## IOWA DEPARTMENT OF TRANSPORTATION

TO OFFICE: District 5
ATTENTION: James V. Armstrong
FROM: Anthony J. Klein
OFFICE: District 5 Design

DATE: $\quad$ February $19^{\text {th }}, 2019$
PROJECT: Lee County STPN-002-9(41)--2J-56
PIN: 19-56-002-020

## SUBJECT: FY 2022 - Slide Repair Project Concept

## PROJECT LOCATION MAP: Page 3 or Click Here

## IA 2, Left Foreslope (North Foreslope), near MP 241.6, approximate Station 91+50

Observations/Notes:
In 2013, foreslope instability was remediated within two separate areas by flattening to an approximate $3: 1$ slope and rebuilding the foreslope using cohesive embankment. Repair to the western site, which is the smaller of the two sites, began at about Station $91+40$ and extended to about Station $92+10$. Repair to the eastern site began at about Station $93+70$ and extended to about Station 95+50. Remediation of the eastern site also involved installing a new 24-inch diameter culvert outletting on the north side of IA 2 near the toe of the flattened foreslope and abandoning two other relatively shorter culverts which would have flanked the new culvert on both sides. Observations of foreslope instability were not noticed within the eastern site during our most recent site visit.
However, a portion of the flattened foreslope, about 25 to 30 feet in width, associated with the western site appeared to have sloughed downslope. The sloughing began about 10 feet away from the outside edge of shoulder. A relatively small hole, less than about 5 inches in diameter, was observed near the top of slope and is likely associated with the visible sloughing of the slope. The depth of the hole was not determined at the time of our field visit. A concentrated, constant flow of water was observed coming out of the foreslope near the toe of slope/bottom of the slough material. The source of the flow could not be determined at the time of our field visit. Side ditch erosion/degradation was also observed to be occurring to the west of the previous repair, beginning at about Station 91+00.
A third area of slope instability was observed located between the eastern and western sites, generally between Station $93+10$ and Station $93+25$. The scarp associated with this third area has a height of about 2 feet and is located about 6 feet from the outside edge of shoulder at its highest point on the foreslope. This third area is also located with the limits of a relatively minor drainage draw, has a maximum foreslope height of about 20 feet and an approximate 2:1 slope.

## Recommendations:

Bench and rebuild the foreslope within both the western and middle sites to the previously constructed slope using Erosion Stone underlain with Engineering Fabric. The repair to the western site shall start at Station $91+40$ and extend to Station $92+10$, and the repair to the middle site shall start at Station 93+00 and extend to Station 93+35. Investigate the flow of water occurring at the western site. Install a rock lined ditch on the north side of IA 2 using Class E Revetment underlain

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with Engineering Fabric from about Station $91+00$ to Station $91+40$. The repair for both locations shall start at the toe of the existing foreslopes and then extend up-slope to about 3 feet from the outside edge of shoulder. The Erosion Stone shall be capped with a 1-foot thick layer of Macadam Stone Base Material (Gradation No. 13, no choke stone course). A relatively small amount of Clearing and Grubbing will be necessary.

It appears that additional ROW will not be needed to complete the repair at the western site. However, additional ROW will likely be needed for the middle site.
Recommend obtaining field survey for the preparation of plans.
The following quantities and associated costs are estimated for the foreslope repair. Please note that this estimate does not include any costs associated with ROW.

Estimated Quantities and Costs:
IA 2 - MM 241.6

| Item | Quantities |  | Cost |  |
| :---: | :---: | :---: | :---: | :---: |
| Excavation, Class 10, Waste |  | 1,001 CY | \$ | 7,300.00 |
| Erosion Stone |  | 1,062 TONS | \$ | 28,818.00 |
| Macadam Stone Slope Protection (Gradation No. 13, no choke stone course) |  | 956 SY | \$ | 33,242.00 |
| Engineering Fabric |  | 1,286 SY | \$ | 3,300.00 |
| Class E Revetment |  | 72 TONS | \$ | 2,100.00 |
| Clearing \& Grubbing |  | 0.25 Acres | \$ | 1,000.00 |
| Contingency, Mobilization \& Traffic Control (35\%) |  |  | \$ | 26,516.00 |
|  | Total $=$ |  | \$ | 102,276.00 |
|  | Total Cost = |  | \$ | 103,000.00 |

## 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.

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## LOCATION MAP:



сс:
C. Purcell
D. L. Maifield
F. W. Todey
C. C. Poole
M. A. Swenson
M. J. Kennerly
K. D. Nicholson
D. R. Tebben
C. B. Brakke
S. J. Megivern
A. A. Welch
S. Anderson
M. J. Sankey
N. M. Miller
G. A. Novey
R. A. Younie
D. L. Newell
B. D. Hofer
B. E. Azeltine
T. D. Hanson
T. D. Crouch
D. E. Sprengeler
J. R. Webb
B. M. Clancy
S. J. Gent
J.W. Laaser-Webb
K. Brink
D.R. Claman
W.A. Sorenson
M. Van Dyke
E. C. Wright
H. Torres-Cacho
A.J. Klein
T. Quam
J. Selmer
J. Woodcock
J. R. Phillips
FHWA
P.C. Keen
B. Walls
J. Garton
B. Hucker
R. Porter

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