

NDT/NDE OF BRIDGE DECKS LADOTD



- ▶ Louisiana has approximately 13,000 bridges; 8,000 are State Owned
- ▶ Louisiana has 175,000,000 square foot of deck area (3rd most in the Country)
- ▶ 155,000,000 square foot of deck area is State Owned



LOUISIANA BRIDGE DECK FACTS

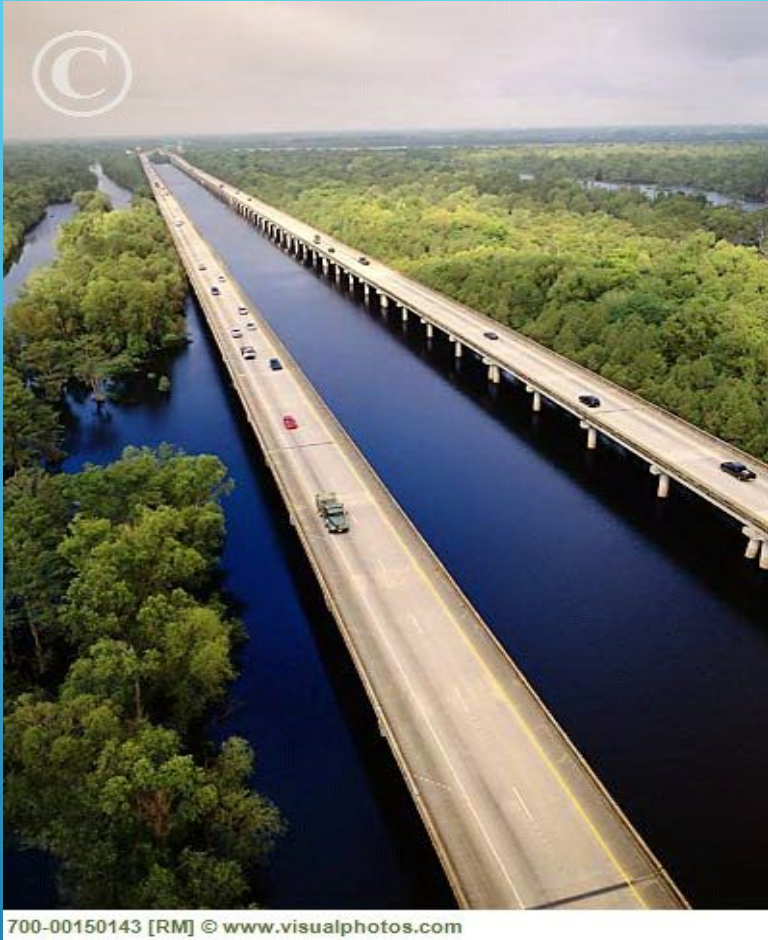
- ▶ Lake Pontchartrain Causeway
- ▶ 23.83 miles
- ▶ Southbound and Northbound
- ▶ 47.66 total miles



LOUISIANA HAS 18 OF THE 20
LONGEST BRIDGES IN THE U.S.



SOUTHBOUND YEAR BUILT 1956
NORTHBOUND YEAR BUILT 1965



700-00150143 [RM] © www.visualphotos.com



I-55 OVER MANCHAC SWAMP
23.09 MILES
46.18 TOTAL MILES
YEAR BUILT 1975-1979



I-10 OVER THE ATCHAFALAYA BASIN
17.39 MILES
34.78 MILES
YEAR BUILT 1972



I10 OVER LAKE PONCHARTRAIN
5.53 MILES
11.06 TOTAL MILES
YEAR BUILT 2011



I-10 OVER BONNET CARRE SPILLWAY

11.84 MILES

23.68 TOTAL MILES

YEAR BUILT 1972

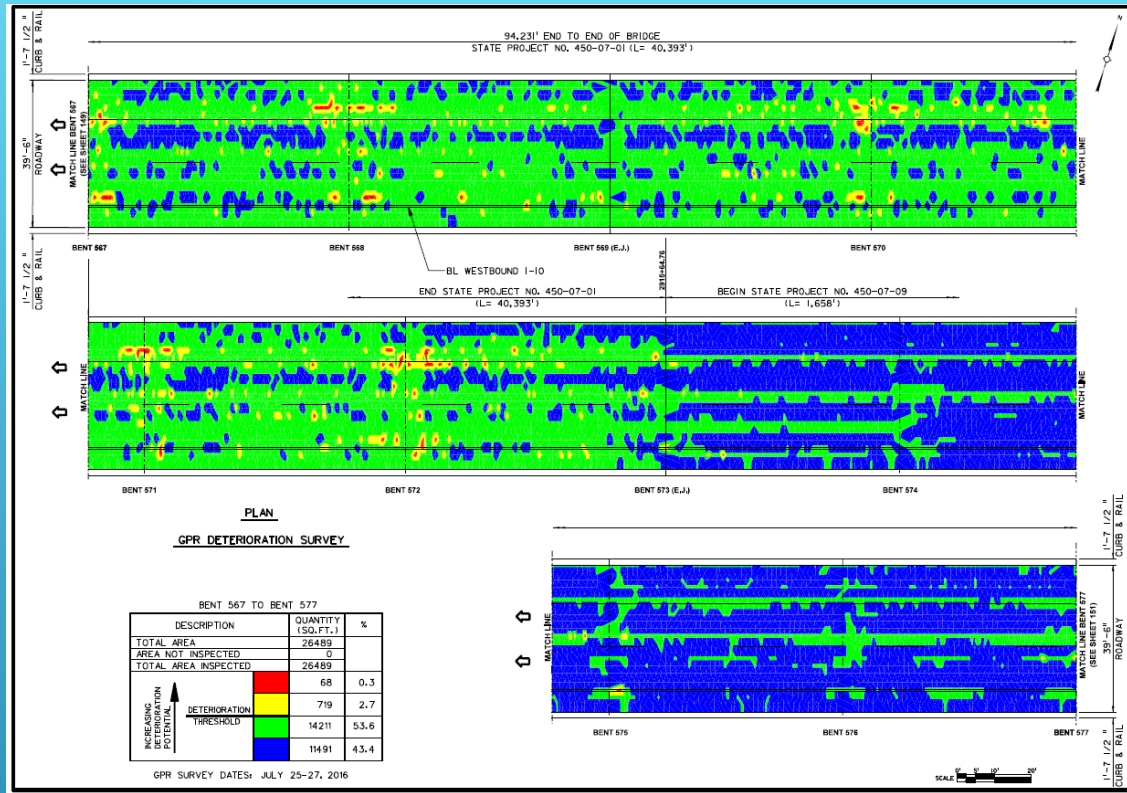
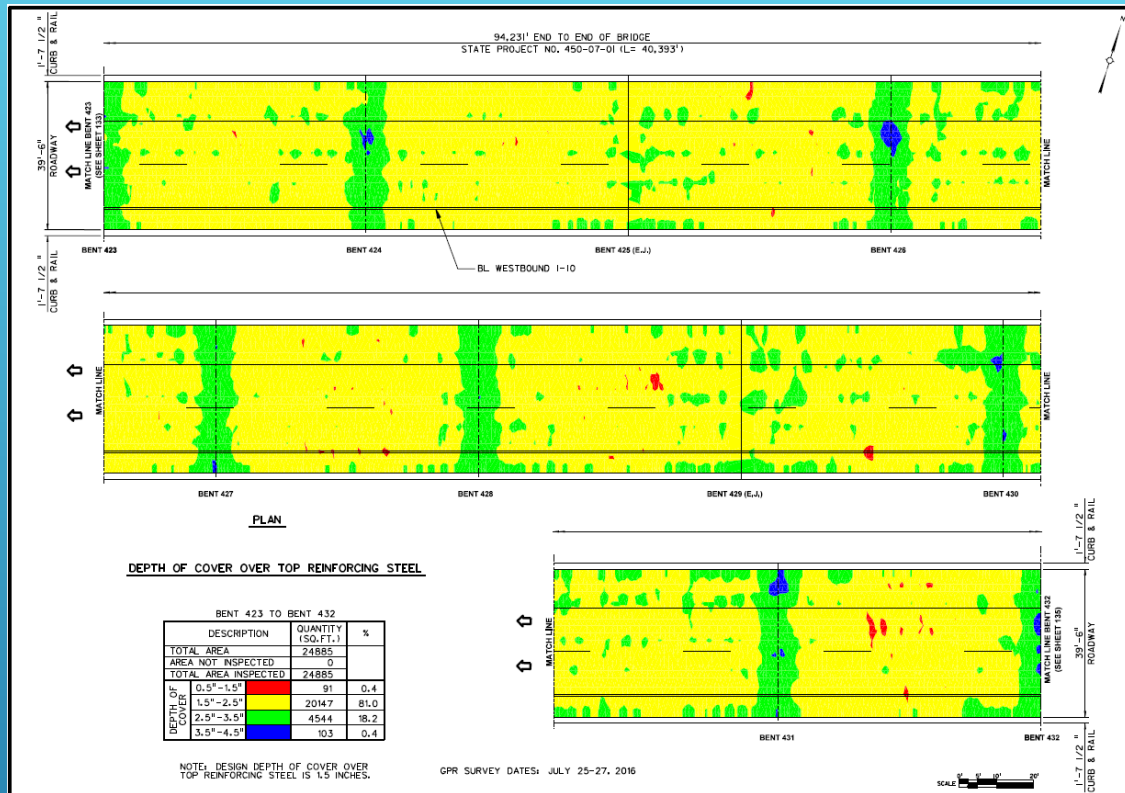
\$153 million Port Fourchon to Leeville
Elevated Highway opened in December.



LA 1 LEEVILLE TO PORT FOURCHON
8.18 MILES
YEAR BUILT 2009



I-10 OVER THE MISSISSIPPI RIVER
101300 ADT
35455 ADTT



GPR PERFORMED ON THE I-10 BASIN BRIDGE WESTBOUND AS PART OF THE SHRP2 R06A NDT FOR CONCRETE BRIDGE DECKS

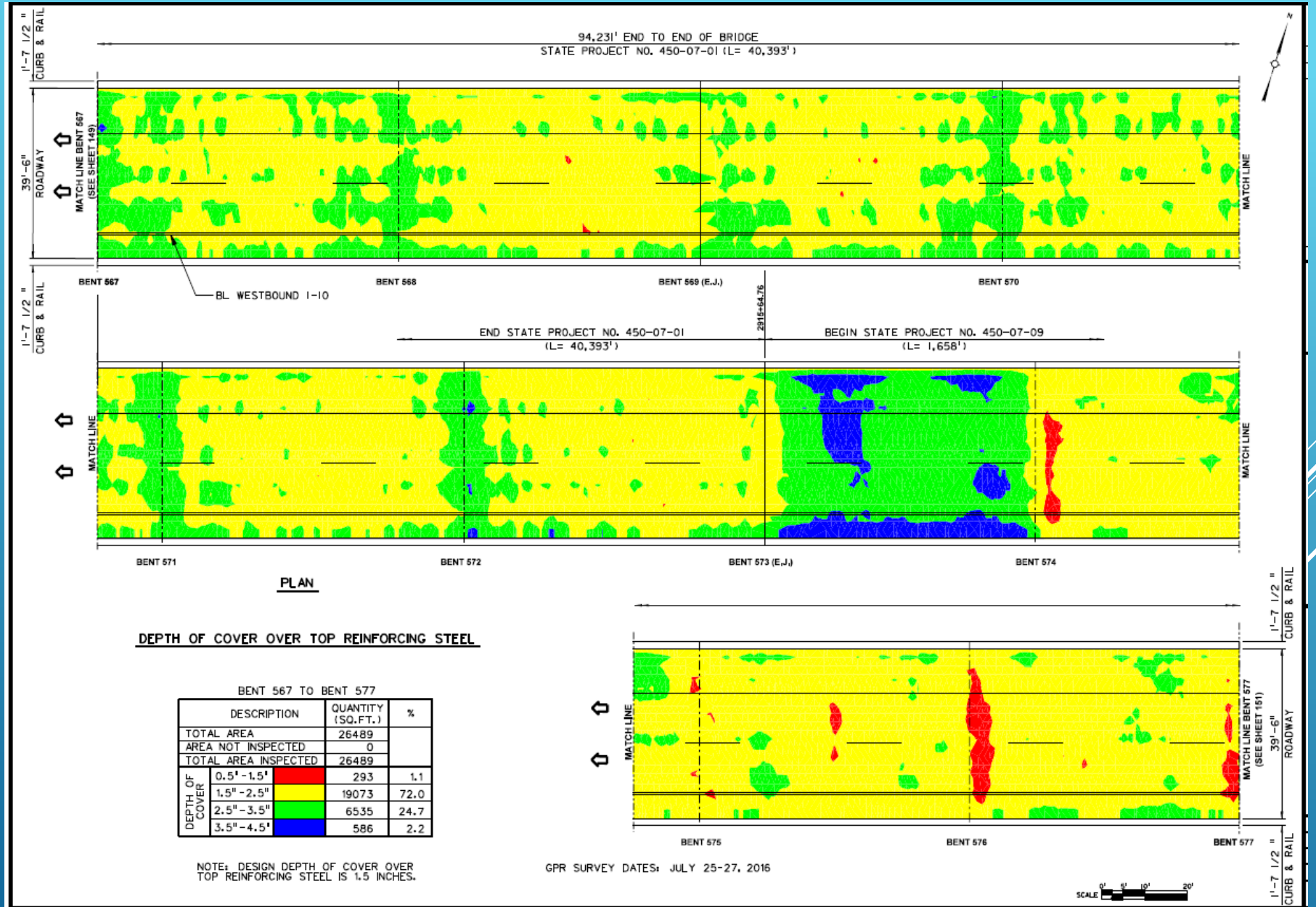
DEPTH OF COVER OVER TOP REINFORCING STEEL

BENT 324 TO BENT 333

DESCRIPTION		QUANTITY (SQ.FT.)	%	
TOTAL AREA		24885		
AREA NOT INSPECTED		0		
TOTAL AREA INSPECTED		24885		
DEPTH OF COVER	0.5" - 1.5"		20	0.1
	1.5" - 2.5"		19512	78.4
	2.5" - 3.5"		5353	21.5
	3.5" - 4.5"		0	0

NOTE: DESIGN DEPTH OF COVER OVER TOP REINFORCING STEEL IS 1.5 INCHES.

GPR DEPTH OF COVER RESULTS

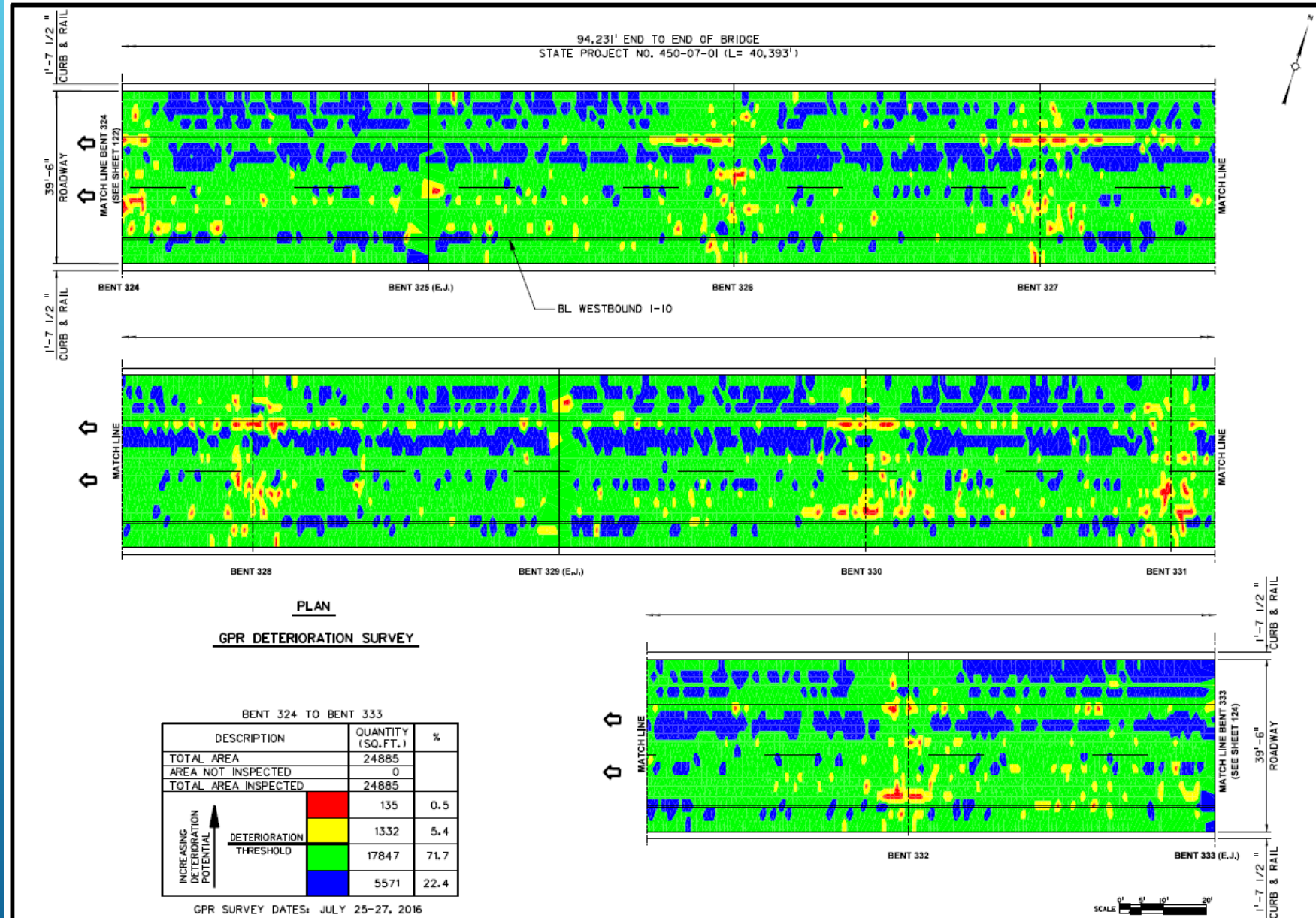


GPR DETERIORATION SURVEY

BENT 333 TO BENT 342

DESCRIPTION	QUANTITY (SQ.FT.)	%																
TOTAL AREA	24885																	
AREA NOT INSPECTED	0																	
TOTAL AREA INSPECTED	24885																	
<div style="display: flex; align-items: center;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg); font-size: small; margin-right: 5px;">INCREASING DETERIORATION POTENTIAL ↑</div> <table border="1" style="border-collapse: collapse;"> <tr> <td style="background-color: red; width: 20px; height: 15px;"></td> <td style="font-size: x-small;">DETERIORATION</td> <td style="width: 20px; height: 15px;"></td> <td style="font-size: x-small;">THRESHOLD</td> </tr> <tr> <td style="background-color: yellow; width: 20px; height: 15px;"></td> <td style="font-size: x-small;">DETERIORATION</td> <td style="width: 20px; height: 15px;"></td> <td style="font-size: x-small;">THRESHOLD</td> </tr> <tr> <td style="background-color: green; width: 20px; height: 15px;"></td> <td style="font-size: x-small;">DETERIORATION</td> <td style="width: 20px; height: 15px;"></td> <td style="font-size: x-small;">THRESHOLD</td> </tr> <tr> <td style="background-color: blue; width: 20px; height: 15px;"></td> <td style="font-size: x-small;">DETERIORATION</td> <td style="width: 20px; height: 15px;"></td> <td style="font-size: x-small;">THRESHOLD</td> </tr> </table> </div>		DETERIORATION		THRESHOLD		DETERIORATION		THRESHOLD		DETERIORATION		THRESHOLD		DETERIORATION		THRESHOLD	157	0.6
		DETERIORATION		THRESHOLD														
		DETERIORATION		THRESHOLD														
		DETERIORATION		THRESHOLD														
	DETERIORATION		THRESHOLD															
	1707	6.9																
	18551	74.5																
	4470	18.0																

GPR SURVEY DATES: JULY 25-27, 2016



GPR

DETERIORATION

POTENTIAL

GPR DATA COLLECTION VAN



- ▶ The data was collected over a 4 night period. The van was able to travel at 35-40 mph.
- ▶ The Baton Rouge and Lafayette District set up mobile lane closures that are used for street sweeping operations.
- ▶ All lanes and shoulders had a pass for data collection.
- ▶ Westbound and Eastbound had data collected, due to budget constraints only the Westbound results were analyzed. LADOTD owns the data for the Eastbound.
- ▶ 69.56 lane miles total

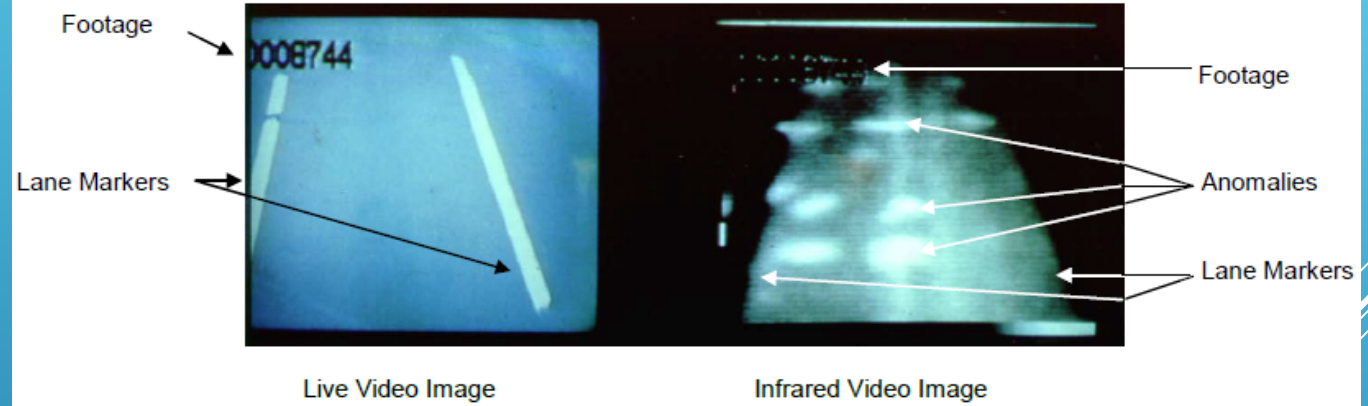
IMPLEMENTING THE TESTING



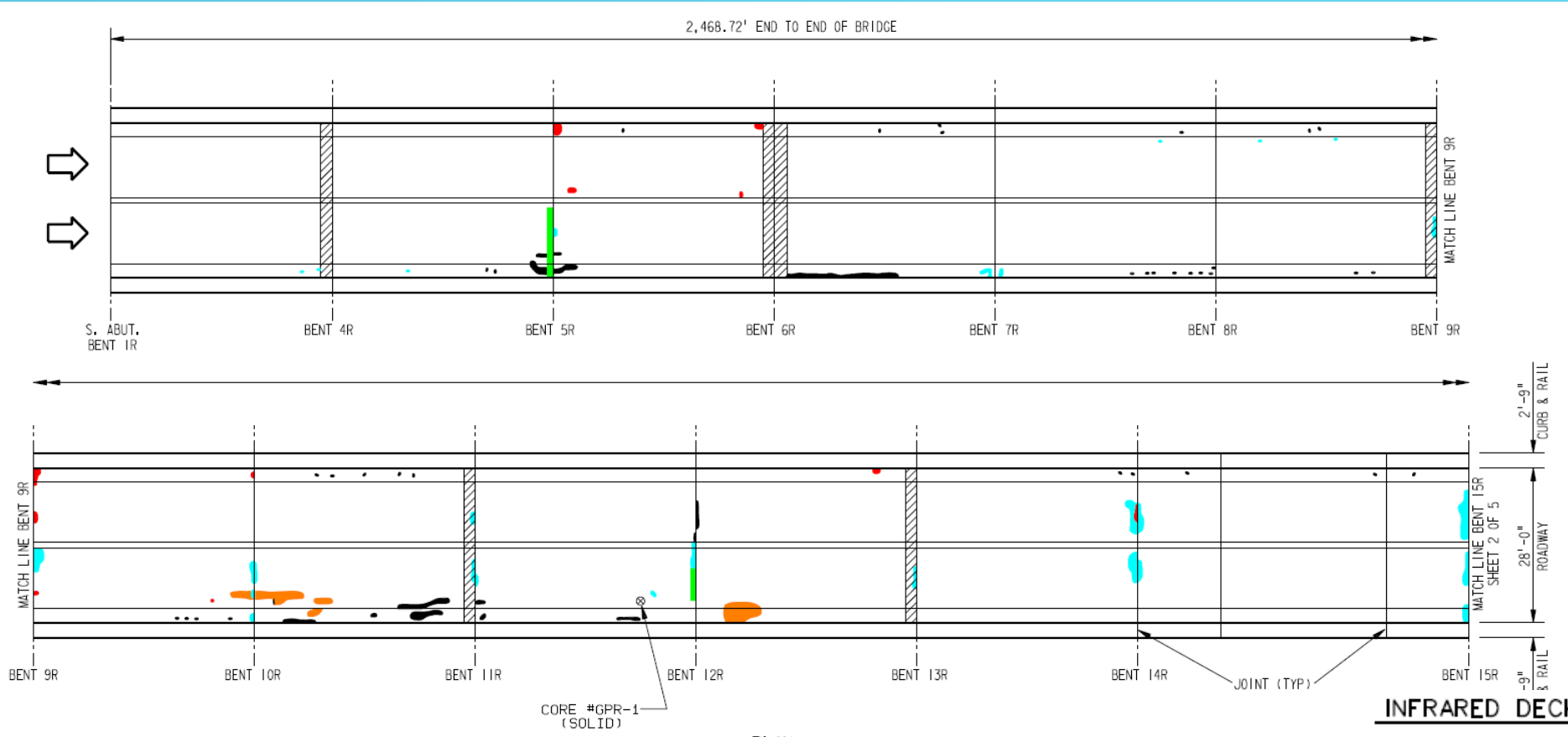
LA 1 OVER PORT ALLEN CANAL
BUILT 1960
MAJOR TRUCK ROUTE FOR
PETRO CHEMICAL INDUSTRY



FIGURE 5
LIVE AND INFRARED IMAGES



DOTD HAD GPR AND INFRARED PERFORMED ON THIS BRIDGE TO ASSESS THE DECK CONDITION.



PLAN
INFRARED DECK INSPECTION RESULTS

INFRARED DECK INSPECTION RESULTS

INFRARED RESULTS

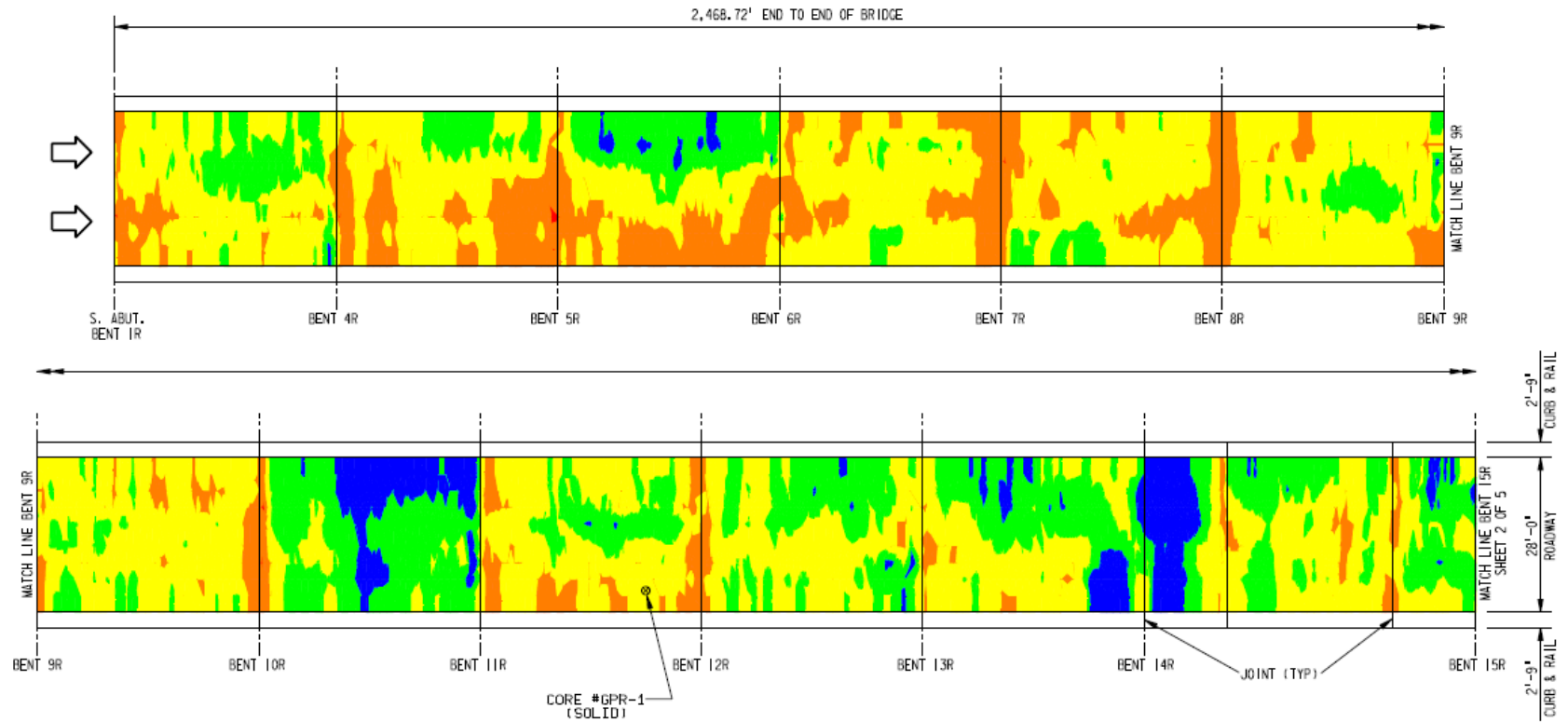
LA ROUTE 1 NORTHBOUND
OVER PORT ALLEN CANAL

FIELD OBSERVATIONS SUMMARY		ROADWAY		LEGEND	
ITEM	UNIT	QUANT.	%		
TOTAL AREA	ft ²	69124		DELAMINATION	
SHADE/DEBRIS	ft ²	0		SPALL	
DELAMINATION	ft ²	162	0.2	SCALING	
SPALL	ft ²	172	0.2	PATCH-CONCRETE	
SCALING	ft ²	582	0.8	PATCH-OTHER	
PATCH-CONCRETE	ft ²	35	<0.1	JOINT REPAIR AREA	
PATCH-OTHER	ft ²	576	0.8		

DEPTH OF COVER OVER TOP REINFORCING STEEL

LA ROUTE 1 NORTHBOUND
OVER PORT ALLEN CANAL

DESCRIPTION		QUANTITY (SQ.FT.)	%
TOTAL AREA		69124	
AREA NOT INSPECTED		0	
TOTAL AREA INSPECTED		69124	
DEPTH OF COVER	1.0' - 1.5'	3669	5.3
	1.5' - 2.0'	26573	38.4
	2.0' - 2.5'	25055	36.3
	2.5' - 3.0'	11694	16.9
	3.0" - 3.7"	2133	3.1



PLAN

GROUND PENETRATING RADAR SURVEY RESULTS
DEPTH OF COVER OVER TOP REINFORCING STEEL

LA ROUTE 1 NORTHBOUND
OVER PORT ALLEN CANAL

DESCRIPTION		QUANTITY (SQ.FT.)	%
TOTAL AREA		69124	
AREA NOT INSPECTED		0	
TOTAL AREA INSPECTED		69124	
DEPTH OF COVER	1.0' - 1.5'	3669	5.3
	1.5' - 2.0'	26573	38.4
	2.0' - 2.5'	25055	36.3
	2.5' - 3.0'	11694	16.9
	3.0" - 3.7"	2133	3.1

SCALE 0' 5' 10' 20'

SURFACE TYPE: CONCRETE - NO OVERLAY
GPR SURVEY DATE: 12/3/15 & 12/4/15

GPR RESULTS

- ▶ Recently LADOTD has awarded two NDE consultant contracts. The contract scopes focus on NDE of Concrete Bridge Decks and Tunnel Liners (Yes, Louisiana has Tunnels (3)).
- ▶ Due to the number of miles of bridge deck it is not feasible to inspect these longer bridges using traditional methods. LADOTD will implement a mobile NDE program using consultants to provide condition data to the program managers.
- ▶ This data will help to plan for deck replacements/partial replacements before visual signs of deck deterioration occurs.
- ▶ LADOTD awarded projects to repair the decks mainly at joint locations for the 1-10 Basin Bridges and the LA 1 Port Allen Canal Bridges. The data presented to the bridge programming section helped facilitate these preventative maintenance projects.

LOUISIANA AND NDE/NDT

QUESTIONS?

