

STATE OF SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION
PLANS FOR PROPOSED

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH-PH-P 0040(312)	1	20
Plotting Date: 03/09/2016		Revised: 3-9-2016 kh	

PROJECT NH-PH-P 0040(312)
SD Highway 79 and
US Highways 212, 16 & 385
MEADE, BUTTE, PENNINGTON
& CUSTER COUNTIES

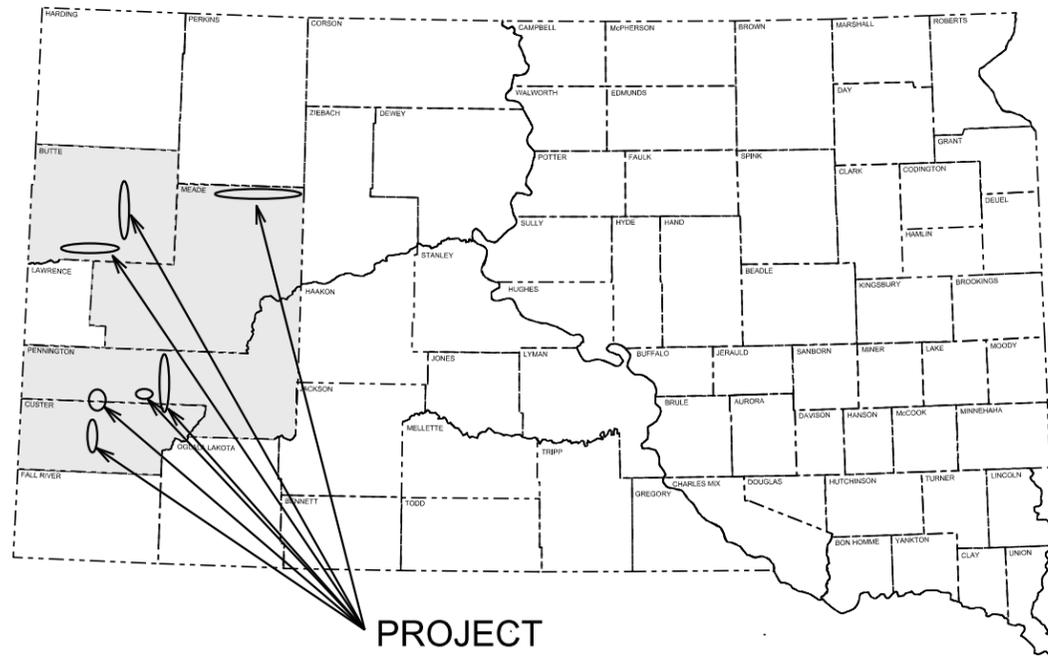
INDEX OF SHEETS

- 1 - 3 General Layout W/Index
- 4 - 10 Estimate With General Notes & Tables
- 11 - 12 Microsurfacing Detail
- 13 - 16 Pavement Marking Details
- 17 Mobile Operation for Traffic Control
- 18 - 20 Standard Plates

MICROSURFACING
MAINLINE OR SHOULDERS

PCN 054Q

GROSS LENGTH	140,912.6 FEET	26.688 MILES
LENGTH OF EXCEPTIONS	0.0 FEET	0.000 MILES
NET LENGTH	140,912.6 FEET	26.688 MILES



PROJECT

US 212
MRM 87.126 to 113.814
DESIGN DESIGNATION

ADT (2014)	630
ADT (2034)	843
DHV	129.8
D	51%
T DHV	8.6%
T ADT	19.0%
V	65 MPH

BEGIN SEGMENT
MRM 87.00 + 0.126
Mileage 85.653

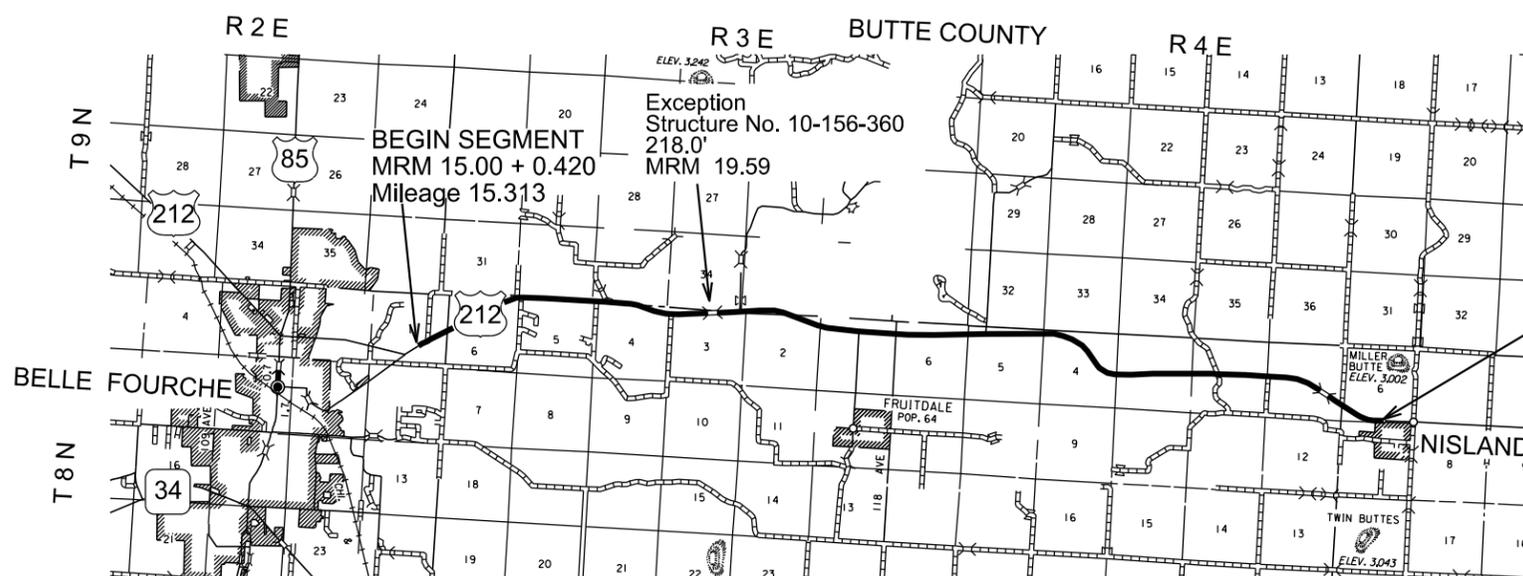
END SEGMENT
MRM 113.00 + 0.814
Mileage 112.341



US 212
MRM 15.420 to 28.833
DESIGN DESIGNATION

ADT (2014)	1815
ADT (2034)	2044
DHV	314.8
D	51%
T DHV	5.9%
T ADT	13.0%
V	65 MPH

GROSS LENGTH	70,820.6 FEET	13.413 MILES
LENGTH OF EXCEPTIONS	218.0 FEET	0.041 MILES
NET LENGTH	70,602.6 FEET	13.372 MILES



BEGIN SEGMENT
MRM 15.00 + 0.420
Mileage 15.313

END SEGMENT
MRM 28.00 + 0.833
Mileage 28.726

6

STORM WATER PERMIT
No Permit Required

Plot Scale - 1:200

Plotted From - trcs11610

File -

SD 79N
MRM 59.150 to 73.667
DESIGN DESIGNATION

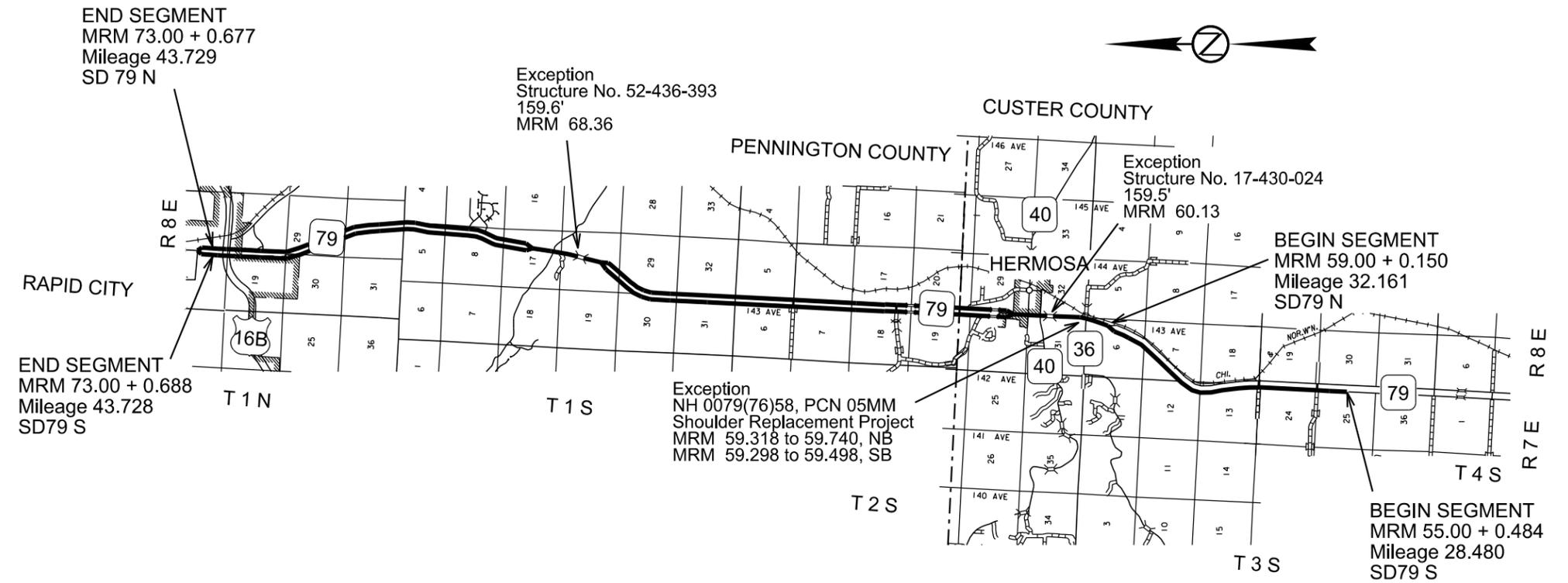
ADT (2014)	3465
ADT (2034)	4586
DHV	568.6
D	50%
T DHV	5.9%
T ADT	12.9%
V	65 MPH

GROSS LENGTH	76,649.8 FEET	14.517 MILES
LENGTH OF EXCEPTIONS	319.1 FEET	0.060 MILES
NET LENGTH	76,330.7 FEET	14.457 MILES

SD 79S
MRM 55.484 to 73.688
DESIGN DESIGNATION

ADT (2014)	3065
ADT (2034)	3993
DHV	546.5
D	50%
T DHV	6.5%
T ADT	14.2%
V	65 MPH

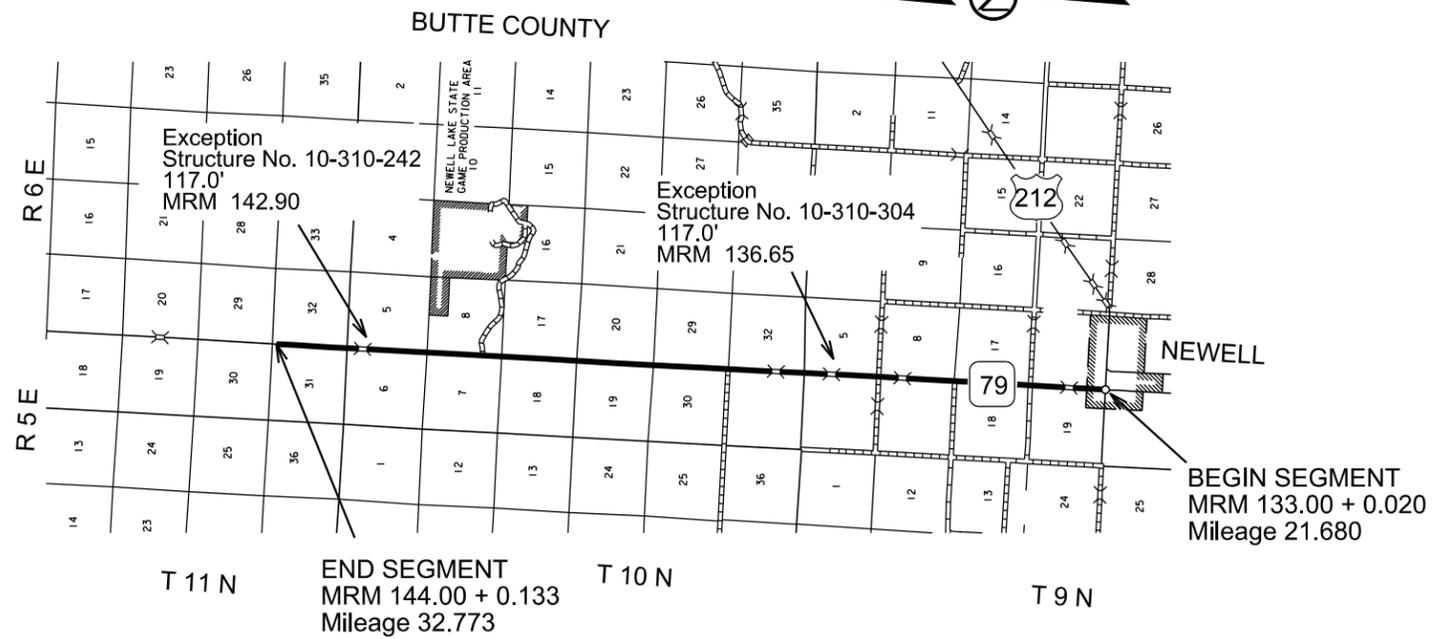
GROSS LENGTH	96,119.4 FEET	18.204 MILES
LENGTH OF EXCEPTIONS	319.1 FEET	0.060 MILES
NET LENGTH	95,800.3 FEET	18.144 MILES



SD 79
MRM 133.020 to 144.133
DESIGN DESIGNATION

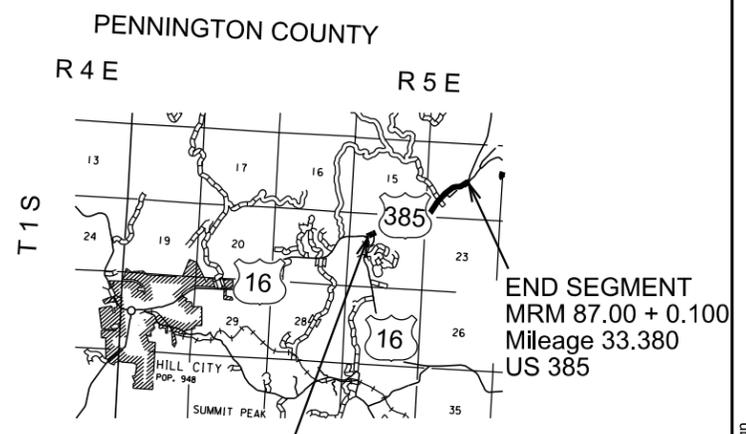
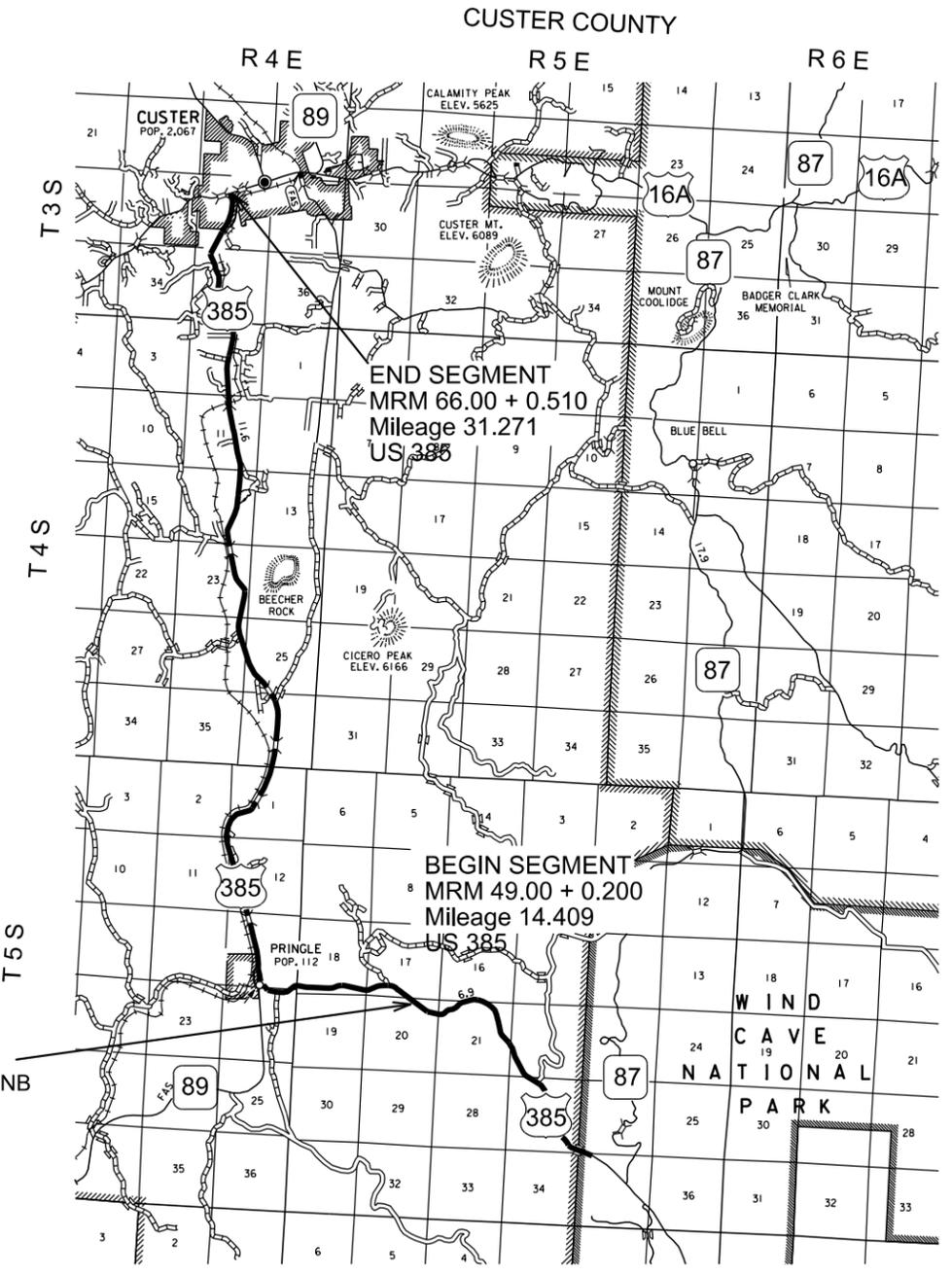
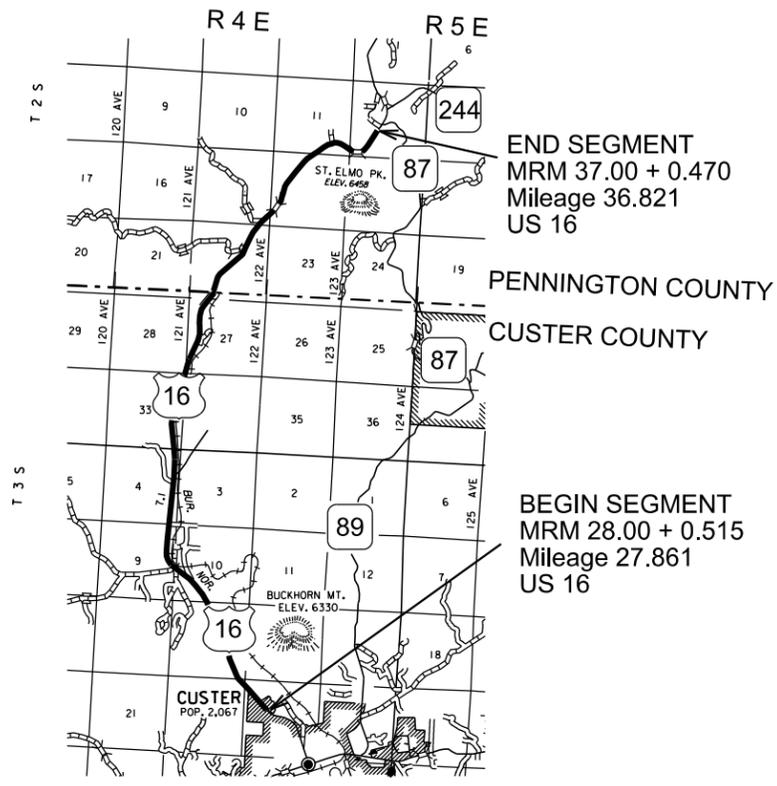
ADT (2014)	680
ADT (2034)	766
DHV	118.0
D	51%
T DHV	9.4%
T ADT	20.6%
V	65 MPH

GROSS LENGTH	58,676.6 FEET	11.113 MILES
LENGTH OF EXCEPTIONS	234.0 FEET	0.044 MILES
NET LENGTH	58,442.6 FEET	11.069 MILES





Plot Scale - 1:200



US 16
MRM 28.515 to 37.470
DESIGN DESIGNATION

ADT (2014)	4835
ADT (2034)	5875
DHV	893.0
D	51%
T DHV	3.6%
T ADT	8.0%
V	65 MPH

Exception
US 385, Climbing Lane
Concrete Shoulder
MRM 51.727 to 53.317, NB

US 385
MRM 85.510 to 87.100
DESIGN DESIGNATION

ADT (2014)	1975
ADT (2034)	2866
DHV	435.6
D	51%
T DHV	2.2%
T ADT	4.8%
V	65 MPH

GROSS LENGTH	47,282.4 FEET	8.955 MILES
LENGTH OF EXCEPTIONS	0.0 FEET	0.000 MILES
NET LENGTH	47,282.4 FEET	8.955 MILES

GROSS LENGTH	8,395.2 FEET	1.590 MILES
LENGTH OF EXCEPTIONS	0.0 FEET	0.000 MILES
NET LENGTH	8,395.2 FEET	1.590 MILES

US 385
MRM 49.200 to 66.510
DESIGN DESIGNATION

ADT (2014)	1696
ADT (2034)	2061
DHV	313.2
D	51%
T DHV	4.0%
T ADT	8.9%
V	65 MPH

GROSS LENGTH	91,396.8 FEET	17.310 MILES
LENGTH OF EXCEPTIONS	0.0 FEET	0.000 MILES
NET LENGTH	91,396.8 FEET	17.310 MILES

Plotted From - trcs11951

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ESTIMATE OF QUANTITIES

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH-PH-P 0040(312)	4	20

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
320E0300	Asphalt Emulsion for Microsurfacing	339,997	Gal
320E4510	Mineral Aggregate for Microsurfacing	6,218.3	Ton
320E4510	Mineral Aggregate for Microsurfacing	962.8	Ton
320E4510	Mineral Aggregate for Microsurfacing	623.3	Ton
320E4510	Mineral Aggregate for Microsurfacing	2,579.0	Ton
320E4510	Mineral Aggregate for Microsurfacing	161.2	Ton
320E4510	Mineral Aggregate for Microsurfacing	594.4	Ton
320E4510	Mineral Aggregate for Microsurfacing	57.2	Ton
320E7012	Grind 12" Rumble Strip or Stripe in Asphalt Concrete	27.5	Mile
330E0210	SS-1h or CSS-1h Asphalt for Flush Seal	72.8	Ton
633E1200	Waterborne Pavement Marking Paint with High Grade Polymer, White	2,102	Gal
633E1205	Waterborne Pavement Marking Paint with High Grade Polymer, Yellow	1,639	Gal
633E1435	Pavement Marking Paint, 24" Yellow	330	Ft
633E1445	Pavement Marking Paint, Arrow	10	Each
634E0010	Flagging	880.0	Hour
634E0020	Pilot Car	440.0	Hour
634E0110	Traffic Control Signs	790	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0560	Remove Pavement Marking, 4" or Equivalent	7,763	Ft
634E0565	Remove Pavement Marking, Arrow	10	Each
634E0630	Temporary Pavement Marking	37.8	Mile

TABLE OF QUANTITIES BY HIGHWAY SEGMENT

	US 212	US 212	SD79	SD 79	US 16	US 385	US 385		
MRM to	87.126	15.420	55.484	133.020	28.515	49.200	85.510		
MRM	113.814	28.833	73.688	144.133	37.470	66.510	87.100	Total	
	Mainline	Shoulder	Shoulder	Mainline	Shoulder	Shoulder	Shoulder		
Item								Quantity	Units
Mobilization	LS	LS							
Asphalt Emulsion for Microsurfacing	189,645	28,776	18,629	78,654	4,818	17,765	1,711	339997.3	Gal
Mineral Aggregate for Microsurfacing	6218.3	962.8	623.3	2579.0	161.2	594.4	57.2	11196.1	Ton
Grind 12" Rumble Strip or Stripe in Asphalt Concrete			27.5					27.5	Mile
SS-1h or CSS-1h Asphalt for Flush Seal		20.0	19.0		6.7	24.7	2.4	72.8	Ton
Waterborne Pavement Marking Paint with High Grade Polymer, White	1483.9			617.9				2101.7	Gal
Waterborne Pavement Marking Paint with High Grade Polymer, Yellow	573.8		811.9	253.3				1639.1	Gal
Pavement Marking Paint, 24" Yellow	330.0							330.0	Ft
Pavement Marking Paint, Arrow	10.0							10.0	Each
Flagging	200	120		200	120	120	120	880.0	Hour
Pilot Car	100	60		100	60	60	60	440.0	Hour
Traffic Control Signs	106	106	154	106	106	106	106	790.0	SqFt
Traffic Control, Miscellaneous	LS	LS							
Remove Pavement Marking, 4" or Equivalent	7763.0							7763.0	Ft
Remove Pavement Marking, Arrow	10.0							10.0	Each
Temporary Pavement Marking	26.7			11.1				37.8	Mile

SPECIFICATIONS

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

ENVIRONMENTAL COMMITMENTS

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

COMMITMENT 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 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.

Construction activities constitute 1 acre or more of earth disturbance.

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 department designated sources and designated option material sources, stockpile sites, storage areas, and waste 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: Contractor furnished material sources, material processing sites, stockpile sites, storage areas, plant sites, and waste areas.

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 Contractor furnished material sources, material processing sites, stockpile sites, storage areas, plant sites, and waste areas 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.

COORDINATION WITH OTHER PROJECTS

The Contractor for this project shall coordinate with the Contractor on project NH0079(76)58, PCN 05MM, Asphalt Shoulder Remove and Replace. The locations scheduled for shoulder replacement will not require microsurfacing treatment. The Contractor shall coordinate traffic control, so that it doesn't interfere with the shoulder replacement project. All costs associated with this coordination shall be incidental to the various bid items on the project.

SUPERELEVATED CURVES US 212

The US 212 shoulders at superelevated curve locations are paved level with the mainline surfacing. The shoulders at these locations will not require microsurfacing treatment. All costs associated skipping these locations shall be incidental to the various bid items on the project.

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH-PH-P 0040(312)	6	20

RATES OF MATERIALS

The Estimate of Quantities is based on the following quantities of material per mile, all of which shall be furnished in place by the Contractor.

The Contractor shall be responsible to verify the exact locations of all rate changes in the field.

Scratch Course – Mainline

Micro-surfacing – SDDOT Type II or III
Applied in 23 feet wide in 2 – 11.5' wide passes

Aggregate For Micro-surfacing (applied at 12 lb per square yard)
106 Ton/mile

Asphalt For Micro-surfacing (13% of Total Mix)
3230 Gal/mile

Applied 23 feet wide, 2 – 11.5' wide passes

Surface Course – Mainline

Type: Micro-surfacing – SDDOT Type II
Applied in 23 feet wide in 2 – 11.5' wide passes

Aggregate For Micro-surfacing (applied at 18 lb per square yard)
127 Ton/mile

Asphalt For Micro-surfacing (13% of Total Mix)
3876 Gal/mile

Asphalt Shoulder Settlement PCCP Filling Course

Micro-surfacing – SDDOT Type II or III Mineral Aggregate

Aggregate For Micro-surfacing applied 2' wide 18 Tons/mile

Asphalt For Micro-surfacing applied 2' wide 538 Gal/mile

Asphalt Shoulder Settlement Asphalt Filling Course US 212

Micro-surfacing – SDDOT Type II or III Mineral Aggregate

Aggregate For Micro-surfacing applied 2' wide 36 Tons/mile

Asphalt For Micro-surfacing applied 2' wide 1076 Gal/mile

TABLE OF MATERIAL QUANTITIES

Highway	Begin	End	Description	Gross Length	Exceptions	Net Length	Width	Mineral Aggregate for Microsurfacing	Asphalt Emulsion for Microsurfacing
	MRM	MRM		(ft)	(ft)	(ft)	(ft)	(Ton)	(Gal)
US 212	87.126	113.814	Mainline	140912.6	0.0	140912.6	23	6218.3	189,645

Highway	Begin	End	Description	Gross Length	Exceptions	Net Length	Width	Mineral Aggregate for Microsurfacing	Asphalt Emulsion for Microsurfacing	SS-1h or CSS-1h Asphalt for Flush Seal
	MRM	MRM		(ft)	(ft)	(ft)	(ft)	(Ton)	(Gal)	(Ton)
US 212	15.420	28.833	Left Shoulder	70820.6	218.0	70602.6	2	481.4	14,388	10.0
US 212	15.420	28.833	Right Shoulder	70820.6	218.0	70602.6	2	481.4	14,388	10.0
							Totals	962.8	28,776	20.0

Highway	Begin	End	Description	Gross Length	Exceptions	Net Length	Width	Mineral Aggregate for Microsurfacing	Asphalt Emulsion for Microsurfacing	Grind 12" Rumble Strip or Stripe in Asphalt Concrete	SS-1h or CSS-1h Asphalt for Flush Seal
	MRM	MRM		(ft)	(ft)	(ft)	(ft)	(Ton)	(Gal)	(Mile)	(Ton)
SD 79N	59.150	59.298	Median Shoulder	781.4		781.4	2.5	2.7	80	0.1	0.1
SD 79N	59.608	60.208	Median Shoulder	3168.0	319.1	2848.9	2.5	9.7	290	0.5	0.3
SD 79N	60.670	73.667	Median Shoulder	68624.2		68624.2	2.5	233.9	6,992	13.0	6.5
SD 79N	59.150	61.208	Outside Shoulder	10866.2	2387.6	8478.6	2	28.9	864		1.2
SD 79S	59.000	59.298	Median Shoulder	1573.4	319.1	1254.3	2.5	4.3	128	0.2	0.1
SD 79S	59.608	60.208	Median Shoulder	3168.0		3168.0	2.5	10.8	323	0.6	0.3
SD 79S	60.670	73.688	Median Shoulder	68735.0		68735.0	2.5	234.3	7,004	13.0	6.5
SD 79S	55.484	61.195	Outside Shoulder	30154.1	1215.5	28938.6	2	98.7	2,949		4.1
							Totals	623.3	18,629	27.5	19.0

Highway	Begin	End	Description	Total Length	Exceptions	Net Length	Width	Mineral Aggregate for Microsurfacing	Asphalt Emulsion for Microsurfacing
	MRM	MRM		(ft)	(ft)	(ft)	(ft)	(Ton)	(Gal)
SD79	133.020	144.133	Mainline	58676.6	234.0	58442.6	23	2579.0	78,654

Highway	Begin	End	Description	Gross Length	Exceptions	Net Length	Width	Mineral Aggregate for Microsurfacing	Asphalt Emulsion for Microsurfacing
	MRM	MRM		(ft)	(ft)	(ft)	(ft)	(Ton)	(Gal)
US 16	28.515	37.470	Right or Left Shoulder	47282.4	0.0	47282.4	2	161.2	4,818

Highway	Begin	End	Description	Gross Length	Exceptions	Net Length	Width	Mineral Aggregate for Microsurfacing	Asphalt Emulsion for Microsurfacing	SS-1h or CSS-1h Asphalt for Flush Seal
	MRM	MRM		(ft)	(ft)	(ft)	(ft)	(Ton)	(Gal)	(Ton)
US 385	49.200	66.510	Left Shoulder	91396.8	0.0	91396.8	2	311.6	9,313	12.9
US 385	49.200	66.510	Right Shoulder	91396.8	8450.0	82946.8	2	282.8	8,452	11.8
							Totals	594.4	17,765	24.7

Highway	Begin	End	Description	Gross Length	Exceptions	Net Length	Width	Mineral Aggregate for Microsurfacing	Asphalt Emulsion for Microsurfacing	SS-1h or CSS-1h Asphalt for Flush Seal
	MRM	MRM		(ft)	(ft)	(ft)	(ft)	(Ton)	(Gal)	(Ton)
US 385	85.510	87.100	Left Shoulder	8395.2	0.0	8395.2	2	28.6	855	1.2
US 385	85.510	87.100	Right Shoulder	8395.2	0.0	8395.2	2	28.6	855	1.2
							Totals	57.2	1,711	2.4

TABLE OF EXCEPTIONS

Highway	MRM	Structure #	Length (ft)
US 212	19.590	10-156-360	218.0
US 385 Climbing lane, 51.727 to 53.317			8450.0
SD 79 N, 59.318 to 59.740			2228.0
SD 79 S, 59.298 to 59.498			1056.0
SD 79	68.360	52-436-393	159.6
SD 79	60.130	17-430-024	159.5
SD 79	136.650	10-310-304	117.0
SD 79	142.900	10-310-242	117.0
Total			12505.1

MICROSURFACING

The polymer modified emulsion used in the mixture shall be a CQS-1p.

A scratch course shall be applied across the surface of the entire project at the rates provided. Adjustments in the rates of materials to level the surface shall be approved by the Engineer.

Micro-surfacing shall not be placed on any bridge or bridge approach slabs.

The asphalt shoulder settlement depth along the project varies along the longitudinal joint between mainline and the shoulder. The Contractor shall fill in this settlement along the project in accordance with the details found in these plans. Micro-surfacing material shall be placed on the shoulder to assure the longitudinal joint is filled and sealed.

The filling for shoulder settlement shall be applied 2' wide. This work may be done with one pass provided the asphalt shoulder settlement filling does not recess below the adjacent surfacing more than 1/4". If unacceptable results occur the Contractor may need to perform an additional pass to fill the shoulder settlement as directed by the Engineer.

The 11.5' width pass is provided to achieve recessed pavement marking for the white edgelines.

RUMBLE STRIPS/STRIPES

Rumble strips shall be installed on the SD79 median shoulder as shown in the table of material quantities after the micro-surfacing installation.

Water shall be used with the rumble strip/stripe installation for dust control.

Rumble strips or stripes shall not be placed on any bridge decks or approach slabs, or within 50 feet of any railroad crossings.

RUMBLE STRIP/STRIPE ROADWAY CLEANING

The Contractor shall remove loose material from the driving surface and/or asphalt shoulders of the roadway on a daily basis. Loose material may be used as fillet material adjacent to the paved shoulder. It shall be the Contractor's responsibility to ensure the loose material does not enter any vegetated areas and/or waterways.

All costs associated with this work shall be incidental to the contract unit price per mile for Grind 12" Rumble Strip or Stripe in Asphalt Concrete.

FLUSH SEAL

SS-1h or CSS-1h Emulsified Asphalt for Flush Seal shall be applied the full width of the shoulder at the rate of 0.05 gallons per square yard after the installation of micro-surfacing or ground in rumble strips. This work will only be required on the shoulder settlement locations as per the table of material quantities.

The distributor shall be equipped with guards to prevent any overspray of emulsified asphalt from coming in contact with the existing pavement marking. A guide installed on the distributor equipment shall be used to follow the alignment of the existing pavement marking. If there is any damage to the existing pavement marking, the Contractor shall replace in kind, at no additional cost to the State.

The seasonal restrictions of Section 330 of the Specifications shall be waived provided the temperature requirements are met.

SHOULDER WORK

The Contractor shall notify the State at least 4 weeks prior to beginning work to allow the state time to inspect and spray for vegetation. Vegetation and accumulated debris shall be removed from the shoulder surface by the Contractor prior to the micro-surfacing work.

PERMANENT PAVEMENT MARKING – GENERAL NOTES

The Contractor shall survey and mark the location of no passing zones prior to covering pavement marking.

The Contractor shall repaint all the existing pavement marking paint including centerline, edge line, lane lines, arrows, gore areas, etc. The Contractor will be required to inventory and mark, with appropriate colored tabs, the extent and location of the existing word messages, turn arrows, stop bars, railroad crossings, pedestrian crossings, gore areas etc.. Locations of pavement marking tape shall be removed. The Contractor shall provide a copy of the pavement marking inventory to the Engineer. The cost of tabs shall be incidental to the temporary pavement making bid item. All costs associated with this work shall be incidental to the pavement marking bid items.

Application of permanent pavement marking may begin 7 calendar days following completion of the micro-surfacing and shall be completed within 14 calendar days following completion of the micro-surfacing.

Striper and advance and trailing warning vehicles shall be equipped with flashing amber or arrow panel warning lights.

WATERBORNE PAVEMENT MARKING PAINT WITH HIGH GRADE POLYMER

All materials shall be applied as per manufacturer's recommendations.

This material shall consist of a durable high build, low VOC, fast drying, waterborne traffic paint with 100% acrylic polymer (DOW DT-400 or DOW HD-21A or equivalent) and with reflective media adhered to the paint. The reflective media shall consist of glass beads as well as bonded core reflective elements.

The bonded core reflective elements shall contain either clear or yellow tinted microcrystalline ceramic beads bonded to the outer surface. All microcrystalline ceramic beads bonded to reflective elements shall have a minimum index of refraction of 1.8 when tested using the liquid oil immersion method.

The Department will take retroreflectivity readings on the pavement marking lines no sooner than 3 days and no later than 30 days after the completion of all line applications required for an individual highway route using a portable retroreflectometer conforming to 30-meter geometry. Retroreflectivity readings will be taken on a test location with cleaning being limited to light hand brooming.

Pavement markings not conforming to the Retroreflectivity requirements shall be removed and replaced. If replacement of markings cannot be applied within the same year, the contractor shall schedule subject work to be completed no later than June 15th in the following year. Upon replacement, the retroreflectivity testing process will be done again requiring new readings.

The Department will randomly select one test location per mile of each edge line including ramps and one test location per mile of centerline (solid and/or skip line will be considered as one centerline). Three retroreflectivity readings will be taken at each test location. The three readings will be averaged and become the reading for that test location.

Initial Readings (within 3 - 30 days of the line application):

<u>Pavement Marking Color</u>	<u>Minimum Value</u>
White	350 mcd/m ² /lux
Yellow	275 mcd/m ² /lux

All pavement markings not conforming to the requirements provided in these plans will be considered deficient and may be required to be removed. Additional retroreflectivity readings will be taken by the Department to determine the limits of removal. The removal shall be accomplished using suitable sand blasting or grinding equipment unless the Engineer authorizes other means. The removal process shall remove at least 90% of the deficient line, with no excessive scarring of the existing pavement. The removal width shall be one inch wider all around the nominal width of the pavement marking to be removed. Removal and replacement of the pavement markings shall be at Contractor's expense, with no cost incurred by the State.

RATES OF MATERIALS WATERBORNE PAVEMENT MARKING PAINT WITH HIGH GRADE POLYMER

Solid 4" Line = 27.8 Gals/Mile
Glass Beads – 5.3 Lbs/Gal
Composite Reflective Elements – 2.1 Lbs/Gal

All cost for materials, labor, and equipment necessary to furnish and install the pavement markings shall be incidental to the contract unit price per gallon for Waterborne Pavement Marking Paint with High Grade Polymer, White or Yellow.

TABLE OF PAVEMENT MARKING QUANTITIES

Highway	Begin	End	Length	Waterborne Pavement Marking Paint with High Grade Polymer, White	Waterborne Pavement Marking Paint with High Grade Polymer, Yellow	Remove Pavement Marking, 4" or Equivalent	Remove Pavement Marking, Arrow	Pavement Marking Paint, Arrow	Temporary Pavement Marking	Pavement Marking Paint, 24" Yellow	Description
	MRM	MRM	(ft)	(Gal)	(Gal)	(ft)	(Each)	(Each)	(Mile)	(ft)	
US 212	87.126	110.773	124856.2	1314.8	486.5				23.6		
US 212	110.773	111.003	1214.4	12.8	25.6	5463	4	4	0.2	220.0	US 212 & SD 73 Intersection
US 212	111.003	113.733	14414.4	151.8	56.2				2.7		
US 212	113.733	113.814	427.7	4.5	5.6	2300	6	6	0.1	110.0	3 lane section with center turn lane
SD 79N	59.150	73.667	76649.8		403.6						Passing Lane Edgeline
SD 79S	59.000	73.688	77552.6		408.3						Passing Lane Edgeline
SD79	133.020	144.133	58676.6	617.9	253.3				11.1		
		Totals	124856.2	2101.7	1639.1	7763.0	10	10	37.8	330.0	

TRAFFIC CONTROL – GENERAL NOTES

1. Unless otherwise stated in these plans, no work will be allowed during hours of darkness.
2. 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.
3. Existing guide, route, informational logo, regulatory, warning signs and delineation shall be temporarily reset and maintained during construction as directed by the Engineer. Removing, relocating, salvaging and resetting of the above items shall be the responsibility of the Contractor.
4. Non-applicable traffic control devices shall be completely covered or removed during periods of inactivity. Periods of inactivity shall be defined as no work taking place for a period of more than 48 hours.
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. Any delineators and signs damaged or lost shall be replaced by the Contractor at no cost to the State.
7. All materials and equipment shall be stored a minimum distance of 30' from the traveled way during nonworking hours.

8. The Contractor shall provide installation details at the preconstruction meeting for all breakaway sign support assemblies.
9. 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.
10. All construction operations shall be conducted in the general direction of traffic movement.
11. 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.
12. Road Work Next ## Miles and End Road Work signs shall be installed on fixed location, breakaway supports at the beginning and end of the project as directed by the Engineer.
13. Traffic shall be maintained on the driving lanes. Use of the shoulder as a driving lane will not be permitted. Any damage to the shoulder due to rerouted traffic or Contractor's equipment shall be repaired at no expense to the State.
14. Traffic approaching the project from intersecting roadways, streets, and approaches must be adequately accommodated. Major intersections or large commercial entrances may require additional signing, flaggers, and channelizing devices on a temporary basis until work activities pass these areas.
15. When a pilot car is used, the delay to the traveling public shall not exceed 15 minutes.
16. RIGHT SHOULDER CLOSED and FRESH OIL signs shall be used to warn the traveling public of the micro-surfacing material on the shoulder. The FRESH OIL signs shall be repeated every 2 miles.

The RIGHT SHOULDER CLOSED sign shall be relocated throughout the day to a location where the microsurfacing has properly cured to allow traffic to cross without damage.

17. The shadow vehicles should position themselves in advance of vertical or horizontal curves that restrict sight distance.
18. The shadow vehicles shall be equipped with two high-intensity flashing lights mounted on the rear, adjacent to the sign.
19. The distance between the work and shadow vehicles may vary according to terrain, cure time, and other factors.

REFLECTORIZED SHEETING REQUIREMENTS FOR TEMPORARY TRAFFIC CONTROL DEVICES

Delete the first paragraph of Section 984.1 and replace with the following:

Temporary traffic control devices, including signs, drums, cones, tubular markers, barricades, vertical panels, and direction indicator barricades shall be reflectORIZED with sheeting applied to a satisfactory backing. For all temporary traffic control warning signs, the reflective sheeting shall meet or exceed the standards of Type VII, Type VIII, Type IX, or Type XI as defined by AASHTO M 268 (ASTM D4956). For all other temporary traffic control signs, the reflective sheeting shall meet or exceed the standards of Type IV, Type V, Type VII, Type VIII, Type IX, or Type XI as defined by AASHTO M 268 (ASTM D4956). For barricades, vertical panels, and direction indicator barricades; the reflective sheeting shall meet or exceed the standards of Type III as defined by AASHTO M 268 (ASTM D4956). Round surfaced temporary traffic control devices including, but not limited to; drums, cones, and tubular markers shall be reflectORIZED with reflectORIZED sheeting meeting or exceeding the standards of Type IV as defined by AASHTO M 268 (ASTM D4956). All orange colored material shall be fluorescent.

TEMPORARY PAVEMENT MARKING

Temporary pavement markings for the centerline of the roadway throughout the full length of the project shall meet the requirements of Section 634 of the Specifications. The markings shall be Temporary Flexible Vertical Markers (Tabs).

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.

In addition, No Passing Zone areas shall be marked by signs as noted below.

The Contractor shall use DO NOT PASS and PASS WITH CARE signs to mark no passing zones on roads following application of asphalt surface treatment.

Highway	ESTIMATED DO NOT PASS SIGNS	ESTIMATED PASS WITH CARE SIGNS
US 212 MRM 87.126 to MRM 113.814	52	52
SD 79 MRM 133.020 to MRM 144.133	28	28

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

INVENTORY OF TRAFFIC CONTROL DEVICES (US 212, MRM 87.126 to MRM 113.814)

SIGN CODE	SIGN DESCRIPTION	#	SIGN SIZE	SQFT PER SIGN	SQFT
W20-1	ROAD WORK AHEAD	2	48" x 48"	16	32
W20-4	ONE LANE ROAD AHEAD	2	48" x 48"	16	32
W20-7	FLAGGER (symbol)	2	48" x 48"	16	32
G20-2	END ROAD WORK	2	36" x 18"	5	10
CONVENTIONAL ROAD TRAFFIC CONTROL SIGNS SQFT					106

INVENTORY OF TRAFFIC CONTROL DEVICES (US 212, MRM 15.420 to MRM 28.833)

SIGN CODE	SIGN DESCRIPTION	#	SIGN SIZE	SQFT PER SIGN	SQFT
W20-1	ROAD WORK AHEAD	2	48" x 48"	16	32
W20-4	ONE LANE ROAD AHEAD	2	48" x 48"	16	32
W20-7	FLAGGER (symbol)	2	48" x 48"	16	32
G20-2	END ROAD WORK	2	36" x 18"	5	10
CONVENTIONAL ROAD TRAFFIC CONTROL SIGNS SQFT					106

INVENTORY OF TRAFFIC CONTROL DEVICES (SD 79, MRM 55.484 to MRM 73.688)

SIGN CODE	SIGN DESCRIPTION	#	SIGN SIZE	SQFT PER SIGN	SQFT
W20-1	ROAD WORK AHEAD	2	48" x 48"	16	32
W20-5	LEFT or RIGHT LANE CLOSED AHEAD	2	48" x 48"	16	32
W21-2	FRESH OIL	3	48" x 48"	16	48
W21-5b	LEFT or RIGHT SHOULDER CLOSED AHEAD	2	48" x 48"	16	32
G20-2	END ROAD WORK	2	36" x 18"	5	10
CONVENTIONAL ROAD TRAFFIC CONTROL SIGNS SQFT					154

INVENTORY OF TRAFFIC CONTROL DEVICES (SD 79, MRM 133.020 to MRM 144.133)

SIGN CODE	SIGN DESCRIPTION	#	SIGN SIZE	SQFT PER SIGN	SQFT
W20-1	ROAD WORK AHEAD	2	48" x 48"	16	32
W20-4	ONE LANE ROAD AHEAD	2	48" x 48"	16	32
W20-7	FLAGGER (symbol)	2	48" x 48"	16	32
G20-2	END ROAD WORK	2	36" x 18"	5	10
CONVENTIONAL ROAD TRAFFIC CONTROL SIGNS SQFT					106

INVENTORY OF TRAFFIC CONTROL DEVICES (US 16, MRM 28.515 to MRM 37.470)

SIGN CODE	SIGN DESCRIPTION	#	SIGN SIZE	SQFT PER SIGN	SQFT
W20-1	ROAD WORK AHEAD	2	48" x 48"	16	32
W20-4	ONE LANE ROAD AHEAD	2	48" x 48"	16	32
W20-7	FLAGGER (symbol)	2	48" x 48"	16	32
G20-2	END ROAD WORK	2	36" x 18"	5	10
CONVENTIONAL ROAD TRAFFIC CONTROL SIGNS SQFT					106

INVENTORY OF TRAFFIC CONTROL DEVICES (US 385, MRM 49.200 to MRM 66.510)

SIGN CODE	SIGN DESCRIPTION	#	SIGN SIZE	SQFT PER SIGN	SQFT
W20-1	ROAD WORK AHEAD	2	48" x 48"	16	32
W20-4	ONE LANE ROAD AHEAD	2	48" x 48"	16	32
W20-7	FLAGGER (symbol)	2	48" x 48"	16	32
G20-2	END ROAD WORK	2	36" x 18"	5	10
CONVENTIONAL ROAD TRAFFIC CONTROL SIGNS SQFT					106

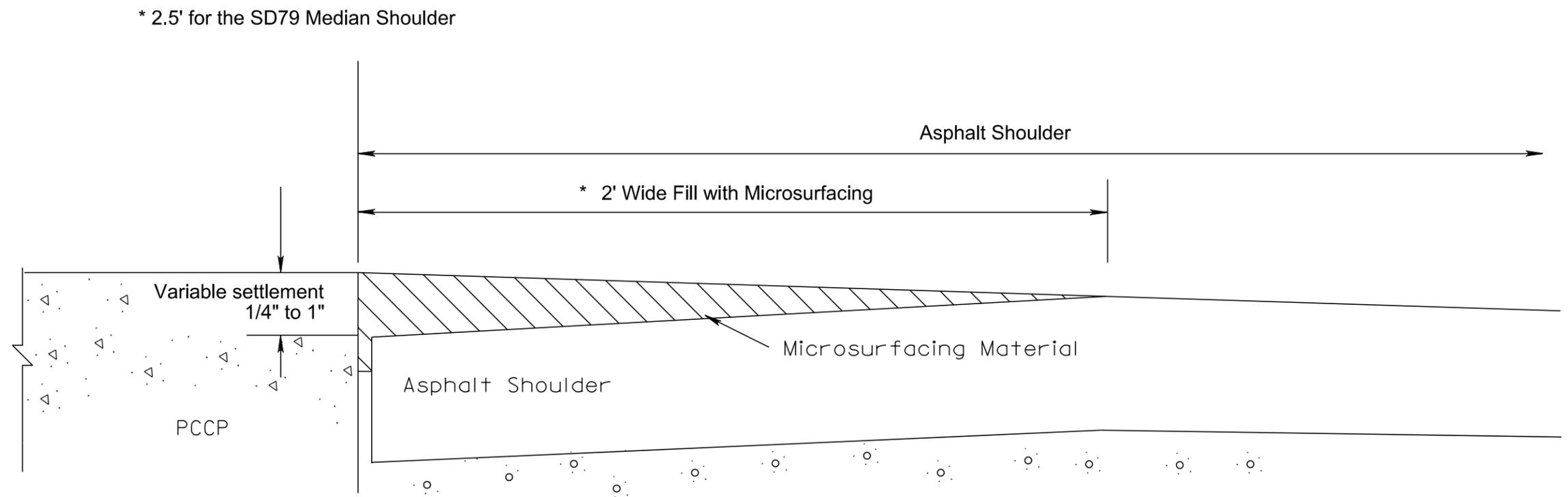
INVENTORY OF TRAFFIC CONTROL DEVICES (US 385, MRM 85.510 to MRM 87.100)

SIGN CODE	SIGN DESCRIPTION	#	SIGN SIZE	SQFT PER SIGN	SQFT
W20-1	ROAD WORK AHEAD	2	48" x 48"	16	32
W20-4	ONE LANE ROAD AHEAD	2	48" x 48"	16	32
W20-7	FLAGGER (symbol)	2	48" x 48"	16	32
G20-2	END ROAD WORK	2	36" x 18"	5	10
CONVENTIONAL ROAD TRAFFIC CONTROL SIGNS SQFT					106

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH-PH-P 0040(312)	11	20

Plotting Date: 02/18/2016

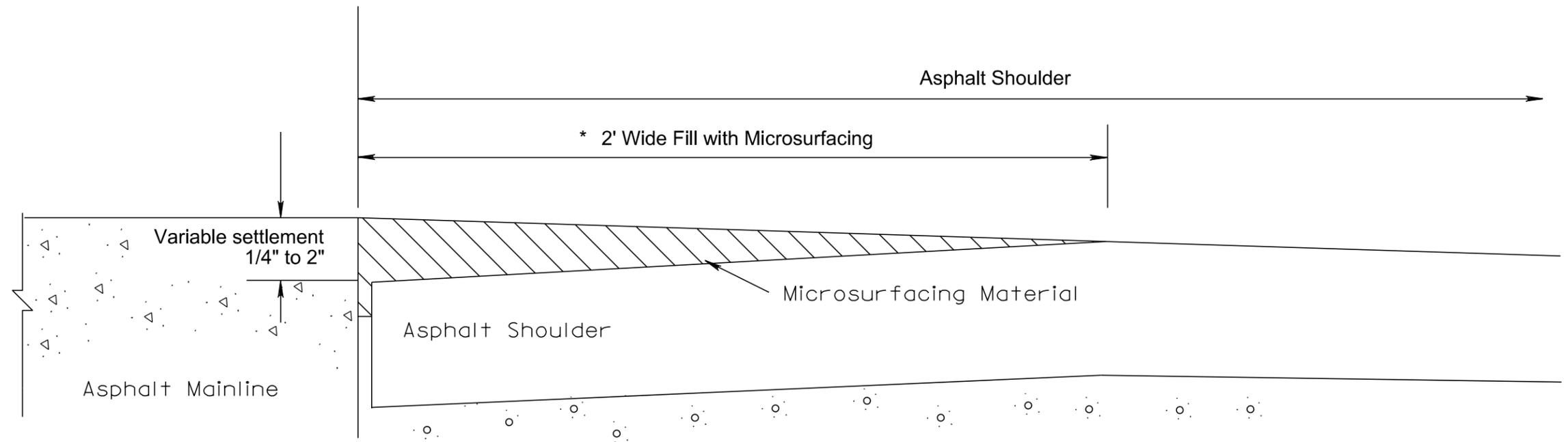
Microsurfacing Asphalt Shoulder Settlement along PCCP



STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH-PH-P 0040(312)	12	20

Plotting Date: 02/18/2016

Microsurfacing Asphalt Shoulder Settlement along Asphalt (US 212)



PLOT SCALE - 1:300

PLOTTED FROM - TRRC11951

PLOT NAME - 9

FILE - ... \ASPHALT SHOULDERREPAIRAC.DGN

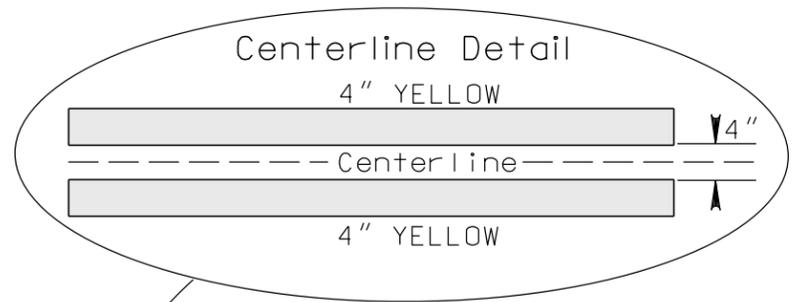
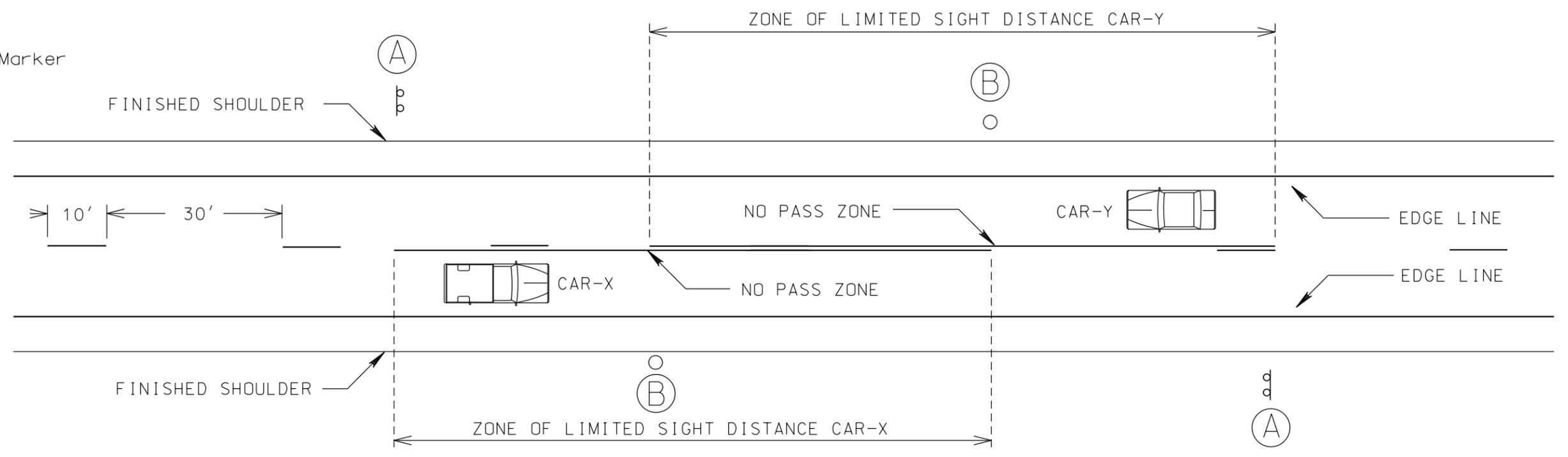
TYPICAL PAVEMENT MARKING LAYOUT

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH-PH-P 0040(312)	13	20
Plotting Date: 01/29/2016			

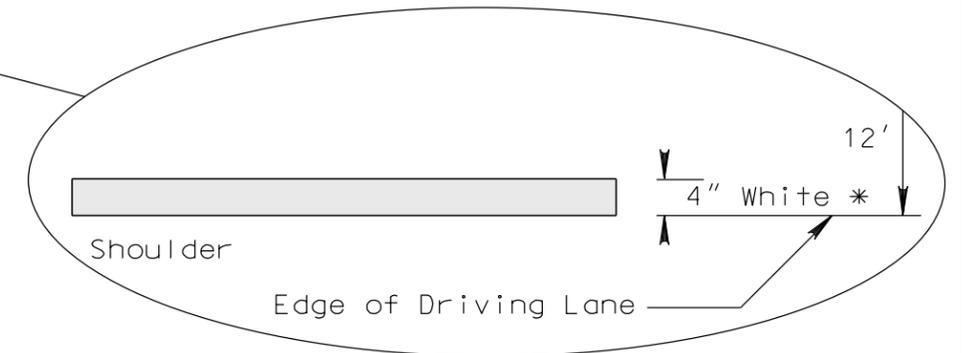
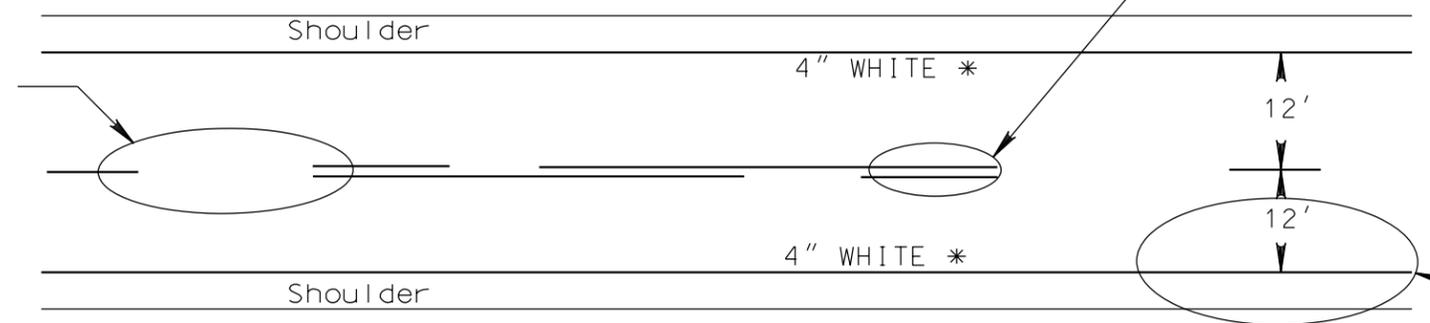
Plotted From: trc11951 Plot Scale: 1:20



(A) NO PASSING ZONE
(B) End of Zone Marker



NOTE: A THREE "GUN" SYSTEM SHALL BE USED TO OBTAIN THIS PATTERN.



* 8" WHITE - As per locations in plans with shoulders less than 2' width.

File: ...IPavementMarkingDetails.dgn

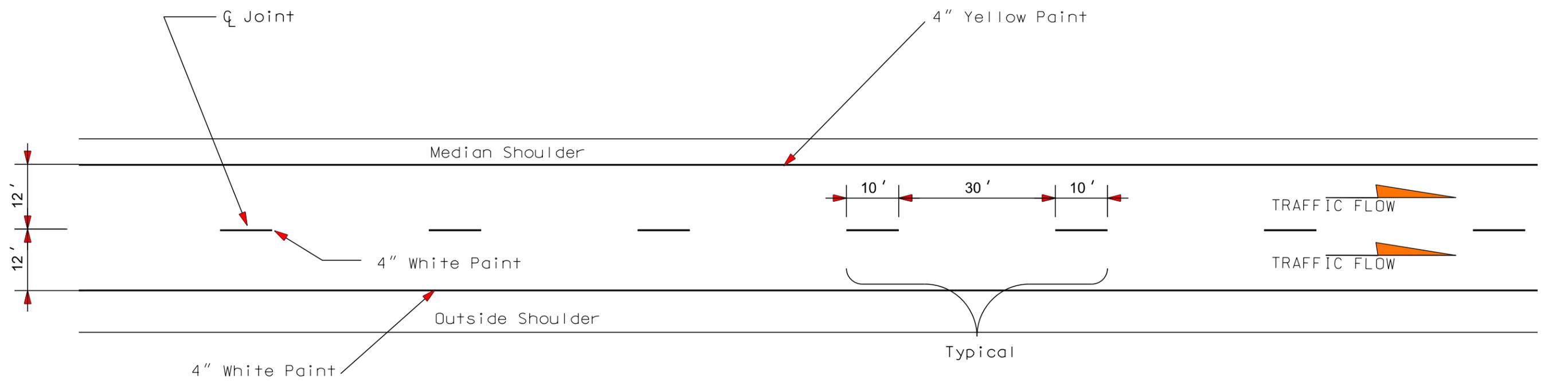
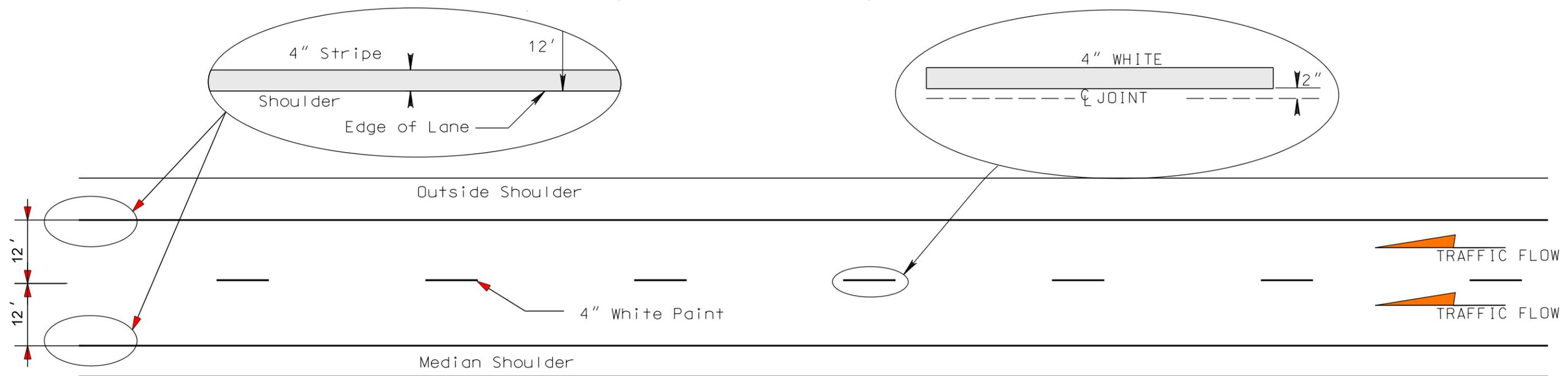
Plot Scale - 1:20

Plotted From - trcs11951

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH-PH-P 0040(312)	14	20
Plotting Date: 01/29/2016			

PAVEMENT MARKING LAYOUT

(4 Lane Divided)



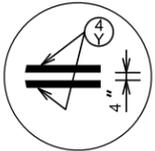
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PAVEMENT MARKING LAYOUT

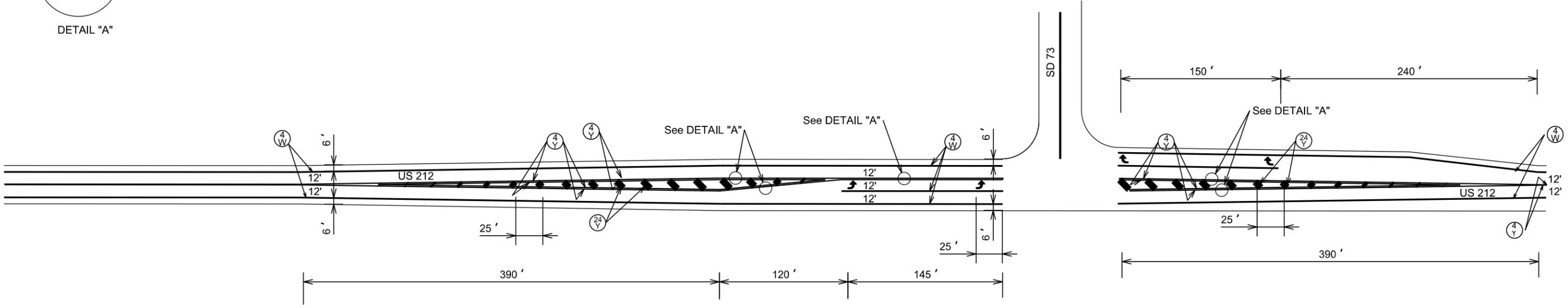
US 212 & SD 73

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH-PH-P 0040(312)	15	20
Plotting Date:		01/29/2016	

ESTIMATE OF QUANTITIES			
KEY	ITEM	EST QUANT	UNIT
(4) (Y)	PAVEMENT MARKING PAINT, 24" YELLOW	220	FT
(4) (A)	PAVEMENT MARKING PAINT, ARROW	4	EACH



DETAIL "A"



Plot Scale - 1:96

Plotted From - trcs11951

File - ...Intersection Pavement Marking.dgn

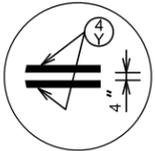
PAVEMENT MARKING LAYOUT

US 212, MRM 113.733 to MRM 113.814

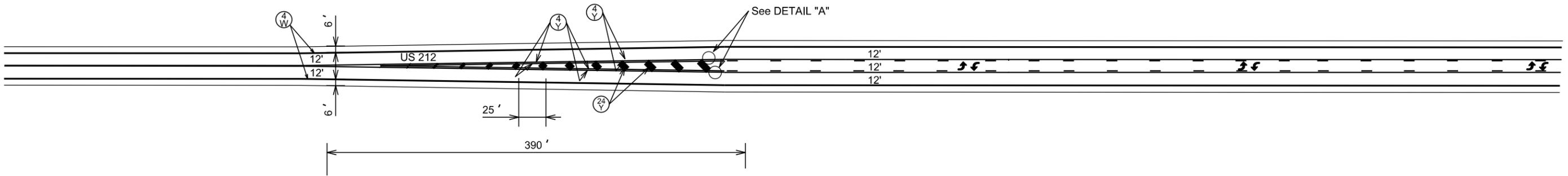
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH-PH-P 0040(312)	16	20

Plotting Date: 02/18/2016

ESTIMATE OF QUANTITIES			
KEY	ITEM	EST QUANT	UNIT
④	PAVEMENT MARKING PAINT, 24" YELLOW	110	FT
↶	PAVEMENT MARKING PAINT, ARROW	6	EACH



DETAIL "A"



Plot Scale - 1:96

Plotted From - trcs11951

File - ...Intersection Pavement Marking 113_7.dgn

PLOT SCALE - 1:200

PLOTTED FROM - TRRC11951

PLOT NAME - 8

FILE - ... \PRJ\MEAD0540\MOBILEOPS.DGN

Pavement Marking Operations

Shadow and Lead Vehicles shall be positioned at the crest of vertical curves or at locations of adequate sight distance for approaching vehicles.

Vehicle-mounted signs shall be mounted in a manner such that they are not obscured by equipment or supplies. Sign legends on vehicle-mounted signs shall be covered or turned from view when work is not in progress.

Shadow and Work vehicles shall display high-intensity rotating lights or strobe lights

Vehicle hazard warning signals shall not be used in place of high-intensity rotating, flashing, oscillating, or strobe lights

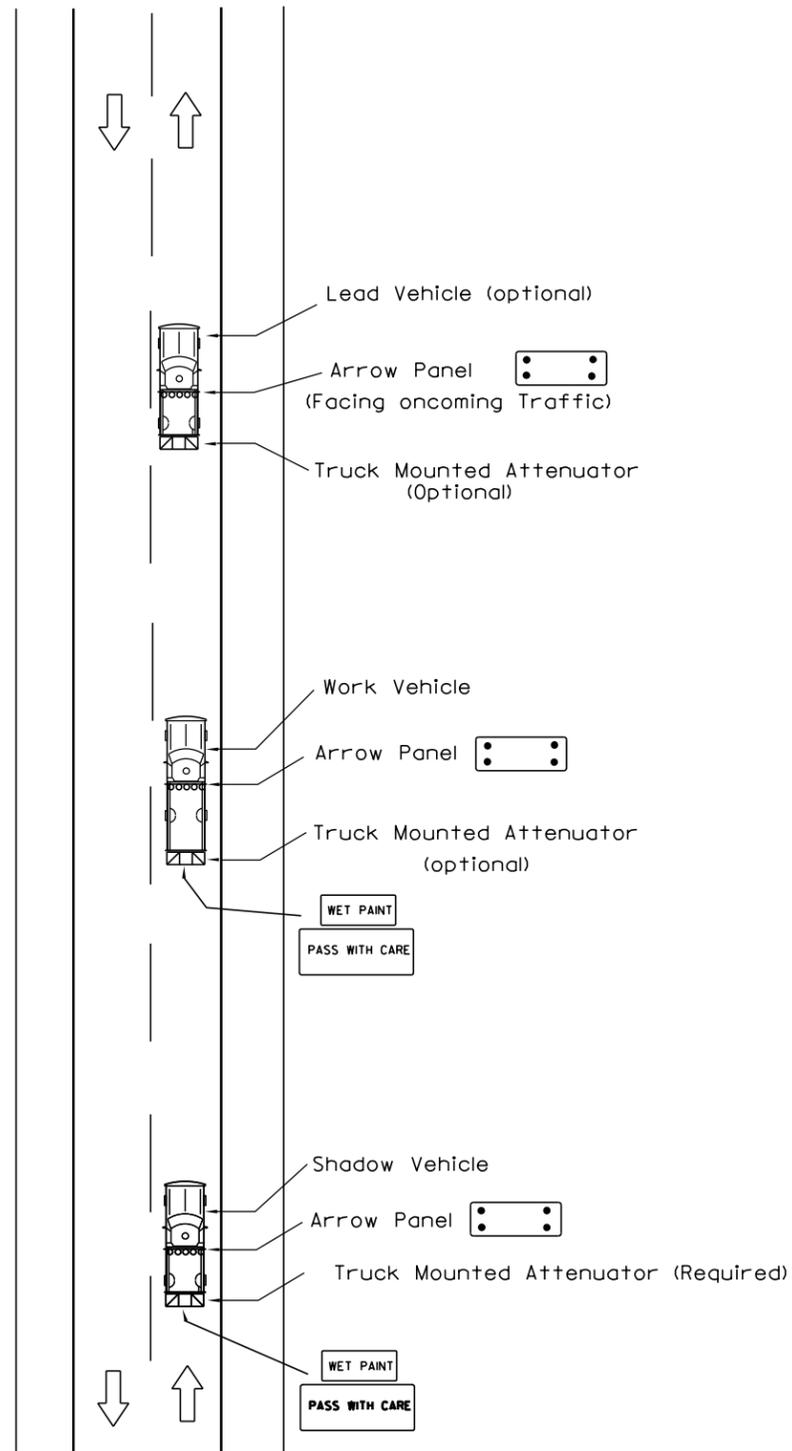
When an arrow panel is used, it shall be used in the caution mode. Marching Diamonds are acceptable.

Arrow panels shall, as a minimum, be Type B, with a size of 60" x 30".

Where practical and when needed, the work and shadow vehicles should pull over periodically to allow motor vehicles traffic to pass

- If ANY part of the vehicle is within the driving lane, an attenuator is REQUIRED

MOBILE: Intermittent and continuous moving.



**GUIDES FOR TRAFFIC CONTROL DEVICES
MOBILE OPERATIONS ON 2-LANE ROAD**

Vehicle-mounted signs shall be mounted in a manner such that they are not obscured by equipment or supplies.

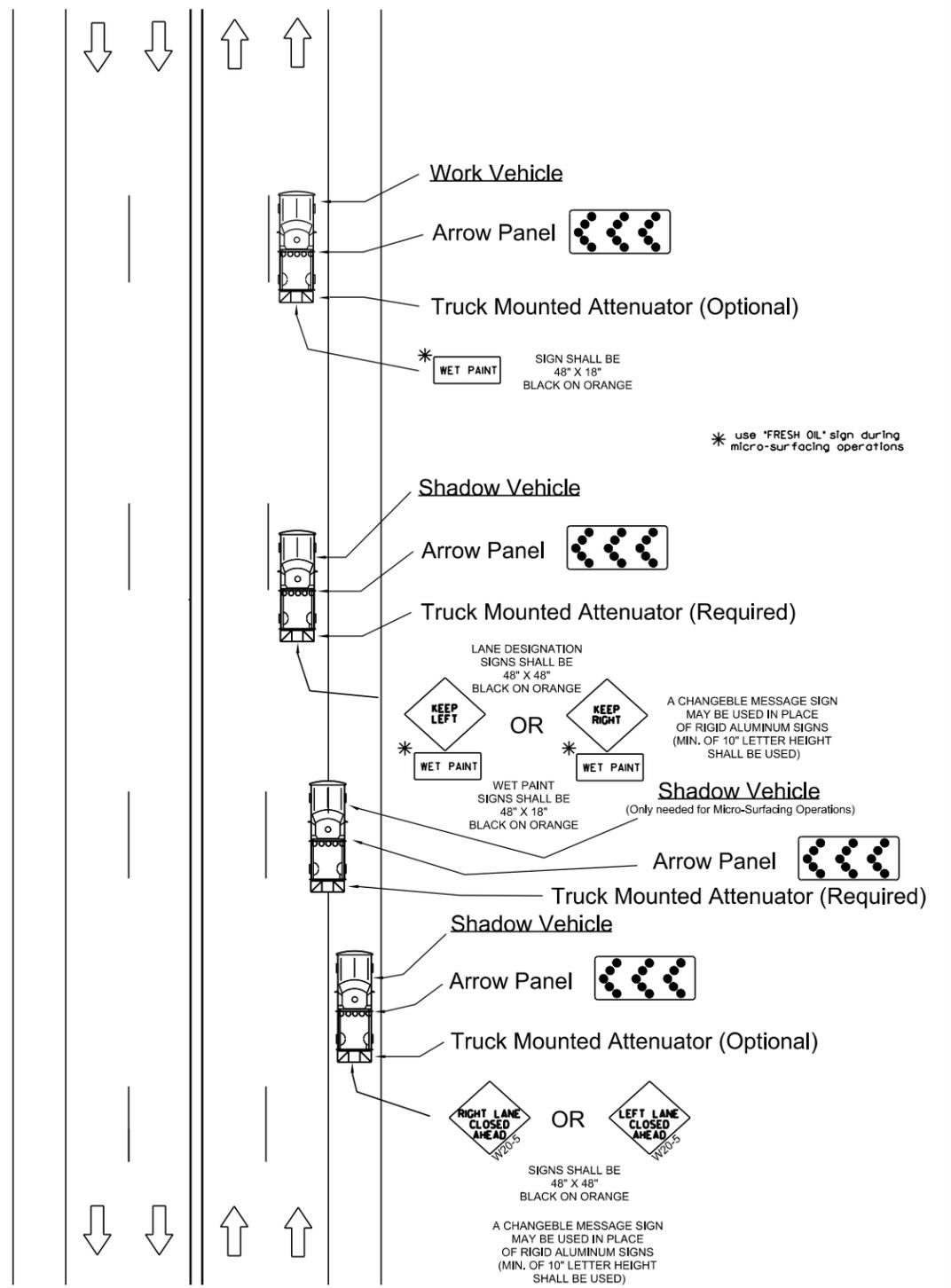
Sign legends on vehicle-mounted signs shall be covered or turned from view when work is not in progress.

Shadow and Work vehicles shall display high-intensity rotating, flashing, oscillating, or strobe lights, flags, signs, or arrow panels.

Vehicle hazard warning signals shall not be used instead of the vehicle's high-intensity rotating, flashing, oscillating, or strobe lights

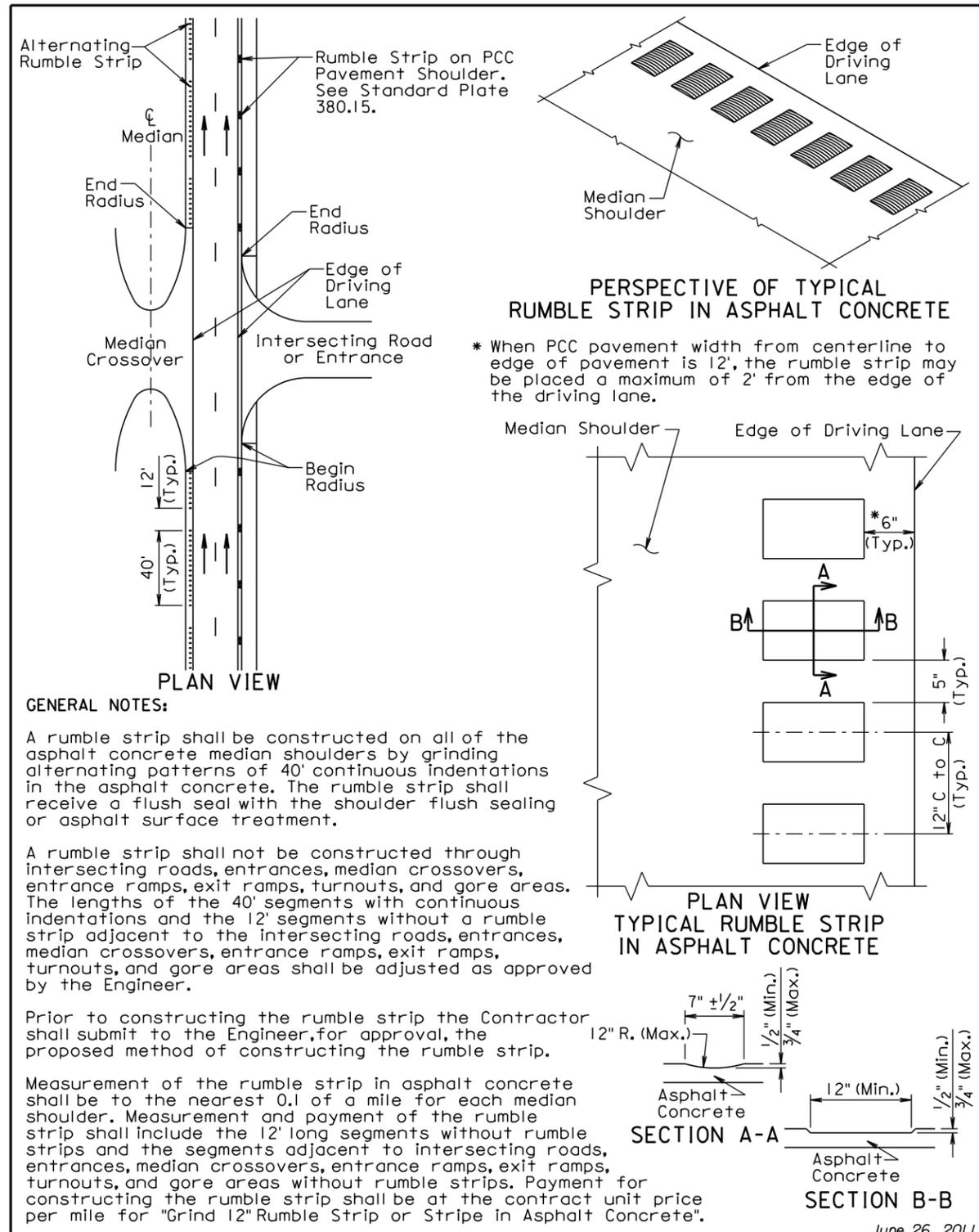
Arrow panels shall, as a minimum, be Type B, with a size of 60" x 30".

Pavement Marking & Micro-surfacing Operations



**GUIDES FOR TRAFFIC CONTROL DEVICES
MOBILE OPERATIONS ON 4-LANE DIVIDED**

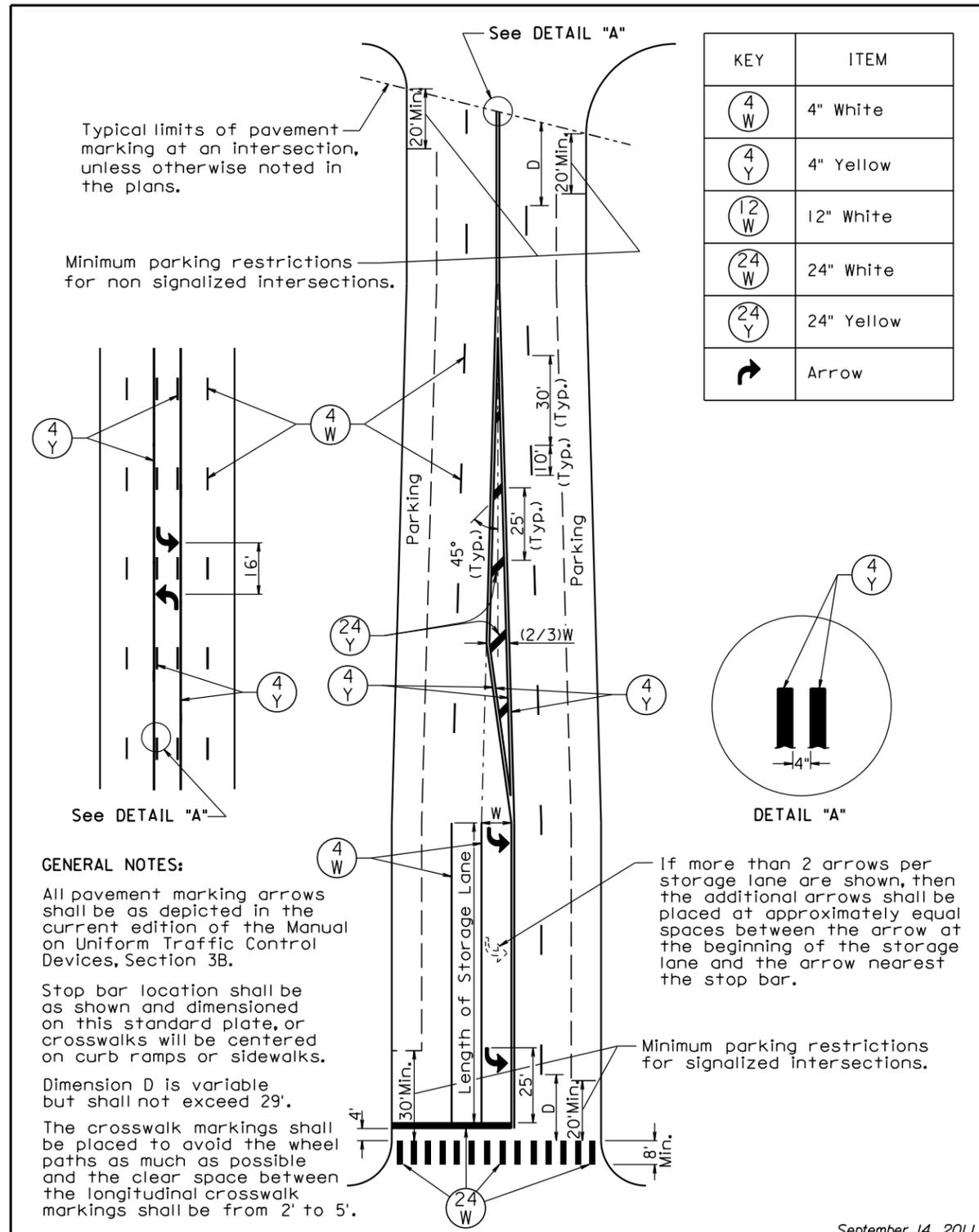
MOBILE: Intermittent & Continuous Moving



* When PCC pavement width from centerline to edge of pavement is 12', the rumble strip may be placed a maximum of 2' from the edge of the driving lane.

June 26, 2011

Published Date: 1st Qtr. 2016	S D D O T	12" RUMBLE STRIP IN ASPHALT CONCRETE ON DIVIDED HIGHWAY MEDIAN SHOULDER	PLATE NUMBER 320.26
			Sheet 1 of 1

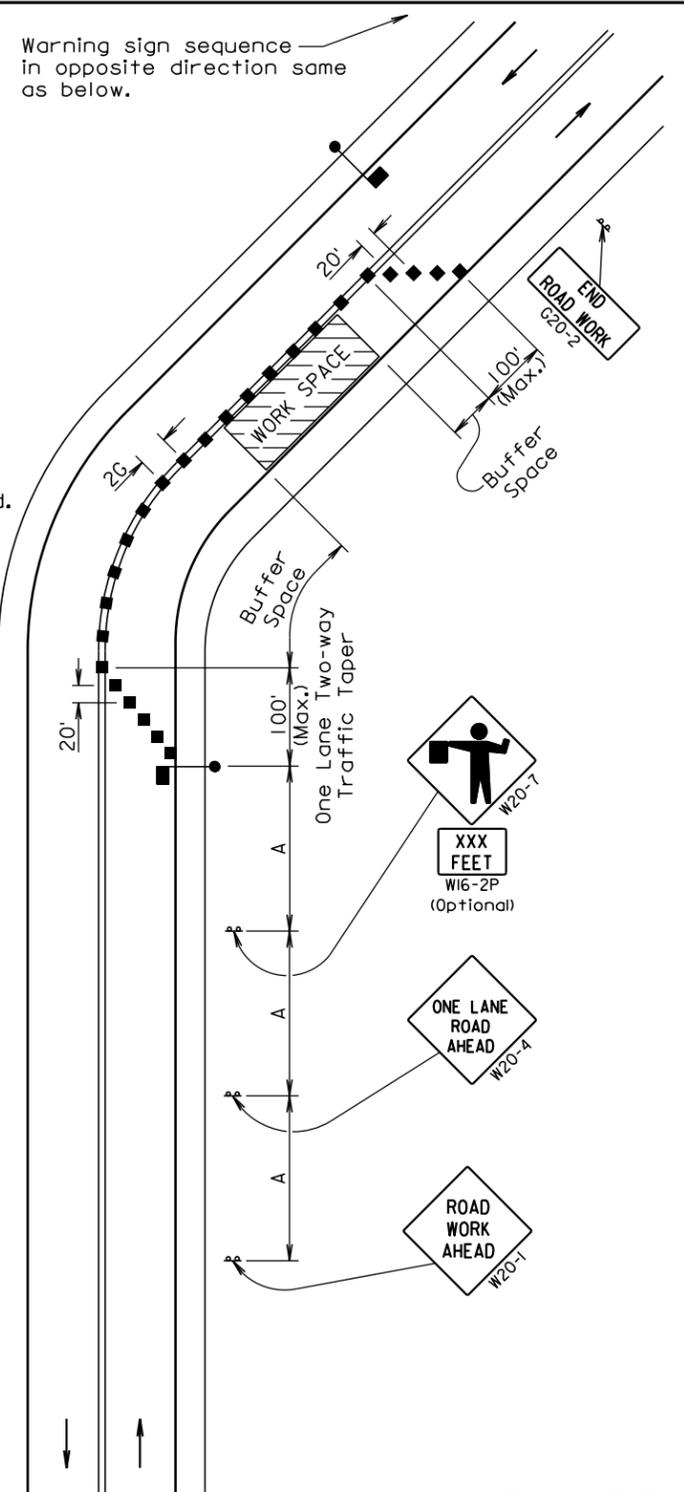


KEY	ITEM
(4 W)	4" White
(4 Y)	4" Yellow
(12 W)	12" White
(24 W)	24" White
(24 Y)	24" Yellow
↷	Arrow

September 14, 2011

Published Date: 1st Qtr. 2016	S D D O T	PAVEMENT MARKINGS FOR ADJACENT INTERSECTIONS AND CENTER TURN LANE	PLATE NUMBER 633.01
			Sheet 1 of 1

Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet) (A)	Spacing of Channelizing Devices (Feet) (C)
0 - 30	200	25
35 - 40	350	25
45 - 50	500	50
55	750	50
60 - 65	1000	50



Warning sign sequence in opposite direction same as below.

- 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.

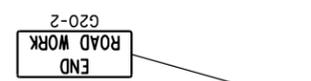
The ROAD WORK AHEAD and the END ROAD WORK signs may be omitted for short duration operations (1 hour or less).

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 drums or 42" cones.

Channelizing devices are not required along the centerline adjacent to work area when pilot cars are utilized for escorting traffic through the work area.



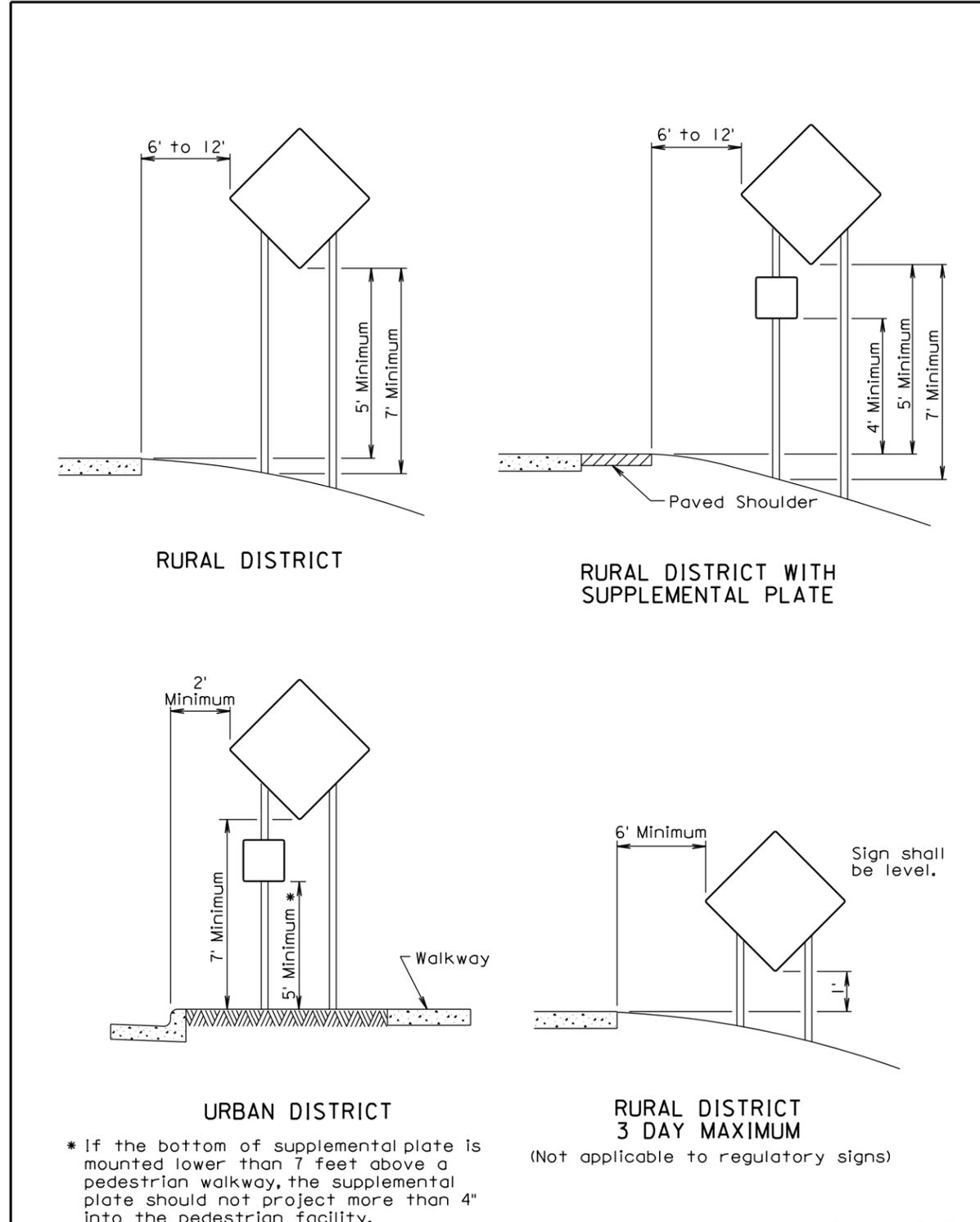
Channelizing devices and flaggers shall be used at intersecting roads to control intersecting road traffic as required.

The buffer space should be extended so that the two-way traffic taper is placed before a horizontal or vertical curve to provide adequate sight distance for the flagger and queue of stopped vehicles.

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

September 22, 2014

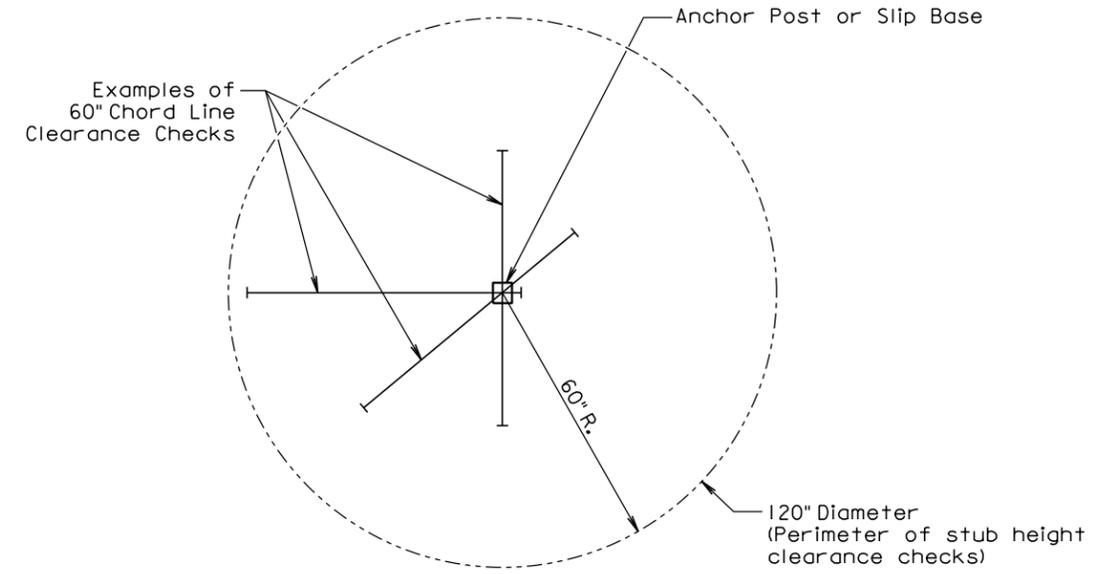
Published Date: 1st Qtr. 2016	S D D O T	GUIDES FOR TRAFFIC CONTROL DEVICES LANE CLOSURE WITH FLAGGER PROVIDED	PLATE NUMBER 634.23
			Sheet 1 of 1



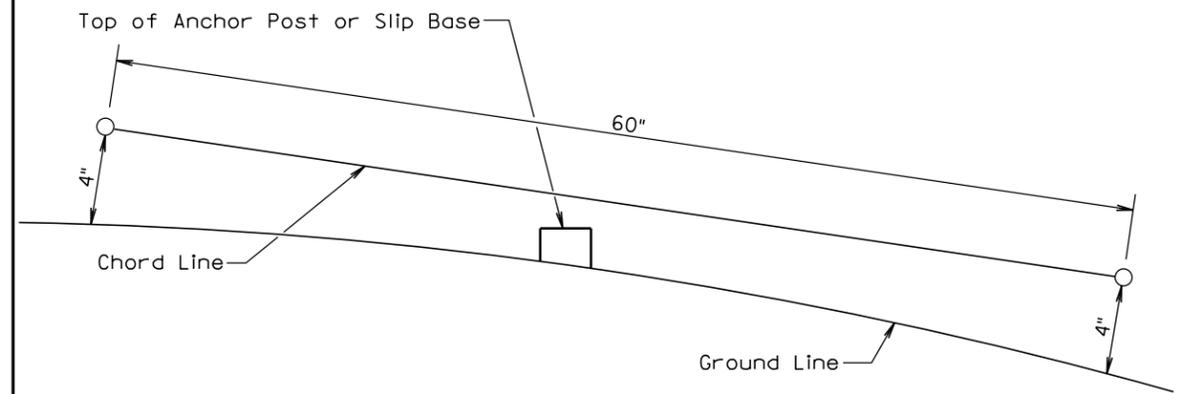
* If the bottom of supplemental plate is mounted lower than 7 feet above a pedestrian walkway, the supplemental plate should not project more than 4" into the pedestrian facility.

September 22, 2014

Published Date: 1st Qtr. 2016	S D D O T	CRASHWORTHY SIGN SUPPORTS (Typical Construction Signing)	PLATE NUMBER 634.85
			Sheet 1 of 1



PLAN VIEW
(Examples of stub height clearance checks)



ELEVATION VIEW

GENERAL NOTES:

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

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

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

July 1, 2005

<i>Published Date: 1st Qtr. 2016</i>	S D D O T	BREAKAWAY SUPPORT STUB CLEARANCE	PLATE NUMBER 634.99
			Sheet 1 of 1