**NOTES:**

1. Elev. 1717.928
2. Elev. 1717.818
3. Elevations with a **are Top of Finished Slab at Left Curb.
4. Elevations with a ^ are Top of Finished Slab at Crown Point.

**Class B Riprap (Typ.)**

**Pier No. 4**

L = 5 -

**Elev. 1711.27**

2 9' - 6''

**NOTES:**

1. Elevations with a **are Top of Finished Slab at Left Curb.
2. Elevations with a ^ are Top of Finished Slab at Crown Point.

**Class B Riprap (Typ.)**

**Pier No. 2**

L = 10' - 7

**Elev. 1716.27**

20' - 0'' (Typ.)

**Sta. 24 + 61.80**

L = 100'

**Type B Drainage Fabric (Typ.)**

**Elev. 1717.67**

10' - 7

**Elev. 1717.72**

5' - 6''

**Berm**

**STRAIGHTNING**

**P. I. Sta. 18 + 50.00**

**P. I. Sta. 26 + 05.00**

**S. D. DEPT. OF TRANSPORTATION**

**CODINGTON COUNTY**

**S. D. DEPT. OF TRANSPORTATION**

**SEPTMBER 2017**

**GENERAL DRAWING**

**FOR**

155'- 0" CONT. CONCRETE BRIDGE

58'- 0" ROADWAY & 5'- 0" SIDEWALKS

0'SKEW

OVER BIG SIOUX RIVER

SEC. 31-63-T117-R52

STA. 23 + 41.80 TO 24 + 96.80

STR. NO. 15-181-180

PCN 0272

A. J. Schuck

DESIGNED BY

DK. DES. BY

GRADED BY

NO. OF SHEETS 39
ESTIMATE OF STRUCTURE QUANTITIES

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>QUANTITY</th>
<th>UNIT</th>
<th>REMARKS</th>
</tr>
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<tbody>
<tr>
<td>Concrete Penetrating Sealer</td>
<td>1,016</td>
<td>CyYd</td>
<td>See Special Provision</td>
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<tr>
<td>Incidental Work, Structure</td>
<td></td>
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<tr>
<td>Membrane Sealant Expansion Joint</td>
<td>146.7</td>
<td>Ft</td>
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<td>Structure Excavation, Bridge</td>
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<td>CyYd</td>
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<td>Bridge Embankment</td>
<td>207</td>
<td>CyYd</td>
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<td>Granular Bridge End Backfill</td>
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<td>Approach Slab Underdrain Excavation</td>
<td>5.3</td>
<td>CyYd</td>
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<td>Class A45 Concrete, Bridge Deck</td>
<td>599.3</td>
<td>CyYd</td>
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<td>Concrete Approach Slab for Bridge</td>
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<td>Concrete Approach Sleeper Slab for Bridge</td>
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<td>Deck Drain, Slab Bridge</td>
<td>8</td>
<td>Each</td>
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<td>Controlled Density Fill</td>
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<td>Steel Pedestrian Railing on Sidewalk</td>
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<td>Steel Pedestrian Railing on Concrete Barrier</td>
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<td>Reinforcing Steel</td>
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<td>Lb</td>
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<tr>
<td>Epoxy Coated Reinforcing Steel</td>
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<td>Prefabricated Slab</td>
<td>81</td>
<td>Each</td>
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<tr>
<td>HP 10x42 Steel Test Pile, Furnish and Drive</td>
<td>490</td>
<td>Ft</td>
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<tr>
<td>HP 10x42 Steel Bearing Pile, Furnish and Drive</td>
<td>10,140</td>
<td>Ft</td>
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<td>4' Rigid Galvanized Steel Conduit</td>
<td>310</td>
<td>Ft</td>
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<td>6' Reinforced Concrete Sidewalk</td>
<td>544</td>
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<td>6' Undrained Pipe</td>
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<td>Type B Drainage Fabric</td>
<td>928</td>
<td>SqYd</td>
<td></td>
</tr>
</tbody>
</table>

GENERAL CONSTRUCTION

1. All mild reinforcing steel shall conform to ASTM A615, Grade 60.
2. All exposed concrete corners and edges shall be chamfered 3/4” unless noted otherwise.
3. Use 2” clear cover on all reinforcing steel except as shown.
4. Contractor shall imprint on the structure the date of new construction as specified and detailed on Standard Plate No. 460.02.
5. Barrier Curbs shall be built normal to the grade.
6. Request for construction joints or re-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 re-steel.
7. The elevation of the bridge deck is 21.5” above subgrade elevation.

INCIDENTAL WORK, STRUCTURE

1. In place centerline Sta. 23+50.80 to centerline Sta. 24+96.80 is a 145.0’ 4 span continuous concrete slab bridge with a 54’-0” clear roadway. The superstructure consists of a reinforced concrete slab with concrete barrier curb continuous across the bridge and 5’-0” cantilever sidewalk with steel railing on both sides of the bridge. The deck includes a 1 inch low slump dense concrete overlay and a single layer epoxy chip seal overlay. The substructure consists of reinforced concrete pier walls and reinforced concrete vertical abutments, all of which are supported on timber piling. The east abutment includes sheet pile in front of the embank and a portion of the sidewalk of the adjacent dam. A 26 1/2” sanitary sewer pipe is located approximately 27 feet north of the roadway centerline. The pipe is to be relocated by the City of Watertown.

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 Specifications. All portions of the existing bridge shall 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. A portion of the sidewalk of the adjacent dam shall be removed to construct Abutment No. 5. See Abutment No. 5 Details (A).

3. During demolition of the structure, efforts shall be taken to prevent material from falling into the river. Under no circumstances is asphalt allowed to fall into the river.

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 shall be 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.

5. It is anticipated that at least 81 timber piers will interfere with piling for this new structure. Any existing pier that interferes with piling for the new structure shall be extracted. Payment for the extracting piling shall be contract unit price per each for Extract Pile and shall be full compensation for extracting piling including materials, labor, and equipment necessary or incidental to the satisfactory completion of this work.

DESIGN MIX OF CONCRETE

1. All structural concrete shall be Class A45 unless otherwise indicated.
2. Type II cement is required.

ABUTMENTS

1. Pro boring piling at each abutmentcmt is required to whiochov in greater, ten feet or to natural ground
2. The HP 10x42 Piling were designed using a factored bearing resistance of 77 tons per pile. Piling shall develop a field verified nominal bearing resistance of 122 tons per pile.
3. The contractor shall have sufficient pile splice material on hand before pile driving is started. See Standard Plate No. 510.40.
4. Piles shall not be driven out of position by more than three inches in the direction normal to the abutment centerline. A pile-driving template shall be used to ensure this accuracy.
5. One test pile shall be driven at each abutment and will become part of the pile group.
6. Each finished abutment shall include a Bridge Survey Marker. See Standard Plate No. 460.05.

SPECIFICATIONS FOR BRIDGE


BRIDGE DESIGN LOADING

1. AASHTO HL-93.
2. Dead Load includes 22 psf for future wearing surface on the roadway.

DESIGN MATERIAL STRENGTHS

<table>
<thead>
<tr>
<th>Material</th>
<th>Strength</th>
</tr>
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<tr>
<td>Concrete</td>
<td>f_c = 4,500 psi</td>
</tr>
<tr>
<td>Reinforcing Steel</td>
<td>f_y = 60,000 psi</td>
</tr>
<tr>
<td>Piling (ASTM A572 Grade 50)</td>
<td>f_y = 50,000 psi</td>
</tr>
</tbody>
</table>

REQUIRED LIST

1. Title Block
2. Project Block
3. Estimate of Quantities
4. Notes

ESTIMATE OF STRUCTURE QUANTITIES AND NOTES

FOR

155'-0” CONT. CONCRETE BRIDGE

STR. NO. 15-181-180

SEPTEMBER 2017

DESIGNED BY: TODAY

CHECKED BY: NEXT DAY

GRAFTED BY: NEXT DAY

PROJECT NO. 8-6

SHEET NO. 4 OF 4
1. A drivability analysis was performed using the wave equation analysis program (GRL/WEAP). The following pile hammer evaluations were evaluated and found to produce acceptable driving stresses:

Delmag D25-32  Delmag D30-32
SPI D30  APE D30-52

2. Pile hammers not listed will require evaluation and approval prior to use from the Geotechnical Engineering Activity.

PIERS
1. The HP 10x42 Piling were designed using a factored bearing resistance of 77 tons per pile. Piling shall develop a 0.95 factored nominal bearing resistance of 192 tons per pile.
2. One test pile shall be driven at each bent and will become part of the pile group.
3. The contractor shall have sufficient pile splice material on hand before pile driving is started. See Plate No. 5.10.40
4. It is anticipated that cofferdams and foundation seals will be necessary. Cofferdams and foundation seals shall be designed and constructed in accordance with Section 423 of the Specifications. Contact the Office of Bridge Design if additional piles are required.
5. Galvanize the pier wall armoring plates and anything welded to them after all welding is completed. They shall be galvanized in accordance with AASHTO M111 (ASTM A123). If welded splices are used subsequent to galvanizing, the weld details and the procedures for preparing the surface for welding and repairing the galvanizing after welding shall be included with the shop plans. Repair of galvanizing shall be by zinc-based solder method in conformance with ASTM A780.
6. Steel for the pier wall armoring plates shall be 1/16" thickness and conform to ASTM A709, Grade 36. Shear connectors shall conform to Clause 7.3, Type A or B of the AASHTO/AWS D1.5 Bridge Welding Code.
7. Welding for the pier wall armoring plates shall be in accordance with AWS D11 Structural Welding Code – Steel.
8. The cost of the pier wall armoring plates complete and in-place including fabrication, welding, and galvanizing shall be incidental to the contract unit price per cubic yard for Class A45 Concrete, Bridge.

SUPERSTRUCTURE
1. Preplanned construction joints may be used in accordance with Section 460.3 of the Specifications. Contact the Office of Bridge Design for joint configuration and allowable location. Emergency slab construction joints shall be as shown with the superstructure details. If an emergency slab joint is used, contact the Office of Bridge Design before proceeding with deck pour.

2. The deck-finishing machine shall be adjusted and operated in such a manner that the roller screed or screeds are parallel with the centerline of the bridge and the finish machine is parallel to the skew of the bridge. Concrete placement in front of the finish machine shall be kept parallel to the machine.
3. Barrier curbs shall be poured after all the slab has been poured. Superstructure falsework shall not be removed until bridge deck concrete, including barrier curbs, has attained a strength of 2400 psi.
4. The bridge deck must be placed and finished continuously at a minimum rate of 22 ft. of deck per hour measured along centerline roadway. If concrete cannot be placed and finished at this rate, the Engineer shall order a header installed and operations stopped. Notify the Bridge Construction Engineer if deck pour operations are stopped. Operations may resume only when the Engineer is satisfied that a minimum rate of 22 ft. of deck pour per hour can be achieved and the concrete in the previous pour has attained a minimum compressive strength of 2000 psi.
5. Snap ties, if used in barrier curb formwork, shall be epoxy coated. The epoxy coating shall be inert in concrete and compatible with the coating applied to the new epoxy coated reinforcing steel.

CLASS A45 CONCRETE, BRIDGE DECK
1. Concrete used in the bridge deck slab and barrier curbs shall be in accordance with the requirements for bridge deck concrete as specified in Section 460.3 A of the Specifications.
2. See Special Provision for Concrete Penetrating Sealer.

CLASS B COMMERCIAL TEXTURE FINISH
1. A Class B commercial texture finish shall be applied to the following areas:

| a) *Abutments: all exposed surfaces to an elevation 1ft below finished ground line. |
| b) Barrier Rail: all exposed surfaces (**front, **top and *back). |
| c) *Slab: edge of slab. |
| d) **Piers: all exposed surfaces. |

*Color shall be an approved tan. **Color shall be "Pearl White."

2. The Class B commercial texture finish shall be applied in accordance with Section 460.3 L 1.c of the Specifications.

3. Where the Class B commercial texture finish is to be applied, concrete curing shall be accomplished with cotton or burlap mats and polyethylene sheeting. Curing shall continue for not less than seven days after placing concrete before the commercial texture finish is applied. The commercial texture finish shall be applied in accordance with the manufacturer’s recommendations. The commercial texture finish itself does not require a specific cure except for drying.

APPRAOCH SLABS
1. Sleeper slab riser shall be cast with the approach slab or cast after the approach slab is placed. Care shall be taken to ensure the correct grade is maintained across the joint.
2. The portion of the sleeper slab below the construction joint may be precast. If the bottom portion of the sleeper slab is precast, the Contractor shall submit proposed lifting and setting plans to the Bridge Construction Engineer for approval. In addition, if reinforcing or other details differ from those shown in the plans, the Contractor shall submit proposed alternate details for approval.
3. The use of an approved finishing machine will be required during placement of Class A45 Concrete for the approach slabs. Concrete placement in front of the machine shall be kept parallel to the screed.
4. The concrete in the approach slab shall be tined normal to centerline roadway.
5. Concrete Approach Sleeper Slab for Bridge, whether cast-in-place or precast, will be paid for at the contract unit price per square yard. This payment shall be full compensation for all excavation, furnishing, hauling, and placing all materials including concrete and reinforcing steel; for disposal of all excavated material and surplus materials; and for labor, tools, equipment and any incidentals necessary to complete this item of work.
6. Concrete Approach Slab for Bridge will be paid for at the contract unit price per square yard. This payment shall be full compensation for all excavation, furnishing, hauling, and placing all materials including concrete, asphalt painted or 6 mil polyethylene sheeting, elastic joint sealant and reinforcing steel; for disposal of all excavated material and surplus materials and for labor, tools, equipment and any incidentals necessary to complete this item of work.

NOTES (CONTINUED)
1. Notes
DECK DRAINS

1. Deck Drains shall be 4” diameter by 1’ – 6 ½” Schedule 40 Polyvinyl Chloride (PVC) Plastic Pipe conforming to the requirements of ASTM D1785.

2. A 4 1/2 inch diameter by 2 inch PVC Plastic Pipe Sleeve conforming to the requirements of ASTM D1785 shall be attached to the 4” diameter PVC Pipe, as shown in the plans, with a solvent cement conforming to ASTM D2584.

3. Payment for Deck Drains shall be at the contract unit price per each for Deck Drain, Slab Bridge, and shall be full compensation for furnishing, fabricating and installing the deck drains in accordance with the Plans and Specifications.

4. The location of the deck draining may be adjusted slightly to clear transverse slab steel.

STEEL RAILING – SIDEWALK

1. All rail posts shall be built vertical

2. All structural steel parts for railing shall conform to ASTM A500, Grade B. Material less than 1/4” thick may be ASTM A1011, Grade 36. Rail post base plates shall conform to ASTM A709, Grade 36.

3. All anchor bolts and nuts for railing shall conform to ASTM A307. Washers shall conform to ASTM F436 and all components shall be galvanized in accordance with ASTM A153 or ASTM F2329, as applicable. The bolts shall be hex head “structural” type with heavy hex nuts and round washers.

4. All anchor bolts shall be tightened to a torque of 120 ft.-lbs. (approximated without the use of a calibrated torque wrench).

5. The non-shrink grout used to fill the recesses beneath the rail post base plates shall be a commercially available non-shrink grout containing no metallic particles and capable of attaining a 28 day compressive strength of 3000 psi. The non-shrink grout shall be mixed according to the manufacturer’s recommendations. The cost of furnishing and placing the non-shrink grout shall be incidental to the contract unit price per foot for Steel Pedestrian Railing on Sidewalk.

6. All steel railing shall be galvanized after shop welding in accordance with ASRM A123 and shall be painted in accordance with Section 411 of the Specifications and the color shall be an approved black (Federal Standard 595B Color 27038). The galvanized steel railing shall be cleaned in accordance with ASTM D6386 before painting.

7. Welding & Weld Inspection shall be done in accordance with the current edition of AWS D1.1 Structural Welding Code-Steel.

8. The costs of structural steel, welding, weld inspection, painting and galvanizing shall be incidental to the contract unit price per foot for Steel Pedestrian Railing on Sidewalk and Steel Pedestrian Railing on Concrete Barrier.

SIDEWALK APPROACH SLABS

1. The reinforced concrete sidewalks adjacent to the bridge shall be paid for at the contract unit price per square foot for 6” Reinforced Concrete Sidewalk. This payment will be full compensation for all excavation, furnishing, hauling and placing all materials including concrete, epoxy coated reinforcing steel, asphalt paint or 4 mil polyethylene sheathing, hot poured elastic joint sealant; for disposal of all excavated and surplus materials; and for all labor, tools, equipment and incidentals necessary to complete this item of work.

2. The top of the sidewalk shall transition from the end of the bridge to the top of approach slab curb at the sidewalk expansion device.

3. All costs involved in furnishing and placing the sidewalk sleeper slabs shall be included in the contract unit price per square foot for 6” Reinforced Concrete Sidewalk.

NOTICE - LEAD BASED PAINT

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

4” RIGID GALVANIZED STEEL CONDUIT

1. The 1/4” diameter concrete inserts for conduit clamps shall be commercially available inserts threaded for use with a galvanized 1/4” diameter A307 bolt. The inserts shall be capable of developing the strength of A307 bolt and shall be galvanized or stainless steel. The cost of furnishing and installing the inserts shall be incidental to the contract unit price per cubic yard for Class A45 Concrete, Bridge Deck.

2. The cost for furnishing and installing the 5” sleeves and polyethylene sheathing shall be incidental to the contract unit price per cubic yard for Class A45 Concrete, Bridge.

REQUIRED LIST

1. Title Block
2. Project Block
3. Notes

NOTES (CONTINUED)

FOR
155' - 0" CONT. CONCRETE BRIDGE
STR. NO. 15-181-180
SEPTEMBER 2017

DESIGNED BY
CK DESIGNED BY
DRAWN BY
**REQUIRED LIST**

1. Title Block
2. Subsurface Profile
3. Project Block
4. North Arrow
5. Plan View (Piling Layout)

**LEGEND**
- Penetration Test
- Water
- Sample Zone
- Drive Test
- Caved

The Geotechnical Engineering Activity has all of the boring logs and laboratory test results available for review at the Central Office in Pierre.

**Glaciated Terrain** contains all sizes of natural mineral sediment ranging from clay to boulders. Streams originating in or flowing through glaciated topography contain sediment loads derived from glaciated sources. Stream and river crossings contain sediment naturally sorted and randomly concentrated. Alluvial sediment located at this project location may have concentrated coarser gravel such as pebbles, cobbles and boulders. The borings shown only represent material that was found at the exact location of the small diameter drill hole. Coarse granular material may be present in areas not penetrated by the depicted borings.

Glaciated Terrain contains all sizes of natural mineral sediment ranging from clay to boulders. Streams originating in or flowing through glaciated topography contain sediment loads derived from glaciated sources. Stream and river crossings contain sediment naturally sorted and randomly concentrated. Alluvial sediment located at this project location may have concentrated coarser gravel such as pebbles, cobbles and boulders. The borings shown only represent material that was found at the exact location of the small diameter drill hole. Coarse granular material may be present in areas not penetrated by the depicted borings.

Penetration test holes are drilled with a 6-inch drill stem and to measure the resistance to penetration of the soil. Drive tests are conducted by dropping a 490 pound hammer 30 inches to drive a 2-inch nominal diameter sample. Penetration tests are conducted by driving a 145 pound hammer 30 inches to obtain 2-inch nominal diameter samples and to measure the resistance to penetration of the soil. Penetration Test results are listed as uncorrected "N" values in blows per foot.

**GROUNDWATER ELEVATIONS**

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<th>Hole Number</th>
<th>Blows per Foot</th>
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<td>A1</td>
<td></td>
<td>1709.6</td>
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<tr>
<td>A2 (DRY)</td>
<td></td>
<td>1710.9</td>
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<td>A3</td>
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<td>1709.7</td>
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<td>A4 (DRY)</td>
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<td>1709.8</td>
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<tr>
<td>A5</td>
<td></td>
<td>1709.7</td>
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**MEASURED SKIN FRICTION**

Drive tests are conducted by dropping a 490 pound hammer 30 inches to drive a 2 1/2 inch drill stem to measure the resistance to penetration of the soil. Penetration test holes are drilled with a 6 1/2 inch diameter hollow stem auger. Penetration tests are conducted by dropping a 145 pound hammer 30 inches to obtain 2 inch nominal diameter samples and to measure the resistance to penetration of the soil. Penetration Test results are listed as uncorrected "N" values in blows per foot.

**GROUNDBORING LOG**

Drive tests are conducted by dropping a 490 pound hammer 30 inches to drive a 2 1/2 inch drill stem to measure the resistance to penetration of the soil. Penetration test holes are drilled with a 6 1/2 inch diameter hollow stem auger. Penetration tests are conducted by dropping a 145 pound hammer 30 inches to obtain 2 inch nominal diameter samples and to measure the resistance to penetration of the soil. Penetration Test results are listed as uncorrected "N" values in blows per foot.
REQUIRED LIST
1. Title Block
2. Project Block
3. North Arrow
4. Plan View (Piling Layout)

NOTE:
This sheet is to be used in conjunction with the SUBSURFACE INVESTIGATION AND PILING LAYOUT sheet.

PILING LAYOUT DETAILS
FOR
155°-0° CONT. CONCRETE BRIDGE
59°-0° ROADWAY & 5°-0° SIDEWALKS
0° SKEW
OVER BIG SIOUX RIVER
ST. 23 + 41.80 TO 24 + 96.80
CODINGTON COUNTY
SEPTEMBER 2017

ESTIMATED QUANTITIES

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<thead>
<tr>
<th>ITEM</th>
<th>UNIT</th>
<th>QUANTITY</th>
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</thead>
<tbody>
<tr>
<td>Extract Pile</td>
<td>Each</td>
<td>81</td>
</tr>
</tbody>
</table>

NOTE:
Existing timber piles to be extracted.
ABUTMENT NO. 1 DETAILS (A)

FOR
155' - 0" CONT. CONCRETE BRIDGE
59' - 0" ROADWAY & 5' - 0" SIDEWALKS
0' SKEW
OVER BIG SIOUX RIVER
SEC. 3-16-T117-116R52W
STA. 23 + 41.80 TO 24 + 96.80
NH 0212(168)376
CODINGTON COUNTY
SEPTEMBER 2017

31 + 80.00 TO 31 + 131.80
STATE DEPT. OF TRANSPORTATION
SEGMENT 155-05-01

Diagram showing details of bridge construction, including:
- HP 10 x 42 Steel Pile (Typ.)
- Crown Slope 0.02 ft./ft.
- Construction Joint
- Roughen Concrete
- Cover with polyethylene sheeting.
- 3" Ø Sleeves for conduit.

Note: All details are as required and shown per plans and specifications.
REQUIRED LIST

1. Title Block
2. Project Block
3. Plan View
4. Elevation View
5. Sections as Required
6. Details as Required

NOTE:
H1 and H2 bars may be adjusted slightly to clear HP 10 X 42 Steel Piles.

155' - 0'' CONT. CONCRETE BRIDGE
FOR
155' - 0'' ROADWAY & 5' - 0'' SIDEWALKS
0° SKEW
OVER BIG SIOUX RIVER
SEC: 31-6-T117/116N-R52W
STA. 23 + 41.80 TO 24 + 96.80
NH 0212(168)376
CODINGTON COUNTY
S. D. DEPT. OF TRANSPORTATION
SEPTEMBER 2017

KL20 X 42 Steel Pile (Typ.)

Plan View
Elevation View
Sections as Required
Details as Required

NOTE:
2/3" Galvanized 24'' x 15' - 8''
### Deck Drain Detail

(See GENERAL DRAWING for spacing of Deck Drains and NOTES (CONTINUED) sheet for deck drain notes.)

5" Preformed Expansion Joint Material with 3" x 3/8" Low - Modulus Silicone Joint Sealer (Color to Match Special Surface Finish)

See TAPERED BARRIER DETAILS (A) for details.

### Drain and Barrier Details

1 - B5

3 - B12 & B16

### Barrier Curb & Deck Drain Details

FOR 155'-0" CONT. CONCRETE BRIDGE

59'-0" ROADWAY & 5'-0" SIDEWALK

6'-0" SKEW

OVER BIG SIOUX RIVER

SEC. 316-T117N-R52W

STA. 23 + 41.80 TO 24 + 96.80

NH 212(168376)

CODINGTON COUNTY

S. D. DEPT. OF TRANSPORTATION

SEPTEMBER 2017

DESIGNED BY

D. K. DES. BY

GRAFTED BY

31' - 0" CONCRETE BRIDGE OVER BIG SIOUX RIVER

SEC. 31/6-T117/116N-R52W

NH 0211(168376)

CODINGTON COUNTY

SEPTEMBER 2017

DESIGNED BY

D. K. DES. BY

GRAFTED BY
NOTE:
For listing of re-bars see SUPERSTRUCTURE DETAILS sheet.

For listing of re-bars see SUPERSTRUCTURE DETAILS sheet.
Steel Pedestrian Railing Details (A)

For

155'-0" Cont. Concrete Bridge

59'-0" Roadway & 6'-0" Sidewalks

0° Skew

Over Big Sioux River

Sec. 31, T117N, R52W

Sta. 23 + 41.80 to 24 + 96.80

NH 0212168376

Str. No. 15-181-180

HL-93

Codington County

S. D. Dept. of Transportation

September 2017

Estimated Quantities

<table>
<thead>
<tr>
<th>Item</th>
<th>Unit</th>
<th>Quantity</th>
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<tbody>
<tr>
<td>Steel Pedestrian Railing in Sidewalk</td>
<td>Ft.</td>
<td>391.0</td>
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Details as Required

- Required List
  - Title Block
  - Project Block
  - Plan View
  - Elevation View

See DETAIL "C"
NOTE:
- Conduit to be installed with bridge end backfill. See Section L.

REQUIRED LIST:

1. Title Block
2. Sheet Title Block
3. Project Block
4. Sec. D - D
5. Sec. B - B
6. Sec. E - E
7. Sec. C - C

 DETAILS OF BRIDGE END BACKFILL
ADJACENT TO ABUTMENT NO. 1 (B)

FOR

155' - 0" CONT. CONCRETE BRIDGE
59' - 0" ROADWAY & 6' - 0" SIDEWALKS
0° SKEW
OVER BIG SIOUX RIVER
SEC. 316-T117/R65, NH-92W
STA. 23 + 41.80 TO 24 + 96.80
NH-0212168376
STR. NO. 15-181-180
HL-93

CODINGTON COUNTY
S. D. DEPT. OF TRANSPORTATION
SEPTEMBER 2017
NOTE: 8" Conduit to be installed with Bridge end backfill. See Section L.

**REQUIRED LIST**

1. Fill Block
2. Project Block
3. Sec. B - B
4. Sec. C - C
5. Sec. D - D
6. Sec. E - E

** DETAILS OF BRIDGE END BACKFILL ADJACENT TO ABUTMENT NO. 5 (B)**

FOR

155'-0" CONT. CONCRETE BRIDGE

58'-0" ROADWAY & 8'-0" SIDEWALKS  0° SKEW

OVER BIG SIOUX RIVER  SEC. 31-8-12N-R52W

STA. 23 + 41.80 TO 24 + 96.80  NH 0212(168)376

STR. NO. 15-181-180

CODINGTON COUNTY

S. D. DEPT. OF TRANSPORTATION

SEPTEMBER 2017

DESIGNED BY

DRAFTED BY
REQUIRED LIST

1. Title Block
2. Project Block
3. Plan Views

DETAILS OF APPROACH SLAB ADJACENT TO BRIDGE (A)

FOR
155'-0" CONT. CONCRETE BRIDGE
50'-0" ROADWAY & 5'-0" SIDEWALK
6'-0" SKEW
OVER BIG SIOUX RIVER
SEC. 31/6-T117/116N-R52W
STA. 23 + 41.80 TO 24 + 96.80
NH 0212(168)376
STR. NO. 15-181-180
CODINGTON COUNTY
S. D. DEPT. OF TRANSPORTATION
SEPTEMBER 2017

1. Plan Views
2. Plan Views
3. Plan Views

(Adjacent to Abut. No. 1, Abut. No. 5 similar opposite hand)
Joint Material
- Preformed Expansion Joint Material with 5/8" x 5/8" Low-Modulus Silicone Joint Sealer (Color to Match Special Surface Finish)
- Low-Modulus Silicone Joint Sealer (Color to Match Special Surface Finish)
- See DETAIL "V"

Tapered Barrier Details (A)

Plan View
Details as Required
Sections as Required

155' - 0" CONT. CONCRETE BRIDGE
OVER BIG SIOUX RIVER
SEC. 31/6-T117/116N-R52W
STA. 23 + 41.80 TO 24 + 96.80
59' - 0" ROADWAY & 5' - 0" SIDEWALK

CODINGTON COUNTY
S. D. DEPT. OF TRANSPORTATION
SEPTEMBER 2017

DESIGNED BY \ D. K. DES. BY \ DRAFTED BY
15-181-180 HL-93
The Membrane Sealant shall be on the approved product list for Membrane Sealant Expansion Joints.

The manufacturer shall supply the membrane sealant in packaging that precompresses the membrane sealant. The precompressed dimension shall be as recommended by the sealant manufacturer, however, in no case shall the precompressed dimension exceed 75% of the joint opening width. The form sealant shall be slowly self-expanding to permit sufficient time to install the membrane sealant before the membrane sealant becomes the joint opening width.

The membrane sealant shall provide a water tight seal throughout a joint movement range of > 39% (minimum) from the specified joint opening dimension. The membrane sealant shall be electrically and ozone resistant.

The bonding adhesive used to attach the membrane sealant to the adjacent concrete shall be approved by the manufacturer.

The bonding adhesive used to attach the membrane sealant to the adjacent concrete shall be approved by the membrane sealant manufacturer.

7. Surfaces that will be in contact with the membrane sealant shall be thoroughly cleaned by abrasive blasting to remove all laitance and contaminants (such as oil, curing compounds, etc.) from the surface. At a minimum, two passes of abrasive blasting with the nozzle held at an angle to within 1 to 2 inches of the surface will be required. Cleaning of the surface with solvents, wire brushing, or grinding shall not be considered sufficient.

8. The minimum ambient air temperature at the time of joint installation and adhesive curing shall be 40° F. Temperature variation affecting the bonding adhesive shall be reported to the Engineer.

9. A technical representative of the membrane sealant manufacturer shall be present at the jobsite during joint installation for his review.

10. Surfaces that will be in contact with the membrane sealant shall be thoroughly cleaned by abrasive blasting to remove all laitance and contaminants (such as oil, curing compounds, etc.) from the surface. At a minimum, two passes of abrasive blasting with the nozzle held at an angle to within 1 to 2 inches of the surface will be required. Cleaning of the surface with solvents, wire brushing, or grinding shall not be considered sufficient.

11. Includes non-water bearing, non-refractory ma...
The elevations shown in these plans are based on the National Geodetic Survey (NGS) North American Vertical Datum of 1988 (NAVD88).

RIPRAP DETAILS

SEC. A - A

Class B Riprap

Type B Drainage Fabric

Elev. 1705.74

Elev. 1712.73

Existing Wall

Controlled Density Fill

SEC. B - B

Class B Riprap

Type B Drainage Fabric

Elev. 1706.84

Elev. 1710.40

Elev. 1712.27

Elev. 1709.14

BEGIN BRIDGE

STA. 23 + 41.80

END BRIDGE

STA. 24 + 96.80

4

1

5

3

2

6

REQUIRED LIST

1. Title Block
2. Project Block
3. Plan View
4. Estimated Quantities
5. Sections as Required
6. North Arrow

ESTIMATED QUANTITIES

<table>
<thead>
<tr>
<th>ITEM</th>
<th>UNIT</th>
<th>QUANTITY</th>
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<tbody>
<tr>
<td>Type B Drainage Fabric</td>
<td>Sq. Yd.</td>
<td>970.1</td>
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<td>Class B Riprap</td>
<td>Ton</td>
<td>928</td>
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<tr>
<td>Controlled Density Fill</td>
<td>Cu. Yd.</td>
<td>12.9</td>
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NOTE:

- For estimating purposes only, a factor of 1.4 tons/cu.yd. was used to convert Cu. Yds. to Tons.
YEAR PLATE DETAILS

GENERAL NOTES:
1. Year plates of the general dimensions shown shall be constructed on all box culverts and bridges. The year plates shall be constructed in reverse and attached to the forms in such a manner that the finished imprint in the concrete does not exceed one-half (½) inch in depth.
2. Year plates shall be located on structure (s) as follows:
   a. On cast-in-place box culverts the year plates shall be four and one-half (4½) inches below the top of the upstream parapet wall and centered laterally on the upstream face. On precast box culverts the year plate shall be centered laterally on the upstream face of the top slab. Where an extended interior wall interferes with the location, the year plate shall be centered in an adjacent barrel.
   b. On bridges with six (6) inch curbs or "Jersey" shaped barriers with no embankments, the year plate shall be centered vertically on the curb face approximately 4½ inches from the end of the bridge, or as designated by the Engineer. On bridges with "Jersey" shaped barrier embankments, the year plate shall be centered on the upper stopped portion of the barrier approximately ½ - 6" from the end of the bridge, or as designated by the Engineer. There shall be one year plate at each end of the bridge on opposite sides.
   c. When the dates specify that both the original date of construction and the date of reconstruction are to be shown, one date shall be placed as listed above and the other specified adjacent to it. Both year plates shall be shown at each end of the bridge on opposite sides.
   d. There shall be no separate measurement or payment made for year plates on box culverts and bridges. All costs for this work shall be incidental to other contract items.

JERSEY BARRIER (with barriers)

June 26, 2019

REQUAED LIST
1. Title Block
2. Insert Required Standard Plate Sheets as Needed

BRIEVE SURVEY MARKER

June 26, 2019
**GENERAL NOTES:**

1. Steel for bearing plates shall conform to ASTM A479 Grade 50.
2. Welding and weld inspection shall be in conformance with AWS D1.5 (Current Year) Bridge Welding Code - Steel.
3. Welder must be certified and registered with the SODOT.
4. Bearing plate shall be as thick as the web of the pile being attached.
5. Web must be coped with 1 inch radius.  
6. Submit Welding Procedure Specification (WPS) to Bridge Construction Engineer for approval prior to pile driving.

**TABLE 1** (BACKING PLATES)

<table>
<thead>
<tr>
<th>PILE</th>
<th>10&quot;</th>
<th>12&quot;</th>
<th>14&quot;</th>
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<tr>
<td>&quot;W&quot; FLANGE</td>
<td>6 1/2&quot;</td>
<td>8&quot;</td>
<td>10&quot;</td>
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<tr>
<td>&quot;W&quot; WEB</td>
<td>4 3/4&quot;</td>
<td>6 1/2&quot;</td>
<td>9 3/4&quot;</td>
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</table>

December 23, 2019

Published Date: 1st Qtr. 2019

SO DOT

STEEL PILE SPlice DETAILS

Plate Number

510.40

Sheet 1 of 1

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**FENCE ANCHORS FOR BRIDGE ABUTMENT WINGS (WINGS 6" AND SHORTER)**

Published Date: 1st Qtr. 2019

SO DOT

FENCE ANCHORS FOR BRIDGE ABUTMENT WINGS (WINGS 6" AND SHORTER)

Plate Number

620.18

Sheet 1 of 1

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**REQUIRED LIST**

1. Title Block
2. Insert Required Standard Plate Sheets as Needed
3. Project Block

155" - 0" CONT. CONCRETE BRIDGE

STR. NO. 15-181-180

SEPTEMBER 2017