

WEBSTER COUNTY

Bridge-Unspecified
BRF-144-0(006)--38-94

LETTING DATE
08/18/2026



PLANS OF PROPOSED IMPROVEMENT ON THE
PRIMARY ROAD SYSTEM
WEBSTER COUNTY
Bridge-Unspecified
East Buttrick Creek 2.2 mi S of IA 175

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

TOTAL

PROJECT IDENTIFICATION NUMBER

22-94-144-010

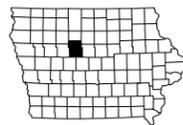
PROJECT NUMBER

BRF-144-0(006)--38-94

R.O.W. PROJECT NUMBER

STPN-144-0(007)--2J-94

PROJECT LOCATION



INDEX OF SEALS			
SHEET NO.	NAME	TYPE	BID QUANTITY SHEETS
A.1	Jeremy J. Vortherms	Primary Signature Block	C.1

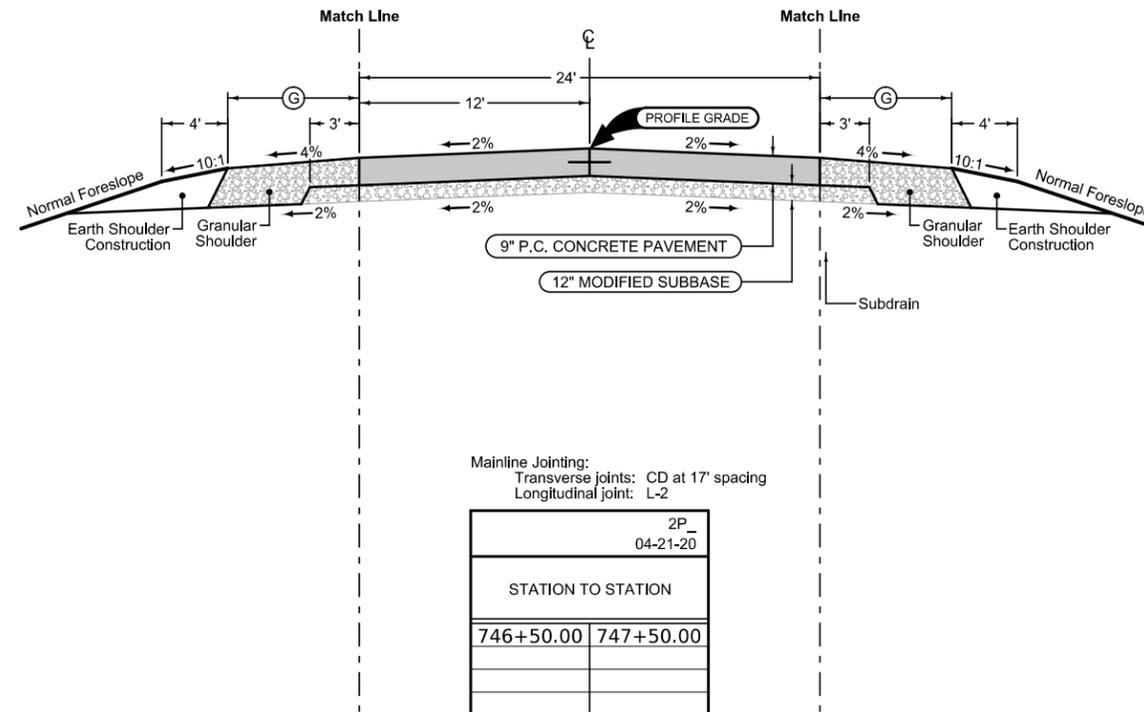
PRELIMINARY PLANS

Subject to change by final design.

D5 PLAN - Date: 01-07-2025

Granular Shoulder

1R_G_		
10-19-10		
BEGIN STATION	END STATION	⊙ Feet
746+50.00	748+25.00	4

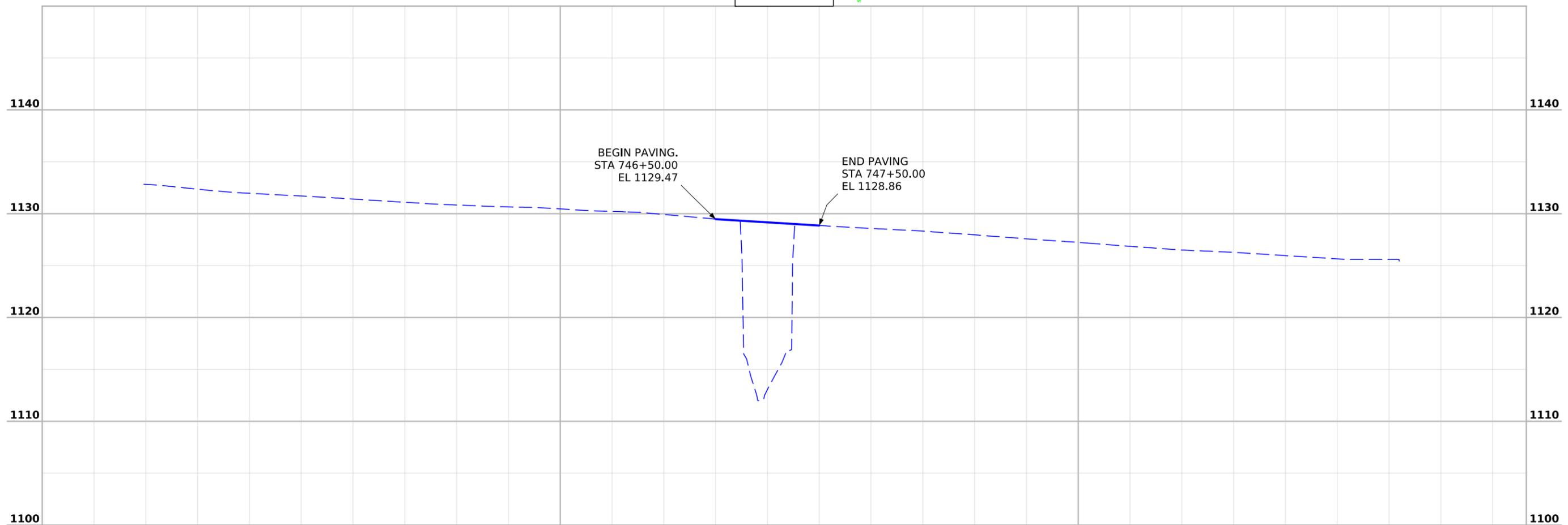
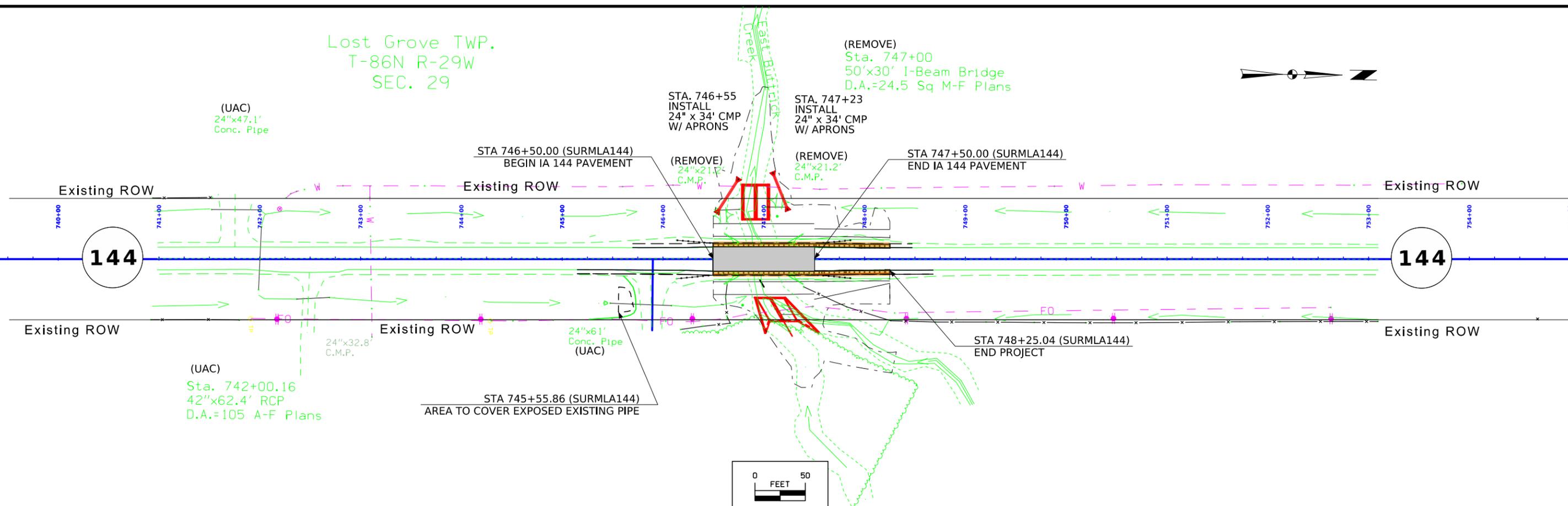


2P_	
04-21-20	
STATION TO STATION	
746+50.00	747+50.00

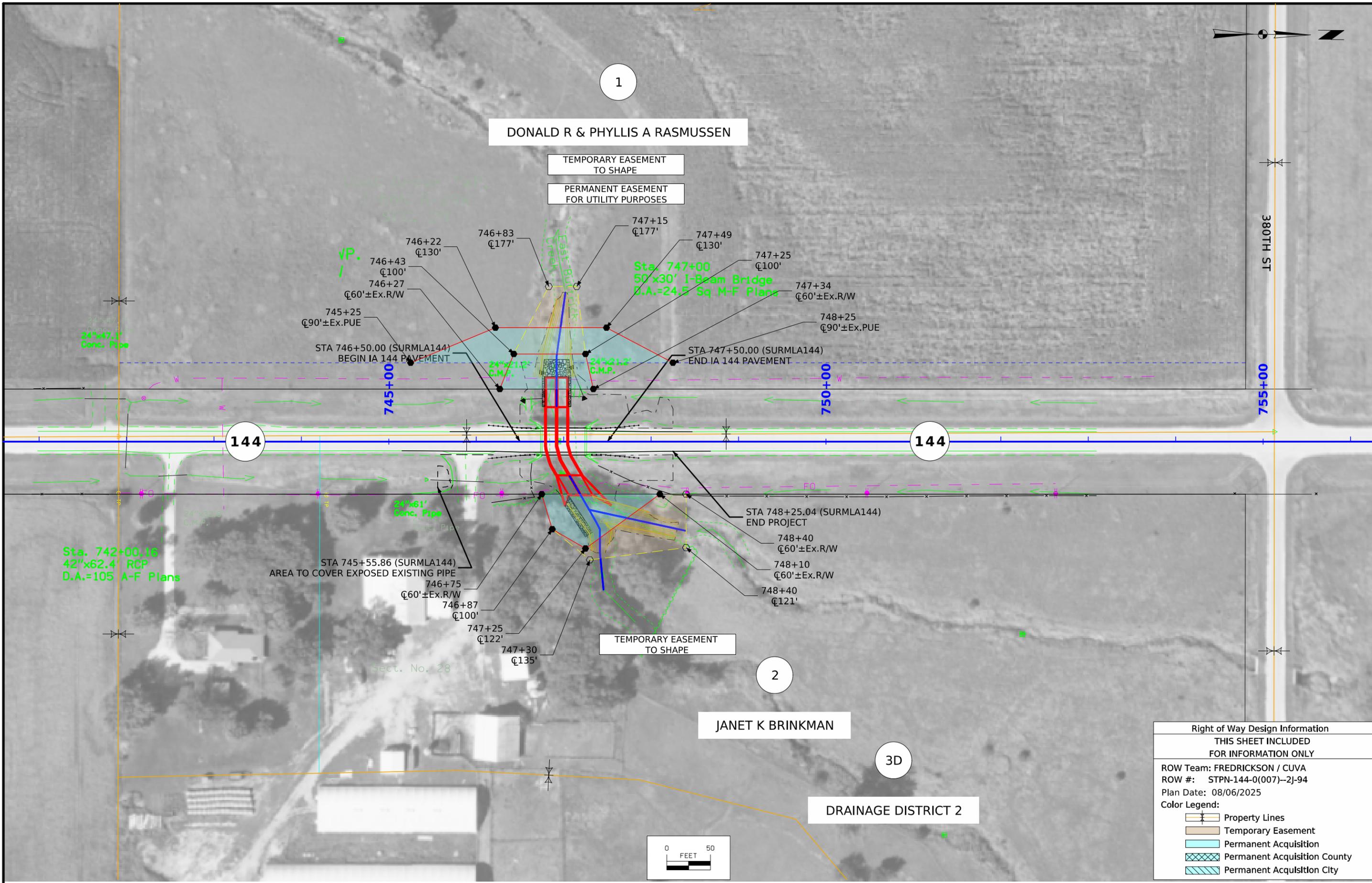
Granular Shoulder

1R_G_		
10-19-10		
BEGIN STATION	END STATION	⊙ Feet
746+50.00	748+25.00	4

Lost Grove TWP.
T-86N R-29W
SEC. 29



NO ACCESS RIGHTS ARE TO BE ACQUIRED ON THIS PROJECT.



DONALD R & PHYLLIS A RASMUSSEN

TEMPORARY EASEMENT TO SHAPE

PERMANENT EASEMENT FOR UTILITY PURPOSES

1

TEMPORARY EASEMENT TO SHAPE

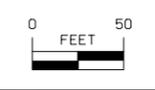
2

JANET K BRINKMAN

3D

DRAINAGE DISTRICT 2

Right of Way Design Information	
THIS SHEET INCLUDED FOR INFORMATION ONLY	
ROW Team: FREDRICKSON / CUVA	
ROW #: STPN-144-0(007)--2J-94	
Plan Date: 08/06/2025	
Color Legend:	
	Property Lines
	Temporary Easement
	Permanent Acquisition
	Permanent Acquisition County
	Permanent Acquisition City



TRAFFIC CONTROL PLAN

108-23A
08-01-08

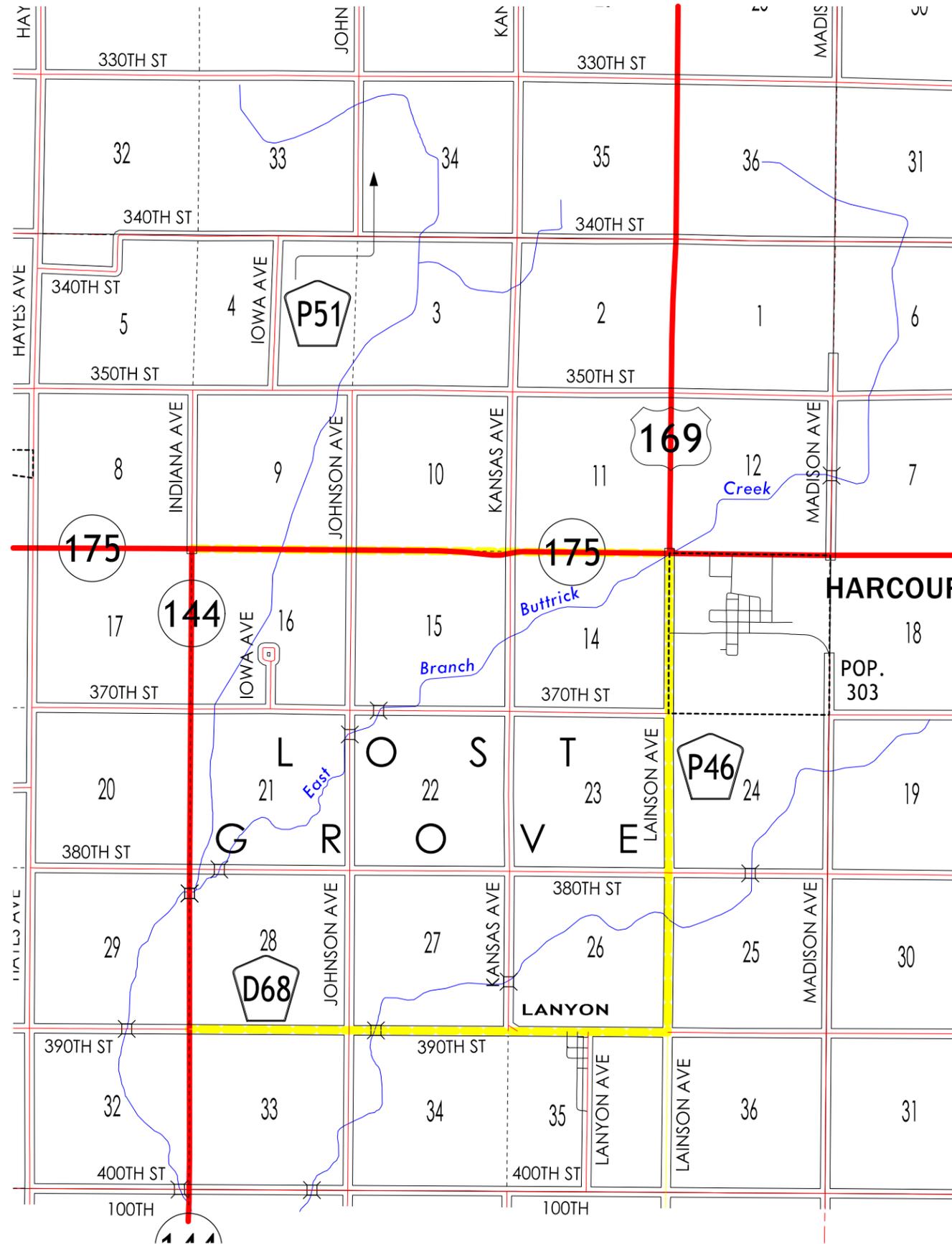
IA 144 shall be closed. Traffic shall use detour found on sheet J.2.

COORDINATED OPERATIONS

111-01
04-17-12

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
Provided at project turn in	



HARCOUR
POP. 303

D68

P46

169

175

175

144

—————
DETOUR ROUTE

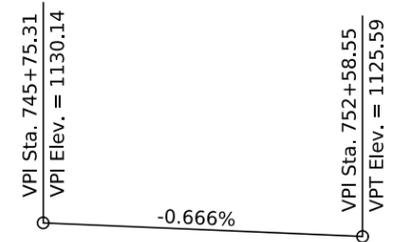
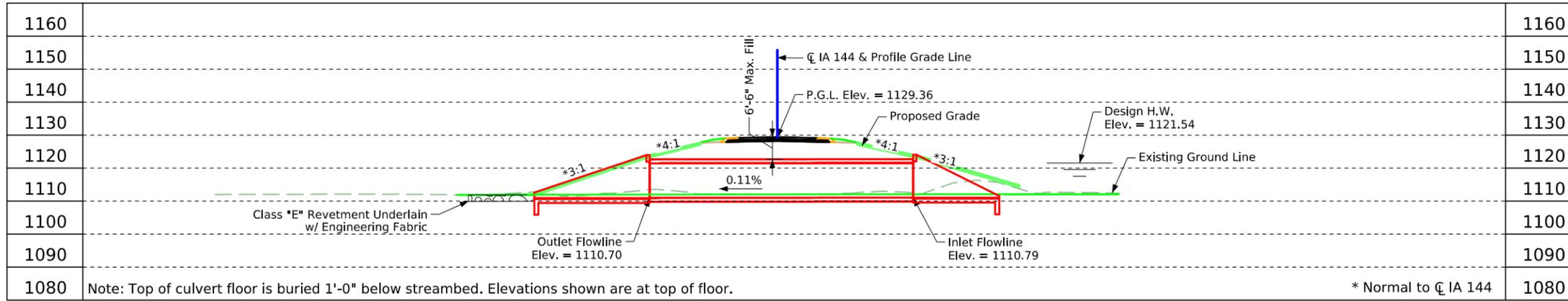
TABULATION OF TEMPLATE QUANTITIES AND ADJUSTMENTS

Station	Cut				Fill					Checks (EW-102)		Topsoil				[16]	[17]	[18]	[19]	[20]	[21]	[22]	
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]								
	Total Cut Unadjusted Volume	Total Class 10 Unadjusted Volume	Topsoil Cut Volume	Total Cut Adjusted	Total Fill Unadjusted Volume	Existing Topsoil Stripping Undercut (+ Fill)	Total Fill Adjusted	Total Fill Adjusted w/ Weighted Average 1.3 Shrink Factor	Total Cut Adjusted Minus Fill w/ Shrink	Approx. Fill Vol. Below 5' & Above 20' w/ Shrink	Approx. Fill Volume Below 3' w/ Shrink	Topsoil Stripping Undercut Volume	Topsoil Placement Undercut Volume	Topsoil Placement With 1.4 Shrink Factor	Topsoil Stripping Minus Topsoil Placement w/Shrink								
746+50.00																							
746+75.00																							
747+00.00	269	214	56	214	345	49	394	513	-299	0	0	56	43	60	-4								
747+25.00	258	219	39	219	325	33	358	466	-247	0	0	39	44	61	-22								
747+50.00	153	98	55	98	292	48	340	443	-345	0	0	55	30	42	13								
747+75.00	166	109	57	109	74	33	107	139	-30	0	0	57	20	28	29								
748+00.00	138	88	50	88	19	14	33	43	45	0	0	50	21	29	21								
748+25.00	93	49	44	49	17	13	30	39	10	0	0	44	17	24	20								
746+50.00																							
Totals:	1,078	777	302	777	1,072	192	1,263	1,642	-866	0	0	302	175	244	58								

TABULATION OF TEMPLATE QUANTITIES AND ADJUSTMENTS

Station	Cut				Fill					Checks (EW-102)		Topsoil				[16]	[17]	[18]	[19]	[20]	[21]	[22]
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Summary:																						
746+50.00	1,078	777	302	777	1,072	192	1,263	1,642	-866	0	0	302	175	244	58							
Project Totals:	1,078	777	302	777	1,072	192	1,263	1,642	-866	0	0	302	175	244	58							

Control Point 941440324: 8493209.115 N, 14659687.677 E, CP FENO Monument set on S. side 380th St approx. 400 ft West of IA 144, Elev. 1126.824



Proposed Profile Grade IA 144

Hydraulic Data

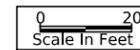
RIDB: E_ButtrickC 8.5
 Drainage Area = 25.4 Sq. Mi.
 Stream Slope = 7.55 Ft./Mi.
 Q₅₀ = 1620 cfs
 HW Elev. = 1121.54
 Exit Velocity = 8.1 fps

Utilities Note:

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

General Utility Symbols:

FO - Webster Calhoun Co-Op Telephone
 W - Xenia Rural Water
 ● - Midland Power Co-Op



Traffic Estimate

2027 AADT	700 V.P.D.
2047 AADT	800 V.P.D.
20?? DHV	?? V.P.H.
TRUCKS	26 %
Total Design ESALS	???

Location

IA 144 over East Buttrick Creek
 T-86N R-29W
 Sections 28 & 29
 Lost Grove Township
 Webster County
 FHWA No. 52341
 Bridge Maint. No. 9432.2S144
 Latitude 42.236551°
 Longitude -94.242690°

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.

Timothy J. Sheets 10/09/2024
 Signature Date

Printed or Typed Name Timothy J. Sheets

My license renewal date is December 31, 2025

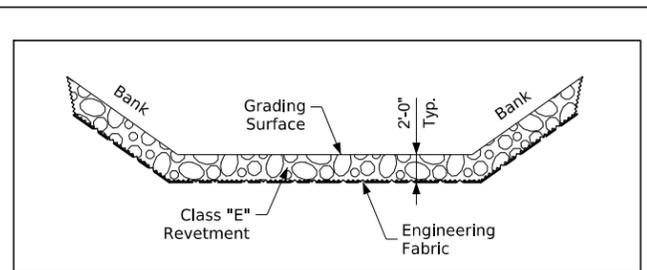
Pages or sheets covered by this sheet: V.1

Longitudinal Section Along Centerline of Culvert

Design Fill Height = 7'-0"
 Anticipated Settlement = ??

General Note:

This design is for the replacement of the existing 50' x 30' continuous I-beam bridge, Webster Design No. 547, FHWA No. 52340, Maint. No. 9432.2S144.

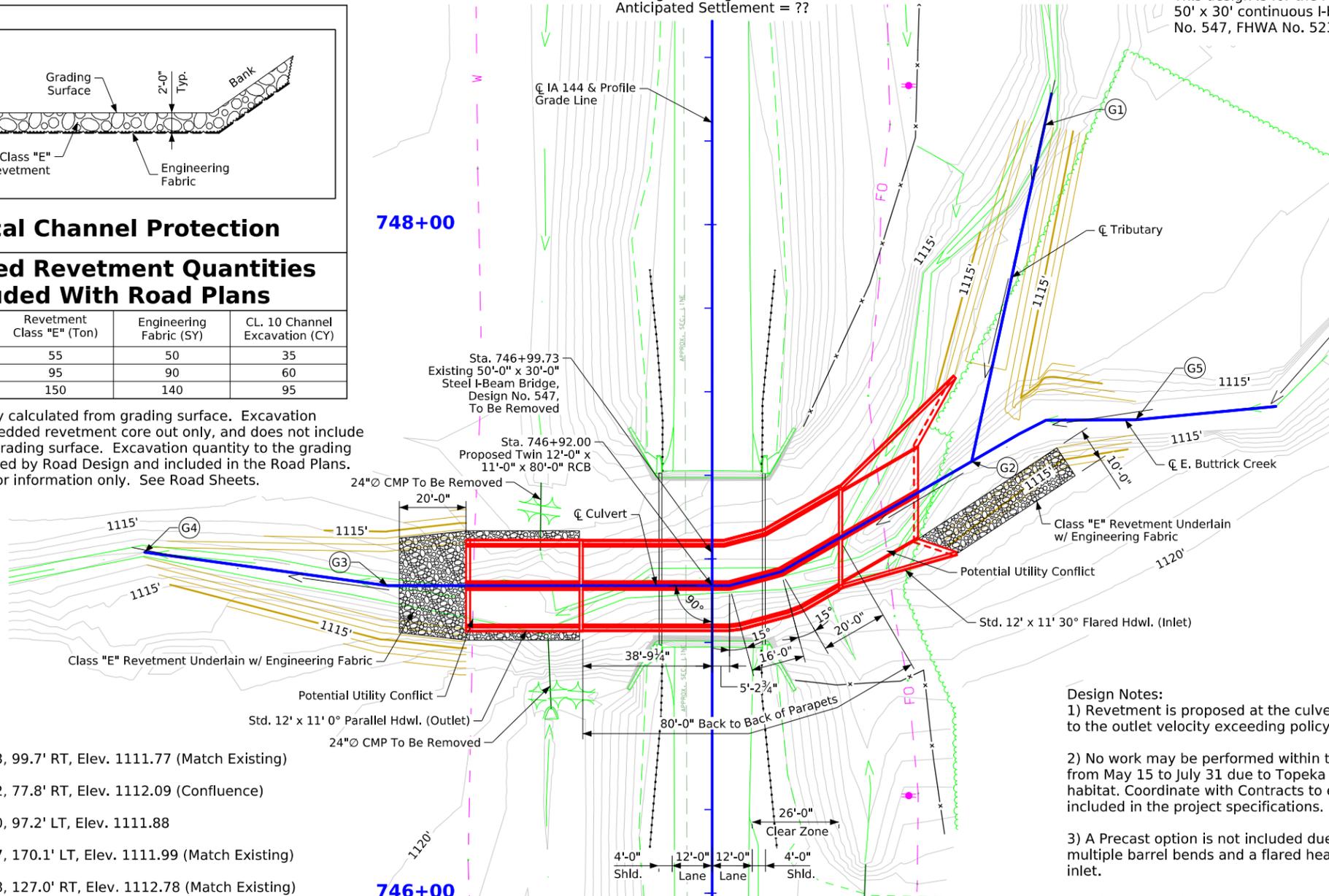


Typical Channel Protection

Estimated Revetment Quantities Included With Road Plans

Location	Revetment Class "E" (Ton)	Engineering Fabric (SY)	CL. 10 Channel Excavation (CY)
Inlet	55	50	35
Outlet	95	90	60
Totals	150	140	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.



Situation Plan

Design Notes:

- 1) Revetment is proposed at the culvert outlet due to the outlet velocity exceeding policy limits.
- 2) No work may be performed within the channel from May 15 to July 31 due to Topeka Shiner habitat. Coordinate with Contracts to ensure this is included in the project specifications.
- 3) A Precast option is not included due to the use of multiple barrel bends and a flared headwall for the inlet.
- 4) A flared wing headwall is proposed at the culvert inlet because it better captures the flow from both the primary stream and tributary.

- (G1) Sta. 748+29.63, 99.7' RT, Elev. 1111.77 (Match Existing)
- (G2) Sta. 747+29.12, 77.8' RT, Elev. 1112.09 (Confluence)
- (G3) Sta. 746+92.00, 97.2' LT, Elev. 1111.88
- (G4) Sta. 747+01.97, 170.1' LT, Elev. 1111.99 (Match Existing)
- (G5) Sta. 747+41.58, 127.0' RT, Elev. 1112.78 (Match Existing)

Grading control points indicate the location and elevation of the channel centerline and are included to aid in the channel realignment.

Design For 0 Degree Skew
Twin 12'-0" x 11'-0" x 80'-0"
Reinforced Concrete Box Culvert

Situation Plan

STA. 746+92.00 (IA 144) Turn-In Date: Oct 2024

Webster County
 IOWA DEPARTMENT OF TRANSPORTATION
 Design No. 227 Design Sheet No. 1 of 1 FHWA/Asset 52341

PRELIMINARY BRIDGE TSL DEVELOPMENT REPORT

October 9, 2024

IA 144 over East Buttrick Creek
Project No. BRF-144-0(006)--38-94
PIN: 22-94-144-010
File No. 32445
Webster County - Design No. 227
Twin 12'-0" x 11'-0" x 80'-0" Reinforced Concrete Box Culvert
Location: 2.2 mi S of IA 175
Station 746+92.00 (C IA 144)
Maintenance No. 9432.25144
FHWA No. 52341
Work Description: Bridge - Unspecified
Prepared for: Iowa DOT
Prepared by: Foth IE

TSL DEVELOPMENT DETAILS

1. BDM 4.2.2 - Hydraulics
 - a. The Iowa Culvert Program was used to determine the size of the culvert.
 - b. The floor of the culvert has been placed 1'-0" below the streambed.
2. BDM 4.3.4 - Horizontal Alignment
 - a. The proposed culvert alignment includes two - 15° bends to facilitate adequate alignment with the stream on both the upstream and downstream sides of the culvert.
3. BDM 4.3.5 - Vertical Alignment
 - a. The slope of the culvert was designed to closely match the natural stream slope adjacent to the culvert location.
4. BDM 4.3.6 - Length Determination
 - a. The overall length of the culvert barrel is primarily based on the required Clear Zone width of 26'.
 - b. The length of the bend sections were reviewed to ensure that the shortest wall lengths were at least 5'.
5. BDM 4.5.1.1 - Cast-in-Place RCB Headwalls
 - a. A standard 0° skew parallel wing headwall is proposed for the outlet.
 - b. A standard 30° skew flared wing headwall is proposed for the inlet. The flared wing headwall was chosen because it better captures the flow from both the primary stream and tributary, which currently have a confluence just upstream of the existing bridge structure.
6. BDM 4.5.2 - Precast RCBs
 - a. A Precast RCB option is not included due to the use of a flared wing headwall for the inlet and the two - 15° bends within the barrel.
7. BDM 4.5.8 - Revetment for RCBs
 - a. Revetment is proposed at the outlet of the box culvert because exit velocities exceed 6 ft/s.

Design For 0 Degree Skew
Twin 12'-0" x 11'-0" x 80'-0"
Reinforced Concrete Box Culvert
 TSL Development Report
 STA. 746+92.00 (IA 144) Turn-In Date: Oct 2024
Webster County
 IOWA DEPARTMENT OF TRANSPORTATION
 Design No. 227 Design Sheet No. of FHWA/Asset 52341

FILE NO. 32445	ENGLISH	DESIGN TEAM Foth	Webster COUNTY	PROJECT NUMBER BRF-144-0(006)--38-94	SHEET NUMBER
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IA 144

