

SHEET 016 EB-452

ESTIMATE OF QUANTITIES

| Bid Item Number | Item | Quantity | Unit |
|--------------------|-------------------------------------|----------|------|
| 009E0010 | Mobilization | Lump Sum | LS |
| 110E0300 | Remove Concrete Curb and Gutter | 21 | Ft |
| 110E1100 | Remove Concrete Pavement | 19.8 | SqYd |
| 110E7150 | Remove Sign for Reset | 2 | Each |
| 110E7152 | Remove Delineator for Reset | 6 | Each |
| 120E0010 | Unclassified Excavation | 35 | CuYd |
| 260E2060 | Gravel Cushion, Modified | 33.1 | Ton |
| 380E0060 | 8.5" Nonreinforced PCC Pavement | 105.1 | SqYd |
| 380E6000 | Dowel Bar | 27 | Each |
| 380E6110 | Insert Steel Bar in PCC Pavement | 32 | Each |
| 632E2100 | Reset Delineator | 6 | Each |
| 632E3500 | Reset Sign | 2 | Each |
| 634E0100 | Traffic Control | 748 | Unit |
| 634E0120 | Traffic Control, Miscellaneous | Lump Sum | LS |
| 634E0420 | Type C Advance Warning Arrow Panel | 1 | Each |
| 650E0085 | Type B68.5 Concrete Curb and Gutter | 6 | Ft |
| 734E0010 | Erosion Control | Lump Sum | LS |
| 734E0154 | 12" Diameter Erosion Control Wattle | 260 | Ft |
| 900E0012 | Refurbish Double Mailbox | 1 | Each |

SPECIFICATIONS

Standard Specifications for Roads & Bridges, 2004 Edition and Required Provisions, Supplemental Specifications and Special Provisions as included in the Proposal

SEQUENCE OF OPERATIONS

- 1. Set up traffic control to close lane.
- 2. Remove delineators & signs for reset.
- 3. Complete grading and paving..
- 4. Reset delineators & signs and refurbish mailboxes.
- 5. Place erosion control measures.
- 6. Remove traffic control.

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 C: WATER SOURCE

The Contractor shall not withdraw water with equipment previously used outside the State of South Dakota without prior approval from the SDDOT Environmental Office. Thoroughly wash all construction equipment before entering South Dakota to reduce the risk of invasive species introduction into the project vicinity.

Action Taken/Required:

The Contractor shall obtain the necessary permits from the regulatory agencies such as the Department of Environment and Natural Resources (DENR) and the United States Army Corps of Engineers (COE) prior to executing water extraction activities.

COMMITMENT E: STORM WATER

Construction activities constitute less than 1 acre of disturbance.

Action Taken/Required:

At a minimum and regardless of project size, appropriate erosion and sediment control measures must be installed to control the discharge of pollutants from the construction site.

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".
- 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.

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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 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.

COMMITMENT K: RAPID CITY AREA AIR QUALITY CONTROL ZONE

Administrative Rule of South Dakota (ARSD) 74:36:18:03 states that "no state facility or state contractor may engage in any construction activity or continuous operation activity within the Rapid City air quality control zone which may cause fugitive emissions of particulate to be released into the ambient air without first obtaining a permit issued by the board or the secretary."

Construction activity is defined as any temporary activity at a state facility, which involves the removal or alteration of the natural or pre-existing cover of one acre or more of land. One acre of surface area is based on a cumulative area of disturbance to be completed for the entire project. Construction activity shall include, but not be limited to, stripping of topsoil, drilling, blasting, excavation, dredging, ditching, grading, street maintenance and repair, or earth moving. Construction activity is generally completed within one year. It also includes stockpiles, access roads, and disposal areas. An off-site disposal area of excess material will require an additional permit.

Action Taken/Required:

In order to be considered eligible for authorization to conduct a construction activity under the terms and conditions of this permit, the owner operator must submit a Notice of Intent (NOI) form. The form must be submitted to the address below at least seven business days prior to the anticipated date of beginning the construction activity.

South Dakota Department of Environment and Natural Resources Air Quality Program

523 East Capitol, Joe Foss Building Pierre, SD 57501-3181 Phone: 605-773-3151

The permit requires the Contractor to use reasonably available technology to control fugitive dust emissions. The Contractor is required to use control measures for track out, paved areas, unpaved roads, unpaved parking lots, disturbed areas, and for material handling and storage. The control measures that the Contractor is required to use are listed in the permit.

UTILITIES

The Contractor shall be responsible for locating and protecting any utility that would conflict with any work. 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.

Any damage done to a utility will be the Contractor's responsibility to repair.

Utilities within the limits of the proposed construction shall be adjusted by the owner unless otherwise indicated in these plans.

EXISTING PCC PAVEMENT

The aggregate in the existing PCC Pavement is limestone.

The existing pavement on US 16B from MRM 64.545 EB to MRM 64.679 EB is 8.5" Nonreinforced PCC Pavement

The existing contraction joints are spaced at approximately 15'. Longitudinal joints are reinforced with No. 4 x 24" deformed tie bars spaced 30" to 48" centers. Transverse joints are reinforced with 1" 1/4" x 18" plain round dowel spaced 12" on center.

REMOVAL OF EXISTING CONCRETE PAVEMENT

The Contractor shall dispose of the concrete pavement at a site approved by the Engineer.

PLACING TOPSOIL

The top 4" of topsoil shall be salvaged and stockpiled prior to excavation for and placement of gravel cushion and 8.5" PCC Pavement at the two intersections on Highway 16B. Limits of this work, depth of salvage, and stockpile location will be directed by the Engineer. Following completion of construction, topsoil shall be spread evenly over the disturbed areas and level with the new top of surfacing.

All cost associated with removing and replacing the topsoil along areas to be resurfaced shall be incidental to the lump sum price for Remove and Replace Topsoil.

UNCLASSIFIED EXCAVATION

Unclassified Excavation is provided on the project for excavating material from the area where new Gravel Cushion, Modified and PCC Pavement will be placed in accordance with the plans. Any excess material shall be handled as waste. The estimate of quantities provides 35 cubic yards of Unclassified Excavation for performing this work.

Payment for Unclassified Excavation shall be plans quantity and field measurement will not be required.

If changes are made in the field during construction, measurements shall be taken and the quantity shall be adjusted accordingly.

TABLE OF UNCLASSIFIED EXCAVATION

| | Quantity |
|----------------------|----------|
| Station to Station | CuYd |
| US 16B MRM 64.545 EB | 18 |
| US 16B MRM 64.679 EB | 17 |
| Total | 35 |

RESTORATION OF GRAVEL CUSHION - PCC PAVEMENT REPAIR LOCATIONS

An inspection of the gravel cushion 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 and excess material shall be removed. Each replacement area shall be leveled and compacted to the satisfaction of the Engineer.

All costs associated with this work shall be incidental to the contract unit price per square yard for Nonreinforced PCC Pavement Repair.

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ALKALI SILICA REACTIVITY

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

Fine aggregate with a 14 day expansion value of 0.400 and greater shall not be used.

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

| Source | <u>Location</u> | Expansion Value | |
|--|--|-----------------|--|
| Bachman B&B ready Mix Birdsall S&G Bitterman Concrete Materials Emme Sand & Gravel Fischer S&G F | Winner, SD Flandreau, SD Blunt, SD Creston, SD Oral, SD Wasta, SD Delmont, SD Corson, SD Oneil, Nebraska Fort Yates, ND Rapid City, SD Spearfish, SD Wasta Pickstown, SD Bigstone, SD Akron, IA Hudson, SD Madison, SD Herried, SD Brookings, SD Hawarden, IA Summit Watertown, SD Yankton, SD Onida Onida Sioux Falls Rauville, SD Luverne, MN Burke, SD Herrick, SD Burke, SD Pickstown, SD Sisseton, SD Sisseton, SD Britton, SD Wagner, SD | | 0.335* 0.113 0.223 0.170 0.136 0.177 0.314* 0.158 0.217 0.264* 0.092 0.053 0.152 0.275* 0.140 0.194 0.187 0.116 0.276* 0.123 0.179 0.163 0.124 0.261* 0.214 0.158 0.105 0.124 0.337* 0.307* 0.329* 0.211 0.106 0.098 0.241 |
| | | | |

^{*} 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.

ALKALI SILICA REACTIVITY (CONTINUED)

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.

GRAVEL CUSHION, MODIFIED

Gravel Cushion, Modified shall conform to the following applicable gradation:

| | Gravel Cushion, | Limestone Ledge Rock Gravel Cushion, |
|-----------------|--------------------|--|
| Sieve | Modified | Modified |
| Passing 1" | 100% | 100% |
| Passing 3/4" | 80-100% | 80-100% |
| Passing 1/2" | 68-91% | 68-90% |
| Passing No. 4 | 46-70% | 42-70% |
| Passing No. 8 | 34-58% | 29-53% |
| Passing No. 40 | 13-35% | 10-28% |
| Passing No. 200 | 3.0-12.0% | 3.0-12.0% |

All other requirements for Gravel Cushion shall apply.

An inspection of the remaining gravel cushion subgrade shall be made after removing concrete and excavating. Areas of excess moisture shall be dried to the satisfaction of the Engineer. Loose and excess material shall be removed. The area shall be leveled and compacted to the satisfaction of the Engineer.

Additional required gravel cushion material shall be, placed and compacted to the satisfaction of the Engineer.

Water for Granular Material is estimated at the rate of 20 gallons of water per cubic yard of Gravel Cushion, Modified.

All costs associated with this work including Water for Granular Material shall be incidental to the contract unit price per ton yard for Gravel Cushion, Modified.

8.5" NONREINFORCED CONCRETE PAVEMENT

The fine aggregate shall be screened over a 1 inch square opening screen just prior to introduction into the concrete paving mix.

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 Specifications.

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

All joints (longitudinal and transverse) through and around the 8.5" Nonreinforced Concrete Pavement areas shall be sawed and sealed with Hot Poured Elastic Joint Sealer

Concrete used in Portland cement concrete pavement shall conform to the Special Provision for Contractor Furnished Mix Design for PCC Pavement.

Stationing based on US 16B Median Centerline Alignment.

The concrete shall be placed with equipment operating from a preset grade line.

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 any time 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 deducts, and delays to the project schedule shall be the responsibility of the Contractor.

| Table of 8.5" Nonreinforced Concrete Pavement | | | | | | |
|---|----------|---------------|----------|--------|-----------|--------|
| | | 8.5" | | | Insert | |
| | Remove | Nonreinforced | Gravel | | Steel Bar | |
| | Concrete | Concrete | Cushion, | | in PCC | Dowel |
| | Pavement | Pavement | Modified | #5 Bar | Pavement | Bar |
| MRM | (SqYd) | (SqYd) | (Ton) | (Each) | (Each) | (Each) |
| 64.545 EB | 13.1 | 54.3 | 17.1 | 16 | 16 | 12 |
| 64.679 EB | 6.7 | 50.8 | 16.0 | 16 | 16 | 15 |
| Total | 19.8 | 105.1 | 33.1 | 32 | 32 | 27 |

STEEL BAR INSERTION

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

The Contractor shall insert the steel bars (1½" x 18" epoxy coated plain round dowel bars and 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.

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. 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 will reach to the back of the hole to ensure that all debris or loose material has been removed prior to epoxy injection.

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A rigid frame or mechanical device will 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 will not be allowed.

Cost for the epoxy resin adhesive, steel bars, drilling of holes, inserting the steel bars into the drilled holes and all other items incidental to the insertion of the steel bars shall be included in the contract unit price per each for Insert Steel Bar in PCC Pavement.

REMOVE AND RESET SIGNS AND DELINEATORS

A street sign and several delineators will need to be removed and reset at each location.

Signs and delineators shall be reset in accordance with MUTCD standards.

Any damage caused to the signs and/or delineators during construction operations shall be the responsibility of the Contractor at no additional cost to the State.

All costs for removing and resetting signs shall be paid for at the contract unit price per each for Remove Sign for Reset and Reset Sign.

All costs for removing and resetting delineators shall be paid for at the contract unit price per each for Remove Delineator for Reset and Reset Delineator.

TRAFFIC CONTROL – GENERAL NOTES

- Requests to deviate from the sequence of operations shall be submitted in writing to the Engineer for review. Approval of an alternate sequence of operations will only be allowed when the proposed changes meet with the Department's intent for traffic control and sequencing of the work. An alternate sequence shall be submitted for review a minimum of one week prior to potential implementation.
- 2. Unless otherwise stated in these plans, no work will be allowed during hours of darkness. Hours of darkness are defined as ½ hour after sunset until ½ hour before sunrise.
- 3. Storage of vehicles and equipment shall be as near the right-of-way as possible. Contractor's employees should mobilize at a location off the right-of-way and arrive at the work sites in a minimum number of vehicles necessary to perform the work. Indiscriminate driving and parking of vehicles within the right-of-way will not be permitted. Any damage of 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.
- 4. Existing guide, route, informational logo, regulatory, warning signs and delineation shall be temporarily reset and maintained during construction as directed by the Engineer. Removing, relocating, salvaging and resetting of the above items shall be the responsibility of the Contractor.
- 5. All non-applicable existing signing and temporary traffic control devices shall be covered or removed during periods of inactivity. Periods of inactivity shall be defined as no work taking place for a period of more than 7 calendar days. The cost of removing or covering non-applicable signs and temporary traffic control devices shall be incidental to the contract lump sum price for Traffic Control, Miscellaneous.
- 6. Construction signing mounted on portable supports shall not be used for a duration of more than 3 days, unless approved by the Engineer. Construction signing that remains in the same location for more than 3 days shall be mounted on fixed location, ground mounted, breakaway supports.
- 7. For each PCN the quantity of traffic control units paid for will be for the greatest number of installations per sign in place at any one time regardless of the number of set-ups on the project.
- 8. Any delineators and signs damaged or lost shall be replaced by the Contractor at no cost to the State.
- 9. All materials and equipment shall be stored a minimum distance of 30' from the traveled way during nonworking hours.
- 10. The Contractor shall provide documentation that all breakaway sign supports comply with FHWA NCHRP 350 or MASH crash-worthy requirements. The Contractor shall provide installation details at the preconstruction meeting for all breakaway sign support assemblies.
- 11. The Contractor shall be required to have a person available 24 hour/day, 7 days/week to maintain traffic control devices. The name and cellular telephone number of this individual shall be given to the Engineer at the preconstruction meeting.

- 12. The Contractor or designated traffic control subcontractor shall make night inspections at the initial set up of traffic control and every week thereafter to ensure the adequacy, legibility and reflectivity of each sign and device. A written summary of each inspection shall be given to the Engineer within 24 hours after completion of the inspection. The cost for the nighttime inspection work shall be incidental to the contract lump sum price for Traffic Control, Miscellaneous.
- 13. Vehicles working in traffic or alongside traffic shall be equipped with a flashing amber light visible from all directions. The amber light shall be mounted on the uppermost part of the Contractor's vehicle. Lights must have peak intensity within the range of 40 to 400 candelas and must flash at 75 ± 15 flashes per minute. Vehicle flasher/hazard lights are not acceptable. All haul trucks shall be equipped with a second flashing amber light that is visible from the backside of the haul truck. The costs for the flashing amber lights shall be incidental to the various related contract bid items.
- All construction operations shall be conducted in the general direction of traffic movement.
- 15. If there is a discrepancy between the traffic control plans, standard plates, and the MUTCD whichever is more stringent shall be used, as determined by the Engineer.
- 16. Temporary Road Markers (Tabs) shall be used for lane closure tapers or lane shift tapers and shall be installed at 5' spacing. Tabs used for tapers and shifts will not be measured for payment. All costs associated to furnish, install, maintain (including replacement as required by the Engineer at no added cost to the Department), and remove all markers will be incidental to the contract lump sum price for Traffic Control, Miscellaneous.
- 17. Drums are required in all lane closure tapers. All costs for drums shall be incidental to the contract lump sum price for Traffic Control, Miscellaneous.
- 18. Traffic shall be maintained on the driving lanes. Use of the shoulder as a driving lane will not be permitted. Any damage to the shoulder due to rerouted traffic or Contractor's equipment shall be repaired at no expense to the State.

INVENTORY OF TRAFFIC CONTROL DEVICES

| SIGN CODE | DESCRIPTION | NUMBER | SIGN SIZE | UNITS PER SIGN | UNITS |
|--------------|------------------------------------|--------|-----------|----------------------|-------|
| R1-1 | STOP | 2 | 36" x 36" | 27 | 54 |
| W4-2 | LEFT or RIGHT LANE ENDS (symbol) | 2 | 48" x 48" | 34 | 68 |
| W20-1 | ROAD WORK AHEAD | 5 | 48" x 48" | 34 | 170 |
| W20-5 | LEFT or RIGHT LANE CLOSED AHEAD | 2 | 48" x 48" | 34 | 68 |
| W21-5 | SHOULDER WORK | 2 | 48" x 48" | 34 | 68 |
| G20-2 | END ROAD WORK | 4 | 48" x 24" | 24 | 96 |
| - | TYPE 3 BARRICADE - 8' double sided | 4 | | 56 | 224 |
| | | | ΤΟΤΔΙ Ι | INITS | 748 |

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TYPE C ADVANCE WARNING ARROW PANEL

For each PCN the quantity of Type C Advance Warning Arrow Panels paid will be the most installations in place at any one time regardless of the number of set-ups on the project.

| Table of Curb and Gutter | | | | |
|--------------------------|-----------------|--------|--|--|
| | Remove | Type | | |
| | Concrete | B68.5 | | |
| | Curb and Curb a | | | |
| | Gutter | Gutter | | |
| MRM | (Ft) | (Ft) | | |
| US 16B 64.545 EB | 20.6 | 6.0 | | |

EROSION CONTROL WATTLE

Erosion control wattles for restraining the flow of runoff and sediment shall be installed at underdrain outlets noted in the table of Subgrade Repair and at locations determined by the Engineer during construction. 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:

http://sddot.com/business/certification/products/Default.aspx

It is anticipated that 260 feet of 12" Erosion Control Wattle will be required for the two intersecting street locations that are receiving new concrete on US 16B.

EROSION CONTROL

Areas disturbed or damaged during subgrade repairs shall be seeded and mulched.

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 $\frac{1}{4}$ " to $\frac{1}{2}$ " of topsoil when possible. Hand raking may be required. This requirement may be waived by the Engineer during construction when raking or dragging is deemed not feasible by conventional methods.

Type F Permanent Seed Mixture shall consist of the following:

| Grass Species | Variety | Pure Live Seed (PLS) (Pounds/Acre) |
|---|-----------------------------------|--|
| Western Wheatgrass | Flintlock, Rodan, Rosana | 7 |
| Green Needlegrass | Lodorm | 4 |
| Sideoats Grama | Butte, Killdeer, Pierre, Trailway | 3 |
| Blue Grama | Bad River, Willis | 2 |
| Oats or Spring Wheat: April through May; | | 10 |
| Winter Wheat: August through November | | |
| | Total: | 26 |

Fiber mulch shall be applied in a separate operation following permanent seeding.

An additional 2% by weight of tackifier shall be added to the fiber mulch product selected from the list below. If the product selected has guar gum tackifier included, then the additional 2% of tackifier shall be guar gum. If the product selected has synthetic tackifier included, then the additional 2% of tackifier shall be synthetic.

Fiber mulch shall be applied at the rate of 2000 pounds per acre.

The Contractor shall allow the fiber mulch to cure a minimum of 18 hours prior to watering or any storm event to ensure proper cohesion between the soil and fiber particles.

All costs for the additional tackifier added to the fiber mulch including labor, equipment, and materials shall be incidental to the contract lump sum price for Erosion Control.

The fiber mulch used on this project shall be one from the list below:

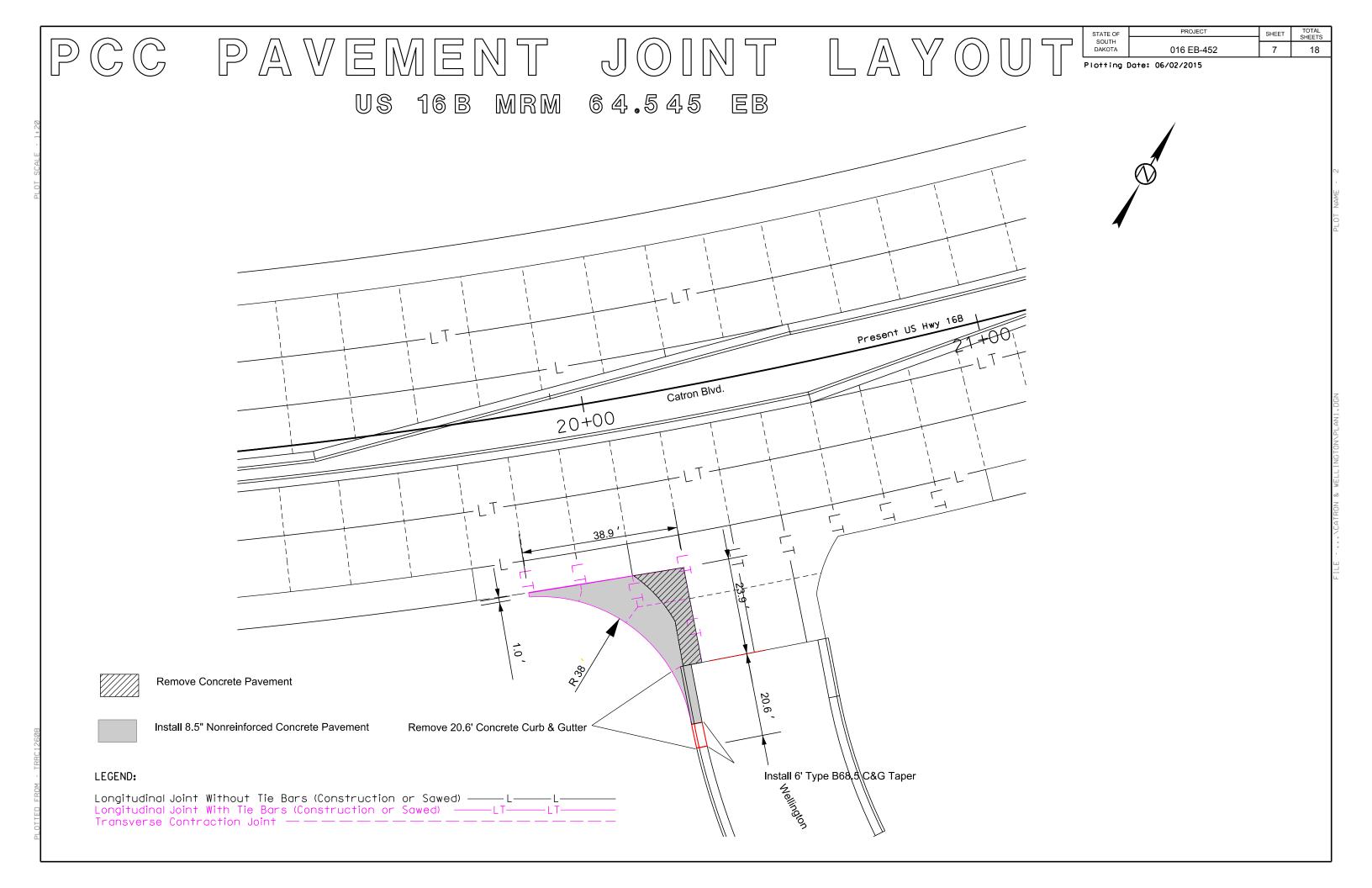
| Product | <u>Manufacturer</u> |
|--|--|
| Mat-Fiber Plus | Mat, Inc. Floodwood, MN Phone: 1-888-477-3028 www.matinc.biz |
| Conwed Hydro Mulch 2000 | Profile Products LLC Buffalo Grove, IL Phone: 1-800-366-1180 www.conwedfibers.com |
| EcoFibre Plus Tackifier | Profile Products LLC Buffalo Grove, IL Phone: 1-800-366-1180 www.profile-eco.com |
| Terra Wood with Tacking Agent 3 | Profile Products LLC Buffalo Grove, IL Phone: 1-800-726-6371 www.terra-mulch.com |
| Bindex Wood WT | American Excelsior Co. Arlington, TX Phone: 1-800-777-7645 www.curlex.com |
| Second Nature Wood Fiber Mulch Plus | Central Fiber LLC Canton, OH |

Approximately 2600 square feet of permanent seeding will be required for the two intersecting street locations that are receiving new concrete on US 16B. The Engineer may adjust this quantity up or down depending on damage to the area surrounding the project.

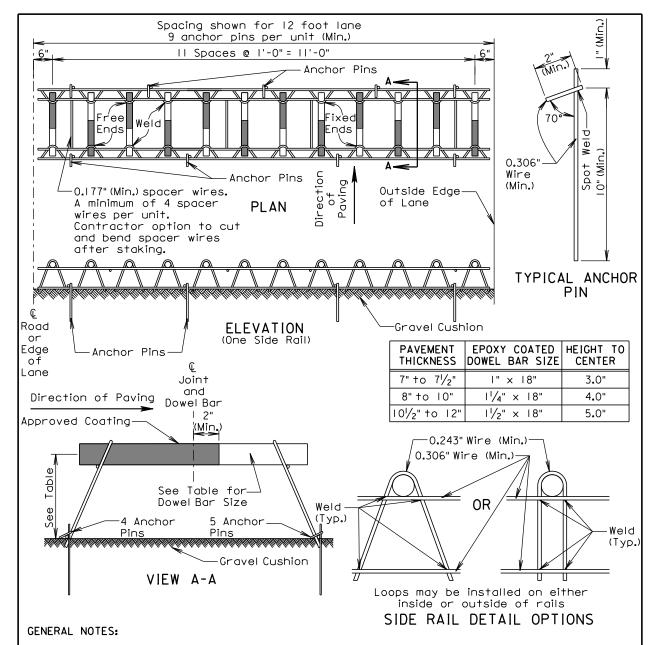
Phone: 1-888-452-2630 www.centralfiber.com

All costs associated with permanent seeding and fiber mulching shall be incidental to the contract lump sum for price for Erosion Control.

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STATE OF SOUTH DAKOTA SHEET PCC PAVEMENT JOINT LAYO 016 EB-452 8 Plotting Date: 06/02/2015 64.679 MRM16 B Catron Blvd 27+00 28+00 26+00 <u></u> 36.9 ′ □ Remove Concrete Pavement Install 8.5" Nonreinforced Concrete Pavement LEGEND:



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

Centerline of individual dowel bars shall be parallel to the centerline of the roadway $\pm 1/2$ 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.

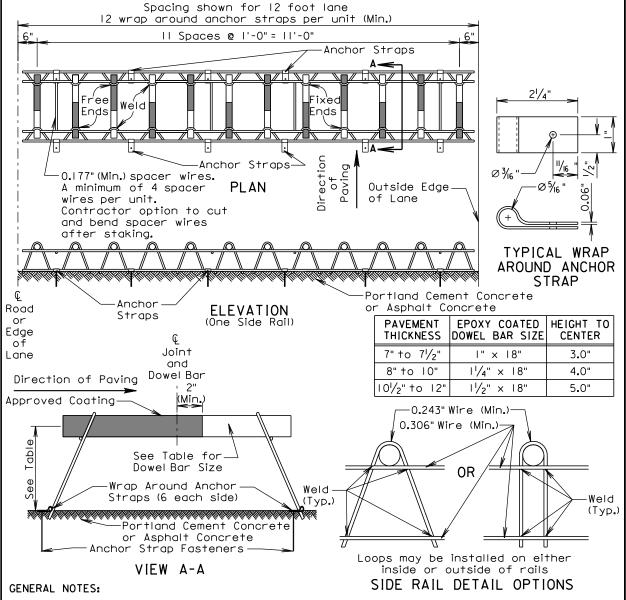
August 30, 2013

Published Date: 1st Qtr. 2015

PCC PAVEMENT DOWEL BAR ASSEMBLY
FOR TRANSVERSE CONTRACTION JOINTS
12 Bar Assembly on Granular Base Material

PLATE NUMBER
380.0/
Sheet 1 of 1

| STATE OF | PROJECT | SHEET | TOTAL SHEETS |
|----------|------------|-------|-----------------|
| SOUTH | | | SHEETS |
| DAKOTA | 016 EB-452 | 9 | 18 |



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

Centerline of individual dowel bars shall be parallel to the centerline of the roadway $\pm 1/2$ 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.

Appropriate anchor strap fasteners shall be used to prevent movement of the dowel bar assemblies during the paving operation.

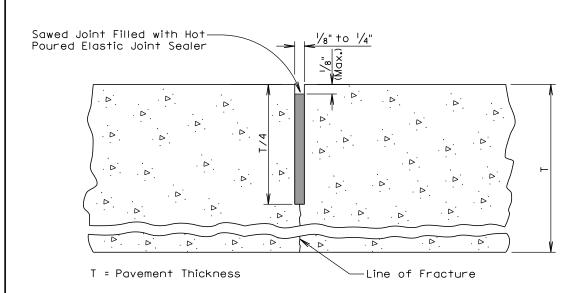
August 30, 2013

Published Date: 1st Qtr. 2015

PCC PAVEMENT DOWEL BAR ASSEMBLY
FOR TRANSVERSE CONTRACTION JOINTS
12 Bar Assembly on Hard Surfaced Base Material
Sheet Lof L

 STATE OF SOUTH DAKOTA
 PROJECT SHEET
 SHEET SHEETS

 10
 18



GENERAL NOTES:

The saw cut to control cracking shall be a minimum of $\frac{1}{4}$ 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, 2013

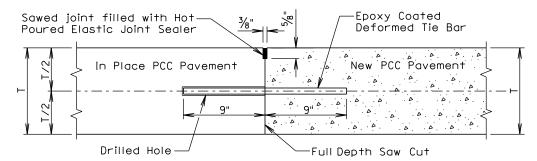
Published Date: 1st Qtr. 2015

| S | PCC PAVEMENT TRANSVERSE CONTRACTION | JOINT WITH OR WITHOUT DOWEL BAR ASSEMBLY |

PLATE NUMBER 380.05

Sheet I of I

DETAIL A TRANSVERSE CONSTRUCTION JOINT WITH TIE BARS



T = In Place PCC Pavement and New PCC Pavement Thickness

GENERAL NOTES:

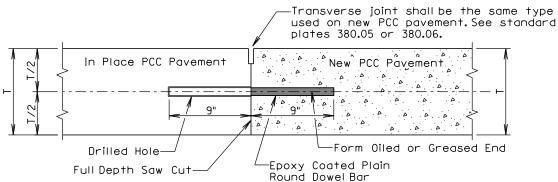
The term "In Place PCC Pavement" in the above drawing indicates that the in place PCC pavement was placed on a previous project.

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 9 inches into the in place PCC pavement and anchored with an epoxy resin adhesive.

No.9 epoxy coated deformed tie bars shall be used in 10 inch thickness and less PCC Pavement and No. II epoxy coated deformed tie bars shall be used in 10.5 inch 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 9 inches from the pavement edges.

DETAIL B TRANSVERSE CONSTRUCTION JOINT WITH DOWEL BARS



T = In Place PCC Pavement and New PCC Pavement Thickness GENERAL NOTES: The term "In Place PCC Pavement" in the above drawing indicates that the in place PCC

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

pavement was placed on a previous project or current project.

D

D

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The plain round dowel bars shall be embedded a minimum depth of 9 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 the same as detailed on the corresponding dowel bar assembly standard plate (380.01, 380.02, 380.03, 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.

September 6, 2013

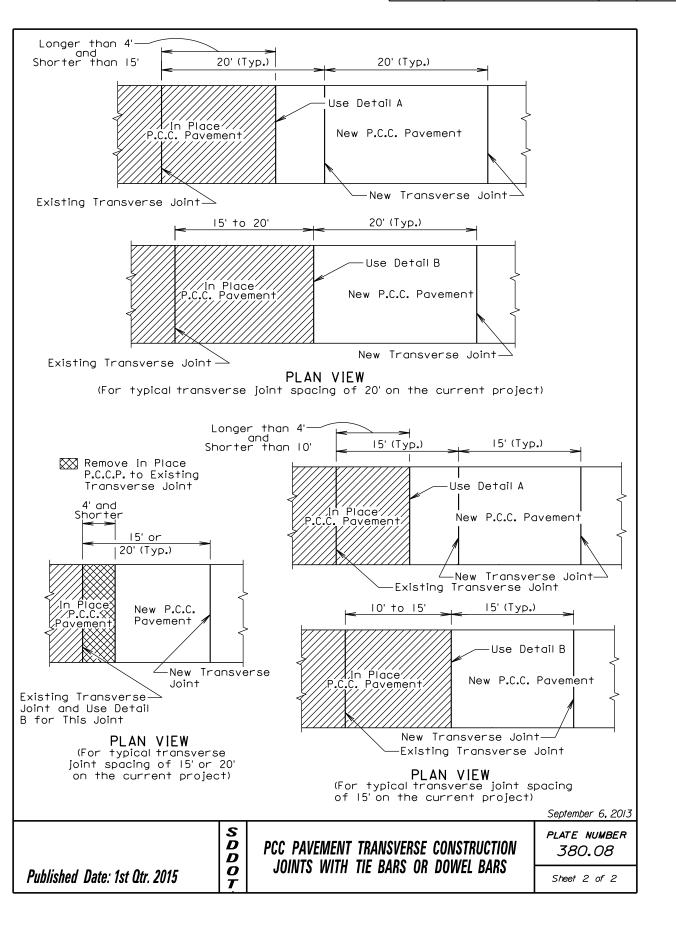
Published Date: 1st Otr. 2015

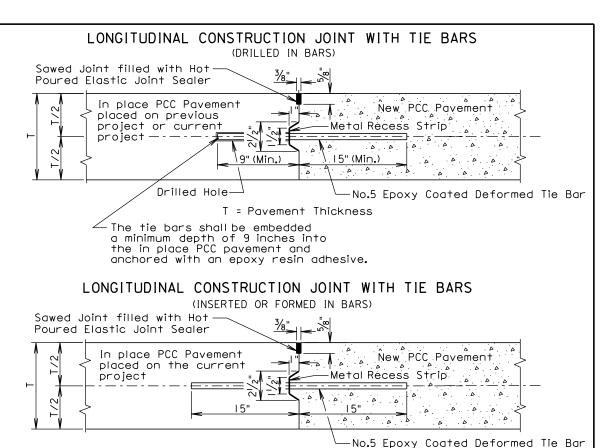
PCC PAVEMENT TRANSVERSE CONSTRUCTION JOINTS WITH TIE BARS OR DOWEL BARS

PLATE NUMBER 380.08

Sheet Lof 2

| STATE OF | PROJECT | SHEET | TOTAL SHEETS |
|----------|------------|-------|-----------------|
| SOUTH | | | |
| DAKOTA | 016 EB-452 | 11 | 18 |





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"N | 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.

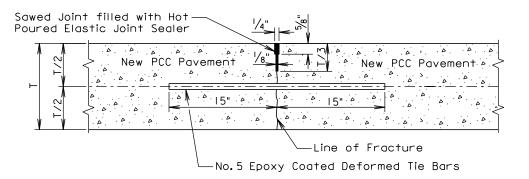
August 31, 2013

PLATE NUMBER
PCC PAVEMENT LONGITUDINAL 380, 10

| STATE OF | PROJECT | SHEET | TOTAL SHEETS |
|-----------------|------------|-------|-----------------|
| SOUTH DAKOTA | 016 EB-452 | 12 | 18 |

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

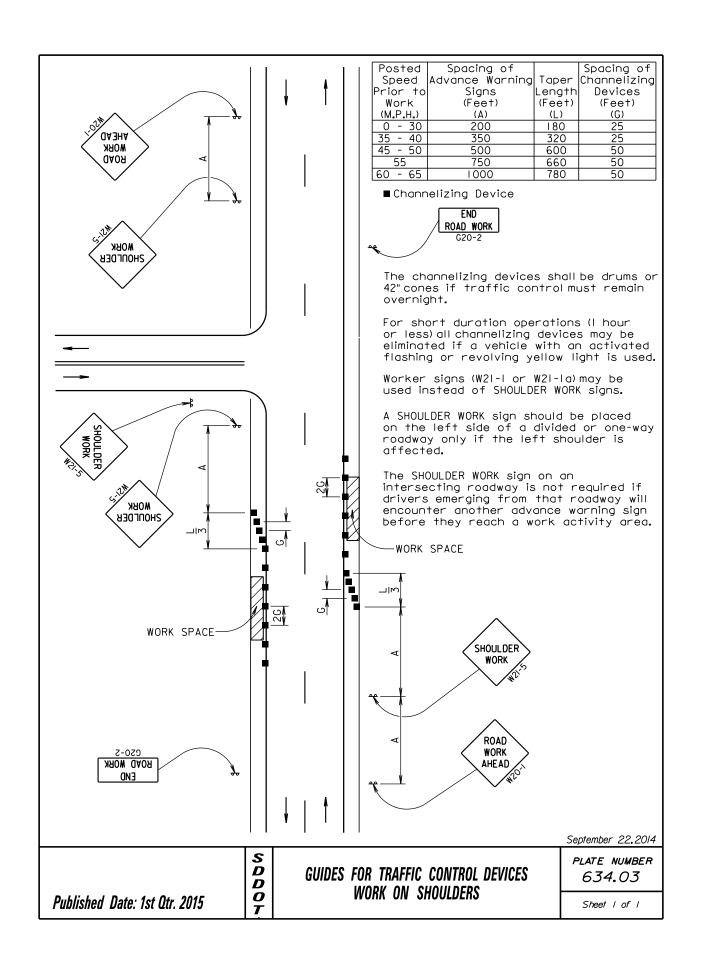
PLATE NUMBER

380.10

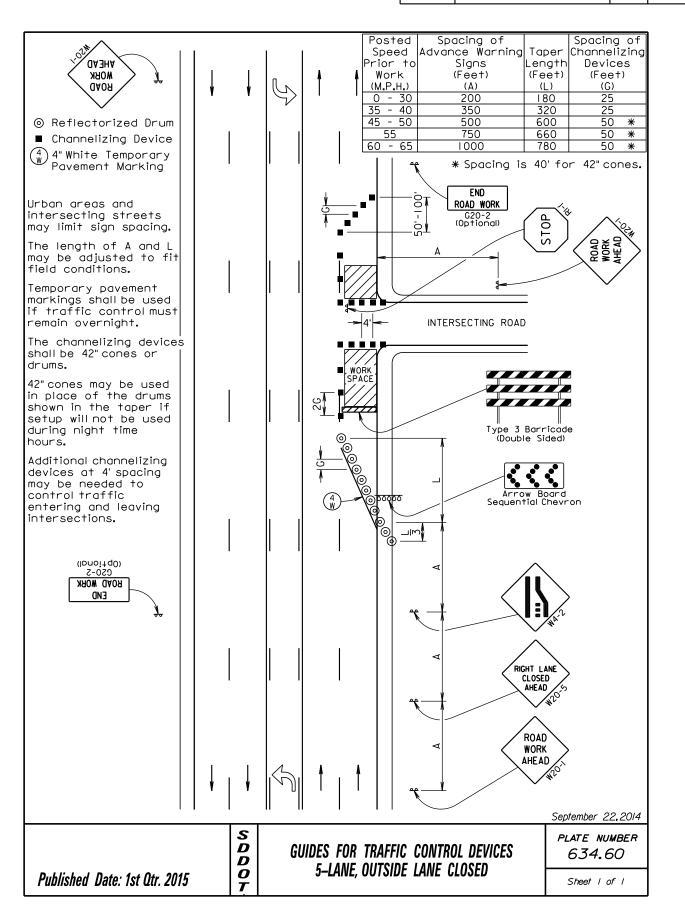
Sheet 2 of 2

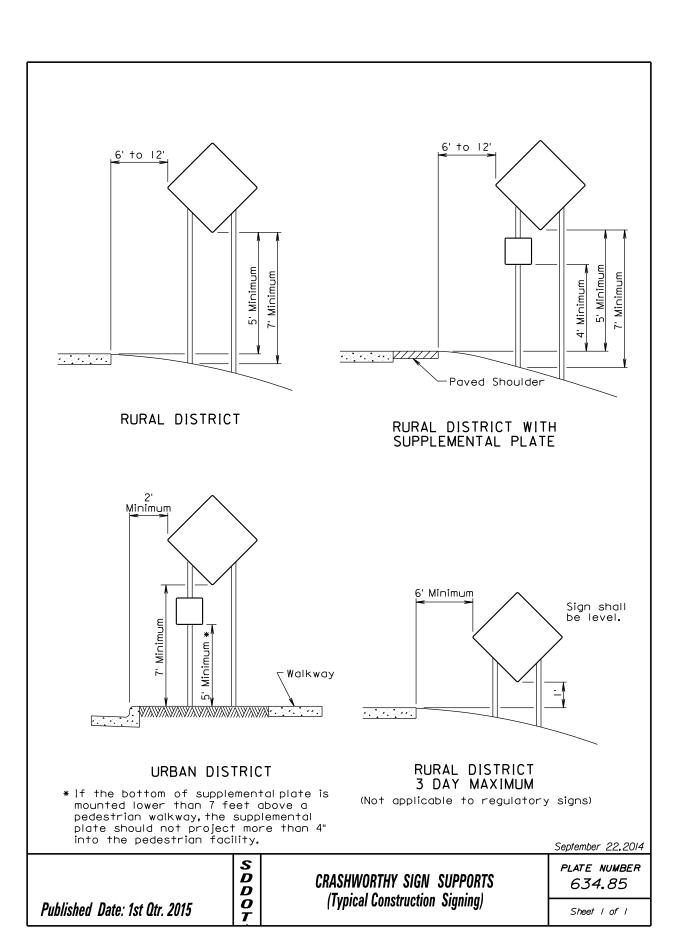
Published Date: 1st Qtr. 2015

PCC PAVEMENT LONGITUDINAL
JOINTS WITH TIE BARS

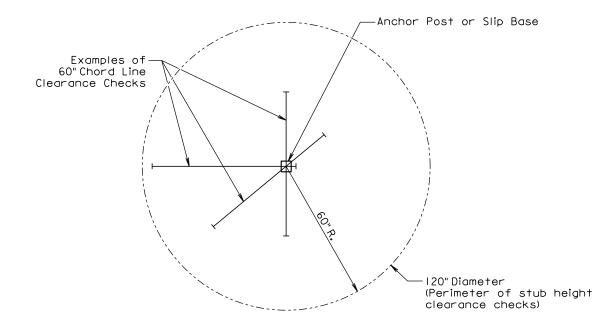


| STATE OF | PROJECT | SHEET | TOTAL SHEETS |
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| SOUTH | | | SHEETS |
| DAKOTA | 016 EB-452 | 13 | 18 |

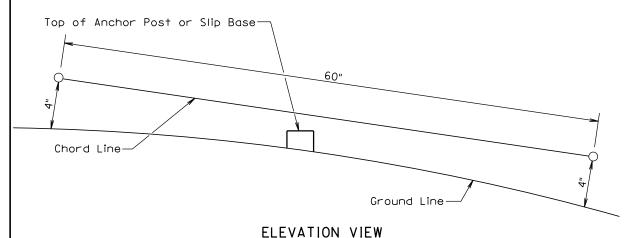




| STATE OF | PROJECT | SHEET | TOTAL SHEETS |
|-----------------|------------|-------|-----------------|
| SOUTH DAKOTA | 016 EB-452 | 14 | 18 |



PLAN VIEW
(Examples of stub height clearance checks)



GENERAL NOTES:

The top of anchor posts and slip bases SHALL NOT extend above a 60" chord line within a 120" diameter circle around the post with ends 4" above the ground.

At locations where there is curb and gutter adjacent to the breakaway sign support, the stub height shall be a maximum of 4" above the ground line at the localized area adjacent to the breakaway support stub.

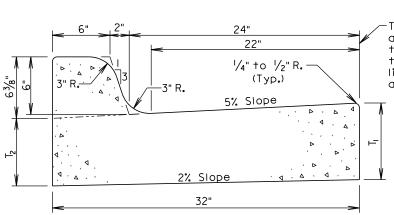
The 4" stub height clearance is not necessary for U-channel lap splices where the support is designed to yield (bend) at the base.

July I. 2005

PLATE NUMBER 634.99

Published Date: 1st Qtr. 2015

**Space of 1



The stated radii on the plans and cross sections refer to this line and it shall also be the basis for horizontal linear foot measurement and payment.

| Туре | T _i (Inches) | T ₂ (Inches) | Cu. Yd. Per Lin. Ft. | Lin.Ft. Per Cu.Yd. |
|--------|----------------------------|--------------------------------|----------------------------|--------------------------|
| B66 | 6 | 5 ¹ / ₁₆ | 0.057 | 17.7 |
| B67 | 7 | 61/16 | 0.065 | 15.4 |
| B68 | 8 | 7½ ₆ | 0.073 | 13.7 |
| B68.5 | 8.5 | 7% | 0.077 | 13.0 |
| B69 | 9 | 8 ¹ / ₁₆ | 0.081 | 12.3 |
| B69.5 | 9.5 | 8% | 0.085 | 11.7 |
| B610 | 10 | 91/16 | 0.090 | 11.2 |
| B610.5 | 10.5 | 9% | 0.094 | 10.7 |
| B611 | 11 | 101/16 | 0.098 | 10.2 |
| B611.5 | 11.5 | 10% | 0.102 | 9.8 |
| B612 | 12 | 111/16 | 0.106 | 9.4 |

GENERAL NOTES:

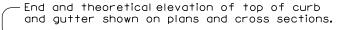
When concrete curb and gutter longitudinally adjoins new concrete pavement, the method of attachment shall be by one of the methods shown on Standard Plate 380.11.

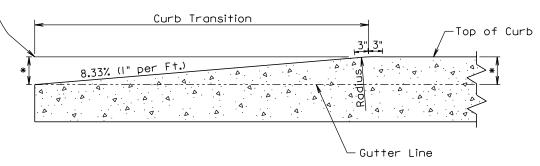
See Standard Plate 650.90 for expansion and contraction joints in the curb and gutter.

September 6, 2008

| | S D D | TYPE B CONCRETE CURB AND GUTTER | PLATE NUMBER 650.01 |
|-------------------------------|-------------|---------------------------------|------------------------|
| Published Date: 1st Qtr. 2015 | O T | | Sheet Lof L |

| STATE OF | PROJECT | SHEET | TOTAL |
|----------|------------|-------|--------|
| SOUTH | | | SHEETS |
| DAKOTA | 016 EB-452 | 15 | 18 |



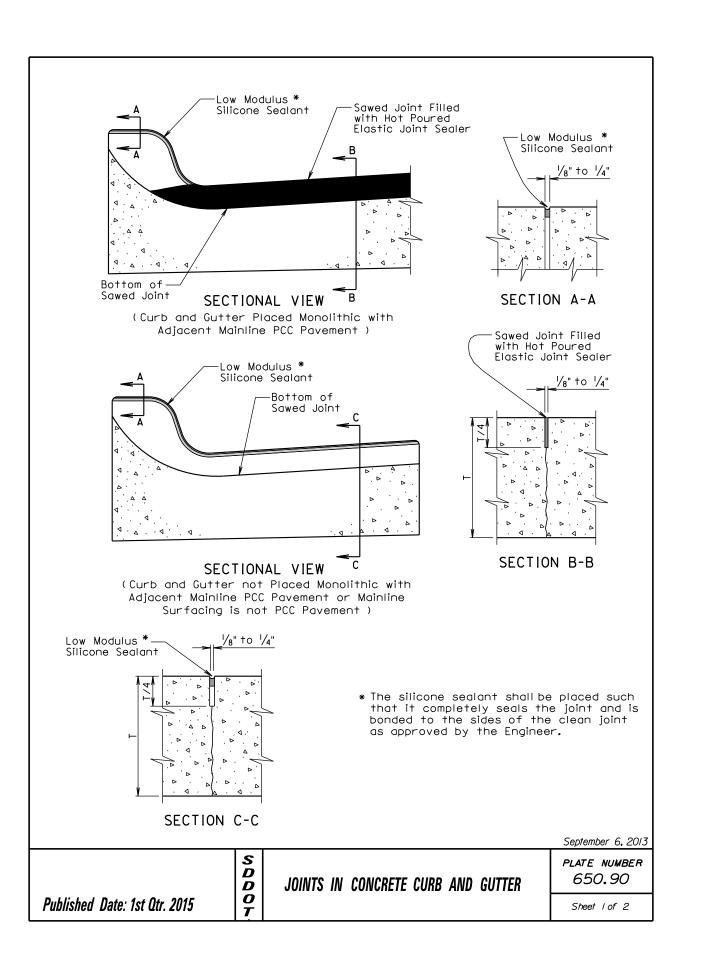


* Height of Curb

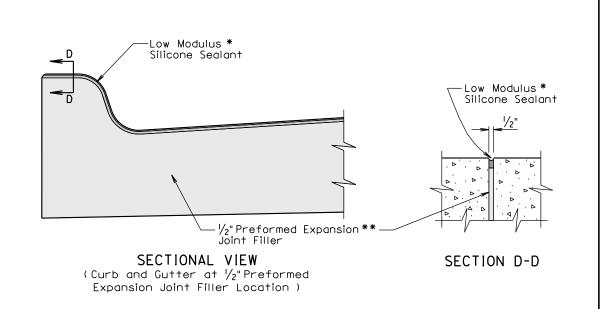
LONGITUDINAL SECTION OF CONCRETE CURB TAPER

September 14, 2005

| | 800 | CONCRETE CURB TAPER | PLATE NUMBER 650.35 |
|-------------------------------|------------|---------------------|---------------------|
| Published Date: 1st Qtr. 2015 | <i>O T</i> | | Sheet of |



| STATE OF | PROJECT | SHEET | TOTAL SHEETS |
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* 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.

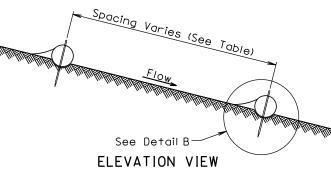
- ** A $\frac{1}{2}$ " preformed expansion joint filler shall be placed transversely in the curb and gutter at the following locations:
 - I. At each junction between the radius return of curb and gutter and curb and gutter which is parallel to the project centerline.
 - 2. At each junction between new 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 $1\frac{1}{2}$ 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 $\frac{1}{4}$ the thickness of the concrete and the joint shall be sealed in accordance with the details shown above.

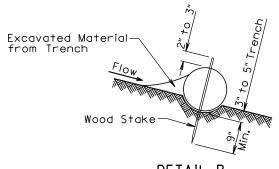
September 6, 2013

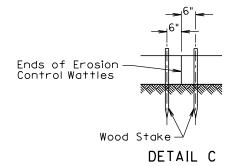
| | S D D | JOINTS IN CONCRETE CURB AND GUTTER | PLATE NUMBER 650.90 |
|-------------------------------|-------------|------------------------------------|------------------------|
| Published Date: 1st Qtr. 2015 | O T | | Sheet 2 of 2 |



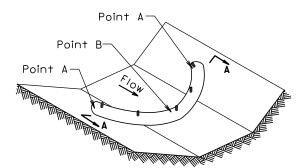
| CUT OR FILL SLOPE INSTALLATION | | | | |
|-----------------------------------|-----------------|--|--|--|
| Slope | Spacing (F†) | | | |
| 1:1 | 10 | | | |
| 2:1 | 20 | | | |
| 3 : I | 30 | | | |
| 4:1 | 40 | | | |

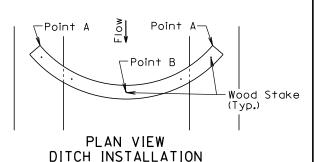
CUT OR FILL SLOPE INSTALLATION





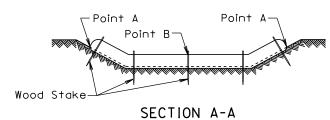
DETAIL B (TYPICAL OF ALL INSTALLATIONS)





ISOMETRIC VIEW DITCH INSTALLATION

| DITCH INSTALLATION | |
|--------------------|-----------------|
| Grade | Spacing (F†) |
| 2% | 150 |
| 3% | 100 |
| 4% | 75 |
| 5% | 50 |



December 23, 2004

| | S D D | EROSION CONTROL WATTLE | PLATE NUMBER 734.06 |
|-------------------------------|-------------|------------------------|------------------------|
| Published Date: 1st Qtr. 2015 | 0 T | | Sheet Lof 2 |

| STATE OF | PROJECT | SHEET | TOTAL SHEETS | |
|----------|------------|-------|-----------------|--|
| SOUTH | 016 FR-452 | 17 | | |
| DAKOTA | 016 EB-452 | 17 | 18 | |

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 can not 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 4'.

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 $\frac{1}{2}$. The Contractor shall remove, dispose, or reshape the accumulated sediment when necessary as determined by the Engineer.

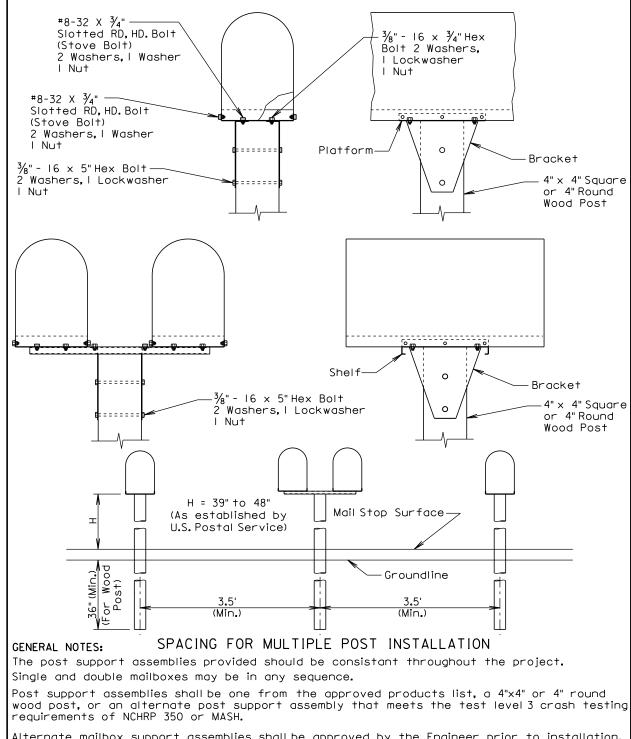
Sediment removal, disposal, or necessary shaping shall be as directed by the Engineer. All costs for removing accumulated sediment, disposal of sediment, and necessary shaping shall be incidental to the contract unit price per cubic yard for "Remove Sediment".

All costs for furnishing and installing the erosion control wattles including labor, equipment, and materials shall be incidental to 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 incidental to the contract unit price per foot for "Remove Erosion Control Wattle".

December 23, 2004

S PLATE NUMBER D *734.06* D EROSION CONTROL WATTLE 0 Published Date: 1st Otr. 2015 Sheet 2 of 2



Alternate mailbox support assemblies shall be approved by the Engineer prior to installation. The Contractor shall provide the Engineer written certification that the mailbox support assembly has met the crash testing requirements and will be installed in accordance with the manufacturer's installation instructions.

September 6, 2013

Published Date: 1st Qtr. 2015

Single and double mailbox assemblies

Plate Number 900.02

Sheet 1 of 1

| STATE OF | PROJECT | SHEET | TOTAL SHEETS |
|-----------------|------------|-------|-----------------|
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