

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	Existing Pavement Details
B.3 - 4	Typical Cross Sections and Details
D Sheets	Mainline Plan and Profile Sheets
* D.1	Plan & Profile Legend & Symbol Information Sheet
* D.2 - 4	Iowa Highway 146
G Sheets	Survey Sheets
G.1 - 3	Survey Information
G.4	Alignment Plan Views
G.5	Horizontal Control Tabulations
H Sheets	Right-of-Way Sheets
H.1 - 2	IA Highway 146
J Sheets	Traffic Control and Staging Sheets
J.1	Traffic Control Plan
J.2	Coordinated Operations
* J.3	Detour Route
* J.4 - 5	Paddling Route Signage
V Sheets	Bridge and Culvert Situation Plans
* V.1	Bridge and Culvert Situation Plan
W Sheets	Mainline Cross Sections
* W.1 - 10	Mainline Cross Sections
	* Color Plan Sheets



PLANS OF PROPOSED IMPROVEMENT ON THE
PRIMARY ROAD SYSTEM
POWESHIEK COUNTY
Bridge - Unspecified
IA 146 over North Skunk River
2.7 mi N of US 63
Location
SCALES: As Noted

Refer to the Proposal Form for list of applicable specifications.

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



MILEAGE SUMMARY			
		105-1	
		09-27-94	
Div.	Location	Lin. Ft.	Miles
1	IA 146 ML Sta. 2148+85.11 to 2162+59.99	1,374.88	0.260

DESIGN DATA RURAL			
2023	AADT	1,310	V.P.D.
2049	AADT	1,700	V.P.D.
20	- DHV	--	V.P.H.
TRUCKS		--	%
Total			
Design ESALs		--	

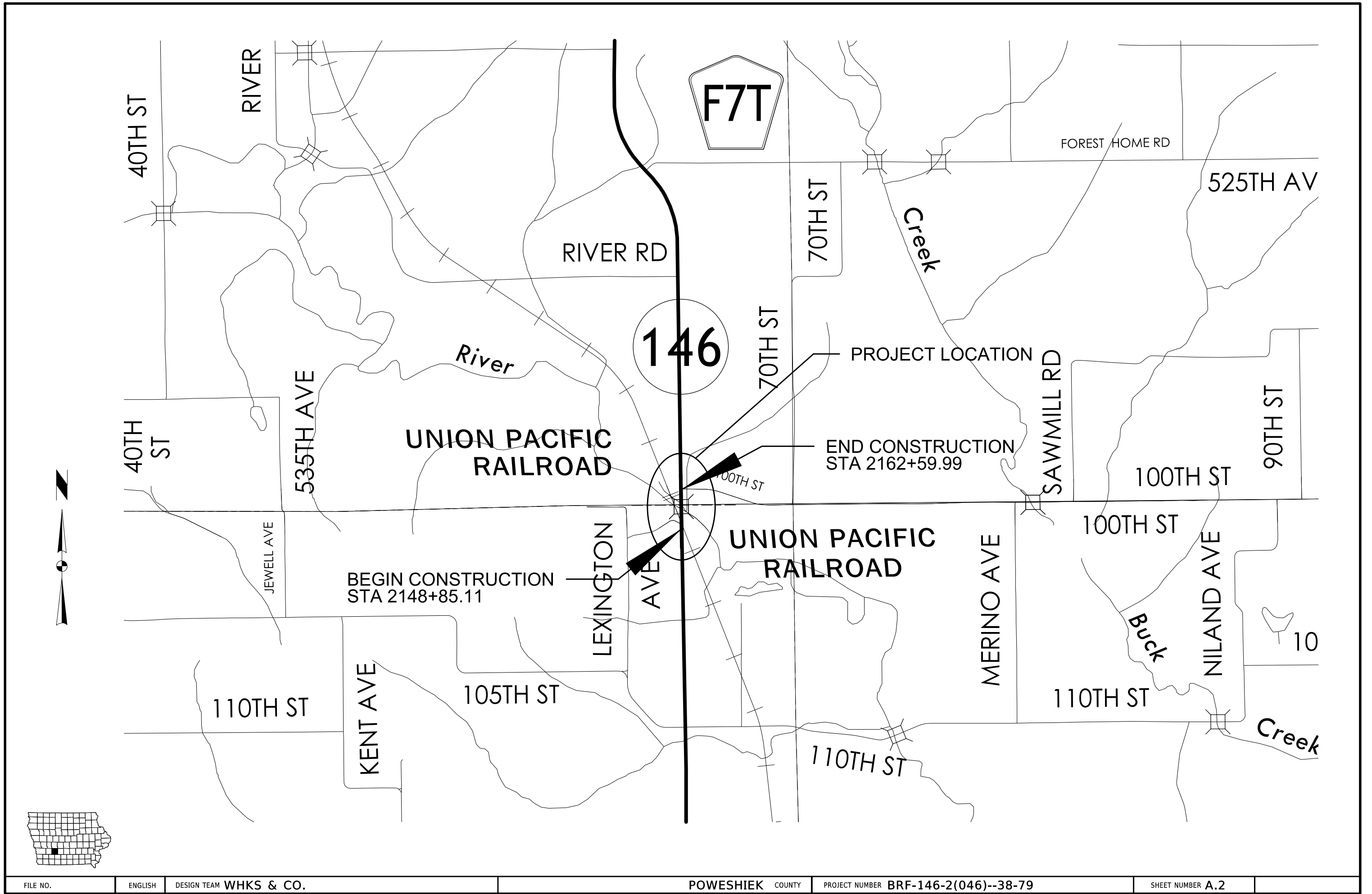
REVISIONS

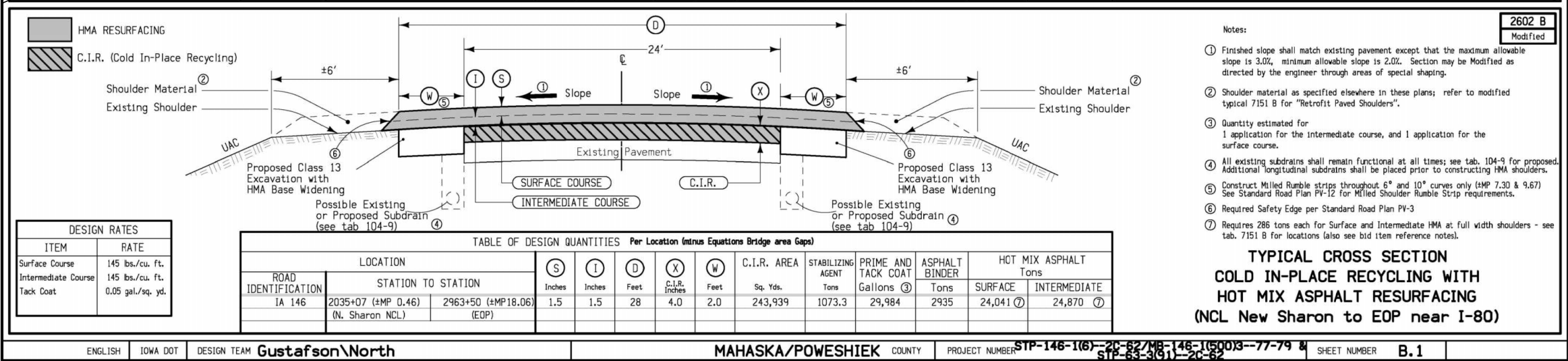
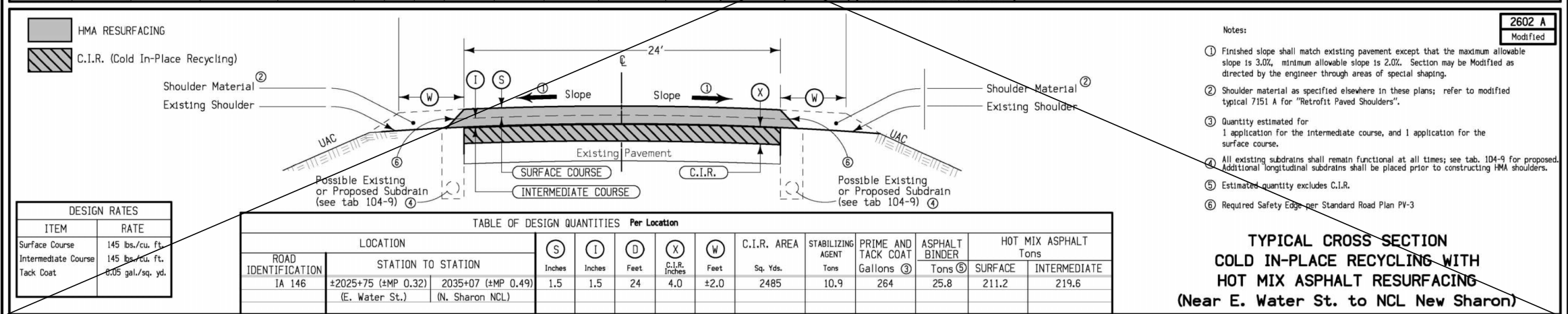
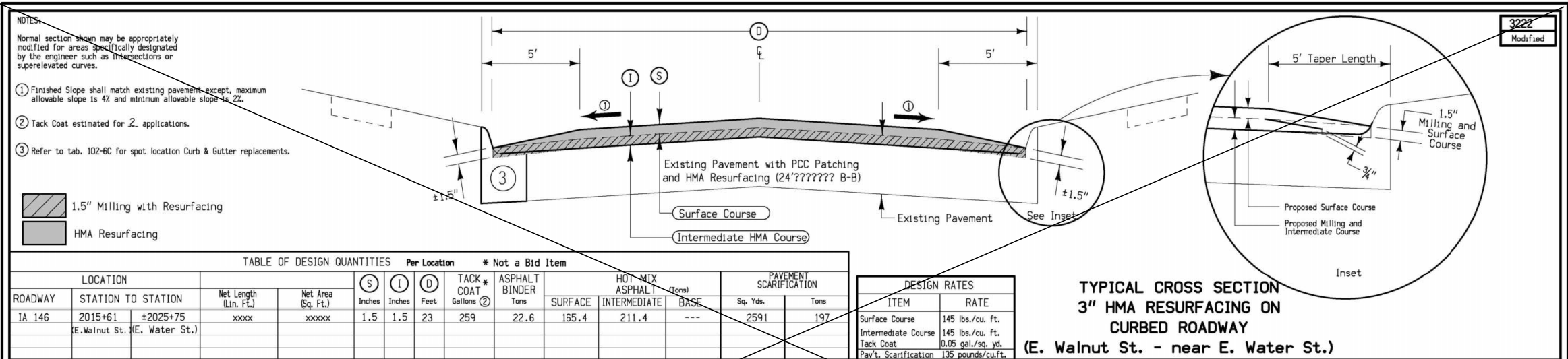
TOTAL
..
PROJECT IDENTIFICATION NUMBER
24-79-146-010
PROJECT NUMBER
BRF-146-2(046)--38-79
R.O.W. PROJECT NUMBER
STPN-146-2(047)--2J-79

PRELIMINARY PLANS

Subject to change by final design.

D3 PLAN - Date: 10/13//2025



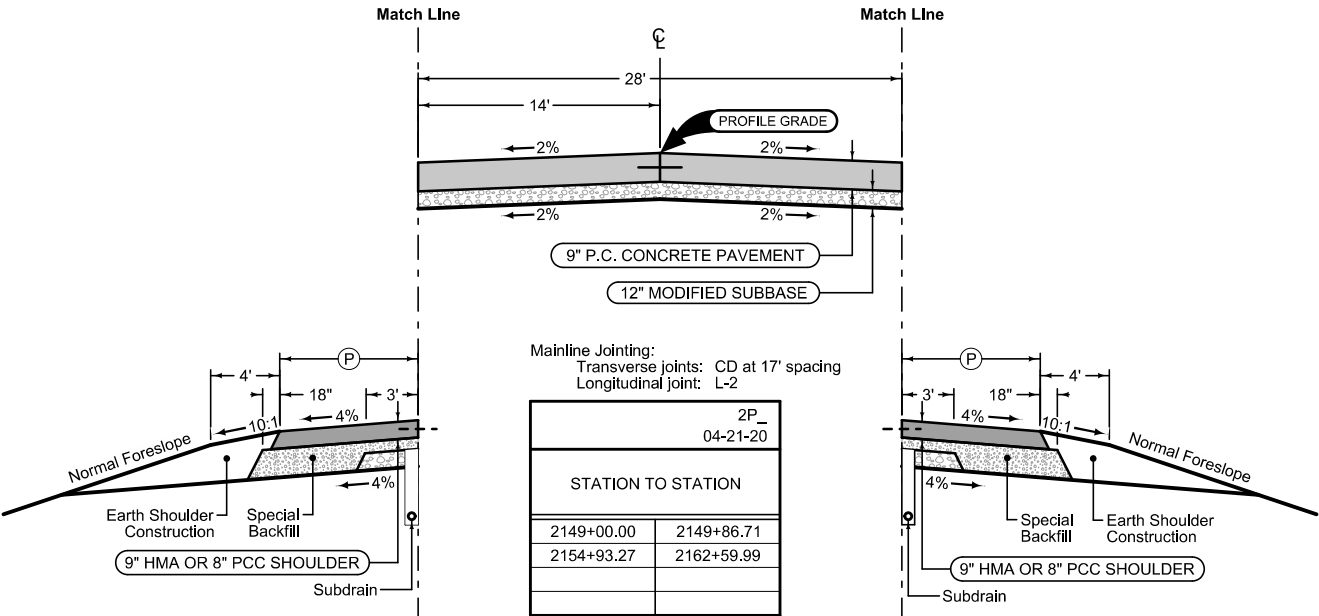


12:57:37 PM 7/29/2011 rinorth W:\Projects\6214601003\DistrictDesign\62146006801.sht

ENGLISH IOWA DOT DESIGN TEAM **Gustafson\North** MAHASKA/POWESHIEK COUNTY PROJECT NUMBER **STP-146-1(6)-2C-62/MB-146-1(500)3--77-79 & STP-64-3(61)-2C-62** SHEET NUMBER **B.1**

For Information Only

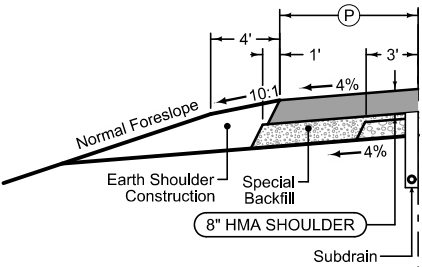
IA 146 Mainline



Paved Shoulder at Guardrail

PCC Shoulder Jointing:
Longitudinal joint: BT-1 or BT-5
Transverse joints: C at mainline spacing
HMA Shoulder Jointing:
Longitudinal joint: B

2_P_Guard_L 04-21-20		
STATION TO STATION		(P) Feet
2149+46.61	2149+86.71	Var.
2154+93.27	2155+94.87	Var.



HMA Shoulder

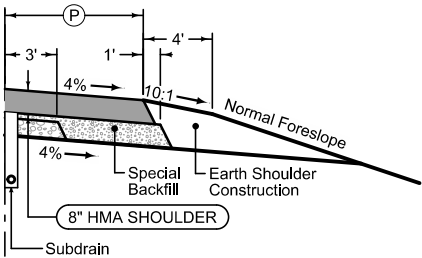
Shoulder Jointing:
Longitudinal joint: B

2_P_HMA_L 04-21-20		
STATION TO STATION		(P) Feet
2149+00.00	2149+46.61	4
2155+94.87	2162+59.99	7.5

Paved Shoulder at Guardrail

PCC Shoulder Jointing:
Longitudinal joint: BT-1 or BT-5
Transverse joints: C at mainline spacing
HMA Shoulder Jointing:
Longitudinal joint: B

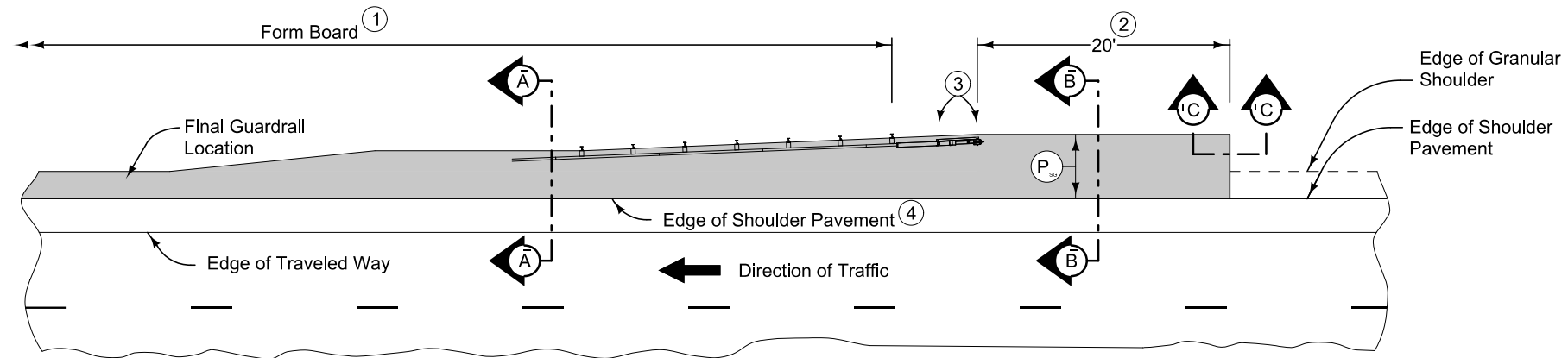
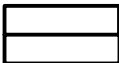
2_P_Guard_R 04-21-20		
STATION TO STATION		(P) Feet
2148+85.11	2149+86.71	Var.
2154+93.27	2155+33.37	Var.



HMA Shoulder

Shoulder Jointing:
Longitudinal joint: B

2_P_HMA_R 04-21-20		
STATION TO STATION		(P) Feet
2156+99.51	2162+59.99	7.5



PLAN VIEW

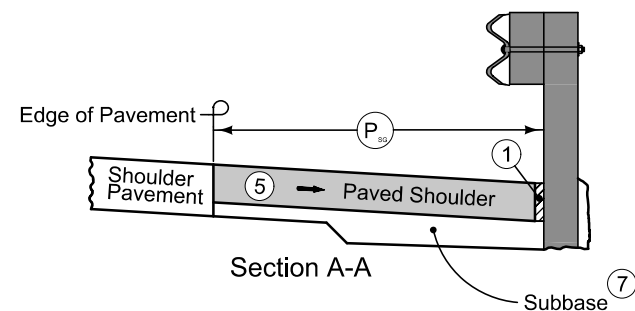
9" HMA Paved Shoulder at guardrail. 8" PCC may be substituted with the following jointing layout:

Match mainline pavement joint spacing. When mainline pavement is 8" or greater in thickness, place additional transverse 'C' joints in shoulder at mid-panel of the mainline pavement. Place longitudinal 'C' joint at $P/2$ from edge of mainline pavement when P is greater than 10' wide. Terminate longitudinal joint at transverse joint less than 10' in length.

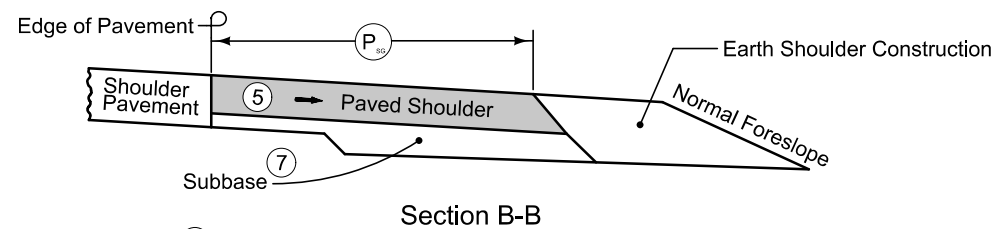
Compaction of HMA is required to face of guardrail post. Hand compaction will be allowed under guardrail. Removal and reinstallation of guardrail will be allowed with no additional payment.

Refer to Tabulation 112-9 for shoulder quantities.

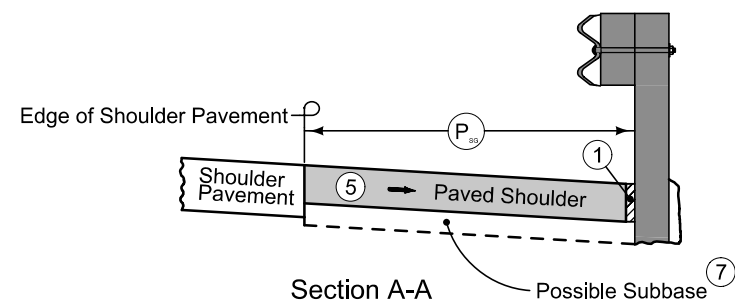
- ① PCC option only: When guardrail posts are installed prior to construction of PCC paved shoulder, fasten form board to the face of guardrail posts for the length shown.
- ② Continue paved shoulder 20 feet beyond the center of the first post.
- ③ Shoulder may be notched for first 2 posts or post sleeves may be installed through pavement. Do not drive posts through pavement.
- ④ 'BT' (per PV-101) joint for PCC shoulder.
'B' (per PV-101) joint for HMA shoulder.
- ⑤ Match shoulder slope.
- ⑥ The Contractor has the option to pave the paved shoulder at guardrail and the partial width paved shoulder as one operation.
- ⑦ Refer to other details in the plan.



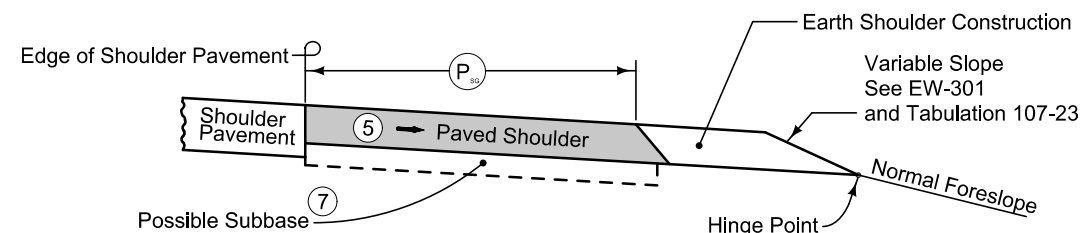
NEW CONSTRUCTION



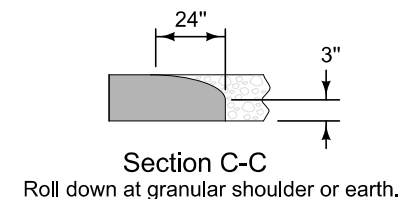
Section B-B



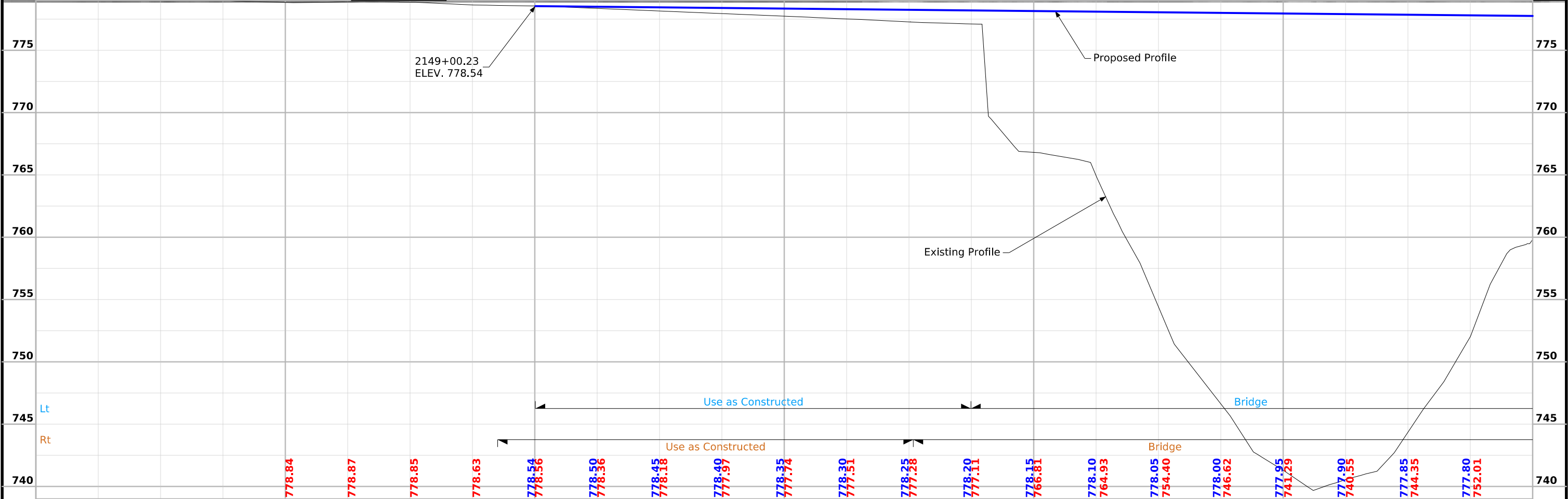
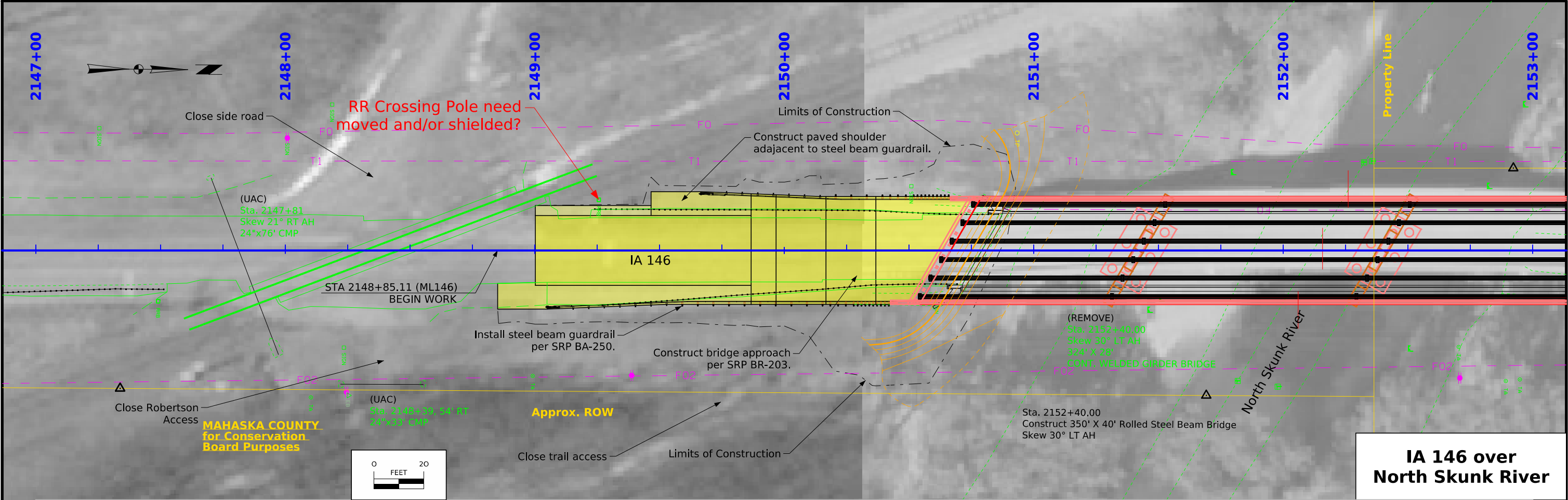
EXISTING SHOULDER

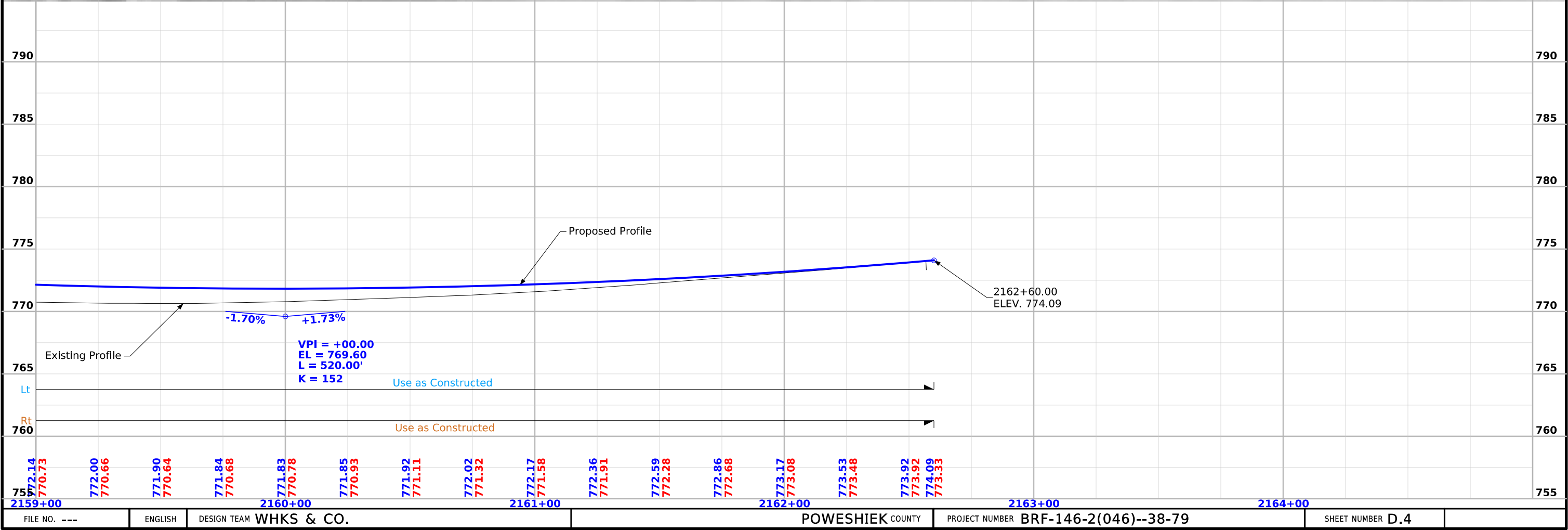
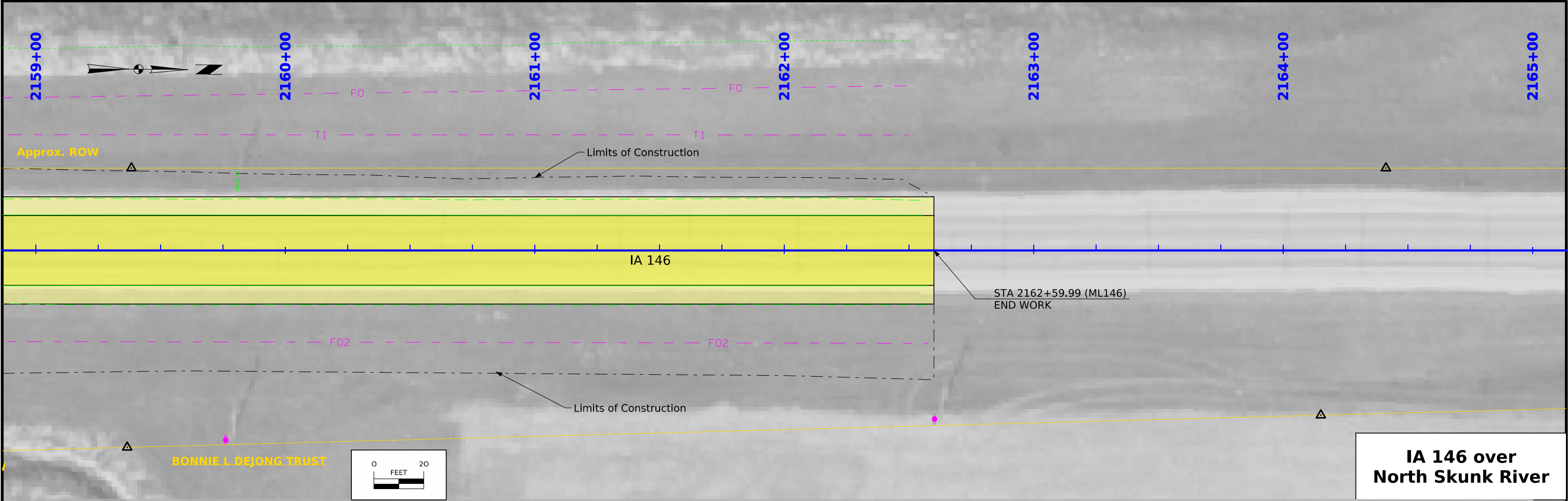


Section B-B

PAVED SHOULDER AT GUARDRAIL
(ADJACENT TO PARTIAL WIDTH PAVED SHOULDER)

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 WH Water Hydrant (Rural) Septic Tank Cistern L.P. Gas Tank (No Footing) Underground Storage Tank Latrine Satellite TV Dish WHU Water Hook Up RT Radio Tower TA Tower Anchor Guardrail (Beam or Cable) GP Guard Post (one or two) Guard Post (over two) FP Filler Pipe GV Gas Valve WV Water Valve SL Speed Limit Sign MM Mile Marker Post SIGN Sign TCB Traffic Signal Control Box RRB Rail Road Signal Control Box TSB Telephone Switch Box EB Electric Box			UTILITY LEGEND F0 FO1D, Aureon - Quality D F02 FO2D, Lumen - Quality D T1 TL1D, Windstream - Quality D	PLAN VIEW COLOR LEGEND OF PLAN AND PROFILE SHEETS <table><tr><th>LINEWORK</th><th colspan="3">Design Color No.</th></tr><tr><td>Green</td><td>(2)</td><td></td><td>Existing Topographic Features and Labels</td></tr><tr><td>Blue</td><td>(1)</td><td></td><td>Proposed Alignment, Stationing, Tic Marks, and Alignment Annotation</td></tr><tr><td>Magenta</td><td>(5)</td><td></td><td>Existing Utilities</td></tr></table> <table><tr><th>SHADING</th><th colspan="2">Design Color No.</th><th>Transparency</th></tr><tr><td>Pink, Dark</td><td>(13)</td><td></td><td>Temporary Pavement Shading</td><td>50%</td></tr><tr><td>Yellow</td><td>(4)</td><td></td><td>Proposed Pavement Shading</td><td>50%</td></tr><tr><td>Orange</td><td>(6)</td><td></td><td>Proposed Granular Shading</td><td>50%</td></tr><tr><td>Orange</td><td>(70)</td><td></td><td>Proposed Shoulder Granular Shading</td><td>50%</td></tr><tr><td>Yellow</td><td>(68)</td><td></td><td>Proposed Shoulder Paved Full Depth Shading</td><td>50%</td></tr><tr><td>Yellow</td><td>(132)</td><td></td><td>Proposed Shoulder Paved Partial Depth Shading</td><td>50%</td></tr><tr><td>Brown, Light</td><td>(236)</td><td></td><td>Grading Shading</td><td>50%</td></tr><tr><td>Orange, Light</td><td>(134)</td><td></td><td>Proposed Granular Entrance Shading</td><td>50%</td></tr><tr><td>Yellow</td><td>(220)</td><td></td><td>Proposed Paved Entrance Shading</td><td>50%</td></tr><tr><td>Tan</td><td>(8)</td><td></td><td>Proposed Sidewalk Shading</td><td>50%</td></tr><tr><td>Blue, Light</td><td>(230)</td><td></td><td>Proposed Sidewalk Landing Shading</td><td>50%</td></tr><tr><td>Pink</td><td>(11)</td><td></td><td>Proposed Sidewalk Ramp Shading</td><td>50%</td></tr><tr><td>Red</td><td>(3)</td><td></td><td>Proposed Structure Shading</td><td>50%</td></tr><tr><td>Red</td><td>(3)</td><td></td><td>Delineates Restricted Areas</td><td>0%</td></tr></table>	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 <table><tr><th>LINEWORK</th><th colspan="3">Design Color No.</th></tr><tr><td>Green</td><td>(10)</td><td></td><td>Existing Ground Line Profile</td></tr><tr><td>Blue</td><td>(1)</td><td></td><td>Proposed Profile and Annotation</td></tr><tr><td>Magenta</td><td>(5)</td><td></td><td>Existing Utilities</td></tr><tr><td>Blue, Light</td><td>(230)</td><td></td><td>Proposed Ditch Grades, Left</td></tr><tr><td>Black</td><td>(0)</td><td></td><td>Proposed Ditch Grades, Median</td></tr><tr><td>Rust</td><td>(14)</td><td></td><td>Proposed Ditch Grades, Right</td></tr></table>	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	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)
LINEWORK	Design Color No.																																																																																																																												
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FILE NO.	ENGLISH	DESIGN TEAM WHKS & CO.	POWESHIEK COUNTY	PROJECT NUMBER BRF-146-2(046)--38-79	SHEET NUMBER D.1																																																																																																																								





Survey Information

SURVEY INDEX

County: Poweshiek
PIN: 24-79-146-010
Project Number: BRF-146-2(046)--38-79
Location: North Skunk River 2.7 mi N of US 63
Type of Work: Bridge Unspecified
Project Directory: 7914601024

Alignment Information

Survey alignment was not created for this project.

Survey Personnel

Jeremy Leemon – Survey Party Chief
Jacob Powers – Assistant Survey Party Chief
Matt Goedken – Assistant Surveyor

Date(s) of Survey

Begin Date 11/11/2024
End Date 11/13/2024

General Information

This survey is for a bridge replacement on IA 146 over North Skunk River. This project is a Limited Topography 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

Nearby Iowa Real Time Network reference stations were utilized to obtain horizontal and vertical control on primary project control points. Three five-minute observations were taken and referenced against an NGS Monument. A Base-Rover setup was then established and calibrated to the RTN and NGS points. 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 9
(U.S. SURVEY FOOT)
VERTICAL DATUM: NAVD88
GEOID MODEL: 2018u3

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 9 (U.S. Survey Foot)

VERT. DATUM: NAVD88 - Geoid Model: 2018u3

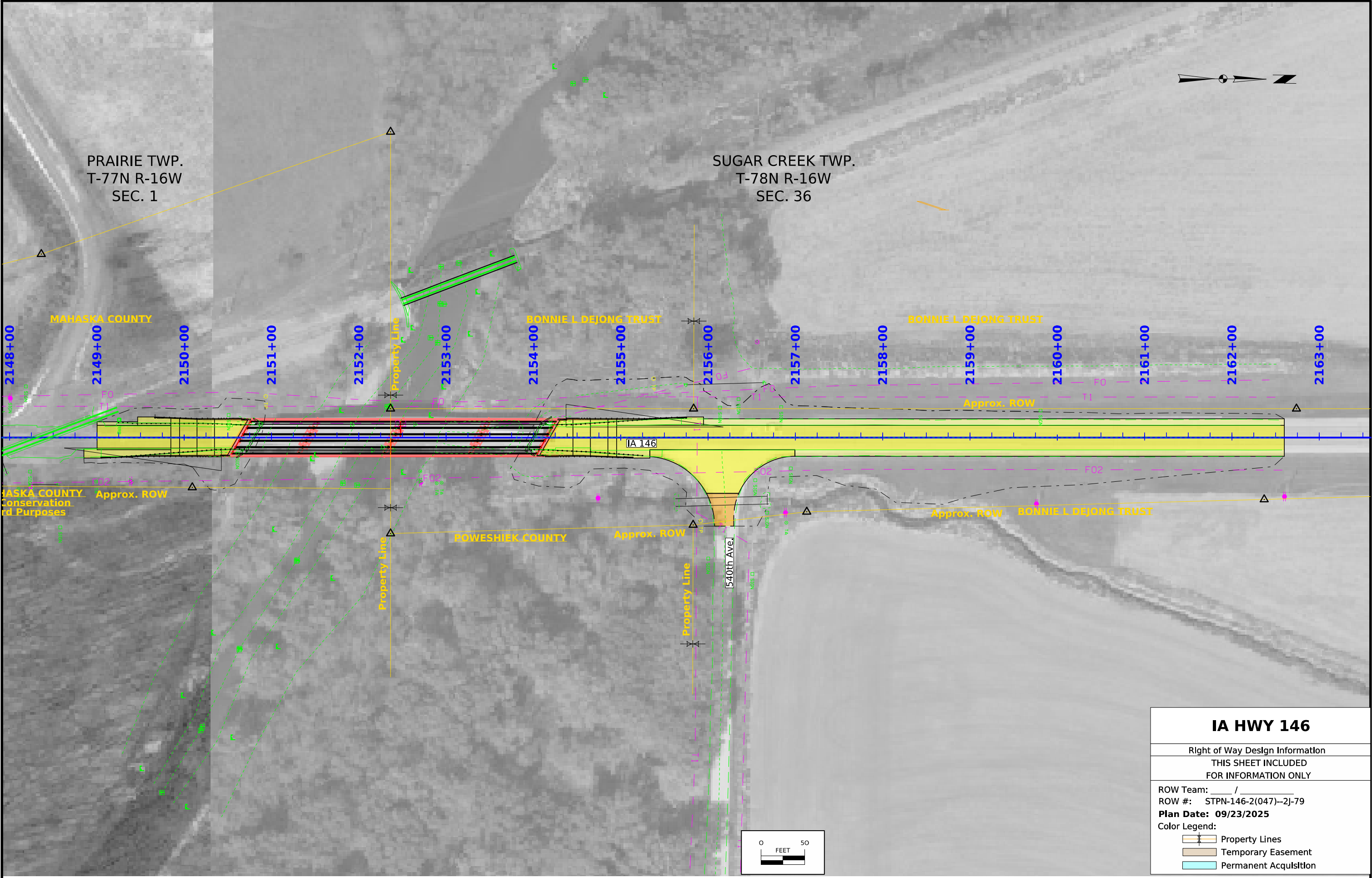
Coordinate listing from next sheet will be used with IaRTN for monument recovery. No other reference ties are given.

HORIZONTAL AND VERTICAL PROJECT CONTROL COORDINATE LISTING
HORIZ. DATUM: NAD83(2011) for EPOCH 2010.00 (IaRTN 2019 Adjustment)
Ia. Regional Coordinate System Zone 9 (U.S. Survey Foot)
VERT. DATUM: NAVD88
Geoid Model: 2018u3

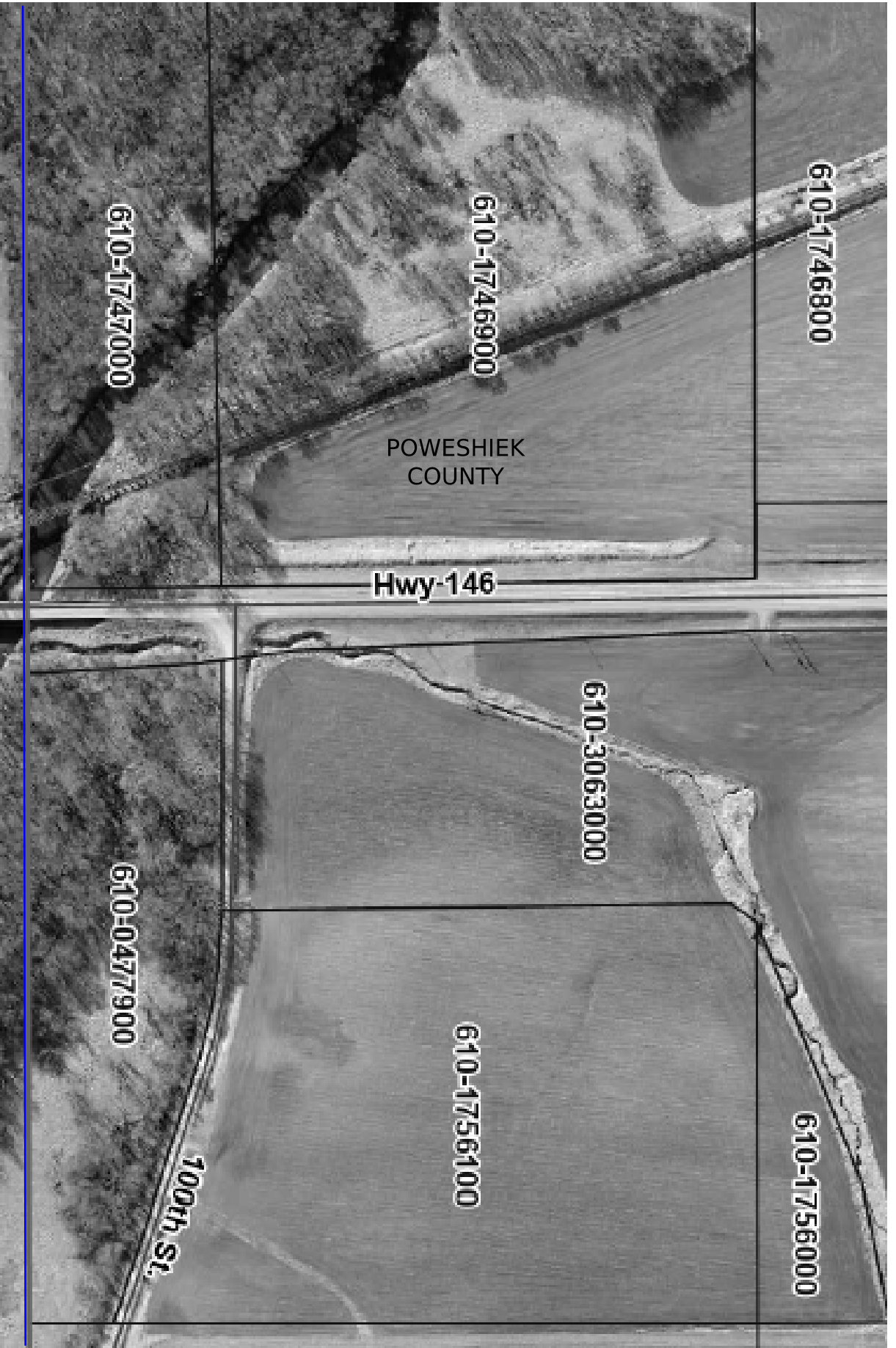
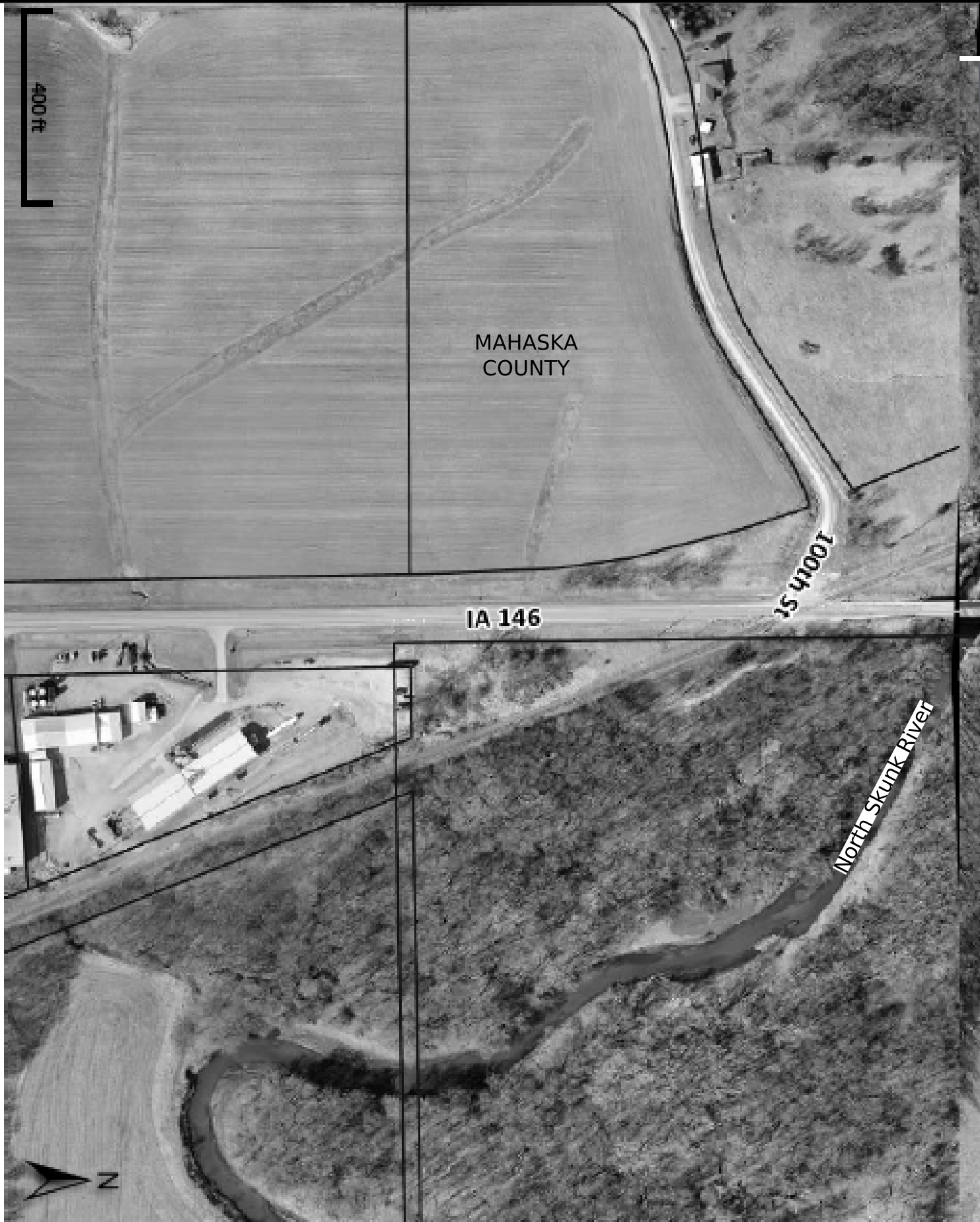
Point Name	Northing	Easting	Elevation	Code-Description
100	7660552.42	19545161.19	784.95	CP SET 5/8" X 4' REBAR W PINK CAP, 23' W OF IA 146 CL, N SIDE OF FIELD ENT
103	7654917.28	19543912.93	843.53	CP SET 5/8" X 4' REBAR W PINK CAP, 15' E OF FARM ENT CL, 1070 LEXINGTON AVE
N87	7658958.53	19545004.82	770.21	BM FOUND NGS MONUMENT NE RAILROAD BRIDGE ABUT
500	7658515.79	19545250.13	770.77	BM SET RR SPK W SIDE PP 50' E OF IA 146 CL



101_16 10/25/24																				
ALIGNMENT COORDINATES																				
Line No.	Name	Location	Point on Tangent Station	Point on Tangent Y Northing	Point on Tangent X Easting	Begin Spiral Station	Begin Spiral Y Northing	Begin Spiral X Easting	Begin Curve Station	Begin Curve Y Northing	Begin Curve X Easting	Simple Curve PI or Master PI Station	Simple Curve PI or Master PI Y Northing	Simple Curve PI or Master PI X Easting	End Curve Station	End Curve Y Northing	End Curve X Easting	End Spiral Station	End Spiral Y Northing	End Spiral X Easting
1.0	ML146		2141+00.00	7657676.570	19545205.884															
2.0	ML146		2167+00.00	7660276.520	19545189.883															



IA HWY 146	
Right of Way Design Information	
THIS SHEET INCLUDED FOR INFORMATION ONLY	
ROW Team: ____ / ____	
ROW #: STPN-146-2(047)--2J-79	
Plan Date: 09/23/2025	
Color Legend:	
	Property Lines
	Temporary Easement
	Permanent Acquisition



108_23A
8/15/22

TRAFFIC CONTROL PLAN

The IA 146 bridge over the North Skunk River will be constructed under a full road closure with a detour. Traffic will be detoured to the East with the following route:

Northbound Traffic: Traffic will travel East on US 63 to Parkin Ave. for 4.0 miles. Then North on US 63 to County Highway F57 in Montezuma for 8.6 miles. Then West to IA 146 for 7.0 miles. Total Detour length is 19.6 miles.

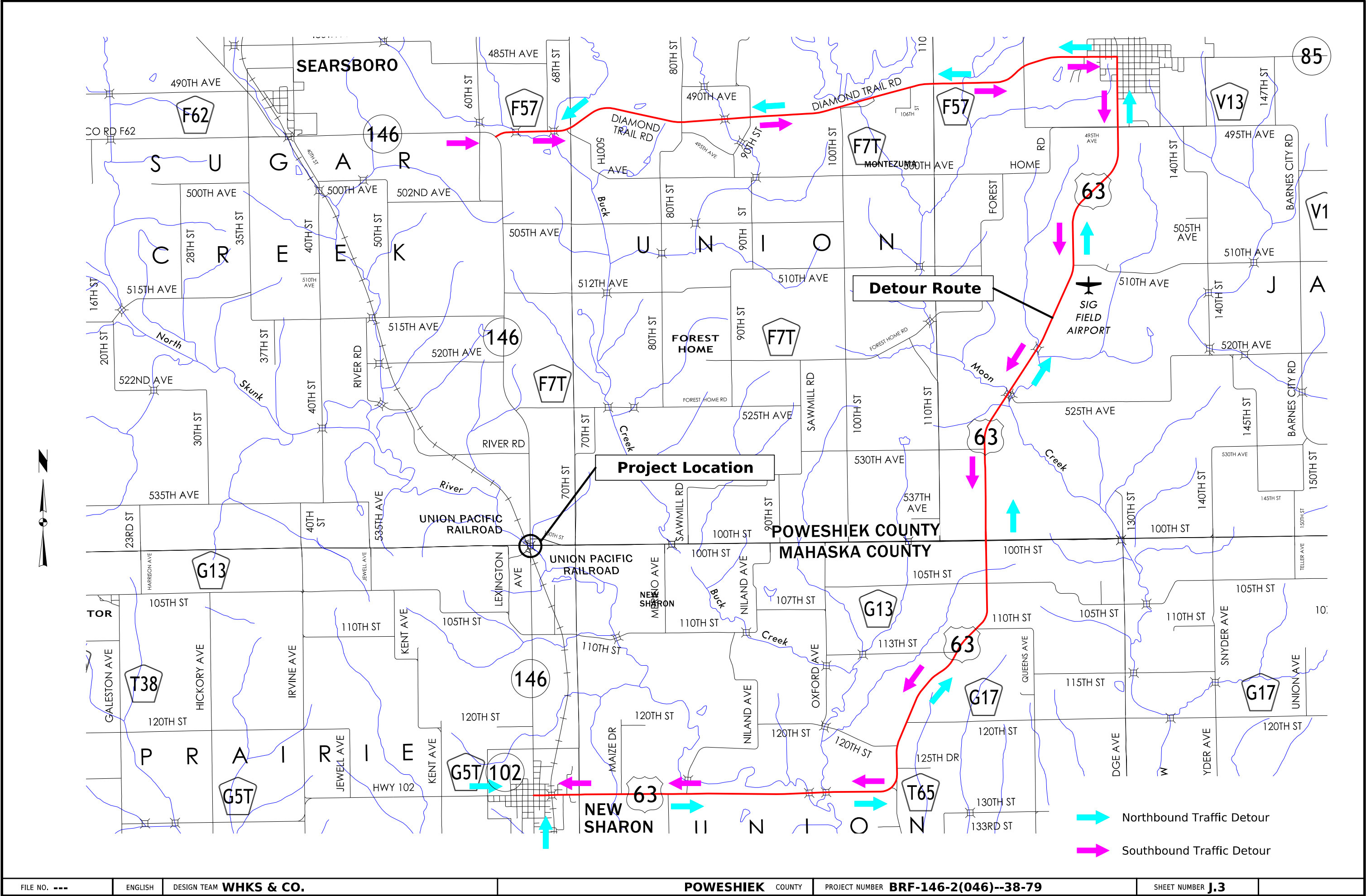
Southbound Traffic: Traffic will travel East on County Highway F57 to US 63 for 7.0 miles. Then South on US 63 for 8.6 miles. Then West on US 63 to IA 146 for 4.0 miles. Total Detour length is 19.6 miles.

111_01
10/14/22

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
District to provide.	



Addendum: Sign Placements and Language for the Hwy 146 Bridge Over the North Skunk River

This stream is identified as a navigable water way and is granted protection in the interest of public safety under the Authority 7 of Iowa Code Chapter 462A.32.

Contractor shall contact the Iowa DNR water trails coordinator prior to starting and finishing project construction so the appropriate information can be entered into the DNR’s interactive river mapping system.

- The Iowa DNR contact is John.wenck@dnr.iowa.gov
- The Iowa DNR shall be contacted no less than one week prior to placing and removing obstructions in channel.

Contractor shall provide, install, maintain, and remove all paddle route signs.

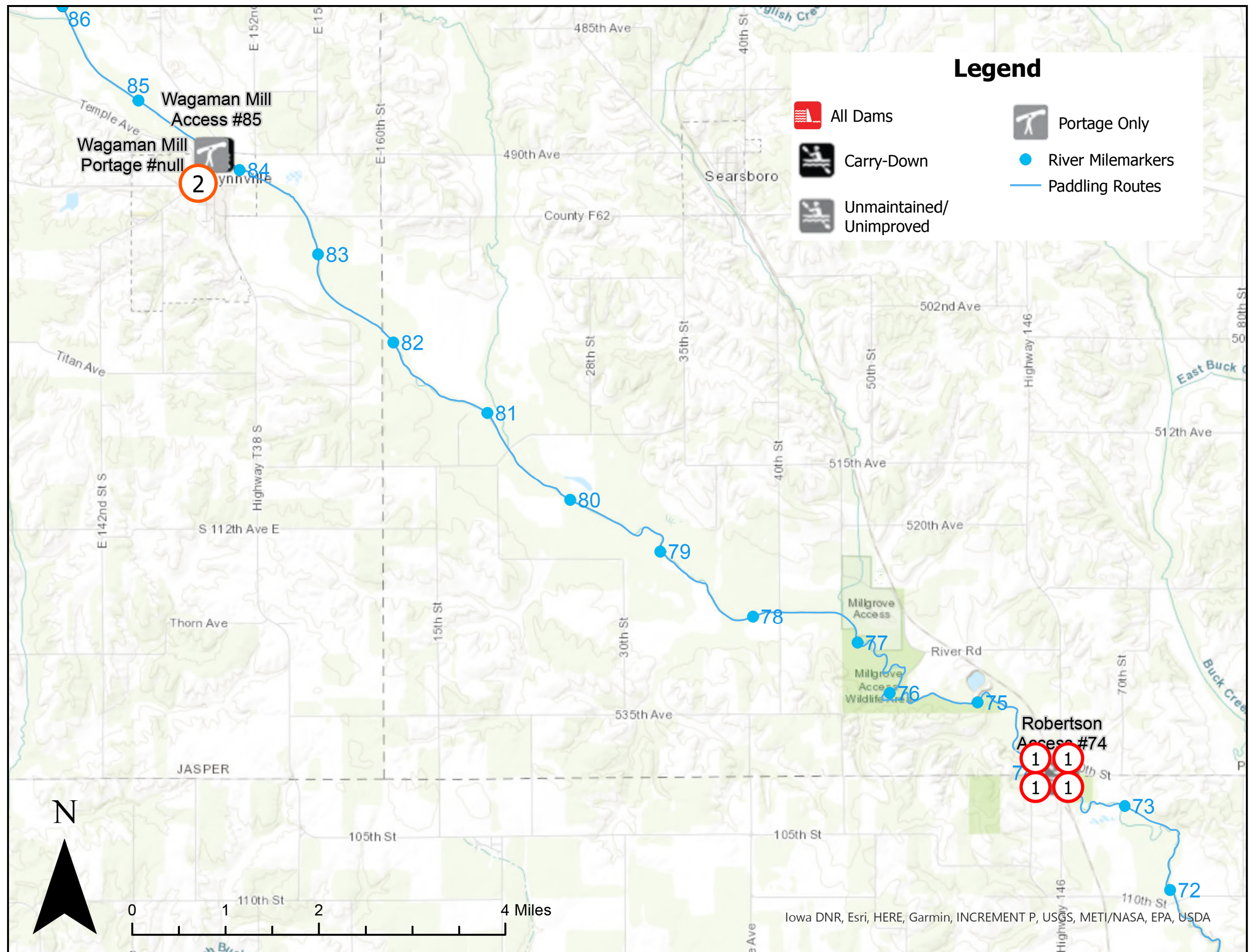
- Refer to map for Paddle Route sign locations
- Sign mounting methods used to install temporary signs shall be at the discretion of applicants and/or their contractors, and are not to be construed as limited to Iowa DNR methods listed in Chapter 6 of *Developing Water Trails in Iowa* found at <https://www.iowadnr.gov/places-go/water-trails/water-trail-development#developing-water-trails-in-iowa>.
- Contractor shall coordinate sign placement and installation with Conservation Officer Will Brickel via phone #641-521-2003 or email will.brickel@dnr.iowa.gov
- Contractor shall coordinate sign placement and management for Wagaman Accesses with Jasper CCB via phone #641-792-9780 or email conservation@jasperia.org

Maintenance of Paddle Route signage shall meet the same requirements as roadway traffic control per Standard Specifications articles 2528.01C, 2528.02 and 2528.03.

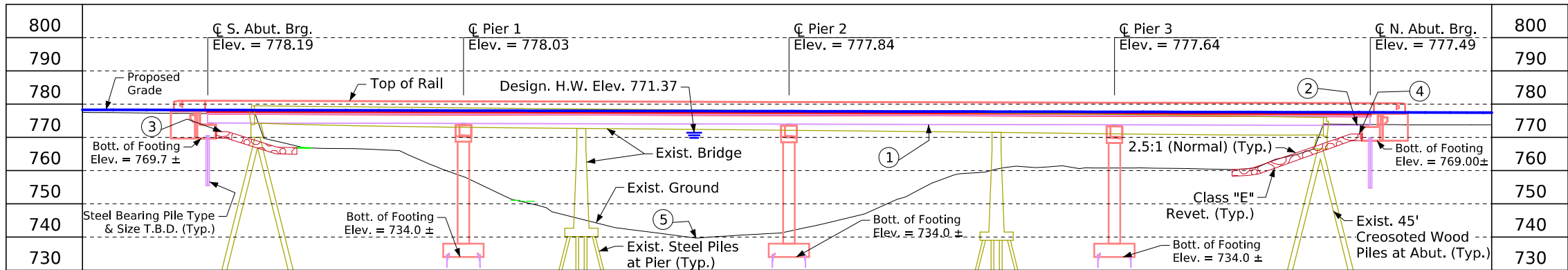
Signs shall be maintained by applicants and/or their contractor so as to be visible throughout the period the channel is obstructed. When obstructions to the channel are not needed for a period of 30 days or greater, signage should be temporarily removed.

Use color coding for all in this color style according to *Developing Water Trails In Iowa* (<https://www.iowadnr.gov/places-go/water-trails/water-trail-development#developing-water-trails-in-iowa>) criteria:

Sign # on Map	Quantity	Style	Minimum Letter Height	Language	Location Orientation
2	1	Orange/Warning	3"	Construction Hazard at Hwy 146 Bridge ----- Don't Launch Here For Downstream Trip	At the top of the boat ramp or carry-down access, facing parking area.
1	4	Red/Danger	4"	No Thru Traffic	At bridge site, opposite sides of the river, 1 pair facing upstream, 1 pair facing downstream; OR, 2 signs placed near center of channel 12 feet above regular water level, one facing upstream, one facing downstream.



Control Point:



VPT Sta. = 2149+00.24 VPT Sta. = 2154+22.50
VPT Elev. = 778.545 VPT Elev. = 777.501

Proposed Profile Grade ℄ IA 146

Hydraulic Data

RIDB: SKUNKR_N_72.70
Drainage Area = 385 sq. mi.
Site Stream (HGL) Slope = 0.039% (2.1 ft/mi)

Discharges from USGS Regression Equations
USGS Report SIR 2013-5086, Region 2

Operational Low Beam (NW Corner) = 773.50
Channel Low Beam 2152+82 = 773.79
Ave. Low Water Stage = 749.0
Extreme Highwater = Unknown
Roadway Overtopping El. = 771.83
Sta. 2159+98 (~100-yr event)

Q₂₅ = 16,800 cfs
Stage = 769.40

Q₅₀ = 19,700 cfs
Stage = 770.43
Natural Stage (DNR No Bridge/Road) = 770.71
Backwater = 0.29 ft
Ave. Bridge Velocity = 5.4 ft/s
Operational Freeboard = 3.07 ft

Q₁₀₀ (Design) = 22,500 cfs
Stage = 771.37
Backwater = 0.35 ft
Ave. Bridge Velocity = 5.8 ft/s
Operational Freeboard = 2.13 ft

Q₂₀₀ = 28,200 cfs
Stage = 773.37
Backwater = 0.90 ft
Ave. Bridge Velocity = 6.0 ft/s
Operational Freeboard = 0.13 ft
Calculated Design Scour = TBD

Q₅₀₀ = 29,700 cfs
Stage = 773.81
Backwater = 0.99 ft
Ave. Bridge Velocity = 6.0 ft/s
Operational Freeboard = -0.31 ft
Channel Freeboard = -0.02 ft
Calculated Check Scour = TBD

Traffic Data

2023 AADT 1,310 V.P.D.
TRUCKS 19 %

Preliminary

Design For 30° LA

350'-0" x 40'-0" Rolled Steel Beam Bridge

77'-0" End Spans 2 - 98'-0" Interior Spans

Situation Plan

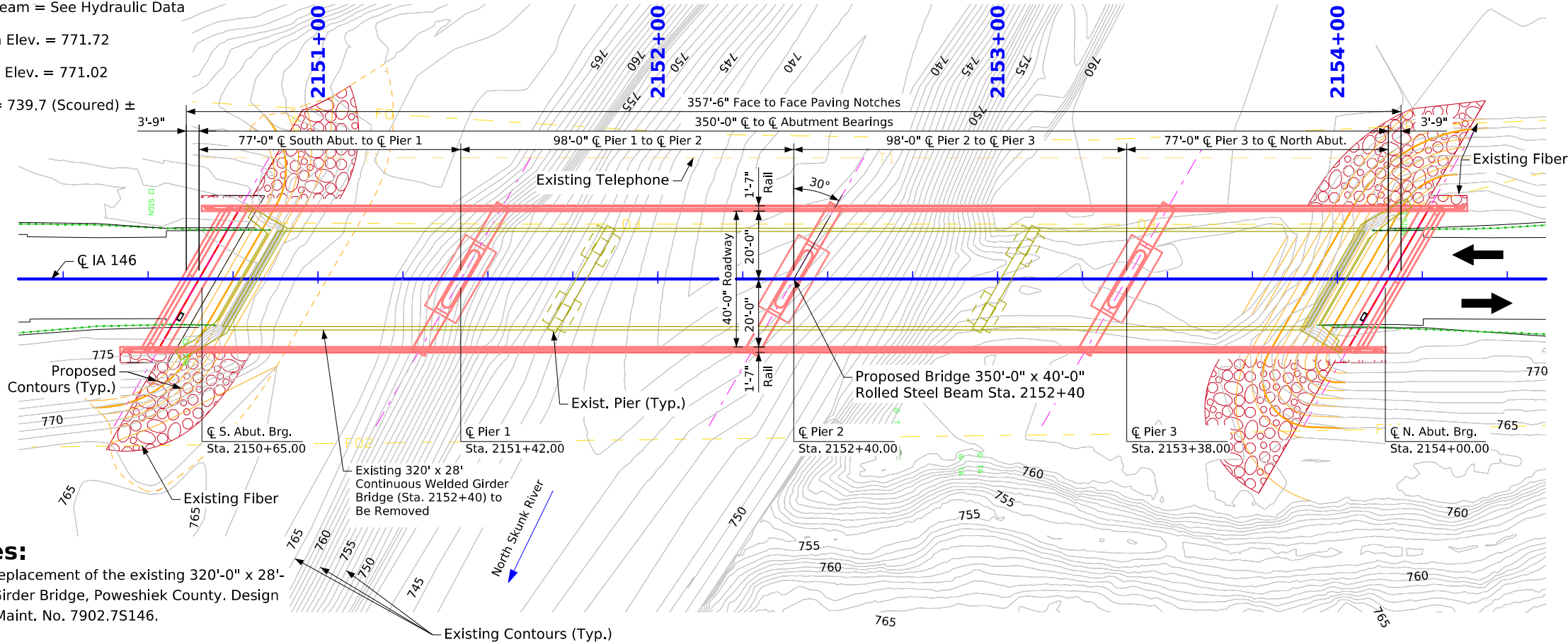
STA. 2152+40 (IA 146) Turn-in Date: March 2025

Poweshiek County

Design No. 2222 IOWA DEPARTMENT OF TRANSPORTATION
Design Sheet No. 1 of 1 FHWA No. 45971

- Channel Low Beam = See Hydraulic Data
- Operational Low Beam = See Hydraulic Data
- Top of South Berm Elev. = 771.72
- Top of North Berm Elev. = 771.02
- Streambed Elev. = 739.7 (Scoured) ±

Longitudinal Section Along ℄ Bridge



Situation Plan

0 20
Scale in Feet

General Notes:

--This design is for the replacement of the existing 320'-0" x 28'-0" Continuous Welded Girder Bridge, Poweshiek County. Design 156, FHWA No. 45970, Maint. No. 7902.75146.

Design Notes:

--TL-4 Single Slope Bridge Railing Proposed
--Beam type - 2'-9" Rolled Steel Beams
--Pier type - T-Piers (assumed width 3'-6")
--Abutment type - Stub (bridge exceeds length limits for integral abutments per BDM 3.7.2). Semi-integral abutments may be considered for use in final design.
--There is a potential for conflicts with remnants of steel shell pier columns near Piers 1 and 3 below Elev. 760 from an old steel truss bridge. Final designer to consider foundation layouts to avoid potential conflict.
--An Iowa DNR Flood Plain Permit is required. Preliminary Design will submit the application and place the permit in the PW Regulatory Permits subdirectory folder upon receipt.
--Requirements for state water trail or paddling route are applicable. Signage, plan notes and bid items shall be addressed by the Design Bureau and included in the road plans.

Plan Notes:

--Top of bridge deck at centerline roadway is 0.03' below the profile grade to account for deck cross slope and parabolic crown.
--Class E revetment stone is embedded.
--The bridge will be designed to withstand the applicable effects of ice and the horizontal stream loads and uplift forces associated with the Q₁₀₀ flood.

Utilities Note:

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

General Utility Symbols:

FO - Fiber Optic Line T - Telephone Line
● - Power Poles

Location

IA 146 over North Skunk River
T-77 & 78 N R-16 W
Section 1 & 36
Prairie & Sugar Creek Township
Poweshiek County
FHWA No. 45970 (Existing)
FHWA No. 45971 (Proposed)
Bridge Maint. No. 7902.75146
Latitude 41.508676°
Longitude -92.651647°

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 Brian J. Birkland Date

Printed or Typed Name

My license renewal date is December 31, 2026

Pages or sheets covered by this seal: V.1

Poweshiek COUNTY

PROJECT NUMBER BRF-146-2(046)--38-79

SHEET NUMBER V.1

FILE NO. 98765

ENGLISH

DESIGN TEAM WHKS & Co.

2:35:28 PM 3/13/2025 bhackman pw:\\projectwise.dot.int.lan:PWMain\\Documents\\Projects\\7914601024\\Bridge\\(046)_Bridge-Unspecified\\SHT_79146046_WHKS_DSN#_FHWA#_Z09.dgn

