IOWA DEPARTMENT OF TRANSPORTATION

TO OFFICE: District 5 **DATE:** October 2nd 2020

ATTENTION: James V. Armstrong **PROJECT:** Muscatine County

STPN-006-8(43)--2J-70

FROM: Anthony J. Klein PIN: 21-70-006-010

OFFICE: District 5 Design

SUBJECT: FY 2022 – Pipe Culverts/Revetment Project Concept

PROJECT LOCATION MAP: Page 4 or Click Here

BACKGROUND: Muscatine County, US 6 - MM 276.7 - 42" CMP & LETDOWN

The 42" CMP is within the DOT ROW located under Noble Avenue. This is a paved county road that accesses the Wendling Quarry and several residences along the Cedar River.

From the plans in the 1970's a 42" CMP & Letdown pipe, 188 ft in length was placed under Noble Ave. and entrance adjacent to US 6. The outlet is towards the Cedar River. This CMP is rusting out at the bottom of the pipe and starting to deform. There is an area adjacent to the entrance where a sinkhole has developed and indicates undermining of the pipe.

If nothing is done at this location more undermining can occur causing section loss under the sideroad and entrance and the pavement could collapse over and around the culvert. This sideroad serves a quarry and several residences.

The District worked with the property owner and the entrance has been relocated from US 6 to Noble Ave. therefore the culvert could be shortened to the portion just under the county sideroad which is estimated to be approximately 88 feet.

It was mentioned that there is a gas line and other utilities on the east side of Noble Ave. in the area of this project that design needs to be aware of.

PIN: 21-70-006-010

Page 2

PHOTOS:



Outlet of the 42" CMP



42" CMP - Looking East



Channelizer on the east side of the entrance denoting the sinkhole



42" CMP - Looking West

Muscatine County STPN-006-8(43)--2J-70 PIN: 21-70-006-010

Page 3

RECOMMENDATIONS:

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

It is recommended that a single 54 inch culvert as the replacement under the side road. This would be approximately 88 feet in length.

The intent would be to construct this project via stage construction. If needed, the quarry has a back entrance they can utilize therefore the suggestion is to replace this culvert by a cut and cover method and patch back the pavement.

The remainder of the culvert approximately 100 feet down towards the river will be removed and regraded via a rock flume with Class E revetment.

The county requested that the roadway patch be placed back as a concrete patch.

Estimate:

Class 10 Excav.	51.00	CY	\$	45.00	\$ 2,295.00
Clearing and Grubbing	0.25	ACRE	\$	10,000.00	\$ 2,500.00
Flooded backfill	32.00	CY	\$	77.00	\$ 2,464.00
flowable mortar	11.00	CY	\$	260.00	\$ 2,860.00
Embankment in Place	27.00	CY	\$	71.00	\$ 1,917.00
CULV, CONC RDWY PIPE, 54"	88.00	FT	\$	250.00	\$ 22,000.00
APRON, CONC, 54"	2.00	EA	\$	3,250.00	\$ 6,500.00
Class E Revetment	242.00	Ton	\$	50.00	\$ 12,100.00
Engineering Fabric	128.00	SY	\$	5.00	\$ 640.00
Gran Shld Type B	4.00	Ton	\$	40.00	\$ 160.00
Gran Surfacing	6.00	Ton	\$	65.00	\$ 390.00
PCC patch, by count	1.00	EA	\$	1,000.00	\$ 1,000.00
PCC patch, by area	134.00	SY	\$	150.00	\$ 20,100.00
Subbase patch	134.00	SY	\$	27.00	\$ 3,618.00
			TC 20%		\$ 15,708.80
			Cont	& Mob 25%	\$ 19,636.00
				Total =	\$ 113,888.80

ROW is not anticipated but should be verified with the design.

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.

Muscatine County STPN-006-8(43)--2J-70

PIN: 21-70-006-010

Page 4

LOCATION MAP:



cc:

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