

STATE OF SOUTH DAKOTA
 DEPARTMENT OF TRANSPORTATION
 PLANS FOR PROPOSED

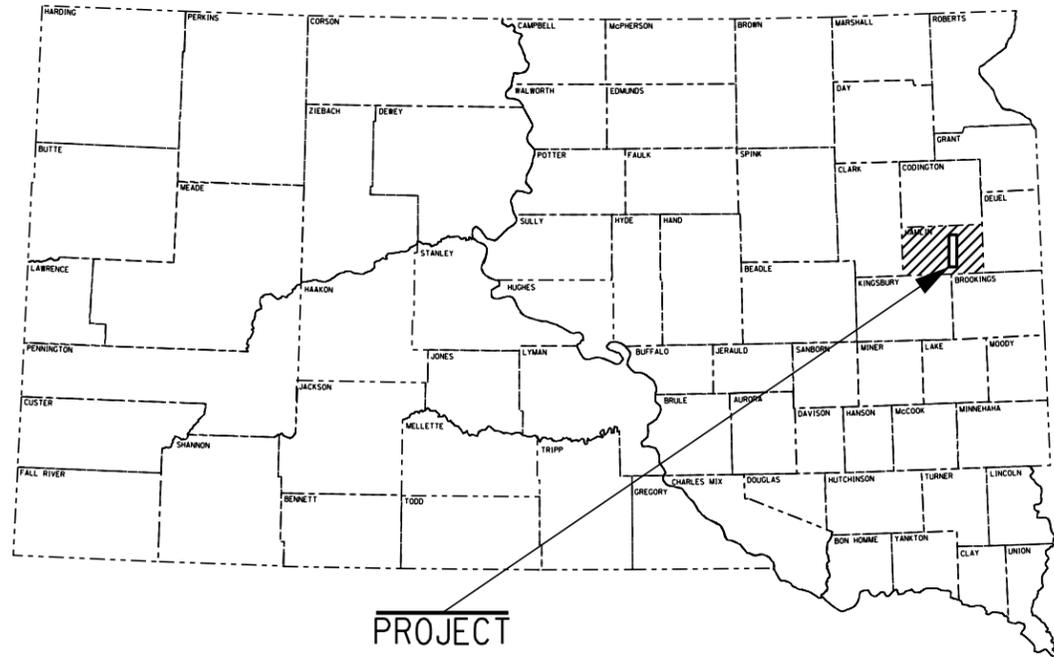
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(99)135	1	51
Plotting Date: 01/08/2015			

PROJECT NH 0081(99)135
US HIGHWAY 81
HAMLIN COUNTY

ASPHALT CONCRETE RESURFACING, CULVERT REPAIR,
 RUMBLE STRIPS, PAVEMENT MARKINGS,
 PERMANENT SIGNING, AND FENCING
 PCN 0366

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PROJECT



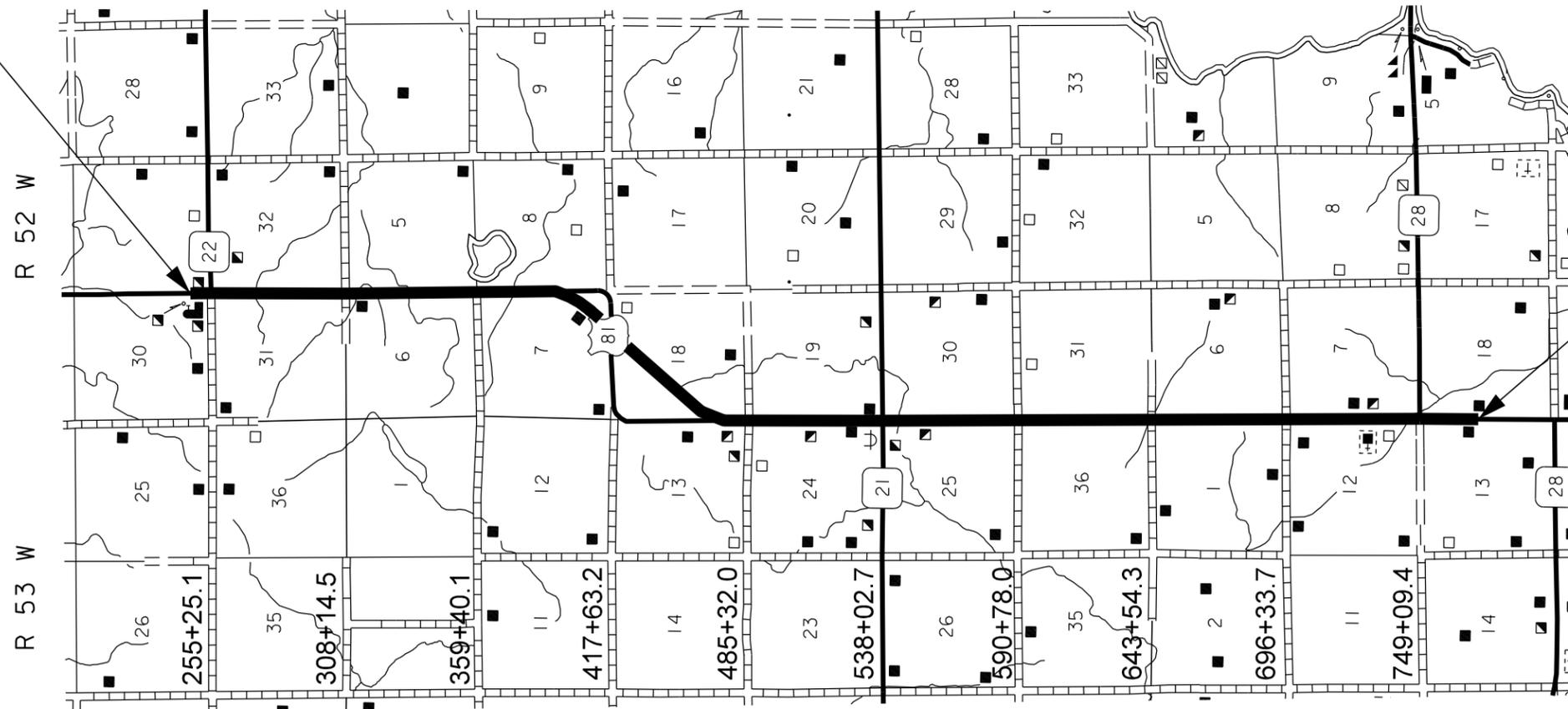
T 115 N

T 114 N

T 113 N

BEGIN PROJECT
 STA. 245+36.8
 MRM 145.09+0.184

END PROJECT
 STA. 769+32.4
 MRM 135.00+0.309



DESIGN DESIGNATION

ADT (2013)	2286
ADT (2033)	2755
DHV	311.3
D	52%
T DHV	8.7%
T ADT	19.2%
V	

STORM WATER PERMIT
 NONE REQUIRED

GROSS LENGTH	52395.6 FEET	9.923 MILES
LENGTH OF EXCEPTIONS	0.0 FEET	0.000 MILES
NET LENGTH	52395.6 FEET	9.923 MILES

10

PLOT SCALE - 1:6000

PLOTTED FROM - TRAB12222

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ESTIMATE OF QUANTITIES AND ENVIRONMENTAL COMMITMENTS

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(99)135	2	51

Revised 01/28/2015 MW

Bid Item Number	Item	Quantity	Unit
009E0010	Mobilization	Lump Sum	LS
009E4200	Construction Schedule, Category II	Lump Sum	LS
110E0130	Remove Traffic Sign	77	Each
110E0510	Remove Pipe End Section	4	Each
110E0590	Remove Cattle Pass	6	Ft
110E1690	Remove Sediment	0.5	CuYd
110E1700	Remove Silt Fence	113	Ft
110E7040	Remove Gate for Reset	2	Each
110E7500	Remove Pipe for Reset	186	Ft
110E7510	Remove Pipe End Section for Reset	23	Each
110E7530	Remove Cattle Pass for Reset	32	Ft
110E7540	Remove Cattle Pass End Section for Reset	4	Each
120E0100	Unclassified Excavation, Digouts	496	CuYd
120E0600	Contractor Furnished Borrow	296	CuYd
250E0020	Incidental Work, Grading	Lump Sum	LS
260E1010	Base Course	1,922.3	Ton
320E0007	PG 64-28 Asphalt Binder	1,956.3	Ton
320E1003	Class Q3 Hot Mixed Asphalt Concrete	34,180.8	Ton
320E4000	Hydrated Lime	337.8	Ton
320E7012	Grind 12" Rumble Strip or Stripe in Asphalt Concrete	17.8	Mile
330E0100	SS-1h or CSS-1h Asphalt for Tack	67.1	Ton
330E0210	SS-1h or CSS-1h Asphalt for Flush Seal	49.4	Ton
330E2000	Sand for Flush Seal	546.0	Ton
332E0010	Cold Milling Asphalt Concrete	1,867	SqYd
450E2008	18" RCP Flared End, Furnish	2	Each
450E2009	18" RCP Flared End, Install	2	Each
450E2028	36" RCP Flared End, Furnish	1	Each
450E2029	36" RCP Flared End, Install	1	Each
450E2032	42" RCP Flared End, Furnish	1	Each
450E2033	42" RCP Flared End, Install	1	Each
450E9000	Reset Pipe	186	Ft
450E9001	Reset Pipe End Section	23	Each
560E5001	4'x6' Reinforced Concrete Cattle Pass, Furnish	6.0	Ft
560E5002	4'x6' Reinforced Concrete Cattle Pass, Install	6.0	Ft
560E5100	Reset Reinforced Concrete Cattle Pass	32.0	Ft
560E5101	Reset Reinforced Concrete Cattle Pass End Section	4	Each
600E0300	Type III Field Laboratory	1	Each
620E1030	3 Post Panel	4	Each
620E2100	Reset Gate	2	Each
632E1320	2.0"x2.0" Perforated Tube Post	931.0	Ft
632E1340	2.5"x2.5" Perforated Tube Post	100.0	Ft
632E3203	Flat Aluminum Sign, Nonremovable Copy High Intensity	373.3	SqFt
632E3205	Flat Aluminum Sign, Nonremovable Copy Super/Very High Intensity	300.2	SqFt
633E0030	Cold Applied Plastic Pavement Marking, 24"	750	Ft
633E0040	Cold Applied Plastic Pavement Marking, Arrow	19	Each
633E1300	Pavement Marking Paint, White	350.0	Gal
633E1305	Pavement Marking Paint, Yellow	210.0	Gal
633E5015	Grooving for Cold Applied Plastic Pavement Marking, 24"	750	Ft
633E5025	Grooving for Cold Applied Plastic Pavement Marking, Arrow	19	Each
633E6020	Pavement Marking Masking, 25"	750	Ft
633E6030	Pavement Marking Masking, Arrow	19	Each
634E0010	Flagging	540	Hour
634E0020	Pilot Car	190	Hour
634E0100	Traffic Control	1,580	Unit
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS

Bid Item Number	Item	Quantity	Unit
634E0630	Temporary Pavement Marking	19.8	Mile
734E0010	Erosion Control	Lump Sum	LS
734E0050	Chemical Grout	72.0	Gal
734E0154	12" Diameter Erosion Control Wattle	200	Ft
734E0604	High Flow Silt Fence	450	Ft
734E0610	Mucking Silt Fence	31	CuYd
900E0010	Refurbish Single Mailbox	8	Each
900E1980	Storage Unit	1	Each

SPECIFICATIONS

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

ENVIRONMENTAL COMMITMENTS

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

COMMITMENT A: WETLANDS

Approximately 0.06 acres of wetlands will be temporarily impacted due to the resetting of equalizer pipe with the project action.

Action Taken/Required:

Temporary impacts will not be mitigated as original grades are to be re-established.

COMMITMENT B: FEDERALLY THREATENED, ENDANGERED, AND PROTECTED SPECIES

COMMITMENT B2: WHOOPING CRANE

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

Action Taken/Required:

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

COMMITMENT C: WATER SOURCE

The Contractor shall not withdraw water with equipment previously used outside the State of South Dakota without prior approval from the SDDOT Environmental Office. Thoroughly wash all construction equipment before entering South Dakota to reduce the risk of invasive species introduction into the project vicinity.

The Contractor shall not withdraw water directly from streams of the James, Big Sioux, and Vermillion watersheds without prior approval from the SDDOT Environmental Office.

Action Taken/Required:

The Contractor shall obtain the necessary permits from the regulatory agencies such as the Department of Environment and Natural Resources (DENR) and the United States Army Corps of Engineers (COE) prior to executing water extraction activities.

COMMITMENT D: WATER QUALITY STANDARDS

COMMITMENT D2: SURFACE WATER DISCHARGE

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

Action Taken/Required:

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

ESTIMATE OF QUANTITIES AND ENVIRONMENTAL COMMITMENTS

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(99)135	3	51

Revised 01/26/2015 MW

COMMITMENT E: STORM WATER

Construction activities constitute less than 1 acre of disturbance.

Action Taken/Required:

At a minimum and regardless of project size, appropriate erosion and sediment control measures must be installed to control the discharge of pollutants from the construction site.

COMMITMENT H: WASTE DISPOSAL SITE

The Contractor shall furnish a site(s) for the disposal of construction and/or demolition debris generated by this project.

Action Taken/Required:

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

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

The waste disposal site(s) shall not be located in a wetland, within 200 feet of surface water, or in an area that adversely affects wildlife, recreation, aesthetic value of an area, or any threatened or endangered species, as approved by the Project Engineer.

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

1. Construction and/or demolition debris consisting of concrete, asphalt concrete, or other similar materials shall be buried in a trench completely separate from wood debris. The final cover over the construction and/or demolition debris shall consist of a minimum of 1 foot of soil capable of supporting vegetation. Waste disposal sites provided outside of the State ROW shall be seeded in accordance with Natural Resources Conservation Service recommendations. The seeding recommendations may be obtained through the appropriate County NRCS Office. The Contractor shall control the access to waste disposal sites not within the State ROW through the use of fences, gates, and placement of a sign or signs at the entrance to the site stating "No Dumping Allowed".

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

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

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

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

COMMITMENT I: HISTORICAL PRESERVATION OFFICE CLEARANCES

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

Action Taken/Required:

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

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

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

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

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

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

COMMITMENT N: SECTION 404 PERMIT

The SDDOT has obtained a Section 404 Permit from the US Army Corps of Engineers for the permanent actions associated with this project.

Action Taken/Required:

The Contractor shall comply with all requirements contained in the Section 404 permit.

The Contractor shall also be responsible for obtaining a Section 404 permit for any dredge, excavation, or fill activities associated with staging areas, borrow sites, waste disposal sites, or material processing sites that affect wetlands or waters of the United States.

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(99)135	4	51
Plotting Date: 01/08/2015			

TYPICAL RESURFACING SECTION

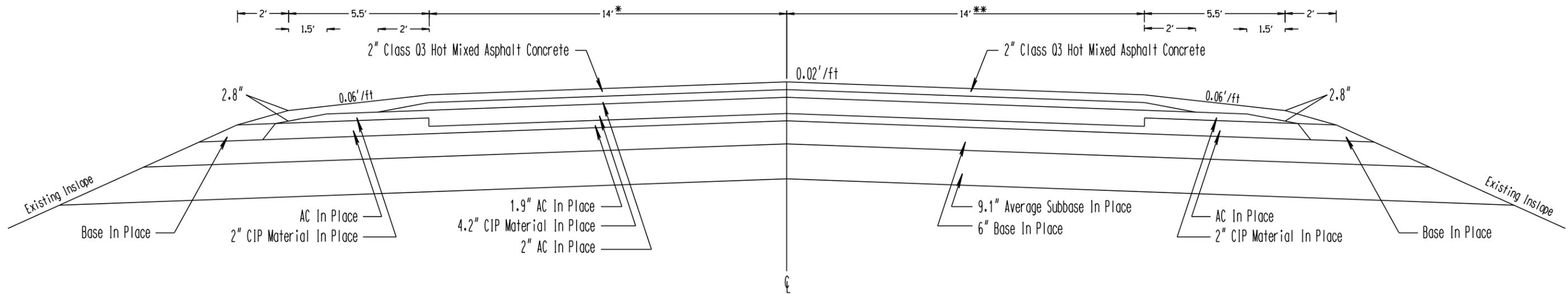
Section 1

Sta 245+36.8 to Sta 769+32.4

In Place & Resurfacing Section

* 26'
 Sta. 248+25.1 to 260+15.1
 Sta. 532+02.7 to 541+52.7
 Sta. 741+99.4 to 753+99.4
 Transition for 14' to 26'
 Sta. 245+36.8 to 248+25.1
 Sta. 528+52.7 to 532+02.7
 Sta. 738+49.4 to 741+99.4
 Transition for 26' to 14'
 Sta. 260+15.1 to 263+65.1
 Sta. 541+52.7 to 545+02.7
 Sta. 753+99.4 to 757+49.4

** 26'
 Sta. 251+75.1 to 261+25.1
 Sta. 533+92.7 to 545+02.7
 Sta. 745+59.4 to 755+09.4
 Transition for 14' to 26'
 Sta. 248+21.1 to 251+75.1
 Sta. 530+42.7 to 533+92.7
 Sta. 742+09.4 to 745+59.4
 Transition for 26' to 14'
 Sta. 261+25.1 to 264+75.1
 Sta. 545+02.7 to 548+52.7
 Sta. 755+09.4 to 758+59.4



PLOT SCALE - 1:4

PLOT NAME - 2

FILE - ... \0366-TYPICAL SECTION (REVISED).DGN

PLOTTED FROM - TRAB1222

RATES OF MATERIALS

The Estimate of Quantities is based on the following quantities of material per mile.

Section 1

STA. 245+36.8 to 769+32.4

CLASS Q3 HOT MIXED ASPHALT CONCRETE

Crushed Aggregate.....	2743 Tons
PG 64-28 Asphalt Binder.....	168 Tons
Total without Lime	2911 Tons
Hydrated Lime.....	29 Tons
Total with Lime	2940 Tons

The exact proportion of these materials will be determined on construction.

SS-1h or CSS-1h Emulsified Asphalt for Tack at the rate of **5.4** tons applied **44** feet wide.
(Rate = 0.05 Gal./Sq.Yd.)

FLUSH SEAL

SS-1h or CSS-1h Emulsified Asphalt for Flush Seal at the rate of **4.7** tons applied **39** feet wide.
(Rate = 0.05 Gal./Sq.Yd.)

Sand for Flush Seal at the rate of **52** tons applied **22** feet wide. (Rate = 8 Lb./Sq.Yd.)

SUMMARY OF ASPHALT CONCRETE

LOCATIONS:

	Class Q3 Hot Mixed Asphalt Concrete with Specified Density Compaction <u>TONS</u>	Class Q3 Hot Mixed Asphalt Concrete without Specified Density Compaction <u>TONS</u>
Section 1	15679.87	13494.95
Spot leveling, strengthening, and repair of existing surface	-	2977.02
Table of Additional Quantities	-	2029.00
TOTAL	15679.9	18501.0
<i>Total Class Q3 Hot Mixed Asphalt Concrete:</i>	34180.8	<i>Tons</i>

TABLE OF ADDITIONAL QUANTITIES

LOCATIONS:	BASE COURSE <u>Ton</u>	CLASS Q3 HOT MIXED ASPHALT CONCRETE <u>Ton</u>	PG 64-28 ASPHALT BINDER <u>Ton</u>	HYDRATED LIME <u>Ton</u>	Virgin Aggregate N.A.B.I. <u>Ton</u>	COLD MILLING ASPHALT CONCRETE <u>(SqYd)</u>
39 Farm and Field Entrances (includes 15 tons of Asphalt Concrete for a farm entrance at Sta. 556+45)	635	15	0.86	0.15	13.99	-
8 Intersecting Asphalt Roads (Cold Mill as detailed elsewhere in these plans)	-	470	26.99	4.70	438.31	799
13 Intersecting Roads with Asphalt Pads	260	280	16.08	2.80	261.12	-
1 Cemetary Approach (Sta. 725+00)	15	20	1.15	0.20	18.65	-
1 Commercial Driveway (Sta. 253+98)	-	25	1.44	0.25	23.31	
Begin Project at Sta. 245+36.8 (Cold Mill as detailed elsewhere in these plans)	-	-	-	-	-	534
End Project at start of PCC Pavement (Cold Mill as detailed elsewhere in these plans)	-	-	-	-	-	534
Extra Lanes						
Intersection with SD 22	-	395	22.68	3.95	368.37	-
Intersection with SD 21	-	400	22.97	4.00	373.03	-
Intersection with SD 28	-	420	24.12	4.20	391.68	-
Shoulder work due to work on Cattle Pass	20	4	0.23	0.04	3.73	-
TOTALS	930	2029	116.5	20.3	1892.2	1867

The tonnage shown in the Table of Additional Quantities for Class Q3 Hot Mix Asphalt Concrete is based on an average compacted thickness of 2 inches.

Included in the Estimate of Quantities are 3.5 tons of Asphalt for Tack SS-1H or CSS-1H for the intersecting roads and other areas throughout the project.

Included in the Estimate of Quantities are 2.8 tons of SS-1H or CSS-1H Asphalt for Flush Seal and 30 tons of Sand for Flush Seal for the intersecting roads and other areas throughout the project.

Shoulder Paving at location of Cattle Pass can be done at same time as spot leveling

Application shall be at the rate shown on the plans or as directed by the Engineer.

The above quantities are included in the Estimate of Quantities.

TABLE OF PROJECT STATIONING								
SECTION	STATION	TO	STATION	LENGTH	GROSS SECTION LENGTH	GROSS SECTION LENGTH	NET SECTION LENGTH	NET SECTION LENGTH
				(Ft)	(Ft)	(Miles)	(Ft)	(Miles)
1	245+36.80	to	769+32.40	52395.6	52395.60	9.923	52395.60	9.923
TOTAL:				52395.60	52395.60	9.923	52395.60	9.923

TABLE OF MATERIAL QUANTITIES														
SECTION	UNCLASSIFIED EXCAVATION, DIG OUTS	BASE COURSE	COLD MILLING ASPHALT CONCRETE	CLASS Q3 HOT MIXED ASPHALT CONCRETE	<-----Spot Leveling----->				<-----Main Line----->				SS-1h/ CSS-1h ASPH. FOR FLUSH SEAL	SAND FOR FLUSH SEAL
					HYDRATED LIME	PG 64-28 ASPHALT BINDER	VIRG. AGGR. (NABI.)	CLASS Q3 HOT MIXED ASPHALT CONCRETE	PG 64-28 ASPHALT BINDER	HYDRATED LIME	VIRG. AGGR. (NABI.)	SS-1h/ CSS-1h ASPH. FOR TACK		
	CuYd	Ton	SqYd	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton
1	496	992.3	-	2977.0	29.8	172.7	2774.6	29174.8	1667.1	287.8	27219.9	53.6	46.6	516.0
Additional Quantities	-	930.0	1867	-	-	-	-	2029.0	116.5	20.3	1892.2	13.5	2.8	30.0
Totals	496	1922.3	1867	2977.0	29.8	172.7	2774.6	31203.8	1783.6	308.1	29112.1	67.1	49.4	546.0

Revised 01/21/2015 MW

TABLE OF MAINLINE CULVERT WORK

#	Station	Approx MRM	Side	Culvert Size and Type		Flow Direction per Original Constr. Plans	Contractor Furnished Borrow (CuYd)	Remove Pipe for Reset (Ft)	Remove Pipe End Section (Each)	Remove Pipe End Section for Reset (Each)	Remove Cattle Pass (Ft)	Remove Cattle Pass for Reset (Ft)	Remove Cattle Pass End Section for Reset (Each)	Furnish and Install				Reset Pipe (Ft)	Reset Pipe End Section (Each)	Reset Reinforced Concrete Cattle Pass (Ft)	Reset Reinforced Concrete Cattle Pass End Section (Each)	Chemical Grout (Gal)	Comments			
														18" RCP Flared End (Each)	36" RCP Flared End (Each)	42" RCP Flared End (Each)	4'X6' Reinforced Concrete Cattle Pass (Ft)									
1	264+82	144.00+0.872	East	36"	RCP			6	1								6	1								
			West																							
2	273+11	144.00+0.719	East	42"	RCP				1									1								
			West					6		1									6	1						
3	312+58	143.00+0.998	East	4' X 6'	Cattle Pass						6	1							6	1						
			West									6	1							6	1					
4	320+88	143.00+0.841	East	24"	CMP																				Pipe is under water. No work required at this time.	
			West																							
5	332+63.5	143.00+0.619	North East	36"	RCP		18	1									18	1								
			North West				6	1											6	1						
6			South East	36"	RCP		18	1										18	1							
			South West				6	1											6	1						
7	356+26.8	143.00+0.184	East	36"	RCP	East		1																		
			West																							
8	374+38	142.00+0.863	North East	54"	RCP																					
			North West				6	1											6	1						
9			South East	54"	RCP		6	1										6	1							
			South West																							
10	411+35	142.00+0.160	East	24"	RCP																					
			West																							
11	419+00	142.00+0.015	East	18"	RCP	East		1								1										
			West						6	1							1		6							
12	426+95	141.00+0.856	East	4' X 6'	Cattle Pass						12	1							12	1					Work onto both shoulders. See plan notes for 3 Post Panel installation.	
			West								6	8	1				6			8	1					
13	437+00	141.00+0.653	East	4' X 6'	Cattle Pass																					
			West																							
14	453+20	141.00+0.342	East	42"	RCP	East		12	1								12	1								
			West						12	1						1		12								
15	466+55	141.00+0.098	East	30"	RCP			6	1								6	1								
			West						6	1								6	1							
16	489+45.6	140.00+0.673	East	30"	RCP																					
			West																							
17	501+52.7	140.00+0.435	East	30"	RCP			6	1								6	1							Ditch clean out on east side. Reslope in both directions. See Plan Note for Ditch Cleanout.	
			West																							

PLOTTED FROM - TRAB12222

US 81, NH 0081(99)135, PCN 0366 Permanent Sign Installation Table

MRM	Side of Road	Description	Sign Code	Width (Inches)	Height (Inches)	Flat Aluminum Sign, Nonremovable Copy High Intensity (SqFt)	Flat Aluminum Sign, Nonremovable Copy Super/Very High Intensity (SqFt)	2.0"x2.0" Perforated Tube Post 12 Ga. (Ft)	2.5"x2.5" Perforated Tube Post 10 Ga. (Ft)	(N.A.B.I.) Square Tube Anchor Sleeve (Each)	(N.A.B.I.) 48" Winged Slip Base Anchor (Each)	Remove Traffic Sign (Each)	Direction Sign Faces	Current Type of Post	Remarks
135.453	Lt.	No Passing Zone	W14-3	48X48X36			5.6	11		1		1	S	4" X 6" Wood	Replace New Sign on New Post
135.528	Rt.	US 81	M1-4	24	24	4.0		20		2		1	S	4" X 6" Wood	Replace New Sign on New Post
		Vertical Arrow	M6-3	21	15	2.2							S		Replace New Sign on New Post
		SD 28	M1-5	24	24	4.0							S		Replace New Sign on New Post
		Double Arrow Vertical Right	M6-6R	21	15	2.2							S		Replace New Sign on New Post
135.633	Rt.	Watertown Esteline--->		72	30	15.0		24		2		1	S	4" X 6" Wood	Replace New Sign on New Post
135.698	Lt.	South	M3-3	24	12	2.0		20		2		1	N	4" X 6" Wood	Replace New Sign on New Post
		US 81	M1-4	24	24	4.0							N		Replace New Sign on New Post
		West	M3-4	24	12	2.0							N		Replace New Sign on New Post
		SD 28	M1-5	24	24	4.0							N		Replace New Sign on New Post
135.708	Rt.	US 81	M1-4	24	24	4.0		20		2		1	S	4" X 6" Wood	Replace New Sign on New Post
		Vertical Arrow	M6-3	21	15	2.2							S		Replace New Sign on New Post
		SD 28	M1-5	24	24	4.0							S		Replace New Sign on New Post
		Horizontal Right Arrow	M6-1R	21	15	2.2							S		Replace New Sign on New Post
135.730	Lt.	Stop	R1-1	30	30		5.2	9		1		1	W	4" X 6" Wood	Replace New Sign on New Post
135.742	Lt.	SD 28	M1-5	24	24	4.0		20		2		1	E	4" X 6" Wood	Replace New Sign on New Post
		Horizontal Left Arrow	M6-1L	21	15	2.2							E		Replace New Sign on New Post
		US 81	M1-4	24	24	4.0							E		Replace New Sign on New Post
		Horizontal Double Arrow	M6-4	21	15	2.2							E		Replace New Sign on New Post
135.743	Rt.	Stop	R1-1	36	36		7.5	10		1		1	E	Telespar	Replace New Sign on New Post
135.751	Rt.	Yield	R1-2	36X36X36			3.9	10		1		1	SE	4" X 6" Wood	Replace New Sign on New Post
		Do Not Enter	R5-1	30	30		6.3						NW		Replace New Sign on New Post

US 81, NH 0081(99)135, PCN 0366 Permanent Sign Installation Table

MRM	Side of Road	Description	Sign Code	Width (Inches)	Height (Inches)	Flat Aluminum Sign, Nonremovable Copy High Intensity (SqFt)	Flat Aluminum Sign, Nonremovable Copy Super/Very High Intensity (SqFt)	2.0"x2.0" Perforated Tube Post 12 Ga. (Ft)	2.5"x2.5" Perforated Tube Post 10 Ga. (Ft)	(N.A.B.I.) Square Tube Anchor Sleeve (Each)	(N.A.B.I.) 48" Winged Slip Base Anchor (Each)	Remove Traffic Sign (Each)	Direction Sign Faces	Current Type of Post	Remarks
135.752	Lt.	SD 28	M1-5	24	24	4.0		20		2		1	N	4" X 6" Wood	Replace New Sign on New Post
		Double Arrow Left Vertical	M6-6L	21	15	2.2					N		Replace New Sign on New Post		
		US 81	M1-4	24	24	4.0					N		Replace New Sign on New Post		
		Vertical Arrow	M6-3	21	15	2.2					N		Replace New Sign on New Post		
135.773	Rt.	North	M3-1	24	12	2.0		10		1		1	S	4" X 6" Wood	Replace New Sign on New Post
		US 81	M1-4	24	24	4.0					S		Replace New Sign on New Post		
135.838	Rt.	Junction SD 21 4 Watertown 20		78	36	19.5			24		2	1	S	4" X 6" Wood	Replace New Sign on New Post
135.838	Lt.	Arlington Estelline		72	30	15.0		24		2		1	N	4" X 6" Wood	Replace New Sign on New Post
135.937	Lt.	Junction Marker	M2-1	21	15	2.2		10		1		1	N	4" X 6" Wood	Replace New Sign on New Post
		SD 28	M1-5	24	24	4.0					N		Replace New Sign on New Post		
136.259	Rt.	No Passing Zone	W14-3	48X48X36			5.6	11		1		1	N	4" X 6" Wood	Replace New Sign on New Post
136.324	Lt.	No Passing Zone	W14-3	48X48X36			5.6	11		1		1	S	4" X 6" Wood	Replace New Sign on New Post
136.700	Lt.	Stop	R1-1	36	36		7.5	10		1		1	W	4" X 6" Wood	Replace New Sign on New Post
136.709	Rt.	Stop	R1-1	36	36		7.5	10		1		1	E	4" X 6" Wood	Replace New Sign on New Post
136.725	Rt.	North	M3-1	24	12	2.0		10		1		1	S	4" X 6" Wood	Replace New Sign on New Post
		US 81	M1-4	24	24	4.0					S		Replace New Sign on New Post		
136.783	Rt.	No Passing Zone	W14-3	48X48X36			5.6	11		1		1	N	4" X 6" Wood	Replace New Sign on New Post
137.764	Lt.	Stop	R1-1	36	36		7.5	10		1		1	W	4" X 6" Wood	Replace New Sign on New Post
137.773	Rt.	Stop	R1-1	30	30		5.2	9		1		1	E	4" X 6" Wood	Replace New Sign on New Post
137.932	Lt.	No Passing Zone	W14-3	48X48X36			5.6	11		1		1	S	4" X 6" Wood	Replace New Sign on New Post
138.488	Rt.	No Passing Zone	W14-3	48X48X36			5.6	11		1		1	N	4" X 6" Wood	Replace New Sign on New Post

US 81, NH 0081(99)135, PCN 0366 Permanent Sign Installation Table

MRM	Side of Road	Description	Sign Code	Width (Inches)	Height (Inches)	Flat Aluminum Sign, Nonremovable Copy High Intensity (SqFt)	Flat Aluminum Sign, Nonremovable Copy Super/Very High Intensity (SqFt)	2.0"x2.0" Perforated Tube Post 12 Ga. (Ft)	2.5"x2.5" Perforated Tube Post 10 Ga. (Ft)	(N.A.B.I.) Square Tube Anchor Sleeve (Each)	(N.A.B.I.) 48" Winged Slip Base Anchor (Each)	Remove Traffic Sign (Each)	Direction Sign Faces	Current Type of Post	Remarks
138.730	Lt.	South	M3-3	24	12	2.0		10		1		1	N	4" X 6" Wood	Replace New Sign on New Post
		US 81	M1-4	24	24	4.0					N		Replace New Sign on New Post		
138.753	Lt.	Stop	R1-1	36	36		7.5	10		1		1	W	4" X 6" Wood	Replace New Sign on New Post
138.761	Rt.	Stop	R1-1	36	36		7.5	10		1		1	E	4" X 6" Wood	Replace New Sign on New Post
139.503	Lt.	No Passing Zone	W14-3	48X48X36			5.6	11		1		1	S	4" X 6" Wood	Replace New Sign on New Post
139.583	Lt.	Junction Marker	M2-1	21	15	2.2		10		1		1	N	4" X 6" Wood	Replace New Sign on New Post
		SD 21	M1-5	24	24	4.0			N		Replace New Sign on New Post				
139.653	Lt.	Junction SD 28 4 Arlington 20 Madison 44		78	42	22.8			26		2	1	N	4" X 6" Wood	Replace New Sign on New Post
139.680	Rt.	SD 21	M1-5	24	24	4.0		20		2		1	S	4" X 6" Wood	Replace New Sign on New Post
		Horizontal Left Arrow	M6-1L	21	15	2.2			S		Replace New Sign on New Post				
		US 81	M1-4	24	24	4.0			S		Replace New Sign on New Post				
		Vertical Arrow	M6-3	21	15	2.2			S		Replace New Sign on New Post				
139.723	Lt.	Do Not Enter	R5-1	30	30		6.3	10		1		1	SE	4" X 6" Wood	Replace New Sign on New Post
		Yield	R1-2	36X36X36			3.9		NW		Replace New Sign on New Post				
139.728	Rt.	US 81	M1-4	24	24	4.0		20		2		1	W	4" X 6" Wood	Replace New Sign on New Post
		Horizontal Double Arrow	M6-4	21	15	2.2			W		Replace New Sign on New Post				
		End Marker	M4-6	24	12	2.0			W		Replace New Sign on New Post				
		SD 21	M1-5	24	24	4.0			W		Replace New Sign on New Post				
139.728	Lt.	Stop	R1-1	36	36		7.5	10		1		1	W	Telespar	Replace New Sign on New Post
139.743	Rt.	Stop	R1-1	36	36		7.5	10		1		1	E	4" X 6" Wood	Replace New Sign on New Post
139.772	Rt.	North	M3-1	24	12	2.0		10		1		1	S	4" X 6" Wood	Replace New Sign on New Post
		US 81	M1-4	24	24	4.0			S		Replace New Sign on New Post				

US 81, NH 0081(99)135, PCN 0366 Permanent Sign Installation Table

MRM	Side of Road	Description	Sign Code	Width (Inches)	Height (Inches)	Flat Aluminum Sign, Nonremovable Copy High Intensity (SqFt)	Flat Aluminum Sign, Nonremovable Copy Super/Very High Intensity (SqFt)	2.0"x2.0" Perforated Tube Post 12 Ga. (Ft)	2.5"x2.5" Perforated Tube Post 10 Ga. (Ft)	(N.A.B.I.) Square Tube Anchor Sleeve (Each)	(N.A.B.I.) 48" Winged Slip Base Anchor (Each)	Remove Traffic Sign (Each)	Direction Sign Faces	Current Type of Post	Remarks
139.772	Lt.	US 81	M1-4	24	24	4.0		20		1		1	N	4" X 6" Wood	Replace New Sign on New Post
		Vertical Arrow	M6-3	21	15	2.2					N		Replace New Sign on New Post		
		SD 21	M1-5	24	24	4.0					N		Replace New Sign on New Post		
		Horizontal Right Arrow	M6-1R	21	15	2.2					N		Replace New Sign on New Post		
139.813	Rt.	Junction SD 22 5 Watertown 16		78	36	19.5			24		2	1	S	4" X 6" Wood	Replace New Sign on New Post
139.813	Lt.	Arlington Hayti		66	30	13.8		22		2		1	N	4" X 6" Wood	Replace New Sign on New Post
139.912	Lt.	Junction Marker	M2-1	21	15	2.2		10		1		1	N	4" X 6" Wood	Replace New Sign on New Post
		SD 21	M1-5	24	24	4.0					N		Replace New Sign on New Post		
139.982	Rt.	No Passing Zone	W14-3	48X48X36			5.6	11		1		1	N	4" X 6" Wood	Replace New Sign on New Post
140.248	Rt.	No Passing Zone	W14-3	48X48X36			5.6	11		1		1	N	4" X 6" Wood	Replace New Sign on New Post
140.735	Lt.	Stop	R1-1	30	30		5.2	9		1		1	W	4" X 6" Wood	Replace New Sign on New Post
140.743	Rt.	Stop	R1-1	30	30		5.2	9		1		1	E	4" X 6" Wood	Replace New Sign on New Post
140.757	Rt.	North	M3-1	24	12	2.0		10		1		1	S	4" X 6" Wood	Replace New Sign on New Post
		US 81	M1-4	24	24	4.0					S		Replace New Sign on New Post		
140.954	Lt.	Stop	R1-1	30	30		5.2	9		1		1	N	4" X 6" Wood	Replace New Sign on New Post
141.505	Lt.	No Passing Zone	W14-3	48X48X36			5.6	11		1		1	SW	4" X 6" Wood	Replace New Sign on New Post
141.976	Rt.	No Passing Zone	W14-3	48X48X36			5.6	11		1		1	NE	4" X 6" Wood	Replace New Sign on New Post
142.035	Lt.	Stop	R1-1	36	36		7.5	10		1		1	W	4" X 6" Wood	Replace New Sign on New Post
142.060	Rt.	Stop	R1-1	36	36		7.5	10		1		1	E	4" X 6" Wood	Replace New Sign on New Post
142.549	Lt.	Horizontal Double Arrow	W1-7	48	24		8.0	10		1		1	E	4" X 6" Wood	Replace New Sign on New Post
142.553	Rt.	Stop	R1-1	36	36		7.5	10		1		1	E	4" X 6" Wood	Replace New Sign on New Post
142.808	Lt.	No Passing Zone	W14-3	48X48X36			5.6	11		1		1	S	4" X 6" Wood	Replace New Sign on New Post

US 81, NH 0081(99)135, PCN 0366 Permanent Sign Installation Table

MRM	Side of Road	Description	Sign Code	Width (Inches)	Height (Inches)	Flat Aluminum Sign, Nonremovable Copy High Intensity (SqFt)	Flat Aluminum Sign, Nonremovable Copy Super/Very High Intensity (SqFt)	2.0"x2.0" Perforated Tube Post 12 Ga. (Ft)	2.5"x2.5" Perforated Tube Post 10 Ga. (Ft)	(N.A.B.I.) Square Tube Anchor Sleeve (Each)	(N.A.B.I.) 48" Winged Slip Base Anchor (Each)	Remove Traffic Sign (Each)	Direction Sign Faces	Current Type of Post	Remarks
143.113	Lt.	Stop	R1-1	36	36		7.5	10		1		1	W	4" X 6" Wood	Replace New Sign on New Post
143.117	Rt.	Horizontal Double Arrow	W1-7	48	24		8.0	10		1		1	W	4" X 6" Wood	Replace New Sign on New Post
143.148	Rt.	No Passing Zone	W14-3	48X48X36			5.6	11		1		1	N	4" X 6" Wood	Replace New Sign on New Post
143.239	Lt.	No Passing Zone	W14-3	48X48X36			5.6	11		1		1	S	4" X 6" Wood	Replace New Sign on New Post
143.681	Rt.	No Passing Zone	W14-3	48X48X36			5.6	11		1		1	N	4" X 6" Wood	Replace New Sign on New Post
144.031	Lt.	South	M3-3	24	12	2.0		10		1		1	N	4" X 6" Wood	Replace New Sign on New Post
		US 81	M1-4	24	24	4.0			N		Replace New Sign on New Post				
144.053	Lt.	Stop	R1-1	30	30		5.2	9		1		1	W	4" X 6" Wood	Replace New Sign on New Post
144.060	Rt.	Stop	R1-1	36	36		7.5	10		1		1	E	4" X 6" Wood	Replace New Sign on New Post
144.345	Rt.	Deer Crossing Warning	W11-3	30	30		6.3	11		1		1	S	4" X 6" Wood	Replace New Sign on New Post
		Next 3 Miles	W7-3aP	24	18		3.0		S		Replace New Sign on New Post				
144.356	Lt.	No Passing Zone	W14-3	48X48X36			5.6	11		1		1	S	4" X 6" Wood	Replace New Sign on New Post
144.627	Rt.	No Passing Zone	W14-3	48X48X36			5.6	11		1		1	N	4" X 6" Wood	Replace New Sign on New Post
144.848	Lt.	No Passing Zone	W14-3	48X48X36			5.6	11		1		1	S	4" X 6" Wood	Replace New Sign on New Post
144.908	Rt.	Junction Marker	M2-1	21	15	2.2		10		1		1	S	4" X 6" Wood	Replace New Sign on New Post
		SD 22	M1-5	24	24	4.0			S		Replace New Sign on New Post				
145.030	Rt.	Watertown Castlewood		78	30	16.3		24		2		1	S	4" X 6" Wood	Replace New Sign on New Post
145.030	Lt.	Junction SD 21 5 Arlington 25 Madison 49		72	42	21.0			26		2	1	N	4" X 6" Wood	Replace New Sign on New Post
145.079	Rt.	US 81	M1-4	24	24	4.0		20		1		1	S	4" X 6" Wood	Replace New Sign on New Post
		Vertical Arrow	M6-3	21	15	2.2			S		Replace New Sign on New Post				
		SD 22	M1-5	24	24	4.0			S		Replace New Sign on New Post				
		Double Arrow Vertical Right	M6-6R	21	15	2.2			S		Replace New Sign on New Post				

US 81, NH 0081(99)135, PCN 0366 Permanent Sign Installation Table

MRM	Side of Road	Description	Sign Code	Width (Inches)	Height (Inches)	Flat Aluminum Sign, Nonremovable Copy High Intensity (SqFt)	Flat Aluminum Sign, Nonremovable Copy Super/Very High Intensity (SqFt)	2.0"x2.0" Perforated Tube Post 12 Ga. (Ft)	2.5"x2.5" Perforated Tube Post 10 Ga. (Ft)	(N.A.B.I.) Square Tube Anchor Sleeve (Each)	(N.A.B.I.) 48" Winged Slip Base Anchor (Each)	Remove Traffic Sign (Each)	Direction Sign Faces	Current Type of Post	Remarks
145.079	Lt.	South	M3-3	24	12	2.0		10		1		1	N	4" X 6" Wood	Replace New Sign on New Post
		US 81	M1-4	24	24	4.0					N		Replace New Sign on New Post		
145.100	Lt.	Stop	R1-1	36	36		7.5	10		1		1	W	4" X 6" Wood	Replace New Sign on New Post
145.110	Rt.	Stop	R1-1	36	36		7.5	10		1		1	E	Telespar	Replace New Sign on New Post
145.113	Lt.	US 81	M1-4	24	24	4.0		20		1		1	E	4" X 6" Wood	Replace New Sign on New Post
		Horizontal Double Arrow	M6-4	21	15	2.2			E		Replace New Sign on New Post				
		SD 22	M1-5	24	24	4.0			E		Replace New Sign on New Post				
		Horizontal Right Arrow	M6-1R	21	15	2.2			E		Replace New Sign on New Post				
145.118	Rt.	Yield	R1-2	36X36X36			3.9	10		1		1	SE	4" X 6" Wood	Replace New Sign on New Post
		Do Not Enter	R5-1	30	30		6.3		NW		Replace New Sign on New Post				
145.124	Lt.	SD 22	M1-5	24	24	4.0		20		1		1	N	4" X 6" Wood	Replace New Sign on New Post
		Horizontal Left Arrow	M6-1L	21	15	2.2			N		Replace New Sign on New Post				
		US 81	M1-4	24	24	4.0			N		Replace New Sign on New Post				
		Vertical Arrow	M6-3	21	15	2.2			N		Replace New Sign on New Post				
145.140	Rt.	West	M3-4	24	12	2.0		20		1		1	S	4" X 6" Wood	Replace New Sign on New Post
		SD 22	M1-5	24	24	4.0			S		Replace New Sign on New Post				
		North	M3-1	24	12	2.0			S		Replace New Sign on New Post				
		US 81	M1-4	24	24	4.0			S		Replace New Sign on New Post				
145.183	Lt.	Arlington Castlewood		78	30	16.3		24		2		1	S	4" X 6" Wood	Replace New Sign on New Post
					TOTAL	373.3	300.2	931.0	100.0	85.0	8.0	77.0			

Sign Summary US 81

Sign Code	Description	Width (Inches)	Height (Inches)	Sq. Ft.	Quantity	Flat Aluminum Sign, Nonremovable Copy High Intensity (SQFT)	Flat Aluminum Sign, Nonremovable Copy Super or Very High Intensity (SQFT)	Text / Background
D1-2	Watertown/Estelline --->	72	30	15.0	1	15.0		White on Green
D2-2	Junction SD 21 4 Watertown 20	78	36	19.5	1	19.5		White on Green
D1-2	Arlington/<---Estelline	72	30	15.0	1	15.0		White on Green
D2-3	Junction SD 28 4 Arlington 20/Madison 44	78	42	22.8	1	22.8		White on Green
D2-2	Junction SD 22 5 Waterown 16	78	36	19.5	1	19.5		White on Green
D1-2	Arlington/Hayti--->	66	30	13.8	1	13.8		White on Green
D1-2	Watertown/Castlewood--->	78	30	16.3	1	16.3		White on Green
D2-3	Junction 21 5 Arlington 25/Madison 44	72	42	21.0	1	21.0		White on Green
D1-2	Arlington/<---Castlewood	78	30	16.3	1	16.3		White on Green
M1-4	US 81	24	24	4.0	19	76.0		Black on White
M1-5	SD 21	24	24	4.0	5	20.0		Refer to Standard Plate 632.20
M1-5	SD 22	24	24	4.0	5	20.0		Refer to Standard Plate 632.20
M1-5	SD 28	24	24	4.0	6	24.0		Refer to Standard Plate 632.20
M2-1	Junction Marker	21	15	2.2	4	8.8		Black on White/Green Border
M3-1	North	24	12	2.0	5	10.0		Black on White
M3-3	South	24	12	2.0	4	8.0		Black on White
M3-4	West	24	12	2.0	2	4.0		Black on White/Green Border
M4-6	End Marker	24	12	2.0	1	2.0		Black on White/Green Border
M6-1L	Horizontal Arrow (Left)	21	15	2.2	3	6.6		Black on White/Green Border
M6-1R	Horizontal Arrow (Right)	21	15	2.2	3	6.6		Black on White/Green Border
M6-3	Vertical Arrow	21	15	2.2	7	15.3		Black on White
M6-4	Horizontal Double Arrow	21	15	2.2	3	6.6		Black on White
M6-6L	Double Arrow Vertical Left	21	15	2.2	1	2.2		Black on White/Green Border
M6-6R	Double Arrow Vertical Right	21	15	2.2	2	4.4		Black on White/Green Border
R1-1	Stop	30	30	5.2	6		31.2	White on Red
R1-1	Stop	36	36	7.5	15		112.5	White on Red
R1-2	Yield	36X36X36		3.9	3		11.7	White on Red
R5-1	Do Not Enter	30	30	6.3	3		18.8	White on Red
W11-3	Advanced Deer Crossing	30	30	6.3	1		6.3	Black on Fluorescent Yellow
W14-3	No Passing Zone	48X48X36		5.6	18		100.8	Black on Fluorescent Yellow
W1-7	Horizontal Double Arrow	48	24	8.0	2		16.0	Black on Fluorescent Yellow
W7-3aP	Next 3 Miles	24	18	3.0	1		3.0	Black on Fluorescent Yellow
Totals						373.3	300.2	

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(99)135	17	51

SURFACING THICKNESS DIMENSIONS

Plans tonnage will be applied even though the thickness may vary from that shown on the plans.

At those locations where material must be placed to achieve a required elevation, plans tonnage may be varied to achieve the required elevation.

SCOPE OF WORK

Work on this project involves placement of 2" Asphalt Concrete pavement, culvert repair, slope flattening, refurbishing mailboxes, rumble strips, pavement markings, permanent signing, and fencing.

SEQUENCE OF OPERATIONS

The following sequence of operations shall be adhered to. Any changes must be approved in writing by the Area Engineer prior to changes being made.

1. Install fixed location signing prior to start of work.
2. Prior to mainline paving operations, complete all mainline pipe, box culvert repair and slope flattening.
3. Prior to mainline paving operations, complete all asphalt concrete strengthening and leveling.
4. Complete gravel placement operations on approaches & intersecting roads.
5. Knockdown gravel to allow access on approaches & intersecting roads.
4. Complete asphalt concrete mainline and auxiliary asphalt paving.
8. Shape approach gravel.
6. Grind rumble strips.
7. Groove and place grooved in pavement markings, mask for flush seal.
8. Place flush seal if required.
9. Install permanent pavement markings & permanent signing.
10. Refurbish mailboxes.
11. Remove project signing.
12. Mow project inslopes and complete any remaining project cleanup.

GENERAL NOTES

The Contractor shall be required to mow the inslopes with a rotary mower to a height of 6 inches for a distance of 14 feet from the edge of the roadway (or shoulder) for the length of the project. This work will be completed to the satisfaction of the Engineer after all construction activities are completed. All costs associated with this work shall be incidental to the various contract items.

UTILITIES

Utilities are not planned to be affected on this project. If utilities are identified near the improvement area through the SD One Call Process as required by South Dakota Codified Law 49-7A and Administrative Rule Article 20:25, the Contractor shall contact the Project Engineer to determine modifications that will be necessary to avoid utility impacts.

TRAFFIC CONTROL

Removing, relocating, covering, salvaging and resetting of existing traffic control devices, including delineation, shall be the responsibility of the Contractor. Cost of this work shall be incidental to the various contract items unless otherwise specified in the plans. Delineators and signs damaged or lost shall be replaced by the Contractor at no cost to the State.

Storage of vehicles and equipment shall be as near the right-of-way line as possible. Contractor's employees should mobilize at a location off the right-of-way and arrive at the work sites in a minimum number of vehicles necessary to perform the work. Indiscriminate driving and parking of vehicles within the right-of-way will not be permitted. Any damage to the vegetation, surfacing, embankment, delineators and existing signs resulting from such indiscriminate use shall be repaired and/or restored by the Contractor, at no expense to the State, and to the satisfaction of the Engineer.

Work activities during non-daylight hours are subject to prior approval.

Work zones for the various construction operations that utilize a pilot car shall not exceed 3 miles in length.

Traffic approaching the project from intersecting roadways, streets, and approaches must be adequately accommodated. Major intersections or large commercial entrances may require additional signing, flaggers, and channelizing devices on a temporary basis until work activities pass these areas.

The bottom of signs on portable or temporary supports shall not be less than seven feet above the pavement in urban areas and one foot above the pavement in rural areas. Portable sign supports may be used as long as the duration is less than 3 days. If the duration is more than 3 days the signs shall be on fixed location, ground mounted, breakaway supports.

The Contractor shall provide documentation that all breakaway sign supports comply with FHWA NCHRP Report 350 or MASH crash-worthy requirements. The Contractor shall provide installation details at the preconstruction meeting for all breakaway sign support assemblies.

An Advisory Speed Plate displaying 30 M.P.H shall be attached to all "Bump" signs used on the project. These speed plates are included in the table of Itemized List for Traffic Control in these plans.

Traffic Control units, as shown in the Estimate of Quantities, are estimates. Contractor's operation may require adjustments in quantities, either more or less. Payment will be for those signs actually ordered by the Engineer and used.

Traffic Control for slope flattening and culvert repair work shall be as follows:

For signing purposes, a work area shall be no longer than two miles for slope flattening and culvert repairs operations.

Flaggers and FLAGGER symbol signs shall be in place when hauling material from one side of the roadway to the other. These shall also be provided when work activities or equipment present a hazard to workers and/or through traffic, or encroaches into driving lanes open to traffic.

STORAGE UNIT

The Contractor shall provide a storage unit such as a portable storage container or a semi-trailer meeting the minimum size requirements from the table below:

Project Total Asphalt Concrete Tonnage	Minimum Internal Size (Cu Ft)	Minimum External Size (L x W x H)
Less than 50,000 ton	1,166	20' x 8' x 8.6' std
More than 50,000 ton	2,360	40' x 8' x 8.6' std
All Gyrotory Controlled QC/QA Projects	2,360	40' x 8' x 8.6' std

The storage unit is intended for use only by the Engineer for the duration of the project. The QC lab personnel or the Contractor will not be allowed to use the storage container while it is on the project, without permission of the Engineer.

The storage unit shall be on site and operational prior to asphalt concrete production. Upon completion of asphalt concrete production, the Engineer will notify the Contractor when the storage unit can be removed from the project. The storage unit use will not exceed 30 calendar days from the completion of asphalt concrete production. The storage unit will remain the property of the Contractor.

The storage unit shall be weather proof and shall be set in a level position. The storage unit shall be able to be locked with a padlock.

The storage unit shall be placed adjacent to the QA lab, as approved by the Engineer.

The following shall apply when the storage unit provided on the project is a portable storage container:

1. The portable storage container shall be constructed of steel.
2. The portable storage container shall be set such that it is raised above the surrounding ground level to keep water from ponding under or around the storage container.

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STORAGE UNIT (CONTINUED)

The following shall apply when the storage unit provided on the project is a semi-trailer:

1. A set of steps and hand railings shall be provided at the exterior door.
2. If the floor of the semi-trailer is 18 inches or more above the ground, a landing shall be constructed at the exterior door. The minimum dimensions for the landing shall be 4 feet by 5 feet. The top of the landing shall be level with the threshold or opening of the doorway.
3. The semi-trailer may be connected to the QA lab by a stable elevated walkway. The walkway shall be a minimum of 48 inches wide and contain handrails installed at 32 inches above the deck of the walkway. The walkway shall be constructed such that it is stable and the deck does not deform during use and allows for proper door operation. Walkway construction shall be approved by the Engineer.

All cost for furnishing, maintaining, and removing the storage unit including labor, equipment, and materials including any necessary walkways, landings, stairways, and handrails shall be included in the contract unit price per each for STORAGE UNIT.

TYPE III FIELD LABORATORY

The lab shall be equipped with an internet connection such as DSL, cable modem, or other approved service. The internet connection shall be provided with a multi-port wireless router. The internet connection shall be a minimum speed of 512 Kb unless limited by job location and approved by the DOT. Prior to installing the wireless router the Contractor shall submit the wireless router's technical data to the Area Office to check for compatibility with the state's computer equipment. The internet connection is intended for state personnel usage only. The Contractor's personnel are prohibited from using the internet connection unless pre-approved by the Project Engineer. These items shall be incidental to the contract unit price per each for TYPE III FIELD LABORATORY.

DITCH CLEANOUT

Ditch cleanout is required at the location where the Table of Mainline Culvert Work indicates Ditch Cleanout is required. There shall be no specific contract item for ditch cleanout. Ditch cleanout shall be included in the contract lump sum price for INCIDENTAL WORK, GRADING.

Ditch cleanout shall include cleaning of the culvert end treatment apron which is a Flared End on this project.

Ditch cleanout shall extend from the end of the culvert to within 1 foot of the Right-of-Way (ROW) Line. The bottom of the ditch cleanout shall be a minimum of 10 feet wide and the side slopes on the channel shall be 20:1 or flatter. The ditch shaping shall extend a minimum of 100' perpendicular to pipe centerline in the ditch bottom.

Cleanout material shall become the property of the Contractor, and may be used as Contractor Furnished Borrow with the approval of the Engineer.

3 POST PANEL

Removal of in place posts and any new barb wire that is needed at the 3 Post Panel installation areas shall be incidental to the contract unit price per each for 3 POST PANEL.

The 3 Post Panel installation locations shall be at the wing walls of the cattle pass.

Any additional fence that the Contractor may need to remove to reset the cattle pass shall be considered incidental and that any additional fence removed shall be reset at no cost to the DOT.

The following table lists these installation areas.

Station	Side Rt./Lt.	3 Post Panel (Each)	Remove & Reset Gate (Each)
426+95	Rt.	2	1
426+95	Lt.	2	1
Total		4	2

The gates that are to be removed and reset are directly in front of the cattle pass opening, at the locations listed above.

CULVERT REPAIR

All pipe and end treatments designated for removal shall become the property of the Contractor for his disposal.

Tie bolts shall be installed at all joint locations where existing pipe sections and end treatments are being reset or installed new. This may require drilling holes into the existing pipe sections and end treatments. These items and any additional tie bolts needed shall be incidental to the various culvert contract items. Tie bolts shall be installed in accordance with Standard Plate No. 450.18.

Culvert barrel and culvert end treatments that are to be removed and reset shall be cleaned prior to resetting. Cost to clean sections of culvert that are removed and reset shall be incidental to the contract unit prices for the various culvert contract items.

Tie bolts shall be installed at all joint locations where existing cattle pass sections and end treatments are being reset or installed new. This may require drilling holes into the existing cattle pass sections and end treatments. These items and any additional tie bolts needed shall be incidental to the various culvert contract items. Tie bolts shall be installed in accordance with Standard Plate No. 560.01.

In place Type 2 Object Markers shall be removed and reset when performing culvert work. Cost to remove and reset Type 2 Object Markers shall be incidental to the various culvert contract items.

CHEMICAL GROUT

Chemical Grout shall be used at the location where the Table of Mainline Culvert Work indicates Chemical Grout is required. Chemical grout shall be used to fill the East and West construction joints at this location.

Work at this location involves cleaning the joint and injecting grout around the construction joints of the box culvert to prevent any further washing and/or fallout of soil at the joint locations. Injection of grout should fill voids and also seal the joint opening in the concrete. Any grout exposed in the joint opening area shall be trimmed leaving a smooth surface upon completion of work. In addition grout shall also be injected up the exterior side-walls to fill any voids that may be present surrounding the exterior sides of the box culvert.

The Contractor shall drill small injection ports through the concrete near the joints and inject chemical grout to fill any voids around the entire circumference of the joint between the sections of culvert. A hole pattern for injection will be determined by the Contractor in consultation with the Engineer. All injection holes shall be plugged with a grout, or other material, as approved by the Engineer. At some locations, the joint opening may be of such extreme that drilling of injection ports may not be required.

Should any de-watering of the box culvert be required to the complete the work, it shall be incidental to contract unit prices for the various culvert contract items.

The Contractor shall follow the Manufacturer's installations instructions in accordance with the Manufacturer's specifications.

The Contractor shall provide worker and inspector protective safety gear in accordance with the Manufacturer's Material Safety Data Sheet.

The chemical grout shall have a free rise density of 1.75 lbs/cu ft, with a minimum compressive strength of 13.8 psi.

The chemical grout shall be a closed-cell foam consisting of two chemical components and shall be from the list below or an approved equal:

<u>Product</u>	<u>Manufacturer</u>
Versi-Foam® Systems	RHH Foam Systems, Inc. 17100 W. Victor Road New Berlin, WI 53151 Phone: 1-800-657-0702 262-754-8088 Fax: 262-754-8089 Email: sales@rhfoamsystems.com Web: www.rhfoamsystems.com

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CONTRACTOR FURNISHED BORROW

The Contractor shall provide a suitable site for Contractor furnished borrow material. The Contractor is responsible for obtaining all required permits and clearances for the borrow site. The borrow material shall be approved by the Engineer. The plans quantity for CONTRACTOR FURNISHED BORROW as shown in the Estimate of Quantities shall be the basis of payment for this item.

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

APPROACH SLOPE FLATTENING

Prior to placing the Contractor Furnished Borrow for construction of new embankment, the Contractor shall remove and stockpile 3 inches of in place topsoil from the construction areas. On completion of construction operations this salvaged topsoil shall be spread evenly over the newly constructed embankment inslopes. Removal and replacement of topsoil will not be measured for payment but shall be incidental to the contract unit price per cubic yard for CONTRACTOR FURNISHED BORROW.

Compaction of inslope embankments shall be to the satisfaction of the Engineer.

It is not anticipated that water for compaction will be required. However, if in the opinion of the Engineer the fill material is extremely dry, water may be ordered and placed to the satisfaction of the Engineer. All costs for any added water shall be incidental to the contract unit price per cubic yard for CONTRACTOR FURNISHED BORROW.

Excavation quantities are computed using the volume of embankment plus 40% for shrinkage. Basis of payment will be plans quantity of CONTRACTOR FURNISHED BORROW. No separate field measurements will be taken. All material used for embankment shall be approved by the Engineer.

Haul of embankment material on established traveled roadways shall be limited to trucks or small scrapers hauling legal loads and which do not sustain damage to the roadway, as approved by the Engineer. Hauling of material in the roadway ditches will not be allowed.

The Contractor shall be responsible for restoration of any areas disturbed outside the limits of the work area.

New slope construction on all approaches shall end within 2 feet of the right-of-way line.

The following table contains the approaches that are to be slope flattened.

Station	Side Rt./Lt.	Slope Back or Ahead	Final Slope	Contractor Furnished Borrow (CuYd)	Fill Stake Distance (Ft)
696+34	Lt.	Ahead	10:1	30	38
		Back	10:1	48	40
696+34	Rt.	Ahead	10:1	118	57
		Back	10:1	80	58
Total				276	

SHOULDER PREPARATION

Vegetation and accumulated material adjacent to the existing surface edge shall be removed to the satisfaction of the Engineer prior to placement of mainline surfacing. Any remaining windrow of accumulated material shall be re-spread evenly on the inslope adjacent to the asphalt shoulder to the satisfaction of the Engineer prior to the application of the flush seal.

This shoulder work shall be incidental to other contract items. Separate measurement and payment will not be made.

Prior to construction, State Maintenance Forces will spray the shoulders to kill existing vegetation. It will be the Contractor's responsibility to notify the State at least 30 days in advance of when he plans to begin work on the surface of the highway. The State assumes no responsibility for the effectiveness of the herbicide applied.

INTERSECTING ROADS AND ENTRANCES

Intersecting roads and entrances shall be satisfactorily cleared of vegetation, shaped, and compacted prior to placement of mainline surfacing. This work will be considered incidental to other contract items. Separate measurement and payment will not be made.

EXCAVATION OF UNSTABLE MATERIAL

Included in the Estimate of Quantities are 50 Cubic Yards of Unclassified Excavation, Digouts per mile for the necessary removal of unstable material.

Backfill shall be Base Course paid for at the contract unit price per ton.

The digout shall be extended to the shoulder and the granular material backfill shall daylight to the inslope to allow water to escape the subgrade.

A copy of the surfacing/subgrade investigation for this project is available from the Watertown Area and the Aberdeen Region offices.

BASE COURSE

Aggregate for Base Course shall conform to the specifications, except that the compaction shall be to the satisfaction of the Engineer.

Included in the Estimate of Quantities are 100 tons of Base Course per mile for backfill of Unclassified Excavation, Digouts.

WATER FOR COMPACTION OF GRANULAR MATERIALS

Cost of water for compaction of the granular material shall be incidental to the contract unit price for the various contract items. Six percent, plus or minus, moisture will be required at the time of compaction unless otherwise directed by the Engineer.

COLD MILLING ASPHALT CONCRETE

The cold milled material obtained from the project shall become the property of the Contractor. Gradation testing of cold milled material not utilized on the project shall not be required, unless deemed necessary by the Engineer.

Cold milled material which remains on the project shall be subjected to gradation testing.

The placement of asphalt concrete shall begin within 5 working days after completion of cold milling of mainline asphalt concrete. The Contractor shall be responsible maintaining the temporary ramps at the project limits and intersecting roads.

ASPHALT FOR TACK

Included in the Estimate of Quantities are 10 tons of SS-1h or CSS-1h Asphalt for Tack for surface repair, strengthening, and spot leveling areas throughout the project. (Rate = 0.05 Gal./ Sq.Yd.).

CLASS Q3 HOT MIXED ASPHALT CONCRETE

Mineral Aggregate for Class Q3 Hot Mixed Asphalt Concrete shall conform to the requirements of the Special Provision for Gyrotory Controlled Quality Control/Quality Assurance Hot Mixed Asphalt Concrete Pavement.

The asphalt concrete on the shoulders will not be compacted to a specified density. The shoulders shall be compacted using the same rolling pattern used on the adjacent mainline asphalt concrete or as directed by the Engineer.

ADDITIONAL QUANTITIES:

Included in the Estimate of Quantities are **300** tons of Class **Q3** Asphalt Concrete and, **3.0** tons of Hydrated Lime of Asphalt concrete and **17.4** tons of PG **64-28** Asphalt Binder, per mile for spot leveling, strengthening, and repair of the existing surface. This material shall be placed where and as directed by the Engineer.

FLUSH SEAL

Application of Flush Seal shall be completed within 10 working days following completion of the asphalt concrete surfacing.

For each working day that the Flush Seal remains uncompleted after the 10 working day limitation, the Contractor will be assessed liquidated damages at the rate of \$250.00 per day.

The liquidated damages shall apply only up to the Contract Completion Date, as extended. After the Contract Completion Date, liquidated damages will be assessed in accordance with the schedule set forth in section 8.7 of the specifications.

Application of Flush Seal may be eliminated by the Engineer. If the paved surface remains tight, the Engineer shall notify the Contractor as soon as possible that the Flush Seal is unnecessary.

SAND FOR FLUSH SEAL

The sand application shall be placed 11' wide in each lane, leaving 12" on center line and 6" on each edge line free of sand.

REFURBISH MAILBOXES

Existing mailboxes shall be removed, turnouts constructed, and mailboxes reset on new posts with the necessary support hardware for single or double mailbox assemblies (See Standard Plate No's. (900.02 and 900.03). The local Postmaster will determine the recommended mounting height of the mailboxes throughout the project. The Contractor shall coordinate with the Engineer on the proper postal representative to contact.

TABLE OF REFURBISH MAILBOXES

Location MRM	SIDE	SINGLE MAILBOX EACH	COMMENTS
136.00+0.436	Lt.	1	
137.00+0.294	Lt.	1	
139.00+0.388	Lt.	1	
139.74+0.238	Lt.	1	
140.00+0.260	Lt.	1	w/ newspaper box
140.00+0.845	Lt.	1	
142.00+0.319	Rt.	1	
142.00+0.820	Rt.	1	
TOTALS		8	

All costs for removing existing mailboxes, providing temporary mailboxes, and resetting mailboxes with new posts and necessary support hardware shall be incidental to the contract unit price per each for REFURBISH SINGLE MAILBOX.

RUMBLE STRIPS

Rumble Strip installation shall be completed prior to application of the Flush Seal and Permanent Pavement Markings. In the event the Flush Seal is eliminated from the contract, the Contractor will still be required to apply a Flush Seal to the newly installed 12" Rumble Strips at a width of 1.5' and at the same rate as specified in this plan set. No adjustment in the contract unit price will be made and SS-1h or CSS-1h Asphalt for Flush Seal will be paid at the contract unit price per ton.

The Contractor shall be required to remove loose material from the driving surface and/or asphalt shoulders of the roadway. Loose material may be broomed to the edge of shoulders and it shall be the Contractor's responsibility to ensure the loose material does not enter any vegetated areas and/or waterways.

All costs associated with the Rumble Strips installation and removal of loose material shall be incidental to the contract unit price per mile for GRIND 12"RUMBLE STRIP OR STRIPE IN ASPHALT CONCRETE.

TABLE OF 12" RUMBLE STRIPS

Station to Station	Length (Ft)	Length (Miles)
245+36.8 to 245+91	108.4	
263+24 to 528+93	53,138.0	
546+33 to 739+35	38,604.0	
757+83 to 769+32.4	2,298.8	
Total	94,149.2	17.8

TEMPORARY AND PERMANENT PAVEMENT MARKINGS

Maintaining size, shape, and dimension of existing pavement markings shall be the responsibility of the Contractor for both temporary and permanent pavement marking applications. The diagonal markings within channelizing islands may be omitted from the temporary markings but shall be provided with the permanent markings.

Temporary road markers shall be used to mark dashed centerline, No Passing Zones and applicable lane lines. Paint will not be allowed for Temporary Pavement Marking on the Asphalt Concrete Class Q3 Hot Mixed Asphalt Concrete wear course or after application of the Flush Seal.

TEMPORARY PAVEMENT MARKINGS

The total length of no passing zone on this project is estimated to be **6.1** miles.

The number of no passing zones for this project is estimated to be 26.

Quantities of Temporary Pavement Markings consist of:
 One pass on top of the Asphalt Concrete.
 One pass on top of the Flush Seal.

If the Flush Seal is eliminated, the application of the Temporary Pavement Marking on top of the Flush Seal will be eliminated. No adjustment in the contract unit price for Temporary Pavement Marking will be made because of a variation in quantities.

Temporary Road Markers (tabs) may be used as detailed in the specifications. Covers on the tabs shall be sufficiently secured to prevent traffic from dislodging the cover and when removed, the covers shall be properly disposed. The Contractor shall remove and properly dispose of the tabs after Permanent Pavement Marking is applied. Method of removal shall be nondestructive to the road surface and shall be accomplished within one week of completion of the Permanent Pavement Marking.

Any tabs with covers removed before the flush seal shall be replaced prior to Flush Seal application.

Cost for furnishing, applying, removing and disposing of the Temporary Road Markers shall be included in the contract unit price per mile for TEMPORARY PAVEMENT MARKING.

Flagger symbol signs (W20-7) and flaggers, or a shadow vehicle with rotating yellow lights or strobe lights shall be positioned on the roadway shoulder in advance of workers for both directions of traffic during the installation of temporary road markers. The traffic control device used shall be moved to provide proper warning of the work operation. A Workers symbol sign (W21-1) shall be mounted on the rear of the shadow vehicle. The method of traffic control used by the Contractor for this work shall be approved by the Engineer.

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PERMANENT PAVEMENT MARKING

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

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

Glass beads shall be applied on the wet paint line at a minimum of eight pounds of glass beads per gallon of paint.

The Contractor shall advise the Engineer a minimum of 2 weeks prior to the application of the permanent pavement marking to allow the State to check and mark the location of no passing zones. All materials shall be applied as per manufacturer's recommendations.

The application of Permanent Pavement Marking paint may not begin until 7 calendar days following completion of final surfacing (including Flush Seal if applied) and shall be completed within 14 calendar days following completion of the final surfacing.

For each working day the application of permanent pavement marking paint remains uncompleted beyond the time limits described in the preceding paragraph, the Contractor will be assessed liquidated damages at the rate of \$250.00 per day.

The liquidated damages shall apply up to the Contract Completion Date, as extended. After the completion date, liquidated damages will be assessed in accordance with section 8.7 of the specifications, until the permanent pavement marking is completed, even though the project may be open to traffic.

COLD WEATHER, WATERBORNE PAINT

Waterborne paint applied after October 15 shall be formulated as cold weather, waterborne paint, and shall be applied in accordance with manufacturer's recommendations, including minimum temperature requirements.

There shall be no adjustment in the contract unit prices should cold weather formulated paint be required.

Cold weather, waterborne paint shall conform to section 980 of the specifications except for the following:

980.1 A - Resin Binder shall be Fastrack XSR manufactured by Dow, or approved equal.

980.1.1 Quantitative Requirements:

The Pigment, Percent By Weight for white: 60.0 – 63.0 and for yellow: 58.5-61.5.

The Pigment, Percent By Weight when tested in accordance with ASTM D3723 for white: 60.0-63.0 and for yellow: 56.1-59.2.

The Non-volatile Vehicle, percent by weight, min. for white: 41.5 and yellow: 41.5 when tested in accordance with FTMS 141c (method 4051.1)

GROOVE FOR PAVEMENT MARKING

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

All surfaces receiving cold applied plastic pavement markings shall be grooved prior to application of the cold applied plastic pavement markings.

The groove shall be made in a single pass dry cut using stacked diamond or carbide tipped cutting heads mounted on a floating head with controls capable of providing uniform depth and alignment. The equipment shall be self- vacuuming and leave the cut groove ready for pavement marking installation. The pavement marking shall be placed in the grooves the same day the grooving is completed. Grooves shall be clean and dry prior to pavement marking application.

Groove cleaning: Grooves must be cleaned by using high pressure compressed air (90 psi minimum).

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

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

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

PAVEMENT MARKING MASKING

Immediately prior to placement of the Flush Seal, all Cold Applied Plastic Pavement Markings shall be covered with an approved pavement marking masking. All costs for furnishing, installing, removing, and disposing of masking shall be incidental to the contract prices for the various pavement marking masking bid items.

SAWING IN EXISTING SURFACING

Where new Asphalt Concrete Pavement is placed adjacent to existing asphalt concrete or existing concrete the existing asphalt concrete shall be sawed full depth to a true line with a vertical face. No separate payment shall be made for sawing.

FERTILIZING

Application of fertilizer will not be required on this project.

DRILLS

In addition to the drills specified in Section 730 of the Specifications, other types of drills including no-till drills will be allowed as long as they have baffles, partitions, agitators, or augers which keep the seed distributed throughout the seed box and the seed is planted at a depth of ¼" to ½".

MYCORRHIZAL INOCULUM

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

- Glomus intraradices* 25%
- Glomus aggregatu* 25%
- Glomus mosseae* 25%
- Glomus etunicatum* 25%

All seed shall be inoculated by the seed supplier with a minimum of 100,000 live propagules of mycorrhizal fungi per acre. All costs of inoculating the seed shall be incidental to the contract lump sum price for EROSION CONTROL.

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

<u>Product</u>	<u>Manufacturer</u>
MycoApply	Mycorrhizal Applications, Inc. Grants Pass, OR Phone: 1-866-476-7800 http://www.mycorrhizae.com/

EROSION CONTROL

The areas to be seeded with Type C Permanent Seed Mixture and mulched comprise of all disturbed areas including the culvert repair and slope flattening areas.

All permanent seed shall be planted in the topsoil at a depth of ¼" to ½".

All seed broadcast must be raked or dragged in (incorporated) within the top ¼" to ½" of topsoil when possible. This requirement may be waived by the Engineer during construction when raking or dragging is deemed not feasible by conventional methods.

All costs associated with seeding and mulching shall be incidental to the contract lump sum price for EROSION CONTROL. The estimated area to seed and mulch is **1.1** acres.

The varieties listed for seed mixtures are preferred varieties.

Native harvest seed will be allowed.

Type C Permanent Seed Mixture shall consist of the following:

Grass Species	Variety	Pure Live Seed (PLS) (Pounds/Acre)
Western Wheatgrass	Flintlock, Rodan, Rosana	16
Canada Wildrye	Mandan	2
Total:		18

MULCHING (GRASS HAY OR STRAW)

Bales with noxious weed contamination will be rejected and the Contractor will be required to remove the contaminated bales from the project.

EROSION CONTROL WATTLE

Erosion control wattles for restraining the flow of runoff and sediment shall be installed at locations determined by the Engineer during construction. Refer to Standard Plate 734.06 for details.

The Contractor shall provide certification that the erosion control wattles do not contain noxious weed seeds.

A quantity of 200 feet of 12" Diameter Erosion Control Wattles has been included in Estimate of Quantities for temporary erosion and sediment control in highway ditch channels.

Erosion control wattles shall remain on the project to decompose.

The erosion control wattle provided shall be from the approved product list. The approved product list for erosion control wattle may be viewed at the following internet site:

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

HIGH FLOW SILT FENCE

The high flow silt fence fabric provided shall be from the approved product list. The approved product list for high flow silt fence may be viewed at the following internet site:

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

High flow silt fence shall be placed at locations that will minimize siltation of adjacent streams, lakes, dams, or drainage areas as determined by the Engineer during construction. Refer to Standard Plate 734.05 for details.

An additional 200 feet of high flow silt fence has been added to the Estimate of Quantities for temporary sediment control.

TABLE OF HIGH FLOW SILT FENCE

Station	L/R	Location	Quantity (Ft)
500+50 to 503+00	L	Ditch Cleanout Area	250
Additional Quantity:			200
Total:			450

MUCKING SILT FENCE

Mucking silt fence shall consist of removing muck trapped by the silt fence and spreading the material evenly over the adjacent area to conform to the existing grade.

REMOVE SILT FENCE

Silt fence shall be removed when vegetation is established. Some or all of the silt fence may be left on the project until vegetation is established.

GENERAL PERMANENT SIGNING NOTES

Permanent sign locations shall be staked in the field by the Contractor and checked by the Engineer. The Contractor shall give the Engineer a minimum of one week to check staked locations prior to sign/post installation.

The Contractor shall be responsible for contacting South Dakota One Call to locate the utilities at the staked sign installation locations.

Prior to ordering sign posts, the Contractor shall verify post lengths. The height of the post shall not exceed the minimum height needed by more than 0.5 feet. Any portion that extends above the sign shall be cut off. No separate payment will be made for cutting the post or for that length cut off.

REMOVE EXISTING SIGNS

Existing signs within the project limits are summarized in the Sign Table. This table provides the approximate MRM location for each sign. Existing signs in the table are indicated to be removed and not reused.

All existing signs and hardware listed to be removed shall become the property of the Contractor.

Holes remaining from the removal of 4"x6" wood posts shall be backfilled and compacted with material placed in layers not to exceed 6 inches in depth.

All costs associated with the removal of existing signs, posts, hardware, and backfilled holes shall be incidental to the contract unit price per each for REMOVE TRAFFIC SIGN.

All existing sign posts and/or sign bases shall be removed in their entirety.

DATE DECALS

The Contractor shall furnish and affix a date decal to each new sign installed.

Date decals shall be self-adhesive weather resistant stickers with removable paper backing, approximately 2" X 2" in size. The date decal shall display the last two digits of the year the sign was manufactured with black numerals on a white background.

One decal shall be placed in the extreme lower left corner of the front of each extruded aluminum panel sign, or the extreme lower left corner of the back of each flat aluminum sign.

Sign supports or other obstructions shall not block the view of the date decal upon completion of the sign installation.

All costs to furnish and install date decals on new signs shall be incidental to the contract unit price per square foot for FLAT ALUMINUM SIGN, NONREMOVABLE COPY HIGH INTENSITY, or FLAT ALUMINUM SIGN, NONREMOVABLE COPY SUPER/VERY HIGH INTENSITY.

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NEW PERMANENT SIGNING

New signs for installation are summarized in the Sign Table.

Sign Design

Signs shall be constructed as required per the Manual on Uniform Traffic Control Devices (MUTCD), the latest edition of "Standard Highway Signs", and as specified on the Special Sign Design sheets.

All sign material shall comply with Section 982 of the Specifications.

All upper/lower case letters and numerals shall be as required per the MUTCD, the latest edition of "Standard Highway Signs", and as illustrated on the Special Sign Design sheets.

The Contractor shall furnish the Aberdeen Region Traffic Engineer (P.O. Box 1767; Aberdeen, SD 57402) with a detailed sign layout sheet for each sign shown. These detailed sign layouts shall be approved by the Region Traffic Engineer prior to ordering the signs.

Sign Sheeting

Signs shall be constructed using High Intensity (ASTM D4956 Type IV) or Super/Very High Intensity (ASTM D4956 Type XI) reflective sheeting as summarized in the US 81 Permanent Sign Installation Tables.

All signs shall be manufactured in accordance with the sheeting manufacturer's recommendations utilizing a matched component system, including inks, electronic cuttable films, and protective overlay films. Digitally printed signs will not be accepted.

All black legend and borders shall be nonreflectorized (unless otherwise specified in these plans).

Sign Installation Hardware

Aluminum U-Channel stiffeners shall be used on all standard highway signs greater than 36 inches in width and shall conform to Alloy 6063-T6 or 6061-T6. The U-Channel shall be 2 inches in width and free of holes. The U-Channel stiffeners shall also be used to connect various signs together so that an entire sign assembly can be erected on a single installation.

Stiffeners may be fastened to signs by use of ¼ inch diameter drive rivets.

Refer to the Breakaway Sign Supports diagram for typical sign and stiffener details.

The Contractor shall use 3/8 inch diameter rust proof machine sign bolts, flat metal washers, neoprene washers (against the sign sheeting), lock washers, and nuts to fasten the sign to the channel aluminum and posts. A minimum of two bolts shall extend through each post.

All costs associated with furnishing and installing the new permanent signs, and with furnishing and installing stiffeners and hardware shall be incidental to the contract unit price per square foot for FLAT ALUMINUM SIGN, NONREMOVABLE COPY HIGH INTENSITY, or FLAT ALUMINUM SIGN, NONREMOVABLE COPY SUPER/VERY HIGH INTENSITY.

SQUARE TUBE ANCHOR SLEEVE

The Contractor shall furnish and install new square tube anchor sleeve as follows:

2.5" x 18", 12 Gauge square tube anchor sleeve, (or equivalent components as approved by the Engineer).

A 2.25" x 2.25" x 4' perforated tube post (12 Gauge) shall be used as the anchor post for installation with the square tube anchor sleeve.

SQUARE TUBE POST SLEEVE

All 2.5" x 2.5" perforated tube post (10 Gauge) shall be sleeved with a 2 3/16" x 2 3/16" x 4' perforated tube post (10 Gauge).

WINGED SLIP BASE ANCHOR

The Contractor shall furnish and install new winged slip base anchor as required per the plans.

Winged slip base anchor shall be installed using direct drive method.

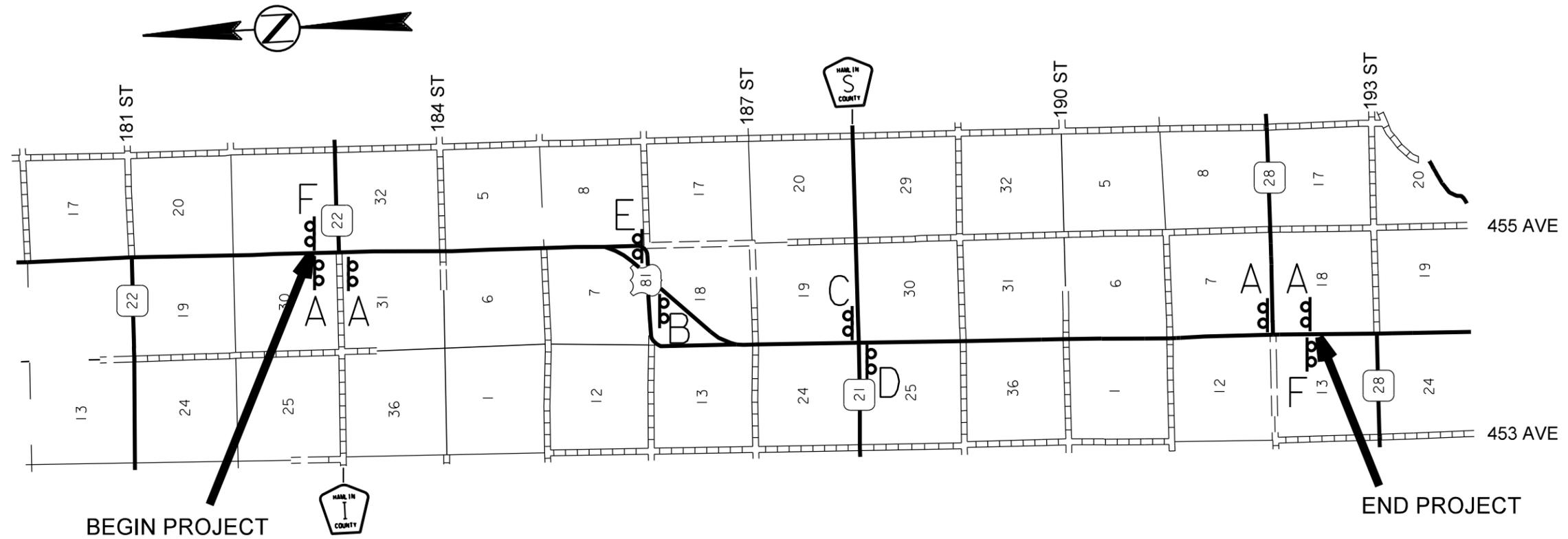
Winged slip base anchor shall consist of a slip base (upper), 48 inch long winged anchor (lower), and hardware kit.

MILEAGE REFERENCE MARKERS

MRMs (Mileage Reference Markers) are not to be disturbed. If an MRM is attached to a sign listed for replacement it shall be salvaged and reattached to the new sign in the same location. Payment for this work shall be incidental to the various signing contract items.

FIXED LOCATION GROUND MOUNTED BREAKAWAY SUPPORT SIGNS

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(99)135	24	51
Plotting Date: 01/08/2015			



W20-1 ROAD WORK AHEAD signs along rural US81 shall be mounted on portable supports, and shall be placed on intersecting roadways as directed by the Engineer. ROAD WORK AHEAD signs shall be moved as necessary to keep current with the work activities.

EXACT LOCATION OF SIGNS TO BE DETERMINED IN THE FIELD BY THE ENGINEER.

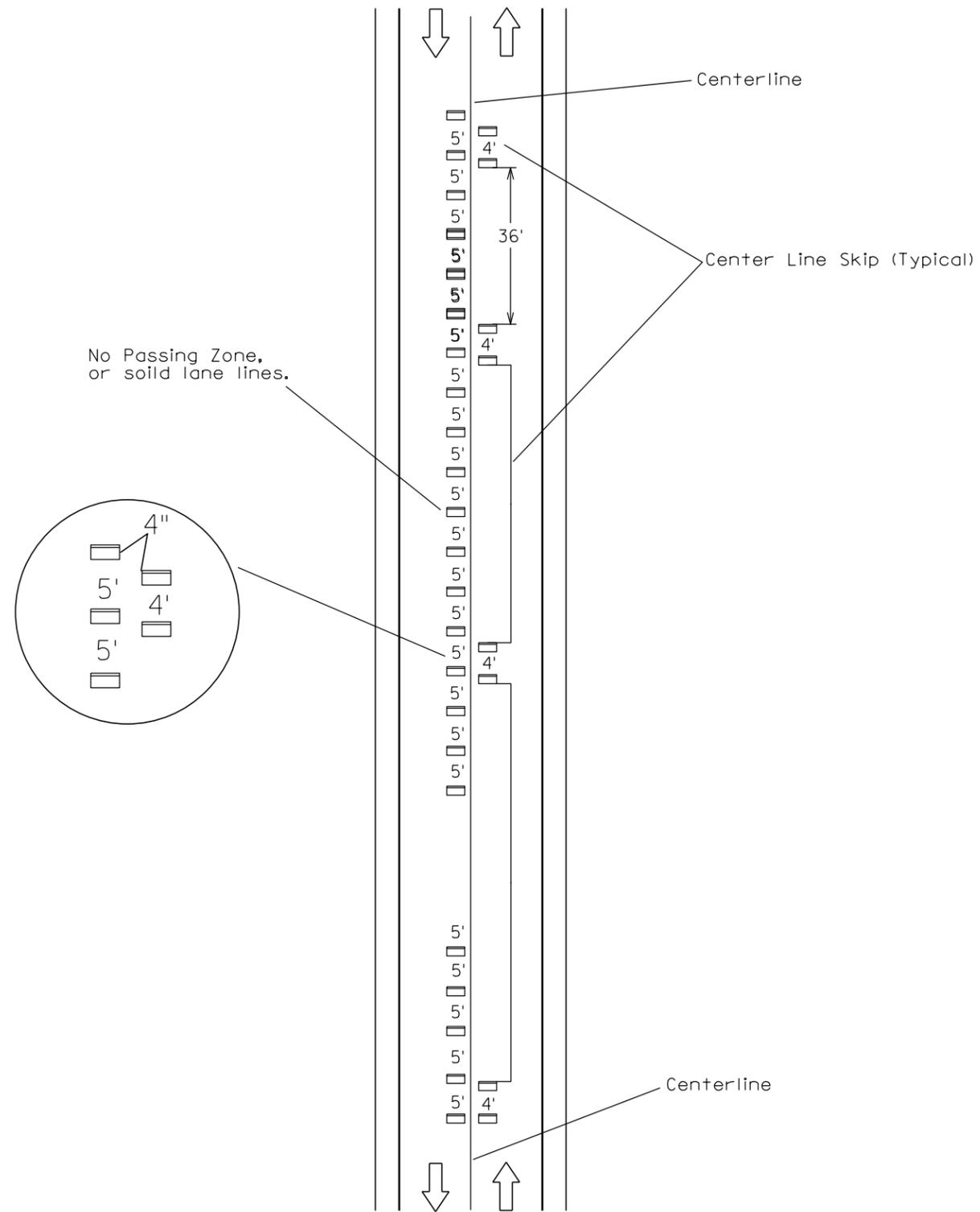
PLOT SCALE - 1:400

PLOTTED FROM - TRAB12222

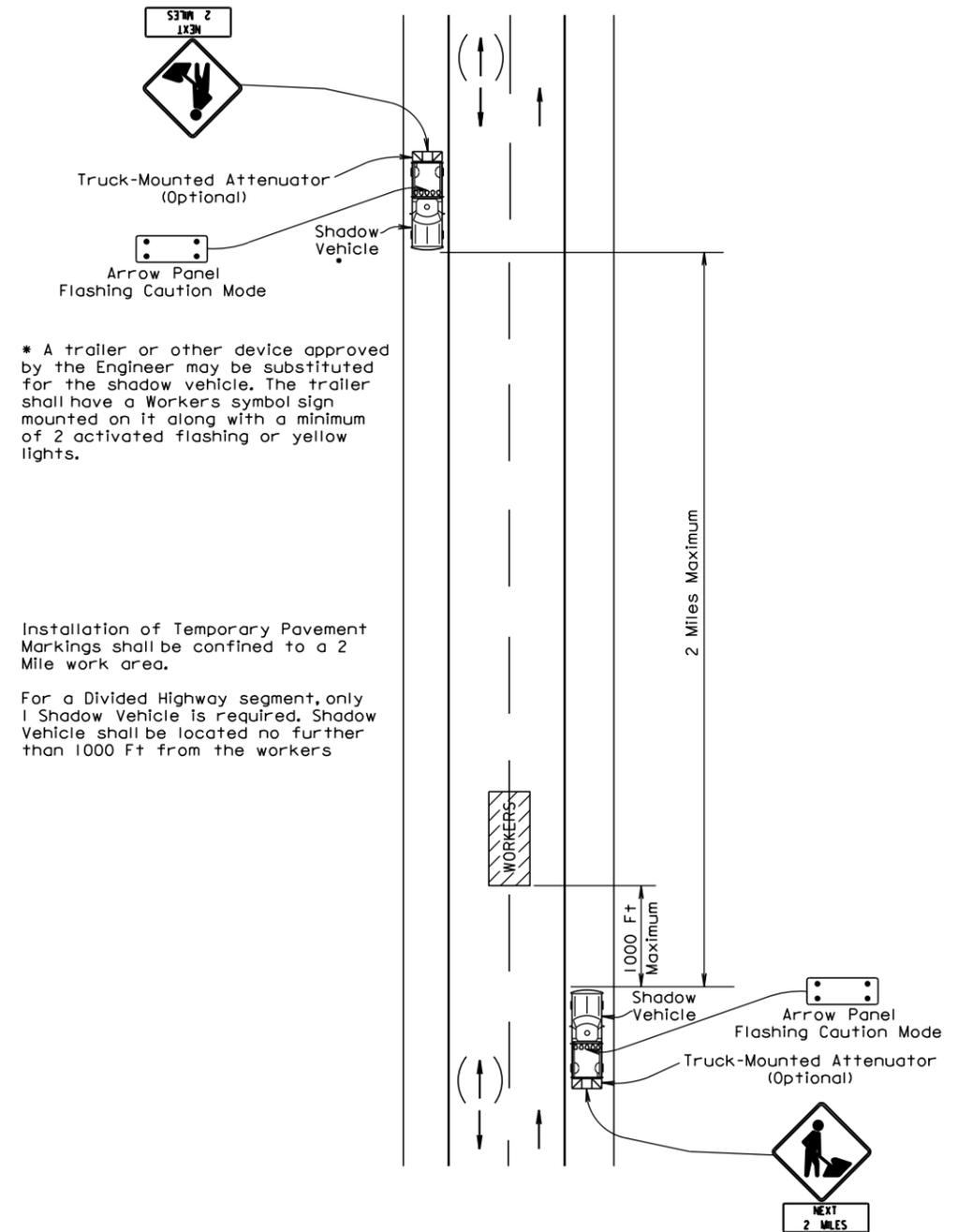
PLOT NAME - 3

FILE - ... \0366_FIXED_SUPPORT(X).DGN

GUIDES FOR TRAFFIC CONTROL DEVICES TEMPORARY ROAD MARKER INSTALLATION



GUIDES FOR TRAFFIC CONTROL DEVICES APPLICATION OF TEMPORARY PAVEMENT MARKING TABS

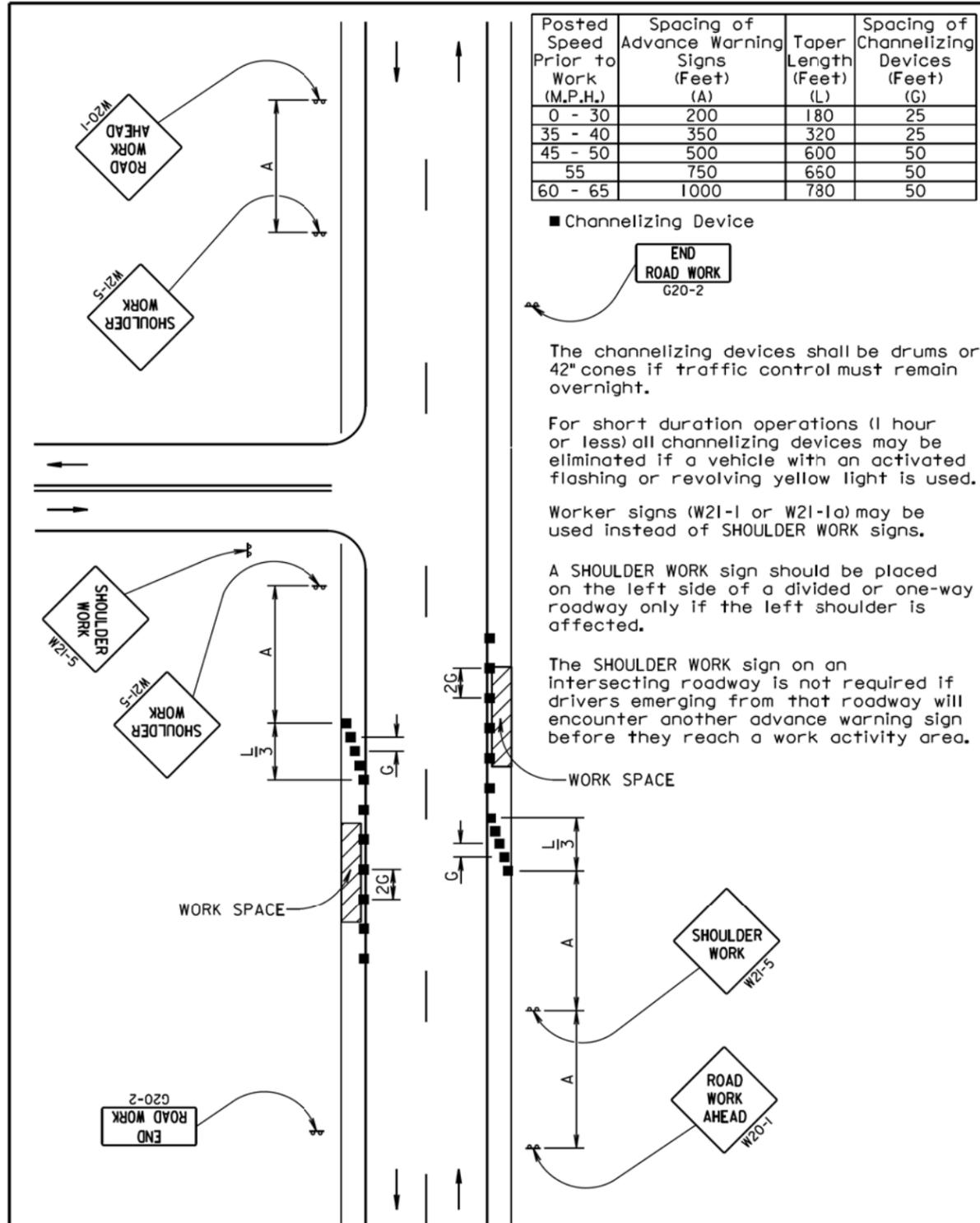


* A trailer or other device approved by the Engineer may be substituted for the shadow vehicle. The trailer shall have a Workers symbol sign mounted on it along with a minimum of 2 activated flashing or yellow lights.

Installation of Temporary Pavement Markings shall be confined to a 2 Mile work area.

For a Divided Highway segment, only 1 Shadow Vehicle is required. Shadow Vehicle shall be located no further than 1000 Ft from the workers

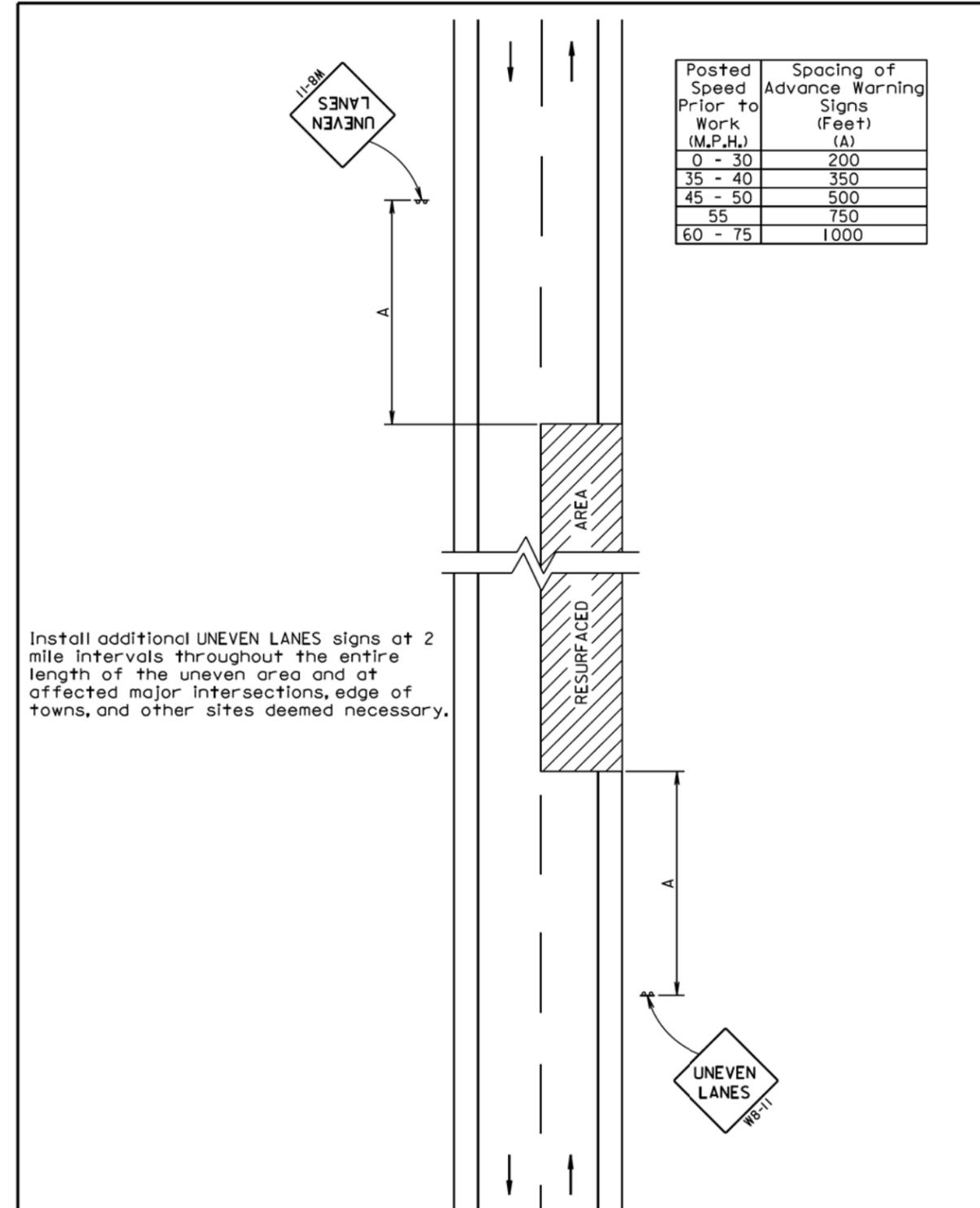
PLOT SCALE - 1:200



September 22, 2014

Published Date: 4th Qtr. 2014	S D D O T	GUIDES FOR TRAFFIC CONTROL DEVICES WORK ON SHOULDERS	PLATE NUMBER 634.03
			Sheet 1 of 1

PLOT NAME - 1



July 1, 2005

Published Date: 4th Qtr. 2014	S D D O T	GUIDES FOR TRAFFIC CONTROL DEVICES UNEVEN ROAD SURFACE	PLATE NUMBER 634.22
			Sheet 1 of 1

PLOTTED FROM - TRAB12222

FILE - ... \STANDARD PLATES\0366-20-TC.DGN

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 - 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.

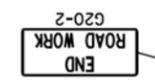
The ROAD WORK AHEAD and the END ROAD WORK signs may be omitted for short duration operations (1 hour or less).

For tack and/or flush seal operations, when flaggers are not being used, the FRESH OIL sign (W21-2) shall be displayed in advance of the liquid asphalt areas.

Flashing warning lights and/or flags may be used to call attention to the advance warning signs.

The channelizing devices shall be drums or 42" cones.

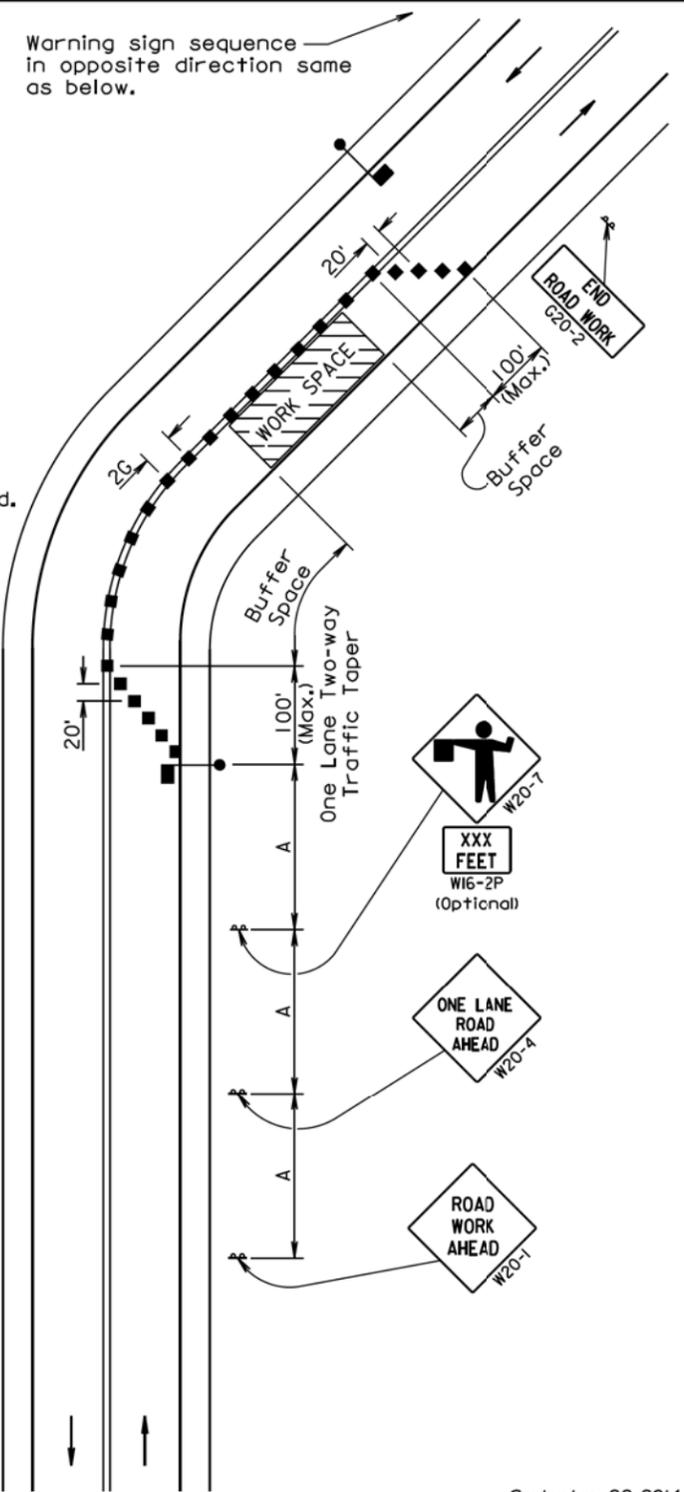
Channelizing devices are not required along the centerline adjacent to work area when pilot cars are utilized for escorting traffic through the work area.



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

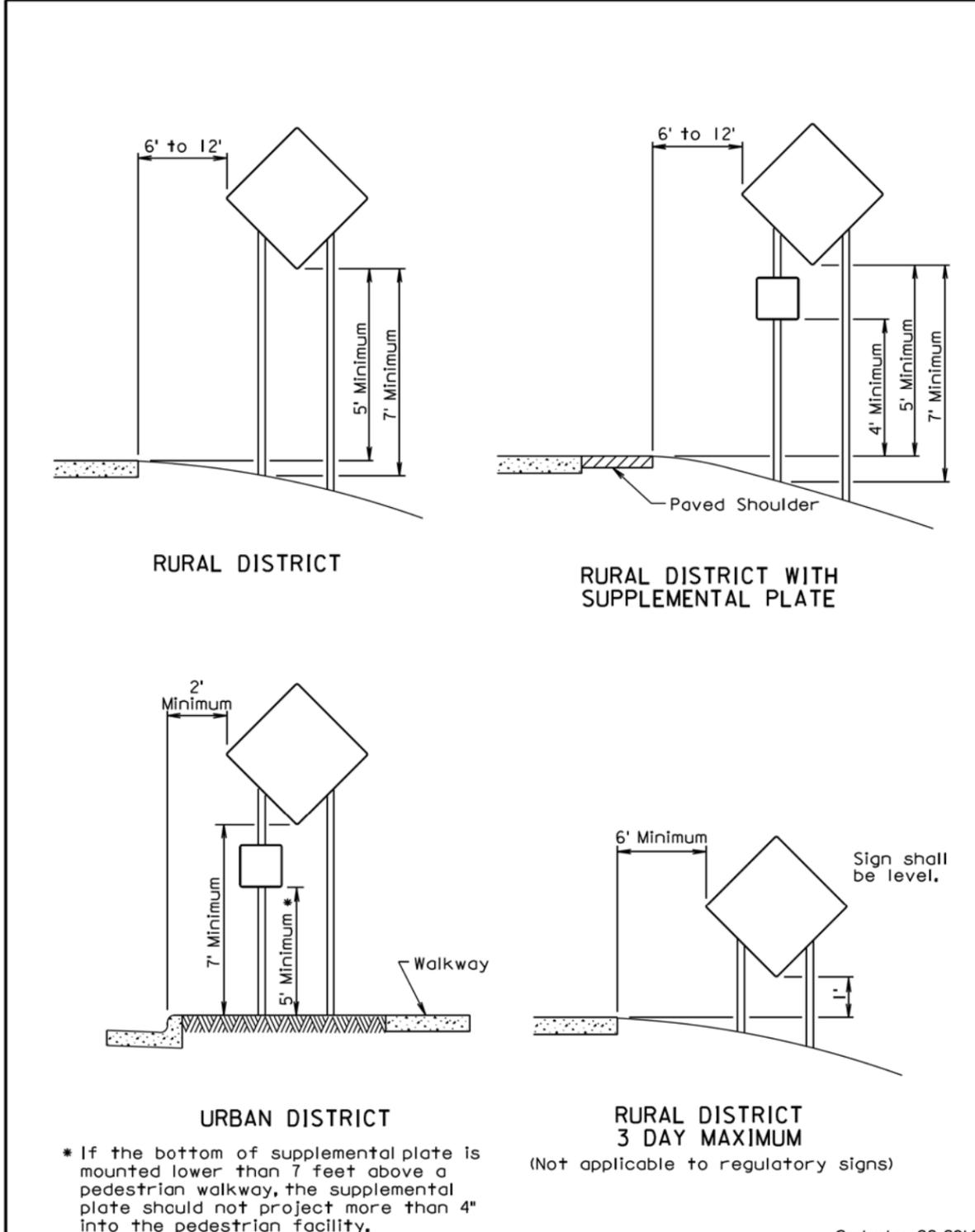
The buffer space should be extended so that the two-way traffic taper is placed before a horizontal or vertical curve to provide adequate sight distance for the flagger and queue of stopped vehicles.

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



September 22, 2014

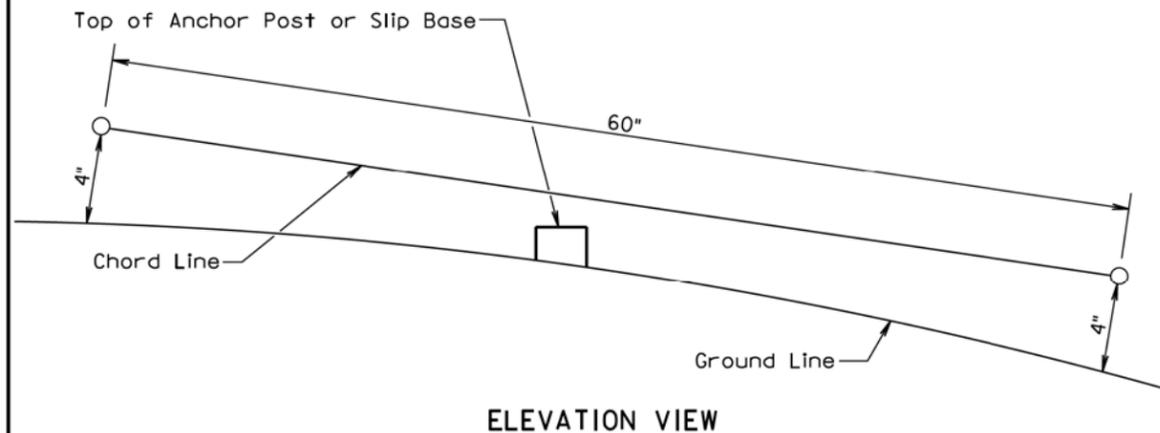
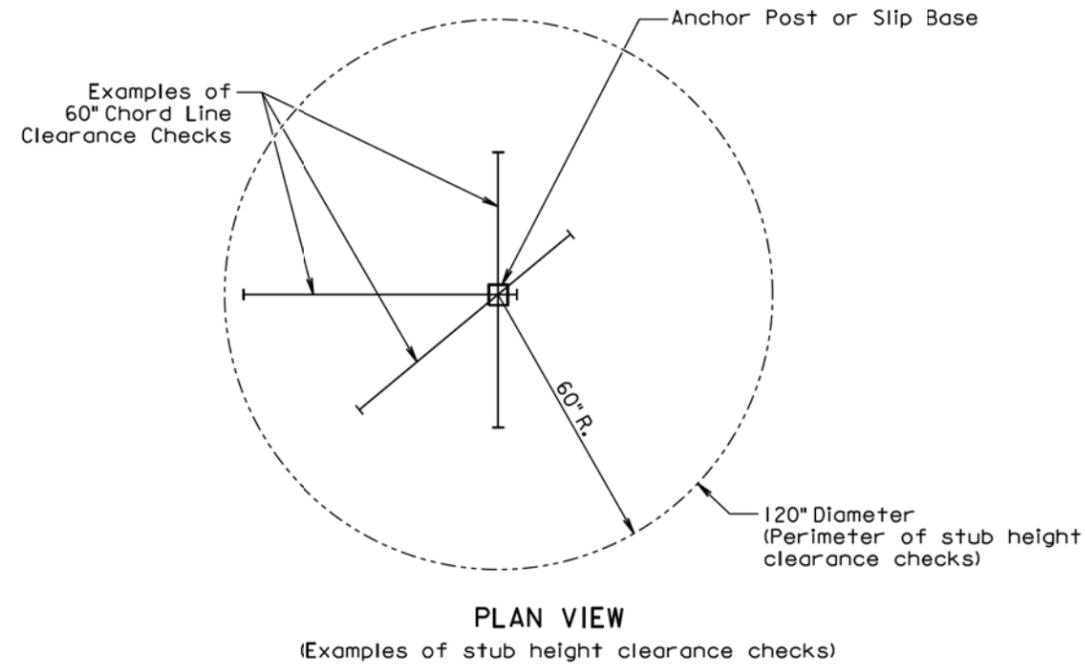
S D D O T	GUIDES FOR TRAFFIC CONTROL DEVICES LANE CLOSURE WITH FLAGGER PROVIDED	PLATE NUMBER 634.23
	Published Date: 4th Qtr. 2014	Sheet 1 of 1



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

September 22, 2014

S D D O T	CRASHWORTHY SIGN SUPPORTS (Typical Construction Signing)	PLATE NUMBER 634.85
	Published Date: 4th Qtr. 2014	Sheet 1 of 1



GENERAL NOTES:

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

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

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

July 1, 2005

Published Date: 4th Qtr. 2014	SD DOT	BREAKAWAY SUPPORT STUB CLEARANCE	PLATE NUMBER 634.99
			Sheet 1 of 1

ITEMIZED LIST FOR TRAFFIC CONTROL

SIGN CODE	DESCRIPTION	CONVENTIONAL ROAD			
		NUMBER	SIGN SIZE	UNITS PER SIGN	UNITS
W8-1	BUMP	4	48" x 48"	34	136
W8-6	TRUCK CROSSING	4	48" x 48"	34	136
W8-11	UNEVEN LANES	2	48" x 48"	34	68
W8-17	SHOULDER DROP-OFF (symbol)	2	48" x 48"	34	68
W13-1P	ADVISORY SPEED (plaque)	4	30" x 30"	21	84
W20-1	ROAD WORK AHEAD	15	48" x 48"	34	510
W20-4	ONE LANE ROAD AHEAD	2	48" x 48"	34	68
W20-7	FLAGGER (symbol)	4	48" x 48"	34	136
W21-2	FRESH OIL	2	48" x 48"	34	68
W21-5	SHOULDER WORK	4	48" x 48"	34	136
G20-1	ROAD WORK NEXT ___ MILES	8	36" x 18"	17	136
G20-2	END ROAD WORK	2	36" x 18"	17	34
TOTAL UNITS 1580					

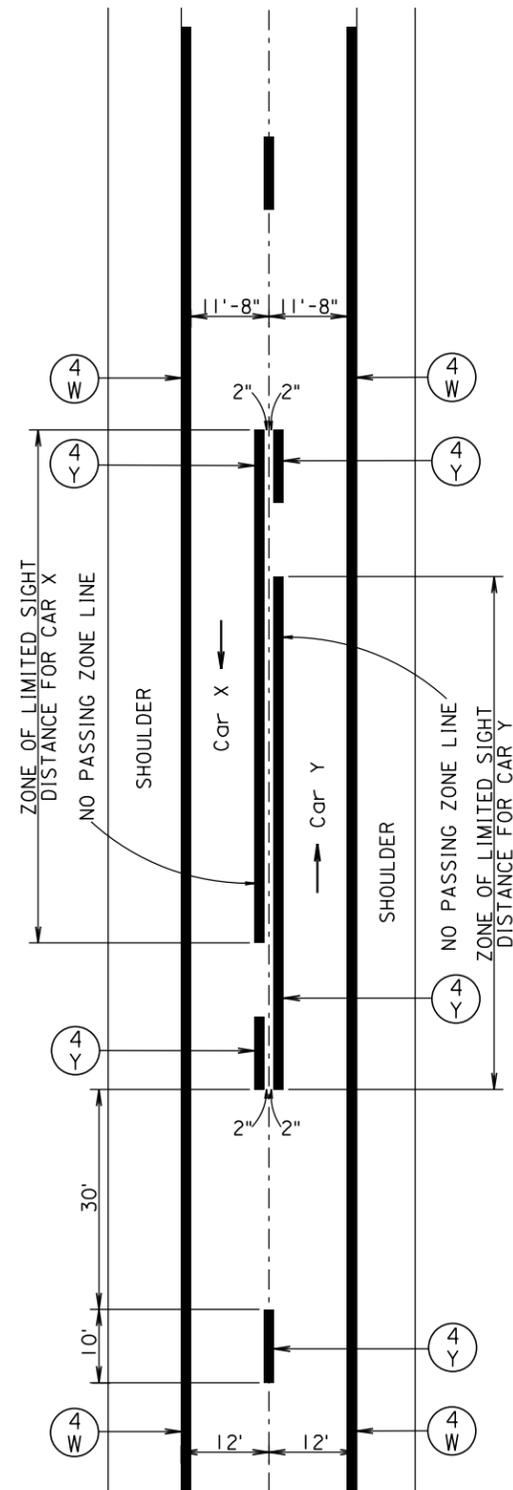
If a sign is required on this project and is not listed in the itemized list inventory, the units per sign will be determined as follow:

Signs 36" X 36" will be measured at 27 units each and signs 48" X 48" will be measured at 34 units each, otherwise:

If a sign measures less than 25" high and 25" wide the units per sign will be computed as sign size (SqFt) X 3.

If a sign measures less than 23H" and 37H" the units per sign will be computed as sign size (SqFt) X 1.2 + 15.

**TWO LANE
UNDIVIDED ROADWAY**



KEY	ITEM
(4) W	4" White
(4) Y	4" Yellow

FURNISHING AND APPLYING PAVEMENT MARKING PAINT

- The pavement marking paint and glass beads will be furnished and applied by the Contractor. Material shall meet the requirements of Section 980 and 981 of the Specifications.
- Construction requirements, methods of measurement, and basis of payment shall conform to the requirements of Section 633 of the Specifications.
- The approximate paint application rates shall be as follows:

Undivided Roadway

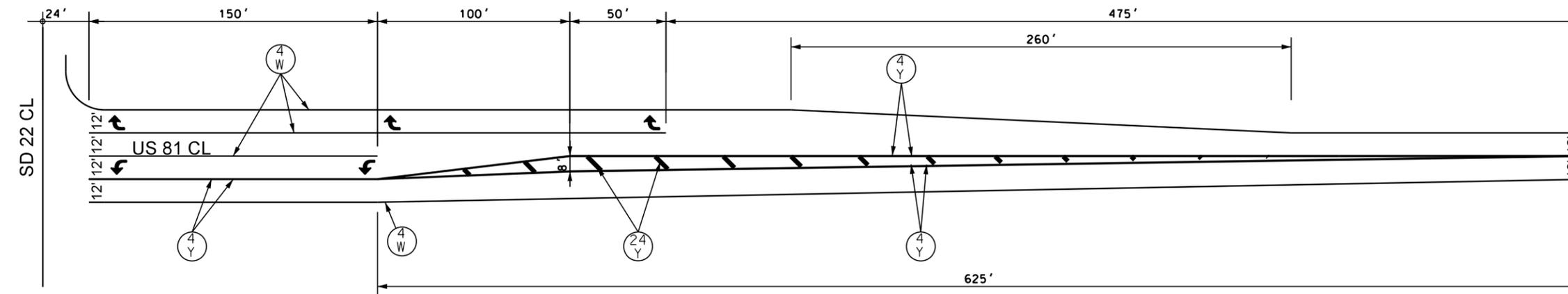
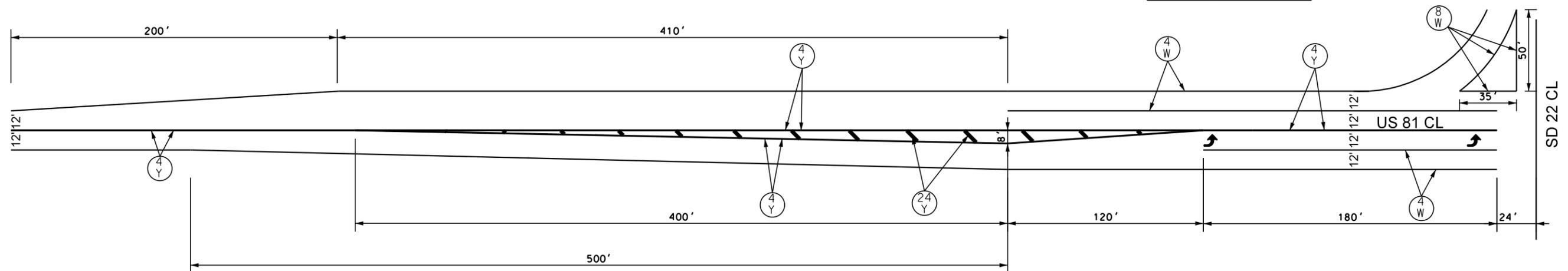
Yellow Centerline
12± Gallons/Pass-Mile
(Includes No-passing lines)

Yellow Centerline
4.6 Gallons/Pass-Mile
(Dashed Line)

4" White Edgeline
16.9 Gallons/Pass-Mile
(Solid Line)
- The typical pavement markings as shown on this sheet shall be applied throughout the entire length of the project.
- Exact location of the NO PASSING ZONE lines will be determined in the field by the Engineer. A dash of white paint will mark the beginning and end of all no passing zones. NO PASSING ZONE signs and the ending post in fence lines, if present, shall not be used as the beginning and ending NO PASSING ZONE lines.
- Traffic Control shall be incidental to the cost of application. The striper and advance or trailing warning vehicle shall be equipped with flashing amber lights or advance warning arrow panel.
- Glass beads shall be applied on the wet paint line at a minimum of eight pounds of glass beads per gallon of paint.

PAVEMENT MARKING LAYOUT US 81 & SD 22 JUNCTION

KEY	ITEM
(4 W)	4" White Paint
(4 Y)	4" Yellow Paint
(8 W)	8" White Paint
(24 Y)	Cold Applied Plastic Pavement Marking Tape, 24" Yellow
↩	Cold Applied Plastic Pavement Marking Tape, White Arrow



PLOT SCALE - 1:66.125

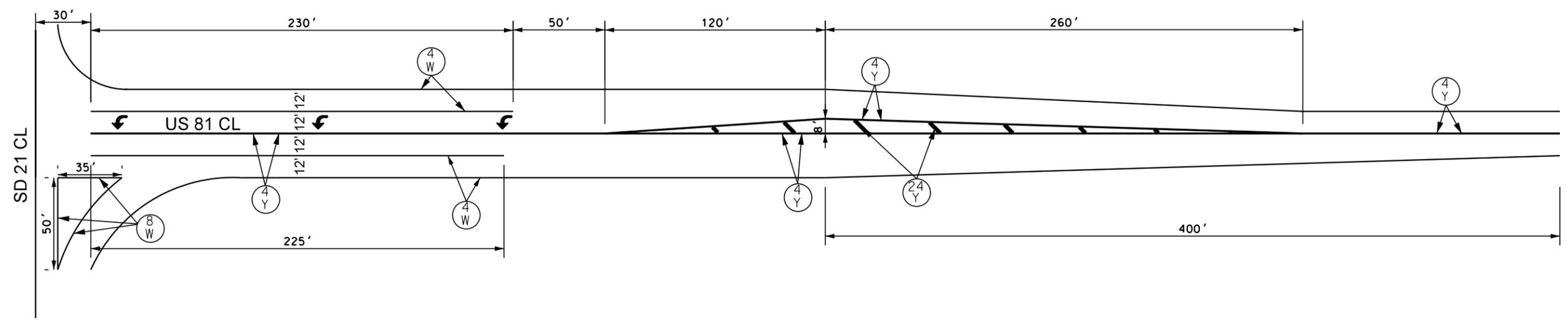
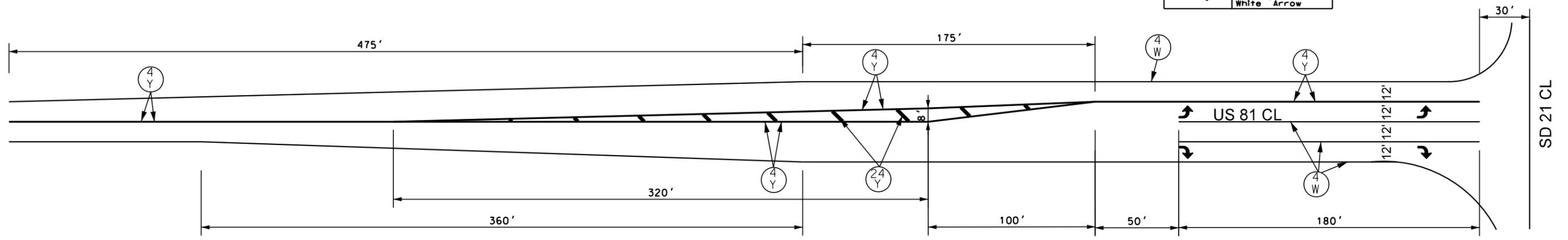
PLOTTED FROM - TRAB12222

PLOT NAME - 6

FILE - ... \0366_US81 & SD 22 PAVEMENT MARKINGS.DGN

PAVEMENT MARKING LAYOUT US 81 & SD 21 JUNCTION

KEY	ITEM
(4) W	4" White Paint
(4) Y	4" Yellow Paint
(8) W	8" White Paint
(24) Y	Cold Applied Plastic Pavement Marking Tape, 24" Yellow
↩	Cold Applied Plastic Pavement Marking Tape, White Arrow



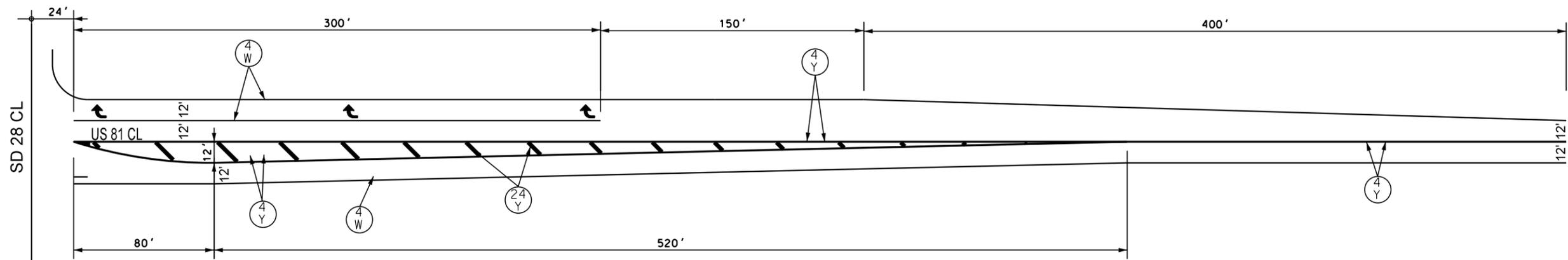
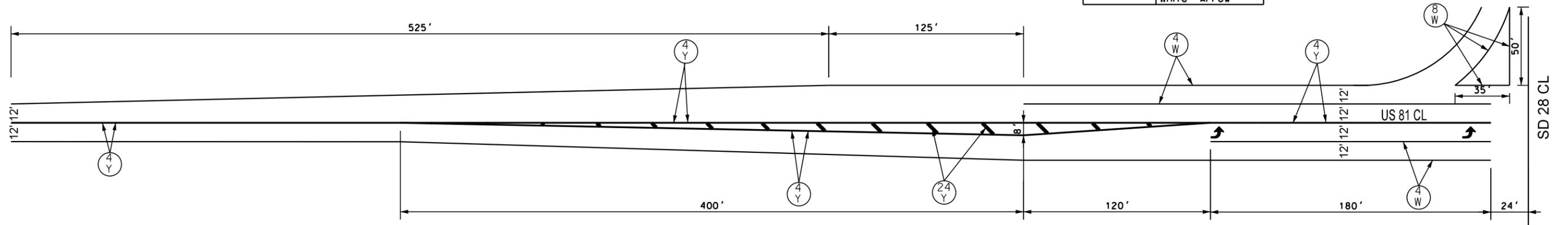
PLOT SCALE - 1:62

PLOTTED FROM - TRAB1222

PLOT NAME - 7
FILE - ... \0366_US81 & SD21 PAVEMENT MARKINGS.DGN

PAVEMENT MARKING LAYOUT US 81 & SD 28 JUNCTION

KEY	ITEM
(4 W)	4" White Paint
(4 Y)	4" Yellow Paint
(8 W)	8" White Paint
(24 Y)	Cold Applied Plastic Pavement Marking Tape, 24" Yellow
↩	Cold Applied Plastic Pavement Marking Tape, White Arrow

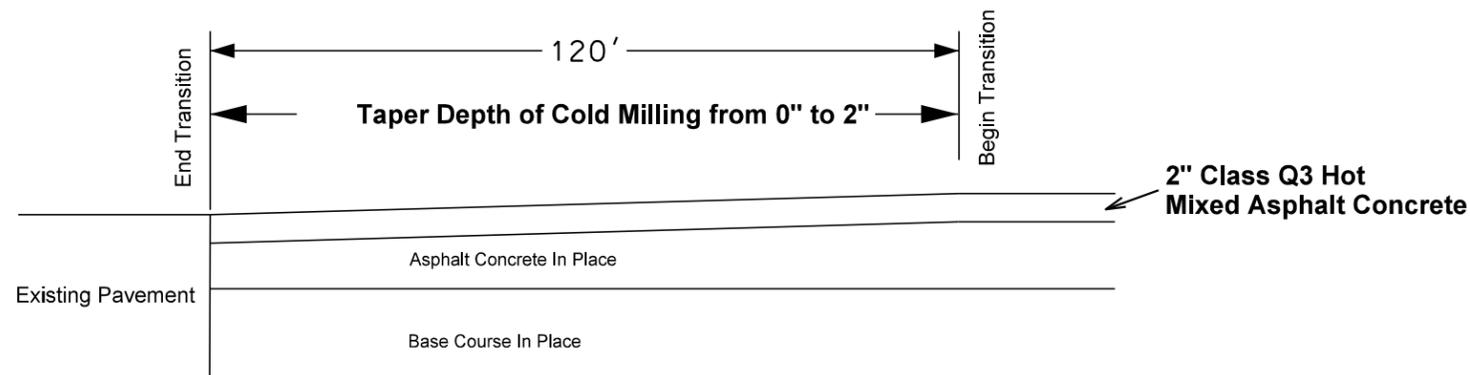


TRANSITION DETAILS FOR PROJECT LIMITS AND INTERSECTING ROADS

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(99)135	33	51
Plotting Date: 01/08/2015			

TRANSITION SECTION

Begin Resurfacing Project
End Resurfacing Project

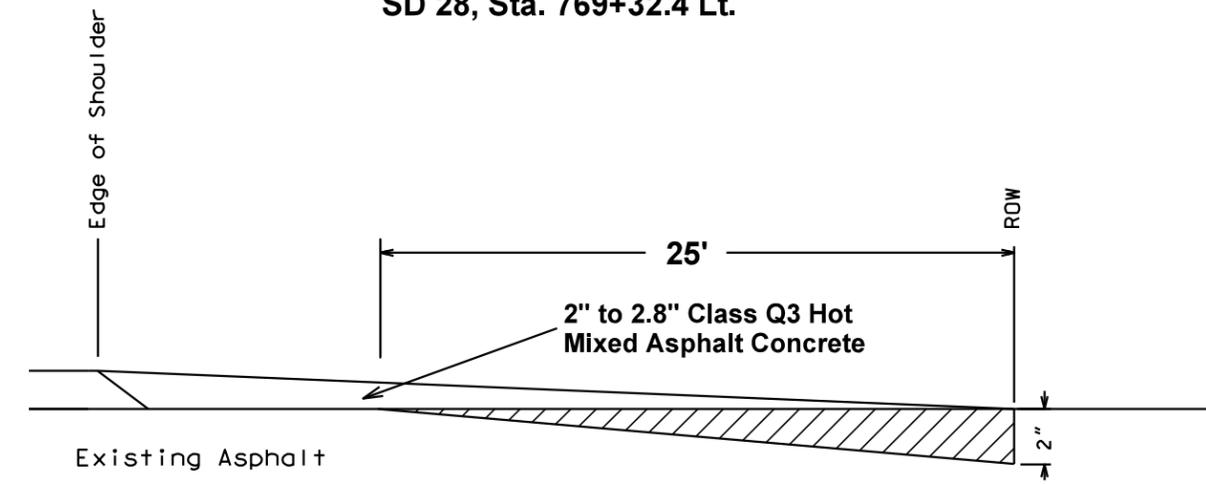


Note: Width of Cold Milling Asphalt Concrete at Beginning and End of the project is approximately 40 feet wide.

Cost for tapering the width and depth of cold milling shall be incidental to the contract unit price per square yard for Cold Milling Asphalt Concrete, unless otherwise indicated.

TRANSITION SECTION

SD 22, Sta. 255+25.1 Lt.
455th Ave, Sta. 391+20 Lt.
186th St, Sta. 417+63.2 Rt. & Lt.
454th Ave, Sta. 473+50 Rt.
SD 21, Sta. 538+02.7 Rt.
188th St, Sta. 538+02.7 Lt.
SD 28, Sta. 769+32.4 Lt.



Note: Width of Cold Milling Asphalt Concrete shall match adjacent surfacing width.

Included in the Table of Additional Quantities for these Transition Areas is 799 sq. yds. of Cold Milling Asphalt Concrete. Basis of payment shall be plans quantity regardless of width of the these Transition Areas.

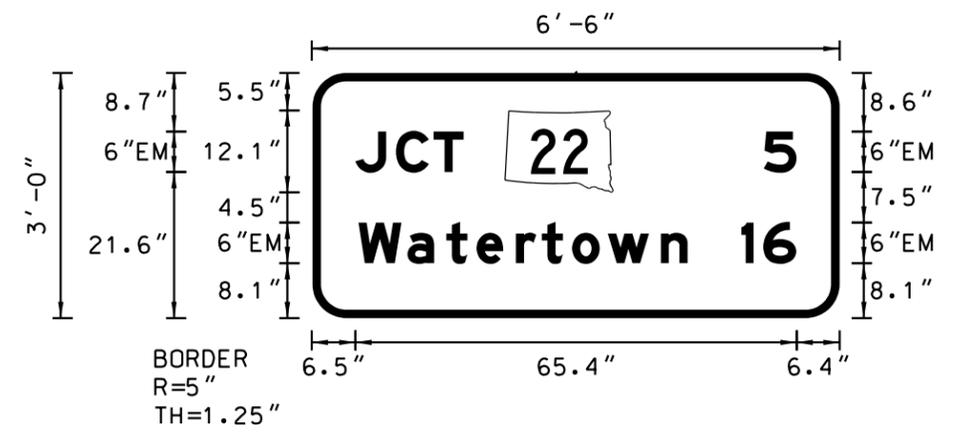
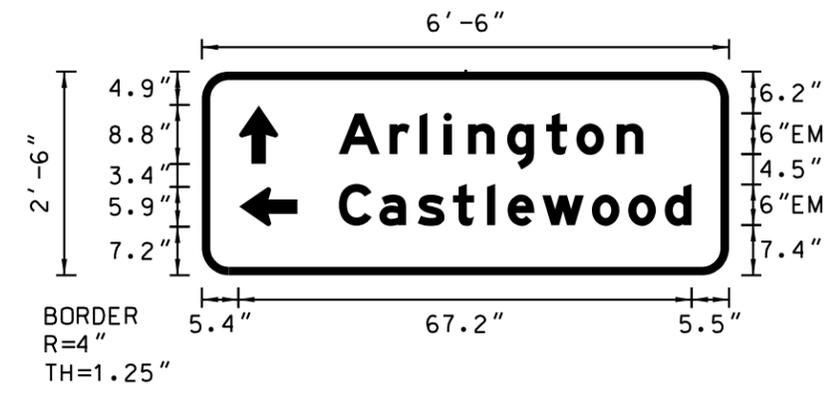
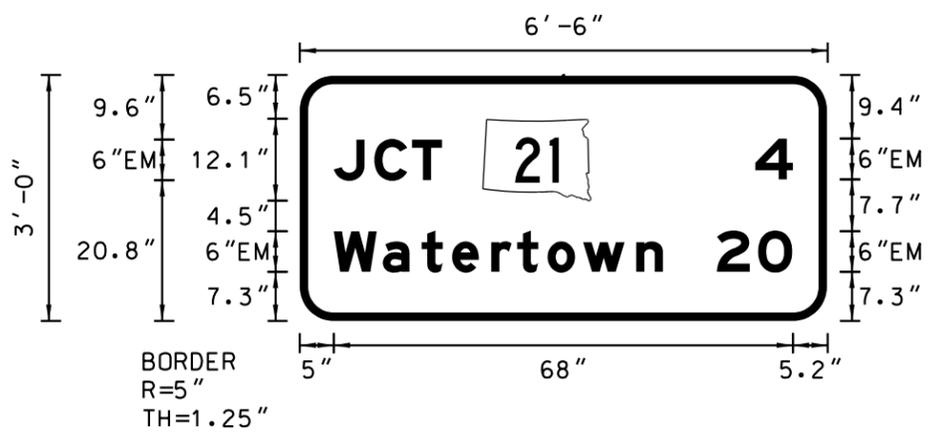
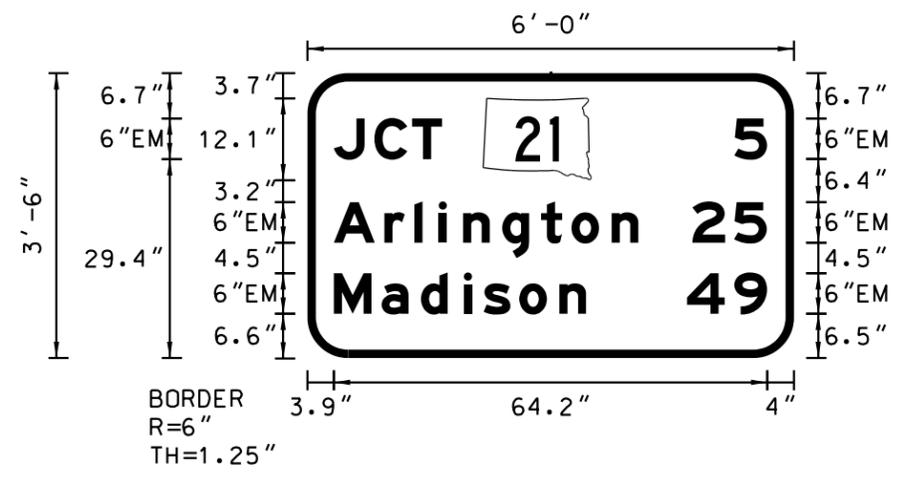
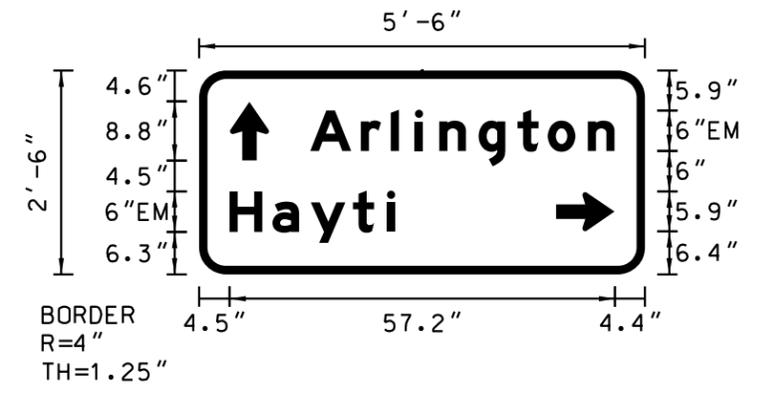
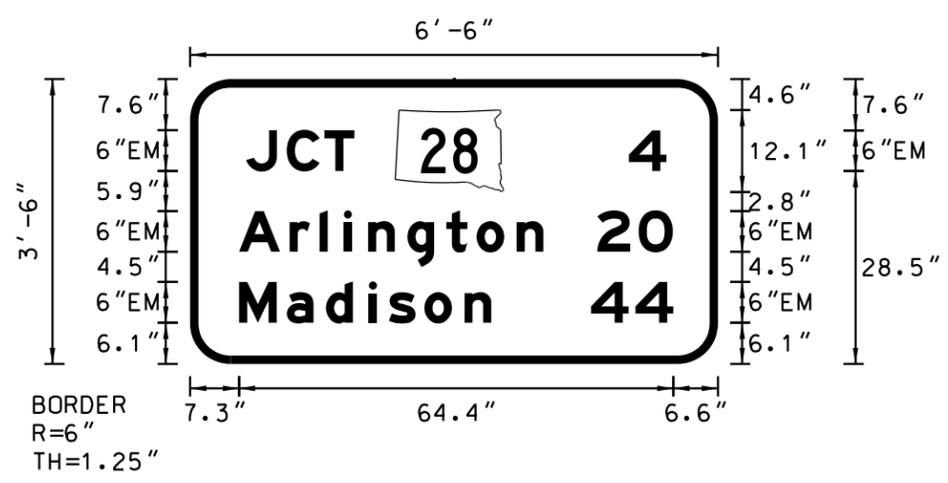
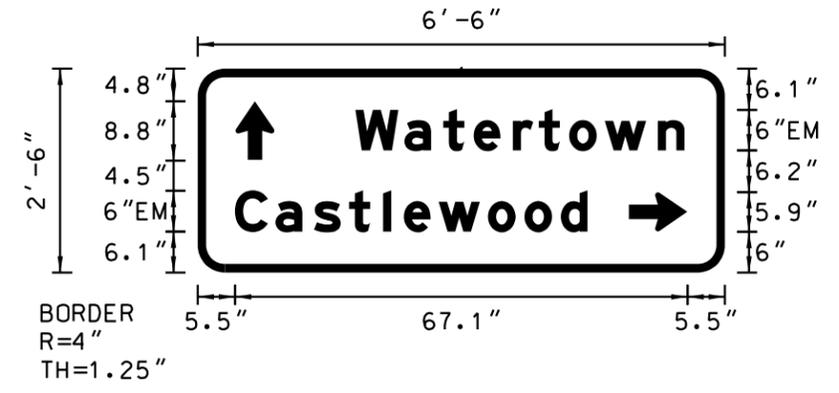
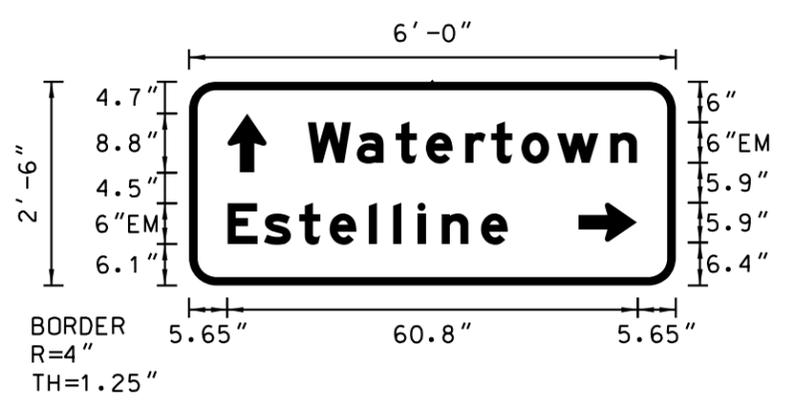
SPECIAL SIGN DESIGN

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(99)135	34	51
Plotting Date: 12/01/2014			

PLOT SCALE - 1:2,2575

PLOT NAME - 1

FILE - ... \SIGN DESIGN.DGN

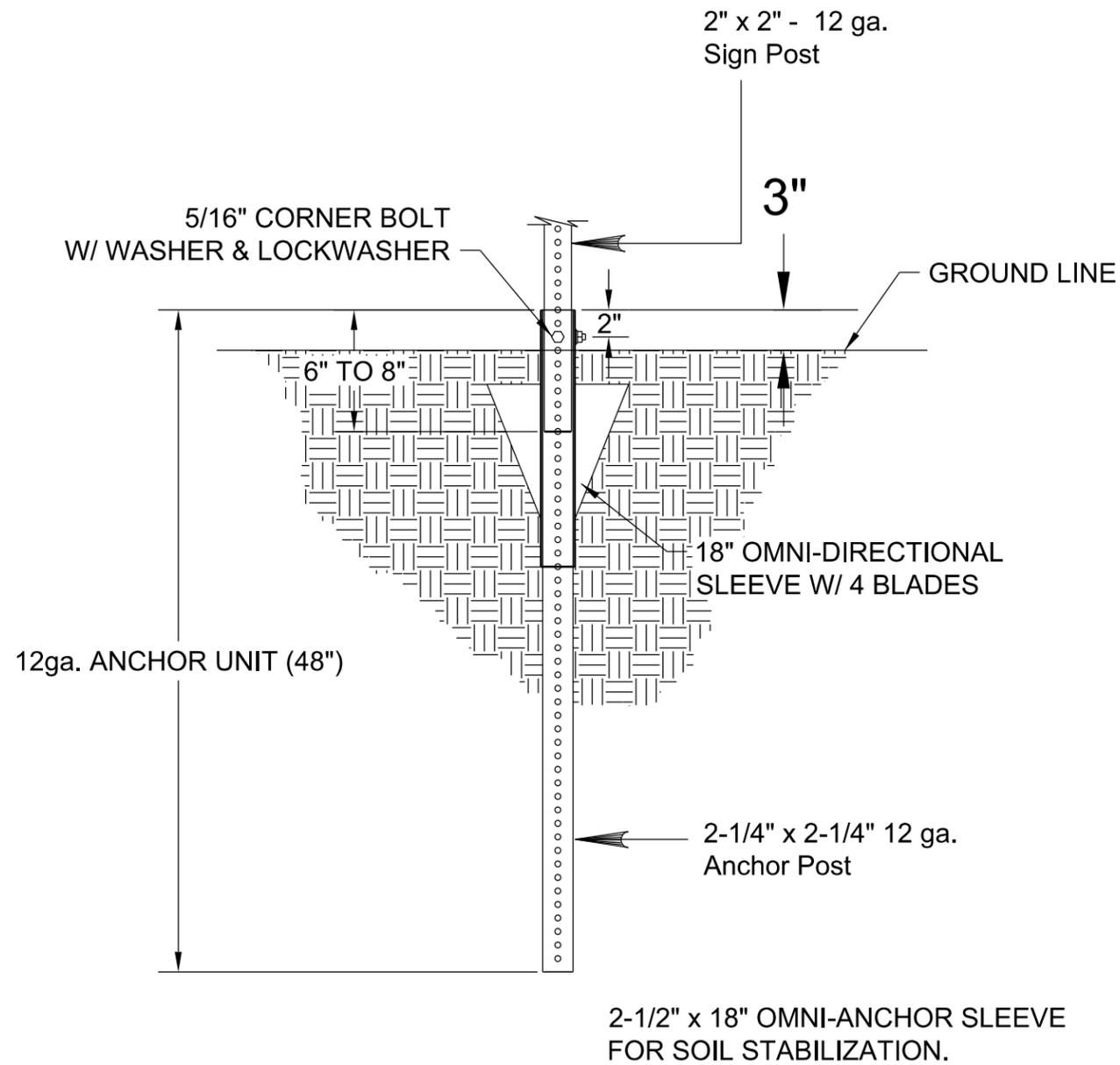


The above signs shall have a green background with white legend and white border

PLOTTED FROM - TRAB10100

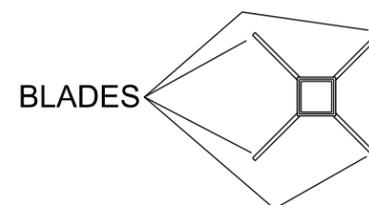
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(99)135	35	51
Plotting Date: 12/01/2014			

SQUARE TUBE 4 BLADE ANCHOR DETAIL



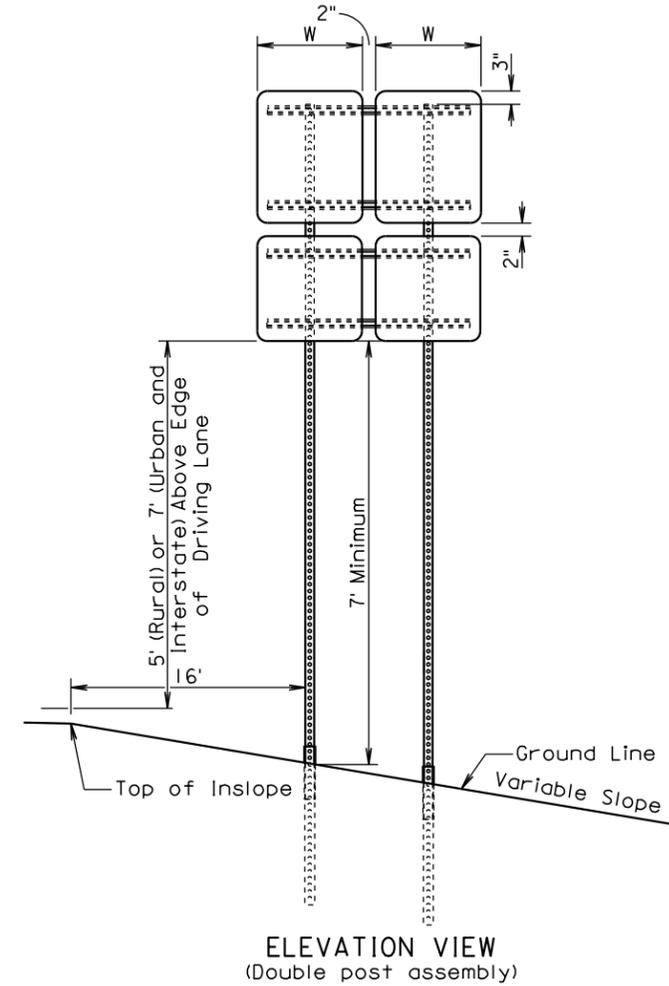
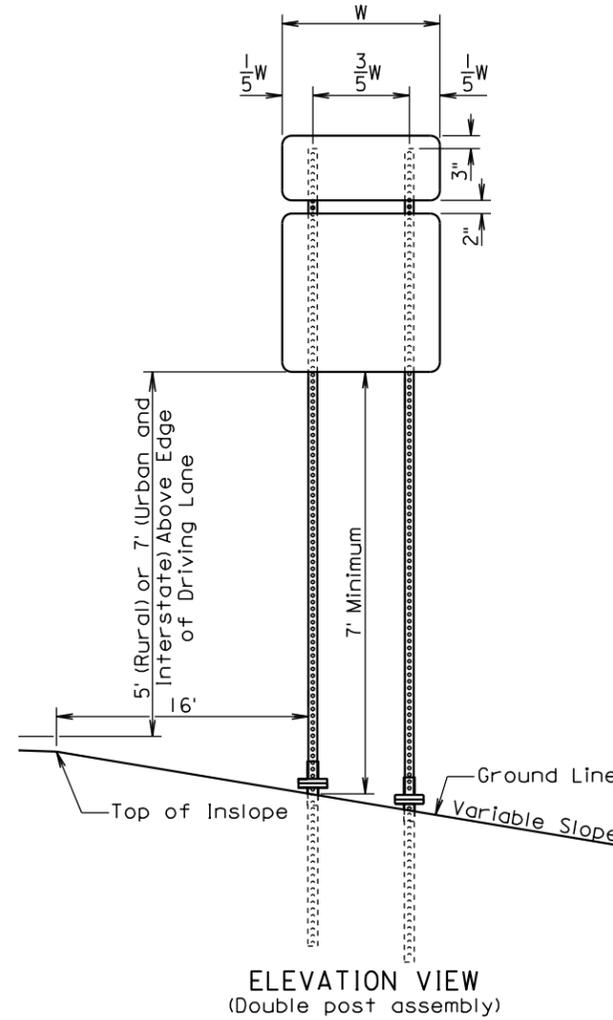
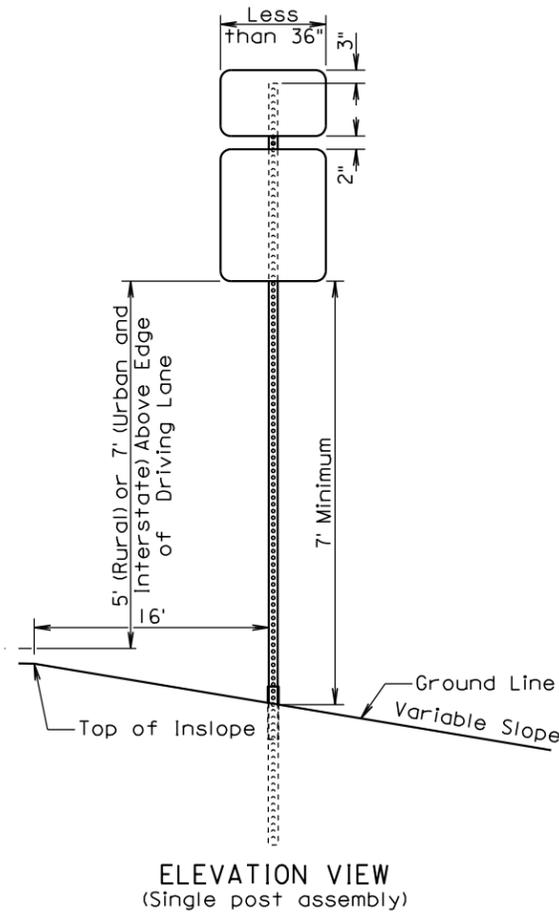
ANCHOR SLEEVE
TOP VIEW

2-1/2" x 18" 12 ga. Omni-Sleeve



STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(99)135	36	51
Plotting Date: 12/01/2014			

INSTALLATION DETAILS FOR MULTIPLE SIGN ASSEMBLIES

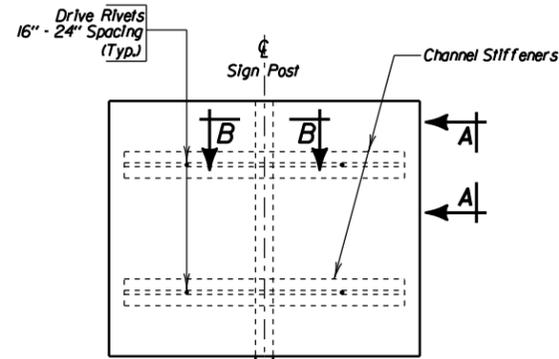


GENERAL NOTES:

The sign posts and bases shown are for illustrative purpose. The post type required shall be the type specified in the plans.

All breakaway sign supports shall comply with NCHRP 350 or MASH crash testing requirements and FHWA requirements. The Contractor shall provide post installation details at the preconstruction meeting for all breakaway sign support assemblies.

ONE POST BREAKAWAY SIGN SUPPORTS

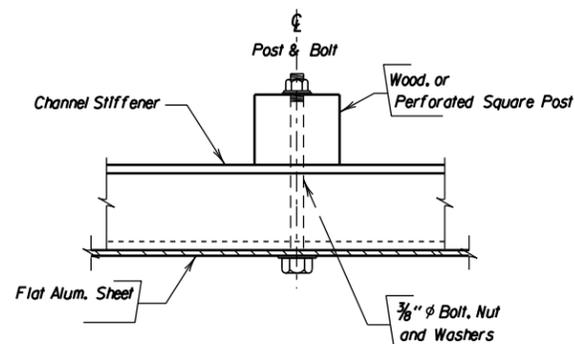
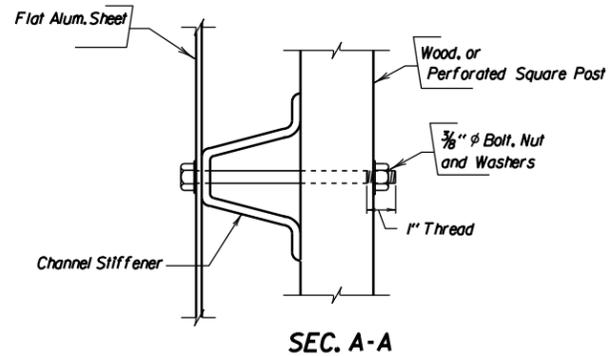
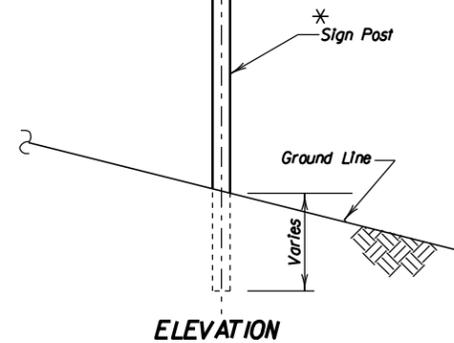


∅ A plastic washer, as recommended by the sheeting manufacturer, shall be installed between the sign face and the metal washer shown.

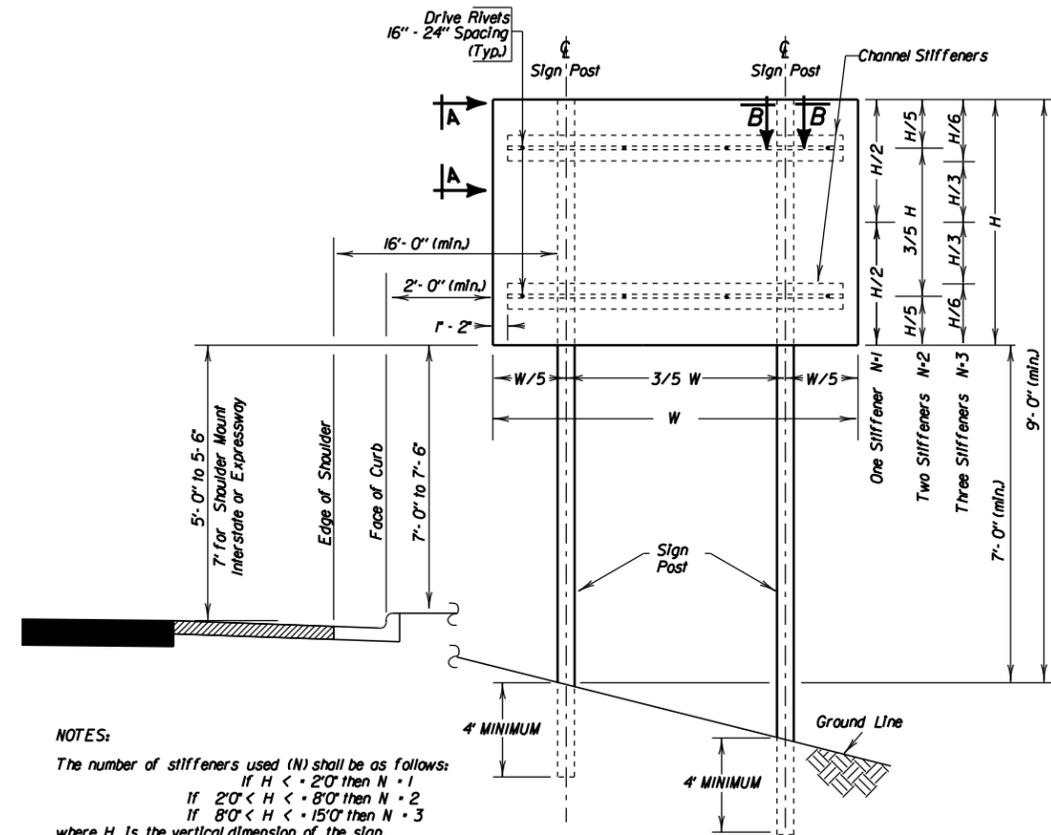
Height and lateral distance as recommended by latest edition of MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.

* Single post installation shown. (See applicable Details or Standard Plates shown in these plans for multiple post spacing requirements.)

(Typical Sign and Stiffener Details)

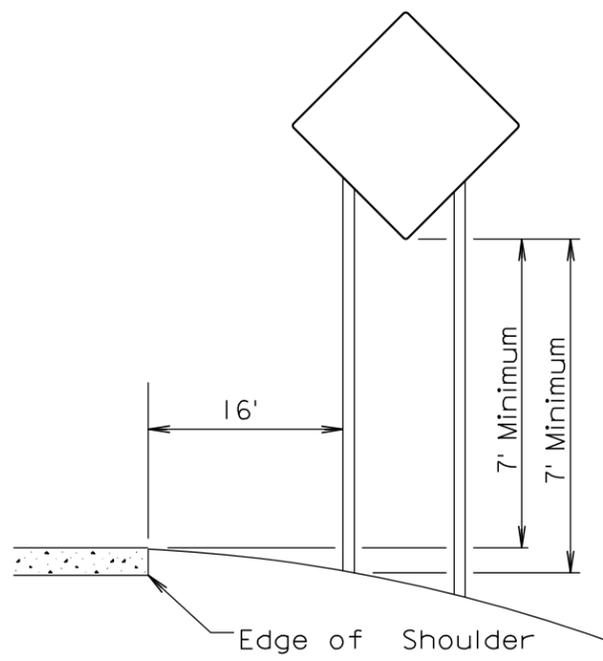


TWO POST BREAKAWAY SIGN SUPPORTS

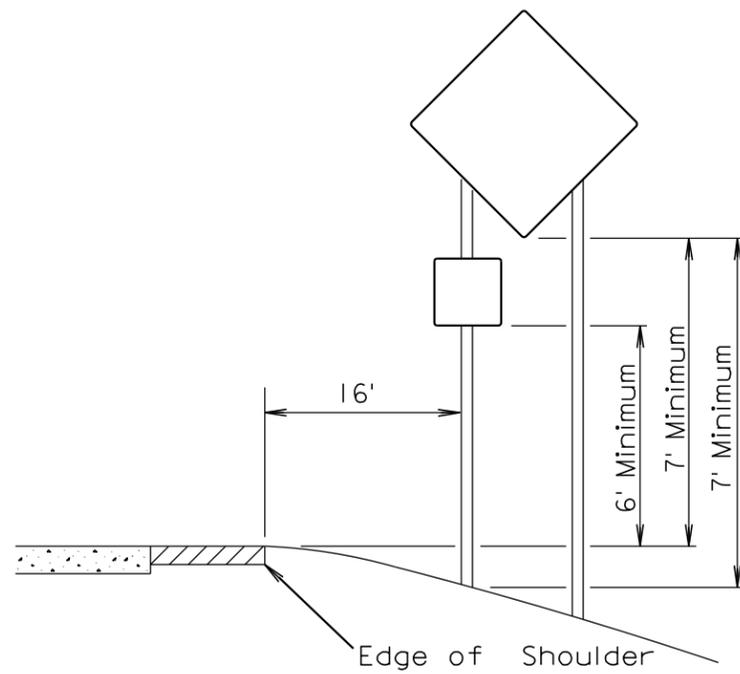


STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(99)135	38	51
Plotting Date: 12/01/2014			

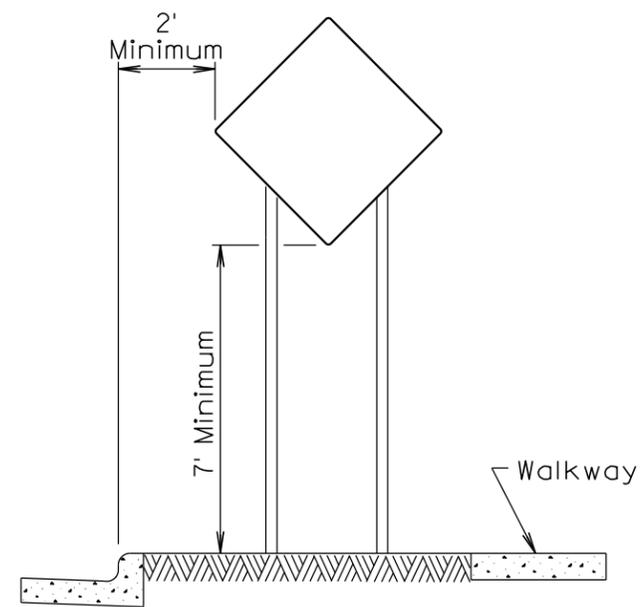
SIGN SUPPORTS (Lateral Off-Sets)



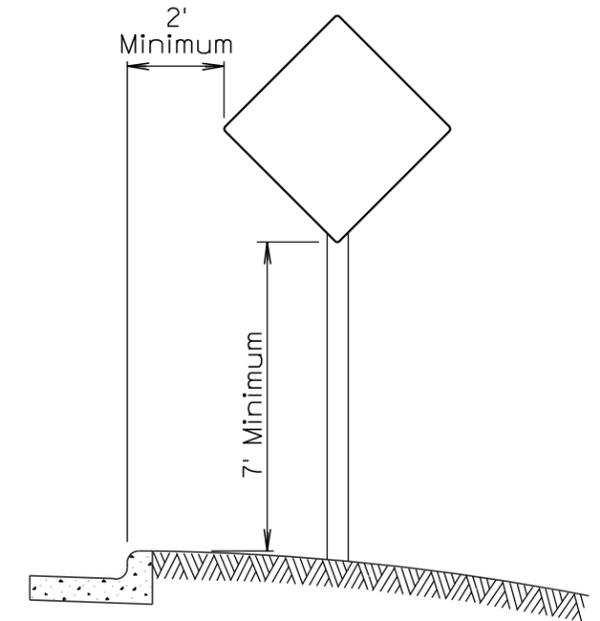
RURAL DISTRICT



RURAL DISTRICT WITH
SUPPLEMENTAL PLATE



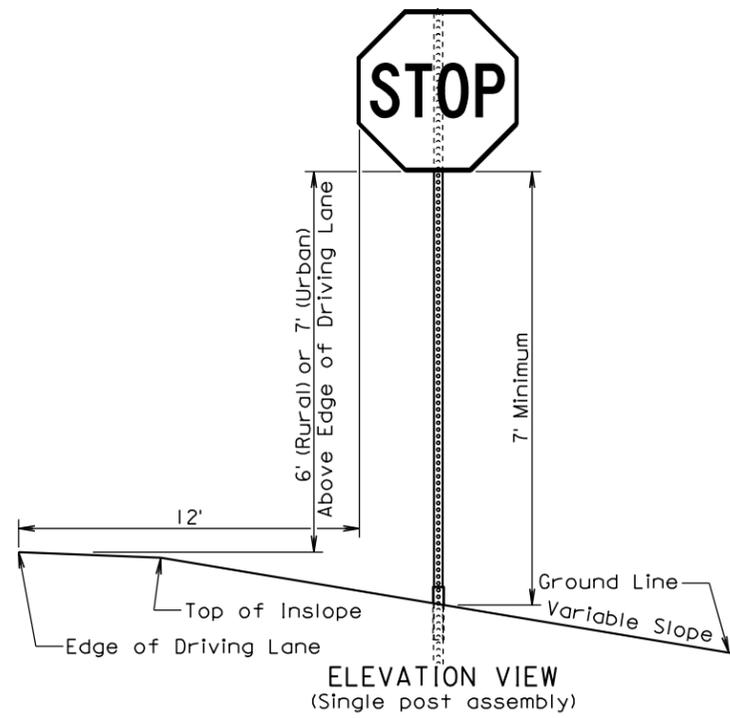
URBAN DISTRICT



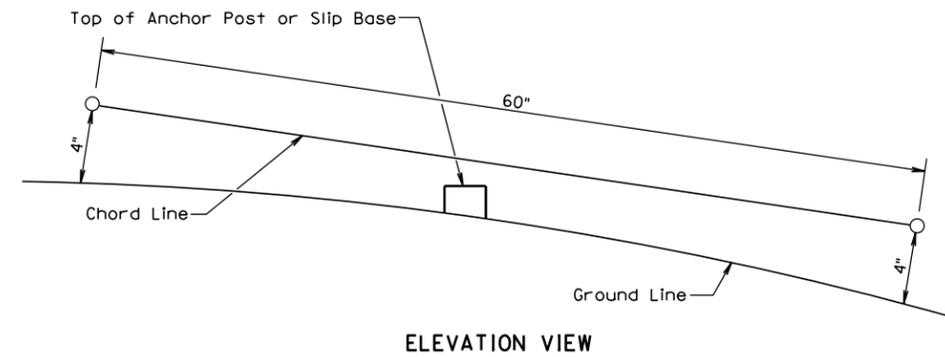
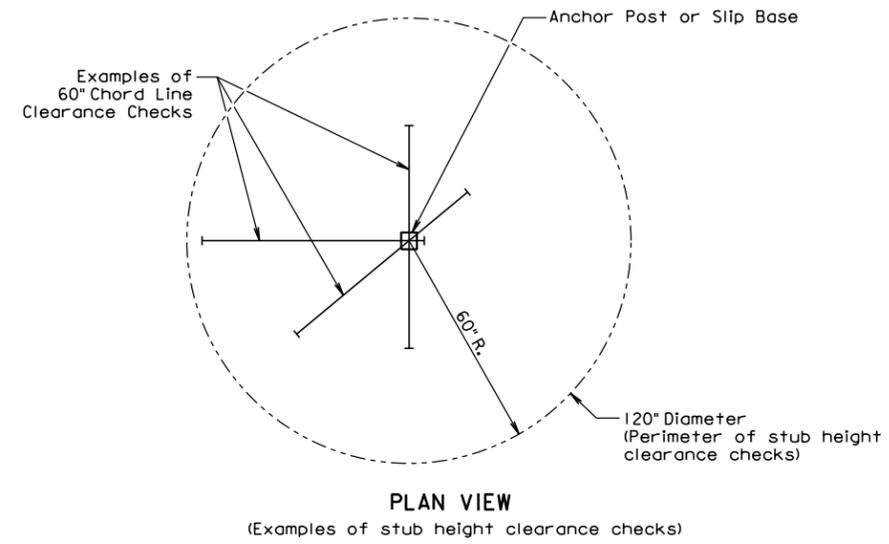
URBAN DISTRICT

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(99)135	39	51
Plotting Date: 12/01/2014			

INSTALLATION DETAILS FOR STOP SIGNS



BREAKAWAY SUPPORT STUB CLEARANCE



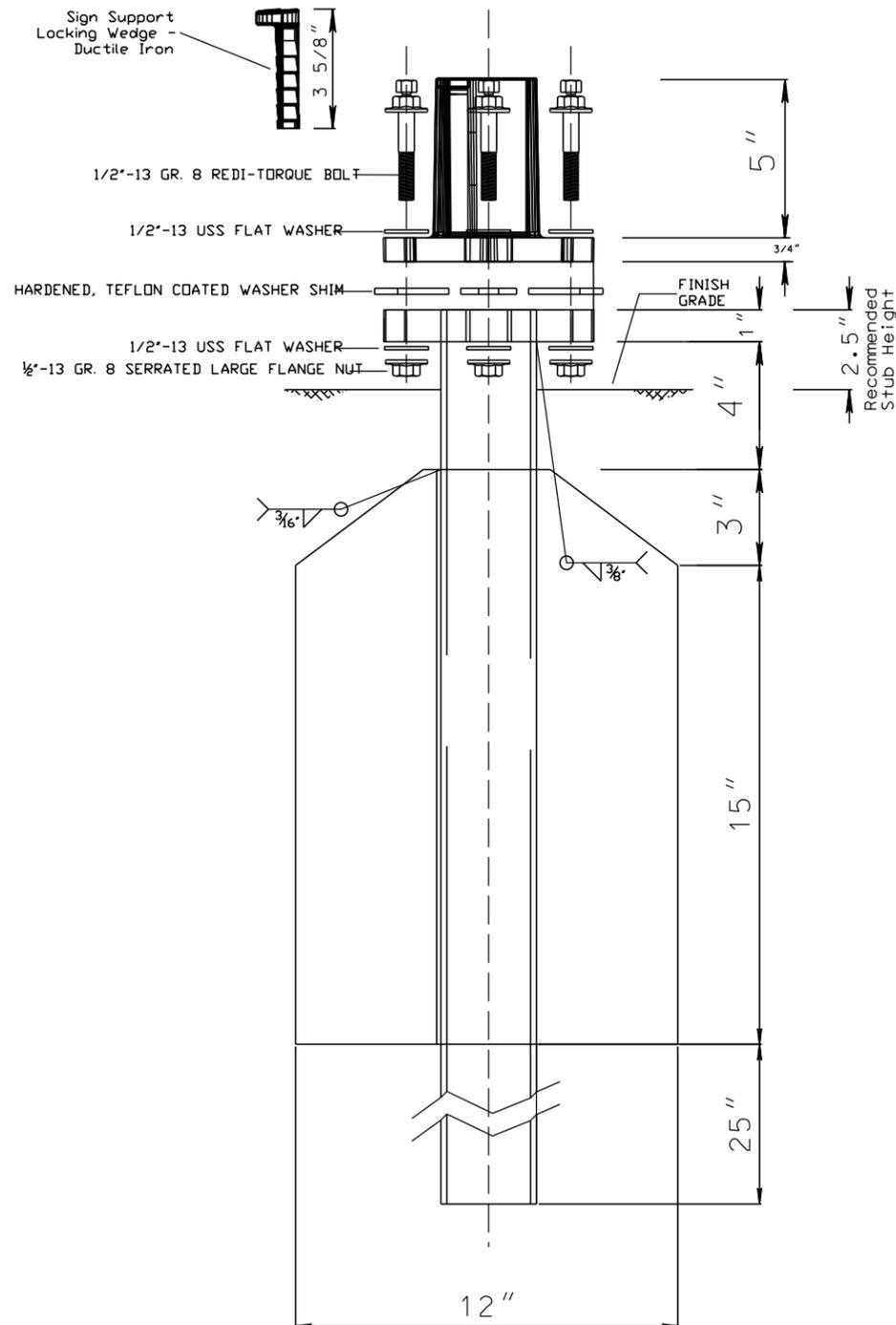
GENERAL NOTES:

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

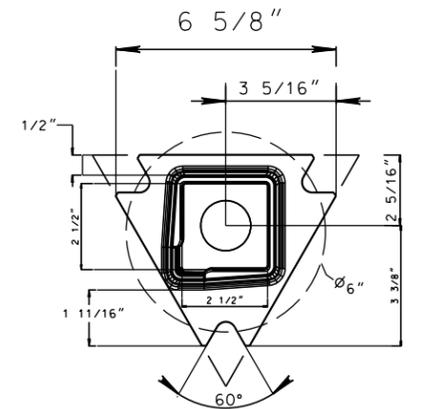
At locations where there is curb and gutter adjacent to the breakaway sign support, the stub height shall be a maximum of 4" above the ground line at the localized area adjacent to the breakaway support stub.

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(99)135	40	51
Plotting Date: 12/01/2014			

48" WINGED ANCHOR SLIP BASE

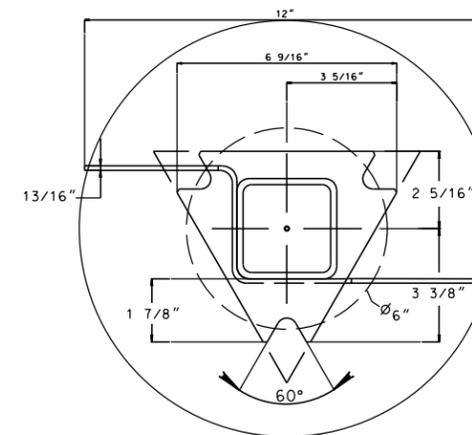


TOP POST RECEIVER
for 2-1/2" SQUARE POST



MATERIAL:
DUCTILE IRON CASTING, CLASS 65-45-12

BOTTOM UNIBASE
SOIL STUB

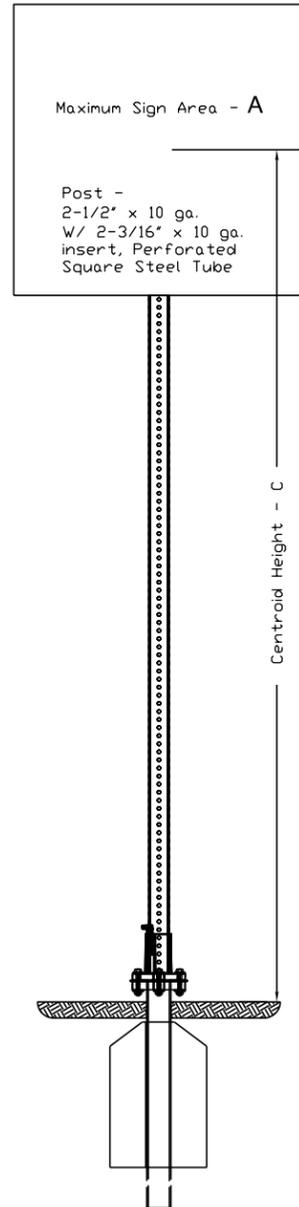


MATERIALS:
Tube - 3" x 3" x 7 ga. ASTM A500 Grade B tube
Stabilizing Wing - 7 ga. H.R.P.D. ASTM A 569
Plate - ASTM A572 grade 50

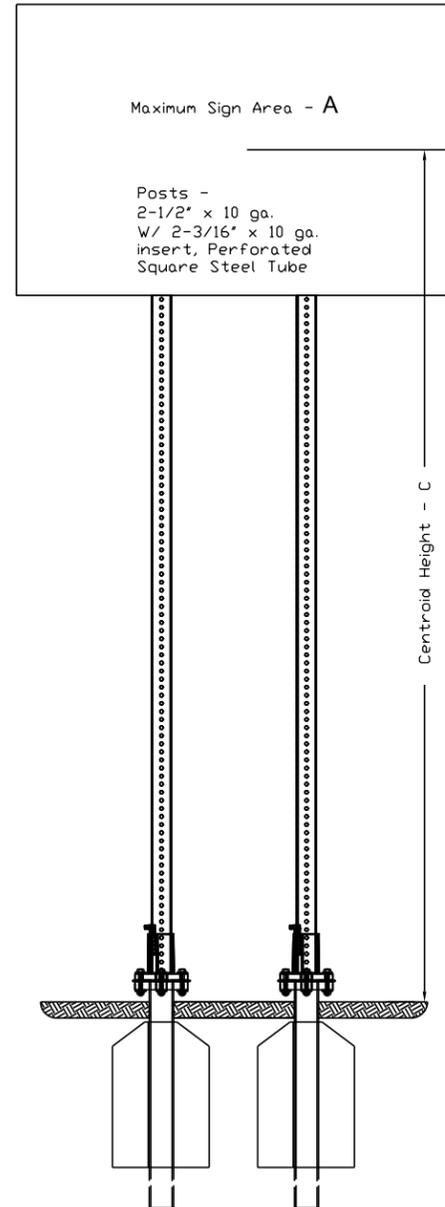


48" WINGED SLIP BASE

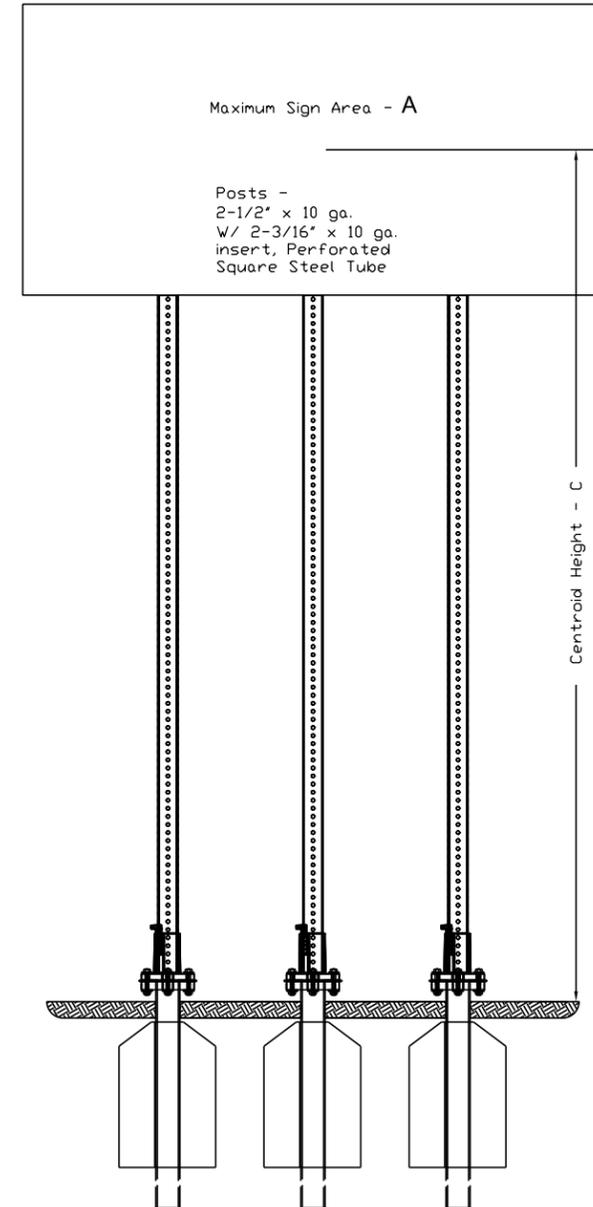
Post and Wind Load Information



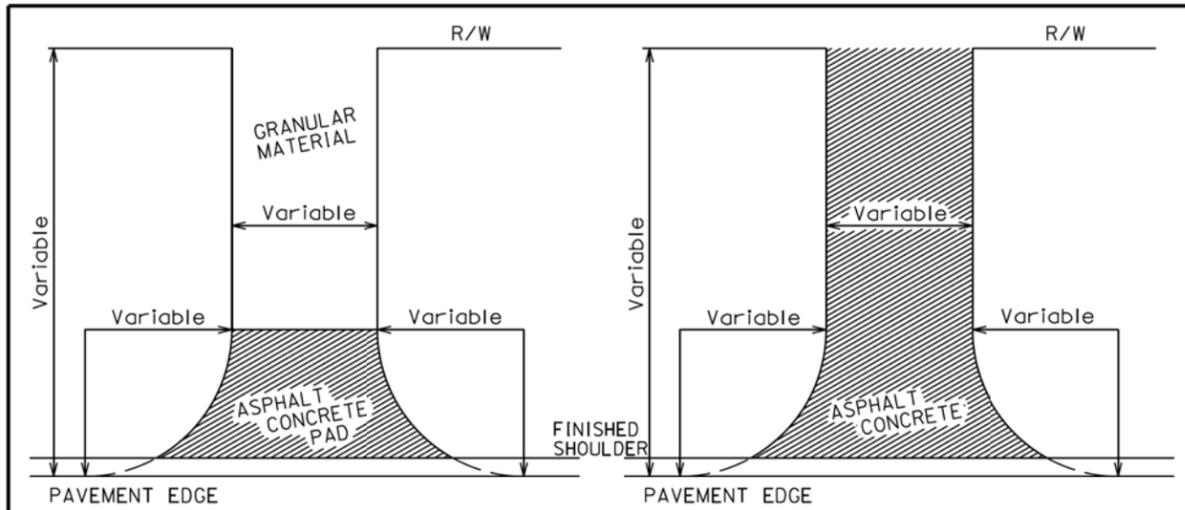
centroid - C	Maximum Sign Area - A
8 ft.	42 ft ²
9 ft.	38 ft ²
10 ft.	34 ft ²
11 ft.	30 ft ²
12 ft.	28 ft ²
13 ft.	26 ft ²
14 ft.	24 ft ²
15 ft.	22 ft ²
16 ft.	20 ft ²



centroid - C	Maximum Sign Area - A
8 ft.	84 ft ²
9 ft.	76 ft ²
10 ft.	68 ft ²
11 ft.	60 ft ²
12 ft.	56 ft ²
13 ft.	52 ft ²
14 ft.	48 ft ²
15 ft.	44 ft ²
16 ft.	40 ft ²

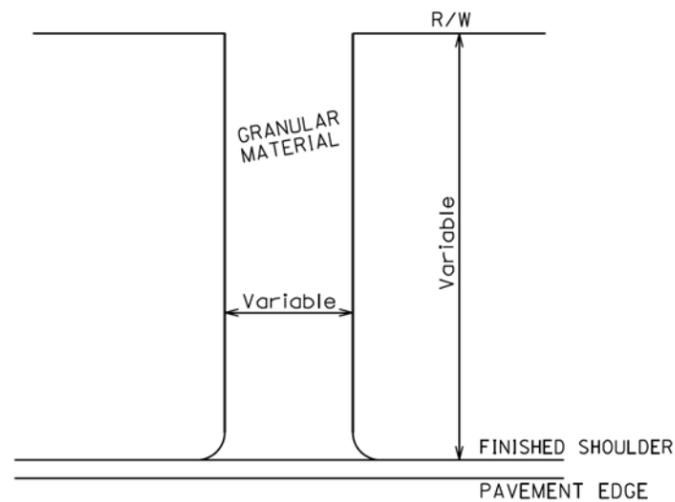


centroid - C	Maximum Sign Area - A
8 ft.	126 ft ²
9 ft.	114 ft ²
10 ft.	102 ft ²
11 ft.	90 ft ²
12 ft.	84 ft ²
13 ft.	78 ft ²
14 ft.	72 ft ²
15 ft.	66 ft ²
16 ft.	60 ft ²



INTERSECTING ROAD
NO ASPHALT CONCRETE SURFACING
BEYOND R/W

INTERSECTING ROAD
ASPHALT CONCRETE SURFACING
BEYOND R/W



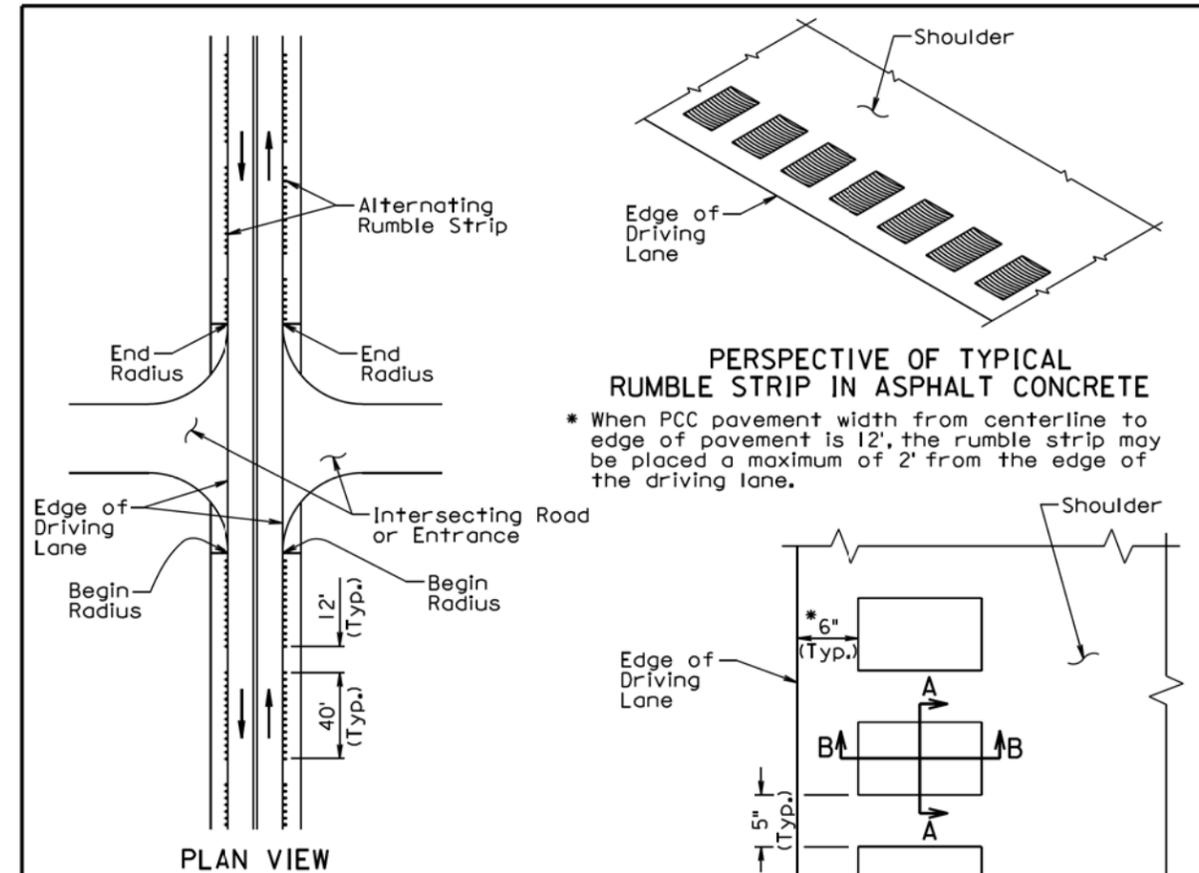
ENTRANCE

The surfacing details shown on this sheet are provided as a guide for surfacing these facilities. The precise construction limits for situations other than the standards shown will be determined by the Engineer, at the time of construction.

ROADWAY WITH SHOULDER

March 31, 2000

Published Date: 4th Qtr. 2014	S D D O T	RESURFACING OF INTERSECTING ROADS AND ENTRANCES	PLATE NUMBER 320.11
			Sheet 1 of 1



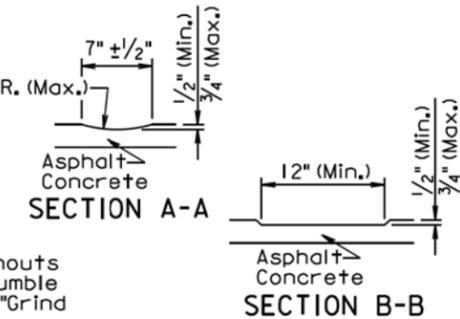
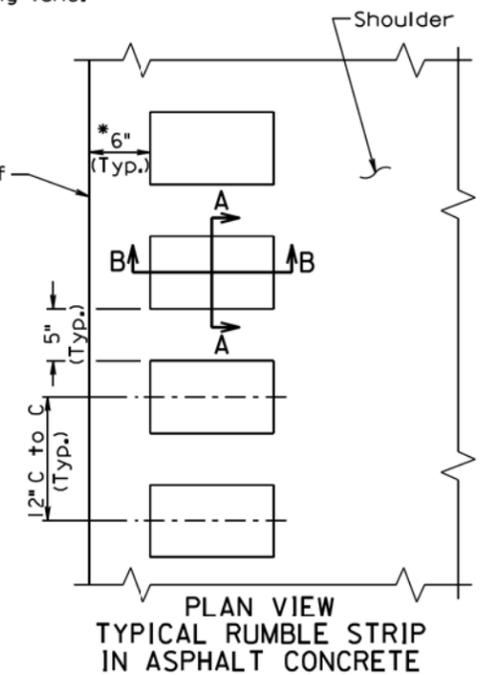
GENERAL NOTES:

A rumble strip shall be constructed on all of the asphalt concrete shoulders by grinding alternating patterns of 40' continuous indentations in the asphalt concrete. The rumble strip shall receive a flush seal with the shoulder flush sealing or asphalt surface treatment.

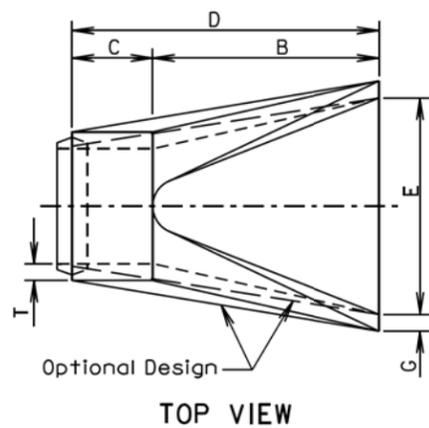
A rumble strip shall not be constructed through intersecting roads, entrances, and turnouts. The lengths of the 40' segments with continuous indentations and the 12' segments without a rumble strip adjacent to the intersecting roads, entrances, and turnouts shall be adjusted as approved by the Engineer.

Prior to constructing the rumble strip the Contractor shall submit to the Engineer, for approval, the proposed method of constructing the rumble strip.

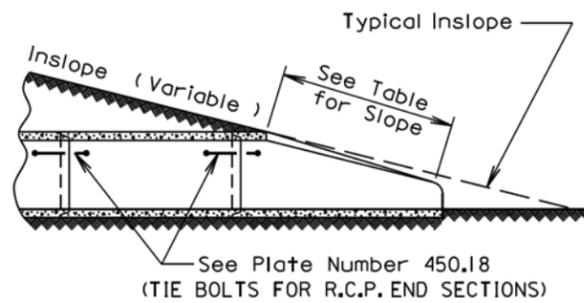
Measurement of the rumble strip shall be to the nearest 0.1 of a mile for each shoulder. Measurement and payment of the rumble strip shall include the 12' long segments without rumble strips and the segments adjacent to the intersecting roads, entrances, and turnouts without rumble strips. Payment for constructing the rumble strip shall be at the contract unit price per mile for "Grind 12" Rumble Strip or Stripe in Asphalt Concrete".



Published Date: 4th Qtr. 2014	S D D O T	12" RUMBLE STRIP IN ASPHALT CONCRETE ON NONDIVIDED HIGHWAY SHOULDERS	PLATE NUMBER 320.24
			Sheet 1 of 1



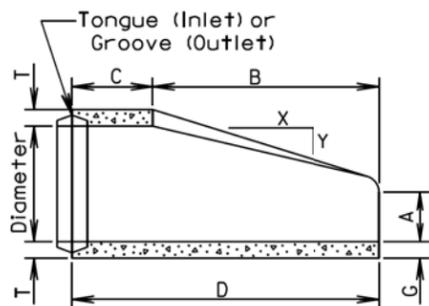
TOP VIEW



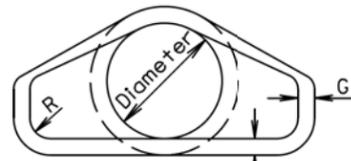
SLOPE DETAIL

GENERAL NOTES:

Lengths of concrete pipe shown on Plan Sheets are between flared Ends only.
Construction of R.C.P. Flared End shall conform to the requirements of Section 990 of the Standard Specifications for Roads and Bridges.



LONGITUDINAL SECTION



END VIEW

Dia. (in.)	Approx. Wt. of Section (lbs.)	Approx. Slope (X to Y)	T (in.)	A (in.)	B (in.)	C (in.)	D (in.)	E (in.)	G (in.)	R (in.)
12	530	2.4:1	2	4	24	48 7/8	72 1/8	24	2	1 1/2
15	740	2.4:1	2 1/4	6	27	46	73	30	2 1/4	1 1/2
18	990	2.3:1	2 1/2	9	27	46	73	36	2 1/2	1 1/2
21	1280	2.4:1	2 3/4	9	36	37 1/2	73 1/2	42	2 3/4	1 1/2
24	1520	2.5:1	3	9 1/2	43 1/2	30	73 1/2	48	3	1 1/2
27	1930	2.5:1	3 1/4	10 1/2	49 1/2	24	73 1/2	54	3 1/4	1 1/2
30	2190	2.5:1	3 1/2	12	54	19 3/4	73 3/4	60	3 1/2	1 1/2
36	4100	2.5:1	4	15	63	34 3/4	97 3/4	72	4	1 1/2
42	5380	2.5:1	4 1/2	21	63	35	98	78	4 1/2	1 1/2
48	6550	2.5:1	5	24	72	26	98	84	5	1 1/2
54	8240	2:1	5 1/2	27	65	33 1/4	98 1/4	90	5 1/2	1 1/2
60	8730	1.9:1	6	35	60	39	99	96	5	1 1/2
66	10710	1.7:1	6 1/2	30	72	27	99	102	5 1/2	1 1/2
72	12520	1.8:1	7	36	78	21	99	108	6	1 1/2
78	14770	1.8:1	7 1/2	36	90	21	111	114	6 1/2	1 1/2
84	18160	1.6:1	8	36	90 1/2	21	111 1/2	120	6 1/2	1 1/2
90	20900	1.5:1	8 1/2	41	87 1/2	24	111 1/2	132	6 1/2	6

March 31, 2000

S D D O T	R. C. P. FLARED ENDS	PLATE NUMBER 450.10
	Published Date: 4th Qtr. 2014	Sheet 1 of 1

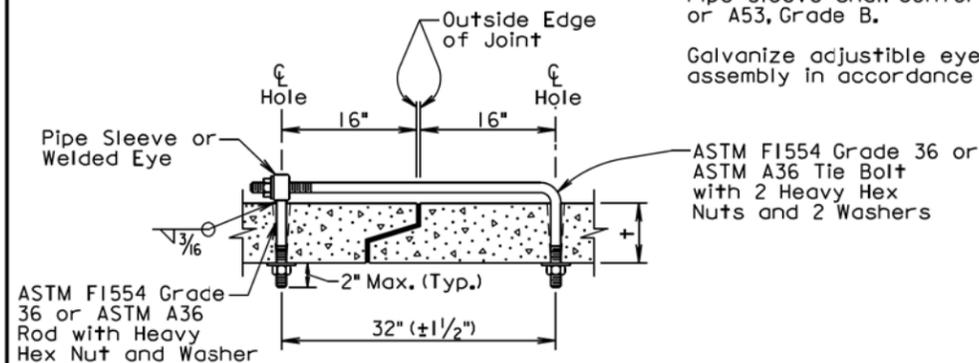
Wall "t" (in.)	Rod Dia. (in.)	Pipe Sleeve Dia. (nominal)
≤ 3/4	5/8	3/4
3/2-6/2	3/4	1
≥ 7	1	1 1/4

GENERAL NOTES:

Tie bolts shall conform to ASTM F1554 Grade 36 or ASTM A36. Nuts shall be heavy hex conforming to ASTM A563. Washers shall conform to ASTM F436.

Pipe Sleeve shall conform to ASTM A500 or A53, Grade B.

Galvanize adjustable eye bolt tie assembly in accordance with ASTM A153.



ADJUSTABLE EYE BOLT TIE

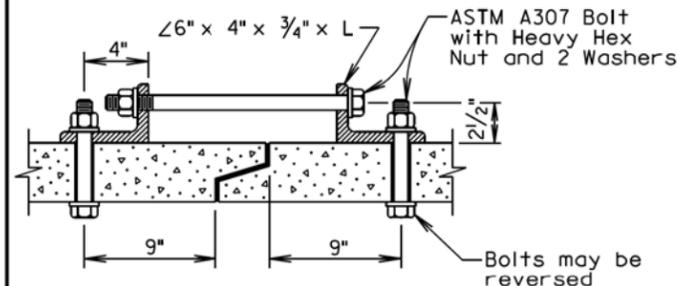
Pipe Dia. (in.)	"L" (in.)	Bolt Dia. (in.)
≤ 48	4	3/4
> 48	6	1

GENERAL NOTES:

Angles shall conform to ASTM A36.

Bolts shall conform to ASTM A307. Nuts shall be heavy hex conforming to ASTM A563. Washers shall conform to ASTM F436.

Galvanize angles, bolts, nuts, and washers in accordance with ASTM A153.



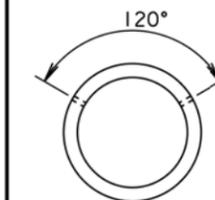
ANGLE AND BOLT TIE

GENERAL NOTES:

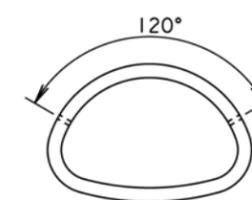
In lieu of the tie bolts detailed above other types of tie bolt connections may be installed as approved by the Office of Bridge Design.

All pipe sections of R.C.P. and R.C.P. Arch shall be tied with tie bolts except for pipe located between drop inlets, manholes, and junction boxes. All pipe sections of pipes that only enter or exit drop inlets, manhole, and junction boxes shall be tied with tie bolts.

There will be no separate measurement or payment for the tie bolts. The cost for furnishing and installing the tie bolts shall be incidental to the contract unit price per foot for the corresponding bid item for R.C.P. or R.C.P. Arch.



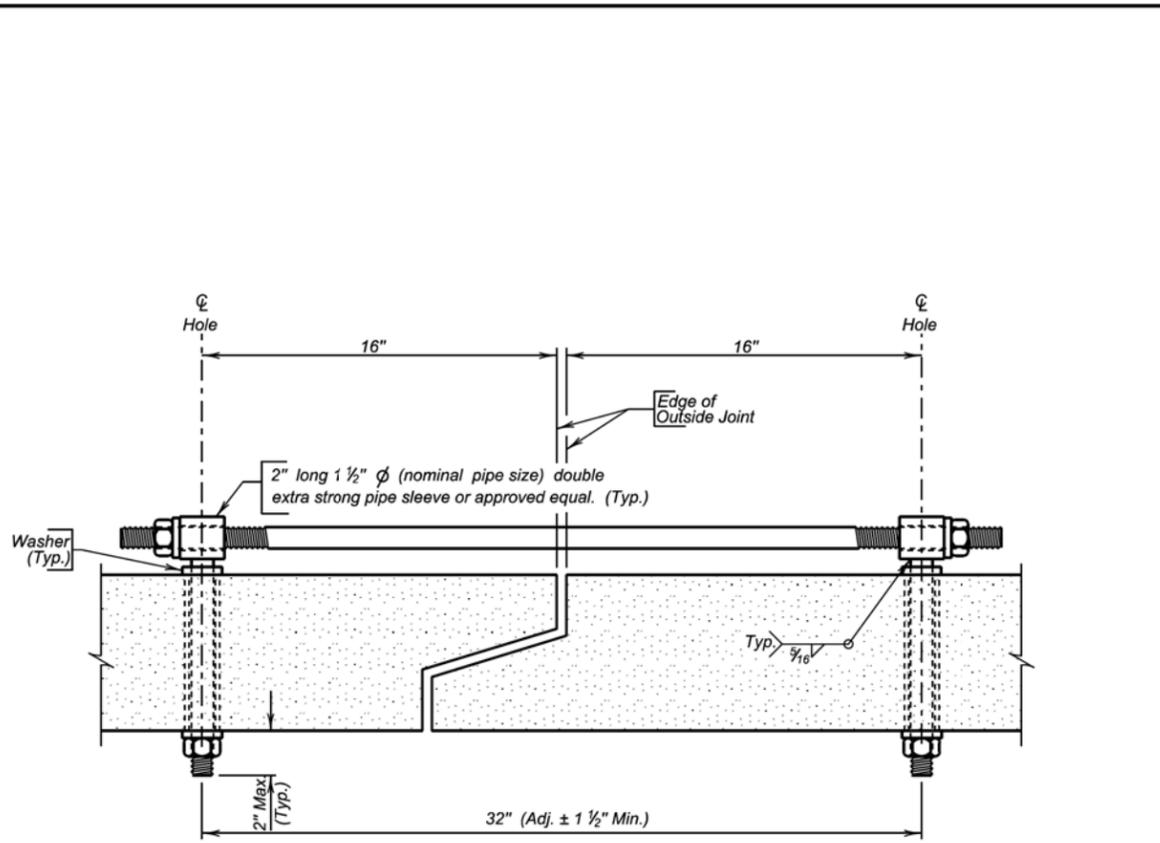
END VIEW "CIRCULAR"



END VIEW "ARCH"

February 28, 2013

S D D O T	TIE BOLTS FOR R.C.P. AND R.C.P. ARCH	PLATE NUMBER 450.18
	Published Date: 4th Qtr. 2014	Sheet 1 of 1



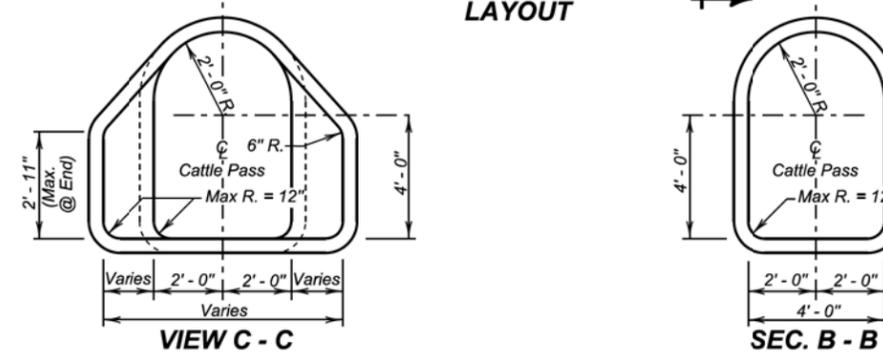
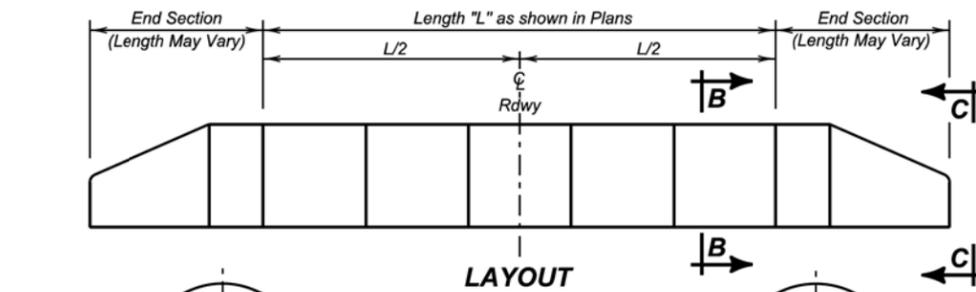
TIE BOLT ASSEMBLY

GENERAL NOTES:

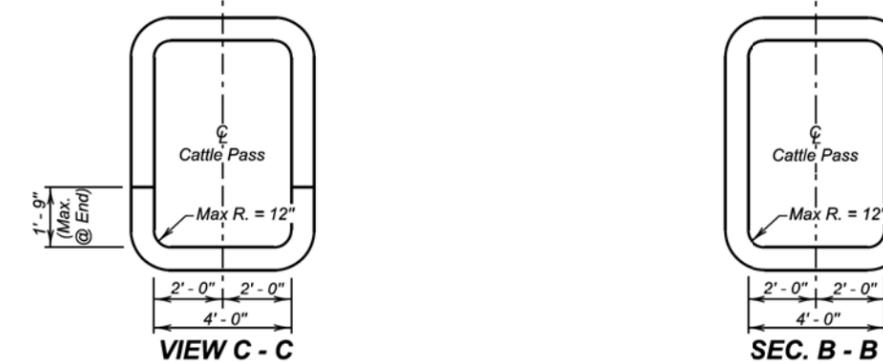
- All holes for tie bolts shall be cast-in-place, 16 inches from outside edge of joint. Cast in inserts or sleeves, if used, shall be made of a corrosion resistant material.
- Ties shall be 1 inch ϕ and conform to the requirements of ASTM A36. Nuts shall be heavy hex in conformance with ASTM A563. Washers shall conform to ASTM F436, Type 1. The welded pipe sleeve shall conform to ASTM A53, Grade B.
- Welding and weld inspection shall be in conformance with AWS/ANSI D1.1 - (Current Year) Structural Welding Code - Steel.
- Tie Bolt Assembly shall be galvanized in accordance with ASTM A153.
- Tie Bolt Assembly details may vary from that shown, but alternate tie bolt assemblies are subject to testing to demonstrate equal strength. Submit details, through proper channels, to the Office of Bridge Design for approval.
- All costs for furnishing and installing the precast box culvert tie bolt assembly shall be incidental to the contract unit price per Foot for "Precast Concrete Box Culvert, Furnish".

December 23, 2012

Published Date: 4th Qtr. 2014	S D D O T	PRECAST BOX CULVERT TIE BOLT ASSEMBLY DETAILS	PLATE NUMBER 560.01
			Sheet 1 of 1



ARCH TOP CATTLE PASS (FLARED END)



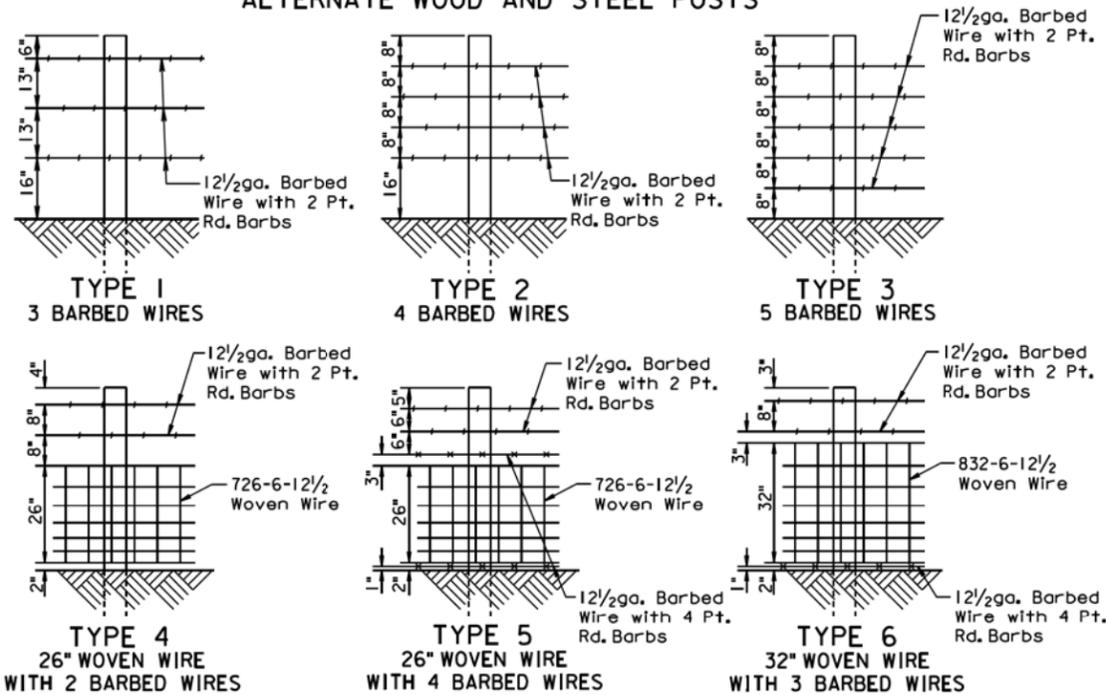
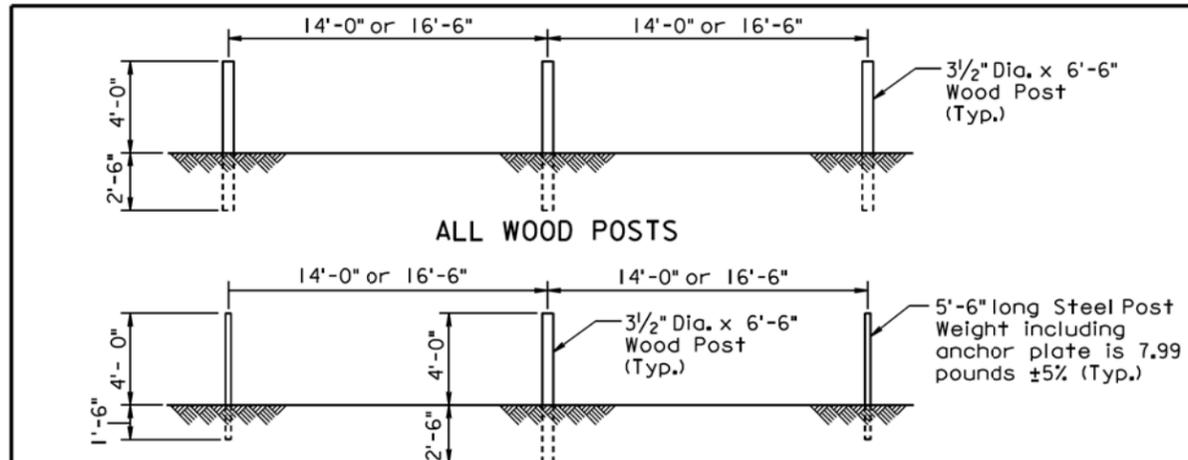
FLAT TOP CATTLE PASS (STRAIGHT END)

GENERAL NOTES:

- Unless otherwise specified elsewhere on the plans, cattle pass may be either cast-in-place or precast. For cast-in-place cattle pass details, see Standard Plate 560.32.
- Precast cattle pass shall be on the current approved list available through proper channels from the SDDOT Office Of Bridge Design. To qualify for addition to the approved list, submit a checked design, done by South Dakota Registered Professional Engineers, and shop plans to the Office of Bridge Design for approval. Design shall be in accordance with the current edition of the AASHTO LRFD Bridge Design Specifications.
- The provisions of Sections 450 and 990 of the Standard Specifications pertaining to Reinforced Concrete Pipe shall apply to the furnishing and installing of the precast cattle pass.
- Shapes other than that shown will be allowed. Submit details to the Office of Bridge Design for approval.
- Minimum section length shall be 4 feet.
- Lift holes shall be plugged with an approved nonshrinkable grout.
- Each section shall be tied to adjacent sections with tie bolts conforming to Standard Plate 560.01.
- All costs associated with furnishing and installing the cattle pass, whether cast-in-place or precast, shall be incidental to the corresponding furnish and install bid items for "4' x 6' Reinforced Concrete Cattle Pass" and "4' x 6' Reinforced Concrete Cattle Pass End Section".

December 23, 2012

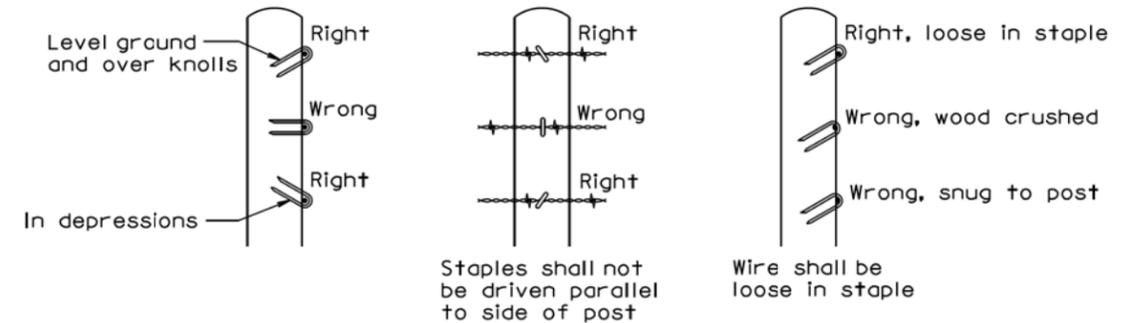
Published Date: 4th Qtr. 2014	S D D O T	PRECAST 4' X 6' CATTLE PASS	PLATE NUMBER 560.30
			Sheet 1 of 1



TYPE OF FENCE		LINE POST SPACING	WIRE GAGE	BARBED WIRE	WOVEN WIRE
TYPE	DESCRIPTION			NUMBER AND SHAPE OF BARBS	STYLE OR DESIGN NO.
1	3 Barbed Wires	16'-6"	12 1/2	2 Point Round	---
2	4 Barbed Wires	16'-6"	12 1/2	2 Point Round	---
3	5 Barbed Wires	16'-6"	12 1/2	2 Point Round	---
4	26" Woven Wire with 2 Barbed Wires	14'-0"	12 1/2	2 Point Round	726-6-12 1/2
5	26" Woven Wire with 4 Barbed Wires	14'-0"	12 1/2	2 wires with 2 Pt. Rd., 2 wires with 4 Pt. Rd.	726-6-12 1/2
6	32" Woven Wire with 3 Barbed Wires	14'-0"	12 1/2	2 wires with 2 Pt. Rd., 1 wire with 4 Pt. Rd.	832-6-12 1/2

GENERAL NOTES:
 Fence types designated on the plans that are followed by the letter S shall have smooth (barbless) wires.
 When type 5S or 6S is designated the bottom wire may be barbed, smooth, or left off.
 All degrees of curvature stated for fence are at centerline of roadway.
 September 14, 2009

Published Date: 4th Qtr. 2014	S D D O T	RIGHT-OF-WAY FENCE	PLATE NUMBER 620.01
			Sheet 1 of 1



STAPLE INSTALLATION

GENERAL NOTES:

The Right-of-Way fence shall consist of barbed wire or a combination of woven wire and barbed wire. The barbed wire and/or woven wire shall be fastened to all wood posts or fastened to alternating wood and steel posts. Only wood posts shall be used for brace panels. Gates shall be of the type designated in the plans or as otherwise directed by the Engineer. Fence shall be constructed conforming to the details on the standard plates and in the plans unless otherwise directed by the Engineer.

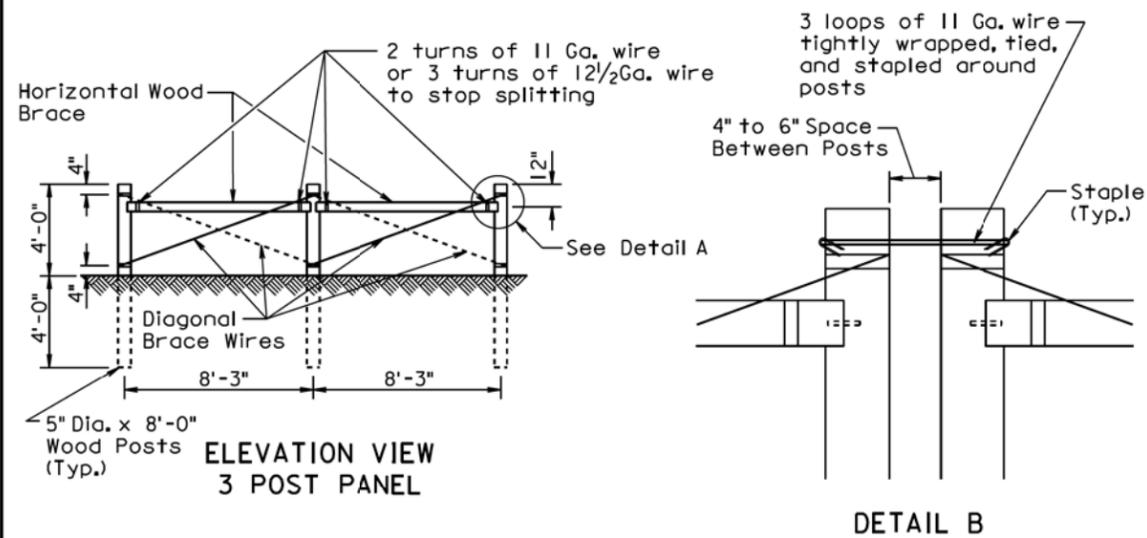
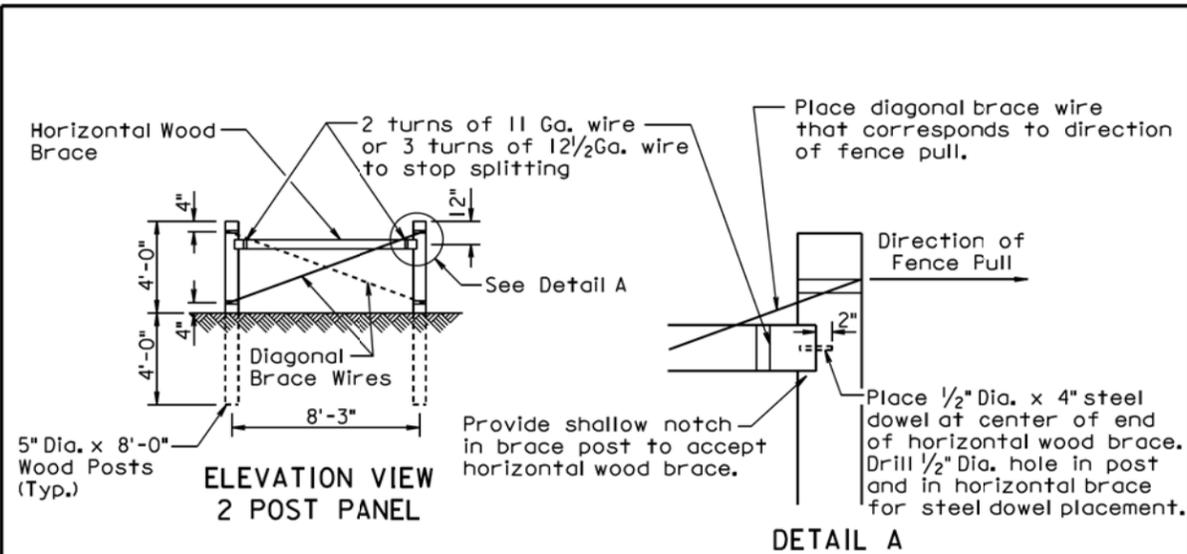
Right-of-Way fence on Interstate Projects shall be constructed one foot within the Interstate Right-of-Way lines except at bridge openings, cattle passes, and as otherwise directed by the Engineer.

Right-of-Way fence other than on Interstate Projects shall be constructed within one foot of the Right-of-Way on the Landowner's side except at bridge openings, cattle passes, and as otherwise directed by the Engineer.

Barbs shall be fabricated from zinc coated 14 ga. wire. Two point barbs shall be wrapped twice around one main strand at 4" spacings and the four point barbs shall be interlocked and wrapped around both main strands at 5" spacings.

The gages of wire and wood post lengths and sizes are the minimum acceptable unless otherwise specified in the plans. The tolerances for steel posts shall be as stated in AASHTO M281. Woven wire shall conform to design and specifications of ASTM A116 and barbed wire shall conform to ASTM A121.

Published Date: 4th Qtr. 2014	S D D O T	STAPLE INSTALLATION AND GENERAL RIGHT-OF-WAY FENCE NOTES	PLATE NUMBER 620.02
			Sheet 1 of 1



GENERAL NOTES:

- Two Post Panels shall be installed at least every 1320' between corners.
- Two Post Panels shall be installed at any sharp vertical angle crest points and as directed by the Engineer.
- Horizontal wood braces shall consist of 4" dia. x 8' wood posts or rough 4" x 4" x 8' timbers.
- Diagonal brace wires shall be fabricated with 4 strands of 9 Ga. galvanized wire twisted tight. The diagonal brace wires shall be installed in accordance with the direction of the fence pull. Two diagonal brace wires are required if fence pull is in both directions.

December 23, 2004

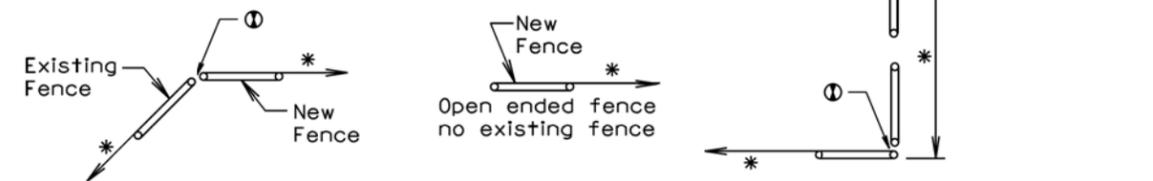
Published Date: 4th Qtr. 2014	S D D O T	BRACE PANELS AND APPLICATIONS OF BRACE PANELS	PLATE NUMBER 620.03
			Sheet 1 of 3

SPACING OF 2 POST PANELS WITHIN CURVES	
DEGREE OF CURVE	SPACING OF 2 POST PANEL
less than 3°15'	** 1320'
3°15' and greater	**At P.C., P.T., and at every 1320' between P.C. and P.T.

GENERAL NOTE:

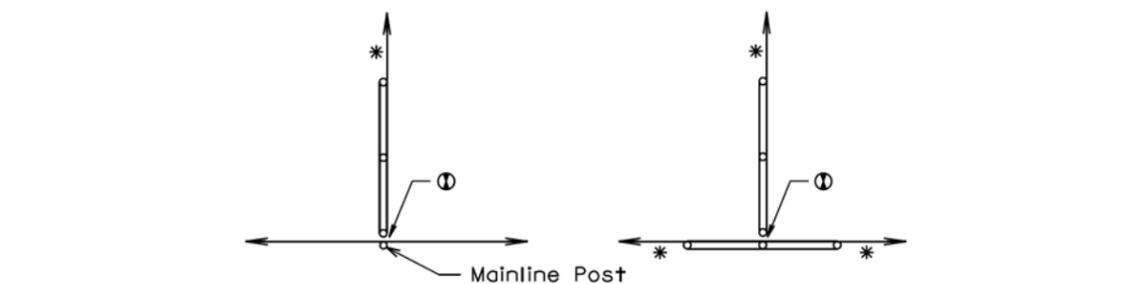
All degrees of curvature stated for fence are at centerline of roadway.

- * If fence length is less than 600' to next corner use a 2 post panel. If fence length is greater than 600' to next corner use a 3 post panel.
- ** Fence lengths greater than 1320' and less than 2640' place 2 Post Panel approximately at midpoint.
- ① See Detail B on Sheet 1 of 3.

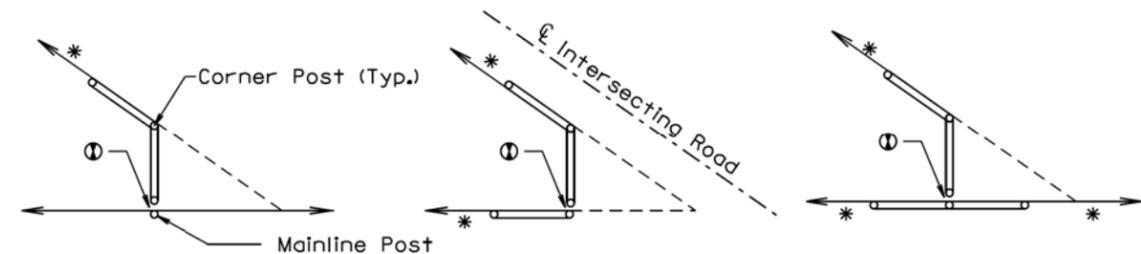


BEGIN OR END FENCE
(where new fence ties into existing fence)

SHORT JOGS IN FENCE



CROSS FENCE



SHARP ANGLES IN CROSS FENCE



ANGLES IN MAINLINE FENCE

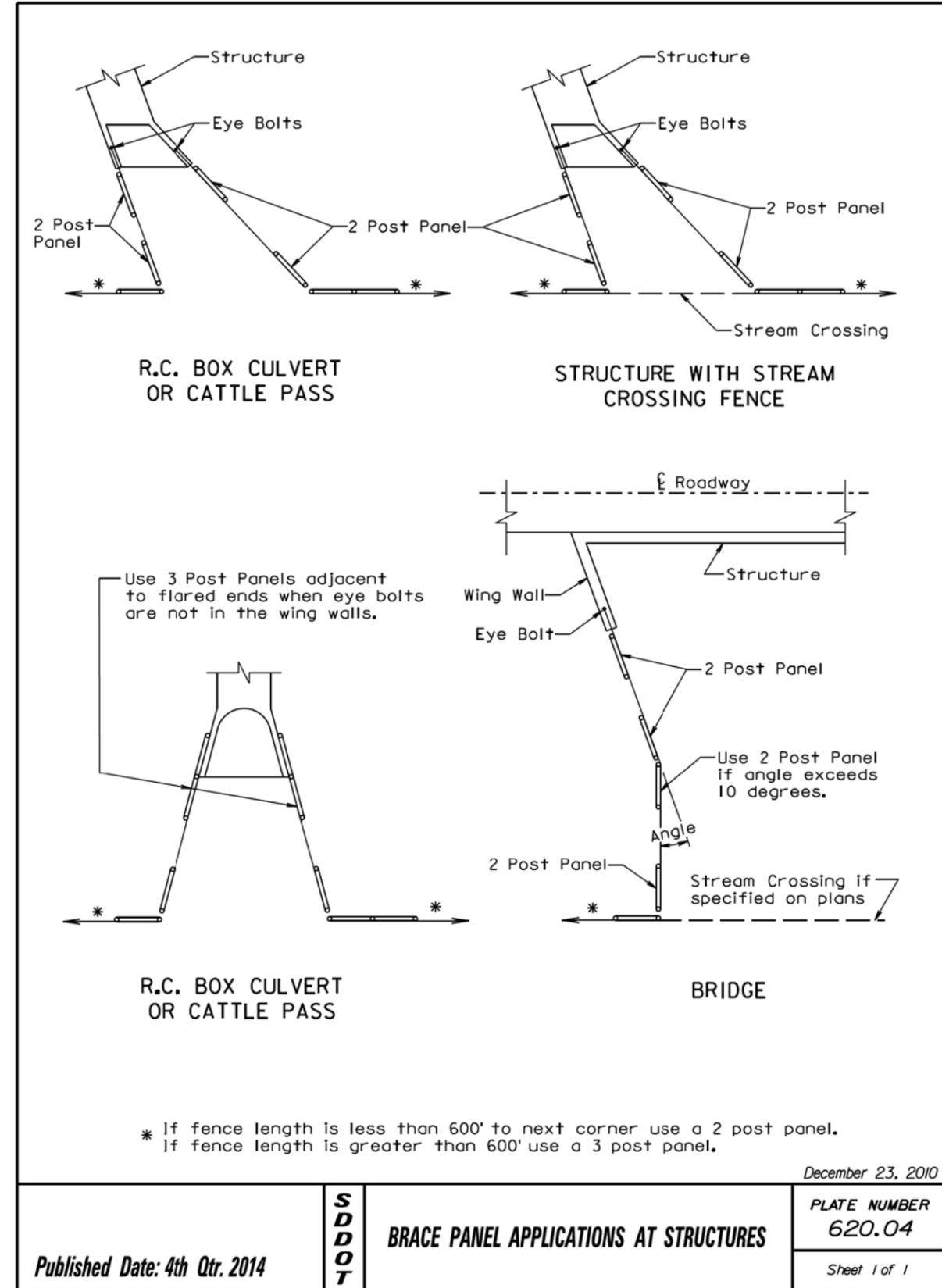
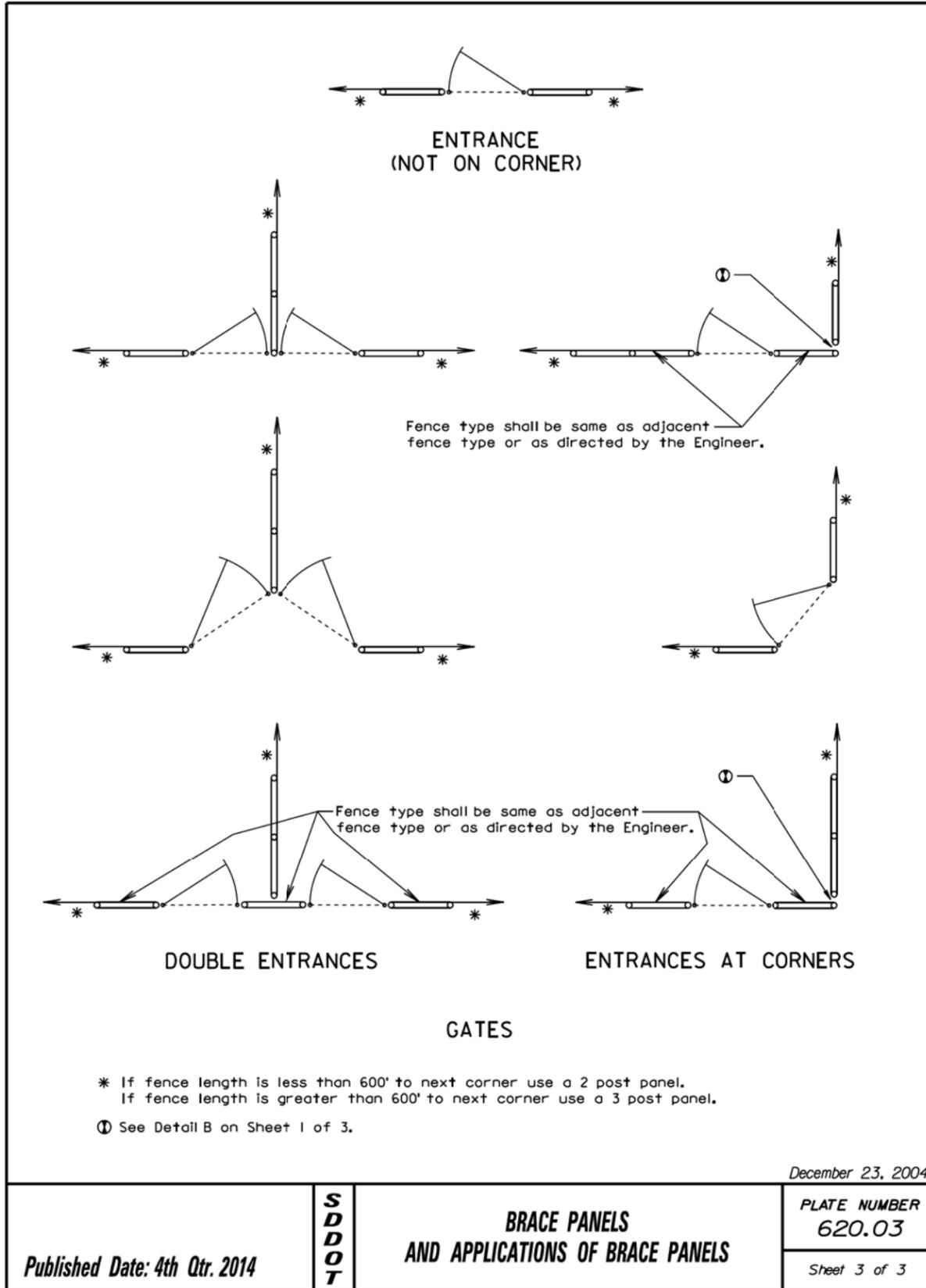
Additional fence panel is NOT required when an angle in the mainline fence is 10° and less.

Additional fence panel is required when an angle in the mainline fence is greater than 10°.

December 23, 2004

Published Date: 4th Qtr. 2014	S D D O T	BRACE PANELS AND APPLICATIONS OF BRACE PANELS	PLATE NUMBER 620.03
			Sheet 2 of 3

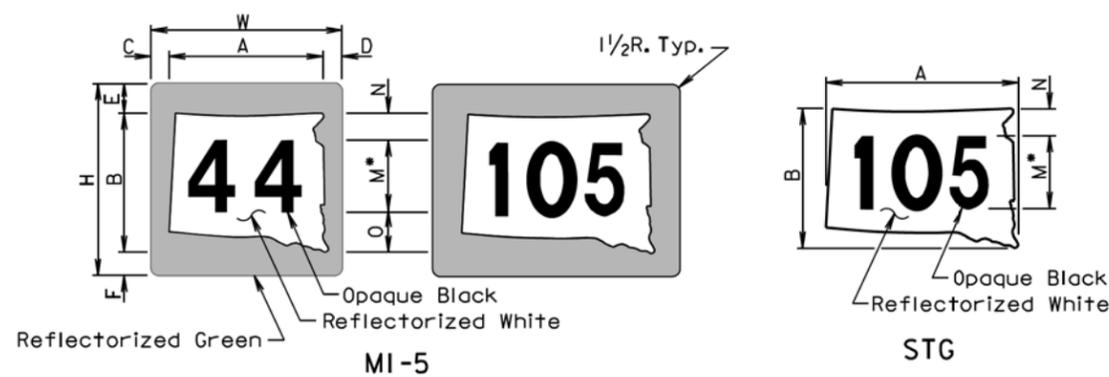
PLOT SCALE - 1:200



PLOTTED FROM - TRAB12222

PLOT NAME - 9

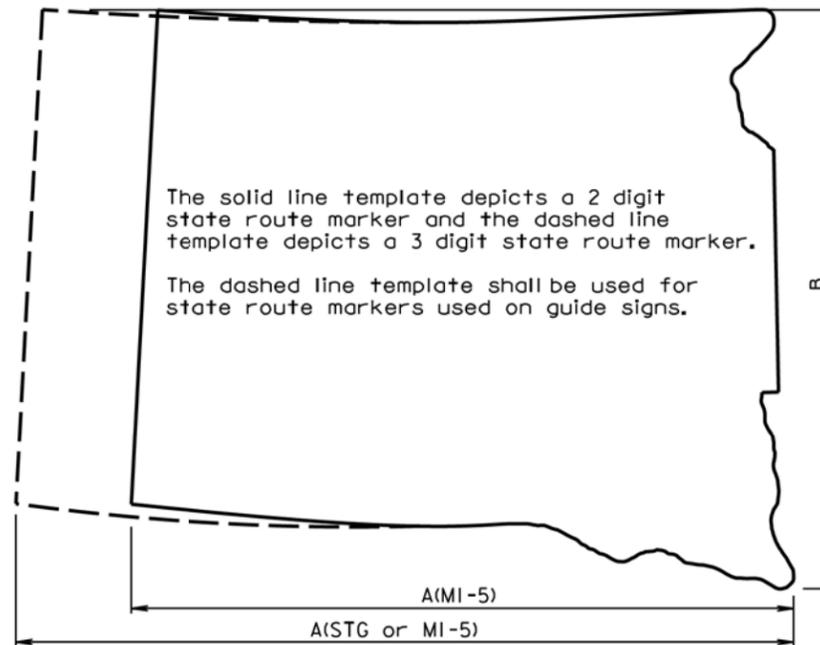
FILE - ... \0366_03C_FENCE.DGN



SIGN CODE	WxH	A	B	C	D	E	F	M*	N	O
MI-5	24x24	20 1/2	18	2	1 1/2	3 1/2	2 1/2	12D	2	4
MI-5**	30x24	24	18	2 1/4	1 3/4	3 1/2	2 1/2	12D	2	4
MI-5	30x30	25 5/8	22 1/2	2 1/2	1 7/8	4 3/8	3 1/8	15D	2 1/2	5
MI-5	36x36	30 3/4	27	3	2 1/4	5 1/4	3 3/4	18D	3	6

SIGN CODE	AxB	M*	N
STG-24	24x18	10D	4
STG-32	32x24	12D	4 3/4
STG-48	48x36	18D	7
STG-64	64x48	24D	9 1/2

*In the few cases where there is not enough space for the numerals, the standard "D" series font may be replaced with "C" series font if approved by the Engineer.
 ** 3 Digits



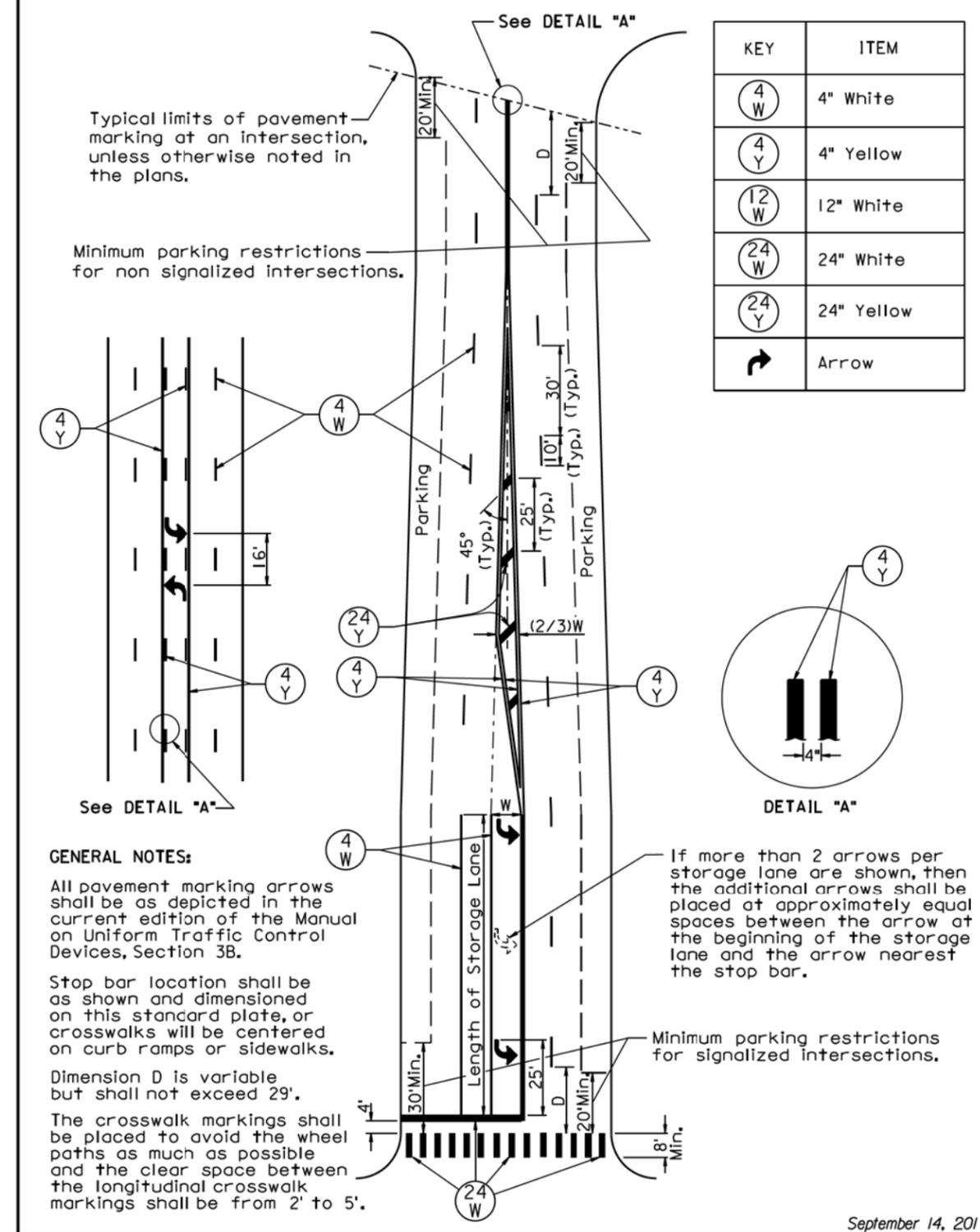
TEMPLATE FOR STATE ROUTE MARKER

GENERAL NOTES:

The unit for all dimensions shown is inches.
 Numerals shall be "D" series font for all state route markers except as noted above.

December 23, 2003

Published Date: 4th Qtr. 2014	S D D O T	STATE ROUTE MARKERS	PLATE NUMBER 632.20
			Sheet 1 of 1



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

Typical limits of pavement marking at an intersection, unless otherwise noted in the plans.

Minimum parking restrictions for non signalized intersections.

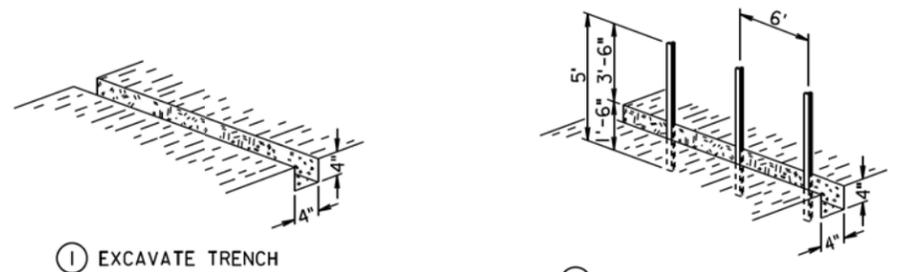
GENERAL NOTES:

All pavement marking arrows shall be as depicted in the current edition of the Manual on Uniform Traffic Control Devices, Section 3B.
 Stop bar location shall be as shown and dimensioned on this standard plate, or crosswalks will be centered on curb ramps or sidewalks.
 Dimension D is variable but shall not exceed 29'.
 The crosswalk markings shall be placed to avoid the wheel paths as much as possible and the clear space between the longitudinal crosswalk markings shall be from 2' to 5'.
 If more than 2 arrows per storage lane are shown, then the additional arrows shall be placed at approximately equal spaces between the arrow at the beginning of the storage lane and the arrow nearest the stop bar.
 Minimum parking restrictions for signalized intersections.

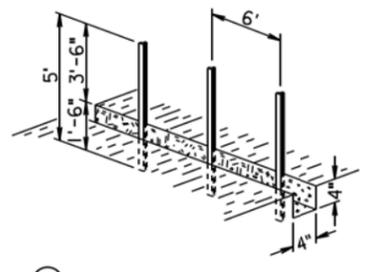
September 14, 2011

Published Date: 4th Qtr. 2014	S D D O T	PAVEMENT MARKINGS FOR ADJACENT INTERSECTIONS AND CENTER TURN LANE	PLATE NUMBER 633.01
			Sheet 1 of 1

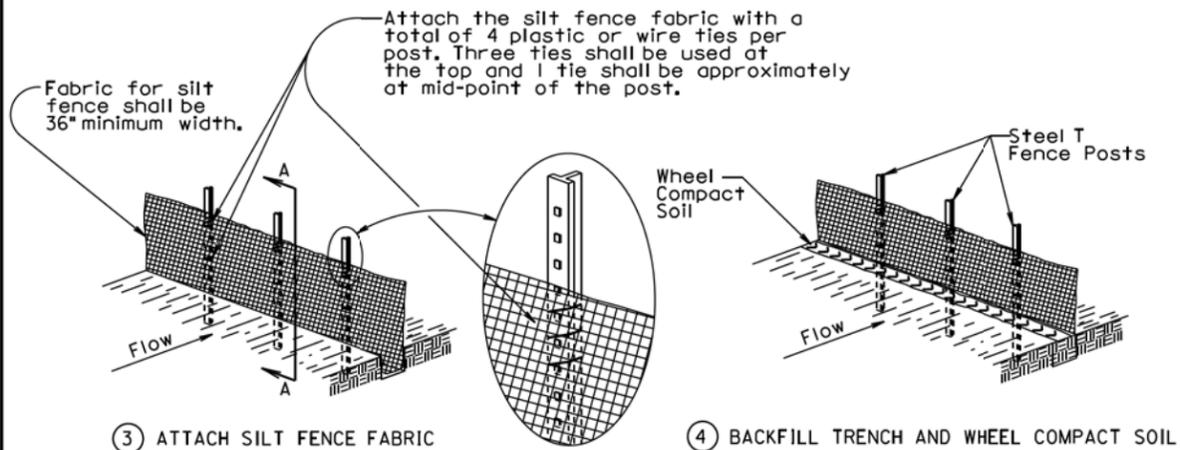
MANUAL HIGH FLOW SILT FENCE INSTALLATION



① EXCAVATE TRENCH

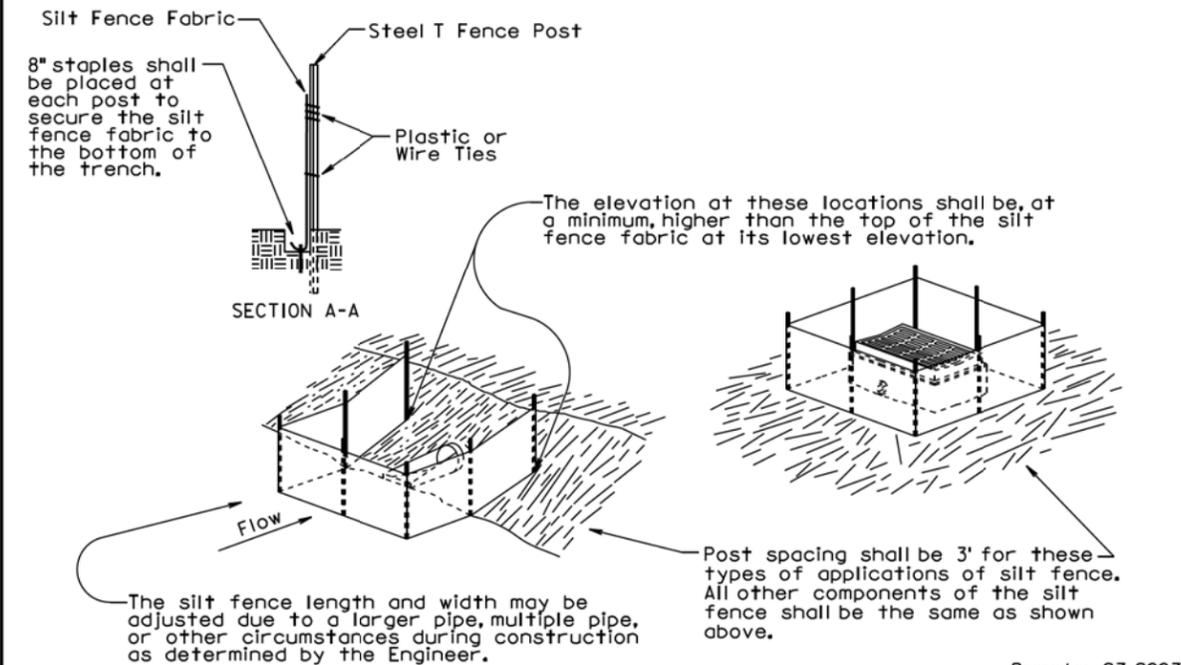


② DRIVE STEEL T FENCE POSTS



③ ATTACH SILT FENCE FABRIC

④ BACKFILL TRENCH AND WHEEL COMPACT SOIL



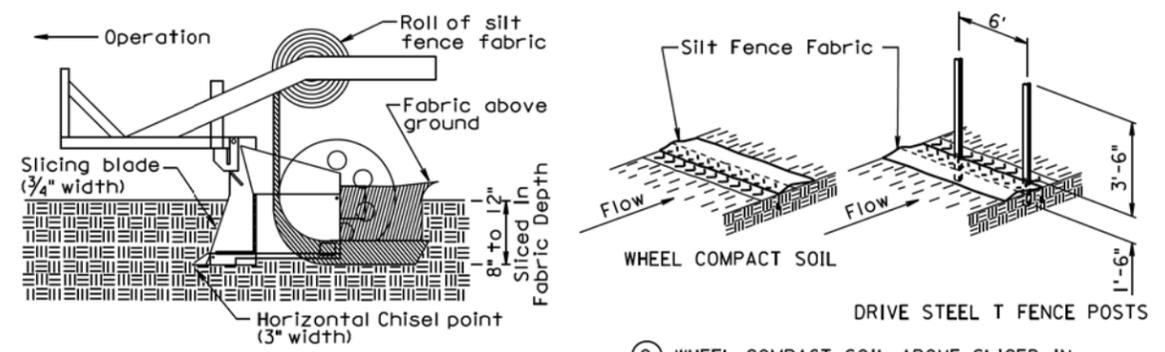
SECTION A-A

The silt fence length and width may be adjusted due to a larger pipe, multiple pipe, or other circumstances during construction as determined by the Engineer.

December 23, 2003

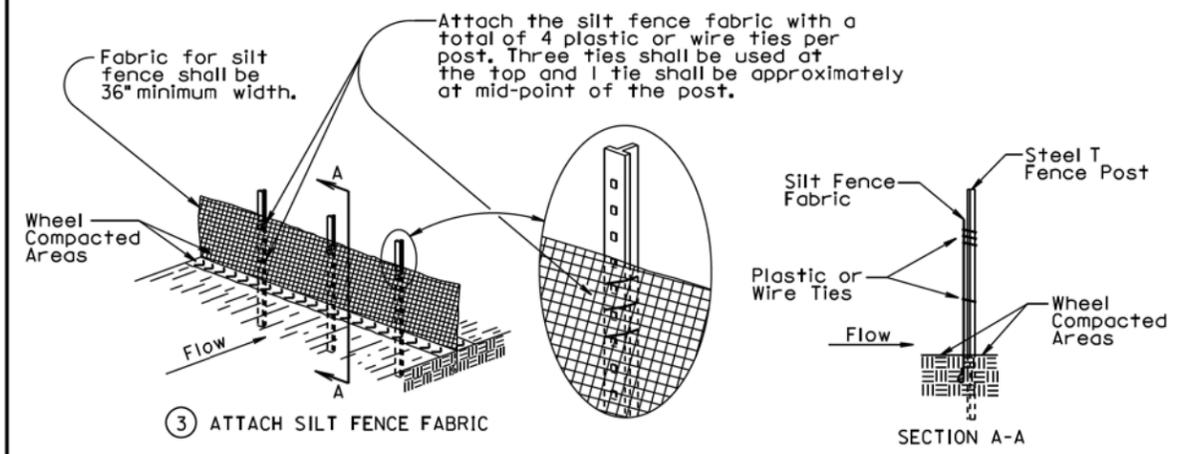
Published Date: 4th Qtr. 2014	S D D O T	HIGH FLOW SILT FENCE	PLATE NUMBER 734.05
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MACHINE SLICED HIGH FLOW SILT FENCE INSTALLATION



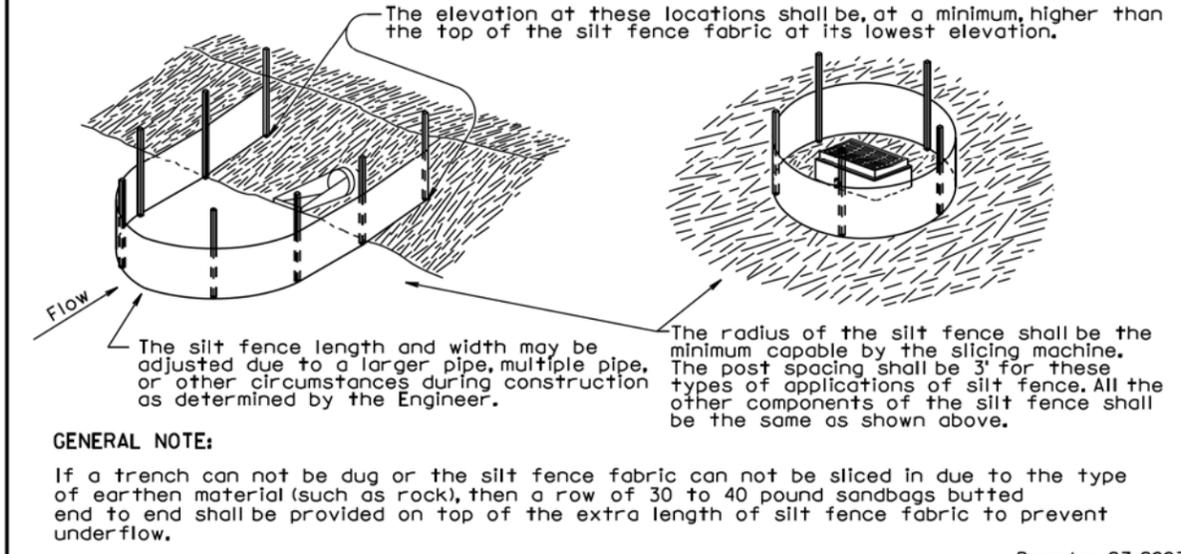
① INSTALL SILT FENCE FABRIC BY MACHINE SLICING METHOD.

② WHEEL COMPACT SOIL ABOVE SLICED IN PORTION OF FABRIC AND THEN DRIVE STEEL T FENCE POSTS.



③ ATTACH SILT FENCE FABRIC

SECTION A-A



GENERAL NOTE:

If a trench can not be dug or the silt fence fabric can not be sliced in due to the type of earthen material (such as rock), then a row of 30 to 40 pound sandbags butted end to end shall be provided on top of the extra length of silt fence fabric to prevent underflow.

December 23, 2003

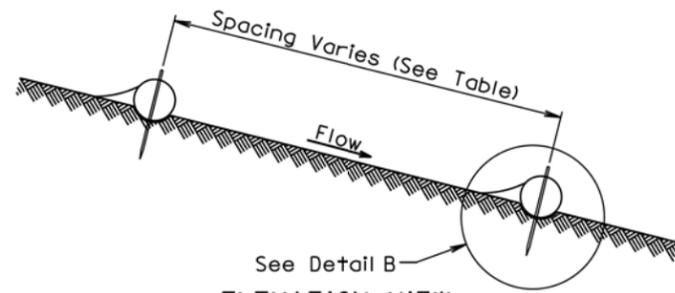
Published Date: 4th Qtr. 2014	S D D O T	HIGH FLOW SILT FENCE	PLATE NUMBER 734.05
			Sheet 2 of 2

PLOT SCALE - 1:200

PLOTTED FROM - TRAB1222

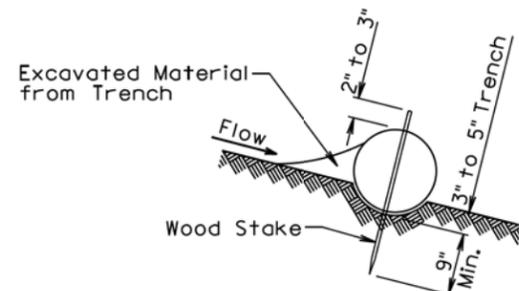
PLOT NAME - 11

FILE - ... \0366-05-EROSTION.DGN

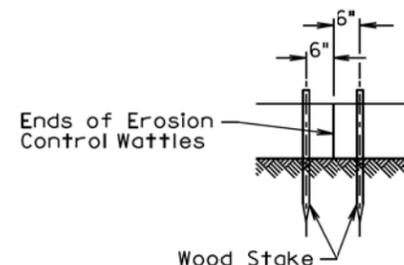


See Detail B
**ELEVATION VIEW
CUT OR FILL SLOPE INSTALLATION**

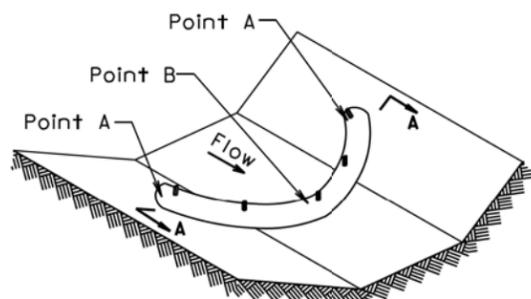
CUT OR FILL SLOPE INSTALLATION	
Slope	Spacing (Ft)
1:1	10
2:1	20
3:1	30
4:1	40



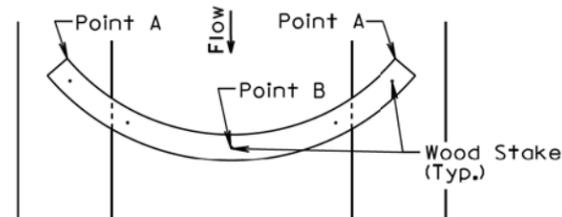
**DETAIL B
(TYPICAL OF ALL INSTALLATIONS)**



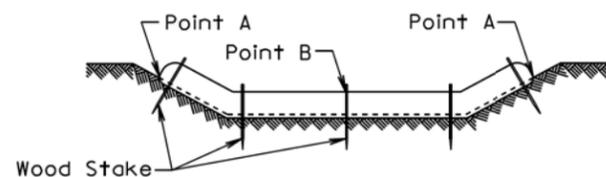
DETAIL C



**ISOMETRIC VIEW
DITCH INSTALLATION**



**PLAN VIEW
DITCH INSTALLATION**



SECTION A-A

DITCH INSTALLATION	
Grade	Spacing (Ft)
2%	150
3%	100
4%	75
5%	50

December 23, 2004

S D D O T	EROSION CONTROL WATTLE	PLATE NUMBER 734.06
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GENERAL NOTES:

At cut or fill slope installations, wattles shall be installed along the contour and perpendicular to the water flow.

At ditch installations, point A must be higher than point B to ensure that water flows over the wattle and not around the ends.

The Contractor shall dig a 3" to 5" trench, install the wattle tightly in the trench so that daylight can not be seen under the wattle, and then compact the soil excavated from the trench against the wattle on the uphill side. See Detail B.

The stakes shall be 1"x2" or 2"x2" wood stakes, however, other types of stakes such as rebar may be used only if approved by the Engineer. The stakes shall be placed 6" from the ends of the wattles and the spacing of the stakes along the wattles shall be 3' to 4'.

Where installing running lengths of wattles, the Contractor shall butt the second wattle tightly against the first and shall not overlap the ends. See Detail C.

The Contractor and Engineer shall inspect the erosion control wattles once every week and within 24 hours after every rainfall event greater than 1/2". The Contractor shall remove, dispose, or reshape the accumulated sediment when necessary as determined by the Engineer.

Sediment removal, disposal, or necessary shaping shall be as directed by the Engineer. All costs for removing accumulated sediment, disposal of sediment, and necessary shaping shall be incidental to the contract unit price per cubic yard for "Remove Sediment".

All costs for furnishing and installing the erosion control wattles including labor, equipment, and materials shall be incidental to the contract unit price per foot for the corresponding erosion control wattle bid item.

All costs for removing the erosion control wattle from the project including labor, equipment, and materials shall be incidental to the contract unit price per foot for "Remove Erosion Control Wattle".

December 23, 2004

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		Sheet 2 of 2
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