Section F: Surfacing Plans

INDEX OF SHEETS
F1  General Layout with Index
F2 - F6  Estimate of Quantities, Notes and Tables
F7  Typical Surfacing Sections
F8  PCC Pavement Layouts
F9 - F10  Construction Phase Layouts
F11  Excavation Profile Details
F12  Construction Profile Details
F13  Guardrail Layout
F14  Additional Guardrail Embankment
F15  Grading PCC Pavement
F16  Joint Tie In Layout
F17  Special Details
F18 - F27 Standard Plates

Project Location
Approx. MRM 236
**SECTION F ESTIMATE OF QUANTITIES**

<table>
<thead>
<tr>
<th>Bid Item Number</th>
<th>Item Description</th>
<th>Quantity Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>00E0010</td>
<td>Mobilization</td>
<td>Lump Sum LS</td>
</tr>
<tr>
<td>10E0070</td>
<td>Remove 3 Cable Guardrail</td>
<td>560 Ft</td>
</tr>
<tr>
<td>10E0071</td>
<td>Remove 3 Cable Guardrail Anchor Assembly</td>
<td>2 Each</td>
</tr>
<tr>
<td>10E0072</td>
<td>Remove 3 Cable Guardrail Slip Base Anchor Assembly</td>
<td>2 Each</td>
</tr>
<tr>
<td>10E1010</td>
<td>Concrete Pavement</td>
<td>3,375.4 Yd</td>
</tr>
<tr>
<td>10E0010</td>
<td>Unclassified Excavition</td>
<td>3,412 CuYd</td>
</tr>
<tr>
<td>10E0020</td>
<td>Water for Granite Material</td>
<td>74.4 Mgal</td>
</tr>
<tr>
<td>20E0010</td>
<td>Remove and Replace Lumber</td>
<td>1,672 Ecf</td>
</tr>
<tr>
<td>20E0100</td>
<td>Base Course</td>
<td>6,003 Yd</td>
</tr>
<tr>
<td>30E0010</td>
<td>10&quot; Reinforced RCC Pavement</td>
<td>2,913 Yd</td>
</tr>
<tr>
<td>30E0020</td>
<td>RCC Overlay</td>
<td>1,860 Yd</td>
</tr>
<tr>
<td>30E0030</td>
<td>RCC Interim Post</td>
<td>1,860 Yd</td>
</tr>
<tr>
<td>30E0040</td>
<td>RCC Base</td>
<td>1,860 Yd</td>
</tr>
<tr>
<td>73E0010</td>
<td>Erosion Control</td>
<td>100 Ft</td>
</tr>
<tr>
<td>73E0115</td>
<td>12&quot; Diameter Erosion Control Wall</td>
<td>100 Ft</td>
</tr>
</tbody>
</table>

**UNCLASSIFIED EXCAVATION**

Unclassified Excavation consisting of earth embankment and/or granular base material shall be removed from the locations listed in the following Table of Unclassified Excavation.

Unclassified excavation shall be used for in situ construction as directed by the Engineer.

Payment will be based on plans quantity. Further measurements will not be made unless there is a change made to the limits of work.

**TABLE OF UNCLASSIFIED EXCAVATION**

<table>
<thead>
<tr>
<th>Location</th>
<th>Volume (CuYd)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mainline NBL</td>
<td>1,890</td>
</tr>
<tr>
<td>Sta. 394+77 to Sta. 398+22</td>
<td>1,890</td>
</tr>
<tr>
<td>Mainline SBL</td>
<td>2,242</td>
</tr>
<tr>
<td>Sta. 393+70 to Sta. 397+15</td>
<td>2,242</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>4,132</strong></td>
</tr>
</tbody>
</table>

**REMOVAL OF EXISTING PCC PAVEMENT**

STA. 394+77.00 to STA. 398+22.00 NBL and STA. 393+70.00 to STA. 397+15.00 SBL

The existing asphalt concrete that was placed as part of additional guardrail widening and the existing concrete WIM vaults are included in the quantity for "Remove Concrete Pavement". The Contractor shall dispose of the concrete pavement and asphalt concrete at a site approved by the Engineer.

The existing 9.5 inch PCC mainline pavement is typically 24 feet wide with a 4' wide PCC pavement median shoulder and a 10' wide PCC pavement outside shoulder.

The existing contraction joints are spaced at approximately 15 feet and have a 9.5 degree skew.

The aggregate in the existing PCC pavement is Gravel, Crushed Gravel or Crushed Rock.

The in place loops will be removed with the PCC pavement and will become the property of the Contractor. All costs associated with removing the in place loops shall be incidental to the price for "Remove Concrete Pavement".

**TABLE OF CONCRETE PAVEMENT REMOVAL**

<table>
<thead>
<tr>
<th>Location</th>
<th>Remove Concrete Pavement (SqYd)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I-29 Mainline</td>
<td></td>
</tr>
<tr>
<td>Northbound Lanes Sta. 394+77 to Sta. 398+22</td>
<td>1,456.7</td>
</tr>
<tr>
<td>Southbound Lanes Sta. 393+70 to Sta. 397+15</td>
<td>1,918.7</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>3,375.4</strong></td>
</tr>
</tbody>
</table>

**ALKALI SILICA REACTIVITY**

Fine aggregate shall conform to Section 800.2.0 Alkali Silica Reactivity (ASR) Requirements.

Below is a list of known fine aggregate sources and the average corresponding 14 day expansion values:

<table>
<thead>
<tr>
<th>Source</th>
<th>Location</th>
<th>Expansion Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bachman</td>
<td>Winner, SD</td>
<td>0.335*</td>
</tr>
<tr>
<td>Bitterman</td>
<td>Delmont, SD</td>
<td>0.316*</td>
</tr>
<tr>
<td>Concrete Materials</td>
<td>Corson, SD</td>
<td>0.170</td>
</tr>
<tr>
<td>Croell</td>
<td>Quin, SD</td>
<td>0.089</td>
</tr>
<tr>
<td>Emme Sand &amp; Gravel</td>
<td>Oneil, NE</td>
<td>0.217</td>
</tr>
<tr>
<td>Fisher &amp; S&amp;G - Valery</td>
<td>Nisland, SD</td>
<td>0.110</td>
</tr>
<tr>
<td>Fisher &amp; S&amp;G - Rapid</td>
<td>City, SD</td>
<td>0.092</td>
</tr>
<tr>
<td>Fisher &amp; S&amp;G - Spearfish</td>
<td>SD</td>
<td>0.053</td>
</tr>
<tr>
<td>Fisher &amp; S&amp;G - Waste</td>
<td>SD</td>
<td>0.159</td>
</tr>
<tr>
<td>Fuchs</td>
<td>Pickstown, SD</td>
<td>0.275*</td>
</tr>
<tr>
<td>Higman</td>
<td>Akron, IA</td>
<td>0.198</td>
</tr>
<tr>
<td>Higman</td>
<td>Madison, SD</td>
<td>0.187</td>
</tr>
<tr>
<td>Jensen</td>
<td>Hurried, SD</td>
<td>0.276*</td>
</tr>
<tr>
<td>L.G. Everist</td>
<td>Brookings, SD</td>
<td>0.166</td>
</tr>
<tr>
<td>L.G. Everist</td>
<td>Hawarden, IA</td>
<td>0.166</td>
</tr>
<tr>
<td>Morris</td>
<td>Blunt, SD</td>
<td>0.192</td>
</tr>
<tr>
<td>Morris - Richards Pit</td>
<td>Onida, SD</td>
<td>0.188</td>
</tr>
<tr>
<td>Myrl &amp; Roys Paving-</td>
<td>Sioux Falls, SD</td>
<td>0.156</td>
</tr>
<tr>
<td>Nelson</td>
<td>SD</td>
<td></td>
</tr>
<tr>
<td>Northern Concrete Agg.</td>
<td>Rauville, SD</td>
<td>0.113</td>
</tr>
<tr>
<td>Northern Concrete Agg.</td>
<td>Luverne, MN</td>
<td>0.133</td>
</tr>
<tr>
<td>Opperman - Gunvordahl</td>
<td>Burke, SD</td>
<td>0.362*</td>
</tr>
<tr>
<td>Opperman - Cahoy Pit</td>
<td>Herrick, SD</td>
<td>0.307*</td>
</tr>
<tr>
<td>Opperman - Jones Pit</td>
<td>Burke, SD</td>
<td>0.321*</td>
</tr>
<tr>
<td>Opperman - Randall Pit</td>
<td>Pickstown, SD</td>
<td>0.239</td>
</tr>
<tr>
<td>Pete Lien &amp; Sons</td>
<td>Creston, SD</td>
<td>0.158</td>
</tr>
<tr>
<td>Pete Lien &amp; Sons</td>
<td>Oral, SD</td>
<td>0.129</td>
</tr>
<tr>
<td>Pete Lien &amp; Sons</td>
<td>Westa, SD</td>
<td>0.182</td>
</tr>
<tr>
<td>Thorpe Pit</td>
<td>Britton, SD</td>
<td>0.098</td>
</tr>
<tr>
<td>Wagner Building Supplies</td>
<td>Pickstown (Wagner), SD</td>
<td>0.241</td>
</tr>
<tr>
<td>Winter Brothers-</td>
<td>Picktown (Brooks), SD</td>
<td>0.197</td>
</tr>
</tbody>
</table>

*These sources will require Type V cement in the concrete mix design and Class F (Modified) fly ash as specified.

The Department will use the running average of the last three known expansion test results or less for determining acceptability of source and the required Type of cement. These expansion results are reported in the preceding table. Additional testing, when requested by the Contractor, will be performed by the Department at the Contractor’s expense.

The values listed in the table are intended for use in bidding. If a previously tested pit by SDDOT with acceptable test values (less than 0.250) is discovered after letting to require Type V cement (greater than 0.250) the Department will accept financial responsibility for the change from Type II to Type V cement.

Type II or Type V cement will not change the requirement for the fly ash. The cost for either type of cement shall be subsidiary to the contract item.

**UTILITIES**

The Contractor shall contact the involved utility companies through South Dakota One Call (1-800-781-7474) prior to starting work. It shall be the responsibility of the Contractor to coordinate work with the utility owners to avoid damage to existing facilities.

Utilities are not planned to be affected on this project. If utilities are identified near the improvement area through the SD One Call Process as required by South Dakota Codified Law 49-7A and Administrative Rule Article 20:25, the Contractor shall contact the Project Engineer to determine modifications that will be necessary to avoid utility impacts.

**SURFACING THICKNESS DIMENSIONS**

Plans tonnage will be applied even though the thickness may vary from that shown on the plans.

At those locations where material must be placed to achieve a required elevation, plans tonnage may be varied to achieve the required elevation.

**SAWING IN EXISTING SURFACING**

Where new asphalt concrete or new PCC Pavement is placed adjacent to existing asphalt concrete or existing PCC Pavement, the existing pavement shall be sawed full depth to a true, straight vertical face. No separate payment shall be made for sawing.

**LOCATION OF CONCRETE PAVEMENT JOINTS**

The location of joints, as shown on the "PCC Pavement Layout" sheets, are only approximate locations to be used as a guide in the final location of joints and to afford bidders a basis for estimating the construction costs of the joints. The final locations of the joints are to be designated by the Engineer during construction.
The fine aggregate may require screening as determined by the Engineer. The concrete used in the Portland Cement Concrete Pavement shall conform to section 380. The contractor is responsible for the mix design used. The contractor shall submit a mix design for approval at least 2 weeks prior to use.

The use of a water reducer at manufacturer’s recommendations will be required. The concrete shall obtain 4,000 psi at 28 days. The contractor shall submit a mix design for approval at least 2 weeks prior to use.

Automatic dowel bar inserters will not be allowed on this project. A construction joint will be sawed whenever new concrete pavement is placed adjacent to existing concrete pavement. The median and outside shoulders may be poured monolithic with the mainline pavement. The shoulder slope of 0.04 foot per foot must be maintained for the outside shoulder and 0.02 foot per foot must be maintained for the median shoulder. The shoulder slopes shall transition to 0.03 foot per foot as noted in the Typical Surfacing Sections.

If the shoulders are poured monolithic with the mainline pavement a sawed joint with tie bars will be constructed between the mainline pavement and the shoulders. The transverse contraction joints shall be perpendicular to the centerline as detailed in the standard plates 380.01 and 380.08. In multilane areas the transverse contraction joints shall be perpendicular to the centerline and be in a straight line across the width of the pavement. In special situations the Engineer may pre-approve transverse contraction joints that do not meet these requirements. All nonconforming transverse contraction joints that are not pre-approved shall be removed at the Contractor’s expense. Any method of placement that cannot produce these requirements shall not be allowed to continue.

In addition to traditional field inspection of reinforcement, a Ground Penetrating Radar (GPR) unit may be used to verify reinforcement locations in the hardened concrete. The GPR may be used anytime prior to the Acceptance of Field Work being issued. All costs related to corrective measures, including but not limited to concrete removal or cutting of reinforcement, price deductions, and delays to the project schedule shall be the responsibility of the Contractor.

Rumble Strips shall be constructed a minimum of 1 foot wide, 6 inches from the outside edge of the driving lane. Payment for constructing rumble strips including labor, materials and incidentals shall be incidental to the contract unit price per mile for “GRIND 12” RUMBLE STRIP OR STRIPE IN PCC PAVEMENT.”

### Table of Grinding PCC Pavement

<table>
<thead>
<tr>
<th>Location (Including shoulders)</th>
<th>10.5 Inch Nonreinforced PCC Pavement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Northbound Lanes Sta. 394+77 to Sta. 398+22</td>
<td>1,456.6</td>
</tr>
<tr>
<td>Southbound Lanes Sta. 393+70 to Sta. 397+15</td>
<td>1,456.6</td>
</tr>
<tr>
<td><strong>Total:</strong></td>
<td><strong>2,913.2</strong></td>
</tr>
</tbody>
</table>

**Grinding PCC Pavement**

Grinding of the PCC pavement shall be done on the Weigh-In-Motion System located at Sta. 394+92 to Sta. 398+07 Northbound Northbound Lanes and Sta. 393+85 to Sta. 397+00 Southbound Lanes. The Contractor shall grind the concrete roadway with a minimum width 48-inch grinder to ensure that the roadway meets ASTM E 1318-09 requirements.

The Contractor shall establish a positive means for the removal of the grinding and/or grooving residue. Solid residue shall be removed from the pavement surfaces before being blown by traffic action or wind. Residue shall not be permitted to flow across lanes used by public traffic. Residue shall be disposed of in a manner that will prevent residue, whether in solid or slurry form, from reaching any waterway in a concentrated state.

The Contractor shall satisfactorily remove grinding material or wastes prior to returning traffic to the roadway. If a significant amount of residue remains after grinding, the Engineer may require flushing be done in a manner and in sufficient quantity to assure that liquids, solids, or other materials produced by the pavement grinding is not deposited on vehicles. The Contractors proposed method of flushing the roadway should produce acceptable results, which will be based on a driving surface that will not create a nuisance for the public. All costs for flushing roadway shall be incidental to the contract unit price per square yard for “Grinding PCC Pavement”.

Residue may continuously flow on adjacent vegetation roadway slopes or ditches within the right-of-way. A flexible drag hose shall be attached to the discharge end of the slurry pipe to minimize splashing of slurry placed on roadway slopes or ditches.

If the Engineer determines that the slurry is going to enter a waterway, drainage facility, or curb & gutter section, the slurry shall be placed in storage tanks and deposited in settling basins, spread over flat vegetated areas, or filtered by other means approved by the Engineer at no additional cost.
The all-natural slow release fertilizer shall be applied according to the manufacturer’s application recommendations. The application rate is 1,000 pounds per acre. The all-natural slow release fertilizer shall be from the list below or an approved equal:

<table>
<thead>
<tr>
<th>Product</th>
<th>Manufacturer</th>
</tr>
</thead>
<tbody>
<tr>
<td>MycoApply</td>
<td>Mycorrhizal Apps, Inc.</td>
</tr>
<tr>
<td>Telephone: 1-866-476-7800</td>
<td>Grants Pass, OR</td>
</tr>
<tr>
<td>HTTP: <a href="http://www.mycorrhizae.com/">www.mycorrhizae.com/</a></td>
<td>Phone: 1-866-476-7800</td>
</tr>
</tbody>
</table>

**TABLE OF STEEL BAR INSERTION**

<table>
<thead>
<tr>
<th>LOCATION</th>
<th>1-1/2&quot; x 18&quot; Plain Round Dowel Bars</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mainline NBL</td>
<td>Sta. 394+77</td>
</tr>
<tr>
<td>Mainline SBL</td>
<td>Sta. 399+70</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**TABLE OF DOWEL BARS**

<table>
<thead>
<tr>
<th>Location</th>
<th>1 1/2&quot; Bars</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mainline NBL</td>
<td>836</td>
</tr>
<tr>
<td>Bars in Mainline</td>
<td>836</td>
</tr>
<tr>
<td>Mainline SBL</td>
<td>836</td>
</tr>
<tr>
<td>Bars in Mainline</td>
<td>836</td>
</tr>
<tr>
<td>Total Dowel Bars:</td>
<td>1,672</td>
</tr>
</tbody>
</table>

**CONTROL OF ACCESS**

If a Contractor's operations would require access to the ROW in any locations not currently designated as public access, prior approval must be obtained from the Department. All requests will be reviewed on the basis of safety and construction sequencing. A Contractor shall not assume that all requests will be granted.

The Contractor shall be responsible for all safety control and signing measures. The request for access shall be provided in writing to the Project Engineer two weeks in advance of any proposed break in control of access.

**REMOVE AND REPLACE TOPSOIL**

Prior to beginning resurfacing operations, a 4" depth of topsoil shall be bladed down the respective inslopes and left in the shoulder where it will be resurfaced. The topsoil shall be bladed back up the slope to the point indicated on the typical section. The estimated amount of topsoil to be removed and replaced is 270 CuYd. All cost associated with removing and replacing the topsoil is to be incidental to the lump sum price for “Erosion Control”. The estimated area to seed and fertilize is 21,780 SqFt.

**EROSION CONTROL**

Fertilizing, mycorrhizal inoculum, permanent seeding, and mulching shall be paid at the lump sum price for “Erosion Control”. The estimated area to seed and fertilize is 21,780 SqFt.

**FERTILIZING**

The Contractor shall apply an all-natural slow release fertilizer prior to seeding or placing sod. The all-natural fertilizer shall have a minimum guaranteed analysis of 4-6-4 and be USDA Certified BioBased. It should provide a minimum of 4% (N) nitrogen with a minimum water insoluble nitrogen (WN) fraction of 3.2%, a minimum of 6% (P2O5) available phosphate, a minimum of 4% (K2O) soluble potash, and a maximum carbon to nitrogen ratio (C:N ratio) of 5:1. The all-natural fertilizer shall be free of weed-seed and pathogens accomplished through thermophilic composting, and not mechanical or chemical sterilization, to assure presence of beneficial soil microbiology. The fertilizer shall have a near-neutral pH, a low salt index, a low biological oxygen demand, contain organic humic and fulvic acids, and have high aerobic organism counts. The fertilizer shall also be stable, free of bad odors, and be unattractive as a food source for animals. It should also be in a granular form that is easily spread.
PERMANENT SEEDING

The areas to be seeded consist of all newly graded areas within the project limits except for the top of roadways and temporary easements under cultivation.

All permanent seed shall be planted in the topsoil at a depth of ¼" to ½".

All seed broadcast must be raked or dragged in (incorporated) within the top ¼" to ½" of topsoil when possible. This requirement may be waived by the Engineer during construction when raking or dragging is deemed not feasible by conventional methods.

The varieties listed for seed mixtures are preferred varieties.

Native harvest seed will be allowed.

Type C Permanent Seed Mixture shall consist of the following:

<table>
<thead>
<tr>
<th>Grass Species</th>
<th>Variety</th>
<th>Pure Live Seed (PLS) (Pounds/Acre)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Western Wheatgrass</td>
<td>Flintlock, Rodan, Rosana</td>
<td>16</td>
</tr>
<tr>
<td>Canada Wildrye</td>
<td>Mandan</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total:</strong></td>
<td></td>
<td><strong>18</strong></td>
</tr>
</tbody>
</table>

MULCHING (GRASS HAY OR STRAW)

Bales with noxious weed contamination will be rejected and the Contractor will be required to remove the contaminated bales from the project.

EROSION CONTROL WATTLE

Erosion control wattles for restraining the flow of runoff and sediment shall be installed at locations determined by the Engineer during construction, such as around pipe inlets, in channels to reduce erosion and capture sediment, and on steep slopes. Refer to Standard Plate 734.06 for details.

The Contractor shall provide certification that the erosion control wattles do not contain noxious weed seeds.

Erosion control wattles shall remain on the project to decompose.

The erosion control wattle provided shall be from the approved product list. The approved product list for erosion control wattle may be viewed at the following internet site:

### TABLE OF GUARDRAIL AND RELATED ITEMS

<table>
<thead>
<tr>
<th>Location</th>
<th>Remove 3 Cable Guardrail</th>
<th>Remove 3 Cable Guardrail Anchor Assembly</th>
<th>Remove 3 Cable Guardrail Slip Base Anchor Assembly</th>
<th>3 Cable Guardrail</th>
<th>3 Cable Guardrail Intermediate Post</th>
<th>3 Cable Guardrail Anchor Assembly</th>
<th>3 Cable Guardrail Slip Base Anchor Assembly</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>SBL Weigh-In-Motion Site Sta. 395+95</td>
<td>(Ft)</td>
<td>(Each)</td>
<td>(Each)</td>
<td>(Ft)</td>
<td>(Each)</td>
<td>(Each)</td>
<td>(Each)</td>
<td>Remove and Replace Guardrail</td>
</tr>
<tr>
<td>Outside Shoulder</td>
<td>340</td>
<td>2</td>
<td>0</td>
<td>364</td>
<td>6</td>
<td>2</td>
<td>0</td>
<td>Remove and Replace Guardrail</td>
</tr>
<tr>
<td>Median Shoulder</td>
<td>250</td>
<td>0</td>
<td>2</td>
<td>296</td>
<td>3</td>
<td>0</td>
<td>2</td>
<td>Remove and Replace Guardrail</td>
</tr>
<tr>
<td><strong>TOTALS:</strong></td>
<td>590</td>
<td>2</td>
<td>2</td>
<td>660</td>
<td>9</td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

### TABLE OF ADDITIONAL QUANTITIES

<table>
<thead>
<tr>
<th>LOCATION</th>
<th>WATER FOR GRANULAR MATERIAL (MGal)</th>
<th>BASE COURSE (Ton)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Northbound Lanes Sta. 394+77 to Sta. 398+22</td>
<td>33.2</td>
<td>2,768.9</td>
</tr>
<tr>
<td>Southbound Lanes Sta. 393+70 to Sta. 397+15 including Guardrail Embankment</td>
<td>41.2</td>
<td>3,434.4</td>
</tr>
<tr>
<td><strong>Totals:</strong></td>
<td><strong>74.4</strong></td>
<td><strong>6,203.2</strong></td>
</tr>
</tbody>
</table>
EXCAVATION PROFILE DETAILS

Scale: 1 Inch = 40 Feet
Sheet: 1 of 1 Sheets

Unclassified Excavation

Section A-A

Northbound Lanes Shown
(Southbound Lanes Reversed)
CONSTRUCTION PROFILE DETAILS

Scale: 1 Inch = 40 Feet
Sheet 1 of 1 Sheets

Construction Area

Sta. 396+17 NBL
(Sla. 397+19 SBL)

SLC Scales
Sta. 395+47 NBL - scales in both driving & passing lanes
(Sla. 395+45 SBL) - scale only in driving lane

Sta. 398+42 NBL
(Sla. 399+40 SBL)

Note:
The top 6" of subgrade will be compacted after excavation in accordance with Section 210.3 B prior to placement of the granular material.

5" Base Course
Minimum

30' 30' 30' 30' 30' 30' 30' 105' 30'

10.5" PCCP

5" Base Course
Minimum

Northbound Lanes Shown
(Southbound Lanes Reversed)
Area to be Surfaced with Base Course
(Height adjacent to edge of shoulder = 10.5"
Surfacing Cross Slope: 10:1 or Flatter

Scale 1 Inch = 30 Feet
Sheet 1 of 1 Sheets
Note: See plan notes for grinding details

PCC Pavement Grinding Limits
Original Contraction Joint Spacing Layout

TYPICAL CONTRACTION JOINT SPACING

Separation between Existing and Proposed Contraction Joints

Existing Skewed Contraction Joints

Proposed Perpendicular Contraction Joints
12" RUMBLE STRIP ON PCC PAVEMENT

GENERAL NOTES:

A rumble strip shall be constructed as shown in the details by grinding continuous indentations in the PCC Pavement.

Prior to constructing the rumble strip, the Contractor shall submit to the Engineer for approval, the proposed method of constructing the rumble strip.

Payment for constructing the rumble strip shall be incidental to the contract unit price per mile for "FORM IN RUMBLE STRIP OR STRIPE IN PCC PAVEMENT".

PCC PAVEMENT TRANSVERSE CONTRACTION JOINT SPACING

<table>
<thead>
<tr>
<th>15'</th>
<th>15'</th>
<th>15'</th>
<th>15'</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

PLAN VIEW

SECTION A-A

SECTION B-B
Spacing shown for 12 foot lane
9 anchor pins per unit (Min)

11 Spaces @ 1'-0" x 1'-0"

Plan

Typical Anchor Pin

Elevation (one side view)

Approved Coating

Joint and Dowel Bar

Spacers Min 0.177" (Min)

1/4" thick Gravel Cushion

Loops may be installed on either side of rolls

General Notes:

Longitudinal joint tie bars shall be placed a minimum of 15 inches from the transverse contraction joint.

Centerline of individual dowel bars shall be parallel to top of subgrade 5/8 inch in 18 inches and to all other dowel bars in the assembly 3 1/16 inch in 18 inches.

Centerline of individual dowel bars shall be parallel to the centerline of the roadway 6 1/2 inch in 18 inches.

The transverse contraction joints shall be sawed perpendicular to the centerline of the roadway and the dowel bars shall be centered on the sawed joint at 1 inch.

Supporting devices as shown on these sheets are equivalent as approved by the Engineer, shall be used to maintain proper horizontal and vertical alignment of the dowel bars.

August 30, 2001

Published Date: 1st Qtr. 2014

Sheet 1 of 1

SDDOT

PCC Pavement Dowel Bar Assembly

Published Date: 1st Qtr. 2014

Sheet 1 of 1

SDDOT

PCC Pavement Beveled Transverse Contraction Joint with or without Dowel Bar Assembly

Published Date: 1st Qtr. 2014

Sheet 1 of 1

SDDOT

PCC Pavement Dowel Bar Assembly

Published Date: 1st Qtr. 2014

Sheet 1 of 1

SDDOT

PCC Pavement Beveled Transverse Contraction Joint with or without Dowel Bar Assembly
**GENERAL NOTES**

No. 4 epoxy coated deformed tie bars shall be spaced 12 inches center to center and shall be a minimum of 3 inches and a maximum of 6 inches from the pavement edges.

The minimum distance between a transverse construction joint and tie bars or an adjacent transverse contraction joint shall be 5 feet.

When a transverse construction joint is made, paving will not be allowed in this area for 12 hours.

A transverse construction joint may be placed in lieu of the transverse contraction joint when shown in the plans.

The term "In Place PCC Pavement" in the above drawing indicates that the In place PCC Pavement was placed on the current project.

---

**DETAIL A**

TRANVERSE CONSTRUCTION JOINT WITH TIE BARS

Sawed Joint filled with Hot Poured Elastic Joint Sealer

Epoxy Coated Deformed Tie Bar

In Place PCC Pavement

New PCC Pavement

Drilled Hole

Full Depth Saw Cut

GENERAL NOTES

The term "In Place PCC Pavement" in the above drawing indicates that the In place PCC pavement was placed on a previous project.

See sheet 2 of 2 of this standard plate to determine if Detail A shall be used.

The tie bars shall be embedded a minimum depth of 8 inches into the In place PCC pavement and anchored with an epoxy resin adhesive.

No. 9 epoxy coated deformed tie bars shall be used 10 inches thickness and less PCC Pavement and No. 11 epoxy coated deformed tie bars shall be used in 10.5 inches thickness and greater PCC Pavement. The tie bar spacing shall be 18 inches center to center and shall be a minimum of 3 inches and a maximum of 6 inches from the pavement edges.

---

**DETAIL B**

TRANVERSE CONSTRUCTION JOINT WITH DOWEL BARS

Drilled Hole

Full Depth Saw Cut

Epoxy Coated Plain Round Dowel Bar

GENERAL NOTES

The term "In Place PCC Pavement" in the above drawing indicates that the In place PCC pavement was placed on a previous project or current project.

See sheet 2 of 2 of this standard plate to determine if Detail B shall be used.

The plain round dowel bars shall be embedded a minimum depth of 8 inches into the In place PCC pavement and anchored with an epoxy resin adhesive.

The epoxy coated plain round dowel bar size, number, and spacing shall be as detailed on the corresponding dowel bar assembly standard plate (380.002, 380.003, or 380.04). The epoxy coated plain round dowel bars shall be a minimum of 3 inches and a maximum of 6 inches from the pavement edges.
LONGITUDINAL CONSTRUCTION JOINT WITH TIE BARS

(Grilled In Bars)

Sewed joint filled with Hot
Pour Elastic Joint Sealer

Drilled Hole

No. 5 Epoxy Coated Deformed Tie Bar

T = Pavement Thickness

The tie bars shall be embedded a
minimum depth of 9 inches into
the in-place PCC pavement and
anchored with an epoxy resin adhesive.

LONGITUDINAL CONSTRUCTION JOINT WITH TIE BARS

(Inserted or Formed In Bars)

Sewed Joint filled with Hot
Pour Elastic Joint Sealer

In place PCC Pavement
placed on previous
project or current
project

New PCC Pavement

New PCC Pavement

No. 5 Epoxy Coated Deformed Tie Bar

GENERAL NOTES:

The epoxy coated deformed tie bars shall be spaced in accordance with the following table:

<table>
<thead>
<tr>
<th>Tile Bar Spacing</th>
<th>Transverse Contraction Joint Spacing</th>
<th>Number of Tie Bars</th>
</tr>
</thead>
<tbody>
<tr>
<td>15' or 20'</td>
<td>5' to 10'</td>
<td>2</td>
</tr>
<tr>
<td>20'</td>
<td>10' to 15'</td>
<td>3</td>
</tr>
<tr>
<td>20'</td>
<td>10' to 15'</td>
<td>4</td>
</tr>
<tr>
<td>20'</td>
<td>15' to 20'</td>
<td>5</td>
</tr>
<tr>
<td>20'</td>
<td>20' to 27'</td>
<td>7</td>
</tr>
</tbody>
</table>

The tie bars shall be placed a minimum of 15 inches from transverse contraction joints.

The required number of tie bars as shown in the table shall be uniformly spaced within each panel. The uniformly spaced tie bars shall be spaced a maximum of 48 inches center to center for a female keyway and shall be spaced a maximum of 20 inches center to
center for a vertical face and male keyway. The maximum tie bar spacing shall apply to
the tie bars within each panel.

The keyway illustrated in the above drawings depict a female keyway.

The keyway is optional and is not required. When concrete pavement is formed and a
keyway is provided, a metal recess strip shall be used. When concrete pavement is slip
formed, a metal recess strip is not required.
SAWED LONGITUDINAL JOINT WITH TIE BARS
(Poured Monolithically)

Sawed Joint filled with Hot-Poured Elastic Joint Sealer

T = Pavement Thickness

GENERAL NOTES (For the detail above)
The epoxy coated deformed tie bars shall be spaced in accordance with the following tables.

<table>
<thead>
<tr>
<th>Tie Bar Spacing</th>
<th>Maximum Joint Spacing</th>
<th>Number of Tie Bars</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.5&quot; to 10&quot;</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>10.5&quot; to 14&quot;</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>14.5&quot; to 18&quot;</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>18.5&quot; to 22&quot;</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

The tie bars shall be placed a minimum of 15 inches from the transverse contraction joints.
The required number of tie bars as shown in the table shall be uniformly spaced within each panel with a maximum space of 48 inches center to center. The maximum tie bar spacing shall apply to tie bars within each panel.
The first saw cut to central cracking shall be a minimum of 1/3 the thickness of the pavement. Additional sawing for widening the saw cut to provide the width for the installation of the hot poured elastic joint sealer is necessary.

August 31, 2014
3 CABLE GUARDRAIL

GENERAL NOTES:
- Flanged channel steel posts shall be produced from high strength steel in accordance with ASTM A499 Grade 60.
- Anchor plate shall be carbon steel sheet.
- Alternate anchor plate shall be ASTM A36 steel.
- Bolt shall be in conformance with ASTM A354 Grade 80 or BC. Nut shall be in conformance with ASTM A563 Grade D.
- Bolt shall be Cadmium plated per ASTM A165-80 Type OS except using clear chromate.
- Finishes for the post and anchor plate shall be a high quality dark green outdoor acrylic enamel; Alternate anchor plate may be unfinished.

3 CABLE GUARDRAIL

POST SPACING FOR DEFLECTION CONTROL

* Post spacings for control of deflection shall continue to one post past the obstacle for one way traffic. Post spacings for control of deflection shall be provided on both sides of the obstacle for two way traffic.

<table>
<thead>
<tr>
<th>X (ft)</th>
<th>POST SPACING PRIOR TO OBSTACLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.0 to 7.9</td>
<td>8 @ 4'-0&quot;</td>
</tr>
<tr>
<td>8.0 to 9.4</td>
<td>6 @ 8'-0&quot;</td>
</tr>
<tr>
<td>9.5 to 10.9</td>
<td>4 @ 12'-0&quot;</td>
</tr>
<tr>
<td>11.0 and Greater</td>
<td>16'-0&quot; (Typ.)</td>
</tr>
</tbody>
</table>

GENERAL NOTES:
For illustrative purposes, the 3 cable guardrail posts and post spacings shown on this standard plate depict the situation when there is a box culvert 7' to 7.9 away from the 3 cable guardrail and the traffic is one way.
3 CABLE GUARDIAN SLIP BASE

ANCHOR CONSTRUCTION NOTES:
1. Aug 3' diameter by 3'-9" deep holes tangent to each other.
2. Clean out the top 6 inches of soil between the holes.
3. Place concrete in holes with anchor bolts and slip base stub post in place.
4. For informational purposes the next line concrete volume of the anchor is .9 cu yds.

ELEVATION (ANCHOR)

PLAN (ANCHOR)

3 CABLE GUARDIAN SLIP BASE

EXTERIOR STIFFENER PLATE

INTERNAL STIFFENER PLATE

CABLE ANCHOR BRACKET

CABLE END ASSEMBLY ROD CONNECTION TO CABLE ANCHOR BRACKET

FILE - 3C88888697, P6639, 3C-5

PLNO - 108353

SECTION 3C-5

DATE - 11/09/93

DRAWN BY:

CHECKED BY:

APPROVED BY:

CURVE 3C-5

REVISIONS:

1. Aug 3' diameter by 3'-9" deep holes tangent to each other.
2. Clean out the top 6 inches of soil between the holes.
3. Place concrete in holes with anchor bolts and slip base stub post in place.
4. For informational purposes the next line concrete volume of the anchor is .9 cu yds.
GENERAL NOTES:
At cut or fill slope installations, wattles shall be installed along the contour and perpendicular to the water flow.
At ditch installations, point A must be higher than point B to ensure that water flows over the wattle and not around the ends.
The Contractor shall dig a 3" to 5" trench, install the wattle tightly in the trench so that daylight cannot be seen under the wattle, and then compact the soil excavated from the trench against the wattle on the uphill side. See Detail B.
The stakes shall be 1"x2" or 2"x2" wood stakes, however, other types of stakes such as rebar may be used only if approved by the Engineer. The stakes shall be placed 6" from the ends of the wattles and the spacing of the stakes along the wattles shall be 3' to 6'.
Where installing running lengths of wattles, the Contractor shall butt the second wattle tightly against the first and shall not overlap the ends. See Detail C.
The Contractor and Engineer shall inspect the erosion control wattles once every week and within 24 hours after every rainfall event greater than 0.5". The Contractor shall remove, dispose of, or reshape the accumulated sediment when necessary as determined by the Engineer.
Sediment removal, disposal, or necessary shaping shall be as directed by the Engineer.
All costs for removing accumulated sediment, disposal of sediment, and necessary shaping shall be included in the contract unit price per cubic yard for "Remove Sediment".
All costs for furnishing and installing the erosion control wattles including labor, equipment, and materials shall be included in the contract unit price per "foot" for the corresponding erosion control wattle bid item.
All costs for removing the erosion control wattle from the project including labor, equipment, and materials shall be included in the contract unit price per "foot" for "Remove Erosion Control Wattles".