ESTIMATE OF STRUCTURE QUANTITIES

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>QUANTITY</th>
<th>UNIT</th>
<th>REMARKS</th>
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<tbody>
<tr>
<td>Bridge Elevation Survey</td>
<td>Lump Sum</td>
<td>LS</td>
<td>See Sht. 29 of 32</td>
</tr>
<tr>
<td>Structural Steel, Install</td>
<td>Lump Sum</td>
<td>LS</td>
<td></td>
</tr>
<tr>
<td>Structural Steel, Miscellaneous</td>
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<tr>
<td>Strip Seal Expansion Joint</td>
<td>116.5</td>
<td>Ft</td>
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<tr>
<td>Compression Seal</td>
<td>116.5</td>
<td>Ft</td>
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<tr>
<td>Structure Excavation, Bridge</td>
<td>622</td>
<td>CuYd</td>
<td></td>
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<tr>
<td>Bridge End Backfill</td>
<td>318</td>
<td>CuYd</td>
<td></td>
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<tr>
<td>Bridge End Backfill Excavation</td>
<td>288</td>
<td>CuYd</td>
<td></td>
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<tr>
<td>Class A45 Concrete, Bridge Deck</td>
<td>642.6</td>
<td>CuYd</td>
<td>See Special Provision</td>
</tr>
<tr>
<td>Class A45 Concrete, Bridge</td>
<td>574.4</td>
<td>CuYd</td>
<td></td>
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<tr>
<td>Concrete Approach Slab for Bridge</td>
<td>289.2</td>
<td>SnYd</td>
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<tr>
<td>Reinforcing Steel</td>
<td>114470</td>
<td>LB</td>
<td></td>
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<tr>
<td>Epoxy Coated Reinforcing Steel</td>
<td>191189</td>
<td>LB</td>
<td></td>
</tr>
<tr>
<td>No. 7 Rebar Splice</td>
<td>150</td>
<td>Each</td>
<td></td>
</tr>
<tr>
<td>No. 14 Rebar Splice</td>
<td>10</td>
<td>Each</td>
<td></td>
</tr>
<tr>
<td>HP 12 Pile tip reinforcement</td>
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<td>Each</td>
<td></td>
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<tr>
<td>HP 12x53 Steel Pile, Furnish and Drive</td>
<td>131</td>
<td>F1</td>
<td></td>
</tr>
<tr>
<td>HP 12x53 Steel Pile, Furnish and Drive</td>
<td>726</td>
<td>F1</td>
<td></td>
</tr>
<tr>
<td>HP 12x74 Steel Pile, Furnish and Drive</td>
<td>62</td>
<td>F1</td>
<td></td>
</tr>
<tr>
<td>HP 12x74 Steel Pile, Furnish and Drive</td>
<td>1248</td>
<td>F1</td>
<td></td>
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<tr>
<td>Bridge Berm Slope Protection, Crushed Aggregate</td>
<td>521</td>
<td>SnYd</td>
<td></td>
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<tr>
<td>Concrete Penetrating Sealer</td>
<td>2320.9</td>
<td>SnYd</td>
<td>See Special Provision</td>
</tr>
</tbody>
</table>

SPECIFICATIONS FOR BRIDGE


BRIDGE DESIGN LOADING

1. AASHTO HS25-44 & Alternate, except HS20-44 & Alt. loading was used for the design of the bridge deck and serviceability requirements.

2. Dead Load includes 22 psf for future wearing surface on the roadway.

DESIGN MIX OF CONCRETE

1. All structural concrete shall be Class A45 unless otherwise indicated.

2. Type II cement conforming to Section 750 is required except, Type III cement is required in the abutments. Type III cement shall contain a maximum 8% Tricalcium Aluminate (Ca3A) and a maximum 0.6% Alkalies (Na2O + 0.658K2O).

3. Coarse aggregate to be used in concrete shall consist of either crushed quartzite or other crushed ledge rock. If crushed ledge rock other than quartzite is to be used, it shall be from a source approved by the Engineer.

4. Grout design mix shall be as specified in the South Dakota Standard Specifications Section 460.3.S. A compressive strength of 2000 psi shall be attained by the grout prior to erection of any beams. Chamfer edges of grout pads ¾". The quantity of grout is included in and shall be paid for at the contract unit price per cubic yard for Class A45 Concrete, Bridge.

UNIT DESIGN STRESSES

1. Design Material Strengths:
   - Class A45 Concrete: f'c = 4,500 p.s.i.
   - Reinforcing Steel (ASTM A615 Gr. 60): fy = 60,000 p.s.i.
   - Structural Steel (ASTM A709 Gr. 50W T2): fy = 50,000 p.s.i.

2. Design unit stresses shall be as set forth in the Design Specification (see note regarding Specifications for Bridge) with the exception that f'c = 1450 p.s.i. for the design of the bridge deck slab (Service Load Design).

GENERAL CONSTRUCTION

1. All mild reinforcing steel shall be deformed bars conforming 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 and End blocks shall be built normal to the grade.

6. Request for construction joints or resteele 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 resteele.

7. The elevation of the bridge deck is 17" above subgrade elevation.

8. See sequence of operations and time limitations elsewhere in plans.
SIOUX QUARTZITE IS A PINK TO RED, HARD SILICA CEMENTED SANDSTONE. IT IS JUNTED, NEEDED, AND CROSS-BEDDED WITH THIN RED TO PURPLE INTERPRETIVE SANDS. ONE SIZE CONCENTRIC. LAYERS OF POORLY CEMENTED SANDS MAY ALSO BE PRESENT. THE SURFACE OF THE QUARTZITE IS NOT FLAT, IT MAY VARY SEVERAL FEET VERTICALLY BY A SHORT HORIZONTAL DISTANCE.

THE GEOTECHNICAL ENGINEERING ACTIVITY HAS ON FILE ALL OF THE BORING LOGS FOR THIS PROJECT. THESE LOGS AND ADDITIONAL RESULTS OF LABORATORY TESTS, IF ANY, ARE AVAILABLE FOR REVIEW AT THE CENTRAL OFFICE IN PIERRE.

GROUND WATER ELEVATIONS AS OF JULY 2003

- G1 (CAVED) 1404.6
- G2 NO DATA
- G3 (CAVED) 1404.4
- G4 (CAVED) 1405.0
- G5 (CAVED) 1405.1
- E1 (CAVED) 1405.3

SUBSURFACE INVESTIGATION & PILING LAYOUT FOR (NORTHBOUND LANES)
374'-0'' CONT. COMP. GIRDER BRIDGE
56'-0'' ROADWAY SEC. 1/24-T1ON-R50W OVER 12TH STREET 0' SKEW STR. NO. 50-176-210 IM 29-3176 78 STA. 84+32.70 TO STA. 88+06.70 HS25-44

MINnehaha COUNTY
S. D. DEPT. OF TRANSPORTATION
DECEMBER 2003

DESIGNED BY
DRAWN BY
CHECKED BY
APPROVED

REQUiRED LIST
① Title Block ② Subsurface Profile
③ Project Block ④ North Arrow
⑤ Plan View (Piling Layout)
Top of grout pad shall be level and smooth.

NOTE - Sections as Required

Details as Required

Estimate of Quantities

Project Block

MINNEHAHA COUNTY
S. D. DEPT. OF TRANSPORTATION

DECEMBER 2003

REINFORCING SCHEDULE

BENT NO. 2 AND NO. 3 DETAILS
FOR
(NORTHBOUND LANES)

374' - 0"

CONT. COMP. GIRDER BRIDGE

56' - 0"

ROADWAY

SEC. 13/24 - T101N - R50W

OVER 12th STREET

0° SKEW

STR. NO. 50 - 176 - 210

IM 29 - 3760.78

STA. 84 + 32.70 TO STA. 88 + 06.70

HS25 - 44

& ALT.)

NOTE - Flow "0"" this 0"" are not of great and elevation of bent.

END OF SHEET
NOTE:
This sheet is to be used in conjunction with Sheet Nos. 12 & 13 of 30.
GENERAL NOTES

1. The estimated weight of the Steel Diaphragms is included in the Quantity for Structural Steel shown for informational purposes in the superstructure quantities.

2. The bolts shall be the heavy hexagon head structural type with heavy semi-finished hexagon nut and hardened washer.

3. Use 1 6'' bolt holes in the &'' gusset and hardened washer.

4. Direct Tension Indicators shall be adjacent for informational purposes in the superstructure quantities.
**TABLE OF SLAB FORM ELEVATIONS & COMPUTATIONS**

<table>
<thead>
<tr>
<th>Girder No.</th>
<th>Elev. ''N''</th>
<th>Elev. ''M''</th>
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</thead>
<tbody>
<tr>
<td>3</td>
<td>1442.751</td>
<td>1442.310</td>
</tr>
<tr>
<td>6</td>
<td>1442.428</td>
<td>1442.000</td>
</tr>
<tr>
<td>6</td>
<td>1442.751</td>
<td>1442.310</td>
</tr>
<tr>
<td>5</td>
<td>1442.751</td>
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<tr>
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<td>1442.310</td>
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<tr>
<td>14</td>
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<td>1442.310</td>
</tr>
<tr>
<td>14</td>
<td>1442.751</td>
<td>1442.310</td>
</tr>
</tbody>
</table>

**NOTE:**
- This sheet is to be used in conjunction with Sheet No. 19 of 30.
- This sheet contains the necessary information to determine the depth of concrete, in feet, with Sheet No. 4 of 30.

**REQUIRED LIST**

- 1Title Block
- 2Project Block
- 3Detail and Notes
- 4Calculation Table

**SLAB FORM ELEVATION**

**FOR (NORTHBOUND LANES)**

**374° O' CONT. COMP. GIRDER BRIDGE**

**56°-0" ROADWAY**

**SEC. 13/24-1100-R50W**

**OVER 12TH STREET**

**STATE NO. 50-176-210**

**IM 29-3170W 78**

**MINNEHAHA COUNTY**

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

**DECEMBER 2003**

**& ALT.**

**NOT**

- This elevation includes correction for deflection due to Dead Load above girders.
- Elevation ''M'' is theoretical top of slab elevation before any concrete has been placed under girders. This elevation must be taken after girder erection is complete, but prior to placing any of the slab sections. This elevation must be taken after girder erection is complete, but prior to placing any of the slab sections. This elevation must be taken after girder erection is complete.
1. Bridge End Backfill Excavation
2. 360 sq. ft. 6 mil Polyethylene Sheeting, not including laps.
3. 276 sq. yds. Type B Drainage Fabric.
4. MSE Gravelly (Fabric)
5. 376 sq. ft. 6 mil Polyethylene Sheeting.

Items 1 thru 5 are approximate quantities contained in the above bid items and are for information only.

Bridge End Backfill excavation will not be measured, Plans quantity payment will be full compensation for this item.

Granular Bridge End Backfill

Typical Fabric Lift and Wrap at Sides (Between End of Wing Wall and Edge of Sleeper Slab)

1'-6'' Vertical Composite Drain

1.5 Double thickness of 6 mil Polyethylene Sheeting

NOTE: Bridge End Backfill shown adjacent to Abut. No. 1. Abut. No. 4 will be similar by opposite hand.
### REQUIRED LIST

1. Title Block
2. Project Block
3. Sections as Required
4. Reinforcing Schedule
5. Details as Required
6. Estimated Quantities
7. Notes

### ESTIMATED QUANTITIES

<table>
<thead>
<tr>
<th>Item</th>
<th>Qty (Lbs.)</th>
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<tbody>
<tr>
<td>Concrete Approach Slab for Bridge</td>
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</tr>
<tr>
<td>Concrete Approach Slab for Polyurethane Coatings</td>
<td>30,000</td>
</tr>
<tr>
<td>Concrete Approach Slab for Barrier Curbs</td>
<td>40,000</td>
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<tr>
<td>Concrete Approach Slab for Bridge</td>
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<td>Concrete Approach Slab for Polyurethane Coatings</td>
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<tr>
<td>Concrete Approach Slab for Barrier Curbs</td>
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### DETAILS OF APPROACH SLAB ADJ. TO BRIDGE

<table>
<thead>
<tr>
<th>SHEETS</th>
<th>STATE</th>
<th>56'-0&quot; ROADWAY</th>
<th>NO.</th>
<th>0&quot; SKEW</th>
<th>STR. NO.</th>
<th>STA.</th>
<th>STA.</th>
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<tbody>
<tr>
<td>2</td>
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<td>55'-8&quot;</td>
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<td></td>
<td>24'</td>
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<td>88+06.70</td>
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### REINFORCING SCHEDULE

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<th>Description</th>
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<th>Length</th>
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<tr>
<td>1</td>
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<tr>
<td>2</td>
<td>Epoxy Coated</td>
<td>(N)</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Steel</td>
<td>(N)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### MINNEAPOLIS COUNTY

DEPARTMENT OF TRANSPORTATION

DESIGNED BY:  
DRAWN BY:  
CHECKED BY:  
APPROVED BY:  

DECEMBER 2003  
23 OF 50
GENERAL NOTES:
1. Materials for the steel extrusion shall conform to ASTM A536, A369, or A780, or equivalent for 2" x 2" x 6" weld metal steel extrusions and to ASTM A572, or equivalent for 3" x 3" x 6" welded steel extrusions. The steel extrusions shall be welded to the STP. 84+32.70 TO 88+06.70 ( See Note No. 10 )
2. The steel extrusions shall be welded to the STP. 84+32.70 TO 88+06.70 ( See Note No. 10 )
3. The steel extrusions shall be welded to the STP. 84+32.70 TO 88+06.70 ( See Note No. 10 )
4. The installation of the neoprene seal shall be as recommended by the manufacturer and approved by the Engineer, if in general shall be as follows. The neoprene seal shall be installed prior to the steel extrusion. The neoprene seal shall be installed without gaps or voids in the extrusion. The neoprene seal shall be bonded to the extrusion in accordance with the manufacturer's instructions. The neoprene seal shall be installed in accordance with the shop plans.
5. The thickness and shape of the neoprene seal may vary from the sketch shown (Detail "C" on this sheet)
6. The installation of the neoprene seal shall be as recommended by the manufacturer and approved by the Engineer.
7. The neoprene seal shall be installed prior to the steel extrusion. The neoprene seal shall be bonded to the extrusion in accordance with the manufacturer's instructions. The neoprene seal shall be installed in accordance with the shop plans.
8. The neoprene seal shall be installed prior to the steel extrusion. The neoprene seal shall be bonded to the extrusion in accordance with the manufacturer's instructions. The neoprene seal shall be installed in accordance with the shop plans.
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ESTIMATED QUANTITIES

<table>
<thead>
<tr>
<th>Item</th>
<th>Unit</th>
<th>Quantity</th>
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<tbody>
<tr>
<td>Item 1</td>
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<tr>
<td>Item 2</td>
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<tr>
<td>Item 3</td>
<td>ft.</td>
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APPROACH SLAB JOINT DETAILS

FOR
( NORTHBOUND LANES )
374'-0" CONT. COMP. GIRDER BRIDGE
56'-0" ROADWAY SEC. 13/21-T08N-R50W
OVER 12TH STREET 0° SKEW
STR. NO. 50-176-210 IM 29-3170.78
STA. 84+37.20 TO STA. 88+06.70 HS25-44
( & ALT. )

MINNEHAHA COUNTY
S. D. DEPT. OF TRANSPORTATION
DECEMBER 2003 25 OF 50

DESIGNED BY
DRAWN BY
CHECKED BY
APPROVED BY
The Contractor shall be responsible for producing the As-Built Elevation Survey shown by the table on this sheet. The completed table shall be given to the Engineer soon after construction is complete and before the bridge is opened to traffic. The As-Built Elevations of the Bridge shall be taken and recorded at the locations shown by the table on this sheet. The completed table shall be given to the Office of Bridge Design and the Region Office.

**NOTE**:
- The Contractor shall be responsible for producing the As-Built Elevation Survey shown by the table on this sheet. The completed table shall be given to the Engineer soon after construction is complete and before the bridge is opened to traffic. The As-Built Elevations of the Bridge shall be taken and recorded at the locations shown by the table on this sheet. The completed table shall be given to the Office of Bridge Design and the Region Office.
NOTES:

1. Year plates of the general dimensions shown shall be constructed on all box culverts and bridges. The year plates shall be located in reverse order on box culverts (the year plate is reversed and the plate is reversed) and on bridges (the year plate is reversed and the plate is reversed). The location shall be in accordance with the shape of the barrier, the location of the box culvert or bridge endblocks, and the type of curb or barrier endblock as shown on the plans.

2. Year plates shall be located on structure as follows:
   a. On box culverts, the year plates shall be located 2' (610mm) from the end of the culvert. On bridges, the year plates shall be located 2' (610mm) from the end of the bridge on the upstream side of the bridge.
   b. On bridges with a single lane of traffic or "Jersey" shaped barriers, the year plates shall be located 2' (610mm) from the end of the bridge on the upstream side of the bridge.
   c. On bridges with a double lane of traffic or "Jersey" shaped barriers, the year plates shall be located 2' (610mm) from the end of the bridge on the upstream side of the bridge.
   d. The year plates shall be centered vertically on the curb face of the bridge.
   e. The year plates shall be centered vertically on the upstream face of the bridge.
   f. The year plates shall be centered vertically on the upstream face of the top slab of the bridge.
   g. The year plates shall be centered vertically on the upstream face of the bridge.
   h. The year plates shall be centered vertically on the upstream face of the bridge.
   i. The year plates shall be centered vertically on the upstream face of the bridge.
   j. The year plates shall be centered vertically on the upstream face of the bridge.

3. There will be no separate measurement or payment made for year plates. All costs for this work shall be included in the other contract items.

4. Survey markers shall be located at each abutment on the same side of the bridge as the year plates. Place survey markers on the abutment wings as shown. Two survey markers will be required at each bridge.

5. Survey markers shall be of a type intended for installation in concrete, be made of solid bronze or bronze, be either a 3" (75mm) diameter or a 2" (50mm) diameter, or be 3/8" (10mm) diameter or 3/8" (20mm) diameter.

6. There will be no separate measurement or payment for survey markers. All costs for this work shall be included in the other contract items.