2018 AASHTO SCOBS Bridge Meeting
T-1 Bridge Security & Hazards

Case Studies
Rehabilitation from extreme events

Artur D'Andrea

Presentation Topics

1. SAMPLE OF MULTI-HAZARD RESPONSES
2. EXAMPLES OF RESPONSES, TEMPORARY AND PERMANENT
3. RISK AND SOLUTIONS
4. FUNDING
5. OWNERS' FLEXIBILITY
6. RECOVERY PERIOD, "TIME ELEMENT"
7. RESTORATION COSTS

RESPONSES TO MULTI-HAZARD EVENTS ARE:

1. DEPENDENT ON THE SIZE OF THE IMPACTS
2. LEVEL OF NATIONAL ATTENTION
3. OWNERS ABILITY TO MOBILIZE ADEQUATE RESOURCES
4. OWNERS EXPERIENCE WITH RECOVERY FROM EXTREME EVENTS

MAJOR EVENTS CAUSE SHORTAGES OF AVAILABLE RESOURCES AS VARIOUS PRIVATE AND PUBLIC ENTITIES COMPETE FOR THE SAME EQUIPMENT AND CAPABLE PEOPLE.

AT THE SAME TIME NORMAL ACCESS ROUTES, POWER, COMMUNICATIONS BECOME COMPROMISED, THUS WORKING WITH SCARCITY BECOMES THE NORM

FOR EACH DAMAGED ASSET THE BASIC DECISION

REPAIR

OR

REPLACE

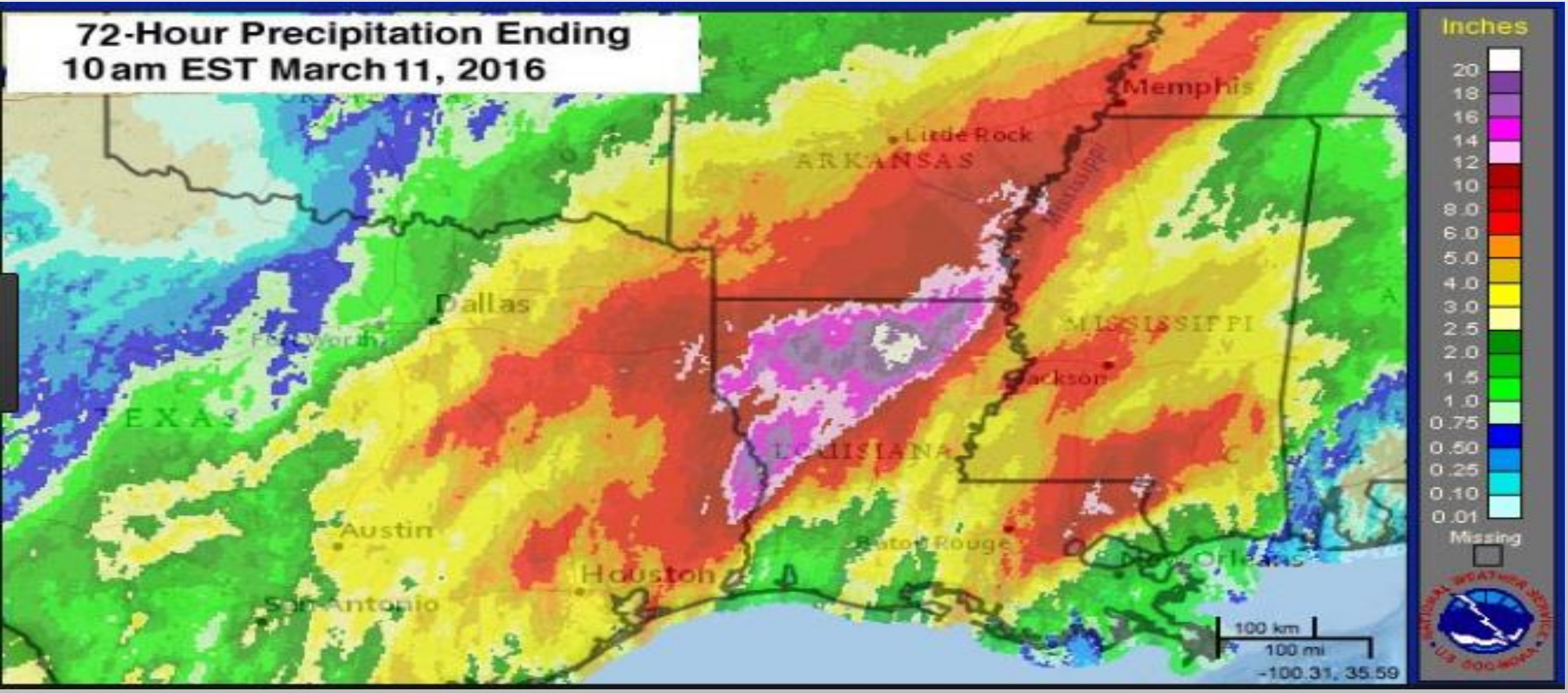
TYPICAL APPROACH DOT DEPLOYED DURING EXTREME EVENT

AN EMERGENCY MULTI-AGENCY TEAM IS DEPLOYED AND HOUSED AT SELECTED LOCATION. DOT'S TEAM MEMBER MAKES AVAILABLE RESOURCES IT CAN PROVIDE AT AFFECTED SITES

CRITICAL PROBLEMS AND INTERRUPTIONS ARE IDENTIFIED, CREWS ARE DISPATCHED FOR REPAIRS AND RESTORE SERVICE

SOON AFTER PRE-SELECTED TEAMS EVALUATE THE REPAIRS RECOMMEND ADDITIONAL WORK OR RELACEMENT AS NECESSARY

March 2016 Flood



U.S. Department
of Transportation
Federal Highway Administration

DETAILED DAMAGE INSPECTION REPORT

(Title 23, Federal-aid Highways)

Report Number: LA-2016-1-013-

Sheet: 1 of 1

Location *(Name of Road and Milepost)*

I-20, C.S. 451-04, Logmile 1.54

FHWA Disaster Number: March 2016 Flood Event

Inspection Date: 3/20/2016

Description of Damage

S.N. 040704510401542, R.N. 011750
Drift accumulation on northwest corner of bridge. Bridges are adjacent to recent clear cut. Cast-in-place revetment failure and wash out on east end between eastbound and westbound bridges ~ approximately 100 ft x 25 ft.
Artur D'Andrea, Mark Bucci, James Melton

Federal-aid Route Number: I-20

State: LA

County: Bienville

Cost Estimate

Description of Work to Date (Equipment, Labor, and Materials)	Unit	Unit Price	Quantity	Cost	
				Completed	Remaining
Labor (divided amongst three I-20 sites)	EA	8713.05	.33	2904.35	
Equipment (divided amongst three I-20 sites)	EA	10011.40	.33	3337.14	
Materials (divided amongst three I-20 sites)	EA	4272	.33	1424	

GRILLETTE, KYLE	P00173641	03/10/2016	EA03 - EXC-PAY OT @ 1.5 RATE	13.00	$ 422.16
LEE, DOUGLAS	P00177414	03/10/2016	EA03 - EXC-PAY OT @ 1.5 RATE	11.00	$ 303.60
SMITH, DANIEL	P00256970	03/10/2016	EA03 - EXC-PAY OT @ 1.5 RATE	14.00	$ 318.79
RASBURY, WILLIAM	P00270011	03/10/2016	EA03 - EXC-PAY OT @ 1.5 RATE	13.00	$ 254.82
HAVARD, TIMOTHY	P00275257	03/10/2016	EA03 - EXC-PAY OT @ 1.5 RATE	13.00	$ 245.02
WRIGHT, DUSTIN	P00277261	03/10/2016	EA03 - EXC-PAY OT @ 1.5 RATE	13.00	$ 298.77

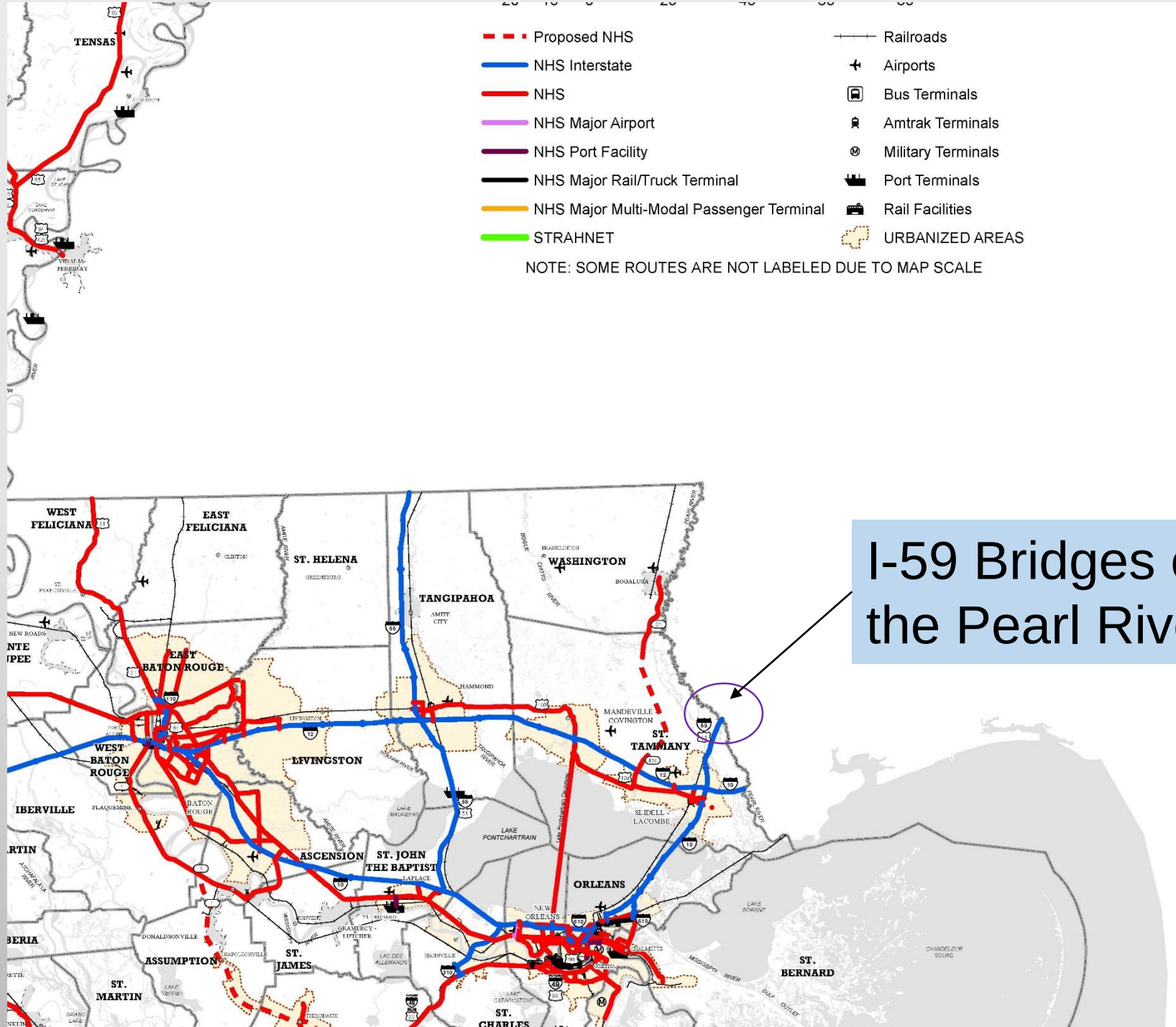
Equipment:

Equipment #	Equipment Class Code	Operator	Work Date	Total Hrs	Mileage	Total Cost
124001	Truck, Pickup - 1 ton - HP	WILLIAM J RASBURY	03/10/2016	13.00	118	$ 260.00
137172	Truck, Pickup - 1 ton - HP	KYLE L GRILLETTE	03/10/2016	13.00		$ 260.00
137235	Truck, Pickup - 1 ton - HP	DANIEL C SMITH	03/10/2016	14.00		$ 280.00
159515	Truck, Tractor - 50000 lb - to 400HP	ALBERT T MOREAU	03/10/2016	14.00		$ 770.00

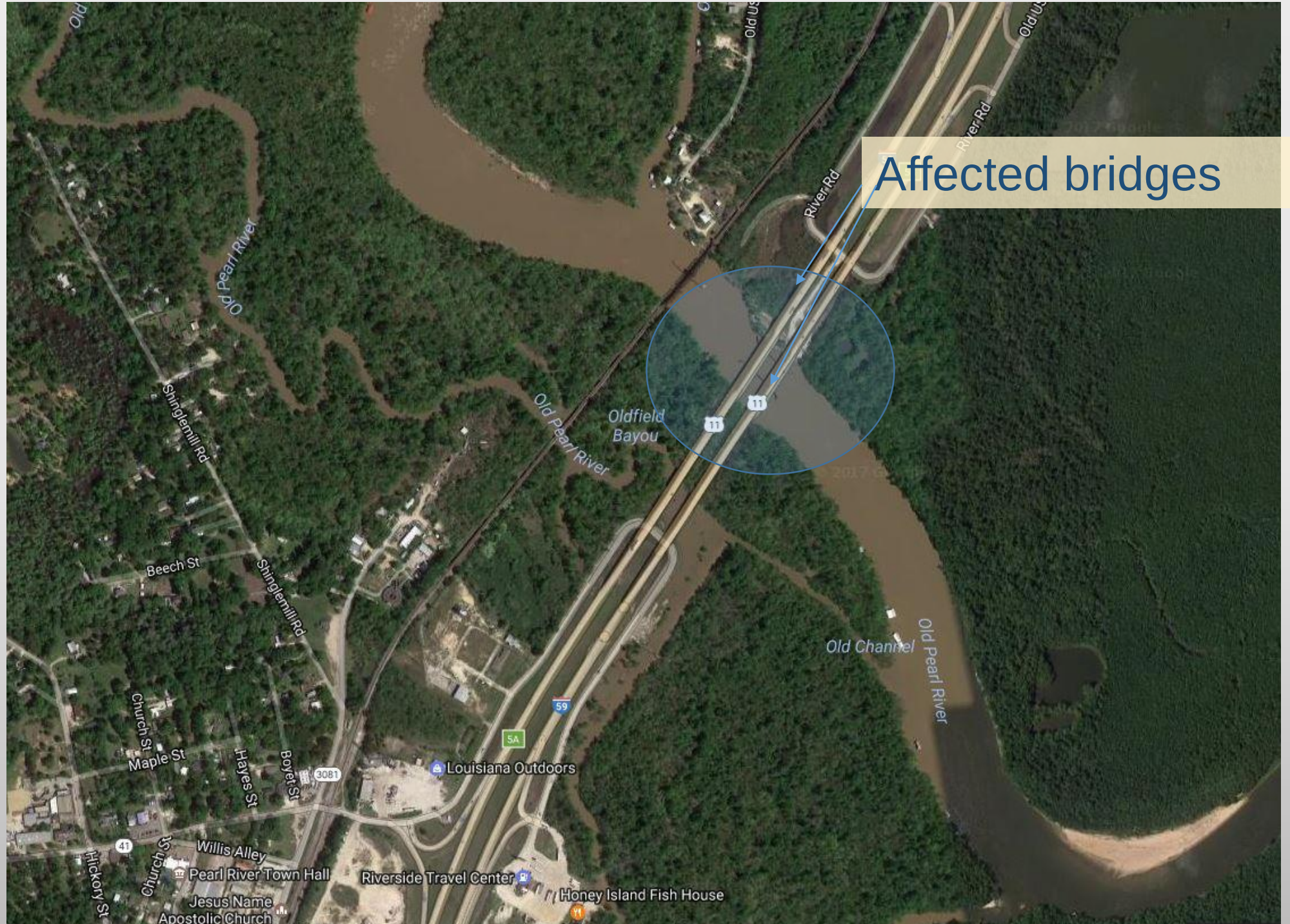

DOTD

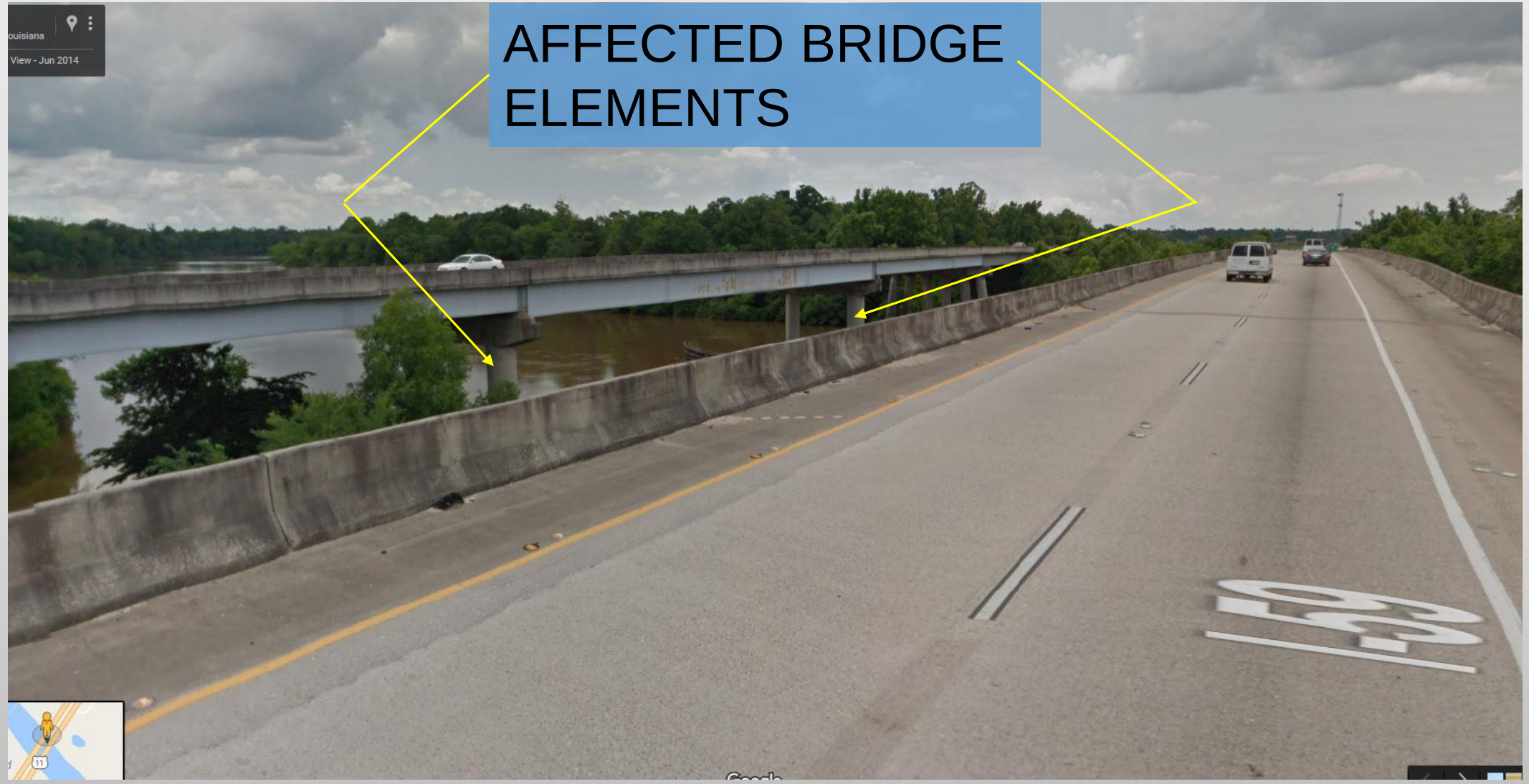
CASE 1

- TIME, EARLY 1980’S
- LOCATION I-59, PEARL RIVER BRIDGE MAIN SPANS
- CONDITION, MULTI FLOOD EVENTS AND ABANDONED BARGE CAUSED HEAVY SCOUR AND BRIDGE INSTABILITY

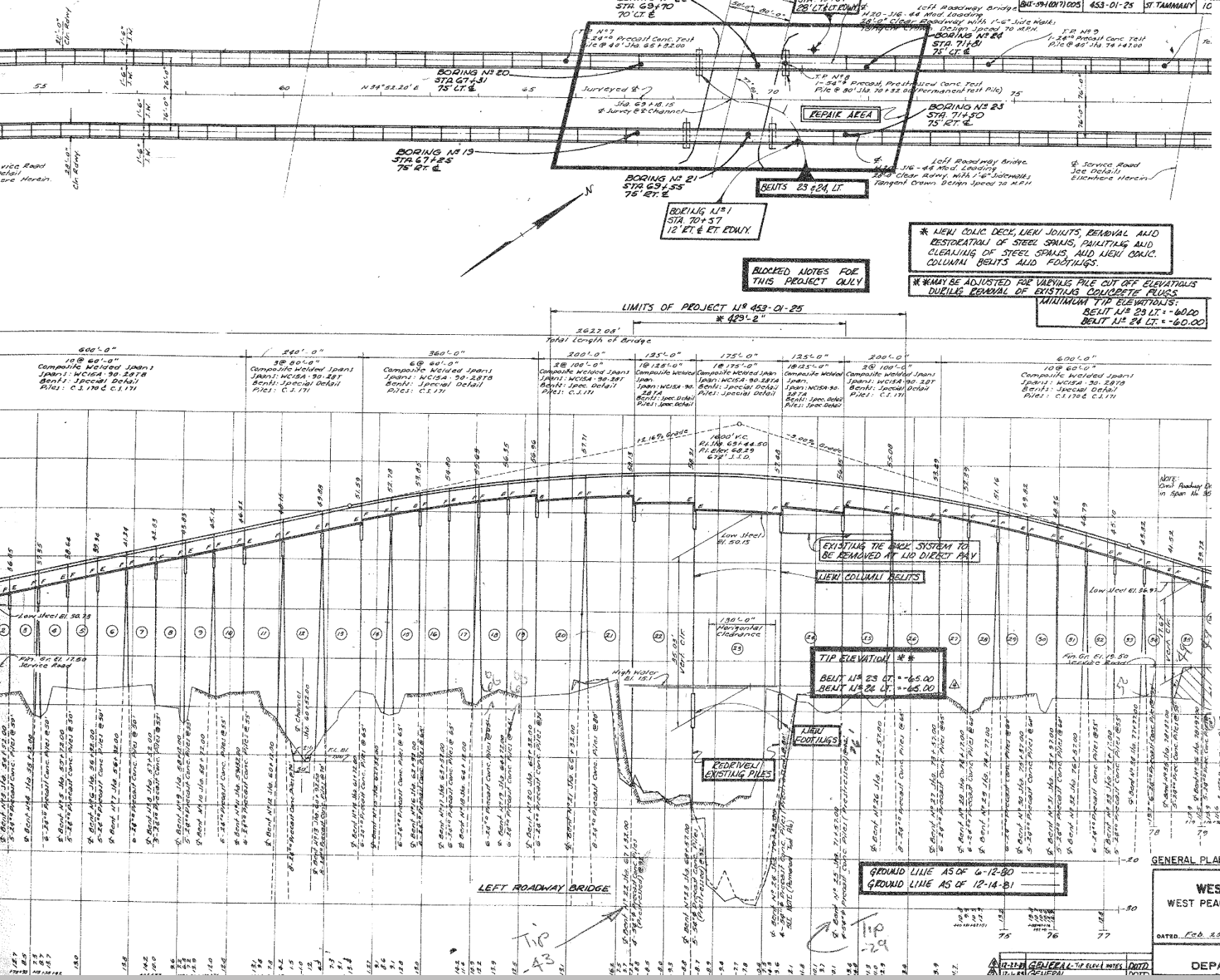


I-59 Bridges over the Pearl River


Affected bridges
Old Pearl River
Shinglemill Rd
Beech St
Shinglemill Rd
Church St
Maple St
Hayes St
Boyet St
3081
Willis Alley
Pearl River Town Hall
Jesus Name Apostolic Church
Hickory St
Church St
41
Riverside Travel Center
Honey Island Fish House
Louisiana Outdoors
5A
59
Old Pearl River
Oldfield Bayou
11
11
River Rd
River Rd
Old Channel
Old Pearl River


AFFECTED BRIDGE ELEMENTS


07/09/2015

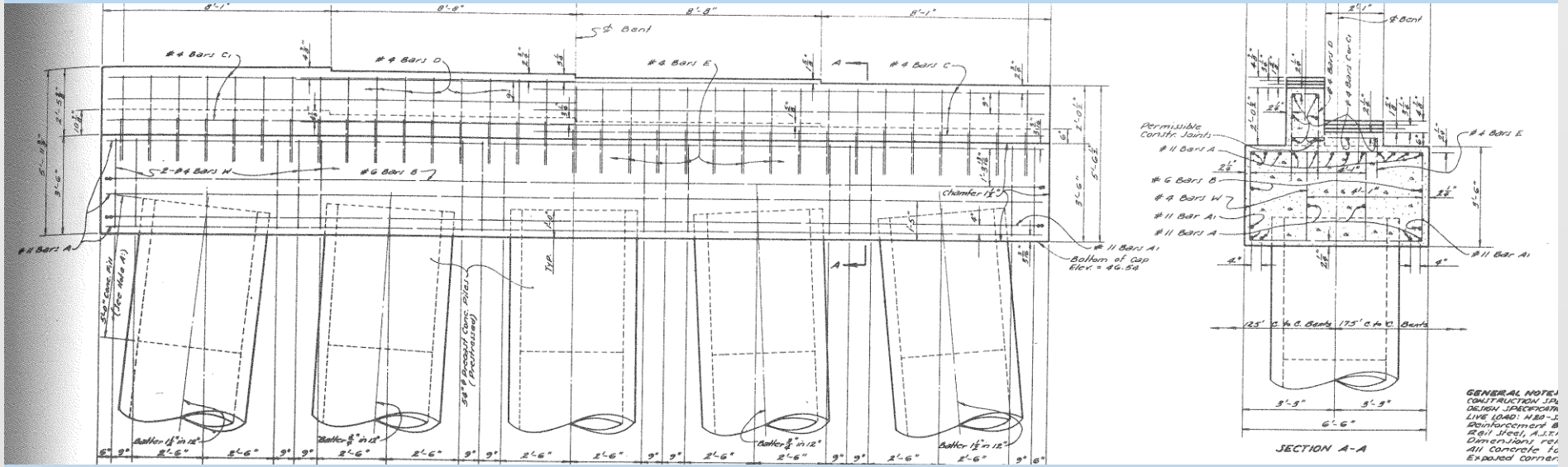


Bridges' Dimensions:
2607'x28'

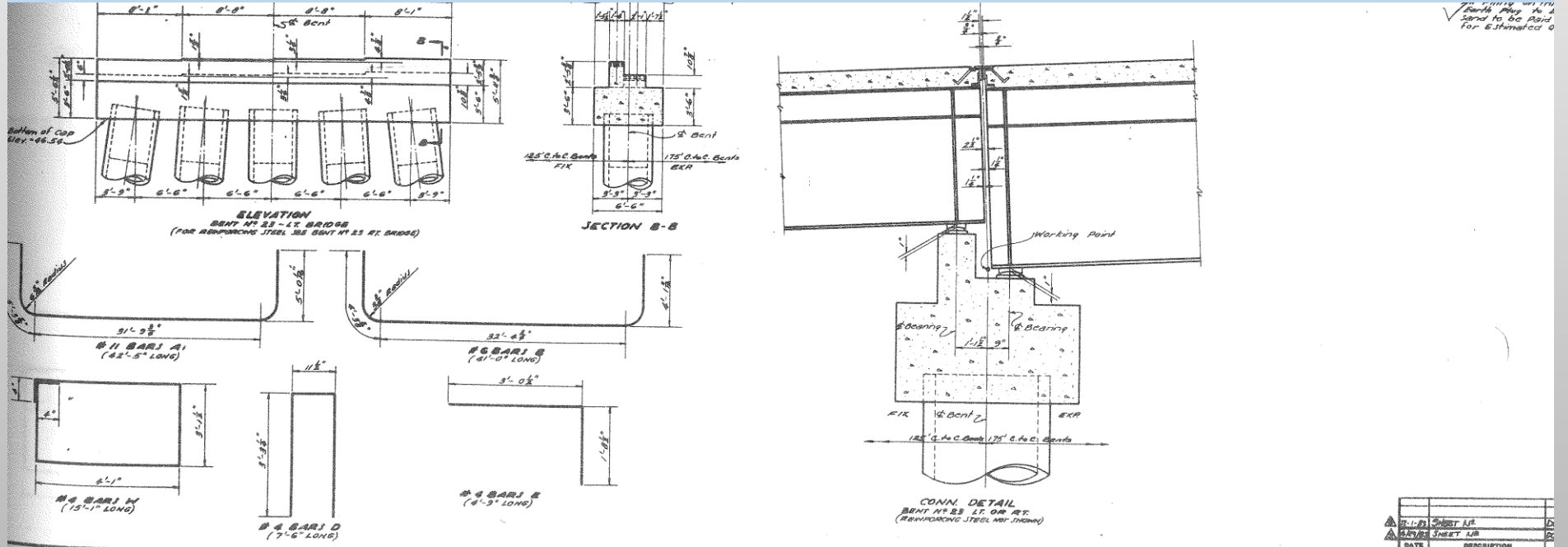
Year built: 1960
Main span steel: 175'
Min.Vert. cl.= 35'
Min.Horiz cl= 130'

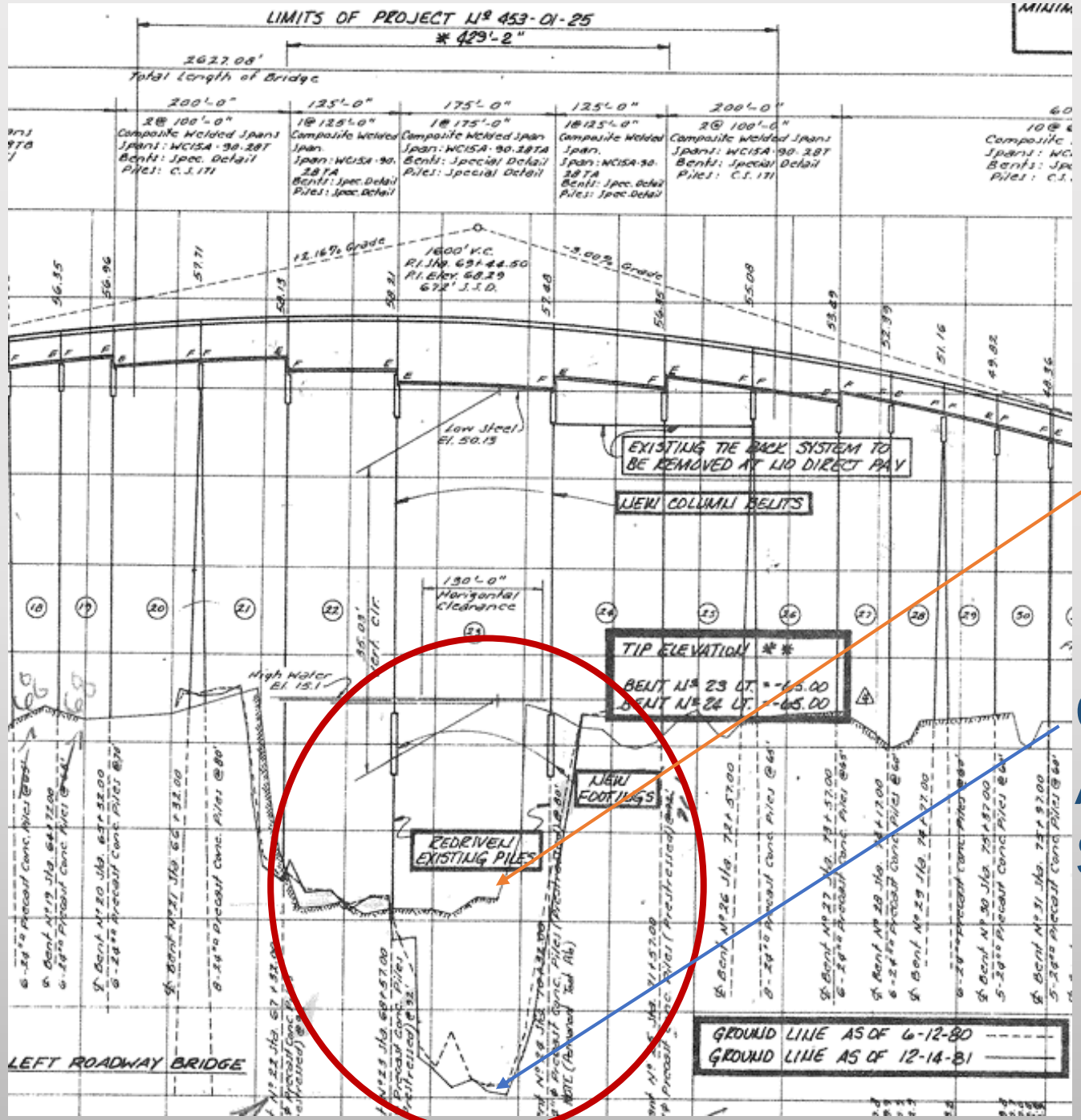
Substructure:
Pile Bents w/
5-54" PCPiles

ORIGINAL CAP- BENT 23



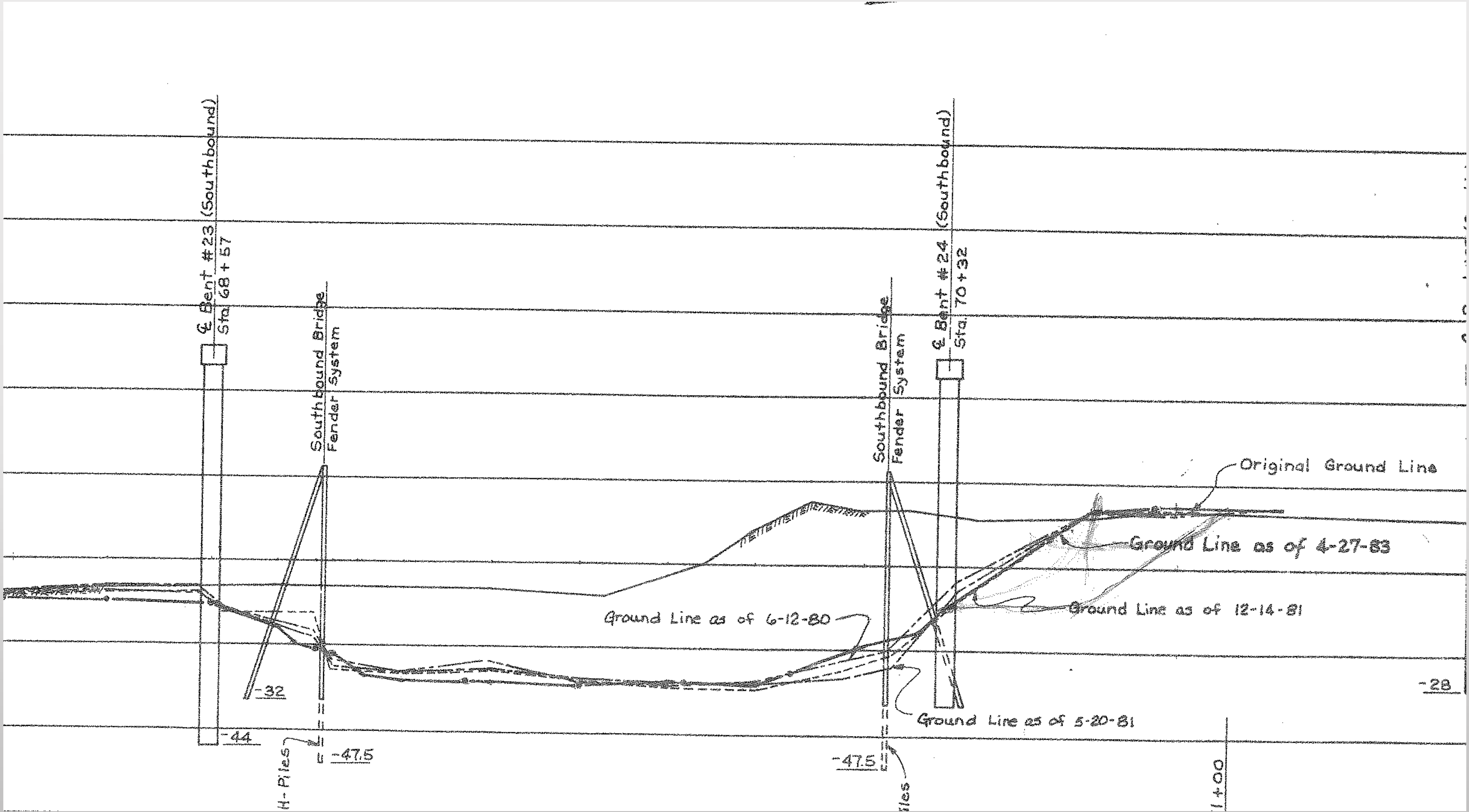
5-54” precast concrete cylinder piles





ORIGINAL GROUND LINE

GROUND LINE AFTER OBSERVED SCOUR


℄ Bent #23 (Southbound)
Sta. 68+57
Southbound Bridge
Fender System
Southbound Bridge
Fender System
℄ Bent #24 (Southbound)
Sta. 70+32
Original Ground Line
Ground Line as of 4-27-83
Ground Line as of 12-14-81
Ground Line as of 6-12-80
Ground Line as of 5-20-81
-32
-44
H-Piles
-47.5
-47.5
-28

USGS 02492600 Pearl River at Pearl River, LA

Rank	Year	Date	gage height, ft	Stream Flow (cfs)
1	1983	Apr. 09, 1983	21.05	230,000
2	2016	Mar. 14, 2016	20.58	206,000
3	1874	1874	20.2	198,000
4	1900	Apr. 19, 1900	19.7	179,000
5	1980	Apr. 02, 1980	19.75	173,800
6	1979	Apr. 26, 1979	19.25	155,000

St. Tammany Parish, Louisiana
Hydrologic Unit Code 03180004
Latitude 30°23'06",
Longitude 89°44'12"
NAD27
Drainage area
8,494.00 square miles
Gage datum -0.05 feet above NGVD29

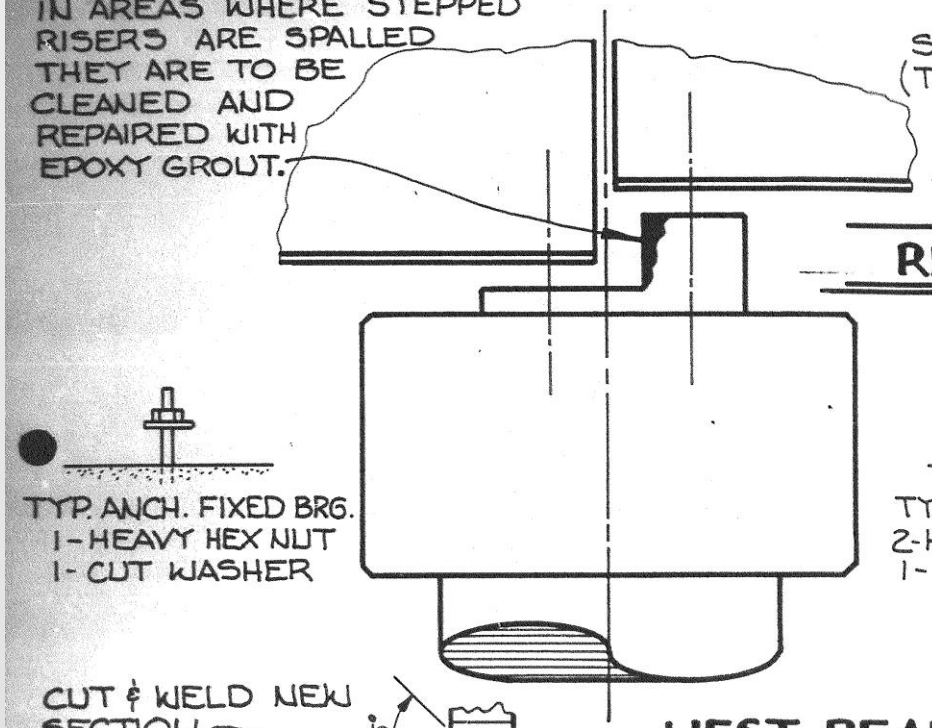
DESCRIPTION DIST. 62 WEST PEARL PAGE 2 of 2
SOUTH BOUND ROWY I-59
STR. NO. 453010524Z DATE 8-7-81

25	5 5/8"	5 7/8"	BOTH SIDES WIDE OPEN
24	2 5/16"	2 1/4"	CRACK IN PEDESTAL @ BT. #24 EAST SIDE HAS WORSENED SINCE
23	2 1/4"	2 3/4"	LAST REPORT. BASE PLATE NOT SETTING LEVEL.
22	1 5/8"	1 5/8"	BOTH SIDES CLOSED TIGHT
21	3"	2 3/4"	

IN AREAS WHERE STEPPED RISERS ARE SPALLED THEY ARE TO BE CLEANED AND REPAIRED WITH EPOXY GROUT.

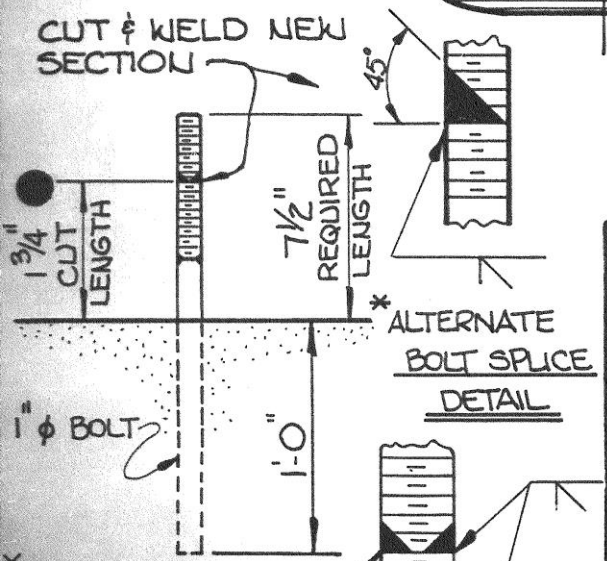
SHEET 1 OF 5
(TYPICAL DETAILS)

REPAIRS

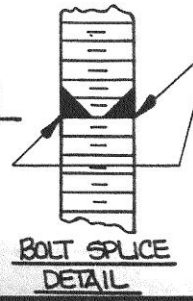


TYP. ANCH. FIXED BRG.
1 - HEAVY HEX NUT
1 - CUT WASHER

TYP. ANCH. EXP. BRG.
2 - HEAVY HEX NUTS
1 - WASHER



*ALTERNATE BOLT SPLICE DETAIL



BOLT SPLICE DETAIL

*NOTE: TO BE USED ONLY IF CONDITIONS PROHIBITS THE USE OF THE PRIMARY WELD DETAIL.

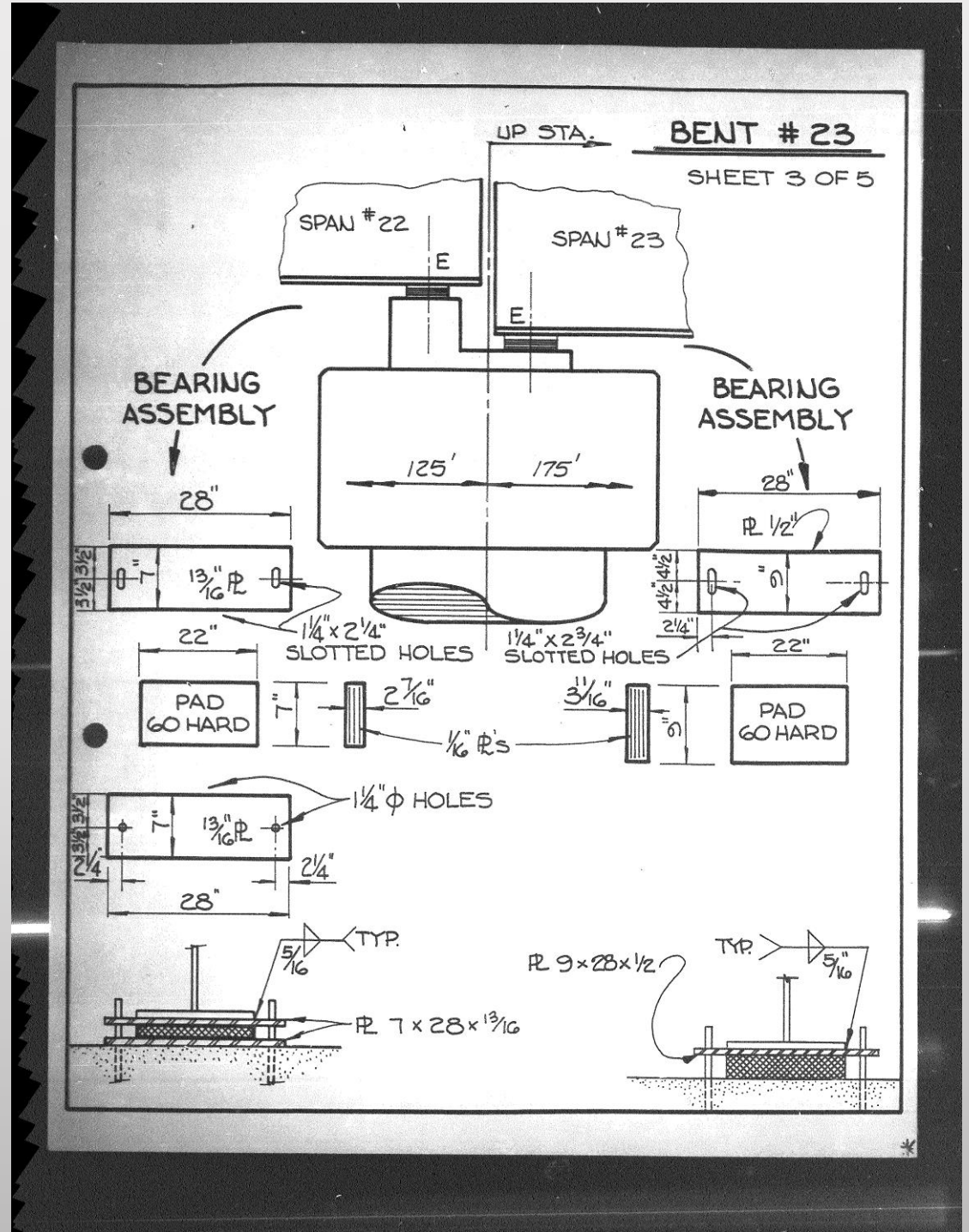
WEST PEARL RIVER
I-59
ST. TAMMANY

ESTIMATED QUANTITIES			
BRG. PAD	7x20x2	16	EA.
BRG. PAD	9x21x1	16	EA.
BRG. PAD	7x22x2 7/16	16	EA.
BRG. PAD	9x22x3 11/16	8	EA.
STEEL (A-36)		6553	LBS.

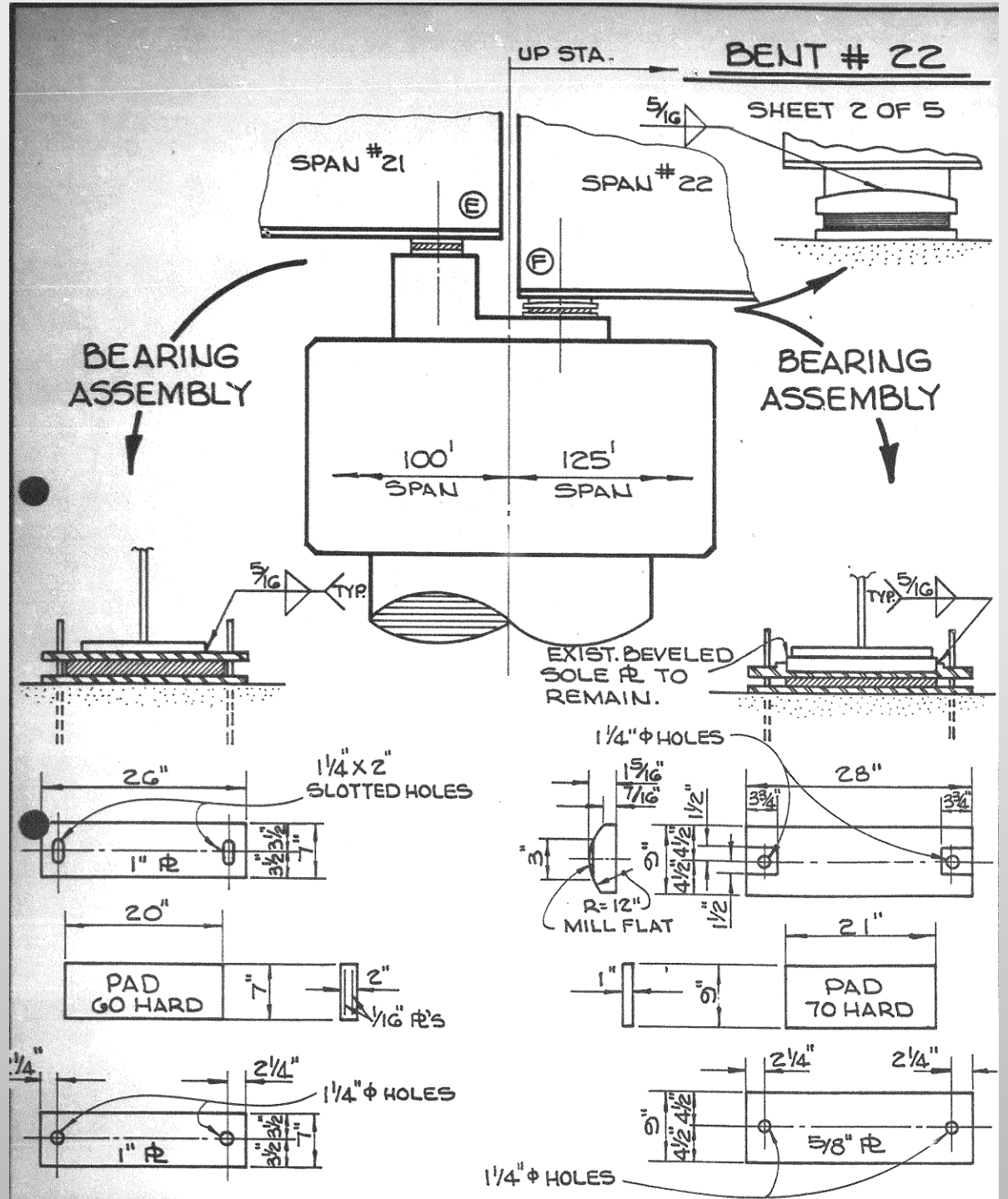
NOTE: AFTER TOP PL's ARE WELDED TO FLANGE & IN PLACE, ENTIRE BRG. IS TO BE SAND BLASTED & PAINTED WITH AN APPROVED PAINT SYSTEM. (TYPICAL.)

BENT # 23

SHEET 3 OF 5



BENT # 22


UP STA.
SPAN #21
SPAN #22
5/16
BEARING ASSEMBLY
BEARING ASSEMBLY
100' SPAN
125' SPAN
5/16 TYP.
TYP. 5/16
EXIST. BEVELED SOLE PL TO REMAIN.
26"
1¼"x2" SLOTTED HOLES
1" PL
3½"
3½"
7"
20"
PAD GO HARD
7"
2"
1/16" PL'S
1¼"
2¼"
1¼"Φ HOLES
1" PL
1¼"Φ HOLES
1 5/16"
7/16"
3"
6"
1½"
4½"
4½"
R=12"
MILL FLAT
28"
3¾"
3¾"
21"
1"
6"
PAD 70 HARD
2¼"
2¼"
6"
4½"
4½"
5/8" PL

I 59
South Bound Rdwy
Bridge Number — 453010 5.242
ST TAMMANY PARISH
DISTRICT 62

JOINT OPENING

BENT Number	WEST ~~BK~~ LT GUTTER LINE		EAST RT GUTTER LINE	
23	2"	1/4" *	2 1/2"	3/4" *
24	2"	1/4" *	2"	1" *
25	1 3/4"	4 3/8" *	2"	5 3/8" *
26	15/16"	OK *	3/4"	

*Red NOTES Before REPAIRS 12-14-81

NOTE; JOINT OPENING Measured at GUTTER LINE ON Sliding PLATE JOINT'S.

ROUTE I-59
SAINT TAMMANY PARISH

BY [illegible] DATE 6-15-82
BY [illegible] DATE 6/16/82
BY _____ DATE _____
BY _____ DATE _____

MEMORANDUM TO: ARE ALL EXISTING CONDITIONS & CHANGES TO ORIGINAL AS BUILT PLANS SHOWN ON THE BRIDGE INSP. REPORT PARTICULAR EXIST BEARINGS OF EACH GIRDER ON EACH END — LUBERITE PLATE LOCATION/ JOINT MEAS. AS BRIDGE DESIGN WILL NEED FOR PLAN PREP.

MR. JACK R. REID
DIRECTOR OF PRECONSTRUCTION

The Plan-in-Hand Inspection on the above captioned project was made on June 4, 1982. Personnel making this inspection are listed on the attached Plan-in-Hand Memorandum Review.

1. Bents No. 21 thru 26 to be moved to correct position. This will be determined from bridge inspection reports and by using measurements from bents no. 21 and 26.

2. Top 20' of piles to be encased if jetting is used.

3. Existing fender system to be removed.

4. All bearing plates, shoes and anchor bolts to be corrected on bents 21 thru 26.

5. It is recommended that our Legal Section take whatever action is necessary to have a sunken barge removed from the channel on the upstream side of the bridge.

6. CAPS SHOULD BE DESIGN & CONTR. TO FACILITATE FUTURE REQ'd DECK & SHOULDER WIDTHS WHEN LIGHT WEIGHT DECKS HAVE TO BE REPLACED & MEET PRESENT DAY DESIGN REQ.

BRIDGE INSP. SHOULD BE COMP. ENOUGH TO SHOW LOCATION OF BENTS — JOINTS EACH BENT MEAS CORR TO DIST FOR TEMP. SHOULD SHOW EACH GIRDER BEARING WITH LOCATION OF LUBERITE PLATE ON ALL BENTS ON BOTH STR. KEN-MAURICE-NATHAN IF REPORTS (INSP.) DO NOT SHOW THIS IT SHOULD BE ACCOMPLISHED IMMEDIATELY SO CORRECTIONS — REPAIRS ACCOMPLISHED CORRECTLY — ALSO SEE LETTER & SKETCHES DATED APR. 29, 1981

EUGENE P. WAGUESPACK
DOTD CHIEF CONSTRUCTION ENGINEER

J W Bergeron

T. W. BERGERON
BRIDGE CONSTRUCTION ENGINEER

TWB:sl

1. SCOUR CAUSING HEAVY LOSS OF PILE PENETRATION AT BENTS 23 AND BENTS 24

2. EXCESSIVE MOVEMENTS AT THEIR TOPS, 3” TO 4”

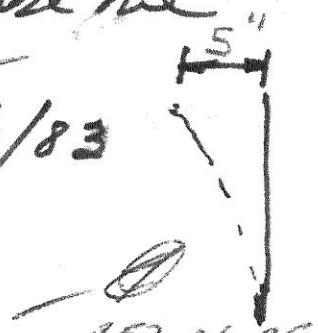
3. BTS23 & 24 WERE TIED OFF TO PREVENT FURTHER MOVEMENT

4. THEIR REPLACEMENT WAS BEING PLANNED

5. UNACCEPTABLE LONGITUDINAL MOVEMENT WAS SET AT FIVE INCHES MAXIMUM

6. TILTMETER WAS INSTALLED

Mr. Knapp
Please advise me
Jeb 2/1/83



Mr. Lynn R. Lane

Tilt Sensor Installation
West Pearl River Bridges
Interstate 59
St. Tammany Parish, LA
Structures No. 453 01 0524 1
453 01 0524 2

Dear Mr. Lane:

This is to request a proposal to install a Tilt Sensor Alignment Monitor System on the above referenced bridges.

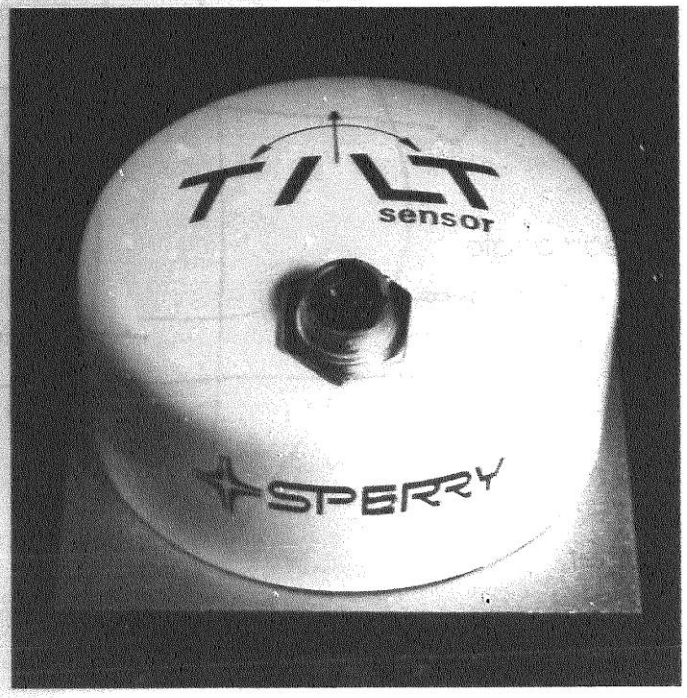
The attached plan sheets show that bents 23 and 24 of each bridge have lost a significant amount of penetration due to scour. These bents are somewhat slender and have experienced excessive movement of 3" to 4" at the top.

Plans are being prepared to replace these bents. They are now tied off to prevent further excessive movement. An installation to monitor the position of the bents and warn of any movement beyond a predetermined amount would make the situation substantially safer.

We understand that systems are available which provide continuous monitoring with intermittant recording. Additionally, a warning device can be triggered when a predetermined degree of tilt occurs. The warning threshold can be set from 1 to 20 arc minutes. Is this threshold pre-set and fixed at the factory or is it user adjustable?

SPERRY

TILT sensor



The low cost, reliable leveling monitor.

Sperry's Tilt Sensor simply, economically and *continuously* monitors vertical and/or horizontal alignment of the structure on which it is mounted.

Proven hardware

The heart of the Tilt Sensor is a miniature Electrolytic Gravity Sensor used as a leveling device in highly accurate aircraft and marine gyroscope systems. Advanced electronics and the gravity sensor are mounted in a rugged, lightweight sealed housing.

Versatile

The Tilt Sensor can be preset to give a warning signal of deviation. The warning threshold may be set as low as 1 minute of arc. Various warning devices, including strobe lights, horns and radio links, may interface with the Tilt Sensor, or it may be hard-wired to a central location. With a recorder, it can provide a permanent log of the actual alignment angle.

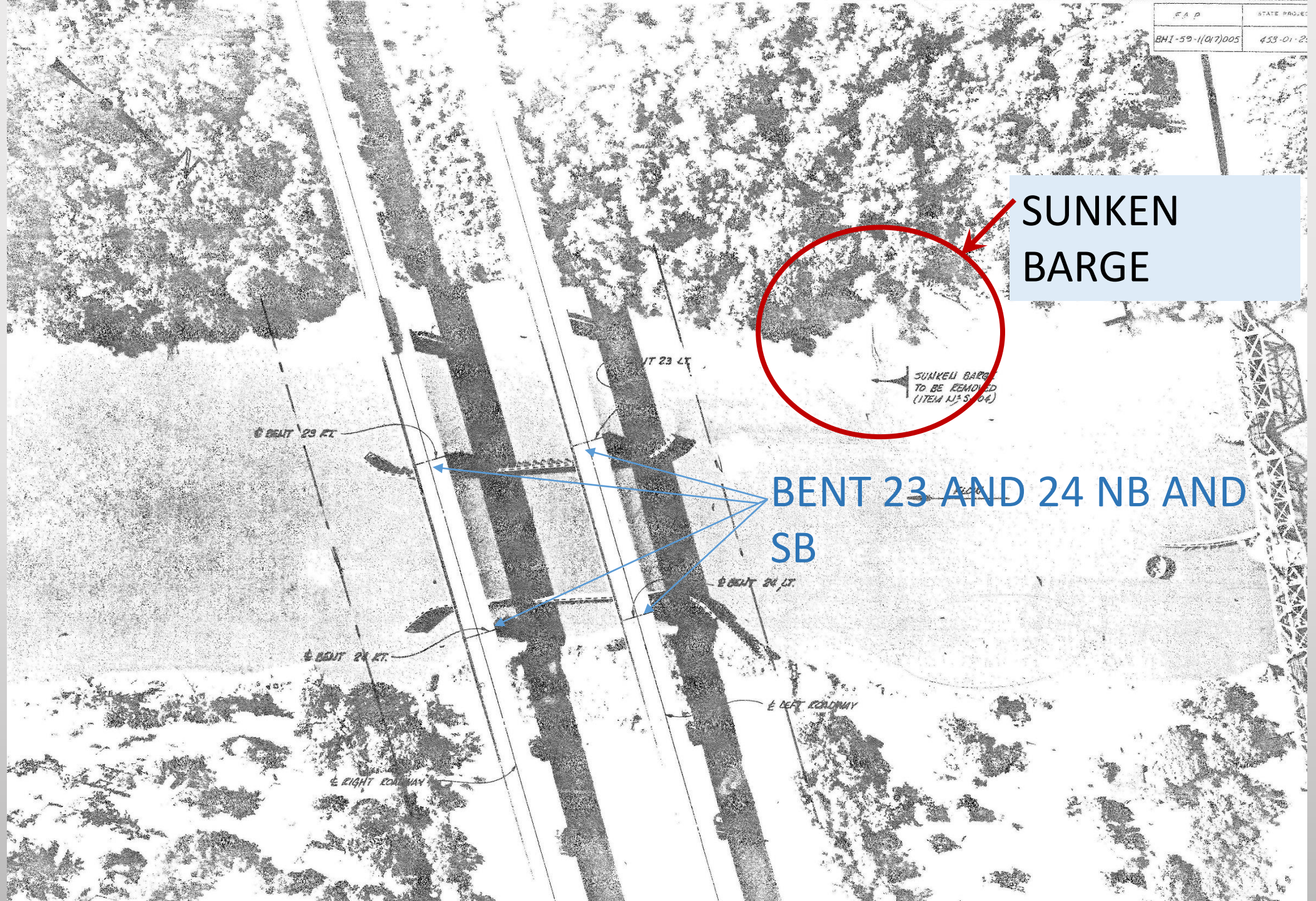
The extremely low operating power of the Tilt Sensor allows months of battery use. It can also be powered from a ± 6VDC supply.

Wide application range

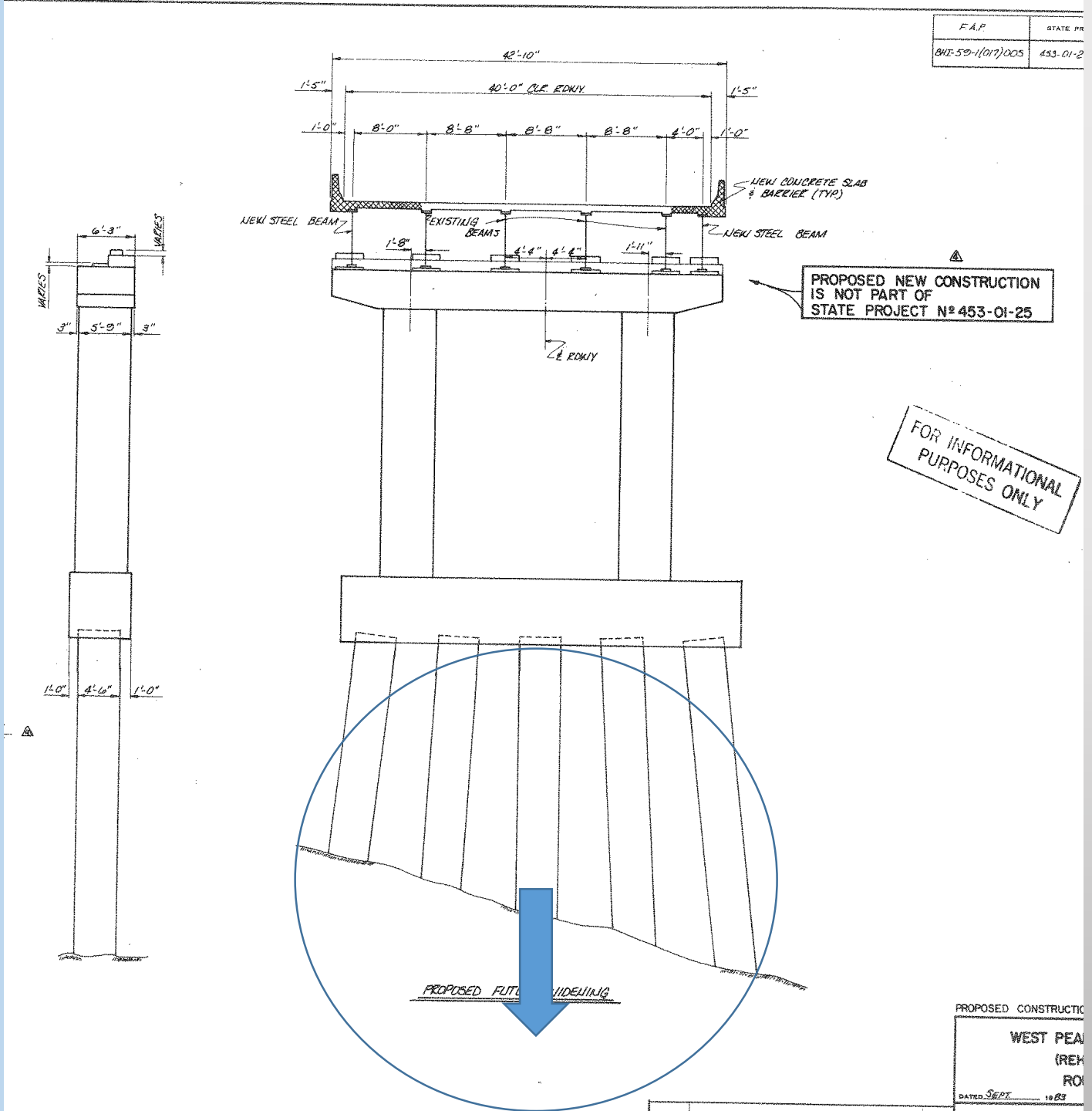
The many potential uses of Tilt Sensors include monitoring of:

- Building structural integrity during construction, and collection of movement data during building life.
- Roofs, floors and ramps of public assem-

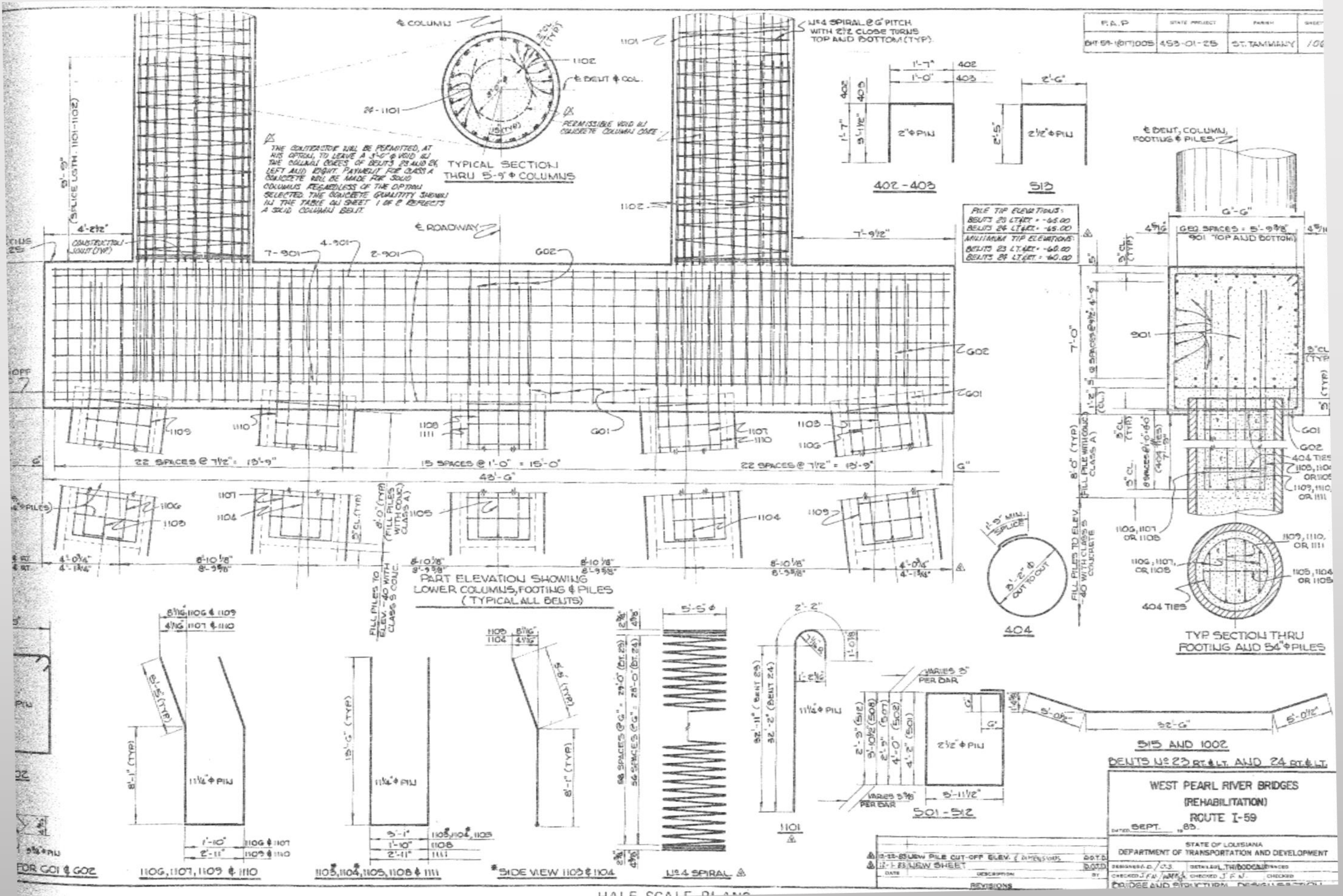
Mr. Doyle and our project personnel were informed that with the heavy loads in Span No. 22 and the removal of the restraining properties of Span No. 23, the Bent No. 23 would tend to try to move toward the river. Because of this the bearing of Span No. 22 on both Bents No. 22 and 23 should be checked to ensure proper bearing and to be sure that the fixed bearing on Bent No. 22 were fully functioning and that the anchor bolts were not sheared or the embedment concrete cracked. If there are problems with the restraints on Bent No. 22 then another restraining method should be devised.


SUNKEN BARGE
BENT 23 AND 24 NB AND SB
SUNKEN BARGE TO BE REMOVED
℄ BENT 23 FT.
℄ BENT 24 FT.
℄ RIGHT ROADWAY
℄ LEFT ROADWAY

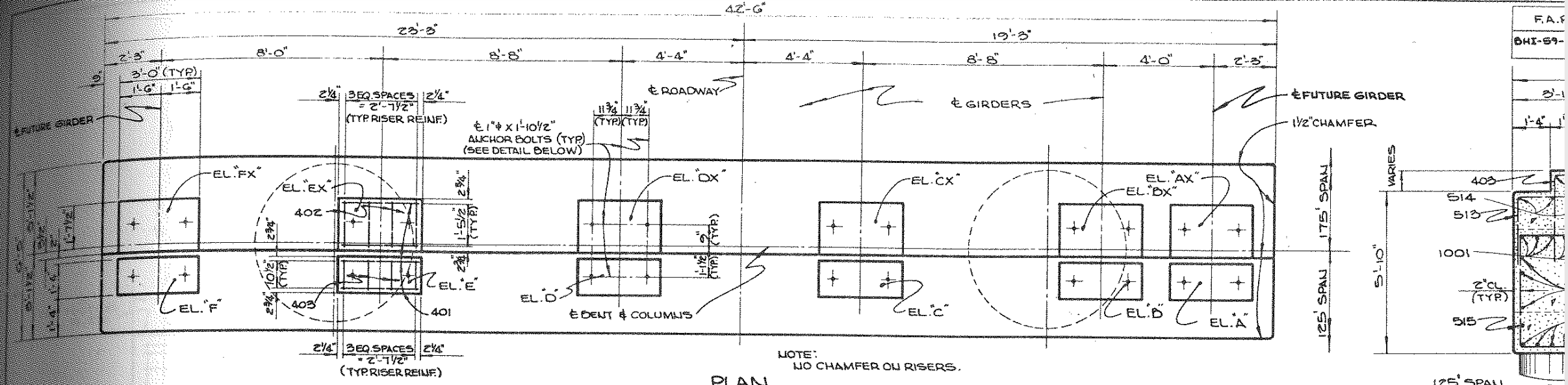
1. Spans removed
2. Bent cap demolished
3. Existing piles driven down 30’
4. New cap/footing poured
5. New columns built
6. Spans placed back on top of the new cap



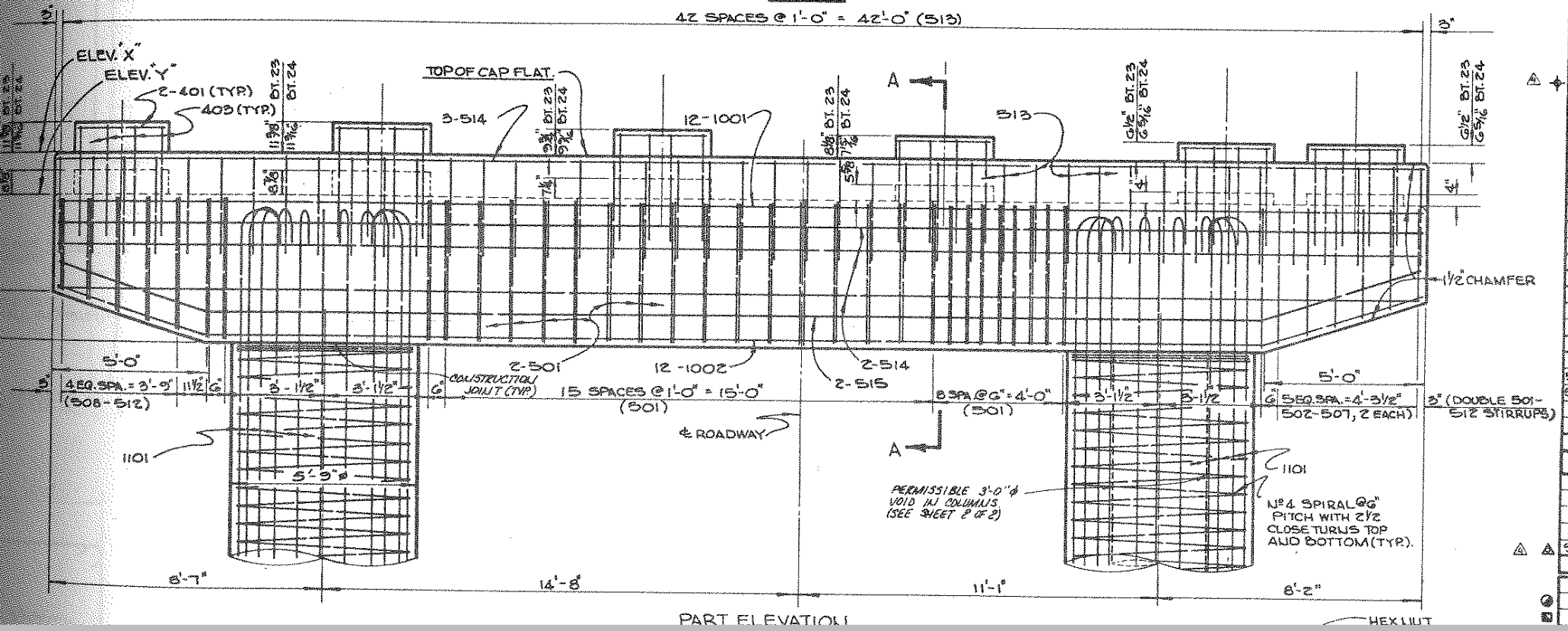

ADDED BRIDGE ELEMENTS



F.A.P.
STATE PROJECT
PARISH
BHT 59-1(017)005
453-01-25
ST. TAMMANY
TYPICAL SECTION THRU 5'-9" ⌀ COLUMNS
THE CONTRACTOR WILL BE PERMITTED, AT HIS OPTION, TO LEAVE A 3'-6" ⌀ VOID IN THE COLUMN CORES OF BENTS 23 AND 24, LEFT AND RIGHT. PAYMENT FOR CLASS A CONCRETE WILL BE MADE FOR SOLID COLUMNS REGARDLESS OF THE OPTION SELECTED. THE CONCRETE QUANTITY SHOWN IN THE TABLE ON SHEET 1 OF 2 REFLECTS A SOLID COLUMN BENT.
PERMISSIBLE VOID IN CONCRETE COLUMN CORE
No 4 SPIRAL @ 6" PITCH WITH 2½ CLOSE TURNS TOP AND BOTTOM (TYP)
402-403
513
PILE TIP ELEVATIONS:
BENTS 23 LT.&RT. = -65.00
BENTS 24 LT.&RT. = -65.00
MINIMUM TIP ELEVATIONS:
BENTS 23 LT.&RT. = -60.00
BENTS 24 LT.&RT. = -60.00
℄ BENT, COLUMN, FOOTING & PILES
22 SPACES @ 7½" = 13'-9"
15 SPACES @ 1'-0" = 15'-0"
48'-6"
PART ELEVATION SHOWING LOWER COLUMNS, FOOTING & PILES (TYPICAL ALL BENTS)
FILL PILES TO ELEV. -40 WITH CLASS S CONC.
404
TYP. SECTION THRU FOOTING AND 54" ⌀ PILES
404 TIES
515 AND 1002
BENTS No 23 RT. & LT. AND 24 RT. & LT.
FOR 601 & 602
1106, 1107, 1109 & 1110
1103, 1104, 1105, 1108 & 1111
*SIDE VIEW 1103 & 1104
No 4 SPIRAL
1101
501-512
WEST PEARL RIVER BRIDGES
(REHABILITATION)
ROUTE I-59
DATED SEPT. 19 83
STATE OF LOUISIANA
DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
12-22-83 NEW PILE CUT-OFF ELEV. & DIMENSIONS
12-1-83 NEW SHEET
REVISIONS
BRIDGE AND STRUCTURAL DESIGN SECTION
HALF SCALE PLANS



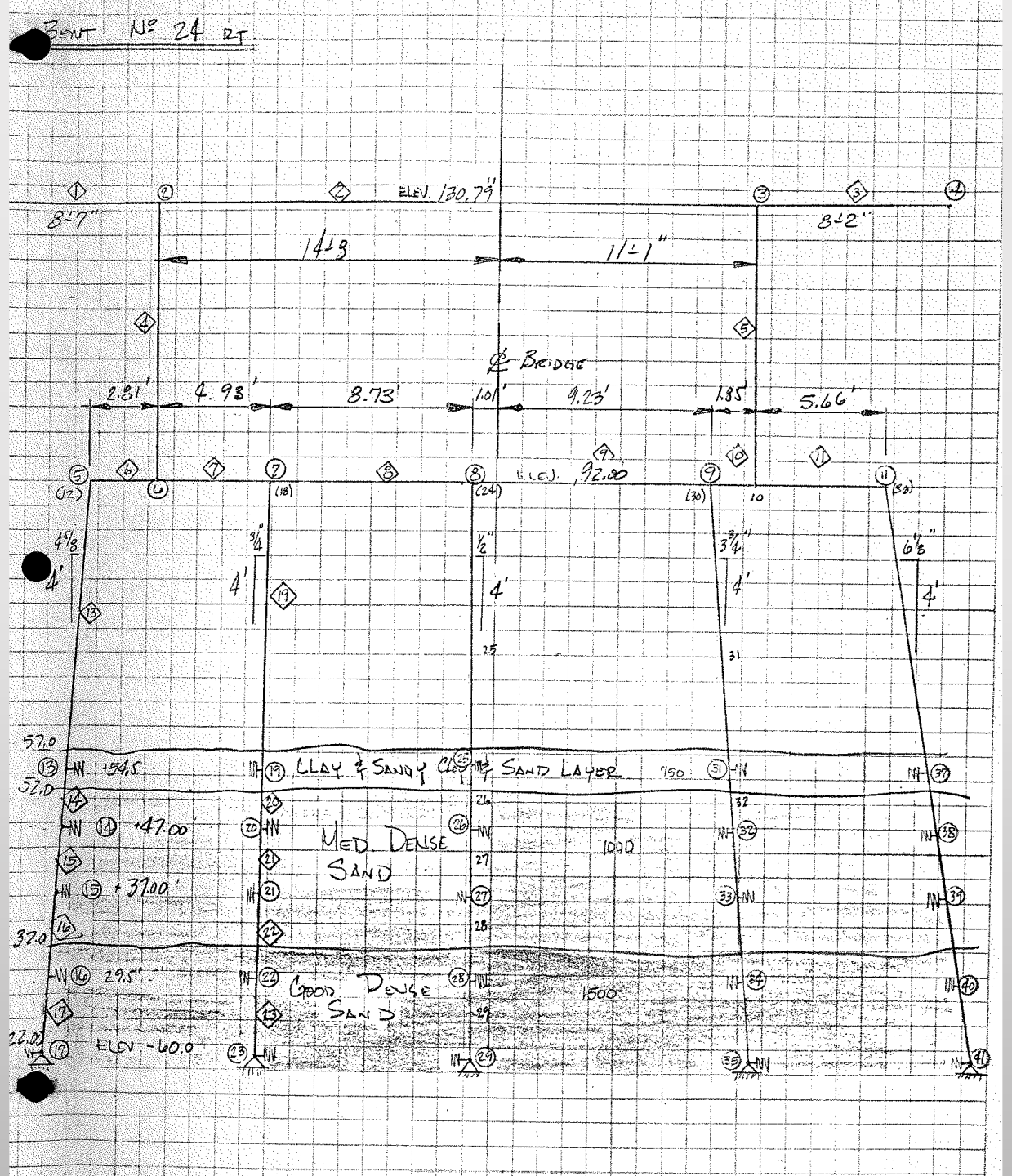
PLAN

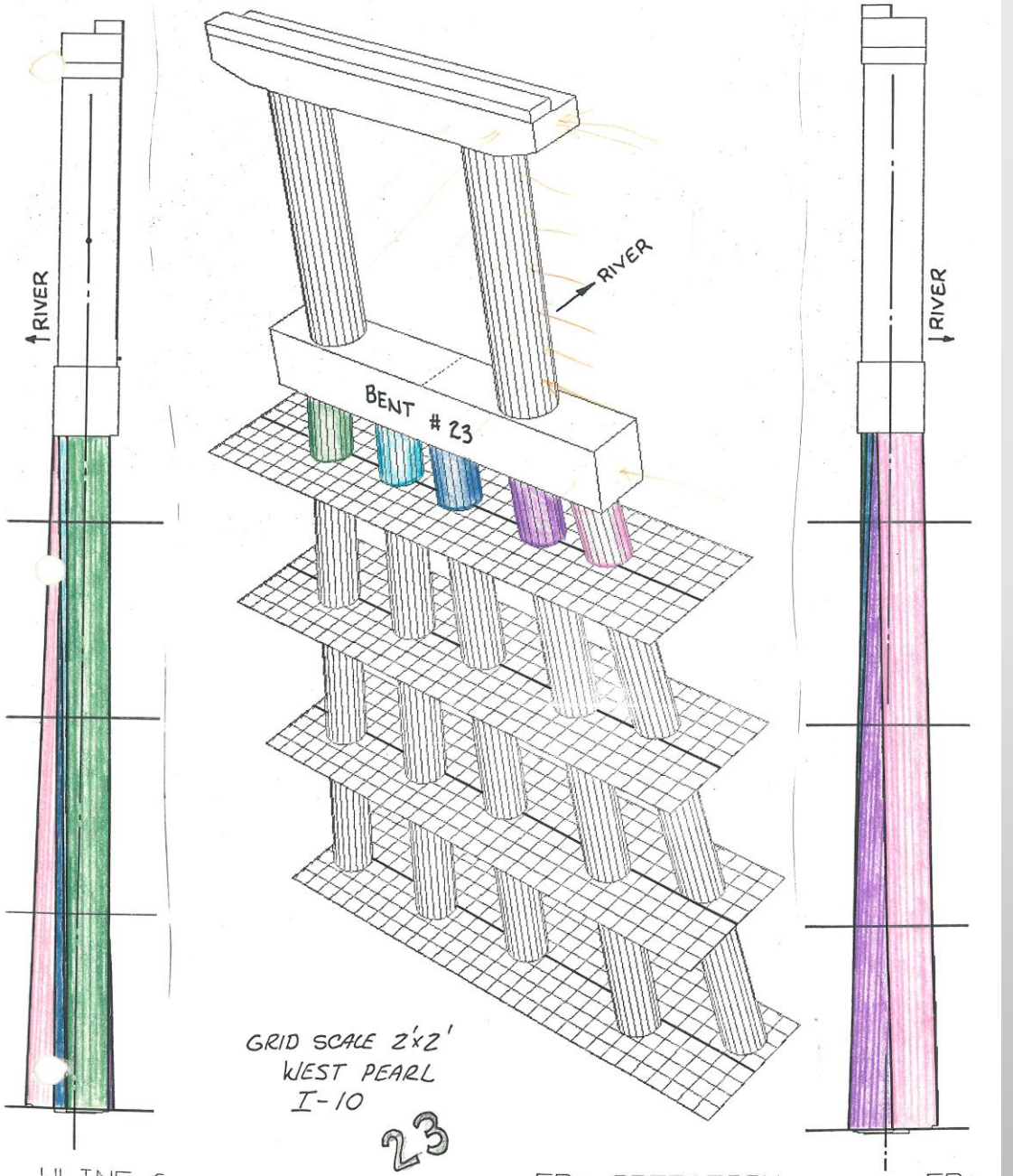


PART ELEVATION

HEX NUT

ESTIMATED				
BAR	SIZE	Nº	SHORT BAR	VAR.
1101	№11	48	35'-1"	—
1102	№11	48	15'-6"	—
1103-1104	№11	2 EA.	30'-1"	—
1105	№11	1	30'-1"	—
1106-1107	№11	2 EA.	28'-10"	—
1108	№11	2	28'-10"	—
1109-1110	№11	2 EA.	29'-11"	—
1111	№11	2	29'-11"	—
TOTAL №11 BARS =				
1001	№10	12	42'-2"	—
1002	№10	12	42'-7"	—
TOTAL №10 BARS =				
901	№9	37	43'-2"	—
TOTAL №9 BARS =				
601	№6	28	22'-5"	—
602	№6	32	24'-7"	—
TOTAL №6 BARS =				
501	№5	56	17'-3"	—
502-507	№5	2 EA.	14'-5"	6"
508-512	№5	2 EA.	14'-5"	6¾"
513	№5	43	7'-4"	—
514	№5	9	42'-2"	—
515	№5	2	42'-7"	—
TOTAL №5 BARS =				
401	№4	24	2'-8"	—
402	№4	24	4'-9"	—
403	№4	24	7'-3"	—
404	№4	40	11'-9"	—
SPIRAL	№4	2	1072'-6	—
TOTAL №4 BARS =				
TOTAL DEFORMED REINFORC				
CLASS A CONCRETE (BENT				
STRUCTURAL METALWORK				


BENT No 24 RT.
ELEV. 130.79'
8'-7"
14'3
11'-1"
8'-2"
℄ BRIDGE
2.31'
4.93'
8.73'
1.01'
9.23'
1.85'
5.66'
ELEV. 92.00
4'
4'
4'
4'
4'
CLAY & SANDY CLAY
SAND LAYER
MED. DENSE SAND
GOOD DENSE SAND
ELEV -60.0



HLINE C

ED: OPERATION

ED:

~~READVERTISEMENT~~
eceived on State Project No. 453-01-25
Project No. BHI-59-1(017)005
BRIDGES (REHABILITATION) Hwy.
Parish
Length - - - - Miles
'E EXISTING BRIDGES

STATE OF LOUISIANA
DEPARTMENT OF TRANSPORTATION
AND DEVELOPMENT

Date February 29, 1984 Bids received up to
Room 431, Headquarters Administration Buildi
To be opened and read at 10:00 A.M. of the sam
in the Auditorium.
Extensions checked by
Checked against proposals by

NAME OF BIDDER

ITEM NO.	QUANTITY	UNIT	ITEM
202(2)(I)	Lump	Lump	Removal of Reinforced Concrete
713(1)	Lump	Lump	Temporary Signs & Barricades
725(1)	2,610.2	Lin.Ft.	Temporary Detour Roads
727(1)	Lump	Lump	Mobilization
805(1)(F)	775.96	Cu.Yd.	Class A Concrete(Bents)
805(3)	873.64	Cu.Yd.	Class AA Concrete
805(9)	177.0	Lin.Ft.	Expansion Joint Seal
806(1)	344,414	Pound	Deformed Reinforcing Steel
807(6)	Lump	Lump	Structural Metalwork
S-101	100	Each	Temp.Prec.Barrier(Hauling from N.LA)
S-102	170	Each	Temp.Prec.Barrier(Hauling from S.LA)
S-103	Lump	Lump	Rem.& Restor.of Exist.Struc.Steel
S-104	Lump	Lump	Removal of Sunken Barge
S-105	59.0	Lin.Ft.	Strip Seal(4")
S-106	20	Each	Excavation & Concrete Fill in Piles
S-107	20	Each	Redriving of Existing 54"Ø Piles
S-108	2,696	Each	Shear Connector Bar Extension
S-109	Lump	Lump	Rem.& Install.of Exist.Aluminum Hand R
TOTAL AMOUNT	OF EACH CONTRACTOR'S		LOW BID:

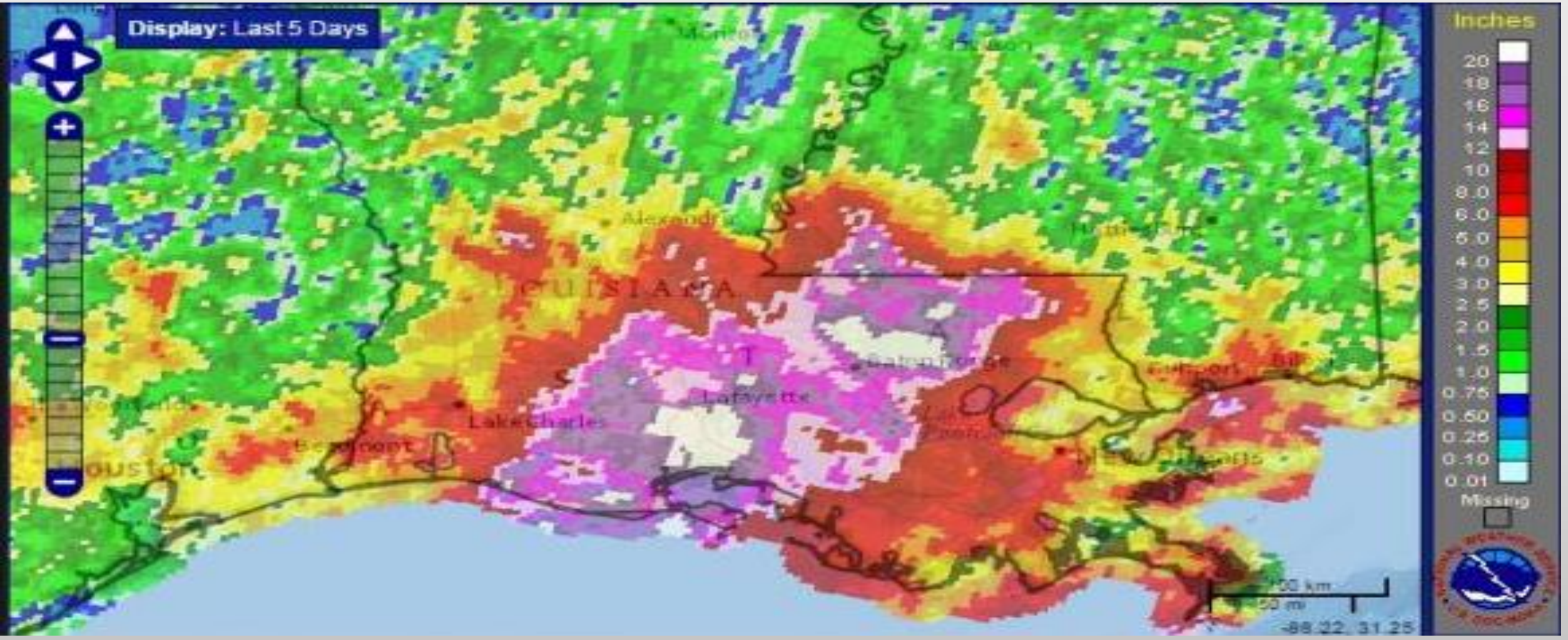
CERTIFIED CORRECT

PROJECT CONTROL ENGINEER

Low bidder, selected pay items

Concrete Cap Demolition (4)=	$165,000
Mobilization	$100,000
Interstate CrossOver Detour	$399,360
Removal and Reinstallation 4 Spans And Girder Restoration	$300,000
Re-driving all 54” piles	$67,000
Total	$1,752,494

- AUGUST 2016 FLOOD EVENT

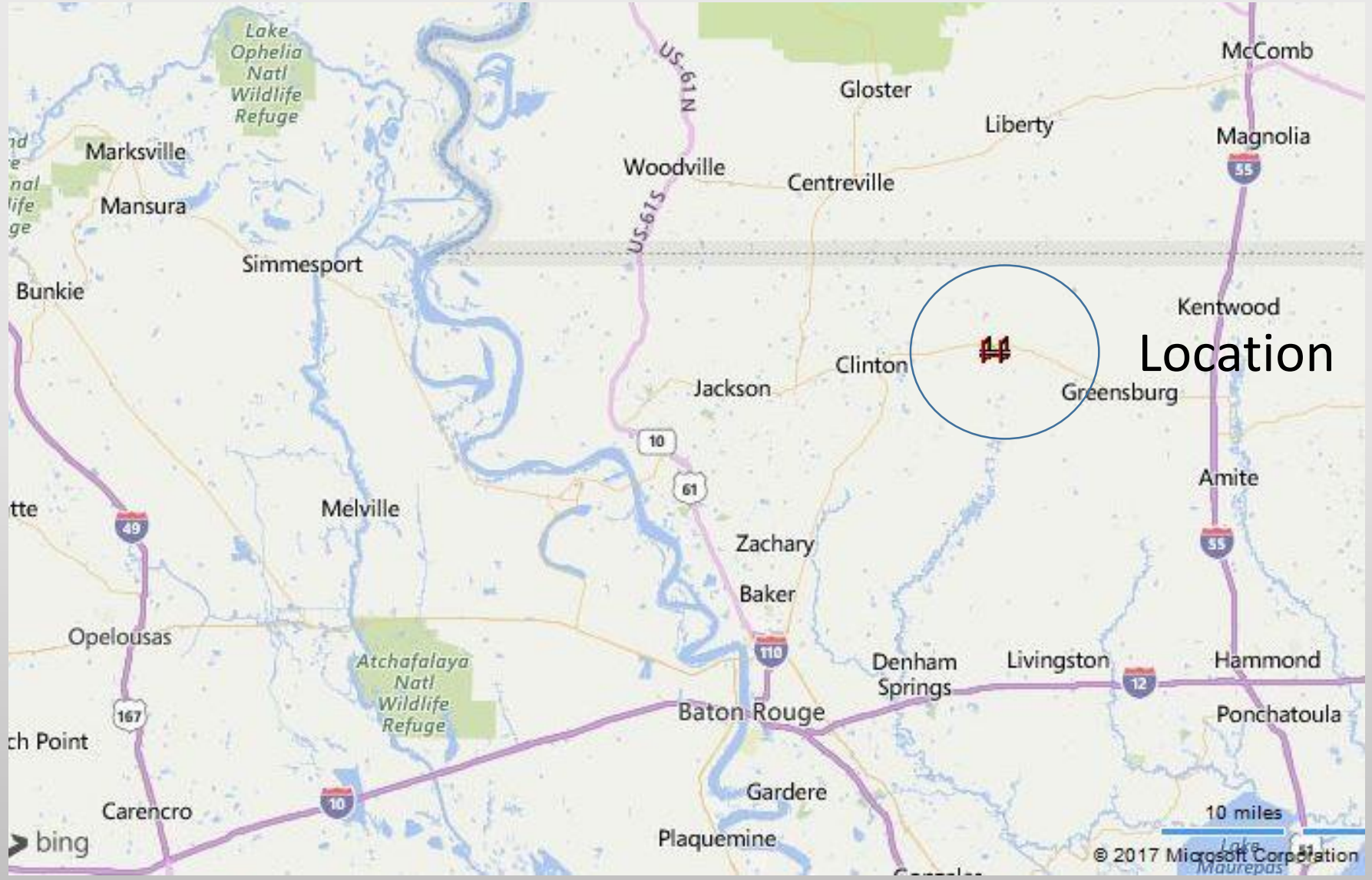


By U.S. Department of Agriculture -

LA 10: AMITE RIVER SCOUR REPAIR

state_route_number
LA0010
AMITE RIVER @ DARLINGTON
i109_pct_adt_truck 23
i29_adt 002300
Year Completed 1963
Dimensions=605’x28’

1) 22.54 ft on 08/13/2016
(2) 22.05 ft on 01/25/1990
(3) 21.76 ft on 04/22/1977
(4) 21.17 ft on 04/13/1955
(5) 20.29 ft on 04/07/1983
(6) 20.20 ft on 01/07/1950
(7) 20.19 ft on 03/25/1973
(8) 20.17 ft on 01/28/1994
(9) 19.69 ft on 03/18/1961
(10) 19.59 ft on 03/28/1980


Location
Lake Ophelia Natl Wildlife Refuge
Marksville
Mansura
Simmesport
Bunkie
US-61N
US-61S
Woodville
Gloster
Centreville
Liberty
McComb
Magnolia
Kentwood
Clinton
Jackson
Greensburg
Amite
Melville
Zachary
Baker
Opelousas
Atchafalaya Natl Wildlife Refuge
Baton Rouge
Denham Springs
Livingston
Hammond
Ponchatoula
Gardere
Plaquemine
Carencro
10 miles
bing
© 2017 Microsoft Corporation

LA 10 Amite River

Channel Migration

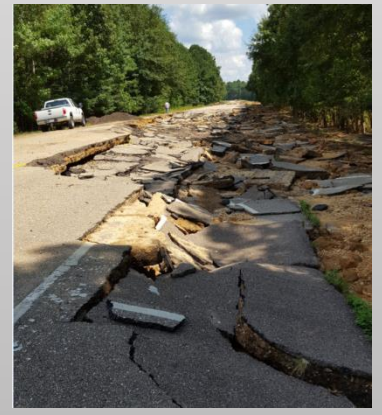
Photos from Atlas Louisiana GIS & Google Earth

LA 10 Amite River

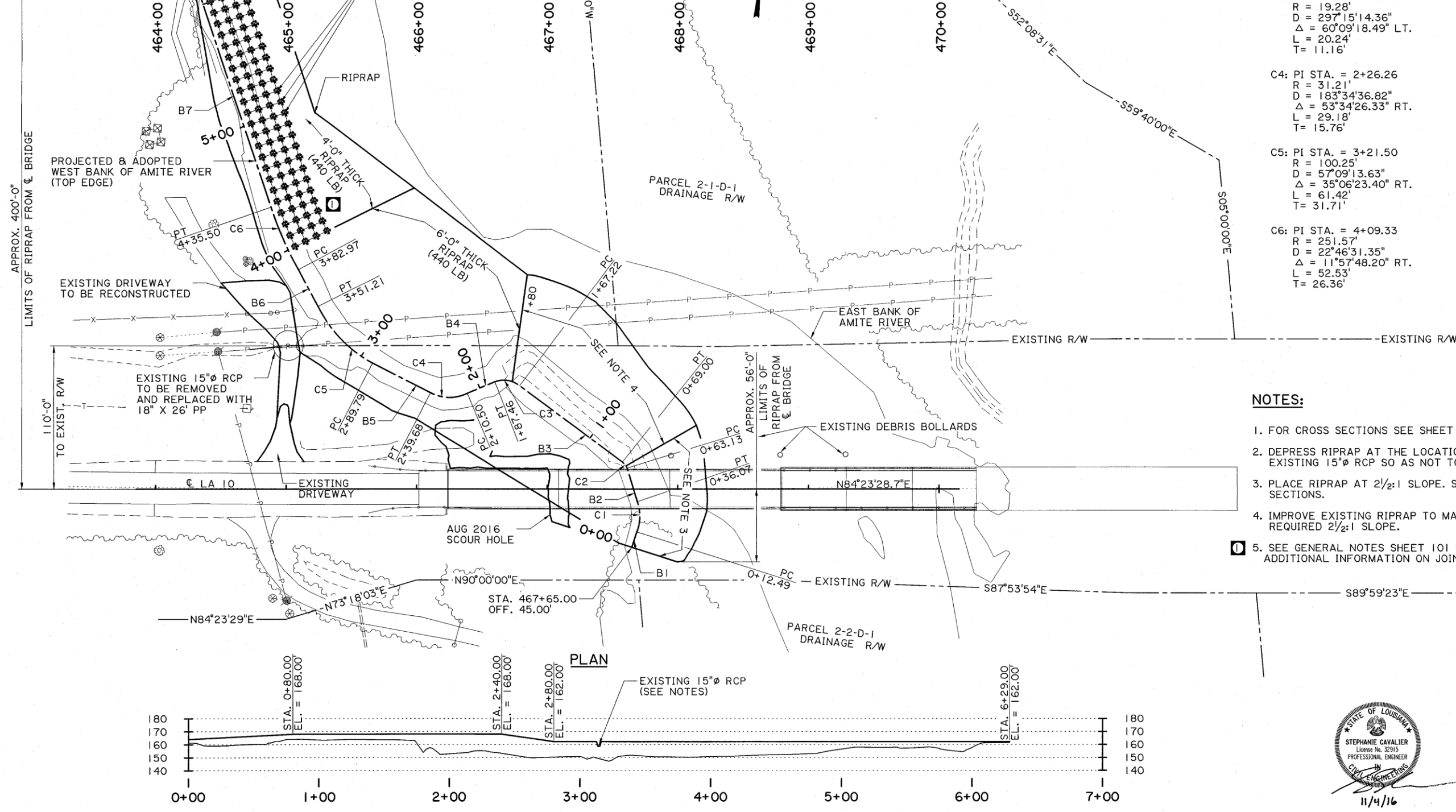
Channel Migration: December 2015 Aerial

LA 10 Amite River

August Flood Photos



http://www1.wbrz.com/videos/big-rig-washed-away-by-flooding-on-hwy-10



C4: PI STA. = 2+26.26
R = 31.21'
D = 183°34'36.82"
Δ = 53°34'26.33" RT.
L = 29.18'
T= 15.76'

C5: PI STA. = 3+21.50
R = 100.25'
D = 57°09'13.63"
Δ = 35°06'23.40" RT.
L = 61.42'
T= 31.71'

C6: PI STA. = 4+09.33
R = 251.57'
D = 22°46'31.35"
Δ = 11°57'48.20" RT.
L = 52.53'
T= 26.36'

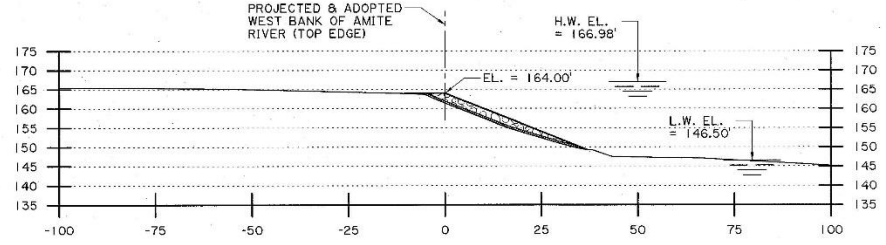
NOTES:

1. FOR CROSS SECTIONS SEE SHEET
2. DEPRESS RIPRAP AT THE LOCATIC EXISTING 15"ø RCP SO AS NOT TO
3. PLACE RIPRAP AT 2½:1 SLOPE. S SECTIONS.
4. IMPROVE EXISTING RIPRAP TO MA REQUIRED 2½:1 SLOPE.
5. SEE GENERAL NOTES SHEET 101 ADDITIONAL INFORMATION ON JOIN

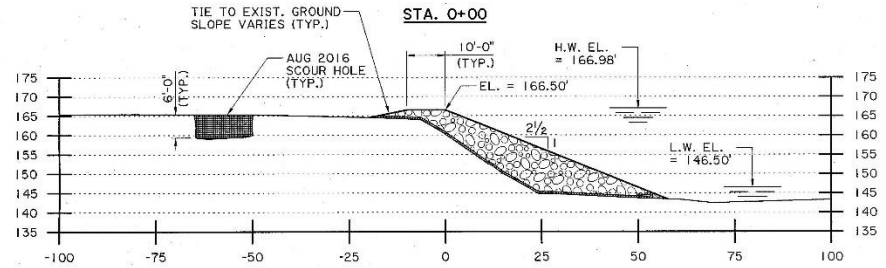
PLAN

STATE OF LOUISIANA
STEPHANIE CAVALIER
License No. 32915
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING

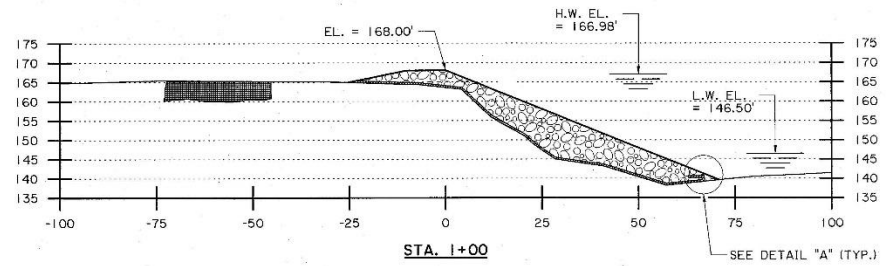
11/4/16



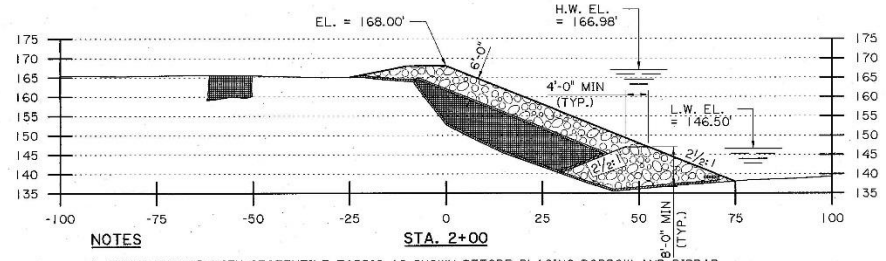
STA. 0+00



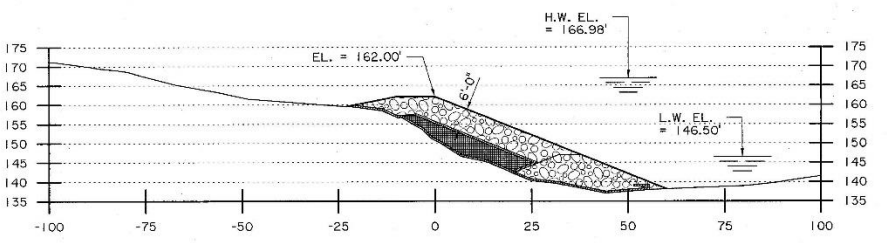
STA. 0+50



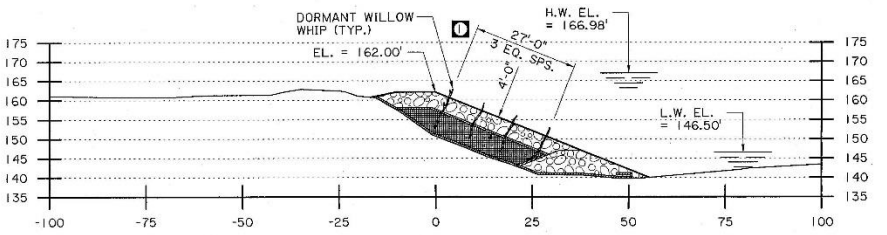
STA. 1+00



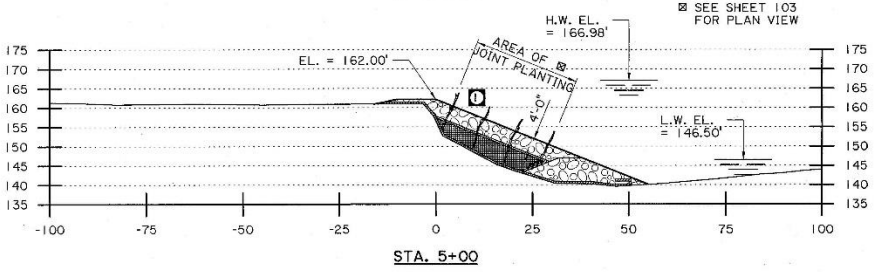
STA. 2+00



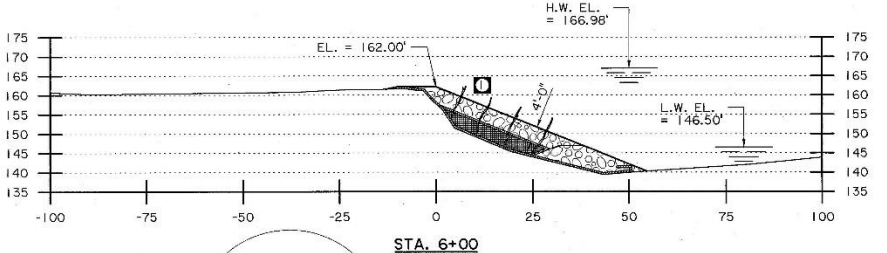
STA. 3+00



STA. 4+00



STA. 5+00



STA. 6+00

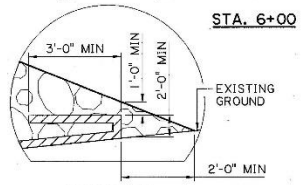
NOTES

1. DRESS GROUND WITH GEOTEXTILE FABRIC AS SHOWN BEFORE PLACING BORROW AND RIPRAP. WRAP GEOTEXTILE FABRIC AROUND TOE AS SHOWN IN DETAIL "A".
2. GEOTEXTILE FABRIC IS NOT RQUIRED OVER AREAS WHERE RIPRAP ALREADY EXISTS. EXISTING RIPRAP IS TO BE IMPROVED TO MATCH THE 2½:1 REQUIRED SLOPE.
3. USE BORROW MATERIAL BEGINNING AT STA. 1+80.00.
4. AUG 2016 SCOUR HOLE WAS NOT INCLUDED IN THE ORIGINAL SURVEY. DIMENSIONS OF SCOUR HOLE WERE OBTAINED FROM FIELD INSPECTION. SEE SHEET 102.
5. BRIDGE IS NOT SHOWN FOR CLARITY.
6. SEE LANDSCAPING NOTE ON GENERAL NOTES SHEET 101 FOR MORE INFORMATION ON JOINT PLANTING.

LEGEND

- RIPRAP (440 LB)
- GEOTEXTILE FABRIC
- BORROW

SCALE: 1/16" = 1'



DETAIL "A"
TOE OF SLOPE (N.T.S.)

STATE OF LOUISIANA
STEPHANIE CAVALIER
License No. 32515
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING
11/4/16

FINAL PLANS

IP_PWP:d0600586\104_Cross_Sections.dgn 11/3/2016 16:11

SHEET NUMBER 104

PARISH: ST. HELENA | CONTROL SECTION: 061-07 | STATE PROJECT: H.011934

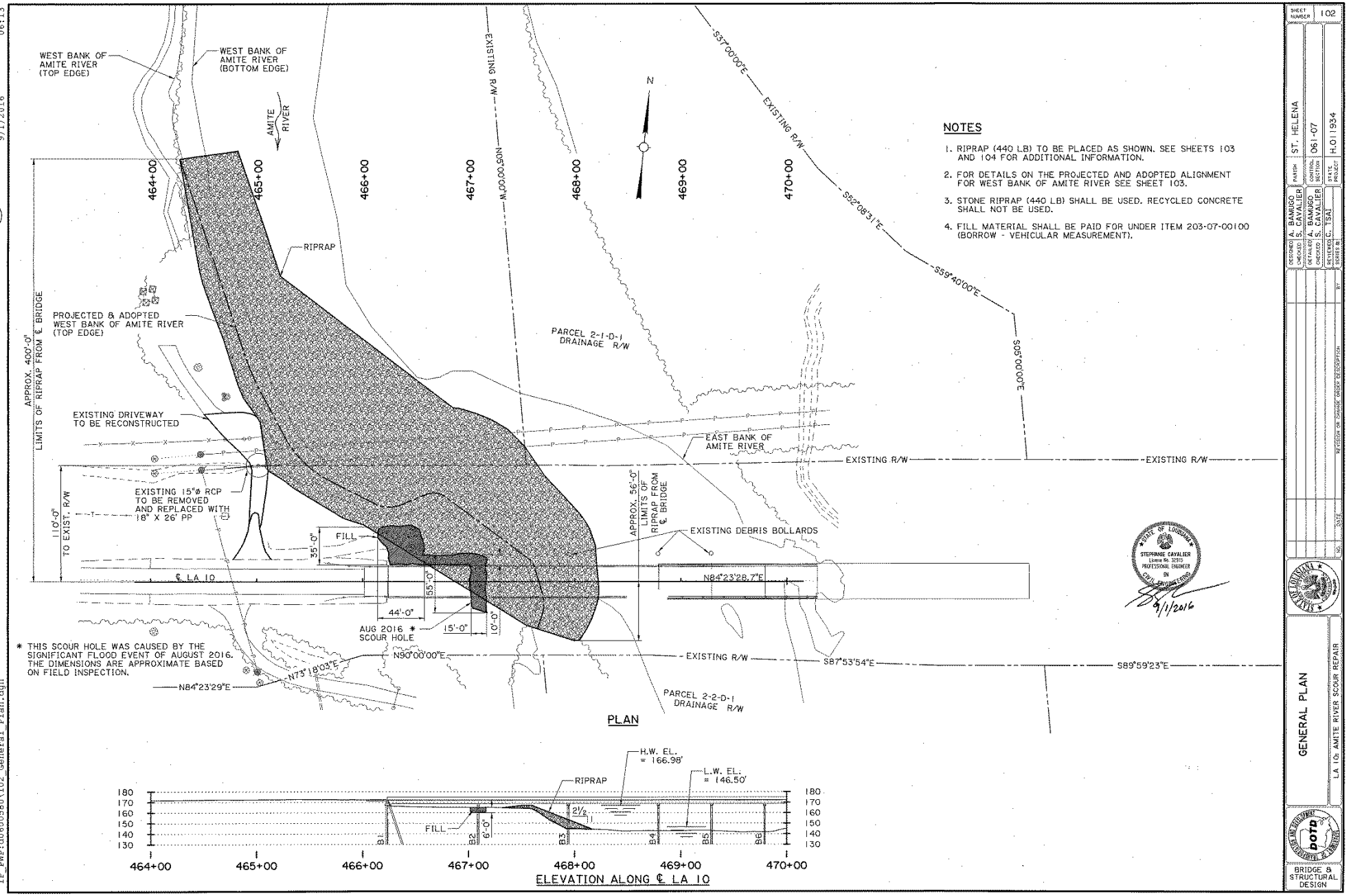
DESIGNED: A. BAMUGO | DETAILED: A. BAMUGO | CHECKED: S. CAVALIER | REVIEWED: C. TSAI | SERIES #:

NO.	DATE	REVISION OR ISSUANCE GROUP DESCRIPTION	BY
1	11/03/16	ADDED JOINT PLANTING DETAILS & NOTE 6	S. C.

CROSS SECTIONS

LA 16, AMITE RIVER SCOUR REPAIR

BRIDGE & STRUCTURAL DESIGN



PLAN

ELEVATION ALONG ℄ LA 10

NOTES

1. RIPRAP (440 LB) TO BE PLACED AS SHOWN. SEE SHEETS 103 AND 104 FOR ADDITIONAL INFORMATION.
2. FOR DETAILS ON THE PROJECTED AND ADOPTED ALIGNMENT FOR WEST BANK OF AMITE RIVER SEE SHEET 103.
3. STONE RIPRAP (440 LB) SHALL BE USED. RECYCLED CONCRETE SHALL NOT BE USED.
4. FILL MATERIAL SHALL BE PAID FOR UNDER ITEM 203-07-00100 (BORROW - VEHICULAR MEASUREMENT).

STATE OF LOUISIANA
STEPHANIE CAVALIER
License No. 32910
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING
9/1/2016

SHEET NUMBER 102

PARISH	CONTROL SECTION	STATE PROJECT
ST. HELENA	061-07	H.011934

DESIGNED	A. BANKOO	CALCULATED	
DRAWN	A. BANKOO	CHECKED	
CHECKED	A. BANKOO	APPROVED	
SUBMITTED	C. TSAI	SCALE	AS SHOWN

NO.	DATE	REVISION OR CHANGE ORDER DESCRIPTION	BY

GENERAL PLAN

LA 10: AMITE RIVER SCOUR REPAIR

DOTD

BRIDGE & STRUCTURAL DESIGN

60% FINAL PLANS

9/1/2016 06:13

IP_PWP:d0600580\102_General_Plan.dgn

LA 10 Amite River

Construction Photos

LA 10 Amite River

Construction Photos

Line Number	Item Number	Item Description	Quantity	Unit of Measure	- 1 - Barriere Construction Co., LLC.		- 2 - Palmisan Constructi LLC					
					Unit Price	Total Amount	Unit Price	Total Amount				
0001	202-02-32120	Removal of Pipe (Side Drain) 15" DIA RCP	22	LNFT	25.00	550.00	0.01	0				
0002	203-07-00100	Borrow (Vehicular Measurement)	4,860	CUYD	30.00	145,800.00	40.00	194,4				
0003	401-02-00100	Aggregate Surface Course (Adjusted Vehicular Measurement)	94.7	CUYD	30.00	2,841.00	50.00	4,735				
0004	701-05-01040	Side Drain Pipe (18" RCP/PP/CMP)	26	LNFT	70.00	1,820.00	105.00	2,730				
0005	711-03-00700	Riprap (440 lb)	20,512.5	TON	61.00	1,251,262.50	58.00	1,189 5				
0006	711-04-00100	Geotextile Fabric	8,757	SQYD	1.00	8,757.00	0.50	4,378				
0007	713-01-00100	Temporary Signs and Barricades	1	LUMP	20,000.00	20,000.00	25,000.00	25,00				
0008	726-01-00100	Bedding Material	2.5	CUYD	250.00	625.00	1.00	2.50	305.00	762.50	90.00	225.00
0009	727-01-00100	Mobilization	1	LUMP	20,000.00	20,000.00	120,000.00	120,000.00	85,600.00	85,600.00	67,255.00	67,255.00
0010	740-01-00100	Construction Layout	1	LUMP	7,000.00	7,000.00	36,000.00	36,000.00	12,000.00	12,000.00	3,500.00	3,500.00
0011	719-04-00100	Landscaping	1	LUMP	20,000.00	20,000.00	21,000.00	21,000.00	23,200.00	23,200.00	28,150.00	28,150.00
		CONTRACTOR TOTAL				1,478,655.50		1,597,971.22		1,945,399.00		1,965,850.96

Low bidder, selected pay items

Borrow, 4860 cu.yds.(4)= $145,800

Mobilization $20,000

Riprap- 20513 tons (440 lb), $1,251,253

Geotextile fabric, 8800sqyds $8,800

Landscaping $20,000

Total $1,478,655

Questions?