P.E. SP-0110-01 (035) 109516-101000

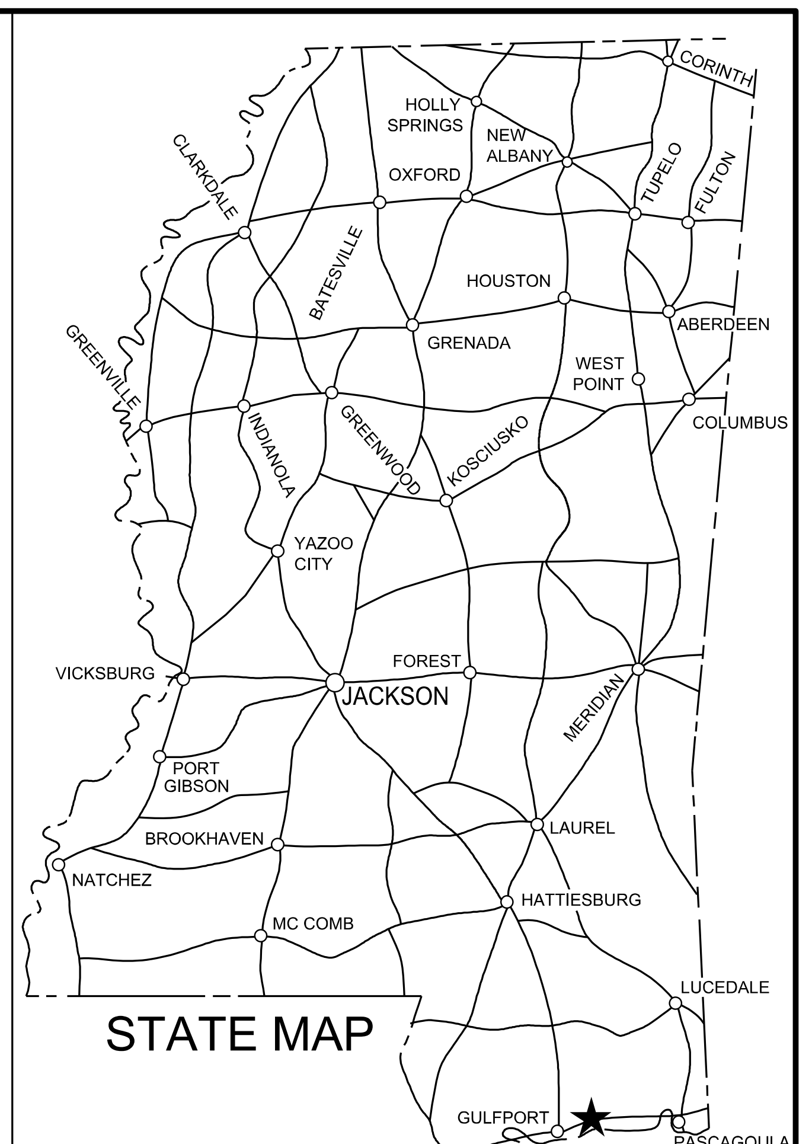
STATE OF MISSISSIPPI
MISSISSIPPI DEPARTMENT OF TRANSPORTATION

BRIDGE REPAIR
PLANS OF INTERSTATE HIGHWAY
PROJECT NO. NHPP-0110-01(035)

INTERSTATE HWY I-110 BRIDGE NO. 0.1 (11316) (PIER 43)
HARRISON COUNTY
CON FMS 109516-301000

GENERAL INDEX

INCLUDED THIS PROJECT		BEGIN WITH SHEET
☐	ROADWAY	1
☐	PERMANENT SIGNS	1001
☐	TRAFFIC SIGNALS	2001
☐	ITS COMPONENTS	3001
☐	LIGHTING	4001
☐	(RESERVED)	5001
☐	ROADWAY STD. DWGS.	6001
☐	BOX CULVERT STD. DWGS (LRFD)	7001
☐	BOX CULVERT STD. DWGS (STD. SPEC.)	7501
☒	BRIDGE	8001
☐	CROSS SECTIONS	9001

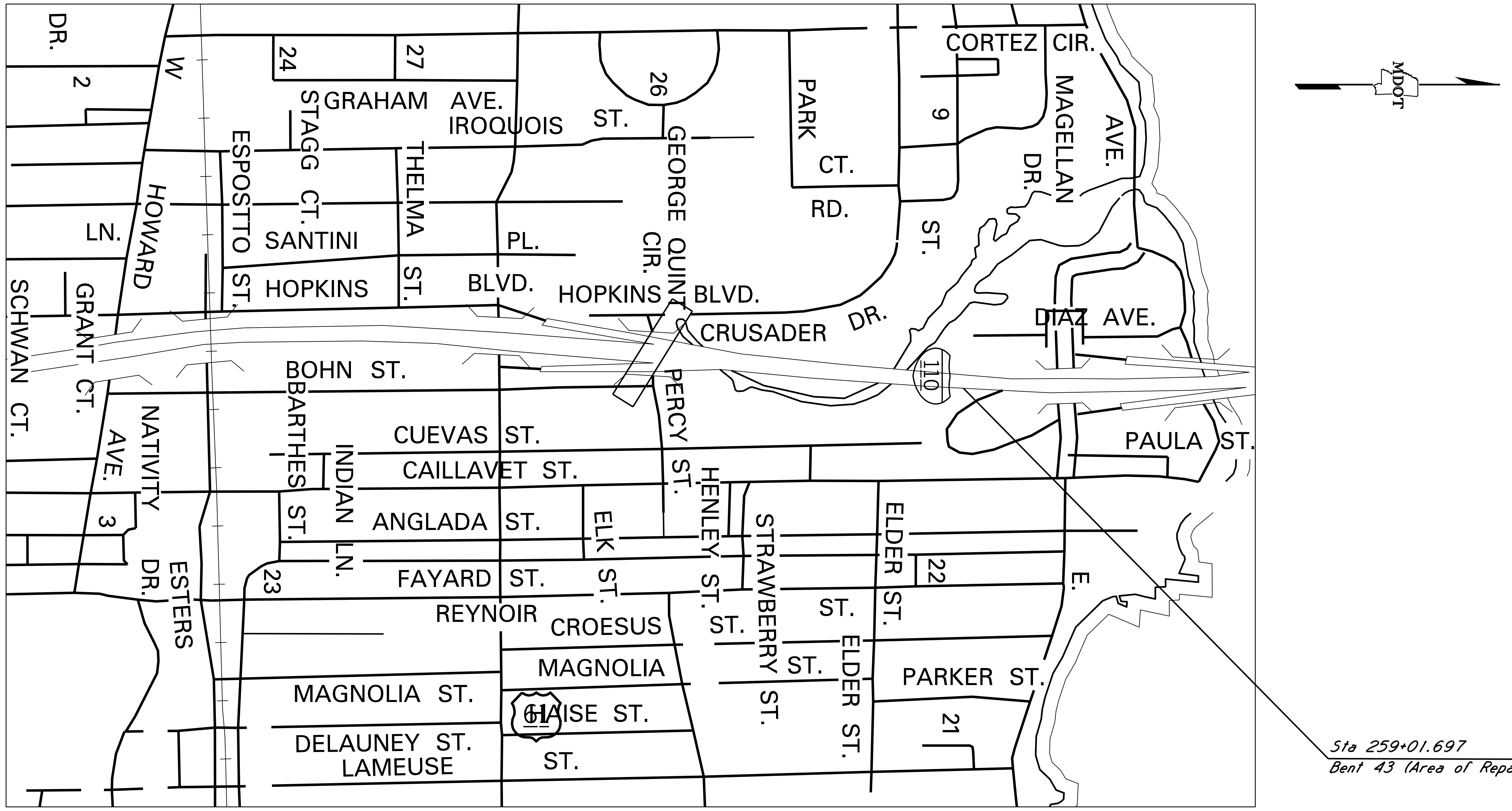


STATE MAP

NOTE
★ INDICATES APPROXIMATE LOCATION OF PROJECT.

BRIDGE STRUCTURES REQ'D.

BOX BRIDGES REQ'D.



DESIGN CONTROL

65 MPH = V (SPEED DESIGN)

ADT (1986) = 14,560 ADT (2006) = 28,970

DHV = 2,510 D = 55 T = % 5

PERMITS ACQUIRED BY MDOT

WETLANDS AND WATERS PERMITS

	WATERS	WETLANDS
NATIONWIDE #14	N	N
NATIONWIDE (OTHER)*	N	N
GENERAL*	N	N
INDIVIDUAL (404)*	N	N

STORMWATER PERMIT N

Y	REQUIRED, CNOI SUBMITTED BY MDOT (DISTURBED AREA=5 ACRES)
S	REQUIRED, SCNOI TO BE SUBMITTED BY CONTRACTOR (1 TO 4.99 ACRES)
N	NO STORMWATER PERMIT REQUIRED (<1 ACRE)

APPROVED BY: ____________________

EQUATIONS

STA. 253+62.41 BK. = P.C. STA. 253+59.64 AH. +2.77 FT.

SCALES

PLAN		1 IN.= 100 FT.
PROFILE	HOR.	1 IN.= 100 FT.
	VERT.	1 IN.= 10 FT.
LAYOUT		1 IN.= FT.

EXCEPTIONS

NONE

CONVENTIONAL SYMBOLS

- COUNTY LINE
- TOWN CORP LINE
- SECTION LINE
- DEED LINE
- EXISTING ROADWAY
- PROPOSED ROADWAY
- RAILROAD
- BRIDGES

LENGTH DATA

LENGTH OF ROADWAY	0	FT.	0	MI.
LENGTH OF BRIDGES	3,062.346	FT.	0.580	MI.
LENGTH OF PROJECT (NET)	3,062.346	FT.	0.580	MI.
LENGTH OF EXCEPTIONS	__________	FT.	_____	MI.
LENGTH OF PROJECT (GROSS)	3,062.346	FT.	0.580	MI.

DESIGNED BY: HDR

CONSTRUCTION PROJECT DATA

EXTERNAL PROJECT NUMBER	NHPP-0110-01(035)
FMS & DETAIL	109516/301000

P S & E DATE: 6/12/2023

JOSHUA LEE WILTSHIRE
ENGINEER
10-24-2023
27822

APPROVED:

DEPUTY EXECUTIVE DIRECTOR / CHIEF ENGINEER

EXECUTIVE DIRECTOR

PLAN SHEET

title_sh.dgn

TIME

DATE

Description of Sheets	Working Number	Sheet Number	Revision
Title Sheet	------	8001	------
Detailed Index (Bridge)	DI-BR-1	8002	------
General Notes	1 OF 8	8003	------
Superstructure Elevation View	2 OF 8	8004	------
Superstructure Plan View	3 OF 8	8005	------
Bent 43SB - West Column	4 OF 8	8006	------
Bent 43SB - East Column	5 OF 8	8007	------
Bent 43NB - West Column	6 OF 8	8008	------
Bent 43NB - East Column	7 OF 8	8009	------
Spall Repair Details	8 OF 8	8010	------
Information Plans	------	8011 - 8036	------

Bridge Division Revisions		
Date	Sheet No.	By

PLAN SHEET

I-110 Bridge Repair.dgn

TIME

DATE

JOSHUA LEE WILTSHIRE
27822
10-24-2023

MDOT
MISSISSIPPI DEPARTMENT OF TRANSPORTATION

DESIGNED BY: R. Robertson
DETAILED BY: B. Busby
CHECKED BY: J. Stauffer
DATE: 10/14/2023

FMS CON: 109516-301000
PROJECT NO.: NHPP-0110-01(035)
COUNTY: HARRISON

I-110 BRIDGE REPAIR
DETAILED INDEX (BRIDGE)

WK. NO.
DI-BR-1

SHEET NO.
8002

General Notes:

1. Specifications: Mississippi Standard Specifications for Road and Bridge Construction, 2017.

2. No change of plans will be permitted except with the approval of the Director of Structures, State Bridge Engineer provided such changes will not be cause for contract price adjustments.

3. All details are based on the dimensions shown on the original plans for the existing structure. All dimensions of the existing structure shall be field verified by the Contractor prior to the start of construction.

4. Work for which no pay item is provided in the plans will not be paid for directly and shall therefore be considered an absorbed item of work.

5. These plans show known damaged areas for which not all damaged concrete has been removed. Further damage areas are anticipated to be identified during the cleaning process and during removal of damaged and unsound concrete. Final quantities will be modified according to the final areas of damage repaired and approved by the Project Engineer. Quantities shall be bid such that the item may be increased, decreased or eliminated as directed by the Project Engineer with no change in the Unit Price.

6. All materials removed from the bridge shall become the property of the Contractor and shall be removed from the construction site and properly disposed of.

7. The cleaning of soot from fire damage, dirt and loose debris shall be performed prior to any other construction activities. Cleaning shall be performed by washing with a pressure washer capable of maintaining 3500 psi of pressure. Clean all columns of Bent 43 and areas of the superstructure underside extending 25' North and 35' South of Bent 43 centerline. Extend the limits of cleaning if inspection identifies additional damaged areas.

8. Prior to construction, the Contractor shall provide a demolition and repair plan to the Director of Structures, State Bridge Engineer for review and approval. The plan shall include all demolition activities, including containment of debris and non-potable water, and concrete repair methods and materials.

9. Upon removal of all damaged or unsound concrete from the segmental superstructure and the bridge columns, the Contractor shall provide a survey of all damaged areas with dimensions of the areas to be removed for review by the Project Engineer.

10. If any unsound concrete or cracks are identified within the reinforced concrete core, the Contractor shall immediately stop further removal and contact the Project Engineer for direction.

11. The contractor shall provide as-built plans depicting the limits of the repaired areas, the repair procedures, materials used, and final dimensions.

Scope of Work:

1. Clean and remove dirt, debris and soot resulting from fire damage from the underside of the segmental superstructure within the limits noted in General Note #7 and all bent columns located at Bent 43.

2. Remove all damaged and unsound concrete within the cleaned portion of the bridge adjacent to Bent 43, including superstructure bottom slab and web surfaces and the columns of Bent 43 columns.

3. Epoxy inject any cracks in otherwise sound concrete.

4. Repair all damaged areas with epoxy mortar.

5. Install FRP on the columns as shown on Column Sheets.

6. Upon completion of the work, the area shall be cleaned and swept of all debris, litter, etc. prior to final inspection.

Epoxy Injection Notes:

1. Based on the preliminary inspection performed to date, no cracks in otherwise sound concrete have been identified but limited quantity of cracks to be repaired should be anticipated beneath the spalled or delaminated concrete.

2. After removing all spalled or unsound concrete, the Contractor shall notify the Project Engineer of any cracks within the remaining concrete and provide crack maps depicting the location, orientation and width of the cracks. The Contractor shall wait to perform epoxy injection until the crack location and severity is evaluated by the Project Engineer.

3. If authorized by the Project Engineer, the Contractor shall epoxy inject cracks over 0.012" in width with a product on MDOT's approved materials list.

4. The Contractor shall perform the epoxy injection in accordance with the manufacturer's written instructions.

5. All items of work related to epoxy repair shall be paid for under pay item 907-824-PP008: Bridge Repair, Epoxy Injection of Cracks

Epoxy Mortar Notes:

1. Repair spalled and unsound concrete areas on the bridge as directed by the Project Engineer and the repair details in these plans. Hammers used to remove spalled or unsound concrete shall be limited to 15 lbs. All areas of the repaired bridge shall be restored to the original dimensions and details on the plans.

2. Prior to construction, all existing reinforcement shall be located. Care shall be exercised to protect the existing reinforcement from damage. Any reinforcement damaged during the concrete removal shall be repaired by the Contractor using a method approved by the Director of Structures, State Bridge Engineer at no additional cost to the State.

3. After removal of the damaged or unsound concrete, the repair area shall be squared up by a saw cut, with a minimum depth shown in the repair details, around the perimeter of the repair area to prevent feather edges. All residual concrete remaining in the repair area shall be removed. All exposed reinforcement shall be blast cleaned to bare steel.

4. The Contractor shall remove the striations on the portion of the columns to be wrapped and build up the section with epoxy mortar.

5. For spalled areas a minimum of 2" deep on the segmental box web/bottom slab interface, the Contractor shall install 3/8" 410 stainless steel Tapcon screws, or approved alternate, on a 12" grid pattern with a minimum of 2 rows anchoring a stainless steel reinforcing mesh having a 2" grid. The Tapcon screws shall be installed in accordance with the manufacturer's instructions. Install 410 stainless Tapcon screws around perimeter of access hatch as depicted on sheet 8010.

6. Prior to applying the epoxy bonding agent, the surface shall be lightly blasted to remove dust and foreign substances that will have a negative effect on the bond.

7. All labor, materials, and equipment, including Tapcon screws and stainless mesh, required to complete all epoxy mortar repairs, including repairs beneath the FRP wrap, shall be paid for under pay item 907-824-PP003: Bridge Repair, Epoxy Mortar Repair.

Epoxy Mortar Notes (Cont'd):

Materials:

1. Epoxy Resin: Resin shall meet the requirements of ASTM C881, Type 1, Grade 2, Class C and be on the MDOT approved materials list.

2. Silica Sand: Silica sand materials shall be bagged general purpose blast cleaning sand.

3. Epoxy Mortar Mix: Epoxy mortar mix shall consist of part liquid epoxy and part clean, dry sand mixed in the ratio recommended by the Manufacturer.

Application:

1. A representative of the epoxy manufacturer must be present for sufficient time to ensure the Contractor is properly educated in the use of the epoxy materials.

2. Prior to placement of the mortar mix, the prepared surface shall be primed with an approved epoxy binder designed to bond new concrete to old.

3. Follow the epoxy mortar manufacturers instruction for cleaning and lubricating trowels.

4. Place the epoxy mortar in accordance with the manufacturer's instructions.

5. Cure the epoxy mortar in accordance with the manufacturer's instructions.

FRP Wrap Notes:

1. FRP Wrap shall be one of the following products or an approved equal and shall be applied according to the manufacturer's recommendations:
    - a. "FRP Wrap" as manufactured by Fyfe Co. LLC, www.aegion.com/about/our-brands/fyfe
    - b. "FRP Wrap" as manufactured by BASF Building Systems LLC, www.master-builders-solutions.basf.us
    - c. "FRP Wrap" as manufactured by Sikawrap, www.usa.sika.com

2. All FRP composite systems shall be proprietary systems consisting of all associated fiber reinforcement and polymer adhesives/resins. FRP composites consisting of fiber reinforcement and polymers provided by more than one manufacturer are not allowed.

3. The Contractor shall design the FRP Wrap in accordance with ACI PRC-440.2-17 Guide for the design and Construction of Externally Bonded FRP Systems for Strengthening Concrete Structures.

4. The FRP composite system shall utilize carbon fiber reinforcement as the primary fiber material (primary structural component).

5. The fibrous reinforcement system shall be unidirectional having a minimum tensile force of 2.1 kips/in. in the direction of the fiber.

6. The orientation of the unidirectional reinforcement fiber shall be horizontal.

7. The FRP reinforcement sheet shall be continuous around the column with the splice located on the North Face.

8. The contractor shall furnish all submittals indicating the materials tools, equipment, transportation, necessary storage, labor, installation plan and supervision required for the application of the composite or polymer system to the Director of Structures, State Bridge Engineer prior to construction.

9. Products shall be stored according to the manufacturer's requirements and shall avoid contact with moisture, dust, and chemical exposure.

10. Prior to installation of FRP wraps, the Contractor shall repair concrete spall areas in accordance with concrete patching details and notes shown in these drawings.

11. A representative of the FRP wrap manufacturer must be present for sufficient time to assure that the Contractor is properly educated in the installation of FRP wrap.

12. Resins (including primers and fillers) shall be mixed according to the FRP system manufacturer's installation instructions. All resin components shall be at a proper temperature and mixed in the manufacturer's prescribed mix ratio until there is a uniform and complete mixing of components. Resin components are often contrasting colors, so full mixing is achieved when color streaks are eliminated. Resins should be mixed for the Manufacturer's prescribed mixing time and visually inspected for uniformity of color.

13. FRP wraps shall not be installed when the ambient temperature is below 40°F or above 100°F. In cold conditions, auxiliary heat may be applied to raise the ambient temperature to a suitable level. Clean heat sources shall be utilized for this purpose (e.g., electric or propane) that do not contaminate the substrate with carbonation.

14. FRP wraps shall not be installed when surface moisture is present on the substrate or when rainfall or condensation is anticipated in the work areas. If water leakage exists through cracks or concrete joints, water flow shall be stopped prior to FRP installation.

15. The FRP system shall be top coated with a coating approved by the FRP system supplier. The coating color shall be selected by the Project Engineer.

16. All labor, materials, and surface preparation associated with the installation of FRP wraps shall be included in pay item 907-824-PP003: Bridge repair, FRP Wrap, Unidirectional.

Pay Item	Description	Quantity	Unit
907-824-PP003	Bridge Repair, Epoxy Mortar Repair	1275	SF
907-824-PP003	Bridge Repair, FRP Wrap, Unidirectional	545.5	SF
907-824-PP004	Bridge Repair, Clean	01	LS
907-824-PP008	Bridge Repair, Epoxy Injection of Cracks	10	LF

Contractor Required Submittals:

1. Demolition and repair plan.

2. Maps of indentified damaged areas.

3. Crack Maps of identified cracks.

4. As-built plans.

Information Plans:

Additional as-built information plans are available at the Contractor's request & can be provided by Bridge Division.

JOSHUA LEE WILTSHIRE
27822
10-24-2023

MDOT
MISSISSIPPI DEPARTMENT OF TRANSPORTATION

DESIGNED BY: R. Robertson
DETAILED BY: B. Busby
CHECKED BY: J. Stauffer
DATE: 10/14/2023

FMS CON: 109516-301000
PROJECT NO.: NHPP-0110-01(035)
COUNTY: HARRISON

I-110 BRIDGE REPAIR
GENERAL NOTES

WK. NO.
1 0F 8

SHEET NO.
8003

PLAN SHEET
I-110 Bridge Repair.dgn
TIME
DATE