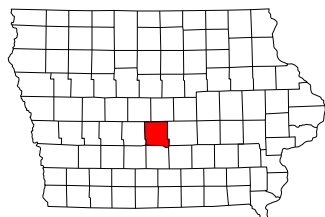


Index of Sheets	
No.	Description
Sheets	Bridge Plan
A.1	Title Sheet
A.2	Location Map Sheet
V.1	Estimated Quantities - Design 2025 - CIP Alt.
V.1 - V.6	Design 2025 - CIP Alt.
V.7	Estimated Quantities - Design 2025 - Precast Alt.
V.7 - V.13	Design 2025 - Precast Alt.
V.14	Estimated Quantities - Design 2125 - CIP Alt.
V.14 - V.19	Design 2125 - CIP Alt.
V.20	Estimated Quantities - Design 2125 - Precast Alt.
V.20 - V.26	Design 2125 - Precast Alt.
V.27	Estimated Quantities - Design 2225
V.27 - V.33	Design 2225
V.34	Estimated Quantities - Design 2325
V.34 - V.40	Design 2325
SPS Sheets	Bridge Plan Soils Sheet
SPS.1 - SPS.2	Bridge Plan Soils Sheet
Road Sheets	Road Plan
A.3 - J.1	Road Plans
C.1	Estimated Quantities - Road
C.1	Standard Plans - Road



PLANS OF PROPOSED IMPROVEMENT ON THE

INTERSTATE ROAD SYSTEM

POLK COUNTY

RCB Culvert New - Single Box

Pedestrian Trail under U.S. 6 (Hickman Road)
W of I-35/80 (City Trail)

Refer to the Plan Sheets for list of applicable specifications.

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



		TOTAL
		57
PROJECT IDENTIFICATION NUMBER		
15-77-080-060		
CONTRACT ID NUMBER		
PROJECT NUMBER		
IMN-080-3(340)125--0E-77		
R.O.W. PROJECT NUMBER		
PROJECT DIRECTORY NUMBER		
7708006015		

English Culvert Standards		
Standard	Issued	Revised
RCB G2-20	July 2020	----
RCB G3-20	July 2020	----
RCB 8-6-20	July 2020	----
PWH 0-1-20	July 2020	----
PWH 0-2-20	July 2020	----
PWH 0-3-20	July 2020	----
PWH 0-4-20	July 2020	----
PWH 0-9-20	July 2020	----
PRCB G1-20	Dec. 2020	----
PRCB G2-20	Dec. 2020	Jan. 2023
PRCB 8-20	Dec. 2020	----
PES 1-20-T1	Dec. 2020	----
PES 2-20-T1	Dec. 2020	Jan. 2023
PES 1-20-T3	Dec. 2020	Oct. 2021
PES 2-20-T3	Dec. 2020	Jan. 2023
PES 9-20-T3	Dec. 2020	----
PES 11-20	Dec. 2020	----
PEP 12-20	Dec. 2020	----
PT G1-20	Aug. 2020	----

Standard Road Plans

Standard Road Plans are listed on Sheet Number C.1.

Design Data Urban

Refer to individual
Situation Plans for
Traffic Data information.

Hydraulic Design		
Sheet No.	Name	Type
A.1	Jerome L. Hatlewick	Structural Design
** V.2, V.9 V.15, V.22	David J. Mulholland	Hydraulic Design
*SPS.1	Gary F. Miller	Geotechnical Design
**A.3	Nathan E. Carhoff	Roadway Design

*Provided by Terracon

**Provided by Snyder & Associates

Structural 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 Jerome L. Hattwick Date 04-25-202

Printed or Typed Name Jerome L. Hallewick

My license renewal date is December 31, 202

Pages or sheets covered by this seal: Sheets A.1, A.2, and V.1 thru V.40
(V.2, V.9, V.15, & V.22 Excluding hydraulic design, channel grading and revetment.)

Estimate Cast-In-Place Culvert Quantities and Reference Notes - Design #2025					
Item No.	Item Code	Item	Unit	Quantities Estimated Design No. 2025	Estimate Reference Notes
1	2402-2720000	Excavation, Class 20	CY	153.4	The excavation quantity is measured from the existing ground surface. Includes filling and compacting low areas around proposed culvert. Includes the excavation necessary to place the 1'-0" thick working blanket. Quantity should be reduced by 51.0 CY in the event that the working blanket is deleted.
2	2402-3825025	Granular Material for Blanket	CY	51.0	Includes cost of 1'-0" thick working blanket. Granular material shall be in accordance with Section 4118, Gradation No. 3 (excluding the No. 200 restriction) of the Standard Specifications. Includes 51.0 CY for a working blanket. The working blanket may be deleted if determined to be unnecessary at the time of construction. Reclaimed Asphalt Pavement (RAP) and reclaimed HMA shall not be used for the working blanket.
3	2403-0100020	Structural Concrete (RCB Culvert)	CY	96.3	Includes all resilient joint filler required.
4	2404-7775000	Reinforcing Steel	LB	13,909	----
5	2519-1001000	Fence, Chain Link, Vinyl Coated	LF	101.6	See Design Sheet Nos. 3, 4 and 5 for details. Chain link fence is 3'-6" in height. Includes cost of concrete encasement.
6	2526-8285000	Construction Survey	LS	1.00	----
7	2533-4980005	Mobilization	LS	1.00	----

Specifications:

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.

General Notes:

It is the intent of this design to construct a 8'-0" x 6'-0" x 72'-0" reinforced concrete box culvert skewed 0° at stations 60005+02.39.

The R.C.B. culvert sections are designed for earth fills of 3 feet.

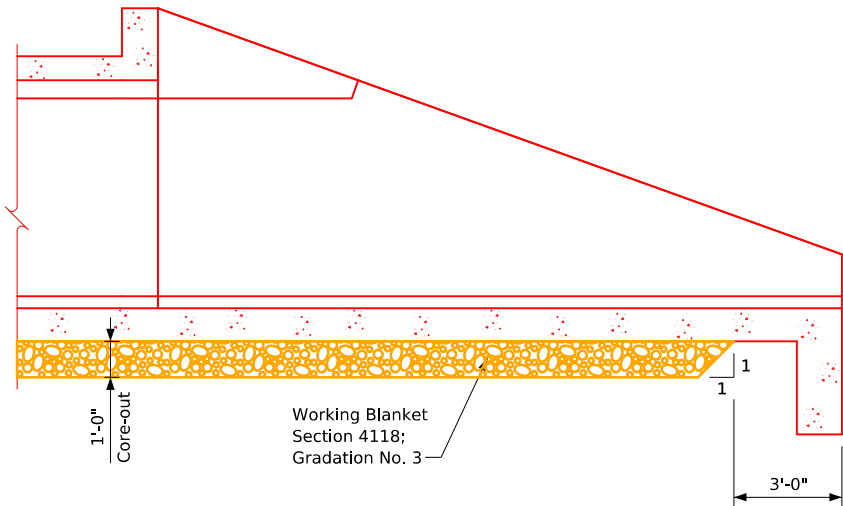
Utility companies and municipalities whose facilities are shown on the plans or known to be within the construction limits shall be notified by the Contractor of the construction starting date.

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

When de-watering presents a problem for placing the curtain walls as detailed, alternate methods such as steel sheet pile and precast concrete walls may be approved but at no additional cost. The culvert Contractor is to submit to the Engineer for approval complete drawings of the proposed curtain wall alternate before beginning construction.

Excess Class 20 Excavation material suitable for backfilling shall be stockpiled at the construction site, as directed by the Engineer.

Class 20 excavation material unsuitable for backfilling shall be disposed of in a manner that will leave the site in a neat condition.



Class 20 Excavation Limits at Headwall
(Longitudinal View)

During construction of this project the Culvert Contractor will be required to coordinate operations with those of other Contractors working within the same area. Other work in progress during the same period of time will include, but is not limited to, construction projects listed on Sheet J.1 of the Road Sheets in this plan set.

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	Chain Link Fence	77_Polk2025_ChainLinkFence.pdf	No
No.	Calculation Description	Working Drawing File Name Convention For Submittal	Certified by Iowa P.E. (Yes/No)
1	Chain Link Fence	77_Polk2025_ChainLinkFenceCalculations.pdf	No

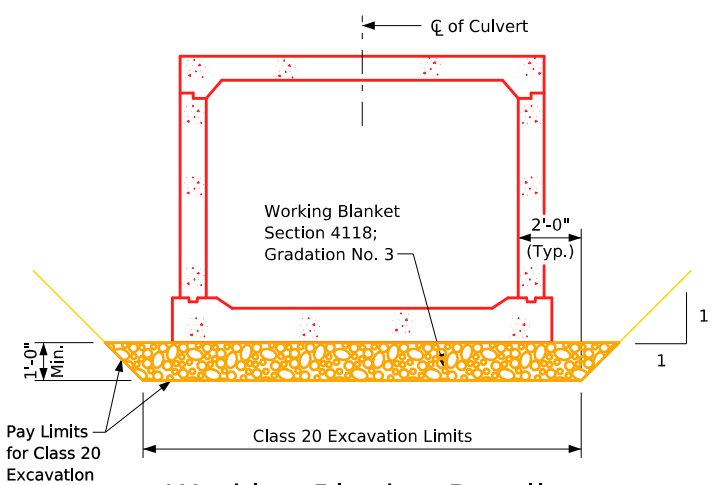
The Pollution Prevention Plan is not included in these plans, but is included in the Grade and Pave Plans for the project IM-080-3(264)124--13-77 which is tied to the RCB culvert plans through the contract letting process.

Roadway quantities are shown in the tied project, project number IM-080-3(264)124--13-77.

Roadway quantities shown elsewhere on these plans.

Standards: For details and notes not shown refer to the following Iowa D.O.T. - Highway Standards:		
Standard	Issued	Revised
PWH 0-1-20	July 2020	-----
PWH 0-2-20	July 2020	-----
PWH 0-3-20	July 2020	-----
PWH 0-4-20	July 2020	-----
PWH 0-9-20	July 2020	-----
RCB G2-20	July 2020	-----
RCB G3-20	July 2020	-----
RCB 8-6-20	July 2020	-----

Summary of Reinforcing Steel		
Location	Quantity	Total
8' X 6' Headwall 0° Skew	2 @ 2,324	4,648
17'-0" End Section	2 @ 2,171	4,342
38'-0" Barrel Section	1 @ 4,853	4,853
5r1 x 3'-6" Dowel Bars	2 @ 33	66
	Total (LB)	13,909



Working Blanket Detail

Granular material shall terminate 3'-0" short of the outside face of each curtain wall.

Traffic Control Plan
The roadway will be open to thru traffic. Refer to the Traffic Control Plan included in the tied Grade and Pave Plans, project number IM-080-3(264)124--13-77.

Concrete Placement Quantities				
Location	Footing	Walls	Slab	Total
8' X 6 Headwall 0° Skew	2 @ 8.9	2 @ 4.8	* 2 @ 1.2	29.8
17'-0" End Section	2 @ 5.9	2 @ 5.3	2 @ 4.5	31.4
38'-0" Barrel Section	1 @ 13.1	1 @ 11.9	1 @ 10.1	35.1
Total (CY)	42.7	32.1	21.5	96.3

* Includes parapet and top of wingwall.

Design For 0 Degree Skew

8'-0" x 6'-0" x 72'-0" Reinforced Concrete Box Culvert - C.I.P.

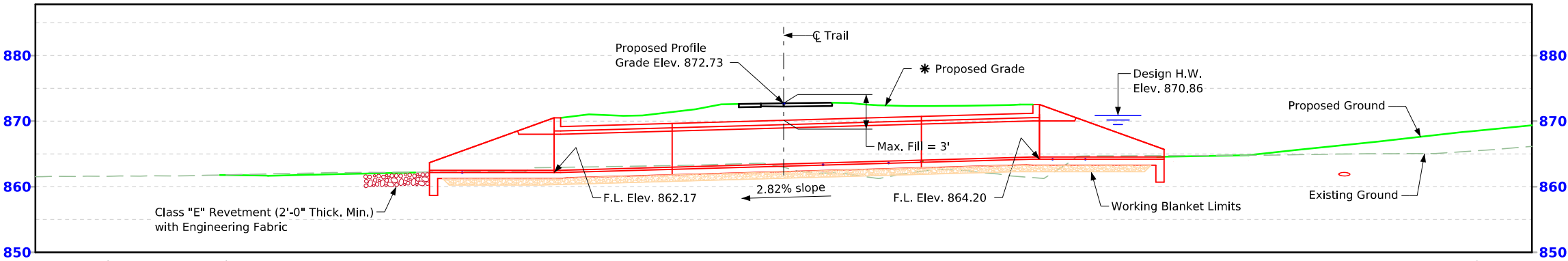
Estimated Quantities/General Notes

STA. 60005+02.39 (Trail) Turn-in Date: May, 2024

Polk County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 2025 Design Sheet No. 1 of 13 FHWA/Asset 900605

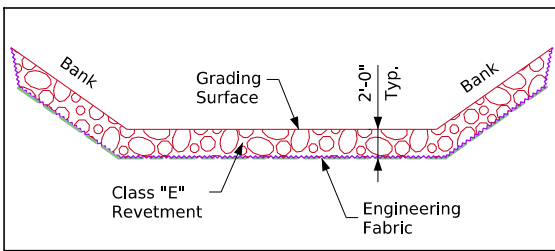
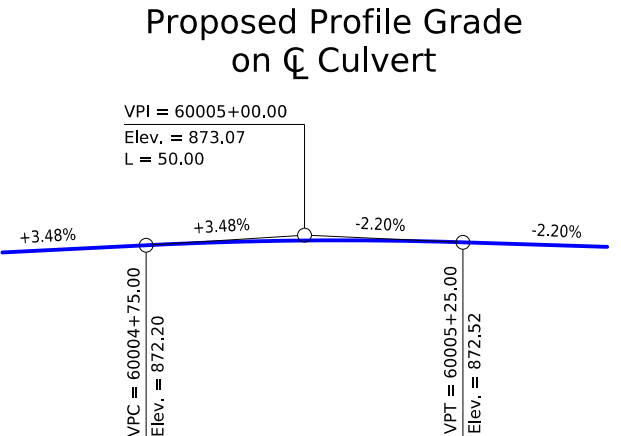
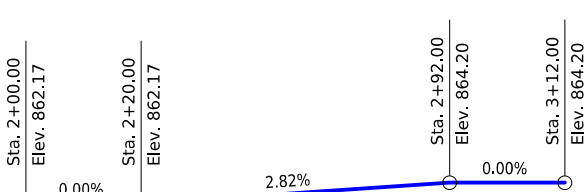
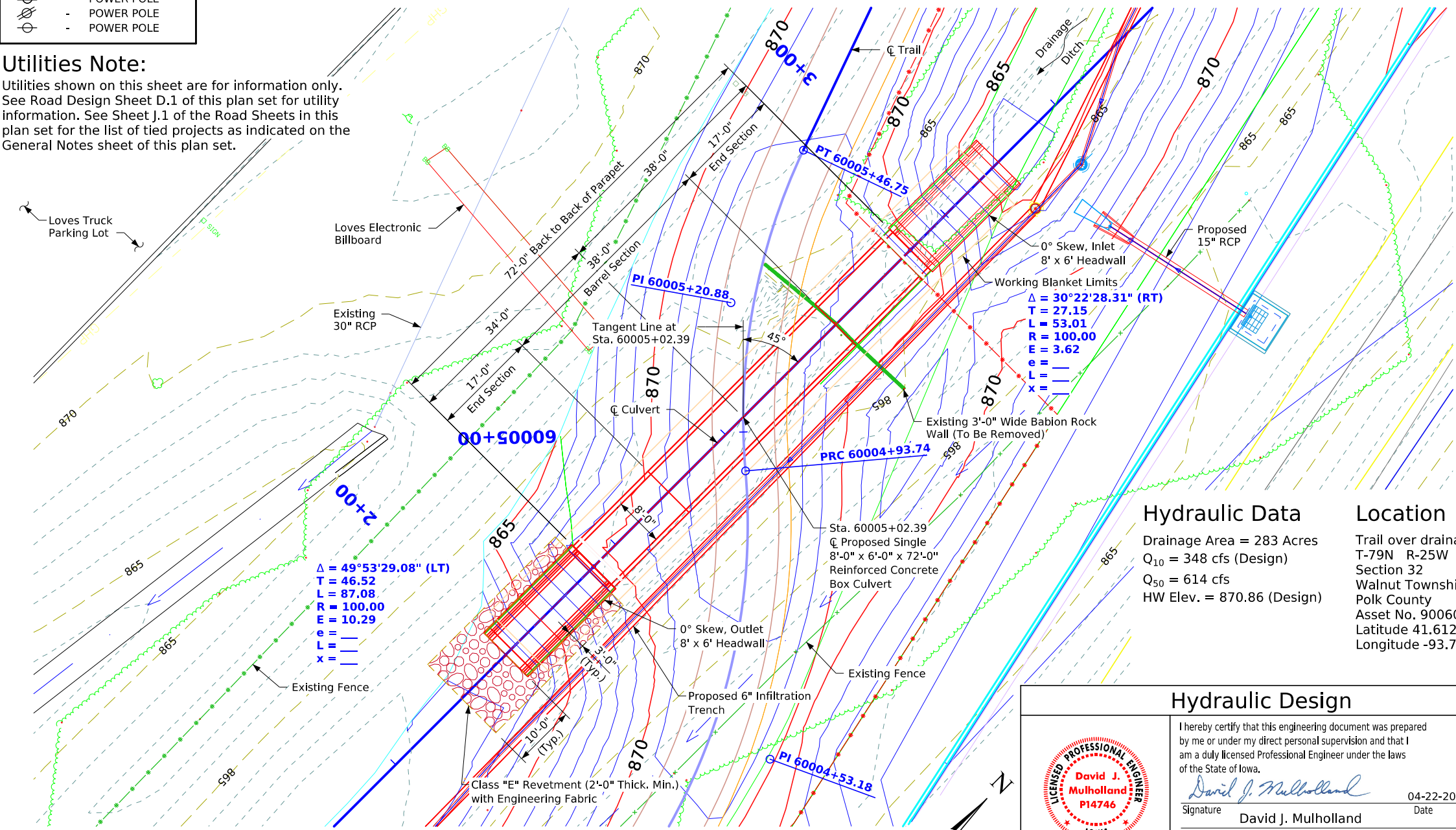


Utility Legend

- GHP- - GAS LINE
- - POWER POLE
- - POWER POLE
- - POWER POLE

Utilities Note:

Utilities shown on this sheet are for information only. See Road Design Sheet D.1 of this plan set for utility information. See Sheet J.1 of the Road Sheets in this plan set for the list of tied projects as indicated on the General Notes sheet of this plan set.



Typical Channel Protection

Estimated Revetment Quantities Included With Road Plans

Location	Revetment Class "E" (Ton)	Engineering Fabric (SY)	CL 10 Channel Excavation (CY)
Inlet	---	---	---
Outlet	33.6	60.3	21.0
Totals	33.6	60.3	21.0

Excavation quantity is calculated from grading surface. Excavation quantity is for embedded revetment core out only, and does not include excavation to the grading surface. Excavation quantity to the grading surface is determined by Road Design and is included in the Road Plans of the tied projects listed on Sheet J.1 of the Road Sheets in this plan set. Quantities shown on this sheet are for information only. See Sheet J.1 of the Road Sheets in this plan set for the list of tied projects as indicated on the General Notes sheet of this plan set.

Hydraulic Data

Drainage Area = 283 Acres

Q_{10} = 348 cfs (Design)

Q_{50} = 614 cfs

HW Elev. = 870.86 (Design)

Location

Trail over drainage ditch

T-79N R-25W

Section 32

Walnut Township

Polk County

Asset No. 900605

Latitude 41.612578°

Longitude -93.777721°

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 *David J. Mulholland* Date 04-22-2024

Printed or Typed Name David J. Mulholland

My license renewal date is December 31, 2024

Pages or sheets covered by this seal: Sheet V.2 (Hydraulic Data, Channel Grading and Revetment)

Design For 0 Degree Skew

8'-0" x 6'-0" x 72'-0" Reinforced Concrete Box Culvert - C.I.P.

Situation Plan

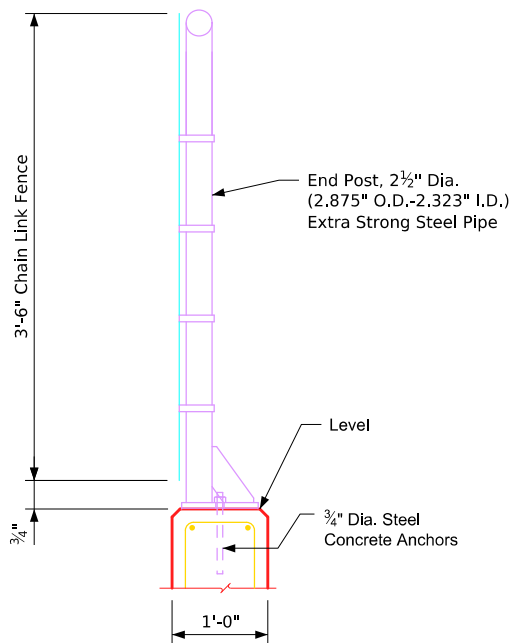
STA. 60005+02.39 (Trail) Turn-In Date: May, 2024

Polk County

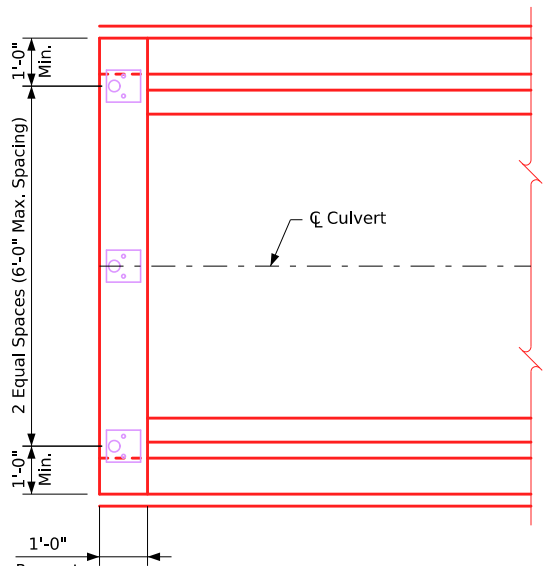
IOWA DEPARTMENT OF TRANSPORTATION

Design No. 2025 Design Sheet No. 2 of 13 FHWA/Asset 900605

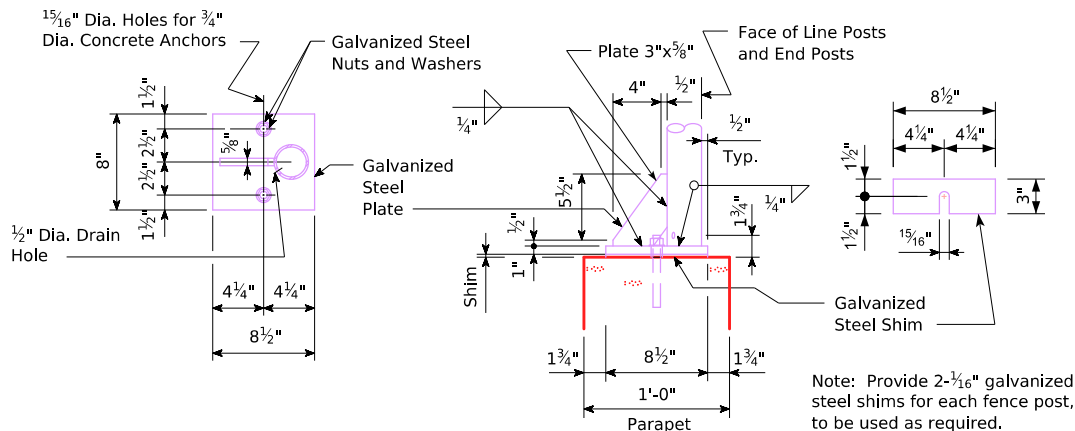




Parapet Typical Section
(Barrel not shown)

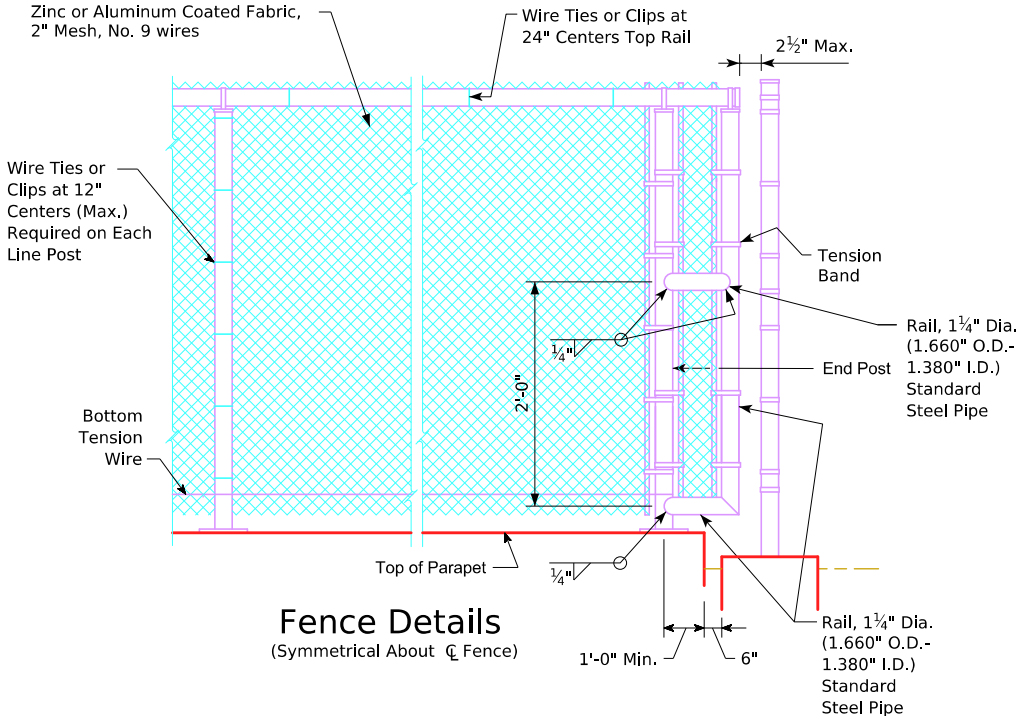


Parapet Fence Plan View
(Reinforcement and Barrel Sections not shown)



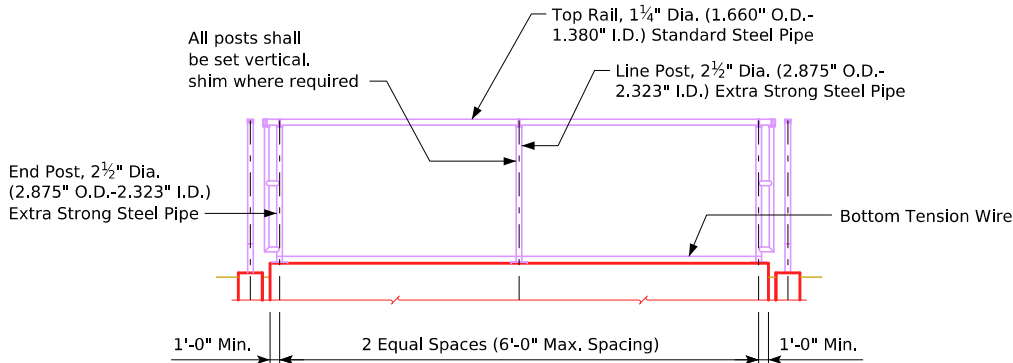
Base Plate Details for End Post and Line Posts

Note: Posts and base plates shall be galvanized, after fabrication, in accordance with the requirements of ASTM A123.



Fence Details

(Symmetrical About C Fence)



Elevation of Fence

The Contractor shall take appropriate care to coordinate chain link fence anchor bolt locations with parapet reinforcement. cutting of reinforcing steel for installation of chain link fence anchor bolts will not be permitted.

Quantities

Item	Units	Amount
Fence, Chain Link, Vinyl Coated	Lin. Ft.	101.6

Steel Chain Link Fence Notes:

The chain link fence is to be bid on a linear foot basis measured from C to C of end posts. The price bid for "Fence, Chain Link, Vinyl Coated" 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 on the precast parapet and in the ground along the precast headwalls in accordance with these plans and specifications.

The chain link fence shall be either zinc (ASTM A392) or aluminum (ASTM A491) coated fabric, 2" mesh, No. 9 wires, 3'-6 height with knuckled selvages top and bottom.

The concrete anchors shall be drilled and grouted in place. The adhesive materials shall be in accordance with Iowa DOT I.M. 491.11. The $\frac{3}{4}$ " dia. anchors shall be galvanized and shall meet the requirements of ASTM A307. Anchors shall have 8" embedment (minimum).

The material for posts, braces, and rails shall be steel pipe in accordance with article 4154.10, A, of the standard specifications. Base plates and shims shall meet the requirements of ASTM A-36. Posts, base plates, and rails shall be galvanized, after fabrication, in accordance with the requirements of ASTM A-123.

Chain link fabric, rails, and fence accessories are to be pvc coated in accordance with ASTM F 668, Class 2B. Color shall be black in accordance with astm F 934. The cost of pvc coating is to be included in the price bid for "Fence, Chain Link, Vinyl Coated".

Steel fence post assemblies shall be abrasive blast cleaned to a minimum of SSPC-SP6 "commercial blast cleaning" prior to hot-dip galvanizing. Galvanize components in accordance with ASTM A-123. Do not quench or apply chromate conversion coatings to any galvanized components that will receive powder coating. Following galvanizing, powder coat components in accordance with materials I.M. 568.

Preparation of galvanized surfaces for paint shall be in accordance with materials I.M. 568, Appendix F. Complete "paint over galvanized surface travel log" in Appendix E.

All powder coating except field touch-up shall be performed in an approved shop in accordance with materials I.M. 568.

Submit proposed preparation methods and product data for all coatings proposed for use to the Engineer for review and approval prior to powder coating. Powder coating shall match sae AMS-STD-595 color number 27038 (black).

If available, vinyl coated fence post assemblies may be substituted for powder coated components provided the material is in compliance with all other requirements listed in these plans and the standard specifications. PVC coating shall comply with ASTM F 668, class 2b and shall be black in accordance with ASTM F 934. The cost of PVC coated fence post assemblies shall be included in the price bid for "Fence, Chain Link, Vinyl Coated".

Protect all powder coated railing surfaces from damage during shipping, handling, and installation.

Following fence installation, repair any damage to the powder coated finish in accordance with the coating manufacturer's recommendations. All costs associated with powder coating shall be considered incidental to the bid item, "Fence, Chain Link, Vinyl Coated".

Special fittings shall be as specified in Article 4154.11 of the Standard Specifications, unless otherwise noted. Similar fence parts and fittings with different shapes or configurations shall not be intermingled within the project limits.

Rail members shall be cut square at all post connection locations. Cut edges shall be filled or ground smooth to remove sharp edges at corner locations. Damaged paint or vinyl coating shall be painted black to match fence.

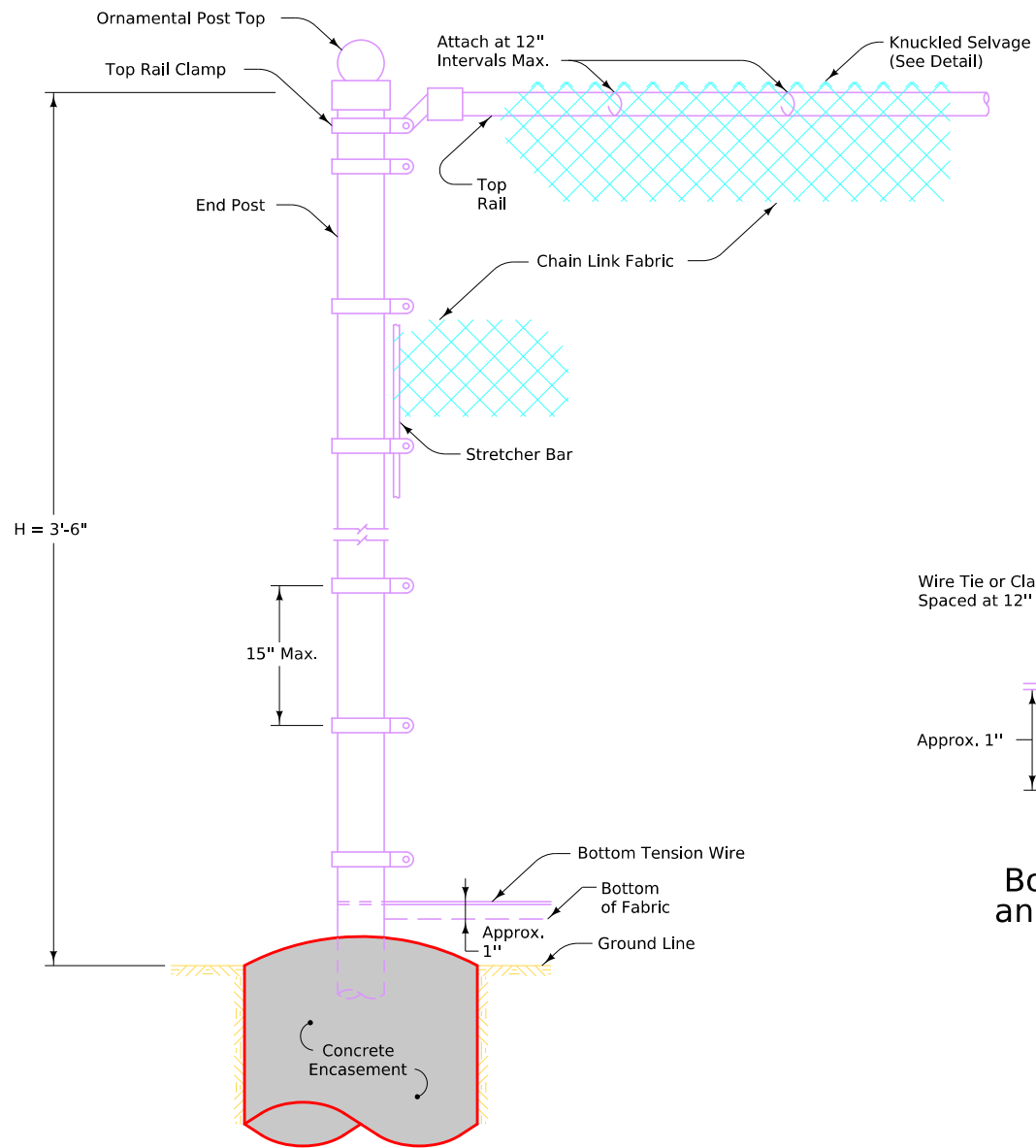
Caulk for base plates shall be black nonsag latex caulk marketed for outdoor use. No testing or certification is required. Excess caulk shall be completely removed from surrounding concrete surfaces.

The fence shall be true to line, taut, and comply with the best practice for fence construction of this type. All ends of wires shall be turned so that they extend away from the roadway side of the fence.

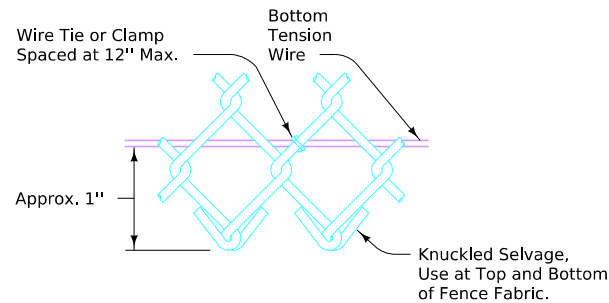
The Contractor shall submit for approval shop drawings of the fence, showing layout of posts and fabrication details of rails, bracing, anchorages, and hardware. Alternate details, if any, shall be submitted with the shop drawings.

The Contractor shall not install any nameplates or other signage on the fence.



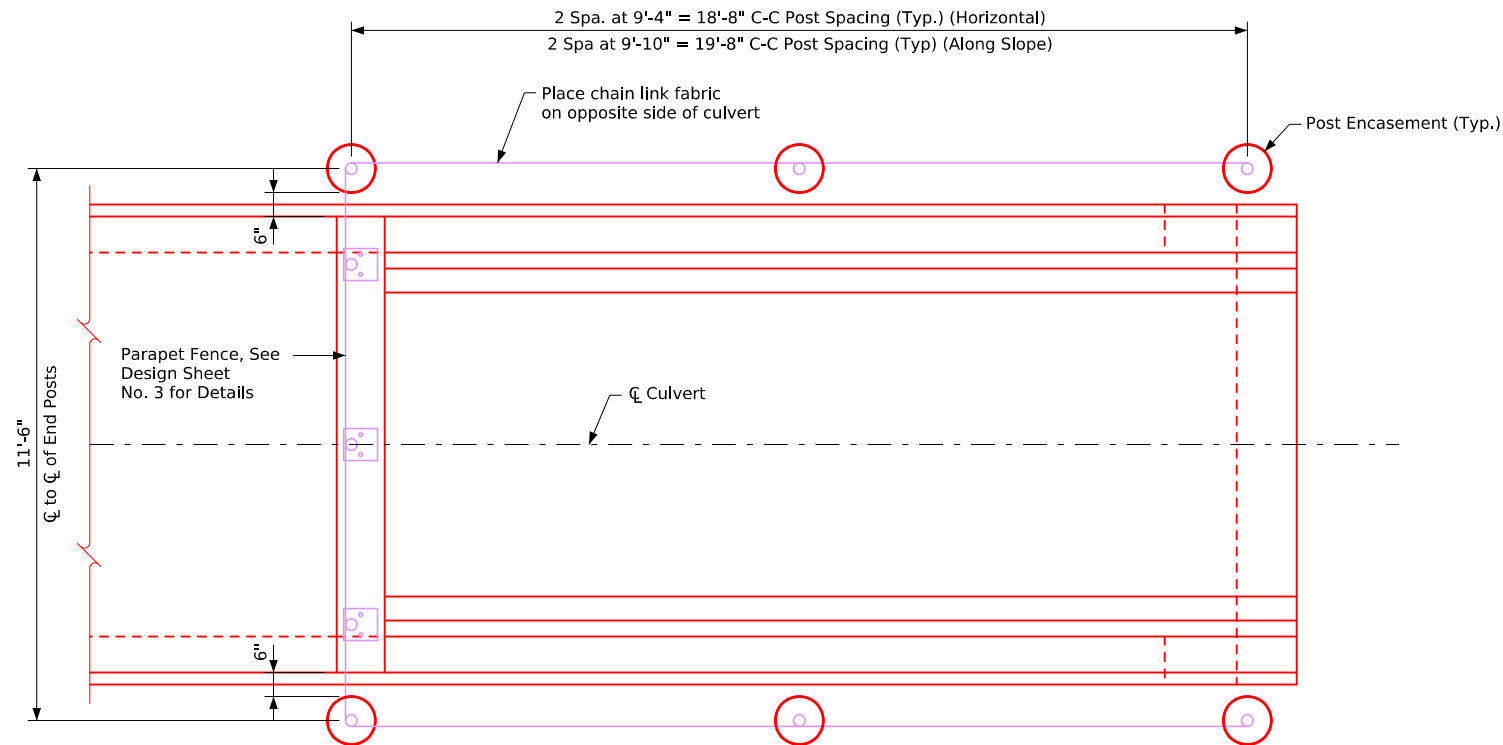


End Post Assembly

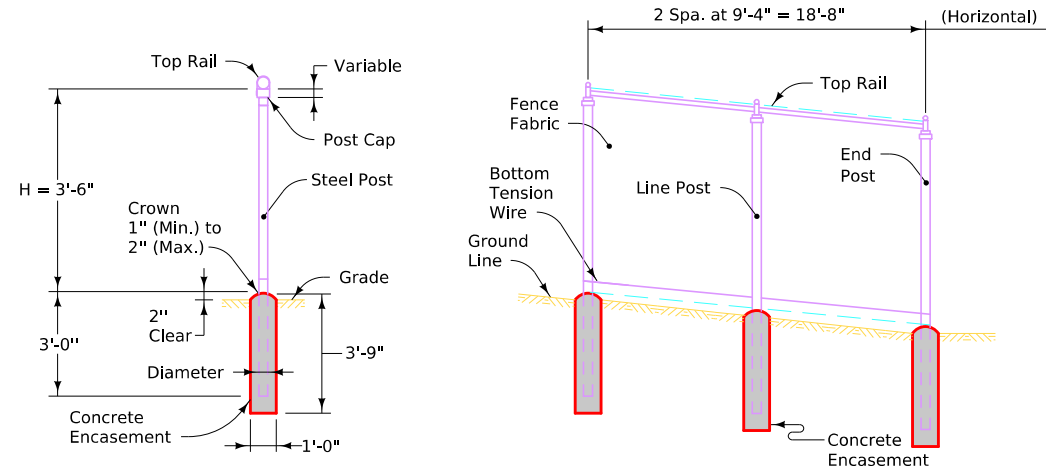


Bottom Tension Wire and Knuckled Selvage

Item	Post Size		
	Nominal Pipe Size, In.	Outside Dia, In.	Weight, Lb./Ft.
Rail	1½	1.660	2.27
Line Post	2½	2.875	5.79
End Post	2½	2.875	5.79



Ground Fence Plan View
(Reinforcement not shown)



Post Installation Details

Steel Chain Link Fence Notes:

See chain link fence notes and quantity on Design Sheet No. 3 for fence details and specifications.
Attach chain link fabric to top rail, tension wire, line posts, and end posts at intervals of 12" maximum.
Connect bottom tension wire to end posts.
Secure each end of each run of fabric using a stretcher bar inserted in the final links of the fabric. Use a bar that is as long as the fabric is wide.

Design For 0 Degree Skew
8'-0" x 6'-0" x 72'-0" Reinforced Concrete Box Culvert - C.I.P.

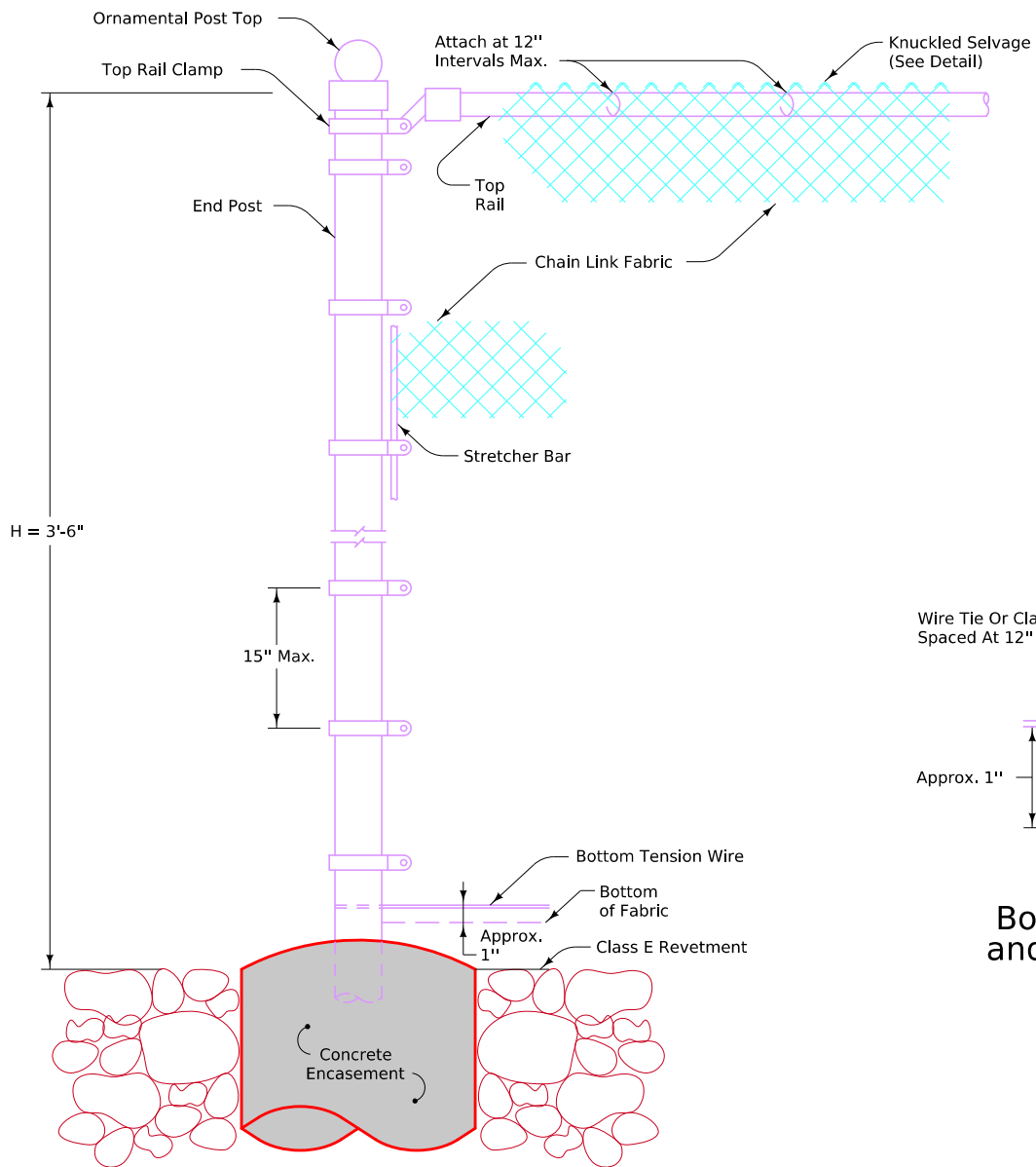
Ground Fence Details

STA. 60005+02.39 (Trail) Turn-in Date: May, 2024

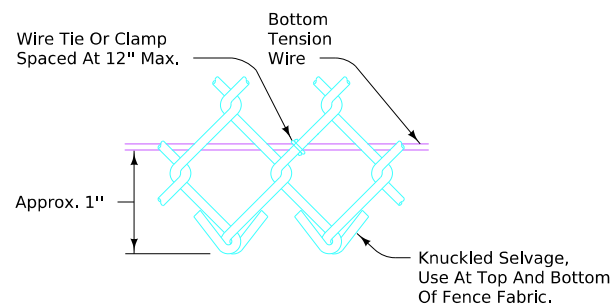
Polk County

IOWA DEPARTMENT OF TRANSPORTATION
Design No. 2025 Design Sheet No. 4 of 13 FHWA/Asset 900605



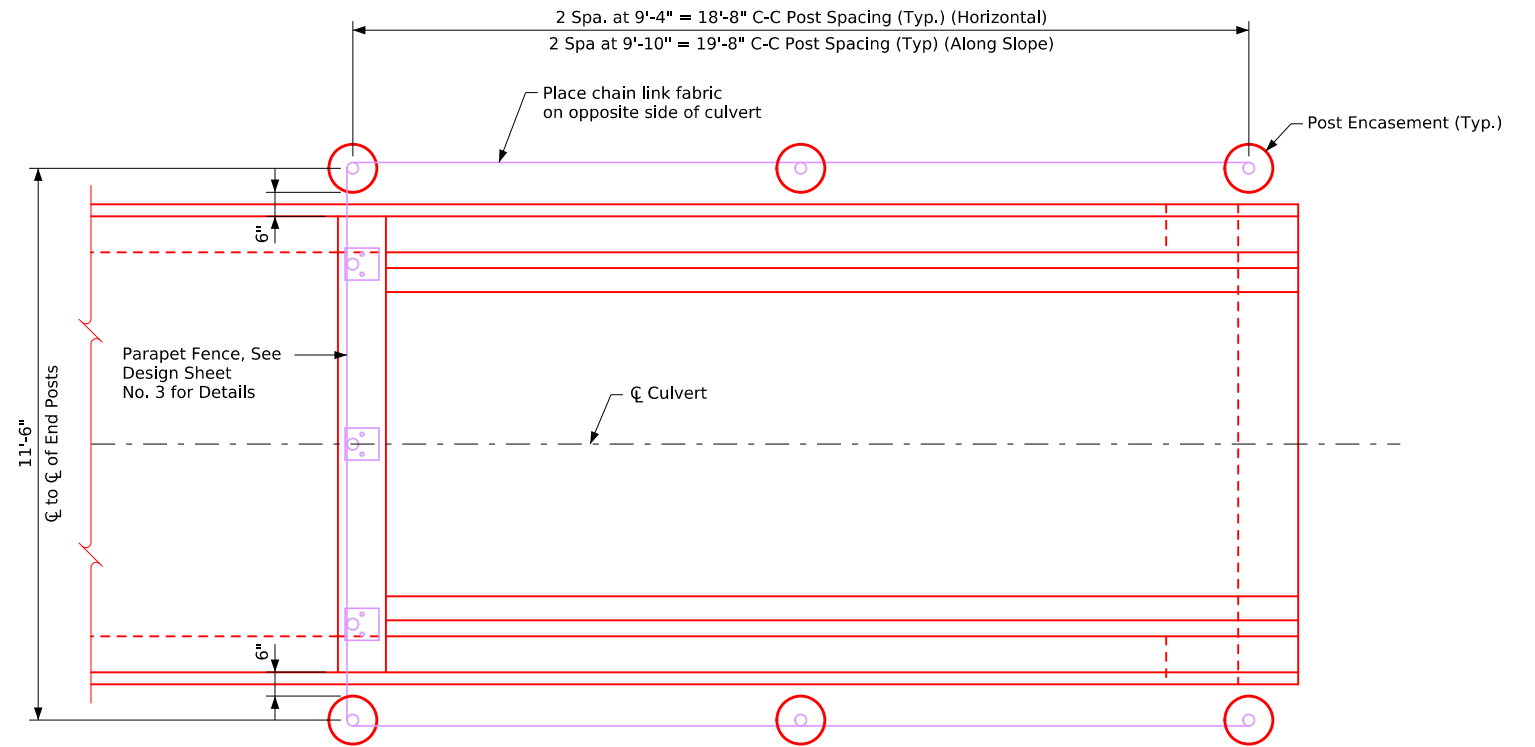


End Post Assembly



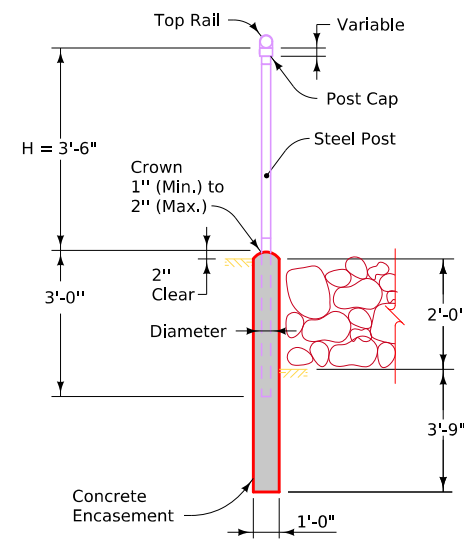
Bottom Tension Wire and Knuckled Selvage

Item	Post Size		
	Nominal Pipe Size, In.	Outside Dia, In.	Weight, Lb./Ft.
Rail	1½	1.660	2.27
Line Post	2½	2.875	5.79
End Post	2½	2.875	5.79

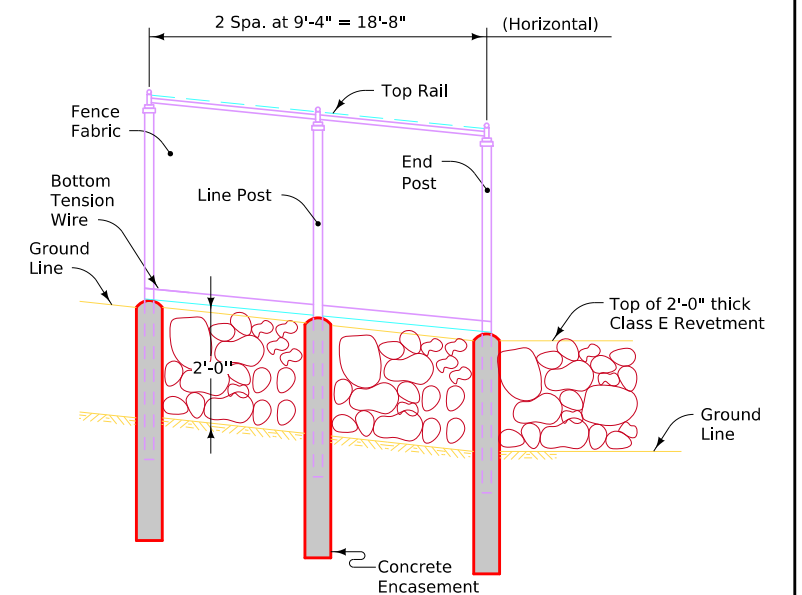


Ground Fence Plan View

(Reinforcement not shown)



Post Installation Details



Steel Chain Link Fence Notes:

See chain link fence notes and quantity on Design Sheet No. 3 for fence details and specifications.
 Attach chain link fabric to top rail, tension wire, line posts, and end posts at intervals of 12" maximum.
 Connect bottom tension wire to end posts.
 Secure each end of each run of fabric using a stretcher bar inserted in the final links of the fabric. Use a bar that is as long as the fabric is wide.

Design For 0 Degree Skew
8'-0" x 6'-0" x 72'-0" Reinforced Concrete Box Culvert - C.I.P.

Ground Fence Details

STA. 60005+02.39 (Trail) Turn-in Date: May, 2024

Polk County

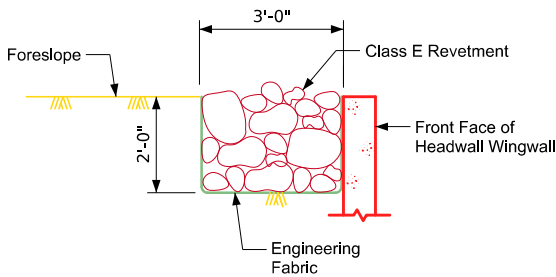
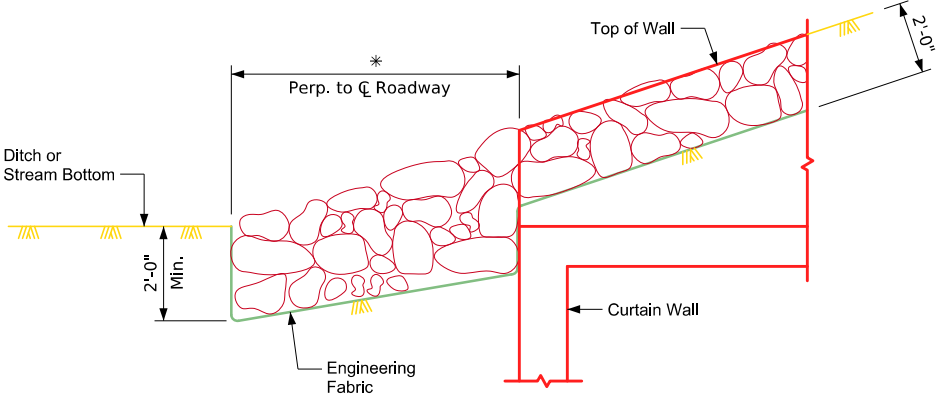
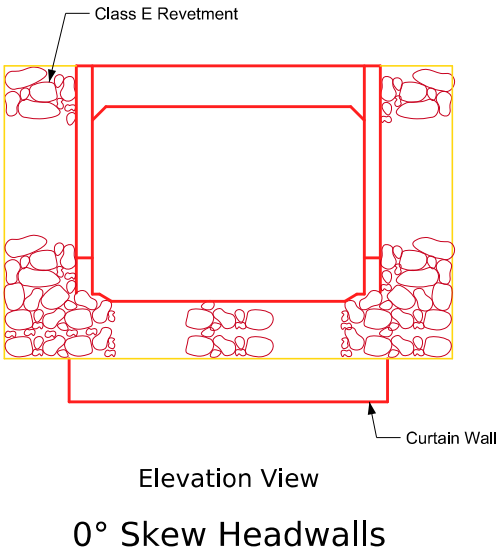
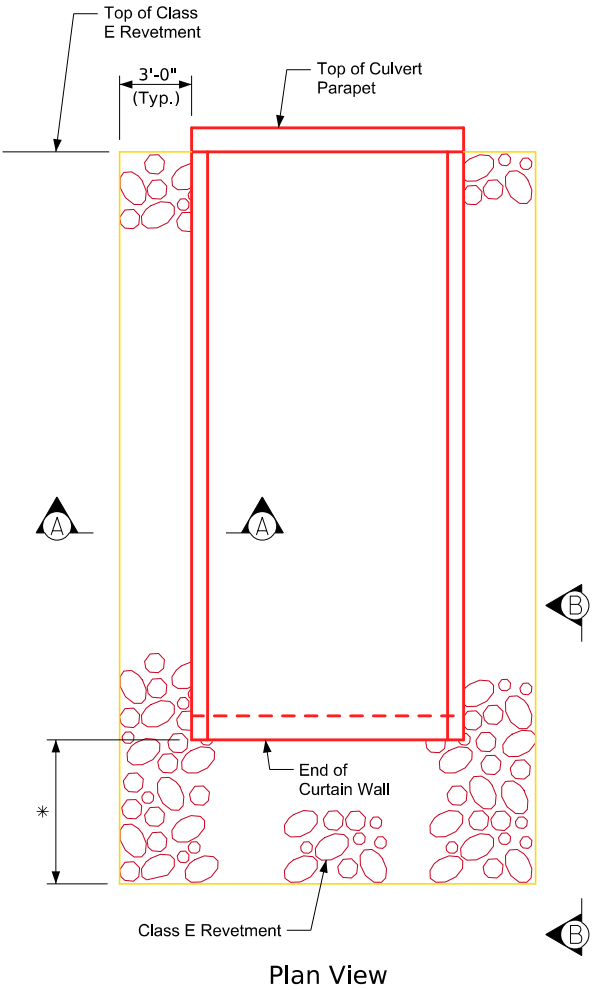
IOWA DEPARTMENT OF TRANSPORTATION

Design No. 2025 Design Sheet No. 5 of 13 FHWA/Asset 900605



REVISED 1-2016 - ADDED NOTE "SEE CULVERT PLANS FOR LIMITS OF REVETMENT AND ENGINEERING FABRIC."
REVISED 02-2017 - ADDED SECTION DIRECTORS "A-A" TO ZERO SKEW PLAN VIEW DETAIL.
REVISION 01-2021 - CHANGED DESIGN SPECIFICATIONS TO AASHTO LRFD 8TH ED.
ENGLISH SINGLE CULVERTS.DGN - 1092 - THIS SHEET ISSUED 04-12.

* = See Design Sheet No. 2 for limits of
revetment and engineering fabric.



Typical Details

Construction Notes:

Class E Revetment shall be used and placed according to Article 2507.03, of the Standard Specifications. The engineering fabric shall meet the material requirements in accordance with Article 4196.01,B,3, of the Standard Specifications.

All associated quantities of revetment protection are included in the table of Estimated Revetment Quantities in Design Sheet No. 2.

Design For 0 Degree Skew

8'-0" x 6'-0" x 72'-0" Reinforced
Concrete Box Culvert - C.I.P.

Revetment Protection Details

STA. 60005+02.39 (Trail) Turn-In Date: May, 2024

Polk County

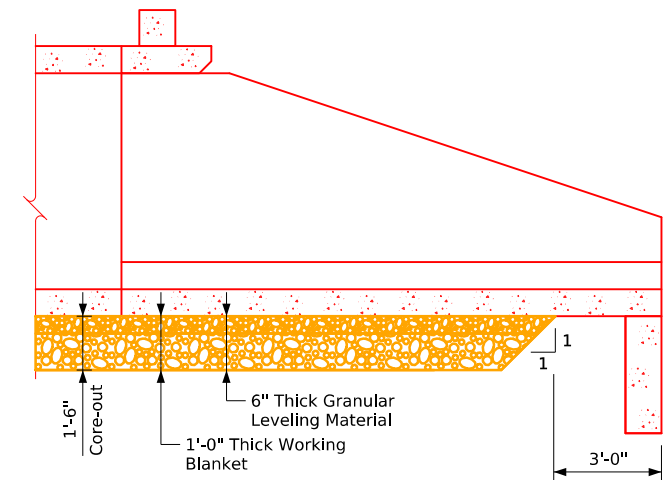
IOWA DEPARTMENT OF TRANSPORTATION

Design No. 2025 Design Sheet No. 6 of 13 FHWA/Asset 900605



FILE NO. 32215	ENGLISH	DESIGN TEAM SMK\MK\CLS	Modified Standard Sheet 1092	Polk COUNTY	PROJECT NUMBER IMN-080-3(340)125--0E-77	SHEET NUMBER V.6
2:18:22 PM	4/29/2024	csallade	pw:\projectwise.dot.int.lan:PWMain\Documents\Projects\7708006015\Bridge\340)_RCB Culvert New - Pedestrian Tunnel\SHT_77080340_2025_CIP_Z08.dgn			

Estimate Precast Culvert Quantities and Reference Notes - Design #2025 - Alternate					
Item No.	Item Code	Item	Unit	Quantities Estimated Design No. 2025	Estimate Reference Notes
8	2402-2720000	Excavation, Class 20	CY	164.3	The excavation quantity is measured from the existing ground surface. Includes filling and compacting low areas around proposed culvert. Includes the excavation necessary to place the 1'-0" thick working blanket and 6" thick granular leveling material. Quantity should be reduced by 47.2 CY in the event that the working blanket is deleted.
9	2402-3825025	Granular Material for Blanket	CY	47.2	Includes cost of 1'-0" thick working blanket. Granular material shall be in accordance with Section 4118, Gradation No. 3 (excluding the No. 200 restriction) of the Standard Specifications. Includes 47.2 CY for a working blanket. The working blanket my be deleted if determined to be unnecessary at the time of construction. Reclaimed Asphalt Pavement (RAP) and reclaimed HMA shall not be used for the working blanket.
10	2415-2110806	Precast Concrete Box Culvert 8 Ft. x 6 Ft.	LF	72	Includes material and labor associated with providing and installing the culvert ties, lifting hole plugs, engineering fabric, granular leveling material, joint material, and grout as required.
11	2415-2200806	Precast Concrete Box Culvert Straight End Section, 8 Ft. x 6 Ft.	EA	2	Includes material and labor associated with providing and installing the culvert ties, lifting hole plugs, engineering fabric, granular leveling material, joint material, and grout as required. Includes 0° skew, 2 precast end sections, 2 precast lintel beams, and 2 precast curtain walls.
12	2519-1001000	Fence, Chain Link, Vinyl Coated	LF	74.0	See Design Sheet Nos. 5, 6 and 7 for details. Chain link fence is 3'-6" in height. Includes cost of concrete encasement.
13	2526-8285000	Construction Survey	LS	1.00	----
14	2533-4980005	Mobilization	LS	1.00	----



Class 20 Excavation Limits at Headwall
(Longitudinal View)

Note: See Design Sheet No. 8 for the Granular Leveling Material Detail.

Roadway quantities shown elsewhere on these plans.



Design For 0 Degree Skew

8'-0" x 6'-0" x 72'-0" Reinforced Concrete Box Culvert - Precast

Estimated Quantities

STA. 60005+02.39 (Trail) Turn-In Date: May, 2024

Polk County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 2025 Design Sheet No. 7 of 13 FHWA/Asset 900605

Revised 01-2023: Added Granular Leveling Material requirement of Section 4117 of Standard Spec. and note to burr Concrete Box Ties. Removed Granular Leveling Material Spec. details and tables.

ENGLISHPRECASTCULVERTS.DGN - 1081P - THIS SHEET ISSUED 01-13.

General Notes:

It is the intent of this design to construct a 8'-0" x 6'-0" x 72'-0" precast reinforced concrete box culvert skewed 0° at stations 60005+02.39.

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

The precast R.C.B. Culvert sections are designed for HL-93 live load and earth fills of 3 feet.

The precast R.C.B. barrel and end sections shall conform to Iowa D.O.T. Single Precast R.C.B. Culvert Standards. At the Contractor's option, precast barrel sections may conform to ASTM C1577.

Excess Class 20 Excavation material suitable for backfilling shall be stockpiled at the construction site, as directed by the Engineer.

Class 20 Excavation material unsuitable for backfilling shall be disposed of in a manner that will leave the site in a neat condition.

When de-watering presents a problem for placing the curtain walls as detailed, alternate methods such as steel sheet pile may be approved but at no additional cost. See Standard Sheet PES 11-20 for details.

The length in linear feet of precast reinforced concrete box culvert will be based on the plan quantity. For the number of linear feet given on the plan, the Contractor will be paid the contract unit price per linear foot. The payment shall be full compensation for furnishing all material, labor and equipment necessary to complete the work except for bid items "Precast Concrete Box Culvert Straight End Section, 8 Ft. x 6 Ft.", "Excavation, Class 20", "Fence, Chain Link, Vinyl Coated", and "Granular Material for Blanket".

For each precast concrete box culvert straight end section installed the Contractor will be paid the contract price per each. The payment shall be full compensation for furnishing all material (including lintel beams and curtain walls), labor and equipment necessary to complete the work except for bid items "Precast Concrete Box Culvet 8 Ft. x 6 Ft.", "Excavation, Class 20", "Fence, Chain Link, Vinyl Coated", and "Granular Material for Blanket".

The curtain wall and the Type 3 lintel beam or Type 1 parapet end sections shall be precast.

The Contractor shall furnish and install culvert ties for all joints. The main section joints will have one tie on each side of the barrel and the last barrel section will be attached to the end sections with two ties per side. The end section joints will have two ties per side.

Culvert ties shall be included in the cost for precast concrete box culvert. Tie rods will be 1 inch diameter steel and shall meet requirements of ASTM A709 Grade 36 or equal. See Standard Sheet G2-20 for details.

Culvert tie assemblies shall be galvanized after fabrication.

The limits for excavation for the precast concrete box culvert shall be as shown on the "Granular Leveling Material Detail".

A minimum of 6 inches of Granular Leveling Material shall be used as bedding for the precast box culvert. The bedding shall be shaped to a flat base using a template. All costs including material and labor associated with providing and installing the Granular Leveling Material shall be included in the bid items "Precast Concrete Box Culvert 8 Ft. x 6 Ft." and "Precast Box Culvert Straight End Section 8 Ft. x 6 Ft.".

The Granular Leveling Material shall meet the requirements of Section 4117 of the Standard Specifications.

The precast box culvert shall be built to the dimensions and specifications shown in these plans.

The Contractor shall submit details (i.e. Shop Drawings) of the proposed precast concrete box sections for this project. The details shall include the following information as found on Standard Sheet 1089P:

- A. A Situation Plan drawing showing the back to back parapet dimension for the line of the culvert sections.
- B. Dimension the number of precast sections and section lengths.
- C. A detail of the precast barrel sections showing a cross section view of the section, steel locations, dimensions, etc.
- D. A detail of the precast concrete culvert end section showing a cross section view of the sections, steel locations, dimensions, etc. similar to the end section details shown in the Iowa D.O.T. Standards.

The Contractor shall provide all information shown on Standard Sheet 1089P. The Contractor shall allow 30 working days for the Engineer's Shop Drawing review. All reinforcing bars and bars noted as dowels supplied for this structure shall be deformed reinforcement unless otherwise noted or shown.

During construction of this project the Culvert Contractor will be required to coordinate operations with those of other Contractors working within the same area. Other work in progress during the same period of time will include, but is not limited to, construction projects listed on Sheet J.1 of the Road Sheets in this plan set.

Installation Notes:

Precast concrete box culvert sections shall be laid with the groove end of each section up-grade, and the sections shall be tightly joined. Concrete ties to be used only to hold box sections together, not for pulling sections tight. Joint openings between sections should be as tight as practicable and limited to a maximum of ¾ inch openings. The joint on the bottom of the culvert shall be sealed with a flexible water tight 1 inch butyl rope gasket as per Materials I.M. 491.09.

Butyl rope gasket shall be installed in accordance with the recommendations of the Manufacturer and shall extend vertically 6 inches above the bottom fillet. All joints shall be trimmed clean on the inside after sealing.

Burr threads of Concrete Box Ties without damaging galvanizing to prevent nut rotation after tightening is complete.

The Contractor shall place a 2 foot wide piece of engineering fabric around the top and sides of each precast joint. The fabric shall be centered with 1 foot on each side of the joint, the fabric shall be attached to the walls and top of each section to prevent the fabric from slipping off the joint during backfilling operations. Attachment methods shall be approved by the Engineer.

The Granular Leveling Material shall be installed in accordance with Article 2402.03, H, 4, of the Standard Specifications. If larger granular material is to be installed below the Granular Leveling Material, the Contractor shall place engineering fabric below the Granular Leveling Material to separate the layers. The fabric shall be oversized by a minimum of 1 foot on all edges to contain the Granular Leveling Material.

All costs including material and labor associated with providing and installing the engineering fabric as described above for the joints and underlayment of the Granular Leveling Material shall be included in the bid items "Precast Concrete Box Culvert 8 Ft. x 6 Ft." and "Precast Box Culvert Straight End Section 8 Ft. x 6 Ft.". The engineering fabric shall be in accordance with Article 4196.01, B, 3, of the Standard Specifications.

Class E revetment will be placed around the precast concrete box culvert end section at the outlet, as shown in these plans.

During backfilling the compaction adjacent to the bottom corner radii or chamfer shall be accomplished with a mechanical hand compactor.

The Contractor shall furnish and install lifting hole plugs for each section. Lifting holes shall be plugged with a precast concrete plug or plastic plug approved by the Engineer, sealed and covered with a 2'-0" x 2'-0" piece of engineering fabric centered over the hole and attached to the section to prevent the fabric from slipping.

Specifications:

Design:
AASHTO LRFD Bridge Design Specifications, 8th Ed., Series of 2017.

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

Design Stresses:

Design stresses for the following materials are in accordance with the AASHTO LRFD Bridge Design Specifications, 8th Ed., Series of 2017: Reinforcing steel in accordance with AASHTO LRFD Section 5, Grade 60. Concrete in accordance with AASHTO LRFD Section 5, f'c for barrel sections as noted on Culvert Barrel Detail Standards, for End Section Design f'c = 5.0 ksi.

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.

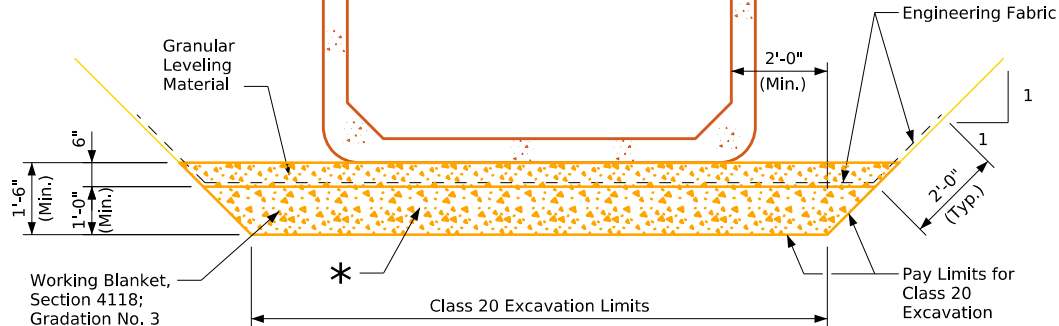
Calculation submittals in this table which are associated with working drawing submittals shall be submitted on the same day. Review time for calculation submittals shall be of the same duration as and run concurrently with review time for associated working drawings. The calculation submittals listed 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	Standard Sheet 1089P	77_Polk2025_StandardSheet1089P.pdf	Yes
2	Chain Link Fence	77_Polk2025_ChainLinkFence.pdf	No

Standards: For details and notes not shown refer to the following Iowa D.O.T. - Highway Standards:		
Standard	Issued	Revised
PRCB G1-20	December 2020	-
PRCB G2-20	December 2020	January 2023
PRCB 8-20	December 2020	-
PES 1-20-T1	December 2020	-
PES 2-20-T1	December 2020	January 2023
PES 1-20-T3	December 2020	October 2021
PES 2-20-T3	December 2020	January 2023
PES 9-20-T3	December 2020	-
PES 11-20	December 2020	-
PEP 12-20	December 2020	-

Note: See Design Sheet No. 7 for the Class 20 Excavation Limits at Headwall detail.

✱ Suitable soil at bottom of excavation as approved by the Engineer. Contractor shall coordinate with Engineer as necessary to permit observation.



Granular Leveling Material Detail

Barrel Section dispalyed. End Section details not shown.
Granular Leveling Material shall terminate 3'-0" short of the precast curtain wall.

The Pollution Prevention Plan is not included in these Plans, but is included in the Grade and Pave Plans, for the project IM-080-3(264)124-13-77 which is tied to the RCB culvert plans through the contract letting process.

Traffic Control Plan
The roadway will be open to thru traffic. Refer to the Traffic Control Plan included in the tied Grade and Pave Plans, Project No. IM-080-3(264)124-13-77.

Design For 0 Degree Skew

8'-0" x 6'-0" x 72'-0" Reinforced Concrete Box Culvert - Precast

General Notes

STA. 60005+02.39 (Trail) Turn-in Date: May, 2024

Polk County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 2025 Design Sheet No. 8 of 13 FHWA No. 900605



Proposed Profile Grade Elev. 872.73

Proposed Grade

Design H.W. Elev. 870.86

Max. Fill = 3'

F.L. Elev. 862.17

Granular Leveling Material

Working Blanket Limits

F.L. Elev. 864.20

Class "E" Revetment (2'-0" Thick, Min.) with Engineering Fabric

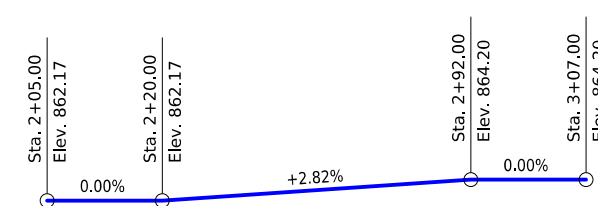
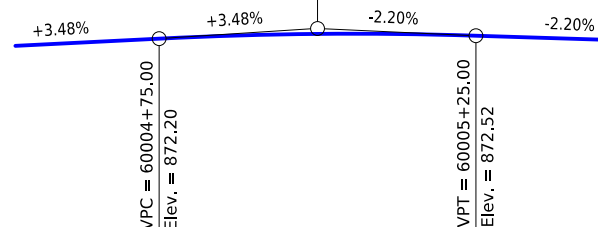
2.82% slope

Trail

* Refer to Roadway Plans for Proposed Grade Slopes

Utility Legend	
--GHP--	- GAS LINE
	- POWER POLE
	- POWER POLE
	- POWER POLE

Utilities shown on this sheet are for information only. See Road Design Sheet D.1 of this plan set for utility information. See Sheet J.1 of the Road Sheets in this plan set for the list of tied projects as indicated on the General Notes sheet of this plan set.


$$\begin{array}{r} \text{VPI} = 60005+00.00 \\ \hline \text{Elev.} = 873.07 \\ \text{L} = 50.00 \end{array}$$


Bank

Grading Surface

2'-0" Typ.

Bank

Class "E" Revetment

Engineering Fabric

Typical Channel Protection

Estimated Revetment Quantities Included With Road Plans

Location	Revetment Class "E" (Ton)	Engineering Fabric (SY)	CL. 10 Channe Excavation (CY)
Inlet	----	----	----
Outlet	33.6	60.3	21.0
Totals	33.6	60.3	21.0

Excavation quantity is calculated from grading surface. Excavation quantity is for embedded revetment core out only, and does not include excavation to the grading surface. Excavation quantity to the grading surface is determined by Road Design and is included in the Road Plans of the tied projects listed on Sheet J.1 of the Road Sheets in this plan set. Quantities shown on this sheet are for information only. See Sheet J.1 of the Road Sheets in this plan set for the list of tied projects as indicated on the General Notes sheet of this plan set.

Hydraulic Data

Drainage Area = 283 Acres
 $Q_{10} = 348$ cfs (Design)
 $Q_{50} = 614$ cfs
 HW Elev. = 870.86 (Design)

Location

Trail over drainage ditch
T-79N R-25W
Section 32
Walnut Township
Polk County
Asset No. 900605
Latitude 41.612578°
Longitude -93.777721°

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.

David J. Mulholland 04-22-2024
Signature Date

Printed or Typed Name

My license renewal date is December 31, 2024

Pages or sheets covered by this seal: _____ Sheet V.9
(Hydraulic Data, Channel Grading and Revetment)

Design For 0 Degree Skew
8'-0" x 6'-0" x 72'-0" Reinforced
Concrete Box Culvert - Precast

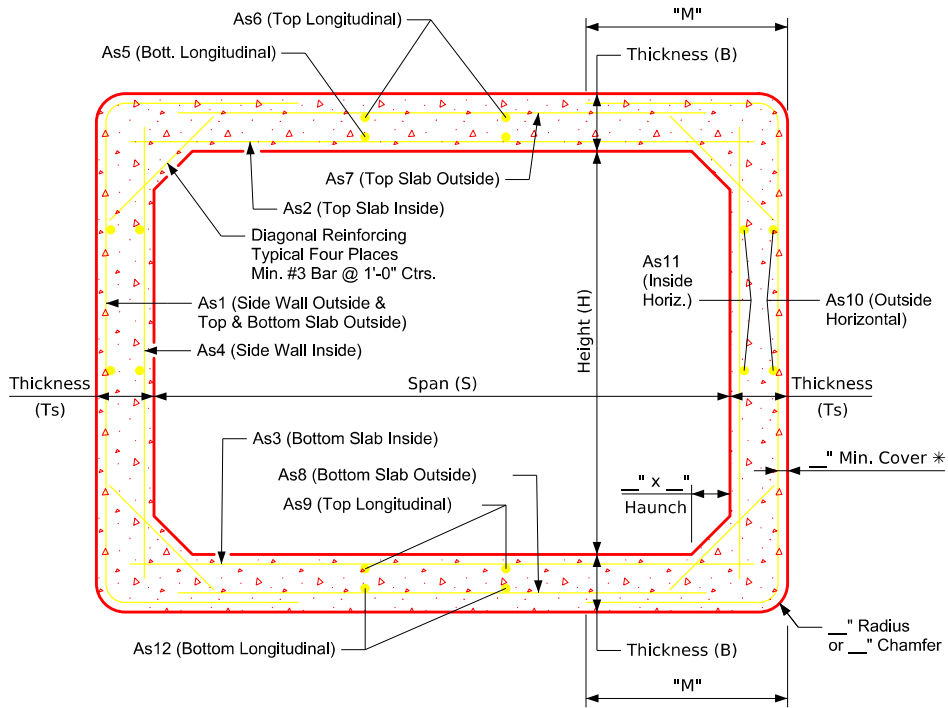
Situation Plan

STA. 60005+02.39 (Trail) Turn-in Date: May, 2024

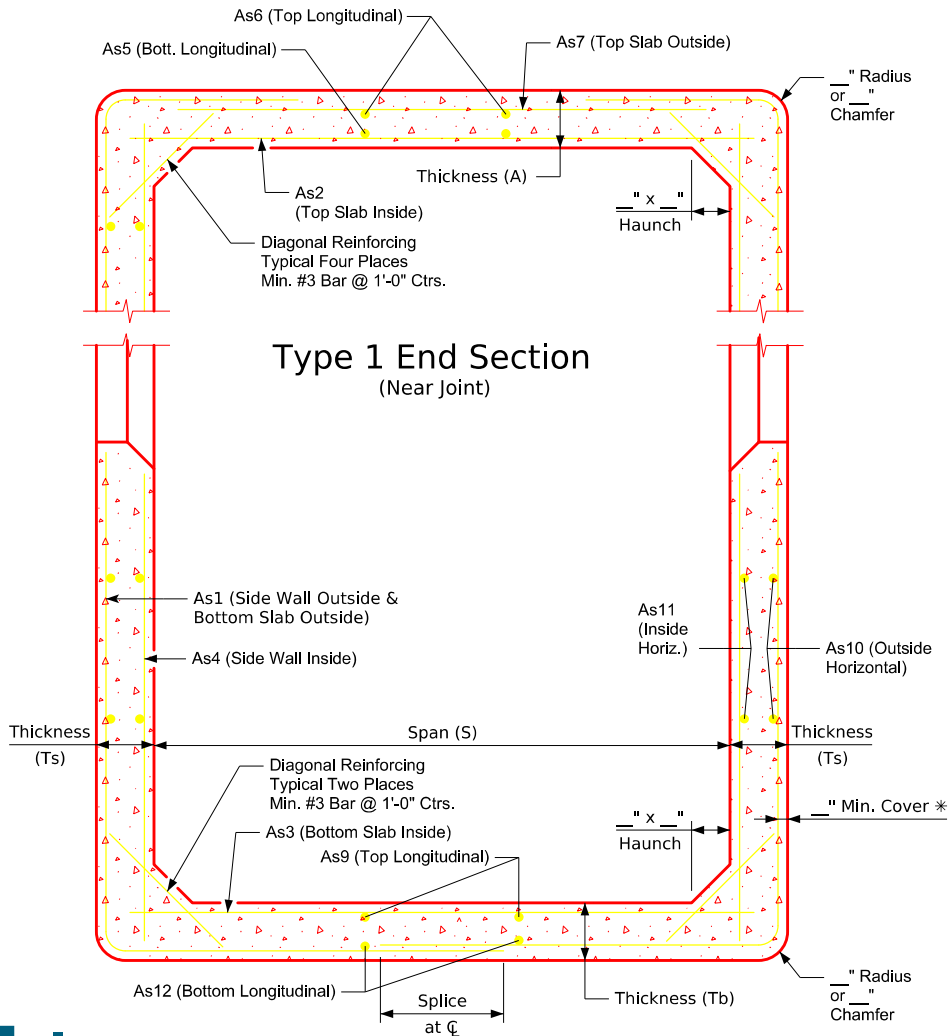
Polk County

IOWA DEPARTMENT OF TRANSPORTATION
 Design No. 2025 Design Sheet No. 9 of 13 FHWA/Asset 900605

Revised 08-2022: Added statement to the Flowable Mortar/Foamed Concrete Option notes regarding "only the options and materials designated on the sheet are allowed. All other options and materials are prohibited".
Revised 01-2023: Added Note 2 stating to burr threads of Concrete Box Ties. Note 3, 4, 5, 6 and 7 were 2, 3, 4, 5 and 6 respectively. Adjusted details to fit additional note.
ENGLISHPRECASTCULVERTS.DGN - 1082P - THIS SHEET ISSUED 02-13.



Barrel Section



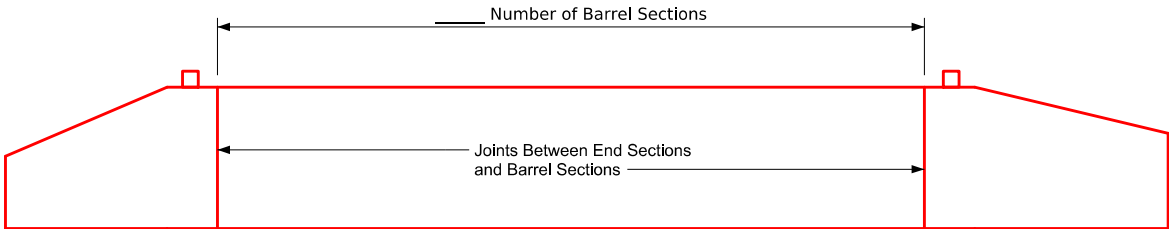
Type 1 End Section
(Near Joint)

Type 1 and 3 End Sections

Note:
Dimension "M" begins at the outside edge of the wall for Iowa D.O.T. Single Precast R.C.B. Culvert Standards. The "M" dimension for the ASTM Standards begins at the reinforcing clear distance from the outside edge of the wall.

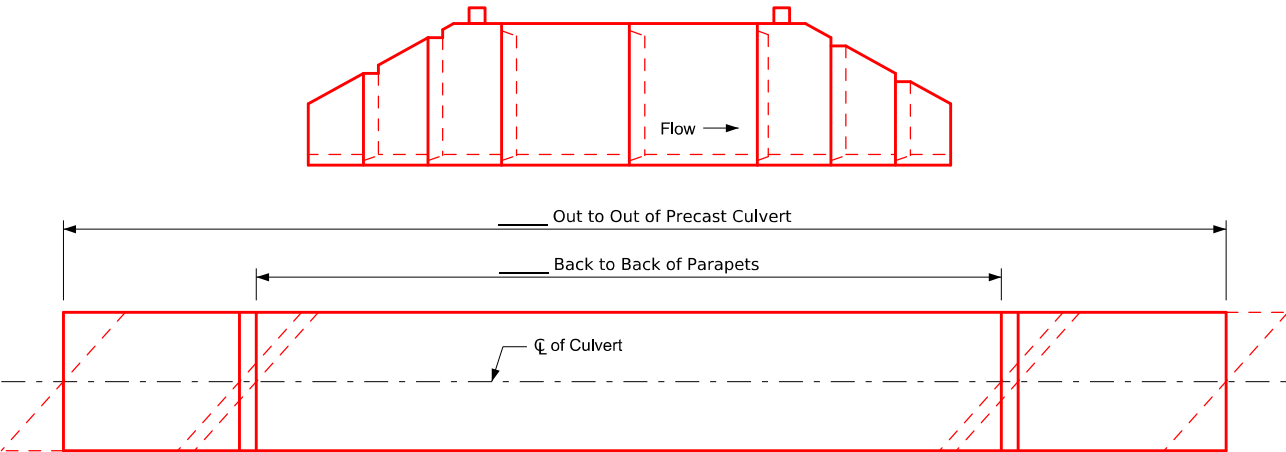
Minimum laying length shall be 4'-0".

* Use 1 inch cover for ASTM design, 1½ inch cover for Iowa D.O.T. standard and non-standard design.



Elevation View

(Show the Number of Barrel and End Sections)



Plan View for Barrel Section

(Show Overall Length and Back to Back of Parapets)

____ ft. x ____ ft. x ____ ft. Culvert																													
Barrel Section																													
Design Earth Cover, ft	f'c ksi	A in.	B in.	C in.	M in.	Circumferential Reinforcement																							
						As1		As2		As3		As4		As5		As6		As7		As8		As9		As10		As11		As12	
						Layer 1	Layer 2	Layer 1	Layer 2	Layer 1	Layer 2	Layer 1	Layer 2	Layer 1	Layer 2	Layer 1	Layer 2	Layer 1	Layer 2	Layer 1	Layer 2	Layer 1	Layer 2	Layer 1	Layer 2	Layer 1	Layer 2	Layer 1	Layer 2
						Bar Size																							
						Spacing (in.)																							
						Area (in²/ft)																							
End Section																													
f'c ksi	Ts in.	Tb in.	A in.	Circumferential Reinforcement																								Length of Splice @ C	
				As1		As2		As3		As4		As5		As6		As7		As9		As10		As11		As12					
				Layer 1	Layer 2	Layer 1	Layer 2	Layer 1	Layer 2	Layer 1	Layer 2	Layer 1	Layer 2	Layer 1	Layer 2	Layer 1	Layer 2	Layer 1	Layer 2	Layer 1	Layer 2	Layer 1	Layer 2	Layer 1	Layer 2				
				Bar Size																									
				Spacing (in.)																									
				Area (in²/ft)																									
Precast Box Option - Check If Applicable: ☐ Astm C1577 Standard ☐ End Section Type - Check One: Type 1 ☐ Type 3 ☐																													
Reinforcement Type - Check One: Plain WWR (65 ksi) ☐ Deformed WWR (70 ksi) ☐ ASTM Standard Reinforcing Bars (60 ksi) ☐																													

Design For 0 Degree Skew

8'-0" x 6'-0" x 72'-0" Reinforced Concrete Box Culvert - Precast

Precast Culvert Design Method Details

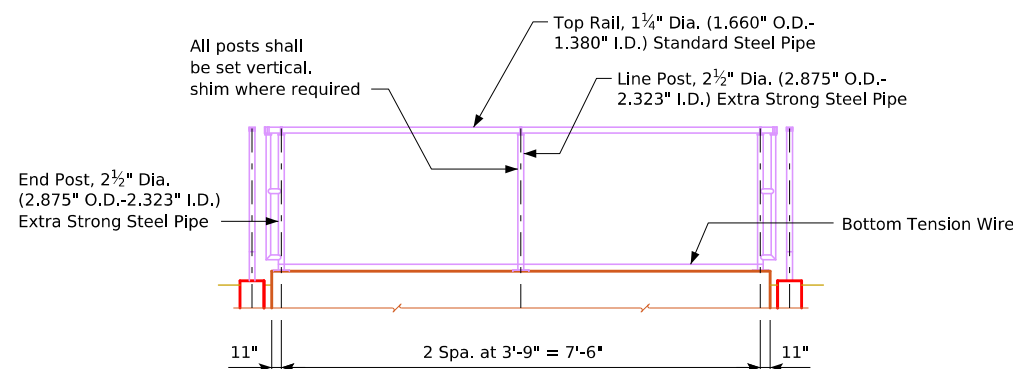
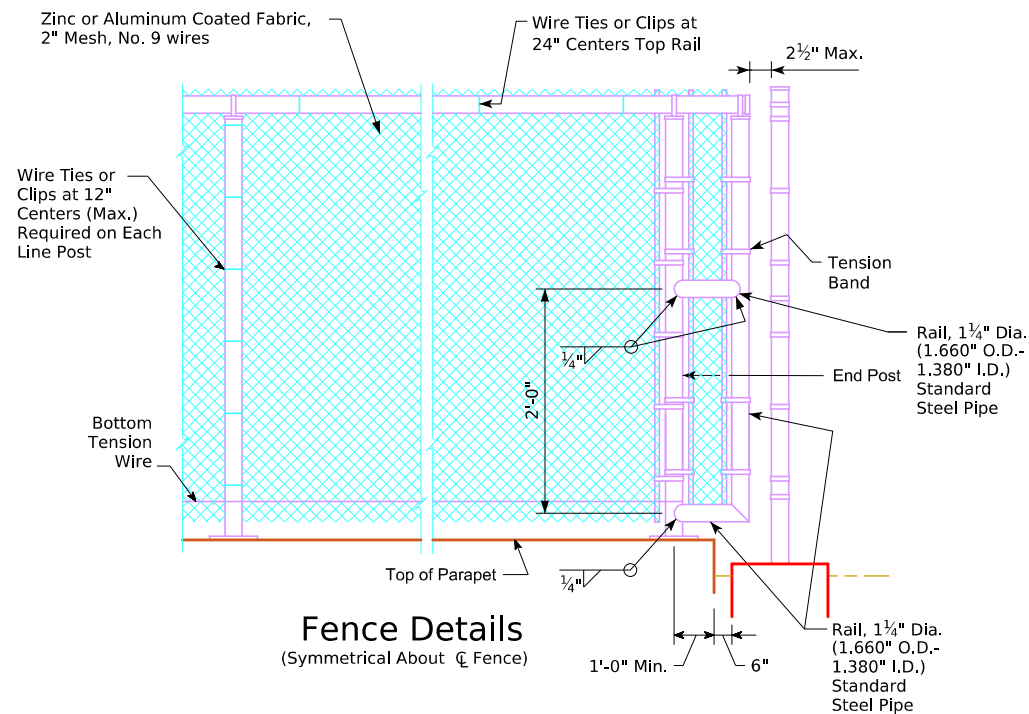
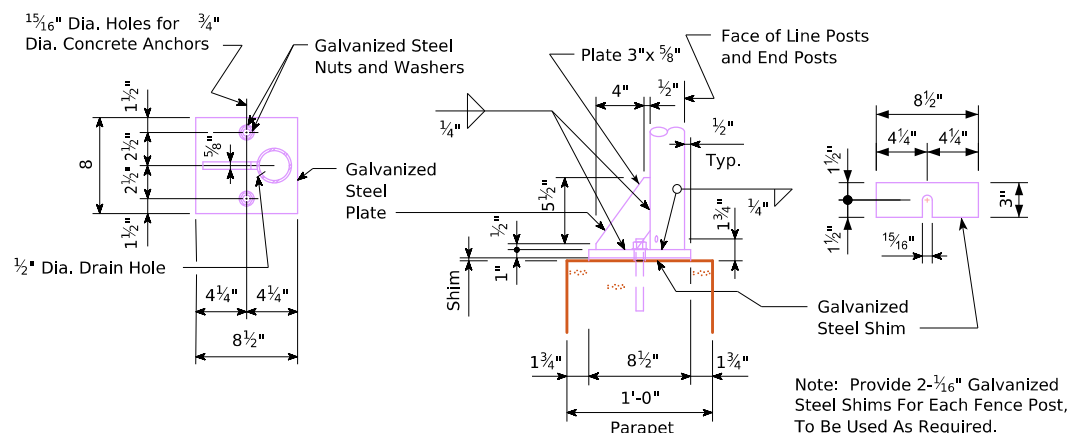
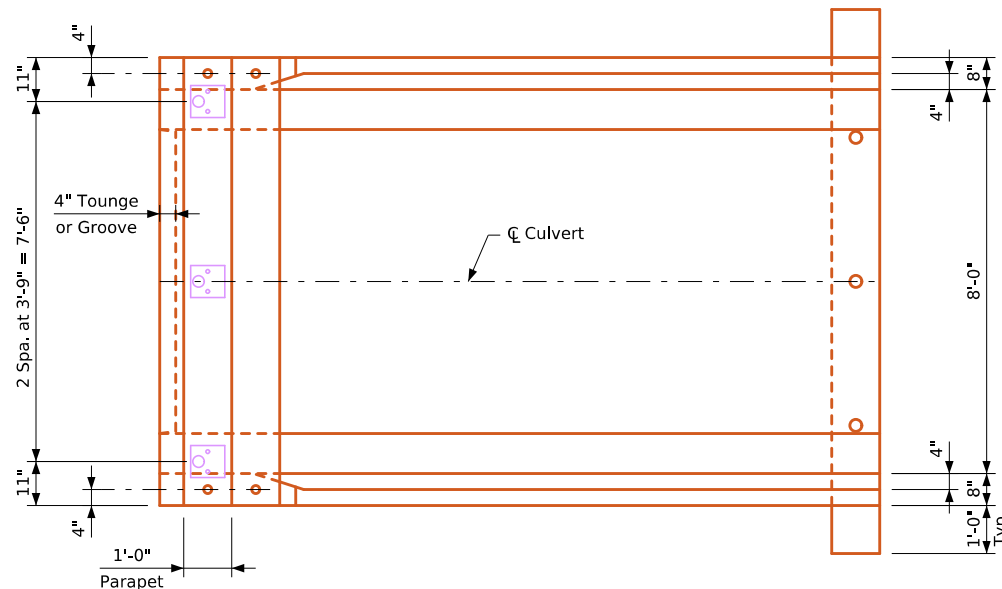
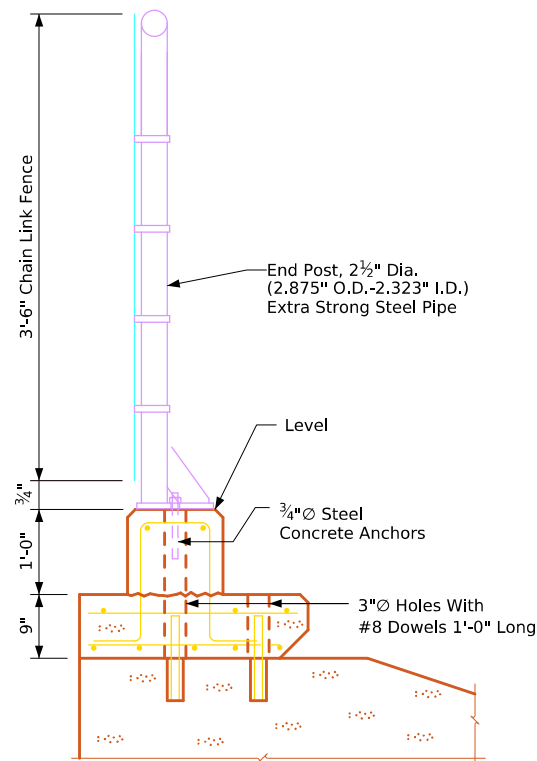
STA. 60005+02.39 (Trail) Turn-In Date: May, 2024

Polk County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 2025 Design Sheet No. 10 of 13 FHWA/Asset 900605





Steel Chain Link Fence Notes:

The chain link fence is to be bid on a linear foot basis measured from $\mathbb{C}$ to $\mathbb{C}$ of end posts. The price bid for "Fence, Chain Link, Vinyl Coated" 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 on the precast parapet and in the ground along the precast headwalls in accordance with these plans and specifications.

The chain link fence shall be either zinc (ASTM A392) or aluminum (ASTM A491) coated fabric, 2" mesh, No. 9 wires, 3'-6" height with knuckled selvages top and bottom.

The concrete anchors shall be drilled and grouted in place, the adhesive materials shall be in accordance with Iowa DOT I.M. 491.11. The $\frac{3}{4}$ " dia. anchors shall be galvanized and shall meet the requirements of ASTM A307. Anchors shall have 8" embedment (minimum).

The material for posts, braces, and rails shall be steel pipe in accordance with article 4154.10, A, of the standard specifications. Base plates and shims shall meet the requirements of ASTM A-36. Posts, base plates, and rails shall be galvanized, after fabrication, in accordance with the requirements of ASTM A-123.

Chain link fabric, rails, and fence accessories are to be pvc coated in accordance with ASTM F 668, Class 2B. Color shall be black in accordance with astm F 934. The cost of pvc coating is to be included in the price bid for "Fence, Chain Link, Vinyl Coated".

Steel fence post assemblies shall be abrasive blast cleaned to a minimum of SSPC-SP6 "commercial blast cleaning" prior to hot-dip galvanizing. Galvanize components in accordance with ASTM A-123. Do not quench or apply chromate conversion coatings to any galvanized components that will receive powder coating. Following galvanizing, powder coat components in accordance with materials I.M. 568.

Preparation of galvanized surfaces for paint shall be in accordance with materials I.M. 568, Appendix F. Complete "paint over galvanized surface travel log" in Appendix E.

All powder coating except field touch-up shall be performed in an approved shop in accordance with materials I.M. 568.

Submit proposed preparation methods and product data for all coatings proposed for use to the Engineer for review and approval prior to powder coating. Powder coating shall match sae AMS-STD-595 color number 27038 (black).

If available, vinyl coated fence post assemblies may be substituted for powder coated components provided the material is in compliance with all other requirements listed in these plans and the standard specifications. PVC coating shall comply with ASTM F 668, class 2b and shall be black in accordance with ASTM F 934. The cost of PVC coated fence post assemblies shall be included in the price bid for "Fence, Chain Link, Vinyl Coated".

Protect all powder coated railing surfaces from damage during shipping, handling, and installation.

Following fence installation, repair any damage to the powder coated finish in accordance with the coating manufacturer's recommendations. All costs associated with powder coating shall be considered incidental to the bid item, "Fence, Chain Link, Vinyl Coated".

Special fittings shall be as specified in Article 4154.11 of the Standard Specifications, unless otherwise noted. Similar fence parts and fittings with different shapes or configurations shall not be intermingled within the project limits.

Rail members shall be cut square at all post connection locations. Cut edges shall be filled or ground smooth to remove sharp edges at corner locations. Damaged paint or vinyl coating shall be painted black to match fence.

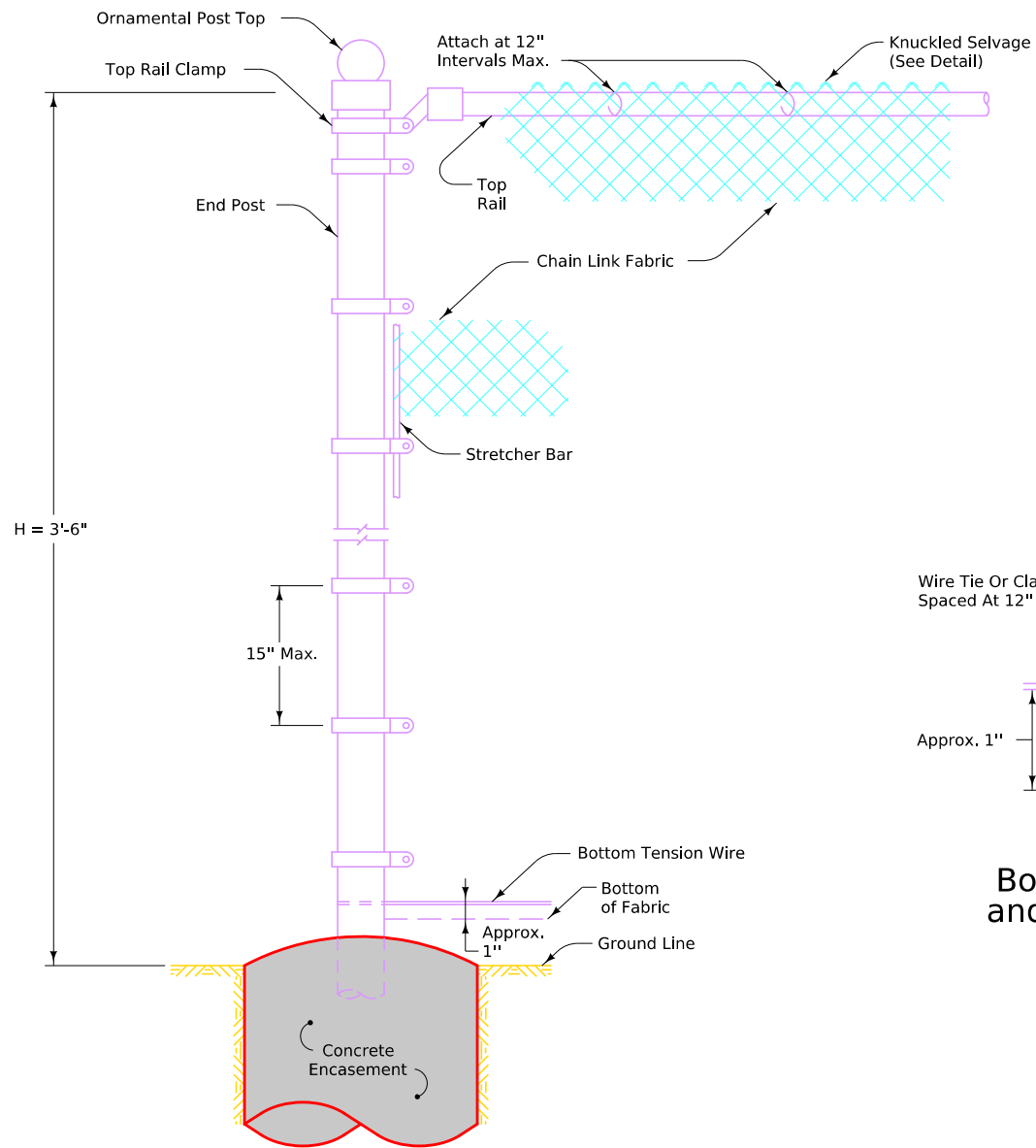
Caulk for base plates shall be black nonsag latex caulk marketed for outdoor use. No testing or certification is required. Excess caulk shall be completely removed from surrounding concrete surfaces.

The fence shall be true to line, taut, and comply with the best practice for fence construction of this type. All ends of wires shall be turned so that they extend away from the roadway side of the fence.

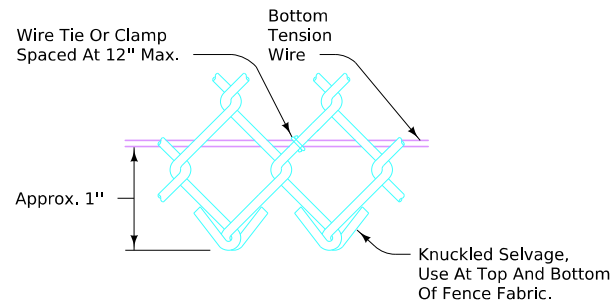
The Contractor shall submit for approval shop drawings of the fence, showing layout of posts and fabrication details of rails, bracing, anchorages, and hardware. Alternate details, if any, shall be submitted with the shop drawings.

The Contractor shall not install any nameplates or other signage on the fence.

Quantities		
Item	Units	Amount
Fence, Chain Link, Vinyl Coated	Lin. Ft.	74.0

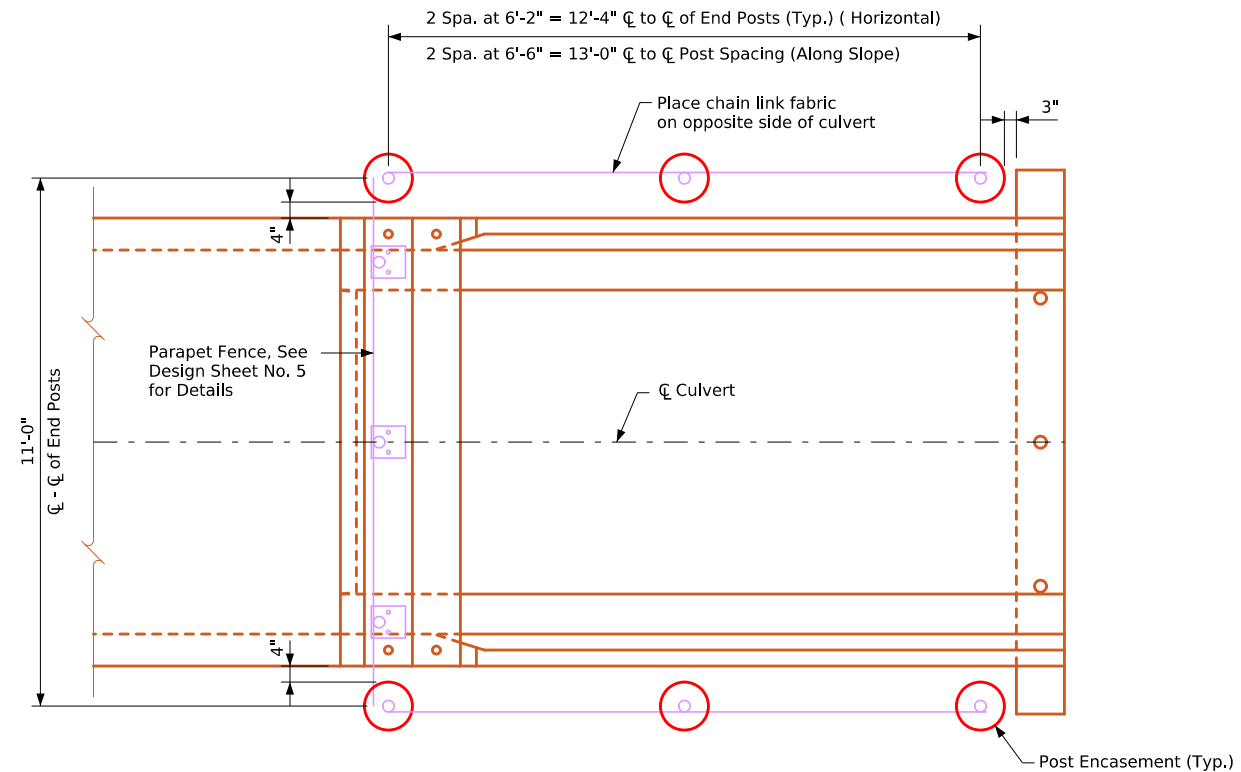


End Post Assembly

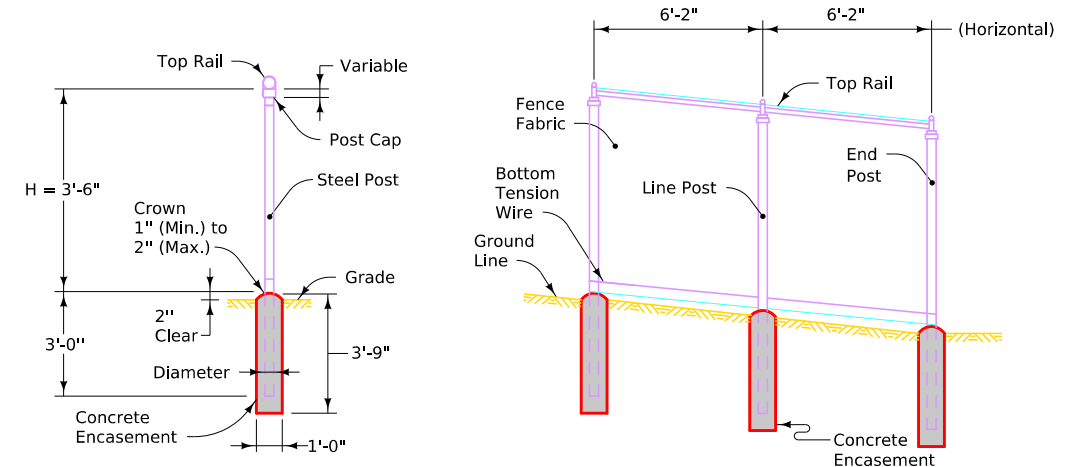


Bottom Tension Wire and Knuckled Selvage

Item	Post Size		
	Nominal Pipe Size, In.	Outside Dia, In.	Weight, Lb./Ft.
Rail	1½	1.660	2.27
Line Post	2½	2.875	5.79
End Post	2½	2.875	5.79



Ground Fence Plan View
(Reinforcement, ties, and joints not shown)



Post Installation Details

Steel Chain Link Fence Notes:

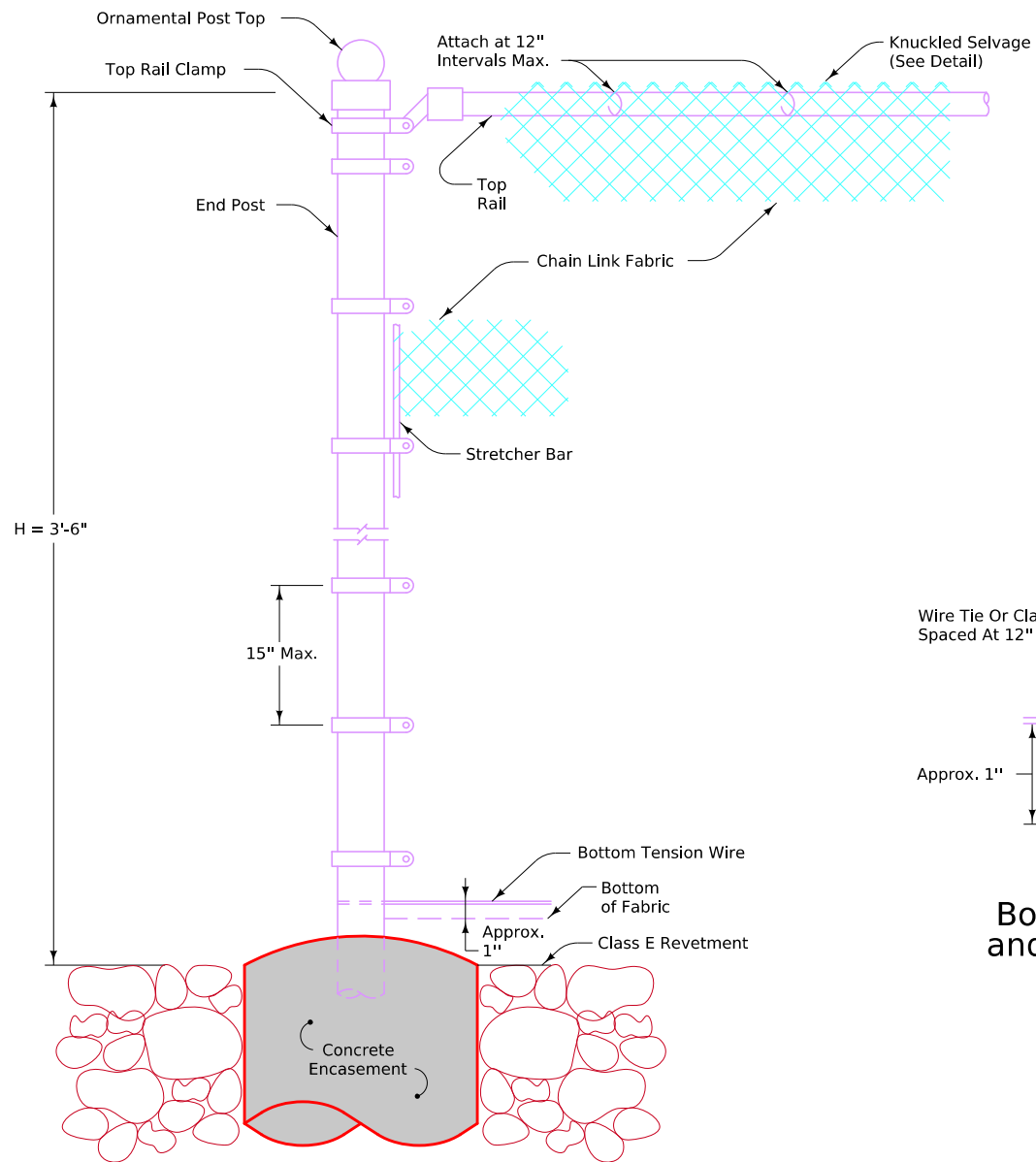
See chain link fence notes and quantity on Design Sheet No. 5 for fence details and specifications.
Attach chain link fabric to top rail, tension wire, line posts, and end posts at intervals of 12" maximum.
Connect bottom tension wire to end posts.
Secure each end of each run of fabric using a stretcher bar inserted in the final links of the fabric. Use a bar that is as long as the fabric is wide.

Design For 0 Degree Skew
8'-0" x 6'-0" x 72'-0" Reinforced Concrete Box Culvert - Precast

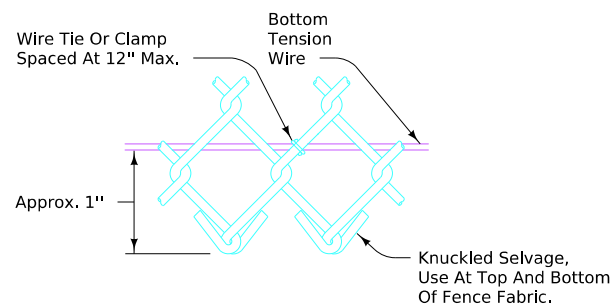
Ground Fence Details

STA. 60005+02.39 (Trail) Turn-In Date: May, 2024
Polk County
IOWA DEPARTMENT OF TRANSPORTATION
Design No. 2025 Design Sheet No. 12 of 13 FHWA/Asset 900605

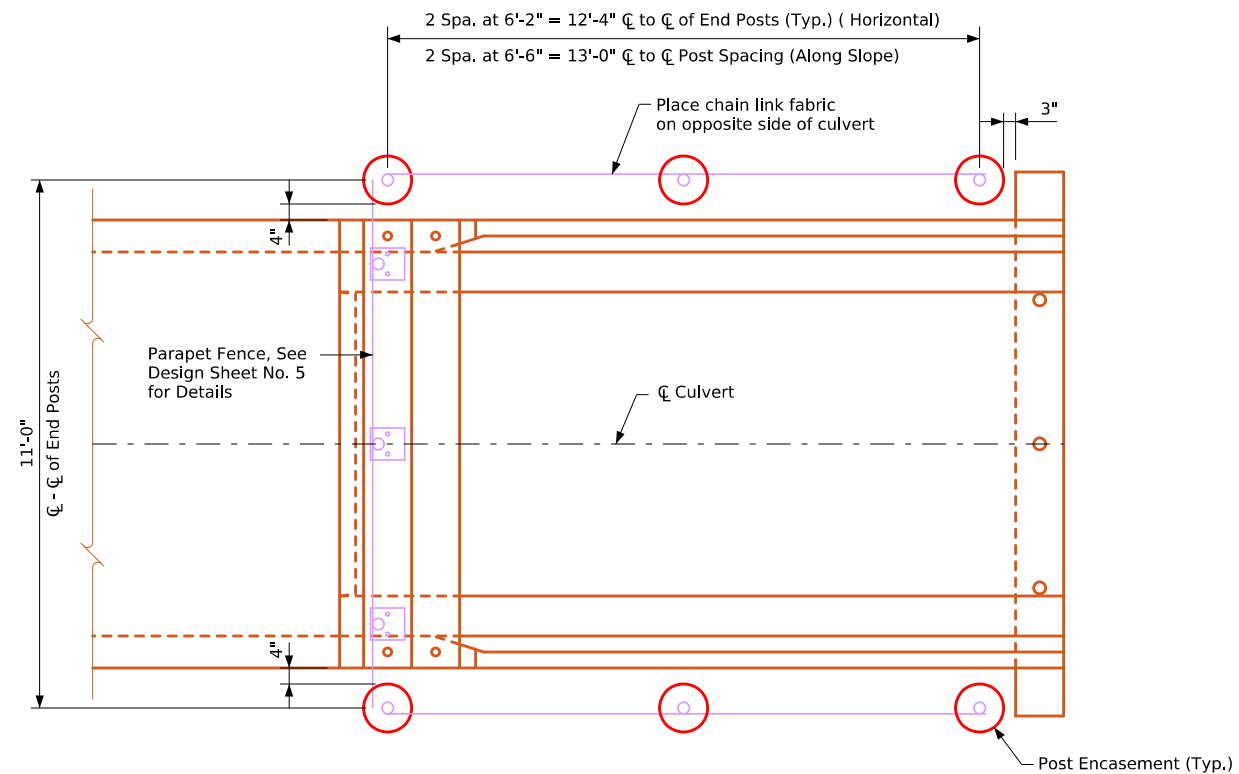




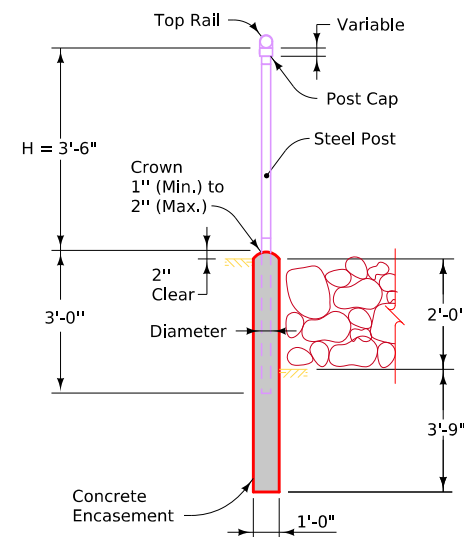
End Post Assembly



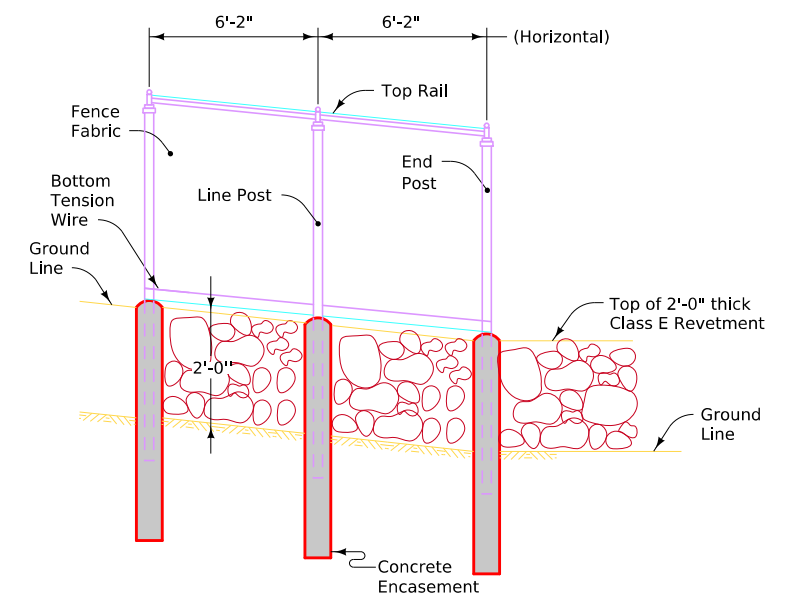
Bottom Tension Wire and Knuckled Selvage



Ground Fence Plan View
(Reinforcement, ties, and joints not shown)



Post Installation Details



Steel Chain Link Fence Notes:

See chain link fence notes and quantity on Design Sheet No. 5 for fence details and specifications.
 Attach chain link fabric to top rail, tension wire, line posts, and end posts at intervals of 12" maximum.
 Connect bottom tension wire to end posts.
 Secure each end of each run of fabric using a stretcher bar inserted in the final links of the fabric. Use a bar that is as long as the fabric is wide.

Item	Post Size		
	Nominal Pipe Size, In.	Outside Dia, In.	Weight, Lb./Ft.
Rail	1½	1.660	2.27
Line Post	2½	2.875	5.79
End Post	2½	2.875	5.79

Design For 0 Degree Skew
8'-0" x 6'-0" x 72'-0" Reinforced Concrete Box Culvert - Precast

Ground Fence Details

STA. 60005+02.39 (Trail) Turn-in Date: May, 2024

Polk County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 2025 Design Sheet No. 13 of 13 FHWA/Asset 900605



Estimate Cast-In-Place Culvert Project Quantities and Reference Notes - Design #2125

Item No.	Item Code	Item	Unit	Quantities Estimated Design No. 2125	Estimate Reference Notes
15	2402-2720000	Excavation, Class 20	CY	242.3	The excavation quantity is measured from the existing ground surface. Includes filling and compacting low areas around proposed culvert. Includes the excavation necessary to place the 1'-0" thick working blanket. Quantity should be reduced by 46.7 CY in the event that the working blanket is deleted.
16	2402-3825025	Granular Material for Blanket	CY	46.7	Includes cost of 1'-0" thick working blanket. Granular material shall be in accordance with Section 4118, Gradation No. 3 (excluding the No. 200 restriction) of the Standard Specifications. Includes 46.7 CY for a working blanket. The working blanket may be deleted if determined to be unnecessary at the time of construction. Reclaimed Asphalt Pavement (RAP) and reclaimed HMA shall not be used for the working blanket.
17	2403-0100020	Structural Concrete (RCB Culvert)	CY	88.0	Includes all resilient joint filler required.
18	2404-7775000	Reinforcing Steel	LB	12,519	----
19	2519-1001000	Fence, Chain Link, Vinyl Coated	LF	101.6	See Design Sheet Nos. 3, 4 and 5 for details. Chain link fence is 3'-6" in height. Includes cost of the concrete encasement.
20	2526-8285000	Construction Survey	LS	1.00	----
21	2533-4980005	Mobilization	LS	1.00	----

Specifications:

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.

General Notes:

It is the intent of this design to construct a 8'-0" x 6'-0" x 63'-0" reinforced concrete box culvert skewed 0° at stations 60012+13.00.

The R.C.B. culvert sections are designed for earth fills of 4-7 feet.

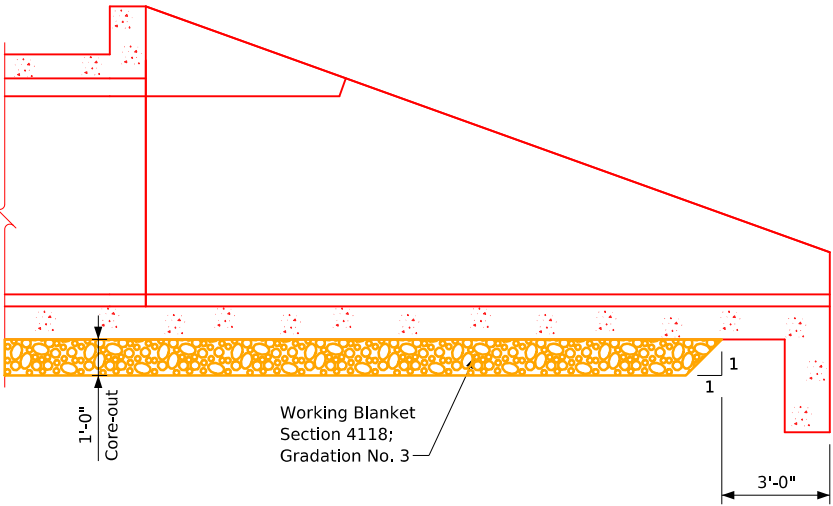
Utility companies and municipalities whose facilities are shown on the plans or known to be within the construction limits shall be notified by the Contractor of the construction starting date.

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

When de-watering presents a problem for placing the curtain walls as detailed, alternate methods such as steel sheet pile and precast concrete walls may be approved but at no additional cost. The culvert Contractor is to submit to the Engineer for approval complete drawings of the proposed curtain wall alternate before beginning construction.

Excess Class 20 Excavation material suitable for backfilling shall be stockpiled at the construction site, as directed by the Engineer.

Class 20 excavation material unsuitable for backfilling shall be disposed of in a manner that will leave the site in a neat condition.



Class 20 Excavation Limits at Headwall
(Longitudinal View)

During construction of this project the Culvert Contractor will be required to coordinate operations with those of other Contractors working within the same area. Other work in progress during the same period of time will include, but is not limited to, construction projects listed on Sheet J.1 of the Road Sheets in this plan set.

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	Chain Link Fence	77_Polk2125_ChainLinkFence.pdf	No
No.	Calculation Description	Working Drawing File Name Convention For Submittal	Certified by Iowa P.E. (Yes/No)
1			

The Pollution Prevention Plan is not included in these plans, but is included in the Grade and Pave Plans for the project IM-080-3(264)124--13-77 which is tied to the RCB culvert plans through the contract letting process.

Traffic Control Plan

The roadway will be open to thru traffic. Refer to the Traffic Control Plan Included in the tied Grade and Pave Plans, project number IM-080-3(264)124--13-77.

Roadway quantities shown elsewhere on these plans.

Standards:
For details and notes not shown refer to the following Iowa D.O.T. - Highway Standards:

Standard	Issued	Revised
PWH 0-1-20	July 2020	-----
PWH 0-2-20	July 2020	-----
PWH 0-3-20	July 2020	-----
PWH 0-4-20	July 2020	-----
PWH 0-9-20	July 2020	-----
RCB G2-20	July 2020	-----
RCB G3-20	July 2020	-----
RCB 8-6-20	July 2020	-----

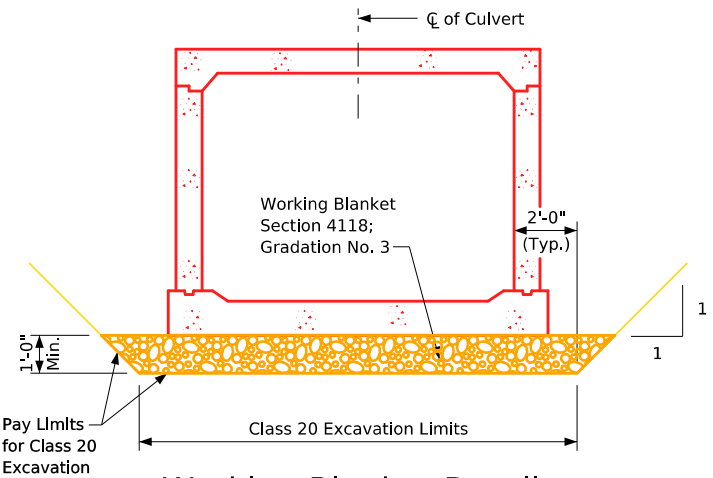
Summary of Reinforcing Steel

Location	Quantity	Total
8' X 6' Headwall 0° Skew	2 @ 2,324	4,648
17'-0" End Section	2 @ 2,106	4,212
29'-0" Barrel Section	1 @ 3,593	3,593
5r1 x 3'-6" Dowel Bars	2 @ 33	66
Total (LB)		12,519

Concrete Placement Quantities

Location	Footing	Walls	Slab	Total
8' X 6' Headwall 0° Skew	2 @ 8.9	2 @ 4.8	* 2 @ 1.2	29.8
17'-0" End Section	2 @ 5.9	2 @ 5.3	2 @ 4.5	31.4
29'-0" Barrel Section	1 @ 10.0	1 @ 9.1	1 @ 7.7	26.8
Total (CY)	39.6	29.3	19.1	88.0

* Includes parapet and top of wingwall.



Working Blanket Detail

Granular material shall terminate 3'-0" short of the outside face of each curtain wall.

Design For 0 Degree Skew
8'-0" x 6'-0" x 63'-0" Reinforced
Concrete Box Culvert - C.I.P.

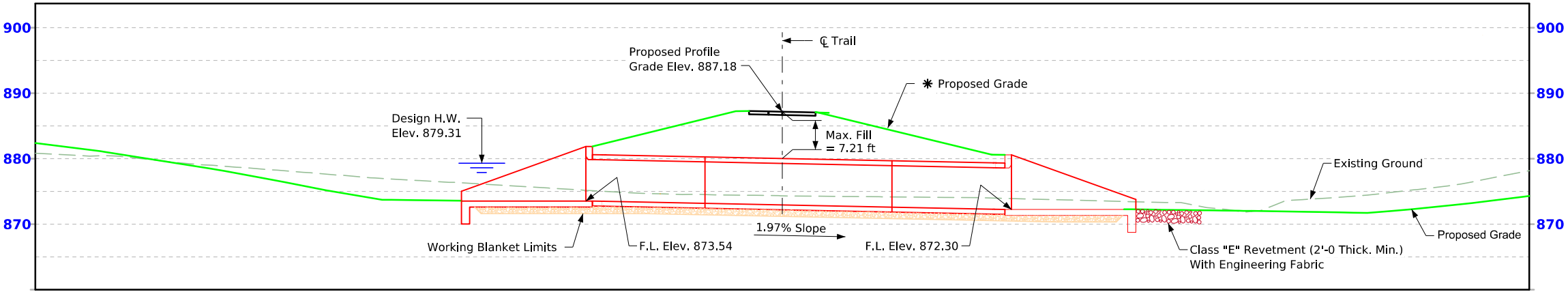
Estimated Quantities/General Notes

STA. 60012+13.00 (Trail) Turn-In Date: May, 2024

Polk County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 2125 Design Sheet No. 1 of 13 FHWA/Asset 900600



Anticipated Settlement is negligible

Longitudinal Section Along Centerline of Culvert

(Developed Elevation Along Centerline of Culvert)

* Refer to Roadway Plans for Proposed Grade Slopes

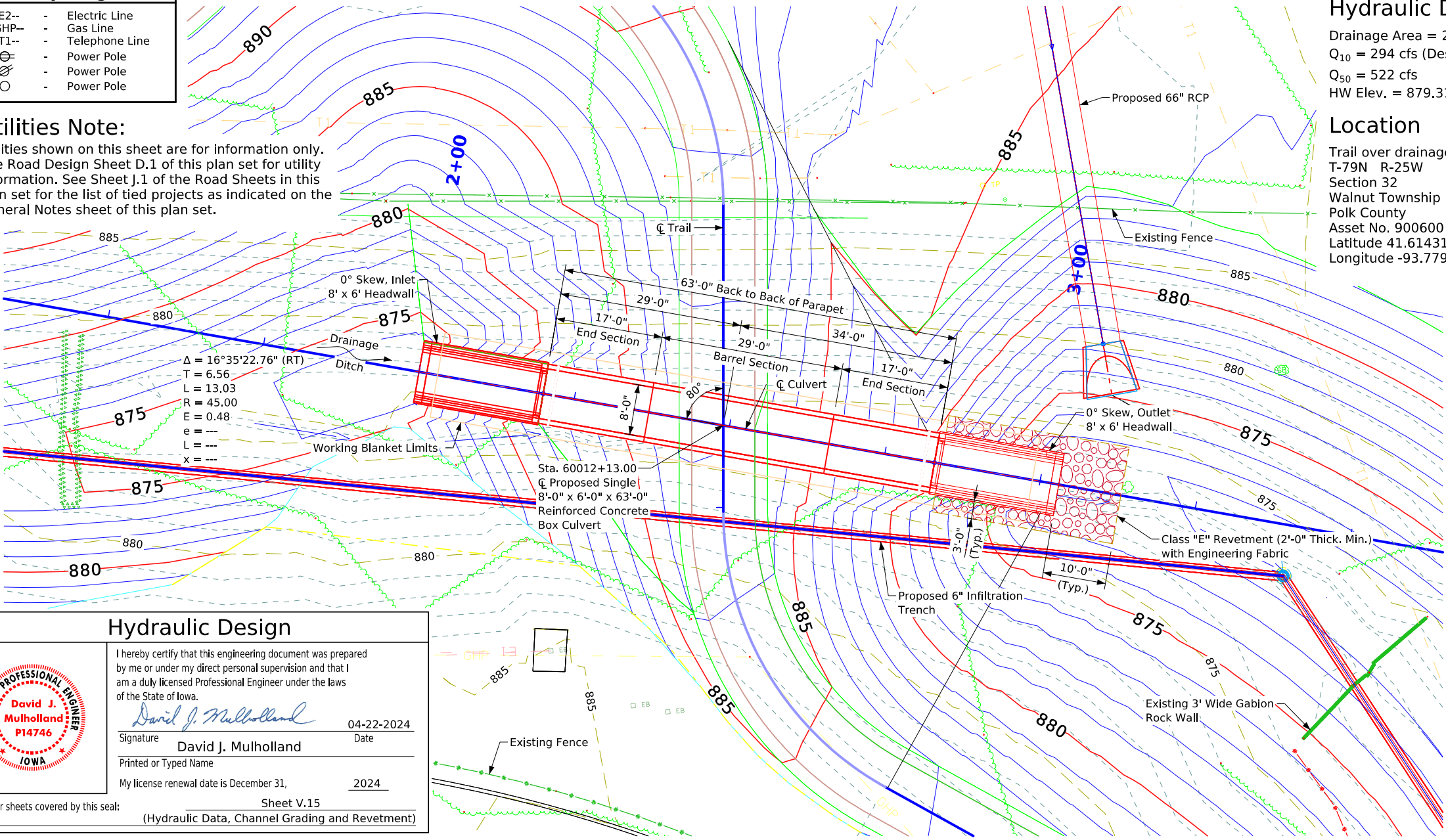
Design Fill Height = 4'-7"
NBIS Structure Length = 8.5'

Utility Legend

- E2- Electric Line
- GHP- Gas Line
- T1- Telephone Line
- ⊙ Power Pole
- ⊙ Power Pole
- ⊙ Power Pole

Utilities Note:

Utilities shown on this sheet are for information only. See Road Design Sheet D.1 of this plan set for utility information. See Sheet J.1 of the Road Sheets in this plan set for the list of tied projects as indicated on the General Notes sheet of this plan set.



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: *David J. Mulholland* Date: 04-22-2024
Printed or Typed Name: David J. Mulholland
My license renewal date is December 31, 2024

Pages or sheets covered by this seal: Sheet V.15 (Hydraulic Data, Channel Grading and Revetment)



Situation Plan

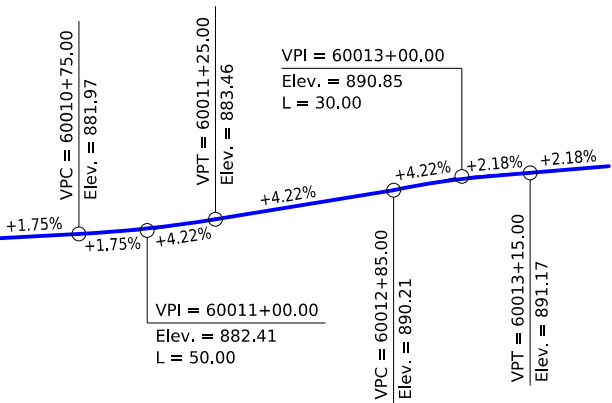
Hydraulic Data

Drainage Area = 243 Acres
Q₁₀ = 294 cfs (Design)
Q₅₀ = 522 cfs
HW Elev. = 879.31 (Design)

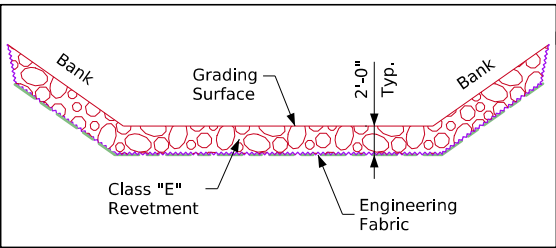
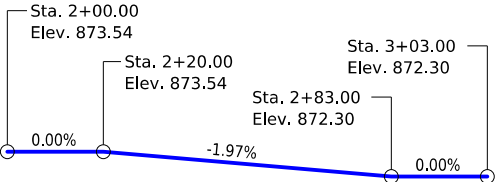
Location

Trail over drainage ditch
T-79N R-25W
Section 32
Walnut Township
Polk County
Asset No. 900600
Latitude 41.614319°
Longitude -93.779810°

Proposed Profile Grade on Trail



Proposed Profile Grade on Centerline of Culvert



Typical Channel Protection

Estimated Revetment Quantities Included With Road Plans

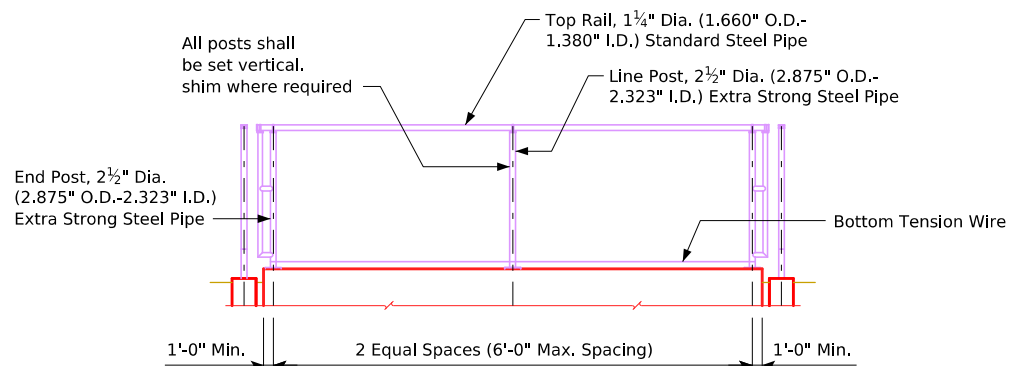
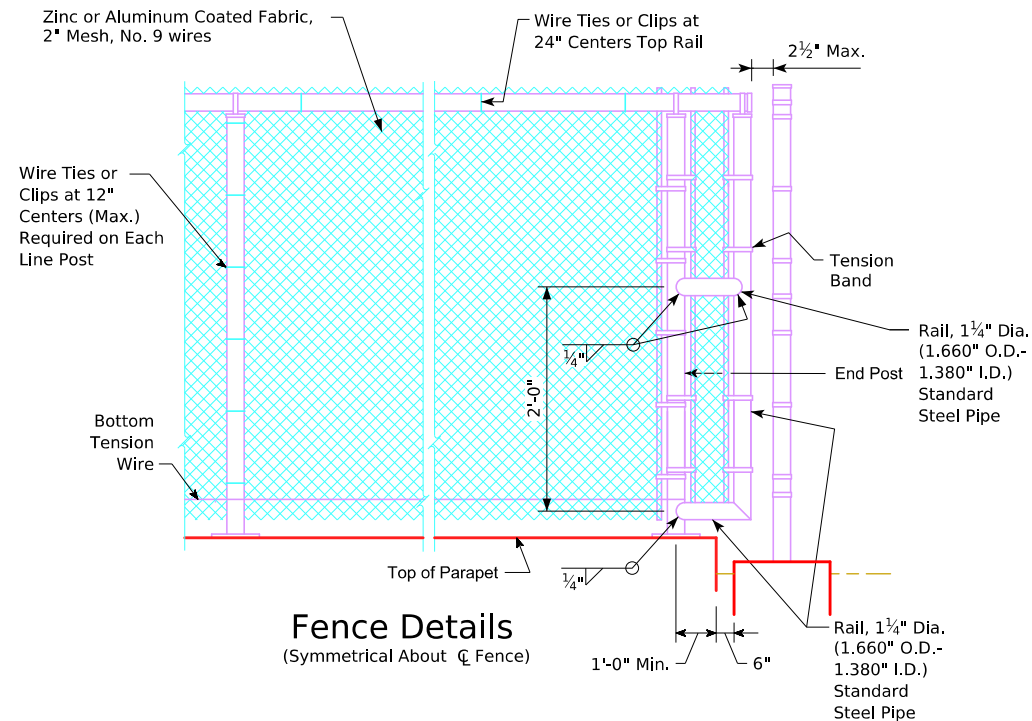
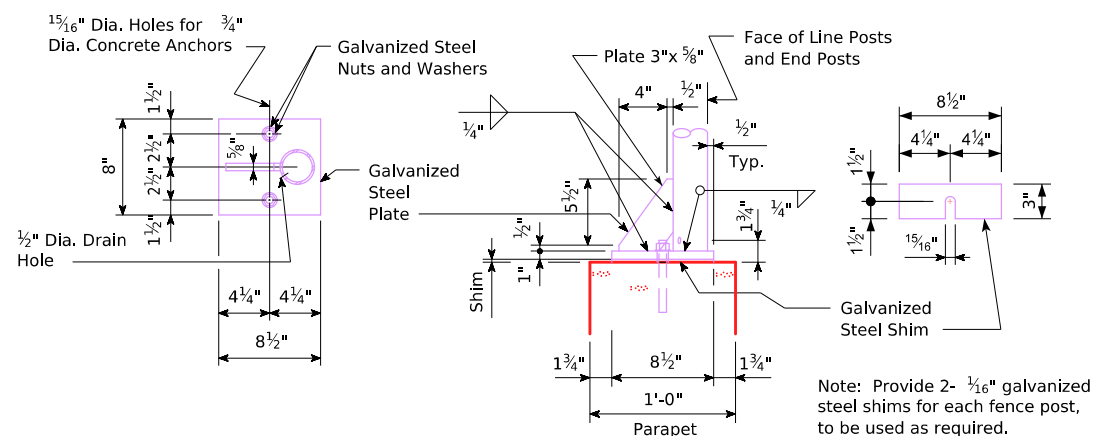
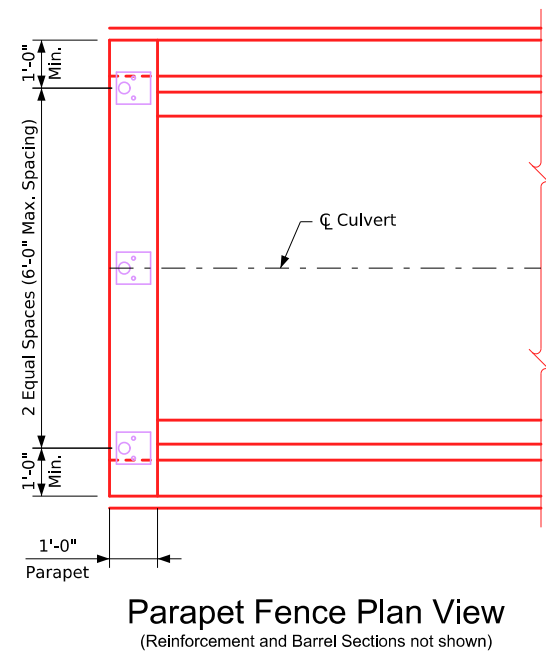
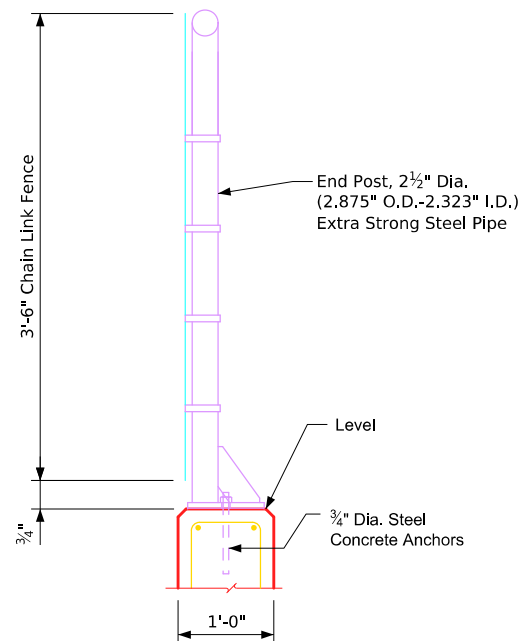
Location	Revetment Class "E" (Ton)	Engineering Fabric (SY)	CL. 10 Channel Excavation (CY)
Inlet	---	---	---
Outlet	33.6	60.3	21.0
Totals	33.6	60.3	21.0

Excavation quantity is calculated from grading surface. Excavation quantity is for embedded revetment core out only, and does not include excavation to the grading surface. Excavation quantity to the grading surface is determined by Road Design and is included in the Road Plans of the tied projects listed on Sheet J.1 of the Road Sheets in this plan set. Quantities shown on this sheet are for information only. See Sheet J.1 of the Road Sheets in this plan set for the list of tied projects as indicated on the General Notes sheet of this plan set.

Design For 0 Degree Skew
8'-0" x 6'-0" x 63'-0" Reinforced Concrete Box Culvert - C.I.P.

Situation Plan

STA. 60012+13.00 (Trail) Turn-In Date: May, 2024
Polk County
IOWA DEPARTMENT OF TRANSPORTATION
Design No. 2125 Design Sheet No. 2 of 13 FHWA/Asset 900600



Steel Chain Link Fence Notes:

The chain link fence is to be bid on a linear foot basis measured from $\mathbb{C}$ to $\mathbb{C}$ of end posts. The price bid for "Fence, Chain Link, Vinyl Coated" 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 on the precast parapet and in the ground along the precast headwalls in accordance with these plans and specifications.

The chain link fence shall be either zinc (ASTM A392) or aluminum (ASTM A491) coated fabric, 2" mesh, No. 9 wires, 3'-6" height with knuckled selvages top and bottom.

The concrete anchors shall be drilled and grouted in place. the adhesive materials shall be in accordance with Iowa DOT I.M. 491.11. The ¾" dia. anchors shall be galvanized and shall meet the requirements of ASTM A307. Anchors shall have 8" embedment (minimum).

The material for posts, braces, and rails shall be steel pipe in accordance with article 4154.10, A, of the standard specifications. Base plates and shims shall meet the requirements of ASTM A-36. Posts, base plates, and rails shall be galvanized, after fabrication, in accordance with the requirements of ASTM A-123.

Chain link fabric, rails, and fence accessories are to be PVC coated in accordance with ASTM F 668, Class 2B. Color shall be black in accordance with ASTM F 934. The cost of PVC coating is to be included in the price bid for "Fence, Chain Link, Vinyl Coated".

Steel fence post assemblies shall be abrasive blast cleaned to a minimum of SSPC-SP6 "commercial blast cleaning" prior to hot-dip galvanizing. Galvanize components in accordance with ASTM A-123. Do not quench or apply chromate conversion coatings to any galvanized components that will receive powder coating. Following galvanizing, powder coat components in accordance with materials I,M, 568.

Preparation of galvanized surfaces for paint shall be in accordance with materials I.M. 568, Appendix F. Complete "paint over galvanized surface travel log" in Appendix E.

All powder coating except field touch-up shall be performed in an approved shop in accordance with materials I.M. 568.

Submit proposed preparation methods and product data for all coatings proposed for use to the Engineer for review and approval prior to powder coating. Powder coating shall match sae AMS-STD-595 color number 27038 (black).

If available, vinyl coated fence post assemblies may be substituted for powder coated components provided the material is in compliance with all other requirements listed in these plans and the standard specifications. PVC coating shall comply with ASTM F 668, class 2B and shall be black in accordance with ASTM F 934. The cost of PVC coated fence post assemblies shall be included in the price bid for "Fence, Chain Link, Vinyl Coated".

Protect all powder coated railing surfaces from damage during shipping, handling, and installation.

Following fence installation, repair any damage to the powder coated finish in accordance with the coating manufacturer's recommendations. All costs associated with powder coating shall be considered incidental to the bid item, "Fence, Chain Link, Vinyl Coated".

Special fittings shall be as specified in Article 4154.11 of the Standard Specifications, unless otherwise noted. Similar fence parts and fittings with different shapes or configurations shall not be intermingled within the project limits.

Rail members shall be cut square at all post connection locations. Cut edges shall be filled or ground smooth to remove sharp edges at corner locations. Damaged paint or vinyl coating shall be painted black to match fence.

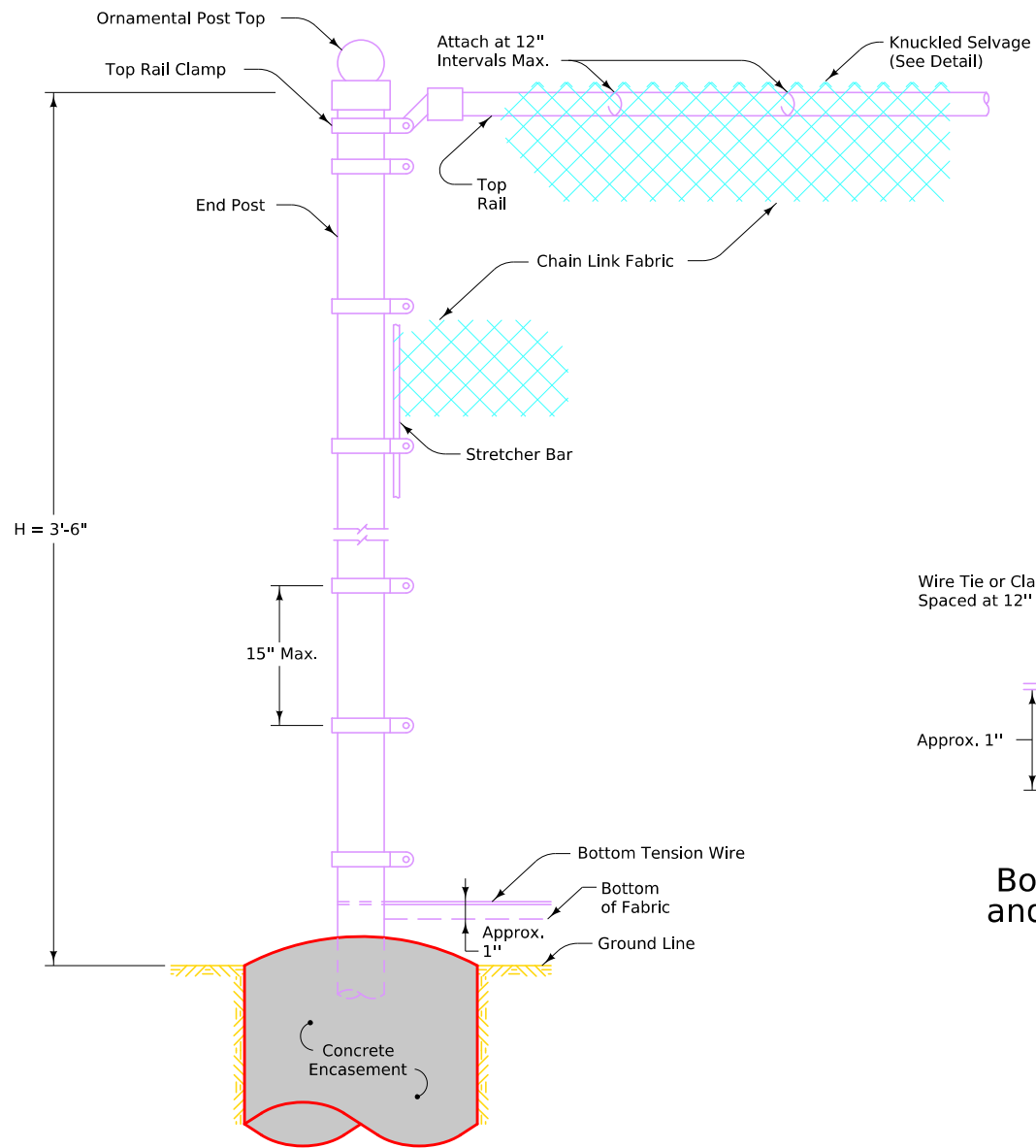
Caulk for base plates shall be black nonsag latex caulk marketed for outdoor use. No testing or certification is required. Excess caulk shall be completely removed from surrounding concrete surfaces.

The fence shall be true to line, taut, and comply with the best practice for fence construction of this type. All ends of wires shall be turned so that they extend away from the roadway side of the fence.

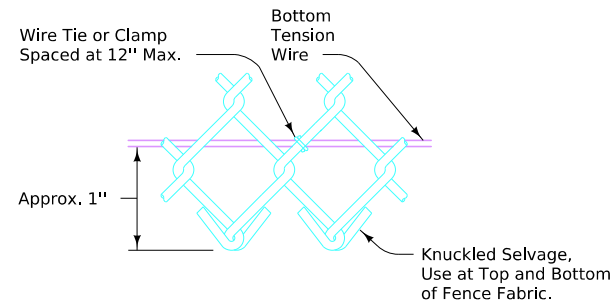
The Contractor shall submit for approval shop drawings of the fence, showing layout of posts and fabrication details of rails, bracing, anchorages, and hardware. Alternate details, if any, shall be submitted with the shop drawings.

The Contractor shall not install any nameplates or other signage on the fence.

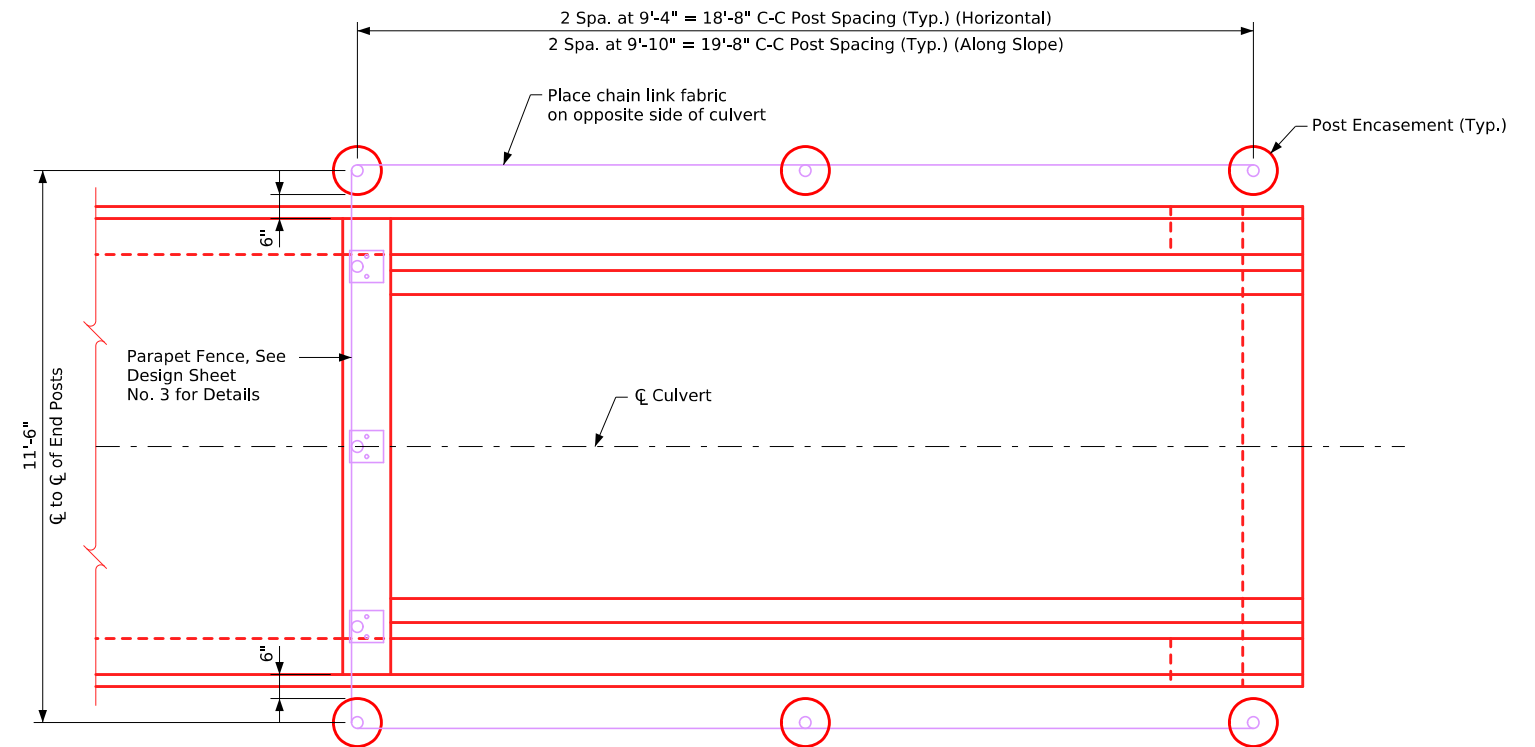
Quantities		
Item	Units	Amount
Fence, Chain Link, Vinyl Coated	Lin. Ft.	101.6



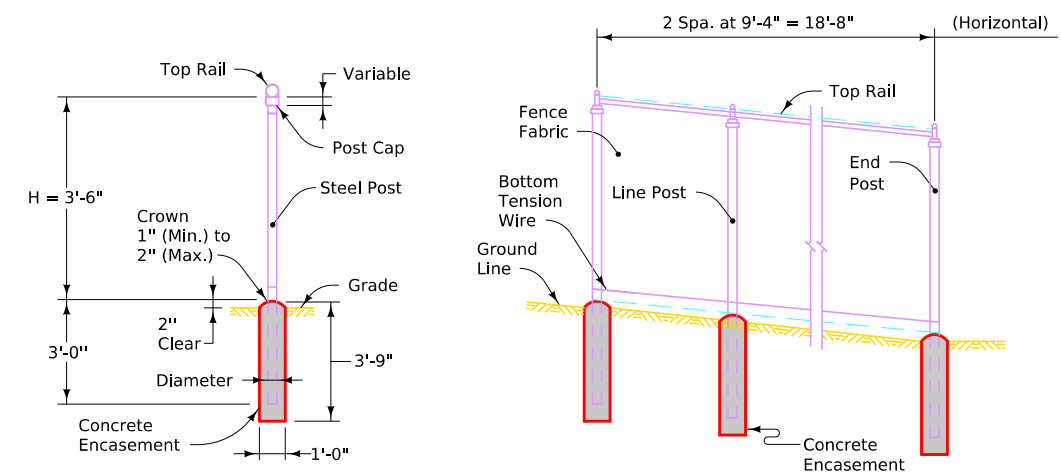
End Post Assembly



Bottom Tension Wire and Knuckled Selvage



Ground Fence Plan View
(Reinforcement not shown)



Post Installation Details

Steel Chain Link Fence Notes:

See chain link fence notes and quantity on Design Sheet No. 3 for fence details and specifications.
Attach chain link fabric to top rail, tension wire, line posts, and end posts at intervals of 12" maximum.
Connect bottom tension wire to end posts.
Secure each end of each run of fabric using a stretcher bar inserted in the final links of the fabric. Use a bar that is as long as the fabric is wide.

Item	Post Size		
	Nominal Pipe Size, In.	Outside Dia, In.	Weight, Lb./Ft.
Rail	1½	1.660	2.27
Line Post	2½	2.875	5.79
End Post	2½	2.875	5.79

Design For 0 Degree Skew
8'-0" x 6'-0" x 63'-0" Reinforced Concrete Box Culvert - C.I.P.

Ground Fence Details

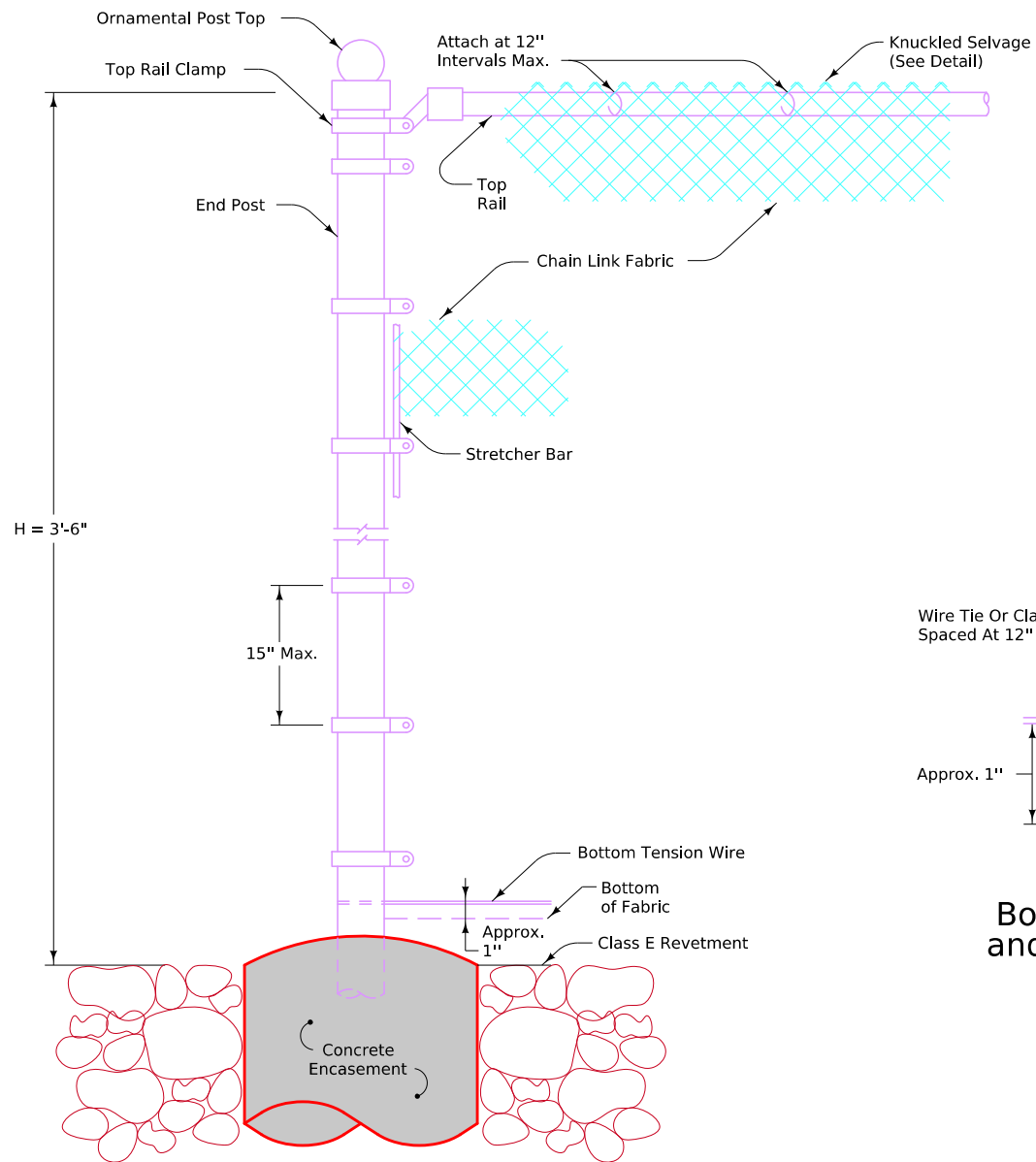
STA. 60012+13.00 (Trail) Turn-In Date: May, 2024

Polk County

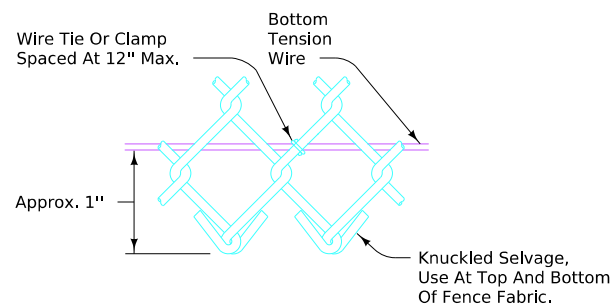
IOWA DEPARTMENT OF TRANSPORTATION

Design No. 2125 Design Sheet No. 4 of 13 FHWA/Asset 900600



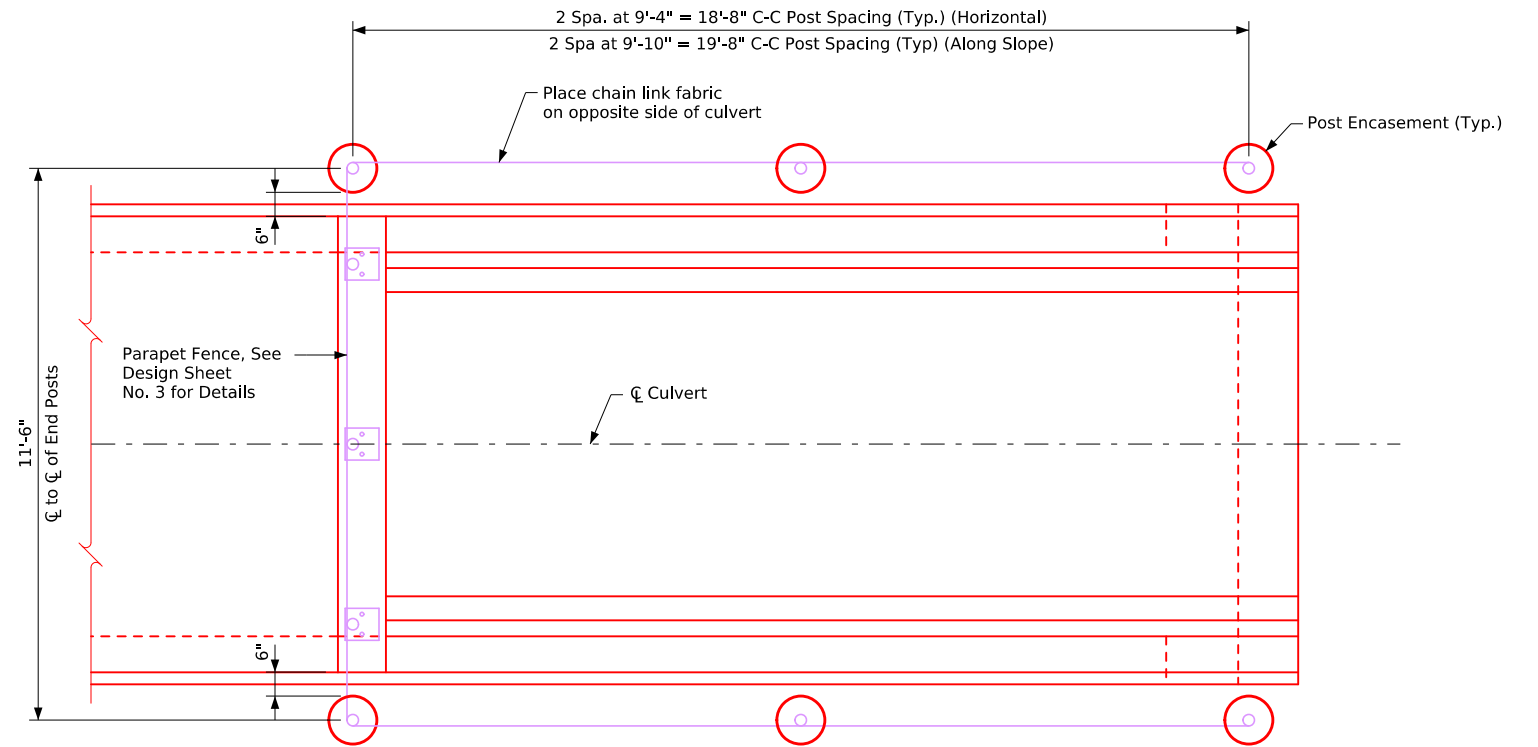


End Post Assembly

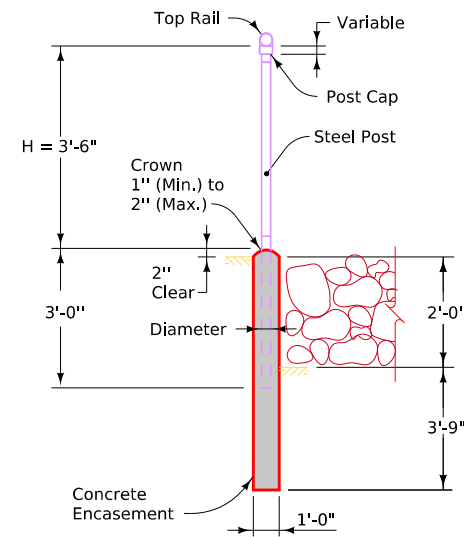


Bottom Tension Wire and Knuckled Selvage

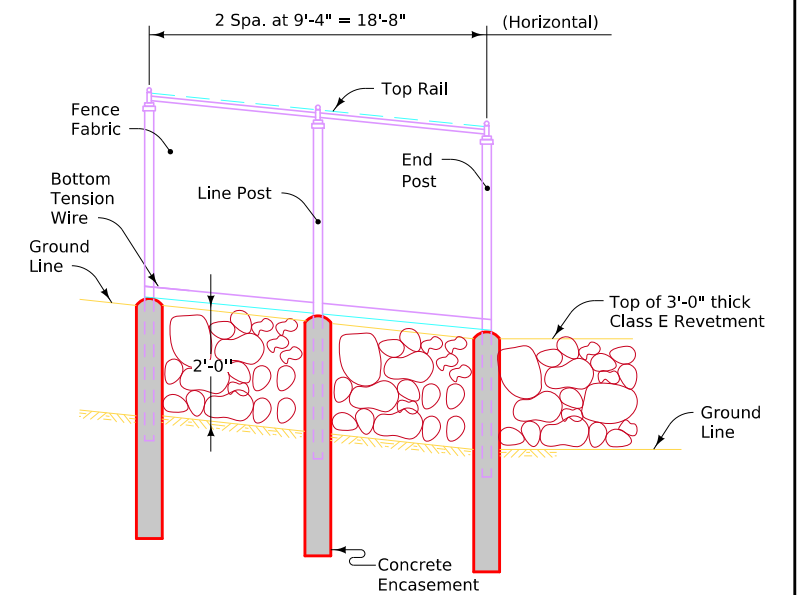
Item	Post Size		
	Nominal Pipe Size, In.	Outside Dia, In.	Weight, Lb./Ft.
Rail	1½	1.660	2.27
Line Post	2½	2.875	5.79
End Post	2½	2.875	5.79



Ground Fence Plan View
(Reinforcement not shown)



Post Installation Details



Steel Chain Link Fence Notes:

See chain link fence notes and quantity on Design Sheet No. 3 for fence details and specifications.
Attach chain link fabric to top rail, tension wire, line posts, and end posts at intervals of 12" maximum.
Connect bottom tension wire to end posts.
Secure each end of each run of fabric using a stretcher bar inserted in the final links of the fabric. Use a bar that is as long as the fabric is wide.

Design For 0 Degree Skew
8'-0" x 6'-0" x 63'-0" Reinforced Concrete Box Culvert - C.I.P.

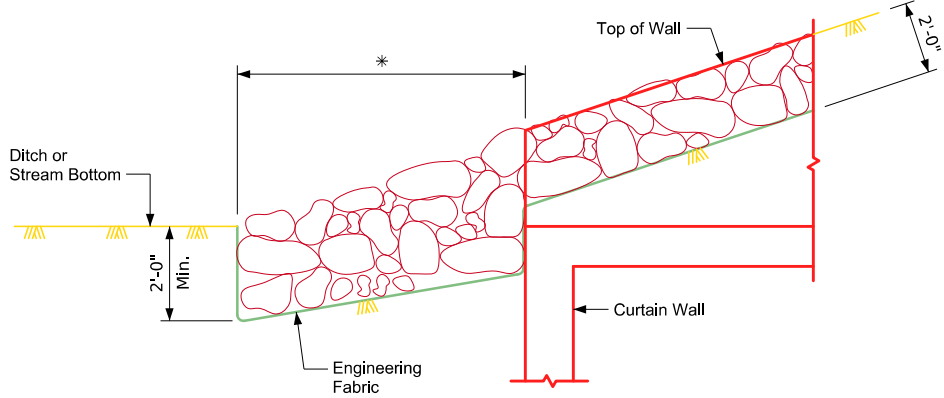
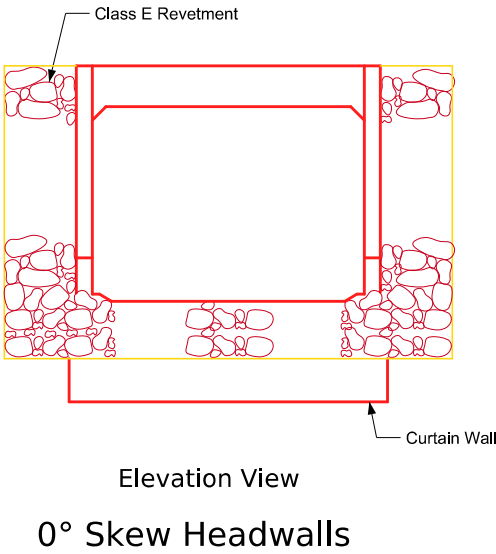
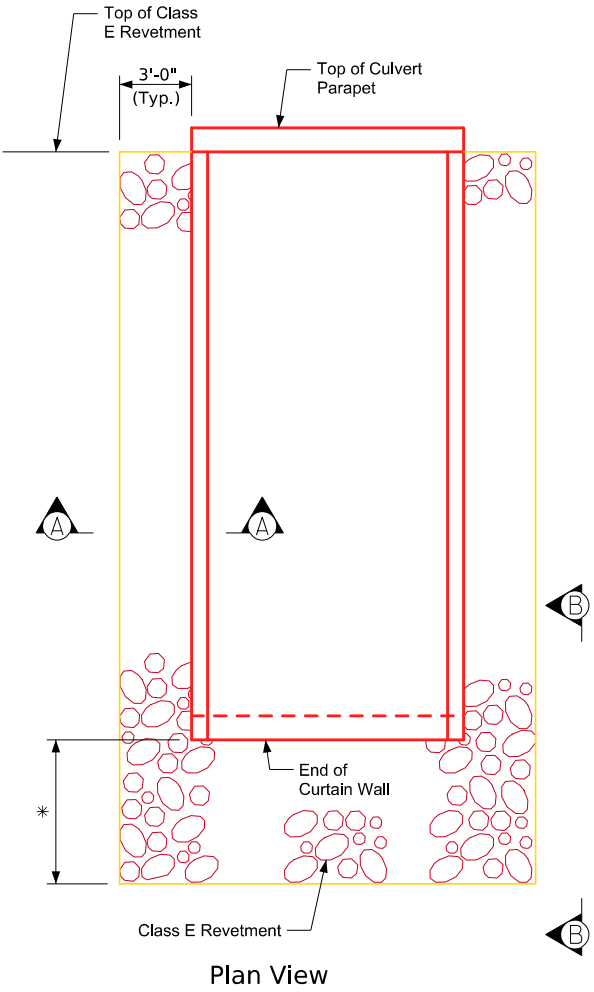
Ground Fence Details

STA. 60012+13.00 (Trail) Turn-in Date: May, 2024
Polk County
IOWA DEPARTMENT OF TRANSPORTATION
Design No. 2125 Design Sheet No. 5 of 13 FHWA/Asset 900600

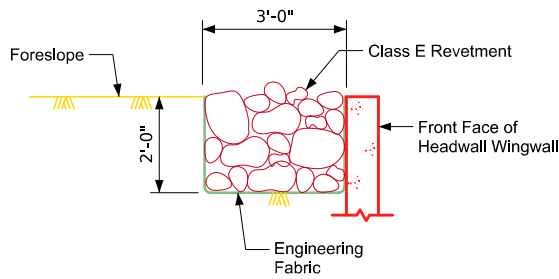


REVISED 1-2016 - ADDED NOTE "SEE CULVERT PLANS FOR LIMITS OF REVETMENT AND ENGINEERING FABRIC."
REVISED 02-2017 - ADDED SECTION DIRECTORS "A-A" TO ZERO SKEW PLAN VIEW DETAIL.
REVISION 01-2021 - CHANGED DESIGN SPECIFICATIONS TO AASHTO LRFD 8TH ED.
ENGLISH SINGLE CULVERTS.DGN - 1092 - THIS SHEET ISSUED 04-12.

* = See Design Sheet No. 2 for limits of
revetment and engineering fabric.



View B-B



Section A-A

Typical Details

Construction Notes:

Class E Revetment shall be used and placed according to Article 2507.03, of the Standard Specifications. The engineering fabric shall meet the material requirements in accordance with Article 4196.01,B,3, of the Standard Specifications.

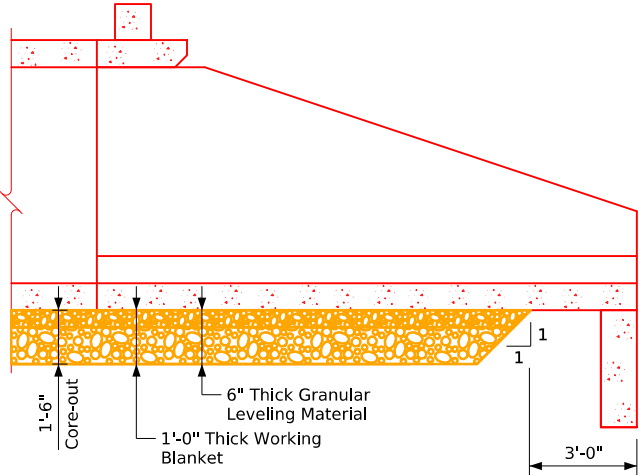
All associated quantities of revetment protection are included in the table of Estimated Revetment Quantities in Design Sheet No. 2.

Design For 0 Degree Skew
**8'-0" x 6'-0" x 63'-0" Reinforced
Concrete Box Culvert - C.I.P.**
Revetment Protection Details
STA. 60012+13.00 (Trail) Turn-In Date: May, 2024
Polk County
IOWA DEPARTMENT OF TRANSPORTATION
Design No. 2125 Design Sheet No. 6 of 13 FHWA/Asset 900600



Estimate Precast Culvert Quantities and Reference Notes Design #2125 - Alternate					
Item No.	Item Code	Item	Unit	Quantities Estimated Design No. 2125	Estimate Reference Notes
22	2402-2720000	Excavation, Class 20	CY	274.6	The excavation quantity is measured from the existing ground surface. Includes filling and compacting low areas around proposed culvert. Includes the excavation necessary to place the 1'-0" thick working blanket. Quantity should be reduced by 46.7 CY in the event that the working blanket is deleted.
23	2402-3825025	Granular Material for Blanket	CY	46.7	Includes cost of 1'-0" thick working blanket. Granular material shall be in accordance with Section 4118, Gradation No. 3 (excluding the No. 200 restriction) of the Standard Specifications. Includes 46.7 CY for a working blanket. The working blanket may be deleted if determined to be unnecessary at the time of construction. Reclaimed Asphalt Pavement (RAP) and reclaimed HMA shall not be used for the working blanket.
24	2415-2110806	Precast Concrete Box Culvert 8 Ft. x 6 Ft.	LF	71.0	Includes material and labor associated with providing and installing the culvert ties, lifting hole plugs, engineering fabric, granular leveling material, joint material, and grout as required.
25	2415-2200806	Precast Concrete Box Culvert Straight End Section, 8 Ft. x 6 Ft.	EA	2	Includes material and labor associated with providing and installing the culvert ties, lifting hole plugs, engineering fabric, granular leveling material, joint material, and grout as required. Includes 0° skew, 2 precast end sections, 2 precast lintel beams, and 2 precast curtain walls.
26	2519-1001000	Fence, Chain Link, Vinyl Coated	LF	74.0	See Design Sheet Nos. 5, 6 and 7 for details. Chain link fence is 3'-6" in height. Includes cost of concrete encasement.
27	2526-8285000	Construction Survey	LS	1.00	----
28	2533-4980005	Mobilization	LS	1.00	----

Roadway quantities shown elsewhere on these plans.



Class 20 Excavation Limits at Headwall
(Longitudinal View)

Note: See Design Sheet No. 8 for the Granular Leveling Material Detail.



Design For 0 Degree Skew

8'-0" x 6'-0" x 63'-0" Reinforced Concrete Box Culvert - Precast

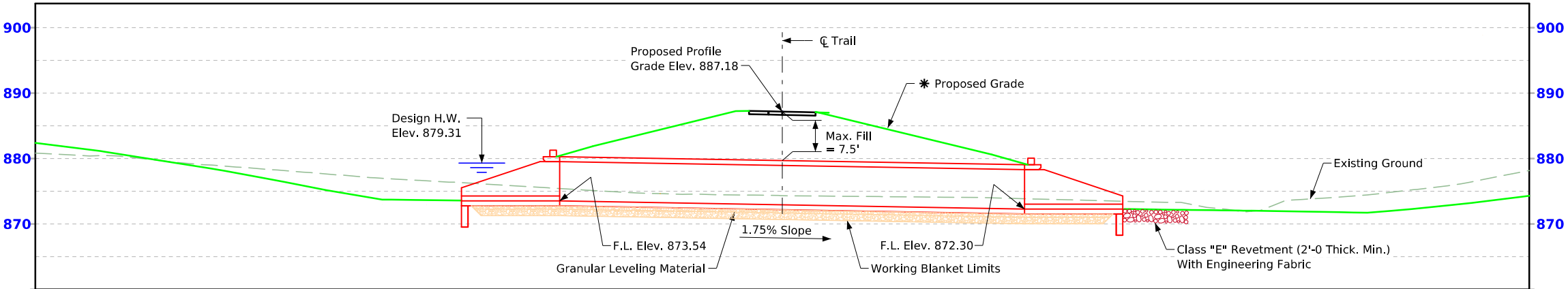
Estimated Quantities

STA. 60012+13.00 (Trail) Turn-In Date: May, 2024

Polk County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 2125 Design Sheet No. 7 of 13 FHWA/Asset 900600



Longitudinal Section Along Centerline of Culvert

(Developed Elevation Along Centerline of Culvert)

* Refer to Roadway Plans for Proposed Grade Slopes

Design Fill Height = 7.5'
NBIS Structure Length = 8.5'

Utility Legend

- E2- Electric Line
- GHP- Gas Line
- T1- Telephone Line
- Power Pole
- Power Pole
- Power Pole

Utilities Note:

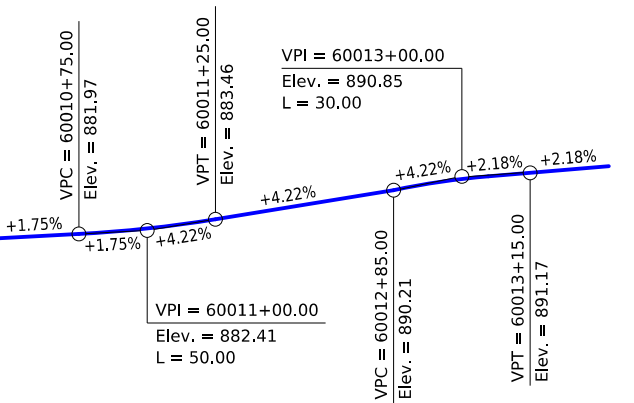
Utilities shown on this sheet are for information only. See Road Design Sheet D.1 of this plan set for utility information. See Sheet J.1 of the Road Sheets in this plan set for the list of tied projects as indicated on the General Notes sheet of this plan set.

Hydraulic Data

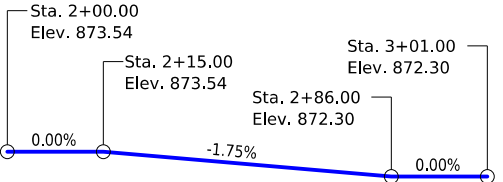
Drainage Area = 243 Acres
 Q_{10} = 294 cfs (Design)
 Q_{50} = 522 cfs
HW Elev. = 879.31 (Design)

Location

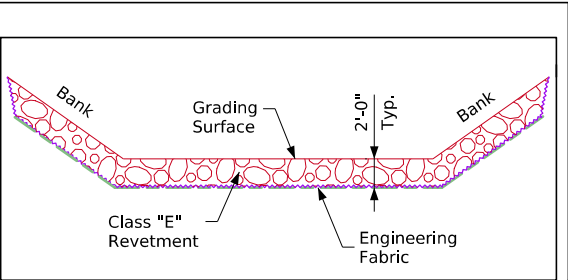
Trail over drainage ditch
T-79N R-25W
Section 32
Walnut Township
Polk County
Asset No. 900600
Latitude 41.614319°
Longitude -93.779810°



Proposed Profile Grade on Trail



Proposed Profile Grade on Centerline of Culvert



Typical Channel Protection

Estimated Revetment Quantities Included With Road Plans

Location	Revetment Class "E" (Ton)	Engineering Fabric (SY)	CL. 10 Channel Excavation (CY)
Inlet	---	---	---
Outlet	33.6	60.3	21.0
Totals	33.6	60.3	21.0

Excavation quantity is calculated from grading surface. Excavation quantity is for embedded revetment core out only, and does not include excavation to the grading surface. Excavation quantity to the grading surface is determined by Road Design and is included in the Road Plans of the tied projects listed on Sheet J.1 of the Road Sheets in this plan set. Quantities shown on this sheet are for information only. See Sheet J.1 of the Road Sheets in this plan set for the list of tied projects as indicated on the General Notes sheet of this plan set.

Hydraulic Design

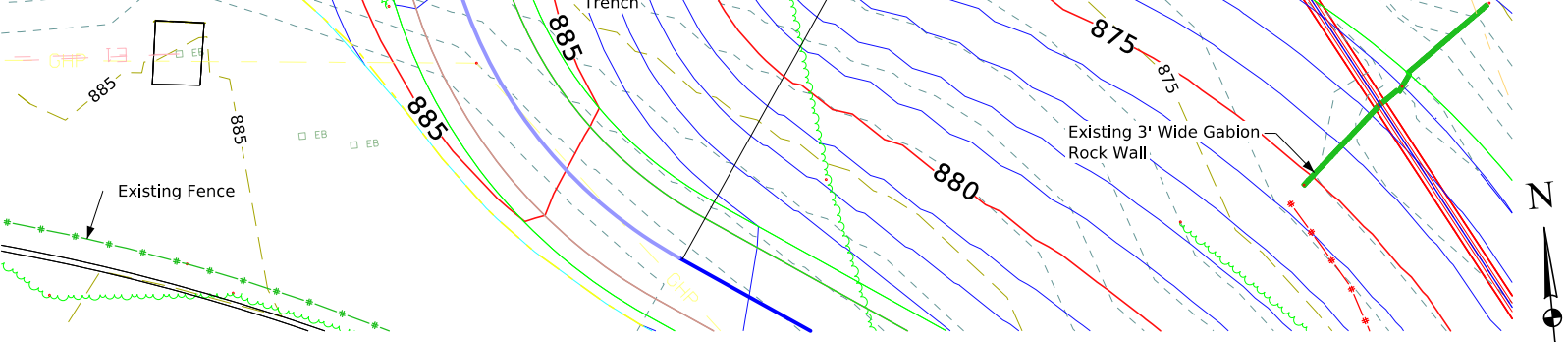
I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Iowa.

Signature: David J. Mulholland
Printed or Typed Name: David J. Mulholland
My license renewal date is December 31, 2024

Pages or sheets covered by this seal: Sheet V.22 (Hydraulic Data, Channel Grading and Revetment)



Situation Plan

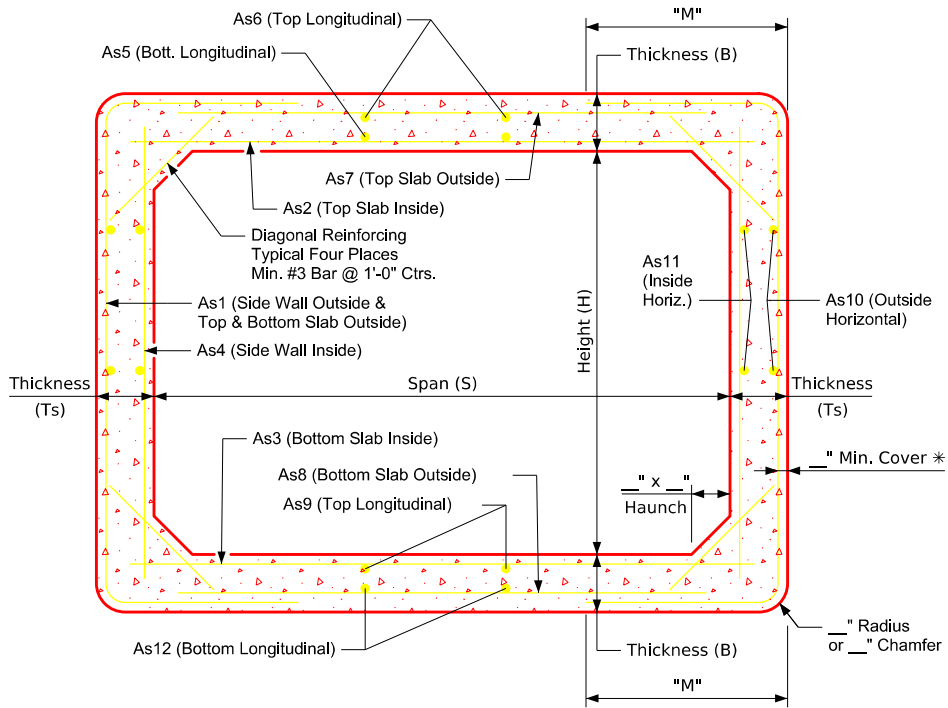


Design For 0 Degree Skew
8'-0" x 6'-0" x 63'-0" Reinforced Concrete Box Culvert - Precast

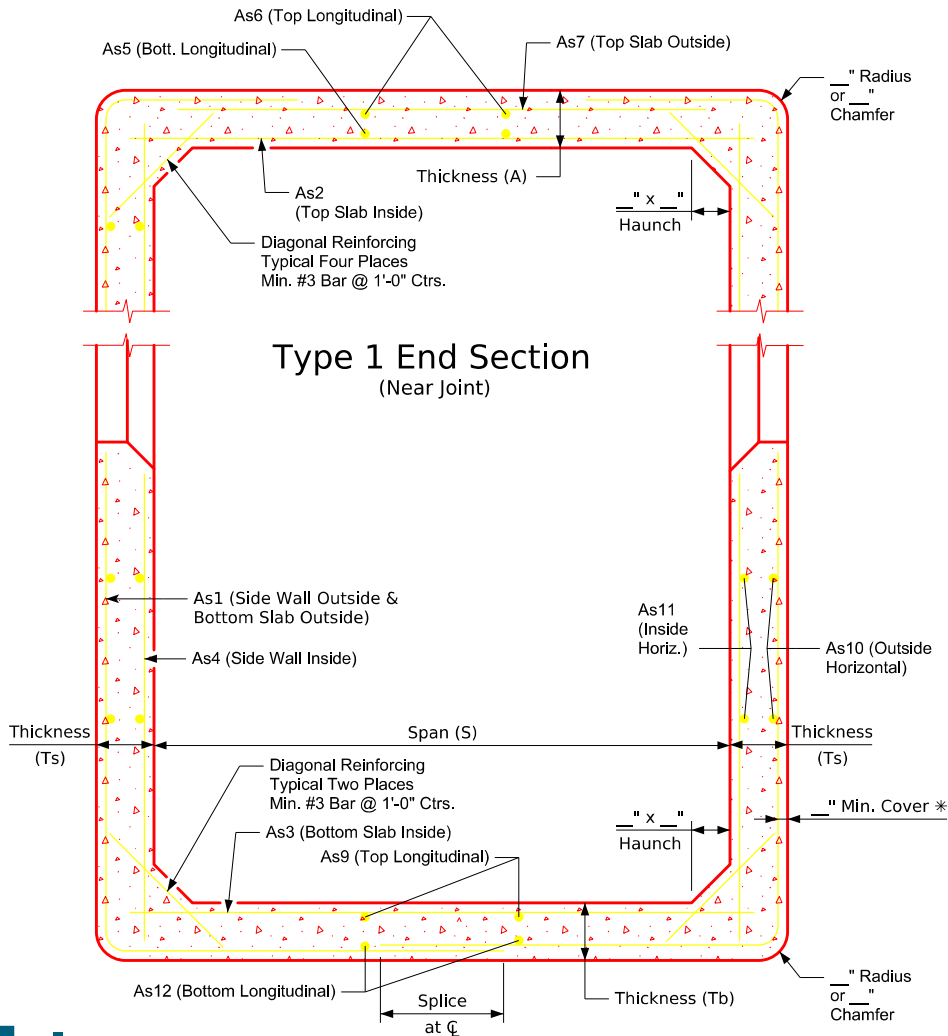
Situation Plan

STA. 60012+13.00 (Trail) Turn-In Date: May, 2024
Polk County
IOWA DEPARTMENT OF TRANSPORTATION
Design No. 2125 Design Sheet No. 9 of 13 FHWA/Asset 900600

Revised 08-2022: Added statement to the Flowable Mortar/Foamed Concrete Option notes regarding "only the options and materials designated on the sheet are allowed. All other options and materials are prohibited".
Revised 01-2023: Added Note 2 stating to burr threads of Concrete Box Ties. Note 3, 4, 5, 6 and 7 were 2, 3, 4, 5 and 6 respectively. Adjusted details to fit additional note.
ENGLISHPRECASTCULVERTS.DGN - 1082P - THIS SHEET ISSUED 02-13.



Barrel Section



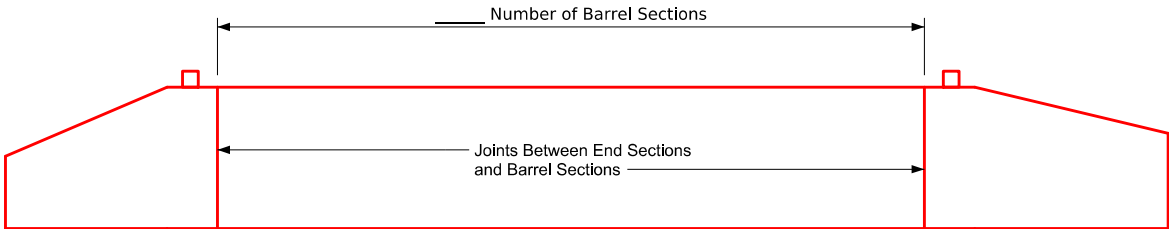
Type 1 End Section
(Near Joint)

Type 1 and 3 End Sections

Note:
Dimension "M" begins at the outside edge of the wall for Iowa D.O.T. Single Precast R.C.B. Culvert Standards. The "M" dimension for the ASTM Standards begins at the reinforcing clear distance from the outside edge of the wall.

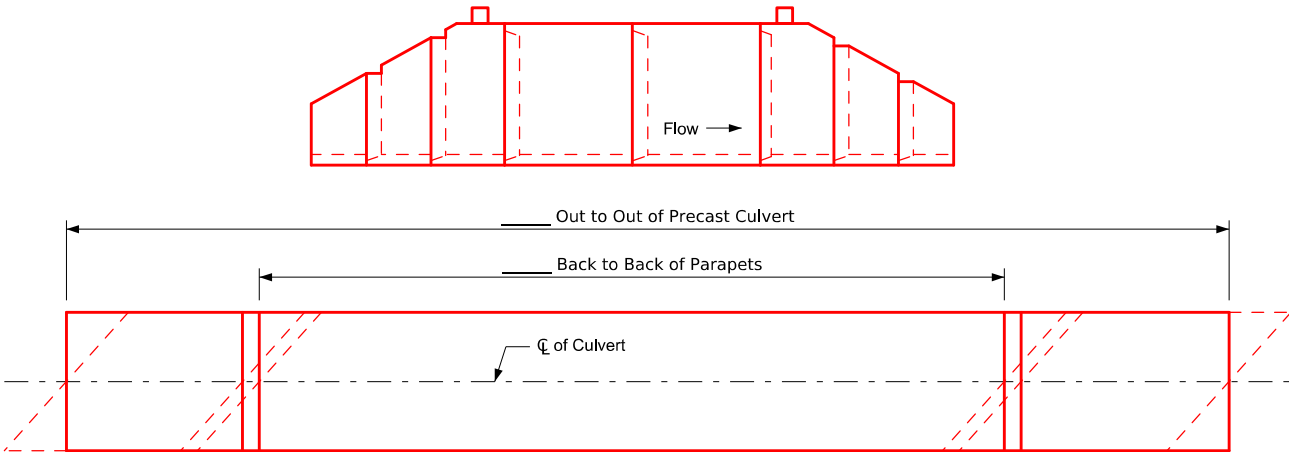
Minimum laying length shall be 4'-0".

* Use 1 inch cover for ASTM design, 1½ inch cover for Iowa D.O.T. standard and non-standard design.



Elevation View

(Show the Number of Barrel and End Sections)



Plan View for Barrel Section

(Show Overall Length and Back to Back of Parapets)

____ ft. x ____ ft. x ____ ft. Culvert																													
Barrel Section																													
Design Earth Cover, ft	f'c ksi	A in.	B in.	C in.	M in.	Circumferential Reinforcement																							
						As1		As2		As3		As4		As5		As6		As7		As8		As9		As10		As11		As12	
						Layer 1	Layer 2	Layer 1	Layer 2	Layer 1	Layer 2	Layer 1	Layer 2	Layer 1	Layer 2	Layer 1	Layer 2	Layer 1	Layer 2	Layer 1	Layer 2	Layer 1	Layer 2	Layer 1	Layer 2	Layer 1	Layer 2	Layer 1	Layer 2
						Bar Size																							
						Spacing (in.)																							
						Area (in. ² /ft)																							
End Section																													
f'c ksi	Ts in.	Tb in.	A in.	Circumferential Reinforcement																								Length of Splice @ 'L	
				As1		As2		As3		As4		As5		As6		As7		As9		As10		As11		As12					
				Layer 1	Layer 2	Layer 1	Layer 2	Layer 1	Layer 2	Layer 1	Layer 2	Layer 1	Layer 2	Layer 1	Layer 2	Layer 1	Layer 2	Layer 1	Layer 2	Layer 1	Layer 2	Layer 1	Layer 2	Layer 1	Layer 2				
				Bar Size																									
				Spacing (in.)																									
				Area (in. ² /ft)																									
Precast Box Option - Check If Applicable: Astm C1577 Standard ☐ End Section Type - Check One: Type 1 ☐ Type 3 ☐																													
Reinforcement Type - Check One: Plain WWR (65 ksi) ☐ Deformed WWR (70 ksi) ☐ ASTM Standard Reinforcing Bars (60 ksi) ☐																													

Design For 0 Degree Skew

8'-0" x 6'-0" x 63'-0" Reinforced Concrete Box Culvert - Precast

Precast Culvert Design Method Details

STA. 60012+13.00 (Trail) Turn-In Date: May, 2024

Polk County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 2125 Design Sheet No. 10 of 13 FHWA/Asset 900600



Steel Chain Link Fence Notes:

The chain link fence is to be bid on a linear foot basis measured from CL to CL of end posts. The price bid for "Fence, Chain Link, Vinyl Coated" 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 on the precast parapet and in the ground along the precast headwalls in accordance with these plans and specifications.

The chain link fence shall be either zinc (ASTM A392) or aluminum (ASTM A491) coated fabric, 2" mesh, No. 9 wires, 3'-6 height with knuckled selvages top and bottom.

The concrete anchors shall be drilled and grouted in place. the adhesive materials shall be in accordance with Iowa DOT I.M. 491.11. The $\frac{3}{4}$ " dia. anchors shall be galvanized and shall meet the requirements of ASTM A307. Anchors shall have 8" embedment (minimum).

The material for posts, braces, and rails shall be steel pipe in accordance with article 4154.10, A, of the standard specifications. Base plates and shims shall meet the requirements of ASTM A-36. Posts, base plates, and rails shall be galvanized, after fabrication, in accordance with the requirements of ASTM A-123.

Chain link fabric, rails, and fence accessories are to be PVC coated in accordance with ASTM F 668, Class 2B. Color shall be black in accordance with ASTM F 934. The cost of PVC coating is to be included in the price bid for "Fence, Chain Link, Vinyl Coated".

Steel fence post assemblies shall be abrasive blast cleaned to a minimum of SSPC-SP6 "commercial blast cleaning" prior to hot-dip galvanizing. Galvanize components in accordance with ASTM A-123. Do not quench or apply chromate conversion coatings to any galvanized components that will receive powder coating. Following galvanizing, powder coat components in accordance with materials I.M. 568.

Preparation of galvanized surfaces for paint shall be in accordance with materials I.M. 568, Appendix F. Complete "paint over galvanized surface travel log" in Appendix E.

All powder coating except field touch-up shall be performed in an approved shop in accordance with materials I.M. 568.

Submit proposed preparation methods and product data for all coatings proposed for use to the Engineer for review and approval prior to powder coating. Powder coating shall match sae AMS-STD-595 color number 27038 (black).

If available, vinyl coated fence post assemblies may be substituted for powder coated components provided the material is in compliance with all other requirements listed in these plans and the standard specifications. PVC coating shall comply with ASTM F 668, class 2B and shall be black in accordance with ASTM F 934. The cost of PVC coated fence post assemblies shall be included in the price bid for "Fence, Chain Link, Vinyl Coated".

Protect all powder coated railing surfaces from damage during shipping, handling, and installation.

Following fence installation, repair any damage to the powder coated finish in accordance with the coating manufacturer's recommendations. All costs associated with powder coating shall be considered incidental to the bid item, "Fence, Chain Link, Vinyl Coated".

Special fittings shall be as specified in Article 4154.11 of the Standard Specifications, unless otherwise noted. Similar fence parts and fittings with different shapes or configurations shall not be intermingled within the project limits.

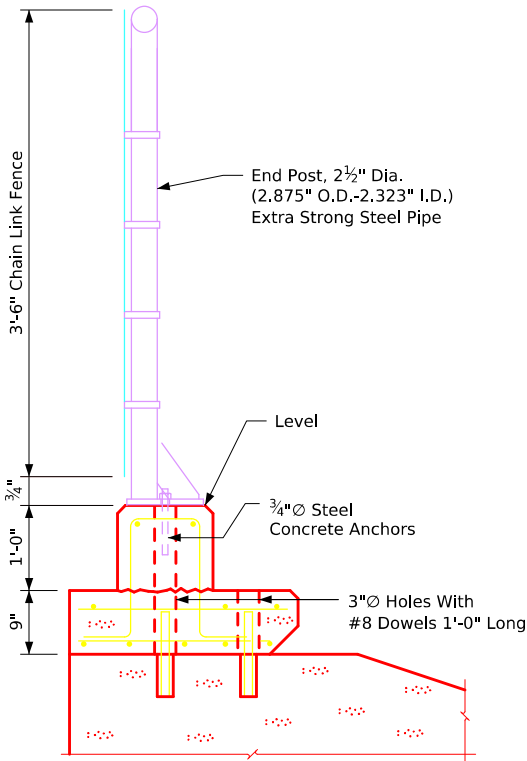
Rail members shall be cut square at all post connection locations. Cut edges shall be filled or ground smooth to remove sharp edges at corner locations. Damaged paint or vinyl coating shall be painted black to match fence.

Caulk for base plates shall be black nonsag latex caulk marketed for outdoor use. No testing or certification is required. Excess caulk shall be completely removed from surrounding concrete surfaces.

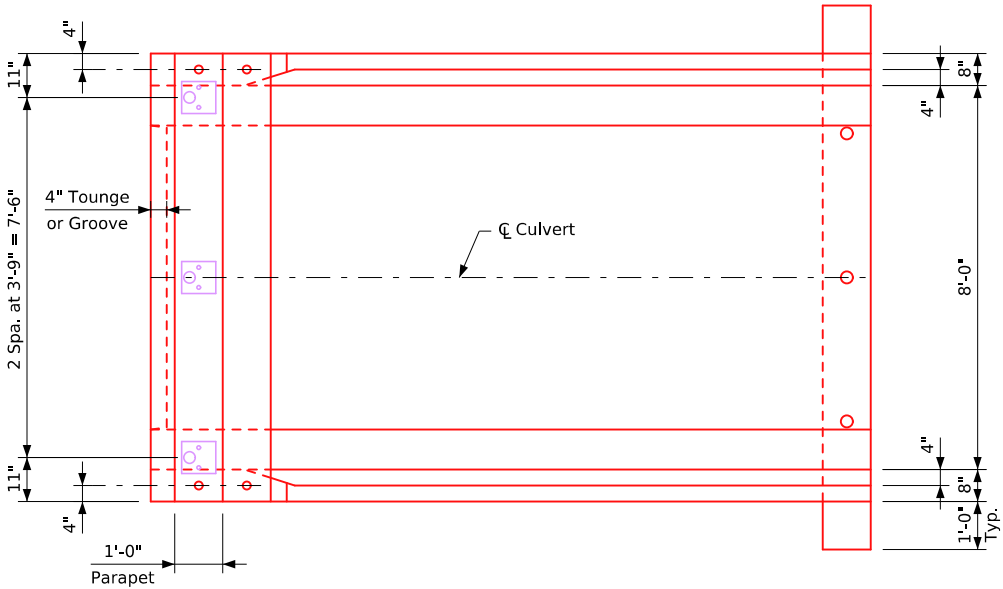
The fence shall be true to line, taut, and comply with the best practice for fence construction of this type. All ends of wires shall be turned so that they extend away from the roadway side of the fence.

The Contractor shall submit for approval shop drawings of the fence, showing layout of posts and fabrication details of rails, bracing, anchorages, and hardware. Alternate details, if any, shall be submitted with the shop drawings.

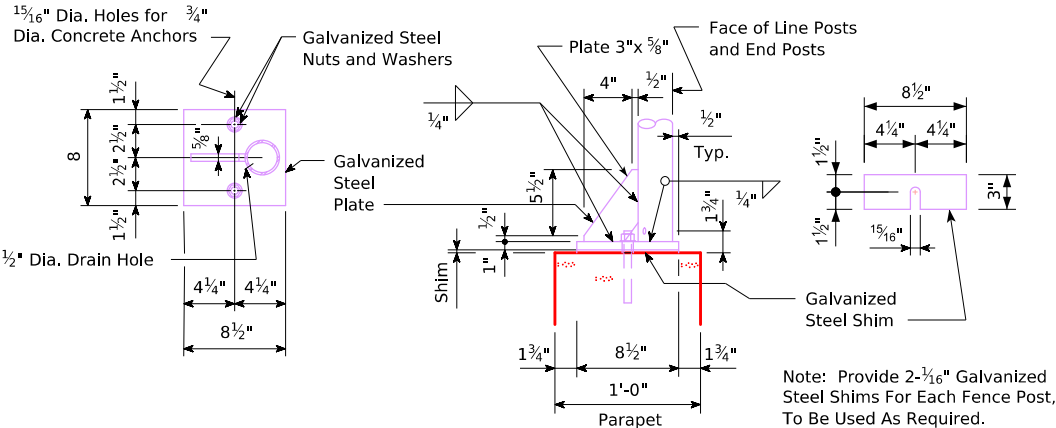
The Contractor shall not install any nameplates or other signage on the fence.



Parapet Typical Section
(Barrel not shown)

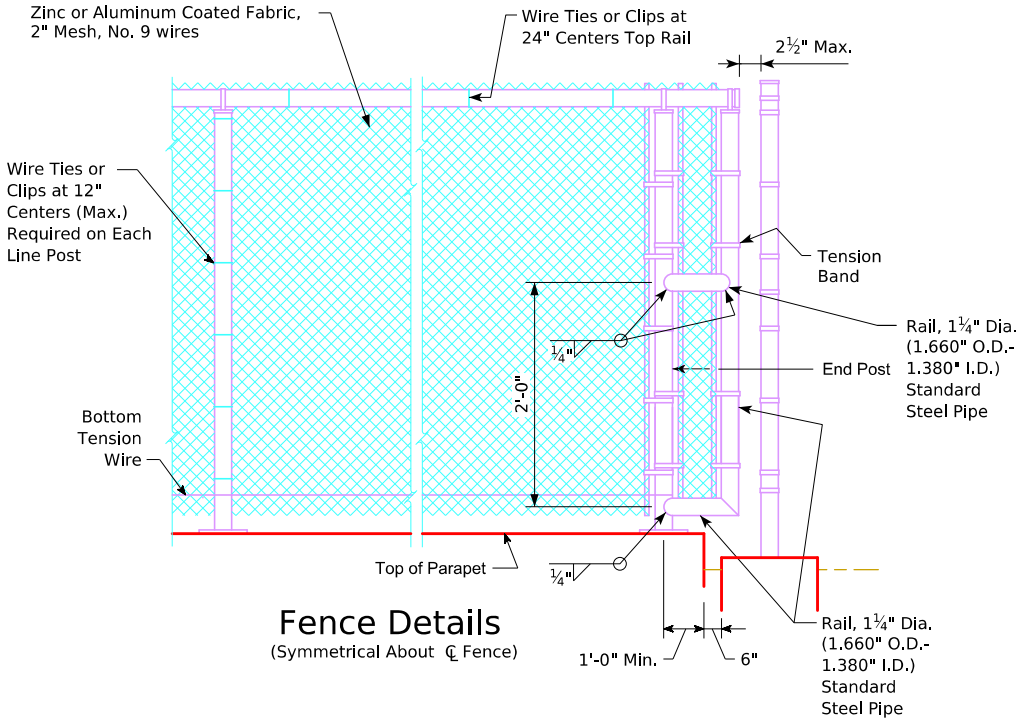


Parapet Fence Plan View
(Reinforcement, ties, and joints not shown)
(End section not shown)



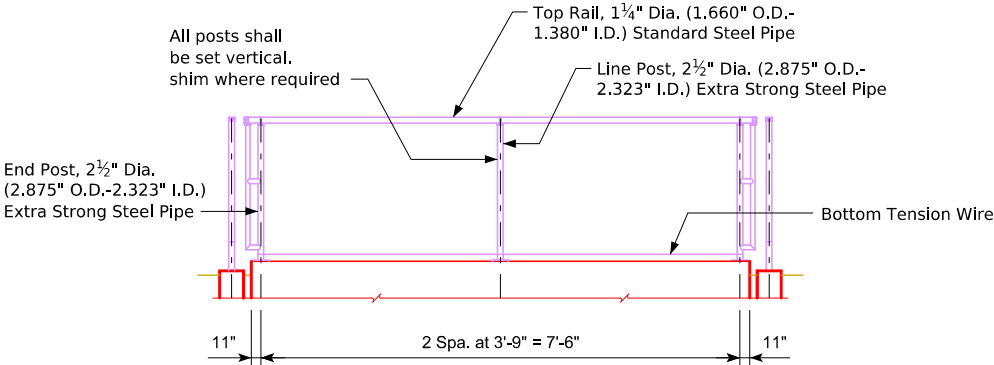
Base Plate Details for End Post and Line Posts

Note: Posts and Base Plates shall be Galvanized, after fabrication, in accordance with the requirements of ASTM A123.



Fence Details

(Symmetrical About CL Fence)



Elevation of Fence

The Contractor shall take appropriate care to coordinate chain link fence anchor bolt locations with parapet reinforcement. cutting of reinforcing steel for installation of chain link fence anchor bolts will not be permitted.

Quantities

Item	Units	Amount
Fence, Chain Link, Vinyl Coated	Lin. Ft.	74.0

Design For 0 Degree Skew
8'-0" x 6'-0" x 63'-0" Reinforced
Concrete Box Culvert - Precast

Parapet Fence Details

STA. 60012+13.00 (Trail)

Turn-in Date: May, 2024

Polk County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 2125

Design Sheet No. 11 of 13

FHWA/Asset 900600

SHEET NUMBER

V.24



FILE NO. 32251

ENGLISH

DESIGN TEAM SMK/MKE/CLS

Polk COUNTY

PROJECT NUMBER

IMN-080-3(340)125--0E-77

SHEET NUMBER

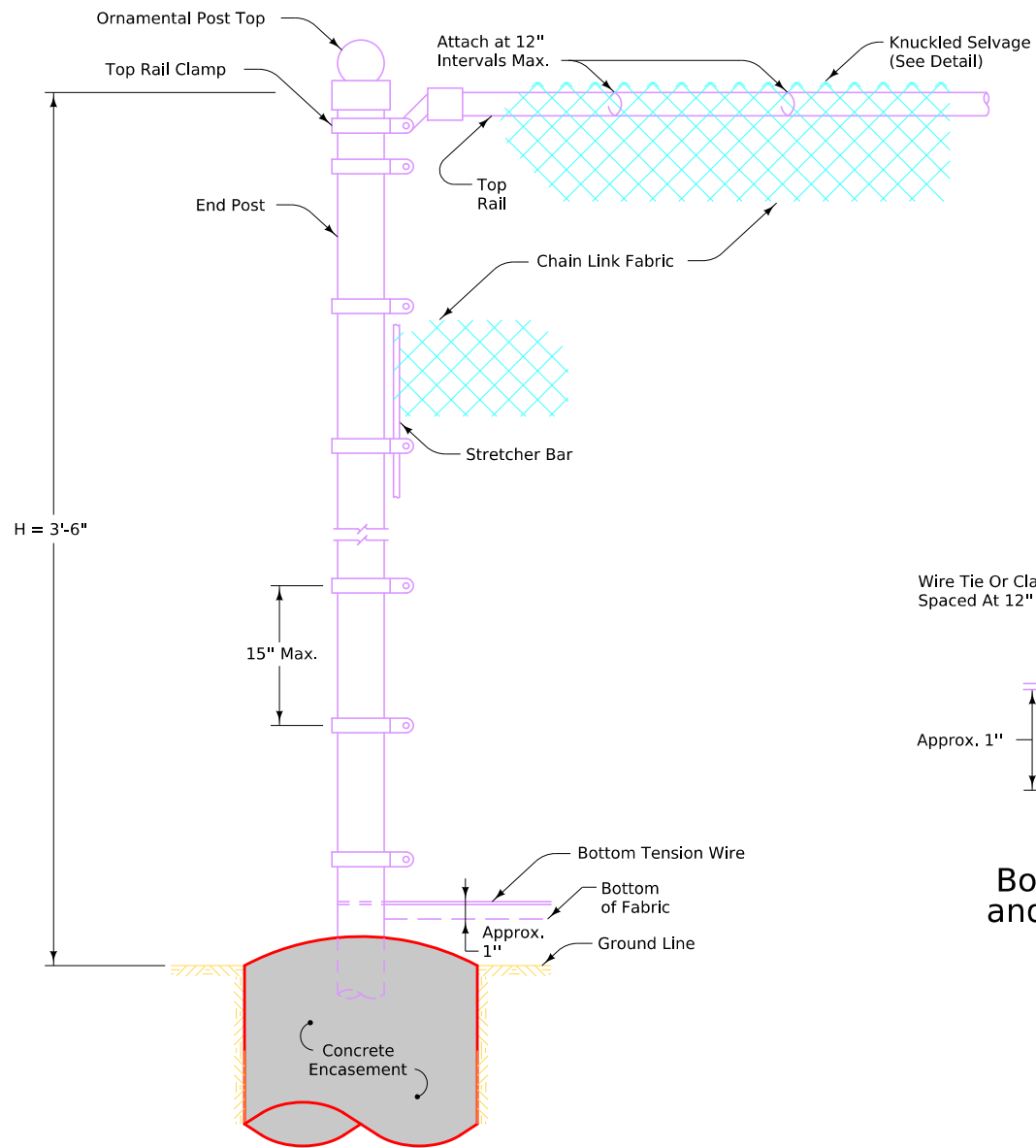
V.24

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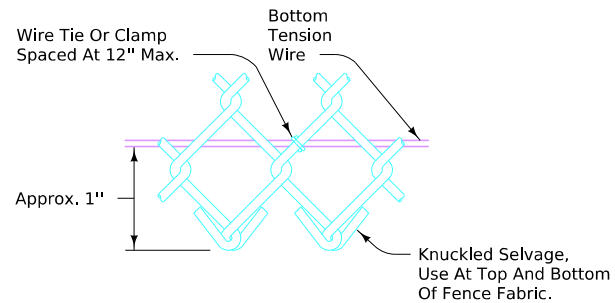
4/29/2024

csallade

pw:\\projectwise.dot.int.lan:PWMMain\\Documents\\Projects\\7708006015\\Bridge\\(340)_RCB Culvert New - Pedestrian Tunnel\\SHT_77080340_2125_PC_Z08.dgn

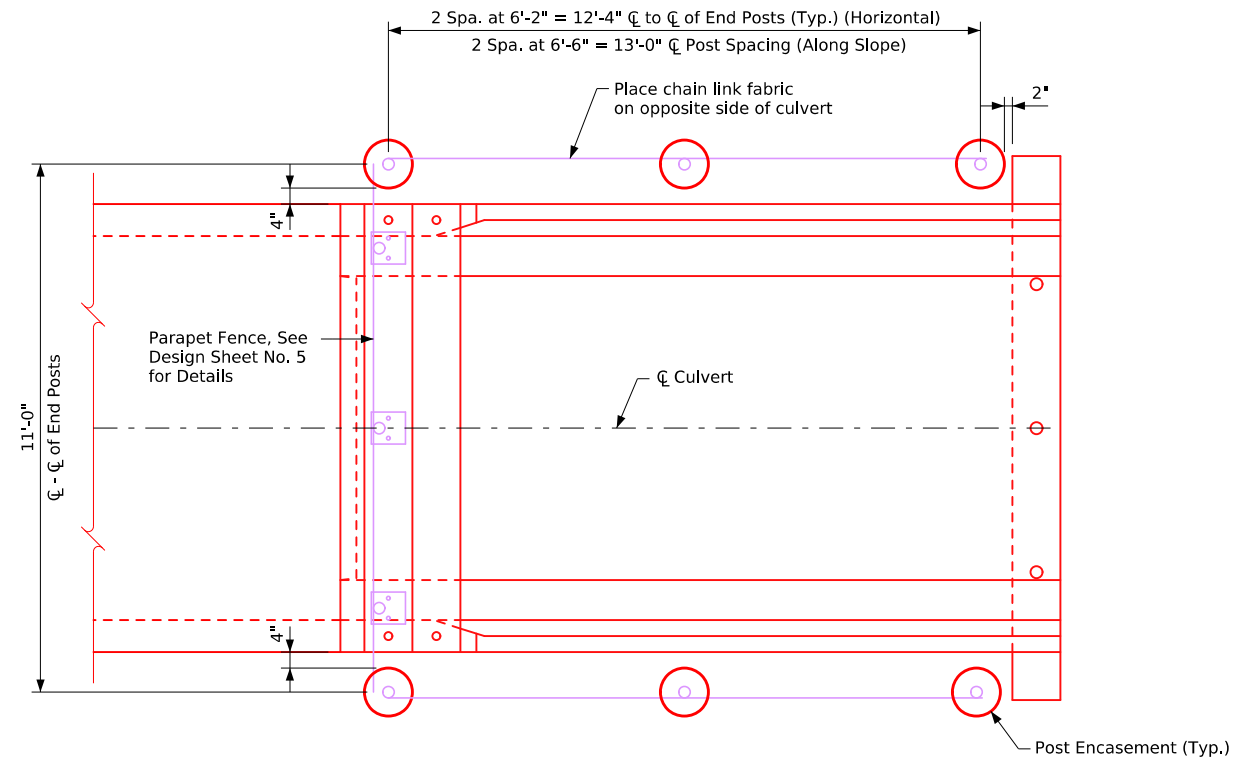


End Post Assembly

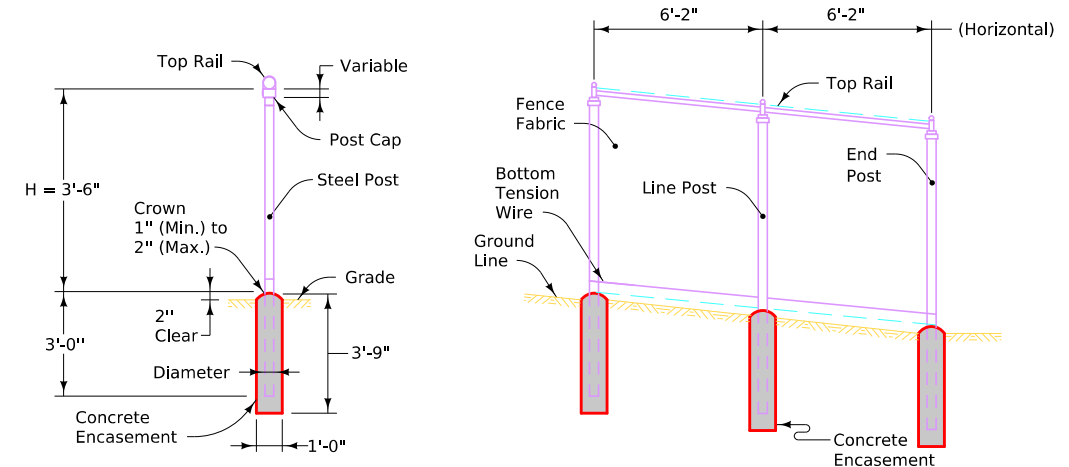


Bottom Tension Wire and Knuckled Selvage

Item	Post Size		
	Nominal Pipe Size, In.	Outside Dia, In.	Weight, Lb./Ft.
Rail	1½	1.660	2.27
Line Post	2½	2.875	5.79
End Post	2½	2.875	5.79



Ground Fence Plan View
(Reinforcement, Ties, and Joints not shown)



Post Installation Details

Steel Chain Link Fence Notes:

See chain link fence notes and quantity on Design Sheet No. 5 for fence details and specifications.
Attach chain link fabric to top rail, tension wire, line posts, and end posts at intervals of 12" maximum.
Connect bottom tension wire to end posts.
Secure each end of each run of fabric using a stretcher bar inserted in the final links of the fabric. Use a bar that is as long as the fabric is wide.

Design For 0 Degree Skew
8'-0" x 6'-0" x 63'-0" Reinforced Concrete Box Culvert - Precast

Ground Fence Details

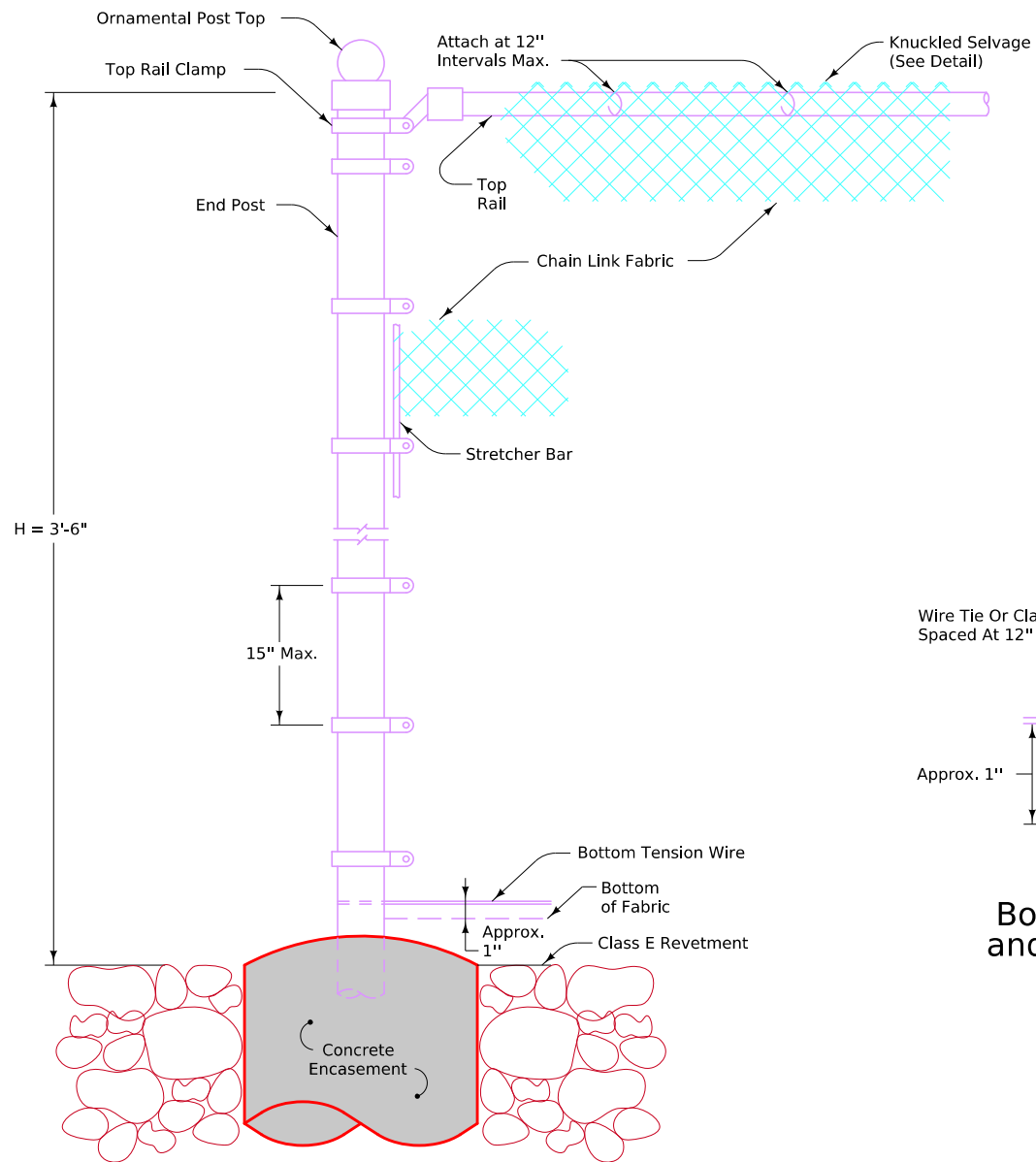
STA. 60012+13.00 (Trail) Turn-In Date: May, 2024

Polk County

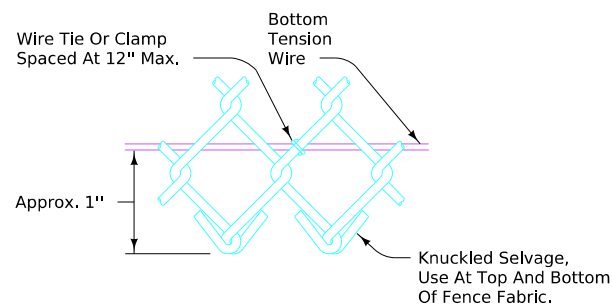
IOWA DEPARTMENT OF TRANSPORTATION

Design No. 2125 Design Sheet No. 12 of 13 FHWA/Asset 900600

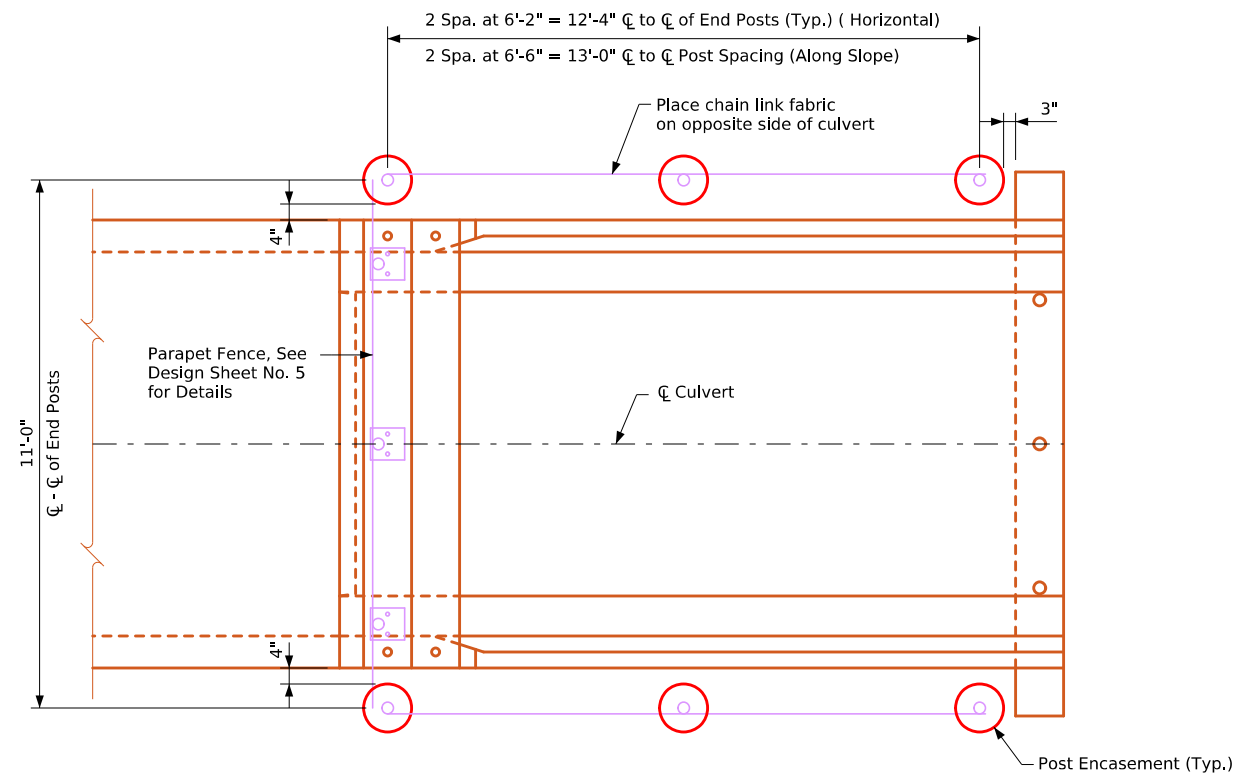




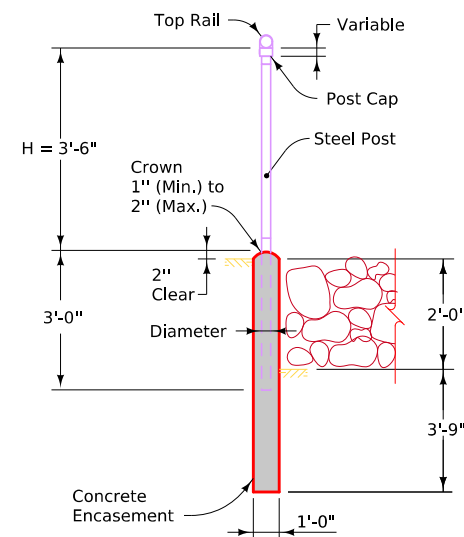
End Post Assembly



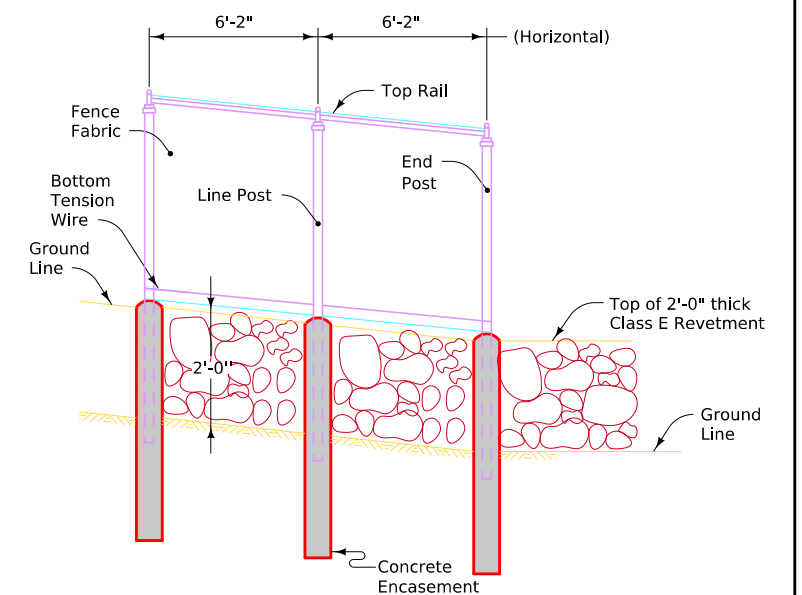
Bottom Tension Wire and Knuckled Selvage



Ground Fence Plan View
(Reinforcement, ties, and joints not shown)



Post Installation Details



Steel Chain Link Fence Notes:

See chain link fence notes and quantity on Design Sheet No. 5 for fence details and specifications.
 Attach chain link fabric to top rail, tension wire, line posts, and end posts at intervals of 12" maximum.
 Connect bottom tension wire to end posts.
 Secure each end of each run of fabric using a stretcher bar inserted in the final links of the fabric. Use a bar that is as long as the fabric is wide.

Item	Post Size		
	Nominal Pipe Size, In.	Outside Dia, In.	Weight, Lb./Ft.
Rail	1½	1.660	2.27
Line Post	2½	2.875	5.79
End Post	2½	2.875	5.79

Design For 0 Degree Skew
8'-0" x 6'-0" x 63'-0" Reinforced Concrete Box Culvert - Precast

Ground Fence Details

STA. 60012+13.00 (Trail) Turn-In Date: May, 2024
Polk County
 IOWA DEPARTMENT OF TRANSPORTATION
 Design No. 2125 Design Sheet No. 13 of 13 FHWA/Asset 900600



Estimate Project Quantities and Reference Notes - Design #2225					
Item No.	Item Code	Item	Unit	Quantities Estimated Design No. 2225	Estimate Reference Notes
29	2402-2720000	Excavation, Class 20	CY	642.6	The excavation quantity is measured from the existing ground surface. Includes filling and compacting low areas around proposed pedestrian tunnel. Includes the excavation necessary to place the 1'-0" thick working blanket. Quantity should be reduced by 31.9 CY in the event that the working blanket is deleted.
30	2402-3825025	Granular Material For Blanket	CY	31.9	Includes cost of 1'-0" thick working blanket. Granular material shall be in accordance with Section 4118, Gradation No. 3 (excluding the No. 200 restriction) of the Standard Specifications. Includes 31.9 CY for a working blanket. The working blanket may be deleted if determined to be unnecessary at the time of construction. Reclaimed Asphalt Pavement (RAP) and reclaimed HMA shall not be used for the working blanket.
31	2403-0100020	Structural Concrete (RCB Culvert)	CY	94.1	Includes all resilient joint filler required. Includes all costs associated with incorporating rustication details in the headwall as detailed in these plans. Includes material and labor associated with providing and installing the rigid steel conduit and necessary fittings in the tunnel headwall as detailed in these plans. Includes 18 LF of 2" diameter rigid steel conduit. Cost of furnishing and installing conductors and light fixtures is included in a future project. Includes all costs associated with furnishing and installing materials for waterproofing as detailed in these plans including PVC waterstops, waterproofing membranes, and bentonite waterstops. No measurement or additional payment will be made for these items.
32	2404-7775000	Reinforcing Steel	LB	19,965	---
33	2501-8400172	Temporary Shoring	LS	1.00	---
34	2526-8285000	Construction Survey	LS	1.00	---
35	2526-8285000	Mobilization	LS	1.00	---
36	2599-9999010	('LUMP SUM' ITEM) Temporary Shoring Left in Place	LS	1.00	All work and materials shall be in accordance with Section 2501 of the Standard Specifications unless noted otherwise. See Situation Plan for location and General Notes for details for shoring designated to be left in place. Shoring Left in Place shall meet the "Buy America" requirements in accordance with Section 1107.06, B of the Standard Specifications.

Summary of Reinforcing Steel		
Location	Quantity	Total
Headwall	1 at 2,691	2,691
26'-0" Barrel Sections	1 at 8,743	8,743
25'-1" Barrel End Section	1 at 8,531	8,531
Total (LB)		19,965

Concrete Placement Quantities				
Location	Footing	Walls	Slab	Total
Headwall	1 at 5.7	1 at 3.6	* 1 at 5.3	14.6
26'-0" Barrel Sections	1 at 12.5	1 at 17.6	1 at 10.4	40.5
25'-1" Barrel End Section	1 at 12.0	1 at 17.0	1 at 10.0	39.0
Total (CY)	30.2	38.2	25.7	94.1

* Includes parapet and top of wingwall.



Roadway quantities shown elsewhere on these plans.

Design For 0 Degree Skew

12'-0"x10'-4"x53'-0" Reinforced Concrete Pedestrian Tunnel

Estimated Quantities

STA. 668+50.00 (Hickman Rd.) Turn-In Date: May, 2024

Polk County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 2225 Design Sheet No. 1 of 7 FHWA/Asset 900595

Specifications:

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.
Supplemental Specifications and Special Provisions shall apply to construction work on this project.

General Notes:

It is the intent of this design to construct a 12'-0" x 10'-4" x 53'-0" reinforced concrete pedestrian tunnel at Sta. 668+50.00 skewed 0°. The RCB culvert sections are designed for HL-93 live load and earth fills of 2 feet. Utility companies and municipalities whose facilities are shown on the plans or known to be within the construction limits shall be notified by the Contractor of the construction starting date.
Excess Class 20 excavation material suitable for backfilling shall be stockpiled at the construction site, as directed by the Engineer.
Class 20 excavation material unsuitable for backfilling shall be disposed of in a manner that will leave the site in a neat condition.
During construction of this project the Culvert Contractor will be required to coordinate operations with those of other Contractors working within the same area. Other work in progress during the same period of time will include, but is not limited to, construction of the projects listed on sheet J.1 of the roadway plans.
Structure stage numbers do not correspond with the roadway construction and traffic staging numbers outlined in the tied IM-080-3(264)124--13-77 plans.

Temporary Shoring Notes:

Temporary shoring (sheet pile or other) shall be required as necessary to prevent the earth under the traffic lane from sloughing in during construction.
The Contractor shall submit a temporary shoring plan for review. The temporary shoring plan shall be designed and certified by a Professional Engineer licensed in the state of Iowa. When determining slope stability to support structures such as bridges, culverts, and retaining walls, a global stability analysis shall be included in the design of the temporary shoring in accordance with Chapter 200F-1 in the Design Manual of the Iowa DOT, Design Bureau. The Contractor shall not proceed with installation of the temporary shoring without notice to proceed from the Engineer.
The temporary shoring submittal shall include:
• Design calculations (including a global stability analysis)
• Soil properties
• Shoring material properties
• Shoring plan layout (showing location of traffic)
• Shoring details
Temporary shoring shall be paid for as a lump sum including all cost for designing, furnishing, installing and removal. All material used for shoring shall remain the property of the Contractor. Shoring is to be removed only after backfilling has been completed. In addition to the requirements noted above, Article 1107.07 of the Standard Specifications still applies.
Temporary shoring shall be designed and constructed so that existing embankment under existing and proposed pavement remains undisturbed.

Shoring Left in Place Notes:

Shoring (sheet pile or other) shall be required as necessary to prevent the earth under the traffic lane from sloughing in during construction.

The Contractor shall submit a Shoring Plan for review. The Shoring Plan shall be designed and certified by a Professional Engineer licensed in the State of Iowa. When determining slope stability to support structures such as bridges, culverts and retaining walls, a global stability analysis shall be included in the design of the shoring in accordance with Chapter 200F-1 in the Design Manual of the Iowa DOT, Design Bureau. The Contractor shall not proceed with installation of the shoring without notice to proceed from the Engineer.

The shoring submittal shall include:
• Design calculations (including a global stability analysis)
• Soil properties
• Shoring material properties
• Shoring plan layout (showing location of traffic)
• Shoring details

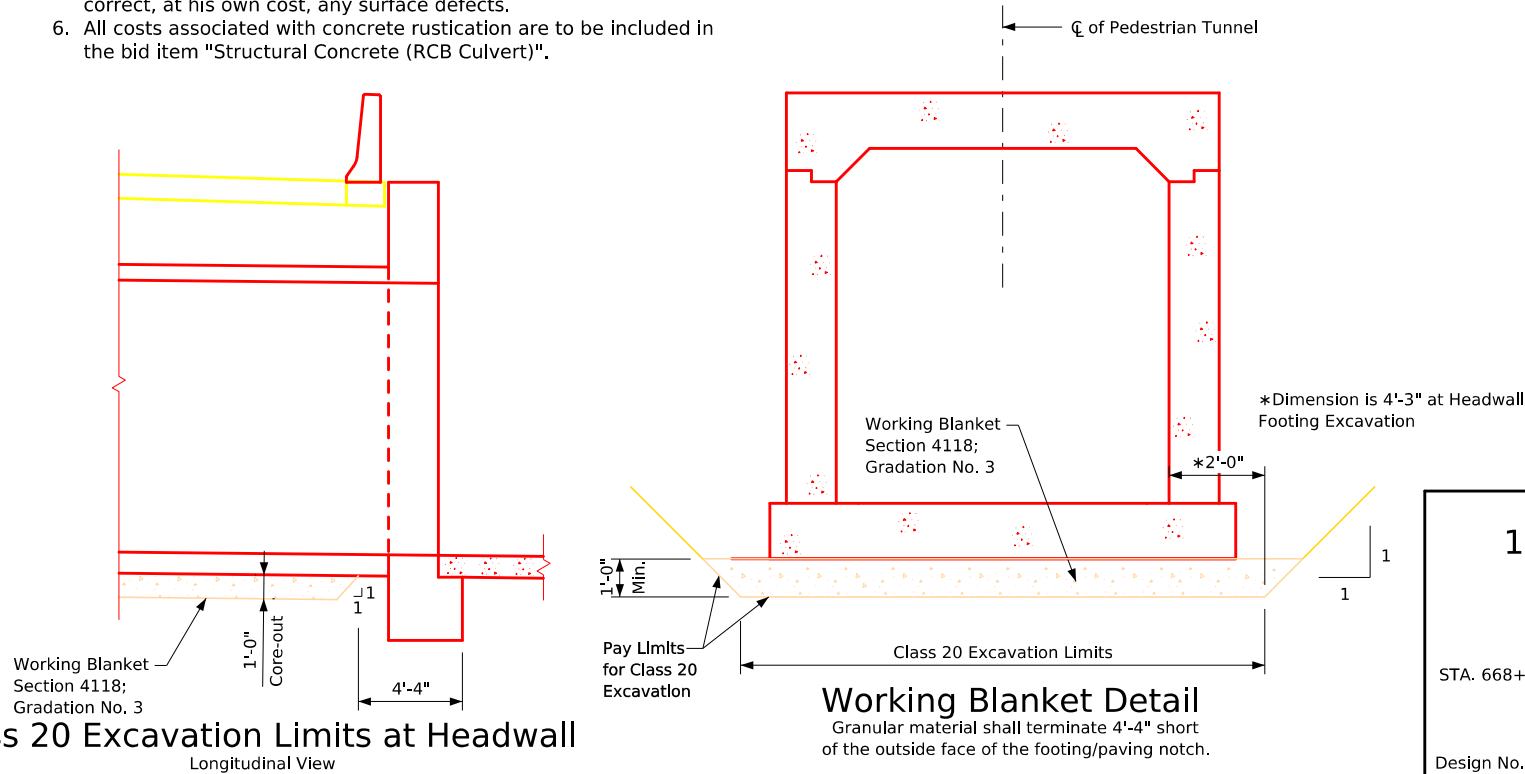
Shoring shall be paid for as a lump sum including all cost for designing, furnishing, installing and abandoning the shoring in place.

Shoring Left in Place Notes (Con't):

Shoring shall meet the "Buy America" requirements in accordance with Section 1107.06 B of the Standard Specifications. In addition to the requirements noted above, Section 1107.07 of the Standard Specifications still applies

General Notes for Concrete Rustication:

- Strips and panels used as inserts within concrete forms to create the rustication features may be made of wood, steel, plastic or other nonporous material capable of withstanding anticipated concrete pour pressures without physical defects. Wood inserts, if used, shall be free of warp, twist, checks or cracks, and shall be presoaked prior to placement of concrete in the forms.
- Rustication inserts shall easily attach to forms and shall not allow leakage of concrete between the form and the insert. When steel forms are used, rustication strips may be rigidly attached to the inside surfaces of the forms. When steel forms are not used, rustication strips and other inserts for small recesses on exposed concrete surfaces shall be fastened to the forms in a manner that will permit them to remain in place when the forms are removed. Leave inserts in place until they can be removed without damage to the surrounding concrete.
- The inserts shall be designed to form surfaces and features conforming to the design intent including the shape, lines, depths and dimensions shown in the plans. Create inserts using a minimum number of splice joints in their length. Splices, if used, shall be tightly joined so as not to allow gaps or leaks, and shall not create any change in alignment or shape of the rustication feature. Do not locate form ties within concrete rustications.
- For rustication features following the perimeter of rounded surfaces, it may be necessary to use multiple layers of insert material in order to achieve the radius curve. This is acceptable, provided that the final shape, line, depth, and dimension of the features are maintained in the final result.
- During loading of forms with concrete, take extra care to ensure proper consolidation of concrete around all rustication inserts to preserve the shape, line and depth of all intended features in the final concrete surface. Following removal of forms, repair all defects to achieve the rustication features as specified in the plans. Patch voids, honeycomb areas, etc., in accordance with the Standard Specifications. If surfaces will not receive a colored sealer coating, add white cement to the patching mortar to lighten it in order to match surrounding concrete when dry. Completed surface shall be free from blemishes, surface voids and conspicuous form marks to the satisfaction of the Engineer. The Contractor shall correct, at his own cost, any surface defects.
- All costs associated with concrete rustication are to be included in the bid item "Structural Concrete (RCB Culvert)".



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	Shoring Left In Place	77_Polk2225_ShoringLeftInPlace.pdf	Yes
2	Temporary Shoring	77_Polk2225_TemporaryShoring.pdf	Yes
No.	Calculation Description	Calculation File Name Convention For Submittal	Certified by Iowa P.E. (Yes/No)
1	Shoring Left In Place	77_Polk2225_ShoringLeftInPlaceCalculations.pdf	Yes
2	Temporary Shoring	77_Polk2225_TemporaryShoringCalculations.pdf	Yes

Standards: For details and notes not shown refer to the following Iowa D.O.T. - Highway Standards:		
Standard	Issued	Revised
PT G1-20	August 2020	-----

See tied IM-080-3(264)124--13-77 plans for construction staging information for roadway and structures, and for traffic staging information, TBR layout, and final paving configuration.

The Pollution Prevention Plan is not included in these plans, but is included in the Grade and Pave Plans for the project IM-080-3(264)124--13-77 which is tied to the pedestrian tunnel plans through the contract letting process.

Traffic Control Plan

The roadway will be open to thru traffic. Refer to the Traffic Control Plan included in the tied Grade and Pave Plans, project number IM-080-3(264)124--13-77.

Design For 0 Degree Skew
12'-0"x10'-4"x53'-0" Reinforced Concrete Pedestrian Tunnel

General Notes

STA. 668+50.00 (Hickman Rd.) Turn-In Date: May, 2024
Polk County
IOWA DEPARTMENT OF TRANSPORTATION
Design No. 2225 Design Sheet No. 2 of 7 FHWA/Asset 900595



The diagram illustrates the cross-section of the Hickman Rd. bridge deck, showing the construction details for Design 2225 - Stage 1 and Design 2325 - Stage 1. The vertical axis represents elevation in feet, ranging from 860 to 940. The horizontal axis represents stationing, with Stage Line Sta. 60016+58.47 and Stage Line Sta. 60017+42.47 marked. The diagram includes various dimensions for the bridge deck, parapets, and shoring. Key features include the existing ground line, proposed trail, and temporary shoring structures.

Dimensions and Elevation Data:

- Stage Line Sta. 60016+58.47:**
 - 94'-2" to Front Face of Headwall
 - 92'-1" to Back Face of Parapet
 - 3'-7 $\frac{5}{8}$ "
 - 41'-0"
 - 7'-5 $\frac{3}{8}$ "
 - 2'-0"
 - 11'-0"
 - 9'-6 $\frac{3}{8}$ "
 - 11'-0"
 - 11'-0"
 - 11'-0"
 - 11'-0"
 - 2'-0"
 - 10'-1"
 - 53'-2"
 - Design 2225 - Stage 1
 - 3'-0"
- Stage Line Sta. 60017+42.47:**
 - 83'-2" to Front Face of Headwall
 - 81'-1" to Back Face of Parapet
 - 43'-0"
 - 3'-3 $\frac{7}{8}$ "
 - Max. Fill = 3'
 - 40'-2"
 - Design 2325 - Stage 1
 - 5'-7" (-)

Elevation Data:

- Elev. 883.58
- Elev. 883.85
- Elev. 883.84
- Elev. 883.64

Other Labels:

- Working Blanket Limits (Typ.)
- Max. Fill = 3'
- Shoring Left in Place
- Temporary Shoring
- Existing Ground
- Proposed Trail

Longitudinal Section Along C Tunnel

The diagram illustrates a parabolic curve with the following data points and labels:

- Vertical Curve Data:**
 - VPC:** Station 60015+50.00, Elevation = 884.56
 - VPT:** Station 60016+00.00, Elevation = 883.55
 - STA:** Station 60016+99.47, Elevation = 884.05
 - VPC:** Station 60017+90.00, Elevation = 883.60
 - VPT:** Station 60018+50.00, Elevation = 885.19
- Grade Segments:**
 - Approach grade: -4.53%
 - First tangent grade: +0.50%
 - Second tangent grade: -0.50%
 - Departure grade: +5.81%
- Curve Parameters:**
 - VPI 1:** Station 60015+75.00, Elevation = 883.43, Length L = 50.00
 - VPI 2:** Station 60018+20.00, Elevation = 883.45, Length L = 60.00

STA. 2668+00.00
Elev. 899.52

STA. 2669+00.00
Elev. 896.92

-2.60%

STA. 1668+00.00
Elev. 899.52

STA. 1669+00.00
Elev. 896.92

-2.60%

Technical engineering drawing of a bridge construction plan for Hickman Rd. over a creek. The drawing shows two bridge sections: Design 2225 Stage 1 (left) and Design 2325 Stage 1 (right). Both sections include a 12'-0" x 10'-4" x 177'-4" RCBC 0° Skew. The drawing details various construction elements such as MSE walls, shoring, temporary barrier rail, and working blanket limits. Stationing is provided for key points along the bridge and approach roads. Topographic contours and existing infrastructure like Hickman Rd. and a trail are also shown.

Design 2225 Stage 1:

- Stage Line Sta. 60016+58.47
- MSE Wall EB
- *Shoring Left in Place
- Headwall
- End Section
- Barrel Section
- Design 2225 Stage 1
- Stage 2 - Future Construction (Not Included in this Design)

Design 2325 Stage 1:

- Stage Line Sta. 60017+42.47
- MSE Wall WB
- *Shoring Left in Place
- Headwall
- End Section
- Barrel Section
- Design 2325 Stage 1

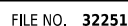
Bridge Construction Details:

- Construct 12'-0" X 10'-4" X 177'-4" RCBC 0° Skew In Stages (53'-2" and 40'-2" for Stage 1)
- Working Blanket Limits (Typ.)
- Temporary Barrier Rail
- Temporary Shoring (as Required)
- *Shoring Left in Place

Approach and Surrounding Area:

- Proposed 18" RCP
- Proposed 12" RCP
- CL Hickman Rd.
- CL Trail
- CL EB Hickman Rd.
- CL WB Hickman Rd.
- Stationing: 60015+00, 60016+00, 60017+00, 60018+00, 60019+00
- Topographic Contours: 880, 885, 890, 895, 900

FHWA/Asset 900595



32251	ENGLISH	DESIGN TEAM	SMK\MKE\CLS
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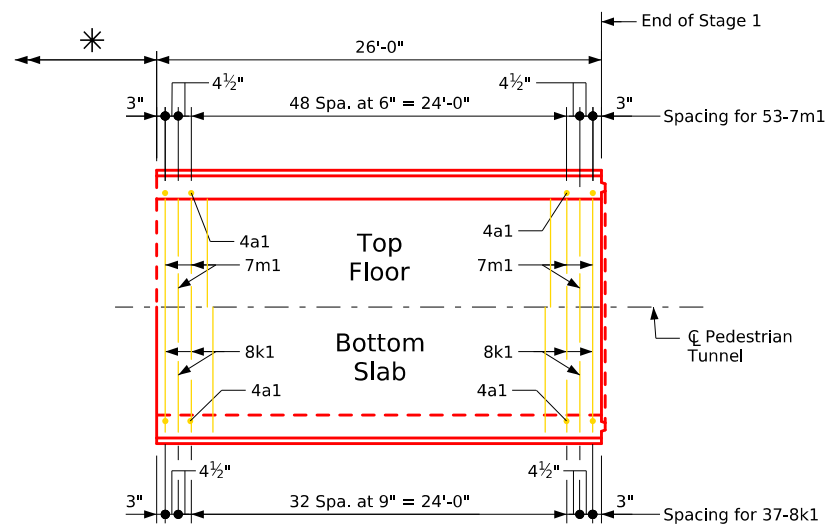
ENGLISH

DESIGN TEAM **SMK\MKE\CLS****Polk** COUNTYPROJECT NUMBER **IMN-080-3(340)125--0E-77**SHEET NUMBER **V.29**

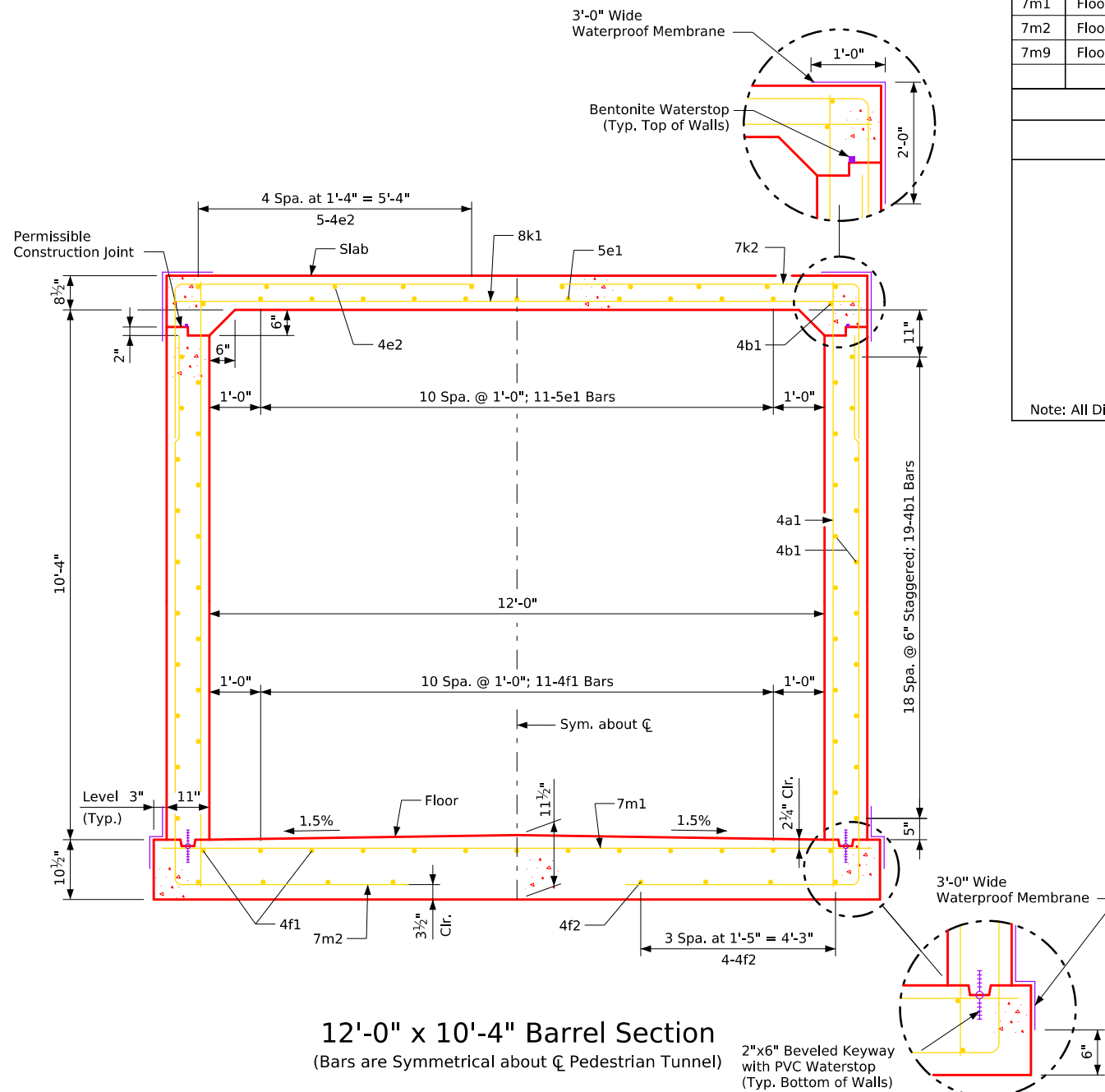
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pw:\projectwise.dot.int.lan:PWMain\Documents\Projects\7708006015\Bridge\340) RCB Culvert New - Pedestrian Tunnel\SHT 77080340 2225 Z08.dgn



* End section and joint details not shown.
See Design Sheet No. 5 for details.



Bent Bar Details

Diagram illustrating the dimensions for Bent Bar Details. The diagram shows two bent bars, labeled 7k2 and 7m2, with dimensions specified in feet and inches.

For Bent Bar 7k2:

- Horizontal dimension: 6'-2"
- Vertical dimension: 4'-0"
- Pin diameter: $D = 5\frac{3}{4}"$

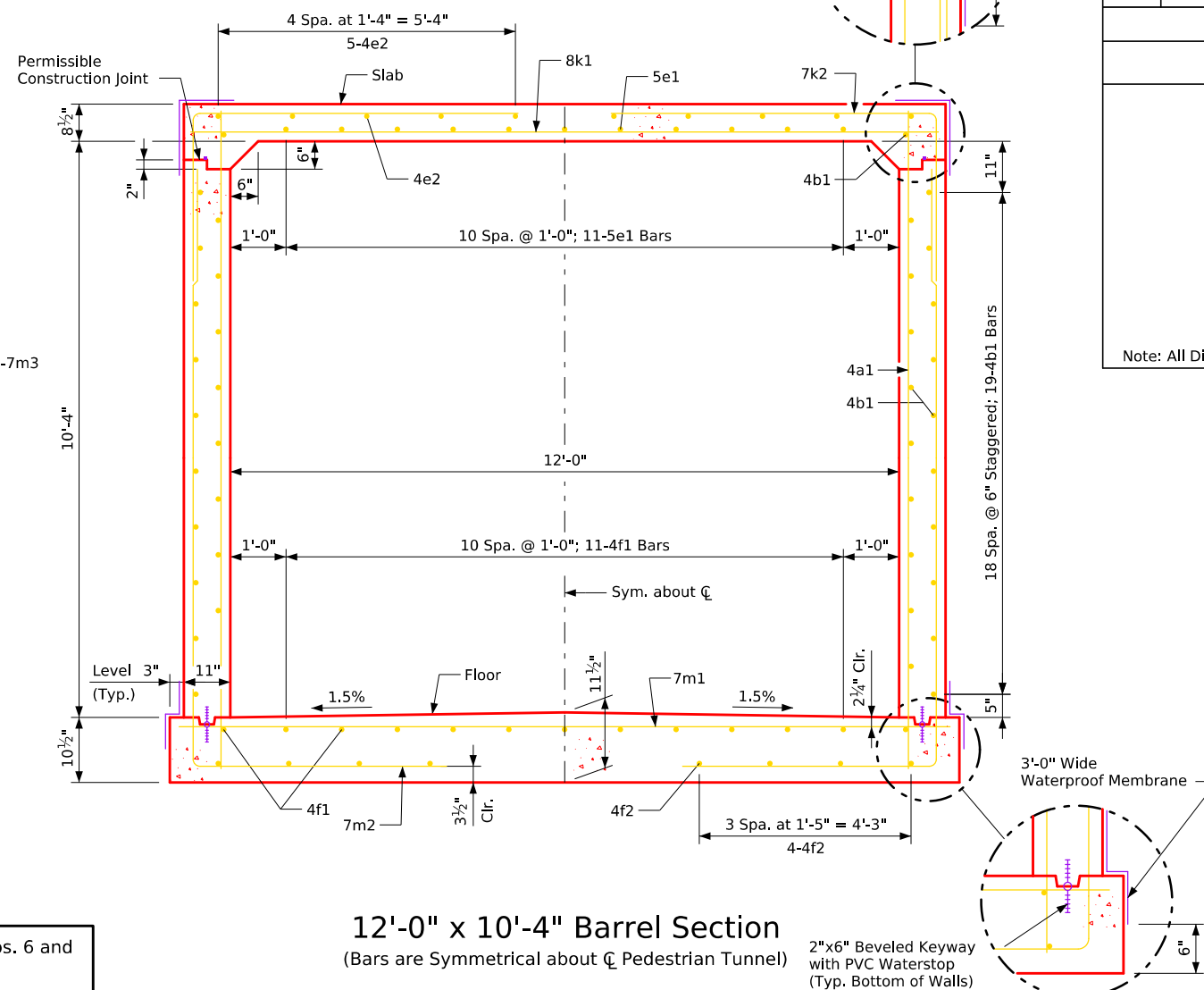
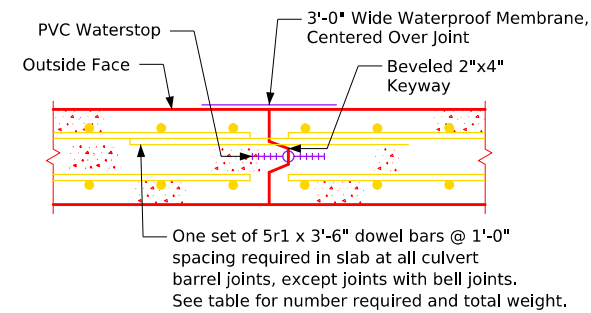
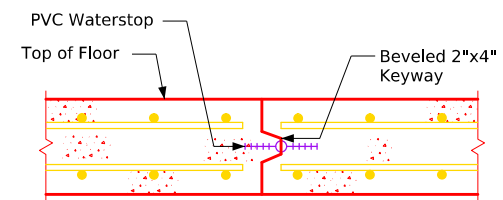
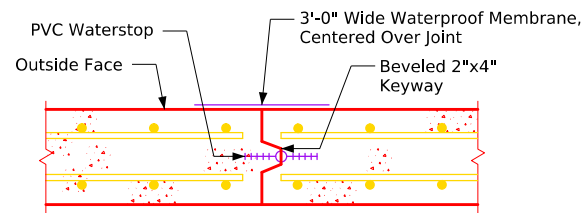
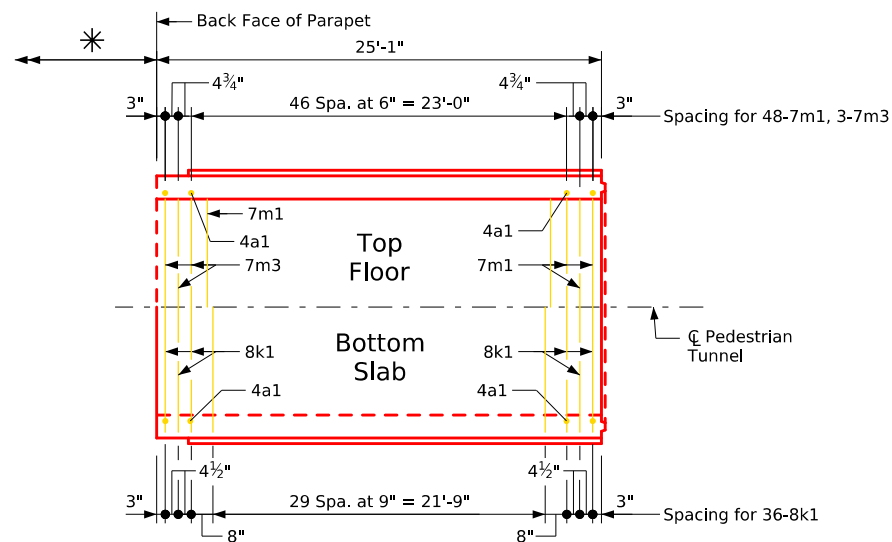
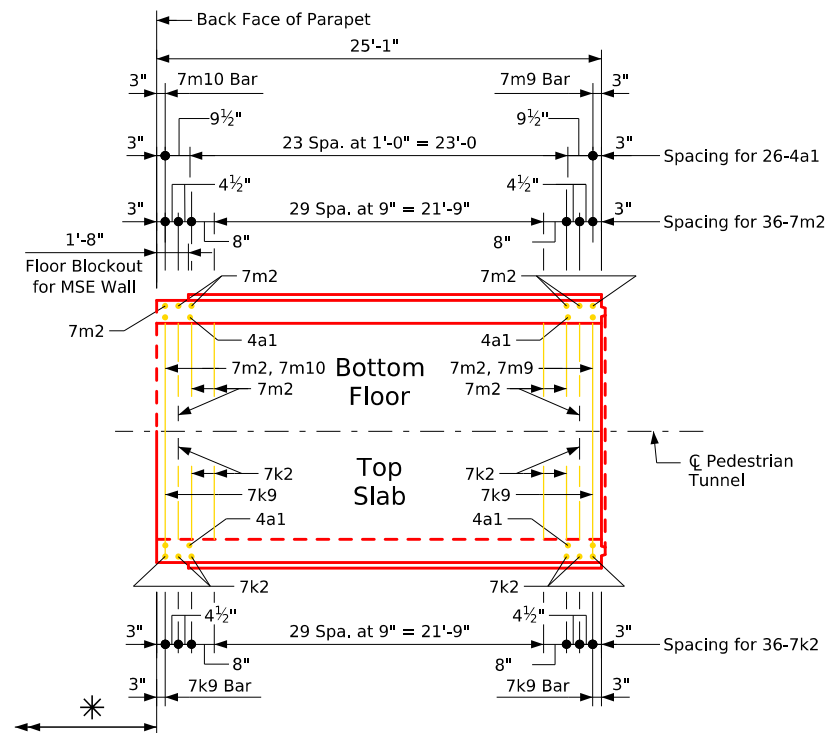
For Bent Bar 7m2:

- Horizontal dimension: 5'-1"
- Vertical dimension: 10'-3"
- Pin diameter: $D = 5\frac{3}{4}"$

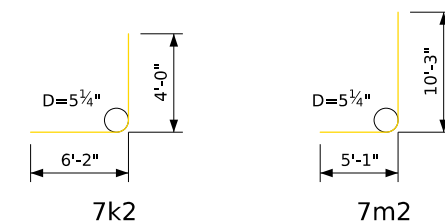
Note: All Dimensions are out to out, D = Pin Diameter.

Note:
Concrete and reinforcing steel quantities are included in
the summary quantities tables on Design Sheet No. 1.

STA. 668+50.00 (Hickman Rd.) Turn-in Date: May, 2024
Polk County
 IOWA DEPARTMENT OF TRANSPORTATION
 Design No. 2225 Design Sheet No. 4 of 7 FHWA/Asset 900595



Reinforcing Bar List - One End Section					
Bar	Location	Shape	No.	Length	Weight
4a1	Walls, F.F.V.		52	11'-5"	397
4b1	Walls, Horizontal		40	24'-11"	661
5e1	Slab, Bott. Longit.		11	24'-11"	284
4e2	Slab, Top Longit.		10	24'-11"	165
4f1	Floor Top Longit.		13	24'-11"	215
4f2	Floor Bott. Longit.		8	24'-11"	132
8k1	Slab, Bott. Transv.		36	13'-6"	1,298
7k2	Slab, Top Transv.		72	10'-2"	1,496
7k9	Slab, Top Transv.		2	13'-6"	55
7m1	Floor, Top Transv.		48	14'-0"	1,374
7m2	Floor, Bott. Corner		72	15'-4"	2,257
7m3	Floor, Top Transv. at MSE Wall Block-Out		3	13'-6"	83
7m9	Floor, Bott. Transv.		1	14'-0"	29
7m10	Floor, Bott. Transv. at MSE Wall Block-Out		1	13'-6"	28
5r1	Slab, Top Longitudinal at Construction Joint		13	3'-6"	47
Total (Lbs.)					8,531



Note: All Dimensions are out to out. D = Pin Diameter.

Concrete Placement Quantities	
Location	Quantity
Floor	12.0
Walls	17.0
Slab	10.0
Total (cu. vd.)	39.0

Note:
Concrete and reinforcing steel quantities are included in the summary quantities tables on Design Sheet No. 1.

Design For 0 Degree Skew
12'-0"x10'-4"x53'-0" Reinforced
Concrete Pedestrian Tunnel

End Section Details

STA. 668+50.00 (Hickman Rd.)

Turn-in Date: May, 2024

Polk County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 2225

Design Sheet No. 5 of 7

FHWA/Asset 900595

SHEET NUMBER **V.31**

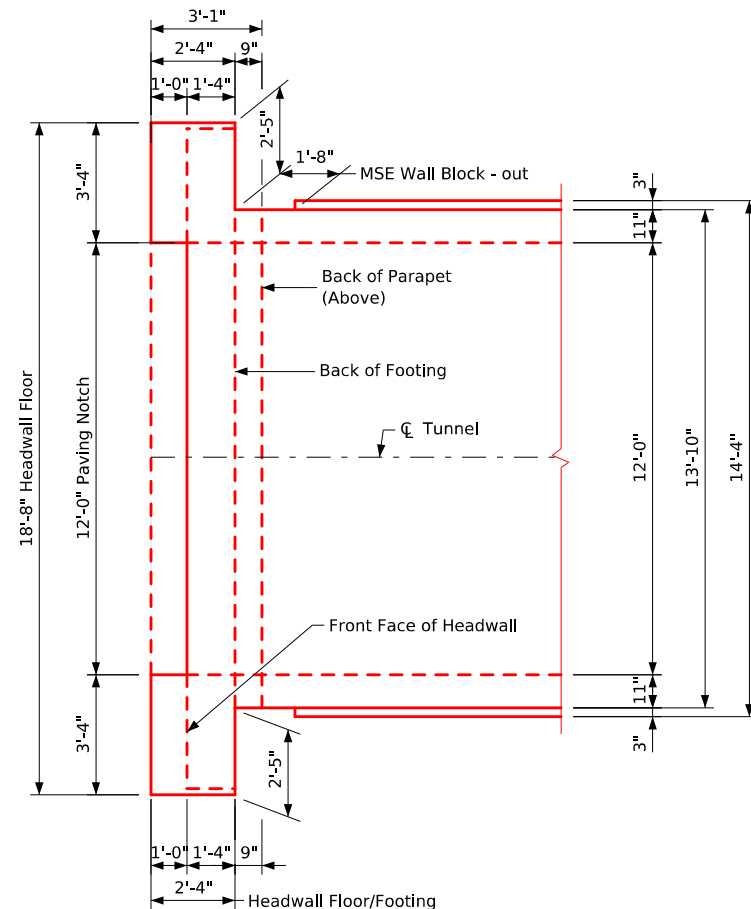
PROJECT NUMBER **IMN-080-3(340)125--0E-77**

Polk COUNTY

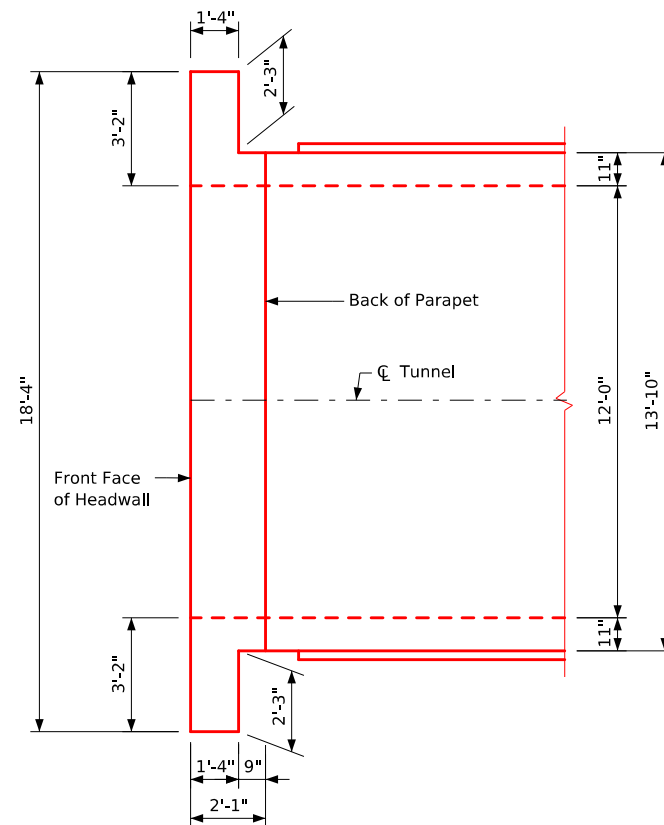
* Headwall not shown. See Design Sheet Nos. 6 and 7 for details.

Headwall floor, wall and slab sections shall be cast monolithically with tunnel end section.

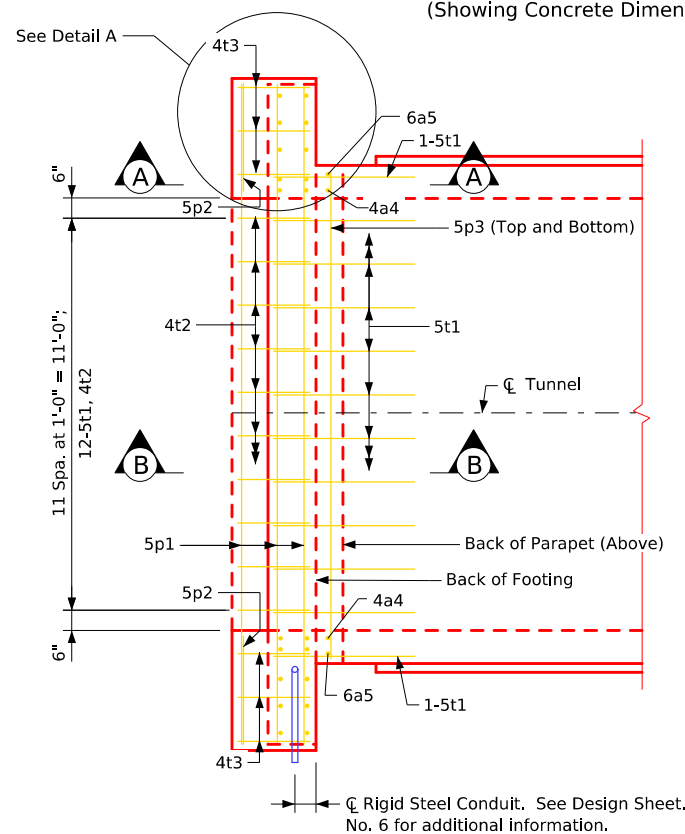




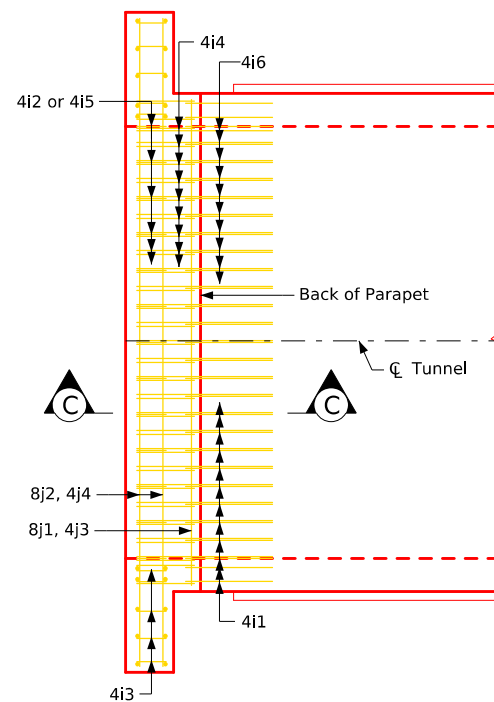
Plan at Floor / Footing
(Showing Concrete Dimensions)



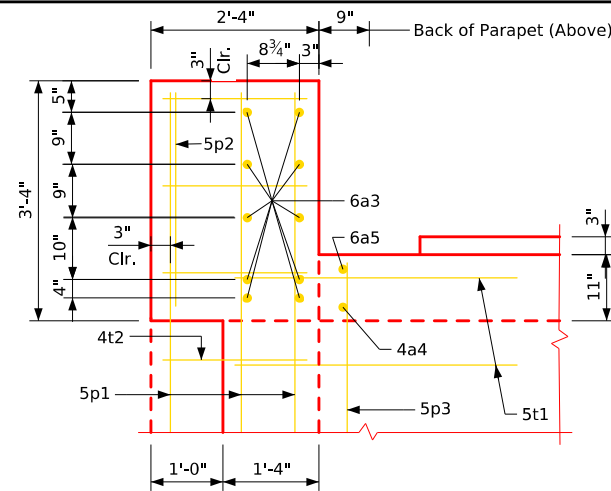
Plan at Top of Parapet
(Showing Concrete Dimensions)



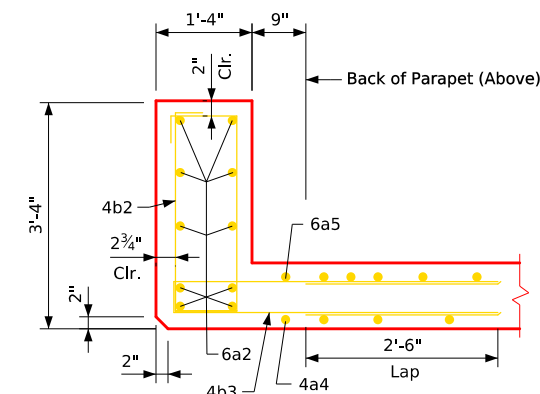
Plan at Floor / Footing
(Showing Reinforcing Steel)



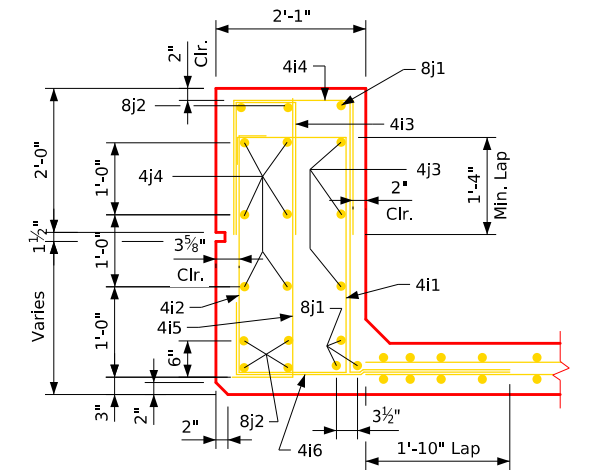
Plan at Top of Parapet
(Showing Reinforcing Steel)



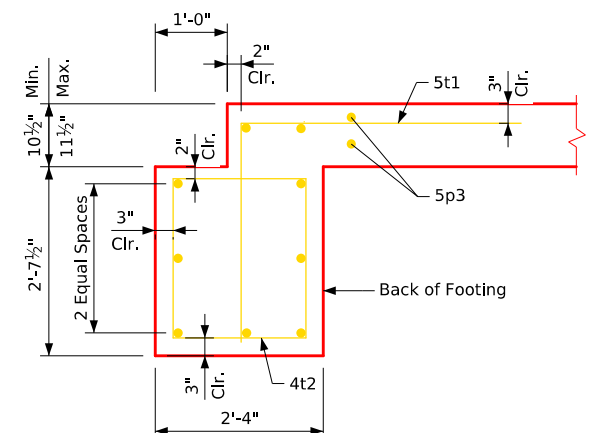
Detail A



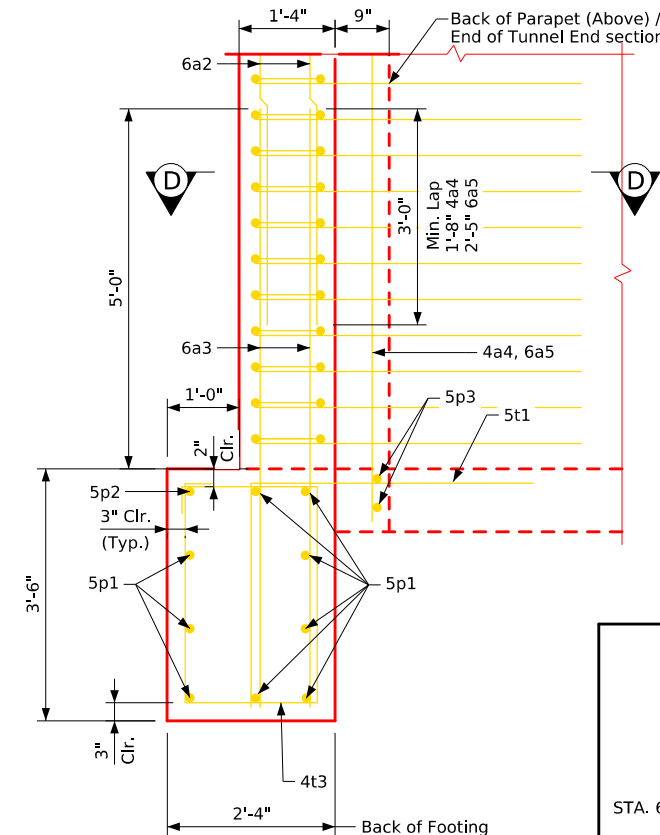
Section D-D
(Wall Reinforcing Shown)



Section C-C



Section B-B



Section A-A

Design For 0 Degree Skew
12'-0"x10'-4"x53'-0" Reinforced Concrete Pedestrian Tunnel

Headwall Details

STA. 668+50.00 (Hickman Rd.)

Turn-in Date: May, 2024

Polk County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 2225

Design Sheet No. 6 of 7

FHWA/Asset 900595



FILE NO. 32251

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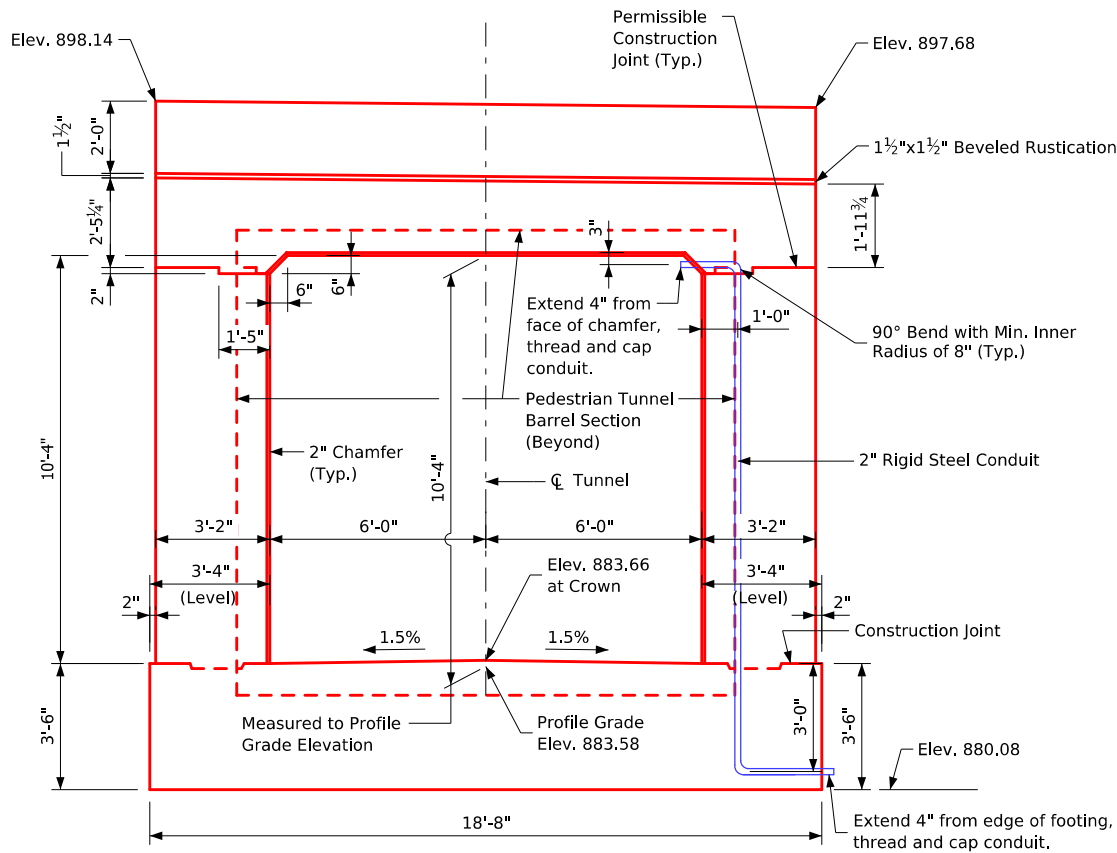
DESIGN TEAM SMK\|MKE\|CLS

Polk COUNTY

PROJECT NUMBER IMN-080-3(340)125--0E-77

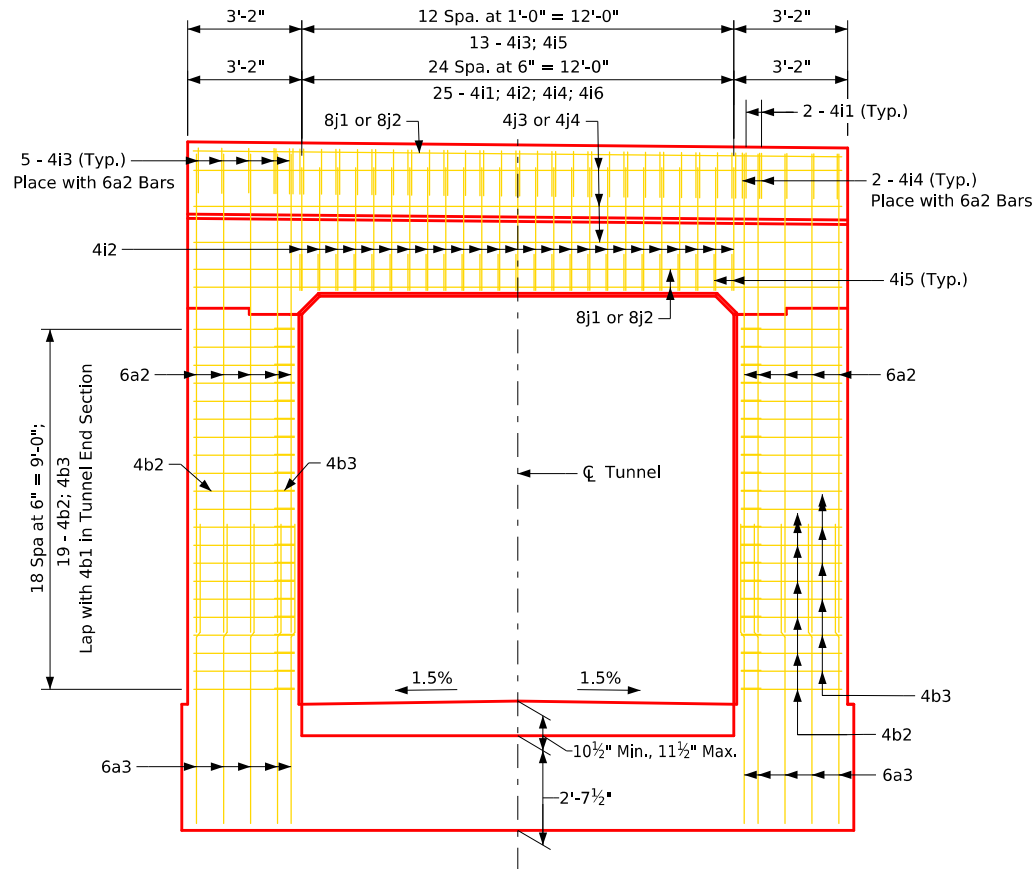
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Headwall Elevation

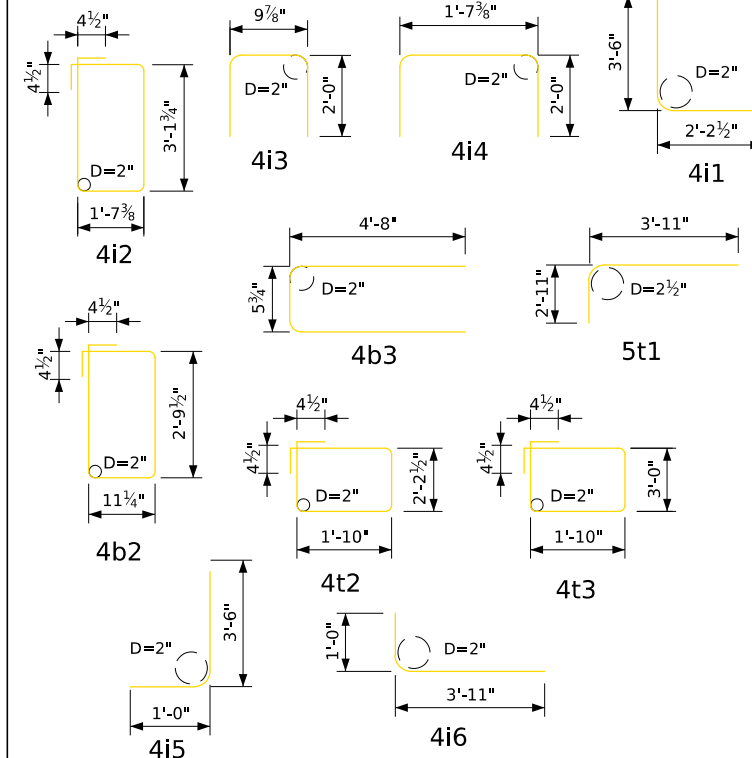
(Looking North - Showing Concrete Dimensions and Rustications, with Tunnel Barrel Beyond)



Headwall Elevation

(Showing Reinforcing Steel and Paving Notch)

Bent Bar Details



Reinforcing Bar List

Bar	Location	Shape	No.	Length	Weight
6a2	Vertical		20	12'-4"	370
6a3	Vertical		20	8'-4"	250
4a4	Walls, Vertical		4	8'-4"	22
6a5	Walls, Vertical		4	8'-9"	53
4b2	Horizontal		38	8'-3"	209
4b3	Horizontal		38	9'-10"	250
4i1	Parapet, B.F.V.		29	5'-9"	111
4i2	Parapet, Vertical		25	10'-3"	171
4i3	Parapet, Vertical		23	4'-0"	74
4i4	Parapet, Vertical		29	5'-8"	110
4i5	Parapet, Vertical		13	4'-6"	39
4i6	Parapet, Horizontal Bottom		25	4'-11"	82
8j1	Parapet, Horizontal		4	13'-6"	144
8j2	Parapet, Horizontal		6	18'-0"	288
4j3	Parapet, Horizontal		3	13'-6"	27
4j4	Parapet, Horizontal		6	18'-0"	72
5p1	Paving Notch, Horizontal		9	18'-4"	172
5p2	Paving Notch, Horizontal		2	3'-0"	6
5p3	Floor, Top and Bottom		2	13'-6"	28
5t1	Footing, Vertical		14	6'-10"	100
4t2	Footing, Hoops		12	8'-10"	71
4t3	Footing, Hoops		6	10'-5"	42
Reinforcing Steel - Total (Lbs.)				2,691	

Headwall Concrete Placement (CY)

Footing	Walls	Slab	Total
5.7	3.6	5.3	14.6

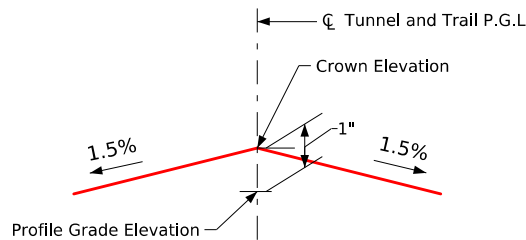
Note: Headwall, floor, wall, and slab sections shall be cast monolithically with tunnel end section.

Notes:

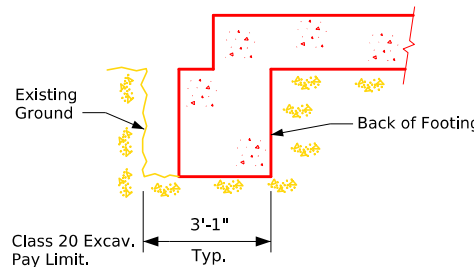
All slab and floor reinforcing steel is to be supported by bar chairs at intervals of not more than 3'-0" in either direction as outlined in the Standard Specifications.

Clear distance from face of concrete to near reinforcing bar is to be 2" unless otherwise noted or shown. Clearance to the bottom ends of vertical bars shall be 3 inches.

Concrete quantities are estimated from back of parapet.



Tunnel Crown Detail



Footing

Class 20 Excavation



Estimate Project Quantities and Reference Notes - Design #2325					
Item No.	Item Code	Item	Unit	Quantities Estimated Design No. 2325	Estimate Reference Notes
37	2402-2720000	Excavation, Class 20	CY	671.2	The excavation quantity is measured from the existing ground surface. Includes filling and compacting low areas around proposed pedestrian tunnel. Includes the excavation necessary to place the 1'-0" thick working blanket. Quantity should be reduced by 23.7 CY in the event that the working blanket is deleted.
38	2402-3825025	Granular Material For Blanket	CY	23.7	Includes cost of 1'-0" thick working blanket. Granular material shall be in accordance with Section 4118, Gradation No. 3 (excluding the No. 200 restriction) of the Standard Specifications. Includes 23.7 CY for a working blanket. The working blanket may be deleted if determined to be unnecessary at the time of construction. Reclaimed Asphalt Pavement (RAP) and reclaimed HMA shall not be used for the working blanket.
39	2403-0100020	Structural Concrete (RCB Culvert)	CY	74.2	Includes all resilient joint filler required. Includes all costs associated with incorporating rustication details in the headwall as detailed in these plans. Includes all costs associated with furnishing and installing materials for waterproofing as detailed in these plans including PVC waterstops, waterproofing membranes, and bentonite waterstops. No measurement or additional payment will be made for these items.
40	2404-7775000	Reinforcing Steel	LB	15,902	---
41	2501-8400172	Temporary Shoring	LS	1.00	---
42	2526-8285000	Construction Survey	LS	1.00	---
43	2526-8285000	Mobilization	LS	1.00	---
44	2599-9999010	('LUMP SUM' ITEM) Temporary Shoring Left in Place	LS	1.00	All work and materials shall be in accordance with Section 2501 of the Standard Specifications unless noted otherwise. Shoring Left in Place shall meet the "Buy America" requirements in accordance with Section 1107.06, B of the Standard Specifications.

Summary of Reinforcing Steel		
Location	Quantity	Total
Headwall	1 at 2,722	2,722
20'-0" Barrel Section	1 at 6,831	6,831
18'-1" Barrel End Section	1 at 6,349	6,349
Total (LB)		15,902

Concrete Placement Quantities				
Location	Footing	Walls	Slab	Total
Headwall	1 at 5.7	1 at 3.6	* 1 at 5.7	15.0
* 20'-0" Barrel Section	1 at 9.6	1 at 13.5	1 at 8.0	31.1
* 18'-1" Barrel End Section	1 at 8.7	1 at 12.2	1 at 7.2	28.1
Total (CY)	24.0	29.3	20.9	74.2

* Includes parapet and top of wingwall.
**Quantities estimated for the footing (floor) include an additional 0.02 CY/FT of concrete for the crown, in addition to the per foot concrete quantity shown on Standard Sheet PT-RCB 12-11-20.

Roadway quantities shown elsewhere in these plans.



Design For 0 Degree Skew

12'-0"x10'-4"x40'-0" Reinforced Concrete Pedestrian Tunnel

Estimated Quantities

STA. 668+50.00 (Hickman Rd.) Turn-in Date: May 2024

Polk County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 2325 Design Sheet No. 1 of 7 FHWA/Asset 900595

Specifications:

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.
Supplemental Specifications and Special Provisions shall apply to construction work on this project.

General Notes:

It is the intent of this design to construct a 12'-0" x 10'-4" x 40'-0" reinforced concrete pedestrian tunnel at Sta. 668+50.00 skewed 0°.
The RCB culvert sections are designed for HL-93 live load and earth fills of 2 feet. Utility companies and municipalities whose facilities are shown on the plans or known to be within the construction limits shall be notified by the Contractor of the construction starting date.
Excess Class 20 excavation material suitable for backfilling shall be stockpiled at the construction site, as directed by the Engineer.
Class 20 excavation material unsuitable for backfilling shall be disposed of in a manner that will leave the site in a neat condition.
During construction of this project the Culvert Contractor will be required to coordinate operations with those of other Contractors working within the same area. Other work in progress during the same period of time will include, but is not limited to, construction of the projects listed on sheet J.1 of the roadway plans.
Structure stage numbers do not correspond with the roadway construction and traffic staging numbers outlined in the tied IM-080-3(264)124--13-77 plans.

Temporary Shoring Notes:

Temporary shoring (sheet pile or other) shall be required as necessary to prevent the earth under the traffic lane from sloughing in during construction.
The Contractor shall submit a temporary shoring plan for review. The temporary shoring plan shall be designed and certified by a Professional Engineer licensed in the state of Iowa. When determining slope stability to support structures such as bridges, culverts, and retaining walls, a global stability analysis shall be included in the design of the temporary shoring in accordance with Chapter 200F-1 in the Design Manual of the Iowa DOT, Design Bureau. The Contractor shall not proceed with installation of the temporary shoring without notice to proceed from the Engineer.
The temporary shoring submittal shall include:
• Design calculations (including a global stability analysis)
• Soil properties
• Shoring material properties
• Shoring plan layout (showing location of traffic)
• Shoring details
Temporary shoring shall be paid for as a lump sum including all cost for designing, furnishing, installing and removal. All material used for shoring shall remain the property of the Contractor. Shoring is to be removed only after backfilling has been completed. In addition to the requirements noted above, Article 1107.07 of the Standard Specifications still applies.
Temporary shoring shall be designed and constructed so that existing embankment under existing and proposed pavement remains undisturbed.

Shoring Left in Place Notes:

Shoring (sheet pile or other) shall be required as necessary to prevent the earth under the traffic lane from sloughing in during construction.

The Contractor shall submit a Shoring Plan for review. The Shoring Plan shall be designed and certified by a Professional Engineer licensed in the State of Iowa. When determining slope stability to support structures such as bridges, culverts and retaining walls, a global stability analysis shall be included in the design of the shoring in accordance with Chapter 200F-1 in the Design Manual of the Iowa DOT, Design Bureau. The Contractor shall not proceed with installation of the shoring without notice to proceed from the Engineer.

The shoring submittal shall include:
· Design calculations (including a global stability analysis)
· Soil properties
· Shoring material properties
· Shoring plan layout (showing location of traffic)
· Shoring details

Shoring shall be paid for as a lump sum including all cost for designing, furnishing, installing and abandoning the shoring in place.

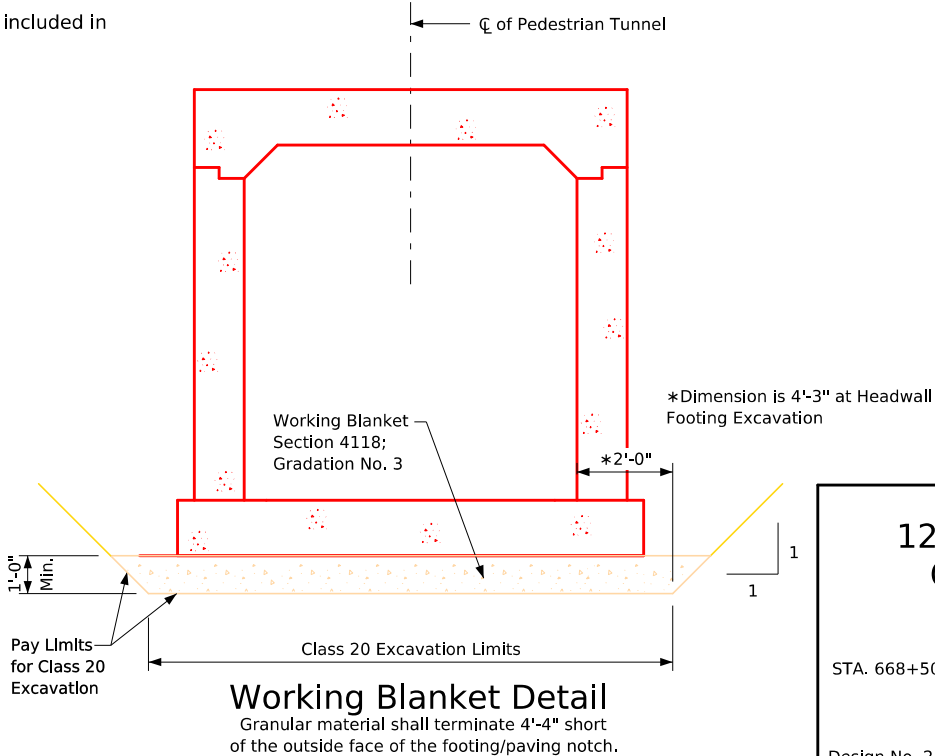
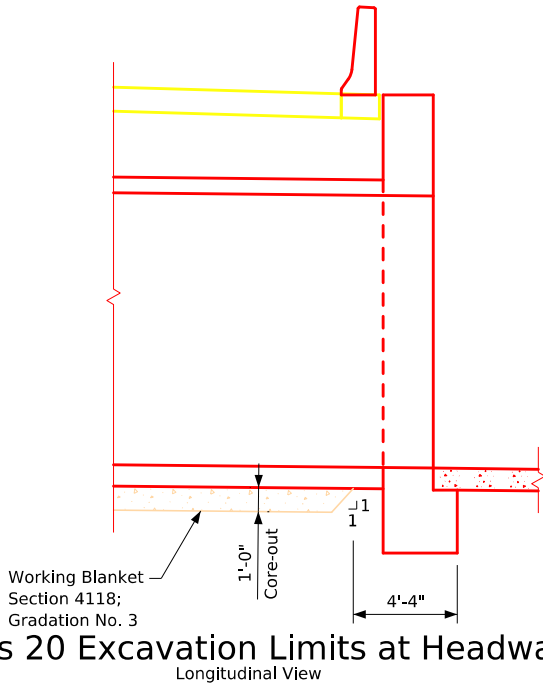


Shoring Left in Place Notes (Con't):

Shoring shall meet the "Buy America" requirements in accordance with Section 1107.06 B of the Standard Specifications. In addition to the requirements noted above, Section 1107.07 of the Standard Specifications still applies

General Notes for Concrete Rustication:

- Strips and panels used as inserts within concrete forms to create the rustication features may be made of wood, steel, plastic or other nonporous material capable of withstanding anticipated concrete pour pressures without physical defects. Wood inserts, if used, shall be free of warp, twist, checks or cracks, and shall be presoaked prior to placement of concrete in the forms.
- Rustication inserts shall easily attach to forms and shall not allow leakage of concrete between the form and the insert. When steel forms are used, rustication strips may be rigidly attached to the inside surfaces of the forms. When steel forms are not used, rustication strips and other inserts for small recesses on exposed concrete surfaces shall be fastened to the forms in a manner that will permit them to remain in place when the forms are removed. Leave inserts in place until they can be removed without damage to the surrounding concrete.
- The inserts shall be designed to form surfaces and features conforming to the design intent including the shape, lines, depths and dimensions shown in the plans. Create inserts using a minimum number of splice joints in their length. Splices, if used, shall be tightly joined so as not to allow gaps or leaks, and shall not create any change in alignment or shape of the rustication feature. Do not locate form ties within concrete rustications.
- For rustication features following the perimeter of rounded surfaces, it may be necessary to use multiple layers of insert material in order to achieve the radius curve. This is acceptable, provided that the final shape, line, depth, and dimension of the features are maintained in the final result.
- During loading of forms with concrete, take extra care to ensure proper consolidation of concrete around all rustication inserts to preserve the shape, line and depth of all intended features in the final concrete surface. Following removal of forms, repair all defects to achieve the rustication features as specified in the plans. Patch voids, honeycomb areas, etc., in accordance with the Standard Specifications. If surfaces will not receive a colored sealer coating, add white cement to the patching mortar to lighten it in order to match surrounding concrete when dry. Completed surface shall be free from blemishes, surface voids and conspicuous form marks to the satisfaction of the Engineer. The Contractor shall correct, at his own cost, any surface defects.
- All costs associated with concrete rustication are to be included in the bid item "Structural Concrete (RCB Culvert)".



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	Shoring Left In Place	77_Polk2325_ShoringLeftInPlace.pdf	Yes
2	Temporary Shoring	77_Polk2325_TemporaryShoring.pdf	Yes
No.	Calculation Description	Calculation File Name Convention For Submittal	Certified by Iowa P.E. (Yes/No)
1	Shoring Left In Place	77_Polk2325_ShoringLeftInPlaceCalculations.pdf	Yes
2	Temporary Shoring	77_Polk2325_TemporaryShoringCalculations.pdf	Yes

Standards: For details and notes not shown refer to the following Iowa D.O.T. - Highway Standards:		
Standard	Issued	Revised
PT G1-20	August 2020	-----

See tied IM-80-3(264)124--13-77 plans for construction staging information for roadway and structures, and for traffic staging information, TBR layout, and final paving configuration.

The Pollution Prevention Plan is not included in these plans, but is included in the Grade and Pave Plans for the project IM-080-3(264)124--13-77 which is tied to the pedestrian tunnel plans through the contract letting process.

Traffic Control Plan

The roadway will be open to thru traffic. Refer to the Traffic Control Plan included in the tied Grade and Pave Plans, project number IM-080-3(264)124--13-77.

Design For 0 Degree Skew

12'-0"x10'-4"x40'-0" Reinforced Concrete Pedestrian Tunnel

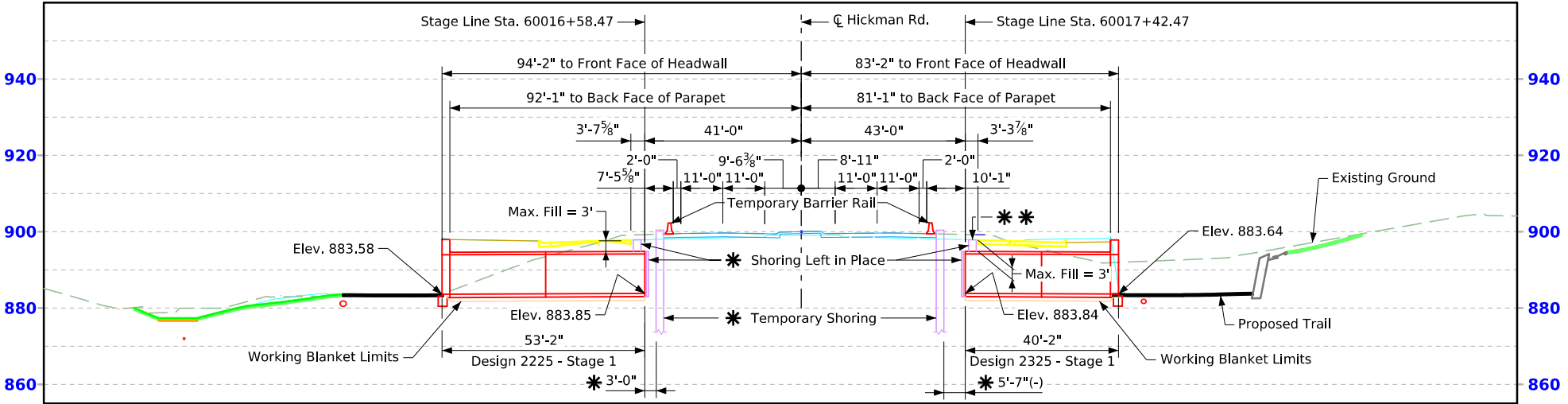
General Notes

STA. 668+50.00 (Hickman Rd.) Turn-in Date: May 2024

Polk County

IOWA DEPARTMENT OF TRANSPORTATION

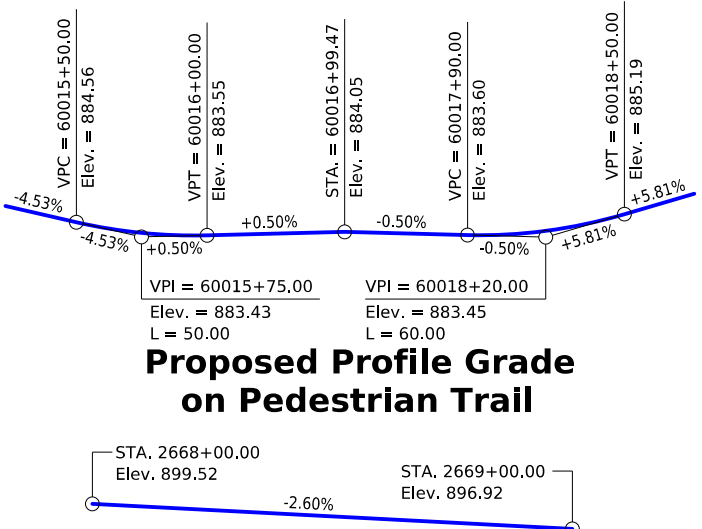
Design No. 2325 Design Sheet No. 2 of 7 FHWA/Asset 900595



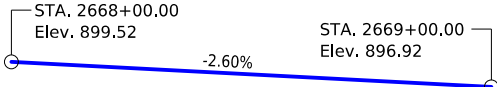
Anticipated Settlement = Negligible
The crown elevation is 1" above the profile grade on trail.

Longitudinal Section Along Centerline of Tunnel

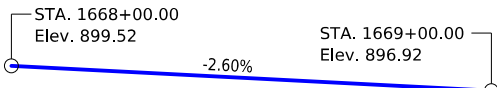
Design Fill Height = 2'
NBIS Structure Length = 12.0'



Proposed Profile Grade on Pedestrian Trail



Proposed Profile Grade on Hickman Rd. WB



Proposed Profile Grade on Hickman Rd. WB

Structure stage numbers do not correspond with the roadway construction and traffic staging numbers outlined in the tied IM-080-3(264)124-13-77 plans.

* Final shoring layout, limits, and configuration is at the discretion of the Contractor, except as noted.

* * Shoring Left in Place shall not exceed 2'-9" above the top of tunnel for Design 2325.

Location

Trail under Hickman Rd.
T-79N R-25W
Section 29
Walnut Township
Polk County
Asset No. 900595
Latitude 41.614866°
Longitude -93.779810°

Hickman Rd. Traffic Estimate

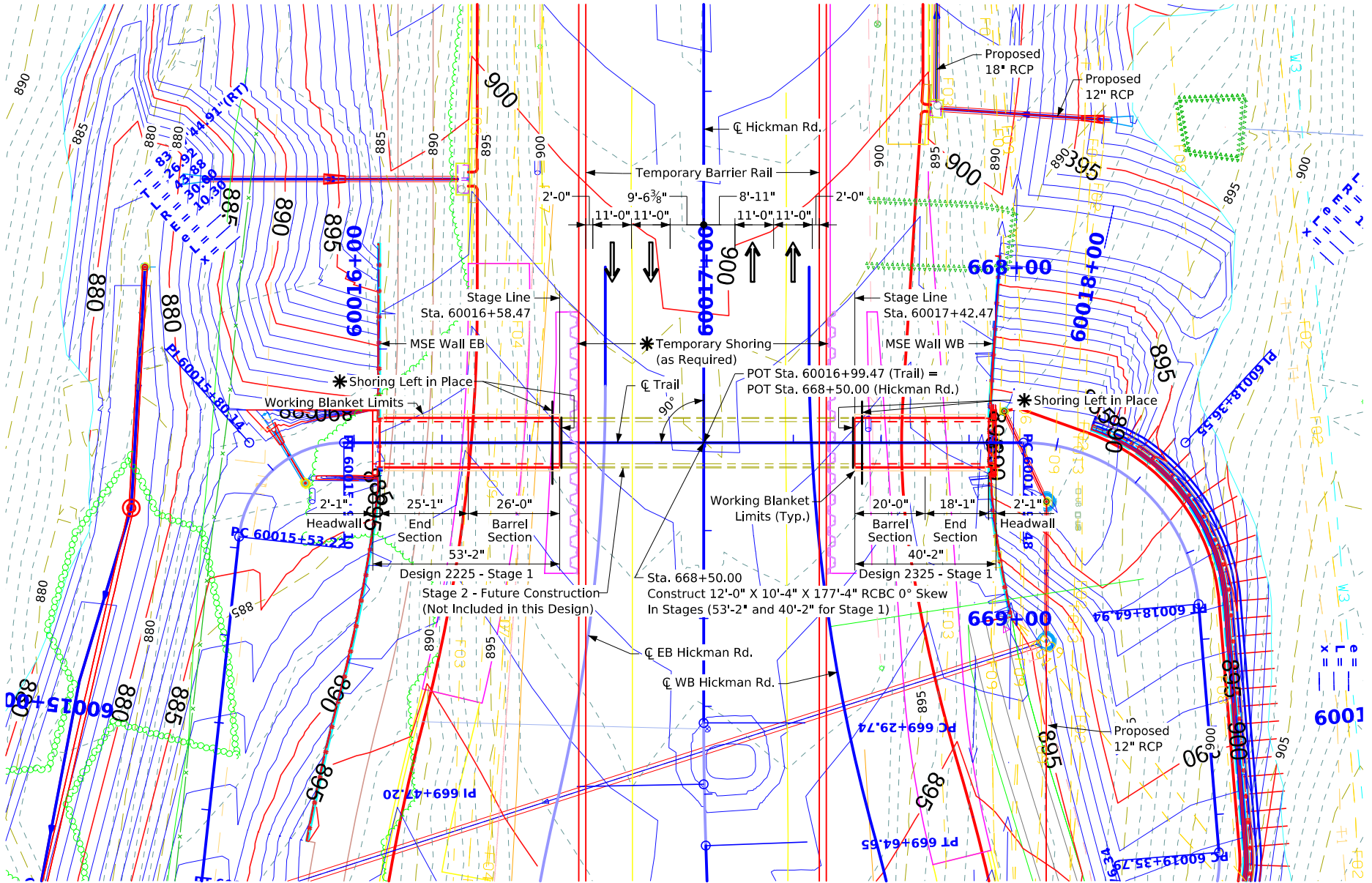
2022 AADT	37,000 V.P.D.
2050 AADT	66,000 V.P.D.
2050 DHV	4,240 V.P.H.
TRUCKS	6 %

Utility Legend

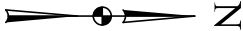
--E2--	- ELECTRIC LINE
--F0--	- FIBER OPTIC LINE
--F02--	- FIBER OPTIC LINE
--F03--	- FIBER OPTIC LINE
--F04--	- FIBER OPTIC LINE
--F06--	- FIBER OPTIC LINE
--F07--	- FIBER OPTIC LINE
--F08--	- FIBER OPTIC LINE
--F09--	- FIBER OPTIC LINE
--F011--	- FIBER OPTIC LINE
--F013--	- FIBER OPTIC LINE
--T1--	- TELEPHONE LINE
--W3--	- WATER LINE
⊕	- POWER POLE
⊗	- POWER POLE
⊙	- POWER POLE

Utilities Note:

Utilities shown on this sheet are for information only. See Road Design Sheet D.1 of this plan set for utility information. See Sheet J.1 of the Road Sheets in this plan set for the list of tied projects as indicated on the General Notes sheet of this plan set.



Situation Plan



Design For 0 Degree Skew
12'-0"x10'-4"x40'-0" Reinforced
Concrete Pedestrian Tunnel

Situation Plan - Stage 1

STA. 668+50.00 (Hickman Rd.) Turn-in Date: May 2024

Polk County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 2325 Design Sheet No. 3 of 7 FHWA/Asset 900595

FILE NO. 32251

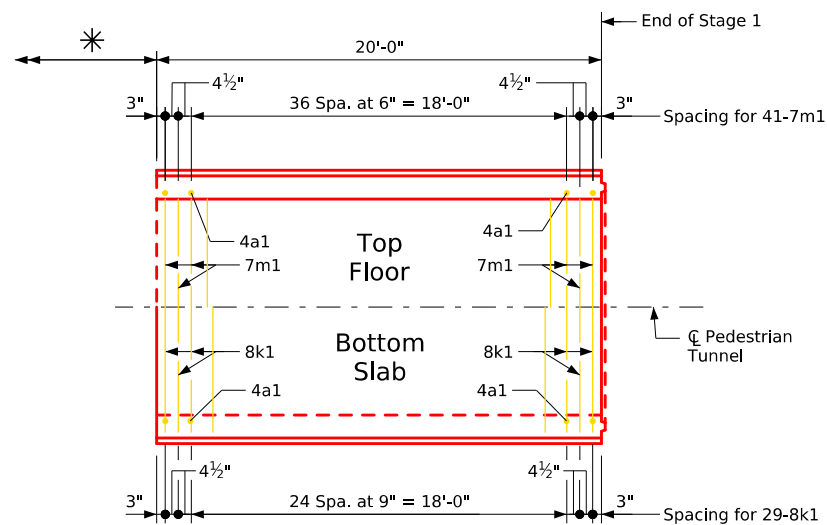
ENGLISH

DESIGN TEAM SMK\MK\CLS

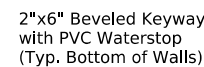
Polk COUNTY

PROJECT NUMBER IMN-080-3(340)125--0E-77

SHEET NUMBER V.36



* End section and joint details not shown.
See Design Sheet No. 5 for details.



Bent Bar Details

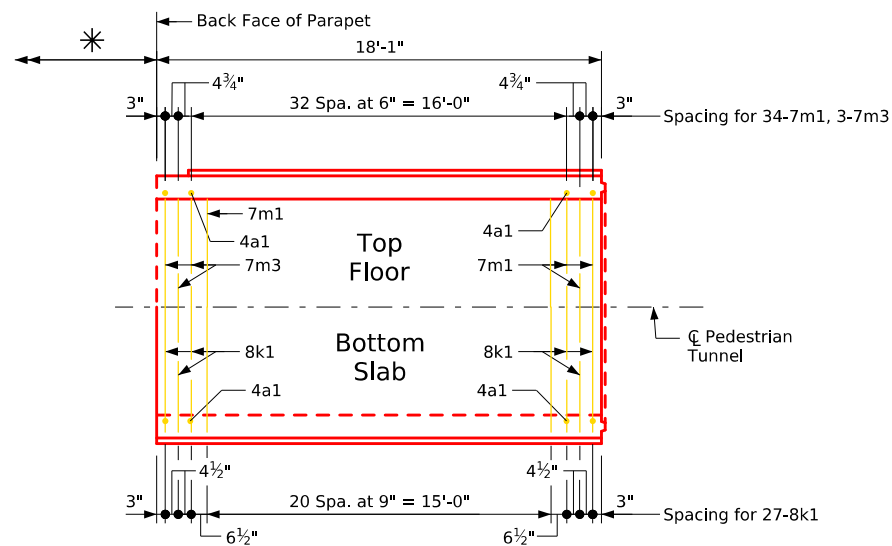
Diagram 1 (Left): Bent Bar Details. Horizontal dimension: 6'-2". Vertical dimension: 4'-0". Pin diameter: $D = 5\frac{3}{4}"$. Label: 7k2.

Diagram 2 (Right): Bent Bar Details. Horizontal dimension: 5'-1". Vertical dimension: 10'-3". Pin diameter: $D = 5\frac{3}{4}"$. Label: 7m2.

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

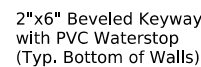
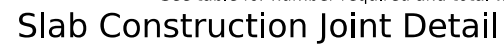
Note:
Concrete and reinforcing steel quantities are included in
the summary quantities tables on Design Sheet No. 1.

STA. 668+50.00 (Hickman Rd.) Turn-in Date: May 2024
Polk County
 IOWA DEPARTMENT OF TRANSPORTATION
 Design No. 2325 Design Sheet No. 4 of 7 FHWA/Asset 900595

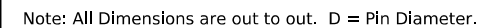


* Headwall not shown. See Design Sheet Nos. 6 and 7 for details.

Headwall floor, wall and slab sections shall be cast monolithically with tunnel end section.



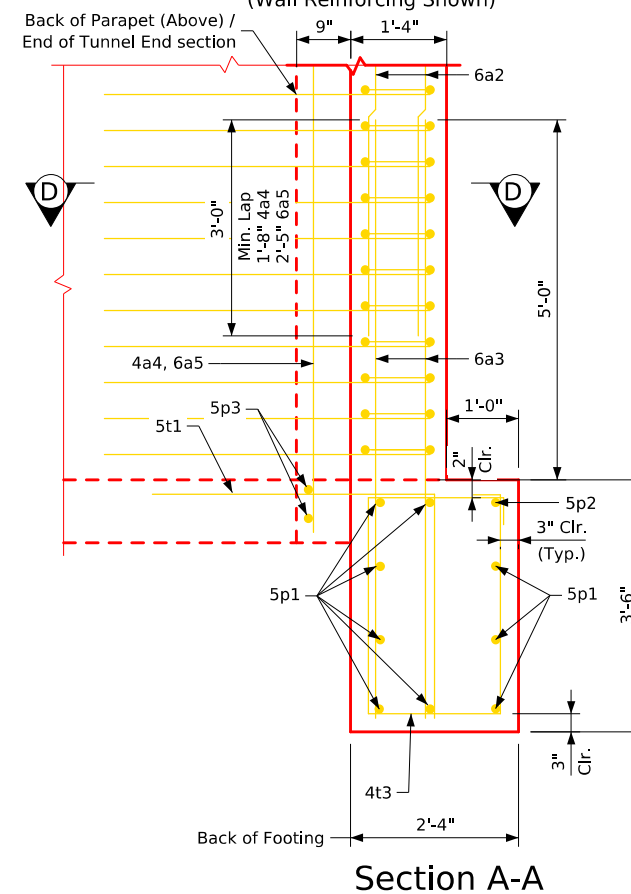
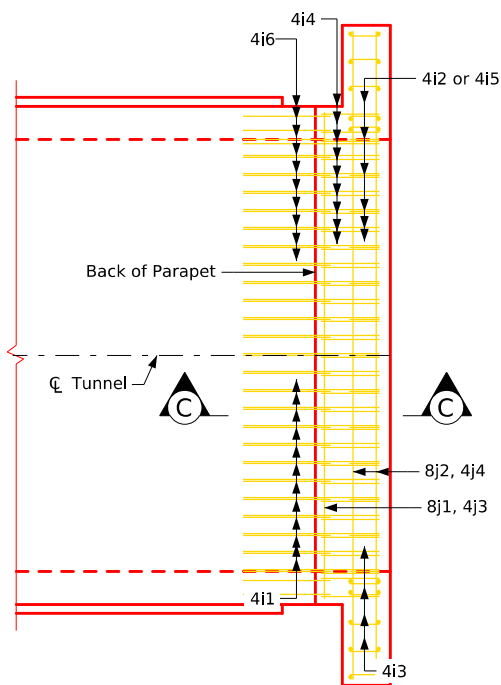
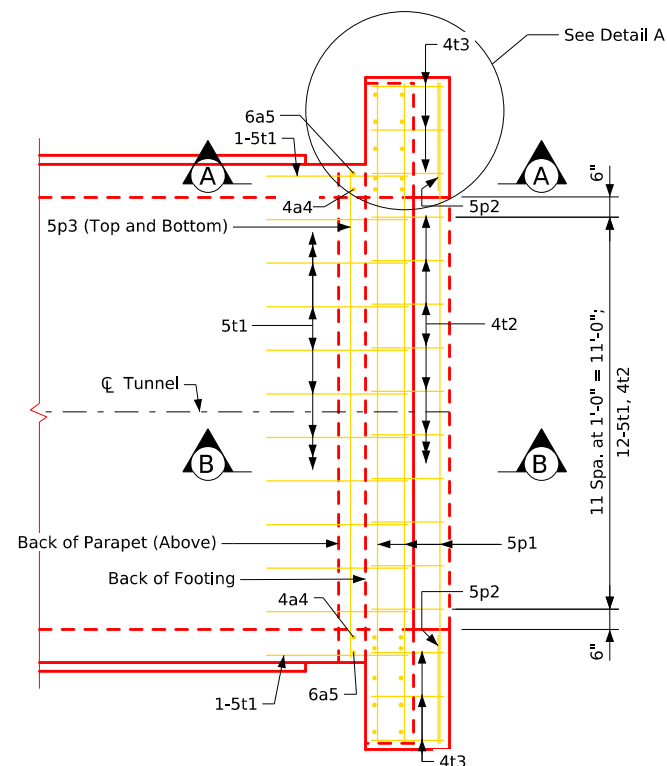
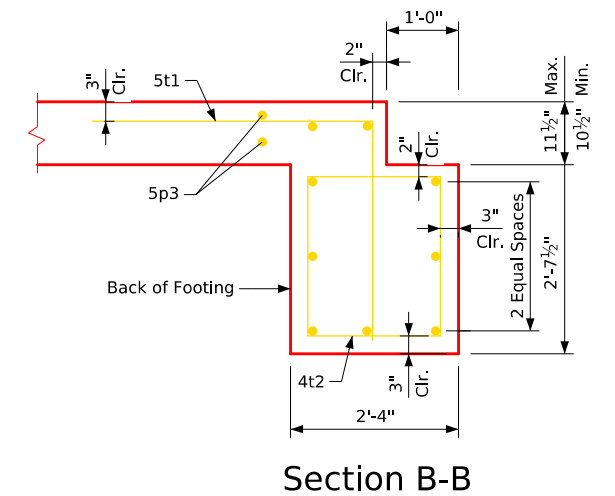
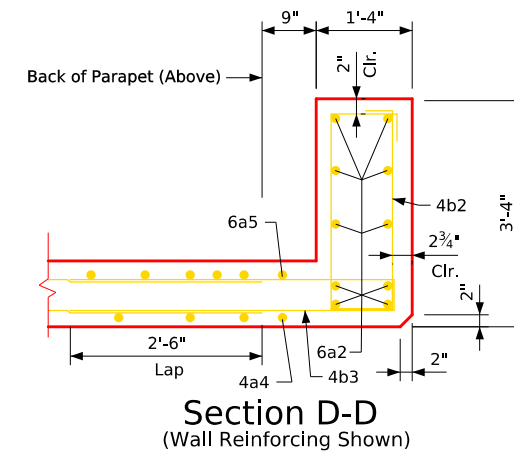
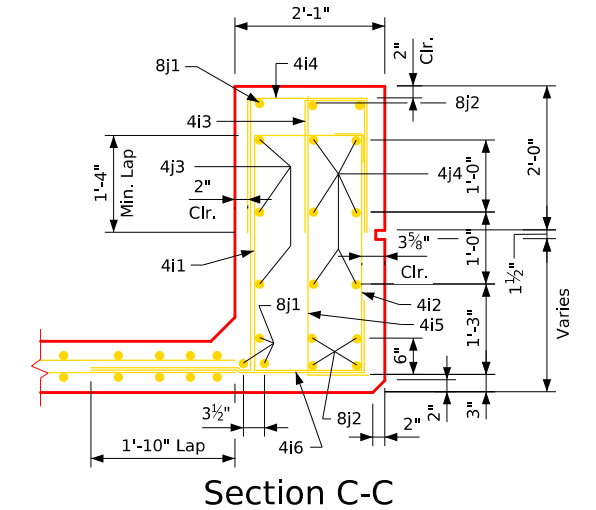
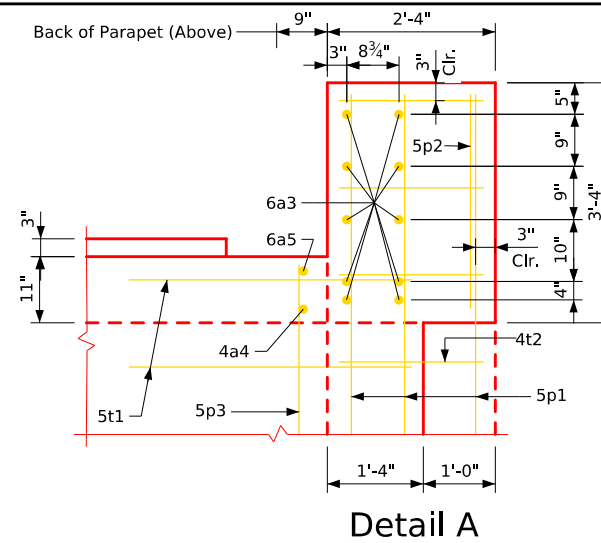
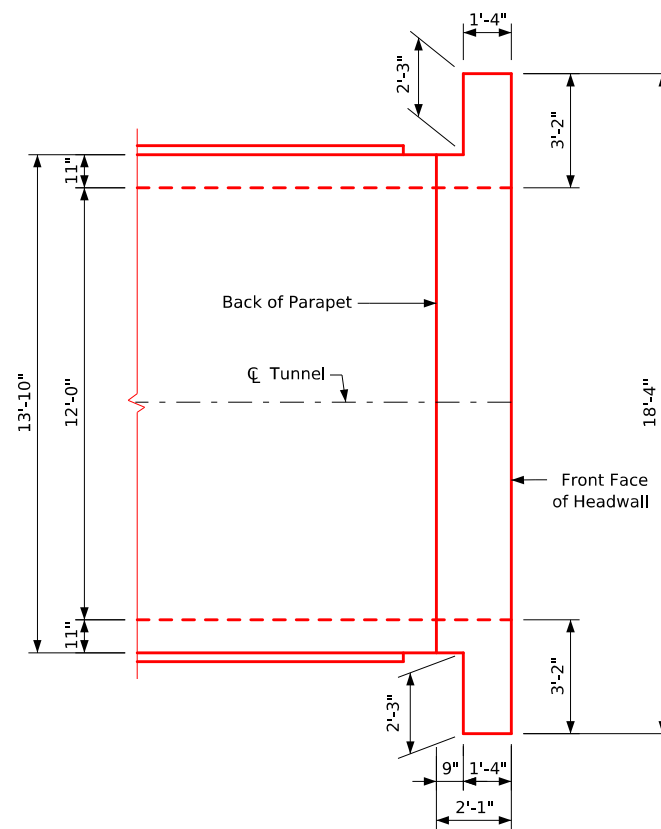
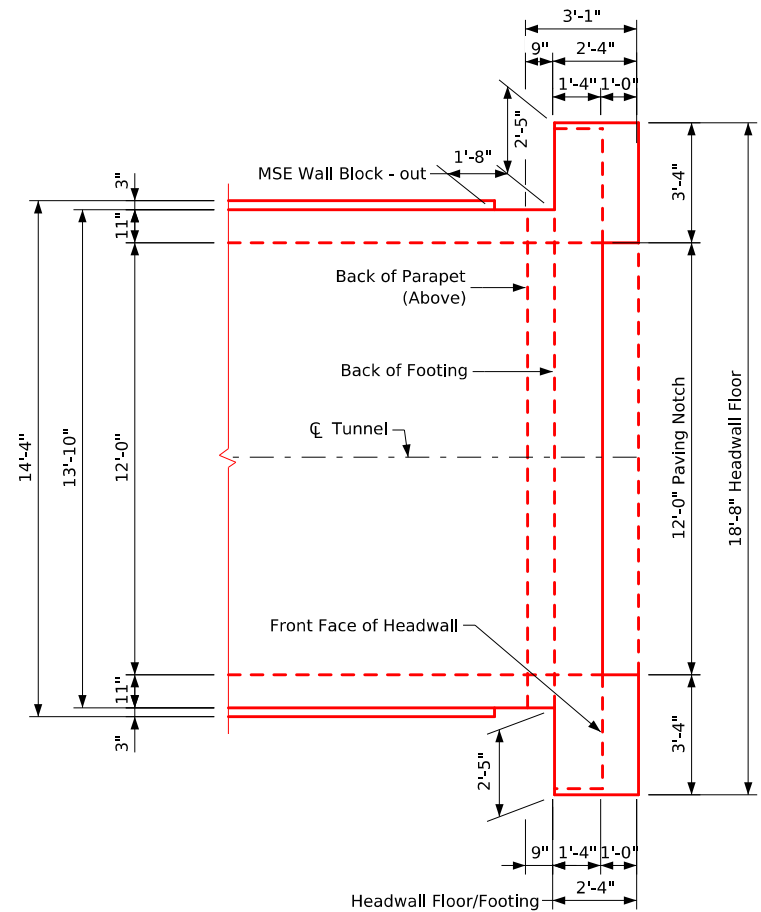
Bent Bar Details



Note:
Concrete and reinforcing steel quantities are included in the summary quantities tables on Design Sheet No. 1.

End Section Details

STA. 668+50.00 (Hickman Rd.)	Polk County	Turn-in Date: May 2024
IOWA DEPARTMENT OF TRANSPORTATION		
Design No. 2325	Design Sheet No. 5 of 7	FHWA/Asset 900595



Design For 0 Degree Skew
12'-0"x10'-4"x40'-0" Reinforced
Concrete Pedestrian Tunnel

Headwall Details

STA. 668+50.00 (Hickman Rd.)

Turn-in Date: May 2024

Polk County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 2325

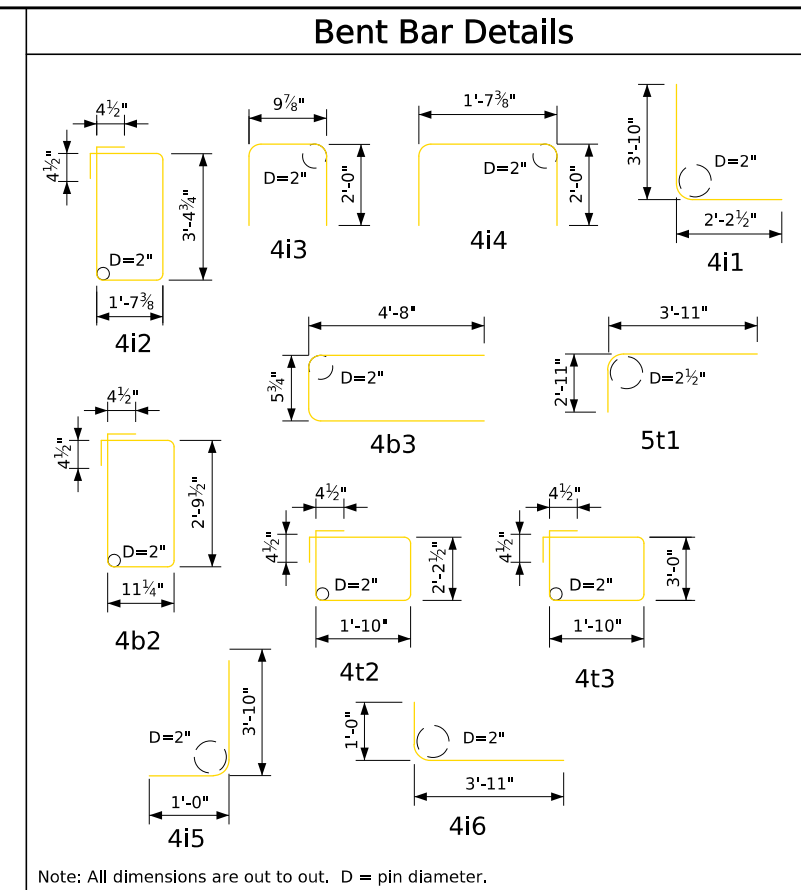
Design Sheet No. 6 of 7

FHWA/Asset 900595

Headwall Elevation

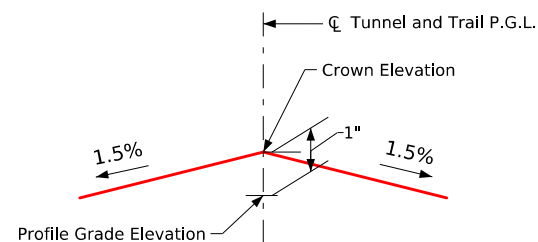
(Looking South Showing Concrete Dimensions and Rustications, with Tunnel Barrel Beyond)

SHUCK+BRITSON Headwall Elevation
(Showing Reinforcing Steel and Paving Notch)

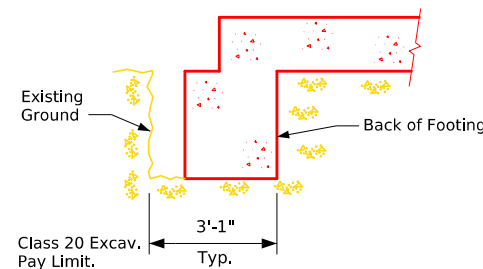


Reinforcing Bar List					
Bar	Location	Shape	No.	Length	Weight
6a2	Vertical		20	12'-8"	381
6a3	Vertical		20	8'-4"	250
4a4	Walls, Vertical		4	8'-6"	23
6a5	Walls, Vertical		4	8'-10"	53
4b2	Horizontal		38	8'-3"	209
4b3	Horizontal		38	9'-10"	250
4i1	Parapet, B.F.V.		29	6'-1"	118
4i2	Parapet, Vertical		25	10'-9"	180
4i3	Parapet, Vertical		23	4'-10"	74
4i4	Parapet, Vertical		29	5'-8"	110
4i5	Parapet, Vertical		13	4'-10"	42
4i6	Parapet, Horizontal Bottom		25	4'-11"	82
8j1	Parapet, Horizontal		4	13'-6"	144
8j2	Parapet, Horizontal		6	18'-0"	288
4j3	Parapet, Horizontal		3	13'-6"	27
4j4	Parapet, Horizontal		6	18'-0"	72
5p1	Paving Notch, Horizontal		9	18'-4"	172
5p2	Paving Notch, Horizontal		2	3'-0"	6
5p3	Floor, Top and Bottom		2	13'-6"	28
5t1	Footing, Vertical		14	6'-10"	100
4t2	Footing, Hoops		12	8'-10"	71
4t3	Footing, Hoops		6	10'-5"	42
Reinforcing Steel - Total (Lbs.)					2,722
Headwall Concrete Placement (CY)					
Footing	Walls	Slab	Total		
5.7	3.6	5.7	15.0		

Note: Headwall, floor, wall, and slab sections shall be cast monolithically with tunnel end section.



Tunnel Crown Detail



Footing
Class 20 Excavation

Notes:

All slab and floor reinforcing steel is to be supported by bar chairs at intervals of not more than 3'-0" in either direction as outlined in the Standard Specifications.

Clear distance from face of concrete to near reinforcing bar is to be 2" unless otherwise noted or shown. Clearance to the bottom ends of vertical bars shall be 3 inches.

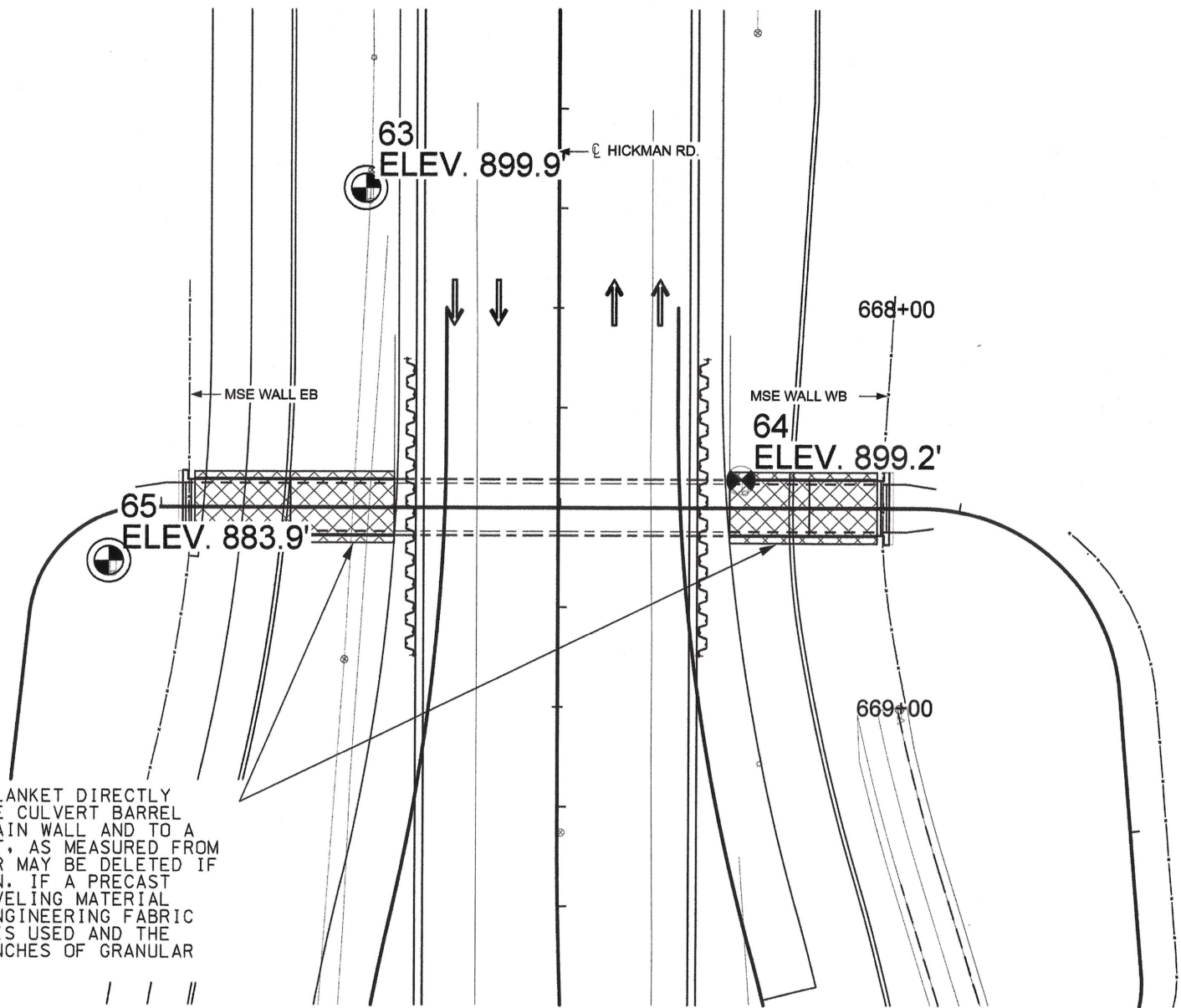
Concrete quantities are estimated from back of parapet.

		Headwall Elevation (Showing Reinforcing Steel and Paving Notch)		Class 20 Excavation		07/14/2023 (11:41 AM)		Polk County IOWA DEPARTMENT OF TRANSPORTATION	
Design No. 2325		Design Sheet No. 7 of 7		FHWA/Asset 900595					
FILE NO. 32251	ENGLISH	DESIGN TEAM SMK MKE CLS			Polk COUNTY	PROJECT NUMBER IMN-080-3(340)125--0E-77		SHEET NUMBER V.40	

NOTE: PLAN VIEW SHEET ORIENTED LOOKING DOWN STATION.

THIS SHEET IS INCLUDED TO SHOW SOIL INFORMATION. DETAILS AND NOTES SHOWN ELSEWHERE IN THESE PLANS SHALL BE USED FOR STRUCTURE CONSTRUCTION.

NOTE: SOILS MAY VARY BETWEEN BORINGS. SEE STANDARD SPECIFICATION 1104.01



INSTALL A 1-FOOT THICK LAYER OF GRANULAR MATERIAL FOR BLANKET DIRECTLY BELOW THE RCB CULVERT EXTENDING THE ENTIRE LENGTH OF THE CULVERT BARREL TO WITHIN 3 FEET INWARD OF THE OUTSIDE FACE OF THE CURTAIN WALL AND TO A WIDTH OF 2 FEET BEYOND THE SIDES OF THE PROPOSED CULVERT, AS MEASURED FROM THE INSIDE FACE. THE GRANULAR MATERIAL FOR BLANKET LAYER MAY BE DELETED IF DETERMINED TO BE UNNECESSARY AT THE TIME OF CONSTRUCTION. IF A PRECAST CULVERT OPTION IS USED, INSTALL 6 INCHES OF GRANULAR LEVELING MATERIAL ABOVE THE GRANULAR MATERIAL FOR BLANKET LAYER WITH AN ENGINEERING FABRIC SEPARATING THE TWO LAYERS. IF A PRECAST CULVERT OPTION IS USED AND THE GRANULAR MATERIAL FOR BLANKET LAYER IS DELETED, THE 6 INCHES OF GRANULAR LEVELING MATERIAL IS STILL USED.

GEOTECHNICAL DESIGN



I hereby certify that this engineering document was prepared under my supervision and that engineering decisions with regard to the design were made by me or by other duly licensed Professional Engineers under the laws of the State of Iowa.

Signature: *Gary F. Miller* Date: 3-6-2024

Printed or Typed Name: GARY F. MILLER
License Number: P25343
My license renewal date is December 31, 2024

Pages or sheets covered by this seal: SPS.1 - SPS.2



0 ENGLISH 40
SCALE IN FEET

Location

Trail under Hickman Rd.
T-79N R-25W
Section 29
Walnut Township
Polk County
Latitude 41.614866°
Longitude -93.779810°

Design For 0 Degree Skew
12'-0"x10'-4"x53'-0" & 12'-0"x10'-4"x40'-0"
Reinforced Concrete Pedestrian Tunnel

Soil Profile Sheet

STA. 668+50.00 (Hickman Rd.)

Polk County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 2225 Design Sheet No. 1 of 2 FHWA/Asset 900595

FILE NO. 32215

ENGLISH

DESIGN TEAM SMKMK/CLS/TERRACON

Polk COUNTY

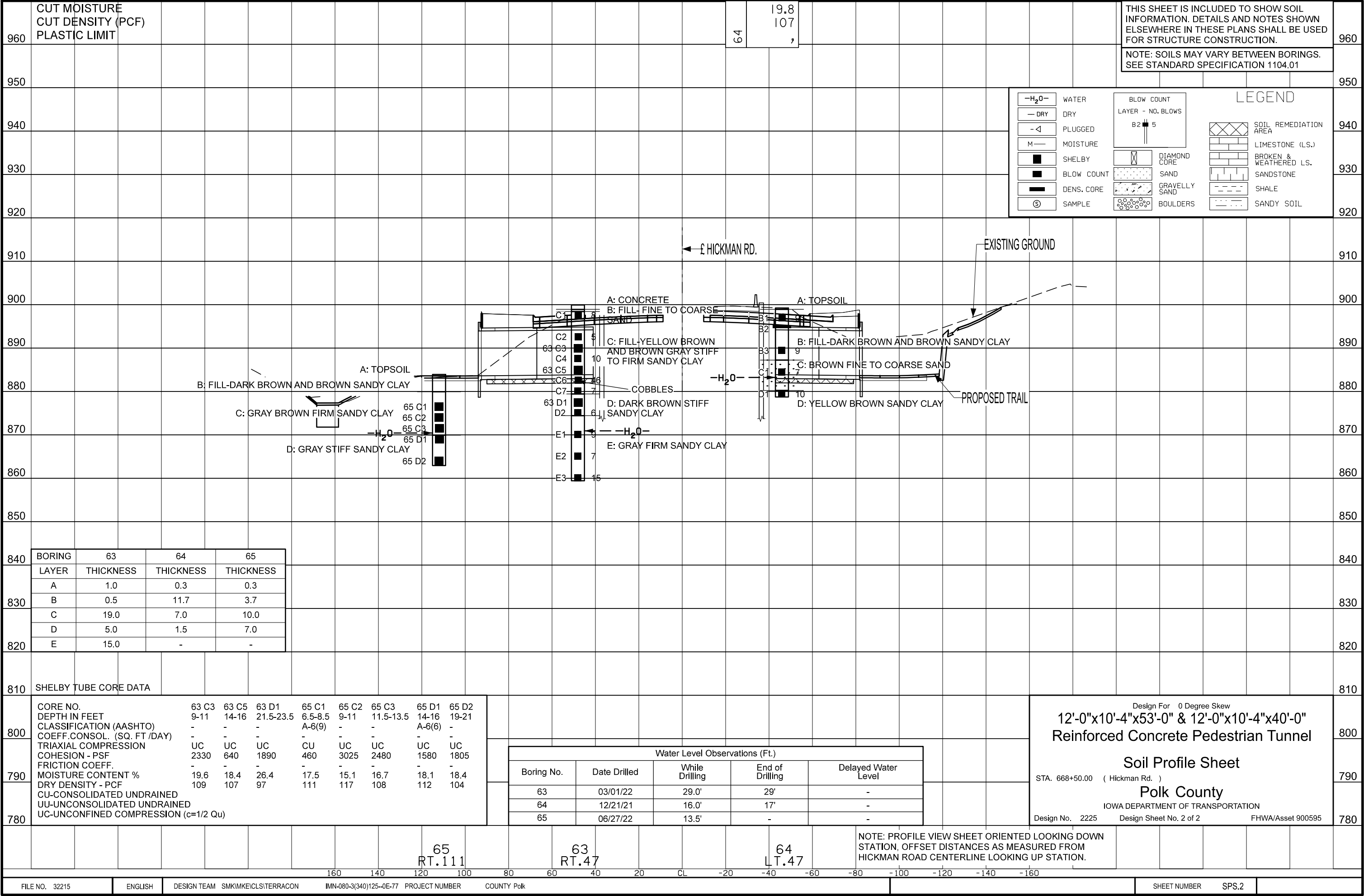
PROJECT NUMBER IMN-080-3(340)125-0E-77

SHEET NUMBER SPS.1

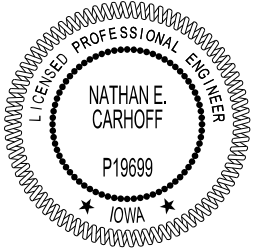
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Personal

pw:\projectwise.dot.int\lan:PWWMain\Documents\Projects\7708008015\Soils\Terracon\SPS\SPS_770807340_2225.dgn SPS.1 11x17clr_pdf.plt



INDEX OF SHEETS	
No.	DESCRIPTION
A Sheets	Title Sheets
A.3	Index of Roadway Sheets
B Sheets	Typical Cross Sections and Details
B.1	Typical Cross Sections and Details
C Sheets	Quantities and General Information
C.1 - 2	Roadway Tabulations
D Sheets	Mainline Plan and Profile Sheets
* D.1	Plan & Profile Legend & Symbol Information Sheet
E Sheets	Side Road Plan and Profile Sheets
* E.1	Interstate 35/80 Trail
* E.2	U.S. Hwy. 6 (Hickman Road)
G Sheets	Survey Sheets
G.1 - 2	Reference Ties and Bench Marks
G.3	Horizontal and Vertical Control Coordinates
G.4	Alignment Coordinates and Curve Data
H Sheets	Right-of-Way Sheets
* HE.1	U.S. Hwy 6 (Hickman Road)
J Sheets	Traffic Control and Staging Sheets
* J.1	Traffic Control Plan
	* Color Plan Sheets



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.

Nathan E. Carhoff 05/01/2024
Nathan E. Carhoff, P.E. Date

License Number P19699

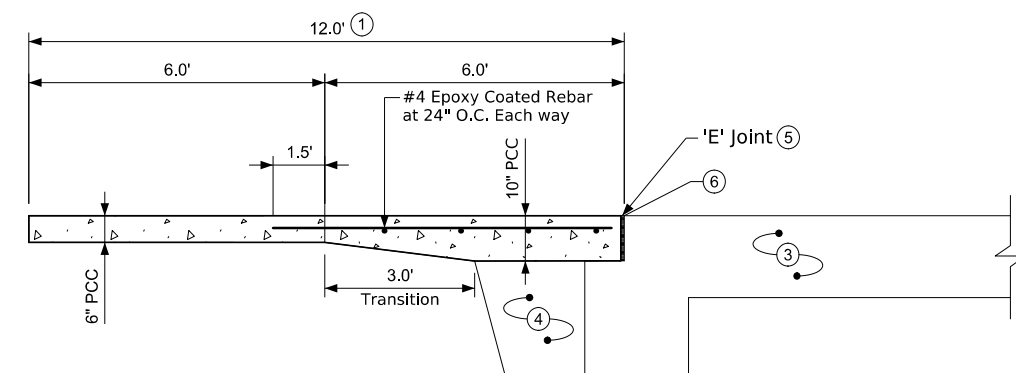
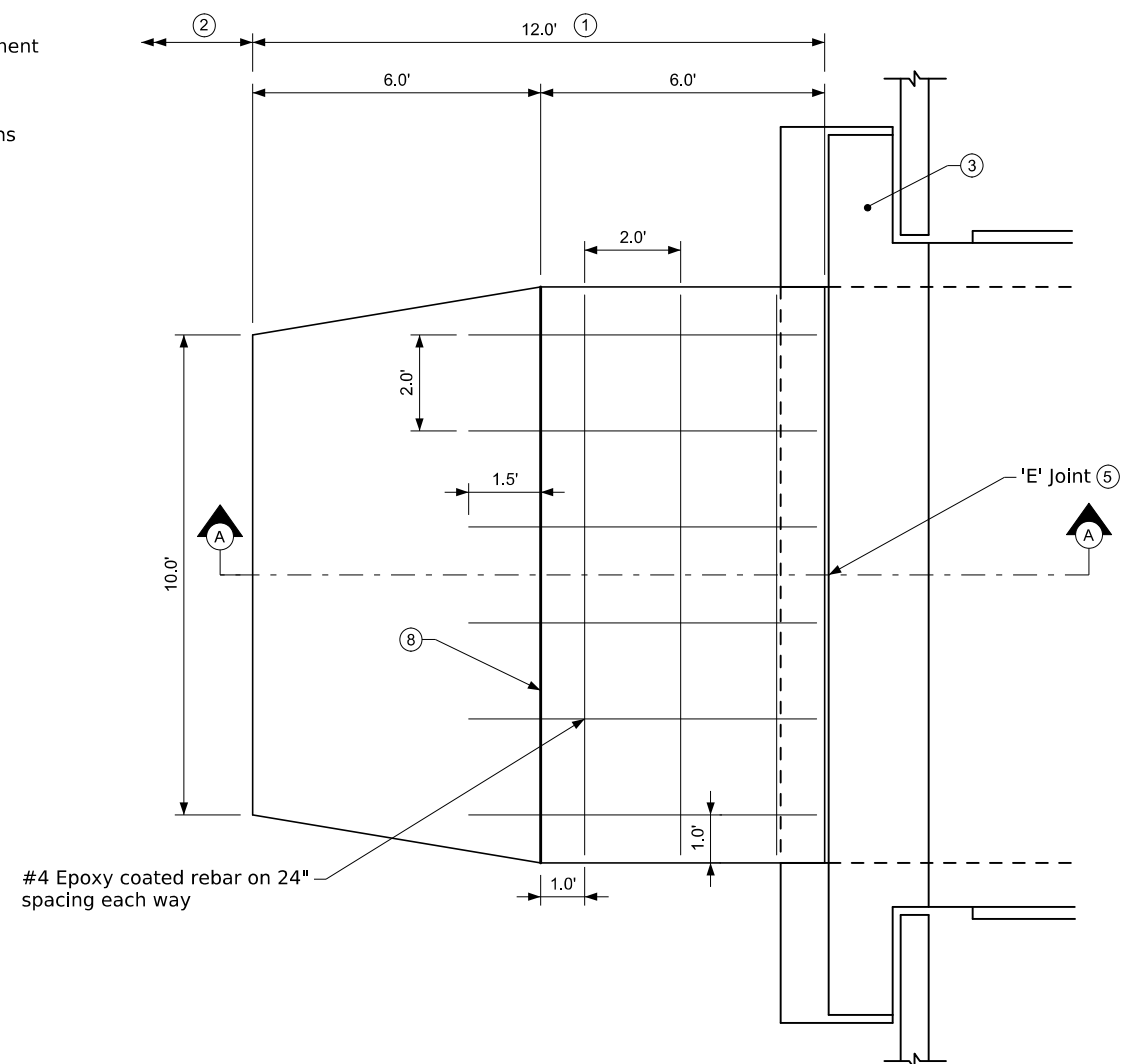
My License Renewal Date is December 31, 2025

Pages or sheets covered by this seal:
A.3 B.1 C.1-C.2 D.1 E.1-E.2 G.1-G.4 HE.1 J.1

Reinforced Tunnel Approach Pavement

Keyed Noted:

- ① Recreational Trail, Reinforced Tunnel Approach Pavement
- ② Future Recreational Trail Pavement
- ③ Pedestrian Tunnel End Section, refer to structural plans
- ④ Refer to structural plans for backfill detail
- ⑤ 1' expansion joint, refer to PV-101
- ⑥ Match Tunnel approach slab elevation to the top of the Pedestrian Tunnel Paving Notch
- ⑦ Match bridge curb, refer to structural plans
- ⑧ 'C' joint, refer to PV-101



SECTION A-A

Location		Estimated Quantities		
STATION TO STATION		PCC (SY)	PCC (CY)	Rebar (lb)
50063+82.18	50063+94.18	16	3.3	53
50065+81.84	50065+93.84	16	3.3	53

ESTIMATED PROJECT QUANTITIES AND REFERENCE NOTES

Trail Items :

Item no.	Item Code	Item	Unit	Quantities	Estimate Reference Notes
				Estimated	
				Trail Items	
1	2599-9999018	('SQUARE YARDS' ITEM) RECREATIONAL TRAIL, REINFORCED TUNNEL APPROACH	SY	32	See detail on sheet B.1 and E sheets for locations. Construction shall comply with Section 2301 of the Standard Specifications for Highway and Bridge Construction, Series 2023, and as detailed in these plans. Use Class "C" Concrete. Certified plant inspection is required for this item. Method of Measurement: The Engineer will determine the square yard of Recreational Trail, Reinforced Tunnel Approach by measuring the length and width of paving to the nearest 0.1 foot. The calculated area will be rounded to the nearest whole square yard. Basis of Payment: The Contractor will be paid the contract unit price per square yard for the Recreational Trail, Reinforced Tunnel Approach for the quantity measured and as calculated above, and constructed per plan requirements. This payment shall be considered full compensation for all labor, equipment, and materials necessary to complete the work as detailed herein and specified in the Contract Documents.

100-1D
10-18-05

PROJECT DESCRIPTION

This project includes partial construction of a pedestrian tunnel under U.S. Hwy 6 (Hickman Road).

105-4
10-18-11

STANDARD ROAD PLANS

The following Standard Road Plans apply to construction work on this project.

Number	Date	Title
PV-101	04-19-22	Joints

262-5
10-18-05

UTILITIES
(POINT 25 PROJECT)

This is a POINT 25 project and is subject to the provisions of IAC 761-115.25.

SURVEY SYMBOLS

	Interstate Highway Symbol
	U.S. Highway Symbol
	Iowa Highway Symbol
	County Road Highway Symbol
	Evergreen Tree
	Deciduous Tree
	Fruit Tree
	Shrub (Bushes)
	Timber
	Hedge
	Stump
	Swamp
	Rock Outcrop
	Broken Concrete
	Revetment (Rip Rap)
	Cemetery
	Grave
	Cave
	Sink Hole
	Board Fence
	Chain Link or Security Fence
	Wire Fence
	Terrace
	Earth Dam or Dike (Existing)
	Tile Outlet
	Edge of Water
	Existing Drainage
	Right of Way Rail or Lot Corner
	Concrete Monument
	Well
	Windmill
	Beehive Intake
	Existing Intake
	Existing Utility Access (Manhole)
	Fire Hydrant
	Water Hydrant (Rural)
	Septic Tank
	Cistern
	L.P. Gas Tank (No Footing)
	Underground Storage Tank
	Latrine
	Satellite TV Dish

	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		
	E1	MidAmerican Energy Company Matthew Novy (515) 901-8274 Matthew.Novy@midamerican.com
	E2	City of Urbandale - Traffic Electric John Larson (515) 331-6718 engpw@urbandale.org
	E3	City of Clive - Traffic Electric Jerry Freestone (515) 223-6231 JFreestone@cityofclive.com
	E4	Iowa Department of Transportation (IDOT) Electric Jason Dale (515) 239-1995 jason.dale@iowadot.us
	E5	GPRS - No Name Electric
	F0	Zayo - Fiber Optic John Ferraresi (847) 417-9609 john.ferraresi@zayo.com
	F02	Lumen / CenturyLink - Fiber Optic Ashlie Clements (906) 284-2821 Ashlie.Clements@lumen.com
	F03	MCI/Verizon - Fiber Optic Grace Gilborn (515) 443-2865 Grace.Gilborn@verizon.com
	F04	Iowa Communications Network (INC) Fiber Optic Timothy Flicknger (515) 491-3750 timothy.flickinger@iowa.gov
	F05	Windstream Communications - Fiber Optic Mark Hussman (402) 677-5874 Mark.Hussman@Windstream.com
	F06	Unite Private Network - Fiber Optic Wyatt Bohle (515) 361-0491 Wyatt.Bohle@upnfiber.com
	F07	Clive Traffic - Fiber Optic Jerry Freestone (515) 223-6231 JFreestone@cityofclive.com

— F08	Consolidated Communications - Fiber Optic Phillip Williams (515) 418-1937 Phillip.Williams@consolidated.com
— F09	No Name (Unidentified) - Fiber Optic
— F010	Aureon - Fiber Optic Jeff Klocko (515) 830-0445 jeff.klocko@aureon.com
— F011	Mediacom - Fiber Optic Jerry Broughton (515) 246-2252 jbroughton@mediacomcc.com
— F013	Metronet - Fiber Optic Jeff Talbert (563) 505-1856 Jeff.Talbert@metronet.com
— G	MidAmerican Energy - Gas Line Matthew Novy (515) 901-8274 Matthew.Novy@midamerican.com
— G2	Unknown - Gas Line
— GHP	MidAmerican Energy - High Pres Gas Line Matthew Novy (515) 901-8274 Matthew.Novy@midamerican.com
—	MidAmerican Energy - Riser Pole Matthew Novy (515) 901-8274 Matthew.Novy@midamerican.com
—	MidAmerican Energy - Power Pole Matthew Novy (515) 901-8274 Matthew.Novy@midamerican.com
— SAN.	City of Clive - Sanitary Sewer Jim Hagelie (515) 223-6231 JHagelie@cityofclive.com
— SAN. 2	Des Moines Waste Water- Sanitary Sewer Patrick Brown (515) 323-8027 PABrown@dmgov.org
— SAN. 3	City of Urbandale - Sanitary Sewer John Larson (515) 331-6718 engpw@urbandale.org
— ST S -	Storm Sewer Co. 1
— T1	CenturyLink - Telephone Line Ashlie Clements (906) 284-2821 Ashlie.Clements@lumen.com
— T2	Comm Data Link - Telephone Line
— TV	Mediacom - TV Cable Jerry Broughton (515) 246-2252 jbroughton@mediacomcc.com
— TV2	Proposed Route - TDI Cable TV Cable
— W	Clive Public Works Water - Water Line Jim Hagelie (515) 223-6231 JHagelie@cityofclive.com
— W2	Urbandale Water - Water Line Gail Palmer (515) 278-3940 gpalmer@urbandalewater.org
— W3	Des Moines Water Works - Water Line Carla Schumacher (515) 323-6227 cscumacher@dmww.com

PLAN VIEW COLOR LEGEND OF PLAN AND PROFILE SHEETS			
LINEWORK	Design Color No.		
Green	(2)		Existing Topographic Features and Labels
Blue	(1)		Proposed Alignment, Stationing, Tic Marks, and Alignment Annotation
Magenta	(5)		Existing Utilities
SHADING	Design Color No.		
Lavender	(9)		Temporary Pavement Shading
Yellow	(4)		Proposed Pavement Shading
Orange	(6)		Proposed Granular Shading
Orange	(70)		Proposed Shoulder Granular Shading
Yellow	(68)		Proposed Shoulder Paved Full Depth Shading
Yellow	(132)		Proposed Shoulder Paved Partial Depth Shading
Gray, Dark	(112)		Proposed Grade and Pave Shading "In conjunction with a paving project"
Brown, Light	(236)		Grading Shading
Orange, Light	(134)		Proposed Granular Entrance Shading
Yellow	(220)		Proposed Paved Entrance Shading
Tan	(8)		Proposed Sidewalk Shading
Blue, Light	(230)		Proposed Sidewalk Landing Shading
Pink	(11)		Proposed Sidewalk Ramp Shading
Green, Light	(225)		Existing Pavement Shading
Red	(3)		Proposed Structure Shading
Red	(3)		Delineates Restricted Areas

PROFILE VIEW COLOR LEGEND OF PLAN AND PROFILE SHEETS			
LINEWORK	Design Color No.		
Green	(10)		Existing Ground Line Profile
Blue	(1)		Proposed Profile and Annotation
Magenta	(5)		Existing Utilities
Blue, Light	(230)		Proposed Ditch Grades, Left
Black	(0)		Proposed Ditch Grades, Median
Rust	(14)		Proposed Ditch Grades, Right

Reference Point

Station

Survey Line

Section Corner

Ground Line Intercept

Saw Cut

Guardrail

Trench Drain

HighTension Cable Guardrail

Sheet Pile

Pavement Removal

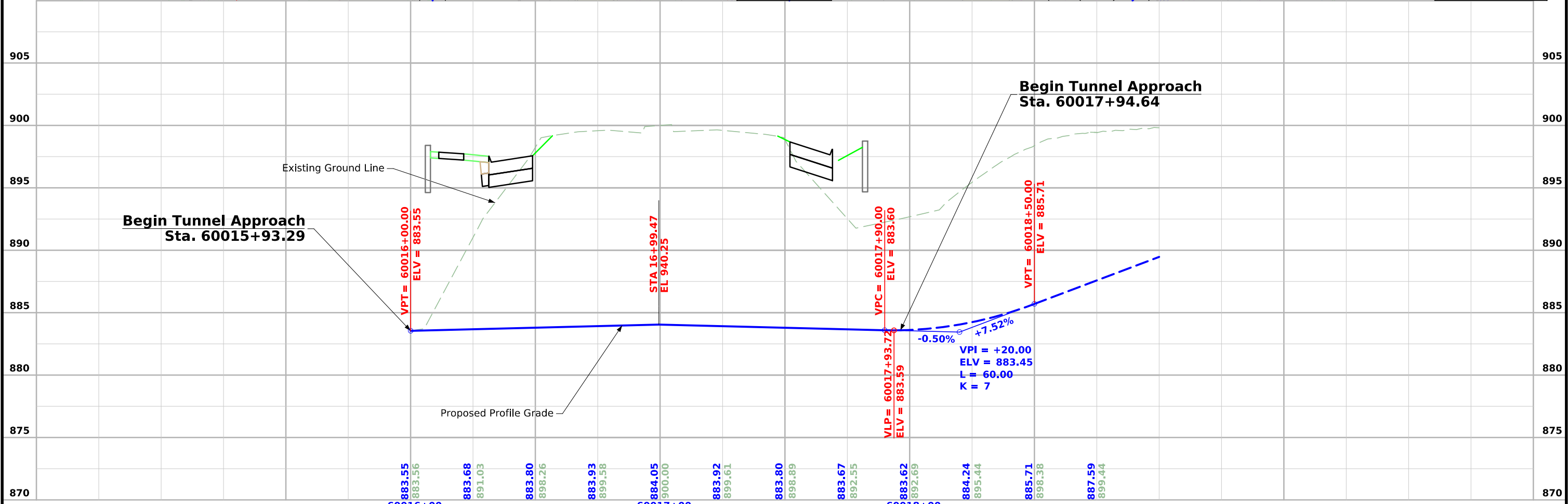
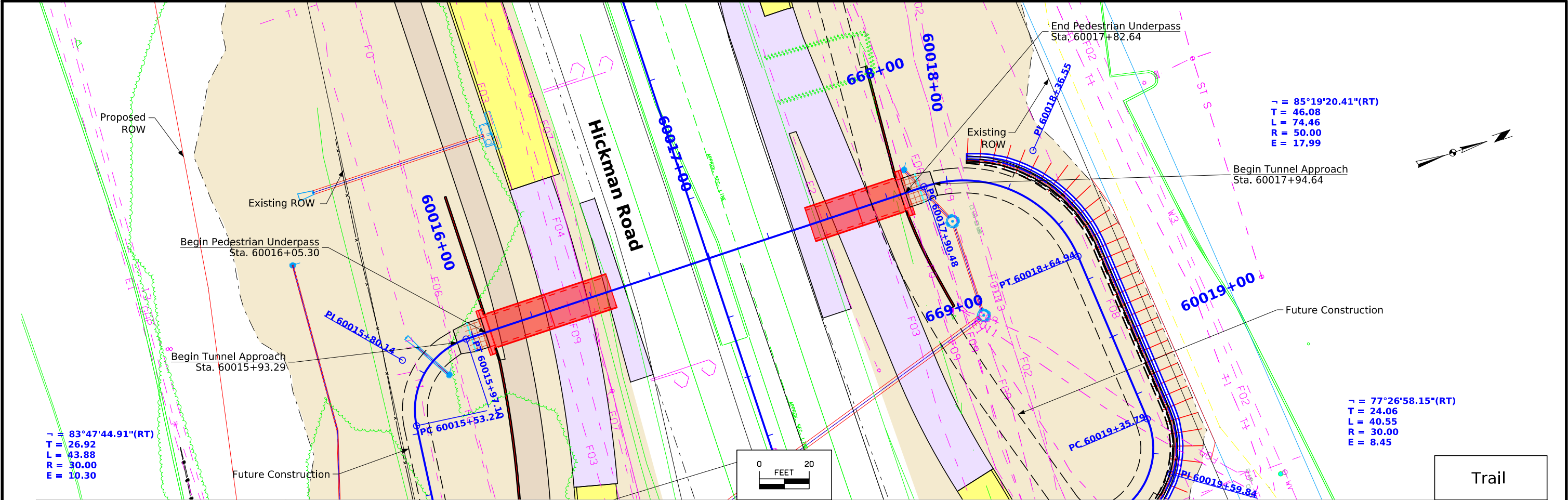
Clearing & Grubbing Area

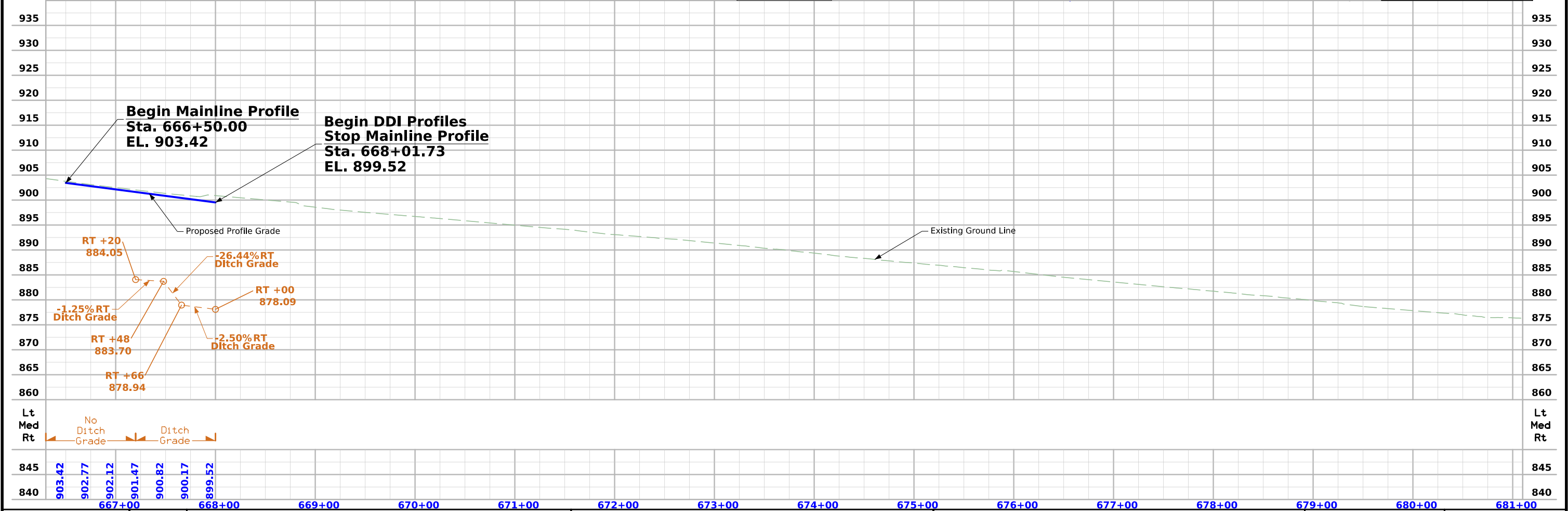
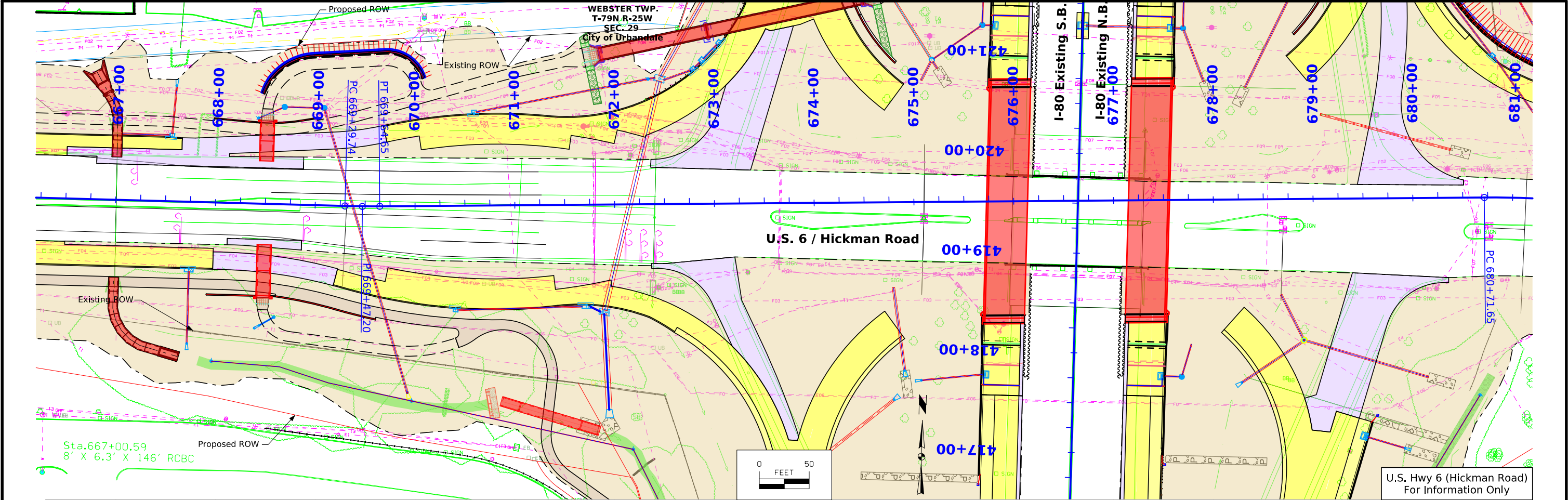
RIGHT-OF-WAY LEGEND

Proposed Right-of-Way

Existing Right of Way

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





Survey Information

POLK COUNTY
IM-080-4(69)125—13-77
I-35/80 & US HWY 6/HICKMAN ROAD INTERCHANGE
PIN 13770804069
SAP#04129

General Information

Measurement units for this survey are US survey feet. This survey is Preliminary Engineering Survey for the proposed Hickman Interchange project. This project is a Partial DTM survey. Traditional survey was performed within the project limits, with the exception of interstate pavement. For efficiency and safety, UAS was utilized to collect photo generated point cloud data on the interstate. The point cloud data was used to generate 3D line in the SUR file.

Vertical Control

Vertical datum for this survey is relative to NAVD88 Geoid 12b. Vertical datum originated from Hickman Road and 128th intersection, NHSX-006-4(189)—77, SAP 07011. Vertical positions originated from City of Urbandale published city benchmark report. BM #55 was used as the primary vertical control and is an IHC brass marker located at NE corner of northbound I-35 bridge over U.S. Highway 6. This survey observed three City of Urbandale Benchmark Monuments with published NAVD88 elevations:

City of Urbandale Benchmark #55 has a published Elev. of 929.83
Survey Elev. = 929.83

City of Urbandale Benchmark #45 has a published Elev. of 908.05
IR-35-2(204)73--12-77 published Elev. of 907.82
Survey Elev. = 908.05

BM #38B Project STP-6-49119)—2C-77 published Elev. of 889.17 (271.021m)
Survey Elev.= 889.46

City of Urbandale Benchmark #57 has a published Elev. of 899.61
Survey Elev. = 899.61

IDOT performed a 2018 survey of the SB University exit ramp, Project IMN-080-3(235)124—OE-77, SAP 0412.8. A difference of 0.07’ was found. Vertical difference between this current survey and the SB University exit ramp project are shown below.

Control Point	Published Elevation	Surveyed Elevation
FENO1	915.08	915.02
FENO2	895.27	895.21
G032	937.70	937.63

Horizontal Control

The project coordinate system is the Iowa Regional Coordinate System, Zone 8. Horizontal datum is NAD83 (2011) for Epoch 2010.00. The projection parameters for Zone 8 of the IaRCS is defined below:

Traverse Mercator Projection North American Datum of 1983
Origin Lat: 40°15'00"N
Origin Central Meridian: 093°43'00"W
Central Meridian Scale: 1.000033
False Northing: 7,000,000
False Easting: 18,500,000

Coordinates were determined by averaging a minimum of three IaRTN observations with appropriate time spans between. The horizontal standard deviation of these observations was less than 0.05’ at 95% confidence level.

Alignment Information

The horizontal alignments for I-35 was a retrace of as-built pacing plans for project IR-35-2(204)73—12-77. Stationing was held at POT Station 419+51.50 and ran ahead and back without equation.

P.C. 363+05.61 (plan) = P.C. 363+00.68 (this survey)

Plan Equation
P.O.T. 388+16.72 (plan back) = P.O.T. 388+17.60 (plan ahead) = P.C. 388+21.85 (this survey)
P.O.T. 419+51.50 (plan) = P.O.T 419+51.50 (this survey)

P.C. 437+32.9 (plan) = P.C. 437+32.9 (this survey)

P.T. 443+32.9 (plan) = P.T. 443+32.89 (this survey)

P.C. 469+65.5 (plan) = P.C. 469+65.5 (this survey)

P.T. 475+65.5 (plan) = P.T. 475+64.91 (this survey)

P.C. 522+83.36 (plan) = P.C. 522+84.09 (this survey)

The horizontal alignments for U.S. Highway 6 and 128th Street was provided by Iowa DOT District 1 Office. Description of alignment as received described below.

The horizontal alignment for U.S. 6 (Hickman Road) is a retrace of as-built paving plan for project STP-6-4(119)--2C-77. Plan stationing is in metric and was converted to U.S. survey foot for this survey. Stationing was held at P.I. 186+92.513m (converted to station 613+27.02 in U.S. survey foot) and ran ahead without equation.

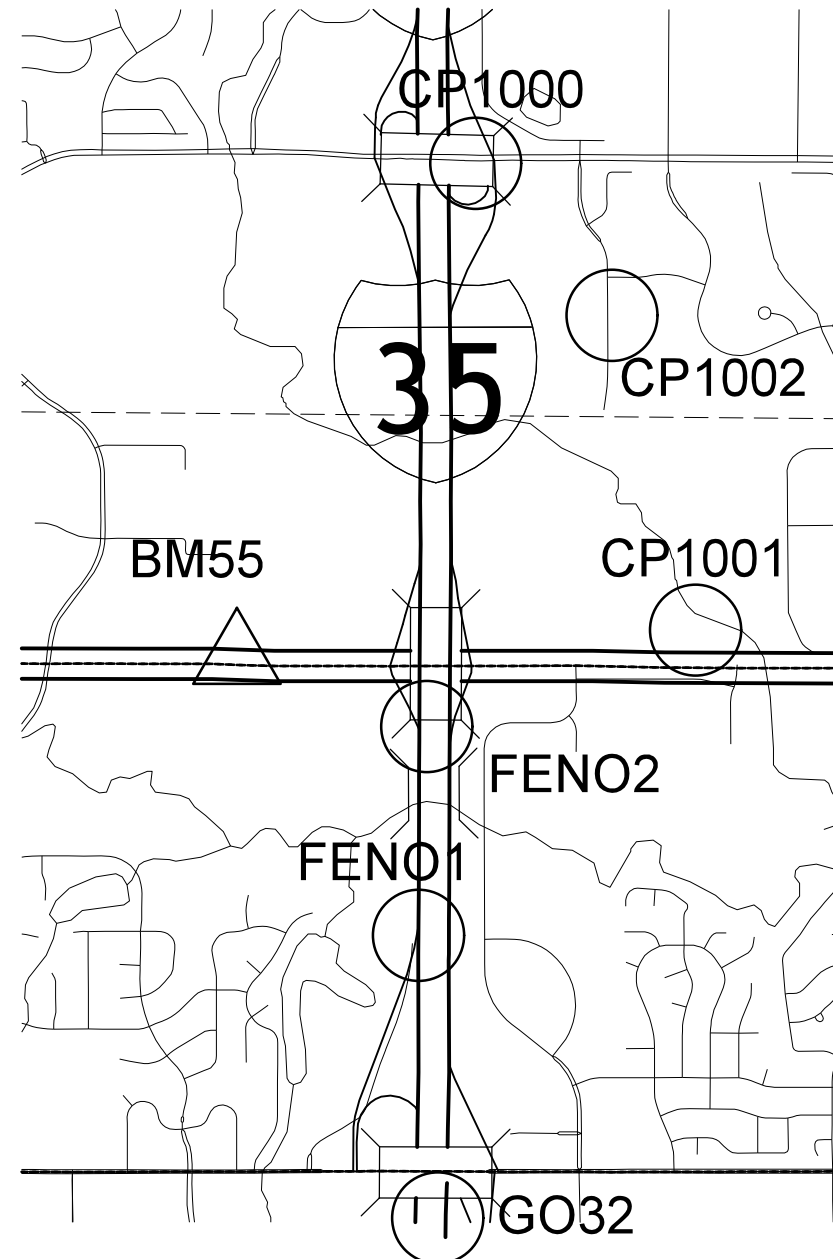
P.I. 186+92.513m (613+27.02 U.S. survey foot) = P.I. 186+92.513m (613+27.02 U.S. survey foot) (this survey)
Found “P-K” nail in conc. crossover

P.C. 198+53.721m (651+36.75 U.S. survey foot) = P.C. 198+53.757 (651+36.87 U.S. survey foot) (this survey)
Found 5/8” re-rod (flush)

Utilizing the provided alignment and the same as-built paving plans for project STP-6-4(119)--2C-77, Snyder & Associates extended alignment east from 651+36.75 to 673+00.

CONTROL POINT VICINITY MAP

This map is a guide to the vicinity of the primary project control points
Primary control is for use with RTK base stations and for RTN validation.
Future surveys will use primary project control to establish temporary
control as needed for construction or other surveying applications.



HORIZ. DATUM: NAD83(2011) EPOCH 2010.00

VERT. DATUM: NAVD88

1a. Regional Coordinate System Zone 8

Coordinate listing from next sheet will be used with 1aRTN for monument
recovery. No other reference ties are given.

HORIZONTAL AND VERTICAL PROJECT CONTROL COORDINATE LISTING

HORIZ. DATUM: NAD83(2011) EPOCH 2010.00

VERT. DATUM: NAVD88

Ia. Regional Coordinate System Zone 8

Point Name	Northing	Easting	Elevation	Feature Definition
CP1000	7502552.37	18483969.64	999.20	FENO-SET MONUMENT +/- 25' SOUTH OF DOUGLAS AVE, +/-25' OFF RAMP.
CP1001	7497688.97	18486259.21	876.70	FENO-SET MONUMENT NORTH SIDE NW 11TH ST, 8' NORTH OF BACK OF CURB, 40' SW OF LIGHT POLE.
CP1002	7500968.72	18485389.65	935.99	FENO-SET MONUMENT EAST SIDE OF 11TH ST, +/- 7' EAST OF 1ST HYDRANT SOUTH OF JOHNSTON SUPPLY.
FEN01	7494509.38	18483375.02	915.02	FENO-FOUND MONUMENT WEST SIDE OF I-35 AT START OF UNIVERSITY OFF RAMP.
FEN02	7496684.19	18483459.91	895.21	FENO-FOUND MOUNUMENT WEST SIDE I-35 AND EAST OF SB ON RAMP OF HICKMAN ROAD.
G032	7491564.87	18483573.86	937.63	FENO-FOUND MONUMENT +/- 5' EAST OF EAST SHOULDER NB I-35, 500' SOUTH OF UNIVERSITY AVE.
BM55	7497393.85	18481482.57	929.83	URBANDALE BM55//FOUND BRASS PLUG IN CONCRETE/NORTH SIDE OF HICKMAN ROAD

101-16 10-20-09																			
ALIGNMENT COORDINATES																			
Name	Location	Point on Tangent			Begin Spiral			Begin Curve			Simple Curve PI or Master PI of SCS			End Curve			End Spiral		
		Station	Coordinates		Station	Coordinates		Station	Coordinates		Station	Coordinates		Station	Coordinates		Station	Coordinates	
			Y (Northing)	X (Easting)		Y (Northing)	X (Easting)		Y (Northing)	X (Easting)		Y (Northing)	X (Easting)		Y (Northing)	X (Easting)		Y (Northing)	X (Easting)
SR006																			
	POB	613+27.02	7497336.77	18477210.04															
	Hickman Curve 1							651+36.87	7497335.47	18481019.89	653+55.18	7497335.40	18481238.20	655+73.43	7497327.00	18481456.34			
	Hickman Curve 2							657+09.06	7497321.79	18481591.87	659+05.58	7497314.23	18481788.25	661+02.06	7497313.41	18481984.76			
	Hickman Curve 3							669+29.74	7497309.98	18482812.44	669+47.20	7497309.91	18482829.90	669+64.65	7497310.45	18482847.35			
	Hickman Curve 4							680+71.65	7497344.51	18483953.82	681+26.43	7497346.19	18484008.57	681+81.10	7497341.89	18484063.18			
	Hickman Curve 5							685+49.54	7497312.93	18484430.48	685+88.90	7497309.84	18484469.72	686+28.21	7497309.84	18484509.07			
	POE	716+00.00	7497309.84	18487480.86															
TRAIL_080																			
	POB	60000+00	7496001.17	18483411.55															
	Curve C1							60001+07.11	7496108.26	18483409.45	60001+43.70	7496144.83	18483408.74	60001+75.74	7496168.22	18483380.60			
	Curve C2							60001+75.74	7496168.22	18483380.60	60002+22.90	7496198.36	18483344.33	60002+63.88	7496245.53	18483344.51			
	Curve C3							60004+06.66	7496388.31	18483345.08	60004+53.18	7496434.82	18483345.26	60004+93.74	7496464.93	18483309.81			
	Curve C4							60004+93.74	7496464.93	18483309.81	60005+20.88	7496482.46	18483289.08	60005+46.75	7496508.06	18483280.06			
	Curve C5							60010+35.88	7496969.41	18483117.56	60010+68.47	7497000.15	18483106.73	60010+98.89	7496969.41	18483079.88			
	Curve C6							60011+46.16	7497045.38	18483040.92	60011+75.57	7497062.04	18483016.68	60011+99.33	7497091.32	18483019.46			
	Curve C7							60012+48.15	7497139.92	18483024.07	60013+66.34	7497257.59	18483035.09	60013+65.21	7497183.55	18482942.97			
	Curve C8							60013+65.21	7497183.55	18482942.97	60013+71.77	7497179.44	18482937.86	60013+78.24	7497176.96	18482931.78			
	Curve C9							60013+78.24	7497176.96	18482931.78	60014+16.53	7497162.49	18482896.33	60014+53.22	7497166.79	18482858.28			
	Curve C10							60015+53.22	7497178.01	18482758.91	60015+80.14	7497181.03	18482732.16	60015+97.10	7497207.94	18482732.27			
	Curve C11							60017+90.48	7497401.32	18482733.08	60018+36.55	7497447.40	18482733.27	60018+64.94	7497450.97	18482779.20			
	Curve C12							60019+35.79	7497456.45	18482849.84	60019+59.84	7497458.31	18482873.83	60019+76.34	7497435.31	18482880.86			
	POE	60020+98.03	7497318.93	18482916.42															

101-17 04-19-11																		
SPIRAL OR CIRCULAR CURVE DATA																		
Name	Location	ΔSCS	Horizontal Alignment Data													Remarks		
			Spiral Data							Curve Data								
			θS	Ls	Ts	Es	Xc	Yc	L.T.	S.T.	ΔC	T	L	R	E			
SR006																		
	Hickman Curve 1										2° 11' 04.29"	218.31	436.56	11450.11	2.08			
	Hickman Curve 2										1° 57' 59.59"	196.52	393.00	11450.11	1.69			
	Hickman Curve 3										2° 00' 01.95"	17.46	34.92	1000.00	0.15			
	Hickman Curve 4										6° 16' 14.38"	54.78	109.44	1000.00	1.50			
	Hickman Curve 5										4° 30' 27.18"	39.36	78.67	1000.00	0.77			
TRAIL_080																		
	Curve C1										49° 08' 57.94"	36.58	68.63	80.00	7.97			
	Curve C2										50° 30' 00.02"	47.16	88.14	100.00	10.56			
	Curve C3										49° 53' 29.08"	46.52	87.08	100.00	10.29			
	Curve C4										30° 22' 28.31"	27.15	53.01	100.00	3.62			
	Curve C5										36° 05' 54.69"	32.59	63.00	100.00	5.18			
	Curve C6										60° 55' 41.81"	29.41	53.17	50.00	8.01			
	Curve C7										134° 08' 18.81"	118.19	117.06	50.00	78.33			
	Curve C8										16° 35' 22.76"	6.56	13.03	45.00	0.48			
	Curve C9										28° 38' 30.37"	38.29	74.98	150.00	4.81			
	Curve C10										83° 47' 44.91"	26.92	43.88	30.00	10.30			
	Curve C11										85° 19' 20.41"	46.08	74.46	50.00	17.99			
	Curve C12										77° 26' 58.15"	24.06	40.55	30	8.45			

108-23A 08-01-08 TRAFFIC CONTROL PLAN Refer to J-Sheets in project IM-080-3(264)124--13-77 for traffic control plan and staging layout details.
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111-01
04-17-12

COORDINATED OPERATIONS

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

Project	Type of Work
IM-080-3(264)124--13-77	PCC Pavement-Grade and New
IM-080-3(265)124--13-77	Traffic Signs
IM-080-3(266)125--13-77	Reconstruction-Bridge Widening
IM-080-3(267)125--13-77	Bridge Replacement-Steel Girder
IM-080-3(268)124--13-77	RCB Culvert Extensions
IM-080-3(271)125--13-77	Reconstruction-Bridge Widening
IM-080-3(272)125--13-77	Bridge Replacement-Steel Girder
IM-080-3(273)125--13-77	RCB Culvert Extensions
ITS-080-3(310)124--25-77	ITS Infrastructure
IMN-080-3(337)125--0E-77	Bridge New-Other
IMN-080-3(338)125--0E-77	Bridge New-Other
IMN-080-3(339)125--0E-77	RCB Culvert New

108-25 10-21-14 511 TRAVEL RESTRICTIONS												
Route	Direction	County	Location Description	Feature Crossed	Object Type	Maint. Bridge No., Structure ID, or FHWA No.	Type of Restriction	Existing Measurement	Construction Measurement	Construction Measurement as Signed	Projected As Built Measurement	Remarks
			Refer to IM-080-3(264)124--13-77 for travel restrictions.									