DEPARTMENT OF TRANSPORTATION

Planning & Engineering
Office of Project Development
700 E Broadway Avenue
Pierre, South Dakota 57501-2586
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dot.sd.gov

December 5, 2025

ADDENDUM NO. 3

RE: Item #1, December 10, 2025 Letting - P-PT 0011(145)83, PCN 05V6, Minnehaha County - Structure (186' Steel Girder & 340' Steel Girder), Approach Grading & Asphalt Concrete 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 510E0220 "Preboring Grouted Pile"

PLANS: Please destroy sheets A2, E2, E4-E6, E11, E34 & E35 and replace with the enclosed sheets, dated 12/5/25.

Sheets A2, E2, E4: Section E – Structure No. 50-280-139
Bid Item 510E0220 "Preboring Grouted Pile" bid item was added.

Sheet E5: PILE DRIVING note was revised.

Sheet E6: PILE GROUT note was revised.

Sheet E11: ESTIMATED QUANTITIES was revised.

Sheets E34 & E35: SPREAD FOOTING ON ROCK note was revised and note spacing was adjusted.

Sincerely,

Sam Weisgram
Engineering Supervisor

SW/gp

CC: Travis Dressen, Mitchell Region Engineer
Harry Johnston, Sioux Falls Area Engineer

SECTION E – ESTIMATE OF STRUCTURE QUANTITES

Str. No. 50-280-139

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E3310	Bridge Elevation Survey	Lump Sum	LS
009E5000	Concrete Penetrating Sealer	1,513.0	SqYd
120E7000	Select Granular Backfill	27.0	Ton
250E0030	Incidental Work, Structure	Lump Sum	LS
410E0020	Structural Steel	Lump Sum	LS
410E2600	Membrane Sealant Expansion Joint	83.8	Ft
411E0100	Bridge Painting	Lump Sum	LS
420E0100	Structure Excavation, Bridge	488	CuYd
430E0200	Bridge End Embankment	1,482	CuYd
430E0300	Granular Bridge End Backfill	101.1	CuYd
430E0510	Approach Slab Underdrain Excavation	8.0	CuYd
430E0700	Precast Concrete Headwall for Drain	4	Each
460E0030	Class A45 Concrete, Bridge Deck	463.4	CuYd
460E0050	Class A45 Concrete, Bridge	288.3	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	2	Each
480E0100	Reinforcing Steel	43,610	Lb
480E0200	Epoxy Coated Reinforcing Steel	2,888	Lb
480E0300	Stainless Reinforcing Steel	102,866	Lb
510E0220	Preboring Grouted Pile	360	Ft
510E0300	Preboring Pile	120	Ft
510E3130	HP 12 Pile Tip Reinforcement	84	Each
510E3401	HP 12x53 Steel Test Pile, Furnish and Drive	165	Ft
510E3405	HP 12x53 Steel Bearing Pile, Furnish and Drive	2,475	Ft
680E0040	4" Underdrain Pipe	155	Ft
680E2500	Porous Backfill	15.0	Ton
700E0210	Class B Riprap	5,593.5	Ton
700E1100	Overburden Excavation for Riprap	3,190	CuYd
831E0110	Type B Drainage Fabric	6,446	SqYd
831E1030	Perforated Geocell	936	SqFt

Str. No. 50-280-136

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E3310	Bridge Elevation Survey	Lump Sum	LS
009E5000	Concrete Penetrating Sealer	823.0	SqYd
120E7000	Select Granular Backfill	25.4	Ton
250E0030	Incidental Work, Structure	Lump Sum	LS
410E0020	Structural Steel	Lump Sum	LS
410E2600	Membrane Sealant Expansion Joint	83.8	Ft
411E0100	Bridge Painting	Lump Sum	LS
420E0100	Structure Excavation, Bridge	601	CuYd
430E0200	Bridge End Embankment	840	CuYd
430E0300	Granular Bridge End Backfill	84.9	CuYd
430E0510	Approach Slab Underdrain Excavation	8.0	CuYd
430E0700	Precast Concrete Headwall for Drain	4	Each
460E0030	Class A45 Concrete, Bridge Deck	253.3	CuYd
460E0050	Class A45 Concrete, Bridge	233.6	CuYd
460E0150	Concrete Approach Slab for Bridge	190.6	SqYd
460E0160	Concrete Approach Sleeper Slab for Bridge	41.9	SqYd
460E0382	Install Dowel in Rock	52.5	Ft
480E0100	Reinforcing Steel	37,461	Lb
480E0200	Epoxy Coated Reinforcing Steel	2,722	Lb
480E0300	Stainless Reinforcing Steel	63,287	Lb
510E0300	Preboring Pile	140	Ft
510E3130	HP 12 Pile Tip Reinforcement	14	Each
510E3401	HP 12x53 Steel Test Pile, Furnish and Drive	90	Ft
510E3405	HP 12x53 Steel Bearing Pile, Furnish and Drive	540	Ft
680E0040	4" Underdrain Pipe	155	Ft
680E2500	Porous Backfill	15.0	Ton
700E0210	Class B Riprap	5,202.6	Ton
700E1100	Overburden Excavation for Riprap	4,058	CuYd
831E0110	Type B Drainage Fabric	5,922	SqYd
831E1030	Perforated Geocell	880	SqFt

ESTIMATE OF STRUCTURE QUANTITIES

DESCRIPTION	QUANTITY	UNIT	REMARKS
Bridge Elevation Survey	Lump Sum	LS	
Concrete Penetrating Sealer	1,513	SqYd	See Special Provision
Select Granular Backfill	27.0	Tons	
Incidental Work, Structure	Lump Sum	LS	
Structural Steel	Lump Sum	LS	
Membrane Sealant Expansion Joint	83.8	Ft	
Bridge Painting	Lump Sum	LS	
Structure Excavation, Bridge	488	CuYd	
Bridge End Embankment	1,482	CuYd	
Granular Bridge End Backfill	101.1	CuYd	
Approach Slab Underdrain Excavation	8.0	CuYd	
Precast Concrete Headwall for Drain	4	Each	
Class A45 Concrete, Bridge Deck	463.4	CuYd	
Class A45 Concrete, Bridge	288.3	CuYd	
Concrete Approach Slab for Bridge	190.6	SqYd	
Concrete Approach Sleeper Slab for Bridge	41.9	SqYd	
Deck Drain, Girder Bridge	2	Each	
Reinforcing Steel	43,610	Lb	
Epoxy Coated Reinforcing Steel	2,888	Lb	
Stainless Reinforcing Steel	102,866	Lb	See Special Provision
Preboring Grouted Pile	360	Ft	
Preboring Pile	120	Ft	
HP 12 Pile Tip Reinforcement	84	Each	
HP 12x53 Steel Test Pile, Furnish and Drive	165	Ft	
HP 12x53 Steel Bearing Pile, Furnish and Drive	2,475	Ft	
4" Underdrain Pipe	155	Ft	
Porous Backfill	15.0	Ton	
Class B Riprap	5593.5	Ton	
Overburden Excavation for Riprap	3190	CuYd	
Type B Drainage Fabric	6446	SqYd	
Perforated Geocell	936	SqFt	

BRIDGE SPECIFICATIONS

1. Design Specifications: AASHTO LRFD Bridge Design Specifications, 9th Edition.

2. Standard Specifications for Roads and Bridges, 10-1-25 Version, Required Provisions, and Special Provisions as included in the Proposal. The Standard Specifications for Roads and Bridges are available for download and viewing at https://dot.sd.gov/doing-business/contractors/standard-specifications.

3. All welding and welding inspections will be in conformance with the latest edition of AASHTO/AWS D1.5/D1.5M Bridge Welding Code unless noted otherwise in the plans.

BRIDGE DESIGN LOADING

1. AASHTO HL-93.

2. 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
Structural Steel (ASTM A709 Gr. 50T2)	f_y = 50,000 psi

GENERAL CONSTRUCTION

1. All lap splices shown are contact lap splices unless noted otherwise.

2. All exposed concrete corners and edges will be chamfered 3/4-inch unless noted otherwise.

3. Use 2-inch clear cover on all reinforcing steel except as shown otherwise on plans.

4. The Contractor will imprint on the structure the date of new construction as specified and detailed on Standard Plate 460.02.

5. Barrier curbs, and end blocks will be built perpendicular to the roadway grade line.

6. 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.

7. Bridge berms will be constructed to the plans template prior to any pile driving or construction of abutment footings. See Standard Plate 120.11. 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.

8. The elevation of the bridge deck is 18 inches above subgrade elevation.

INCIDENTAL WORK, STRUCTURE

1. In place centerline Sta. 115+01.25 to centerline Sta. 118+15.75 is a 314.5-foot, 5 span steel girder bridge with a 30'-0" clear roadway width. The superstructure consists of a reinforced concrete slab with steel channel rail attached to the back-side of curbs, faced with spacer blocks and steel Thrie-beam continuous across the bridge. The deck has been overlaid with 3-4.5 inches of asphalt. The substructure consists of 2 column reinforced concrete bents supported on spread footings and reinforced concrete sill type abutments; the abutments are supported on timber piling.

2. 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 at an approved. An appropriate site will be as described in the Environmental Commitments Notes in the plans.

3. 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.

4. 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.

NOTICE - LEAD BASED PAINT

Be advised that the paint on the steel surfaces of the existing structure contains lead. The Contractor should plan operations accordingly and inform employees of the hazards of lead exposure.

DESIGN MIX OF CONCRETE

1. All structural concrete will be Class A45 Concrete unless otherwise indicated.

2. Type II cement conforming to Section 750 of the Construction Specifications is required in all concrete on the structure except in the abutments. Abutment concrete will use a Type III cement or an approved modified A45 mix. The modified mix will meet the requirements for A45 concrete specified in Section 460 of the Construction Specification with the following modifications: a high range water reducer is required at the manufactures' recommended dosage, the maximum concrete slump is 6 inches, the maximum water/cementitious material ratio will be at least 0.02 less than the A45 mix used in the rest of the substructure, and the minimum concrete temperature at time of placement will be 65 degrees Fahrenheit. If used, type III cement will contain a maximum 8% Tricalcium Aluminate (C_3A) and a maximum 0.6% Alkalis ($Na_2O + O.658K_2O$).

3. 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.

ESTIMATE OF STRUCTURE QUANTITIES AND NOTES

FOR

340' - 3" STEEL GIRDER BRIDGE

STR. NO. 50-280-139

FEBRUARY 2025

DESIGNED BY	CK. DES. BY	DRAFTED BY	
JH	ER	BT	Steve A Johnson BRIDGE ENGINEER
MINN05V6	05V6TA02		

ABUTMENTS

1. Preboring piling at each abutment is required to whichever is greater, ten feet or to natural ground.
2. The HP 12x53 Piling were designed using a factored bearing resistance of 98 tons per pile. Piling will develop a field verified nominal bearing resistance of 245 tons per pile.
3. One test pile will be driven at each abutment and will become part of the pile group. The test pile will be driven before any other pile and will be driven to the required field verified nominal bearing resistance or as directed by the Engineer prior to driving any portion of the bearing piles.
4. Pile can be driven to elevation 1325.00', but not below, prior to splicing. This will prevent setup of the pile before full bearing depth is reached.
5. The Contractor will have sufficient pile splice material on hand before pile driving is started. See Standard Plate 510.40.
6. Piles will not be driven out of position by more than three inches in the direction parallel to the girder centerline. A pile-driving template will be used to ensure this accuracy.
7. Each finished abutment will include a Bridge Survey Marker. See Standard Plate 460.05
8. Pile tip reinforcement will be required. See Standard Plate 510.30.

CONNECTION OF GIRDER TO PILE

1. Cut off piling at the elevations shown in the plans and weld bearing plates to the piling. Adjust as necessary to make bearing plates level, and to permit proper position of the girders. If piles are driven out of position to the extent that bearing plates will not fit, the Contractor will submit the method of correction to the Engineer for approval. Piles will not be pulled into position.
2. All girder erection will be complete with the splices fully bolted and diaphragms in place, before welding girders to bearing plates. (Diaphragms need not be secured with more than temporary bolting, prior to the pile to girder connections.)
3. An alternate connection, capable of transmitting a direct load of 8000 lbs. to the pile and developing 30,000 lbs. horizontal force, may be submitted to the Office of Bridge Design for prior approval.
4. This connection will not be made when the temperature is greater than 70° F or less than 30° F.
5. Steel for the bearing plates will conform to ASTM A709 Gr. 50.
6. Payment for furnishing and installing the bearing plates will be incidental to the contract lump sum price for Structural Steel.

POURING OF ABUTMENT CONCRETE

1. Abutment concrete will be placed, as directed by the Engineer, at a time when a relatively stable temperature can be expected. A relatively stable temperature is defined as an air temperature deviation of not more than 30° F within 12 hours of completing the abutment pour from the air temperature at the time when the abutment concrete is placed.
2. The forms will be secured to the girders in such a manner that they will be free to move longitudinally with the expansion or contraction of the girder.
3. The girders will be braced near the abutments in such a manner that their lateral movement or rotation will be prevented during the placing of concrete. The Contractor will include details for this bracing with the falsework plans.

BENTS

1. All Swedge Bolts will be 1 1/2-inch diameter x 2'-6" F1554, Grade 55 bolts with heavy hex nut and cut washer (listed with structural steel in Superstructure quantities). A minimum of 20% of the embedded bolt surface will be covered with deformations whose radial dimensions are 15 to 20% of the bolt diameter.
2. The HP 12x53 Piling were designed using a factored bearing resistance of 98 tons per pile. Piling will develop a field verified nominal bearing resistance of 245 tons per pile.
3. One test pile will be driven at each bent and will become part of the pile group. The test pile will be driven before any other pile and will be driven to the required field verified nominal bearing resistance or as directed by the Engineer prior to driving any portion of the bearing piles.
4. The Contractor will have sufficient pile splice material on hand before pile driving is started. See Standard Plate 510.40
5. Pile tip reinforcement will be required. See Standard Plate. 510.30.
6. Spiral reinforcement may be fabricated from cold drawn wire conforming to ASTM A1064 or hot rolled plain or deformed bars conforming to the strength requirements of ASTM A615, Grade 60.
7. It is anticipated that cofferdams will be necessary. Cofferdams will be designed and constructed in accordance with Section 423 of the Construction Specifications.

PILE DRIVING

1. A drivability analysis was performed using the wave equation analysis program (GRLWEAP). The following pile hammers were evaluated and found to produce acceptable driving stresses:

   Delmag D19-42 APE D19-42 MVE M-19

2. Pile hammers not listed will require evaluation and approval prior to use from the Geotechnical Engineering Activity. Requests for evaluation of hammers not listed will be submitted a minimum of 5 business days prior to installation of piles.
3. Steel piling will obtain bearing on Corson Diabase bedrock. This material is extremely hard and impenetrable by nature. The Site Plan & Subsurface profile sheet should be reviewed to obtain the approximate Corson Diabase elevation prior to pile driving operations. Some piles may be shorter than the projected depth. Extreme care should be taken during pile driving operations not to over-stress the piles when the tips encounter Corson Diabase bedrock.
4. A dense layer of mudstone (Corson Slate) is present from approximately elevation 1312-1322 feet. Below the Corson Slate is a layer of brown claystone, which overlies the Corson Diabase.
5. If abutment piling penetrate the Corson Slate, preboring at the bents may not be required. Consult the Bridge Construction Engineer for direction.
6. If abutment piling do not adequately penetrate the Corson Slate, or the bent piling are driven first, the Contractor will prebore bent piling 5 feet. After the bent piling are driven, backfill the prebore with grout.
7. The Bridge Construction Engineer will be notified a minimum of two weeks prior to the start of pile driving operations.

PILE GROUT

1. Grout will be a low shrink, neat cement grout or a sand-cement grout. The Grout will have a max Water/Cementitious ratio of 0.45 capable of obtaining a compressive strength of at least 4,000 psi. The contractor will submit a proposed grout mix design, along with compressive strength results, to the SDDOT Concrete Engineer, through the Area Engineer, a minimum of 30 working days prior to the first planned use. The proposed mix design will include brands and planned dosages of all admixtures and will explain the method and timing of introduction into the mix. The Concrete Engineer will review the proposed mix design prior to its use.

NOTES (CONTINUED)

FOR

340' - 3" STEEL GIRDER BRIDGE

STR. NO. 50-280-139

FEBRUARY 2025

DESIGNED BY	CK. DES. BY	DRAFTED BY	
JH	ER	BT	BRIDGE ENGINEER
MINN05V6	05V6TA03		

PILE GROUT (CONTINUED)

2. Grout equipment will produce a uniformly mixed grout free of lumps and undispersed cement and be capable of continuously agitating the mix. Use a positive displacement grout pump to place the grout. The grouting equipment will be sized to enable the prebore to be grouted in one continuous operation. The grout will be placed within 60 minutes after mixing or within the time recommended by the admixture manufacturer if admixtures are used. Grout not placed within the time limit will be rejected.

3. After all the piling has been seated, grout the piling prebore to the proper elevation as stated in the plans. The piling will be grouted as soon as possible after drilling and seating of the pile. Inject the grout at the lowest point of each prebore through a grout tube. The outlet end of the grout tube will deliver grout below the surface of the grout as the grout tube is withdrawn to prevent the creation of voids. Fill the prebore to the proper elevation in one continuous operation.

4. All costs for furnishing and installing the pile grout including, labor materials, equipment, and incidentals necessary to complete the work will be at the contract unit price per foot for Preboring Grouted Pile.

SUPERSTRUCTURE

1. Structural steel will conform to ASTM A709 Gr. 50T2. Steel for diaphragms and stiffeners may conform to ASTM A709 Gr. 50. Shear connectors will conform to Section 7.3 Type B of the Bridge Welding Code.

2. Bolts, nuts and washers will conform to ASTM F3125, Grade A325.

3. The shear connectors will be installed during fabrication. Any request to field install the shear connectors must be approved by the Office of Bridge Design.

4. All butt-welded girder splices will be ultrasonically inspected.

5. The cost of welding and weld inspection will be incidental to the contract lump sum price for Structural Steel.

6. Structural Steel will be painted in accordance with Section 411 of the Specifications. The top coat will be an approved brown (Federal Standard 595 Color 30045).

7. The top of the top flange will be shop painted, following the shear connector attachment, with 3 mils of inorganic zinc primer in accordance with Section 411 of the Construction Specifications. No top coat of polyurethane will be applied.

8. Structural steel used in all girder web plates, girder flanges, and girder splice plates will comply with the Charpy-V-Notch toughness requirements set forth in Section 970 of the Construction Specifications. Material greater than 1 1/2 inches in thickness will require frequency (P) testing in lieu of heat lot (H) testing. See Girder Layout for location of tension and stress reversal areas of girder flanges.

9. The use of an approved deck finishing machine will be required during placement of bridge deck concrete. The deck finishing machine will be adjusted and operated in such a manner that the screed or screeds are parallel with the centerline of the bridge. The finish machine and concrete placement will be parallel to the skew of the bridge. If the deck finish machine cannot match the exact skew of the bridge, the difference will need be approved by the Engineer.

10. The concrete bridge deck will be placed and finished at a minimum rate of 65 feet of deck per hour measured along centerline roadway. If concrete cannot be placed and finished at this rate, the Engineer will order a header installed and operations stopped. If a header is required sometime during the pour operation, its location will be at or as near as possible to the three-quarter point of the span. Notify the Bridge Construction Engineer if deck pour operations are stopped. Operations may resume only when the Engineer is satisfied that a rate of 65 feet per hour can be maintained and the concrete has attained a minimum compressive strength of 2000 psi.

11. Dead Load camber will be cut into the girder webs. Do not induce or correct camber in plate girders by local heating without prior approval from the Engineer.

12. Snap ties, if used in the barrier curb formwork, will be corrosion resistant. The corrosion resistant ties will be inert in concrete and compatible with the reinforcing steel.

13. The Contractor is required to submit a detailed plan showing the proposed girder erection. The girder erection plan will be designed and stamped by a Professional Engineer registered with the State of South Dakota. The plan must be submitted 30 days prior to the start of work for approval by the Office of Bridge Design. The plan will include. But not limited to, complete sequencing details, splice bolt up procedures, girder pick point locations, temporary shoring details, and temporary bracing details.

14. All single girder segments will be adequately braced or held in position until the adjacent girder segment is placed and all diaphragms between the segments are fully installed and bolts fully tightened. Single girder segments will not be allowed to remain in place beyond the end of a work shift without connection to an adjacent girder segment with all diaphragms between the segments fully connected. At no time will a single girder segment be allowed over traffic.

15. See Special Provision for Concrete Penetrating Sealer.
16. Any concrete mortar that gets on all surfaces of all the superstructure components will be washed off or removed before it is dry.

BEARINGS

1. All steel for the bearings will conform to ASTM A709, Gr. 50.

2. The pre-formed fabric pads will be composed of multiple layers of 8-ounce cotton duck impregnated and bonded with high quality natural rubber or of equivalent and equally suitable materials compressed into resilient pads of uniform thickness after compression and vulcanization. The finished pads will withstand compression loads perpendicular to the plane of the laminations of not less than 10,000 psi without detrimental reduction in thickness or extrusion.

3. The bearing plates will be shop painted with 3 mils of inorganic zinc primer in accordance with Section 411 of the Construction Specifications. No top coat of polyurethane will be applied.

4. Tolerances and surface finish for Rocker Plates will be as follows:

Convex Radius Dimension	+0.000-inch to -0.010-inch
Surface Finish, Machined Surfaces	125 RMS or Better
Surface Finish, Other Surfaces	230 RMS or Better

5. Payment for furnishing and installing the bearings, including the pre-formed fabric pads under the bearing plates and painting, will be incidental to the contract lump sum price for Structural Steel.

FIELD BOLTED GIRDER SPLICES

1. Steel for splice and filler plates will conform to ASTM A709 Gr. 50T2

2. Bolts in flange splices will be placed with the heads down.

3. Bolts in web splices of exterior girders will be placed with the heads on the exterior face of girders.

4. All bolts will be fully tightened prior to removing temporary supports.

WELDING AND WELD INSPECTION

Main members referred to in Section 6.7 Nondestructive Testing of the Bridge Welding Code are identified as follows: girder webs, girder flanges, and bearing stiffeners. Ultrasonic testing of groove welds will be used in lieu of radiography. See girder layout for locations of tension and stress reversal areas of the girder flanges.

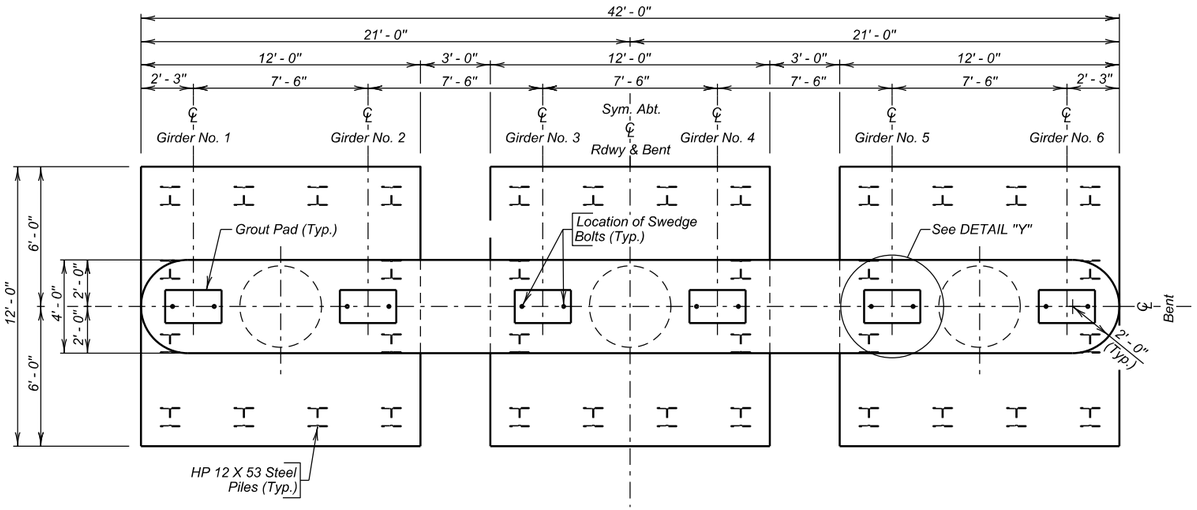
NOTES (CONTINUED)
FOR
340' - 3" STEEL GIRDER BRIDGE

STR. NO. 50-280-139
FEBRUARY 2025

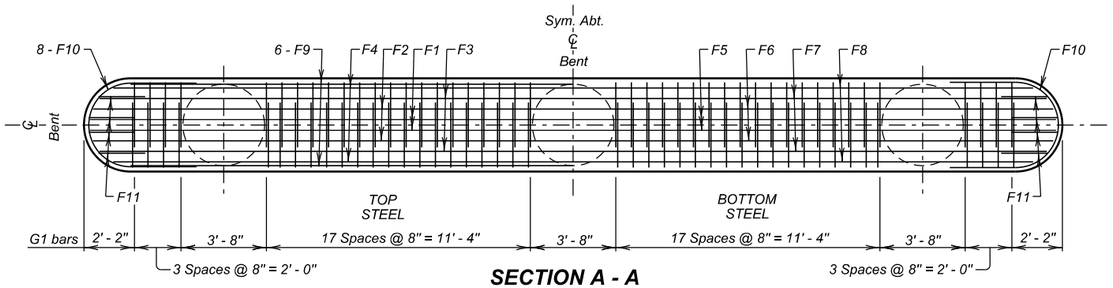
DESIGNED BY	CK. DES. BY	DRAFTED BY	
JH	ER	BT	Steve A Johnson BRIDGE ENGINEER
MINN05V6	05V6TA04		

Revised December 5, 2025 JH ER

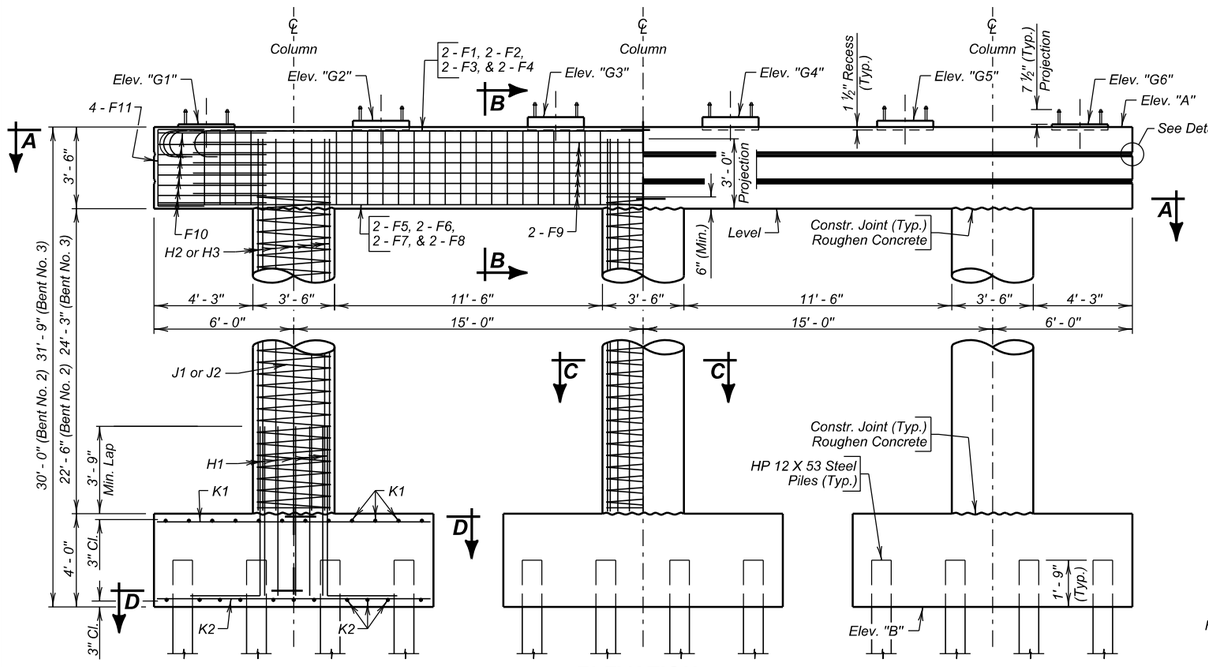
STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	P - PT 0011(145)83	E11	E59



PLAN



SECTION A - A



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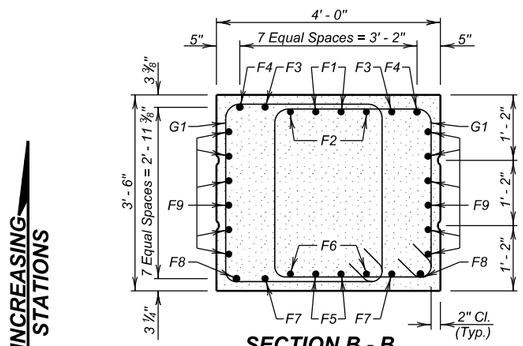

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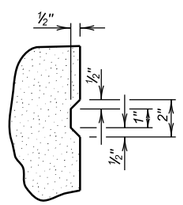

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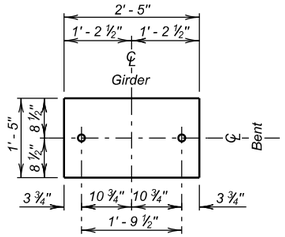
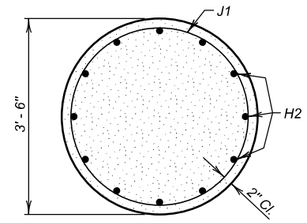
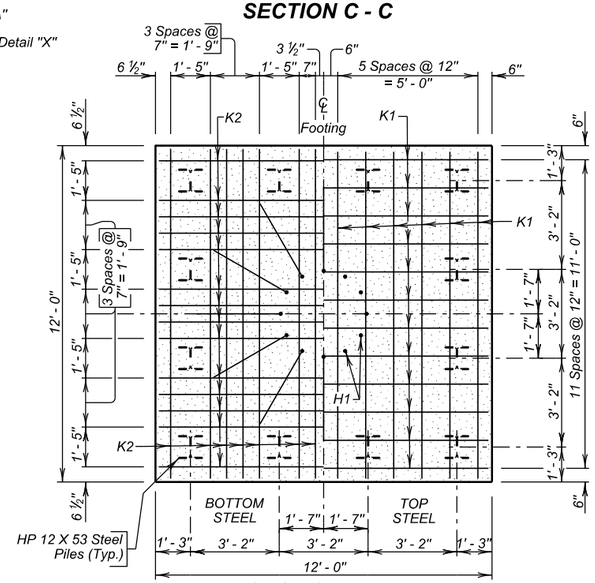


DETAIL "Y"
(Grout Pad)



SECTION C - C



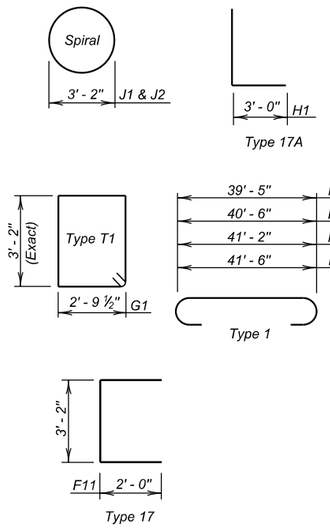
SECTION D - D

INCREASING STATIONS

REINFORCING SCHEDULE
(For One Bent - Two Required)

Mk.	No.	Size	Length	Type	Bending Details
F1	2	10	44' - 4"	1	
F2	2	10	44' - 0"	1	
F3	2	10	43' - 4"	1	
F4	2	10	42' - 3"	1	
F5	2	8	41' - 6"	Str.	
F6	2	8	41' - 2"	Str.	
F7	2	8	40' - 6"	Str.	
F8	2	8	39' - 5"	Str.	
F9	12	4	38' - 8"	Str.	
F10	16	4	11' - 6"	S11	
F11	8	4	7' - 2"	17	
G1	88	6	13' - 3"	T1	
H1	36	10	11' - 0"	17A	
H2	36	10	25' - 6"	Str.	
J1	3	4	462' - 1"	Spiral	
H3	36	10	27' - 3"	Str.	
J2	3	4	496' - 5"	Spiral	
K1	72	4	11' - 6"	Str.	
K2	84	9	11' - 6"	Str.	

Bent No. 2 / Bent No. 3



All dimensions are out to out of bars.
Spirals - Use 6" pitch and 1 ½ extra turns at each end. Use 1 ½ turns for lap at splice as required, or weld as approved by the Office of Bridge Design. Use 3 vertical spacer bars per column. Spirals may be smooth bars, bar length shown does not include splices.

ESTIMATED QUANTITIES

ITEM	UNIT	QUANTITY	
		Bent No. 2	Bent No. 3
⏍ Class A45 Concrete, Bridge	Cu. Yd.	109.6	111.5
△ Reinforcing Steel	Lb.	15185	15525
⊛ Structure Excavation, Bridge	Cu. Yd.	152	312
HP 12 X 53 Steel Test Pile, Furnish and Drive	Ft.	1 @ 25' = 25'	1 @ 30' = 30'
HP 12 X 53 Steel Bearing Pile, Furnish and Drive	Ft.	35 @ 25' = 875'	35 @ 30' = 1050'
HP 12 Pile Tip Reinforcement	Each	36	36
Preboring Grouted Pile	Ft.	36 @ 5' = 180'	36 @ 5' = 180'

⏍ Includes 0.2 Cu. Yds. for Grout Pads.
△ Includes Spacer Bars: 164 lbs. at each bent. Each spacer bar is computed at ¾ bs. per lin. ft. regardless of type furnished.
⊛ Excavation will be neat lined to the exact dimensions of the footing.

⟠ TABLE OF ELEVATIONS

Bent No.	Elev. "A"	Elev. "B"	Elev. "G1" or "G6"	Elev. "G2" or "G5"	Elev. "G3" or "G4"
2	1347.52	1317.52	1347.65	1347.80	1347.95
3	1347.05	1315.30	1347.18	1347.33	1347.48

NOTES:
⟠ Elev. "G1", "G2", "G3", "G4", "G5" and "G6" are on top of grout pads at ℄ Bent. Top of grout pads will be level and smooth.

BENT DETAILS

FOR

340' - 3" STEEL GIRDER BRIDGE

40' - 0" ROADWAY — 0° SKEW
OVER SPLIT ROCK CREEK — SEC. 10/11-T102N-048W
STA. 115 + 21.46 TO 118 + 61.71 — P - PT 0011(145)83
STR. NO. 50-280-139 — HL-93

MINNEHAHA COUNTY
S. D. DEPT. OF TRANSPORTATION
FEBRUARY 2025

9 OF 29

DESIGNED BY	CK. DES. BY	DRAFTED BY	
JH	ER	BT	Steve A Johnson BRIDGE ENGINEER
MINN05V6	05V6TA09		

DESIGN MIX OF CONCRETE (CONTINUED)

3. 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.

ABUTMENTS

1. Preboring piling at each abutment is required to whichever is greater, ten feet or to natural ground.

2. The HP 12x53 Piling were designed using a factored bearing resistance of 98 tons per pile. Piling will develop a field verified nominal bearing resistance of 245 tons per pile.

3. One test pile will be driven at each abutment and will become part of the pile group. The test pile will be driven before any other pile and will be driven to the required field verified nominal bearing resistance or as directed by the Engineer prior to driving any portion of the bearing piles.

4. The Contractor will have sufficient pile splice material on hand before pile driving is started. See Standard Plate 510.40.

5. Piles will not be driven out of position by more than three inches in the direction parallel to the girder centerline. A pile-driving template will be used to ensure this accuracy.

6. Each finished abutment will include a Bridge Survey Marker. See Standard Plate 460.05

7. Pile tip reinforcement will be required. See Standard Plate 510.30.

CONNECTION OF GIRDER TO PILE

1. Cut off piling at the elevations shown in the plans and weld bearing plates to the piling. Adjust as necessary to make bearing plates level, and to permit proper position of the girders. If piles are driven out of position to the extent that bearing plates will not fit, the Contractor will submit the method of correction to the Engineer for approval. Piles will not be pulled into position.

2. All girder erection will be complete with the splices fully bolted and diaphragms in place, before welding girders to bearing plates. (Diaphragms need not be secured with more than temporary bolting, prior to the pile to girder connections.)

3. An alternate connection, capable of transmitting a direct load of 8000 lbs. to the pile and developing 30,000 lbs. horizontal force, may be submitted to the Office of Bridge Design for prior approval.

4. This connection will not be made when the temperature is greater than 70° F or less than 30° F.

5. Steel for the bearing plates will conform to ASTM A709 Gr. 50.

6. Payment for furnishing and installing the bearing plates will be incidental to the contract lump sum price for Structural Steel.

POURING OF ABUTMENT CONCRETE

1. Abutment concrete will be placed, as directed by the Engineer, at a time when a relatively stable temperature can be expected. A relatively stable temperature is defined as an air temperature deviation of not more than 30° F within 12 hours of completing the abutment pour from the air temperature at the time when the abutment concrete is placed.

2. The forms will be secured to the girders in such a manner that they will be free to move longitudinally with the expansion or contraction of the girder.

3. The girders will be braced near the abutments in such a manner that their lateral movement or rotation will be prevented during the placing of concrete. The Contractor will include details for this bracing with the falsework plans.

PILE DRIVING

1. A drivability analysis was performed using the wave equation analysis program (GRLWEAP). The following pile hammers were evaluated and found to produce acceptable driving stresses:

   Delmag D19-42 APE D19-42 MVE M-19

2. Pile hammers not listed will require evaluation and approval prior to use from the Geotechnical Engineering Activity. Requests for evaluation of hammers not listed will be submitted a minimum of 5 business days prior to installation of piles.

3. Steel piling will obtain bearing on Corson Diabase bedrock. This material is extremely hard and impenetrable by nature. The Site Plan & Subsurface profile sheet should be reviewed to obtain approximate Corson Diabase elevations prior to pile driving operations. Extreme care should be taken during pile driving operations not to overstress the piles when the tips encounter Corson Diabase bedrock.

BENT

1. All Swedge Bolts will be 1 1/4-inch diameter x 2'-6" F1554, Grade 55 bolts with heavy hex nut and cut washer (listed with structural steel in Superstructure quantities). A minimum of 20% of the embedded bolt surface will be covered with deformations whose radial dimensions are 15 to 20% of the bolt diameter.

2. Spiral reinforcement may be fabricated from cold drawn wire conforming to ASTM A1064 or hot rolled plain or deformed bars conforming to the strength requirements of ASTM A615, Grade 60.

SPREAD FOOTING ON ROCK

1. Before exposure of the foundation area the Geotechnical Engineering Activity will be contacted through proper channels so that a member of the Geotechnical Engineering Activity may be present during excavation of the foundation area.

2. If upon inspection, the Geotechnical Engineering Activity personnel determine that the material at the plan shown footing elevation is unsuitable for foundation support or if sound bedrock is encountered at an elevation other than the plan shown footing elevation, the Engineer will order the footing elevation changed to an elevation approved by the Geotechnical Engineering Activity personnel. If the footing elevations are changed, the Office of Bridge Design will be contacted prior to proceeding with construction to determine if a redesign of the substructure unit is required. If a redesign is required, a maximum of 5 working days may be required to perform this design. Any costs associated to delays within the 5 working day period for redesign will be borne by the Contractor at no additional cost to the Department.

3. If the footing elevations are lowered due to bedrock conditions, the excavation below the plan shown footing elevation ordered by the Engineer will be paid for at the contract unit price per cubic yard for Structure Excavation, Bridge. The additional concrete and reinforcing steel required for bent construction will be paid for at the contract unit price per cubic yard for Class A45 Concrete, Bridge and contract unit price per pound for Reinforcing Steel, respectively.

4. The rock surface will be cleaned of all soil and debris prior to placing reinforcing steel for the spread footing. Cleaning will be accomplished by water washing or air jetting. Material washed from the rock surface will be directed into a sump or low area and physically removed from the exposed rock surface.

5. Vertical fractures in the foundation rock that the Geotechnical Engineer determines to be detrimental to the integrity of the foundation will be repaired. Designated fractures will be repaired by cleaning to remove soil and other relatively weak material to a depth of 1.5 to 2 times the width of the fracture. The cleaned opening will then be filled with grout or a lean concrete mix.

6. The cost of cleaning the rock will be included in the contract unit price per cubic yard for Structure Excavation, Bridge. Payment will be considered full compensation for all materials, labor, equipment and incidentals necessary to satisfactorily complete the work.

7. If cleaning and filling of rock fractures is ordered, the work will be paid for as EXTRA WORK, in accordance with Section 4.4 of the Construction Specifications.

8. It is anticipated that cofferdams will be necessary to construct the spread footing on rock at the bent. Due to the irregular surface of the bedrock, extra effort may be required to seal the cofferdam. Cofferdams will be designed and constructed in accordance with Section 423 of the Specifications.

NOTES (CONTINUED)

FOR

186' - 0" STEEL GIRDER BRIDGE

STR. NO. 50-280-136

APRIL 2025

DESIGNED BY	CK. DES. BY	DRAFTED BY	
JH	AH	BT	Steve A Johnson BRIDGE ENGINEER
MINN05V6	05V6TB03		

ROCK DOWELS

1. The steel dowels will be deformed bars conforming to ASTM A615 Grade 60.

2. Following the engineering evaluation of the foundation rock, the Engineer may order the number of dowels and/or spacing to be increased or decreased in accordance with the Geotechnical Engineer's recommendations. Increases or decreases in quantity will be at the unit price per foot for Install Dowel in Rock.

3. The steel dowel for use with the item Install Dowel in Rock is included in the Reinforcing Schedule and will be paid for at the contract unit price per pound for Reinforcing Steel.

4. Dowel bond material will be a fast set polyester resin rock anchoring system in a 40 mm (minimum) capsule from one of the following manufacturer's: Dywidag Systems International (Falsoc), Minova (Lokset), or Williams Form Engineering Corp. The resin will be suitable for bonding steel dowel bars to rock in the existing moisture conditions. The diameter of the hole, drilled into the rock, will be a maximum of 3/8-inch larger than the diameter of the steel dowel, or as specified by the dowel bond material manufacturer. The drilled holes will be blown out with compressed air using a device that will reach the bottom of the hole to ensure that all debris or loose material has been removed prior to epoxy injection. The Contractor must submit dowel bonding material product data and installation plan to the Engineer for approval.

5. A demonstration of the Contractor's rock dowel installation method must be performed and accepted by the Engineer prior to installation of any production dowels. The demonstration may either conducted within the footprint of the footing or adjacent exposed bedrock as approved by the Engineer. Additional dowels may be required at the expense of the Contractor should the demonstration not yield acceptable results. Dowels used for demonstration will be incidental to the contract unit price per foot for Install Dowel in Rock.

6. Install Dowel in Rock will not be measured unless a change is ordered. Payment will be for the linear foot of embedment into the rock and, will be considered full compensation for all materials, labor, equipment, and incidentals necessary to satisfactorily complete the work.

SUPERSTRUCTURE

1. Structural steel will conform to ASTM A709 Gr. 50T2. Steel for the diaphragms and stiffeners will conform to ASTM A709 Gr. 50. Shear connectors will conform to Section 7.3 Type B of the Bridge Welding Code.

2. Bolts, nuts and washers will conform to ASTM F3125, Grade A325.

3. The shear connectors will be installed during fabrication. Any request to field install the shear connectors must be approved by the Office of Bridge Design.

4. All butt-welded girder splices will be ultrasonically inspected.

5. The cost of welding and weld inspection will be incidental to the contract lump sum price for Structural Steel.

6. Structural Steel will be painted in accordance with Section 411 of the Specifications. The top coat will be an approved brown (AMS STD 595 Color 30045).

7. The top of the top flange will be shop painted, following the shear connector attachment, with 3 mils of inorganic zinc primer in accordance with Section 411 of the Construction Specifications. No top coat of polyurethane will be applied.

8. Structural steel used in all girder web plates, girder flanges, and girder splice plates will comply with the Charpy-V-Notch toughness requirements set forth in Section 970 of the Construction Specifications. Material greater than 1 1/2 inches in thickness will require frequency (P) testing in lieu of heat lot (H) testing. See Girder Layout for location of tension and stress reversal areas of girder flanges.

9. The use of an approved deck finishing machine will be required during placement of bridge deck concrete. The deck finishing machine will be adjusted and operated in such a manner that the screed or screeds are parallel with the centerline of the bridge. The finish machine and concrete placement will be parallel to the skew of the bridge. If the deck finish machine cannot match the exact skew of the bridge, the difference will need be approved by the Engineer.

10. The concrete bridge deck will be placed and finished at a minimum rate of 50 feet of deck per hour measured along centerline roadway. If concrete cannot be placed and finished at this rate, the Engineer will order a header installed and operations stopped. If a header is required sometime during the pour operation, its location will be at or as near as possible to the three-quarter point of the span. Notify the Bridge Construction Engineer if deck pour operations are stopped. Operations may resume only when the Engineer is satisfied that a rate of 50 feet per hour can be maintained and the concrete has attained a minimum compressive strength of 2000 psi.

11. Snap ties, if used in the barrier curb formwork, will be corrosion resistant. The corrosion resistant ties will be inert in concrete and compatible with the reinforcing steel.

12. The Contractor is required to submit a detailed plan showing the proposed girder erection. The girder erection plan will be designed and stamped by a Professional Engineer registered with the State of South Dakota. The plan must be submitted 30 days prior to the start of work for approval by the Office of Bridge Design. The plan will include but not limited to, complete sequencing details, splice bolt up procedures, girder pick point locations, temporary shoring details, and temporary bracing details.

13. All single girder segments will be adequately braced or held in position until the adjacent girder segment is placed and all diaphragms between the segments are fully installed and bolts fully tightened. Single girder segments will not be allowed to remain in place beyond the end of a work shift without connection to an adjacent girder segment with all diaphragms between the segments fully connected.

14. See Special Provision for Concrete Penetrating Sealer.

15. Any concrete mortar that gets on all surfaces of all the superstructure components will be washed off or removed before it is dry.

BEARINGS

1. All steel for the bearings will conform to ASTM A709, Gr. 50.

2. The pre-formed fabric pads will be composed of multiple layers of 8-ounce cotton duck impregnated and bonded with high quality natural rubber or of equivalent and equally suitable materials compressed into resilient pads of uniform thickness after compression and vulcanization. The finished pads will withstand compression loads perpendicular to the plane of the laminations of not less than 10,000 psi without detrimental reduction in thickness or extrusion.

3. The bearing plates will be shop painted with 3 mils of inorganic zinc primer in accordance with Section 411 of the Construction Specifications. No top coat of polyurethane will be applied.

4. Tolerances and surface finish for Rocker Plates will be as follows:

Convex Radius Dimension	+0.000-inch to -0.010-inch
Surface Finish, Machined Surfaces	125 RMS or Better
Surface Finish, Other Surfaces	230 RMS or Better

5. Payment for furnishing and installing the bearings, including the pre-formed fabric pads under the bearing plates and painting, will be incidental to the contract lump sum price for Structural Steel.

FIELD BOLTED GIRDER SPLICES

1. Steel for splice and filler plates will conform to ASTM A709 Gr. 50T2

2. Bolts in flange splices will be placed with the heads down.

3. Bolts in web splices of exterior girders will be placed with the heads on the exterior face of girders.

4. All bolts will be fully tightened prior to removing temporary supports.

NOTES (CONTINUED)

FOR

186' - 0" STEEL GIRDER BRIDGE

STR. NO. 50-280-136

APRIL 2025

DESIGNED BY	CK. DES. BY	DRAFTED BY	
JH MINN05V6	AH 05V6TB04	BT	Steve A Johnson BRIDGE ENGINEER