

No Permit Required

SHEETS	SHEET	PROJECT	
23	1	090 W-452, etc.	DAKOTA
		05/07/2015	Plotting Date:
		05/07/2015	Plotting Date:

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#### ESTIMATE OF QUANTITIES (090 W-452, PCN i3v9)

Bid Item Number	Item	Quantity	Unit
009E0010	Mobilization	Lump Sum	LS
332E5000	Grinding Asphalt Concrete	1,506	SqYd
633E1400	Pavement Marking Paint, 4" White	679	Ft
633E1405	Pavement Marking Paint, 4" Yellow	542	Ft
634E0100	Traffic Control	587	Unit
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0420	Type C Advance Warning Arrow Panel	1	Each
634E0640	Temporary Pavement Marking	542	Ft

#### ESTIMATE OF QUANTITIES (090 E-451, PCN i3va)

Bid Item Number	Item	Quantity	Unit
009E0010	Mobilization	Lump Sum	LS
120E0100	Unclassified Excavation, Digouts	13	CuYd
320E1200	Asphalt Concrete Composite	26.7	Ton
634E0100	Traffic Control	587	Unit
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0420	Type C Advance Warning Arrow Panel	1	Each

#### ESTIMATE OF QUANTITIES (014A-451, PCN i3vc)

Bid Item Number	Item	Quantity	Unit
009E0010	Mobilization	Lump Sum	LS
120E0100	Unclassified Excavation, Digouts	79	CuYd
120E6200	Water for Granular Material	0.8	MGal
250E0020	Incidental Work, Grading	Lump Sum	LS
260E1010	Base Course	78.7	Ton
320E1200	Asphalt Concrete Composite	256.4	Ton
332E0010	Cold Milling Asphalt Concrete	2,133	SqYd
450E0122	18" RCP Class 2, Furnish	54	Ft
450E0130	18" RCP, Install	54	Ft
450E2008	18" RCP Flared End, Furnish	4	Each
450E2009	18" RCP Flared End, Install	4	Each
633E1400	Pavement Marking Paint, 4" White	3,392	Ft
633E1405	Pavement Marking Paint, 4" Yellow	2,544	Ft
634E0010	Flagging	160.0	Hour
634E0100	Traffic Control	742	Unit
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0640	Temporary Pavement Marking	1,696	Ft
734E0010	Erosion Control	Lump Sum	LS
734E0154	12" Diameter Erosion Control Wattle	160	Ft
734E5005	Dewatering	Lump Sum	LS

#### ESTIMATE OF QUANTITIES (034-451, i3vd)

Bid Item Number	Item	Quantity	Unit
009E0010	Mobilization	Lump Sum	LS
120E0100	Unclassified Excavation, Digouts	83	CuYd
120E6200	Water for Granular Material	0.3	MGal
260E1010	Base Course	31.5	Ton
260E5000	Shot Rock	75.0	Ton
320E1200	Asphalt Concrete Composite	33.3	Ton
633E1400	Pavement Marking Paint, 4" White	63	Ft
633E1405	Pavement Marking Paint, 4" Yellow	50	Ft
634E0010	Flagging	200.0	Hour
634E0100	Traffic Control	495	Unit
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0420	Type C Advance Warning Arrow Panel	1	Each
634E0640	Temporary Pavement Marking	50	Ft
831E0300	MSE Geotextile Fabric	210	SqYd

#### **SPECIFICATIONS**

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

#### **ENVIRONMENTAL COMMITMENTS**

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

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

#### COMMITMENT B2: WHOOPING CRANE

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

#### Action Taken/Required:

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

#### COMMITMENT B4: BALD EAGLE

Bald eagles are known to occur in this area.

#### Action Taken/Required:

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

#### COMMITMENT 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 D: WATER QUALITY STANDARDS

#### COMMITMENT D1: SURFACE WATER QUALITY

Spearfish Creek is classified as a cold water permanent fishery with a total suspended solids standard of 30 milligrams/liter.

Spearfish Creek is classified as fish and wildlife propagation, recreation, irrigation, and stock watering waters. Because of these beneficial uses, special construction measures may have to be taken to ensure that this water body is not impacted.

#### Action Taken/Required:

The Contractor is advised the South Dakota Surface Water Quality Standards, administered by the Department of Environment and Natural Resources (DENR), apply to this project. Special construction measures shall be taken to ensure the above standard(s) of the surface waters are maintained and protected.

#### COMMITMENT D2: SURFACE WATER DISCHARGE

Spearfish Creek is classified as a cold water permanent fishery with a Surface Water Discharge standard of 30 milligrams/liter total suspended solids.

Spearfish Creek is classified as fish and wildlife propagation, recreation, irrigation and stock watering waters. Because of these beneficial uses, special construction measures may have to be taken to ensure that this water body is not impacted.

#### Action Taken/Required:

If construction dewatering is required, the Contractor shall obtain a Temporary Discharge Permit from the DENR and provide a copy to the Project Engineer. Contact the DENR Surface Water Program at 605-773-3351 to apply for a permit.

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

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

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

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

#### **COMMITMENT I: HISTORICAL PRESERVATION OFFICE CLEARANCES**

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

#### Action Taken/Required:

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

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

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

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

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

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

#### COMMITMENT R: FIRE PREVENTION IN THE BLACK HILLS AREA

This project is located within the confines of the Black Hills Forest Fire Protection Boundary.

#### **Action Taken/Required:**

The Contractor shall adhere to the "Special Provision for Fire Plan".

#### UTILITIES

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

The Contractor shall be aware that the existing utilities might require adjustment at some locations. The Contractor shall contact each utility owner and confirm the status of all existing utility facilities.

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 or as directed by the Engineer.

### **INCIDENTAL WORK, GRADING**

MRM	
27.663	Re

### SUBGRADE REPAIR

Included in the Estimate of Quantities is Unclassified Excavation, Digouts for the necessary removal of unstable material.

Backfill shall be Shot Rock and Base Course installed in accordance with the detail for Subgrade Repair.

The MSE Geotextile Fabric shall be placed on the bottom and the sides of the excavated subgrade. Additional fabric shall be provided to allow for wrapping the top of the shot rock backfill. Shot rock shall be placed in lifts not to exceed 8 inches. The shot rock shall be watered and compacted by at least 4 complete vibratory roller passes per lift.

When the shot rock backfill has reached a compacted depth of 1.5 feet, the shot rock shall be covered with MSE Geotextile Fabric. Gravel Cushion shall be placed on top of the MSE Geotextile Fabric.

#### SHOT ROCK

Shot Rock shall consist of broken or crushed ledge rock produced from blasting or quarrying operations. Shot Rock material utilized in subgrade stabilization shall be less than 8" in diameter with a nominal size of 4". Gypsum may not be used as Shot Rock.

Compaction shall be to the satisfaction of the Engineer. Acceptance of Shot Rock material shall be visually inspected and may be used without further testing as directed by the Engineer.

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Remarks move 18" CMP 26' & 2 end sections

#### **BASE COURSE**

Base Course shall be placed on the shoulders in 4 inch maximum layers and compacted according to Section 260.3 B. of the Specifications except that a pneumatic tire roller shall be used. At the time of compaction, the material placed on the shoulders shall have approximately 4 percent moisture uniformly blended throughout the depth of material. The percent moisture may be adjusted by the Engineer.

All remaining requirements of the Specifications for Base Course shall apply, except that in Section 260.3 A, the requirement for mixing the Base Course with water by a central plant and placed on the shoulder by an approved spreader shall be waived.

Water for Granular Material is estimated at the rate of 20 gallons of water per cubic yard of Base Course.

#### **MAINTENANCE PATCHING**

Maintenance Patching shall be in accordance with the requirements of Section 324 of the Standard Specifications, Asphalt Concrete Composite.

#### UNCLASSIFIED EXCAVATION DIGOUTS

Provided in the Estimate of Quantities is Unclassified Excavation-Digouts for the necessary removal of existing asphalt concrete and base material. The dimensions provided in these plans are subject to change in the field, at the discretion of the Engineer. Payment will be based on the actual quantities installed. Unclassified Excavation Digouts depth shall be 1 foot or as directed by the Engineer. Backfill shall be 6" of Base Course placed in 3" lifts and 6" of Asphalt Concrete Composite placed in 3" lifts.

The existing asphalt concrete shall be sawed full depth with a vertical face to the removal limits established by the Engineer.

All costs associated with sawing, removal and disposal of existing asphalt and base material shall be incidental to the contract unit price per cubic yard Unclassified Excavation Digouts.

#### SURFACING THICKNESS DIMENSIONS

The thickness may vary from that shown in the plans. At those locations where material must be placed to achieve a required elevation for smoothness, plans tonnage may be varied to achieve the required elevation.

#### ASPHALT CONCRETE COMPOSITE

Asphalt Concrete Composite shall be furnished by the Contractor.

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

SS-1h or CSS-1h Emulsified Asphalt for Tack shall be applied at the rate of 0.05 gallons per square yard.

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

A Flush Seal will not be required on the Asphalt Concrete Composite.

Locations and quantities of asphalt repair are subject to change. The exact locations will be determined in the field by the Engineer. The Engineer reserves the right to adjust quantities and/or add locations at no additional cost to the state.

#### **COLD MILLING**

The removed material from the Cold Milling operation shall be properly disposed of by the Contractor.

The asphalt surfacing on US14A, Deadwood shall be removed from the portland cement concrete pavement that lies directly beneath. The asphalt thickness is 1.25". The Contractor shall take the necessary precautions to complete this work.

The Contractor shall provide temporary asphalt ramps with a 50:1 transition at all locations where traffic is transitioning from a milled to a paved surface and vice versa. All costs associated with this work shall be incidental to the various bid items on the project.

#### **GRINDING ASPHALT CONCRETE**

The intent of the Grinding Asphalt Concrete described in this set of plans is to improve the overall ride of the existing asphalt concrete patches. No structural improvement is required or intended. The Engineer will have the sole determination as to whether the Contractor is pursuing this goal in a satisfactory manner and will also determine when this goal has been accomplished.

Grinding shall be done utilizing diamond blades mounted on a self-propelled machine designed for grinding and texturing pavement. The equipment shall be such that it will not strain or damage the underlying pavement surface. Grinding equipment that causes ravels, aggregate fractures, spalls, or other disturbance shall not be permitted. Vacuuming equipment for removal of residue and excess water shall be used. Residue and wastewater shall not be expelled on the roadway or shoulder surface.

The finished texture shall be uniform. Structures shall not be ground.

The grinding shall be performed in a longitudinal direction. The grinding shall begin and end at lines normal to the pavement centerline within any one ground area. The area ground shall not be left smooth or polished.

The grinding shall result in a parallel corduroy texture consisting of grooves between 0.090 and 0.130 inches wide. The distance between the grooves shall be between 0.060 and 0.125 inches. The peaks of the ridges shall be approximately 1/16 inch higher than the bottom of the grooves.

Adequate cross slope drainage shall be maintained.

The transverse slope of the pavement shall be uniform to the degree that no depressions or misalignment of slope greater than 1/4 inch in ten feet exist when tested with a ten-foot straightedge. Straightedge requirements do not apply across longitudinal joints or outside the ground areas.

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

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

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

If the Engineer determines that the slurry is going to enter a waterway, drainage facility, or curb & gutter section, the slurry shall be placed in storage tanks and deposited in settling basins, spread over flat vegetated areas, or filtered by other means approved by the Engineer at no additional cost.

All costs associated with this work shall be incidental to the contract unit price per square yard for Grinding Asphalt Concrete.

#### PIPE REPLACEMENT AND INSTALLATION

Base course shall be used to backfill the pipe installation trenches.

Asphalt Concrete Composite shall then be placed in two 3" lifts.

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	Table of Grinding Asphalt Concrete - I-90 WB (090 W-452 , PCN i3v9)									
Highway	MRM	Description	Width	Length	Grinding Asphalt Concrete	Temporary Pavement Marking	Pavement Marking Paint, 4" White	Pavement Marking Paint, 4" Yellow		
			Ft	Ft	SqYd	Ft	Ft	Ft		
I-90 WB	119.8	Diamond Grind patch	25	67	186.1	67	84	67		
I-90 WB	118.6	Diamond Grind patch	25	89	247.2	89	112	89		
I-90 WB	114.1	Diamond Grind patch	25	170	472.2	170	213	170		
I-90 WB	113.5	Diamond Grind patch	25	104	288.9	104	130	104		
I-90 WB	113.3	Diamond Grind patch	25	112	311.1	112	140	112		
				Tatal				540		

Т	able of A	sphalt Concr	ete Rep	oair - I-90	) EB (090	) E-451, PCN	i3va)
Highway	MRM	Description	Width	Length	Depth	Asphalt Concrete Composite	Unclassified Excavation Digouts
			Ft	Ft	Ft	Ton	CuYd
!-90 EB	28.500	Shoulder	8	40	0.50	17.8	8.9
I-90 EB	42.100	Shoulder	8	20	0.50	8.9	4.4
					Totals	26.7	13

						•	Table of Aspha	alt Concr	ete Repaii	r - US 14A (01	L4A-451, P	CN i3vc							
Highway	MRM	MRM	Description	Width	Length	Depth	Unclassified Excavation, Digouts	Base Course	Water for Granular Material	Asphalt Concrete Composite	Cold Milling Asphalt Concrete	18" RCP Class 2, Furnish	18" RCP, Install	18" RCP Flared End, Furnish	18" RCP Flared End, Install	12" Erosion Control Wattle	Temporary Pavement Marking	Pavement Marking Paint, 4" White	Pavement Marking Paint, 4" Yellow
				Ft	Ft	Ft	CuYd	Ton	MGal	Ton	SqYd	Ft	Ft	Each	Each	Ft	Ft	Ft	Ft
14A	22.100		Digout	6	10	1.000	2.2	2.2	0.02	2.2							10	20	15
14A	27.663		Pipe Installation	24	12	1.000	11.0	10.7	0.11	10.7		30.0	30.0	2.0	2.0	80.0	12	24	18
14A	27.697		Pipe Installation	24	12	1.000	11.0	10.7	0.11	10.7		24.0	24.0	2.0	2.0	80.0	12	24	18
14A	28.200		Digout	24	62	1.000	55.1	55.1	0.58	55.1							62	124	93
14A	41.800	42.100	Mill & Overlay	12	1,600	0.125				177.8	2133.3						1600	3200	2400
							79	78.7	0.8	256.4	2133	54.0	54.0	4	4	160.0	1696	3392	2544

	SD Highway 34 Subgrade Repair (034-451, i3vd)										
								Water		Pavement	Pavement
			Unclass		MSE	Asphalt		for	Temporary	Marking	Marking
			Exc,	Shot	Geo	Concrete	Base	Granular	Pavement	Paint, 4"	Paint, 4"
Location	L	W	Digouts	Rock	Fabric	Composite	Course	Material	Marking	White	Yellow
MRM	Ft	Ft	CuYd	Ton	SqYd	Ton	Ton	MGal	Ft	Ft	Ft
35.137	50	18	83	75.0	210	33.3	31.5	0.3	50	63	50
	TOT	ALS	83	75.0	210	33.3	31.5	0.3	50	63	50

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#### **TEMPORARY PAVEMENT MARKING**

Temporary Road Markers shall be used for temporary pavement marking.

The Contractor shall be responsible for maintaining a visible and reflective centerline throughout the project. Any marking covered or damaged shall be replaced prior to the end of the day. All costs associated with this work shall be incidental to the contract unit price per mile for Temporary Pavement Marking.

All costs for temporary pavement marking including furnishing, applying, maintenance, removal and disposing of temporary road markers shall be incidental to the contract unit price per mile for Temporary Pavement Marking.

Payment for temporary pavement marking will be by the foot per 4" line or equivalent. Any temporary pavement marking arrows that are needed will be paid for as 250' of Temporary Pavement Marking. Payment will be for all costs to furnish, and install temporary pavement markings.

The quantities of temporary pavement marking provided in the tables are for opening completed repair areas to traffic. Temporary and permanent pavement marking will not be required for PCN i3va. The temporary pavement marking for traffic control in accordance with the standard plates and details in these plans shall be incidental to the contract unit price per lump sum for Traffic Control, Miscellaneous.

#### **PERMANENT PAVEMENT MARKINGS**

The pavement marking material shall be as defined in Section 983 of the Specifications.

The location of the existing pavement marking shall be documented prior to removal, so that replacement can be at the existing location.

Application of permanent pavement marking shall be completed within 14 calendar days following completion of the pavement repair.

Traffic Control shall be incidental to the cost of application. The striper and advance or tailing warning vehicle shall be equipped with flashing amber lights or advance warning arrow panel.

#### **RATES OF APPLICATION**

*Edgeline striping	<ul> <li>– 16.9 gallons per mile</li> </ul>
Glass beads	<ul> <li>8.0 pounds per gallon</li> </ul>

\*Rate is the Region average and is for one 4" edgeline.

#### **TRAFFIC CONTROL – 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.
- 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 60 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. The quantity of signs paid for will be for the greatest number of installations per sign per PCN in place at any one time regardless of the number of set-ups on the project.
- 7. Any delineators and signs damaged or lost shall be replaced by the Contractor at no cost to the State.
- 8. All materials and equipment shall be stored a minimum distance of 30' from the traveled way during nonworking hours.
- 9. 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.
- 10. 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.
- 11. 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.

- of traffic movement.

- traffic.
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12. 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.

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

14. 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.

15. 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.

16. Drums are required in all lane closure tapers.

17. Permanent pavement markings, signs, and delineation shall be installed prior to opening each completed phase of construction to

18. Storage of equipment or materials on the bridge deck will not be allowed. No equipment or materials will be allowed on the bridge

19. All costs for the temporary pavement marking shown on standard plate 634.25 shall be incidental to the contract lump sum price for Traffic Control, Miscellaneous,

#### **SEQUENCE OF OPERATIONS**

#### I-90 WB (090 W-452, PCN i3v9)

- 1. Set up traffic control.
- Complete Grinding Asphalt Concrete in the passing lane. 2.
- Switch traffic control and close driving lane. 3.
- Complete Grinding Asphalt Concrete in the driving lane. 4.
- 5. Install temporary pavement markings.
- 6. Install permanent pavement markings
- 7. Remove traffic control.

#### I-90 EB (090 E-451, PCN i3va)

- 1. Set up traffic control.
- 2. Complete Unclassified Excavation, Digouts
- Complete asphalt concrete composite. 3.
- 4. Remove traffic control.

US 14A (014A-451, PCN i3vc)

#### Pipe Replacement MRM 27.663 & 27.697

- 1. Set up traffic control std. plt. 634.25.
- 2. Install new pipe 1/2 width.
- 3. Install surfacing and open to traffic.
- 4. Install remaining 1/2 width of pipe.
- 5. Install surfacing and open to traffic.
- 6. Install temporary pavement marking.
- 7. Install permanent pavement marking.

#### Digouts MRM 22.1 & 28.2

- 1. Set up traffic control std. plt. 634.25.
- 2. Perform digout 1/2 width.
- 3. Install surfacing and open to traffic.
- 4. Perform remaining 1/2 width digout.
- 5. Install surfacing and open to traffic.
- 6. Install temporary pavement marking.
- 7. Install permanent pavement marking.

#### Mill & Overlay MRM 41.8 to 42.1

- 1. Setup traffic control and close the driving lane.
- 2. Complete cold milling and asphalt concrete composite in the westbound lane.
- 3. Install temporary pavement markings.
- 4. Complete permanent pavement markings.

#### SD 34 (034-451, PCN i3vd)

- 1. Setup traffic control.
- 2. Complete the required work in the repair area.
- 3. Install temporary pavement markings.
- 4. Complete permanent pavement markings.

#### **TYPE C ADVANCE WARNING ARROW PANEL**

The quantity of Type C Advance Warning Arrow Panels paid for will be the most installations in place at any one time regardless of the number of setups on the project.

#### PRESS RELEASE ANNOUNCEMENTS

The SDDOT will prepare a Press Release to be released 5 days prior to any phase change or any other major change that affects traffic flow. The SDDOT will be responsible to keep law enforcement, emergency services, and the traveling public notified of changes in project access. The Contractor shall provide the Engineer with pertinent information 7 days prior to any phase change or any other major changes that affect traffic flow.

#### INVENTORY OF TRAFFIC CONTROL DEVICES I-90 W (090 W-452, PCN i3v9)

SIGN CODE	DESCRIPTION	NUMBER	SIGN SIZE	UNITS PER SIGN	UNIT
R2-1	SPEED LIMIT	5	36" x 48"	29	145
W3-5	SPEED REDUCTION AHEAD ( MPH)	3	48" x 48"	34	102
W4-2	LEFT or RIGHT LANE ENDS (symbol)	2	48" x 48"	34	68
W20-1	ROAD WORK AHEAD	2	48" x 48"	34	68
W20-5	LEFT or RIGHT LANE CLOSED AHEAD	2	48" x 48"	34	68
G20-2	END ROAD WORK	1	48" x 24"	24	24
-	TYPE 3 BARRICADE - 8' double sided	2		56	112
		Т	OTAL U	NITS	58

### INVENTORY OF TRAFFIC CONTROL DEVICES I-90 E (090 E-451, PCN

#### i3va)

SIGN CODE	DESCRIPTION	NUMBER	SIGN SIZE	UNITS PER SIGN	UNITS
R2-1 W3-5	SPEED LIMIT SPEED REDUCTION AHEAD ( MPH)	5 3	36" x 48" 48" x 48"	29 34	145 102
W4-2	LEFT or RIGHT LANE ENDS (symbol)	2	48" x 48"	34	68
W20-1	ROAD WORK AHEAD	2	48" x 48"	34	68
W20-5	LEFT or RIGHT LANE CLOSED AHEAD	2	48" x 48"	34	68
G20-2	END ROAD WORK	1	48" x 24"	24	24
-	TYPE 3 BARRICADE - 8' double sided	2		56	112
		т	ΟΤΑΙ U	INITS	587

## <u>i3vc)</u>

SIGN CODE	DESCRIPTION	NUMBER	SIGN SIZE	UNITS PER SIGN	UNITS
R1-1	STOP	2	30" x 30"	21	42
W1-3 W3-1	REVERSE TURN (L or K) STOP AHEAD (symbol)	2	48" x 48" 48" x 48"	34 34	68 68
W8-11	UNEVEN LANES	2	48" x 48"	34	68
W9-3	CENTER LANE CLOSED AHEAD	1	48" x 48"	34	34
W20-1	ROAD WORK AHEAD	2	48" x 48"	34	68
W20-4	ONE LANE ROAD AHEAD	2	48" x 48"	34	68
W20-7	FLAGGER (symbol)	2	48" x 48"	34	68
G20-2	END ROAD WORK	2	36" x 18"	17	34
-	TYPE 3 BARRICADE - 8' double sid	4		56	224
			TOTAL U	NITS	742

## i3vd)

SIGN CODE	DESCRIPTION	NUMBER	SIGN SIZE	UNITS PER SIGN	UNITS
R3-2	NO LEFT TURN (symbol)	1	30" × 30"	21	21
W1-3	REVERSE TURN (L or R)	1	48" × 48"	34	34
W1-4	REVERSE CURVE (L or R)	1	48" x 48"	34	34
W4-2	LEFT or RIGHT LANE ENDS (symbol)	1	48" x 48"	34	34
W9-3	CENTER LANE CLOSED AHEAD	1	48" x 48"	34	34
W20-1	ROAD WORK AHEAD	2	48" x 48"	34	68
W20-5	LEFT or RIGHT LANE CLOSED AHEAD	2	48" x 48"	34	68
G20-2	END ROAD WORK	2	36" × 18"	17	34
-	TYPE 3 BARRICADE - 8' double sided	3		56	168
		-		JNITS	495

#### DEWATERING

The type of temporary stream diversion device shall be chosen by the Contractor. All costs for labor, equipment, materials to complete the temporary stream diversion shall be incidental to the contract lump sum price for Dewatering. Dewatering shall be paid for once per site regardless of the number of times water is diverted at each individual site.

STATE OF	PROJECT	SHEET	TOTAL
SOUTH DAKOTA	090 W-452, etc.	7	23

#### INVENTORY OF TRAFFIC CONTROL DEVICES US 14A (014A-451, PCN

#### INVENTORY OF TRAFFIC CONTROL DEVICES SD 34 (034-451, PCN

A temporary stream diversion will be required to divert stream flows away for the culvert installation and replacement areas.

#### **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 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

80 feet of 12" Erosion Control Wattle are provided for perimeter control for the replacement of the pipe culvert on Highway 14A.

#### **EROSION CONTROL**

Areas disturbed shall be seeded, fertilized, and mulched.

#### SEEDING

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. 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.

#### MYCORRHIZAL INOCULUM

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

Glomus intraradices 25% 25% 25% 25%

All seed shall be inoculated with a minimum of 100,000 live propagules of mycorrhizal fungi per acre. All costs of inoculating the seed shall be incidental to the contract unit price per pound for the corresponding permanent seed mixture.

The mycorrhizal inoculum shall be from the list below or an approved equal:

Product

MycoApply

### Manufacturer

Mycorrhizal Applications, Inc. Grants Pass. OR Phone: 1-866-476-7800 http://www.mycorrhizae.com/

Approximately 1000 square feet will require permanent seeding, fertilizing, and mulching. The Engineer may adjust this quantity up or down depending on damage to the area surrounding the project.

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

approved equal:

Product Sustane

MULCHING

Product

Mat-Fiber Plus

Glomus aggregatu Glomus mosseae Glomus etunicatum

## 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.

s	STATE OF	PROJECT	SHEET	TOTAL
	SOUTH DAKOTA	090 W-452, etc.	8	23

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

#### Manufacturer

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

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

Manufacturer

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



	STATE OF	PROJECT	SHEET	TOTAL SHEETS
	SOUTH DAKOTA	090 W-452, etc.	9	23
	Plotting Date:	05/07/2015		
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TYPICAL ASPHALT SHOULDER RESURFACING SECTION I-90 Eastbound Shoulder, MRM 28.5 and MRM 42.1







# Subgrade Repair Detail

LONGITUDINAL SECTION ALONG CENTERLINE

Length of Poor Subgrade



MSE Geotextile Fabric wrapped around Shot Rock

STATE OF	PROJECT	SHEET	TOTAL SHEETS
SOUTH DAKOTA	090 W-452, etc.	12	23
Plotting Date:	05/07/2015		



Shoulder

Shoulder

Edge of Driving Lane

12′

4" White

(A)

STATE OF	PROJECT	SHEET	TOTAL SHEETS
DAKOTA	090 W-452, etc.	13	23
Plotting [	)ate: 05/07/2015		





Remove 18" CMP - 26' & 2 End Sections Install 18" RCP - 30' & 2 18" RCP Flared Ends



Date:	05/07/2015	STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
		DAKOTA	090 W-452, etc.	14	23
				-	230
				-	225
					225
				-	2000
					220
				_	045
				5	215
				_	010
 				5	210
				5	205
1 1					
	<sup>1</sup>			5	200 ¦ 160







Plottin	ng Date:	05/07/2015	STATE OF	PROJECT	SHEET NO:	TOTAL SHEETS
			DAKOTA	090 W-452, etc.	15	23
					5	240
		1				
	1 1 1	1				
	 				5	235
	1				5	230
	1 1 1	1				
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		1				
					5	210
	1					
	, , !			0+03	5 5	205
						160

#### TOLERANCES IN DIMENSIONS Diameter: $\pm 1.5\%$ for 24" Dia. or less and $\pm 1\%$ or $\frac{3}{6}$ " whichever is more for 27" Dia. or greater. Diameters at Joints: $\pm 3/16$ " for 30" Dia. or less and $\pm 1/4$ " for 36" or greater. Length of joint (j): ±1/4". Wall thickness (T): not less than design T by more than 5% or $\frac{3}{16}$ ", whichever is greater. Laying length: shall not underrun by more than $\frac{1}{2}$ ". P D1 D1 <u>14</u> ö Laying Length END VIEW LONGITUDINAL SECTION GENERAL NOTES: Construction of R.C.P. shall conform to the requirements of Section 990 of the Standard Specifications for Roads and Bridges. Not more than 2 four foot sections shall be permitted near the ends of any culvert. Four foot lengths shall be used only to secure the required length of culvert. Addrox Diam. DI D4 D2 D3 W+./F+. (in.) (in.) (in.) (in.) (in.) (in.) (in.) (Ib.) 13/4 131/8 12 92 2 1 3<sup>1</sup>/4 135/8 14<sup>1</sup>/4 15 21/4 171/4 175/8 127 2 $16\frac{1}{2}$ 167/8 $2^{1}/_{4}$ 203/8 18 168 $2^{1}/_{2}$ 195/8 20 20¾ 21 214 2¾ 227/8 23<sup>1</sup>/4 233⁄4 24<sup>1</sup>/8 $2^{1}/_{2}$ 24 265 2∛₄ 26 263/8 27 273/8 3 27 322 31/4 3 29<sup>1</sup>/4 295/8 30<sup>1</sup>/4 305/8 30 384 31/2 3<sup>1</sup>/4 323/8 323⁄4 331/2 337/8 40<sup>1</sup>/2 38¾ 36 524 4 3¾ 391/4 40 45<u>1/8</u> 45<u>%</u> 42 685 47 $4^{1}/_{2}$ 4 $46\frac{1}{2}$ 511/2 48 867 52 $53^{1}/_{2}$ 5 $4^{1}/_{2}$ 53 597/8 54 1070 5<sup>1</sup>/2 573/8 583% 59% $4^{1}/_{2}$ 60 1296 64<sup>1</sup>/4 64¾ 66 66<sup>1</sup>/2 6 5 705/8 66 1542 6<sup>1</sup>/2 5<sup>1</sup>/2 711/8 72<sup>1</sup>/2 73 72 1810 7 6 77 771/2 79 79<sup>1</sup>/2 78 2098 71/2 $6^{1/2}$ 833/8 831/8 855/8 86<sup>1</sup>/8 84 2410 8 7 89¾ 90<sup>1</sup>/4 92<sup>1</sup>/8 925/8 90 2740 953⁄4 96<sup>1</sup>/4 98<sup>1</sup>/8 985/8 81/2 7 96 2950 9 7 1021/8 1025/8 1041/2 105 102 3075 91/2 71/2 109 1091/2 111/2 112 108 3870 10 71/2 $115\frac{1}{2}$ 116 118 1181/2 March 31, 2000 S PLATE NUMBER D 450.01 **REINFORCED CONCRETE PIPE** D 0 Published Date: 2nd Qtr. 2015 Sheet Lof L T







s	STATE OF	PROJECT	SHEET	TOTAL
C	SOUTH DAKOTA	090 W-452, etc.	17	23



Work       (Feet)       (Feet)         (MP,H,I)       (A)       (G)         0 - 30       200       25         35 - 40       350       25         45 - 50       500       50         55       750       50         60 - 65       1000       50         For low-volume traffic situations with short work zones on straight roadways where the flagger is visible to road users approaching from both directions, a single flagger may be used. The ROAD WORK AHEAD and the END ROAD WORK signs may be omitted for short duration operations (I hour or less).         For tack and/or flush seal operations when flaggers are not being used, the FRESH OIL sign (W21-2) shall be displayed in advance of the liquid asphalt areas.         Flashing warning lights and/or flags may be used to call attention to the advance warning signs.         The channelizing devices are not required along the centerline adjacent to work area when pilot cars are utilized for escorting traffic through the work area.         Z-029         WOM OVOU       ON3         Channelizing devices and flaggers shall be drum or 42" cones.         Channelizing devices and flaggers shall be used at intersecting roads to control intersecting roads to control intersecting roads to control intersecting road traffic as required.         The buffer space should be extended so that the two-way traffic toper is placed before a horizontal or verti	rosted       Spacing ot       Spacing ot         Speed Advance Warning Channelizing       Devices         Work       (feet)       (feet)         (M.P.H.)       (A)       (G)         0       -30       200       25         35       -40       350       25         45       -50       500       50         55       750       50         60       -65       1000       50         For low-volume traffic situations       with short work zones on straight         roadways where the flagger is visible       to road users approaching from both         directions, a single flagger may be user       The ROAD WORK AHEAD and the END ROAD         WORK signs may be omitted for short       duration operations (I hour or less).         For tack and/or flush seal operations, when flaggers are not being used, the       FRESH OIL sign (W21-2) shall be displayed in advance of the liquid asphalt areas.         Flashing warning lights and/or flags may be used to call attention to the advance warning signs.       The channelizing devices are not required along the centerline adjacent to work area.         Z-020       YHOW OYOH       ON3       ON3         Out advance of the liquid asphalt area.       Channelizing devices and flaggers shall be used to control intersecting road traffic as required.
Work       (Feet)       (Feet)         (M,P,H,)       (A)       (G)         0       - 30       200       25         35       40       350       25         45       50       50       50         55       750       50         60       - 65       1000       50         50       60       - 65       1000       50         50       60       - 65       1000       50         51       0       50       50       60         60       - 65       1000       50       50         50       - 65       1000       50       50         50       - 65       1000       50       50         50       - 64       16gger is visible       50       50         50       - 64       16gger may be used       50       50         10       readvays where the flagger may be used       50       100       50         10       readvance samproaching from both       directions, a single flagger may be used       100       100       100         10       reas.       For tack and/or flush seal operations       100       100       100 <td>Prior to       Spacing of       Spacing of         Speed       Advance Warning(Channelizing         Prior to       Signs       Devices         Work       (Feet)       (Feet)         (M.P.H.)       (A)       (G)         0       30       200       25         35       40       350       25         45       50       50       50         55       750       50         60       - 65       1000       50         60       - 65       1000       50         60       - 65       1000       50         60       - 65       1000       50         60       - 65       1000       50         5       750       50       50         60       - 65       1000       50         5       750       50       50         60       - 65       nodo       50         5       750       50       50         60       - 65       nodo       50         7       - 64       Bager is visible       50         7       - 60       - 60       50       50      &lt;</td>	Prior to       Spacing of       Spacing of         Speed       Advance Warning(Channelizing         Prior to       Signs       Devices         Work       (Feet)       (Feet)         (M.P.H.)       (A)       (G)         0       30       200       25         35       40       350       25         45       50       50       50         55       750       50         60       - 65       1000       50         60       - 65       1000       50         60       - 65       1000       50         60       - 65       1000       50         60       - 65       1000       50         5       750       50       50         60       - 65       1000       50         5       750       50       50         60       - 65       nodo       50         5       750       50       50         60       - 65       nodo       50         7       - 64       Bager is visible       50         7       - 60       - 60       50       50      <
Work       (Feet)       (Feet)         (M.P.H.)       (A)       (G)         0 - 30       200       25         355 - 40       350       25         45 - 50       500       50         55       750       50         60 - 65       1000       50         •       Flagger       •         •       Channelizing Device    For low-volume traffic situations with short work zones on straight roadways where the flagger is visible to road users approaching from both directions, a single flagger may be used         The ROAD WORK AHEAD and the END ROAD WORK signs may be omitted for short duration operations (I hour or less).         For tack and/or flush seal operations when flaggers are not being used, the FRESH OIL sign (W21-2) shall be displayed in advance of the liquid asphalt areas.         Flashing warning lights and/or flags may be used to call attention to the advance warning signs.         The channelizing devices are not required along the centerline adjacent to work area when pilot cars are utilized for escorting traffic through the work area.         Z-020         WOM OVON ONE         ON3         Channelizing devices and flaggers shall be used at intersecting roads to control intersecting roads to control intersecting road traffic as required.	Prior to       Speed       Advance Warning Channelizing         Prior to       Signs       Devices         Work       (Feet)       (Feet)         (M.P.H.)       (A)       (G)         0       - 30       200       25         45       - 50       500       50         55       750       50         60       - 65       1000       50         Image: Channelizing Device       For low-volume traffic situations with short work zones on straight roadways where the flagger is visible to road users approaching from both directions, a single flagger may be use         The ROAD WORK AHEAD and the END ROAD WORK signs may be omitted for short duration operations (I hour or less).         For tack and/or flush seal operations, when flaggers are not being used, the FRESH OIL sign (W21-2) shall be displayed in advance of the liquid asphalt areas.         Flashing warning lights and/or flags may be used to call attention to the advance warning signs.         The channelizing devices are not required along the centerline adjacent to work area when pilot cars are utilized for escorting traffic through the work area.         Z-020       MOM OVON ONE         MNM OVON ONE       The short cars are utilized for escorting traffic through the work area.
Work       (Feet)       (G)         0 - 30       200       25         35 - 40       350       25         45 - 50       500       50         55       750       50         60 - 65       1000       50         For low-volume traffic situations with short work zones on straight roadways where the flagger is visible to road users approaching from both directions, a single flagger may be used the ROAD WORK AHEAD and the END ROAD WORK signs may be omitted for short duration operations (I hour or less).         For tack and/or flush seal operations when flaggers are not being used, the FRESH OIL sign (W21-2) shall be displayed in advance of the liquid asphalt areas.         Flashing warning lights and/or flags may be used to call attention to the advance warning signs.         The channelizing devices are not required along the centerline adjacent to work area when pilot cars are utilized for escorting traffic through the work area.	Prosted       Speed       Advance Warning Channelizing         Prior to       Signs       Devices         Work       (Feet)       (Feet)         (M.P.H.)       (A)       (G)         0 - 30       200       25         35 - 40       350       25         45 - 50       500       50         55       750       50         60 - 65       1000       50 <b>F</b> Flagger       E         Channelizing Device       For low-volume traffic situations         with short work zones on straight       roadways where the flagger is visible         to road users approaching from both       directions, a single flagger may be use         The ROAD WORK AHEAD and the END ROAD       WORK signs may be omitted for short         duration operations (I hour or less).       For tack and/or flush seal operations, when flaggers are not being used, the         FRESH OIL sign (W21-2) shall be displayed in advance of the liquid asphalt areas.       Flashing warning lights and/or flags may be used to call attention to the advance warning signs.         The channelizing devices are not required along the centerline adjacent to work area when pilot cars are utilized for escorting traffic through the work area.         2000 MOND       MON MOND         MON MYON       MON MYON <t< td=""></t<>
North(Feet)(Feet)Work(Feet)(G)0 - 302002535 - 403502545 - 505005575060 - 6510005060 - 6510005060 - 6510005060 - 6510005060 - 6510005060 - 6510005060 - 6510005060 - 6510005060 - 6510005060 - 6510005060 - 6510005060 - 6510005060 - 6510005060 - 6510005060 - 6510005060 - 651000505150505050505050505051525354555550505051525354555555555555555556575758	rostedSpacing ofSpacing ofSpeedAdvance Warning ChannelizingPrior toSignsDevicesWork(Feet)(G)0 - 302002535 - 403502545 - 5050050557505060 - 65100050Channelizing DeviceFor low-volume traffic situationswith short work zones on straightroadways where the flagger is visibleto road users approaching from bothdirections, a single flagger may be useThe ROAD WORK AHEAD and the END ROADWORK signs may be omitted for shortduration operations (I hour or less).For tack and/or flush seal operations,when flaggers are not being used, theFRESH OIL sign (W21-2) shall be displayedin advance of the liquid asphaltareas.Flashing warning lights and/or flagsmay be used to call attention to theadvance warning signs.The channelizing devices are not requiredalong the centerline adjacent to workarea when pilot cars are utilized forescorting traffic through the workarea
Work       (Feet)       (G)         Work       (Feet)       (G)         0 - 30       200       25         35 - 40       350       25         45 - 50       500       50         55       750       50         60 - 65       1000       50         For low-volume traffic situations with short work zones on straight roadways where the flagger is visible to road users approaching from both directions, a single flagger may be used         The ROAD WORK AHEAD and the END ROAD WORK signs may be omitted for short duration operations (I hour or less).         For tack and/or flush seal operations when flaggers are not being used, the FRESH OIL sign (W21-2) shall be displayed in advance of the liquid asphalt areas.         Flashing warning lights and/or flags may be used to call attention to the advance warning signs.         The channelizing devices shall be drum or 42" cones.	ProstedSpacing ofSpacing ofSpeedAdvance WarningChannelizingPrior toSignsDevicesWork(Feet)((Feet))(M.P.H.)(A)(G)0- 302002535 - 403502545 - 5050050557505060 - 65100050
Work       (Feet)       (Feet)         (M.P.H.)       (A)       (G)         0 - 30       200       25         35 - 40       350       25         45 - 50       500       50         55       750       50         60 - 65       1000       50         •       Flagger       •         •       Channelizing Device         For low-volume traffic situations with short work zones on straight roadways where the flagger is visible to road users approaching from both directions, a single flagger may be used to road users approaching from both directions, a single flagger may be used the the text of the short duration operations (I hour or less).         For tack and/or flush seal operations when flaggers are not being used, the FRESH OIL sign (W21-2) shall be displayed in advance of the liquid asphalt areas.         Flashing warning lights and/or flags may be used to call attention to the advance warning signs.	ProstedSpacing ofSpacing ofSpeedAdvance WarningChannelizingPrior toSignsDevicesWork(Feet)(Feet)(M.P.H.)(A)(G)0 - 302002535 - 403502545 - 5050050557505060 - 65100050FlaggerChannelizing DeviceFor low-volume traffic situations with short work zones on straight roadways where the flagger is visible to road users approaching from both directions, a single flagger may be useThe ROAD WORK AHEAD and the END ROAD WORK signs may be omitted for short duration operations (I hour or less).For tack and/or flush seal operations, when flaggers are not being used, the FRESH OIL sign (W21-2) shall be displayed in advance of the liquid asphalt areas.Flashing warning lights and/or flags may be used to call attention to the advance warning signs.
Work       (Feet)       (G)         Work       (Geet)       (G)         0 - 30       200       25         35 - 40       350       25         45 - 50       500       50         55       750       50         60 - 65       1000       50         Flagger       Channelizing Device         For low-volume traffic situations with short work zones on straight roadways where the flagger is visible to road users approaching from both directions, a single flagger may be use         The ROAD WORK AHEAD and the END ROAD WORK signs may be omitted for short duration operations (I hour or less).         For tack and/or flush seal operations when flaggers are not being used, the FRESH OIL sign (W21-2) shall be displayed in advance of the liquid asphalt areas.	Fosted       Spacing of       Spacing of         Speed       Advance Warning Channelizing         Prior to       Signs       Devices         Work       (Feet)       (Feet)         (M.P.H.)       (A)       (G)         0 - 30       200       25         35 - 40       350       25         45 - 50       500       50         55       750       50         60 - 65       1000       50         •       Flagger       •         •       Channelizing Device         For low-volume traffic situations         with short work zones on straight         roadways where the flagger is visible         to road users approaching from both         directions, a single flagger may be use         The ROAD WORK AHEAD and the END ROAD         WORK signs may be omitted for short         duration operations (I hour or less).         For tack and/or flush seal operations,         when flaggers are not being used, the         FRESH OIL sign (W21-2) shall be displayed         in advance of the liquid asphalt
Work       (Feet)       (Feet)         (M.P.H.)       (A)       (G)         0 - 30       200       25         35 - 40       350       25         45 - 50       500       50         55       750       50         60 - 65       1000       50         Flagger         Endbox       Flagger         Endbox       Channelizing Device         For low-volume traffic situations with short work zones on straight roadways where the flagger is visible to road users approaching from both directions, a single flagger may be used         The ROAD WORK AHEAD and the END ROAD WORK signs may be omitted for short duration operations (I hour or less).	For Low-volume traffic situations with short work zones on straight road ways where the flagger may be use         For Low-volume traffic situations with short work zones on straight road ways where the flagger may be use         The ROAD WORK AHEAD and the END ROAD WORK signs may be omitted for short duration operations (I hour or less).
Work       (Feet)       (Feet)         (M.P.H.)       (A)       (G)         0 - 30       200       25         35 - 40       350       25         45 - 50       500       50         55       750       50         60 - 65       1000       50         •       Flagger       •         •       Channelizing Device         For low-volume traffic situations with short work zones on straight roadways where the flagger is visible to road users approaching from both directions, a single flagger may be used	Fosted       Spacing of       Spacing of         Speed       Advance Warning Channelizing         Prior to       Signs       Devices         Work       (Feet)       (Feet)         (M.P.H.)       (A)       (G)         0 - 30       200       25         35 - 40       350       25         45 - 50       500       50         55       750       50         60 - 65       1000       50         Flagger         Channelizing Device
Work       (Feet)       (Feet)         (M.P.H.)       (A)       (G)         0 - 30       200       25         35 - 40       350       25         45 - 50       500       50         55       750       50         60 - 65       1000       50         Flagger         Channelizing Device	Posted       Spacing of       Spacing of         Speed       Advance Warning Channelizing         Prior to       Signs       Devices         Work       (Feet)       (Feet)         (M.P.H.)       (A)       (G)         0 - 30       200       25         35 - 40       350       25         45 - 50       500       50         60 - 65       1000       50         Flagger         Channelizing Device
Work     (Feet)     (Feet)       (M.P.H.)     (A)     (G)       0 - 30     200     25       35 - 40     350     25       45 - 50     500     50       55     750     50       60 - 65     1000     50	Posted       Spacing of       Spacing of         Speed       Advance Warning Channelizing         Prior to       Signs       Devices         Work       (Feet)       (Feet)         (M.P.H.)       (A)       (G)         0 - 30       200       25         35 - 40       350       25         45 - 50       500       50         60 - 65       1000       50
Work         (Feet)         (Feet)           (M.P.H.)         (A)         (G)           0 - 30         200         25           35 - 40         350         25           45 - 50         500         50           55         750         50           60 - 65         1000         50	Posted         Spacing of         Spacing of         Spacing of           Speed         Advance Warning Channelizing           Prior to         Signs         Devices           Work         (Feet)         (Feet)           (M.P.H.)         (A)         (G)           0 - 30         200         25           35 - 40         350         25           45 - 50         500         50           55         750         50           60 - 65         1000         50
Work         (Feet)         (Feet)           (M.P.H.)         (A)         (G)           0 - 30         200         25           35 - 40         350         25           45 - 50         500         50	PostedSpacing ofSpacing ofSpeedAdvance Warning ChannelizingPrior toSignsWork(Feet)(M.P.H.)(A)0 - 3020025035 - 4035025045 - 50500
Work         (Feet)         (Feet)           (M.P.H.)         (A)         (G)           0         - 30         200         25	PostedSpacing ofSpacing ofSpeedAdvance Warning ChannelizingPrior toSignsWork(Feet)(M.P.H.)(A)(G)25
Work (Feet) (Feet)	Prior to Work (Feet) Spacing of Speed Advance Warning Channelizing Devices (Feet) (Feet)
Speed Advance Warning Channelizing Prior to Signs Devices	LI POSTEA I SDACINA OT I SDACINA OT I











	Posted	Spacing of	
	Prior to		
	Work	(Feet)	
	(M.P.H.)	(A) (B) (C)	
	0 - 30	200	
	35 - 40	350	
	45 - 50	500	
	55	1000	
	60 - 65	1000	
		(A) (B) (C)	
	70 - 75	1000 1500 2640	
* * Speed	d appropr	iate for location.	
⊚ Refle	ctorized	Drum	
Chanr	nelizing D	evice	1
	5		1
ROAD WOR	RK AHEAD	sian is only required	d
in advar	ice of th	e first lane closure	
High spe	ed is def	ined as having a po	sted
speed m	nn greai	er man 45 mpn.	
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	STATE OF	PROJECT	SHEET	TOTAL
SOUTH	SOUTH DAKOTA	090 W-452, etc.	22	23



	STATE OF	PROJEC	Г	SHEET	TOTAL SHEETS
	SOUTH DAKOTA	090 W-452	2, etc.	23	23
		-			
shall be insta	illed alor	ng the contour	r and		
gher than poi he ends.	nt B to	ensure that w	water		
n, install the w e wattle, and the uphill side	attle tig then com See Det	phtly in the th pact the soil tail B.	rench so excavated		
akes however.	other t	voes of stake	s such as		
the Engineer. e spacing of t	The stak the stak	es shall be plo es along the v	wattles		
les, the Contro Ill not overlap	actor sh the end	all butt the s Is. See Detail C	econd •		
t the erosion	control	wattļes once	every		
ainfallevent g ape the accum 7.	nulated s	than $V_2$ ".The sediment when			
shaping shall t	oe as dir	ected by the	Engineer.		
ient, disposal o ct unit price	f sedime per cubi	nt,and necess c yard for "R	sary emove		
		-			
e erosion con al to the con <sup>-</sup> attle bid item	trol wat <sup>.</sup> tract un •	tles including it price per f	labor, oot		
ol wattle from	m the pr	oject includin	g labor,		
al to the con-	tract un	it price per f	oot for		
			_		
			December 23	3,2004	
			PLATE NU	MBER	
EROSION CON	TROL WAT	TLE	/ 34.0	16	
			Sheet 2 d	of 2	
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