

STATE OF	PROJECT	SHEET	TOTAL
SOUTH DAKOTA	016 WB-452		SHEETS
	016 EB-452	1	37
	05/00/0010		

Plotting Date:

05/20/2013

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ESTIMATE OF QUANTITIES

PCN i2wq

Bid Item Number	Item	Quantity	Unit
009E0010	Mobilization	Lump Sum	LS
110E7700	Remove Drop Inlet Frame and Grate Assembly for Reset	1	Each
120E0600	Contractor Furnished Borrow	195	CuYd
230E0100	Remove and Replace Topsoil	Lump Sum	LS
450E4757	18" CMP 12 Gauge, Furnish	40	Ft
450E4760	18" CMP, Install	40	Ft
450E5406	18" CMP Safety End, Furnish	1	Each
450E5407	18" CMP Safety End, Install	1	Each
460E0300	Breakout Structural Concrete	0.3	CuYd
462E0100	Class M6 Concrete	1.5	CuYd
480E0100	Reinforcing Steel	171	Lb
634E0010	Flagging	10	Hour
634E0100	Traffic Control	238	Unit
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0420	Type C Advance Warning Arrow Panel	1	Each
670E7000	Reset Drop Inlet Frame and Grate Assembly	1	Each
730E0210	Type F Permanent Seed Mixture	1	Lb
731E0100	Fertilizing	83	Lb
732E0250	Fiber Mulching	104	Lb
734E0154	12" Diameter Erosion Control Wattle	48	Ft

PCN i2wr

Bid Item Number	Item	Quantity	Unit
009E0010	Mobilization	Lump Sum	LS
110E0300	Remove Concrete Curb and Gutter	23	Ft
110E1010	Remove Asphalt Concrete Pavement	661.8	SqYd
110E1140	Remove Concrete Sidewalk	13.7	SqYd
120E0010	Unclassified Excavation	170	CuYd
120E6200	Water for Granular Material	8.7	MGal
230E0100	Remove and Replace Topsoil	Lump Sum	LS
260E1010	Base Course	39.0	Ton
260E2010	Gravel Cushion	190.0	Ton
320E1200	Asphalt Concrete Composite	20.6	Ton
380E5010	Fast Track Concrete	646.0	SqYd
380E6000	Dowel Bar	325	Each
380E6110	Insert Steel Bar in PCC Pavement	148	Each
633E0010	Cold Applied Plastic Pavement Marking, 4"	95	Ft
633E0030	Cold Applied Plastic Pavement Marking, 24"	232	Ft
633E0040	Cold Applied Plastic Pavement Marking, Arrow	1	Each
633E5000	Grooving for Cold Applied Plastic Pavement Marking, 4"	95	Ft
633E5015	Grooving for Cold Applied Plastic Pavement Marking, 24"	232	Ft
633E5025	Grooving for Cold Applied Plastic Pavement Marking, Arrow	1	Each
634E0010	Flagging	100	Hour
634E0100	Traffic Control	2,039	Unit
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0420	Type C Advance Warning Arrow Panel	2	Each
635E5540	Sawed-In Detector Loop	4	Each
635E7035	Install Preformed Detector Loop	5	Each
650E1095	Type F69.5 Concrete Curb and Gutter	261	Ft
651E0040	4" Concrete Sidewalk	119	SqFt
651E7000	Type 1 Detectable Warnings	10	SqFt
730E0210	Type F Permanent Seed Mixture	2	Lb
731E0100	Fertilizing	96	Lb
734E0133	Type 3 Turf Reinforcement Mat	311.0	SqYd

SPECIFICATIONS

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

SEQUENCE OF OPERATIONS

PCN i2wq, 5th St. & US 16B

- 1. Set up traffic control.
- 2. Strip topsoil.
- 3. Complete work on drop inlet and install pipe and end section.
- 4. Place Contractor Furnished Borrow.
- 5. Place seed and erosion control.
- 6. Remove traffic control.

PCN i2wr, Homestead Avenue and Service Road

- 1. Two-way traffic on Homestead and Service Road shall be maintained at all times.
- 1. Set up Traffic Control to complete work on one side using Standard Plates 634.33 and 634.53.
- 2. Complete concrete, asphalt and erosion control work.
- 2. Switch traffic control and work on the other side using Standard Plates 634.33 and 634.53.
- 3. Complete remaining concrete, asphalt and erosion control work.

PCN i2wr, Cheyenne Boulevard

- 3. Two-way traffic Cheyenne Boulevard shall be maintained at all times.
- 4. Set up Traffic Control for Phase 1 using Standard Plates 634.33 and 634.53.
- 5. Complete work on Phase 1.
- 6. Set up Traffic Control for Phase 2 using Standard Plates 634.33 and 634.52. When concrete work is directly adjacent to the northbound lanes, standard plate 634.63 shall be used.
- 7. Complete work on Phase 2.
- 8. Set up Traffic Control for Phase 3 using Standard Plates 634.33 and 634.53. When concrete work is directly adjacent to the northbound lanes, standard plate 634.63 shall be used.
- 9. Complete work on Phase 3.
- 10. Remove Traffic Control.

UTILITIES

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.

plans.

PERMIT FOR THE 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 guality 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."

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, South Dakota 57501-3181 605-773-3151

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.

The permit requires the Contractor to use reasonably available technology to control fugitive dust emissions. The Contractor is required to use control measures for trackout, 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.

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Utilities within the limits of the proposed construction shall be adjusted by the owner as addressed in SDCL 31-26-23 unless otherwise indicated in these

WATER SOURCE

The Contractor shall not withdraw water with equipment previously used outside the State of South Dakota without prior approval from the DOT Environmental Office.

The DOT Environmental Office contact is the Environmental Project Scientist, 605-773-3268. The WATER SOURCE plan note does not relieve the Contractor of his/her responsibility to obtain the necessary permits from other agencies such as the Department of Environment and Natural Resources (DENR) and the United States Army Corps of Engineers (COE).

WORK AFFECTING WATERWAYS

Storm Water

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.

HISTORICAL PRESERVATION OFFICE CLEARANCES

To obtain State Historical Preservation Office (SHPO) clearance, a cultural resources survey may need to be conducted by a gualified archaeologist. In lieu of a cultural resources survey, the Contractor could request a records search from Jim Donohue, State Archaeological Research Center (SARC). Provide SARC 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 no artifacts have been found on the site. The Contractor shall arrange and pay for the cultural resource survey and/or records search.

If any earth disturbing activities occur within the current geographical or historic boundaries of any South Dakota reservation, the Contractor shall obtain Tribal Historical Preservation Office (THPO) clearance. If no THPO exists, the required SHPO clearance shall suffice, with documentation of Tribal contact efforts provided to SHPO.

To facilitate SHPO or THPO responses, the Contractor should submit a records search or cultural resources survey report to the DOT Environmental Engineer, 700 East Broadway Avenue, Pierre, SD 57501-2586 (605-773-3268). Allow 30 days from the date this information is submitted to the Environmental Engineer for SHPO/THPO approval. The Contractor is responsible for obtaining all required permits and clearances for staging areas, borrow sites, waste disposal sites, and all material processing sites. The Contractor shall provide the required permits and clearances to the Engineer at the preconstruction meeting.

WASTE DISPOSAL SITE

The Contractor will be required to furnish a site(s) for the disposal of construction/demolition debris generated by this project.

Construction/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.

WASTE DISPOSAL SITE (CONTINUED)

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 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/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/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.

EXISTING CONDUIT

Any damage to existing conduit or wiring not designated for replacement shall be repaired by the Contractor at no additional cost to the State.

REMOVE AND REPLACE TOPSOIL

Prior to beginning operations at the 5th Street location, a 4" depth of topsoil shall be bladed and left in a windrow at the outside edge of the Right-of-Way. Following completion of operations, topsoil shall be bladed across the disturbed areas.

Topsoil shall also be salvaged and stockpiled prior to shaping for the Reinforced Turf Mat. Depth of salvage, and stockpile location will be directed by the Engineer. Following completion of construction of the swales, topsoil shall be spread evenly over the disturbed areas.

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

Excavation.

Any excavation required for the installation of Asphalt Concrete Composite shall be considered Unclassified Excavation.

It is estimated that 170 CuYd of Unclassified Excavation will be required.

Plans quantity shall be the basis of payment for Unclassified Excavation.

SAWING IN EXISTING SURFACING

Where new Portland Cement Concrete Pavement (PCCP) or new asphalt concrete is placed adjacent to existing asphalt concrete or PCCP, the existing pavement shall be sawed full depth to a true line with a vertical face. No separate payment shall be made for sawing.

REMOVAL OF EXISTING ASPHALT CONCRETE PAVEMENT

shall be removed.

At Chevenne Boulevard asphalt shall be removed to provide for the installation of new PCCP.

At the service road a 1-foot width shall be saw-cut and removed along the outside edges of the in-place asphalt prior to placement of new base course and Asphalt Concrete Composite.

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

TABLE OF ASPHALT CONCRETE PAVEMENT REMOVAL

Location

Homestead Avenue Chevenne Blvd. Service Road

Total:

Loca

Homestead Aver Chevenne Blvd.

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Removal of base material under the in-place asphalt concrete required to provide for the installation of PCCP shall be considered Unclassified

At Homestead Avenue the asphalt patches adjacent to the in-place PCCP

Quantity (SqYd)	
35.2	
599.3	
27.3	
661.8	

TABLE OF CONCRETE CURB AND GUTTER REMOVAL

	Quantity
ation	(Ft)
nue – South Side	18.0
 Loop Installation 	5.0
Total:	23.0

TABLE OF SIDEWALK REMOVAL

	Quantity
Location	(SqYd)
Service Road – North Side	13.7
Total:	13.7

CONTRACTOR FURNISHED BORROW

Contractor Furnished Borrow shall be used to fill in the ditch up to the new level of the Type C drop inlet and CMP culvert at 5th Street.

It is estimated that 195 CuYd of Contractor Furnished Borrow will be required.

Plans guantity shall be the basis of payment for Contractor Furnished Borrow.

The Contractor shall provide a suitable site for Contractor furnished borrow 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.

Water for Embankment is estimated at the rate of 20 gallons of water per cubic yard of Embankment. The estimated quantity of Water for Embankment is 3.9 MGal. No separate payment will be made for the Water for Embankment and all costs associated shall be incidental to the contract unit price per cubic yard of Contractor Furnished Borrow.

Restoration of the Contractor furnished borrow site shall be the responsibility of the Contractor.

BASE COURSE

Base Course shall be provided for locations requiring Asphalt Concrete Composite. The Base Course shall be placed at a 1-foot depth unless otherwise directed by the Engineer.

All requirements of the Standard Specifications for Base Course shall apply, except that Base Course for Backfill shall be compacted to the satisfaction of the Engineer.

Included in the Estimate of Quantities are 39.0 tons of Base Course and 1.5 M. gallons of Water for Granular Material

GRAVEL CUSHION

Gravel Cushion shall be provided for locations requiring PCCP and/or Curb and Gutter. The Gravel shall be placed at a 5-inch depth unless otherwise directed by the Engineer

Included in the Estimate of Quantities are 190 tons of Gravel Cushion and 7.2 M. gallons of Water for Granular Material

ASPHALT CONCRETE COMPOSITE

Mineral aggregate for the Asphalt Concrete Composite shall conform to the requirements of the Standard Specifications for Class E, Type 1.

All other requirements in the Standard Specifications for Asphalt Concrete Composite shall apply.

The asphalt binder used in the mixture shall be PG 64-22, PG 64-28 or PG 64-34 Asphalt Binder.

Asphalt Concrete Composite shall be placed at a depth of 6 inches.

FAST TRACK CONCRETE

The intent of the Fast Track Concrete is to insure the new pavement can be opened to traffic within 24 hours after placement.

Fast Track Concrete shall be constructed according to plan details and Standard Specifications for the **9.5**" Nonreinforced PCC Pavement except as follows:

The Fast Track Concrete shall be designed to achieve a minimum compressive strength of 3800 psi in 24 hours. Use of a water reducer, accelerator, or a high range water reducer may be required to achieve the desired early strength. If any of these additives are used, they shall be compatible with all other ingredients of the mix. The minimum pounds of cement shall be 600 pounds per cubic yard of Type I, II, III, or V cement. In addition to the cement a minimum of 105 pounds per cubic yard of Fly Ash will be used in the mix. The coarse aggregate shall be a minimum of 53% of total aggregate weight per cubic yard. Coarse aggregate shall be crushed ledge rock, Size No. 1 or 15. The water cement ratio shall be as low as practical to achieve the desired results. The slump requirement will be limited to 4 inches maximum and the entrained air content shall be 4.5% to 7.0% after all admixtures are added and the concrete. The Contractor is responsible for the mix design used. The Contractor shall submit a mix design and supporting documentation to the Engineer for approval at least 2 weeks prior to use. The Department of Transportation's Office of Materials & Surfacing shall review and comment on the proposed mix design prior to its use.

Fast Track Concrete shall be cured with Linseed Oil Base Emulsion Curing Compound. In addition, the concrete shall be immediately covered with a suitable insulation blanket consisting of a layer of closed cell polystyrene foam protected by at least one layer of plastic. The insulation blanket shall have an R-value of at least 0.5, as rated by the manufacturer. The insulation blanket shall be left in place, except for initial joint sawing operations, until the 3800 psi is attained. The initial contraction joint sawing shall be performed as soon as practical after placement to avoid random cracking.

The pavement may be opened to traffic, earlier than 24 hours, provided the compressive strength of 3800 psi has been attained. The final contraction joint sawing and sealing are not required at this time to open up pavement to traffic.

All costs for Fast Track Concrete shall be incidental to the contract unit price per square yard for FAST TRACK CONCRETE.

9.5" NONREINFORCED PCC PAVEMENT

The fine aggregate may require screening as determined by the Engineer.

grade prior to placement of concrete.

adjacent to existing concrete pavement.

The transverse contraction joints shall be perpendicular to the centerline as detailed in standard plate 380.01. In multilane areas the transverse contraction joints shall be perpendicular to the centerline and be in a straight line across the width of the pavement. In special situations the Engineer may pre-approve transverse contraction joints that do not meet these requirements. All nonconforming transverse contraction joints that are not pre-approved shall be removed at the Contractor's expense. Any method of placement that cannot produce these requirements shall not be allowed to continue.

In addition to traditional field inspection of reinforcement, a Ground Penetrating Radar (GPR) unit may be used to verify reinforcement locations in the hardened concrete. The GPR may be used 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 FAST TARCK CONCRETE

	Fast Track
Location	Concrete
	(SqYd)
Homestead Ave.	47
Cheyenne Blvd.	599
Total	646

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- Fine aggregate shall conform to Section 800.2.D Alkali Silica Reactivity (ASR) Requirements of the Standard Specifications.
- In lieu of an automatic subgrader operating from a preset line, a motor grader or other suitable equipment may be used to bring the gravel cushion to final
- The surface of the mainline paving shall be tined to within 2 or 3 feet of the face of the curb. A self-propelled mechanical tiner will not be required.
- Automatic dowel bar inserters will not be allowed on this project.
- A construction joint will be sawed whenever new concrete pavement is placed

All areas shall be tined as directed by the Engineer.

ALKALI SILICA REACTIVITY

Fine aggregate shall conform to Section 800.2.D Alakali 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*
Birdsall S&G	Creston, SD	0.158
Birdsall S&G	Oral, SD	0.131
Birdsall S&G	Wasta, SD	0.170
Bitterman	Delmont, SD	0.316*
Concrete Materials	Corson, SD	0.170
Croell	Quinn, SD	0.089
Emme Sand & Gravel	Oneil, NE	0.217
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	0.198
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	0.141
Morris	Blunt, SD	0.192
Morris – Richards Pit	Onida, SD	0.188
Myrl & Roys Paving- Nelson Pit	Sioux Falls, SD	0.156
Northern Concrete Agg.	Rauville, SD	0.113
Northern Concrete Agg.	Luverne, MN	0.124
Opperman - Gunvordahl Pit	Burke, SD	0.337*
Opperman - Cahoy Pit	Herrick, SD	0.307*
Opperman - Jones Pit	Burke, SD	0.321*
Opperman – Randall Pit	Pickstown, SD	0.239
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.

TIE BARS AND LONGITUDINAL JOINTS

No. 5 x 24" epoxy coated deformed tie bars shall be used for longitudinal joints

The use of automatic tie bar inserters will not be allowed.

Tie bars shall be held in the specified position parallel to the slab surface and perpendicular to the centerline by a supporting device. Tie bars or tie bar baskets shall be securely staked to the roadbed and shall hold the bar at the correct spacing, alignment, and elevation.

Tie bars will not require supports if inserted into the side of the pavement during slip form paying of the longitudinal construction joint operation. Failure to acquire the correct tie bar locations or position in the construction joint shall require the bars to be corrected and a change made to the operation which may include drilling and epoxy bars or other methods as approved by the engineer.

The final position of each tie bar shall be within the following tolerances:

- -- Vertical Placement: \pm T/6 for any part of the tie bar (T = slab thickness)
- -- Transverse Placement (side shift): ± 3 inches when measured perpendicular to the longitudinal joint line

If the tie bar does not meet the requirements and tolerances specified, corrective action shall be performed at the Contractor's expense to the satisfaction of the engineer.

STEEL BAR INSERTION

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 (1¹/₄" x 18" epoxy coated plain round dowel 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.

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 I, Grade 3 (equivalent to AASHTO M235, Type I, 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.

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.

STEEL BAR INSERTION (CONTINUED)

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.

Location	1 ¼" Plain Round Dowel Bar
	(Each)
Homestead Ave.	109
Cheyenne Blvd.	39
Total	148

PERMANENT PAVEMENT MARKINGS

Specifications.

The Contractor is responsible for properly locating the new striping in the original locations.

GROOVE FOR PAVEMENT MARKING

All concrete pavement surfaces which require cold applied plastic tape shall be grooved prior to application.

The grooving, light grinding or sand blasting operation shall remove the existing pavement markings and provide the surface preparation required for application of the cold applied plastic tape.

The work shall generally consist of grooving the concrete surface and subsequent application of cold applied plastic tape.

The groove shall be made in a single pass dry cut using stacked diamond or carbide tipped cutting heads mounted on a floating head with controls capable of providing uniform depth and alignment. The equipment shall be selfvacuuming and leave the cut groove ready for pavement marking installation. Dry cut grooving without a vacuum shall only be allowed if markings run perpendicular to the roadway, such as "STOP BARS". The pavement marking shall be placed in the grooves the same day as the cut. Grooves shall be clean and dry prior to pavement marking application.

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Pavement marking material for skip, lane lines, arrows, solid area and diagonal hash lines shall be Cold Applied Plastic Pavement Marking, 3M 380ES or equivalent Type A as defined in Section 983 of the Standard

GROOVE FOR PAVEMENT MARKING (CONTINUED)

Cutting head: The spacing between each blade must be such that there is less than a 10 mil raise in the finished groove between the blades.

Groove width: Pavement marking width + 1/2 inch (+/- 1/8 inch)

Groove depth: 80 Mils (+ 5/-0 Mils) for cold applied plastic tape

Groove length: Full length of marking + 3 inch grooving transition each end

Groove position: Minimum of 2 inches from edge of longitudinal seam

Groove cleaning: Grooves must be cleaned by using high pressure compressed air (90 psi minimum). A leaf blower will not be an acceptable substitute for compressed air.

If the cold applied plastic tape (including primer if required) does not immediately follow dry pavement grooving, the following shall apply:

Within 24 hours prior to placing the cold applied plastic tape the groove shall be sandblasted and free of any residue and laitance. If the cold applied plastic tape is not placed within 24 hours of sandblasting, the groove shall be re-sandblasted.

The cold applied plastic tape shall be installed in accordance with the manufacturer's recommendations.

SEQUENCE OF OPERATIONS – GENERAL NOTES

- 1. 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 1/2 hour after sunset until 1/2 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.

TRAFFIC CONTROL – GENERAL NOTES (CONTINUED)

- 4. Existing guide, route, informational logo, regulatory, and warning signs shall be temporarily reset and maintained during construction. Removing, relocating, covering, salvaging and resetting of existing traffic control devices, including delineation, shall be the responsibility of the Contractor. Non-applicable signing 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 36 hours. The cost of removing or covering non-applicable signs shall be incidental to the contract lump sum price for. Traffic Control. Miscellaneous.
- 5. 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.
- 6. If inappropriate/conflicting pavement markings exist, the markings shall be removed and replaced with applicable temporary pavement markings when the work duration is more than 3 days. When the work duration is less than 3 days, the channelizing devices in the area where the pavement markings conflict shall be placed at a spacing of $\frac{1}{2}$ G. Pavement marking removals shall be paid for at the contract unit price for Remove Pavement Marking, 4" or equivalent. Temporary pavement marking shall be paid for at the contract unit bid price for Temporary Pavement Marking. The additional channelizing devices shall be incidental to the contract lump sum price for Traffic Control, Miscellaneous.
- 7. The quantity of Signs 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.

TRAFFIC CONTROL – GENERAL NOTES (CONTINUED)

- are not acceptable.
- of traffic movement.

- present.
- devices.

- all times
- two separate occasions.

S	STATE OF	PROJECT	SHEET	TOTAL SHEETS
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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

14. All construction operations shall be conducted in the general direction

15. If there is a discrepancy between the traffic control plans, standard plates, and the MUTCD – whichever is more stringent shall be used.

16. Temporary Road Markers shall be used for lane closure tapers or lane shift tapers. Temporary Road Markers used for tapers and shifts will not be measured for payment and will be incidental to the contract lump sum price for Traffic Control. Miscellaneous.

17. Drums are required in all lane closure tapers.

18. Lane closures shall be removed from US 16B when workers are not

19. Hauling material to and from the project site shall be conducted in a safe manner by utilizing flaggers and appropriate traffic control

20. At no time during construction shall a vertical drop-off of greater than 16" be left overnight adjacent to the traveled way. The Contractor may utilize existing gravel cushion to ensure a 16" vertical drop-off is not exceeded. Vertical drop-offs greater than 16" shall be shouldered to a 3:1 minimum slope. No separate payment will be made for constructing these slopes.

21. The City of Rapid City Traffic Division shall be contacted 1 week prior to any signal phase changes within the project limits as the traffic signal timings may need to be adjusted.

22. Traffic shall be maintained in two lanes with a 12 ft. minimum width at

23. The Contractor shall conduct work operations such that work at the US 16B/Cheyenne Boulevard and US 16B/Service Road intersections take place simultaneously so as not to disrupt traffic in the area on

INVENTORY OF TRAFFIC CONTROL DEVICES

PCN i2wq

SIGN CODE	SIGN SIZE	DESCRIPTION	NUM BER REQUIRED	UNITS PER SIGN		
G20-2	36" x 18"	END ROAD WORK	2	17	34	
W20-1	48" x 48"	ROAD WORK AHEAD	2	34	68	
W20-7a	48" x 48"	FLAGGER	2	34	68	
VV21-5	48" x 48"	SHOULDER WORK	2	34	68	
TOTAL UNITS 238						

PCN i2wr

				UNITS	
SIGN	SIGN SIZE	DESCRIPTION	#	PER	UNITS
CODE				SIGN	T _
G20-2	36" x 18"	END ROAD WORK	12	17	204
R2-1	24" x 30"	SPEED LIMIT ##	3	18	54
R2-6aP	24" x 18"	FINES DOUBLE	2	7	14
R3-2	24" x 24"	NO LEFT TURN (SYMBOL)	5	16	80
R9-8	36" x 18"	PEDESTRIAN CROSSWALK	2	17	34
R9-9	24" x 12"	SIDEWALK CLOSED	1	4	4
R9-10	24" x 12"	SIDEWALK CLOSED, USE OTHER SIDE	2	4	8
R9-11	24" x 18"	SIDEWALK CLOSED AHEAD, CROSS HERE	1	7	7
W1-6	60" x 30"	ONE DIRECTION LARGE ARROW	4	30	120
W3-5	48" x 48"	REDUCED SPEED LIMIT AHEAD	2	34	68
W4-2	48" x 48"	LEFT OR RIGHT LANE ENDS (SYMBOL)	2	34	68
W9-3	48" x 48"	CENTER LANE CLOSED #### FT.	2	34	68
W11-2	36" x 36"	PEDSTRIAN (SYMBOL)	4	27	108
W16-7F	30" x 18"	DOWNWARD DIAGONAL ARROW	2	15	30
W16-9F	30" X 18"	AHEAD	2	15	30
W20-1	48" x 48"	ROAD WORK #### FT. OR AHEAD	13	34	442
W20-4	48" x 48"	ONE LANE ROAD AHEAD	2	34	68
W20-5R	48" x 48"	RT. LANE CLOSED AHEAD	4	34	136
W20-5	48" x 48"	CENTER LANE CLOSED AHEAD	2	34	68
W20-7a	48" x 48"	FLAGGER	3	34	102
W21-5	48" x 48"	SHOULDER WORK	3	34	102
*****		TYPE III BARRICADE - 8 FT. DOUBLE SIDED	4	56	224
		тот	'AL U	NITS	2039

PREFORMED DETECTOR LOOPS

The 5 Preformed Detector Loops shall be replaced at the locations shown on the EXISTING CONDUIT LAYOUT sheet for the Cheyenne Boulevard location.

A 5-ft length of curb and gutter removal and replacement has been included in the plans to facilitate the installation of conduit at this location.

All costs for installing the detector loops shall be incidental to the contract unit price per each for Install Preformed Detector Loop.

SAWED-IN DETECTOR LOOPS

Sawed-In Detector Loops shall be installed at the Homestead Avenue location. The 4 Sawed-In Detector Loops shall replace the existing loops at the same location.

All costs for installing the detector loops shall be incidental to the contract unit price per each for Sawed-In Detector Loop.

TABLE OF TYPE F69.5 CONCRETE CURB AND GUTTER

Station to	Station	L/R	Quantity (Ft)	TYPE 1 DETECTABLE WARNI	NG (CONTINUED)
Cheyenne Blvd	l.		5.0	<u>Туре 1 [</u>	Detectable Warnings
Homestead Ave 197+10.6	e. 197+34.4	R	50.0	Product	Manufacturer
197+67.8	197+86.5	R	37.0	Detectable Warning Plate Cast Iron Plate	Neenah Foundry Company Neenah, WI
Service Road 278+68.7 279+68.0	279+40.8 278+95,0	R R	103.0 66.0		800-558-5075 http://www.neenahfoundry.com
	,	Total:	261.0	Detectable Warning Plate	Deeter Foundry
TYPE 1 DETEC		<u>NG</u>		Cast non ride	800-234-7466 http://www.deeter.com/

At mrm 72.937, service rod location the in-place detectable warning panel shall be replaced.

Detectable warnings shall be in compliance with the Americans with Disability Act regulations.

The detectable warnings shall be installed according to the manufacturer's installation instructions.

A concrete thickness equal to the adjacent concrete sidewalk thickness and 2 inches of granular cushion material shall be placed below the Type 1 Detectable Warnings. When concrete is placed below the detectable warnings then the concrete thickness shall be transitioned at the rate of 1" per foot to match the adjacent concrete sidewalk thickness.

The detectable warnings shall be a brick red color for application in concrete curb ramps. Cast iron plates may be a natural patina (weathered steel).

When Type 1 Detectable Warnings are specified, the Contractor shall furnish and install only one of the products listed in the Type 1 Detectable Warnings table.

Detectable Warning Plate Cast Iron Plate

> CAST-DWD Cast Iron Plate

Alertcast Composite Replaceable Cast in Place

Detectable Warning Tile Composite Replaceable Wet-Set

Access Tile Composite Replaceable Cast in Place

Armorcast Detectable Warning Tile Composite Replaceable Wet-Set

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East Jordan Iron Works, Inc. 301 Spring Street East Jordan, MI 49727 800-626-4653 http://www.ejiw.com

Key 3 Casting (Northern Foundry) 555 West 25th Street Hibbing, MN 55746 218-263-8871 http://key3casting.com

Cape Fear Systems, III, LLC 215 South Water Street, Suite 103 Wilmington, NC 28401 877-232-6287 http://www.alerttile.com/

ADA Solutions. Inc. North Billerica, MA 01862 800-372-0519 http://www.adatile.com

Access Products Inc. 241 Main Street. Suite 100 Buffalo, NY 14203 888-679-4022 http://www.accesstile.com/

Armorcast Products Company 13230 Saticoy Street North Hollywood, CA 91605 818-982-3600 http://www.armorcastprod.com/

CONCRETE SIDEWALK



The concrete sidewalk shall be constructed in accordance with Section 651 of the Standard Specifications. The sidewalk details shown above are typical of this project; however, the sidewalk widths, boulevard widths, and other special details are shown on the Curb and Gutter Layout sheets.

TABLE OF 4" CONCRETE SIDEWALK

Station	to	Station	L/R	Quantity (SqFt)
279+88.	58	280+10.0	R	119.0
			Total:	119.0

RAISING THE DROP INLET AT INTERSECTION OF US16B AND 5TH STREET

The existing frame and grate shall be removed for reset.

The existing drop inlet shall be broken out around the existing reinforcing steel to a depth of 1 foot. The removal limits shall be defined by a 3/4" sawcut around the perimeter of the drop inlet. Care shall be taken not to damage the existing reinforcing steel. Any damage to the existing reinforcing steel shall be repaired by the Contractor as directed by the Engineer at no additional cost to the State.

All costs for breaking out, removing, and disposing of the existing concrete shall be paid for at the contract unit price per CuYd for Breakout Structural Concrete.

A lap splice of 1' between the new reinforcing steel and the existing reinforcing steel shall be made.

New reinforcing steel shall be installed in accordance with standard plates.

The Type C Frame and Grate shall be reset on top of the raised drop inlet.

It is estimated that 1.54 CuYd of Class M6 Concrete and 170.74 Lbs of Reinforcing Steel will be required.

CORRUGATED METAL PIPE

The 18" CMP shall be installed in the raised portion of the drop inlet as shown in these plans.

Corrugated metal pipes shall have 2 ²/₃-inch X ¹/₂-inch corrugations for 42-inch and smaller round pipe and 48-inch and smaller arch pipe unless otherwise stated in the plans. Corrugated metal pipes shall have 3-inch X 1-inch or 5inch X 1-inch corrugations for 48-inch and larger round pipe and 54-inch and larger arch pipe unless otherwise stated in the plans.

The gauge of the corrugated metal ends shall match the thickest gauge of corrugated metal pipe it is connected to.

FERTILIZING

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

The all-natural slow release fertilizer shall be applied according to the manufacturer's application recommendations.

The application rate is 1,500 pounds per acre.

The all-natural slow release fertilizer shall be from the list below or an approved equal

> Product Sustane

Manufacturer

Sustane Corporate Headquarters Cannon Falls, Minnesota Phone: 1-800-352-9245 http://www.sustane.com/

PERMANENT SEEDING

The areas to be seeded comprise of all newly graded areas at the 5th Street location and the Turf Reinforcement Mat locations at the Service Road site.

All permanent seed shall be planted in the topsoil at a depth of $\frac{1}{4}$ to $\frac{1}{2}$.

All seed broadcast must be raked or dragged in (incorporated) within the top $\frac{1}{4}$ " to $\frac{1}{2}$ " of topsoil when possible. This requirement may be waived by the Engineer during construction when raking or dragging is deemed not feasible by conventional methods.

The varieties listed for the seed mixture are preferred varieties. Native harvest seed will be allowed.

PERMANENT SEEDING (CONTINUED)

Grass Species

Western Wheatgras **Green Needlegrass** Sideoats Grama Little Bluestem or Buffalograss or Blue Grama Regreen or QuickGuard: all year Oats or Spring Whea April through May: Winter Wheat: Augu through November

FIBER MULCHING

seedina.

An additional 2% by weight of tackifier shall be added to the fiber mulch product selected from the approved product list. 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 unit price per pound for "Fiber Mulching".

The fiber mulch provided shall be from the approved product list. The approved product list for fiber mulch may be viewed at the following internet site:

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

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Special Permanent Seed Mixture shall consist of the following:

	Variety	Pure Live Seed (PLS) (Pounds/Acre)
s	Flintlock, Rodan, Rosana	7
	Lodorm	4
	Butte, Killdeer, Pierre, Trailway	3
	Badlands, Itasca Bowie, Cody, Tatanka Bad River, Willis	2
ır; eat: ust		10
	Total:	26

Fiber mulch shall be applied in a separate operation following permanent

EROSION CONTROL WATTLE

Erosion control wattles for restraining the flow of runoff and sediment shall be installed at locations noted in the table 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 until vegetation has been established.

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 estimated that 48 feet of 12" Erosion Control Wattle will be required.

TURF REINFORCEMENT MAT

Turf Reinforcement Mat shall be installed at locations shown in the table at the widths specified, and at locations determined by the Engineer during construction. The Contractor shall use a turf reinforcement mat from the approved products list. The approved product list for turf reinforcement mat may be viewed at the following internet site:

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

Installation of the Turf Reinforcement Mat shall be according to the manufacturer's installation instructions.

Turf Reinforcement Mat shall be installed at the erosional areas off the ends of the pavement/curb and gutter. The erosional channels shall be reshaped so that a swale 20 feet wide by 6" deep.

TABLE OF TURF REINFORCEMENT MAT

	Width	_	Quantity
Location	(Ft)	Туре	(SqYd)
Service Road	20	3	133
On Ramp	20	3	178
- 1-			

Total Type 3 Turf311Reinforcement Mat:

STATE OF		SHEET	TOTAL SHEETS
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SOUTH DAKOTA	016 WB-452 016 EB-452	10	37
Plotting Date:	05/13/2013		

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Intersection of 5th Street & US 16B (Catron Blvd.)



Additional wall height on drop inlet

STATE OF	PROJECT	SHEET	TOTAL SHEETS	
SOUTH DAKOTA	016 WB-452 016 EB-452	11	37	
Plotting Date	05/13/2013			

Catron Blvd. (US 16B)

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PAVEMENT MARKING LAYOUT US HWY NO 16B/ELK VALE ROAD & CHEYENNE DIVO.

	ESTIMATE OF QUANTITIES		
KEY	ITEM	UNIT	EST QUANT
(4) W	COLD APPLIED PLASTIC PAVEMENT MARKING - 4" WHITE	FT	31.7
$\begin{pmatrix} 4 \\ Y \end{pmatrix}$	COLD APPLIED PLASTIC PAVEMENT MARKING - 4" YELLOW	FT	63.4
(24) W	COLD APPLIED PLASTIC PAVEMENT MARKING - 24" WHITE	FT	232
•	COLD APPLIED PLASTIC PAVEMENT MARKING - ARROW LEFT - 4 / RIGHT - O	EACH	1
	GROOVE PAVEMENT FOR PAVEMENT MARKING - 4" WHITE - 31.7 / YELLOW - 63.4	FT	95.1
	GROOVE PAVEMENT FOR PAVEMENT MARKING - 24" WHITE - 400	FT	232
	GROOVE PAVEMENT FOR PAVEMENT MARKING - ARROW LEFT - 4 / RIGHT - 0	EACH	1







\270pm dgn





	-					
STATE OF		PROJE	СТ	SHEET	TOTAL SHEETS	
DAKOTA		016 WB-4	152	17	37	
	L Doto:	05/13/2013	102	17	57	
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- Work Area for Phase I
- Work Area for Phase 2
- Work Area for Phase 3

EXISTING CONDUIT LAYOUT US HWY NO 16B/ELK VALE ROAD & CHEYENNE BLVD.

EXISTING ITEMS

	EXISTING TIEMS			
KEY	ITEM			
0	JUNCTION BOX (EJA1,EJA2,EJL19)	_		
Δ	ELECTRICAL SERVICE CABINET	_		
53	TRAFFIC SIGNAL CONTROLLER	_		
	PREFORMED DETECTOR LOOP	_		
(SCH)	2" RIGID CONDUIT, SCHEDULE 40	_		
(SCH)	2" RIGID CONDUIT, SCHEDULE 80	_		
(#)	1/C #1 AWG COPPER WIRE			
(#4)	1/C #4 AWG COPPER WIRE			
(#6)	1/C #6 AWG COPPER WIRE			
(19/c)	19/C #14 AWG COPPER TRAY CABLE, K2			
0	3' DIAMETER FOOTING (A1-A4)			
0	18" DIAMETER JUNCTION BOX (JA2,JA3,JA5-JA7)	_	US HWY NO 16B.	/ELK VALE ROAD
Ø	24" DIAMETER JUNCTION BOX (JA1, JA4)			
	ELECTRICAL SERVICE CABINET			
	SAWED-IN DETECTOR LOOP (E1-E5.N1-N3)	268+00	269+00	270+00
	DETECTOR UNIT			
SCH 40	2" RIGID CONDUIT, SCHEDULE 40			
SCH 40	5" RIGID CONDUIT, SCHEDULE 40			
SCH 80	3" RIGID CONDUIT, SCHEDULE 80			
SCH 80	5" RIGID CONDUIT, SCHEDULE 80			
(#4)				
	1/C #4 AWG COPPER WIRE	-		120\240 v.a.c., 60hz.,
# 6	1/C #4 AWG COPPER WIRE 1/C #6 AWG COPPER WIRE	-		120\240 v.a.c., 60hz., I Phase, 3 Wire Service By WEST RIVER ELECTRIC
*6 *0	1/C #4 AWG COPPER WIRE 1/C #6 AWG COPPER WIRE 1/C #10 AWG COPPER WIRE	-		120\240 v.a.c., 60hz., I Phase, 3 Wire Service By WEST RIVER ELECTRIC
*6 *10	1/C #4 AWG COPPER WIRE 1/C #6 AWG COPPER WIRE 1/C #10 AWG COPPER WIRE 2/C #14 AWG COPPER TRAY CABLE, K2	-		120\240 v.a.c., 60hz., I Phase, 3 Wire Service By WEST RIVER ELECTRIC
*6 *10	<pre>1/C #4 AWG COPPER WIRE 1/C #6 AWG COPPER WIRE 1/C #10 AWG COPPER WIRE 2/C #14 AWG COPPER TRAY CABLE, K2 4/C #14 AWG COPPER TRAY CABLE, K2</pre>	-		120\240 v.a.c., 60hz., I Phose, 3 Wire Service By WEST RIVER ELECTRIC
*6 *10	1/C #4 AWG COPPER WIRE 1/C #6 AWG COPPER WIRE 1/C #10 AWG COPPER WIRE 2/C #14 AWG COPPER TRAY CABLE, K2 4/C #14 AWG COPPER TRAY CABLE, K2 7/C #14 AWG COPPER TRAY CABLE, K2	-		I20\240 v.o.c., 60hz., I Phase, 3 Wire Service By WEST RIVER ELECTRIC
-) *6) *10) 7/c) &4/c)	<pre>1/C #4 AWG COPPER WIRE 1/C #6 AWG COPPER WIRE 1/C #10 AWG COPPER WIRE 2/C #14 AWG COPPER TRAY CABLE, K2 4/C #14 AWG COPPER TRAY CABLE, K2 7/C #14 AWG COPPER TRAY CABLE, K2 24/C #14 AWG COPPER TRAY CABLE, K2</pre>			120\240 v.a.c., 60hz., I Phase, 3 Wire Service By WEST RIVER ELECTRIC
	<pre>1/C #4 AWG COPPER WIRE 1/C #6 AWG COPPER WIRE 1/C #10 AWG COPPER WIRE 2/C #14 AWG COPPER TRAY CABLE, K2 4/C #14 AWG COPPER TRAY CABLE, K2 7/C #14 AWG COPPER TRAY CABLE, K2 24/C #14 AWG COPPER TRAY CABLE, K2 #16 AWG COPPER TWISTED SHIELDED PAIR</pre>			120\240 v.a.c., 60hz., I Phose, 3 Wire Service By WEST RIVER ELECTRIC
	<pre>1/C #4 AWG COPPER WIRE 1/C #6 AWG COPPER WIRE 1/C #10 AWG COPPER WIRE 2/C #14 AWG COPPER TRAY CABLE, K2 4/C #14 AWG COPPER TRAY CABLE, K2 7/C #14 AWG COPPER TRAY CABLE, K2 24/C #14 AWG COPPER TRAY CABLE, K2 24/C #14 AWG COPPER TRAY CABLE, K2 #16 AWG COPPER TWISTED SHIELDED PAIR 2/C #10 AWG COPPER POLE & BRACKET CABLE</pre>			120\240 v.a.c., 60hz., I Phase, 3 Wire Service By WEST RIVER ELECTRIC
2 *6 *10 7 2 2 2 2 2 2 2 2 2 2 2 2 2	<pre>1/C #4 AWG COPPER WIRE 1/C #6 AWG COPPER WIRE 1/C #10 AWG COPPER WIRE 2/C #14 AWG COPPER TRAY CABLE, K2 4/C #14 AWG COPPER TRAY CABLE, K2 7/C #14 AWG COPPER TRAY CABLE, K2 24/C #14 AWG COPPER TRAY CABLE, K2 #16 AWG COPPER TWISTED SHIELDED PAIR 2/C #10 AWG COPPER POLE & BRACKET CABLE PREEMPTION CABLE</pre>			120\240 v.a.c., 60hz., I Phose, 3 Wire Service By WEST RIVER ELECTRIC

Plotted From





	STATE OF		010		<u> </u>		SHEET NO.	TOTAL SHEETS
	DAKOTA		010	6 EB-45	2		19	37
De TRANSITION EINFORCED CON	state of south pakota ** Insiope Transition drainage structure Structure	CENERAL NOTES: TYPE 2 INSLOPE TRANSITION	This Type 2 Inslope Transition is used when the specified inslope at the pipe or RCBC is flatter than a 6:1 slope.	Line B-B represents the clear zone line, the location where soil intercepts the parapet on an RCBC, B 24 the location where the soil intercepts the top of the pipe adjacent to the opening of the pipe end B 24 24 25 25 section, or may represent a change in slope.	2 2 * Transition from Inslope at drainage structure to a 6 :1 inslope and 3:1 inslope.	VEX 19 ** Transition from typical inslope to the inslopes adjacent to the drainage structure. Within the clear Constant of the structure instant * Transition from edge of subgrade shoulder to line B-B) use 100' length for each 1:1 slope change.	19 19 19 19 19 19 19 19 19 19	37
				•				1





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December 23, 2007

Sheet I of I

TRANSVERSE CONSTRUCTION JOINT WITH TIE BARS	
Sawed joint filled with Hot	
In Place PCC Pavement	
Drilled Hole	
T = In Place PCC Pavement and New PCC Pavement Thickness GENERAL NOTES:	5
This detail shall be used when the transverse joint is less than 15 feet the existing transverse contraction joint.	rom
The tie bars shall be embedded a minimum depth of 9 inches into the in p PCC pavement and anchored with an epoxy resin adhesive.	blace
No.9 epoxy coated deformed tie bars shall be spaced 18 inches center to and shall be a minimum of 3 inches and a maximum of 9 inches from the pavement edges.	o center
The term "In Place PCC Pavement"in the above drawing indicates that the PCC pavement was placed on a previous project.	in place
TRANSVERSE CONSTRUCTION JOINT WITH DOWEL BARS	
-Transverse joint shall be used on new PCC pavement	the same type t.See standard
In Place PCC Pavement	
Drilled Hole - Form Oiled or Greas	ed End
Full Depth Saw Cut LI1/4" Epoxy Coated Plain Round Dowel Bar	
T = In Place PCC Pavement and New PCC Pavement Thickness	
GENERAL NOTES:	
This detail shall be used when the transverse joint is 15 feet or greater the existing transverse contraction joint.	from
The plain round dowel bars shall be embedded a minimum depth of 9 inches in place PCC pavement and anchored with an epoxy resin adhesive.	into the
The I'_4 " epoxy coated plain round dowelbars shall be spaced 12 inches ce center and shall be a minimum of 3 inches and a maximum of 6 inches fro pavement edges.	nter to m the
The term "In Place PCC Pavement" in the above drawing indicates that the PCC pavement was placed on a previous project or current project.	in place
	September 6, 2006
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Published Date: 2nd Qtr. 2013	Sheet of

GENERAL NOTES: No.5 epoxy coated deformed tie bars shall b female keyway or 30" center to center for keyway shown above is a female keyway. The tie bars shall be placed a minimum of 1 contraction joints.
T = Pavement
Poured Elastic Joint Sealer
LONGITUDINAL CONSTRUCTION (INSERTED OR FO Sawed Joint filled with Hot
The term "In Place PCC Pavement" in the abo PCC pavement was placed on a previous pro
contraction joints. The keyway is optional and is not required. a keyway is provided, a metal recess strip s
No.5 epoxy coated deformed the bars shall be female keyway or 30" center to center for keyway shown above is a female keyway. The tie bars shall be placed a minimum of 1
GENERAL NOTES: The tie bars shall be embedded a minimum de pavement and anchored with an epoxy resin
T = Pavemen
In Place PCC Pavement
Sawed Joint filled with Hot- Poured Elastic Joint Sealer

SOUTH 016 WB-452 016 EB-452 21 37	STATE OF	PROJECT	SHEET	TOTAL
	SOUTH DAKOTA	016 WB-452 016 EB-452	21	37





	STATE OF		NO.
	DAKOTA	016 WB-452 016 EB-452	22
LONGITUDINAL CONST	RUCTION JOINT WITH	TIE BARS	
Concrete Gutter or Concrete Curb and Gut	ter PCC Pavemer	> +	
Sawed Joint filled with Hot			
Poured Elastic Joint Sealer		= Pavement Thick	ness
			-
In Place Gutter or Curb and Gutter	Metal Recess Strip	Pavement	1/2
— · — · • • • • • • •			
<u> </u>			
GENERAL NOTES:	No.5 Epoxy C	pated Deformed	Tie Bar
No.5 epoxy coated deformed tie bars s shown above is a female keyway.	hall be spaced 48" center	to center. The k	keyway
The tie bars shall be placed a minimum joints.	of 15 inches from existin	ng transverse co	ontraction
The keyway is optional and is not requi keyway is provided, a metal recess strip formed, a metal recess strip is not rec	red.When concrete paven > shallbe used.When con uired.	nent is formed a crete pavement	nd a is slip
The transverse contraction joints in t shall be placed at each mainline PCC par contraction joints in the concrete gut	he concrete gutter or c vement transverse contr	oncrete curb an action joint. The	d gutter transverse
deep if formed in fresh concrete using	g a suitable grooving too	ol. If a saw is us	sed to cut
deep if formed in fresh concrete using the transverse contraction joints, they thickness of the concrete gutter or o	g a suitable grooving too n the depth of the joint concrete curb and gutter	D and gutter sn I. If a saw is us shall be at leas	sed to cut $\frac{1}{4}$ the
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ARCH C.M.P. SAFETY ENDS											
Fauv.	(Incl	nes)	Min. 1	「hick.	Dim	ensio	ons ()	nches)	L Dime	L Dimensions	
Dia. (In.)	Span	Rise	In.	Gage	А	Н	w	Overall Width	Slope	Length (In.)	
18	21	15	.064	16	8	6	27	43	6:1	30	
21	24	18	.064	16	8	6	30	46	6:1	48	
24	28	20	.064	16	8	6	34	50	6:1	60	
30	35	24	.079	14	12	9	41	65	6:1	84	
36	42	29	.109	12	12	9	48	72	6:1	4	
42	49	33	.109	12	16	12	55	87	6:1	138	
48	57	38	.109	12	16	12	63	95	6:1	168	
54	64	43	.109	12	16	12	70	102	6:1	198	
60	71	47	.109	12	16	12	77	109	6 : I	222	
72	83	57	.109	12	16	12	89	121	6:1	282	

	CIRCULAR C.M.P. SAFETY ENDS							
Pipe	Min.	Thick.	Dim	nensio	ons ()	Inches)	L Dime	nsions
Dia. (In.)	ln.	Gage	А	Н	W	Overall Width	Slope	Length (In.)
15	.064	16	8	6	21	37	6:1	30
18	.064	16	8	6	24	40	6:1	48
21	.064	16	8	6	27	43	6 : I	66
24	.064	16	8	6	30	46	6:1	84
30	.109	12	12	9	36	60	6 : I	120
36	.109	12	12	9	42	66	6:1	156
42	.109	12	16	12	48	80	6:1	192
48	.109	12	16	12	54	86	6:1	228
54	.109	12	16	12	60	92	6:1	264
60	.109	12	16	12	66	98	6:1	300

GENERAL NOTES:

Safety bars shall be attached to safety ends over 24" in diameter only. Safety ends shall be fabricated from galvanized steel conforming to the requirements of the Standard Specifications.

Safety bars shall be fabricated from steelpipe conforming to the requirements of ASTM A-53 Schedule 40 Specifications.

Slotted holes for safety bar attachment shall be provided for all end sections. Attachment to circular pipes 15" through 24" diameter shall be made with Type #1 straps. All other sizes shall be attached with Type #2 rods and lugs.

When stated in the plans, optional toe plate extension shall be punched and bolted to end section apron lip with $\frac{3}{8}$ " diameter galvanized bolts. Steel for toe plate extension shall be same gauge as end section. Dimensions shall be overall width less 6" by 8" high.

Installation shall be performed in accordance with the Standard Specifications.

All work and materials required for fabrication and installation of safety ends shall be incidental to the bid items for the various sizes of safety ends.

Published Dates and Oty 2012 0	

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March 31, 2000

PLATE NUMBER 450.38

C. M. P. SAFETY ENDS

Sheet 2 Of 2



	S D D	G
Channelizing devices and flag be used at intersecting road control intersecting road tra- required. The buffer space should be so that the two-way traffic placed before a horizontal o curve to provide adequate s distance for the flagger and of stopped vehicles.	gers s ds to affic d extend taper r vert ight d queu	ted isall
END ESD-2 CSO-2 END		
Channelizing devices are not along the centerline adjacen area when pilot cars are ut escorting traffic through th area.	requir t to v ilized ne wor	red vork for K
The channelizing devices shall or 42" cones.	lbe di	rums
Flashing warning lights and/c may be used to call attentio	r flag n to t	s the
For tack and/or flush seal of when flaggers are not being FRESH OIL sign (W2I-2) shall be in advance of the liquid asp areas.	perati used, displa halt	ons, the yed
The ROAD WORK AHEAD and the WORK signs may be omitted f duration operations (I hour o	END R or sho or less	COAD
For low-volume traffic situa with short work zones on st roadways where the flagger to road users approaching f directions, a single flagger m	tions raight is visi rom be ay be	íble oth used.
Channelizing Device		
■ Flagger		
45 - 50 500 55 750 60 - 65 1000	50 50 50	
0 - 30 200 35 - 40 350	25 25	
(M.P.H.) (A)	(G)	
Prior to Signs D Work (Feet)	evices (Feet)	











Work (Feet) (Feet) </th <th></th> <th></th> <th></th> <th></th> <th></th> <th>S D</th> <th></th>						S D	
<pre>Nor to bevolues (Feet) (Feet) (ABC) (ABC) (MP,H,) (G) (L) (ABC) 0 - 30 25 180 200 35 - 40 25 320 350 45 - 50 50 * 600 500 55 50 * 780 1000 70 - 75 50 * 900 1000 1500 2640 * Spacing to be every 40' for 42" cones.</pre>	42"cone drums not be	əs may t shown ir used dı	be u h the uring	sed in e tape g any i	place r if se night t	of the tup wi ime ho	; ill urs.
<pre>In the temporary pavement marking tape for right lane closures and 4" yellow temporary pavement marking tape for right lane closures and 4" yellow temporary pavement marking tape for left lane closures or temporary road morkers are not present.</pre>	■ Cha con	nnelizinç ies or di) De rums	vice st S	all be	42"	
<pre>Interview of the set of the</pre>	⊚ Ref	lectoriz	ed [)rum			
Work (Feet) (Fee	** Sp	eed app	ropr	iate f	or loca	ition.	
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Work (Feet) (Feet) (Feet) (Feet) (M,P,H,) (G) (L) (ABC) 0 - 30 25 180 200 35 - 40 25 320 350 45 - 50 50 * 660 750 60 - 65 50 * 780 1000 70 - 75 50 * 900 1000 1500 2640 * Spacing to be every 40' for 42" cones. Flagger (As Necessary) b SPEED LMT 45 R2-1 4" white temporary pavement marking tape for left lane closures or temporary road markers at 5' spacing shall be installed when the lane is closed overnight or longer. Signs a, b, and c shall be removed or covered when workers are not present. ROAD WORK AHEAD sign is only required in advance of the first lane closure. m	The FLA wheneve	GGER sig er there	n sh is	all be a Flago	used jer pre	esent.	
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Work (Feet) (Feet) (Feet) (Feet) (M.P.H.) (G) (L) (ABC) 0 - 30 25 180 200 35 - 40 25 320 350 45 - 50 50 600 500 55 50 660 750 60 - 65 50 780 1000 70 - 75 50 900 1000 1500 2640 * Spacing to be every 40' for 42" Motor 42" cones. Flagger Motor 42"					LIM 4 R2	5 **	
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Work (Feet) (Feet) <td>cone</td> <td>S.</td> <td></td> <td></td> <td>Flagge</td> <td>er</td> <td>M</td>	cone	S.			Flagge	er	M
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	70 - 75 * Spac	ing to t	* >e e	900 very 4	1000 15 0' for	<u>2640</u> 42"	Miles
Work (Feet) (Feet) <td>45 - 50 55 60 - 65</td> <td>50 50 50</td> <td>* *</td> <td>660 780</td> <td>75</td> <td>0 0 00</td> <td></td>	45 - 50 55 60 - 65	50 50 50	* *	660 780	75	0 0 00	
Work (Feet) (Feet) (Feet) (M.P.H.) (G) (L) (ABC)	0 - 30 35 - 40 45 - 50	25 25 50	*	180 320 600	20 35 50	00 50	¶]≥
	Work (M.P.H.)	(Feet (G)	-)	(Feet) (L)	(Fe (AE	et) 3C)	. Ni

SOUTH 016 WB-452 016 EB-452 27 37		STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL	
			016 WB-452 016 EB-452	27	37	











SOUTH 016 WB-452 016 EB-452 29 37	STATE OF	PROJECT	SHEET	TOTAL
	SOUTH DAKOTA	016 WB-452 016 EB-452	29	37





ST	STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL
D		016 WB-452 016 EB-452	31	37





GENERAL NOTES:

For illustrative purpose only, type I detectable warnings are shown in the drawings.

The curb ramp depicted on this standard plate may be used with a PCC fillet section, with curved curb and gutter, or with straight curb and gutter. The curb ramp shall be placed at the location stated in the plans.

Sidewalk shall not be placed adjacent to the ramp flares when a 2' curb transition is used unless shown otherwise in the plans.

* Care shall be taken to ensure a uniform grade on the ramp, free of sags and short grade changes.

Surface texture of the ramp shall be obtained by coarse brooming transverse to the slope of the ramp.

The normal gutter line profile shall be maintained through the area of the ramp.

Joints shall be sawed or tooled into the concrete adjacent to the detectable warnings to alleviate possible corner cracking.

Care shall be taken to ensure that the surface of the detectable warnings are clean and maintains a uniform color.

The detectectable warnings shall be cut as necessary to fit the plan specified limits of the detectable warnings. Cost for cutting the detectable warnings shall be incidental to the corresponding detectable warning bid item.

There will be no separate payment for curb ramps. The curb ramp shall be measured and paid for at the contract unit price per square foot for the corresponding concrete sidewalk bid item. The square foot area of the detectable warnings shall be included in the measured and paid for quantity of sidewalk.

The curb transitions and ramp opening shall be measured and paid for at the contract unit price per foot for the corresponding curb and gutter bid item when curb and gutter is used. The curb transitions and ramp opening shall be measured and paid for at the contract unit price per square yard for the corresponding PCC fillet section bid item when a PCC fillet section is used.

All costs for furnishing and installing the transition area at the base of the ramp shall be incidental to the contract unit price per foot for the corresponding curb and gutter bid item when curb and gutter is used and shall be incidental to the contract unit price per square yard for the corresponding PCC fillet section bid item when a PCC fillet section is used.

The type I detectable warnings shall be measured to the nearest square foot. All costs for furnishing and installing the type I detectable warnings including labor, equipment, materials, and incidentals shall be paid for at the contract unit price per square foot for "Type I Detectable Warnings".

The type 2 detectable warnings shall be measured to the nearest square foot. All costs for furnishing and installing the type 2 detectable warnings including labor, equipment, and materials, including adhesive, necessary sealant or grout, and necessary grinding shall be paid for at the contract unit price per square foot for "Type 2 Detectable Warnings".

				March 22, 2013
		S D D	TYPE 2 CURB RAMP	plate number 651.02
Published Date: 2nd Qtr. 2013	Date: 2nd Qtr. 2013	0 T	(DIRECTIONAL CORD RAINIF)	Sheet 3 of 3

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5	STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL
		016 WB-452 016 EB-452	35	37





STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
SOUTH DAKOTA	016 WB-452 016 EB-452	36	37

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

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 D D	EROSION CONTROL WATTLE	plate number 734 . 06
Published Date: 2nd Qtr. 2013			Sheet 2 of 2

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