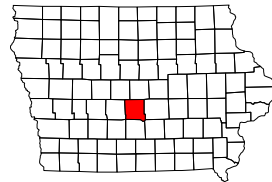


Polk County Conservation



Local Trail System Polk County Conservation Bridge Rehabilitation

For Utility Contact Information see Sheet D.1.

This project will be covered by a Local Flood Plain Development Permit. See Sheet V.1

105-1
09-27-94

Div.	Location	Lin. Ft.	Miles
1	Sta. 221+52.00 To Sta. 226+88.00 (Includes One Bridge)	536.00	0.10



Sheet No.	Name	Type
A,1	Brady L. Bogaard	Roadway Design
A,1	Kara A. Ruble	Structural Design
V,4	Brian J. Birkland	Hydraulic Design

Pages or sheets covered by this seal: Sheets A.1-A.2, SPS.1, V.1-V.25

Pages or sheets covered by this seal: Sheets B.1-B.2, C.1-C.4, D.1-D.2, G.1, J.1-J.2

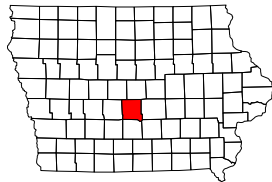
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		39
PROJECT IDENTIFICATION NUMBER		
PROJECT NUMBER		
TAP-U-C077(255)--81-77		
R.O.W. PROJECT NUMBER		
PROJECT DIRECTORY NUMBER		

No.	Description
A.1	Title Sheet
A.2	Map Sheet
B.1-B.2	Typical Sections
C.1 - C.4	Quantities and Tabulations
D.1-D.2	Plan & Profile
G.1	Geometric Information
J.1 - J.2	Traffic Control and Staging
SPS.1	Soil Profile Sheets
V.1-V.25	Bridge Sheets

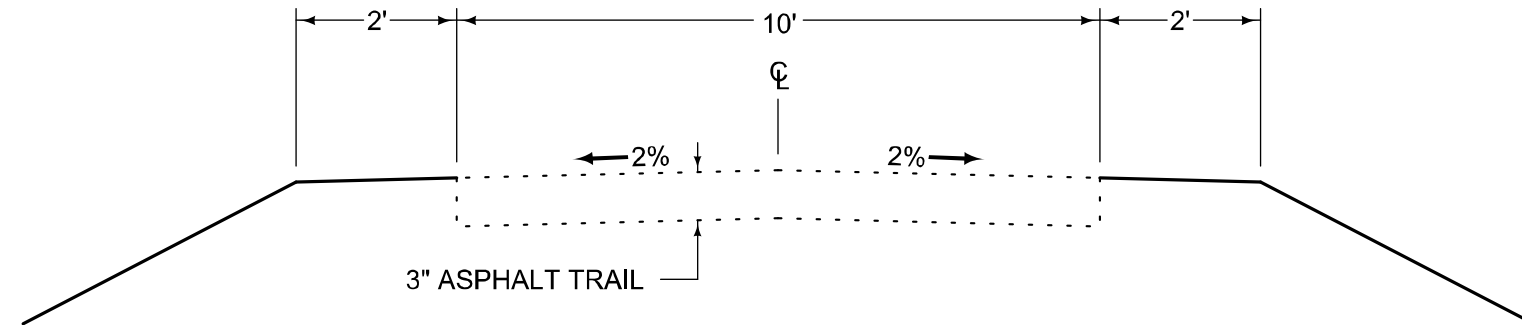
FILE NO. 98765	ENGLISH	DESIGN TEAM Iowa DOT	Polk County Conservation	PROJECT NUMBER TAP-U-C077(255)--81-77	SHEET NUMBER A.1
3:58:56 PM 8/5/2026	[talley	pwt:\whks-pw.bentley.com\whks-pw-01\Documents\Projects\IA\10292\41 CAD\Bridge\CVTOverSkunkRiver.dgn			



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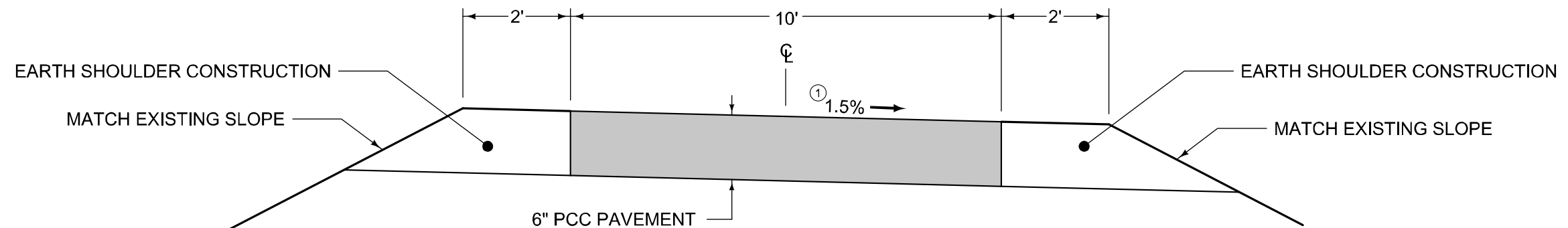


FILE NO.	ENGLISH	DESIGN TEAM	COUNTY	PROJECT NUMBER	SHEET NUMBER	A,2
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CHICHAQUA VALLEY TRAIL
EXISTING PAVEMENT
STA. 218+00.00 - STA. 221+52.00
STA. 226+88.00 - STA. 230+00.00

① Transition cross slope to match existing over 10 feet.



CHICHAQUA VALLEY TRAIL
PROPOSED PAVEMENT
STA. 221+52.00 - STA. 221+61.31
STA. 226+78.26 - STA. 226+88.00

FILE NO.	ENGLISH	DESIGN TEAM	WHKS & CO.	POLK	COUNTY	PROJECT NUMBER	TAP-U-C077(255)--81-77	SHEET NUMBER	B.1
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10:38:57 AM 5/8/2026 bbogaard pw:\\whks-pw.bentley.com:whks-pw-01\Documents\Projects\IA\10292\41 CAD\Design\CADD_Files\Sheet_Files\B Sheets

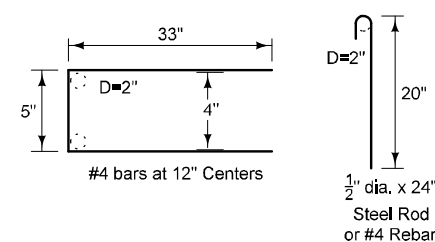
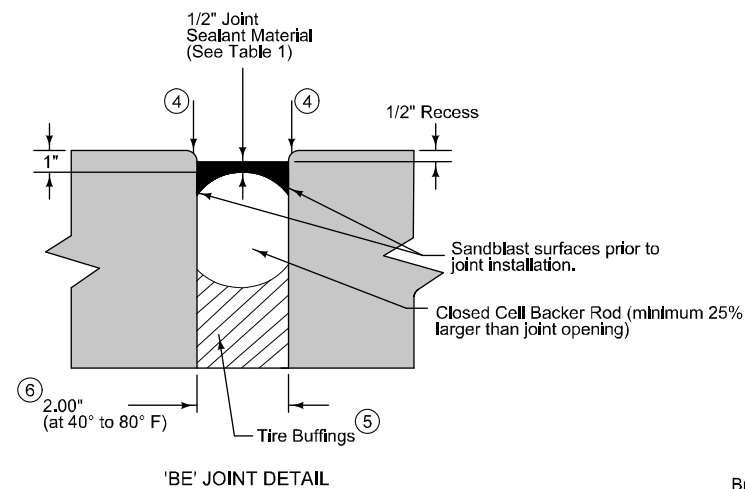
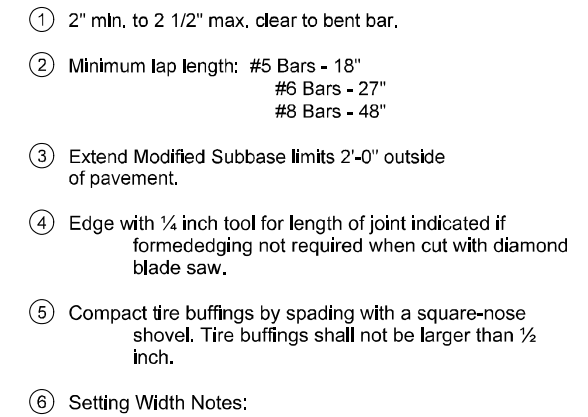
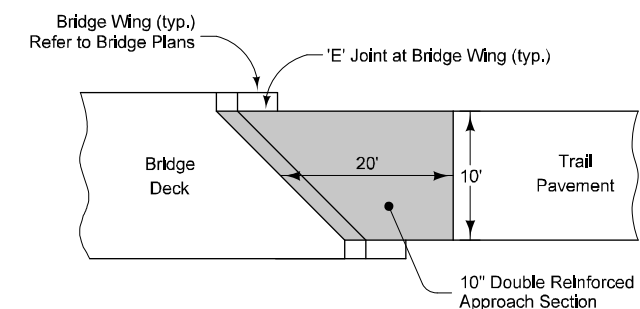


Table 1
Approved List of Sealant
Dow - Dowsil 902 RCS
Sika - Sikasil 728 RCS
Watson Bowman Acme - Wabo SilliconeSeal
Pecora - 322FC



CHICHAQUA VALLEY TRAIL
PROPOSED REINFORCED
APPROACH SECTION
STA. 221+61.31 - STA. 221+81.31
STA. 226+58.26 - STA. 226+78.26

ESTIMATED PROJECT QUANTITIES AND REFERENCE NOTES

Item no.	Item Code	Item	Unit	Quantities	Estimate Reference Notes
				Estimated	
				Division 1	
1	2101-1001010	REMOVAL OF DEBRIS FROM WATERWAY AREAS	LS	1	
2	2102-2713090	EXCAVATION, CLASS 13, WASTE	CY	5	Item is for the excavation and removal of material under the existing HMA trail.
3	2104-2710020	EXCAVATION, CLASS 10, CHANNEL	CY	614.6	Item is for excavation within the channel to shape berms and place revetment protection as shown on Sheet V.4.
4	2105-8425015	TOPSOIL, STRIP, SALVAGE AND SPREAD	CY	10	Item is for stripping, salvaging, and spreading of 6" topsoil for the area outside of the trail replacement. Quantity does not include shrink.
5	2123-7450000	SHOULDER CONSTRUCTION, EARTH	STA	0.95	Item is for the construction of the earth shoulders adjacent to the PCC trail and PCC bridge approach sections. Shoulder construction material shall be supplied by the contractor and is incidental to this item. Refer to the B and D sheets.
6	2210-0475290	MACADAM STONE BASE	TON	50	Item is for placement of macadam stone base for the construction access routes on the existing levee. Item shall be used only as directed by the Engineer. Any macadam stone placed without prior approval of the Engineer will not be measured or paid for. Macadam stone base shall be installed over engineering fabric. Engineering fabric is incidental to this item. Quantity is to establish bid price, contractor will be paid for the amount used.
7	2301-0685550	BRIDGE APPROACH PAVEMENT, AS PER PLAN	SY	44.44	Item is for the reinforced bridge approach pavement sections. Refer to the B and D Sheets. Excavation, grading, modified subbase, joint material, and reinforcing steel are incidental to this item. Certified plant inspection is required. Method of Measurement shall be square yards of bridge approach pavement installed. Basis of Payment shall be per square yards of bridge approach pavement installed paid at the contract unit price.
8	2401-6750001	REMOVALS, AS PER PLAN	LS	1	Includes all work for removal and off-site disposal of timber stringer approach spans, timber pile bents, and timber deck and rails on the main spans. Removal of scheduled items shall be in accordance with Section 2401, of the Standard Specifications. Any damage to material not to be removed shall be the responsibility of the Contractor and repaired at no extra cost to the owner. Method of measurement and basis of payment for this item is lump sum.
9	2402-2720000	EXCAVATION, CLASS 20	CY	53.4	

10	2403-0100010	STRUCTURAL CONCRETE (BRIDGE)	CY	262.5	Includes furnishing and placing subdrain (including excavation), floodable backfill, porous backfill, geotextile fabric, water flooding, and subdrain outlet at abutments and toe of berm. Includes furnishing and placing 3 inch diameter PVC plastic pipe and expanding foam in the abutment wings. The contractor is responsible for certified plant inspection.
11	2404-7775005	REINFORCING STEEL, EPOXY COATED	LB	60,593	
12	2413-1300000	PREFORMED, PRE-COMPRESSED, SELF-EXPANDING, SEALANT SYSTEM WITH SILICONE PRE-COATED SURFACE	LF	78.5	
13	2417-1060030	CULVERT, CORRUGATED METAL ROADWAY PIPE, 30 IN. DIA.	LF	20	Item is for the extension of the existing 30" CMP culvert. Connection to the existing pipe culvert is incidental to this item. Refer to the D sheets.
14	2426-6772016	CONCRETE REPAIR	SF	180	The contractor is responsible for certified plant inspection.
15	2501-0100010	PILES, WOOD (TREATED TIMBER FOUNDATION PILES)	LF	300	Includes furnishing and installing steel pile points.
16	2501-0301014	PILES, STEEL PIPE, 14 IN. (P10A TYPE 1)	LF	1,080	Includes furnishing and installing steel pile points.
17	2507-2638660	BRIDGE WING ARMORING - MACADAM STONE	SY	11.8	Includes furnishing and placing engineering fabric, macadam stone, 4" x 6" treated timbers, 1/2" diameter steel pins (or rebars), and all required excavating, shaping and compacting for wing armoring.
18	2507-3250005	ENGINEERING FABRIC	SY	741	Engineering fabric shall be material as specified for embankment erosion control in accordance with Article 4196.01,B,3, of the Standard Specifications.
19	2507-6800061	REVETMENT, CLASS E	TON	654	Estimated at 1.6 ton/cu yd.
20	2511-0300000	REMOVAL OF RECREATIONAL TRAIL	SY	65.6	Refer to the B sheets and Tab 110-1. Existing trail is approximately 3" HMA.
21	2511-0302600	RECREATIONAL TRAIL, PORTLAND CEMENT CONCRETE, 6 IN.	SY	21.1	Refer to the B and D sheets. The contractor is responsible for certified plant inspection.
22	2526-8285020	CONSTRUCTION SURVEY, CONTROL POINT SURVEY	LS	1	
23	2526-8285040	CONSTRUCTION SURVEY, LOCATION SURVEY	LS	1	

24	2528-2518000	SAFETY CLOSURE	EACH	2	Refer to Tab 108-13A.
25	2528-8445110	TRAFFIC CONTROL	LS	1	
26	2533-4980005	MOBILIZATION	LS	1	
27	2599-9999005	('EACH' ITEM) <i>Remove, Salvage, and Reinstall Flap Gate, 36"</i>	EACH	1	Item is for the removal and reinstallation of the existing 36" flap gate on the outlet of the existing 30" CMP culvert. Item includes all material, labor, and equipment required for the removal, storage, and installation of existing flap gate. Refer to the D sheets. Method of Measurement shall be per each flap gate removed and reinstalled. Basis of Payment shall be at the contract unit price of each flap gate removed and reinstalled.
28	2599-9999009	('LINEAR FEET' ITEM) <i>Side-Mounted Fence</i>	LF	969	Includes furnishing all material, including concrete anchors and shims, and all of the equipment and labor required to erect the fence in accordance with these Plans and Specifications. Method of measurement shall be per linear feet of side-mounted fence. Basis of Payment shall be at the contract unit price per linear feet of side-mounted fence. See sheet V.21 for material information and additional notes.
29	2601-2634100	MULCHING	ACRE	0.1	
30	2601-2636015	NATIVE GRASS SEEDING	ACRE	0.1	
31	2601-2636043	SEEDING AND FERTILIZING (RURAL)	ACRE	0.1	Contractor shall seed, fertilize, and mulch all disturbed areas after construction is complete. 8' adjacent to the trail shall be rural seed, all other areas shall be native grass seed. Contractor shall take care to minimize the size of disturbed areas. All disturbed areas outside of those designated in the plans shall be restored at no additional cost.
32	2601-2642100	STABILIZING CROP - SEEDING AND FERTILIZING	ACRE	0.1	Item is included for disturbed areas. Seed and fertilize all disturbed areas according to Article 2601.03, C, 1, of the Standard Specifications. If permanent seeding cannot be placed due to the restrictive planting dates, stabilizing crop will need to be placed on all disturbed areas as temporary erosion control. Preparation and seeding shall be performed in accordance with Section 2601. Stabilizing crop will not be used when the application dates in Section 2601 allows permanent seeding. If stabilizing crop must be used, place immediately following completions of finished grading. Reseeding of these areas will be required at contractors expense if damage occurs due to contractors negligence during the contract period. It is not necessary to place stabilizing crop in locations that have be covered by Wood Excelsior Mat.
33	2602-0000312	PERIMETER AND SLOPE SEDIMENT CONTROL DEVICE, 12 IN. DIA.	LF	200	
34	2602-0000351	REMOVAL OF PERIMETER AND SLOPE OR DITCH CHECK SEDIMENT CONTROL DEVICE	LF	200	Perimeter and slope sediment control devices shall be placed adjacent to all disturbed areas. Verify locations in the field with the Engineer prior to placement. Refer to Tab 100-19.

105_04
10/20/26

STANDARDS

The following Standards apply to construction work on this project.

Number	Date	Title
DR-101	04-18-17	Pipe Culvert (Bedding and Backfill)
EC-204	10-19-21	Perimeter, Slope and Ditch Check Sediment Control Devices
EW-401	10-20-15	Temporary Stream Crossing, Causeway, or Equipment Pad
PV-101	10-20-26	Joints
TC-1	10-15-19	Work Not Affecting Traffic (Two-Lane or Multi-Lane)

111_25
10/20/26

INDEX OF TABULATIONS

Line No.	Tabulation	Tabulation Title	Sheet No.
1.0	100_19	PERIMETER AND SLOPE SEDIMENT CONTROL DEVICE	C.4
2.0	105_04	STANDARD ROAD PLANS	C.4
3.0	108_13A	SAFETY CLOSURES	C.4
4.0	110_01	REMOVAL OF PAVEMENT	C.4
5.0	111_26	UTILITIES	C.4
6.0	282_03	TEMPORARY STREAM CROSSING, CAUSEWAY, OR EQUIPMENT PAD	C.4

111_26
4/15/25

UTILITIES

Line No.	Company	Contact	Phone	Email
No known utilities on this project.				

110_01
4/5/24

REMOVAL OF PAVEMENT

Refer to Tabulation 102-5.

* Not a bid item.

Line No.	Station From	Station To	Side	Pavement Type	Area (SV)	Saw Cut* (LF)	Remarks
1.0	221+52.00	221+81.31	Both	HMA	32.6	10.0	3" HMA
2.0	226+58.26	226+88.00	Both	HMA	33.0	10.0	3" HMA

100_19
10/15/24

PERIMETER AND SLOPE SEDIMENT CONTROL DEVICE

Possible Standards: EC-204

Line No.	Station From	Station To	Side	Sediment Control Device Type	Diameter Size	Length (LF)	Remarks
1.0	221+50.00	222+00.00	Right	Perimeter and Slope	12 inch	50.00	
2.0	221+50.00	222+00.00	Left	Perimeter and Slope	12 inch	50.00	
3.0	226+40.00	226+90.00	Right	Perimeter and Slope	12 inch	50.00	
4.0	226+40.00	226+90.00	Left	Perimeter and Slope	12 inch	50.00	

108_13A
3/27/25

SAFETY CLOSURES

Station	Road Closure Qty.	Hazard Closure Qty.	Remarks
221+50.00		1	
227+00.00		1	

282_03
9/28/22

TEMPORARY STREAM CROSSING, CAUSEWAY, OR EQUIPMENT PAD

Standard Road Plan EW-401 is listed in Tabulation 105-4; however, it is included for information purposes only since it is an option. No quantities associated with constructing EW-401 are included in any bid items.

FILE NO.	ENGLISH	DESIGN TEAM	WHKS & CO.	POLK COUNTY	PROJECT NUMBER	TAP-U-C077(255)--81-77	SHEET NUMBER	C.4
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BRADY.BOGAARD@IOWA.EDU

	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

LINEWORK			
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
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
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
Red	(3)		Proposed Structure Shading
Red	(3)		Delineates Restricted Areas

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

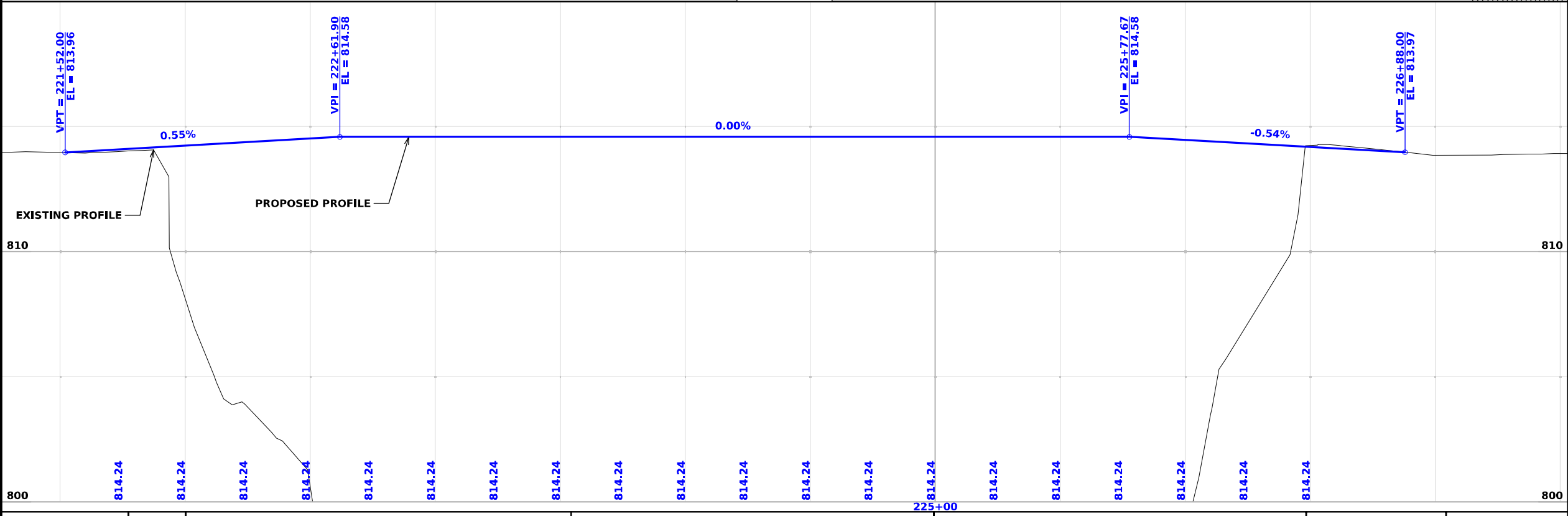
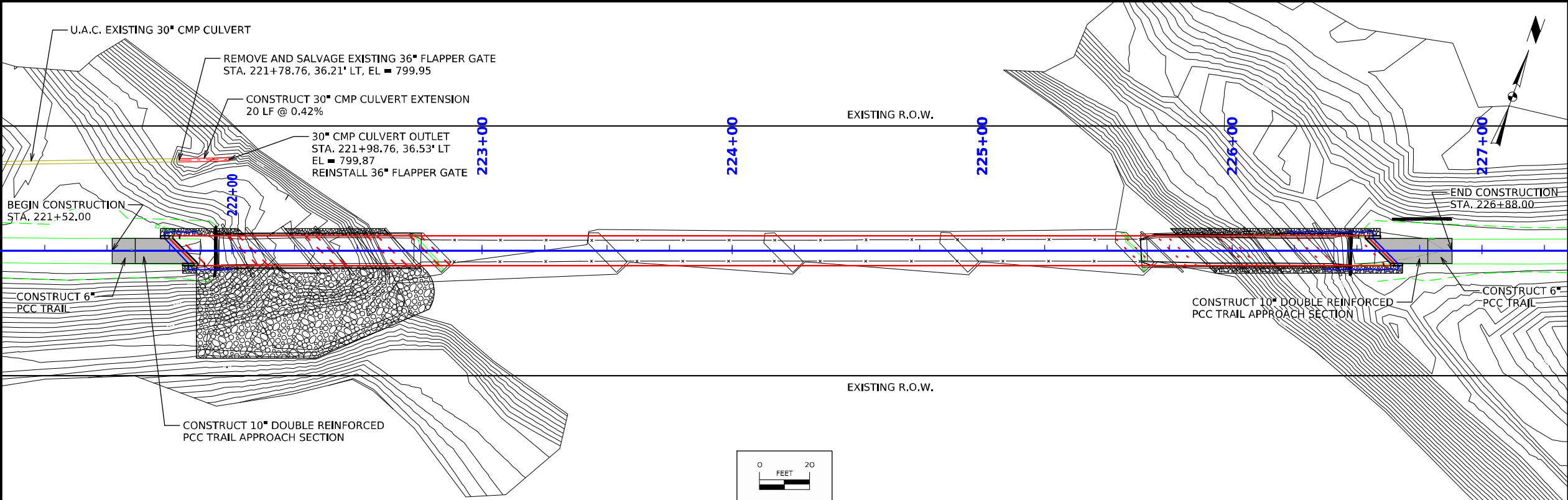
RIGHT-OF-WAY LEGEND

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

RIGHT-OF-WAY LEGEND

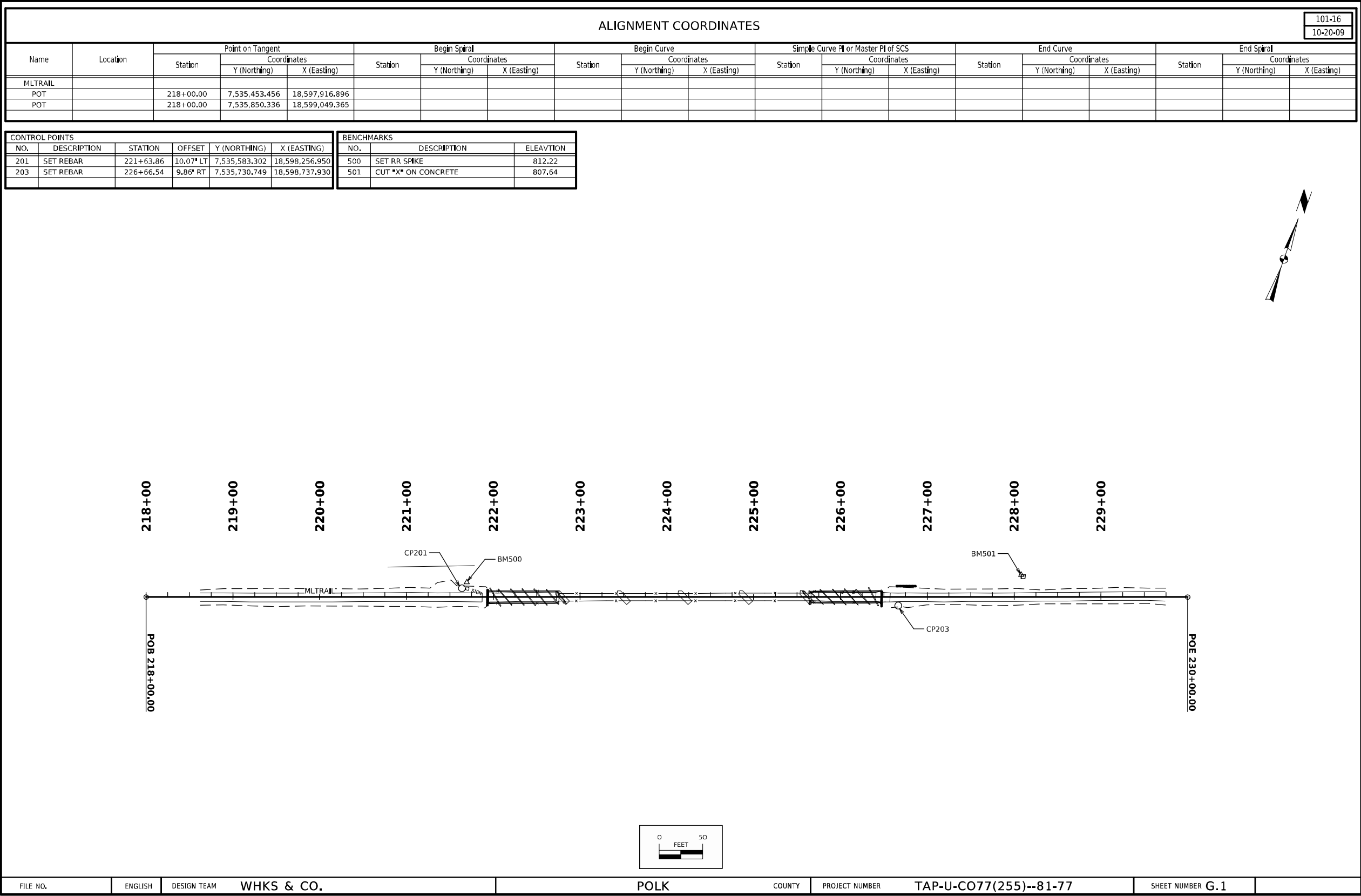
	Proposed Right-of-Way Symbol
	Proposed Right-of-Way Line
	Existing Right of Way
	Existing and Proposed Right-of-Way
	Easement and Existing Right-of-Way
	Easement (Temporary) Symbol
	Easement (Temporary) Line
	Easement
	Access Control
	Property Line Symbol
	Property Line

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

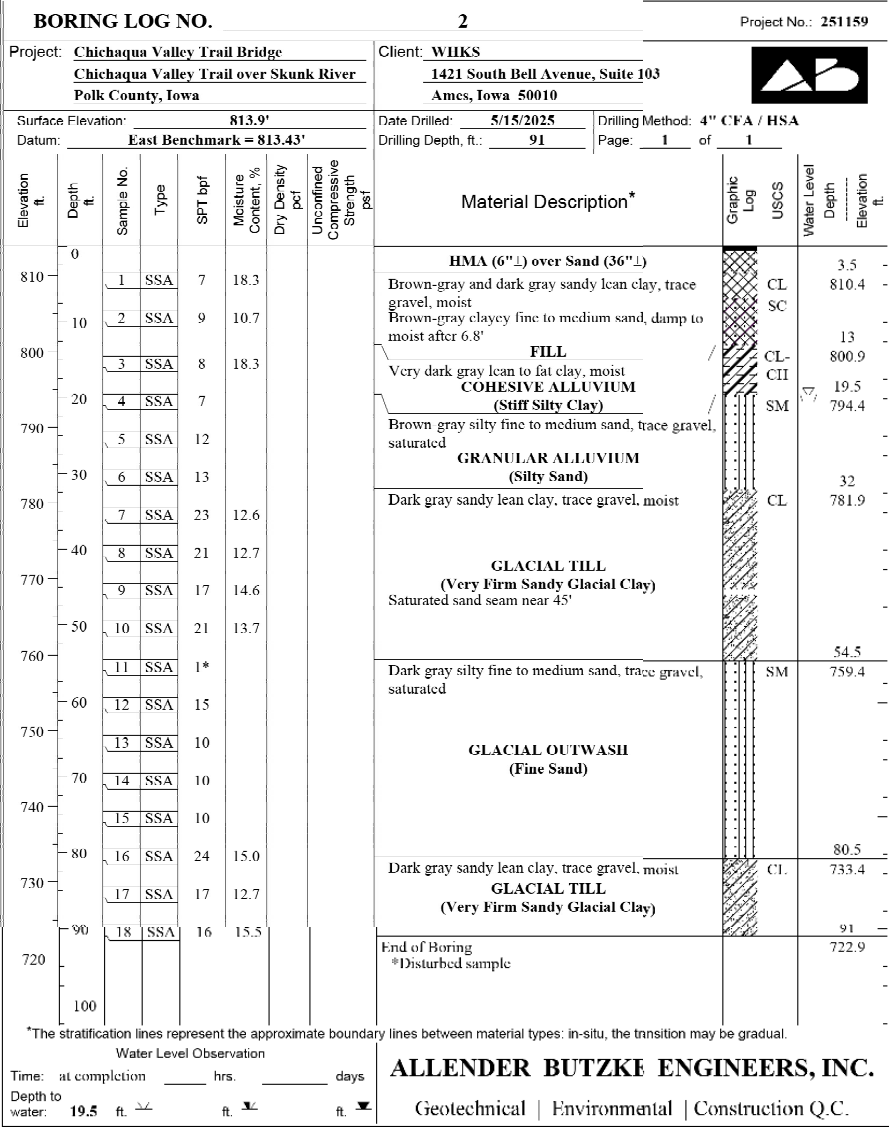
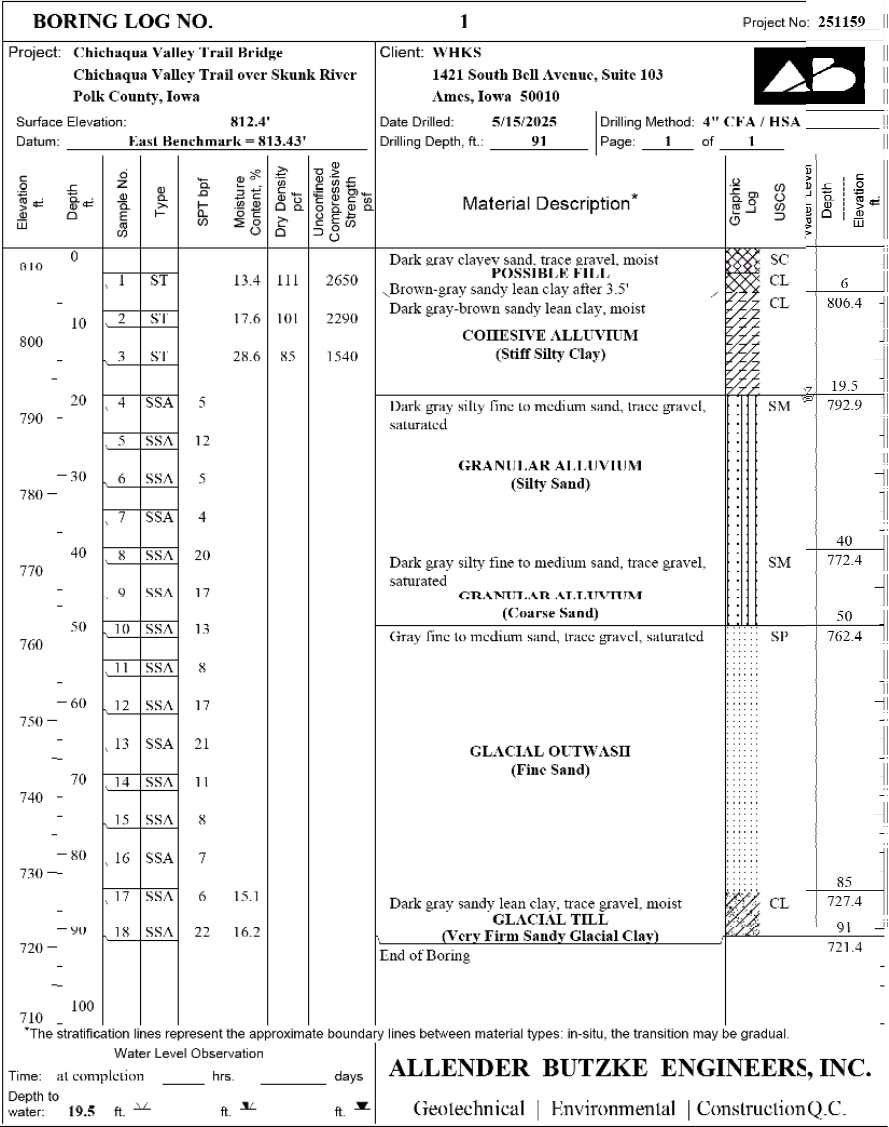


FILE NO.	ENGLISH	DESIGN TEAM	WHKS & CO.	POLK	COUNTY	PROJECT NUMBER	TAP-U-CO77(255)--81-77	SHEET NUMBER	D.2
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TRAFFIC CONTROL PLAN		108_23A 8/15/22						
1. The Chichaqua Valley Trail bridge shall be closed to traffic for the duration of the project. 2. Place "Trail Closed Ahead" signs at the trail intersections with NE 112th Street and NE 94th Avenue. 3. Safety closures shall be placed at each end of the work area. The Chichaqua Valley Trails shall remain open from both directions up to the bridge closure.								
FILE NO.	ENGLISH	DESIGN TEAM	WHKS & CO.	POLK COUNTY	PROJECT NUMBER	TAP-U-C077(255)--81-77	SHEET NUMBER	J.1



Design For 45° Skew (RA)
477' x 12' Trail Bridge
Chichaqua Valley Trail
24'-6" End Spans 97'-2 7/8" Concrete Approaches
4 x 70'-4" (Approx.) Steel Main Spans
Soil Boring Log
STA. 224+19.79 (Chichaqua Valley Trail) Turn-in Date: April, 2026
Polk County

General Notes:

This design is for rehabilitation of the existing 453' x 10" steel girder bridge with concrete piers and timber stringer approach spans with timber pile bent substructure on Chichaqua Valley Trail STA.224+19.79, over South Skunk River. Copies of existing bridge plans are not available.

Rehabilitation shall consist of:

- 1. Remove timber approach spans and replace with 80'-0" x 12' continuous concrete slab approach spans with Type 1 P10L pile bent substructure. Construct 17'-3 jump spans to connect approach spans to main spans.
- 2. Remove timber deck and rails on the main steel spans and replace with concrete deck.
- 3. Install ornamental fence.
- 4. Perform concrete repairs to piers 4 - 8.
- 5. Place Class E revetment on both berms.
- 6. Replace trail approach panels.

"Removals, as per plan" include all costs associated with removing the timber stringer approach spans, timber pile bents, and timber deck and rails on the main spans. Removals shall be in accordance with section 2401, of the standard specifications. Any damage to other portions of the existing structure not noted for removal shall be the responsibility of the bridge contractor and shall be repaired at no extra cost to the owner.

Faint lines on plans indicate the existing structure.

This bridge is designed for HL-93 loading plus 20 lbs. per square foot of roadway for future wearing surface.

All dimensions and details shown on these plans pertinent to new construction shall be verified in the field by the contractor before starting construction.

Utility companies whose facilities are shown on the plans or known to be within the construction limits shall be notified by the bridge contractor of the starting date.

It shall be the bridge contractor's responsibility to provide sites for excess excavated material. No payment for overhaul will be allowed for material hauled to these sites.

These bridge plans label all reinforcing steel with English notation (5a1 is 5/8" diameter bar). English reinforcing steel received in the field may display the following "bar designation". The "bar designation" is the stamped impression on the reinforcing bras, and is equivalent to the bar diameter in millimeters.

ENGLISH SIZE:	3	4	5	6	7	8	9	10	11
BAR DESIGNATION:	10	13	16	19	22	25	29	32	36

Keyway dimensions shown on the plans are based on nominal dimensions unless states otherwise. In addition, the bevel used on the keyway shall be limited to a maximum of 10 degrees from vertical.

All reinforcing bars and bars noted as dowels supplied for this structure shall be deformed reinforcement unless otherwise noted or shown.

Minimum clear distance from face of concrete to near reinforcing bar is to be 2" unless otherwise noted or shown.

The bridge contractor is to clear and/or shape the channel within the approximate limits of the areas as shown on the "situation plan" and "longitudinal section along centerline roadway" on sheet V.3.

The trail will be closed to traffic during construction. See traffic control plan note on this sheet.



The contractor shall provide a certified plant inspection for all structural concrete produced for this project.

Pier caps shall be non-monolithic.

Testing for asbestos was performed on this bridge. No asbestos was detected in the samples tested. In the event that asbestos is encountered during construction, cease work and notify the Owner.

All construction debris is to be removed from the river channel when the temporary construction platform is removed.

The Contractor will need to submit for a Grading Permit with Polk County prior to beginning work.

Sovereign Lands Construction Permit 2026-0229SL-01 shall apply to work on this project. The Iowa DNR Conservation Officer for the area shall be contacted at least 48 hours prior to commencing work. Contact Todd Gosselink at 515-238-6936.

The Contractor shall coordinate with the engineer for a Local Floodplain Permit with Polk County prior to beginning work.

The Contractor is responsible for the construction survey.

Bridge Deck Dimension Table			
No.	Item	Unit	Quantity
1	Deck Length	L.F.	476.9
2	Deck Width	L.F.	12.0
3	Deck Area	S.F.	5723

- 1. Deck length is measured from face-to-face of paving notches along the centerline of trail.
- 2. Deck widths are measured from out-to-out of deck perpendicular to the centerline of trail.
- 3. Deck area is to be based on the face-to-face paving notch distance and out-to-out deck dimensions.

Specifications:

Design: AASHTO LRFD Bridge Design Specifications, 10th Ed., Series of 2024.
Construction: Iowa Department of Transportation Standard Specifications for Highway and Bridge Construction, Series 2023, plus applicable General Supplemental Specifications, Developmental Specifications, Supplemental Specifications and Special Provisions shall apply to construction work on this project.
Developmental Specifications for Fabric Formed Concrete Structure Revetment.

Design Stresses:

Design stresses for the following materials are in accordance with the AASHTO LRFD Bridge Design Specifications, 10th Ed., Series of 2024.
Reinforcing steel in accordance with LRFD AASHTO Section 5, Grade 60, for epoxy and non-coated bars,
Concrete in accordance with LRFD AASHTO Section 5, f'c = 4,000 psi,
Structural steel in accordance with LRFD AASHTO Section 6, ASTM A709 Grade 36 or Grade 50 (AASHTO M270 Grade 36 or Grade 50),
n = 8 for tension steel
2n = 16 for compression steel
HL-93 live load plus 20 lbs. per sq. ft. for future wearing surface.
End span length is used to calculate equivalent width in live load distribution.
Control of cracking by distribution of reinforcement for slab design based on the AASHTO LRFD Bridge Design Specifications, 10th Ed., Series of 2024.

Working Drawing and Calculation Submittals

Working drawings and calculations shall be submitted for the following items shown in the table below. (Note additional working drawings and calculations may be required in accordance with Article 1105.03 of the Standard Specifications.)

Submittal requirements for working drawings and calculations shall be in accordance with 1105.03 of the Standard Specifications for Highway and Bridge Construction of the Iowa Department of Transportation. The absence of a certification requirement for a submittal does not relieve the Contractor of the responsibility to attain certification.

Calculation submittals in this table which are associated with working drawing submittals shall be submitted on the same day. Review time for calculation submittals shall be of the same duration as and run concurrently with review time for associated working drawings. The calculation submittals listed in the table are not meant to be an exhaustive list and do not relieve the Contractor from providing additional calculation submittals if requested by the Engineer.

No.	Working Drawing Description	Working Drawing File Name Convention For Submittal	Certified by Iowa P.E. (Yes/No)
1	Slab Falsework	(255)_Polk_SlabFalseworkPlans.pdf	Yes
2	Side-Mounted Fence	(255)_Polk_SideMountedFence.pdf	No
No.	Calculation Description	Calculation File Name Convention for Submittal	Certified by Iowa P.E. (Yes/No)
1	Slab Falsework	(255)_Polk_SlabFalseworkCalculations.pdf	Yes
--			

Roadway Quantities shown elsewhere in these plans.

Traffic Control Plan
The roadway will be closed to thru traffic. Refer to the Traffic Control Plan shown elsewhere in these plans.

Design For 45° Skew (RA)
477' x 12' Trail Bridge
Chichaqua Valley Trail
24'-6" End Spans 97'-2 7/8" Concrete Approaches
4 - 70'-4" (Approx.) Steel Main Spans
General Notes
STA. 224+19.79 (Chichaqua Valley Trail) Turn-in Date: April, 2026
Polk County

SUMMARY OF CONCRETE QUANTITIES	
LOCATION	STRUCTURAL CONCRETE
West Abutment Footing	5.7
East Abutment Footing	5.7
Superstructure	210.5
Abutment Wings	3.0
Piers	37.6

TOTAL (CU. YDS.)	262.5

SUMMARY OF REINFORCING STEEL			
LOCATION	NON-COATED REINFORCING STEEL	STAINLESS STEEL REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
WEST ABUTMENT FOOTING			785 *
EAST ABUTMENT FOOTING			785 *
SUPERSTRUCTURE			51,715
PIERS			7,308
	*****	*****	*****
TOTAL (LBS.)	0	0	60,593
* INCLUDES 41 LBS FOR SPIRALS AND SPIRAL SPACERS WHICH ARE TO BE NON-COATED REINFORCING BUT MAY BE COATED AT THE CONTRACTOR'S OPTION AND EXPENSE.			

SUMMARY OF FOUNDATIONS					
LOCATION	SUBSTRUCTURE TYPE	FOUNDATION TYPE	NUMBER	LENGTH (LIN. FT.)	TOTAL (LIN. FT.)
W. ABUT. FTG.	INTEGRAL ABUTMENT	TIMBER FOUNDATION PILING	4	35	140
E. ABUT. FTG.	INTEGRAL ABUTMENT	TIMBER FOUNDATION PILING	4	40	160
PIER NO. 1	PILE BENT PIER, TYPE 1	14" STEEL PIPE PILE	4	45	180
PIER NO. 2	PILE BENT PIER, TYPE 1	14" STEEL PIPE PILE	4	45	180
PIER NO. 3	PILE BENT PIER, TYPE 1	14" STEEL PIPE PILE	4	45	180
PIER NO. 9	PILE BENT PIER, TYPE 1	14" STEEL PIPE PILE	4	45	180
PIER NO. 10	PILE BENT PIER, TYPE 1	14" STEEL PIPE PILE	4	45	180
PIER NO. 11	PILE BENT PIER, TYPE 1	14" STEEL PIPE PILE	4	45	180

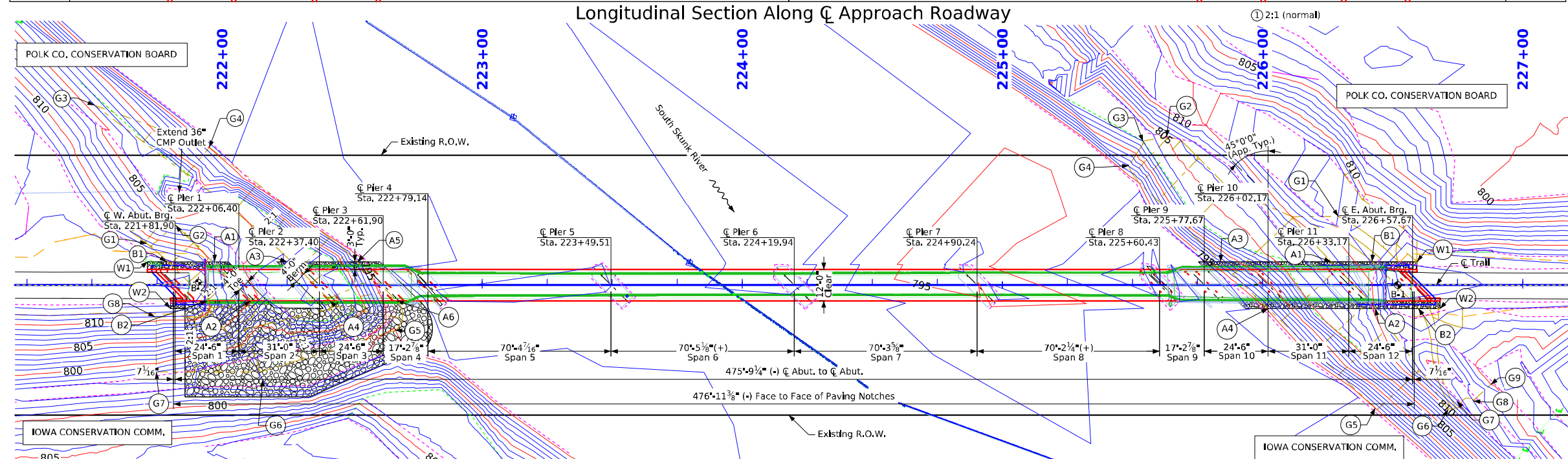
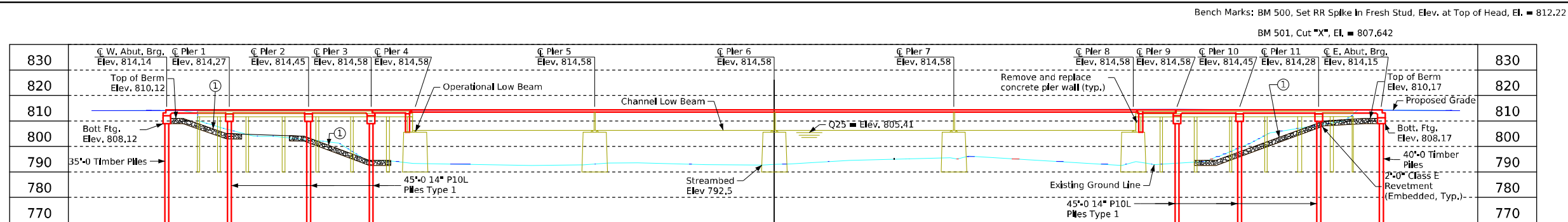
SUMMARY OF EXCAVATION		
LOCATION	Class 20 Excavation	Class 10 Excavation
West Abutment Footing	26.5	
East Abutment Footing	26.9	
West Abutment Berm		358.4
East Abutment Berm		256.2
TOTAL (CU. YDS.)	53.4	614.6

See C Sheets for Bridge Plan Bid Items and Estimate Reference Information

Design For 45° Skew (RA)
477' x 12' Trail Bridge
Chichaqua Valley Trail
24'-6" End Spans 97'-2 7/8" Concrete Approaches
4 - 70'-4" (Approx.) Steel Main Spans
Summary of Quantities
STA. 224+19.79 (Chichaqua Valley Trail) Turn-in Date: April, 2026
Polk County

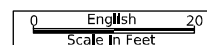
FILE NO.	ENGLISH	DESIGN TEAM WHKS & Co.	POLK COUNTY	PROJECT NUMBER TAP-U-CO77(255)-81-77	SHEET NUMBER V.2
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3:59:48 PM 8/5/2026 jtalley pw:\\whks-pw.bentley.com:whks-pw-01\Documents\Projects\IA\10292\41 CAD\Bridge\CVTOverSkunkRiver.dgn



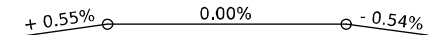
Notes:
 All units are in Survey Feet unless otherwise noted.
 Contours are existing.
 Class E revetment stone is embedded.
 No known utilities in bridge vicinity.
 See Sheet V.5 for hydraulic information.
 See Sheet V.4 for Berm Slope Location Table.

Situation Plan

 Soil Boring Locations

V.P.I. Sta. = 222+61.90	V.P.I. Sta. = 225+77.67
V.P.I. Elev. = 814.58	V.P.I. Elev. = 814.58

V.P.I. Sta. = 225+77.67
V.P.I. Elev. = 814.58



V.P.I. Sta. = 221+52.00
V.P.I. Elev. = 813.96

V.P.I. Elev. = 813.96

V.P.I. Sta. = 226+88.00
V.P.I. Elev. = 813.97

V.P.I. Elev. = 813.97

Proposed Grade ∇ Bridge

Preliminary

Design For 45° Skew (RA)

477' x 12' Trail Bridge
Chichaqua Valley Trail

24'-6" End Spans

4 - 70'-4" (Approx.) Steel Main Spans

4 - 70" x 4" (Approx.) Steel Main Spans

Situation Plan

STA. 224+19.79 (Chichaqua Valley Trail)

Turn-in Date: April, 2026

Polk County

Location

Chichaqua Valley Trail
over South Skunk River
T-80E R-22W
Section 24
Franklin Township
Polk County
Latitude 41.719583°
Longitude -93.355873°

T-80E R-22W

Section 24

Franklin T.

Polk County

Latitude 41.

Longitude -93.35587



whks
engineers | planners | land surveyors

ENGLISH	DESIGN TEAM WHKS & Co.
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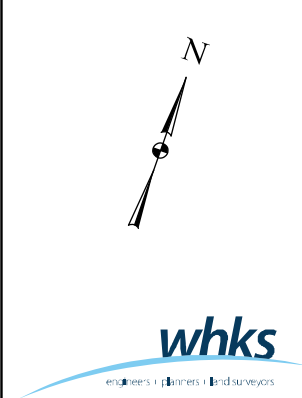
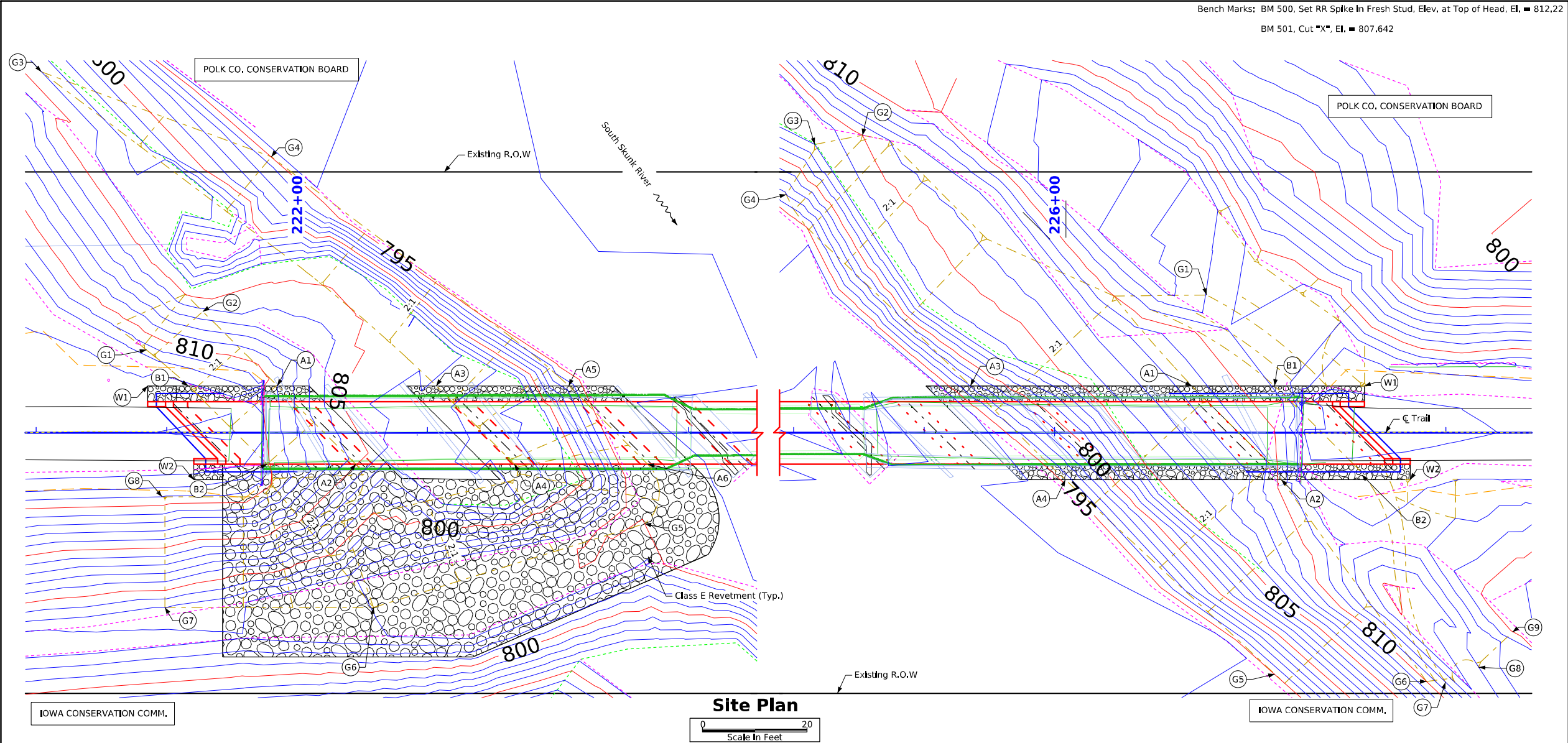
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Polk COUNTY

PROJECT NUMBER	TAP-U-CO77(255)--8I-77
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SHEET NUMBER V.3

SHEET NUMBER	V.3
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Berm Slope Location Table						
Points	West Abutment			East Abutment		
	Station	Offset	Elev.	Station	Offset	Elev.
A1	221+96.23	9.00' LT.	805.00	226+26.35	9.00' LT.	810.00
A2	222+11.23	6.00' RT.	805.00	226+43.46	9.00' RT.	810.00
A3	222+26.66	9.00' LT.	804.00	225+83.87	9.00' LT.	794.50
A4	222+41.70	6.00' RT.	804.00	226+02.11	9.00' RT.	794.50
A5	222+52.05	9.00' LT.	794.50			
A6	222+67.15	6.00' RT.	794.50			
B1	221+79.16	9.00' LT.	810.12	226+46.55	9.00' LT.	810.17
B2	221+94.26	6.00' RT.	810.12	226+64.55	9.00' RT.	810.17
G1	221+64.87	20.52' LT.	810.12	226+11.4	23.47' LT.	812.00
G2	221+78.58	26.58' LT.	805.00	225+68.4	56.00' LT.	805.00

Berm Slope Location Table (cont.)						
G3	221+50.98	69.20' LT.	804.00	225+54.04	55.29' LT.	803.00
G4	221+94.99	52.94' LT.	794.50	225+52.54	46.19' LT.	794.50
G5	222+66.62	17.44' RT.	794.50	226+44.06	48.00' RT.	794.50
G6	222+15.78	31.81' RT.	796.00	226+71.38	47.80' RT.	810.00
G7	221+74.68	33.50' RT.	798.00	226+76.74	47.88' RT.	813.00
G8	221+74.10	12.33' RT.	810.12	226+83.23	47.95' RT.	813.00
G9				226+87.77	38.22' RT.	810.00
W1	221+71.95	9.00' LT.	815.14	226+58.44	9.00' LT.	815.14
W2	221+80.78	9.00' RT.	813.34	226+58.14	9.00' RT.	813.34

Design For 45° Skew (RA)
477' x 12' Trail Bridge
Chichaqua Valley Trail
24'-6" End Spans 97'-2 7/8" Concrete Approaches
4 - 70'-4" (Approx.) Steel Main Spans
Situation Plan - Grading
STA. 224+19.79 (Chichaqua Valley Trail) Turn-in Date: April, 2026
Polk County

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 Angie Jansen via phone #515-238-5006 or email angie.jansen@dnr.iowa.gov

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
	4	Red/Danger	6"	Nc 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.

Estimated Berm Armoring Quantities			
Location	Class E Revetment (Tons)	Engineering Fabric (SY)	Excavation, Class 10 (CY)
West Berm	503.6	550.4	358.4
East Berm	150.1	190.2	256.2
Total	653.6	740.6	614.6



Iowa RIDB: SKUNKR_S_196.5
Drainage Area = 754 sq. mi.
Site Stream (HGL) Slope = 0.046% (2.43 ft/mi)

Discharges based on Ames/Colfax Gage Data and Report 2013-5086 Regression Equation Weighted Independent Estimates (WIE's) at each gage. Flows in this region are inversely proportional to drainage area. Final flows average the WIE gage estimates (conservative).

Existing (Operational)/Channel Main Span Low Steel Elev. = 806.25
Existing End Spans Low Wood Elev. = 811.60
Proposed End Spans Low Steel Elev. = 812.88
Ave. Low Water Stage = 794.7
Extreme Highwater = Unknown
Trail Overtopping El. = 807.7 (100-yr event)

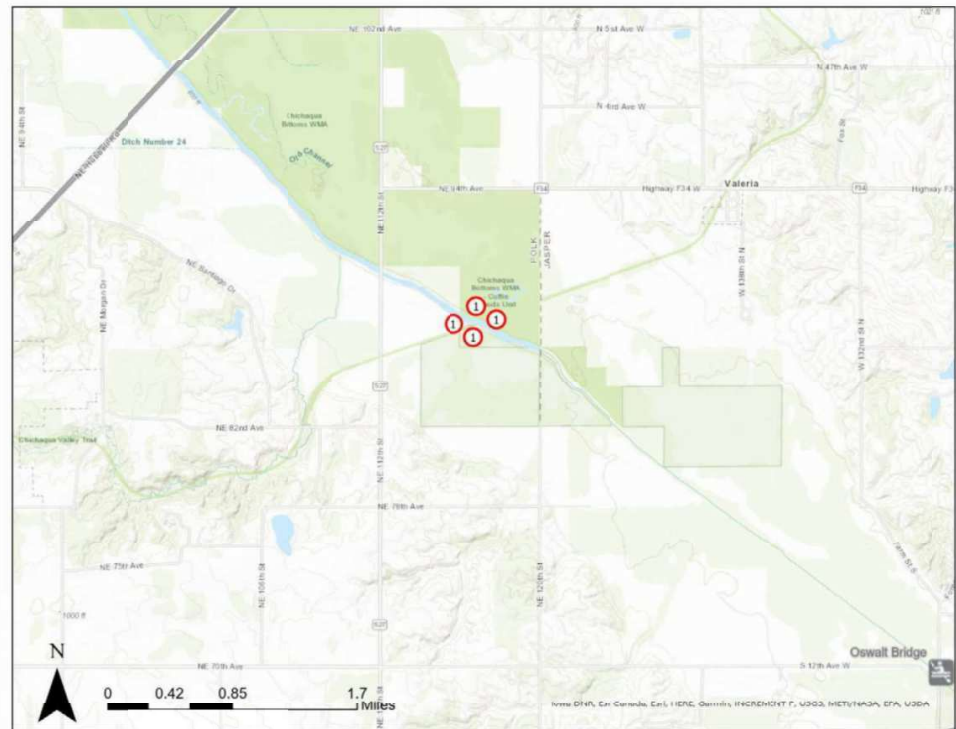
Q25 (Design) = 15,900 cfs
Stage = 805.41

Q50 = 18,900 cfs
Stage = 806.54
Backwater = 0.36 ft.
Ave. Bridge Velocity = 4.5 ft/s

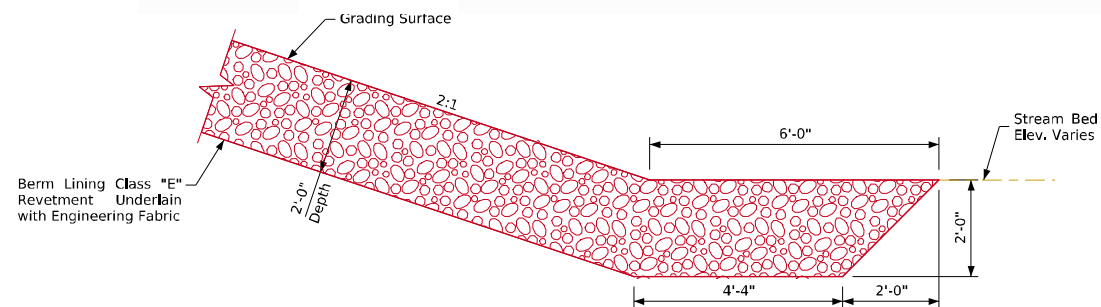
Q100 = 21,900 cfs
Stage = 807.56
Backwater = 0.50 ft.
Ave. Bridge Velocity = 5.0 ft/s

Q200 = 25,800 cfs
Stage = 808.85
Backwater = 0.64 ft.
Ave. Bridge Velocity = 5.3 ft/s

Q500 = 29,600 cfs
Stage = 810.00
Backwater = 0.35 ft.
Ave. Bridge Velocity = 4.3 ft/s



Location Map - South Skunk River Signage



Section Thru Embedded Revetment Berm

	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.	
		8-4-2026
	Signature	Date
	Printed or Typed Name	
	My license renewal date is December 31, 2026	
Pages or sheets covered by this seal: V.3-V.5		

Design For 45° Skew (RA)

477' x 12' Trail Bridge

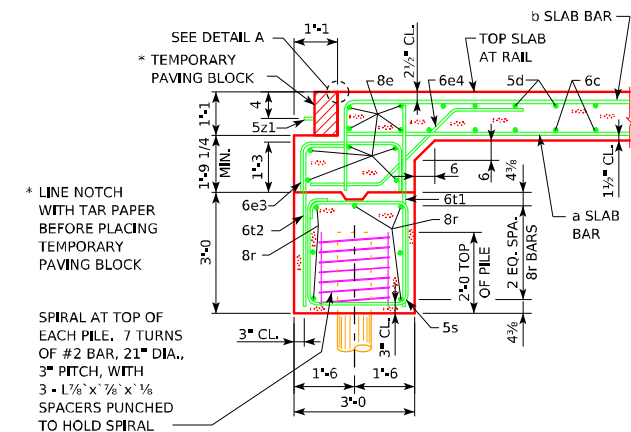
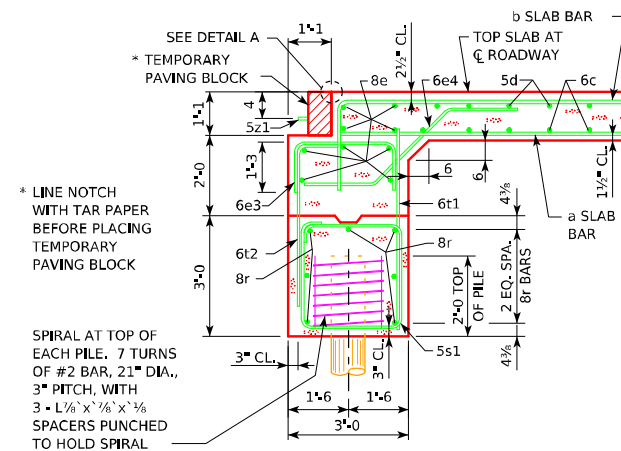
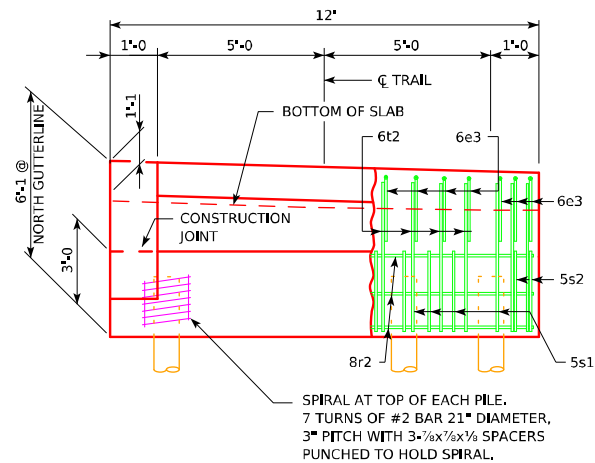
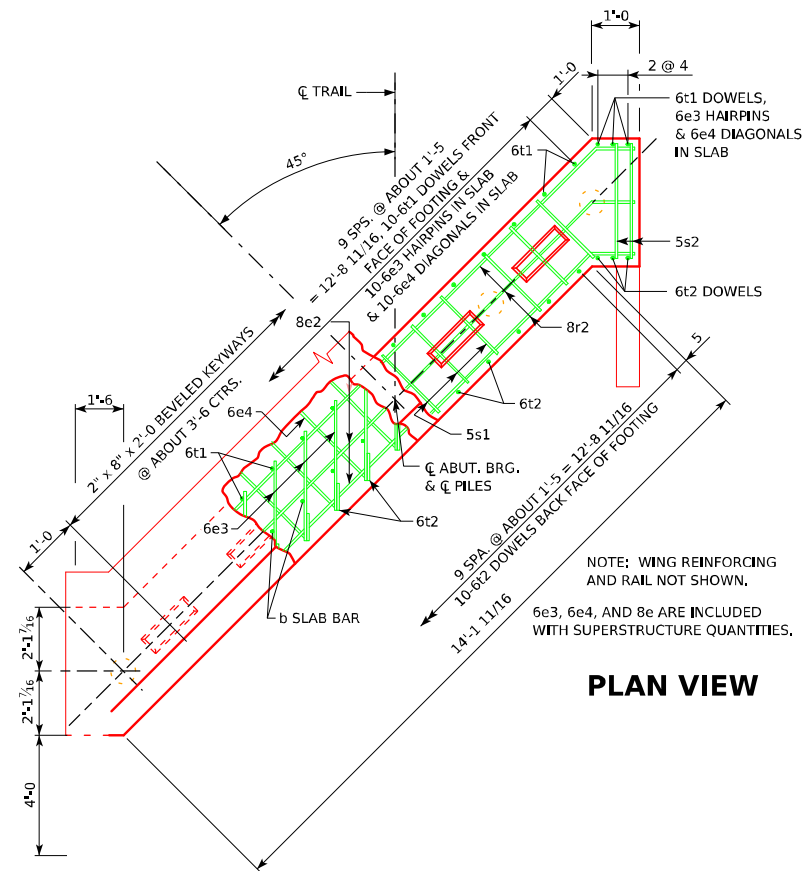
Chichaqua Valley Trail

24'-6" End Spans 97'-2 7/8" Concrete Approaches
4 • 70'-4" (Approx.) Steel Main Spans

Water Trails Access

STA. 224+19.79 (Chichaqua Valley Trail) Turn-in Date: April, 2026

Polk County



ABUTMENT NOTES:

THE CONCRETE AND REINFORCING STEEL FOR THE WINGS IS INCLUDED WITH THE SUPERSTRUCTURE.

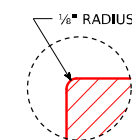
THE MINIMUM CLEAR DISTANCE FROM THE FACE OF THE CONCRETE TO NEAR REINFORCING BAR IS TO BE 2 INCHES UNLESS OTHERWISE NOTED OR SHOWN.

TIMBER PILES SHALL BE DRIVEN TO FULL PENETRATION IF PRACTICABLE BUT IN NO CASE TO A BEARING VALUE LESS THAN SHOWN IN DESIGN PLANS. TIMBER PILES SHALL NOT BE DRIVEN TO MORE THAN 160 TONS.

ALL REINFORCING STEEL IS TO BE GRADE 60.

ABUTMENT PILING WAS DESIGNED FOR HL-93 LOADING

4 - TIMBER FOUNDATION PILING REQUIRED AT EACH ABUTMENT.



DETAIL A

**SECTION NORMAL TO
ABUTMENT AT SOUTH GUTTERLINE**

Design For 45° Skew (RA)
477' x 12' Trail Bridge
Chichaqua Valley Trail

24¹-6¹ End Spans

4 - 70'-4" (Approx.) Steel Main Spans

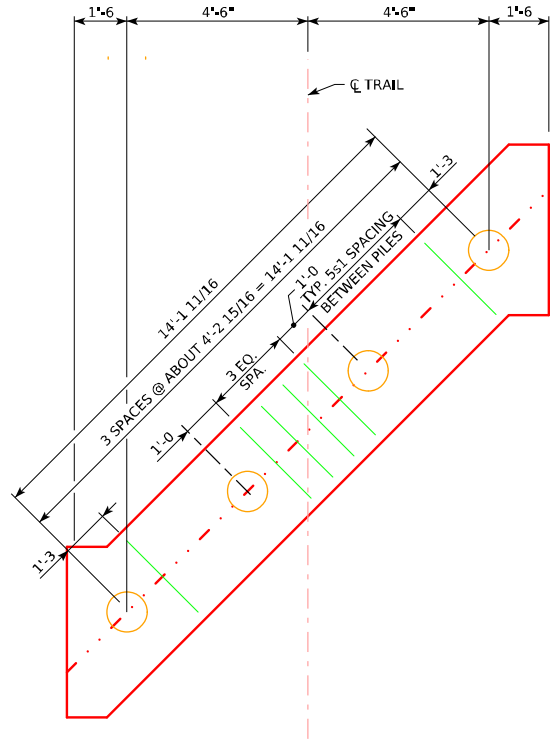
4 - 70" x 4" (Approx.) Steel Main Spans

Abutment Details

STA. 224+19.79 (Chichaqua Valley Trail)

Turn-in Date: April, 2026

Polk County



Pile Plan

West Abutment Pile Notes:

THE CONTRACT LENGTH OF 35 FEET FOR THE WEST ABUTMENT PILES IS BASED ON A MIXED SOIL CLASSIFICATION, A TOTAL FACTORED AXIAL LOAD PER PILE (PU) OF 35 KIPS, AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.6.

THE NOMINAL AXIAL BEARING RESISTANCE FOR CONSTRUCTION CONTROL WAS DETERMINED FROM A MIXED SOIL CLASSIFICATION AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.55. PILES ARE ASSUMED TO BE DRIVEN FROM A START ELEVATION AT THE BOTTOM OF FOOTING.

THE REQUIRED NOMINAL AXIAL BEARING RESISTANCE FOR WEST ABUTMENT PILES IS 32 TONS AT END OF DRIVE OR RETAP, THE PILE CONTRACT LENGTH SHALL BE DRIVEN AS PER PLAN UNLESS PILES REACH REFUSAL. CONSTRUCTION CONTROL REQUIRES A MODIFIED IOWA DOT ENR FORMULA.

East Abutment Pile Notes:

THE CONTRACT LENGTH OF 40 FEET FOR THE EAST ABUTMENT PILES IS BASED ON A MIXED SOIL CLASSIFICATION, A TOTAL FACTORED AXIAL LOAD PER PILE (PU) OF 35 KIPS, AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.6.

THE NOMINAL AXIAL BEARING RESISTANCE FOR CONSTRUCTION CONTROL WAS DETERMINED FROM A MIXED SOIL CLASSIFICATION AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.55. PILES ARE ASSUMED TO BE DRIVEN FROM A START ELEVATION AT THE BOTTOM OF FOOTING.

THE REQUIRED NOMINAL AXIAL BEARING RESISTANCE FOR EAST ABUTMENT PILES IS 32 TONS AT END OF DRIVE OR RETAP, THE PILE CONTRACT LENGTH SHALL BE DRIVEN AS PER PLAN UNLESS PILES REACH REFUSAL, CONSTRUCTION CONTROL REQUIRES A MODIFIED IOWA DOT ENR FORMULA.

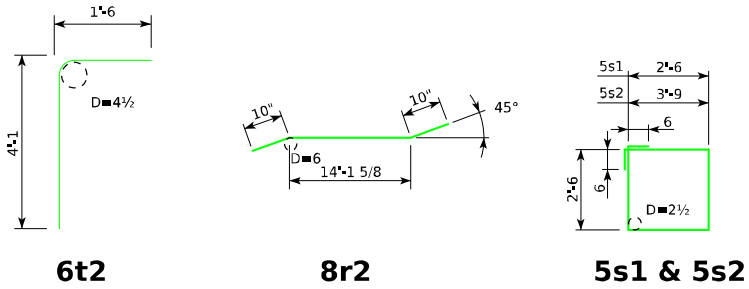


REINFORCING BAR LIST - ONE ABUTMENT					
BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
8r1	ABUTMENT FOOTING LONGITUDINAL		7	15'-10	296
5s1	ABUTMENT FOOTING HOOPS		12	11'-0	138
5s2	ABUTMENT FOOTING HOOPS		4	13'-6	56
6t1	FOOTING TO SLAB DOWELS		16	5'-0	120
6t2	FOOTING TO SLAB DOWELS		16	5'-7	134
#2	PILE SPIRAL		4	38'-6	26
	SPIRAL SPACERS, L7/8X7/8X1/8X0.70		12	1'-10	15
EPOXY COATED REINFORCING STEEL - TOTAL (LBS)					785

CONCRETE PLACEMENT QUANTITIES

STRUCTURAL CONCRETE (BRIDGE)	
LOCATION	QUANTITY (CY)
ABUTMENT FOOTING - 2 @ 5.7 CY	11.4
TOTAL STRUCTURAL CONCRETE (BRIDGE)	
	11.4

BENT BAR DETAILS



NOTE: DIMENSIONS ARE OUT TO OUT. D = PIN DIAMETER.

Design For 45° Skew (RA)

477' x 12' Trail Bridge

Chichaqua Valley Trail

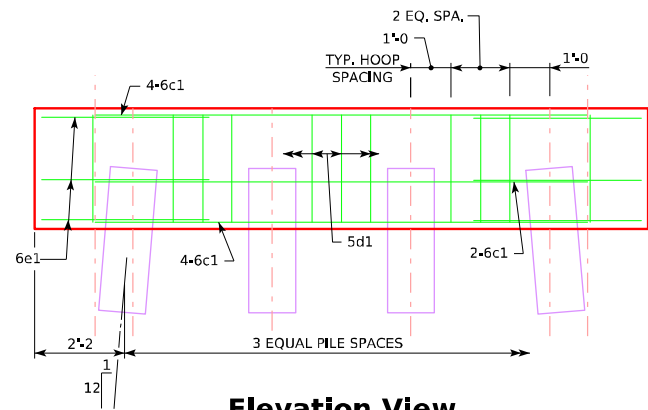
24'-6" End Spans 97'-2 7/8" Concrete Approaches

4 - 70'-4" (Approx.) Steel Main Spans

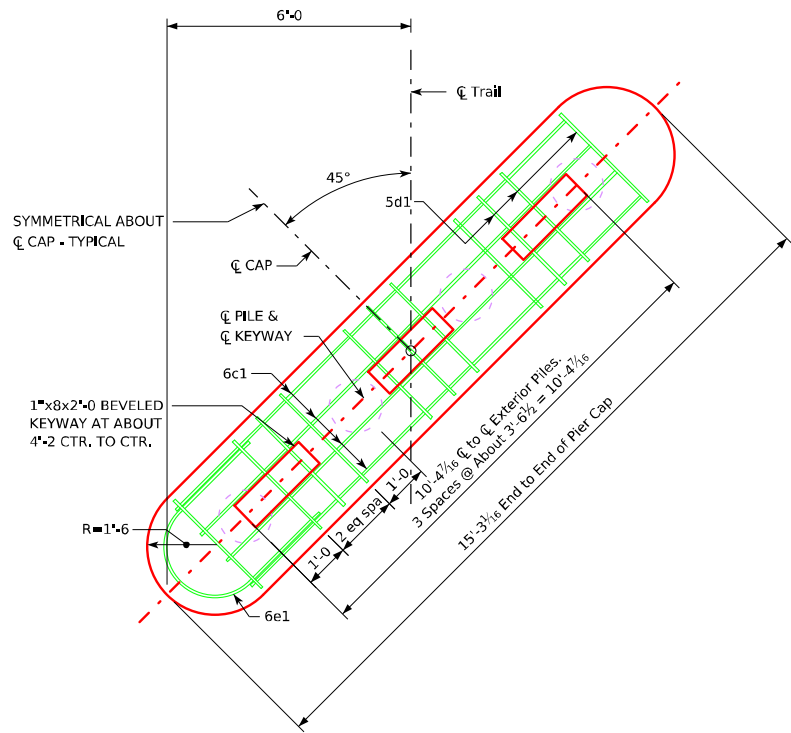
Abutment Details

STA. 224+19.79 (Chichaqua Valley Trail) Turn-in Date: April, 2026

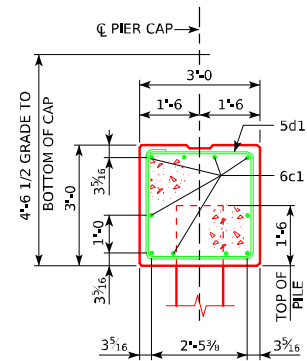
Polk County



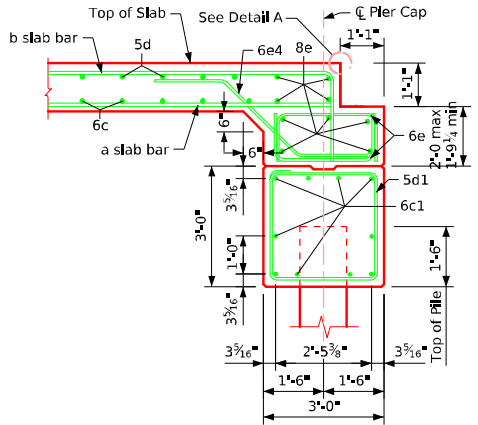
Elevation View
Piers 1, 2, 3, 9, 10, and 11



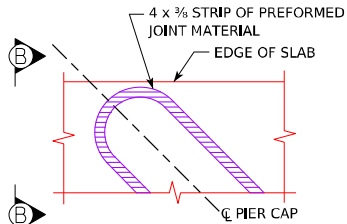
PLAN VIEW
Piers 1, 2, 3, 9, 10, and 11



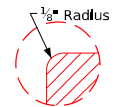
TYP. SECTION
At Piers 1, 2, 10, and 11



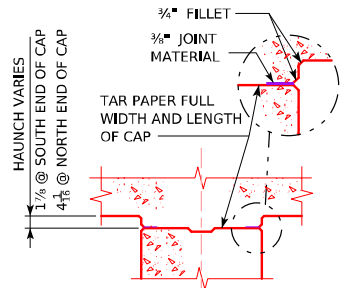
TYPICAL SECTION
At Piers 3 & 9



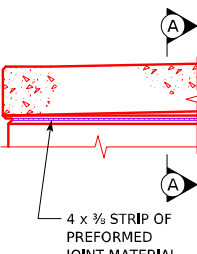
PART PLAN
SHOWING TREATMENT OF 4 x 3/8 STRIP OF PREFORMED JOINT MATERIAL AT ENDS OF PIER CAP. NOTE THAT JOINT MATERIAL IS TO GO ALL THE WAY AROUND PIER CAP.



DETAIL A



PART SECT A-A



PART SECT B-B



Design For 45° Skew (RA)
477' x 12' Trail Bridge
Chichaqua Valley Trail
24'-6" End Spans 97'-2 7/8" Concrete Approaches
4 - 70'-4" (Approx.) Steel Main Spans
Pier Details
STA. 224+19.79 (Chichaqua Valley Trail) Turn-in Date: April, 2026
Polk County

General Notes:

Except as noted elsewhere, material, construction, driving and extensions or build ups when necessary shall be in accordance with Standard Specifications of the Iowa D.O.T. and current Supplemental Specifications and Special Provisions applicable.

Cost of all driving points and cap steel is to be included in the price bid per linear foot for piling.

Wire spiral shall conform to ASTM A1064 Grade 70.

Cast in Place Pile Notes:

Shell thicknesses shown are minimum requirements. The method of driving steel shell piles shall be adapted to the type and thickness of shell specified. Any shells which have been improperly driven, broken or are otherwise defective shall be removed and replaced by the bridge Contractor.

All cast in place piles shall have a closure plate. Driving points shall be used if specified on the plans.

Bidding Notes:

The plans shall designate the size of pile to be used. They shall also specify Type 1.

Piles shall be bid designating the size, type and length.

Type 1 piling will be bid per linear foot of pile.

West Approach Pile Notes:

THE CONTRACT LENGTH OF 45 FEET FOR THE WEST PIER PILES IS BASED ON A MIXED SOIL CLASSIFICATION, A TOTAL FACTORED AXIAL LOAD PER PILE (PU) OF 58 KIPS, AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.6.

THE NOMINAL AXIAL BEARING RESISTANCE FOR CONSTRUCTION CONTROL WAS DETERMINED FROM A MIXED SOIL CLASSIFICATION AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.55. PILES ARE ASSUMED TO BE DRIVEN FROM A START ELEVATION AT THE PROPOSED GROUND ELEVATION.

THE REQUIRED NOMINAL AXIAL BEARING RESISTANCE FOR WEST PIER PILES IS 66 TONS AT END OF DRIVE OR RETAP. THE PILE CONTRACT LENGTH SHALL BE DRIVEN AS PER PLAN UNLESS PILES REACH REFUSAL. CONSTRUCTION CONTROL REQUIRES A MODIFIED IOWA DOT ENR FORMULA.

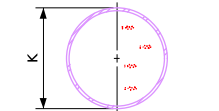
East Approach Pile Notes:

THE CONTRACT LENGTH OF 45 FEET FOR THE EAST PIER PILES IS BASED ON A MIXED SOIL CLASSIFICATION, A TOTAL FACTORED AXIAL LOAD PER PILE (PU) OF 58 KIPS, AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.6.

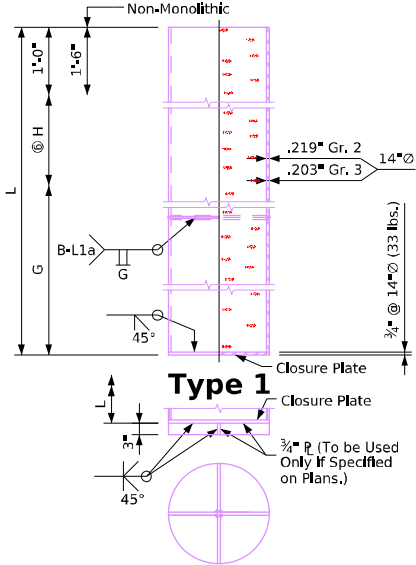
THE NOMINAL AXIAL BEARING RESISTANCE FOR CONSTRUCTION CONTROL WAS DETERMINED FROM A MIXED SOIL CLASSIFICATION AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.55. PILES ARE ASSUMED TO BE DRIVEN FROM A START ELEVATION AT THE PROPOSED GROUND ELEVATION.

THE REQUIRED NOMINAL AXIAL BEARING RESISTANCE FOR EAST PIER PILES IS 63 TONS AT END OF DRIVE OR RETAP. THE PILE CONTRACT LENGTH SHALL BE DRIVEN AS PER PLAN UNLESS PILES REACH REFUSAL. CONSTRUCTION CONTROL REQUIRES A MODIFIED IOWA DOT ENR FORMULA.

Cast in Place



Spiral Welded or Seamless Steel Pipe ASTM A252 GR. 2 or GR. 3



Steel Driving Points
ASTM A36

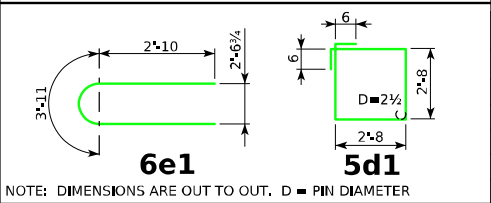
K Dimension	in	14	Ø
G Min, Below Ground	ft	24	
Ⓜ H Max, Above Ground	ft	18	
Shell ASTM A-252		Gr. 2	Gr. 3
Concrete (L=40')	cy	1.49	1.49
Concrete 1' Change	cy	0.0372	0.0373
① Wt. of Shell (L=40')	lb	1325	1231
Wt. of Shell 1' Change	lb	32.26	29.94
f'c	ksi	4.0	4.0
⑤ Nominal Resistance Pn	kips	119	119

① Includes Weight of Closure Plate.

REINFORCING BAR LIST - ONE PIER

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
6c1	PIER LONGITUDINAL		10	12'-3	184
5d1	PIER HOOPS		53	11'-8	645
6e1	PIER LONGITUDINAL, ENDS		6	9'-7	86
EPOXY COATED REINFORCING STEEL - TOTAL (LBS)					915

BENT BAR DETAILS



CONCRETE PLACEMENT QUANTITIES

STRUCTURAL CONCRETE (BRIDGE)	
LOCATION	QUANTITY (CY)
PIER CAP - 6 @ 4.9 CY	29.4
TOTAL STRUCTURAL CONCRETE (BRIDGE)	29.4

PIER NOTES:

THE MINIMUM CLEAR DISTANCE FROM THE FACE OF THE CONCRETE TO NEAR REINFORCING BAR IS TO BE 2 INCHES UNLESS OTHERWISE NOTED OR SHOWN.

ALL REINFORCING STEEL IS TO BE GRADE 60.

PIER PILING WAS DESIGNED FOR HL-93 LOADING

4 - 14"Ø STEEL PIPE PILING REQUIRED AT EACH PIER.

Bottom of Pier Cap Elevations

	Pier 1	Pier 2	Pier 3	Pier 9	Pier 10	Pier 11
North Exterior Pile	812.73	812.90	811.57	812.97	812.95	811.31
CL of Trail	812.75	812.93	811.61	813.06	812.93	811.31
South Exterior Pile	812.78	812.95	811.73	813.04	812.90	811.32

The bottom of pier cap is to be sloped to compensate for grade. See the table for elevations at the bottom of cap at the CL of roadway and each exterior pile.



Design For 45° Skew (RA)

477' x 12' Trail Bridge

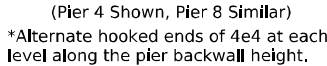
Chichaqua Valley Trail

24'-6" End Spans 97'-2 7/8" Concrete Approaches
4 - 70'-4" (Approx.) Steel Main Spans

Pier Details

STA. 224+19.79 (Chichaqua Valley Trail) Turn-in Date: April, 2026

Polk County



Bent Bar Details

The diagram illustrates three types of bent bars used in reinforcement:

- 5e1 & 5e2:** A straight bar with a 135° hook. The hook length is 10d, and the straight length is 10d + 4d. The bar is labeled 10d + 1 5e1 and 10d + 4 5e2.
- 5e3:** A U-shaped bar with a 180° hook. The hook length is 10d, and the straight length is 3d + 2d. The bar is labeled 10d + 3 5e3.
- 4e4:** A bent bar with a 45° hook. The hook length is 10d, and the straight length is 5d. The bar is labeled 10d + 2 1/2 4e4.

Note: Dimensions are out to out, D = Pin Diameter

Concrete Placement Quantities	
Structural Concrete (Bridge)	
Location	Quantity (CY)
Pier Wall - @ 4.1 CY	8.2
Total Structural Concrete (Bridge)	8.2



Existing pier wall shape and location is approximated based on survey and field measurements.

Reinforcement connecting existing pier backwall to pier shall be cut smooth with top of pier and sealed with two coats of zinc-rich paint.

Any damage to existing pier during removal operations shall be repaired by Contractor at no additional cost to the County.

The 5d3 bars shall be set as dowels in drilled holes. Holes are to be 1'-10" deep. The dowels shall be installed in accordance with the Manufacturer's recommendations. Either of the following systems may be used as a bonding agent for vertical dowels, but only System "A" may be used for horizontal dowels:

A. Polymer grout system in accordance with Article 2301.03, E, of the Standard Specifications.

B. Hydraulic cement grout systems. Drilled holes are to be $2\frac{1}{2}$ times the dowel diameter and are to be blown clean with compressed air immediately prior to placing grout. The hydraulic cement grout shall be one of those approved in Materials I.M. 491.13 and shall be used in accordance with the Manufacturer's recommendations.

The price bid for "Structural Concrete" shall include the costs of setting bars as dowels in the pier.

Design For 45° Skew (RA)

477' x 12' Trail Bridge

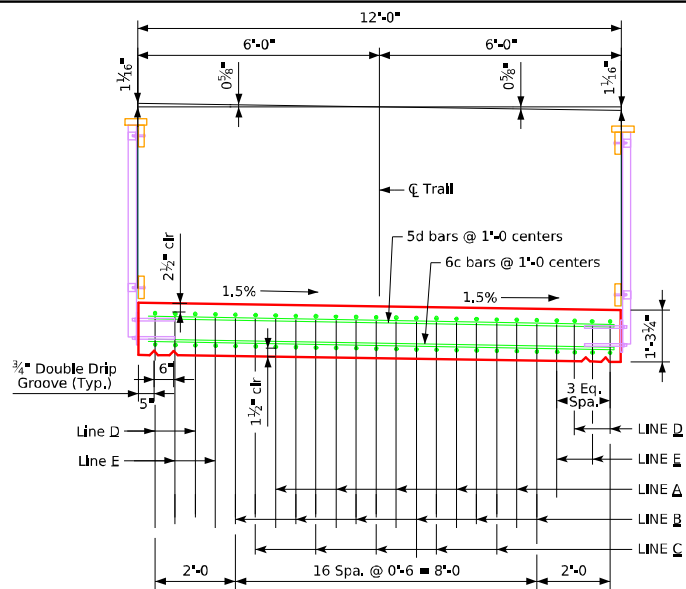
Chichaqua Valley Trail

24'-6" End Spans 97'-2 7/8" Concrete Approaches
4 x 70'-4" (Approx.) Steel Main Spans

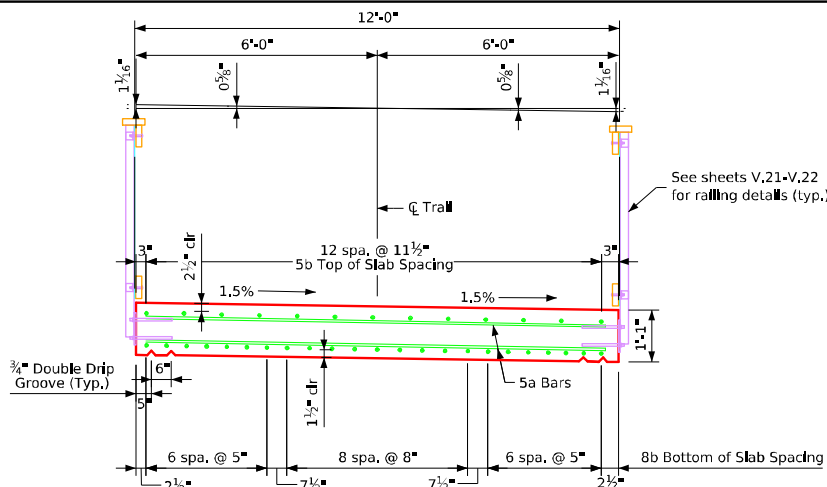
Pier Details - Piers 4 & 8

STA. 224+19.79 (Chichaqua Valley Trail) Turn-in Date: April, 2026

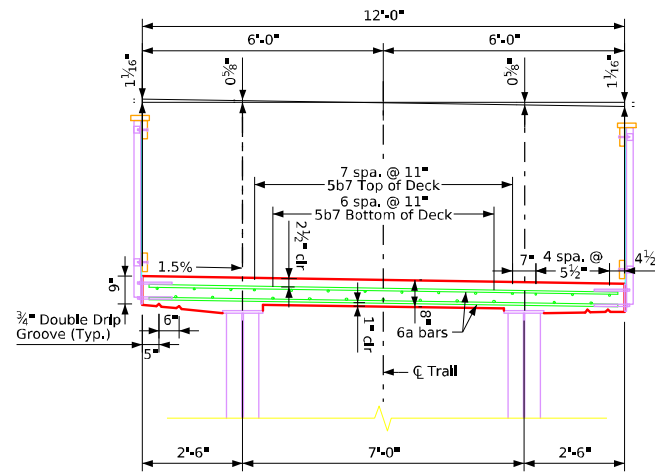
Polk County



Transverse Section - Approach Spans
Span 1-3, 10-12; Looking East

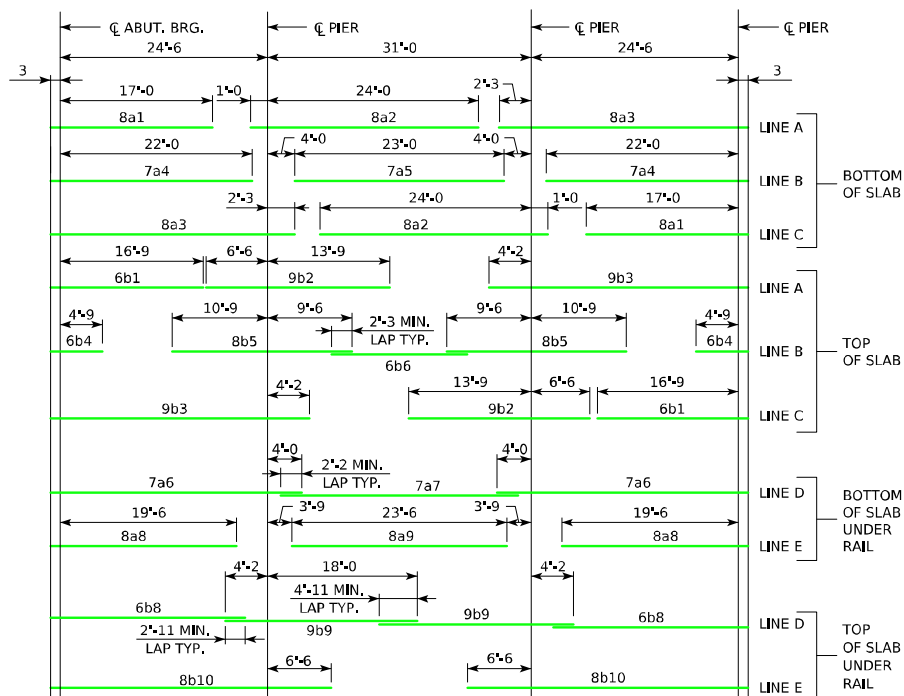


Transverse Section - Jump Spans
Spans 4 shown, Looking East
Span 9 Similar

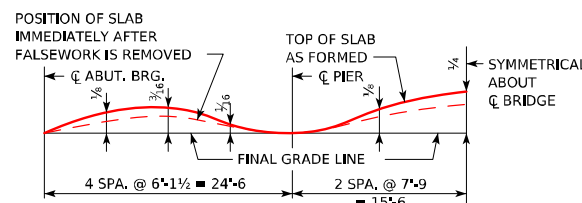


Transverse Section - Main Spans
Span 5-8, Looking East

Deck Area = 8.6 Sq. Ft.
Deck area does not
include the haunch



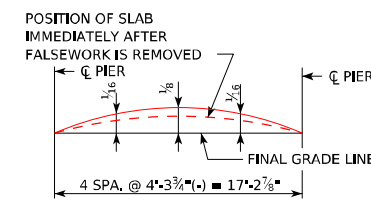
PLACEMENT FOR LONGITUDINAL REINFORCEMENT
Span 1-3, 10-12



FORM CAMBER DIAGRAM

Span 1-3, 10-12

THIS DIAGRAM SHOWS THE FORM CAMBER REQUIRED TO COMPENSATE FOR THE ANTICIPATED ULTIMATE DEAD LOAD DEFLECTION. THE ABOVE DIMENSIONS DO NOT INCLUDE ANY ALLOWANCE FOR FORM DEFLECTION OR FALSEWORK SETTLEMENT.

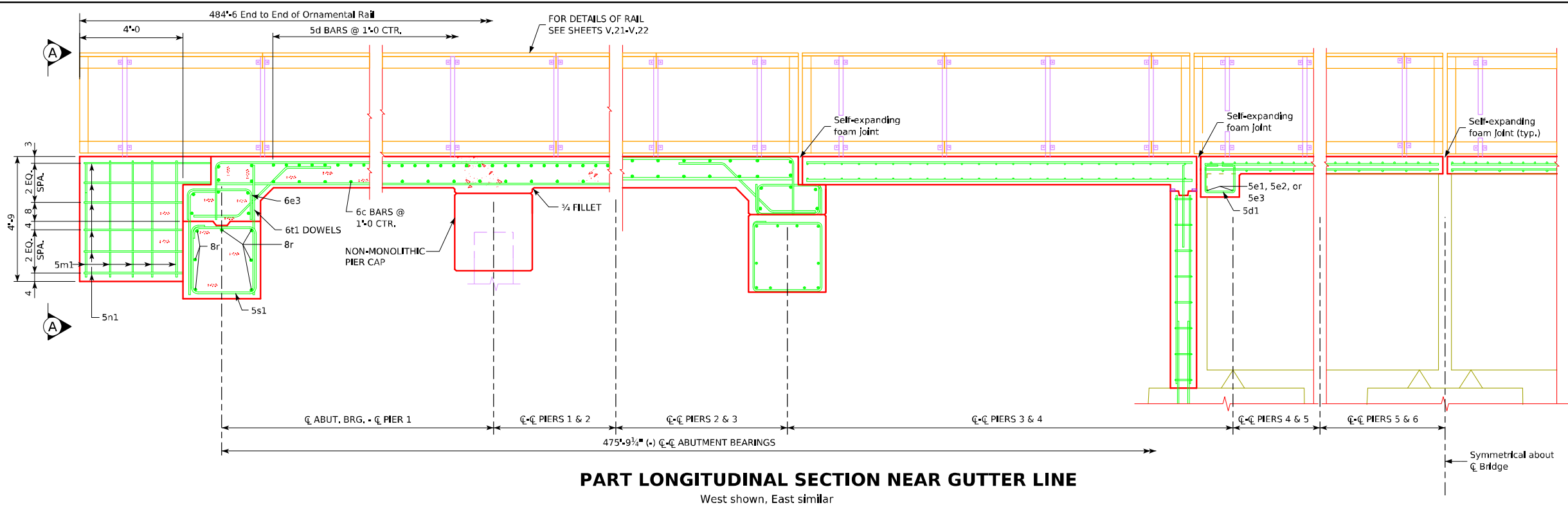


FORM CAMBER DIAGRAM

Span 4 & 9

THIS DIAGRAM SHOWS THE FORM CAMBER REQUIRED TO COMPENSATE FOR THE ANTICIPATED ULTIMATE DEAD LOAD DEFLECTION. THE ABOVE DIMENSIONS DO NOT INCLUDE ANY ALLOWANCE FOR FORM DEFLECTION OR FALSEWORK SETTLEMENT.





West shown, East similar

SUPERSTRUCTURE NOTES:

THIS BRIDGE IS DESIGNED FOR HL-93 LOADING PLUS AN ALLOWANCE OF 20 POUNDS PER SQUARE FOOT OF ROADWAY FOR FUTURE WEARING SURFACE.

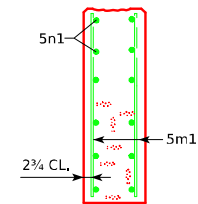
THE SLAB AS SHOWN INCLUDES A 1/2 INCH INTEGRAL WEARING SURFACE.

THE MINIMUM CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR SHALL BE 2 INCHES UNLESS OTHERWISE NOTED OR SHOWN, ALL REINFORCING STEEL IS TO BE SECURELY WIRED IN PLACE. SEE "BAR CHAIR NOTE".

ALL REINFORCING SHALL BE GRADE 60.

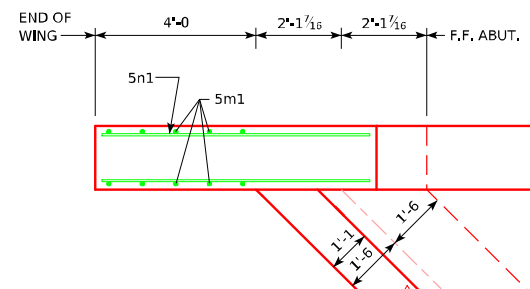
THE CONCRETE SLAB IS TO BE PLACED WITH A MINIMUM OF CONSTRUCTION JOINTS. PROCEDURES FOR PLACING SLAB CONCRETE SHALL BE SUBMITTED FOR APPROVAL TOGETHER WITH A STATEMENT OF THE PROPOSED METHOD AND EVIDENCE THAT THE CONTRACTOR POSSESSES THE NECESSARY EQUIPMENT AND FACILITIES TO ACCOMPLISH THE REQUIRED RESULT.

NOTE THAT WHEN PORTLAND CEMENT APPROACH PAVEMENT IS PLACED, COMPRESSIBLE JOINT MATERIAL MUST BE USED BETWEEN PAVEMENT AND END OF BRIDGE.



SECTION A-A

NOTE: 5m1 & 5n1 BARS ARE INCLUDED
IN SUPERSTRUCTURE BAR LIST.



PART PLAN
(RAILING NOT SHOWN)

BAR CHAIR NOTE:

TOP MAT OF REINFORCING STEEL IS TO BE SUPPORTED BY INDIVIDUAL BAR CHAIRS SPACED AT NOT MORE THAN 3'-0" CENTERS LONGITUDINALLY AND TRANSVERSELY. THE BOTTOM MAT OF REINFORCING STEEL IS TO BE SUPPORTED BY INDIVIDUAL BAR CHAIRS SPACED AT NOT MORE THAN 3'-0" CENTERS LONGITUDINALLY AND TRANSVERSELY, OR BY CONTINUOUS ROWS OF BAR HIGH CHAIRS OR SLAB BOLSTERS SPACED 4'-0" APART, I.M. 451.01 REQUIREMENTS SHALL APPLY FOR BAR CHAIRS, BAR HIGH CHAIRS, AND SLAB BOLSTERS.

Design For 45° Skew (RA)

477' x 12' Trail Bridge

Chichaqua Valley Trail

24'-6" End Spans 97'-2 7/8" Concrete Approaches
4 - 70'-4" (Approx.) Steel Main Spans

Longitudinal Section

STA. 224+19.79 (Chichaqua Valley Trail)

Turn-in Date: April, 2026

Polk County

NOTE: ALL DIMENSIONS ARE OUT TO OUT. D = PIN DIAMETER.

NOTE: ALL DIMENSIONS ARE OUT TO OUT. D = PIN DIAMETER.

LOCATION	QUANTITY (CY)
APPROACH SLABS + WINGS + SLAB DIAPHRAGMS	105.3
JUMP SLABS	14.6
DECK + DECK DIAPHRAGMS	93.6
TOTAL STRUCTURAL CONCRETE (BRIDGE)	213.5

*INCLUDES 4 WINGS @ 0.68 C.Y. EACH AND 2 TEMPORARY PAVING BLOCKS; EXCLUDES RAIL CONCRETE

*INCLUDES 4 WINGS @ 0.68 C.Y. EACH AND 2 TEMPORARY PAVING BLOCKS; EXCLUDES RAIL CONCRETE

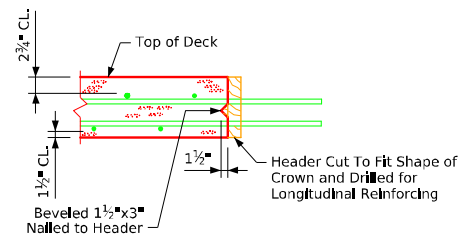


Figure 10-10 is a detailed cross-section of a bridge deck with a 45° skew angle. The diagram illustrates the reinforcement layout and dimensions for a typical cross-section. Key features include:

- Deck Dimensions:** The total width is 84'-3" out-to-out of the slab, and the total depth is 12'-0" out of the slab. The deck width at the bottom is 32'-6 1/2".
- Reinforcement:**
 - Top reinforcement: 6c2 and 5d2 (4" x 2) and 8e2.
 - Bottom reinforcement: 6c2 and 5d2 (4" x 2) and 8e2.
 - Pier reinforcement: 6c1 and 5d1 (11" x 8).
- Dimensions and Spacing:**
 - Deck width at the top: 70 SPA, @ 1'-0" = 70'-0"; 71'-6c1 (BOTT. SLAB) & 71'-5d1 (TOP SLAB).
 - Deck width at the bottom: 6 SPA, @ 1'-0" = 6'-0"; 7'-6c2 (BOTT. SLAB) & 7'-5d2 (TOP SLAB).
 - Pier width: 30'-6 1/2".
 - Deck width at the bottom: 32'-6 1/2".
 - Deck width at the top: 70'-0" (BOTT. SLAB) & 71'-5d1 (TOP SLAB).
 - Deck width at the bottom: 6 SPA, @ 1'-0" = 6'-0"; 7'-6c2 (BOTT. SLAB) & 7'-5d2 (TOP SLAB).
- Other Details:**
 - Centerline of roadway (CL ROADWAY).
 - Centerline of pier (CL PIER).
 - Centerline of abutment (CL ABUT. BRG.).
 - Alternate location of transverse construction joints.
 - Permissible transverse construction joints.

Span 1-3 & 10-12

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
8a1	SLAB, LONGITUDINAL BOTTOM		20	17'-3	921
8a2	SLAB, LONGITUDINAL BOTTOM		20	25'-0	1,335
8a3	SLAB, LONGITUDINAL BOTTOM		20	27'-0	1,442
7a4	SLAB, LONGITUDINAL BOTTOM		24	22'-3	1,091
7a5	SLAB, LONGITUDINAL BOTTOM		12	23'-0	564
7a6	SLAB, LONGITUDINAL BOTTOM, AT EDGE OF SLAB		16	28'-9	76
7a7	SLAB, LONGITUDINAL BOTTOM, AT EDGE OF SLAB		8	27'-4	447
8a8	SLAB, LONGITUDINAL BOTTOM, AT EDGE OF SLAB		16	19'-9	844
8a9	SLAB, LONGITUDINAL BOTTOM, AT EDGE OF SLAB		8	23'-6	502
5a10	JUMP SLAB, TRANSVERSE		44	11'-8	535
5a11	JUMP SLAB, TRANSVERSE		56	VARIES	338
5a12	JUMP SLAB, TRANSVERSE		40	VARIES	186
5a13	JUMP SLAB, TRANSVERSE, ENDS		4	15'-0	63
5a14	JUMP SLAB, TRANSVERSE, ENDS		4	11'-0	46
6a15	DECK, TRANSVERSE		44	VARIES	482
6a16	DECK, TRANSVERSE		800	11'-8	14,019
6a17	DECK, TRANSVERSE		186	VARIES	1,653
6a18	DECK, TRANSVERSE, ENDS		4	14'-0	84
6a19	DECK, TRANSVERSE, ENDS		12	15'-0	270
6b1	SLAB, LONGITUDINAL TOP		20	19'-3	578
9b2	SLAB, LONGITUDINAL TOP		20	20'-3	1,377
9b3	SLAB, LONGITUDINAL TOP		20	31'-2	2,119
6b4	SLAB, LONGITUDINAL TOP		24	7'-3	261
8b5	SLAB, LONGITUDINAL TOP		24	20'-3	1,298
6b6	SLAB, LONGITUDINAL TOP		12	16'-6	297
6b8	SLAB, LONGITUDINAL TOP, AT EDGE OF SLAB		16	25'-9	619
9b9	SLAB, LONGITUDINAL TOP, AT EDGE OF SLAB		16	22'-2	1,206
8b10	SLAB, LONGITUDINAL TOP, AT EDGE OF SLAB		16	33'-6	1,431
5b11	JUMP SLAB, LONGITUDINAL TOP		2	16'-10	35
5b12	JUMP SLAB, LONGITUDINAL TOP		6	VARIES	98
5b13	JUMP SLAB, LONGITUDINAL TOP		18	13'-11	261
8b14	JUMP SLAB, LONGITUDINAL BOTTOM		4	16'-10	180
8b15	JUMP SLAB, LONGITUDINAL BOTTOM		12	VARIES	499
8b16	JUMP SLAB, LONGITUDINAL BOTTOM		30	14'-0	1,121
5b17	DECK, LONGITUDINAL		200	37'-1	7,736
6c1	SLAB, TRANSVERSE BOTTOM		142	11'-8	2,488
6c2	SLAB, TRANSVERSE BOTTOM, ENDS		28	VARIES	298
5d1	SLAB, TRANSVERSE TOP		142	11'-8	1,728
5d2	SLAB, TRANSVERSE TOP, ENDS		28	VARIES	207
5d3	DECK DIAPHRAGM, HOOP		26	5'-8	154
8e2	SLAB, TRANSVERSE, AT ABUTMENT & PIERS 4 & 8		36	15'-8	1,506
6e3	SLAB, HAIRPINS, AT ABUTMENT & PIERS 4 & 8		40	6'-1	365
6e4	SLAB, DIAGONALS, AT ABUTMENT & PIERS 4 & 8		40	5'-11	355
5e5	DECK, DIAPHRAGM, TRANSVERSE		4	2'-2	9
5e6	DECK, DIAPHRAGM, TRANSVERSE		4	9'-2	38
5e7	DECK, DIAPHRAGM, TRANSVERSE		4	2'-8	11
5m1	WINGS, VERTICAL		40	4'-5	184
5n1	WINGS, HORIZONTAL, BOTH FACES		48	6'-8	334
5z1	PAVING BLOCK LIFTING HOOPS				

EPOXY COATED REINFORCING STEEL - TOTAL (LBS)	51,715
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Design For 45° Skew (RA)

477' x 12' Trail Bridge

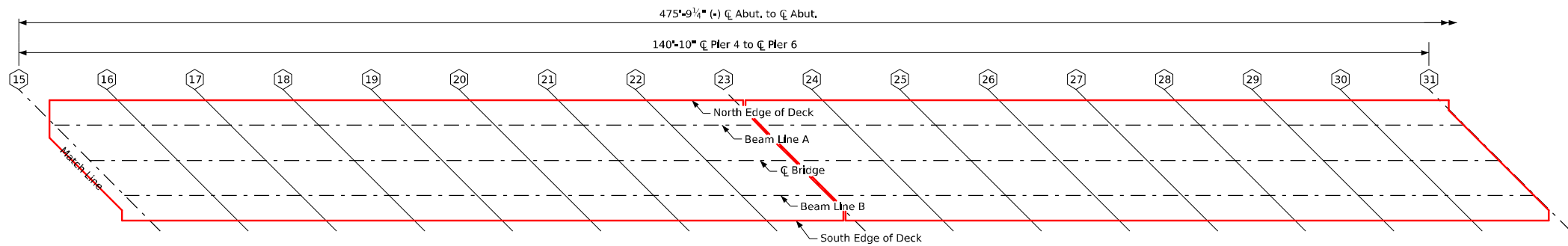
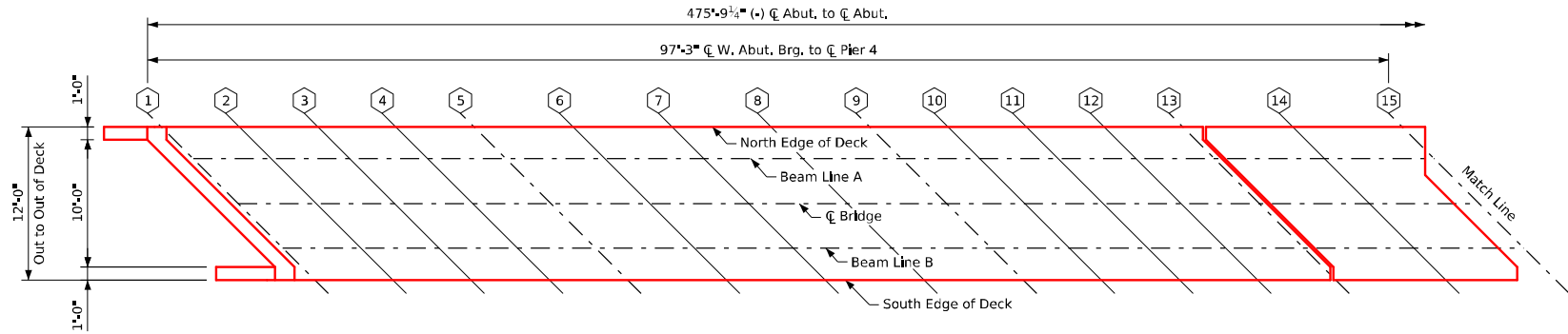
Chichaqua Valley Trail

24'-6" End Spans 97'-2 7/8" Concrete Approaches
4 x 70'-4" (Approx.) Steel Main Spans

Superstructure Details

STA. 224+19.79 (Chichaqua Valley Trail) Turn-In Date: April, 2026

Polk County



Slab/Deck Elevation Plan

Top of Slab/Deck Elevations																			
LOCATION	C.L. W. ABUT. BRG.				C.L. PIER #1				C.L. PIER #2				C.L. PIER #3		C.L. PIER #4		C.L. PIER #5		C.L. PIER #6
	LINE 1	LINE 2	LINE 3	LINE 4	LINE 5	LINE 6	LINE 7	LINE 8	LINE 9	LINE 10	LINE 11	LINE 12	LINE 13	LINE 14	LINE 15	LINE 16-22	LINE 23	LINE 24-30	LINE 31
NORTH EDGE OF DECK	814.20	814.23	814.26	814.30	814.33	814.37	814.42	814.46	814.50	814.54	814.57	814.60	814.64	814.67	814.67	814.67	814.67	814.67	814.67
BEAM LINE A	814.17	814.21	814.24	814.27	814.31	814.35	814.39	814.44	814.48	814.51	814.55	814.58	814.61	814.63	814.63	814.63	814.63	814.63	814.63
CL BRIDGE	814.14	814.17	814.21	814.24	814.27	814.32	814.36	814.40	814.45	814.48	814.51	814.55	814.58	814.58	814.58	814.58	814.58	814.58	814.58
BEAM LINE B	814.11	814.14	814.17	814.21	814.24	814.28	814.33	814.37	814.41	814.45	814.48	814.51	814.53	814.53	814.53	814.53	814.53	814.53	814.53
SOUTH EDGE OF DECK	814.08	814.12	814.15	814.18	814.22	814.26	814.30	814.35	814.39	814.42	814.46	814.49	814.49	814.49	814.49	814.49	814.49	814.49	814.49



Design For 45° Skew (RA)

477' x 12' Trail Bridge

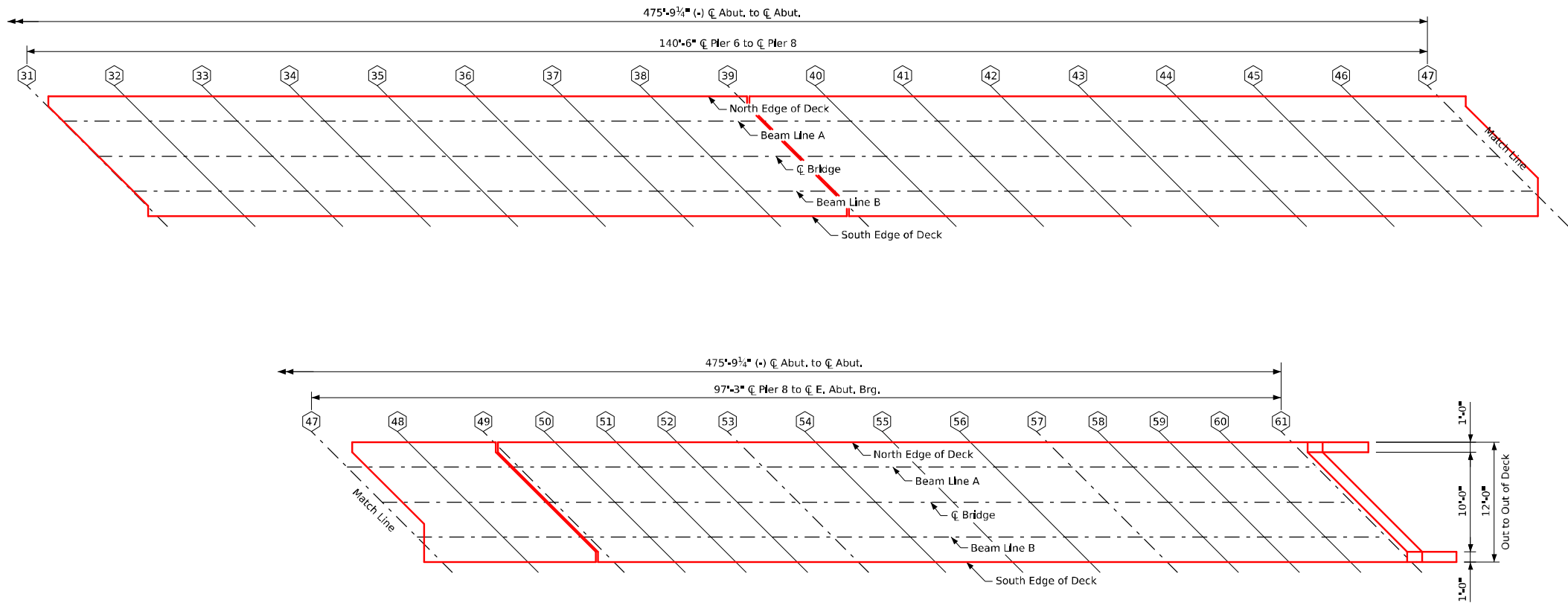
Chichaqua Valley Trail

24'-6" End Spans 97'-2 7/8" Concrete Approaches
4 - 70'-4" (Approx.) Steel Main Spans

Elevation Plan

STA. 224+19.79 (Chichaqua Valley Trail) Turn-in Date: April, 2026

Polk County



Slab/Deck Elevation Plan

Top of Slab/Deck Elevations																		
LOCATION	C.L. PIER #6		C.L. PIER #7		C.L. PIER #8		C.L. PIER #9				C.L. PIER #10				C.L. PIER #11			C.L. E. ABUT. BRG.
	LINE 31	LINE 32-38	LINE 39	LINE 40-46	LINE 47	LINE 48	LINE 49	LINE 50	LINE 51	LINE 52	LINE 53	LINE 54	LINE 55	LINE 56	LINE 57	LINE 58	LINE 59	LINE 60
NORTH EDGE OF DECK	814.67	814.67	814.67	814.67	814.67	814.67	814.67	814.67	814.64	814.60	814.57	814.53	814.49	814.44	814.40	814.37	814.34	814.30
BEAM LINE A	814.63	814.63	814.63	814.63	814.63	814.63	814.63	814.62	814.59	814.55	814.52	814.48	814.44	814.39	814.35	814.32	814.29	814.25
CL BRIDGE	814.58	814.58	814.58	814.58	814.58	814.58	814.58	814.55	814.51	814.48	814.45	814.41	814.36	814.32	814.28	814.25	814.21	814.18
BEAM LINE B	814.53	814.53	814.53	814.53	814.53	814.53	814.51	814.48	814.44	814.41	814.38	814.33	814.29	814.25	814.21	814.18	814.14	814.11
SOUTH EDGE OF DECK	814.49	814.49	814.49	814.49	814.49	814.49	814.46	814.42	814.39	814.36	814.33	814.28	814.24	814.20	814.16	814.12	814.09	814.06



Design For 45° Skew (RA)
477' x 12' Trail Bridge
Chichaqua Valley Trail
24'-6" End Spans 97'-2 7/8" Concrete Approaches
4 - 70'-4" (Approx.) Steel Main Spans
Elevation Plan
STA. 224+19.79 (Chichaqua Valley Trail) Turn-in Date: April, 2026
Polk County

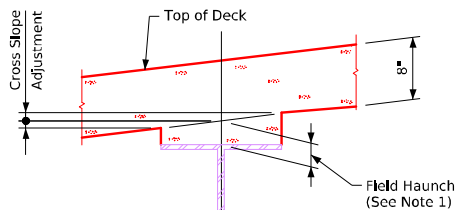
BM 501, Cut "X", Northing: 7535811.324 Easting: 18598859.99, El. = 807.642

Beam Line Haunch Elevations																
	Pier 4								Pier 5							
	Line 15	Line 16	Line 17	Line 18	Line 19	Line 20	Line 21	Line 22	Line 23	Line 24	Line 25		Line 27	Line 28	Line 29	Line 30
Beam A	813.97	813.97	813.98	813.98	813.98	813.98	813.98	813.97	813.97	813.97	813.98	813.98	813.98	813.98	813.98	813.97
Beam B	813.86	813.87	813.87	813.87	813.87	813.87	813.87	813.87	813.87	813.86	813.87	813.87	813.87	813.87	813.87	813.87

[illegible]

Miscellaneous Data Table																	
	Beam Line	Pier 4 Line 15	Line 16	Line 17	Line 18	Line 19	Line 20	Line 21	Line 22	Pier 5 Line 23	Line 24	Line 25	Line 26	Line 27	Line 28	Line 29	Line 30
Anticipated Deflection Due to Deck (in.)	All	0.00	0.10	0.19	0.24	0.26	0.24	0.19	0.10	0.00	0.10	0.19	0.24	0.26	0.24	0.19	0.10
Cross Slope Adjustments (in.)	All	1/16" +/-															
Allowable Field Haunch (in. & ft.)	Max	All	3" (0.250')														
	Min	All	0" (0.000')														

Miscellaneous Data Table (Cont.)																		
	Beam Line	Pier 6 Line 31	Line 32	Line 33	Line 34	Line 35	Line 36	Line 37	Line 38	Pier 7 Line 39	Line 40	Line 41	Line 42	Line 43	Line 44	Line 45	Line 46	Pier 8 Line 47
Anticipated Deflection Due to Deck (in.)	All	0.00	0.10	0.19	0.24	0.26	0.24	0.19	0.10	0.00	0.10	0.19	0.24	0.26	0.24	0.19	0.10	0.00
Cross Slope Adjustments (in.)	All	1/16" +/-																
Allowable	Max	All	3" (0.250")															
Field Haunch (in. & ft.)	Min	All	0" (0.000")															



Haunch Detail

Note: Haunch locations are at the same location as the encircled letters and numbers shown on deck elevations sheet.

Note: Bridge seat elevations are set based on theoretical camber and beam deflections. These bridge seats will provide a theoretical beam haunch within design parameters. Field haunches are determined using surveyed top of beam elevations and "Beam Line Haunch Elevation" data. Allowable maximum and minimum "Field Haunch" values are given in inches and decimals of feet in the "Miscellaneous Data" table. "Cross slope adjustment" values will aid the Contractor in determining actual formed haunch dimensions at the edges of the top flange.

Note 1: To calculate field haunch required at each location, survey the beam tops consistent with the spacings shown on the "Top of Deck Elevations Layout". Subtract the surveyed beam shot from the "Beam Line Haunch Elevation". This value will be the haunch needed (see "Field Haunch" in haunch detail). The "Beam Line Haunch Elevation" includes adjustments for deck thicknesses and anticipated deflections. No additional calculations are required. If the field haunch exceeds the maximums and minimums shown in inches and decimals of feet in the miscellaneous data table, adjustments to the grade or additional haunch reinforcement will be required.

Design For 45° Skew (RA)

477' x 12' Trail Bridge

Chichaqua Valley Trail

24'-6" End Spans 97'-2 7/8" Concrete Approaches
4 - 70'-4" (Approx.) Steel Main Spans

Deck Haunch Data Details

STA. 224+19.79 (Chichaqua Valley Trail) Turn-in Date: April, 2026

Polk County

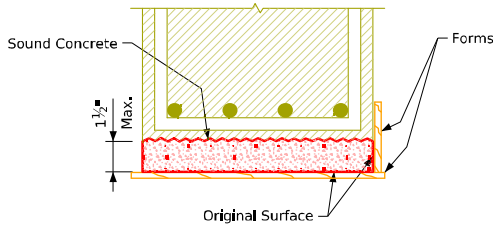


Typical Concrete Repair Areas
Piers 4 - 8

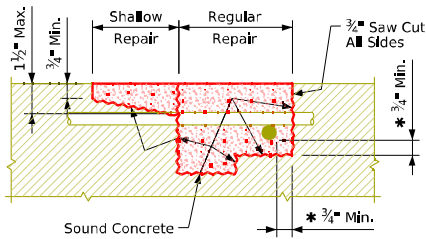


Design For 45° Skew (RA)
477' x 12' Trail Bridge
Chichaqua Valley Trail
24'-6" End Spans 97'-2 7/8" Concrete Approaches
4 - 70'-4" (Approx.) Steel Main Spans
Concrete Repairs
STA. 224+19.79 (Chichaqua Valley Trail) Turn-in Date: April, 2026
Polk County

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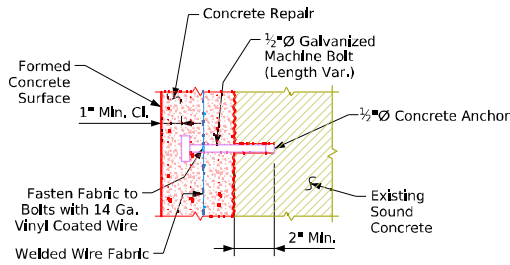


Shallow Repair
Bottom Surface



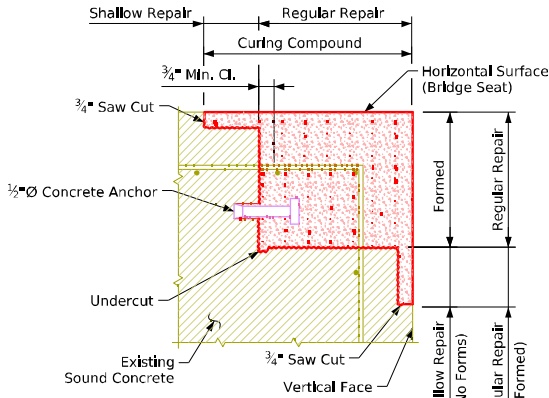
Repair Definition

* Indicates Clearance for an Un-Bonded Rebar.

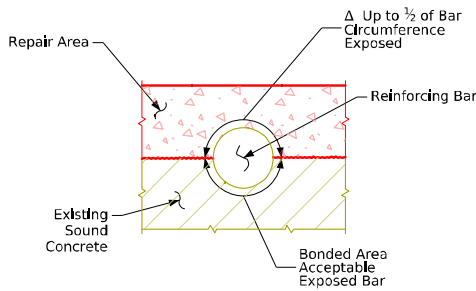


Anchor Detail

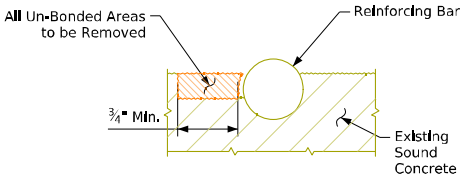
For Spacing and Use of Concrete Anchors and WWF See the Repair Notes.



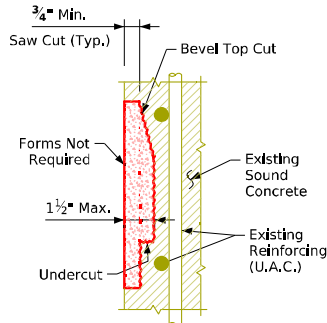
Corner Repair



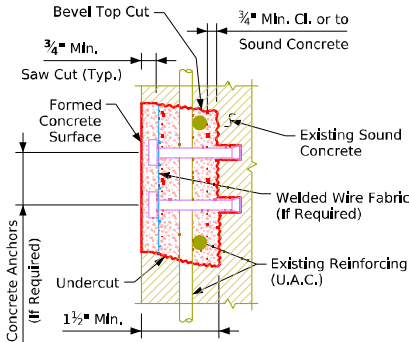
Δ If more than 1/2 of the rebar is exposed it shall be treated as an un-bonded rebar.



Concrete Removal
Adjacent to Reinforcing



Shallow Repair
Vertical Face



Regular Repair
Vertical Face

Repair Notes:

- The spalled and hollow areas of this bridge as noted and shown in these plans shall be repaired as follows:
- All the costs of equipment and materials required to repair the spalled and hollow areas of this bridge shall be included in the price bid for "Concrete Repair".
 - The price bid for "Concrete Repair" shall include the cost of all concrete anchors and welded wire fabric required by the plans.
 - The Engineer shall determine and outline by visual and audible inspection the actual areas of the concrete repairs. The Contractor shall be paid for the actual amount of repairs made on a square foot basis based on the price bid per square foot.
 - All existing reinforcing bars that are exposed by the concrete removal shall be cleaned and carefully incorporated into the new work, except badly deteriorated existing reinforcing which shall be replaced as directed by the Engineer.
 - The concrete anchors required shall have a minimum pull out of 5,000 lbs based on 4,000 psi concrete. An anchor meeting the requirements of Iowa D.O.T. Materials I.M. 453.09 and the pull out load above is required. The anchors shall be galvanized and shall be installed according to recommendations of the Manufacturer. The cost of furnishing and installing the concrete anchors shall be included in the price bid for "Concrete Repair".
 - The welded wire fabric shall be ASTM A185 and galvanized as per ASTM A-641. The WWF wires shall be spaced 3x3 or 4x4 and the wires shall have a nominal area of 0.014 to 0.029 square inch inclusive, example "WWF 3x3 - W1.4xW2.9".
- Where reinforcement has been exposed and clearance around the periphery of the existing bar is provided, no supplemental reinforcing is required, except where existing reinforcement density and pattern are such that individual open spaces between bars are of 1.5 square feet or larger. For this condition 1/2" concrete anchors and welded wire fabric shall be installed at the rate of one concrete anchor with WWF per each 1.5 square feet of area within each open space.
- Repairing the structural concrete shall be in accordance with Section 2426 of the Standard Specifications.

Concrete Placement Quantities

Mark	Type	Units	Quantity
①	Shallow Repair	Sq. Ft.	0
②	Regular Repair	Sq. Ft.	180
		Total (Sq. Ft.)	180

Estimated Concrete Repair Quantities

Description	Units	Amount
Concrete Repair	Sq. Ft.	180



Self-Expanding Sealant System Notes:

The self-expanding sealant system shall be in accordance with article 4136.03, E of the standard specifications, and Iowa DOT Materials I.M 436.07. The self-expanding sealant system shall be from the Iowa DOT Materials approved product listing enterprise (Maple).

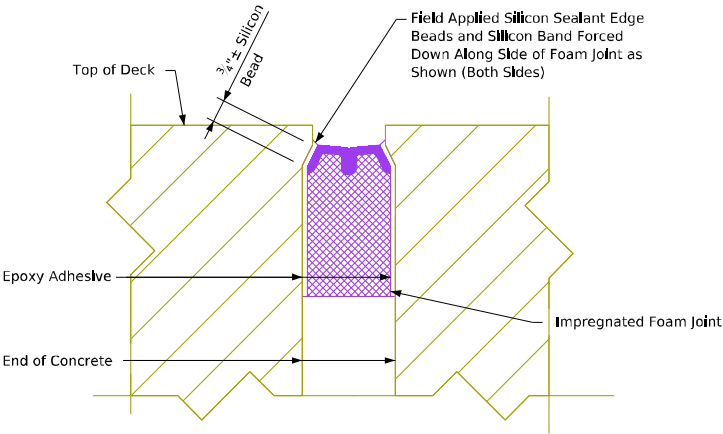
Clean the surfaces of the adjacent concrete to which the joint sealant will be attached to a depth of at least 1/8" below the bottom of the foam joint material. All laitance, rust, and debris, should be removed in accordance with manufacturer recommendations before installing the sealant system.

The sealant system shall be installed per manufacturer's recommendations with the following possible exception: a field-applied silicone sealant edge bead as noted and shown on this sheet shall be applied regardless of whether or not the manufacturer requires this step. If the manufacturer does not include this step in their standard procedure the silicone sealant used in this step shall be identical to the sealant provided by the manufacturer for use on the butt splice.

The sealant system shall extend full width out-to-out of the concrete slab. Follow the guidance provided by manufacturer's recommendations and/or technical representative.

Sealant width must be sized so that it can be installed in the proper width opening for the appropriate temperature at the time of installation. Contact the manufacturer for information required by them to assure appropriate size is ordered. The contractor shall be responsible for field measuring the joint and coordinating the actual product dimensions with the technical representative.

The number of feet of self-expanding sealant system installed shall be paid for at the contract unit price per foot based on plan quantities. The price for "Preformed, Pre-compressed, Self-expanding sealant system with silicone pre-coated surface" shall be full compensation for furnishing, installing of the new sealant system. This work will consist of cleaning the existing concrete, installation of the sealant system. All work and materials necessary for the installation of the sealant system shall comply with the recommendations of the sealant system manufacturer except noted and shown.

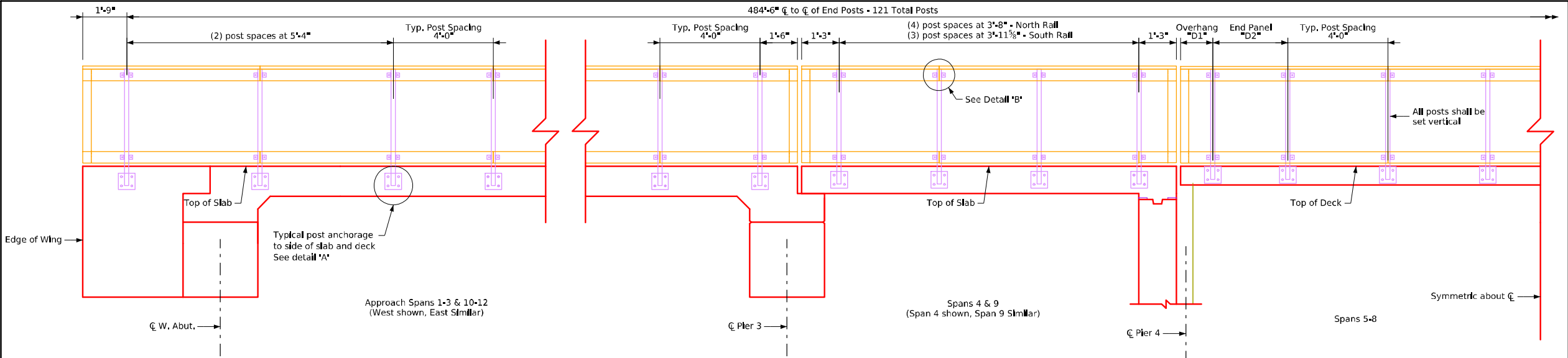


Expansion Opening Detail
(Typ. at Piers 4 - 8)



Design For 45° Skew (RA)
477' x 12' Trail Bridge
Chichaqua Valley Trail
24'-6" End Spans 97'-2 7/8" Concrete Approaches
4 - 70'-4" (Approx.) Steel Main Spans
Joint Details
STA. 224+19.79 (Chichaqua Valley Trail) Turn-in Date: April, 2026
Polk County

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Part Elevation of Side-Mounted Fence
(Wire mesh not shown for clarity)

Fencing Notes:

Contractor shall verify dimensions of concrete and end posts on bridge prior to commencing final layout and installation of railing. Contractor shall notify Engineer of any discrepancies in concrete dimensions prior to railing installation.

Anchorage shall be accurately drilled and grouted to provide correct alignment of railing. Anchors are to be 3/8" diameter threaded rods conforming to ASTM A307 Grade A.

All anchoring hardware is to be galvanized per the Standard Specifications.

The anchor bolts shall be set in drilled holes 9 inches deep (min.). Use adhesive bonding material system in accordance with Materials I.M. 491. 11. Materials used shall be capable of obtaining an ultimate load per bolt of 3 kips in tension. Submit evidence of the proposed adhesive anchorage system's ability to develop required load capacity to the Engineer for approval prior to use. Anchor bolt installation, including hole size, drilling, clean-out, placement and curing shall be in accordance with the Manufacturer's recommendations.

HSS structural steel posts and rails shall comply with ASTM A500 Grade B. All other structural steel materials shall comply with ASTM A709 Grade 50 minimum.

No single wire in the welded wire mesh shall be secured to the frame at both ends of the wire.

The welded wire fabric panels shall be hot-dip galvanized in accordance with ASTM A123. Good standard practices shall be followed in accordance with ASTM A143 and ASTM A384. Prepare the fabricated panel surfaces by abrasive blast cleaning to a minimum of SSPC-SP 6 "Commercial Blast Cleaning" prior to hot-dip galvanizing. The hot-dip galvanized panels will be processed utilizing a "dry" kettle.

Steel railing components, including wire mesh, shall be prepared in accordance with Materials I.M. 568 prior to hot-dip galvanizing. Galvanize components in accordance with ASTM A123.

Post shall be installed plumb. Top of rail shall be perpendicular to posts.

All timber rails shall span at least two posts.

The fence is to be bld on a linear foot basis measured from centerline to centerline of end posts. The price bid for "Side-Mounted Fence" shall be full compensation for furnishing all material, including concrete anchors and shims, and all of the equipment and labor required to erect the fence in accordance with these Plans and Specifications.

All railing connections shall be 3/8" round head bolts, hot dip galvanized in accordance with ASTM F2329. Bolts, nuts, and washers to meet the requirements of article 4153.07 of the Standard Specifications.

Rail members shall be treated standard dimension lumber (S4S).

Main Span End Post Dimensions		
Span	"D1"	"D2"
5 (North)	1'-4"	3'-3 1/2"
5 (South)	2'-0"	4'-0"
6	1'-5"	3'-8 1/16"+/-
7	1'-5"	3'-7 3/8"+/-
8 (North)	1'-11"	4'-0"
8 (South)	1'-4"	3'-2 3/8"

Design For 45° Skew (RA)

477' x 12' Trail Bridge

Chichaqua Valley Trail

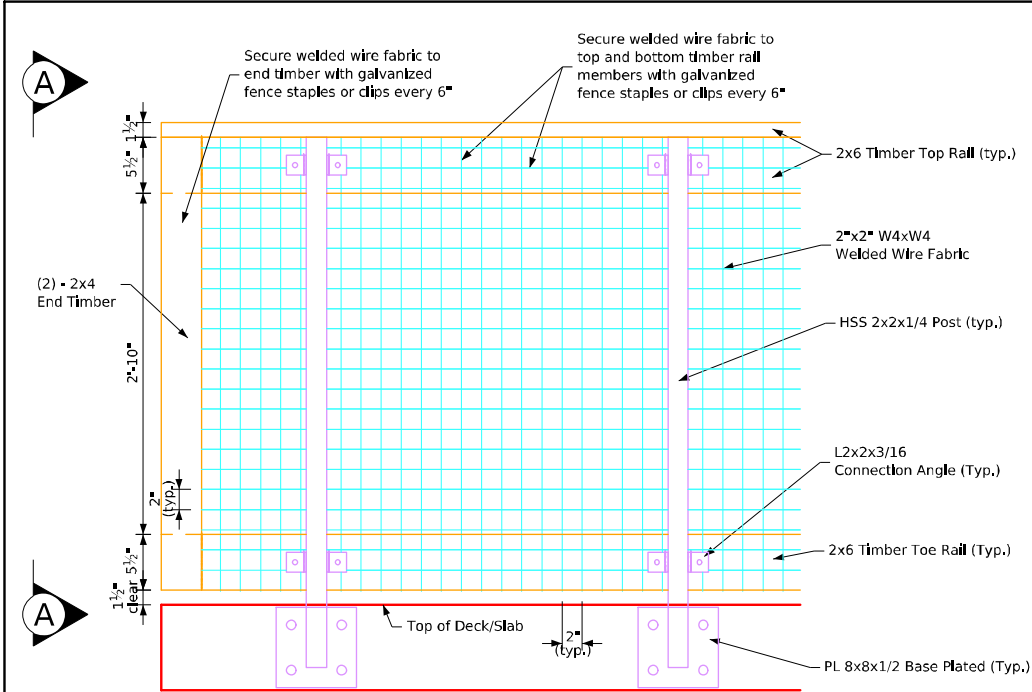
24'-6" End Spans97'-2 7/8" Concrete Approaches
4 - 70'-4" (Approx.) Steel Main Spans

Fence Details

STA. 224+19.79 (Chichaqua Valley Trail)Turn-in Date: April, 2026

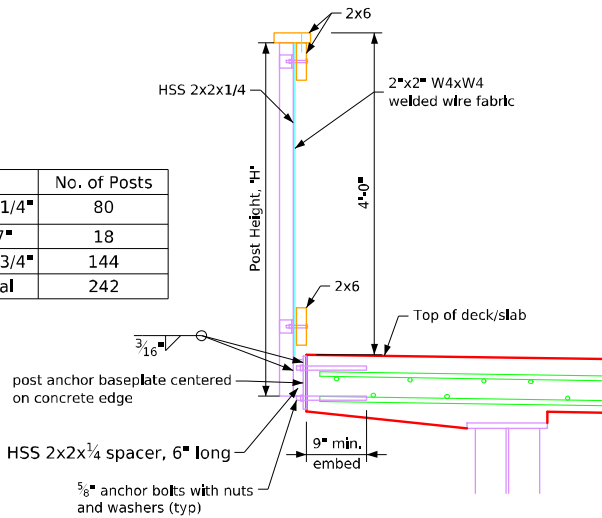
Polk County



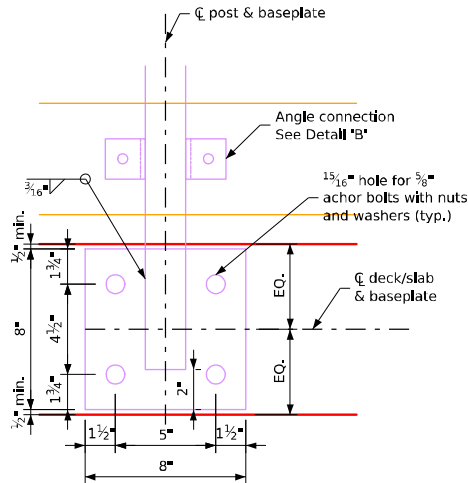


Fence Details

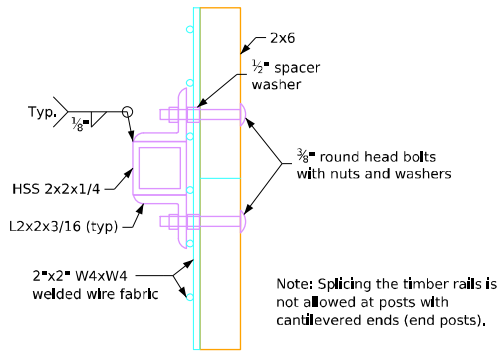
Spans	H	No. of Posts
1-3,10-12	4' - 8 1/4"	80
4 & 9	4' - 7"	18
5-8	4' - 4 3/4"	144
	Total	242



Typical Section
(Main span shown, approach slabs similar)
(Looking East)

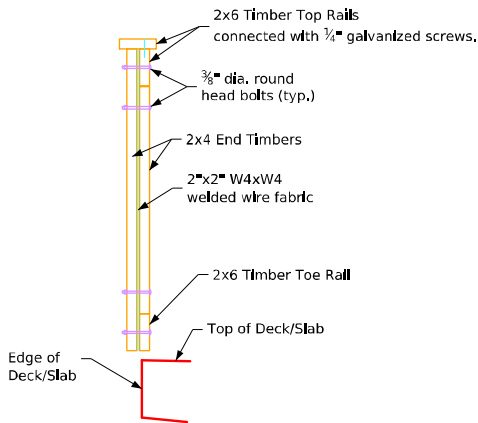


Detail 'A'
Typical Post Anchorage Connection



Detail 'B'
Typical Timber Connection

Note: Horizontal wire always overlaps vertical on the pedestrian side. Do not secure ends of the same wire to the frame, stagger fence staples or clips.

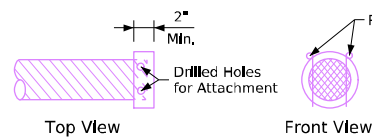
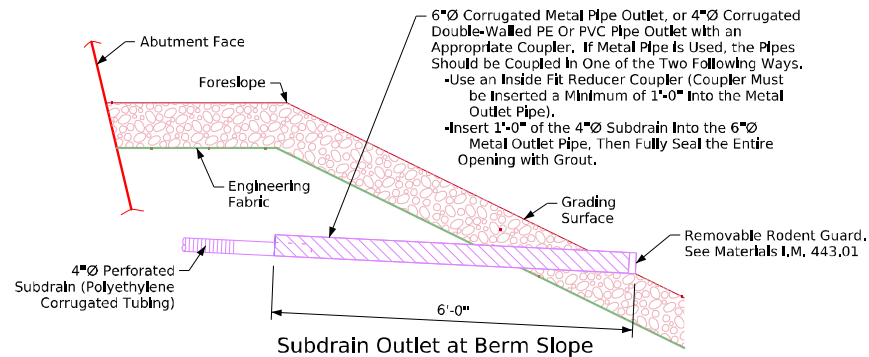


Section A-A

Quantities		
Item	Units	Amount
Side-Mounted Fence	Lin. Ft.	969,0



Design For 45° Skew (RA)
477' x 12' Trail Bridge
Chichaqua Valley Trail
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Fence Details
 STA. 224+19.79 (Chichaqua Valley Trail) Turn-in Date: April, 2026
Polk County



Outlet Details

Subdrain Notes:

This plan sheet shows details for placing all subdrains and subdrain outlets required for this structure.

The subdrains shall be 4"Ø and shall be in accordance with Article 4143.01, B, of the Standard Specifications.

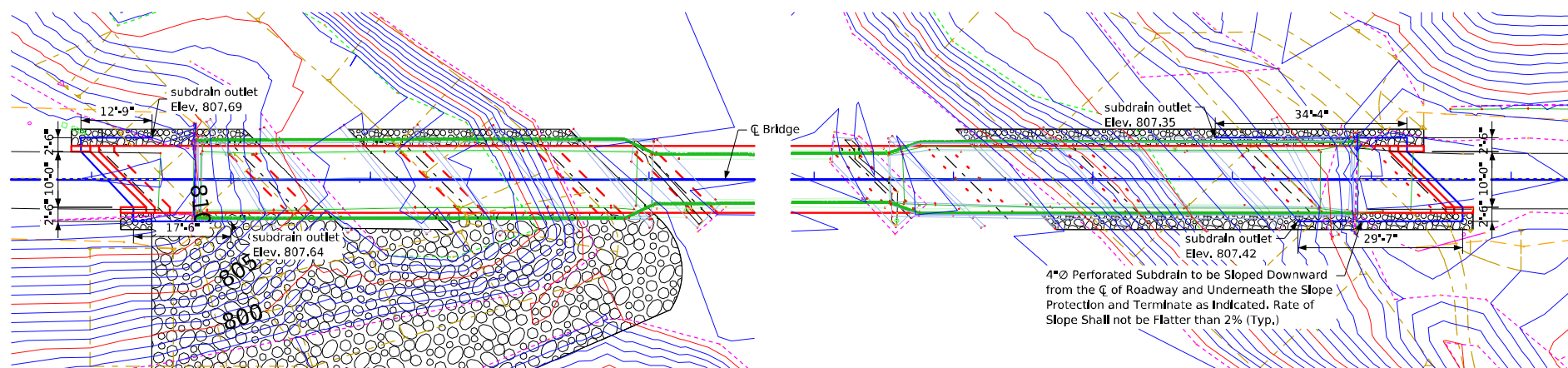
The subdrain outlet shall consist of 6'-0" length of pipe with a removable rodent guard as detailed on this sheet.

The cost of furnishing and placing subdrain (including excavation), granular backfill, porous backfill, and subdrain outlet is to be included in the price bid for "Structural Concrete (Bridge)". No extra payment will be made.

The dimensions shown for the proposed subdrains are based on the proposed grading layout of bridge berms. The dimensions shown are for estimating only. Required lengths and general locations of subdrains are subject to change due to field adjustments of the grading layout.

The uphill end of the perforated subdrain at the toe of slope protection shall be capped as approved by the Engineer.

The porous backfill and subdrain are to be carried around pier columns if the column placement interferes with alignment of subdrain as shown on this sheet.



SITUATION PLAN

REFER TO SITUATION PLAN FOR NORTH ARROW.



Design For 45° Skew (RA)

477' x 12' Trail Bridge

Chichaqua Valley Trail

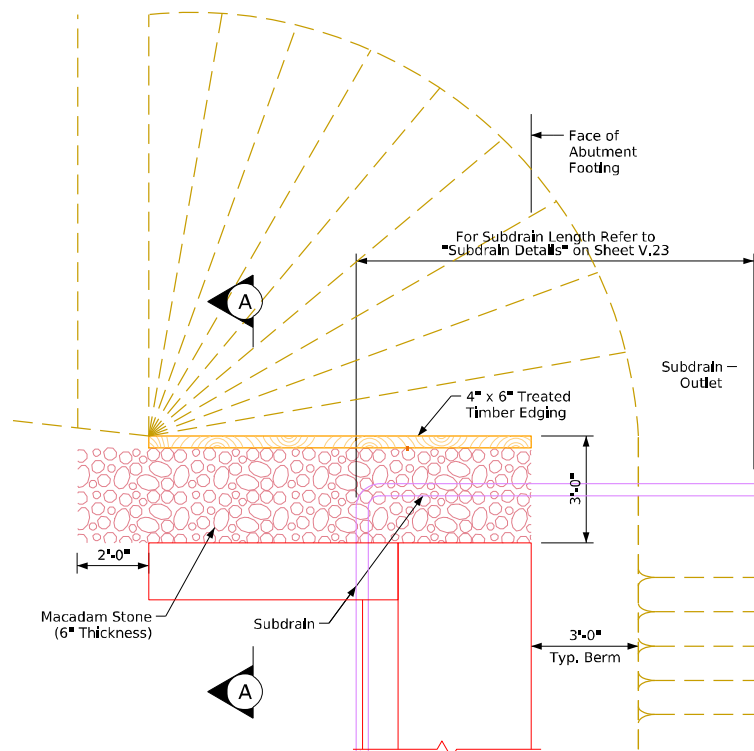
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Subdrain Details

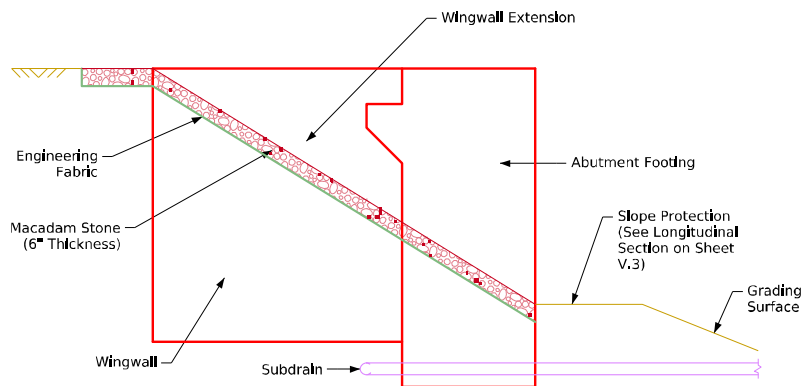
STA. 224+19.79 (Chichaqua Valley Trail) Turn-in Date: April, 2026

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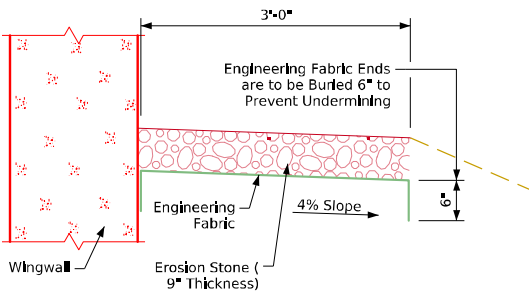
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Top View of Wing Armoring



Profile View of Wing Armoring



Section A-A

General Notes:

Macadam stone shall be placed along the sides of the wing and abutment footing as shown in Section A-A. This is typical at each corner of the bridge unless otherwise noted in the plans. The macadam stone at these locations shall be underlaid with engineering fabric in accordance with Article 4196.01, B, 3, of the Standard Specifications.

The macadam stone shall be in accordance with Section 4122, of the Standard Specifications, coarse material (no choke stone is allowed).

Wood preservative treatment for the timber edging shall meet the requirements for guardrail posts, sawed four sides, in accordance with Section 4161, of the Standard Specifications.

The macadam stone shall be deposited, spread, consolidated and shaped by mechanical or hand methods that will provide uniform 6 inch depth and density and provide uniform surface appearance.

Payment for the bridge wing armoring will be bid per square yard. Cost will include engineering fabric, macadam stone, treated timber edging, excavation, shaping, and compaction to dimensions shown in these plans. Bid item shall be "Bridge Wing Armoring - Macadam Stone"

Design For 45° Skew (RA)

477' x 12' Trail Bridge

Chichaqua Valley Trail

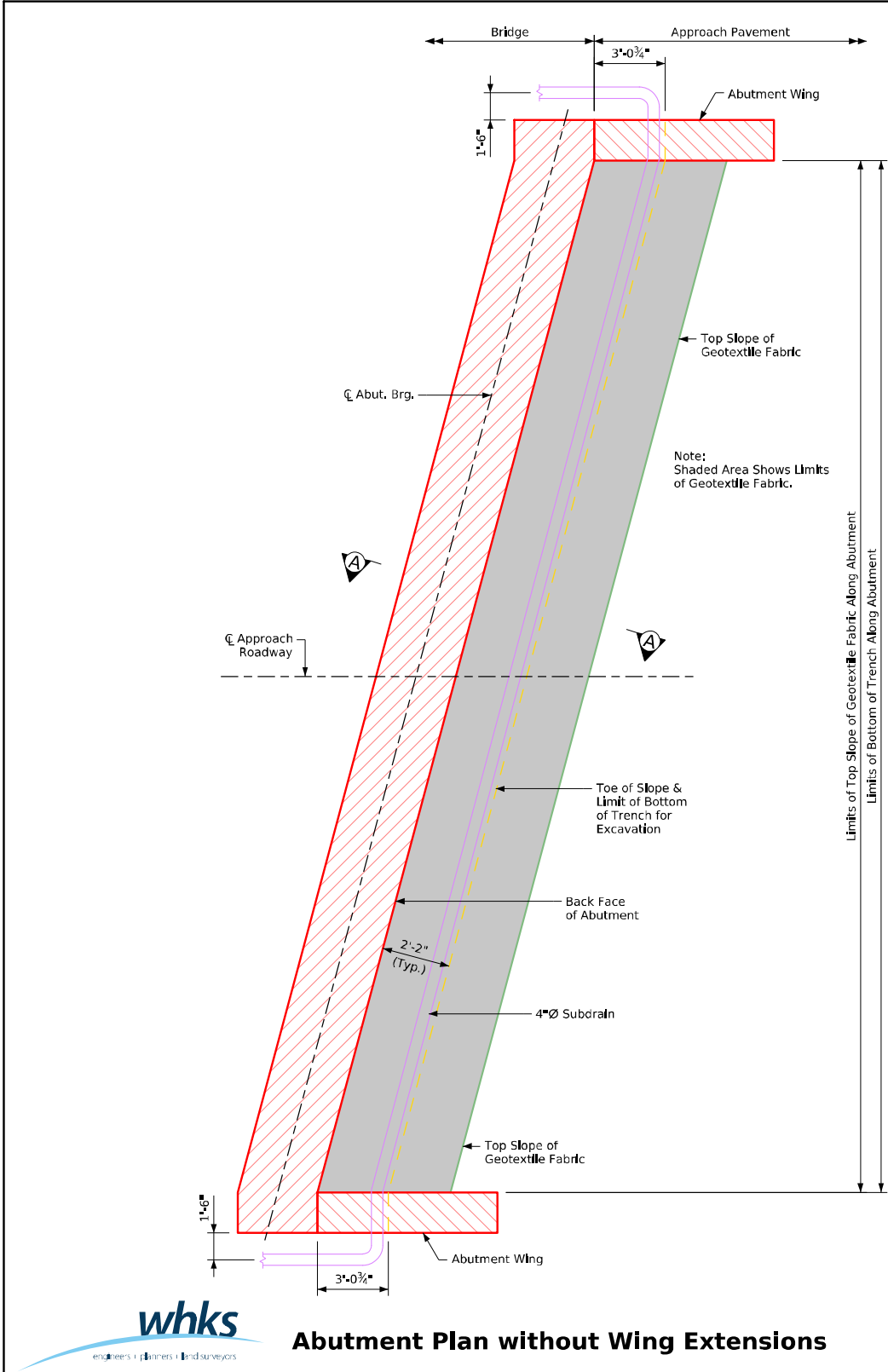
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Bridge Wing Armoring Details

STA. 224+19.79 (Chichaqua Valley Trail) Turn-in Date: April, 2026

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ABUTMENT BACKFILL PROCESS:

THE BASE OF THE EXCAVATION SUBGRADE BEHIND THE ABUTMENT IS TO BE GRADED WITH A 4% SLOPE AWAY FROM THE ABUTMENT FOOTING AND A 2% CROSS SLOPE IN THE DIRECTION OF THE SUBDRAIN OUTLET. THIS EXCAVATION SHAPING IS TO BE DONE PRIOR TO BEGINNING INSTALLATION OF THE GEOTEXTILE AND BACKFILL MATERIAL.

AFTER THE SUBGRADE HAS BEEN SHAPED, THE GEOTEXTILE FABRIC SHALL BE INSTALLED IN ACCORDANCE WITH THE DETAILS SHOWN. THE FABRIC IS INTENDED TO BE INSTALLED IN THE BASE OF THE EXCAVATION AND EXTENDED VERTICALLY UP THE ABUTMENT BACKWALL, ABUTMENT WING WALLS, AND EXCAVATION FACE TO A HEIGHT THAT WILL BE APPROXIMATELY 1 TO 2 FOOT HIGHER THAN THE HEIGHT OF THE POROUS BACKFILL PLACEMENT AS SHOWN IN THE "BACKFILL DETAILS" ON THIS SHEET. THE STRIPS OF THE FABRIC PLACED SHALL OVERLAP APPROXIMATELY 1 FOOT AND SHALL BE PINNED IN PLACE. THE FABRIC SHALL BE ATTACHED TO THE ABUTMENT BY USING LATH FOLDED IN THE FABRIC AND SECURED TO THE CONCRETE WITH SHALLOW CONCRETE NAILS. THE FABRIC PLACED AGAINST THE EXCAVATION FACE SHALL BE PINNED.

WHEN THE FABRIC IS IN PLACE, THE SUBDRAIN SHALL BE INSTALLED DIRECTLY ON THE FABRIC AT THE TOE OF THE REAR EXCAVATION SLOPE. A SLOT WILL NEED TO BE CUT IN THE FABRIC AT THE POINT WHERE THE SUBDRAIN EXITS THE FABRIC NEAR THE END OF THE ABUTMENT WING WALL.

POROUS BACKFILL IS THEN PLACED AND LEVELED, NO COMPACTION IS REQUIRED.

THE REMAINING WORK INVOLVES BACKFILLING WITH FLOODABLE BACKFILL, SURFACE FLOODING, AND VIBRATORY COMPACTION. THE FLOODABLE BACKFILL MATERIAL SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. THE FLOODABLE BACKFILL SHALL BE PLACED IN INDIVIDUAL LIFTS, SURFACE FLOODED, AND COMPACTED WITH VIBRATORY COMPACTION TO ENSURE FULL CONSOLIDATION. LIMIT THE LOOSE LIFTS TO NO MORE THAN 2 FEET OF THICKNESS.

START SURFACE FLOODING FOR EACH FLOODABLE BACKFILL LIFT AT THE HIGH POINT OF THE SUBDRAIN AND PROGRESS TO THE LOW POINT WHERE THE SUBDRAIN EXITS THE FABRIC. TO ENSURE UNIFORM SURFACE FLOODING, WATER RUNNING FULL IN A 2-INCH DIAMETER HOSE SHOULD BE SPRAYED IN SUCCESSIVE 6-FOOT TO 8-FOOT INCREMENTS FOR 5 MINUTES WITHIN EACH INCREMENT.

FLOODABLE BACKFILL LIFT PLACEMENT, FLOODING, AND COMPACTION SHALL PROGRESS UNTIL THE REQUIRED FULL THICKNESS OF THE ABUTMENT BACKFILL HAS BEEN COMPLETED.

WATER REQUIRED FOR FLOODING, SUBDRAINS, POROUS BACKFILL, FLOODABLE BACKFILL, AND GEOTEXTILE FABRIC FURNISHED AT THE BRIDGE ABUTMENTS WILL NOT BE MEASURED SEPARATELY FOR PAYMENT.

THE COST OF WATER REQUIRED FOR FLOODING, SUBDRAINS, POROUS BACKFILL, FLOODABLE BACKFILL, AND GEOTEXTILE FABRIC FURNISHED AT THE BRIDGE ABUTMENTS SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID FOR STRUCTURAL CONCRETE.

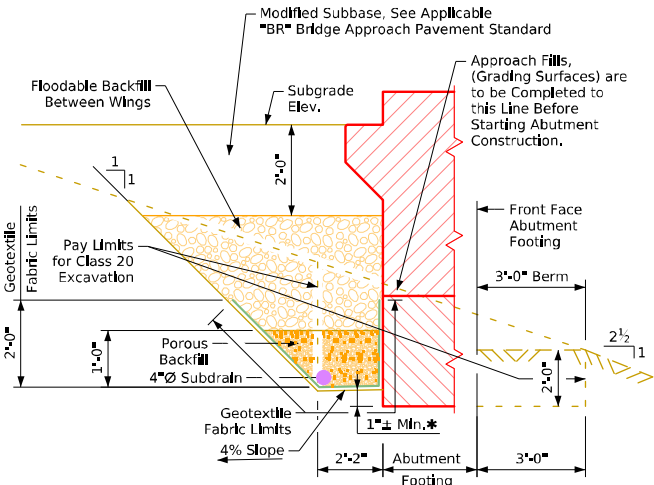
NOTE:
SEE SUBDRAIN DETAILS SHEET FOR DETAILS NOT SHOWN ON THIS SHEET WHICH ARE PERTINENT TO THIS STRUCTURE.

NOTE:

SUBDRAIN SHALL SLOPE DOWNWARD 2% FROM C APPROACH ROADWAY WHEN OUTLETTING BOTH SIDES OF THE ABUTMENT.

SUBDRAIN SHALL SLOPE DOWNWARD 2% FROM HIGH END WHEN OUTLETTING AT ONE END OF THE ABUTMENT.

THE GEOTEXTILE FABRIC SHALL BE IN ACCORDANCE WITH ARTICLE 4196.01, B, 6 OF THE STANDARD SPECIFICATIONS. IF THE ENGINEERING FABRIC IS LAPPED THE LAPS SHALL BE A MINIMUM OF ONE FOOT IN LENGTH, SHINGLE FASHION WITH UP SLOPE LAP PIECE ON TOP AND STAPLED FOR CONTINUITY.



Section A-A
Backfill Details

Note: Geotextile Fabric will be Attached to Face of Abutment Footing and Wings.

* Dimension Varies Due to 2% Subdrain Slope.

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477' x 12' Trail Bridge
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4 - 70'-4" (Approx.) Steel Main Spans
Abutment Backfill Details
STA. 224+19.79 (Chichaqua Valley Trail) Turn-in Date: April, 2026
Polk County