SLIDE REPAIR

ER-061-4(111)--28-70

LETTING DATE 08-18-2020

MUSCATINE Co.

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IOWA DOT

*Highway Division*

PLANS OF PROPOSED IMPROVEMENT ON THE

PRIMARY ROAD SYSTEM

# MUSCATINE COUNTY

## SLIDE REPAIR

**0.25 mi S of IA 22 (NB) and 0.75 mi N of IA 22 (SB)**

SCALES: As Noted

Refer to the Proposal Form for list of applicable specifications.

Value Engineering Saves. Refer to Article 1105.14 of the Specifications.

IOWA ONE CALL 1-800-292-8989 811 www.iowaonecall.com Know what's below. Call before you dig.

REVISIONS

| TOTAL 11 |
|---|
| PROJECT IDENTIFICATION NUMBER |
| 20-70-061-010 |
| PROJECT NUMBER |
| ER-061-4(111)--28-70 |
| R.O.W. PROJECT NUMBER |
| NHSN-061-4(112)--2R-70 |

For Project Location Map
Refer to Sheet No. A.2

| US 61 NB DESIGN DATA RURAL | | |
|---|---|---|
| 2017 AADT | 12,300 | V.P.D. |
| 20-- AADT | -- | V.P.D. |
| 20-- DHV | -- | V.P.H. |
| TRUCKS | 18.24 | % |
| Total Design ESALs | -- | |

| US 61 SB DESIGN DATA RURAL | | |
|---|---|---|
| 2017 AADT | 14,500 | V.P.D. |
| 20-- AADT | -- | V.P.D. |
| 20-- DHV | -- | V.P.H. |
| TRUCKS | 12.77 | % |
| Total Design ESALs | -- | |

| INDEX OF SEALS | | |
|---|---|---|
| SHEET NO. | NAME | TYPE |
| A.1 | Paul W. Flattery | Primary Signature Block |
| CD.1 | David R. Claman | Hydraulic Signature Block |
| CS.1 | Mark A. Dell | Geotechnical Design |
| | | |
| | | |
| | | |
| | | |

**ROADWAY DESIGN**

LICENSED PROFESSIONAL ENGINEER — Paul W. Flattery 15282 — IOWA

I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

Signature — 06-02-2020 Date

Paul W. Flattery
Printed or Typed Name

My license renewal date is December 31, 2021

Pages or sheets covered by this seal: A.1-A.2, C.1, J.1

| FILE NO. 31910 | ENGLISH | DESIGN TEAM Flattery \ Jack | MUSCATINE COUNTY | PROJECT NUMBER ER-061-4(111)--28-70 | SHEET NUMBER A.1 |
|---|---|---|---|---|---|

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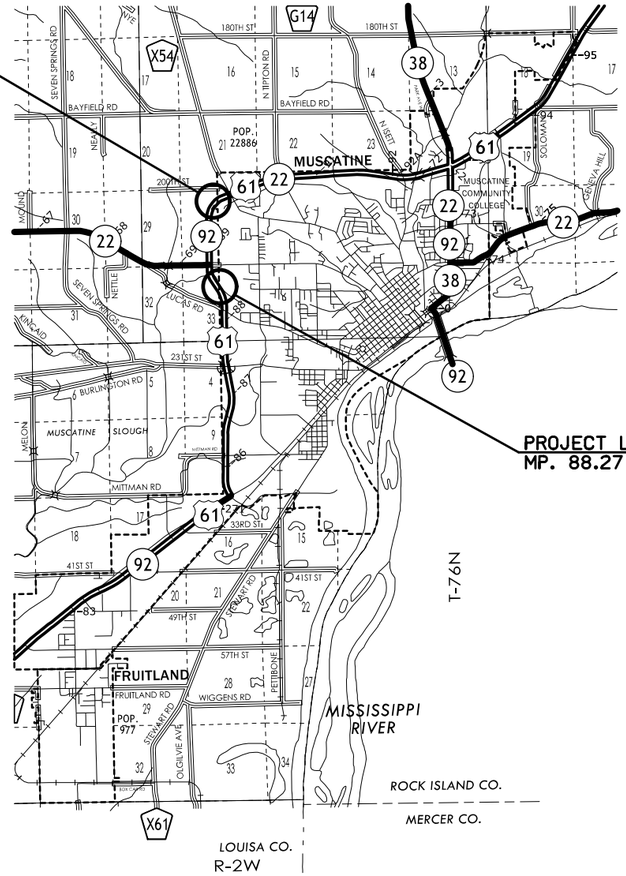
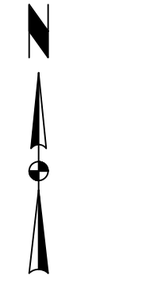
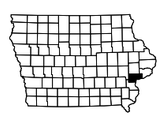
PROJECT LOCATION (SB)
MP. 89.52




PROJECT LOCATION (NB)
MP. 88.27





LOCATION MAP SCALE
0 1 2 3
Miles

| FILE NO. 31910 | ENGLISH | DESIGN TEAM Flattery \ Jack | MUSCATINE COUNTY | PROJECT NUMBER ER-061-4(111)--28-70 | SHEET NUMBER A.2 |
|---|---|---|---|---|---|

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100-1D
10-18-05

## PROJECT DESCRIPTION

This project invloves repairing letdown drainage structures that have resulted in foreslope slides at two locations on US 61.

100-1A
07-15-97

## ESTIMATED PROJECT QUANTITIES
## (1 DIVISION PROJECT)

| Item No. | Item Code | Item | Unit | Total | As Built Qty. |
|---|---|---|---|---|---|
| 1 | 2101-0850001 | CLEARING AND GRUBBING | ACRE | 0.3 | |
| 2 | 2102-2625001 | EMBANKMENT-IN-PLACE, CONTRACTOR FURNISHED | CY | 11,249.0 | |
| 3 | 2102-2710090 | EXCAVATION, CLASS 10, WASTE | CY | 674.0 | |
| 4 | 2105-8425015 | TOPSOIL, STRIP, SALVAGE AND SPREAD | CY | 554.0 | |
| 5 | 2107-3825025 | GRANULAR MATERIAL FOR BLANKET AND SUBDRAIN | CY | 104.0 | |
| 6 | 2422-0360036 | APRONS, UNCLASSIFIED, 36 IN. DIA. | EACH | 1 | |
| 7 | 2422-0360042 | APRONS, UNCLASSIFIED, 42 IN. DIA. | EACH | 1 | |
| 8 | 2422-1723036 | CULVERT, UNCLASSIFIED ROADWAY PIPE, 36 IN. DIA. | LF | 50 | |
| 9 | 2422-1723042 | CULVERT, UNCLASSIFIED ROADWAY PIPE, 42 IN. DIA. | LF | 68 | |
| 10 | 2502-8212024 | SUBDRAIN, LONGITUDINAL, (BACKSLOPE) 4 IN. DIA. | LF | 360.0 | |
| 11 | 2502-8221306 | SUBDRAIN OUTLET, DR-306 | EACH | 2 | |
| 12 | 2526-8285000 | CONSTRUCTION SURVEY | LS | 1.00 | |
| 13 | 2528-8445110 | TRAFFIC CONTROL | LS | 1.00 | |
| 14 | 2533-4980005 | MOBILIZATION | LS | 1.00 | |

105-4
10-18-11

## STANDARD ROAD PLANS

The following Standard Road Plans apply to construction work on this project.

| Number | Date | Title |
|---|---|---|
| DR-102 | 04-21-15 | Pipe Culvert (Cover and Camber) |
| DR-122 | 10-18-16 | Construction of Type "C" Concrete Adaptors for Pipe Culvert Connections |
| DR-141 | 04-18-17 | Pipe Bends and Half Pipe |
| DR-303 | 10-17-17 | Subdrains (Longitudinal) |
| DR-306 | 10-16-18 | Precast Concrete Headwall for Subdrain Outlets |
| DR-641 | 04-18-17 | Concrete/Corrugated Pipe Culvert Letdown Structure with Metal Apron |
| TC-1 | 10-15-19 | Work Not Affecting Traffic (Two-Lane or Multi-Lane) |

100-4A
10-29-02

## ESTIMATE REFERENCE INFORMATION

| Item No. | Item Code | Description |
|---|---|---|
| 0.3 | | |
| 1 | 2101-0850001 | **CLEARING AND GRUBBING** |
| | | Quantity includes all disturbed areas. |
| - | - | - |
| 2 | 2102-2625001 | **EMBANKMENT-IN-PLACE, CONTRACTOR FURNISHED** |
| | | See Tab. 103-12 in the CS Sheets for locations and details. |
| | | |
| - | - | - |
| 3 | 2102-2710090 | **EXCAVATION, CLASS 10, WASTE** |
| | | See Tab. 103-6 and Tab. 103-12 in the CS Sheets for locations and details. |
| - | - | - |
| 4 | 2105-8425015 | **TOPSOIL, STRIP, SALVAGE AND SPREAD** |
| | | See Tab. 103-7, Tab. 103-10, and Tab. 103-12 in the CS Sheets for locations and details. |
| - | - | - |
| 5 | 2107-3825025 | **GRANULAR MATERIAL FOR BLANKET AND SUBDRAIN** |
| | | See Tab. 103-12 in the CS Sheets for locations and details. |
| | | |
| - | - | - |
| 6 | 2422-0360036 | **APRONS, UNCLASSIFIED, 36 IN. DIA.** |
| 7 | 2422-0360042 | **APRONS, UNCLASSIFIED, 42 IN. DIA.** |
| 8 | 2422-1723036 | **CULVERT, UNCLASSIFIED ROADWAY PIPE, 36 IN. DIA.** |
| 9 | 2422-1723042 | **CULVERT, UNCLASSIFIED ROADWAY PIPE, 42 IN. DIA.** |
| | | See Tab. 104-3 in the CD Sheets for locations and details. |
| - | - | - |
| 10 | 2502-8212024 | **SUBDRAIN, LONGITUDINAL, (BACKSLOPE) 4 IN. DIA.** |
| 11 | 2502-8221306 | **SUBDRAIN OUTLET, DR-306** |
| | | See Tab. 104-9 in the CS Sheets for locations and details. |
| - | - | - |
| 12 | 2526-8285000 | **CONSTRUCTION SURVEY** |
| | | - - |
| - | - | - |
| 13 | 2528-8445110 | **TRAFFIC CONTROL** |
| | | - - |
| - | - | - |
| 14 | 2533-4980005 | **MOBILIZATION** |
| | | - - |
| - | - | - |

262-6
10-18-05

## UTILITIES
## (NOT A POINT 25 PROJECT)

This is NOT a POINT 25 project and is not subject to the provisions of IAC 761-115.25.

# DRAINAGE STRUCTURE BY ROAD CONTRACTOR

Length of unclassified pipe calculated is based on using Reinforced Concrete Pipe.
* Not a bid item
(1) Diameter or equivalent diameter
(2) UNCL = Unclassified Pipe CMP = Corrugated Metal Pipe RCP = Reinforced Concrete Pipe LCP = Arch or Elliptical Low Clearance Pipe SARC = Steel Arch Pipe
(3) Backfill according to DR-101

| Drainage Area | Location | Type | Size (1) | Kind Of Pipe (2) | Length New Const. | Bedding Class | Design Cover (H) | Camber* (DR-102) | Apron No. | | Apron Guard* (DR-213) | Elbow* (DR-141) | Diaphragm* (DR-501) | Tee Section* (DR-142) | "D" Section* (DR-141) | Reducer* | Type 'C' Connections* (DR-122) | | Connected Pipe Joint* (DR-121) | 4" Perforated Subdrain* | Flow Line Elevations | | | | Dimensions Lin. Ft. Total | | Dimensions Lin. Ft. Extensions | | Skew Ahead Degrees | | Dike Rt./Lt. | Dike Location Station | Dike Top Elevation | Dike Type | Class 20 | Flowable Mortar | Floodable* Backfill (A) | Porous* Backfill (B) | Flooded Backfill (3) (A+B) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ACRE | | | IN | | LF | | FT | FT | IN | OUT | No. | No. | No. | No. | No. | No. | Type | No. | Type | FT | Lt. | Rt. | Other | Other | Lt. | Rt. | Lt. | Rt. | Lt. | Rt. | Lt. | | | | CY | CY | CY | CY | CY | |
| 11.5 | 149+86.08 | DR-641 | 36 | EXST | 50 | | 2.0 | 0.08 | | 1 | | 2 | | | | | C-3 | 1 | | | | 634.94 | 643.95 | 635.87 | | | | 50.0 | | | | | | | | | | | | (1) |
| 25.0 | 204+61.62 | DR-641 | 42 | EXST | 68 | | 2.0 | 0.08 | | 1 | | 2 | | | | | C-3 | 1 | | | 672.66 | | 672.92 | 692.37 | | | 68.0 | | | | | | | | | | | | (2) |

Notes:
(1) Repair with 36" HDPE letdown B=21 C=2 E=27 L=5.25
(2) Repair with 42" HDPE letdown B=60 C=2 E=8 L=6.21

**BID ITEMS:**

| | | |
|---|---|---|
| **APRONS, UNCLASSIFIED, 36 IN. DIA.** | **EACH** | **1** |
| **APRONS, UNCLASSIFIED, 42 IN. DIA.** | **EACH** | **1** |
| **CULVERT, UNCLASSIFIED ROADWAY PIPE, 36 IN. DIA.** | **LF** | **50** |
| **CULVERT, UNCLASSIFIED ROADWAY PIPE, 42 IN. DIA.** | **LF** | **68** |

## HYDRAULIC DESIGN

LICENSED PROFESSIONAL ENGINEER
David R. Claman
11571
IOWA

I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

David R. Claman 5/27/2020
Signature Date

David R. Claman
Printed or Typed Name

My license renewal date is December 31, 20 20

Pages or sheets covered by this seal: CD.1, V.1, V.2

103-12
10-15-19

## SLIDE REPAIR

| Site No. | Location | | Side | Boulders Cl. 12 Exc. | Embankment-in-Place | Class 10 | | Class "E" Revetment | Engineering Fabric | Erosion Stone | Gra. Material Blankets & Subdrain | Macadam Stone Slope Protection | Top Soil | | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Begin Sta. | End Sta. | | | | Excavation | Waste | | | | | | Furnish & Spread | Strip, Salvage & Spread | |
| | | | | CY | CY | CY | CY | Tons | SY | Tons | CY | SY | CY | CY | |
| 1 | 143+75.00 | 145+25.00 | Rt. | | 11249 | | 674 | | | | 104 | | | 554 | |

103-6
10-17-17

## EMBANKMENT WITH MOISTURE CONTROL

Moisture Control is required for all Class 10 fill placed in all locations and depths. Stability berms placed outside the normal foreslope template and topsoil will not require Moisture Control.

103-7
08-01-08

## SHRINKAGE DATA

| Material | % | Remarks |
|---|---|---|
| Topsoil | 40% | |

103-10
04-18-17

## TOPSOIL STRIPPING AND PLACEMENT

| Location | | | | Topsoil Stripping Thickness | Topsoil Placement Thickness | Remarks |
|---|---|---|---|---|---|---|
| Road Identification | Dir. of Traffic | Begin Station | End Station | IN | IN | |
| US 61 | NBL | 143+75.00 | 145+25.00 | 12.0 | 8.0 | |

104-9
10-17-17

## LONGITUDINAL SUBDRAIN SHOULDER AND BACKSLOPE

Refer to Soils Sheets

* Not a bid item. Bridge berm quantities assume a trench depth of 24 inches.

| Line No. | Location | | | Side | Depth (D) | Longitudinal Subdrain (DR-303) | | | | | | | Subdrain Outlet | | Porous* Backfill | Class "A"* Crushed Stone | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Road or Lane Identification | Station to Station | | | | Shoulder | | Backslope | | Bridge Berm (EW-203 or EW-204) | | | DR-303, DR-305 or DR-306 | | | | |
| | | | | | | Size | Length | Size | Length | Standard Road Plan and Type | Size | Length | Station | Standard Road Plan and Type | | | |
| | | | | | IN | IN | FT | IN | FT | | IN | FT | | | CY | CY | |
| 1 | NBL | 143+75.00 | 145+25.00 | Rt | 66.0 | | | 4.0 | 180.0 | | | | 144+50.00 | DR-306 | 22.2 | | Place on foreslope bench at Elevation 655 |
| 2 | NBL | 143+75.00 | 145+25.00 | Rt | 66.0 | | | 4.0 | 180.0 | | | | 144+45.00 | DR-306 | 22.2 | | Place on foreslope bench at Elevation 665 |
| Total: | | | | | | | 0.0 | | 360.0 | | | | | DR-306 = 2 | 44.4 | | |

## GEOTECHNICAL DESIGN

LICENSED PROFESSIONAL ENGINEER
Mark A. Dell
21208
IOWA

I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

Mark A Dell 4/26/20
Signature Date

Mark A. Dell
Printed or Typed Name

My license renewal date is December 31, 2021

Pages or sheets covered by this seal: CS.1, Q.1-3

| FILE NO. | ENGLISH | DESIGN TEAM MEGIVER\DELL\MOYLE | MUSCATINE COUNTY | PROJECT NUMBER ER-61-4(111)--28-70 | SHEET NUMBER CS.1 |
|---|---|---|---|---|---|

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108-23A
08-01-08

## TRAFFIC CONTROL PLAN

Traffic on US 61 Shall be maintained at all times.

108-25
10-21-14

## 511 TRAVEL RESTRICTIONS

| Route | Direction | County | Location Description | Feature Crossed | Object Type | Maint. Bridge No., Structure ID, or FHWA No. | Type of Restriction | Existing Measurement | Construction Measurement | Construction Measurement as Signed | Projected As Built Measurement | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | None anticipated at this time. | | | | | | | | | |

111-01
04-17-12

## COORDINATED OPERATIONS

Other work in progress during the same period of time will include the construction of the projects listed. Coordinate operations with those of other contractors working within the same area.

| Project | Type of Work |
|---|---|
| None Provided. | |

Slide Repair - US 61

On the east (right) side of US 61 from approximate Station 143+75 to Station 145+25, bench and rebuild the foreslope to pre-existing conditions (approximately a 3.75:1 slope) using suitable Class 10 cohesive material.

The repair shall start with the bottom bench at about elevation 652.0 feet (near the limits of the existing tree line) and then extend up-slope to within about 4 feet of the outside edge of the existing concrete shoulder.

The Contractor shall exercise caution to avoid slope repair activities causing any instability of the existing concrete shoulder.

Benches shall extend a minimum of 6 feet into the undisturbed foreslope.

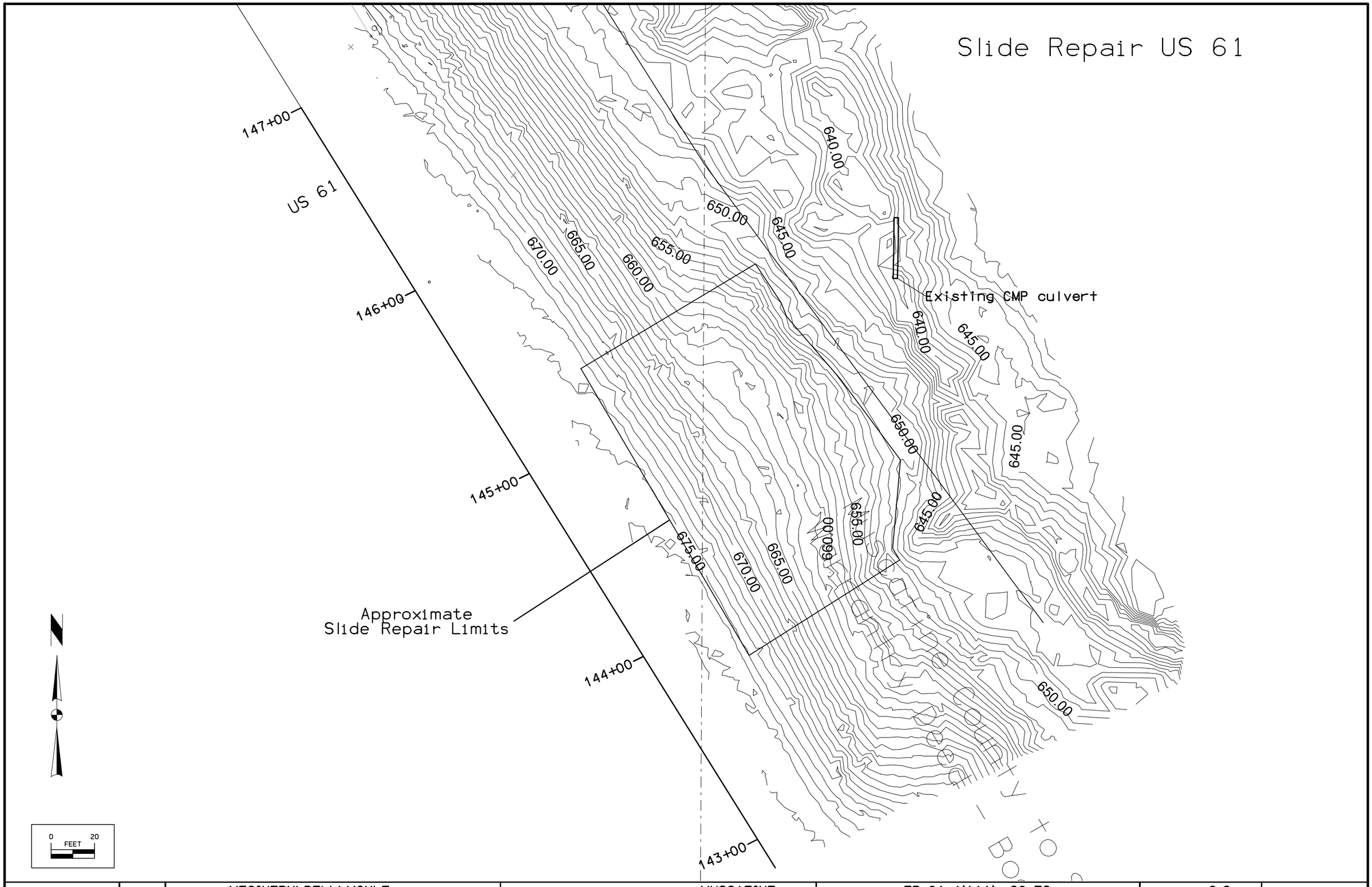
Install a foreslope bench drain on the benches as shown in the typical section on Sheet Q.3 and detailed in Tab 104-9 on sheet CS.1.

Strip 12 inches of surficial material to be considered topsoil and then spread 8 inches of this topsoil material after rebuilding the foreslope.

Slope repair activities shall not disturb any existing tree vegetation present between the toe of the existing foreslope and right of way (ROW) limits.

Actual limits of the repair will depend on conditions at the time of construction.

# Slide Repair US 61




| FILE NO. | ENGLISH | DESIGN TEAM MEGIVERN\DELL\MOYLE | MUSCATINE COUNTY | PROJECT NUMBER ER-61-4(111)--28-70 | SHEET NUMBER Q.2 |
|---|---|---|---|---|---|

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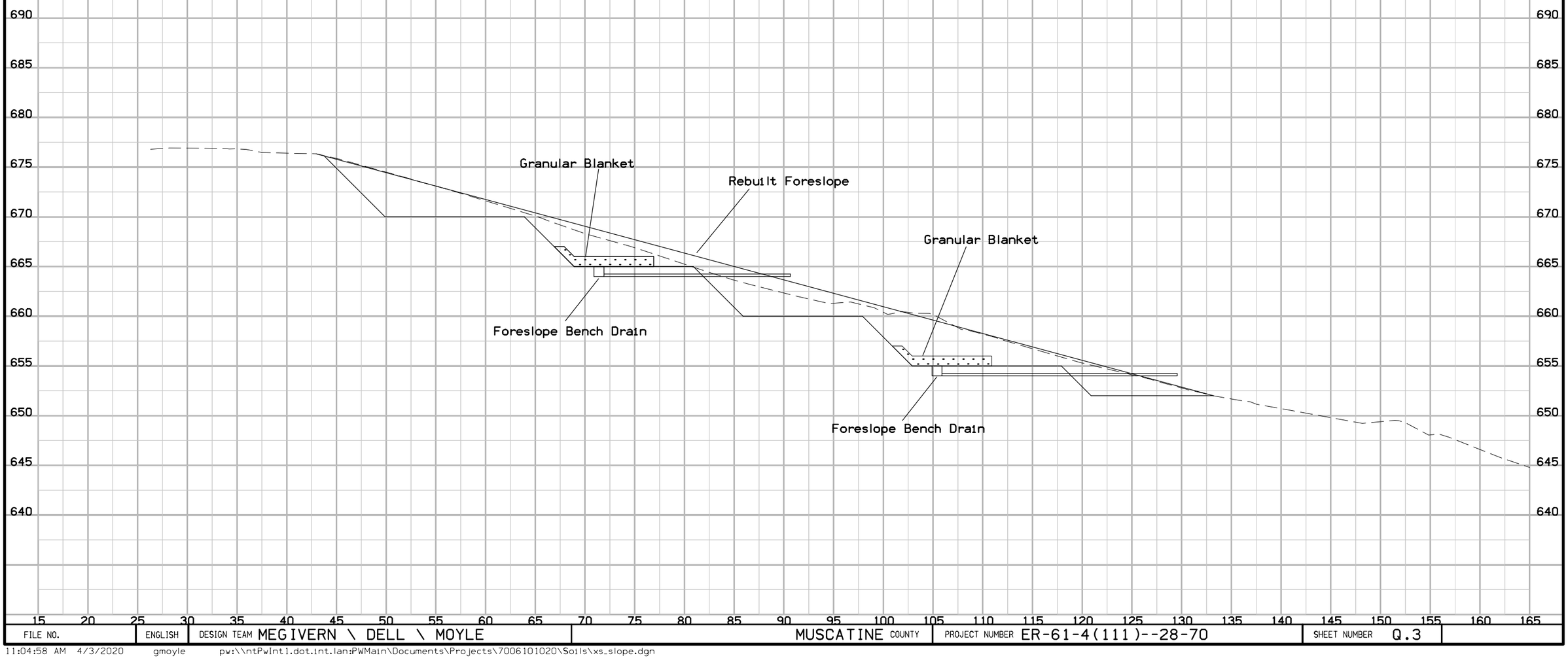
# US 61
# Slide Repair

## Typical Section




| FILE NO. | ENGLISH | DESIGN TEAM MEGIVERN \ DELL \ MOYLE | MUSCATINE COUNTY | PROJECT NUMBER ER-61-4(111)--28-70 | SHEET NUMBER Q.3 |
|---|---|---|---|---|---|

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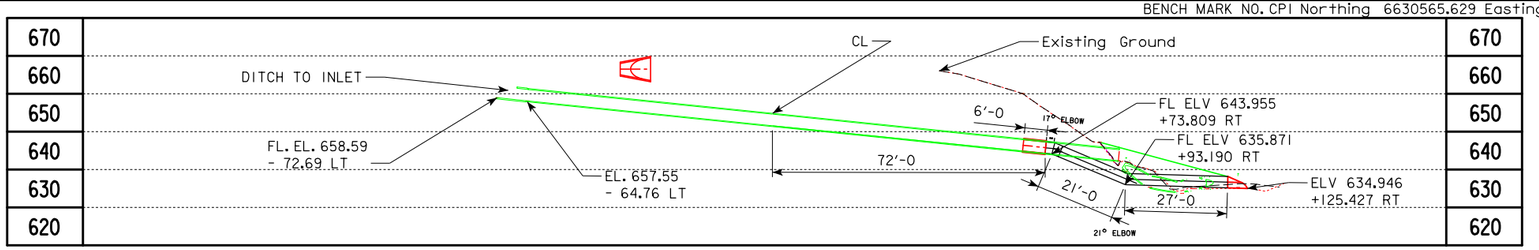
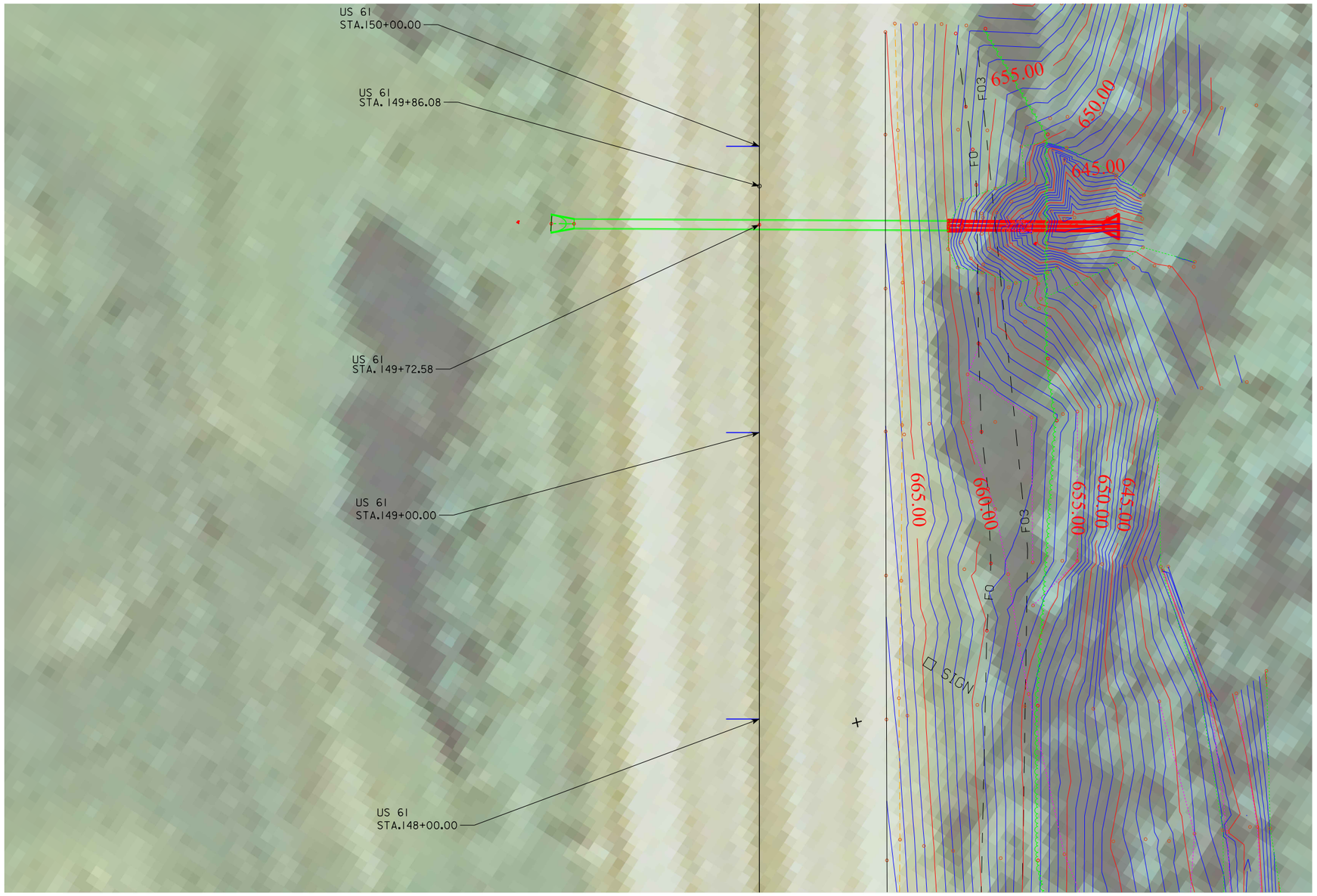
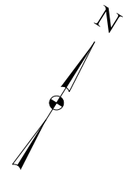
BENCH MARK NO. CP1 Northing 6630565.629 Easting 24543964.411 Elevation 669.009 Description Set $\frac{5}{8}$ Rebar




## LONGITUDINAL SECTION ALONG ℄ CULVERT




## SITUATION PLAN




0 ENGLISH 40
SCALE IN FEET

## HYDRAULIC DATA

DRAINAGE AREA = 11.5 ACRES H
$Q_{50}$ = 38 CFS

## UTILITIES LEGEND:

- FO — Centurylink - Quality D
- FO2 — Aureon - Quality D
- FO3 — Windstream - Quality D

## LOCATION

T-71N R-2W
SECTION 33
BLOOMINGTON TOWNSHIP
MUSCATINE COUNTY
LATITUDE 41.4322050°
LONGITUDE -091.0903542°

PRELIMINARY

# 36" REINFORCED CONCRETE PIPE CULVERT WITH 36" HDPE LETDOWN SITUATION PLAN

STATION 149+72.58

MUSCATINE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. ___ OF 1 FILE NO. 31910 DESIGN NO. 0

DESIGN TEAM | MUSCATINE COUNTY | PROJECT NUMBER ER-061-4(111)--28-70 | SHEET NUMBER V.1

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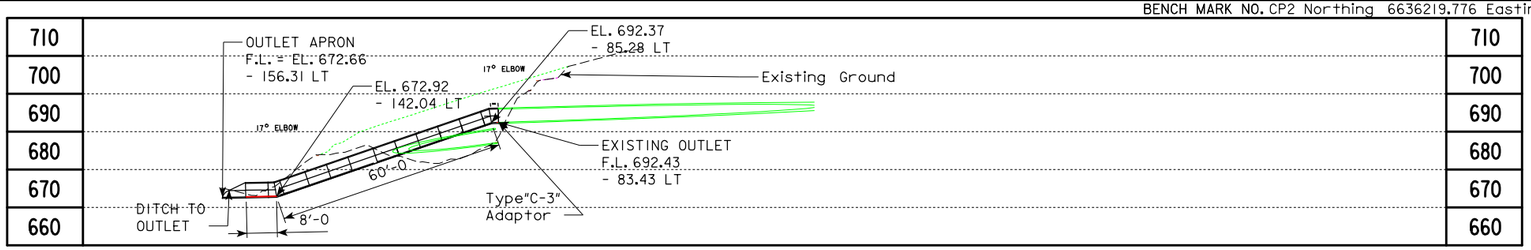
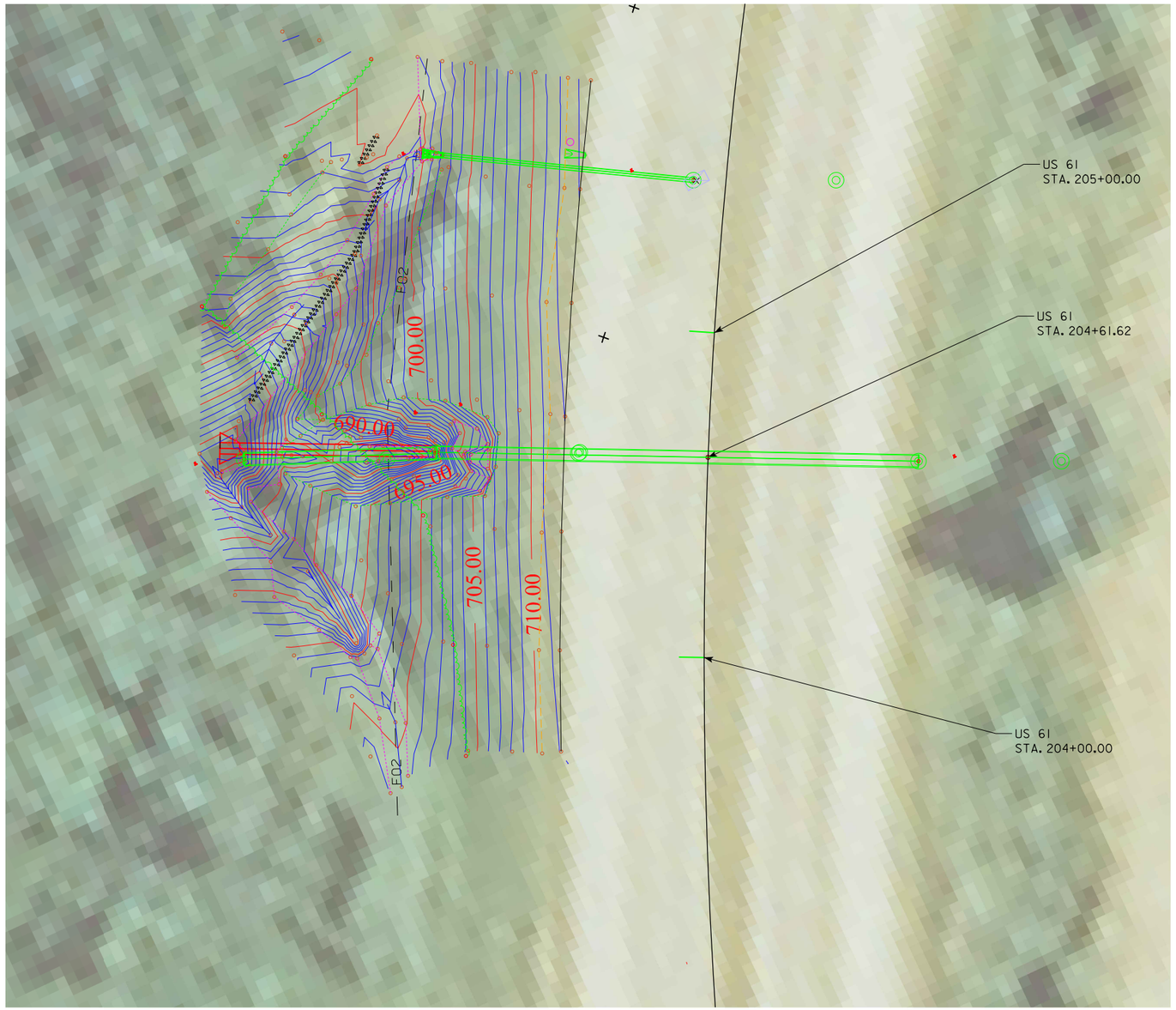
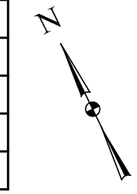
BENCH MARK NO. CP2 Northing 6636219.776 Easting 24543575.536 Elevation 712.392 Description Set 5/8 Rebar

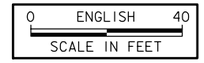



## LONGITUDINAL SECTION ALONG ℄ CULVERT




## SITUATION PLAN




## HYDRAULIC DATA

DRAINAGE AREA = 24 ACRES R
$Q_{50}$ = 50.0 CFS

## UTILITIES LEGEND:

- F0 — Centurylink - Quality D
- F02 — Aureon - Quality D
- F03 — Windstream - Quality D

## LOCATION

T-71N R-2W
SECTION 28
BLOOMINGTON TOWNSHIP
MUSCAATINE COUNTY
LATITUDE 41.4468134°
LONGITUDE -091.0909341°

PRELIMINARY

# 42" REINFORCED CONCRETE PIPE CULVERT WITH 42" HDPE LETDOWN SITUATION PLAN

STATION 204+61.62

## MUSCATINE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. ___ OF 1 FILE NO. 31910 DESIGN NO. 0

DESIGN TEAM | MUSCATINE COUNTY | PROJECT NUMBER ER-061-4(111)--28-70 | SHEET NUMBER V.2

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