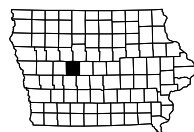


LETTING DATE
11-15-2022

RCB CULVERT REPLACEMENT - TWIN BOX
BRF-144-3(22)--38-37

GREENE CO.



Highway Division

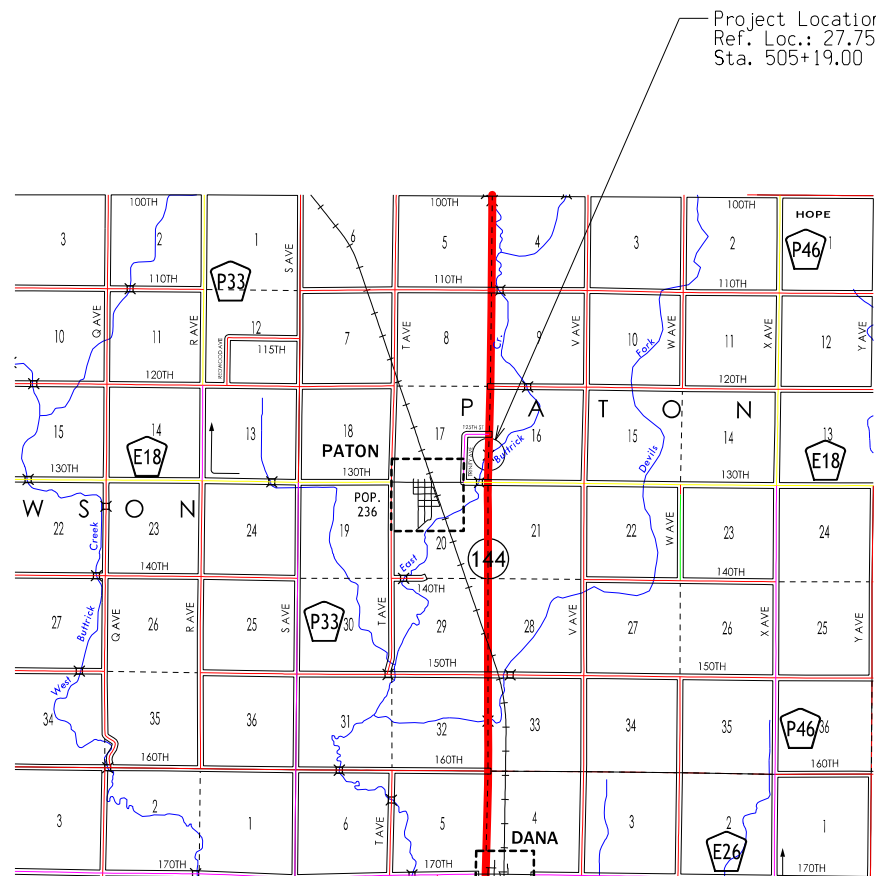
PLANS OF PROPOSED IMPROVEMENT ON THE

GREENE COUNTY

RCB CULVERT REPLACEMENT - TWIN BOX

East Buttrick Creek 6.7 mi S of IA 175

SCALES: As Noted



Project Location:
Ref. Loc.: 27.75
Sta. 505+19.00

Refer to the Proposal Form for list of applicable specifications.

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



REVISIONS

TOTAL	--
PROJECT IDENTIFICATION NUMBER	18-37-144-010
PROJECT NUMBER	BRF-144-3(22)--38-37
R.O.W. PROJECT NUMBER	STPN-144-3(23)--2J-37

INDEX OF SHEETS	
No.	DESCRIPTION
A Sheets	Title Sheets
* A.1	Title Sheet
* A.1	Location Map Sheet
B Sheets	Typical Cross Sections and Details
B.1 - 3	Typical Cross Sections and Details
D Sheets	Mainline Plan and Profile Sheets
* D.1	Plan & Profile Legend & Symbol Information Sheet
* D.2 - 3	IA 144
G Sheets	Survey Sheets
G.1	Survey Information
G.2	Control Point Vicinity Map
G.3	Horizontal Control Tab. & Super for all Alignments
J Sheets	Traffic Control and Staging Sheets
J.1	Traffic Control Plan
J.1	Staging Notes Stage
J.2	Detour Map
V Sheets	Bridge and Culvert Situation Plans
V.1 - 2	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

D4 PLAN - Date: 7-19-2022
LETTING - Date: 11-15-2022

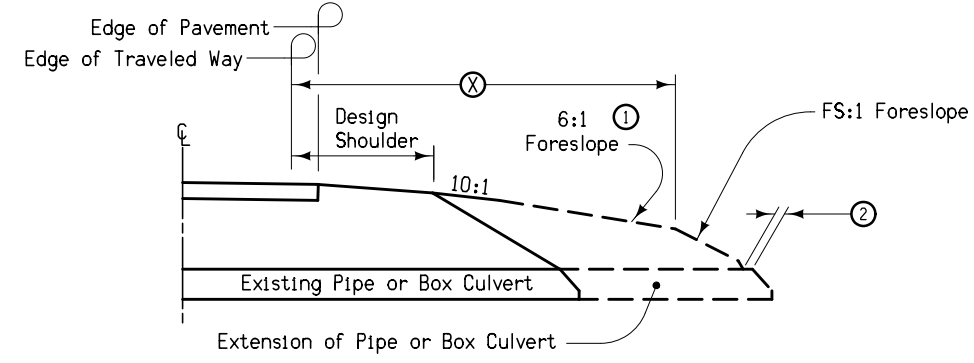
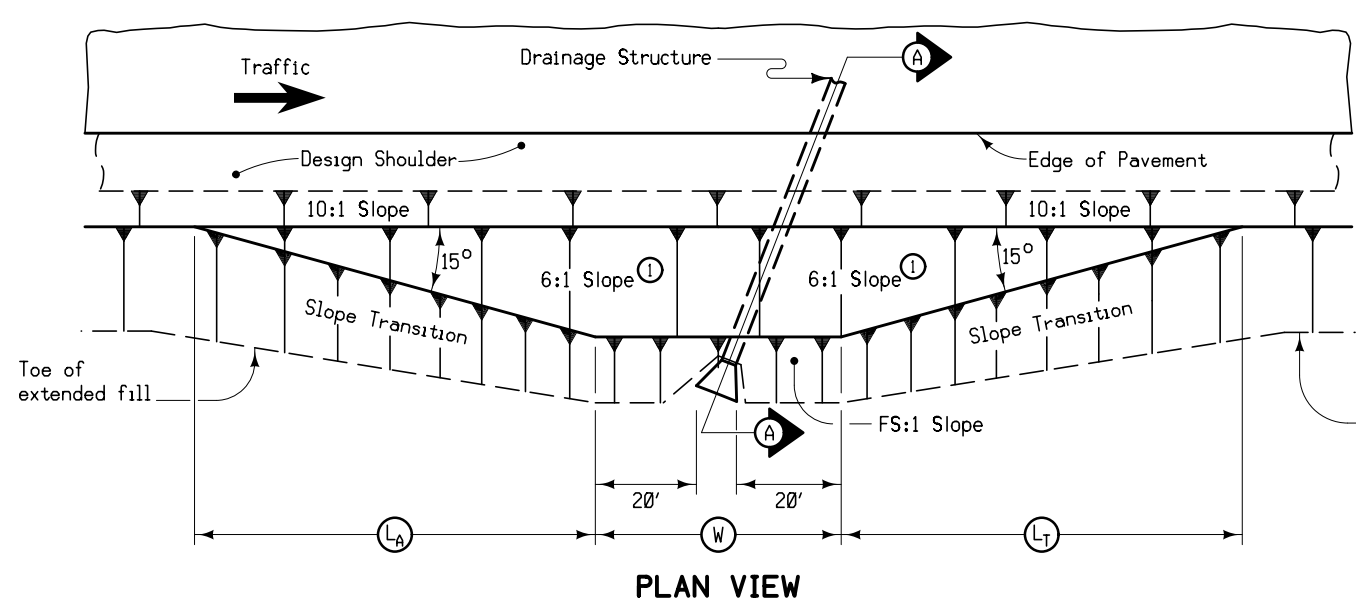
PRELIMINARY PLANS

Subject to change by final design.

D5 PLAN - Date: 1-12-2020

DESIGN DATA RURAL			
2021 AADT	590	V.P.D.	
2041 AADT	640	V.P.D.	
20 DHV		V.P.H.	
TRUCKS	31	%	
Total Design ESALs			

INDEX OF SEALS		
SHEET NO.	NAME	TYPE
A.1	X	Primary Signature Block



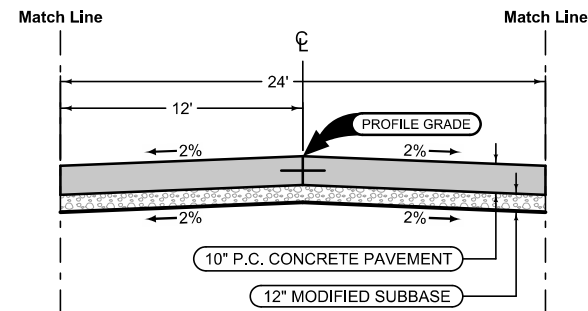
SECTION A-A

At locations where an extended or newly constructed drainage structure extends beyond the normal foreslope cover, flatten as indicated so as to cover the structure. Minimum earth cover is 6 inches.

- ① Slope may be flatter than 6:1.
- ② 6 inch minimum for pipe installations or to top of headwall on RCB.
- ③ At \bar{C} of road.
- Ⓜ = Pipe or RCB opening width plus 20 feet each side.

STRUCTURE LOCATION		Ⓜ	Ⓐ	Ⓙ	Ⓧ	ⓕ
STATION ③	SIDE	Feet	Feet	Feet	Feet	
505+19.00	Both	X	X	X	24	X

BARNROOF FORESLOPE AT SKEWED DRAINAGE STRUCTURE

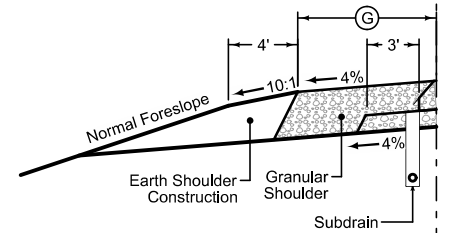


Mainline Jointing:
 Transverse joints: CD at 17' spacing
 Longitudinal joint: L-2

2P_	
04-21-20	
STATION TO STATION	
504+25.00	506+50.00

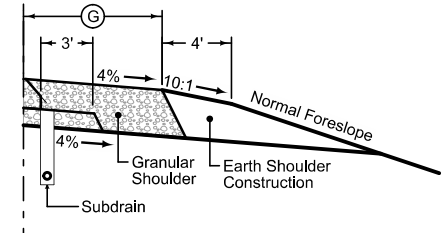
Granular Shoulder

2_G_		
04-21-20		
STATION TO STATION		Ⓞ
Feet		Feet
504+25.00	506+50.00	6



Granular Shoulder

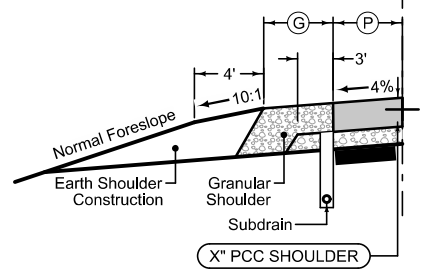
2_G_		
04-21-20		
STATION TO STATION		Ⓞ
Feet		Feet
504+25.00	506+50.00	6



Full Depth PCC Combination Shoulder

Shoulder Jointing:
 Longitudinal joint: BT-2, L-2 or KT-2
 Transverse joints: C at 17' spacing

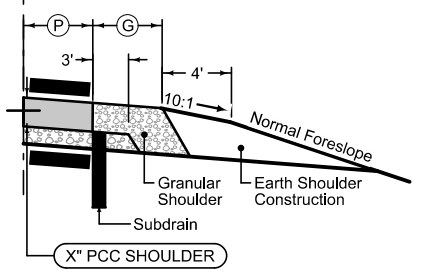
2_C_FullPCC_			
04-20-21			
STATION TO STATION		Ⓟ	Ⓞ
Feet		Feet	Feet
504+25.00	506+50.00	4	2



Full Depth PCC Combination Shoulder

Shoulder Jointing:
 Longitudinal joint: BT-2, L-2 or KT-2
 Transverse joints: C at 17' spacing

2_C_FullPCC_			
04-20-21			
STATION TO STATION		Ⓟ	Ⓞ
Feet		Feet	Feet
504+25.00	506+50.00	4	2



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

ROADWAY IDENTIFICATION IA 144

SURVEY SYMBOLS

- WC Wild Card (Misc. Field Shot)
- REF Reference Tie Point
- SCR Section Corner
- ROW Right of Way Mark
- TW Top of Water
- SP Stream Profile
- GDL Guard Rail Steel
- PRO Profile Shot
- CUL Culvert
- PLG Location of General Photo
- SOP Size of Pipe or Culvert
- C Centerline BL of Road (ML or SR)
- SNP Unpaved Shoulder
- EP Edge of Paved Roads (ML or SR)
- ENU Edge Unpaved Entrance & Parking
- CON Concrete or A/C Slab
- BD Bridge Deck
- BCL Bridge Centerline
- BRG Bridge
- BL Topo Breakline
- PPA Power Pole Co. 1
- SIGN SI Sign
- x--- FW Wire Fence
- x--- WL1D Water Line Co. 1 - Quality D
- CP Control Point
- BNK Stream Bank
- TIL Tile Line
- RIP Rip-Rap
- BLS Bridge Low Steel
- D Centerline Draw or Stream (Down)
- OUT Tile Outlet
- EW Edge of Water
- ENT Centerline BL of Entrance
- fo--- FO1D Fiber Optic Co. 1 - Quality D
- SBR Size of Bridge
- LIN Miscellaneous Line
- TOP Top of Bridge Pier
- PCP Photo Control Point

UTILITY LEGEND

This is a POINT 25 Project and is subject to the provisions of IAC 761-115.25.

- FO - Webster-Calhoun Co-op Telephone Assn.
Daryl Promes
1106 Beek Street, PO Box 475
Gowrie, IA 50543
(515) 352-3151
dpromes@wccta.com
- Midland Power Cooperative
Bill McKim
1005 E Lincolnway
Jefferson, IA 50129-2063
(515) 386-4111
b.mckim@midlandpower.coop
- T1 - Lehigh Valley Co-Op Telephone
Jim Suchan
9090 Taylor Road
Lehigh, IA 50557
(515) 359-2211
Jsmgr@lvcta.com
- W - Xenia Rural Water District
LeRoy Wagner
23998 - 141st Street
Bouton, IA 50039
(515) 676-2117
lwagner@xenialwater.org

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

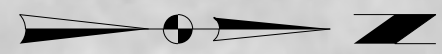
- Reference Point
- Station
- Survey Line
- Section Corner
- Ground Line Intercept
- Saw Cut
- Guardrail
- Trench Drain
- HighTension Cable Guardrail
- Sheet Pile
- Pavement Removal
- Clearing & Grubbing Area

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)



Paton Twp.
T-85N R29W
Sec. 17

Curve Data
Δ = 1° 35' 55.00" (RT)
T = 318.40
L = 636.76
E = 22,822.05
P = 2.22

Sta. 504+25.00
Begin Project

Sta. 506+50.00
End Project

502

503

504

505

506

507

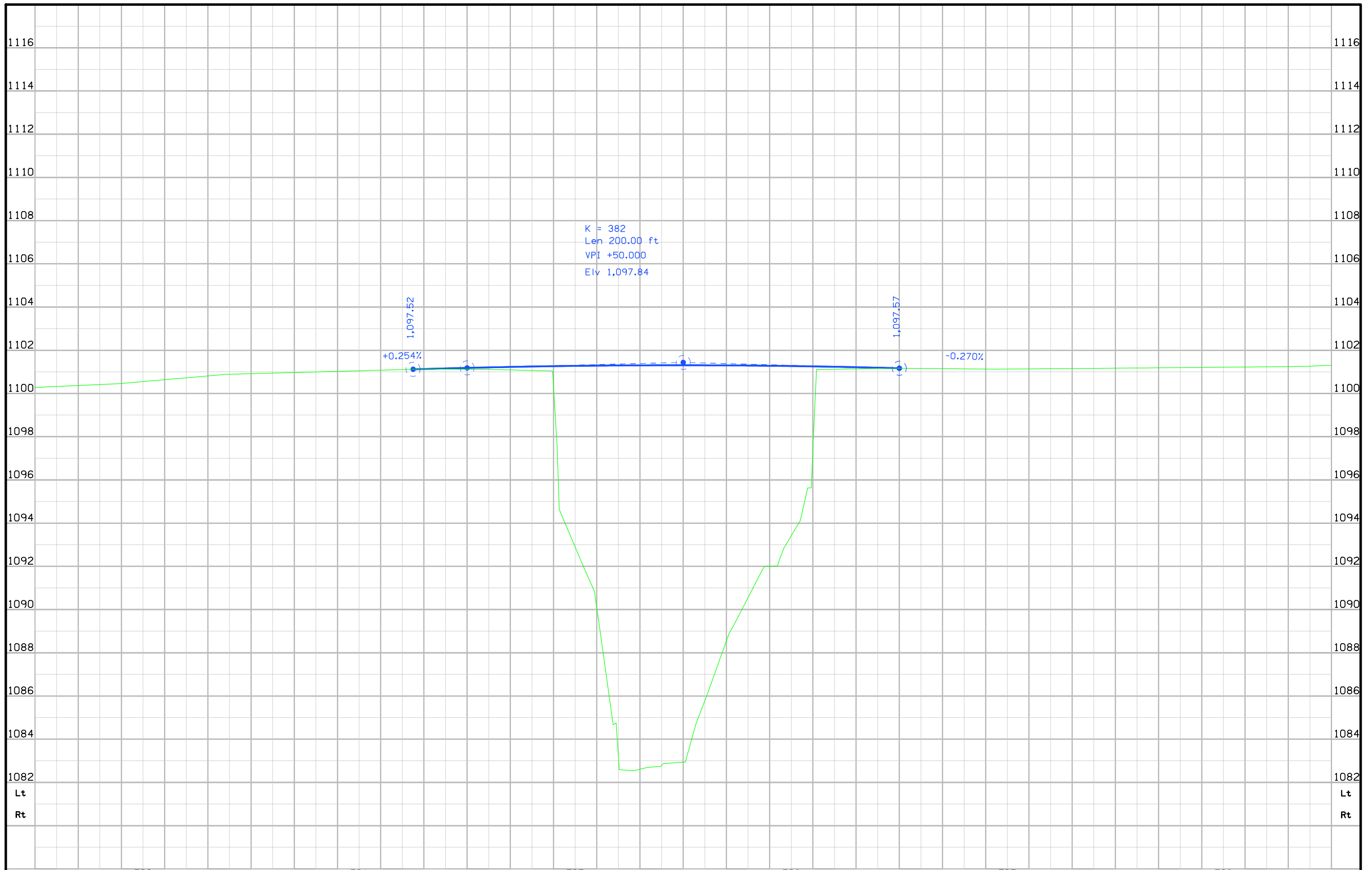
508

144

Paton Twp.
T-85N R29W
Sec. 16

(Remove)
Sta. 505+51
120' X 26' Continuous I-Beam Bridge
D.A.=44.5 SQ Miles F-R-T

Sta. 505+19.00
Build TWIN 10'-0x12'-0x96'-0 RCB
Skew = 10° L. Ahd.
F.L. = Lt. 1078.01
Rt. 1078.31
Design No. 0123



K = 382
 Len 200.00 ft
 VPI +50.000
 Eiv 1,097.84

1,097.52
 +0.254%

1,097.57
 -0.270%

Survey Information

Greene County
BRF-144-3(22)--38-37
East Buttrick Creek 6.7 mi S of IA 175
18-37-144-010
Sap-728.2

Date(s) of Survey

Begin Date 02/26/2019
End Date 05/17/2019

General Information

Measurement units for this survey are US survey feet. This survey is for unspecified bridge work @ East Buttrick Creek on IA Hwy 144. Project datum and control information is provided by Design Survey Office. This project is a partial field survey supplemented with photo control.

Vertical Control

Vertical Control was established on 2 points on this project by 6 hour static session. Vertical datum for this survey is relative to NAVD88. Geoid 12 B was used in processing. GRS80 Ellipsoidal Height was computed at project Pts. CP5, and CP6. Vertical control from Project Nos. BRFN-144-3(16)--39-37 was used to establish vertical datum on CP5 AND CP6. Vertical control was checked with IARTN checks.

This survey observed a Bridge Seat Elevation to compare to local ground control:

North Bridge Seat @ East Buttrick Creek Project # 785 (2) Elev. = 1097.42
= North Bridge Seat @ East Buttrick Creek Survey Elev. = 1093.32

Horizontal Control

The project coordinate system for this survey is Iowa RCS Zone 7 (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). Coordinates were determined by conducting six hour static observations. Additional control points were placed throughout the project using a GNSS Base-Rover setups. A minimum of three observations were collected with 1 hour or greater time span between each observation.

Point Name	Northing	Easting	Elevation	Description
FENO1	7482661.740	17606115.190	1091.840	Feno Monument
CP5	7496866.740	17605846.610	1112.610	Conc Monument
CP6	7501351.820	17605957.130	1113.260	Conc Monument

Alignment Information

IA Hwy 144

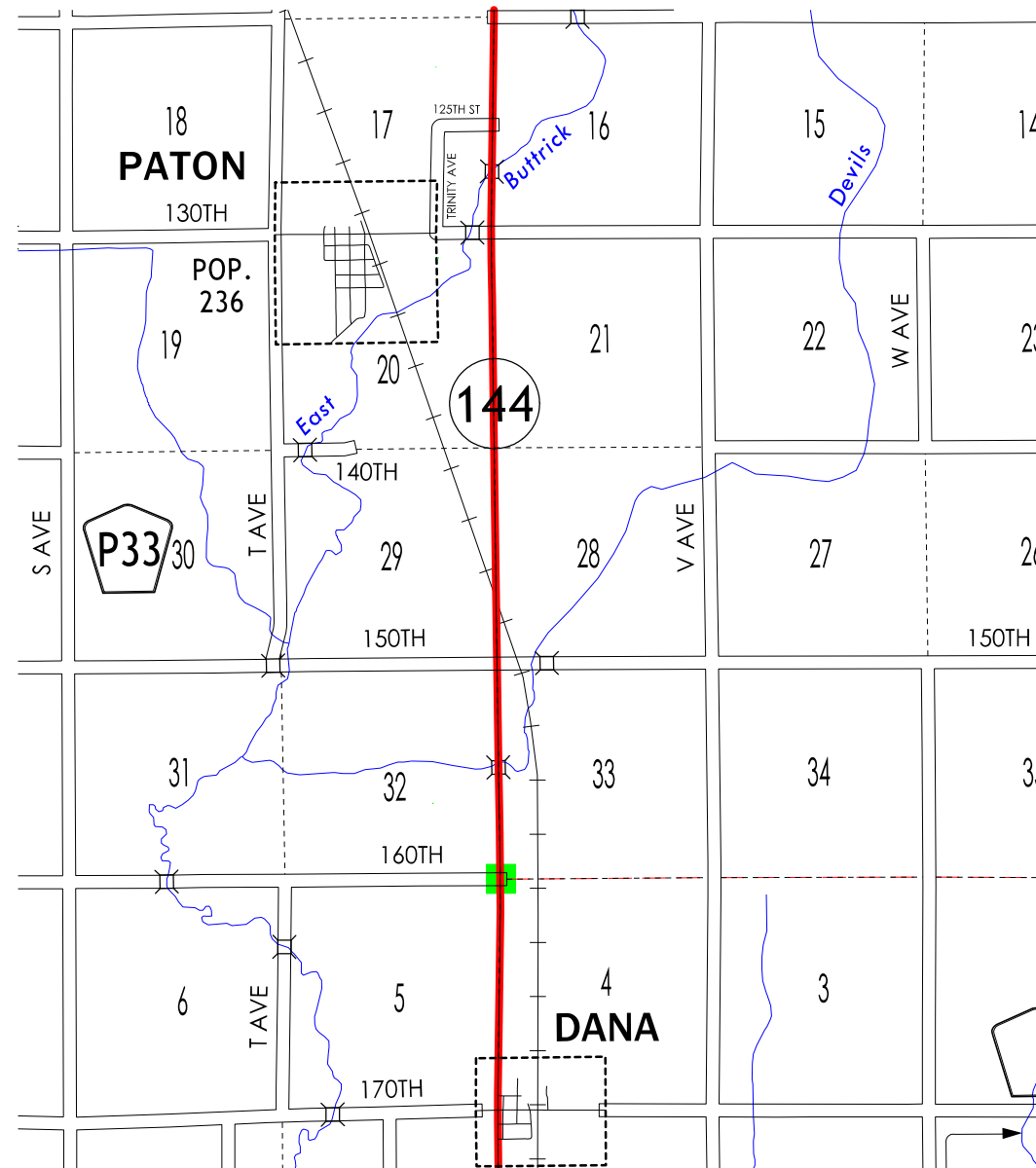
The horizontal alignment for this survey is created from As-built Plans Project # 785 (2). Survey stationing was equated to the Plan PI @ Sta. 490+50.10 and run back and ahead without equation throughout the survey.

Survey stationing relates to as built plan stationing as follows:

PI Sta. 490+50.10 As-built Plans Project No. 785 (2).
= PI Sta. 490+50.10 this 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 7

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

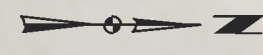
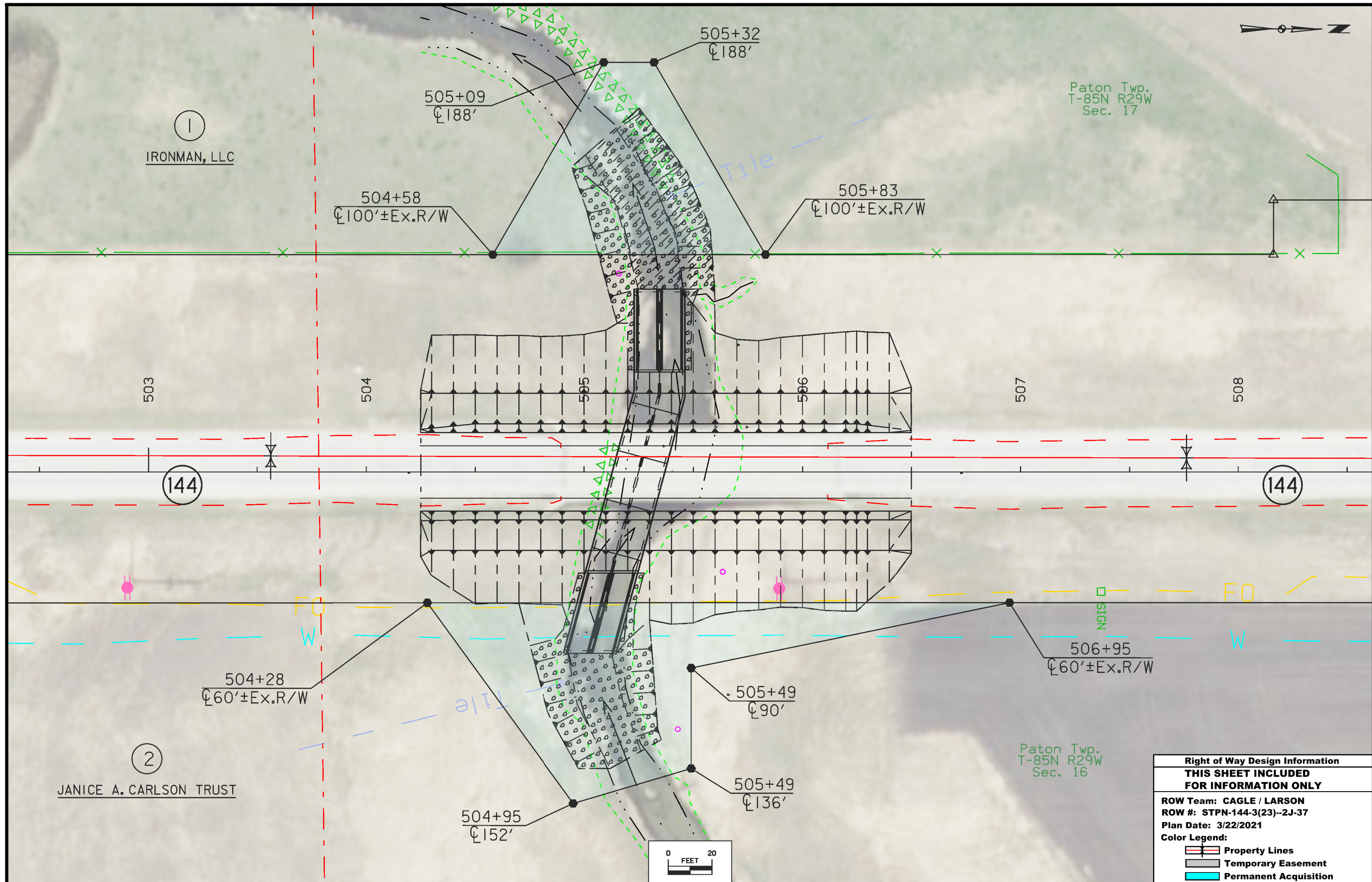
VERT. DATUM: NAVD88

Ia. Regional Coordinate System Zone 7

Point Name	North	East	Elevation	Feature Definition-Description
CP1	7482661.74	17606115.19	1091.84	FENO - IDOT Feno monument located in the approximate center of a field entrance, .3' below ground, 24.5' east of IA Hwy 144, 105.7' SE of conc reference monument, 102.65' NE of conc reference monument, 61.9' NW of conc reference monument, 39.2' SW of conc reference monument.
CP5	7496866.74	17605846.61	1112.61	CP - Conc reference monument located on the backslope of IA Hwy 144 @ Paton Cemetery projecting 1' above ground, 128' south of Paton Cemetery sign, 38' north of the middle entrance into cemetery, 37' west of IA Hwy 144.
CP6	7501351.82	17605957.13	1113.26	CP - Conc reference monument located on the backslope just south of entrance to residence address 345 U Ave, projecting .4 tenths above ground, 121' north of mile marker 28 sign, 57' east of IA Hwy 144, 25' south of residential entrance, 3' northeast of telephone pedestal.

Greene	ROW: STPN-144-3(23)--2J-37				PIN 18-37-144-010														
	East Buttrick Creek 6.7 mi S of IA 175																		
			STATE		COUNTY		CITY			TEMP EASE		BORROW							
PARCEL NO.	OWNER NAME	FEE	EASE	FEE	EASE	FEE	EASE	EXCESS			FEE	T.E.	MITIGATION	OTHER	HOUSE	BUILDING(S)	A/C ONLY	TOTAL ACQ.	
1	Ironman, LLC - Fee		0.15 AC																
2	Janice A. Carlson Trust - Fee		0.22 AC																
2 Parcels	"TOTALS	0 AC	0.37 AC	0 AC	0 AC	0 AC	0 AC	0 AC	0 AC	0 AC	0 AC	0 AC	0 AC	0 AC					
		0 SF		0 SF	0 SF	0 SF	0 SF	0 SF	0 SF	0 SF	0 SF								

NO ACCESS RIGHTS ARE TO BE ACQUIRED ON THIS PROJECT.



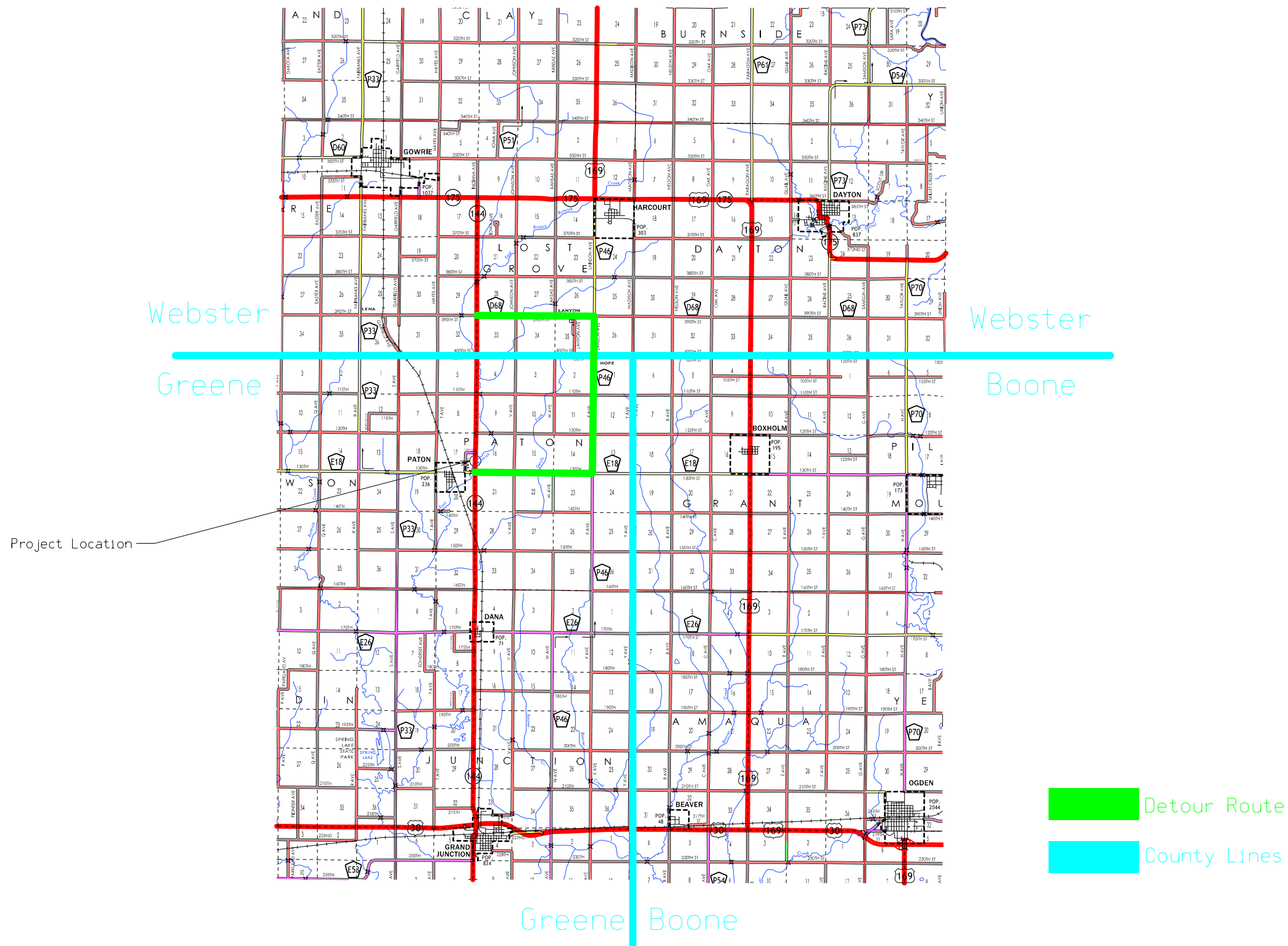
Paton Twp.
T-85N R29W
Sec. 17

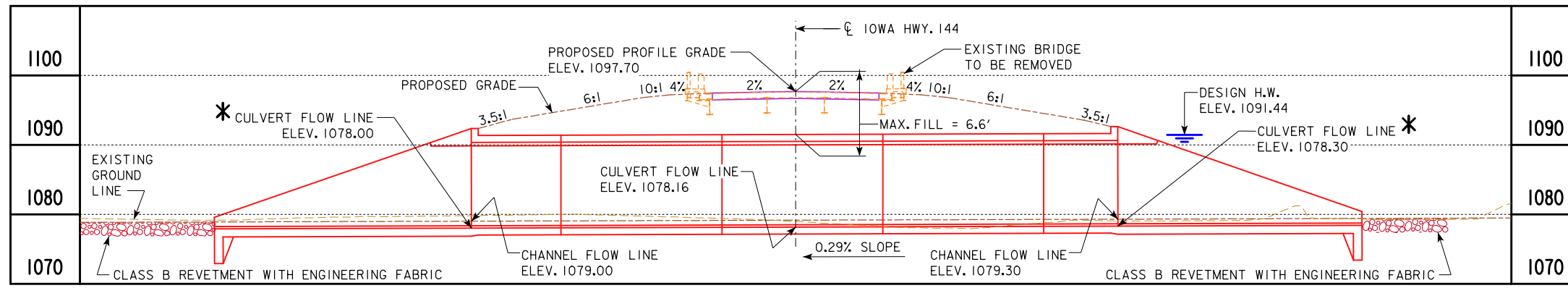
①
IRONMAN, LLC

②
JANICE A. CARLSON TRUST

Right of Way Design Information	
THIS SHEET INCLUDED FOR INFORMATION ONLY	
ROW Team: CAGLE / LARSON	
ROW #: STPN-144-3(23)--2J-37	
Plan Date: 3/22/2021	
Color Legend:	
	Property Lines
	Temporary Easement
	Permanent Acquisition

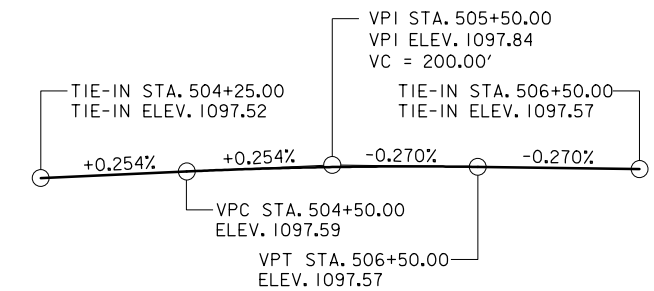






LONGITUDINAL SECTION ALONG CULVERT

CONTROL POINT 6: NORTHING 7501351.82 EASTING 17605957.13 ELEVATION 1113.26 DESCRIPTION: CONC REFERENCE MONUMENT LOCATED ON THE BACKSLOPE JUST SOUTH OF ENTRANCE TO RESIDENCE ADDRESS 345 U AVE, PROJECTING .4 TENTHS ABOVE GROUND, 121' NORTH OF MILE MARKER 28 SIGN, 57' EAST OF IA HWY 144, 25' SOUTH OF RESIDENTIAL ENTRANCE, 3' NORTHEAST OF TELEPHONE PEDESTAL.



PROPOSED PROFILE GRADE ON IOWA HIGHWAY 144

* CULVERT FLOW LINE BURIED 1.0 FOOT BELOW CREEK BOTTOM TO PROVIDE A NATURAL REESTABLISHED CREEK BOTTOM FOR FISH PASSAGE.

HYDRAULIC DATA

DRAINAGE AREA = 46.8 SQ. MI.
 STREAM SLOPE = 15.8 FT./MI.
 DESIGN DISCHARGE, Q_{50} = 2320 CFS
 H.W. ELEV. = 1091.44 FT.
 OUTFLOW VELOCITY = 14.18 ft/s
 DISCHARGE, Q_{100} = 2720 CFS
 H.W. ELEV. = 1094.06 FT.
 OUTFLOW VELOCITY = 15.40 ft/s

TRAFFIC ESTIMATE

2021 AADT	590	V.P.D.
2041 AADT	640	V.P.D.
2041 DHV	33	V.P.H.
TRUCKS	31	%

LOCATION

IOWA 144 OVER EAST BUTTRICK CREEK
 T-85N R-29W
 SECTION 16 & 17
 PATON TOWNSHIP
 FHWA NO. 25771
 BRIDGE MAINT. NO. 3727.6S144
 GREENE COUNTY
 LATITUDE 42.170249°
 LONGITUDE -94.242782°

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: *Steven A. Klocke* Date: 1-6-2021
 Printed or Typed Name: Steven A. Klocke

My license renewal date is December 31, 2021

Pages or sheets covered by this seal: 2 & 3 (HYDRAULIC DATA, CHANNEL GRADING AND REVETMENT)

UTILITY LEGEND

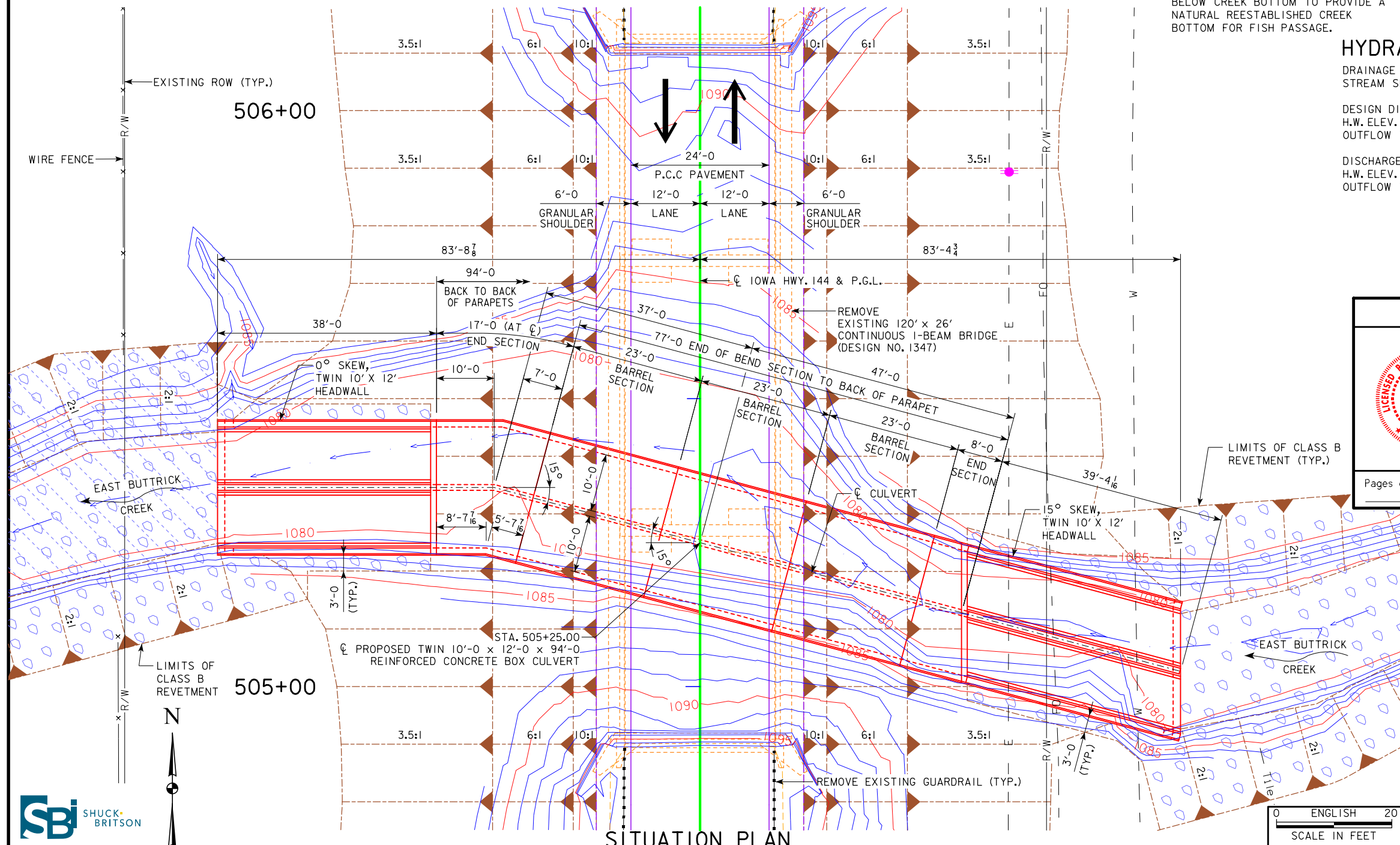
- E-- OVERHEAD ELECTRIC - UNKNOWN
- FO-- FIBER OPTIC LINE - WEBSTER-CALHOUN COOP
- W-- WATER LINE - XENIA RURAL WATER
- POWER POLE

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

DESIGN FOR 15° SKEW (L.A.)
TWIN 10'-0 X 12'-0 X 94'-0
REINFORCED CONCRETE BOX CULVERT

SITUATION PLAN
 STA. 505+25.00 (IA 144) DECEMBER 2020
 GREENE COUNTY

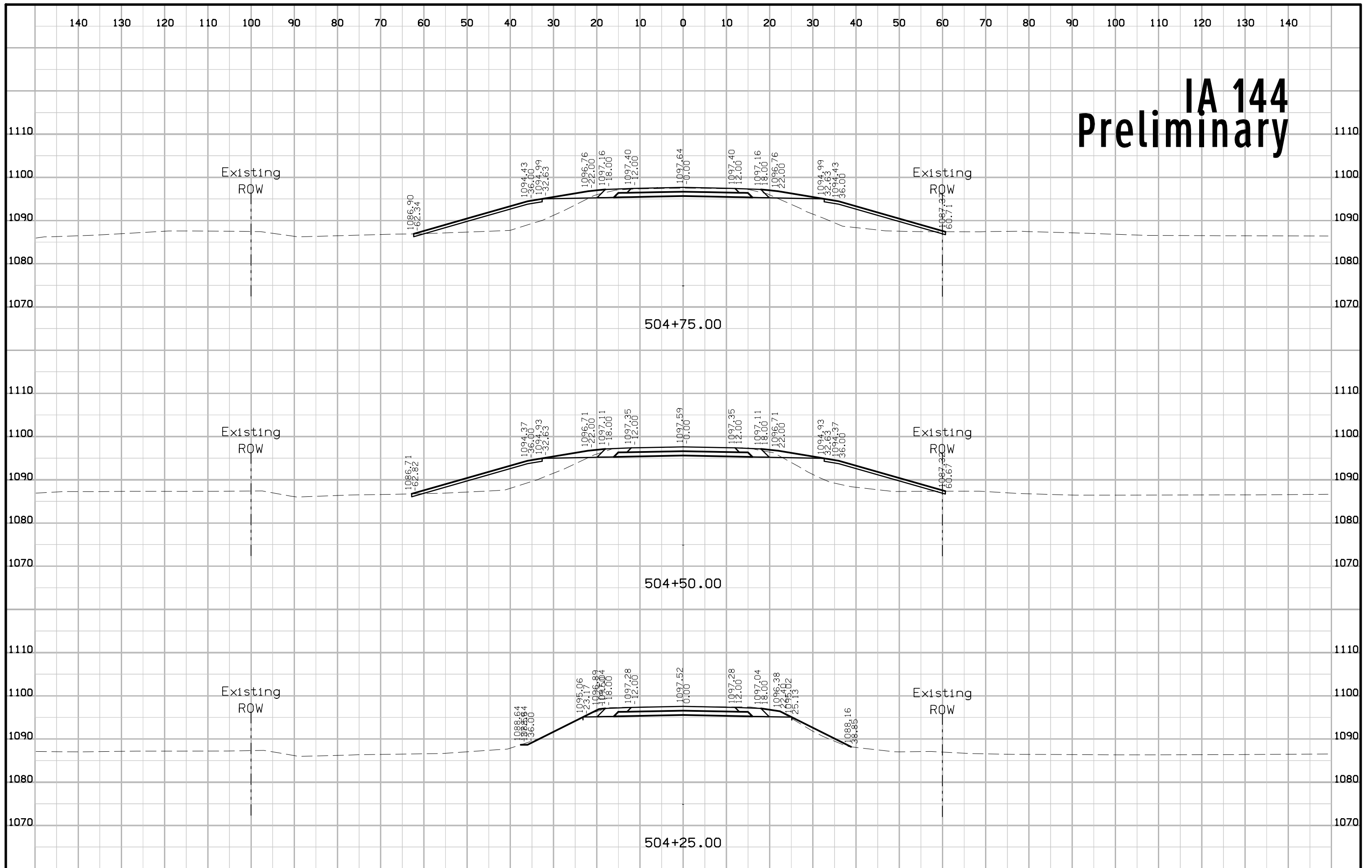
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 1 OF 2 FILE NO. 31708 DESIGN NO. 123



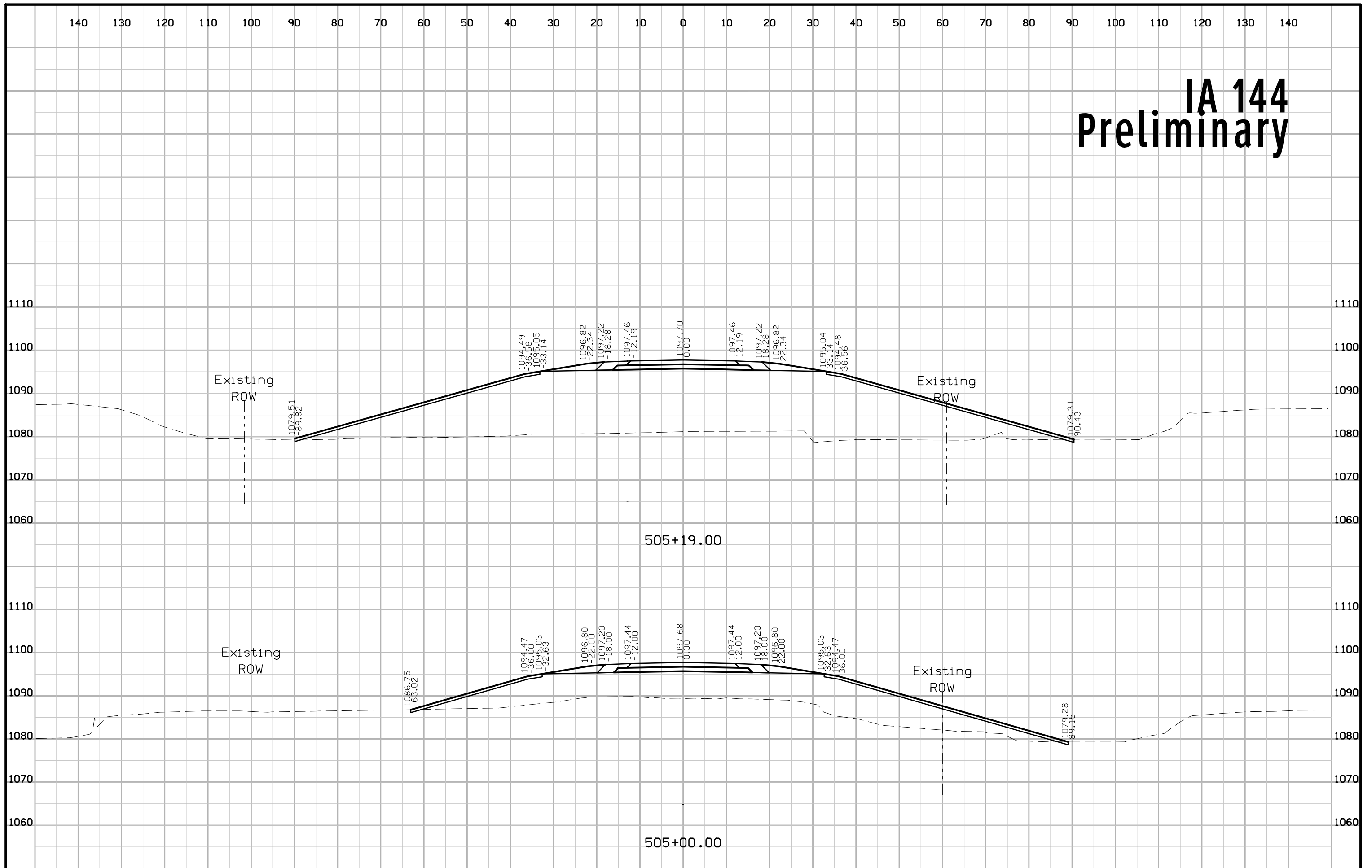
SITUATION PLAN



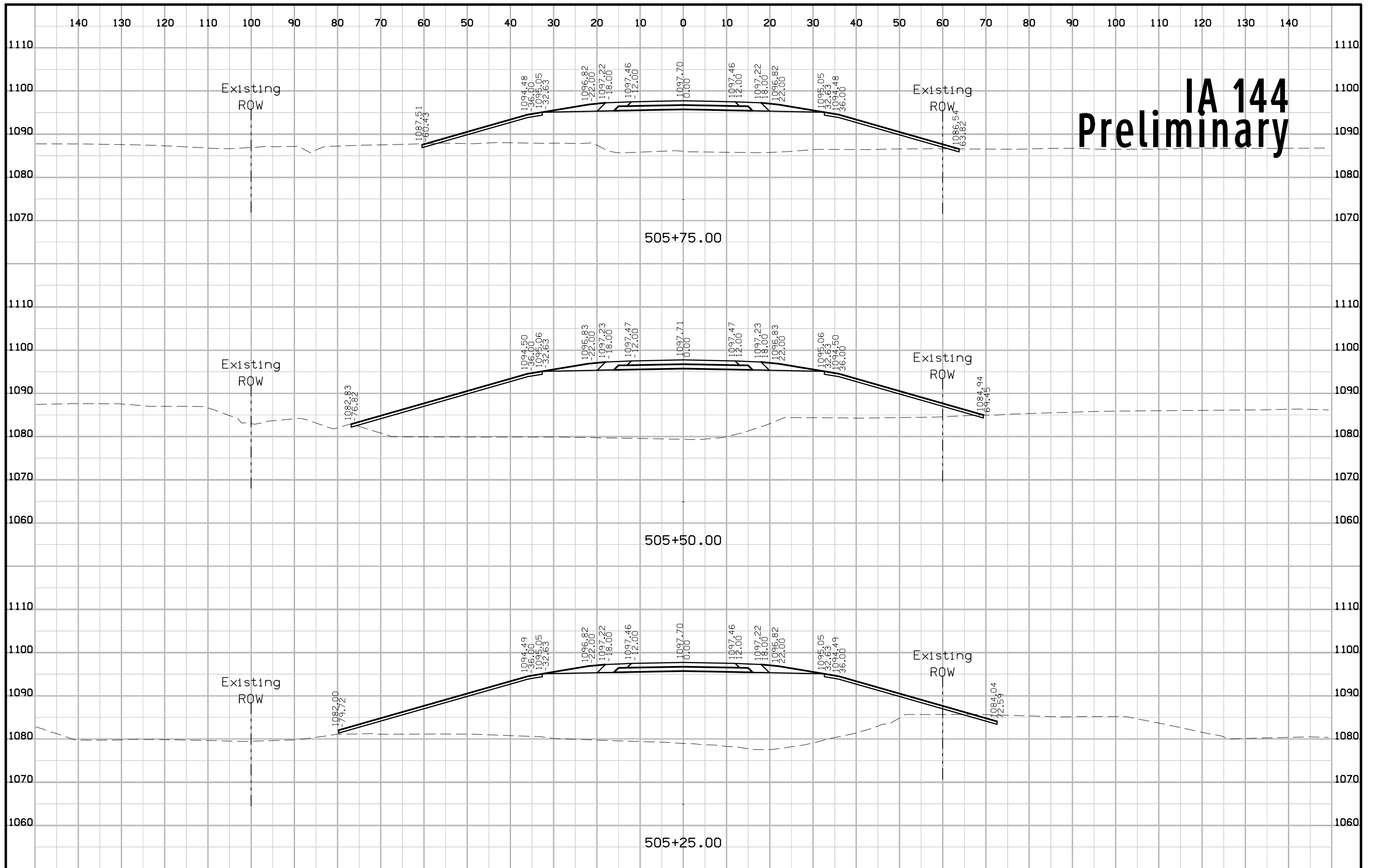
IA 144 Preliminary



IA 144 Preliminary



IA 144 Preliminary



IA 144 Preliminary

