.neel-schaffer.com*

Neel-Schaffer, Inc. Confidentiality Note:
Information contained in this message along with any attachment(s) may be confidential and protected by legal privilege. This message is meant solely for the use of the individual(s) to whom it is addressed. Viewing or the use of information and attachment(s) within this message without the expressed permission of Neel-Schaffer, Inc. is prohibited. If you are not the intended recipient of this message, Neel-Schaffer, Inc. requests you take immediate action to notify the sender of the error and that you delete this message and all attachments without modifying, copying or distributing its content.

Barry Brupbacher

From: Hengst, Thomas L MVK <Thomas.L.Hengst@usace.army.mil>
Sent: Thursday, October 08, 2015 9:11 AM
To: Hengst, Thomas L MVK; Mallard, Jennifer A MVK; Bradley, William N MVK; Brister, Jacob G MVK; Jenkins, David G MVK
Subject: RE: CONTRACT NO. 4400005579, H.000284 US 90: PEARL RIVER BRIDGES AND H.000286 EAST PEARL RIVER BRIDGE - US 90 Structure over the West Pearl River

All,

Mr. Brupbacher called me again this morning asking if the Corps was going to respond to his request. Consultants tend to expect immediate answers and have fairly aggressive schedules. He has a meeting with LADOT next Thursday, 15 October, and would like to have some indication of the Vicksburg District's opinion by that time. As stated below, although we have an authorized project (for now), I see no circumstance where we will ever be directed to re-establish the project dimensions for commercial use. At any rate, when the LADOT and Neal-Schaffer decide what they want to do, they will have to submit the plans to the District for review. We do not need to let them expend time and money on design of something that we will have heartburn with.

TH

Thomas L. Hengst, P. E.
Chief, River Operations Branch
Operations Division, Vicksburg District
U. S. Army Corps of Engineers
CEMVK-OD-R
2449 Haining Rd
Vicksburg, MS 39183
601-631-5600: Phone
601-529-5600: Cell
601-631-5100: Fax
thomas.l.hengst@usace.army.mil

-----Original Message-----
From: Hengst, Thomas L MVK
Sent: Friday, October 02, 2015 7:08 AM
To: Mallard, Jennifer A MVK; Bradley, William N MVK; Brister, Jacob G MVK; Jenkins, David G MVK
Subject: FW: CONTRACT NO. 4400005579, H.000284 US 90: PEARL RIVER BRIDGES AND H.000286 EAST PEARL RIVER BRIDGE - US 90 Structure over the West Pearl River

All,

I talked to this fellow yesterday and asked him to send me what LADOT was planning to do. The District needs to decide whether or not it is necessary to maintain the navigation capabilities on the West Pearl Project as it pertains to the US 90 bridge. I personally see no sense in it as we will likely never have commercial traffic on this waterway again. From talking to him the only time that the bridge has been raised in the last several years was to pass fishing vessels running up the Pearl to ride out a storm.

TH

Thomas L. Hengst, P. E.
Chief, River Operations Branch
Operations Division, Vicksburg District
U. S. Army Corps of Engineers
CEMVK-OD-R
2449 Haining Rd
Vicksburg, MS 39183
601-631-5600: Phone
601-529-5600: Cell
601-631-5100: Fax
thomas.l.hengst@usace.army.mil

-----Original Message-----
From: Barry Brupbacher [mailto:barry.brupbacher@neel-schaffer.com]
Sent: Thursday, October 01, 2015 4:32 PM
To: Hengst, Thomas L MVK
Cc: Frank, David M CIV; Ronald Broadbent; Stacie Palmer; Roy Thomas
Subject: [EXTERNAL] CONTRACT NO. 4400005579, H.000284 US 90: PEARL RIVER BRIDGES AND H.000286 EAST PEARL RIVER BRIDGE - US 90 Structure over the West Pearl River

Thomas L. Hengst, P. E.

Chief, River Operations Branch

Operations Division, Vicksburg District

U. S. Army Corps of Engineers

CEMVK-OD-R

Thomas,

The Louisiana Department of Transportation and Development (LADOTD) is preparing planning and environmental documents for the rehabilitation or replacement of five bridge structures associated with the Pearl River system along US 90. The project logical termini are the US90 intersection with US 190 in St. Tammany Parish Louisiana and the US90 intersection with MS 604 in Hancock County Mississippi. The existing roadway is a two lane rural arterial roadway (RA-2) with 12 foot travel lanes and 8 foot paved shoulders. Average Daily Traffic is approximately 3,000 vehicles per day.

Five bridges associated with the Pearl River system are crossed as follows:

* Structure no. 62520060705291, West Pearl River Bridge, Movable Lift Span
* Structure no. 62520060706701, West Middle Pearl River Bridge
* Structure no. 62520060707111, Middle Middle Pearl River Bridge
* Structure no. 62520060707701, East Middle Pearl River Bridge

* Structure no. 62520060800001, East Pearl River Bridge, Movable Swing Span

The Federal Highway Administration (FHWA) is the lead Federal agency for the project. Neel-Schaffer is under contract to LADOTD to provide associated environmental and engineering services in support of project.

Documentation regarding the West Pearl River structure follows:

US 90 Bridge across West Pearl River

Structure Number: 62520060705291

Recall Number: 058710

The US 90 bridge across the West Pearl River was built in 1933. The structure is 570 feet long and consists of 14 reinforced concrete deck girder approach spans, 2 steel truss tower anchor spans and 1 steel truss lift span in the main navigation span. The main span must be elevated to allow passage of vessels taller than 10 feet. The maximum vertical clearance for vessel navigation with the main span in the raised position is 50 feet. The horizontal navigation clearance is 90 feet. The tension elements in the steel truss spans of this bridge are classified as Fracture Critical Members such that failure of these components would result in collapse of the bridge. The most recent bridge inspection made on 4/28/2015 indicates that many of the steel components have varying corrosion and section loss in some areas ranging from 10% to 30%. The National Bridge Inventory (NBI) Condition Ratings are 5 (Fair) for the Deck, 3 (Serious) for the Superstructure and 6 (Satisfactory) for the Substructure. The overall Structure Evaluation is 3 which indicates the structure is considered to be in overall SERIOUS condition. The Sufficiency Rating for the structure based on the 2014 NBI data is 20.2 (out of 100) and the bridge is classified as Structurally Deficient. The horizontal bridge roadway width (24 feet) and vertical clearance (15 feet) do not meet the minimum requirements for a Rural Arterial (RA-2) roadway. The bridge does not have shoulders. This bridge is classified as a "Preservation Candidate" as determined under the PA regarding historic bridges in Louisiana.

The consultant team is developing alternatives for rehabilitation and or replacement, which will include fixed span and movable spans replacement structures. A summary review bridge tender reports (July 2010 - July 2011) follows:

The report shows limited navigation upstream of the US 90 West Pearl River bridge. Vessel heights are 30 feet or less. Because of the very limited navigation upstream of US 90, we may consider alternatives that reduce the vertical navigation clearance from 50 feet to 35 feet above mean high, and the horizontal navigation clearance for 90 feet to 50 feet. This change in the navigation clearance would benefit LADOTD by reducing the overall project cost. We

understand that this change in navigation clearance will require USCG approval and we are in discussion with David Frank, USCG.

From your web page, the West Pearl River Navigation Project was authorized in 1935 by the River and Harbor Act. The project consists of 58 miles of waterway from the mouth of the West Pearl River to the mouth of Bogalusa Creek at Bogalusa, Louisiana, including 20.8 miles of excavated canal. Within the 20.8 miles of the lateral canal there are 3 locks, 3 sills (one for each lock pool) and 4 boat ramps. Each lock is 65 feet in width by 310 feet in length. Lock 1 is located at Mile 29.7, Lock 2 is located at Mile 40.8, and Lock 3 is located at Mile 43.9. Pool's Bluff sill is located at Mile 48.7, Bogue Chitto Sill is located at Mile 44.0 and the spillway is located at Mile 33.0. In 1995, the West Pearl River Navigation Project was placed in a caretaker status and the Corps was directed by Congress to use limited funds to maintain the Project in this status.

Can you provide any further information on West Pearl River navigation, including the status of commercial navigation of the waterway; whether there is a maintained navigation channel, and if there are any projects planned to improve the waterway for navigation? Finally, do you have a "Design Vessel" documented within you project files, and if so, can you provide documentation of the design vessel?

Thanking you in advance for any information you may be able to provide,

Barry Brupbacher

Senior Project Manager

Neel-Schaffer, Inc.

Phone: 985.674.9820

Cell: 985-778-3105

FAX: 985.674.9822

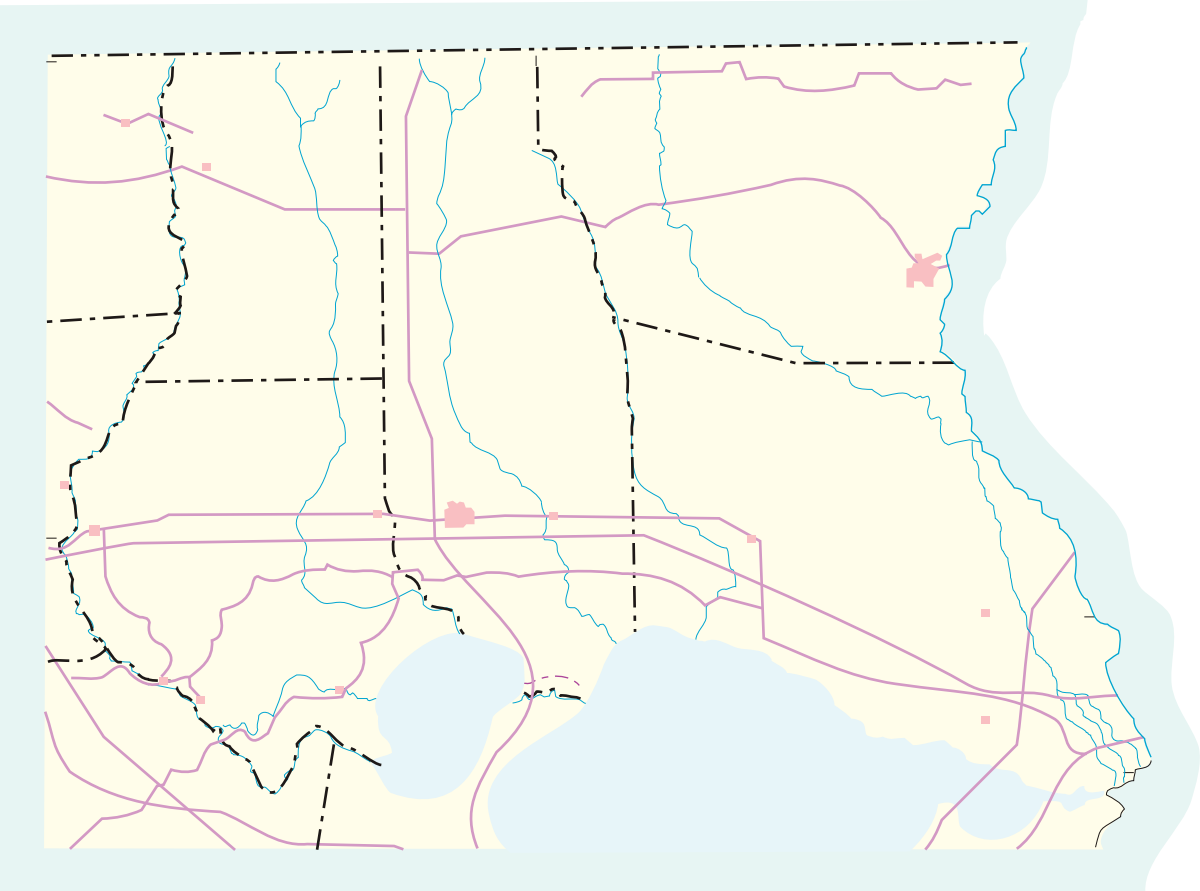
Website: Blockedwww.neel-schaffer.com <Blockedhttp://www.neel-schaffer.com/>

Neel-Schaffer, Inc. Confidentiality Note:
Information contained in this message along with any attachment(s) may be confidential and protected by legal privilege. This message is meant solely for the use of the individual(s) to whom it is addressed. Viewing or the use of information and attachment(s) within this message without the expressed permission of Neel-Schaffer, Inc. is prohibited. If you are not the intended recipient of this message, Neel-Schaffer, Inc. requests you take immediate action to notify the sender of the error and that you delete this message and all attachments without modifying, copying or distributing its content.

Appendix B
West Pearl River
Excerpts of the Department's 1999 Report Estimation of Scour and Channel Stability for Selected Highway Crossings of Rivers in the Florida Parishes, Southeastern Louisiana

Estimation of Scour and Channel Stability for Selected Highway Crossings of Rivers in the Florida Parishes, Southeastern Louisiana

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
Water Resources Technical Report No. 67B



STATE OF LOUISIANA
DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
PUBLIC WORKS AND FLOOD CONTROL DIRECTORATE
WATER RESOURCES SECTION
in cooperation with the
U.S. GEOLOGICAL SURVEY

1999

West Pearl River near Slidell, Louisiana

The West Pearl River is formed as a distributary of the Pearl River approximately 24 mi upstream of the U.S. Hwy. 90 embankment (upstream of both the I-10 and I-59 embankments). The only significant distributary of this reach of the river is the formation of the Middle River approximately 7 mi upstream of the U.S. Hwy. 90 embankment (2 mi upstream of the I-10 embankment). The channel curves sharply to the left immediately downstream of the bridge; upstream of the bridge there is a mild curve to the left (fig. 44).

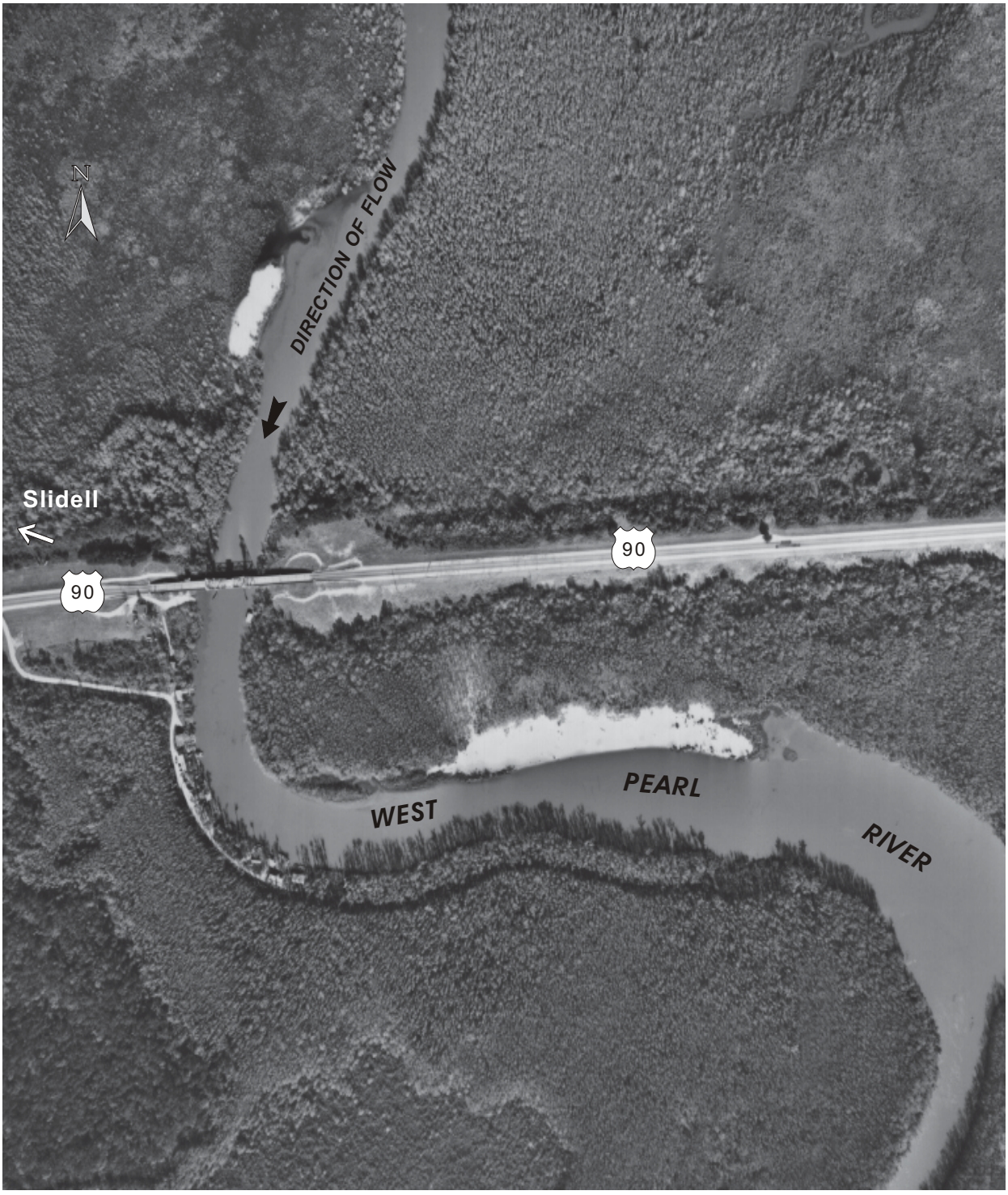
Pier Scour

Simulation of the Q_{500} indicated velocities ranging from approximately 2 to 6 ft/s and a water-surface elevation of approximately 7.5 ft above sea level. The bridge piers are not skewed to the channel at an angle greater than 15 degrees; therefore, no correction for alignment was applied. There are timber fenders protecting the main channel piers from river traffic. The effect of these fenders may tend to align the flow with the pile bents. The presence of the fender structures may also have an effect of reducing pier scour at that location (Abed and Richardson, 1993). The greatest predicted pier scour is approximately 13.3 ft and occurs at the main channel pier at DOTD station 344+48 (table 23, fig. 45). Scour at the three other main piers that are in or near the channel ranged from 7.9 to 11.3 ft. Estimated scour depth at the overbank piers was approximately 2 ft.

Table 23. Scour data for U.S. Highway 90 crossing of the West Pearl River near Slidell, Louisiana

[DOTD, Louisiana Department of Transportation and Development; water-surface elevation is 7.5 feet above sea level; K_2, dimensionless correction factor for angle of flow attack; ft, feet; ft/s, foot per second; pile tip elevations scaled from DOTD bridge plans; NA, not applicable]

DOTD station	Ground elevation (ft above sea level)	Pier shape	K_2	Pier width (ft)	Velocity (ft/s)	Local or pier scour (ft)	Contraction scour (ft)	Scour elevation (ft above sea level)	Pile tip elevation (ft above sea level)
341+06	10.0	Abutment	1.0	NA	1.7	NA	4.3	-1	-20
341+35	3.0	Square	1.0	1.5	1.7	2.1	4.3	-3	-20
341+63	3.0	Square	1.0	1.5	1.7	2.1	4.3	-3	-20
341+90	3.0	Square	1.0	1.5	1.7	2.1	4.3	-3	-20
342+18	3.0	Square	1.0	1.5	1.7	2.1	4.3	-3	-20
342+45	3.0	Square	1.0	1.5	1.7	2.1	4.3	-3	-20
342+74	3.0	Square	1.0	1.5	1.7	2.1	4.3	-3	-20
343+05	-9.0	Square	1.0	5.5	3.5	7.9	6.4	-23	-44
343+35	-8.0	Square	1.0	8.0	4.7	11.3	6.4	-26	-52
344+48	-19.0	Square	1.0	8.0	5.7	13.3	6.4	-39	-52
344+80	-10.0	Square	1.0	5.5	4.9	9.2	6.4	-26	-44
345+18	3.0	Square	1.0	1.5	1.7	2.1	3.9	-3	-20
345+38	3.0	Square	1.0	1.5	1.6	2.0	3.9	-3	-20
345+65	3.0	Square	1.0	1.5	1.6	2.0	3.9	-3	-20
345+92	3.0	Square	1.0	2.0	1.6	2.5	3.9	-3	-20
346+20	3.0	Square	1.0	2.0	1.6	2.5	3.9	-3	-20
346+50	3.0	Square	1.0	2.0	1.6	2.5	3.9	-3	-20
346+76	10.0	Abutment	1.0	NA	1.6	NA	3.9	-1	-20



Photograph source: Louisiana Department of Transportation and Development, December 1971

Figure 44. Aerial photograph of the U.S. Highway 90 crossing of the West Pearl River near Slidell, Louisiana.

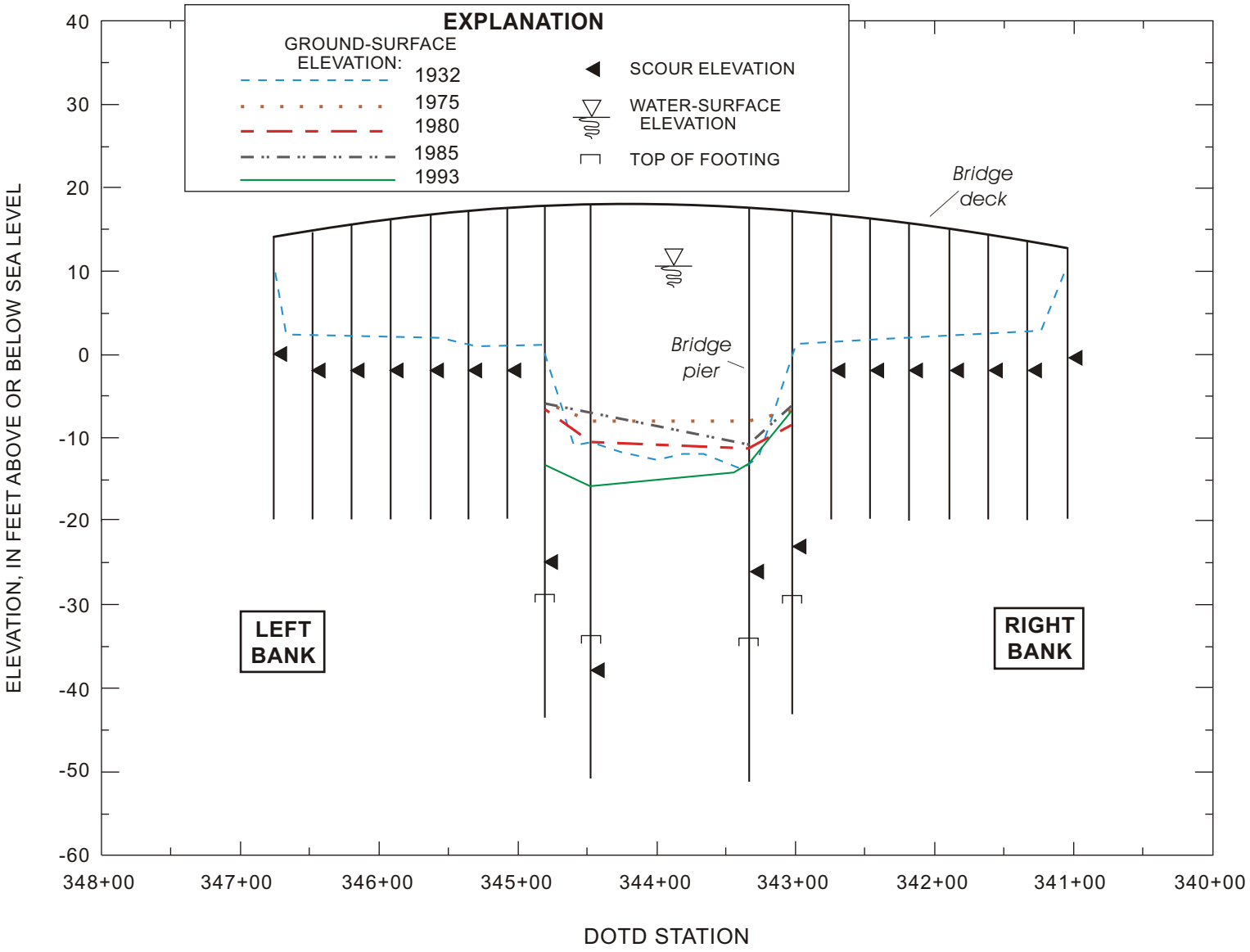


Figure 45. Comparative cross sections and scour estimates at the U.S. Highway 90 crossing of the West Pearl River near Slidell, Louisiana.

Channel Stability

The cross-section information at the bridge does not indicate any lateral movement of the channel. The timber fender structures at the bridge may serve to help align the flow through the structure and limit lateral migration of the channel (fig. 44). The bed elevation has changed by approximately 5 ft, both above and below the original (pre-construction) cross section. The most recent cross section indicates a lowering of approximately 5 ft in some locations.

Contraction and Abutment Scour

Flow through the bridge was subdivided into flow in the main channel, left overbank, and right overbank. The average depth of the channel at the bridge is approximately 22 ft for the main channel and 4.5 ft for the overbanks. For contraction scour estimates in the main channel, the flow in the main channel upstream was defined as a section of channel, approximately 200 ft in width. The width of the main channel at the bridge is 210 ft. Contraction scour in the main channel was computed as 6.4 ft. Scour on the left and right overbanks was predicted as 3.9 and 4.3 ft, respectively. The overbanks are vegetated with marsh grasses which may reduce scour potential in the overbank areas. No abutment scour was indicated.

Appendix C
West Pearl River
Photographs of Upstream and Downstream Approaches

West Pearl River

Upstream Approach



Downstream Approach



Appendix D
West Pearl River
2013-2018 Navigation Logs

DOTD 03-41-1084
REV. 6/77

STATE OF LOUISIANA
DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT

BRIDGE TENDER'S REPORT ON OPENINGS FOR NAVIGATION

DISTRICT NO. 62

CONTROL _____ UNIT _____ STRUCTURE NO. _____ NAME OF BRIDGE West Pearl

MONTH OF March 19 2013 NAME OF STREAM _____ STATE ROUTE NO. 90

SIGNATURE OF BRIDGE TENDERS ON DUTY	TIME ARRIVED	TIME LEFT
1. Huey Magee	#	#
2.		
3.		

Sun

fill in table completely

DATE 3-31-13	EXACT TIME OF OPENING	EXACT TIME OF CLOSING	DIRECTION OF TOW	NO. OF BARGES E OR L.	H	NAME AND DESCRIPTION OF VESSEL & TOW
	11:30 AM	11:45 AM	S	—	20	House boat
	5:50 PM	6:05 PM	N	—	20	House Boat

COUNT NUMBER OF BRIDGE OPENINGS LISTED ON THIS SHEET AND SHOW HERE 2

EXPLANATION: SHOW TIME OF OPENING & TIME OF CLOSING THUS: 3:42 A.M.
UNDER "NAME AND DESCRIPTION OF VESSEL" GIVE NAME OR NUMBER & BRIEF DESCRIPTION.
IF TUG WITH BARGES, GIVE NAME OF TUG & DESCRIPTION OF TOW.
E INDICATES EMPTY
L INDICATES LOAD
H INDICATES HEIGHT

West P.

DOTD 03-41-1084
REV. 6/77

STATE OF LOUISIANA
DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT

BRIDGE TENDER'S REPORT ON OPENINGS FOR NAVIGATION

DISTRICT NO. 62

CONTROL 006 UNIT 07 STRUCTURE NO. 05291 NAME OF BRIDGE West Pearl

MONTH OF _____ 19___ NAME OF STREAM _____ STATE ROUTE NO. 90

SIGNATURE OF BRIDGE TENDERS ON DUTY	TIME ARRIVED	TIME LEFT
1. Huey Magee	1740 PM	125 PM
2.		
3.		

fill in table completely

DATE	EXACT TIME OF OPENING	EXACT TIME OF CLOSING	DIRECTION OF TOW	NO. OF BARGES E. OR L.	H	NAME AND DESCRIPTION OF VESSEL & TOW
4/3/13	~~12~~ 119 PM	125 PM	S	—	25	Bait Boat
4/6/13	12.20	12.35	N	—		Shrimp Boat

COUNT NUMBER OF BRIDGE OPENINGS LISTED ON THIS SHEET AND SHOW HERE ---------- 1

EXPLANATION: SHOW TIME OF OPENING & TIME OF CLOSING THUS: 3:42 A.M.
UNDER "NAME AND DESCRIPTION OF VESSEL" GIVE NAME OR NUMBER & BRIEF DESCRIPTION.
IF TUG WITH BARGES, GIVE NAME OF TUG & DESCRIPTION OF TOW.
E INDICATES EMPTY
L INDICATES LOAD
H INDICATES HEIGHT

DOTD 03-41-1084
REV. 6/77

STATE OF LOUISIANA
DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT

BRIDGE TENDER'S REPORT ON OPENINGS FOR NAVIGATION

DISTRICT NO. 62

CONTROL 006 UNIT 07 STRUCTURE NO. 05291 NAME OF BRIDGE W. Pearl

MONTH OF May 19 2013 NAME OF STREAM West Pearl River STATE ROUTE NO. 90

SIGNATURE OF BRIDGE TENDERS ON DUTY	TIME ARRIVED	TIME LEFT
1.		
2.		
3.		

fill in table completely

DATE 5-4-13	EXACT TIME OF OPENING	EXACT TIME OF CLOSING	DIRECTION OF TOW	NO. OF BARGES E. OR L.	H	NAME AND DESCRIPTION OF VESSEL & TOW
5-4-13	12 PM	1 35 PM	N	—	25	Bait Boat
	2 35 PM	2 50 PM	N	—	30	Catchin Hell Shrimp Boat
5-6-13	8 10 PM	8 25 PM	S	—	30	Catchin Hell
	3 25 PM	3 40 PM	N	—	30	Catchin Hell
5-7-13	7 20 PM	7 35 PM	S	—	30	Catchin Hell
	4 10 PM	4 25 PM	N	—	30	" "
5-8-13	8 15 PM	8 30 PM	S	—	30	" "
	2 10 PM	2 25 PM	N	—	30	
5-9-13	8 10 AM	8 25 PM	S	—	30	Catchin Hell
5-15-13	8 00 AM	8 10 AM	S	—	25	Bait Boat
5-25-13	12 PM	1 35 PM	S	—	40	Shrimp Vessel
	12 PM	1 35 PM	S	—	30	Bait Boat
5-29-13	7 09 AM	7 17 PM	S	—	30	Shrimp Boat

COUNT NUMBER OF BRIDGE OPENINGS LISTED ON THIS SHEET AND SHOW HERE ------- 13

EXPLANATION: SHOW TIME OF OPENING & TIME OF CLOSING THUS: 3:42 A.M.
UNDER "NAME AND DESCRIPTION OF VESSEL" GIVE NAME OR NUMBER & BRIEF DESCRIPTION.
IF TUG WITH BARGES, GIVE NAME OF TUG & DESCRIPTION OF TOW.
E INDICATES EMPTY
L INDICATES LOAD
H INDICATES HEIGHT

DOTD 03-41-1084
REV. 6/77

STATE OF LOUISIANA
DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT

BRIDGE TENDER'S REPORT ON OPENINGS FOR NAVIGATION

DISTRICT NO. 62

CONTROL 006 UNIT 07 STRUCTURE NO. 05291 NAME OF BRIDGE W. Pearl

MONTH OF Oct 19 15 NAME OF STREAM Pearl River STATE ROUTE NO. 90

SIGNATURE OF BRIDGE TENDERS ON DUTY	TIME ARRIVED	TIME LEFT
1.		
2.		
3.		

fill in table completely

DATE	EXACT TIME OF OPENING	EXACT TIME OF CLOSING	DIRECTION OF TOW	NO. OF BARGES E OR L	H	NAME AND DESCRIPTION OF VESSEL & TOW
10/24			N	1		House Boat (Barge)

COUNT NUMBER OF BRIDGE OPENINGS LISTED ON THIS SHEET AND SHOW HERE _____

EXPLANATION: SHOW TIME OF OPENING & TIME OF CLOSING THUS: 3:42 A.M.
UNDER "NAME AND DESCRIPTION OF VESSEL" GIVE NAME OR NUMBER & BRIEF DESCRIPTION.
IF TUG WITH BARGES, GIVE NAME OF TUG & DESCRIPTION OF TOW.
E INDICATES EMPTY
L INDICATES LOAD
H INDICATES HEIGHT

DOTD 03-41-1084
REV. 6/77

STATE OF LOUISIANA
DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT

BRIDGE TENDER'S REPORT ON OPENINGS FOR NAVIGATION

DISTRICT NO. 62

CONTROL _____ UNIT _____ STRUCTURE NO. _____ NAME OF BRIDGE West Pearl

MONTH OF April June 15 2017 NAME OF STREAM West Pearl STATE ROUTE NO. 90

SIGNATURE OF BRIDGE TENDERS ON DUTY	TIME ARRIVED	TIME LEFT
1.		
2.		
3. Thursday		

fill in table completely

DATE 3-23-17	EXACT TIME OF OPENING	EXACT TIME OF CLOSING	DIRECTION OF TOW	NO. OF BARGES E. OR L.	H	NAME AND DESCRIPTION OF VESSEL & TOW
	1:35 pm	1:45	S		18	Houseboat
4-4-17	10:42 am	10:53	Test			Tested w/ David H. for "screeching"
4-6-17	9:38 am	9:42	Test			Tested after plunger LS rewire
4-6-17	4:00 pm	4:08	Test			Tested after phase failure install
4-6-17	5:18 pm	5:24	Test			Test of the test
4-7-17	9:10 AM	9:20 AM	N	1-L	25	Spud Barge
4-7-17	9:25 am	9:35 am	Test			Test
4-18-17	10:30 am	10:37 am	Test			Test
4-19-17	11:15 AM	11:30 AM	N	1-L	30	Spud Barge
4-25-17	9:30	9:45	-			-
4-29-17	4:15	4:30	N		25	shrimp boat (Mr Rudd m.v.)
6-30-17	10:00 AM	10:15 AM	S	L	25	Spud barge
	10:30 AM	10:47 AM	training			HM ED
	11:15 AM	11:30 AM				HM ED
	12:45 PM	12:30 PM	TRAINS			HM ED
	1:00 PM	1:15 PM	N			HM ED
	1:30 PM	1:45 PM	TRAINS			HM ED

COUNT NUMBER OF BRIDGE OPENINGS LISTED ON THIS SHEET AND SHOW HERE March (1) April 10 June 6 #

EXPLANATION: SHOW TIME OF OPENING & TIME OF CLOSING THUS: 3:42 A.M.
UNDER "NAME AND DESCRIPTION OF VESSEL" GIVE NAME OR NUMBER & BRIEF DESCRIPTION.
IF TUG WITH BARGES, GIVE NAME OF TUG & DESCRIPTION OF TOW.
E INDICATES EMPTY
L INDICATES LOAD
H INDICATES HEIGHT

DOTD 03-41-1084
REV. 6/77

STATE OF LOUISIANA
DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT

BRIDGE TENDER'S REPORT ON OPENINGS FOR NAVIGATION

DISTRICT NO. _____

CONTROL _____ UNIT _____ STRUCTURE NO. _____ NAME OF BRIDGE West Pearl

MONTH OF July 19 18 NAME OF STREAM _____ STATE ROUTE NO. _____

SIGNATURE OF BRIDGE TENDERS ON DUTY	TIME ARRIVED	TIME LEFT
1.		
2.		
3.		

fill in table completely

DATE	EXACT TIME OF OPENING	EXACT TIME OF CLOSING	DIRECTION OF TOW	NO. OF BARGES E OR L.	H	NAME AND DESCRIPTION OF VESSEL & TOW
~~06-19~~						
06-21	11:30AM	11:45AM	—	—	-	Opening the bridge.
08-27	9:30AM	9:45AM	—	—	-	bridge opening
9-5-	11:00AM	11:31	-	-		checked Breaker.
10-23	10:30AM	10:45AM	—	—	-	Bridge opening

COUNT NUMBER OF BRIDGE OPENINGS LISTED ON THIS SHEET AND SHOW HERE _____

EXPLANATION: SHOW TIME OF OPENING & TIME OF CLOSING THUS: 3:42 A.M.
UNDER "NAME AND DESCRIPTION OF VESSEL" GIVE NAME OR NUMBER & BRIEF DESCRIPTION.
IF TUG WITH BARGES, GIVE NAME OF TUG & DESCRIPTION OF TOW.
E INDICATES EMPTY
L INDICATES LOAD
H INDICATES HEIGHT

(1) REPAIR AND REPLACEMENT WORK

DATE	TIME	DESCRIPTION OF REPAIRS AND PARTS REPLACED	SIGNATURE OF PERSON DOING WORK
6-21-18	11:00 am	ANNUAL INSPECTION & OPENING.	SP, PLW

(2) WIRE SEALS

A. WHEN INSTALLED OR REPLACED

DATE	TIME	SEAL NUMBER	SIGNATURE OF ELECTRICIAN

B. WHEN BRIDGE TENDER HAS TO BREAK SEAL

DATE	TIME	NUMBER OF BROKEN SEAL	APPARENT REASON FOR HAVING TO USE BY-PASS	SIGNATURE OF BRIDGE TENDER ON DUTY

(3) BRIDGE LUBRICATION

DATE	TIME	WHAT PARTS WERE LUBRICATED	SIGNATURE OF PERSON DOING WORK

(4) MALFUNCTIONING NAVIGATION HORN

DATE	TIME HORN STOPPED WORKING PROPERLY	TIME DISTRICT WAS NOTIFIED	SIGNATURE OF BRIDGE TENDER ON DUTY

(5) VISITORS TO BRIDGE (FOR EXAMPLE: BRIDGE INSPECTORS)

DATE	TIME	PURPOSE OF VISIT	SIGNATURE OF VISITOR

(6) AREAS IN NEED OF REPAIR OR REPLACEMENT WORK

DATE	TIME	DESCRIPTION OF AREAS IN NEED OF REPAIR/REPLACEMENT	SIGNATURE OF BRIDGE TENDER ON DUTY

Navigation Study
US 90 Crossing of the WEST MIDDLE PEARL RIVER

US 90 Pearl River Bridges
Environmental Assessment
St. Tammany Parish, LA and Hancock County, MS

STATE PROJECT NO. H.000284 & NO. H.000286
FEDERAL AID PROJECT NO. H000284 & NO. H000286



West Middle River Upstream Approach

USCG Draft Navigation Impact Report

DOTD
LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

U.S. Department of Transportation
Federal Highway Administration

July 2019

Table of Contents

		Page
Section 1.0	Navigation Study – US 90 Crossing the West Middle Pearl River	1
1.1	Introduction	1
1.2	Project Purpose and Need	3
1.3	Reference Datum Conversion	3
1.4	Floodplain Consideration	3
1.5	Navigation Clearance above Mean High Water	3
1.6	Establishment of the Planning Elevation	4
1.7	Current Navigational Usage	5
1.8	Recommended Clearances associated with Replacement US 90 Bridge Crossing of the West Middle Pearl River	8
1.9	Environmental Assessment Alternatives	9
1.10	Proposed Bridge's Impacts to Existing and Potential Navigation	16
1.11	Consideration of River Hydrology in the Siting and Design for a Replacement Structure	16

Tables

Table 1	Summary of Datum Conversion Elevations	4
Table 2	Distribution of Flows within the Pearl River Watershed	17
Table 3	NOAA Standard Datum Elevations West Pearl and East Pearl Rivers, Mean High Water and Mean Low Water	18

Figures

Figure 1	Study Area	2
Figure 2	Land Use and Zoning	7
Figure 3	Cross-section of West Middle Pearl River	18

Engineering Plates

Fixed Span Alternative Existing Alignment Plan View, Plates 1-2	10-11
Fixed Span Alternative Upstream Alignment Plan View, Plates 1-3	12-14
Fixed Span Alternative Profiles Views, Plates 1	15

Appendix

Appendix A	West Middle Pearl River, Excerpts of the 1999 Report Estimation of Scour and Channel Stability for Selected Highway Crossings of Rivers in the Florida Parishes, Southeastern Louisiana	20
Appendix B	Photographs of Upstream/Downstream Approaches	21

1.0 Navigation Study - US 90 Crossing of the West Middle Pearl River

1.1 Introduction

The Louisiana Department of Transportation and Development (LADOTD) is preparing planning and environmental documents for the improvement of five bridge structures associated with the Pearl River system along US Highway 90 (US 90). The enclosed Study Area map, Figure 1, shows the limits of the project. The project limits extend along US 90 from US 190 in Louisiana to the US 90 intersection with Kelly Road / 7th Avenue in Pearlington, Mississippi. The existing roadway is a two lane rural arterial roadway (RA-2) with 12-foot travel lanes and 8-foot paved shoulders. Average Daily Traffic is approximately 3,000 vehicles per day.

Five bridges associated with the Pearl River system are crossed as follows:

- Structure no. 62520060705291, West Pearl River Bridge, Movable Lift Span
- Structure no. 62520060706701, West Middle Pearl River Bridge
- Structure no. 62520060707111, Middle Middle Pearl River Bridge
- Structure no. 62520060707701, East Middle Pearl River Bridge
- Structure no. 62520060800001, East Pearl River Bridge, Movable Swing Span

This Navigational Study assesses the current and anticipated future use of the West Middle Pearl River, and investigates the required clearances for the proposed bridge replacement alternatives.

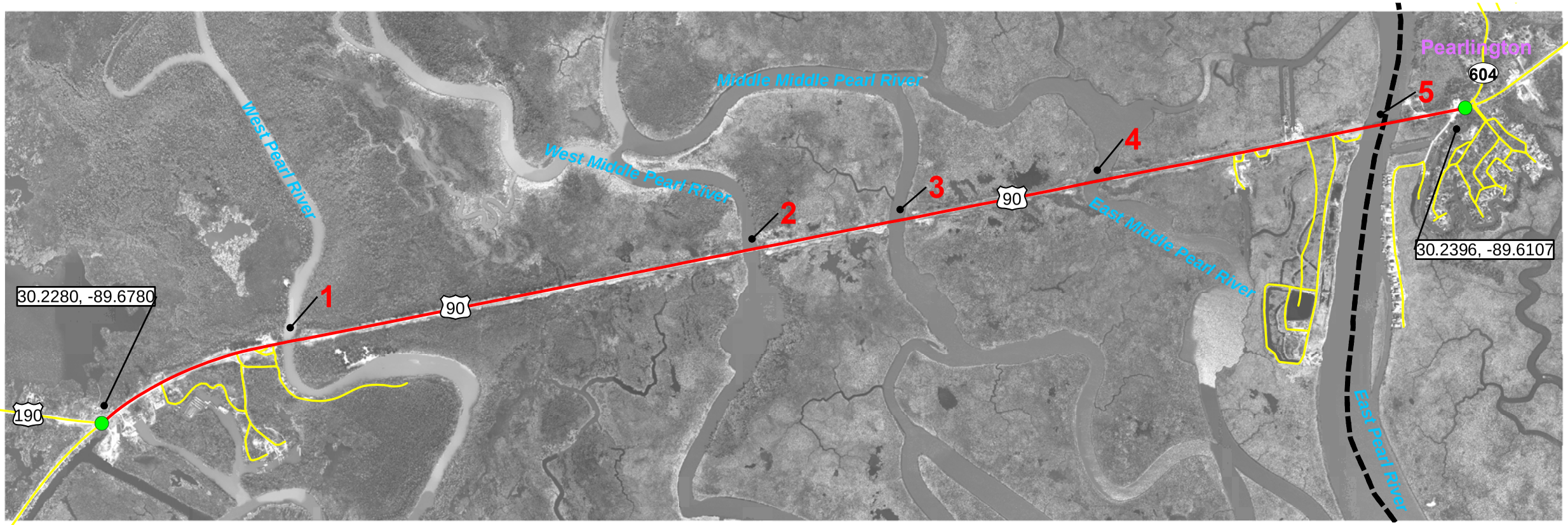
US 90 Bridge across West Middle Pearl River
Structure Number: 62520060706701
Recall Number: 058720

The US 90 bridge across the West Middle Pearl River was built in 1933. The structure is 24' wide, 582' long and consists of 12 reinforced concrete deck girder approach spans and 3 steel pony truss spans across the river. The maximum vertical clearance for vessel navigation is 10'.

The bridge width (24') does not meet the minimum requirements for a RA roadway. The 2017 LADOTD minimum design guidelines state that the preferable bridge width is equal to the approach travel lanes (24') and the shoulder width (8'). The bridge does not have shoulders. This bridge is classified as a "Non-Priority Bridge" as determined under the PA regarding historic bridges in Louisiana. The horizontal navigation clearance is 60'.

Map No.	Structure Number	Structure Type	Water Body Crossing
1	62520060705291	Movable: Lift-Span	West Pearl River
2	62520060706701	Pony Truss - Warren Truss	West Middle Pearl River
3	62520060707111	Pony Truss - Warren Truss	Middle Middle Pearl River
4	62520060707701	Pony Truss - Warren Truss	East Middle Pearl River
5	62520060800001	Movabe: Swing - Through Truss (Parker Truss)	East Pearl River

NOTE: Logical Termini are the intersections of US 90 with US 190 and MS 604 and latitude and longitude data are in decimal format



Source (Citation) for 2010 six inch pixel imagery Parish Mosaics

This imagery was provided by the Louisiana Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP) as the sole source owner, and is shared with Louisiana state government agencies in the interest of good government practices.

Reproduction and distribution of the data is prohibited. Please refer any requests for data to the Deputy Director for Management, Finance and Interoperability of GOHSEP. This imagery was distributed by the Regional Planning Commission for Jefferson, Orleans, Plaquemines, St. Bernard and St. Tammany Parishes (RPC) with permission from GOHSEP.

GOHSEP and the RPC are not responsible for any errors arising from any use of alterations made to the data. Under no circumstances is resale or distribution of the data permitted.

Mosaics were produced and compressed by the Louisiana State University Coastal Studies Institute.

Imagery Information: The red, green, blue (true color) and near infrared four-band aerial imagery was captured between February 10th and April 1st of 2010 (re-flights for any corrections flown until April 28th, 2010) by Sanborn Map Company, Inc.

The imagery is projected to UTM 15 NAD 83; unit of measure is meters. The spatial resolution is approximately a six inch pixel. Any use of the data must be accompanied with this citation and accompanying seals and logos embedded within.

Prepared By: Neel-Schaffer, Inc.

Figure 1

Study Area

Legend

- Logical Termini
- Project Limits
- Roadway Network
- LA/MS State Boundary Line

XX.XXX, XX.XXX Latitude, Longitude

N

1,250 625 0 1,250 Feet

H.000284 US 90: PEARL RIVER BRIDGES AND
H.000286 EAST PEARL RIVER BRIDGE
ROUTE US 90
ST. TAMMANY PARISH, LA

Prepared For:

DOTD
LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

1.2 Project Purpose and Need

The purposes of the proposed action, which have been approved by the Federal Highway Administration (FHWA), are:

- To maintain a system link, to provide a diversion route in the event of an incident on I-10.
- To improve the structural integrity and functionality of the bridges.
- To support hurricane evacuations

1.3 Reference Datum Conversion

Permit and as-built drawings for the US 90 bridges over the five Pearl River crossings show elevations in Mean Gulf Level (MGL), a commonly used hydrographic datum at that time. A topographic survey was performed by a LADOTD survey crew in December 2015 to establish a reference bridge elevation point for each of the bridges. The reference datum allows for conversion of as-built drawing elevation to existing NAVD88 datum in feet.

1.4 Floodplain Consideration

LADOTD guidance for bridge replacements is to locate a replacement structure at not less than the 100-year floodplain plus 1 foot. The 100-year flood elevations have been determined to be significantly higher than the elevation of the existing roadway between all of the bridge sites. Based on the 2008 Preliminary Flood Insurance Rating Map (FIRM), the 100-year floodplain elevation at the US 90 crossing of the West Middle Pearl River is elevation 19.13 NAVD88.

Additionally, LADOTD provided storm surge and wave height estimates for each bridge location. The storm surge plus wave action plus one foot for the West Middle Pearl River bridge is elevation 12.51 NAVD88

1.5 Navigation Clearance above Mean High Water

The United States Coast Guard (USCG) utilizes the National Oceanic and Atmospheric Administration (NOAA) derived determinations for Mean High Water (MHW) datum to establish vertical navigation clearances for bridges. In the United States, MHW is the average of all the high water heights observed over a period of 19 years (for the East and West Pearl Rivers, 1983-2001) and is referred to as the National Tidal Datum Epoch.

NOAA determined mean high water is elevation 1.35 NAVD88 for the West Pearl River. NOAA did not provide mean high water determinations for the West Middle Pearl River. Because the five rivers are hydraulically connected, the mean high water elevation was assumed to be 1.35 NAVD88 for the West Middle Pearl River.

1.6 Establishment of the Planning Elevation for the Five Bridges

Table 1 summarizes the results of a datum conversion process undertaken to rectify the elevations provided by varying sources using differing datum to NAVD88. All elevations hereafter referenced are shown in NAVD88. This information indicates that the West Middle Pearl River bridge was constructed with a low chord elevation of 11.37 feet NAVD88. The proposed bridge low chord elevation using the storm surge plus wave plus 1 foot criteria exceeds the existing low chord elevation by 1.14 feet.

Only two benchmarks at the West Pearl River bridge were recovered in the project area for this analysis. Assuming the rivers are hydraulically connected, the conversions for the West Pearl River were applied to the other four rivers.

Table 1: Summary of Datum Conversion Elevations

		West Pearl	West Middle Pearl	Middle Middle Pearl	East Middle Pearl	East Pearl
	Existing Elevations (NAVD88) - see notes below for datum conversion					
	Mean High Water [1,2,3]	1.35	1.35	1.35	1.35	1.36
	Existing Low Chord [6]	12.20	11.37	11.37	11.37	12.22
	Clearance above Mean High Water	10.85	10.02	10.02	10.02	10.86
	Design Considerations (NAVD88) - controlling condition in bold					
1	Storm Surge + Wave Height + 1 foot [4,5]	10.86	**12.51**	**13.23**	**13.31**	12.60
2	100-year + 1 foot [7]	**19.13**	20.13	21.14	21.14	**18.14**
3	Mean High Water (1.35) + Suggested Clearance (10') [1,3,8]	11.35	11.35	11.35	11.35	11.35

Source: Neel-Schaffer, Inc.

Datum Conversion Notes:

1. Per NOAA website, at West Pearl River Station the Mean High Water elevation is 3.841 meters (12.60 feet) below benchmark 141.

2. Per NOAA website, at West Pearl River Station the Mean High Water elevation is 1.413 meters (4.64 feet) below benchmark 1294 A 1980.

3. Therefore, Mean High Water elevation in NAVD88 is 13.95 - 12.60 = 1.35 using benchmark 141. Benchmark 1294 A 1980 yields similar results to within 0.05 feet. Use 1.35 as elevation of Mean High Water in NAVD88.

4. Per NOAA website, using Station Datum, Mean Sea Level is 0.28' below Mean High Water. Therefore, Mean Sea Level in NAVD88 is 1.35 - 0.28 = 1.07.

5. DOTD provided storm surge in elevations of Mean Sea Level. To convert to NAVD88, need to add 1.07 to elevations in MSL (assuming MSL elevations were provided for the W. Pearl River station).

6. DOTD-provided as-builts showing estimated bottom chord elevations of 12.83 for the West Pearl, 12.00 for the three Middle Rivers, and 12.85 for the East Pearl. No datum is specified. Finished road elevation is 14.08 at the location of Benchmark 141 (13.95 NAVD88). The benchmark is on the curb, so add 6" (14.08 + 0.50 = 14.58). Therefore, as an estimate, subtract 0.63' from as-built elevations to convert to NAVD88.

7. 100-year flood elevations were taken from the St. Tammany Parish DFIRM maps. The elevations from the map were in NGVD29, and were processed though the NGS VertCon program to obtain NAVD88 elevations. The difference in elevations ranged from 0.125 to 0.144 feet.

8. USCG–provided permit drawings show a clearance of 10.0 feet from mean high water. This agrees with the clearances calculated in the existing conditions; therefore, 10.0 feet clearance is suggested in this design condition as well.

1.7 Current Navigational Usage

This section discusses the existing navigational usage of West Middle Pearl River impacted by the bridge replacement project. The discussion will include existing users, vessel trip frequency, and potential impact to business owners.

Channel Status

The West Middle Pearl River is not a federal authorized navigation channel.

Existing Commercial Users

Except for out parcels as shown on Figure 2, the area between the West Pearl River and the East Pearl River is owned and managed by the Pearl River Wildlife Management Area, part of the Louisiana Department of Wildlife and Fisheries. Except for parcels as noted in Figure 2, St. Tammany Parish zoning along the West Pearl River is for residential purposes.

There are two eco-tour businesses located on the West Pearl River that utilize the entire Pearl River system, including the West Middle Pearl River. The vessels used in the eco-tour businesses are longer than 21 feet and the larger vessels accommodate up to 25 persons.

Vessel Trip Frequency

The eco-tour businesses offer tours daily. Other vessels that may cross under this bridge are privately owned pleasure boats, fishing boats, etc., that can travel under the existing fixed structure.

Projected changes in waterway usage based upon anticipated waterway improvement projects

None.

Impact to vessel owners that would be precluded from transiting the waterway if a proposed bridge project is authorized

The existing bridge low chord elevation is 11.37 feet. Utilizing the storm surge plus wave plus 1-foot criteria as shown in Table 1 to establish the low chord elevation for the replacement structure, the low chord elevation of the proposed replacement bridge will be set at 12.51 feet or higher. This elevation is at least 1.14 feet higher than the low chord elevation of the existing bridge. Therefore, none of the current vessels that use this waterway would be impacted. The increase in navigation clearance may support the use of larger vessels by the eco-tour businesses.

Upstream and Downstream Clearances

There is one overhead transmission line crossings over the West Middle Pearl River at the US 90 bridge. This crossing is owned by Washington St. Tammany Electric and consists of 45 foot poles on both sides of the River.

Review of annual cargo movements

There is no cargo transported along the West Middle Pearl River. Consequently, there is no cargo requiring disassembly to pass under the current structure.

Design Vessel

A design vessel has not been identified. However, the vertical clearance requirement for the larger eco-tour vessels currently transiting the waterway is 8 feet.

Specific Vessel Transit

There are no levee maintenance, bridge work, channel maintenance, or emergency operations upstream of the US 90 bridge that require certain vessels to transit the waterway.

NOTE: Logical Termini are the intersections of US 90 with US 190 and MS 604 and latitude and longitude data are in decimal format

Stennis Space Center

Port Bienville

30.2396, -89.6107

30.2280, -89.6780

1 2 3 4 5

N

Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

Legend

- Logical Termini
- Pearl River Bridges
- Project Limits
- XX.XXX, XX.XXX Latitude, Longitude
- Stennis Buffer Zone

Zoning Classification

- Suburban (A-1 thru A-3)
- Residental (A-4 thru A-8, MD-1)
- Animal Training Housing
- Public/Community/Recreational (WMA)
- Education (Primary and Secondary)
- Commercial/Service
- Industrial
- Neighborhood Institutional
- Planned Unit Development (PUD)

Figure 2
Land Use and Zoning

8,000 4,000 0 8,000 Feet

H.000284 US 90: PEARL RIVER BRIDGES AND H.000286 EAST PEARL RIVER BRIDGE
ROUTE US 90
ST. TAMMANY PARISH, LA

Prepared For:

DOTD
LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

Prepared By: Neel-Schaffer, Inc.

Current "governing limitation" for navigation on the waterway

The current bridge is the most restrictive structure. The navigation clearances associated with the current bridge follow:

- Vertical Clearance – The existing bridge low chord is elevation 11.37 NAVD88, which is 10.01 feet above mean high water elevation, 1.35 NAVD88.
- Horizontal Clearance – The existing bridge provides a 60-foot horizontal clearance.

There are no downstream structures or power lines governing navigation on the waterway. As mentioned above, there is one set of power lines at the existing to-be-replaced bridge.

What is the most restrictive horizontal clearance on the waterway? This may be bridge piers on another bridge downstream, it may be a navigational lock, it may be a man-made channel, it may be the actual width of the narrowest portion of the waterway.

The most restrictive horizontal clearance is the natural narrowing of the waterway upstream from the existing West Middle Pearl River bridge.

Historic Vessel Collision Information

The National Transportation Safety Board issues a Marine Accident Report following each investigation. These reports are available online for reports issued since 1996. The reports listing is sortable by the event date, report date, city, and state at the following website.

http://www.ntsb.gov/investigations/AccidentReports/Pages/marine.aspx

The website was searched March 31, 2016, sorted by state. The Louisiana incident reports were reviewed and there were no reports associated with marine incidents on the West Middle Pearl River.

1.8 Recommended Clearances associated with Replacement US 90 Bridge Crossing of the West Middle Pearl River

1. Vertical navigation clearance provided will be 11.16 NAVD88 above mean high water (elevation 1.35 NAVD88).
2. Horizontal Clearance will be 60 feet to match the existing bridge clearance.
3. Considering the Environmental Assessment alternatives analysis,
    a. Replacement bridge alternatives will provide vertical and horizontal clearances as noted above.

b. Replacement structures to be offset and situated within the channel as required to allow for the continued operation of the existing bridge during construction of the replacement structure.

Impacts of Proposed Bridge Clearances on Present and Prospective Upstream Commercial Activity

The proposed bridge clearances will not impact present users of the waterway. Based on Wildlife Management Area ownership of upstream properties, and residential zoning of above stream out parcels, prospective upstream commercial activities (jobs, economic growth and development) are limited to eco-tour businesses that utilize the waterway. There are no existing or planned commercial/industrial growth and developments negatively affected by the proposed clearances. The River is contained within the Pearl River Wildlife Management Area.

Input from tour companies that use the River show that, as long as the proposed clearances meet or exceed the present clearance of the existing bridge, their businesses will not be affected. Comments were received that, should the vertical clearances be increased, larger tour boats could be built and used on the River.

Low chord elevation of the proposed replacement bridge based on the storm surge plus wave plus 1 foot criteria is set at 12.51 feet. This elevation exceeds the existing low chord elevation by 1.14 feet.

There are no existing facilities on the waterway that are or could be considered critical infrastructure, key resource, or important/unique US industrial capabilities.

1.9 Environmental Assessment Alternatives

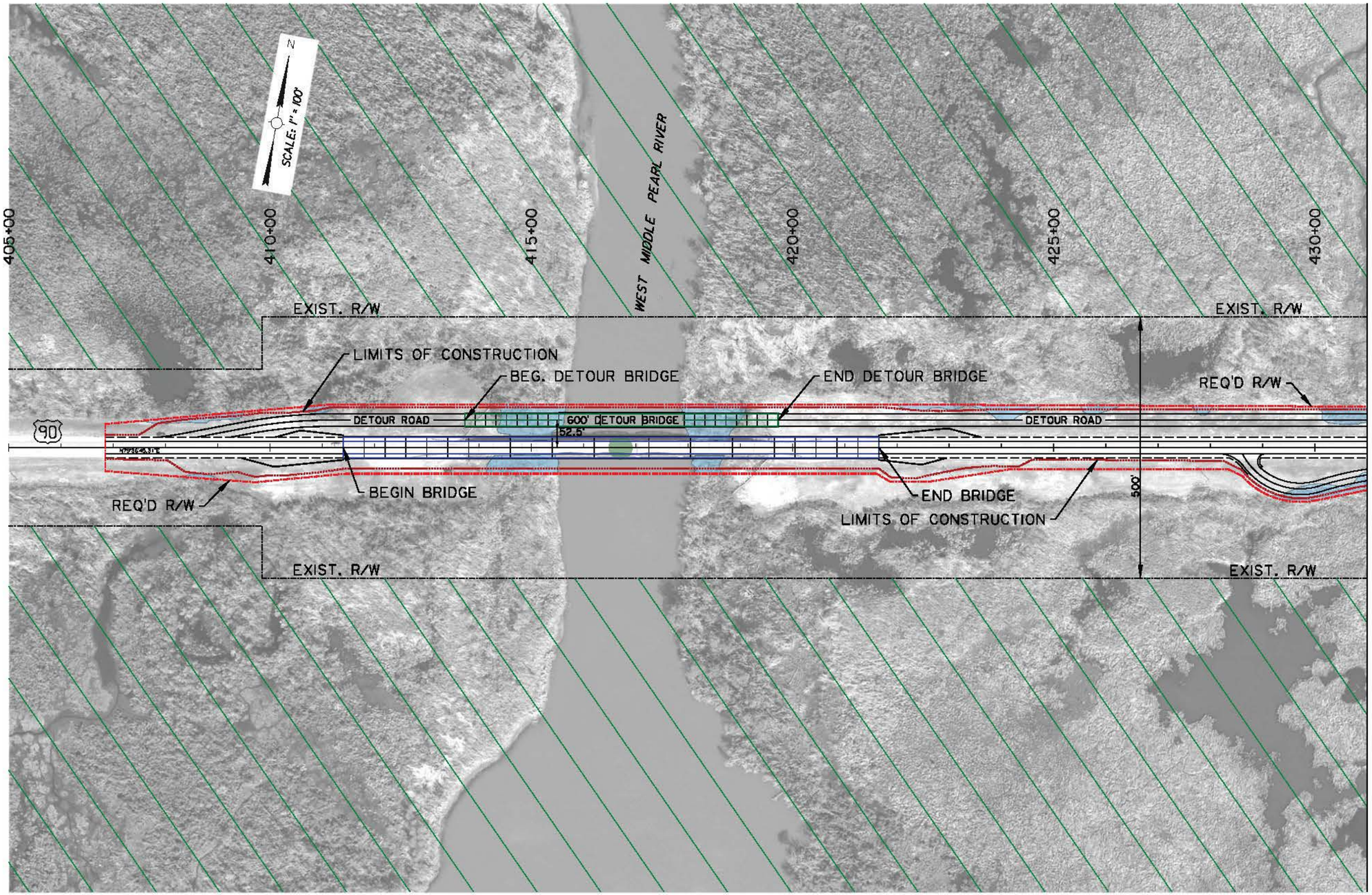
The existing West Middle pony truss fixed span structure provides a horizontal navigation clearance of 60 feet. Vertical clearance of the existing fixed spans is approximately 10 feet above high water. Build alternatives developed in support of the Environmental Assessment include:

- A fixed span structure on offset alignment, upstream of the existing alignment;
- A fixed span structure on existing alignment, with the construction of temporary detour structures. (a USCG Permit will also be required in support of the construction of the temporary detour bridge.)

The West Middle and Middle Middle Pearl River Environmental Assessment alternatives compare the placement of the upstream alternative for both bridges with the placement of an alternative on existing alignment for both bridges. Both bridges will either be placed on the upstream alignment or on the existing alignment. The Plan Sheets enclosed show both alternatives for both bridges. The profile sheet presents profiles for all three Middle River bridges. No additional right-of-way is required.

12/9/2016 11:26:23 AM

US 90 EA



PREPARED BY NEEL-SCHAFFER, INC.

Federal Highway Administration

DOTD LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

West and Middle Middle Pearl River Bridges
Existing Alignment Plan View
Plate 1 of 2
Page 10

LEGEND

- HISTORIC STRUCTURE
- WILDLIFE MANAGEMENT AREA
- WETLANDS (EXCLUDED WATER OF THE U.S.)
- REMOVAL
- LIMITS OF CONSTRUCTION
- REQ'D R/W

SHEET NUMBER

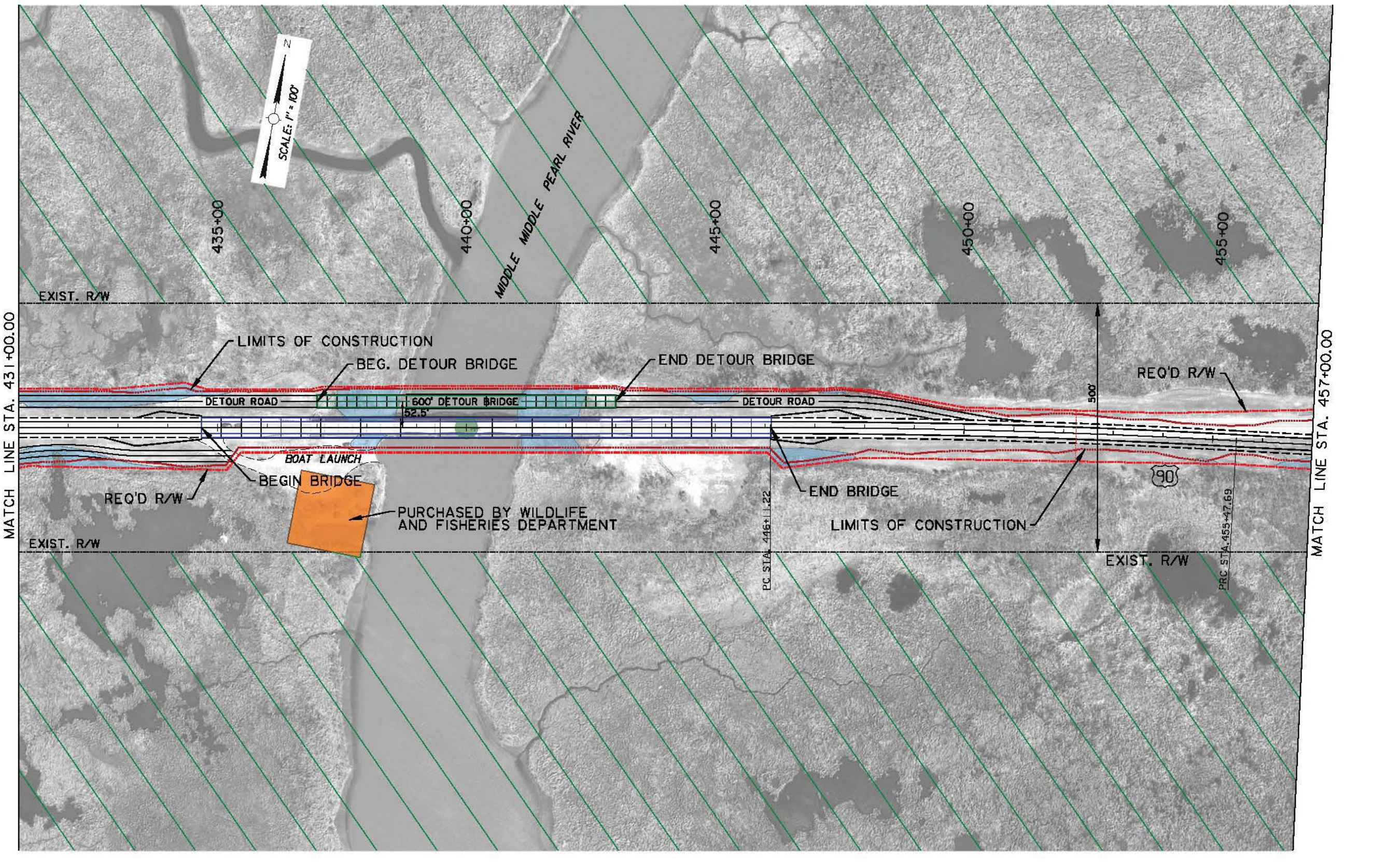
PARISH: ST. TAMMANY
CONTROL SECTION:
STATE PROJECT: H.000284

DESIGNED
CHECKED
DETAILED
CHECKED
DATE
SHEET: 12-06-16 1 OF 3

NO. DATE REVISION DESCRIPTION BY

MIDDLE PEARL RIVER BRIDGES
FIXED SPAN ALTERNATIVE
PLAN VIEW
US 90 BRIDGES

Lay_ MP_2Ex_1DS_1.dgn



PARED BY NEEL-SCHAFFER, INC.

al Highway inistration

DOTD LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

US 90: WEST MIDDLE & MIDDLE MIDDLE PEARL RIVER BRIDGES
FIXED SPAN BRIDGE ALTERNATIVE F-2
STATE PROJECT NO. H.000284
ST. TAMMANY PARISH, LA

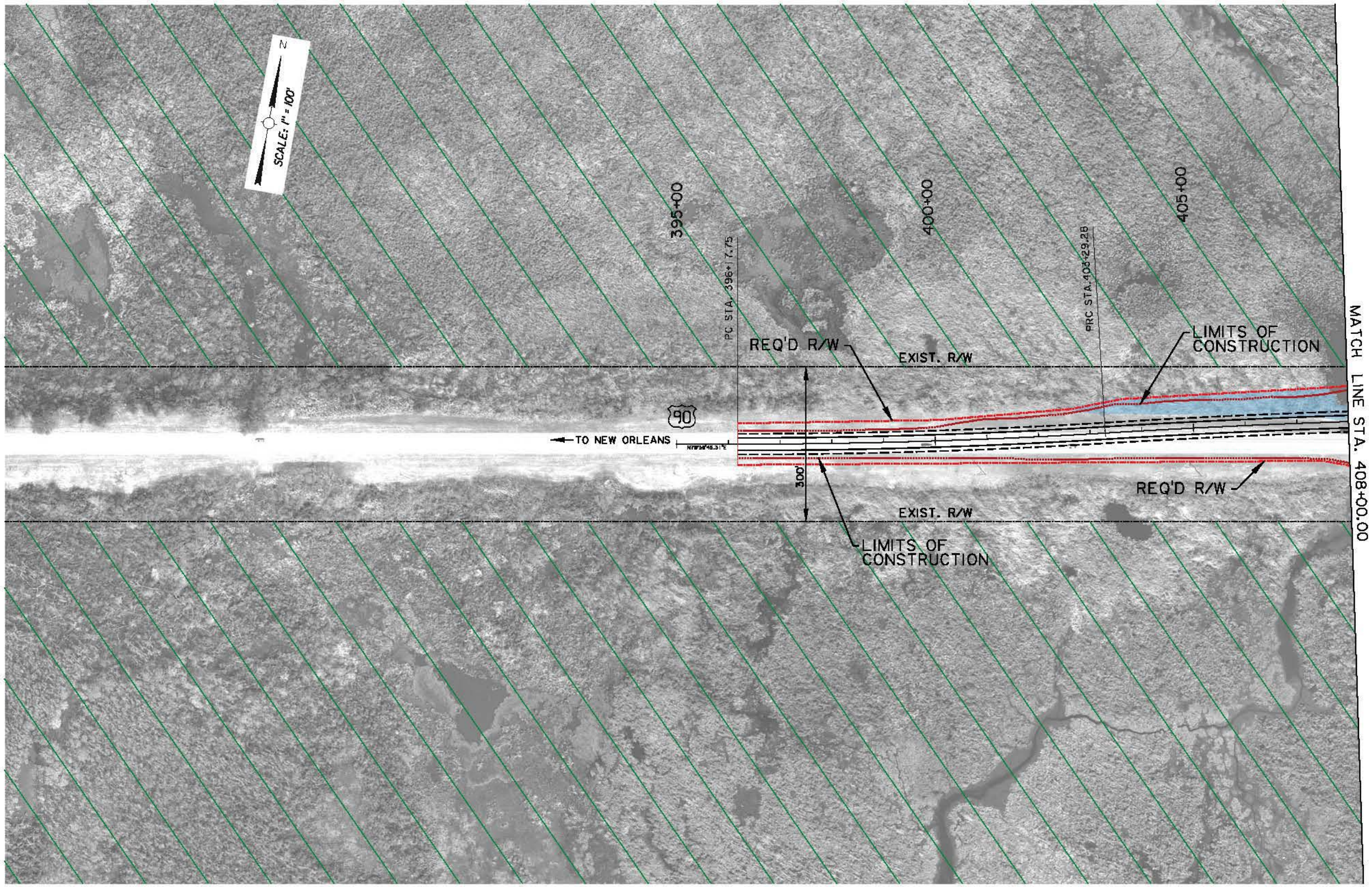
LEGEND
- HISTORIC STRUCTURE
- WILDLIFE MANAGEMENT AREA
- WETLANDS (EXCLUDED WATER OF THE U.S.)
- REMOVAL
- LIMITS OF CONSTRUCTION
- REQ'D R/W

SHEET NUMBER
PARISH: ST. TAMMANY
CONTROL SECTION
STATE PROJECT: H.000284
DESIGNED
CHECKED
DETAILED
CHECKED
DATE SHEET: 12-06-16 2 OF 3
NO. DATE BY REVISION DESCRIPTION

MIDDLE PEARL RIVER BRIDGES
FIXED SPAN ALTERNATIVE
PLAN VIEW
US 90 BRIDGES

West and Middle Middle Pearl River Bridges
Existing Alignment Plan View
Plate 2 of 2
Page 11

12/9/2016 11:27:06 AM
US 90 EA



100 50 0 100
GRAPHIC SCALE
SCALE: 1"=100'

EPARED BY NEEL-SCHAFFER, INC.

eral Highway
lministration

DOTD
LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

US 90: WEST MIDDLE & MIDDLE MIDDLE PEARL RIVER BRIDGES
FIXED SPAN BRIDGE ALTERNATIVE
STATE PROJECT NO. H.000284
ST. TAMMANY PARISH, LA

LEGEND
- HISTORIC STRUCTURE
- WILDLIFE MANAGEMENT AREA
- WETLANDS (EXCLUDED WATER OF THE U.S.)
- REMOVAL
- LIMITS OF CONSTRUCTION
- REQ'D R/W

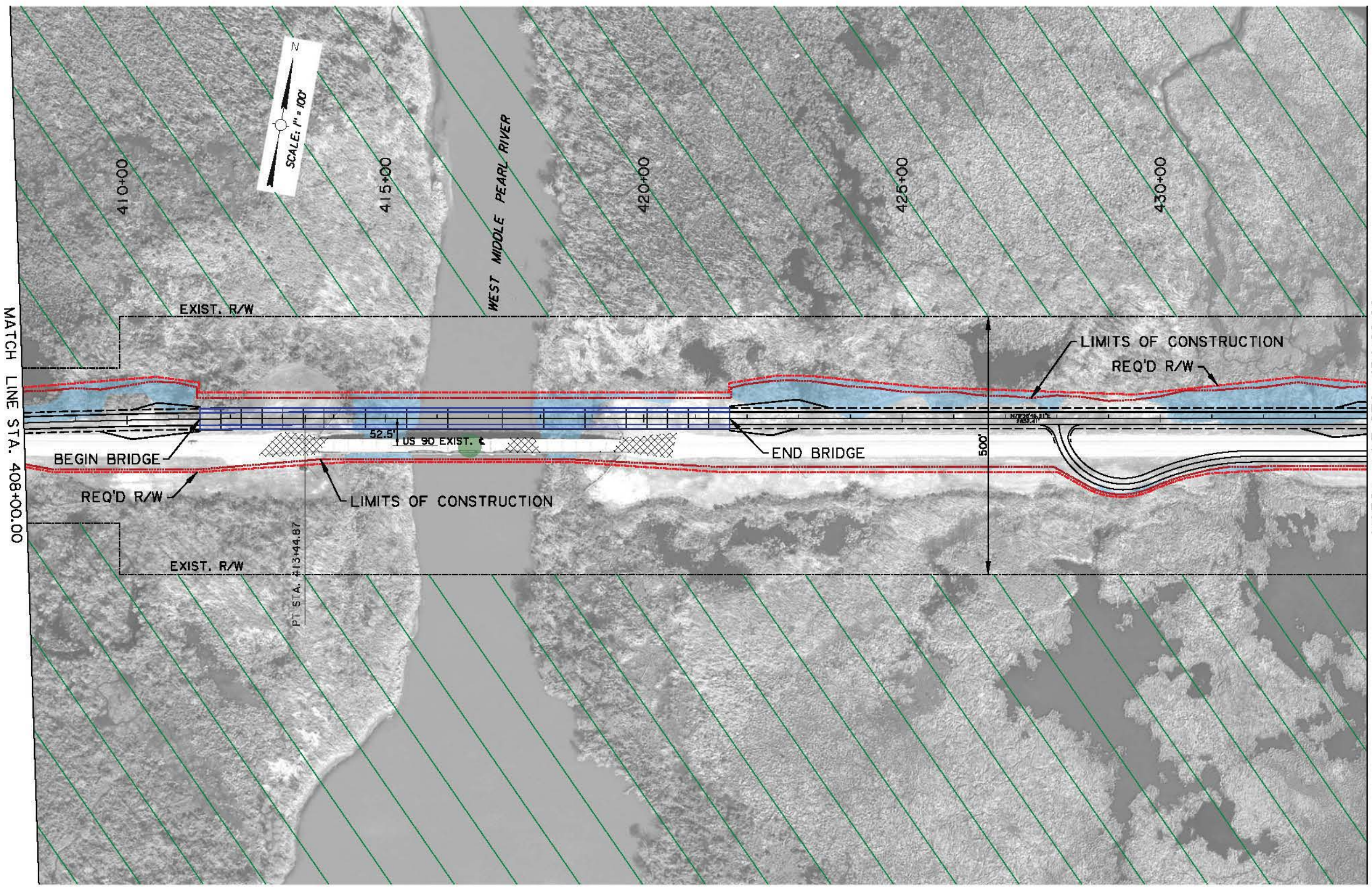
West and Middle Middle Pearl River Bridges
Upstream Alignment Plan View
Plate 1 of 3
Page 12

SHEET NUMBER
PARISH: ST. TAMMANY
CONTROL SECTION:
STATE PROJECT: H.000284
DESIGNED
CHECKED
DETAILED
CHECKED
DATE
SHEET: 12-05-16 1 OF 4
NO. DATE BY REVISION DESCRIPTION

MIDDLE PEARL RIVER BRIDGES
FIXED SPAN ALTERNATIVE
PLAN VIEW
US 90 BRIDGES

12/9/2016 11:27:19 AM

US 90 EA



West and Middle Middle Pearl River Bridges
Upstream Alignment Plan View
Plate 2 of 3
Page 13

PREPARED BY NEEL-SCHAFFER, INC.

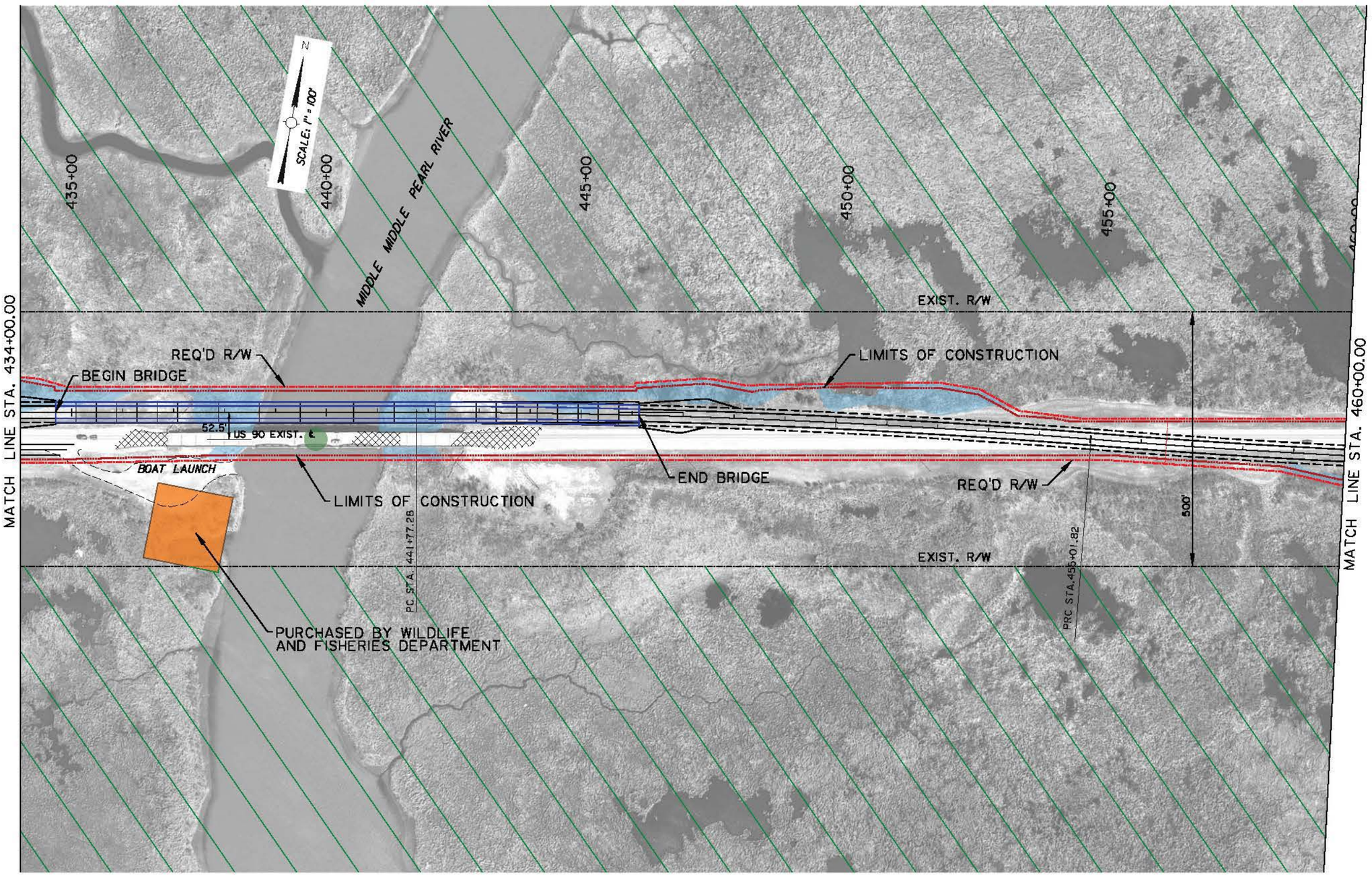
US 90: WEST MIDDLE & MIDDLE MIDDLE PEARL RIVER BRIDGES
FIXED SPAN BRIDGE ALTERNATIVE
STATE PROJECT NO. H.000284
ST. TAMMANY PARISH, LA

LEGEND
- HISTORIC STRUCTURE
- WILDLIFE MANAGEMENT AREA
- WETLANDS (EXCLUDED WATER OF THE U.S.)
- REMOVAL
- LIMITS OF CONSTRUCTION
- REQ'D R/W

SHEET NUMBER
PARISH: ST. TAMMANY
CONTROL SECTION
STATE PROJECT: H.000284
DESIGNED / CHECKED
DETAILED / CHECKED
DATE / SHEET: 12-05-16 / 2 OF 4
REVISION DESCRIPTION | NO. | DATE | BY

MIDDLE PEARL RIVER BRIDGES
FIXED SPAN ALTERNATIVE
PLAN VIEW
US 90 BRIDGES

12/9/2016 11:27:27 AM



PREPARED BY NEEL-SCHAFFER, INC.

Federal Highway Administration

DOTD LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

West and Middle Middle Pearl River Bridges
Upstream Alignment Plan View
Plate 3 of 3
Page 14

LEGEND

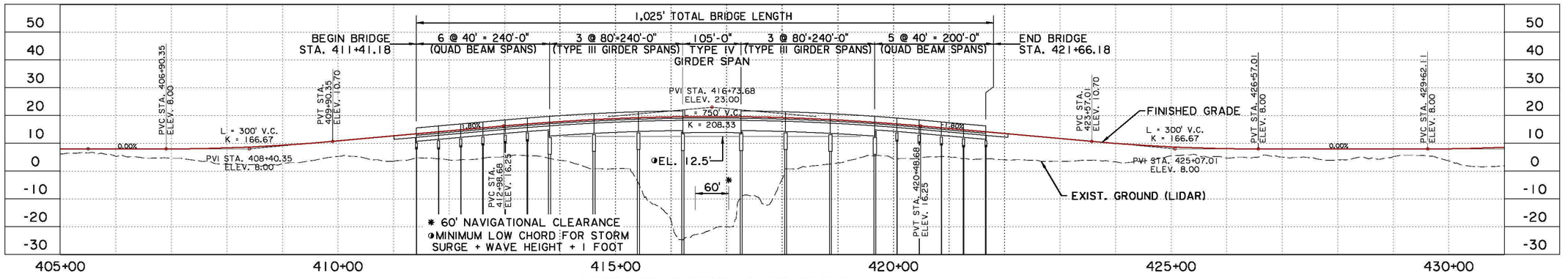
- HISTORIC STRUCTURE
- WILDLIFE MANAGEMENT AREA
- WETLANDS (EXCLUDED WATER OF THE U.S.)
- REMOVAL
- LIMITS OF CONSTRUCTION
- REQ'D R/W

SHEET NUMBER	
PARISH	ST. TAMMANY
CONTROL SECTION	
STATE PROJECT	H.000284
DESIGNED / CHECKED	
DETAILED / CHECKED	
DATE / SHEET	12-05-16 / 3 OF 4

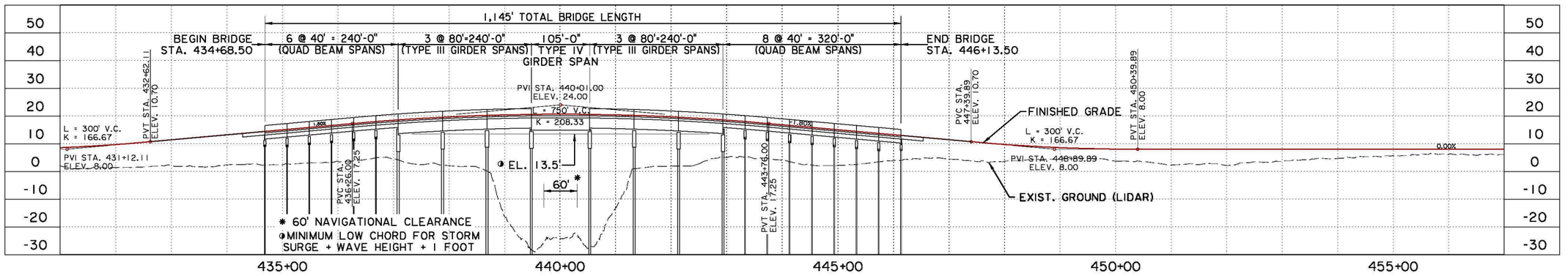
MIDDLE PEARL RIVER BRIDGES
FIXED SPAN ALTERNATIVE
PLAN VIEW
US 90 BRIDGES

Lay_ MP_2DS_1DS_3.dgn

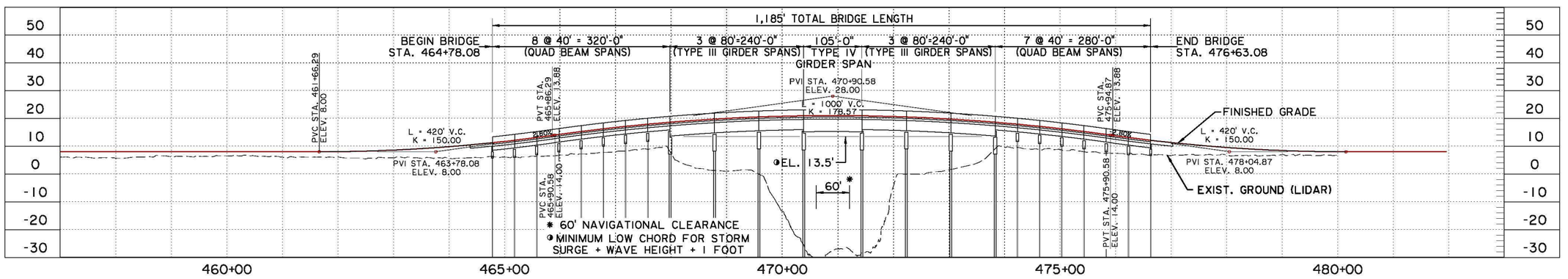
12/9/2016 11:07:17 AM
US 90 EA
Pro_ MP_2Ex_1DS_1.dgn



WEST MIDDLE PEARL RIVER BRIDGE



MIDDLE MIDDLE PEARL RIVER BRIDGE



EAST MIDDLE PEARL RIVER BRIDGE

PREPARED BY NEEL-SCHAFFER, INC.

Federal Highway Administration

DOTD LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

Middle Pearl River Bridges
Profile Views
Plate 1 of 1
Page 15

Note 1: The bridge concepts shown (including pier placement and girder selection) are conceptual. During preliminary engineering, the types of girders and the pier placement will be finalized. The selected girders and associated pier placement may differ from the conceptual profiles as shown.

SCALES
HORIZONTAL 1" = 100'
VERTICAL 1" = 20'

SHEET NUMBER
PARISH: ST. TAMMANY
CONTROL SECTION
STATE PROJECT: H.000284
DESIGNED
DETAILED
CHECKED
DATE: 2-05-16
SHEET: 1 OF 1
BY
NO. DATE REVISION DESCRIPTION

STATE OF LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT

MIDDLE PEARL RIVER BRIDGES
FIXED BRIDGE ALTERNATIVES
PROFILE VIEW
US 90 BRIDGES

1.10 Proposed Bridge's Impacts to Existing and Potential Navigation

The West Middle Pearl River is entirely contained within the Pearl River Wildlife Management Area. The existing US 90 bridge is a fixed span with clearances as described earlier in this study. The proposed bridge will be higher than the existing vertical clearance, and will maintain the existing horizontal clearance. In addition:

- The proposed bridge does not completely obstruct passage of any existing waterway users or access to waterborne facilities.
- The proposed bridge will not establish a new navigational limiting factor, as the proposed bridge low chord elevation using storm surge plus wave criteria plus 1 foot exceeds the existing low chord elevation by 1.14 feet.
- The proposed bridge does not impact present and prospective commercial activity on the waterway.
- The proposed bridge does not impact existing or planned commercial/industrial developments.
- The proposed bridge does not impact existing facilities on the waterway that are or could be considered critical infrastructure, key resources, or important/unique US industrial capability.
- The proposed bridge does not impact USACE ability to transit the bridge in a federal project channel.
- The bridge does not impact USCG and other government vessels' ability to Transit Bridge to conduct mission essential functions.
- The proposed bridge does not impact existing and future cruise ship port-of-call/terminals, commercial freighters, or ports supporting post-panamax vessels as navigation associated with these facilities is not possible on the West Middle Pearl River.
- The proposed bridge does not impact vessels that require helper boats/tugs, as none currently use the waterway.

1.11 Consideration of River Hydrology in the Siting and Design for a Replacement Structure

1.11.1 Introduction

There are a number of hydrology modeling investigations underway relating to the performance of the Lower Pearl River Floodplain during flood and hurricane events. In April 2019, the University of Southern Mississippi released a report documenting the Development of a Forecast Model for the Lower Pearl River Basin. The most comprehensive discussion of the performance of the US 90 bridges during high flow river conditions is a 1999 joint report issued by LADOTD and the US Geological Survey (USGS), *Estimation of Scour and Channel Stability for Selected Highway Crossings of Rivers in the Florida Parishes, Southeastern Louisiana, Louisiana*

Department of Transportation And Development, Water Resources Technical Report No. 67B. The report will be hereafter referenced as the Scour Report.
The following discussion utilizes the findings of the Scour Report as the basis to describe the hydraulic performance of each of the five rivers at each of the US 90 Pearl River bridge sites. The Scour Report investigates scour conditions at each bridge site assuming a 500-year storm as the base condition.

Excerpts from The Scour Report relevant to the West Middle Pearl River are provided in Appendix A. Specific tables and figures from the Scour Report will be referenced in this narrative. Photographs of the upstream and downstream approaches to the West Middle Pearl River bridge are included in Appendix B.

1.11.2 River Hydrology

Between the West Pearl River and the East Pearl River, the US 90 embankment of the lower Pearl River Basin spans over 4 miles of the river floodplain system. There are five openings in the embankment for the channels of the East Pearl, the East Middle, the Middle Middle, West Middle, and the West Pearl Rivers. The elevation of the roadway embankment is approximately 8 feet above sea level throughout and floodplain elevations range from 1 to 2 feet above sea level.

Table 2 shows the distribution of the 500 year storm event through the five river channels.

Table 2
Disribution of Flows Within Pearl River Watershed

	Flow in ft^3/sec	Percent of total flow
East Pearl River	100,002	36.6%
East Middle Pearl River	33,000	12.1%
Middle Middle Pearl River	41,000	15.0%
West Middle Pearl River	50,000	18.3%
West Pearl River	33,000	12.1%
Overflow	16,000	5.9%
Total	273,002	100.0%

Source: Neel-Schaffer, Inc.

The West Middle Pearl River is formed as a distributary of the Middle Middle Pearl River approximately one-half mile downstream of the I-10 embankment. There are no substantial or named tributaries or distributaries of this channel in the reach between I-10 and US 90; however, the low-water channels of the West Middle Pearl River and the Middle Middle Pearl River are joined approximately one-half mile upstream of the US 90 embankment.

1.11.3 Waterway Layout and Geometry

The West Middle Pearl River channel at US 90 is straight when passing through the bridge opening and the bridge crosses the river at approximately 90 degrees to the river. The main channel completes a 90 degree bend to the left about two bridge

widths upstream of the highway crossing (Scour Report Figure 42). Figure 42 also shows river flow, which is roughly from north to south at the bridge.

1.11.4 Waterway Depth and Elevation Fluctuations

As shown in Scour Report Figure 43, channel depth in proximity to the existing bridge has varied with the channel deepening slightly over time due to scour. In 1993 the main channel was approximately at elevation -25.

Table 3 shows NOAA-provided information for the East and West Pearl Rivers.

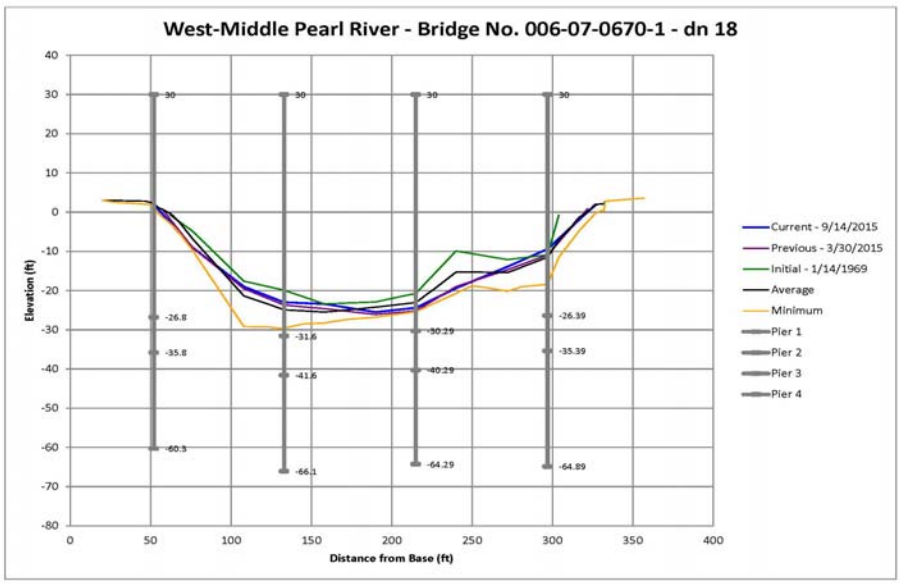
Table 3
NOAA Information from Station Datum
(Elevation Datum NAVD88)
West Pearl and East Pearl Rivers at US 90

	MHW	MLW
West Pearl River	1.35	0.74
East Pearl River	1.36	0.22

Source Neel-Schaffer, Inc.

NOAA does not provide information for the three middle rivers. However, the five rivers are hydraulically connected. The East Pearl River exhibits the greater elevation change between MHW and Mean Low Water (MLW). Consequently, the East Pearl range will be applied to the middle rivers to show the potential range of river fluctuations. MHW elevation for the East Pearl River at US 90 is elevation 1.36 NAVD88. Mean MLW is elevation 0.22 NAVD88, which indicates that there is a relatively small range of elevation fluctuations affecting navigation. Figure 3 presents a recently taken cross-section approximately 18 feet downstream of the bridge.

Figure 3 – LADOTD Cross-section of West Middle Pearl River (18' Downstream of Bridge)



1.11.5 Channel and Waterway Alignment

The existing West Middle Pearl River Bridge crosses the river at roughly 90 degrees to the river. Bridge replacement alternatives located new structures upstream from the existing bridge. Alternatives were also considered locating new structures along the existing alignment. In those situations, a temporary by pass structure will be provided that meets or exceeds the existing clearances. The centerline of the replacement structure will be 52.5 feet from the centerline of the existing bridge. The existing 60-foot horizontal channel will be maintained in alignment with the existing fixed span; so there will be no change in the navigation geometry

1.11.6 Current Speed and Direction

Simulation of the 500-year event indicated West Middle Pearl River flow velocities ranging from approximately 2 feet/second near the channel bank to approximately 8 feet/second at center channel (Scour Report Table 22). As noted in Table 2, estimated flow at the bridge was approximately 50,000 feet^3/second.

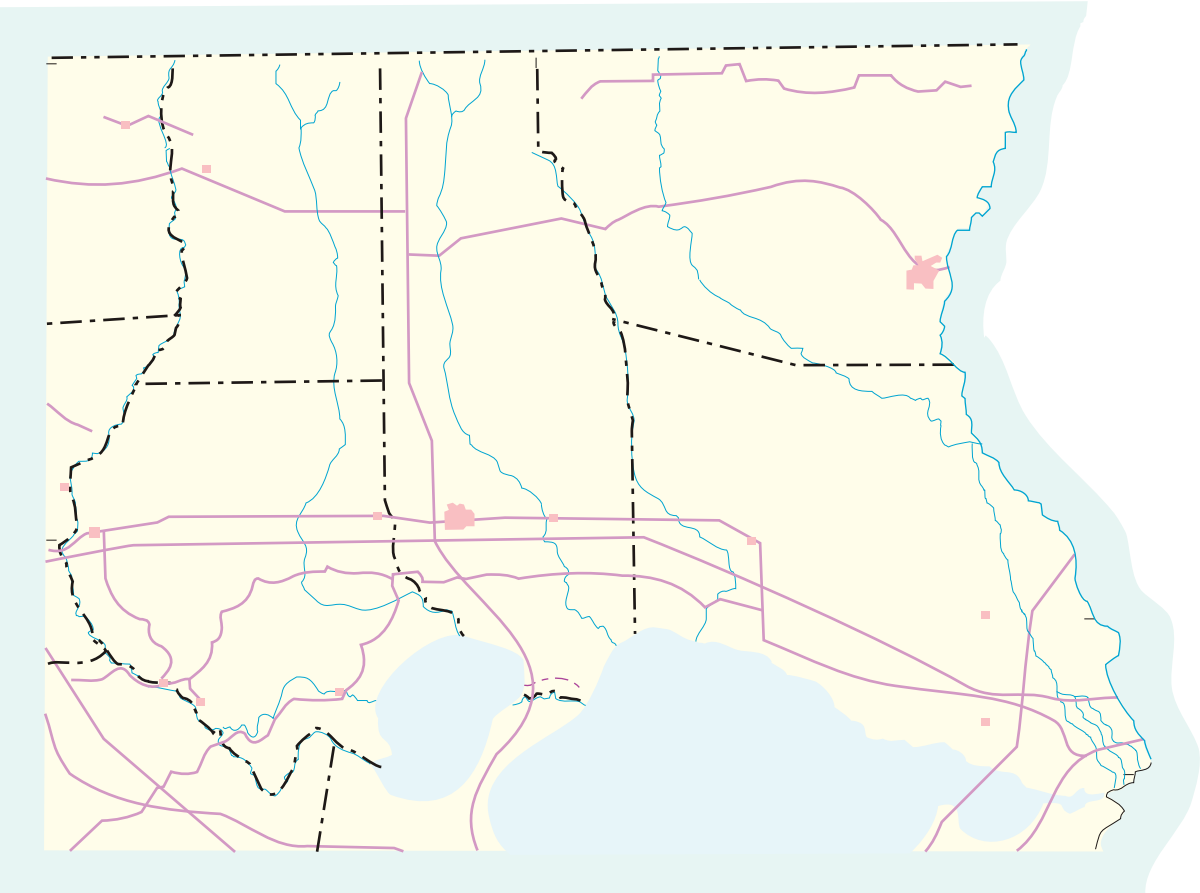
1.11.7 Natural Flow of Waterway including Currents, Water Velocity, Water Direction and Velocity Fluctuations that Might Affect Navigation

Replacement bridge alternatives are situated in proximity to the existing bridge, maintaining the 60-foot horizontal channel width and relative channel alignment. Forecast river velocities under extreme navigation conditions (during a 500-year event) are approximately 8 feet/second. MHW and MLW elevations fluctuations are 1.14 feet. There is no indication that natural flow of the waterway at the new bridge location (including currents, water velocity, water direction and velocity fluctuations) might affect navigation.

Appendix A
West Middle Pearl River
Excerpts from 1999 Report, Estimation of Scour and Channel Stability for Selected Highway Crossings of Rivers in the Florida Parishes, Southeastern Louisiana

Estimation of Scour and Channel Stability for Selected Highway Crossings of Rivers in the Florida Parishes, Southeastern Louisiana

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
Water Resources Technical Report No. 67B



STATE OF LOUISIANA
DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
PUBLIC WORKS AND FLOOD CONTROL DIRECTORATE
WATER RESOURCES SECTION
in cooperation with the
U.S. GEOLOGICAL SURVEY

1999

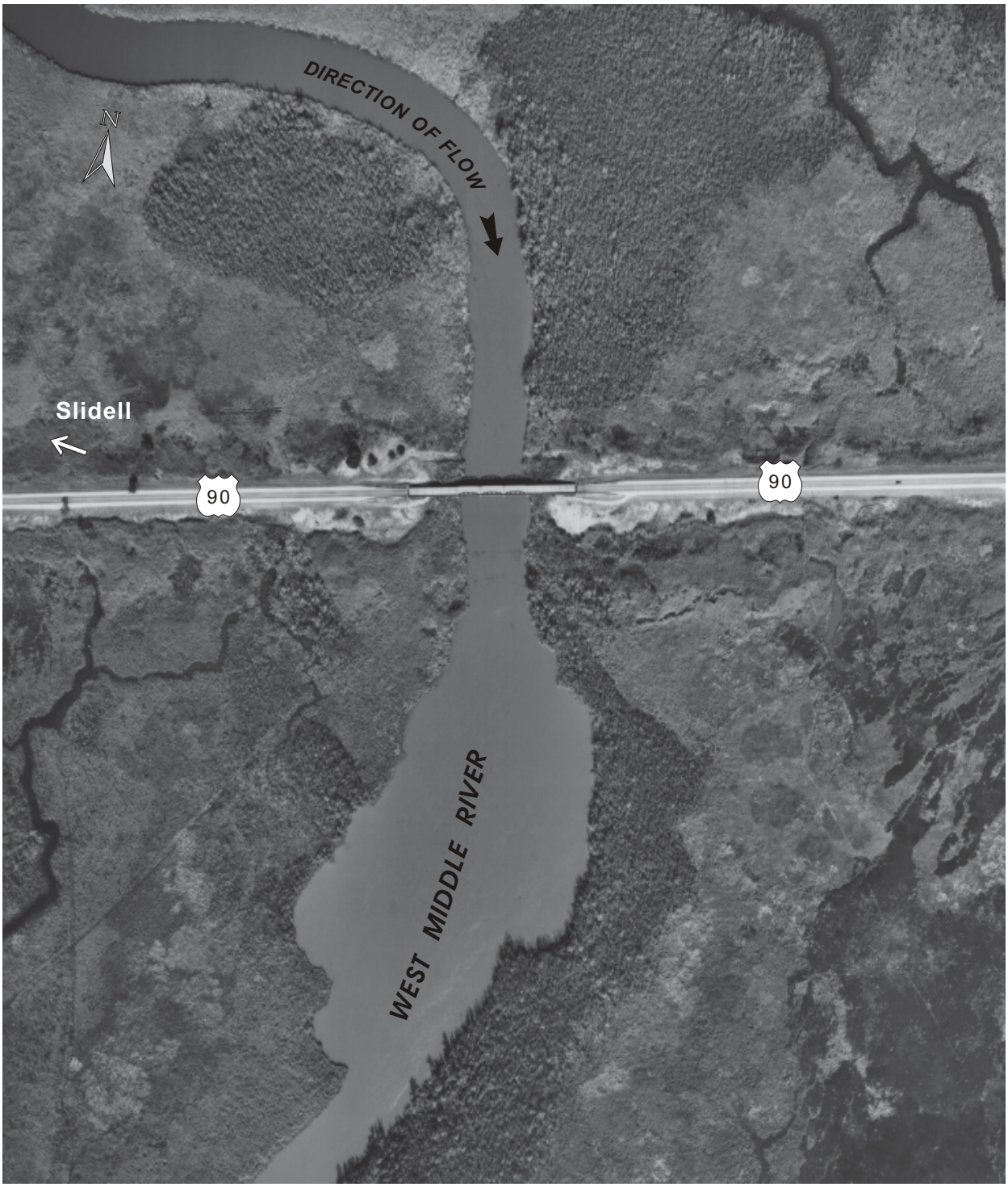
USGS
science for a changing world

West Middle River near Slidell, Louisiana

The West Middle River is formed as a distributary of the Middle River approximately one-half mi downstream of the I-10 embankment. There are no substantial or named tributaries or distributaries of this channel in the reach between I-10 and U.S. Hwy. 90; however, the low-water channels of the West Middle River and the Middle River are joined approximately one-half mi upstream of the U.S. Hwy. 90 embankment. This is the fourth (east to west) opening for the U.S. Hwy. 90 crossing of the Pearl River system. The main channel completes a 90 degree bend to the right about two bridge widths upstream of the highway crossing, and is straight when passing through the bridge opening (fig. 42).

Pier Scour

Simulation of the Q_{500} indicated velocities ranging from approximately 2 to 8 ft/s and a water-surface elevation of approximately 6.5 ft above sea level. The bridge piers are skewed to the channel at an angle less than 15 degrees; therefore, no correction for alignment was applied. The greatest predicted pier scour is approximately 15 ft at the main channel pier at DOTD station 417+20 (table 22, fig. 43). Scour at the three other main piers that are in or near the channel ranged approximately from 4 to 13 ft. Estimated scour depth at the overbank piers was approximately 2 ft.



Photograph source: Louisiana Department of Transportation and Development, December 1978

Figure 42. Aerial photograph of the U.S. Highway 90 crossing of the West Middle River near Slidell, Louisiana.

Table 22. Scour data for U.S. Highway 90 crossing of the West Middle River near Slidell, Louisiana

[DOTD, Louisiana Department of Transportation and Development; water-surface elevation is 6.5 feet above sea level; K_2, dimensionless correction factor for angle of flow attack; ft, feet; ft/s, foot per second; pile tip elevations scaled from DOTD bridge plans; NA, not applicable]

DOTD station	Ground elevation (ft above sea level)	Pier shape	K_2	Pier width (ft)	Velocity (ft/s)	Local or pier scour (ft)	Contraction scour (ft)	Scour elevation (ft above sea level)	Pile tip elevation (ft above sea level)
413+87	1.0	Abutment	1.0	NA	1.8	NA	3.7	-3	-20
414+15	1.0	Square	1.0	1.5	1.8	2.2	3.7	-5	-20
414+40	1.0	Square	1.0	1.5	1.8	2.2	3.7	-5	-20
414+70	1.0	Square	1.0	1.5	1.8	2.2	3.7	-5	-20
415+00	1.0	Square	1.0	1.5	1.8	2.2	3.7	-5	-20
415+30	1.0	Square	1.0	1.5	1.8	2.2	3.7	-5	-20
415+55	-3.0	Square	1.0	5.5	6.1	4.0	11.8	-19	-52
416+35	-24.0	Square	1.0	8.0	7.4	12.0	11.8	-48	-58
417+20	-23.0	Square	1.0	8.0	7.8	15.0	11.8	-50	-58
418+00	-11.0	Square	1.0	5.5	6.6	13.0	11.8	-36	-56
418+30	1.0	Square	1.0	1.5	2.0	2.3	3.7	-5	-20
418+55	1.0	Square	1.0	1.5	2.0	2.3	3.7	-5	-20
418+85	1.0	Square	1.0	1.5	2.0	2.3	3.7	-5	-20
419+15	1.0	Square	1.0	1.5	2.0	2.3	3.7	-5	-20
419+40	1.0	Square	1.0	1.5	2.0	2.8	3.7	-5	-20
419+68	1.0	Abutment	1.0	NA	2.0	NA	3.7	-3	-20

Channel Stability

A pool about one bridge width downstream of the highway crossing is approximately three bridge widths long and two bridge widths wide. It is unlikely that this downstream pool would cause any changes in the cross section at the bridge that are related to contraction scour. It is more likely that the pool area provides conditions for turbulent losses to fully develop and dissipate any flow jet caused by the contraction at the bridge. The cross-section information at the bridge does not indicate any lateral movement of the channel, but does show some widening that may have been initiated at the time of construction.

Contraction and Abutment Scour

Flow through the bridge was subdivided into flow in the main channel, left overbank, and right overbank. The average depth of the channel at the bridge is approximately 25 ft for the main channel and 5 ft for the overbanks. For contraction scour estimates in the main channel, the main channel upstream was defined as a section of channel approximately 220 ft in width. The width of the main channel at the opening is 275 ft. Contraction scour in the main channel was computed as approximately 12 ft. Scour on the left and right overbanks was predicted as approximately 4 ft. The overbanks are vegetated with marsh grasses which may reduce the scour potential in these areas of the bridge. No abutment scour was indicated.

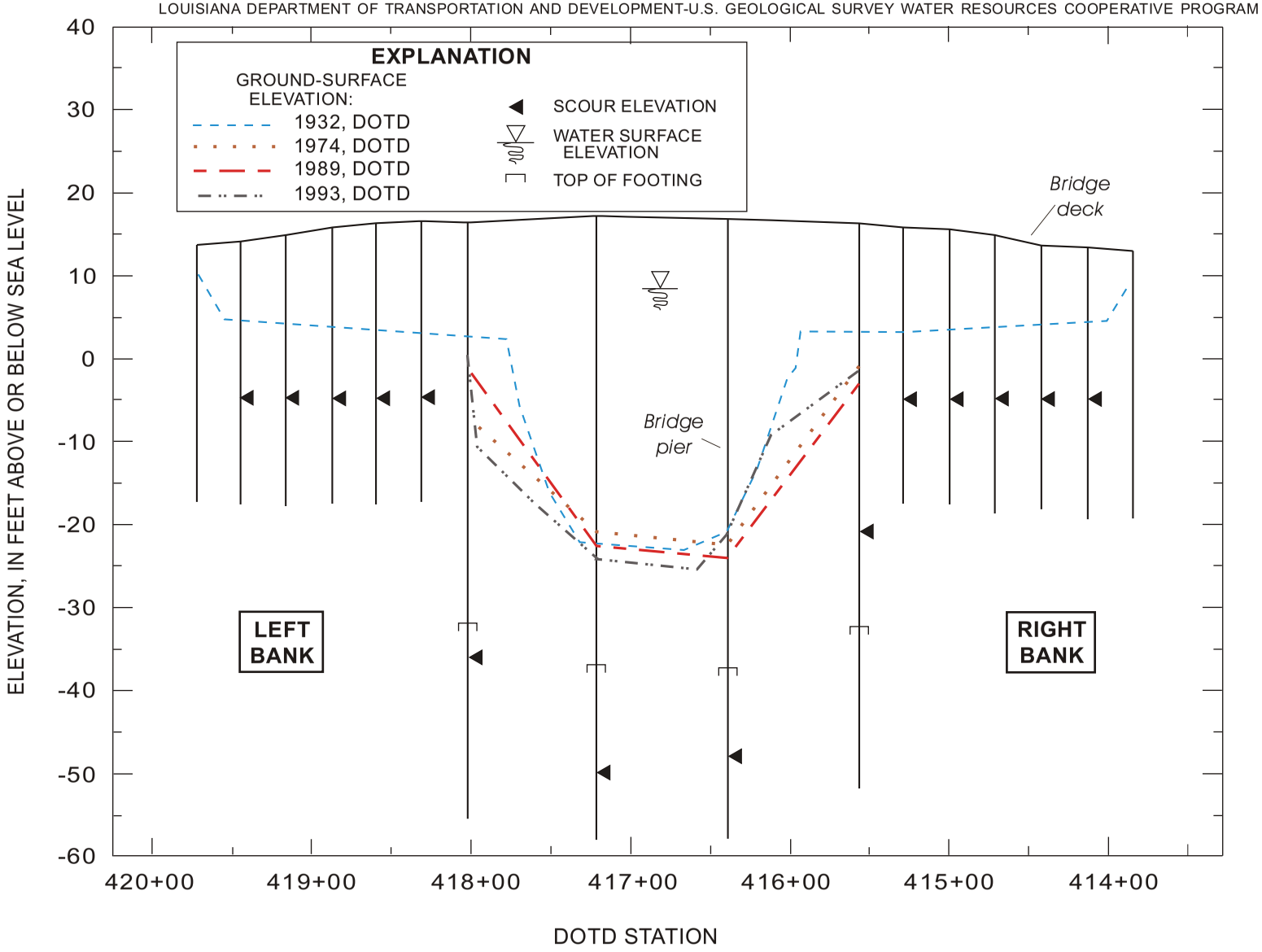
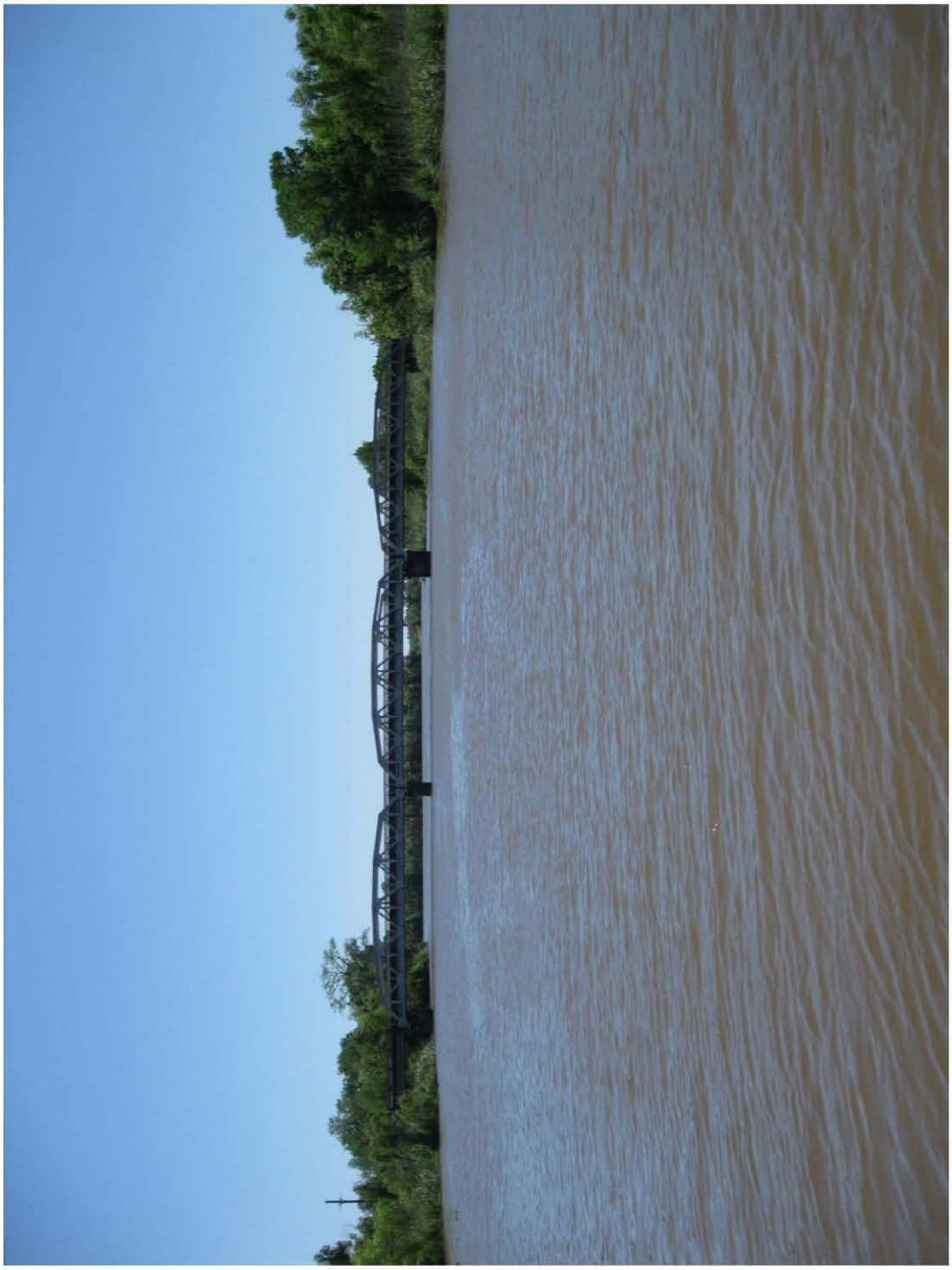


Figure 43. Comparative cross sections and scour estimates at the U.S. Highway 90 crossing of the West Middle River near Slidell, Louisiana.

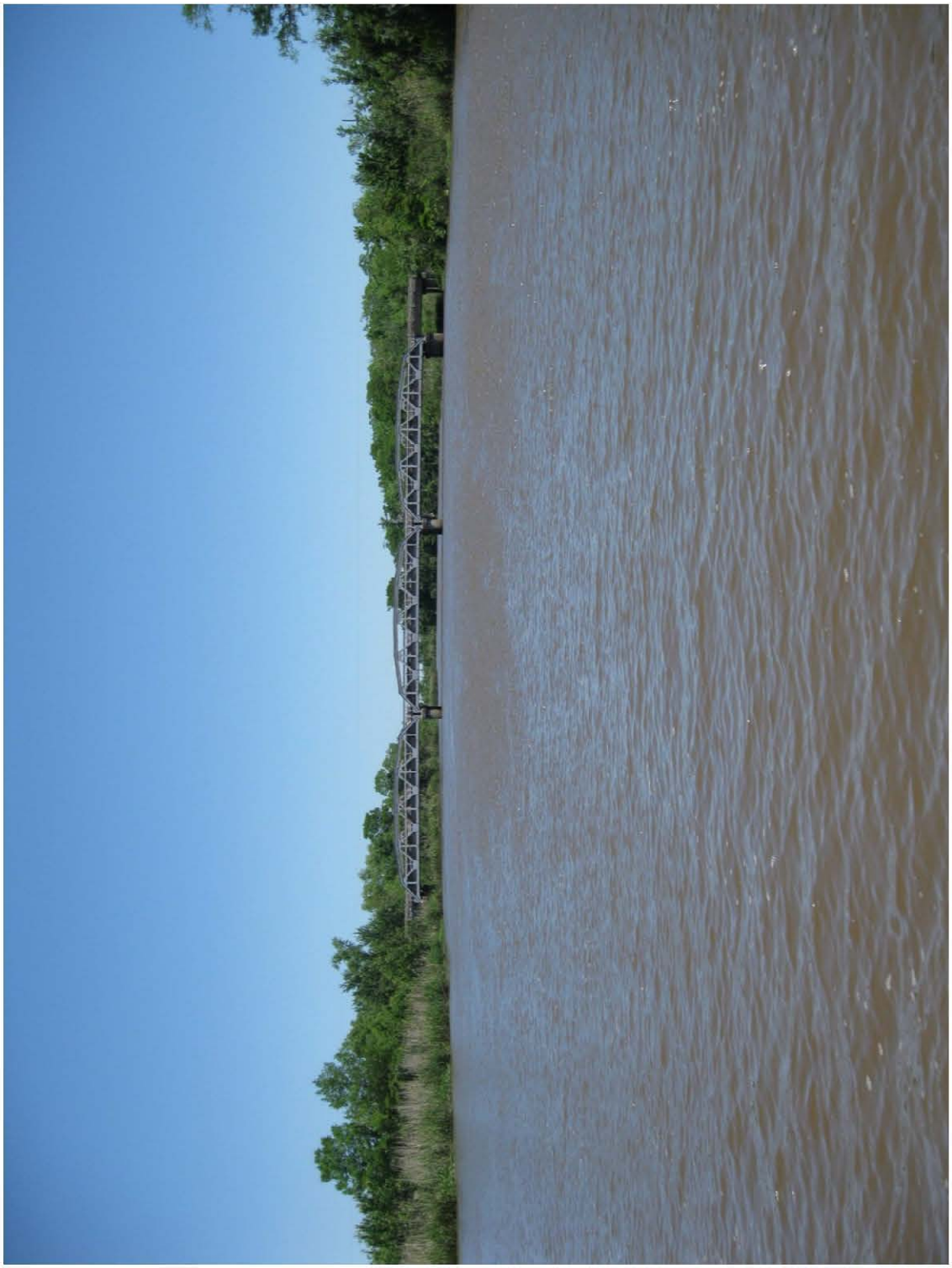
Appendix B
Photographs of the West Middle Pearl River Upstream and Downstream Approaches

West Middle Pearl River

Upstream Approach



Downstream Approach



Navigation Study
US 90 Crossing of the MIDDLE MIDDLE PEARL RIVER

US 90 Pearl River Bridges
Environmental Assessment
St. Tammany Parish, LA and Hancock County, MS

STATE PROJECT NO. H.000284 & NO. H.000286
FEDERAL AID PROJECT NO. H000284 & NO. H000286



Middle Middle River Upstream Approach

USCG Draft Navigation Impact Report

DOTD
LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

U.S. Department of Transportation
Federal Highway Administration

July 2019

Table of Contents

		Page
Section 1.0	Navigation Study – US 90 Crossing the Middle Middle Pearl River	1
1.1	Introduction	1
1.2	Project Purpose and Need	3
1.3	Reference Datum Conversion	3
1.4	Floodplain Consideration	3
1.5	Navigation Clearance above Mean High Water	3
1.6	Establishment of the Planning Elevation	4
1.7	Current Navigational Usage	5
1.8	Recommended Clearances associated with Replacement US 90 Bridge Crossing of the Middle Middle Pearl River	9
1.9	Environmental Assessment Alternatives	10
1.10	Proposed Bridge's Impacts to Existing and Potential Navigation	17
1.11	Consideration of River Hydrology in the Siting and Design for a Replacement Structure	17

Tables

Table 1	Summary of Datum Conversion Elevations	4
Table 2	Distribution of Flows within the Pearl River Watershed	18
Table 3	NOAA Standard Datum Elevations West Pearl and East Pearl Rivers, Mean High Water and Mean Low Water	19

Figures

Figure 1	Study Area	2
Figure 2	Land Use and Zoning	6
Figure 3	Middle Pearl River Public Boat Launch	7
Figure 4	Cross-section of Middle Middle Pearl River	20

Engineering Plates

Fixed Span Alternative Existing Alignment Plan View, Plates 1-2	11-12
Fixed Span Alternative Upstream Alignment Plan View, Plates 1-3	13-15
Fixed Span Alternative Profile View, Plates 1	16

Appendix

Appendix A	Middle Middle Pearl River, Excerpts of the 1999 Report Estimation of Scour and Channel Stability for Selected Highway Crossings of Rivers in the Florida Parishes, Southeastern Louisiana	22
Appendix B	Photographs of Upstream/Downstream Approaches	23

1.0 Navigation Study - US 90 Crossing of the Middle Middle Pearl River

1.1 Introduction

The Louisiana Department of Transportation and Development (LADOTD) is preparing planning and environmental documents for the improvement of five bridge structures associated with the Pearl River system along US Highway 90 (US 90). The enclosed Study Area map, Figure 1, shows the limits of the project. The project limits extend along US 90 from US 190 in Louisiana to the US 90 intersection with Kelly Road / 7th Avenue in Pearlington, Mississippi. The existing roadway is a two lane rural arterial roadway (RA-2) with 12-foot travel lanes and 8-foot paved shoulders. Average Daily Traffic is approximately 3,000 vehicles per day.

Five bridges associated with the Pearl River system are crossed as follows:

- Structure no. 62520060705291, West Pearl River Bridge, Movable Lift Span
- Structure no. 62520060706701, West Middle Pearl River Bridge
- Structure no. 62520060707111, Middle Middle Pearl River Bridge
- Structure no. 62520060707701, East Middle Pearl River Bridge
- Structure no. 62520060800001, East Pearl River Bridge, Movable Swing Span

This Navigational Study assesses the current and anticipated future use of the Middle Middle Pearl River, and investigates the required clearances for the proposed bridge replacement alternatives.

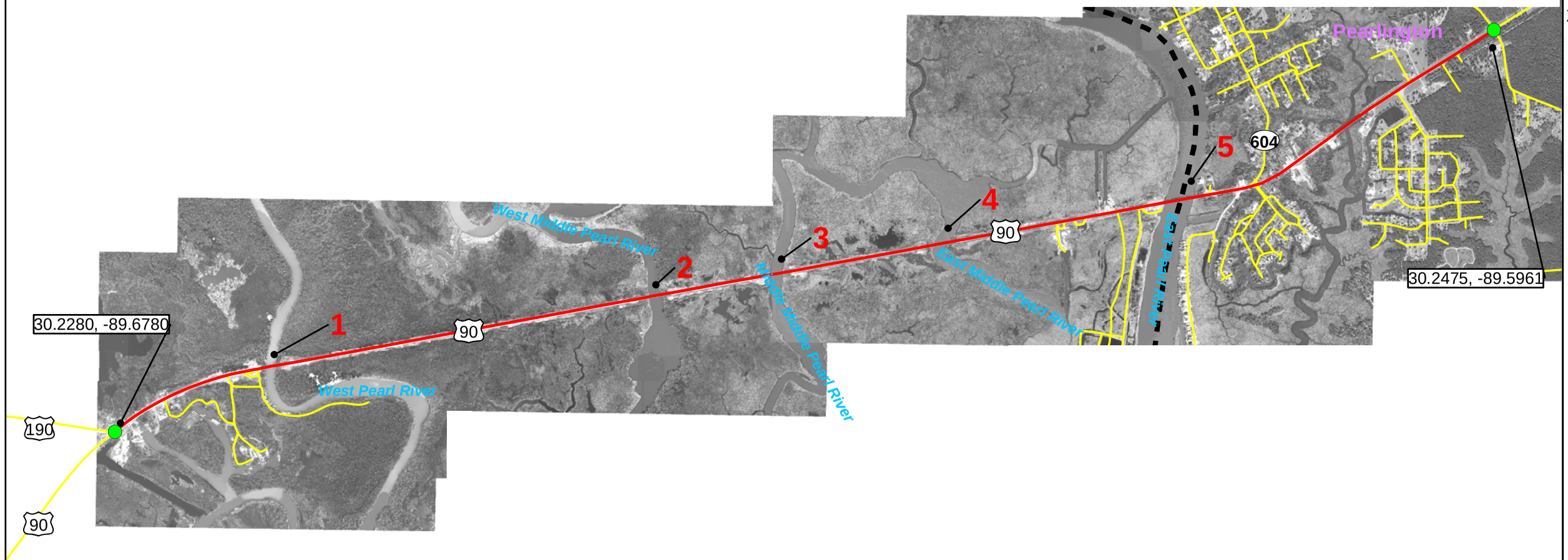
US 90 Bridge across Middle Middle Pearl River
Structure Number: 62520060707111
Recall Number: 058730

The US 90 bridge across the Middle Middle Pearl River was built in 1933. The structure is 24' wide, 582' long and consists of 12 reinforced concrete deck girder approach spans and 3 steel pony truss spans across the river. The maximum vertical clearance for vessel navigation is 10'.

The bridge width (24') does not meet the minimum requirements for a RA roadway. The 2017 LADOTD minimum design guidelines state that the preferable bridge width is equal to the approach travel lanes (24') and the shoulder width (8'). The bridge does not have shoulders. This bridge is classified as a "Non-Priority Bridge" as determined under the PA regarding historic bridges in Louisiana. The horizontal clearance is 60 feet.

Map No.	Structure Number	Structure Type	Water Body Crossing
1	62520060705291	Movable: Lift-Span	West Pearl River
2	62520060706701	Pony Truss - Warren Truss	West Middle Pearl River
3	62520060707111	Pony Truss - Warren Truss	Middle Middle Pearl River
4	62520060707701	Pony Truss - Warren Truss	East Middle Pearl River
5	62520060800001	Movable: Swing - Through Truss (Parker Truss)	East Pearl River

NOTE: Logical Termini are the intersections of US 90 with US 190 and Kelly Rd/7th Ave and latitude and longitude data are in decimal format



Source (Citation) for 2010 six inch pixel imagery Parish Mosaics

This imagery was provided by the Louisiana Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP) as the sole source owner, and is shared with Louisiana state government agencies in the interest of good government practices.

Reproduction and distribution of the data is prohibited. Please refer any requests for data to the Deputy Director for Management, Finance and Interoperability of GOHSEP. This imagery was distributed by the Regional Planning Commission for Jefferson, Orleans, Plaquemines, St. Bernard and St. Tammany Parishes (RPC) with permission from GOHSEP.

GOHSEP and the RPC are not responsible for any errors arising from any use of alterations made to the data. Under no circumstances is resale or distribution of the data permitted.

Mosaics were produced and compressed by the Louisiana State University Coastal Studies Institute.

Imagery Information: The red, green, blue (true color) and near infrared four-band aerial imagery was captured between February 10th and April 1st of 2010 (re-flights for any corrections flown until April 28th, 2010) by Sanborn Map Company, Inc.

The imagery is projected to UTM 15 NAD 83; unit of measure is meters.
The spatial resolution is approximately a six inch pixel.
Any use of the data must be accompanied with this citation and accompanying seals and logos embedded within.

Prepared By: Neel-Schaffer, Inc.

Figure 1

Study Area

Legend

- Logical Termini
- Project Limits
- Roadway Network
- LA/MS State Boundary Line

XX.XXX, XX.XXX Latitude, Longitude

N

1,500 750 0 1,500 Feet

H.000284 US 90: PEARL RIVER BRIDGES AND H.000286 EAST PEARL RIVER BRIDGE
ROUTE US 90
ST. TAMMANY PARISH, LA

Prepared For:

DOTD
LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

1.2 Project Purpose and Need

The purposes of the proposed action, which have been approved by the Federal Highway Administration (FHWA), are:

- To maintain a system link which provides a diversion route in the event of an incident on I-10.
- To improve the structural integrity and functionality of the bridges.
- To support hurricane evacuations

1.3 Reference Datum Conversion

Permit and as-built drawings for the US 90 bridges over the five Pearl River crossings show elevations in Mean Gulf Level (MGL), a commonly used hydrographic datum at that time. A topographic survey was performed by a LADOTD survey crew in December 2015 to establish a reference bridge elevation point for each of the bridges. The reference datum allows for conversion of as-built drawing elevation to existing NAVD88 datum in feet.

1.4 Floodplain Consideration

LADOTD guidance for bridge replacements is to locate a replacement structure at not less than the 100-year floodplain plus 1 foot. The 100-year flood elevations have been determined to be significantly higher than the elevation of the existing roadway between all of the bridge sites. Based on the 2008 Preliminary Flood Insurance Rating Map (FIRM), the 100-year floodplain elevation at the US 90 crossing of the Middle Pearl River is elevation 20.14 NAVD88.

Additionally, LADOTD provided storm surge and wave height estimates for each bridge location. The storm surge plus wave action plus 1 foot for the Middle Middle Pearl River bridge is 13.23 NAVD88.

1.5 Navigation Clearance above Mean High Water

The United States Coast Guard (USCG) utilizes the National Oceanic and Atmospheric Administration (NOAA) derived determinations for Mean High Water (MHW) datum to establish vertical navigation clearances for bridges. In the United States, MHW is the average of all the high water heights observed over a period of 19 years (for the East and West Pearl Rivers, 1983-2001) and is referred to as the National Tidal Datum Epoch.

NOAA determined mean high water is elevation 1.35 NAVD88 for the West Pearl River. NOAA did not provide mean high water determinations for the three Middle Pearl Rivers. Because the five rivers are hydraulically connected, the mean high water elevation was assumed to be 1.35 NAVD88 for the three Middle Pearl Rivers.

1.6 Establishment of the Planning Elevation for the Five Bridges

Table 1 summarizes the results of a datum conversion process undertaken to rectify the elevations provided by varying sources using differing datum to NAVD88. All elevations hereafter referenced are shown in NAVD88. This information indicates that the Middle Middle Pearl River bridge was constructed with a low chord elevation of 11.37 feet NAVD88. The proposed bridge low chord elevation using the storm surge plus wave plus 1 foot criteria exceeds the existing low chord elevation by 1.86 feet.

Detailed notes on datum conversions are included below. Only two benchmarks at the West Pearl River bridge were recovered in the project area for this analysis. Assuming the rivers are hydraulically connected, the conversions for the West Pearl River were applied to the other four rivers.

Table 1: Summary of Datum Conversion Elevations

		West Pearl	West Middle Pearl	Middle Middle Pearl	East Middle Pearl	East Pearl
	Existing Elevations (NAVD88) - see notes below for datum conversion					
	Mean High Water [1,2,3]	1.35	1.35	1.35	1.35	1.36
	Existing Low Chord [6]	12.20	11.37	11.37	11.37	12.22
	Clearance above Mean High Water	10.85	10.02	10.02	10.02	10.86
	Design Considerations (NAVD88) - controlling condition in bold					
1	Storm Surge + Wave Height + 1 foot [4,5]	10.86	**12.51**	**13.23**	**13.31**	12.60
2	100-year + 1 foot [7]	**19.13**	20.13	21.14	21.14	**18.14**
3	Mean High Water (1.35) + Suggested Clearance (10') [1,3,8]	11.35	11.35	11.35	11.35	11.35

Source: Neel-Schaffer. Inc.

Datum Conversion Notes:

1. Per NOAA website, at West Pearl River Station the Mean High Water elevation is 3.841 meters (12.60 feet) below benchmark 141.

2. Per NOAA website, at West Pearl River Station the Mean High Water elevation is 1.413 meters (4.64 feet) below benchmark 1294 A 1980.

3. Therefore, Mean High Water elevation in NAVD88 is 13.95 - 12.60 = 1.35 using benchmark 141. Benchmark 1294 A 1980 yields similar results to within 0.05 feet. Use 1.35 as elevation of Mean High Water in NAVD88.

4. Per NOAA website, using Station Datum, Mean Sea Level is 0.28' below Mean High Water. Therefore, Mean Sea Level in NAVD88 is 1.35 - 0.28 = 1.07.

5. DOTD provided storm surge in elevations of Mean Sea Level. To convert to NAVD88, need to add 1.07 to elevations in MSL (assuming MSL elevations were provided for the W. Pearl River station).

6. DOTD-provided as-builts showing estimated bottom chord elevations of 12.83 for the West Pearl, 12.00 for the three Middle Rivers, and 12.85 for the East Pearl. No datum is specified. Finished road elevation is 14.08 at the location of Benchmark 141 (13.95 NAVD88). The benchmark is on the curb, so add 6" (14.08 + 0.50 = 14.58). Therefore, as an estimate, subtract 0.63' from as-built elevations to convert to NAVD88.

7. 100-year flood elevations were taken from the St. Tammany Parish DFIRM maps. The elevations from the map were in NGVD29, and were processed though the NGS VertCon program to obtain NAVD88 elevations. The difference in elevations ranged from 0.125 to 0.144 feet.

8. USCG–provided permit drawings show a clearance of 10.0 feet from mean high water. This agrees with the clearances calculated in the existing conditions; therefore, 10.0 feet clearance is suggested in this design condition as well.

1.7 Current Navigational Usage

This section discusses the existing navigational usage of Middle Middle Pearl River impacted by the bridge replacement project. The discussion will include existing users, vessel trip frequency, and potential impact to business owners.

Channel Status

The Middle Middle Pearl River is not a federal authorized navigation channel.

Existing Commercial and Recreational Users

Except for out parcels as shown on Figure 2, the area between the West Pearl River and the East Pearl River is owned and managed by the Pearl River Wildlife Management Area, part of the Louisiana Department of Wildlife and Fisheries. Except for parcels as noted in Figure 2, St. Tammany Parish zoning along the West Pearl River is for residential purposes.

There are two eco-tour businesses located on the West Pearl River that utilize the entire Pearl River system, including the Middle Middle Pearl River. The vessels used in the eco-tour businesses are longer than 21 feet and the larger vessels accommodate up to 25 persons.

NOTE: Logical Termini are the intersections of US 90 with US 190 and Kelly Rd/7th Ave and latitude and longitude data are in decimal format

Stennis Space Center

Port Bienville

30.2745, -89.5961

30.2280, -89.6780

1 2 3 4 5

N

Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

Legend

- Logical Termini
- Pearl River Bridges
- Project Limits
- XX.XXX, XX.XXX Latitude, Longitude
- Stennis Buffer Zone

Zoning Classification

- Suburban (A-1 thru A-3)
- Residental (A-4 thru A-8, MD-1)
- Animal Training Housing
- Public/Community/Recreational (WMA)
- Education (Primary and Secondary)
- Commercial/Service
- Industrial
- Neighborhood Institutional
- Planned Unit Development (PUD)

Figure 2
Land Use and Zoning

8,000 4,000 0 8,000 Feet

H.000284 US 90: PEARL RIVER BRIDGES AND
H.000286 EAST PEARL RIVER BRIDGE
ROUTE US 90
ST. TAMMANY PARISH, LA

Prepared For:

DOTD
LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

Prepared By: Neel-Schaffer, Inc.

As shown in Figure 3, there is a recreational boat launch located within LADOTD right-of-way located south of US 90 and west of the Middle Middle Pearl River Channel. The launch serves as the primary point of departure for recreational boat access to Pearl River Wildlife Management Area. Because it is within LADOTD right-of-way it is not considered a property subject to 4(f) protection.



Figure 3 -Middle Middle Pearl River Public Launch

Vessel Trip Frequency

The eco-tour businesses offer tours daily. Other vessels that may cross under this bridge are privately owned pleasure boats, fishing boats, etc., that can travel under the existing fixed structure.

Projected changes in waterway usage based upon anticipated waterway improvement projects

None.

Impact to vessel owners that would be precluded from transiting the waterway if a proposed bridge project is authorized

The existing low chord bridge elevation is 11.37 feet. Utilizing storm surge plus wave plus 1-foot criteria as shown in Table 1 to establish the low chord elevation for the replacement structure, the low chord elevation of the replacement bridge will be set at 13.23 feet or higher. This elevation is at least 1.86 feet higher than the low chord elevation of the existing bridge. Therefore, none of the current vessels that use this waterway would be impacted. The increase in navigation clearance may support the use of larger vessels by the eco-tour businesses.

Upstream and Downstream Clearances

There is one overhead transmission line crossing over the Middle Middle Pearl River at the US 90 bridge. This crossing is owned by Washington St. Tammany Electric and consists of 45 foot poles on both sides of the River.

Review of annual cargo movements

There is no cargo transported along the Middle Middle Pearl River. Consequently, there is no cargo requiring disassembly to pass under the current structure.

Design Vessel

A design vessel has not been identified. However, the vertical clearance requirement for the larger eco-tour vessels currently transiting the waterway is 8 feet.

Specific Vessel Transit

There are no levee maintenance, bridge work, channel maintenance, or emergency operations upstream of the US 90 bridge that require certain vessels to transit the waterway.

Current "governing limitation" for navigation on the waterway

The current bridge is the most restrictive structure. The navigation clearances associated with the current bridge follow:

- Vertical Clearance – Based on 2015 LADOTD survey, the existing bridge provides 10.02 foot clearance above mean high water elevation 1.35 NAVD88.
- Horizontal Clearance – The existing bridge provides a 60-foot horizontal clearance.

There are no downstream structures or power lines governing navigation on the waterway. As mentioned above, there is one set of power lines at the existing to-be-replaced bridge.

What is the most restrictive horizontal clearance on the waterway? This may be bridge piers on another bridge downstream, it may be a navigational lock, it may be a man-made channel, it may be the actual width of the narrowest portion of the waterway.

The most restrictive horizontal clearance is the natural narrowing of the waterway upstream from the existing Middle Middle Pearl River Bridge.

Historic Vessel Collision Information

The National Transportation Safety Board issues a Marine Accident Report following each investigation. These reports are available online for reports issued since 1996. The reports listing is sortable by the event date, report date, city, and state at the following website.

http://www.ntsb.gov/investigations/AccidentReports/Pages/marine.aspx

The website was searched March 31, 2016, sorted by state. The Louisiana incident reports were reviewed and there were no reports associated with marine incidents on the Middle Middle Pearl River.

1.8 Recommended Clearances associated with Replacement US 90 Bridge Crossing of the Middle Middle Pearl River

1. Low chord elevation of the proposed replacement bridge based on the storm surge plus wave plus 1 foot criteria is set at 13.23 NAVD88. This elevation exceeds the existing low chord elevation by 1.86 feet.
2. Horizontal Clearance will be 60 feet to match the existing bridge clearance.
3. Considering the Environmental Assessment alternatives analysis,
    a. Replacement bridge alternatives will provide vertical and horizontal clearances as noted above.
    b. Replacement structures to be offset and situated within the channel as required to allow for the continued operation of the existing bridge during construction of the replacement structure.

Impacts of Proposed Bridge Clearances on Present and Prospective Upstream Commercial Activity

The proposed bridge clearances will not impact present users of the waterway. Based on Wildlife Management Area ownership of upstream properties, and residential zoning of above stream out parcels, prospective upstream commercial activities (jobs, economic growth and development) are limited to eco-tour businesses that utilize the waterway. There are no existing or planned commercial/industrial growth and developments negatively affected by the proposed clearances. The River is contained within the Pearl River Wildlife Management Area.

Input from tour companies that use the River show that, as long as the proposed clearances meet or exceed the present clearance of the existing bridge, their businesses will not be affected. Comments were received that, should the vertical clearances be increased, larger tour boats could be built and used on the River. Applying the storm surge plus wave plus 1 foot criteria, the clearance of the proposed replacement bridge is 1.86 feet higher than the low chord elevation of the existing span.

There are no existing facilities on the waterway that are or could be considered critical infrastructure, key resource, or important/unique US industrial capabilities.

1.9 Environmental Assessment Alternatives

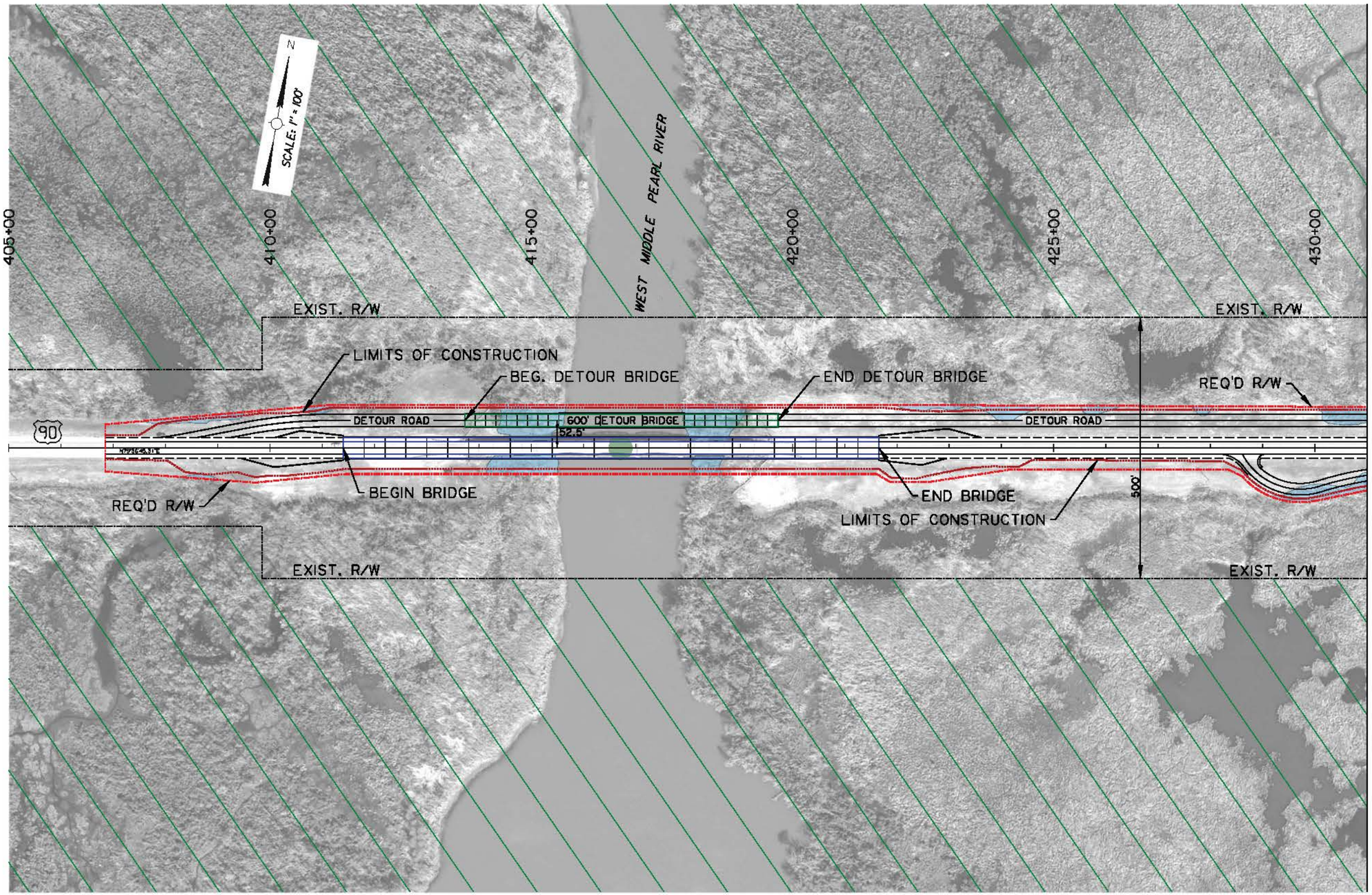
The existing Middle Middle pony truss fixed span structure provides a horizontal navigation clearance of 60 feet. Vertical clearance of the existing fixed span is approximately 10 feet above high water. Build alternatives developed in support of the Environmental Assessment include:

- A fixed span structure on offset alignment, upstream of the existing alignment;
- A fixed span structure on existing alignment, with the construction of temporary detour structures. (A USCG Permit will be required in support of the construction of the temporary detour bridge.)

The West Middle and Middle Middle Pearl River Environmental Assessment alternatives compare the placement of the upstream alternative for both bridges with the placement of an alternative on existing alignment for both bridges. Both bridges will either be placed on the upstream alignment or on the existing alignment. The Plan Sheets enclosed show both alternatives for both bridges. The profile sheet presents profiles for all three Middle River bridges. No additional right-of-way is required.

There is a public boat launch located downstream on the west side of the Middle Middle River. The launch serves as the primary water access point of departure to the Pearl River Wildlife Management Area. Continuous access from existing US 90 to the launch will be maintained during construction and thereafter from relocated US 90.

12/9/2016 11:26:23 AM
US 90 EA
Lay_ MP 28x 1DS 1.dgn



PREPARED BY NEEL-SCHAFFER, INC.

Federal Highway Administration

DOTD LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

West and Middle Middle Pearl River Bridges
Existing Alignment Plan View
Plate 1 of 2
Page 11

LEGEND

- HISTORIC STRUCTURE
- WILDLIFE MANAGEMENT AREA
- WETLANDS (EXCLUDED WATER OF THE U.S.)
- REMOVAL
- LIMITS OF CONSTRUCTION
- REQ'D R/W

SHEET NUMBER

PARISH	CONTROL SECTION	STATE PROJECT
ST. TAMMANY		H.000284

DESIGNED | CHECKED | DETAILED | CHECKED | DATE | SHEET
12-06-16 | 1 OF 3

NO.	DATE	REVISION DESCRIPTION	BY

STATE OF LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT

MIDDLE PEARL RIVER BRIDGES
FIXED SPAN ALTERNATIVE
PLAN VIEW
US 90 BRIDGES

DOTD

12/9/2016 11:26:39 AM

US 90 EA

GRAPHIC SCALE
SCALE: 1"=100'
100 50 0 100

N
SCALE: 1" = 100'

435+00
440+00
445+00
450+00
455+00

MIDDLE MIDDLE PEARL RIVER

EXIST. R/W

MATCH LINE STA. 431+00.00

LIMITS OF CONSTRUCTION
BEG. DETOUR BRIDGE
END DETOUR BRIDGE
REQ'D R/W
DETOUR ROAD
600' DETOUR BRIDGE
52.5'
DETOUR ROAD
500'
BOAT LAUNCH
BEGIN BRIDGE
REQ'D R/W
PURCHASED BY WILDLIFE AND FISHERIES DEPARTMENT
END BRIDGE
LIMITS OF CONSTRUCTION
90
EXIST. R/W
EXIST. R/W
PC STA. 446+11.22
PRC STA. 453+47.69
MATCH LINE STA. 457+00.00

EPARED BY NEEL-SCHAFFER, INC.

eral Highway ministration

DOTD LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

US 90: WEST MIDDLE & MIDDLE MIDDLE PEARL RIVER BRIDGES
FIXED SPAN BRIDGE ALTERNATIVE F-2
STATE PROJECT NO. H.000284
ST. TAMMANY PARISH, LA

LEGEND
- HISTORIC STRUCTURE
- WILDLIFE MANAGEMENT AREA
- WETLANDS (EXCLUDED WATER OF THE U.S.)
- REMOVAL
- LIMITS OF CONSTRUCTION
- REQ'D R/W

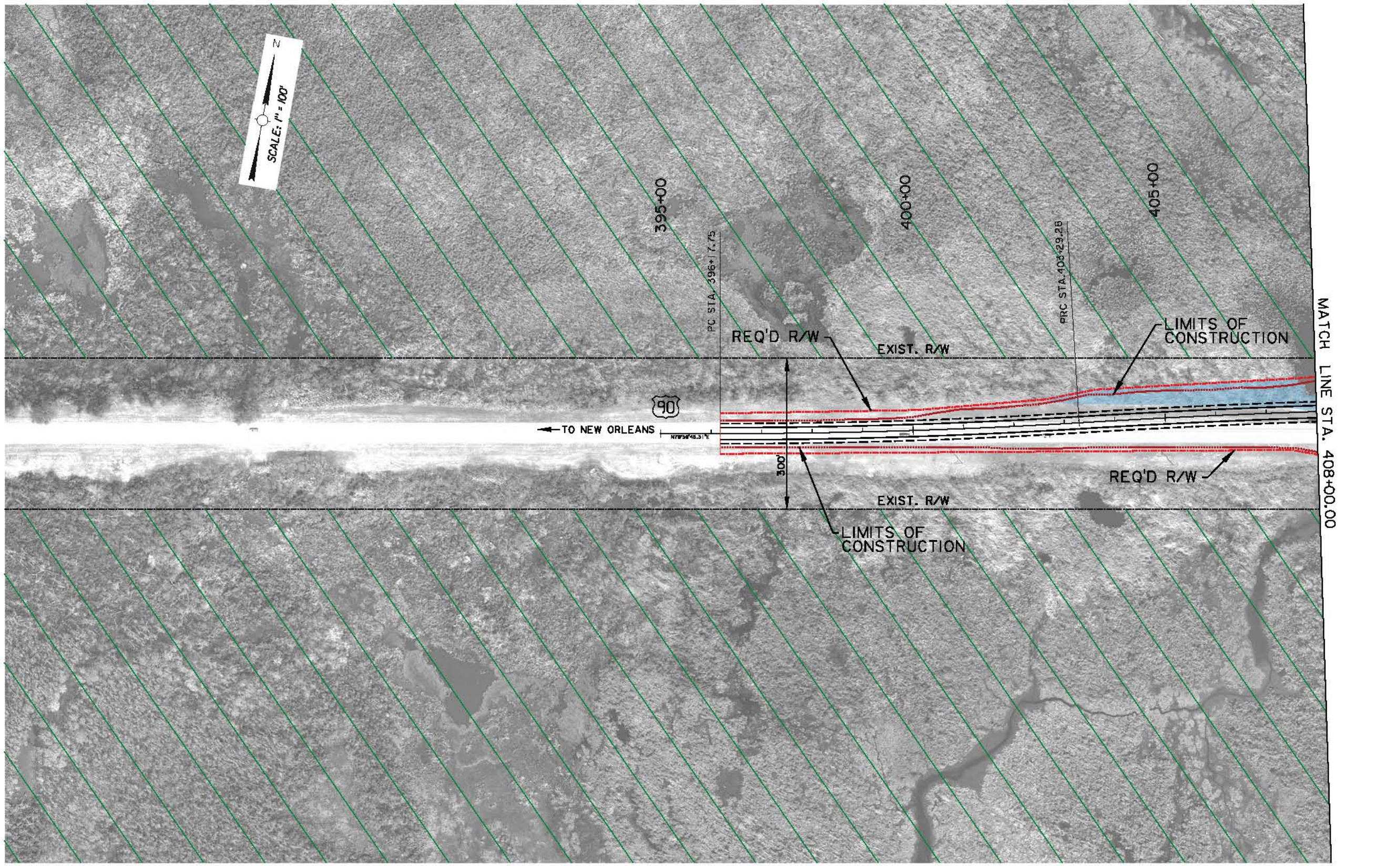
West and Middle Middle Pearl River Bridges
Existing Alignment Plan View
Plate 2 of 2
Page 12

SHEET NUMBER
PARISH: ST. TAMMANY
CONTROL SECTION
STATE PROJECT: H.000284
DESIGNED
CHECKED
DETAILED
CHECKED
DATE: 12-05-16
SHEET: 2 OF 3
NO. DATE REVISION DESCRIPTION BY

MIDDLE PEARL RIVER BRIDGES
FIXED SPAN ALTERNATIVE
PLAN VIEW
US 90 BRIDGES

12/9/2016 11:27:06 AM

US 90 EA



100 50 0 100
GRAPHIC SCALE
SCALE: 1"=100'

EPARED BY NEEL-SCHAFFER, INC.

eral Highway
lministration

DOTD
LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

US 90: WEST MIDDLE & MIDDLE MIDDLE PEARL RIVER BRIDGES
FIXED SPAN BRIDGE ALTERNATIVE
STATE PROJECT NO. H.000284
ST. TAMMANY PARISH, LA

LEGEND
- HISTORIC STRUCTURE
- WILDLIFE MANAGEMENT AREA
- WETLANDS (EXCLUDED WATER OF THE U.S.)
- REMOVAL
- LIMITS OF CONSTRUCTION
- REQ'D R/W

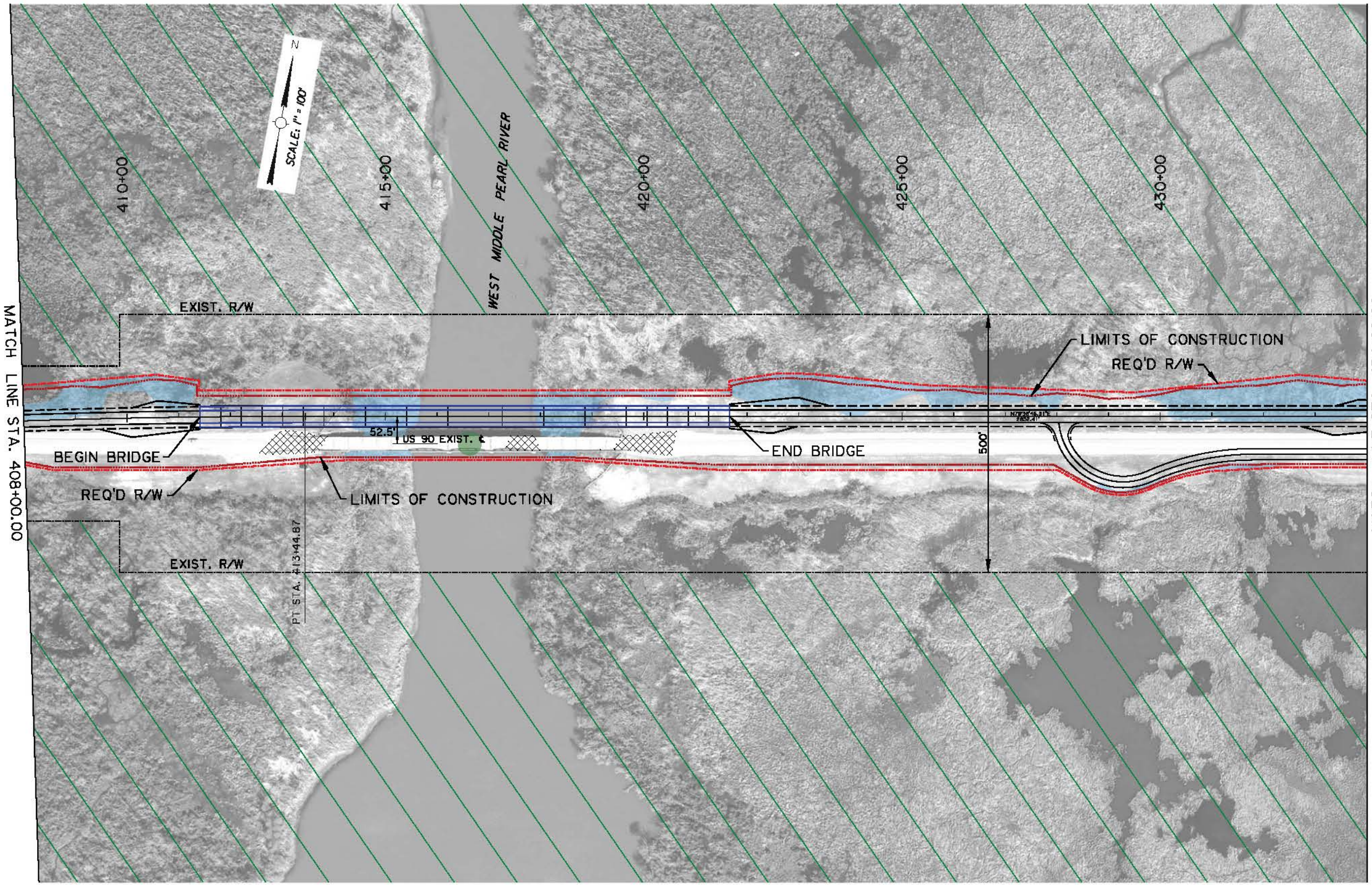
West and Middle Middle Pearl River Bridges
Upstream Alignment Plan View
Plate 1 of 3
Page 13

SHEET NUMBER
PARISH: ST. TAMMANY
CONTROL SECTION:
STATE PROJECT: H.000284
DESIGNED
CHECKED
DETAILED
CHECKED
DATE: 12-05-16
SHEET: 1 OF 4
NO. DATE BY REVISION DESCRIPTION

MIDDLE PEARL RIVER BRIDGES
FIXED SPAN ALTERNATIVE
PLAN VIEW
US 90 BRIDGES

12/9/2016 11:27:19 AM

US 90 EA



West and Middle Middle Pearl River Bridges
Upstream Alignment Plan View
Plate 2 of 3
Page 14

PREPARED BY NEEL-SCHAFFER, INC.

Federal Highway Administration

DOTD LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

US 90: WEST MIDDLE & MIDDLE MIDDLE PEARL RIVER BRIDGES
FIXED SPAN BRIDGE ALTERNATIVE
STATE PROJECT NO. H.000284
ST. TAMMANY PARISH, LA

LEGEND

- HISTORIC STRUCTURE
- WILDLIFE MANAGEMENT AREA
- WETLANDS (EXCLUDED WATER OF THE U.S.)
- REMOVAL
- LIMITS OF CONSTRUCTION
- REQ'D R/W

SHEET NUMBER

PARISH: ST. TAMMANY
CONTROL SECTION:
STATE PROJECT: H.000284

DESIGNED
CHECKED
DETAILED
CHECKED
DATE
SHEET: 12-05-16 2 OF 4

NO. DATE REVISION DESCRIPTION BY

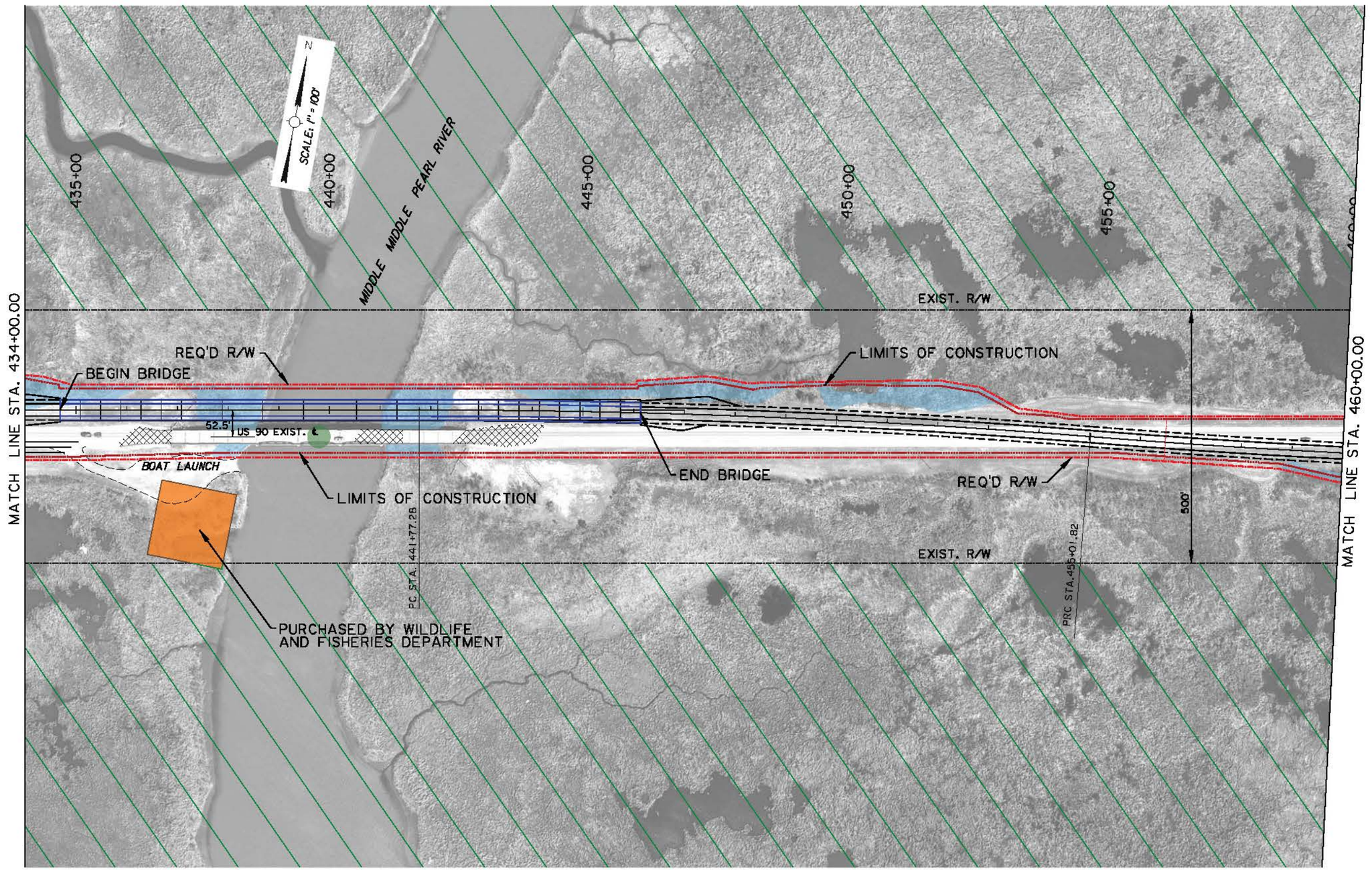
STATE OF LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT

MIDDLE PEARL RIVER BRIDGES
FIXED SPAN ALTERNATIVE
PLAN VIEW
US 90 BRIDGES

DOTD LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

12/9/2016 11:27:27 AM

US 90 EA



PREPARED BY NEEL-SCHAFFER, INC.

Federal Highway Administration

DOTD LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

West and Middle Middle Pearl River Bridges
Upstream Alignment Plan View
Plate 3 of 3
Page 15

LEGEND

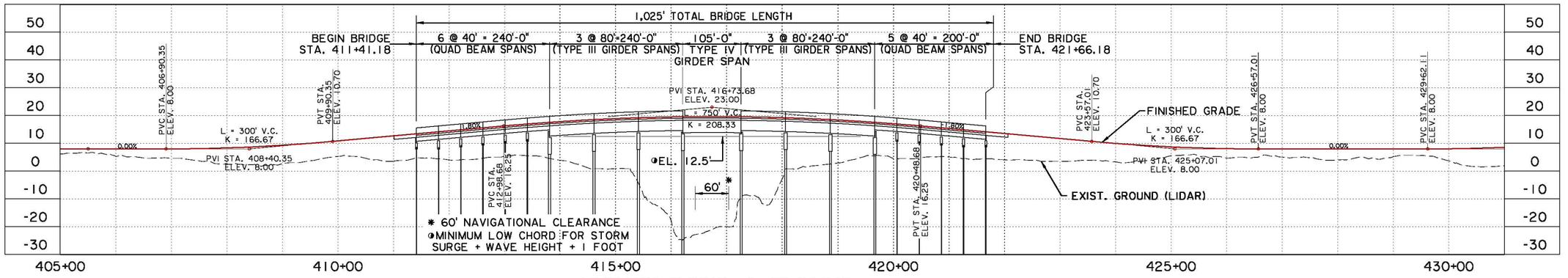
- HISTORIC STRUCTURE
- WILDLIFE MANAGEMENT AREA
- WETLANDS (EXCLUDED WATER OF THE U.S.)
- REMOVAL
- LIMITS OF CONSTRUCTION
- REQ'D R/W

SHEET NUMBER	
PARISH	ST. TAMMANY
CONTROL SECTION	
STATE PROJECT	H.000284
DESIGNED / CHECKED	
DETAILED / CHECKED	
DATE / SHEET	12-05-16 / 3 OF 4

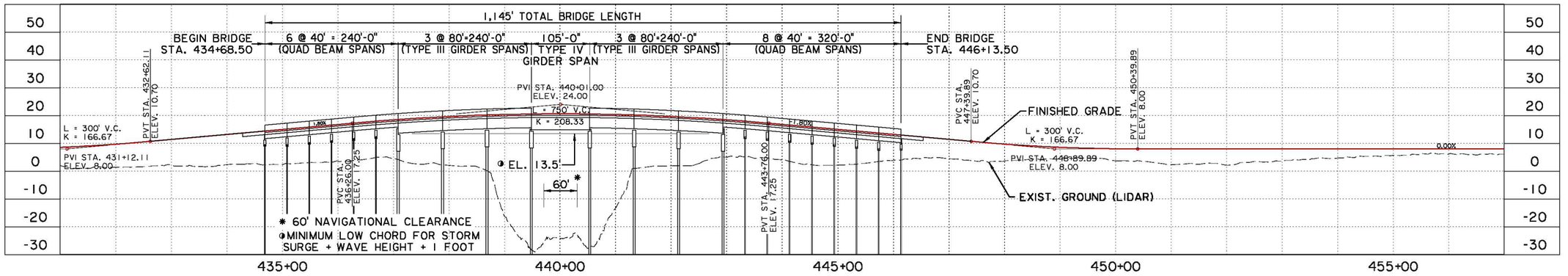
NO. DATE REVISION DESCRIPTION BY

MIDDLE PEARL RIVER BRIDGES
FIXED SPAN ALTERNATIVE
PLAN VIEW
US 90 BRIDGES

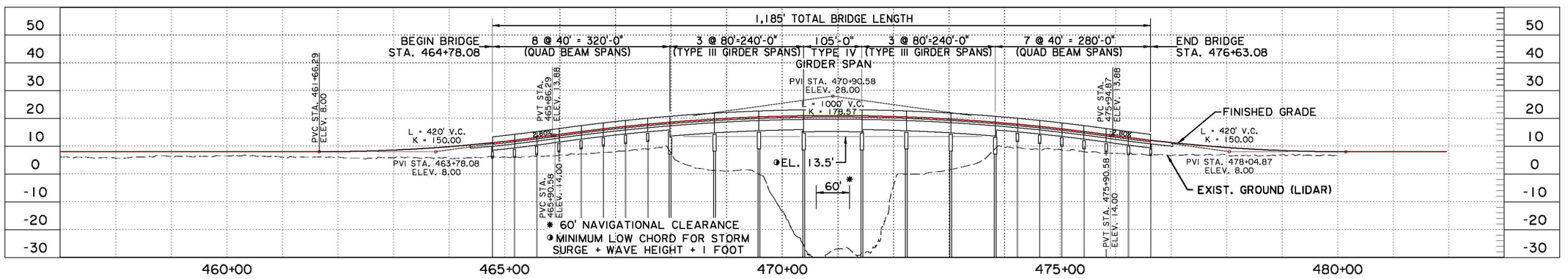
Lay_ MP_2DS_1DS_3.dgn



WEST MIDDLE PEARL RIVER BRIDGE



MIDDLE MIDDLE PEARL RIVER BRIDGE



EAST MIDDLE PEARL RIVER BRIDGE

PREPARED BY NEEL-SCHAFFER, INC.

Federal Highway Administration

DOTD LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

Middle Pearl River Bridges
Profile Views
Plate 1 of 1
Page 16

Note 1: The bridge concepts shown (including pier placement and girder selection) are conceptual. During preliminary engineering, the types of girders and the pier placement will be finalized. The selected girders and associated pier placement may differ from the conceptual profiles as shown.

SCALES
HORIZONTAL 1" = 100'
VERTICAL 1" = 20'

US 90 EA

12/9/2016 11:07:17 AM

Pro_ MP_2Ex_1DS_1.dgn

SHEET NUMBER

PARISH: ST. TAMMANY
CONTROL SECTION
STATE PROJECT: H.000284

DESIGNED
DRAWN
CHECKED
DETAILED
CHECKED
DATE
SHEET: 2-05-16 1 OF 1

REVISION DESCRIPTION
BY
NO.
DATE

STATE OF LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT

MIDDLE PEARL RIVER BRIDGES
FIXED BRIDGE ALTERNATIVES
PROFILE VIEW
US 90 BRIDGES

DOTD LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT

1.10 Proposed Bridge's Impacts to Existing and Potential Navigation

The Middle Middle Pearl River is entirely contained within the Pearl River Wildlife Management Area. The existing US 90 bridge is a fixed span with clearances as described earlier in this study. The proposed bridge will be at or higher than the existing vertical clearance, and will maintain the existing horizontal clearance. In addition:

- The proposed bridge does not completely obstruct passage of any existing waterway users or access to waterborne facilities.
- The proposed bridge will not establish a new navigational limiting factor, as the proposed bridge utilizing the storm surge plus wave plus one foot criteria will be 1.86 feet higher than the existing low chord elevation of the Middle Middle Pearl River Bridge.
- The proposed bridge does not impact present and prospective commercial activity on the waterway.
- The proposed bridge does not impact existing or planned commercial/industrial developments.
- The proposed bridge does not impact existing facilities on the waterway that are or could be considered critical infrastructure, key resources, or important/unique US industrial capability.
- The proposed bridge does not impact USACE ability to transit the bridge in a federal project channel.
- The bridge does not impact USCG and other government vessels' ability to transit the bridge to conduct mission essential functions.
- The proposed bridge does not impact existing and future cruise ship port-of-call/terminals, commercial freighters, or ports supporting post-panamax vessels as navigation associated with these facilities is not possible on the Middle Middle Pearl River.
- The proposed bridge does not impact vessels that require helper boats/tugs, as none currently use the waterway.

1.11 Consideration of River Hydrology in the Siting and Design for a Replacement Structure

1.11.1 Introduction

There are a number of hydrology modeling investigations underway relating to the performance of the Lower Pearl River Floodplain during flood and hurricane events. In April 2019, the University of Southern Mississippi released a report documenting the Development of a Forecast Model for the Lower Pearl River Basin. The most comprehensive discussion of the performance of the US 90 bridges during high flow river conditions is a 1999 joint report issued by LADOTD and the US Geological Survey (USGS), *Estimation of Scour and Channel Stability for Selected Highway*

Crossings of Rivers in the Florida Parishes, Southeastern Louisiana, Louisiana Department of Transportation And Development, Water Resources Technical Report No. 67B. The report will be hereafter referenced as the Scour Report.

The following discussion utilizes the findings of the Scour Report as the basis to describe the hydraulic performance of each of the five rivers at each of the US 90 Pearl River bridge sites. The Scour Report investigates scour conditions at each bridge site assuming a 500-year storm as the base condition.

Excerpts from The Scour Report relevant to the Middle Middle Pearl River are provided in Appendix A. Specific tables and figures from the Scour Report will be referenced in this narrative. Photographs of the upstream and downstream approaches to the existing Middle Middle Pearl River bridge are included in Appendix B.

1.11.2 River Hydrology

Between the West Pearl River and the East Pearl River, the US 90 embankment of the lower Pearl River Basin spans over 4 miles of the river floodplain system. There are five openings in the embankment for the channels of the East Pearl, the East Middle, the Middle Middle, West Middle, and the West Pearl Rivers. The elevation of the roadway embankment is approximately 7-8 feet throughout and floodplain elevations range from 1 to 2 feet above sea level.

Table 2 shows the distribution of the 500 year storm event through the five river channels.

Table 2
Disribution of Flows Within Pearl River Watershed

	Flow in ft^3/sec	Percent of total flow
East Pearl River	100,002	36.6%
East Middle Pearl River	33,000	12.1%
Middle Middle Pearl River	41,000	15.0%
West Middle Pearl River	50,000	18.3%
West Pearl River	33,000	12.1%
Overflow	16,000	5.9%
Total	273,002	100.0%

Source: Neel-Schaffer, Inc.

The Middle Middle Pearl River is formed as a distributary of the West Pearl River approximately 2 mi upstream of the I-10 embankment. Approximately 2,200 feet upstream of the existing bridge the Middle Middle channel intercepts an east-west channel which contributes flow to the East Middle Pearl River. Approximately 2,400 downstream from the existing bridge the channel splits contributing flow both to the West Middle Pearl River and the East Middle Middle Pearl River.

1.11.3 Waterway Layout and Geometry

The Middle Middle Pearl River channel at US 90 is relatively straight when passing through the bridge opening and the bridge crosses the river at a slight skew to the river. The channel curves mildly to the right upstream of the bridge and then mildly to the left immediately downstream of the bridge (Scour Report Figure 40).

1.11.4 Waterway Depth and Elevation Fluctuations

As shown in Scour Report Figure 41, channel depth in proximity to the existing bridge has varied with the channel deepening over time due to scour. In 1994 the main channel was approximately at elevation -30 to -35.

Table 3 shows NOAA provided information for the East and West Pearl Rivers.

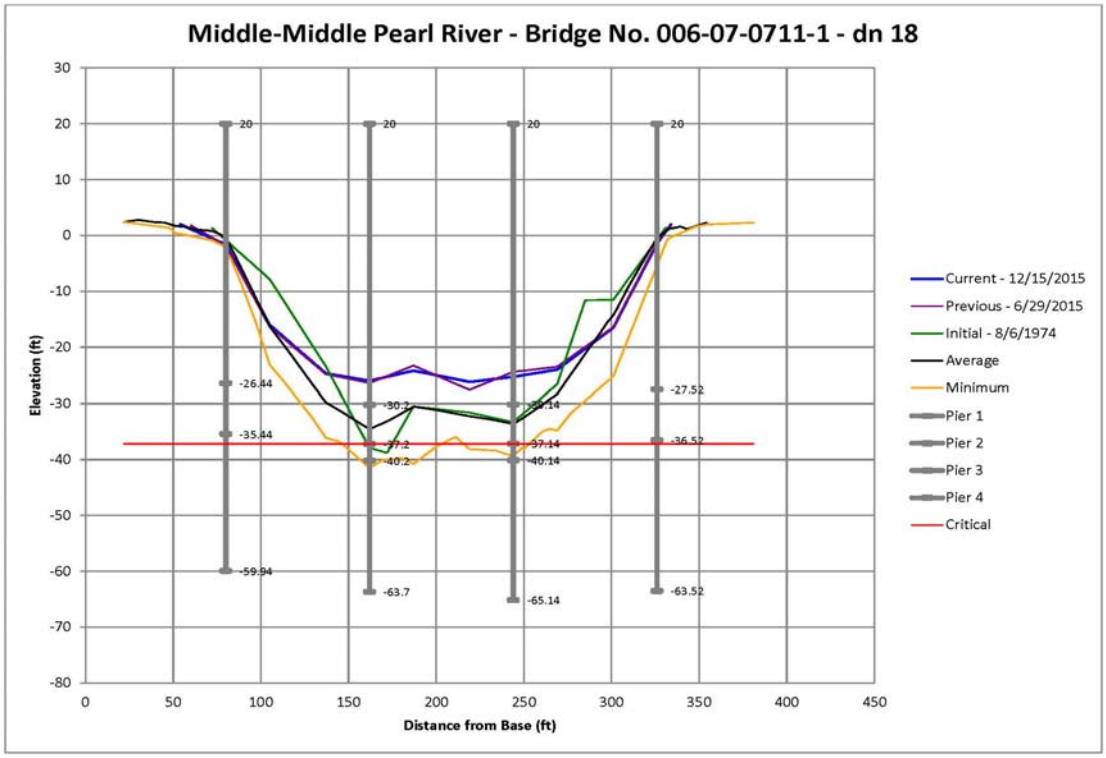
Table 3
NOAA Information from Station Datum
(Elevation Datum NAVD88)
West Pearl and East Pearl Rivers at US 90

	MHW	MLW
West Pearl River	1.35	0.74
East Pearl River	1.36	0.22

Source Neel-Schaffer, Inc.

NOAA does not provide information for the three middle rivers. However, the five rivers are hydraulically connected. The East Pearl River exhibits the greater elevation change between MHW and Mean Low Water (MLW). Consequently, the East Pearl range will be applied to the middle rivers to show the potential range of river fluctuations. MHW elevation for the East Pearl River at US 90 is elevation 1.36 NAVD88. Mean MLW is elevation 0.22 NAVD88, which indicates that there is a relatively small range of elevation fluctuations affecting navigation. Figure 4 presents a recently taken cross-section approximately 18 feet downstream of the bridge.

Figure 4 – LADOTD Cross-section of Middle Middle Pearl River (18' Downstream of Bridge)



1.11.5 Channel and Waterway Alignment

The existing Middle Middle Pearl River bridge is crosses the river at slight skew to the river. Bridge replacement alternatives located new structures upstream from the existing bridge. Alternatives were also considered locating new structures along the existing alignment. In those situations a temporary by pass structure maintaining navigation clearances as described herein would be provided. The centerline of the replacement structure will be 52.5 feet from the centerline of the existing bridge. The existing 60-foot horizontal channel will be maintained in alignment with the existing fixed span; so there will be no change in the navigation geometry.

1.11.6 Current Speed and Direction

Simulation of the 500-year event indicated Middle Middle Pearl River flow velocities ranging from approximately 1.2 feet/second near the channel bank to approximately 6.5 feet/second at center channel (Scour Report Table 21). As noted in Table 2 estimated flow at the bridge was approximately 41,000 $feet^3$/second.

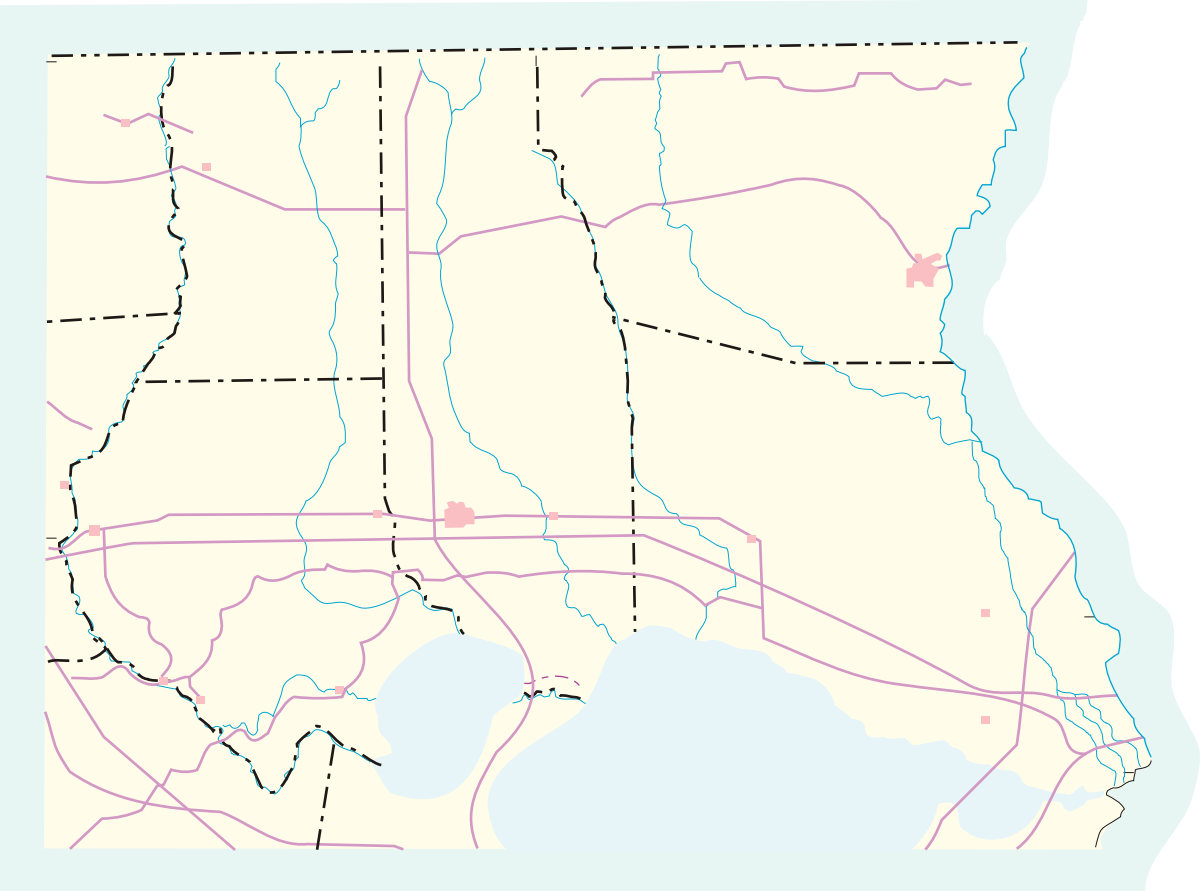
Natural Flow of Waterway including Currents, Water Velocity, Water Direction and Velocity Fluctuations that Might Affect Navigation

Replacement bridge alternatives are situated in proximity to the existing bridge, maintaining the 60-foot horizontal channel width and relative channel alignment. Forecast river velocities under extreme navigation conditions (during a 500-year event) are approximately 6.5 feet/second. MHW and MLW elevations fluctuations are 1.14 feet. There is no indication that the natural flow of the waterway at the new bridge location (including currents, water velocity, water direction and velocity fluctuations) might affect navigation.

Appendix A
Middle Middle Pearl River
Excerpts from 1999 Report, Estimation of Scour and Channel Stability for Selected Highway Crossings of Rivers in the Florida Parishes, Southeastern Louisiana

Estimation of Scour and Channel Stability for Selected Highway Crossings of Rivers in the Florida Parishes, Southeastern Louisiana

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
Water Resources Technical Report No. 67B



STATE OF LOUISIANA
DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
PUBLIC WORKS AND FLOOD CONTROL DIRECTORATE
WATER RESOURCES SECTION
in cooperation with the
U.S. GEOLOGICAL SURVEY

1999

Middle River near Slidell, Louisiana

The Middle River is formed as a distributary of the West Pearl River approximately 2 mi upstream of the I-10 embankment. This is the third (east to west) bridge opening for the U.S. Hwy. 90 crossing of the Pearl River system. The channel curves mildly to the right upstream of the bridge and then mildly to the left immediately downstream of the bridge (fig. 40).

Pier Scour

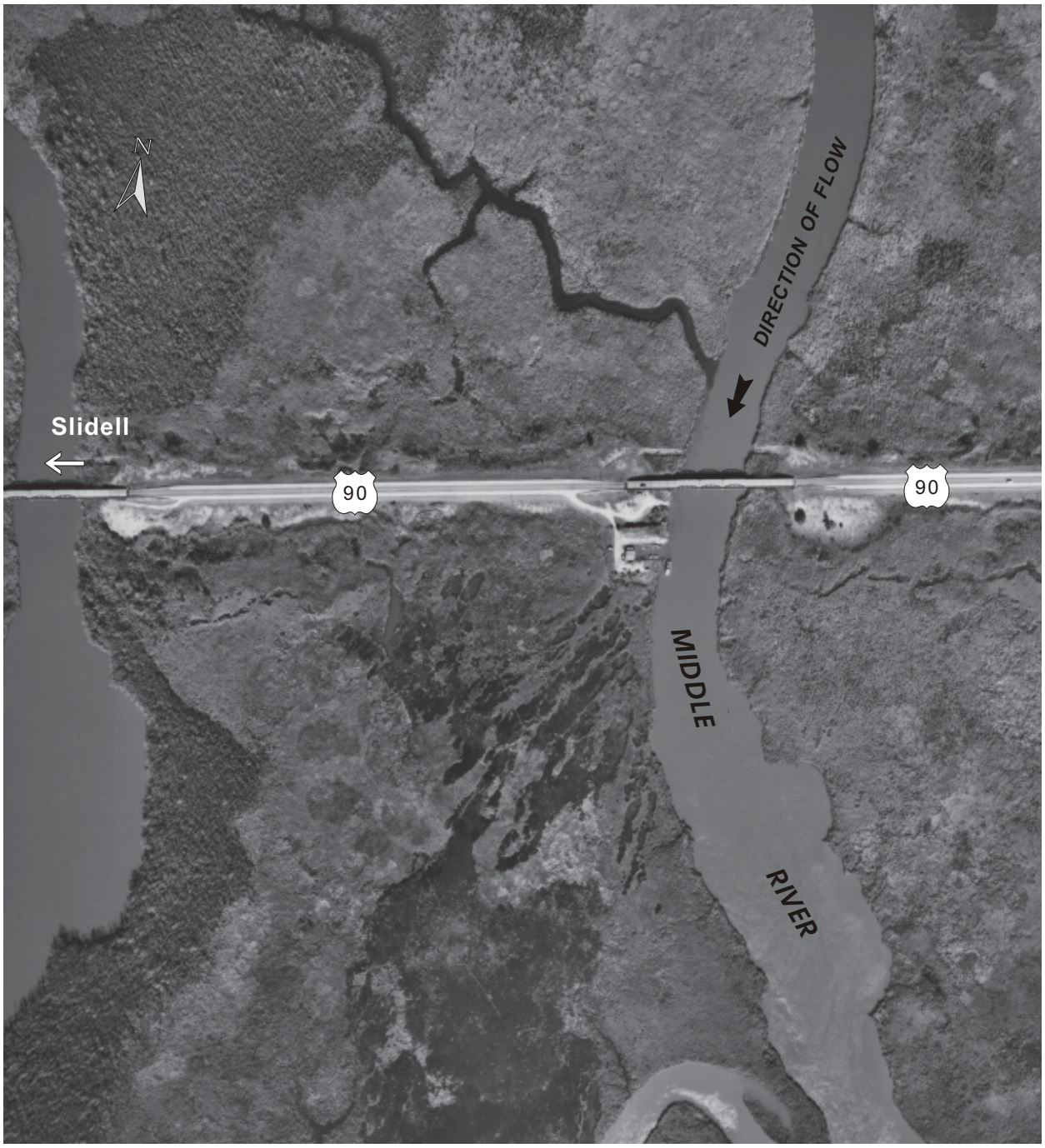
Simulation of the Q_{500} indicated velocities ranging from approximately 1 to 6 ft/s and a water-surface elevation of approximately 6.5 ft above sea level at the bridge. The bridge piers are skewed to the channel at an angle less than 15 degrees; therefore, no correction for alignment was applied. The greatest predicted pier scour is approximately 12.4 ft and occurs at the main channel pier at DOTD station 440+35 (table 21, fig. 41). Scour at the three other main piers that are in or near the channel ranged from approximately 6 to 10 ft. Estimated scour depth at the overbank piers was approximately 2 ft.

Channel Stability

The cross-section information at the bridge does not indicate any significant lateral movement of the channel. Comparison of the 1932 (pre-construction) and the 1994 (post-construction) cross sections indicates a lowering of the channel bed of approximately 10 ft. This is most likely the channel response to embankment construction as is noted in the other openings in this embankment.

Contraction and Abutment Scour

Flow through the bridge was subdivided into flow in the main channel, left overbank, and right overbank. The average depth of the channel at the bridge is approximately 33 ft for the main channel and 5 ft for the overbanks. For contraction scour estimates in the main channel, the flow in the main channel upstream was defined as a section of channel, approximately 250 ft in width. The width of the main channel at the opening is 242 ft. Contraction scour in the main channel was computed as 5.4 ft. Scour on the left and right overbanks was predicted as 1.6 and 1.1 ft, respectively. The overbanks are vegetated with marsh grasses which may reduce the scour potential in the overbank areas. No abutment scour was indicated.



Photograph source: Louisiana Department of Transportation and Development, December 1971

Figure 40. Aerial photograph of the U.S. Highway 90 crossing of the Middle River near Slidell, Louisiana.

Table 21. Scour data for U.S.Highway 90 crossing of the Middle River near Slidell, Louisiana

[DOTD, Louisiana Department of Transportation and Development; water-surface elevation is 6.5 feet above sea level; K_2, dimensionless correction factor for angle of flow attack; ft, feet; ft/s, foot per second; pile tip elevations scaled from DOTD bridge plans; NA, not applicable]

DOTD station	Ground elevation (ft above sea level)	Pier shape	K_2	Pier width (ft)	Velocity (ft/s)	Local or pier scour (ft)	Contraction scour (ft)	Scour elevation (ft above sea level)	Pile tip elevation (ft above sea level)
437+10	1.0	Abutment	1.0	NA	1.2	NA	1.1	0	-20
437+28	1.0	Square	1.0	1.5	1.2	1.8	1.1	-2	-20
437+58	1.0	Square	1.0	1.5	1.2	1.8	1.1	-2	-20
437+86	1.0	Square	1.0	1.5	1.2	1.8	1.1	-2	-20
438+14	1.0	Square	1.0	1.5	1.2	1.8	1.1	-2	-20
438+42	1.0	Square	1.0	1.5	1.2	1.8	1.1	-2	-20
438+72	0	Round	1.0	6.0	3.0	6.9	5.4	-12	-54
439+52	-37.0	Round	1.0	6.0	4.1	10.2	5.4	-53	-56
440+35	-35.0	Round	1.0	6.0	6.5	12.4	5.4	-53	-56
441+15	0	Round	1.0	6.0	3.0	6.9	1.6	-8	-52
441+45	1.0	Square	1.0	1.5	1.4	2.0	1.6	-3	-20
441+72	1.0	Square	1.0	1.5	1.4	2.0	1.6	-3	-20
442+00	1.0	Square	1.0	1.5	1.4	2.0	1.6	-3	-20
442+25	1.0	Square	1.0	1.5	1.4	2.0	1.6	-3	-20
442+58	1.0	Square	1.0	1.5	1.4	2.0	1.6	-3	-20
442+84	1.0	Abutment	1.0	NA	1.4	NA	1.6	-1	-20

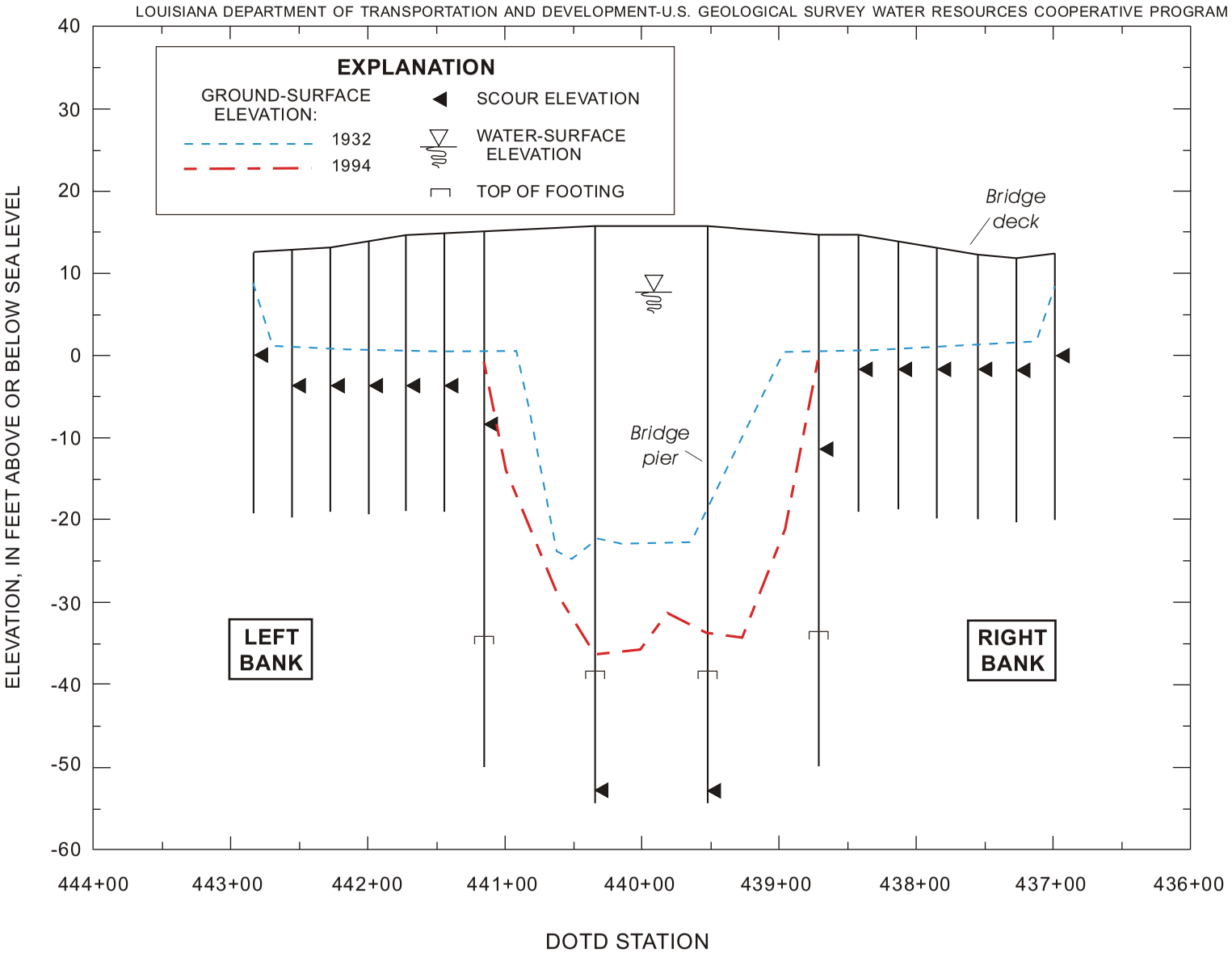
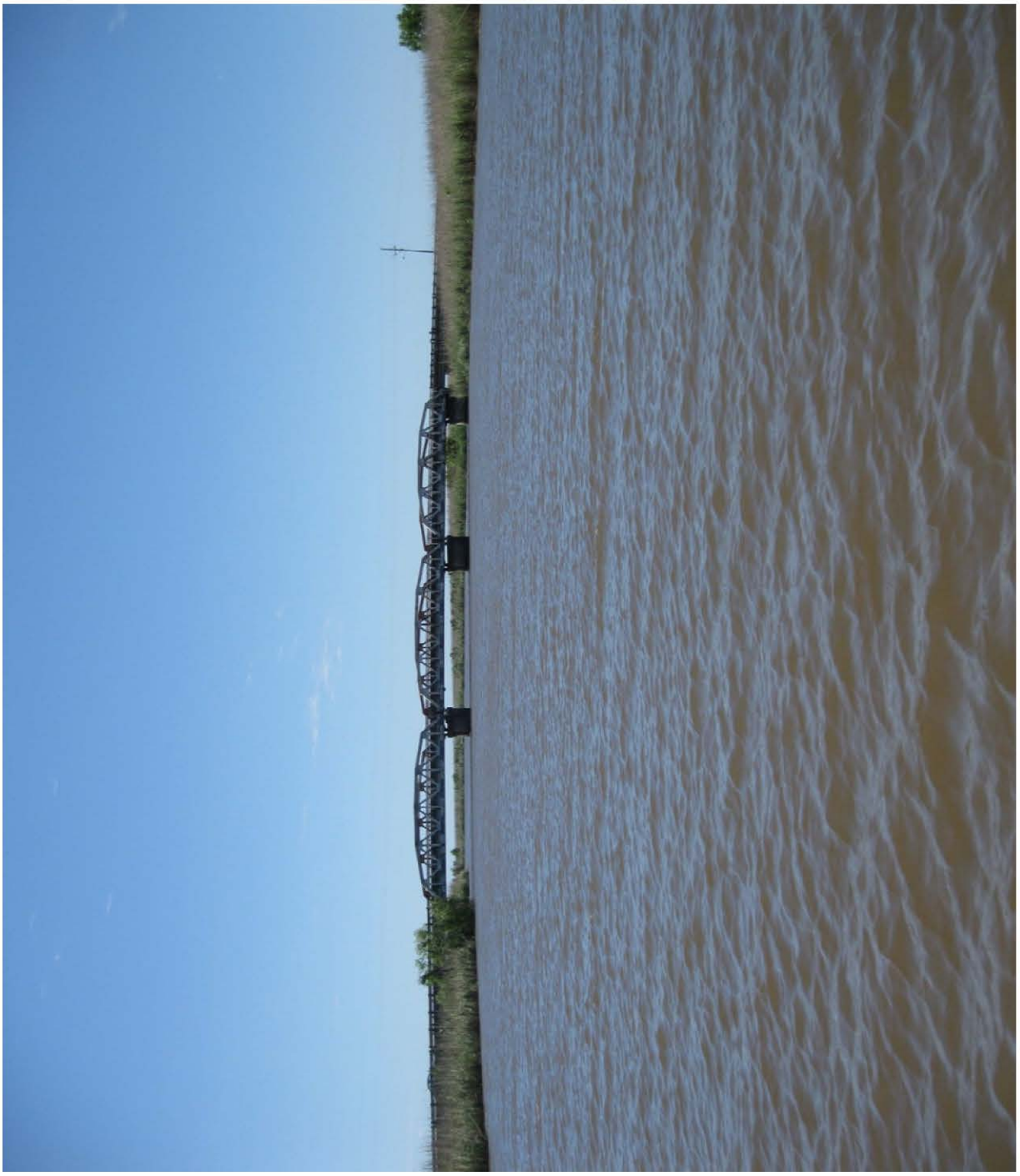


Figure 41. Comparative cross sections and scour estimates at the U.S. Highway 90 crossing of the Middle River near Slidell, Louisiana.

Appendix B
Photographs of the Middle Middle Pearl River Upstream and Downstream Approaches

Middle Middle Pearl River

Upstream Approach



Downstream Approach



Navigation Study
US 90 Crossing of the EAST MIDDLE PEARL RIVER

US 90 Pearl River Bridges
Environmental Assessment
St. Tammany Parish, LA and Hancock County, MS

STATE PROJECT NO. H.000284 & NO. H.000286
FEDERAL AID PROJECT NO. H000284 & NO. H000286



East Middle Pearl River Downstream Approach

USCG Draft Navigation Impact Report

DOTD
LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

U.S. Department of Transportation
Federal Highway Administration

July 2019

Table of Contents

		Page
Section 1.0	Navigation Study – US 90 Crossing the East Middle Pearl River	1
1.1	Introduction	1
1.2	Project Purpose and Need	3
1.3	Reference Datum Conversion	3
1.4	Floodplain Consideration	3
1.5	Navigation Clearance above Mean High Water	3
1.6	Establishment of the Planning Elevation	4
1.7	Current Navigational Usage	5
1.8	Recommended Clearances associated with Replacement US 90 Bridge Crossing of the East Middle Pearl River	8
1.9	Environmental Assessment Alternatives	9
1.10	Proposed Bridge's Impacts to Existing and Potential Navigation	13
1.11	Consideration of River Hydrology in the Siting and Design for A Replacement Structure	13

Tables

Table 1	Summary of Datum Conversion Elevations	4
Table 2	Distribution of Flows within the Pearl River Watershed	14
Table 3	NOAA Standard Datum Elevations West Pearl and East Pearl Rivers, Mean High Water and Mean Low Water	15

Figures

Figure 1	Study Area	2
Figure 2	Land Use and Zoning	7
Figure 3	Cross-section of East Middle Pearl River	16

Engineering Plates

Plan View, Existing Alignment, Plate 1 of 1	10
Plan View, Upstream Alignment, Plates 1-2	11
Profile Views, Three Middle Pearl Rivers, Plate 1 of 1	12

Appendix

Appendix A	East Middle Pearl River, Excerpts of the 1999 Report Estimation of Scour and Channel Stability for Selected Highway Crossings of Rivers in the Florida Parishes, Southeastern Louisiana	18
Appendix B	Photographs of Upstream/Downstream Approaches	19

1.0 Navigation Study - US 90 Crossing of the East Middle Pearl River

1.1 Introduction

The Louisiana Department of Transportation and Development (LADOTD) is preparing planning and environmental documents for the improvement of five bridge structures associated with the Pearl River system along US Highway 90 (US 90). The enclosed Study Area map, Figure 1, shows the limits of the project. The project limits extend along US 90 from US 190 in Louisiana to the US 90 intersection with Kelly Road / 7th Avenue in Pearlington, Mississippi. The existing roadway is a two lane rural arterial roadway (RA-2) with 12-foot travel lanes and 8-foot paved shoulders. Average Daily Traffic is approximately 3,000 vehicles per day.

Five bridges associated with the Pearl River system are crossed as follows:

- Structure no. 62520060705291, West Pearl River Bridge, Movable Lift Span
- Structure no. 62520060706701, West Middle Pearl River Bridge
- Structure no. 62520060707111, Middle Middle Pearl River Bridge
- Structure no. 62520060707701, East Middle Pearl River Bridge
- Structure no. 62520060800001, East Pearl River Bridge, Movable Swing Span

This Navigational Study assesses the current and anticipated future use of the East Middle Pearl River, and investigates the required clearances for the proposed bridge replacement alternatives.

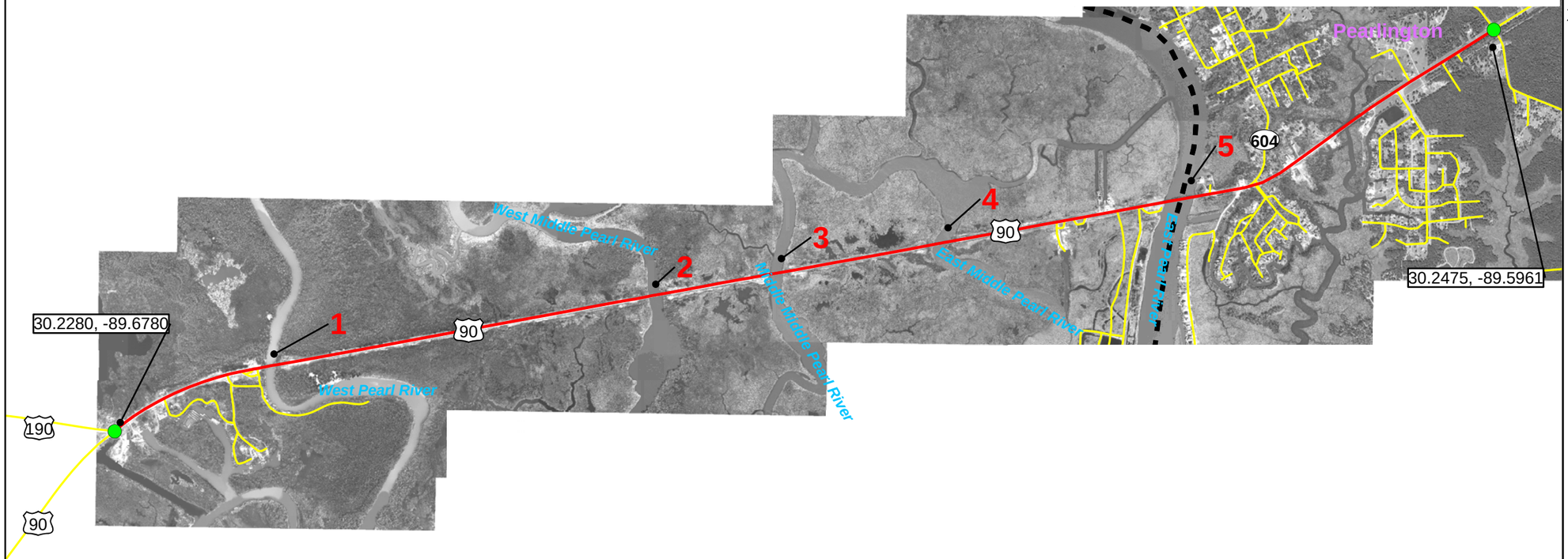
US 90 Bridge across East Middle Pearl River
Structure Number: 62520060707111
Recall Number: 058740

The US 90 bridge across the East Middle Pearl River was built in 1933. The structure is 24' wide, 582' long and consists of 12 reinforced concrete deck girder approach spans and 3 steel pony truss spans across the river. The maximum vertical clearance for vessel navigation is 10'.

The bridge width (24') does not meet the minimum requirements for an RA-2. The 2017 LADOTD minimum design guidelines state that the preferable bridge width is equal to the approach travel lanes (24') and the shoulder width (8'). The bridge does not have shoulders. This bridge is classified as a "Preservation Candidate" as determined under the PA regarding historic bridges in Louisiana. The horizontal navigation clearance is 60 feet.

Map No.	Structure Number	Structure Type	Water Body Crossing
1	62520060705291	Movable: Lift-Span	West Pearl River
2	62520060706701	Pony Truss - Warren Truss	West Middle Pearl River
3	62520060707111	Pony Truss - Warren Truss	Middle Middle Pearl River
4	62520060707701	Pony Truss - Warren Truss	East Middle Pearl River
5	62520060800001	Movable: Swing - Through Truss (Parker Truss)	East Pearl River

NOTE: Logical Termini are the intersections of US 90 with US 190 and Kelly Rd/7th Ave and latitude and longitude data are in decimal format



Source (Citation) for 2010 six inch pixel imagery Parish Mosaics

This imagery was provided by the Louisiana Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP) as the sole source owner, and is shared with Louisiana state government agencies in the interest of good government practices.

Reproduction and distribution of the data is prohibited. Please refer any requests for data to the Deputy Director for Management, Finance and Interoperability of GOHSEP. This imagery was distributed by the Regional Planning Commission for Jefferson, Orleans, Plaquemines, St. Bernard and St. Tammany Parishes (RPC) with permission from GOHSEP.

GOHSEP and the RPC are not responsible for any errors arising from any use of alterations made to the data. Under no circumstances is resale or distribution of the data permitted.

Mosaics were produced and compressed by the Louisiana State University Coastal Studies Institute.

Imagery Information: The red, green, blue (true color) and near infrared four-band aerial imagery was captured between February 10th and April 1st of 2010 (re-flights for any corrections flown until April 28th, 2010) by Sanborn Map Company, Inc.

The imagery is projected to UTM 15 NAD 83; unit of measure is meters.
The spatial resolution is approximately a six inch pixel.
Any use of the data must be accompanied with this citation and accompanying seals and logos embedded within.

Governor's Office

Prepared By: Neel-Schaffer, Inc.

Figure 1

Study Area

Legend

- Logical Termini
- Project Limits
- Roadway Network
- LA/MS State Boundary Line
- XX.XXX, XX.XXX Latitude, Longitude

N

1,500 750 0 1,500 Feet

H.000284 US 90: PEARL RIVER BRIDGES AND H.000286 EAST PEARL RIVER BRIDGE
ROUTE US 90
ST. TAMMANY PARISH, LA

Prepared For:

DOTD
LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

1.2 Project Purpose and Need

The purposes of the proposed action, which have been approved by Federal Highway Administration (FHWA), are:

- To maintain a system link to provide a diversion route in the event of an incident on I-10.
- To improve the structural integrity and functionality of the bridges.
- To support hurricane evacuations

1.3 Reference Datum Conversion

Permit and as-built drawings for the US 90 bridges over the five Pearl River crossings show elevations in Mean Gulf Level (MGL), a commonly used hydrographic datum at that time. A topographic survey was performed by a LADOTD survey crew in December 2015 to establish a reference bridge elevation point for each of the bridges. The reference datum allows for conversion of as-built drawing elevation to existing NAVD88 datum in feet.

1.4 Floodplain Consideration

LADOTD guidance for bridge replacements is to locate a replacement structure at not less than the 100-year floodplain plus 1 foot. The 100-year flood elevations have been determined to be significantly higher than the elevation of the existing roadway between all of the bridge sites. Based on the 2008 Preliminary Flood Insurance Rating Map (FIRM), the 100-year floodplain elevation at the US 90 crossing of the East Middle Pearl River is elevation 20.14 NAVD88.

Additionally, LADOTD provided storm surge and wave height estimates for each bridge location. The storm surge plus wave action plus one foot for the East Middle Pearl River bridge is elevation 13.31 feet NAVD88.

1.5 Navigation Clearance above Mean High Water

The United States Coast Guard (USCG) utilizes the National Oceanic and Atmospheric Administration (NOAA) derived determinations for Mean High Water (MHW) datum to establish vertical navigation clearances for bridges. In the United States, MHW is the average of all the high water heights observed over a period of 19 years (for the East and West Pearl Rivers, 1983-2001) and is referred to as the National Tidal Datum Epoch.

NOAA determined mean high water is elevation 1.35 NAVD88 for the West Pearl River. NOAA did not provide mean high water determinations for the three Middle

Pearl Rivers. Because the five rivers are hydraulically connected, the mean high water elevation was assumed to be 1.35 NAVD88 for the three Middle Pearl Rivers.

1.6 Establishment of the Planning Elevation

Table 1 summarizes the results of a datum conversion process undertaken to rectify the elevations provided by varying sources using differing datum to NAVD88. All elevations hereafter referenced are shown in NAVD88. This information indicates that the East Middle Pearl River bridge was constructed with a low chord elevation of 11.37 feet NAVD88. The proposed bridge low chord elevation using the storm surge plus wave plus 1 foot criteria exceeds the existing low chord elevation by 1.94 feet.

Detailed notes on datum conversions are included below. Only two benchmarks at the West Pearl River bridge were recovered in the project area for this analysis. Assuming the rivers are hydraulically connected, the conversions for the West Pearl River were applied to the other four rivers.

Table 1: Summary of Datum Conversion Elevations

		West Pearl	West Middle Pearl	Middle Middle Pearl	East Middle Pearl	East Pearl
	Existing Elevations (NAVD88) - see notes below for datum conversion					
	Mean High Water [1,2,3]	1.35	1.35	1.35	1.35	1.35
	Existing Low Chord [6]	12.20	11.37	11.37	11.37	12.22
	Clearance above Mean High Water	10.85	10.02	10.02	10.02	10.87
	Design Considerations (NAVD88) - controlling condition in bold					
1	Storm Surge + Wave Height + 1 foot [4,5]	10.86	**12.51**	**13.23**	**13.31**	12.60
2	100-year + 1 foot [7]	**19.13**	20.13	21.14	21.14	**18.14**
3	Mean High Water (1.35) + Suggested Clearance (10') [1,3,8]	11.35	11.35	11.35	11.35	11.35

Source: Neel-Schaffer, Inc.

Datum Conversion Notes:

1. Per NOAA website, at West Pearl River Station the Mean High Water elevation is 3.841 meters (12.60 feet) below benchmark 141.

2. Per NOAA website, at West Pearl River Station the Mean High Water elevation is 1.413 meters (4.64 feet) below benchmark 1294 A 1980.

3. Therefore, Mean High Water elevation in NAVD88 is 13.95 - 12.60 = 1.35 using benchmark 141. Benchmark 1294 A 1980 yields similar results to within 0.05 feet. Use 1.35 as elevation of Mean High Water in NAVD88.

4. Per NOAA website, using Station Datum, Mean Sea Level is 0.28' below Mean High Water. Therefore, Mean Sea Level in NAVD88 is 1.35 - 0.28 = 1.07.

5. DOTD provided storm surge in elevations of Mean Sea Level. To convert to NAVD88, need to add 1.07 to elevations in MSL (assuming MSL elevations were provided for the W. Pearl River station).

6. DOTD-provided as-builts showing estimated bottom chord elevations of 12.83 for the West Pearl, 12.00 for the three Middle Rivers, and 12.85 for the East Pearl. No datum is specified. Finished road elevation is 14.08 at the location of Benchmark 141 (13.95 NAVD88). The benchmark is on the curb, so add 6" (14.08 + 0.50 = 14.58). Therefore, as an estimate, subtract 0.63' from as-built elevations to convert to NAVD88.

7. 100-year flood elevations were taken from the St. Tammany Parish DFIRM maps. The elevations from the map were in NGVD29, and were processed though the NGS VertCon program to obtain NAVD88 elevations. The difference in elevations ranged from 0.125 to 0.144 feet.

8. USCG–provided permit drawings show a clearance of 10.0 feet from mean high water. This agrees with the clearances calculated in the existing conditions; therefore, 10.0 feet clearance is suggested in this design condition as well.

1.7 Current Navigational Usage

This section discusses the existing navigational usage of the East Middle Pearl River impacted by the bridge replacement project. The discussion will include existing users, vessel trip frequency, and potential impact to business owners.

Channel Status

The East Middle Pearl River is not a federal authorized navigation channel.

Existing Commercial Users

Figure 2 shows the land use and zoning abutting the Pearl River system in Louisiana and Mississippi. Except for out parcels as shown on Figure 2, the area between the West Pearl River and the East Pearl River is owned and managed by the Pearl River Wildlife Management Area, part of the Louisiana Department of Wildlife and Fisheries.

There are two eco-tour businesses located on the West Pearl River that utilize the entire Pearl River system, including the East Middle Pearl River. The vessels used in the eco-tour businesses are longer than 21 feet and the larger vessels accommodate up to 25 persons.

Vessel Trip Frequency

The eco-tour businesses offer tours daily. Other vessels that may cross under this bridge are privately owned pleasure boats, fishing boats, etc., that can travel under the existing fixed structure.

Projected changes in waterway usage based upon anticipated waterway improvement projects

None.

Impact to vessel owners that would be precluded from transiting the waterway if a proposed bridge project is authorized

The existing low chord bridge elevation is 11.37 feet. Utilizing storm surge plus wave plus 1-foot criteria as shown in Table 1 to establish the low chord elevation for the replacement structure, the low chord elevation of the replacement bridge will be set at 13.31 feet or higher. This elevation is at least 1.94 feet higher than the low chord elevation of the existing bridge. Therefore, none of the current vessels that use this waterway would be impacted. The increase in navigation clearance may support the use of larger vessels by the eco-tour businesses

Upstream and Downstream Clearances

There is one overhead transmission line crossing over the East Middle Pearl River at the US 90 bridge. This crossing is owned by Washington St. Tammany Electric and consists of 45 foot poles on both sides of the River.

Review of annual cargo movements

There is no cargo transported along the East Middle Pearl River. Consequently, there is no cargo requiring disassembly to pass under the current structure.

Design Vessel

A design vessel has not been identified. However, the vertical clearance requirement for the larger eco-tour vessels currently transiting the waterway is 8 feet.

Specific Vessel Transit

There are no levee maintenance, bridge work, channel maintenance, or emergency operations upstream of the US 90 bridge that require certain vessels to transit the waterway.

NOTE: Logical Termini are the intersections of US 90 with US 190 and Kelly Rd/7th Ave and latitude and longitude data are in decimal format

Stennis Space Center

Port Bienville

30.2745, -89.5961

30.2280, -89.6780

1 2 3 4 5

N

Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

Legend

- Logical Termini
- Pearl River Bridges
- Project Limits
- XX.XXX, XX.XXX Latitude, Longitude
- Stennis Buffer Zone

Zoning Classification

- Suburban (A-1 thru A-3)
- Residental (A-4 thru A-8, MD-1)
- Animal Training Housing
- Public/Community/Recreational (WMA)
- Education (Primary and Secondary)
- Commercial/Service
- Industrial
- Neighborhood Institutional
- Planned Unit Development (PUD)

Figure 2
Land Use and Zoning

8,000 4,000 0 8,000 Feet

H.000284 US 90: PEARL RIVER BRIDGES AND
H.000286 EAST PEARL RIVER BRIDGE
ROUTE US 90
ST. TAMMANY PARISH, LA

Prepared For:

DOTD
LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

Prepared By: Neel-Schaffer, Inc.

Current "governing limitation" for navigation on the waterway

The current bridge is the most restrictive structure. The navigation clearances associated with the current bridge follow:

- Vertical Clearance - The existing bridge provides 10.02 foot clearance above the MHW elevation 1.35 feet.
- Horizontal Clearance The existing bridge provides a 60-foot horizontal clearance.

There are no downstream structures or power lines governing navigation on the waterway. As mentioned above, there is one set of power lines at the existing to-be-replaced bridge.

What is the most restrictive horizontal clearance on the waterway? This may be bridge piers on another bridge downstream, it may be a navigational lock, it may be a man-made channel, it may be the actual width of the narrowest portion of the waterway.

The most restrictive horizontal clearance is the natural narrowing of the waterway upstream from the existing East Middle Pearl River Bridge.

Historic Vessel Collision Information

The National Transportation Safety Board issues a Marine Accident Report following each investigation. These reports are available online for reports issued since 1996. The reports listing is sortable by the event date, report date, city, and state at the following website.

http://www.ntsb.gov/investigations/AccidentReports/Pages/marine.aspx

The website was searched March 31, 2016, sorted by state. The Louisiana incident reports were reviewed and there were no reports associated with marine incidents on the East Middle Pearl River.

1.8 Recommended Clearances associated with Replacement US 90 Bridge Crossing of the East Middle Pearl River

1. Low chord elevation of the proposed replacement bridge based on the storm surge plus wave plus 1 foot criteria is set at 13.31 feet. This elevation exceeds the existing low chord elevation by 1.94 feet.
2. Horizontal Clearance will be 60 feet to match the existing bridge clearance.
3. Considering the Environmental Assessment alternatives analysis,
    a. Replacement bridge alternatives will provide vertical and horizontal clearances as noted above.

b. Replacement structures to be offset and situated within the channel as required to allow for the continued operation of the existing bridge during construction of the replacement structure.

Impacts of Proposed Bridge Clearances on Present and Prospective Upstream Commercial Activity

The proposed bridge clearances will not impact present users of the waterway. Based on Wildlife Management Area ownership of upstream properties, and residential zoning of above stream out parcels, prospective upstream commercial activities (jobs, economic growth and development) are limited to eco-tour businesses that utilize the waterway. There are no existing or planned commercial/industrial growth and developments negatively affected by the proposed clearances. The River is contained within the Pearl River Wildlife Management Area.

Input from tour companies that use the River show that, as long as the proposed clearances meet or exceed the present clearance of the existing bridge, their businesses will not be affected. Comments were received that, should the vertical clearances be increased, larger tour boats could be built and used on the River. Applying the storm surge plus wave plus 1 foot criteria, the low chord elevation of the proposed replacement bridge is 1.94 feet higher than the low chord elevation of the existing span.

There are no existing facilities on the waterway that are or could be considered critical infrastructure, key resource, or important/unique US industrial capabilities.

1.9 Environmental Assessment Alternatives

The existing pony truss fixed span provides horizontal navigation clearance of 60 feet. Vertical clearance of the existing fixed span is approximately 10 feet above high water.

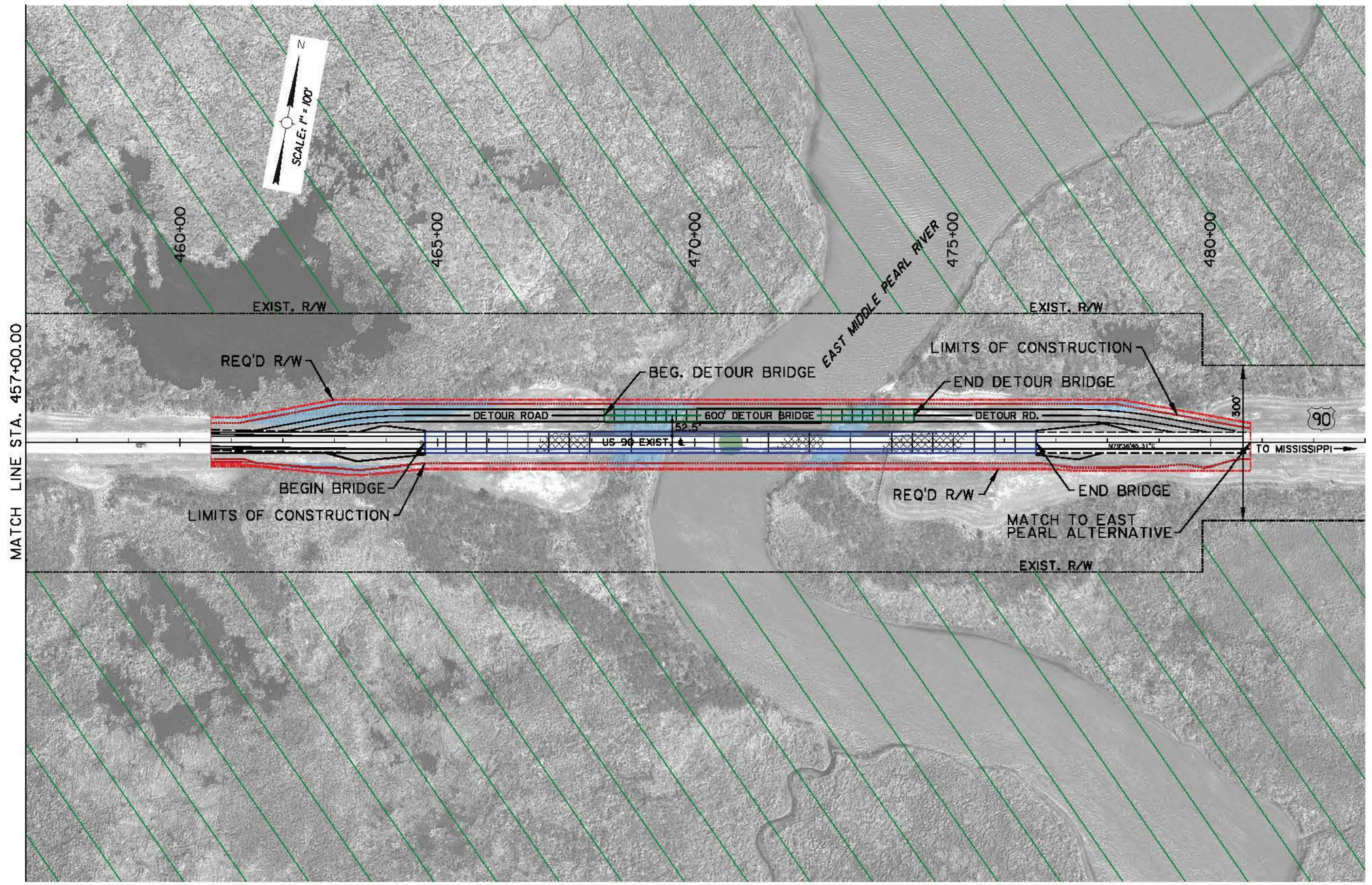
Build Alternatives developed in support of the Environmental Assessment include:

- A fixed span structure on offset alignment, downstream of the existing alignment
- A fixed span structure on existing alignment, with the construction of temporary detour structures.
- Rehabilitation

The Plan Sheets enclosed show the replacement build alternatives as noted above. The Section Sheet shows the sections for three middle river bridges. No additional right-of-way is required.

12/9/2016 11:28:41 AM

US 90 EA



PREPARED BY NEEL-SCHAFFER, INC.

Federal Highway Administration

DOTD LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

East Middle Pearl River
Existing Alignment Plan View
Plate 1 of 1
Page 10

LEGEND

- HISTORIC STRUCTURE
- WILDLIFE MANAGEMENT AREA
- WETLANDS (EXCLUDED WATER OF THE U.S.)
- REMOVAL
- LIMITS OF CONSTRUCTION
- REQ'D R/W

SHEET NUMBER	
PARISH	ST. TAMMANY
CONTROL SECTION	
STATE PROJECT	H.000284
DESIGNED / CHECKED	
DETAILED / CHECKED	
DATE / SHEET	12-05-16 / 3 OF 3

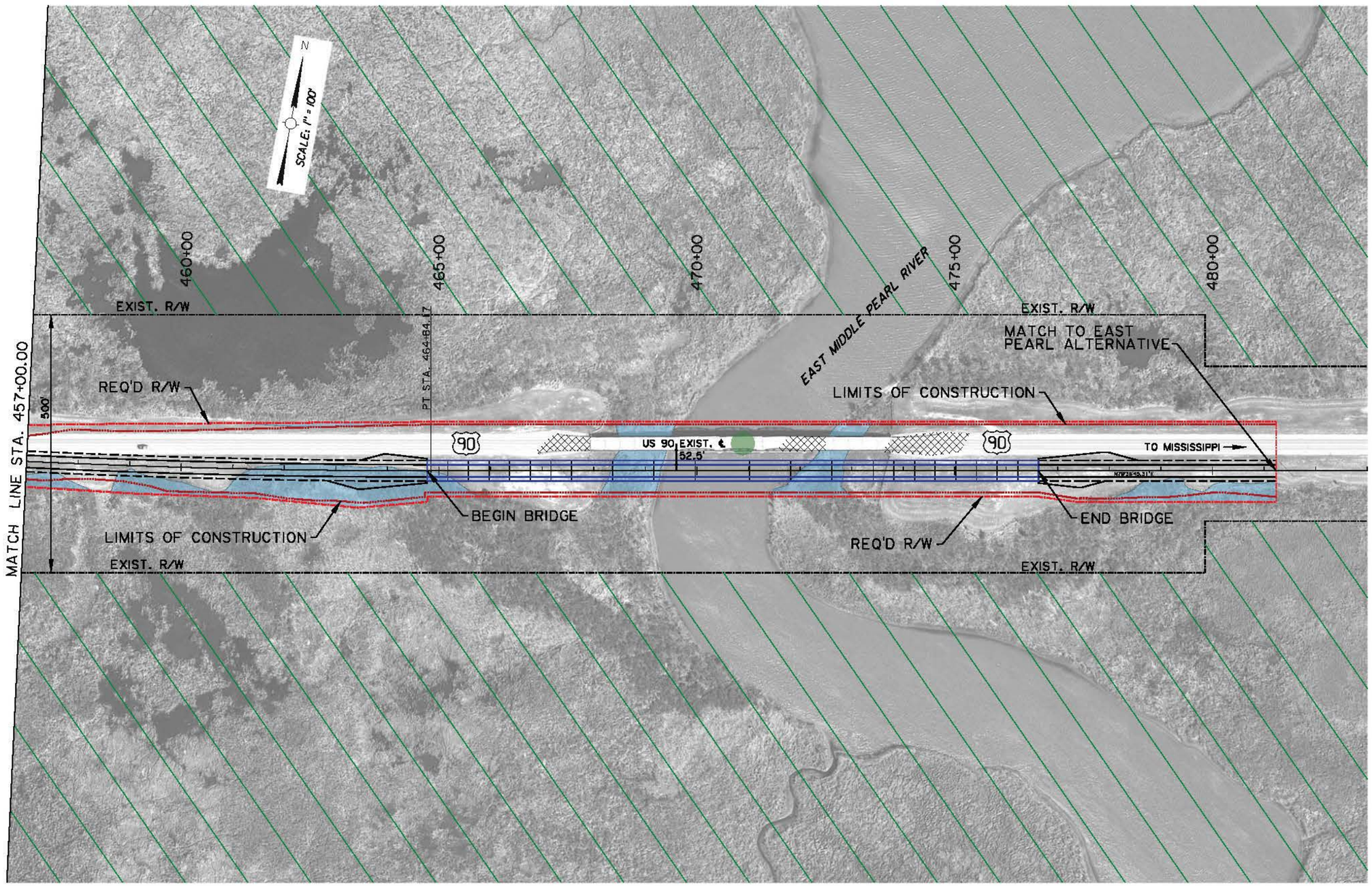
REVISION DESCRIPTION | NO. | DATE | BY

MIDDLE PEARL RIVER BRIDGES
FIXED SPAN ALTERNATIVE
PLAN VIEW
US 90 BRIDGES

Lay_ MP_33x_3.dgn

12/9/2016 11:26:54 AM

US 90 EA



100 50 0 100
GRAPHIC SCALE
SCALE: 1"=100'

PREPARED BY NEEL-SCHAFFER, INC.

Federal Highway Administration

DOTD LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

East Middle Pearl River
Downstream Alignment Plan View
Plate 2 of 2
Page 11

LEGEND

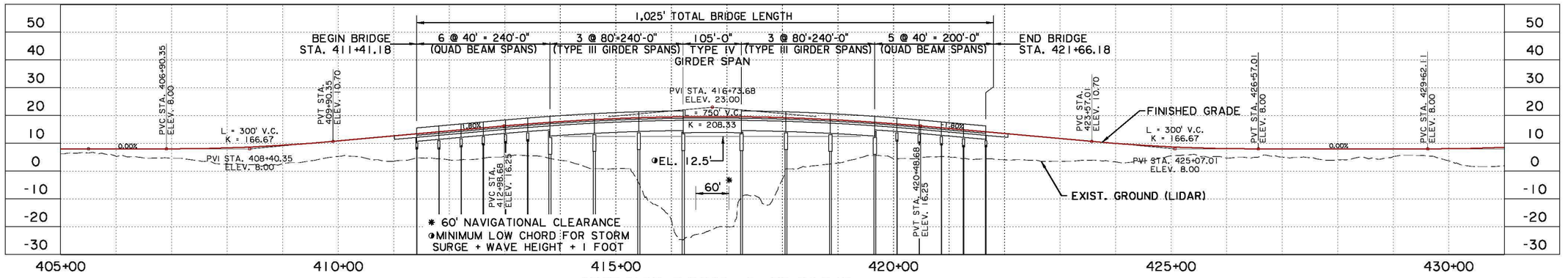
- HISTORIC STRUCTURE
- WILDLIFE MANAGEMENT AREA
- WETLANDS (EXCLUDED WATER OF THE U.S.)
- REMOVAL
- LIMITS OF CONSTRUCTION
- REQ'D R/W

SHEET NUMBER	
PARISH	ST. TAMMANY
CONTROL SECTION	
STATE PROJECT	H.000284
DESIGNED / CHECKED	
DETAILED / CHECKED	
DATE / SHEET	12-05-16 / 3 OF 3

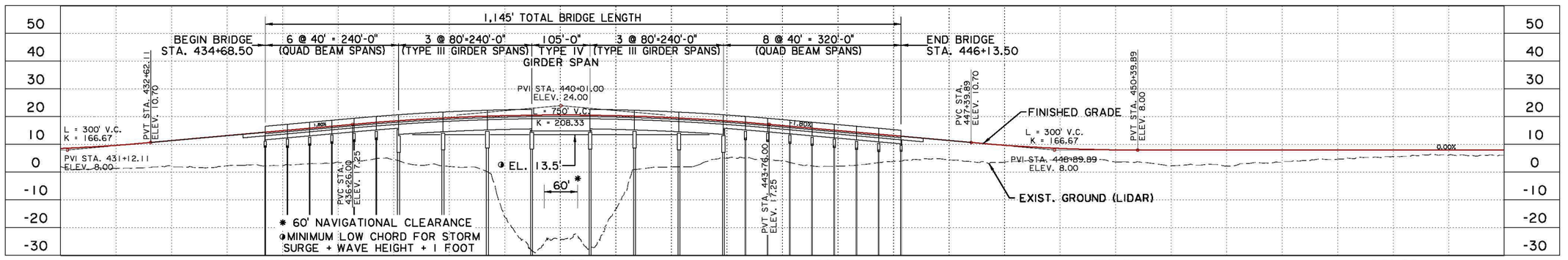
REVISION DESCRIPTION | NO. | DATE | BY

MIDDLE PEARL RIVER BRIDGES
FIXED SPAN ALTERNATIVE
PLAN VIEW
US 90 BRIDGES

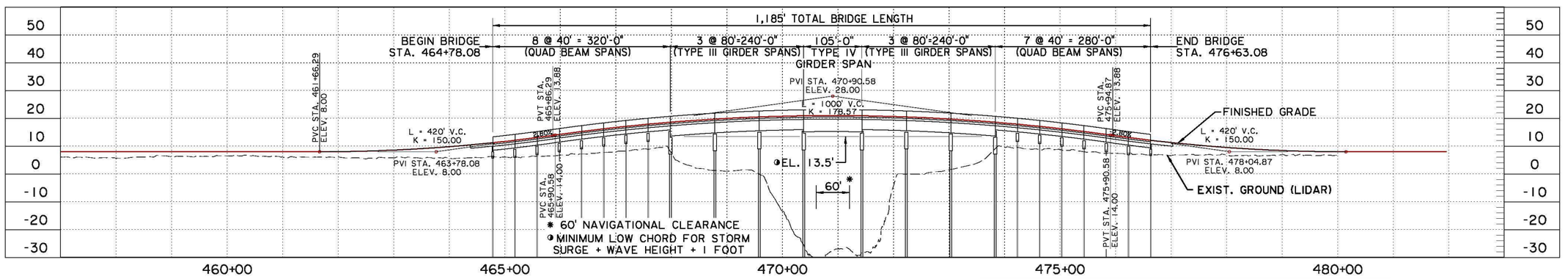
Lay_ MP_2Ex_1DS_3.dgn



WEST MIDDLE PEARL RIVER BRIDGE



MIDDLE MIDDLE PEARL RIVER BRIDGE



EAST MIDDLE PEARL RIVER BRIDGE

PREPARED BY NEEL-SCHAFFER, INC.

Federal Highway Administration

DOTD LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

Middle Pearl River
Profile Views
Plate 1 of 1
Page 12

Note 1: The bridge concepts shown (including pier placement and girder selection) are conceptual. During preliminary engineering, the types of girders and the pier placement will be finalized. The selected girders and associated pier placement may differ from the conceptual profiles as shown.

SCALES
HORIZONTAL 1" = 100'
VERTICAL 1" = 20'

US 90 EA

12/9/2016 11:07:17 AM

Pro_ MP 2Ex 1DS 1.dgn

SHEET NUMBER

PARISH: ST. TAMMANY
CONTROL SECTION
STATE PROJECT: H.000284

DESIGNED
DRAWN
CHECKED
DETAILED
CHECKED
DATE: 2-05-16
SHEET: 1 OF 1

REVISION DESCRIPTION
BY
DATE
NO.

STATE OF LOUISIANA

MIDDLE PEARL RIVER BRIDGES
FIXED BRIDGE ALTERNATIVES
PROFILE VIEW
US. 90 BRIDGES

DOTD LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

1.10 Proposed Bridge's Impacts to Existing and Potential Navigation

The East Middle Pearl River is entirely contained within the Pearl River Wildlife Management Area. The existing US 90 bridge is a fixed span with clearances as described earlier in this study. The proposed bridge will be higher than the existing vertical clearance, and will maintain the existing horizontal clearance. In addition:

- The proposed bridge does not completely obstruct passage of any existing waterway users or access to waterborne facilities.
- The proposed bridge will not establish a new navigational limiting factor, as the proposed bridge exceeds the existing vertical navigational clearance and maintains the horizontal clearance of the existing structure at the location.
- The proposed bridge does not impact present and prospective commercial activity on the waterway.
- The proposed bridge does not impact existing or planned commercial/industrial developments.
- The proposed bridge does not impact existing facilities on the waterway that are or could be considered critical infrastructure, key resources, or important/unique US industrial capability.
- The proposed bridge does not impact USACE ability to transit the bridge in a federal project channel.
- The bridge does not impact USCG and other government vessels' ability to transit the bridge to conduct mission essential functions.
- The proposed bridge does not impact existing and future cruise ship port-of-call/terminals, commercial freighters, or ports supporting post-panamax vessels as navigation associated with these facilities is not possible on the East Middle Pearl River.
- The proposed bridge does not impact vessels that require helper boats/tugs, as none currently use the waterway.

1.11 Consideration of River Hydrology in the Siting and Design for a Replacement Structure

1.11.1 Introduction

There are a number of hydrology modeling investigations underway relating to the performance of the Lower Pearl River Floodplain during flood and hurricane events. In April 2019, the University of Southern Mississippi released a report documenting the Development of a Forecast Model for the Lower Pearl River Basin. The most comprehensive discussion of the performance of the US 90 bridges during high flow river conditions is a 1999 joint report issued by LADOTD and the US Geological Survey (USGS), *Estimation of Scour and Channel Stability for Selected Highway*

Crossings of Rivers in the Florida Parishes, Southeastern Louisiana, Louisiana Department of Transportation And Development, Water Resources Technical Report No. 67B. The report will be hereafter referenced as the Scour Report

The following discussion utilizes the findings of the Scour Report as the basis to describe the hydraulic performance of each of the five rivers at each of the US 90 Pearl River bridge sites. The Scour Report investigates scour conditions at each bridge site assuming a 500-year storm as the base condition.

Excerpts from The Scour Report relevant to the East Middle Pearl River are provided in Appendix A. Specific tables and figures from the Scour Report will be referenced in this narrative. Photographs of the upstream and downstream approaches to the East Middle Pearl River bridge are included in Appendix B.

1.11.2 River Hydrology

Between the West Pearl River and the East Pearl River, the US 90 embankment of the lower Pearl River Basin spans over 4 miles of the river floodplain system. There are five openings in the embankment for the channels of the East Pearl, the East Middle, the Middle Middle, West Middle, and the West Pearl Rivers. The elevation of the roadway embankment is approximately 8 feet above sea level throughout and floodplain elevations range from 1 to 2 feet above sea level.

Table 2 shows the distribution of the 500 year storm event through the five river channels.

Table 2
Disribution of Flows Within Pearl River Watershed

	Flow in ft^3/sec	Percent of total flow
East Pearl River	100,002	36.6%
East Middle Pearl River	33,000	12.1%
Middle Middle Pearl River	41,000	15.0%
West Middle Pearl River	50,000	18.3%
West Pearl River	33,000	12.1%
Overflow	16,000	5.9%
Total	273,002	100.0%

Source: Neel-Schaffer, Inc.

The East Middle Pearl River is formed as a distributary of the Middle Middle Pearl River half a mile upstream of the US. 90 embankment. Upstream of the bridge, a pool is approximately four bridge widths long and three bridge widths wide, which connects with two small channels (Scour Report Figure. 38) which may be distributary or tributary in nature depending on flow conditions. One of the two channels provides a connection between the East Middle Pearl River and the East Pearl River. The East Middle Pearl River channel bends to the left upon exiting this pool.

1.11.3 Waterway Layout and Geometry

The East Middle Pearl River channel at US 90 is curving upstream to the right when passing through the bridge opening and the bridge crosses the river at a slight skew to the river.

1.11.4 Waterway Depth and Elevation Fluctuations

As shown in Scour Report Figure 39, channel depth in proximity to the existing bridge has varied with the channel deepening over time due to scour. In 1994 the main channel was approximately at elevation -30.

Table 3 shows NOAA-provided information for the East and West Pearl Rivers.

Table 3
NOAA Information from Station Datum
(Elevation Datum NAVD88)
West Pearl and East Pearl Rivers at US 90

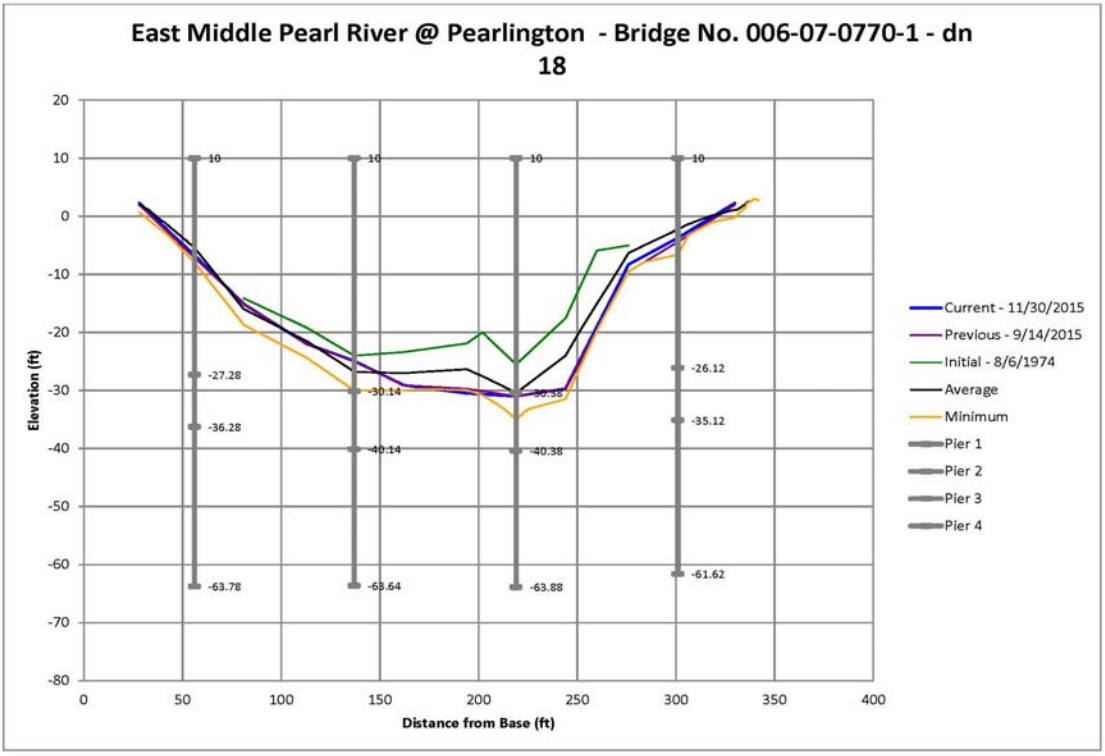
	MHW	MLW
West Pearl River	1.35	0.74
East Pearl River	1.36	0.22

Source Neel-Schaffer, Inc.

NOAA does not provide standard datum measures for the three middle rivers. However, the five rivers are hydraulically connected. The East Pearl River exhibits the greater elevation change between MHW and Mean Low Water (MLW). Consequently, the East Pearl range will be applied to the middle rivers to show the potential range of river fluctuations.

MHW elevation for the East Pearl River at US 90 is elevation 1.35 NAVD88. MLW is elevation 0.22 NAVD88, which indicates that there is a relatively small range of elevation fluctuations affecting navigation. Figure 3 presents a recently taken cross-section approximately 18 feet downstream of the bridge.

Figure 3 – LADOTD Cross-section of East Middle Pearl River (18' Downstream of Bridge)



1.11.5 Channel and Waterway Alignment

The existing East Middle Pearl River bridge crosses the river at slight skew to the river. Bridge replacement alternatives located new structures upstream from the existing bridge. Alternatives were also considered locating new structures along the existing alignment. In those situations a temporary by pass structure maintaining navigation clearances as described herein would be provided. The centerline of the replacement structure will be 52.5 feet from the centerline of the existing bridge. The existing 60-foot horizontal channel will be maintained in alignment with the existing fixed span; so there will be no change in the navigation geometry.

1.11.6 Current Speed and Direction

Simulation of the 500-year event indicated East Middle Pearl River flow velocities ranging from approximately 2 feet/second near the channel bank to approximately 8 feet/second at center channel (Scour Report Table 20). As noted in Table 2 estimated flow at the bridge was approximately 33,000 feet^3/second.

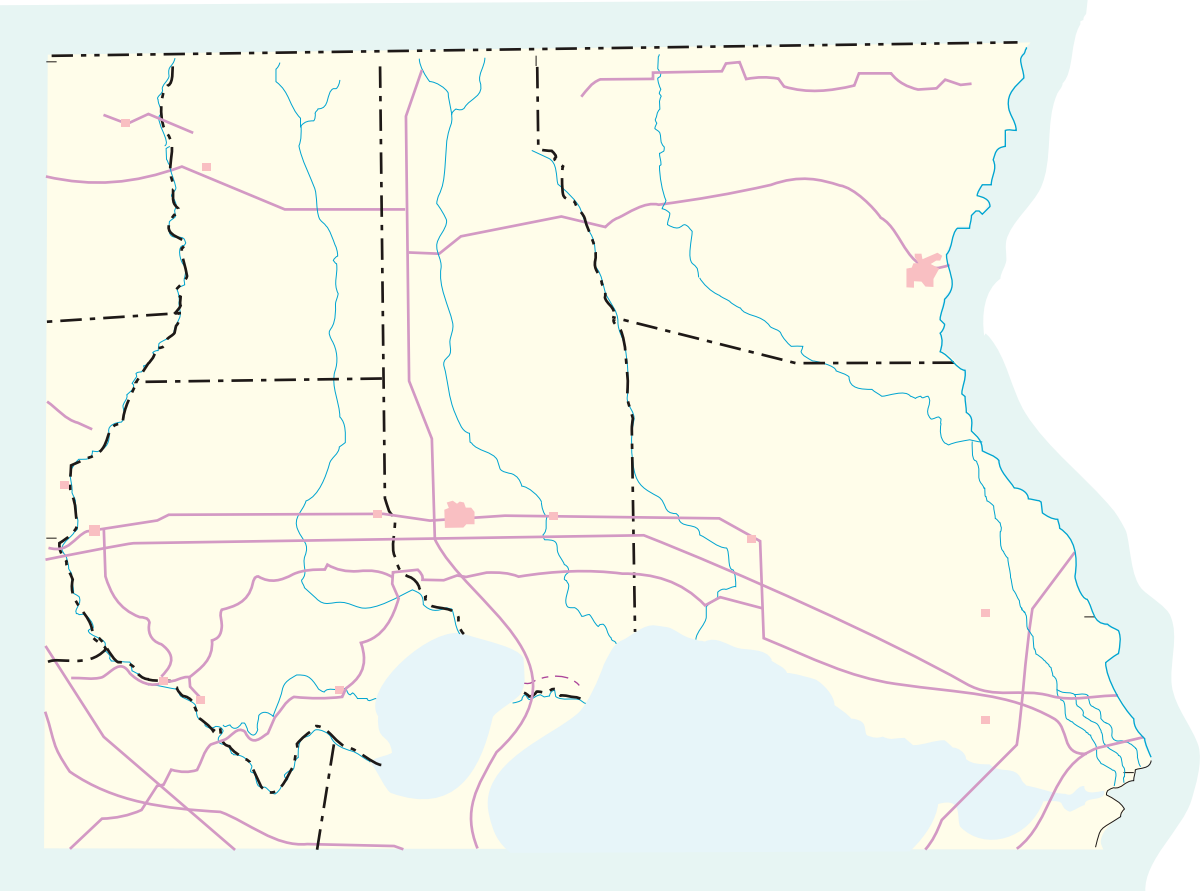
1.11.7 Natural Flow of Waterway including Currents, Water Velocity, Water Direction and Velocity Fluctuations that Might Affect Navigation

Replacement bridge alternatives are situated in proximity to the existing bridge, maintaining the 60-foot horizontal channel width and relative channel alignment. Forecast river velocities under extreme navigation conditions (during a 500-year event) are approximately 8 feet/second. MHW and MLW elevations fluctuations are 1.14 feet. There is no indication that the natural flow of the waterway at the new bridge location (including currents, water velocity, water direction and velocity fluctuations) might affect navigation.

Appendix A
East Middle Pearl River
Excerpts from 1999 Report Estimation of Scour and Channel Stability for Selected Highway Crossings of Rivers in the Florida Parishes, Southeastern Louisiana

Estimation of Scour and Channel Stability for Selected Highway Crossings of Rivers in the Florida Parishes, Southeastern Louisiana

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
Water Resources Technical Report No. 67B



STATE OF LOUISIANA
DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
PUBLIC WORKS AND FLOOD CONTROL DIRECTORATE
WATER RESOURCES SECTION
in cooperation with the
U.S. GEOLOGICAL SURVEY

1999

East Middle River near Slidell, Louisiana

The East Middle River is formed as a distributary of the Middle River half a mile upstream of the U.S. Hwy. 90 embankment. This is the second bridge opening (east to west) of the U.S. Hwy. 90 crossing of the Pearl River system. Upstream of the bridge, a pool is approximately four bridge widths long and three bridge widths wide, which connects with two small channels (fig. 38) which may be distributary or tributary in nature depending on flow conditions. The channel bends to the left upon exiting this pool.

Pier Scour

Simulation of the Q_{500} indicated velocities ranging from approximately 2 to 8 ft/s and a water-surface elevation of approximately 6.5 ft above sea level. The bridge piers are at an angle of 35 degrees with the channel; therefore, the correction for alignment, K_2, was 2.0. The greatest pier scour is approximately 27 ft and occurs at the main channel pier at DOTD station 470+60 (table 20, fig. 39). Pier scour at the three other main piers that are in or near the channel ranged from 13 to 25 ft. Estimated scour depth at the overbank piers was approximately 4 ft. Bed elevation estimates which include contraction scour show elevations that are below the pile tip as indicated on the bridge plans.

Table 20. Scour data for U.S. Highway 90 crossing of the East Middle River near Slidell, Louisiana

[DOTD, Louisiana Department of Transportation and Development; water-surface elevation is 6.5 feet above sea level; K_2, dimensionless correction factor for angle of flow attack; ft, feet; ft/s, foot per second; pile tip elevations scaled from DOTD bridge plans; NA, not applicable]

DOTD station	Ground elevation (ft above sea level)	Pier shape	K_2	Pier width (ft)	Velocity (ft/s)	Local or pier scour (ft)	Contraction scour (ft)	Scour elevation (ft above sea level)	Pile tip elevation (ft above sea level)
468+08	1.0	Abutment	2.0	NA	1.9	0	4.3	-3	-20
468+35	1.0	Square	2.0	1.5	1.9	4.5	4.3	-8	-20
468+65	1.0	Square	2.0	1.5	1.9	4.5	4.3	-8	-20
468+95	1.0	Square	2.0	1.5	1.9	4.5	4.3	-8	-20
469+20	1.0	Square	2.0	1.5	1.9	4.5	4.3	-8	-20
469+50	1.0	Square	2.0	1.5	1.9	4.5	4.3	-8	-20
469+80	0	Round	2.0	6.0	3.0	13.8	4.3	-18	-54
470+60	-28.0	Round	2.0	6.0	7.8	26.9	12.3	-67	-56
471+40	-30.0	Round	2.0	6.0	6.7	25.0	12.3	-67	-56
472+20	0	Round	2.0	6.0	2.7	13.2	4.3	-18	-54
472+50	1.0	Square	2.0	1.5	1.9	4.5	4.3	-8	-20
472+80	1.0	Square	2.0	1.5	1.9	4.5	4.3	-8	-20
473+10	1.0	Square	2.0	1.5	1.9	4.5	4.3	-8	-20
473+40	1.0	Square	2.0	1.5	1.9	4.5	4.3	-8	-20
473+80	1.0	Square	2.0	1.5	1.9	4.5	4.3	-8	-20
473+91	1.0	Abutment	NA	NA	1.9	0	4.3	-3	-20



Photograph source: Louisiana Department of Transportation and Development, December 1971

Figure 38. Aerial photograph of the U.S. Highway 90 crossing of the East Middle River near Slidell, Louisiana.

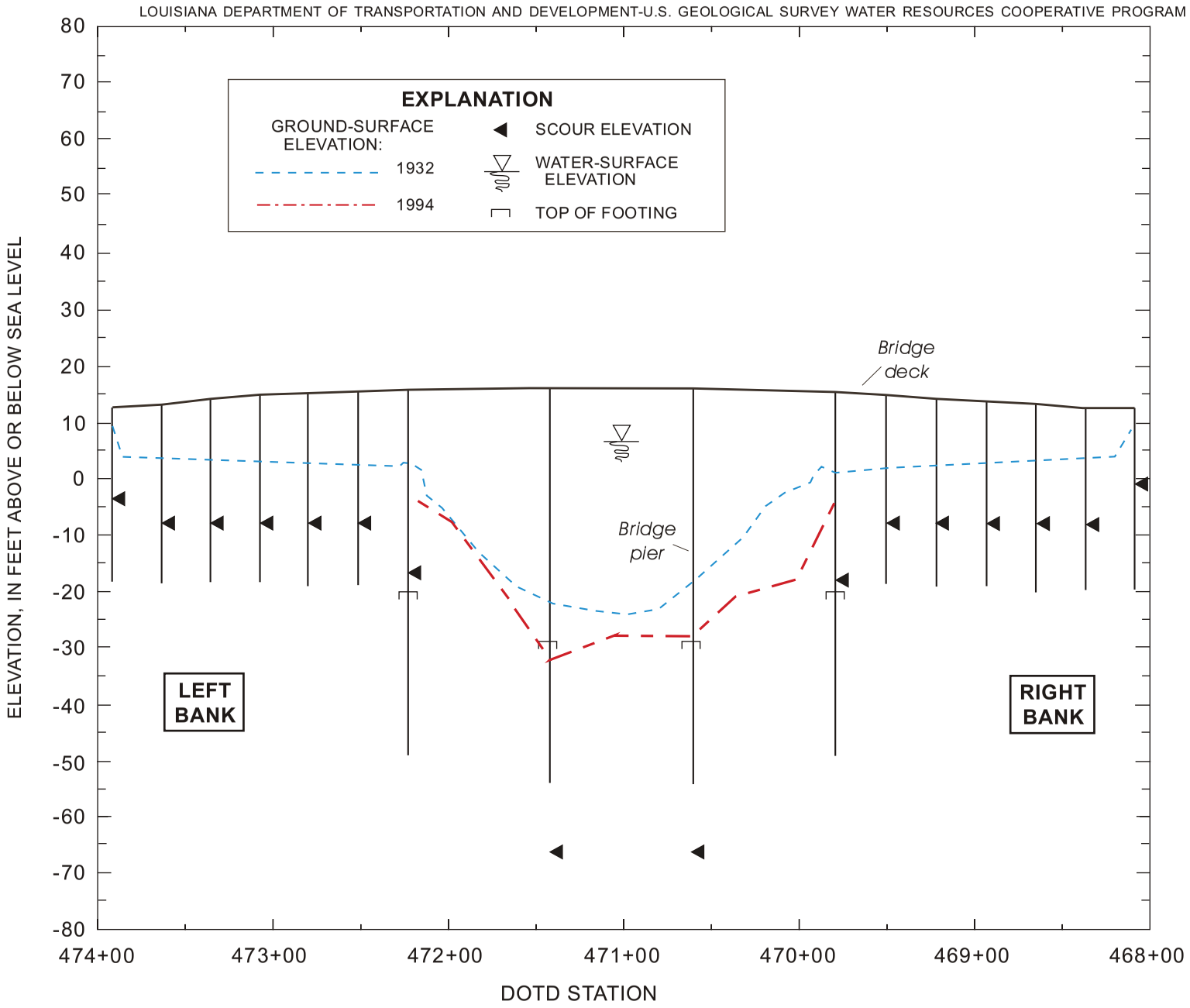


Figure 39. Comparative cross sections and scour estimates at the U.S. Highway 90 crossing of the East Middle River near Slidell, Louisiana.

Channel Stability

Although the bridge crossing is located at a bend to the left in the channel, the cross-section information at the bridge does not indicate any significant lateral movement of the channel. Inspection of the site after the 1983 flood did not indicate substantial scouring of the overbanks.

Contraction and Abutment Scour

Flow through the bridge was subdivided into flow in the main channel, left overbank, and right overbank. The average depth of the channel at the bridge is approximately 22 ft for the main channel and 5 ft for the overbanks. For contraction scour estimates in the main channel, the flow in the main channel upstream was defined as a section of channel, approximately 200 ft in width. The width of the main channel at the opening is 200 ft. Contraction scour in the main channel was computed as 12 ft. Scour on the left and right overbanks was predicted as approximately 4 ft. The overbanks are vegetated with marsh grasses which may reduce the scour potential on the overbanks. Inspection of the site after the 1983 flood did not indicate significant scouring of the overbanks.

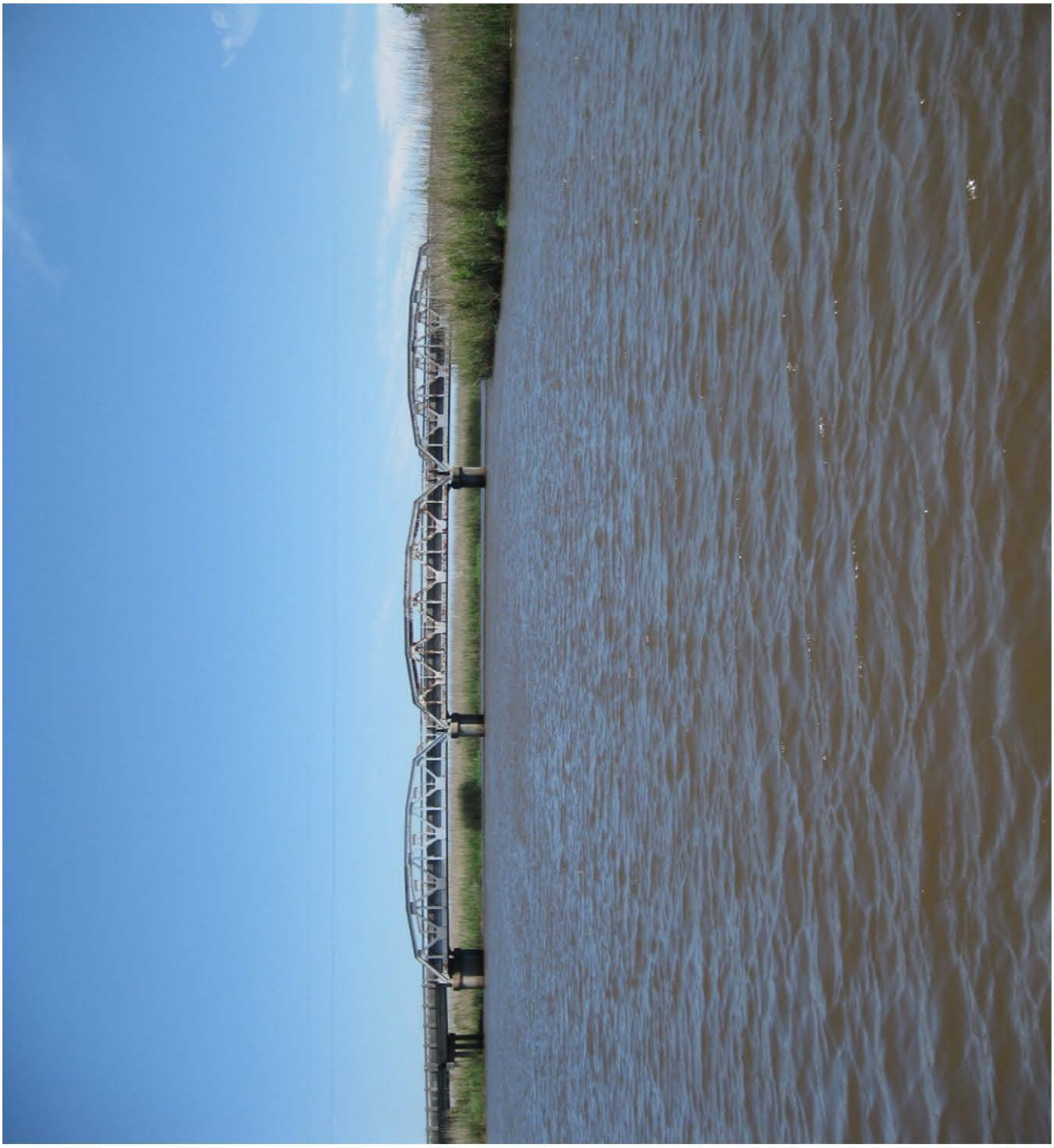
Appendix B
Photographs of the East Middle Pearl River Upstream and Downstream Approaches

East Middle Pearl River

Upstream Approach



Downstream Approach



Navigation Study
US 90 Crossing of the EAST PEARL RIVER

US 90 Pearl River Bridges
Environmental Assessment
St. Tammany Parish, LA and Hancock County, MS

STATE PROJECT NO. H.000284 & NO. H.000286
FEDERAL AID PROJECT NO. H000284 & NO. H000286



USCG Draft Navigation Impact Report

July 2019

U.S. Department of Transportation
Federal Highway Administration

DOTD
LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

MDOT

Table of Contents

		Page
Section 1.0	Navigation Study – US 90 Crossing the East Pearl River	1
1.1	Introduction	1
1.2	Project Purpose and Need	3
1.3	Reference Datum Conversion	3
1.4	Floodplain Consideration	3
1.5	Navigation Clearance above Mean High Water	3
1.6	Establishment of the Planning Elevation	4
1.7	Current Navigational Usage	6
1.8	Recommended Clearances associated with Replacement US 90 Bridge Crossing of the East Pearl River	12
1.9	Environmental Assessment Alternatives	13
1.10	Proposed Bridge's Impacts to Existing and Potential Navigation	32
1.11	Consideration of River Hydrology in the Siting and Design for a Replacement Structure	30

Tables

Table 1	Planning Elevation Datum Conversion	5
Table 2	Summary of 2013 US 90 Bridge Openings	10
Table 3	Distribution of Flows within the Pearl River Watershed	33
Table 4	NOAA Standard Datum Elevations East Pearl River, Mean High Water and Mean Low Water	34

Figures

Figure 1	Study Area	2
Figure 2	East Pearl River Navigation to GIWW	6
Figure 3	Land Use and Zoning	8
Figure 4	East Pearl River Public Boat Launch	9
Figure 5	Downstream Section at East Pearl River	34

Engineering Plates

Long Span Alternative Plan View, Plates 1-4	15-18
Long Span Alternative Profile View, Plates 1-3	19-21
Movable Span Alternative Plan View, Plates 1-2	23-24
Movable Span Alternative Profile View, Plate 1	25
Mid-Level Double Leaf Trunion Bascule Bridge Concept, Plates 1-3	26-28
Mid-Level Vertical Lift Bridge Concept, Plates 1-3	29-31

Appendix

Appendix A	Year 2013 and Year 2018 Bridge Tender Report Summaries	36
Appendix B	Documentation of Coordination with Stennis Agencies Using the East Pearl River	37
Appendix C	East Pearl River, Excerpts of the 1999 Report Estimation of Scour and Channel Stability for Selected Highway Crossings of Rivers in the Florida Parishes, Southeastern Louisiana	38
Appendix D	Upstream and Downstream Bridge Approach Photos	39
Appendix E	East Pearl River Bridge Tender Logs Year 2013 – 2018	CD

1.0 Navigation Study - US 90 Crossing of the East Pearl River

1.1 Introduction

The Louisiana Department of Transportation and Development (LADOTD) is preparing planning and environmental documents for the improvement of five bridge structures associated with the Pearl River system along US Highway 90 (US 90). The enclosed Study Area map, Figure 1, shows the limits of the project. The project limits extend along US 90 from US 190 in Louisiana to the US 90 intersection with Kelly Road / 7th Avenue in Pearlington, MS. The existing roadway is a two lane rural arterial roadway (RA-2) with 12-foot travel lanes and 8-foot paved shoulders. Average Daily Traffic is approximately 3,000 vehicles per day.

Five bridges associated with the Pearl River system are crossed as follows:

- Structure no. 62520060705291, West Pearl River Bridge, Movable Lift Span
- Structure no. 62520060706701, West Middle Pearl River Bridge
- Structure no. 62520060707111, Middle Middle Pearl River Bridge
- Structure no. 62520060707701, East Middle Pearl River Bridge
- Structure no. 62520060800001, East Pearl River Bridge, Movable Swing Span

This Navigational Study assesses the current and anticipated future use of the East Pearl River, and investigates the required clearances for the proposed bridge replacement alternatives.

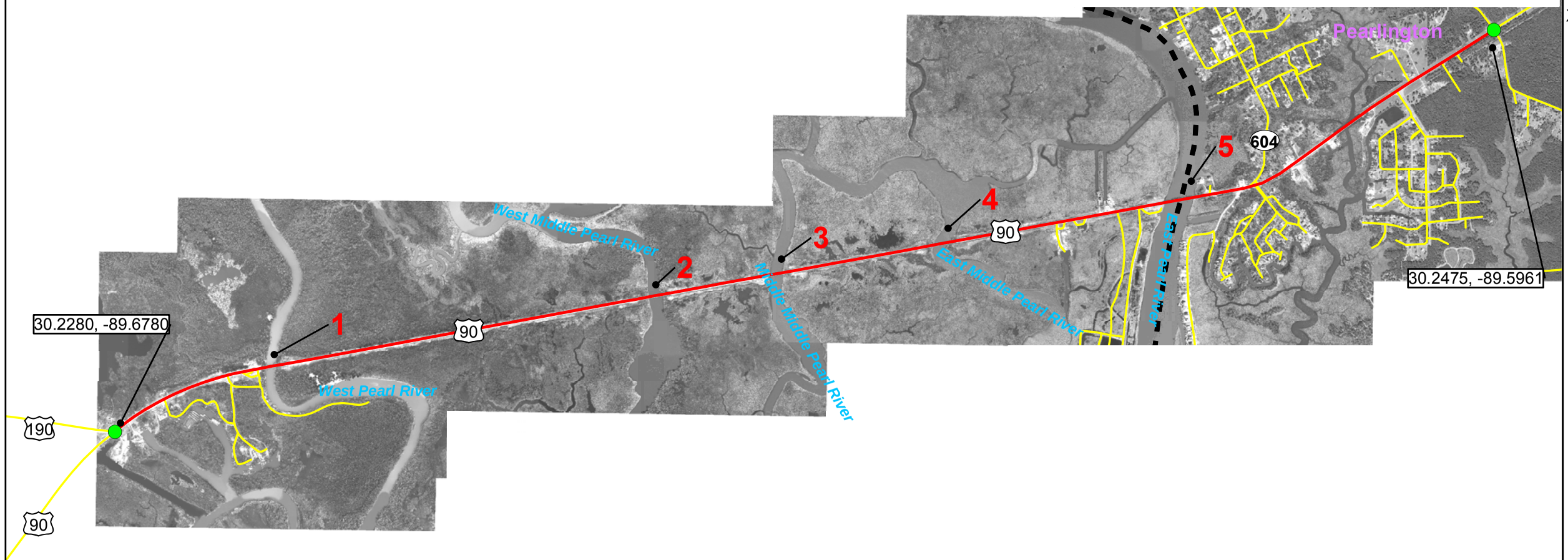
US 90 Bridge across East Pearl River
Structure Number: 62520060800001
Recall Number: 058750

The US 90 bridge across the East Pearl River was built in 1933. The structure is 24' wide, 961' long and consists of 14 reinforced concrete deck girder approach spans, 2 fixed steel through truss anchor spans, and 1 steel through truss swing span in the main navigation span. The main span must be turned to allow passage of vessels taller than 10'.

The horizontal bridge roadway width (24') and vertical clearance (15') do not meet the minimum requirements for a RA roadway. The 2017 LADOTD minimum design guidelines state that the preferred bridge width is equal to the approach travel lanes (24') and the shoulder width (8'). The bridge does not have shoulders. The horizontal navigation clearance is 90 feet.

Map No.	Structure Number	Structure Type	Water Body Crossing
1	62520060705291	Movable: Lift-Span	West Pearl River
2	62520060706701	Pony Truss - Warren Truss	West Middle Pearl River
3	62520060707111	Pony Truss - Warren Truss	Middle Middle Pearl River
4	62520060707701	Pony Truss - Warren Truss	East Middle Pearl River
5	62520060800001	Movable: Swing - Through Truss (Parker Truss)	East Pearl River

NOTE: Logical Termini are the intersections of US 90 with US 190 and Kelly Rd/7th Ave and latitude and longitude data are in decimal format



Source (Citation) for 2010 six inch pixel imagery Parish Mosaics

This imagery was provided by the Louisiana Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP) as the sole source owner, and is shared with Louisiana state government agencies in the interest of good government practices.

Reproduction and distribution of the data is prohibited. Please refer any requests for data to the Deputy Director for Management, Finance and Interoperability of GOHSEP. This imagery was distributed by the Regional Planning Commission for Jefferson, Orleans, Plaquemines, St. Bernard and St. Tammany Parishes (RPC) with permission from GOHSEP.

GOHSEP and the RPC are not responsible for any errors arising from any use of alterations made to the data. Under no circumstances is resale or distribution of the data permitted.

Mosaics were produced and compressed by the Louisiana State University Coastal Studies Institute.

Imagery Information: The red, green, blue (true color) and near infrared four-band aerial imagery was captured between February 10th and April 1st of 2010 (re-flights for any corrections flown until April 28th, 2010) by Sanborn Map Company, Inc.

The imagery is projected to UTM 15 NAD 83; unit of measure is meters.
The spatial resolution is approximately a six inch pixel.
Any use of the data must be accompanied with this citation and accompanying seals and logos embedded within.

Governor's Office

Prepared By: Neel-Schaffer, Inc.

Figure 1

Study Area

Legend

- Logical Termini
- Project Limits
- Roadway Network
- LA/MS State Boundary Line
- XX.XXX, XX.XXX Latitude, Longitude

N

1,500 750 0 1,500 Feet

H.000284 US 90: PEARL RIVER BRIDGES AND
H.000286 EAST PEARL RIVER BRIDGE
ROUTE US 90
ST. TAMMANY PARISH, LA

Prepared For:

DOTD
LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

The mechanical system for the swing span bridge is in good condition due to continued upkeep and maintenance. For rehabilitation purposes, lubrication and painting will be required. Complete replacement of the corroded resistor bank will be required as well as replacement of the dated electrical system. The submarine cables have been recently replaced and will not require rehabilitation as they are in good condition. Additionally, the traffic barriers are also in good condition and do not need to be replaced.

1.2 Project Purpose and Need

The purposes of the proposed action, which have been approved by Federal Highway Administration (FHWA), are:

- To maintain a system link to provide a diversion route in the event of an incident on I-10.
- To improve the structural integrity and functionality of the bridges.
- To support hurricane evacuations

1.3 Reference Datum Conversion

Permit and as-built drawings for the US 90 bridges over the five Pearl River crossings show elevations in Mean Gulf Level (MGL), a commonly used hydrographic datum at that time. A topographic survey was performed by a LADOTD survey crew in December 2015 to establish a reference bridge elevation point for each of the bridges. The reference datum allows for conversion of as-built drawing elevation to existing NAVD88 datum in feet.

1.4 Floodplain Consideration

LADOTD guidance for bridge replacements is to locate a replacement structure at not less than the 100-year floodplain plus 1 foot. The 100-year flood elevations have been determined to be significantly higher than the elevation of the existing roadway between all of the bridge sites. Based on the 2008 Preliminary Flood Insurance Rating Map (FIRM), the 100-year floodplain elevation at the US 90 crossing of the East Pearl River is elevation 17.14 NAVD88.

Additionally, LADOTD provided storm surge and wave height estimates for each bridge location. The storm surge plus wave action plus one foot elevation for the East Pearl River bridge is elevation 12.60 NAVD88.

1.5 Navigation Clearance above Mean High Water

The United States Coast Guard (USCG) utilizes the National Oceanic and Atmospheric Administration (NOAA) derived determinations for Mean High Water (MHW) datum to establish vertical navigation clearances for bridges. In the United States, MHW is the average of all the high water heights observed over a period of 19

years (for the East and West Pearl Rivers, 1983-2001) and is referred to as the National Tidal Datum Epoch. The existing bridge is a swing span with no vertical navigation restrictions. The horizontal clearance associated with the existing swing span bridge is 90 feet.

NOAA determined mean high water is elevation 1.36 NAVD88 for the East Pearl River.

1.6 Establishment of the Planning Elevation

Table 1 summarizes the results of a datum conversion process undertaken to rectify the elevations provided by varying sources using differing datum to NAVD88. All elevations hereafter referenced are shown in NAVD88. The East Pearl River bridge was constructed with a low chord elevation of 12.22 feet NAVD88.

Two bridge concepts are under consideration, a fixed span structure providing 73' vertical clearance above MHW elevation 1.36 and movable span concepts providing 73' vertical navigation clearance in the position open for navigation.

For the movable span concepts, in the position closed to navigation, the low chord elevation above the navigation channel will be set at 25 feet above mean high water elevation 1.36. At this elevation approximately 80% of the marine traffic will be able to pass under the movable span.

The low chord elevation of the existing swing span bridge is 12.22 feet. The minimum bridge low chord elevation will be set using the 100-year floodplain plus 1-foot elevation as shown in Table 1. For the fixed span components of the movable span alternatives, low chord elevation will be set at elevation 18.14' or higher. This elevation is at least 5.92 feet higher than the low chord elevation of the existing bridge. Therefore, none of the current vessels that use this waterway would be impacted.

Detailed notes on datum conversions are included in Table 1. Only two benchmarks at the West Pearl River bridge were recovered in the project area for this analysis. Assuming the rivers are hydraulically connected, the conversions for the West Pearl River were applied to the other four rivers.

Table 1
Planning Elevation Datum Conversion

		West Pearl	West Middle Pearl	Middle Middle Pearl	East Middle Pearl	East Pearl
Existing Elevations (NAVD88) - see notes below for datum conversion						
	Mean High Water [1,2,3]	1.35	1.35	1.35	1.35	1.36
	Existing Low Chord [6]	12.20	11.37	11.37	11.37	12.22
	Clearance above Mean High Water	10.85	10.02	10.02	10.02	10.86
Design Considerations (NAVD88) - controlling condition in bold						
1	Storm Surge + Wave Height + 1 foot [4,5]	10.86	12.51	13.23	13.31	12.60
2	100-year + 1 foot [7]	19.13	20.13	21.14	21.14	18.14
3	Mean High Water (1.35) + Suggested Clearance (10') [1,3,8]	11.35	11.35	11.35	11.35	11.35

Source: Neel-Schaffer, Inc.

Datum Conversion Notes:

1. Per NOAA website, at West Pearl River Station the Mean High Water elevation is 3.841 meters (12.60 feet) below benchmark 141.

2. Per NOAA website, at West Pearl River Station the Mean High Water elevation is 1.413 meters (4.64 feet) below benchmark 1294 A 1980.

3. Therefore, Mean High Water elevation in NAVD88 is 13.95 - 12.60 = 1.35 using benchmark 141. Benchmark 1294 A 1980 yields similar results to within 0.05 feet. Use 1.35 as elevation of Mean High Water in NAVD88.

4. Per NOAA website, using Station Datum, Mean Sea Level is 0.28' below Mean High Water. Therefore, Mean Sea Level in NAVD88 is 1.35 - 0.28 = 1.07.

5. DOTD provided storm surge in elevations of Mean Sea Level. To convert to NAVD88, need to add 1.07 to elevations in MSL (assuming MSL elevations were provided for the W. Pearl River station).

6. DOTD-provided as-builts showing estimated bottom chord elevations of 12.83 for the West Pearl, 12.00 for the three Middle Rivers, and 12.85 for the East Pearl. No datum is specified. Finished road elevation is 14.08 at the location of Benchmark 141 (13.95 NAVD88). The benchmark is on the curb, so add 6" (14.08 + 0.50 = 14.58). Therefore, as an estimate, subtract 0.63' from as-built elevations to convert to NAVD88.

7. 100-year flood elevations were taken from the St. Tammany Parish DFIRM maps. The elevations from the map were in NGVD29, and were processed though the NGS VertCon program to obtain NAVD88 elevations. The difference in elevations ranged from 0.125 to 0.144 feet.

8. USCG–provided permit drawings show a clearance of 10.0 feet from mean high water. This agrees with the clearances calculated in the existing conditions; therefore, 10.0 feet clearance is suggested in this design condition as well.

1.7 Current Navigational Usage

This section discusses the existing navigational usage of East Pearl River impacted by the bridge replacement project. The discussion will include existing users, vessel trip frequency, and potential impact to navigation interests.

Channel Status

In 2014, Neel-Schaffer Inc. led a team which provided planning and engineering services to the Mississippi Department of Transportation (MDOT) on the Statewide Ports Needs and Marketing Study. The work included an evaluation of the needs of Port Bienville in Hancock County, Mississippi. The following discussion describing navigation extending from the East Pear River to the *Gulf Intracoastal Waterway (GIWW)* was extracted from that study.

> *Technically, there is a 9 feet x 200 feet channel authorized under The East Pearl River Navigation Project (completed in 1911) extending from the deep water contour of the Pearl River to the 9-foot deep water contour of Lake Borgne. The GIWW did not exist when this channel was authorized in 1910, so the authorized channel does not provide access to the GIWW. About one mile above the mouth of the Pearl River, the channel passes through an antiquated CSX swing rail bridge with 87 feet of horizontal clearance. In addition to the relatively narrow horizontal clearance, the bridge is located at the first bend of the Pearl River with the opening on the inside of the bend. Significant vessel traffic has not used this channel for many years; therefore, it has not been maintained and has returned to natural conditions. Currently, NOAA navigation charts show this channel to be approximately 6.5 feet deep from the mouth of the Pearl River to the GIWW. See Figure 2.*

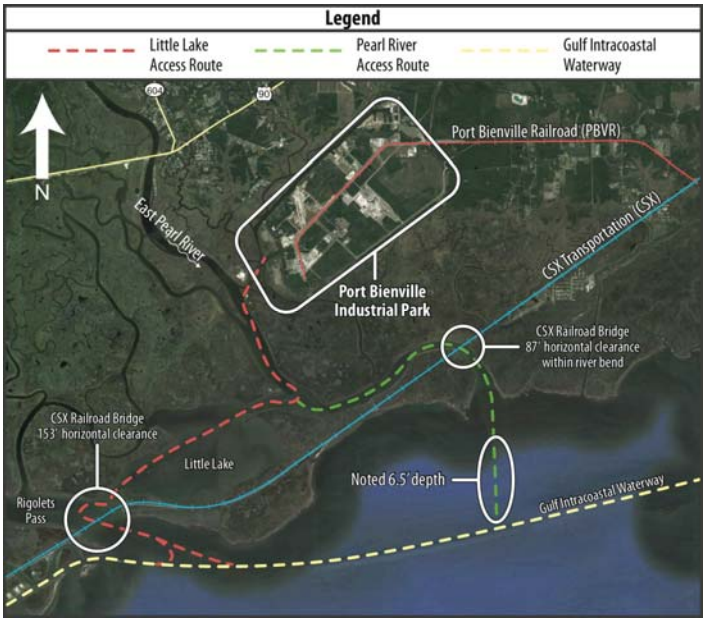


Figure 2, East Pearl River Navigation to GIWW

Access from the East Pearl River to the GIWW is through Little Lake. The Little Lake Channel was originally dredged by the USACE for NASA in 1965 on a cost- reimbursable basis. Segments of the Pearl River have been dredged on the same basis since then, and NASA had obtained all necessary permits for this work. However, unsure of future operating and funding, NASA did not participate in obtaining the last dredging permit. This is not a federally authorized and maintained channel, but it is the channel that is currently used for maritime access to Port Bienville and the Stennis Space Center.

Shoaling can be a substantial problem, and because it is not federally authorized and a Dredged Material Management Plan (DMMP) does not exist, it is a difficult and lengthy process for the port to obtain the necessary permits to dredge. Vessels using the Little Lake Channel to reach the Stennis Space Center leave the GIWW in Lake Borgne and travel less than one mile through the Rigolets. Vessels must then make a sharp turn into East Pass, which brings them into Little Lake. Vessels travel approximately four miles through Little Lake to Little Lake Pass, which connects Little Lake to the Pearl River at about River Mile 4. The GIWW navigation channel is 12 feet deep x 150 feet wide, and the Little Lake Channel is noted as 12 feet deep x 100 feet wide.

The Rigolets portion of the Channel crosses a CSX rail bridge, which has a horizontal clearance of 153 feet. Additionally, there are several difficult turns on this channel. The first is immediately after the CSX rail bridge, where the channel turns into East Pass. Because of the proximity of the turn to the Rigolets CSX rail bridge, barges must navigate beyond East Pass and turn around to enter it. A second difficult turn occurs when barges turn from Little Lake Pass into the Pearl River. Again, barges must first turn downriver, and then turn around to head upriver.

A Feasibility Report completed in 1984 determined that the benefit-cost ratio of a 12-foot x 115-foot channel through Little Lake was approximately 2:1. However, the project did not advance due to a lack of local funds.

Existing Vessel Traffic

Figure 3 shows the land use and zoning abutting the Pearl River system in Louisiana and Mississippi. The Stennis Space Center and buffer zone dominate the land use in Mississippi.

NOTE: Logical Termini are the intersections of US 90 with US 190 and Kelly Rd/7th Ave and latitude and longitude data are in decimal format

Stennis Space Center

Port Bienville

30.2745, -89.5961

30.2280, -89.6780

1 2 3 4 5

N

Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

Legend

- Logical Termini
- Pearl River Bridges
- Project Limits
- XX.XXX, XX.XXX Latitude, Longitude
- Stennis Buffer Zone

Zoning Classification

- Suburban (A-1 thru A-3)
- Residental (A-4 thru A-8, MD-1)
- Animal Training Housing
- Public/Community/Recreational (WMA)
- Education (Primary and Secondary)
- Commercial/Service
- Industrial
- Neighborhood Institutional
- Planned Unit Development (PUD)

Figure 3
Land Use and Zoning

8,000 4,000 0 8,000 Feet

H.000284 US 90: PEARL RIVER BRIDGES AND
H.000286 EAST PEARL RIVER BRIDGE
ROUTE US 90
ST. TAMMANY PARISH, LA

Prepared For:

DOTD
LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

Prepared By: Neel-Schaffer, Inc.

Except for out parcels as shown on Figure 3, the area between the West Pearl River and the East Pearl River is owned and managed by the Pearl River Wildlife Management Area, part of the Louisiana Department of Wildlife and Fisheries. There is a public boat launch situated in LADOTD right-of-way on the southwest side of the US 90 at the East Pearl River as shown in Figure 4. The launch is not subject to 4(f) protection.



Figure 4, East Pearl River Public Launch

On the Mississippi side, there are numerous private boat launches and recreational docks located within the City of Pearlington with direct access to the East Pearl River.

The year 2013 through 2018 Bridge Tender logs were provided by LADOTD to document the bridge opening associated with commercial navigation. Copies of the logs for each year are provided on the CD placed in the rear folder of this report. Summaries of the 2013 and 2018 logs are presented in in Appendix A. To establish the vessel vertical clearance the Bridge Operator either estimates the vessel height above water using clearance gauges or simply requests the information from the vessel via the radio. There were a few vertical estimates by bridge tenders that exceed 73'. These were investigated in concert with NASA and were determined to be erroneous based on NASA documentation of vessel transit. Considering all of the documented vessel transits upstream of the existing US 90 East Pearl River between years 2013 and 2018, the vertical clearance requirement for all vessels was less than 73 feet in height.

These openings are related to recreation traffic (including houseboats and large personal crafts), commercial fishing traffic, transport of barges/materials, and patrolling/training from the U.S. Navy and St. Tammany Parish Sheriff's office.

Navigation access associated with the Stennis Space Center is limited to the East Pearl River. It includes NASA facilities as well as military traffic as documented in the Appendix A - Bridge Tender Reports. The larger navy vessels transiting the East Pearl River are not stationed at Stennis, but use the facility intermittently for training and as a safe harbor. Vertical clearance requirements for these vessels are 25 feet with antennas lowered and 35 feet with antennas raised. The navy also operates a smaller craft with 12-foot clearance without configuration (lowering the radar arch). Also, the navy periodically transits civilian training craft upriver to Stennis, the largest of which is a 57-foot Viking Sportfish. It has a tower above the main bridge which requires 39 feet of clearance.

The two largest vessels associated with NASA operations are the M/V Clermont II and the Pegasus Barge. Consultation with NASA personnel indicate that the new East Pearl River bridge should match the clearances permitted and provided by the I-10 East Pearl River crossing (73 foot vertical clearance above high water and 115 foot horizontal clearance). NASA indicated that these clearances will meet their current and anticipated future navigation needs.

Coordination with NASA and the US Navy

Appendix B provides email documentation between the design team and agencies with operations at Stennis, including the US Navy and NASA. Also provided are minutes of a June 12, 2019 meeting at Stennis with representatives of NASA and the US Navy documenting requirements for navigation of the East Pearl by these agencies.

Vessel Trip Frequency

Bridge tender logs for years 2013 - 2018 are provided in the CD attached to the rear folder of this report. Year 2013 and 2018 reports are presented in data list format in Appendix A. Considering the possibility of a 25 -foot clearance mid-level movable span bridge, Table 2 summarizes the vertical navigation clearance associated with year 2013 and 2018 vessel transits aggregated by clearance.

TABLE 2
SUMMARY OF 2013 BRIDGE OPENINGS
US 90 @ EAST PEARL RIVER

2013	Total Openings	Military Patrol Crafts	Vessels Clearance Greater Than 25'	Vessels Clearance 25' or less
Number of Openings	284	64	46	241
Percent	100.0%	22.5%	16.2%	84.9%
2018	**Total Openings**	**Military Patrol Crafts**	**Clearance Greater Than 25'**	**Clearance 25' or less**
Number of Openings	356	118	75	281
Percent	100.0%	33.1%	21.1%	78.9%

Twenty-one (21) of the 75 vessel transits with vessel clearance greater than 25 feet occurred between September 2, 2018 and September 6, 2018 concurrent with Tropical Storm Gordon's landfall in Mississippi. This represents 28% of the annual vessel traffic considering vessels with clearance greater than 25 feet.

Projected changes in waterway usage based upon anticipated waterway improvement projects

None.

Impact to vessel owners that would be precluded from transiting the waterway if a proposed bridge project is authorized

The existing bridge is a swing span with no vertical navigation restrictions. The horizontal clearance associated with the existing swing span bridge is 90 feet.

Consultation with Stennis Space Center personnel indicate the clearances associated with a new US 90 bridge crossing of the East Pearl River should minimally provide the clearances associated with the upriver I-10 bridge (73 foot vertical navigation clearance and 115 foot horizontal clearance).

Upstream and Downstream Clearances

Upstream clearances are governed by the I-10 bridge clearance (73 foot vertical clearance and 115 foot horizontal clearance). Also, the 110 foot wide NASA navigation lock provides access to the interior Stennis waterway complex.

Within the East Peral River, there is a downstream swing bridge owned by the CSX Railroad with an unrestricted vertical clearance and a horizontal clearance of 87 feet.

Current access from the East Pearl River to the Gulf is through Rigolets Pass via Little Lake. Navigation from the Rigolets Pass is controlled by the CSX swing span rail bridge which provides 153-foot horizontal clearance. The Gulf Intracoastal Waterway (GIWW) joins the Rigolets just to the south of the CSX wing span bridge. Channel depth on the GIWW is noted at 12 feet.

Review of annual cargo movements

Per bridge tender reports and discussions with NASA personnel, NASA vessels and an occasional barge transit the East Pearl River upstream of the US 90 East Pearl River Bridge.

Design Vessel

The larger vessels transiting the waterway are the NASA M/V Clermont II and the Pegasus Barge. Again, consultations with NASA indicate that the I-10 crossing of the East Pearl River was permitted and designed to accommodate these vessels, and that the new East Pearl River crossing should match the I-10 clearances. The

Meeting Minutes for the June 12, 2019 Meeting at Stennis are provided in Appendix B. The minutes include documentation of the navigation clearances of the Clermont II and the Pegasus Barge.

Specific Vessel Transit

Other than the previously noted vessels, there are no specific vessels transiting the waterway. There is no levee maintenance, bridge work, channel maintenance, or emergency operations upstream of the US 90 Bridge that require certain vessels to transit the waterway.

What is the most restrictive horizontal clearance on the waterway? This may be bridge piers on another bridge downstream, it may be a navigational lock, it may be a man-made channel, and it may be the actual width of the narrowest portion of the waterway.

Upstream of Stennis, the river narrows as it meanders through the Pearl River Wildlife Management Area. The access to Stennis interior waterway network is controlled by a 110-foot wide navigation lock. Between Stennis and the US 90 Bridge, the I-10 span controls both the vertical limit (73 feet above navigation channel) and horizontal channel width (115-foot channel width). Between the IGWW and the I-10 bridge, the existing US 90 bridge with a horizontal clearance of 90 feet is the most restrictive clearance.

Historic Vessel Collision Information

The National Transportation Safety Board issues a Marine Accident Report following each investigation. These reports are available online for reports issued since 1996. The reports listing is sortable by the event date, report date, city, and state at the following website.

http://www.ntsb.gov/investigations/AccidentReports/Pages/marine.aspx

The website was searched March 31, 2016, sorted by state. The Louisiana incident reports were reviewed and there were no reports associated with marine incidents on the East Pearl River.

1.8 Recommended Clearances associated with Replacement US 90 Bridge Crossing of the East Pearl River

1. Vertical navigation clearance provided will be 73 feet above mean high water (elevation 1.36 to match upstream I-10 clearance.
2. Horizontal Clearance will be 115 feet to match upstream I-10 span clearance.
3. Considering the Environmental Assessment alternatives analysis,

a. Temporary replacement bridge alternatives will provide for a 73 foot vertical navigation clearance; and retain the minimum current 90 foot horizontal channel.
b. Permanent replacement bridge alternatives will provide 73 foot vertical clearance above mean high water elevation 1.36 and a 115 foot horizontal clearance.
c. Movable span structures will at a minimum be set at the 100 year floodplain plus 1 foot, elevation 18.14, on their fixed span components. This may be adjusted based on negotiations with MDOT in the consideration of sea level rise. A mid-level movable span bridge with 25' foot vertical clearance is propsed for consideration in the project Environmental Assessment.
d. Replacement structures to be offset and situated within the channel as required to allow for the continued operation of the existing bridge during construction of the replacement structure.

Impacts of Proposed Bridge Clearances on Present and Prospective Upstream Commercial Activity

Although Stennis Space Center vessels have not extensively navigated the East Pearl River in recent years, NASA consider this passageway to be "Mission Critical". If NASA was not able to move equipment and or the upcoming SLS stage (Space Launch System) through the East Pearl River using the Clermont and the Pegasus vessels, it would impact NASA's Mission.

1.9 Environmental Assessment Alternatives

1.9.1 Long Span Bridge Alternative

Long Span Plan and Profile Sheets are enclosed. This alternative would construct a new long span bridge south of the existing East Pearl River Bridge. West of the river, a new road, Boat Launch Access Road, would be constructed to the north of existing US 90 which would tie back to the existing US 90 centerline. This road would provide continued access to the existing bridge during construction of the new bridge. Access to Honey Island Marina road and the boat launch would remain unchanged. The boat launch would be impacted by the placement of bridge support piers.

Because the construction of the new long span bridge would prohibit continued east–west access along existing US 90, a new connector roadway would be constructed for MS 604 and US 90. Two concepts for routing the Long Span bridge in Pearlington have been developed: the Loop Road and the Gooseneck Frontage Road.

Sheet 3 of 4 shows the Loop Road connection between US 90 east of the new bridge and MS 604. This concept was presented at the September 2016 Public Meeting. The MS 604 / US 90 intersection would be relocated east of the existing intersection and remain as a stop control intersection. A left turn lane is provided from eastbound US 90 to northbound MS 604. Connectivity will be provided to Tahiti Road with a

newly constructed frontage road located north of the new bridge, extending west from existing MS 604. The existing Riverside Drive would be routed under the new bridge to tie in with the new frontage road.

The loop road would support continued east–west access between MS 604 and US 90. During construction, access can be provided from US 90 to the existing bridge with the use of the loop road or a diversion. Access would be provided to existing residences and commercial properties as shown in the meeting drawings. Some properties may be impacted by the loss of direct access to existing US 90.

Sheet 4 of 4 shows the Gooseneck Frontage Road connection between US 90 east of the new bridge and MS 604. This concept was developed subsequent to the September 2016 Public Meeting. The existing MS 604 / US 90 intersection would be reconstructed as a roundabout and a left turn lane is provided from eastbound US 90 to northbound MS 604.

A frontage road would tie into the roundabout extending west to provide access to developed properties. Existing Riverside Drive would be routed under the new bridge to tie in with the new frontage road.

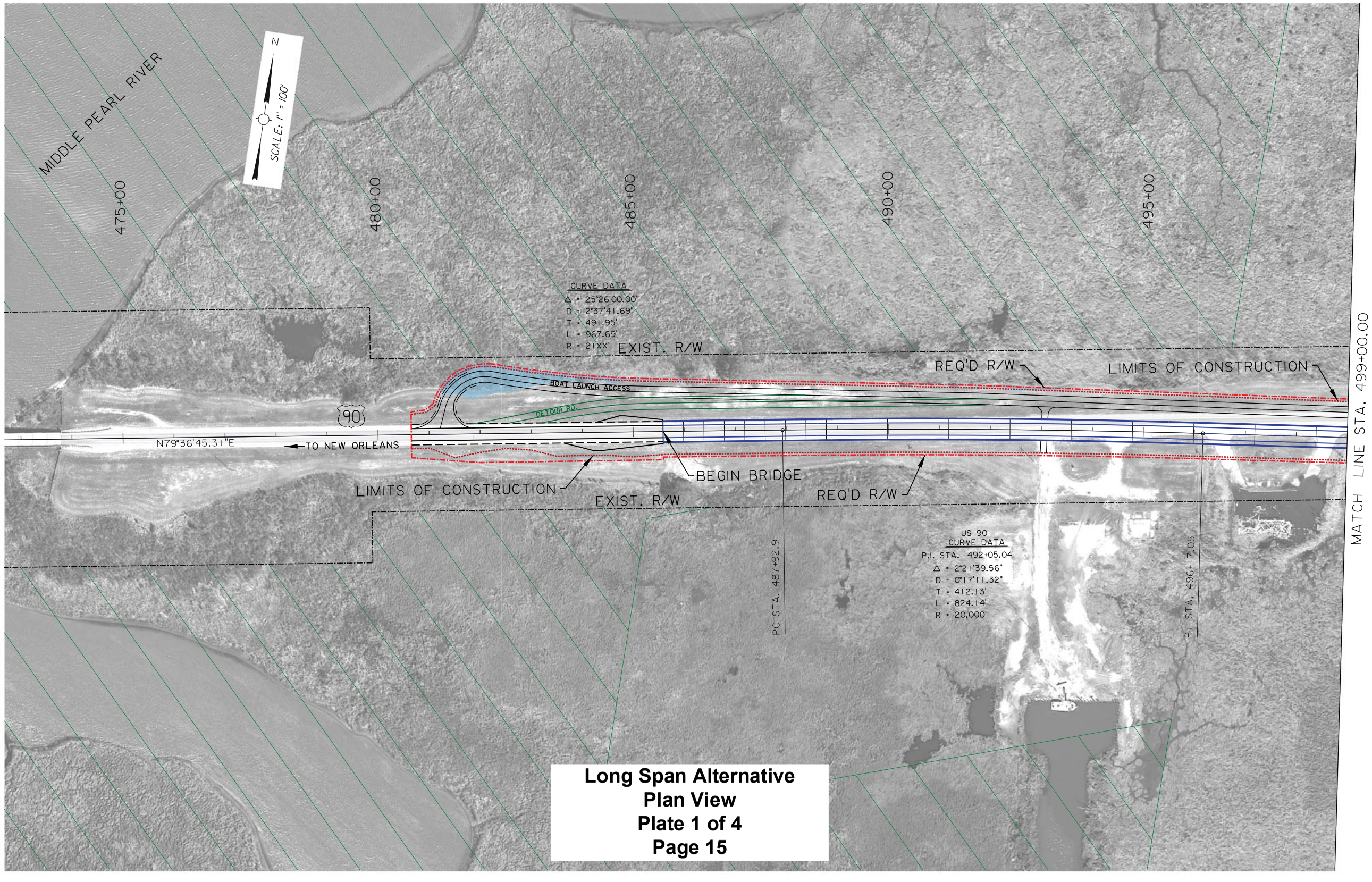
Tahiti Drive would connect directly with the roundabout. A frontage road would extend east from the roundabout, north of the new bridge, and intersect existing US 90 east of the new bridge.

The new Gooseneck Frontage Road would support continued east–west access between MS 604 and US 90. During construction, access can be provided from US 90 to the existing bridge with the use of the Gooseneck Frontage Road or a diversion. Access would be provided to existing residences and commercial properties as shown in the meeting drawings. There are two business relocations anticipated. Some properties may be impacted by the loss of direct access to existing US 90.
.

12/1/2016 9:43:07 AM

US 90 EA

GRAPHIC SCALE
SCALE: 1"=100'
100 50 0 100



Long Span Alternative
Plan View
Plate 1 of 4
Page 15

PREPARED BY NEEL-SCHAFFER, INC.

Federal Highway Administration | DOTD Louisiana Department of Transportation & Development | MDOT

US 90: EAST PEARL RIVER BRIDGE
LONG SPAN BRIDGE ALTERNATIVE F-4
STATE PROJECT NO. H.000284
ST. TAMMANY PARISH, LA / HANCOCK COUNTY, MS

LEGEND
- HISTORIC STRUCTURE
- WILDLIFE MANAGEMENT AREA
- WETLANDS (EXCLUDED WATER OF THE U.S.)
- REMOVAL
- LIMITS OF CONSTRUCTION
- REQ'D R/W

SHEET NUMBER	
PARISH	ST. TAMMANY
CONTROL SECTION	
STATE PROJECT	H.000284
DESIGNED / CHECKED	
DETAILED / CHECKED	
DATE / SHEET	11-30-16

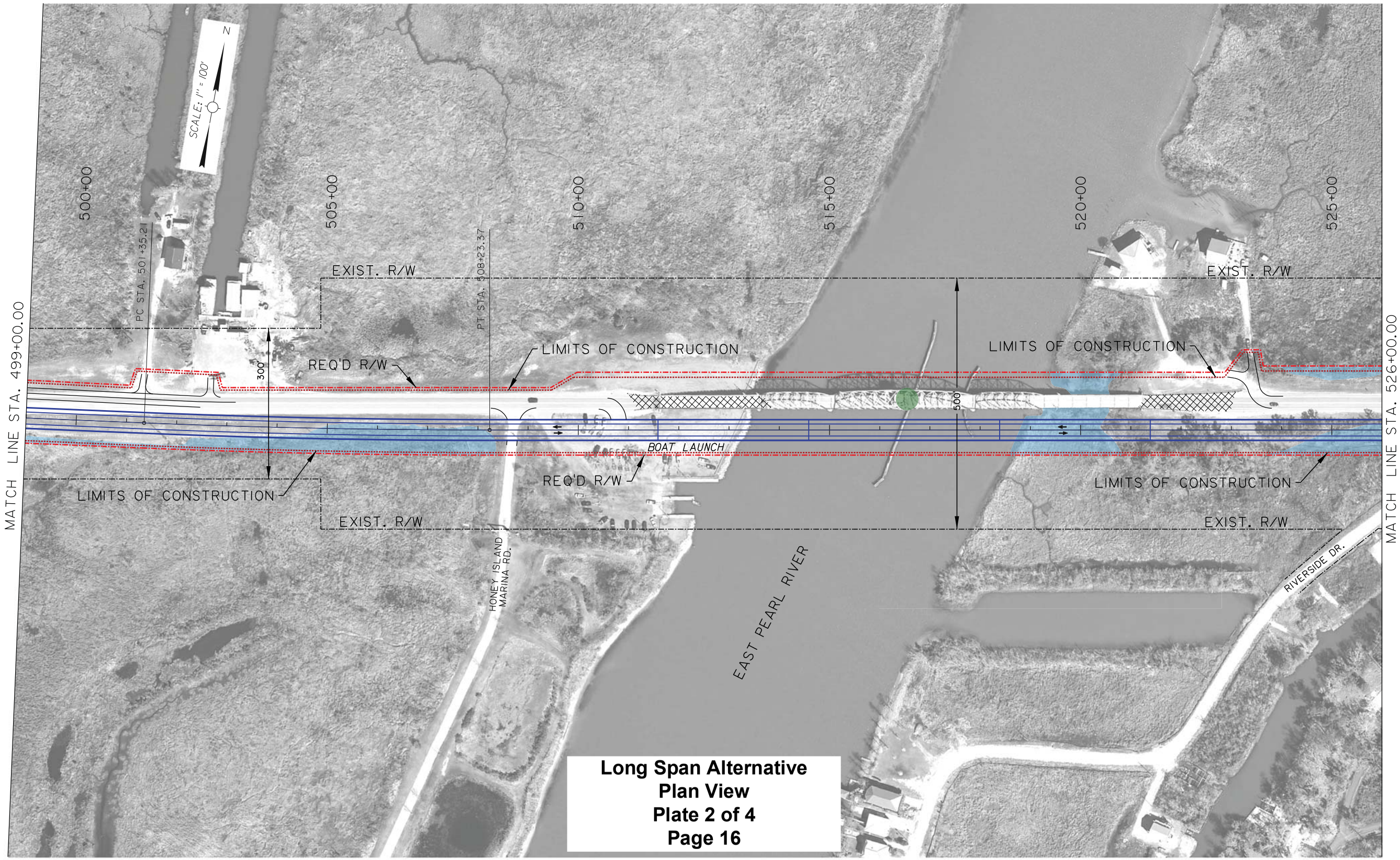
REVISION DESCRIPTION | NO. | DATE | BY

EAST PEARL RIVER BRIDGE
FIXED BRIDGE ALTERNATIVE
PLAN VIEW
US 90 BRIDGES

Lay_ EP_Fix_1.dgn

12/1/2016 9:43:14 AM

US 90 EA



Long Span Alternative
Plan View
Plate 2 of 4
Page 16

GRAPHIC SCALE
SCALE: 1"=100'
100 50 0 100

LEGEND

- HISTORIC STRUCTURE
- WILDLIFE MANAGEMENT AREA
- WETLANDS (EXCLUDED WATER OF THE U.S.)
- REMOVAL
- LIMITS OF CONSTRUCTION
- REQ'D R/W

PREPARED BY NEEL-SCHAFFER, INC.

Federal Highway Administration

DOTD LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

MDOT

US 90: EAST PEARL RIVER BRIDGE
LONG SPAN BRIDGE ALTERNATIVE F-4
STATE PROJECT NO. H.000284
ST. TAMMANY PARISH, LA / HANCOCK COUNTY, MS

SHEET NUMBER

PARISH	CONTROL SECTION	STATE PROJECT
ST. TAMMANY		H.000284

DESIGNED	CHECKED	DETAILED	CHECKED	DATE	SHEET
				11-30-16	

NO.	DATE	REVISION DESCRIPTION	BY

STATE OF LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT

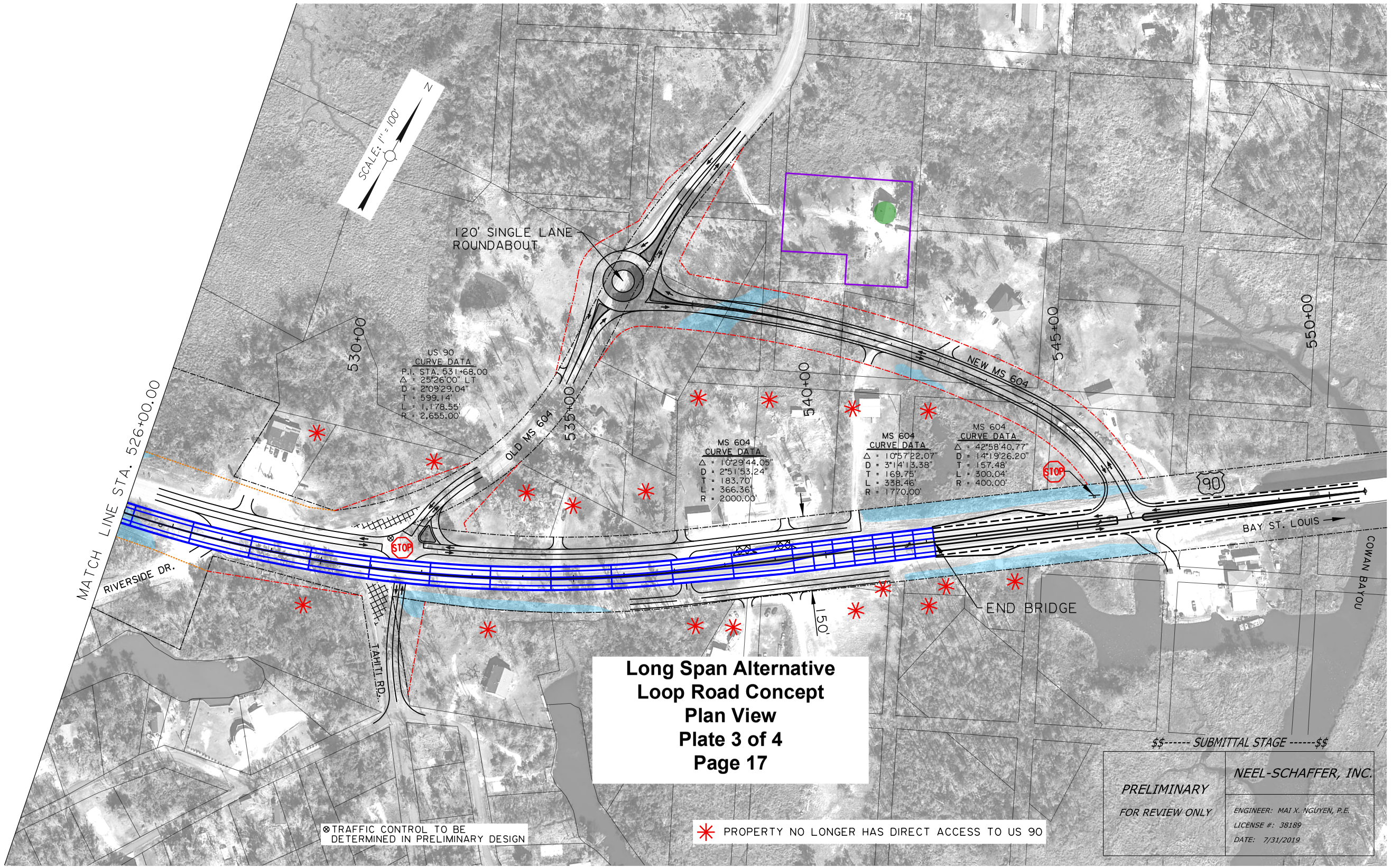
EAST PEARL RIVER BRIDGE
MOVABLE BRIDGE ALTERNATIVES
PLAN VIEW
US 90 BRIDGES

DOTD DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT

Lay_ EP_Fix_2.dgn

7/31/2019 2:36:38 PM

US 90 EA



Long Span Alternative
Loop Road Concept
Plan View
Plate 3 of 4
Page 17

100 50 0 100
GRAPHIC SCALE
SCALE: 1"=100'

$$------ SUBMITTAL STAGE ------$$

PRELIMINARY	NEEL-SCHAFFER, INC.
FOR REVIEW ONLY	ENGINEER: MAI X. NGUYEN, P.E. LICENSE #: 38189 DATE: 7/31/2019

PREPARED BY NEEL-SCHAFFER, INC.

Federal Highway Administration · DOTD Louisiana Department of Transportation & Development · MDOT

US 90: EAST PEARL RIVER BRIDGE
LONG SPAN BRIDGE ALTERNATIVE F-4 LOOP OPTION
STATE PROJECT NO. H.000286
ST. TAMMANY PARISH, LA / HANCOCK COUNTY, MS

LEGEND
- HISTORIC STRUCTURE
- NATIONAL REGISTER PROPERTY LIMITS
- PROPOSED BRIDGE
- REQ'D R/W
- WETLANDS (EXCLUDED WATER OF THE U.S.)
- REMOVAL
- LIMITS OF CONSTRUCTION
- EXIST. R/W

SHEET NUMBER	
PARISH	ST. TAMMANY
CONTROL SECTION	
STATE PROJECT	H.000286
DESIGNED / CHECKED	
DETAILED / CHECKED	
DATE / SHEET	03-09-17 / 3 OF 3

NO.	DATE	REVISION DESCRIPTION	BY

EAST PEARL RIVER BRIDGE
FIXED BRIDGE ALTERNATIVE
PLAN VIEW

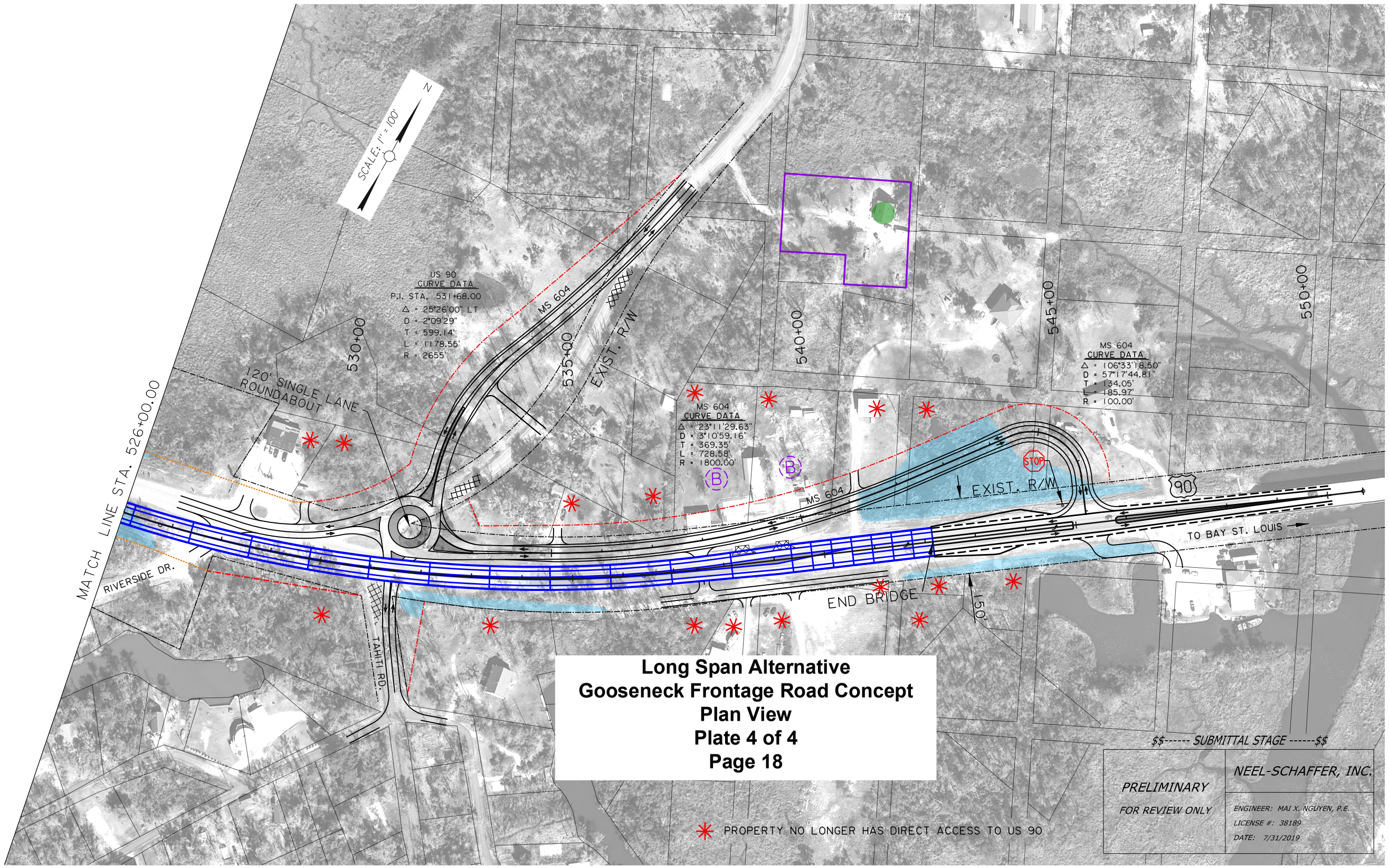
EAST PEARL RIVER BRIDGE

EW_Lay_EP_Fix_3_Loop Option.dgn

7/31/2019 2:36:33 PM

US 90 EA

EW_Lay_ EP_Fix_3_Goose Neck Option.dgn



Long Span Alternative
Gooseneck Frontage Road Concept
Plan View
Plate 4 of 4
Page 18

* PROPERTY NO LONGER HAS DIRECT ACCESS TO US 90

$$------ SUBMITTAL STAGE ------$$

PRELIMINARY
FOR REVIEW ONLY

NEEL-SCHAFFER, INC.

ENGINEER: MAI X. NGUYEN, P.E.
LICENSE #: 38189
DATE: 7/31/2019

PREPARED BY NEEL-SCHAFFER, INC.

Federal Highway Administration

DOTD LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

MDOT

US 90: EAST PEARL RIVER BRIDGE
LONG SPAN BRIDGE ALTERNATIVE F-4: GOOSENECK OPTION
STATE PROJECT NO. H.000286
ST. TAMMANY PARISH, LA / HANCOCK COUNTY, MS

LEGEND

- HISTORIC STRUCTURE
- NATIONAL REGISTER PROPERTY LIMITS
- PROPOSED BRIDGE
- REQ'D R/W
- (B) BUSINESS TAKING
- WETLANDS (EXCLUDED WATER OF THE U.S.)
- REMOVAL
- LIMITS OF CONSTRUCTION
- EXIST. R/W

SHEET NUMBER	
PARISH	ST. TAMMANY
CONTROL SECTION	
STATE PROJECT	H.000286
DESIGNED / CHECKED	
DETAILED / CHECKED	
DATE / SHEET	03-09-17 / 3 OF 3

NO.	DATE	REVISION DESCRIPTION	BY

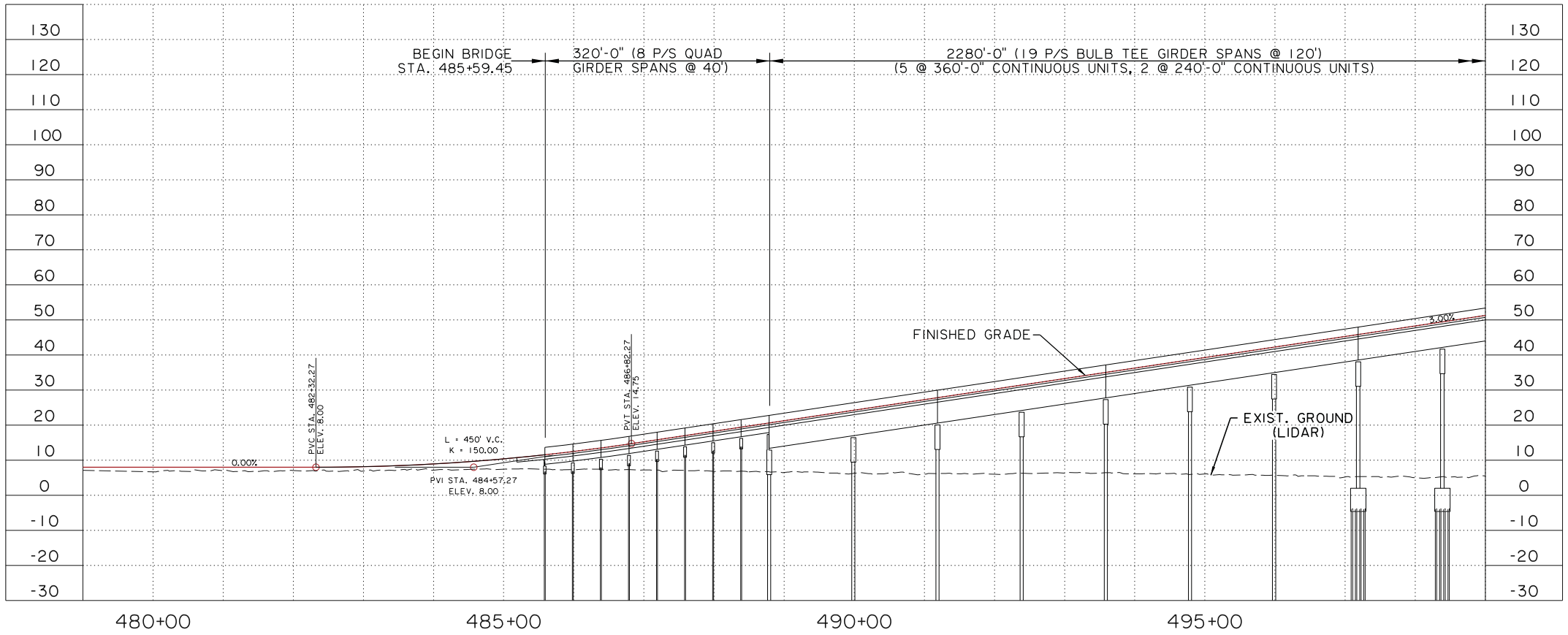
STATE OF LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT

EAST PEARL RIVER BRIDGE
FIXED BRIDGE ALTERNATIVE
PLAN VIEW

EAST PEARL RIVER BRIDGE

12/1/2016 9:43:30 AM
US 90 EA
Pro_ EP_Fix_1.dgn

Note 1: The bridge concepts shown (including pier placement and girder selection) are conceptual. During preliminary engineering, the types of girders and the pier placement will be finalized. The selected girders and associated pier placement may differ from the conceptual plans as shown.



Long Span Alternative
Profile View
Plate 1 of 3
Page 19

PREPARED BY NEEL-SCHAFFER, INC.

US 90: EAST PEARL RIVER BRIDGE
LONG SPAN BRIDGE ALTERNATIVE F-4
STATE PROJECT NO. H.000284
ST. TAMMANY PARISH, LA / HANCOCK COUNTY, MS

SCALES
HORIZONTAL 1" = 100'
VERTICAL 1" = 20'

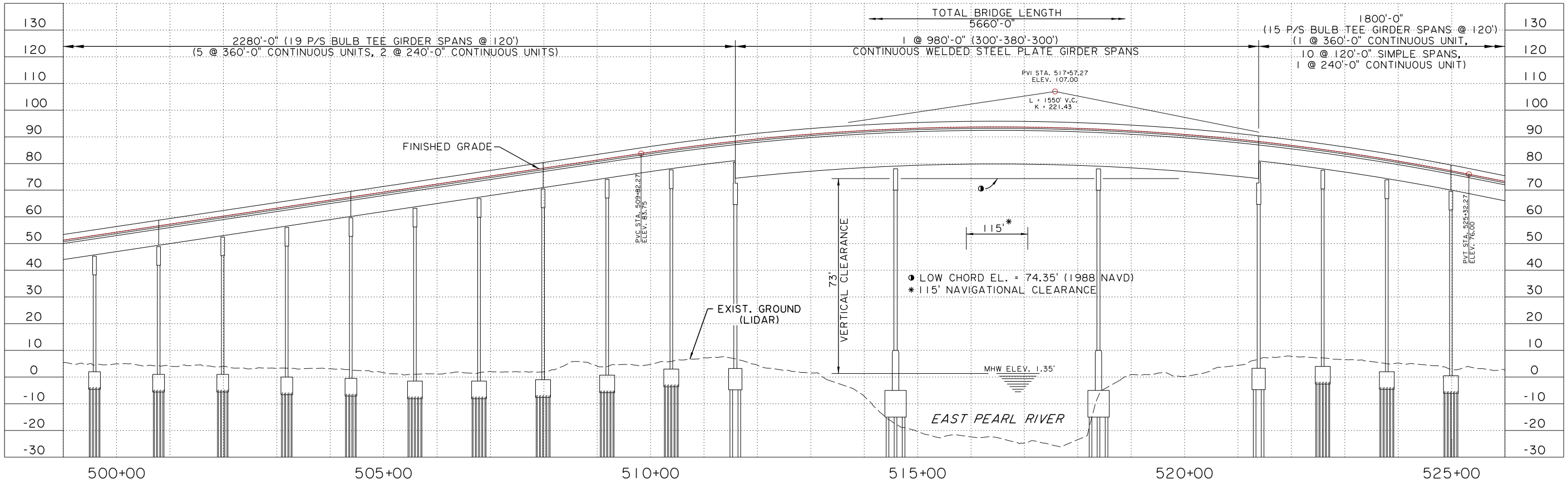
SHEET NUMBER
PARISH: ST. TAMMANY
CONTROL SECTION
STATE PROJECT: H.000284
DESIGNED
CHECKED
DETAILED
CHECKED
DATE: 11-30-16
SHEET
REVISION DESCRIPTION
NO. DATE BY

EAST PEARL RIVER BRIDGE
FIXED BRIDGE ALTERNATIVE
PROFILE VIEW
US 90 BRIDGES

12/1/2016 9:43:31 AM

US 90 EA

Note 1: The bridge concepts shown (including pier placement and girder selection) are conceptual. During preliminary engineering, the types of girders and the pier placement will be finalized. The selected girders and associated pier placement may differ from the conceptual plans as shown.



Long Span Alternative
Profile View
Plate 2 of 3
Page 20

US 90: EAST PEARL RIVER BRIDGE
LONG SPAN BRIDGE ALTERNATIVE F-4
STATE PROJECT NO. H.000284
ST. TAMMANY PARISH, LA / HANCOCK COUNTY, MS

PREPARED BY NEEL-SCHAFFER, INC.

Federal Highway Administration
DOTD LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT
MDOT

SCALES
HORIZONTAL 1" = 100'
VERTICAL 1" = 20'

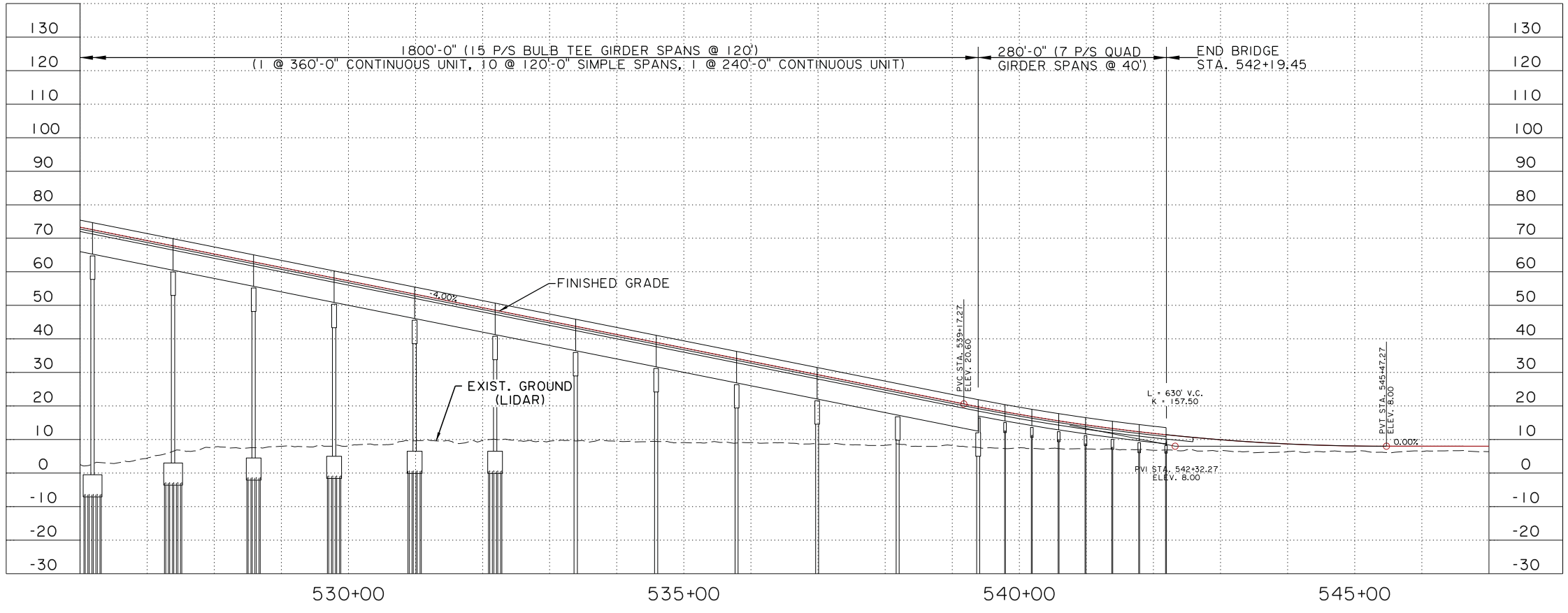
SHEET NUMBER
PARISH: ST. TAMMANY
CONTROL SECTION
STATE PROJECT: H.000284
DESIGNED
CHECKED
DETAILED
CHECKED
DATE: 11-30-16
SHEET
BY
REVISION DESCRIPTION
NO. DATE

EAST PEARL RIVER BRIDGE
FIXED BRIDGE ALTERNATIVE
PROFILE VIEW
US 90 BRIDGES

Pro_ EP_Fix_2.dgn

12/1/2016 9:43:32 AM
US 90 EA
Pro_ EP_Fix_3.dgn

Note 1: The bridge concepts shown (including pier placement and girder selection) are conceptual. During preliminary engineering, the types of girders and the pier placement will be finalized. The selected girders and associated pier placement may differ from the conceptual plans as shown.



Long Span Alternative
Profile View
Plate 3 of 3
Page 21

US 90: EAST PEARL RIVER BRIDGE
LONG SPAN BRIDGE ALTERNATIVE F-4
STATE PROJECT NO. H.000284
ST. TAMMANY PARISH, LA / HANCOCK COUNTY, MS

PREPARED BY NEEL-SCHAFFER, INC.

Federal Highway Administration
DOTD LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT
MDOT

SCALES
HORIZONTAL 1" = 100'
VERTICAL 1" = 20'

SHEET NUMBER
PARISH: ST. TAMMANY
CONTROL SECTION
STATE PROJECT: H.000284
DESIGNED
CHECKED
DETAILED
CHECKED
DATE SHEET: 11-30-16
NO. | DATE | REVISION DESCRIPTION | BY

STATE OF LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT

EAST PEARL RIVER BRIDGE
FIXED BRIDGE ALTERNATIVE
PROFILE VIEW
US 90 BRIDGES

DOTD LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT

1.9.2 Movable Span Alternatives

This alternative would construct a lift span or bascule span south of the existing bridge. To allow for the location of a downstream movable span at 52.5' offset, modifications would have to be made to the existing swing span structure allowing the structure to reverse the direction of its swing. The work to modify the existing span could take up to a month, and there would be temporary disruptions of bridge operations relating to the modifications. During this period when the electrical system is down, the bridge would require manual opening, potentially resulting in navigation delays from a half hour to up to four hours. USCG permits would be required for the work and coordination with the USCG will be accomplished to establish protocols supportive of continuous river navigation.

A review of three years of navigation data showed that approximately 80% of the marine traffic requiring that the existing bridge be opened would be able to transit the river unimpeded if the clearance of the new bridge in the closed position was 25' or greater above MHW. The mid-level alternatives were developed to provide 25' vertical clearance in support of this concept. Both lift span and bascule span concepts have been evaluated. Exhibits are provided in the meeting showing details of the lift and bascule span alternatives as proposed.

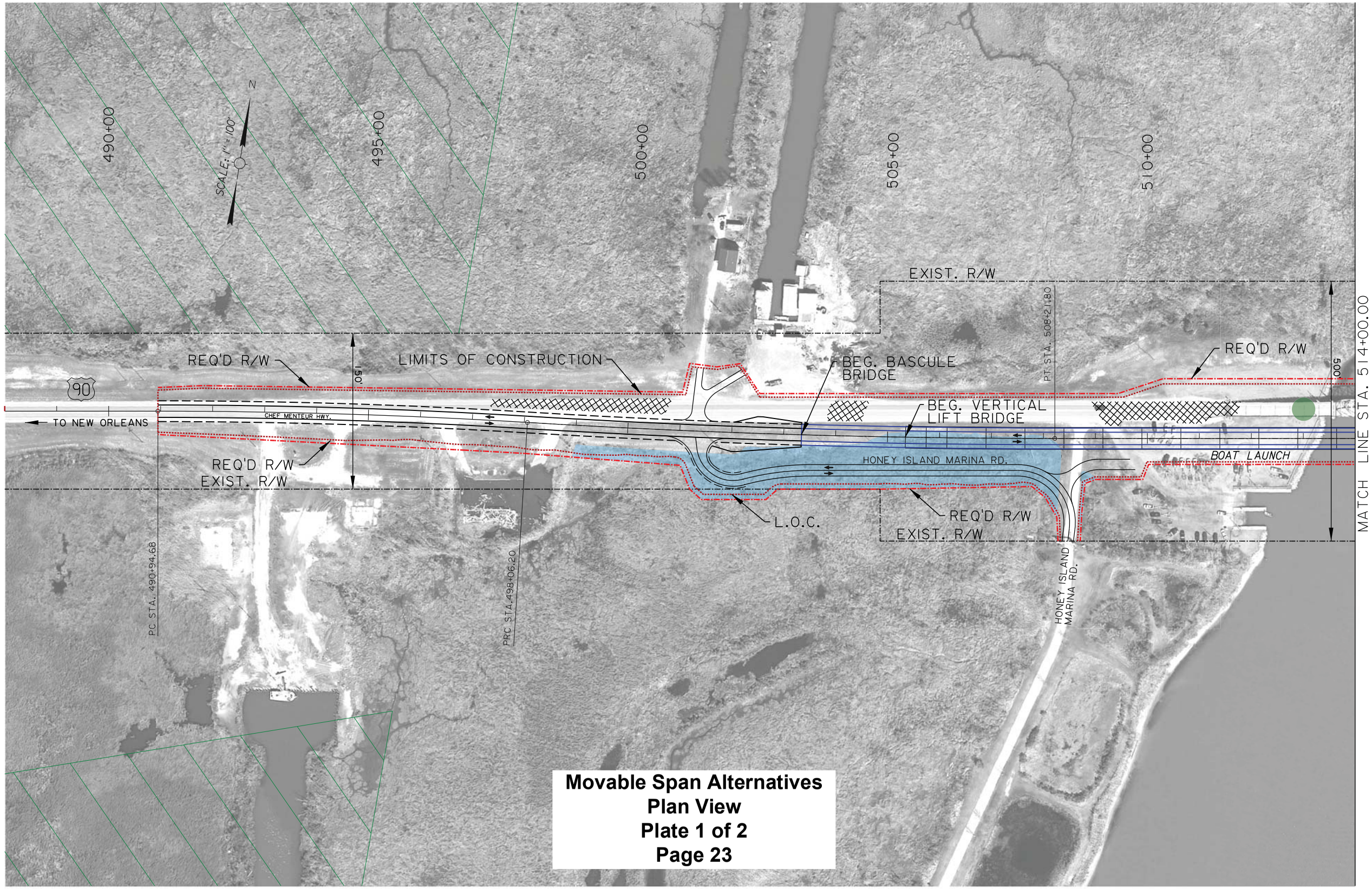
West of the river, the mid-level span does not provide sufficient vertical clearance to support continued access to the boat launch and Honey Island Marina Road at their current connections with US 90. A new road would be constructed south of and parallel to the alignment of the new mid-level span which would support continued access to Honey Island Marina Road and the boat launch. Access to the existing bridge would remain as is during construction of the new bridge.

Plate 2 of 2 shows the Movable Span bridge plan view in Pearlington. A left turn lane is provided from eastbound US 90 to northbound MS 604 and right turn lane is provided from westbound US 90 to northbound MS 604. East of the river, because of conflicts with the new movable span bridge, Riverside Drive would be routed east to tie into Tahiti Road, and a new intersection would be constructed including US 90, relocated Tahiti Road and MS 604. Access would also be provided as shown to existing commercial and residential properties.

Both Lift span and Bascule span movable bridge concepts have been evaluated.

12/1/2016 9:43:32 AM
US 90 EA
Lay_ EP_Mov_1.dgn

GRAPHIC SCALE
SCALE: 1"=100'
100 50 0 100



Movable Span Alternatives
Plan View
Plate 1 of 2
Page 23

PREPARED BY NEEL-SCHAFFER, INC.

Federal Highway Administration
DOTD LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT
MDOT

US 90: EAST PEARL RIVER BRIDGE
MOVABLE BRIDGE ALTERNATIVES
STATE PROJECT NO. H.000284
ST. TAMMANY PARISH, LA / HANCOCK COUNTY, MS

LEGEND
- HISTORIC STRUCTURE
- WILDLIFE MANAGEMENT AREA
- WETLANDS (EXCLUDED WATER OF THE U.S.)
- REMOVAL
- LIMITS OF CONSTRUCTION
- REQ'D R/W

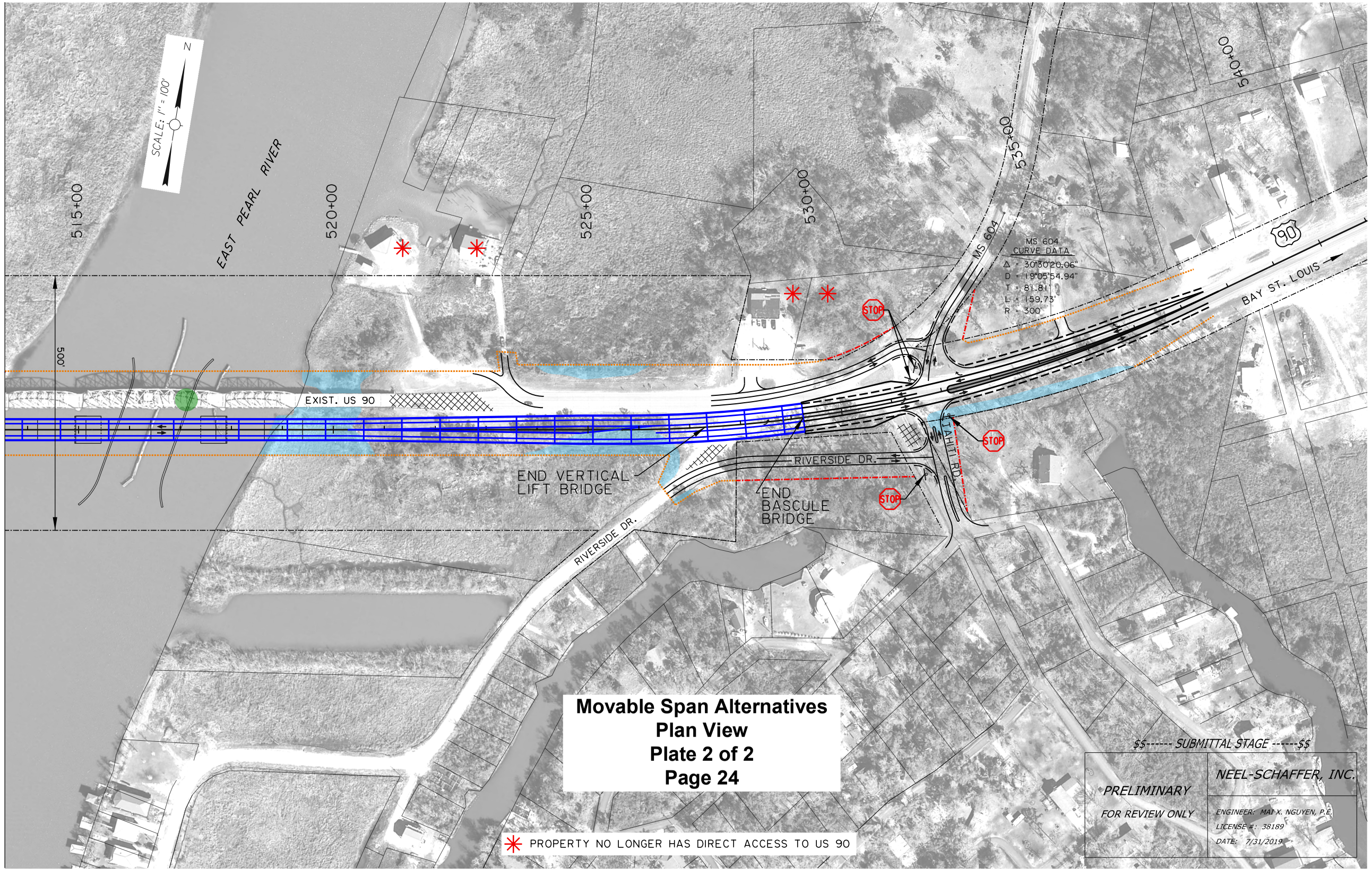
SHEET NUMBER
PARISH: ST. TAMMANY
CONTROL SECTION
STATE PROJECT: H.000284
DESIGNED
CHECKED
DETAILED
CHECKED
DATE SHEET: 11-30-16
REVISION DESCRIPTION | DATE | NO. | BY

STATE OF LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT

EAST PEARL RIVER BRIDGE
MOVABLE BRIDGE ALTERNATIVES
PLAN VIEW
US 90 BRIDGES

7/31/2019 2:36:43 PM

US 90 EA



PREPARED BY NEEL-SCHAFFER, INC.

Federal Highway Administration

DOTD LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

MDOT

US 90: EAST PEARL RIVER BRIDGE
MOVABLE BRIDGE ALTERNATIVES
STATE PROJECT NO. H.000286
ST. TAMMANY PARISH, LA / HANCOCK COUNTY, MS

LEGEND

- HISTORIC STRUCTURE
- REQ'D R/W
- LIMITS OF CONSTRUCTION
- PROPOSED BRIDGE
- WETLANDS (EXCLUDED WATER OF THE U.S.)
- REMOVAL
- EXIST. R/W

SHEET NUMBER	
PARISH	ST. TAMMANY
CONTROL SECTION	
STATE PROJECT	H.000286
DESIGNED	
CHECKED	
DETAILED	03-09-17
CHECKED	2 OF 2
DATE	
SHEET	

NO.	DATE	REVISION DESCRIPTION	BY

STATE OF LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT

EAST PEARL RIVER BRIDGE
MOVABLE BRIDGE ALTERNATIVES
PLAN VIEW

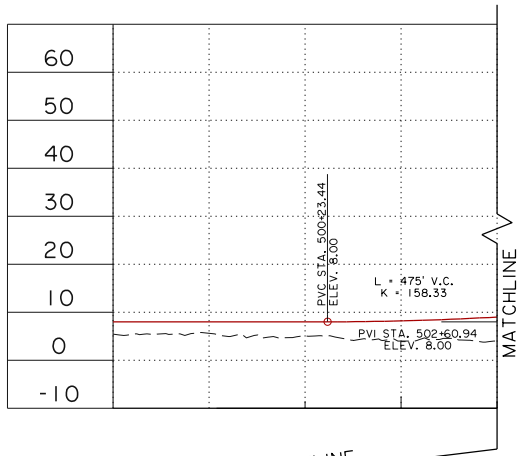
EAST PEARL RIVER BRIDGE

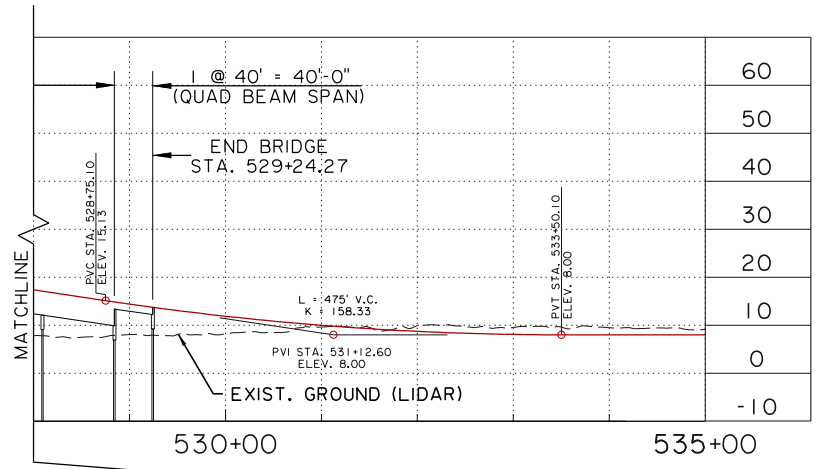
EW_Lay_ EP_Mov_2.dgn

12/1/2016 9:48:56 AM
US 90 EA
Pro_ EP_Mov_Mai.dgn

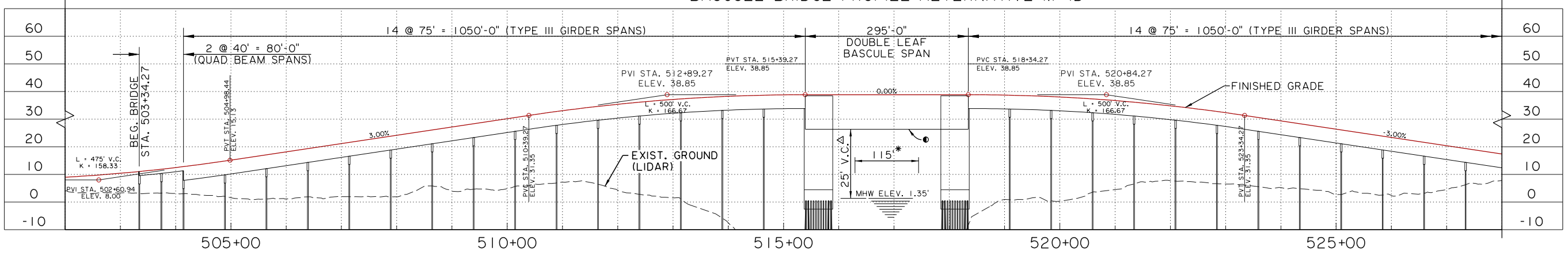
SCALES
HORIZONTAL 1" = 100'
VERTICAL 1" = 20'

Note 1: The bridge concepts shown (including pier placement and girder selection) are conceptual. During preliminary engineering, the types of girders and the pier placement will be finalized. The selected girders and associated pier placement may differ from the conceptual plans as shown.

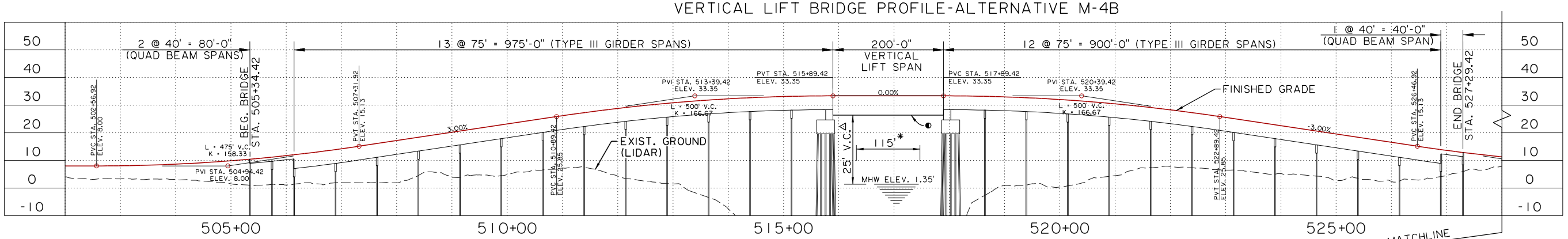




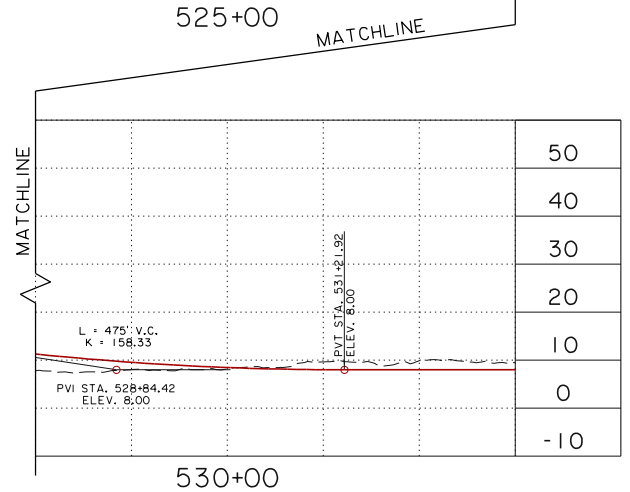
BASCULE BRIDGE PROFILE-ALTERNATIVE M-4D



VERTICAL LIFT BRIDGE PROFILE-ALTERNATIVE M-4B



◑ LOW CHORD EL. = 26.35' (1988 NAVD)
* 115' NAVIGATIONAL CLEARANCE
Δ 73' VERTICAL CLEARANCE AT OPEN POSITION



Movable Span Alternatives
Profile Views
Plate 1 of 1
Page 25

PREPARED BY NEEL-SCHAFFER, INC.

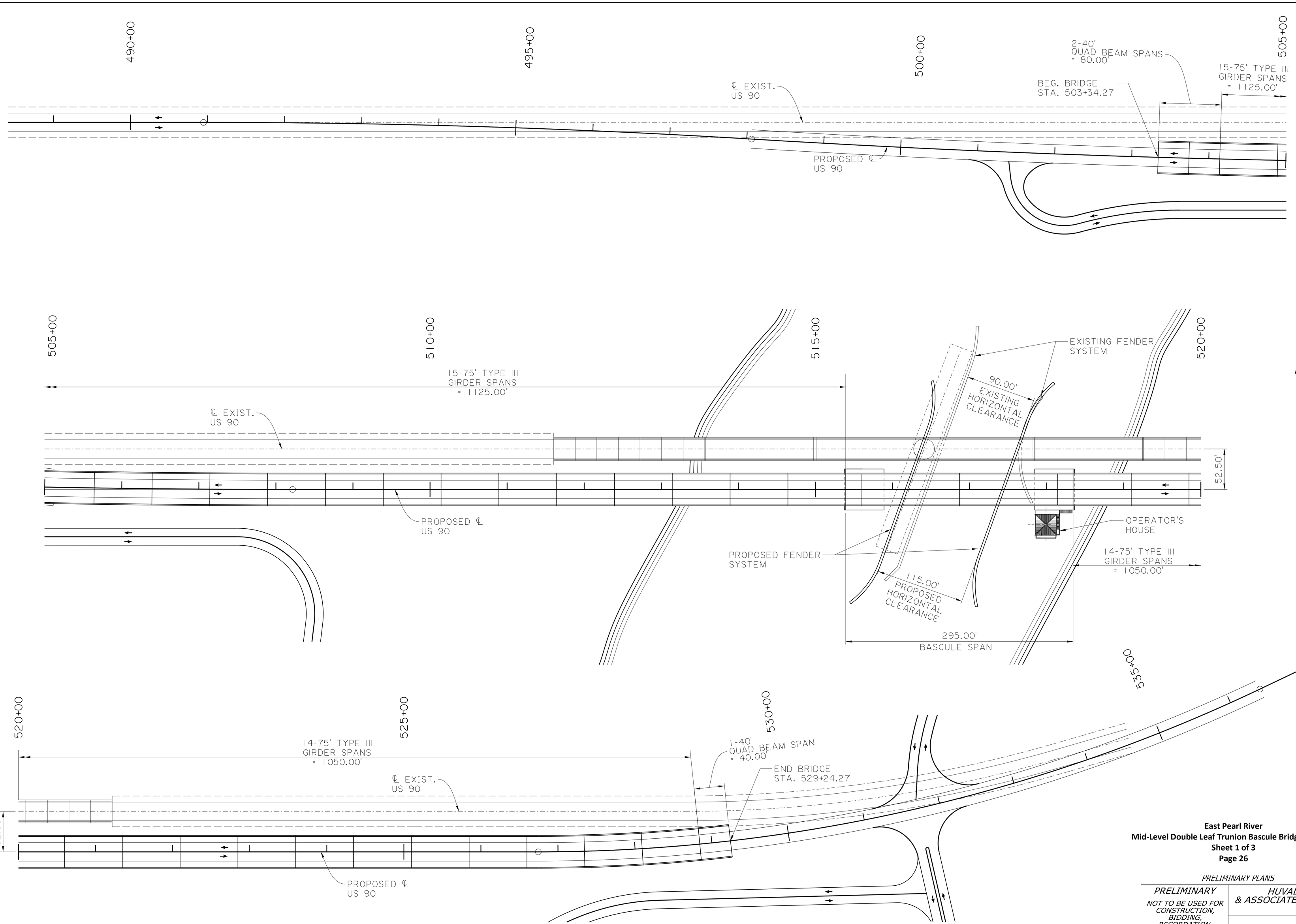
Federal Highway Administration
DOTD LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT
MDOT

US 90: EAST PEARL RIVER BRIDGE
MOVABLE BRIDGE ALTERNATIVES
STATE PROJECT NO. H.000284
ST. TAMMANY PARISH, LA / HANCOCK COUNTY, MS

SHEET NUMBER
PARISH: ST. TAMMANY
CONTROL SECTION
STATE PROJECT
DESIGNED CHECKED
DETAILED CHECKED
DATE SHEET: 11-30-16
NO. DATE BY REVISION DESCRIPTION
STATE OF LOUISIANA
EAST PEARL
MOVABLE ALTERNATIVES
DRAWING TITLE OR DESCRIPTION
US 90 BRIDGES
DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT DOTD

PRELIMINARY PLANS

X:\HUVAL Projects\6106 (US 90 @ Pearl River EA)\05-Working Drawings\02-Border to Print\East Pearl Public Meeting\1_Midlevel Bascule 9/12/2016 9:26:10 AM



PLAN - MIDLEVEL DOUBLE LEAF TRUNION BASCULE OPTION

SCALE: 1" = 60'

East Pearl River
Mid-Level Double Leaf Trunion Bascule Bridge Concept
Sheet 1 of 3
Page 26

PRELIMINARY PLANS

PRELIMINARY *NOT TO BE USED FOR CONSTRUCTION, BIDDING, RECORDATION, CONVEYANCE, SALES OR AS THE BASIS FOR THE ISSUANCE OF A PERMIT.*	*HUVAL & ASSOCIATES, INC.*
	ENGINEER: DAVID S. HUVAL *LICENSE #: 9931* *DATE: 9/12/2016*

SHEET NUMBER	1		
PARISH	ST. TAMMANY	CONTROL SECTION	006-07
STATE PROJECT	H.000284 & H.000286		
DESIGNED	MCH	DETAILED	MCH
CHECKED	WLH	CHECKED	TMG
SERIES NUMBER	1 OF 3		

NO.	DATE	REVISION OR CHANGE ORDER DESCRIPTION	BY

MIDLEVEL DOUBLE LEAF TRUNION BASCULE PLAN

EAST PEARL RIVER

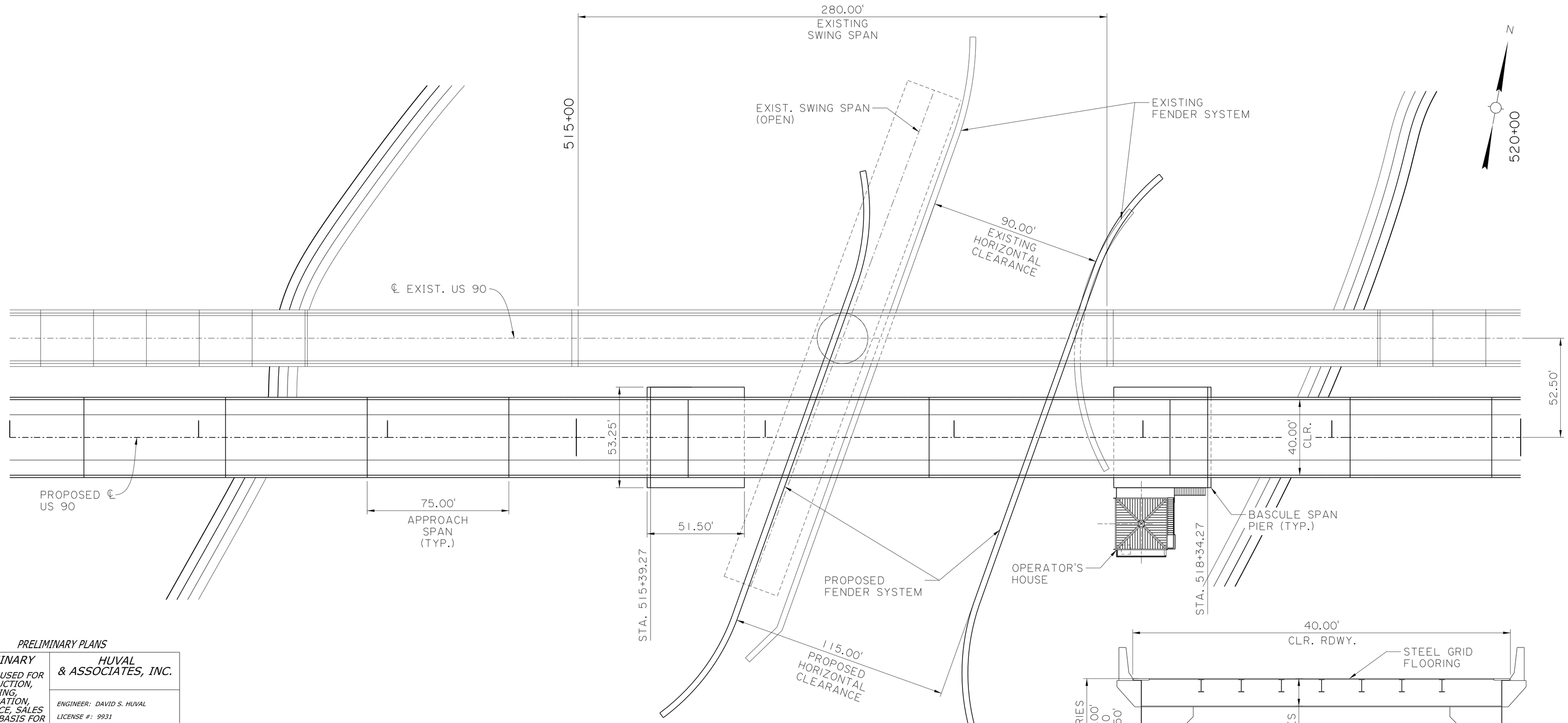
US 90 @ PEARL RIVER EA

DOTD TRANSPORTATION & DEVELOPMENT

HUVAL & ASSOCIATES, INC. Consulting Engineers

PRELIMINARY PLANS

X:\HUVAL Projects\6106 (US 90 @ Pearl River EA)\05-Working Drawings\02-Border to Print\East Pearl Public Meeting\2_Midlevel Bascule Drawings.dgn 9/28/2016 9:28:10 AM

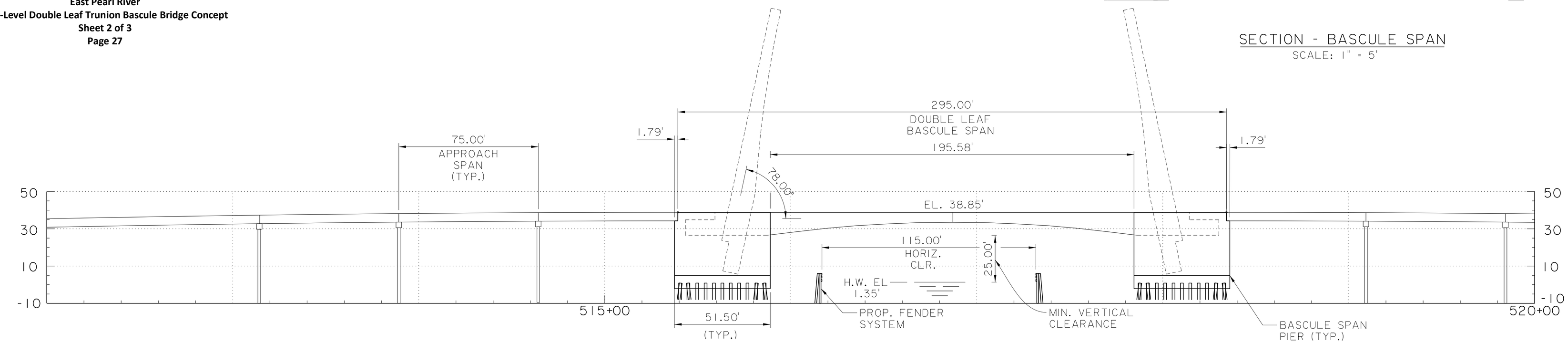


PLAN - MIDLEVEL DOUBLE LEAF TRUNION BASCULE OPTION

SCALE: 1" = 30'

SECTION - BASCULE SPAN

SCALE: 1" = 5'



PROFILE - MIDLEVEL DOUBLE LEAF TRUNION BASCULE OPTION

SCALE: 1" = 30'

PRELIMINARY PLANS

PRELIMINARY	*HUVAL & ASSOCIATES, INC.*
NOT TO BE USED FOR CONSTRUCTION, BIDDING, RECORDATION, CONVEYANCE, SALES OR AS THE BASIS FOR THE ISSUANCE OF A PERMIT.	*ENGINEER: DAVID S. HUVAL* *LICENSE #: 9931* *DATE: 9/12/2016*

East Pearl River
Mid-Level Double Leaf Trunion Bascule Bridge Concept
Sheet 2 of 3
Page 27

SHEET NUMBER	2
PARISH	ST. TAMMANY
CONTROL SECTION	006-07
STATE PROJECT	H.000284 & H.000286
DESIGNED MCH / CHECKED WLH	
DETAILED MCH / CHECKED TMG	
SERIES NUMBER	2 OF 3

REVISION OR CHANGE ORDER DESCRIPTION | BY | NO. | DATE

MIDLEVEL DOUBLE LEAF
TRUNION BASCULE DETAILS

EAST PEARL RIVER

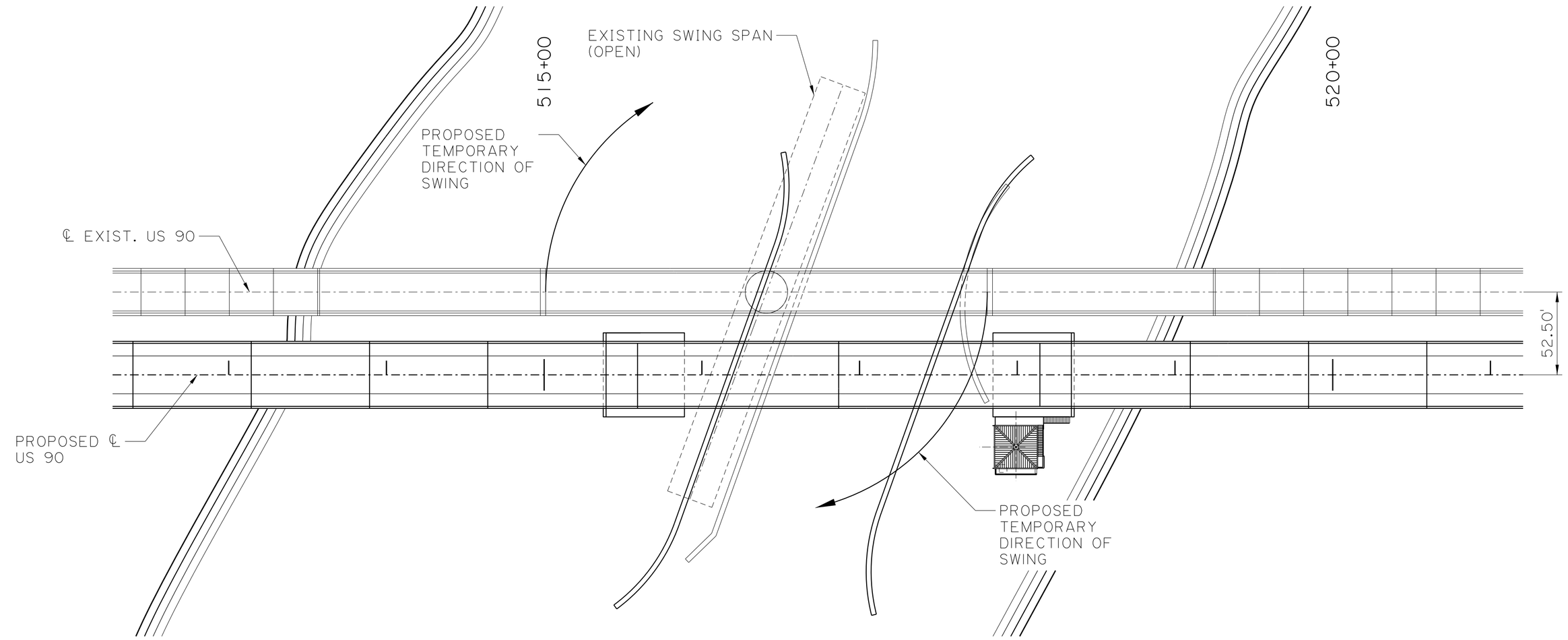
US 90 @ PEARL RIVER EA

DOTD
LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

HUVAL
& ASSOCIATES, INC.
Consulting Engineers

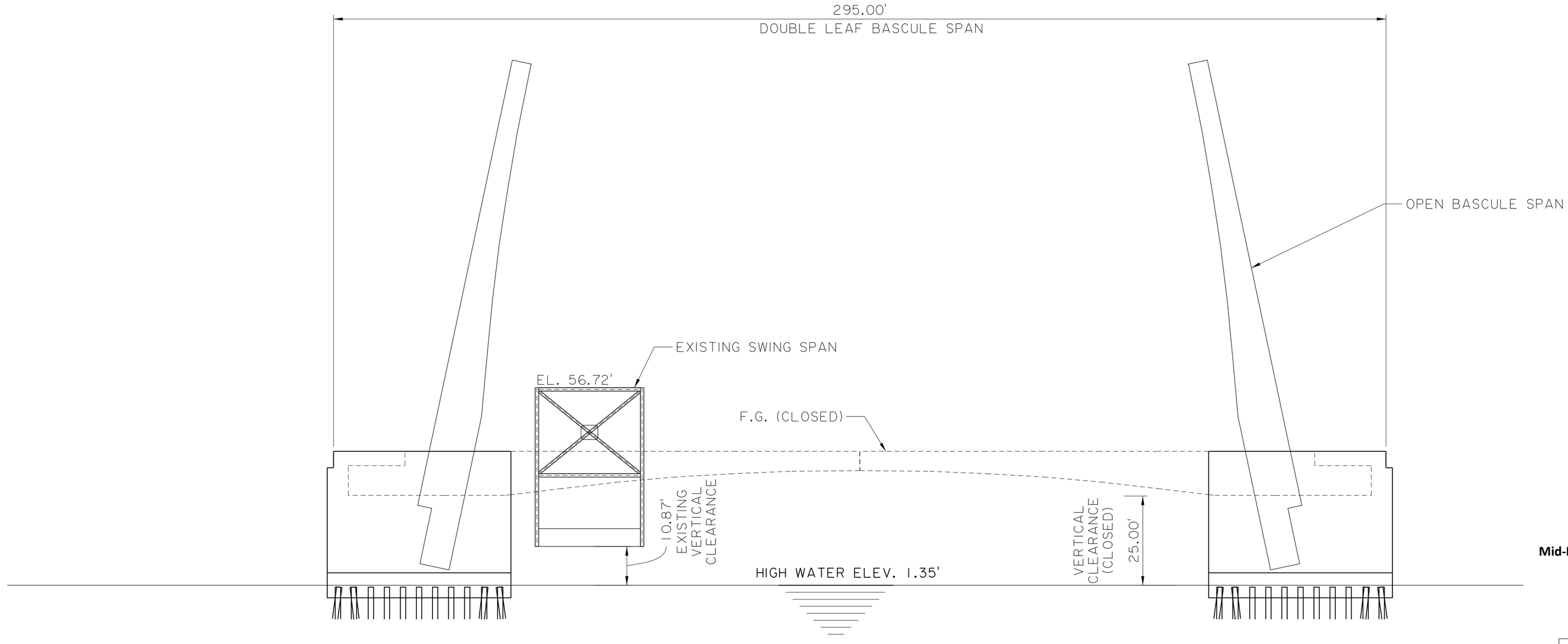
PRELIMINARY PLANS

X:\HUVAL Projects\6106 (US 90 @ Pearl River EA)\05-Working Drawings\02-Border to Print\East Pearl Public Meeting\MidLevel Bascule_Swing Span Clearance_2016.dgn 9/9/2016



PLAN - MIDLEVEL DOUBLE LEAF TRUNION BASCULE

SCALE: 1" = 50'



ELEVATION AT BASCULE SPAN

SCALE: 1" = 10'

NOTE:

THE PROPOSED DOUBLE LEAF BASCULE SPAN IS TO BE BUILT IN THE OPEN POSITION IN ORDER TO ALLOW CONTINUED USE OF THE EXISTING SWING SPAN STRUCTURE.

THIS WILL RESULT IN MINIMAL DISTRUPTIONS TO MARINE TRAFFIC IN THE CHANNEL.

East Pearl River
Mid-Level Double Leaf Trunion Bascule Bridge Concept
Sheet 3 of 3
Page 28

PRELIMINARY PLANS

PRELIMINARY	*HUVAL & ASSOCIATES, INC.*
NOT TO BE USED FOR CONSTRUCTION, BIDDING, RECORDATION, CONVEYANCE, SALES OR AS THE BASIS FOR THE ISSUANCE OF A PERMIT.	*ENGINEER: DAVID S. HUVAL* *LICENSE #: 9931* *DATE: 9/12/2016*

SHEET NUMBER	3
PARISH	ST. TAMMANY
CONTROL SECTION	006-07
STATE PROJECT	H.000284 & H.000286
DESIGNED / CHECKED	MCH / WLH
DETAILED / CHECKED	MCH / TMG
SERIES NUMBER	3 OF 3

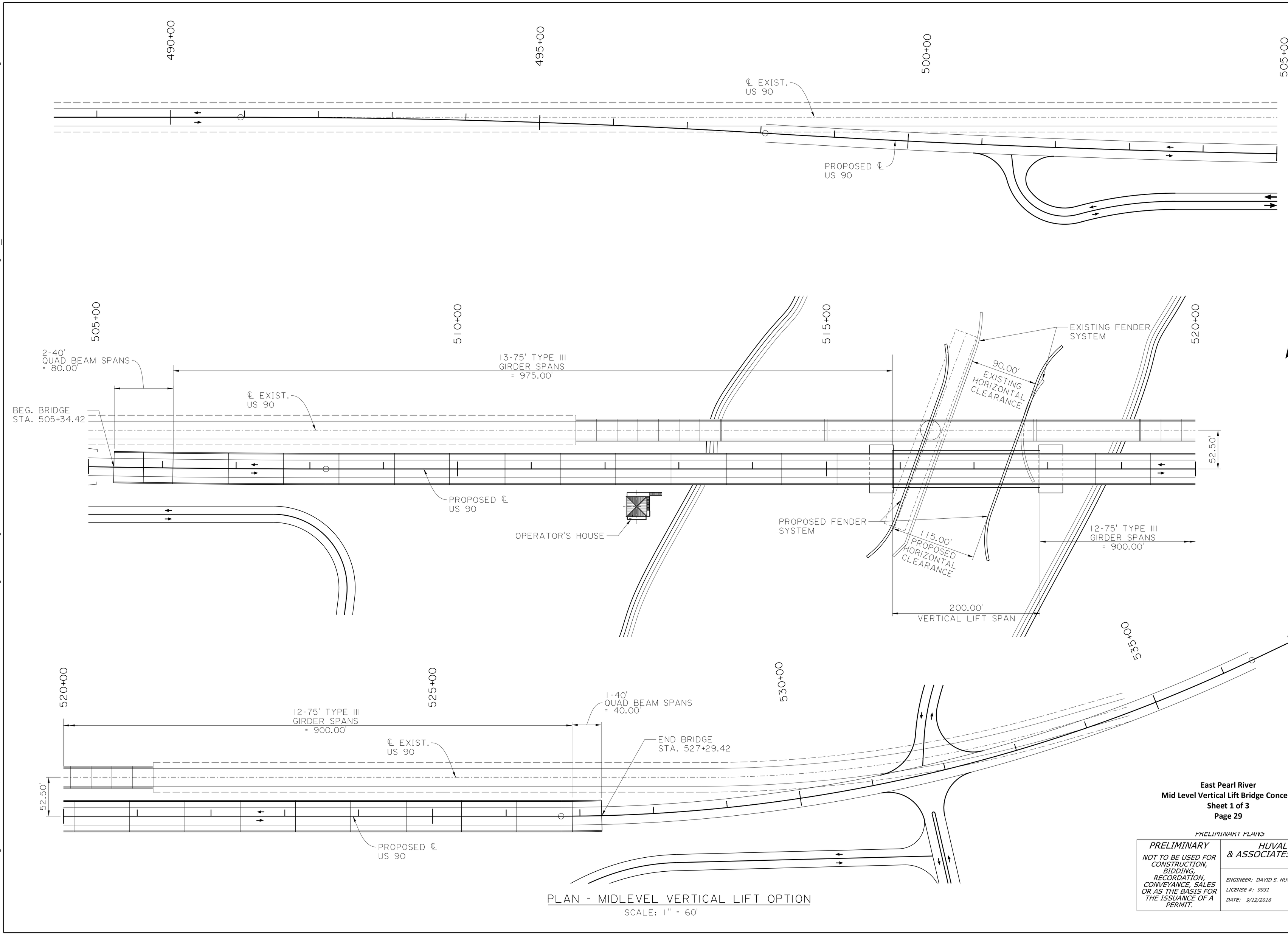
NO.	DATE	REVISION OR CHANGE ORDER DESCRIPTION	BY

MIDLEVEL BASCULE
EXIST. SWING SPAN CLEARANCE
EAST PEARL RIVER
US 90 @ PEARL RIVER EA

HUVAL
& ASSOCIATES, INC.
Consulting Engineers

PRELIMINARY PLANS

X:\HUVAL Projects\6106 (US 90 @ Pearl River EA)\05-Working Drawings\02-Border to Print\East Pearl Public Meeting\3_Midlevel Vertical Lift Plan.dgn 10:35:57 AM



PLAN - MIDLEVEL VERTICAL LIFT OPTION

SCALE: 1" = 60'

East Pearl River
Mid Level Vertical Lift Bridge Concept
Sheet 1 of 3
Page 29

PRELIMINARY PLANS

PRELIMINARY NOT TO BE USED FOR CONSTRUCTION, BIDDING, RECORDATION, CONVEYANCE, SALES OR AS THE BASIS FOR THE ISSUANCE OF A PERMIT.	*HUVAL & ASSOCIATES, INC.*
	ENGINEER: DAVID S. HUVAL *LICENSE #: 9931* *DATE: 9/12/2016*

SHEET NUMBER	4
PARISH	ST. TAMMANY
CONTROL SECTION	006-07
STATE PROJECT	H.000284 & H.000286
DESIGNED / CHECKED	MCH / WLH
DETAILED / CHECKED	MCH / TMG
SERIES NUMBER	1 OF 3

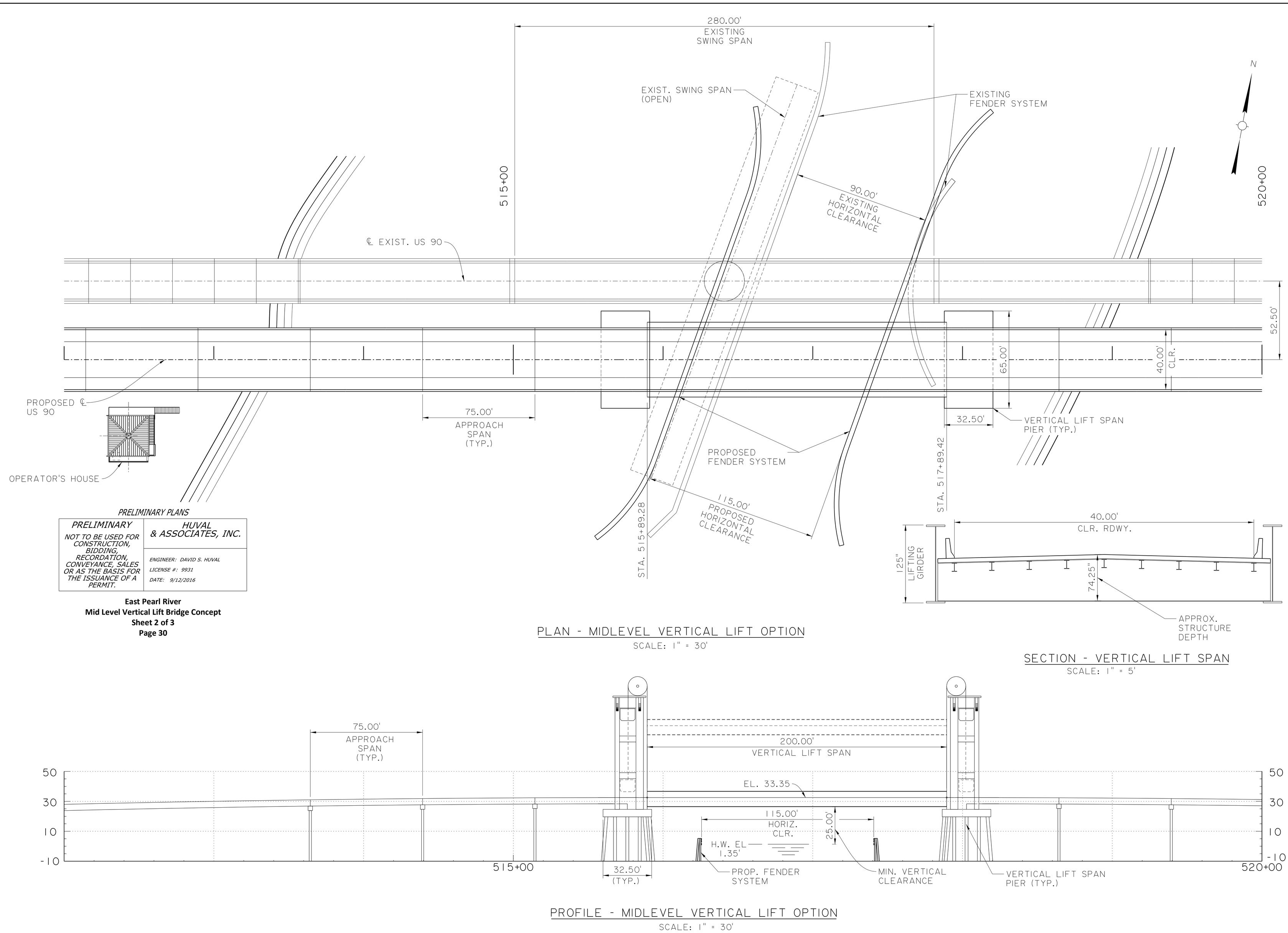
REVISION OR CHANGE ORDER DESCRIPTION — NO. — DATE — BY

MIDLEVEL VERTICAL LIFT
PLAN
EAST PEARL RIVER
US 90 @ PEARL RIVER EA

DOTD
DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

HUVAL
& ASSOCIATES, INC.
Consulting Engineers

PRELIMINARY PLANS
X:\HUVAL Projects\6106 (US 90 @ Pearl River EA)\05-Working Drawings\02-Border to Print\East Pearl Public Meeting\4_Midlevel Vertical Details.dgn 9/12/2016 10:39:32 AM



PLAN - MIDLEVEL VERTICAL LIFT OPTION
SCALE: 1" = 30'

SECTION - VERTICAL LIFT SPAN
SCALE: 1" = 5'

PROFILE - MIDLEVEL VERTICAL LIFT OPTION
SCALE: 1" = 30'

PRELIMINARY PLANS

PRELIMINARY	*HUVAL & ASSOCIATES, INC.*
NOT TO BE USED FOR CONSTRUCTION, BIDDING, RECORDATION, CONVEYANCE, SALES OR AS THE BASIS FOR THE ISSUANCE OF A PERMIT.	*ENGINEER: DAVID S. HUVAL* *LICENSE #: 9931* *DATE: 9/12/2016*

East Pearl River
Mid Level Vertical Lift Bridge Concept
Sheet 2 of 3
Page 30

SHEET NUMBER	5
PARISH	ST. TAMMANY
CONTROL SECTION	006-07
STATE PROJECT	H.000284 & H.000286
DESIGNED MCH CHECKED WLH	DETAILED MCH CHECKED TMG
SERIES NUMBER	2 OF 3

NO.	DATE	REVISION OR CHANGE ORDER DESCRIPTION	BY

STATE OF LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT

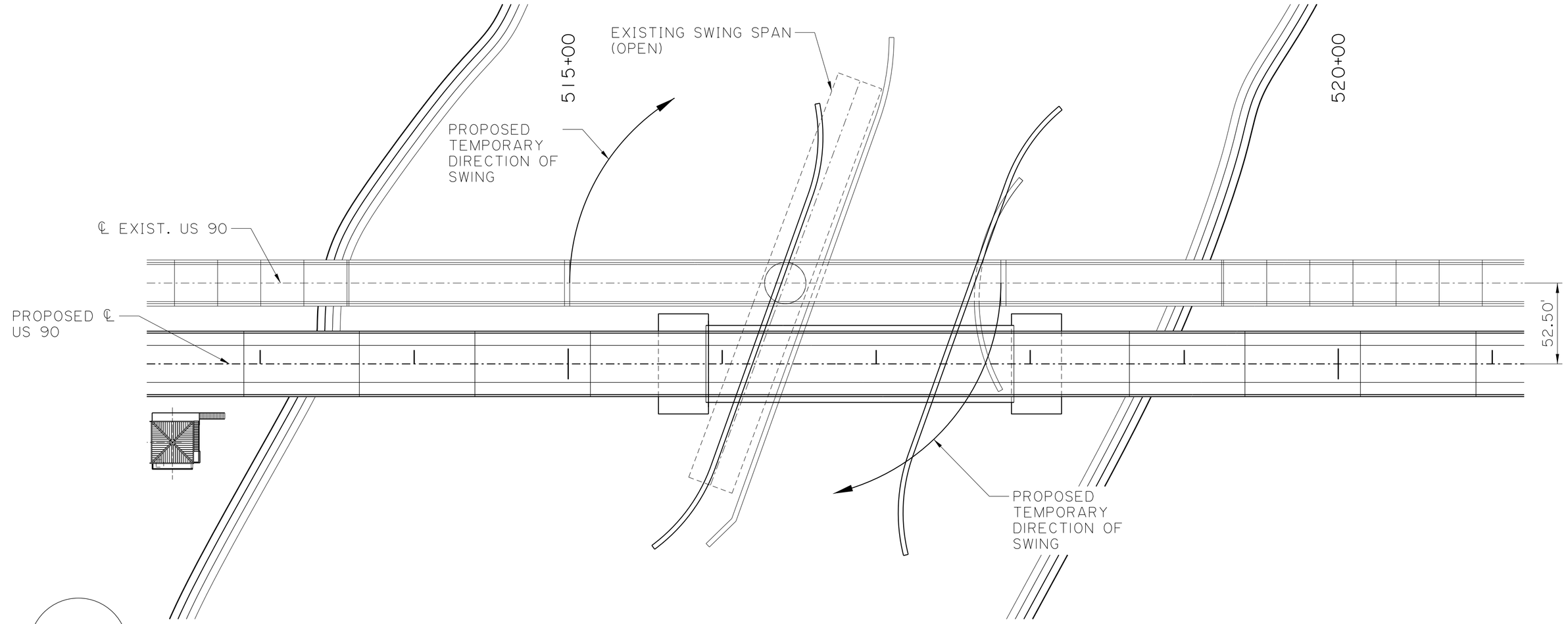
MID-LEVEL VERTICAL LIFT DETAILS
EAST PEARL RIVER
US 90 @ PEARL RIVER EA

DOTD DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

HUVAL
& ASSOCIATES, INC.
Consulting Engineers

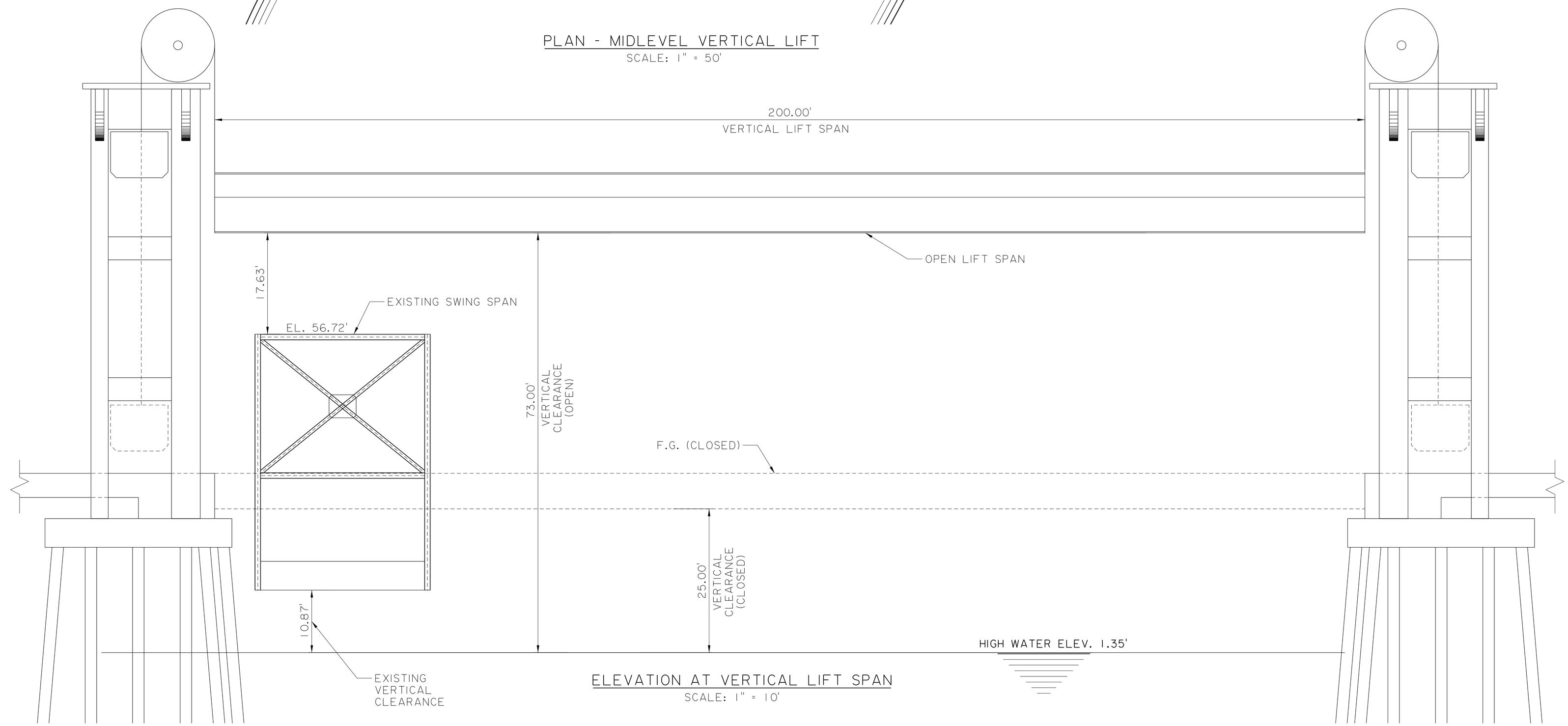
PRELIMINARY PLANS

X:\HUVAL Projects\6106 (US 90 @ Pearl River EA)\05-Working Drawings\02-Border to Print\East Pearl Public Meeting\MidLevel Vertical Lift_Exist Swing Span Clearance_2016.dgn



PLAN - MIDLEVEL VERTICAL LIFT

SCALE: 1" = 50'



ELEVATION AT VERTICAL LIFT SPAN

SCALE: 1" = 10'

PRELIMINARY PLANS

PRELIMINARY NOT TO BE USED FOR CONSTRUCTION, BIDDING, RECORDATION, CONVEYANCE, SALES OR AS THE BASIS FOR THE ISSUANCE OF A PERMIT.	HUVAL & ASSOCIATES, INC. ENGINEER: DAVID S. HUVAL LICENSE #: 9931 DATE: 9/12/2016

East Pearl River
Mid Level Vertical Lift Bridge Concept
Sheet 3 of 3
Page 31

NOTE:

THE PROPOSED VERTICAL LIFT SPAN IS TO BE BUILT IN THE OPEN POSITION IN ORDER TO ALLOW CONTINUED USE OF THE EXISTING SWING SPAN STRUCTURE.

THIS WILL RESULT IN MINIMAL DISTRUPTIONS TO MARINE TRAFFIC IN THE CHANNEL.

SHEET NUMBER	6
PARISH	ST. TAMMANY
CONTROL SECTION	006-07
STATE PROJECT	H.000284 & H.000286
DESIGNED MCH CHECKED WLH	DETAILED MCH CHECKED TMG
SERIES NUMBER	3 OF 3

REVISION OR CHANGE ORDER DESCRIPTION | BY | NO. | DATE

STATE OF LOUISIANA — DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT

MIDLEVEL VERTICAL LIFT
EXIST. SWING SPAN CLEARANCE

EAST PEARL RIVER

US 90 @ PEARL RIVER EA

DOTD — LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

HUVAL & ASSOCIATES, INC. Consulting Engineers

1.10 Proposed Bridge's Impacts to Existing and Potential Navigation

To determine if the proposed project meets the reasonable needs of existing and potential navigation, the following factors of evaluation were considered:

- The proposed bridge does not completely obstruct passage of any existing waterway users or access to waterborne facilities.
- The proposed bridge will not establish a new navigational limiting factor, as the proposed bridge alternatives exceed the horizontal navigational clearance of the existing structure at the location, and will conform to the vertical clearance of the upstream I-10 bridge.
- The proposed bridge does not impact present and prospective commercial activity on the waterway.
- The proposed bridge does not impact existing or planned commercial/industrial developments.
- The proposed bridge does not impact existing facilities on the waterway that are or could be considered critical infrastructure, key resources, or important/unique US industrial capability. Stennis Space Center will able to transport their current vessels through the bridge crossing as the proposed bridge will meet or exceed the upstream I-10 clearances.
- The proposed bridge does not impact USACE ability to transit the bridge in a federal project channel.
- The bridge does not impact USCG and other government vessels' ability to Transit Bridge to conduct mission essential functions.
- The proposed bridge does not impact existing and future cruise ship port-of-call/terminals, commercial freighters, or ports supporting post-panamax vessels as navigation associated with these facilities is not possible on the East Pearl River.
- The proposed bridge does not impact vessels that require helper boats/tugs.

1.11 Consideration of River Hydrology in the Siting and Design for a Replacement Structure

1.11.1 Introduction

There are a number of hydrology modeling investigations underway relating to the performance of the Lower Pearl River Floodplain during flood and hurricane events. In April 2019, the University of Southern Mississippi released a report documenting the Development of a Forecast Model for the Lower Pearl River Basin. The most comprehensive discussion of the performance of the US 90 bridges during high flow river conditions is a 1999 joint report issued by LADOTD and the US Geological Survey (USGS), *Estimation of Scour and Channel Stability for Selected Highway Crossings of Rivers in the Florida Parishes, Southeastern Louisiana, Louisiana*

Department of Transportation And Development, Water Resources Technical Report No. 67B. The report will be hereafter referenced as the Scour Report.

The following discussion utilizes the findings of the Scour Report as the basis to describe the hydraulic performance of each of the five rivers at each of the US 90 Pearl River bridge sites. The Scour Report investigates scour conditions at each bridge site assuming a 500-year storm as the base condition.

Excerpts from The Scour Report relevant to the East Pearl River are provided in Appendix B. Specific tables and figures from the Scour Report will be referenced in this narrative.

1.11.2 River Hydrology

Between the West Pearl River and the East Pearl River, the US 90 embankment of the lower Pearl River Basin spans over 4 miles of the river floodplain system. There are five openings in the embankment for the channels of the East Pearl, the East Middle, the Middle Middle, West Middle, and the West Pearl Rivers. The elevation of the roadway embankment is approximately 7-8 feet throughout and floodplain elevations range from 1 to 2 feet.

Table 3 shows the distribution of the 500 year storm event through the five river channels.

Table 3
Disribution of Flows Within Pearl River Watershed

	Flow in ft^3/sec	Percent of total flow
East Pearl River	100,002	36.6%
East Middle Pearl River	33,000	12.1%
Middle Middle Pearl River	41,000	15.0%
West Middle Pearl River	50,000	18.3%
West Pearl River	33,000	12.1%
Overflow	16,000	5.9%
Total	273,002	100.0%

Source: Neel-Schaffer, Inc.

The East Pearl River is the principal channel of the Pearl River. The East Pearl River has no substantial tributaries or distributaries in the reach between the I-10 embankment and the US. 90 embankment. But there is a connecting channel between the East Pear River and the East Middle Pearl River which enters the East Pearl River approximately a half-mile upstream of the existing bridge.

1.11.3 Waterway Layout and Geometry

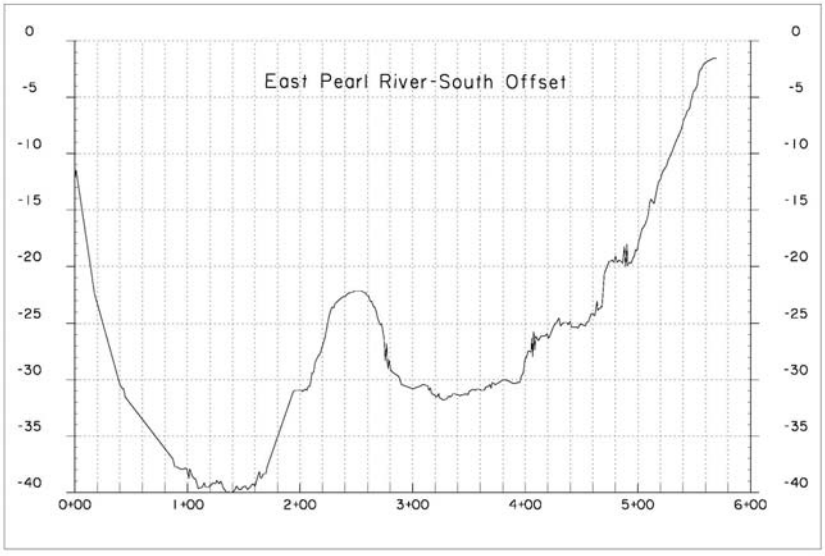
The East Pearl River channel at US 90 is curving slightly upstream to the right when passing through the bridge opening and the bridge crosses the river at a slight skew to

the river. Scour Report Figure 36 shows the bridge and river alignment as well as the river flow, which is approximately north to south.

1.11.4 Waterway Depth and Elevation Fluctuations

As shown in Scour Report Figure 37, channel depth in proximity to the existing bridge has varied with the channel deepening over time due to scour. In 1994 the main channel was approximately at elevation -25 to -30. Figure 5 shows a recent (April 2016) channel section downstream channel section developed in support of the project environmental studies of potential fish habitat.

Figure 5
Downstream Section of East Pearl River



Source: Neel-Schaffer, Inc. Hydrographic Survey (April 2016)
Developed in support of project environmental studies.

Table 4 shows NOAA Standard Datum for the East Pearl River.

Table 4
NOAA Elevations
(Elevations Convert to NAVD88)
East Pearl River at US 90

	MHW	MLW
East Pearl River	1.36	0.22

Source Neel-Schaffer, Inc.

MHW elevation for the East Pearl River at US 90 is elevation 1.36. Mean Low Water (MLW) is elevation 0.22, which indicates that there is a relatively small range of elevation fluctuations affecting navigation.

1.11.5 Channel and Waterway Alignment

The existing East Pearl River bridge crosses the river at slight skew to the river. Bridge replacement alternatives located new structures upstream and downstream from the existing bridge. Alternatives were also considered locating new structures along the existing alignment. In those situations a temporary by-pass structure maintaining navigation clearances as described herein would be provided. The by-pass structure will require a USCG permit. The centerline of the replacement structure will be 52.5 feet from the centerline of the existing bridge. The existing 90-foot horizontal channel will be increased to 115 feet and vertical clearance will be 73 feet above MHW to match the upstream I-10 river crossing clearances.

In consultations with NASA regarding river navigation, NASA personnel indicated that the placement of parallel span would not conflict with their navigation requirements as long as the new structure is located within 150 feet of the existing structure. The fixed long span alternative is located 52.5 feet downstream from the existing bridge. The movable span mid-level alternative would be located downstream a sufficient distance to allow for the continuing operation of the existing swing span during construction of the replacement bridge. The final bridge location will be established in consultation with Stennis to make certain that existing channel is protected.

Current Speed and Direction

Simulation of the 500-year event indicated East Pearl River flow velocities ranging from approximately 2 feet/second near the channel bank to approximately 8 feet/second at center channel (Scour Report Table). As noted in Table 3, estimated flow at the bridge was approximately 100,000 $feet^3$/second.

1.11.6 Natural Flow of Waterway including Currents, Water Velocity, Water Direction and Velocity Fluctuations that Might Affect Navigation

Replacement bridge alternatives are situated in proximity to the existing bridge. The existing 90-foot horizontal clearance is increased to 115 feet and relative channel alignment is maintained. Forecast river velocities under extreme navigation conditions (during a 500-year event) are approximately 8 feet/second. MHW and MLW elevation fluctuations are 1.14 feet. There is no indication that the natural flow of the waterway at the new bridge location (including currents, water velocity, water direction and velocity fluctuations) might affect navigation.

Appendix A
Year 2013 and Year 2018 Bridge Tender Report Summaries

East Pearl River - Tender Reports (2013)

Date	Time Open	Time Closed	Direction	Height	Vessel
Jan. 4, 2013	1610	1650	S	32	Salty Dog
Jan. 7, 2013	720	730	S	18	Miss Diane
Jan. 7, 2013	1240	1250	N	18	Miss Diane
Jan. 12, 2013	1335	1345	N	18	The Old Crab
Jan. 12, 2013	1716	1726	S	18	The Old Crab
Jan. 13, 2013	942	957	S	18	Miss Diane
Jan. 13, 2013	1445	1455	N	18	Miss Diane
Jan. 19, 2013	946	956	N	18	Houseboat
Jan. 19, 2013	1731	1741	S	18	Houseboat
Jan. 20, 2013	1013	1023	N	32	Salty Dog
Jan. 20, 2013	1530	1530	S	32	Salty Dog
Jan. 23, 2013	735	745	S	18	Miss Diane
Jan. 23, 2013	1315	1325	N	18	Miss Diane
Jan. 26, 2013	1440	1450	N	20	Houseboat
Jan. 27, 2013	1700	1720	S	20	Houseboat
Feb. 2, 2013	810	820	N	20	Houseboat
Feb. 3, 2013	1610	1620	S	20	Houseboat
Feb. 4, 2013	735	745	S	18	Miss Diane
Feb. 4, 2013	1310	1320	N	18	Miss Diane
Feb. 6, 2013	910	920	S	32	Salty Dog
Feb. 8, 2013	941	951	S	18	The Old Crab
Feb. 8, 2013	1723	1733	N	18	The Old Crab
Feb. 9, 2013	802	812	S	18	Miss Diane
Feb. 9, 2013	1418	1428	N	18	Miss Diane
Feb. 14, 2013	1031	1041	N	32	Salty Dog
Feb. 15, 2013	1001	1011	S	35	Victoria Milliet
Feb. 16, 2013	1417	1427	S	18	Houseboat
Feb. 17, 2013	721	731	S	18	Miss Diane
Feb. 17, 2013	1519	1529	N	18	Miss Diane
Feb. 22, 2013	725	735	S	18	Miss Diane
Feb. 22, 2013	1412	1422	N	18	Miss Diane
Feb. 24, 2013	1003	1013	N	35	Victoria Milliet
Feb. 25, 2013	1022	1032	N	18	Navy patrol boats / 2
Feb. 25, 2013	1139	1149	S	18	Navy patrol boats / 2
Feb. 26, 2013	915	925	N	18	Navy patrol boats / 3
Feb. 26, 2013	1232	1242	S	18	Navy patrol boats / 3
Feb. 27, 2013	919	929	N	18	Navy patrol boat / 1
Feb. 27, 2013	1031	1041	N	18	Navy patrol boats / 2
Feb. 27, 2013	1510	1520	S	18	Navy patrol boats /2
Feb. 27, 2013	1530	1540	S	18	Navy patrol boat / 1
Feb. 28, 2013	1000	1010	N	18	Navy patrol boats / 2
Feb. 28, 2013	1640	1655	S	18	Navy patrol boats / 2

East Pearl River - Tender Reports (2013)

Date	Time Open	Time Closed	Direction	Height	Vessel
Mar. 2, 2013	1610	1620	N	18	Sheriff patrol
Mar. 2, 2013	1715	1725	S	18	Sheriff patrol
Mar. 4, 2013	710	720	S	18	Navy patrol gun boats / 2
Mar. 4, 2013	1420	1430	N	18	Navy patrol gun boats / 2
Mar. 5, 2013	920	930	S	18	Navy patrol gun boats / 2
Mar. 5, 2013	1540	1550	N	18	Navy patrol gun boats / 2
Mar. 7, 2013	1425	1435	N		Brison tug (w/ 1 loaded barge)
Mar. 10, 2013	723	743	N	18	Miss Diane
Mar. 10, 2013	1312	1322	S	18	Miss Diane
Mar. 12, 2013	945	955	N	18	Houseboat
Mar. 12, 2013	1621	1631	S	18	Houseboat
Mar. 15, 2013	715	725	S	18	Miss Diane
Mar. 15, 2013	1330	1340	N	18	Miss Diane
Mar. 16, 2013	1000	1010	N	20	Houseboat
Mar. 17, 2013	1635	1645	S	20	Houseboat
Mar. 18, 2013	1130	1140	S	18	Navy gun boats / 4
Mar. 18, 2013	1710	1720	N	18	Navy gun boats / 4
Mar. 21, 2013	1650	1700	S	18	Navy gun boats / 4
Mar. 23, 2013	802	812	S	18	Miss Diane
Mar. 23, 2013	1247	1257	N	18	Miss Diane
Mar. 24, 2013	1013	1023	N	36	Who Dat
Mar. 24, 2013	1709	1719	S	36	Who Dat
Mar. 26, 2013	1347	1351	N	18	The Old Crab
Mar. 29, 2013	1005	1015	N	18	Houseboat
Mar. 31, 2013	1810	1820	S	18	Houseboat
Apr. 3, 2013	720	730	S	18	Miss Diane
Apr. 3, 2013	1405	1415	N	18	Miss Diane
Apr. 5, 2013	1015	1025	N	18	Houseboat
Apr. 6, 2013	751	800	S	18	Miss Diane
Apr. 6, 2013	1345	1355	N	18	Miss Diane
Apr. 7, 2013	1650	1700	S	18	Houseboat
Apr. 12, 2013	1610	1620	N	18	Houseboat
Apr. 15, 2013	1541	1551	S	16	Houseboat
Apr. 17, 2013	1135	1145	N	18	Navy patrol boat / 1
Apr. 17, 2013	1200	1210	S	18	Navy patrol boat / 1
Apr. 18, 2013	1042	1052	N	18	Navy patrol boat
Apr. 18, 2013	1435	1445	S	18	Navy patrol boat
Apr. 20, 2013	802	812	S	18	Miss Diane
Apr. 20, 2013	1358	1408	N	18	Miss Diane
Apr. 21, 2013	1003	1013	N	18	Houseboat
Apr. 21, 2013	1717	1727	S	18	The Old Crab
Apr. 26, 2013	716	726	S	18	Miss Diane

East Pearl River - Tender Reports (2013)

Date	Time Open	Time Closed	Direction	Height	Vessel
Apr. 26, 2013	1326	1336	N	18	Miss Diane
Apr. 27, 2013	940	950	N	18	The Old Crab
Apr. 27, 2013	1821	1831	S	18	Houseboat
Apr. 29, 2013	1340	1350	S	18	The Old Crab
Apr. 30, 2013	1540	1550	N	25	Navy boat
May 4, 2013	1010	1020	N	18	Houseboat
May 5, 2013	1715	1725	S	18	Houseboat
May 7, 2013	715	725	N	18	Miss Diane
May 7, 2013	1419	1429	S	18	Miss Diane
May 10, 2013	1710	1720	N	45	Perry Lynn
May 11, 2013	1205	1215	N	40	Last Chance S.V.
May 11, 2013	1800	1810	S	40	Last Chance S.V.
May 12, 2013	925	935	S	45	Perry Lynn (w/ 1 empty barge)
May 13, 2013	715	725	S	18	Miss Diane
May 13, 2013	1340	1350	N	18	Miss Diane
May 14, 2013	730	740	S	65	Brice MII
May 18, 2013	742	752	S	18	Miss Diane
May 18, 2013	1319	1329	N	18	Houseboat
May 18, 2013	1621	1631	N	18	Miss Diane
May 19, 2013	1037	1047	N	35	Summertime / pleasureboat
May 19, 2013	1757	1807	S	35	Summertime / pleasureboat
May 21, 2013	1219	1229	S	18	Houseboat
May 24, 2013	1600	1610	N	18	Houseboat
May 25, 2013	740	750	S	18	Miss Diane
May 25, 2013	1425	1435	N	18	Miss Diane
May 27, 2013	1215	1225	S	45	Miss Tessie S.V.
May 27, 2013	1310	1320	S	25	Mr. Mongo
May 27, 2013	1745	1755	N	45	Miss Tessie S.V.
May 27, 2013	1745	1755	N	25	Mr. Mongo
May 31, 2013	1612	1622	S	18	Houseboat
Jun. 1, 2013	746	756	N	18	Miss Diane
Jun. 1, 2013	1419	1429	S	18	Miss Diane
Jun. 2, 2013	1137	1147	N	35	Who Dat / pleasureboat
Jun. 3, 2013	915	925	S	25	Navy patrol boat / high antenna
Jun. 3, 2013	1340	1350	N	60	Brice MII w/ loaded barge and crane
Jun. 5, 2013	1718	1728	N	18	Houseboat
Jun. 7, 2013	805	815	S	18	Miss Diane
Jun. 7, 2013	1420	1430	N	18	Miss Diane
Jun. 8, 2013	1115	1125	N	20	Houseboat
Jun. 11, 2013	1519	1529	S	20	Houseboat
Jun. 13, 2013	1612	1622	S	35	Who Dat / pleasureboat
Jun. 14, 2013	1133	1143	N	25	Navy patrol boat

East Pearl River - Tender Reports (2013)

Date	Time Open	Time Closed	Direction	Height	Vessel
Jun. 15, 2013	809	819	S	18	Miss Diane
Jun. 15, 2013	1515	1525	N	18	Miss Diane
Jun. 16, 2013	1147	1157	N	25	Shrimpboat w/ booms
Jun. 17, 2013	1045	1055	N	25	Survey boat
Jun. 21, 2013	1307	1317	N	20	Navy patrol boats / 3
Jun. 22, 2013	724	734	S	18	Miss Diane
Jun. 22, 2013	1412	1422	N	18	Miss Diane
Jun. 25, 2013	750	800	S	18	Miss Diane
Jun. 25, 2013	1410	1420	N	18	Miss Diane
Jun. 26, 2013	910	915			OPENED FOR ENGINEERS
Jun. 27, 2013	1245	1255	N	20	Navy patrol boats / 3
Jun. 28, 2013	1317	1327	S	18	Houseboat
Jun. 30, 2013	745	800	S	18	Miss Diane
Jun. 30, 2013	1336	1346	N	18	Miss Diane
Jul. 2, 2013	1418	1428	N	18	Houseboat
Jul. 5, 2013	805	815	S	18	Miss Diane
Jul. 5, 2013	1420	1430	N	18	Miss Diane
Jul. 6, 2013	1010	1020	S	20	Houseboat
Jul. 7, 2013	1720	1730	S	20	Houseboat
Jul. 9, 2013	1135	1145	S	40	Brice MII w/ loaded barge
Jul. 11, 2013	1045	1055	S	17	Navy patrol boats / 3
Jul. 11, 2013	1320	1330	N	17	Navy patrol boats / 3
Jul. 13, 2013	740	750	N	18	Houseboat
Jul. 14, 2013	1715	1725	S	18	Houseboat
Jul. 16, 2013	1035	1045	S	17	Navy patrol boats / 2
Jul. 16, 2013	1520	1530	N	17	Navy patrol boats / 2
Jul. 17, 2013	740	750	S	18	Miss Diane
Jul. 17, 2013	1315	1325	N	18	Miss Diane
Jul. 18, 2013	1205	1215	S	18	Navy patrol boats / 3
Jul. 18, 2013	1225	1235	N	18	Navy patrol boats / 3
Jul. 19, 2013	725	735	S	18	Miss Diane
Jul. 19, 2013	1315	1325	N	18	Miss Diane
Jul. 21, 2013	925	935	N	25	Delta Dawn
Jul. 21, 2013	1740	1750	S	25	Delta Dawn
Jul. 22, 2013	725	735	N	35	Stress Management
Jul. 26, 2013	1225	1235	S	18	Houseboat
Jul. 26, 2013	1815	1825	N	18	Houseboat
Jul. 27, 2013	735	745	S	18	Miss Diane
Jul. 27, 2013	1310	1320	N	18	Miss Diane
Jul. 28, 2013	1429	1439	N	35	Seahorse / pleasureboat
Jul. 30, 2013	1617	1627	S	35	Seahorse / pleasureboat
Aug. 1, 2013	1202	1212	S	45	Stress Management

East Pearl River - Tender Reports (2013)

Date	Time Open	Time Closed	Direction	Height	Vessel
Aug. 1, 2013	1705	1715	N	45	Stress Management
Aug. 2, 2013	941	951	S	45	Stress Management
Aug. 3, 2013	840	850	N	18	Houseboat
Aug. 4, 2013	1650	1700	S	18	Houseboat
Aug. 5, 2013	720	730	S	20	Miss Diane
Aug. 5, 2013	1300	1310	N	20	Miss Diane
Aug. 9, 2013	932	942	N	18	Houseboat
Aug. 10, 2013	810	820	S	18	Miss Diane
Aug. 10, 2013	1415	1425	N	18	Miss Diane
Aug. 10, 2013	1503	1513	N	18	St. Tammany Sheriff Dept.
Aug. 10, 2013	1541	1551	S	18	St. Tammany Sheriff Dept.
Aug. 11, 2013	1545	1555	S	18	Houseboat
Aug. 12, 2013	1111	1121	N	45	Stress Management
Aug. 13, 2013	1402	1412	S	45	Stress Management
Aug. 14, 2013	1621	1631	N	45	Stress Management
Aug. 16, 2013	1120	1130	S	45	Stress Management
Aug. 17, 2013	720	730	N	18	Houseboat
Aug. 18, 2013	1720	1730	S	18	Houseboat
Aug. 19, 2013	720	730	S	18	Miss Diane
Aug. 19, 2013	1340	1350	N	18	Miss Diane
Aug. 24, 2013	735	745	N	18	Houseboat
Aug. 25, 2013	1740	1750	S	18	Houseboat
Aug. 26, 2013	725	735	S	18	Miss Diane
Aug. 26, 2013	1305	1315	N	18	Miss Diane
Aug. 27, 2013	1145	1155	N	45	Stress Management
Aug. 28, 2013	1815	1825	N	30	Death Row
Aug. 29, 2013	1020	1030	S	18	Navy patrol boats / 4
Aug. 29, 2013	1240	1250	N	18	Navy patrol boats / 4
Aug. 30, 2013	1315	1325	N	18	Houseboat
Aug. 31, 2013	1720	1730	N	35	Death Row
Sep. 1, 2013	1040	1050	N	20	Slip Knot
Sep. 1, 2013	1120	1130	N	25	Bayou Queen
Sep. 1, 2013	1315	1325	N	45	Miss Dixie S.V.
Sep. 1, 2013	1820	1835	S	20, 25, 45	Slip Knot, Bayou Queen, Miss Dixie S.V.
Sep. 2, 2013	710	720	S	18	Miss Diane
Sep. 2, 2013	1340	1350	N	18	Miss Diane
Sep. 4, 2013	1000	1015	S	20	Navy patrol boats / 5
Sep. 4, 2013	1540	1555	N	20	Navy patrol boats / 5
Sep. 5, 2013	1000	1015	S	20	Navy patrol boats / 5
Sep. 5, 2013	1503	1513	N	20	Navy patrol boats / 5
Sep. 7, 2013	728	738	S	18	Miss Diane
Sep. 7, 2013	1410	1420	N	18	Miss Diane

East Pearl River - Tender Reports (2013)

Date	Time Open	Time Closed	Direction	Height	Vessel
Sep. 8, 2013	945	955	N	18	Houseboat
Sep. 8, 2013	1727	1737	S	18	Houseboat
Sep. 13, 2013	1725	1735	N	18	Houseboat
Sep. 14, 2013	950	1000	S	20	Navy patrol boats / 4
Sep. 14, 2013	1530	1540	N	20	Navy patrol boats / 4
Sep. 15, 2013	1120	1130	N	18	Why Knot
Sep. 15, 2013	1610	1620	S	18	Why Knot
Sep. 16, 2013	940	950	S	18	Houseboat
Sep. 17, 2013	950	1000	S	20	Navy patrol boats / 3
Sep. 17, 2013	1505	1515	N	20	Navy patrol boats / 3
Sep. 18, 2013	1530	1540	N	45	Morgan Ray / spud barge - tug
Sep. 20, 2013	1015	1025	N	18	Houseboat
Sep. 21, 2013	941	951	S	20	Miss Diane
Sep. 21, 2013	1507	1517	N	20	Miss Diane
Sep. 23, 2013	1718	1728	S	18	Houseboat
Sep. 27, 2013	751	801	N	18	Why Knot
Sep. 27, 2013	1319	1329	S	18	Why Knot
Sep. 28, 2013	710	720	S	18	Miss Diane
Sep. 28, 2013	1347	1357	N	18	Miss Diane
Oct. 2, 2013	1315	1325	N	18	U.S. Coast Guard
Oct. 2, 2013	1710	1720	S	18	U.S. Coast Guard
Oct. 3, 2013	720	730	S	18	Miss Diane
Oct. 3, 2013	1430	1445	N	18	Miss Diane
Oct. 4, 2013	235	245	N	45, 30	Miss Jill Ann, Miss Jo-Ann
Oct. 4, 2013	1630	1645	N		NavaOceana, Navy patrol
Oct. 5, 2013	1021	1036	N	25	Seahorse / pleasureboat
Oct. 6, 2013	1654	1704	S	25	Seahorse / pleasureboat
Oct. 8, 2013	729	739	S	18	Miss Diane
Oct. 8, 2013	1400	1410	N	18	Miss Diane
Oct. 9, 2013	1245	1255	N	25	Danny Boy 2 / spud barge
Oct. 10, 2013	1040	1050	S	45	Miss Jill Ann
Oct. 11, 2013	941	951	N	18	Houseboat
Oct. 13, 2013	1710	1720	S	18	Houseboat
Oct. 14, 2013	720	730	S	18	Miss Diane
Oct. 14, 2013	1215	1225	N	18	Miss Diane
Oct. 18, 2013	740	750	N	18	Houseboat
Oct. 19, 2013	1350	1400			BRIDGE INSPECTION
Oct. 21, 2013	1120	1130	S	45, 25	Oceana, H2314HS
Oct. 22, 2013	1040	1050	S	20	Navy patrol boats / 2
Oct. 22, 2013	1345	1355	N	20	Navy patrol boats / 2
Oct. 23, 2013	915	925	S, N	20	Navy patrol
Oct. 24, 2013	1010	1020	S	20	Navy patrol boats / 2

East Pearl River - Tender Reports (2013)

Date	Time Open	Time Closed	Direction	Height	Vessel
Oct. 24, 2013	1350	1400	N	20	Navy patrol boats / 2
Oct. 25, 2013	925	935	N	18	Houseboat
Oct. 27, 2013	1740	1750	S	18	Houseboat
Oct. 28, 2013	1130	1140	S	20	Navy patrol boats / 2
Oct. 28, 2013	1155	1205	S	45	Tug w/ 3 empty barges
Oct. 28, 2013	1415	1425	N	20	Navy patrol boats / 2
Nov. 1, 2013	758	808	S	18	Miss Diane
Nov. 1, 2013	1412	1422	N	18	Miss Diane
Nov. 2, 2013	1115	1125	S	20	Houseboat
Nov. 4, 2013	1405	1415	N	25	Navy patrol boats / 4
Nov. 4, 2013	1735	1745	S	25	Navy patrol boats / 4
Nov. 5, 2013	1340	1350	N	25	Navy patrol boats / 4
Nov. 5, 2013	1745	1755	S	25	Navy patrol boats / 4
Nov. 6, 2013	927	937	N	25	Navy patrol boats / 4
Nov. 6, 2013	1820	1830	S	25	Navy patrol boats / 4
Nov. 8, 2013	1325	1335	N	18	Houseboat
Nov. 9, 2013	719	729	S	18	Miss Diane
Nov. 9, 2013	1341	1351	N	18	Miss Diane
Nov. 13, 2013	720	730	S	18	Miss Diane
Nov. 13, 2013	1345	1355	N	18	Miss Diane
Nov. 14, 2013	810	820	S	18	Navy patrol boats / 4
Nov. 14, 2013	1030	1040	N	18	Navy patrol boats / 4
Nov. 16, 2013	1354	1404	S	18	Houseboat
Nov. 18, 2013	915	925	S	18	Miss Diane
Nov. 18, 2013	1527	1537	N	18	Miss Diane
Nov. 23, 2013	910	920	S	18	Navy patrol boats / 2
Nov. 23, 2013	1420	1430	N	18	Navy patrol boats / 2
Nov. 24, 2013	715	725	S	18	Miss Diane
Nov. 24, 2013	1340	1350	N	18	Miss Diane
Nov. 25, 2013	205	215	S	18	Navy patrol boats / 3
Nov. 25, 2013	1520	1530	N	18	Navy patrol boats / 3
Nov. 26, 2013	215	225	S	18	Navy patrol boats / 3
Nov. 27, 2013	210	220	S	18	Navy patrol boats / 3

East Pearl River - Bridge Tender Reports (2018)

Date	Direction	Height	Vessel
Jan. 10, 2018	S	18	Miss Diane
Jan. 10, 2018	N	18	Miss Diane
Jan. 19, 2018	N	35	Charlston
Jan. 20, 2018	S	35	Charlston
Jan. 23, 2018	N	18	Miss Diane
Jan. 23, 2018	S	18	Miss Diane
Jan. 24, 2018	N	20	Capt Sonny
Jan. 29, 2018	S	45	Big Lazy
Jan. 31, 2018	N	20	Navy Patrol boat/2
Jan. 31, 2018	S	20	Navy Patrol boat/2
Jan. 31, 2018	S	25	Ms. Lunoy's
Jan. 31, 2018	N	25	Ms. Lunoy's
Jan. 31, 2018	N	20	Capt Vick
Feb. 3, 2018	S	25	Old Crab
Feb. 4, 2018	N	18	Miss Diane
Feb. 4, 2018	S	18	Miss Diane
Feb. 6, 2018	N	20	Navy Patrol boat/2 & 1
Feb. 6, 2018	S	20	Navy Patrol boat/pcoc 2 & 1
Feb. 7, 2018	S	20	Navy Patrol boat/pcoc 2 & 1
Feb. 7, 2018	N	20	Navy Patrol boat/pcoc 2 & 1
Feb. 9, 2018	S	40	Big Easy
Feb. 9, 2018	N	18	House boat
Feb. 10, 2018	S	18	Miss Diane
Feb. 10, 2018	N	18	Miss Diane
Feb. 11, 2018	S	18	House boat
Feb. 15, 2018	N	18	STSO
Feb. 15, 2018	S	18	STSO
Feb. 15, 2018	N	18	House boat
Feb. 16, 2018	S	18	House boat
Feb. 17, 2018	N	18	Miss Diane
Feb. 17, 2018	S	18	Miss Diane
Feb. 21, 2018	S	18	Miss Diane
Feb. 21, 2018	N	18	Miss Diane
Feb. 24, 2018	S	18	Navy Patrol boat/2
Feb. 24, 2018	N	18	Navy Patrol boat/2
Mar. 2, 2018	N	20	STSO
Mar. 2, 2018	S	20	STSO
Mar. 3, 2018	N	20	STSO
Mar. 3, 2018	S	20	STSO
Mar. 4, 2018	N	20	STSO
Mar. 4, 2018	S	20	STSO
Mar. 5, 2018	N	18	Miss Diane
Mar. 5, 2018	N	20	STSO

East Pearl River - Bridge Tender Reports (2018)

Date	Direction	Height	Vessel
Mar. 5, 2018	S	20	Miss Olivia
Mar. 6, 2018	N	20	Miss Olivia
Mar. 7, 2018	N	20	US Coast Guard
Mar. 7, 2018	S	20	US Coast Guard
Mar. 8, 2018	N	18	House boat
Mar. 10, 2018	S	18	Miss Diane
Mar. 10, 2018	N	18	Miss Diane
Mar. 11, 2018	S	18	House boat
Mar. 13, 2018	N	20	Miss Olivia
Mar. 13, 2018	S	20	Miss Olivia
Mar. 16, 2018	S	18	Miss Diane
Mar. 16, 2018	N	18	Miss Diane
Mar. 18, 2018	N	40	Mystick
Mar. 22, 2018	N	21	Navy Patrol boat/pcoc 2 & 1
Mar. 22, 2018	S	21	Navy Patrol boat/pcoc 2 & 1
Mar. 24, 2018	N	20	House boat
Mar. 24, 2018	S	20	House boat
Mar. 26, 2018	S	18	Miss Diane
Mar. 26, 2018	N	18	Miss Diane
Mar. 30, 2018	S	40	Mystick
Apr. 2, 2018	N	25	Endeavor
Apr. 3, 2018	S	25	Endeavor
Apr. 3, 2018	N	18	Miss Diane
Apr. 3, 2018	S	18	Miss Diane
Apr. 5, 2018	N	25	Ms. Luavis
Apr. 7, 2018	N	18	House boat
Apr. 7, 2018	S	18	House boat
Apr. 8, 2018	S	25	Ms. Luavis
Apr. 13, 2018	N	18	House boat
Apr. 15, 2018	S	18	House boat
Apr. 16, 2018	S	18	Miss Diane
Apr. 16, 2018	N	18	Miss Diane
Apr. 17, 2018	N	35	Rising Star
Apr. 17, 2018	S	35	Rising Star
Apr. 20, 2018	S	18	Miss Diane
Apr. 20, 2018	N	18	Miss Diane
Apr. 24, 2018	N	25	Capt. Jack
Apr. 27, 2018	N	18	Miss Diane
Apr. 27, 2018	S	18	Miss Diane
Apr. 28, 2018	S	25	Capt. Jack
Apr. 30, 2018	N	20	Navy Patrol boat/pcoc 2 & 1
Apr. 30, 2018		20	Capt. Sally
May 1, 2018	S	25	Ms. Lunoy's

East Pearl River - Bridge Tender Reports (2018)

Date	Direction	Height	Vessel
May 1, 2018	N	25	Ms. Lunoy's
May 2, 2018	N	20	Navy Patrol boat/1 & 2
May 2, 2018	S	20	Navy Patrol boat/1 & 2
May 4, 2018	N	18	House boat
May 6, 2018	S	18	House boat
May 8, 2018	S	18	Navy Patrol boat/2
May 8, 2018	N	18	Navy Patrol boat/2
May 10, 2018	N	18	Miss Diane
May 10, 2018	S	18	Miss Diane
May 10, 2018	N	20	House boat
May 11, 2018	N	20	House boat
May 11, 2018	N	20	Navy Patrol boat/pcoc 1 & 31
May 11, 2018	S	20	Navy Patrol boat/pcoc 1 & 31
May 12, 2018	N	25	Seahorse
May 13, 2018	S	48	Sailboat
May 14, 2018	N	18	Navy boat/Seals 4
May 14, 2018	S	18	Navy boat/Seals 4
May 15, 2018	S	18	US Coast Guard
May 15, 2018	N	18	US Coast Guard
May 17, 2018	N	18	Navy Patrol boat/1 & 2
May 17, 2018	S	18	Navy Patrol boat/1 & 2
May 25, 2018	N	18	Miss Diane
May 25, 2018	S	18	Miss Diane
May 27, 2018	N	18	Seahorse
Jun. 1, 2018	N	18	House boat
Jun. 3, 2018	S	18	House boat
Jun. 4, 2018	S	18	Miss Diane
Jun. 4, 2018	N	18	Miss Diane
Jun. 6, 2018	S	18	Navy Patrol boat/2
Jun. 6, 2018	N	18	Navy Patrol boat/2
Jun. 8, 2018	N	40	Capt Jaun
Jun. 8, 2018	N	40	Six Stars
Jun. 10, 2018	S	40	Six Stars
Jun. 10, 2018	S	40	Capt Jaun
Jun. 11, 2018	N	40	Capt Jaun
Jun. 11, 2018	N	40	Six Stars
Jun. 13, 2018	S	40	Six Stars
Jun. 13, 2018	S	40	Six Stars
Jun. 15, 2018	N	40	Six Stars
Jun. 15, 2018	N	40	Capt Jaun
Jun. 16, 2018	N	18	House boat
Jun. 16, 2018	S	18	Miss Diane
Jun. 16, 2018	N	18	Miss Diane

East Pearl River - Bridge Tender Reports (2018)

Date	Direction	Height	Vessel
Jun. 17, 2018	S	18	House boat
Jun. 20, 2018	S	18	Navy Patrol boat/2
Jun. 20, 2018	N	18	Navy Patrol boat/2
Jun. 20, 2018	S	40	Capt Jaun
Jun. 20, 2018	S	40	Six Stars
Jun. 21, 2018	S	18	Navy Patrol/2
Jun. 21, 2018	N	18	Navy Patrol/2
Jun. 23, 2018	N	18	House boat
Jun. 24, 2018	S	18	House boat
Jun. 24, 2018	S	40	Six Stars
Jun. 24, 2018	S	40	Capt Jaun
Jun. 26, 2018	S	18	Navy Patrol boat/2
Jun. 26, 2018	N	18	Navy Patrol boat/2
Jun. 27, 2018	S	18	Navy Patrol boat/2
Jun. 27, 2018	N	18	Navy Patrol boat/2
Jun. 28, 2018	S	18	Navy Patrol boat/2
Jun. 28, 2018	N	18	Navy Patrol boat/2
Jul. 2, 2018	N	20	US Coast Guard
Jul. 2, 2018	S	20	US Coast Guard
Jul. 4, 2018	N	45	Spirit
Jul. 4, 2018	S	45	Spirit
Jul. 9, 2018	N	18	2 Navy Vessel/Seals
Jul. 9, 2018	S	18	2 Navy Vessel/Seals
Jul. 10, 2018	N	18	2 Navy Vessel/Seals 2
Jul. 10, 2018	S	18	2 Navy Seal & Vessel
Jul. 11, 2018	N	18	2 Navy Patrol boat/pcoc 1 & 2
Jul. 11, 2018	S	18	1 Navy Patrol boat/pcoc 1 & 2
Jul. 11, 2018	N	25	Artica/Marlin 28
Jul. 11, 2018	N	25	Artica/Marlin 28
Jul. 12, 2018	S	18	Navy Patrol/pcoc 3
Jul. 12, 2018	N	18	Navy Patrol/pcoc 3
Jul. 13, 2018	S	70	Lauren Renee Shrimp Boat
Jul. 14, 2018	N	70	Lauren Renee Shrimp Boat
Jul. 15, 2018	N	18	House boat
Jul. 16, 2018	S	70	Lauren Renee Shrimp Boat
Jul. 27, 2018	N	18	Miss Diane
Jul. 27, 2018	S	18	Miss Diane
Aug. 3, 2018	S	18	Miss Diane
Aug. 3, 2018	N	18	Miss Diane
Aug. 15, 2018	N	25	Oyster Boat
Aug. 15, 2018	S	25	Oyster Boat
Aug. 16, 2018	N	18	Miss Diane
Aug. 16, 2018	S	18	Miss Diane

East Pearl River - Bridge Tender Reports (2018)

Date	Direction	Height	Vessel
Aug. 17, 2018	N	25	Oyster Boat
Aug. 17, 2018	S	25	Oyster Boat
Aug. 18, 2018	N	25	Oyster Boat
Aug. 19, 2018	S	25	Oyster Boat
Aug. 20, 2018	N	25	Oyster Boat
Aug. 21, 2018	S	25	Oyster Boat
Aug. 23, 2018	N	25	Oyster Boat
Aug. 24, 2018	S	18	Navy Patrol boat/pcoc 1 & 2
Aug. 24, 2018	N	18	US Coast Guard
Aug. 24, 2018	N	18	Navy Patrol boat/pcoc 1 & 2
Aug. 27, 2018	S	60	Six Stars
Aug. 27, 2018	S	60	Capt Jaun
Aug. 29, 2018	N	60	Six Stars
Aug. 29, 2018	N	60	Capt Jaun
Aug. 31, 2018	S	60	Capt Jaun
Aug. 31, 2018	S	60	Six Stars
Sep. 2, 2018	N	60	Capt Jaun
Sep. 2, 2018	N	60	Six Stars
Sep. 3, 2018	N	18	Miss Diane
Sep. 3, 2018	S	18	Miss Diane
Sep. 3, 2018	N	35	Yacht
Sep. 3, 2018	N	18	Navy patrol vessel
Sep. 3, 2018	N	50	Sailboat
Sep. 3, 2018	N	65	2 sailboats
Sep. 3, 2018	N	18	2 Navy patrol boats
Sep. 4, 2018	N	40	Lyla Marie
Sep. 4, 2018	N	65	Sailboat
Sep. 4, 2018	N	35	Capt Dell
Sep. 4, 2018	S	45	pleasure boat
Sep. 4, 2018	S	48	shrimp boat
Sep. 5, 2018	S	65	sailboats
Sep. 5, 2018	S	35	yacht & pleasure boat
Sep. 5, 2018	S	48	shrimp boats
Sep. 6, 2018	S	45	pleasure boat
Sep. 6, 2018	S	60	sailboat
Sep. 6, 2018	S	35	Capt Dell
Sep. 6, 2018	S	35	Oyster Boat
Sep. 7, 2018	S	18	Navy Patrol boat
Sep. 7, 2018	N	18	Navy Patrol boat
Sep. 10, 2018	S	18	Peacock I-II
Sep. 11, 2018	N	18	Peacock I-II
Sep. 12, 2018	S	18	2 Navy patrol boats
Sep. 13, 2018	S	18	Navy Patrol boat/pcoc 2

East Pearl River - Bridge Tender Reports (2018)

Date	Direction	Height	Vessel
Sep. 13, 2018	N	55	Lil Susans & Trent Joseph
Sep. 13, 2018	N	35	Pegasas/Space Shuttle
Sep. 13, 2018	N	18	Navy Patrol boat/pcoc 2
Sep. 13, 2018	S	35	Lil Susans & Trent Joseph
Sep. 14, 2018	N	18	Miss Diane
Sep. 14, 2018	S	18	Miss Diane
Sep. 14, 2018	N	40	Fish/Houseboat
Sep. 15, 2018	S	40	Fish/Houseboat
Sep. 18, 2018	N	18	Oyster Boat
Sep. 19, 2018	S	18	Navy Patrol boat/pcoc 2
Sep. 19, 2018	S	18	US Coast Guard
Sep. 19, 2018	N	18	US Coast Guard
Sep. 19, 2018	N	18	Navy Patrol boat/pcoc 2
Sep. 19, 2018	S	18	fishing boat/oyster boat
Sep. 26, 2018	N	18	Miss Diane
Sep. 26, 2018	S	18	Miss Diane
Sep. 28, 2018	N	30	Seahorse
Sep. 29, 2018	S	30	Seahorse
Oct. 1, 2018		18	Oyster Boat
Oct. 2, 2018	N	18	Miss Diane
Oct. 2, 2018	S	18	Miss Diane
Oct. 3, 2018	S	18	Navy Seals
Oct. 5, 2018	N	18	House boat
Oct. 6, 2018	S	18	Navy Patrol boat 3
Oct. 6, 2018	N	18	Navy patrol boat 3
Oct. 7, 2018	S	18	Navy Patrol boat 2
Oct. 7, 2018	N	18	Navy Patrol boat 2
Oct. 8, 2018	S	18	House boat
Oct. 9, 2018	S	18	Miss Diane
Oct. 9, 2018	N	18	Miss Diane
Oct. 11, 2018	S	35	Capt Jaun
Oct. 12, 2018	N	35	Capt Jaun
Oct. 13, 2018	N	18	House boat
Oct. 14, 2018	S	18	House boat
Oct. 15, 2018	S	18	Miss Diane
Oct. 15, 2018	N	18	Miss Diane
Oct. 23, 2018	S	18	Navy Patrol boat/pcoc 1 & 2
Oct. 23, 2018	N	18	Navy Patrol boat/pcoc 1 & 2
Oct. 24, 2018	S	18	Seahorse
Oct. 24, 2018	N	18	Navy Patrol boat/pcoc 1 & 2
Oct. 24, 2018	S	18	Navy Patrol boat/pcoc 1 & 2
Oct. 26, 2018	N	18	Seahorse
Oct. 26, 2018	S	18	Navy Patrol boat/pcoc 1 & 2

East Pearl River - Bridge Tender Reports (2018)

Date	Direction	Height	Vessel
Oct. 26, 2018	N	18	Navy Patrol boat/pcoc 1 & 2
Oct. 27, 2018	S	18	House boat
Oct. 28, 2018	N	18	Miss Diane
Oct. 28, 2018	S	18	Miss Diane
Oct. 29, 2018	N	18	House boat
Oct. 29, 2018	S	18	Navy patrol boat/pcoc 1 & 2
Oct. 29, 2018	N	18	Navy patrol boat/pcoc 1 & 2
Oct. 30, 2018	S	18	Oyster Boat
Oct. 31, 2018	S	18	2 Navy seal boats
Oct. 31, 2018	N	18	2 Navy seal boats
Nov. 2, 2018	S	18	2 Navy Patrol boats
Nov. 2, 2018	N	18	2 Navy Patrol boats
Nov. 3, 2018	S	18	Capt Jaun
Nov. 4, 2018	S	20	Miss Diane
Nov. 4, 2018	N	20	Miss Diane
Nov. 5, 2018	S	35	Capt Jaun
Nov. 5, 2018	S	35	Six Stars
Nov. 6, 2018	S	18	2 Navy Patrol boats
Nov. 6, 2018	N	18	2 Navy Patrol boats
Nov. 7, 2018	S	18	Navy patrol boat
Nov. 8, 2018	S	18	2 Navy patrol boats
Nov. 8, 2018	N	18	2 Navy patrol boats
Nov. 14, 2018	N	18	Navy patrol boats/pcoc 1 & 2
Nov. 14, 2018	S	18	Navy patrol boats/pcoc 1 & 2
Nov. 16, 2018	N	18	House boat
Nov. 17, 2018	S	18	Miss Diane
Nov. 17, 2018	N	18	Miss Diane
Nov. 18, 2018	S	18	House boat
Nov. 19, 2018	S	18	2 Navy patrol boats
Nov. 19, 2018	N	18	2 Navy patrol boats
Nov. 20, 2018	S	18	Navy patrol boats/pcoc 1 & 2
Nov. 20, 2018	N	18	Navy patrol boat
Nov. 24, 2018	S	18	Miss Diane
Nov. 24, 2018	N	18	Miss Diane
Nov. 26, 2018	N	18	House boat
Nov. 27, 2018	S	18	House boat
Nov. 28, 2018	N	25	Capt Jack Max
Nov. 30, 2018	N	18	House boat
Nov. 30, 2018	S	18	House boat
Dec. 1, 2018	N	18	House boat
Dec. 2, 2018	S	18	House boat
Dec. 5, 2018	N	65	Lonnie M Bell
Dec. 6, 2018	N	65	Sidney V Tug

East Pearl River - Bridge Tender Reports (2018)

Date	Direction	Height	Vessel
Dec. 6, 2018	N	65	Lonnie M Bell
Dec. 6, 2018	N	18	House boat
Dec. 7, 2018	N	85	Pegasas
Dec. 7, 2018	N	47	Sidney V Tug
Dec. 7, 2018	N	47	Lonnie M Bell
Dec. 7, 2018	S	18	House boat
Dec. 10, 2018	N	18	Miss Diane
Dec. 10, 2018	S	18	Miss Diane
Dec. 13, 2018	S	18	Navy Seals
Dec. 14, 2018	S	18	2 Navy patrol boats
Dec. 14, 2018	N	18	2 Navy patrol boats
Dec. 15, 2018	N	18	House boat
Dec. 15, 2018	S	18	3 Navy patrol boats
Dec. 15, 2018	N	18	3 Navy patrol boats
Dec. 16, 2018	S	18	House boat
Dec. 17, 2018	S	18	2 Navy patrol boats
Dec. 17, 2018	N	18	2 Navy patrol boats
Dec. 18, 2018	S	18	Miss Diane
Dec. 18, 2018	N	18	Miss Diane
Dec. 19, 2018	S	18	3 Navy patrol boats
Dec. 19, 2018	N	18	3 Navy patrol boats
Dec. 21, 2018	S	18	Miss Diane
Dec. 21, 2018	N	18	Miss Diane
Dec. 22, 2018	S	18	House boat
Dec. 23, 2018	N	18	House boat

Source: Bridge Tender Logs Provided by LADOTD

Appendix B
Documentation of Coordination with Stennis Agencies Using the East Pearl River

Barry Brupbacher

From: Barry Brupbacher
Sent: Thursday, March 24, 2016 8:32 AM
To: 'Greenleaf, Arthur A CWO-3 USSOCOM NAVSOC NSWSBT22'
Subject: RE: CONTRACT NO. 4400005579, H.000284 US 90: PEARL RIVER BRIDGES AND H.000286 EAST PEARL RIVER BRIDGE - East Pearl Navigation Study

Thanks so much.

Barry Brupbacher
Senior Project Manager

Neel-Schaffer, Inc.
Phone: 985.674.9820
Cell: 985-778-3105
FAX: 985.674.9822
Website: www.neel-schaffer.com

-----Original Message-----
From: Greenleaf, Arthur A CWO-3 USSOCOM NAVSOC NSWSBT22 [mailto:Arthur.Greenleaf@navsoc.socom.mil]
Sent: Thursday, March 24, 2016 8:30 AM
To: KNUDSEN, CHRISTOPHER M. (SSC-RA20) <christopher.m.knudsen@nasa.gov>
Cc: Barry Brupbacher <barry.brupbacher@neel-schaffer.com>
Subject: RE: CONTRACT NO. 4400005579, H.000284 US 90: PEARL RIVER BRIDGES AND H.000286 EAST PEARL RIVER BRIDGE - East Pearl Navigation Study

Sir,

Bottom line is I am not sure what exactly you will need but here is a basic overview. The most common craft we operate on the pearl river are relatively small craft. All of which require approximately 12' clearance without changing the configuration(ie. Lowering the Radar Arch). At times we transit Civilian training craft up the river to Stennis. The largest of which is a 57' Viking Sportfish. It has a Tower above the main bridge which requires 39' of clearance and she has an 18' beam. I am not sure what other specifications you will need but I can provide any other information you require.

V/R
Kimo
CWO3 A. "Kimo" Greenleaf
SBT-22, N3 Special Programs Manager
Office 228-813-4000 ext:13308
Cell 228-239-1891
arthur.greenleaf@navsoc.socom.mil

-----Original Message-----
From: KNUDSEN, CHRISTOPHER M. (SSC-RA20) [mailto:christopher.m.knudsen@nasa.gov]
Sent: Thursday, March 24, 2016 7:23 AM
To: Greenleaf, Arthur A CWO-3 USSOCOM NAVSOC NSWSBT22

Cc: barry.brupbacher@neel-schaffer.com
Subject: [Non-DoD Source] RE: CONTRACT NO. 4400005579, H.000284 US 90: PEARL RIVER BRIDGES AND H.000286 EAST PEARL RIVER BRIDGE - East Pearl Navigation Study

Warrant,

No, I don't believe it's too late. I've copied Barry Brupbacher who is the project manager.

Sincerely,
Chris Knudsen
National Aeronautics and Space Administration John C. Stennis Space Center Operations and Maintenance Division AST, Experimental Facility Development christopher.m.knudsen@nasa.gov
228-688-2171

-----Original Message-----
From: Greenleaf, Arthur A CWO-3 USSOCOM NAVSOC NSWSBT22 [mailto:Arthur.Greenleaf@navsoc.socom.mil]
Sent: Tuesday, March 22, 2016 12:25 PM
To: KNUDSEN, CHRISTOPHER M. (SSC-RA20) <christopher.m.knudsen@nasa.gov>
Subject: FW: CONTRACT NO. 4400005579, H.000284 US 90: PEARL RIVER BRIDGES AND H.000286 EAST PEARL RIVER BRIDGE - East Pearl Navigation Study

Sir,

I just recovered this email from a junk folder. Have your questions been answered and if not, is there time for input?

V/R
Kimo
CWO3 A. "Kimo" Greenleaf
SBT-22, N3 Special Programs Manager
Office 228-813-4000 ext:13308
Cell 228-239-1891
arthur.greenleaf@navsoc.socom.mil

-----Original Message-----
From: KNUDSEN, CHRISTOPHER M. (SSC-RA20) [mailto:christopher.m.knudsen@nasa.gov]
Sent: Monday, February 22, 2016 10:41 AM
To: Everett, David L CIV USSOCOM NAVSOC NSWSBT22
Subject: [Non-DoD Source] FW: CONTRACT NO. 4400005579, H.000284 US 90: PEARL RIVER BRIDGES AND H.000286 EAST PEARL RIVER BRIDGE - East Pearl Navigation Study

Dave,

There are plans in the works to redo the Hwy 90 bridges over the Pearl River. Do you know who I could point this guy to in order to obtain required vertical and horizontal clearances for small boat ops? If they are going to redo the bridges we might as well get them built to make our lives easier if possible.

Sincerely,

Chris Knudsen

National Aeronautics and Space Administration

John C. Stennis Space Center

Operations and Maintenance Division

AST, Experimental Facility Development

christopher.m.knudsen@nasa.gov <mailto:christopher.m.knudsen@nasa.gov>

228-688-2171

From: Barry Brupbacher [mailto:barry.brupbacher@neel-schaffer.com]
Sent: Monday, February 22, 2016 7:48 AM
To: KNUDSEN, CHRISTOPHER M. (SSC-RA20)
Subject: RE: CONTRACT NO. 4400005579, H.000284 US 90: PEARL RIVER BRIDGES AND H.000286 EAST PEARL RIVER BRIDGE - East Pearl Navigation Study

Thanks Chris.

At this point the offset for all of the East Pearl River bridge concepts are within 150' of the existing swing span. There is one other item. Can you provide a point of contact at the Navy who would be able to provide the design clearances for their multiple navy vessels operating with the Pearl River system?

Thanks,

Barry Brupbacher

Senior Project Manager

Neel-Schaffer, Inc.

Phone: 985.674.9820

Cell: 985-778-3105

FAX: 985.674.9822

Website: www.neel-schaffer.com <http://www.neel-schaffer.com/>

From: KNUDSEN, CHRISTOPHER M. (SSC-RA20) [mailto:christopher.m.knudsen@nasa.gov]
Sent: Monday, February 22, 2016 7:36 AM
To: Barry Brupbacher <barry.brupbacher@neel-schaffer.com>
Cc: Carmouche, Gregory C. (SSC-EA20) <gregory.c.carmouche@nasa.gov>; Alston, David (SSC-SACOM)[SYNCOM SPACE SERVICES] <david.alston-1@nasa.gov>; Mosher, Gary W. (SSC-SACOM)[SYNCOM SPACE SERVICES] <gary.w.mosher@nasa.gov>; Pullman, Rodrick (SSC-SACOM)[SYNCOM SPACE SERVICES] <rodrick.pullman-1@nasa.gov>
Subject: RE: CONTRACT NO. 4400005579, H.000284 US 90: PEARL RIVER BRIDGES AND H.000286 EAST PEARL RIVER BRIDGE - East Pearl Navigation Study

Barry,

See responses to your questions in the email below. Please forward future correspondence to me. Let me know if you need any additional information.
Thanks.

Sincerely,

Chris Knudsen

National Aeronautics and Space Administration

John C. Stennis Space Center

Operations and Maintenance Division

AST, Experimental Facility Development

christopher.m.knudsen@nasa.gov

228-688-2171

From: Pullman, Rodrick (SSC-SACOM)[SYNCOM SPACE SERVICES]
Sent: Friday, February 19, 2016 12:03 PM
To: KNUDSEN, CHRISTOPHER M. (SSC-RA20)
Cc: Carmouche, Gregory C. (SSC-EA20); Alston, David (SSC-SACOM)[SYNCOM SPACE SERVICES]; Mosher, Gary W. (SSC-SACOM)[SYNCOM SPACE SERVICES]
Subject: RE: CONTRACT NO. 4400005579, H.000284 US 90: PEARL RIVER BRIDGES AND H.000286 EAST PEARL RIVER BRIDGE - East Pearl Navigation Study

Mr. Chris, this is what I've drafted for response to Barry's request listed below. Please feel free to make any changes to this response as you deem necessary.

1. The present East Pearl River Hwy 90 Bridge when it is fully open has
90' Horizontal clearance and unlimited Vertical clearance, because it is a swing bridge. This requires no disassembly of cargo. The new purposed Bridge that would be a fixed span providing vertical clearance of 73' above mean high water and 110' of horizontal clearance would meet NASA's requirements for today and purposed future.

2. If the location of new purposed bridge is within 150' of existing
bridge upstream or downstream this would not pose any concerns, but if the location is greater than 150' then we would need the exact location of new bridge before we could comment on any Marine Navigation concerns that we might have.

s3 logo

Rocky Pullman

Heavy Equipment, Marine Operations, VEM Supervisor

Bldg. 3201

o. (228)-688-3318/c.228-493-3318/c.228-304-2296

rodrick.pullman-1@nasa.gov

From: Barry Brupbacher [mailto:barry.brupbacher@neel-schaffer.com]
Sent: Wednesday, January 27, 2016 4:19 PM
To: Pullman, Rodrick (SSC-JACOBS)[JACOBS TECHNOLOGY INC (SSC FOSC)]
Subject: CONTRACT NO. 4400005579, H.000284 US 90: PEARL RIVER BRIDGES AND H.000286 EAST PEARL RIVER BRIDGE - East Pearl Navigation Study

Rocky,

We are addressing a few LDOTD comments on our draft navigation reports, and I am hoping you will be able to assist in addressing the comments:

Identify whether cargo disassembly is required to pass under the current structure.

. We recognize the current movable span does not pose a vertical restriction, does the horizontal restriction on the existing structure require cargo disassembly? Would a new fixed span providing clearances of 73' above mean high water vertical and 110' horizontal pose a restriction which might require future cargo disassembly?

Channel hydrology as it may impact navigation associated with the East Pearl crossing. Please note any concerns regarding the following taking into consideration the existing span, and upstream or downstream locations of new structures:

* Waterway layout and geometry
* Waterway depth and elevation fluctuations
* River hydrology
* Channel and waterway alignment
* Natural flow of waterway including currents, water velocity, water direction and velocity fluctuations that might affect navigation
* Current speed and direction

Thanks for your participation in the project.

Barry Brupbacher

Senior Project Manager

Neel-Schaffer, Inc.

Phone: 985.674.9820

Cell: 985-778-3105

FAX: 985.674.9822

Website: www.neel-schaffer.com <http://www.neel-schaffer.com/>

Neel-Schaffer, Inc. Confidentiality Note:
Information contained in this message along with any attachment(s) may be confidential and protected by legal privilege. This message is meant solely for the use of the individual(s) to whom it is addressed. Viewing or the use of information and attachment(s) within this message without the expressed permission of Neel-Schaffer, Inc. is prohibited. If you are not the intended recipient of this message, Neel-Schaffer, Inc. requests you take immediate action to notify the sender of the error and that you delete this message and all attachments without modifying, copying or distributing its content.

Barry Brupbacher

From: Stadalis, Jeffery C CIV NAVOCEANO, N62306 <jeffery.stadalis@navy.mil>
Sent: Friday, February 26, 2016 11:02 AM
To: Barry Brupbacher
Subject: RE: CONTRACT NO. 4400005579, H.000284 US 90: PEARL RIVER BRIDGES AND H.000286 EAST PEARL RIVER BRIDGE - East Pearl Navigation Study
Attachments: image001.png

Barry,

The vertical clearance required for our vessels is 25' with antennas lowered and 35' with antennas raised.

Jeff

_____
From: Barry Brupbacher [barry.brupbacher@neel-schaffer.com]
Sent: Thursday, February 25, 2016 4:49 PM
To: Stadalis, Jeffery C CIV NAVOCEANO, N62306
Subject: [Non-DoD Source] FW: CONTRACT NO. 4400005579, H.000284 US 90: PEARL RIVER BRIDGES AND H.000286 EAST PEARL RIVER BRIDGE - East Pearl Navigation Study

Jeff,

Just a follow-up on our phone call, the navy vessels transiting the East Pearl River are not stationed at Stennis, but use the facility intermittently for training and as a safe harbor. Vertical clearances are 22’ with the antenna mast down and 28’ with the antenna mast raised.

Please clarify above if necessary.

Thanks,
Barry Brupbacher
Senior Project Manager

Neel-Schaffer, Inc.
Phone: 985.674.9820
Cell: 985-778-3105
FAX: 985.674.9822
Website: www.neel-schaffer.com<http://www.neel-schaffer.com/>

From: KNUDSEN, CHRISTOPHER M. (SSC-RA20) [mailto:christopher.m.knudsen@nasa.gov]
Sent: Thursday, February 25, 2016 12:25 PM
To: Barry Brupbacher <barry.brupbacher@neel-schaffer.com>
Subject: RE: CONTRACT NO. 4400005579, H.000284 US 90: PEARL RIVER BRIDGES AND H.000286 EAST PEARL RIVER BRIDGE - East Pearl Navigation Study

Barry,

Here's an excerpt of an email that came from NAVO "…the bridge's vertical and horizontal clearance (73' x 110') will not impede Boat Operations ability to navigate the Pearl river …". In case you need further info from NAVO the POC is:
Jeff Stadalis
Boat Operations Branch
NAVO
228-216-1273

Please let me know if you need anything else. Thanks.

Sincerely,
Chris Knudsen
National Aeronautics and Space Administration John C. Stennis Space Center Operations and Maintenance Division AST, Experimental Facility Development christopher.m.knudsen@nasa.gov<mailto:christopher.m.knudsen@nasa.gov>
228-688-2171

From: Barry Brupbacher [mailto:barry.brupbacher@neel-schaffer.com]
Sent: Thursday, February 25, 2016 10:43 AM
To: KNUDSEN, CHRISTOPHER M. (SSC-RA20)
Subject: RE: CONTRACT NO. 4400005579, H.000284 US 90: PEARL RIVER BRIDGES AND H.000286 EAST PEARL RIVER BRIDGE - East Pearl Navigation Study

Chris,

Thanks for your assistance.

Barry Brupbacher
Senior Project Manager

Neel-Schaffer, Inc.
Phone: 985.674.9820
Cell: 985-778-3105
FAX: 985.674.9822
Website: www.neel-schaffer.com<http://www.neel-schaffer.com/>

From: KNUDSEN, CHRISTOPHER M. (SSC-RA20) [mailto:christopher.m.knudsen@nasa.gov]
Sent: Thursday, February 25, 2016 10:42 AM
To: Barry Brupbacher <barry.brupbacher@neel-schaffer.com<mailto:barry.brupbacher@neel-schaffer.com>>
Cc: Mccoy, David J CIV USSOCOM NAVSOC NSWSBT22
<david.mccoy@navsoc.socom.mil<mailto:david.mccoy@navsoc.socom.mil>>
Subject: RE: CONTRACT NO. 4400005579, H.000284 US 90: PEARL RIVER BRIDGES AND H.000286 EAST PEARL RIVER BRIDGE - East Pearl Navigation Study

Barry,

Mr. David McCoy can provide you with information pertaining to the boats utilized by SBT22. I've copied him on this email so you may contact him directly. I'm still waiting on contact information for NAVO.

Sincerely,

Chris Knudsen
National Aeronautics and Space Administration John C. Stennis Space Center Operations and Maintenance Division AST, Experimental Facility Development christopher.m.knudsen@nasa.gov<mailto:christopher.m.knudsen@nasa.gov>
228-688-2171

From: Barry Brupbacher [mailto:barry.brupbacher@neel-schaffer.com]
Sent: Monday, February 22, 2016 7:48 AM
To: KNUDSEN, CHRISTOPHER M. (SSC-RA20)
Subject: RE: CONTRACT NO. 4400005579, H.000284 US 90: PEARL RIVER BRIDGES AND H.000286 EAST PEARL RIVER BRIDGE - East Pearl Navigation Study

Thanks Chris.

At this point the offset for all of the East Pearl River bridge concepts are within 150' of the existing swing span. There is one other item. Can you provide a point of contact at the Navy who would be able to provide the design clearances for their multiple navy vessels operating with the Pearl River system?

Thanks,

Barry Brupbacher
Senior Project Manager

Neel-Schaffer, Inc.
Phone: 985.674.9820
Cell: 985-778-3105
FAX: 985.674.9822
Website: www.neel-schaffer.com<http://www.neel-schaffer.com/>

From: KNUDSEN, CHRISTOPHER M. (SSC-RA20) [mailto:christopher.m.knudsen@nasa.gov]
Sent: Monday, February 22, 2016 7:36 AM
To: Barry Brupbacher <barry.brupbacher@neel-schaffer.com<mailto:barry.brupbacher@neel-schaffer.com>>
Cc: Carmouche, Gregory C. (SSC-EA20) <gregory.c.carmouche@nasa.gov<mailto:gregory.c.carmouche@nasa.gov>>; Alston, David (SSC-SACOM)[SYNCOM SPACE SERVICES] <david.alston-1@nasa.gov<mailto:david.alston-1@nasa.gov>>; Mosher, Gary W. (SSC-SACOM)[SYNCOM SPACE SERVICES] <gary.w.mosher@nasa.gov<mailto:gary.w.mosher@nasa.gov>>; Pullman, Rodrick (SSC-SACOM)[SYNCOM SPACE SERVICES] <rodrick.pullman-1@nasa.gov<mailto:rodrick.pullman-1@nasa.gov>>
Subject: RE: CONTRACT NO. 4400005579, H.000284 US 90: PEARL RIVER BRIDGES AND H.000286 EAST PEARL RIVER BRIDGE - East Pearl Navigation Study

Barry,

See responses to your questions in the email below. Please forward future correspondence to me. Let me know if you need any additional information. Thanks.

Sincerely,
Chris Knudsen
National Aeronautics and Space Administration John C. Stennis Space Center Operations and Maintenance Division AST, Experimental Facility Development christopher.m.knudsen@nasa.gov<mailto:christopher.m.knudsen@nasa.gov>
228-688-2171

From: Pullman, Rodrick (SSC-SACOM)[SYNCOM SPACE SERVICES]
Sent: Friday, February 19, 2016 12:03 PM
To: KNUDSEN, CHRISTOPHER M. (SSC-RA20)
Cc: Carmouche, Gregory C. (SSC-EA20); Alston, David (SSC-SACOM)[SYNCOM SPACE SERVICES]; Mosher, Gary W. (SSC-SACOM)[SYNCOM SPACE SERVICES]
Subject: RE: CONTRACT NO. 4400005579, H.000284 US 90: PEARL RIVER BRIDGES AND H.000286 EAST PEARL RIVER BRIDGE - East Pearl Navigation Study

Mr. Chris, this is what I've drafted for response to Barry's request listed below. Please feel free to make any changes to this response as you deem necessary.

1. The present East Pearl River Hwy 90 Bridge when it is fully open has 90' Horizontal clearance and unlimited Vertical clearance, because it is a swing bridge. This requires no disassembly of cargo. The new purposed Bridge that would be a fixed span providing vertical clearance of 73' above mean high water and 110' of horizontal clearance would meet NASA's requirements for today and purposed future.

2. If the location of new purposed bridge is within 150' of existing bridge upstream or downstream this would not pose any concerns, but if the location is greater than 150' then we would need the exact location of new bridge before we could comment on any Marine Navigation concerns that we might have.

[s3 logo]

Rocky Pullman
Heavy Equipment, Marine Operations, VEM Supervisor Bldg. 3201 o. (228)-688-3318/c.228-493-3318/c.228-304-2296
rodrick.pullman-1@nasa.gov<mailto:rodrick.pullman-1@nasa.gov>

From: Barry Brupbacher [mailto:barry.brupbacher@neel-schaffer.com]
Sent: Wednesday, January 27, 2016 4:19 PM
To: Pullman, Rodrick (SSC-JACOBS)[JACOBS TECHNOLOGY INC (SSC FOSC)]
Subject: CONTRACT NO. 4400005579, H.000284 US 90: PEARL RIVER BRIDGES AND H.000286 EAST PEARL RIVER BRIDGE - East Pearl Navigation Study

Rocky,

We are addressing a few LDOTD comments on our draft navigation reports, and I am hoping you will be able to assist in addressing the comments:

Identify whether cargo disassembly is required to pass under the current structure.

• We recognize the current movable span does not pose a vertical restriction, does the horizontal restriction on the existing structure require cargo disassembly? Would a new fixed span providing clearances of 73' above mean high water vertical and 110' horizontal pose a restriction which might require future cargo disassembly?

Channel hydrology as it may impact navigation associated with the East Pearl crossing. Please note any concerns regarding the following taking into consideration the existing span, and upstream or downstream locations of new structures:

* Waterway layout and geometry
* Waterway depth and elevation fluctuations
* River hydrology
* Channel and waterway alignment
* Natural flow of waterway including currents, water velocity, water direction and velocity fluctuations that might affect navigation
* Current speed and direction

Thanks for your participation in the project.

Barry Brupbacher
Senior Project Manager

Neel-Schaffer, Inc.
Phone: 985.674.9820
Cell: 985-778-3105
FAX: 985.674.9822
Website: www.neel-schaffer.com<http://www.neel-schaffer.com/>

Neel-Schaffer, Inc. Confidentiality Note:
Information contained in this message along with any attachment(s) may be confidential and protected by legal privilege. This message is meant solely for the use of the individual(s) to whom it is addressed. Viewing or the use of information and attachment(s) within this message without the expressed permission of Neel-Schaffer, Inc. is prohibited. If you are not the intended recipient of this message, Neel-Schaffer, Inc. requests you take immediate action to notify the sender of the error and that you delete this message and all attachments without modifying, copying or distributing its content.

Barry Brupbacher

From: Michelle Campbell <MCampbell@huvalassoc.com>
Sent: Friday, October 09, 2015 8:57 AM
To: Barry Brupbacher
Cc: Pullman, Rodrick (SSC-JACOBS)[JACOBS TECHNOLOGY INC (SSC FOSC)]; Alston, David (SSC-JACOBS)[JACOBS TECHNOLOGY INC (SSC FOSC)]; Byrd, Mary R. (SSC-RA00); Taylor, Eric S. (MSFC-AS42); Murphy, Alan W. (MSFC-AS42); Clarke, Andrew L. (SSC-RA50); Griffith, Donald R. (SSC-RA50); Carmouche, Gregory C. (SSC-RA20)
Subject: RE: Marshall (Pegasus Barge)

All,

The temporary span(s) proposed for the crossing of US 90 at the East Pearl River will meet or exceed 73' vertical navigational clearance to meet the upstream vertical navigational clearance at the I-10 crossing and allow for adequate clearance for the Pegasus and Clermont barges. The design criteria will be modified to reflect this change.

Thanks,

Michelle Campbell, E.I.
Huval & Associates, Inc.
922 West Pont Des Mouton Road
Lafayette, LA 70507
Wk: (337) 234-3798
Fax: (337) 234-2475
mcampbell@huvalassoc.com

From: Barry Brupbacher [mailto:barry.brupbacher@neel-schaffer.com]
Sent: Friday, October 09, 2015 7:26 AM
To: Michelle Campbell
Cc: Pullman, Rodrick (SSC-JACOBS)[JACOBS TECHNOLOGY INC (SSC FOSC)]; Alston, David (SSC-JACOBS)[JACOBS TECHNOLOGY INC (SSC FOSC)]; Byrd, Mary R. (SSC-RA00); Taylor, Eric S. (MSFC-AS42); Murphy, Alan W. (MSFC-AS42); Clarke, Andrew L. (SSC-RA50); Griffith, Donald R. (SSC-RA50); Carmouche, Gregory C. (SSC-RA20)
Subject: RE: Marshall (Pegasus Barge)

Michelle,

Please get with me this morning so we can revise design criteria for temporary East Pearl Span. We need to address the noted concerns.

Thanks,

Barry Brupbacher
Senior Project Manager

Neel-Schaffer, Inc.
Phone: 985.674.9820
Cell: 985-778-3105
FAX: 985.674.9822

From: Carmouche, Gregory C. (SSC-RA20) [mailto:gregory.c.carmouche@nasa.gov]
Sent: Thursday, October 08, 2015 4:20 PM
To: Barry Brupbacher <barry.brupbacher@neel-schaffer.com>
Cc: Pullman, Rodrick (SSC-JACOBS)[JACOBS TECHNOLOGY INC (SSC FOSC)] <rodrick.pullman-1@nasa.gov>; Alston, David (SSC-JACOBS)[JACOBS TECHNOLOGY INC (SSC FOSC)] <david.alston-1@nasa.gov>; Byrd, Mary R. (SSC-RA00) <mary.r.byrd@nasa.gov>; Taylor, Eric S. (MSFC-AS42) <eric.s.taylor@nasa.gov>; Murphy, Alan W. (MSFC-AS42) <alan.w.murphy@nasa.gov>; Clarke, Andrew L. (SSC-RA50) <andrew.l.clarke@nasa.gov>; Griffith, Donald R. (SSC-RA50) <donald.r.griffith@nasa.gov>
Subject: FW: Marshall (Pegasus Barge)

Barry,
Good Afternoon
In response to your email to Mr Pullman below, we performed some verification measurements on the Clermont and came up with the following:
The overall height of M/V Clermont II is as follows:

1. Height to top of Mast from the water is 62’ to 63’ depending on fuel load:
2. Height to top of upper most VHF Antennas is 67’ to 68’ depending on fuel load.

With that said, the proposal of a temporary lift span with a 60’ vertical clearance above mean high water unfortunately will not accommodate passage of the Clermont for us.
Although we have not extensively navigated the Pearl in recent years, we do consider this passageway to be what we at NASA call “Mission Critical”
If we are not able to move equipment and or the upcoming SLS stage (Space Launch System) through the Pearl using the Clermont and the Pegasus it would in no doubt impact NASA’s Mission.
If you have any questions at all please feel free give me a call and or email me.
We will try to be as accommodating as possible to your project if we can.
Regards
greg

Gregory Carmouche
NASA
Stennis Space Center
Center Operations
Center Operations Test Complex Lead Engineer
gregory.c.carmouche@nasa.gov
Cell 985 705 0483
Work 228 688 2189
Work Cell 228 342 2602

From: Pullman, Rodrick (SSC-JACOBS)[JACOBS TECHNOLOGY INC (SSC FOSC)]
Sent: Tuesday, October 06, 2015 11:25 AM
To: Carmouche, Gregory C. (SSC-RA20)
Subject: FW: Marshall (Pegasus Barge)

Greg, please see the following E-mail below.

Thank You
R. Pullman
Marine Operations Supervisor

Jacobs FOSC
Ph. 228 688-3318
Cell 228-493-3318
Cell 228-304-2096

From: Barry Brupbacher [mailto:barry.brupbacher@neel-schaffer.com]
Sent: Saturday, October 03, 2015 12:45 PM
To: Pullman, Rodrick (SSC-JACOBS)[JACOBS TECHNOLOGY INC (SSC FOSC)]
Cc: Michelle Campbell; Roy Thomas
Subject: Marshall (Pegasus Barge)

Rocky,

I am working my way through the design criteria for the US 90 bridges project. As you recall, because the existing swing span bridge is a national register eligible property, we are required to consider a rehab alternative for the existing span. If the rehab cannot be completed allowing the roadway function to continue while the rehab is performed, we will be required to consider providing a temporary movable span bridge meeting navigation requirements. My specialty movable span consultant is proposing a temporary lift span with a 60' vertical clearance above mean high water. This is 13' less than the current I-10 clearance, which is 73'. Please advise if this proposed vertical clearance would be acceptable under a temporary condition. Also can you provide a sketch showing the navigation requirements for the Pegasus Barge?

Thanking you in advance for your assistance,

Barry Brupbacher
Senior Project Manager

Neel-Schaffer, Inc.
Phone: 985.674.9820
Cell: 985-778-3105
FAX: 985.674.9822
Website: www.neel-schaffer.com

Neel-Schaffer, Inc. Confidentiality Note:
Information contained in this message along with any attachment(s) may be confidential and protected by legal privilege. This message is meant solely for the use of the individual(s) to whom it is addressed. Viewing or the use of information and attachment(s) within this message without the expressed permission of Neel-Schaffer, Inc. is prohibited. If you are not the intended recipient of this message, Neel-Schaffer, Inc. requests you take immediate action to notify the sender of the error and that you delete this message and all attachments without modifying, copying or distributing its content.

Barry Brupbacher

From: Catherine Mastin <Catherine.Mastin@LA.GOV>
Sent: Wednesday, May 22, 2019 3:13 PM
To: Barry Brupbacher
Subject: FW: H.000284 US 90 Pearl River Bridges (HBI) Navigation Requirements for NASA Stennis
Attachments: image005.emz; Pegasus Configuration.pptx

Barry,

I discussed the 180' entry with the District they agree that this must be an error of some type. Also, they confirmed that the vessel heights are bridge tender estimates.

Cathy

From: Carmouche, Gregory C. (SSC-EA20) <gregory.c.carmouche@nasa.gov>
Sent: Tuesday, May 21, 2019 9:31 AM
To: Barry Brupbacher <barry.brupbacher@neel-schaffer.com>; Ladner, Gina H. (SSC-RA32) <gina.ladner@nasa.gov>
Cc: Catherine Mastin <Catherine.Mastin@LA.GOV>; Bello, Douglas V. (SSC-SACOM)[SYNCOM SPACE SERVICES LLC - Contract] <douglas.bello@nasa.gov>; Davis, Billy S. (SSC-SACOM)[SYNCOM SPACE SERVICES LLC - Contract] <billy.s.davis@nasa.gov>; Vander, Maury A. (SSC-EA20) <maury.a.vander@nasa.gov>
Subject: RE: H.000284 US 90 Pearl River Bridges (HBI) Navigation Requirements for NASA Stennis

Good Morning Mr. Brupbacher,
I wanted to follow up with you on the following bridge tender log information at the bridge on the Pearl on HWY 90. My answers are in Blue.
Here

- September 14 & 15, 2014 Vessel G.W. Griffin 180' vertical is noted – We have no record of receiving anything at Stennis on these dates. However highly unlikely anything of that height could traverse the river.
- June 16, 2016 Space Shuttle 90' vertical is noted – (Reference the picture below). The space shuttle entry is incorrect and should have been "Saturn IV Booster". We moved the Booster from MAF to Stennis Space Center on that date. The approximate height is 35 to 40 Feet and not the 90 Feet noted in the log entry.
- December 7, 2018 Pegasus 85' vertical is noted – This entry is correct with the exception of the height, (Reference the attached PowerPoint charts). The Vertical height should have been approx. 50 Feet. Also as another important note: Our tugboat the Clermont is 60 Feet from the waterline to the top of the mast which is approx. 10 feet higher than the Pegasus.

I will follow up with you in the latter part of this week on the dates for the meeting here at SSC for both yourself and LaDOTD staff.

Best Regards
Greg



Gregory Carmouche
NASA
Stennis Space Center
Test Operations
Senior Test Director
gregory.c.carmouche@nasa.gov
Cell 985 705 0483
Work 228 688 2189
Work Cell 228 342 2602

From: Barry Brupbacher [mailto:barry.brupbacher@neel-schaffer.com]
Sent: Monday, May 20, 2019 9:42 AM
To: Carmouche, Gregory C. (SSC-EA20) <gregory.c.carmouche@nasa.gov>; Ladner, Gina H. (SSC-RA32) <gina.ladner@nasa.gov>
Cc: Catherine Mastin <catherine.mastin@la.gov>; Bello, Douglas V. (SSC-SACOM)[SYNCOM SPACE SERVICES LLC - Contract] <douglas.bello@nasa.gov>; Davis, Billy S. (SSC-SACOM)[SYNCOM SPACE SERVICES LLC - Contract] <billy.s.davis@nasa.gov>
Subject: RE: H.000284 US 90 Pearl River Bridges (HBI) Navigation Requirements for NASA Stennis

Morning Greg,

It would be very helpful to meet with you other Stennis personnel to discuss the project. The following dates work for myself and LaDOTD staff.

- Thursday May 30th
- Wed June 5th
- Wed June 12th
- Tues June 18th, 11:00 or after
- Wed June 19th

Please let us know what date/times are convenient for the meeting.

Thanks,

Barry Brupbacher
Senior Project Manager

Neel-Schaffer, Inc.
3 Sanctuary Blvd., Suite 101
Mandeville, LA 70471
Phone: 985.674.9820
FAX: 985.674.9822
Cell: 985-778-3105
Website: www.neel-schaffer.com

From: Carmouche, Gregory C. (SSC-EA20) <gregory.c.carmouche@nasa.gov>
Sent: Tuesday, May 14, 2019 1:00 PM
To: Barry Brupbacher <barry.brupbacher@neel-schaffer.com>; Ladner, Gina H. (SSC-RA32) <gina.ladner@nasa.gov>
Cc: Catherine Mastin <catherine.mastin@la.gov>; Bello, Douglas V. (SSC-SACOM)[SYNCOM SPACE SERVICES LLC - Contract] <douglas.bello@nasa.gov>; Davis, Billy S. (SSC-SACOM)[SYNCOM SPACE SERVICES LLC - Contract] <billy.s.davis@nasa.gov>
Subject: RE: H.000284 US 90 Pearl River Bridges (HBI) Navigation Requirements for NASA Stennis

Barry,
I believe all of these noted anomalous entries are associated with move of the Pegasus Barge from the MAF (NASA Michoud Facility) to Stennis Space Center and then Back from Stennis Space Center to MAF.
Just in the Last 2 Weeks we have moved the Pegasus Barge back and forth from MAF to Stennis two times.
However, I will check with our Boat Captain to check his logs on these particular days to verify the information you have requested below.
Also, I am going to extend you an offer to visit Stennis Space Center if you wish in order that you may better understand our current and future operations.
We have drawing and dimensions of the Pegasus and our Tug the Clermont which is actually taller than the Pegasus. I need to see if I can share that information with you however before I just send it to you.

We can sit down and talk specifics if you would like Sir.
Here are some pictures of the Pegasus Barge. One moving through our Locks and One as it is being docked at the B2 Test Stand





Regards

Gregory Carmouche
NASA
Stennis Space Center
Test Operations
Senior Test Director
gregory.c.carmouche@nasa.gov
Cell 985 705 0483
Work 228 688 2189
Work Cell 228 342 2602

From: Barry Brupbacher [mailto:barry.brupbacher@neel-schaffer.com]
Sent: Tuesday, May 14, 2019 10:51 AM
To: Carmouche, Gregory C. (SSC-EA20) <gregory.c.carmouche@nasa.gov>; Ladner, Gina H. (SSC-RA32) <gina.ladner@nasa.gov>
Cc: Catherine Mastin <catherine.mastin@la.gov>
Subject: H.000284 US 90 Pearl River Bridges (HBI) Navigation Requirements for NASA Stennis

Greg and Gina,

The existing East Pearl River bridge is a swing span with no vertical navigation restrictions. The existing bridge low chord in the closed position is elevation 12.2' NAVD88 which is 10.87' clearance above mean high water elevation 1.35 NAVD88. The horizontal clearance associated with the existing swing span bridge is 90 feet.

Earlier consultations with Stennis Space Center personnel and with David Frank, USCG, indicated the clearances associated with a replacement US 90 East Pearl River bridge crossing should minimally provide the clearances associated with the upriver I-10 bridge (73' vertical navigation clearance above high water and 115' horizontal clearance).

Three US 90 replacement alternatives are currently under consideration. The fixed span concept provides 73' clearance above mean high water. The mid-level movable lift span concept provides 73' elevation clearance in the open position. In the closed position the movable lift span elevation provides 25'clearance. A movable bascule span is also under consideration. The bascule span provides unlimited vertical clearance in the open position. In the closed position, the bascule span provides 25' elevation clearance. 115' horizontal clearance is provided for all bridge concepts under consideration.

PDF files presenting the bridge profile view for each of the three concepts are attached. We are asking that you review these concepts and provide comments as may be appropriate.

Also, in reviewing recent bridge tender logs associated with the operation of the existing swing span structure, we have noted three anomalous bridge opening data entries which suggest that vessels exceeding the vertical clearances as herein proposed have transited upstream of the existing East Pearl River movable span as follows:

- September 14 & 15, 2014 Vessel G.W. Griffin 180' vertical is noted
- June 16, 2016 Space Shuttle 90' vertical is noted
- December 7, 2018 Pegasus 85' vertical is noted

Vessels entering Stennis transit through a lock structure and pass through a bascule bridge integral with MS 607. Considering potential NASA documentation of all vessels entering the Stennis facility, LADOTD requests NASA assistance in the reconciliation of the above vessel transits, which appear to require navigation clearances in excess of those provided by the I-10 East Pearl River crossing.

Thanking you in advance for your assistance in this matter,

Barry Brupbacher
Senior Project Manager

Neel-Schaffer, Inc.
3 Sanctuary Blvd., Suite 101
Mandeville, LA 70471
Phone: 985.674.9820
FAX: 985.674.9822
Cell: 985-778-3105
Website: www.neel-schaffer.com

Neel-Schaffer, Inc. Confidentiality Note:
Information contained in this message along with any attachment(s) may be confidential and protected by legal privilege. This message is meant solely for the use of the individual(s) to whom it is addressed. Viewing or the use of information and attachment(s) within this message without the expressed permission of Neel-Schaffer, Inc. is prohibited. If you are not the intended recipient of this message, Neel-Schaffer, Inc. requests you take immediate action to notify the sender of the error and that you delete this message and all attachments without modifying, copying or distributing its content.

MEETING AGENDA
JUNE 12, 2019, COORDINATION MEETING WITH STENNIS
CONTRACT NO. 4400005579
H.000284 US 90 PEARL RIVER BRIDGES (HBI)

1. **Existing US 90 East Pearl River Bridge -** The existing East Pearl River bridge is a swing span with no vertical navigation restrictions. The existing bridge low chord in the closed position is elevation 12.2' NAVD88 which is 10.87' clearance above mean high water elevation 1.35 NAVD88. The horizontal clearance associated with the existing swing span bridge is 90 feet.

2. **Existing I-10 crossing of the East Pearl River** -73' vertical navigation clearance above high water and 115' horizontal clearance

3. **Navigation Clearance Associated with Pegasus Barge**

4. **Navigation Clearance Associated with US Navy**

5. **Proposed US 90 Bridge Concepts**

JUNE 12, 2019, COORDINATION MEETING WITH STENNIS
CONTRACT NO. 4400005579
H.000284 US 90 PEARL RIVER BRIDGES (HBI)

Meeting Minutes

Attending:

Representatives of NASA, the US Navy, LaDOTD and Neel-Schaffer participated in the meeting as documented on the enclosed attendance sign-n sheet.

Meeting Purpose:

LaDOTD contracted with Neel-Schaffer, Inc. to provide engineering and environmental services associated with the conceptual design of US 90 replacement bridge alternatives associated with US 90 crossings of the Pearl River system in Louisianan and Mississippi. The purpose of the meeting was to review and document the requirements for marine navigation access via the East Pearl River to the Stennis Space Center considering both NASA and US Navy operations.

1. **Existing US 90 East Pearl River Bridge -** The existing East Pearl River bridge is a swing span with no vertical navigation restrictions. The existing bridge low chord in the closed position is elevation 12.2' NAVD88 which is 10.87' clearance above mean high water elevation 1.35 NAVD88. The horizontal clearance associated with the existing swing span bridge is 90 feet.

2. **Existing I-10 crossing of the East Pearl River** -A plan and profile drawing showing the I-10 span crossing of the East Pearl River was presented. The exhibit documented 73' vertical navigation clearance above high water and 115' horizontal clearance – Discussion focused on the fact that the original structure provided a removable main span, which was later replaced by MDOT. The bridge now functions as a fixed span structure meeting the horizontal and vertical navigation requirements as shown on the exhibit.

3. **Proposed US 90 Bridge Concepts –** Neel-Schaffer presented plan-profile drawings showing both the fixed span and movable replacement span concepts. The proposed replacement concepts provide the same minimal clearances (73' vertical navigation clearance above high water and 115' horizontal clearance) as the existing I-10 span. NASA representatives requested copies of the drawings and LaDOTD agreed that Neel-Schaffer would send pdf files of the drawings to NASA clearly marked as review drafts.

4. **Navigation Clearance Associated with Pegasus Barge and Clermont II Tug –** Greg Carmouche with NASA provided exhibits documenting the navigation requirements of both the Pegasus Barge and the Clermont II tug. Copies of the exhibits are attached. As shown on the outboard profile drawing the tugs vertical clearance requirement is 60'3". **Greg indicated NASA would re-measure the vessel to confirm the vessel dimensions.**

NASA preference is that there be 10' clearance between its vessel and the bottom of the bridge structure. NASA indicated that the navigation clearances associated with the proposed US 90 replacement bridge concepts would meet NASA's current and planned navigation access requirement via the East Pearl River.

5. **Navigation Clearance Associated with US Navy –** Mike Dossett SBT-22 represented the US Navy at the meeting. The Navy operations routinely transit the East Pearl in small boat training exercises. The training vessels currently must lower antenna packages to transit under the existing swing span bridge. Both the fixed span replacement bridge concept with 73' vertical clearance and the movable span replacement bridge concepts with 25' vertical clearance at the navigation channel, support more flued navy operations within the river.

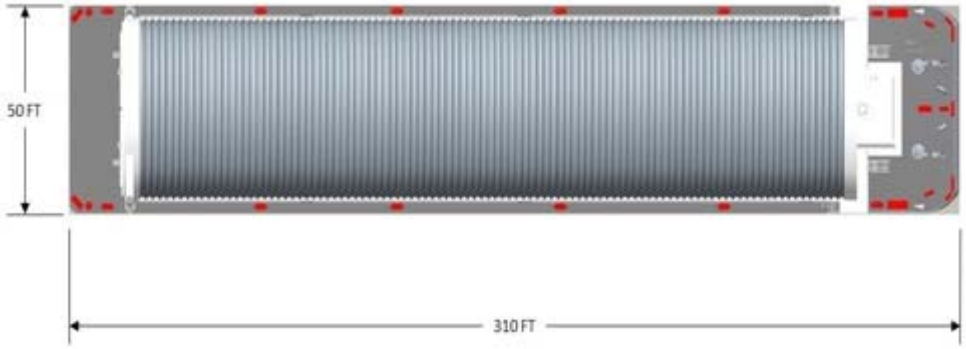
6. **Other Items of Discussion** – There was a discussion about construction activities associated with the potential bridge replacement. NASA was concerned that there may be closures of the river to navigation during future construction. NASA requested that any such closure be brief (a day or two, not weeks) and that the closures be scheduled in coordination with NASA. LaDOTD suggested that the Environmental Documents would include a commitment to work with NASA and the US Navy on the scheduling of any closures of the river to navigation during construction. Also, permitting of such closures would be under USCG jurisdiction purview.

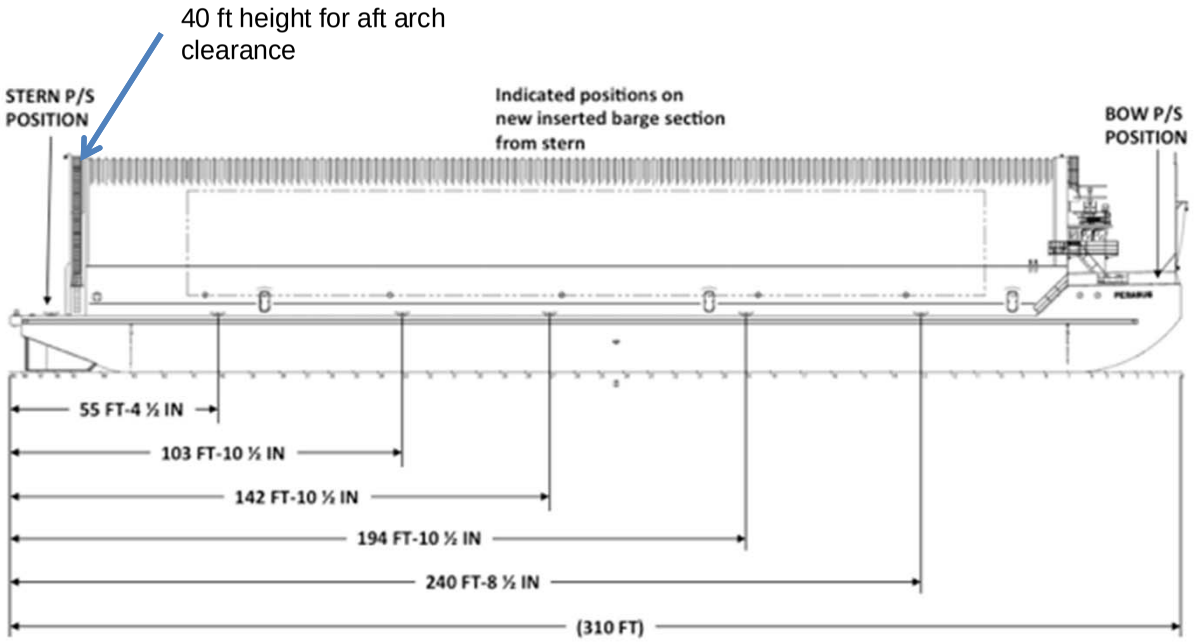
ATTENDANCE RECORD
JUNE 12, 2019, COORDINATION MEETING WITH STENNIS
CONTRACT NO. 4400005579
H.000284 US 90 PEARL RIVER BRIDGES (HBI)
ROUTE US 90
ST. TAMMANY PARISH

Name	Representing	Phone	Email
Catherine Mastin	LaDOTD	(225) 379-1652	Catherine.Mastin@la.gov
Stacie Palmer	LaDOTD Environmental	(225) 242-4517	stacie.palmer@la.gov
Andrew Michael	LaDOTD Bridge Design	225-379-1062	andrew.michael@la.gov
Mathilda Rilovich	LaDOTD	225-379-1380	Mathilda.Rilovich@LA.GOV
Gregory Carmouche		228 688 2189	gregory.c.carmouche@nasa.gov
Gina Ladner	NASA RA32	2286881450	gina.ladner@nasa.gov
Douglas Bello			douglas.bello@nasa.gov
Billy Davis			billy.s.davis@nasa.gov
Mike Dossett	SBT-22 / US NAVY	(228) 813-4000	robert.dossett@socom.mil
Barry Brupbacher	Neel-Schaffer	(985) 674-9820	barry.brupbacher@neel-schaffer.com
Dishili Young	Neel-Schaffer	(225) 614-2816	dishili.young@neel-schaffer.com
Teresa Perry	NASA	228 688 1492	Teresa.t.perry@nasa.gov
ANDREW "BO" CLARKE	NASA RA-01	228-688-1645	ANDREW.L.CLARKE@NASA.GOV
Craig Chandler	NASA RA-32	228-688-3223	Craig.A.Chandler@NASA.GOV
Thom Rich	NASA RA 31	228-688 3946	thomas.m.rich@nasa.gov
Scott Olive	NASA RA 31	228-688-2578	Scott.M.Olive@NASA.GOV
GREG CARMOUCHE	NASA RA20	228-688-2189	gregory.c.carmouche@nasa.gov
Billy S DAVIS	S3	228-688-2455	Billy.S.Davis@nasa.gov
Ray Nichols	NASA EA30	228-688-1731	raymond.c.nichols@nasa.gov

Pegasus Configuration

- **Length: 310 ft, Width: 50 ft**
- **Height: 57 ft – 10 in (tallest structure from keel)**
- **Draft: 8 ft (nominal draft)**
- **Minimum depth requested for barge operations: 12 ft during docking operations at KSC, SSC and MAF; 10 ft during transit.**
- **Dock width required is 34 ft 1 in for cargo path**
- **Tie-off Locations are below.**



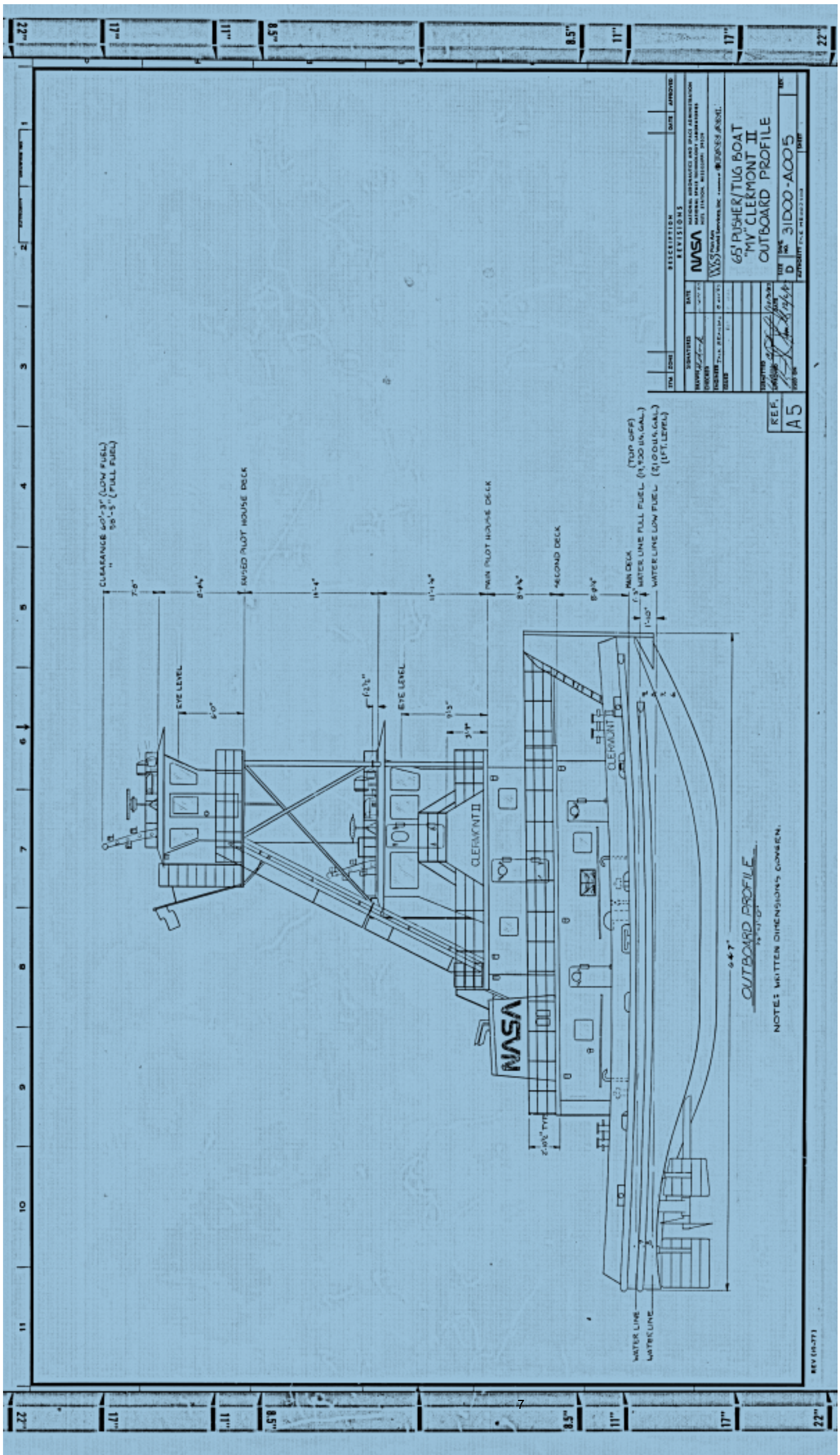


Highest point will be 57'-10" above the keel at the top of the lights above the canopy. At 10' Draft barge will have 47'-10" Clearance above waterline. This provides for a 16'-2" clearance margin between the top of Pegasus and the bottom of the bridge span (65' lowest nominal bridge height on Pearl).

Pegasus from MAF to SSC Final river levels/bridge clearances

- Final river levels/bridge clearances will be assessed/monitored before and during the trip to assure adequate clearances or need for increasing draft. Nominally, the Gulf Intracoastal Waterway, Rigolets Waterway, Little Lake, Pearl River has worst case vertical clearance of 65'. Highest point of the Pegasus will be 57'-10" above the keel at the top of the lights above the canopy. At 10' Draft barge will have 47'-10" Clearance above waterline. This provides for a **16'-2" clearance margin between the top of Pegasus and the bottom of the bridge span.**

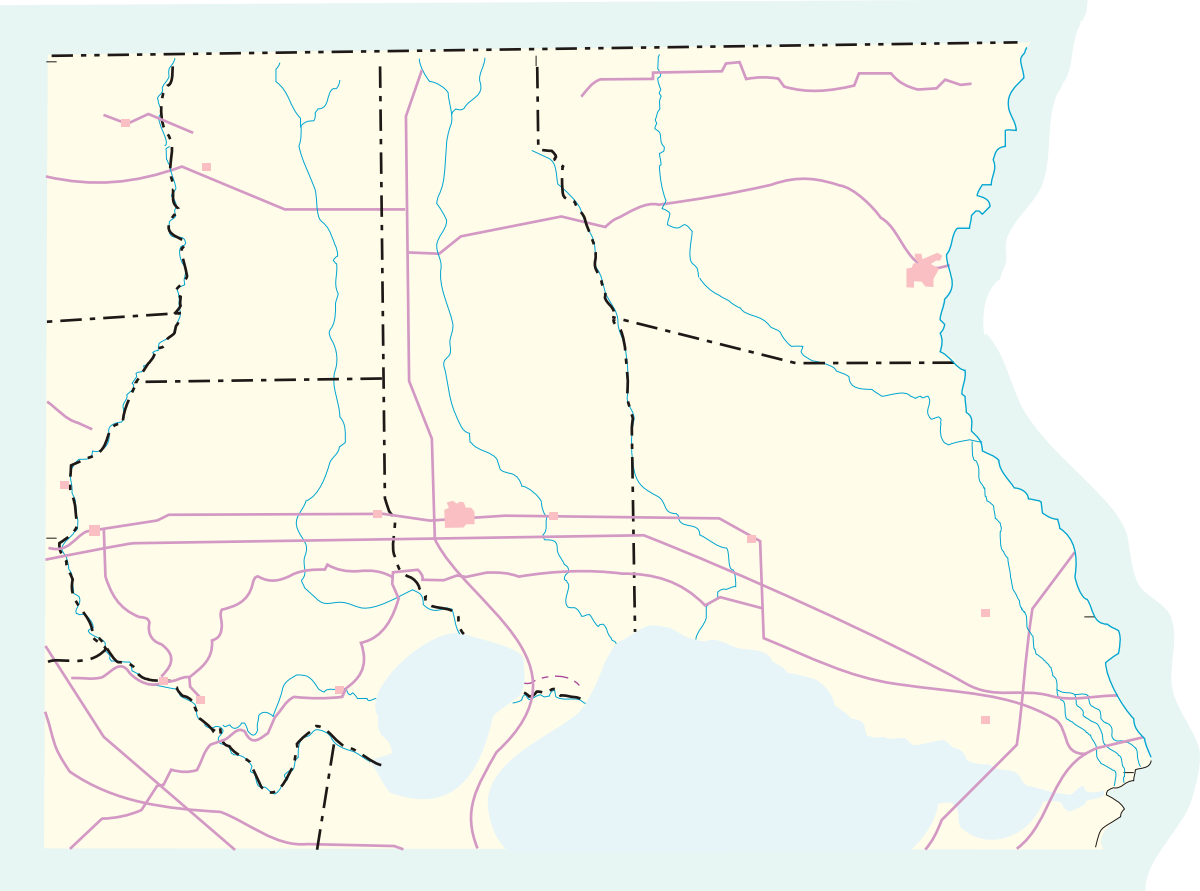
Clermont II Profile				
	feet		inches	
	7	feet	8	inches
	8	feet	0.25	inches
	14	feet	4	inches
	11	feet	1.25	inches
	8	feet	0.25	inches
	8	feet	0.25	inches
	1	feet	3	inches
	1	feet	10	inches
Total Height	**58**	**feet**	**27**	**inches**
27 inches =	2	feet	3	inches
Conversion Total Height	**60**	**feet**	**3**	**inches**



Appendix C
East Pearl River
Excerpts of the 1999 Report Estimation of Scour and Channel Stability for Selected Highway Crossings of Rivers in the Florida Parishes, Southeastern Louisiana

Estimation of Scour and Channel Stability for Selected Highway Crossings of Rivers in the Florida Parishes, Southeastern Louisiana

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
Water Resources Technical Report No. 67B



STATE OF LOUISIANA
DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
PUBLIC WORKS AND FLOOD CONTROL DIRECTORATE
WATER RESOURCES SECTION
in cooperation with the
U.S. GEOLOGICAL SURVEY

1999

USGS
science for a changing world

Pearl River near Slidell, Louisiana

The opening for the Pearl River in the U.S. Hwy. 90 embankment (fig. 36) is the eastern-most bridge opening for the Pearl River system. The Pearl River has no substantial tributaries or distributaries in the reach between the I-10 embankment and the U.S. Hwy. 90 embankment. The bridge is located downstream of a mild curve to the right and upstream of a mild curve to the left.

Pier Scour

Simulation of the Q_{500} indicated velocities ranging from approximately 2 to 8 ft/s and a water-surface elevation of approximately 6 ft above sea level at the bridge. The piers located at DOTD stations 516+55 and 518+00 have timber fenders protecting the piers from river traffic (table 19). The bridge and piers cross the channel at an angle slightly greater than 15 degrees; the correction factor for alignment, K_2, was specified as 1.5 except for piers adjacent to the fenders. The presence of the fender structures may also have an effect of reducing pier scour at that location (Abed and Richardson, 1993). These fenders may tend to align the flow with the pile bents; therefore, the correction factor for angle of attack was specified as 1.0. The greatest scour occurs at the main channel pier at DOTD station 516+55 where the predicted pier scour is 33 ft. (table 19, fig. 37). Scour at the four other main piers that are in or near the channel ranged from 9 to 24 ft. Estimated scour depth at the overbank piers was approximately 1.3 ft.



Photograph source: Louisiana Department of Transportation and Development, December 1971

Figure 36. Aerial photograph of the U.S. Highway 90 crossing of the Pearl River near Slidell, Louisiana.

Table 19. Scour data for U.S. Highway 90 crossing of the Pearl River near Slidell, Louisiana

[DOTD, Louisiana Department of Transportation and Development; water-surface elevation is 6.0 feet above sea level; K_2, dimensionless correction factor for angle of flow attack; ft, feet; ft/s, foot per second; pile tip elevations scaled from DOTD bridge plans; NA, not applicable]

DOTD station	Ground elevation (ft above sea level)	Pier shape	K_2	Pier width (ft)	Velocity (ft/s)	Local or pier scour (ft)	Contraction scour (ft)	Scour elevation (ft above sea level)	Pile tip elevation (ft above sea level)
511+70	1.0	Abutment	NA	NA	NA	NA	1.3	0	-24
512+00	1.0	Square	1.5	1.5	2.5	3.8	1.3	-4	-24
512+30	1.0	Square	1.5	1.5	2.5	3.8	1.3	-4	-24
512+60	1.0	Square	1.5	1.5	2.5	3.8	1.3	-4	-24
512+90	1.0	Square	1.5	1.5	2.5	3.8	1.3	-4	-24
513+10	1.0	Square	1.5	1.5	2.5	3.8	1.3	-4	-24
513+40	1.0	Square	1.5	1.5	2.5	3.8	1.3	-4	-24
513+70	0	Round	1.5	6.0	3.0	10.2	1.3	-12	-52
515+10	-30.0	Round	1.5	8.0	7.8	24.0	0.3	-54	-56
516+55	-25.0	Round	1.0	28.0	6.7	33.0	.3	-58	-56
518+00	-20.0	Round	1.0	8.0	2.7	9.6	.3	-30	-56
519+40	0	Round	1.5	6.0	2.7	9.8	.3	-10	-54
519+70	1.0	Square	1.5	1.5	1.9	3.3	1.3	-4	-24
519+90	1.0	Square	1.5	1.5	1.9	3.3	1.3	-4	-24
520+25	1.0	Square	1.5	1.5	1.9	3.3	1.3	-4	-24
520+50	1.0	Square	1.5	1.5	1.9	3.3	1.3	-4	-24
520+80	1.0	Square	1.5	1.5	1.9	3.3	1.3	-4	-24
521+10	1.0	Square	1.5	1.5	1.9	3.3	1.3	-4	-24
521+40	1.0	Abutment	NA	NA	NA	NA	1.3	0	-24

Channel Stability

The left edge of the floodplain is approximately 1,000 ft from the left edge of the low water channel. To the right of the right edge of the low water channel lies the majority of the floodplain with the other named channels. The cross-section information at the bridge does not indicate any lateral movement of the channel. Lowering of the channel-bed elevation by 5 to 10 ft is indicated by comparison of the 1932 (pre-construction) cross section and the 1980 (post construction) cross section. No significant change in the channel bed is indicated by comparison of the 1980 and 1994 cross sections.

Contraction and Abutment Scour

Flow through the bridge was subdivided into flow in the main channel, left overbank, and right overbank. The average depth of the channel at the bridge is approximately 25 ft for the main channel and 5 ft for the overbanks. The width of the main channel at the opening is 572 ft. Contraction scour in the main channel was computed as less than one foot. Scour on the left and right overbanks was estimated as 1.3 ft. The overbanks are vegetated with marsh grasses which may provide some resistance to scouring.

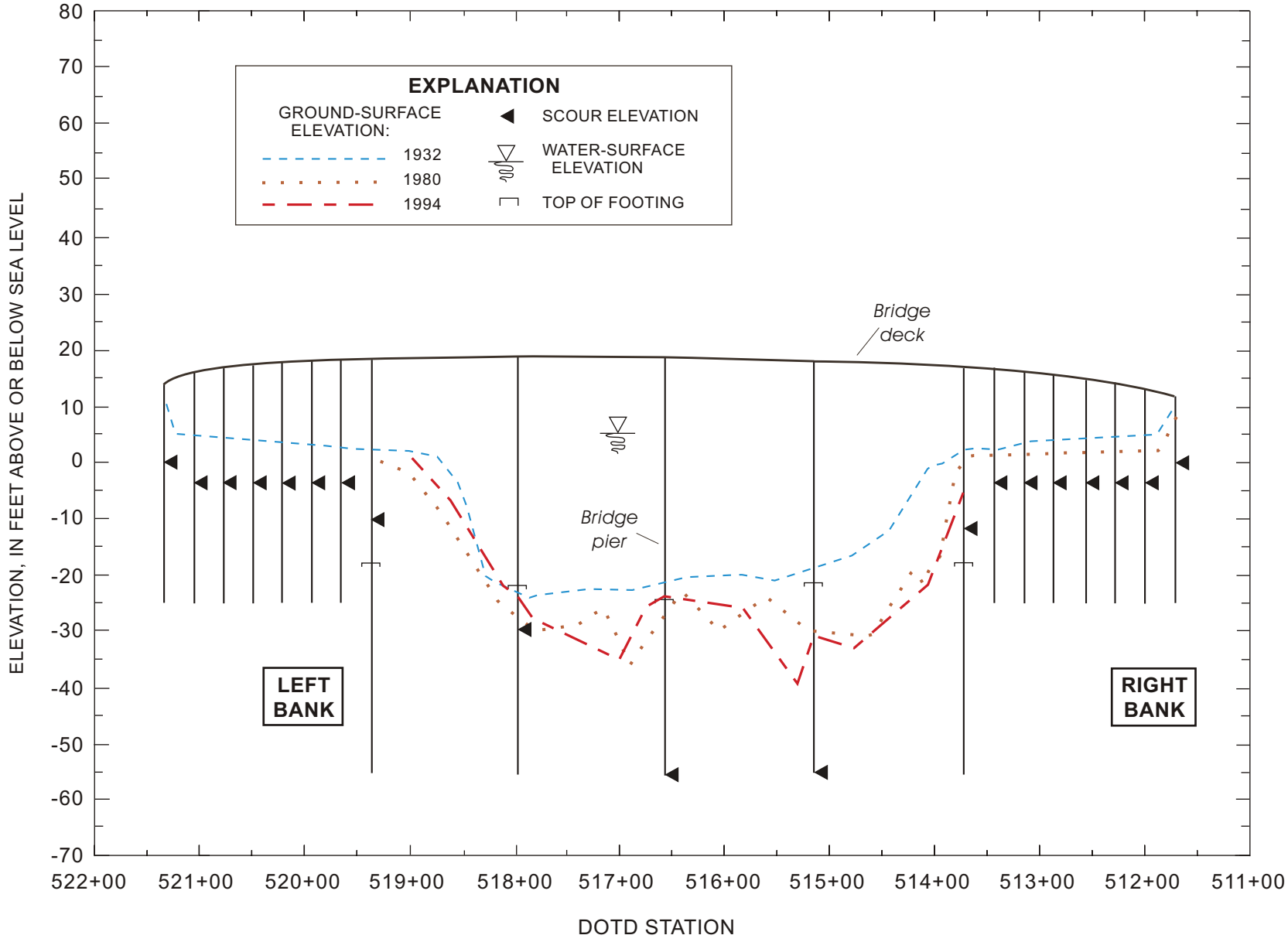


Figure 37. Comparative cross sections and scour estimates at the U.S. Highway 90 crossing of the Pearl River near Slidell, Louisiana.

Appendix D
East Pearl River
Photographs of Upstream and Downstream Approaches

EastPearl River

Upstream Approach



Downstream Approach



Appendix E
East Pearl River
Bridge Tender Logs Year 2013 – 2018
Provided on Enclosed CD

U.S. Department of Homeland Security
United States Coast Guard

Commander
Eighth Coast Guard District
Hale Boggs Federal Building

500 Poydras Street
New Orleans, LA 70130-3310
Staff Symbol: (dpb)
Phone: (504) 671-2128
Fax: (504) 671-2133
Email: D8dpball@uscg.mil

16590
October 17, 2019

Louisiana Department of Transportation and Development
Attn: Ms. Noel Ardoin
1201 Capitol Access Road
Baton Rouge, LA 70802

Dear Ms. Ardoin:

We have reviewed the information you provided us on September 9, 2019 concerning the replacement of 5 bridges that span the U.S. 90 highway across the several Pearl Rivers located in St. Tammany Parish, Louisiana. In your letter you asked the Coast Guard to review the navigation studies associated with each bridge and provide you with preliminary navigation determinations on each proposed replacement bridge. Table 1 summarizes your proposals. All vertical clearances are referenced to NAVD88 datum.

Table 1. Summary of Bridge Clearances and Preliminary Navigation Determinations

Waterway	Proposed Structure	Proposed Vertical Clearance above MHW	Proposed Horizontal Clearance
West Pearl River	Fixed or drawbridge	Fixed - 50' Draw – 50' in the open to vessel position	90'
West Middle Pearl River	Fixed	11.16'	60'
Middle Middle Pearl River	Fixed	11.88'	60'
East Middle Pearl River	Fixed	11.96'	60'
East Pearl River	Fixed or drawbridge	73'	115'

The clearances for all of the bridges would meet the reasonable needs of navigation and the alignments and locations of the new bridges do not appear to present hazards to navigation. The Coast Guard may require that the clearances proposed in this navigation study be revalidated if there is a lengthy period of time between the date of this study and the date of the actual bridge permit application.

You indicated that you might build moveable bridges at the West Pearl River and East Pearl River locations. Your study provided vertical clearances for both moveable bridges in the closed to vessel position. The Coast Guard has no comment on these clearances. Each bridge must provide the clearances contained in Table 1 while in the open to vessel position.

Your study mentioned building temporary bridges during construction. These temporary bridges are an important aspect to obtaining a Coast Guard bridge permit. These waterways are used by

vessels as harbors of safe refuge during hurricanes. Any closure of these rivers due to bridge construction during hurricane season would need to be approved by the Coast Guard prior to the closure. US 90 is also used as a land evacuation route during adverse weather and emergencies. LADOTD should coordinate bridge construction with the appropriate agencies responsible for land evacuations.

Please contact me or Donna Gagliano if you need additional information.

Sincerely,

Doug Blakemore

DOUG BLAKEMORE
Chief, Bridge Administration Branch
U.S. Coast Guard
By direction of the District Commander

Copy: CG Sector New Orleans

LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

Office of Engineering
Environmental Section
PO Box 94245 | Baton Rouge, LA 70804-9245
ph: 225-242-4502 fx: 225-242-4500

John Bel Edwards, Governor
Shawn D. Wilson, Ph.D., Secretary

June 14, 2022

STATE PROJECT NOS.: H.000284/H.000286
F.A.P. NOS.: H.000284/H.000286
PROJECT NAME: US 90 PEARL RIVER BRIDGES (HBI)
BRIDGE RECALL NOS.: 058710, 058720, 058730, 058740, 058750
ROUTE: US 90
LOCATION: ST. TAMMANY PARISH, LA & HANCOCK COUNTY, MS

Mr. Doug Blakemore
Commander, Eighth Coast Guard District (dpb)
Hale Boggs Federal Building
500 Poydras St.
New Orleans, LA 70130-3310

Via E-mail to: D8DPBALL@uscg.mil

SUBJECT: Request West Pearl Bridge (Recall # 058710) Reduced Vertical Navigational Clearance

Dear Mr. Blakemore,

The Louisiana Department of Transportation and Development (LADOTD) in cooperation with the Mississippi Department of Transportation (MDOT) and the Federal Highway Administration (FHWA) are proposing to replace/rehabilitate five historic bridges along US 90 between Slidell, Louisiana and Pearlington, Mississippi (Map 1).

The West Pearl River is designated as a Scenic Stream and is within the Pearl River Wildlife Management Area. The West Pearl River Bridge is eligible for the National Register of Historic Places (NRHP). The Section 106 Programmatic Agreement for Treatment of Louisiana Historic Bridges (PA) designated the West Pearl River Bridge as a Preservation Candidate. In accordance with the stipulations of the PA it was determined, through analysis and consultation with SHPO that rehabilitation of the bridge was not a prudent and feasible alternative. SHPO concurred with recommendation for replacement of the West Pearl River Bridge (see attached SHPO letters dated September 27, 2017 and June 20, 2019).

On September 9, 2019 our office sent the Navigational Impact Reports for these bridges and a request for a preliminary navigation determination (see enclosed letter). A summary is presented in the table below (see Table 1).

Table 1. Summary of Bridge Clearances and Preliminary Navigation Determinations

Waterway	Proposed Structure	Proposed Vertical Clearance above MHW (NAVD88 datum)	Proposed Horizontal Clearance
West Pearl River	Fixed or drawbridge	Fixed – 50' Draw – 50' in the open position	90'
West Middle Pearl River	Fixed	11.16'	60'
Middle Middle Pearl River	Fixed	11.88'	60'
East Middle Pearl River	Fixed	11.96'	60'
East Pearl River	Fixed or drawbridge	73'	115'

Your office responded on October 17, 2019 (see enclosed letter) stating that the clearances for all the bridges would meet the reasonable needs of navigation and the alignments and locations of the new bridges do not appear to present hazards to navigation.

Currently LADOTD in cooperation with MDOTD and FHWA is proposing a fixed span bridge as the preferred alternative for both the West Pearl Bridge (Recall # 058710) and the East Pearl River Bridge (Recall # 058750).

After a review of the upstream waterway constraints of the West Pearl River Bridge (Recall # 058710) crossing and as mentioned in Section 1.8 of the *Navigation Study – US 90 Crossing of the West Pearl River* (see enclosed report pg 12); LADOTD is seeking to reduce the vertical clearance from 50' to 35' above MHW and to maintain the proposed 90' horizontal clearance of the West Pearl River Bridge (Recall # 058710). A 35' vertical clearance matches the vertical clearance provided by the I-10 crossing approximately 5 miles upstream (see enclosed permit) and the I-59 crossing approximately 11.6 miles upstream respectively (Map 2).

Previously proposed (see Table 1) bridge clearances and preliminary navigation determinations for the West Middle Pearl River Bridge (Recall # 058720), Middle Middle Pearl River Bridge (Recall # 058730), East Middle Pearl River Bridge (Recall # 058740) and the East Pearl River Bridge (Recall # 058750) have not changed.

LADOTD is requesting your review and concurrence of a reduced 35' vertical clearance for the West Pearl River Bridge (Recall # 058710) (Table 2).

Table 2. West Pearl River Bridge (Recall # 058710) Proposed Clearance

Waterway	Proposed Structure	Proposed Vertical Clearance above MHW (NAVD88 datum)	Proposed Horizontal Clearance
West Pearl River	Fixed	35'	90'

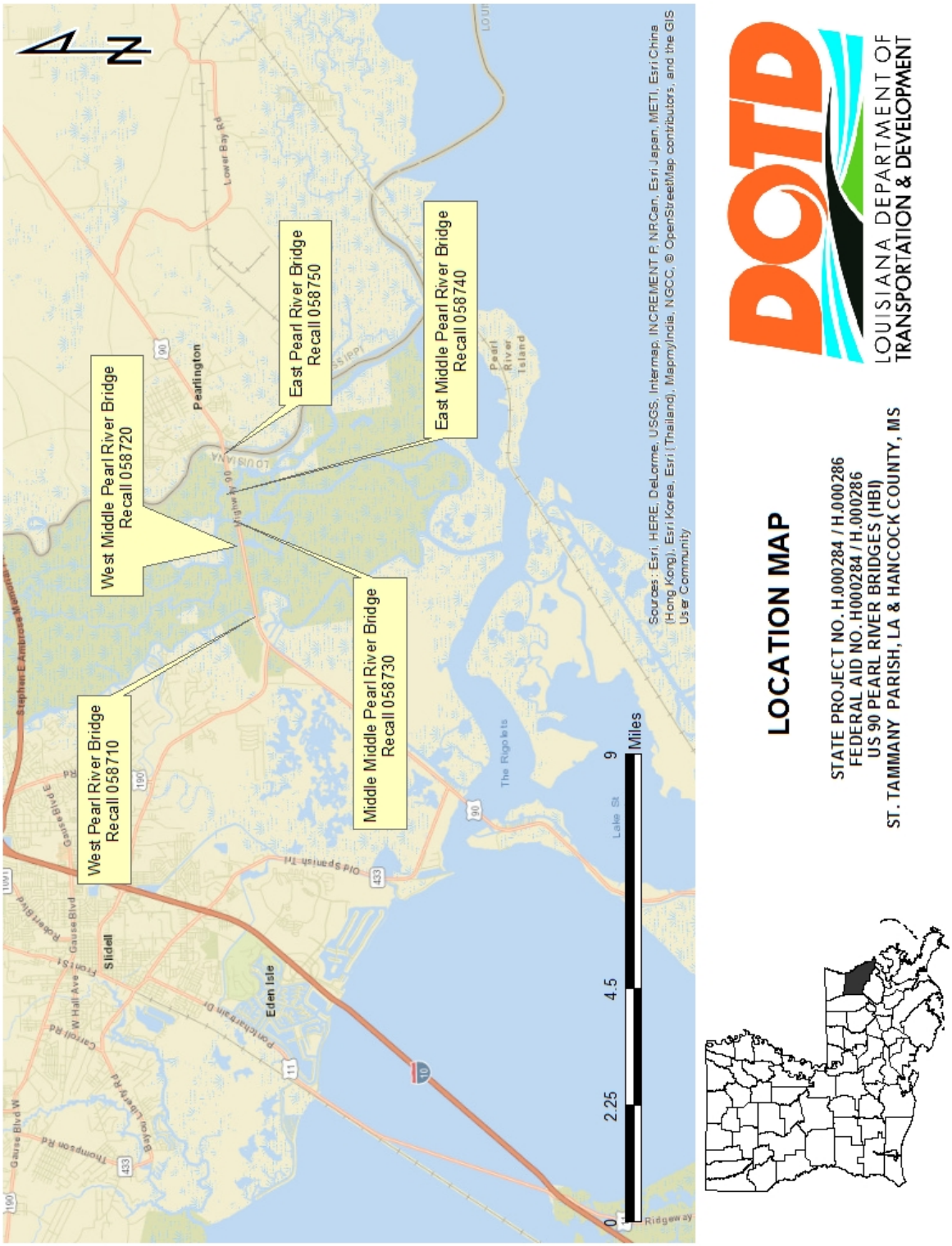
If you have any questions regarding this request or the associated documents please contact Stacie Palmer at (225) 242-4517 or stacie.palmer@la.gov.

Sincerely,

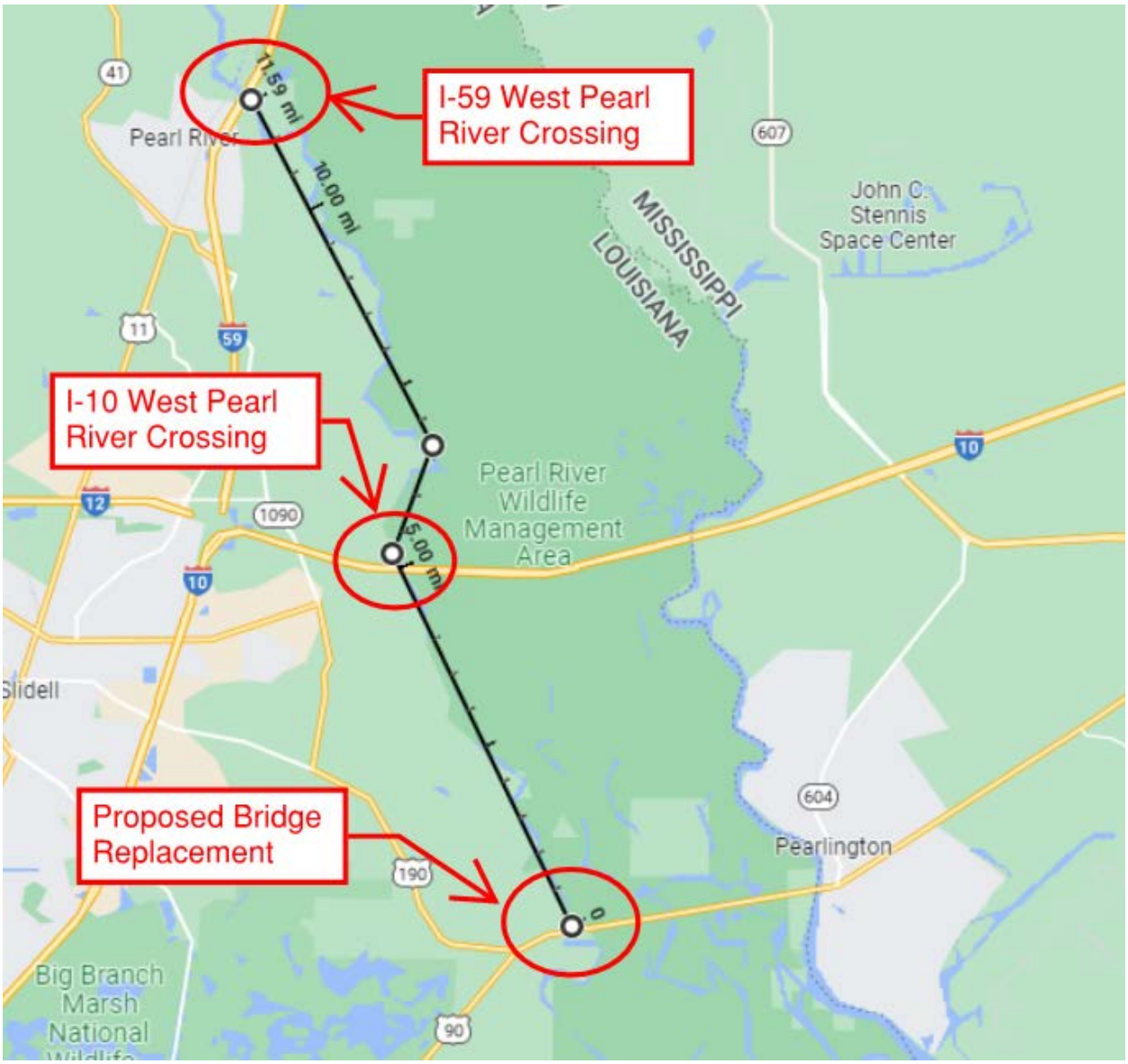
for Noel Ardoin
Environmental Engineer Administrator

Enclosures
NA/sp

cc: Ryan Morvant, LADOTD
Robert Mahoney FHWA
Jerry Pitts FHWA
Robert Lott, LADOTD



Map 1: Proposed Project Area



Map 2: West Pearl River Bridge and upstream river crossings at I-10 and I-59.

BILLY NUNGESSER
LIEUTENANT GOVERNOR

State of Louisiana
OFFICE OF THE LIEUTENANT GOVERNOR
DEPARTMENT OF CULTURE, RECREATION & TOURISM
OFFICE OF CULTURAL DEVELOPMENT

BILL CODY
DEPUTY SECRETARY

September 27, 2017

Noel Ardoin
Environmental Engineer Administrator
Environmental Section
LA DOTD
P O Box 94245
Baton Rouge, La 70804

Re: State Project No.: H.000284
Name: US 90 Pearl River Bridges (HBI)
Route: US 90
Structure #/Recall #: 62520060705291/058710 & 6250060707701/058740
West Pearl River Bridge & East Middle Pearl River Bridge (Preservation Candidates)
Parish: St. Tammany

Dear Ms. Ardoin:

Thank you for your letter of August 2, 2017, notifying our office that LADOTD in conjunction with the Federal Highway Administration is recommending replacement of the above-referenced bridges. As you are aware, these bridges serve as an important connector for U.S. 90 over the Pearl River along with three other bridges in close proximity. Two of the four bridges have been determined non-priority bridges (which will be replaced without consultation as determined by the Bridge PA) and one additional bridge is a border bridge. The two bridges referenced above are candidate bridges that are now also being considered for replacement. We are concerned that all of these bridges will be lost. Of the two bridges addressed in your letter, we would like to focus on the East Middle Pearl River Bridge. We have no issue with DOTD/FHWA replacing the West Pearl River Bridge.

A meeting with your staff would be appreciated to discuss the alternative analysis and other information provided for the East Middle Pearl River Bridge. We would like clarification, to understand why it is not prudent & feasible to retain and maintain this bridge in some form, per alternatives provided.

Please contact Nicole Hobson-Morris in our Division of Historic Preservation at 225-342-8172 or by email at nmorris@crt.la.gov to set up a meeting and/or with questions.

Sincerely,

Kristin P. Sanders

Kristin Sanders,
Deputy State Historic Preservation Officer

BILLY NUNGESSER
LIEUTENANT GOVERNOR

State of Louisiana
OFFICE OF THE LIEUTENANT GOVERNOR
DEPARTMENT OF CULTURE, RECREATION & TOURISM
OFFICE OF CULTURAL DEVELOPMENT

RICHARD H. HARTLEY
DEPUTY SECRETARY

KRISTIN P. SANDERS
ASSISTANT SECRETARY

June 20, 2019

Noel Ardoin
Environmental Engineer Administrator
Louisiana Department of Transportation and Development
Environmental Section
PO Box 94245
Baton Rouge, LA 70804

Re: **Section 106 Programmatic Agreement for the Treatment of Louisiana Historic Bridges (HBPA) Preservation Candidate Bridge East Middle Pearl**

Ms. Ardoin:

Thank you for your letter dated May 21, 2019 requesting concurrence on your recommendation to replace the East Middle Pearl River Bridge, a preservation candidate bridge, and to market the bridge as per the HBPA-VII (C) (3), page 12. We concur with the recommendation based on the additional information provided to our office at the November 17th meeting referenced in your letter, and included in the updated alternative analyses matrix.

If you have questions, please contact Andrea McCarthy at 225-342-8164 or by email at amccarthy@crt.la.gov.

Sincerely,

Kristin Sanders
State Historic Preservation Officer

LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

Office of Engineering
Environmental Section
PO Box 94245 | Baton Rouge, LA 70804-9245
ph: 225-242-4501 fx: 225-242-4500

John Bel Edwards, Governor
Shawn D. Wilson, Ph.D., Secretary

September 9, 2019

STATE PROJECT NOS.: H.000284/H.000286
F.A.P. NOS.: H.000284/H.000286
PROJECT NAME: US 90 PEARL RIVER BRIDGES (HBI)
BRIDGE RECALL NOS.: 0587500, 058710, 0587200, 058730, 058740
ROUTE: US 90
LOCATION: ST. TAMMANY PARISH, LA & HANCOCK COUNTY, MS

Mr. Doug Blakemore
Commander, Eighth Coast Guard District (dpb)
Hale Boggs Federal Building
500 Poydras St.
New Orleans, LA 70130-3310

Via E-mail to: D8DPBALL@uscg.mil

SUBJECT: Preliminarily Navigation Determination

Dear Mr. Blakemore,

The Louisiana Department of Transportation and Development (LADOTD) in cooperation with the Mississippi Department of Transportation (MDOT) and the Federal Highway Administration (FHWA) are proposing to replace/rehabilitate five historic bridges along US 90 between Slidell, Louisiana and Pearlington, Mississippi (see attached map). All bridges have been determined eligible for the National Register of Historic Places. Enclosed for you review are the Navigational Impact Reports for the five bridges. We are requesting a preliminary navigation determination on these bridges.

All structures (described below) are within a tidal zone. The East Pearl River Bridge (Recall # 058750) and West Pearl River Bridge (Recall # 058710) locations are utilized by vessels greater that 21-feet in length. The West Middle Pearl Bridge (Recall # 0587200), Middle Middle Pearl River Bridge (Recall # 058730), and the East Middle Pearl River Bridge (Recall # 058740) are located within the Pearl River Wildlife Management Area (WMA). Vessel traffic within the WMA includes recreational boating, fishing, and other small vessels. All bridge crossing are considered navigable waterways and will require permitting.

- **West Pearl River Bridge** – Recall number 058710
  River Mile Location – 7.9
  - Existing clearances
    - Horizontal – 90'
    - Vertical

- Open – 50' above MHW
- Closed – 10' above MHW

- Proposed clearances - maintain or exceed current horizontal and vertical clearances
  - Fixed replacement alternative
    - Horizontal – 90'
    - Vertical – 50'
  - Moveable replacement alternative
    - Horizontal – 90'
    - Vertical
      - Open
        - Bascule option – Unrestricted
        - Lift option Open – 50' above MHW
      - Closed – 19' above MHW

- **West Middle Pearl River Bridge** – Recall number 058720
  River Mile Location – 10.00 miles from mouth of Indian Village
  - Existing clearances
    - Horizontal – 60'
    - Vertical – 10' above MHW
  - Proposed clearances - maintain or exceed current horizontal and vertical clearances
    - Horizontal - 60'
    - Vertical – 11.16' above MHW

- **Middle Middle Pearl River Bridge** - Recall number 058730
  River Mile Location – 10.00 miles from mouth of Indian Village
  - Existing clearances
    - Horizontal – 60'
    - Vertical – 10' above MHW
  - Proposed clearances - maintain or exceed current horizontal and vertical clearances
    - Horizontal - 60'
    - Vertical – 11.88' above MHW

- **East Middle Pearl River Bridge** - Recall number 058740
  River Mile Location – 10.00 miles from mouth near Pearlington, MS
  - Existing clearances
    - Horizontal – 60'
    - Vertical – 10' above MHW
  - Proposed clearances - maintain or exceed current horizontal and vertical clearances
    - Horizontal - 60'
    - Vertical – 11.96' above MHW

- **East Pearl River Bridge** - Recall number 058750
  River Mile Location – 8.8 miles
  - Existing clearances
    - Horizontal – 90'
    - Vertical
      - Open – Unrestricted
      - Closed – 10' above MHW
  - Proposed clearances
    - Mid-level moveable alternative (passes 80% of vessels)
      - Horizontal 115' – match I-10
      - Vertical
        - Closed – bascule & lift option – 25' above MHW
        - Open –
          - Bascule option - unrestricted
          - Lift option – 73' above MHW – match I-10
    - High level fixed alternative
      - Horizontal 115' – match I-10
      - Vertical – 73' above MHW – match I-10

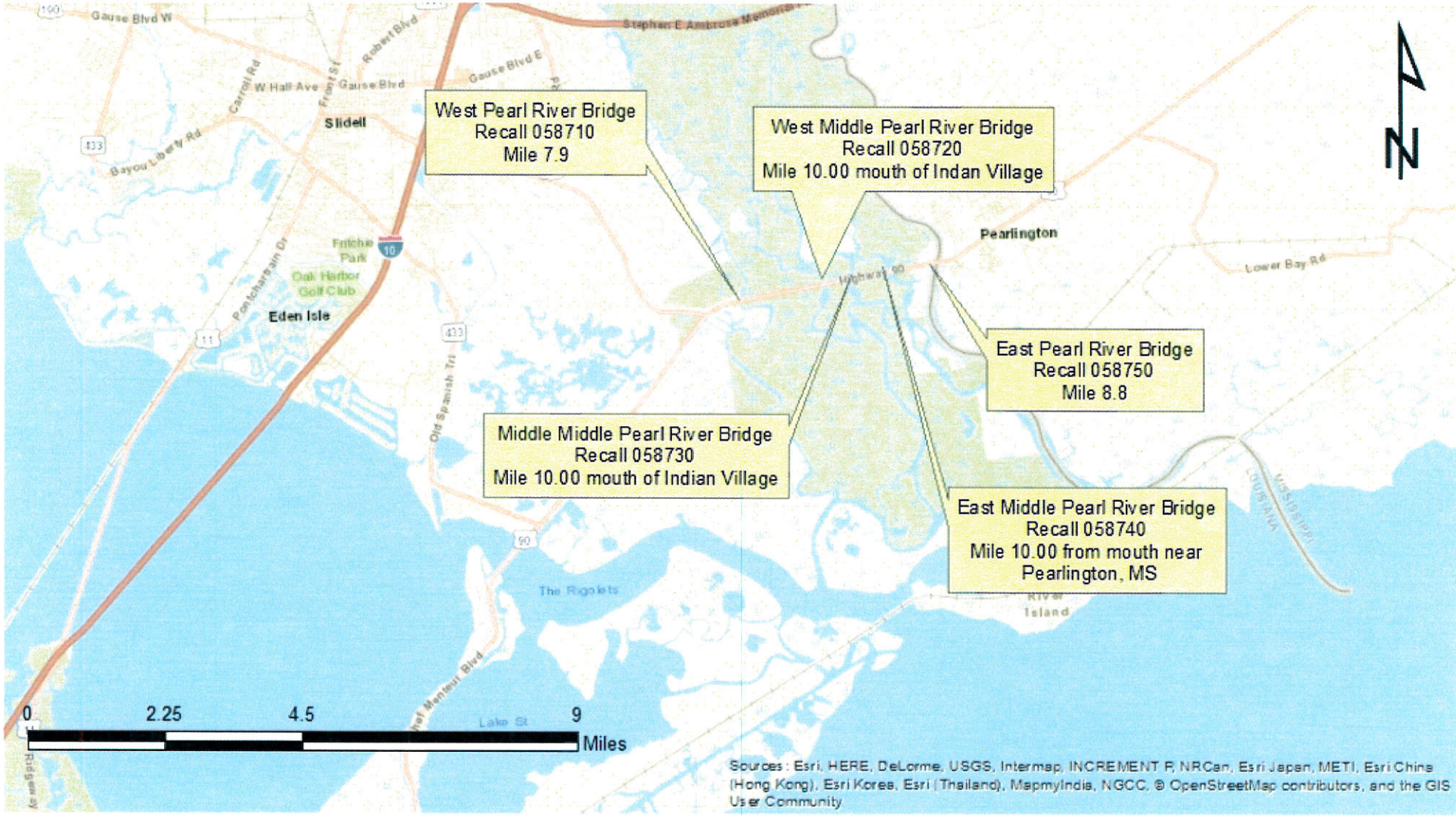
If you have any questions regarding this request or the associated documents please contact Stacie Palmer at (225) 242-4517 or Stacie.palmer@la.gov.

Sincerely,

Noel Ardoin
Environmental Engineer Administrator

Attachment
NA/sp

cc: Catherine Mastin
Robert Mahoney FHWA
Traci Johnson





LOCATION MAP

STATE PROJECT NO. H.000284 / H.000286
FEDERAL AID NO. H000284 / H.000286
US 90 PEARL RIVER BRIDGES (HBI)
ST. TAMMANY PARISH, LA & HANCOCK COUNTY, MS

DOTD
LOUISIANA DEPARTMENT OF
TRANSPORTATION & DEVELOPMENT

U.S. Department of Homeland Security
United States Coast Guard

Commander
Eighth Coast Guard District
Hale Boggs Federal Building

500 Poydras Street
New Orleans, LA 70130-3310
Staff Symbol: (dpb)
Phone: (504) 671-2128
Fax: (504) 671-2133
Email: D8dpball@uscg.mil

16590
October 17, 2019

Louisiana Department of Transportation and Development
Attn: Ms. Noel Ardoin
1201 Capitol Access Road
Baton Rouge, LA 70802

Dear Ms. Ardoin:

We have reviewed the information you provided us on September 9, 2019 concerning the replacement of 5 bridges that span the U.S. 90 highway across the several Pearl Rivers located in St. Tammany Parish, Louisiana. In your letter you asked the Coast Guard to review the navigation studies associated with each bridge and provide you with preliminary navigation determinations on each proposed replacement bridge. Table 1 summarizes your proposals. All vertical clearances are referenced to NAVD88 datum.

Table 1. Summary of Bridge Clearances and Preliminary Navigation Determinations

Waterway	Proposed Structure	Proposed Vertical Clearance above MHW	Proposed Horizontal Clearance
West Pearl River	Fixed or drawbridge	Fixed - 50' Draw – 50' in the open to vessel position	90'
West Middle Pearl River	Fixed	11.16'	60'
Middle Middle Pearl River	Fixed	11.88'	60'
East Middle Pearl River	Fixed	11.96'	60'
East Pearl River	Fixed or drawbridge	73'	115'

The clearances for all of the bridges would meet the reasonable needs of navigation and the alignments and locations of the new bridges do not appear to present hazards to navigation. The Coast Guard may require that the clearances proposed in this navigation study be revalidated if there is a lengthy period of time between the date of this study and the date of the actual bridge permit application.

You indicated that you might build moveable bridges at the West Pearl River and East Pearl River locations. Your study provided vertical clearances for both moveable bridges in the closed to vessel position. The Coast Guard has no comment on these clearances. Each bridge must provide the clearances contained in Table 1 while in the open to vessel position.

Your study mentioned building temporary bridges during construction. These temporary bridges are an important aspect to obtaining a Coast Guard bridge permit. These waterways are used by

vessels as harbors of safe refuge during hurricanes. Any closure of these rivers due to bridge construction during hurricane season would need to be approved by the Coast Guard prior to the closure. US 90 is also used as a land evacuation route during adverse weather and emergencies. LADOTD should coordinate bridge construction with the appropriate agencies responsible for land evacuations.

Please contact me or Donna Gagliano if you need additional information.

Sincerely,

Doug Blakemore

DOUG BLAKEMORE
Chief, Bridge Administration Branch
U.S. Coast Guard
By direction of the District Commander

Copy: CG Sector New Orleans

Navigation Study
US 90 Crossing of the WEST PEARL RIVER

US 90 Pearl River Bridges
Environmental Assessment
St. Tammany Parish, LA and Hancock County, MS

STATE PROJECT NO. H.000284 & NO. H.000286
FEDERAL AID PROJECT NO. H000284 & NO. H000286



USCG Draft Navigation Impact Report

DOTD
LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

U.S. Department of Transportation
Federal Highway Administration

July 2019

Table of Contents

		Page
Section 1.0	Navigation Study – US 90 Crossing the West Pearl River	1
1.1	Introduction	1
1.2	Project Purpose and Need	3
1.3	Reference Datum Conversion	3
1.4	Floodplain Consideration	3
1.5	Navigation Clearance above Mean High Water	3
1.6	Establishment of the Planning Elevation	4
1.7	Current Navigational Usage	6
1.8	Recommended Clearances associated with Replacement US 90 Bridge Crossing of the West Pearl River	11
1.9	Environmental Assessment Alternatives	13
1.10	Proposed Bridge's Impacts to Existing and Potential Navigation	27
1.11	Consideration of River Hydrology in the Siting and Design for a Replacement Structure	28

Tables

Table 1	Summary of Datum Conversion Elevations	5
Table 2	Summary of West Pearl River Bridge Tender Report July 2010 – July 2011	7
Table 3	Distribution of Flows within the Pearl River Watershed	29

Figures

Figure 1	Study Area	2
Figure 2	Land Use and Zoning	9
Figure 3	Cross-section of West Pearl River	30

Engineering Plates

Fixed Span Alternative Plan View, Plates 1-3	14-16
Fixed Span Alternative Profile Views, Plates 1	17
Movable Span Alternative Plan View, Plates 1-2	19-21
Movable Span Alternative Profile Views, Plate 1	22
Single-Level Trunion Bascule Bridge Concept, Plates 1-2	23-24
Vertical Lift Bridge Concept, Plates 1-2	25-26

Appendix

Appendix A	Appendix A, Documentation of Email Correspondence with the USACE, Vicksburg District Regarding West Pearl River Navigation	31
Appendix B	West Pearl River, Excerpts of the 1999 Report Estimation of Scour and Channel Stability for Selected Highway Crossings of Rivers in the Florida Parishes, Southeastern Louisiana	32
Appendix C	Photographs of Upstream/Downstream Approaches	33
Appendix D	2013-2018 Navigation Logs	34

1.0 Navigation Study - US 90 Crossing of the West Pearl River

1.1 Introduction

The Louisiana Department of Transportation and Development (LADOTD) is preparing planning and environmental documents for the improvement of five bridge structures associated with the Pearl River system along US Highway 90 (US 90). The enclosed Study Area map, Figure 1, shows the limits of the project. The project limits extend along US 90 from US 190 in Louisiana to the US 90 intersection with Kelly Road / 7th Avenue in Pearlington, Mississippi. The existing roadway is a two lane rural arterial roadway (RA-2) with 12-foot travel lanes and 8-foot paved shoulders. Average Daily Traffic is approximately 3,000 vehicles per day.

Five bridges associated with the Pearl River system are crossed as follows:

- Structure no. 62520060705291, West Pearl River Bridge, Movable Lift Span
- Structure no. 62520060706701, West Middle Pearl River Bridge
- Structure no. 62520060707111, Middle Middle Pearl River Bridge
- Structure no. 62520060707701, East Middle Pearl River Bridge
- Structure no. 62520060800001, East Pearl River Bridge, Movable Swing Span

This Navigational Study assesses the current and anticipated future use of the Pearl River, and investigates the required clearances for the proposed bridge replacement alternatives.

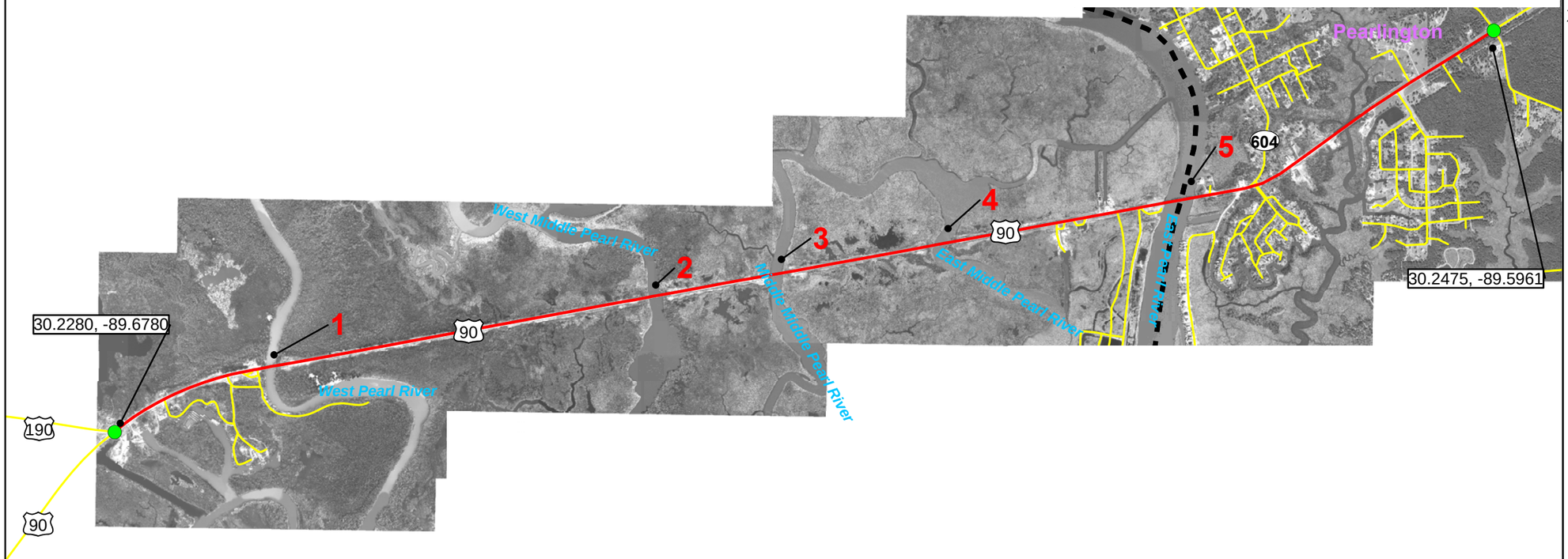
US 90 Bridge across West Pearl River
Structure Number: 62520060705291
Recall Number: 058710

The US 90 bridge across the West Pearl River was built in 1933. The structure is 24' wide, 570' long and consists of 14 reinforced concrete deck girder approach spans, 2 steel truss tower anchor spans and 1 steel truss lift span in the main navigation span. The main span must be elevated to allow passage of vessels taller than 10'. The maximum vertical clearance for vessel navigation with the main span in the raised position is 50'.

The horizontal bridge roadway width (24') and vertical clearance (15') do not meet the minimum requirements for a RA roadway. The 2017 LADOTD minimum design guidelines state that the preferable bridge width is equal to the approach travel lanes (24') and the shoulder width (8'). The bridge does not have shoulders. This bridge is classified as a "Preservation Candidate" as determined under the August 18, 2015 Programmatic Agreement (PA) regarding historic bridges

Map No.	Structure Number	Structure Type	Water Body Crossing
1	62520060705291	Movable: Lift-Span	West Pearl River
2	62520060706701	Pony Truss - Warren Truss	West Middle Pearl River
3	62520060707111	Pony Truss - Warren Truss	Middle Middle Pearl River
4	62520060707701	Pony Truss - Warren Truss	East Middle Pearl River
5	62520060800001	Movable: Swing - Through Truss (Parker Truss)	East Pearl River

NOTE: Logical Termini are the intersections of US 90 with US 190 and Kelly Rd/7th Ave and latitude and longitude data are in decimal format



Source (Citation) for 2010 six inch pixel imagery Parish Mosaics

This imagery was provided by the Louisiana Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP) as the sole source owner, and is shared with Louisiana state government agencies in the interest of good government practices.

Reproduction and distribution of the data is prohibited. Please refer any requests for data to the Deputy Director for Management, Finance and Interoperability of GOHSEP. This imagery was distributed by the Regional Planning Commission for Jefferson, Orleans, Plaquemines, St. Bernard and St. Tammany Parishes (RPC) with permission from GOHSEP.

GOHSEP and the RPC are not responsible for any errors arising from any use of alterations made to the data. Under no circumstances is resale or distribution of the data permitted.

Mosaics were produced and compressed by the Louisiana State University Coastal Studies Institute.

Imagery Information: The red, green, blue (true color) and near infrared four-band aerial imagery was captured between February 10th and April 1st of 2010 (re-flights for any corrections flown until April 28th, 2010) by Sanborn Map Company, Inc.

The imagery is projected to UTM 15 NAD 83; unit of measure is meters.
The spatial resolution is approximately a six inch pixel.
Any use of the data must be accompanied with this citation and accompanying seals and logos embedded within.

Prepared By: Neel-Schaffer, Inc.

Figure 1

Study Area

Legend

- Logical Termini
- Project Limits
- Roadway Network
- LA/MS State Boundary Line
- XX.XXX, XX.XXX Latitude, Longitude

N

1,500 750 0 1,500 Feet

H.000284 US 90: PEARL RIVER BRIDGES AND H.000286 EAST PEARL RIVER BRIDGE
ROUTE US 90
ST. TAMMANY PARISH, LA

Prepared For:

DOTD
LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

in Louisiana. The horizontal navigation clearance is 90'.

The mechanical system for the vertical lift bridge is in good condition due to continued upkeep and maintenance. For rehabilitation purposes, lubrication and painting will be required. The wire rope system is in poor condition and will need replacement. The electrical components of the vertical lift span will need complete replacement as they are in poor condition and are dated. The bridge barriers appear to be in good condition and do not need to be replaced.

1.2 Project Purpose and Need

The purposes of the proposed action, which have been approved by the Federal Highway Administration (FHWA), are:

- To maintain a system link, in the event of an incident on I-10.
- To improve the structural integrity and functionality of the bridges.
- To support hurricane evacuations

1.3 Reference Datum Conversion

Permit and as-built drawings for the US 90 bridges over the five Pearl River crossings show elevations in Mean Gulf Level (MGL), a commonly used hydrographic datum at that time. A topographic survey was performed by LADOTD survey crew in December 2015 to establish a reference bridge elevation point for each of the bridges. The reference datum allows for conversion of as-built drawing elevation to existing NAVD88 datum in feet.

1.4 Floodplain Consideration

LADOTD guidance for bridge replacements is to locate a replacement structure at not less than the 100-year floodplain plus 1 foot. The 100-year flood elevations have been determined to be significantly higher than the elevation of the existing roadway between all of the bridge sites. Based on the 2008 Preliminary Flood Insurance Rating Map (FIRM), the 100-year floodplain elevation at the US 90 crossing of the West Pearl River is elevation 18.13 NAVD88. The low chord elevation of the replacement West Pearl River Bridge using floodplain guidance is elevation 19.13 converted to NAVD88.

Additionally, LADOTD provided storm surge and wave height estimates for each bridge location. The storm surge plus wave action plus one foot elevation for the West Pearl River bridge is 10.86 NAVD88.

1.5 Navigation Clearance above Mean High Water

The United States Coast Guard (USCG) utilizes the National Oceanic and Atmospheric Administration (NOAA) derived determinations for Mean High Water

(MHW) datum to establish vertical navigation clearances for bridges. In the United States, MHW is the average of all the high water heights observed over a period of 19 years (for the East and West Pearl Rivers, 1983-2001) and is referred to as the National Tidal Datum Epoch.

NOAA determined mean high water is elevation 1.35 NAVD88 for the West Pearl River.

1.6 Establishment of the Planning Elevation for the Five Bridges

Table 1 summarizes the results of a datum conversion process undertaken to rectify the elevations provided by varying sources using differing datum to NAVD88. All elevations hereafter referenced are shown in NAVD88. The West Pearl River bridge was constructed with a low chord elevation of 12.20 feet NAVD88. The FEMA DFIRM condition controls the design elevations for the West and East Pearl Rivers. The proposed West Pearl River bridge low chord elevation using the 100-year DFIRM plus one foot criteria for the fixed span components of the movable span alternatives exceeds the existing low chord elevation by 6.93 feet.

Detailed notes on datum conversions are included below. Only two benchmarks at the West Pearl River bridge were recovered in the project area for this analysis. Assuming the rivers are hydraulically connected, the conversions for the West Pearl River were applied to the other four rivers.

Table 1: Summary of Datum Conversion Elevations

		West Pearl	West Middle Pearl	Middle Middle Pearl	East Middle Pearl	East Pearl
Existing Elevations (NAVD88) - see notes below for datum conversion						
	Mean High Water [1,2,3]	1.35	1.35	1.35	1.35	1.35
	Existing Low Chord [6]	12.20	11.37	11.37	11.37	12.22
	Clearance above Mean High Water	10.85	10.02	10.02	10.02	10.87
Design Considerations (NAVD88) - controlling condition in bold						
1	Storm Surge + Wave Height + 1 foot [4,5]	10.86	**12.51**	**13.23**	**13.31**	12.60
2	100-year + 1 foot [7]	**19.13**	20.13	21.14	21.14	**18.14**
3	Mean High Water (1.35) + Suggested Clearance (10') [1,3,8]	11.35	11.35	11.35	11.35	11.35

Source: Neel-Schaffer, Inc.

Datum Conversion Notes:

1. Per NOAA website, at West Pearl River Station the Mean High Water elevation is 3.841 meters (12.60 feet) below benchmark 141.

2. Per NOAA website, at West Pearl River Station the Mean High Water elevation is 1.413 meters (4.64 feet) below benchmark 1294 A 1980.

3. Therefore, Mean High Water elevation in NAVD88 is 13.95 - 12.60 = 1.35 using benchmark 141. Benchmark 1294 A 1980 yields similar results to within 0.05 feet. Use 1.35 as elevation of Mean High Water in NAVD88.

4. Per NOAA website, using Station Datum, Mean Sea Level is 0.28' below Mean High Water. Therefore, Mean Sea Level in NAVD88 is 1.35 - 0.28 = 1.07.

5. DOTD provided storm surge in elevations of Mean Sea Level. To convert to NAVD88, need to add 1.07 to elevations in MSL (assuming MSL elevations were provided for the W. Pearl River station).

6. DOTD-provided as-builts showing estimated bottom chord elevations of 12.83 for the West Pearl, 12.00 for the three Middle Rivers, and 12.85 for the East Pearl. No datum is specified. Finished road elevation is 14.08 at the location of Benchmark 141 (13.95 NAVD88). The benchmark is on the curb, so add 6" (14.08 + 0.50 = 14.58). Therefore, as an estimate, subtract 0.63' from as-built elevations to convert to NAVD88.

7. 100-year flood elevations were taken from the St. Tammany Parish DFIRM maps. The elevations from the map were in NGVD29, and were processed though the NGS VertCon program to obtain NAVD88 elevations. The difference in elevations ranged from 0.125 to 0.144 feet.

8. USCG–provided permit drawings show a clearance of 10.0 feet from mean high water. This agrees with the clearances calculated in the existing conditions; therefore, 10.0 feet clearance is suggested in this design condition as well.

1.7 Current Navigational Usage

This section discusses the existing navigational usage of West Pearl River impacted by the bridge replacement project. The discussion will include existing users, vessel trip frequency, and potential impact to business owners.

Channel Status

The West Pearl River Navigation Project was authorized by the River and Harbor Act of 1935. Construction was completed in 1956. The project initially provided a navigation channel from the mouth of the West Pearl River to the vicinity of Bogalusa, a distance of approximately 58 miles. The 7-foot deep channel had a bottom width of 100 feet in the river sections and 80 feet in the lateral canal sections. Three locks with inside dimensions of 54 feet by 310 feet and two sills controlled water levels.

Commercial navigation on the West Pearl River declined to the extent that maintenance of the channel dimensions could not be economically justified. The last dredging to accommodate commercial traffic was in 1973, and use of the waterway to Bogalusa is now limited to recreational traffic.

In 1995, the West Pearl River Navigation Project was placed in a caretaker status. The United States Army Corps of Engineers (USACE) was directed by Congress to use limited funds to maintain the Project in this status.

Appendix A presents documentation of email correspondence with the Vicksburg District regarding West Pearl River navigation. The USACE indicates that, except for maintenance associated with continued lock operations, there is no maintenance (dredging) performed on any section of the River, and there is none planned.

Existing Commercial Users

Figure 2 shows the land use and zoning abutting the Pearl River system in Louisiana and Mississippi. Except for out parcels as shown on Figure 2, the area between the West Pearl River and the East Pearl River is owned and managed by the Pearl River Wildlife Management Area, part of the Louisiana Department of Wildlife and Fisheries. Except for parcels as noted in Figure 2, St. Tammany Parish zoning along the West Pearl River is for residential purposes.

Table 2 provides a summary of Bridge Tender logs for a representative 1-year period. The navigation logs for 2013-2018 are included as Appendix D.

Table 2
Summary of West Pearl River - Tender Reports
Documenting Bridge Openings
July 2010 - July 2011

Date	Time Open	Time Closed	Direction	Height	Vessel
Jul. 20, 2010	745	755	N	25	Old Blue (Buddy Temple) - trawler
Jul. 30, 2010					MAINTENANCE OPENING
Aug. 1, 2010	905	915	S	25	Old Blue Shrimp Boat
Sep. 15, 2010	1105	1115	N	25	Old Blue Shrimp Boat
Sep. 16, 2010	705	715	S	25	Old Blue Shrimp Boat
Oct. 15, 2010					MAINTENANCE OPENING
Nov. 20, 2010					MAINTENANCE OPENING
Dec. 3, 2010	920	935	N	30	Small barge with backhoe (Pearl River Navigation Co.)
Jan. 11, 2011	840	850	N	15	Splash Madison yacht
Jan. 11, 2011	1020	1030	S	15	Splash Madison yacht
Feb. 3, 2011	1000	1010	S	20	Barge with backhoe
Mar. 16, 2011	919	929	S	15	Houseboat
Mar. 30, 2011					MAINTENANCE OPENING
Apr. 1, 2011	655	710	N	15	Houseboat
Apr. 25, 2011					MAINTENANCE OPENING
May 30, 2011					MAINTENANCE OPENING
Jun. 15, 2011	1515	1525	S	25	Blue Dog Shrimp Boat
Jun. 16, 2011	1600	1610	N	25	Blue Dog Shrimp Boat
Jul. 1, 2011	735	745	S	25	Blue Dog Shrimp Boat

Source: Neel-Schaffer, Inc.

The following commercial users of the West Pearl River were identified from bridge tender logs and communications with local businesses:

- Durwood Dunn Construction
- Pearl River Eco-tours
- Cajun Encounters Tours

Durwood Dunn Construction has a laydown yard along Camp Road with canal access to the West Pearl for barge storage. However, per the company, the River is too shallow upstream of the US 90 bridge for their vessels. They have no need to cross under the bridge and do not foresee a future scenario in which they would.

Pearl River Eco-tours has canal access to the West Pearl River south of US 90. Cajun Encounters Eco-tours operates from west of the West Pearl River, and launches tours of various sizes from both sides of the US 90 bridge. Both companies utilize the entire Pearl River system. The vessels used in the eco-tour businesses are longer than 21 feet and the larger vessels accommodate up to 25 persons. The vessels require a vertical navigation clearance of 8 feet.

Review of annual cargo movements

There is no cargo transported along the West Pearl River. Consequently, there is no cargo requiring disassembly to pass under the current structure.

Projected changes in waterway usage based upon anticipated waterway improvement projects

None.

Impact to vessel owners that would be precluded from transiting the waterway if a proposed bridge project is authorized

Two bridge concepts are under consideration, a fixed span structure providing 50’ vertical clearance above MHW and movable span concepts providing 50’ vertical navigation clearance in the position open for navigation.

For the movable span concepts, utilizing 100-year floodplain plus 1-foot elevation as shown in Table 1, the low chord of the bridge above the navigation channel will be set at elevation 19.3’ or higher. This elevation is at least 6.93 feet higher than the low chord elevation of the existing bridge. Therefore, none of the current vessels that use this waterway would be impacted. The increase in navigation clearance may support the use of larger vessels by the eco-tour businesses.

NOTE: Logical Termini are the intersections of US 90 with US 190 and Kelly Rd/7th Ave and latitude and longitude data are in decimal format

Stennis Space Center

Port Bienville

30.2745, -89.5961

30.2280, -89.6780

1 2 3 4 5

N

Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

Legend

- Logical Termini
- Pearl River Bridges
- Project Limits
- XX.XXX, XX.XXX Latitude, Longitude
- Stennis Buffer Zone

Zoning Classification

- Suburban (A-1 thru A-3)
- Residental (A-4 thru A-8, MD-1)
- Animal Training Housing
- Public/Community/Recreational (WMA)
- Education (Primary and Secondary)
- Commercial/Service
- Industrial
- Neighborhood Institutional
- Planned Unit Development (PUD)

Figure 2
Land Use and Zoning

8,000 4,000 0 8,000 Feet

H.000284 US 90: PEARL RIVER BRIDGES AND
H.000286 EAST PEARL RIVER BRIDGE
ROUTE US 90
ST. TAMMANY PARISH, LA

Prepared For:

DOTD
LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

Prepared By: Neel-Schaffer, Inc.

Upstream and Downstream Clearances

The existing US 90 lift span structure provides a 50-foot vertical clearance above mean high water and a 90-foot horizontal navigation channel. The existing low chord elevation is 12.20 feet NAVD88.

Overhead transmission lines cross the West Pearl River in three locations between the US 90 bridge and the I-10 bridge. From North to South:

- Entergy owns a transmission line crossing just south of I-10. The clearance of the power lines exceeds the clearance of the I-10 bridge.
- Washington-St. Tammany Electric Cooperative (WSTE) owns a line crossing at the Indian Village subdivision, where a line crosses the River to camps on the east bank. This crossing consists of a 60 foot pole on the west bank and a 70 foot pole on the east bank.
- WSTE also owns a crossing at US 90, and consists of 80 foot poles on both sides of the River.

The I-10 bridge provides vertical clearance of 35 feet above high water and a horizontal clearance of 106 feet. The 1-59 bridge also provides a 35 foot vertical clearance above high water, and a 135 foot horizontal clearance is provided.

There is a Norfolk Southern rail crossing of the West Pearl immediately upstream of I-59. The bridge originally was a swing span structure. However there has been change in permit status converting the Norfolk Southern swing span rail crossing of the West Pearl to a fixed span. The new permit allows the structure to operate as a fixed span structure with vertical clearance set at 7 feet above mean high water, elevation 16.27 NGVD 29.

Downstream of the US 90 bridge, the West Pearl River flows into the Rigolets waterway. There is a CSX Transportation swing span bridge situated within the Rigolets channel with unrestricted vertical clearance and a horizontal clearance of 153 feet. The bridge provides access to the Intracoastal Waterway.

Design Vessel

A query was made to the River Operations Branch, Operations Division, Vicksburg District, USACE to provide documentation regarding the West Pearl River Navigation Project design vessel. The USACE did not respond to this request.

Specific Vessel Transit

There is no planned levee maintenance, bridge work, channel maintenance, or emergency operations upstream of the US 90 bridge that requires certain vessels to transit the waterway. However, unless advised to the contrary by the USACE, planning for the bridge should consider navigation as may be required in support of future upstream channel maintenance or dredging.

Current "governing limitation" for navigation on the waterway

There are no downstream structures or power lines governing navigation on the waterway. The current bridge is the most restrictive structure from the Gulf of Mexico to US 90.

Upstream of the US 90 bridge, the I-10 and I-59 structures limit vertical navigation to 35’ clearance above high water. Also, there has been change in permit status converting the Norfolk Southern swing span rail crossing of the West Pearl (just upstream of I-59) to a fixed span. The lock system supporting the Pearl River Navigation upstream of I-59 limits navigation to 65-foot horizontal clearance.

What is the most restrictive horizontal clearance on the waterway? This may be bridge piers on another bridge downstream, it may be a navigational lock, it may be a man-made channel, it may be the actual width of the narrowest portion of the waterway.

The most restrictive horizontal clearance is the natural narrowing of the waterway upstream from the existing West Pearl River bridge. For navigation within the Pearl River Navigation Project locks, the 65-foot lock width is the limiting horizontal clearance.

Historic Vessel Collision Information

The National Transportation Safety Board issues a Marine Accident Report following each investigation. These reports are available online for reports issued since 1996. The reports listing is sortable by the event date, report date, city, and state at the following website.

http://www.ntsb.gov/investigations/AccidentReports/Pages/marine.aspx

The website was searched March 31, 2016, sorted by state. The Louisiana incident reports were reviewed and there were no reports associated with marine incidents on the West Pearl River.

1.8 Recommended Clearances associated with Replacement US 90 Bridge Crossing of the West Pearl River

The bridge tender logs document the very limited navigation upstream by vessels having vertical navigation requirements approaching 35 feet. Also, although the bridge tender logs do not document horizontal navigation requirements for individual vessels, the work barge was most likely the vessel requiring the widest horizontal clearance. These types of barges typically range between 40 feet to 50 feet in width.

There are restrictions on navigation upstream. These include a navigation channel that has not been maintained, 35-foot vertical clearance upstream above high water at

the I-10 and I-59 bridges, a fixed span Norfolk Southern crossing of the West Pearl just upstream of I-59, as well as a navigation lock system supporting the Pearl River Navigation Project which limits navigation to 65-foot horizontal clearance.

Finally, West Pearl River Navigation Project was placed in a caretaker status in 1995 and the USACE was directed by Congress to use limited funds to maintain the Project in this status.

Considering the legal status of the West Pearl River Navigation Project, the limited marine traffic transiting the bridge, the documented navigation requirements of the traffic during the reporting period and the upstream navigation restrictions, there are opportunities to petition the USCG to modify the current vertical navigation limits on a future bridge. There will be considerable construction cost savings to the LADOTD if less restrictive navigation clearances can be achieved.

The USCG process for requesting navigation clearances less restrictive than existing includes the issuance of a Solicitation of Views (SOV) to all upstream property owners who may be affected by a change in allowed navigation limits.

The planning for the new bridge will proceed using the existing 50-foot vertical clearance. Simultaneously, coordination with the USCG will investigate the possibility of reducing the vertical clearance to 35-feet. Considering the existing upstream navigation restrictions, 35-foot vertical clearance over high water is an appropriate target elevation.

1. Vertical navigation clearance provided will be 50 feet above mean high water (elevation 1.35 NAVD88). For movable bridge alternatives, the clearance of the bridge closed to navigation will be set at 100-year flood plus 1-foot (elevation 19 NAVD88).
2. Horizontal Clearance will be 90-foot as currently provided by the existing lift span.
3. Considering the Environmental Assessment alternatives analysis,
    a. Temporary replacement bridge alternatives will retain the minimum current 90-foot horizontal channel.
    b. Permanent fixed span replacement bridge alternatives will provide 50 foot vertical clearance above mean high water and a 90 foot horizontal clearance.
    c. Movable span structures will provide minimum low chord elevation 19 NAVD88 on their fixed span components.
    d. Replacement structures to be offset and situated within the channel as required to allow for the continued operation of the existing bridge during construction of the replacement structure.

Impacts of Proposed Bridge Clearances on Present and Prospective Upstream Commercial Activity

The proposed bridge clearances will not impact present users of the waterway. Based on Wildlife Management Area ownership of upstream properties, and residential zoning of above stream out parcels, prospective upstream commercial activities (jobs, economic growth and development) are limited to eco-tour businesses that utilize the waterway. There are no existing or planned commercial/industrial growth and developments negatively affected by the proposed clearances.

Discussions with tour companies that use the River show that, as long as the proposed clearances meet or exceed the present clearance of the existing bridge in the closed position, their businesses will not be affected. Comments were received that, should the vertical clearances be increased, larger tour boats could be built and used on the River. Applying the 100-year floodplain plus 1 foot criteria, the clearance will be increased by 6.93 feet.

There are no existing facilities on the waterway that are or could be considered critical infrastructure, key resource, or important/unique US industrial capabilities.

1.9 Environmental Assessment Alternatives

The build alternatives developed for the Environmental Assessment conform to the existing navigation clearances. However, the vertical clearance of the upstream I-10 West Pearl River span is 35 feet above high water. LADOTD may pursue adjusting the vertical clearance of the US 90 span from 50 feet to 35 feet at a later date. This decision would include future consultations with the USCG, and upstream property owners would be notified as part of the USCG consultations.

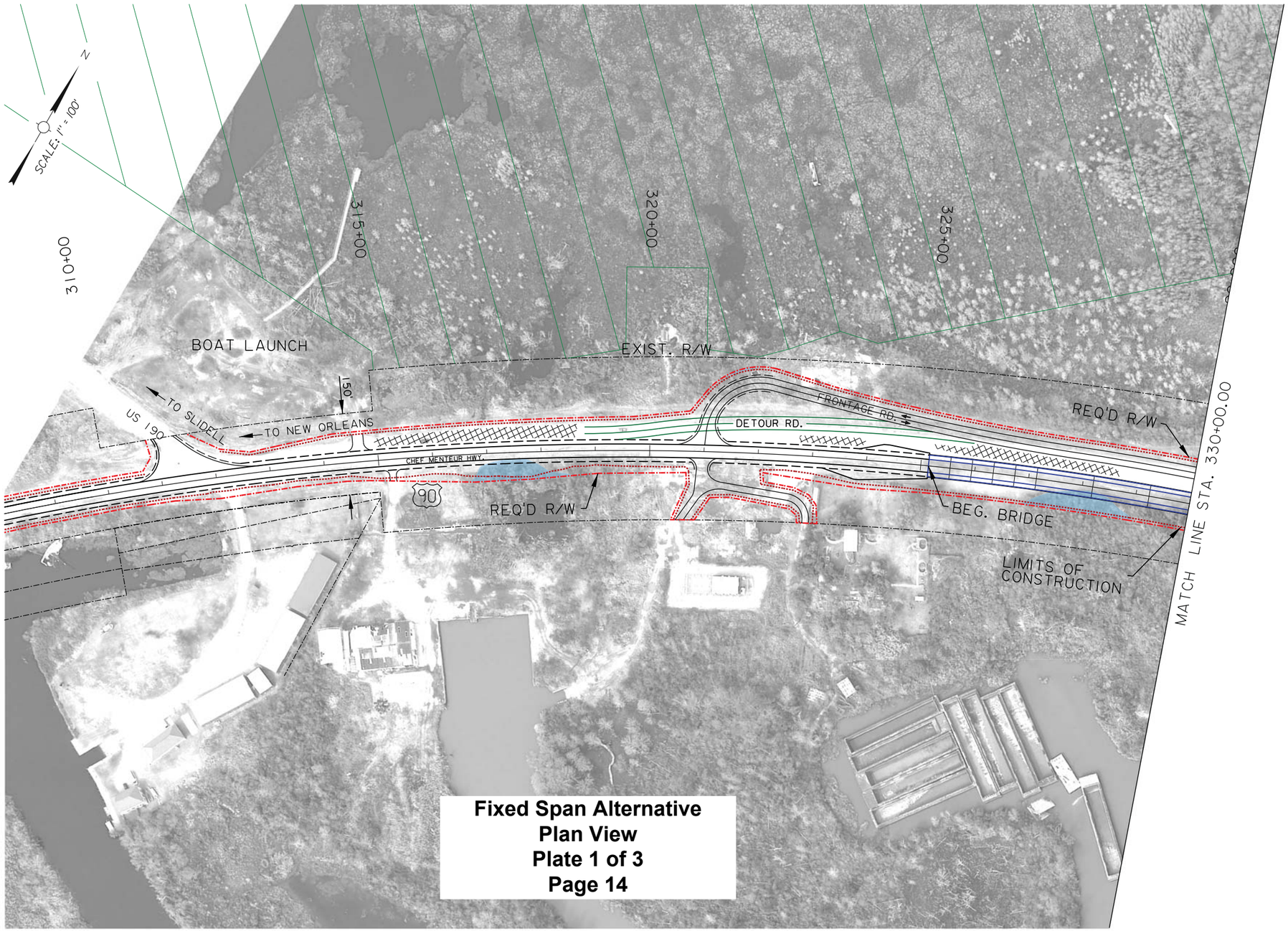
1.9.1 Fixed Span Bridge Alternative

Fixed Span Plan and Profile Sheets are enclosed. The fixed span alternative is located at a 52.5 foot offset downstream from the existing bridge centerline. The new fixed span structure will provide 50-foot vertical clearance above NOAA Mean High Water of 1.35 NAVD88. The existing 90’ wide channel will be retained.

West of the river, a new road is constructed to the north of existing US 90 which ties back to the existing US 90 centerline. This road provides continued access to the existing bridge during construction of the new fixed span bridge. Access to Camp Road remains essentially as it is in the existing condition. No additional right-of-way is required.

12/6/2016 10:07:13 AM

US 90 EA



Fixed Span Alternative
Plan View
Plate 1 of 3
Page 14

PREPARED BY NEEL-SCHAFFER, INC.

Federal Highway Administration

DOTD LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

US 90: WEST PEARL RIVER BRIDGE
FIXED SPAN BRIDGE ALTERNATIVE F-I
STATE PROJECT NO. H.000284
ST. TAMMANY PARISH, LA

LEGEND

- HISTORIC STRUCTURE
- WILDLIFE MANAGEMENT AREA
- WETLANDS (EXCLUDED WATER OF THE U.S.)
- REMOVAL
- LIMITS OF CONSTRUCTION
- REQ'D R/W

SHEET NUMBER		
PARISH	CONTROL SECTION	STATE PROJECT
ST. TAMMANY		H.000284
DESIGNED / CHECKED	DETAILED / CHECKED	DATE / SHEET
		12-05-16 / 1 OF 3

NO.	REVISION DESCRIPTION	DATE	BY

STATE OF LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT

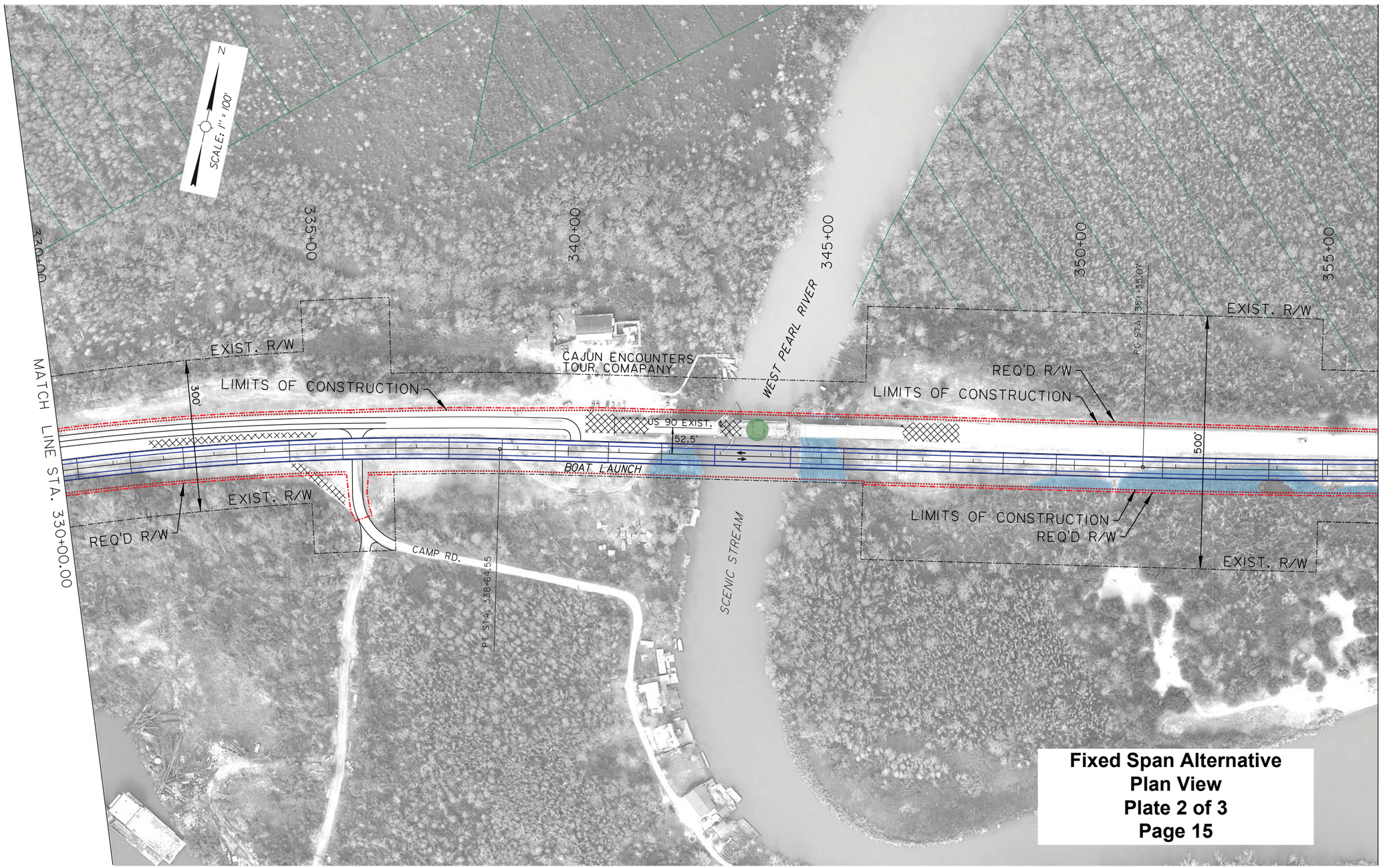
WEST PEARL RIVER BRIDGE
FIXED BRIDGE ALTERNATIVE
PLAN VIEW
US 90 BRIDGES

DOTD LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

Lay_ WP_Fix_1.dgn

12/6/2016 10:07:20 AM

US 90 EA



100 50 0 100
GRAPHIC SCALE
SCALE: 1"=100'

Fixed Span Alternative
Plan View
Plate 2 of 3
Page 15

PREPARED BY NEEL-SCHAFFER, INC.

Federal Highway Administration

DOTD LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

US 90: WEST PEARL RIVER BRIDGE
FIXED SPAN BRIDGE ALTERNATIVE F-1
STATE PROJECT NO. H.000284
ST. TAMMANY PARISH, LA

LEGEND

- HISTORIC STRUCTURE
- WILDLIFE MANAGEMENT AREA
- WETLANDS (EXCLUDED WATER OF THE U.S.)
- REMOVAL
- LIMITS OF CONSTRUCTION
- REQ'D R/W

SHEET NUMBER	
PARISH	ST. TAMMANY
CONTROL SECTION	
STATE PROJECT	H.000284
DESIGNED / CHECKED	
DETAILED / CHECKED	
DATE / SHEET	12-05-16 / 2 OF 3

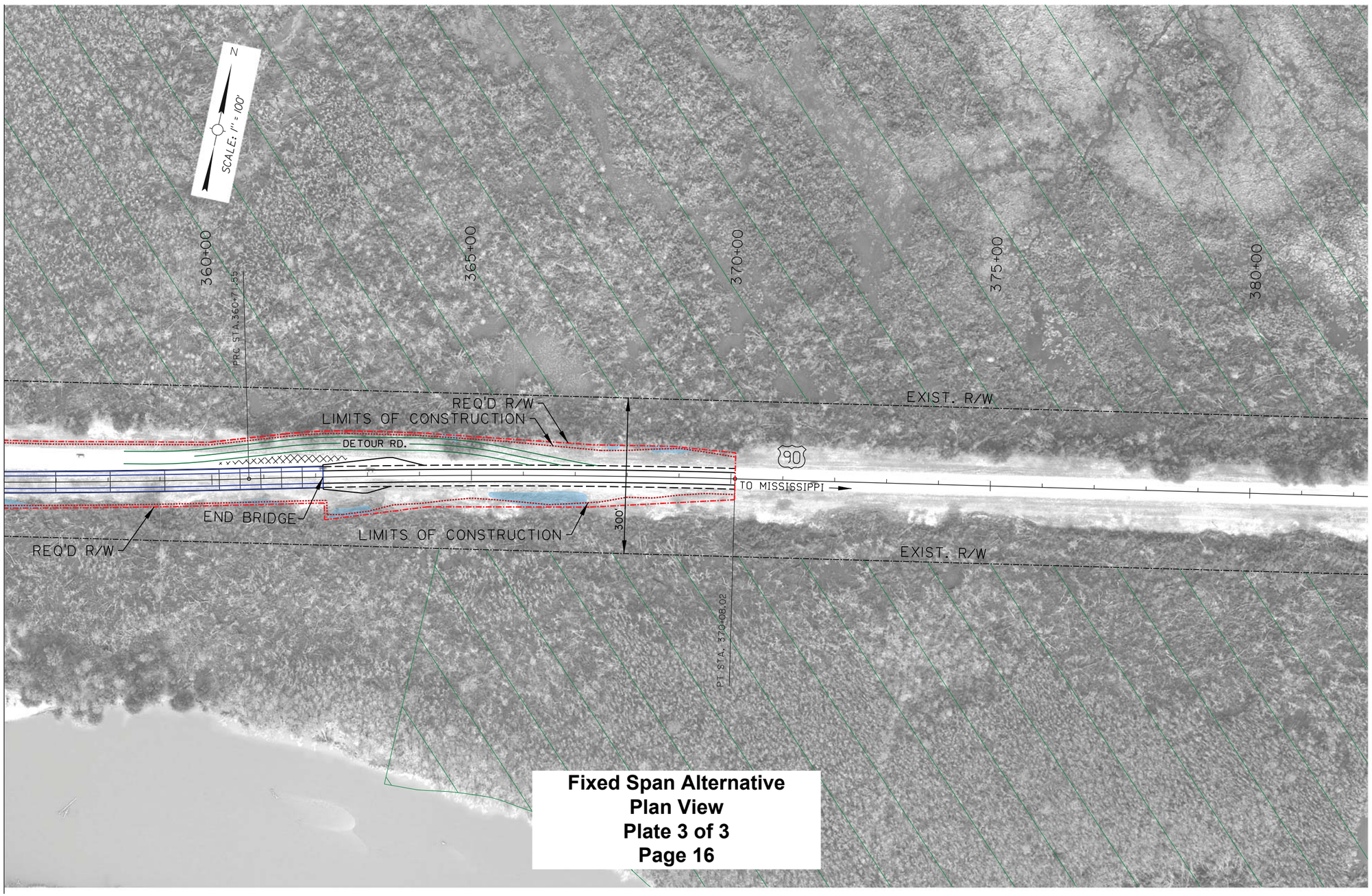
REVISION DESCRIPTION | DATE | BY

STATE OF LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT

WEST PEARL RIVER BRIDGE
FIXED BRIDGE ALTERNATIVE
PLAN VIEW
US 90 BRIDGES

Lay_ WP_Fix_2.dgn

12/6/2016 10:07:29 AM



Fixed Span Alternative
Plan View
Plate 3 of 3
Page 16

100 50 0 100
GRAPHIC SCALE
SCALE: 1"=100'

PREPARED BY NEEL-SCHAFFER, INC.

Federal Highway Administration

DOTD LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

US 90: WEST PEARL RIVER BRIDGE
FIXED SPAN BRIDGE ALTERNATIVE F-I
STATE PROJECT NO. H.000284
ST. TAMMANY PARISH, LA

LEGEND
- HISTORIC STRUCTURE
- WILDLIFE MANAGEMENT AREA
- WETLANDS (EXCLUDED WATER OF THE U.S.)
- REMOVAL
- LIMITS OF CONSTRUCTION
- REQ'D R/W

SHEET NUMBER	
PARISH	ST. TAMMANY
CONTROL SECTION	
STATE PROJECT	
DESIGNED / CHECKED	
DETAILED / CHECKED	
DATE / SHEET	12-05-16 / 3 OF 3

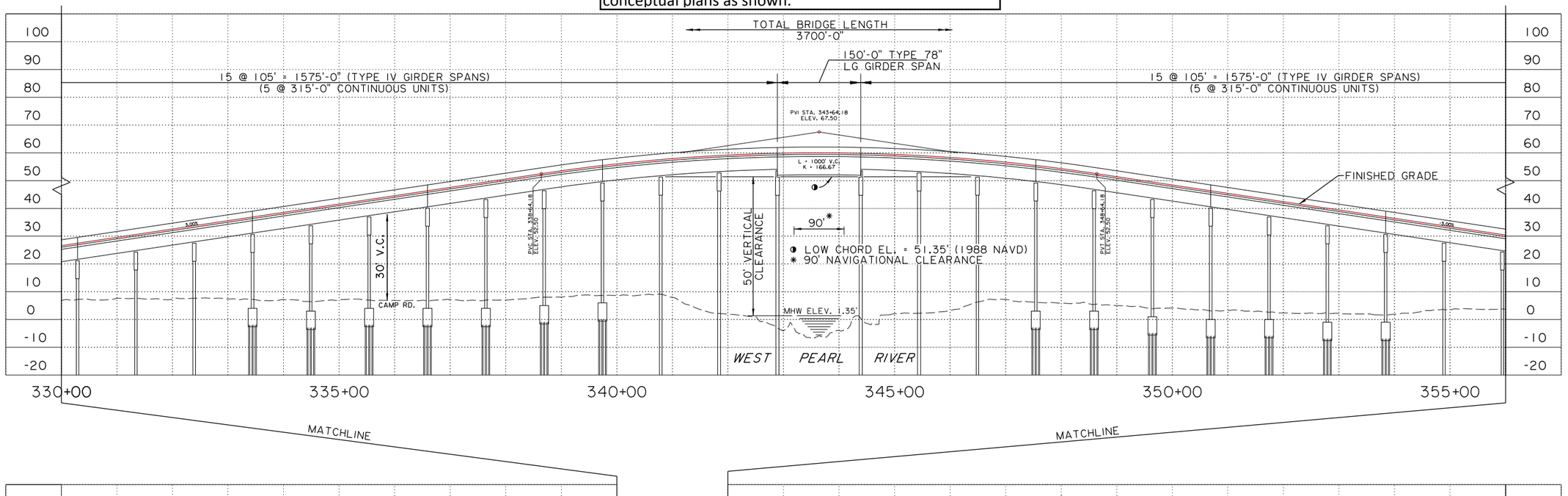
NO.	DATE	REVISION DESCRIPTION	BY

WEST PEARL RIVER BRIDGE
FIXED BRIDGE ALTERNATIVE
PLAN VIEW
US 90 BRIDGES

12/6/2016 10:07:38 AM

US 90 EA

Note 1: The bridge concepts shown (including pier placement and girder selection) are conceptual. During preliminary engineering, the types of girders and the pier placement will be finalized. The selected girders and associated pier placement may differ from the conceptual plans as shown.



PREPARED BY NEEL-SCHAFFER, INC.

Federal Highway Administration

DOTD LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

US 90: WEST PEARL RIVER BRIDGE
FIXED SPAN BRIDGE ALTERNATIVE F-1
STATE PROJECT NO. H.000284
ST. TAMMANY PARISH, LA

Fixed Span Alternative
Profile View
Plate 1 of 1
Page 17

SCALES
HORIZONTAL 1" = 100'
VERTICAL 1" = 20'

SHEET NUMBER

PARISH	CONTROL SECTION	STATE PROJECT
ST. TAMMANY	H.000284	

DESIGNED
CHECKED
DETAILED
CHECKED
DATE 12-05-16
SHEET 1 OF 1

REVISION DESCRIPTION | BY | DATE | NO.

STATE OF LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT

WEST PEARL RIVER BRIDGE
FIXED BRIDGE ALTERNATIVE
PROFILE VIEW

US 90 BRIDGES

Pro_ WP_Fix_1.dgn

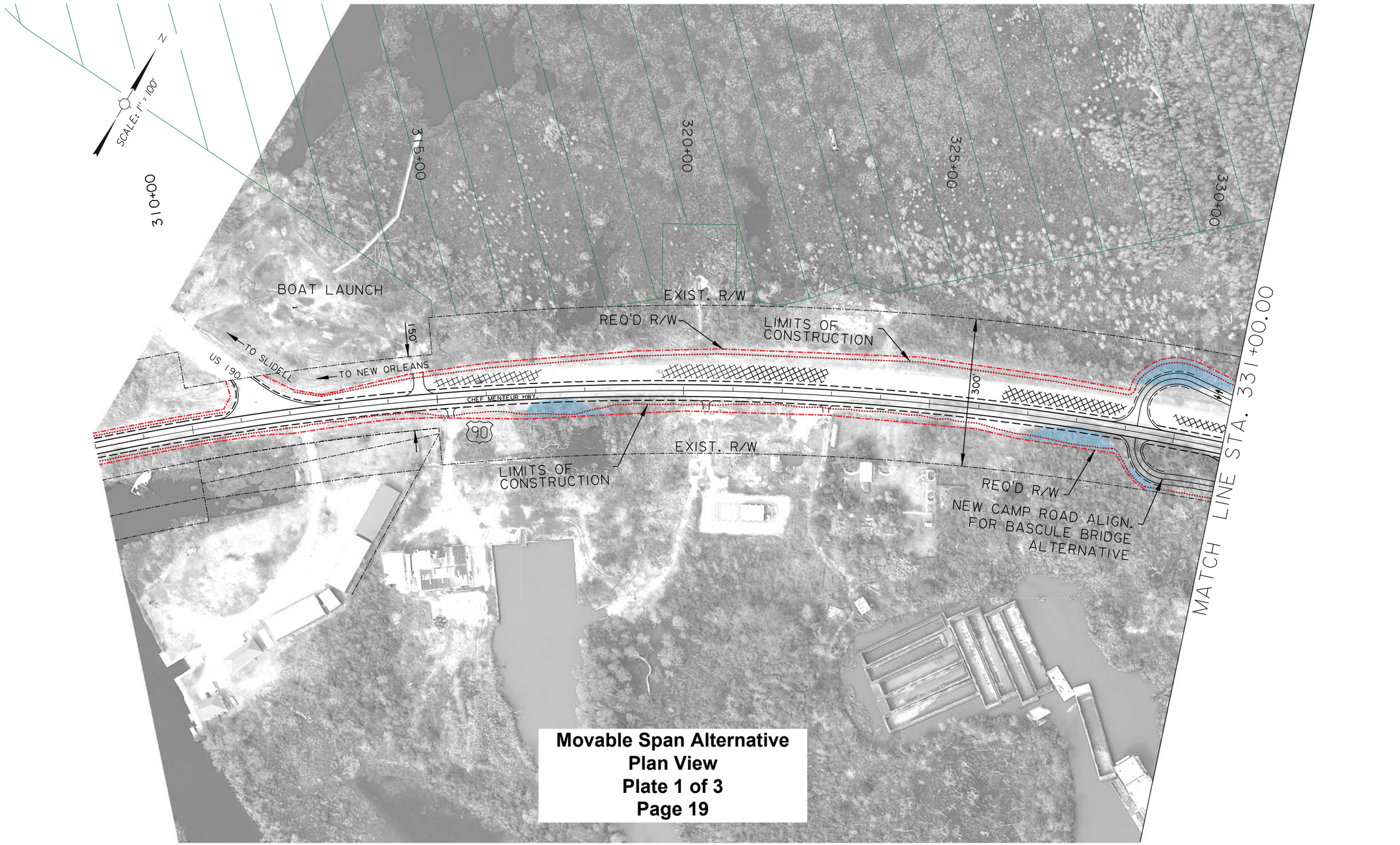
1.9.2 Movable Span Bridge Alternative

Movable span alternatives located at a 52.5 foot offset downstream from the existing bridge centerline. The navigation channel retains 90 foot clearance. The vertical clearance with the movable span in the open position is 50 feet above NOAA Mean High Water of 1.35 NAVD88. The clearance of the bridge in closed position would be at the 100-year flood plus 1-foot elevation, which is 19 NAVD88. This would place the bridge low chord clearance approximately 6.9' higher than the elevation of the existing lift span in the closed position. Both lift span and bascule span options have been developed. Movable Span Plan and Profile Sheets as well as sheets detailing each movable bridge concept are presented.

A new road is constructed to the north of existing US 90 which ties back to the existing US 90 centerline. This new road provides continued access to the existing bridge during construction of the new movable span bridge. A new road is also constructed to the south of the existing US 90 centerline to provide continued access to Camp Road. No additional right-of-way is required.

12/6/2016 10:07:39 AM

US 90 EA



Movable Span Alternative
Plan View
Plate 1 of 3
Page 19

100 50 0 100
GRAPHIC SCALE
SCALE: 1"=100'

PREPARED BY NEEL-SCHAFFER, INC.

Federal Highway Administration

DOTD LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

US 90: WEST PEARL RIVER BRIDGE
MOVABLE BRIDGE ALTERNATIVES
STATE PROJECT NO. H.000284
ST. TAMMANY PARISH, LA

LEGEND

- HISTORIC STRUCTURE
- WILDLIFE MANAGEMENT AREA
- WETLANDS (EXCLUDED WATER OF THE U.S.)
- REMOVAL
- LIMITS OF CONSTRUCTION
- REQ'D R/W

SHEET NUMBER	
PARISH	ST. TAMMANY
CONTROL SECTION	
STATE PROJECT	H.000284
DESIGNED / CHECKED	
DETAILED / CHECKED	
DATE / SHEET	12-05-16 / 1 OF 3

REVISION DESCRIPTION | DATE | BY | NO.

STATE OF LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT

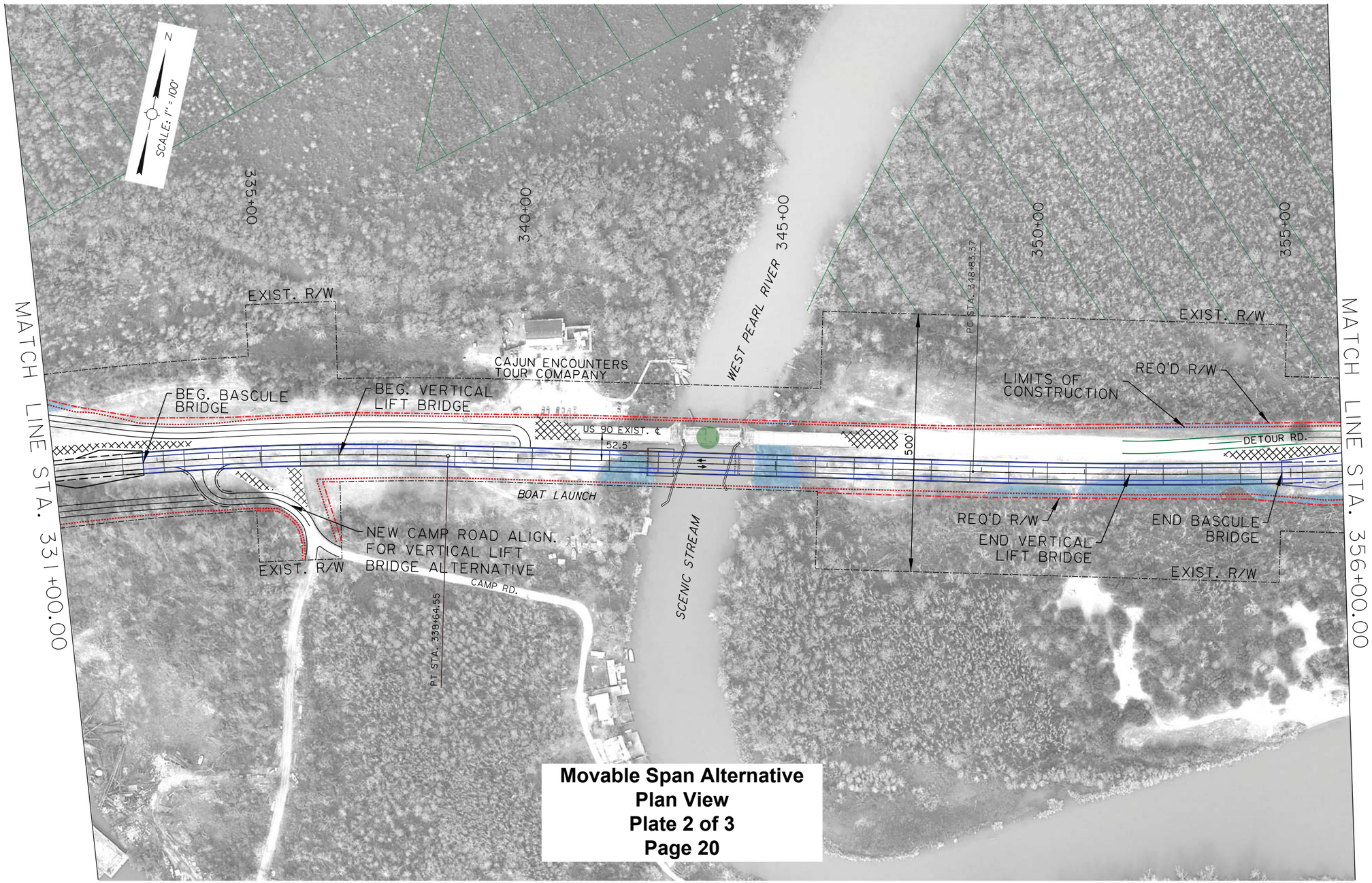
WEST PEARL RIVER BRIDGE
MOVABLE BRIDGE ALTERNATIVES
PLAN VIEW

US 90 BRIDGES

Lay_ WP_Mov_1.dgn

12/6/2016 10:07:46 AM

US 90 EA



Movable Span Alternative
Plan View
Plate 2 of 3
Page 20

PREPARED BY NEEL-SCHAFFER, INC.

Federal Highway Administration

DOTD LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

US 90: WEST PEARL RIVER BRIDGE
MOVABLE BRIDGE ALTERNATIVES
STATE PROJECT NO. H.000284
ST. TAMMANY PARISH, LA

LEGEND

- HISTORIC STRUCTURE
- WILDLIFE MANAGEMENT AREA
- WETLANDS (EXCLUDED WATER OF THE U.S.)
- REMOVAL
- LIMITS OF CONSTRUCTION
- REQ'D R/W

SHEET NUMBER	
PARISH	ST. TAMMANY
CONTROL SECTION	
STATE PROJECT	H.000284
DESIGNED / CHECKED	
DETAILED / CHECKED	
DATE / SHEET	12-05-16 / 2 OF 3

NO.	DATE	REVISION DESCRIPTION	BY

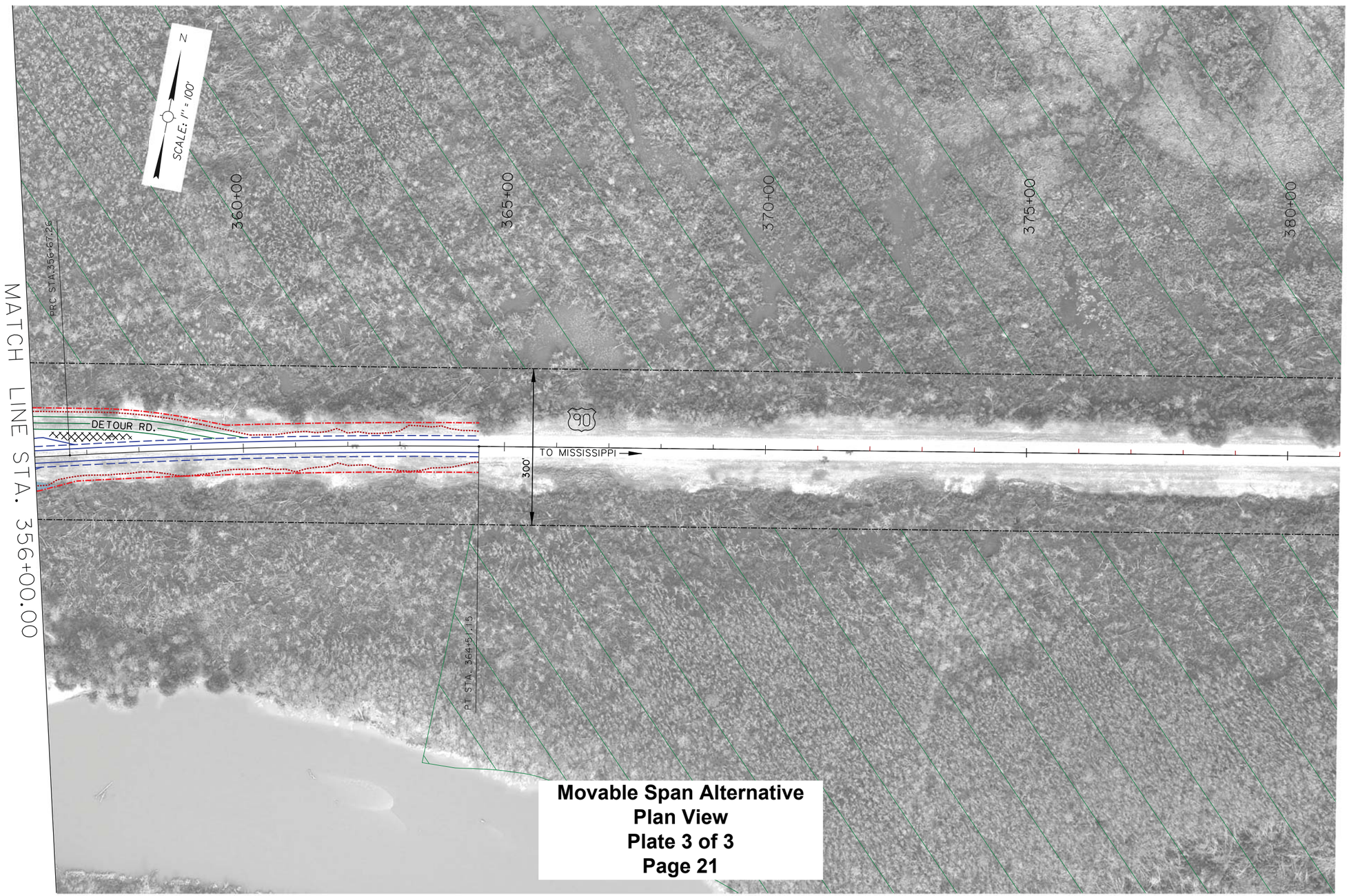
STATE OF LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT

WEST PEARL RIVER BRIDGE
MOVABLE BRIDGE ALTERNATIVES
PLAN VIEW

US 90 BRIDGES

Lay_ WP_Mov_2.dgn

12/6/2016 10:08:00 AM
US 90 EA
Lay_ WP_Mov_3.dgn



100 50 0 100
GRAPHIC SCALE
SCALE: 1"=100'

Movable Span Alternative
Plan View
Plate 3 of 3
Page 21

PREPARED BY NEEL-SCHAFFER, INC.

Federal Highway Administration

DOTD LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

US 90: WEST PEARL RIVER BRIDGE
MOVABLE BRIDGE ALTERNATIVES
STATE PROJECT NO. H.000284
ST. TAMMANY PARISH, LA

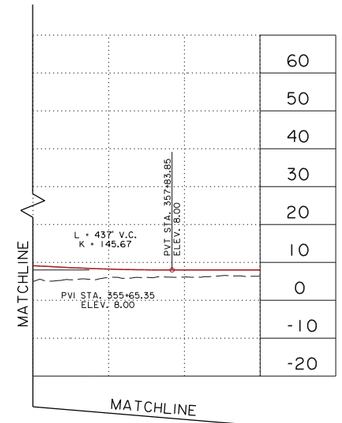
LEGEND
- HISTORIC STRUCTURE
- WILDLIFE MANAGEMENT AREA
- WETLANDS (EXCLUDED WATER OF THE U.S.)
- REMOVAL
- LIMITS OF CONSTRUCTION
- REQ'D R/W

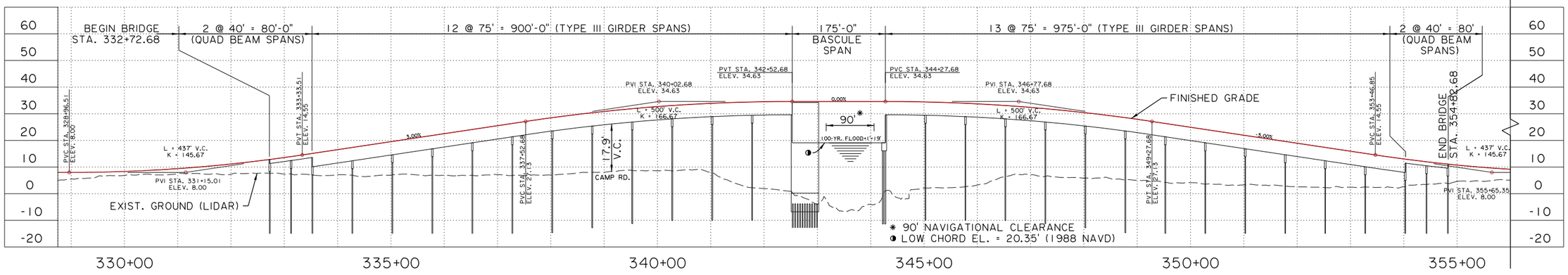
SHEET NUMBER
PARISH: ST. TAMMANY
CONTROL SECTION
STATE PROJECT
DESIGNED
CHECKED
DETAILED
CHECKED
DATE 12-05-16
SHEET 3 OF 3
NO. DATE REVISION DESCRIPTION BY

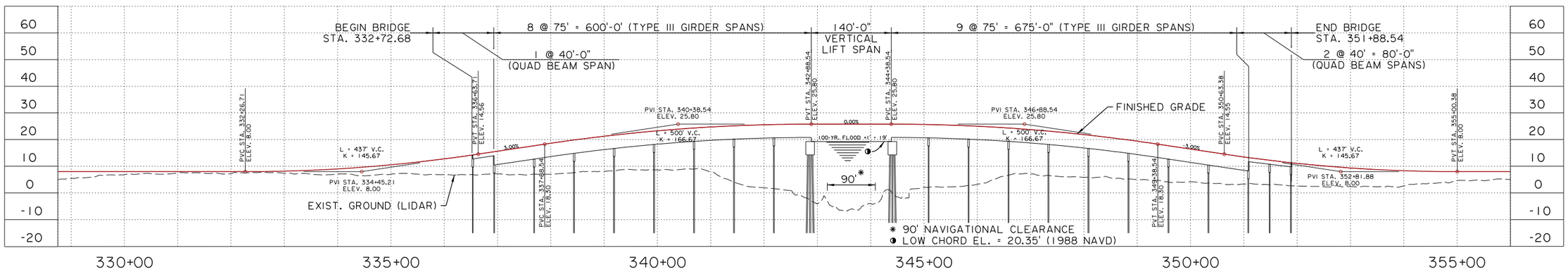
WEST PEARL RIVER BRIDGE
MOVABLE BRIDGE ALTERNATIVES
PLAN VIEW
US 90 BRIDGES

Movable Span Alternative
Profile View
Plate 1 of 1
Page 22

Note 1: The bridge concepts shown (including pier placement and girder selection) are conceptual. During preliminary engineering, the types of girders and the pier placement will be finalized. The selected girders and associated pier placement may differ from the conceptual plans as shown.







PREPARED BY NEEL-SCHAFFER, INC.

Federal Highway Administration

DOTD LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

MOVABLE BRIDGE ALTERNATIVE PROFILES

STATE PROJECT NO. H.000286
US 90: PEARL RIVER BRIDGE
ST. TAMMANY PARISH

SCALES
HORIZONTAL 1" = 100'
VERTICAL 1" = 20'

US 90 EA

Pro_ WP_Mov_2_MAI.dgn

SHEET NUMBER

PARISH: ST. TAMMANY
CONTROL SECTION
STATE PROJECT

DESIGNED
CHECKED
DETAILED
CHECKED
DATE SHEET: 12-05-16 # OF 12

NO. DATE BY REVISION DESCRIPTION

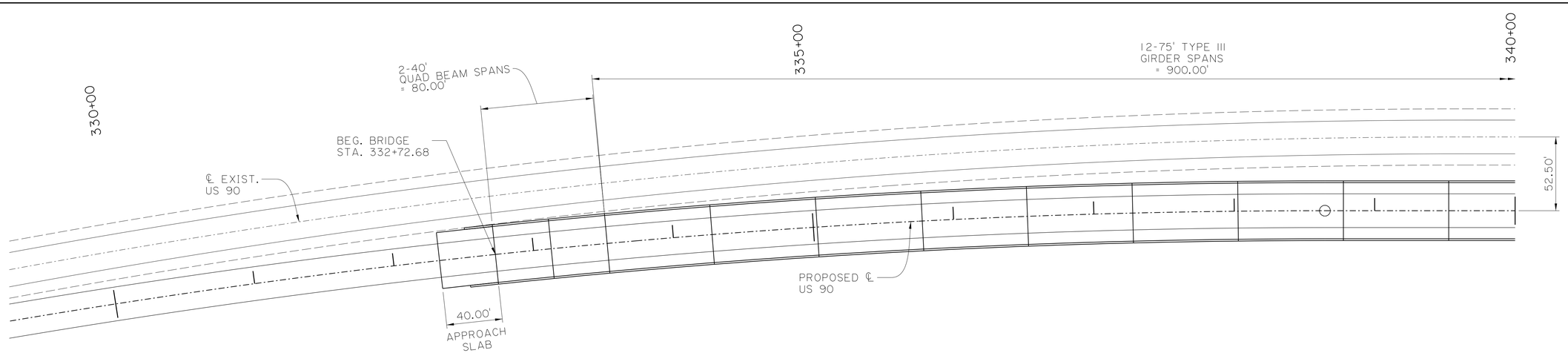
STATE OF LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

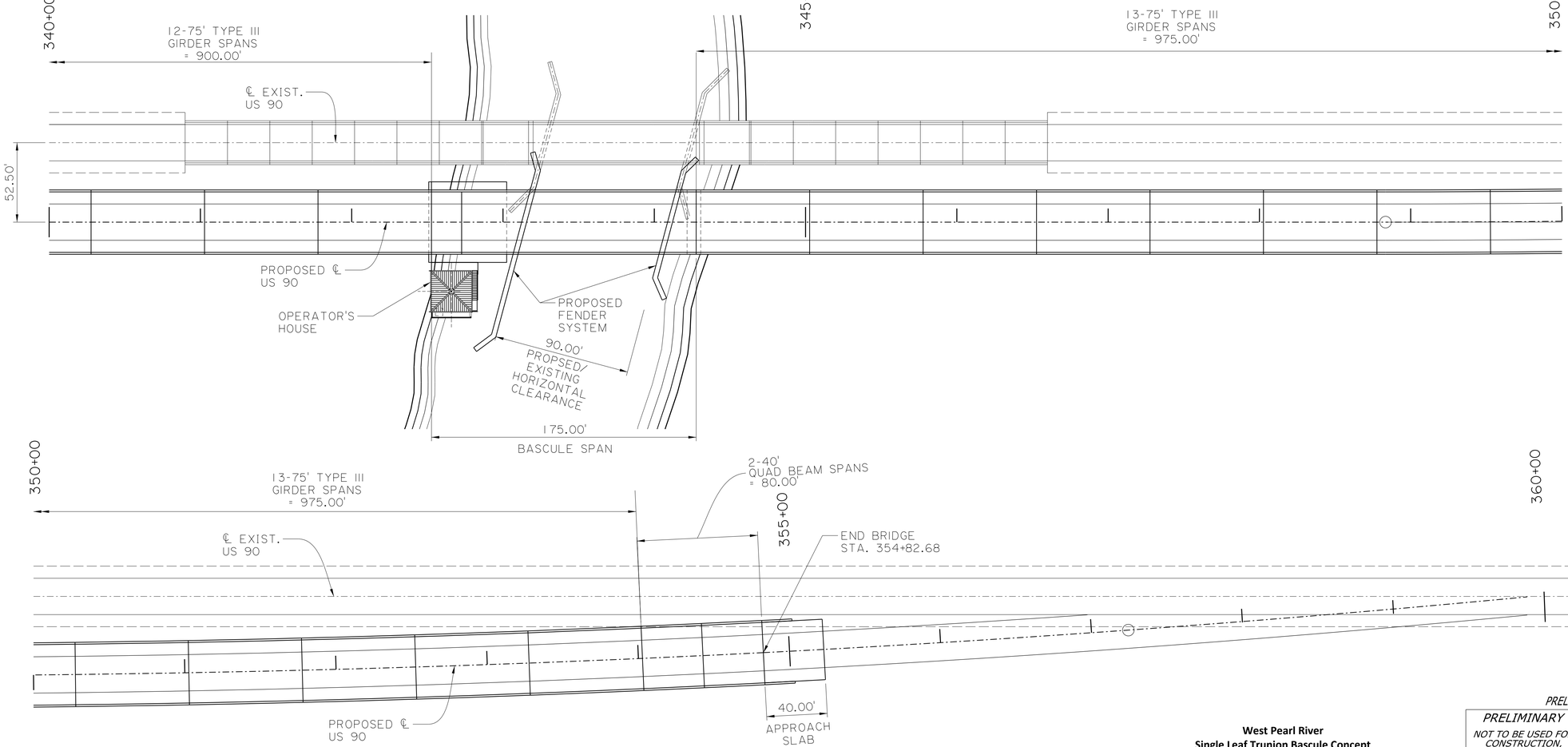
WEST PEARL BRIDGE
MOVABLE ALTERNATIVE PROFILES
US 90 BRIDGES

DOTD

PRELIMINARY PLANS

X:\HUVAL Projects\6106 (US 90 @ Pearl River EA)\05-Working Drawings\02-Border to Print\West Pearl Public Meeting\1_Bascule Plan.dgn 9/12/2016 9:21:15 A





PLAN - SINGLE LEAF TRUNION BASCULE OPTION

SCALE: 1" = 40'

West Pearl River
Single Leaf Trunion Bascule Concept
Sheet 1 of 2
Page 23

PRELIMINARY PLANS

PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION, BIDDING, RECORDATION, CONVEYANCE, SALES OR AS THE BASIS FOR THE ISSUANCE OF A PERMIT.

HUVAL & ASSOCIATES, INC.

ENGINEER: DAVID S. HUVAL
LICENSE #: 9931
DATE: 9/12/2016

SHEET NUMBER: 1

PARISH	CONTROL SECTION	STATE PROJECT
ST. TAMMANY	006-07	H.000284 & H.000286

DESIGNED	MCH	DETAILED	MCH	SERIES NUMBER	1 OF 2
CHECKED	WLH	CHECKED	TMG		

NO.	DATE	REVISION OR CHANGE ORDER DESCRIPTION	BY

SINGLE LEAF
TRUNION BASCULE PLAN
WEST PEARL RIVER
US 90 @ PEARL RIVER EA

DOTD TRANSPORTATION & DEVELOPMENT

HUVAL & ASSOCIATES, INC. Consulting Engineers

PRELIMINARY PLANS

X:\HUVAL Projects\6106 (US 90 @ Pearl River EA)\05-Working Drawings\02-Border to Print\West Pearl Public Meeting\2_Bascule Details.dgn 9/12/2016 9:24:23

340+00

345+00

110.00'
EXISTING
VERTICAL LIFT

EXISTING
FENDER SYSTEM

℄ EXIST. US 90

52.50'

53.25'

40.00'
CLR.

PROPOSED ℄
US 90

75.00'
APPROACH
SPAN
(TYP.)

BASCULE SPAN
MAIN PIER

OPERATOR'S
HOUSE

BASCULE SPAN
REST PIER

STA. 342+52.68

STA. 344+27.68

PROPOSED
FENDER SYSTEM

90.00'
PROPOSED/
EXISTING
HORIZONTAL
CLEARANCE

PLAN - SINGLE LEAF TRUNION BASCULE OPTION

SCALE: 1" = 30'

40.00'
CLR. RDWY.

STEEL GRID
FLOORING

VARIES
15.00'
TO
8.00'

VARIES

SECTION - BASCULE SPAN

SCALE: 1" = 5'

175.00'
SINGLE LEAF
BASCULE SPAN

75.00'
APPROACH
SPAN
(TYP.)

1.79'

119.28'

78.00°

50
30
10
-10

EL. 34.63'

90.00'
HORIZ.
CLR.

BASCULE SPAN
REST PIER

340+00

345+00

BASCULE SPAN
MAIN PIER

51.50'

PROP.
FENDER
SYSTEM

MIN. REQ'D
LOW CHORD
ELEVATION = 19.13'

9.00'

PROFILE - SINGLE LEAF TRUNION BASCULE OPTION

SCALE: 1" = 30'

PRELIMINARY PLANS

PRELIMINARY	*HUVAL & ASSOCIATES, INC.*
NOT TO BE USED FOR CONSTRUCTION, BIDDING, RECORDATION, CONVEYANCE, SALES OR AS THE BASIS FOR THE ISSUANCE OF A PERMIT.	*ENGINEER: DAVID S. HUVAL* *LICENSE #: 9931* *DATE: 9/12/2016*

West Pearl River
Single Leaf Trunion Bascule Concept
Sheet 2 of 2
Page 24

SHEET NUMBER	2
PARISH	ST. TAMMANY
CONTROL SECTION	006-07
STATE PROJECT	H.000284 & H.000286
DESIGNED MCH CHECKED WLH	
DETAILED MCH CHECKED TMG	
SERIES NUMBER	2 OF 2

NO.	DATE	REVISION OR CHANGE ORDER DESCRIPTION	BY

SINGLE LEAF
TRUNION BASCULE DETAILS

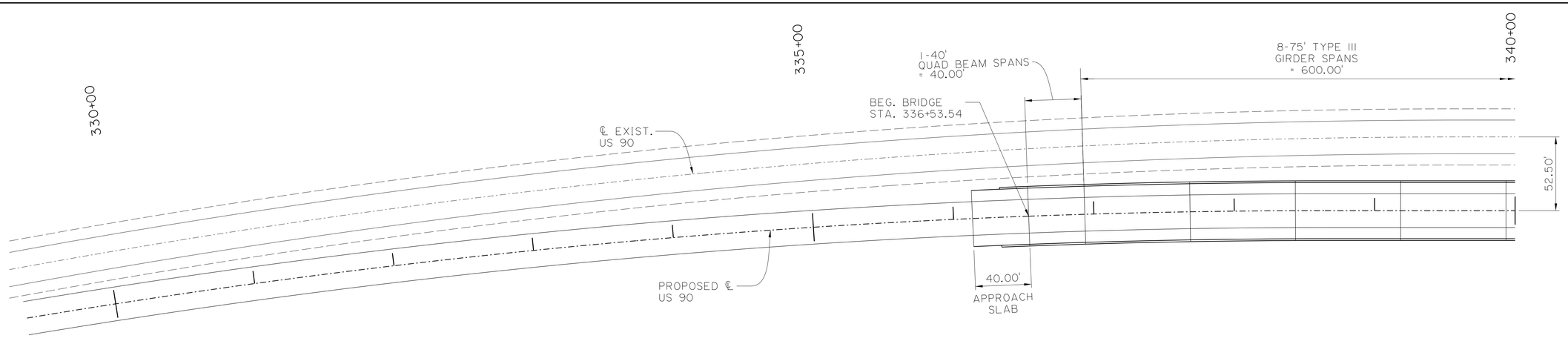
WEST PEARL RIVER

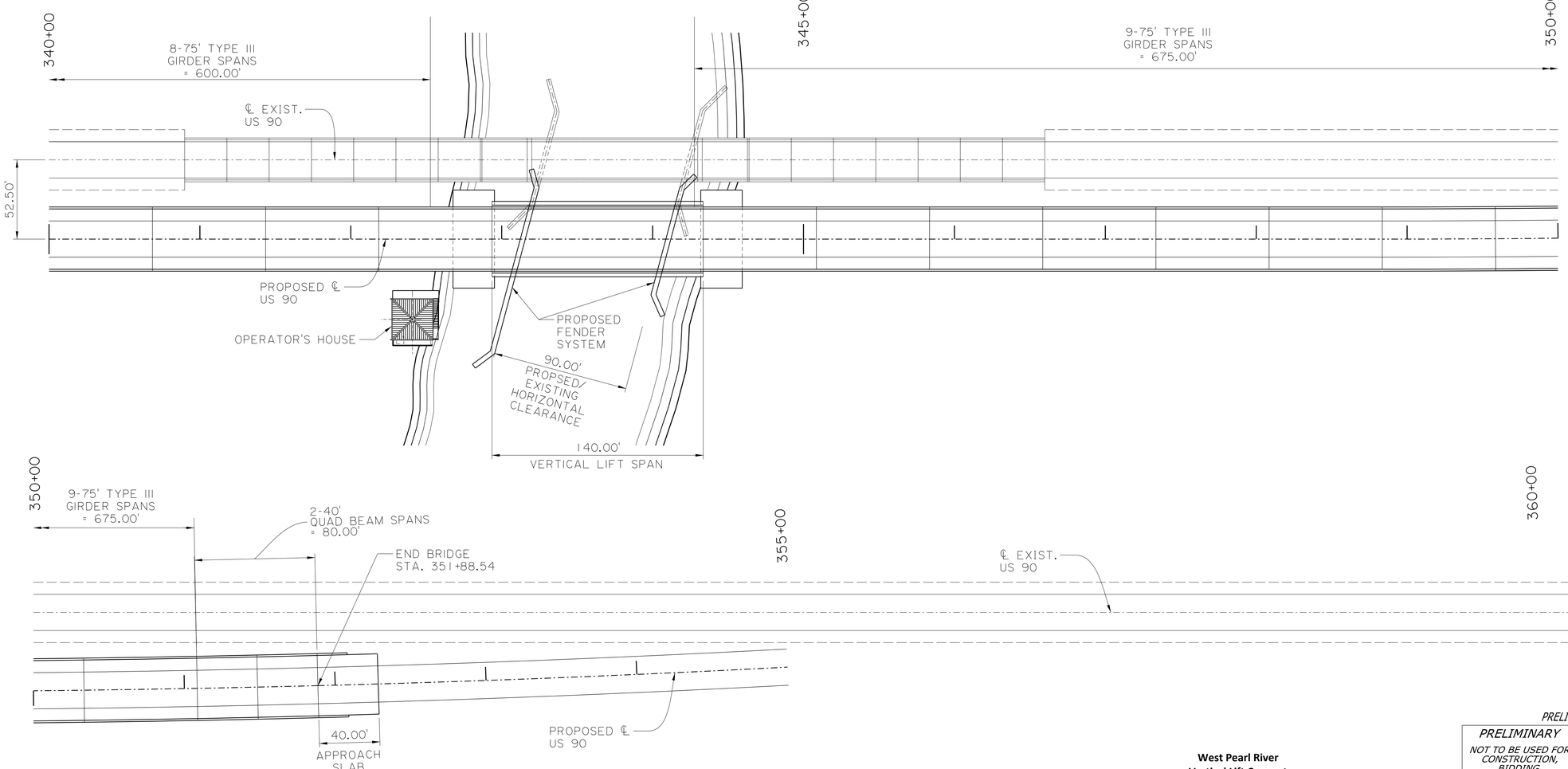
US 90 @ PEARL RIVER E.A.

DOTD
LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

HUVAL
& ASSOCIATES, INC
Consulting Engineers

PRELIMINARY PLANS
X:\HUVAL Projects\6106 (US 90 @ Pearl River EA)\05-Working Drawings\02-Border to Print\West Pearl Public Meeting\3_Vertical Lift Plan.dgn 9/12/2016 10:43:12 AM





PLAN - VERTICAL LIFT OPTION

SCALE: 1" = 40'

West Pearl River
Vertical Lift Concept
Sheet 1 of 2
Page 25

PRELIMINARY PLANS

PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION, BIDDING, RECORDATION, CONVEYANCE, SALES OR AS THE BASIS FOR THE ISSUANCE OF A PERMIT.

HUVAL & ASSOCIATES, INC.

ENGINEER: DAVID S. HUVAL
LICENSE #: 9931
DATE: 9/12/2016

SHEET NUMBER	3
PARISH	ST. TAMMANY
CONTROL SECTION	006-07
STATE PROJECT	H.000284 & H.000286
DESIGNED MCH / CHECKED WLH	
DETAILED MCH / CHECKED TMG	
SERIES NUMBER	1 OF 2

NO.	DATE	REVISION OR CHANGE ORDER DESCRIPTION	BY

VERTICAL LIFT PLAN
WEST PEARL RIVER
US 90 @ PEARL RIVER EA

DOTD TRANSPORTATION & DEVELOPMENT

HUVAL & ASSOCIATES, INC. Consulting Engineers

PRELIMINARY PLANS

X:\HUVAL Projects\6106 (US 90 @ Pearl River EA)\05-Working Drawings\02-Border to Print\West Pearl Public Meeting\4_Vertical Lift Details.dgn 9/12/2016 10:44:52

340+00

345+00

110.00'
EXISTING
VERTICAL LIFT

EXISTING
FENDER SYSTEM

℄ EXIST. US 90

52.50'

65.00'

40.00'
CLR.

PROPOSED ℄
US 90

75.00'
APPROACH
SPAN
(TYP.)

OPERATOR'S HOUSE

℄ STA. 342+93.54

PROPOSED
FENDER SYSTEM

90.00'
PROPOSED/
EXISTING
HORIZONTAL
CLEARANCE

STA. 344+33.54

PLAN - VERTICAL LIFT OPTION
SCALE: 1" = 30'

40.00'
CLR. RDWY.

115"
LIFTING
GIRDER

70"

APPROX.
STRUCTURE
DEPTH

SECTION - VERTICAL LIFT SPAN
SCALE: 1" = 5'

140.00'
VERTICAL LIFT
SPAN

VERTICAL CLEARANCE
PROVIDED ABOVE
M.H.W. = 1.35'

75.00'
APPROACH
SPAN
(TYP.)

50
30
10
-10

EL. 34.63'

50.00'

90.00'
HORIZ.
CLR.

340+00

345+00

VERTICAL
LIFT PIER
(TYP.)

PROP.
FENDER
SYSTEM

MIN. REQ'D
LOW CHORD
ELEVATION = 19.13'

PROFILE - VERTICAL LIFT OPTION
SCALE: 1" = 30'

PRELIMINARY PLANS

PRELIMINARY	*HUVAL & ASSOCIATES, INC.*
NOT TO BE USED FOR CONSTRUCTION, BIDDING, RECORDATION, CONVEYANCE, SALES OR AS THE BASIS FOR THE ISSUANCE OF A PERMIT.	*ENGINEER: DAVID S. HUVAL* *LICENSE #: 9931* *DATE: 9/12/2016*

West Pearl River
Vertical Lift Concept
Sheet 2 of 2
Page 26

SHEET NUMBER	4
PARISH	ST. TAMMANY
CONTROL SECTION	006-07
STATE PROJECT	H.000284 & H.000286
DESIGNED MCH CHECKED WLH	DETAILED MCH CHECKED TMG
SERIES NUMBER	2 OF 2

NO.	DATE	REVISION OR CHANGE ORDER DESCRIPTION	BY

VERTICAL LIFT SPAN
DETAILS
WEST PEARL RIVER
US 90 @ PEARL RIVER EA

DOTD
LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

HUVAL
& ASSOCIATES, INC.
Consulting Engineers

1.10 Proposed Bridge's Impacts to Existing and Potential Navigation

The West Pearl River borders the western side of the Pearl River Wildlife Management Area. The proposed bridge will be at or higher than the existing vertical clearance, and will maintain the existing horizontal clearance. In addition:

- Temporary replacement bridge alternatives will provide for a 50-foot vertical navigation clearance; and retain the minimum current 90-foot horizontal channel.
- Permanent replacement bridge alternatives will provide 50-foot vertical clearance above mean high water and a 90-foot horizontal clearance.
- Movable span structures will provide minimum 19 feet vertical clearance on their fixed span components. This will be 6.93 feet higher than the existing clearance.
- Replacement structures to be offset and situated within the channel as required to allow for the continued operation of the existing bridge during construction of the replacement structure.
- The proposed bridge does not completely obstruct passage of any existing waterway users or access to waterborne facilities.
- The proposed bridge does not impact present and prospective commercial activity on the waterway.
- The proposed bridge does not impact existing or planned commercial/industrial developments.
- Other than the Cajun Encounters Eco-tours, there are no commercial activities located upstream of US 90.
- The proposed bridge does not impact existing facilities on the waterway that are or could be considered critical infrastructure, key resources, or important/unique US industrial capability.
- The proposed bridge does not impact USACE ability to transit the bridge in a federal project channel.
- The bridge does not impact USCG and other government vessels' ability to transit the bridge to conduct mission essential functions.
- The proposed bridge does not impact existing and future cruise ship port-of-call/terminals, commercial freighters, or ports supporting post-panamax vessels as navigation associated with these facilities is not possible on the West Pearl River.
- The proposed bridge does not impact vessels that require helper boats/tugs.

1.11 Consideration of River Hydrology in the Siting and Design for a Replacement West Pearl River Structure

1.11.1 Introduction

There are a number of hydrology modeling investigations underway relating to the performance of the Lower Pearl River Floodplain during flood and hurricane events. In April 2019, the University of Southern Mississippi released a report documenting the Development of a Forecast Model for the Lower Pearl River Basin. The most comprehensive discussion of the performance of the US 90 bridges during high flow river conditions is a 1999 joint report issued by LADOTD and the US Geological Survey (USGS), *Estimation of Scour and Channel Stability for Selected Highway Crossings of Rivers in the Florida Parishes, Southeastern Louisiana, Louisiana Department of Transportation And Development, Water Resources Technical Report No. 67B.* The report will be hereafter referenced as the Scour Report

The following discussion utilizes the findings of the Scour Report as the basis to describe the hydraulic performance of each of the five rivers at each of the US 90 Pearl River bridge sites. The Scour Report investigates scour conditions at each bridge site assuming a 500-year storm as the base condition.

Excerpts from The Scour Report relevant to the West Pearl River are provided in Appendix B. Specific tables and figures from the Scour Report will be referenced in this narrative. Photographs of the upstream and downstream approaches to the West Pearl River bridge are included in Appendix C.

1.11.2 River Hydrology

Between the West Pearl River and the East Pearl River, the U.S. Hwy. 90 embankment of the lower Pearl River Basin spans over 4 miles of the river floodplain system. There are five openings in the embankment for the channels of the East Pearl, the East Middle, the Middle Middle, West Middle, and the West Pearl Rivers. The elevation of the roadway embankment is approximately 7-8 feet elevation throughout and floodplain elevations range from 1 to 2 feet.

Table 3 shows the distribution of the 500 year storm event through the five river channels.

Table 3 Disribution of Flows Within Pearl River Watershed		
	Flow in ft^3/sec	Percent of total flow
East Pearl River	100,002	36.6%
East Middle Pearl River	33,000	12.1%
Middle Middle Pearl River	41,000	15.0%
West Middle Pearl River	50,000	18.3%
West Pearl River	33,000	12.1%
Overflow	16,000	5.9%
Total	273,002	100.0%

Source: Neel-Schaffer, Inc.

The West Pearl River is formed as a distributary of the Pearl River approximately 24 miles upstream of the U.S. 90 embankment (upstream of both the I-10 and I-59 embankments). The only significant distributary of this reach of the river is the formation of the Middle River approximately 7 miles upstream of the U.S. 90 embankment (2 miles upstream of the I-10 embankment).

1.11.3 Waterway Layout and Geometry

The West Pearl River channel at US 90 is in a slight curve to the right and as a result the bridge crosses the river at a very slight skew. Approximately 400 feet downstream from the existing bridge the river curves sharply to the left; upstream of the existing bridge the mild curve to the right continues (Scour Report Figure 44). Figure 44 also shows river flow, which is roughly from north to south.

1.11.4 Waterway Depth and Elevation Fluctuations

As shown in Scour Report Figure 45, channel depth in proximity to the existing bridge has varied with the channel deepening slightly over time due to scour. In 1993 the main channel was approximately at elevation -15. MHW elevation for the West Pearl River at US 90 has been documented at elevation 1.35. The NOAA Mean Low Water (MLW) is elevation 0.74, which indicates that there is a relatively small range of elevation fluctuations affecting navigation. Figure 3 presents a recently taken cross-section approximately 19 feet downstream of the bridge. When compared to cross-sections shown in Appendix B Scour Report, it is indicates that the River has undergone significant siltation. This has been confirmed in discussions with local navigation interests.

1.11.5 Channel and Waterway Alignment

The existing West Pearl River bridge is at very slight skew to the river. Bridge replacement alternatives located new structures downstream from the existing bridge. Alternatives were also considered locating new structures along the existing alignment. In those situations a temporary by pass structure maintaining navigation clearances as described herein would be provided. The centerline of the replacement

structure will be 52.5 feet from the centerline of the existing bridge. The existing 90-foot horizontal channel will be maintained in alignment with the existing fixed span; so there will be no change in the navigation geometry.

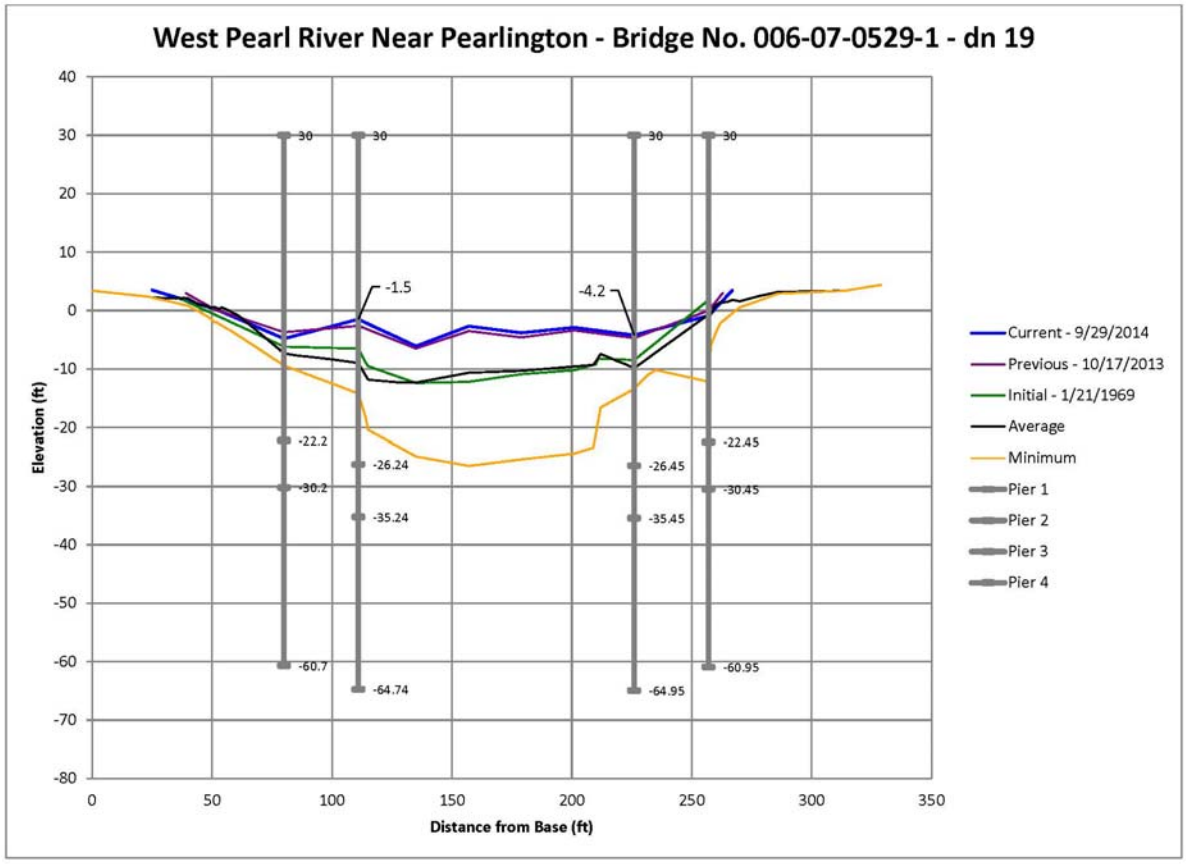
1.11.6 Current Speed and Direction

Simulation of the 500-year event indicated West Pearl River flow velocities ranging from approximately 2 feet/second near the channel bank to approximately 6 feet/second at center channel (Scour Report Table 23). As noted in Table 3, estimated flow at the bridge was approximately 33,000 feet^3/second.

1.11.7 Natural Flow of Waterway including Currents, Water Velocity, Water Direction and Velocity Fluctuations that Might Affect Navigation

Replacement bridge alternatives are situated in proximity to the existing bridge, maintaining the 90-foot horizontal channel width and relative channel alignment. Forecast river velocities under extreme navigation conditions (during a 500-year event) are approximately 6 feet/second. MHW and MLW elevations fluctuations are 0.65 feet. There is no indication that the natural flow of waterway including currents, water velocity, water direction and velocity fluctuations might affect navigation.

Figure 3 – LADOTD Cross-section of West Pearl River (19' Downstream of Bridge)



Appendix A
Documentation of Email Correspondence with the USACE, Vicksburg District Regarding West Pearl River Navigation

Barry Brupbacher

From: Hengst, Thomas L MVK <Thomas.L.Hengst@usace.army.mil>
Sent: Thursday, March 31, 2016 1:18 PM
To: Barry Brupbacher
Subject: Re: [EXTERNAL] CONTRACT NO. 4400005579, H.000284 US 90: PEARL RIVER BRIDGES AND H.000286 EAST PEARL RIVER BRIDGE

I probably should have said no maintenance on any of the Pearl River channel. We do perform minimal maintenance on the three Locks.

TH

Sent from my BlackBerry 10 smartphone.

From: Barry Brupbacher
Sent: Thursday, March 31, 2016 1:14 PM
To: Hengst, Thomas L MVK
Subject: RE: [EXTERNAL] CONTRACT NO. 4400005579, H.000284 US 90: PEARL RIVER BRIDGES AND H.000286 EAST PEARL RIVER BRIDGE

Thanks

Barry Brupbacher
Senior Project Manager

Neel-Schaffer, Inc.
Phone: 985.674.9820
Cell: 985-778-3105
FAX: 985.674.9822
Website: *Blockedwww.neel-schaffer.com*

From: Hengst, Thomas L MVK [mailto:Thomas.L.Hengst@usace.army.mil]
Sent: Thursday, March 31, 2016 1:13 PM
To: Barry Brupbacher <barry.brupbacher@neel-schaffer.com>
Cc: Catherine Mastin <Catherine.Mastin@LA.GOV>
Subject: Re: [EXTERNAL] CONTRACT NO. 4400005579, H.000284 US 90: PEARL RIVER BRIDGES AND H.000286 EAST PEARL RIVER BRIDGE

There is no maintenance performed on any of the Pearl River and there are no plans for such.

TH

Sent from my BlackBerry 10 smartphone.

From: Barry Brupbacher
Sent: Thursday, March 31, 2016 12:51 PM
To: Hengst, Thomas L MVK
Cc: Catherine Mastin

Subject: [EXTERNAL] CONTRACT NO. 4400005579, H.000284 US 90: PEARL RIVER BRIDGES AND H.000286 EAST PEARL RIVER BRIDGE

Thomas,

My understanding is that in 1995, the West Pearl River Navigation Project was placed in a caretaker status. The Corps was directed by Congress to use limited funds to maintain the Project in this status.

1. Is the West Pearl River channel maintained for navigation downstream of I-10?
2. If so, to what depth?
3. Are there any plans to improve navigation of the West Pearl downstream of I-10?

Thanks,

Barry Brupbacher
Senior Project Manager

Neel-Schaffer, Inc.
Phone: 985.674.9820
Cell: 985-778-3105
FAX: 985.674.9822
Website: *BlockedBlockedwww.neel-schaffer.com*

Neel-Schaffer, Inc. Confidentiality Note:
Information contained in this message along with any attachment(s) may be confidential and protected by legal privilege. This message is meant solely for the use of the individual(s) to whom it is addressed. Viewing or the use of information and attachment(s) within this message without the expressed permission of Neel-Schaffer, Inc. is prohibited. If you are not the intended recipient of this message, Neel-Schaffer, Inc. requests you take immediate action to notify the sender of the error and that you delete this message and all attachments without modifying, copying or distributing its content.

Barry Brupbacher

From: Hengst, Thomas L MVK <Thomas.L.Hengst@usace.army.mil>
Sent: Thursday, October 08, 2015 9:11 AM
To: Hengst, Thomas L MVK; Mallard, Jennifer A MVK; Bradley, William N MVK; Brister, Jacob G MVK; Jenkins, David G MVK
Subject: RE: CONTRACT NO. 4400005579, H.000284 US 90: PEARL RIVER BRIDGES AND H.000286 EAST PEARL RIVER BRIDGE - US 90 Structure over the West Pearl River

All,

Mr. Brupbacher called me again this morning asking if the Corps was going to respond to his request. Consultants tend to expect immediate answers and have fairly aggressive schedules. He has a meeting with LADOT next Thursday, 15 October, and would like to have some indication of the Vicksburg District's opinion by that time. As stated below, although we have an authorized project (for now), I see no circumstance where we will ever be directed to re-establish the project dimensions for commercial use. At any rate, when the LADOT and Neal-Schaffer decide what they want to do, they will have to submit the plans to the District for review. We do not need to let them expend time and money on design of something that we will have heartburn with.

TH

Thomas L. Hengst, P. E.
Chief, River Operations Branch
Operations Division, Vicksburg District
U. S. Army Corps of Engineers
CEMVK-OD-R
2449 Haining Rd
Vicksburg, MS 39183
601-631-5600: Phone
601-529-5600: Cell
601-631-5100: Fax
thomas.l.hengst@usace.army.mil

-----Original Message-----
From: Hengst, Thomas L MVK
Sent: Friday, October 02, 2015 7:08 AM
To: Mallard, Jennifer A MVK; Bradley, William N MVK; Brister, Jacob G MVK; Jenkins, David G MVK
Subject: FW: CONTRACT NO. 4400005579, H.000284 US 90: PEARL RIVER BRIDGES AND H.000286 EAST PEARL RIVER BRIDGE - US 90 Structure over the West Pearl River

All,

I talked to this fellow yesterday and asked him to send me what LADOT was planning to do. The District needs to decide whether or not it is necessary to maintain the navigation capabilities on the West Pearl Project as it pertains to the US 90 bridge. I personally see no sense in it as we will likely never have commercial traffic on this waterway again. From talking to him the only time that the bridge has been raised in the last several years was to pass fishing vessels running up the Pearl to ride out a storm.

TH

Thomas L. Hengst, P. E.
Chief, River Operations Branch
Operations Division, Vicksburg District
U. S. Army Corps of Engineers
CEMVK-OD-R
2449 Haining Rd
Vicksburg, MS 39183
601-631-5600: Phone
601-529-5600: Cell
601-631-5100: Fax
thomas.l.hengst@usace.army.mil

-----Original Message-----
From: Barry Brupbacher [mailto:barry.brupbacher@neel-schaffer.com]
Sent: Thursday, October 01, 2015 4:32 PM
To: Hengst, Thomas L MVK
Cc: Frank, David M CIV; Ronald Broadbent; Stacie Palmer; Roy Thomas
Subject: [EXTERNAL] CONTRACT NO. 4400005579, H.000284 US 90: PEARL RIVER BRIDGES AND H.000286 EAST PEARL RIVER BRIDGE - US 90 Structure over the West Pearl River

Thomas L. Hengst, P. E.

Chief, River Operations Branch

Operations Division, Vicksburg District

U. S. Army Corps of Engineers

CEMVK-OD-R

Thomas,

The Louisiana Department of Transportation and Development (LADOTD) is preparing planning and environmental documents for the rehabilitation or replacement of five bridge structures associated with the Pearl River system along US 90. The project logical termini are the US90 intersection with US 190 in St. Tammany Parish Louisiana and the US90 intersection with MS 604 in Hancock County Mississippi. The existing roadway is a two lane rural arterial roadway (RA-2) with 12 foot travel lanes and 8 foot paved shoulders. Average Daily Traffic is approximately 3,000 vehicles per day.

Five bridges associated with the Pearl River system are crossed as follows:

* Structure no. 62520060705291, West Pearl River Bridge, Movable Lift Span
* Structure no. 62520060706701, West Middle Pearl River Bridge
* Structure no. 62520060707111, Middle Middle Pearl River Bridge
* Structure no. 62520060707701, East Middle Pearl River Bridge

* Structure no. 62520060800001, East Pearl River Bridge, Movable Swing Span

The Federal Highway Administration (FHWA) is the lead Federal agency for the project. Neel-Schaffer is under contract to LADOTD to provide associated environmental and engineering services in support of project.

Documentation regarding the West Pearl River structure follows:

US 90 Bridge across West Pearl River

Structure Number: 62520060705291

Recall Number: 058710

The US 90 bridge across the West Pearl River was built in 1933. The structure is 570 feet long and consists of 14 reinforced concrete deck girder approach spans, 2 steel truss tower anchor spans and 1 steel truss lift span in the main navigation span. The main span must be elevated to allow passage of vessels taller than 10 feet. The maximum vertical clearance for vessel navigation with the main span in the raised position is 50 feet. The horizontal navigation clearance is 90 feet. The tension elements in the steel truss spans of this bridge are classified as Fracture Critical Members such that failure of these components would result in collapse of the bridge. The most recent bridge inspection made on 4/28/2015 indicates that many of the steel components have varying corrosion and section loss in some areas ranging from 10% to 30%. The National Bridge Inventory (NBI) Condition Ratings are 5 (Fair) for the Deck, 3 (Serious) for the Superstructure and 6 (Satisfactory) for the Substructure. The overall Structure Evaluation is 3 which indicates the structure is considered to be in overall SERIOUS condition. The Sufficiency Rating for the structure based on the 2014 NBI data is 20.2 (out of 100) and the bridge is classified as Structurally Deficient. The horizontal bridge roadway width (24 feet) and vertical clearance (15 feet) do not meet the minimum requirements for a Rural Arterial (RA-2) roadway. The bridge does not have shoulders. This bridge is classified as a "Preservation Candidate" as determined under the PA regarding historic bridges in Louisiana.

The consultant team is developing alternatives for rehabilitation and or replacement, which will include fixed span and movable spans replacement structures. A summary review bridge tender reports (July 2010 - July 2011) follows:

The report shows limited navigation upstream of the US 90 West Pearl River bridge. Vessel heights are 30 feet or less. Because of the very limited navigation upstream of US 90, we may consider alternatives that reduce the vertical navigation clearance from 50 feet to 35 feet above mean high, and the horizontal navigation clearance for 90 feet to 50 feet. This change in the navigation clearance would benefit LADOTD by reducing the overall project cost. We

understand that this change in navigation clearance will require USCG approval and we are in discussion with David Frank, USCG.

From your web page, the West Pearl River Navigation Project was authorized in 1935 by the River and Harbor Act. The project consists of 58 miles of waterway from the mouth of the West Pearl River to the mouth of Bogalusa Creek at Bogalusa, Louisiana, including 20.8 miles of excavated canal. Within the 20.8 miles of the lateral canal there are 3 locks, 3 sills (one for each lock pool) and 4 boat ramps. Each lock is 65 feet in width by 310 feet in length. Lock 1 is located at Mile 29.7, Lock 2 is located at Mile 40.8, and Lock 3 is located at Mile 43.9. Pool's Bluff sill is located at Mile 48.7, Bogue Chitto Sill is located at Mile 44.0 and the spillway is located at Mile 33.0. In 1995, the West Pearl River Navigation Project was placed in a caretaker status and the Corps was directed by Congress to use limited funds to maintain the Project in this status.

Can you provide any further information on West Pearl River navigation, including the status of commercial navigation of the waterway; whether there is a maintained navigation channel, and if there are any projects planned to improve the waterway for navigation? Finally, do you have a "Design Vessel" documented within you project files, and if so, can you provide documentation of the design vessel?

Thanking you in advance for any information you may be able to provide,

Barry Brupbacher

Senior Project Manager

Neel-Schaffer, Inc.

Phone: 985.674.9820

Cell: 985-778-3105

FAX: 985.674.9822

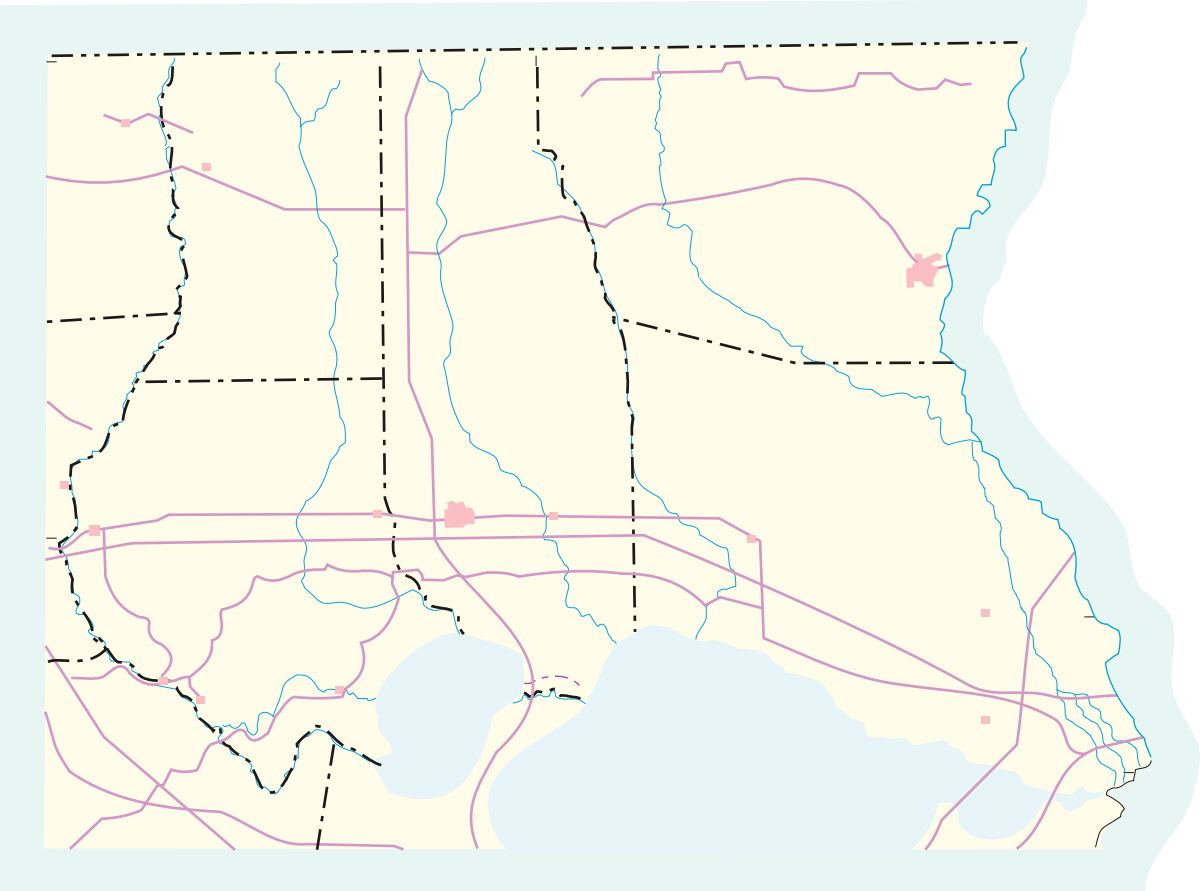
Website: Blockedwww.neel-schaffer.com <Blockedhttp://www.neel-schaffer.com/>

Neel-Schaffer, Inc. Confidentiality Note:
Information contained in this message along with any attachment(s) may be confidential and protected by legal privilege. This message is meant solely for the use of the individual(s) to whom it is addressed. Viewing or the use of information and attachment(s) within this message without the expressed permission of Neel-Schaffer, Inc. is prohibited. If you are not the intended recipient of this message, Neel-Schaffer, Inc. requests you take immediate action to notify the sender of the error and that you delete this message and all attachments without modifying, copying or distributing its content.

Appendix B
West Pearl River
Excerpts of the Department's 1999 Report Estimation of Scour and Channel Stability for Selected Highway Crossings of Rivers in the Florida Parishes, Southeastern Louisiana

Estimation of Scour and Channel Stability for Selected Highway Crossings of Rivers in the Florida Parishes, Southeastern Louisiana

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
Water Resources Technical Report No. 67B



STATE OF LOUISIANA
DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
PUBLIC WORKS AND FLOOD CONTROL DIRECTORATE
WATER RESOURCES SECTION
in cooperation with the
U.S. GEOLOGICAL SURVEY

1999

West Pearl River near Slidell, Louisiana

The West Pearl River is formed as a distributary of the Pearl River approximately 24 mi upstream of the U.S. Hwy. 90 embankment (upstream of both the I-10 and I-59 embankments). The only significant distributary of this reach of the river is the formation of the Middle River approximately 7 mi upstream of the U.S. Hwy. 90 embankment (2 mi upstream of the I-10 embankment). The channel curves sharply to the left immediately downstream of the bridge; upstream of the bridge there is a mild curve to the left (fig. 44).

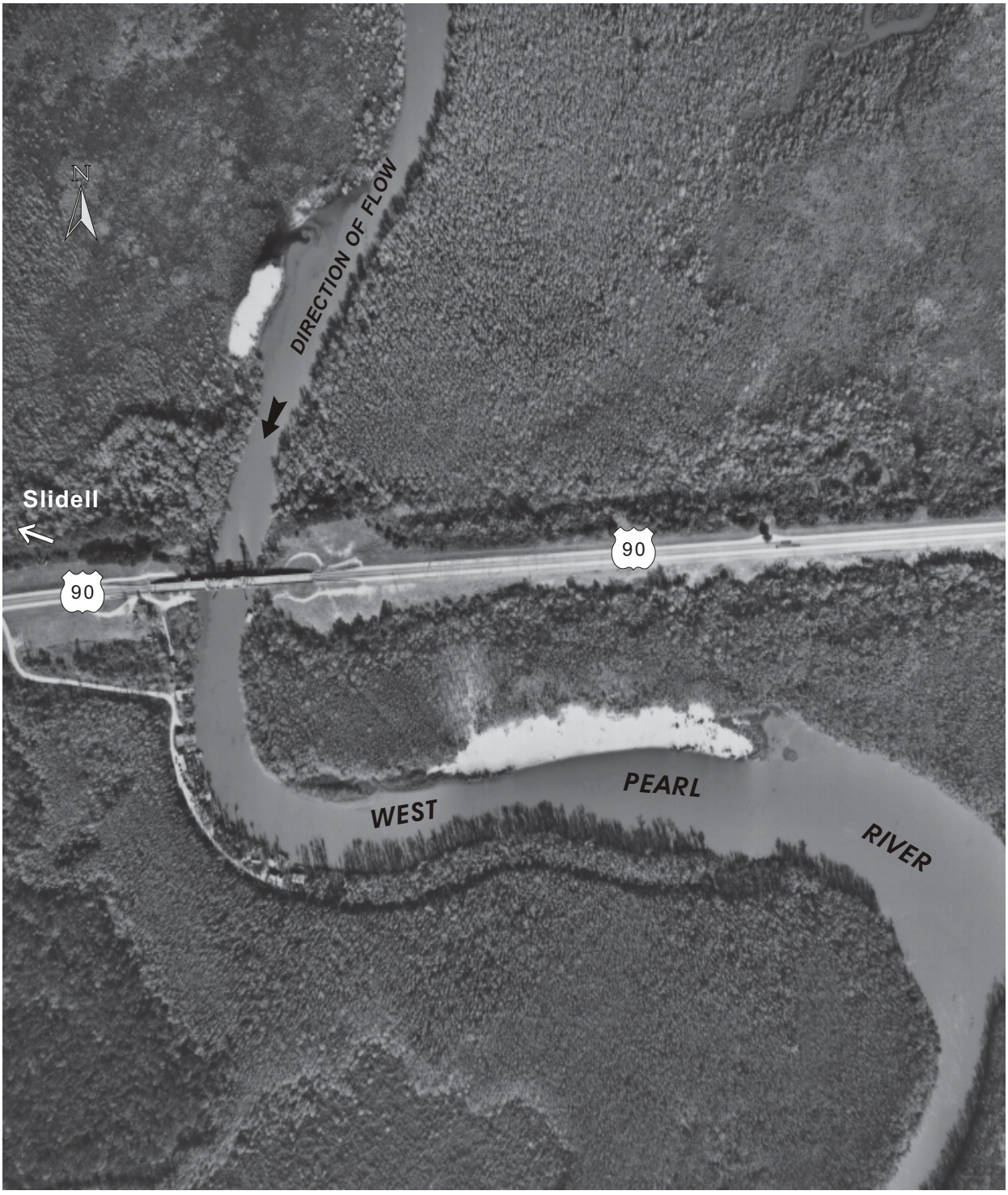
Pier Scour

Simulation of the Q_{500} indicated velocities ranging from approximately 2 to 6 ft/s and a water-surface elevation of approximately 7.5 ft above sea level. The bridge piers are not skewed to the channel at an angle greater than 15 degrees; therefore, no correction for alignment was applied. There are timber fenders protecting the main channel piers from river traffic. The effect of these fenders may tend to align the flow with the pile bents. The presence of the fender structures may also have an effect of reducing pier scour at that location (Abed and Richardson, 1993). The greatest predicted pier scour is approximately 13.3 ft and occurs at the main channel pier at DOTD station 344+48 (table 23, fig. 45). Scour at the three other main piers that are in or near the channel ranged from 7.9 to 11.3 ft. Estimated scour depth at the overbank piers was approximately 2 ft.

Table 23. Scour data for U.S. Highway 90 crossing of the West Pearl River near Slidell, Louisiana

[DOTD, Louisiana Department of Transportation and Development; water-surface elevation is 7.5 feet above sea level; K_2, dimensionless correction factor for angle of flow attack; ft, feet; ft/s, foot per second; pile tip elevations scaled from DOTD bridge plans; NA, not applicable]

DOTD station	Ground elevation (ft above sea level)	Pier shape	K_2	Pier width (ft)	Velocity (ft/s)	Local or pier scour (ft)	Contraction scour (ft)	Scour elevation (ft above sea level)	Pile tip elevation (ft above sea level)
341+06	10.0	Abutment	1.0	NA	1.7	NA	4.3	-1	-20
341+35	3.0	Square	1.0	1.5	1.7	2.1	4.3	-3	-20
341+63	3.0	Square	1.0	1.5	1.7	2.1	4.3	-3	-20
341+90	3.0	Square	1.0	1.5	1.7	2.1	4.3	-3	-20
342+18	3.0	Square	1.0	1.5	1.7	2.1	4.3	-3	-20
342+45	3.0	Square	1.0	1.5	1.7	2.1	4.3	-3	-20
342+74	3.0	Square	1.0	1.5	1.7	2.1	4.3	-3	-20
343+05	-9.0	Square	1.0	5.5	3.5	7.9	6.4	-23	-44
343+35	-8.0	Square	1.0	8.0	4.7	11.3	6.4	-26	-52
344+48	-19.0	Square	1.0	8.0	5.7	13.3	6.4	-39	-52
344+80	-10.0	Square	1.0	5.5	4.9	9.2	6.4	-26	-44
345+18	3.0	Square	1.0	1.5	1.7	2.1	3.9	-3	-20
345+38	3.0	Square	1.0	1.5	1.6	2.0	3.9	-3	-20
345+65	3.0	Square	1.0	1.5	1.6	2.0	3.9	-3	-20
345+92	3.0	Square	1.0	2.0	1.6	2.5	3.9	-3	-20
346+20	3.0	Square	1.0	2.0	1.6	2.5	3.9	-3	-20
346+50	3.0	Square	1.0	2.0	1.6	2.5	3.9	-3	-20
346+76	10.0	Abutment	1.0	NA	1.6	NA	3.9	-1	-20



Photograph source: Louisiana Department of Transportation and Development, December 1971

Figure 44. Aerial photograph of the U.S. Highway 90 crossing of the West Pearl River near Slidell, Louisiana.

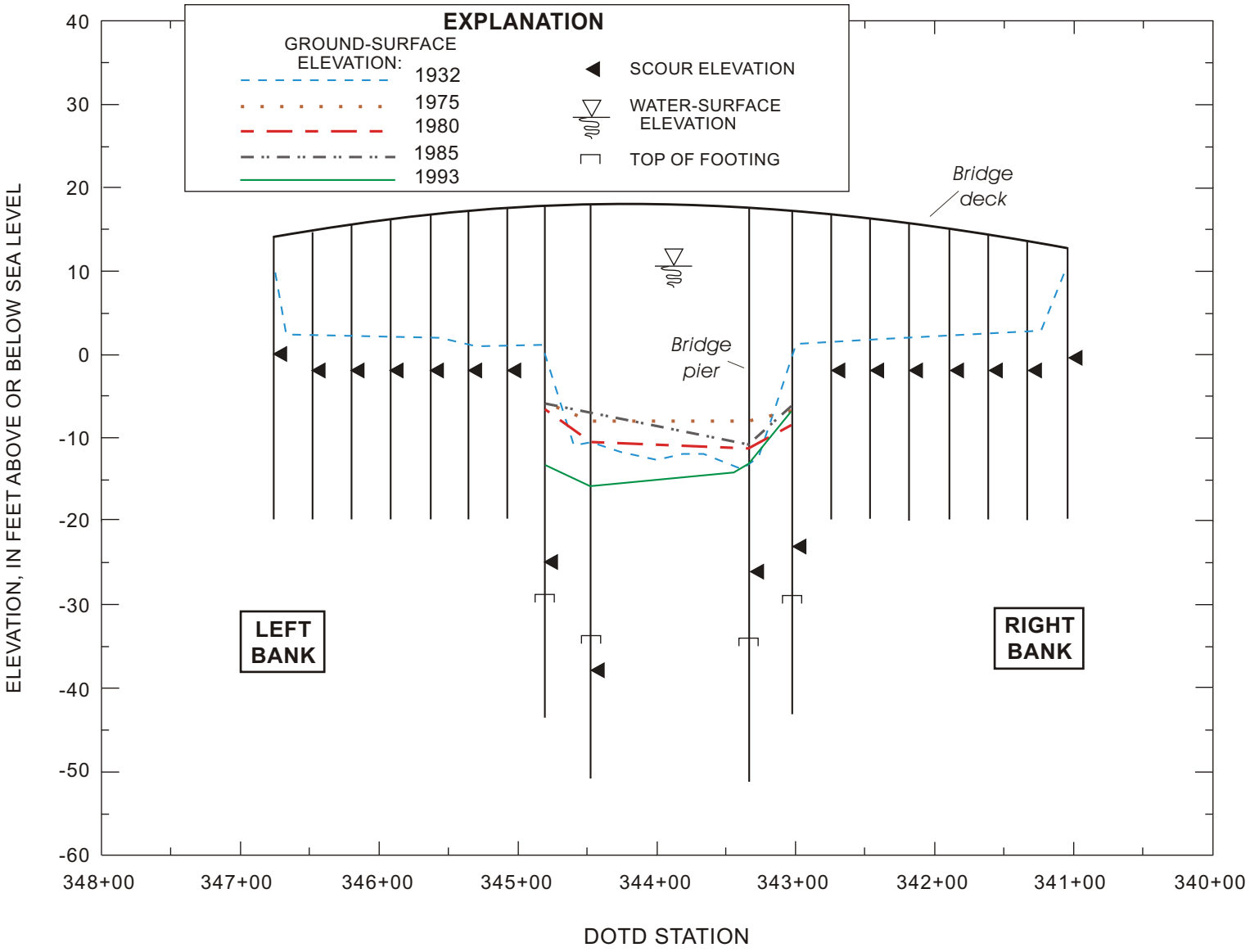


Figure 45. Comparative cross sections and scour estimates at the U.S. Highway 90 crossing of the West Pearl River near Slidell, Louisiana.

Channel Stability

The cross-section information at the bridge does not indicate any lateral movement of the channel. The timber fender structures at the bridge may serve to help align the flow through the structure and limit lateral migration of the channel (fig. 44). The bed elevation has changed by approximately 5 ft, both above and below the original (pre-construction) cross section. The most recent cross section indicates a lowering of approximately 5 ft in some locations.

Contraction and Abutment Scour

Flow through the bridge was subdivided into flow in the main channel, left overbank, and right overbank. The average depth of the channel at the bridge is approximately 22 ft for the main channel and 4.5 ft for the overbanks. For contraction scour estimates in the main channel, the flow in the main channel upstream was defined as a section of channel, approximately 200 ft in width. The width of the main channel at the bridge is 210 ft. Contraction scour in the main channel was computed as 6.4 ft. Scour on the left and right overbanks was predicted as 3.9 and 4.3 ft, respectively. The overbanks are vegetated with marsh grasses which may reduce scour potential in the overbank areas. No abutment scour was indicated.

Appendix C
West Pearl River
Photographs of Upstream and Downstream Approaches

West Pearl River

Upstream Approach



Downstream Approach



Appendix D
West Pearl River
2013-2018 Navigation Logs

DOTD 03-41-1084
REV. 6/77

STATE OF LOUISIANA
DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT

BRIDGE TENDER'S REPORT ON OPENINGS FOR NAVIGATION

DISTRICT NO. 62

CONTROL _____ UNIT _____ STRUCTURE NO. _____ NAME OF BRIDGE West Pearl

MONTH OF March 19 2013 NAME OF STREAM _____ STATE ROUTE NO. 90

SIGNATURE OF BRIDGE TENDERS ON DUTY	TIME ARRIVED	TIME LEFT
1. Huey Magee	#	#
2.		
3.		

Sun

fill in table completely

DATE 3-31-13	EXACT TIME OF OPENING	EXACT TIME OF CLOSING	DIRECTION OF TOW	NO. OF BARGES E OR L.	H	NAME AND DESCRIPTION OF VESSEL & TOW
	11:30 AM	11:45 AM	S	—	20	House boat
	5:50 PM	6:05 PM	N	—	20	House Boat

COUNT NUMBER OF BRIDGE OPENINGS LISTED ON THIS SHEET AND SHOW HERE 2

EXPLANATION: SHOW TIME OF OPENING & TIME OF CLOSING THUS: 3:42 A.M.
UNDER "NAME AND DESCRIPTION OF VESSEL" GIVE NAME OR NUMBER & BRIEF DESCRIPTION.
IF TUG WITH BARGES, GIVE NAME OF TUG & DESCRIPTION OF TOW.
E INDICATES EMPTY
L INDICATES LOAD
H INDICATES HEIGHT

West P.

DOTD 03-41-1084
REV. 6/77

STATE OF LOUISIANA
DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT

BRIDGE TENDER'S REPORT ON OPENINGS FOR NAVIGATION

DISTRICT NO. 62

CONTROL 006 UNIT 07 STRUCTURE NO. 05291 NAME OF BRIDGE West Pearl

MONTH OF _____ 19___ NAME OF STREAM _____ STATE ROUTE NO. 90

SIGNATURE OF BRIDGE TENDERS ON DUTY	TIME ARRIVED	TIME LEFT
1. Huey Magee	1740 PM	125 PM
2.		
3.		

fill in table completely

DATE	EXACT TIME OF OPENING	EXACT TIME OF CLOSING	DIRECTION OF TOW	NO. OF BARGES E. OR L.	H	NAME AND DESCRIPTION OF VESSEL & TOW
4/3/13	~~12~~ 119 PM	125 PM	S	—	25	Bait Boat
4/6/13	12.20	12.35	N	—		Shrimp Boat

COUNT NUMBER OF BRIDGE OPENINGS LISTED ON THIS SHEET AND SHOW HERE ---------- 1

EXPLANATION: SHOW TIME OF OPENING & TIME OF CLOSING THUS: 3:42 A.M.
UNDER "NAME AND DESCRIPTION OF VESSEL" GIVE NAME OR NUMBER & BRIEF DESCRIPTION.
IF TUG WITH BARGES, GIVE NAME OF TUG & DESCRIPTION OF TOW.
E INDICATES EMPTY
L INDICATES LOAD
H INDICATES HEIGHT

DOTD 03-41-1084
REV. 6/77

STATE OF LOUISIANA
DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT

BRIDGE TENDER'S REPORT ON OPENINGS FOR NAVIGATION

DISTRICT NO. 62

CONTROL 006 UNIT 07 STRUCTURE NO. 05291 NAME OF BRIDGE W. Pearl

MONTH OF May 19 2013 NAME OF STREAM West Pearl River STATE ROUTE NO. 90

SIGNATURE OF BRIDGE TENDERS ON DUTY	TIME ARRIVED	TIME LEFT
1.		
2.		
3.		

fill in table completely

DATE 5-4-13	EXACT TIME OF OPENING	EXACT TIME OF CLOSING	DIRECTION OF TOW	NO. OF BARGES E. OR L.	H	NAME AND DESCRIPTION OF VESSEL & TOW
5-4-13	12 PM	1 35 PM	N	—	25	Bait Boat
	2 35 PM	2 50 PM	N	—	30	Catchin Hell Shrimp Boat
5-6-13	8 10 PM	8 25 PM	S	—	30	Catchin Hell
	3 25 PM	3 40 PM	N	—	30	Catchin Hell
5-7-13	7 20 PM	7 35 PM	S	—	30	Catchin Hell
	4 10 PM	4 25 PM	N	—	30	" "
5-8-13	8 15 PM	8 30 PM	S	—	30	" "
	2 10 PM	2 25 PM	N	—	30	
5-9-13	8 10 AM	8 25 PM	S	—	30	Catchin Hell
5-15-13	8 00 AM	8 10 AM	S	—	25	Bait Boat
5-25-13	12 PM	1 35 PM	S	—	40	Shrimp Vessel
	12 PM	1 35 PM	S	—	30	Bait Boat
5-29-13	7 09 AM	7 17 PM	S	—	30	Shrimp Boat

COUNT NUMBER OF BRIDGE OPENINGS LISTED ON THIS SHEET AND SHOW HERE ------- 13

EXPLANATION: SHOW TIME OF OPENING & TIME OF CLOSING THUS: 3:42 A.M.
UNDER "NAME AND DESCRIPTION OF VESSEL" GIVE NAME OR NUMBER & BRIEF DESCRIPTION.
IF TUG WITH BARGES, GIVE NAME OF TUG & DESCRIPTION OF TOW.
E INDICATES EMPTY
L INDICATES LOAD
H INDICATES HEIGHT

DOTD 03-41-1084
REV. 6/77

STATE OF LOUISIANA
DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT

BRIDGE TENDER'S REPORT ON OPENINGS FOR NAVIGATION

DISTRICT NO. 62

CONTROL 006 UNIT 07 STRUCTURE NO. 05291 NAME OF BRIDGE W. Pearl

MONTH OF Oct 19 15 NAME OF STREAM Pearl River STATE ROUTE NO. 90

SIGNATURE OF BRIDGE TENDERS ON DUTY	TIME ARRIVED	TIME LEFT
1.		
2.		
3.		

fill in table completely

DATE	EXACT TIME OF OPENING	EXACT TIME OF CLOSING	DIRECTION OF TOW	NO. OF BARGES E OR L	H	NAME AND DESCRIPTION OF VESSEL & TOW
10/24			N	1		House Boat (Barge)

COUNT NUMBER OF BRIDGE OPENINGS LISTED ON THIS SHEET AND SHOW HERE _____

EXPLANATION: SHOW TIME OF OPENING & TIME OF CLOSING THUS: 3:42 A.M.
UNDER "NAME AND DESCRIPTION OF VESSEL" GIVE NAME OR NUMBER & BRIEF DESCRIPTION.
IF TUG WITH BARGES, GIVE NAME OF TUG & DESCRIPTION OF TOW.
E INDICATES EMPTY
L INDICATES LOAD
H INDICATES HEIGHT

DOTD 03-41-1084
REV. 6/77

STATE OF LOUISIANA
DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT

BRIDGE TENDER'S REPORT ON OPENINGS FOR NAVIGATION

DISTRICT NO. 62

CONTROL _____ UNIT _____ STRUCTURE NO. _____ NAME OF BRIDGE West Pearl

MONTH OF April June 15 2017 NAME OF STREAM West Pearl STATE ROUTE NO. 90

SIGNATURE OF BRIDGE TENDERS ON DUTY	TIME ARRIVED	TIME LEFT
1.		
2.		
3. Thursday		

fill in table completely

DATE 3-23-17	EXACT TIME OF OPENING	EXACT TIME OF CLOSING	DIRECTION OF TOW	NO. OF BARGES E. OR L.	H	NAME AND DESCRIPTION OF VESSEL & TOW
	1:35 pm	1:45	S		18	Houseboat
4-4-17	10:42 am	10:53	Test			Tested w/ David H. for "screeching"
4-6-17	9:38 am	9:42	Test			Tested after plunger LS rewire
4-6-17	4:00 pm	4:08	Test			Tested after phase failure install
4-6-17	5:18 pm	5:24	Test			Test of the test
4-7-17	9:10 AM	9:20 AM	N	1-L	25	Spud Barge
4-7-17	9:25 am	9:35 am	Test			Test
4-18-17	10:30 am	10:37 am	Test			Test
4-19-17	11:15 AM	11:30 AM	N	1-L	30	Spud Barge
4-25-17	9:30	9:45	-			-
4-29-17	4:15	4:30	N		25	shrimp boat (Mr Rudd m.v.)
6-30-17	10:00 AM	10:15 AM	S	L	25	Spud barge
	10:30 AM	10:47 AM	training			HM ED
	11:15 AM	11:30 AM				HM ED
	12:45 PM	12:30 PM	TRAINS			HM ED
	1:00 PM	1:15 PM	N			HM ED
	1:30 PM	1:45 PM	TRAINS			HM ED

COUNT NUMBER OF BRIDGE OPENINGS LISTED ON THIS SHEET AND SHOW HERE March (1) April 10 June 6 #

EXPLANATION: SHOW TIME OF OPENING & TIME OF CLOSING THUS: 3:42 A.M.
UNDER "NAME AND DESCRIPTION OF VESSEL" GIVE NAME OR NUMBER & BRIEF DESCRIPTION.
IF TUG WITH BARGES, GIVE NAME OF TUG & DESCRIPTION OF TOW.
E INDICATES EMPTY
L INDICATES LOAD
H INDICATES HEIGHT

DOTD 03-41-1084
REV. 6/77

STATE OF LOUISIANA
DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT

BRIDGE TENDER'S REPORT ON OPENINGS FOR NAVIGATION

DISTRICT NO. _____

CONTROL _____ UNIT _____ STRUCTURE NO. _____ NAME OF BRIDGE West Pearl

MONTH OF July 19 18 NAME OF STREAM _____ STATE ROUTE NO. _____

SIGNATURE OF BRIDGE TENDERS ON DUTY	TIME ARRIVED	TIME LEFT
1.		
2.		
3.		

fill in table completely

DATE	EXACT TIME OF OPENING	EXACT TIME OF CLOSING	DIRECTION OF TOW	NO. OF BARGES E OR L.	H	NAME AND DESCRIPTION OF VESSEL & TOW
~~06-19~~						
06-21	11:30AM	11:45AM	—	—	-	Opening the bridge.
08-27	9:30AM	9:45AM	—	—	-	bridge opening
9-5-	11:00AM	11:31	-	-		checked Breaker.
10-23	10:30AM	10:45AM	—	—	-	Bridge opening

COUNT NUMBER OF BRIDGE OPENINGS LISTED ON THIS SHEET AND SHOW HERE _____

EXPLANATION: SHOW TIME OF OPENING & TIME OF CLOSING THUS: 3:42 A.M.
UNDER "NAME AND DESCRIPTION OF VESSEL" GIVE NAME OR NUMBER & BRIEF DESCRIPTION.
IF TUG WITH BARGES, GIVE NAME OF TUG & DESCRIPTION OF TOW.
E INDICATES EMPTY
L INDICATES LOAD
H INDICATES HEIGHT

(1) REPAIR AND REPLACEMENT WORK

DATE	TIME	DESCRIPTION OF REPAIRS AND PARTS REPLACED	SIGNATURE OF PERSON DOING WORK
6-21-18	11:00 am	ANNUAL INSPECTION & OPENING.	SP, PLW

(2) WIRE SEALS

A. WHEN INSTALLED OR REPLACED

DATE	TIME	SEAL NUMBER	SIGNATURE OF ELECTRICIAN

B. WHEN BRIDGE TENDER HAS TO BREAK SEAL

DATE	TIME	NUMBER OF BROKEN SEAL	APPARENT REASON FOR HAVING TO USE BY-PASS	SIGNATURE OF BRIDGE TENDER ON DUTY

(3) BRIDGE LUBRICATION

DATE	TIME	WHAT PARTS WERE LUBRICATED	SIGNATURE OF PERSON DOING WORK

(4) MALFUNCTIONING NAVIGATION HORN

DATE	TIME HORN STOPPED WORKING PROPERLY	TIME DISTRICT WAS NOTIFIED	SIGNATURE OF BRIDGE TENDER ON DUTY

(5) VISITORS TO BRIDGE (FOR EXAMPLE: BRIDGE INSPECTORS)

DATE	TIME	PURPOSE OF VISIT	SIGNATURE OF VISITOR

(6) AREAS IN NEED OF REPAIR OR REPLACEMENT WORK

DATE	TIME	DESCRIPTION OF AREAS IN NEED OF REPAIR/REPLACEMENT	SIGNATURE OF BRIDGE TENDER ON DUTY

DEPARTMENT OF THE ARMY

APPROVAL OF LOCATION AND PLANS OF BRIDGE

Whereas *by Title V of an act of Congress approved August 2, 1946, entitled General Bridge Act of 1946 (33 U. S. C., 525–533, as amended) the consent of Congress was granted for the construction, maintenance, and operation of bridges and approaches thereto over the navigable waters of the United States;*

And whereas *section 502(b) of said act provides that: "The location and plans for such bridges shall be approved by the Chief of Engineers and the Secretary of the Army before construction is commenced, and, in approving the location and plans of any bridge, they may impose any specific conditions relating to the maintenance and operation of the structure which they may deem necessary in the interest of public navigation, and the conditions so imposed shall have the force of law;"*

And whereas the STATE OF LOUISIANA, DEPARTMENT OF HIGHWAYS has *submitted plans and a map of the location of a twin bridge to be constructed across* WEST PEARL RIVER near Slidell, *in the State of* Louisiana;

Now therefore, *This is to certify that the location and attached plans are hereby approved by the Chief of Engineers and by the Secretary of the Army, pursuant to the above-mentioned act of Congress, subject to the following conditions:*

1. The district engineer in charge of the locality within which the bridge is to be built may supervise its construction in order that said plans shall be complied with.

2. All work shall be so conducted so that the free navigation of the waterway shall not be unreasonably interfered with and the present navigable depths shall not be impaired. The channel or channels through the structure shall be promptly cleared of all falsework, piling, or other obstructions placed therein or caused by the construction of the bridge, to the satisfaction of the said district engineer, when in his judgment the construction work has reached a point where such action should be taken, and in any case not later than ninety *days after the bridge has been opened to traffic.*

3. The approval hereby granted shall cease and be null and void unless the actual construction of the bridge be commenced within 2 year(s) and completed within 4 years from the date of this instrument.

4. No deviation from the approved plans shall be made either before or after completion of the structure unless the modification of said plans has previously been submitted to and received the approval of the Chief of Engineers and of the Secretary of the Army.

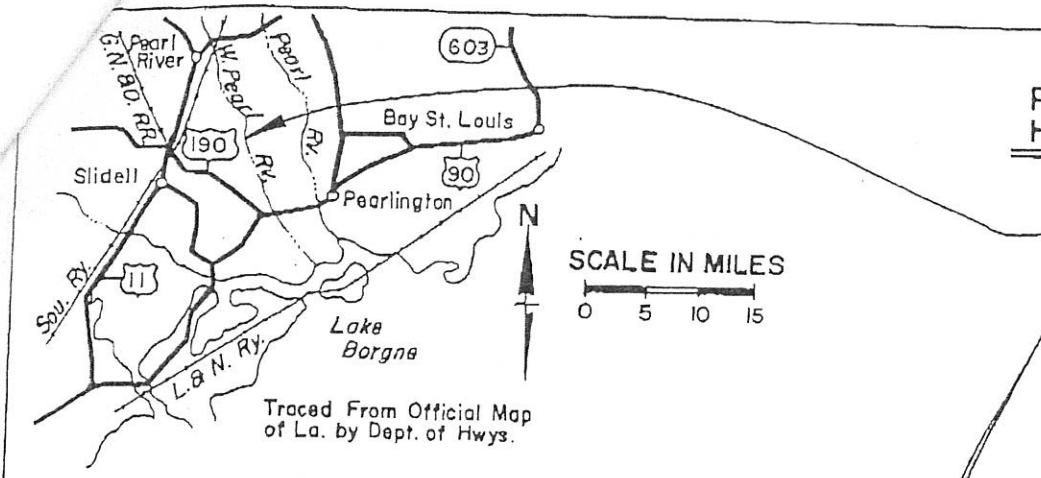
In witness whereof I have hereunto set my hand by direction of the Chief of Engineers this 15th day of March 1961

WILLIAM F. CASSIDY
Major General, USA
Director of Civil Works
(Assistant to the Chief of Engineers
for Civil Works)

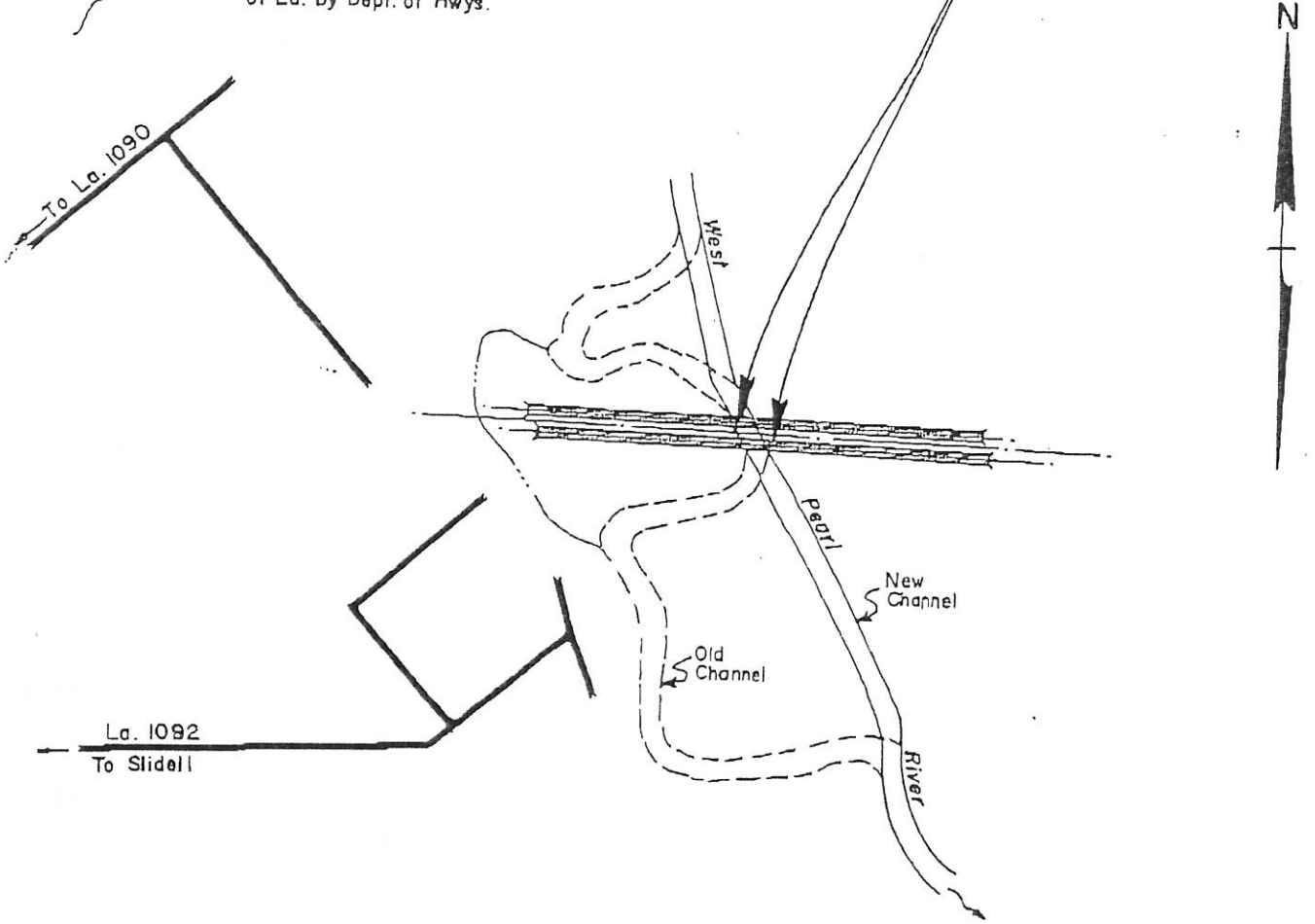
In witness whereof I have hereunto set my hand by direction of the Assistant Secretary of the Army (FM) this 17th day of March 1961

WALTER J. WELLS
Colonel, GS
Executive

U.S. GOVERNMENT PRINTING OFFICE : 1959—O-507094



PROPOSED
HIGHWAY BRIDGES



SCALE IN FEET

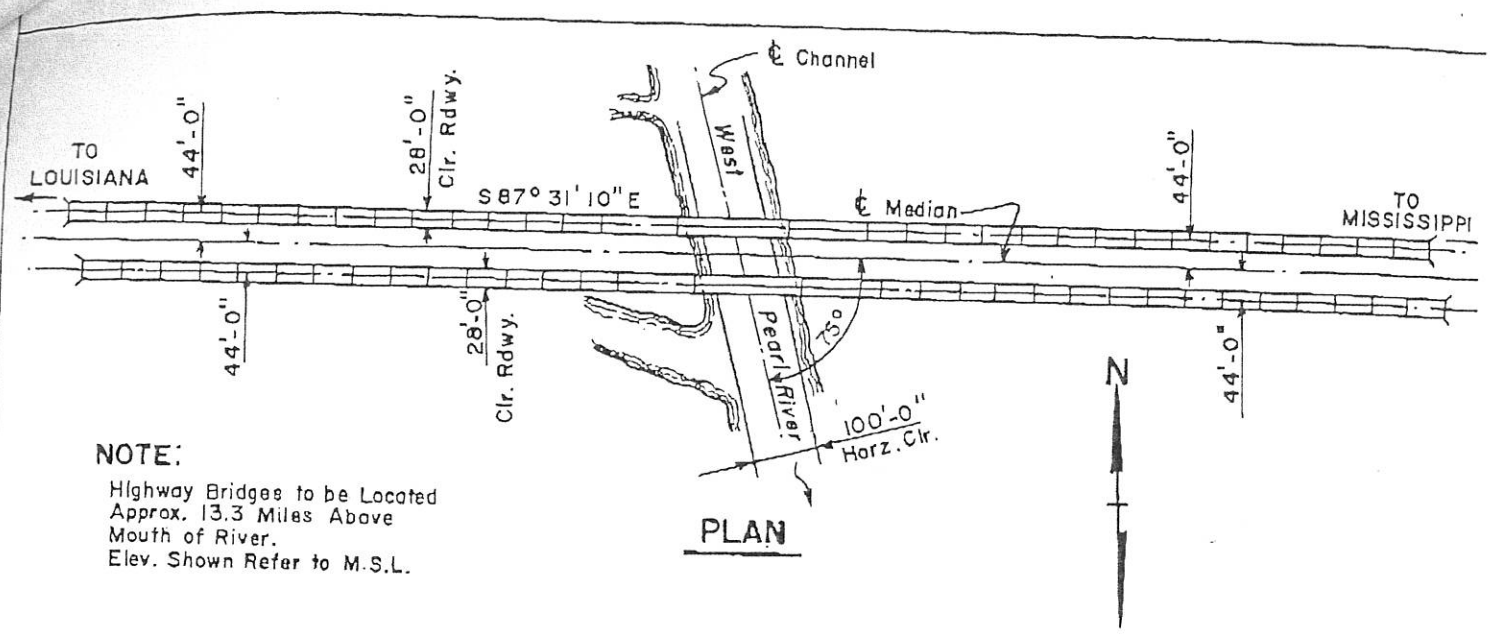
0 1000 2000

PROPOSED
HIGHWAY BRIDGES
OVER
WEST PEARL RIVER
NEAR
PEARL RIVER
ROUTE I-10
ST. TAMMANY PARISH
STATE OF LOUISIANA
DEPARTMENT OF HIGHWAYS
BATON ROUGE, LA.
MAY 25, 1960

Bridge 1-

REVISED
DEC. 21, 1960

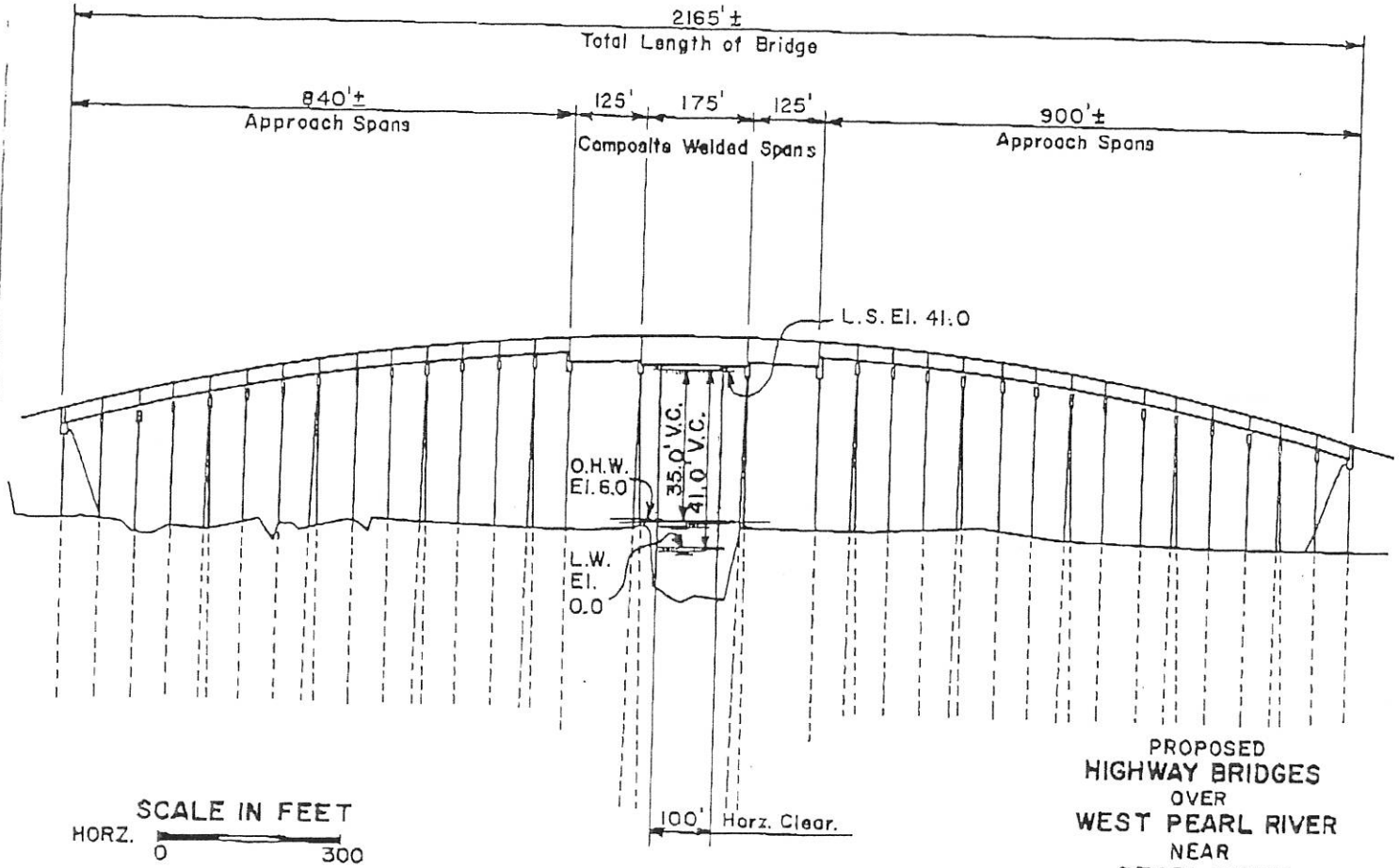
SHEET 1 OF 2 SHEETS



NOTE:

Highway Bridges to be Located Approx. 13.3 Miles Above Mouth of River.
Elev. Shown Refer to M.S.L.

PLAN



SCALE IN FEET

HORZ. 0 300

VERT. 0 40

ELEVATION NORTH STRUCTURE

(LOOKING NORTH)
(SOUTH STRUCTURE SAME)

REVISED
DEC. 21, 1960

PROPOSED
HIGHWAY BRIDGES
OVER
WEST PEARL RIVER
NEAR
PEARL RIVER
ROUTE I-10
ST. TAMMANY PARISH
STATE OF LOUISIANA
DEPARTMENT OF HIGHWAYS
BATON ROUGE, LA.
MAY 25, 1960

SHEET 2 OF 2 SHEETS

LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

Office of Engineering
Environmental Section
PO Box 94245 | Baton Rouge, LA 70804-9245
ph: 225-242-4502 fx: 225-242-4500

John Bel Edwards, Governor
Shawn D. Wilson, Ph.D., Secretary

August 25, 2022

STATE PROJECT NOS.: H.000284/H.000286
F.A.P. NOS.: H.000284/H.000286
PROJECT NAME: US 90 PEARL RIVER BRIDGES (HBI)
BRIDGE RECALL NOS.: 0587500, 058710, 0587200, 058730, 058740
ROUTE: US 90
LOCATION: ST. TAMMANY PARISH, LA & HANCOCK COUNTY, MS

Mr. Doug Blakemore
Commander, Eighth Coast Guard District (dpb)
Hale Boggs Federal Building
500 Poydras St.
New Orleans, LA 70130-3310

Via E-mail to: D8DPBALL@uscg.mil

SUBJECT: Further Considerations West Pearl River Bridge (Recall # 058710) Reduced Vertical and Horizontal Navigational Clearance

Dear Mr. Blakemore,

On June 14, 2022, the Louisiana Department of Transportation (LADOTD) submitted a letter (see attached) to your office requesting a reduction of the vertical clearance of the West Pearl River Bridge from 50' above mean high water (MHW) to 35' above MHW while maintaining the 90' horizontal clearance. The reduction in vertical clearance was based on the upstream river constraints imposed by the existing I-10 and I-59 fixed bridges (Map 1). On July 14, 2022 LADOTD paused that request to study and develop its plans for the closed US 90 corridor from the West Pearl River Bridge to the East Pearl River Bridge (Map 2). At this time, LADOTD does not intend to reopen US 90 to vehicular traffic through the means of temporary bridge at the West Pearl River but instead close the route until new permanent structures at the West Pearl, West Middle Pearl, Middle Middle Pearl and East Middle Pearl can be constructed (Map 2).

Upon further review of the upstream crossings, latest bridge opening data, and historic streambed depth data, LADOTD believes that a vertical clearance of 12' above MHW and a horizontal clearance of 60' for a fixed span bridge would be sufficient for the proposed replacement of the West Pearl River Bridge (Recall #058710). LADOTD is seeking your review and concurrence on this reduced vertical and horizontal clearance. A summary of our findings is present below for your consideration.

Previously proposed (see Table 1) bridge clearances and preliminary navigation determinations for the West Middle Pearl River Bridge (Recall # 058720), Middle Middle Pearl River Bridge Recall # 058730), East Middle Pearl River Bridge (Recall # 058740) and the East Pearl River Bridge (Recall # 058750) have not changed.

Table 1. Summary of Bridge Clearances and Preliminary Navigation Determinations

Waterway	Proposed Structure	Proposed Vertical Clearance above MHW (NAVD88 datum)	Proposed Horizontal Clearance
West Middle Pearl River	Fixed	11.16'	60'
Middle Middle Pearl River	Fixed	11.88'	60'
East Middle Pearl River	Fixed	11.96'	60'
East Pearl River	Fixed or Drawbridge	73'	115'

The Bridge Tender logs from 2013 to 2018 can be found in the Navigation Study and logs from 2019 to 2021 are attached to this letter. There has been a significant reduction in the number of vessels that require the bridge to open (Table 2) which can be attributed to aggradation of the river since the "West Pearl River Navigation Project" was placed in caretaker status in 1995.

Table 2: West Pearl River Bridge openings per year for marine travel purposes (2011 through 2021)

2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
17	37	28	3	1	3	4	0	0	2	1

The historic hydrographic survey data from January 21, 1969 to November 22, 2021 (Figure 1) demonstrates the significant aggradation that has occurred over time. This aggradation limits the allowable boat draft and, in turn, boat height and explains the reduction in bridge openings for marine traffic. The three plots below show streambed depths at the West Pearl River Bridge Pier 2, Mid River, and Pier 3.

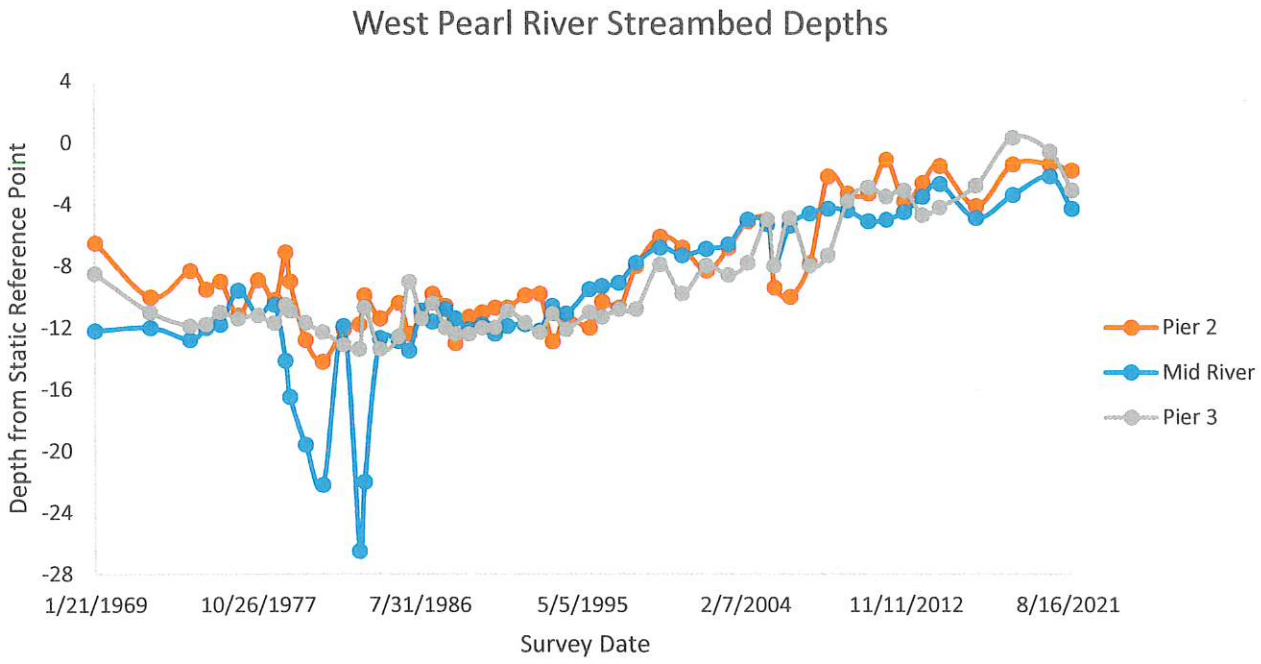


Figure 1: Hydrographic survey data West Pearl River Bridge January 21, 1969 – November 22, 2021.

The West Pearl River Bridge Navigation Study (attached) highlights the West Pearl River's dredging history and current "Caretaker" status. Additionally, the navigation study contains communications from a past waterway user (Durwood Dunn Construction) that demonstrates how the aggradation of the river has affected their ability to traverse the river with large vessels. With no plans to dredge the West Pearl River in the future, LADOTD is requesting to proceed with a replacement bridge that provides the same vertical clearance as the existing bridge in the closed position. The primary users of the West Pearl River are the eco-tour boats in the area as well as sportsman who utilize the adjacent wildlife management area for hunting and fishing. The proposed 12' vertical and 60' horizontal clearances match the clearances of the three fixed middle river structures whose waterways service the same eco-tours and sportsman.

Additionally, LA DOTD understands that the USCG approved a permit in 2018 for the existing Norfolk Southern Railroad Bridge approximately 12 miles upstream of the US 90 crossing. The 2018 permit allows the existing swing span bridge to operate as a fixed bride with a clearance of 7 feet above mean high water, elevation 16.27, NGVD 29. The Norfolk Southern Railroad Bridge is the upstream controlling vertical clearance.

Based on the information provided LADOTD is requesting to reduce the preliminary vertical navigational clearance determination for the West Pearl River Bridge from 50' to 12' above MHW and the Horizontal Clearance from 90' to 60'. If you have any questions regarding this request or the associated documents please contact Ryan Morvant at 225-379-1067 or ryan.morvant@la.gov.

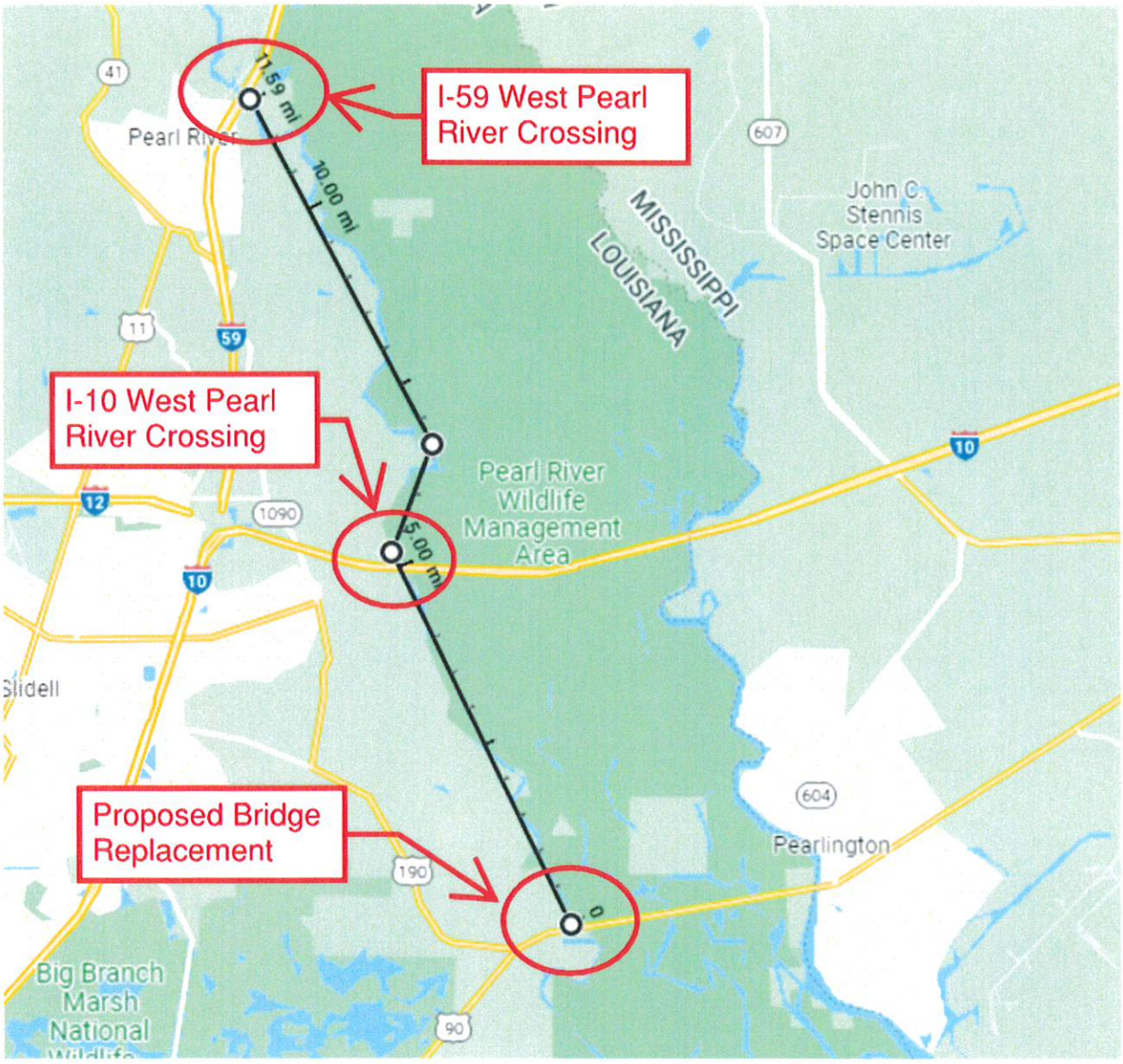
Sincerely,

Noel Ardoin
Environmental Engineer Administrator

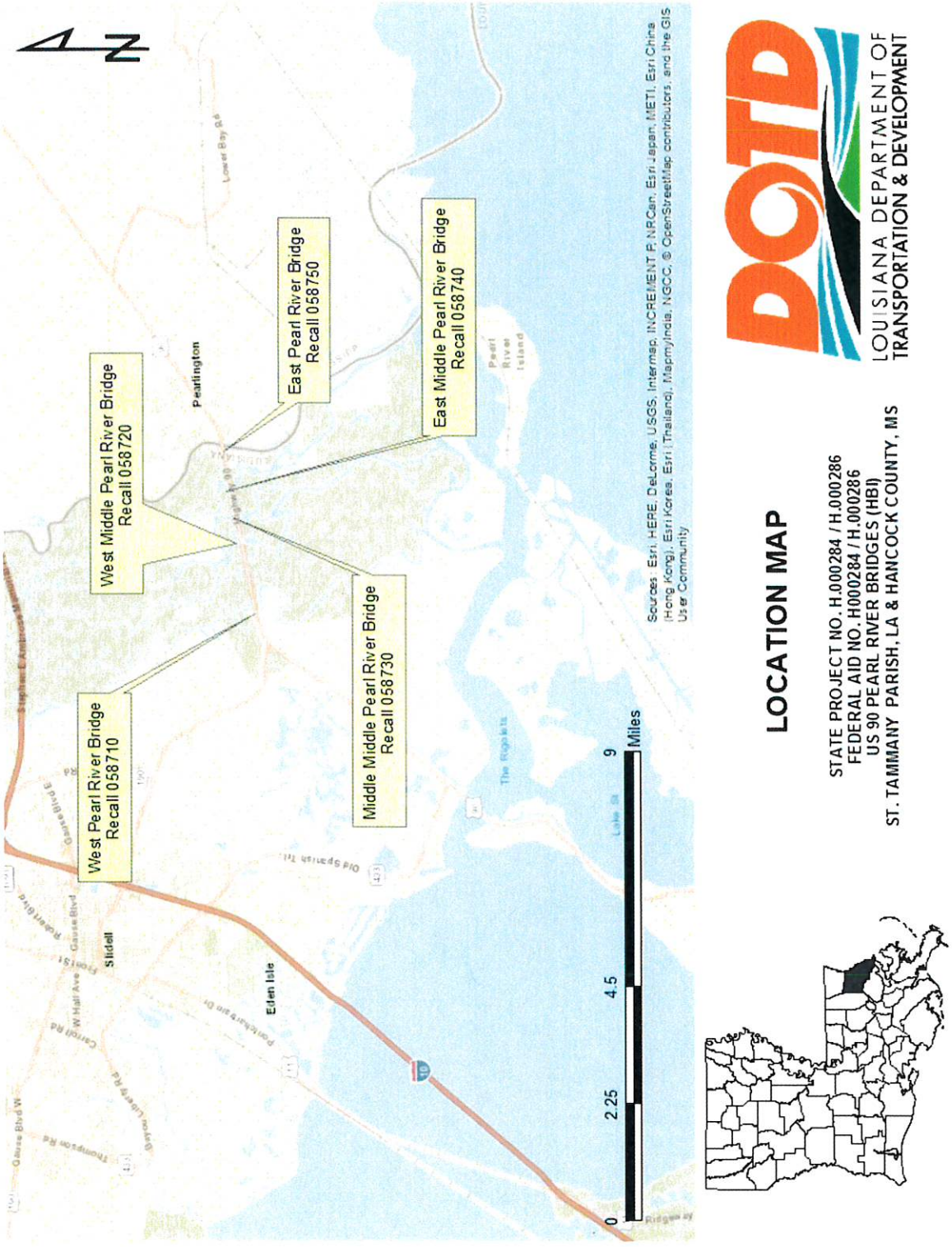
Enclosures
NA/sp

cc:

Lynn Heisler FHWA
Jerry Pitts FHWA
Robert Lott, LADOTD
Stacie Palmer, LADOTD



Map 1: West Pearl River Bridge and upstream river crossings at I-10 and I-59.



Map: US 90 corridor West Pearl River Bridge to East Pearl River Bridge (MS boarder).

U.S. Department of Homeland Security

United States Coast Guard

Commander
Eighth Coast Guard District
Hale Boggs Federal Building

500 Poydras Street, Room 1313
New Orleans, LA 70130-3310
Staff Symbol: (dpb)
Phone: (504) 671-2131
Fax: (504) 671-2133
D8DPBALL@uscg.mil

16590
September 19, 2023

Louisiana Department of Transportation and Development
Attn: Noel Ardoin
1201 Capitol Access Road
Baton Rouge, LA 70802

Dear Ms. Ardoin:

We reviewed the information you provided us on August 25, 2022 concerning the replacement of the West Pearl River Drawbridge that span the U. S. 90 highway across the West Pearl River located in St. Tammany Parish, Louisiana and Hancock County, MS. In your letter you asked the Coast Guard to review the navigation studies associated with the bridge and provide you with preliminary navigation determination on the proposed replacement bridge.

The Coast Guard has determined that a fixed bridge would need to have a vertical clearance of 20' at mean high water (MHW)) and a horizontal clearance of 90' to support the reasonable needs of navigation. This river is used by recreational, small commercial fishing, and tour boats that need a vertical clearance of 20' at MHW to safely pass beneath the bridge.

This preliminary determination does not constitute an approval or final agency determination, which we can only make according to the regulations and after LADOTD submits a complete bridge permit application. Please contact Terry Webster if you need further information. He can be contacted at (504) 671-2131, email Terry.M.Webster@uscg.mil.

Sincerely,

Doug Blakemore

Doug Blakemore
Chief, Bridge Administration Branch
U.S. Coast Guard
By direction of the District Commander

Copy: CG Sector New Orleans

LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

Office of Engineering
Environmental Section
PO Box 94245 | Baton Rouge, LA 70804-9245
ph: 225-242-4502 | fx: 225-379-4500

John Bel Edwards, Governor
Eric Kalivoda, Secretary

November 8, 2023

STATE PROJECT NOS.: H.000284/H.000286
F.A.P. NOS.: H.000284/H.000286
PROJECT NAME: US 90 PEARL RIVER BRIDGES (HBI)
BRIDGE RECALL NOS.: 058750, 058710, 058720, 058730, 058740
ROUTE: US 90
LOCATION: ST. TAMMANY PARISH, LA & HANCOCK COUNTY, MS

Mr. Doug Blakemore
Commander, Eighth Coast Guard District (dpb)
Hale Boggs Federal Building
500 Poydras St.
New Orleans, LA 70130-3310

Via E-mail to: D8DPBALL@uscg.mil

SUBJECT: Further Considerations for the Middle Three Pearl River Bridges (Recall # 058720, 058730, 058740) Revised Vertical Navigational Clearance

Dear Mr. Blakemore,

On September 9, 2019, the Louisiana Department of Transportation and Development (LADOTD) submitted a letter (see attached) to your office requesting a concurrence to vertical navigational clearances as shown in the below:

Bridge Name	Existing Vertical Clearance	Proposed Vertical Clearance
West Middle Pearl River	10' above MHW	11.16' above MHW
Middle Middle Pearl River	10' above MHW	11.88' above MHW
East Middle Pearl River	10' above MHW	11.96' above MHW

On October 17, 2019, your office responded that these vertical clearances meet the reasonable needs of navigation (see attached). LADOTD is requesting to maintain the existing vertical clearances for all three (3) bridges as shown in the table below with the understanding that through the design process and permitting the vertical clearance may be heightened.

Bridge Name	Existing Vertical Clearance	Proposed Vertical Clearance
West Middle Pearl River	10' above MHW	10' above MHW
Middle Middle Pearl River	10' above MHW	10' above MHW
East Middle Pearl River	10' above MHW	10' above MHW

LA DOTD is requesting your concurrence to maintain the existing 10' clearance above MHW for the three middle Pearl River Bridges (Recall # 058720, 058730, 058740). If you have any questions regarding this request or associated documents, please contact Stacie Palmer at (225) 242-4517 or Stacie.palmer@la.gov.

Sincerely,

Noel Ardoin
Environmental Engineer Administrator

KC Enclosures
NA/sp

CC: Ryan Morvant, LADOTD
Larry Breland, FHWA
Robert Lott, LADOTD
Terry Webster, USCG

U.S. Department of Homeland Security

United States Coast Guard

Commander
Eighth Coast Guard District
Hale Boggs Federal Building

500 Poydras Street
New Orleans, LA 70130-3310
Staff Symbol: (dpb)
Phone: (504) 671-2128
Fax: (504) 671-2133
Email: D8dpbail@uscg.mil

16590
October 17, 2019

Louisiana Department of Transportation and Development
Attn: Ms. Noel Ardoin
1201 Capitol Access Road
Baton Rouge, LA 70802

Dear Ms. Ardoin:

We have reviewed the information you provided us on September 9, 2019 concerning the replacement of 5 bridges that span the U.S. 90 highway across the several Pearl Rivers located in St. Tammany Parish, Louisiana. In your letter you asked the Coast Guard to review the navigation studies associated with each bridge and provide you with preliminary navigation determinations on each proposed replacement bridge. Table 1 summarizes your proposals. All vertical clearances are referenced to NAVD88 datum.

Table 1. Summary of Bridge Clearances and Preliminary Navigation Determinations

Waterway	Proposed Structure	Proposed Vertical Clearance above MHW	Proposed Horizontal Clearance
West Pearl River	Fixed or drawbridge	Fixed - 50' Draw – 50' in the open to vessel position	90'
West Middle Pearl River	Fixed	11.16'	60'
Middle Middle Pearl River	Fixed	11.88'	60'
East Middle Pearl River	Fixed	11.96'	60'
East Pearl River	Fixed or drawbridge	73'	115'

The clearances for all of the bridges would meet the reasonable needs of navigation and the alignments and locations of the new bridges do not appear to present hazards to navigation. The Coast Guard may require that the clearances proposed in this navigation study be revalidated if there is a lengthy period of time between the date of this study and the date of the actual bridge permit application.

You indicated that you might build moveable bridges at the West Pearl River and East Pearl River locations. Your study provided vertical clearances for both moveable bridges in the closed to vessel position. The Coast Guard has no comment on these clearances. Each bridge must provide the clearances contained in Table 1 while in the open to vessel position.

Your study mentioned building temporary bridges during construction. These temporary bridges are an important aspect to obtaining a Coast Guard bridge permit. These waterways are used by

LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

Office of Engineering
Environmental Section
PO Box 94245 | Baton Rouge, LA 70804-9245
ph: 225-242-4501 fx: 225-242-4500

John Bel Edwards, Governor
Shawn D. Wilson, Ph.D., Secretary

September 9, 2019

STATE PROJECT NOS.: H.000284/H.000286
F.A.P. NOS.: H.000284/H.000286
PROJECT NAME: US 90 PEARL RIVER BRIDGES (HBI)
BRIDGE RECALL NOS.: 0587500, 058710, 0587200, 058730, 058740
ROUTE: US 90
LOCATION: ST. TAMMANY PARISH, LA & HANCOCK COUNTY, MS

Mr. Doug Blakemore
Commander, Eighth Coast Guard District (dpb)
Hale Boggs Federal Building
500 Poydras St.
New Orleans, LA 70130-3310

Via E-mail to: D8DPBALL@uscg.mil

SUBJECT: Preliminarily Navigation Determination

Dear Mr. Blakemore,

The Louisiana Department of Transportation and Development (LADOTD) in cooperation with the Mississippi Department of Transportation (MDOT) and the Federal Highway Administration (FHWA) are proposing to replace/rehabilitate five historic bridges along US 90 between Slidell, Louisiana and Pearlington, Mississippi (see attached map). All bridges have been determined eligible for the National Register of Historic Places. Enclosed for you review are the Navigational Impact Reports for the five bridges. We are requesting a preliminary navigation determination on these bridges.

All structures (described below) are within a tidal zone. The East Pearl River Bridge (Recall # 058750) and West Pearl River Bridge (Recall # 058710) locations are utilized by vessels greater that 21-feet in length. The West Middle Pearl Bridge (Recall # 0587200), Middle Middle Pearl River Bridge (Recall # 058730), and the East Middle Pearl River Bridge (Recall # 058740) are located within the Pearl River Wildlife Management Area (WMA). Vessel traffic within the WMA includes recreational boating, fishing, and other small vessels. All bridge crossing are considered navigable waterways and will require permitting.

- **West Pearl River Bridge** – Recall number 058710
  River Mile Location – 7.9
  - Existing clearances
    - Horizontal – 90'
    - Vertical

- **East Pearl River Bridge** - Recall number 058750
  River Mile Location – 8.8 miles
  - Existing clearances
    - Horizontal – 90'
    - Vertical
      - Open – Unrestricted
      - Closed – 10' above MHW
  - Proposed clearances
    - Mid-level moveable alternative (passes 80% of vessels)
      - Horizontal 115' – match I-10
      - Vertical
        - Closed – bascule & lift option – 25' above MHW
        - Open –
          - Bascule option - unrestricted
          - Lift option – 73' above MHW – match I-10
    - High level fixed alternative
      - Horizontal 115' – match I-10
      - Vertical – 73' above MHW – match I-10

If you have any questions regarding this request or the associated documents please contact Stacie Palmer at (225) 242-4517 or Stacie.palmer@la.gov.

Sincerely,

Noel Ardoin
Environmental Engineer Administrator

Attachment
NA/sp

cc: Catherine Mastin
Robert Mahoney FHWA
Traci Johnson

U.S. Department of Homeland Security

United States Coast Guard

Commander
Eighth Coast Guard District
Hale Boggs Federal Building

500 Poydras Street, Room 1313
New Orleans, LA 70130-3310
Staff Symbol: (dpb)
Phone: (504) 671-2131
Fax: (504) 671-2133
D8DPBALL@uscg.mil

16590
December 29, 2023

Louisiana Department of Transportation and Development
Attn: Noel Ardoin
1201 Capitol Access Road
Baton Rouge, LA 70802

Dear Ms. Ardoin:

We reviewed the information you provided us on November 8, 2023 concerning the replacement of 3 bridges that span the West, Middle, and East Pearl River fixed bridges that span the U. S. 90 highway across the several Pearl Rivers located in St. Tammany Parish, Louisiana. In your letter you asked the Coast Guard to review the navigation studies associated with the bridges and provide you with preliminary navigation determination on each proposed replacement bridge.

Bridge Name	Existing Vertical Clearance	Proposed Vertical Clearance
West Middle Pearl River	10' above MHW	10' above MHW
Middle Middle Pearl River	10' above MHW	10' above MHW
East Middle Pearl River	10' above MHW	10' above MHW

The clearances for all three of the bridges would meet the reasonable needs of navigation and the alignments and locations of the new bridges do not appear to present hazards to navigation. The Coast Guard may require that the clearances proposed in this navigation study be revalidated if there is a lengthy period of time between the date of this study and the date of the actual bridge permit application.

This preliminary determination does not constitute an approval or final agency determination, which we can only make according to the regulations and after LADOTD submits a complete bridge permit application. Please contact Terry Webster if you need further information. He can be contacted at (504) 671-2131, email Terry.M.Webster@uscg.mil.

Sincerely,

Doug Blakemore

Doug Blakemore
Chief, Bridge Administration Branch
U.S. Coast Guard
By direction of the District Commander

Copy: CG Sector New Orleans