

IOWA DEPARTMENT OF TRANSPORTATION

To Office District 5

Date June 28, 2022

Attention Steve McElmeel

Ref No. Davis County

From Sean Connor / Ron Meyer

BRFN-063-1(96)--39-26

PIN 20-26-063-020

Bureau Bridges and Structures

Design No. 125

File No. 32250

FHWA No. 22550

Subject Final Concept for Culvert Repair of Twin 10' x 12' x 95' RCB
Bridge Maintenance No. 2622.2S063

The RCB culvert on US 63 over North Chequest Creek has been programmed for Culvert Repair to be let on January 22, 2025. The current cost estimate is \$75,057 including inflation and a 20 percent contingency presuming a FY 2025 letting. The programmed amount is \$1,001,716. The culvert field exam on March 2, 2022 was attended by Steven McElmeel, Dewight Jones, and Jared Klein of District 5 and Sean Connor and Jacob Verry of HR Green.

The bridge location map and asset information can be viewed in SIIMS using the following link:

https://siims.iowadot.gov/InspectTech/bridgedetail.aspx?type=0&as_id=69049

EXISTING CONDITIONS

The culvert was constructed in 1963, design number 162. The culvert is on the NHS system.

The culvert barrel sections are generally in fair to good condition. The walls have vertical hairline cracking at approximately 8'-10' cts. Several of the cracks are leaching with rust stains and a few isolated spalls. Deterioration of top slab is isolated to construction joints and includes map cracking, leaching and staining. The center construction joint of both barrels has opened, forming a 3" gap at the base of the wall (tight at top). The steel brackets across the joint are in place. The north barrel, north wall is losing fill at this joint location causing a void to form which is approximately 3' deep, 4' tall and 4' wide.

The wingwalls are in fair condition. Large areas of delamination with map-cracking, leaching and staining are typical for each wing. Approximate areas of delaminated per wing are as follows: Northwest 50 sf, Northeast 8 sf, Southwest 100 sf, and Southeast 50 sf.

The waterway is in fair condition. The 3'-5' of sediment has built up in the south barrel, extending the entire length of the culvert. A tree is growing in the sediment above the west apron on the south side. The bank adjacent to the north wing on the east apron is sloughing. Ice was present at time of field exam, but inspection report notes minor scour at inlet end, 0.8' deep.

The posted speed limit is 55 mph and 2019 AADT is 6,500 with 9% trucks.

The approach roadway is a 2-lane section with 24' paved roadway and each shoulder has an effective width of 10'. Shoulders include 4' paved and 6' granular sections.

The Bridge Condition Report indicates the existing roadway is paved with PCC and overlaid with HMA. The overlay is in fair condition with minor cracking. No settlement of the pavement was observed. No guardrail present on this project. Foreslopes above the culvert are between 2.5:1 and 3:1.

RECOMMENDATIONS

It is recommended that the following repairs be made:

1. Use flowable mortar to fill void and gaps in center construction joint. (This will be performed by the District under contract work, and is not included in the Estimate.)
2. Perform concrete repairs on the wingwalls.
3. Clearing and grubbing to remove tree and other vegetation from aprons.
4. Remove sediment from the south culvert barrel and aprons.
5. Place revetment at aprons to stabilized banks and mitigate scour.

This project is not considered a Traffic Critical Project. Traffic control shall be in accordance with Standard Road Plans TC-1 (Work Not Affecting Traffic) and TC-202 (Work Within 15 ft of Traveled Way).

This project does not cross an Iowa DNR paddling route. No action required.

The District should provide a site survey of the utilities.

Estimated cost of repairs is as follows:

BRIDGE ESTIMATE:

Item	Quantity	Unit	Rate	Amount
Clearing and Grubbing	0.1	ACRE	\$10,000	\$1,000
Excavation, Class 10, Channel	200	CY	\$10	\$2,000
Concrete Repair	208	SF	\$200	\$41,600
Revetment, Class E	50	TON	\$50	\$2,500
Mobilization	1	LS	10%	\$4,710
			Base Cost:	\$51,810
			Contingency:	20% \$10,362
			3 Years Inflation:	4.5% \$8,777
			BRIDGE TOTAL:	\$70,949

ROADWAY ESTIMATE:

Item	Quantity	Unit	Rate	Amount
Traffic Control	1	LS	\$2,500	\$2,500
Additional Roadway Items	1	LS	10%	\$250
Mobilization	1	LS	10%	\$250
			Base Cost:	\$3,000
			Contingency:	20% \$600
			3 Years Inflation:	4.5% \$508

ROADWAY TOTAL: \$4,108

PROJECT TOTAL: \$75,057

SEC

Distributed to:

Bob Younie, District 5
Steve McElmeel, District 5
Bob Porter, District 5
Jim Webb, District 5
Dewight Jones, District 5
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Joe Stanisz , Bridges and Structures
Ronald Meyer, Bridges and Structures
Curtis Carter, Construction and Materials
Jesse Peterson, Construction and Materials
Dan Sprengeler, Traffic and Safety
Willy Sorenson, Traffic and Safety

Appendix



US 63 Facing North



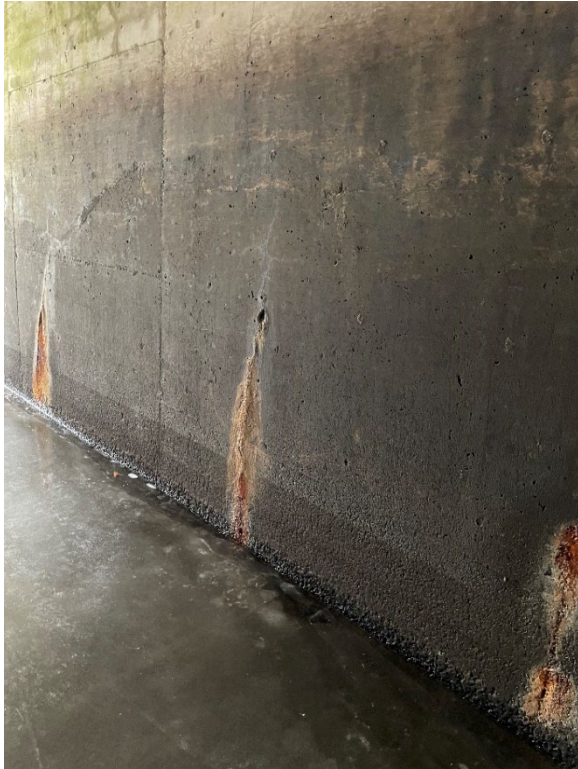
US 63 Facing South



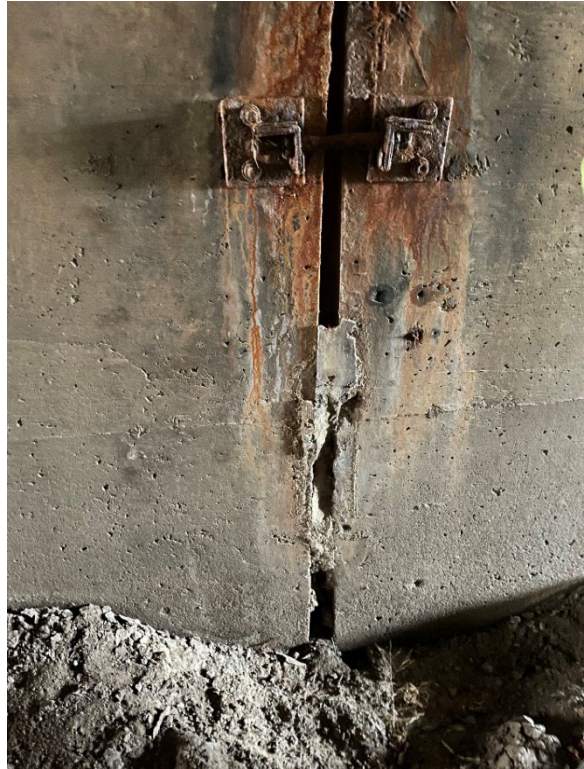
Downstream End Looking West



Upstream End Looking East



Typical Cracking in Wall



Bracket in Place in South Barrel



Void at Center Construction Joint of South Barrel



Typical Top Slab at Construction Joint



Deterioration at Southwest and Southeast Wings



West Upstream Channel



East Downstream Channel