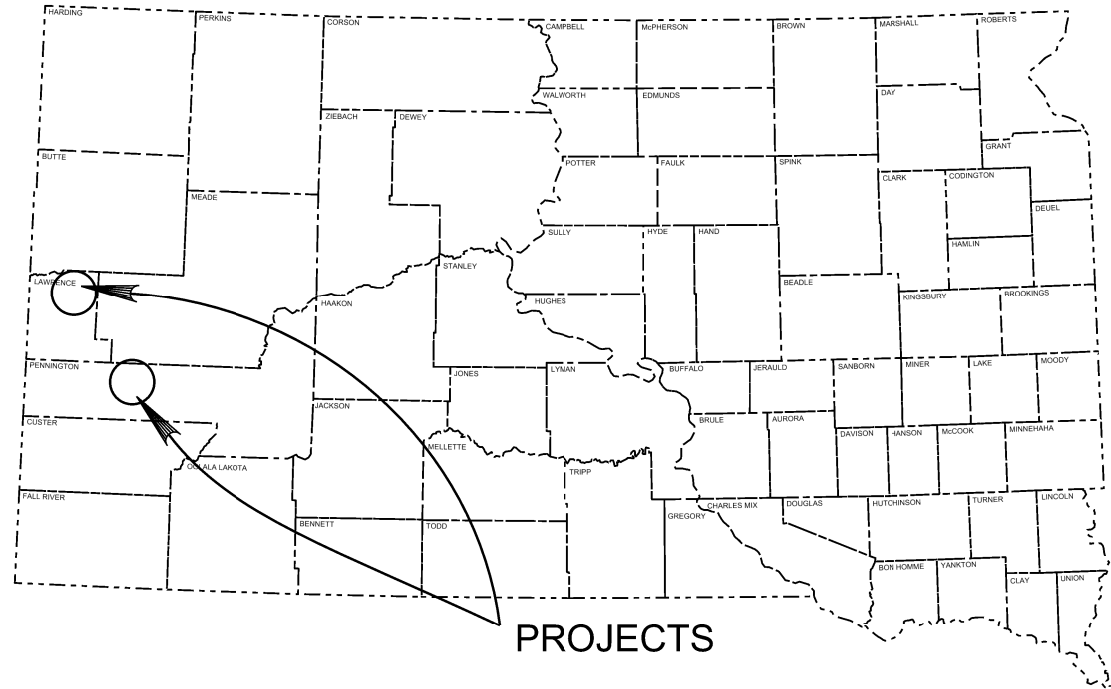


Plot Scale - 1:200

Plotted From - frrc12216



STATE OF SOUTH DAKOTA  
DEPARTMENT OF TRANSPORTATION  
PLANS FOR PROPOSED  
**PROJECT**  
**000I-451, 000P-452**  
**INTERSTATE 90 & SD HWY 79**  
**LAWRENCE &**  
**PENNINGTON COUNTY**  
SIGN REPAIR  
PCN i5GH, i5GK

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	000I-451 & 000P-452	1	12

Plotting Date: 02/19/2019

INDEX OF SECTIONS

Sheet 1	Title Sheet
Sheet 2-3	Estimate of Quantities and Environmental Commitments
Sheet 4-5	Notes and Permanent Signing Table
Sheet 6	Sign Layout
Sheet 7-9	Sign Support Standards
Sheet 10-12	Standard Plates

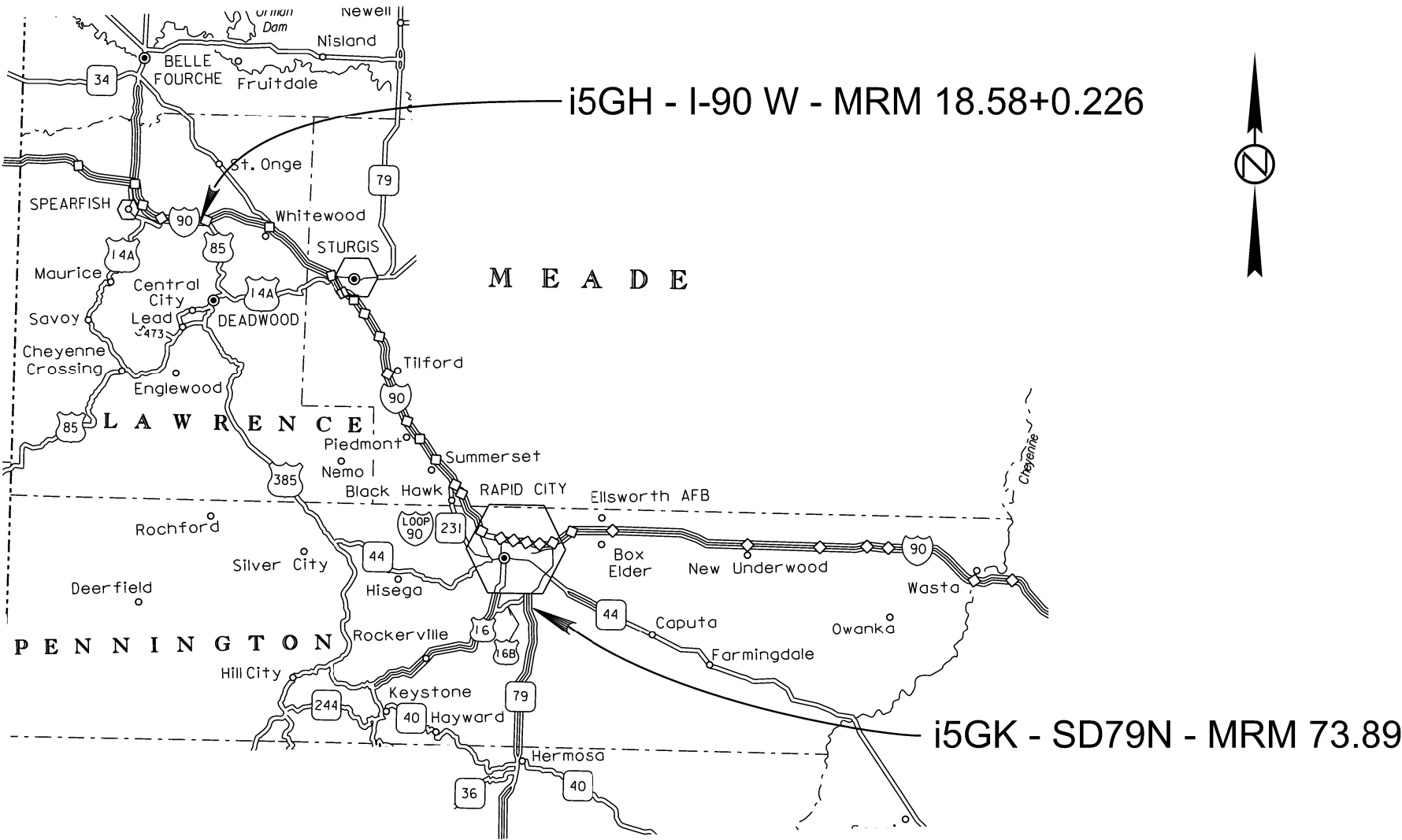
DESIGN DESIGNATION - i5GH  
I-90W MRM 18.58

AADT (2017)	5191
AADT (2037)	6842
DHV	937
D	51%
DHV T%	8.5%
AADT T%	18.7%

DESIGN DESIGNATION - i5GK  
SD79N - 73.89

AADT (2017)	5,253
AADT (2037)	7,622
DHV	930
D	50%
DHV T%	5.5%
AADT T%	12.0%

STORM WATER PERMIT  
NO PERMIT REQUIRED



**ESTIMATE OF QUANTITIES – i5GH**

**Non-Section Method**

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
110E0100	Remove Concrete Footing(s)	Lump Sum	LS
110E7150	Remove Sign for Reset	1	Each
632E0014	1.75' Diameter Breakaway Support Concrete Footing	16.0	Ft
632E1250	W8x24 Steel Post	48.0	Ft
632E3500	Reset Sign	1	Each
634E0110	Traffic Control Signs	104.0	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0275	Type 3 Barricade	1	Each

**ESTIMATE OF QUANTITIES – i5GK**

**Non-Section Method**

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
110E0100	Remove Concrete Footing(s)	Lump Sum	LS
110E7150	Remove Sign for Reset	2	Each
632E0014	1.75' Diameter Breakaway Support Concrete Footing	8.0	Ft
632E3005	Aluminum Overlay Sign, Nonremovable Copy Super/Very High Intensity	32.5	SqFt
632E3500	Reset Sign	2	Each
634E0110	Traffic Control Signs	164.5	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0275	Type 3 Barricade	1	Each

**SPECIFICATIONS**

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

**ENVIRONMENTAL COMMITMENTS**

The SDDOT is committed to protecting the environment and uses - Environmental Commitments as a communication tool for the Engineer and Contractor to ensure that attention is given to avoid, minimize, and/or mitigate an environmental impact. Environmental commitments to various agencies and the public have been made to secure approval of this project. An agency with permitting authority can delay a project if identified environmental impacts have not been adequately addressed. Unless otherwise designated, the Contractor’s primary contact regarding matters associated with these commitments will be the Project Engineer. These environmental commitments are not subject to change without prior written approval from the SDDOT Environmental Office.

Additional guidance on SDDOT’s Environmental Commitments can be accessed through the Environmental Procedures Manual found at: <http://www.sddot.com/resources/Manuals/EnvironProcManual.pdf>

For questions regarding change orders in the field that may have an effect on an Environmental Commitment, the Project Engineer will contact the Environmental Office at 605-773-3098 or 605-773-4336 to determine whether an environmental analysis and/or resource agency coordination is necessary.

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

**COMMITMENT B2: WHOOPING CRANE**

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

**Action Taken/Required:**

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

**COMMITMENT E: STORM WATER**

Construction activities constitute less than 1 acre of disturbance.

**Action Taken/Required:**

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

**COMMITMENT H: WASTE DISPOSAL SITE**

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

**Action Taken/Required:**

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

The waste disposal site(s) will be managed and reclaimed in accordance with the following from the General Permit for Construction/Demolition Debris

Disposal Under the South Dakota Waste Management Program issued by the Department of Environment and Natural Resources.

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

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

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

2. Concrete and asphalt concrete debris may be stockpiled within view of the ROW for a period 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) will be incidental to the various contract items.

**COMMITMENT I: HISTORICAL PRESERVATION OFFICE  
CLEARANCES**

State Historical Preservation Office (SHPO or THPO) concurrence has not been obtained for this project.

**Action Taken/Required:**

All earth disturbing activities not designated within the plans require a cultural resource review prior to scheduling the pre-construction meeting. This work includes but is not limited to: Contractor furnished material sources, material processing sites, stockpile sites, storage areas, plant sites, and waste areas.

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

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

The Contractor will submit the cultural resources survey report to SDDOT Environmental Office, 700 East Broadway Avenue, Pierre, SD 57501-2586. SDDOT will submit the information to the appropriate SHPO/THPO. Allow **30 Days** from the date this information is submitted to the Environmental Engineer for SHPO/THPO review.

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

The Contractor is responsible for obtaining any additional permits and clearances for Contractor furnished material sources, material processing sites, stockpile sites, storage areas, plant sites, and waste areas that affect wetlands, threatened and endangered species, or waterways. The Contractor will not utilize a site known or suspected of having contaminated soil or water. The Contractor will provide the required permits and clearances to the Project Engineer at the preconstruction meeting.

**COMMITMENT K: RAPID CITY AREA AIR QUALITY CONTROL ZONE**

Administrative Rule of South Dakota (ARSD) 74:36:18:03 states that "no state facility or state contractor may engage in any construction activity or continuous operation activity within the Rapid City air quality control zone which may cause fugitive emissions of particulate to be released into the ambient air without first obtaining a permit issued by the board or the secretary."

Construction activity is defined as any temporary activity which involves the removal or alteration of the natural or pre-existing cover of one acre or more of land. One acre of surface area is based on a cumulative area of disturbance to be completed for the entire project. Construction activity will include, but not be limited to, stripping of topsoil, drilling, blasting, excavation, dredging, ditching, grading, street maintenance and repair, or earth moving. It also includes stockpiles, access roads, and disposal areas. An off-site disposal area of excess material will require an additional permit.

**Action Taken/Required:**

To be considered eligible for authorization to conduct a construction activity under the terms and conditions of this permit, the owner operator must submit a Notice of Intent (NOI) form. The form must be submitted to the address below at least seven business days prior to the anticipated date of beginning the construction activity.

South Dakota Department of Environment and Natural Resources Air Quality Program, 523 East Capitol, Joe Foss Building, Pierre, SD 57501-3181, Phone: 605-773-3151.

The permit requires the Contractor to use reasonably available technology to control fugitive dust emissions. The Contractor is required to use control measures for track out, paved areas, unpaved roads, unpaved parking lots, disturbed areas, and for material handling and storage. The control measures that the Contractor is required to use are listed in the permit.

The Rapid City Air Quality Permit will need to be renewed annually by the Contractor until construction activities are completed.

The online form can be found at: <http://denr.sd.gov/des/aq/airpermits.aspx>

SCOPE OF WORK

The work on this project includes, but is not limited to, remove and reset sign assemblies, furnishing and installing new sign posts, and foundations; and associated work.

PERMANENT SIGNING

The Contractor shall furnish all signs, posts, stiffeners, bases, hardware, and labor for installation of permanent signs in size, type, and quantity as shown in these plans and/or as required by the Engineer.

The Contractor shall provide all labor and equipment necessary to install permanent signing, remove existing signs, and reset existing signs as detailed in these plans and/or as required by the Engineer. Payment for furnishing and installing permanent signs will be paid for at the contract unit price for each type of sign based on sheeting requirements per square foot of sign. All signs shall have sheeting as noted on the sign detail sheets. Payment for new signposts, hardware, bases, and labor will be made at the contract unit price per foot for W8x24 Steel Post. See breakaway post details regarding posts, hardware, bases, and footings. Measurement of post lengths for payment will be for above ground post lengths as field measured. The sign post contract items shall include post bases and all hardware. The lengths of the posts in the sign tables are approximate lengths only. The post lengths shall be verified by the Contractor prior to installation.

The Contractor shall stake the signs and the Engineer will verify the location prior to installation. The lateral distance for the signs is 16 ft. from the edge of surfacing to the edge of the sign and the height is 7 ft. from the shoulder surface to the bottom of the sign.

LOGO SIGNS

The Contractor shall remove and reset the existing WB - Exit 17 – Food Logo sign on new footings. The new sign footings will be moved 30 ft back from the existing location. The Contractor shall reset existing business logos on each sign as directed by the Engineer. The Contractor will be responsible for replacing the logo signs if they are damaged during removing and resetting of the signs.

All cost for labor and equipment necessary to remove and reset business logos shall be incidental to all other contract unit prices.

FURNISH & INSTALL ALUMINUM OVERLAY, NON-REMOVABLE COPY SUPER/VERY HIGH INTENSITY

Measurement of sign areas will include payment for the entire sign blank and/or extruded aluminum sign backing. The square unit measurement for each sign shall be as shown in the table of Permanent Signing. This payment for signs designated as Overlay under the New Sign column in the table of Permanent Signing shall include all labor, equipment, and materials to complete the work and shall be paid for at the contract unit price per square foot for Aluminum Overlay, Non-Removable Copy Super/Very High Intensity.

SIGN LEGEND, BORDER, BACKGROUND, AND MOUNTING

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

All upper-case letters, lower-case letters and all numerals shall be as shown in these plans.

The sign colors shall be as stipulated in the MUTCD and as shown in the sign details.

REMOVE CONCRETE FOOTINGS

The Contractor shall remove the existing footings at westbound I-90 MRM 18.58+0.227 and northbound SD79 MRM 73.95+0.027 as shown in the table for Permanent Signing. The Contractor shall be responsible for disposing concrete bases that are removed.

The pair of concrete bases that call for being removed in the table for Permanent Signing shall be incidental to the contract lump sum unit price for “Remove Concrete Footings”. This payment shall include all cost for labor and equipment necessary to remove, dispose of, and backfill holes for the existing concrete bases westbound I-90 MRM 18.58+0.227 and northbound SD79 MRM 73.95+0.027.

REMOVE SIGN FOR RESET & RESET SIGN

PCN i5GH - The Contractor shall remove the WB - Exit 17 – Food Logo signs and extruded panels for reset and reset the existing sign on new W8x24 Steel Posts and new footings.

All cost for labor, equipment, and materials necessary to remove and reset the existing sign panel and logo signs at the new location shall be included in the contract unit price per each for “Remove Sign for Reset” and “Reset Sign”.

PCN i5GK – The Contractor shall remove for reset the SD 79 NB sign assembly – “ALL VEHICLES EXCEEDING 10,000 GVW SECOND RIGHT” and “SCALE OPEN/CLOSED” and reset the existing signs, steel beams, and ladder at MRM 73.89 – about 450 ft. south of the junction of Old Folsom Rd. and SD 79 N.

All cost for labor, equipment, and materials necessary to remove and reset the existing posts, ladder and existing signs at the new location shall be included in the contract unit price per each for “Remove Sign for Reset” and “Reset Sign”.

SHEETING FOR TRAFFIC CONTROL SIGNS

All fluorescent orange background material on traffic control signs, all temporary delineators, and all temporary STOP (R1-1), YIELD (R1-2), DO NOT ENTER (R5-1), and WRONG WAY (R5-1a) signs will conform to the requirements of ASTM D4956 Type IX or XI. All other traffic control signs and background colors will conform to the requirements of ASTM D4956 Type IV.

CONCRETE FOOTINGS

Footings for breakaway signs shall be below ground as shown on the footing details and need not be formed.

Excavation for footings shall be accomplished from off the roadway and shoulders where feasible. The excavation areas shall be covered if not filled by nightfall. Concrete shall be placed within 24 hours of excavation.

PCN i5GK

New W6x12 stub posts shall be installed in the new footings at SD 79 N MRM – 73.89. All costs for labor, equipment, and materials to install the new stub posts shall be incidental to the per ft. unit price for “1.75’ Diameter Breakaway Support Concrete Footings”.

ITEMIZED LIST FOR TRAFFIC CONTROL

PCN i5GH

ITEMIZED LIST FOR TRAFFIC CONTROL SIGNS					
SIGN CODE	SIGN DESCRIPTION	EXPRESSWAY / INTERSTATE			
		NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
W20-1	ROAD WORK AHEAD	2	48" x 48"	16.0	32.0
W21-5a	LEFT or RIGHT SHOULDER CLOSED	2	48" x 48"	16.0	32.0
W21-5b	LEFT or RIGHT SHOULDER CLOSED AHEAD	2	48" x 48"	16.0	32.0
G20-2	END ROAD WORK	1	48" x 24"	8.0	8.0
		EXPRESSWAY / INTERSTATE TRAFFIC CONTROL SIGNS SQFT			
		104.0			

TYPE 3 BARRICADES	
ITEM DESCRIPTION	QUANTITY
Type 3 Barricade	1 Each

PCN i5GK

ITEMIZED LIST FOR TRAFFIC CONTROL SIGNS					
SIGN CODE	SIGN DESCRIPTION	CONVENTIONAL ROAD			
		NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
W20-1	ROAD WORK AHEAD	4	48" x 48"	16.0	64.0
W21-5	SHOULDER WORK	2	48" x 48"	16.0	32.0
W21-5a	LEFT or RIGHT SHOULDER CLOSED	2	48" x 48"	16.0	32.0
W21-5b	LEFT or RIGHT SHOULDER CLOSED AHEAD	2	48" x 48"	16.0	32.0
G20-2	END ROAD WORK	1	36" x 18"	4.5	4.5
		CONVENTIONAL ROAD TRAFFIC CONTROL SIGNS SQFT			
		164.5			

TYPE 3 BARRICADES	
ITEM DESCRIPTION	QUANTITY
Type 3 Barricade	1 Each



PERMANENT SIGNING - I5GH - I-90WB MRM: 18.58+0.227 & I5GK - SD79N - MRM 73.89																	
EXISTING MRM (Approx.)	NEW MRM (Approx.)	SIGN								POST					SIGN DESCRIPTION	WORK TO BE DONE	
		Number	Width (in)	Height (in)	Facing Traffic	New Sign	Remove Existing	Square Footage	Sheeting Type	New Post	Length (ft)	Size (in)	# of Posts	Shear Slip Base			
<b>PCN I5GH - I-90 W</b>																	
18.58+0.227	18.58+0.226	WB - 01	228	120	WESTBOUND	NO	YES	190.0	IV	YES	24.0	W8x24	2	YES	SPECIAL SERVICE SIGN - 6 LOGOS - EXT 17 - FOOD <Mainline Interstate>		REMOVE EXISTING FOOTINGS & EXTRUDED ALUMINUM SIGN AND RESET SIGN ON NEW BREAKAWAY POSTS AND NEW FOOTINGS
<b>PCN I5GK - SD 79 N</b>																	
73.95+0.027	73.89	SD79 - 01	78	60	NORTHBOUND	OVERLAY	YES	32.5	XI	NO	0.0	W6x12	2	YES	ALL VEHICLES EXCEEDING 10,000 GVW SECOND RIGHT		REMOVE EXISTING FOOTINGS & SIGN ASSEMBLY & LADDER AND RESET ASSEMBLY WITH NEW OVERLAY ON NEW FOOTINGS
73.95+0.027	73.89	NA	72	18	NORTHBOUND	NO	YES	9.0	XI	NO	-	-	-	-	SCALE OPEN/CLOSED		REMOVE EXISTING EXTR ALUM SIGN AND RESET BELOW ALL VEHICLES EXCEEDING 10,000 GVW SECOND RIGHT SIGN

BREAKAWAY SIGN POSTS & FOOTING INFORMATION

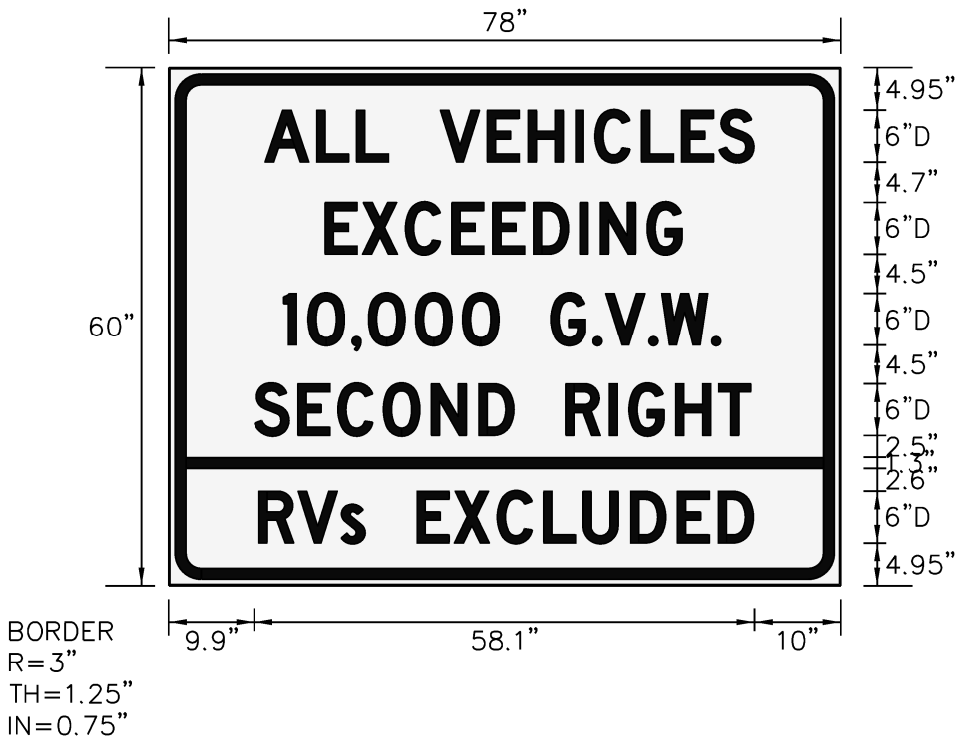
								Footing Steel				
Project	Location		MRM	Post Size	Footing Diameter, ft	Footing Depth, ft	Stub Post Length, ft	Longitudinal Steel		Spiral, ft		Quantity, lb
								Qty and Size	Length, ft	Diameter	Length	
i5GH	I-90 W	WB Mainline	18.58 + 0.226	W 8 X 24	1.75	8	2.50	8 - #6 Bars	7.667	1.4167	46.75	92.12
i5GK	SD 79 N	NB Mainline	73.89	W 6 X 12	1.75	4	2.00	8 - #6 Bars	3.667	1.4167	28.75	44.06

Two-post, Two-Direction Breakaway Sign Supports

1:1.95568  
Plot Scale -

Plotted From -  
trrc12216

SIGN DETAIL  
1:30



Letter locations are panel edge to lower left corner

LETTER POSITIONS (X)												LENGTH		SERIES/SIZE	
S	I	G	N		D	E	S	I	G	N					Arial
128.7	140.7	144.6	158.1	167.5	174.9	187	197.6	209.6	213.6	227					107.8 12
A	L	L		V	E	H	I	C	L	E	S				D 2000
139.1	145.1	149.8	153.5	159.5	164.9	169.7	175.2	177.5	182.9	187.5	191.8				56.8 6
E	X	C	E	E	D	I	N	G							D 2000
146.1	150.4	155.4	160.8	165.6	170.3	175.7	178.1	183.5							41.6 6
1	0	,	0	0	0		G	.	V	.	W	.			D 2000
141.3	144.1	149.2	151.1	156.6	162	166.3	172.3	177.2	178.7	183.7	185.2	191			50.8 6
S	E	C	O	N	D		R	I	G	H	T				D 2000
137.9	143	147.6	152.9	158.4	164	168	174	179.1	181.4	186.8	191.8				57.7 6
R	V	s		E	X	C	L	U	D	E	D				D 2000
138.4	143	148	150.8	156.8	161.1	166.1	171.5	176.1	181.6	187	191.8				57.4 6/4.5

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	000I-451 & 000P-452	6	12

Plotting Date: 02/19/2019

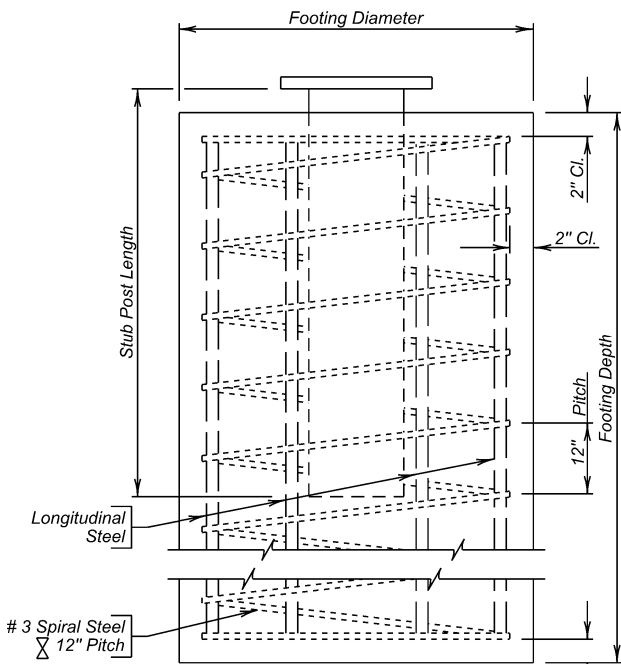
SIGN NUMBER	SD79N - 01
WIDTH x HGHT.	6'-6" x 5'-0"
BORDER WIDTH	1.25"
CORNER RADIUS	3"
MOUNTING	Ground
BACKGROUND	TYPE: XI
	COLOR: White
LEGEND/BORDER	TYPE: Reflective
	COLOR: Black/Black

SYMBOL	ROT	X	Y	WID	HT

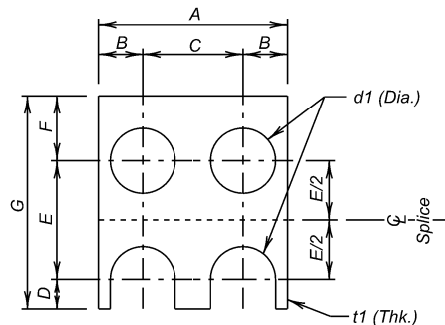
SITE LOCATION	MRM	POST SIZE	FOOTING DIMENSIONS		STUB POST LENGTH	LONGITUDINAL STEEL QUANTITIES			# SPIRAL STEEL QUANTITIES	
			DIA.	DEPTH		NO.	SIZE	LENGTH	DIA.	LENGTH
I-90 W	18.58+0.226	W 8 X 24	1.75	8	2.50	8	#6	7.667	1.4167	46.75
SD 79 N	73.89	W 6 X 12	1.75	4	2.00	8	#6	3.667	1.4167	28.75

⌘ # Spirals - Use 12" pitch and 1 ½ extra turns at each end. Use 1 ½ turns for lap at splice as required, or weld as approved by the Office of Bridge Design. Spirals may be smooth bars, Bar length shown does not include Splices. Dimensions are out to out of bars.

NOTE:  
The above is a Site Specific data entry table and the inserted information is the responsibility of the Region Traffic Engineer.

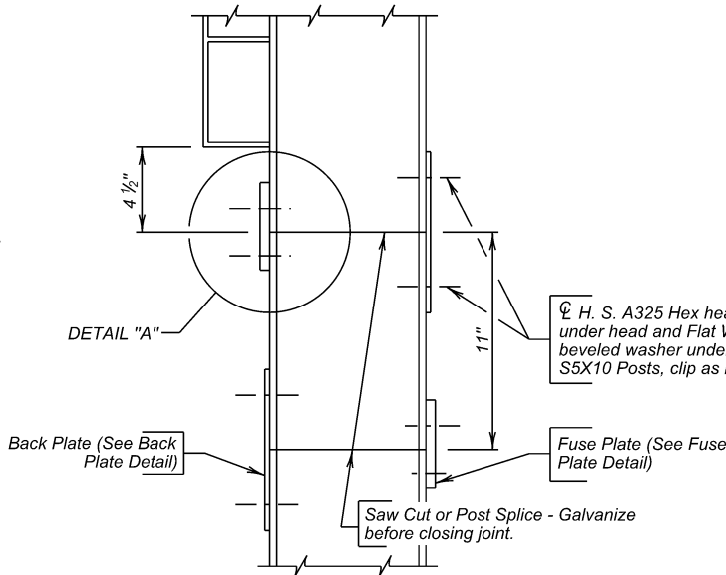


FOOTING DETAIL

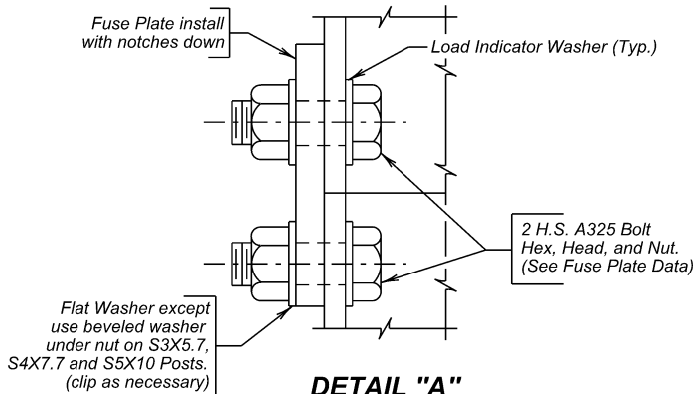


FUSE PLATE DETAIL

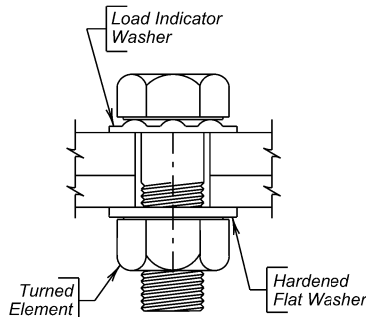
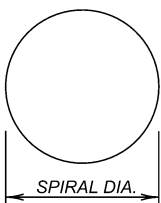
TABLE 1 - FUSE PLATE DATA										
Post Size	A	B	C	D	E	F	G	d1	t1	Bolt Size
S3X5.7	2 5/8"	9/16"	1 1/2"	1/2"	1 1/2"	1 1/8"	3 1/8"	5/8" ⌀	1/4"	1/2" ⌀
S4X7.7	2 5/8"	9/16"	1 1/2"	1/2"	1 1/2"	1 1/8"	3 1/8"	5/8" ⌀	1/4"	1/2" ⌀
S5X10	3"	1 1/16"	1 5/8"	5/8"	2 1/4"	1 1/8"	4"	3/4" ⌀	3/8"	5/8" ⌀
W6X12	4"	1 5/16"	2 1/8"	5/8"	2 1/2"	1 3/8"	4 1/2"	3/4" ⌀	3/8"	5/8" ⌀
W6X15	6"	1 3/8"	3 1/4"	5/8"	2 1/2"	1 3/8"	4 1/2"	3/4" ⌀	3/8"	5/8" ⌀
W6X20	6"	1 3/8"	3 1/4"	5/8"	2 1/2"	1 3/8"	4 1/2"	3/4" ⌀	3/8"	5/8" ⌀
W8X18	5 1/4"	1 5/16"	2 5/8"	3/4"	2 1/2"	1 3/8"	4 5/8"	7/8" ⌀	1/2"	3/4" ⌀
W8X21	5 1/4"	1 5/16"	2 5/8"	3/4"	2 1/2"	1 3/8"	4 5/8"	7/8" ⌀	1/2"	3/4" ⌀
W8X24	6 1/2"	1 1/2"	3 1/2"	7/8"	3"	1 3/8"	5 1/2"	1" ⌀	3/4"	7/8" ⌀
W8X28	6 1/2"	1 5/16"	3 3/8"	7/8"	3"	1 3/4"	5 3/8"	1" ⌀	1/2"	7/8" ⌀
W8X31	8"	1 3/8"	4 3/4"	1"	3 1/2"	2"	6 1/2"	1 1/8" ⌀	3/8"	1" ⌀
W10X33	8"	1 7/8"	4 1/4"	1 1/8"	4 1/2"	2 1/4"	7 7/8"	1 1/4" ⌀	3/4"	1 1/8" ⌀



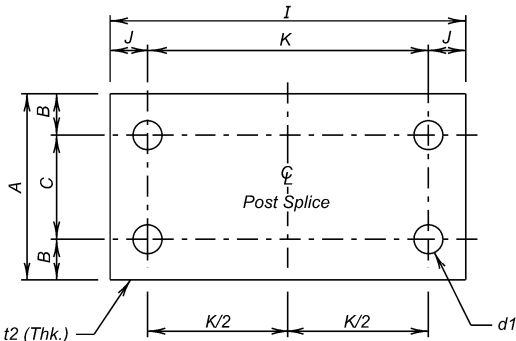
FUSE & BACK PLATE INSTALLATION



DETAIL "A"



LOAD INDICATOR WASHER DETAIL



BACK PLATE DETAIL

TABLE 5 - BACK PLATE DATA										
Post Size	A	B	C	J	K	I	d1	t2	Bolt Size	
S3X5.7	2 5⁄8"	9⁄16"	1 1⁄2"	1 1⁄4"	4 1⁄2"	7"	5⁄8" ⌀	1⁄4"	1⁄2" ⌀	
S4X7.7	2 5⁄8"	9⁄16"	1 1⁄2"	1 1⁄4"	4 1⁄2"	7"	5⁄8" ⌀	1⁄4"	1⁄2" ⌀	
S5X10	3"	1 1⁄16"	1 5⁄8"	1 1⁄4"	4 3⁄4"	7 1⁄4"	3⁄4" ⌀	1⁄4"	5⁄8" ⌀	
W6X12	4"	1 5⁄16"	2 1⁄8"	1 1⁄4"	4 3⁄4"	7 1⁄4"	3⁄4" ⌀	1⁄4"	5⁄8" ⌀	
W6X15	6"	1 3⁄8"	3 1⁄4"	1 1⁄4"	5 1⁄4"	7 3⁄4"	3⁄4" ⌀	1⁄4"	5⁄8" ⌀	
W6X20	6"	1 3⁄8"	3 1⁄4"	1 1⁄4"	5 1⁄4"	7 3⁄4"	3⁄4" ⌀	1⁄4"	5⁄8" ⌀	
W8X18	5 1⁄4"	1 5⁄16"	2 5⁄8"	1 3⁄8"	5 3⁄4"	8 1⁄2"	7⁄8" ⌀	1⁄4"	3⁄4" ⌀	
W8X21	5 1⁄4"	1 5⁄16"	2 5⁄8"	1 3⁄8"	5 3⁄4"	8 1⁄2"	7⁄8" ⌀	1⁄4"	3⁄4" ⌀	
W8X24	6 1⁄2"	1 1⁄2"	3 1⁄2"	1 5⁄8"	6"	9 1⁄4"	1" ⌀	5⁄16"	7⁄8" ⌀	
W8X28	6 1⁄2"	1 5⁄16"	3 3⁄8"	1 3⁄4"	6"	9 1⁄2"	1" ⌀	3⁄8"	7⁄8" ⌀	
W8X31	8"	1 5⁄8"	4 3⁄4"	2"	6 1⁄2"	10 1⁄2"	1 1⁄8" ⌀	3⁄8"	1" ⌀	
W10X33	8"	1 7⁄8"	4 1⁄4"	2 1⁄2"	7"	1' - 0"	1 1⁄4" ⌀	7⁄16"	1 1⁄8" ⌀	

## NOTES

- Design Specification: AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, 2001 Edition with 2003 Interims.
- Concrete Footings shall be Class M6 - fc = 4000 p. s. i.
- Structural Steel shall conform to ASTM A36.
- All Reinforcing Steel, except spirals, shall conform to ASTM 615 Grade 60.
- Spiral Reinforcing Steel may be fabricated from cold drawn wire ASTM A1064, or hot rolled plain or deformed bars conforming to the strength requirements of ASTM A615, Grade 60.
- All Bolts and Nuts shall conform to ASTM A325 except that 1/2" diameter bolts may conform to either ASTM A325 or ASTM A449. Washers shall conform to ASTM F436. All hardware shall be galvanized in accordance with ASTM F2329.
- All structural steel including Posts and Post Stubs shall be galvanized in accordance with ASTM A123.
- All Bolt Holes shall be drilled. All plate cuts shall preferably be saw cuts. However, Flame Cutting will be permitted providing all edges are ground smooth (metal projecting beyond the plane of the plate face will NOT be allowed).
- All welding and weld inspection shall be in accordance with the latest edition of AWS D 1.5 Structural Welding Code.

## PROCEDURE FOR ASSEMBLING SLIP BASE

- Place galvanized Sheet Metal Diaphragms on top of the lower slip plate.
- Connect main post to Stub Post with clean unlubricated bolts and nuts with one Hardened Washer on each bolt between slip plates.
- Plumb post by adding shims between slip plates.
- Tighten bolts to a practical maximum, using a 12" - 15" wrench in order to bed surfaces and clean threads. DO NOT TIGHTEN TO PROOF LOAD.
- Loosen all bolts and retighten in increments, using a systematic order, until each bolt has been tightened to the specified torque corresponding to the post size used (See Slip Base Plate Data). Tighten bolts only to the torque specified. DO NOT OVERTIGHTEN. Check torque on each bolt after entire sign has been erected.

## ASSEMBLY OF FRICTION FUSE PLATES, BACK PLATES AND STIFFENERS

High strength bolts shall be tightened so as to obtain a residual tension by the use of load indicator washers.

## SHOP PLANS


The fabricator shall submit shop plans in accordance with the Specifications or in Adobe PDF format. Shop plan submittals shall be sent to the Office of Bridge Design. Include design and check design, if applicable, with initial submittal.

## ERECTION DETAILS FOR TWO-POST TWO-DIRECTION BREAKAWAY SIGN SUPPORTS

S. D. DEPT. OF TRANSPORTATION

DECEMBER 2016

1 OF 2

DESIGNED BY RH/DM CNTYPCNX	DRAWN BY RH/TB/MDG PCNXDSPG	CHECKED BY RH/DM/PW BSTDBS2C	 BRIDGE ENGINEER
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STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	000I-451 & 000P-452	8	12

Δ Mounting height as recommended by latest edition of AASHTO ROADSIDE DESIGN GUIDE.

∅ Clear distance as recommended by latest edition of MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.

NOTE:  
N = Number of Stiffeners to be used  
H = Vertical dimension of sign  
L = Horizontal dimension of Main Sign

∅ Clear span between posts shall be 7' - 0" minimum for posts larger than 18 lb/ft. Reference FHWA acceptance letter dated 6/4/91 (Code SS-25).

\* See Erection Details for SLIP BASE ALTERNATE.

NOTE:  
Sign face details shown are those for extruded aluminum panels.  
See Erection Details for SHEET ALUMINUM SIGNS for mounting flat sheet sign face.

### SIDE TRIM MOLDING

Side Trim Molding is required on all vertical edges of extruded panels. They shall be fastened at a minimum of one (1) rivet per panel.

### STIFFENER NOTES

- Stiffeners must always be used on Two Post Breakaway signs regardless of type of sign face employed.
- Number of stiffeners used, N, shall be as follows:  
if  $H \leq 2' - 0"$  then  $N = 1$   
if  $2' - 0" < H \leq 8' - 0"$  then  $N = 2$   
if  $8' - 0" < H \leq 15' - 0"$  then  $N = 3$

### SEC. A - A

### SEC. B - B (Stiffener not shown)

TABLE 3 - SHEET METAL DIAPHRAGM DATA

Post Size	M	N	O	P	Q	R	V
S3X5.7	3/4"	6"	7 1/2"	3/4"	1 1/2"	3"	5/8"
S4X7.7	3/4"	6"	7 1/2"	3/4"	1 1/2"	3"	5/8"
S5X10	7/8"	7 1/4"	9"	3/4"	2"	3 1/2"	3/4"
W6X12	7/8"	8 1/4"	10"	7/8"	2 3/4"	4 1/2"	3/4"
W6X15	1 1/8"	8 1/2"	10 3/4"	1 1/4"	4"	6 1/2"	7/8"
W6X20	1 1/8"	10"	1' - 0 1/4"	1 1/4"	4"	6 1/2"	7/8"
W8X18	1 1/8"	10 1/2"	1' - 0 3/4"	1 1/4"	3 1/2"	6"	7/8"
W8X21	1 1/4"	11 1/4"	1' - 1 3/4"	1 1/4"	3 1/2"	6"	1"
W8X24	1 1/2"	11"	1' - 2"	1 5/8"	4 1/4"	7 1/2"	1"
W8X28	1 5/8"	11 1/4"	1' - 2 1/2"	1 5/8"	4 1/4"	7 1/2"	1 1/8"
W8X31	1 3/4"	11 1/4"	1' - 2 3/4"	1 7/8"	5 1/4"	9"	1 1/8"
W10X33	1 3/4"	1' - 2"	1' - 5 1/2"	1 7/8"	5 1/4"	9"	1 1/8"

### ERECTION DETAILS

FOR

## TWO-POST TWO-DIRECTION BREAKAWAY SIGN SUPPORTS

S. D. DEPT. OF TRANSPORTATION

DECEMBER 2016

2 OF 2

DESIGNED BY RH/DM CNTYPCNX	DRAWN BY TB/MDG PCNXDSPG	CHECKED BY RH/DM/PW BSTDBS2D	<i>Steve A. Johnson</i> BRIDGE ENGINEER
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NOTE:  
Diaphragm need not be regalvanized after cutting to size and drilling of holes.

TABLE 4 - SLIP BASE PLATE DATA

Post Size	M	N	O	P	Q	R	S	T	U	t3	Bolt Size	Bolt Torque
S3X5.7	3/4"	6"	7 1/2"	3/4"	1 1/2"	3"	3/32"	3 3/4"	3 3/4"	5/8"	1/2" ∅	142" - #
S4X7.7	3/4"	6"	7 1/2"	3/4"	1 1/2"	3"	3/32"	3 3/4"	3 3/4"	5/8"	1/2" ∅	142" - #
S5X10	7/8"	7 1/4"	9"	3/4"	2"	3 1/2"	1/32"	4 1/2"	4 1/2"	7/8"	5/8" ∅	345" - #
W6X12	7/8"	8 1/4"	10"	7/8"	2 3/4"	4 1/2"	1/32"	5"	5"	7/8"	5/8" ∅	345" - #
W6X15	1 1/8"	8 1/2"	10 3/4"	1 1/4"	4"	6 1/2"	1/32"	5 3/8"	5 3/8"	1"	3/4" ∅	554" - #
W6X20	1 1/8"	10"	1' - 0 1/4"	1 1/4"	4"	6 1/2"	1/32"	6 1/8"	6 1/8"	1"	3/4" ∅	554" - #
W8X18	1 1/8"	10 1/2"	1' - 0 3/4"	1 1/4"	3 1/2"	6"	1/32"	6 3/8"	6 3/8"	1"	3/4" ∅	554" - #
W8X21	1 1/4"	11 1/4"	1' - 1 3/4"	1 1/4"	3 1/2"	6"	1/32"	6 7/8"	6 7/8"	1"	7/8" ∅	645" - #
W8X24	1 1/2"	11"	1' - 2"	1 5/8"	4 1/4"	7 1/2"	1/32"	7"	7"	1"	7/8" ∅	645" - #
W8X28	1 5/8"	11 1/4"	1' - 2 1/2"	1 5/8"	4 1/4"	7 1/2"	1/32"	7 1/4"	7 1/4"	1 1/8"	1" ∅	735" - #
W8X31	1 3/4"	11 1/4"	1' - 2 3/4"	1 7/8"	5 1/4"	9"	1/32"	7 3/8"	7 3/8"	1 1/8"	1" ∅	735" - #
W10X33	1 3/4"	1' - 2"	1' - 5 1/2"	1 7/8"	5 1/4"	9"	1/32"	8 3/4"	8 3/4"	1 1/4"	1" ∅	735" - #

### SEC. C - C

### GALVANIZED SHEET METAL DIAPHRAGM

### ELEVATION

### BREAKAWAY SUPPORT STUB CLEARANCE DIAGRAM

NOTE:  
The post stub and lower slip plate shall NOT extend more than 4" max. above the chordline within 60" chord.

### \* SLIP BASE DETAIL



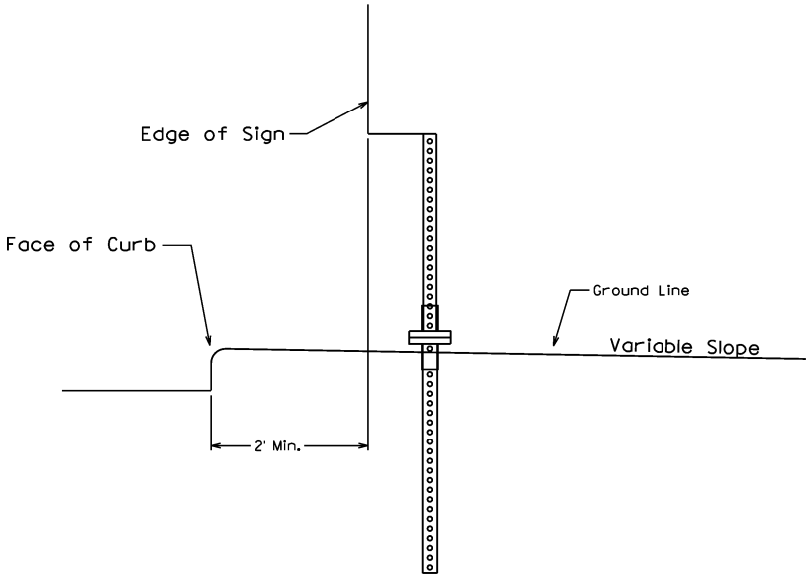
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Plot Scale -

Plotted From -  
trrc12216

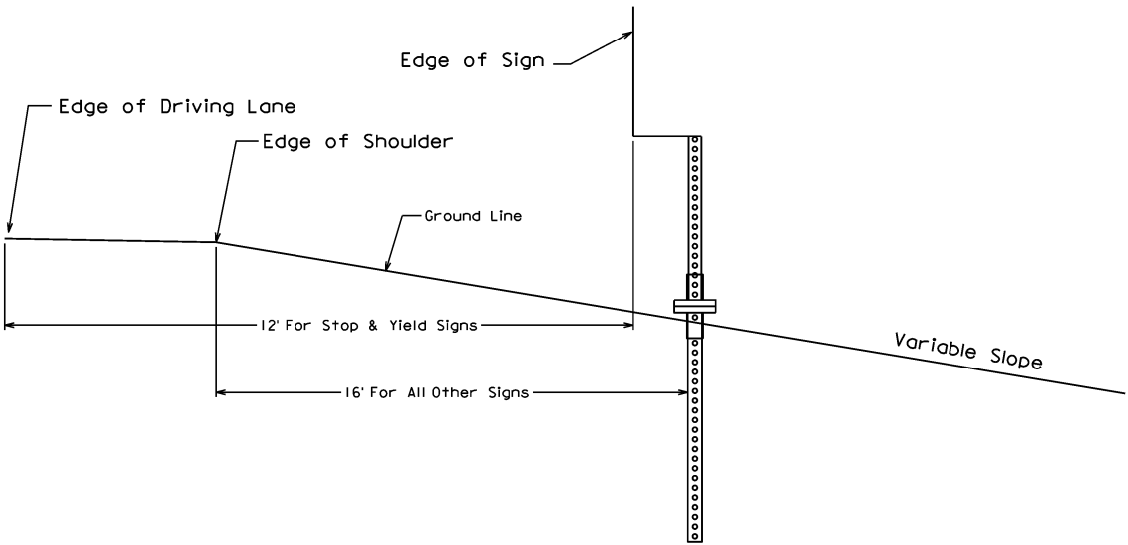
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	000I-451 & 000P-452	9	12

Plotting Date: 02/19/2019

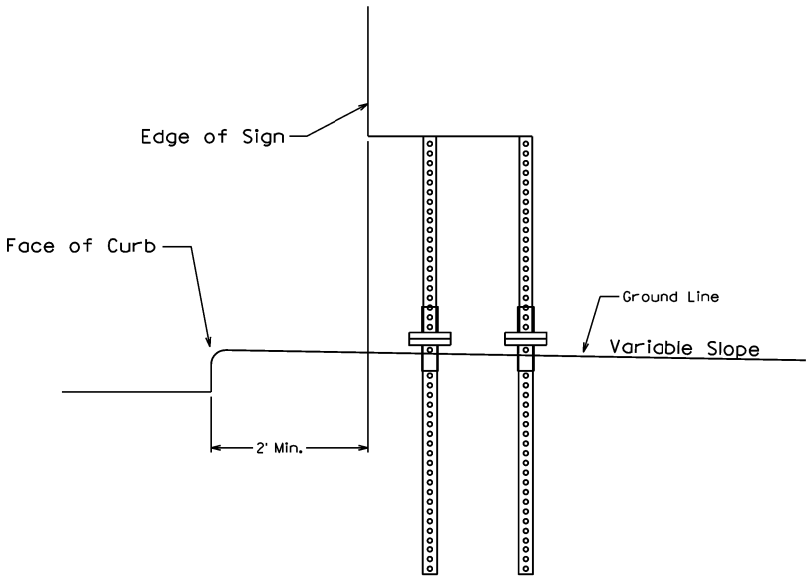
# TYPICAL SIGN DETAIL



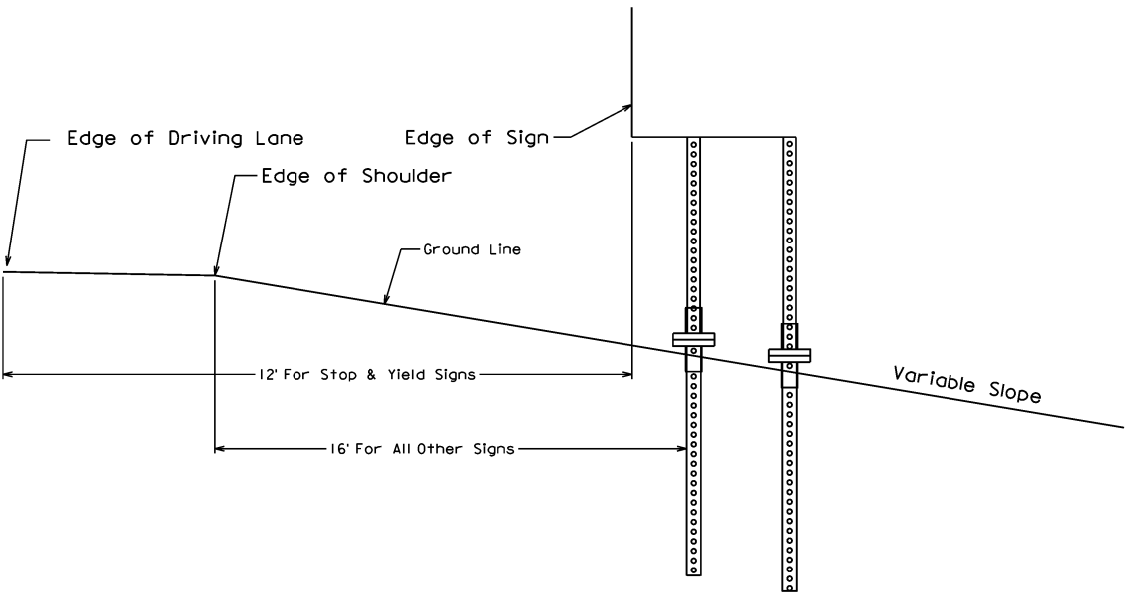
URBAN LOCATION WITH 1 POST  
(Drawing shown from face of sign)



RURAL LOCATION WITH 1 POST  
(Drawing shown from face of sign)



URBAN LOCATION WITH 2 POSTS  
(Drawing shown from face of sign)



RURAL LOCATION WITH 2 POSTS  
(Drawing shown from face of sign)

The signs illustrated are not required if the work space is behind a barrier, more than 2 feet behind the curb, or 15 feet or more from the edge of any roadway.

The signs illustrated shall be used where there are distracting situations; such as: vehicles parked on shoulder, vehicles accessing the work site via the highway, and equipment traveling on or crossing the roadway to perform work operations.

The ROAD WORK AHEAD sign may be replaced with other appropriate signs, such as the SHOULDER WORK sign. The SHOULDER WORK sign may be used for work adjacent to the shoulder.

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

For short term, short duration, or mobile operations, all signs and channelizing devices may be eliminated if a vehicle with an activated flashing or revolving yellow light is used.

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



April 15, 2015

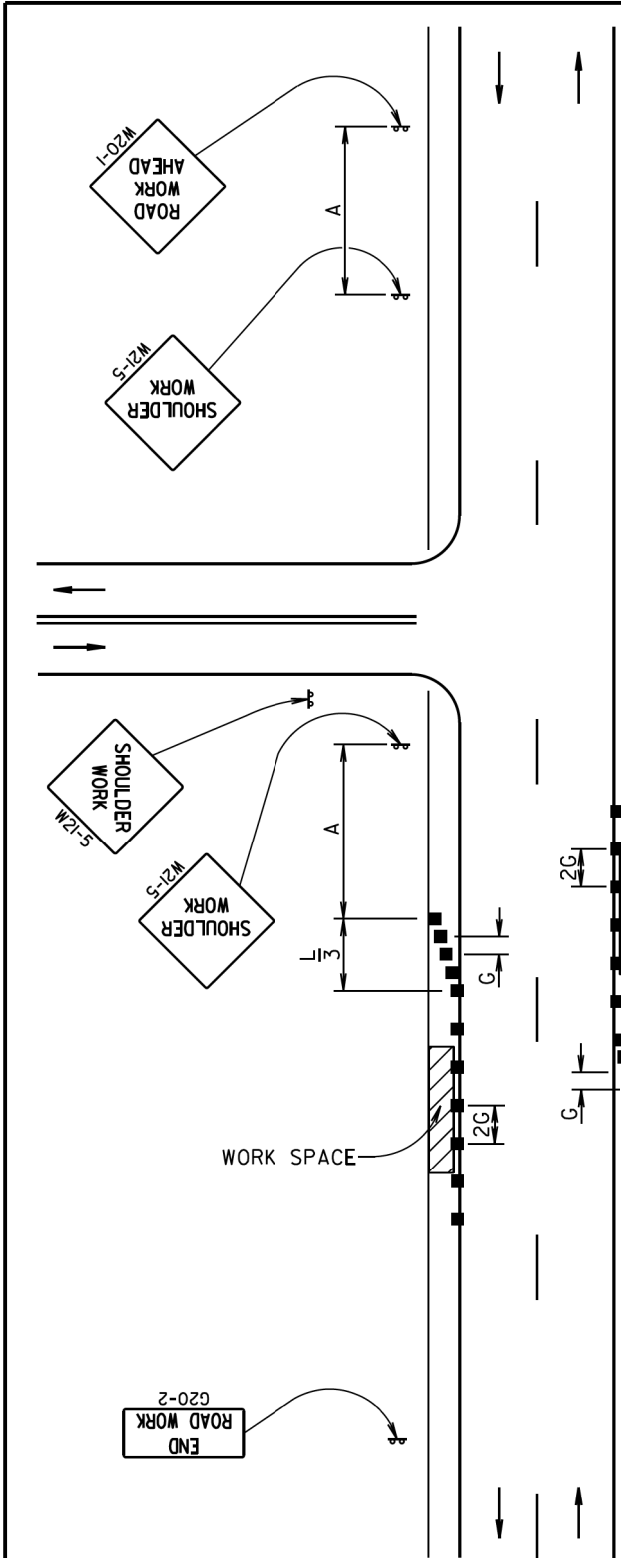
S  
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T

GUIDES FOR TRAFFIC CONTROL DEVICES  
WORK BEYOND THE SHOULDER

PLATE NUMBER  
634.01

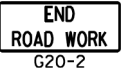
Sheet 1 Of 1

Published Date: 1st Qtr. 2019



Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet) (A)	Taper Length (Feet) (L)	Spacing of Channelizing Devices (Feet) (G)
0 - 30	200	180	25
35 - 40	350	320	25
45	500	600	25
50	500	600	50
55	750	660	50
60 - 65	1000	780	50

■ Channelizing Device



The channelizing devices shall be drums or 42" cones if traffic control must remain overnight.

For short duration operations (1 hour or less) all channelizing devices may be eliminated if a vehicle with an activated flashing or revolving yellow light is used.

Worker signs (W21-1 or W21-1a) may be used instead of SHOULDER WORK signs.

A SHOULDER WORK sign should be placed on the left side of a divided or one-way roadway only if the left shoulder is affected.

The SHOULDER WORK sign on an intersecting roadway is not required if drivers emerging from that roadway will encounter another advance warning sign before they reach a work activity area.

WORK SPACE



June 3, 2016

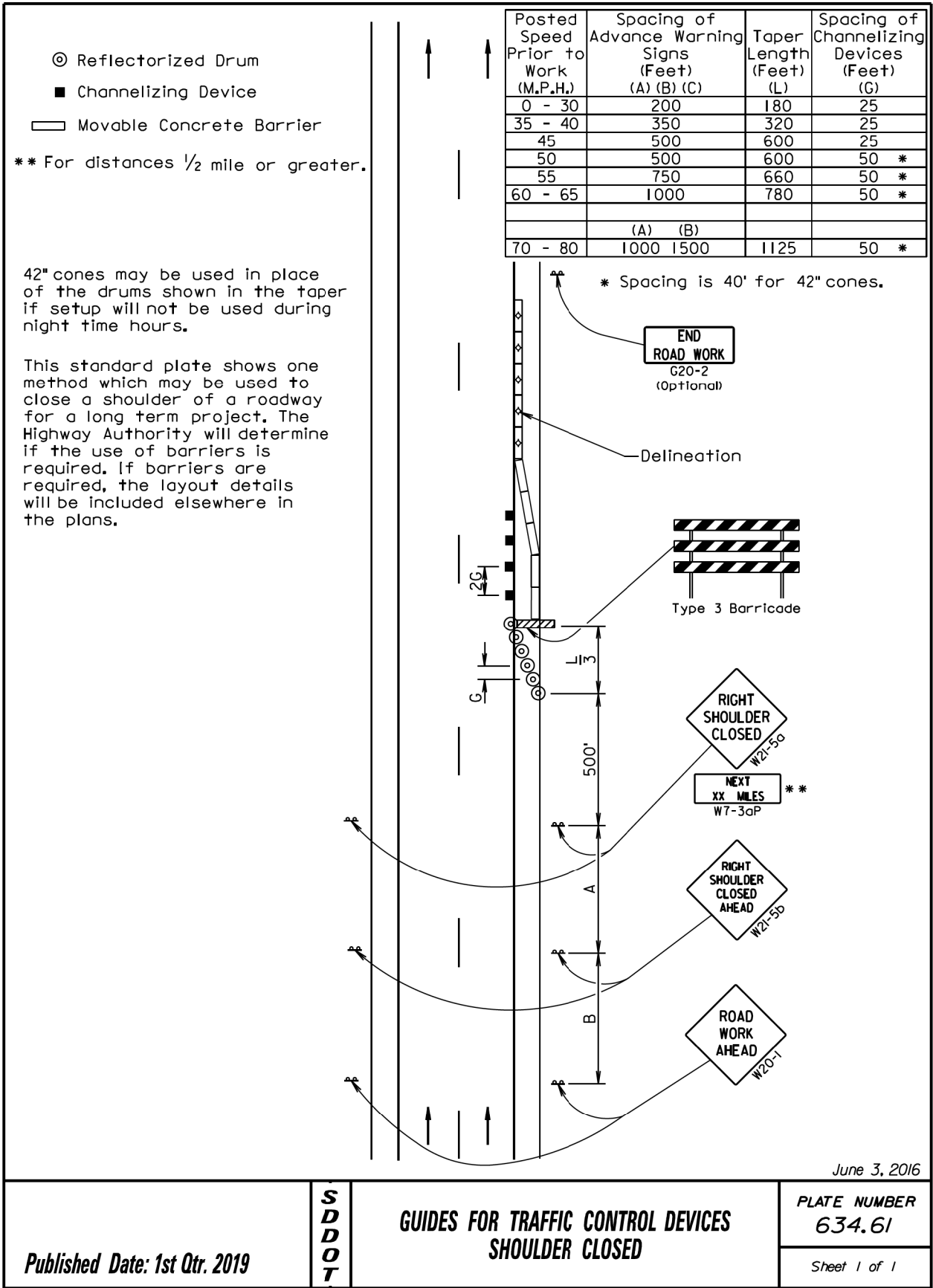
S  
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GUIDES FOR TRAFFIC CONTROL DEVICES  
WORK ON SHOULDERS

PLATE NUMBER  
634.03

Sheet 1 Of 1

Published Date: 1st Qtr. 2019



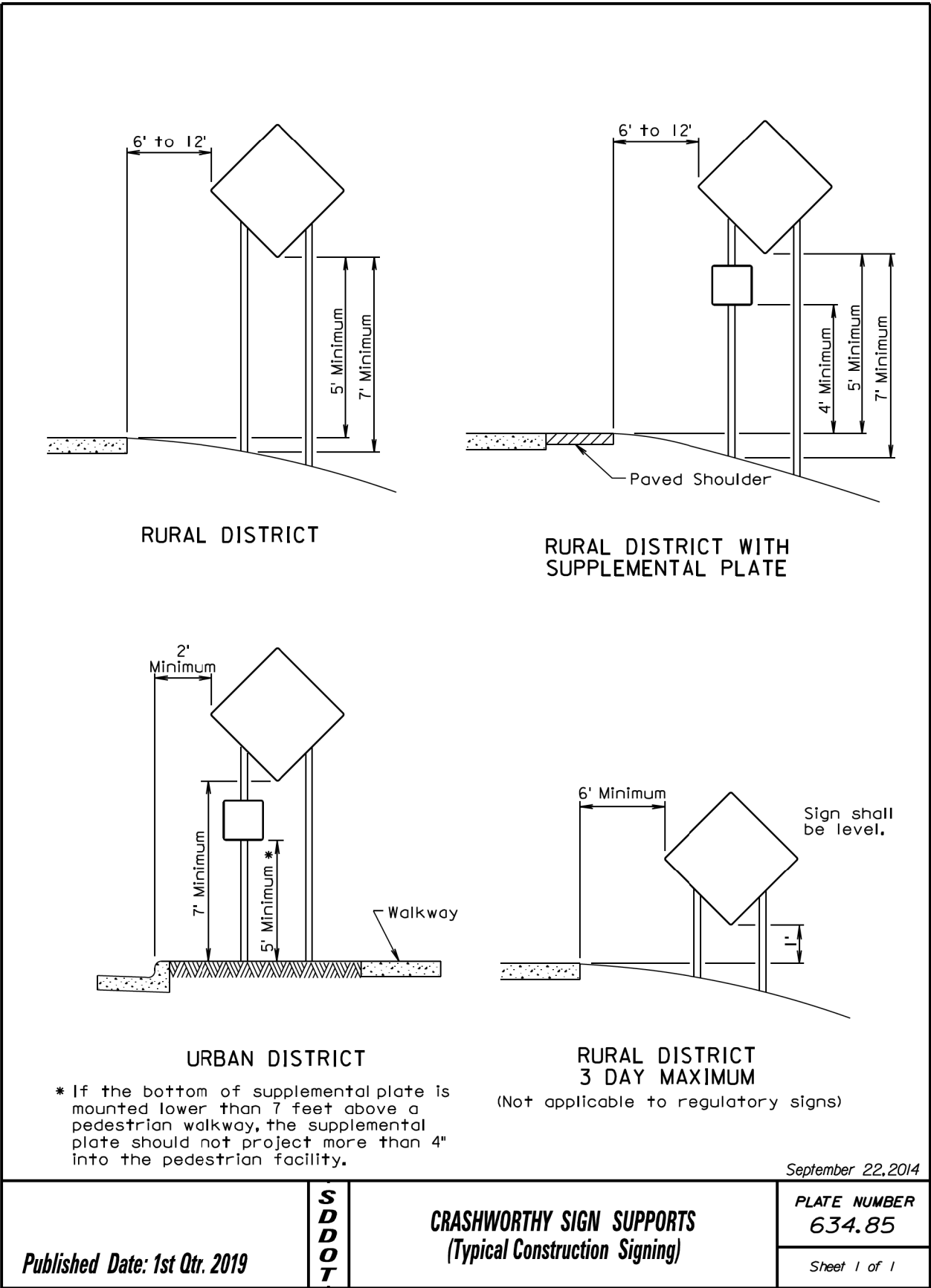
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GUIDES FOR TRAFFIC CONTROL DEVICES  
SHOULDER CLOSED

PLATE NUMBER  
634.61

Sheet 1 of 1

Published Date: 1st Qtr. 2019



S  
D  
D  
O  
T

CRASHWORTHY SIGN SUPPORTS  
(Typical Construction Signing)

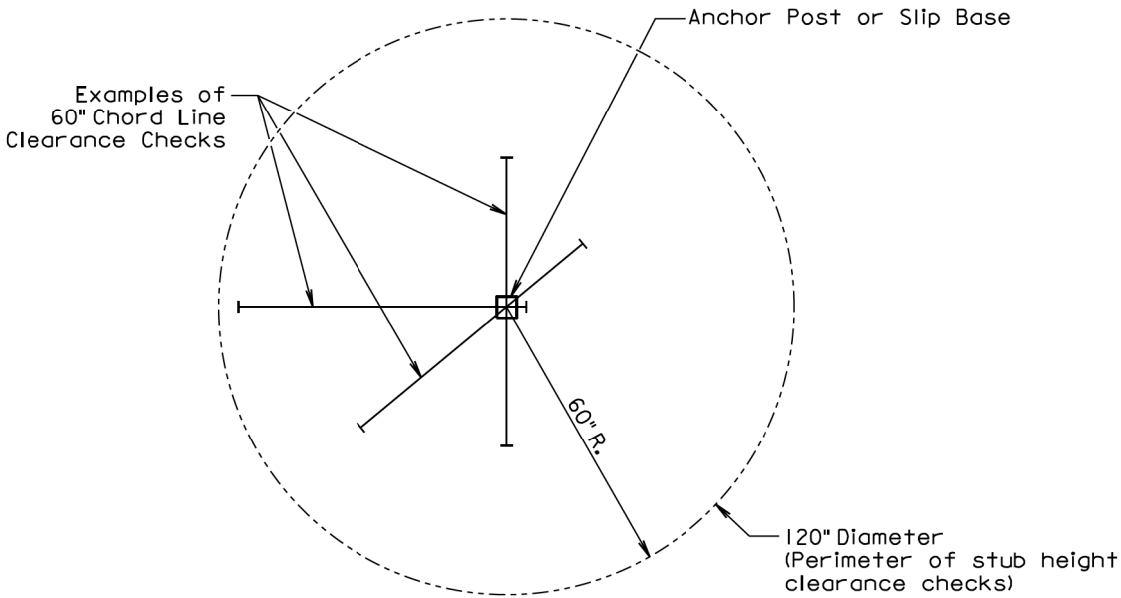
PLATE NUMBER  
634.85

Sheet 1 of 1

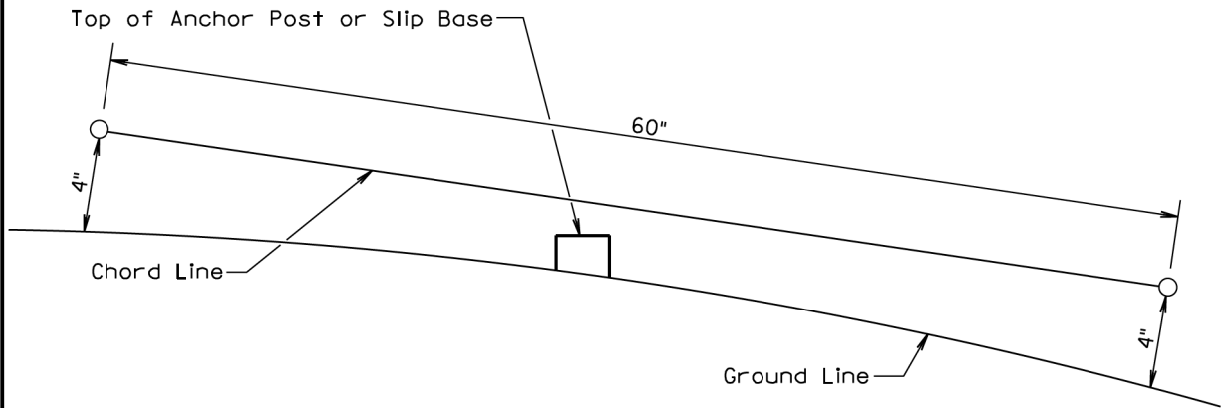
Published Date: 1st Qtr. 2019

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	000I-451 & 000P-452	12	12

Plotting Date: 02/19/2019



PLAN VIEW  
(Examples of stub height clearance checks)



ELEVATION VIEW

GENERAL NOTES:

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

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

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

July 1, 2005

<i>Published Date: 1st Qtr. 2019</i>	<b>S D D O T</b>	<b>BREAKAWAY SUPPORT STUB CLEARANCE</b>	PLATE NUMBER 634.99
			Sheet 1 of 1