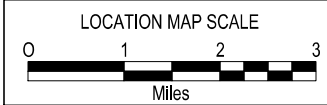
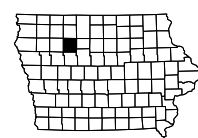
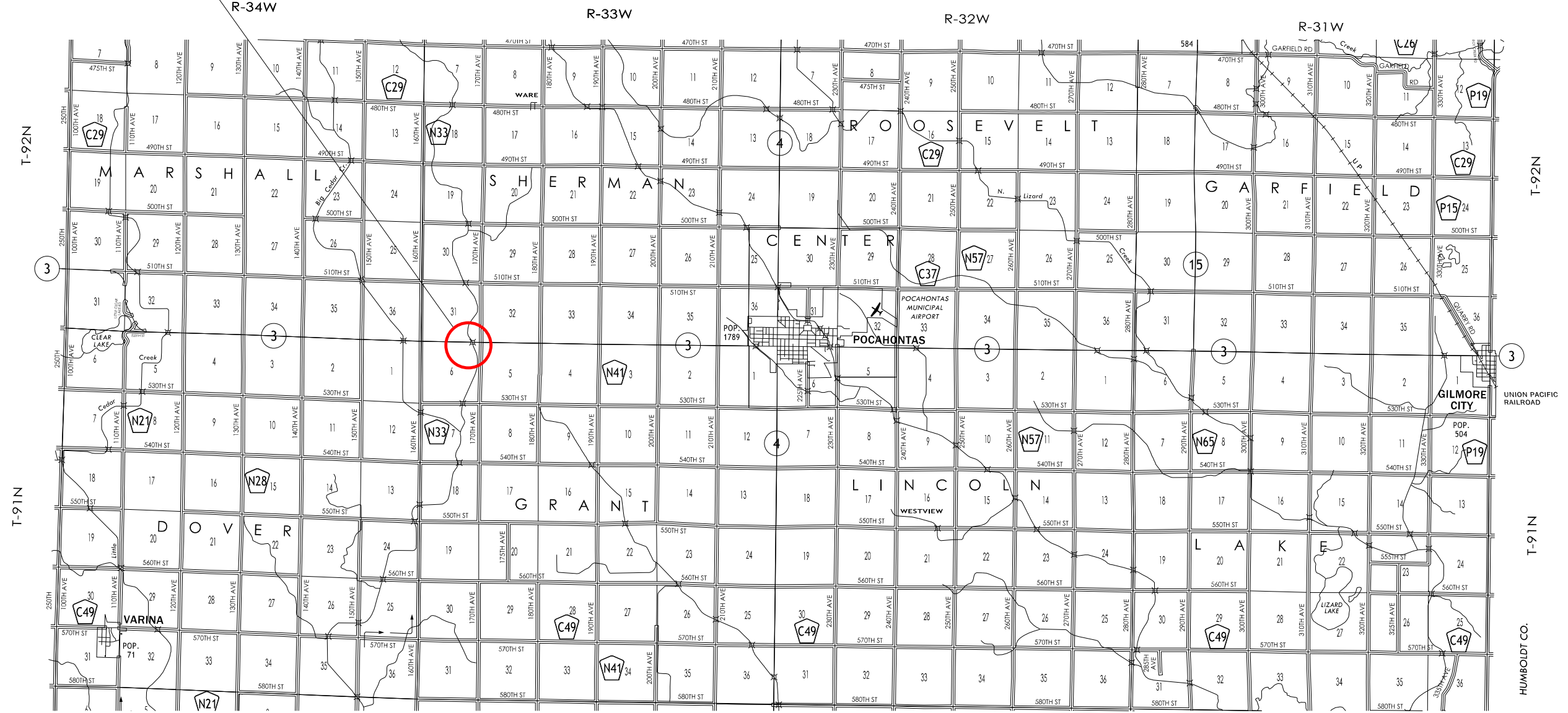


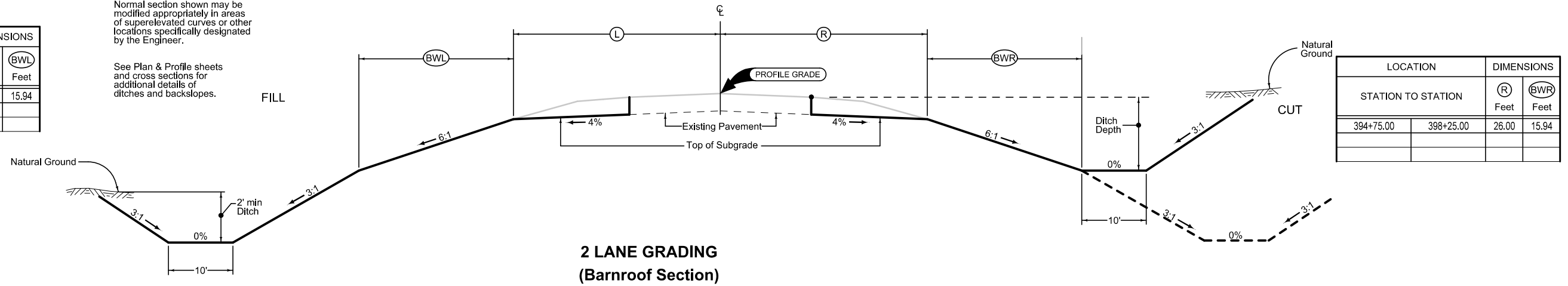
Drainage Ditch
 Sta. 396+54.00
 Existing FHWA# 40090
 Existing MAINT# 7601.2S003
 New Asset # 40091



LOCATION		DIMENSIONS	
STATION TO STATION		(L) Feet	(BWL) Feet
394+75.00	398+25.00	26.00	15.94

Normal section shown may be modified appropriately in areas of superelevated curves or other locations specifically designated by the Engineer.

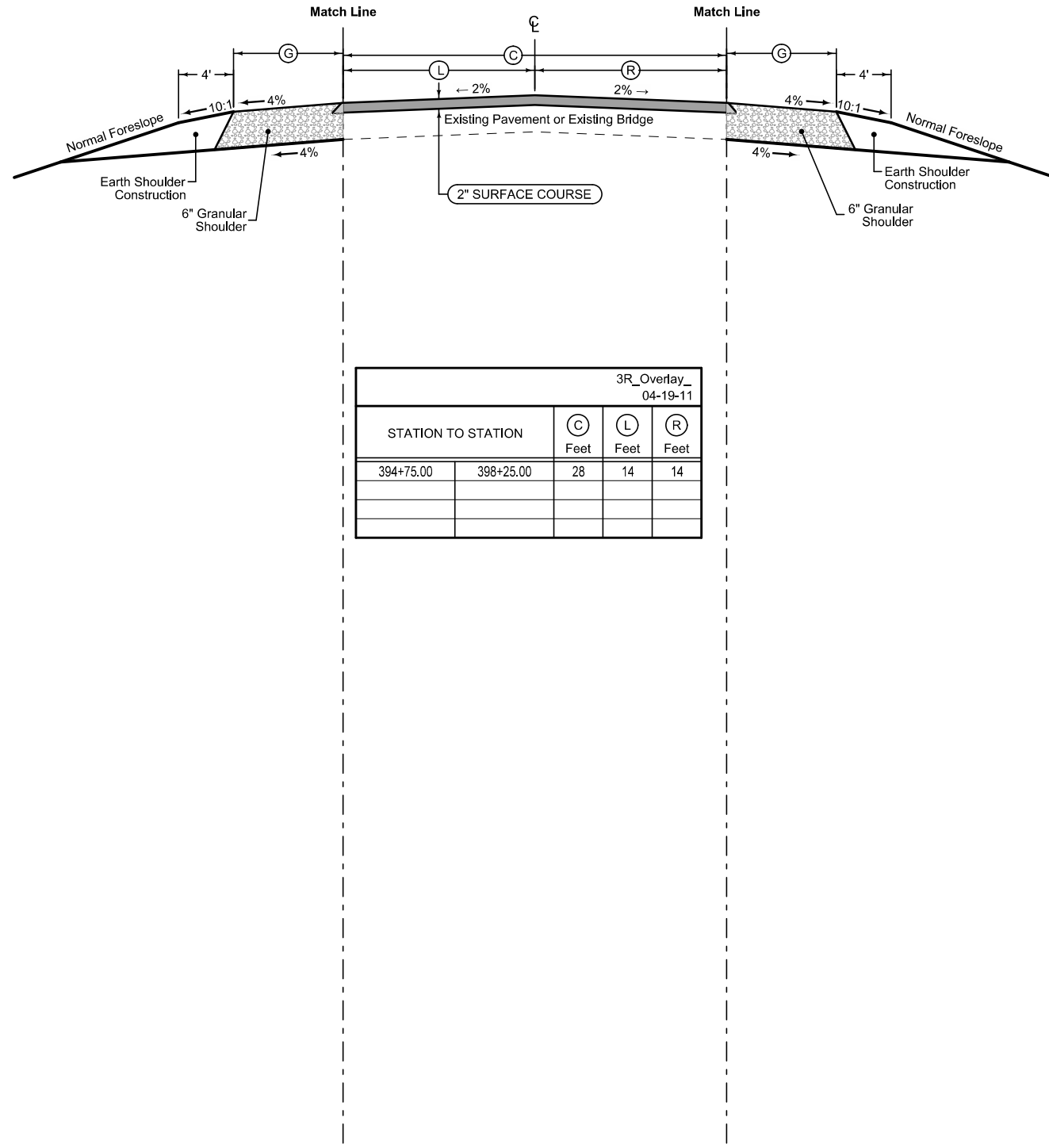
See Plan & Profile sheets and cross sections for additional details of ditches and backslopes.



LOCATION		DIMENSIONS	
STATION TO STATION		(R) Feet	(BWR) Feet
394+75.00	398+25.00	26.00	15.94

Granular Shoulder with Safety Edge

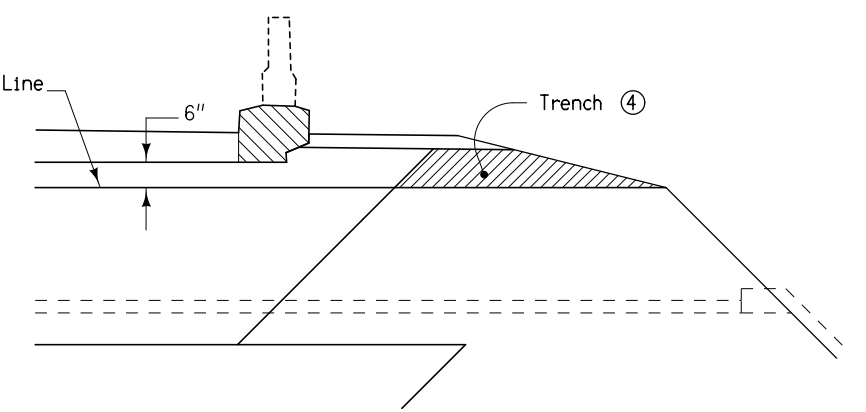
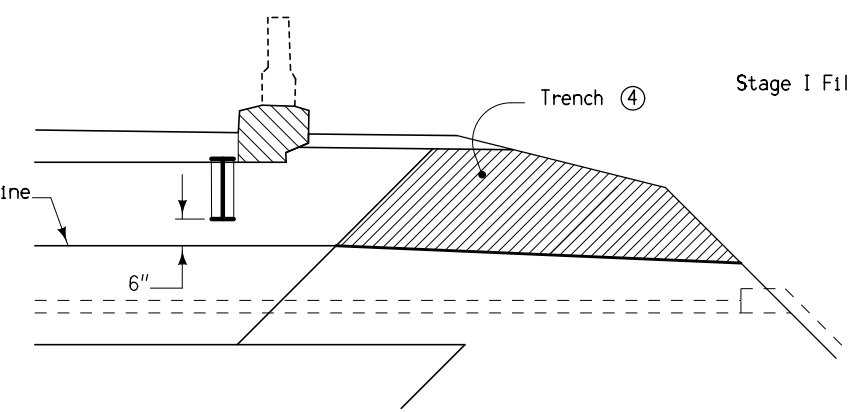
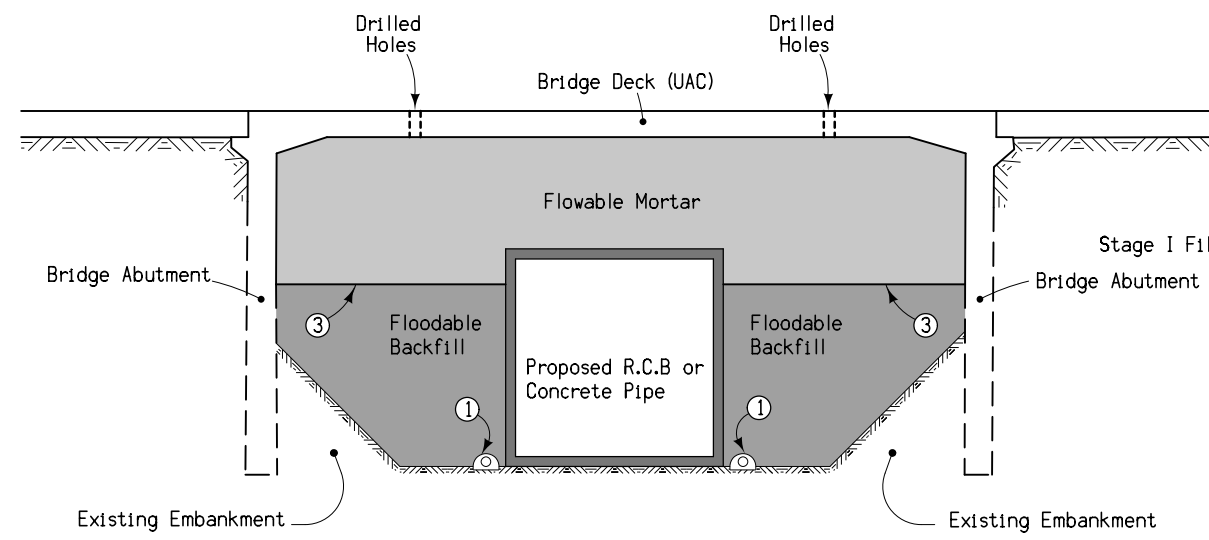
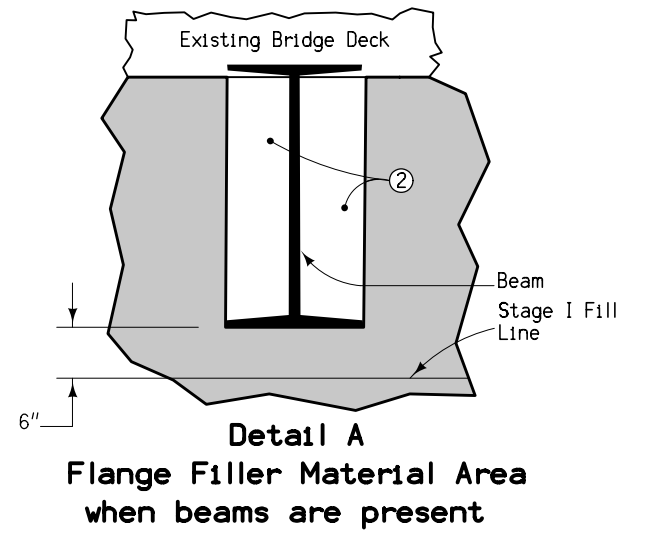
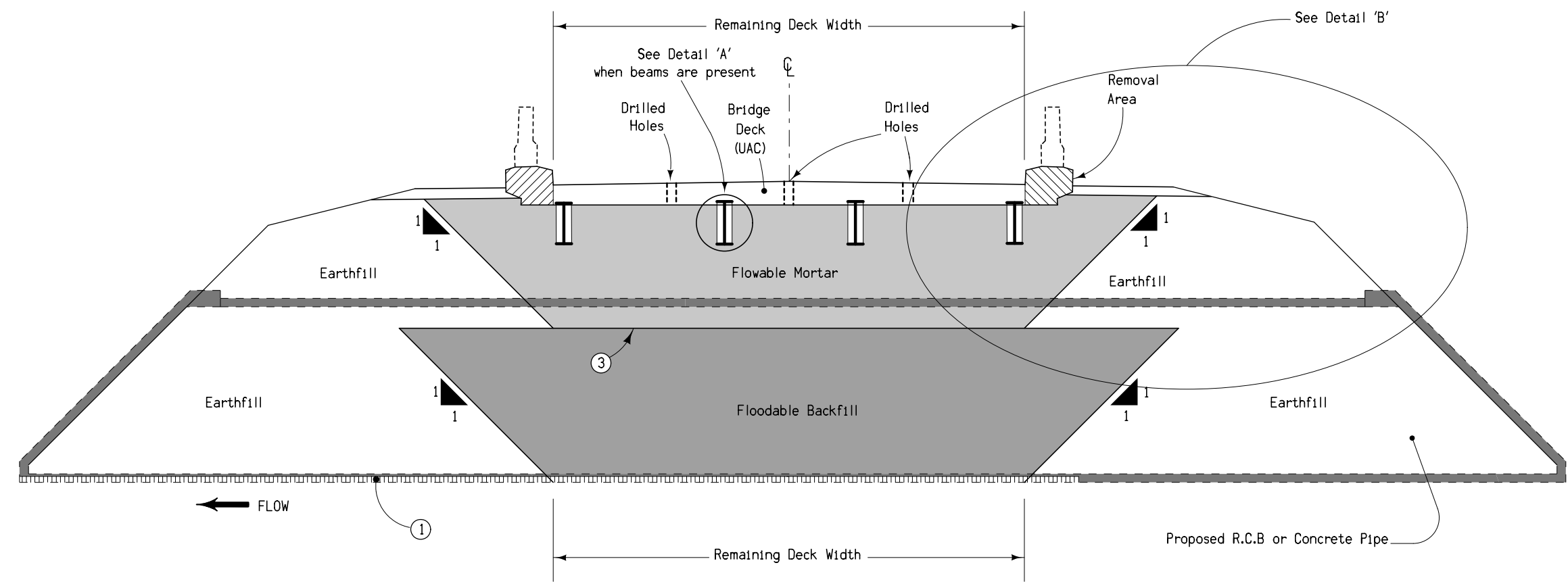
		2_G_ 04-21-20
STATION TO STATION		Ⓞ Feet
394+75.00	398+25.00	6



Granular Shoulder with Safety Edge

		2_G_ 04-21-20
STATION TO STATION		Ⓞ Feet
394+75.00	398+25.00	6

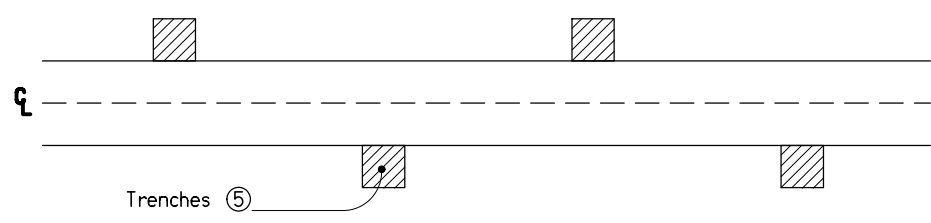
3R_Overlay_ 04-19-11				
STATION TO STATION		Ⓞ Feet	Ⓛ Feet	Ⓡ Feet
394+75.00	398+25.00	28	14	14





Section along Centerline

Detail B (Beam Bridge)

Detail B (Slab Bridge)

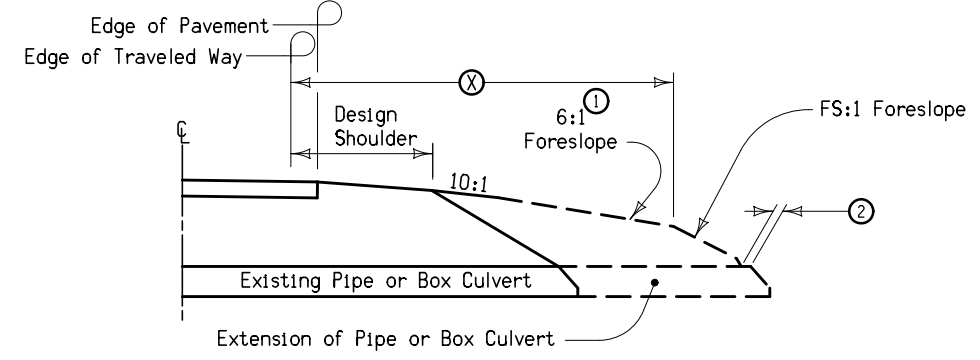
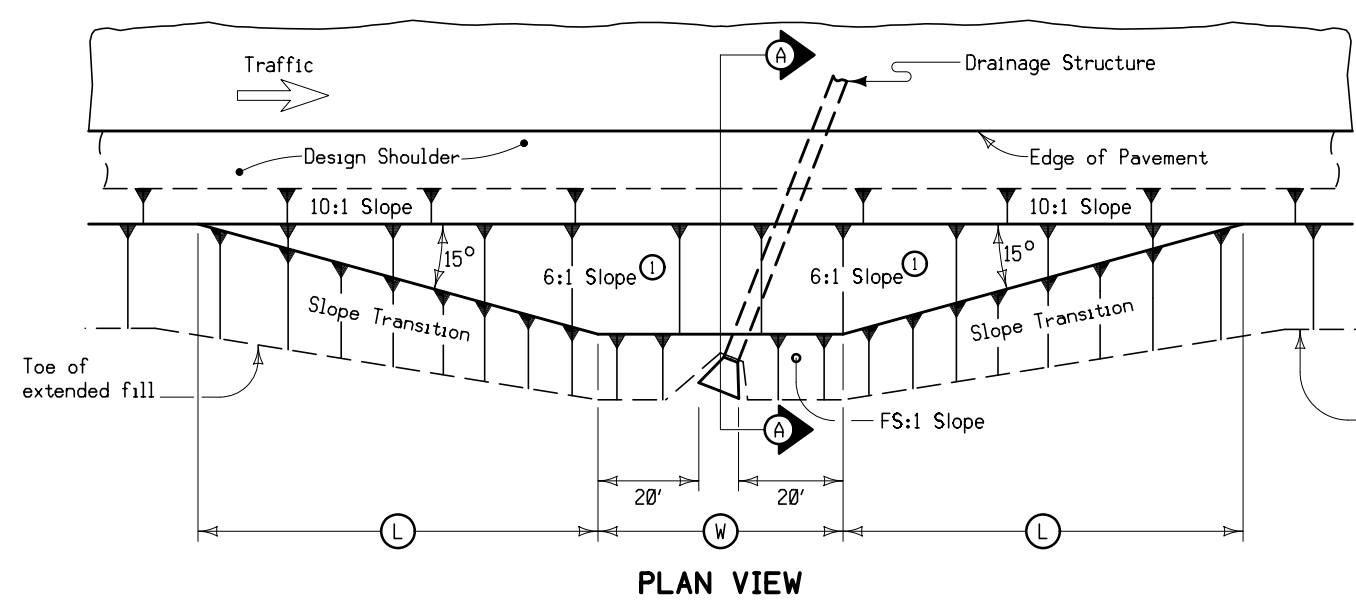


Trench Layout

 Denotes pay limits for flowable mortar
 Denotes pay limits for flooded backfill

- ① 4" Subdrain at flowline elevation of culvert with 4" cover of porous backfill.
- ② Place Flange Filler Material to fill pocket area between flanges to prevent flowable mortar from building up. Flange Filler Material is incidental to flowable mortar.
- ③ Fill void with the maximum amount of Floodable Backfill possible. Distance from Floodable Backfill to bridge beams (when present) or bridge deck shall not exceed 5'.
- ④ Cut trenches in the soil plug to provide drainage for the flowable mortar. Backfill the trenches with open graded crushed stone, gravel, or recycled PCC to allow water to drain. Backfill material is incidental to flowable mortar.
- ⑤ Place trenches at 20' spacing with a minimum of two trenches on each side of the roadway.

FILL FOR CULVERT USED IN BRIDGE REPLACEMENTS

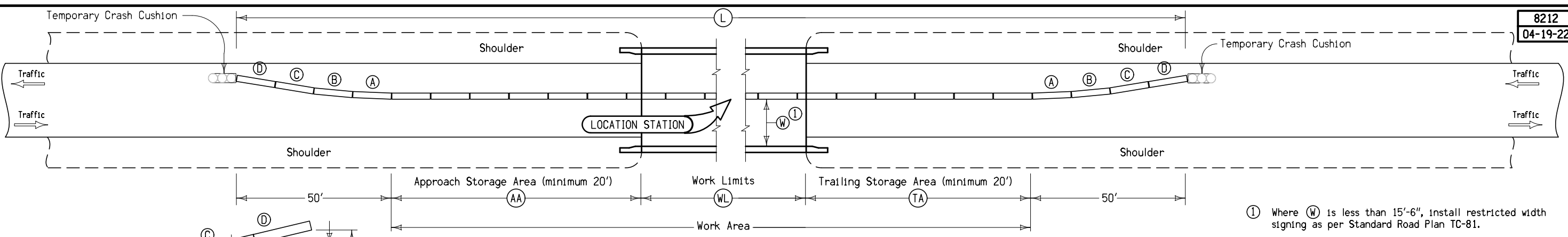


- At locations where an extended or newly constructed drainage structure extends beyond the normal foreslope cover, flatten as indicated so as to cover the structure. Minimum earth cover is 6 inches.
- ① Slope may be flatter than 6:1.
 - ② 6 inch minimum for pipe installations or to top of headwall on RCB.
 - ③ At \bar{C} of roadway.
 - Ⓜ = Pipe or RCB opening width plus 20 feet each side.

SECTION A-A

STRUCTURE LOCATION		Ⓜ	Ⓛ	Ⓧ	ⓕs
STATION ③	SIDE	Feet	Feet	Feet	
396+79.64	R	68	82	30	3
396+29.26	L	68	82	30	3

BARNROOF FORESLOPE AT SKEWED DRAINAGE STRUCTURE



- ① Where Ⓜ is less than 15'-6", install restricted width signing as per Standard Road Plan TC-81.

BARRIER OFFSETS FOR FLARE SECTIONS

Station	Side	ⓂⓂ	ⓌⓁ	ⓉⓂ	Ⓛ	Anchored X	Ⓦ①	Remarks
		Feet	Feet	Feet	Feet		Ft-Inches	
396+54.00	Both	20	50	20	190		16	

TEMPORARY CONCRETE BARRIER LAYOUT for Two-Way Traffic

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

SURVEYED UTILITY OWNER SYMBOLS

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

- TL1D, Centurylink - Quality D
- PPA, Iowa Lakes Elec Co-op

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
Red	(3)		Delineates Restricted Areas

PROFILE VIEW COLOR LEGEND OF PLAN AND PROFILE SHEETS

LINEWORK		Design Color No.	
Green	(10)		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)

Sherman TWP.
T-92N R-33W
SEC. 31



Drainage Ditch

Sta. 394+75.00 (ML003)
Begin Construction

Sta. 398+25.00 (ML003)
End Construction

394+00

395+00

396+00

397+00

398+00

399+00

3

Remove
21" C.M.P.
Outlet Approx. Location

+35
Type 'C' Ent.
24" Uncl. Pipe
+70 Prop.
Prop. Type 'C' Ent.

+60
Type 'C' Ent.
24" Uncl. Pipe
+77 Prop.
Prop. Type 'C' Ent.

Remove
18"x96.5'
C.M.P.

Remove
18"x123'
C.M.P.

Remove
15"x110'
C.M.P.

+50
Type 'C' Ent.
24" Uncl. Pipe

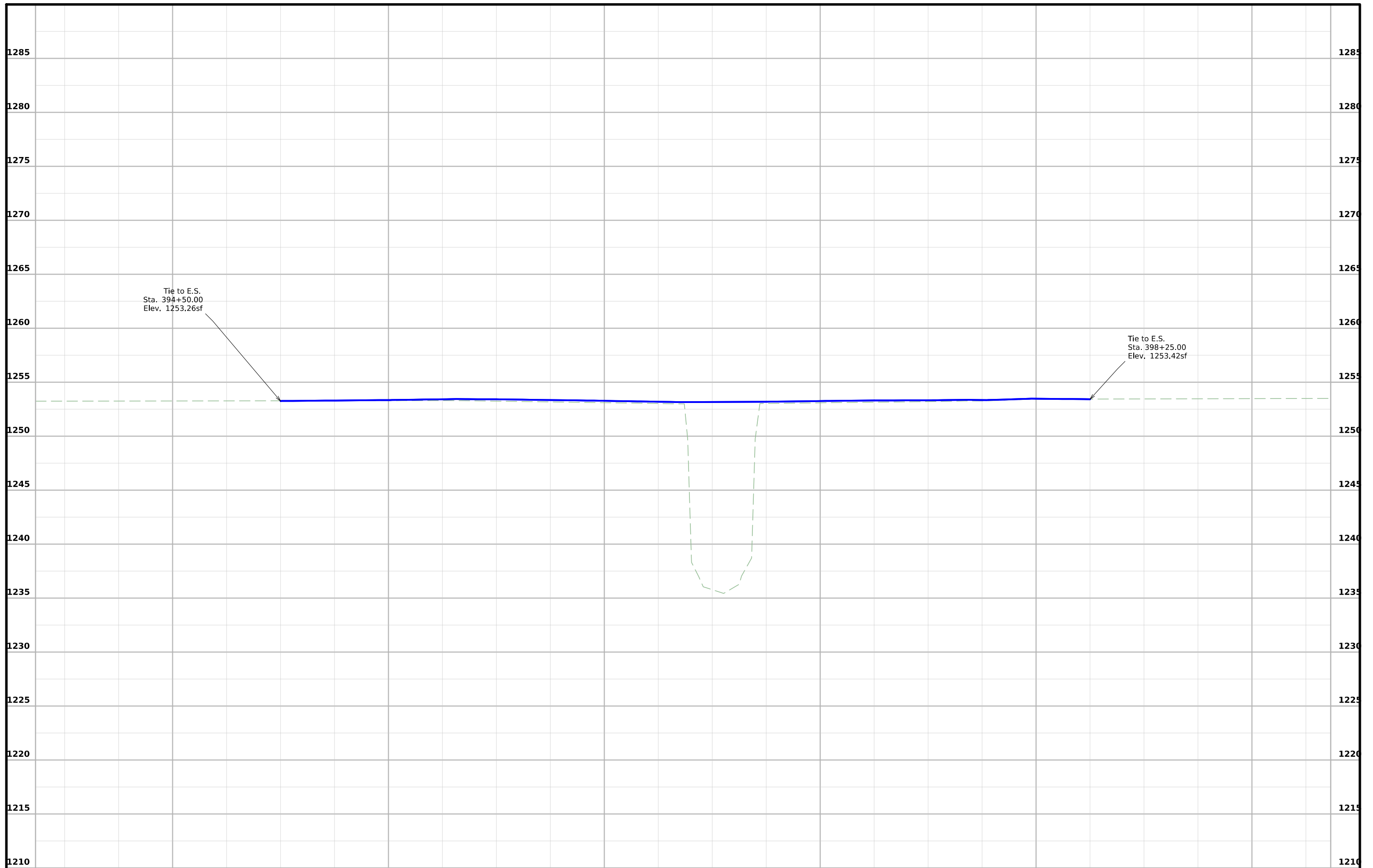
+80
Type 'C' Ent.
24" Uncl. Pipe
+65 Prop.
Prop. Type 'C' Ent.

Sta. 396+54.7
Skew 26° RT AH
33'8"x30' Simple Span I-Beam Bridge
D.A.=19 Sq Miles R-F (Plans)
Sawcut and remove bridge rails.

Install Twin 10'x12'x114'-11 1/8"
Precast RCB Culvert



Grant TWP.
T-91N R-33W
SEC. 6



FILE NO.	ENGLISH	DESIGN TEAM Flattery\Bell\Schneider	POCAHONTAS COUNTY	PROJECT NUMBER BRF-003-3(75)--38-76	SHEET NUMBER D.3
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Survey Information

SURVEY INDEX

County: Pocahontas
PIN: 21-76-003-050
Project Number: BRF-003-3(75)--38-76
Location: Drainage Ditch No. 21 - 5.0 mi W of IA 4
Type of Work: RCB Culvert Replacement – Twin Box
Project Directory: 7600305021

Survey Personnel

Clay Henningsen – Survey Party Chief
Jason Arn – Survey Party Chief
Dan Duncan – Assistant Survey Party Chief

Date(s) of Survey

Begin Date 04/14/2022
End Date 05/03/2022

General Information

Measurement units for this survey are US survey feet. This survey is for IA Hwy 3 bridge replacement over Drainage Ditch No. 21. Project datum and control information is provided by the Design Survey Office. This project is a full field DTM survey.

Project Control

Nearby Iowa Real Time Network reference stations were utilized to obtain horizontal and vertical control on primary project control points. Two five-minute observations were taken with appropriate time spans between and used in a weighted average to obtain final coordinate values. For additional details of the control survey, contact the Preliminary Survey department.

PROJECT DATUM: NAD83(2011) EPOCH 2010.00
VERTICAL DATUM: NAVD88
COORDINATE SYSTEM: IOWA REGIONAL COORDINATE SYSTEM ZONE 4
GEOID MODEL: 2012bu3

Alignment Information

The horizontal alignment for this survey is a retrace of As-built Plans Project No. FN-3-2(39)--21-11. Survey stationing was equated to the plan POT at Sta. 404+08.6 and run back and ahead without equation throughout the survey.

Survey stationing relates to As-built plan stationing as follows:

PI Sta. 381+98.0 As-built Plans Project No. FN-3-2(39)--21-11
= Survey PI Sta. 381+97.91

POT Sta. 404+08.6 As-built Plans Project No. FN-3-2(39)--21-11
= Survey POT Sta. 404+08.60

POT Sta. 430+52.7 As-built Plans Project No. FN-3-2(39)--21-11
= Survey POT Sta. 430+53.23

Utility Information

For logging data and other utility details see Utility Survey and Ownership Report in the Utility folder of the PrelimSurvey project directory.

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 - Ia. RCS Zone 04
VERT. DATUM: NAVD88 - Geoid Model 2012bu3

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
 1a. Regional Coordinate System Zone 04

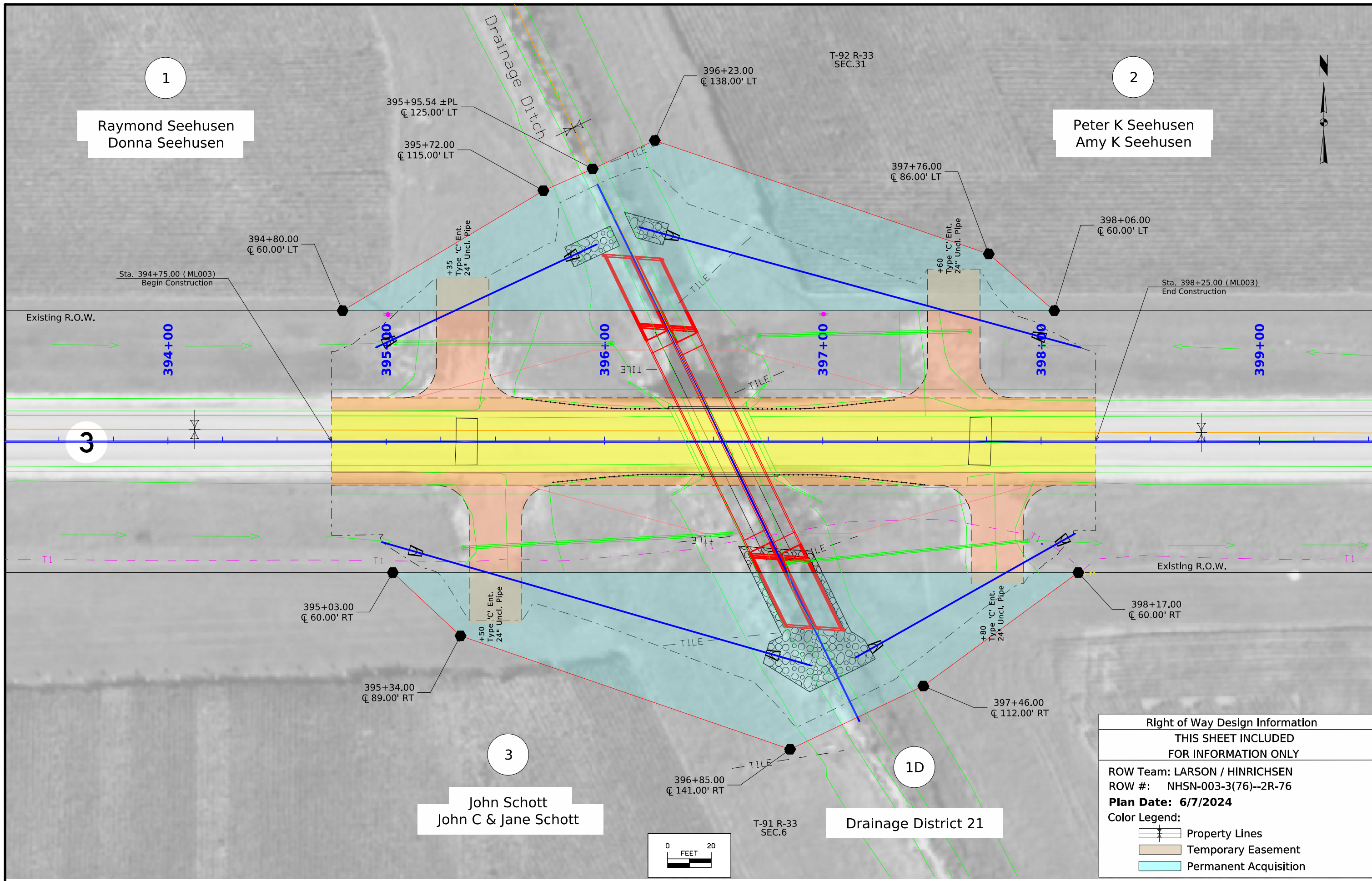
VERT. DATUM: NAVD88
 Geoid Model 2012bu3
 Project Control Marks are Bench Marks

Point Name	Northing	Easting	Elevation	Feature Code - Description
760031004	8672553.27	14509823.66	1257.63	CP 760031004 FROM THE INTERSECTION OF HWY 3 AND HWY 4 IN POCAHONTAS GO 6 MILES WEST ALONG HWY 3 AT THE INTERSECTION IN THE SOUTHWEST QUADRANT A FOUND IRON PIN SET IN A CONC MONUMENT 38 FEET SOUTH OF THE PAVED SHOULDER 42 FEET WEST OF CLOF 160TH AVE AND 30 FEET NORTHWEST OF CENTER OF FIELD DRIVEWAY
760031011	8672615.84	14514474.86	1253.50	CP 760031011 FROM THE INTERSECTION OF HWY 3 AND HWY 4 IN POCAHONTAS GO 5.1 MILES WEST ALONG HWY 3 AT THE BRIDGE OVER DITCH NO 21 A FOUND 1/2 REBAR ON NE CORNER OF BRIDGE WING WALL 50 FEET SOUTHWEST OF A POWERPOLE 20 FEET NORTH OF CL HWY 3 AND 64 FEET WEST OF END OF GUARDRAIL
760031014	8672538.69	14515168.41	1250.84	CP 760031014 FROM THE INTERSECTION OF HWY 3 AND HWY 4 IN POCAHONTAS GO 5 MILES WEST ALONG HWY 3 AT THE INTERSECTION IN THE SOUTHWEST QUADRANT A FOUND IRON PIN SET IN A CONC MONUMENT 42 FEET SOUTH OF THE PAVED SHOULDER 51 FEET WEST OF CLOF 170TH AVE AND 28 FEET NORTHWEST OF CENTER OF FIELD DRIVEWAY
760031022	8672536.59	14520420.84	1259.58	CP 760031022 FROM THE INTERSECTION OF HWY 3 AND HWY 4 IN POCAHONTAS GO 4 MILES WEST ALONG HWY 3 AT THE INTERSECTION IN THE SOUTHWEST QUADRANT A FOUND IRON PIN SET IN A CONC MONUMENT 44 FEET SOUTH OF THE PAVED SHOULDER 58 FEET WEST OF CLOF 180TH AVE AND 14 FEET EAST OF A ROW RAIL

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.

NO ACCESS RIGHTS ARE TO BE ACQUIRED ON THIS PROJECT.



108-23A
08-01-08

TRAFFIC CONTROL PLAN

Traffic on IA 3 shall be maintained at all times.

One lane of traffic shall be maintained at all times via the use of TC-217 with TBR and signals during the removal of bridge rail, guardrail, and flowable mortar.

111-01
04-17-12

COORDINATED OPERATIONS

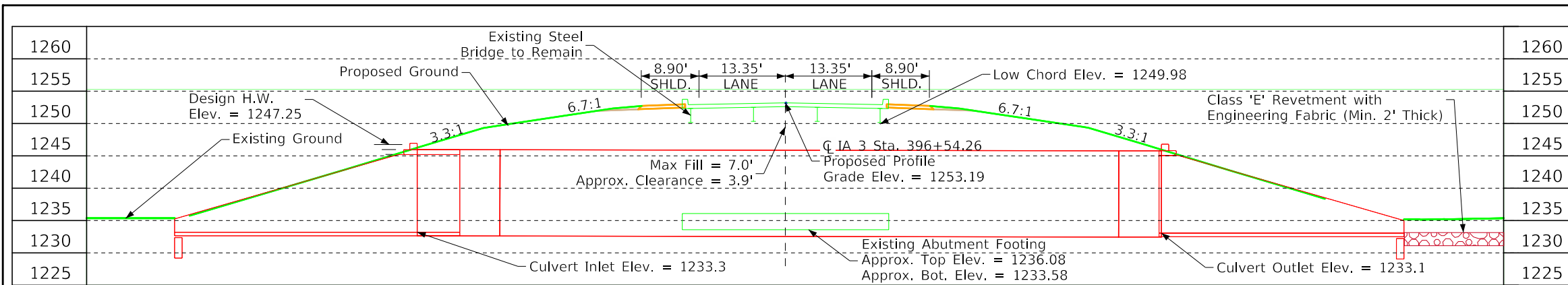
Other work in progress during the same period of time will include the construction of the projects listed. Coordinate operations with those of other contractors working within the same area.

Project	Type of Work
None Provided	

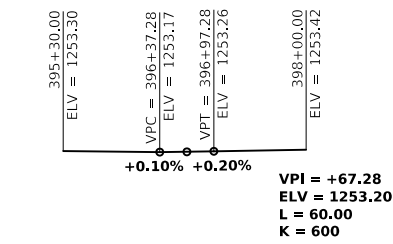
108-25
10-21-14

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									



Control Point:
 Northing: 8672553.27 Easting: 14509823.66 Elev.: 1257.63
 Iron pin set in a conc. monument 38 feet S of the paved shoulder 42 feet W of CL of 160th Ave and 30 feet NW of center of field driveway



Longitudinal Section Along CL Culvert

Hydraulic Data
 RIDB: "DDitch21_POCA_1.6"
 Drainage Area = 20.1 Sq.Mi.
 Q₅₀ = 835 cfs
 HW Elev. = 1247.25
 Exit Velocity = 4.18 fps
 Stream Slope = 3.8 Ft./Mi.

Proposed Profile Grade IA 3

General Note:
 This design is for the replacement of the existing 33'-8 x 30' Steel Beam Bridge, Pocahontas Design No. 953, FHWA No. 040090 Maint. No. 7601.25003

Plan Note:
 Flow line of the culvert has been set 2' below streambed to allow bottom to silt in and provide a natural bottom for fish passage.

Lintel beam and curtain walls shall form one continuous line and shall not be staggered or offset.

The project is proposed to be constructed with flowable mortar methods.

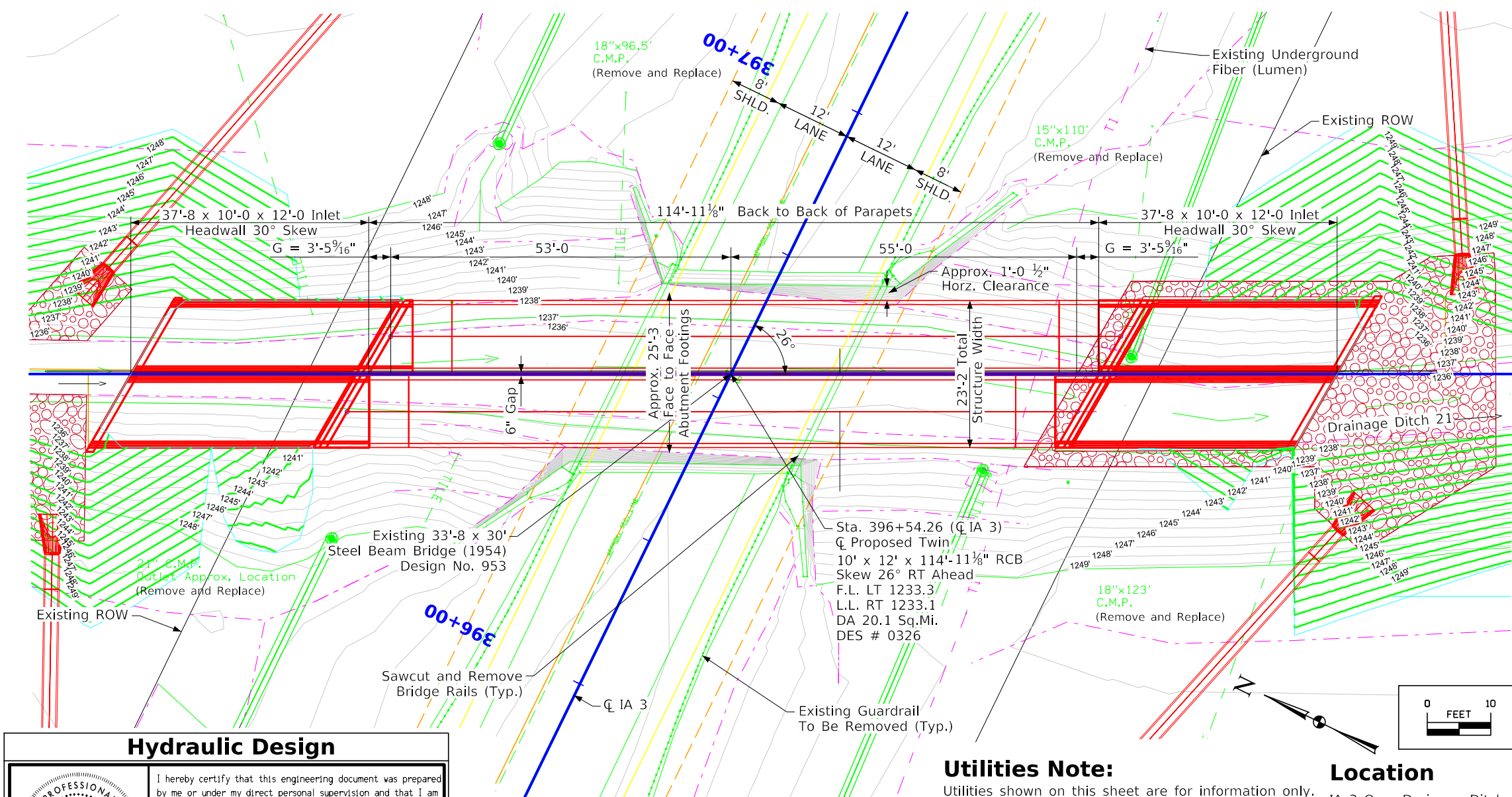
Design Note(s):
 Revetment is proposed at the culvert outlet due to the increased velocities over existing conditions.

Prelim has corresponded with the Soils Unit, and flowable mortar has been determined to be feasible. The Final Design shall include effort to coordinate with the design team to address or mitigate the potential for replacement bridge piling downdrag. Coordination may include structural calculations for bridge pile loading or pile capacity checks for mitigation options.

CIP was not a viable option because of the horizontal clearance checks to the existing structure footing.

Traffic is to be maintained at all times during construction of the new RCB under the existing bridge. However, it will be necessary to reduce traffic down to one lane via the use of flaggers during the removal of the bridge rail, guardrail, placement of the flowable mortar and HMA resurfacing.

Existing bridge to remain after project construction.



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: DANIEL D. KIMBALL
 Printed or Typed Name: DANIEL D. KIMBALL
 Date: _____
 My license renewal date is December 31, 2025

Pages or sheets covered by this seal: _____

Utilities Note:
 Utilities shown on this sheet are for information only. See Road Design sheets for utility information.

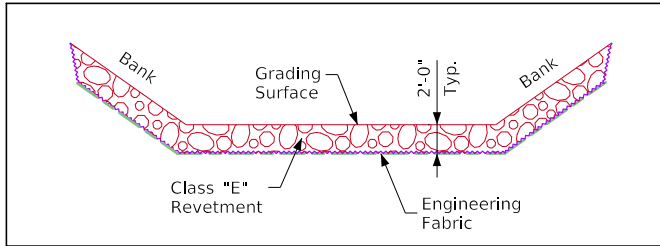
General Utility Symbols:
 E - Electric Line
 G - Gas Line
 SAN. - Sanitary Sewer
 T - Telephone Line
 W - Water Line
 FO - Fiber Optic Line
 GHP - Gas High Pressure
 ST S - Storm Sewer
 TV - TV
 ● - Power Poles

Location
 IA 3 Over Drainage Ditch
 T-92N & 91N R-33W
 Sections 31 & 6
 Sherman & Grant Township
 Pocahontas County
 FHWA No. 40090
 Bridge Maint. No. 7601.25003
 Latitude 42.732512°
 Longitude -94.779517°

Traffic Estimate

2026 AADT	1600 V.P.D.
2046 AADT	1800 V.P.D.
TRUCKS	36 %

Design For 26 Degree Skew RA
Twin 10' x 12' x 114'-11 1/8" Precast RCB Culvert
 Situation Plan
 STA. 396+54.26 (IA 3) Turn-In Date: Aug 15 2023
 Pocahontas County
 IOWA DEPARTMENT OF TRANSPORTATION
 Design No. 0326 Design Sheet No. 1 of 2 FHWA/Asset 40091

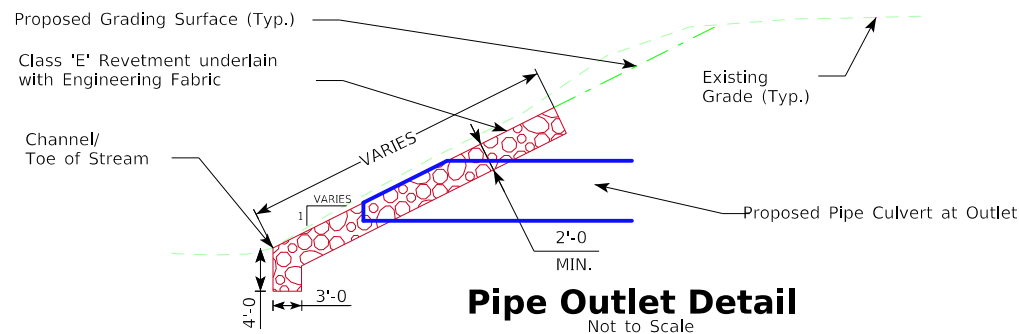


Typical Channel Protection

Estimated Revetment Quantities Included With Road Plans

Location	Revetment Class "E" (Ton)	Engineering Fabric (SY)	CL. 10 Channel Excavation (CY)
Inlet	47.04	86.48	--
Outlet	150.02	256.96	94.95
Totals	197.06	343.44	94.95

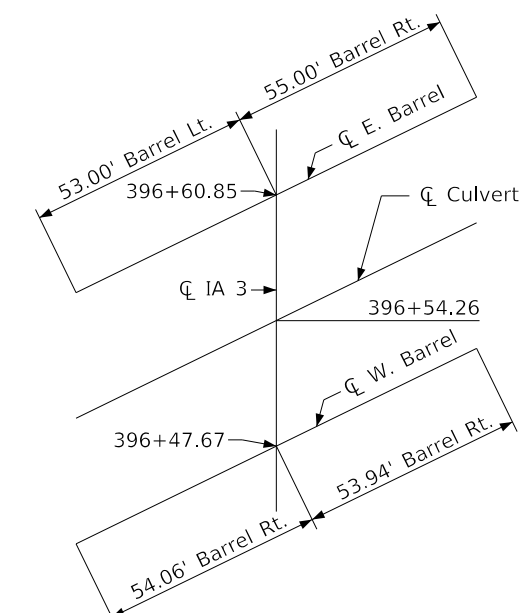
Excavation quantity calculated from grading surface. Excavation quantity is for embedded revetment core out only, and does not include excavation to the grading surface. Excavation quantity to the grading surface is determined by Road Design and included in the Road Plans. Quantities shown for information only. See Road Sheets.



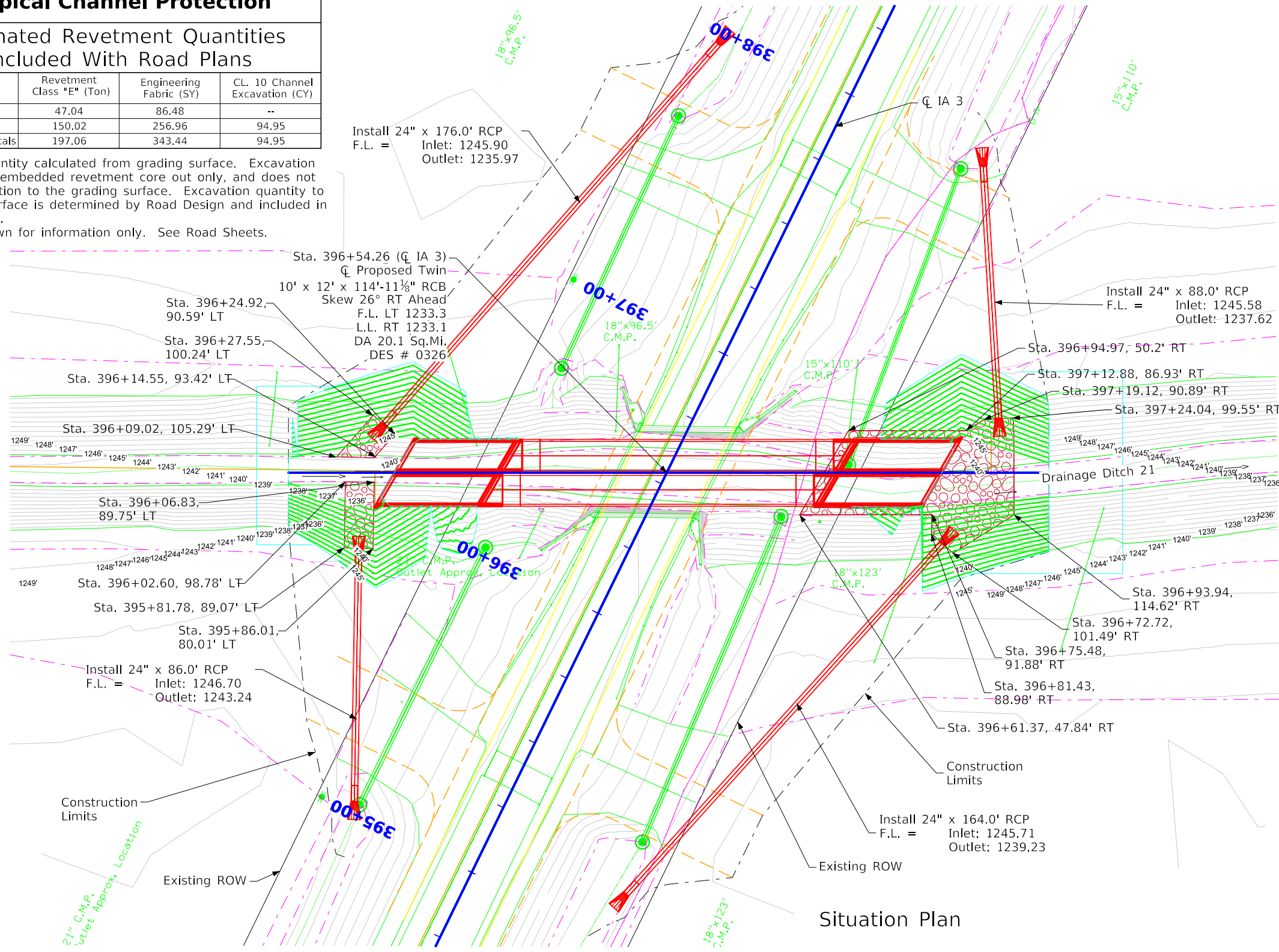
Pipe Outlet Detail

Not to Scale

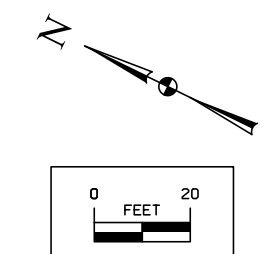
Control Point:
 Northing: 8672553.27 Easting: 14509823.66 Elev.: 1257.63
 Iron pin set in a conc. monument 38 feet S of the paved shoulder 42 feet W of □ of 160th Ave and 30 feet NW of center of field driveway



Barrel Layout



Situation Plan



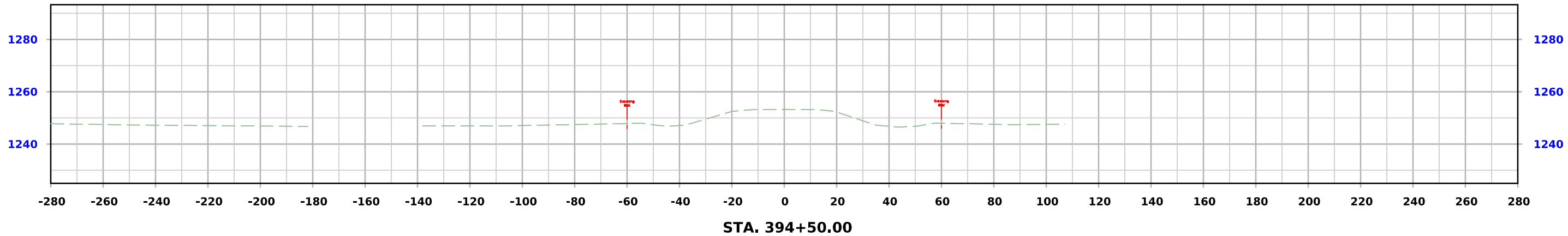
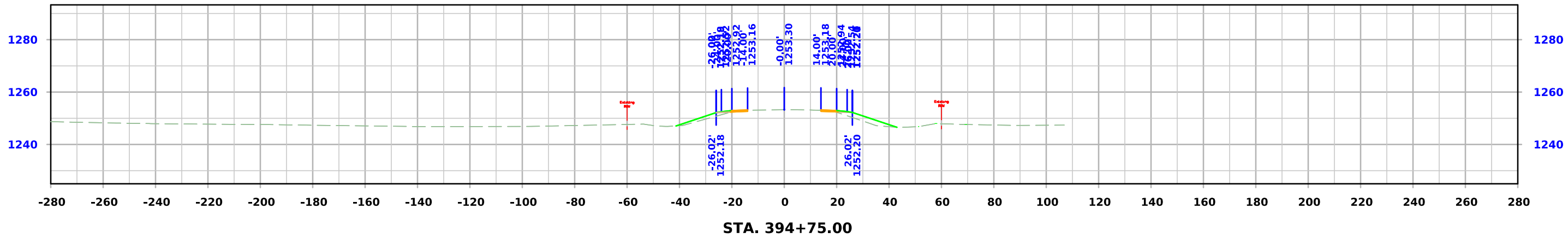
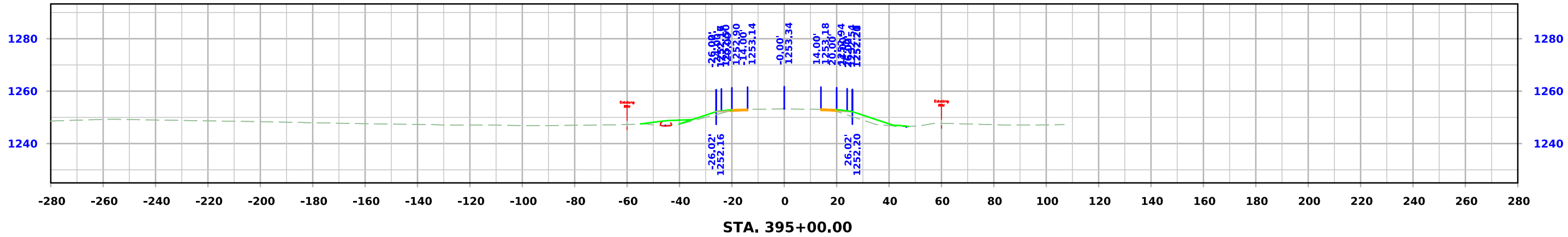
Design For 26 Degree Skew RA
Twin 10' x 12' x 114'-11 1/8" Precast RCB Culvert
 Situation Plan
 STA. 396+54.26 (IA 3) Turn-In Date: Aug 15 2023
 Pocahontas County
 IOWA DEPARTMENT OF TRANSPORTATION
 Design No. 0326 Design Sheet No. 2 of 2 FHWA/Asset 40091

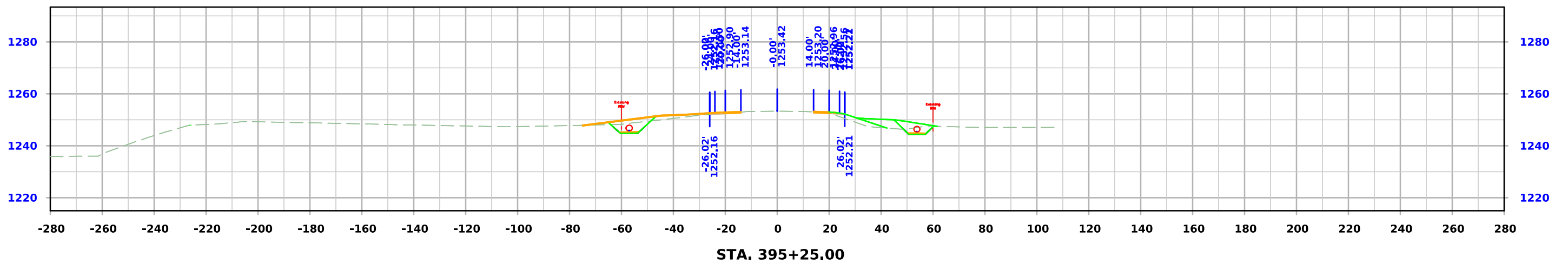
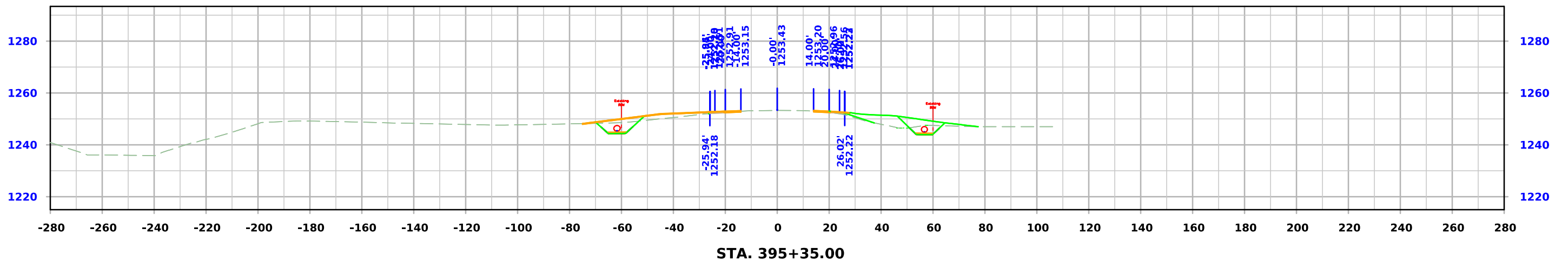
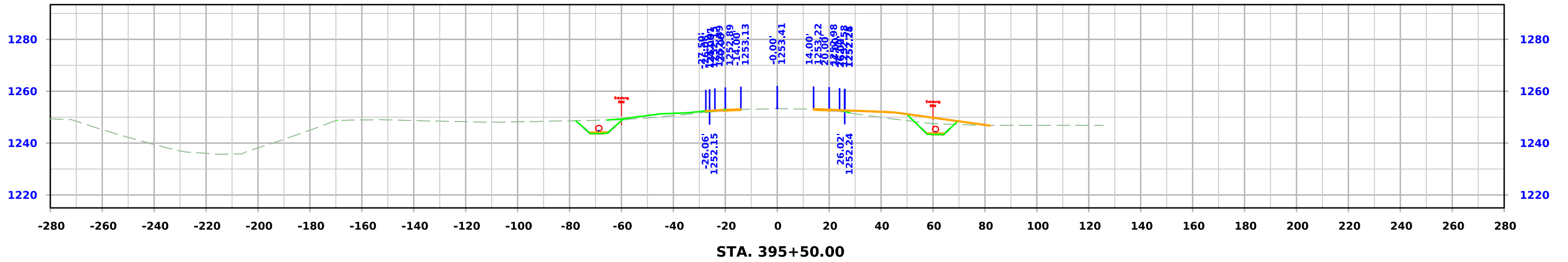
CROSS SECTION VIEW COLOR LEGEND

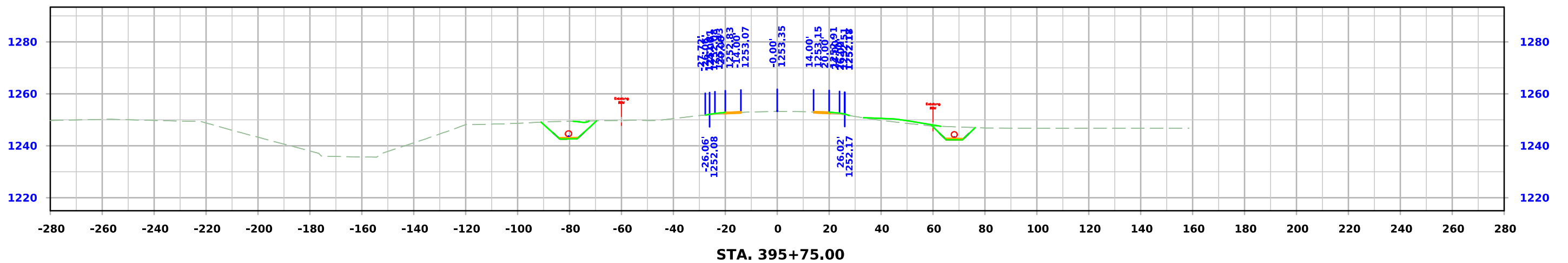
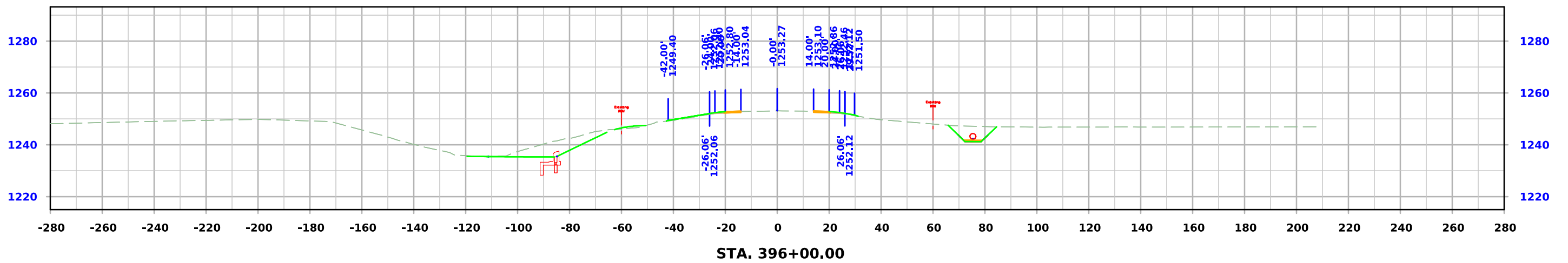
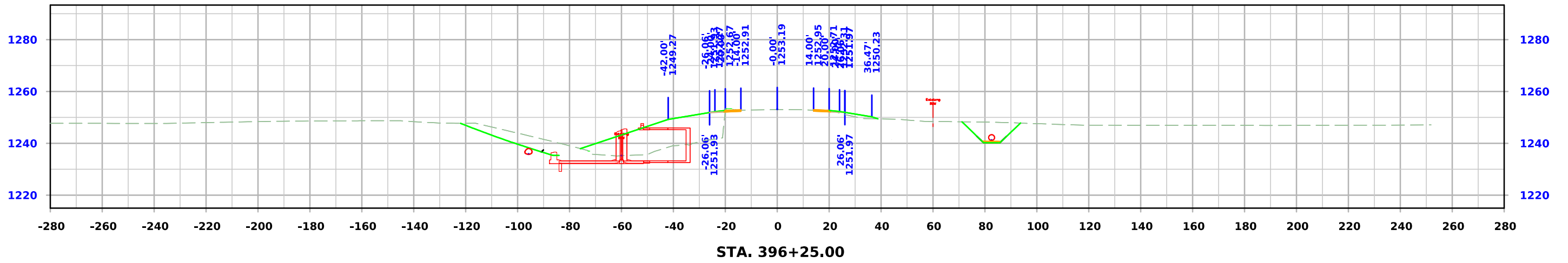
Design Color No.	Feature	Design Color No.	Feature
Aggregate			
(64)	Choke Stone	(112)	Noise Wall
(42)	Engineering Fabric	(112)	Noise Wall Footing
(8)	Flooded Backfill	(112)	Retaining Wall Back
(92)	Macadam Stone	(112)	Retaining Wall Back Excavate
(20)	Modified	(112)	Retaining Wall Face
(12)	Plowing Shaping	(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
Existing			
(0)	Existing Pavement	(11)	Unsuitable Type C
		(3)	Waste

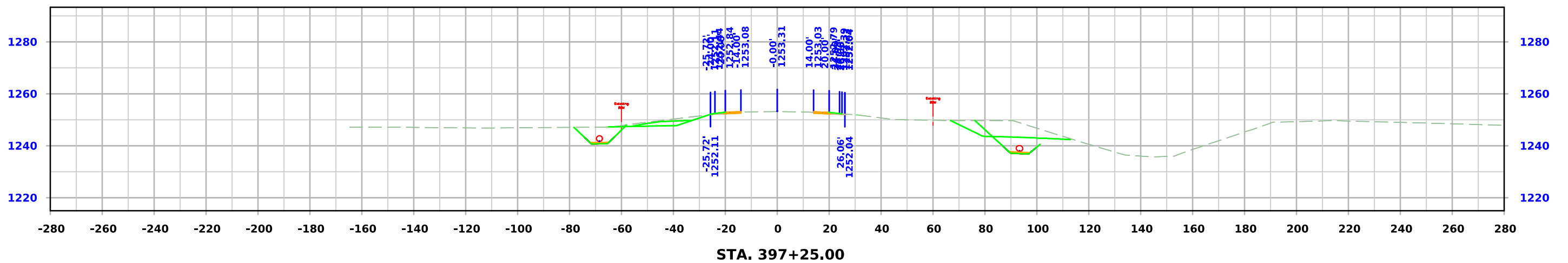
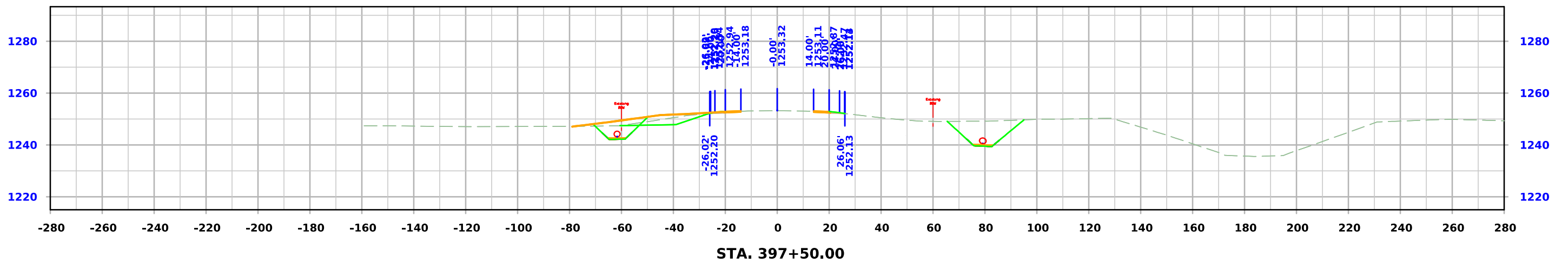
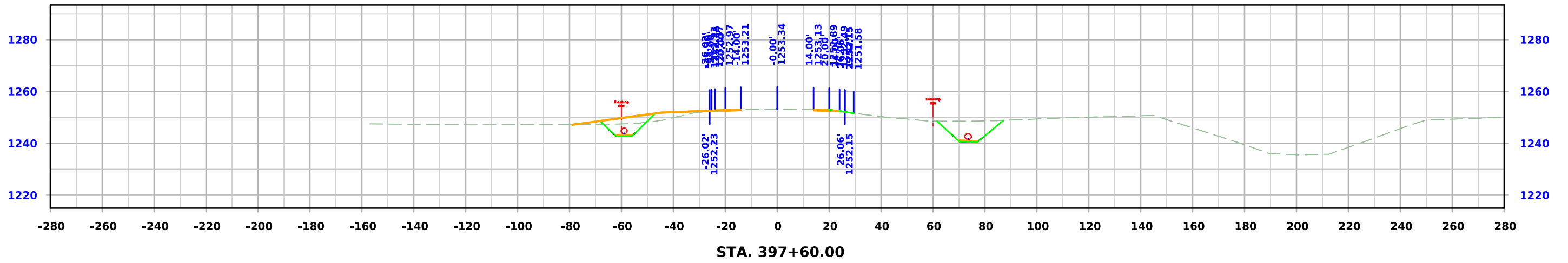
**CROSS SECTIONS
LEGEND AND INFORMATION SHEET**

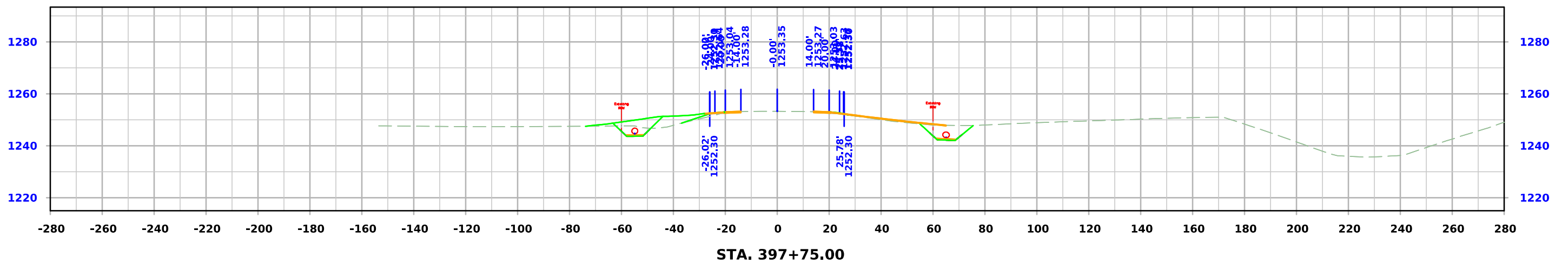
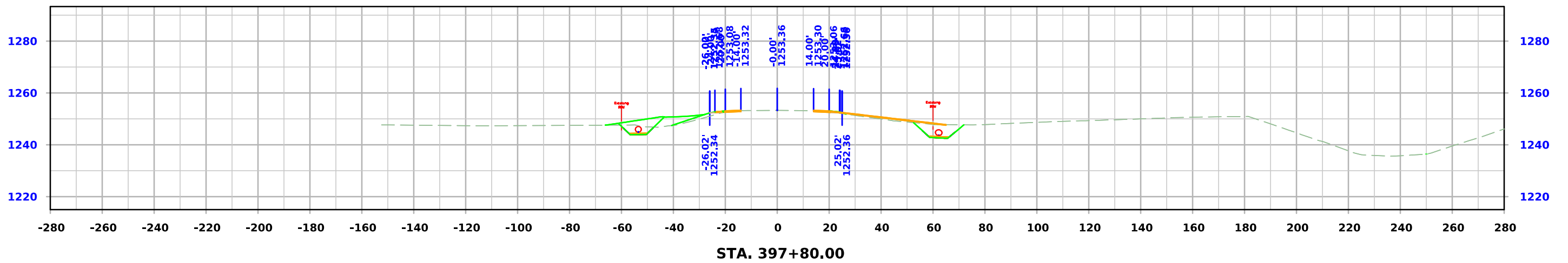
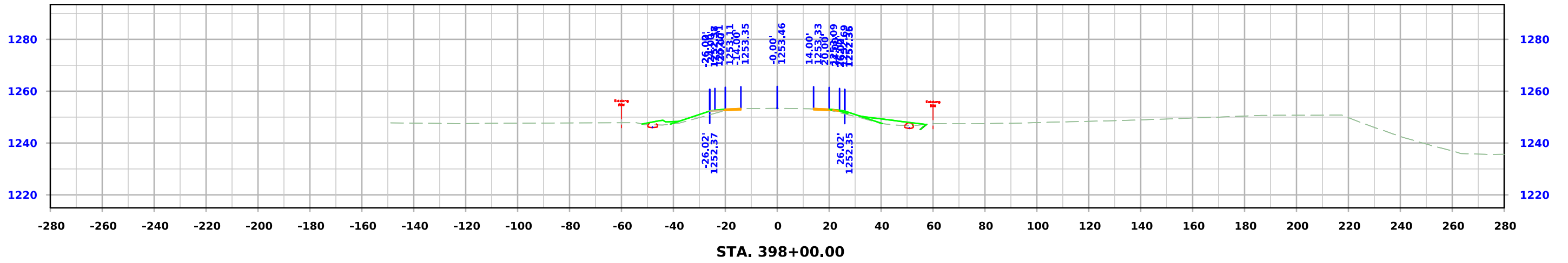
(COVERS SHEET SERIES W, X, Y, & Z)

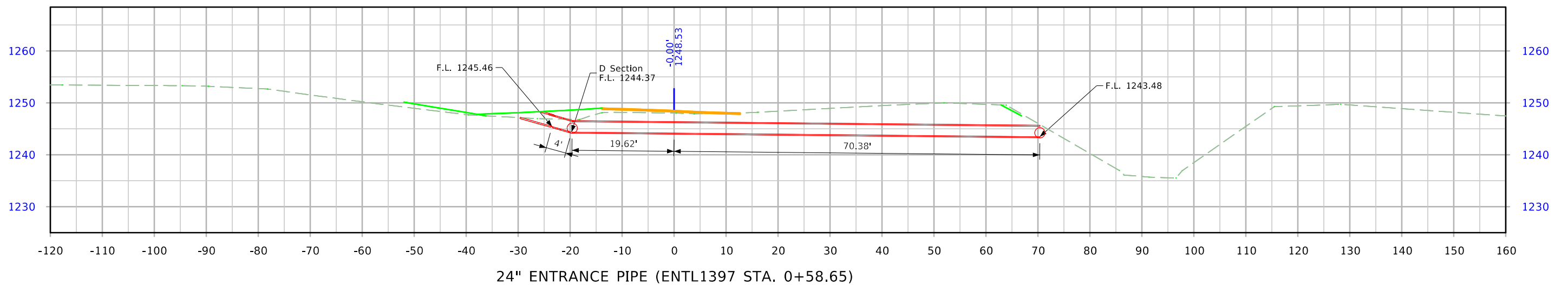
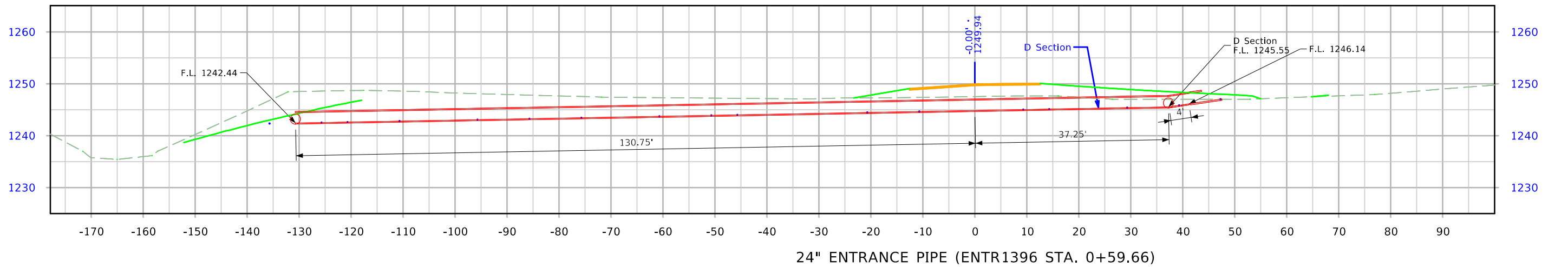
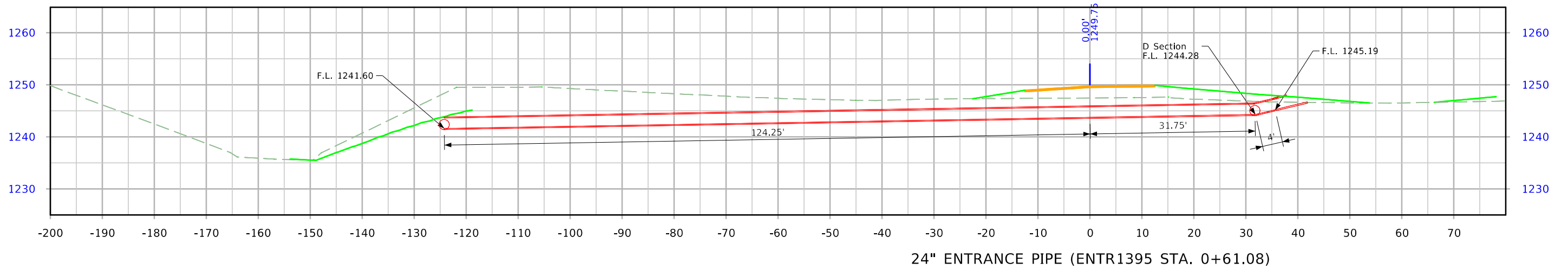


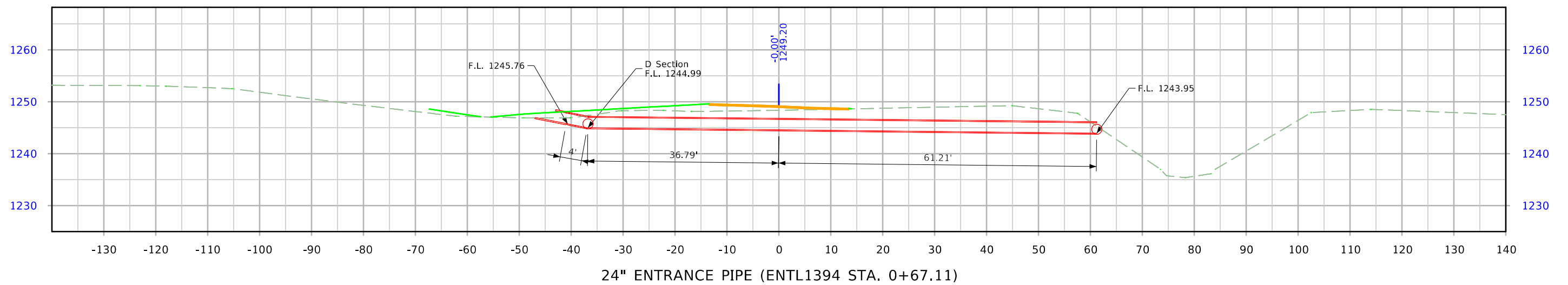












24" ENTRANCE PIPE (ENTL1394 STA. 0+67.11)