



REVISIONS

TOTAL	..
PROJECT IDENTIFICATION NUMBER	20-23-136-070
PROJECT NUMBER	BRF-136-1(105)--38-23
R.O.W. PROJECT NUMBER	Hydraulic Design

No.	DESCRIPTION
<b>A Sheets</b>	<b>Title Sheets</b>
* A.1	Title Sheet
* A.2	Location Map Sheet
<b>B Sheets</b>	<b>Typical Cross Sections and Details</b>
B.1 - 2	Typical Cross Sections and Details
<b>D Sheets</b>	<b>Mainline Plan and Profile Sheets</b>
* D.1	Plan & Profile Legend & Symbol Information Sheet
* D.2	IA 136
<b>G Sheets</b>	<b>Survey Sheets</b>
G.1 - 3	Reference Ties and Bench Marks
<b>J Sheets</b>	<b>Traffic Control and Staging Sheets</b>
J.1	Traffic Control Plan
<b>V Sheets</b>	<b>Bridge and Culvert Situation Plans</b>
* V.1	Bridge and Culvert Situation Plans
<b>W Sheets</b>	<b>Mainline Cross Sections</b>
W.1	Cross Sections Legend & Symbol Information Sheet
W.2 - 5	Mainline Cross Sections
	* Color Plan Sheets

PLANS OF PROPOSED IMPROVEMENT ON THE  
**PRIMARY ROAD SYSTEM**  
**CLINTON COUNTY**  
Bridge Replacement  
Ditch 8,6 Mi N of US 61

SCALES: As Noted

Refer to the Proposal Form for list of applicable specifications.

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



DESIGN DATA RURAL		
2025	AADT	900 V.P.D.
2045	AADT	1100 V.P.D.
2025	DHV	110 V.P.H.
	TRUCKS	10 %
	Total Design ESALs	--

INDEX OF SEALS		
SHEET NO.	NAME	TYPE
A.1	Michael J. Janecek	Primary Signature Block
V.1	Phillip M. Harpole	Hydraulic Design

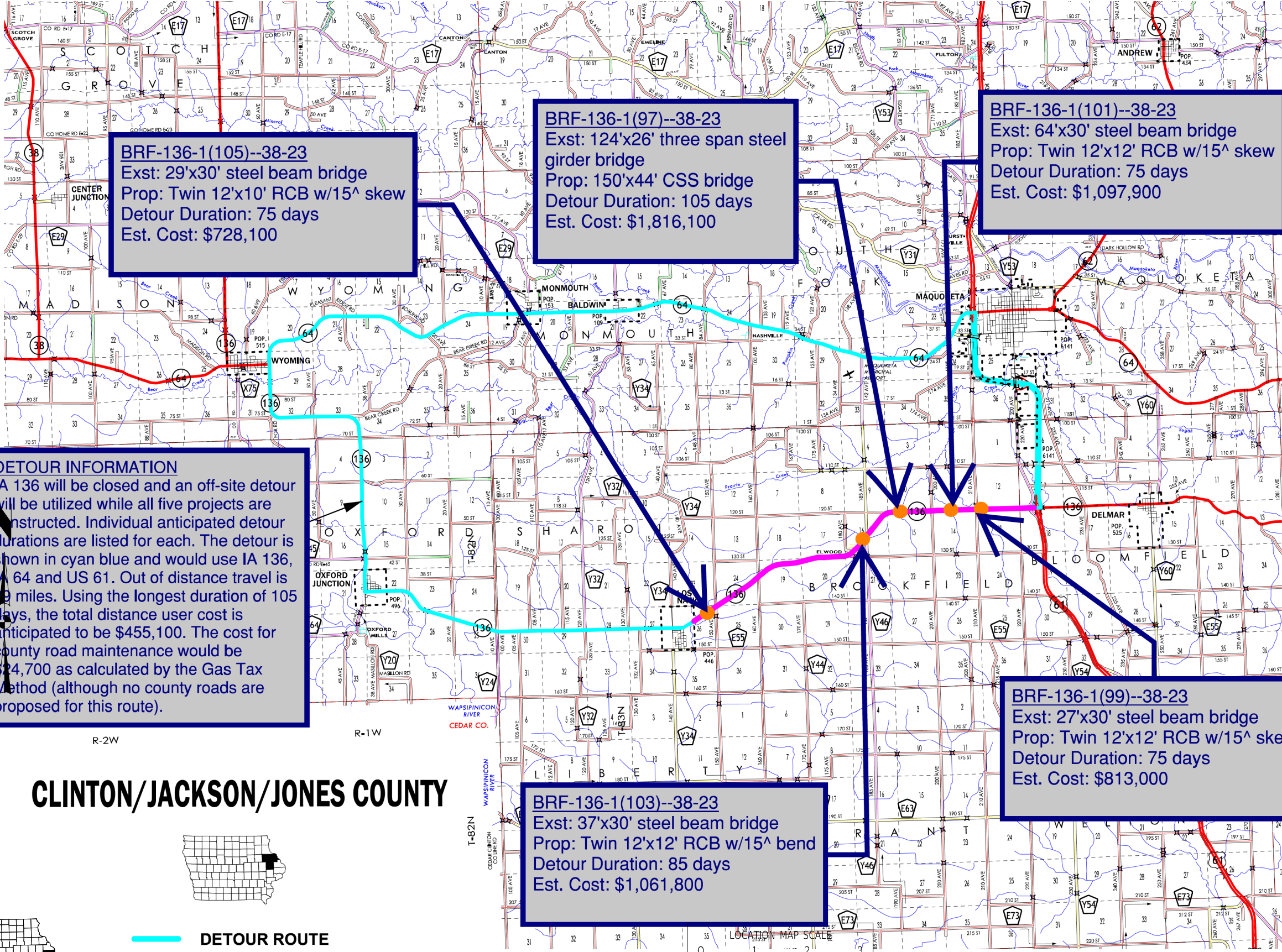
D4 PLAN – June 18, 2022  
D5 PLAN – Sept. 16, 2022

PRELIMINARY PLANS

Subject to change by final design.

D3 PLAN – May 20, 2022





**BRF-136-1(105)--38-23**  
 Exst: 29'x30' steel beam bridge  
 Prop: Twin 12'x10' RCB w/15^ skew  
 Detour Duration: 75 days  
 Est. Cost: \$728,100

**BRF-136-1(97)--38-23**  
 Exst: 124'x26' three span steel girder bridge  
 Prop: 150'x44' CSS bridge  
 Detour Duration: 105 days  
 Est. Cost: \$1,816,100

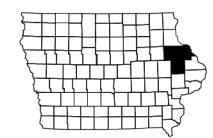
**BRF-136-1(101)--38-23**  
 Exst: 64'x30' steel beam bridge  
 Prop: Twin 12'x12' RCB w/15^ skew  
 Detour Duration: 75 days  
 Est. Cost: \$1,097,900

**DETOUR INFORMATION**  
 IA 136 will be closed and an off-site detour will be utilized while all five projects are constructed. Individual anticipated detour durations are listed for each. The detour is shown in cyan blue and would use IA 136, IA 64 and US 61. Out of distance travel is 29 miles. Using the longest duration of 105 days, the total distance user cost is anticipated to be \$455,100. The cost for county road maintenance would be \$24,700 as calculated by the Gas Tax Method (although no county roads are proposed for this route).

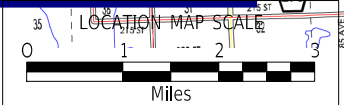
**BRF-136-1(99)--38-23**  
 Exst: 27'x30' steel beam bridge  
 Prop: Twin 12'x12' RCB w/15^ skew  
 Detour Duration: 75 days  
 Est. Cost: \$813,000

**BRF-136-1(103)--38-23**  
 Exst: 37'x30' steel beam bridge  
 Prop: Twin 12'x12' RCB w/15^ bend  
 Detour Duration: 85 days  
 Est. Cost: \$1,061,800

**CLINTON/JACKSON/JONES COUNTY**



**DETOUR ROUTE**

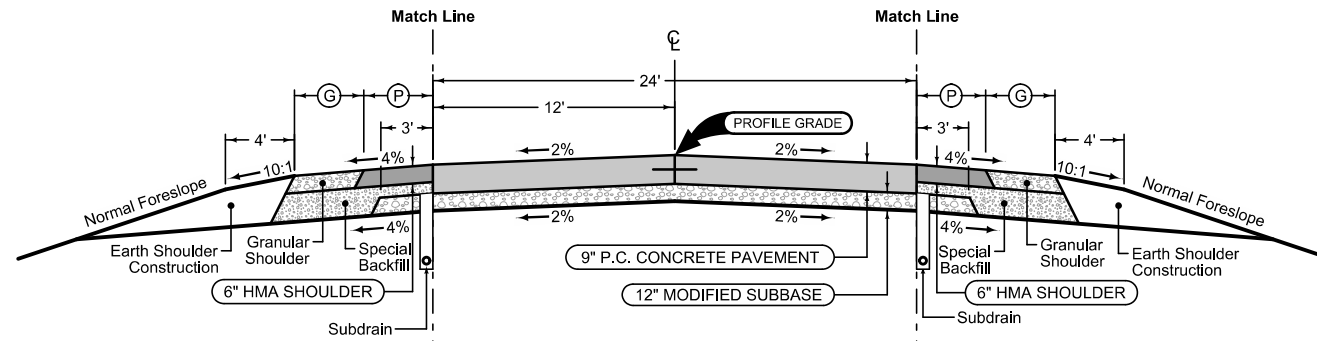




**Combination Shoulder**

Shoulder Jointing:  
Longitudinal joint: B

2_C_			
04-21-20			
STATION TO STATION	(P)	(G)	
	Feet	Feet	



Mainline Jointing:  
Transverse joints: CD at 17' spacing  
Longitudinal joint: L-2

2P_	
04-21-20	
STATION TO STATION	

**Combination Shoulder**

Shoulder Jointing:  
Longitudinal joint: B

2_C_			
04-21-20			
STATION TO STATION	(P)	(G)	
	Feet	Feet	

### SURVEY SYMBOLS

- Interstate Highway Symbol
- U.S. Highway Symbol
- Iowa Highway Symbol
- County Road Highway Symbol
- Evergreen Tree
- Deciduous Tree
- Fruit Tree
- Shrub (Bushes)
- Timber
- Hedge
- Stump
- Swamp
- Rock Outcrop
- Broken Concrete
- Revetment (Rip Rap)
- Cemetery
- Grave
- Cave
- Sink Hole
- Board Fence
- Chain Link or Security Fence
- Wire Fence
- Terrace
- Earth Dam or Dike (Existing)
- Tile Outlet
- Edge of Water
- Existing Drainage
- Right of Way Rail or Lot Corner
- Concrete Monument
- Well
- Windmill
- Beehive Intake
- Existing Intake
- Existing Utility Access (Manhole)
- Fire Hydrant
- Water Hydrant (Rural)
- Septic Tank
- Cistern
- L.P. Gas Tank (No Footing)
- Underground Storage Tank
- Latrine
- Satellite TV Dish
- Water Hook Up
- Radio Tower
- Tower Anchor
- Guardrail (Beam or Cable)
- Guard Post (one or two)
- Guard Post (over two)
- Filler Pipe
- Gas Valve
- Water Valve
- Speed Limit Sign
- Mile Marker Post
- Sign
- Traffic Signal Control Box
- Rail Road Signal Control Box
- Telephone Switch Box
- Electric Box

### UTILITY LEGEND

### PLAN VIEW COLOR LEGEND OF PLAN AND PROFILE SHEETS

LINEWORK		Design Color No.	
Green	(2)		Existing Topographic Features and Labels
Blue	(1)		Proposed Alignment, Stationing, Tic Marks, and Alignment Annotation
Magenta	(5)		Existing Utilities
SHADING		Design Color No.	
Lavender	(9)		Temporary Pavement Shading
Yellow	(4)		Proposed Pavement Shading
Orange	(6)		Proposed Granular Shading
Orange	(70)		Proposed Shoulder Granular Shading
Yellow	(68)		Proposed Shoulder Paved Full Depth Shading
Yellow	(70)		Proposed Shoulder Paved Partial Depth Shading
Gray, Dark	(112)		Proposed Grade and Pave Shading "In conjunction with a paving project"
Brown, Light	(236)		Grading Shading
Orange, Light	(134)		Proposed Granular Entrance Shading
Yellow	(220)		Proposed Paved Entrance Shading
Tan	(8)		Proposed Sidewalk Shading
Blue, Light	(230)		Proposed Sidewalk Landing Shading
Pink	(11)		Proposed Sidewalk Ramp Shading
Green, Light	(225)		Existing Pavement Shading
Red	(3)		Proposed Structure Shading

### PROFILE VIEW COLOR LEGEND OF PLAN AND PROFILE SHEETS

LINEWORK		Design Color No.	
Green	(2)		Existing Ground Line Profile
Blue	(1)		Proposed Profile and Annotation
Magenta	(5)		Existing Utilities
Blue, Light	(230)		Proposed Ditch Grades, Left
Black	(0)		Proposed Ditch Grades, Median
Rust	(14)		Proposed Ditch Grades, Right

- Reference Point
- Station
- Survey Line
- Section Corner
- Ground Line Intercept
- Saw Cut
- Guardrail
- Trench Drain
- HighTension Cable Guardrail
- Sheet Pile
- Pavement Removal
- Clearing & Grubbing Area

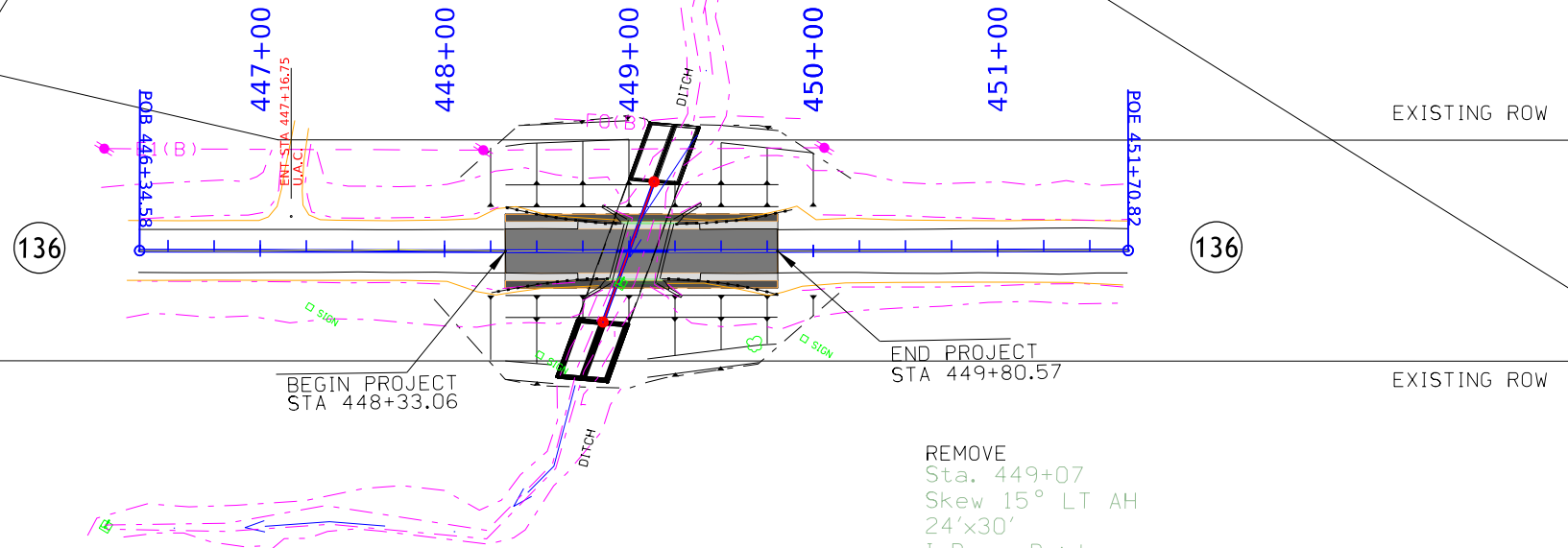
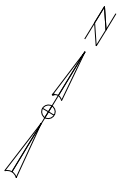
- #### RIGHT-OF-WAY LEGEND
- Proposed Right-of-Way
  - Existing Right of Way
  - Existing and Proposed Right-of-Way
  - Easement and Existing Right-of-Way
  - Easement (Temporary)
  - Easement
  - Access Control
  - Property Line

## PLAN AND PROFILE LEGEND AND SYMBOL INFORMATION SHEET

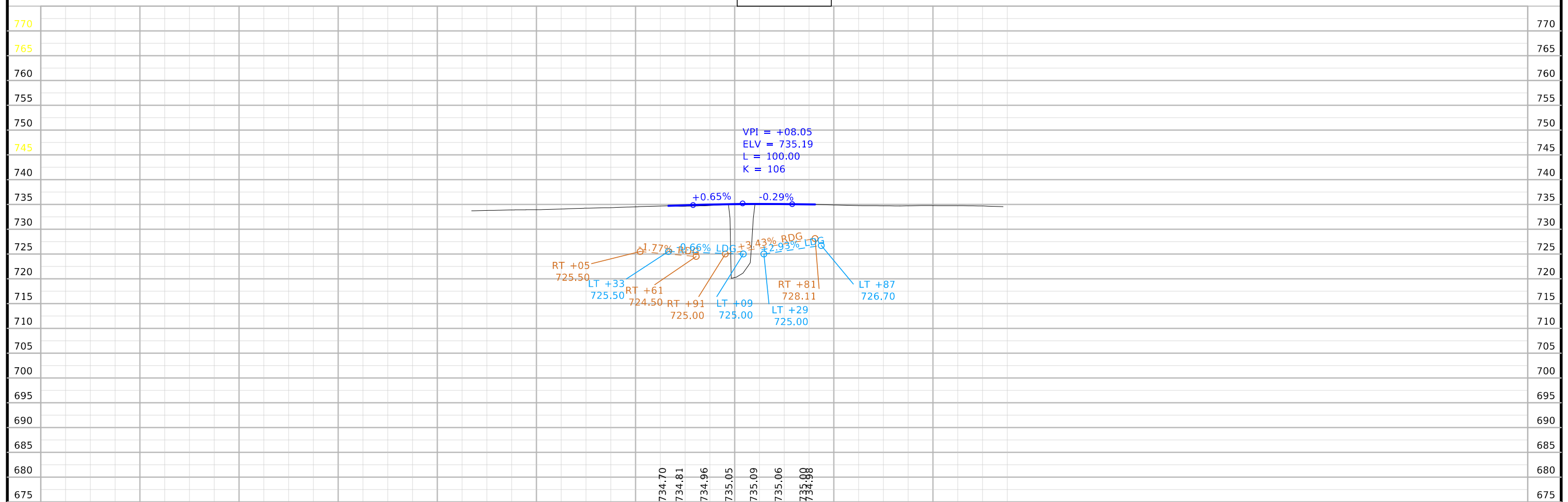
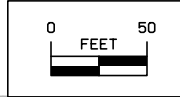
(COVERS SHEET SERIES D, E, F, & K)



Sharon TWP.  
T-83N R-1E  
SEC. 26



REMOVE  
Sta. 449+07  
Skew 15° LT AH  
24'x30'  
I Beam Bridge  
D.A.=1360 AC-H  
BUILD  
TWIN 12'x10' RCB



## Survey Information

Clinton County  
BRF-136-1(105)-38-23  
State Highway 136 over Ditch  
PIN 20-23-136-070  
Sap-766.6

### Party Personnel

Murray Berting – Survey Party Chief  
Gavin Gear – Assistant Survey Party Chief

### Date(s) of Survey

Begin Date 08/23/2021  
End Date 10/22/2021

### General Information

Measurement units for this survey are US survey feet. This survey is for proposed Bridge reconstruction and reconstruction of State Highway 136 over a ditch; 8.6 miles North of US Highway 61. Project datum and control information is provided by Shive-Hattery Inc. This project is a Preliminary DTM Field Survey. This survey request was for the Bridge over ditch, State Highway 136 Corridor and ditch area.

### Vertical Control

IARTN  
Vertical datum for this survey is NAVD88 (Computed using Geoid12B). Additional benchmarks were placed throughout the project using a Total Station setup relative to Point 1 and Point 2. Vertical control was verified between control points with check shots by Total Station through multiple setup from various occupation points with a vertical error of less than 0.05 feet.

This survey found (2) local control benchmark monuments (benchmark 'cut X' on bridge abutments in the NW and SE corner bridge). No vertical information was available at the time field work was completed.

### Horizontal Control

#### **(Project Coordinates from Redundant IARTN Observations)**

The project coordinate system is modified Iowa Regional Coordinate System Zone 11 (U.S. Survey Feet This survey control is relative to the IARTN reference stations. IARTN Reference Station coordinates are relative to the National Reference Station

observations with appropriate occupation times. Additional control points were placed throughout the project using a Total Station setup relative to Point 1 and Point 2.

### Utility Information

Sub-Surface Utility Mapping Quality Level is in accordance with C/ASCE 38-02 *Standard Guidelines for the Collection and Depiction of Existing Subsurface Utility Data.*

### Remark abbreviations

QLA – Quality Level A Highest guideline quality level  
QLD – Quality Level D Lowest guideline quality level

**A One-call utility locate request (Ticket# 552104698) was made August 02, 2021. The following Companies were listed:**

<u>Company (Quality)</u>	<u>Symbol</u>	<u>Remark</u>
Alliant Energy (ASE)	PPA	Power Poles South of IA 136; Clear
Lost Nation-Elwood Telephone (LN1)	FOC	Clear

Following are the list of contacts made in the order they were received:

( ASE ) ALLIANT ENERGY

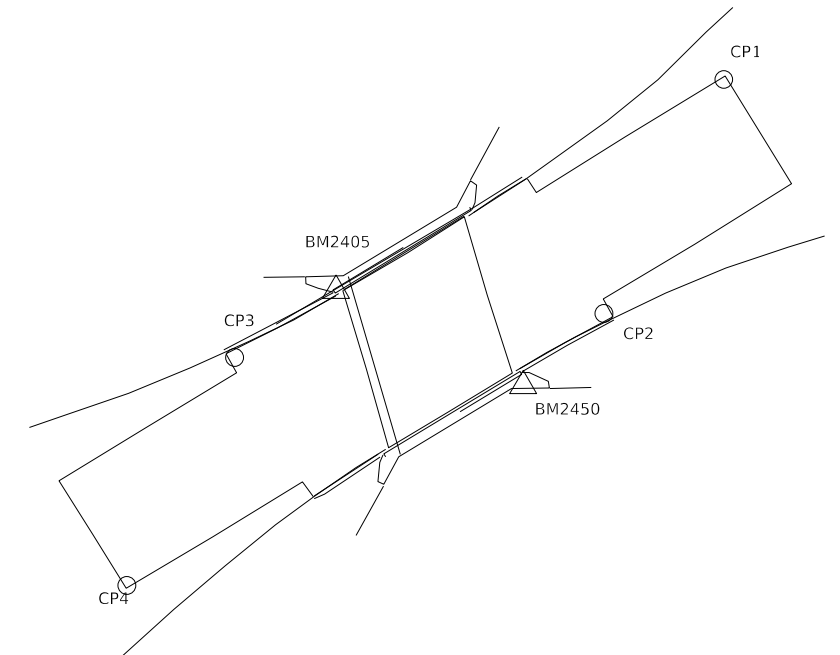
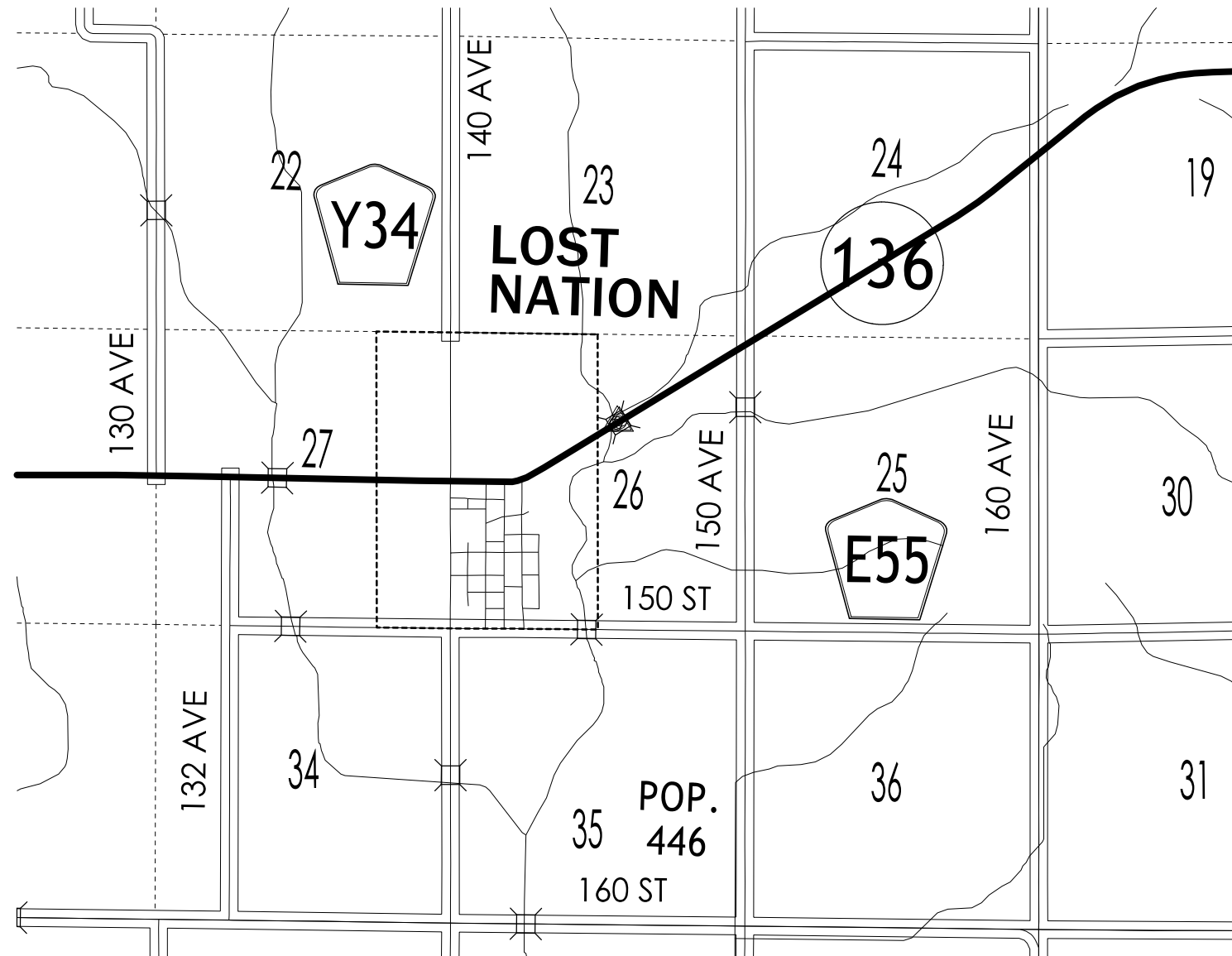
Contact Name : Alliant Energy Field Engineer Contact Phone: 8002554268 Contact Email: [locate\\_IPL@alliantenergy.com](mailto:locate_IPL@alliantenergy.com)

( LN1 ) LOST NATION-ELWOOD TELEPHONE

Contact Name : Jody Holtz  
Contact Phone: 5636782470  
Contact Email: [jody@lencomm.com](mailto:jody@lencomm.com)

### CONTROL POINT VICINITY MAP

This map is a guide to the vicinity of the primary project control points  
 Primary control is for use with RTK base stations and for RTN validation.  
 Future surveys will use primary project control to establish temporary control as needed for construction or other surveying applications.



HORIZ. DATUM: NAD83(2011) EPOCH 2010.00

VERT. DATUM: NAVD88

Ia. Regional Coordinate System Zone XX

Coordinate listing from next sheet will be used with IaRTN for monument recovery. No other reference ties are given.



HORIZONTAL AND VERTICAL PROJECT CONTROL COORDINATE LISTING

HORIZ. DATUM: NAD83(2011) EPOCH 2010.00

VERT. DATUM: NAVD88

1a. Regional Coordinate System Zone XX  
Project Control Marks are Bench Marks

<b>POINT NAME</b>	<b>Y</b>	<b>X</b>	<b>Z</b>	<b>FEATURE DEFINITION - DESCRIPTION</b>
1	8227046.921	21424953.810	734.710	CP1 CX (CUT 'X' IN PAVEMENT)
2	8227002.597	21424931.090	734.801	CP2 CX (CUT 'X' IN PAVEMENT)
3	8226994.262	21424861.170	734.701	CP3 CX (CUT 'X' IN PAVEMENT)
4	8226951.093	21424840.740	734.591	CP4 CX (CUT 'X' IN PAVEMENT)
2405	8227006.954	21424880.360	737.064	BM CX
2450	8226988.874	21424915.820	735.486	BM CX

**NOTE:**

The first two digits in the control point name refer to the county number.  
The next 3 digits refer to the highway number.  
The next 3 digits refer to the highway milepost.  
The last digit refers to the distance from the referenced milepost to the nearest tenth of a mile.

**108-26A**  
08-01-08

### STAGING NOTES

Stage 1:  
With IA 136 traffic using detour, remove and replace bridge over the stream with a culvert.

Stage 2:  
Reopen IA 136 to normal traffic pattern.

**108-23A**  
08-01-08

### TRAFFIC CONTROL PLAN

1) While bridge and approaches are being removed and replaced with RCB culvert, IA 136 traffic shall be maintained via an off-site detour. Detours are furnished, maintained and removed by the Contractor. Refer to TC-252 for road closure and advanced signage details.

2) Contractor will furnish, install, maintain, and remove detour signs. All existing signs that conflict with detour shall be covered. These functions shall be included in the Traffic Control Bid Item.

**108-25**  
10-21-14

### 511 TRAVEL RESTRICTIONS

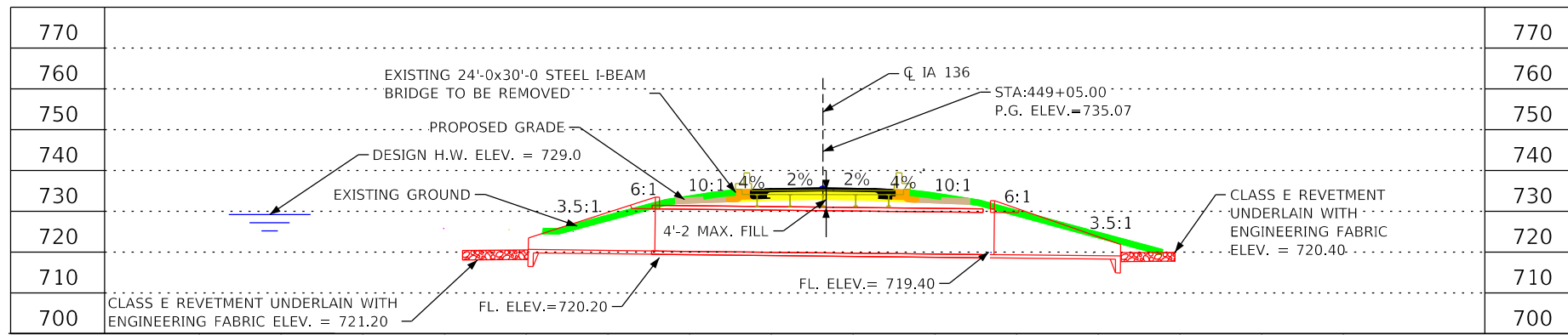
Route	Direction	County	Location Description	Feature Crossed	Object Type	Maint. Bridge No., Structure ID, or FHWA No.	Type of Restriction	Existing Measurement	Construction Measurement	Construction Measurement as Signed	Projected As Built Measurement	Remarks
			No Travel Restrictions Expected									

**111-01**  
04-17-12

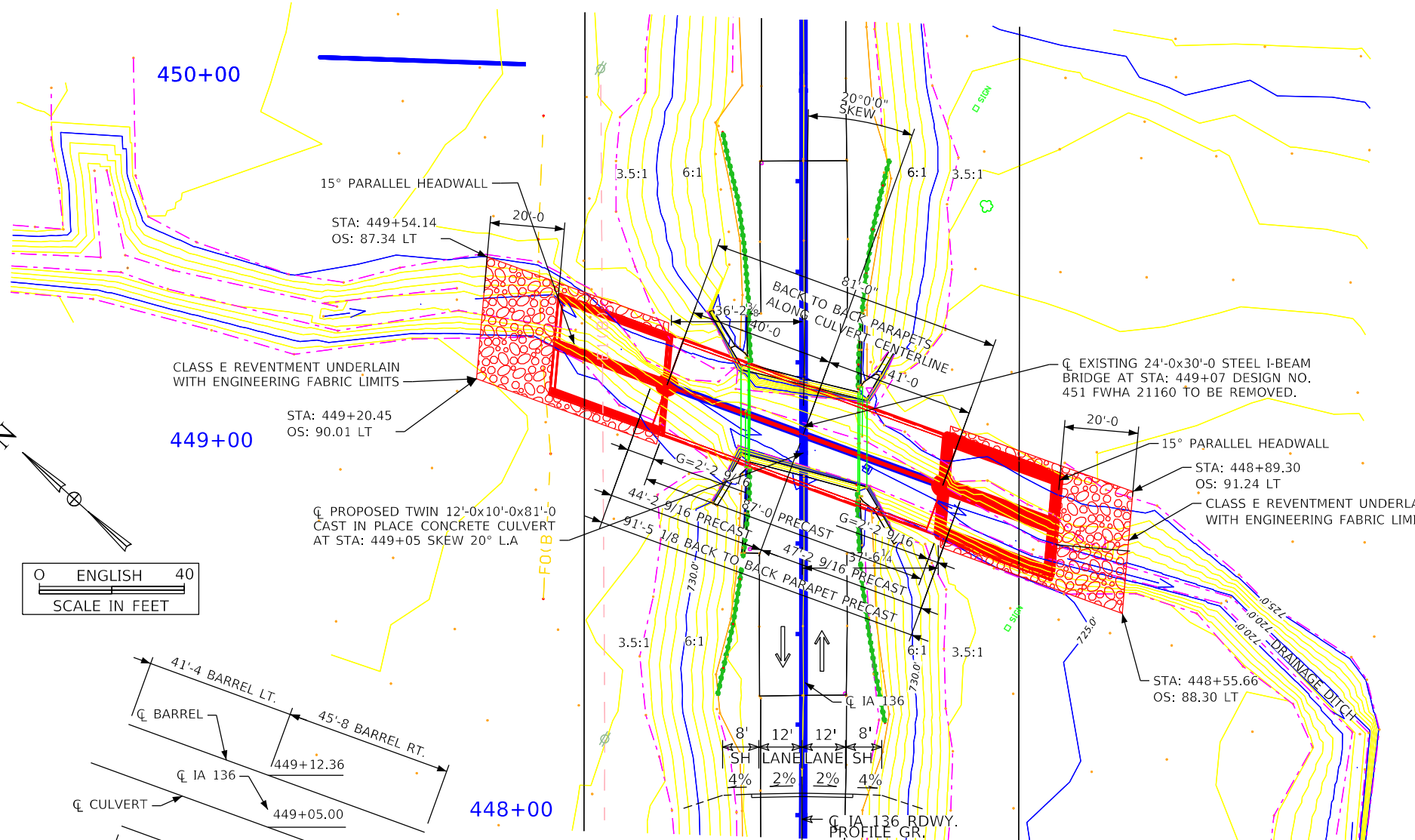
### COORDINATED OPERATIONS

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.

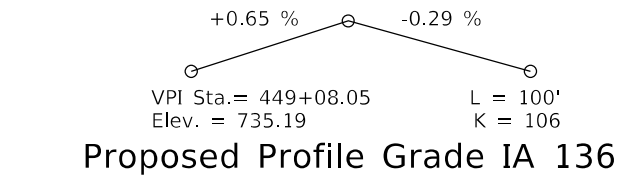
Project	Type of Work



LONGITUDINAL SECTION ALONG CL CULVERT



TYPICAL APPROACH SECTION



Notes:

- GENERAL NOTES  
 1. THIS DESIGN IS FOR THE REPLACEMENT OF THE EXISTING 24'-0 x 30'-0 STEEL I-BEAM BRIDGE, DESIGN NO. 451, CLINTON FHWA NO. 21160, MAINT. NO. 2338.6s136
- DESIGNER NOTES  
 1. BURIED AND OVERHEAD UTILITIES TO BE RELOCATED TEMPORARILY OR PERMANENTLY AS REQUIRED FOR CONSTRUCTION.
- PLAN NOTES  
 1. DRAINAGE THROUGH EXISTING BRIDGE/CULVERT/CHANNEL MUST BE MAINTAINED THROUGHOUT CONSTRUCTION.  
 2. FLOW LINE OF CULVERT HAS BEEN SET 1 FOOT BELOW STREAMBED

Hydraulic Data

Drainage Area = 2.05 Sq. Mi.  
 Q<sub>50</sub> = 1,640 CFS  
 HW Elev. = 729.0  
 Stream Slope = 36.9 Ft./Mi.  
 Q<sub>100</sub> = 1,950 CFS  
 HW Elev. = 730.0  
 Q<sub>500</sub> = 2,830 CFS  
 HW Elev. = 732.4

Utilities Legend:

- SYMBOL - TYPE
- POWER POLE
  - FIBER OPTIC
  - ELECTRIC

UTILITIES SHOWN ON THIS SHEET ARE FOR INFORMATION ONLY. SEE ROAD DESIGN SHEETS FOR FINAL UTILITY INFORMATION.

Location

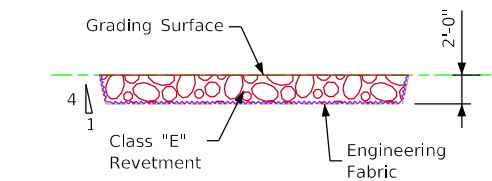
IA 136 Over a Drainage Ditch  
 T-83N R-IE  
 Section 26  
 Sharon Township  
 Clinton County  
 FHWA No. Bridge Maint. No. 2338.6s136  
 Latitude 41.970461°  
 Longitude -90.809500°

Traffic Estimate

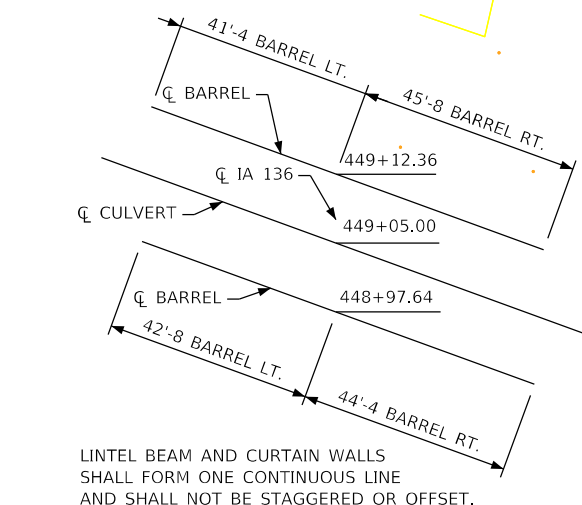
2025 AADT	900	V.P.D.
2045 AADT	1100	V.P.D.
2045 DHV	110	V.P.H.
Trucks	10	%
Total Design ESALS	27,222	

Estimated Revetment Quantities

Location	Revetment Class. "E" (Ton)	Engineering Fabric (SY)	Excavation (CY)
Inlet	102	149	49
Outlet	102	149	49
Totals	204	298	98



Typical Channel Protection



PRECAST OPTION BARREL LAYOUT

SITUATION PLAN

HYDRAULIC DESIGN

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 \_\_\_\_\_ Date \_\_\_\_\_  
 Printed or Typed Name \_\_\_\_\_  
 My license renewal date is December 31, 20 \_\_\_\_

Pages or sheets covered by this seal: \_\_\_\_\_

Design For 20° Skew L.A.

**TWIN 12'-0 x 10'-0 x 81'-0 CAST IN PLACE CONCRETE CULVERT**

**SITUATION PLAN**

STA. 449+05.00 (IA 136) MAY 2022

**CLINTON COUNTY**  
 IOWA DEPARTMENT OF TRANSPORTATION

Design No. XXX Design Sheet No.001 of XXX FHWA No. XXX

## CROSS SECTION VIEW COLOR LEGEND

Design Color No.	Feature	Design Color No.	Feature
<b>Aggregate</b>			
(64)	Choke Stone	(8)	Behind Curb Cut
(42)	Engineering Fabric	(6)	Granular
(8)	Flooded Backfill	(13)	Granular Back Fill
(92)	Macadam Stone	(48)	Rock Undercut
(20)	Modified	(8)	Shoulder Earth Fill
(12)	Plowing Shaping	(2)	Side Slopes
(14)	Porous Backfill	(226)	Side Slopes Dressing
(8)	Revetment Class A	<b>Substrata</b>	
(6)	Revetment Class B	(128)	Boulder Substrata
(62)	Revetment Class C	(209)	Boulder Removed Substrata
(188)	Revetment Class D	(48)	Broken Weathered Substrata
(28)	Revetment Class E	(210)	Broken Weathered Removed Substrata
(12)	Shoulder Special Backfill	(3)	Core Out Substrata
(12)	Special Backfill	(195)	Core Out Remove and Replace Substrata
(20)	Subbase	(115)	Core Out Remove Only Substrata
(20)	Subbase Lower	(203)	Existing Pavement Substrata
(20)	Subbase Upper	(200)	Existing Pavement Remove and Replace Substrata
(118)	Subgrade Treatment	(184)	Existing Pavement Remove Only Substrata
<b>Asphalt</b>			
(207)	HMA Base Course	(6)	Loam Substrata
(207)	HMA Interim Course	(211)	Loam Removed Substrata
(207)	HMA Surface Course	(80)	Rock Substrata
<b>Concrete</b>			
(0)	Barrier Concrete	(212)	Rock Removed Substrata
(0)	Barrier Concrete Footing	(4)	Select Sand Substrata
(0)	Curb Gutter	(214)	Select Sand Removed Substrata
(48)	Flowable Mortar	(3)	Shale Substrata
(0)	Median Concrete	(215)	Shale Removed Substrata
(0)	PCC Pavement	(10)	Topsoil Substrata
(0)	Sidewalk	(4)	Topsoil Remove and Replace Substrata
<b>Shoulder</b>			
(209)	Shoulder HMA	(2)	Topsoil Remove Only Substrata
(0)	Shoulder PCC	<b>Unsuitable / Waste</b>	
(6)	Shoulder Granular	(3)	Unsuitable Type A
<b>Existing</b>			
(0)	Existing Pavement	(216)	Unsuitable Type A Removed
<b>Structural</b>			
(0)	Bridge	(13)	Unsuitable Type B
(21)	Guardrail	(217)	Unsuitable Type B Removed
(112)	Noise Wall	(11)	Unsuitable Type C
(112)	Noise Wall Footing	(218)	Unsuitable Type C Removed
(112)	Retaining Wall Back	(3)	Waste
(112)	Retaining Wall Back Excavate	(219)	Waste Removed
(112)	Retaining Wall Face	<b>Trigger Switches</b>	
(112)	Retaining Wall Front Excavate	(27)	Do Not Construct
(112)	Retaining Wall Front Footing		
(112)	Retaining Wall MSE Gutter		
(112)	Retaining Wall Reinforced Earth		

**NOTES:**

Text

**NOTES:**

Text

## CROSS SECTIONS LEGEND AND INFORMATION SHEET

(COVERS SHEET SERIES W, X, Y, & Z)

