



REVISIONS

| | |
|-------------------------------|-----------------------|
| TOTAL | 16 |
| PROJECT IDENTIFICATION NUMBER | |
| PROJECT NUMBER | 20-23-136-070 |
| R.O.W. PROJECT NUMBER | BRF-136-1(105)--38-23 |
| | Hydraulic Design |

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

<----- H 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 | -- |

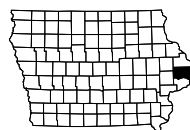
| INDEX OF SEALS | | |
|----------------|--------------------|-------------------------|
| SHEET NO. | NAME | TYPE |
| A.1 | Michael J. Janecek | Primary Signature Block |
| V.1 | Phillip M. Harpole | Hydraulic Design |
| | | |
| | | |

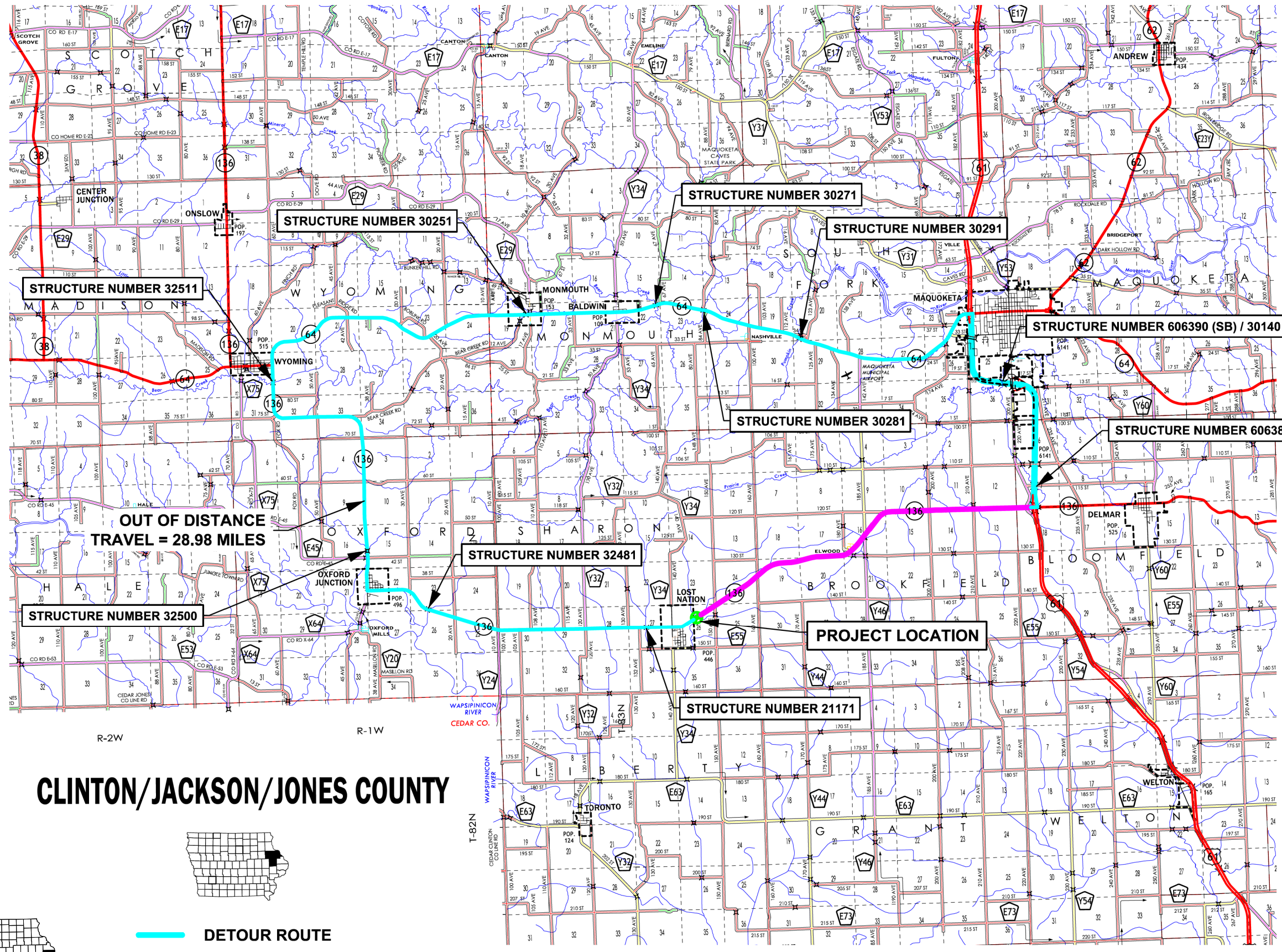
D4 PLAN - June 18, 2022

PRELIMINARY PLANS

Subject to change by final design.

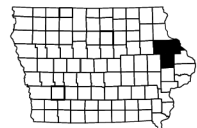
D5 PLAN - Sept. 16, 2022



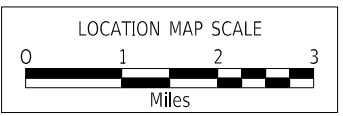


OUT OF DISTANCE
TRAVEL = 28.98 MILES

CLINTON/JACKSON/JONES COUNTY



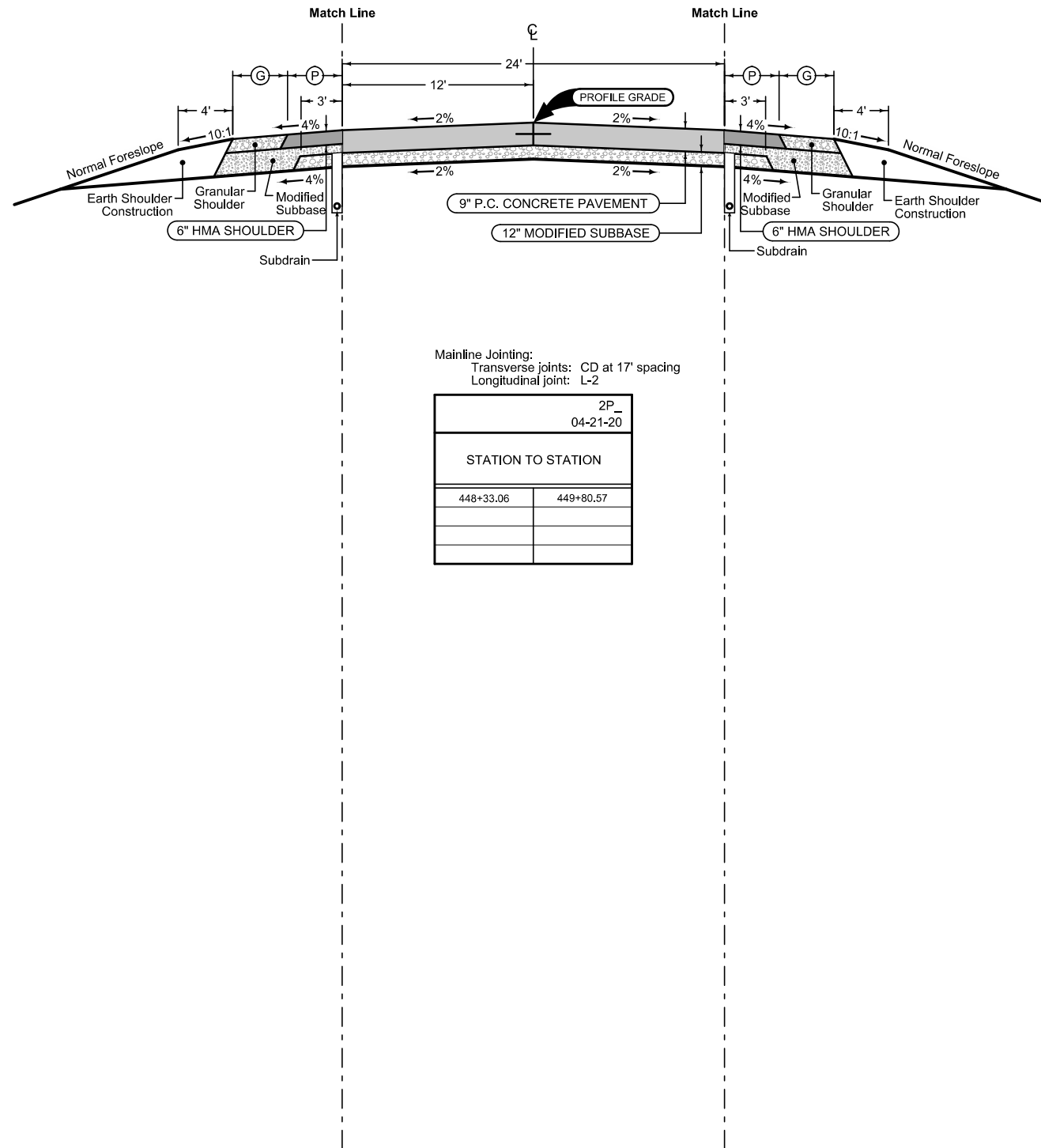
— DETOUR ROUTE



Combination Shoulder

Shoulder Jointing:
Longitudinal joint: B

| | | 2_C_ | |
|--------------------|-----------|-------------|-------------|
| | | 04-21-20 | |
| STATION TO STATION | | (P) Feet | (G) Feet |
| 448+33.06 | 449+80.57 | 4 | 4 |
| | | | |
| | | | |



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

| | | 2P_ | |
|--------------------|-----------|----------|--|
| | | 04-21-20 | |
| STATION TO STATION | | | |
| 448+33.06 | 449+80.57 | | |
| | | | |
| | | | |

Combination Shoulder

Shoulder Jointing:
Longitudinal joint: B

| | | 2_C_ | |
|--------------------|-----------|-------------|-------------|
| | | 04-21-20 | |
| STATION TO STATION | | (P) Feet | (G) Feet |
| 448+33.06 | 449+80.57 | 4 | 4 |
| | | | |
| | | | |

SURVEY SYMBOLS

- | | | | |
|--|-----------------------------------|--|------------------------------|
| | Interstate Highway Symbol | | Septic Tank |
| | U.S. Highway Symbol | | Cistern |
| | Iowa Highway Symbol | | L.P. Gas Tank (No Footing) |
| | County Road Highway Symbol | | Underground Storage Tank |
| | Evergreen Tree | | Latrine |
| | Deciduous Tree | | Satellite TV Dish |
| | Fruit Tree | | Water Hook Up |
| | Shrub (Bushes) | | Radio Tower |
| | Timber | | Tower Anchor |
| | Hedge | | Guardrail (Beam or Cable) |
| | Stump | | Guard Post (one or two) |
| | Swamp | | Guard Post (over two) |
| | Rock Outcrop | | Filler Pipe |
| | Broken Concrete | | Gas Valve |
| | Revetment (Rip Rap) | | Water Valve |
| | Cemetery | | Speed Limit Sign |
| | Grave | | Mile Marker Post |
| | Cave | | Sign |
| | Sink Hole | | Traffic Signal Control Box |
| | Board Fence | | Rail Road Signal Control Box |
| | Chain Link or Security Fence | | Telephone Switch Box |
| | Wire Fence | | Electric Box |
| | 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) | | |

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 | (132) | | 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 | | Survey Line |
| | Station | | Section Corner |
| | Ground Line Intercept | | Saw Cut |
| | Guardrail | | Trench Drain |
| | HighTension Cable Guardrail | | Sheet Pile |
| | Pavement Removal | | Clearing & Grubbing Area |

- ### RIGHT-OF-WAY LEGEND
- -
 -
 -
 -
 -
 -
 -

PLAN AND PROFILE LEGEND AND SYMBOL INFORMATION SHEET

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

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

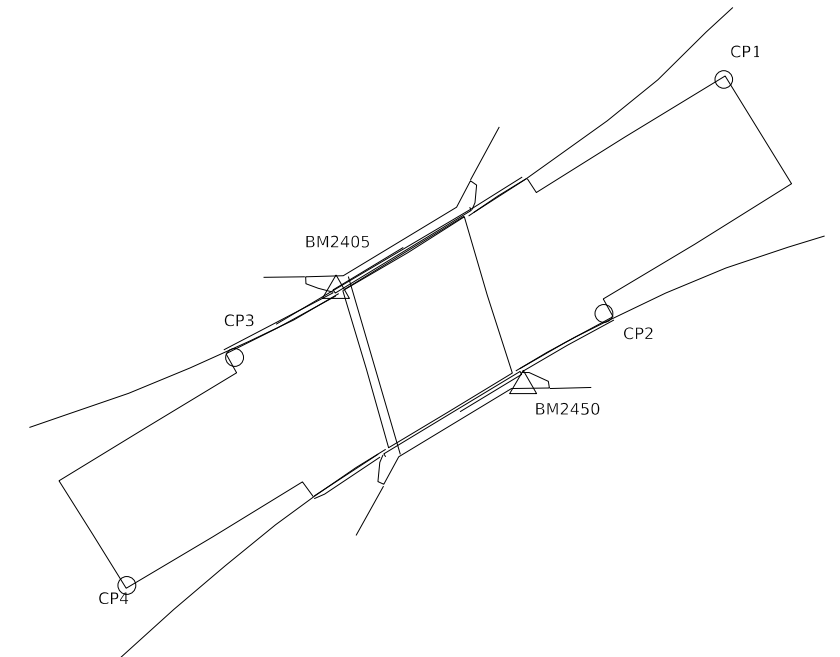
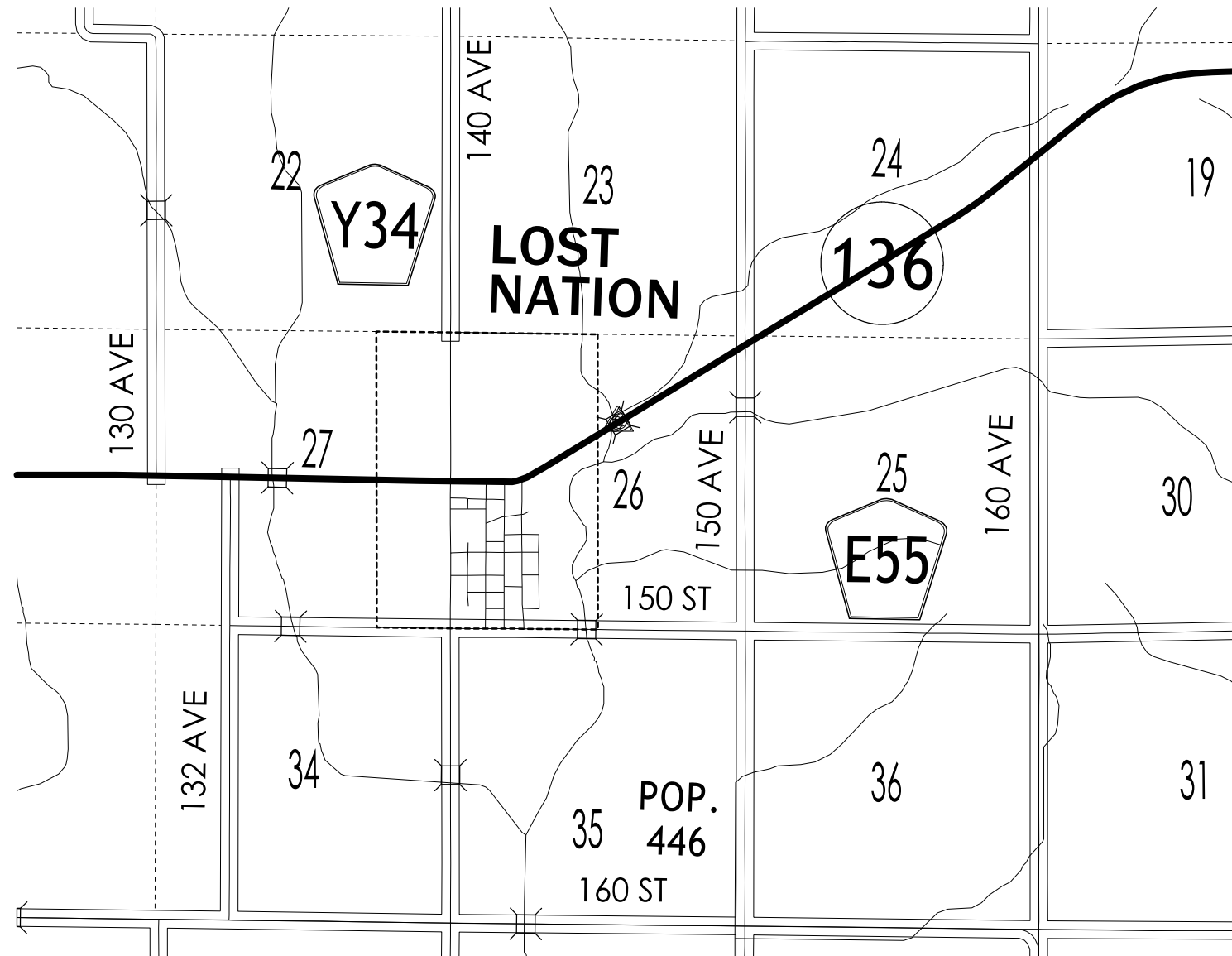
Contact Name : Alliant Energy Field Engineer Contact Phone: 8002554268 Contact Email: locate_IPL@alliantenergy.com

(LN1) LOST NATION-ELWOOD TELEPHONE

Contact Name : Jody Holtz
Contact Phone: 5636782470
Contact Email: 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

| POINT NAME | Y | X | Z | FEATURE DEFINITION - DESCRIPTION |
|------------|-------------|--------------|---------|----------------------------------|
| 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.



| | |
|--|-----------------------|
| Right of Way Design Information | |
| THIS SHEET INCLUDED FOR INFORMATION ONLY | |
| ROW Team: CUVA / FREDRICKSON | |
| ROW #: STPN-136-1(106)--2J-23 | |
| Plan Date: 11/15/2022 | |
| Color Legend: | |
| | Property Lines |
| | Temporary Easement |
| | Permanent Acquisition |

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

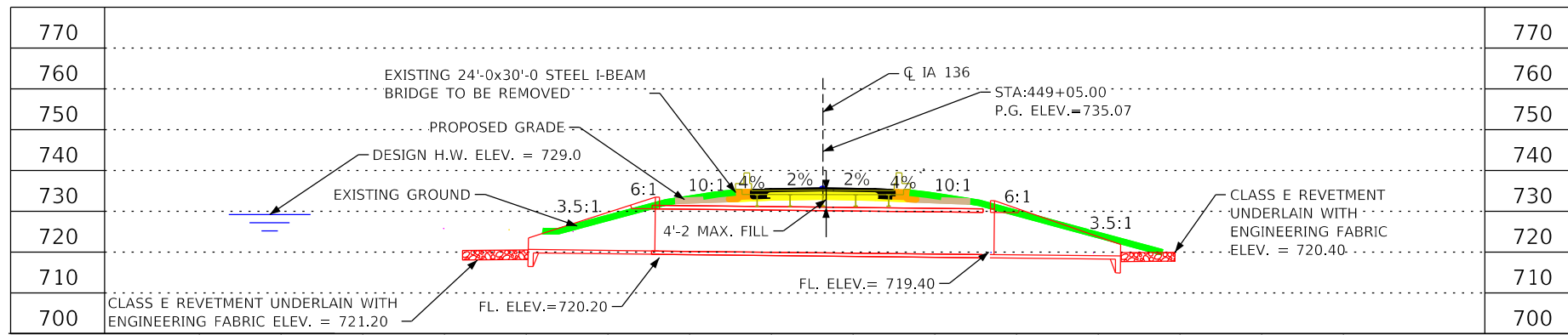
| Route | Direction | County | Location Description | Feature Crossed | Object Type | Maint. Bridge No., Structure ID, or FHWA No. | Type of Restriction | Existing Measurement | Construction Measurement | Construction Measurement as Signed | Projected As Built Measurement | Remarks |
|-------|-----------|--------|---------------------------------|---------------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

111-01
04-17-12

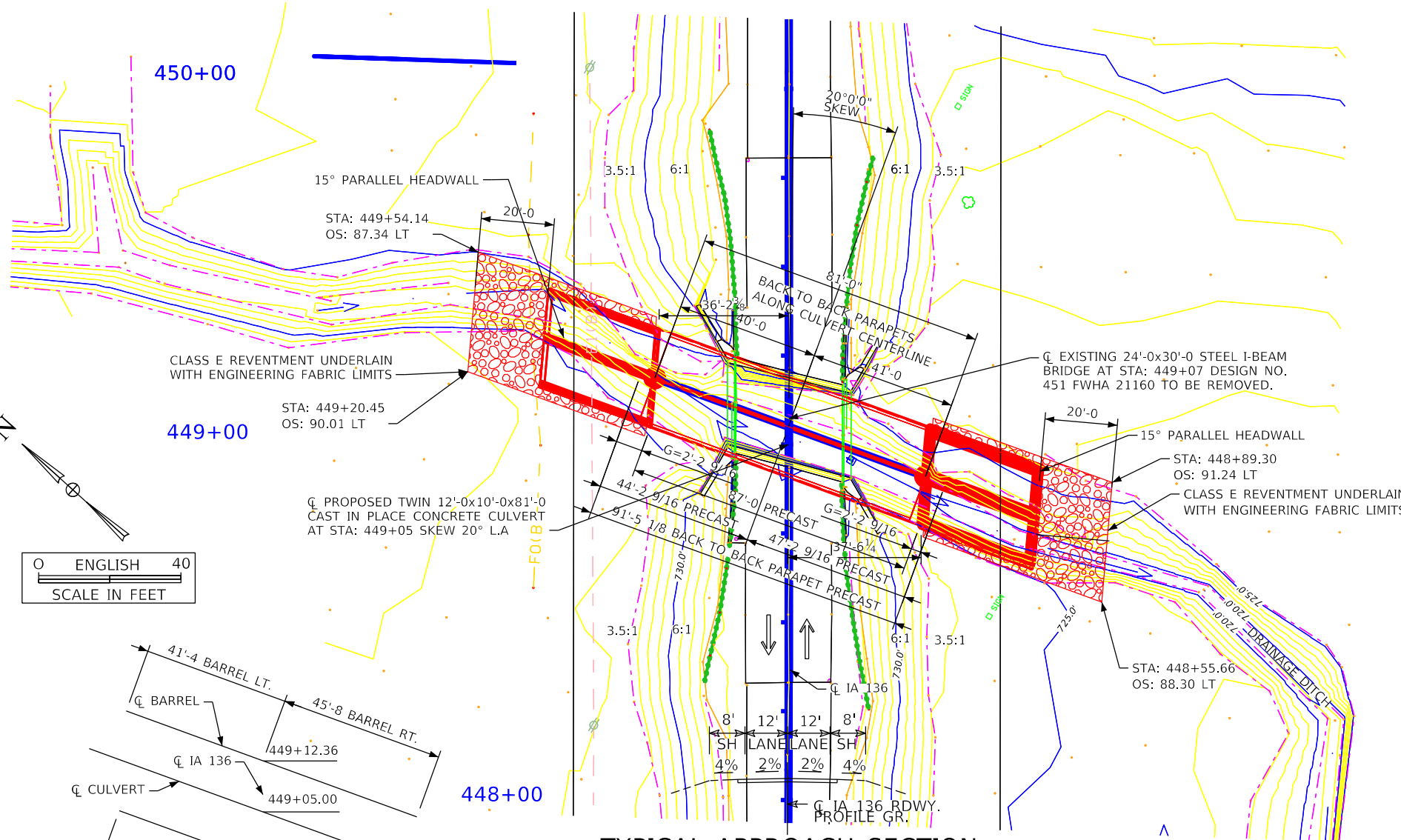
COORDINATED OPERATIONS

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 |
|---------|--------------|
| | |
| | |
| | |
| | |

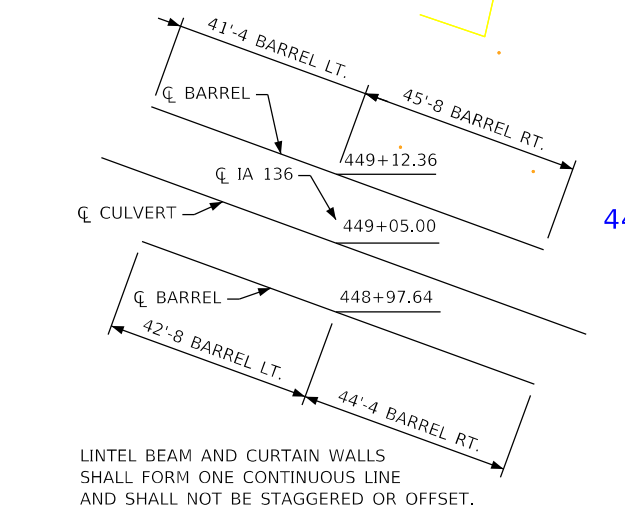


LONGITUDINAL SECTION ALONG CL CULVERT

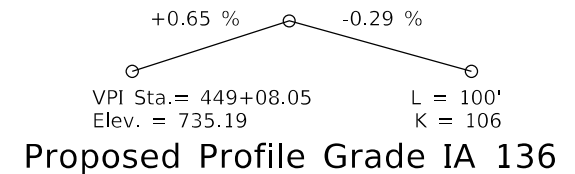


TYPICAL APPROACH SECTION

SITUATION PLAN



PRECAST OPTION BARREL LAYOUT



Notes:

- GENERAL NOTES
- 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
- BURIED AND OVERHEAD UTILITIES TO BE RELOCATED TEMPORARILY OR PERMANENTLY AS REQUIRED FOR CONSTRUCTION.
- PLAN NOTES
- DRAINAGE THROUGH EXISTING BRIDGE/CULVERT/CHANNEL MUST BE MAINTAINED THROUGHOUT CONSTRUCTION.
 - FLOW LINE OF CULVERT HAS BEEN SET 1 FOOT BELOW STREAMBED

Hydraulic Data

Drainage Area = 2.05 Sq. Mi.
 Q₅₀ = 1,640 CFS
 HW Elev. = 729.0
 Stream Slope = 36.9 Ft./Mi.
 Q₁₀₀ = 1,950 CFS
 HW Elev. = 730.0
 Q₅₀₀ = 2,830 CFS
 HW Elev. = 732.4

Utilities Legend:

- SYMBOL - TYPE
- ⊕ POWER POLE
 - FO(B) — FIBER OPTIC
 - E1 (B) — ELECTRIC

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

Location

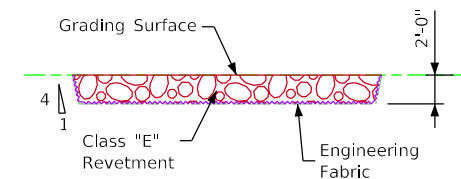
IA 136 Over a Drainage Ditch
 T-83N R-IE
 Section 26
 Sharon Township
 Clinton County
 FHWA No. Bridge Maint. No. 2338.6s136
 Latitude 41.970461°
 Longitude -90.809500°

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

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: _____

PHILIP M. HARPOLE
 12910
 IOWA

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 |
|------------------|---------------------------|---------------------------|---------------------------------|
| Aggregate | | | |
| (64) | Choke Stone | (112) | Noise Wall |
| (42) | Engineering Fabric | (112) | Noise Wall Footing |
| (8) | Flooded Backfill | (112) | Retaining Wall Back |
| (92) | Macadam Stone | (112) | Retaining Wall Back Excavate |
| (20) | Modified | (112) | Retaining Wall Face |
| (12) | Plowing Shaping | (112) | Retaining Wall Front Excavate |
| (14) | Porous Backfill | (112) | Retaining Wall Front Footing |
| (8) | Revetment Class A | (112) | Retaining Wall MSE Gutter |
| (6) | Revetment Class B | (112) | Retaining Wall Reinforced Earth |
| (62) | Revetment Class C | | |
| (188) | Revetment Class D | Grading | |
| (28) | Revetment Class E | (8) | Behind Curb Cut |
| (12) | Shoulder Special Backfill | (6) | Granular |
| (12) | Special Backfill | (13) | Granular Back Fill |
| (20) | Subbase | (48) | Rock Undercut |
| (20) | Subbase Lower | (8) | Shoulder Earth Fill |
| (20) | Subbase Upper | (2) | Side Slopes |
| (118) | Subgrade Treatment | (226) | Side Slopes Dressing |
| Asphalt | | | |
| (207) | HMA Base Course | Substrata | |
| (207) | HMA Interim Course | (128) | Boulder Substrata |
| (207) | HMA Surface Course | (48) | Broken Weathered Substrata |
| Concrete | | | |
| (0) | Barrier Concrete | (3) | Core Out Substrata |
| (0) | Barrier Concrete Footing | (203) | Existing Pavement Substrata |
| (0) | Curb Gutter | (6) | Loam Substrata |
| (48) | Flowable Mortar | (80) | Rock Substrata |
| (0) | Median Concrete | (4) | Select Sand Substrata |
| (0) | PCC Pavement | (3) | Shale Substrata |
| (0) | Sidewalk | (10) | Topsoil Substrata |
| Shoulder | | | |
| (209) | Shoulder HMA | Unsuitable / Waste | |
| (0) | Shoulder PCC | (3) | Unsuitable Type A |
| (6) | Shoulder Granular | (13) | Unsuitable Type B |
| | | (11) | Unsuitable Type C |
| | | (3) | Waste |
| Existing | | | |
| (0) | Existing Pavement | | |

NOTES:

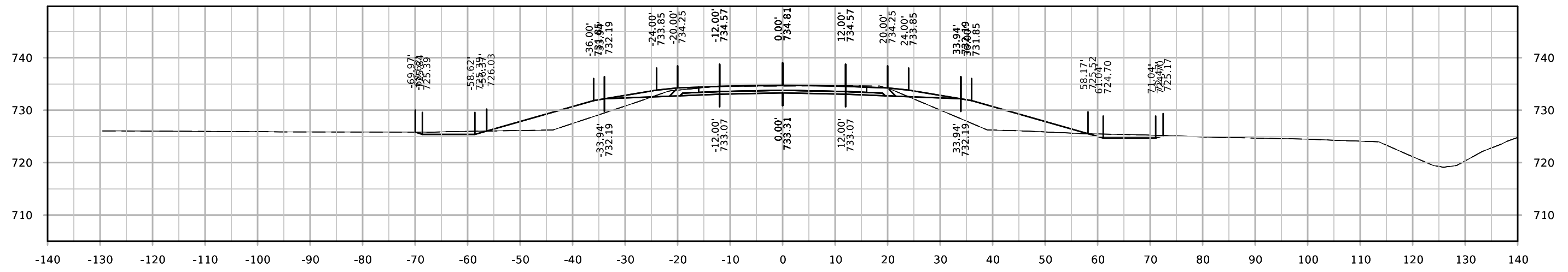
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NOTES:

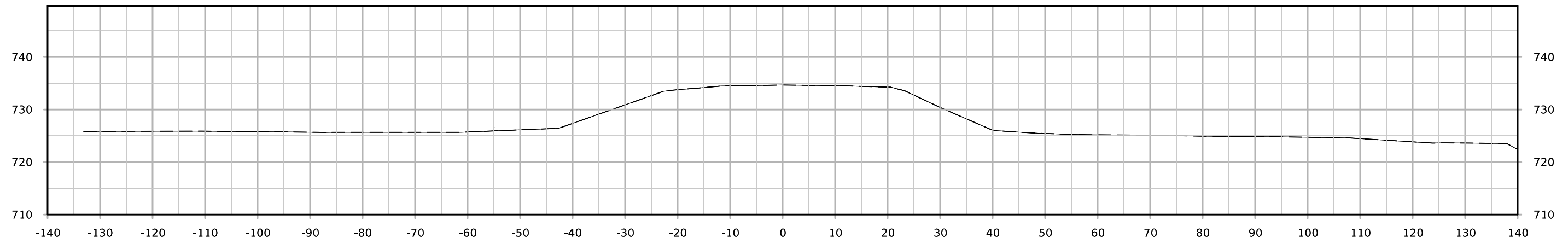
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CROSS SECTIONS LEGEND AND INFORMATION SHEET

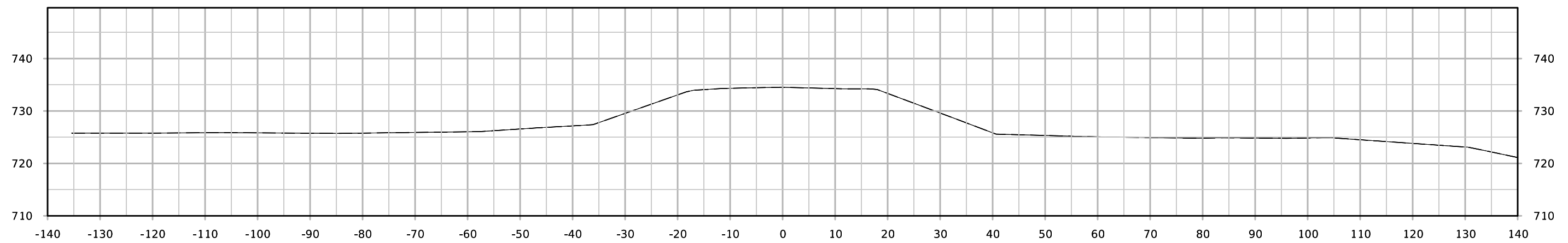
(COVERS SHEET SERIES W, X, Y, & Z)



STA. 448+50.00



STA. 448+25.00



STA. 448+00.00

