

This project has been approved by Iowa DNR Flood Plain Construction Permit No. 2024-0662FP-01.

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PLANS OF PROPOSED IMPROVEMENT ON THE
PRIMARY ROAD SYSTEM
STORY COUNTY
Bridge Replacement - PPCB
US 30 over South Skunk River
1.2 Miles W. of I-35 (EB)

Refer to the Plan Sheets for list of applicable specifications.

Value Engineering Saves. Refer to Article 1105.13 of the Specifications.



Revisions

	TOTAL
	38
PROJECT IDENTIFICATION NUMBER	
19-85-030-020	
CONTRACT ID NUMBER	
PROJECT NUMBER	
BRF-030-5(305)--38-85	
R.O.W. PROJECT NUMBER	
PROJECT DIRECTORY NUMBER	
8503002019	

Design Data Urban

2023 AADT 16,300 V.P.D.
TRUCKS 8 %
Includes Eastbound Traffic Only

Index Of Seals

Sheet No.	Name	Type
A.1	Joshua J. Opheim	Structural Design
SPS.1	Adam Tyler	Geotechnical Design

Structural Design

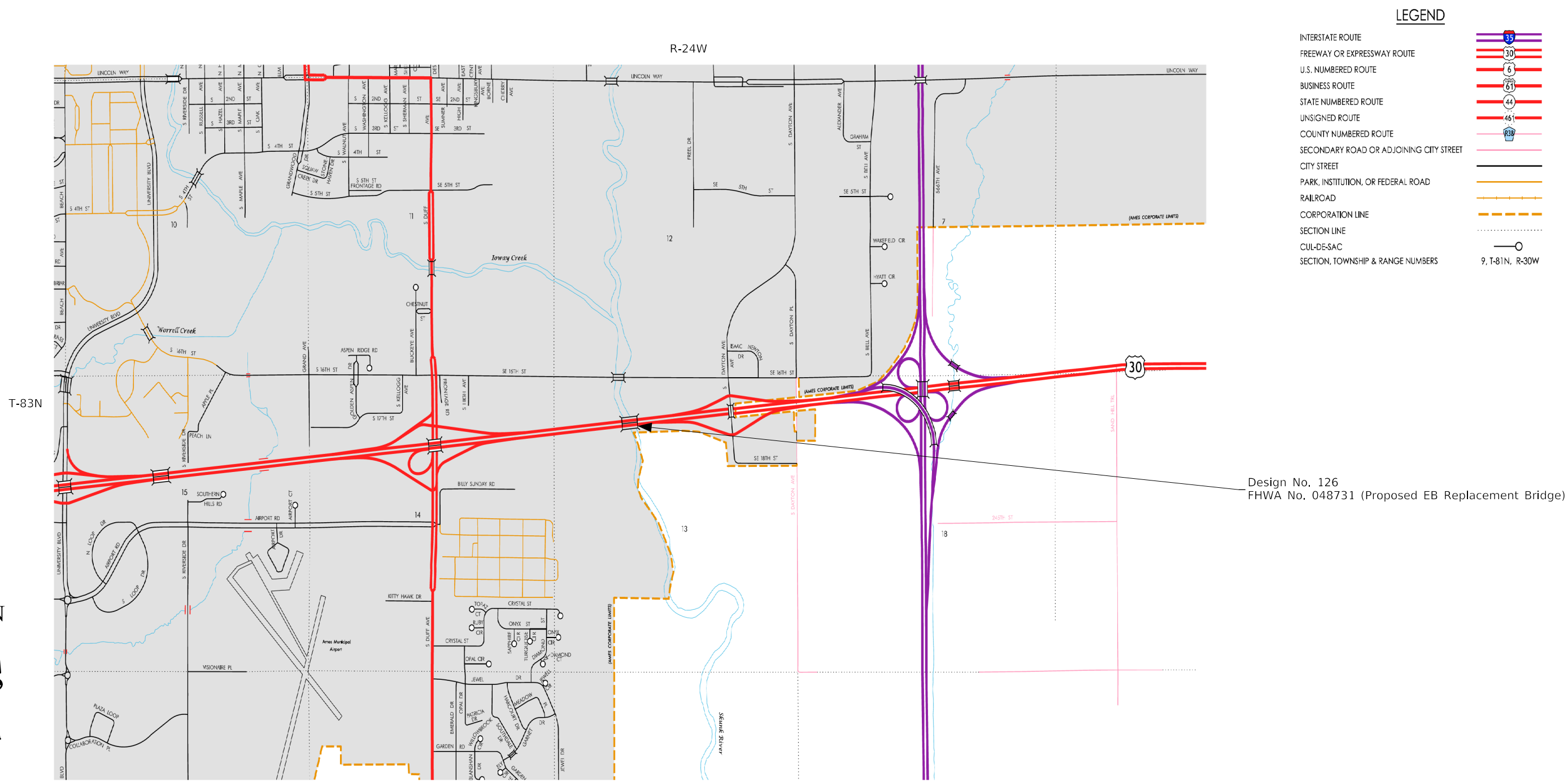


I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

Signature Joshua J. Opheim Date 7-16-2025
Printed or Typed Name Joshua J. Opheim

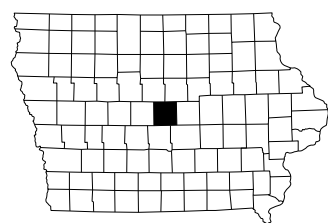
My license renewal date is December 31, 2026

Pages or sheets covered by this seal: A.1-A.2 & V.1-V.34



Part of City of Ames Location Map

Not To Scale



Estimated Bridge Quantities					
Item No.	Item Code	Item	Unit	Division 1	As-Built Qty.
1	2104-2710020	Excavation, Class 10, Channel	CY	949.7	
2	2401-6745625	Removal of Existing Bridge	LS	1.00	
3	2402-2720000	Excavation, Class 20	CY	423	
4	2402-2721000	Excavation, Class 21	CY	1,036	
5	2403-0100010	Structural Concrete (Bridge)	CY	656.0	
6	2403-1000005	Fiber Reinforcement for Structural Concrete	CY	806.7	
7	2403-1000010	Trial Batch and Test Placement (Fiber Reinforced Concrete)	LS	1.00	
8	2403-7000210	High Performance Structural Concrete	CY	806.7	
9	2404-7775000	Reinforcing Steel	LB	98,422	
10	2404-7775005	Reinforcing Steel, Epoxy Coated	LB	254,225	
11	2404-7775009	Reinforcing Steel, Stainless Steel	LB	7,052	
12	2407-0563080	Beams, Pretensioned Prestressed Concrete, BTC80	EACH	14	
13	2407-0563105	Beams, Pretensioned Prestressed Concrete, BTC105	EACH	14	
14	2408-7800000	Structural Steel	LB	10,598	
15	2414-6424110	Concrete Barrier Railing	LF	806.0	
16	2501-0201057	Piles, Steel, HP 10 x 57	LF	2,145	
17	2501-0201473	Piles, Steel, HP 14 x 73	LF	5,265	
18	2501-6335010	Prebored Holes	LF	220	
19	2501-8400172	Temporary Shoring	LS	1.00	
20	2507-2638650	Bridge Wing Armoring - Erosion Stone	SY	24.4	
21	2507-3250005	Engineering Fabric	SY	1,053.3	
22	2507-6800061	Revetment, Class E	TON	1,519.4	
23	2526-8285000	Construction Survey	LS	1.00	
24	2533-4980005	Mobilization	LS	1.00	

Estimate Reference Information		
Item No.	Item Code	Description
1	2104-2710020	Excavation, Class 10, Channel
		--
2	2401-6745625	Removal of Existing Bridge
		Includes all work for removal and off-site disposal of the existing bridge in these plans. Removal of scheduled items shall be in accordance with Section 2401 of the Standard Specifications. Any damage to material not to be removed shall be the responsibility of the Contractor and shall be repaired at no extra cost to the State. Contractor to add the following information when submitting the Iowa DNR "Notification of Demolition" form: Name of Asbestos Inspector: Brad Azeltine, Date Inspected: 12/15/2021, IA License Number: IA DOT, Inspector Phone: 515-239-1938, Asbestos present: No, Procedure used to detect the presence of asbestos materials: Polarized Light Microscopy (PLM).
3	2402-2720000	Excavation, Class 20
		--
4	2402-2721000	Excavation, Class 21
		--
5	2403-0100010	Structural Concrete (Bridge)
		Includes all resilient joint filler required. Includes furnishing and placing subdrain (including excavation), floodable backfill, porous backfill, geotextile fabric, water flooding, and subdrain outlet at abutments as shown on Design Sheet No. 33. Includes furnishing and placing 3 inch diameter PVC plastic pipe and expanding foam in the abutment wings. Includes splash basins under deck drains (6 locations).
6	2403-1000005	Fiber Reinforcement for Structural Concrete
		Refer to Developmental Specifications for Fiber Reinforcement for Structural Concrete for additional information. Polypropylene fibers shall be included in the bridge deck, abutment and pier diaphragms, and wing extensions.
7	2403-1000010	Trial Batch and Test Placement (Fiber Reinforced Concrete)
		--

Estimated Reference Information		
Item No.	Item Code	Description
8	2403-7000210	High Performance Structural Concrete
		--
9	2404-7775000	Reinforcing Steel
		--
10	2404-7775005	Reinforcing Steel, Epoxy Coated
		--
11	2404-7775009	Reinforcing Steel, Stainless Steel
		--
12	2407-0563080	Beams, Pretensioned Prestressed Concrete, BTC80
		Includes pier and abutment bearing material. Includes Contractor filling out beam numbers by location and beam seat elevations in "PPC Beam Data Spreadsheet" and forwarding electronic spreadsheet to the Engineer. Standard beam design for spacing greater than 9'-3" was verified using LEAP Bridge Concrete.
13	2407-0563105	Beams, Pretensioned Prestressed Concrete, BTC105
		Includes pier bearing material. Includes Contractor filling out beam numbers by location and beam seat elevations in "PPC Beam Data Spreadsheet" and forwarding electronic spreadsheet to the Engineer. Standard beam design for spacing greater than 9'-3" was verified using LEAP Bridge Concrete.
14	2408-7800000	Structural Steel
		Includes 16 deck drains at 106 lbs. each. Includes steel intermediate diaphragms.
15	2414-6424110	Concrete Barrier Railing
		Includes material and labor associated with providing and installing the rigid steel conduit, junction boxes and fittings. Includes 810 LF of 2" diameter rigid steel conduit. If placement of concrete is done by the slipforming method, Class BR concrete is required. Cast-in-place barrier rails shall use Class C mix. Price bid for this item shall include the cost of cast-in-place forms if required for placement of the concrete.
16	2501-0201057	Piles, Steel, HP 10 x 57
		Includes furnishing and installing steel pile points.
17	2501-0201473	Piles, Steel, HP 14 x 73
		Includes furnishing and installing steel pile points.
18	2501-6335010	Prebored Holes
		--
19	2501-8400172	Temporary Shoring
		--
20	2507-2638650	Bridge Wing Armoring - Erosion Stone
		Includes furnishing and placing engineering fabric, erosion stone, and all required excavating, shaping and compacting for wing armoring.
21	2507-3250005	Engineering Fabric
		Engineering fabric shall be material as specified for embankment erosion control in accordance with Article 4196.01,B,3, of the Standard Specifications.
22	2507-6800061	Revetment, Class E
		Estimated at 1.6 Ton/CY.
23	2526-8285000	Construction Survey
		--
24	2533-4980005	Mobilization
		--

Roadway quantities are included in the tied Road Plans, Project No. NHSX-030-5(304)--3H-85.

Design For 20° Skew (R.A.)

376'-0" x 60'-0" Pretensioned Prestressed Concrete Beam Bridge

81'-0" End Spans2 - 107'-0" Interior Spans

Estimated Bridge Quantities

STA. 1301+29.00 (EB US 30)Turn-In Date: August, 2025

Story County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 126Design Sheet No. 1 of 34FHWA No. 048731



General Notes:

This design is for the replacement of the existing 320'-0" x 30'-0" continuous welded plate girder bridge on EB US 30 over the South Skunk River, Design No. 3061 with a year of construction of 1964. Electronic plans of the existing EB bridge are available to the Contractor as part of the e-files supplied with the Contract Documents.

The lump sum bid for "Removal of Existing Bridge" shall include removal of the existing 320'-0" x 30'-0" continuous welded plate girder (two girder with floor beam/substringer system) bridge with concrete deck, concrete wall piers, and concrete high wall abutments. Removals shall be in accordance with Section 2401, of the Standard Specifications.

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

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

Faint lines on plans indicate the existing structure.

Guardrail will not be installed in this project, but it will be installed in another tied project associated with this contract.

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

English Size	3	4	5	6	7	8	9	10	11
Bar Designation	10	13	16	19	22	25	29	32	36

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

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

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

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

The Bridge Contractor shall prebore holes for abutment piles. Holes shall be bored to the elevations shown on the "Longitudinal Section Along Centerline Roadway" on Design Sheet No. 4. Piles shall be driven through the holes to at least the specified design bearing.

Cast in-one-piece steel pile points are required for the abutment and pier piles in accordance with Article 4167.02 of the current Standard Specifications and Materials I.M. 468.

The abutment berm slope excavation is not a part of this project, but it will be included in another tied project associated with this contract. The berm excavation shall be completed before abutment piles are driven.

Class 20 excavation quantities are based on the assumption that the new berm slope excavation is completed prior to starting construction of the abutments and piers.

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

Concrete barrier rails placed using the slipform method will require the use of a Class BR Concrete in accordance with Article 2513.03, A, 2, of the Standard Specifications. Cast-in-place barrier rails shall use Class C mix. Class D Concrete is not permitted for concrete barrier rails (cast-in-place or slipformed method).

Longitudinal grooving will not be a part of this project, but will be included in another project associated with this Contract.



The Contractor shall be responsible for ensuring stability of prestressed concrete beams during erection and construction up through the concrete bridge deck reaching its full 28-day strength. The Contractor shall provide sufficient temporary anchor bracing at beam ends and temporary intermediate bracing as needed to ensure prestressed beam stability. Partially or fully installed permanent bracing as shown in these design plans shall not be assumed sufficient to brace prestressed beams during erection and construction. Temporary bracing shall not be welded to prestressed beam stirrups.

A scrape sample was taken from an abutment bearing on this bridge to get an indication of the existence of and level of total lead and total chromium. Analysis of total lead on this sample was <48.5 parts per million (ppm). Analysis of total chromium on this sample was 185 ppm. These analyses show the existence of these two toxic constituents. Levels indicated by these tests could create conditions above regulatory limits for health and safety requirements. No other constituents were analyzed. The Bidder should not rely on the Iowa DOT's testing and analysis for any purpose other than as an indication of the existence of these two toxic constituents.

During construction of this project the Bridge 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 following projects:

PCC Pavement - Grade & New	NHSX-030-5(304)--3H-85
RCB Culvert New - Triple Box	NHSX-030-5(306)--3H-85
RCB Culvert New - Triple Box	NHSX-030-5(307)--3H-85
Traffic Signs	NHSX-030-5(308)--3H-85
Lighting	NHSX-030-5(309)--3H-85

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. 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.

Bridge Deck Dimensions Table			
No.	Item	Unit	Quantity
1	Deck Length	L.F.	379.2
2	Deck Width	L.F.	63.2
3	Deck Area	S.F.	23,952

- Deck length is measured from face-to-face of paving notches along the centerline of the roadway.
- Deck width is measured from out-to-out of deck perpendicular to the centerline of roadway.
- Deck area is to be based on the face-to-face paving notch distance and out-to-out deck dimensions.

Specifications:

Design:
AASHTO LRFD 8th Ed, Series of 2017, except as noted in the current Iowa Bridge Design Manual.

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, including:

- Developmental Specifications for High Performance Concrete for Structures
- Developmental Specifications for Fiber Reinforcement for Structural Concrete

Design Stresses:
Design stresses for the following materials are in accordance with the AASHTO LRFD Bridge Design Specifications, 8th Ed, Series of 2017, except as noted in the current Iowa Bridge Design Manual.

Reinforcing steel in accordance with AASHTO LRFD Section 5, Grade 60 for epoxy coated and non-coated, and Grade 60 or 75 for stainless.

Concrete in accordance with AASHTO LRFD Section 5, f'c = 4.0 ksi, except prestressed beam concrete as noted.

Prestressed concrete beams, see beam details on Design Sheet No. 22.

Structural steel in accordance with AASHTO LRFD Section 6. ASTM A709 Grade 36 and Grade 50 (AASHTO M270 Grade 36 and Grade 50).

Design History at this Site	
(Includes this Design)	
Des. No.	Type of Work
3061	Original Design
781	Bridge Repairs
684	Overlay & Retrofit Rail
405	Rail End Sections
425	Temporary Bridge (Median)
126	Bridge Replacement (EB)

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	Intermediate Diaphragms	(305)_Story_Design126_IntermediateDiaphragms.pdf	No
2	Deck Drains	(305)_Story_Design126_DeckDrains.pdf	No
3	Temporary Shoring	(305)_Story_Design126_TemporaryShoring.pdf	Yes
--			
No.	Calculation Description	Calculation File Name Convention For Submittal	Certified by Iowa P.E. (Yes/No)
4	Temporary Shoring	(305)_Story_Design126_TemporaryShoring.pdf	Yes

Traffic Control Plan
The Eastbound roadway will be closed to thru traffic. Refer to the Traffic Control Plan included in the tied Road Plans, Project No. NHSX-030-5(304)--3H-85.

404 Permit information and the Pollution Prevention Plan are included in the tied Road Plans, Project No. NHSX-030-5(304)--3H-85.

Design For 20° Skew (R.A.)

376'-0" x 60'-0" Prestensioned
Prestressed Concrete Beam Bridge

81'-0" End Spans2 - 107'-0" Interior Spans

General Notes

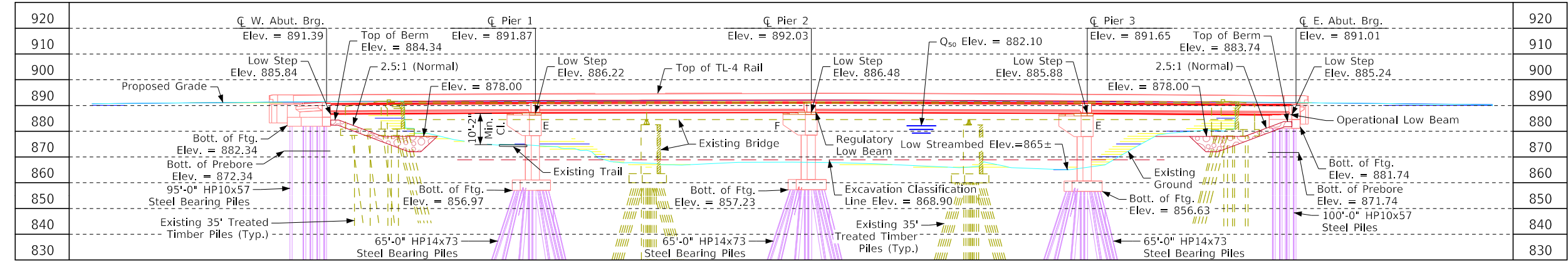
STA. 1301+29.00 (EB US 30)Turn-In Date: August, 2025

Story County

IOWA DEPARTMENT OF TRANSPORTATION

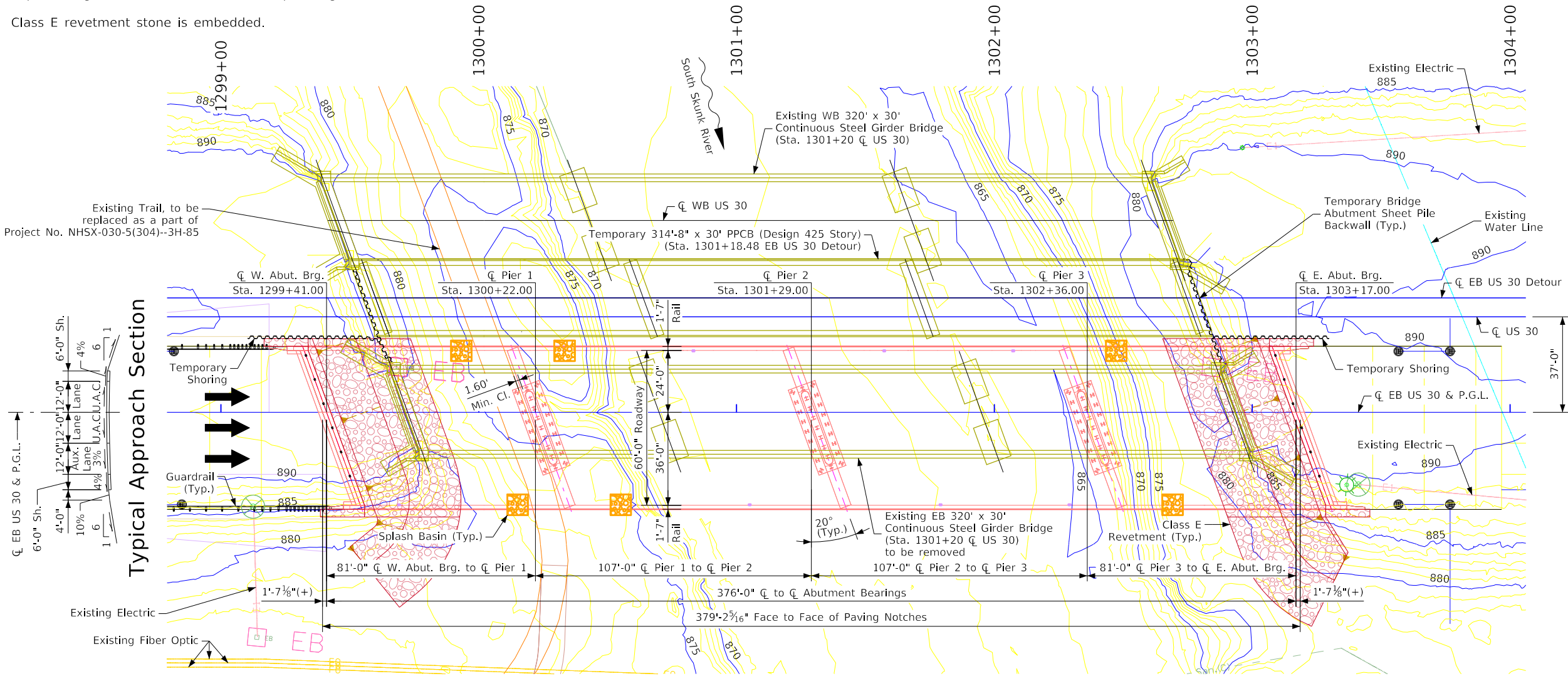
Design No. 126Design Sheet No. 3 of 34FHWA No. 048731

Control Point #100: N. 7639937.050, E. 18534748.551, Elev. 878.893 CP FD NGS MON 48' South of US 30 EB CL, 670' West of Dayton Ave. CL



Notes:
Top of bridge deck crown is 0.03' below profile grade.

Class E revetment stone is embedded.



Traffic Estimate (EB)

2023 AADT 16,300 V.P.D.
Trucks 8 %

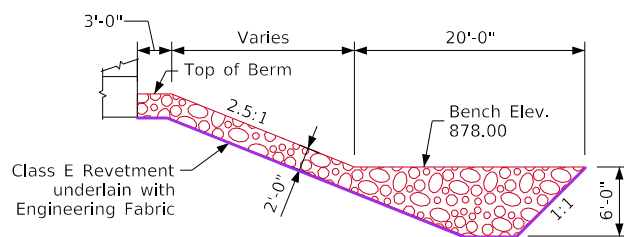


Utilities Legend:

- Symbol - Type
- FO Fiber Optic (Iowa Communications Network)
 - SAN Sanitary Sewer (City of Ames)
 - E1 Electric (Iowa DOT)
 - W(C) Water (City of Ames)

Utilities Shown on this sheet are for information only. See tied Road Plans, Project No. NHSX-030-5(304)--3H-85, for final utility information.

Situation Plan



Typical Berm Armoring Detail

Location

EB US 30 over the South Skunk River
T-83N R-24W
Section 13
Washington Township
Story County
City of Ames
FHWA No. 48731 (Proposed)
Bridge Maint. No. 8550.2R030
Latitude 42.005896°
Longitude -93.595211°

Design For 20° Skew (R.A.)

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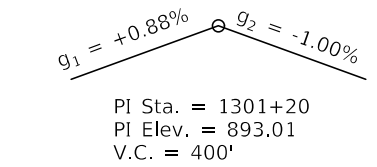
Situation Plan

STA. 1301+29.00 (EB US 30) Turn-In Date: August, 2025

Story County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 126 Design Sheet No. 4 of 34 FHWA No. 048731



Proposed Profile Grade On EB US 30

Hydraulic Data

Drainage area = 556 SQ. MI.
Stream slope = 2.50 FT./MI.
Avg. low water stage = el. 868.9

Q₂₅ = 17,050 CFS (19,900 CFS)*
25 YR. Operational
Stage = 882.1

Q₅₀ = 17,050 CFS (19,990 CFS)*
Stage = 882.1
Regulatory Low beam = 886.6
Backwater = -0.16 Ft./ -
Avg. bridge velocity = 4.4 FPS

Q₁₀₀ = 19,860 CFS (23,500 CFS)*
Stage = 882.5
Backwater = -0.61 Ft./0.25 FT.
Avg. bridge velocity = 4.9 FPS

Q₃₀₀ = 22,870 CFS (27,400 CFS)*
100 YR. Operational/50 YR. projected
Stage = 883.1
Backwater = -0.49 Ft.
Avg. bridge velocity = 5.4 FPS

Q₅₀₀ = 27,000 CFS (33,100 CFS)*
100 YR. Projected
Operational low beam = 885.5
Stage = 883.7

Q = 31,000 CFS (42,300 CFS)*
200 YR. Projected
Stage = 884.6
Avg. bridge velocity = 6.7 FPS
Calculated design scour = 850.1

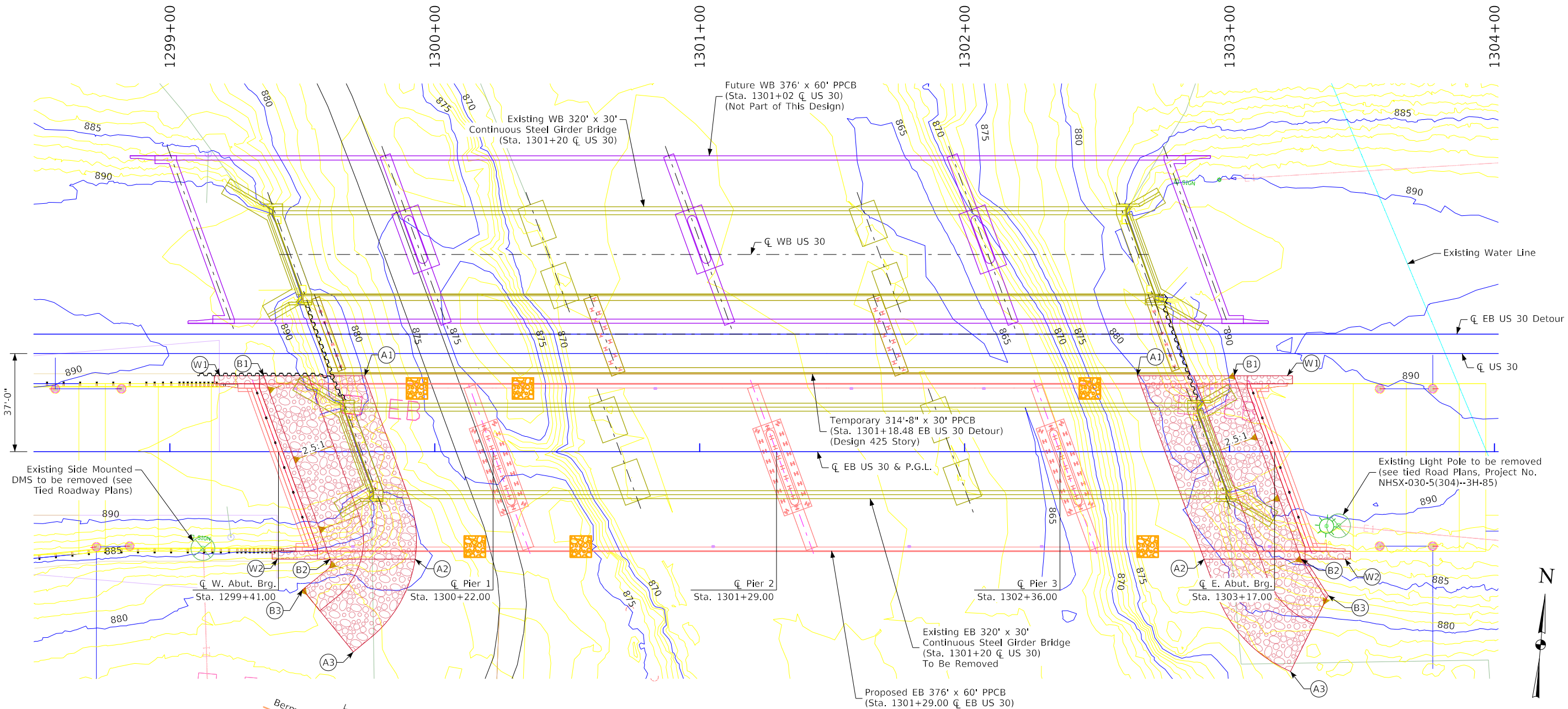
Q = 34,200 CFS (50,500 CFS)*
500 YR. Projected
Stage = 885.2
Avg. bridge velocity = 7.0 FPS
Calculated check scour = 848.4

Roadway overtop = 30,200 CFS
Roadway overtop El. = 884.5
Sta. 1288+75

*Discharge in parentheses represents total streamflow.

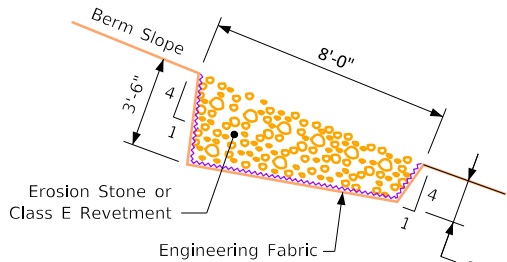
Backwater references change from existing/pre-development condition near first high-damage potential development upstream of project site (d/s 16th st. near west side menards, central landscape) .

Control Point #100: N. 7639937.050, E. 18534748.551, Elev. 878.893 CP FD NGS MON 48' South of US 30 EB CL, 670' West of Dayton Ave. CL



Site Plan

8' x 8' Splash Basin
under deck drains



Splash Basin Under Bridge Drain
Typical Section for Berm Slopes

Splash Basin Notes:

The cost of furnishing and placing splash basins (including excavation, erosion stone, or Class E revetment, and engineering fabric) is to be included in the price bid for "Structural Concrete (Bridge)". No extra payment will be made. Total number of splash basins = 6.

Berm Slope Location Table

Points	West Abutment			East Abutment		
	Station	Offset	Elev.	Station	Offset	Elev.
A1	1299+73.54	28.58' LT.	878.00	1302+65.25	28.58' LT.	878.00
A2	1299+92.58	40.58' RT.	878.00	1302+90.43	40.58' RT.	878.00
A3	1299+69.26	75.56' RT.	878.00	1303+22.98	82.97' RT.	878.00
B1	1299+35.38	28.58' LT.	884.34	1303+01.81	28.58' LT.	884.74
B2	1299+60.56	40.58' RT.	884.34	1303+26.98	40.58' RT.	884.74
B3	1299+50.14	52.08' RT.	884.34	1303+37.19	54.25' RT.	884.74
W1	1299+18.76	28.58' LT.	890.75	1303+21.76	28.58' LT.	890.50
W2	1299+40.60	40.58' RT.	890.49	1303+43.60	40.58' RT.	889.84

Berm slope elevations reflect the grading surface.
Stations and offsets are based on the centerline of EB US 30.

Estimated Berm Armoring Quantities

Location	Revetment Class E (Ton)	Engineering Fabric (SY)	Excavation Class 10 (CY)
West Berm	728.3	508.6	455.2
East Berm	791.1	544.7	494.5
Totals	1,519.4	1,053.3	949.7

Excavation quantities are calculated from grading surface.

Design For 20° Skew (R.A.)
376'-0" x 60'-0" Prestressed Concrete Beam Bridge
81'-0" End Spans 2 - 107'-0" Interior Spans

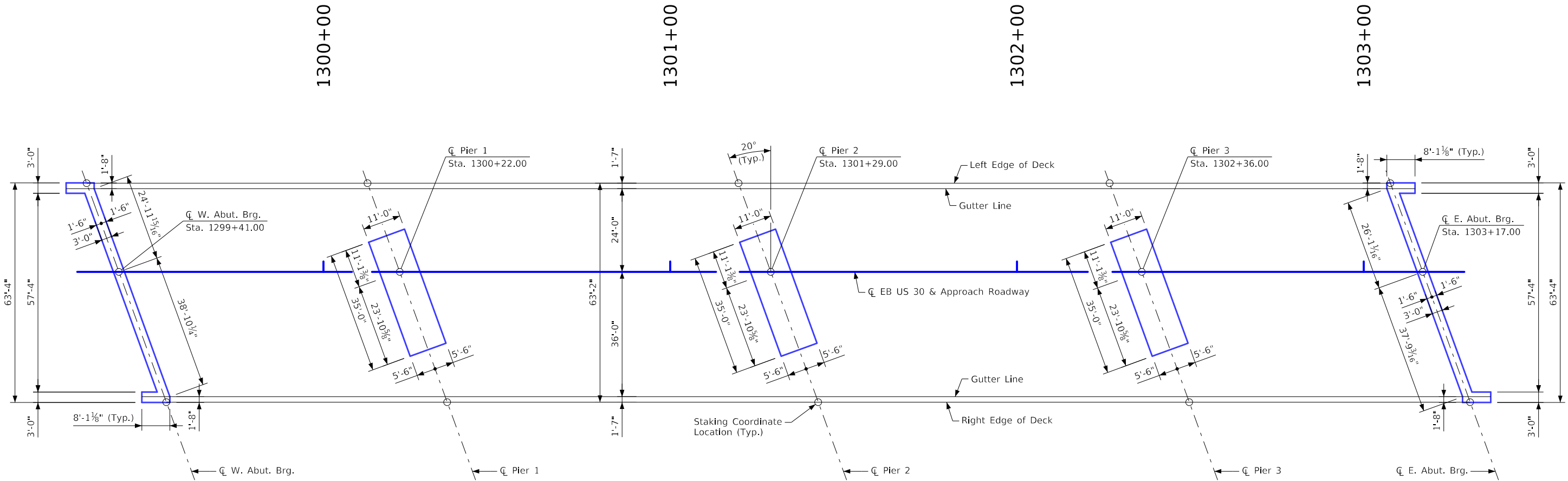
Site Plan

STA. 1301+29.00 (EB US 30) Turn-In Date: August, 2025

Story County

IOWA DEPARTMENT OF TRANSPORTATION
Design No. 126 Design Sheet No. 5 of 34 FHWA No. 048731





Staking Diagram



Bridge Staking Coordinates					
Location	CL W. Abut. Brg.	CL Pier 1	CL Pier 2	CL Pier 3	CL E. Abut. Brg.
Left Edge of Deck	E=18533000.367 N=7639842.917	E=18533080.999 N=7639850.636	E=18533187.512 N=7639860.833	E=18533294.025 N=7639871.030	E=18533374.656 N=7639878.749
CL Approach Roadway	E=18533012.075 N=7639818.337	E=18533092.706 N=7639826.056	E=18533199.219 N=7639836.253	E=18533305.732 N=7639846.450	E=18533386.363 N=7639854.169
Right Edge of Deck	E=18533029.273 N=7639782.229	E=18533109.905 N=7639789.948	E=18533216.418 N=7639800.145	E=18533322.931 N=7639810.341	E=18533403.562 N=7639818.060

Note:
An electronic file containing the bridge coordinate data is available as a part of the e-Files supplied with the contract documents. The Contractor shall verify these coordinates with the project horizontal control information provided in the road plans.

Design For 20° Skew (R.A.)

376'-0" x 60'-0" Pretensioned
Prestressed Concrete Beam Bridge

81'-0" End Spans2 - 107'-0" Interior Spans

Staking Diagram

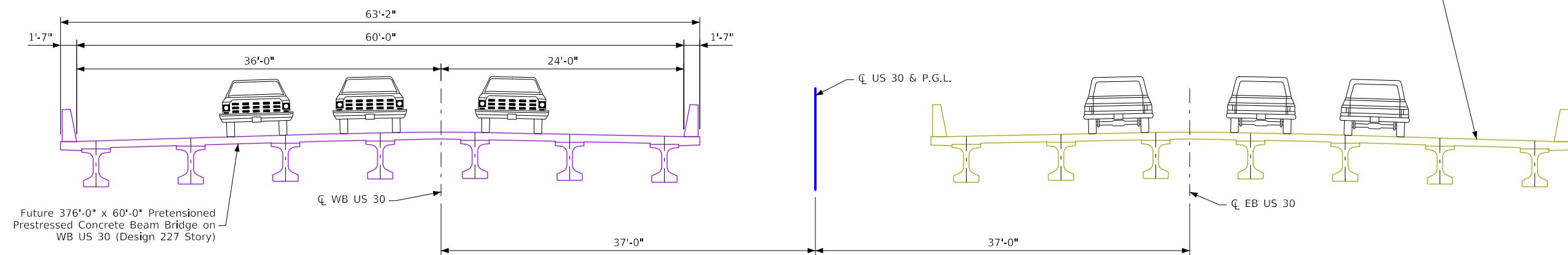
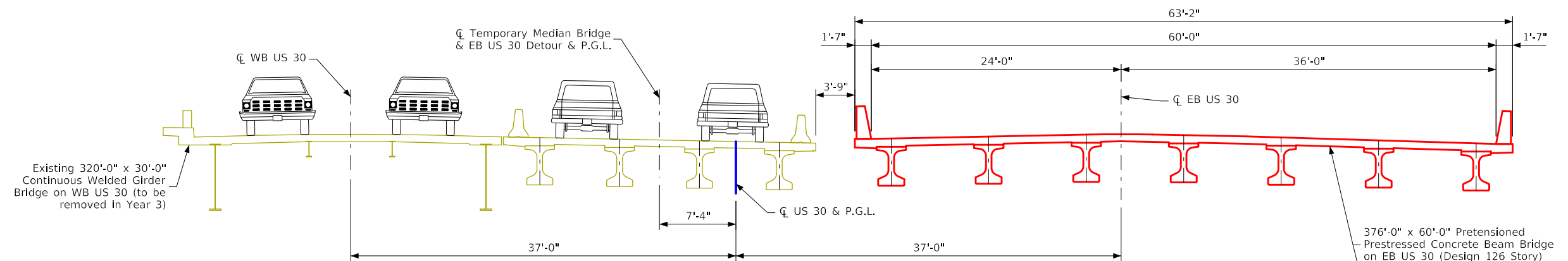
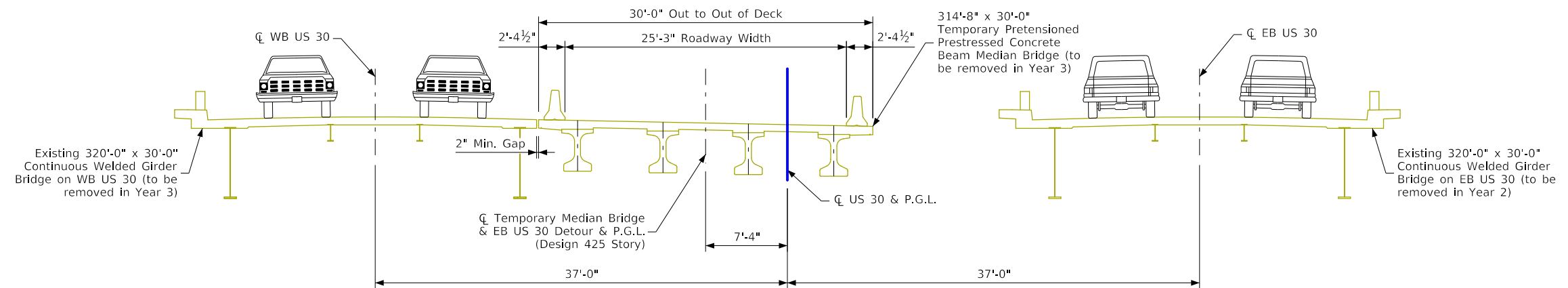
STA. 1301+29.00 (EB US 30)Turn-In Date: August, 2025

Story County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 126Design Sheet No. 6 of 34FHWA No. 048731

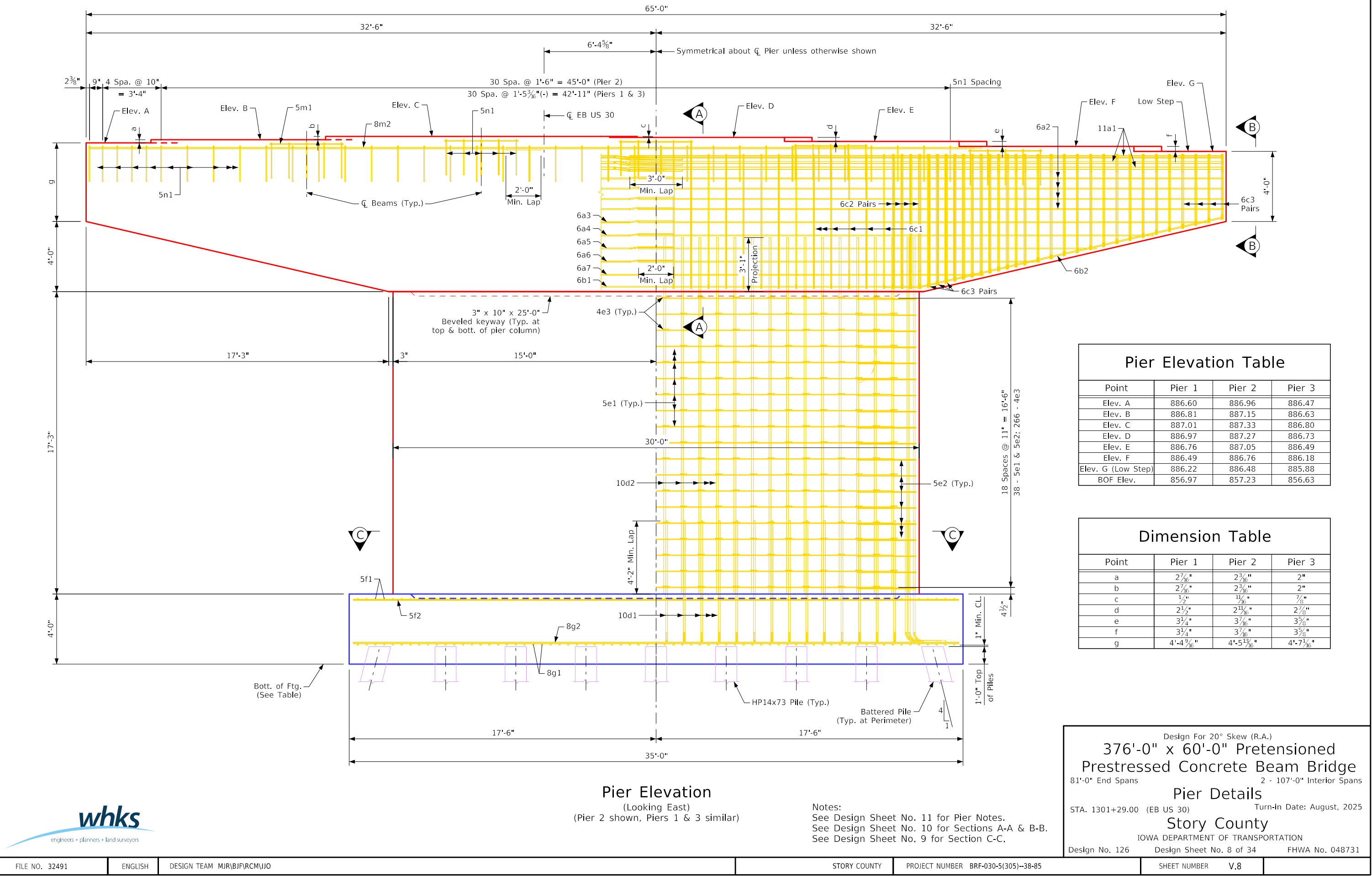


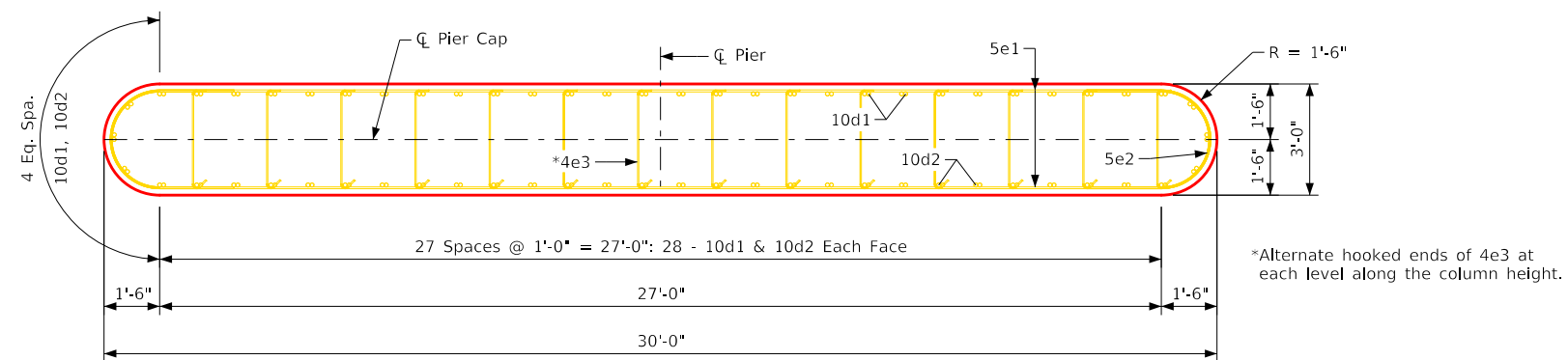
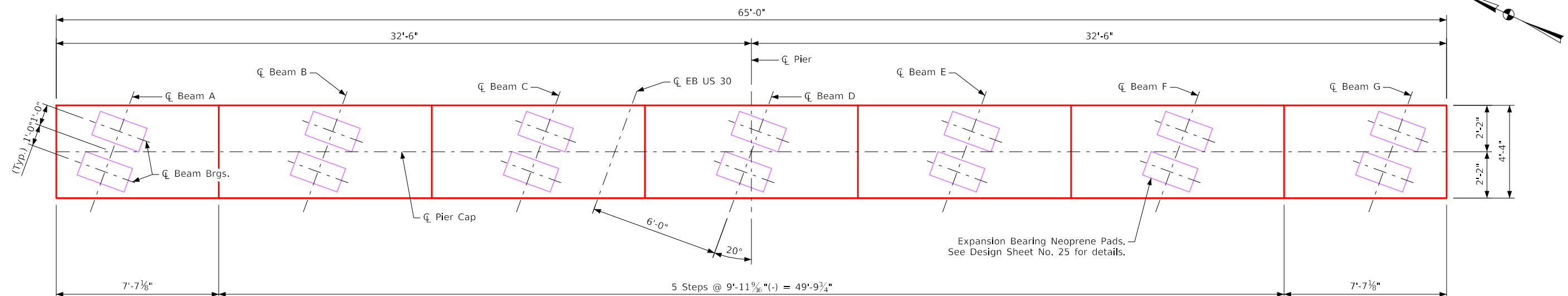
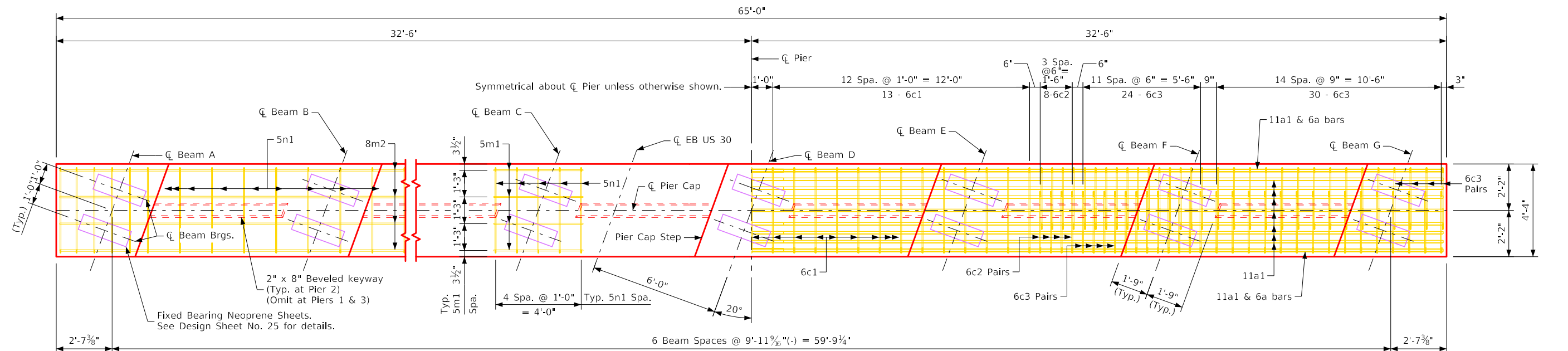


Design For 20° Skew (R.A.)
**376'-0" x 60'-0" Pretensioned
 Prestressed Concrete Beam Bridge**
 81'-0" End Spans 2 - 107'-0" Interior Spans
Project Staging Plan
 STA. 1301+29.00 (EB US 30) Turn-In Date: August, 2025
Story County
 IOWA DEPARTMENT OF TRANSPORTATION
 Design No. 126 Design Sheet No. 7 of 34 FHWA No. 048731

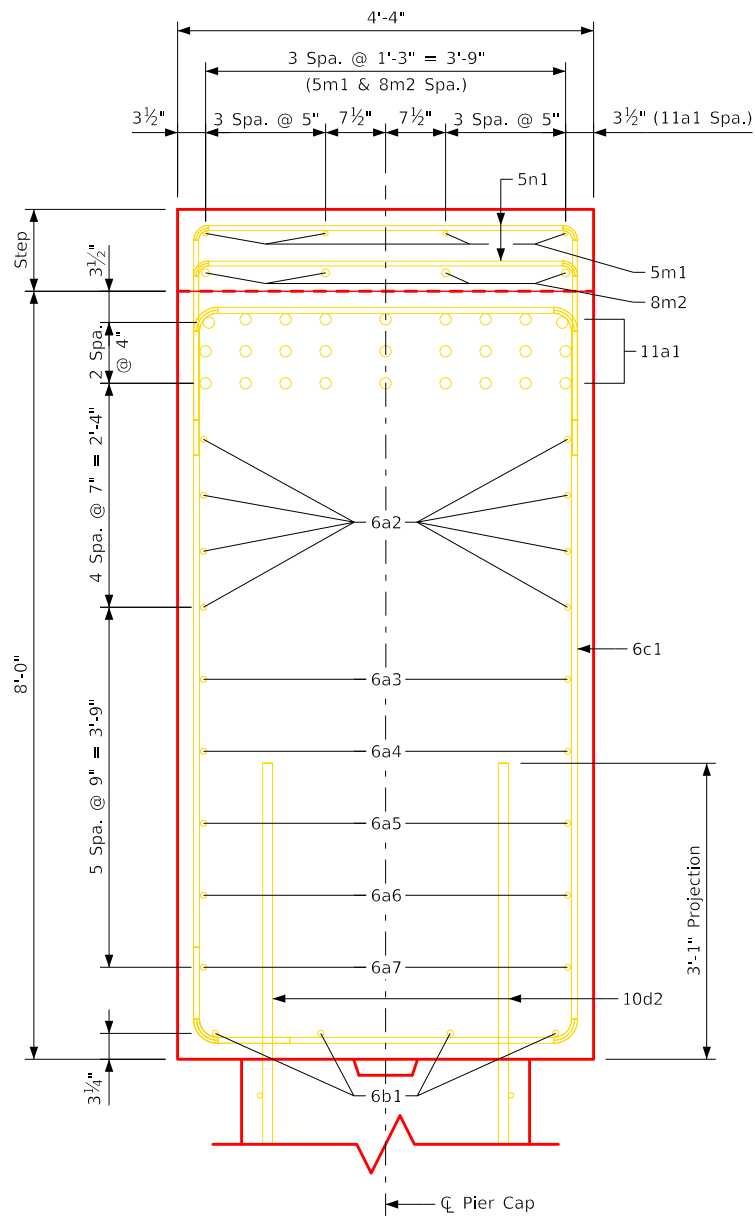


Control Point #100: N. 7639937.050, E. 18534748.551, Elev. 878.893 CP FD NGS MON 48' South of US 30 EB CL, 670' West of Dayton Ave. CL

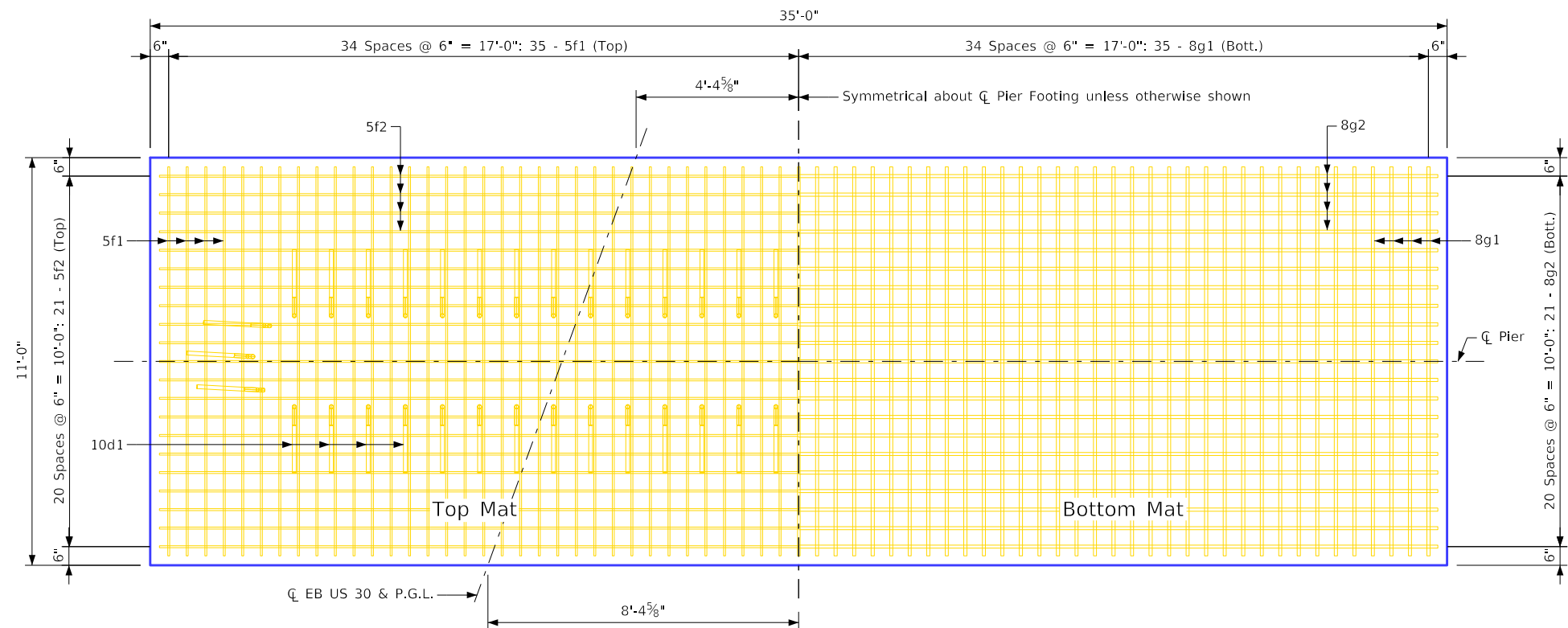




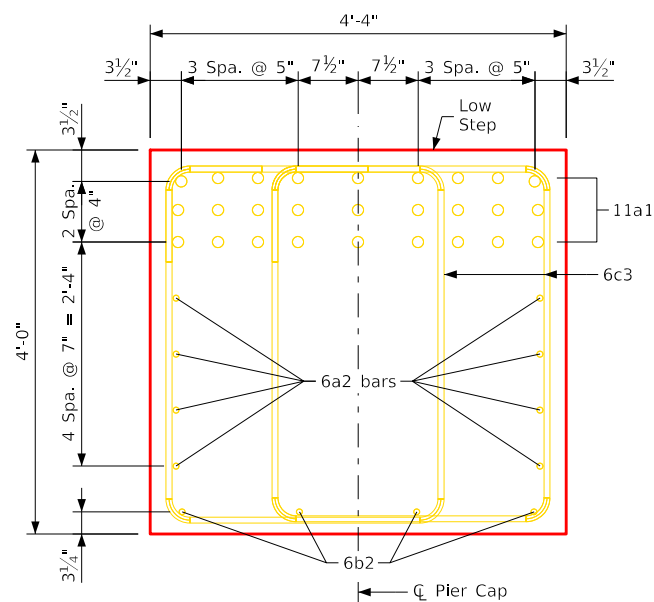
Design For 20° Skew (R.A.)
376'-0" x 60'-0" Pretensioned
Prestressed Concrete Beam Bridge
81'-0" End Spans 2 - 107'-0" Interior Spans
Pier Details
STA. 1301+29.00 (EB US 30) Turn-in Date: August, 2025
Story County
IOWA DEPARTMENT OF TRANSPORTATION
Design No. 126 Design Sheet No. 9 of 34 FHWA No. 048731



Section A-A



Pier Footing Plan



Section B-B

Note:
See Design Sheet No. 8 for Section A-A and B-B locations.

Design For 20° Skew (R.A.)
376'-0" x 60'-0" Prestressed Concrete Beam Bridge
81'-0" End Spans 2 - 107'-0" Interior Spans
Pier Details
STA. 1301+29.00 (EB US 30) Turn-In Date: August, 2025
Story County
IOWA DEPARTMENT OF TRANSPORTATION
Design No. 126 Design Sheet No. 10 of 34 FHWA No. 048731



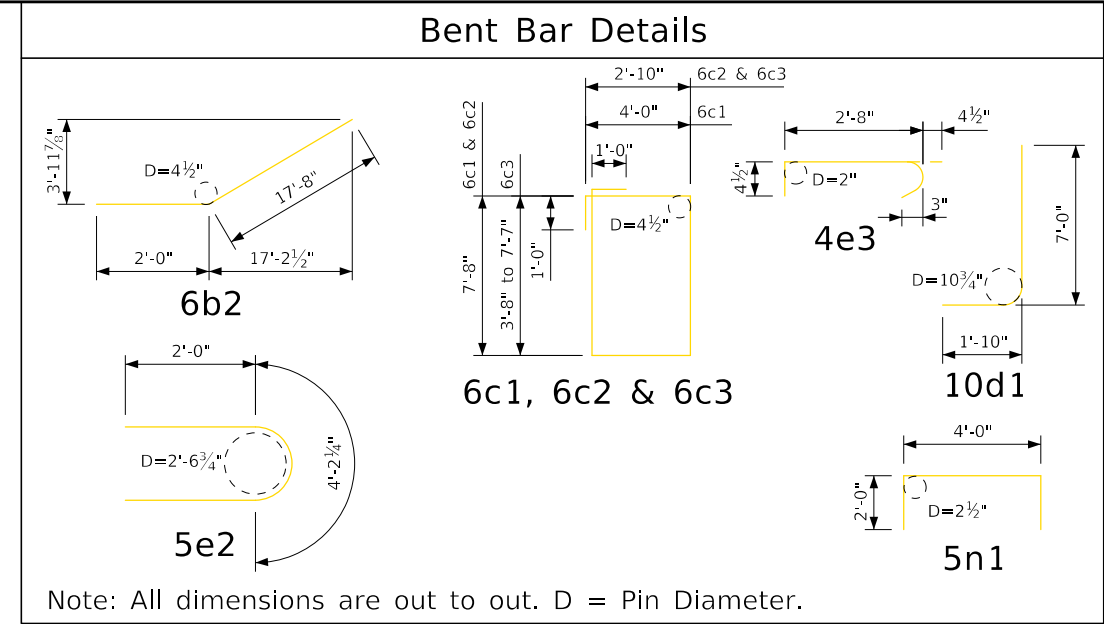
Pier Pile Driving Notes:

Piers 1-3:

The contract length of 65 feet for the pier piles is based on a non-cohesive soil classification, a total factored axial load per pile (Pu) of 186 kips, and a geotechnical resistance factor (Phi) of 0.55 for soil and 0.7 for rock end bearing.

The nominal axial bearing resistance for construction control was determined from a non-cohesive soil classification and a geotechnical resistance factor (Phi) of 0.55 for soil and 0.7 for rock end bearing. Piles are assumed to be driven from a start elevation at the bottom of footing. Design scour (200 year) was assumed to affect the upper 7 feet of embedded pile length and cause 20 kips of driving resistance.

The required nominal axial bearing resistance for pier piles is 165 tons at end of drive or retap. The pile contract length shall be driven as per plan unless piles reach refusal. In no case shall a pile be embedded less than 23 feet. Construction control requires a WEAP analysis with bearing graph.



Pier Notes:

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

Forms for all pier caps may be removed with the approval of the Engineer when the following two conditions have been met:

- Pier cap concrete has been in place for a minimum of 2 calendar days excluding days that the concrete surface is subjected to temperatures at or below 40°F and
- The pier cap concrete compressive strength is at least 2500 PSI.

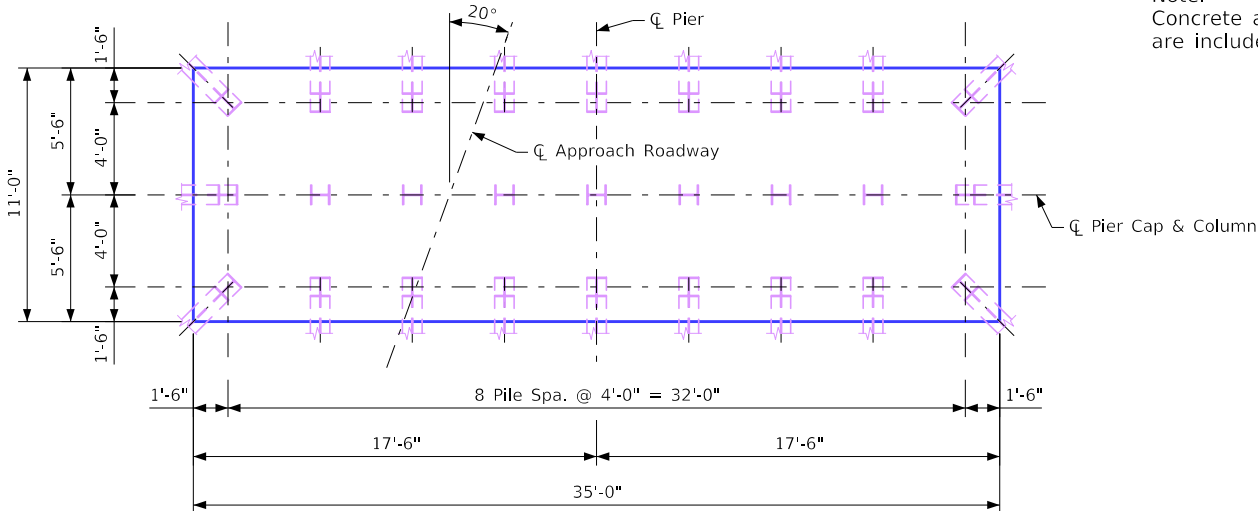
Minimum concrete compressive strength of 2500 PSI shall be verified by flexural strength according to Materials I.M. 316 with a minimum flexural strength of 450 PSI or by the maturity method according to Materials I.M. 383. Curing of pier cap concrete shall be in accordance with the Standard Specifications. Pier cap concrete shall be subjected to exterior loads in accordance with Article 2403.03, N, 2 of the Standard Specifications.

Chamfer all corners 3/4" unless noted otherwise.

Construction joints at top and bottom of pier walls are to be formed with a 3" x 10" x 25'-0" dressed and beveled strip.

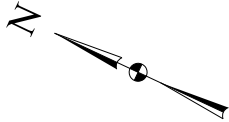
All battered piles shall be trimmed to a horizontal line to aid in the placement of reinforcing.

Steel pile points are required for the steel H-piles at the piers.



Pier Pile Plan

Notes:
Dimensions shown are at bottom of footing. Batter piles 4:1 in the direction shown. 27 - HP14x73 steel bearing piling required.



Reinforcing Bar List - One Pier

Non-Coated Reinforcing	Bar	Location	Shape	No.	Length	Weight
	11a1	Cap, Longitudinal, Top		54	33'-10"	9,707
	6a2	Cap, Longitudinal, Sides		16	33'-4"	801
	6a3	Cap, Longitudinal, Sides		4	32'-7"	196
	6a4	Cap, Longitudinal, Sides		4	29'-4"	176
	6a5	Cap, Longitudinal, Sides		4	26'-1"	157
	6a6	Cap, Longitudinal, Sides		4	22'-11"	138
	6a7	Cap, Longitudinal, Sides		2	37'-3"	112
	6b1	Cap, Longitudinal, Bottom		4	30'-2"	181
	6b2	Cap, Longitudinal, Bottom, Bent		8	19'-8"	236
	6c1	Cap, Hoops		27	25'-4"	1,027
	6c2	Cap, Hoops		16	23'-0"	553
	6c3	Cap, Hoops, Cantilever		108	Varies	3,069
	10d1	Footing to Column Dowels		62	8'-10"	2,357
	10d2	Column, Vertical		62	20'-4"	5,425
	5e1	Column, Horizontal		38	27'-0"	1,070
	5e2	Column, Horizontal, Ends		38	8'-2"	324
	4e3	Column, Ties		266	3'-5"	607
	5f1	Footing, Top, Transverse		69	10'-8"	768
	5f2	Footing, Top, Longitudinal		21	34'-8"	759
	8g1	Footing, Bottom, Transverse		69	10'-8"	1,965
	8g2	Footing, Bottom, Longitudinal		21	34'-8"	1,944
	5m1	Cap, Steps, Longitudinal, Under Beams		20	4'-2"	87
	8m2	Cap, Steps, Longitudinal		8	26'-5"	564
	5n1	Cap, Steps, Transverse		61	8'-0"	509
Reinforcing Steel - Non-Coated - Total (lbs.)						32,732

Concrete Placement Quantities

Location	Quantity
Cap - Pier 1	77.5
Cap - Pier 2	78.6
Cap - Pier 3	78.6
Columns (3 @ 56.3 CY)	168.9
Footings (3 @ 57.0 CY)	171.0
Total Concrete (CY)	574.6

Note:
Concrete and reinforcing steel quantities are included on the summary quantities sheet.



Design For 20° Skew (R.A.)

376'-0" x 60'-0" Prestensioned
Prestressed Concrete Beam Bridge

81'-0" End Spans2 - 107'-0" Interior Spans

Pier Details & Pier Pile Driving Notes

STA. 1301+29.00 (EB US 30)Turn-In Date: August, 2025

Story County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 126Design Sheet No. 11 of 34FHWA No. 048731

Technical drawing of a bridge deck cross-section showing reinforcement details. The drawing includes a 60'-0" roadway width, 1'-7" level dimensions, and various reinforcement bars labeled 8g1, 5h5, 5h7, 5d8, 6g4, 4t1, 3" x 3" x 2'-4 1/2" Bar, 8f3 and 8f5, 5p2, and 2" Cl. The drawing also shows a keyway formed by beveled 2" x 8" bars and a coil rod. The bottom of the figure is labeled "Bott. of Ftg. Elev. (See Table)".

Part Rear Elevation at Abutment
(Wings not Shown)



Part Section B-B

Point	West Abutment	East Abutment
Elev. A	886.15	885.91
Elev. B	886.36	886.06
Elev. C	886.58	886.21
Elev. D	886.55	886.13
Elev. E	886.36	885.87
Elev. F	886.10	885.56
v. G (Low Step)	885.84	885.24
from Footing Elev.	882.34	881.74

Table of Abutment Steps

Step	West Abutment	East Abutment
a	$2\frac{9}{16}$ "	$1\frac{7}{8}$ "
b	$2\frac{9}{16}$ "	$1\frac{7}{8}$ "
c	$\frac{5}{16}$ "	$1\frac{1}{16}$ "
d	$2\frac{5}{16}$ "	$3\frac{1}{4}$ "
e	$3\frac{1}{16}$ "	$3\frac{3}{4}$ "
f	$3\frac{1}{16}$ "	$3\frac{3}{4}$ "

Abutment Concrete Quantity

Location	Quantity
West Abutment Footing	33.9
East Abutment Footing	35.5
Total (Cu. Yds.)	69.4



5h7 → Keyway Formed by Reveled 2" x 8"

Part Section A-A

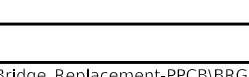
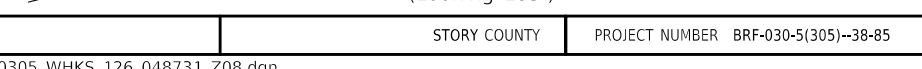


Abutment Pile Plan

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

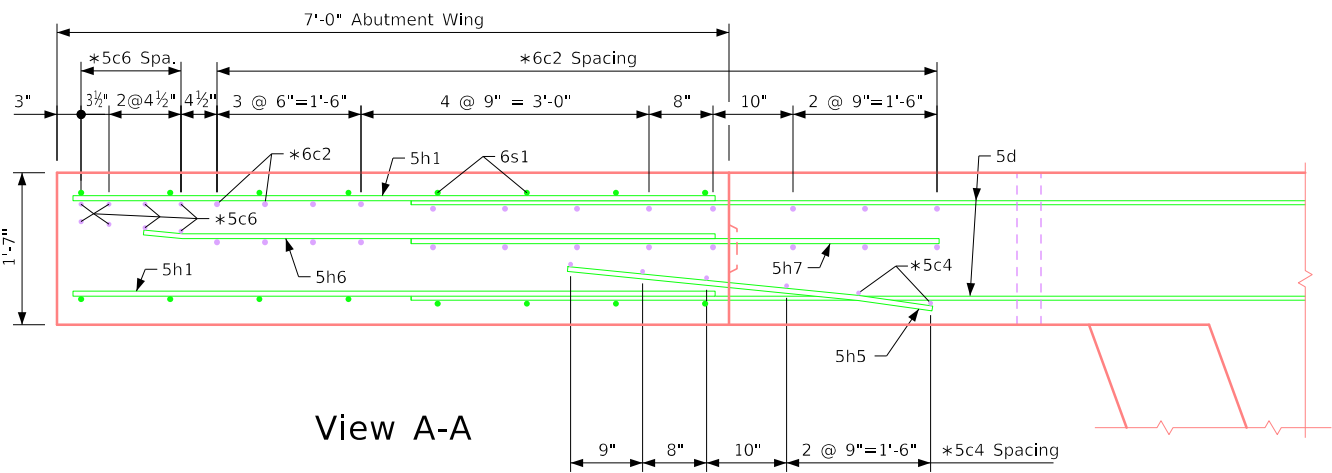
If necessary to prevent damage to the end of the bridge deck and backwall from construction equipment, an appropriate method of protection approved by the Engineer shall be provided by the bridge Contractor at no extra cost to the State.

Steel pile points are required for the steel H-piles at the abutments.

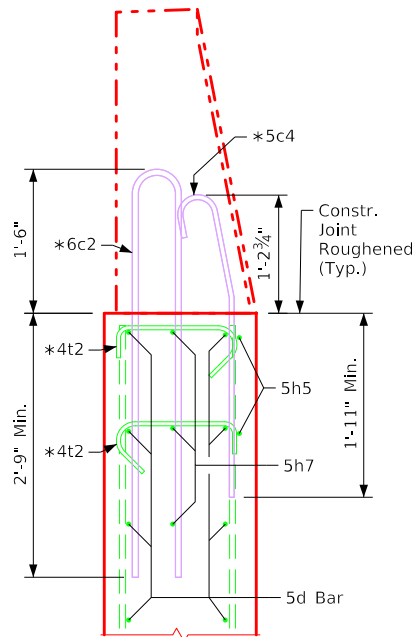
Part
Section C-C

Abutment Step Diagram
(Looking East)

	SHEET NUMBER	V.12	
--	--------------	------	--



View A-A



Section B-B

*Barrier rail end section bars to be placed with abutment wing and abutment.

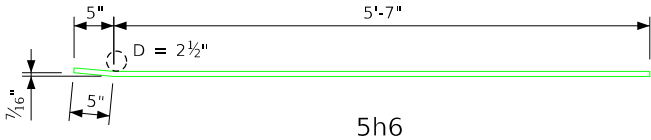
See Barrier Rail End Section Sheet on Design Sheet No. 28-29 for details of reinforcing bars 6c2, 5c4, 5c6 and 4t2.

See Abutment Details Sheet on Design Sheet No. 12 for details of reinforcing bars 5d, 5h2, 5h5 and 5h7.

Reinforcing Bar List - One Abut. Wing

Bar	Location	Shape	No.	Length	Weight
5h1	Horizontal Both Faces		18	6'-8"	125
5h6	Horizontal Wingwall		3	6'-0"	19
6s1	Vertical Both Faces		16	6'-11"	166

Epoxy Reinforcing Total Weight (lbs.) 310



5h6

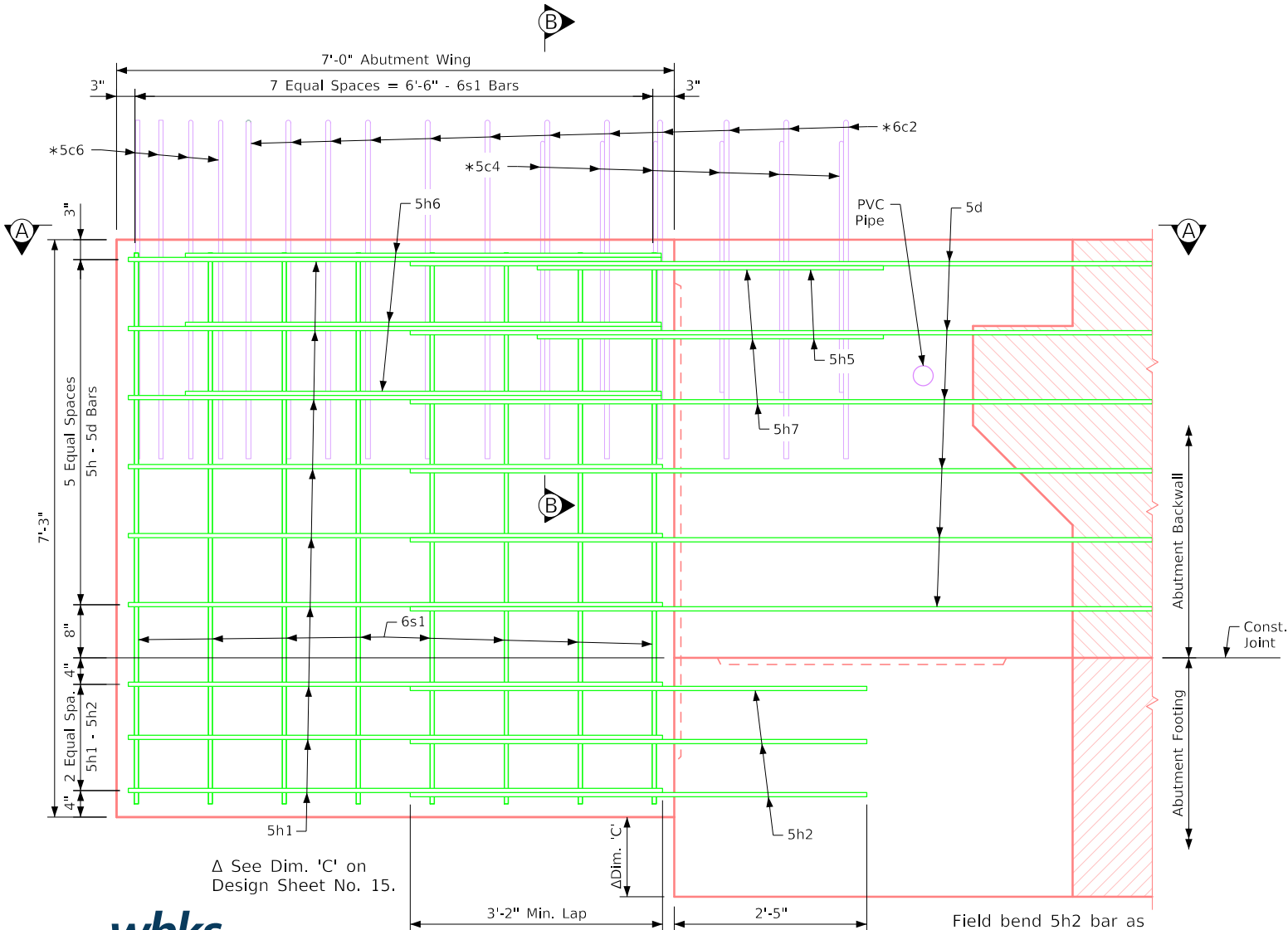
Bent Bar Details

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

Concrete Placement Summary

Section	Total
One Abutment Wing	3.0
Total (cu. yds.)	3.0

Note: Concrete and reinforcing steel quantities are included on the Summary Quantities Sheet.



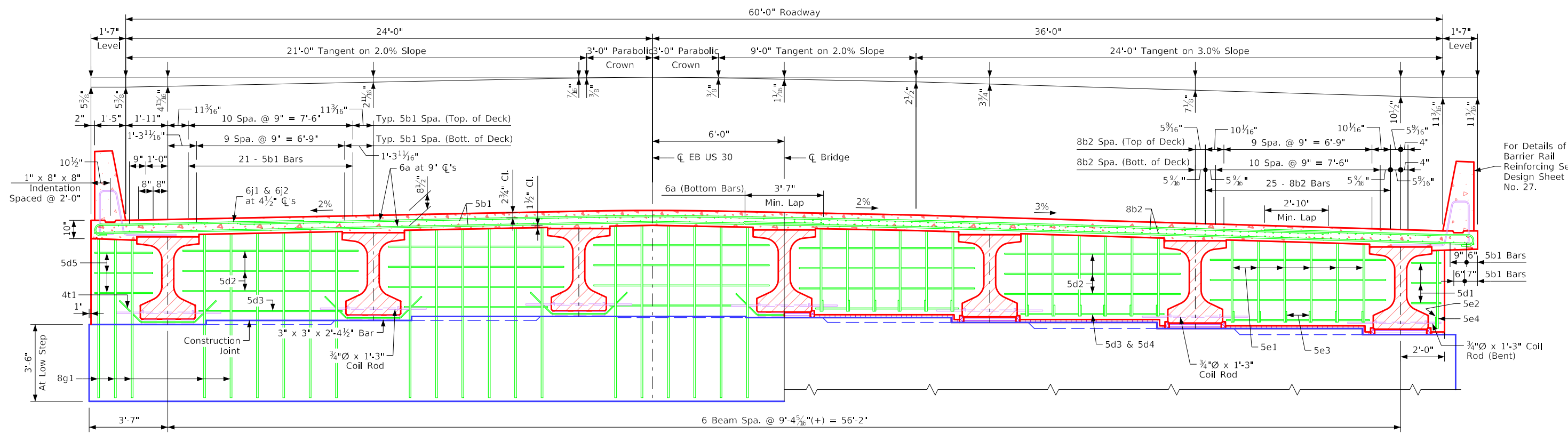
Abutment Wing - Elevation View

Field bend 5h2 bar as necessary to avoid pile in abutment wing.



Δ See Dim. 'C' on Design Sheet No. 15.

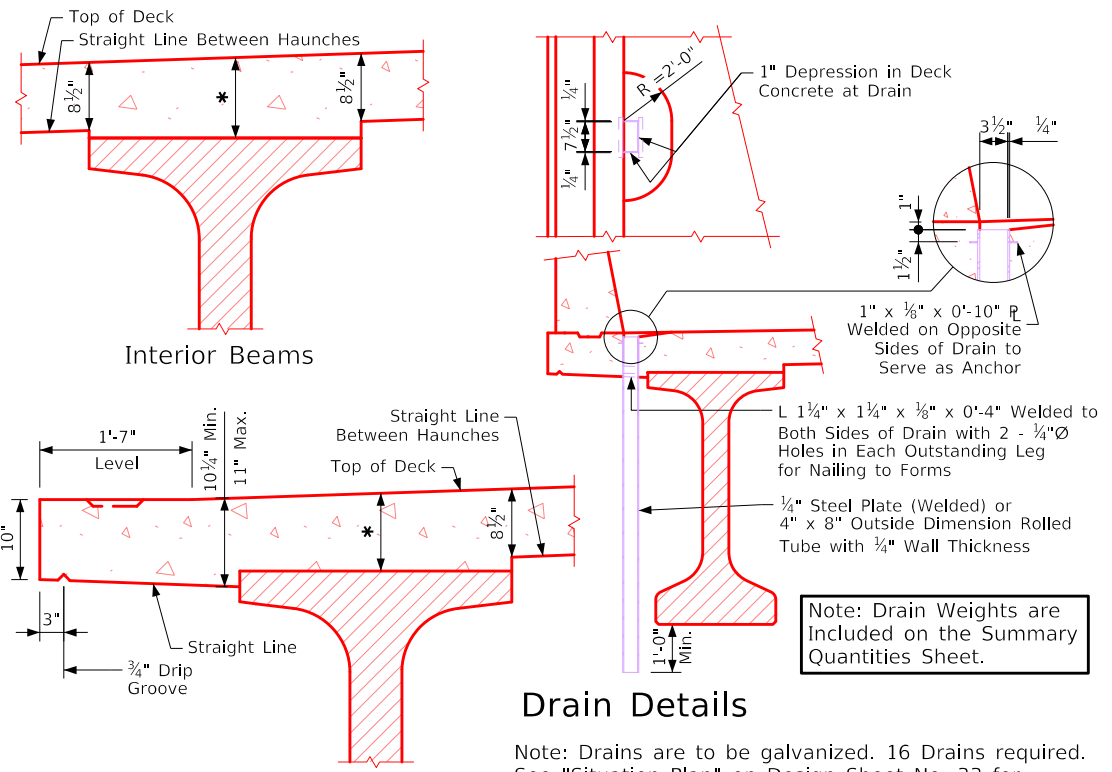
Design For 20° Skew (R.A.)
376'-0" x 60'-0" Prestressed Concrete Beam Bridge
81'-0" End Spans 2 - 107'-0" Interior Spans
Abutment Wing Details
STA. 1301+29.00 (EB US 30) Turn-In Date: August, 2025
Story County
IOWA DEPARTMENT OF TRANSPORTATION
Design No. 126 Design Sheet No. 13 of 34 FHWA No. 048731



Half Section Near Abutment

Half Section Near Fixed Pier 2

Deck area = 45.44 Sq. Ft.
Deck area does not
include the nominal 1/2"
haunch.



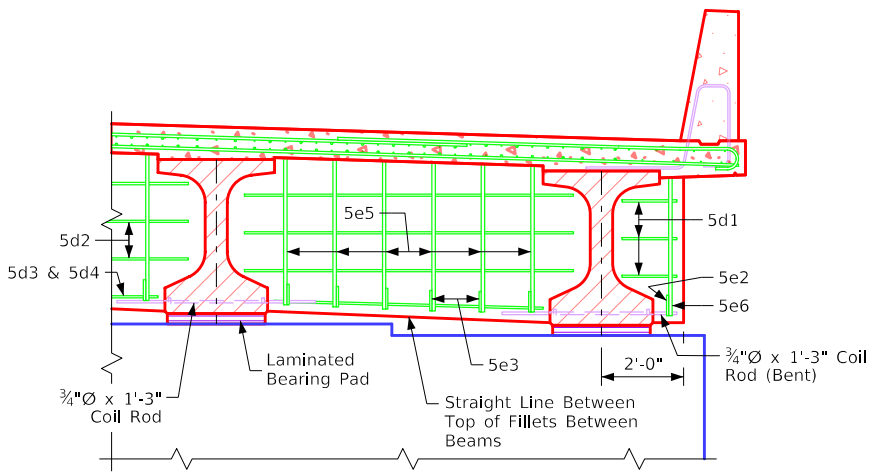
Drain Details

Note: Drains are to be galvanized. 16 Drains required. See "Situation Plan" on Design Sheet No. 33 for location. Weight of drains is included in the quantity for "Structural Steel". Weight is based on rolled tube.

Data for One Drain	
Beam Size	BTC
Drain Weight (lbs.)	106
Drain Length (ft.)	5'-6 3/4"

Superstructure Notes:

The bridge deck as shown includes 3/4" integral wearing surface.
The pier and abutment diaphragm concrete is to be placed monolithically with the bridge deck.
Cost of all resilient joint filler material is to be included in the price bid for "Structural Concrete (Bridge)".
All beams are to be set vertical.
Forms for the deck and barrier rail are to be supported by the prestressed concrete beams.
Clear distance from face of concrete to near reinforcing bar shall be 2" unless otherwise noted or shown.
All deck and diaphragm reinforcing is to be wired in place and adequately supported before concrete is placed.
Top transverse reinforcing steel is to be parallel to and 2 3/4" clear below top of deck. Bottom transverse reinforcing steel is to be parallel to and 1 1/2" clear above bottom of deck. Top and bottom reinforcing steel is to be supported by individual bar chairs spaced at not more than 3'-0" centers longitudinally and transversely, or by continuous rows of bar high chairs or deck bolsters spaced 4'-0" apart. I.M. 451.01 requirements shall apply for bar chairs, bar high chairs, and deck bolsters.
Top transverse deck reinforcing may be spliced at one location midway between beams (min, 2'-10").
Payment for reinforcing bars shall be based on no splices, and no allowance shall be made for the additional length of bar required for the use of splices.
Cost for bearing material is to be included in the price bid for "Pretensioned Prestressed Concrete Beams".



Half Section Near Expansion Piers 1 & 3

Design For 20° Skew (R.A.)

376'-0" x 60'-0" Pretensioned
Prestressed Concrete Beam Bridge

81'-0" End Spans 2 - 107'-0" Interior Spans

Transverse Section

STA. 1301+29.00 (EB US 30) Turn-In Date: August, 2025

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Design No. 126 Design Sheet No. 14 of 34 FHWA No. 048731

Control Point #100: N. 7639937.050, E. 18534748.551, Elev. 878.893 CP FD NGS MON 48' South of US 30 EB $\frac{1}{4}$, 670' West of Dayton Ave. $\frac{1}{4}$

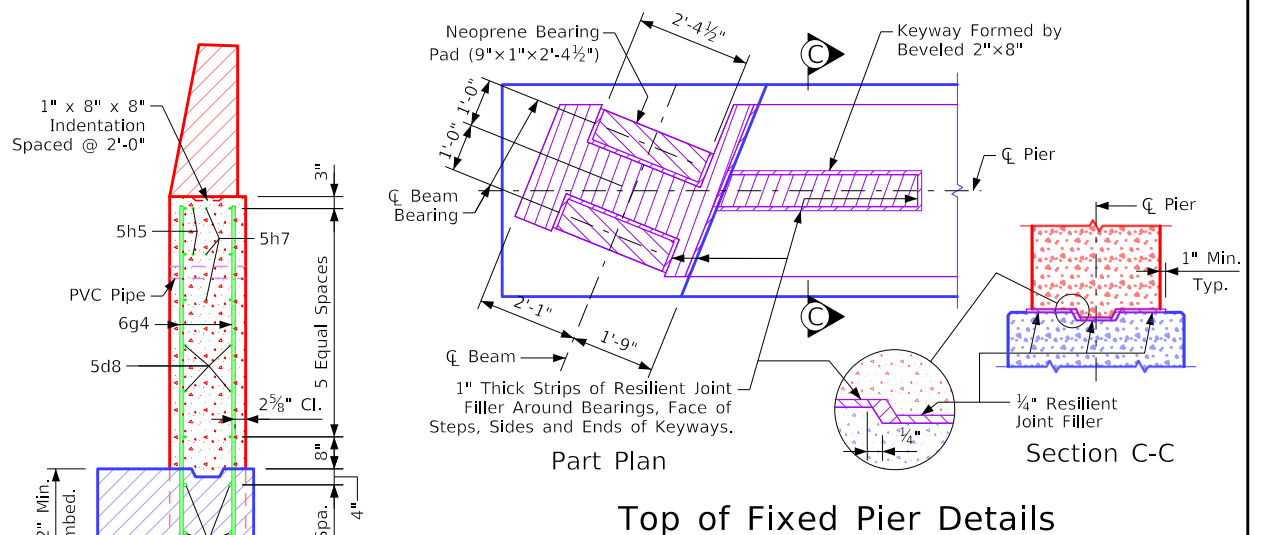
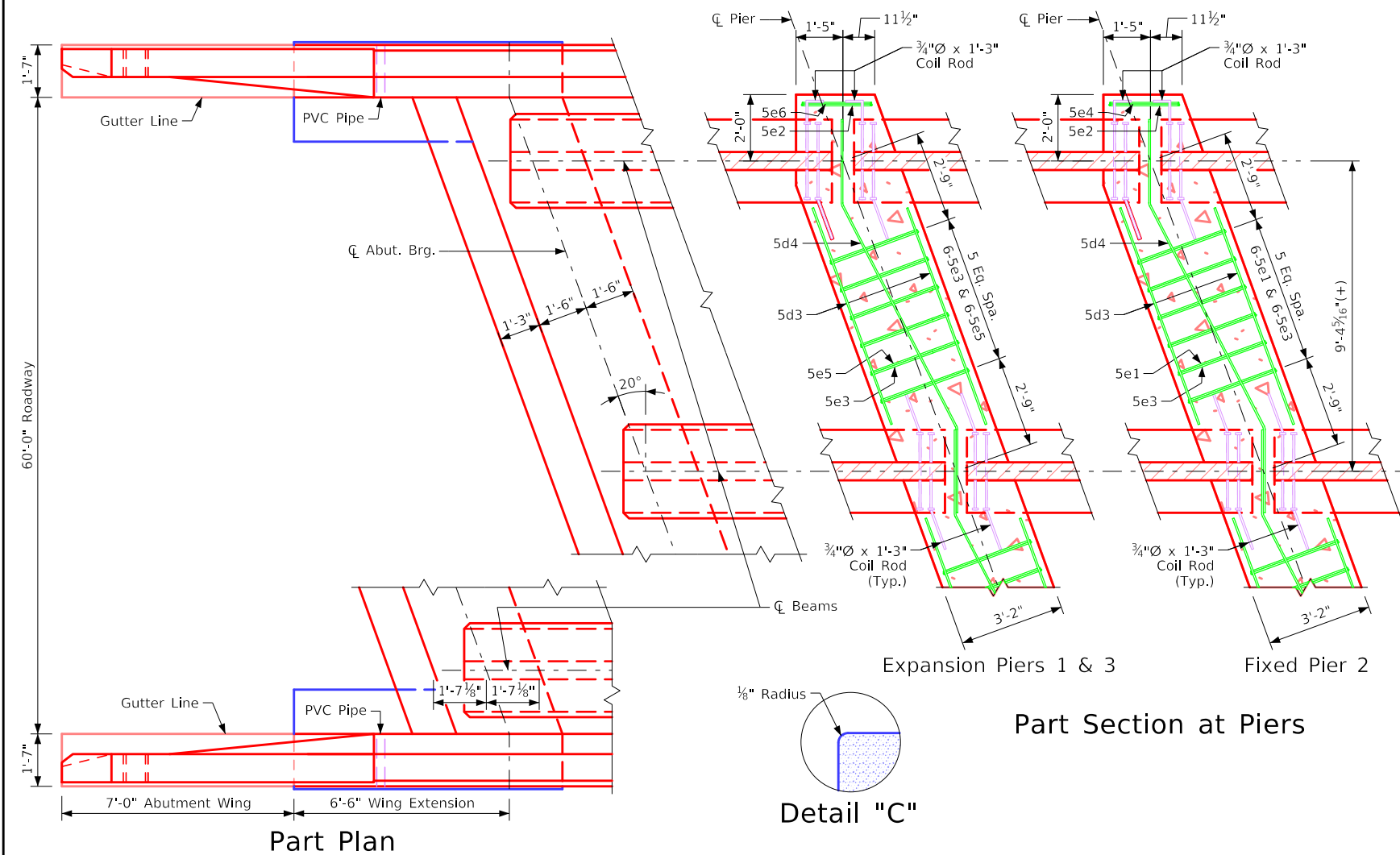
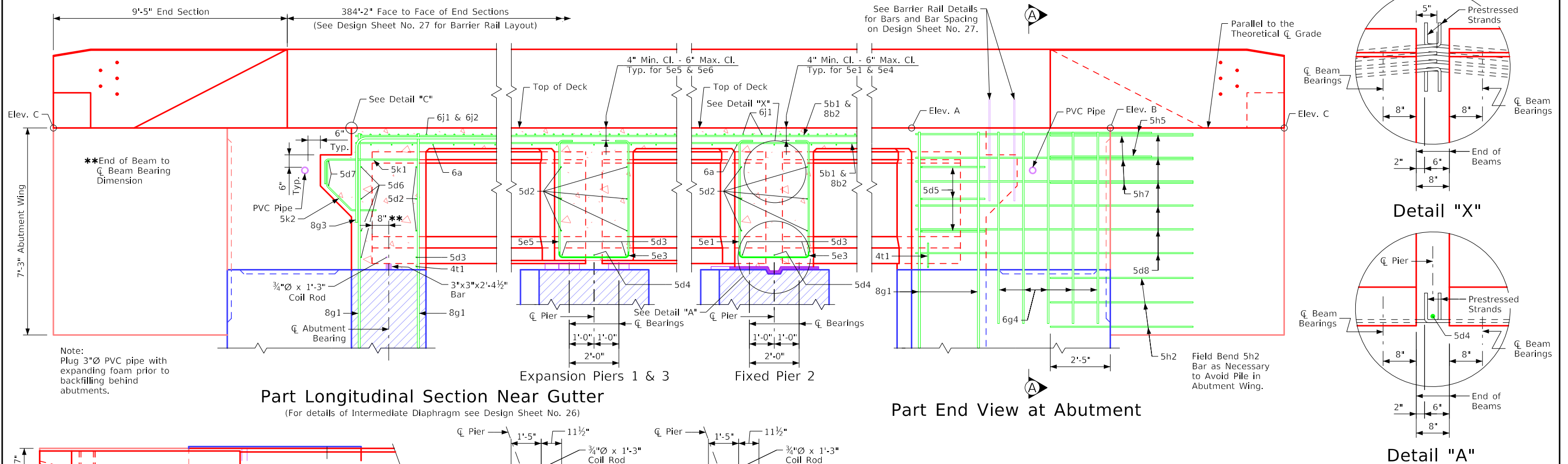


Table of Wingwall Elevations				
Location	Dim "C"	Elev. A	Elev. B	Elev. C
N.W. Corner	1'-2 $\frac{3}{4}$ "	890.89	890.82	890.76
S.W. Corner	11 $\frac{7}{8}$ "	890.57	890.52	890.46
N.E. Corner	1'-7 $\frac{7}{8}$ "	890.66	890.58	890.51
S.E. Corner	10 $\frac{3}{4}$ "	889.96	889.88	889.81

Design For 20° Skew (R.A.)

376'-0" x 60'-0" Pretensioned
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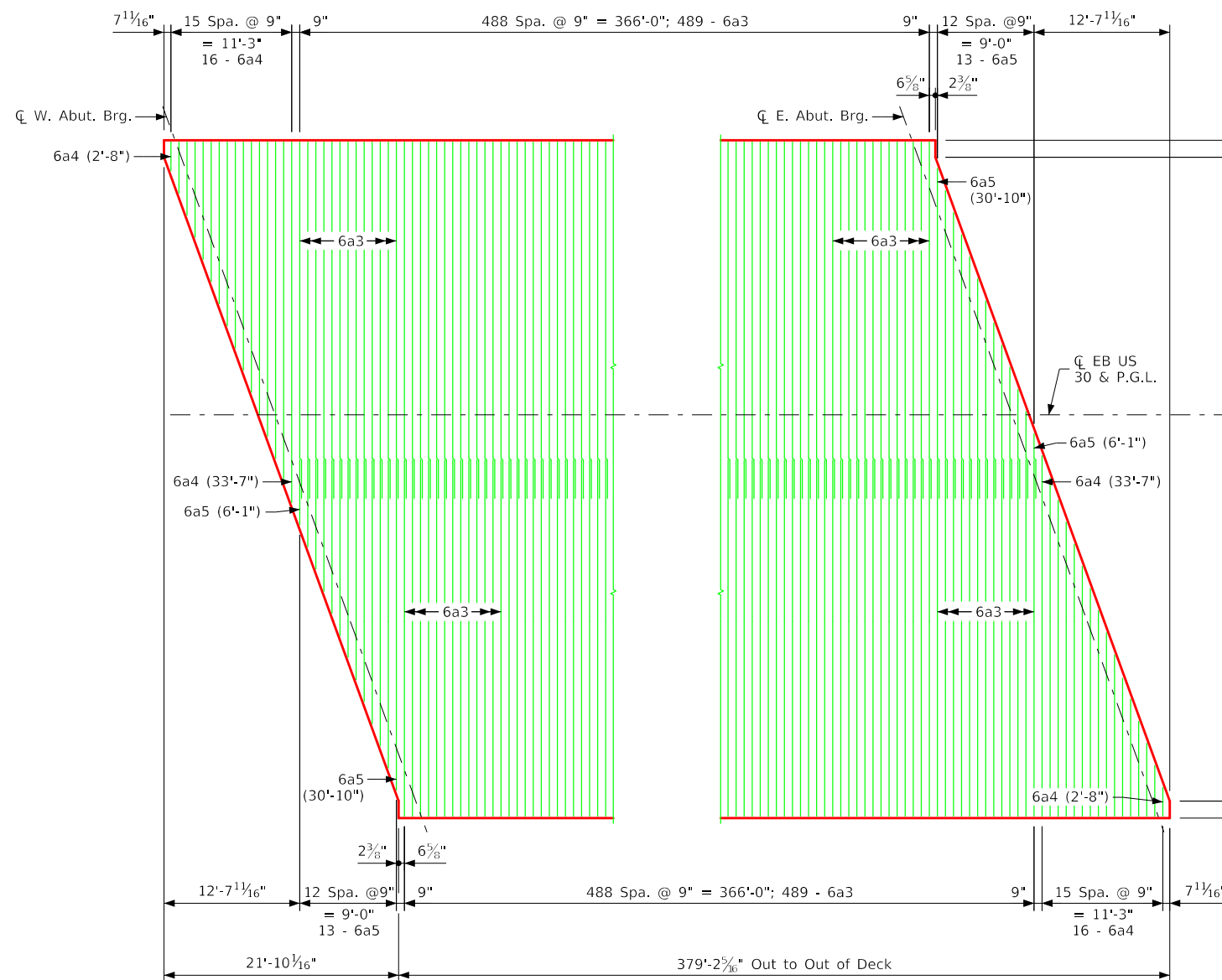
Longitudinal Section

STA. 1301+29.00 (EB US 30) Turn-In Date: August, 2025

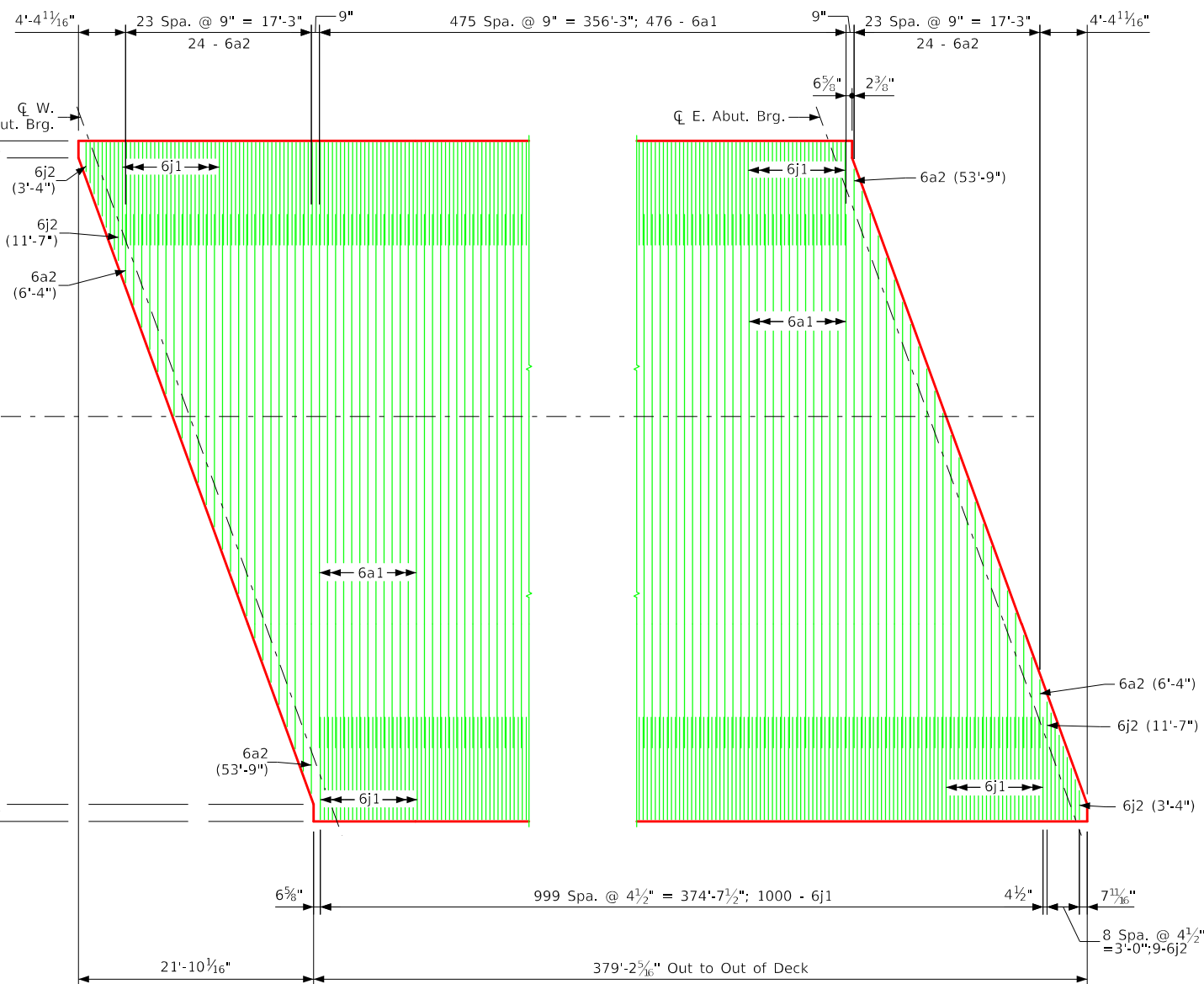
Story County

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Design No. 126 Design Sheet No. 15 of 34 FHWA No. 048731



Deck Bottom Transverse Reinforcing Layout



Deck Top Transverse Reinforcing Layout



Design For 20° Skew (R.A.)

376'-0" x 60'-0" Pretensioned Prestressed Concrete Beam Bridge

81'-0" End Spans 2 - 107'-0" Interior Spans

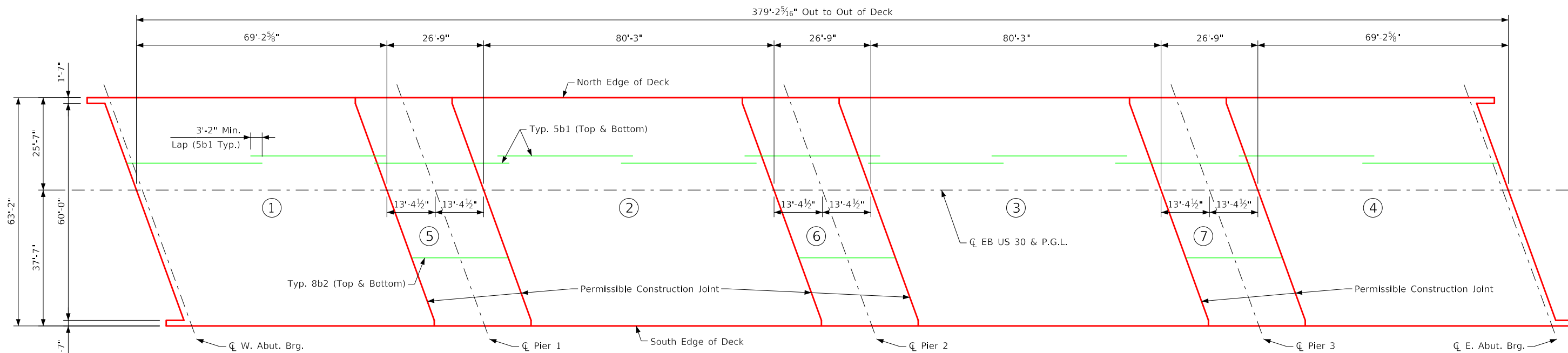
Deck Reinforcing Layout

STA. 1301+29.00 (EB US 30) Turn-In Date: August, 2025

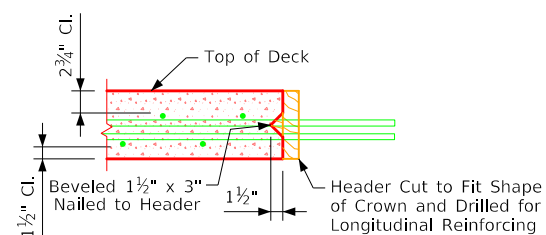
Story County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 126 Design Sheet No. 16 of 34 FHWA No. 048731



Longitudinal Reinforcing Layout & Concrete Placement Diagram



Permissible Transverse Deck Construction Joint

Note:
Concrete deck shall be placed in one of the two sections and sequences indicated:
Option 1: Seven sections in the following sequence 1-2-3-4-5-6-7
Option 2: Three sections in the following sequence (1+5+2)-(3+7+4)-6

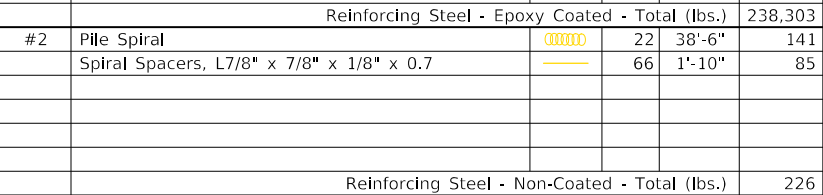
Alternate procedures for placing deck concrete may be submitted for approval together with a statement of the proposed method and evidence that the Contractor possesses the necessary equipment and facilities to accomplish the required results. The bridge Engineer shall review any alternate procedures. The cost of any additional analysis and plan modifications shall be paid for by the Contractor. The Engineer shall determine if a retarding admixture is required to maintain plasticity of the concrete deck during placement.

Deck concrete section shall cure for a minimum of 48 hours and shall achieve a minimum strength of 75% of the 28 day deck concrete strength prior to removing deck headers and beginning an adjacent pour.



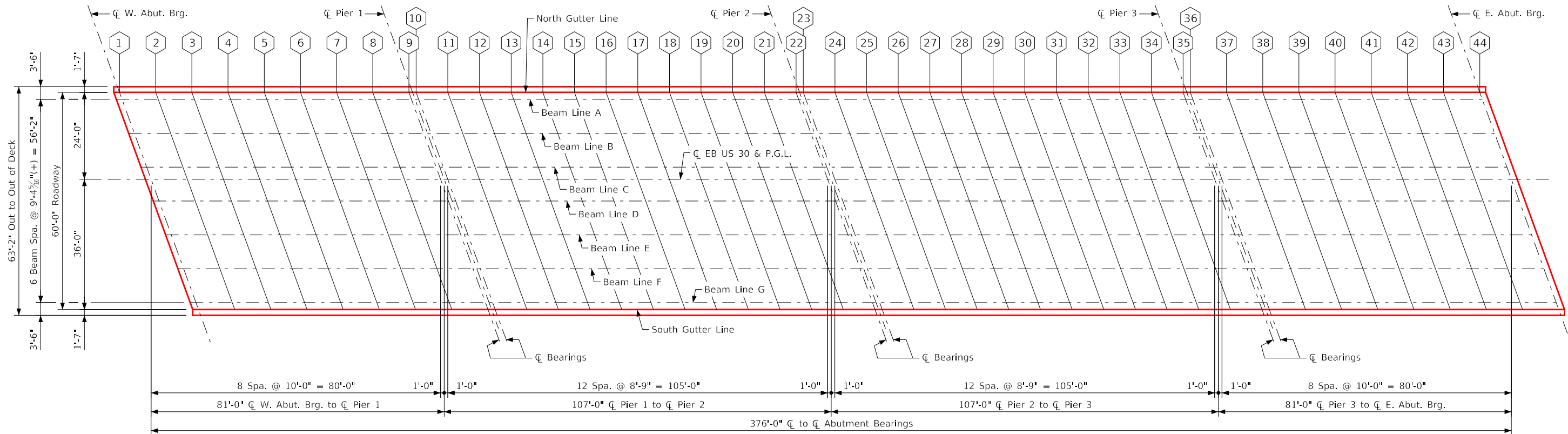
Design For 20° Skew (R.A.)
**376'-0" x 60'-0" Pretensioned
Prestressed Concrete Beam Bridge**
81'-0" End Spans 2 - 107'-0" Interior Spans
Deck Reinforcing Layout
STA. 1301+29.00 (EB US 30) Turn-In Date: August, 2025
Story County
IOWA DEPARTMENT OF TRANSPORTATION
Design No. 126 Design Sheet No. 17 of 34 FHWA No. 048731

Reinforcing Bar List-Deck, Abut. & Diaphragms



11:54:27 AM 7/16/2025 cmartin pw:\\projectwise.dot.int.lan:PWMain\\Documents\\Projects\\8503002019\\Bridge\\(305) Bridge Replacement-PPCB\\BRG 85030305 WHKS 126 048731 Z08.dgn

Control Point #100: N. 7639937.050, E. 18534748.551, Elev. 878.893 CP FD NGS MON 48' South of US 30 EB CL, 670' West of Dayton Ave. CL



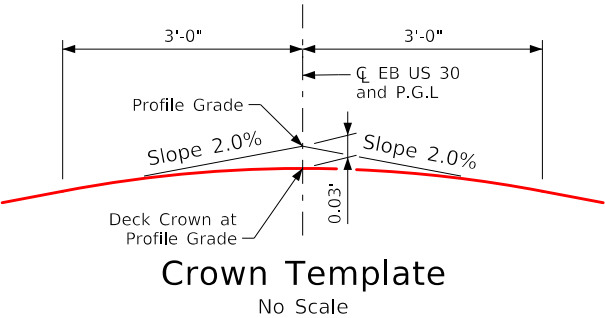
Deck Elevation Plan

Top of Deck Elevations

Location	CL W. Abut. Brg.								CL Pier 1 Bearings													CL Pier 2 Bearings	
	Line 1	Line 2	Line 3	Line 4	Line 5	Line 6	Line 7	Line 8	Line 9	Line 10	Line 11	Line 12	Line 13	Line 14	Line 15	Line 16	Line 17	Line 18	Line 19	Line 20	Line 21	Line 22	Line 23
North Gutter Line	890.87	890.95	891.03	891.10	891.17	891.23	891.28	891.33	891.38	891.39	891.43	891.46	891.49	891.51	891.54	891.56	891.57	891.58	891.59	891.59	891.59	891.59	891.59
Beam Line A	890.92	891.00	891.07	891.14	891.21	891.27	891.33	891.38	891.42	891.43	891.47	891.50	891.53	891.56	891.58	891.59	891.61	891.62	891.63	891.63	891.63	891.63	891.63
Beam Line B	891.13	891.21	891.28	891.35	891.42	891.48	891.53	891.58	891.63	891.63	891.67	891.70	891.73	891.75	891.77	891.79	891.80	891.81	891.82	891.82	891.82	891.81	891.81
Beam Line C	891.35	891.42	891.50	891.56	891.62	891.68	891.74	891.78	891.83	891.83	891.87	891.90	891.92	891.95	891.97	891.98	891.99	892.00	892.01	892.01	892.00	892.00	892.00
CL Roadway & EB US 30 P.G.L.	891.39	891.47	891.54	891.61	891.67	891.73	891.78	891.83	891.87	891.88	891.91	891.94	891.96	891.99	892.01	892.02	892.03	892.04	892.04	892.04	892.04	892.03	892.03
Beam Line D	891.32	891.40	891.47	891.53	891.59	891.65	891.70	891.75	891.79	891.80	891.83	891.86	891.88	891.90	891.92	891.93	891.94	891.95	891.95	891.95	891.95	891.94	891.94
Beam Line E	891.13	891.20	891.27	891.33	891.39	891.45	891.49	891.54	891.58	891.59	891.62	891.65	891.67	891.69	891.70	891.72	891.73	891.73	891.73	891.73	891.73	891.72	891.71
Beam Line F	890.87	890.94	891.01	891.07	891.13	891.18	891.23	891.27	891.31	891.32	891.35	891.37	891.40	891.41	891.43	891.44	891.45	891.45	891.45	891.44	891.43	891.43	891.43
Beam Line G	890.62	890.69	890.75	890.81	890.87	890.92	890.96	891.01	891.04	891.05	891.08	891.10	891.12	891.14	891.15	891.16	891.17	891.17	891.17	891.17	891.16	891.15	891.14
South Gutter Line	890.56	890.63	890.70	890.76	890.81	890.86	890.91	890.95	890.99	890.99	891.02	891.05	891.07	891.08	891.10	891.11	891.11	891.11	891.11	891.11	891.10	891.09	891.08

Note:
Hexagonal numbers correspond to the line numbers shown in Top of Deck Elevations Table.

Top of Deck Elevations																						
Location												C. Pler 3 Bearings										C. E. Abut. Brg.
	Line 24	Line 25	Line 26	Line 27	Line 28	Line 29	Line 30	Line 31	Line 32	Line 33	Line 34	Line 35	Line 36	Line 37	Line 38	Line 39	Line 40	Line 41	Line 42	Line 43	Line 44	
North Gutter Line	891.58	891.57	891.56	891.54	891.52	891.49	891.46	891.43	891.39	891.35	891.31	891.26	891.25	891.19	891.13	891.06	890.98	890.91	890.82	890.74	890.64	
Beam Line A	891.62	891.61	891.59	891.57	891.55	891.53	891.50	891.46	891.43	891.39	891.34	891.30	891.28	891.22	891.16	891.09	891.02	890.94	890.86	890.77	890.68	
Beam Line B	891.80	891.79	891.77	891.75	891.73	891.70	891.67	891.64	891.60	891.56	891.51	891.46	891.45	891.39	891.32	891.25	891.18	891.10	891.01	890.92	890.83	
Beam Line C	891.99	891.97	891.95	891.93	891.91	891.88	891.85	891.81	891.77	891.73	891.68	891.63	891.62	891.56	891.49	891.42	891.34	891.26	891.17	891.08	890.98	
C. Roadway & EB US 30 P.G.L.	892.02	892.01	891.99	891.97	891.94	891.91	891.88	891.84	891.80	891.76	891.71	891.66	891.65	891.58	891.52	891.44	891.37	891.28	891.20	891.11	891.01	
Beam Line D	891.93	891.91	891.89	891.87	891.84	891.81	891.78	891.74	891.70	891.66	891.61	891.56	891.54	891.48	891.41	891.34	891.26	891.18	891.09	891.00	890.90	
Beam Line E	891.70	891.68	891.66	891.64	891.61	891.58	891.54	891.51	891.46	891.42	891.37	891.32	891.30	891.24	891.17	891.09	891.01	890.93	890.84	890.74	890.64	
Beam Line F	891.41	891.40	891.37	891.35	891.32	891.29	891.25	891.21	891.17	891.12	891.07	891.01	891.00	890.93	890.86	890.78	890.70	890.61	890.52	890.43	890.33	
Beam Line G	891.13	891.11	891.08	891.06	891.02	890.99	890.95	890.91	890.87	890.82	890.77	890.71	890.70	890.63	890.55	890.47	890.39	890.30	890.21	890.11	890.01	
South Gutter Line	891.07	891.05	891.02	891.00	890.96	890.93	890.89	890.85	890.81	890.76	890.70	890.65	890.63	890.56	890.49	890.41	890.33	890.24	890.15	890.05	889.95	



Crown Template
No Scale

Design For 20° Skew (R.A.)

376'-0" x 60'-0" Pretensioned
Prestressed Concrete Beam Bridge

81'-0" End Spans2 - 107'-0" Interior Spans

Top of Deck Elevations

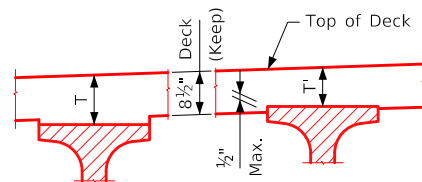
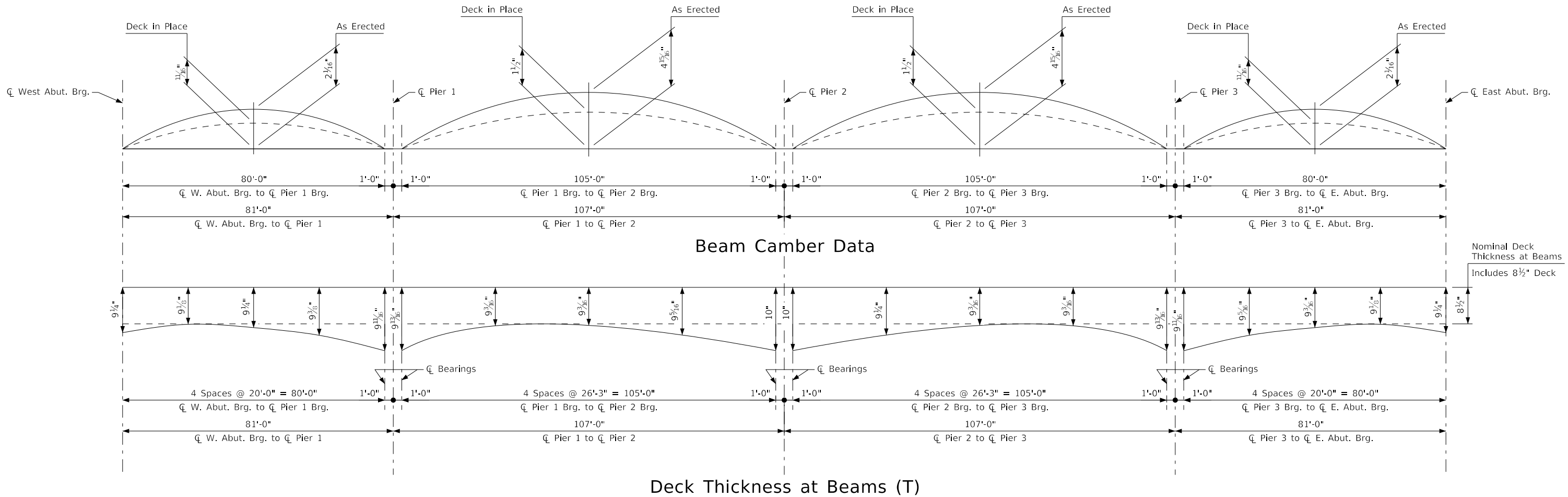
STA. 1301+29.00 (EB US 30)Turn-In Date: August, 2025

Story County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 126Design Sheet No. 19 of 34FHWA No. 048731





Deck Thickness Details

Note:
The deck thickness (T) at beams is based on the anticipated beam camber and deflections. These values are used by the designer to set beam elevations and estimate concrete quantities. Refer to the haunch data details sheet for additional information to aid the Contractor in setting the field haunches required for construction.



Design For 20° Skew (R.A.)

376'-0" x 60'-0" Pretensioned
Prestressed Concrete Beam Bridge

81'-0" End Spans2 - 107'-0" Interior Spans

Deck Thickness Details

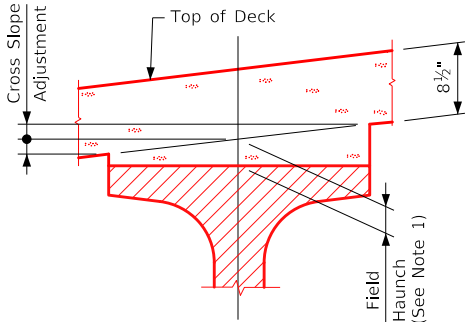
STA. 1301+29.00 (EB US 30)Turn-In Date: August, 2025

Story County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 126Design Sheet No. 20 of 34FHWA No. 048731

Table of Beam Line Deck Haunch Elevations																							
Beam Line	℄ W. Abut. Brg.								℄ Pier 1 Bearings													℄ Pier 2 Bearings	
	Line 1	Line 2	Line 3	Line 4	Line 5	Line 6	Line 7	Line 8	Line 9	Line 10	Line 11	Line 12	Line 13	Line 14	Line 15	Line 16	Line 17	Line 18	Line 19	Line 20	Line 21	Line 22	Line 23
A	890.21	890.33	890.44	890.54	890.61	890.66	890.70	890.71	890.71	890.72	890.84	890.94	891.03	891.10	891.15	891.18	891.18	891.16	891.13	891.07	891.00	890.92	890.92
B	890.42	890.55	890.66	890.75	890.82	890.87	890.90	890.92	890.92	890.93	891.04	891.14	891.22	891.29	891.34	891.37	891.37	891.35	891.31	891.26	891.19	891.10	891.10
C	890.64	890.76	890.87	890.96	891.03	891.08	891.11	891.12	891.12	891.13	891.24	891.34	891.42	891.49	891.54	891.56	891.56	891.54	891.50	891.44	891.37	891.29	891.29
D	890.61	890.73	890.84	890.93	891.00	891.04	891.07	891.08	891.08	891.09	891.20	891.29	891.38	891.44	891.49	891.51	891.51	891.49	891.45	891.39	891.32	891.23	891.23
E	890.42	890.53	890.64	890.73	890.79	890.84	890.87	890.87	890.87	890.88	890.99	891.08	891.17	891.23	891.27	891.30	891.30	891.27	891.23	891.17	891.09	891.01	891.01
F	890.16	890.28	890.38	890.47	890.53	890.58	890.60	890.61	890.60	890.61	890.72	890.81	890.89	890.96	891.00	891.02	891.02	890.99	890.95	890.89	890.81	890.72	890.72
G	889.91	890.02	890.12	890.21	890.27	890.31	890.34	890.34	890.33	890.34	890.45	890.54	890.62	890.68	890.72	890.74	890.74	890.71	890.67	890.60	890.52	890.44	890.43



Haunch Detail

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

Table of Beam Line Deck Haunch Elevations																						
Beam Line												C Pier 3 Bearings									C E. Abut. Brg.	
	Line 24	Line 25	Line 26	Line 27	Line 28	Line 29	Line 30	Line 31	Line 32	Line 33	Line 34	Line 35	Line 36	Line 37	Line 38	Line 39	Line 40	Line 41	Line 42	Line 43	Line 44	
A	890.99	891.05	891.09	891.12	891.12	891.11	891.07	891.01	890.92	890.82	890.71	890.59	890.58	890.56	890.53	890.49	890.42	890.33	890.23	890.10	889.97	
B	891.17	891.23	891.27	891.30	891.30	891.28	891.24	891.18	891.10	890.99	890.88	890.75	890.74	890.73	890.70	890.65	890.58	890.49	890.38	890.26	890.12	
C	891.35	891.41	891.45	891.47	891.48	891.46	891.42	891.35	891.27	891.16	891.05	890.92	890.91	890.89	890.86	890.81	890.74	890.65	890.54	890.42	890.28	
D	891.29	891.35	891.39	891.41	891.41	891.39	891.35	891.28	891.20	891.09	890.98	890.85	890.84	890.82	890.78	890.73	890.66	890.57	890.46	890.33	890.19	
E	891.07	891.12	891.16	891.18	891.18	891.16	891.11	891.05	890.96	890.86	890.74	890.61	890.59	890.57	890.54	890.49	890.41	890.32	890.21	890.08	889.93	
F	890.78	890.83	890.87	890.89	890.89	890.87	890.82	890.75	890.66	890.56	890.43	890.30	890.29	890.27	890.23	890.18	890.10	890.01	889.89	889.76	889.62	
G	890.49	890.54	890.58	890.60	890.60	890.57	890.52	890.45	890.36	890.26	890.13	890.00	889.99	889.96	889.92	889.87	889.79	889.70	889.58	889.45	889.31	

Miscellaneous Data Table																									
	Beam Line	℄ W. Abut. Brg.								℄ Pier 1 Bearings														℄ Pier 2 Bearings	
		Line 1	Line 2	Line 3	Line 4	Line 5	Line 6	Line 7	Line 8	Line 9	Line 10	Line 11	Line 12	Line 13	Line 14	Line 15	Line 16	Line 17	Line 18	Line 19	Line 20	Line 21	Line 22	Line 23	
Anticipated Deflection Due to Deck (in.)	All	0	1/2	15/16	1 1/4	1 5/16	1 1/4	15/16	1/2	0	0	15/16	1 3/4	2 7/16	3	3 3/8	3 7/16	3 3/8	3	2 7/16	1 3/4	15/16	0	0	
Cross Slope Adjustments (in.)	A-D	±5/16"																							
	E-G	±1/2"																							
Allowable Field Haunch (in. & ft.)	Max.	All	2 1/2" (0.208)																						
	Min.	A-D	-3/16" (-0.013)																						
		E-G	0																						

Miscellaneous Data Table																							
	Beam Line												CL Pier 3 Bearings										CL E. Abut. Brg.
			Line 24	Line 25	Line 26	Line 27	Line 28	Line 29	Line 30	Line 31	Line 32	Line 33	Line 34	Line 35	Line 36	Line 37	Line 38	Line 39	Line 40	Line 41	Line 42	Line 43	Line 44
Anticipated Deflection Due to Deck (in.)	All		15/16	1 3/4	2 7/16	3	3 3/8	3 7/16	3 3/8	3	2 7/16	1 3/4	15/16	0	0	1/2	15/16	1 1/4	1 5/16	1 1/4	15/16	1/2	0
Cross Slope Adjustments (in.)	A-D		±5/16"																				
	E-G		±1/2"																				
Allowable Field Haunch (in. & ft.)	Max.	All	2 1/2" (0.208)																				
	Min.	A-D	-3/16" (-0.013)																				
		E-G	0																				

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

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



Design For 20° Skew (R.A.)

376'-0" x 60'-0" Pretensioned
Prestressed Concrete Beam Bridge

81'-0" End Spans2 - 107'-0" Interior Spans

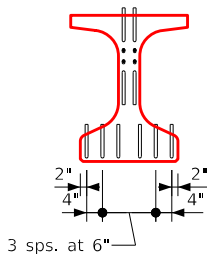
Deck Haunch Data

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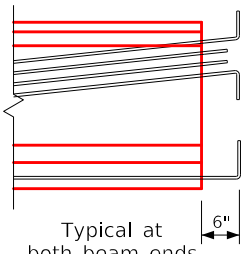
Story County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 126Design Sheet No. 21 of 34FHWA No. 048731



The top and bottom rows of the deflected strands are to be cut with 1'-2" projections which are to be shop bent as shown. The remaining top deflected strands are to be cut with 5" projections. Six bottom strands are to be cut with 1'-6" projections which are to be shop bent as shown. The remaining bottom strands are to be cut off reasonably flush with the concrete.



Design Stresses:

Design stresses for the following materials are to be in accordance with AASHTO LRFD Bridge Design Specifications, Series of 2017.

- Reinforcing steel in accordance with Section 5, Grade 60.
- Concrete in accordance with Section 5.
- Prestressing steel in accordance with Section 5, Grade 270.

Specifications:

Construction: Standard Specifications of the Iowa Department of Transportation, current series, with current applicable special provisions and supplemental specifications.
Design: AASHTO LRFD, Series of 2017 with minor modifications.

BTC Beam Data																	
BTC Beam	Span Length Ç-Ç Bearing	Overall Beam Length (L)	Concrete Strength		Strand Size Dia. (in.)	Number of Strands		Total Initial Prestress ⁽³⁾ (kips)	Hold Down Force (kips)	Camber (in.) ⁽⁶⁾		Deflection (in.) Δ_D		Permissible Maximum Spacing	Weight (tons)	Concrete (cu. yd.)	Reinforcing Steel (weight-lb.)
			f'ci (ksi.)	f'c (ksi.)		Straight	Deflected			At Release	After Losses	Immediate ⁽¹⁾ (elastic) Δ_I	Time ⁽²⁾ (plastic) Δ_T	HL-93 Loading			
Steel Diaphragm	Steel Diaphragm	Steel Diaphragm															
BTC80	80'-0"	81'-4"	6.00	7.00	0.60"	20	4	1021	18.8	1.11"	2.04"	1.11"	0.28"	9'-3"	29.3	14.5	2114
BTC105	105'-0"	106'-4"	7.50	8.50	0.60"	34	8	1786	25.8	3.10"	4.96"	3.04"	0.76"	9'-3"	38.3	18.9	2762

① Deflections at mid-span due to weight of deck and diaphragm. The deflections shown are for a deck (8.5") and haunch (1.5") weight of:
1.04 kips/ft. for 9'-3" beam spacing
And one steel diaphragm (0.500 kips) at $\frac{1}{4}$ of span. For different deck and diaphragm weights, deflections will be directly proportional.

② Deflections due to the combined effect of creep due to weight of deck and shrinkage of deck.

Total beam deflections at Q_L of span, Δ_D , due to weight of deck and diaphragms for detailing purpose:

(A) $\Delta_D = \Delta_I + \Delta_T$ for simple span.

(B) $\Delta_D = \Delta_I + \frac{3}{4}\Delta_T$ for end spans of continuous bridge.

(C) $\Delta_D = \Delta_I + \frac{1}{2}\Delta_T$ for interior spans of continuous bridge.

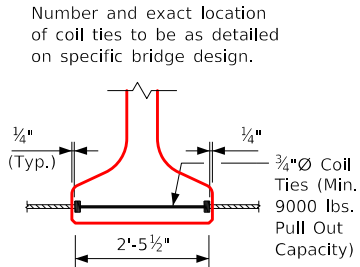
③ Total initial prestress is based on 72.6% f'_s , $f'_s = 270$ ksi.
and $A_s = 0.217$ in.².

⑥ Calculated design cambers are based on multipliers developed from research in Iowa.

Standard BTC80 and BTC105 beam design for spacing greater than 9'-3" was verified using LEAP Bridge Concrete.

Beams	Lifting Loops Each End	# of Strands Per Loop	D	Beam Overhang (ft.)
BTC80	2	4	1'-3"	11
BTC105	2	4	6'-3"	12

Lifting loops shall carry loads equally.



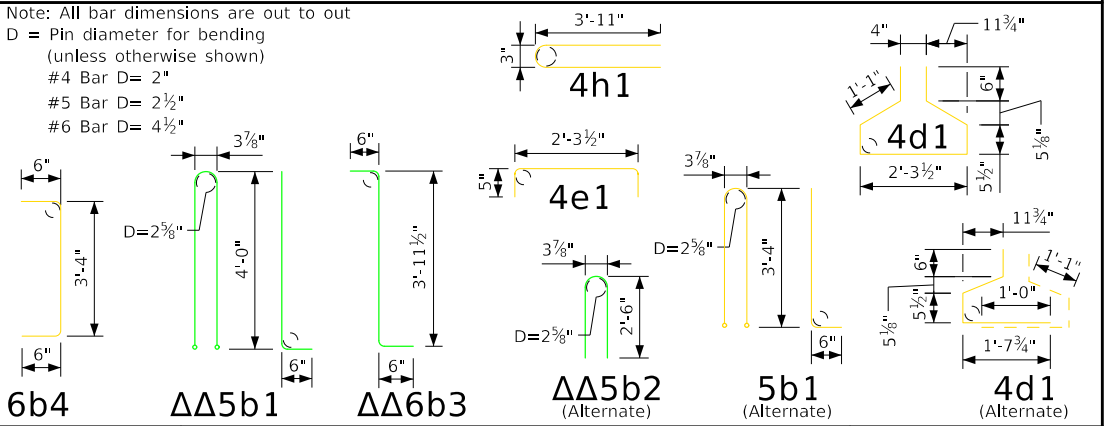
Coil Tie Detail

- ΔΔ 5b1 and 6b3 bars to be epoxy coated
- * 6b3 and 6b4 bars to be used in pairs

Reinforcing Bar List						
Beam		BTC80		BTC105		
Bar Shape		No.	Length	No.	Length	
ΔΔ ΔΔ* *	5a1		12	24'-0"	12	36'-6"
	5a2		6	40'-0"	6	40'-0"
	5b1		61	9'-2"	85	9'-2"
	6b3		34	5'-0"	40	5'-0"
	6b4		16	4'-4"	24	4'-4"
	4c1		103	2'-7"	139	2'-7"
	4d1		83	6'-5"	107	6'-5"
	4e1		26	3'-2"	26	3'-2"
	4h1		6	8'-0"	6	8'-0"

Bent Bar Details

Note: All bar dimensions are out to out
D = Pin diameter for bending
(unless otherwise shown)
#4 Bar D= 2"
#5 Bar D= 2½"
#6 Bar D= 4½"



Beam Notes:

These beams are designed for AASHTO live loads as indicated in above table with an allowance of 20 lbs. per square foot of roadway for future wearing surface.

All PPC beams shall use high performance concrete ('HPC') in accordance with the Standard Specifications.

Hold down points for deflected strands may be moved toward ends of beam a distance of 0,05 L maximum at producer's option.

All prestressing strands except lifting loop strands shall be 0.60 in. nominal diameter (nominal steel area = 0.217 in.²) and conform to ASTM A416 Grade 270 Low Relaxation Strands. Minimum strand breaking strength shall be 58.6 kips.

Tops of beams are to be struck off level and finished as per Materials I.M.570.

Bearings shall be as detailed on other design sheets.

Beams to be used in bridges made continuous by the poured in place deck, are to be at least 28 days old before the deck is placed unless a shorter curing time is approved by the Bridge Engineer.

The portions of the prestressed beams that are to be embedded in the abutment and pier diaphragms shall be roughened for a distance of 10" from the beam end by sandblasting or other approved methods to provide suitable bond between the beam and the diaphragm in accordance with Article 2403.03, I, of the Standard Specifications.

All beams are to be increased in length to compensate for elastic shortening, creep and shrinkage.

For transporting, the allowable overhang is shown in the "Lifting Loop and Overhang Table".

The contractor shall assure the lateral stability of the BTC105 beams during handling, transporting and erection by providing temporary bracing as needed.

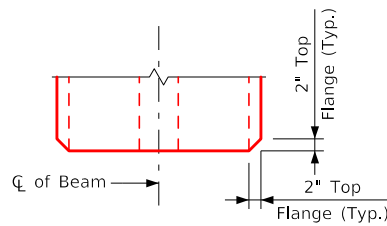
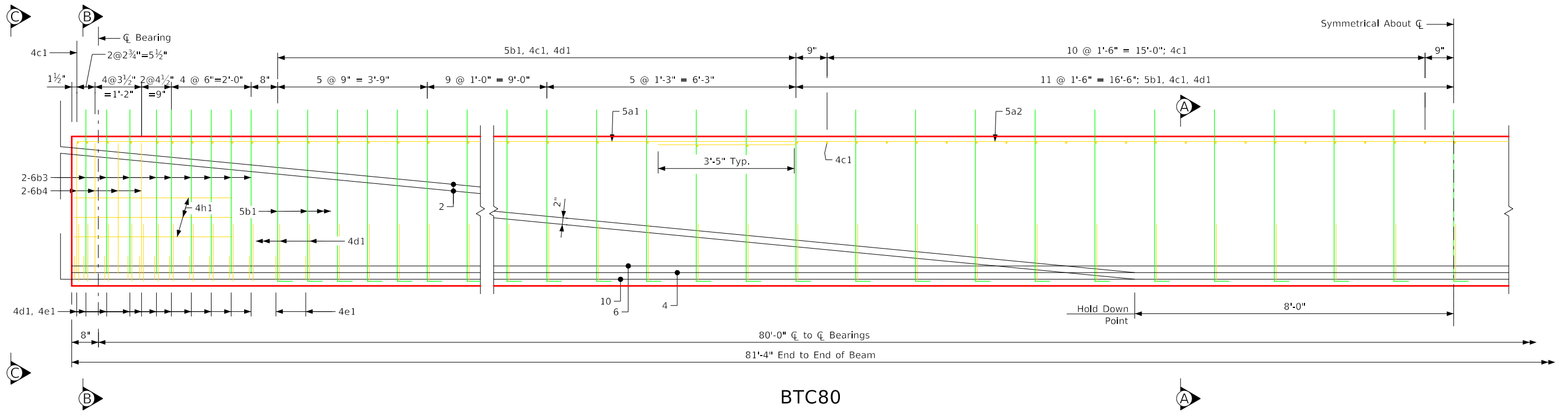
Holes must be cast in the web to accommodate the steel diaphragm attachments as detailed on the Steel Diaphragm Detail Sheet.

Minimum concrete f'_c (at 28 days) and minimum f'_ci at release are located in the BTC Beam Data Table above.

Four 0.60 in. diameter strands stressed to not more than 5000 lbs. each may be used in lieu of bars 5a1 and 5a2 in the top flange.

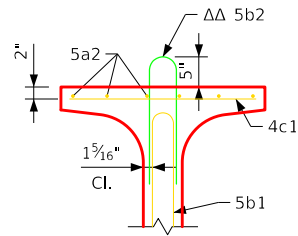
Correction 12-13: Coil Tie Detail was Changed to Reflect the Distance Between Coil Tie Anchors Embedded ¼ inch.
Revised 10-24: Revised "At Release" and "After Losses" Camber Values for BTC85 to BTC115.
Issued 05-04.
Beams.dgn - 4700 - This Sheet Re-Issued 04-2024. Sheet Format Update.

Revision 10-07: 5b2 Bar Deleted. 5b1 Bar Lengthened to Extend 5 Inches Above Beam Top. Alternate Section A-A Added.
Issued 05-04.
Beams.dgn - 4711 - This Sheet Re-Issued 04-2024. Sheet Format Update.



Top View

The top flange beam corners are to be chamfered 2" as shown at both ends of the beam.

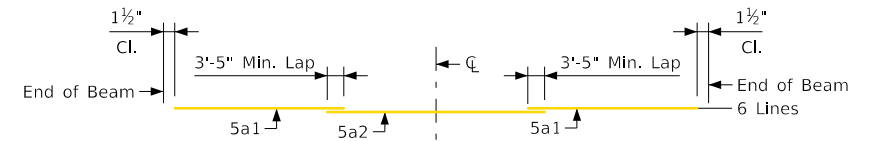


Section A-A (Alternate)

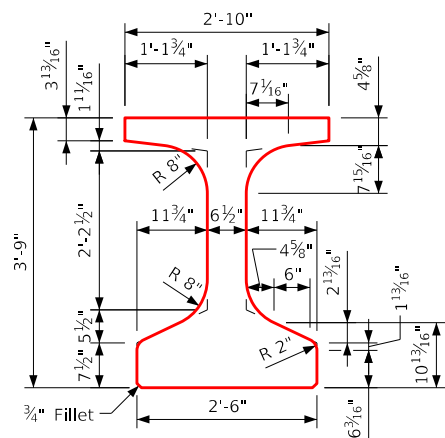
See Alternate Bar Note on Design Sheet No. 22.

Area = 691.8 in.²
 $\bar{y}_b = 20.74$ in.
 $I = 178,971$ in.⁴

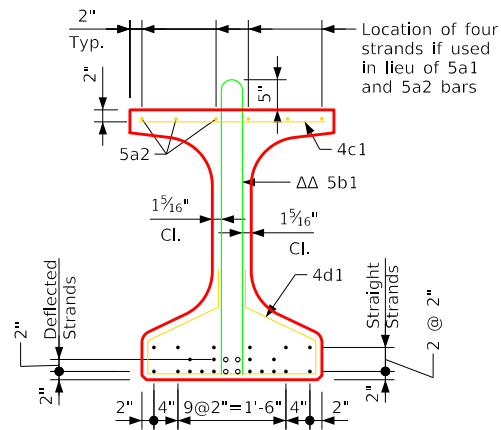
Beam Section Properties



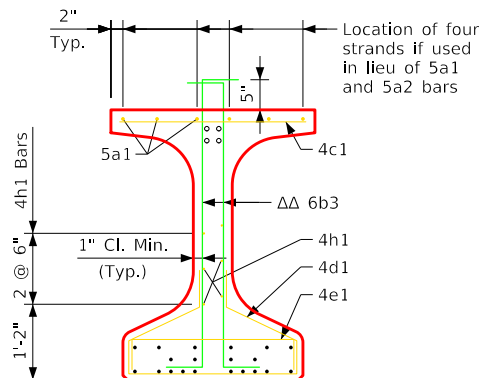
Top Flange Longitudinal Bar Layout



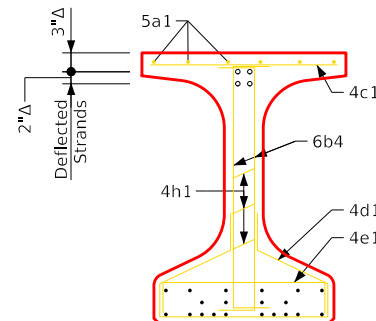
BTC Beam Cross Section



Section A-A



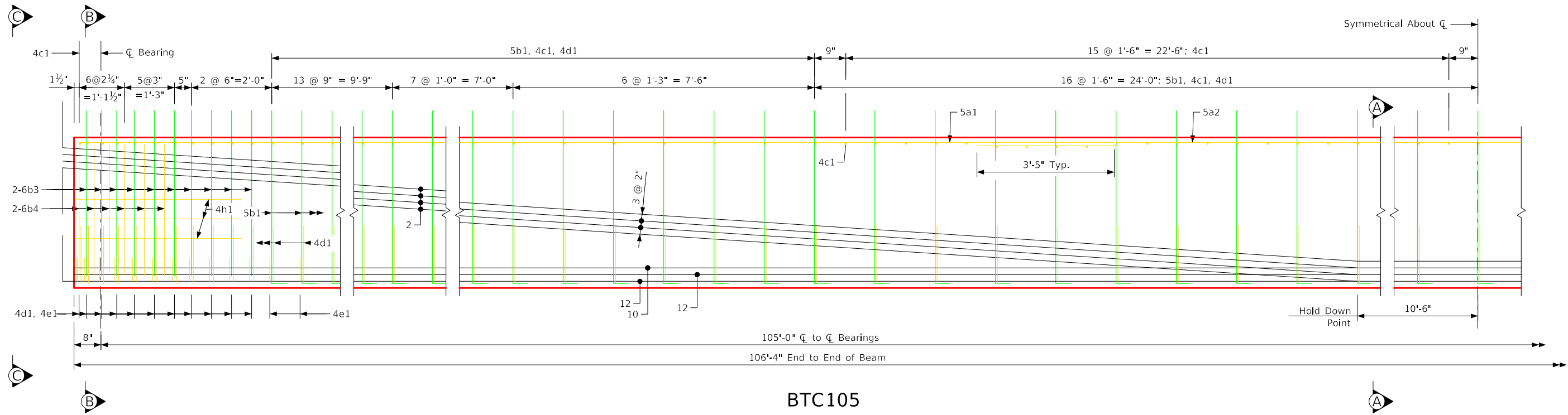
Section B-B



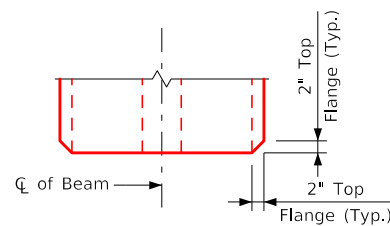
View C-C

Design For 20° Skew (R.A.)
376'-0" x 60'-0" Prestressed Concrete Beam Bridge
81'-0" End Spans 2 - 107'-0" Interior Spans
BTC80 Beam Details
STA. 1301+29.00 (EB US 30) Turn-In Date: August, 2025
Story County
IOWA DEPARTMENT OF TRANSPORTATION
Design No. 126 Design Sheet No. 23 of 34 FHWA No. 048731

Revision 10-07: 5b2 bar deleted. 5b1 Bar Lengthened to Extend 5 Inches Above Beam Top. Alternate Section A-A Added.
Issued 05-04.
Beams.dgn - 4716 - This Sheet Re-Issued 04-2024. Sheet Format Update.

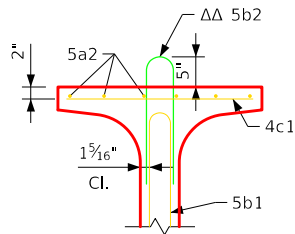


BTC105



Top View

The top flange beam corners are to be chamfered 2" as shown at both ends of the beam.

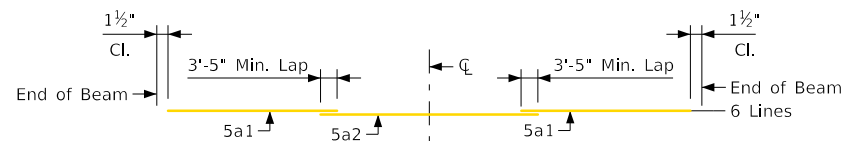


Section A-A
(Alternate)

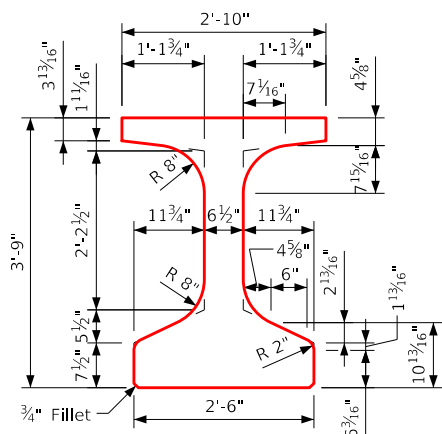
See Alternate Bar Note on Design Sheet No. 22.

Area = 691.8 in.²
 $\bar{y}_b = 20.74$ in.
 $I = 178,971$ in.⁴

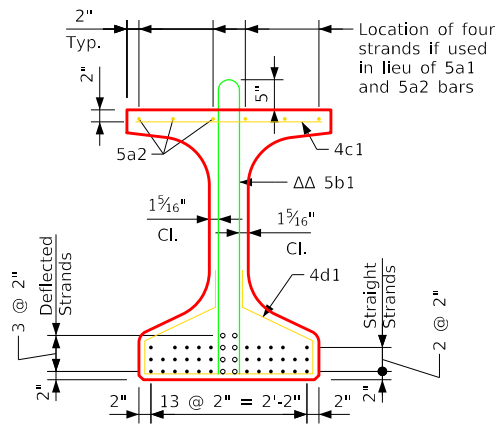
Beam Section Properties



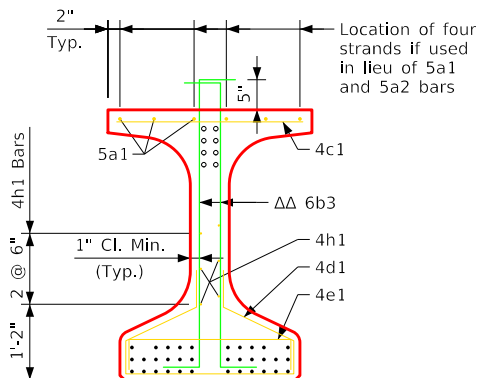
Top Flange Longitudinal Bar Layout



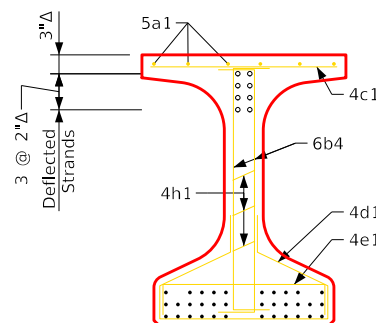
BTC Beam Cross Section



Section A-A



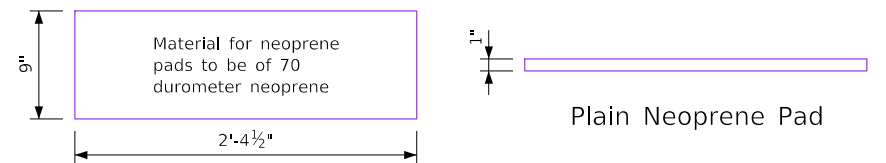
Section B-B



View C-C

° Deflected Strands
Δ Dimensions at End of Beam
ΔΔ Epoxy Coated Bars

Design For 20° Skew (R.A.)
376'-0" x 60'-0" Prestressed Concrete Beam Bridge
81'-0" End Spans 2 - 107'-0" Interior Spans
BTC105 Beam Details
STA. 1301+29.00 (EB US 30) Turn-In Date: August, 2025
Story County
IOWA DEPARTMENT OF TRANSPORTATION
Design No. 126 Design Sheet No. 24 of 34 FHWA No. 048731

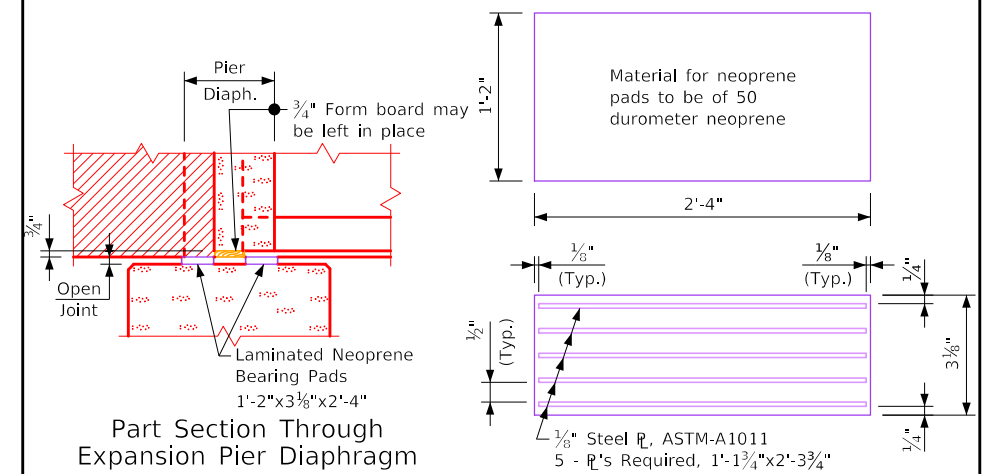


Plain Neoprene Pad

Note:

Cost of neoprene pads shall be included in the price bid for "Pretensioned Prestressed Concrete Beams".

Fixed Pier 2

Part Section Through
Expansion Pier Diaphragm

Laminated Neoprene Pad

Note:

Cost of neoprene pads shall be included in the price bid for "Pretensioned Prestressed Concrete Beams".

Expansion Piers 1 & 3

Design For 20° Skew (R.A.)

376'-0" x 60'-0" Pretensioned
Prestressed Concrete Beam Bridge

81'-0" End Spans

2 - 107'-0" Interior Spans

Bearing Details

STA. 1301+29.00 (EB US 30)

Turn-in Date: August, 2025

Story County

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Design No. 126

Design Sheet No. 25 of 34

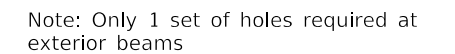
FHWA No. 048731



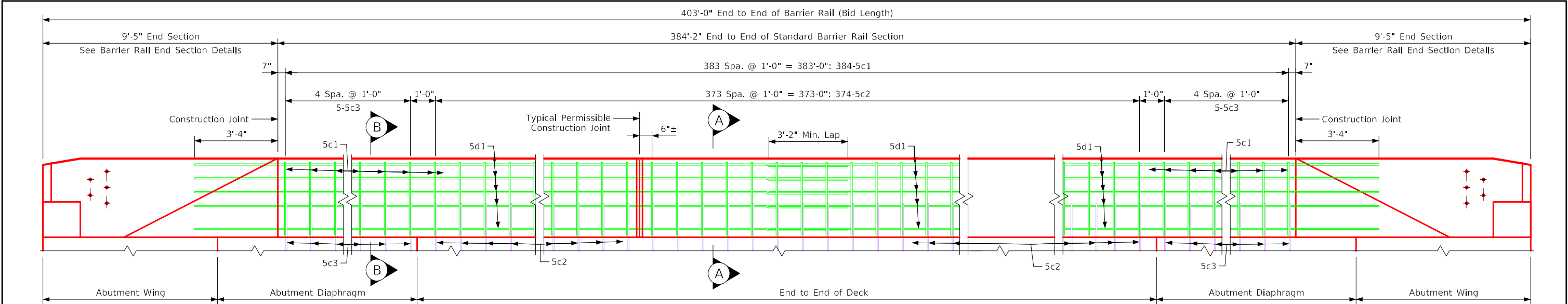
[illegible]

NOTE: Structural Steel weight
is included on the Summary
Quantities Sheet.

All bolts are to be tightened prior to placing bridge deck concrete.



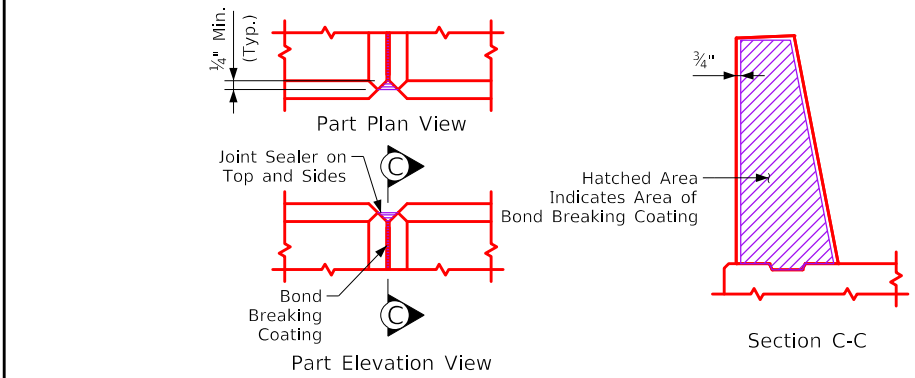
11:54:31 AM	7/16/2025	cmartin	pw:\\projectwise.dot.int.lan:P\\Main\\Documents\\Projects\\8503002019\\Bridge\\(305) Bridge Replacement-PPC\\BRG 85030305 WHKS 126 048731 Z08.dgn
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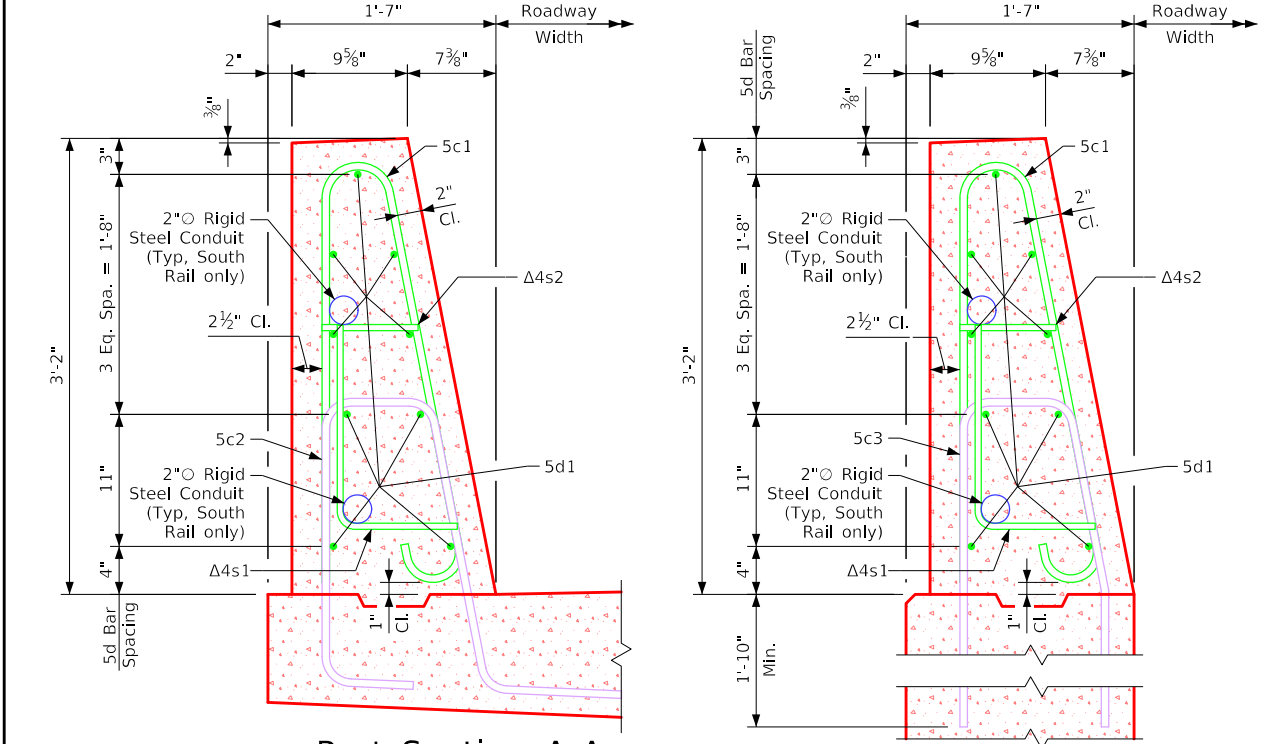
Elevation of Barrier Rail

Concrete Placement Summary		
Section		Total
Standard Section 768'-4" at 0.13 Cu. Yd. per Ft.		99.9
Total (cu. yd.)		99.9
Concrete Barrier Rail Quantities		
Item	Unit	Quantity
Concrete Barrier Railing	L.F.	806.0

Epoxy Coated Reinf. Steel - Two Rails						
Section	Bar	Location	Shape	No.	Length	Weight
Standard Sections	5c1	Rail, Vertical		768	6'-8"	5,340
	5d1	Rail, Longitudinal		198	38'-5"	7,934
Epoxy Reinf. Total Weight (lbs.)						13,274
Stainless Steel Reinf. Steel - Two Rails						
Section	Bar	Location	Shape	No.	Length	Weight
Standard Sections	5c2	Rail, Vertical		748	7'-8"	5,981
	5c3	Rail, Vertical		20	7'-5"	155
Stainless Steel Reinf. Total Weight (lbs.)						6,136



Barrier Rail Joint Details



Part Section A-A

Part Section B-B

Barrier Rail Notes:

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

The permissible construction joints are to be placed between vertical bars at a minimum spacing of 20 feet. Construction joint contact surfaces are to be coated with an approved bond breaker.

Cost of the joint sealer and bond breaker shall be considered incidental to other construction.

All barrier rail reinforcing steel is to be either epoxy coated or stainless steel as shown. The stainless steel reinforcing steel shall be deformed bar grade 60 meeting the requirements of Construction and Materials I.M. 452.

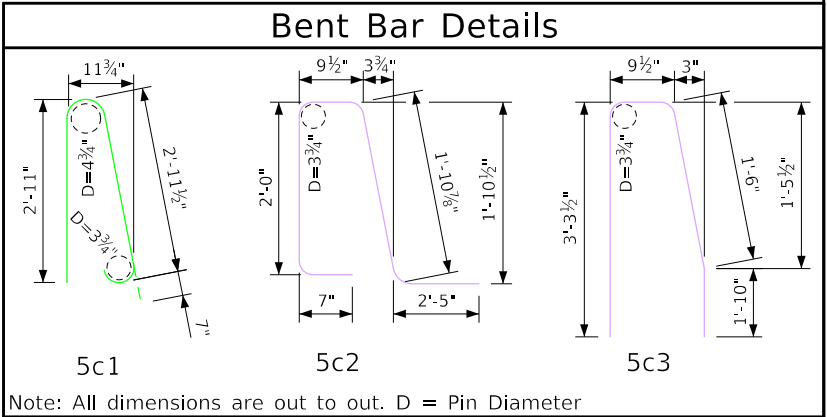
The concrete barrier rail is to be bid on a lineal foot basis. The number of linear feet of barrier rail installed will be paid for at the contract price per lineal foot based on plan quantities. Price bid for concrete barrier railing shall be full compensation for furnishing all material, excluding reinforcing steel, and all of the equipment and labor required to erect the rail in accordance with these plans and current specifications. The rigid steel conduit, junction boxes and fittings including labor and any additional work to do the installation is considered incidental to the cost of the railing.

The joint sealer shall be light gray nonsag latex caulking sealer marketed for outdoor use. No testing or certification is required.

Top of the barrier rail is to be parallel to the theoretical $\bar{C}$ grade.

All exposed corners on the top of the barrier and all other corners 90° or sharper to be filleted with a $\frac{3}{4}$ " dressed and beveled strip.

Cross sectional area of the Standard Sections of the barrier rail = 3.50 square feet.



Note: Reinforcing steel quantities are included on the Summary Quantities Sheet.

Design For 20° Skew (R.A.)

376'-0" x 60'-0" Prestensioned

Prestressed Concrete Beam Bridge

81'-0" End Spans 2 - 107'-0" Interior Spans

Barrier Rail Details

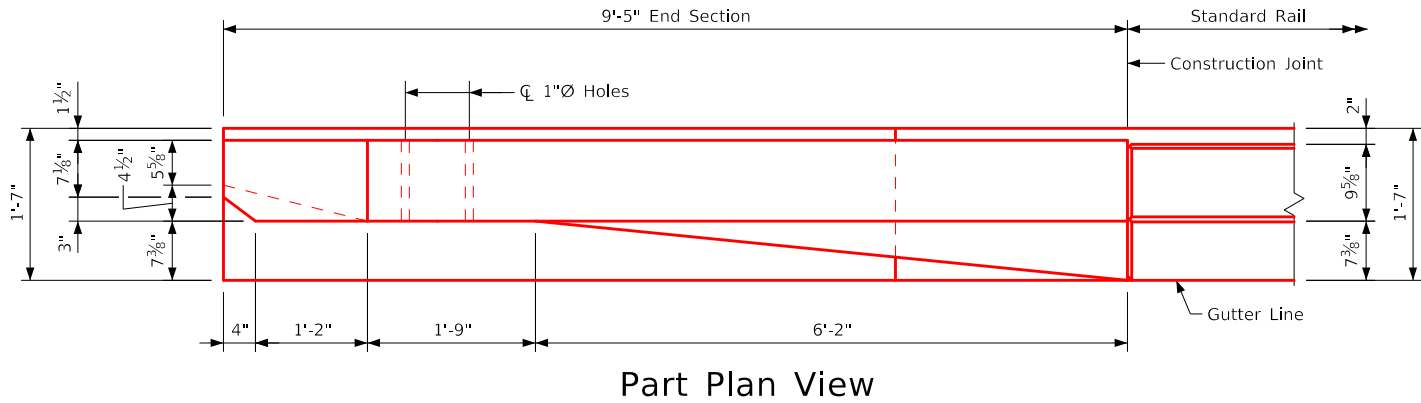
STA. 1301+29.00 (EB US 30) Turn-In Date: August, 2025

Story County

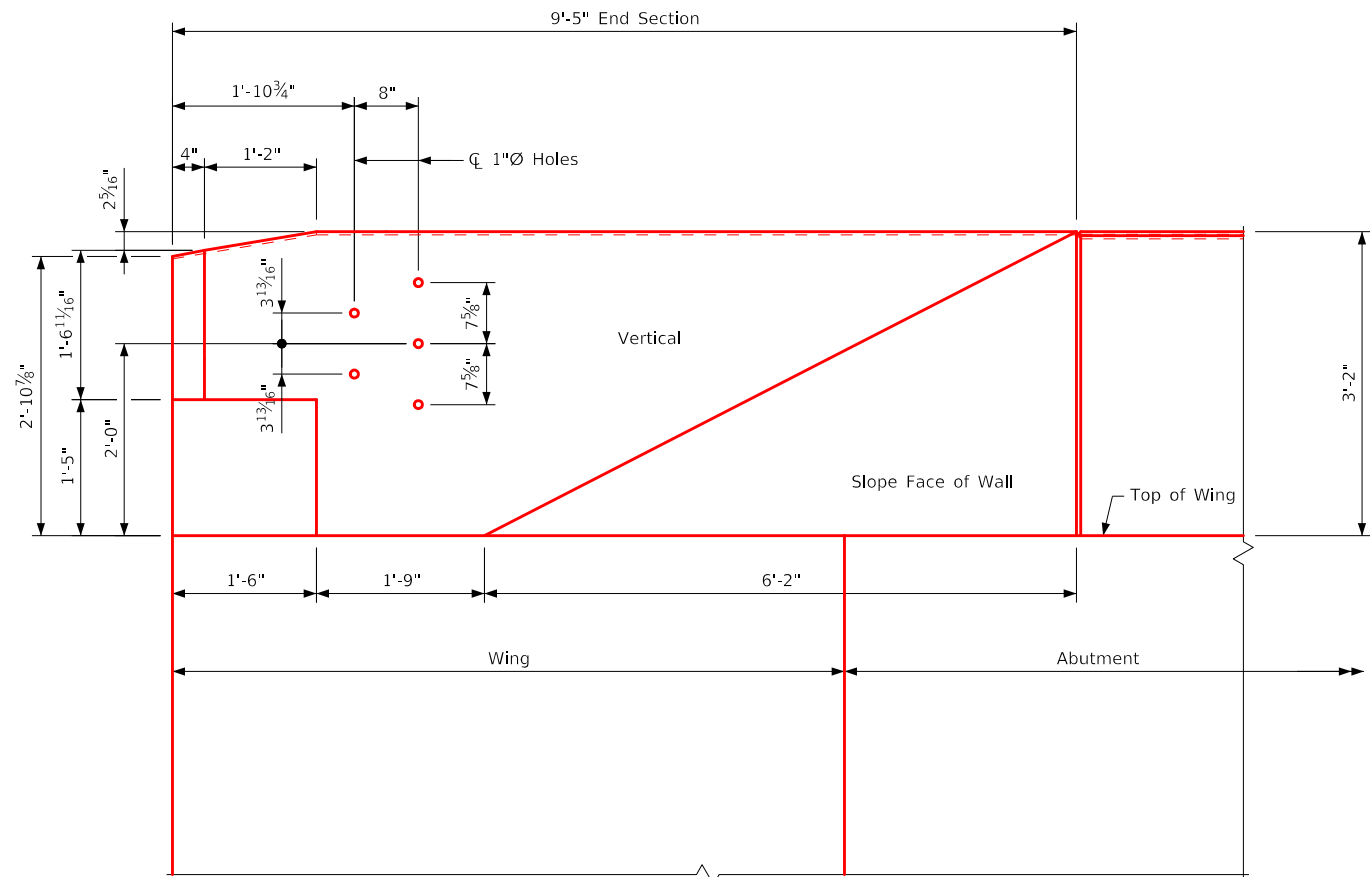
IOWA DEPARTMENT OF TRANSPORTATION

Design No. 126 Design Sheet No. 27 of 34 FHWA No. 048731

Issued 04-14, Added Stainless Steel Reinforcing Bar List and Changed 6c3, 6c4 & 5c5-10 Bars to Stainless Steel.
DeckRailBridges.dgn - 10175-1 - This Sheet Re-Issued 05-2024. Sheet Format Update Number was Originally 10175).

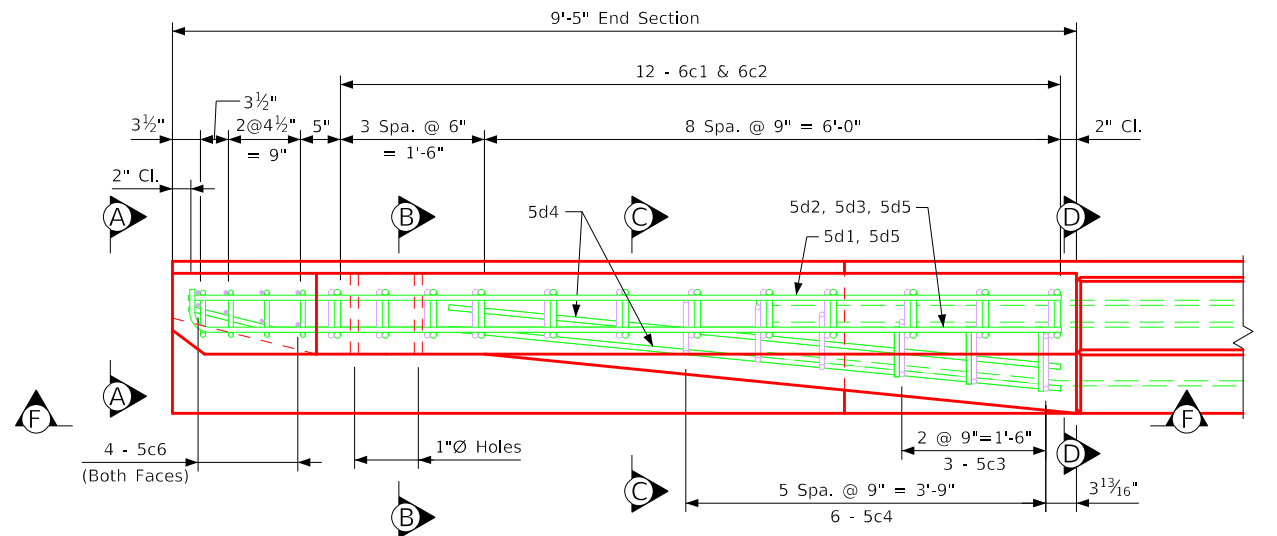


Part Plan View

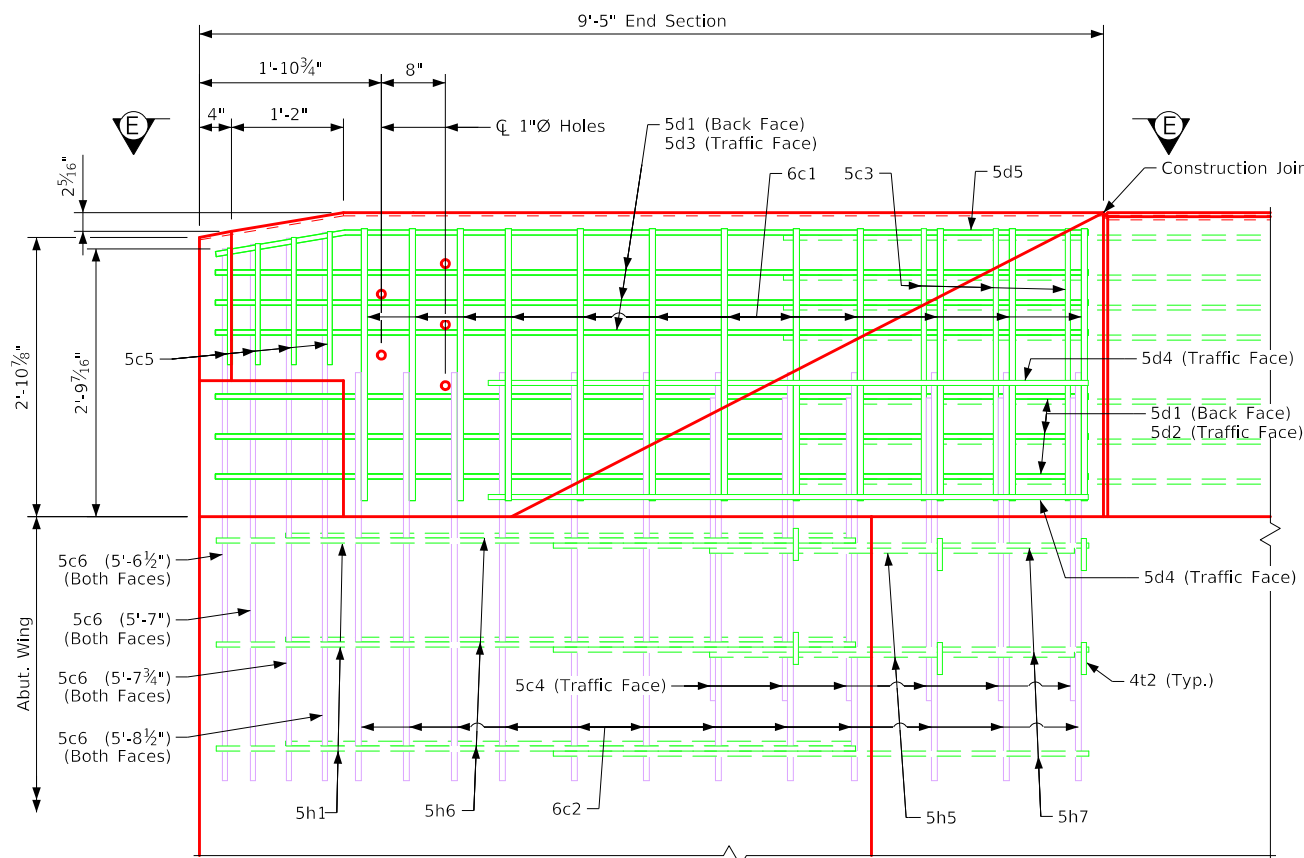


Part Elevation View

Provide 5 holes formed with 1"Ø plastic conduit.
Cost to be included in price of bid for Concrete Barrier Railing.



Part View E-E



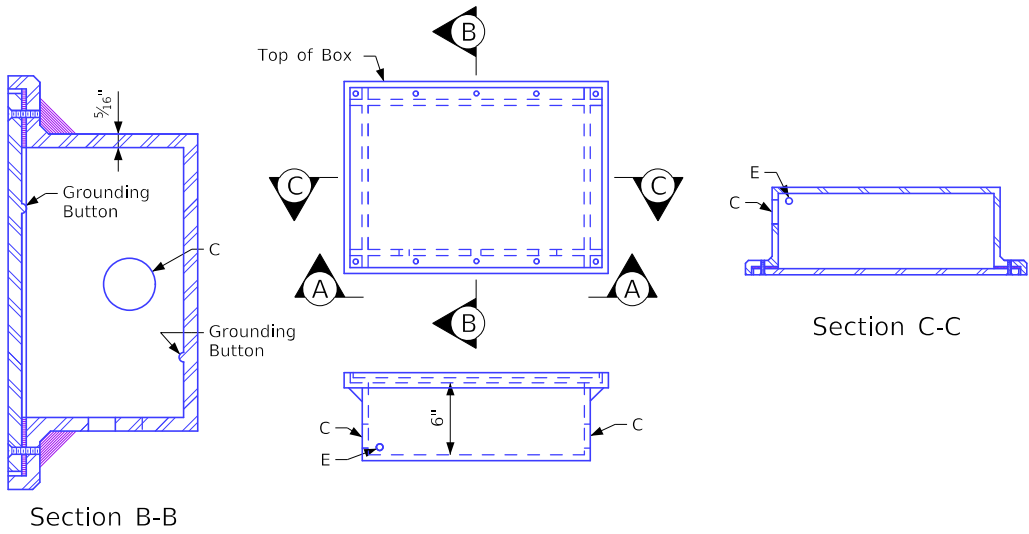
Part View F-F

Notes: 4t2 placement - 3 bars each at top two rows of 5h1/d bars in abutment wing and abutment wing extension.
Construction joint between top of abutment wing and abutment wing extension with barrier rail is roughened concrete.
The 6c2, 5c4, 5c6, and 4t2 bars are to be placed with the abutment wing and abutment wing extension. The details for placement are shown on the Abutment Wing Sheet and Abutment Wing Extension Sheet.
Dashed lines below the top of wing are the abutment wing reinforcing steel. See Abutment Wing Sheet and Abutment Wing Extension Sheet for placement.
For Bar List, Bent Bar Details, View A-A, Sections B-B, C-C, and D-D see Design Sheet No. 29.

Design For 20° Skew (R.A.)		
376'-0" x 60'-0" Prestressed Concrete Beam Bridge		
81'-0" End Spans	2 - 107'-0" Interior Spans	
Barrier Rail End Section		
STA. 1301+29.00 (EB US 30)		Turn-In Date: August, 2025
Story County		
IOWA DEPARTMENT OF TRANSPORTATION		
Design No. 126	Design Sheet No. 28 of 34	FHWA No. 048731

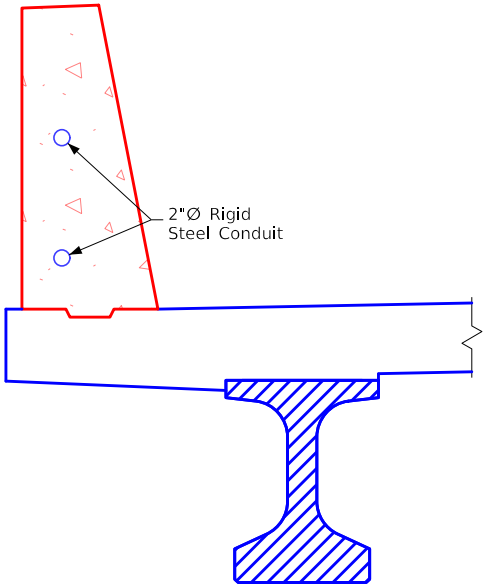
Bossed For	Hole	For Conduit Size
5 Threads	C	2" Ø Rigid Steel
None	E	½" Ø Rigid Steel

Note: The grounding buttons are to be blind drilled and tapped for ⅜"Ø x 0'-0¾" bolts.



View A-A
LI-104 Junction Box
Watertight, Cast Iron - Flush Mount

Note: For location of conduits, see lighting layout details in these plans.



Typical Section thru Outside Rail

Conduit Notes:
See LI-104 Standard Road Plan for additional information on junction boxes.
Construction shall conform to the current Iowa D.O.T. Standard and Supplemental Specifications and Special Provisions.
Conduit installation shall be in accordance with Article 2523.03, N, of the Standard Specifications.
All "C" entrance holes in junction boxes shall be drilled and tapped for the specified conduit size. All other holes shall have a concrete - tight slip fit. Conduit ends shall not protrude into junction box more than ¼". Drain pipe end shall be flush with inside surface of box. Grounding buttons shall be located approximately 3" from the inside surface of the box wall, and not closer than 3" to the edge of any hole in the box floor. Holes for drain pipe shall be placed in the low corner of the box, with a minimum clearance of 1" between the edge of the hole and the inside surface of the box wall. Typical details are shown on this sheet.
The rigid steel conduit, junction boxes and fittings including labor and any additional work to do the installation is considered incidental to the cost of the railing.
All reinforcing steel is to be epoxy coated and grade 60.
Stainless-steel reinforcement shall not be allowed to be in contact with the uncoated reinforcement, bare metal forming hardware, or to galvanized attachments or galvanized conduit.

Design For 20° Skew (R.A.)

376'-0" x 60'-0" Prestensioned
Prestressed Concrete Beam Bridge

81'-0" End Spans2 - 107'-0" Interior Spans

Conduit Details

STA. 1301+29.00 (EB US 30)Turn-In Date: August, 2025

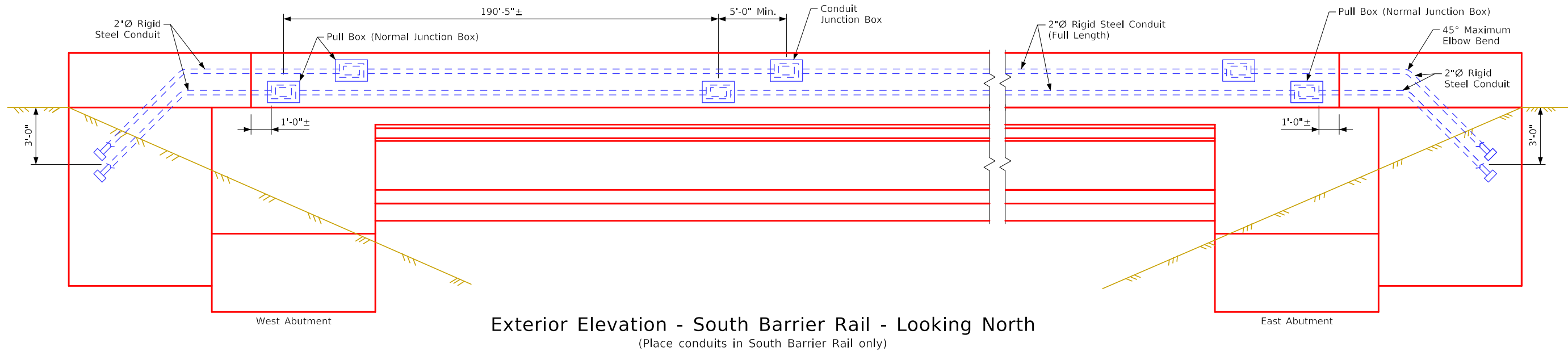
Story County

IOWA DEPARTMENT OF TRANSPORTATION

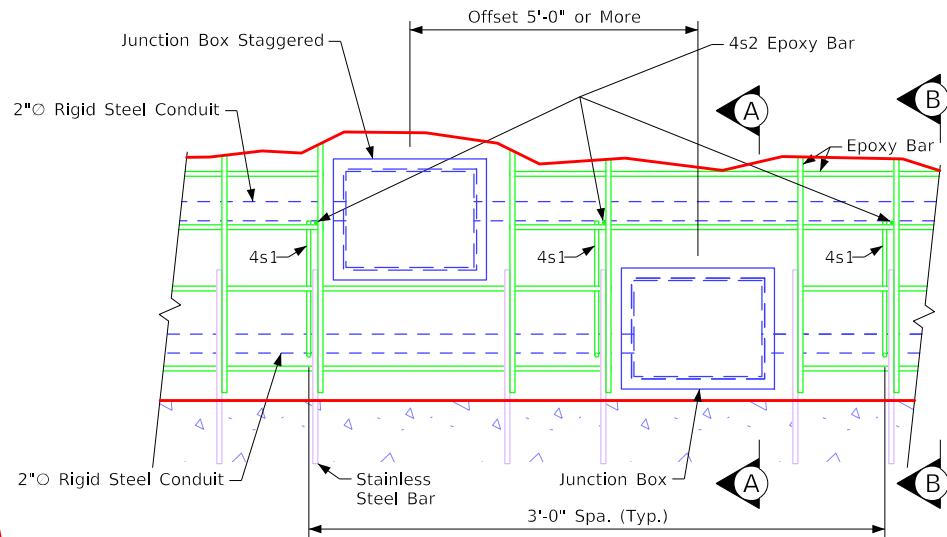
Design No. 126Design Sheet No. 30 of 34FHWA No. 048731

Revised 09-16: Added Standard Specifications 4185.02.B,2 in Lighting Notes. Changed Bar Mark from "x" to "p".
Redrawn 09-08-88.
DeckRailBridges.dgn - 1030As1 -This Sheet Re-Issued 05-2024. Sheet Format Update.

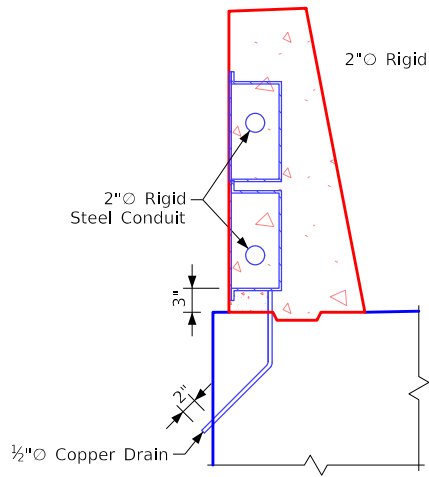
Revised 09-16: Added Conduit Support Rail Detail to Keep Conduit Isolated from the Stainless Steel Reinforcing.
Issued 09-03.
DeckRailBridges.dgn - 1030As2 -This Sheet Re-Issued 05-2024. Sheet Format Update.



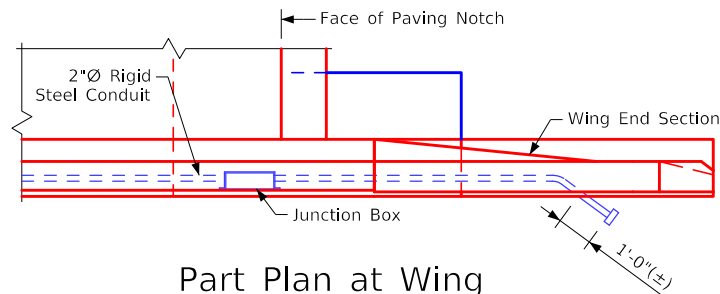
Exterior Elevation - South Barrier Rail - Looking North
(Place conduits in South Barrier Rail only)



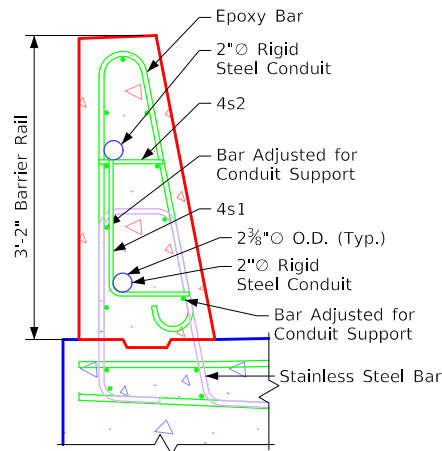
Conduit Support - Rail Elev. Detail
Two Junction Box Detail - Adjust reinforcing to clear junction box.



Section A-A
Thru Junction Box



Part Plan at Wing



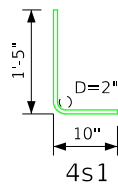
Section B-B - Conduit Support

Only used in rail with conduit, use 3'-0" spacing. Galvanized conduit shall not come into contact with the stainless steel reinforcing.

Epoxy Coated Reinf. Steel - One Rail

Bar	Location	Shape	No.	Length	Weight
4s1	Rail Conduit		133	2'-3"	200
4s2	Rail Conduit		133	0'-8"	60
Epoxy Reinforcing Total Weight (lbs.)					260

Bent Bar Details

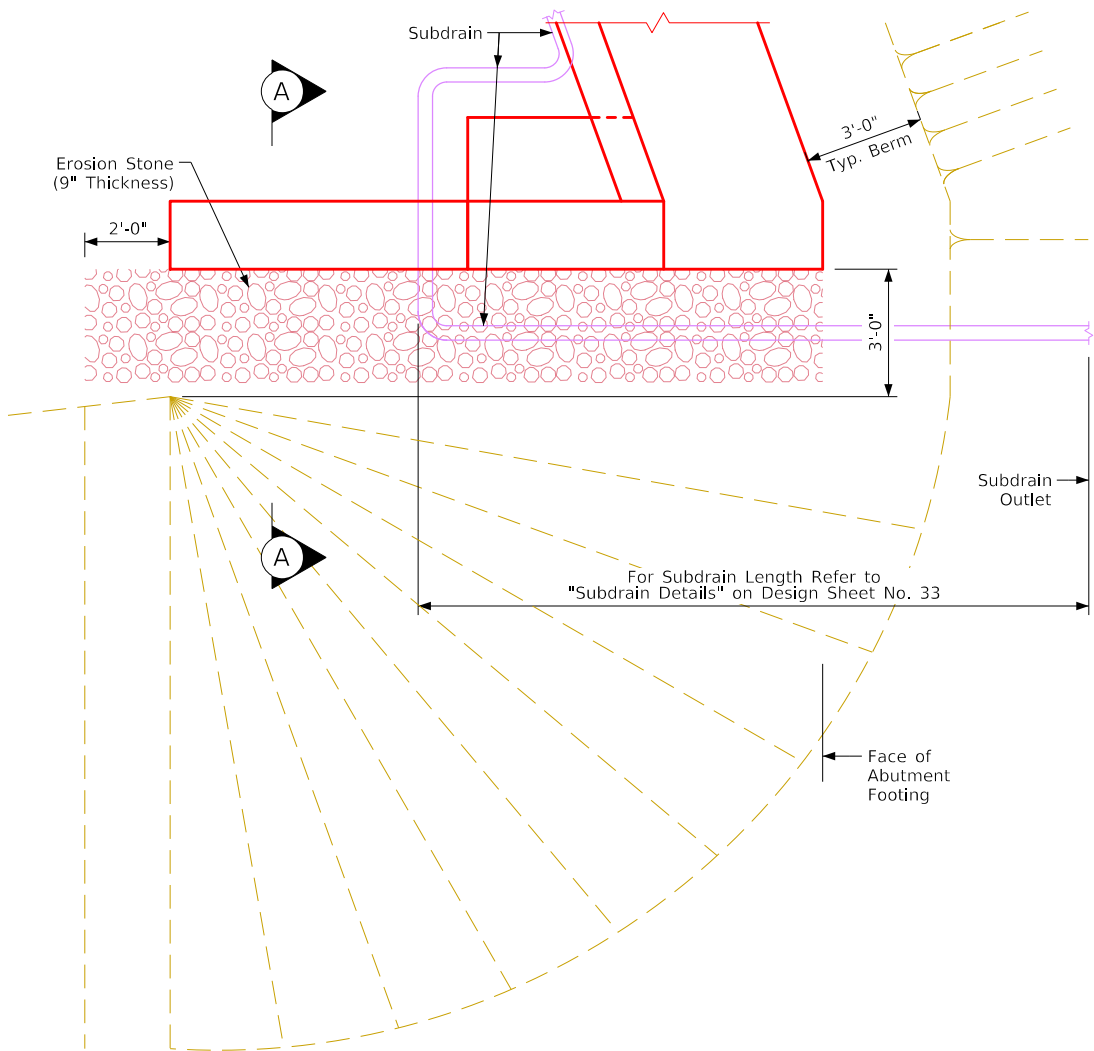


Note: All Dimensions are out to out. D = Pin Diameter

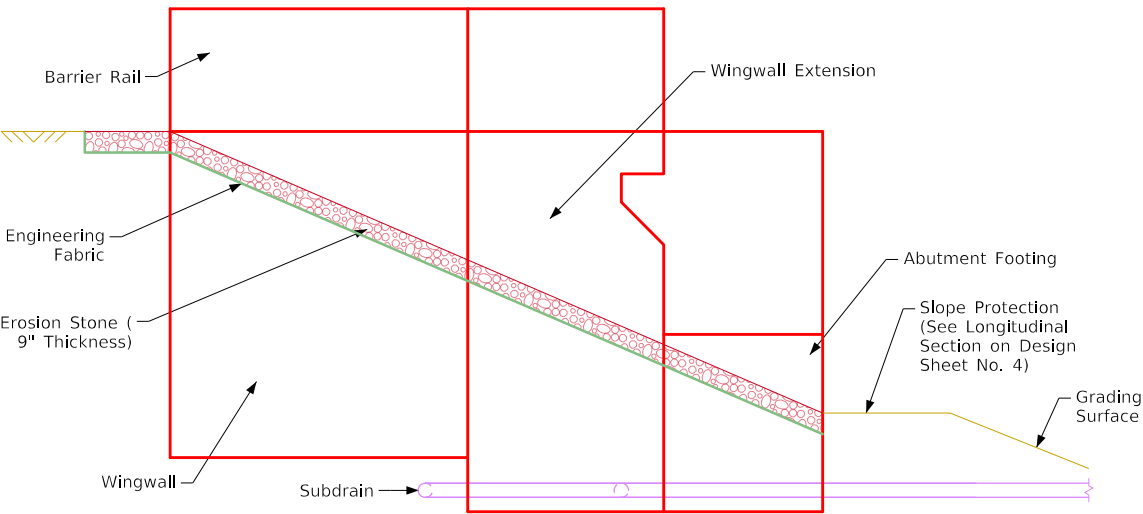
Note: Reinforcing steel quantities are included on the Summary Quantities Sheet.

Design For 20° Skew (R.A.)
376'-0" x 60'-0" Prestressed Concrete Beam Bridge
81'-0" End Spans 2 - 107'-0" Interior Spans
Conduit Details
STA. 1301+29.00 (EB US 30) Turn-In Date: August, 2025
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IOWA DEPARTMENT OF TRANSPORTATION
Design No. 126 Design Sheet No. 31 of 34 FHWA No. 048731

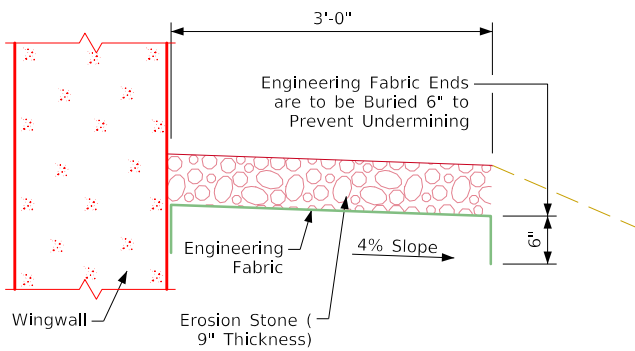
Revised 06-14 - Added 2 Feet of Length of Erosion Stone in Front of the Bridge Wing.
Revised 09-2023; Changed direction of Section Director Arrows "A-A" to match what section view "Section A-A" is showing.
ForeSlopeProtectionBridges.dgn - 1005A - This Sheet Issued 06-02.
ForeSlopeProtectionBridges.dgn - 1005A - This Sheet Issued 07-23.



Top View of Wing Armoring



Profile View of Wing Armoring



Section A-A

General Notes:

Erosion stone shall be placed along the sides of the wings and abutment footing as shown in Section A-A. This is typical at each corner of the bridge. The erosion stone at these locations shall be underlayed with engineering fabric in accordance with Article 4196.01, B, 3, of the Standard Specifications.

The erosion stone shall be in accordance with Section 4130, of the Standard Specifications. Material passing the 3 inch screen but 100% retained on a 1 inch screen may be used as choke stone.

The erosion stone shall be deposited, spread, consolidated and shaped by mechanical or hand methods that will provide uniform 9 inch depth and density and provide uniform surface appearance.

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

Design For 20° Skew (R.A.)		
376'-0" x 60'-0" Prestressed Concrete Beam Bridge		
81'-0" End Spans	2 - 107'-0" Interior Spans	
Bridge Wing Armoring		
STA. 1301+29.00 (EB US 30)		Turn-In Date: August, 2025
Story County		
IOWA DEPARTMENT OF TRANSPORTATION		
Design No. 126	Design Sheet No. 32 of 34	FHWA No. 048731

Control Point #100: N. 7639937.050, E. 18534748.551, Elev. 878.893 CP FD NGS MON 48' South of US 30 EB CL, 670' West of Dayton Ave. CL

Subdrain Notes:

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

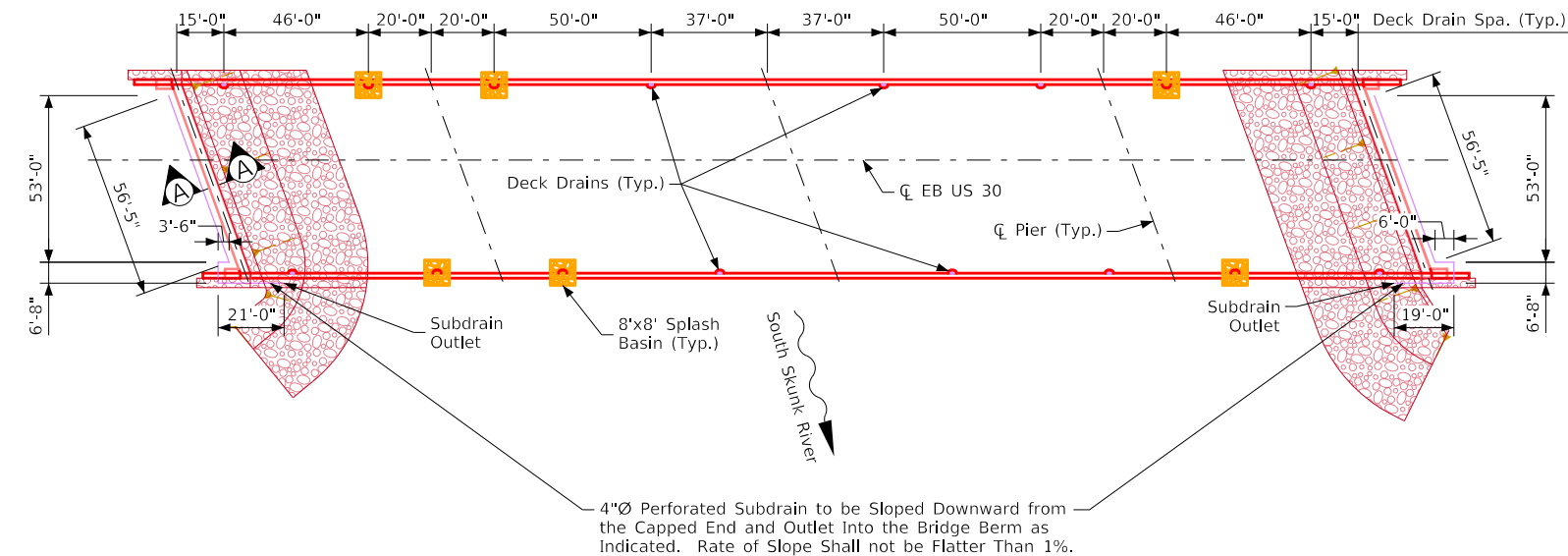
The subdrains shall be 4"Ø and shall be in accordance with Article 4143.01, B, of the Standard Specifications.

The subdrain outlet shall consist of a length of pipe with a removable rodent guard as detailed on this sheet. The length of the outlet pipe shall be determined by the revetment and it's placement location. The Contractor is to insure the outlet pipe is adequately strong enough and will not be damaged when revetment is placed. A check will be made at the subdrain outlet to insure that the subdrain is not damaged and is draining properly during the backfill flooding process. If a metal outlet pipe is used, it shall be 6"Ø and coupled to the 4"Ø subdrain in one of the two following ways.

- Use an inside fit reducer coupler (coupler must be inserted a minimum of 1'-0" into the metal outlet pipe).
- Insert 1'-0" of the 4"Ø subdrain into the 6"Ø metal outlet pipe, then fully seal the entire opening with grout.

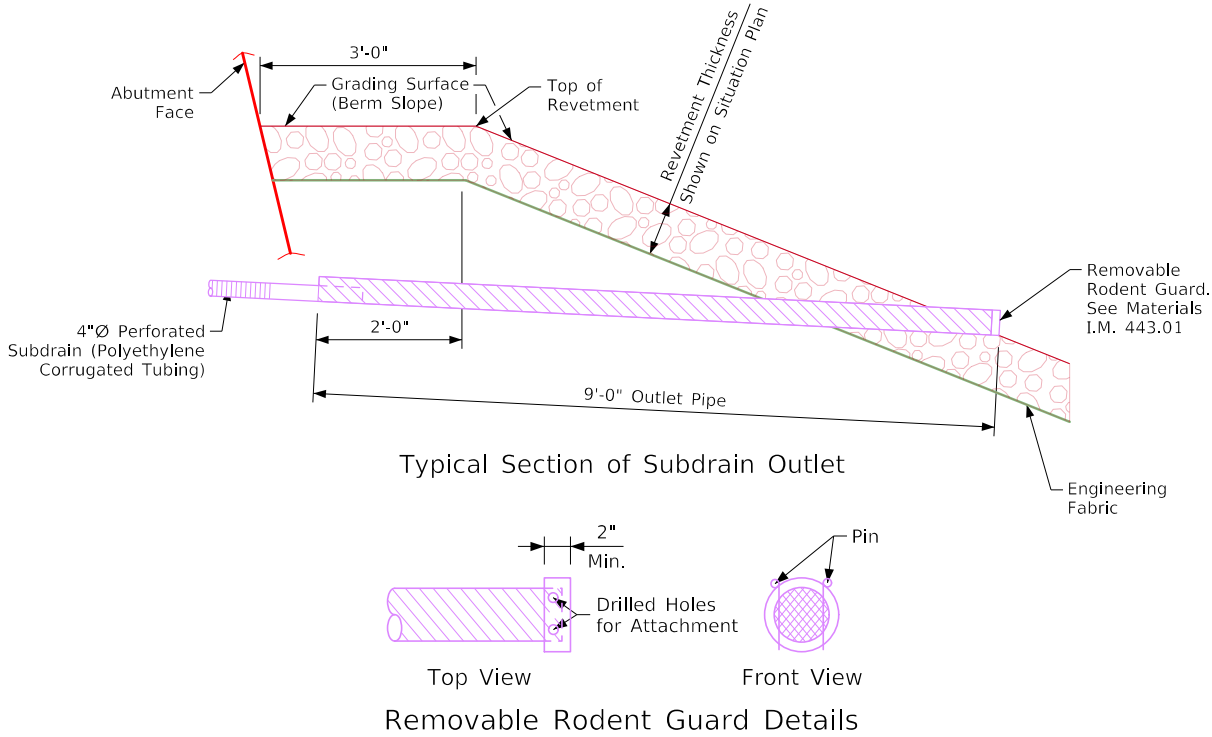
The cost of furnishing and placing subdrain (including excavation), granular backfill, porous backfill, and subdrain outlet is to be included in the price bid for "Structural Concrete (Bridge)". No extra payment will be made.

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



Situation Plan
Showing Deck Drain and Subdrain Locations

Note: See Design Sheet No. 34 for Section A-A.



Revetment Stone (Embedded) Outlet Details

Subdrain Outlet Elevations	
Location	Elevation
West Abutment	881.8
East Abutment	881.2

Design For 20° Skew (R.A.)

376'-0" x 60'-0" Prestensioned
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81'-0" End Spans 2 - 107'-0" Interior Spans

Subdrain Details

STA. 1301+29.00 (EB US 30) Turn-In Date: August, 2025

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Design No. 126 Design Sheet No. 33 of 34 FHWA No. 048731

Note:
For Details not Shown on this Sheet which are
Pertinent to this Structure See Subdrain Details
Sheet on Design Sheet No. 33.

Design For 20° Skew (R.A.)

376'-0" x 60'-0" Pretensioned
Prestressed Concrete Beam Bridge

81'-0" End Spans 2 - 107'-0" Interior Spans

Abutment Backfill Details

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