

PLOT SCALE - 200,000000:1.000000

PLOTTED FROM - ITRC11625

STATE OF SOUTH DAKOTA  
DEPARTMENT OF TRANSPORTATION

PLANS FOR PROPOSED

PROJECT NO. 000N-491  
US HIGHWAY 16A &  
SD HIGHWAY 87  
CUSTER & PENNINGTON  
COUNTIES

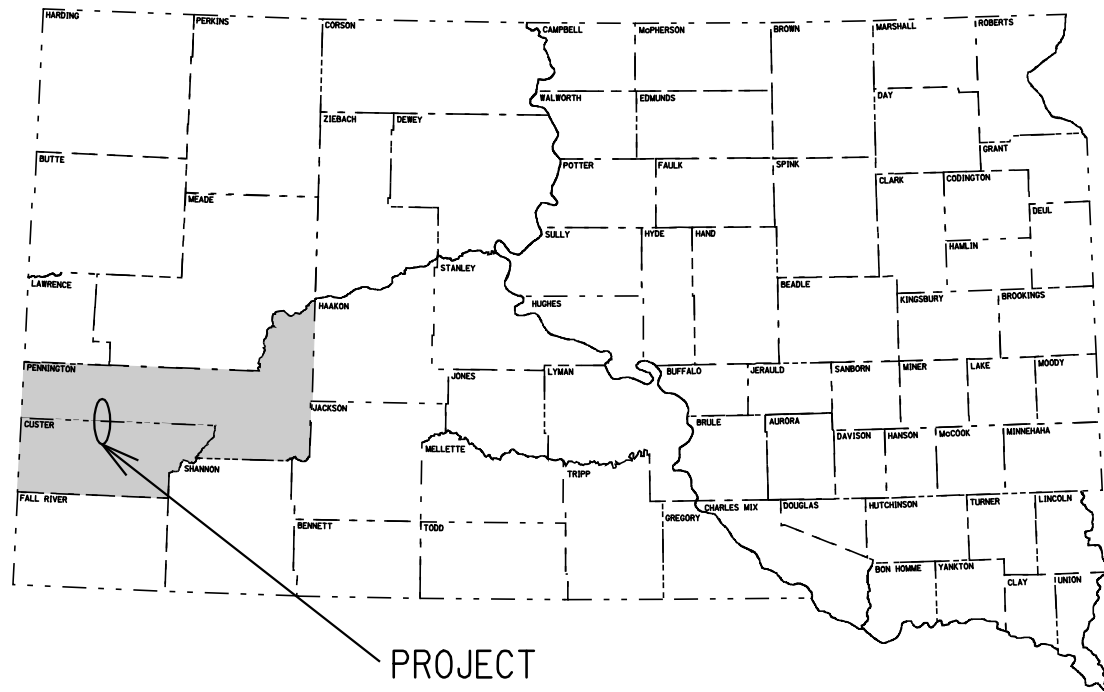
PAVEMENT MARKING  
PCN NO. 11UR

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	0000N-491	1	6

Plotting Date: 12-MAY-2010

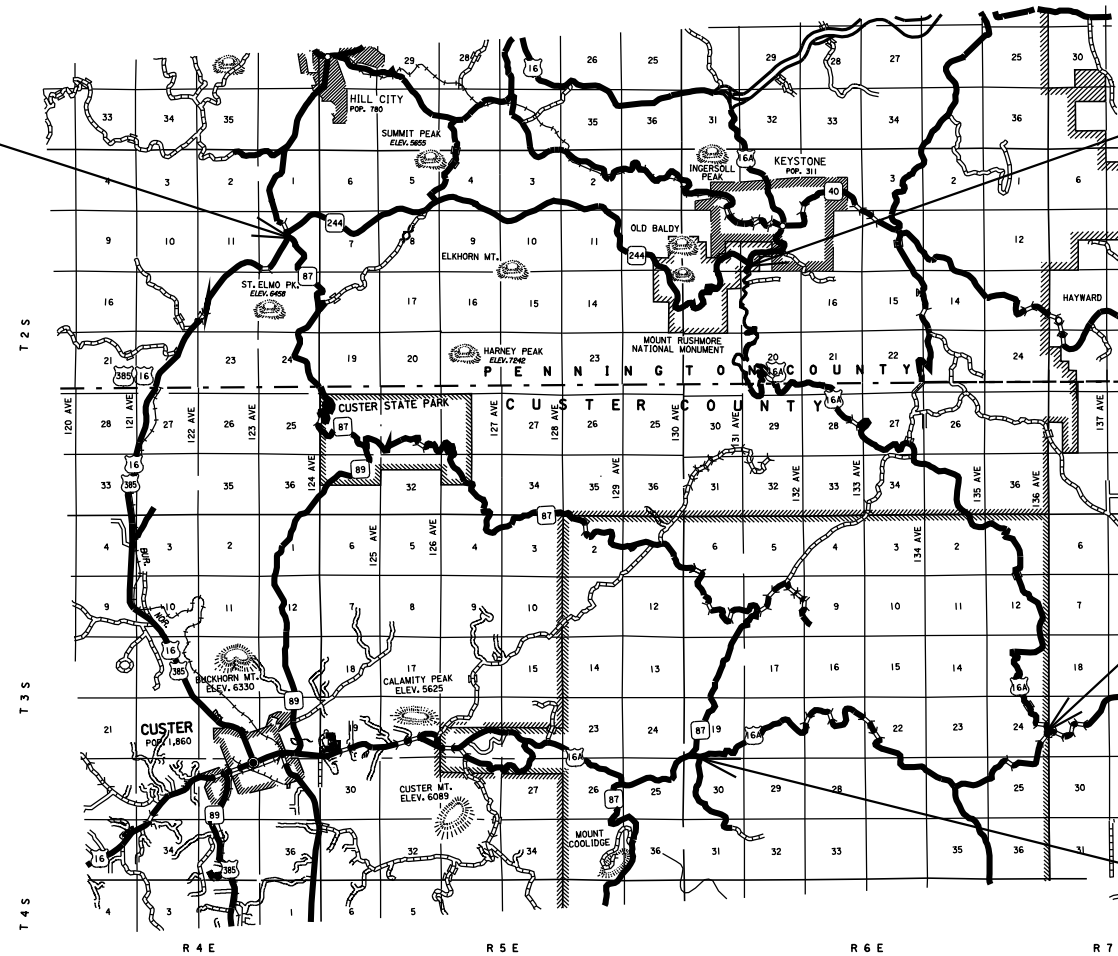
INDEX OF SHEETS

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- Sheets 2-3 Estimate of Quantities & General Notes
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END Project Hwy 87  
MRM 79.00+0.220

END Project Hwy 16A  
MRM 55.00+0.660



BEGIN Project Hwy 16A  
MRM 39.00+0.040

BEGIN Project Hwy 87  
MRM 59.00+0.380

US16A	17 Miles	MRM 39.00+0.040 to 55.00+0.660
SD87	20 Miles	MRM 59.00+0.380 to 79.00+0.220

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**ESTIMATE OF QUANTITIES**

Bid Item Number	Item	Quantity	Unit
009E0010	Mobilization	Lump Sum	LS
633E1300	Pavement Marking Paint, White	2,042.0	Gal
633E1305	Pavement Marking Paint, Yellow	1,021.0	Gal
634E0010	Flagging	20	Hour
634E0100	Traffic Control	238	Unit
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS

**WORK DESCRIPTION**

Work on this project consists of applying pavement markings on Highway 16A & Highway 87. Typical road description involves narrow winding roads with limited access and low, narrow tunnels.

**SPECIFICATIONS**

- South Dakota Department of Transportation Standard Specifications for Roads and Bridges. 2004 Edition, Required Provisions, Supplemental Specifications and/or Special Provisions as included in the Proposal.
- U.S. Department of Transportation Federal Highway Administration Manual on Uniform Traffic Control Devices. 2003 Edition and current Revisions.

**GENERAL NOTES**

- When the Contractor starts work on a highway he shall pursue the work on that highway to completion before commencing work on another highway.
- Beginning and ending of No Passing Zones will be marked by the Region Traffic Engineer prior to the start of work under this contract. The exact starting point for each route to be marked will be determined by the Region Traffic Engineer. The Contractor shall give the Region Traffic Engineer 2 weeks notice prior to starting painting on any route.
- Pavement edgelines will be a variable distance from centerline, as directed by the Region Traffic Engineer.
- Excess material shall be removed by brooming full width, including edgeline locations, and will be accomplished by SDDOT Maintenance Forces in advance of the Contractor's operations. All other brooming shall be incidental to the contract unit price bid for yellow and white paint.
- If a No Passing Zone is painted incorrectly, it shall be the Contractor's responsibility to completely remove the incorrect markings and paint correctly at no cost to the SDDOT. Pavement marking edgelines, centerlines, or No Passing Zone lines painted in a non-straight manner, with excessive overspray, in a poor workmanship like manner, or not conforming with the Pavement Marking Details and within the Tolerances listed below, shall be adequately obliterated in accordance with Standard Specification 634.3 D. and repainted at no cost to the SDDOT.
- The Contractor shall have a satisfactory calibrated meter on each color of paint to measure the quantity of paint used.
- Personnel operating the painting equipment shall demonstrate competence in this type of work and provide evidence of previous striping experience before commencing work on this project.

**GENERAL NOTES (CONTINUED)**

The SDDOT shall provide a representative on the project to coordinate, inspect painting operations, and document quantities for the striping operations.

The Contractor shall provide a detailed list showing route, length of route, and gallons of paint applied on each route. This list shall be signed by a representative of the Contractor before submittal to the SDDOT for payment. Payment will not be made until the SDDOT receives a detailed and signed list of paint applied.

**MAINTENANCE OF TRAFFIC**

Each construction work area shall be individually signed throughout the entire length of the construction work area.

Equipment and vehicles entering or exiting the roadway working within the right-of-way shall display a flashing amber light visible for a minimum distance of 1/4 mile in all directions. Hazard lights alone are not acceptable.

Resetting, temporary relocation and/or covering of existing or conflicting traffic control devices as necessary to adequately maintain traffic or perform the work, shall be the responsibility of the Contractor. This work shall be included in the contract lump sum price for Traffic Control, Miscellaneous.

Contractor 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.

Damage to the ditch due to the Contractor's operations shall be repaired by the Contractor, to the satisfaction of the Engineer, at no expense to the State.

**SEQUENCE OF OPERATIONS**

The Contractor shall maintain traffic in accordance with applicable MUTCD Standards, Section 4.4 and 634 of the Standard Specifications, and the details shown in these plans.

**SIGN TABULATION**

SIGN CODE	SIGN SIZE	DESCRIPTION	NUMBER REQUIRED	UNITS PER SIGN	UNITS
G20-2	36" x 18"	END ROAD WORK	2	17	34
W3-4	48" x 48"	BE PREPARED TO STOP	2	34	68
W20-1	48" x 48"	ROAD WORK ##### FT. OR AHEAD	2	34	68
W20-7a	48" x 48"	FLAGGER	2	34	68
<b>TOTAL UNITS</b>					<b>238</b>

**TRAFFIC CONTROL**

During painting operations, a lead vehicle equipped with a Type B Advance Warning Arrow Panel facing oncoming traffic, shall be used. The Type B Advance Warning Arrow Panel shall operate in the caution mode only. A trail vehicle, in the same position as the striping, and displaying a sign with the legend WET PAINT AHEAD and an arrow panel operating in the caution mode, or an alternative acceptable to the Region Traffic Engineer, shall be used at all times. PASS WITH CARE SIGNS shall also be used.

All other equipment shall display flashing amber lights visible to traffic in all directions as a minimum.

Flaggers will be required during US16A painting operations. Flaggers will be required to hold traffic for not more than 15 minutes at each end of portions of US16A while narrow stretches of that highway are being painted. The FLAGGER symbol signs shall be removed, covered or turned to face away from traffic when the flagger is not at the flagger station.

Painting will be allowed only during the hours from 1/2 hour after sunrise to 1/2 hour before sunset.

Cost of equipment and traffic control devices on equipment, including arrow panels and signs, will be paid for at the contract lump sum price for Traffic Control, Miscellaneous.

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

Whenever adequate stopping sight distance exists to the rear, the shadow vehicle should maintain the minimum distance from the work vehicle and proceed at the same speed. The shadow vehicle should slow down in advance of vertical or horizontal curves that restrict sight distance.

The shadow vehicles should also be equipped with two high-intensity flashing lights mounted on the rear, adjacent to the sign.

The distance between the work and shadow vehicles may vary according to terrain, paint drying time, and other factors.

Additional shadow vehicles to warn and reduce the speed of oncoming or opposing vehicular traffic may be used. No additional payment will be made for additional shadow vehicles.

A truck-mounted attenuator may be used on the shadow vehicle or on the work vehicle.

Shadow vehicles are used to warn motor vehicle traffic of the operation ahead.

During non-working hours, all materials and equipment shall be stored a minimum of 30 feet from the traveled lanes or 6' behind the curb and gutter in Urban areas.

Traffic control shall be provided in type and quantity as shown on the Traffic Control Plan Sheets. The use and placement of signs shall be as shown on the Traffic Control Plan Sheets or as required by the Engineer.

**TABLE OF PAVEMENT MARKING – SD87**

MRM to	MRM	Pavement Marking	Length (Mile)
59.00+0.380	66.00+0.600	No passing zone	7.22
66.00+0.600	72.00+0.010	No centerline or edgelines	5.41
72.00+0.010	73.00+0.250	No passing zone	1.24
73.00+0.250	73.00+0.480	None – SD87/SD89 intersection	0.23
73.00+0.480	74.00+0.350	No passing zone	0.87
74.00+0.350	74.00+0.990	No centerline or edgelines	0.64
74.00+0.990	77.00+0.120	No passing zone	2.13
77.00+0.120	--	Pedestrian crossing	0.00
77.00+0.120	79.00+0.220	No passing zone	2.10
			<b>19.84</b>

**RATES OF MATERIALS AND APPLICATION**

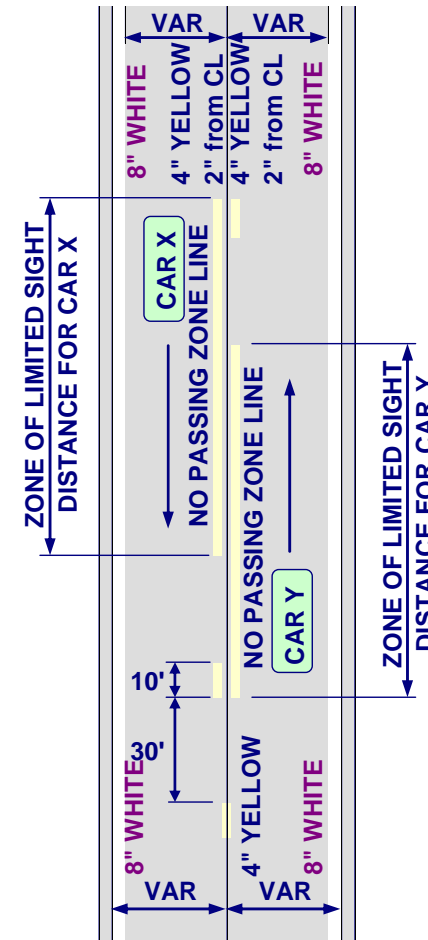
<b>Two Lane Roadway</b> (Rates for one line)
<u>Dashed Yellow Centerline</u> Rate = 4.6 Gals./Pass-Mile
<u>Solid Yellow Centerline</u> Rate = 16.9 Gals./Pass-Mile
<u>Solid White Edgeline</u> (Rate for one 8" line) Rate = 33.8 Gals./Pass-Mile
Glass Beads = 6 Lbs./Gal.

**TABLE OF PAVEMENT MARKING – US16A**

MRM to	MRM	Pavement Marking	Length (Mile)
39.00+0.040	50.00+0.480	No passing zone	11.44
50.00+0.480	50.00+0.510	No centerline or edgelines	0.03
50.00+0.510	52.00+0.060	No passing zone	1.55
52.00+0.060	52.00+0.400	Divided section	0.34
52.00+0.400	52.00+0.970	No passing zone	0.57
52.00+0.970	53.00+0.000	No centerline or edgelines	0.03
53.00+0.000	53.00+0.120	No passing zone	0.12
53.00+0.120	53.00+0.520	Divided section	0.40
53.00+0.520	53.00+0.630	No passing zone	0.11
53.00+0.630	53.00+0.680	No centerline or edgelines	0.05
53.00+0.680	54.00+0.030	No passing zone	0.35
54.00+0.030	54.00+0.070	No centerline (1 lane)	0.04
54.00+0.070	55.00+0.660	No passing zone	1.59
			<b>16.62</b>

**TABLE OF TUNNEL DIMENSIONS**

Highway	MRM	Height	Width
US16A	50+0.490	12'4"	13'4"
US16A	53+0.000	12'2"	13'2"
US16A	53+0.650	12'9"	14'0"
SD87	66+0.850	12'3"	9'0"
US87	72+0.000	12'0"	8'4"
US87	74+0.650	10'7"	10'6"



# US16A & SD87 Striping Map

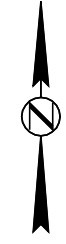
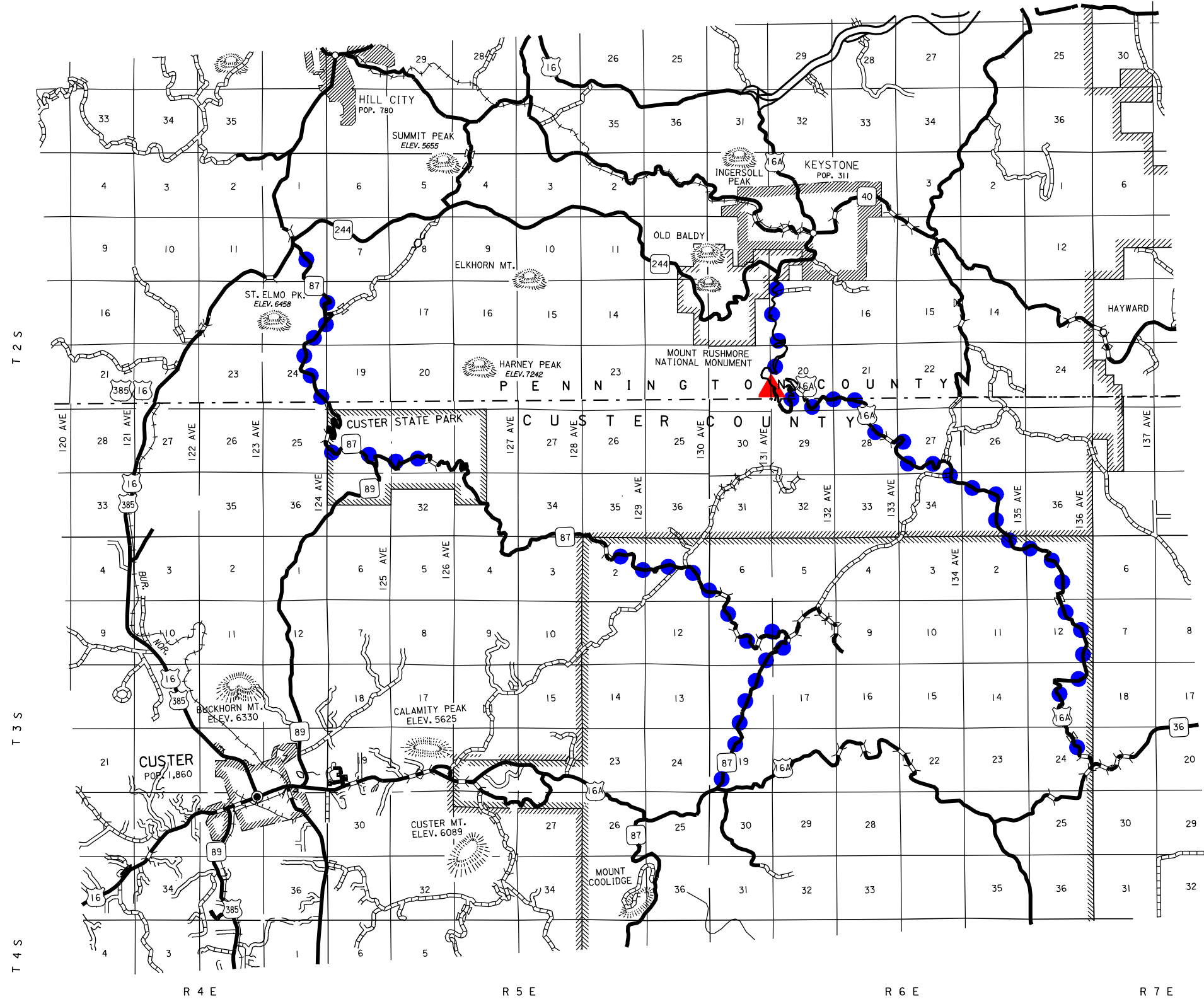
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
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**LEGEND**

- .....CENTERLINE & EDGELINES
- ▲ .....EDGELINES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	0000N-491	5	6

Plotting Date: 12-MAY-2010

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.

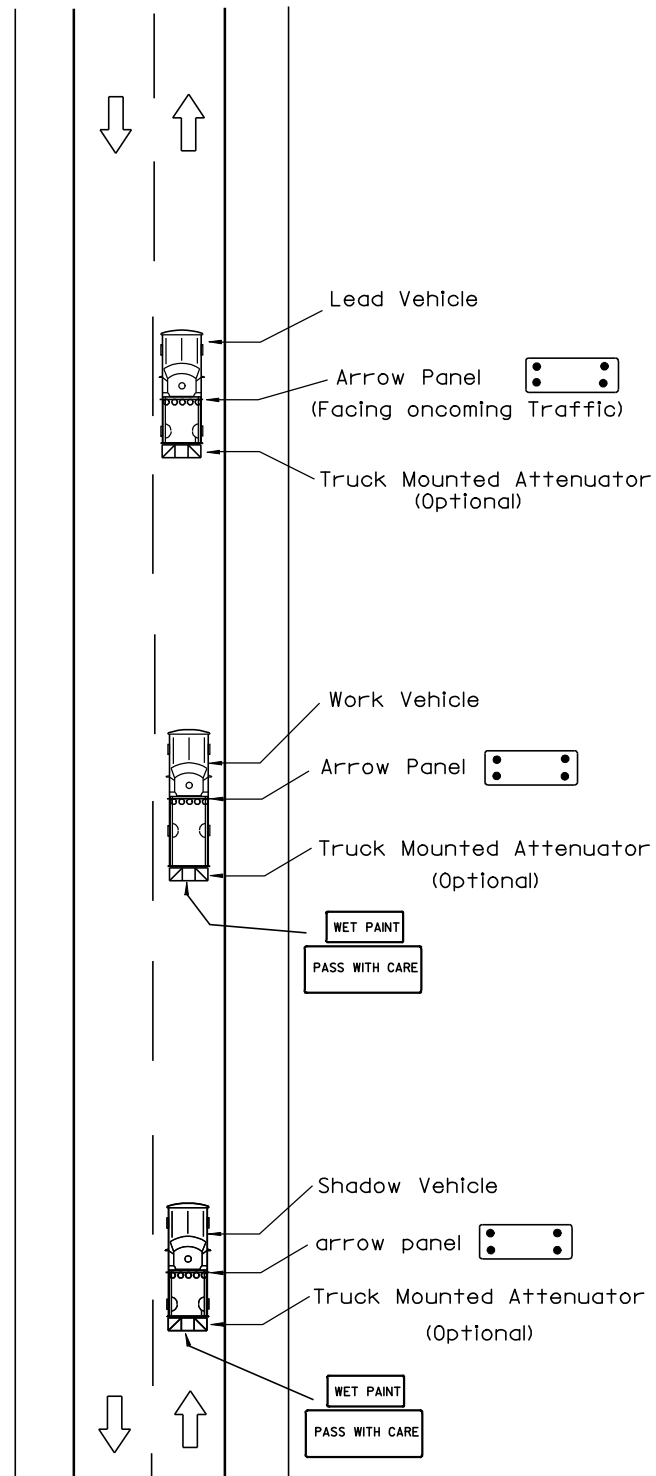
Shadow and Work vehicles shall display high-intensity rotating, flashing, oscillating, or strobe lights, flags, signs, or arrow panels.

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

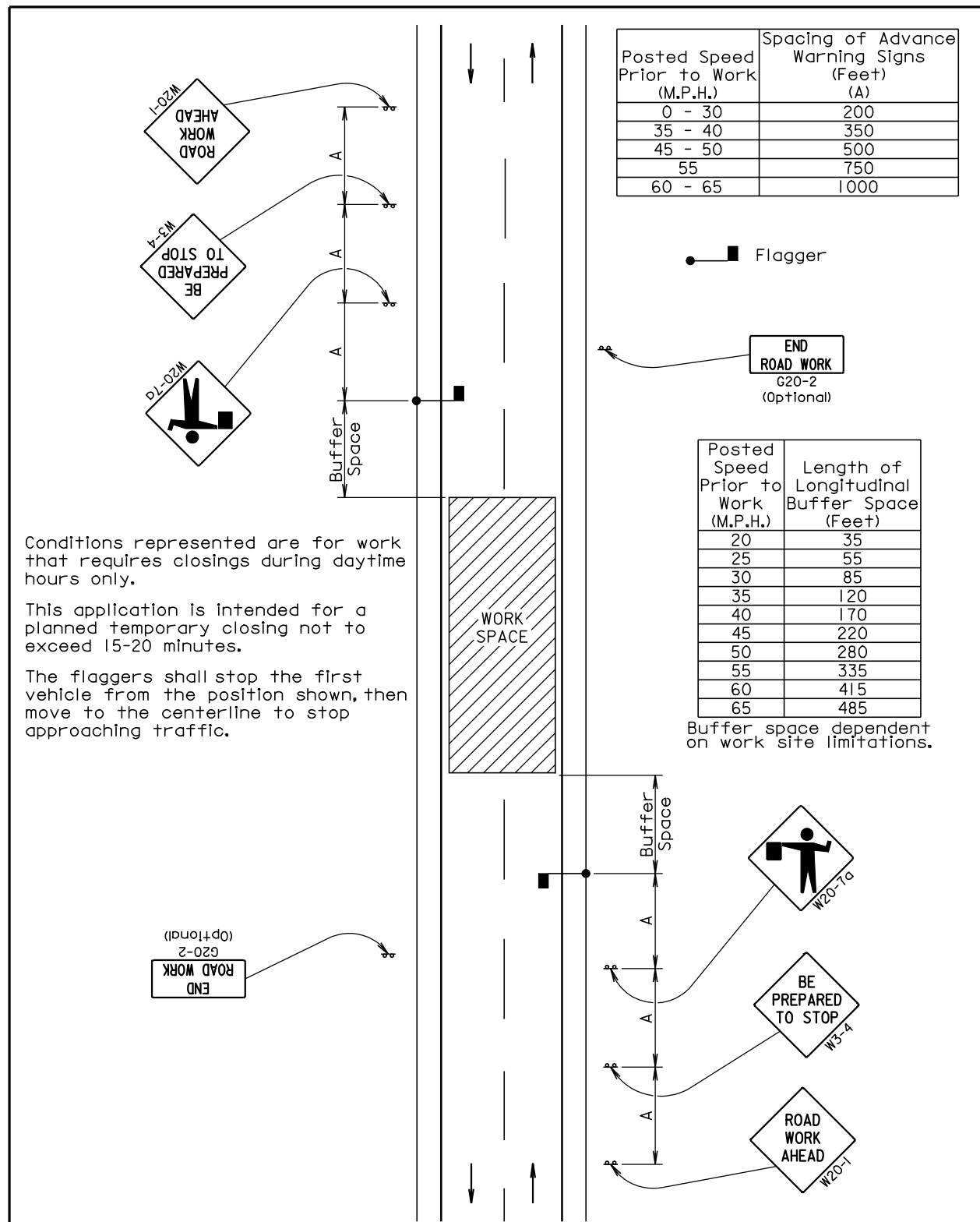
When an arrow panel is used, it shall be used in the caution mode

Arrow panels shall, as a minimum, be Type B, with a size of 1500 x 750mm (60 x 30) in.

MOBILE: Intermittent and continuous moving.



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



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

Flagger

END ROAD WORK G20-2 (Optional)

Posted Speed Prior to Work (M.P.H.)	Length of Longitudinal Buffer Space (Feet)
20	35
25	55
30	85
35	120
40	170
45	220
50	280
55	335
60	415
65	485

Buffer space dependent on work site limitations.

Conditions represented are for work that requires closings during daytime hours only.

This application is intended for a planned temporary closing not to exceed 15-20 minutes.

The flaggers shall stop the first vehicle from the position shown, then move to the centerline to stop approaching traffic.

END ROAD WORK G20-2 (Optional)

December 23, 2008

Published Date: 2nd Qtr. 2010

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**GUIDES FOR TRAFFIC CONTROL DEVICES  
TEMPORARY ROAD CLOSURE**

PLATE NUMBER  
634.30

Sheet 1 of 1