| STATE OF SOUTH DAKOTA | PROJECT | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|
| | 012-151 & 000P-151 | 1 | 30 |

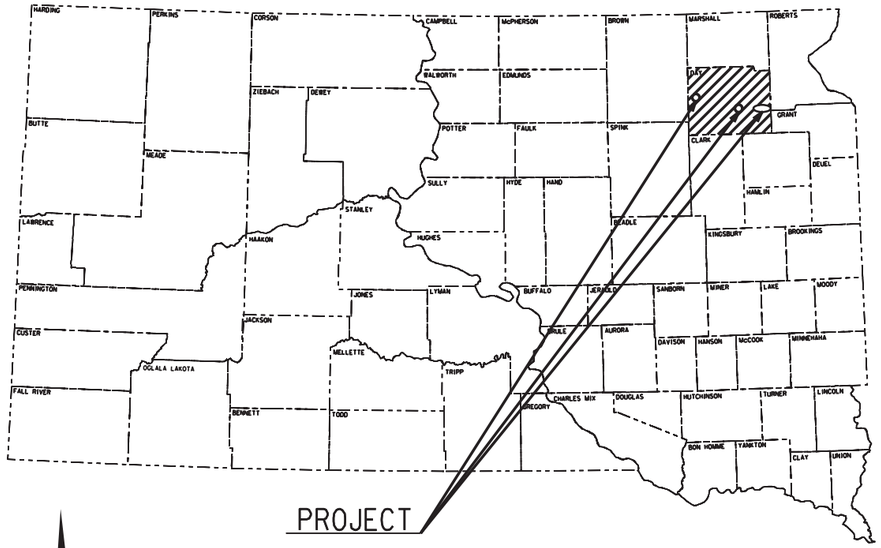
# STATE OF SOUTH DAKOTA
## DEPARTMENT OF TRANSPORTATION
## PLANS FOR PROPOSED

# PROJECT NO. 012–151 & 000P–151 US HIGHWAY 12 DAY COUNTY

PCC PAVEMENT REPAIR

& PCC PAVEMENT MEDIAN CONSTRUCTION

PCN NO. i3u4 & i3wn




| INDEX OF SHEETS | |
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| Sheet 1 | Title Sheet |
| Sheet 2 | Repair Areas |
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| Shhet 4 | Environmental Commitments |
| Sheet 5-8 | Table of Quantities |
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| Sheet 13-16 | Traffic Control |
| Sheet 17-19 | Existing Layout and Typical Sections |
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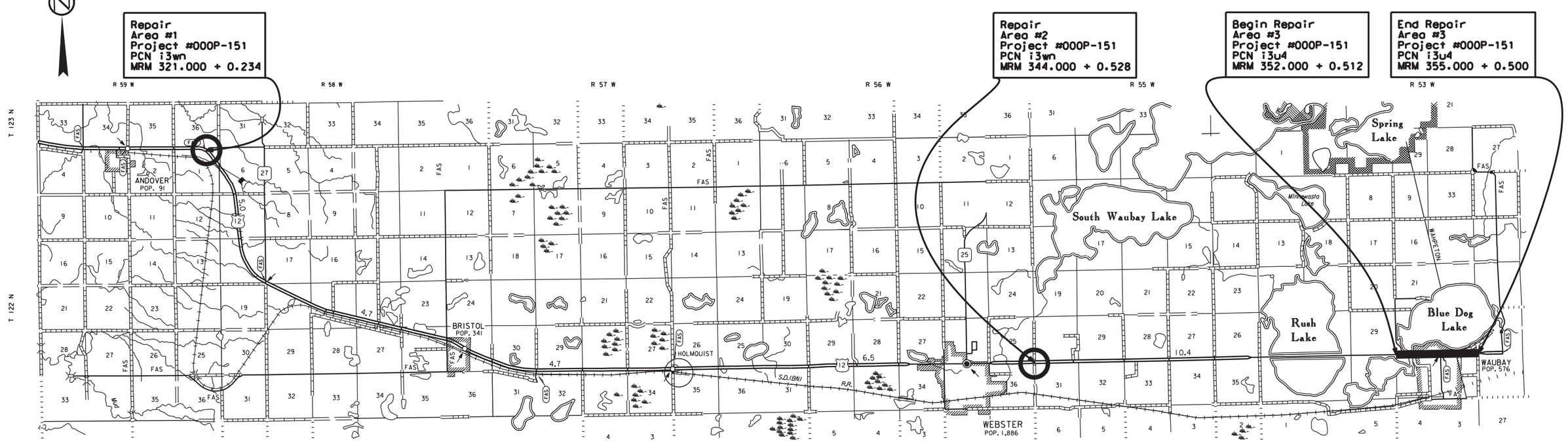



Repair Area #1

DESIGN DESIGNATION

| | |
|---|---|
| ADT (2014) | 1610 |
| ADT (2034) | 2099 |
| DHV | 228.8 |
| D | 51% |
| T DHV | 11.1% |
| T ADT | 24.3% |
| V | 70 mph |

Repair Area #2

DESIGN DESIGNATION

| | |
|---|---|
| ADT (2014) | 1515 |
| ADT (2034) | 2062 |
| DHV | 224.8 |
| D | 51% |
| T DHV | 12.1% |
| T ADT | 26.6% |
| V | 70 mph |

Repair Area #3

DESIGN DESIGNATION

| | |
|---|---|
| ADT (2001) | 3200 |
| ADT (2034) | 4355 |
| DHV | 474.7 |
| D | 51% |
| T DHV | 10.5% |
| T ADT | 23.1% |
| V | 70 mph |

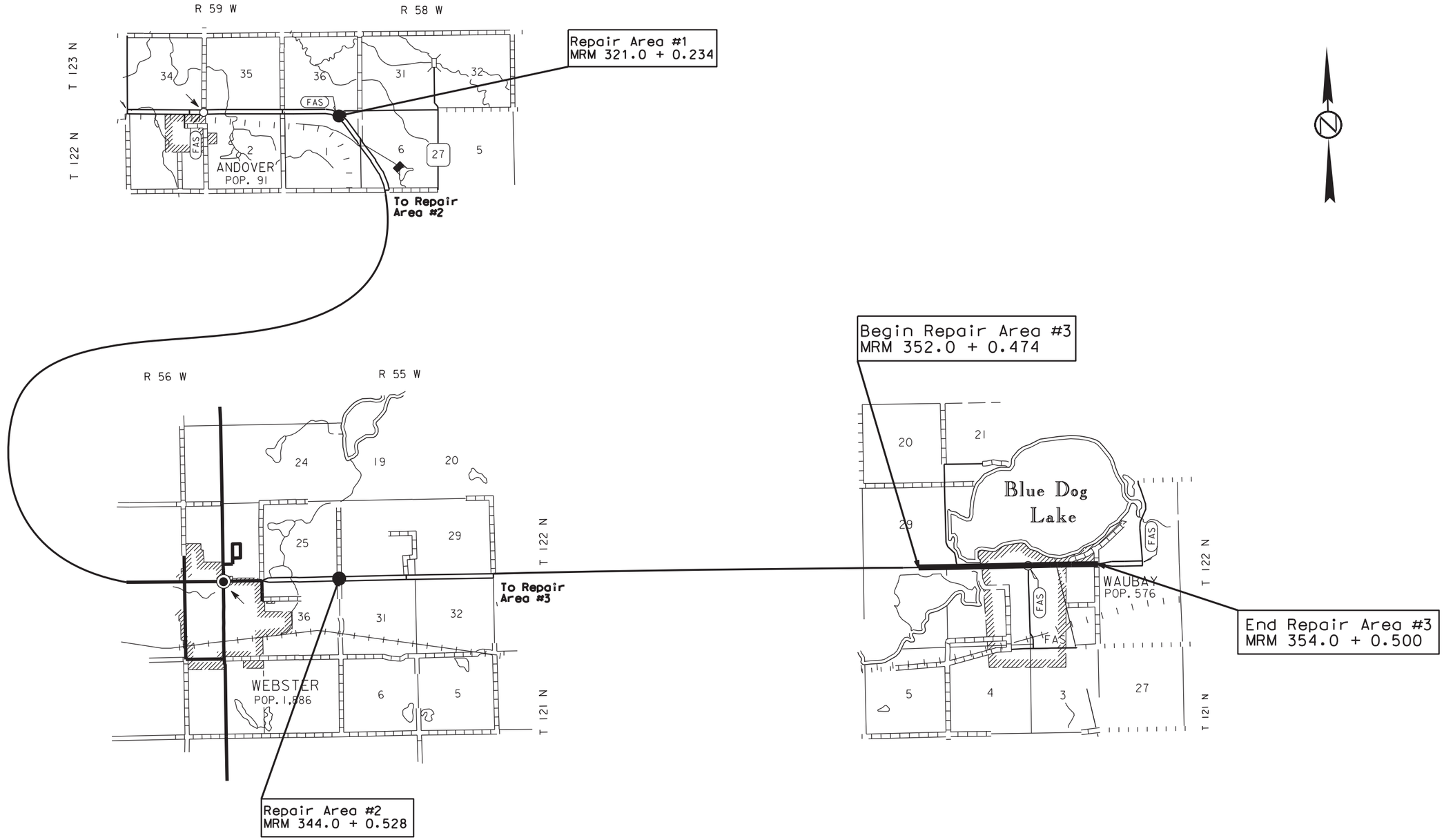
Storm Water Permit

None Required

PLOTTED FROM - TRAB13004

| STATE OF SOUTH DAKOTA | PROJECT | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|
| | 012-151 & 000P-151 | 2 | 30 |

# Repair Area Locations




PLOTTED FROM - TRAB18004

| STATE OF SOUTH DAKOTA | PROJECT | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|
| | 012-151 & 000P-151 | 3 | 30 |

## i3u4

| BID ITEM NUMBER | ITEM | QUANTITY | UNIT |
|---|---|---|---|
| 009E0010 | Mobilization | 1 | LS |
| 110E0320 | Remove Concrete Gutter | 4 | Ft |
| 120E0100 | Unclassified Excavation, Digouts | 25 | CuYd |
| 260E2010 | Gravel Cushion | 50.0 | Ton |
| 380E5030 | Nonreinforced PCC Pavement Repair | 2,434.2 | SqYd |
| 380E6000 | Dowel Bar | 720 | Each |
| 380E6110 | Insert Steel Bar in PCC Pavement | 2,763 | Each |
| 380E6200 | Tie Bar Retrofit, Stitching | 1,532 | Each |
| 634E0010 | Flagging | 100.0 | Hour |
| 634E0110 | Traffic Control Signs | 219 | SqFt |
| 634E0120 | Traffic Control, Miscellaneous | 1 | LS |
| 634E0285 | Type 3 Barricade, 8' Double Sided | 28 | Each |
| 634E0420 | Type C Advance Warning Arrow Board | 2 | Each |
| 634E0600 | 4" Temporary Pavement Marking Tape Type I | 2,970 | Ft |
| 650E4685 | Type P8.5 Concrete Gutter | 4 | Ft |
| 734E5010 | Sweeping | 10 | Hour |

## i3wn

| BID ITEM NUMBER | ITEM | QUANTITY | UNIT |
|---|---|---|---|
| 009E0010 | Mobilization | 1 | LS |
| 110E1010 | Remove Asphalt Concrete Pavement | 1,049.4 | SqYd |
| 120E0010 | Unclassified Excavation | 239 | CuYd |
| 120E0600 | Contractor Furnished Borrow Excavation | 479 | CuYd |
| 120E2000 | Undercutting | 479 | CuYd |
| 260E2010 | Gravel Cushion | 369.6 | Ton |
| 320E1200 | Asphalt Concrete Composite | 22.7 | Ton |
| 380E0070 | 9" Nonreinforced PCC Pavement | 1,436.3 | SqYd |
| 632E3520 | Remove, Salvage, Relocate, and Reset Traffic Sign | 4 | Each |
| 634E0110 | Traffic Control Signs | 922 | SqFt |
| 634E0120 | Traffic Control, Miscellaneous | 1 | LS |
| 634E0285 | Type 3 Barricade, 8' Double Sided | 24 | Each |
| 634E0420 | Type C Advance Warning Arrow Board | 4 | Each |
| 634E0600 | 4" Temporary Pavement Marking Tape Type I | 2,700 | Ft |
| 734E0010 | Erosion Control | 1 | LS |

**SPECIFICATIONS**

Standard Specifications for Roads and Bridges, 2015 Edition and Required Provisions, Supplemental Specifications, and Special Provisions as included in the Proposal.

## ENVIRONMENTAL COMMITMENTS

An Environmental Commitment is a measure that SDDOT commits to implement in order to avoid, minimize, and/or mitigate a real or potential environmental impact. Environmental commitments to various agencies and the public have been made to secure approval of this project. An agency mentioned below with permitting authority can influence a project if perceived environmental impacts have not been adequately addressed. Unless otherwise designated, the Contractor's primary contact regarding matters associated with these commitments will be the Project Engineer. These environmental commitments are not subject to change without prior written approval from the SDDOT Environmental Office. The environmental commitments associated with this project are as follows:

### COMMITMENT B: FEDERALLY THREATENED, ENDANGERED, AND PROTECTED SPECIES

### COMMITMENT B2: WHOOPING CRANE

The Whooping Crane is a spring and fall migratory bird in South Dakota that is about 5 feet tall and typically stops on wetlands, rivers, and agricultural lands along their migration route. An adult Whooping Crane is white with a red crown and a long, dark, pointed bill. Immature Whooping Cranes are cinnamon brown. While in flight, their long necks are kept straight and their long dark legs trail behind. Adult Whooping Cranes' black wing tips are visible during flight.

**Action Taken/Required:**

Harassment or other measures to cause the Whooping Crane to leave the site is a violation of the Endangered Species Act. If a Whooping Crane is sighted roosting in the vicinity of the project, borrow pit, or staging site associated with the project, cease construction activities in the affected area until the Whooping Crane departs and contact the Project Engineer. The Project Engineer will contact the Environmental Office so that the sighting can be reported to USFWS.

### COMMITMENT B4: BALD EAGLE

Bald eagles are known to occur in this area.

**Action Taken/Required:**

If a nest is observed within one mile of the project site, notify the Project Engineer immediately so that he/she can consult with the Environmental Office for an appropriate course of action.

### COMMITMENT H: WASTE DISPOSAL SITE

The Contractor shall furnish a site(s) for the disposal of construction and/or demolition debris generated by this project.

**Action Taken/Required:**

Construction and/or demolition debris may not be disposed of within the State ROW.

The waste disposal site(s) shall be managed and reclaimed in accordance with the following from the General Permit for Highway, Road, and Railway Construction/Demolition Debris Disposal Under the South Dakota Waste Management Program issued by the Department of Environment and Natural Resources.

The waste disposal site(s) shall not be located in a wetland, within 200 feet of surface water, or in an area that adversely affects wildlife, recreation, aesthetic value of an area, or any threatened or endangered species, as approved by the Project Engineer.

If the waste disposal site(s) is located such that it is within view of any ROW, the following additional requirements shall apply:

1. Construction and/or demolition debris consisting of concrete, asphalt concrete, or other similar materials shall be buried in a trench completely separate from wood debris. The final cover over the construction and/or demolition debris shall consist of a minimum of 1 foot of soil capable of supporting vegetation. Waste disposal sites provided outside of the State ROW shall be seeded in accordance with Natural Resources Conservation Service recommendations. The seeding recommendations may be obtained through the appropriate County NRCS Office. The Contractor shall control the access to waste disposal sites not within the State ROW through the use of fences, gates, and placement of a sign or signs at the entrance to the site stating "No Dumping Allowed".

2. Concrete and asphalt concrete debris may be stockpiled within view of the ROW for a period of time not to exceed the duration of the project. Prior to project completion, the waste shall be removed from view of the ROW or buried and the waste disposal site reclaimed as noted above.

The above requirements will not apply to waste disposal sites that are covered by an individual solid waste permit as specified in SDCL 34A-6-58, SDCL 34A-6-1.13, and ARSD 74:27:10:06.

Failure to comply with the requirements stated above may result in civil penalties in accordance with South Dakota Solid Waste Law, SDCL 34A-6-1.31.

All costs associated with furnishing waste disposal site(s), disposing of waste, maintaining control of access (fence, gates, and signs), and reclamation of the waste disposal site(s) shall be incidental to the various contract items.

### COMMITMENT I: HISTORICAL PRESERVATION OFFICE CLEARANCES

The SDDOT has obtained concurrence with the State Historical Preservation Office (SHPO or THPO) for all work included within the project limits and all designated option borrow sites provided within the plans.

**Action Taken/Required:**

All earth disturbing activities not designated within the plans require review of cultural resources impacts. This work includes, but is not limited to: staging areas, borrow sites, waste disposal sites, and all material processing sites.

The Contractor shall arrange and pay for a cultural resource survey and/or records search. The Contractor has the option to contact the state Archaeological Research Center (ARC) at 605-394-1936 or another qualified archaeologist, to obtain either a records search or a cultural resources survey. A record search might be sufficient for review; however, a cultural resources survey may need to be conducted by a qualified archaeologist.

The Contractor shall provide ARC with the following: a topographical map or aerial view on which the site is clearly outlined, site dimensions, project number, and PCN. If applicable, provide evidence that the site has been previously disturbed by farming, mining, or construction activities with a landowner statement that artifacts have not been found on the site.

The Contractor shall submit the records search or cultural resources survey report and if the location of the site is within the current geographical or historic boundaries of any South Dakota reservation to SDDOT Environmental Engineer, 700 East Broadway Avenue, Pierre, SD 57501-2586 (605-773-3180). SDDOT will submit the information to the appropriate SHPO/THPO. Allow **30 Days** from the date this information is submitted to the Environmental Engineer for SHPO/THPO review.

If evidence for cultural resources is uncovered during project construction activities, then such activities shall cease and the Project Engineer shall be immediately notified. The Project Engineer will contact the SDDOT Environmental Engineer in order to determine an appropriate course of action.

SHPO/THPO review does not relieve the Contractor of the responsibility for obtaining any additional permits and clearances for staging areas, borrow sites, waste disposal sites, or material processing sites that affect wetlands, threatened and endangered species, or waterways. The Contractor shall provide the required permits and clearances to the Project Engineer at the preconstruction meeting.

# i3u4 Table of Concrete Removal & Repair

| | | |
|---|---|---|
| EBOL | = | Eastbound Outside Lane |
| EBIL | = | Easbound Inside Lane |
| CTL | = | Center Turn Lane |
| WBIL | = | West Bound Inside Lane |
| WBOL | = | West Bound Outside Lane |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Insert Steel Bar in PCC Pavement (Each) | | | | | |
| | | | | Cross Stitch | Nonreinforced PCC Pavement Repair | | | | Dowel Bars | Remove Concrete Type P8.5 Concrete Gutter | Type P8.5 Concrete Gutter |
| MRM | Lane | Length (ft) | Width (ft) | Each | Sq. Yd | 1.25" | #9 | #5 | Each | Feet | Feet |
| 352.512 | WBOL | 4 | 14 | 0 | 6.2 | 0 | 0 | 0 | 0 | 0 | 0 |
| 352.512 | WBIL | 4 | 12 | 0 | 5.3 | 0 | 0 | 0 | 0 | 0 | 0 |
| 352.611 | EBOL | 0 | 0 | 96 | 0.0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 352.627 | EBOL | 4 | 7 | 0 | 3.1 | 7 | 5 | 2 | 0 | 0 | 0 |
| 352.703 | WBOL | 20 | 7 | 0 | 15.6 | 7 | 0 | 8 | 7 | 0 | 0 |
| 352.707 | WBOL | 20 | 14 | 0 | 31.1 | 21 | 0 | 0 | 0 | 0 | 0 |
| 352.707 | WBIL | 12 | 4 | 0 | 5.3 | 0 | 16 | 2 | 0 | 0 | 0 |
| 352.712 | EBOL | 0 | 0 | 60 | 0.0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 352.723 | WBOL | 20 | 7 | 0 | 15.6 | 0 | 0 | 8 | 7 | 0 | 0 |
| 352.727 | WBOL | 20 | 14 | 0 | 31.1 | 21 | 0 | 0 | 0 | 0 | 0 |
| 352.727 | WBIL | 4 | 12 | 0 | 5.3 | 0 | 16 | 2 | 0 | 0 | 0 |
| 352.739 | EBOL | 0 | 0 | 140 | 0.0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 352.765 | EBOL | 6 | 5 | 0 | 3.3 | 5 | 4 | 3 | 0 | 0 | 0 |
| 352.769 | EBOL | 0 | 0 | 60 | 0.0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 352.776 | EBOL | 60 | 14 | 0 | 93.3 | 24 | 0 | 24 | 24 | 0 | 0 |
| 352.787 | EBOL | 0 | 0 | 280 | 0.0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 352.840 | EBOL | 6 | 7 | 0 | 4.7 | 0 | 5 | 3 | 7 | 0 | 0 |
| 352.85 | EBOL | 8 | 7 | 0 | 6.2 | 0 | 5 | 4 | 0 | 0 | 0 |
| 352.854 | EBOL | 0 | 0 | 20 | 0.0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 352.858 | EBIL | 4 | 12 | 0 | 5.3 | 0 | 16 | 0 | 0 | 0 | 0 |
| 352.858 | EBOL | 40 | 14 | 0 | 62.2 | 24 | 0 | 16 | 24 | 0 | 0 |
| 353.063 | WBOL | 7 | 6 | 0 | 4.7 | 7 | 5 | 3 | 0 | 0 | 0 |
| 353.063 | WBIL | 14 | 12 | 0 | 18.7 | 8 | 11 | 8 | 4 | 0 | 0 |
| 353.063 | EBOL | 4 | 4 | 0 | 1.8 | 4 | 3 | 4 | 0 | 0 | 0 |
| 353.110 | EBOL | 0 | 0 | 56 | 0.0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 353.221 | CTL | 6 | 12 | 0 | 8.0 | 0 | 16 | 2 | 12 | 0 | 0 |
| 353.413 | EBIL | 4 | 12 | 0 | 5.3 | 0 | 16 | 2 | 0 | 0 | 0 |
| 353.413 | EBOL | 4 | 20 | 0 | 8.9 | 0 | 32 | 2 | 0 | 4 | 4 |
| 353.455 | CTL | 4 | 12 | 0 | 5.3 | 12 | 8 | 1 | 0 | 0 | 0 |
| 353.470 | EBIL | 4 | 12 | 0 | 5.3 | 12 | 8 | 1 | 0 | 0 | 0 |
| 353.490 | CTL | 4 | 12 | 0 | 5.3 | 12 | 8 | 2 | 0 | 0 | 0 |
| 353.497 | EBOL | 0 | 0 | 80 | 0.0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 353.542 | WBOL | 0 | 0 | 40 | 0.0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 353.550 | WBOL | 10 | 7 | 0 | 7.8 | 7 | 5 | 0 | 0 | 0 | 0 |
| 353.550 | WBIL | 4 | 12 | 0 | 5.3 | 0 | 16 | 8 | 0 | 0 | 0 |

# i3u4 Table of Concrete Removal & Repair

| | | |
|---|---|---|
| EBOL | = | Eastbound Outside Lane |
| EBIL | = | Easbound Inside Lane |
| CTL | = | Center Turn Lane |
| WBIL | = | West Bound Inside Lane |
| WBOL | = | West Bound Outside Lane |

| | | | | | | Insert Steel Bar in PCC Pavement (Each) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Cross Stitch | Nonreinforced PCC Pavement Repair | | | | Dowel Bars | Remove Concrete Type P8.5 Concrete Gutter | Type P8.5 Concrete Gutter |
| MRM | Lane | Length (ft) | Width (ft) | Each | Sq. Yd | 1.25" | #9 | #5 | Each | Feet | Feet |
| 353.585 | EBOL | 7 | 20 | 0 | 15.6 | 14 | 0 | 8 | 7 | 0 | 0 |
| 353.585 | CTL | 4 | 12 | 0 | 5.3 | 0 | 16 | 0 | 0 | 0 | 0 |
| 353.585 | EBIL | 4 | 12 | 0 | 5.3 | 0 | 16 | 3 | 0 | 0 | 0 |
| 353.585 | EBOL | 12 | 14 | 0 | 18.7 | 0 | 10 | 5 | 0 | 0 | 0 |
| 353.640 | EBOL | 8 | 4 | 0 | 3.6 | 8 | 6 | 4 | 4 | 0 | 0 |
| 353.661 | WBOL | 140 | 7 | 0 | 108.9 | 14 | 0 | 56 | 42 | 0 | 0 |
| 353.661 | EBOL | 0 | 0 | 60 | 0.0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 353.687 | EBOL | 4 | 5 | 0 | 2.2 | 4 | 3 | 2 | 0 | 0 | 0 |
| 353.791 | WBOL | 140 | 7 | 0 | 108.9 | 14 | 0 | 56 | 49 | 0 | 0 |
| 353.813 | EBOL | 0 | 0 | 40 | 0.0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 353.837 | EBOL | 0 | 0 | 80 | 0.0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 353.864 | WBIL | 20 | 6 | 0 | 13.3 | 7 | 0 | 8 | 7 | 0 | 0 |
| 353.865 | WBOL | 40 | 7 | 0 | 31.1 | 14 | 0 | 16 | 7 | 0 | 0 |
| 353.865 | WBIL | 20 | 6 | 0 | 13.3 | 14 | 0 | 8 | 0 | 0 | 0 |
| 353.868 | WBIL | 20 | 12 | 0 | 26.7 | 21 | 8 | 0 | 0 | 0 | 0 |
| 353.879 | WBOL | 80 | 7 | 0 | 62.2 | 14 | 0 | 32 | 21 | 0 | 0 |
| 353.886 | WBOL | 4 | 14 | 0 | 6.2 | 0 | 20 | 2 | 0 | 0 | 0 |
| 353.886 | WBIL | 4 | 12 | 0 | 5.3 | 0 | 16 | 0 | 0 | 0 | 0 |
| 353.936 | WBOL | 4 | 14 | 0 | 6.2 | 0 | 20 | 2 | 0 | 0 | 0 |
| 353.936 | WBIL | 4 | 12 | 0 | 5.3 | 0 | 16 | 0 | 0 | 0 | 0 |
| 353.958 | CTL | 6 | 12 | 0 | 8.0 | 0 | 16 | 3 | 12 | 0 | 0 |
| 353.971 | EBIL | 10 | 12 | 0 | 13.3 | 0 | 16 | 4 | 0 | 0 | 0 |
| 353.971 | EBOL | 10 | 14 | 0 | 15.6 | 0 | 20 | 0 | 0 | 0 | 0 |
| 353.977 | EBIL | 340 | 6 | 0 | 226.7 | 6 | 0 | 304 | 96 | 0 | 0 |
| 354.004 | WBOL | 60 | 7 | 0 | 46.7 | 14 | 0 | 48 | 14 | 0 | 0 |
| 354.044 | EBOL | 0 | 0 | 20 | 0.0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 354.048 | WBOL | 4 | 14 | 0 | 6.2 | 0 | 20 | 2 | 0 | 0 | 0 |
| 354.048 | WBIL | 4 | 12 | 0 | 5.3 | 0 | 16 | 0 | 0 | 0 | 0 |
| 354.048 | EBOL | 14 | 7 | 0 | 10.9 | 7 | 5 | 6 | 0 | 0 | 0 |
| 354.053 | EBIL | 60 | 12 | 0 | 80.0 | 12 | 0 | 48 | 24 | 0 | 0 |
| 354.056 | EBIL | 60 | 6 | 0 | 40.0 | 0 | 0 | 48 | 18 | 0 | 0 |
| 354.058 | EBIL | 20 | 12 | 0 | 26.7 | 12 | 0 | 16 | 6 | 0 | 0 |
| 354.058 | EBOL | 4 | 14 | 0 | 6.2 | 0 | 20 | 0 | 0 | 0 | 0 |
| 354.062 | EBIL | 40 | 6 | 0 | 26.7 | 6 | 0 | 32 | 6 | 0 | 0 |
| 354.066 | EBOL | 40 | 7 | 0 | 31.1 | 14 | 0 | 16 | 7 | 0 | 0 |

# i3u4 Table of Concrete Removal & Repair

| | | |
|---|---|---|
| EBOL | = | Eastbound Outside Lane |
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| CTL | = | Center Turn Lane |
| WBIL | = | West Bound Inside Lane |
| WBOL | = | West Bound Outside Lane |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Insert Steel Bar in PCC Pavement (Each) | | | | | |
| | | | | Cross Stitch | Nonreinforced PCC Pavement Repair | | | | Dowel Bars | Remove Concrete Type P8.5 Concrete Gutter | Type P8.5 Concrete Gutter |
| MRM | Lane | Length (ft) | Width (ft) | Each | Sq. Yd | 1.25" | #9 | #5 | Each | Feet | Feet |
| 354.077 | WBOL | 51 | 7 | 0 | 39.7 | 7 | 5 | 42 | 12 | 0 | 0 |
| 354.081 | EBIL | 120 | 7.5 | 0 | 100.0 | 10 | 0 | 96 | 39 | 0 | 0 |
| 354.094 | EBIL | 120 | 7 | 0 | 93.3 | 5 | 0 | 96 | 42 | 0 | 0 |
| 354.094 | EBIL | 4 | 2 | 0 | 0.9 | 0 | 1 | 0 | 0 | 0 | 0 |
| 354.098 | WBOL | 0 | 0 | 20 | 0.0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 354.098 | EBOL | 0 | 0 | 20 | 0.0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 354.102 | WBOL | 20 | 7 | 0 | 15.6 | 14 | 0 | 8 | 0 | 0 | 0 |
| 354.102 | EBOL | 4 | 4 | 0 | 1.8 | 4 | 3 | 2 | 0 | 0 | 0 |
| 354.102 | EBOL | 0 | 0 | 16 | 0.0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 354.106 | WBOL | 0 | 0 | 20 | 0.0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 354.106 | EBOL | 4 | 4 | 0 | 1.8 | 4 | 3 | 2 | 0 | 0 | 0 |
| 354.106 | EBOL | 0 | 0 | 16 | 0.0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 354.110 | EBOL | 15 | 7 | 0 | 11.7 | 7 | 10 | 7 | 7 | 0 | 0 |
| 354.110 | EBOL | 0 | 0 | 16 | 0.0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 354.119 | EBIL | 20 | 12 | 0 | 26.7 | 10 | 0 | 16 | 7 | 0 | 0 |
| 354.119 | EBOL | 4 | 14 | 0 | 6.2 | 0 | 20 | 0 | 0 | 0 | 0 |
| 354.121 | WBOL | 11 | 14 | 0 | 17.1 | 12 | 10 | 5 | 0 | 0 | 0 |
| 354.121 | WBIL | 4 | 12 | 0 | 5.3 | 0 | 16 | 0 | 0 | 0 | 0 |
| 354.121 | EBIL | 260 | 7 | 0 | 202.2 | 0 | 0 | 208 | 84 | 0 | 0 |
| 354.128 | CTL | 4 | 12 | 0 | 5.3 | 0 | 16 | 0 | 0 | 0 | 0 |
| 354.147 | EBOL | 12 | 6 | 0 | 8.0 | 6 | 4 | 10 | 0 | 0 | 0 |
| 354.151 | EBOL | 0 | 0 | 56 | 0.0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 354.161 | EBIL | 20 | 12 | 0 | 26.7 | 14 | 0 | 16 | 0 | 0 | 0 |
| 354.161 | EBOL | 7 | 14 | 0 | 10.9 | 12 | 10 | 0 | 0 | 0 | 0 |
| 354.162 | EBOL | 4 | 4 | 0 | 1.8 | 4 | 3 | 2 | 0 | 0 | 0 |
| 354.165 | WBOL | 40 | 7 | 0 | 31.1 | 7 | 0 | 16 | 12 | 0 | 0 |
| 354.165 | EBOL | 40 | 7 | 0 | 31.1 | 7 | 0 | 16 | 12 | 0 | 0 |
| 354.166 | EBOL | 0 | 0 | 20 | 0.0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 354.171 | WBOL | 6 | 14 | 0 | 9.3 | 0 | 20 | 3 | 0 | 0 | 0 |
| 354.171 | WBIL | 6 | 12 | 0 | 8.0 | 0 | 16 | 0 | 0 | 0 | 0 |
| 354.192 | WBOL | 50 | 14 | 0 | 77.8 | 7 | 20 | 20 | 24 | 0 | 0 |
| 354.192 | WBIL | 50 | 12 | 0 | 66.7 | 12 | 8 | 0 | 24 | 0 | 0 |
| 354.192 | CTL | 40 | 12 | 0 | 53.3 | 24 | 0 | 16 | 12 | 0 | 0 |
| 354.192 | EBIL | 40 | 12 | 0 | 53.3 | 24 | 0 | 16 | 12 | 0 | 0 |
| 354.192 | EBOL | 40 | 14 | 0 | 62.2 | 21 | 0 | 0 | 12 | 0 | 0 |

| STATE OF SOUTH DAKOTA | PROJECT | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|
| | 012-151 & 000P-151 | 8 | 30 |

# i3u4 Table of Concrete Removal & Repair

| | | |
|---|---|---|
| EBOL | = | Eastbound Outside Lane |
| EBIL | = | Easbound Inside Lane |
| CTL | = | Center Turn Lane |
| WBIL | = | West Bound Inside Lane |
| WBOL | = | West Bound Outside Lane |

| | | | | | | Insert Steel Bar in PCC Pavement (Each) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Cross Stitch | Nonreinforced PCC Pavement Repair | | | | Dowel Bars | Remove Concrete Type P8.5 Concrete Gutter | Type P8.5 Concrete Gutter |
| MRM | Lane | Length (ft) | Width (ft) | Each | Sq. Yd | 1.25" | #9 | #5 | Each | Feet | Feet |
| 354.351 | WBOL | 4 | 14 | 0 | 6.2 | 0 | 20 | 4 | 0 | 0 | 0 |
| 354.351 | WBIL | 6 | 12 | 0 | 8.0 | 0 | 16 | 6 | 0 | 0 | 0 |
| 354.377 | WBOL | 0 | 0 | 20 | 0.0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 354.381 | WBOL | 20 | 7 | 0 | 15.6 | 14 | 0 | 8 | 0 | 0 | 0 |
| 354.385 | WBOL | 0 | 0 | 40 | 0.0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 354.390 | WBOL | 40 | 14 | 0 | 62.2 | 24 | 0 | 16 | 12 | 0 | 0 |
| 354.398 | WBOL | 0 | 0 | 116 | 0.0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 354.411 | WBOL | 4 | 4 | 0 | 1.8 | 4 | 3 | 2 | 0 | 0 | 0 |
| 354.489 | WBOL | 12 | 4 | 0 | 5.3 | 0 | 6 | 6 | 4 | 0 | 0 |
| 354.493 | WBOL | 0 | 0 | 140 | 0.0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 354.523 | WBOL | 20 | 7 | 0 | 15.6 | 14 | 0 | 8 | 0 | 0 | 0 |
| | | | **Total** | **1532** | **2434.2** | **633** | **649** | **1481** | **720** | **4** | **4** |

# i3wn Table of Crossover Repair

| MRM | Remove Asphalt Concrete Pavement | Unclassified Excavation | Undercut | Contractor Furnished Borrow | Gravel Cushion | 9" Non-Reinforced PCC Pavement | Asphalt Composite |
|---|---|---|---|---|---|---|---|
| | Sq. Yd | Cu .Yd | Cu. Yd | Cy. Yd | Ton | Sq.Yd | Tons |
| 321.234 | 618.9 | 126.7 | 253.4 | 253.4 | 221.7 | 760.2 | 22.7 |
| 344.528 | 430.5 | 112.7 | 225.4 | 225.4 | 147.9 | 676.1 | 0.0 |
| **Total** | **1049.4** | **239.4** | **478.8** | **478.8** | **369.6** | **1436.3** | **22.7** |

## SCOPE OF WORK

Work on this project includes, but is not limited to PCC Pavement repair and construction of PCCP Median Crossovers.

## SEQUENCE OF OPERATIONS

The following Sequence of Operations shall be adhered to. Any change must be approved in writing by the Engineer prior to the change being made.

1. Crossover Replacement US 12 at MRM 321.234 East of Andover & Crossover Replacement US 12 at MRM 344.528 East of Webster.
2. PCC pavement repair US 12 through Waubay

Construction activities will be permitted during daylight hours only.

Once repair work starts on one project the Contractor shall be required to work continuously on the project. Contractor shall finish work at one project before moving to the next project. Closing sections of road and leaving the project or working on other sections of the project will not be permitted.

Crossovers will be allowed to be closed to traffic during construction. Adequate signing will be provided to inform the traveling public of the closure and prohibit any crossing of the median while it is closed.

While performing the work for project 012-151, no repair areas will be allowed to be left open for more than 24 hours or over the weekend or holidays.

## EXISTING PCC PAVEMENT

The existing PCC Pavement at US 12 through Waubay is non-reinforced and was constructed using crushed ledge rock aggregate. Load transfer bars are located in the transverse joints. The joint spacing on the project is 20 feet. Transverse joints were sealed with hot poured elastic joint sealer.

## DIMENSIONS OF EXISTING CONTRACTION JOINTS

All details and dimensions of the existing contraction joints contained in these plans are provided as information only. It is the Contractor's responsibility to inspect and verify the actual field conditions and necessary dimensions affecting the satisfactory completion of the work required for this project.

## MAINTENANCE OF TRAFFIC

Removing, relocating, covering, salvaging and resetting of existing traffic control devices, including delineation, shall be the responsibility of the Contractor. Cost of this work shall be incidental to the various contract bid items unless otherwise specified in the plans. Delineators and signs damaged or lost shall be replaced by the Contractor at no cost to the State.

Indiscriminate driving and parking of vehicles within the right-of-way will not be permitted. Any damage to the vegetation, surfacing, embankment, delineators and existing signs resulting from such indiscriminate use shall be repaired and/or restored by the Contractor, at no expense to the State, and to the satisfaction of the Engineer.

Sufficient traffic control devices have been provided to allow for two lane closures on US 12 to complete the pavement repair. The Contractor shall be required to move and reset these signs according to their operations. All costs associated with moving and resetting of the traffic control shall be incidental to the contract lump sum price for TRAFFIC CONTROL, MISCELLANEOUS.

Work activities during non-daylight hours are subject to prior approval.

One lane of traffic shall be maintained in each direction at all times on US 12. Crossing of traffic into the oncoming lane will not be allowed. No two adjacent driving lanes shall be left closed overnight.

Throughout the project, the Contractor must maintain local traffic and access to businesses and residences at all times.

Locations of signs on traffic control layouts are diagrammatic. Portable stands may be used on the shoulders or on driving lanes closed to traffic. The bottom of signs on portable or temporary supports shall not be less than seven feet above the pavement in urban areas and one foot above the pavement in rural areas. Portable sign supports may be used as long as the duration is less than 3 days. If the duration is more than 3 days the signs shall be on fixed location, ground mounted, breakaway supports.

All operations shall be confined to a 12 ft lane plus the shoulder, leaving the adjoining 12 ft lane open for thru traffic.

Contractor will be allowed to encroach on the traffic lane approximately 3 feet if flagger signs and a flagger are used. The flagger signs and flagging are included in the Estimate of Quantities.

Type 3 Barricades 8’ wide shall protect PCC Pavement replacement during open excavation and concrete cure periods. In addition, Type 3 Barricades 8' wide shall be placed every 1000' in the lane that is closed to traffic.

The Contractor shall use 42” cones as channelizing devices except for lane tapers which require reflectorized drums.

While work is being performed on the inside lanes for the PCCP Repair work, channelizing devices shall be installed along the edge line at a spacing of 500 ft to prohibit traffic from driving on the asphalt shoulder.

## 4” TEMPORARY PAVEMENT MARKING TAPE, TYPE I

Temporary pavement marking shall consist of 4” Temporary Pavement Marking Tape, Type I applied and maintained for both projects.

Temporary road markers may be used in place of the temporary pavement marking tape per the approval of the Engineer.

The temporary pavement marking tape shall be kept clean and visible at all times.

## REMOVE EXISTING PAVEMENT MARKINGS

Centerline pavement markings shall be masked with black 4” Temporary Pavement Marking Tape, Type I within the transition areas. Payment for this work shall be incidental to the contract lump sum price for 4” TEMPORARY PAVEMENT MARKING TAPE, TYPE I

## REMOVE, SALVAGE, RELOCATE, AND RESET TRAFFIC SIGN

Project #000P-151 has 2 Yield signs mounted on 4 x 6 wood posts at each crossover that will need to be removed and reset. All cost associated with this shall be incidental to the contract unit price for REMOVE, SALVAGE, RELOCATE, AND RESET TRAFFIC SIGN.

## CONTRACTOR FURNISHED BORROW EXCAVATION

The Contractor shall provide a suitable site for Contractor Furnished Borrow Excavation material. The Contractor is responsible for obtaining all required permits and clearances for the borrow site. The borrow material shall be approved by the Engineer. The plans quantity for “Contractor Furnished Borrow” as shown in the Estimate of Quantities will be the basis of payment for this item, unless changes are ordered in the field by the Engineer.

Restoration of the Contractor Furnished Borrow Excavation site shall be the responsibility of the Contractor.

## CROSSOVER REPLACEMENT WORK

Prior to excavation for project 000P-151, the Contractor shall remove and stockpile 3 inches of in place topsoil from the construction areas. On completion of construction operations this salvaged topsoil shall be spread evenly over the newly constructed embankment inslopes. The Contractor is responsible for arranging an agreement with the landowner for topsoil replacement in borrow areas. Removal and replacement of topsoil will not be measured for payment but shall be incidental to the contract unit price per cubic yard for CONTRACTOR FURNISHED BORROW.

The Contractor shall remove the existing asphalt concrete surfacing, estimated at 3 inches in place at each of the crossovers. After this work has been completed the contractor shall excavate the in-place gravel cushion and subgrade an additional 12 inches. The subgrade shall be graded in order to place 6 inches of gravel cushion and 9 inches of non-reinforced PCCP flush with the existing lanes for US Hwy 12W and 12E. The new subgrade for the crossovers shall be undercut a minimum of 1 foot and back filled with Contractor Furnished Borrow. The depth of undercut is an estimate and the actual depth necessary shall be determined during construction. The Engineer will determine how much undercut shall be done in accordance with Section 120 of the Specifications. Compaction of the Contractor Furnished Borrow shall be to specified density.

All material generated from the removal of the asphalt concrete pavement shall become property of the contractor. All costs associated with the disposal of removed asphalt concrete shall be incidental to the contract unit price per square yard for REMOVE ASHALT CONCRETE PAVEMENT.

All material generated from the removal of the gravel cushion and subgrade shall become property of the Contractor. All costs associated with the disposing this waste material shall be incidental to the contract unit price per cubic yard for UNCLASSIFIED EXCAVATION and/or UNDERCUT.

Salvaged granular material with not be allowed for backfill of undercut.

**9" NONREINFORCED PCC PAVEMENT**

The fine aggregate shall be screened over a 1 inch square opening screen just prior to introduction into the concrete paving mix. The Contractor will screen all of the aggregate to prevent the incorporation of foreign materials (i.e.: mud balls) into the concrete mix.

Fine aggregate shall conform to Section 800.2.D Alkali Silica Reactivity (ASR) Requirements of the Standard Specifications.

The concrete used in Portland Cement Concrete Pavement shall have a minimum cement content of 480 pounds per cubic yard and a fly ash content of 120 pounds per cubic yard.

A construction joint will be sawed whenever new concrete pavement is placed adjacent to existing concrete pavement.

There will be no direct payment for trimming of the gravel cushion for PCC pavement. The trimming will be considered incidental to the related items required for PCC Pavement. Trimming shall be performed as required by Section 380.3 C. of the Standard Specifications.

**REMOVE CONCRETE PAVEMENT**

All removed concrete shall be removed from within the right of way by the end of the workday and disposed of at the Contractor's waste disposal site.

The Contractor shall notify the Engineer two working days prior to beginning work at each particular location so the Engineer may mark removal limits. The Engineer shall mark exact dimensions prior to removal of concrete pavement. Payment will be made for quantity marked and measured in the field. Variations from plans estimated quantities and/or locations will not be considered cause for re-negotiation of the contract unit prices.

Care shall be exercised in the removal of concrete slab panels to avoid damage to adjacent pavement, manholes, drop inlets, and growth joints. Existing growth joints shall be preserved and remain in place. Damage to adjacent pavement, manholes, drop inlets and/or growth joints shall be repaired to the satisfaction of the Engineer at the Contractor's expense.

Contractor shall not saw cut any longitudinal joints without tie bars (See PCC Pavement Layout). If any longitudinal joints without tie bars are cut the contractor will be required to repair the keyway between the two panels at their expense.

Removal of Concrete Pavement shall be incidental to the contract unit price per square yard for NONREINFORCED PCC PAVEMENT REPAIR. This payment will be full compensation for full and partial depth sawing, removal of all PCC Pavement, disposal of all removed material, and all equipment, labor, and incidentals necessary to satisfactorily complete work.

**REMOVE CONCRETE CURB AND GUTTER**

Approximate locations of existing concrete curb and gutter to be removed are provided in the Table of Concrete Removal and Repair. Prior to removal the Contractor shall saw cut full depth at the limits of the removal area as directed by the Engineer. Existing concrete in the replacement areas shall be removed by means that minimize damage to the sides of the remaining in place concrete pavement and sidewalk. All removed concrete shall be removed from within the right of way by the end of the workday and disposed of at the Contractor's waste disposal site.

After concrete removal has been accomplished, the Contractor shall shape, water and recompact the remaining granular material prior to placement of concrete. Any additional gravel cushion required to prepare the area shall be furnished and placed by the Contractor and shall be incidental to the contract unit price per foot for REMOVE CONCRETE CURB AND GUTTER.

Gravel cushion material shall be from a Contractor furnished source. Water content and compaction shall be to the satisfaction of the Engineer.

Costs for this work for full and partial depth sawing, removal of all curb and gutter, disposal of all removed material, and all equipment, labor, and incidentals necessary to satisfactorily complete work shall be incidental to the contract unit price per foot for REMOVE CONCRETE CURB AND GUTTER.

**RESTORATION OF GRAVEL CUSHION**

An inspection of the granular subgrade shall be made after removing concrete from each pavement replacement area. Areas of excess moisture shall be dried to the satisfaction of the Engineer. Loose material shall be removed. Each replacement area shall be leveled and compacted to the satisfaction of the Engineer.

If additional gravel cushion material is required, the Contractor shall furnish, place and compact gravel cushion to the satisfaction of the Engineer at no additional cost to the State.

Cost for this work shall be incidental to the contract unit price per square yard for NONREINFORCED PCC PAVEMENT REPAIR.

**EXCAVATION OF UNSTABLE MATERIAL**

Included in the Estimate of Quantities are **25** Cubic Yards of Unclassified Excavation, Digouts for the necessary removal of unstable material.

Backfill shall be Gravel Cushion paid for at the contract unit price per ton.

**GRAVEL CUSHION**

Gravel Cushion shall conform to the requirements of the Standard Specifications.

Included in the Estimate of Quantities is **50** tons of Gravel Cushion for backfill of Unclassified Excavation, Digouts. The only time Gravel Cushion will be measured and paid for is in locations where digouts are required and for the median crossovers.

**STEEL BAR INSERTION**

Locations and quantities of concrete repair are subject to change in the field at the discretion of the Engineer. The Contractor shall be responsible for ordering the actual quantity of steel bars necessary to complete the work.

The Contractor shall insert the steel bars (1.25 inch x 18 inch epoxy coated plain round dowel bar for transverse joints, No. 9 x 18" epoxy coated deformed tie bars for transverse joints, and No. 5 x 24" epoxy coated deformed tie bars for longitudinal joints) into drilled holes in the existing concrete pavement. An epoxy resin adhesive must be used to anchor the steel bar in the drilled hole.

Plain round dowel bars shall be cut to the specified length by sawing and shall be free from burring or other deformations. Shearing shall not be permitted.

Epoxy resin adhesive shall be of the type intended for horizontal applications, and shall conform to the requirements of ASTM C 881, Type IV, Grade 3 (equivalent to AASHTO M235, Type IV, Grade 3).

Epoxy coated plain round steel bars shall be installed on 12 inch centers in the transverse joint. The first steel bar shall be placed a minimum of 3 inches and a maximum of 6 inches from the outside edge of the slab.

Epoxy coated deformed steel bars shall be inserted on 18 inch centers in the transverse joint. The first steel bar shall be placed a minimum of 3 inches and a maximum of 9 inches from the outside edge of the slab.

Epoxy coated deformed steel bars shall be inserted on 30 inch centers in the longitudinal joint and shall be placed a minimum of 15 inches from the existing transverse contraction joint.

The diameter of the drilled holes in the existing concrete pavement for the steel bars shall not be less than 1/8 inch nor more than 3/8 inch greater than the overall diameter of the steel bar. Holes drilled into the existing concrete pavement shall be located at mid-depth of the slab and true and normal. The drilled holes shall be blown out with compressed air using a device that shall reach to the back of the hole to ensure that all debris or loose material has been removed prior to epoxy injection.

A rigid frame or mechanical device shall be required to guide the drill to ensure proper horizontal and vertical alignment of the steel bars in the drilled holes.

Mix the epoxy resin as recommended by the manufacturer and apply by an injection method approved by the Engineer. If an epoxy pump is utilized, it shall be capable of metering the components at the manufacturer's designated rate and be equipped with an automatic shut-off. The pump shall shut off when any of the components are not being metered at the designated rate.

Fill the drilled holes 1/3 to 1/2 full of epoxy, or as recommended by the manufacturer, prior to insertion of the steel bar. Care shall be taken to prevent epoxy from running out of the horizontal holes prior to steel bar insertion. Rotate the steel bar during insertion to eliminate voids and ensure complete bonding of the bar. Insertion by the dipping method shall not be allowed.

Cost for the epoxy resin adhesive, steel bars, drilling of holes, applying the adhesive, installing the steel bars into the drilled holes and all other items incidental to the installation of the steel bars shall be incidental to the contract unit price per each for INSERT STEEL BAR IN PCC PAVEMENT.

**NONREINFORCED PCC PAVEMENT REPAIR**

Locations and size (length or width) of concrete repair areas are subject to change in the field, at the discretion of the Engineer. Payment shall be based on actual area replaced.

Existing concrete pavement shall be sawed full depth on all sides of the PCCP repair areas except on any longitudinal joints that are not tied. When either the beginning or end of a PCCP repair area falls close to an existing joint or crack, the PCCP repair area shall be extended to eliminate the existing joint or crack. Where possible, new working joints shall be adjacent to existing working joints.

Saw cuts that extend beyond the repair area shall be minimized and filled with a non-shrinkage mortar mix at the Contractor's expense.

Existing concrete pavement in the replacement areas shall be removed by the lift out method or by means that minimize damage to the base and sides of remaining in place concrete. All removed material shall be removed from within the right-of-way by the end of the workday. Damage to adjacent concrete caused by the Contractor's operations shall be removed and replaced at the Contractor's expense.

If the pavement replacement area is entirely on either side of the existing contraction joint, the location of one of the working joints shall be at the original location. Any existing dowel bar assemblies shall be sawed off or removed.

At repair locations where the new working joint is not opposite the existing working joint, the Contractor shall place a ¼" preformed asphalt expansion joint material along the longitudinal joint from the existing working joint to the new working joint. The expansion joint material shall meet the requirements of AASHTO M33. Cost for this material shall be incidental to the contract unit price per square yard for NONREINFORCED PCC PAVEMENT REPAIR.

All joints (longitudinal and transverse) through and around the repair areas shall be sawed and sealed in accordance with the details shown in these plans. Refer to Saw and Seal Joints notes.

New pavement thickness shall be according to the typical sections at all locations.

Concrete shall meet the requirements of the Standard Specifications Section 380, except as modified by the following notes:

The fine aggregate shall be screened over a one-inch square-opening screen just prior to introduction into the concrete paving mix if required by the Engineer.

The slump requirement shall be limited to 3" maximum after water reducer is added and the concrete shall contain 4.5% to 7.0% entrained air. The concrete mix shall contain a minimum of 50% coarse aggregate by weight. Coarse aggregate shall be crushed ledge rock, Size No. 1 unless an alternative gradation is approved by the Concrete Engineer. The concrete mix shall contain at least 650 lbs. of Type I or II cement or 600 lbs. of Type III cement per cubic yard. The minimum 28 day compressive strength shall be 4,000 psi. The Contractor is responsible for the mix design used. The Contractor shall submit a mix design and supporting documentation for approval at least 2 weeks prior to use.

The use of a water reducer at manufacturer's recommended dosage shall be required.

Concrete shall be cured with white pigmented curing compound (AASHTO M148, Type 2) applied as soon as practical at a rate of 125 square feet per gallon. Concrete shall be cured for a minimum of 48 hours before opening to traffic. The 48 hours is based upon a concrete surface temperature of 60º F or higher throughout the cure period. If the concrete temperature falls below 60º F, the cure time shall be extended or other measures shall be taken, at no additional cost to the State. In addition to the curing requirements, a strength of 4,000 psi must be attained prior to opening to traffic.

Insulation blankets will be used to cover concrete at intersecting streets, driveways and areas designated by the Engineer to expedite the curing of the concrete. Concrete shall be covered with suitable insulation blanket consisting of a layer of closed cell polystyrene foam protected by at least one layer of plastic. Insulation blanket shall have an R-value of at least 0.5, as rated by the manufacturer. Insulation blanket shall be left in place, except for joint sawing operations, until the 4000 psi is attained. Insulation blanket shall be overlapped on to the existing concrete by 4'. The initial contraction joint sawing shall be performed as soon as practical after placement to avoid random cracking.

Cost for performing the aforementioned work including furnishing and placing concrete, labor, tools and equipment shall be incidental to the contract unit price per square yard for NONREINFORCED PCC PAVEMENT REPAIR.

**RETROFITTING TIE BARS (STITCHING)**

The Contractor shall install No. 5 epoxy coated deformed tie bars into drilled holes in the existing concrete pavement. An epoxy resin adhesive must be used to anchor the steel bar in the drilled hole. The drill used shall be hydraulic percussive type and not a hand held.

The steel bars shall be cut to the specified length by sawing and shall be free from burring or other deformations. Shearing will not be permitted.

Epoxy resin adhesive shall be of the type intended for horizontal applications, and shall conform to the requirements of ASTM C 881, Type IV, Grade 3 (equivalent to AASHTO M235, Type IV, Grade 3).

The diameter of the drilled holes in the existing concrete pavement for the steel bars shall not be less than 1/8 inch nor more than 3/8 inch greater than the overall diameter of the steel bar. The holes shall be drilled at an angle alternating from opposite sides of the joint to produce a cross-stitching pattern. The drilled holes shall be blown out with compressed air using a device that will reach to the back of the hole to ensure that all debris or loose material has been removed prior to epoxy injection. Damage to pavement shall be repaired to the satisfaction of the Engineer at the Contractor's expense. Mix the epoxy resin as recommended by the manufacturer and apply by an injection method approved by the Engineer. If an epoxy pump is utilized, it shall be capable of metering the components at the manufacturers designated rate and be equipped with an automatic shut-off. The pump shall shut off when any of the components are not being metered at the designated rate. Fill the drilled holes sufficiently with epoxy prior to the insertion of the tie bar such that the epoxy will be level with the top of the concrete pavement after insertion of the tie bar. Rotate the steel bar during installation to eliminate voids and ensure complete bonding of the bar. Insertion of the bars by the dipping method will not be allowed. The top of the drilled hole shall be filled with epoxy or excess epoxy removed such that the epoxy is level with the existing pavement.

No bars shall be installed within 12 inches of an existing transverse contraction joint. Any bars not functioning or damaged shall be repaired or replaced at the Contractor's expense.

Cost for the epoxy resin adhesive, tie bars, drilling of holes, debris or loose material removal, applying the adhesive, installing the tie bars into the drilled holes and all other items incidental to the installation of the tie bars shall be incidental to the contract unit price per each for TIE BAR RETROFIT, STITCHING.

**SAW AND SEAL JOINTS**

All longitudinal and transverse joints at concrete repair areas shall be sawed and sealed.

Joints shall not be sealed unless they are thoroughly clean and dry. Cleaning shall be accomplished by sand blasting and other tools as necessary. Just prior to sealing, each joint shall be blown out using a jet of compressed air to remove all traces of dust.

Longitudinal and transverse joints shall be sealed with Hot Poured Elastic Joint Sealer.

Cost for sawing and sealing of the longitudinal and transverse joints shall be incidental to the contract unit price per square yard for NONREINFORCED PCC PAVEMENT REPAIR.

## ALKALI SILICA REACTIVITY

Fine aggregate shall conform to Section 800.2 D. Alkali Silica Reactivity (ASR) Requirements.

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

| Source | Location | Expansion Value |
|---|---|---|
| Bachman | Winner, SD | 0.335* |
| Bitterman | Delmont, SD | 0.316* |
| Concrete Materials | Corson, SD | 0.170 |
| Croell | Hot Springs, SD | 0.089 |
| Croell | Wasta, SD | 0.212 |
| Emme Sand & Gravel | Oneil, NE | 0.217 |
| Fisher S&G – Mickelson Pit | E. of Nisland, SD | 0.129 |
| Fisher S&G - Vallery Pit | Nisland, SD | 0.110 |
| Fisher S&G | Rapid City, SD | 0.092 |
| Fisher S&G | Spearfish, SD | 0.053 |
| Fisher S&G | Wasta, SD | 0.159 |
| Fuchs | Pickstown, SD | 0.275* |
| Higman | Akron, IA | 0.203 |
| Higman | Hudson, SD | 0.187 |
| Hilde | Madison, SD | 0.116 |
| Jensen | Herried, SD | 0.276* |
| L.G. Everist | Brookings, SD | 0.186 |
| L.G. Everist | Hawarden, IA | 0.166 |
| L.G. Everist | Summit, SD | 0.178 |
| Morris | Blunt, SD | 0.192 |
| Morris - Richards Pit | Onida, SD | 0.188 |
| Myrl & Roys – Ode Pit | E Sioux Falls, SD | 0.214 |
| Myrl & Roys - Nelson Pit | NE Sioux Falls, SD | 0.156 |
| Northern Concrete Agg. | Rauville, SD | 0.113 |
| Northern Concrete Agg. | Luverne, MN | 0.133 |
| Opperman - Gunvordahl Pit | Burke, SD | 0.362* |
| Opperman - Cahoy Pit | Herrick, SD | 0.307* |
| Opperman - Jones Pit | Burke, SD | 0.321* |
| Opperman - Randall Pit | Pickstown, SD | 0.239 |
| Pete Lien & Sons | Creston, SD | 0.158 |
| Pete Lien & Sons | Oral, SD | 0.129 |
| Pete Lien & Sons | Wasta, SD | 0.192 |
| Thorpe Pit | Britton, SD | 0.098 |
| Wagner Building Supplies | Pickstown (Wagner), SD | 0.241 |
| Winter Brothers- Whitehead Pit | Brookings, SD | 0.197 |

* 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.

## SWEEPING OF ROADWAY

Cost of cleaning the roadway with a broom shall be incidental to the contract unit price per hour for SWEEPING. Sweeping will be measured and paid for to the nearest 0.1 hours.

At a minimum, sweeping will be required:

1. Prior to opening any segment of roadway to traffic.

When sawing operations are underway in the inside driving lanes, the outside driving lanes and gutter may need to be swept to control dust

## SEEDING AT CROSSOVERS

Disturbed locations shall be seeded with a Type C Permanent Seed Mixture. 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.

Type C Permanent Seed Mixture shall consist of the following:

| Grass Species | Variety | Pure Live Seed (PLS) (Pounds/Acre) |
|---|---|---|
| Western Wheatgrass | Flintlock, Rodan, Rosana | 16 |
| Canada Wildrye | Mandan | 2 |
| | Total: | 18 |

All costs associated with Mycorrhizal inoculum, and seeding shall be incidental to the contract lump sum price EROSION CONTROL.

## MYCORRHIZAL INOCULUM

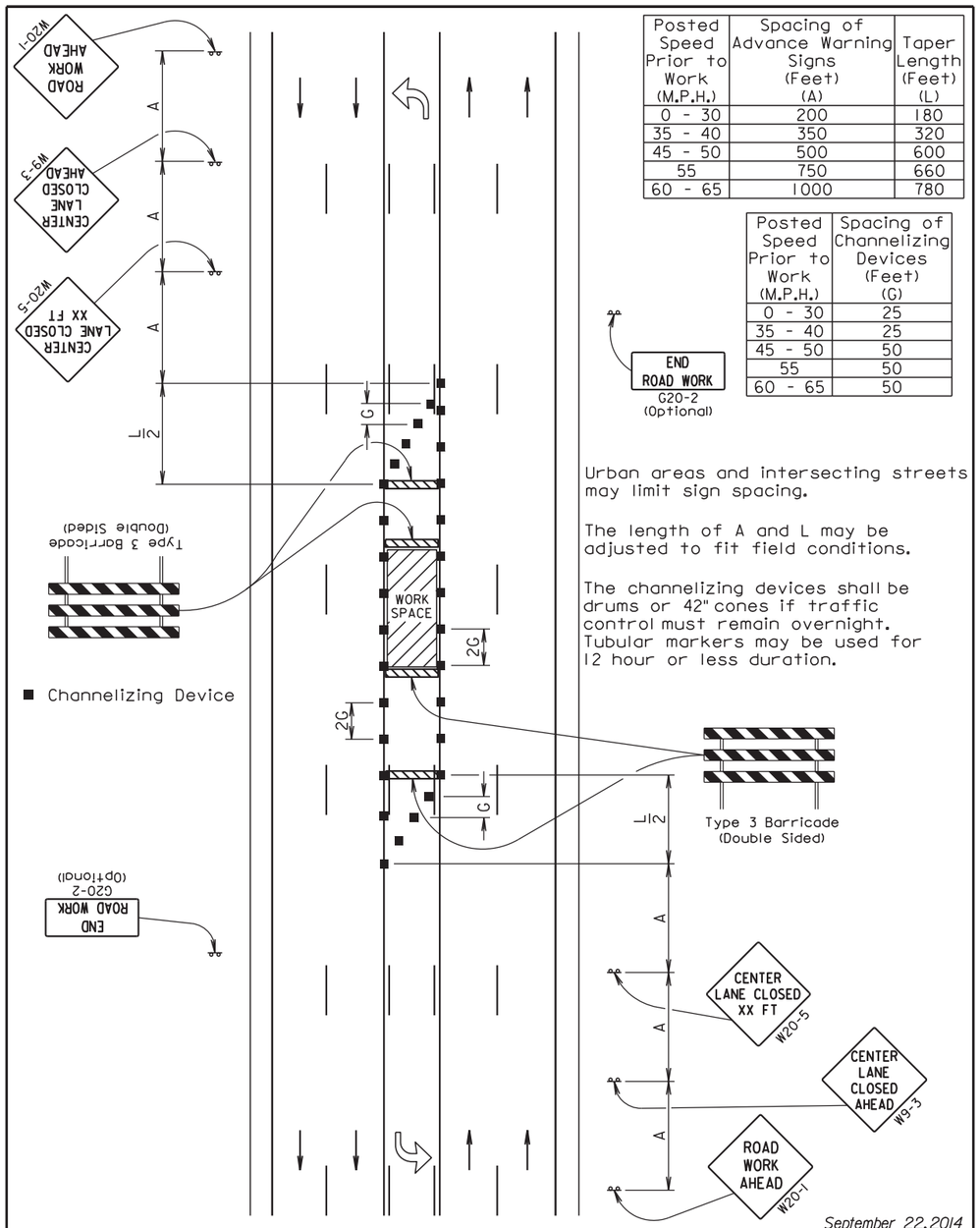
Mycorrhizal inoculum shall consist of mycorrhizal fungi spores and mycorrhizal fungi-infected root fragments in a solid carrier. The carrier may include organic materials, calcinated clay, or other materials consistent with application and good plant growth. The supplier shall provide certification of the fungal species claimed and the live propagule count. The inoculum shall include the following fungal species:

| | |
|---|---|
| *Glomus intraradices* | 25% |
| *Glomus aggregatu* | 25% |
| *Glomus mosseae* | 25% |
| *Glomus etunicatum* | 25% |

All seed shall be inoculated with a minimum of 100,000 live propagules of mycorrhizal fungi per acre. All costs of inoculating the seed shall be incidental to the contract unit price lump sum for EROSION CONTROL.

All seed shall be inoculated with a minimum of 20,000 live propagules of mycorrhizal fungi per 1,000 square feet. All costs of inoculating the seed shall be incidental to the contract unit price per pound for the corresponding permanent seed mixture.

| STATE OF SOUTH DAKOTA | PROJECT | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|
| | 012-151 & 000P-151 | 13 | 30 |




| Posted Speed Prior to Work (M.P.H.) | Spacing of Advance Warning Signs (Feet) (A) | Taper Length (Feet) (L) |
|---|---|---|
| 0 - 30 | 200 | 180 |
| 35 - 40 | 350 | 320 |
| 45 - 50 | 500 | 600 |
| 55 | 750 | 660 |
| 60 - 65 | 1000 | 780 |

| Posted Speed Prior to Work (M.P.H.) | Spacing of Channelizing Devices (Feet) (G) |
|---|---|
| 0 - 30 | 25 |
| 35 - 40 | 25 |
| 45 - 50 | 50 |
| 55 | 50 |
| 60 - 65 | 50 |

Urban areas and intersecting streets may limit sign spacing.

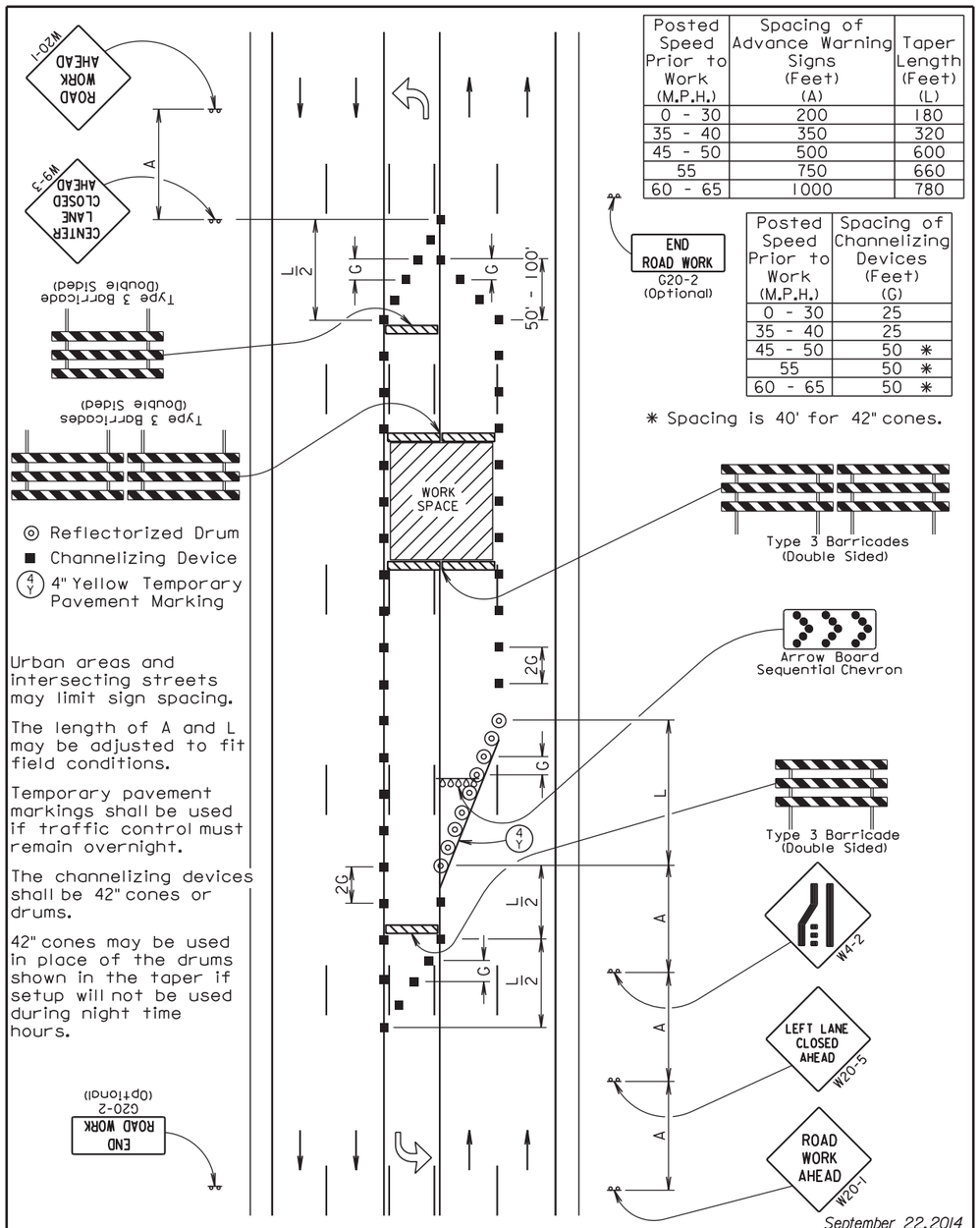
The length of A and L may be adjusted to fit field conditions.

The channelizing devices shall be drums or 42" cones if traffic control must remain overnight. Tubular markers may be used for 12 hour or less duration.

■ Channelizing Device

September 22, 2014

| Published Date: 3rd Qtr. 2015 | SDDOT | GUIDES FOR TRAFFIC CONTROL DEVICES 5-LANE, CENTER LANE CLOSED | PLATE NUMBER 634.55 |
|---|---|---|---|
| | | | Sheet 1 of 1 |




| Posted Speed Prior to Work (M.P.H.) | Spacing of Advance Warning Signs (Feet) (A) | Taper Length (Feet) (L) |
|---|---|---|
| 0 - 30 | 200 | 180 |
| 35 - 40 | 350 | 320 |
| 45 - 50 | 500 | 600 |
| 55 | 750 | 660 |
| 60 - 65 | 1000 | 780 |

| Posted Speed Prior to Work (M.P.H.) | Spacing of Channelizing Devices (Feet) (G) |
|---|---|
| 0 - 30 | 25 |
| 35 - 40 | 25 |
| 45 - 50 | 50 * |
| 55 | 50 * |
| 60 - 65 | 50 * |

* Spacing is 40' for 42" cones.

◎ Reflectorized Drum
■ Channelizing Device
(4Y) 4" Yellow Temporary Pavement Marking

Urban areas and intersecting streets may limit sign spacing.

The length of A and L may be adjusted to fit field conditions.

Temporary pavement markings shall be used if traffic control must remain overnight.

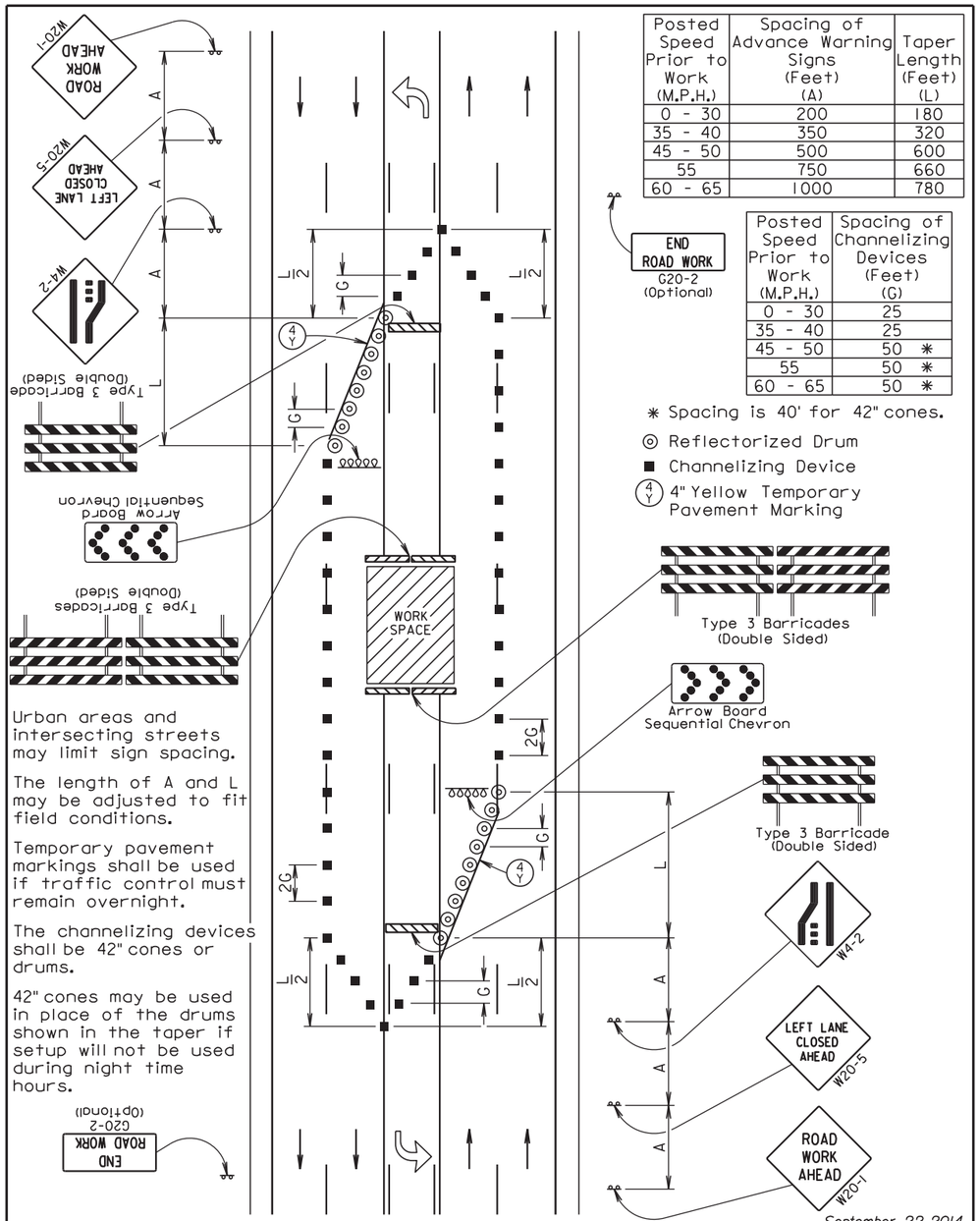
The channelizing devices shall be 42" cones or drums.

42" cones may be used in place of the drums shown in the taper if setup will not be used during night time hours.

September 22, 2014

| Published Date: 3rd Qtr. 2015 | SDDOT | GUIDES FOR TRAFFIC CONTROL DEVICES 5-LANE, INSIDE 2 LANES CLOSED | PLATE NUMBER 634.56 |
|---|---|---|---|
| | | | Sheet 1 of 1 |

| STATE OF SOUTH DAKOTA | PROJECT | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|
| | 012-151 & 000P-151 | 14 | 30 |




| Posted Speed Prior to Work (M.P.H.) | Spacing of Advance Warning Signs (Feet) (A) | Taper Length (Feet) (L) |
|---|---|---|
| 0 - 30 | 200 | 180 |
| 35 - 40 | 350 | 320 |
| 45 - 50 | 500 | 600 |
| 55 | 750 | 660 |
| 60 - 65 | 1000 | 780 |

| Posted Speed Prior to Work (M.P.H.) | Spacing of Channelizing Devices (Feet) (G) |
|---|---|
| 0 - 30 | 25 |
| 35 - 40 | 25 |
| 45 - 50 | 50 * |
| 55 | 50 * |
| 60 - 65 | 50 * |

* Spacing is 40' for 42" cones.

◎ Reflectorized Drum

■ Channelizing Device

(4Y) 4" Yellow Temporary Pavement Marking

Urban areas and intersecting streets may limit sign spacing.

The length of A and L may be adjusted to fit field conditions.

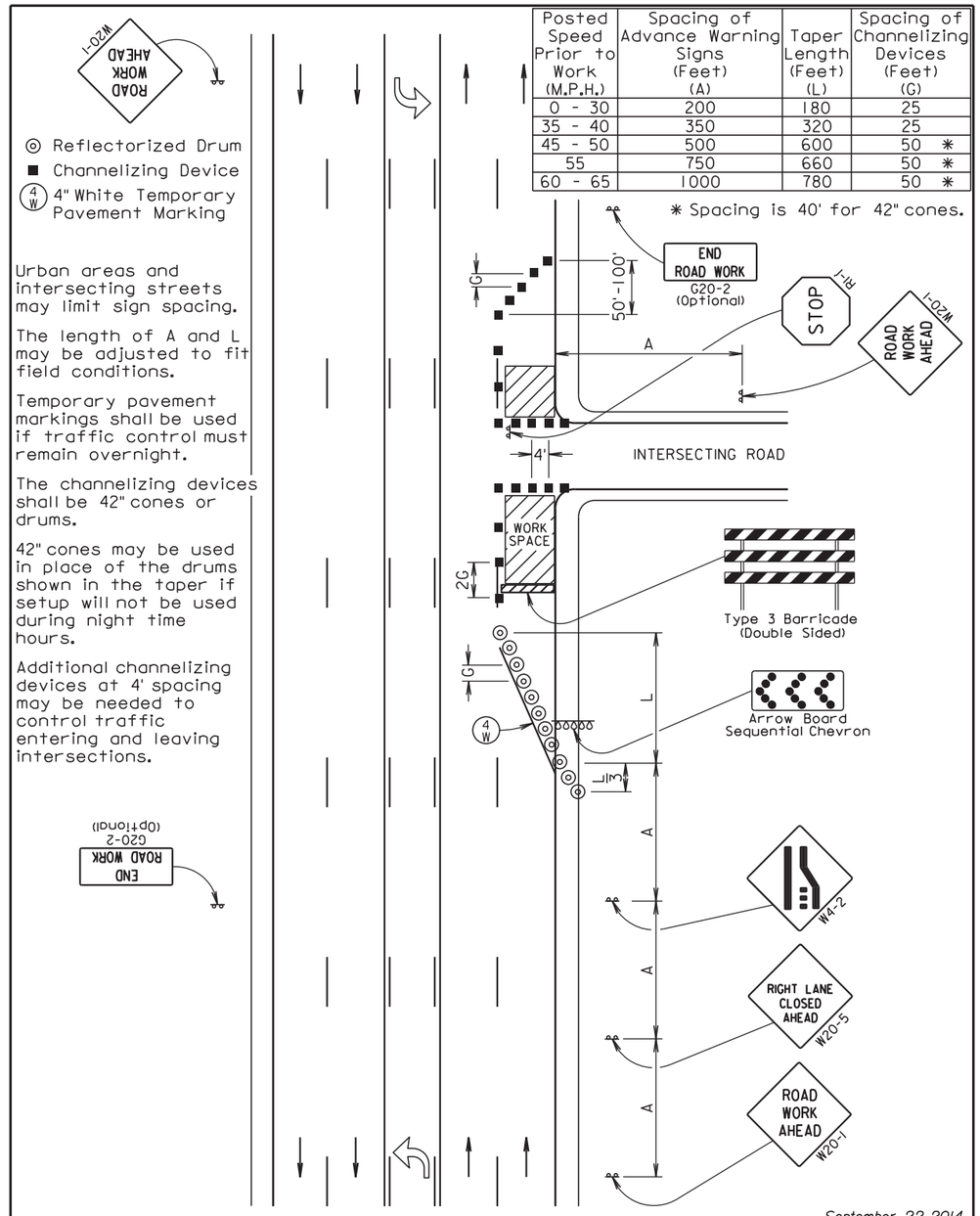
Temporary pavement markings shall be used if traffic control must remain overnight.

The channelizing devices shall be 42" cones or drums.

42" cones may be used in place of the drums shown in the taper if setup will not be used during night time hours.

*September 22, 2014*

| Published Date: 3rd Qtr. 2015 | SDDOT | GUIDES FOR TRAFFIC CONTROL DEVICES 5-LANE, CENTER 3 LANES CLOSED | PLATE NUMBER 634.57 Sheet 1 of 1 |
|---|---|---|---|




| Posted Speed Prior to Work (M.P.H.) | Spacing of Advance Warning Signs (Feet) (A) | Taper Length (Feet) (L) | Spacing of Channelizing Devices (Feet) (G) |
|---|---|---|---|
| 0 - 30 | 200 | 180 | 25 |
| 35 - 40 | 350 | 320 | 25 |
| 45 - 50 | 500 | 600 | 50 * |
| 55 | 750 | 660 | 50 * |
| 60 - 65 | 1000 | 780 | 50 * |

* Spacing is 40' for 42" cones.

◎ Reflectorized Drum

■ Channelizing Device

(4W) 4" White Temporary Pavement Marking

Urban areas and intersecting streets may limit sign spacing.

The length of A and L may be adjusted to fit field conditions.

Temporary pavement markings shall be used if traffic control must remain overnight.

The channelizing devices shall be 42" cones or drums.

42" cones may be used in place of the drums shown in the taper if setup will not be used during night time hours.

Additional channelizing devices at 4' spacing may be needed to control traffic entering and leaving intersections.

*September 22, 2014*

| Published Date: 3rd Qtr. 2015 | SDDOT | GUIDES FOR TRAFFIC CONTROL DEVICES 5-LANE, OUTSIDE LANE CLOSED | PLATE NUMBER 634.60 Sheet 1 of 1 |
|---|---|---|---|

PLOTTED FROM - TRAB18004

| STATE OF SOUTH DAKOTA | PROJECT | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|
| | 012-151 & 000P-151 | 15 | 30 |

| Posted Speed Prior to Work (M.P.H.) | Spacing of Advance Warning Signs (Feet) (A) (B) (C) |
|---|---|
| 0 - 30 | 200 |
| 35 - 40 | 350 |
| 45 - 50 | 500 |
| 55 | 750 |
| 60 - 65 | 1000 |
| | |
| | (A) (B) (C) |
| 70 - 80 | 1000 1500 2640 |

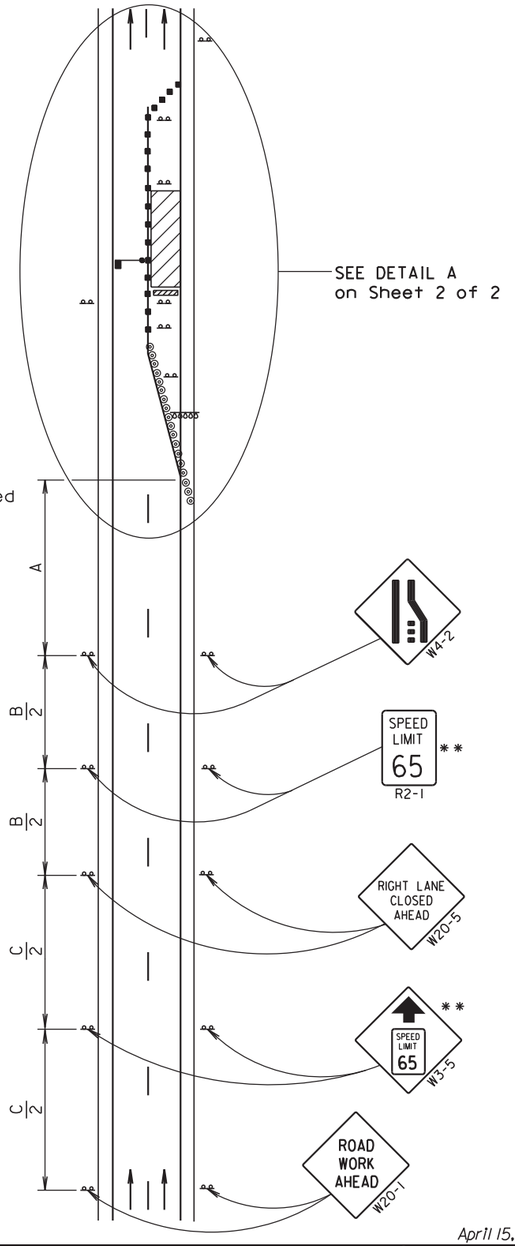
** Speed appropriate for location.

◎ Reflectorized Drum

■ Channelizing Device

ROAD WORK AHEAD sign is only required in advance of the first lane closure.

High speed is defined as having a posted speed limit greater than 45 mph.




April 15, 2015

| Published Date: 3rd Qtr. 2015 | SDDOT | WORK ZONE SPEED REDUCTION FOR INTERSTATE AND HIGH SPEED MULTI-LANE HIGHWAYS | PLATE NUMBER 634.63 | Sheet 1 of 2 |
|---|---|---|---|---|

| Posted Speed Prior to Work (M.P.H.) | Spacing of Channelizing Devices (Feet) (G) | Taper Length (Feet) (L) |
|---|---|---|
| 0 - 30 | 25 | 180 |
| 35 - 40 | 25 | 320 |
| 45 - 50 | 50 * | 600 |
| 55 | 50 * | 660 |
| 60 - 65 | 50 * | 780 |
| 70 - 80 | 50 * | 960 |

* Spacing is 40' for 42" cones.

** Speed appropriate for location.

*** Use speed limit designated for the condition when workers are present in the work space. Signs shall be covered or removed when workers are not present.

■—● Flagger (As Necessary)

◎ Reflectorized Drum

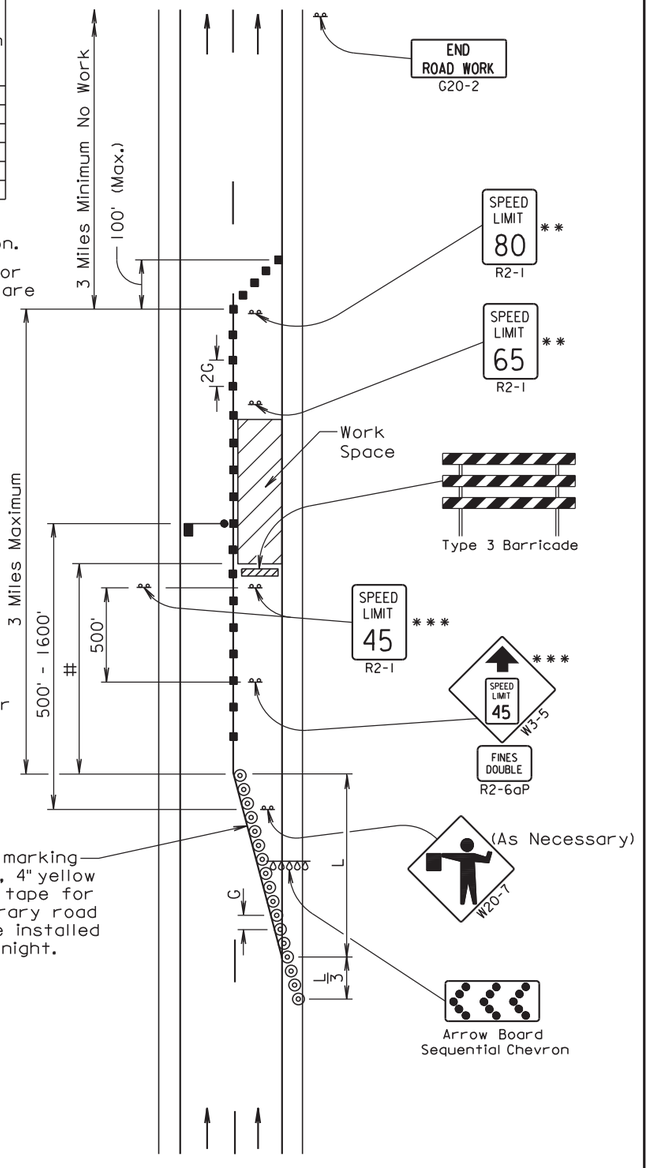
■ Channelizing Device

# The Work Space shall be a minimum of 500' from the end of the taper.

The FLAGGER sign shall be used whenever there is a Flagger present.

The channelizing devices shall be 42" cones or drums.

42" cones may be used in place of the drums shown in the taper if setup will not be used during night time hours.




4" white temporary pavement marking tape for right lane closures, 4" yellow temporary pavement marking tape for left lane closures, or temporary road markers at 5' spacing shall be installed when the lane is closed overnight.

DETAIL A

April 15, 2015

| Published Date: 3rd Qtr. 2015 | SDDOT | WORK ZONE SPEED REDUCTION FOR INTERSTATE AND HIGH SPEED MULTI-LANE HIGHWAYS | PLATE NUMBER 634.63 | Sheet 2 of 2 |
|---|---|---|---|---|

PLOTTED FROM - TRAB19004

| STATE OF SOUTH DAKOTA | PROJECT | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|
| | 012-151 & 000P-151 | 16 | 30 |

## i3u4 - ITEMIZED LIST FOR TRAFFIC CONTROL SIGNS

| SIGN CODE | SIGN DESCRIPTION | EXPRESSWAY / INTERSTATE NUMBER | SIGN SIZE | SQFT PER SIGN | SQFT |
|---|---|---|---|---|---|
| R1-1 | STOP | 3 | 36" x 36" | 9 | 27 |
| W4-2 | LEFT or RIGHT LANE ENDS (symbol) | 2 | 48" x 48" | 16 | 32 |
| W20-1 | ROAD WORK AHEAD | 5 | 48" x 48" | 16 | 80 |
| W20-5 | LEFT or RIGHT LANE CLOSED AHEAD | 2 | 48" x 48" | 16 | 32 |
| W20-7 | FLAGGER (symbol) | 2 | 48" x 48" | 16 | 32 |
| G20-2 | END ROAD WORK | 2 | 48" x 24" | 8 | 16 |
| | | EXPRESSWAY / INTERSTATE TRAFFIC CONTROL SIGNS SQFT | | | 219 |

### TYPE 3 BARRICADES

| ITEM DESCRIPTION | QUANTITY |
|---|---|
| Type 3 Barricade, 8' Double Sided | 28 Each |

### ARROW BOARDS

| ITEM DESCRIPTION | QUANTITY |
|---|---|
| Type C Arrow Board | 2 Each |

## i3wn - ITEMIZED LIST FOR TRAFFIC CONTROL SIGNS

| SIGN CODE | SIGN DESCRIPTION | EXPRESSWAY / INTERSTATE NUMBER | SIGN SIZE | SQFT PER SIGN | SQFT |
|---|---|---|---|---|---|
| R2-1 | SPEED LIMIT 45 | 12 | 36" x 48" | 12 | 144 |
| R2-1 | SPEED LIMIT 70 | 4 | 36" x 48" | 12 | 48 |
| R2-6aP | FINES DOUBLE (plaque) | 4 | 36" x 24" | 6 | 24 |
| W3-5 | SPEED REDUCTION AHEAD (45 MPH) | 12 | 48" x 48" | 16 | 192 |
| W4-2 | LEFT or RIGHT LANE ENDS (symbol) | 8 | 48" x 48" | 16 | 128 |
| W9-3 | CENTER LANE CLOSED AHEAD | 2 | 48" x 48" | 16 | 32 |
| W20-1 | ROAD WORK AHEAD | 11 | 48" x 48" | 16 | 176 |
| W20-5 | LEFT or RIGHT LANE CLOSED AHEAD | 8 | 48" x 48" | 16 | 128 |
| G20-2 | END ROAD WORK | 4 | 48" x 24" | 8 | 32 |
| M4-10 | DETOUR ARROW (L or R) | 3 | 48" x 18" | 6 | 18 |
| | | EXPRESSWAY / INTERSTATE TRAFFIC CONTROL SIGNS SQFT | | | 922 |

### TYPE 3 BARRICADES

| ITEM DESCRIPTION | QUANTITY |
|---|---|
| Type 3 Barricade, 8' Double Sided | 24 Each |

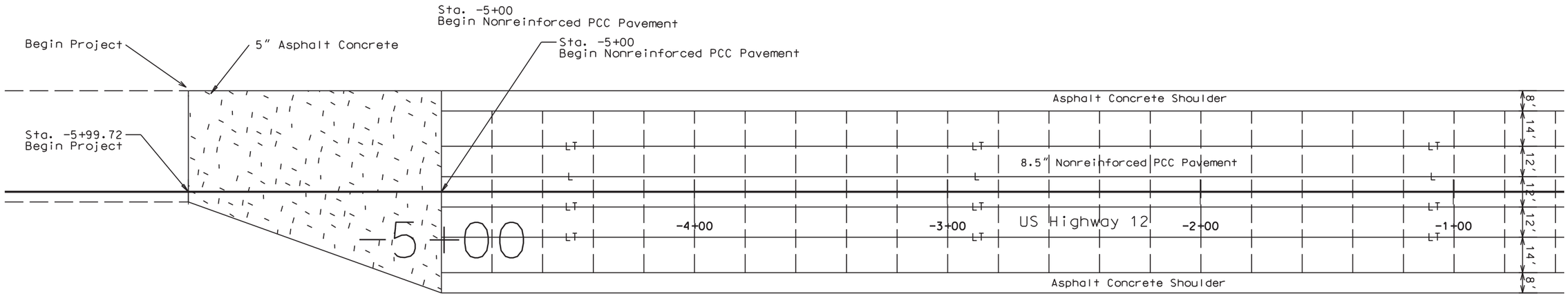
### ARROW BOARDS

| ITEM DESCRIPTION | QUANTITY |
|---|---|
| Type C Arrow Board | 4 Each |

| STATE OF SOUTH DAKOTA | PROJECT | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|
| | 012-151 & 000P-151 | 17 | 30 |

# PCC PAVEMENT LAYOUT

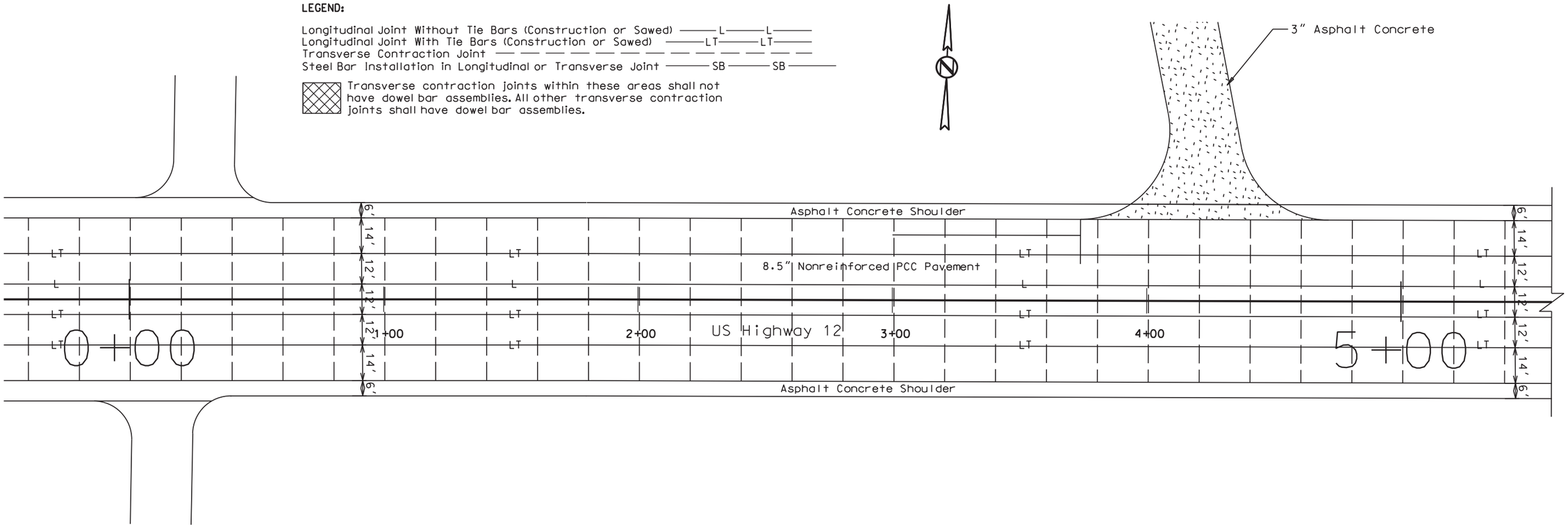
## Original Construction
## (For Information Only)




**LEGEND:**

Longitudinal Joint Without Tie Bars (Construction or Sawed) ——L——L——
Longitudinal Joint With Tie Bars (Construction or Sawed) ——LT——LT——
Transverse Contraction Joint — — — — — — — — — — — — — —
Steel Bar Installation in Longitudinal or Transverse Joint ——SB——SB——

Transverse contraction joints within these areas shall not have dowel bar assemblies. All other transverse contraction joints shall have dowel bar assemblies.




PLOTTED FROM - TRAB18004

| STATE OF SOUTH DAKOTA | PROJECT | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|
| | 012-151 & 000P-151 | 18 | 30 |

# TYPICAL SURFACING SECTIONS

## Original Construction
## (For Information Only)

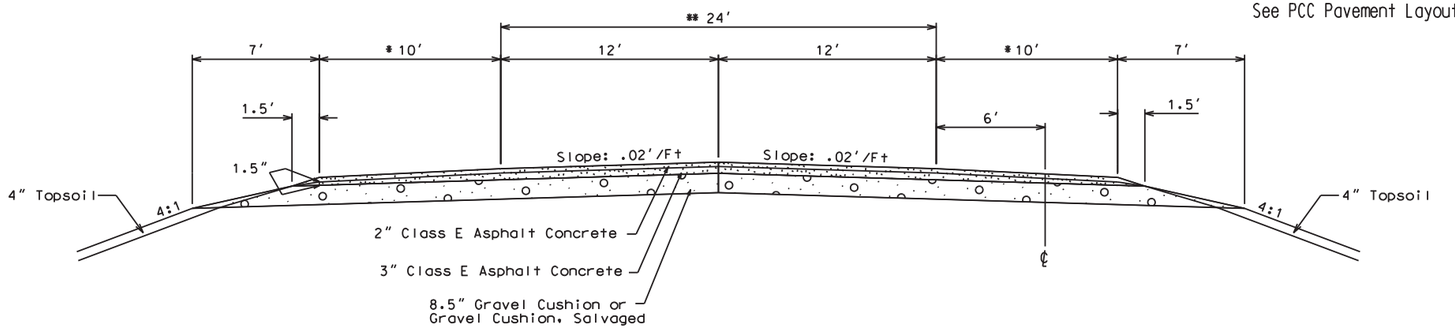
Transitions:

Sta. .-5+99.72 to -5+00
* 10' to 8'
** 24' to 64'

Transition Crown from
18' Lt. of ℄ to 6' Lt. of ℄

See PCC Pavement Layout Sheet

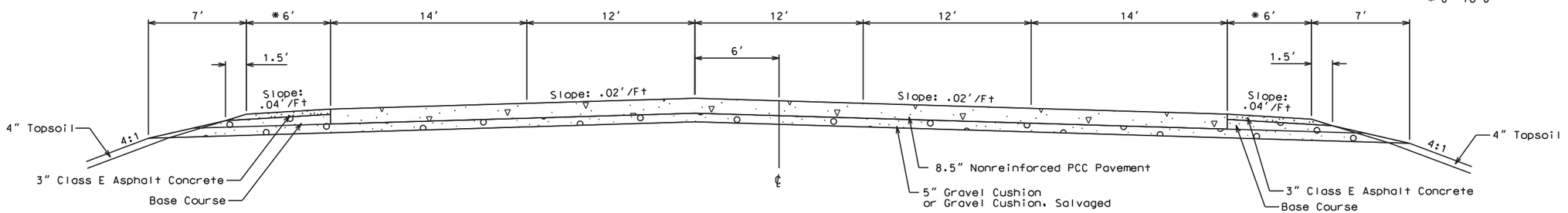
US 12 Mainline
Sta. -5+99.72 to -5+00



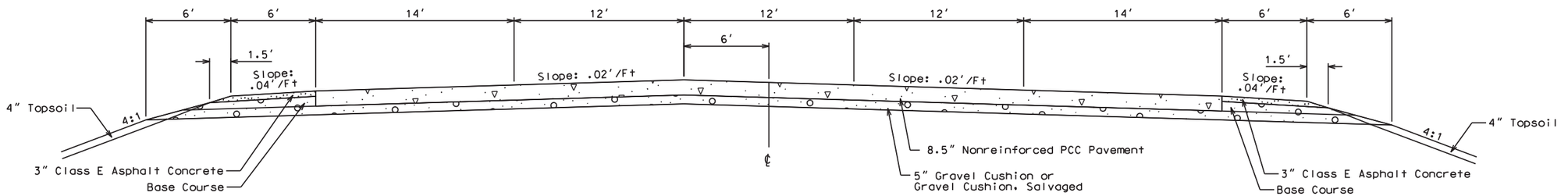

US 12 Mainline
Sta. -5+00 to 20+00

Transitions:

Sta. 0+22
* 8' to 6'




US 12 Mainline
Sta. 20+00 to 43+02
Sta. 47+84 to 51+83
Sta. 56+40 to 93+20.2




PLOTTED FROM - TRAB18004

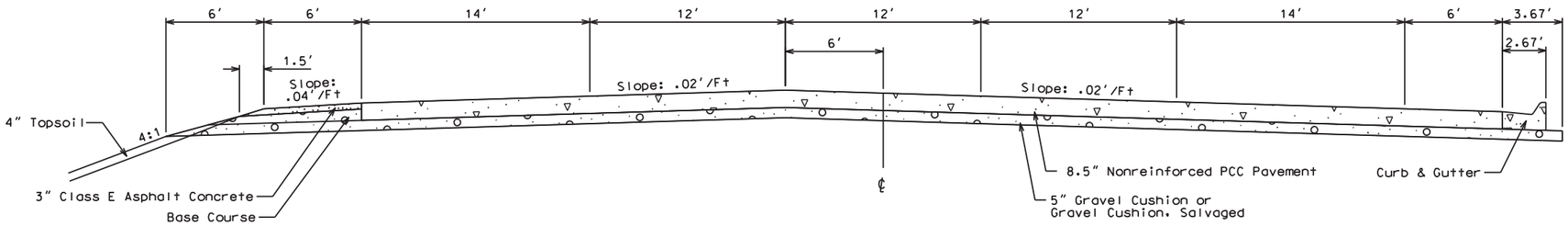
| STATE OF SOUTH DAKOTA | PROJECT | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|
| | 012-151 & 000P-151 | 19 | 30 |

# TYPICAL SURFACING SECTIONS

## Original Construction
## (For Information Only)

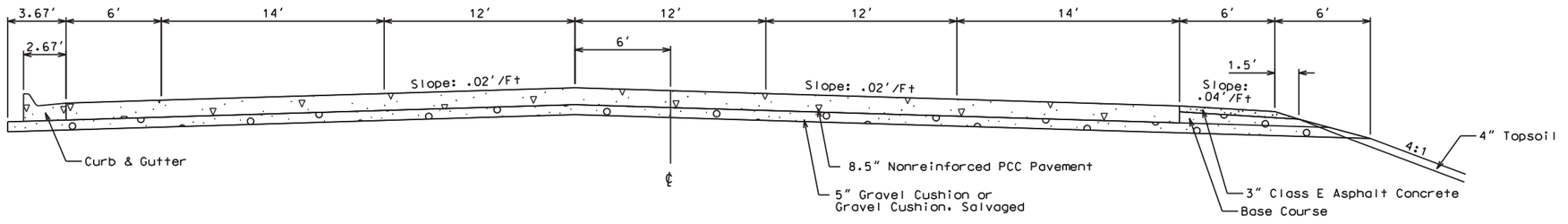
US 12 Mainline

Sta. 43+02 to 47+84




US 12 Mainline

Sta. 51+83 to 56+40

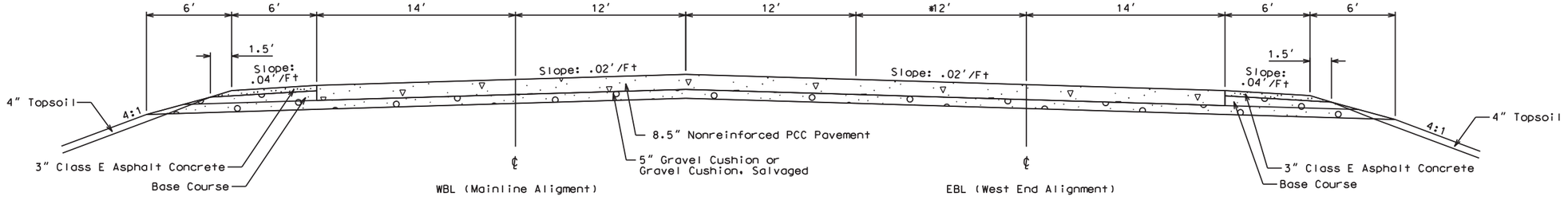



US 12

Sta. 93+20.2 to 101+14.2 WBL (Mainline Aligment)
Sta. 0+00 to 7+94.9 EBL (West End Alignment)

Transition:

Sta. 99+13.85 to 101+14.2 WBL (Mainline Aligment)=
Sta. 5+94.7 to 7+94.9 EBL (West End Alignment)
* 12′ to 14′



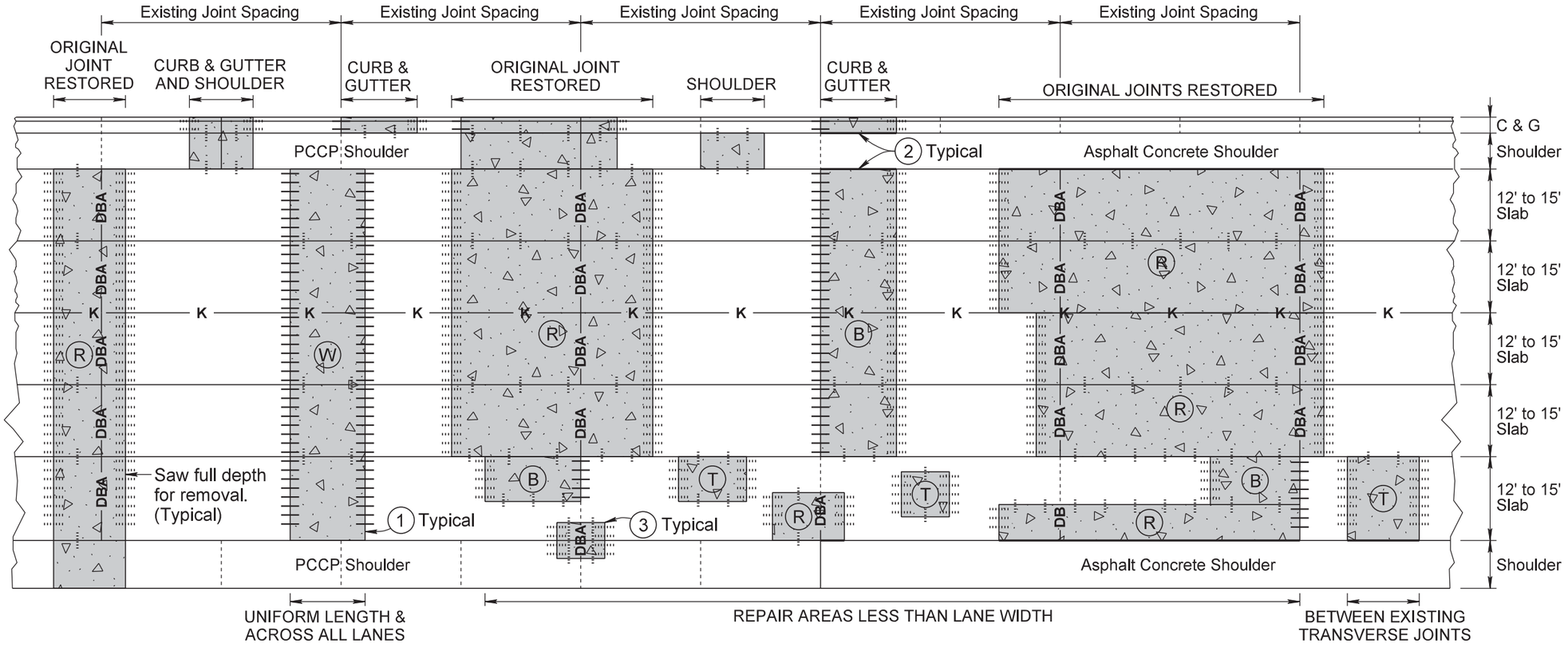

PLOTTED FROM - TRAB18004

| STATE OF SOUTH DAKOTA | PROJECT | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|
| | 012-151 & 000P-151 | 20 | 30 |

# NONREINFORCED PCC PAVEMENT REPAIR

## UP TO FOUR LANE ROADWAY WITH CENTER TURN LANE OR UP TO TEN LANE DIVIDED ROADWAY

## TYPICAL REPAIR AREAS




KEY:

PCC Pavement Repair Area

PCC PAVEMENT REPAIR AREA TYPES:

(W) Two Working Joints (Use only if repair is full roadway width and uniform length (across all lanes))

(T) Two Tied Joints

(B) One Working & One Tied Joint

(R) Two Tied Joints with Original Joint Restored with Dowel Bar Assembly

Longitudinal Keyway Joints Without Bars

— K — Where a repair area intersects an existing longitudinal keyway joint without tie bars, the newly constructed joint should also be a keyway without tie bars.

Steel Bars for Transverse Joints

Pavement Thickness >= 10.5"

— Drilled in 1½" x 18" epoxy coated plain round dowel bars spaced 18" center to center.

..... Drilled in No. 11 x 18" epoxy coated deformed tie bars spaced 18" center to center.

Pavement Thickness >= 8.5" and < 10.5"

— Drilled in 1¼" x 18" epoxy coated plain round dowel bars spaced 18" center to center.

..... Drilled in No. 9 x 18" epoxy coated deformed tie bars spaced 18" center to center.

Pavement Thickness < 8.5"

— Drilled in 1" x 18" epoxy coated plain round dowel bars spaced 18" center to center.

..... Drilled in No. 8 x 18" epoxy coated deformed tie bars spaced 18" center to center.

DBA Dowel Bar Assembly

Steel Bars for Longitudinal Joints

No. 5 x 30" epoxy coated deformed tie bars.
Sawed Joint - spaced 48" center to center.
Construction Joint - spaced 48" center to center.

No. 5 x 24" epoxy coated deformed tie bars.
Drilled In - spaced 30" center to center.

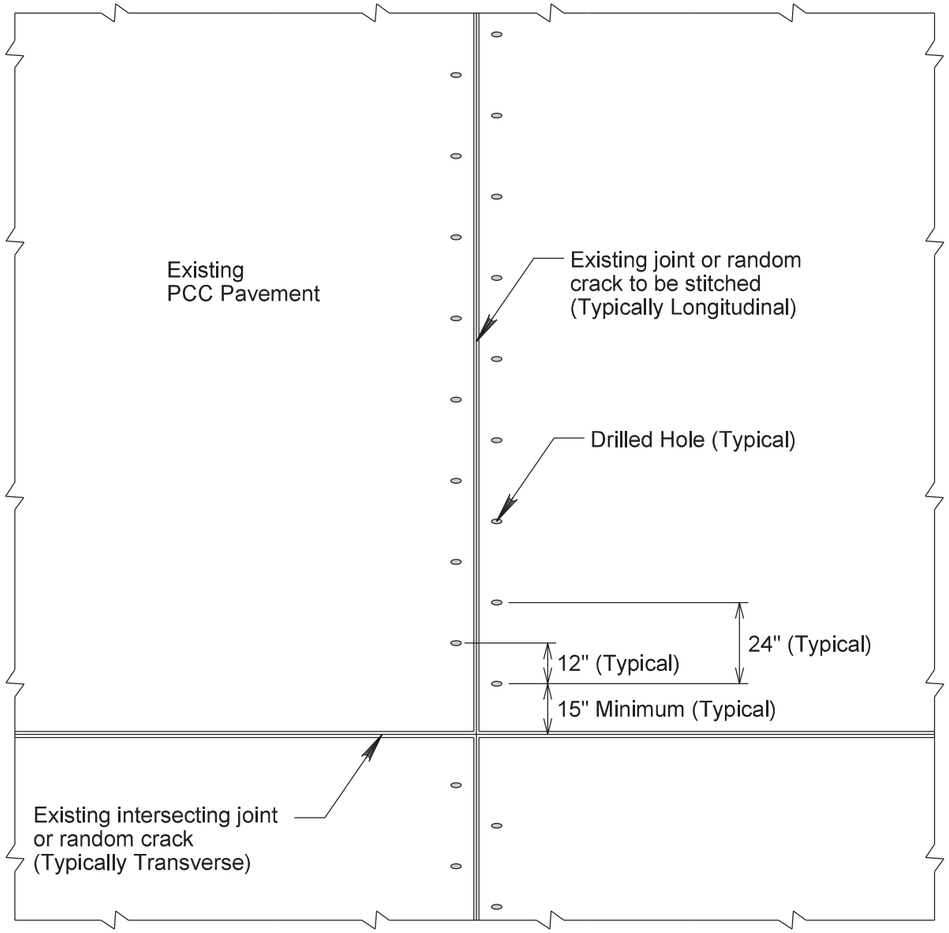
NOTES: Saw around repair areas full depth for removal.

(1) Where possible, transverse joints shall be constructed/maintained full roadway width.

(2) Edges of repair areas shall be formed to match the width of the existing concrete pavement.

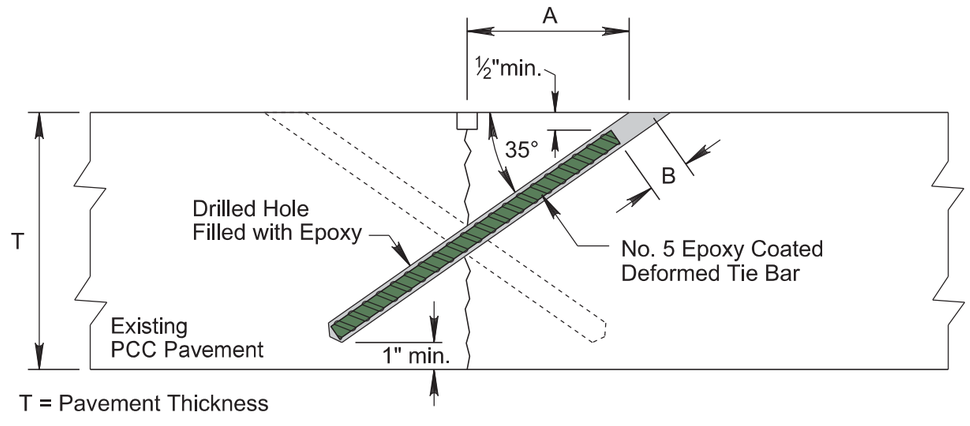
(3) Need for bars in small repair areas on/near the shoulder to be determined on a case-by-case basis, on construction by the Engineer.

# TIE BAR RETROFIT (STITCHING)




**PLAN VIEW**

# TIE BAR RETROFIT (STITCHING)



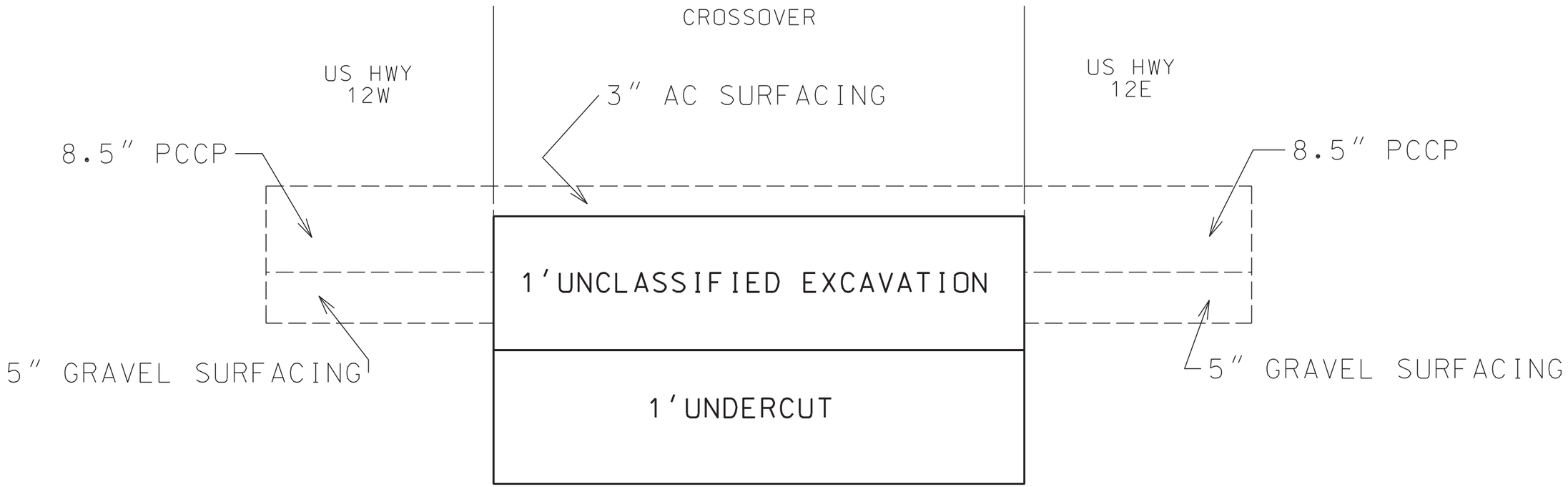

**ELEVATION VIEW**

**TABLE OF STITCHING DIMENSIONS**

| T | A | B | Length of Tie Bar |
|---|---|---|---|
| 8" | 5" | 1½"± | 10" |
| 8½" | 5¼" | 1⅜"± | 11" |
| 9" | 5⅝" | 1¼"± | 12" |
| 9½" | 6" | 1⅝"± | 12½" |
| 10" | 6⅜" | 1½"± | 13½" |
| 10½" | 6¾" | 1⅜"± | 14½" |
| 11" | 7" | 1¼"± | 15½" |
| 11½" | 7⅜" | 1⅜"± | 16" |
| 12" | 7¾" | 1⅜"± | 16½" |
| 12½" | 8⅛" | 1¼"± | 17½" |

| STATE OF SOUTH DAKOTA | PROJECT | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|
| | 012-151 & 000P-151 | 22 | 30 |

# Crossover Removal

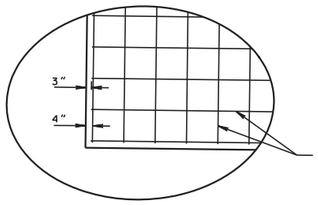



*Drawing not to scale

PLOTTED FROM - TRAB18004

| STATE OF SOUTH DAKOTA | PROJECT | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|
| | 012-151 & 000P-151 | 23 | 30 |

# Crossover Detail
# MRM 344.528




In Shaded Areas Place
No. 5 Epoxy Coated Deformed Steel Bars
spaced 18" Center to center.
Cost for this material shall be incidental
to the contract unit price per square yard
for 9" PCC Pavement.

Full depth 1/4" preformed asphalt expansion joint material.
The expansion joint material shall meet the requirements of
AASHTO M33. Cost for this material shall be incidental to
the contract unit price per square yard for 9" PCC Pavement.

US 12W

PCCP Surface

175'

4'

R 80'

72'

R 10'

R 80'

180'

4'

PCCP Surface

US 12E

Full depth 1/4" preformed asphalt expansion joint material.
The expansion joint material shall meet the requirements of
AASHTO M33. Cost for this material shall be incidental to
the contract unit price per square yard for 9" PCC Pavement.

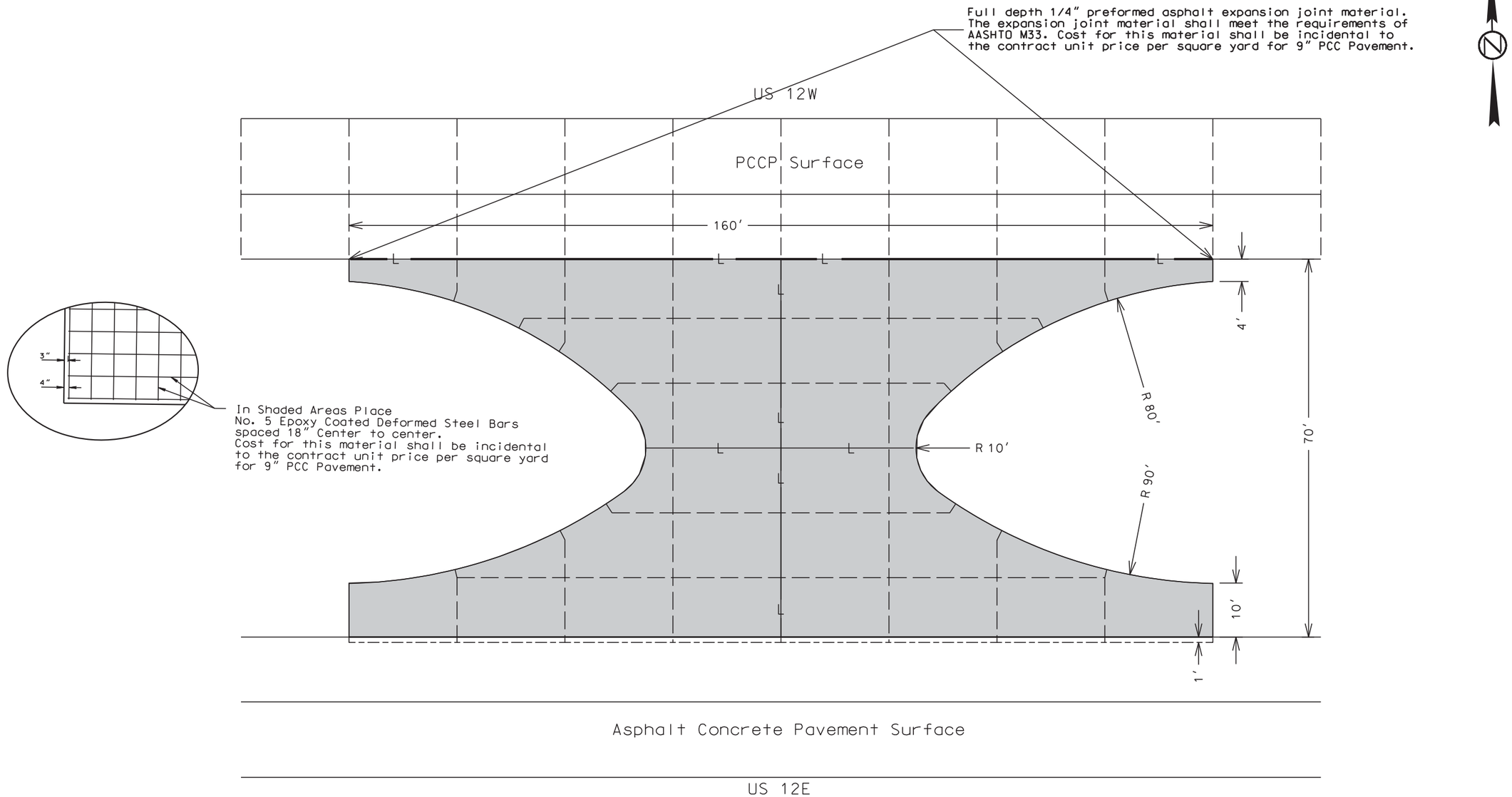
**LOCATION OF CONCRETE PAVEMENT JOINTS**

The location of joints, as shown and/or designated on pcc pavement joint layout sheets are only approximate locations to be used as a guide in the final location of the joints and to afford bidders a basis for estimating the construction cost of the joints. The final location of the joints are to be designated by the Engineer during construction.

PLOTTED FROM - TRAB18004

| STATE OF SOUTH DAKOTA | PROJECT | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|
| | 012-151 & 000P-151 | 24 | 30 |

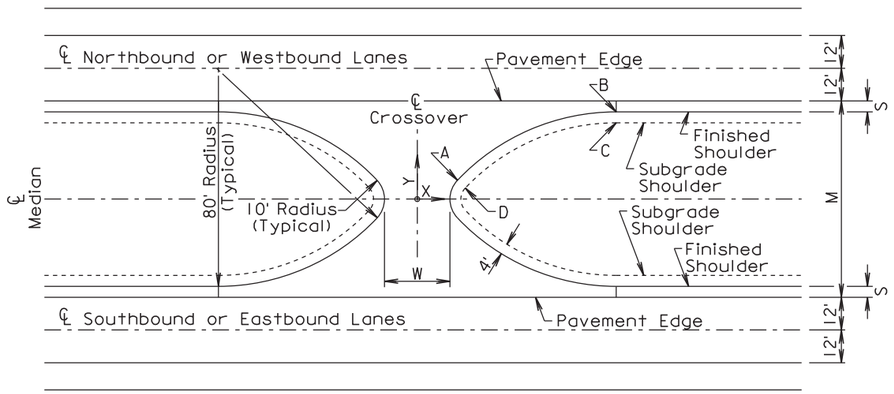
# Crossover Detail
# MRM 321.234




**LOCATION OF CONCRETE PAVEMENT JOINTS**

The location of joints, as shown and/or designated on pcc pavement joint layout sheets are only approximate locations to be used as a guide in the final location of the joints and to afford bidders a basis for estimating the construction cost of the joints. The final location of the joints are to be designated by the Engineer during construction.

PLOTTED FROM - TRAB18024




PLAN VIEW

S = Finished Shoulder Width
M = Median Width
W = Finished Median Crossover Width

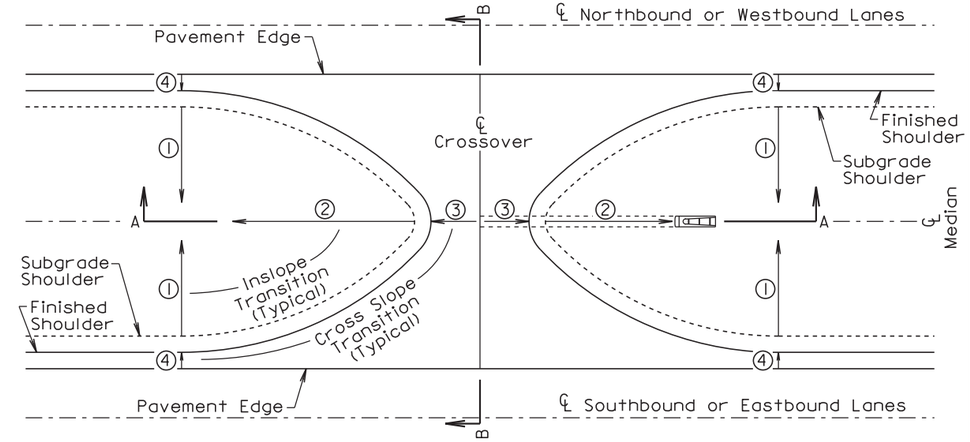
PUBLIC ACCESS MEDIAN
CROSSOVER LAYOUT INFORMATION

| M | S | W | Point A | | Point B | | Point C | | Point D | |
|---|---|---|---|---|---|---|---|---|---|---|
| (Ft) | (Ft) | (Ft) | X (Ft) | Y (Ft) | X (Ft) | Y (Ft) | X (Ft) | Y (Ft) | X (Ft) | Y (Ft) |
| 60 | 4 | 24 | 15.7 | 7.7 | 66.5 | 26.0 | 66.5 | 22.0 | 18.2 | 4.7 |
| 60 | 4 | 40 | 23.7 | 7.7 | 74.5 | 26.0 | 74.5 | 22.0 | 26.2 | 4.7 |
| 60 | 6 | 24 | 16.0 | 8.0 | 64.0 | 24.0 | 64.0 | 20.0 | 18.4 | 4.8 |
| 60 | 6 | 40 | 24.0 | 8.0 | 72.0 | 24.0 | 72.0 | 20.0 | 26.4 | 4.8 |
| 66 | 4 | 24 | 15.2 | 7.3 | 70.0 | 29.0 | 70.0 | 25.0 | 17.9 | 4.4 |
| 66 | 4 | 40 | 23.2 | 7.3 | 78.0 | 29.0 | 78.0 | 25.0 | 25.9 | 4.4 |
| 66 | 6 | 24 | 15.5 | 7.6 | 67.7 | 27.0 | 67.7 | 23.0 | 18.1 | 4.6 |
| 66 | 6 | 40 | 23.5 | 7.6 | 75.7 | 27.0 | 75.7 | 23.0 | 26.1 | 4.6 |
| 72 | 4 | 24 | 14.8 | 6.9 | 73.0 | 32.0 | 73.0 | 28.0 | 17.6 | 4.1 |
| 72 | 4 | 40 | 22.8 | 6.9 | 81.0 | 32.0 | 81.0 | 28.0 | 25.6 | 4.1 |
| 72 | 6 | 24 | 15.0 | 7.1 | 71.0 | 30.0 | 71.0 | 26.0 | 17.8 | 4.3 |
| 72 | 6 | 40 | 23.0 | 7.1 | 79.0 | 30.0 | 79.0 | 26.0 | 25.8 | 4.3 |
| 80 | 4 | 24 | 14.2 | 6.3 | 76.4 | 36.0 | 76.4 | 32.0 | 17.3 | 3.8 |
| 80 | 4 | 40 | 22.2 | 6.3 | 84.4 | 36.0 | 84.4 | 32.0 | 25.3 | 3.8 |
| 80 | 6 | 24 | 14.5 | 6.6 | 74.8 | 34.0 | 74.8 | 30.0 | 17.5 | 4.0 |
| 80 | 6 | 40 | 22.5 | 6.6 | 82.8 | 34.0 | 82.8 | 30.0 | 25.5 | 4.0 |

The dimensions provided for "X" and "Y" begin from the intersection of the median centerline and the crossover centerline.

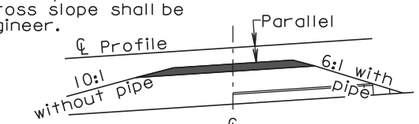
March 28, 2001

| Published Date: 3rd Qtr. 2015 | SDDOT | PUBLIC ACCESS MEDIAN CROSSOVER | PLATE NUMBER 120.03 |
|---|---|---|---|
| | | | Sheet 1 of 2 |

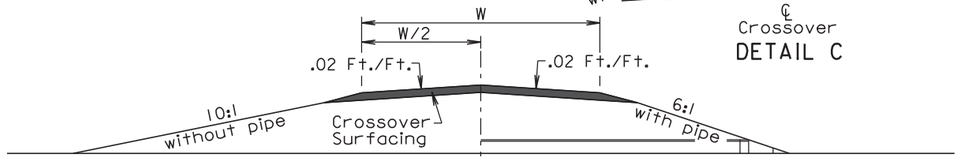



PLAN VIEW

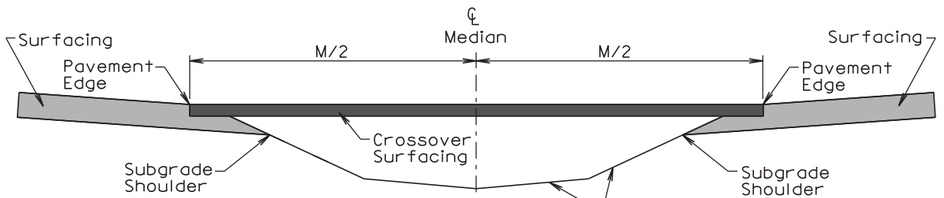
① Inslope as specified on the typical sections or cross sections
② 10:1 Inslope without pipe, 6:1 with pipe
③ Cross slope shall be .02 Ft./Ft. when centerline profiles of adjacent lanes are at less than 2% grade. When the centerline profiles of the adjacent lanes are 2% and greater the cross slope shall be parallel to the profile or as approved by the Engineer. (See Detail C)
④ Cross slope as specified on the typical sections




DETAIL C




SECTION A-A



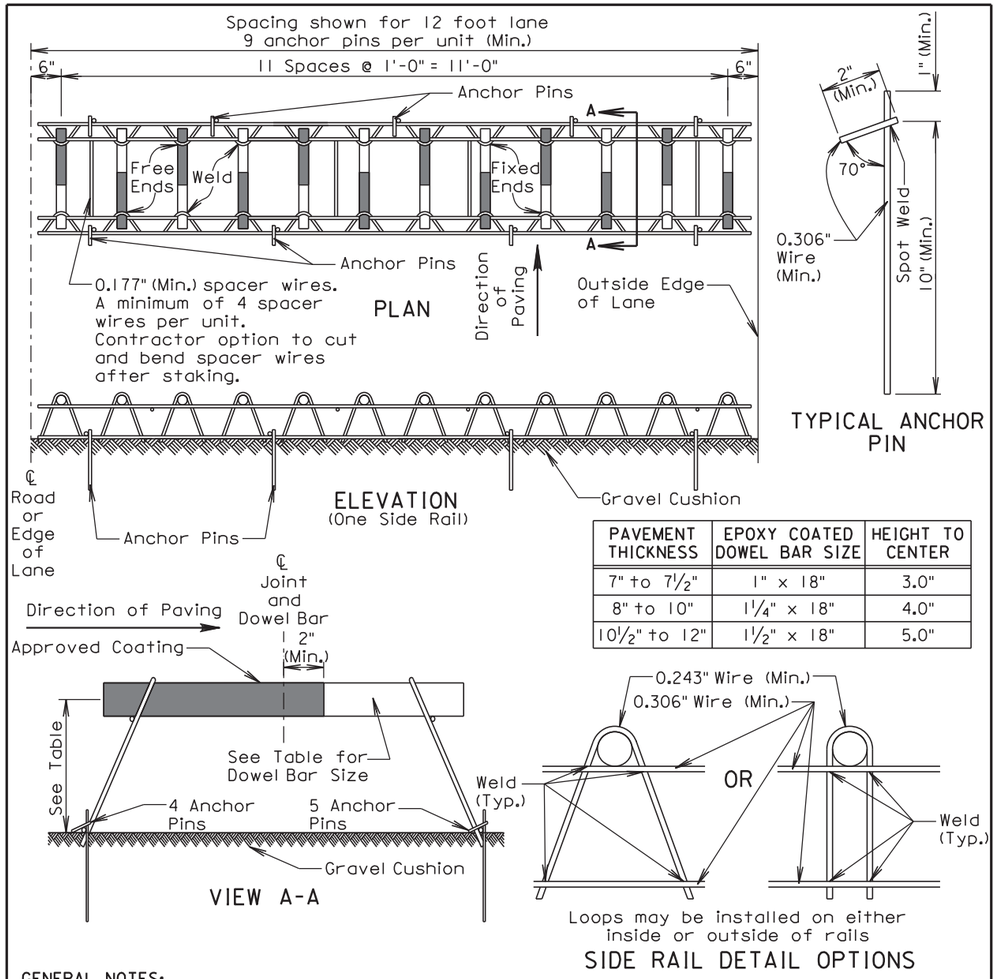

SECTION B-B

**GENERAL NOTE:**

The quantities of materials necessary for construction of the public access median crossover are as provided in the plans and shall be paid for at their respective contract unit prices for the various materials used.

March 28, 2001

| Published Date: 3rd Qtr. 2015 | SDDOT | PUBLIC ACCESS MEDIAN CROSSOVER | PLATE NUMBER 120.03 |
|---|---|---|---|
| | | | Sheet 2 of 2 |




| PAVEMENT THICKNESS | EPOXY COATED DOWEL BAR SIZE | HEIGHT TO CENTER |
|---|---|---|
| 7" to 7½" | 1" x 18" | 3.0" |
| 8" to 10" | 1¼" x 18" | 4.0" |
| 10½" to 12" | 1½" x 18" | 5.0" |

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 ±1/8 inch in 18 inches and to all other dowel bars in the assembly ±1/16 inch in 18 inches.

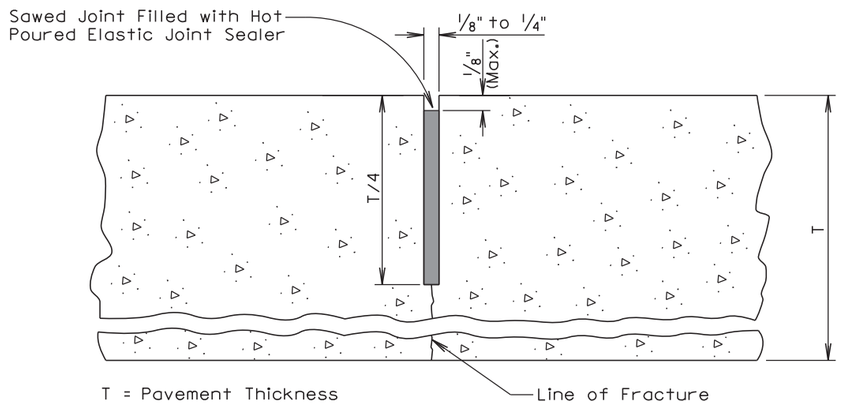
Centerline of individual dowel bars shall be parallel to the centerline of the roadway ±1/2 inch in 18 inches.

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 ±1 inch.

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

*August 30, 2013*

| | | | |
|---|---|---|---|
| *Published Date: 3rd Qtr. 2015* | SDDOT | **PCC PAVEMENT DOWEL BAR ASSEMBLY FOR TRANSVERSE CONTRACTION JOINTS 12 Bar Assembly on Granular Base Material** | PLATE NUMBER 380.01<br>Sheet 1 of 1 |




GENERAL NOTES:

If an early entrance sawcut does not develop the full transverse crack, then the saw cut to control cracking shall be a minimum of ¼ the thickness of the pavement.

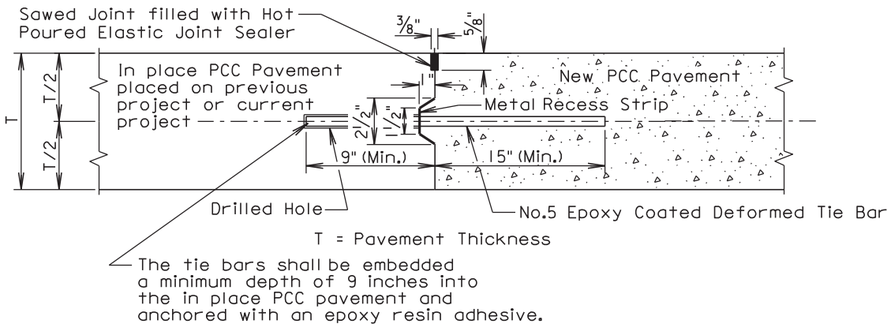
All hot poured elastic joint sealer material spilled on the surface of the concrete pavement shall be removed as soon as the material has cooled. The extent of removal of material shall be to the satisfaction of the Engineer. All costs for removal of the spilled joint sealer material shall be borne by the Contractor.

*June 26, 2015*

| | | | |
|---|---|---|---|
| *Published Date: 3rd Qtr. 2015* | SDDOT | **PCC PAVEMENT TRANSVERSE CONTRACTION JOINT WITH OR WITHOUT DOWEL BAR ASSEMBLY** | PLATE NUMBER 380.05<br>Sheet 1 of 1 |

| STATE OF SOUTH DAKOTA | PROJECT | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|
| | 012-151 & 000P-151 | 27 | 30 |

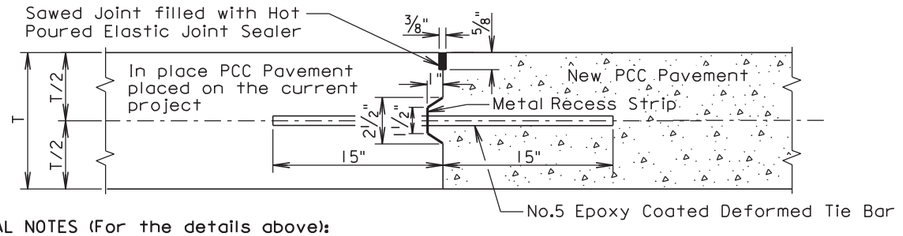
## LONGITUDINAL CONSTRUCTION JOINT WITH TIE BARS
(DRILLED IN BARS)




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)




**GENERAL NOTES (For the details above):**

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

| Tie Bar Spacing 48" Maximum | |
|---|---|
| Transverse Contraction Joint Spacing | Number of Tie Bars |
| 6.5' to 10' | 2 |
| 10.5' to 14' | 3 |
| 14.5' to 18' | 4 |
| 18.5' to 22' | 5 |

| Tie Bar Spacing 30" Maximum | |
|---|---|
| Transverse Contraction Joint Spacing | Number of Tie Bars |
| 5' to 7' | 2 |
| 7.5' to 9.5' | 3 |
| 10' to 12' | 4 |
| 12.5' to 14.5' | 5 |
| 15' to 17' | 6 |
| 17.5' to 19.5' | 7 |
| 20' to 22' | 8 |

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 30 inches center to center for a vertical face and male keyway. The maximum tie bar spacing shall apply to tie bars within each panel.

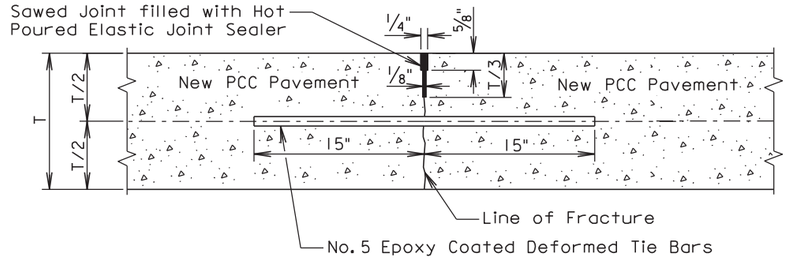
The keyway illustrated in the above details depict a female keyway.

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.

*August 31, 2013*

| | | | |
|---|---|---|---|
| *Published Date: 3rd Qtr. 2015* | SDDOT | *PCC PAVEMENT LONGITUDINAL JOINTS WITH TIE BARS* | *PLATE NUMBER 380.10* |
| | | | *Sheet 1 of 2* |

## SAWED LONGITUDINAL JOINT WITH TIE BARS
(POURED MONOLITHICALLY)




T = Pavement Thickness

**GENERAL NOTES (For the detail above):**

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

| Tie Bar Spacing 48" Maximum | |
|---|---|
| Transverse Contraction Joint Spacing | Number of Tie Bars |
| 6.5' to 10' | 2 |
| 10.5' to 14' | 3 |
| 14.5' to 18' | 4 |
| 18.5' to 22' | 5 |

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

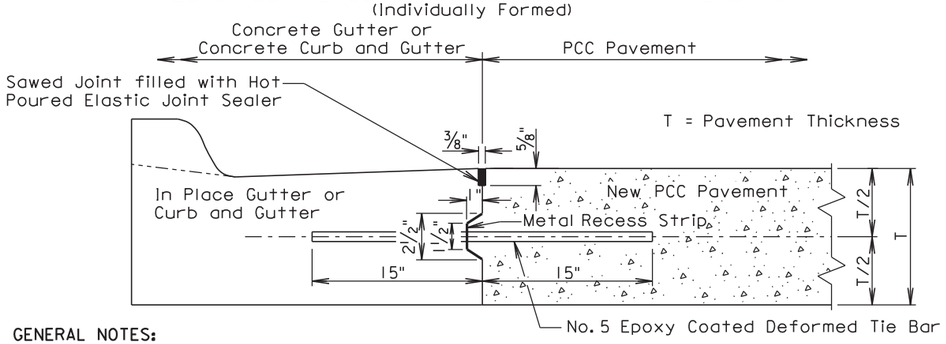
The required number of tie bars as shown in the table shall be uniformly spaced within each panel with a maximum space of 48 inches center to center. The maximum tie bar spacing shall apply to tie bars within each panel.

The first saw cut to control 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, 2013*

| | | | |
|---|---|---|---|
| *Published Date: 3rd Qtr. 2015* | SDDOT | *PCC PAVEMENT LONGITUDINAL JOINTS WITH TIE BARS* | *PLATE NUMBER 380.10* |
| | | | *Sheet 2 of 2* |

## LONGITUDINAL CONSTRUCTION JOINT WITH TIE BARS
(Individually Formed)




**GENERAL NOTES:**

No. 5 epoxy coated deformed tie bars shall be spaced 48 inches center to center. The keyway shown above is a female keyway.

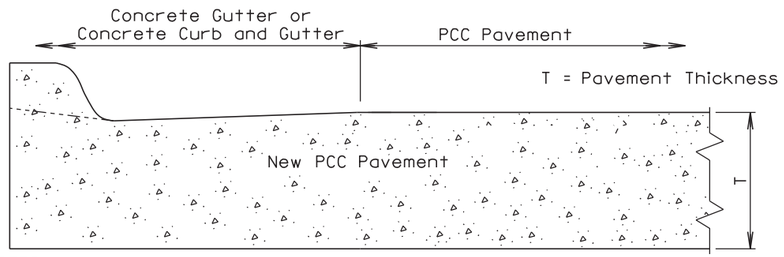
The tie bars shall be placed a minimum of 15 inches from existing transverse contraction joints.

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.

The transverse contraction joints in the concrete gutter or concrete curb and gutter shall be placed at each mainline PCC pavement transverse contraction joint. The transverse contraction joints in the concrete gutter or the concrete curb and gutter shall be 1½ inches deep if formed in fresh concrete using a suitable grooving tool. If a saw is used to cut the transverse contraction joints, then the depth of the joint shall be at least ¼ the thickness of the concrete gutter or concrete curb and gutter.

The term "In Place Gutter or Curb and Gutter" in the above drawing indicates that the in place concrete gutter and concrete curb and gutter was placed on the current project.

## POURED MONOLITHICALLY




**GENERAL NOTES:**

The mainline curb and gutter may be placed monolithically with the PCC pavement if the mainline lane width is less than or equal to 12 feet. If this method of construction is used, the tie bars and the sawed joint between the curb and gutter and the PCC pavement shall be eliminated.

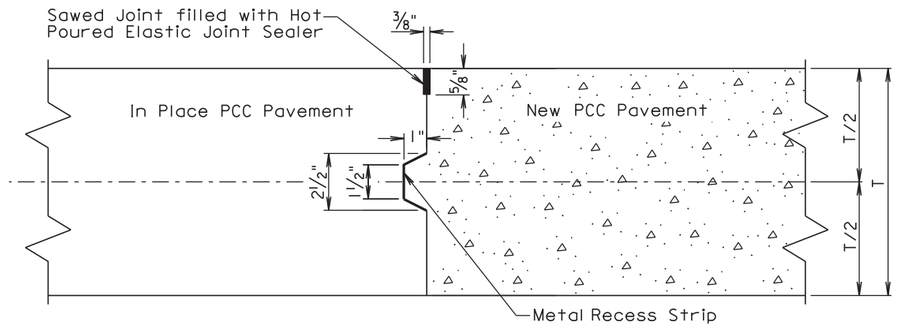
The gutter or curb and gutter shall be sawed transversely at each mainline transverse contraction joint. The transverse contraction joints in the gutter or curb and gutter shall be sawed and sealed same as the transverse contraction joints in the PCC pavement.

The slope of the gutter shall be the slope designated for the type of gutter or curb and gutter to be constructed. The bottom slope of the gutter or curb and gutter shall be constructed at the same slope as the mainline concrete pavement.

June 26, 2013

| | | | |
|---|---|---|---|
| Published Date: 3rd Qtr. 2015 | SDDOT | PCC PAVEMENT LONGITUDINAL CONSTRUCTION JOINTS WITH CONCRETE GUTTER OR CONCRETE CURB AND GUTTER | PLATE NUMBER 380.11<br>Sheet 1 of 1 |

## LONGITUDINAL CONSTRUCTION JOINT WITHOUT TIE BARS



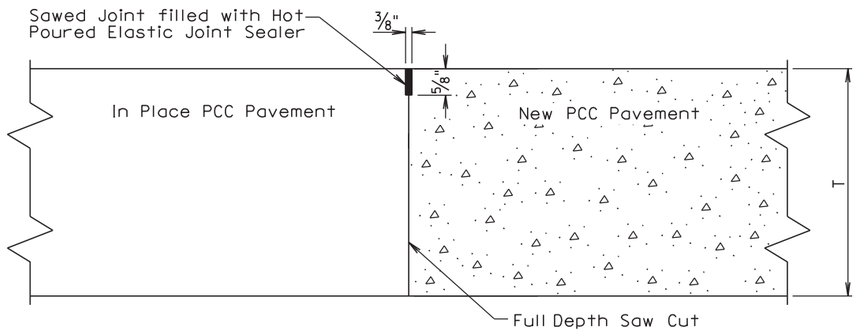

T = Pavement Thickness

**GENERAL NOTES:**

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.

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

## LONGITUDINAL CONSTRUCTION JOINT WITHOUT TIE BARS




T = Pavement Thickness

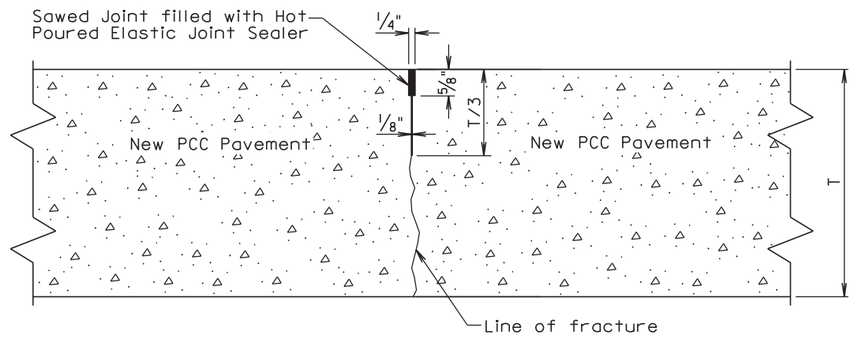
**GENERAL NOTE:**

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

*September 14, 2001*

| | | | |
|---|---|---|---|
| *Published Date: 3rd Qtr. 2015* | SDDOT | *PCC PAVEMENT LONGITUDINAL JOINTS WITHOUT TIE BARS* | *PLATE NUMBER* 380.12 |
| | | | *Sheet 1 of 2* |

## SAWED LONGITUDINAL JOINT WITHOUT TIE BARS




T = Pavement Thickness

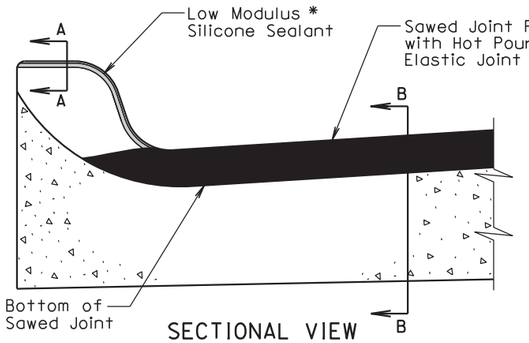
**GENERAL NOTE:**

The first saw cut to control 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 will be necessary.

*September 14, 2001*

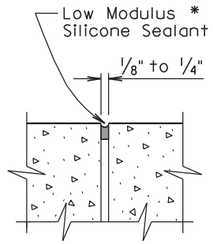
| | | | |
|---|---|---|---|
| *Published Date: 3rd Qtr. 2015* | SDDOT | *PCC PAVEMENT LONGITUDINAL JOINTS WITHOUT TIE BARS* | *PLATE NUMBER* 380.12 |
| | | | *Sheet 2 of 2* |

| STATE OF SOUTH DAKOTA | PROJECT | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|
| | 012-151 & 000P-151 | 30 | 30 |

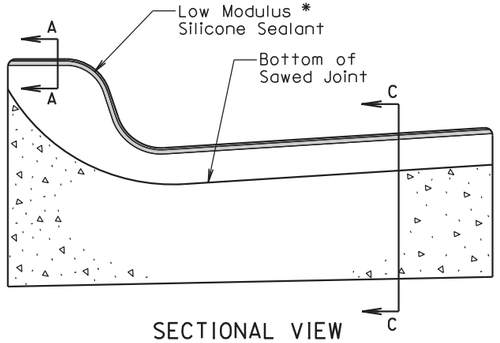



SECTIONAL VIEW

( Curb and Gutter Placed Monolithic with Adjacent Mainline PCC Pavement )

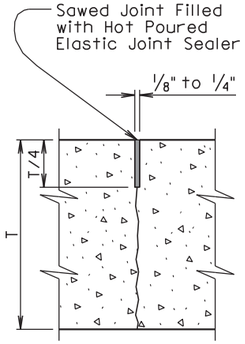



SECTION A-A

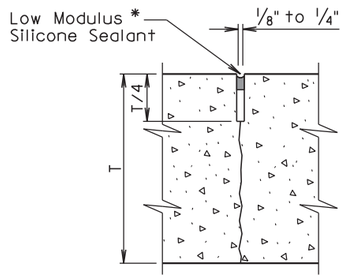



SECTIONAL VIEW

( Curb and Gutter not Placed Monolithic with Adjacent Mainline PCC Pavement or Mainline Surfacing is not PCC Pavement )




SECTION B-B

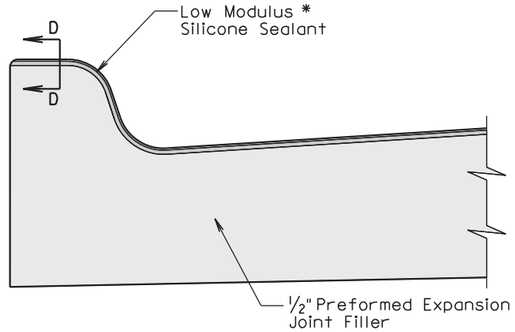



SECTION C-C

* The silicone sealant shall be placed such that it completely seals the joint and is bonded to the sides of the clean joint as approved by the Engineer.

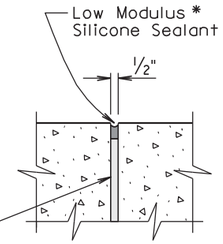
September 6, 2013

| Published Date: 3rd Qtr. 2015 | SDDOT | JOINTS IN CONCRETE CURB AND GUTTER | PLATE NUMBER 650.90 |
|---|---|---|---|
| | | | Sheet 1 of 2 |




SECTIONAL VIEW

( Curb and Gutter at 1/2" Preformed Expansion Joint Filler Location )




SECTION D-D

* The silicone sealant shall be placed such that it completely seals the joint and is bonded to the sides of the clean joint as approved by the Engineer.

GENERAL NOTES:

For illustrative reason, only the type B curb and gutter is shown.

** A 1/2" preformed expansion joint filler shall be placed transversely in the curb and gutter at the following locations:

1. At each junction between the radius return of curb and gutter and curb and gutter which is parallel to the project centerline.
2. At each junction between new curb and gutter and existing curb and gutter.

Transverse contraction joints shall be constructed at 10' intervals in the concrete curb and gutter except when the concrete curb and gutter is constructed adjacent to mainline PCC pavement. When concrete curb and gutter is constructed adjacent to mainline PCC pavement, a transverse contraction joint shall be constructed in the concrete curb and gutter at each mainline PCC pavement transverse contraction joint location.

When concrete curb and gutter is not placed monolithically with the mainline PCC pavement or when the adjacent mainline surfacing is not PCC concrete, the transverse contraction joints in the concrete curb and gutter shall be 1 1/2 inches deep if formed in the fresh concrete using a suitable grooving tool. If a saw is used to cut the contraction joints, then the depth of the joint shall be at least 1/4 the thickness of the concrete and the joint shall be sealed in accordance with the details shown above.

September 6, 2013

| Published Date: 3rd Qtr. 2015 | SDDOT | JOINTS IN CONCRETE CURB AND GUTTER | PLATE NUMBER 650.90 |
|---|---|---|---|
| | | | Sheet 2 of 2 |