

August 27, 2024

ADDENDUM NO. 1

**RE: Item #3, September 4, 2024 Letting - IM 0902(18)101, PCN 035F, Pennington County -
Replace Structure ((2) 394.5' Prestressed Girder Bridges), Approach Grading, Asphalt
Surfacing**

TO WHOM IT MAY CONCERN:

The following addenda to the plans shall be inserted and made a part of your proposal for the referenced project.

SPECIAL PROVISIONS: NO CHANGE

SDEBS BID PROPOSAL: *The electronic bid proposal for this contract has been revised to include the changes associated with this addendum. Bidders must log in to the SDEBS to retrieve and incorporate these changes into their bid.*

Bid Items were added:

Bid Item 480E0511 "No. 11 Rebar Splice"

PLANS: Please destroy sheets A2, E2, E3, E4, E14, E33, E34, and E44 and replace with the enclosed sheets, dated 8/14/24, 8/22/24, and 8/26/24.

Sheets A2, E2, E4 & E34: Bid Item 480E0511 "No. 11 Rebar Splice" was added.

Sheets E3 & E33: LAYOUT was revised to show the Temporary Retaining Structures.

Sheets E14 & E44: ESTIMATED QUANTITIES was revised. Bid Item "No. 11 Rebar Splice" was added.

Sincerely,

Sam Weisgram
Engineering Supervisor

SW/cj

CC: Todd Seaman, Rapid City Region Engineer
Mike Carlson, Rapid City Area Engineer

ESTIMATE OF QUANTITIES AND ENVIRONMENTAL COMMITMENTS

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0902(18)101	A2	A6

Plotting Date: 08/26/2024 Rev 08/26/24 RU

Section E – Structure

Section D - Erosion and Sediment Control

Str. No. 52-831-309

Str. No. 52-831-310

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
110E1690	Remove Sediment	4.1	CuYd
110E1695	Remove Sediment Filter Bag	128	Ft
110E1700	Remove Silt Fence	477	Ft
230E0010	Placing Topsoil	2,143	CuYd
730E0100	Cover Crop Seeding	3.0	Bu
730E0210	Type F Permanent Seed Mixture	104	Lb
731E0200	Fertilizing	3.00	Ton
732E0100	Mulching	12.0	Ton
734E0044	Soil Stabilizer	2.3	Acre
734E0103	Type 3 Erosion Control Blanket	11,922	SqYd
734E0154	12" Diameter Erosion Control Wattle	1,225	Ft
734E0165	Remove and Reset Erosion Control Wattle	307	Ft
734E0180	Sediment Filter Bag	128	Ft
734E0602	Low Flow Silt Fence	1,600	Ft
734E0604	High Flow Silt Fence	306	Ft
734E0610	Mucking Silt Fence	132	CuYd
734E0620	Repair Silt Fence	477	Ft
734E0845	Sediment Control at Inlet with Frame and Grate	5	Each
900E1310	Concrete Washout Facility	2	Each
900E1320	Construction Entrance	2	Each

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E3310	Bridge Elevation Survey	Lump Sum	LS
009E5000	Concrete Penetrating Sealer	1,754.0	SqYd
120E7000	Select Granular Backfill	19.6	Ton
250E0030	Incidental Work, Structure	Lump Sum	LS
410E0030	Structural Steel, Miscellaneous	Lump Sum	LS
410E2600	Membrane Sealant Expansion Joint	83.8	Ft
420E0100	Structure Excavation, Bridge	29	CuYd
430E0200	Bridge End Embankment	536	CuYd
430E0300	Granular Bridge End Backfill	119.4	CuYd
430E0510	Approach Slab Underdrain Excavation	9.5	CuYd
430E0700	Precast Concrete Headwall for Drain	2	Each
460E0030	Class A45 Concrete, Bridge Deck	605.2	CuYd
460E0050	Class A45 Concrete, Bridge	254.6	CuYd
460E0150	Concrete Approach Slab for Bridge	190.6	SqYd
460E0160	Concrete Approach Sleeper Slab for Bridge	41.9	SqYd
460E0500	Deck Drain, Girder Bridge	3	Each
465E0100	Class A45 Concrete, Drilled Shaft	263.8	CuYd
465E0200	Drilled Shaft Excavation	259.4	CuYd
465E1056	56" Permanent Casing	151.1	Ft
480E0100	Reinforcing Steel	82,392	Lb
480E0200	Epoxy Coated Reinforcing Steel	2,883	Lb
480E0300	Stainless Reinforcing Steel	125,037	Lb
480E0511	No. 11 Rebar Splice	108	Each
510E0100	Extract Pile	5	Each
510E0300	Preboring Pile	180	Ft
510E3421	HP 12x74 Steel Test Pile, Furnish and Drive	140	Ft
510E3425	HP 12x74 Steel Bearing Pile, Furnish and Drive	1,040	Ft
560E8081	81" Minnesota Shape Prestressed Concrete Beam	2,345	Ft
680E0040	4" Underdrain Pipe	131	Ft
680E2500	Porous Backfill	18.0	Ton
700E0210	Class B Riprap	1,611.0	Ton
700E1100	Overburden Excavation for Riprap	950	CuYd
831E0110	Type B Drainage Fabric	1,922	SqYd
831E1030	Perforated Geocell	560	SqFt

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E3310	Bridge Elevation Survey	Lump Sum	LS
009E5000	Concrete Penetrating Sealer	1,754.0	SqYd
120E7000	Select Granular Backfill	19.6	Ton
250E0030	Incidental Work, Structure	Lump Sum	LS
410E0030	Structural Steel, Miscellaneous	Lump Sum	LS
410E2600	Membrane Sealant Expansion Joint	83.8	Ft
420E0100	Structure Excavation, Bridge	29	CuYd
430E0200	Bridge End Embankment	537	CuYd
430E0300	Granular Bridge End Backfill	119.4	CuYd
430E0510	Approach Slab Underdrain Excavation	9.5	CuYd
430E0700	Precast Concrete Headwall for Drain	2	Each
460E0030	Class A45 Concrete, Bridge Deck	605.2	CuYd
460E0050	Class A45 Concrete, Bridge	255.1	CuYd
460E0150	Concrete Approach Slab for Bridge	190.6	SqYd
460E0160	Concrete Approach Sleeper Slab for Bridge	41.9	SqYd
460E0500	Deck Drain, Girder Bridge	3	Each
465E0100	Class A45 Concrete, Drilled Shaft	263.5	CuYd
465E0200	Drilled Shaft Excavation	259.1	CuYd
465E1056	56" Permanent Casing	151.1	Ft
480E0100	Reinforcing Steel	82,430	Lb
480E0200	Epoxy Coated Reinforcing Steel	2,883	Lb
480E0300	Stainless Reinforcing Steel	125,037	Lb
480E0511	No. 11 Rebar Splice	108	Each
510E0100	Extract Pile	5	Each
510E0300	Preboring Pile	180	Ft
510E3421	HP 12x74 Steel Test Pile, Furnish and Drive	140	Ft
510E3425	HP 12x74 Steel Bearing Pile, Furnish and Drive	1,040	Ft
560E8081	81" Minnesota Shape Prestressed Concrete Beam	2,345	Ft
680E0040	4" Underdrain Pipe	131	Ft
680E2500	Porous Backfill	18.0	Ton
700E0210	Class B Riprap	1,699.0	Ton
700E1100	Overburden Excavation for Riprap	1,028	CuYd
831E0110	Type B Drainage Fabric	2,020	SqYd
831E1030	Perforated Geocell	560	SqFt

Plot Scale - 1:200

Plotted From - TRPR17190

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SECTION E – ESTIMATE OF STRUCTURE QUANTITIES

Str. No. 52-831-309

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E3310	Bridge Elevation Survey	Lump Sum	LS
009E5000	Concrete Penetrating Sealer	1,754.0	SqYd
120E7000	Select Granular Backfill	19.6	Ton
250E0030	Incidental Work, Structure	Lump Sum	LS
410E0030	Structural Steel, Miscellaneous	Lump Sum	LS
410E2600	Membrane Sealant Expansion Joint	83.8	Ft
420E0100	Structure Excavation, Bridge	29	CuYd
430E0200	Bridge End Embankment	536	CuYd
430E0300	Granular Bridge End Backfill	119.4	CuYd
430E0510	Approach Slab Underdrain Excavation	9.5	CuYd
430E0700	Precast Concrete Headwall for Drain	2	Each
460E0030	Class A45 Concrete, Bridge Deck	605.2	CuYd
460E0050	Class A45 Concrete, Bridge	254.6	CuYd
460E0150	Concrete Approach Slab for Bridge	190.6	SqYd
460E0160	Concrete Approach Sleeper Slab for Bridge	41.9	SqYd
460E0500	Deck Drain, Girder Bridge	3	Each
465E0100	Class A45 Concrete, Drilled Shaft	263.8	CuYd
465E0200	Drilled Shaft Excavation	259.4	CuYd
465E1056	56" Permanent Casing	151.1	Ft
480E0100	Reinforcing Steel	82,392	Lb
480E0200	Epoxy Coated Reinforcing Steel	2,883	Lb
480E0300	Stainless Reinforcing Steel	125,037	Lb
480E0511	No. 11 Rebar Splice	108	Each
510E0100	Extract Pile	5	Each
510E0300	Preboring Pile	180	Ft
510E3421	HP 12x74 Steel Test Pile, Furnish and Drive	140	Ft
510E3425	HP 12x74 Steel Bearing Pile, Furnish and Drive	1,040	Ft
560E8081	81" Minnesota Shape Prestressed Concrete Beam	2,345	Ft
680E0040	4" Underdrain Pipe	131	Ft
680E2500	Porous Backfill	18.0	Ton
700E0210	Class B Riprap	1,611.0	Ton
700E1100	Overburden Excavation for Riprap	950	CuYd
831E0110	Type B Drainage Fabric	1,922	SqYd
831E1030	Perforated Geocell	560	SqFt

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BID ITEM NUMBER	ITEM	QUANTITY	UNIT
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430E0300	Granular Bridge End Backfill	119.4	CuYd
430E0510	Approach Slab Underdrain Excavation	9.5	CuYd
430E0700	Precast Concrete Headwall for Drain	2	Each
460E0030	Class A45 Concrete, Bridge Deck	605.2	CuYd
460E0050	Class A45 Concrete, Bridge	255.1	CuYd
460E0150	Concrete Approach Slab for Bridge	190.6	SqYd
460E0160	Concrete Approach Sleeper Slab for Bridge	41.9	SqYd
460E0500	Deck Drain, Girder Bridge	3	Each
465E0100	Class A45 Concrete, Drilled Shaft	263.5	CuYd
465E0200	Drilled Shaft Excavation	259.1	CuYd
465E1056	56" Permanent Casing	151.1	Ft
480E0100	Reinforcing Steel	82,430	Lb
480E0200	Epoxy Coated Reinforcing Steel	2,883	Lb
480E0300	Stainless Reinforcing Steel	125,037	Lb
480E0511	No. 11 Rebar Splice	108	Each
510E0100	Extract Pile	5	Each
510E0300	Preboring Pile	180	Ft
510E3421	HP 12x74 Steel Test Pile, Furnish and Drive	140	Ft
510E3425	HP 12x74 Steel Bearing Pile, Furnish and Drive	1,040	Ft
560E8081	81" Minnesota Shape Prestressed Concrete Beam	2,345	Ft
680E0040	4" Underdrain Pipe	131	Ft
680E2500	Porous Backfill	18.0	Ton
700E0210	Class B Riprap	1,699.0	Ton
700E1100	Overburden Excavation for Riprap	1,028	CuYd
831E0110	Type B Drainage Fabric	2,020	SqYd
831E1030	Perforated Geocell	560	SqFt

Temporary Retaining Structures

Temporary retaining structures will be necessary to maintain traffic on the existing alignment adjacent to the new abutments and berms during excavation, drilled shaft construction, and placement of riprap. The following soil parameters for the existing embankment and underlying soils will be used in the design of temporary retaining structures. See the Site Plan and Subsurface Profile in Section E for boring and testing information.

Soil Parameters for Temporary Retaining Structures

	Friction Angle, ϕ	Cohesion, C	Wet Unit Weight, γ_w
Brown Silt Clay (Existing Embankment)	18 degrees	100 psf	121 pcf
Black Clay	12 degrees	50 psf	106 pcf
Brown Clay with Gravel	24 degrees	50 psf	122 pcf
Dark Gray Silt Clay (Pierre Shale)	18 degrees	1,900 psf	125 pcf

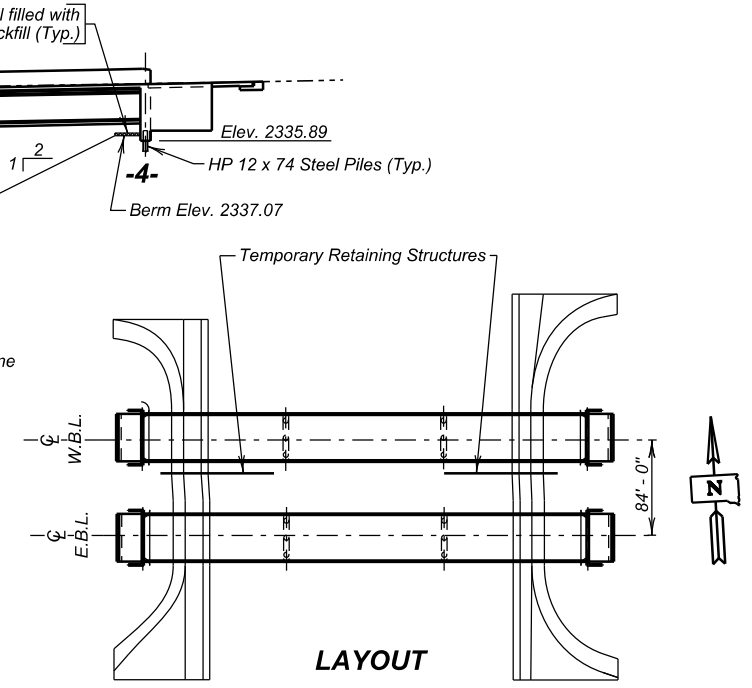
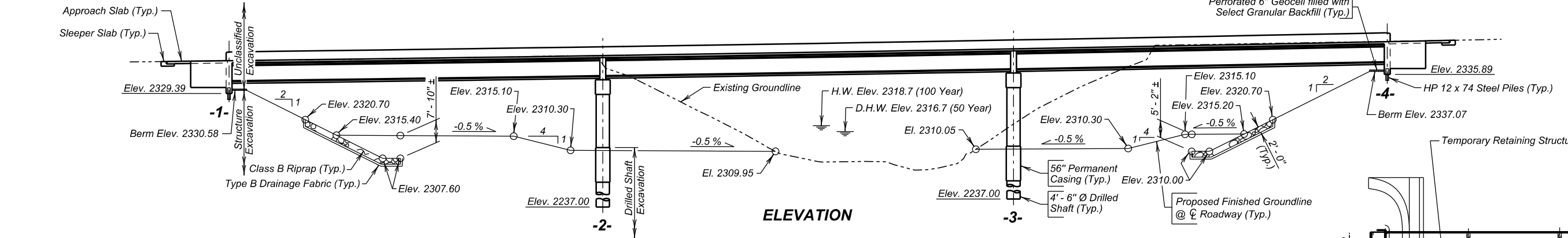
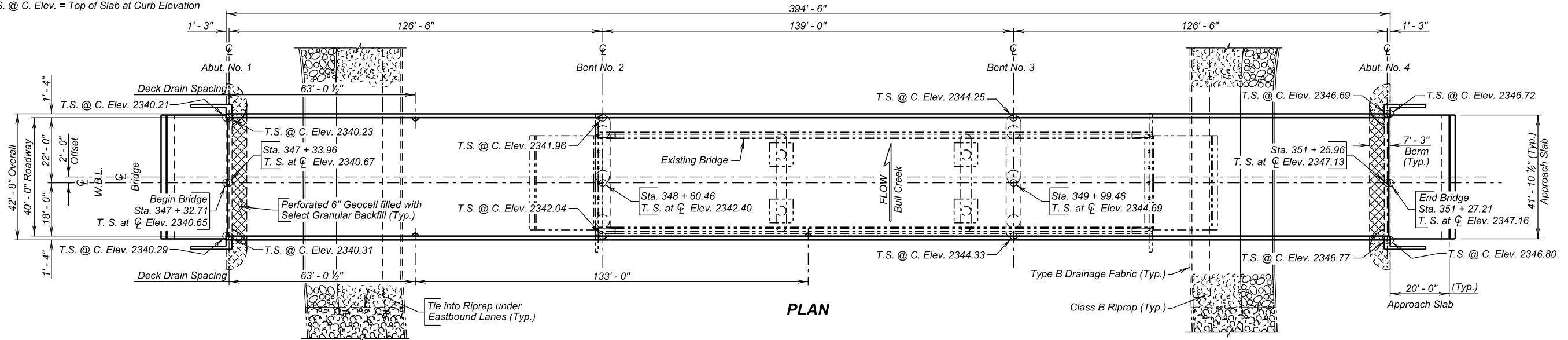
The design of the temporary retaining structure is the responsibility of the Contractor. The Contractor will submit plans and calculations sealed by a Professional Engineer registered in South Dakota. Do not begin construction of the temporary retaining structure until the plans and calculations have been accepted by the SDDOT Bridge Construction Engineer. Allow a minimum of 15 days for review. The cost for the temporary retaining structure is incidental to the contract unit bid price for Structure Excavation, Bridge.

The elevations shown in these plans are based on the National Geodetic Survey (NGS) North American Vertical Datum of 1988 (NAVD88).

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0902(18)101	E3	E62

Revised August 14, 2024 PW

NOTES:
 T.S. @ C Elev. = Top of Slab at Centerline Elevation
 T.S. @ C. Elev. = Top of Slab at Curb Elevation

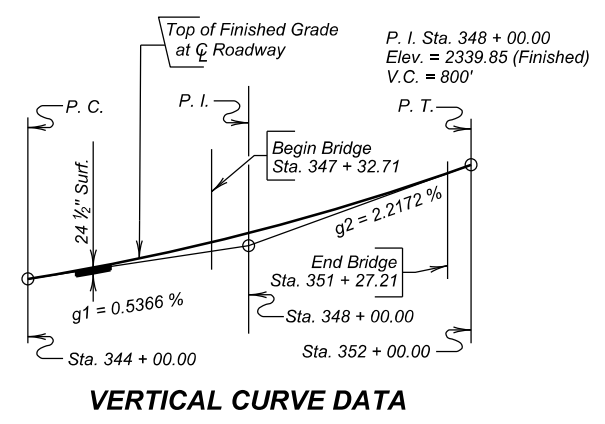


- X081- INDEX OF BRIDGE SHEETS -**
- Sheet No. 1 - General Drawing
 - Sheet No. 2 - Estimate of Structure Quantities and Notes
 - Sheet No. 3 - Notes (Continued)
 - Sheet No. 4 - Notes (Continued)
 - Sheet No. 5 - Notes (Continued)
 - Sheet No. 6 - Subsurface Investigation, Piling, & Drilled Shaft Layout
 - Sheet No. 7 - Piling Layout Details
 - Sheet No. 8 - Abutment No. 1 Details (A)
 - Sheet No. 9 - Abutment No. 1 Details (B)
 - Sheet No. 10 - Abutment No. 4 Details (A)
 - Sheet No. 11 - Abutment No. 4 Details (B)
 - Sheet No. 12 - Bent Details
 - Sheet No. 13 - Superstructure Details (A)
 - Sheet No. 14 - Superstructure Details (B)
 - Sheet No. 15 - Endblock, Barrier Curb, and Deck Drain Details
 - Sheet No. 16 - 126' - 3" Girder Details
 - Sheet No. 17 - 138' - 3" Girder Details
 - Sheet No. 18 - Erection Data
 - Sheet No. 19 - Slab Form Elevations
 - Sheet No. 20 - Diaphragm Details
 - Sheet No. 21 - Details of Bridge End Backfill Adjacent to Bridge (A)
 - Sheet No. 22 - Details of Bridge End Backfill Adjacent to Bridge (B)
 - Sheet No. 23 - Details of Approach Slab Adjacent to Bridge
 - Sheet No. 24 - Approach Slab Joint Details
 - Sheet No. 25 - Riprap Details
 - Sheet No. 26 - As - Built Elevation Survey (A)
 - Sheet No. 27 - As - Built Elevation Survey (B)
 - Sheet No. 28 - Details of Standard Plate No's. 430.50 and 460.02
 - Sheet No. 29 - Details of Standard Plate No's. 460.05 and 510.40
 - Sheet No. 30 - Details of Standard Plate No's. 620.19 and 630.92

HYDRAULIC DATA

Q_d	8811 cfs
A_d	1025 sq. ft.
V_d	8.6 fps
Q_F	8811 cfs
Q_{100}	13476 cfs
Q_{OT}	$>Q_{500}$ cfs
V_{max}	9.0 fps

Q_d = Design discharge for the proposed bridge based on 50 year frequency. El. 2316.7.
 Q_{OT} = Overtopping discharge and frequency $>Q_{500}$ year recurrence interval. El. 2338.4 @ Sta. 342 + 24.00 ±
 Q_F = Designated peak discharge for the basin approaching proposed project based on 50 year frequency.
 Q_{100} = Computed discharge for the basin approaching proposed project based on 100 year frequency. El. 2318.7.
 V_{max} = Maximum computed outlet velocity for the proposed bridge, based on 100 year frequency.



GENERAL DRAWING FOR (WESTBOUND LANES)

394' - 6" PRESTRESSED GIRDER BRIDGE
 40' - 0" ROADWAY
 OVER BULL CREEK
 STA. 347 + 32.71 TO 351 + 27.21
 STR. NO. 52-831-309
 PCN 035F

0° SKEW
 SEC. 1-T1N-R14E
 IM 0902(18)101
 HL-93

PENNINGTON COUNTY
 S. D. DEPT. OF TRANSPORTATION
 AUGUST 2022

DESIGNED BY CL PENNO35F	CK. DES. BY SK 035FTA01	DRAFTED BY BT	BRIDGE ENGINEER <i>Steve A. Johnson</i>
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PLANS BY:
 OFFICE OF BRIDGE DESIGN, SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION

ESTIMATE OF STRUCTURE QUANTITIES

Description	Quantity	Unit	Remarks
Bridge Elevation Survey	Lump Sum	LS	
Concrete Penetrating Sealer	1754	Sq. Yd.	See Special Provision
Select Granular Backfill	19.6	Ton	
Incidental Work, Structure	Lump Sum	LS	
Structural Steel, Miscellaneous	Lump Sum	LS	
Membrane Sealant Expansion Joint	83.8	Ft.	
Structural Excavation, Bridge	29	Cu.Yd.	
Bridge End Embankment	536	Cu.Yd.	
Granular Bridge End Backfill	119.4	Cu.Yd.	
Approach Slab Underdrain Excavation	9.5	Cu.Yd.	
Precast Concrete Headwall for Drain	2	Each	
Class A45 Concrete, Bridge Deck	605.2	Cu.Yd.	
Class A45 Concrete, Bridge	254.6	Cu.Yd.	
Concrete Approach Slab for Bridge	190.6	Sq.Yd.	
Concrete Approach Sleeper Slab for Bridge	41.9	Sq.Yd.	
Deck Drain, Girder Bridge	3	Each	
Class A45 Concrete, Drilled Shaft	263.8	Cu.Yd.	See Special Provision
Drilled Shaft Excavation	259.4	Cu.Yd.	
56" Permanent Casing	151.1	L.F.	
Reinforcing Steel	82392	Lb.	
Epoxy Coated Reinforcing Steel	2883	Lb.	
Stainless Reinforcing Steel	125037	Lb.	See Special Provision
No. 11 Rebar Splice	108	Each	
Extract Pile	5	Each	
Preboring Pile	180	Ft.	
HP 12x74 Steel Test Pile, Furnish and Drive	140	Ft.	
HP 12x74 Steel Bearing Pile, Furnish and Drive	1040	Ft.	
81" Minnesota Shape Prestressed Concrete Beam	2345	Ft.	
4" Underdrain Pipe	131	Ft.	
Porous Backfill	18	Ton	
Class B Riprap	1611.0	Ton	
Overburden Excavation for Riprap	950	Cu.Yd.	
Type B Drainage Fabric	1922	Sq.Yd.	
Perforated Geocell	560	Sq.Ft.	

BRIDGE SPECIFICATIONS

- Design Specifications: AASHTO LRFD Bridge Design Specifications, 9th Edition.
- Construction Specifications: South Dakota Standard Specifications for Roads and Bridges, 2015 Edition and required provisions, supplemental specifications and special provisions as included in the proposal.

BRIDGE DESIGN LOADING

- Girders are designed continuous for AASHTO HL-93 Live Load.
- Dead Load includes 22 psf for future wearing surface on the roadway.

DESIGN MATERIAL STRENGTHS*

Class A45 Concrete $f'_c = 4,500$ psi
 Reinforcing Steel (ASTM A615, Gr. 60) $f_y = 60,000$ psi
 Stainless Steel (ASTM A955, Gr. 60) $f_y = 60,000$ psi
 Piling (ASTM A572 Grade 50) $f_y = 50,000$ psi

*For prestressed beams, see notes regarding Prestressed Girders.

GENERAL CONSTRUCTION

- All lap splices shown are contact lap splices unless noted otherwise.
- All exposed concrete corners and edges will be chamfered 3/4-inch unless noted otherwise.
- Use 2-inch clear cover on all reinforcing steel except as shown otherwise on plans.
- The Contractor will imprint on the structure the date of new construction as specified and detailed on Standard Plate 460.02.
- Barrier Curbs and End blocks will be built perpendicular to the roadway grade line.
- Requests for construction joints or reinforcing steel splices at points other than those shown, must be submitted to the Engineer for prior approval. If additional splices are approved, no payment will be allowed for the added quantity of reinforcing steel.
- Bridge berms will be constructed to the plans template prior to any pile driving or construction of abutment footings. See Standard Plate 120.10. Berm slopes will not be disturbed after construction. Any alterations to the berm or slopes after berm construction will be submitted to the Bridge Construction Engineer for approval. Allow 30 days for review of proposals.
- The elevation of the bridge deck is 24.5 inches above subgrade elevation.

DESIGN MIX OF CONCRETE

- All structural concrete will be Class A45 Concrete unless otherwise indicated.
- Type II cement conforming to Section 750 is required except Type III cement may be used for prestressed beams.
- Grout design mix will be as specified in Section 460.2 K of the Construction Specifications. A compressive strength of 2000 psi will be attained by the grout prior to erection of any beams. Chamfer edges of grout pads 3/4-inch. The quantity of grout is included in and will be paid for at the contract unit price per cubic yard for Class A45 Concrete, Bridge.

INCIDENTAL WORK, STRUCTURE

- In place centerline Sta. 348+57.38 to centerline Sta. 350+46.88 is a 189.5-foot, 3 span prestressed concrete girder bridge with a 30'-0" clear roadway. The superstructure consists of a reinforced concrete slab with concrete barrier continuous across the bridge. The substructure consists of 2 column reinforced concrete bents and reinforced concrete vertical abutments. The bents are supported on spread footings on rock, and the abutments are supported on 10BP42 Steel Bearing Piles.
- Break down and remove the existing bridge, and approach/sleeper slabs if applicable, to 1-foot below finished groundline, or as required to construct the new structure in accordance with Section 110 of the Construction Specifications. All portions of the existing bridge will be removed and disposed of by the Contractor on a site obtained by the Contractor and approved by the Engineer in accordance with the Environmental Commitments found in Section A.
- During demolition of the structure, efforts will be taken to prevent material from falling into the creek. Under no circumstances is asphalt allowed to fall into the creek.
- The foregoing is a general description of the in-place bridge and should not be construed to be complete in all details. Before preparing the bid, it is the responsibility of the Contractor to make a visual inspection of the structure to verify the extent of the work and materials involved. If desired by the Contractor, a copy of the original construction plans may be obtained through the Office of Bridge Design.

ESTIMATE OF STRUCTURE QUANTITIES AND NOTES

FOR

(WESTBOUND LANES)

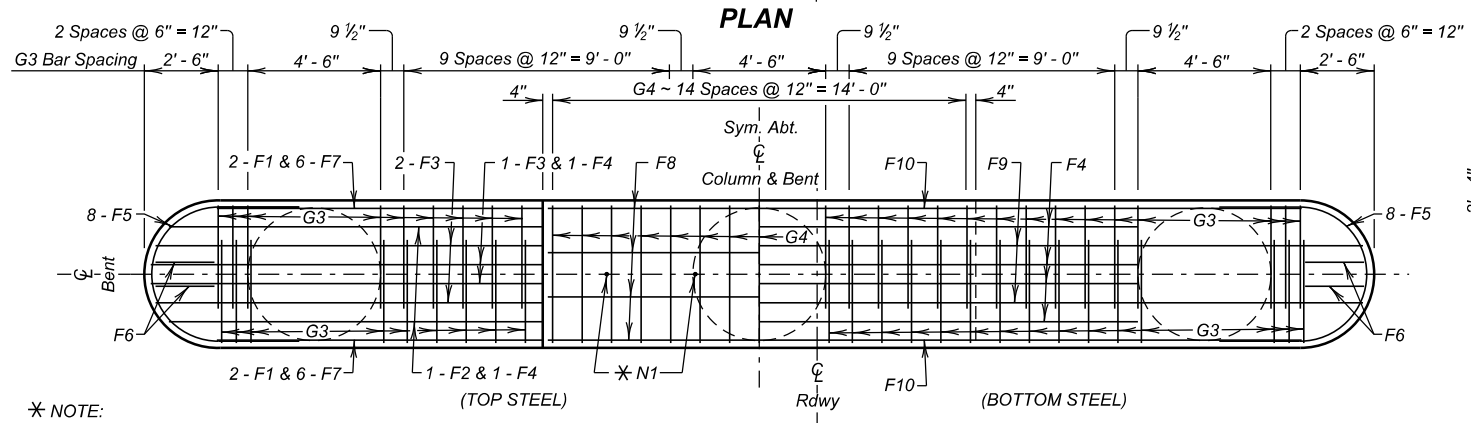
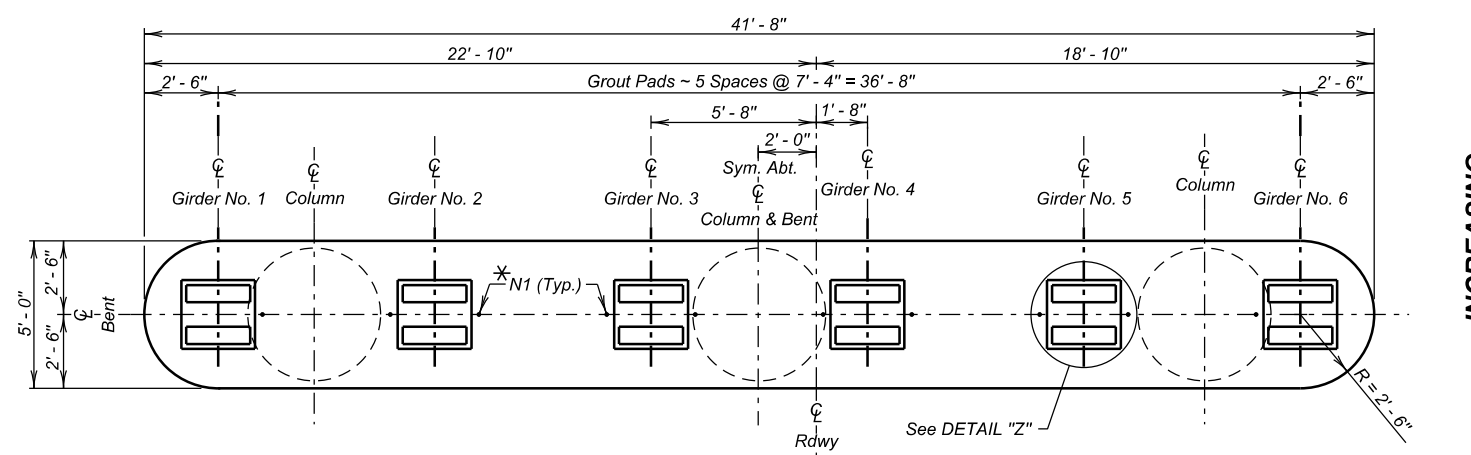
394' - 6" PRESTRESSED GIRDER BRIDGE

STR. NO. 52-831-309

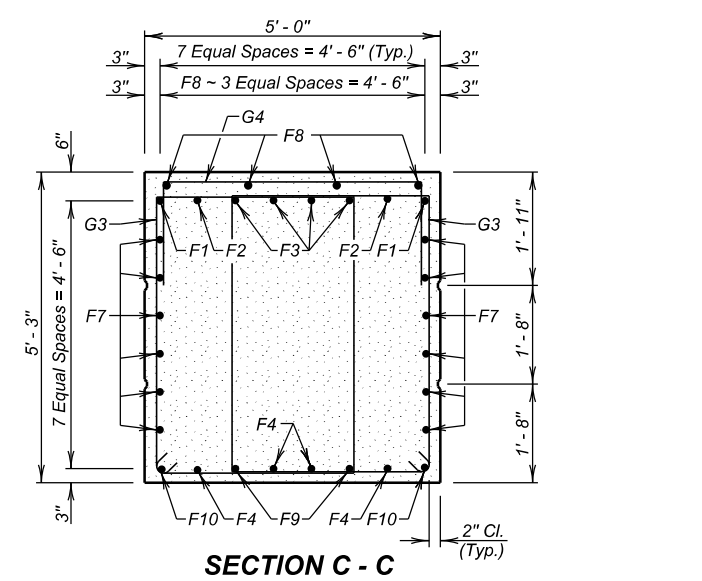
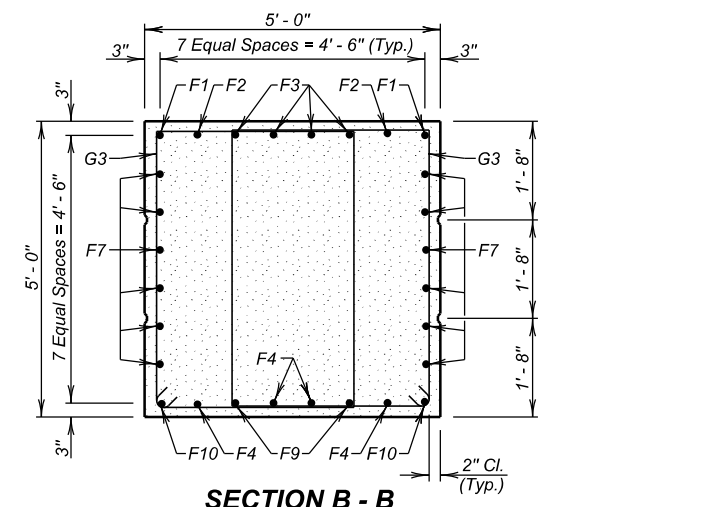
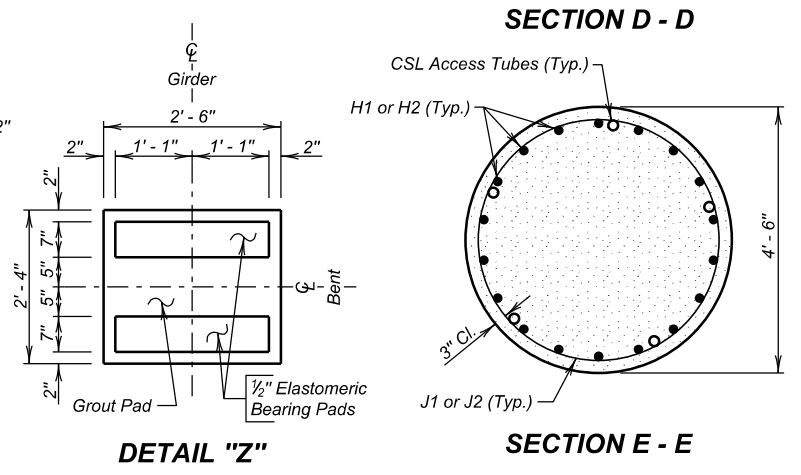
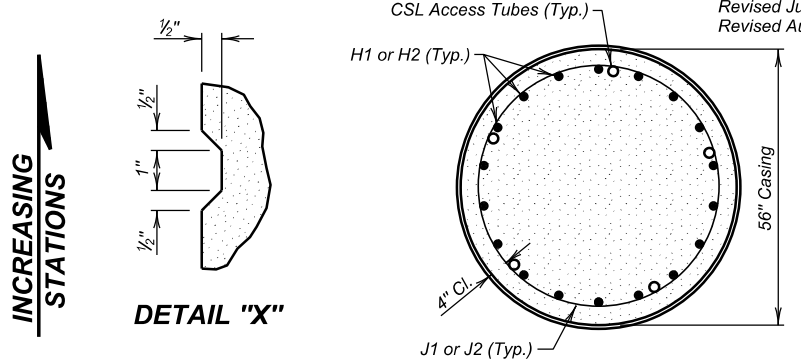
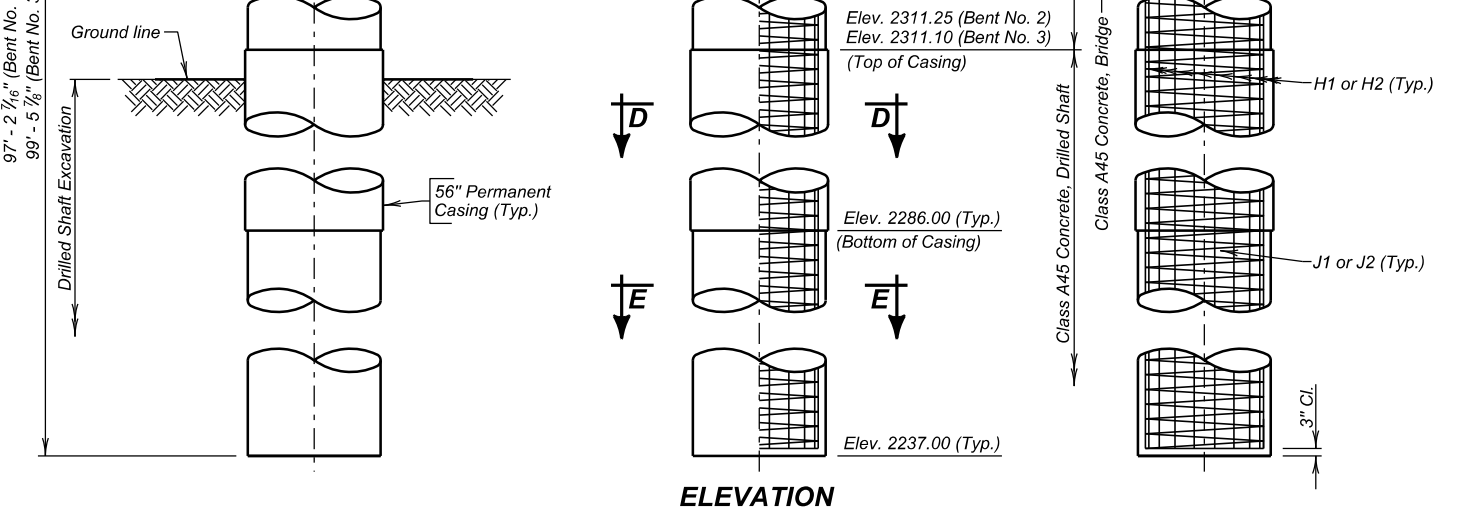
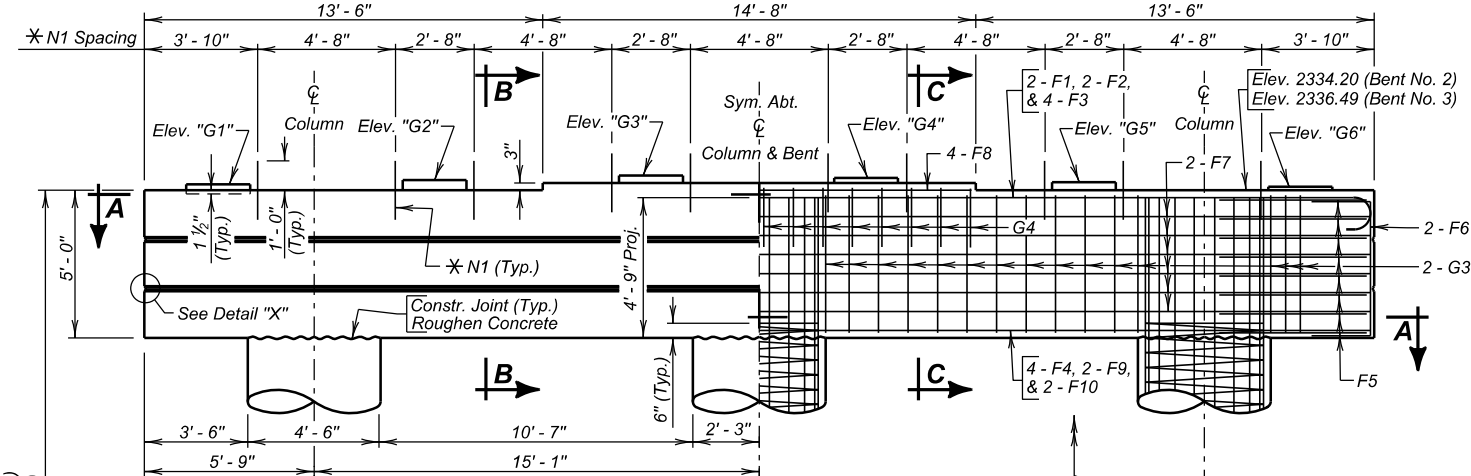
AUGUST 2022

2 OF 30

DESIGNED BY CL PENNO35F	CK. DES. BY SK 035FTA02	DRAFTED BY BT	 BRIDGE ENGINEER
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* NOTE:
The portion of the N1 bar above the bent cap is to be coated with asphalt paint or wrapped with tar paper to a minimum thickness of 1/16".



REINFORCING SCHEDULE (For 1 Bent)

Mk.	No.	Size	Length	Type
F1	2	8	38'-7"	1
F2	2	8	41'-10"	1
F3	4	8	42'-9"	1
F4	4	8	25'-8"	Str.
F5	16	6	12'-8"	S11
F6	4	6	8'-6"	17
F7	12	4	36'-9"	Str.
F8	4	6	14'-5"	Str.
F9	2	8	40'-11"	Str.
F10	2	8	36'-9"	Str.
G3	60	5	16'-9"	T1
G4	15	6	8'-8"	17
N1	10	8	2'-0"	Str.

Bent No. 2		Bent No. 3	
H1	54	11	96'-8"
J1	3	4	1172'-0"
H2	54	11	99'-0"
J2	3	4	1200'-0"

NOTES:
All dimensions are out to out of bars.
Spirals - Use 6" pitch and 1 1/2 extra turns at each end. Use 1 1/2 turns for lap at splice as required or weld as approved by the Office of Bridge Design. Use 4 vertical spacer bars per column. Spirals may be smooth bars. Bar length shown does not include splices.
Length shown is full length required. The Contractor must submit a splice plan for approval. Mechanical splices must be staggered and not placed side by side. Splices will not be placed within 10 feet of the point of fixity or top and bottom of casing.

ESTIMATED QUANTITIES

ITEM	UNIT	QUANTITY	
		Bent No. 2	Bent No. 3
Class A45 Concrete, Bridge	Cu. Yd.	70.0	74.4
Reinforcing Steel	Lb.	33691	34417
Drilled Shaft Excavation	Cu. Yd.	129.4	130.0
Class A45 Concrete, Drilled Shaft	Cu. Yd.	131.2	132.6
56" Permanent Casing	L.F.	75.8	75.3
No. 11 Rebar Splice	Each	54	54

Includes 0.3 Cu. Yds. for Grout Pads.
Includes 551 lbs. for Spacer Bars.
Each bar is computed at 3/4 lbs per linear foot regardless of type furnished.

TABLE OF ELEVATIONS

Bent No.	*Elev. "G1"	*Elev. "G2"	*Elev. "G3"	*Elev. "G4"	*Elev. "G5"	*Elev. "G6"
2	2234.33	2334.47	2334.62	2334.70	2334.55	2334.41
3	2336.62	2336.76	2336.91	2337.00	2336.84	2336.70

NOTE: Top of Grout Pad shall be level and smooth.
* Elevations are Top of Grout Pad at centerline of bent.

BENT DETAILS FOR (WESTBOUND LANES)

394' - 6" PRESTRESSED GIRDER BRIDGE

40' - 0" ROADWAY
OVER BULL CREEK
STA. 347 + 32.71 TO 351 + 27.21
STR. NO. 52-831-309

0° SKEW
SEC. 1-T1N-R14E
IM 0902(18)101
HL-93

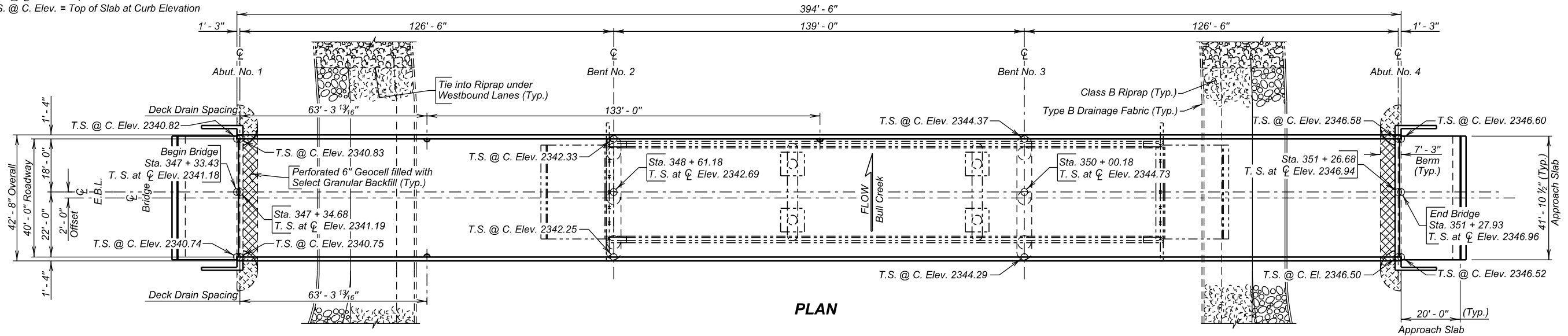
PENNINGTON COUNTY
S. D. DEPT. OF TRANSPORTATION
AUGUST 2022

The elevations shown in these plans are based on the National Geodetic Survey (NGS) North American Vertical Datum of 1988 (NAVD88).

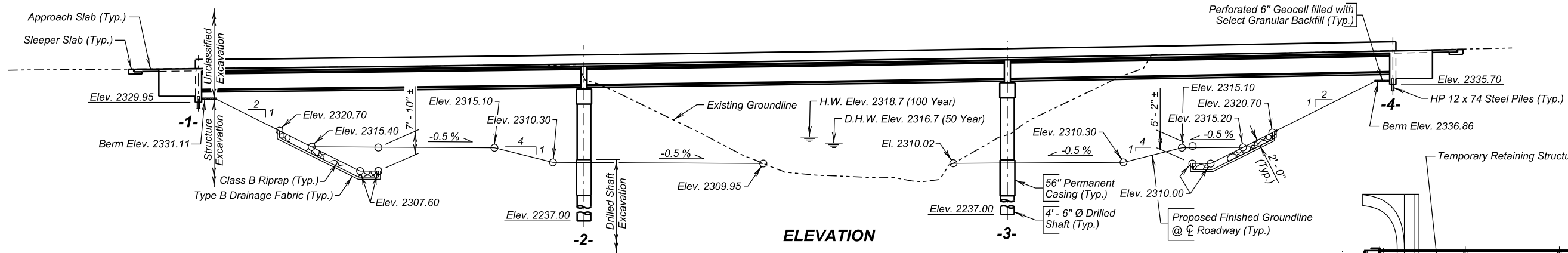
Revised August 14, 2024 PW

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0902(18)101	E33	E62

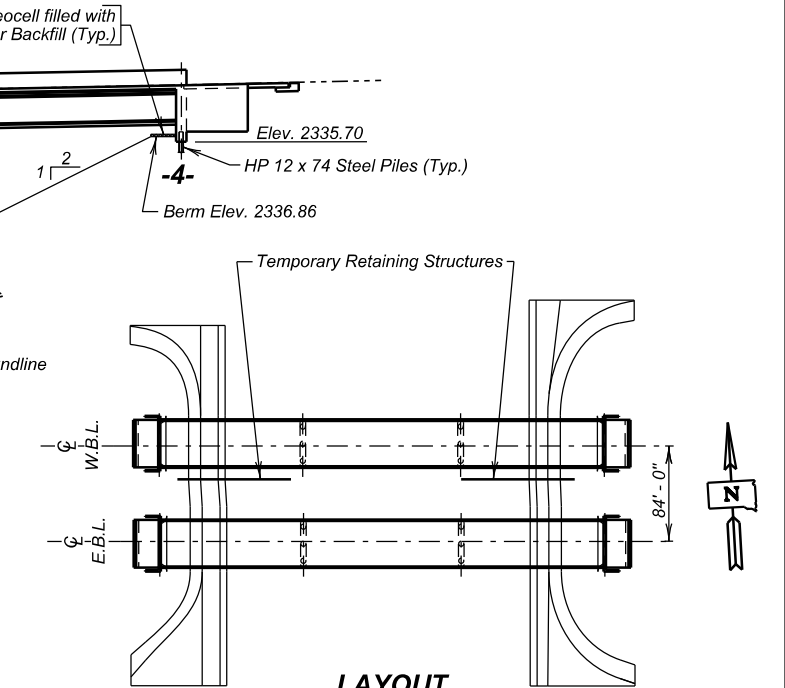
NOTES:
T.S. @ C Elev. = Top of Slab at Centerline Elevation
T.S. @ C. Elev. = Top of Slab at Curb Elevation



PLAN



ELEVATION



LAYOUT

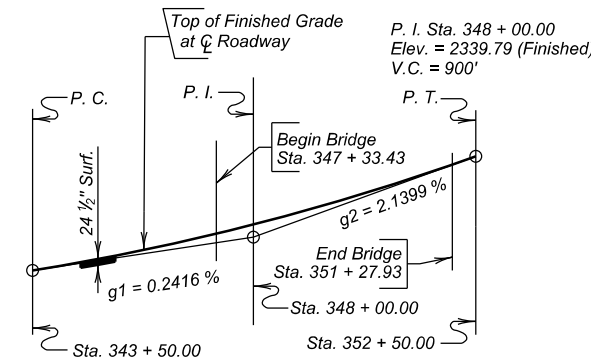
-X081- INDEX OF BRIDGE SHEETS -

- Sheet No. 1 - General Drawing
- Sheet No. 2 - Estimate of Structure Quantities and Notes
- Sheet No. 3 - Notes (Continued)
- Sheet No. 4 - Notes (Continued)
- Sheet No. 5 - Notes (Continued)
- Sheet No. 6 - Subsurface Investigation, Piling, & Drilled Shaft Layout
- Sheet No. 7 - Piling Layout Details
- Sheet No. 8 - Abutment No. 1 Details (A)
- Sheet No. 9 - Abutment No. 1 Details (B)
- Sheet No. 10 - Abutment No. 4 Details (A)
- Sheet No. 11 - Abutment No. 4 Details (B)
- Sheet No. 12 - Bent Details
- Sheet No. 13 - Superstructure Details (A)
- Sheet No. 14 - Superstructure Details (B)
- Sheet No. 15 - Endblock, Barrier Curb, and Deck Drain Details
- Sheet No. 16 - 126' - 3" Girder Details
- Sheet No. 17 - 138' - 3" Girder Details
- Sheet No. 18 - Erection Data
- Sheet No. 19 - Slab Form Elevations
- Sheet No. 20 - Diaphragm Details
- Sheet No. 21 - Details of Bridge End Backfill Adjacent to Bridge (A)
- Sheet No. 22 - Details of Bridge End Backfill Adjacent to Bridge (B)
- Sheet No. 23 - Details of Approach Slab Adjacent to Bridge
- Sheet No. 24 - Approach Slab Joint Details
- Sheet No. 25 - Riprap Details
- Sheet No. 26 - As - Built Elevation Survey (A)
- Sheet No. 27 - As - Built Elevation Survey (B)
- Sheet No. 28 - Details of Standard Plate No's. 430.50 and 460.02
- Sheet No. 29 - Details of Standard Plate No's. 460.05 and 510.40
- Sheet No. 30 - Details of Standard Plate No's. 620.19 and 630.92

HYDRAULIC DATA

Q_d	8811 cfs
A_d	1025 sq. ft.
V_d	8.6 fps
Q_F	8811 cfs
Q_{100}	13476 cfs
Q_{OT}	$>Q_{500}$ cfs
V_{max}	9.0 fps

Q_d = Design discharge for the proposed bridge based on 50 year frequency. Elev. 2316.7.
 Q_{OT} = Overtopping discharge and frequency $>Q_{500}$ year recurrence interval. Elev. 2338.4 @ Sta. 342 + 24.00 ±.
 Q_F = Designated peak discharge for the basin approaching proposed project based on 50 year frequency.
 Q_{100} = Computed discharge for the basin approaching proposed project based on 100 year frequency. Elev. 2318.7.
 V_{max} = Maximum computed outlet velocity for the proposed bridge, based on 100 year frequency.



VERTICAL CURVE DATA

GENERAL DRAWING FOR (EASTBOUND LANES)

394' - 6" PRESTRESSED GIRDER BRIDGE
40' - 0" ROADWAY
OVER BULL CREEK
STA. 347 + 33.43 TO 351 + 27.93
STR. NO. 52-831-310
PCN 035F

PENNINGTON COUNTY
S. D. DEPT. OF TRANSPORTATION
AUGUST 2022

DESIGNED BY CL PENNO35F	CK. DES. BY SK 035FTB01	DRAFTED BY BT	BRIDGE ENGINEER <i>Steve A. Johnson</i>
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PLANS BY:
OFFICE OF BRIDGE DESIGN, SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION

ESTIMATE OF STRUCTURE QUANTITIES

Description	Quantity	Unit	Remarks
Bridge Elevation Survey	Lump Sum	LS	
Concrete Penetrating Sealer	1754	Sq. Yd.	See Special Provision
Select Granular Backfill	19.6	Ton	
Incidental Work, Structure	Lump Sum	LS	
Structural Steel, Miscellaneous	Lump Sum	LS	
Membrane Sealant Expansion Joint	83.8	Ft.	
Structural Excavation, Bridge	29	Cu.Yd.	
Bridge End Embankment	537	Cu.Yd.	
Granular Bridge End Backfill	119.4	Cu.Yd.	
Approach Slab Underdrain Excavation	9.5	Cu.Yd.	
Precast Concrete Headwall for Drain	2	Each	
Class A45 Concrete, Bridge Deck	605.2	Cu.Yd.	
Class A45 Concrete, Bridge	255.1	Cu.Yd.	
Concrete Approach Slab for Bridge	190.6	Sq.Yd.	
Concrete Approach Sleeper Slab for Bridge	41.9	Sq.Yd.	
Deck Drain, Girder Bridge	3	Each	
Class A45 Concrete, Drilled Shaft	263.5	Cu.Yd.	See Special Provision
Drilled Shaft Excavation	259.1	Cu.Yd.	
56" Permanent Casing	151.1	L.F.	
Reinforcing Steel	82430	Lb.	
Epoxy Coated Reinforcing Steel	2883	Lb.	
Stainless Reinforcing Steel	125037	Lb.	See Special Provision
No. 11 Rebar Splice	108	Each	
Extract Pile	5	Each	
Preboring Pile	180	Ft.	
HP 12x74 Steel Test Pile, Furnish and Drive	140	Ft.	
HP 12x74 Steel Bearing Pile, Furnish and Drive	1040	Ft.	
81" Minnesota Shape Prestressed Concrete Beam	2345		
4" Underdrain Pipe	131	Ft.	
Porous Backfill	18	Ton	
Class B Riprap	1699.0	Ton	
Overburden Excavation for Riprap	1028	Cu.Yd.	
Type B Drainage Fabric	2020	Sq.Yd.	
Perforated Geocell	560	Sq.Ft.	

BRIDGE SPECIFICATIONS

- Design Specifications: AASHTO LRFD Bridge Design Specifications, 9th Edition.
- Construction Specifications: South Dakota Standard Specifications for Roads and Bridges, 2015 Edition and required provisions, supplemental specifications and special provisions as included in the proposal.

BRIDGE DESIGN LOADING

- Girders are designed continuous / simple for AASHTO HL-93 Live Load.
- Dead Load includes 22 psf for future wearing surface on the roadway.

DESIGN MATERIAL STRENGTHS*

Class A45 Concrete $f'_c = 4,500$ psi
 Reinforcing Steel (ASTM A615, Gr. 60) $f_y = 60,000$ psi
 Stainless Steel (ASTM A955, Gr. 60) $f_y = 60,000$ psi
 Piling (ASTM A572 Grade 50) $f_y = 50,000$ psi

*For prestressed beams, see notes regarding Prestressed Girders.

GENERAL CONSTRUCTION

- All lap splices shown are contact lap splices unless noted otherwise.
- All exposed concrete corners and edges will be chamfered 3/4-inch unless noted otherwise.
- Use 2-inch clear cover on all reinforcing steel except as shown otherwise on plans.
- The Contractor will imprint on the structure the date of new construction as specified and detailed on Standard Plate 460.02.
- Barrier Curbs and End blocks will be built perpendicular to the roadway grade line.
- Requests for construction joints or reinforcing steel splices at points other than those shown, must be submitted to the Engineer for prior approval. If additional splices are approved, no payment will be allowed for the added quantity of reinforcing steel.
- Bridge berms will be constructed to the plans template prior to any pile driving or construction of abutment footings. See Standard Plate 120.10. Berm slopes will not be disturbed after construction. Any alterations to the berm or slopes after berm construction will be submitted to the Bridge Construction Engineer for approval. Allow 30 days for review of proposals.
- The elevation of the bridge deck is 24.5 inches above subgrade elevation.

DESIGN MIX OF CONCRETE

- All structural concrete will be Class A45 Concrete unless otherwise indicated.
- Type II cement conforming to Section 750 is required except Type III cement may be used for prestressed beams.
- Grout design mix will be as specified in Section 460.2 K of the Construction Specifications. A compressive strength of 2000 psi will be attained by the grout prior to erection of any beams. Chamfer edges of grout pads 3/4-inch. The quantity of grout is included in and will be paid for at the contract unit price per cubic yard for Class A45 Concrete, Bridge.

INCIDENTAL WORK, STRUCTURE

- In place centerline Sta. 348+57.38 to centerline Sta. 350+46.88 is a 189.5-foot, 3 span prestressed concrete girder bridge with a 30'-0" clear roadway. The superstructure consists of a reinforced concrete slab with concrete barrier continuous across the bridge. The substructure consists of 2 column reinforced concrete bents and reinforced concrete vertical abutments. The bents are supported on spread footings on rock, and the abutments are supported on 10BP42 Steel Bearing Piles.
- Break down and remove the existing bridge, and approach/sleeper slabs if applicable, to 1-foot below finished groundline, or as required to construct the new structure in accordance with Section 110 of the Construction Specifications. All portions of the existing bridge will be removed and disposed of by the Contractor on a site obtained by the Contractor and approved by the Engineer in accordance with the Environmental Commitments found in Section A.
- During demolition of the structure, efforts will be taken to prevent material from falling into the creek. Under no circumstances is asphalt allowed to fall into the creek.
- The foregoing is a general description of the in-place bridge and should not be construed to be complete in all details. Before preparing the bid, it is the responsibility of the Contractor to make a visual inspection of the structure to verify the extent of the work and materials involved. If desired by the Contractor, a copy of the original construction plans may be obtained through the Office of Bridge Design.

ESTIMATE OF STRUCTURE QUANTITIES AND NOTES

FOR
(EASTBOUND LANES)

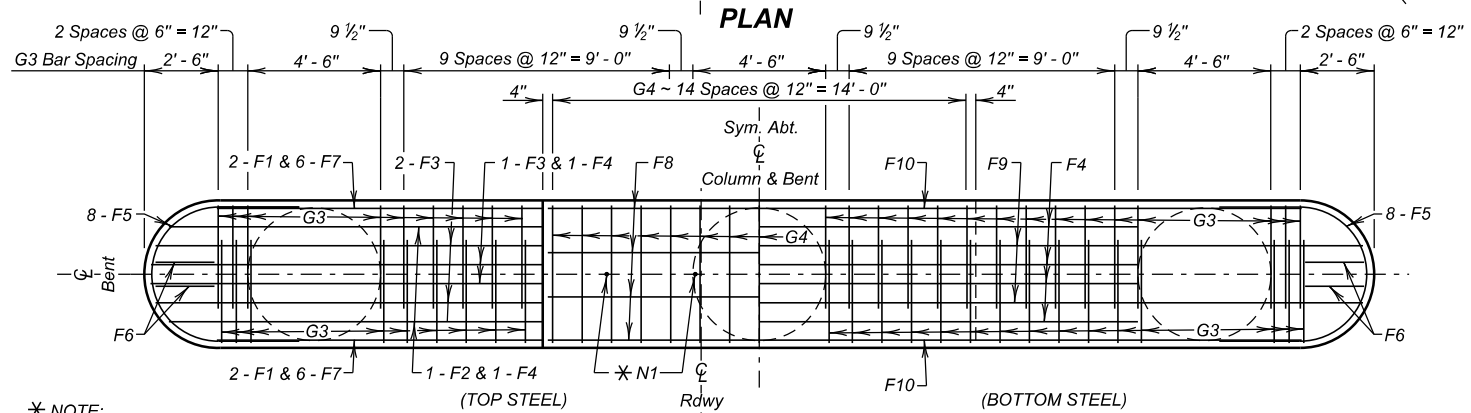
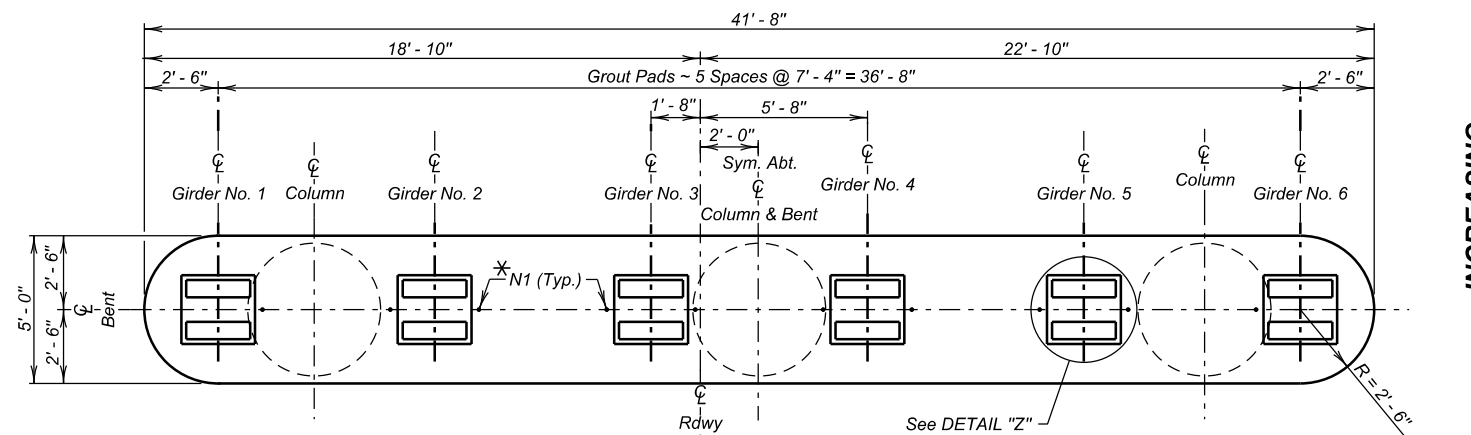
394' - 0" PRESTRESSED GIRDER BRIDGE

STR. NO. 52-831-310

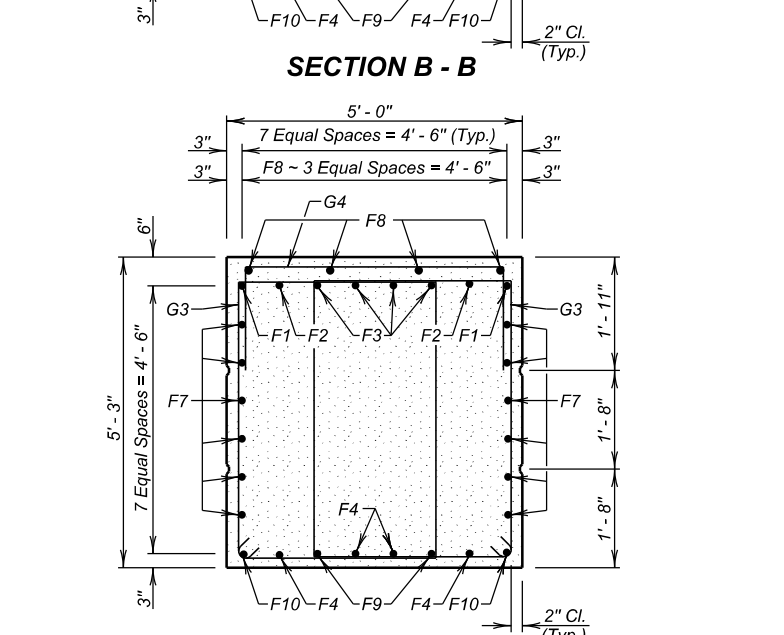
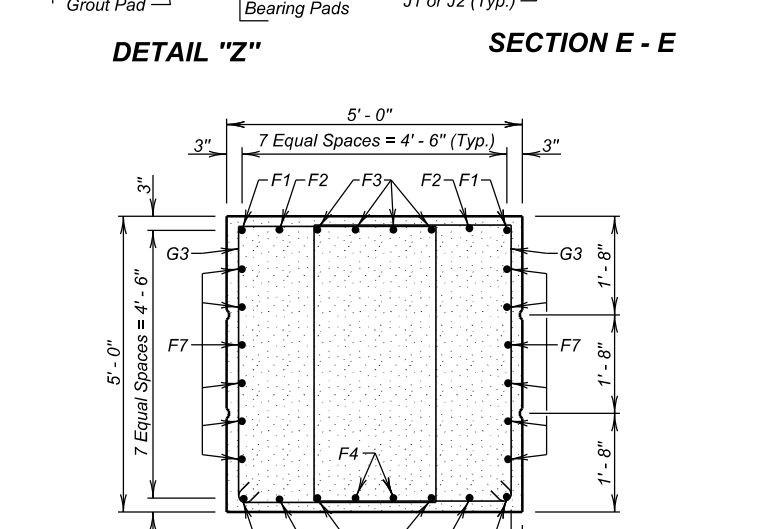
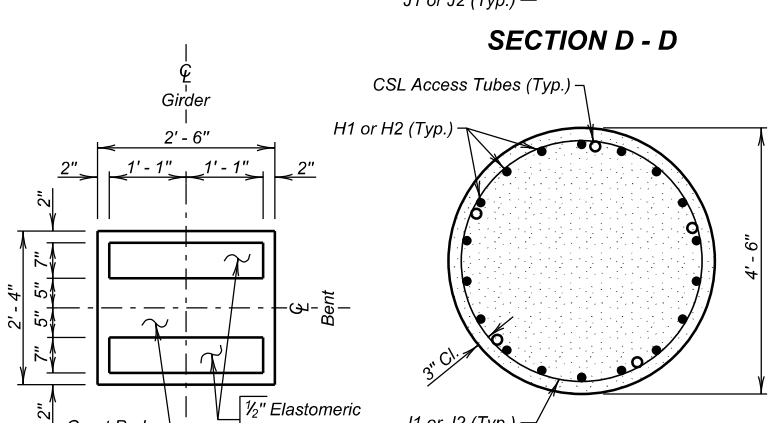
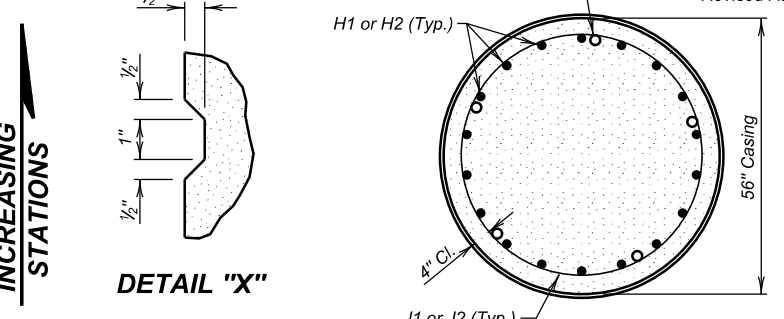
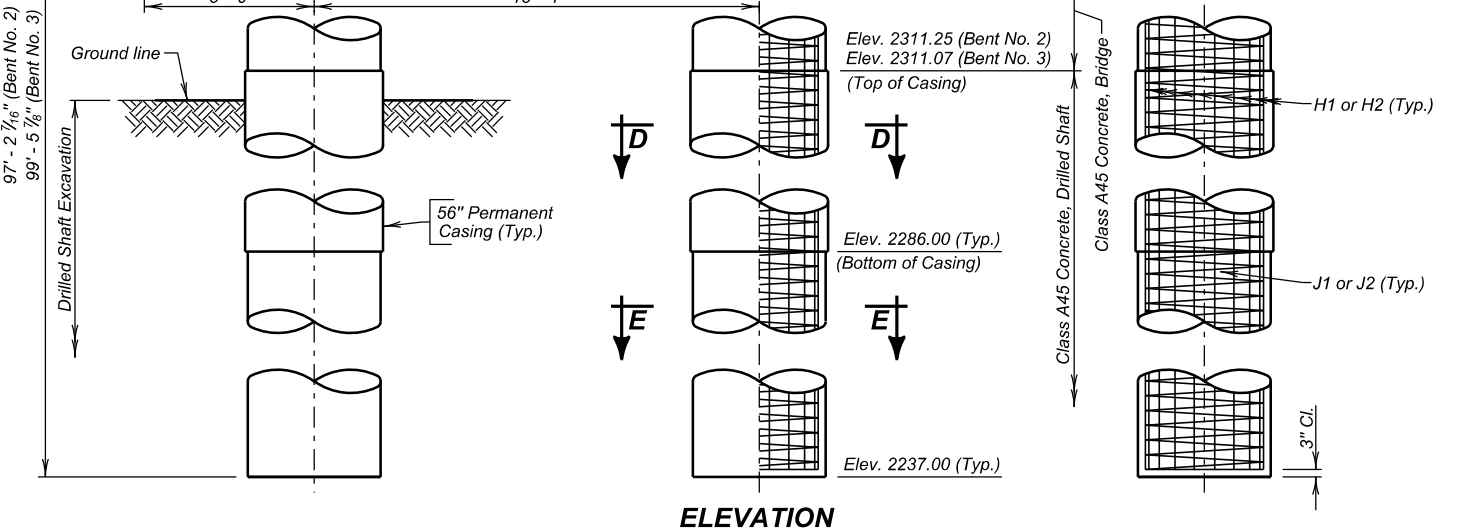
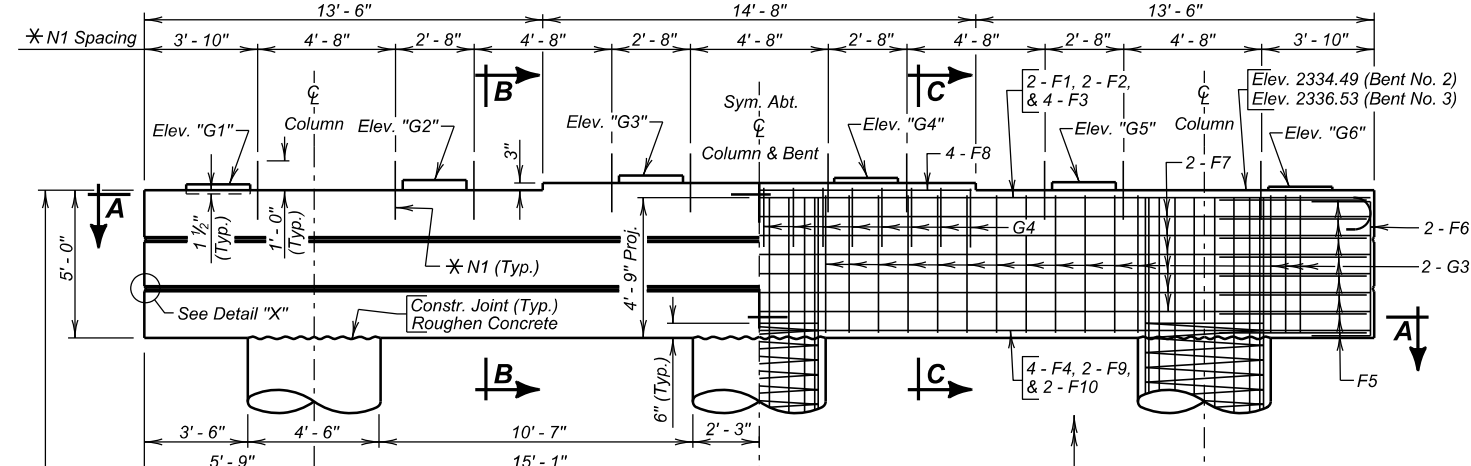
AUGUST 2022

2 OF 30

DESIGNED BY CL PENNO35F	CK. DES. BY SK 035FTB02	DRAFTED BY BT	 BRIDGE ENGINEER
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* NOTE:
The portion of the N1 bar above the bent cap is to be coated with asphalt paint or wrapped with tar paper to a minimum thickness of 1/16".



REINFORCING SCHEDULE (For 1 Bent)

Mk.	No.	Size	Length	Type
F1	2	8	38'-7"	1
F2	2	8	41'-10"	1
F3	4	8	42'-9"	1
F4	4	8	25'-8"	Str.
F5	16	6	12'-8"	S11
F6	4	6	8'-6"	17
F7	12	4	36'-9"	Str.
F8	4	6	14'-5"	Str.
F9	2	8	40'-11"	Str.
F10	2	8	36'-9"	Str.
G3	60	5	16'-9"	T1
G4	15	6	8'-8"	17
N1	10	8	2'-0"	Str.

Bent No. 2		Bent No. 3		
Mk.	No.	Mk.	No.	
H1	54	11	97'-0"	Str.
J1	3	4	1143'-3"	Spiral
Bent No. 3				
H2	54	11	99'-0"	Str.
J2	3	4	1200'-1"	Spiral

NOTES:
All dimensions are out to out of bars.
Spirals - Use 6" pitch and 1 1/2 extra turns at each end. Use 1 1/2 turns for lap at splice as required or weld as approved by the Office of Bridge Design. Use 4 vertical spacer bars per column. Spirals may be smooth bars. Bar length shown does not include splices.
Length shown is full length required. The Contractor must submit a splice plan for approval. Mechanical splices must be staggered and not placed side by side. Splices will not be placed within 10 feet of the point of fixity or top and bottom of casing.

ESTIMATED QUANTITIES

ITEM	UNIT	QUANTITY	
		Bent No. 2	Bent No. 3
Class A45 Concrete, Bridge	Cu. Yd.	70.5	74.4
Reinforcing Steel	Lb.	33729	34417
Drilled Shaft Excavation	Cu. Yd.	129.1	130.0
Class A45 Concrete, Drilled Shaft	Cu. Yd.	130.9	132.6
56" Permanent Casing	L.F.	75.8	75.3
No. 11 Rebar Splice	Each	54	54

Includes 0.3 Cu. Yds. for Grout Pads.
Includes 551 lbs. for Spacer Bars.
Each bar is computed at 3/4 lbs per linear foot regardless of type furnished.

TABLE OF ELEVATIONS

Bent No.	*Elev. "G1"	*Elev. "G2"	*Elev. "G3"	*Elev. "G4"	*Elev. "G5"	*Elev. "G6"
2	2234.70	2334.84	2335.00	2334.91	2334.76	2334.62
3	2336.74	2336.88	2337.03	2336.95	2336.80	2336.66

NOTE: Top of Grout Pad shall be level and smooth.
*Elevations are Top of Grout Pad at centerline of bent.

BENT DETAILS FOR (EASTBOUND LANES)

394' - 6" PRESTRESSED GIRDER BRIDGE
 40' - 0" ROADWAY OVER BULL CREEK
 0° SKEW
 STA. 347 + 33.43 TO 351 + 27.93
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 SEC. 1-T1N-R14E
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PENNINGTON COUNTY
 S. D. DEPT. OF TRANSPORTATION
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