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W.2 - 5	Mainline Cross Sections



PLANS OF PROPOSED IMPROVEMENT ON THE
PRIMARY ROAD SYSTEM
Osceola COUNTY
RCB Culvert Replacement - Single Box
Approx 0.2 mi S of 250th St

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

PROJECT IDENTIFICATION NUMBER	TOTAL
	16
24-72-059-010	
PROJECT NUMBER	
STPN-059-9(019)--2J-72	
R.O.W. PROJECT NUMBER	
STPN-059-9(020)--2J-72	

DESIGN DATA RURAL				
2027	AADT	1450	V.P.D.	
2047	AADT	1750	V.P.D.	
20 --	DHV	--	V.P.H.	
TRUCKS		26	%	
Total Design ESALs		--		

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

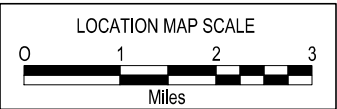
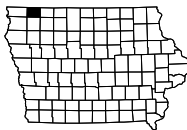
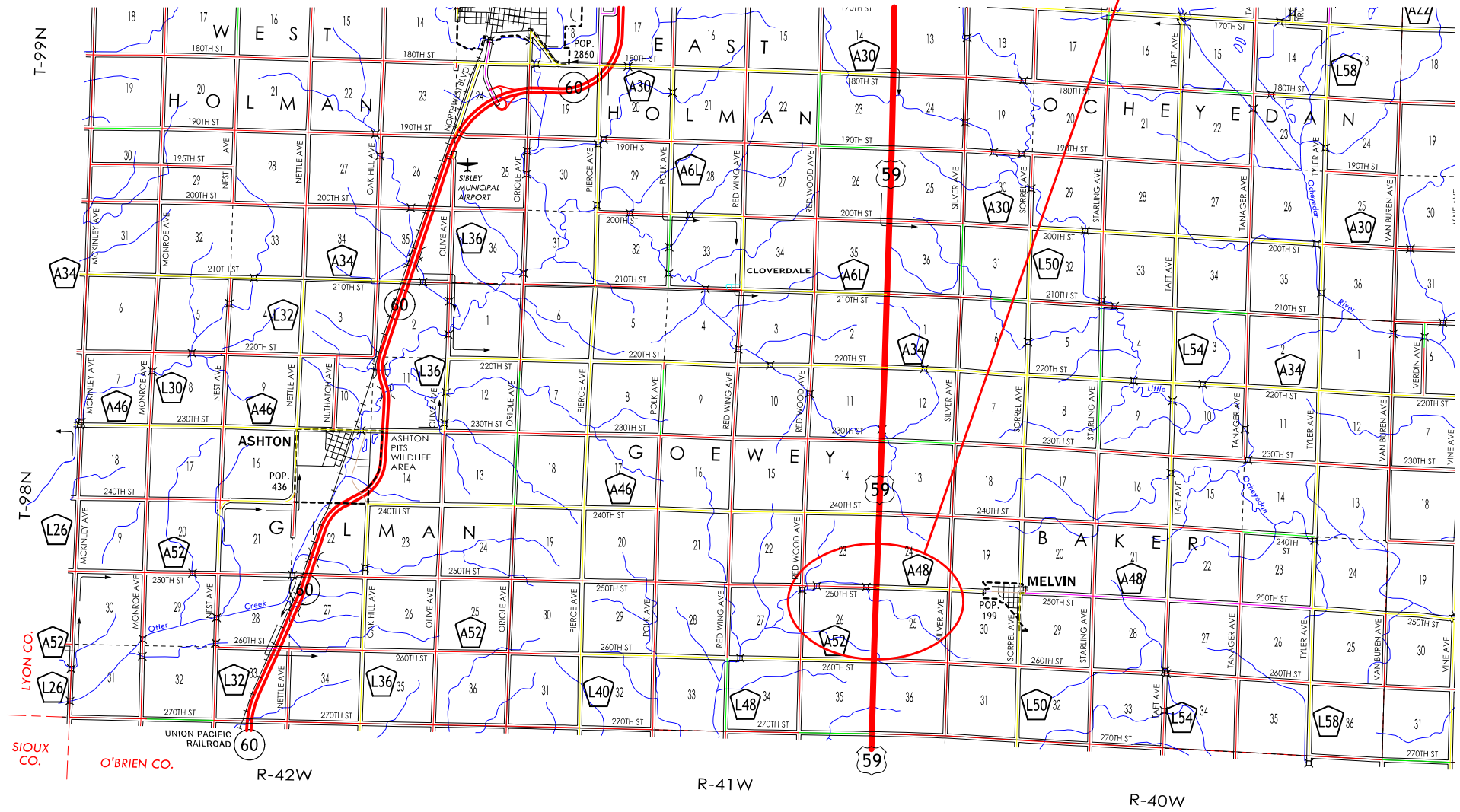
D4 PLAN - Date: 11-17-26

PRELIMINARY PLANS

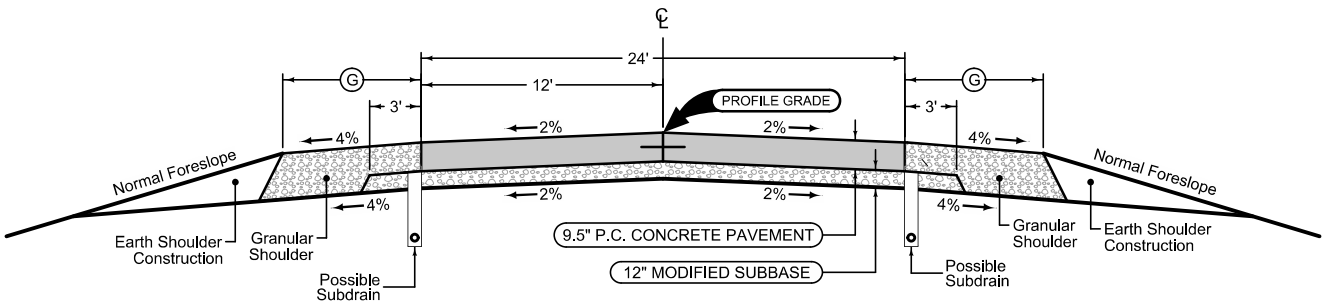
Subject to change by final design.

D5 PLAN - Date: 7/21/25

PROJECT LOCATION
STA. 94+47.38
M.P. 200.91



Granular Shoulder		
2_G_SR_04-21-20		Ⓔ
STATION TO STATION		Feet
95+15.00	95+80.00	6



Granular Shoulder		
2_G_SR_04-21-20		Ⓔ
STATION TO STATION		Feet
95+15.00	95+80.00	6

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

2P_04-21-20	
STATION TO STATION	
95+15.00	95+80.00

US 59 Paving

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

W **WL1D, Osceola Rural Water**

Doug Westerman
System Manager
Osceola Rural Water System Water
orwsdoug@windstream.net
(712) 261-1131

T1 **TL1D, Windstream Communications**

Hugh Carroll
OSP Construction Manager
Windstream Communications Fiber Distribution
hugh.carroll@windstream.com
(314) 239-3728

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.		Transparency
Pink, Dark	(13)		Temporary Pavement Shading 50%
Yellow	(4)		Proposed Pavement Shading 50%
Orange	(6)		Proposed Granular Shading 50%
Orange	(70)		Proposed Shoulder Granular Shading 50%
Yellow	(68)		Proposed Shoulder Paved Full Depth Shading 50%
Yellow	(132)		Proposed Shoulder Paved Partial Depth Shading 50%
Brown, Light	(236)		Grading Shading 50%
Orange, Light	(134)		Proposed Granular Entrance Shading 50%
Yellow	(220)		Proposed Paved Entrance Shading 50%
Tan	(8)		Proposed Sidewalk Shading 50%
Blue, Light	(230)		Proposed Sidewalk Landing Shading 50%
Pink	(11)		Proposed Sidewalk Ramp Shading 50%
Red	(3)		Proposed Structure Shading 50%
Red	(3)		Delineates Restricted Areas 0%

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

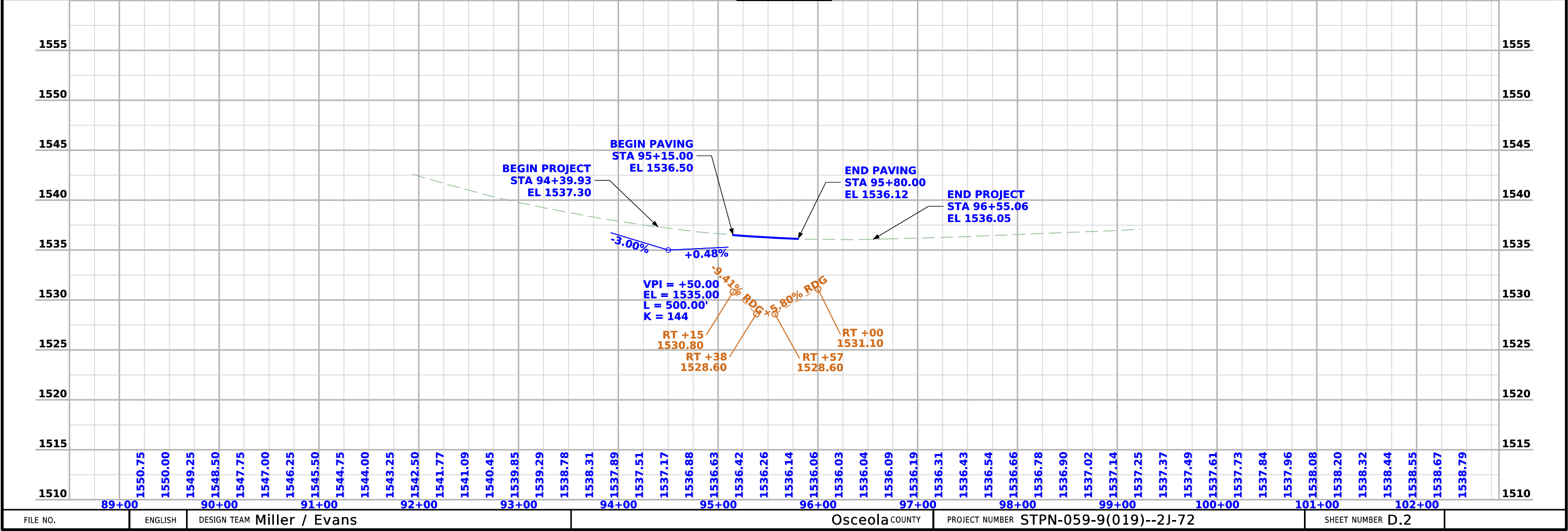
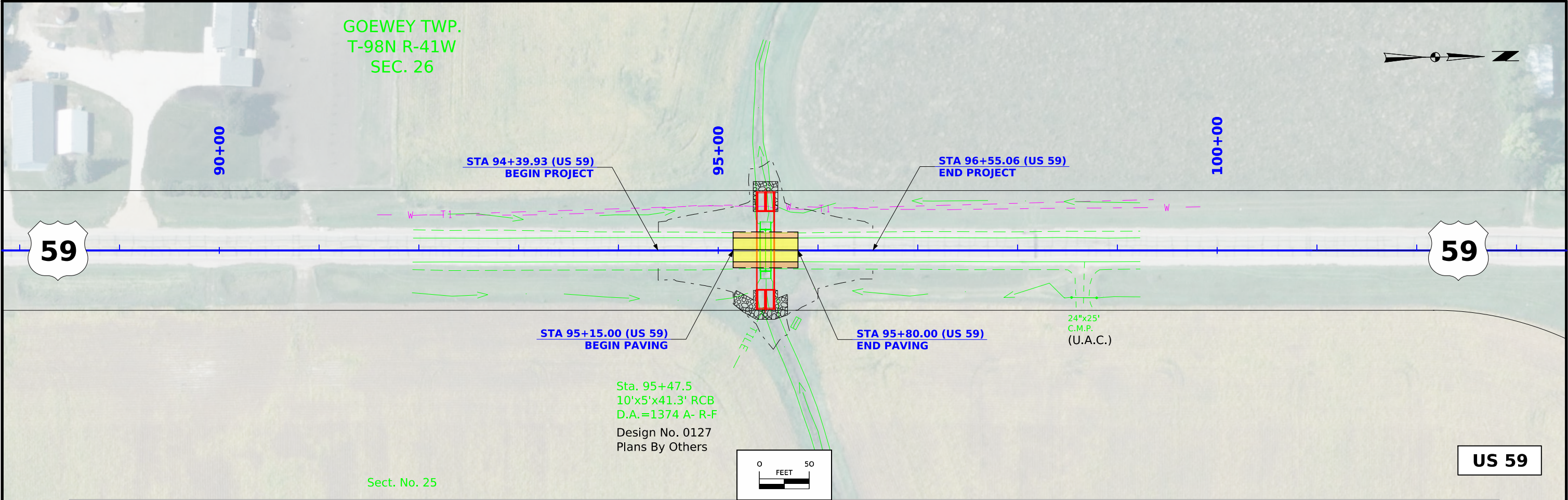
	Reference Point		Survey Line
	Station		Section Corner
	Ground Line Intercept		Saw Cut
	Guardrail		Trench Drain
	HighTension Cable Guardrail		Sheet Pile
	Pavement Removal		Clearing & Grubbing Area

RIGHT-OF-WAY LEGEND

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

PLAN AND PROFILE
LEGEND AND SYMBOL
INFORMATION SHEET

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



SURVEY INDEX

County: Osceola
PIN: 24-72-059-010
Project Number: STPN-059-9(019)--2J-72
Location: Approx 0.2 mi S of 250th St
Type of Work: Culvert
Project Directory: 7205901024

Survey Personnel

Daniel Duncan – Survey Party Chief

Date(s) of Survey

Begin Date 05/20/2024
End Date 06/12/2024

General Information

This survey is for US Hwy 59 Box Culvert Project This project is a Full Field DTM survey.

Utility Information

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

Project Control

Coordinates were determined for primary project control points by conducting concurrent six-hour static observations. Post processing is constrained to nearby Iowa Real Time Network reference stations. For additional details of the control survey, contact the Preliminary Survey department.

PROJECT DATUM: NAD83(2011) for EPOCH 2010.00 (IaRTN 2019 ADJUSTMENT)
COORDINATE SYSTEM: IOWA REGIONAL COORDINATE SYSTEM ZONE 01
(U.S. SURVEY FOOT)
VERTICAL DATUM: NAVD88
GEOID MODEL: 2018u3

Alignment Information

The horizontal alignment for U.S. Hwy 59 this survey is a retrace of As-built Plans No. FA-734AB. Survey stationing was equated to the plan 10FT X 5FT RCB at Sta. 95+47.5 and carried back and ahead without equation throughout the survey.

Survey stationing relates to as built plan stationing as follows:

PI Sta. 80+41.8 As-built Plans Project No. FA-734AB
Survey PI Sta. 80+41.51

10FTX5FT RCB Sta. 95+47.5 As-Built Plans Project No. FA-734AB
Survey Sta. 95+47.50

NE Cor. Sec. 26 Sta. 105+98.8 8.3’ Lt As-built Plans Project No. FA-734AB
Survey Station. 105+98.14 8.31’ Lt

E ¼ Cor. Sec. 23 Sta. 132+49.3 1.8’ Rt As-built Plans Project No. FA-734AB
Survey Sta. 132+48.99 1.80’ Rt

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) for EPOCH 2010.00 (IaRTN 2019 Adjustment) - Iowa RCS Zone 01 (U.S. Survey Foot)

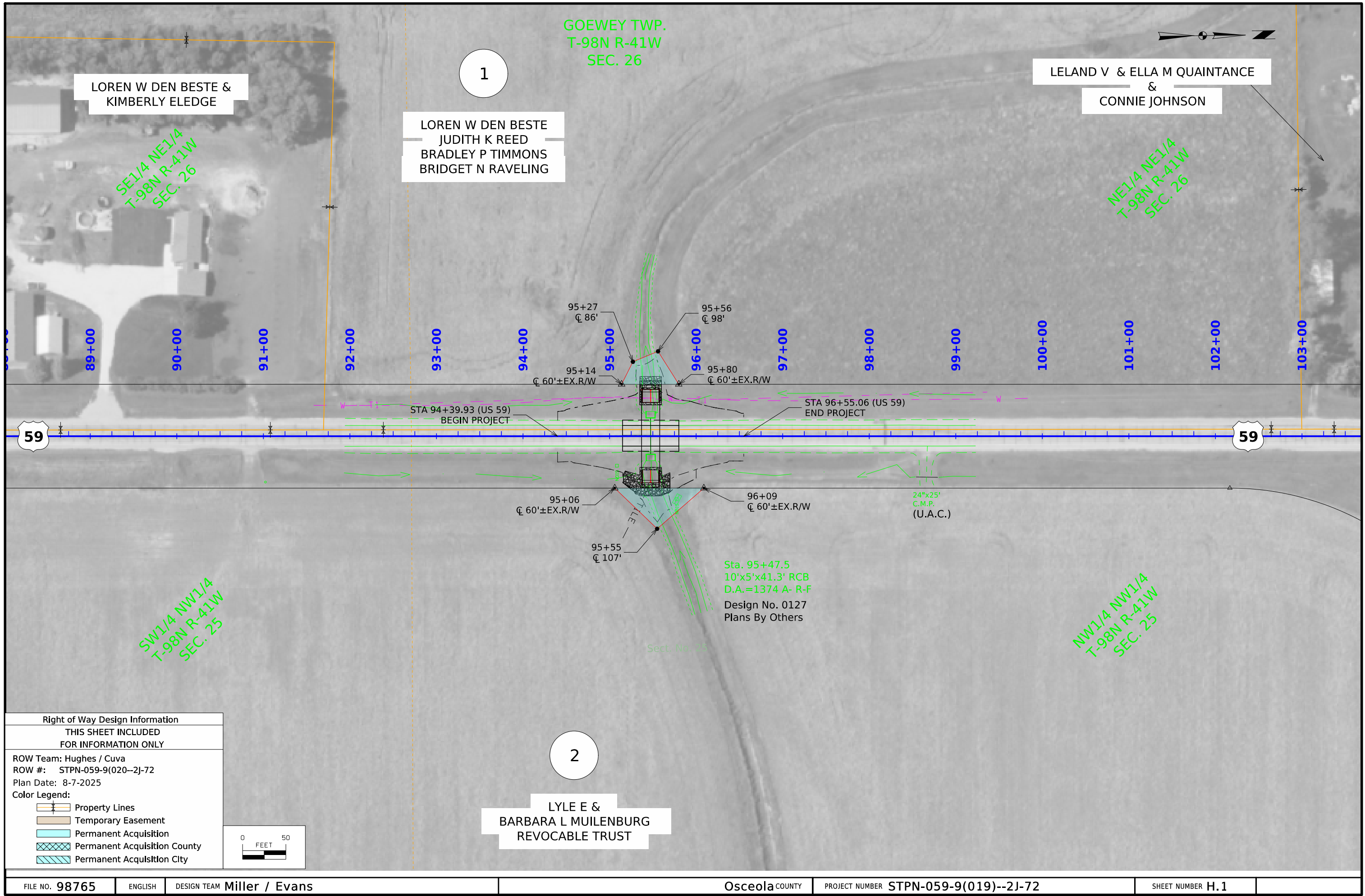
VERT. DATUM: NAVD88 - Geoid Model: 2018u3

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

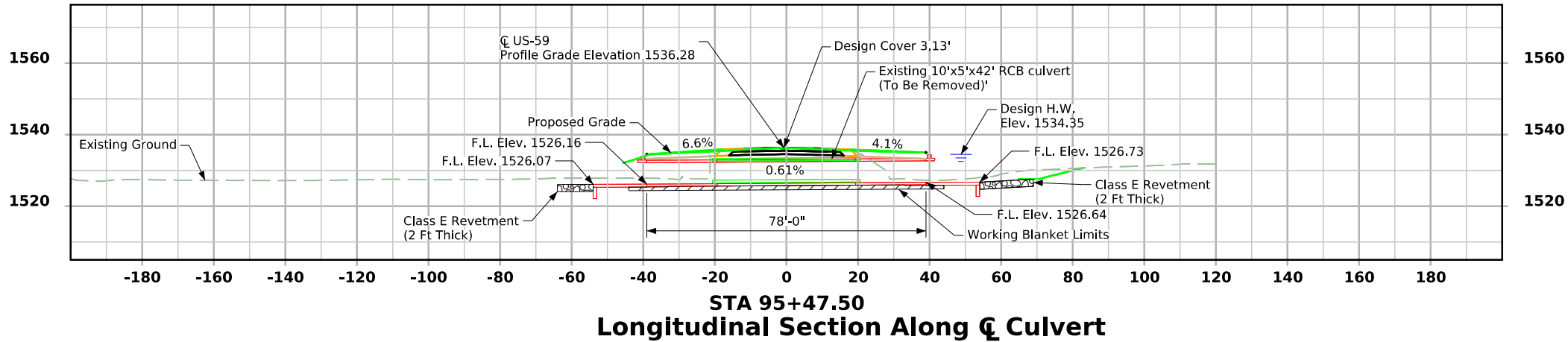
HORIZONTAL AND VERTICAL PROJECT CONTROL COORDINATE LISTING
HORIZ. DATUM: NAD83(2011) for EPOCH 2010.00 (IaRTN 2019 Adjustment)
Ia. Regional Coordinate System Zone 01 (U.S. Survey Foot)
VERT. DATUM: NAVD88
Geoid Model: 2018u3

Point Name	Northing	Easting	Elevation	Code-Description
7225001	9632113.91	11393441.96	1526.85	CP SET FENO MONUMENT 0.2 MI WEST OF US 59 AND 250TH STREET INTERSECTION
7225002	9632182.41	11397740.40	1559.96	CP SET FENO MONUMENT 0.5 MI EAST OF US 59 AND 250TH STREET INTERSECTION
720592008	9630659.45	11395110.34	1544.76	CP SET FENO MONUMENT 0.3 MI SOUTH OF US 59 AND 250TH STREET INTERSECTION
720592018	9636230.94	11395084.35	1556.05	CP SET FENO MONUMENT 0.8 MI NORTH OF US 59 AND 250TH STREET INTERSECTION

NO ACCESS RIGHTS ARE TO BE ACQUIRED ON THIS PROJECT.



Control Point: 7225001,CP set feno monument 0.2 mi west of us 59 and 250th street intersection. Elev. 1526.846, N.9632113.905, E.11393441.957



General Notes:

This design is for the replacement of an existing single 10'-0" x 5'-0" x 42' RCB culvert with an twin 8'-0" x 6'-0" x 78'-0" RCB culvert, Asset ID No. 900910.

Design Notes:

- Design fill for this P.C. culvert is 3.13'.
- Anticipated settlement is negligible.
- Revetment is proposed at the culvert inlet and outlet due to erosion concerns.

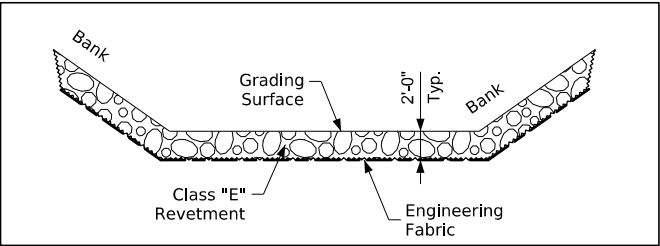
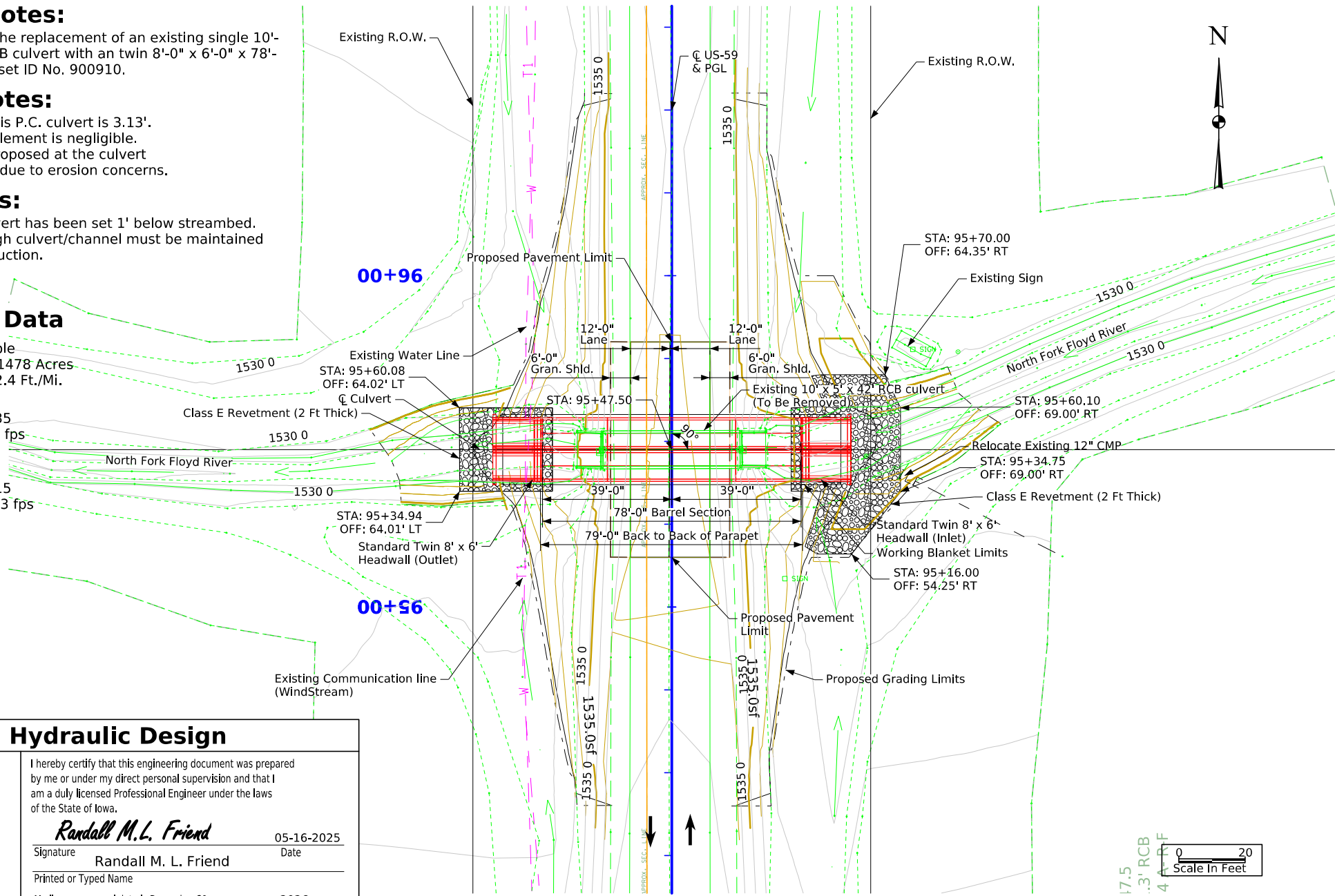
Plan Notes:

- Flow line of culvert has been set 1' below streambed.
- Drainage through culvert/channel must be maintained throughout construction.

Hydraulic Data

RIDB: Not Applicable
Drainage Area = 1478 Acres
Stream Slope = 12.4 Ft./Mi.
Q₅₀ = 400 cfs
HW Elev. = 1534.35
Exit Velocity = 5.0 fps

Q₁₀₀ = 490 cfs
HW Elev. = 1535.15
Exit Velocity = 6.13 fps



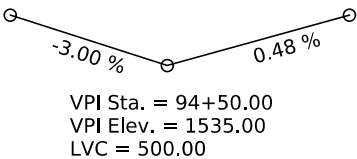
Typical Channel Protection

Estimated Revetment Quantities Included With Road Plans

Location	Revetment Class "E" (Ton)	Engineering Fabric (SY)	CL 13 Channel Excavation (CY)
Inlet	119	126	84
Outlet	44	46	31
Totals	163	172	115

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.

VPC Sta. = 92+00.00 VPT Sta. = 97+00.00
VPC Elev. = 1542.50 VPT Elev. = 1536.19



Proposed Profile Grade US-59

Location

US-59 over North Fork Floyd River
T-98N R-41W
Section 25
Goewey Township
Osceola County
Bridge Maint. No. 7200.9B059
Asset ID No. 900910
Latitude 43.284656°
Longitude -95.644065°

Traffic Estimate

2023 AADT	1170 V.P.D.
2047 AADT	1750 V.P.D.
20?? DHV	?? V.P.H.
TRUCKS	29 %
Total	???
Design ESALs	???

Utilities Note:

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

General Utility Symbols:

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

Design For 0°
Twin 8'-0" x 6'-0" x 78'-0" Reinforced Concrete Box Culvert

Situation Plan - P.C.

STA. 95+47.50 (US-59) Turn-in Date: May 2025

Osceola County

IOWA DEPARTMENT OF TRANSPORTATION
Design No. 0127 Design Sheet No. 2 of 2 FHWA/Asset 900910

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.

Randall M.L. Friend 05-16-2025
Signature Date

Randall M. L. Friend
Printed or Typed Name

My license renewal date is December 31, 2026

Pages or sheets covered by this seal:
V.1 and V.2

P28452

FILE NO. 32711

ENGLISH

DESIGN TEAM HNTB

Osceola COUNTY

PROJECT NUMBER STPN-059-9(019)--2J-72

SHEET NUMBER

V.2

CROSS SECTION VIEW COLOR LEGEND			
Design Color No.	Feature	Design Color No.	Feature
Aggregate		Grading	
(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	Substrata	
(6)	Revetment Class B	(128)	Boulder
(62)	Revetment Class C	(209)	Boulder Removed
(188)	Revetment Class D	(48)	Broken Weathered
(28)	Revetment Class E	(210)	Broken Weathered Removed
(12)	Shoulder Special Backfill	(3)	Core Out
(12)	Special Backfill	(115)	Core Out Remove Only
(20)	Subbase	(195)	Core Out Remove and Replace
(20)	Subbase Lower	(203)	Existing Pavement
(20)	Subbase Upper	(184)	Existing Pavement Remove Only
(118)	Subgrade Treatment	(200)	Existing Pavement Remove and Replace
Asphalt		(6)	Loam
(207)	HMA Base Course	(211)	Loam Removed
(207)	HMA Interim Course	(80)	Rock
(207)	HMA Surface Course	(212)	Rock Removed
Bridge		(4)	Select Sand
(0)	Bridge	(214)	Select Sand Removed
Concrete		(3)	Shale
(0)	Barrier Concrete	(215)	Shale Removed
(0)	Barrier Concrete Footing	(10)	Topsoil
(0)	Curb Gutter	(2)	Topsoil Remove Only
(48)	Flowable Mortar	(4)	Topsoil Remove and Replace
(0)	Median Concrete	Unsuitable / Waste	
(0)	PCC Pavement	(3)	Unsuitable Type A
(0)	Sidewalk	(216)	Unsuitable Type A Removed
Existing		(13)	Unsuitable Type B
(0)	Existing Pavement	(217)	Unsuitable Type B Removed
Shoulder		(11)	Unsuitable Type C
(209)	Shoulder HMA	(218)	Unsuitable Type C Removed
(0)	Shoulder PCC	(3)	Waste
(6)	Shoulder Granular	(219)	Waste Removed
Structural			
(112)	Noise Wall		
(112)	Noise Wall Footing		
(112)	Retaining Wall Back		
(112)	Retaining Wall Back Excavate		
(112)	Retaining Wall Face		
(112)	Retaining Wall Front Excavate		
(112)	Retaining Wall Front Footing		
(112)	Retaining Wall MSE Gutter		
(112)	Retaining Wall Reinforced Earth		

NOTES:

Text

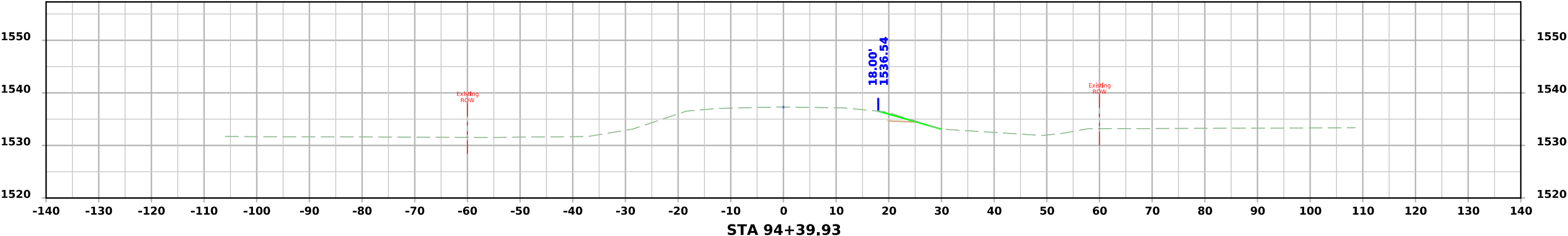
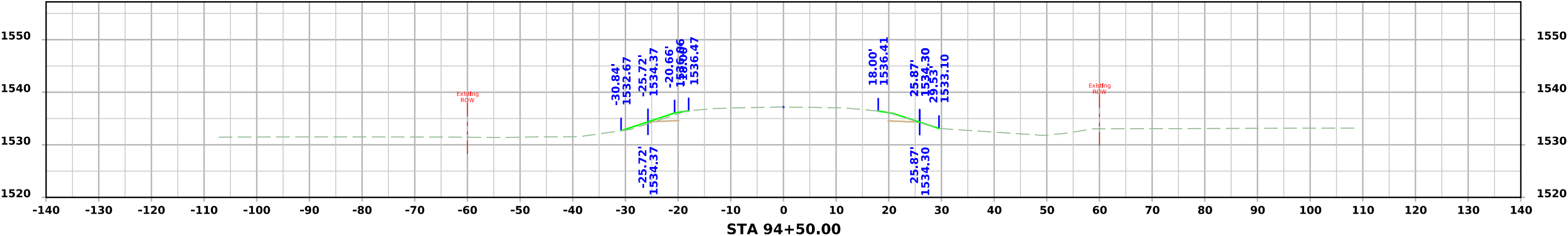
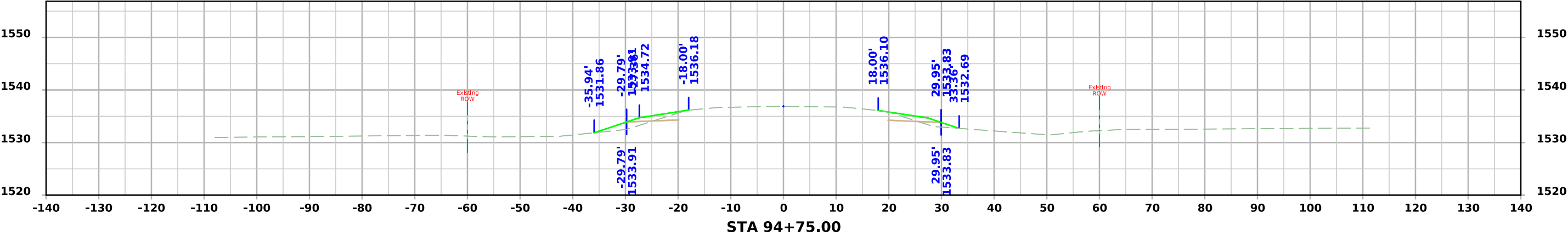
NOTES:

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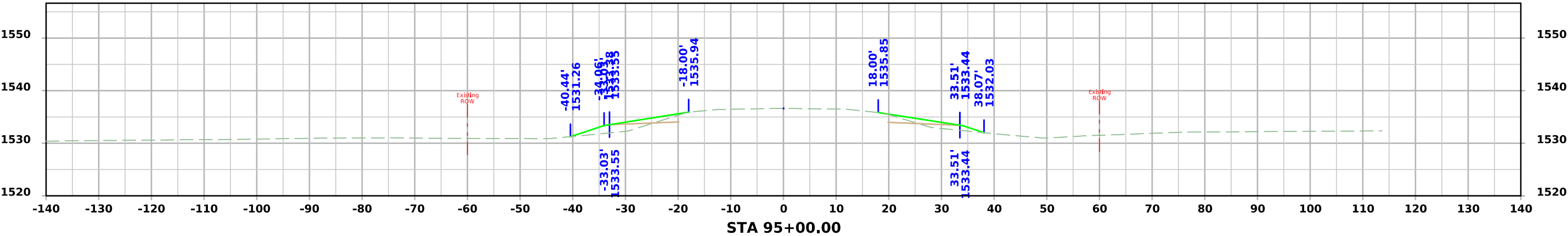
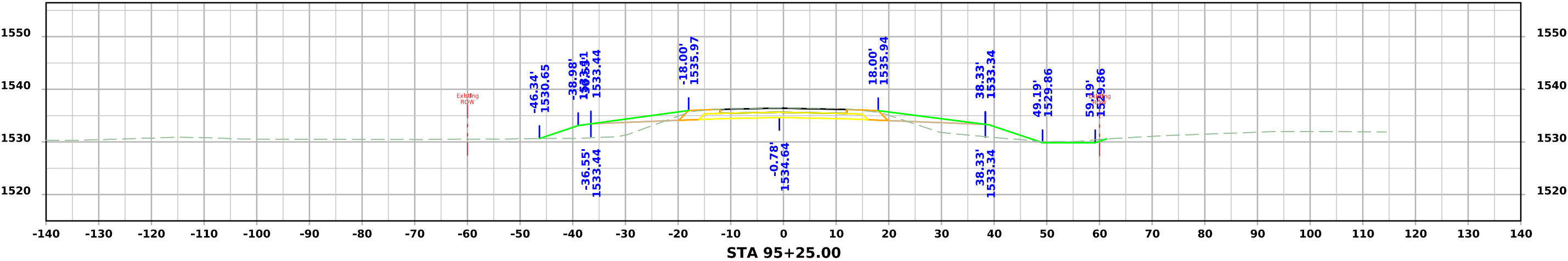
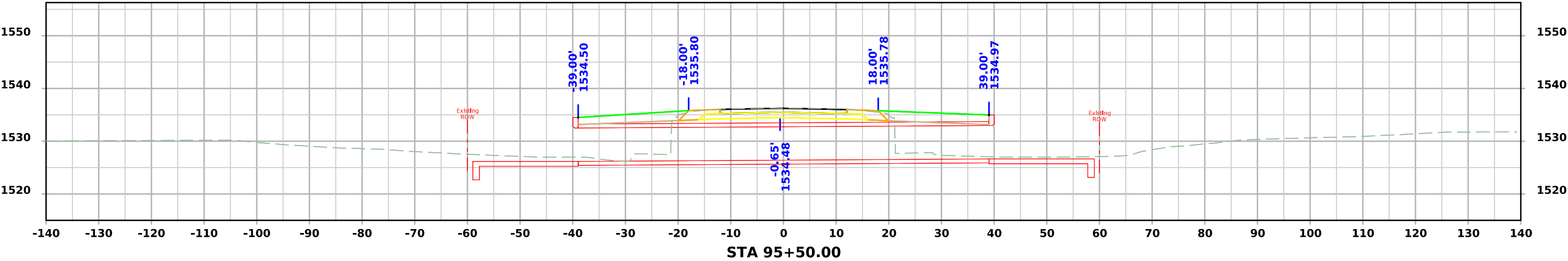
CROSS SECTIONS
LEGEND AND INFORMATION SHEET

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

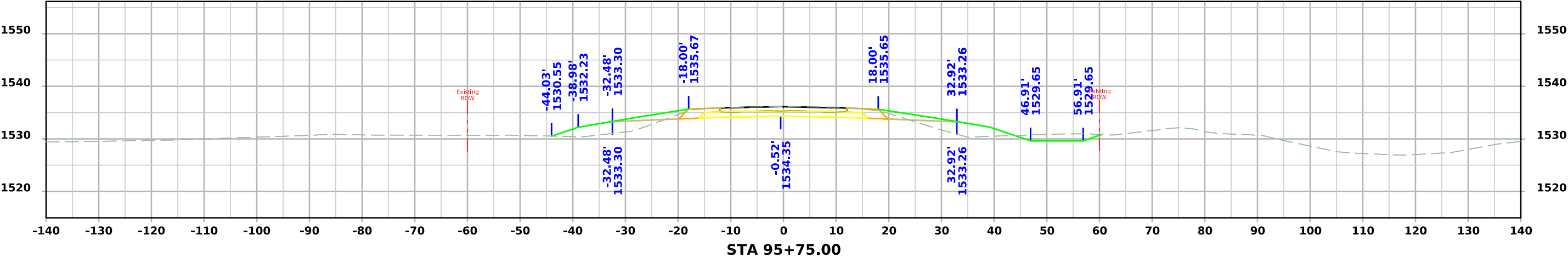
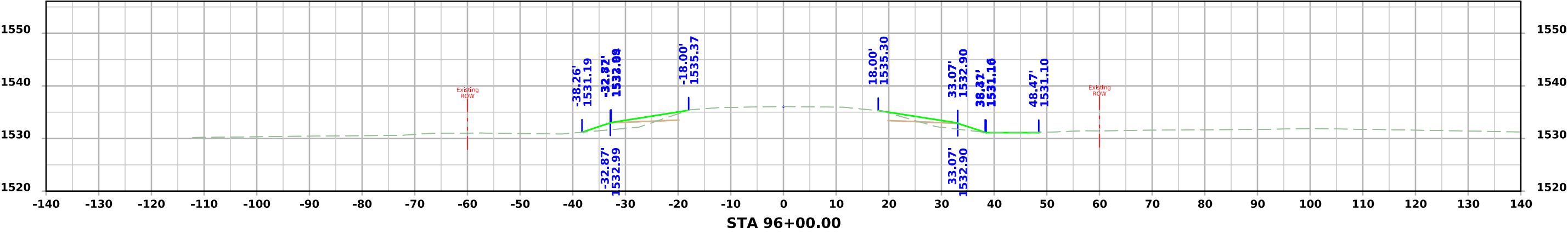
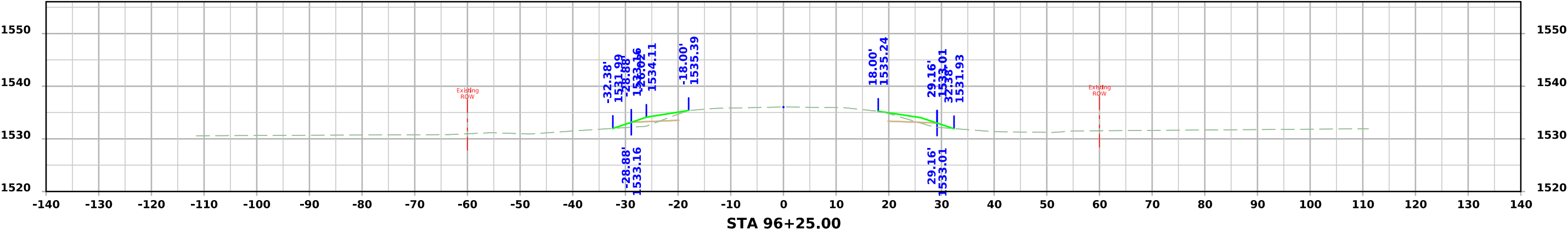
ML - US59



ML - US59



ML - US59



ML - US59

