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IOWA DEPARTMENT OF TRANSPORTATION

To Office	District 5	Date	October 22, 2020
Attention	Mark Van Dyke, Assistant District Engineer	Ref No.	Des Moines County BRFN-034-9(235)--39-29
From	Joe Stanisz/WHKS		PIN 19-29-034-020 Design No. 0124
Bureau	Bridges and Structures		File No. 31969 FHWA No. 602880

Subject Final Concept for Bridge Rehabilitation of a 426'-5 x 54' Pretensioned Prestressed Concrete Beam Bridge.
Bridge Maintenance No. 2962.0O034

The bridge on Curran Street over US 34, 0.8 mi E of Jct. US 61, has been programmed for a repair to be let on 11/21/2023. The current cost estimate is $925,139 and includes inflation and 20% contingency. The programmed amount is $500,000.

A site took place on 7/30/2020 by Casey Faber and Lucas Fatka of WHKS. Others in attendance included Mark Van Dyke and Junior Jones of the District.

EXISTING CONDITIONS

The bridge was constructed in 1973 (Des. No. 669). The bridge is not on the National Highway System.

The deck is PC concrete and was overlaid in 1999 (Des. No. 198). There is some cracking in the top of the deck and patches at the south end. There is one leaching crack in the bottom of the deck between the east beams at the north abutment. The sidewalk overhang is severely deteriorated. There is a conduit in the sidewalk and a watermain is attached to the east overhang.

The retrofit rails are 34" high and were installed in 1999 (Des. No. 198). The left rail is an F-shape with height extension and handrail. The handrail on top of the separation is 3'-6 above the sidewalk. The exterior chain link fence is 6'-0 high. The right rail is a retrofit rail.

There is debris in the joints, and the north extrusion is corroded and leaking. There are cracks in the deck adjacent to extrusions. Some spalling exists at the south end of the deck.

Beam end deterioration was noted at the following locations; west two beams and second beam from the east at the north abutment and the east beam and the third and fourth beams from the west at the south line at the south pier.

There is spalling and exposed reinforcing on the north face of the west end and the bottom of the east end of pier 3. The west mask wall at the north abutment is cracked and leaching. Concrete slope protection on the south end is shifting down the slope with some panels buckling. There is an 8" gap at the face of the abutment that has been filled with grout.

An asbestos inspection was completed in 2019 and large quantities were identified in the following areas. Iowa OSHA requires material less than 1% to be handled as asbestos material.

- At the expansion joint material between the top of the abutments and pier caps and the diaphragms totaling 560 square feet containing less than 1% chrysotile asbestos.
- At the grayish-colored tar sealant on the joints of the concrete slope protection pads, appears to be the original application totaling 200 square feet containing 8% chrysotile asbestos.
- At the darker black-colored tar sealant on the joints of the concrete slope protection pads, appears to be a second application totaling 400 square feet containing 8% chrysotile asbestos.
- At the gray caulk under the metal base plates for the chain link fence posts along the walkway (46 bases) totaling 21 square feet containing less than 1% chrysotile asbestos.

The existing roadway in the vicinity of the bridge is 2-lane, 57-foot wide PCC pavement with HMA overlay. The roadway has 14.5-ft PCC shoulders with HMA overlay. The roadway is posted at 25 mph and has a 2018 ADT of 8,800 vehicles per day with 0% trucks.

The approaches are in poor condition.

There are no guardrails present. Concrete turndowns are at each corner.

RECOMMENDATIONS

It is recommended that the following repairs be made:

1. Replace west sidewalk overhang.
2. Remove and replace the existing chain link fence.
3. Perform concrete repairs along curbs. Clean and seal rails and curbs.
4. Remove and replace existing strip seal gland at north end.
5. Perform Class A repair adjacent to extrusions and at south end of deck adjacent to approach CF joint.
6. Repair deteriorated beam ends. Clean and seal other beam ends below joints.
7. Perform concrete repairs on substructure.
8. Clean and seal backwall, bridge seats, and pier caps below joints.
9. Replace paving notches.
10. Replace concrete slope protection at south berm with macadam slope protection.
11. Remove and replace 80 ft of the south approach pavement and sidewalk ramps at all four corners of sidewalk at the south ramp intersection.
12. Remove and replace 16.5’ of double reinforced north bridge approach and all four corners of sidewalk at the north ramp intersection.
13. Remove and replace all sidewalk adjacent to the approach replacement and bridge rails up to the abutment.

This project is not considered a Traffic Critical Project. Traffic control will involve temporary barrier rail and traffic signals in accordance with Standard Road Plan TC-217. Entrance and exit ramps at all four corners are in close proximity. Two ramps to US 34 will be closed during each stage. Traffic for the closed ramps will be detoured to adjacent interchanges to avoid using local streets.

The District should provide a site survey of the utilities and for ADA at the intersections.

Estimated cost of repairs is as follows:

BRIDGE ESTIMATE:

Item	Quantity	Unit	Rate	Amount
Concrete Repair	95	SF	$250	$23,750
Removals, as per plan	1	LS	$15,000	$15,000
Deck Repair, Class A	27.2	SY	$200	$5,440
Structural Concrete (Misc.)	70.1	CY	$2,500	$175,250
Reinforcing Steel, Epoxy Coated	14020	LB	$3	$42,060
Neoprene Gland Installation and Testing	56	LF	$80	$4,480
Paving Notch Replacement	126.6	LF	$265	$33,549
Repair Beam Ends	6	EA	$1,500	$9,000
Clean and Seal Beam Ends	44	EA	$550	$24,200
Macadam Slope Protection	412	SY	$63	$25,956
Vinyl Coated Chain Link Fence	445	LF	$100	$44,500
Mobilization	1	LS	10%	$40,319
	Base Cost:			$443,504
	Contingency:		20%	$88,701
	3 Years Inflation:		4.5%	$75,129
	BRIDGE TOTAL:			**$607,333**

ROADWAY ESTIMATE:

Item	Quantity	Unit	Rate	Amount
Bridge Approach, 12"	611.2	SY	$220	$134,464
Removal of Pavement	611.2	SY	$15	$9,168
Removal of Sidewalk	52	SY	$25	$1,300
Sidewalk, P.C. Concrete, 6 in.	52	SY	$108	$5,616
Detectable Warning	32	SF	$45	$1,440
Temporary Barrier Rails	1250	LF	$14	$17,500
Temporary Traffic Signals	2	EA	$3,700	$7,400
Temporary Crash Cushion	4	EA	$1,250	$5,000
Traffic Control	1	LS	$20,000	$20,000
Additional Roadway Items	1	LS	$10,000	$10,000
Mobilization	1	LS	10%	$20,189
	Base Cost:			$232,077
	Contingency:		20%	$46,415
	3 Years Inflation:		4.5%	$39,314
	ROADWAY TOTAL:			**$317,806**
	PROJECT TOTAL:			**$925,139**

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Appendix – Field Exam Photos

North abutment joint

Cracking along pier joint

Deterioration at south end of bridge

Leaching and spalling on west overhang

Deterioration of west overhang at pier 1

Deterioration of west overhang at pier 3

Spalled beam end at north abutment

North face of west end of pier 3

East side of pier 3 overhang

Northwest maskwall leaching

Gap at top of slope protection

Toe of south abutment concrete slope protection

North approach looking north

South approach looking east