

For Project Location Map
Refer to Sheet No. A.02

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	US 218
* D.3	US 218 Roadway Pipe Replacement
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 - 4	Mainline Cross Sections
	* Color Plan Sheets

<--- H Sheets



PLANS OF PROPOSED IMPROVEMENT ON THE
PRIMARY ROAD SYSTEM
BENTON COUNTY
RCB CULVERT REPLACEMENT - TWIN BOX
 US 218 - Pratt Creek, 0.1 mi E. of Co. Rd. V61

SCALES: As Noted

Refer to the Proposal Form for list of applicable specifications.

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



REVISIONS

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TOTAL	15
PROJECT IDENTIFICATION NUMBER	18-06-218-020
PROJECT NUMBER	BRFN-218-6(56)--39-06
R.O.W. PROJECT NUMBER	

DESIGN DATA RURAL			
2024	AADT	3,000	V.P.D.
2044	AADT	3,100	V.P.D.
2044	DHV	320	V.P.H.
	TRUCKS	11	%
	Total		
	Design ESALs	--	

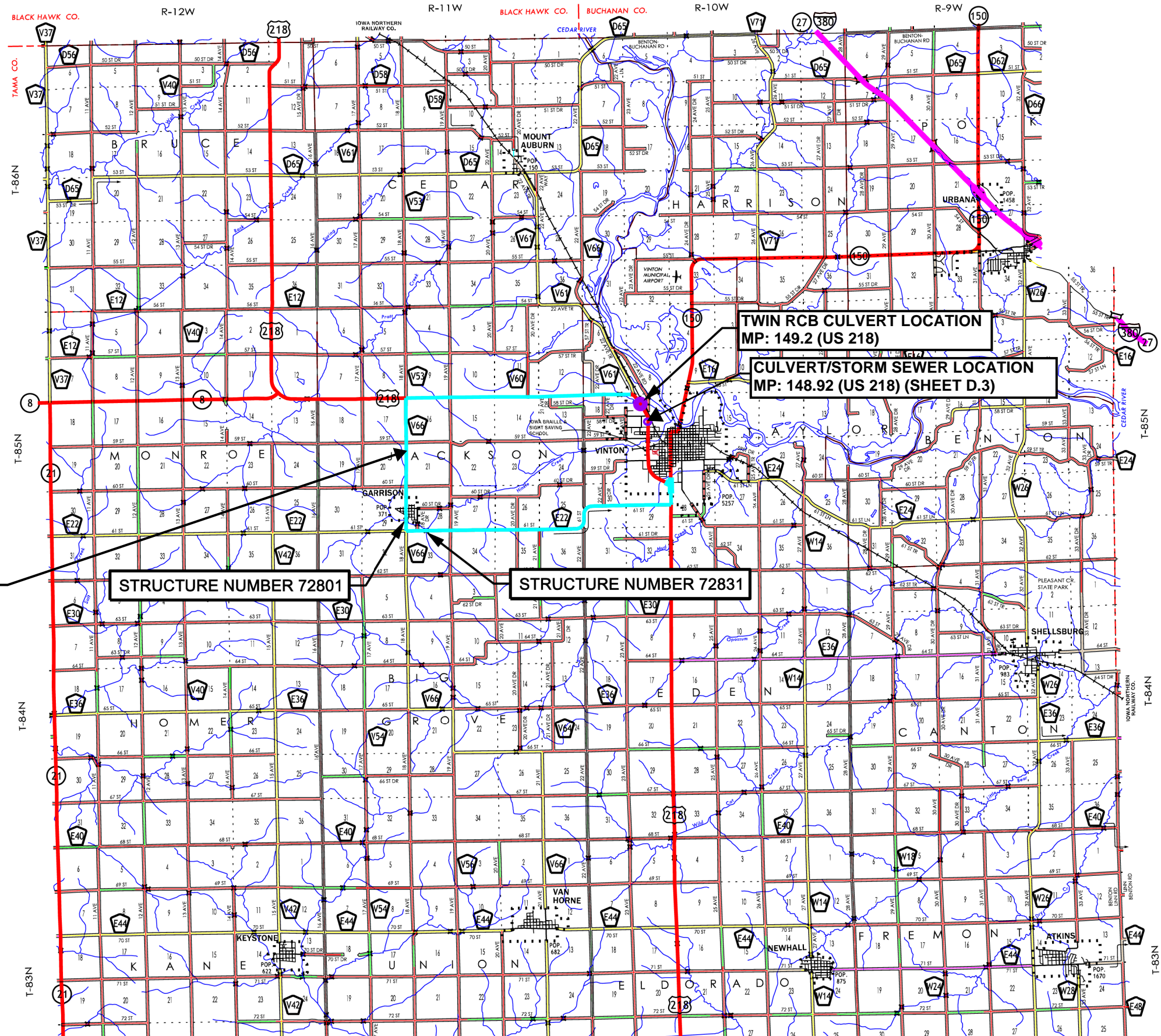
INDEX OF SEALS		
SHEET NO.	NAME	TYPE
A.1	Michael J. Janecek	Primary Signature Block
V.1	Phillip M. Harpole	Hydraulic Design

D4 PLAN - July 25, 2023

PRELIMINARY PLANS

Subject to change by final design.

D5 PLAN - October 15, 2021



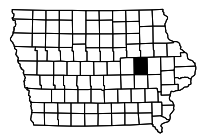
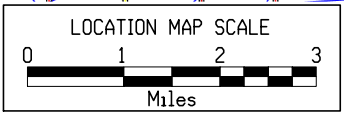
DETOUR ROUTE

STRUCTURE NUMBER 72801

STRUCTURE NUMBER 72831

**TWIN RCB CULVERT LOCATION
MP: 149.2 (US 218)**

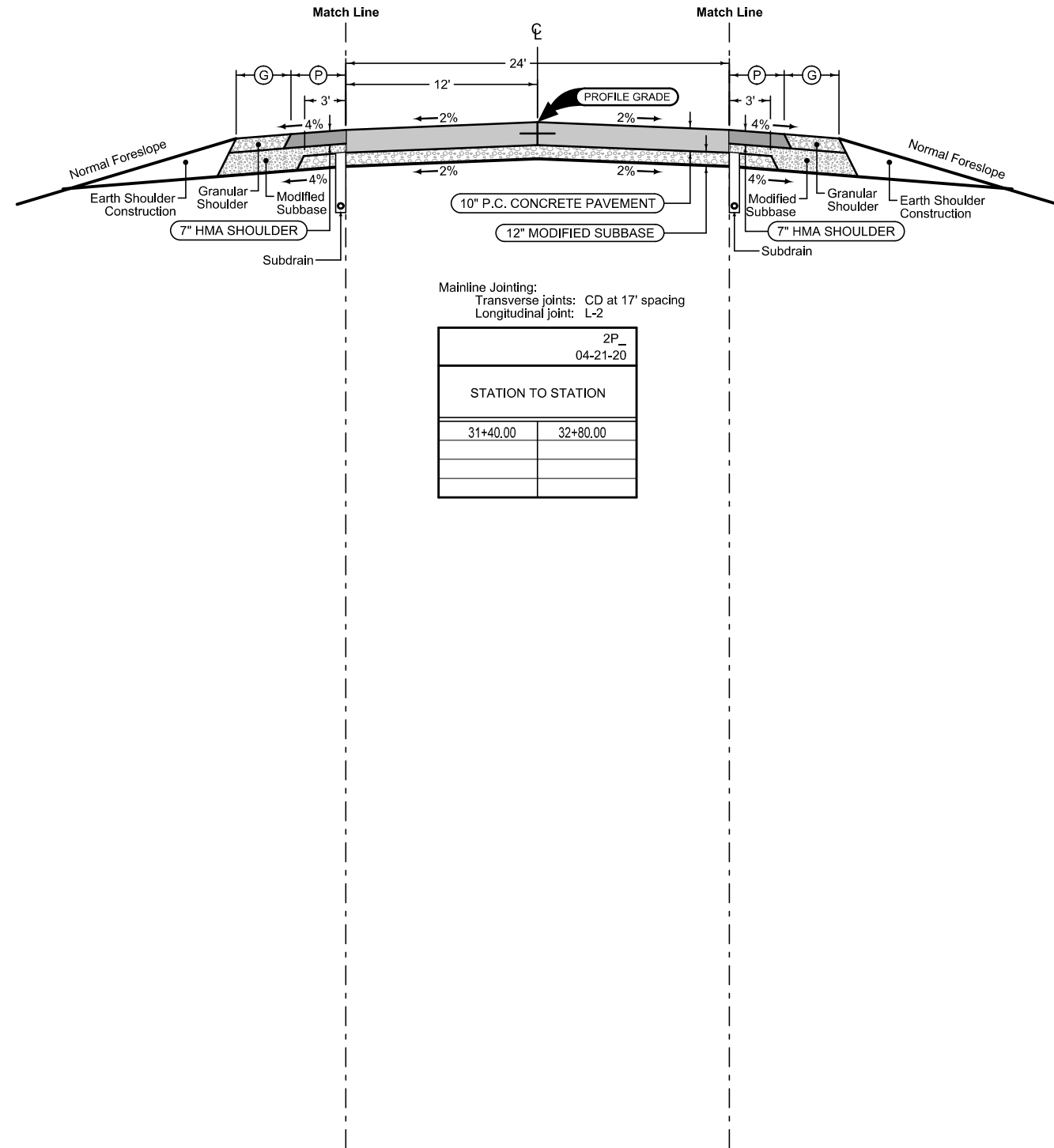
**CULVERT/STORM SEWER LOCATION
MP: 148.92 (US 218) (SHEET D.3)**



Combination Shoulder

Shoulder Jointing:
Longitudinal joint: B

STATION TO STATION		(P) Feet	(G) Feet
31+40.00	32+80.00	4	4



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

STATION TO STATION	
31+40.00	32+80.00

Combination Shoulder

Shoulder Jointing:
Longitudinal joint: B

STATION TO STATION		(P) Feet	(G) Feet
31+40.00	32+80.00	4	4

See Tab 100-24 or 100-25 for pavement quantities.
See Tab 112-9 for shoulder quantities.

US 218

SURVEY SYMBOLS

- CP Control Point
- ◻ FENO FENO Monument
- PRO Profile Shot
- EP Edge of Paved Roads (ML or SR)
- GR Ground Shot
- - - - - BL Topo Breakline
- - - - - EW Edge of Water
- MIS Miscellaneous
- OUT Tile Outlet
- TILE — TIL Tile Line
- REF Reference Tie Point
- ~ TLNR Tree Line Right
- PPA Power Pole Co. 1
- ◻ UB Utility Box
- ◻ EB Electrical Box
- - - - - C Centerline BL of Road (ML or SR)
- EG Edge of Gravel Road
- MM Mile Marker Post
- LIN Miscellaneous Line
- PIP Pipe Culvert
- ◻ SIGN SI Sign
- TPA Telephone Pole Co. 1
- LUM Luminaire
- x - x - x - FW Wire Fence
- CUL Culvert
- FO(C) — FO1C Fiber Optic Co. 1 - Quality C
- BLS Bridge Low Steel
- BRG Bridge
- BD Bridge Deck
- +++++ RR Centerline of Railroad Tracks
- SOP Size of Pipe or Culvert

UTILITY LEGEND

Sub-Surface Utility Mapping Quality Level is in accordance with CI/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

- PPA Power Pole Co. 1
- ◻ UB Utility Box
- ◻ EB Electrical Box
- TPA Telephone Pole Co. 1
- LUM Luminaire
- FO1C Fiber Optic Co. 1 - Quality C

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.	
Yellow	(4)	Highlight for Critical Notes or Features
Red	(3)	Delineates Restricted Areas
Lavender	(9)	Temporary Pavement Shading
Gray, Light	(48)	Proposed Pavement Shading
Gray, Med	(80)	Proposed Granular Shading
Gray, Dark	(112)	Proposed Grade and Pave Shading "In conjunction with a paving project"
Brown, Light	(236)	Grading Shading
Tan	(8)	Proposed Sidewalk Shading
Blue, Light	(230)	Proposed Sidewalk Landing Shading
Pink	(11)	Proposed Sidewalk Ramp 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

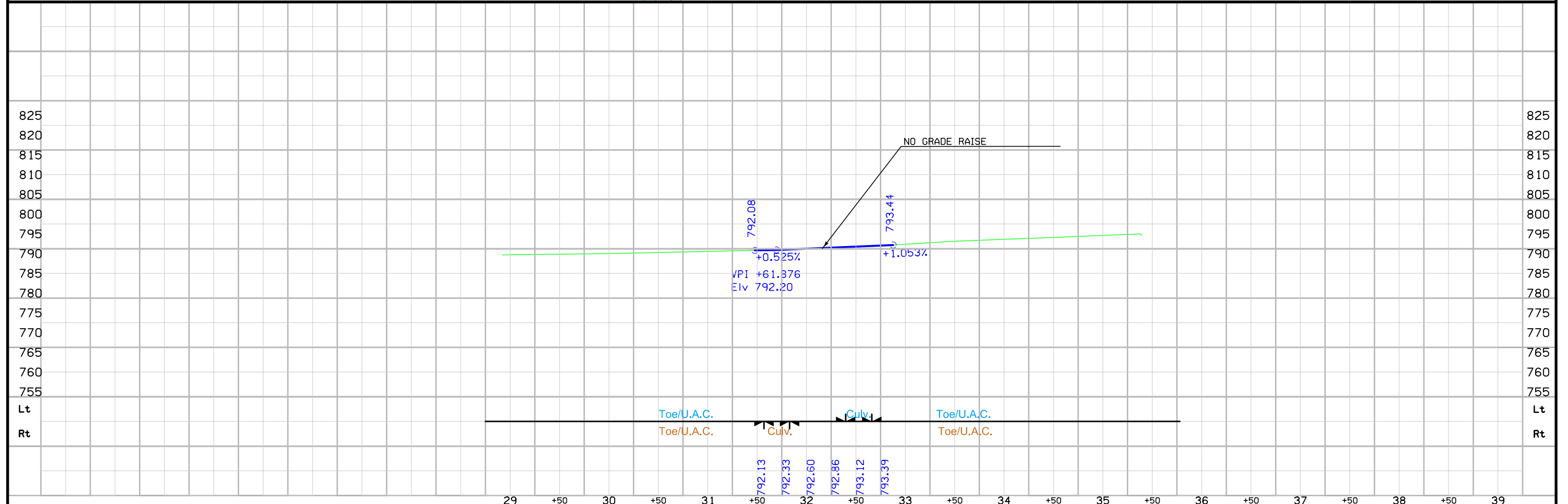
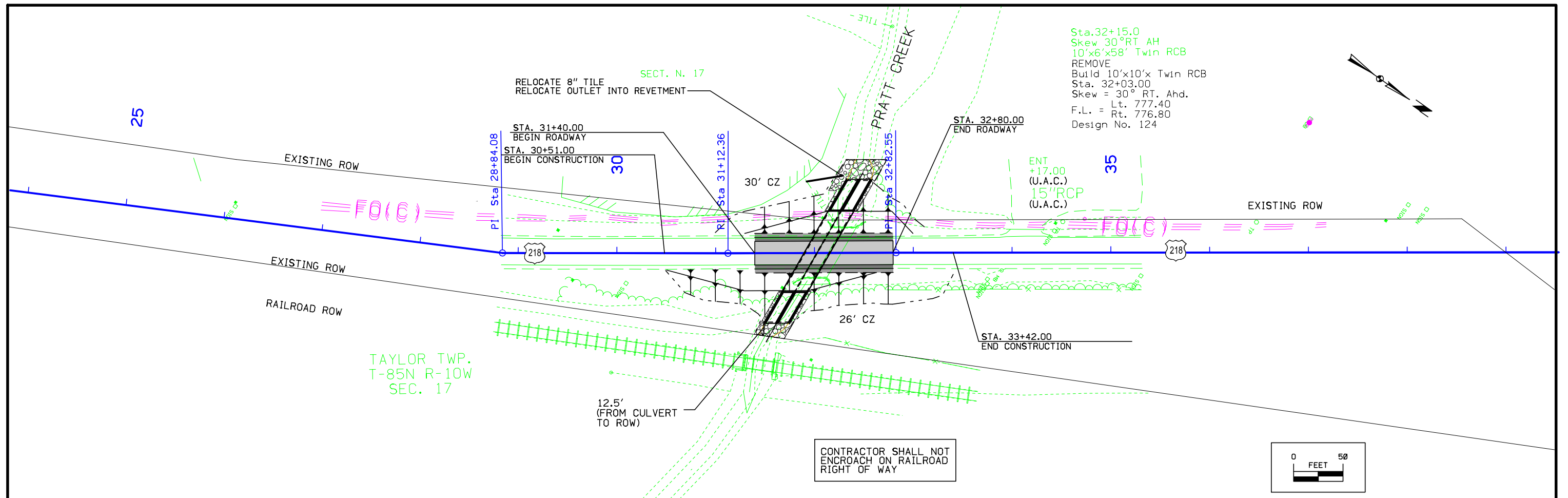
- Reference Point
- Station
- ▲ Section Corner
- - - - - Ground Line Intercept
- Saw Cut
- Guardrail
- Trench Drain
- HighTension Cable Guardrail
- Sheet Pile
- Pavement Removal
- Clearing & Grubbing Area

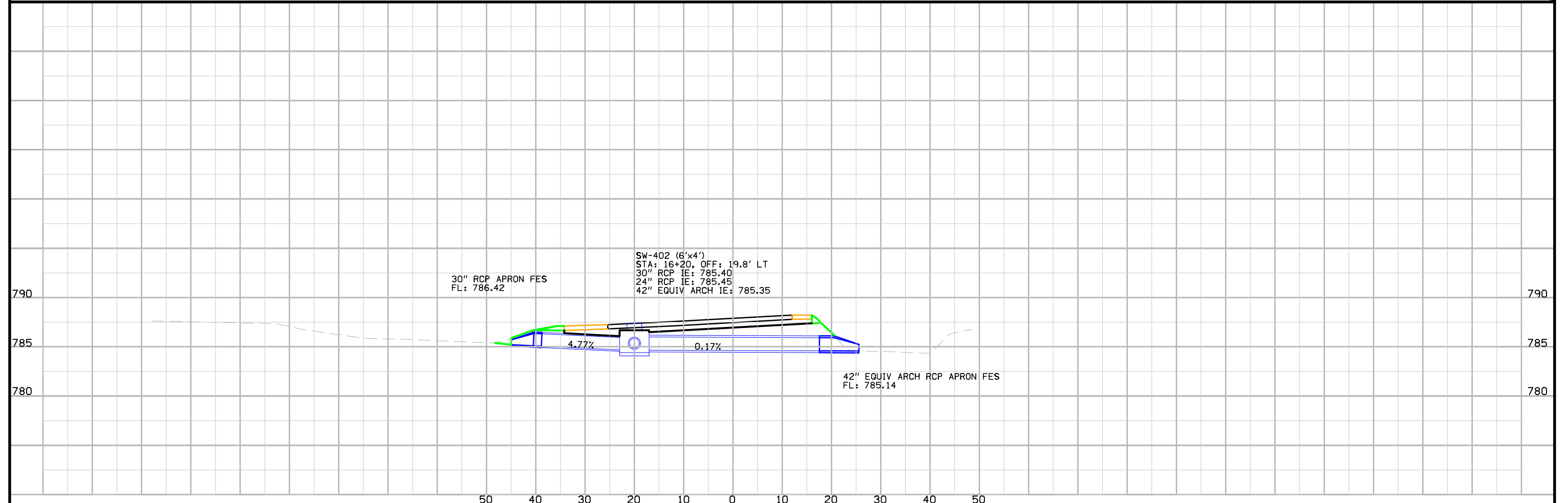
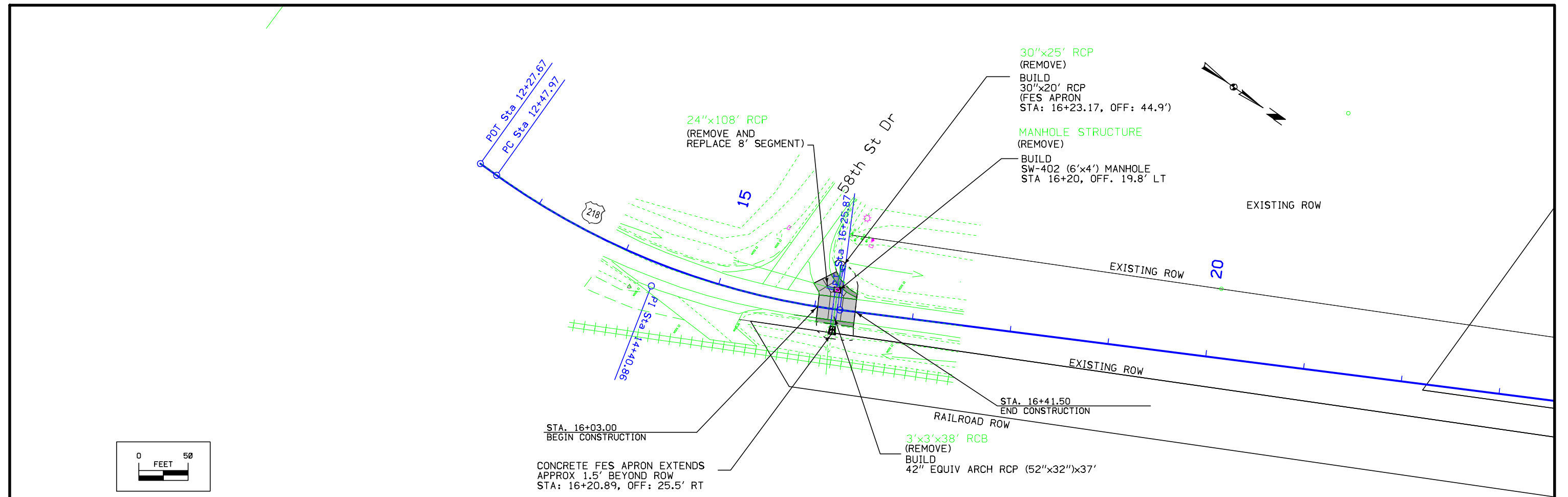
RIGHT-OF-WAY LEGEND

- ▲ Proposed Right-of-Way
- △ Existing Right of Way
- ▲ Existing and Proposed Right-of-Way
- ▲ Easement and Existing Right-of-Way
- Easement (Temporary)
- Easement
- C/A Access Control
- Property Line

PLAN AND PROFILE LEGEND AND SYMBOL INFORMATION SHEET

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





Survey Information

Benton County
BRFN-218-6(56)-39-06
U.S. 218 Small stream 0.1 mi
E. of Co Rd V61
PIN 18-06-218-020
Sap-01971

Party Personnel

Jacob Larson - Party Chief
Hunter Wamre - Assistant Survey Party Chief

Date(s) of Survey

Begin Date 05/06/2020
End Date 05/06/2020

General Information

Measurement units for this survey are US survey feet. This survey is for proposed RCB reconstruction and reconstruction of U.S. 218. Project datum and control information is provided by Shive-Hattery, Inc. This survey request was for the U.S. 218 corridor and part of the IANR Railroad only.

Vertical Control

Iowa Regional Coordinate System: Zone 10 Cedar Rapids on the Iowa Real Time Network (IaRTN)

Vertical datum for this survey is NAVD88 (Computed using Geoid 12A). Additional benchmarks were placed throughout the project using a Total Station set up relative to Control Points 1 & 2.

Horizontal Control

(Project Coordinates from the Iowa Regional Coordinate System)

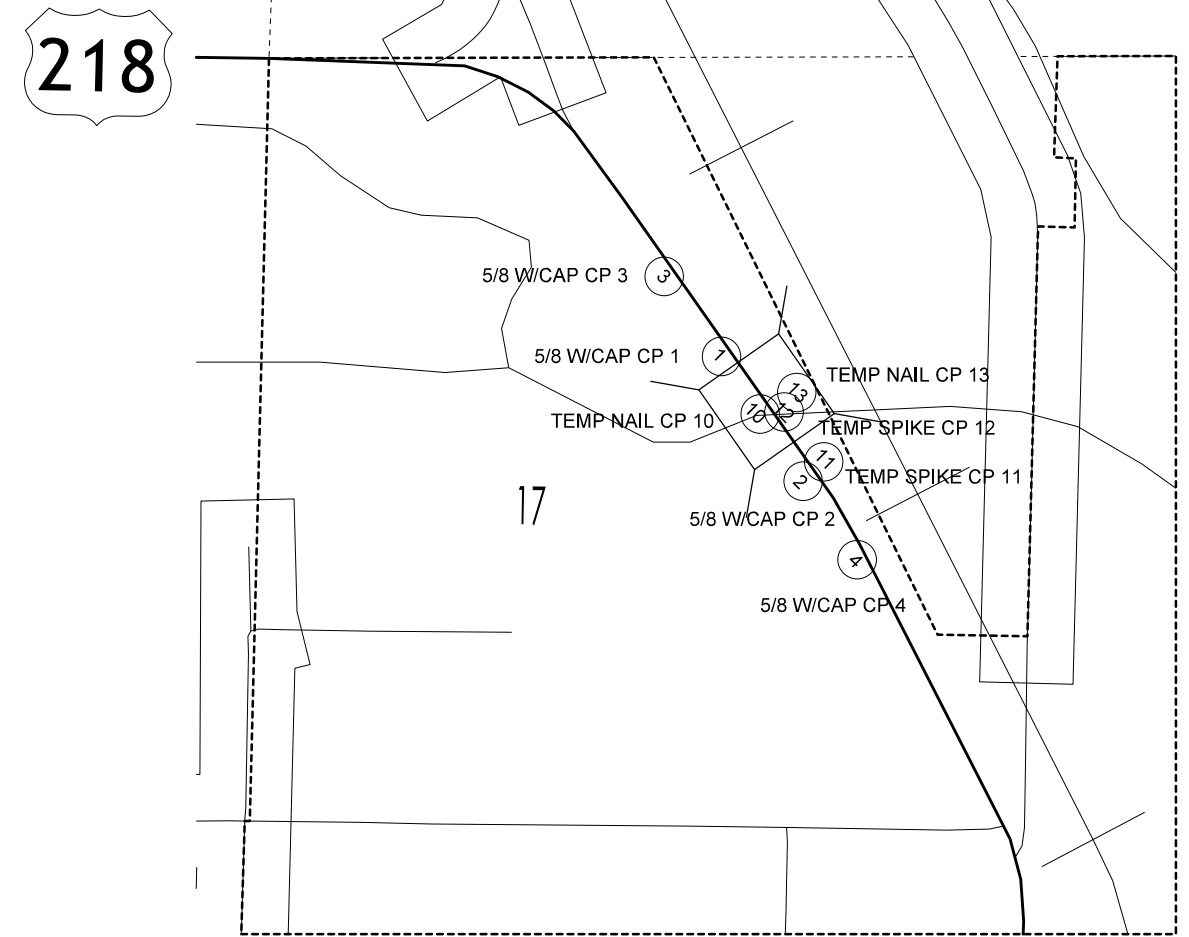
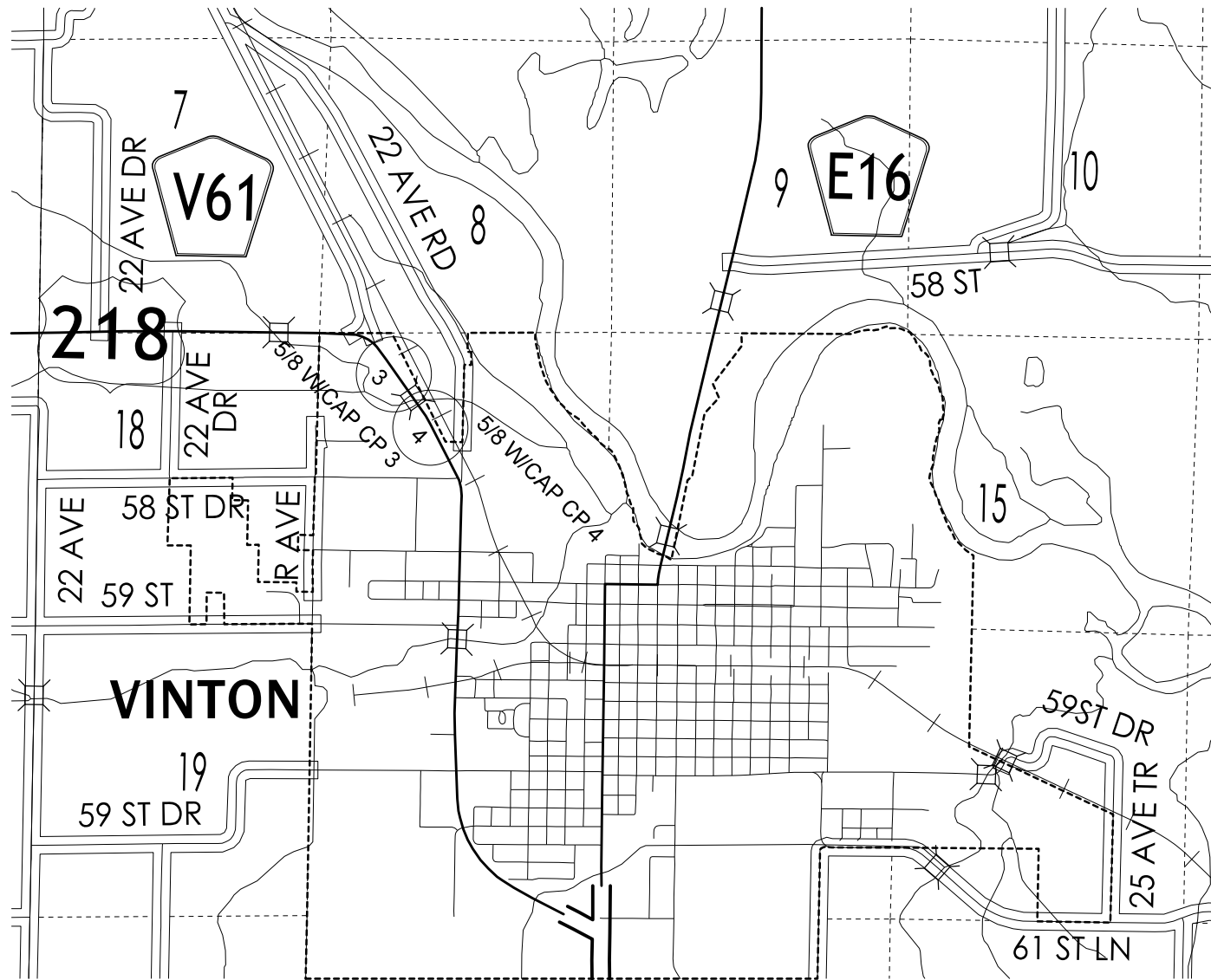
The project coordinate system for this survey is Iowa Regional Coordinate System Zone 10 Cedar Rapids (U.S. Survey Feet). This survey control is relative to IaRTN reference stations. IaRTN Reference Station coordinates are relative to the National Reference Station network datum: NAD83 (2011) for Epoch 2010.00. Coordinates were determined by averaging a minimum of five IaRTN observations with appropriate time occupation times. Additional control points were placed throughout the project using a Total Station setup relative to Point 1 and Point 2.

Alignment Information

The horizontal alignment for this survey was established from best fit centerline points. Survey stationing was equated to the Plan F-251-A 1928 plan RCB Culvert Sta: 32+15 and run back and ahead without equation throughout the survey.

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

1a. Regional Coordinate System Zone 10

Coordinate listing from next sheet will be used with 1aRTN 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

Ia. Regional Coordinate System Zone 10

CONTROL POINTS				
POINT NO.	NORTHING	EASTING	ELEVATION	DESCRIPTION
1	8125930.20	20398482.23	794.74	CP 1 5/8 W/CAP
2	8125522.61	20398778.11	787.49	CP 2 5/8 W/CAP
3	8126202.05	20398287.52	797.26	CP 3 5/8 W/CAP
4	8125239.58	20398943.20	785.70	CP 4 5/8 W/CAP
10	8125734.57	20398613.61	782.20	CP 10 NAIL
11	8125563.67	20398810.88	785.34	CP 11 SPIKE
12	8125741.68	20398694.91	783.18	CP 12 SPIKE
13	8125807.67	20398737.78	784.60	CP 13 NAIL

EDWARDS PLUMBING
 30"x25' RCP (REMOVE)
 BUILD
 30"x20' RCP (FES APRON)
 STA: 16+23.17, OFF: 44.9')

MANHOLE STRUCTURE (REMOVE)
 BUILD
 SW-402 (6'x4') MANHOLE
 STA 16+20, OFF. 19.8' LT

TAYLOR TWP.
 T-85N R-10W
 SEC. 17

THOMAS S. &
 EUNICE J. PINGENOT

24"x108' RCP
 (REMOVE AND REPLACE 8' SEGMENT)

STA. 16+03.00
 BEGIN CONSTRUCTION

STA. 16+41.50
 END CONSTRUCTION

16+06
 24'±EX.R/W

16+35
 24'±EX.R/W

16+00
 35'

16+15
 30'

16+27
 30'

16+49
 35'

3'x3'x38' RCB (REMOVE)
 BUILD
 42" EQUIV ARCH RCP (52"x32")x37'
 CONCRETE FES APRON EXTENDS APPROX 1.5' BEYOND ROW
 STA: 16+20.89, OFF: 25.5' RT

TEMPORARY EASEMENT TO SHAPE

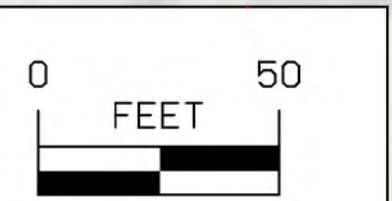
2R
 IOWA NORTHERN RAILROAD COMPANY

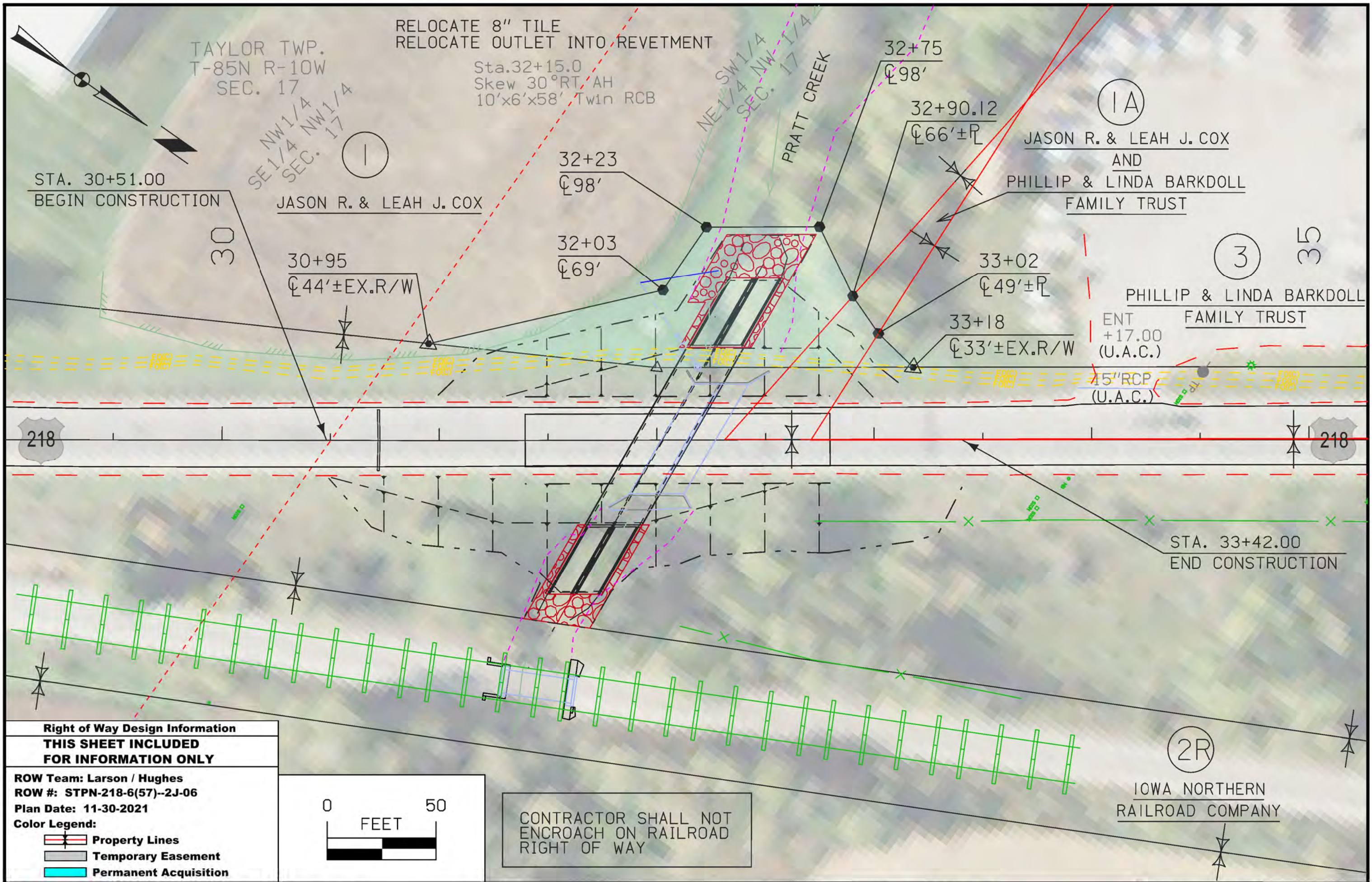
Right of Way Design Information
THIS SHEET INCLUDED FOR INFORMATION ONLY

ROW Team: Larson / Hughes
 ROW #: STPN-218-6(57)--2J-06
 Plan Date: 11-30-2021

Color Legend:

- Property Lines
- Temporary Easement
- Permanent Acquisition





TAYLOR TWP.
T-85N R-10W
SEC. 17

RELOCATE 8" TILE
RELOCATE OUTLET INTO REVETMENT
Sta. 32+15.0
Skew 30° RT/AH
10'x6'x58' Twin RCB

STA. 30+51.00
BEGIN CONSTRUCTION

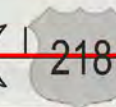
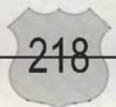
JASON R. & LEAH J. COX

JASON R. & LEAH J. COX
AND
PHILLIP & LINDA BARKDOLL
FAMILY TRUST

PHILLIP & LINDA BARKDOLL
FAMILY TRUST

ENT
+17.00
(U.A.C.)
15" RCP
(U.A.C.)

STA. 33+42.00
END CONSTRUCTION



Right of Way Design Information
THIS SHEET INCLUDED
FOR INFORMATION ONLY

ROW Team: Larson / Hughes
ROW #: STPN-218-6(57)--2J-06
Plan Date: 11-30-2021

Color Legend:

- Property Lines
- Temporary Easement
- Permanent Acquisition



CONTRACTOR SHALL NOT
ENCROACH ON RAILROAD
RIGHT OF WAY

IOWA NORTHERN
RAILROAD COMPANY

108-23A
08-01-08

TRAFFIC CONTROL PLAN

- 1) While existing bridge is removed and RCB is being constructed, US 218 traffic shall be maintained via off-site detour as shown on sheet A.2.
- 2) Contractor shall provide, install, maintain and remove all detour signage.

108-25
10-21-14

511 TRAVEL RESTRICTIONS

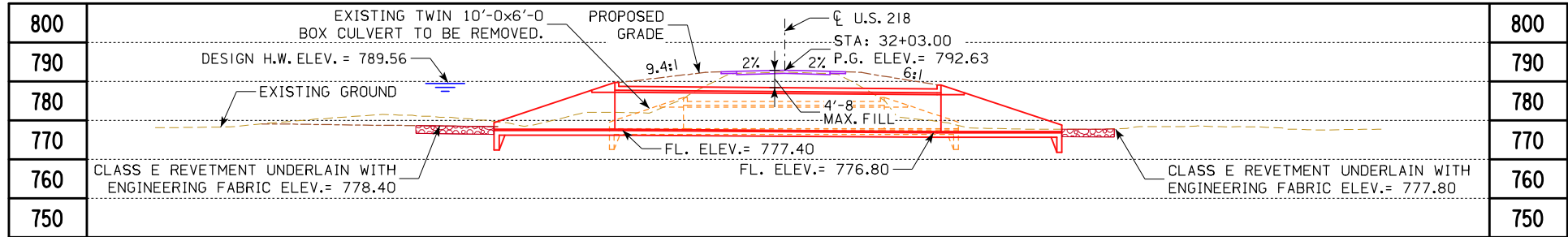
Route	Direction	County	Location Description	Feature Crossed	Object Type	Maint. Bridge No., Structure ID, or FHWA No.	Type of Restriction	Existing Measurement	Construction Measurement	Construction Measurement as Signed	Projected As Built Measurement	Remarks
US 218	Both	Benton	0.1 Miles East of Co. Rd. V-61	Small Stream			None					

111-01
04-17-12

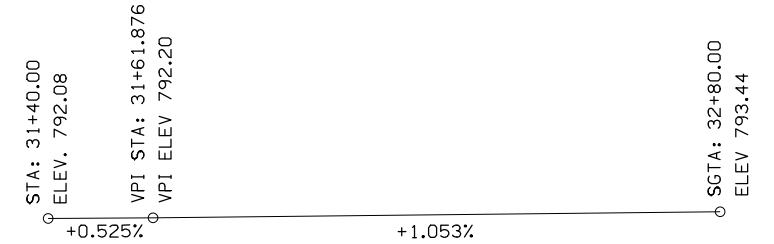
COORDINATED OPERATIONS

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	



BENCH MARK NO. 1: STA: 34+44.48, 29.73 LT SET 5/8" IRON ROD WITH RED CAP, 29.8 FEET
SOUTHEAST OF LIGHT POLE AND 29.7 FEET SOUTHWEST OF CENTERLINE US 218. ELEVATION = 794.74



LONGITUDINAL SECTION ALONG \varnothing CULVERT

PROPOSED PROFILE GRADE U.S. 218

NOTES:

GENERAL NOTES
1. THIS DESIGN IS FOR THE REPLACEMENT OF THE EXISTING TWIN 10'-0x6'-0x58'-0 RCB CULVERT DESIGN NO. 8526, BENTON FHWA NO. 14345, MAINT. NO. 0649.2S218.

DESIGNER NOTES
1. BURIED AND OVERHEAD UTILITIES TO BE RELOCATED TEMPORARILY OR PERMANENTLY AS REQUIRED FOR CONSTRUCTION.
2. AN IOWA DNR FLOOD PLAIN PERMIT IS REQUIRED.

PLAN NOTES
1. DRAINAGE THROUGH EXISTING CULVERT/CHANNEL MUST BE MAINTAINED THROUGHOUT CONSTRUCTION.
2. FLOW LINE OF CULVERT HAS BEEN SET 1 FOOT BELOW STREAMBED.

HYDRAULIC DATA

DRAINAGE AREA = 2.5 SQ. MI.
Q₅₀ = 1,790 CFS
HW ELEV. = 789.56
STREAM SLOPE = 33.80 FT./MI.
Q₁₀₀ = 2,140 CFS
HW ELEV. = 790.13
Q₅₀₀ = 3,090 CFS
HW ELEV. = 791.25

UTILITIES LEGEND:

- ALLIANT ENERGY
- UB CENTRYLINK PEDISTAL
- EB ALLIANT ENERGY ELECTRIC BOX
- ⊛ LUMINAIRE
- FO(C)— CENTRYLINK FIBER OPTIC

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

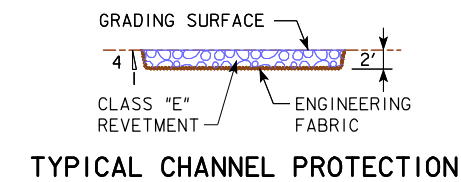
LOCATION TRAFFIC ESTIMATE

US 218 OVER PRATT CREEK	2024 AADT	3,000	V.P.D.
T-85N R-10W SECTION 17	2044 AADT	3,100	V.P.D.
CITY OF VINTON	2044 DHV	320	V.P.H.
BENTON COUNTY	TRUCKS	11	%
FHWA NO. 14346	TOTAL		
BRIDGE MAINT. NO. 0649.2S218	DESIGN ESALS		
LATITUDE 42.177795°			
LONGITUDE -92.040569°			

PRELIMINARY

ESTIMATED REVETMENT QUANTITIES

LOCATION	REVETMENT CL. "E" (TON)	ENGINEERING FABRIC (SY)	EXCAVATION (CY)
INLET	139	169	87
OUTLET	81	108	51
TOTALS	220	276	138



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.

Philip M. Harpole 10-05-2021
Signature Date
Philip M Harpole
Printed or Typed Name

My license renewal date is December 31, 2021

Pages or sheets covered by this seal: V.1

DESIGN FOR 30° SKEW L.A.
TWIN 10'-0x10'-0x94'-0 CAST IN PLACE CONCRETE CULVERT
SITUATION PLAN
STATION 32+03 SEPTEMBER 2021
BENTON COUNTY
IOWA DEPARTMENT OF TRANSPORTATION
DESIGN SHEET NO. 1 OF 1 FILE NO. 31932 DESIGN NO. 124

LINE SURVEY SYMBOLS OF CROSS SECTION SHEETS (ROAD)

- - - - - - Existing Ground Line
- Proposed Template
- Proposed Topsoil Placement
- - - - - Additional Topsoil Removal
- Subgrade Treatment
- - - - - Granular Shoulder
- Pavement
- - - - - Existing Pipe\RCB
- Proposed Pipe\RCB
- Proposed Dike
- All Elements Associated with Proposed Entrances

LINE STYLE LEGEND OF CROSS SECTION SHEETS (SOILS)

- Topsoil (Class 10)
- Slope Dressing Only
- Class 10 Materials
- Select Loams And Clay-Loams
- Select Sand
- Unsuitable Type A Disposal
- Unsuitable Type B Disposal
- Unsuitable Type C Disposal
- Shale
- Waste
- Broken and Weathered Rock
- Solid Rock
- Boulders

Note: All layer lines and descriptions identify layers above the line.

Note: Vertical or near vertical lines connecting soil layers at edges of cross sections are only for the purpose of calculating template quantities and do not depict soil stratification.

SYMBOL LEGEND OF CROSS SECTION SHEETS

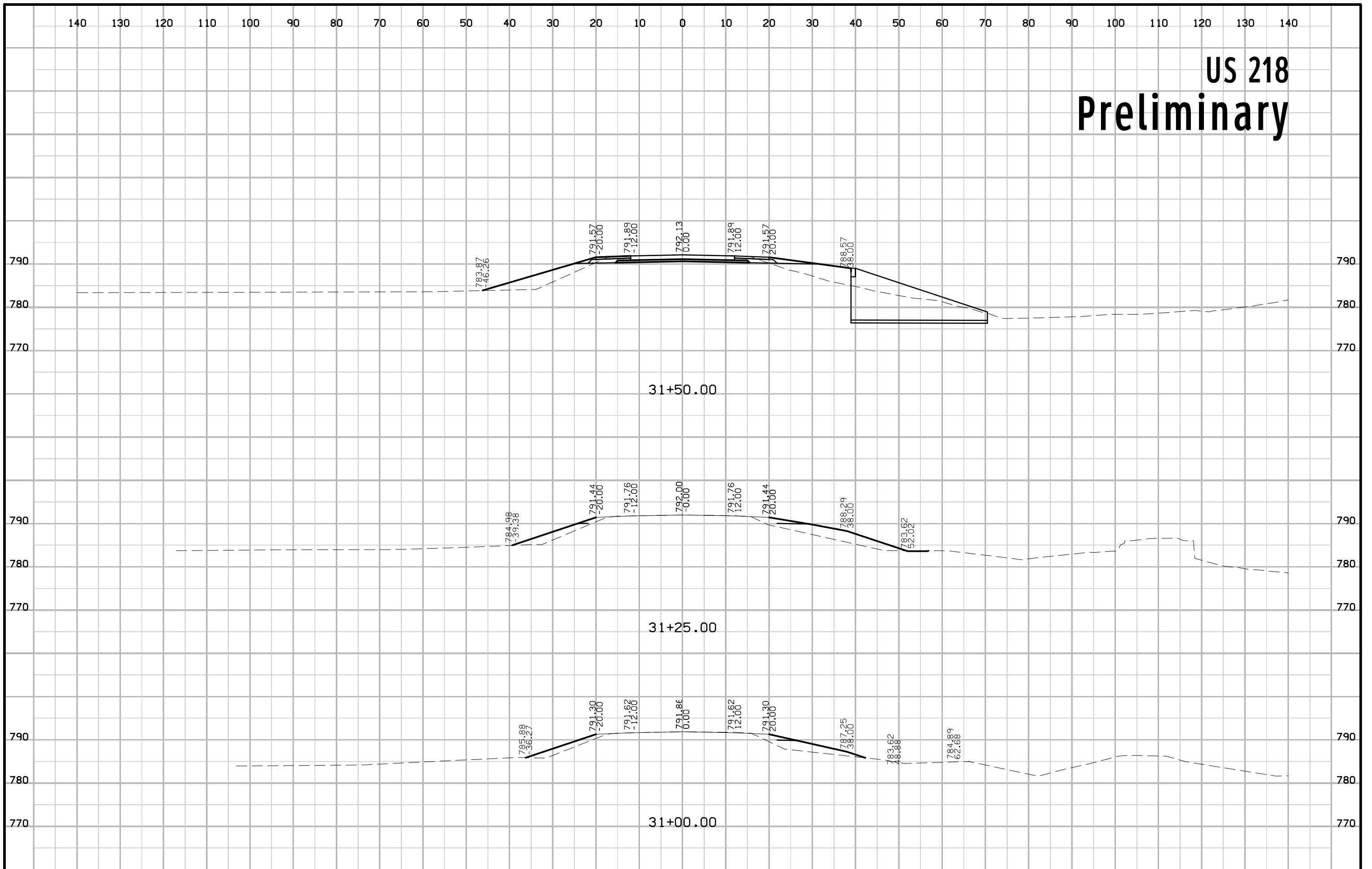
- Existing ROW
|
Existing Right-of-Way Limit
- Proposed ROW
|
Proposed Right-of-Way Limit
- Temporary ROW
|
Temporary Right-of-Way Limit

UTILITY LEGEND

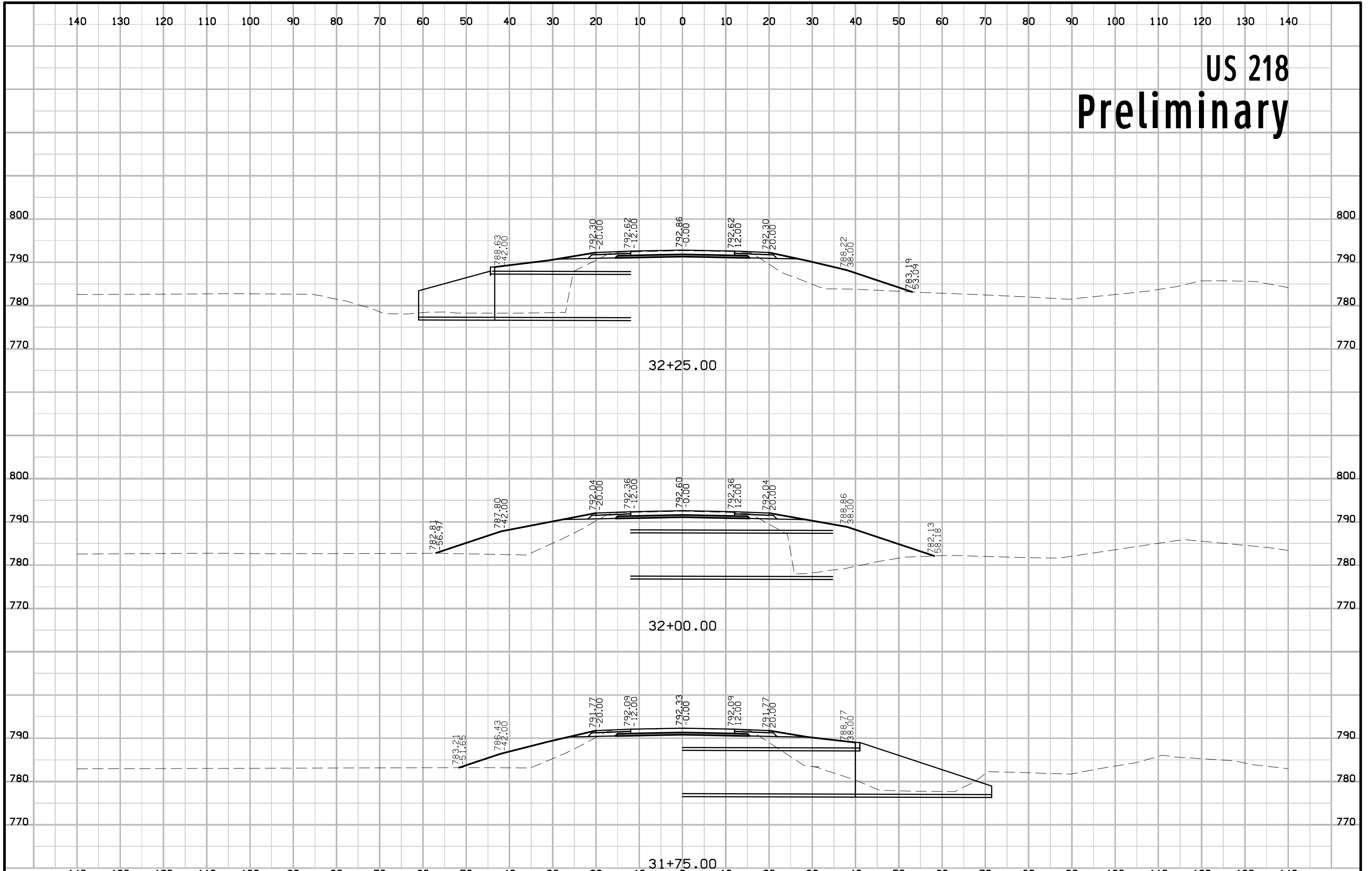
**CROSS SECTION
LEGEND AND SYMBOL
INFORMATION SHEET**

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

US 218 Preliminary



US 218 Preliminary



US 218 Preliminary

