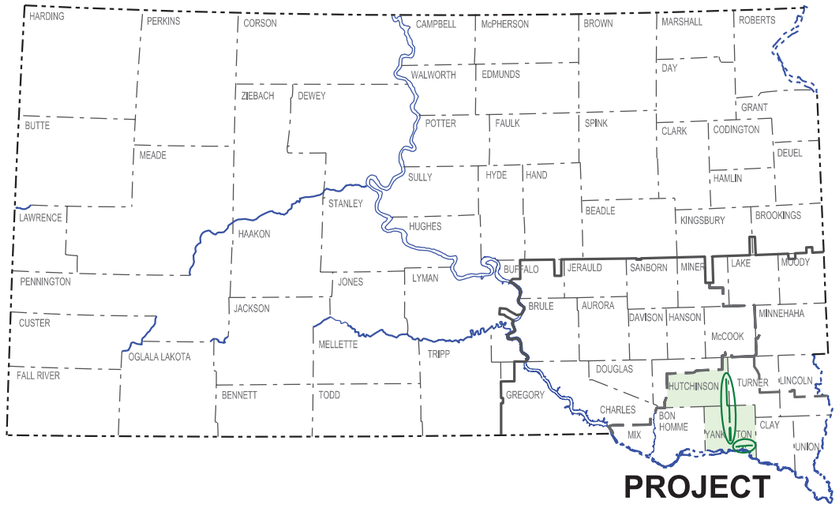


STATE OF SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION
PLANS FOR PROPOSED

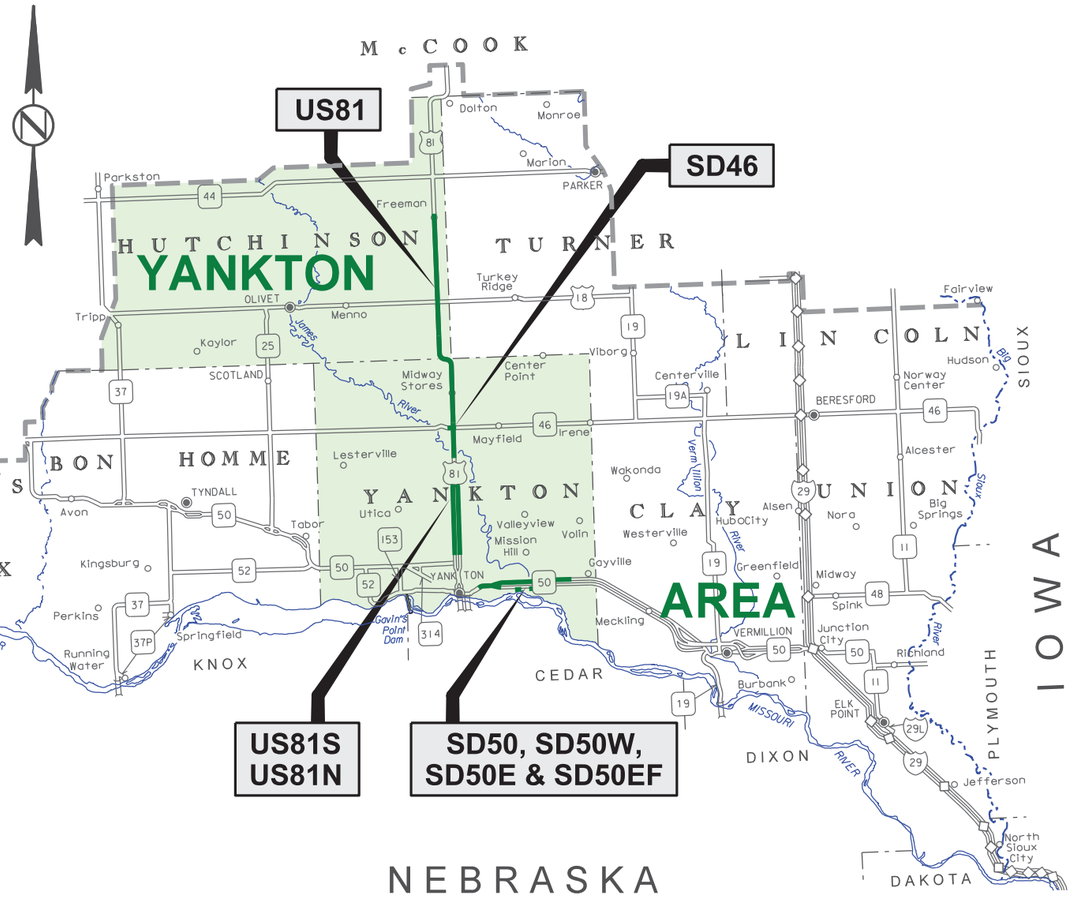
PROJECT NH–P 0023(73)

US HIGHWAY 81S, 81N & 81,
SD HIGHWAYS 46, 50, 50W, 50E & 50EF
HUTCHINSON & YANKTON COUNTIES
ASPHALT SURFACE TREATMENT &
ASPHALT SURFACE TREATMENT OF SHOULDERS
PCN 09WX

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH-P 0023(73)	1	29

Plotting Date: 02/18/2026

INDEX OF SHEETS



STORM WATER PERMIT
(None required)

7

May 6, 2026

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH-P 0023(73)	2	29

Plotting Date: 02/05/2026

US HIGHWAY 81
HUTCHINSON & YANKTON COUNTIES
ASPHALT SURFACE TREATMENT
LENGTH: 19.602 MILES

END US81
STA. 1035+00
MRM 35.00 +0.263
(715' N of ℄ Jct 278th St)

BEGIN US81
STA. 0+00
MRM 15.00 +0.491
(825' N of ℄ Jct SD46)

ADT (2024) 1,795

PLOT SCALE - 1:70000
PLOT NAME - 15
FILE - ...\2026 YAN AREA CHIP SEAL TITL09WX.DGN
PLOTTED FROM - TRYA1L032

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH-P 0023(73)	3	29

Plotting Date: 02/05/2026

US HIGHWAYS 81S
YANKTON COUNTY
ASPHALT SURFACE TREATMENT
OF SHOULDERS
SB GROSS LENGTH: 5.447 MILES
BRIDGE & APPROACH/SLEEPER
SLABS LENGTH: 0.030 MILE
SB NET LENGTH: 5.417 MILES

US HIGHWAYS 81N
YANKTON COUNTY
ASPHALT SURFACE TREATMENT
OF SHOULDERS
NB GROSS LENGTH: 5.447 MILES
BRIDGE & APPROACH/SLEEPER
SLABS LENGTH: 0.030 MILE
NB NET LENGTH: 5.417 MILES

US HIGHWAY 81 (AC) YANKTON COUNTY
ASPHALT SURFACE TREATMENT
LENGTH: 0.153 MILE

END US81S&N
STA. 200+00
MRM 9.62 +0.000
(At End Divided)

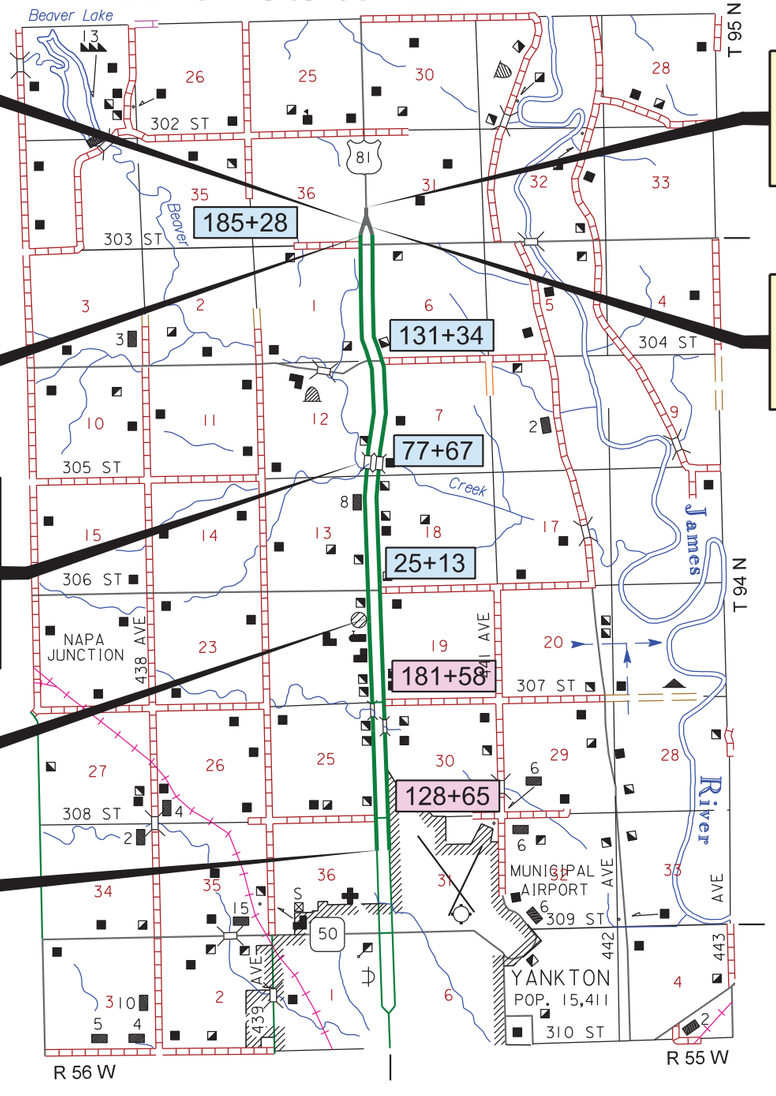
END ML PCC
BEGIN ML AC
STA. 192+54
MRM 9.00 +0.478

TWIN STR. NOS. 64-120/121-139
SB 83+43.75 to 84+53.09
NB 83+21.24 to 84+30.58
Twin Prestressed Girder Bridges
109'-4"=0.021 Mile MRM 7.43
Two Approach/Sleeper Slabs
1@22', 1@23'=45' = 0.009 Mile

EQUATION
219+15 Back =
10+05 Ahead

BEGIN US81S&N
STA.114+02
MRM 3.53 +0.039
(At Begin New PCC)

US81 ADT (2024) 3,545
US81S ADT (2025) 2,841
US81N ADT (2025) 2,840



END US81 (AC)
STA. 208+10
MRM 9.62 +0.153
(At End New AC)

BEGIN US81 (AC)
STA. 200+00
MRM 9.62 +0.000
(At Begin Undivided)

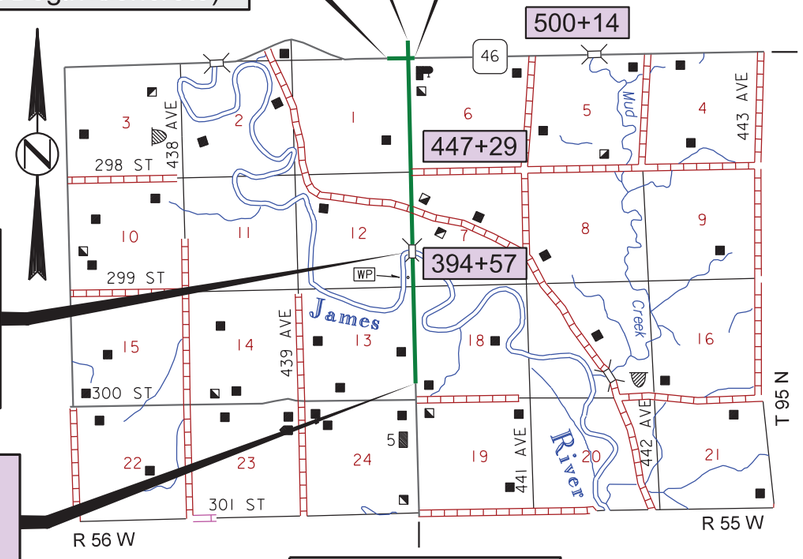
US HIGHWAY 81
YANKTON COUNTY
ASPHALT SURFACE TREATMENT
OF SHOULDERS
GROSS LENGTH: 3.020 MILES
BRIDGE & APPROACH/SLEEPER
SLABS LENGTH: 0.066 MILE
NET LENGTH: 2.954 MILES

SD HIGHWAY 46
YANKTON COUNTY
ASPHALT SURFACE TREATMENT
OF SHOULDERS
LENGTH: 0.203 MILE

END US81
STA. 508+39
MRM 15.00 +0.491
(825' N of ℄ Jct SD46)

BEGIN SD46
STA. 0+00
MRM 334.00 +0.366
(At Begin Concrete)

END SD46
STA. 10+72
MRM 334.56 +0.031
(105' E of Jct US81)



STR. NO. 68-120-077
Sta. 408+53 to Sta. 411+61
Cont. Comp. Girder Bridge
307'-6" = 0.058 Mile
MRM 13.66
Two Approach/Sleeper Slabs
2@22'=44'=0.008 Mile

BEGIN US81
STA. 348+95
MRM 12.36 +0.109
(At Begin ML PCC)

ADT (2024) 1,059

PLOT SCALE - 1:7000
PLOTTED FROM - TRYA1L032
PLOT NAME - 13
FILE - ...\2026 YAN AREA CHIP SEAL TITL09WX.DGN

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH-P 0023(73)	4	29

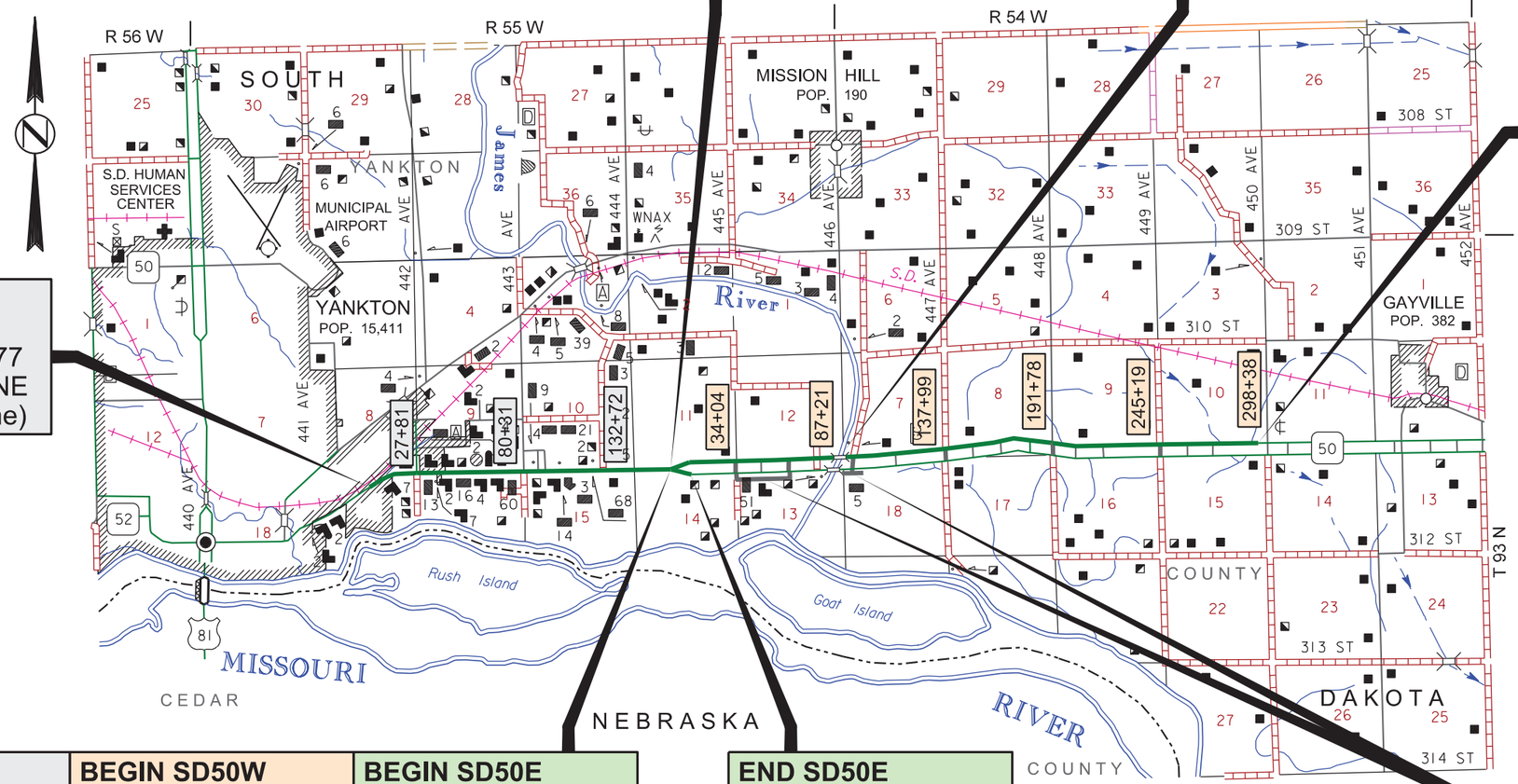
Plotting Date: 02/05/2026

SD HIGHWAYS 50, 50W, 50E & 50EF
YANKTON COUNTY
ASPHALT SURFACE TREATMENT OF SHOULDERS
SD50 LENGTH: 2.868 MILES
SD50W GROSS LENGTH: 5.625 MILES
SD50W BRIDGE & APPROACH/SLEEPER SLABS LENGTH: 0.074 MILE
SD50W NET LENGTH: 5.551 MILES
SD50E LENGTH: 0.231 MILE
SD50EF LENGTH: 0.705 MILE

EQUATION
SD50 151+45 Back =
SD50W 0+00 Ahead
SD50E 0+00 Ahead

STR. NO. 68-180-200 (SD50W)
Sta. 84+76 to Sta. 88+02
Continuous Composite Girder Bridge
326'-1 9/16"=0.062 Mile MRM 390.05
Appr Slabs 2@33'=66' = 0.013 Mile

END SD50W
STA. 297+01
MRM 394.00 +0.028
(At Concrete Change
137' W of 450 Ave)



BEGIN SD50
STA. 0+00
MRM 385.00 +0.277
(At End C&G just NE
of Jct Archery Lane)

END SD50	BEGIN SD50W	BEGIN SD50E
STA. 151+45	STA. 0+00	STA. 0+00
MRM 388.24 +0.000	MRM 388.24 +0.000	MRM 388.24 +0.000
(At Begin Widening to Divided Section)	(At Begin Widening to Divided Section)	(At Begin Widening to Divided Section)

END SD50E
STA. 12+20
MRM 388.24 +0.231
(At End Widening for
full Divided Section)

SD50EF
Lane Rd - 2,625' from 445 Ave E to Antler Dr
MRM 389.00 +0.097 to MRM 389.00 +0.593
1,100' from James River E to End Frontage
MRM 390.05 +0.000 to MRM 390.05 +0.208

SD50 ADT (2024) 9,987
SD50W ADT (2024) 2,818
SD50E ADT (2024) 2,712

ESTIMATE OF QUANTITIES

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH-P 0023(73)	5	29

Rev 3/10 NP (MR)

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
009E4100	Construction Schedule, Category I	Lump Sum	LS
330E0300	SS-1h or CSS-1h Asphalt for Fog Seal	203.0	Ton
330E3000	Sand for Fog Seal	55.2	Ton
360E0042	CRS-2P Asphalt for Surface Treatment	869.4	Ton
360E1040	Type 2B Cover Aggregate	5,058.7	Ton
360E1040	Type 2B Cover Aggregate	98.1	Ton
360E1040	Type 2B Cover Aggregate	129.5	Ton
360E1040	Type 2B Cover Aggregate	466.0	Ton
360E1040	Type 2B Cover Aggregate	19.4	Ton
360E1040	Type 2B Cover Aggregate	119.0	Ton
633E1200	High Build Waterborne Pavement Marking Paint, White	1,124	Gal
633E1205	High Build Waterborne Pavement Marking Paint, Yellow	450	Gal
633E3000	Durable Pavement Marking, 4" White	174,182	Ft
633E3005	Durable Pavement Marking, 4" Yellow	141,201	Ft
633E3010	Durable Pavement Marking, 8" White	1,931	Ft
633E3030	Durable Pavement Marking, 24" White	1,195	Ft
633E3035	Durable Pavement Marking, 24" Yellow	938	Ft
633E3045	Durable Pavement Marking, Arrow	91	Each
633E3060	Durable Pavement Marking, Message	10	Word
633E5050	Surface Preparation for Pavement Marking	51,202	Ft
633E5052	Surface Preparation for Pavement Marking	5	Each
633E5100	Grooving for Durable Pavement Marking, 4"	258,916	Ft
633E5105	Grooving for Durable Pavement Marking, 8"	1,931	Ft
633E5115	Grooving for Durable Pavement Marking, 24"	1,898	Ft
633E5125	Grooving for Durable Pavement Marking, Arrow	86	Each
633E6020	Pavement Marking Masking, 25"	96	Ft
633E6040	Pavement Marking Masking, Message	5	Word
633E9200	Mobile Retroreflectometer Measurements	60.000	Mile
634E0010	Flagging	760.0	Hour
634E0020	Pilot Car	125.0	Hour
634E0110	Traffic Control Signs	2,085.2	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0275	Type 3 Barricade	6	Each
634E0420	Type C Advance Warning Arrow Board	6	Each
634E0630	Temporary Pavement Marking	59.3	Mile
634E1255	Contractor Furnished Vehicle Speed Feedback Sign	6	Each

ESTIMATE OF QUANTITIES (FOR INFORMATION ONLY)

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH-P 0023(73)	6	29

Rev 3/10 NP (MR)

BID ITEM NUMBER	ITEM	US HWY 81	US HWY 81 SHOULDERS	SD HWY 46 SHOULDERS	US HWY S&N 81SHOULDERS	US HWY 81 AC	SD HWY 50	SD HWY 50W	SD HWY 50E	SD HWY 50EF	TOTAL QUANTITY
009E0010	Mobilization	<----------Lump Sum---------->									Lump Sum
009E4100	Construction Schedule Category I										
330E0300	SS-1h or CSS-1h Asphalt for Fog Seal	145.7	3.8	0.3	27.9	4.1	3.7	13.4	0.6	3.6	203.0 Ton
330E3000	Sand for Fog Seal	39.2	2.0	1.0	3.0	0.5	3.0	3.0	2.0	1.5	55.2 Ton
360E0042	CRS-2P Asphalt for Surface Treatment	745.9				14.4	19.1	68.7	2.9	18.4	869.4 Ton
360E1040	Type 2B Cover Aggregate	5058.7									5058.7 Ton
360E1040	Type 2B Cover Aggregate					98.1					98.1 Ton
360E1040	Type 2B Cover Aggregate						129.5				129.5 Ton
360E1040	Type 2B Cover Aggregate							466.0			466.0 Ton
360E1040	Type 2B Cover Aggregate								19.4		19.4 Ton
360E1040	Type 2B Cover Aggregate									119.0	119.0 Ton
633E1200	High Build Pavement Marking Paint, White	1103				21					1124 Gal
633E1205	High Build Pavement Marking Paint, Yellow	424				25.9					450 Gal
633E3000	Durable Pavement Marking, 4" White		31673	2423	63303		36140	38148	2495		174182 Ft
633E3005	Durable Pavement Marking, 4" Yellow		19529	2842	52272		31163	32955	2440		141201 Ft
633E3010	Durable Pavement Marking, 8" White				1931						1931 Ft
633E3030	Durable Pavement Marking, 24" White		227	60	908						1195 Ft
633E3035	Durable Pavement Marking, 24" Yellow		200	175				563			938 Ft
633E3045	Durable Pavement Marking, Arrow		5	3	19		64				91 Each
633E3060	Durable Pavement Marking, Message		4	5	1						10 Word
633E5050	Surface Preparation for Pavement Marking		51202								51202 Ft
633E5052	Surface Preparation for Pavement Marking		5								5 Each
633E5100	Grooving for Durable Pavement Marking, 4"				115575		67303	71103	4935		258916 Ft
633E5105	Grooving for Durable Pavement Marking, 8"				1931						1931 Ft
633E5115	Grooving for Durable Pavement Marking, 24"		427		908			563			1898 Ft
633E5125	Grooving for Durable Pavement Marking, Arrow			3	19		64				86 Each
633E6020	Pavement Marking Masking, 25"	96									96 Ft
633E6040	Pavement Marking Masking, Message	5									5 Each
633E9200	Mobile Reflectometer Measurements		9.77	1.04	22.42		12.74	13.57	0.93		60 Mile
634E0010	Flagging	480	30	16	64	20	40	60	20	30	760 Hour
634E0020	Pilot Car	120				2				3	125 Hour
634E0110	Traffic Control Signs	642.7	166.0	115.0	478.0	96.0	152.5	324.5	57.5	53.0	2085.2 SqFt
634E0120	Traffic Control, Miscellaneous	<----------Lump Sum---------->									Lump Sum
634E0275	Type 3 Barricade				2		2	1	1		6 Each
634E0420	Type C Advance Warning Arrow Board				2		2	1	1		6 Each
634E0630	Temporary Pavement Marking	58.8				0.5					59.3 Mile
634E1255	Contractor Furnished Vehicle Speed Feedback Sign				2.0		2.0	1.0	1.0		6.0 Each

ENVIRONMENTAL COMMITMENTS

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH-P 0023(73)	7	29

ENVIRONMENTAL COMMITMENTS

The SDDOT is committed to protecting the environment and uses Environmental Commitments as a communication tool for the Engineer and Contractor.
to ensure that attention is given to avoid, minimize, and/or mitigate an environmental impact. Environmental commitments to various agencies and the public have been made to secure approval of this project. An agency with permitting authority can delay a project if identified 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. During construction, the Project Engineer will verify that the Contractor has met Environmental Commitment requirements. These environmental commitments are not subject to change without prior written approval from the SDDOT Environmental Office.

Additional guidance on SDDOT's Environmental Commitments can be accessed through the Environmental Procedures Manual found at: <https://dot.sd.gov/media/3677d319/EnvironmentalProceduresManual.pdf >

For questions regarding change orders in the field that may have an effect on an Environmental Commitment, the Project Engineer will contact the Environmental Engineer at 605-773-3180 or 605-773-4336 to determine whether an environmental analysis and/or resource agency coordination is necessary.

Once construction is complete, the Project Engineer will review all environmental commitments for the project and document their completion.

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 pits, or staging areas associated with the project, cease construction activities in the affected area until the Whooping Crane departs and immediately contact the Project Engineer. The Project Engineer will contact the Environmental Office so that the sighting can be reported to USFWS.

COMMITMENT B4: BALD AND GOLDEN EAGLE

Bald and/or Golden 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 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 will furnish a site(s) for the disposal of construction and/or demolition debris generated by this project.

Action Taken/Required:

Construction and/or demolition of debris may not be disposed of within the Public ROW.

The waste disposal site(s) will be managed and reclaimed in accordance with the following from the General Permit for Construction/Demolition Debris Disposal Under the South Dakota Waste Management Program issued by the Department of Agriculture and Natural Resources.

The waste disposal site(s) will 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 Environmental Office and the Project Engineer.

If the waste disposal site(s) is located such that it is within view of any ROW, the following additional requirements will apply:

1. Construction and/or demolition debris consisting of concrete, asphalt concrete, or other similar materials will be buried in a trench separate from wood debris. The final cover over the construction and/or demolition debris will consist of a minimum of 1 foot of soil capable of supporting vegetation. Waste disposal sites provided outside of the Public ROW will be seeded in accordance with Natural Resources Conservation Service recommendations. The seeding recommendations may be obtained through the appropriate County NRCS Office. The Contractor will control the access to waste disposal sites not within the Public ROW with 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 not to exceed the duration of the project. Prior to project completion, the waste will 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) will be incidental to the various contract items.

COMMITMENT I: HISTORIC PRESERVATION OFFICE CLEARANCES

The SDDOT has obtained concurrence with the State Historic 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 a cultural resource review prior to scheduling the pre-construction meeting. 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 will arrange and pay for a record search and when necessary, a cultural resource survey. 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 if the site was previously surveyed; however, a cultural resources survey may need to be conducted by a qualified archaeologist.

The Contractor will provide ARC with the following: a topographical map or aerial view in 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 will submit the cultural resources survey report to SDDOT Environmental Office, 700 East Broadway Avenue, Pierre, SD 57501-2586. 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.

In the event of an inadvertent discovery of human remains, funerary objects, or if evidence of cultural resources is identified during project construction activities, then such activities within 150 feet of the inadvertent discovery will
immediately cease and the Project Engineer will be immediately notified. The Project Engineer will contact the SDDOT Environmental Office, who will contact the appropriate SHPO/THPO within 48 hours of the discovery to determine an appropriate course of action.

SHPO/THPO review does not relieve the Contractor of the responsibility/The Contractor is responsible 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 will not utilize a site known or suspected of having contaminated soil or water. The Contractor will provide the required permits and clearances to the Project Engineer at the preconstruction meeting.

RATES OF MATERIALS AND TABLE OF ADDITIONAL QUANTITIES

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH-P 0023(73)	8	29

US81
Mainline **0+00 to 1035+00** **19.602 miles**

CRS-2P Asphalt for Surface Treatment at the rate of 37.11 tons/mile applied 39 feet wide (Rate = 0.38 gallon per square yard).

Type 2B Cover Aggregate at the rate of 251.68 tons/mile applied 39 feet wide (Rate = 22 pounds per square yard).

SS-1h or CSS-1h Asphalt for Fog Seal at the rate of 7.25 tons/mile applied 39 feet wide (Rate = 0.075 gallons per square yard).

US HWY 81 TABLE OF ADDITIONAL QUANTITIES

LOCATION		CRS-2P ASPHALT SURFACE TREATMENT TON	TYPE 2B COVER AGGREGATE TON	CSS-1H ASPH.FOR FOG SEAL TON
US Hwy 81				
Sta 1027+85 Turn Lane at 278th St Rates = 0.38 gal, 22 lb & 0.075 gal/SqYd	1046 SqYd	1.69	11.50	0.33
Sta 100+141 Turn Lane at E.6th St in Freeman Rates = 0.38 gal, 22 lb & 0.075 gal/SqYd	920 SqYd	1.49	10.12	0.29
Sta 922+01 Turn Lane at 286th St @ US18 Rates = 0.38 gal, 22 lb & 0.075 gal/SqYd	1210 SqYd	1.96	13.31	0.38
Sta 606+26 Turn Lane at 280th St Rates = 0.38 gal, 22 lb & 0.075 gal/SqYd	3990 SqYd	6.47	43.89	1.26
Sta 307+91 Turn Lane at 291th St Rates = 0.38 gal, 22 lb & 0.075 gal/SqYd	4221 SqYd	6.84	46.43	1.33
US Hwy 81 Total Additional Quantities		**18.45**	**125.25**	**3.59**

US HWY 81SUMMARY OF MATERIAL QUANTITIES

	MILES	CRS-2P	TYPE 2B	CSS-1H
Mainline	19.602	727.43	4933.43	142.11
Additional Quantities		18.45	125.25	3.59
US HWY 81 Total Tons		**745.88**	**5058.68**	**145.7**

US HWY 81 SHOULDERS
Shoulders **348+95 to 408+53** **1.128 miles**
411+61 to 508+39 **1.825 miles**

SS-1h or CSS-1h Asphalt for Fog Seal at the rate of 1.30 tons/mile applied 7 feet wide (Rate = 0.075 gallons per square yard).

US HWY 81 SHOULDERS SUMMARY OF MATERIAL QUANTITIES

	MILES	CRS-2P	TYPE 2B	CSS-1H
Shoulders	2.954			3.84
US 81 @ 46 Total Tons				**3.84**

SD HWY 46 SHOULDERS
Shoulders **0+00 to 10+72** **0.203 miles**

SS-1h or CSS-1h Asphalt for Fog Seal at the rate of 1.30 tons/mile applied 7 feet wide (Rate = 0.075 gallons per square yard).

SD HWY 46 SHOULDERS SUMMARY OF MATERIAL QUANTITIES

	MILES	CRS-2P	TYPE 2B	CSS-1H
Shoulders	0.203			0.26
SD HWY 46 Total Tons				**0.26**

US HWY 81 SOUTH & NORTH SHOULDERS
SOUTHBOUND SHOULDERS

Inside Shoulders **114+02 to 192+54** **5.417 miles**

SS-1h or CSS-1h Asphalt for Fog Seal at the rate of 1.11 tons/mile applied 6 feet wide (Rate = 0.075 gallons per square yard).

Outside Shoulders **114+02 to 192+54** **5.417 miles**

SS-1h or CSS-1h Asphalt for Fog Seal at the rate of 1.47 tons/mile applied 8 feet wide (Rate = 0.075 gallons per square yard).

NORTHBOUND SHOULDERS

Inside Shoulders **114+02 to 192+54** **5.417 miles**

SS-1h or CSS-1h Asphalt for Fog Seal at the rate of 1.11 tons/mile applied 6 feet wide (Rate = 0.075 gallons per square yard).

Outside Shoulders **114+02 to 192+54** **5.417 miles**

SS-1h or CSS-1h Asphalt for Fog Seal at the rate of 1.47 tons/mile applied 8 feet wide (Rate = 0.075 gallons per square yard).

US HWY 81 N&S SHOULDERS SUMMARY OF MATERIAL QUANTITIES

	MILES	CRS-2P	TYPE 2B	CSS-1H
NORTHBOUND				
Inside Shoulders	5.417			6.01
Outside Shoulders	5.417			7.96
SOUTHBOUND				
Inside Shoulders	5.417			6.01
Outside Shoulders	5.417			7.96
US 81 N&S TOTAL TONS				**27.94**

RATES OF MATERIALS AND TABLE OF ADDITIONAL QUANTITIES

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH-P 0023(73)	9	29

US HWY 81 (AC)
Southbound Mainline 192+54 to 199+88 0.141 miles

CRS-2P Asphalt for Surface Treatment at the rate of 24.74 tons/mile applied 26 feet wide (Rate = 0.38 gallon per square yard).

Type 2B Cover Aggregate at the rate of 167.78 tons/mile applied 26 feet wide (Rate = 22 pounds per square yard).

SS-1h or CSS-1h Asphalt for Fog Seal at the rate of 7.43 tons/mile applied 40 feet wide (Rate = 0.075 gallons per square yard).

Northbound Mainline 192+54 to 199+88 0.141 miles

CRS-2P Asphalt for Surface Treatment at the rate of 24.74 tons/mile applied 26 feet wide (Rate = 0.38 gallon per square yard).

Type 2B Cover Aggregate at the rate of 167.78 tons/mile applied 26 feet wide (Rate = 22 pounds per square yard).

SS-1h or CSS-1h Asphalt for Fog Seal at the rate of 7.43 tons/mile applied 40 feet wide (Rate = 0.075 gallons per square yard).

Mainline 199+88 to 208+10 0.160 miles

CRS-2P Asphalt for Surface Treatment at the rate of 24.74 tons/mile applied 26 feet wide (Rate = 0.38 gallon per square yard).

Type 2B Cover Aggregate at the rate of 167.78 tons/mile applied 26 feet wide (Rate = 22 pounds per square yard).

SS-1h or CSS-1h Asphalt for Fog Seal at the rate of 8.18 tons/mile applied 44 feet wide (Rate = 0.075 gallons per square yard).

US81 (AC) TABLE OF ADDITIONAL QUANTITIES

LOCATION		CRS-2P ASPHALT SURFACE TREATMENT TON	TYPE 2B COVER AGGREGATE TON	CSS-1H ASPH.FOR FOG SEAL TON
US Hwy 81				
Sta. 199+08 to 208+10	2178 SqYd	3.53	23.95	0.69
Rates = 0.38 gal, 22 lb & 0.075 gal/SqYd				
US Hwy 81 Total Additional Quantities		**3.54**	**23.95**	**0.69**

US HWY 81(AC) SUMMARY OF MATERIAL QUANTITIES

	MILES	CRS-2P	TYPE 2B	CSS-1H
Southbound Mainline	0.141	3.48	23.65	1.04
Northbound Mainline	0.141	3.48	23.65	1.04
Mainline	0.160	3.95	26.84	1.31
Additional Quantities		3.53	23.95	0.69
US 81 AC Total Tons		**14.44**	**98.09**	**4.08**

SD HWY 50 SHOULDERS
Shoulders 0+00 to 151+45 2.868 miles

CRS-2P Asphalt for Surface Treatment at the rate of 6.67 tons/mile applied 7 feet wide (Rate = 0.38 gallon per square yard).

Type 2B Cover Aggregate at the rate of 45.17 tons/mile applied 7 feet wide (Rate = 22 pounds per square yard).

SS-1h or CSS-1h Asphalt for Fog Seal at the rate of 1.30 tons/mile applied 7 feet wide (Rate = 0.075 gallons per square yard).

SD HWY 50 SUMMARY OF MATERIAL QUANTITIES

	MILES	CRS-2P	TYPE 2B	CSS-1H
Shoulders	2.868	19.12	129.54	3.72
SD HWY 50 Total Tons		**19.12**	**129.54**	**3.72**

SD HWY 50W SHOULDERS
Inside Shoulders 0+00 to 84+76 1.605 miles
88+02 to 297+01 3.950 miles

CRS-2P Asphalt for Surface Treatment at the rate of 5.70 tons/mile applied 6 feet wide (Rate = 0.38 gallon per square yard).

Type 2B Cover Aggregate at the rate of 38.72 tons/mile applied 6 feet wide (Rate = 22 pounds per square yard).

SS-1h or CSS-1h Asphalt for Fog Seal at the rate of 1.11 tons/mile applied 6 feet wide (Rate = 0.075 gallons per square yard).

Outside Shoulders 0+00 to 84+76 1.605 miles
88+02 to 297+01 3.950 miles

CRS-2P Asphalt for Surface Treatment at the rate of 6.67 tons/mile applied 7 feet wide (Rate = 0.38 gallon per square yard).

Type 2B Cover Aggregate at the rate of 45.17 tons/mile applied 6 feet wide (Rate = 22 pounds per square yard).

SS-1h or CSS-1h Asphalt for Fog Seal at the rate of 1.30 tons/mile applied 6 feet wide (Rate = 0.075 gallons per square yard).

SD HWY 50W SUMMARY OF MATERIAL QUANTITIES

	MILES	CRS-2P	TYPE 2B	CSS-1H
Inside Shoulders	5.555	31.66	215.09	6.17
Outside Shoulders	5.555	37.05	250.92	7.22
SD HWY 50W Total Tons		**68.71**	**466.01**	**13.39**

RATES OF MATERIALS AND TABLE OF ADDITIONAL QUANTITIES

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH-P 0023(73)	10	29

SD HWY 50E SHOULDERS

Inside Shoulders **0+00 to 12+20** **0.231 miles**

CRS-2P Asphalt for Surface Treatment at the rate of 5.70 tons/mile applied 6 feet wide (Rate = 0.38 gallon per square yard).

Type 2B Cover Aggregate at the rate of 38.72 tons/mile applied 6 feet wide (Rate = 22 pounds per square yard).

SS-1h or CSS-1h Asphalt for Fog Seal at the rate of 1.11 tons/mile applied 6 feet wide (Rate = 0.075 gallons per square yard).

Outside Shoulders **0+00 to 12+20** **0.231 miles**

CRS-2P Asphalt for Surface Treatment at the rate of 6.67 tons/mile applied 7 feet wide (Rate = 0.38 gallon per square yard).

Type 2B Cover Aggregate at the rate of 45.17 tons/mile applied 7 feet wide (Rate = 22 pounds per square yard).

SS-1h or CSS-1h Asphalt for Fog Seal at the rate of 1.30 tons/mile applied 7 feet wide (Rate = 0.075 gallons per square yard).

SD HWY 50E SUMMARY OF MATERIAL QUANTITIES

	MILES	CRS-2P	TYPE 2B	CSS-1H
Inside Shoulders	0.231	1.31	8.94	0.25
Outside Shoulders	0.231	1.54	10.43	0.30
SD HWY 50E Total Tons		**2.85**	**19.37**	**0.55**

SD HWY 50EF FRONTAGE ROAD

MAINLINE **MRM 390.05+000 to MRM 390.05+0.208** **0.20 mile**

MRM 389.00+097 to MRM 389.00+0.593 **0.49 mile**

CRS-2P Asphalt for Surface Treatment at the rate of 26.64 tons/mile applied 28 feet wide (Rate = 0.38 gallon per square yard).

Type 2B Cover Aggregate at the rate of tons/mile applied 172.48 feet wide (Rate = 21 pounds per square yard).

SS-1h or CSS-1h Asphalt for Fog Seal at the rate of 5.21 tons/mile applied 28 feet wide (Rate = 0.075 gallons per square yard).

SD HWY 50EF SUMMARY OF MATERIAL QUANTITIES

	MILES	CRS-2P	TYPE 2B	CSS-1H
Mainline (MRM 390.05+000 to MRM 390.05+0.208)	0.20	5.32	34.5	1.04
Mainline (MRM 389.00+097 to MRM 389.00+0.593)	0.49	13.05	84.51	2.55
SD HWY 50EF Total Tons		**18.37**	**119.01**	**3.59**

RIDE ACROSS SOUTH DAKOTA BIKE TOUR

The Ride Across South Dakota bike tour may be on routes that are in this contract to have asphalt surface treatment applied to them. The routes of the tour can be found at www.RASDAK.com. The Contractor will schedule work to complete the affected routes after the bike tour is completed.

SHOULDER WORK

Prior to construction, Department of Transportation Maintenance Forces will spray the shoulders to kill existing vegetation. It will be the Contractor's responsibility to notify the State a minimum of 30 days prior to starting work on the shoulders of the highway. The State assumes no responsibility for the effectiveness of the herbicide applied.

Vegetation and accumulated material on or adjacent to the existing roadway edge will be removed to the satisfaction of the Engineer prior to asphalt surface treatment.

Shoulder work will be incidental to other contract items. Separate measurement and payment will not be made.

BRIDGES, APPROACH SLABS, SLEEPER SLABS, JOINTS, RAILROAD CROSSINGS, MANHOLES, WATER VALVES, MAINLINE RUMBLE STRIPS AND CONCRETE

Asphalt Surface Treatment will not be placed on any of the bridges, approach slabs, sleeper slabs, joints, railroad crossings, manholes, water valves or any type of concrete. It also will not be placed on the rumble strips in the mainline driving lane prior to a Stop sign.

Material used to cover and protect these areas will be removed and disposed of properly after the application of the asphalt surface treatment. When the material is removed, the asphalt surface treatment that does not stay adhered to the material will be removed from the road surface.

ESTIMATED QUANTITIES FOR ASPHALT SURFACE TREATMENT

The quantities of asphalt for surface treatment and cover aggregate are based on the rates shown in the Rates of Materials. This is only an estimate. The actual application rates of materials will be determined by mix design as stated in the Special Provision for Asphalt Surface Treatment Design. The mix design rates may vary from the estimated rates stated in the Rates of Materials depending on the aggregate source and the variation in gradation and flakiness index. The application rates may also be adjusted in the field due to results of gradation, flakiness index, sweep tests and differing surface conditions as encountered. Pay quantities will be based on the actual target rates the inspectors use even though they may vary significantly from plans estimates.

ASPHALT FOR SURFACE TREATMENT

The asphalt for surface treatment that is delivered for use on this contract will be used in the order it is received. Storage of asphalt for surface treatment will only be allowed at the end of the workday. The material that is placed in storage will be the first material used the following day.

COVER AGGREGATE

At least 50% of the aggregate will be stockpiled at each stockpile site, adjacent to or near the routes on this contract, at least one week prior to work beginning on the project. This is to allow the Area Office time to run tests on the material and enter the results into the mix design spreadsheets.

BROOMING

Material will be broomed off bridges and curb & gutter areas adjacent to the bridges. No material will be broomed under the guardrail, including the 3-cable guardrail or into the drop inlets. Material from the curb & gutter areas of the bridges, from guardrail areas of the bridges, and from drop inlets will be disposed of in a manner satisfactory to the Engineer.

No material will be broomed into the ditches or on the boulevards in residential and commercial areas where the adjacent landowner conducts the mowing of the right-of-way. This material will be disposed of in a manner satisfactory to the Engineer.

Material that is broomed onto the roadway inslopes will not be left in piles or windrows. The material will be evenly distributed at a height that will not hinder mowing operations or cause dispersion of the material into the traveled roadway when passed over with a mower.

Anticipated areas, other than the bridge areas stated above, that will require either removal of the chips with a pickup sweeper or additional dispersal of the chips with the rotary powered broom are

ROUTE	LOCATION
SD50EF	Residential area on Lane Road
US81	Urban Areas Of Freeman (From Sta 974+97 to Sta 1027+85)

This list may not be complete. Additional areas may need attention as directed by the Engineer.

FOG SEAL

Fog Seal will be placed on all the routes.

The fog seal will be placed following the completion of the asphalt surface treatment and prior to the placement of the permanent pavement marking.

Application of the fog seal will begin no earlier than the morning following application of the chip seal but no later than four days after the application of each day's chip seal.

Immediately prior to the applications of the fog seal the Contractor will be required to broom the entire width of the chip seal. An SS-1h or CSS-1h emulsion will be used for the fog seal application. An emulsion-to-water ratio of 3:1 should be used for the binder application.

Sand for Fog Seal will conform to Section 879.1 B of the specifications except for the following requirements:

> The shale content or other particles of low specific gravity (less than 1.95) passing the No. 4 sieve will not exceed 4.5%. Prior to hauling, sand will be screened to minimize segregation, eliminate oversize and effectively breakup or discard material bonded into chunks.

Sand for Fog Seal will be furnished by the Contractor. A rate of application for the sand will not be given. A small quantity of Sand for Fog Seal is set up for each respective route to be Fog Sealed, to be used as directed by the Engineer at locations of high traffic volumes, such as intersecting state or county highways, that traffic cannot be stopped from crossing. The Contractor will be required to keep traffic off other areas until the Fog Seal has cured sufficiently as to not stick to tires.

TRANSVERSE RUMBLE STRIPS

The Contractor will ensure transverse rumble strips are not damaged or otherwise modified to lose their functionality during the application of the surface treatment. The Contractor will only apply a fog seal to the rumble strips. The Contractor will repair any damage or loss of functionality of rumble strips to the satisfaction of the Engineer at no additional cost to the State.

PERMANENT VEHICLE CLASSIFICATION

The SDDOT Office of Inventory Management & Research has a permanent Automatic Traffic Recorder (ATR) located on US 81, MRM 31.00 + 0.419.

The Contractor will not damage the existing loops, pull boxes, conduit, or electronics cabinet. Any pull boxes, conduit, cabinet, or loops damaged during the construction project will be replaced by the Contractor at the Contractors expense. The loops are visible on the roadway. If necessary, SDDOT Office of Inventory Management & Research will aide in locating loops. Contact 605-773-6644, or 605-773-3278 to notify the office and request assistance to locate the ATR.

TEMPORARY PAVEMENT MARKING

Paint will not be allowed for Temporary Pavement Marking,

The total length of no passing zones on this contract is estimated to be 8.5 miles.

For locations where the annual average daily traffic (ADT) is 2500 or less, it is estimated that 33 DO NOT PASS and 34 PASS WITH CARE signs will be required to mark the no passing zones, should the Contractor elect to use these signs.

For routes with centerline rumble strips, temporary flexible vertical markers (tabs) Will be installed on one side of the centerline rumble for the temporary pavement Marking. No passing zones will be marked in accordance with Specifications. DO NOT PASS (R4-1) and PASS WITH CARE (R4-2) signs will also be used in addition to the temporary flexible vertical markers (tabs) placed per Specifications to mark no passing zones.

TABLES OF DO NOT PASS AND PASS WITH CARE SIGNS (ADT LESS THAN OR EQUAL TO 2500)

ROUTE	DO NOT PASS	PASS WITH CARE
US81	33	34
US81 Shoulders	-	-
SD46 Shoulders	-	-
US81S Shoulders	-	-
US81N Shoulders	-	-
US81 AC	-	-
SD50 Shoulders	-	-
SD50W Shoulders	-	-
SD50E Shoulders	-	-
SD50EF	-	-
TOTAL	**33**	**34**

Prior to asphalt surface treatment the Contractor will mark, with appropriately colored temporary flexible vertical markers (tabs), the location of existing pavement marking, except edgelines. However, the Contractor will place temporary flexible vertical markers (tabs) on the edgeline of transition areas such as turn lanes and climbing lanes and on dashed edgelines. Prior to installation of the permanent pavement marking, the Engineer is to be notified. The Contractor will give the Engineer ample notification to verify and check the placement of the temporary flexible vertical markers (tabs) that are to be used for placement of the permanent pavement marking.

If the Contractor uses the DO NOT PASS and PASS WITH CARE signs, the beginning and ending of no passing zones will be marked with temporary flexible vertical markers (tabs).

The Contractor will remove and dispose of temporary flexible vertical markers (tabs) after Permanent Pavement Marking is applied. Removal will be accomplished within one week of completion of the Permanent Pavement Marking.

TEMPORARY PAVEMENT MARKING (CONTINUED)

Full reflectivity of all temporary flexible vertical markers (tabs) is required at all times. The Contractor will be required to replace any missing or non-reflective tabs after each installation as detailed below at no additional cost to the State.

Quantities of Temporary Pavement Markings consist of:

One pass prior to the chip seal
One pass after the chip seal
One pass after the fog seal

In the absence of a signed lane closure or pilot car operation, Flagger symbol signs (W20-7) and flaggers, or a shadow vehicle with rotating yellow lights or strobe lights will be positioned on the shoulder in advance of workers for both directions of traffic during the installation and removal of temporary flexible vertical markers (tabs). The traffic control device used will be moved intermittently to provide proper warning of the work operation. A ROAD WORK AHEAD (W20-1), a Workers symbol sign (W21-1) or a BE PREPARED TO STOP (W3-4) warning sign will be mounted on the rear of the shadow vehicle. The method of traffic control used by the Contractor for this work will be approved by the Engineer.

PAVEMENT MARKING MASKING

Any existing pavement marking that is to be salvaged on this contract will be covered with an approved pavement marking masking immediately prior to sealing to preserve the various marking. The masking material will be sturdy enough to eliminate being punctured by the cover aggregate when traffic drives over it.

Pavement marking to be masked will be cleaned with a high pressure air blast device immediately prior to the application of the Pavement Marking Masking. The width of this masking will be one inch wider than the existing marking. The various items for Pavement Marking Masking will include material, labor and equipment to satisfactorily install the masking prior to sealing and remove and dispose of the masking after the completion of the work and will be incidental to the contract unit price for Pavement Marking Masking.

If the pavement marking is damaged due to improper masking, it will be replaced or repaired at the Contractor's expense.

When the masking is removed, the asphalt surface treatment that does not stay adhered to the masking will be removed from the road surface.

TABLE OF PAVEMENT MARKING MASKING

ROUTE	LOCATION	DESCRIPTION
US81	Intersection of US81 & US18	24” Stop Bar x 46’
US81	Intersection of US81 & US18	24” Stop Bar x 50’
US81	Intersection of US81 & US18	Word Messages (4 Each)
US81	Intersection of US81 & SD46	Word Messages (1 Each)

* Masking of the required areas on these routes may need to be done twice due to the required placement of the Fog Seal on these routes. Once prior to the placement of the chip seal and once prior to the fog seal application. Each masking application will be paid for separately. If the Contractor can achieve satisfactory results by leaving the masking in place for both the chip seal and the fog seal applications, this procedure will be allowed. In this case, the masking will be paid for once.

HIGH BUILD WATERBORNE PAVEMENT MARKING PAINT

All materials will be applied as per manufacturer’s recommendations. High build waterborne pavement marking paint will conform to Section 980.1 B.

Reflective media will consist of glass beads and Reflective media will require a Certificate of Compliance for Certification for each source and lot. Acceptance sampling will not be required.

RATES OF MATERIALS FOR HIGH BUILD WATERBORNE PAVEMENT MARKING PAINT

Solid 4” line = 27.8 Gals/Mile
Dashed 4” line = 7.6 Gal/Mile
Glass Beads = 8 Lbs/Gal.

Cost for material, labor and equipment necessary to furnish and install the pavement markings will be incidental to the contract unit price for the respective High Build Waterborne Pavement Marking Paint items.

MOBILE RETRO-REFLECTIVITY MEASUREMENTS

Retro-reflectivity measurements will be taken by an Independent Consultant hired by the Contractor. Measurements will be taken in accordance with the ASTM testing methods E1710 and E2177.

A retro-reflectivity report of the measurements from the Independent Consultant will be provided to the Engineer.

The Independent Consultant will take measurements using a vehicle mounted mobile retro-reflectometer. The mobile retro-reflectometer will utilize 30-meter CEN geometry in accordance with ASTM E 1710 (Standard Test Method for Measurement of Retroreflective Pavement Marking Material with CEN-Prescribed Geometry Reflectometers).

The retro-reflectometer will be calibrated no less than twice a day in accordance with the operating manual and calibration guide for the particular machine and vehicle.

Measurement will consist of the average retro-reflective readings and standard deviations for pavement marking placed under this Contract. Retro-reflectivity measurements will be taken on each mainline edgeline, mainline and ramp gore marking, and skip centerline marking. Measure each line type separately. Measurement units will be mcd/m2 /lux.

Retro-reflectivity will be measured by taking a minimum of 40 retro-reflectivity readings within 528’ (1/10 mile) on solid lines and a minimum 20 retroreflectivity readings within 528’ (1/10 mile) on skip lines. Gore markings will have a minimum of two retro-reflectivity readings taken on each marking. The average retro-reflectivity readings for each individual 4” wide line will be obtained at 528’ (1/10 mile) intervals.

Payment will be made for the actual length of retro-reflectivity measured. This is based on one laser instrument on one van that reads one line with each pass. Three passes are required for each mile of two-lane divided in one direction: LEL – Left Edgeline, REL – Right Edgeline and all gore markings along right edgeline, CL- Centerline, RCL-Right Centerline, LCL-Left Centerline. One additional pass per the length of the gore marking on the left side of the ramp will be required.

Measurements will be obtained no sooner than 7 days and no later than 30 days after the completion of all the line applications required for an individual highway

MOBILE RETRO-REFLECTIVITY MEASUREMENTS (CONTINUED)

route. Excess reflective media must not be visible when the retroreflectivity testing is conducted.

Retro-reflectivity measurements will be collected when pavement and markings are dry, clean and no visible moisture is on the road surface. These criteria define initial pavement marking retro-reflectivity values. Markings will be measured in the direction of intended vehicular travel.

The Independent Consultant should expect to retest failed segments after the markings have been replaced at no additional cost to the State.

The average retro-reflectivity measurements must meet the requirements for retro-reflectivity as specified. Any retro-reflectivity readings not meeting the minimum average dry and wet retro-reflectivity requirements for pavement markings will be considered failed. Failed markings will be removed and remarked by the Contractor in 528' lengths.

The Contractor will mark the begin and end of the length of line to be removed and remarked that is represented by the failed averaged reading.

The measurement report will be in the form of an electronic database file, or delimited text file, and contain all raw data collected. The electronic file must also contain a summary of findings. The retroreflectivity report, including the summary and a copy of the electronic file with all data, will be provided to the Engineer. The measurement report will include:

- State Project number
- Trunk Highway number
- Date the measurements were taken
- Geographical location of the measurements were taken including a distance from the nearest permanent site identification, such as a mile reference marker. The beginning and ending reference points of data collection rounded to the nearest thousandths of a mile and the beginning and ending coordinates determined by a Global Positioning System receiver with 3 meter accuracy, including the direction of travel in terms of increasing or decreasing reference points
- Identification of the pavement marking material including line type, color, age, and transverse location on the road. Identification of the marking to be included in the format; (LEL – Left Edgeline, REL – Right Edgeline, CL – Centerline, RCL – Right Centerline, LCL – Left Centerline)
- Identification of the retroreflectometer.
- A summary of the dry average retroreflective measurements for each continuous length of 0.1 mile measured

Should another mobile unit be available, the maximum acceptable deviation for measurements made by the two different instruments of the same manufacturer and for the same roadway length will be ± 10%.

Repeatability for the given mobile unit will be ± 6%.

The locations of the measurements will be randomly selected.

No final payment for pavement markings will be made until the retroreflectivity measurements are taken and the retroreflectivity report is provided to the Engineer.

Cost for all mobile retroreflectivity measurements, reports, marking of failed lengths, equipment, materials and labor will be included in the contract unit price per mile for Mobile Retroreflectometer Measurements.

SURFACE PREPARATION FOR PAVEMENT MARKING

The Contractor will prepare the pavement surface prior to applying the durable pavement marking in accordance with the following.

In areas where the existing groove meets the required depth and existing markings are still in place, the Contractor will clean the existing groove without adding additional depth beyond the required depth for the new pavement marking, including reflective media as noted below.

Description	Specification	Tolerance
Depth of Groove	Marking Thickness[1] + 15 mils	+ 5 mils

[1] Marking thickness will include the thickness of marking material and reflective media.

The cleaning will result in the existing pavement marking being adequately scuffed, abraded, and removed by light grinding or abrasive blasting or both to allow proper adhesion of the new durable pavement marking as per the manufacturer's recommendations to comply with product warranties.

Existing grooves not meeting the required depth will be re-grooved to the required depth for the new pavement marking, including reflective media. Equipment for grooving will be capable of the following:

- Grooving the total width of the groove in one pass or uniform depths with multiple passes.
- Grooving without causing damage to the pavement joints or joint sealant material.
- Provide uniform alignment and depth.
- Moving continuously to permit a mobile traffic work operation.

Cost associated with cleaning of the existing groove, including re-grooving, if needed, will be included in the contract unit price per foot for Surface Preparation for Pavement Marking and per each for the Surface Preparation for Pavement Marking.

PERMANENT PAVEMENT MARKING

The application of permanent pavement marking may not begin until 7 calendar days following completion of the fog seal and will be completed within 14 calendar days following completion of the fog seal.

Marking eight-inch edgelines and gore areas will require the use of two spray nozzles to achieve the required width. Marking twelve-inch gore lines will require the use of three spray nozzles to achieve the required width.

The Contractor will be required to repaint existing pavement marking including centerline, edgeline, dashed edgelines, dashed lane lines, lane lines, turn lanes, gore areas, etc.

Stop lines are to be located at a minimum of 10' and a maximum of 30' back from the edge of the intersecting roadway. The stop line is to be located to provide the best sight distance for a stopped motorist to view intersecting traffic. The Project Engineer is to be notified prior to the installation of the stop lines to verify their location. Adjustments of the location of the existing stop lines, if needed, will be made prior to the placement of the new stop lines.
Flush sealing will not be allowed as an option for correction of pavement marking not within tolerance due to the occurrence of shadow through.

PERMANENT PAVEMENT MARKING (CONTINUED)

The following table contains locations of existing pavement marking to be painted by hand.

TABLE OF HAND WORK FOR PAVEMENT MARKING

ROUTE	LOCATION
US81	Left Arrows at 278th St. (4 Ea)
US81	24" Hashes in Turn Bays at 278th St.
US81	Left Arrows between 4th & 6th St. (4 Ea)
US81	24" Hashes in Turn Bays between 4th & 6th St.
US81	Left Arrows at 280th St. (5 Ea)
US81	24" Hashes in Turn Bays at 280th St.
US81	Left Arrows at US18 (4 Ea)
US81	24" Hashes in Turn Bays at US18
US81	Left Arrows at 291ST St. (3 Ea)
SD50	Left Arrows at MRM 385.60 (2 Ea)
SD50	Left Arrows at MRM 385.66 (2 Ea)
SD50	Left Arrows at MRM 385.75 (2 Ea)
SD50	Left Arrows at MRM 385.84 (2 Ea)
SD50	Left Arrows at MRM 385.93 (2 Ea)
SD50	Left Arrows West of Bill Baggs Rd (2 Ea)
SD50	Left Arrows East of Bill Baggs Rd (2 Ea)
SD50	Left Arrows at MRM 386.17 (2 Ea)
SD50	Left Arrows at MRM 386.26 (2 Ea)
SD50	Left Arrows at MRM 386.36 (2 Ea)
SD50	Left Arrows at MRM 386.44 (2 Ea)
SD50	Left Arrows at MRM 386.56 (2 Ea)
SD50	Left Arrows at MRM 386.65 (2 Ea)
SD50	Left Arrows at MRM 386.73 (2 Ea)
SD50	Left Arrows at MRM 386.84 (2 Ea)
SD50	Left Arrows at MRM 386.93 (2 Ea)
SD50	Left Arrows West of East Side Dr (2 Ea)
SD50	Left Arrows East of East Side Dr (2 Ea)
SD50	Left Arrows West of Oak St. (2 Ea)
SD50	Left Arrows East of Oak St. (2 Ea)
SD50	Left Arrows West of Sunrise Dr (2 Ea)
SD50	Left Arrows at MRM 387.30 (2 Ea)
SD50	Left Arrows at MRM 387.40 (2 Ea)
SD50	Left Arrows West of WEK Rd (2 Ea)
SD50	Left Arrows West of Bel Air Rd (2 Ea)
SD50	Left Arrows West of Meadow View Rd (2 Ea)
SD50	Left Arrows at MRM 387.69 (2 Ea)
SD50	Left Arrows West of Willowdale Rd (2 Ea)
SD50	Left Arrows at MRM 387.83 (2 Ea)
SD50	Left Arrows at MRM 387.95 (2 Ea)
SD50	Left Arrows at MRM 388.04 (2 Ea)
SD50	Left Arrows at MRM 388.14 (2 Ea)
SD50W	24" Hatches in 5 Semi Circle Gores (21Ea)
US81 (N&S)	Left Arrows in front of Double T Truck Shop (5 Ea)
US81 (N&S)	Left Arrows at 306th St. (6 Ea)
US81 (N&S)	Left Arrows at 304th St. (4 Ea)
US81 (N&S)	Left Arrows at 303RD St. (4 Ea)
US81 (N&S)	Lane Drop Arrows North of 303rd St. (2 Ea)

PERMANENT PAVEMENT MARKING (CONTINUED)

TABLES OF PERMANENT PAVEMENT MARKING

US81	White	Yellow
4” Yellow Centerline Dashes = 14.0 miles @ 7.6 Gal/Mile		106.4
4” Solid Yellow Centerline = 6.966 miles @ 27.8 Gal/Mile		193.7
24” Yellow Hatches for Turn Bays= 0.169 miles @ 166.8 Gal/Mile		28.2
4” Double Yellow for Turn Bays = 2 x 1.72 miles @ 27.8 Gal/Mile		95.6
4” Solid White Edgeline = 38.5 miles @ 27.8 Gal/Mile	1070.3	
4” Solid White Turning Lane Line = 0.337 mile @ 27.8 Gal/Mile	9.4	
Arrows = 20 Each @ 0.8 Gal/Each	16	
White Word Messages = 5 @ 1.5 Gal/Word	7.5	
TOTAL GALLONS	**1103.2**	**423.9**

PERMANENT PAVEMENT MARKING (CONTINUED)

US81 (AC)	White	Yellow
4” White Centerline Dashes = 0.28 miles @ 7.6 Gal/Mile	2.1	
4” Solid White Edgeline = 0.62 miles @27.8 Gal/Mile	17.2	
4” Solid Yellow for Gore Area = 0.22 miles @ 27.8 Gal/Mile		6.1
8” Solid Yellow for Gore Area = 0.17 miles @ 55.6 Gal/Mile		9.4
24” Yellow Hatches for Gore Area = 0.0625 miles @ 166.8 Gal/Mile		10.4
Arrows = 2 Each @ 0.8 Gal/Each	1.6	
TOTAL GALLONS	**20.9**	**25.9**

FURNISHING AND APPLYING PAVEMENT MARKING PAINT

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH-P 0023(73)	15	29

Painting application rates will be as follows

Two Lane / Divided/ Four lane Roadway (Rates for one line)
Solid Yellow Edgeline Rate = 27.8 Gals/Pass-Mile
Dashed White/ Yellow Centerline Rate = 7.6 Gals/Pass-Mile
Solid Yellow Centerline Rate = 27.8 Gals/Pass-Mile
Solid White Edgeline Rate = 27.8 Gals/Pass-Mile
Solid Yellow/White line – 8”, Rate = 55.6 Gals/Pass-Mile Solid Yellow/White line- 24”, Rate =166.8 Gals/Pass-Mile

Typical pavement marking as shown on these sheets will be applied throughout The entire length of applicable sections of roadway.

Traffic Control will be incidental to the cost of application. The striper and advance or trailing warning vehicles will be equipped with flashing amber lights and advance warning arrow board.

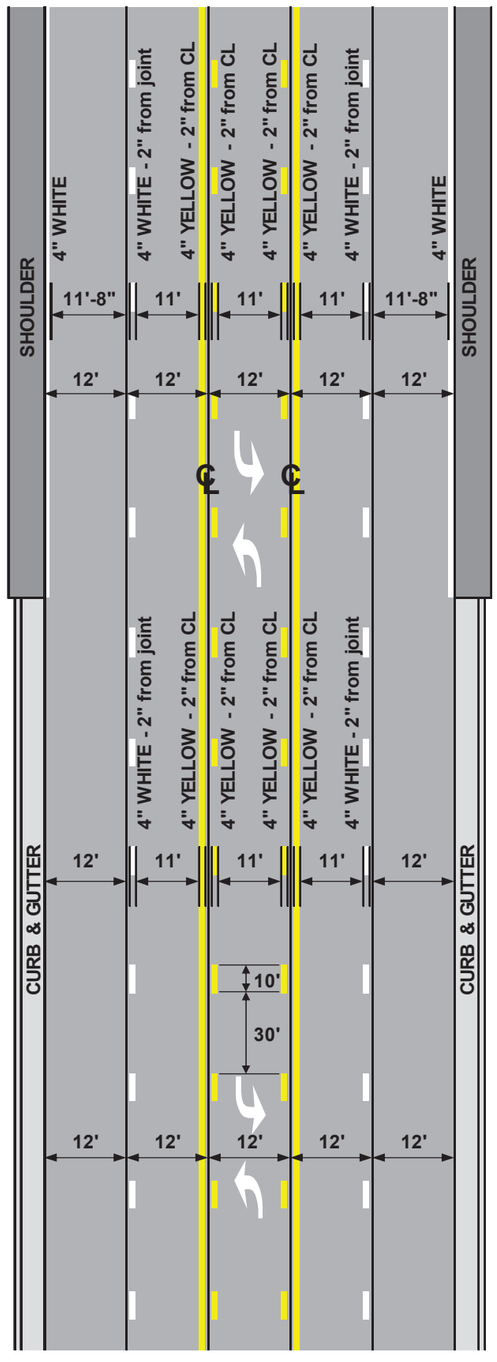
4” Yellow Skip Centerline (when not adjacent to a 4” Yellow No Passing Zone) Will be placed consistently to the south or east of centerline.

ESTIMATED QUANTITIES (BASED 0N 0NE APPLICATION)					
DURABLE	**4”**	**8”**	**12”**	**24”**	**SOLID AREAS**
WHITE	174182’	1931’	-	1195’	-
YELLOW	141201’	-	-	938’	-

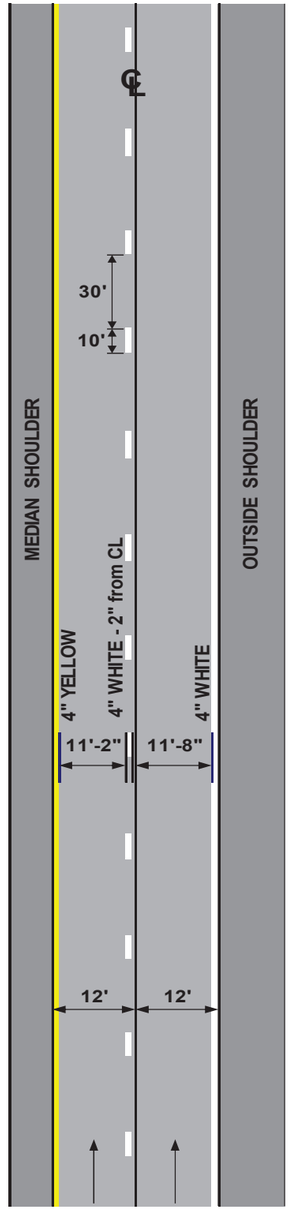
Two Lane / Divided/ Four lane Roadway (Rates for one line)
Solid Yellow Edgeline Rate = 27.8 Gals/Pass-Mile
Dashed White/ Yellow Centerline Rate = 7.6 Gals/Pass-Mile
Solid White Centerline Rate = 27.8 Gals/Pass-Mile

ESTIMATED QUANTITIES		
ROUTES	**HIGH BUILD**	
	WHITE	**YELLOW**
US HWY 81	1103.2	423.9
US HWY 81 (AC)	20.9	25.9
SD HWY 50EF	NA	NA
TOTALS:	**1124.1 GALLONS**	**449.8 GALLONS**

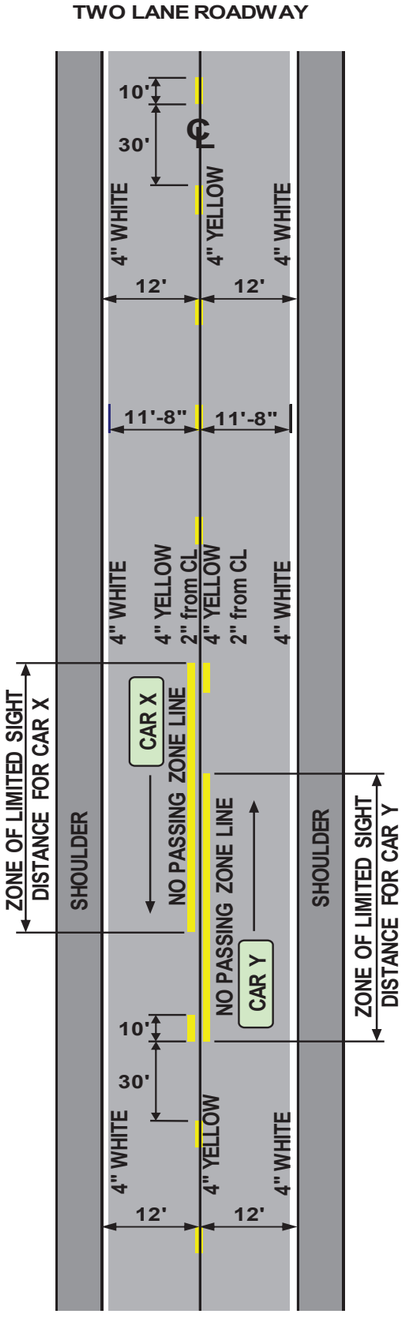
FOUR LANE ROADWAY WITH CENTER TURN LANE



DIVIDED ROADWAY (ONE DIRECTION SHOWN)



TWO LANE ROADWAY



SEQUENCE OF OPERATIONS

The below sequence is per route:

1. Install fixed location ground mounted traffic control devices.
2. Install and remove temporary traffic control devices as needed for each type of work.
3. Place temporary pavement marking not more than 24 hours prior to chip seal.
4. Place pavement marking masking immediately prior to chip seal. See Pavement Marking Masking note for alternate sequence.
5. Apply chip seal.

   The brooming operation will be immediately in front of the asphalt distributor.

   The Contractor will begin sealing operations at the farthest point from the stockpile site and work towards the stockpile site to eliminate unnecessary driving and turning on the fresh seal.

   Only one distributor will be allowed to apply the chip seal oil at a time for each chip seal crew. If the Contractor wants to propose to use more than one distributor at a time, then their process will need to be approved by the Engineer in writing two weeks prior to the start of chip seal operations.

   The application of the asphalt and aggregate will cease at least one hour prior to sunset each day.
6. Remove pavement marking masking immediately after chip seal.
7. Remove plastic covers from temporary flexible vertical markers (tabs) after application of the chip seal and prior to nightfall.
8. Broom chip sealed areas the next morning following the chip seal application.
9. Place pavement marking masking immediately prior to fog seal. See Pavement Marking Masking note for alternate sequence.
10. Pick up cover aggregate in curb & gutter areas and other areas as stated in the plans and directed by the Engineer.
11. Apply fog seal.

    Only one distributor will be allowed to apply the fog seal oil at a time for each fog seal crew.
12. Remove pavement marking masking immediately after fog seal.
13. Remove plastic covers from temporary flexible vertical markers (tabs) or apply temporary pavement marking paint after application of the fog seal and prior to nightfall.
14. Immediately prior to application of the permanent pavement marking, the areas to be painted will be broomed or blown off with high pressure compressed air. If a high pressure air device is used to clean the pavement surface, it will be capable of sustaining continuous high pressure for the duration of the pavement marking process.
15. Complete the permanent pavement marking.
16. Complete required hand painted pavement marking areas within the 14 day time period specified elsewhere in the plans.
17. Remove temporary flexible vertical markers (tabs) within the seven day time period specified elsewhere in the plans.
18. Remove traffic control devices.

SEQUENCE OF OPERATIONS (CONTINUED)

Contractor requests to deviate from the sequence of operations will 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 will be submitted for review a minimum of one week prior to potential implementation.

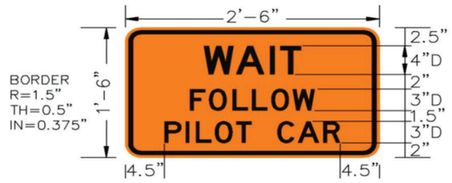
TRAFFIC CONTROL SIGNS

Traffic control signs have been included in a table for each route. Payment will only be for these signs used on each route.

FLAGGING

Operations will be conducted so that the travelling public will not have to wait longer than 15 minutes at the flagger station.

Additional flagger warning signs and flagger hours have been included in the Estimate of Quantities for use on intersecting roads. These flaggers will be used as directed by the Engineer and will be used primarily during daytime hours. Also included in the Estimate of Quantities are WAIT FOLLOW PILOT CAR signs for use on low volume intersecting roads as determined by the Engineer. WAIT FOLLOW PILOT CAR signs will not block the view of the stop sign.



It is required that the flaggers and pilot car operators be able to communicate with one another. If an emergency vehicle needs to pass through the project, the Contractor will be required to expedite traffic movement. Cost associated with this will be incidental to the contract unit price per hour for Flagging.

STOCKPILE SITE RELEASES

Upon completion of the contract, the Contractor will supply the Engineer a copy of the stockpile site releases to place in the Department's file.

COORDINATION BETWEEN CONTRACTORS

The Contractor will schedule work so as not to interfere with or hinder the progress of the work performed by the other Contractors. Conflicting traffic control devices may need to be temporarily adjusted or removed as directed by the Engineer and at no additional cost to the contract.

WORK ZONE SPEED REDUCTION

The Department is required to obtain a speed reduction resolution prior to the installation of any SPEED LIMIT (R2-1) signs shown on the standard plate 634.63. To provide adequate time for the resolution to be enacted, the Contractor will inform the Engineer a minimum of 3 weeks prior to the scheduled installation of any work zone speed reduction signs on the project. The information provided by the Contractor will include the anticipated date of sign installation, the newly reduced speed limit, the location of the work zone, and the anticipated completion date of the work requiring the speed reduction.

TRAFFIC CONTROL FOR ASPHALT SURFACE TREATMENT

The Contractor will furnish, install, maintain, and remove TRUCK CROSSING (W8-6) signs daily. The TRUCK CROSSING signs will be displayed when haul vehicles are hauling material. When hauling conditions no longer exist, the signs will be covered or removed from view. The exact number and location will be determined on construction. Payment for additional signs will be based on the contract unit price per square foot for Traffic Control Signs.

The Contractor will furnish, install, and maintain LOOSE GRAVEL (W8-7) signs with 40 MPH (W13-1P) advisory speed plaques upon start of surface treatment operations at each end of the segment and on either side of intersecting asphalt roads and major intersections as determined by the Engineer. In addition, LOOSE GRAVEL signs with 40 MPH advisory speed plaques will be installed at no more than 4 mile intervals throughout each segment. The 40 MPH advisory speed plaque should not be installed with LOOSE GRAVEL signs in areas where the posted speed limit is less than 40 MPH. LOOSE GRAVEL sign and 40 MPH advisory speed plaques will be covered or removed from view when they are not applicable.

ROAD WORK NEXT XX MILES (G20-1), LOOSE GRAVEL (W8-7), and END ROAD WORK (G20-2) signs are the only signs that need to be mounted on fixed location breakaway sign supports, as shown on the plan layout. ROAD WORK AHEAD (W20-1), FLAGGER (W20-7), ONE LANE ROAD AHEAD (W20-4), and TRUCK CROSSING (W8-6) signs may be mounted on portable supports. Signs mounted on portable supports will be moved as necessary to keep current with the work activities.

Until the end of each day's chip seal operations, at the discretion of the Contractor, additional flaggers and FLAGGER (W20-7) symbol signs will be provided to alert the traveling public entering completed portions of the project to the potential of airborne chips.

The flaggers will provide each motorist with a printed notice on the Contractor's letterhead similar to the one shown below. Cost of the notice will be incidental to other contract items.

"CONTRACTOR'S LETTERHEAD"

THIS HIGHWAY IS BEING RESURFACED WITH A ROCK CHIP SEAL COAT.

THIS TYPE OF CONSTRUCTION HAS THE POTENTIAL OF CAUSING VEHICLE DAMAGE SUCH AS CHIPPED WINDSHIELDS AND BROKEN HEADLIGHTS DUE TO ROCKS BEING THROWN BY HIGH SPEED ONCOMING OR PASSING TRAFFIC.

YOU MAY WISH TO CONSIDER TAKING AN ALTERNATE ROUTE.IF YOU PROCEED, KEEP TO THE RIGHT AND DRIVE 40 MPH OR LESS. ANOTHER FLAGGER AND A PILOT CAR WILL BE ESCORTING YOU AROUND THE OIL SEAL COAT APPLICATION AREA.

THANK YOU.

ITEMIZED LIST FOR TRAFFIC CONTROL

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH-P 0023(73)	17	29

US HIGHWAY 81 HUTCHINSON AND YANKTON COUNTIES

SIGN CODE	SIGN DESCRIPTION	CONVENTIONAL ROAD NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
W8-6	TRUCK CROSSING	2	48" x 48"	16.0	32.0
W8-7	LOOSE GRAVEL	19	48" x 48"	16.0	304.0
W13-1P	ADVISORY SPEED (plaque)	19	30" x 30"	6.3	119.7
W20-1	ROAD WORK AHEAD	4	48" x 48"	16.0	64.0
W20-4	ONE LANE ROAD AHEAD	2	48" x 48"	16.0	32.0
W20-7	FLAGGER (symbol)	4	48" x 48"	16.0	64.0
G20-1	ROAD WORK NEXT 20 MILES	2	36" x 18"	4.5	9.0
G20-1	ROAD WORK NEXT 12 MILES	1	36" x 18"	4.5	4.5
G20-1	ROAD WORK NEXT 8 MILES	1	36" x 18"	4.5	4.5
G20-2	END ROAD WORK	2	36" x 18"	4.5	9.0
		CONVENTIONAL ROAD TRAFFIC CONTROL SIGNS SQFT			642.7

US HIGHWAY 81 (SHOULDERS) YANKTON COUNTY

SIGN CODE	SIGN DESCRIPTION	CONVENTIONAL ROAD NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
W20-1	ROAD WORK AHEAD	2	48" x 48"	16.0	32.0
W20-7	FLAGGER (symbol)	2	48" x 48"	16.0	32.0
W21-2	FRESH OIL	4	48" x 48"	16.0	64.0
G20-1	ROAD WORK NEXT 3 MILES	2	36" x 18"	4.5	9.0
G20-2	END ROAD WORK	2	36" x 18"	4.5	9.0
SPECIAL	ON SHOULDER	4	30" x 24"	5.0	20.0
		CONVENTIONAL ROAD TRAFFIC CONTROL SIGNS SQFT			166.0

SD HIGHWAY 46 (SHOULDERS) YANKTON COUNTY

SIGN CODE	SIGN DESCRIPTION	CONVENTIONAL ROAD NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
W20-1	ROAD WORK AHEAD	2	48" x 48"	16.0	32.0
W20-7	FLAGGER (symbol)	2	48" x 48"	16.0	32.0
W21-2	FRESH OIL	2	48" x 48"	16.0	32.0
G20-2	END ROAD WORK	2	36" x 18"	4.5	9.0
SPECIAL	ON SHOULDER	2	30" x 24"	5.0	10.0
		CONVENTIONAL ROAD TRAFFIC CONTROL SIGNS SQFT			115.0

US HIGHWAY 81 SOUTH & NORTH (SHOULDERS) & YANKTON COUNTY

SIGN CODE	SIGN DESCRIPTION	CONVENTIONAL ROAD NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
R2-1	SPEED LIMIT XX	10	24" x 30"	5.0	50.0
R2-6aP	FINES DOUBLE (plaque)	2	24" x 18"	3.0	6.0
W3-5	SPEED REDUCTION AHEAD (XX MPH)	6	48" x 48"	16.0	96.0
W4-2	LEFT or RIGHT LANE ENDS (symbol)	4	48" x 48"	16.0	64.0
W20-1	ROAD WORK AHEAD	4	48" x 48"	16.0	64.0
W20-5	LEFT or RIGHT LANE CLOSED AHEAD	4	48" x 48"	16.0	64.0
W20-7	FLAGGER (symbol)	2	48" x 48"	16.0	32.0
W21-2	FRESH OIL	4	48" x 48"	16.0	64.0
G20-1	ROAD WORK NEXT 6 MILES	2	36" x 18"	4.5	9.0
G20-2	END ROAD WORK	2	36" x 18"	4.5	9.0
SPECIAL	ON SHOULDER	4	30" x 24"	5.0	20.0
		CONVENTIONAL ROAD TRAFFIC CONTROL SIGNS SQFT			478.0

US HIGHWAY 81 (AC) YANKTON COUNTY

SIGN CODE	SIGN DESCRIPTION	CONVENTIONAL ROAD NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
W8-7	LOOSE GRAVEL	2	48" x 48"	16.0	32.0
W20-1	ROAD WORK AHEAD	2	48" x 48"	16.0	32.0
W20-7	FLAGGER (symbol)	2	48" x 48"	16.0	32.0
		CONVENTIONAL ROAD TRAFFIC CONTROL SIGNS SQFT			96.0

SD HIGHWAY 50 (SHOULDERS) YANKTON COUNTY

SIGN CODE	SIGN DESCRIPTION	CONVENTIONAL ROAD NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
W8-7	LOOSE GRAVEL	4	48" x 48"	16.0	64.0
W20-1	ROAD WORK AHEAD	2	48" x 48"	16.0	32.0
W20-7	FLAGGER (symbol)	2	48" x 48"	16.0	32.0
G20-2	END ROAD WORK	1	36" x 18"	4.5	4.5
SPECIAL	ON SHOULDER	4	30" x 24"	5.0	20.0
		CONVENTIONAL ROAD TRAFFIC CONTROL SIGNS SQFT			152.5

ITEMIZED LIST FOR TRAFFIC CONTROL

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH-P 0023(73)	18	29

SD HIGHWAY 50W (SHOULDERS) YANKTON COUNTY

		CONVENTIONAL ROAD			
SIGN CODE	SIGN DESCRIPTION	NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
R2-1	SPEED LIMIT XX	5	24" x 30"	5.0	25.0
R2-6aP	FINES DOUBLE (plaque)	1	24" x 18"	3.0	3.0
W3-5	SPEED REDUCTION AHEAD (XX MPH)	3	48" x 48"	16.0	48.0
W4-2	LEFT or RIGHT LANE ENDS (symbol)	2	48" x 48"	16.0	32.0
W8-6	TRUCK CROSSING	2	48" x 48"	16.0	32.0
W8-7	LOOSE GRAVEL	4	48" x 48"	16.0	64.0
W20-1	ROAD WORK AHEAD	2	48" x 48"	16.0	32.0
W20-5	LEFT or RIGHT LANE CLOSED AHEAD	2	48" x 48"	16.0	32.0
W20-7	FLAGGER (symbol)	2	48" x 48"	16.0	32.0
G20-1	ROAD WORK NEXT 6 MILES	1	36" x 18"	4.5	4.5
SPECIAL	ON SHOULDER	4	30" x 24"	5.0	20.0
		CONVENTIONAL ROAD TRAFFIC CONTROL SIGNS SQFT			324.5

SD HIGHWAY 50E (SHOULDERS) YANKTON COUNTY

		CONVENTIONAL ROAD			
SIGN CODE	SIGN DESCRIPTION	NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
W8-7	LOOSE GRAVEL	1	48" x 48"	16.0	16.0
W20-1	ROAD WORK AHEAD	1	48" x 48"	16.0	16.0
W20-7	FLAGGER (symbol)	1	48" x 48"	16.0	16.0
G20-2	END ROAD WORK	1	36" x 18"	4.5	4.5
SPECIAL	ON SHOULDER	1	30" x 24"	5.0	5.0
		CONVENTIONAL ROAD TRAFFIC CONTROL SIGNS SQFT			57.5

SD HIGHWAY 50EF YANKTON COUNTY

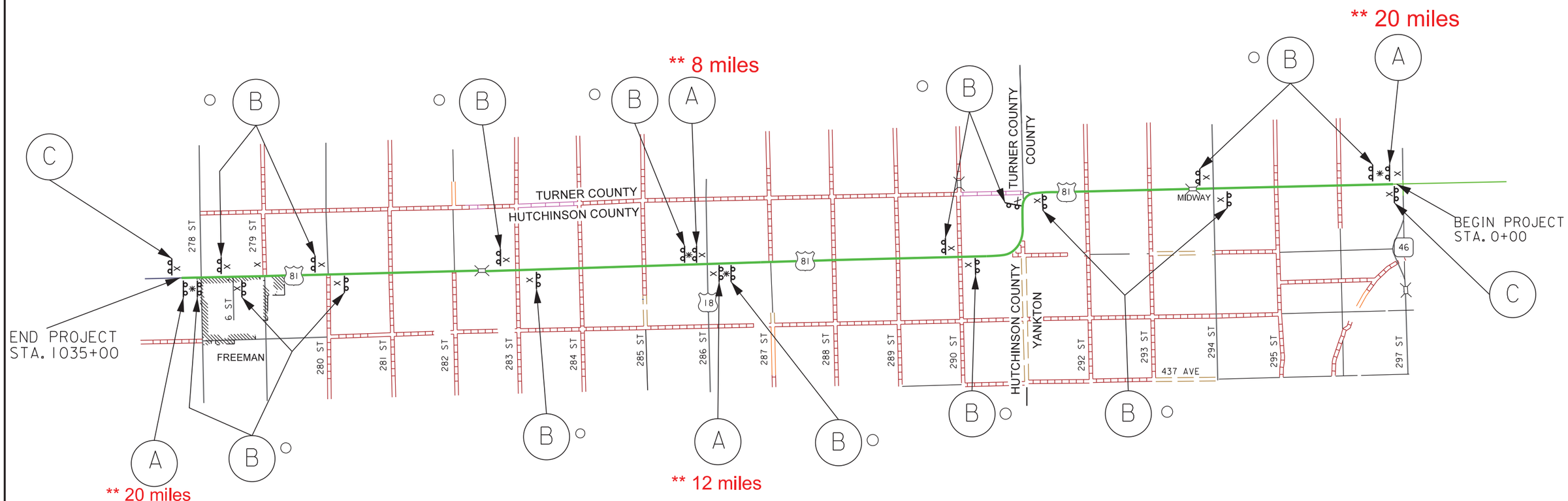
		CONVENTIONAL ROAD			
SIGN CODE	SIGN DESCRIPTION	NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
W8-7	LOOSE GRAVEL	1	48" x 48"	16.0	16.0
W20-1	ROAD WORK AHEAD	1	48" x 48"	16.0	16.0
W20-7	FLAGGER (symbol)	1	48" x 48"	16.0	16.0
SPECIAL	ON SHOULDER	1	30" x 24"	5.0	5.0
		CONVENTIONAL ROAD TRAFFIC CONTROL SIGNS SQFT			53.0

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH-P 0023(73)	19	29

TRAFFIC CONTROL

FIXED LOCATION SIGNS
(GROUND MOUNTED SUPPORTS)

US HWY 81
HUTCHINSON & YANKTON COUNTIES



Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet) (*)
0 - 30	200
35 - 40	350
45 - 50	500
55	750
60 - 65	1000
75	2600

NOTES:

Road Work Next xx Miles and End Road Work signs will remain in place until pavement marking is complete.

X - Signs will be placed 150' to 200' from Intersection. Exact location to be approved by the Engineer.

Construction signs will not obscure existing signs and must be located a minimum of 100' from an existing sign.

○ Loose Gravel signs with advisory speed plaques will be removed from view the same day that the fog seal is applied in the area they represent

A

G20-1

B ○

W8-7

W13-1P

C

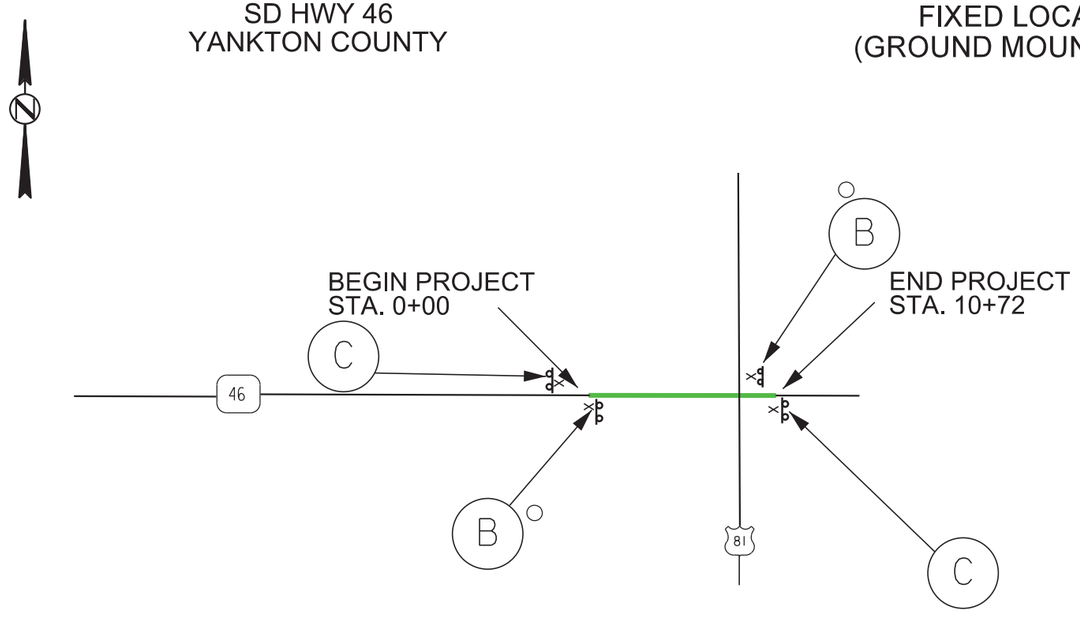
G20-2

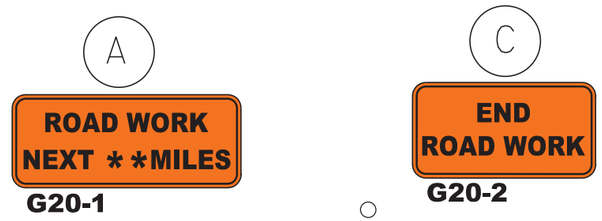
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH-P 0023(73)	20	29

TRAFFIC CONTROL

SD HWY 46
YANKTON COUNTY

FIXED LOCATION SIGNS
(GROUND MOUNTED SUPPORTS)





ON SHOULDER SPECIAL

Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet) (*)
0 - 30	200
35 - 40	350
45 - 50	500
55	750
60 - 65	1000
75	2600

NOTES:

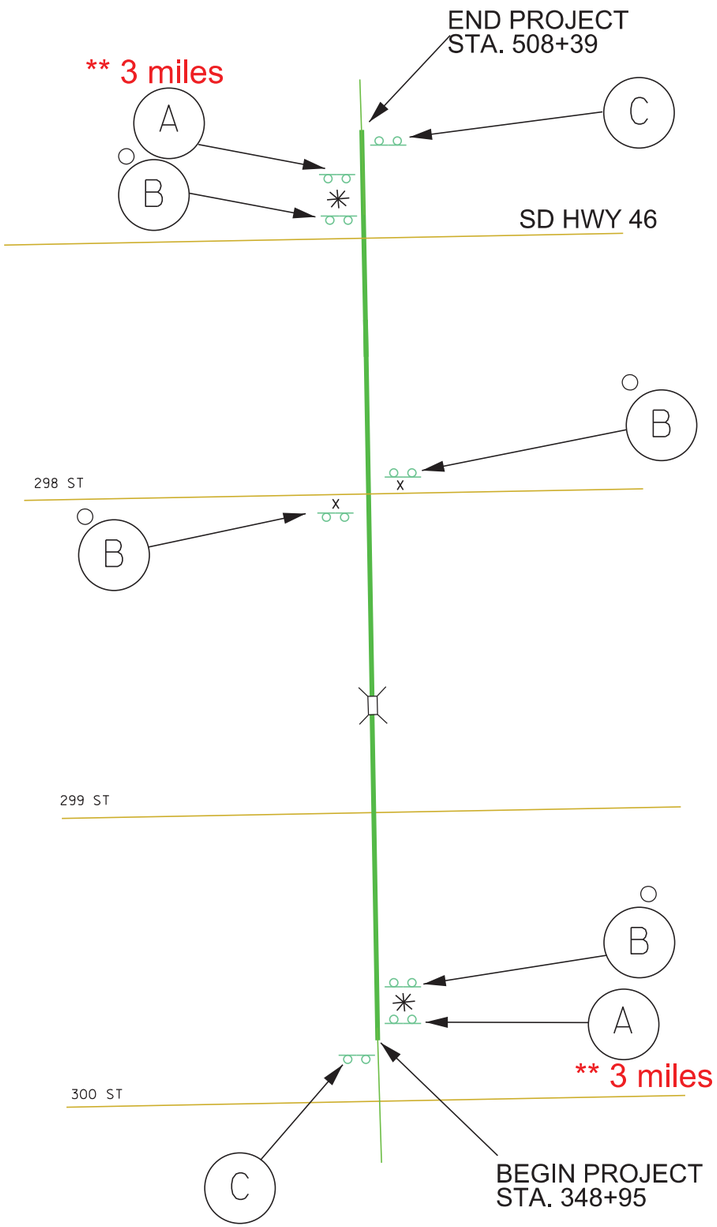
Road Work Next xx Miles and End Road Work signs will remain in place until pavement marking is complete.

X - Signs will be placed 150' to 200' from Intersection. Exact location to be approved by the Engineer.

Construction signs will not obscure existing signs and must be located a minimum of 100' from an existing sign.

○ Loose Gravel signs with advisory speed plaques will be removed from view the same day that the fog seal is applied in the area they represent

US HWY 81
YANKTON COUNTY



STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH-P 0023(73)	21	29

TRAFFIC CONTROL

FIXED LOCATION SIGNS
(GROUND MOUNTED SUPPORTS)

US HWY 81 S & N
YANKTON COUNTY

A

G20-1

B ○

W21-2
(30"x 30")

C

G20-2

SPECIAL

Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet) (*)
0 - 30	200
35 - 40	350
45 - 50	500
55	750
60 - 65	1000
75	2600

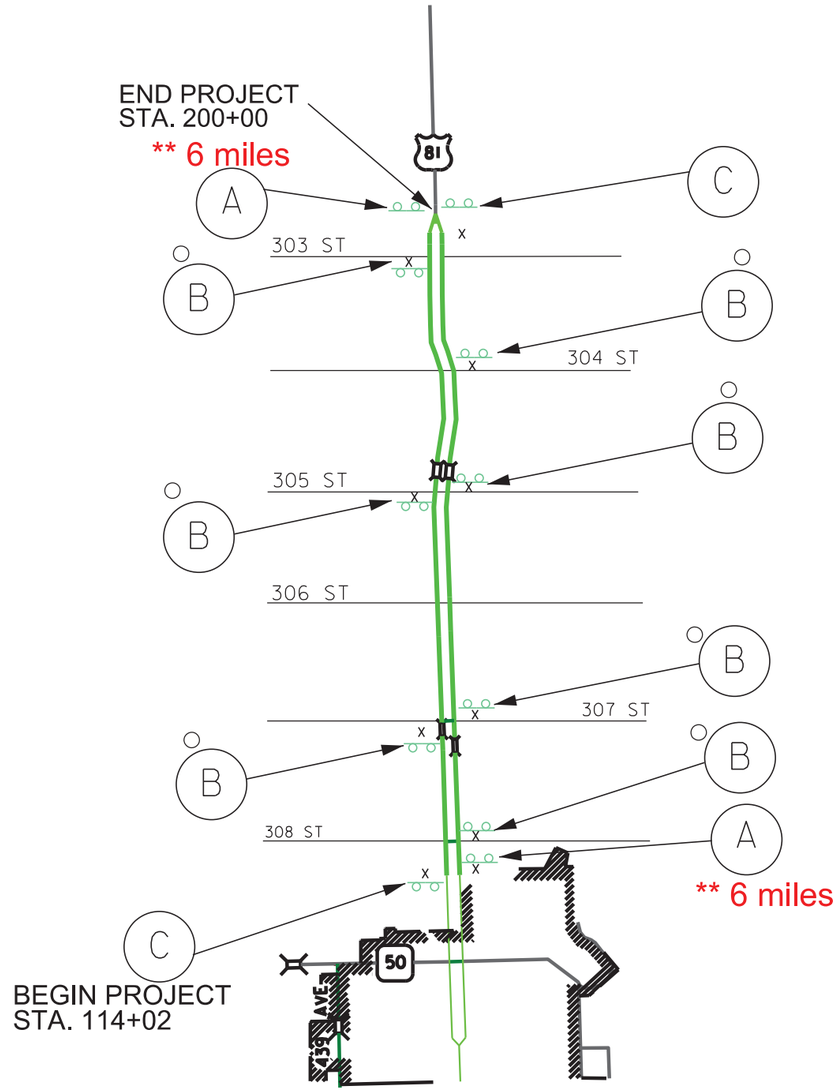
NOTES:

Road Work Next xx Miles and End Road Work signs will remain in place until pavement marking is complete.

X - Signs will be placed 150' to 200' from Intersection. Exact location to be approved by the Engineer.

Construction signs will not obscure existing signs and must be located a minimum of 100' from an existing sign.

○ Loose Gravel signs with advisory speed plaques will be removed from view the same day that the fog seal is applied in the area they represent

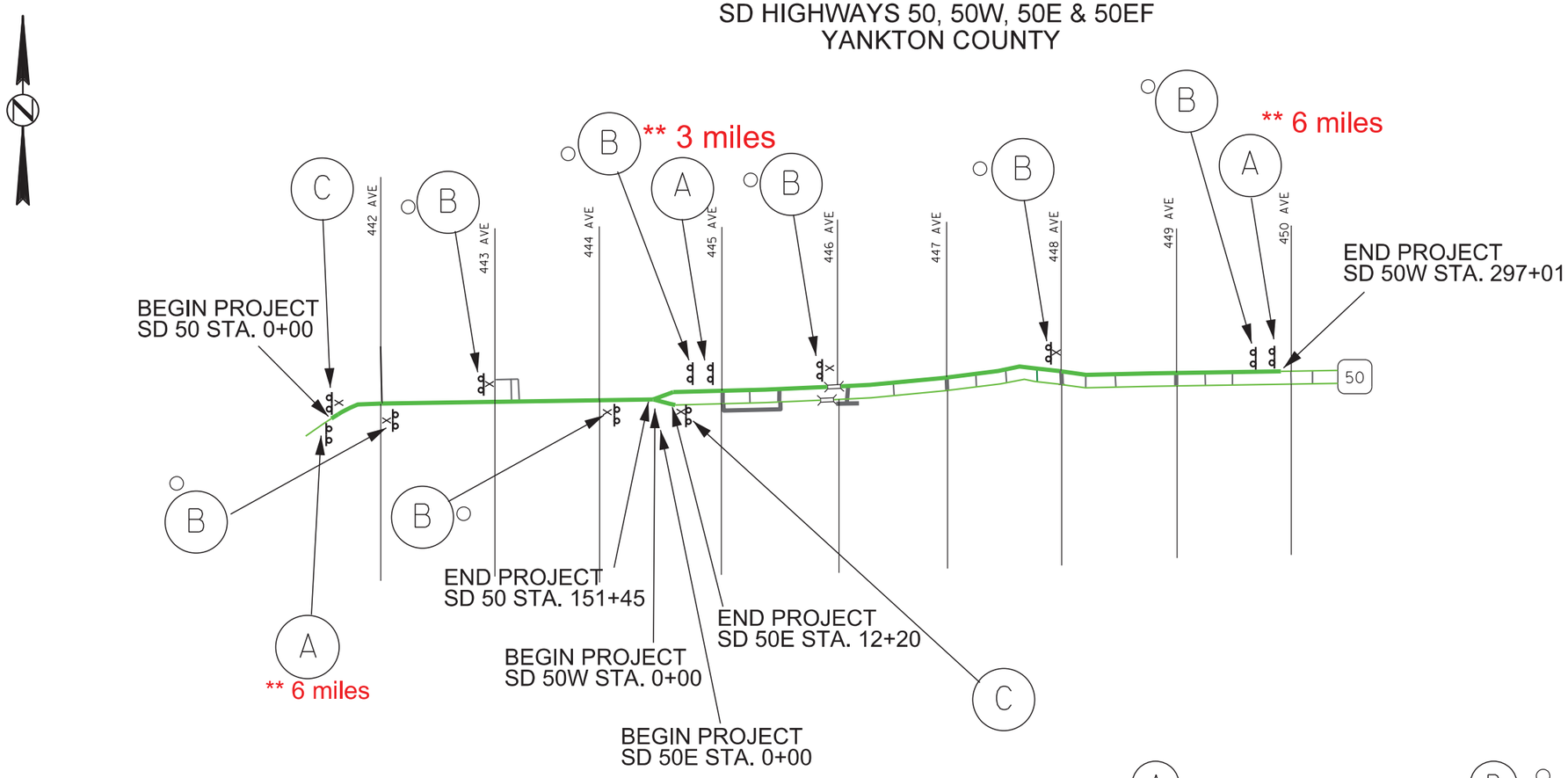


STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH-P 0023(73)	22	29

TRAFFIC CONTROL

FIXED LOCATION SIGNS
(GROUND MOUNTED SUPPORTS)

SD HIGHWAYS 50, 50W, 50E & 50EF
YANKTON COUNTY



Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet) (*)
0 – 30	200
35 – 40	350
45 – 50	500
55	750
60 – 65	1000
75	2600

NOTES:

Road Work Next xx Miles and End Road Work signs will remain in place until pavement marking is complete.

X - Signs will be placed 150' to 200' from Intersection. Exact location to be approved by the Engineer.

Construction signs will not obscure existing signs and must be located a minimum of 100' from an existing sign.

○ Loose Gravel signs with advisory speed plaques will be removed from view the same day that the fog seal is applied in the area they represent

A

G20-1

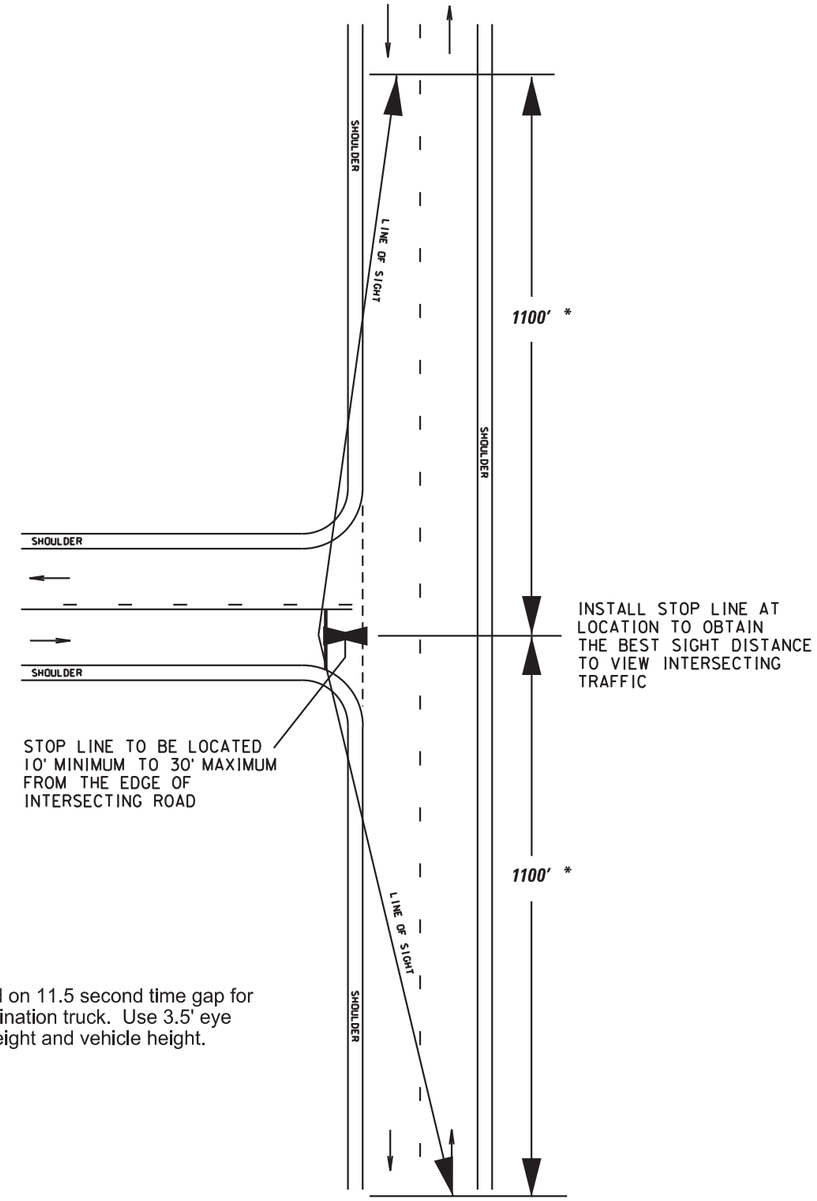
B ○

W8-7

SPECIAL

C

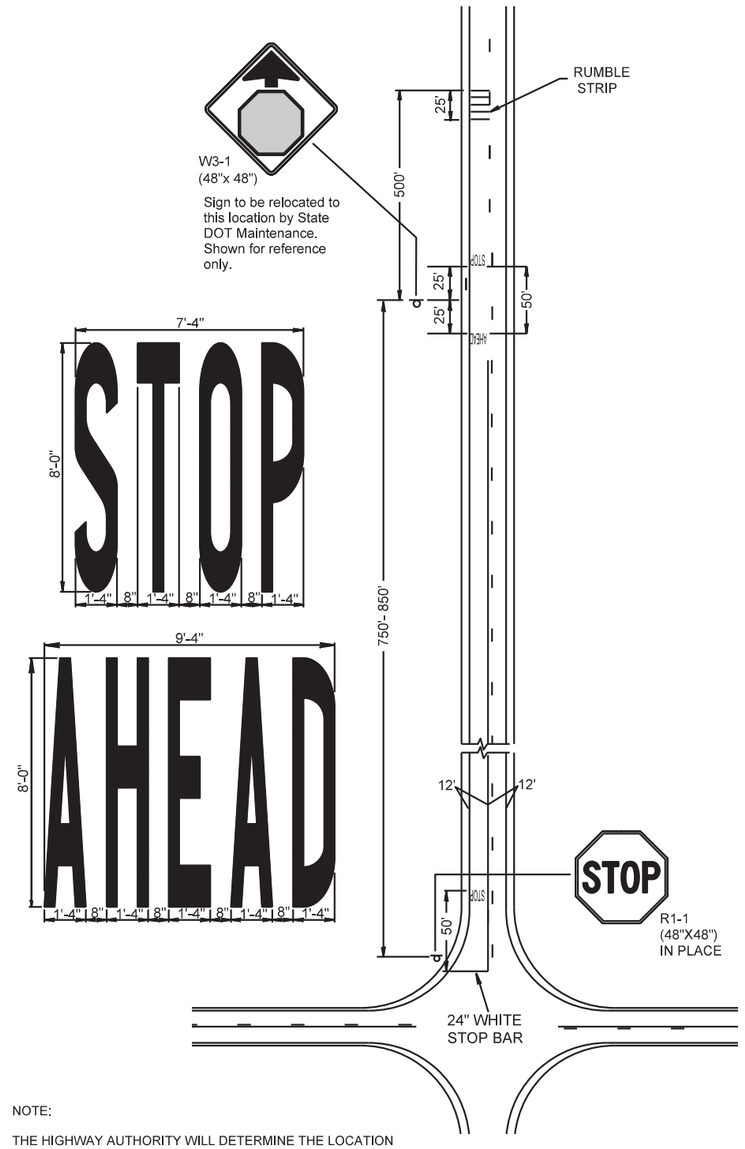
G20-2



* - Based on 11.5 second time gap for combination truck. Use 3.5' eye height and vehicle height.

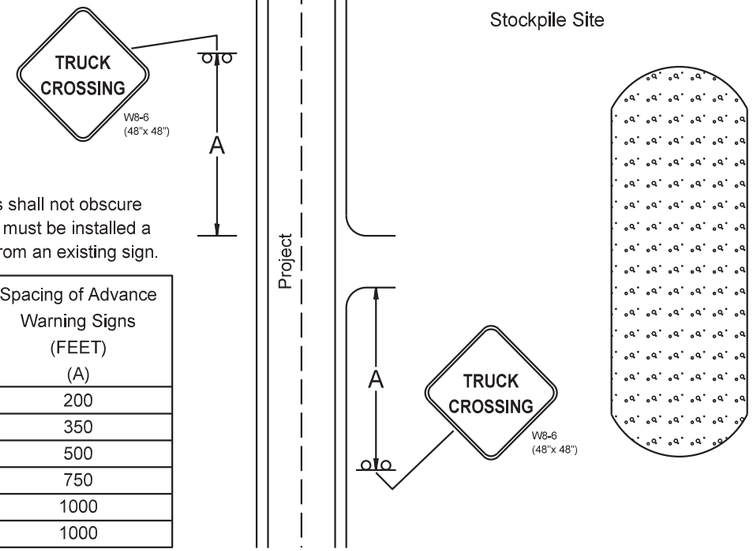
STOP LINE PAVEMENT MARKING INSTALLATION

INTERSECTION APPROACH PAVEMENT MARKING (Typical)



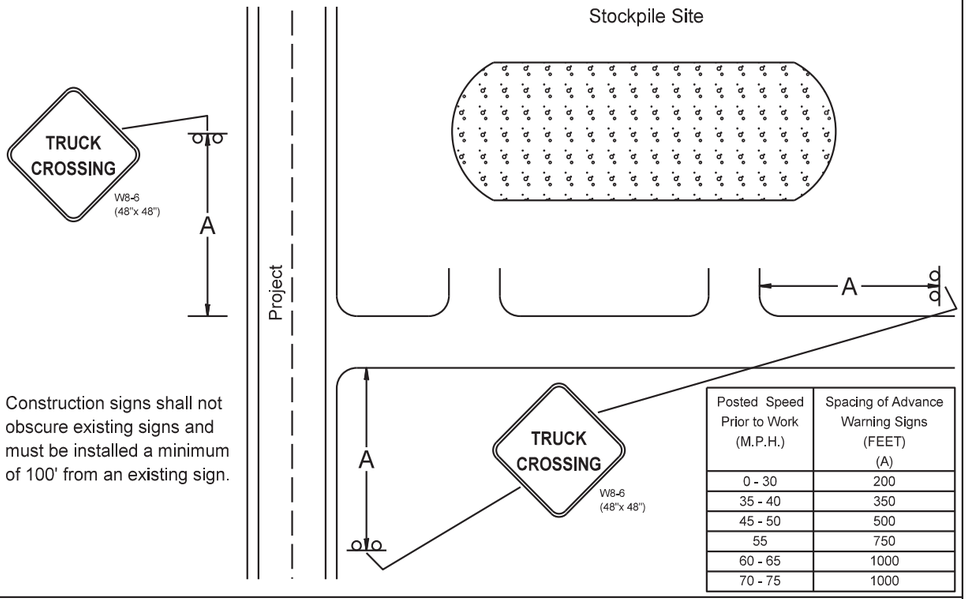
NOTE:

THE HIGHWAY AUTHORITY WILL DETERMINE THE LOCATION OF THE STOP LINE.



Construction signs shall not obscure existing signs and must be installed a minimum of 100' from an existing sign.

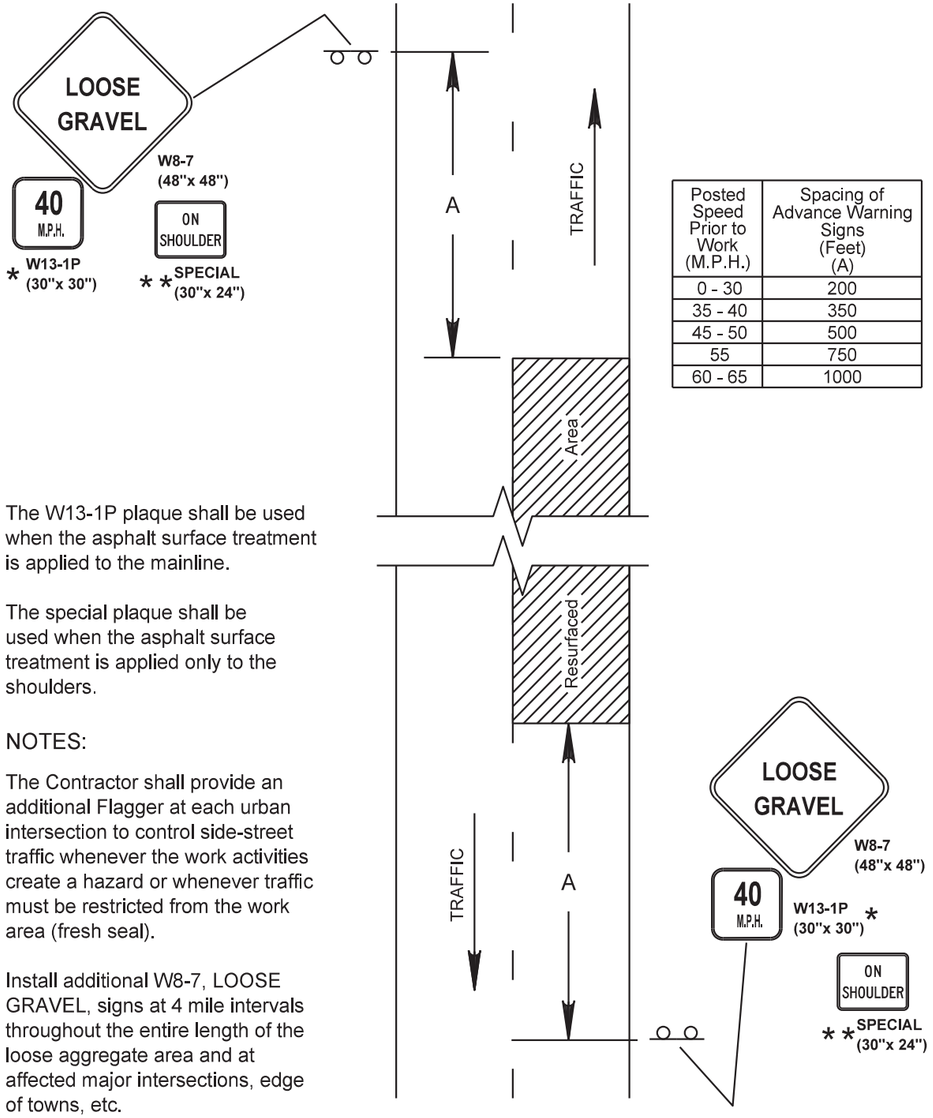
Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (FEET) (A)
0 - 30	200
35 - 40	350
45 - 50	500
55	750
60 - 65	1000
75	1000



Construction signs shall not obscure existing signs and must be installed a minimum of 100' from an existing sign.

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
70 - 75	1000

GUIDES FOR TRAFFIC CONTROL DEVICES TRUCK CROSSING SIGN INSTALLATION



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

* The W13-1P plaque shall be used when the asphalt surface treatment is applied to the mainline.

** The special plaque shall be used when the asphalt surface treatment is applied only to the shoulders.

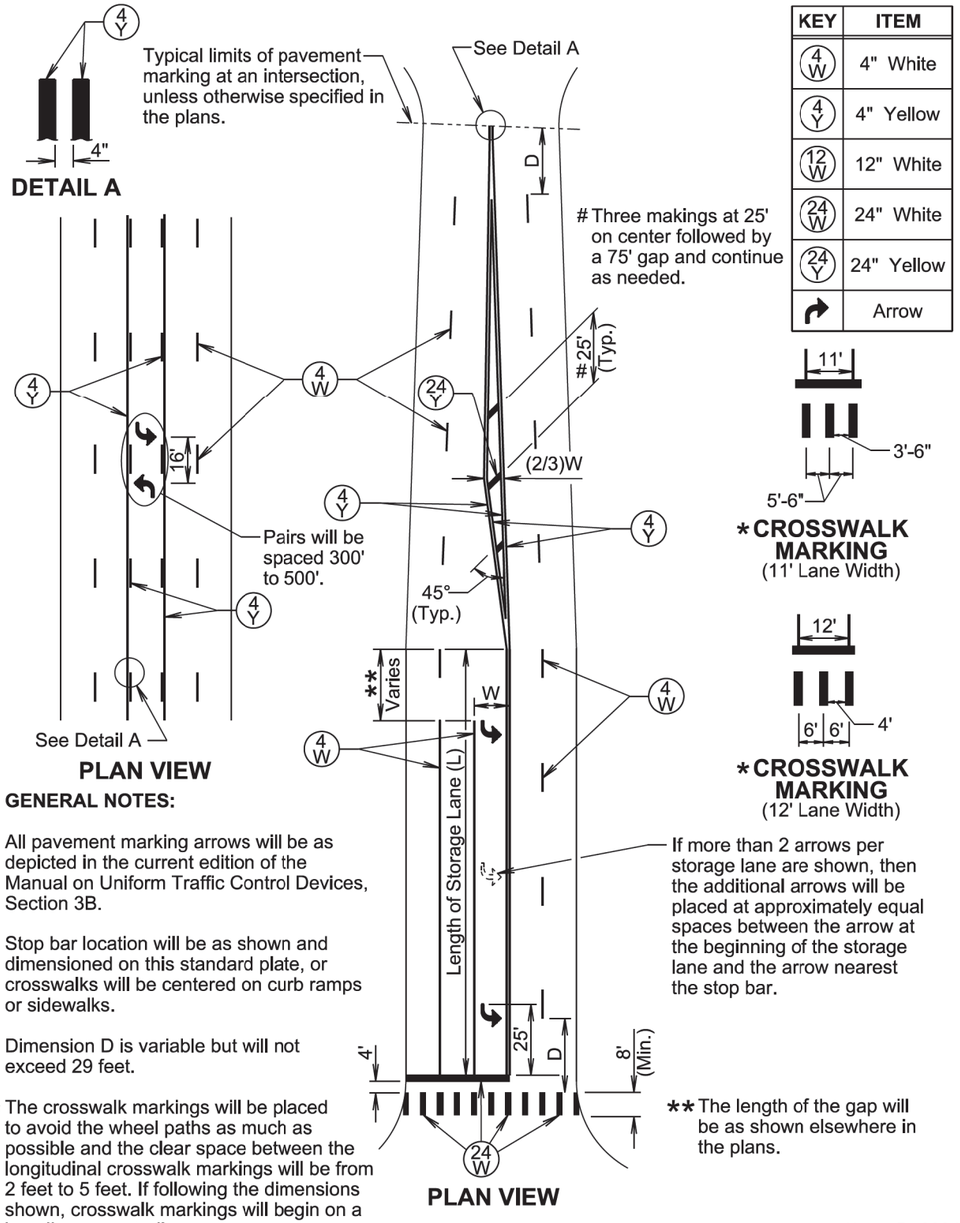
NOTES:

The Contractor shall provide an additional Flagger at each urban intersection to control side-street traffic whenever the work activities create a hazard or whenever traffic must be restricted from the work area (fresh seal).

Install additional W8-7, LOOSE GRAVEL, signs at 4 mile intervals throughout the entire length of the loose aggregate area and at affected major intersections, edge of towns, etc.

GUIDES FOR TRAFFIC CONTROL DEVICES

Typical Application - Traffic Control Devices to be used on an undivided highway, Asphalt Surface Treatment, when operations have created a driving surface of loose aggregate.



GENERAL NOTES:

All pavement marking arrows will be as depicted in the current edition of the Manual on Uniform Traffic Control Devices, Section 3B.

Stop bar location will be as shown and dimensioned on this standard plate, or crosswalks will be centered on curb ramps or sidewalks.

Dimension D is variable but will not exceed 29 feet.

* The crosswalk markings will be placed to avoid the wheel paths as much as possible and the clear space between the longitudinal crosswalk markings will be from 2 feet to 5 feet. If following the dimensions shown, crosswalk markings will begin on a lane line or centerline.

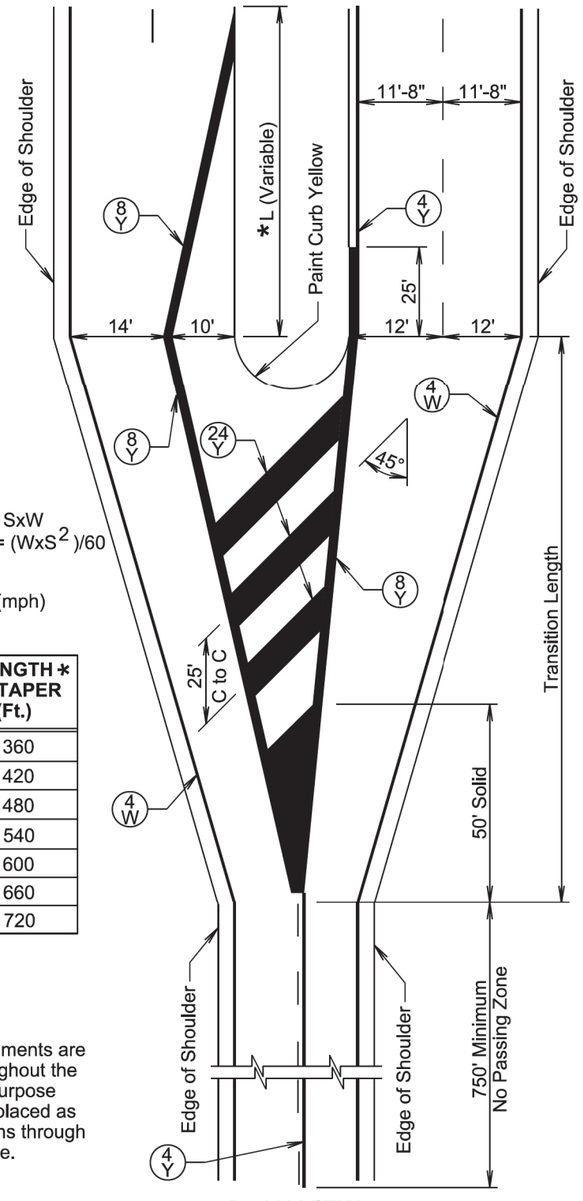
If more than 2 arrows per storage lane are shown, then the additional arrows will be placed at approximately equal spaces between the arrow at the beginning of the storage lane and the arrow nearest the stop bar.

** The length of the gap will be as shown elsewhere in the plans.

March 31, 2024

Published Date: 2026	SDDOT	PAVEMENT MARKINGS FOR ADJACENT INTERSECTIONS AND CENTER TURN LANE	PLATE NUMBER 633.01
			Sheet 1 of 1

KEY	ITEM
4W	4" White
4Y	4" Yellow
8Y	8" Yellow
24Y	24" Yellow



For 45 MPH and faster $L = SxW$
For 40 MPH and slower $L = (WxS^2)/60$

L = Length of Taper (Ft.)
S = 85th Percentile Speed (mph)
W = Width of Offset (Ft.)

85th PERCENTILE SPEED (mph)	LENGTH * OF TAPER (Ft.)
30	360
35	420
40	480
45	540
50	600
55	660
60	720

GENERAL NOTE:

Straight line angular alignments are shown on this plate throughout the transition for illustration purpose only. The striping will be placed as rounded/smooth transitions through areas of alignment change.

June 26, 2019

Published Date: 2026	SDDOT	APPROACH PAVEMENT MARKINGS FOR TWO-LANE TO FOUR-LANE DIVIDED HIGHWAYS	PLATE NUMBER 633.03
			Sheet 1 of 1

*In situations where multiple work locations in a limited distance make it practical to place stationary signs, the distance between the advance warning sign and the work should not exceed 5 miles.

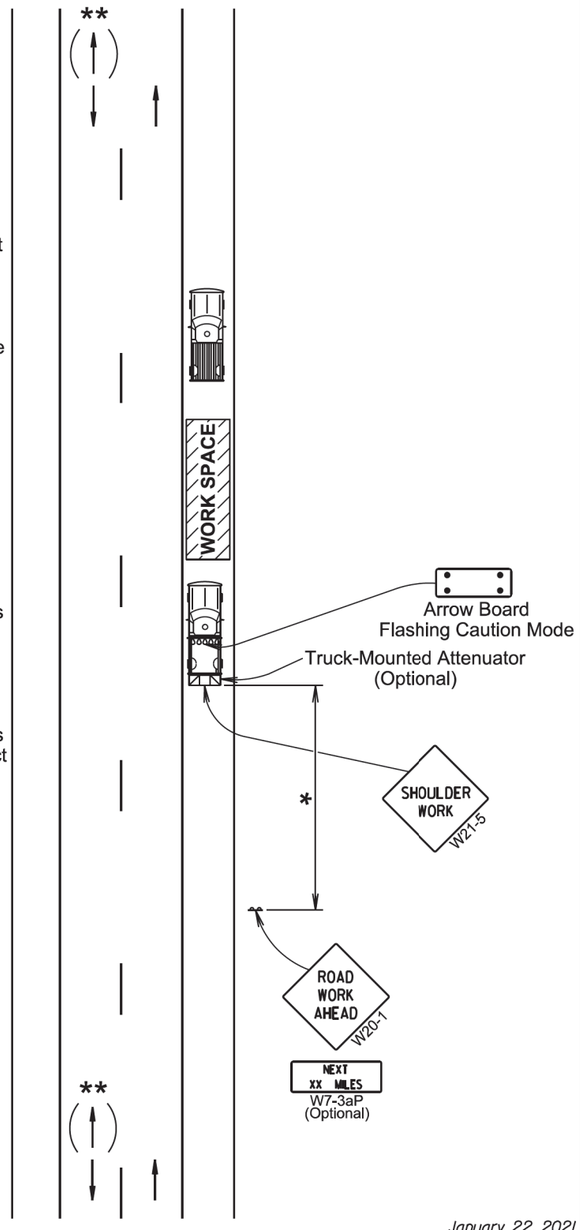
The ROAD WORK NEXT xx MILES sign may be used instead of the ROAD WORK AHEAD sign if the work locations occur over a distance of more than 2 miles.

Arrow board is required for intermittently and continuously moving mobile operations when work exceeds 1 hour.

**If the work space is on a divided highway, an advance warning sign should also be placed on the left side of the directional roadway.

In situations where the distance between the advance warning signs and the work is 2 miles to 5 miles, a Supplemental Distance plaque should be used with the ROAD WORK AHEAD sign.

All costs associated with the traffic control for mobile operation including signs, arrow boards and equipment will be incidental to the contract lump sum price for "Traffic Control, Miscellaneous".



January 22, 2021

Published Date: 2026	SDDOT	MOBILE OPERATIONS ON SHOULDERS	PLATE NUMBER 634.04
			Sheet 1 of 1

* Messages on signs will vary depending on the operation being conducted.

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

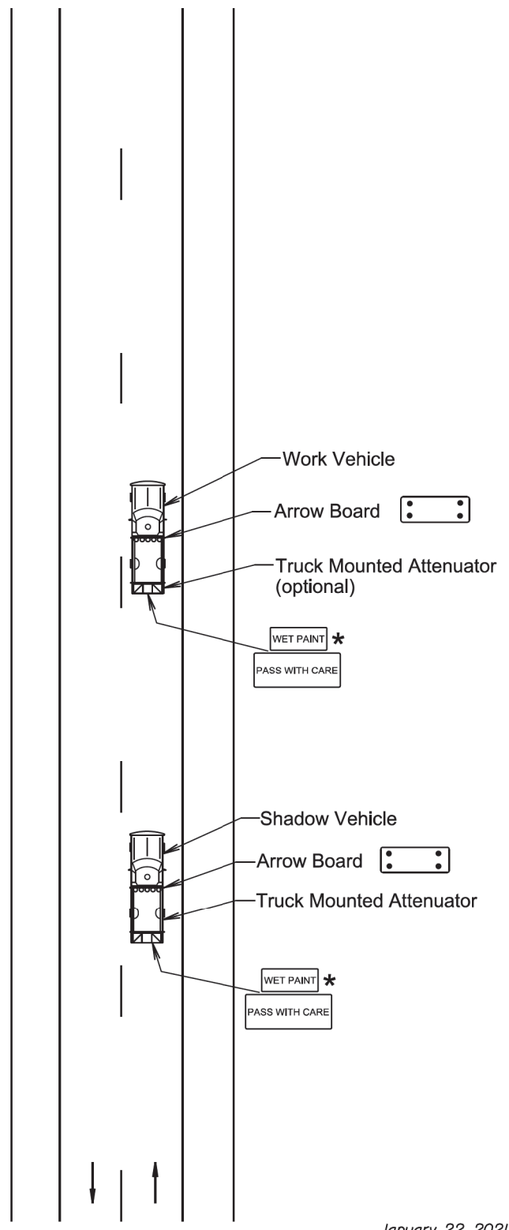
Shadow and Work vehicles will display high-intensity rotating, flashing, oscillating, or strobe lights, flags, signs, or arrow boards.

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

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

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

All costs associated with the traffic control for mobile operation including signs, arrow boards and equipment will be incidental to the contract lump sum price for “Traffic Control, Miscellaneous”.



January 22, 2021

Published Date: 2026	SDDOT	MOBILE OPERATIONS ON 2-LANE ROAD	PLATE NUMBER 634.06
			Sheet 1 of 1

Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet) (A)	Spacing of Channelizing Devices (Feet) (G)
0 - 30	200	25
35 - 40	350	25
45	500	25
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.

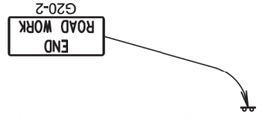
The ROAD WORK AHEAD and the END ROAD WORK signs may be omitted for short duration operations (1 hour or less).

For tack and/or flush seal operations, when flaggers are not being used, the FRESH OIL sign (W21-2) will 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 will be drums or 42" cones.

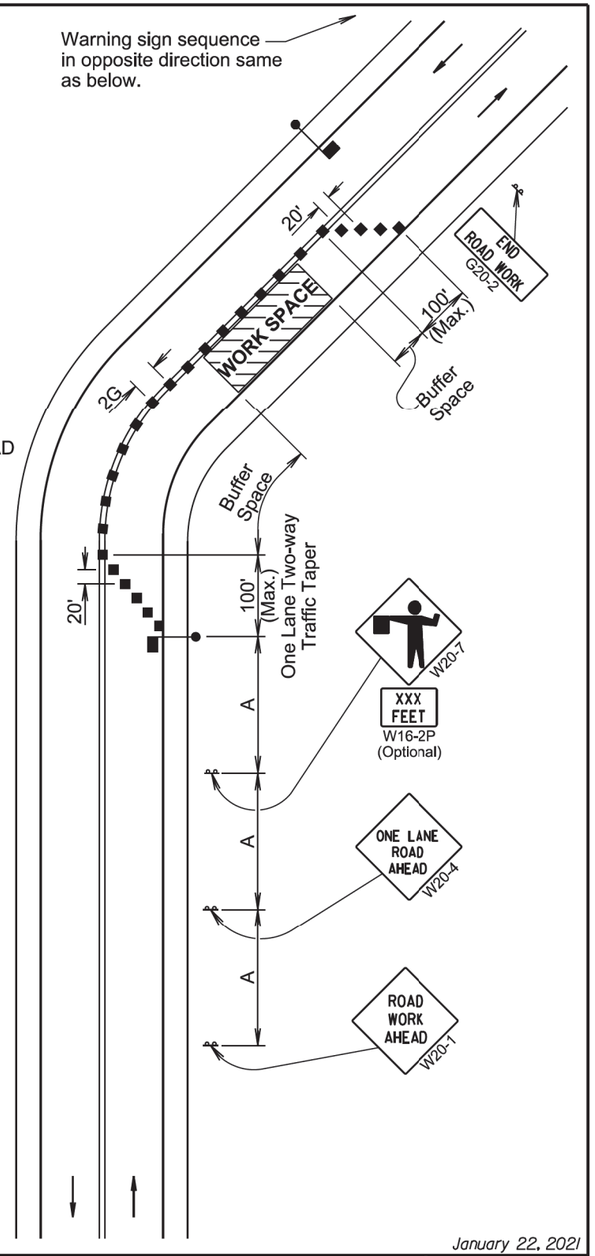
Channelizing devices are not required along the centerline adjacent to work area when pilot cars are utilized for escorting traffic through the work area.



Channelizing devices and flaggers will 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.



January 22, 2021

Published Date: 2026	SDDOT	LANE CLOSURE WITH FLAGGER PROVIDED	PLATE NUMBER 634.23
			Sheet 1 of 1

Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet) (A) (B) (C)		
0 - 30	200		
35 - 40	350		
45 - 50	500		
55	750		
60 - 65	1000		
	(A)	(B)	(C)
70 - 80	1000	1500	2640

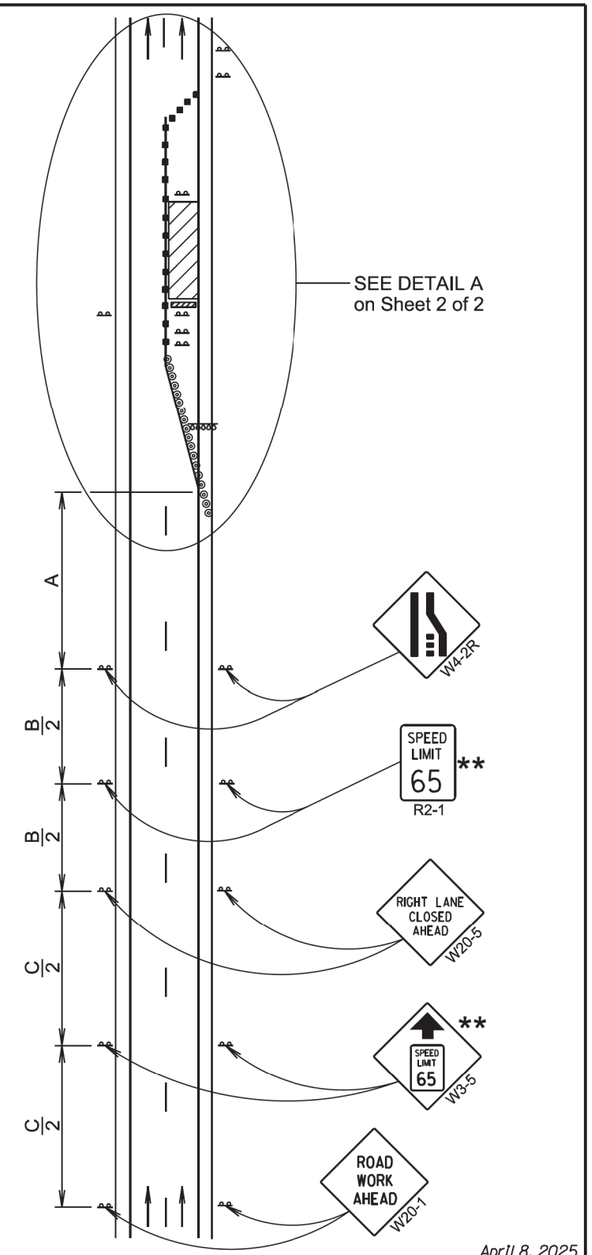
** Speed appropriate for location.

◎ Reflectorized Drum

■ Channelizing Device

ROAD WORK AHEAD sign is only required in advance of the first lane closure.

High speed is defined as having a posted speed limit greater than 45 mph.



April 8, 2025

Published Date: 2026	SDDOT	WORK ZONE SPEED REDUCTION FOR INTERSTATE AND HIGH SPEED MULTI-LANE HIGHWAYS	PLATE NUMBER 634.63
			Sheet 1 of 2

Posted Speed Prior to Work (M.P.H.)	Spacing of Channelizing Devices (Feet) (G)	Taper Length (Feet) (L)
0 -30	25	180
35 - 40	25	320
45	25	600
50	50 *	600
55	50 *	660
60 - 65	50 *	780
70 - 80	50 *	960

* Spacing is 40' for 42" cones.

** Speed appropriate for location.

*** Use speed limit designated for the condition when workers are present in the work space. Signs will be covered or removed when workers are not present.

◎ Reflectorized Drum

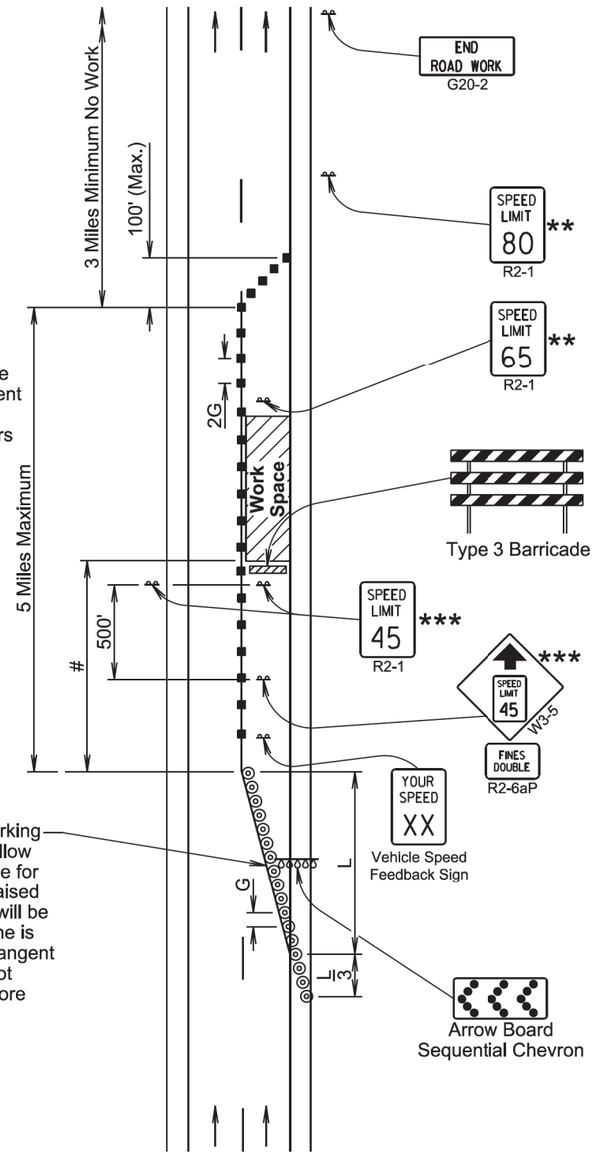
■ Channelizing Device

The Work Space will be a minimum of 500' from the end of the taper.

The channelizing devices will be 42" cones or drums.

42" cones may be used in place of the drums shown in the taper if setup will not be used during night time hours.

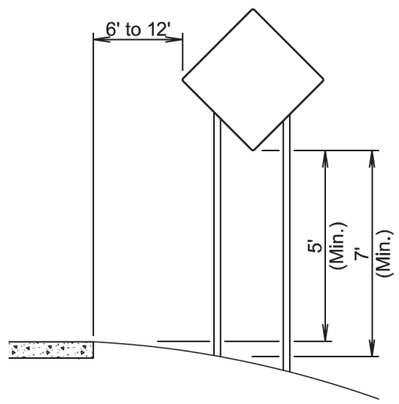
4" white temporary pavement marking tape for right lane closures, 4" yellow temporary pavement marking tape for left lane closures, or temporary raised pavement markers at 5' spacing will be installed in the taper when the lane is closed overnight, and along the tangent section where the skip lines do not exist and the lane is closed for more than 3 days.



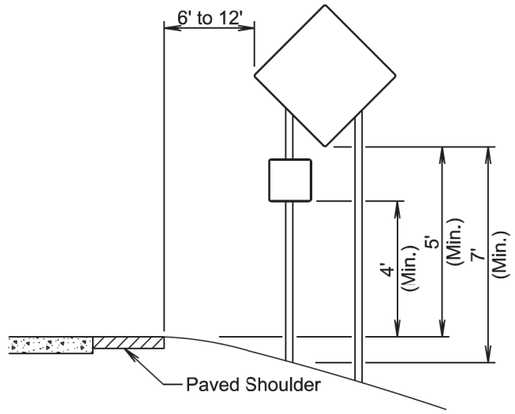
DETAIL A

April 8, 2025

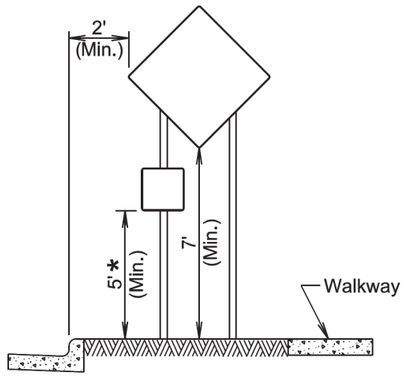
Published Date: 2026	SDDOT	WORK ZONE SPEED REDUCTION FOR INTERSTATE AND HIGH SPEED MULTI-LANE HIGHWAYS	PLATE NUMBER 634.63
			Sheet 2 of 2



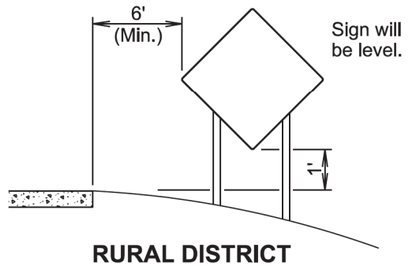
RURAL DISTRICT



RURAL DISTRICT WITH SUPPLEMENTAL PLATE



URBAN DISTRICT

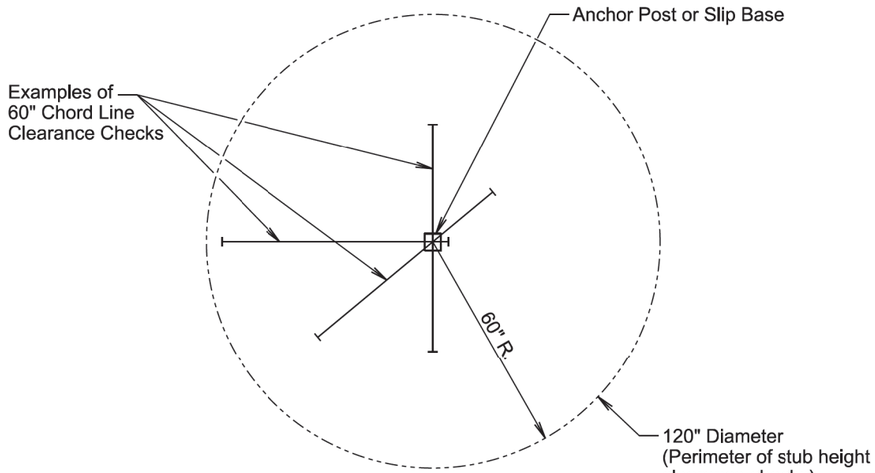


RURAL DISTRICT 3 DAY MAXIMUM
(Not applicable to regulatory signs)

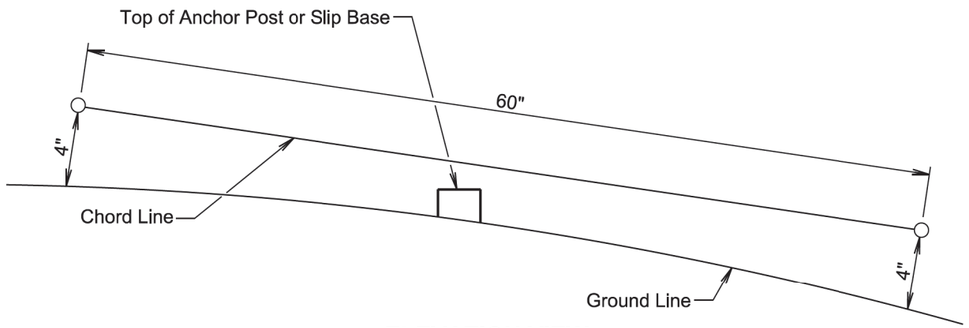
* If the bottom of supplemental plate is mounted lower than 7 feet above a pedestrian walkway, the supplemental plate should not project more than 4" into the pedestrian facility.

January 22, 2021

Published Date: 2026	SDDOT	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 WILL 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 will 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.

January 22, 2021

Published Date: 2026	SDDOT	***BREAKAWAY SUPPORT STUB CLEARANCE***	PLATE NUMBER 634.99 Sheet 1 of 1