

PHOTOS:



Holes in the floor of the box.



Crack across the entire floor near the downstream end. Water also running under the concrete floor.



Inlet end of the culvert



Crack across entire floor near outlet end

FEASIBLE OPTIONS:

The culvert should be replaced based upon the structural condition of the box, particularly the floor. This RCB was analyzed for slip lining and did not meet the criteria.

It is recommended that a single 88 inch x 54 inch low clearance RCP as the replacement for this culvert. The culvert can be replaced using the existing flow lines and adequate cover will be provided over the top of the pipe.

There are three options on how to accomplish this work for the replacement. One is to jack a new pipe next to the existing RCB a second is by detouring traffic and the third option is via stage construction. With the detour option the out-of-distance travel route is approximately 46 miles, this is primarily state roads and using some county roadways.

A 30' clear zone was used to compute total length of pipe needed using the existing flowline elevations. A partially grouted revetment splash basin is recommended at the outlet for erosion control due to high velocities.

Option 1: Pipe Jacking

Abandon-in-Place, Existing Culvert 5'x5' RCB	1250	CF	\$	24	\$30,000
Excavation, Class 10	350	CY	\$	25	\$8,750
Embankment In-Place	200	CY	\$	31	\$6,200
CULV, CONC PIPE, 2000D, TRENCHLESS, 72"	84	LF	\$	1,600	\$134,400
APRON, CONC, 72"	2	EA	\$	3,500	\$7,000
Class B Revetment	85	CY	\$	70	\$5,950
Class E Revetment	75	CY	\$	60	\$4,500
Grout for partially grouted revetment	6	CY	\$	250	\$1,500
					Contingency (10%)
					\$19,830
					Mobilization (20%)
					\$39,660
					Traffic Control (5%)
					\$9,915
					Total =
					\$267,705

Estimate: \$268,000

Option 2: Detour

Embankment-In-Place	178	CY	\$	25	\$4,450
Removal, Existing Culvert 5'x5' RCB	50	LF	\$	100	\$5,000
88 inch x 54 inch low clearance pipe, 97 LF	97	LF	\$	600	\$58,200
88 inch x 54 inch low clearance pipe aprons, 2 EA	2	EA	\$	3,500	\$7,000
Modified Subbase	534	CY	\$	68	\$36,312
Pavement	30	CY	\$	165	\$4,950
Class B Revetment	85	CY	\$	70	\$5,950
Class E Revetment	75	CY	\$	60	\$4,500
Grout for partially grouted revetment	6	CY	\$	250	\$1,500
Out of Distance Cost (10 WD) - 46 mi total; 34.4 mi on state & 11.6 mi on county	1	LS	\$	244,754	\$244,754
					Contingency (10%)
					\$36,817
					Mobilization (10%)
					\$36,817
					Traffic Control (10%)
					\$36,817
					Total =
					\$478,616

Estimate: \$235,000

Out of Distance travel cost: \$245,000

Total Cost: \$480,000

Option 3: Stage Construction

SPECIAL BACKFILL	CY	250	\$37.00	\$9,250.00
EMBANKMENT-IN-PLACE	CY	698	\$21.00	\$14,658.00
EXCAVATION, CL 13, WASTE	CY	625	\$20.00	\$12,500.00
SHLD CONSTRUCTION, EARTH	STA	11.2	\$480.00	\$5,376.00
DETOUR PAV'T	SY	1,125.00	\$76.00	\$85,500.00
RMVL OF EXIST STRUCT	LS	1	\$5,000.00	\$5,000.00
FLOODED BACKFILL	CY	322	\$49.00	\$15,778.00
EXCAVATION, CL 20, RDWY PIPE CULV	CY	165	\$21.00	\$3,465.00
APRON, LOW CLEARANCE CONC, EQUIV DIA 72"	EA	2	\$3,500.00	\$7,000.00
CULV,LOW CLEAR CONC RDWY PIPE,EQ DIA 72"	LF	98	\$600.00	\$58,800.00
CONC GROUT-REVTMENT+GABION	CY	6	\$250.00	\$1,500.00
REVTMENT, CL B	TON	85	\$70.00	\$5,950.00
REVTMENT, CLASS E	TON	75	\$60.00	\$4,500.00
TEMP BARRIER RAIL, CONC	LF	375	\$15.00	\$5,625.00
TEMP TRAFFIC SIGNAL	EA	2	\$11,000.00	\$22,000.00
PATCH, FULL-DEPTH FINISH, BY AREA	SY	66.7	\$176.00	\$11,739.20
PATCH, FULL-DEPTH FINISH, BY COUNT	EA	2	\$700.00	\$1,400.00
SUBBASE, (PATCH)	SY	66.7	\$22.00	\$1,467.40
TEMP CRASH CUSHION, SEVERE USE (SU)	EA	4	\$5,800.00	\$23,200.00
TRAFFIC CONTROL 5.00 %	LS	1	\$14,735.43	\$14,735.43
MOBILIZATION LS 5.00 %	LS	1	\$14,735.43	\$14,735.43
PCT-999 UNQUANTIFIED % of Project 30.00 %				\$97,253.84
			Total =	\$421,433.30

Estimate: \$220,000
 Staging Items: \$200,000
 Total Cost: \$420,000

RECOMMENDATIONS:

Option 1: Pipe Jacking is preferred based on costs and other factors with construction and detours. Tile exploration should be performed with this project to make sure there isn't any other tiles coming through this area that need to be addressed.

Estimate: \$268,000

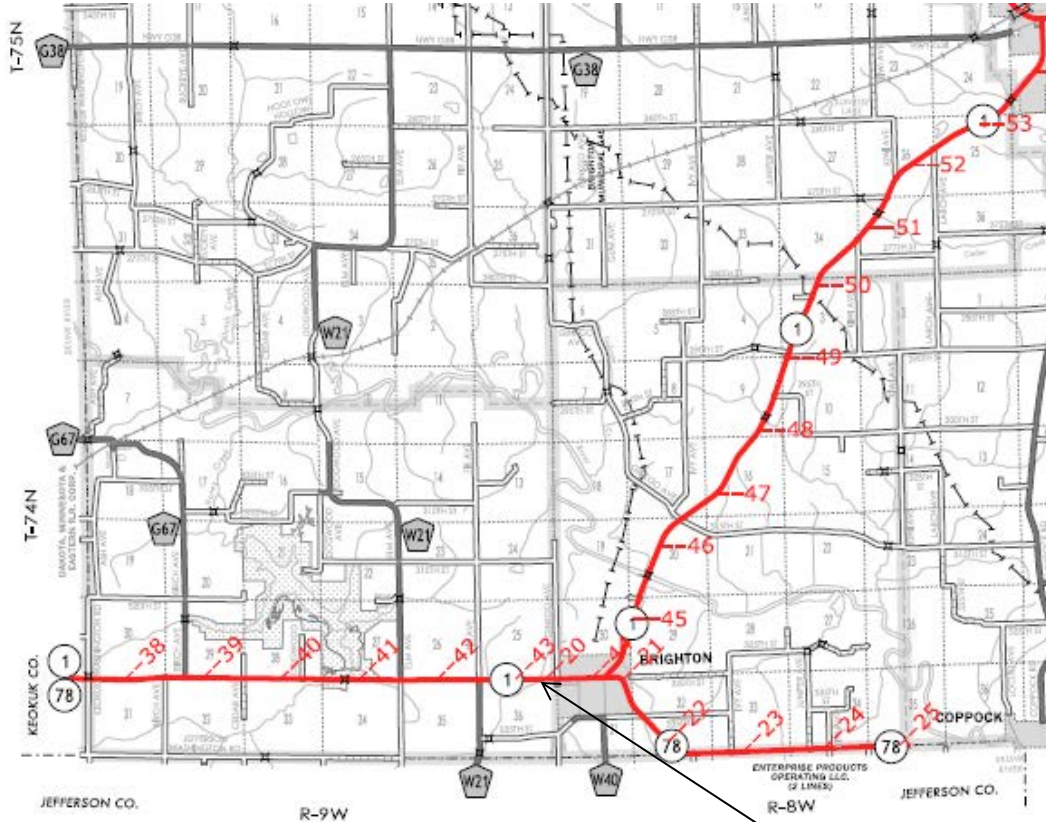
ROW will be needed for this project.

NOTE: Right of way and/or easement costs are not included in the above cost estimate.

FUNDS PROGRAMMED:

It has been identified by the District 5 office for construction in FY 2022. A schedule of events for plan development will be determined following approval of the Project Concept.

LOCATION MAP:



IA 1 - MM 43.31

cc:

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