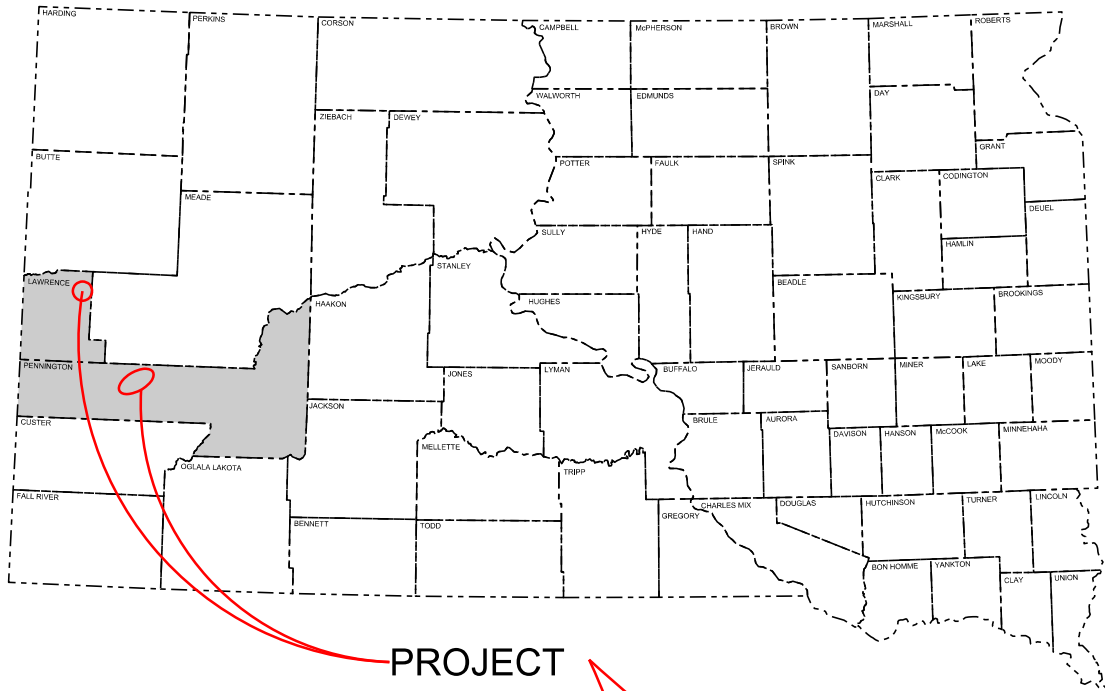


Plot Scale - 1:200

TRR012608

Plotted From -



STATE OF SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION

PLANS FOR PROPOSED
**PROJECTS 090 W-451, 190 N-452,
190 S-452, 016 W-452, 044-452,
044 W-452, 044 E-452**
**INTERSTATE 90 EB & WB,
INTERSTATE 190 NB & SB,
US HIGHWAY 16 WB, AND
SD HIGHWAY 44 EB & WB**
**LAWRENCE AND
PENNINGTON COUNTIES**
CONCRETE REPAIR

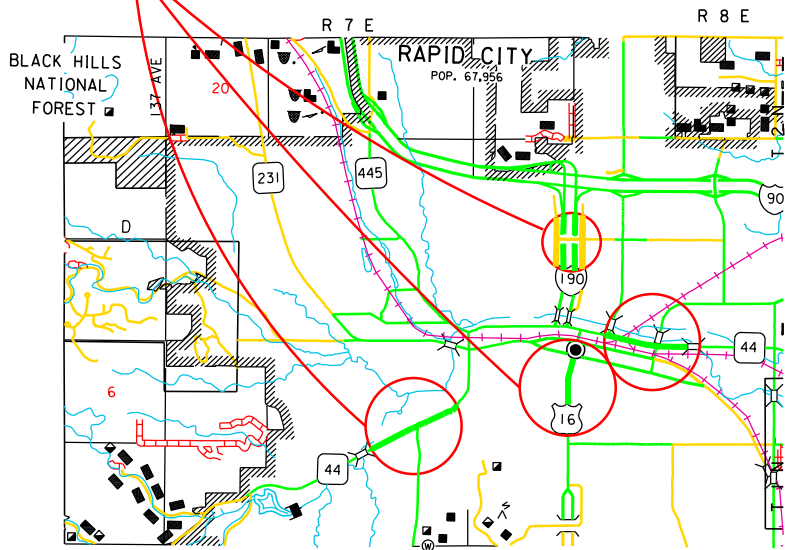
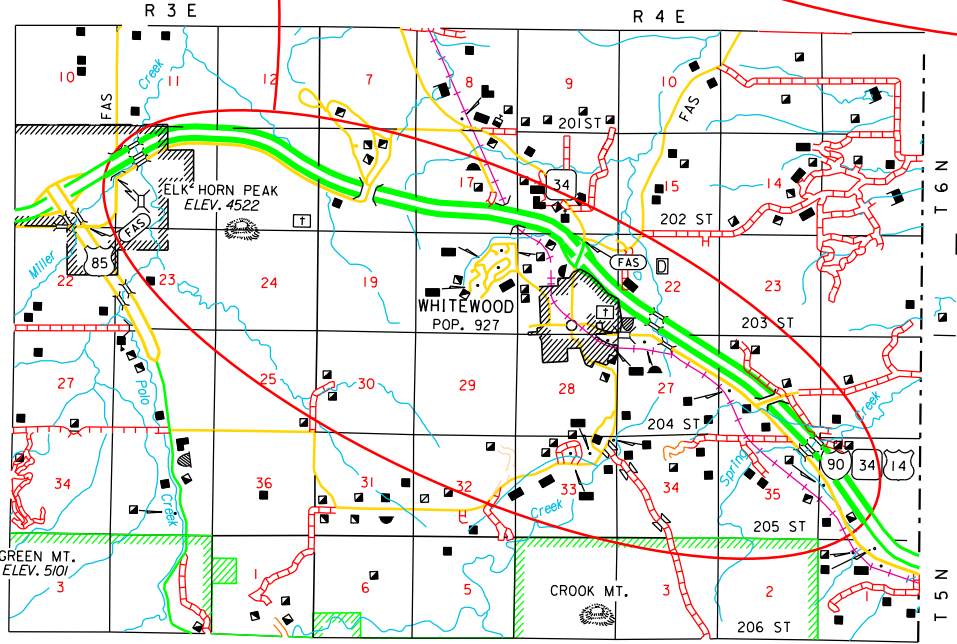
PCNS i5m7, i5mc, i5mg, i5mh, i5mj, i5mk, i5mL, i5mm

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	090 W-451, etc.	1	28

Plotting Date: 05/06/2019

INDEX OF SHEETS

1	General Layout with Index
2-11	Estimate with General Notes & Tables
12-18	Special Details
19-28	Standard Plates



STORM WATER PERMIT
None Required

DESIGN DESIGNATION								
Proj. No.	090 W-451	090 E-451	190 N-452	190 S-452	016 W-452	044-452	044 W-452	044 E-452
PCN	i5m7	i5mc	i5mg	i5mh	i5mj	i5mk	i5mL	i5mm
Highway	190 WB	190 EB	I 190 NB	I 190 SB	US 16 SB	SD 44	SD 44 WB	SD 44 EB
MRM - MRM	18.843 - 27.980	20.624 - 26.984	0.21 - 0.64	0.21 - 0.64	68.4 - 68.9	41.143 - 43.379	45.620	45.155
AADT (2018)	5402	5402	8788	8795	14357	12995	12995	13499
AADT (2038)	8921	9037	11345	11354	25010	22638	2638	23515
DHV	1222	1238	1169	1169	3952	2762	2762	2869
D%	51%	51%	50%	50%	51%	50%	50%	50%
DHV T%	8.5%	8.5%	1.0%	1.0%	2.6%	1.3%	1.3%	2.1%
AADT T%	18.7%	18.7%	2.1%	2.1%	5.7%	2.9%	2.9%	4.7%
V mph	75	75	65	65	35	40	40	40

ESTIMATE OF QUANTITIES

PCN i5m7

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
380E0010	6" Nonreinforced PCC Pavement	120.0	SqYd
380E5100	Continuously Reinforced PCC Pavement Repair	149.1	SqYd
380E6000	Dowel Bar	54	Each
380E6110	Insert Steel Bar in PCC Pavement	140	Each
633E0010	Cold Applied Plastic Pavement Marking, 4"	394	Ft
633E5000	Grooving for Cold Applied Plastic Pavement Marking, 4"	394	Ft
634E0010	Flagging	20.0	Hour
634E0110	Traffic Control Signs	246.0	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0275	Type 3 Barricade	2	Each
634E0310	Temporary Flexible Vertical Markers (Tabs)	5,944	Ft
634E0420	Type C Advance Warning Arrow Board	1	Each

PCN i5mc

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
380E5030	Nonreinforced PCC Pavement Repair	96.0	SqYd
380E5100	Continuously Reinforced PCC Pavement Repair	34.5	SqYd
380E6000	Dowel Bar	48	Each
380E6110	Insert Steel Bar in PCC Pavement	110	Each
633E0010	Cold Applied Plastic Pavement Marking, 4"	196	Ft
633E5000	Grooving for Cold Applied Plastic Pavement Marking, 4"	196	Ft
634E0010	Flagging	20.0	Hour
634E0110	Traffic Control Signs	246.0	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0275	Type 3 Barricade	2	Each
634E0310	Temporary Flexible Vertical Markers (Tabs)	5,812	Ft
634E0420	Type C Advance Warning Arrow Board	1	Each

PCN i5mg

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
634E0010	Flagging	20.0	Hour
634E0110	Traffic Control Signs	310.0	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0275	Type 3 Barricade	2	Each
634E0310	Temporary Flexible Vertical Markers (Tabs)	1,740	Ft
634E0420	Type C Advance Warning Arrow Board	1	Each
651E0040	4" Concrete Sidewalk	1,360	SqFt

PCN i5mh

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
634E0010	Flagging	20.0	Hour
634E0110	Traffic Control Signs	310.0	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0275	Type 3 Barricade	2	Each
634E0310	Temporary Flexible Vertical Markers (Tabs)	1,740	Ft
634E0420	Type C Advance Warning Arrow Board	1	Each
651E0040	4" Concrete Sidewalk	1,394	SqFt

PCN i5mj

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
380E5030	Nonreinforced PCC Pavement Repair	14.0	SqYd
380E6110	Insert Steel Bar in PCC Pavement	30	Each
634E0010	Flagging	20.0	Hour
634E0110	Traffic Control Signs	170.5	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS

PCN i5mk

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
380E5030	Nonreinforced PCC Pavement Repair	36.4	SqYd
380E6110	Insert Steel Bar in PCC Pavement	78	Each
634E0010	Flagging	40.0	Hour
634E0110	Traffic Control Signs	161.0	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0275	Type 3 Barricade	6	Each
634E0310	Temporary Flexible Vertical Markers (Tabs)	4,160	Ft
634E0420	Type C Advance Warning Arrow Board	1	Each
651E3000	Grinding Miscellaneous Concrete	75.0	SqFt

PCN i5mL

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
380E5030	Nonreinforced PCC Pavement Repair	2.8	SqYd
380E6110	Insert Steel Bar in PCC Pavement	6	Each
634E0010	Flagging	20.0	Hour
634E0110	Traffic Control Signs	68.5	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0310	Temporary Flexible Vertical Markers (Tabs)	320	Ft
634E0420	Type C Advance Warning Arrow Board	1	Each

PCN i5mm

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
380E5030	Nonreinforced PCC Pavement Repair	2.8	SqYd
380E6110	Insert Steel Bar in PCC Pavement	6	Each
634E0010	Flagging	20.0	Hour
634E0110	Traffic Control Signs	68.5	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0310	Temporary Flexible Vertical Markers (Tabs)	320	Ft
634E0420	Type C Advance Warning Arrow Board	1	Each

SPECIFICATIONS

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

WORK COORDINATION NOTE

It may be necessary to coordinate lane closures with the Prime Contractor on Project NH-PS 0044(00)44, PCN 04TG and NH 0016(00)68, PCN 05JH when working on US 16/Mt. Rushmore Road and SD44/Omaha Street due to sequence limitations on those projects for pedestrian detours.

SEQUENCE OF OPERATIONS

A sequence of operations shall be provided by the Contractor two weeks prior to the preconstruction meeting for approval by the Engineer.

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	090 W-451, etc.	2	28

ENVIRONMENTAL COMMITMENTS

The SDDOT is committed to protecting the environment and uses Section A 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 B4: BALD EAGLE

Bald eagles are known to occur in this area.

Action Taken/Required:

If a nest is observed within one mile of the project site, notify the Project Engineer immediately so that he/she can consult with the Environmental Office for an appropriate course of action.

COMMITMENT C: WATER SOURCE

The Contractor will not withdraw water with equipment previously used outside the State of South Dakota or previously used in aquatic invasive species waters within South Dakota without prior approval from the SDDOT Environmental Office. Thoroughly wash all construction equipment to prevent and control the introduction and spread of invasive species into the project vicinity.

Action Taken/Required:

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

Additional information and mapping of Aquatic Invasive Species in South Dakota can be accessed at: <http://sdleastwanted.com/maps/default.aspx>.

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".

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
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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

COMMITMENT I: HISTORICAL PRESERVATION OFFICE CLEARANCES

The SDDOT has obtained concurrence with the State Historical Preservation Office (SHPO or THPO) for all work included within the project limits and all department designated sources and designated option material sources, stockpile sites, storage areas, and waste sites provided within the plans.

Action Taken/Required:

All earth disturbing activities not designated within the plans require 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.

SHPO/THPO review does not relieve the Contractor of the responsibility for obtaining any additional permits and clearances for Contractor furnished material sources, material processing sites, stockpile sites, storage areas, plant sites, and waste areas that affect wetlands, threatened and endangered species, or waterways. The Contractor 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>

UTILITIES

The Contractor shall contact the involved utility companies through South Dakota One Call (1-800-781-7474) prior to starting work. It shall be the responsibility of the Contractor to coordinate work with the utility owners to avoid damage to existing facilities.

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.

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Table of Continuously ReinforcedPCC Pavement Repair - PCN i5m7								
			Width	Length	Continuously Reinforced PCC Pavement Repair	Insert Steel Bar in PCC Pavement (48" Spacing)	Cold Applied Plastic Pavement Marking, 4"	Grooving for Cold Applied Plastic Pavement Marking, 4"
HWY	MRM	Lane	(Ft)	(Ft)	(SqYd)	(Each)	(Ft)	(Ft)
I-90 WB	27.98	Centerline	6	6	4.0	4.0	6	6
	27.878	Driving Lane	6	6	4.0	4.0	6	6
	27.559	Driving Lane	6	15	10.0	5.0	15	15
	26.869	Driving Lane	14	15	23.3	9.0	30	30
	26.715	Driving Lane	14	15	23.3	9.0	30	30
	26.442	Passing Lane	6	8	5.3	4.0	8	8
	25.985	Driving Lane	6	8	5.3	4.0	8	8
	25.918	Driving Lane	6	6	4.0	4.0	6	6
	25.038	Passing Lane	6	6	4.0	4.0	6	6
	23.456	Passing Lane	6	6	4.0	4.0	6	6
	23.082	Driving Lane	6	15	10.0	5.0	15	15
	21.932	Passing Lane	6	8	5.3	4.0	8	8
	21.377	Driving Lane	6	16	10.7	6.0	16	16
	20.49	Passing Lane	6	20	13.3	6.0	20	20
	20.437	Passing Lane	6	20	13.3	6.0	20	20
	18.843	Driving Lane	6	14	9.3	5.0	14	14
Total					149.1	83.0	214.0	214.0

Table of Continuously Reinforced PCC Pavement Repair - PCN i5mc								
			Width	Length	Continuously Reinforced PCC Pavement Repair	Insert Steel Bar in PCC Pavement (48" Spacing)	Cold Applied Plastic Pavement Marking, 4"	Grooving for Cold Applied Plastic Pavement Marking, 4"
HWY	MRM	Lane	(Ft)	(Ft)	(SqYd)	(Each)	(Ft)	(Ft)
I-90 EB	20.264	Driving Lane	6	8	5.3	4.0	8	8
	20.319	Driving Lane	6	8	5.3	4.0	8	8
	20.572	Passing Lane	6	8	5.3	4.0	8	8
	25.449	Passing Lane	6	8	5.3	4.0	8	8
	26.056	Passing Lane	6	6	4.0	4.0	6	6
	26.922	Driving Lane	6	8	5.3	4.0	8	8
	26.984	Driving Lane	6	6	4.0	4.0	6	6
Total					34.5	28.0	52.0	52.0

Table of Nonreinforced PCC Pavement Repair I-90 & I-190												
		Width	Length	Nonreinforced PCC Pavement Repair	No. 5 Deformed Tie Bar	No. 9 Deformed Tie Bar	1 ¼" Bar	Insert Steel Bar in PCC Pavement	Dowel Bar	4" Concrete Sidewalk	Cold Applied Plastic Pavement Marking, 4"	Grooving for Cold Applied Plastic Pavement Marking, 4"
HWY	MRM	(Ft)	(Ft)	(SqYd)	(Each)	(Each)	(Each)	(Each)	(Each)	(SqFt)	(Ft)	(Ft)
I90 Exit 23 WB On-Ramp - i5m7	23.419	6	180	120.0	45	6	6	57	54		180	180
I90 Exit 61 EB Ramps - i5mc	23.58	6	72	48.0	29	6	6	41	24		72	72
	24.05	6	72	48.0	29	6	6	41	24		72	72
			Total	96.0	58.0	12.0	12.0	82.0	48.0		144.0	144.0
I-190 NB - i5mg										1360		
I-190 SB - i5mh										1394		

SD 44 Jackson Blvd Concrete Repair around Manholes - PCN i5mk										
				Width	Length	8" Nonreinforced PCC Pavement Repair	No. 9 Deformed Tie Bar	1 ¼" Bar	Insert Steel Bar in PCC Pavement	Grinding Miscellaneous Concrete
MRM	Displacement	Direction	Lane	(Ft)	(Ft)	(SqYd)	(Each)	(Each)	(Each)	(Sqft)
41	0.143	WB	PL	5	5	2.8	3	3	6	
41	0.365	WB	PL	5	5	2.8	3	3	6	
41	0.6	WB	PL	5	5	2.8	3	3	6	
41	0.452	WB	PL	5	5	2.8	3	3	6	
41	0.578	WB	PL	5	5	2.8	3	3	6	
41	0.907	WB	PL	5	5	2.8	3	3	6	
42	0.064	WB	PL	5	5	2.8	3	3	6	
42	0.7	WB	PL	5	5	2.8	3	3	6	
42	0.702	WB	LL	5	5	2.8	3	3	6	
42	0.828	EB	PL	5	5	2.8	3	3	6	
43	0.21	EB	PL	5	5	2.8	3	3	6	
43	0.293	EB	PL	5	5	2.8	3	3	6	
43	0.379	EB	PL	5	5	2.8	3	3	6	
NE Quadrant, Intersection of Jackson Blvd and Canyon Lake Dr.				5	15					75
Total						36.4	39	39	78	75

SD 44 Omaha Street Concrete Repair around Manholes - PCN i5ml & i5mm									
						8" Nonreinforced PCC Pavement Repair	No. 9 Deformed Tie Bar	1 ¼" Bar	Insert Steel Bar in PCC Pavement
PCN	MRM	Displacement	Location	(Ft)	(Ft)	(SqYd)	(Each)	(Each)	(Each)
i5mL	45	0.620	WB	5	5	2.8	3	3	6
i5mm	45	0.155	EB	5	5	2.8	3	3	6

US 16 Mt. Rushmore Road Concrete Repair Adjacent to Manholes - PCN i5mj									
						9.5" Nonreinforced PCC Pavement Repair	No. 9 Deformed Tie Bar	1 ¼" Bar	Insert Steel Bar in PCC Pavement
Location	Direction	Lane	Width (Ft)	Length (Ft)		(SqYd)	(Each)	(Each)	(Each)
Columbus St./Mt. Rushmore Rd	SB	PL	5	5		2.8	3	3	6
South St./Mt. Rushmore Rd	SB	PL	5	5		2.8	3	3	6
In front of BH Bagels/Mt. Rushmore Rd	SB	PL	5	5		2.8	3	3	6
Qunincy St./Mt. Rushmore Rd	SB	PL	5	5		2.8	3	3	6
Columbus St./Mt. Rushmore Rd	SB	DL	5	5		2.8	3	3	6
Total						14.0	15	15	30

EXISTING PCC PAVEMENT

The existing pavement from I90 EB MRM 20.624 to MRM 26.984 and from I90 WB MRM 18.843 to MRM 27.980, is 10” Continuously Reinforced PCC Pavement with limestone aggregate. The longitudinal steel is a #6 deformed steel bar spaced 6” center to center. The transverse steel is a #4 deformed steel bar spaced 48” center to center.

The existing pavement on US Highway 16, Mt Rushmore Road, is 10” Nonreinforced PCC Pavement with limestone aggregate.

The existing pavement on SD Highway 44, Omaha Street, is 9.5” Nonreinforced PCC Pavement with limestone aggregate.

The existing pavement on SD Highway 44, Jackson Boulevard, is 9.5” Nonreinforced PCC Pavement with limestone aggregate.

RESTORATION OF GRAVEL CUSHION

An inspection of the gravel cushion subgrade shall be made after removing concrete from the pavement replacement area. Areas of excess moisture shall be dried to the satisfaction of the Engineer, although excess moisture is not anticipated. Loose and excess material shall be removed. Each replacement area shall be leveled and compacted to the satisfaction of the Engineer.

If additional gravel cushion material is required, the Contractor shall furnish, place and compact gravel cushion to the satisfaction of the Engineer.

All costs associated with this work shall be incidental to the contract unit price per square yard for Nonreinforced PCC Pavement Repair.

NONREINFORCED PCC PAVEMENT REPAIR

New pavement thickness shall equal existing pavement thickness.

Locations and size (length or width) of concrete repair areas are subject to change in the field, at the discretion of the Engineer. There will be no increase in the contract unit price bid for these changes. Payment will be based on the actual area replaced.

Existing concrete pavement shall be sawed full depth at the beginning and end of the PCCP repair areas. When either the beginning or end of a PCCP repair area falls close to an existing joint or crack, the PCCP repair area shall be extended to eliminate the existing joint or crack. Where possible, new working joints shall be adjacent to existing working joints.

Existing concrete pavement in the replacement areas shall be removed by the lift out method or by means that minimize damage to the base and sides of remaining in place concrete. All removed material shall be removed from within the right-of-way by the end of the workday. Damage to adjacent concrete caused by the Contractor’s operations shall be removed and replaced at the Contractor’s expense.

If the pavement replacement area is entirely on either side of the existing contraction joint, the location of one of the working joints will be at the original location.

Upon removal of the concrete, the Engineer shall inspect for existing tie bars along longitudinal joint to determine if tie bar installation will be required.

At repair locations where the new working joint is not opposite the existing working joint, the Contractor shall place a ¼ inch preformed asphalt expansion joint material along the longitudinal joint from the existing working joint to the new working joint. The expansion joint material shall meet the requirements of AASHTO M33. Cost for this material shall be incidental to the contract unit price per square yard for Nonreinforced PCC Pavement Repair.

All joints (longitudinal and transverse) through and around the repair areas shall be sawed and sealed with Hot Poured Elastic Joint Sealer.

Saw cuts that extend beyond the repair area shall be minimized and filled with Hot Pour Elastic Joint Sealant at the Contractor’s expense.

The slump requirement will be limited to 3" maximum after water reducer is added and the concrete shall contain 4.5% to 7.0% entrained air. Coarse aggregate shall be crushed ledge rock, Size No. 1, unless an alternative gradation is approved by the concrete engineer as part of the mix design submittal. The concrete mixture shall contain a minimum of 50% coarse aggregate by weight. The concrete mix shall contain at least 600 lbs. of type I, II or III cement per cubic yard. The minimum 28 day compressive strength shall be 4,000 psi. The Contractor is responsible for the mix design used. The Contractor may need to modify the mix design to meet contract time requirements on the project. The Contractor shall submit a mix design and supporting documentation for approval at least 2 weeks prior to use.

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	090 W-451, etc.	8	28

Concrete shall be cured with white pigmented curing compound (AASHTO M148, Type 2) applied as soon as practical at a rate of 125 square feet per gallon. Concrete shall be cured for a minimum of 48 hours before opening to traffic. The 48 hours is based upon a concrete surface temperature of 60 degrees Fahrenheit or higher throughout the cure period. If the concrete temperature falls below 60 degrees Fahrenheit, the cure time shall be extended or other measures shall be taken, at no additional cost to the State. In addition to the curing requirements, strength of 3,500 psi must be obtained prior to opening to traffic.

The initial contraction joint sawing shall be performed as soon practical to avoid random cracking.

All costs for performing this work including sawing and removing concrete, furnishing and placing concrete, #5 tie bars cast in place, curing, sawing and sealing joints, repairing asphalt shoulders, labor, tools and equipment shall be incidental to the contract unit price per square yard for Nonreinforced PCC Pavement Repair.

STEEL BAR INSERTION

Locations and quantities of concrete repair are subject to change in the field at the discretion of the Engineer. The Contractor will be responsible for ordering the actual quantity of steel bars necessary to complete the work.

The Contractor shall insert the steel bars (1½” x 18” epoxy coated plain round dowel bars for transverse joints and No. 5 x 24” epoxy coated deformed tie bars for longitudinal joints) into drilled holes in the existing concrete pavement. An epoxy resin adhesive must be used to anchor the steel bar in the drilled hole as per Section 380.3 C.1.

Epoxy coated deformed steel bars shall be inserted on 18 inch centers in the transverse joint. The first steel bar shall be placed a minimum of 3 inches and a maximum of 9 inches from the outside edge of the slab. Epoxy coated deformed steel bars shall be inserted on 30 inch centers in the longitudinal joint and shall be placed a minimum of 15 inches from the existing transverse contraction joint. It will be necessary to laterally adjust the location of some of the inserted steel bars when the dimensions above interfere with existing steel bar locations.

A rigid frame or mechanical device will be required to guide the drill to ensure proper horizontal and vertical alignment of the steel bars in the drilled holes.

CONTINUOUSLY REINFORCED PCC PAVEMENT REPAIR

Locations and size (length or width) of pavement repair areas are subject to change in the field, at the discretion of the Engineer, at no additional cost to the state. Payment will be based on actual area replaced.

The Engineer will mark the location of the area to be repaired on construction.

The Contractor shall saw the in place concrete transversely at four locations for each repair area. Two saw cuts shall be full depth. The other two saw cuts shall be partial depth saw cuts 2” deep and 2’ away from the full depth saw cuts. The outside partial depth cuts shall be a minimum of 6” from the nearest crack outside of the patch.

The Contractor may use Mechanical Bar Splices as per section 480 of the Specifications instead of lap splicing to reduce the amount of concrete removal required around the existing steel. All costs associated with installing Mechanical Bar Splices shall be incidental to the contract unit price per square yard Continuously Reinforced PCC Pavement Repair.

The Contractor shall lift out or break out the center section (including reinforcing steel) and then use light chipping hammers (not exceeding 15 pounds) to remove the remaining concrete at each end of the repair area, leaving 2’ of the existing reinforcing steel in place. Care shall be taken not to cut, bend or otherwise damage the in place reinforcing steel. Damage to in place reinforcing steel or to in place concrete beyond the repair area will be replaced at the Contractor’s expense, to the satisfaction of the Engineer.

Existing exposed reinforcing steel and concrete faces shall be cleaned by sandblasting and compressed air to remove dirt and debris prior to placement of concrete.

Place reinforcing steel according to the notes for Reinforcing Steel and Steel Bar Insertion.

Concrete placed adjacent to asphalt concrete shoulders shall be formed full depth to match the width of existing concrete pavement. The excavated area of the asphalt concrete shoulder adjacent to repair areas shall be filled with asphalt concrete.

Concrete shall not be placed in the repair areas before 12:00pm and should be placed in the late afternoon. Temperature of the concrete at the time of placement shall be between 50°F and 90°F. The temperature of the concrete shall be maintained above 40°F during the curing period.

Saw cuts that extend beyond the repair area shall be minimized and filled with Hot Pour Elastic Joint Sealant at the Contractor’s expense.

New pavement thickness shall be equal to existing pavement thickness.

The slump requirement will be limited to 4" maximum after water reducer is added and the concrete shall contain 4.5% to 7.0% entrained air. Coarse aggregate shall be crushed ledge rock, Size No. 1, unless an alternative gradation is approved by the concrete engineer as part of the mix design submittal. The concrete mixture shall contain a minimum of 50% coarse aggregate by weight. The concrete mix shall contain at least 600 lbs. of type I, II or III cement per cubic yard. The minimum 28 day compressive strength shall be 4,000 psi. The Contractor is responsible for the mix design used. The Contractor shall submit a mix design and supporting documentation for approval at least 2 weeks prior to use.

The use of a water reducer at manufacturer's recommended dosage will be required.

Concrete shall be cured with white pigmented curing compound (AASHTO M148, Type 2) applied as soon as practical at a rate of 125 square feet per gallon. Concrete shall be cured for a minimum of 48 hours before opening to traffic. The 48 hours is based upon a concrete surface temperature of 60 degrees Fahrenheit or higher throughout the cure period. If the concrete temperature falls below 60 degrees Fahrenheit, the cure time shall be extended or other measures shall be taken, at no additional cost to the State. In addition to the curing requirements, a strength of 3,800 psi must be obtained prior to opening to traffic.

Concrete shall be covered with suitable insulation blanket consisting of a layer of closed cell polystyrene foam protected by at least one layer of plastic. Insulation blanket shall have an R-value of at least 0.5, as rated by the manufacturer. Insulation blanket shall be left in place, except for joint sawing operations, until the 3,800 psi is attained. Insulation blanket shall be overlapped on to the existing concrete. During warmer periods of weather the use of insulation blankets maybe eliminated if the concrete temperature and strength requirements can be met.

All costs associated with this work including sawing, chipping and removing concrete, sandblasting, cleaning, furnishing and placing concrete and reinforcing steel, finishing and curing, replacing asphalt concrete shoulders, labor and equipment shall be incidental to the contract unit price per square yard for Continuously Reinforced PCC Pavement Repair.

REINFORCING STEEL

After removal of the in place concrete and any needed repair to the base material, new reinforcing steel shall be installed as per the CRC Pavement Repair details provided in these plans Area layouts for details. All costs associated with this work, furnishing reinforcing steel, ties, labor and equipment shall be incidental to the contract unit price per square yard for Continuously Reinforced PCC Pavement Repair.

GRINDING MISCELLANEOUS CONCRETE

The sidewalk ramp in the NE quadrant of the intersection of Jackson Blvd. and Canyon Lake Drive has experienced differential settlement. The sidewalk at this ramp shall be ground to re-establish smooth contours throughout the ramp.

TRAFFIC CONTROL – GENERAL NOTES

Requests to deviate from the sequence of operations shall be submitted in writing to the Engineer for review. Approval of an alternate sequence of operations will only be allowed when the proposed changes meet with the Department’s intent for traffic control and sequencing of the work. An alternate sequence shall be submitted for review a minimum of one week prior to potential implementation.

Unless otherwise stated in these plans, no work will be allowed during hours of darkness.

Existing guide, route, informational logo, regulatory, warning signs and delineation shall be temporarily reset and maintained during construction as directed by the Engineer. Removing, relocating, salvaging and resetting of the above items shall be the responsibility of the Contractor.

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	090 W-451, etc.	9	28

Non-applicable traffic control devices shall be completely covered or removed during periods of inactivity. Periods of inactivity shall be defined as no work taking place for a period of more than 2 calendar days.

All regulatory signs shall have a minimum mounting height of 5’ in rural locations, even when mounted on portable supports.

All materials and equipment shall be stored a minimum distance of 30’ from the traveled way during nonworking hours.

The Contractor shall provide installation details at the preconstruction meeting for all breakaway sign support assemblies.

All haul trucks shall be equipped with a second flashing amber light that is visible from the backside of the haul truck. The costs for the flashing amber lights shall be incidental to the various related contract bid items.

All construction operations shall be conducted in the general direction of traffic movement.

If there is a discrepancy between the traffic control plans, standard plates, and the MUTCD – whichever is more stringent shall be used, as determined by the Engineer.

Temporary Flexible Vertical Markers (Tabs) shall be used for lane closure tapers or lane shift tapers and shall be installed at 5' spacing. Tabs used for tapers and shifts will not be measured for payment. All costs associated to furnish, install, maintain (including replacement as required by the Engineer at no added cost to the Department), and remove all markers will be incidental to the contract lump sum price for Traffic Control, Miscellaneous.

TRAFFIC CONTROL FOR PCCP REPAIR

Each mainline concrete repair location, from which the in-place concrete has been removed, will be marked with a minimum of two reflectorized drums. In areas containing numerous concrete repair locations, two reflectorized drums should be installed at a spacing of 660 feet alternating with the Type 3 Barricades.

Construction workspaces on divided roadways will be limited to 5 miles in length. Construction workspaces on undivided roadways will be limited to 1000 feet in length. The distance between the closest points of any two construction workspaces, including channeling devices, will not be less than 3 miles. Drivers in two-way traffic workspaces must be able to see approaching traffic through and beyond the work zone.

Construction workspaces in urban areas will be limited to 3 blocks in length. The minimum distance between workspaces will be 3 blocks.

When work is in progress within an intersection, Flaggers will be required to direct traffic.

Holes adjacent to centerline in the lane open to traffic created during removal and replacement of PCC pavement repair areas will be filled with gravel cushion material and cold-mix asphalt concrete prior to opening the lane to traffic. Gravel cushion material and cold-mix asphalt concrete will be furnished by the Contractor.

Holes in the gravel and asphalt concrete shoulders created during removal and replacement of PCC pavement repair areas will be filled with gravel cushion material and hot-mix asphalt concrete (to match the shoulder surfacing) prior to opening the lane to traffic. Gravel cushion material and hot-mix asphalt concrete will be furnished and installed by the Contractor at no additional cost to the State.

All costs for furnishing, hauling, and placing gravel cushion material and asphalt concrete will be incidental to the contract unit price per square yard for Nonreinforced PCC Pavement Repair, or Continuously Reinforced PCC Pavement Repair.

Routing traffic onto the mainline shoulders during any phase of the construction will not be allowed.

Damage to the shoulders, median, or ditch due to the Contractor's operations will be repaired by the Contractor to the satisfaction of the Engineer at no expense to the State. This includes the apparent routing of traffic onto the shoulders around the work zones.

Type B warning lights will be placed on top of FLAGGER (W20-7) symbol signs.

Joints in approaches to signalized intersections containing vehicle detector loops will not be sawed, sealed, or otherwise disturbed.

The Contractor will be required to contact the Engineer two weeks in advance so that the Region Traffic Engineer can arrange for signal timings to be adjusted to accommodate traffic when a lane is closed near a signalized intersection.

Reflectorized drums or Type 2 Barricades will be used to maintain a minimum of two-way traffic at intersecting roads or streets. The Contractor will mark and maintain alternating one-way access to businesses and residences along the project with cones, drums, or Type 1 Barricades. The Contractor will advise affected businesses before a restriction to the business is installed, as well as the anticipated duration of the restriction.

The Contractor will maintain pedestrian access at crosswalk locations. Additional traffic control devices will be used as necessary to accommodate the pedestrian traffic if work activities block an existing crosswalk.

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 shall conform to the requirements of ASTM D4956 Type IX or XI. All other traffic control signs and background colors shall conform to the requirements of ASTM D4956 Type IV.

TYPE C ADVANCE WARNING ARROW BOARD

The quantity of Type C Advance Warning Arrow Boards paid will be the most installations in place at any one time for each project regardless of the number of setups on the project.

Table of Temporary Pavement Marking					
PCN	Mainline Length of Temporary Flexible Vertical Markers (TAB)	Standard Plate	Number of Closures	Length of Temporary Flexible Vertical Markers (TAB)	Temporary Flexible Vertical Markers (TAB)
	(Ft)			(Ft)	(Ft)
i5m7	184	634.63	6	960	5944
i5mc	52	634.63	6	960	5812
i5mg		634.63	1	960	
		634.70	1	780	
		Total			1740
i5mh		634.63	1	960	
		634.70	1	780	
		Total			1740
i5mk		634.56	13	320	4160
i5mL		634.47	1	320	320
i5mm		634.47	1	320	320

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	090 W-451, etc.	10	28

INVENTORY OF TRAFFIC CONTROL DEVICES

PCN i5m7 - I-90

SIGN CODE	SIGN DESCRIPTION	EXPRESSWAY / INTERSTATE			
		NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
R2-1	SPEED LIMIT 65	3	36" x 48"	12.0	36.0
R2-1	SPEED LIMIT 45	2	36" x 48"	12.0	24.0
R2-1	SPEED LIMIT 75	1	36" x 48"	12.0	12.0
R2-6aP	FINES DOUBLE (plaque)	1	36" x 24"	6.0	6.0
W3-5	SPEED REDUCTION AHEAD (65 MPH)	2	48" x 48"	16.0	32.0
W3-5	SPEED REDUCTION AHEAD (45 MPH)	1	48" x 48"	16.0	16.0
W4-2	LEFT or RIGHT LANE ENDS (symbol)	2	48" x 48"	16.0	32.0
W20-1	ROAD WORK AHEAD	2	48" x 48"	16.0	32.0
W20-5	LEFT or RIGHT LANE CLOSED AHEAD	2	48" x 48"	16.0	32.0
W20-7	FLAGGER (symbol)	1	48" x 48"	16.0	16.0
G20-2	END ROAD WORK	1	48" x 24"	8.0	8.0
		EXPRESSWAY / INTERSTATE TRAFFIC CONTROL SIGNS SQFT			246.0

PCN i5mc – I-90

SIGN CODE	SIGN DESCRIPTION	EXPRESSWAY / INTERSTATE			
		NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
R2-1	SPEED LIMIT 65	3	36" x 48"	12.0	36.0
R2-1	SPEED LIMIT 45	2	36" x 48"	12.0	24.0
R2-1	SPEED LIMIT 75	1	36" x 48"	12.0	12.0
R2-6aP	FINES DOUBLE (plaque)	1	36" x 24"	6.0	6.0
W3-5	SPEED REDUCTION AHEAD (65 MPH)	2	48" x 48"	16.0	32.0
W3-5	SPEED REDUCTION AHEAD (45 MPH)	1	48" x 48"	16.0	16.0
W4-2	LEFT or RIGHT LANE ENDS (symbol)	2	48" x 48"	16.0	32.0
W20-1	ROAD WORK AHEAD	2	48" x 48"	16.0	32.0
W20-5	LEFT or RIGHT LANE CLOSED AHEAD	2	48" x 48"	16.0	32.0
W20-7	FLAGGER (symbol)	1	48" x 48"	16.0	16.0
G20-2	END ROAD WORK	1	48" x 24"	8.0	8.0
		EXPRESSWAY / INTERSTATE TRAFFIC CONTROL SIGNS SQFT			246.0

PCN i5mg – I-190

SIGN CODE	SIGN DESCRIPTION	EXPRESSWAY / INTERSTATE			
		NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
R2-1	SPEED LIMIT 65	3	36" x 48"	12.0	36.0
R2-1	SPEED LIMIT 45	2	36" x 48"	12.0	24.0
R2-1	SPEED LIMIT 75	1	36" x 48"	12.0	12.0
R2-6aP	FINES DOUBLE (plaque)	1	36" x 24"	6.0	6.0
W3-5	SPEED REDUCTION AHEAD (65 MPH)	2	48" x 48"	16.0	32.0
W3-5	SPEED REDUCTION AHEAD (45 MPH)	1	48" x 48"	16.0	16.0
W4-2	LEFT or RIGHT LANE ENDS (symbol)	2	48" x 48"	16.0	32.0
W4-3	ADDED LANE (symbol)	1	48" x 48"	16.0	16.0
W20-1	ROAD WORK AHEAD	5	48" x 48"	16.0	80.0
W20-5	LEFT or RIGHT LANE CLOSED AHEAD	2	48" x 48"	16.0	32.0
W20-7	FLAGGER (symbol)	1	48" x 48"	16.0	16.0
G20-2	END ROAD WORK	1	48" x 24"	8.0	8.0
		EXPRESSWAY / INTERSTATE TRAFFIC CONTROL SIGNS SQFT			310.0

INVENTORY OF TRAFFIC CONTROL DEVICES (CONTINUED)

PCN i5mh – I-190

SIGN CODE	SIGN DESCRIPTION	EXPRESSWAY / INTERSTATE			
		NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
R2-1	SPEED LIMIT 65	3	36" x 48"	12.0	36.0
R2-1	SPEED LIMIT 45	2	36" x 48"	12.0	24.0
R2-1	SPEED LIMIT 75	1	36" x 48"	12.0	12.0
R2-6aP	FINES DOUBLE (plaque)	1	36" x 24"	6.0	6.0
W3-5	SPEED REDUCTION AHEAD (65 MPH)	2	48" x 48"	16.0	32.0
W3-5	SPEED REDUCTION AHEAD (45 MPH)	1	48" x 48"	16.0	16.0
W4-2	LEFT or RIGHT LANE ENDS (symbol)	2	48" x 48"	16.0	32.0
W4-3	ADDED LANE (symbol)	1	48" x 48"	16.0	16.0
W20-1	ROAD WORK AHEAD	5	48" x 48"	16.0	80.0
W20-5	LEFT or RIGHT LANE CLOSED AHEAD	2	48" x 48"	16.0	32.0
W20-7	FLAGGER (symbol)	1	48" x 48"	16.0	16.0
G20-2	END ROAD WORK	1	48" x 24"	8.0	8.0
		EXPRESSWAY / INTERSTATE TRAFFIC CONTROL SIGNS SQFT			310.0

PCN i5mj – US 16

SIGN CODE	SIGN DESCRIPTION	CONVENTIONAL ROAD			
		NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
R4-7	KEEP RIGHT (symbol)	4	24" x 30"	5.0	20.0
W4-2	LEFT or RIGHT LANE ENDS (symbol)	1	48" x 48"	16.0	16.0
W20-1	ROAD WORK AHEAD	5	48" x 48"	16.0	80.0
W20-7	FLAGGER (symbol)	2	48" x 48"	16.0	32.0
G20-2	END ROAD WORK	5	36" x 18"	4.5	22.5
		CONVENTIONAL ROAD TRAFFIC CONTROL SIGNS SQFT			170.5

PCN i5mk – SD 44

SIGN CODE	SIGN DESCRIPTION	CONVENTIONAL ROAD			
		NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
R9-9	SIDEWALK CLOSED	2	24" x 12"	2.0	4.0
R9-11a	SIDEWALK CLOSED (ARROW L or R) CROSS HERE	2	24" x 12"	2.0	4.0
W4-2	LEFT or RIGHT LANE ENDS (symbol)	1	48" x 48"	16.0	16.0
W9-3	CENTER LANE CLOSED AHEAD	1	48" x 48"	16.0	16.0
W20-1	ROAD WORK AHEAD	4	48" x 48"	16.0	64.0
W20-5	LEFT or RIGHT LANE CLOSED AHEAD	1	48" x 48"	16.0	16.0
W20-7	FLAGGER (symbol)	2	48" x 48"	16.0	32.0
G20-2	END ROAD WORK	2	36" x 18"	4.5	9.0
		CONVENTIONAL ROAD TRAFFIC CONTROL SIGNS SQFT			161.0

PCN i5mL – SD 44

SIGN CODE	SIGN DESCRIPTION	CONVENTIONAL ROAD			
		NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
W4-2	LEFT or RIGHT LANE ENDS (symbol)	1	48" x 48"	16.0	16.0
W20-1	ROAD WORK AHEAD	1	48" x 48"	16.0	16.0
W20-5	LEFT or RIGHT LANE CLOSED AHEAD	1	48" x 48"	16.0	16.0
W20-7	FLAGGER (symbol)	1	48" x 48"	16.0	16.0
G20-2	END ROAD WORK	1	36" x 18"	4.5	4.5
		CONVENTIONAL ROAD TRAFFIC CONTROL SIGNS SQFT			68.5

PCN i5mm – SD 44

SIGN CODE	SIGN DESCRIPTION	CONVENTIONAL ROAD			
		NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
W4-2	LEFT or RIGHT LANE ENDS (symbol)	1	48" x 48"	16.0	16.0
W20-1	ROAD WORK AHEAD	1	48" x 48"	16.0	16.0
W20-5	LEFT or RIGHT LANE CLOSED AHEAD	1	48" x 48"	16.0	16.0
W20-7	FLAGGER (symbol)	1	48" x 48"	16.0	16.0
G20-2	END ROAD WORK	1	36" x 18"	4.5	4.5
		CONVENTIONAL ROAD TRAFFIC CONTROL SIGNS SQFT			68.5

COLD APPLIED PLASTIC PAVEMENT MARKING

All materials shall be applied as per the manufacturer’s recommendations.

Cold applied plastic pavement markings shall be placed into a recessed groove on the surface.

Final locations of markings will be determined by Engineer.

GROOVING FOR COLD APPLIED PLASTIC MARKINGS

The grooving shall be completed within the following tolerance:

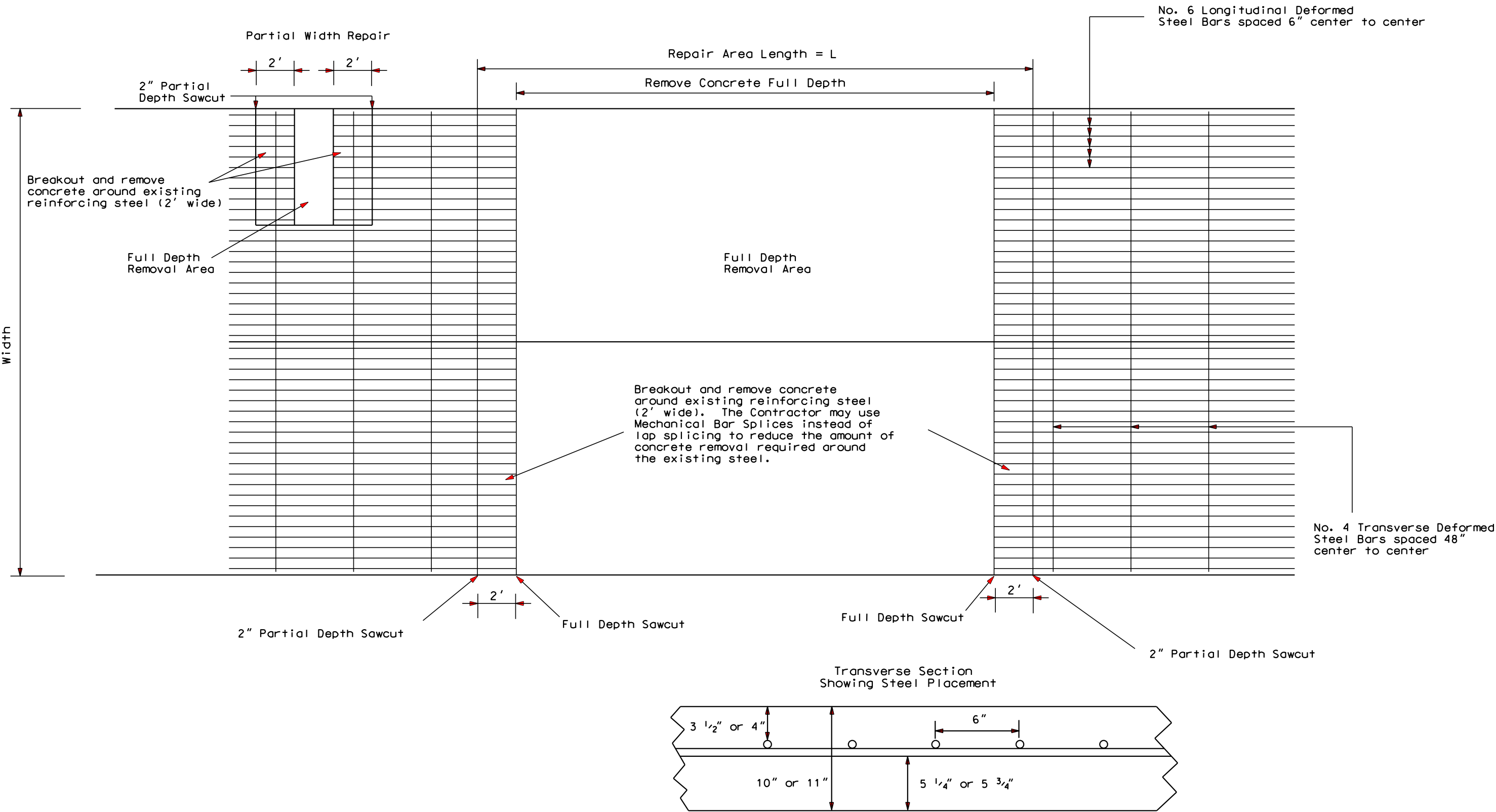
Depth of Groove: 100 mils, ± 10 mils.

The Contractor will establish a positive means for the removal of the grinding and/or grooving residue. Residue from dry grooving will be vacuumed. Solid residue will be removed from the pavement surfaces before being blown by traffic action or wind. The Contractor will conduct this work to control and minimize airborne dust and similar debris that may become a hazard to motor vehicle operation or nuisance to property owners. Residue from wet grooving will not be permitted to flow across lanes being used by public traffic or into gutter or drainage facilities. Residue, whether in solid or slurry form, will be disposed of in a manner that will prevent it from reaching any waterway in a concentrated state. All costs for removal of grinding and/or grooving residue will be included in the contract unit price per foot for Grooving for Cold Applied Plastic Pavement Marking contract

Grooving on bridge decks will not be required. The Contractor shall not damage bridge joints near any pavement marking grooving. Markings on bridge decks shall be surface applied.

CONTINUOUSLY REINFORCED PCC PAVEMENT REPAIR

Existing Pavement and Removal Limits

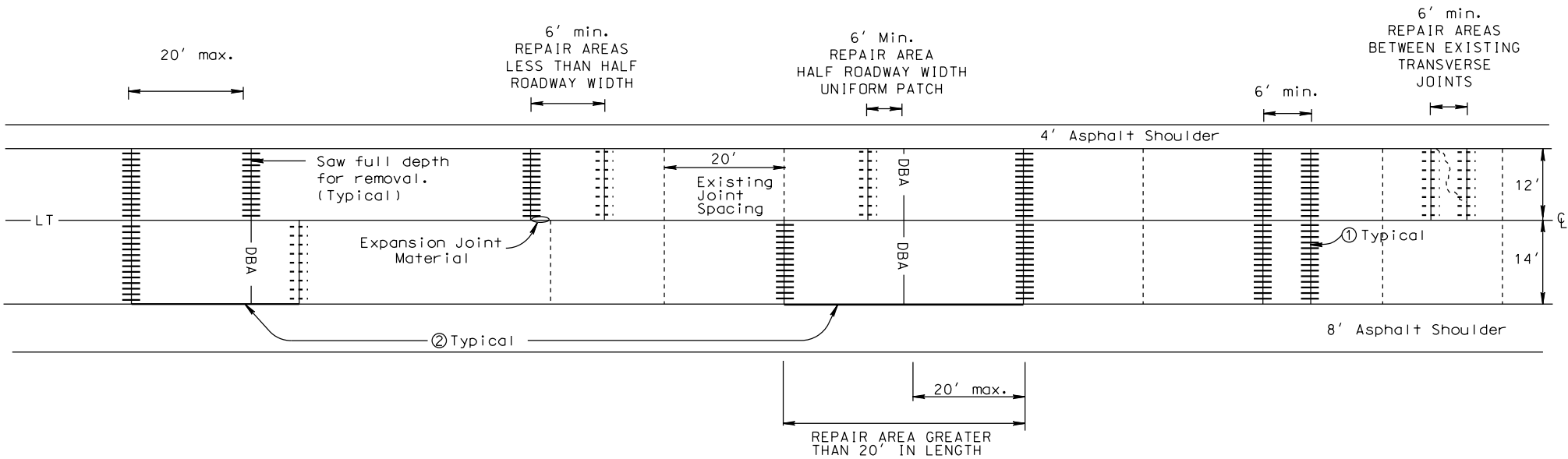


STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	090 W-451, etc.	14	28

Plotting Date: 05/02/2019

NONREINFORCED PCC PAVEMENT REPAIR

TYPICAL REPAIR AREAS



NOTES:

- ① Where possible, transverse joints shall be constructed full roadway width.
- ② All edges of repair areas that are adjacent to asphalt concrete shall be formed to match the width of the existing concrete pavement and replaced with new asphalt

Legend:

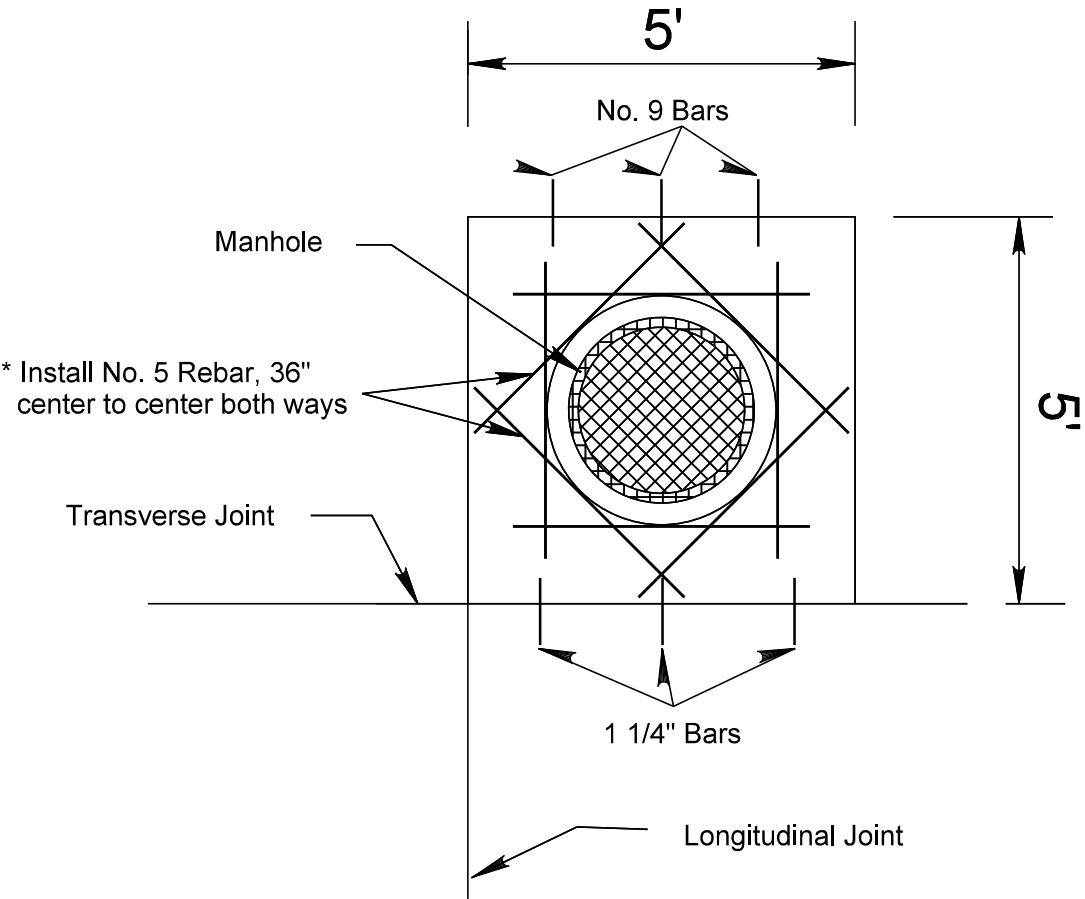
- Drilled in 1 1/4 " x 18" epoxy coated plain round dowel bar
- - - Drilled in No. 9 x 18" epoxy coated deformed tie bars
- DBA Dowel Bar Assembly (for repair areas greater than 20' in length)
- L — Longitudinal Construction Joint Without Tie Bars (Keyway Joint)
- LT — Longitudinal Construction Joint With Tie Bars (Do not tie more than 48' width of pavement)

TYPICAL MANHOLE BOX-OUT DETAILS FOR PCC PAVEMENT

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	090 W-451, etc.	15	28

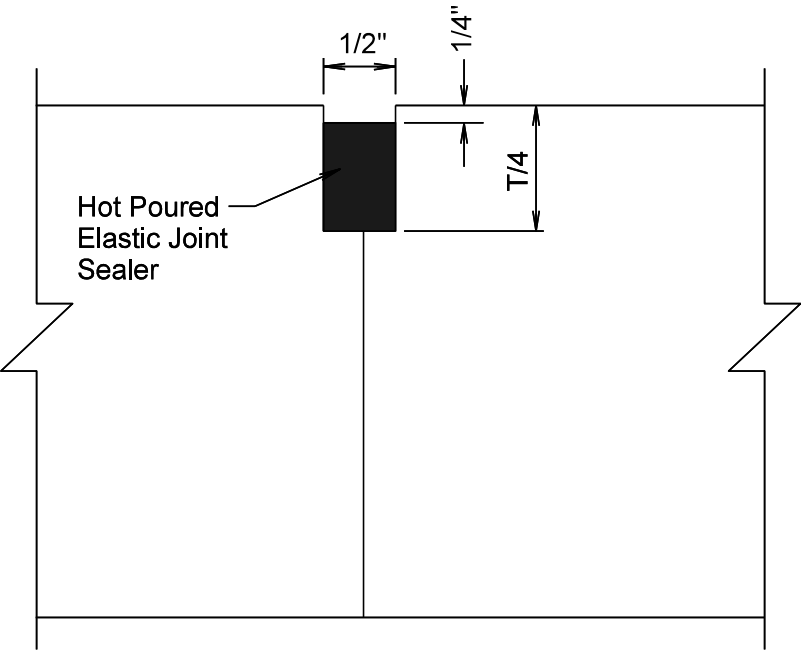
Plotting Date: 05/02/2019

REBAR LAYOUTS IN PCC PAVEMENT
WITH BOX-OUTS



Note: The rebar shall not cross any joint in the concrete pavement.
If manhole is next to a joint in the concrete pavement the
Engineer shall approve a revised layout of the rebar.

MANHOLE EXPANSION JOINT DETAIL

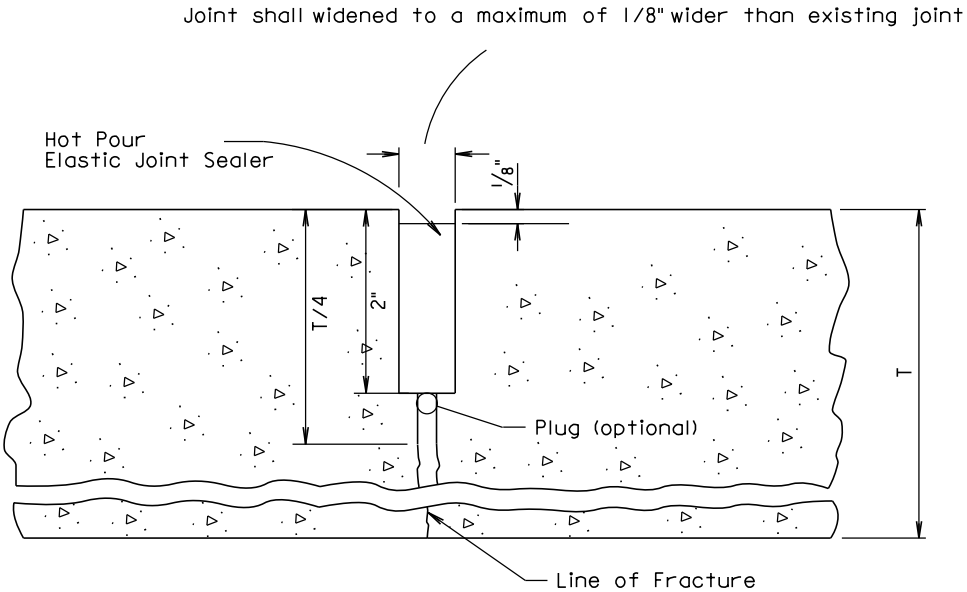


* Rebar will be placed at the midpoint depth of the PCC Pavement.
Cost for furnishing & installing rebar and constructing box-outs
shall be incidental to the contract unit price per square yard for
Nonreinforced PCC Pavement Repair

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	090 W-451, etc.	16	28

Plotting Date: 05/02/2019

RESEAL PCC PAVEMENT TRANSVERSE JOINT

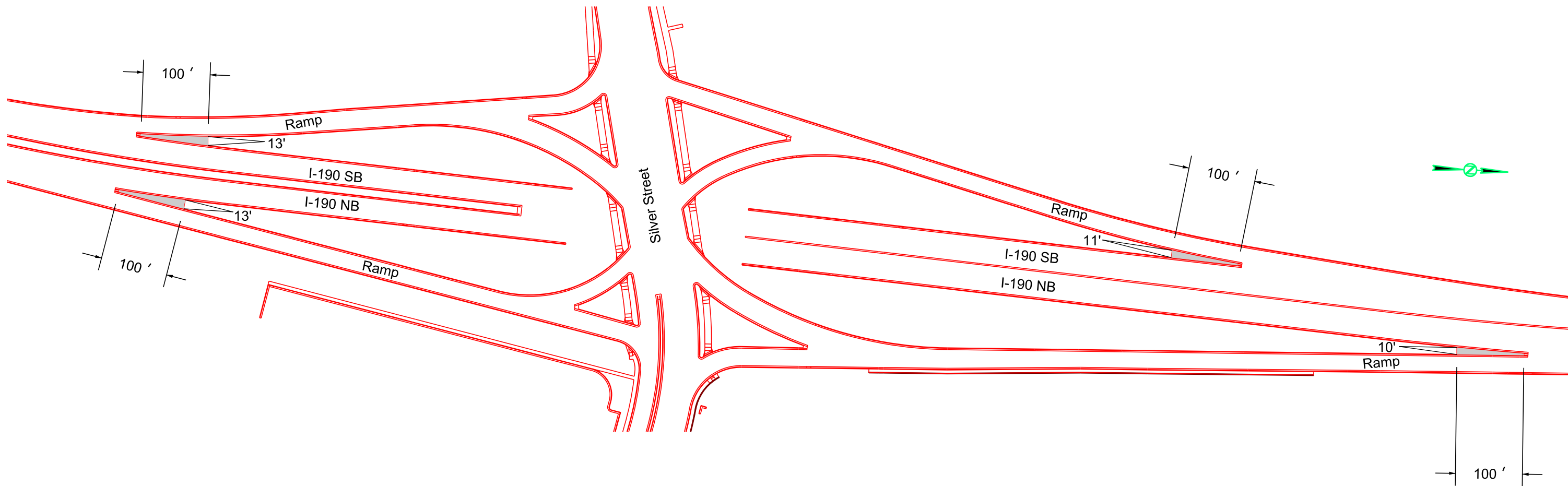


T/4 when saw cutting to control cracking.

LAYOUT FOR SIDEWALK AT I-190 SILVER STREET INTERCHANGE
PCN i5mg & i5mh

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	090 W-451, etc.	17	28

Plotting Date: 05/02/2019



A 6' minimum of clearance shall be left around existing signs.
A 4" core hole shall be placed for delineators.
This work including any removal and reset of delineators
shall be incidental to the unit price per square foot for
4" PCC Sidewalk



4" PCC Sidewalk

PLOT SCALE - 1:150

PLOTTED FROM - TRRC12608

PLOT NAME - 7

FILE - ... \DESIGN\RAMP CORE LAYOUTS.DGN

TYPICAL PAVEMENT MARKING LAYOUT

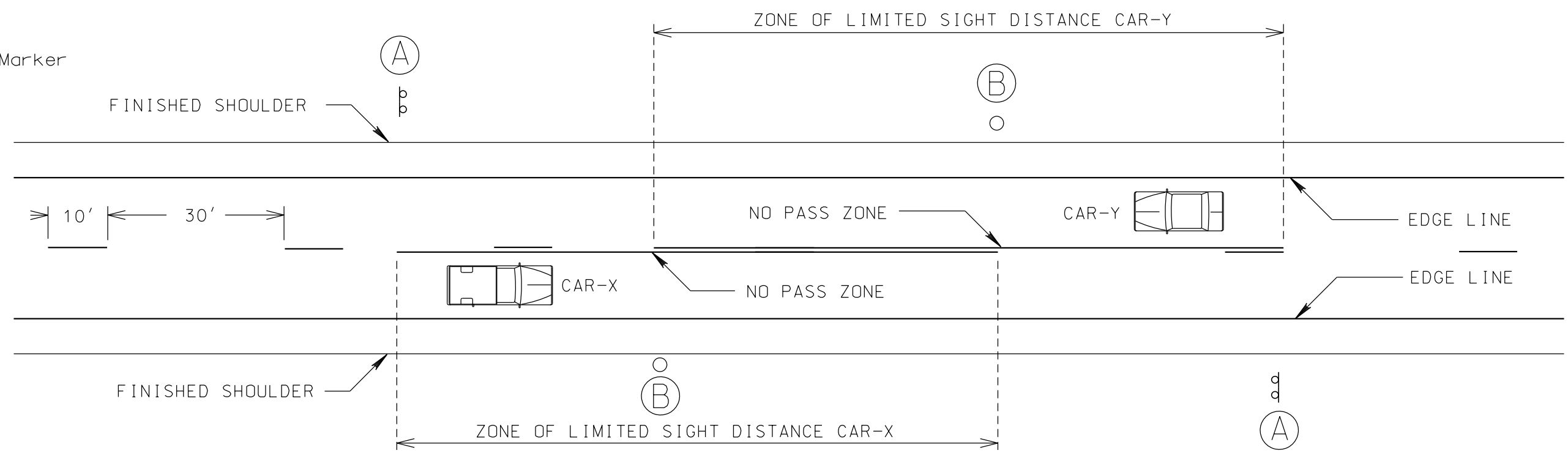
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	090 W-451, etc.	18	28

Plotting Date: 05/02/2019

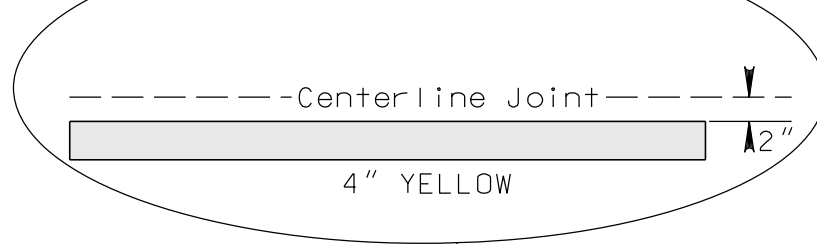
1:20
Plot Scale -
Plotted From - TRRC12608



(B) End of Zone Marker



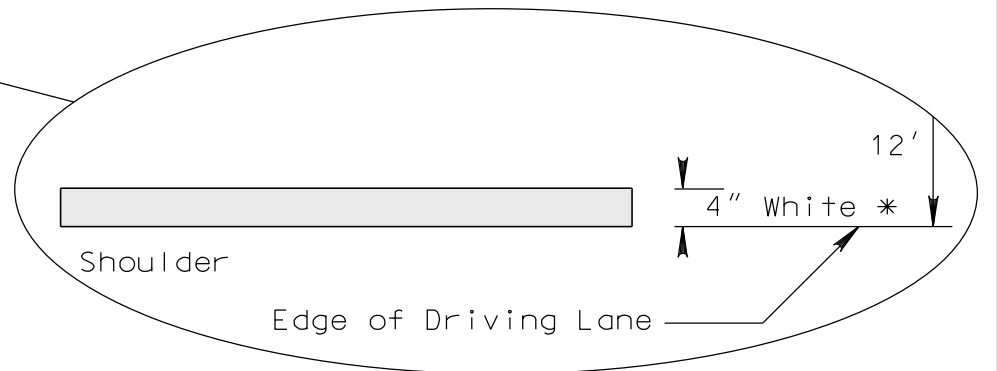
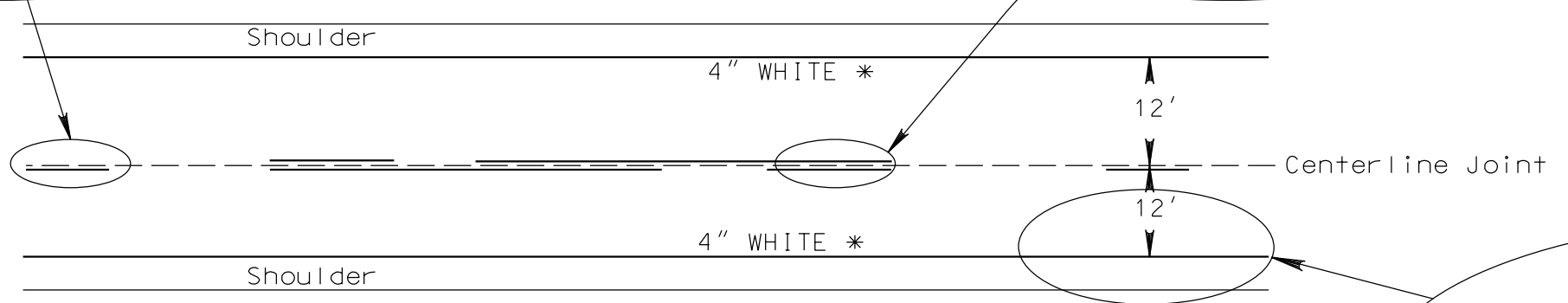
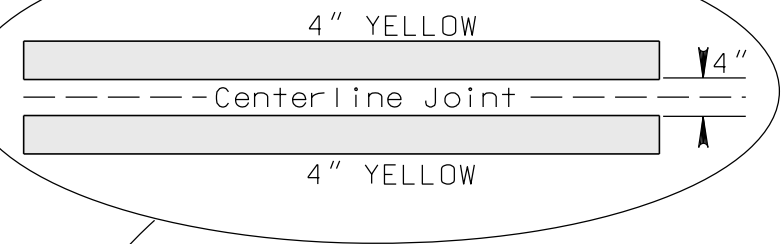
Centerline Detail



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

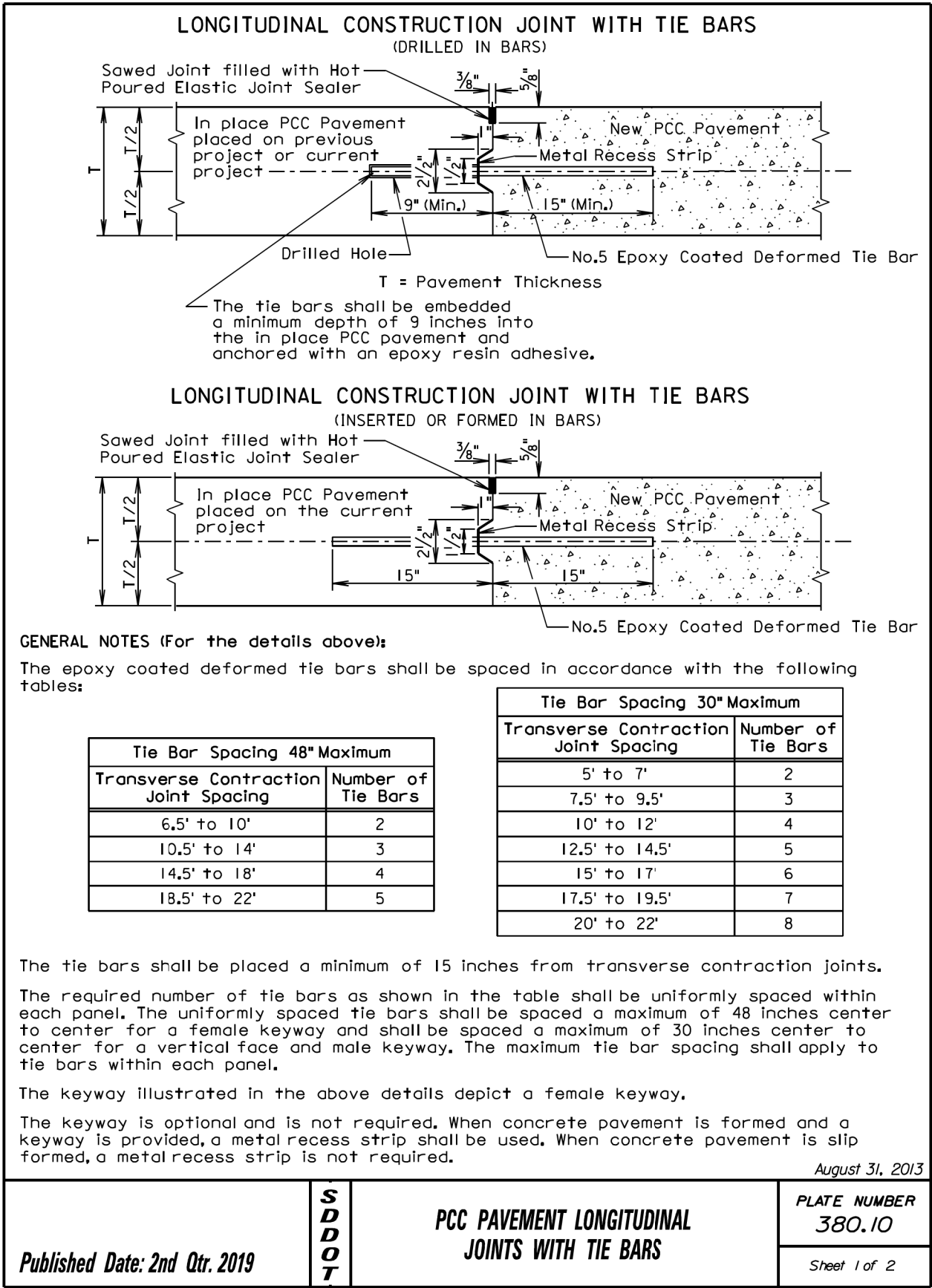
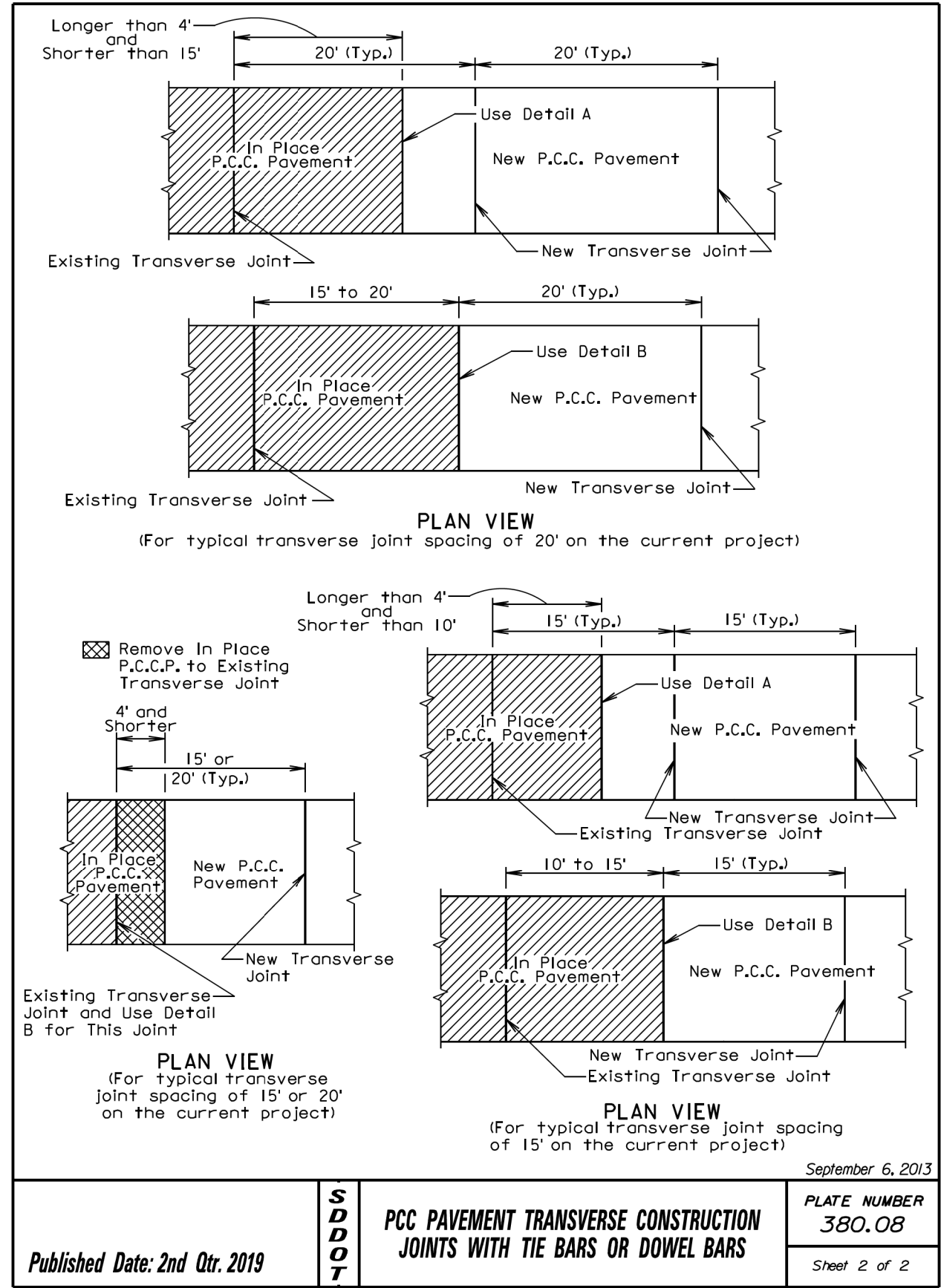
WHEN A SINGLE SKIP LINE EXISTS, THE SKIP SHALL BE PLACED TO THE SOUTH OR EAST OF THE CENTERLINE JOINT.

Centerline Detail

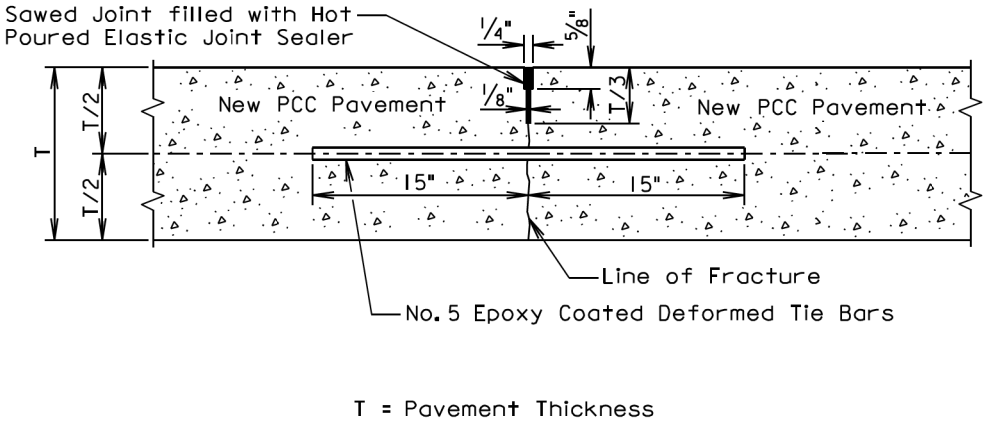


* 8" WHITE - As per locations in plans with shoulders less than 2' width.

File - ...PavementMarkingDetails.dgn



SAWED LONGITUDINAL JOINT WITH TIE BARS
(POURED MONOLITHICALLY)



GENERAL NOTES (For the detail above):
The epoxy coated deformed tie bars shall be spaced in accordance with the following table:

Tie Bar Spacing 48" Maximum	
Transverse Contraction Joint Spacing	Number of Tie Bars
6.5' to 10'	2
10.5' to 14'	3
14.5' to 18'	4
18.5' to 22'	5

The tie bars shall be placed a minimum of 15 inches from the transverse contraction joints.

The required number of tie bars as shown in the table shall be uniformly spaced within each panel with a maximum space of 48 inches center to center. The maximum tie bar spacing shall apply to tie bars within each panel.

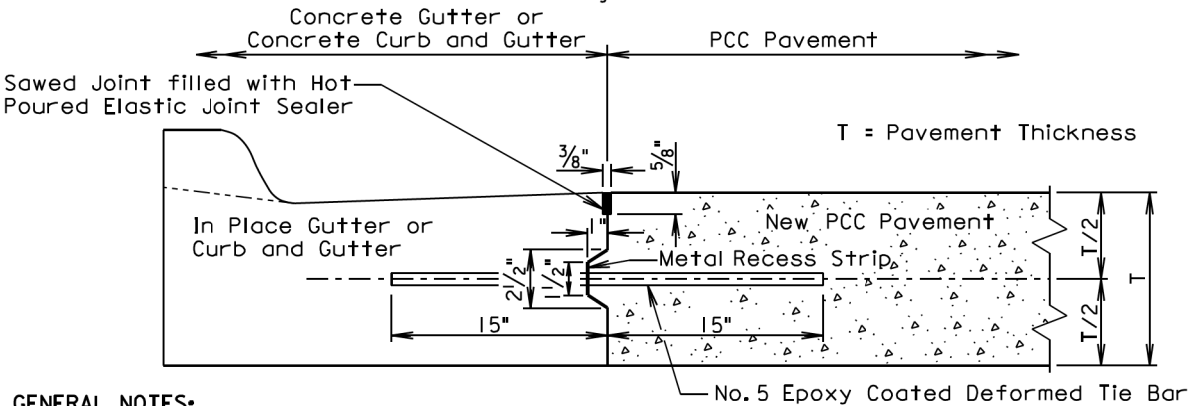
The first saw cut to control cracking shall be a minimum of 1/3 the thickness of the pavement. Additional sawing for widening the saw cut to provide the width for the installation of the hot poured elastic joint sealer is necessary.

August 31, 2013

S D D O T	PCC PAVEMENT LONGITUDINAL JOINTS WITH TIE BARS	PLATE NUMBER 380.10
		Sheet 2 of 2

Published Date: 2nd Qtr. 2019

LONGITUDINAL CONSTRUCTION JOINT WITH TIE BARS
(Individually Formed)



GENERAL NOTES:
No. 5 epoxy coated deformed tie bars shall be spaced 48 inches center to center. The keyway shown above is a female keyway.

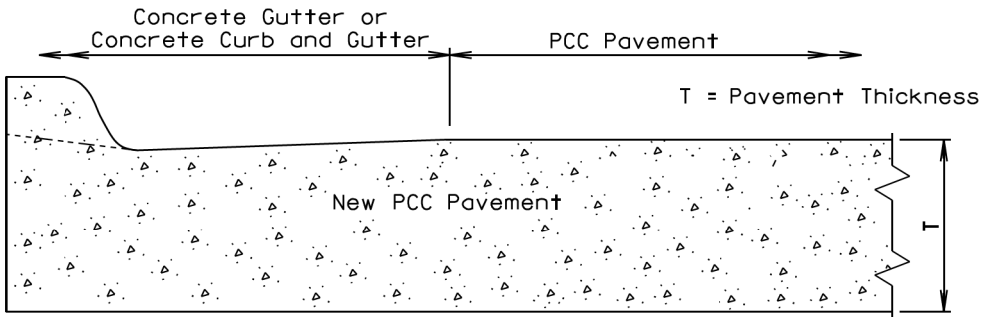
The tie bars shall be placed a minimum of 15 inches from existing transverse contraction joints.

The keyway is optional and is not required. When concrete pavement is formed and a keyway is provided, a metal recess strip shall be used. When concrete pavement is slip formed, a metal recess strip is not required.

The transverse contraction joints in the concrete gutter or concrete curb and gutter shall be placed at each mainline PCC pavement transverse contraction joint. The transverse contraction joints in the concrete gutter or the concrete curb and gutter shall be 1 1/2 inches deep if formed in fresh concrete using a suitable grooving tool. If a saw is used to cut the transverse contraction joints, then the depth of the joint shall be at least 1/4 the thickness of the concrete gutter or concrete curb and gutter.

The term "In Place Gutter or Curb and Gutter" in the above drawing indicates that the in place concrete gutter and concrete curb and gutter was placed on the current project.

POURED MONOLITHICALLY



GENERAL NOTES:
The mainline curb and gutter may be placed monolithically with the PCC pavement if the mainline lane width is less than or equal to 12 feet. If this method of construction is used, the tie bars and the sawed joint between the curb and gutter and the PCC pavement shall be eliminated.

The gutter or curb and gutter shall be sawed transversely at each mainline transverse contraction joint. The transverse contraction joints in the gutter or curb and gutter shall be sawed and sealed same as the transverse contraction joints in the PCC pavement.

The slope of the gutter shall be the slope designated for the type of gutter or curb and gutter to be constructed. The bottom slope of the gutter or curb and gutter shall be constructed at the same slope as the mainline concrete pavement.

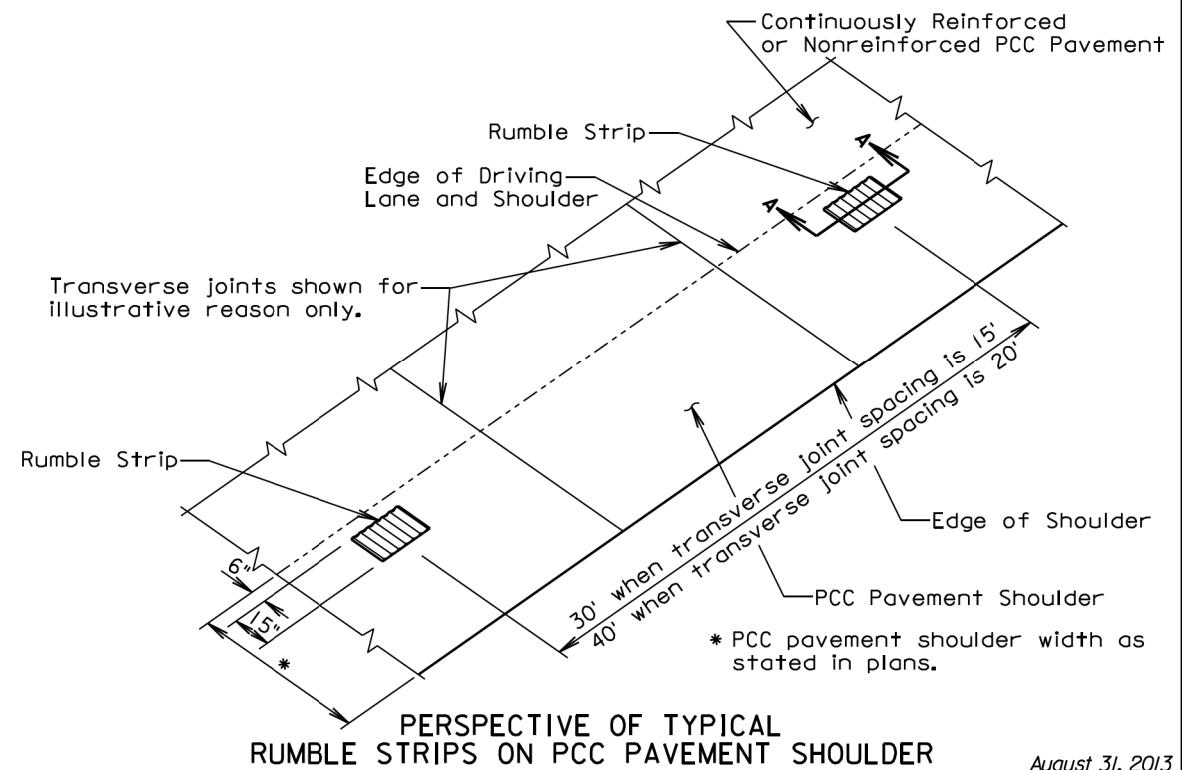
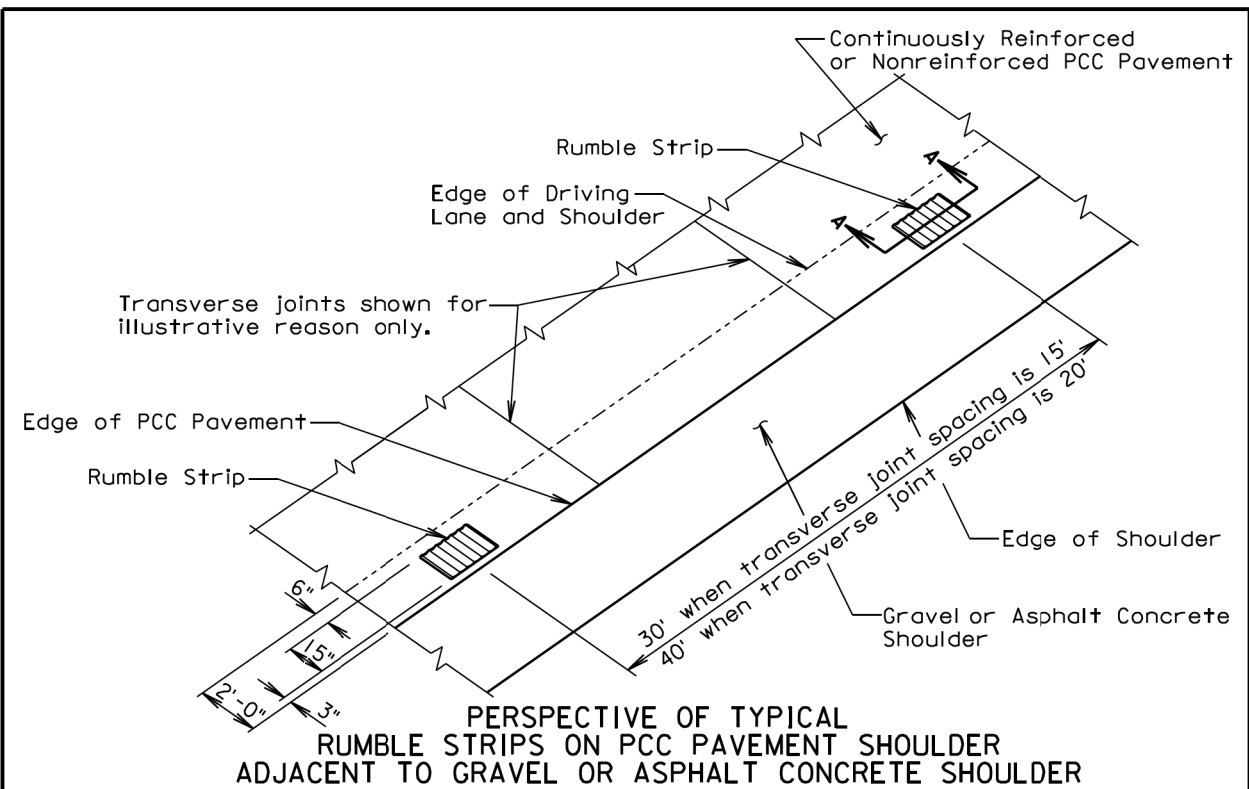
June 26, 2013

S D D O T	PCC PAVEMENT LONGITUDINAL CONSTRUCTION JOINTS WITH CONCRETE GUTTER OR CONCRETE CURB AND GUTTER	PLATE NUMBER 380.11
		Sheet 1 of 1

Published Date: 2nd Qtr. 2019

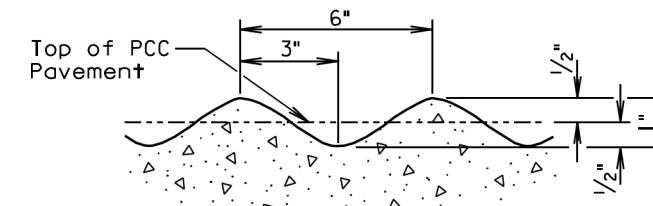
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	090 W-451, etc.	22	28

Plotting Date: 05/06/2019

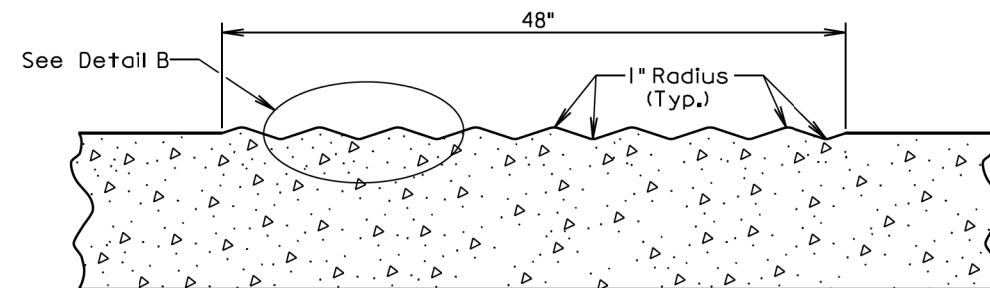


August 31, 2013

Published Date: 2nd Qtr. 2019	S D D O T	RUMBLE STRIP ON PCC PAVEMENT SHOULDER	PLATE NUMBER 380.15
			Sheet 1 of 2



DETAIL B



SECTION A-A

GENERAL NOTES:

The rumble strips shall be evenly spaced and shall not coincide with any transverse contraction joints.

The rumble strips shall NOT be placed along areas adjacent to entrance ramps, exit ramps, and gore areas.

Payment for constructing the PCC Pavement Rumble Strips shall be incidental to the contract unit price per square yard for the corresponding PCC Pavement bid item.

August 31, 2013

Published Date: 2nd Qtr. 2019	S D D O T	RUMBLE STRIP ON PCC PAVEMENT SHOULDER	PLATE NUMBER 380.15
			Sheet 2 of 2

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	090 W-451, etc.	23	28

Plotting Date: 05/02/2019

Only the traffic control devices controlling pedestrian flows are shown. Other devices may be needed to control traffic on the streets. Use lane closure signing or ROAD NARROWS signs, as needed.

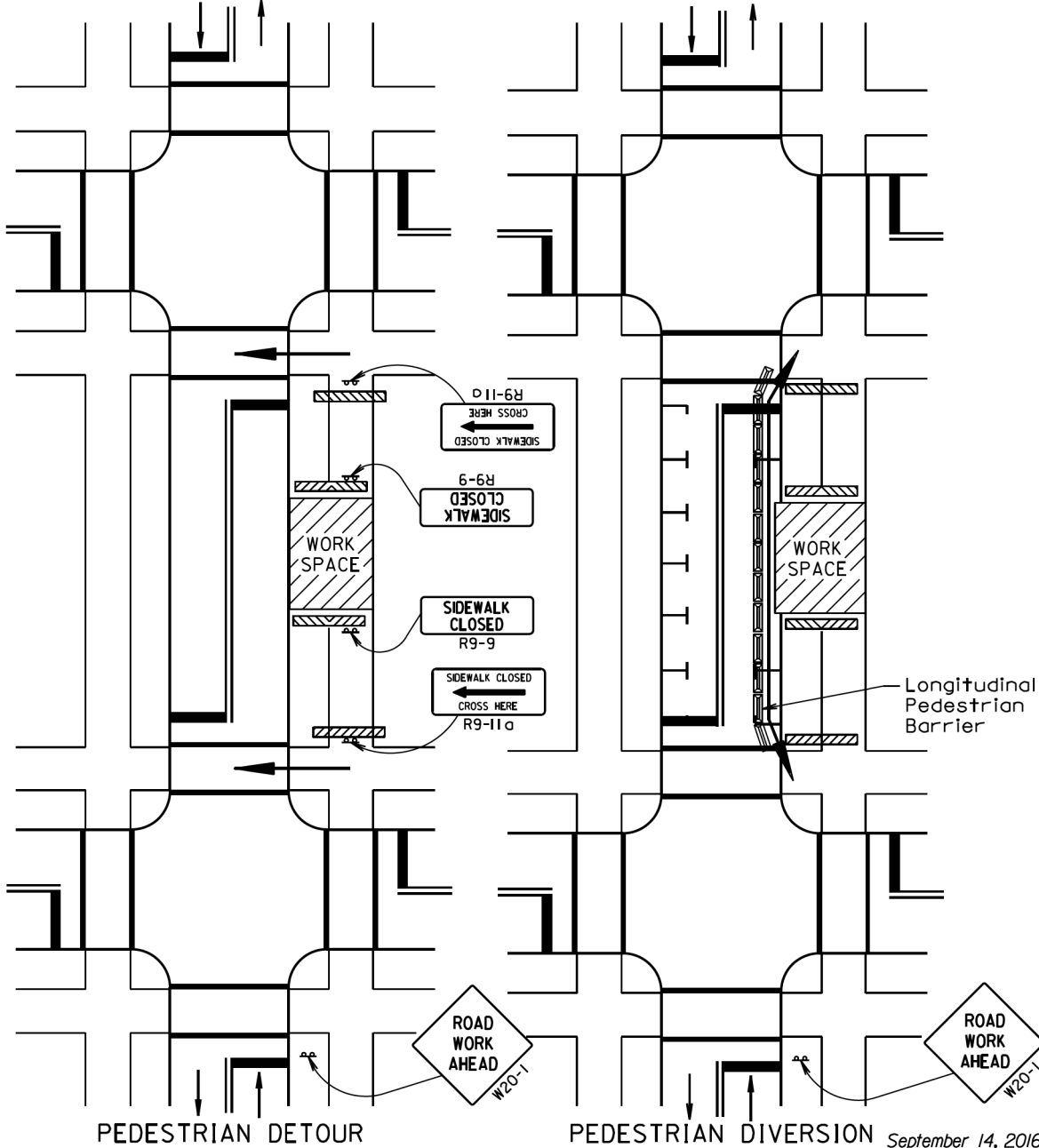
Signs may be placed along a temporary diversion to guide or direct pedestrians. Examples include KEEP RIGHT and KEEP LEFT signs.

Additional advance warning may be necessary.

For nighttime closures, Type A flashing warning lights may be used on barricades supporting signs and closing sidewalks. Type C steady-burn lights may be used on channelizing devices separating the temporary pedestrian diversion from vehicular traffic.

Street lighting should be considered.


 Longitudinal Pedestrian Barricade and 

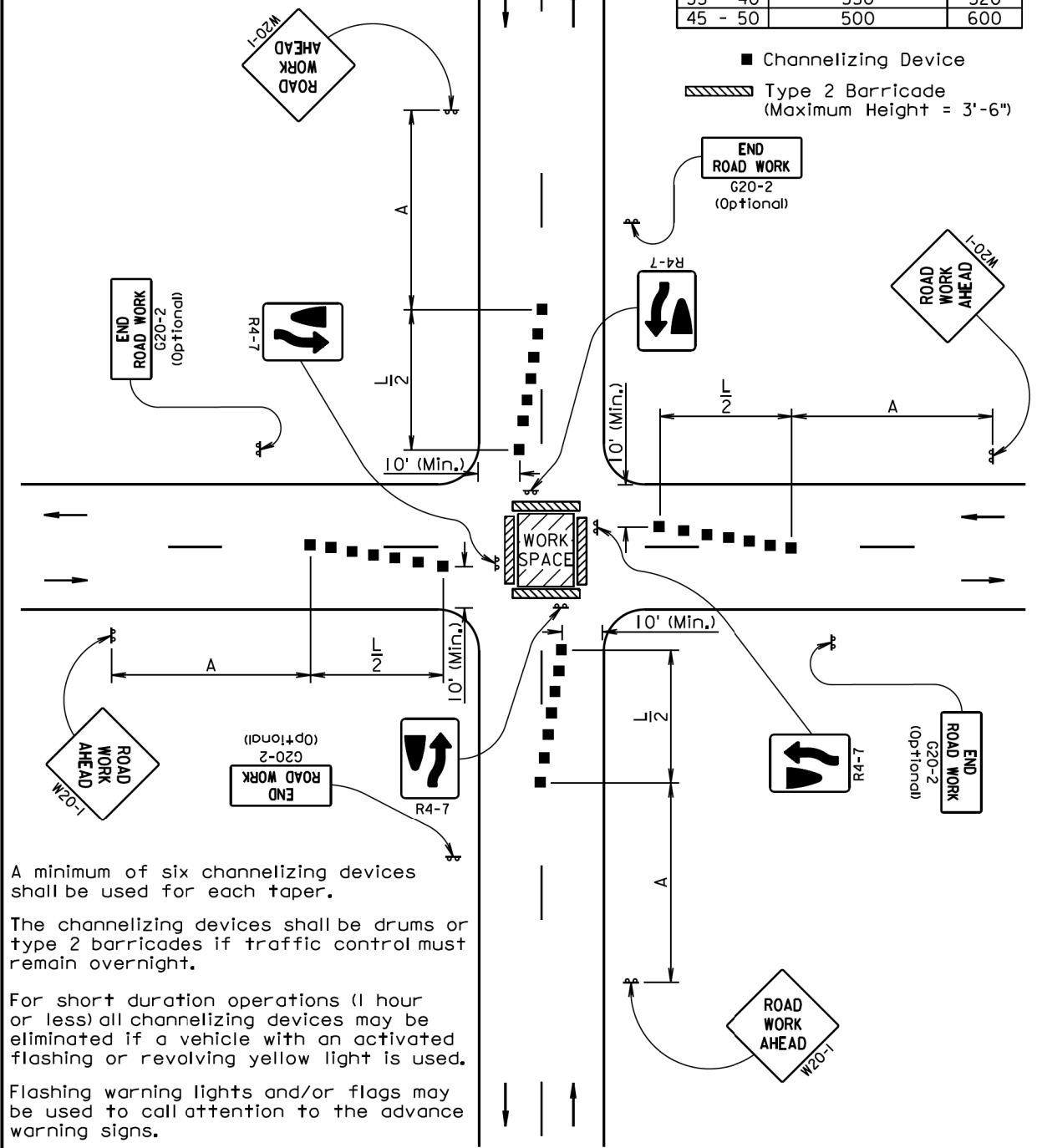


SDOT <i>Published Date: 2nd Qtr. 2019</i>	GUIDES FOR TRAFFIC CONTROL DEVICES PEDESTRIAN DETOUR AND PEDESTRIAN DIVERSION	PLATE NUMBER 634.34
		Sheet 1 of 1

Prohibit left turns as required by traffic conditions. Unless the streets are wide, it may be physically impossible to turn left, especially for large vehicles.

Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet) (A)	Taper Length (Feet) (L)
0 - 30	200	180
35 - 40	350	320
45 - 50	500	600

■ Channelizing Device
 Type 2 Barricade (Maximum Height = 3'-6")



A minimum of six channelizing devices shall be used for each taper.

The channelizing devices shall be drums or type 2 barricades 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.

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

SDOT <i>Published Date: 2nd Qtr. 2019</i>	GUIDES FOR TRAFFIC CONTROL DEVICES CLOSURE IN CENTER OF INTERSECTION	PLATE NUMBER 634.35
		Sheet 1 of 1

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 *

* Spacing is 40' for 42" cones.

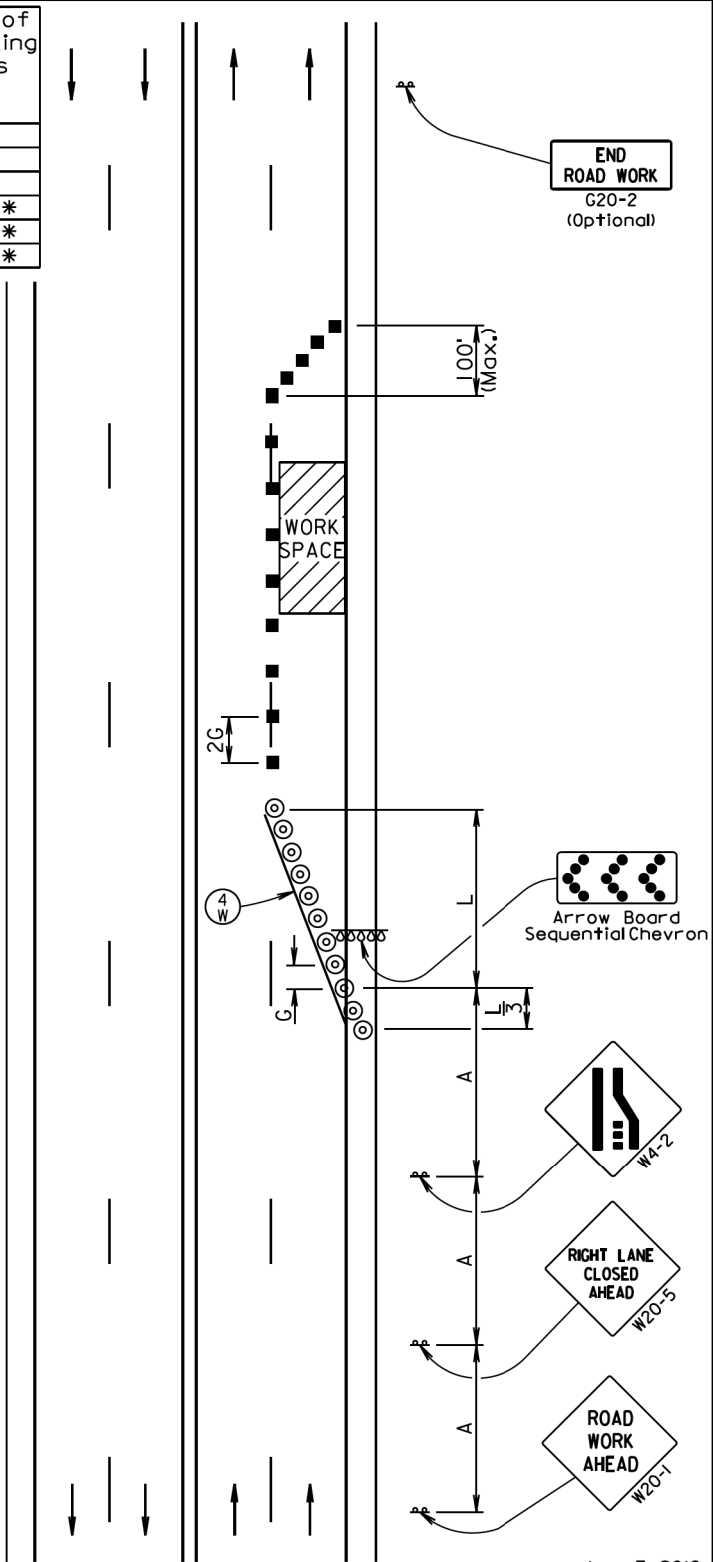
- ⊙ Reflectorized Drum
- Channelizing Device
- ④ 4" White Temporary Pavement Marking

The channelizing devices shall be 42" cones or drums.

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

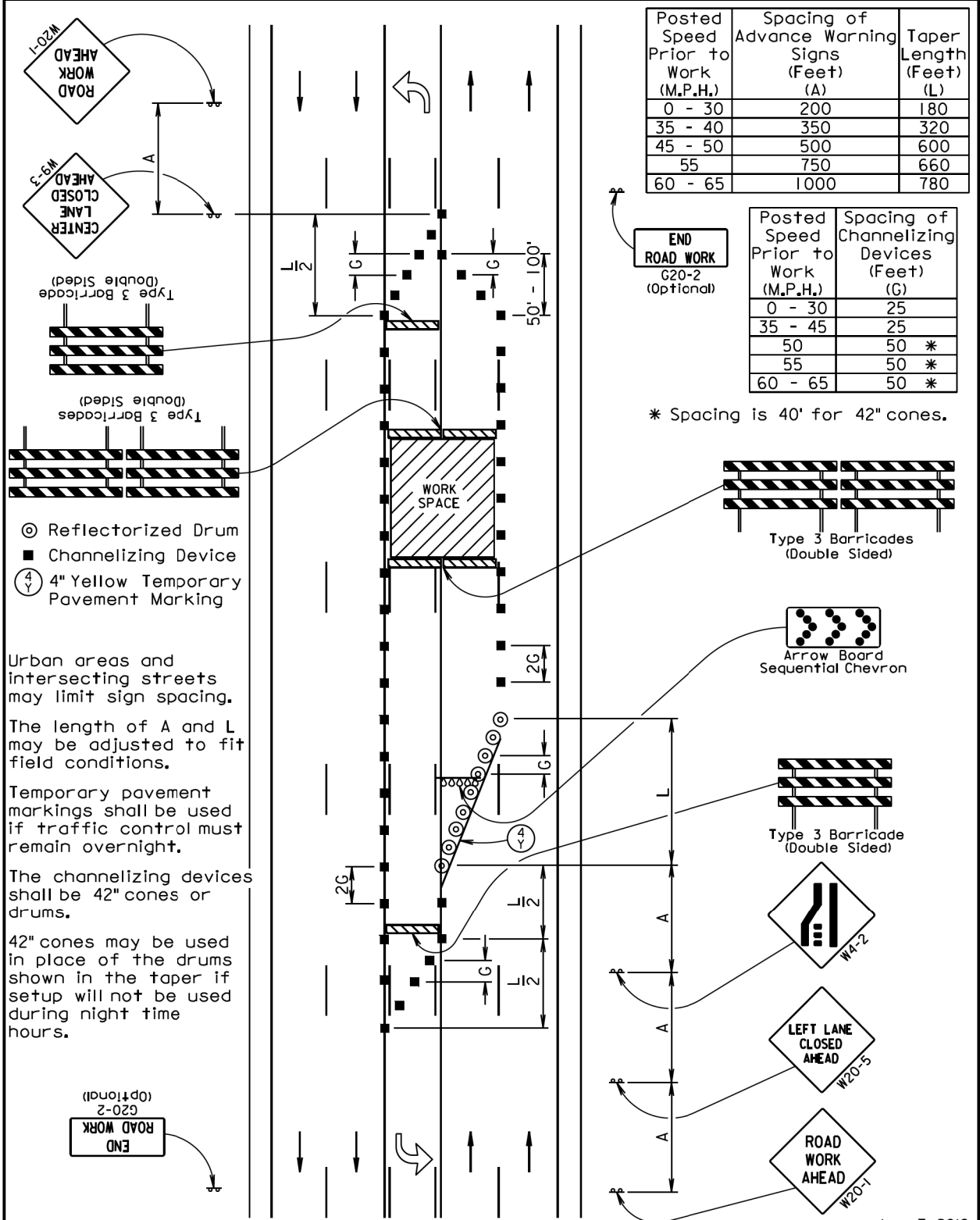
Temporary pavement markings shall be used if traffic control must remain overnight.

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



June 3, 2016

Published Date: 2nd Qtr. 2019	S D D O T	GUIDES FOR TRAFFIC CONTROL DEVICES 4-LANE UNDIVIDED, RIGHT LANE CLOSED	PLATE NUMBER 634.47
		Sheet 1 of 1	



June 3, 2016

Published Date: 2nd Qtr. 2019	S D D O T	GUIDES FOR TRAFFIC CONTROL DEVICES 5-LANE, INSIDE 2 LANES CLOSED	PLATE NUMBER 634.56
		Sheet 1 of 1	

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	090 W-451, etc.	25	28

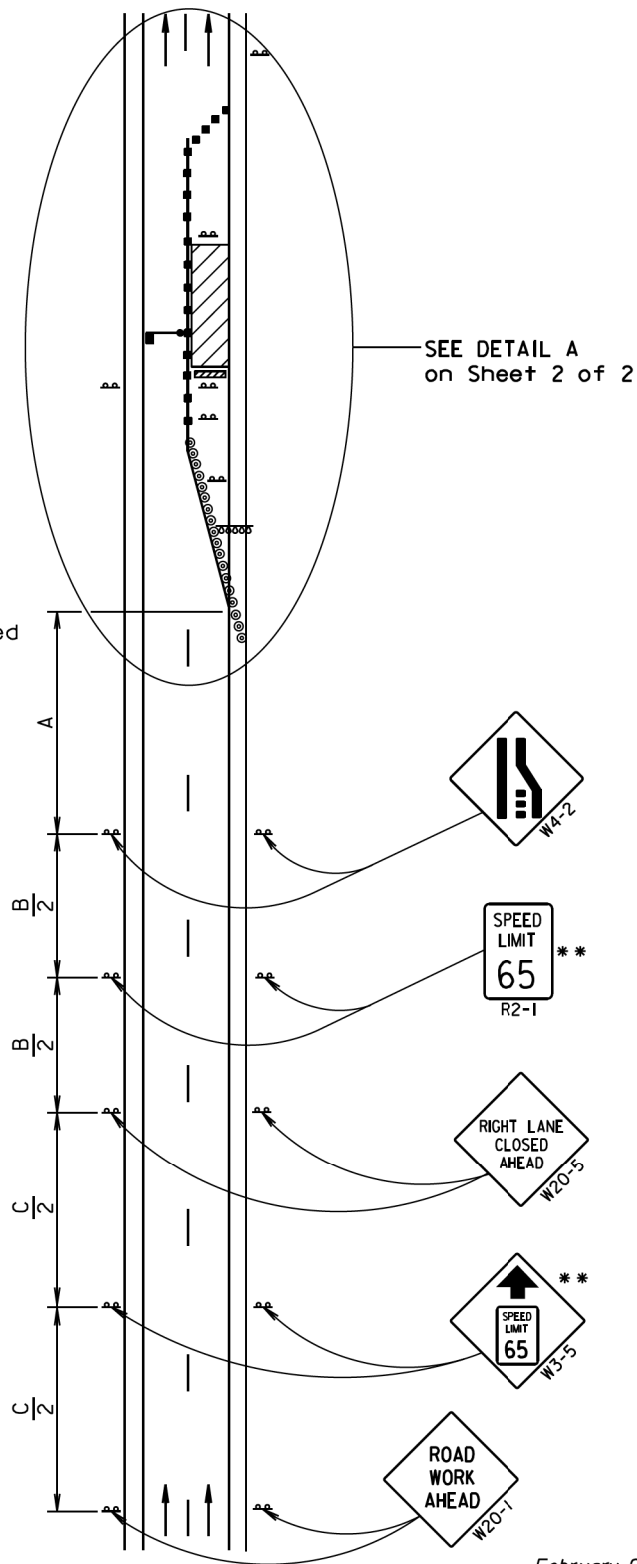
Plotting Date: 05/02/2019

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

- ** Speed appropriate for location.
 ● Reflectorized Drum
 ■ Channelizing Device

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

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



February 25, 2019

Published Date: 2nd Qtr. 2019	S D D O T	WORK ZONE SPEED REDUCTION FOR INTERSTATE AND HIGH SPEED MULTI-LANE HIGHWAYS	PLATE NUMBER 634.63
			Sheet 1 of 2

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

- * Spacing is 40' for 42" cones.
 ** Speed appropriate for location.
 *** Use speed limit designated for the condition when workers are present in the work space. Signs will be covered or removed when workers are not present.

- Flagger (As Necessary)
 ● Reflectorized Drum
 ■ Channelizing Device

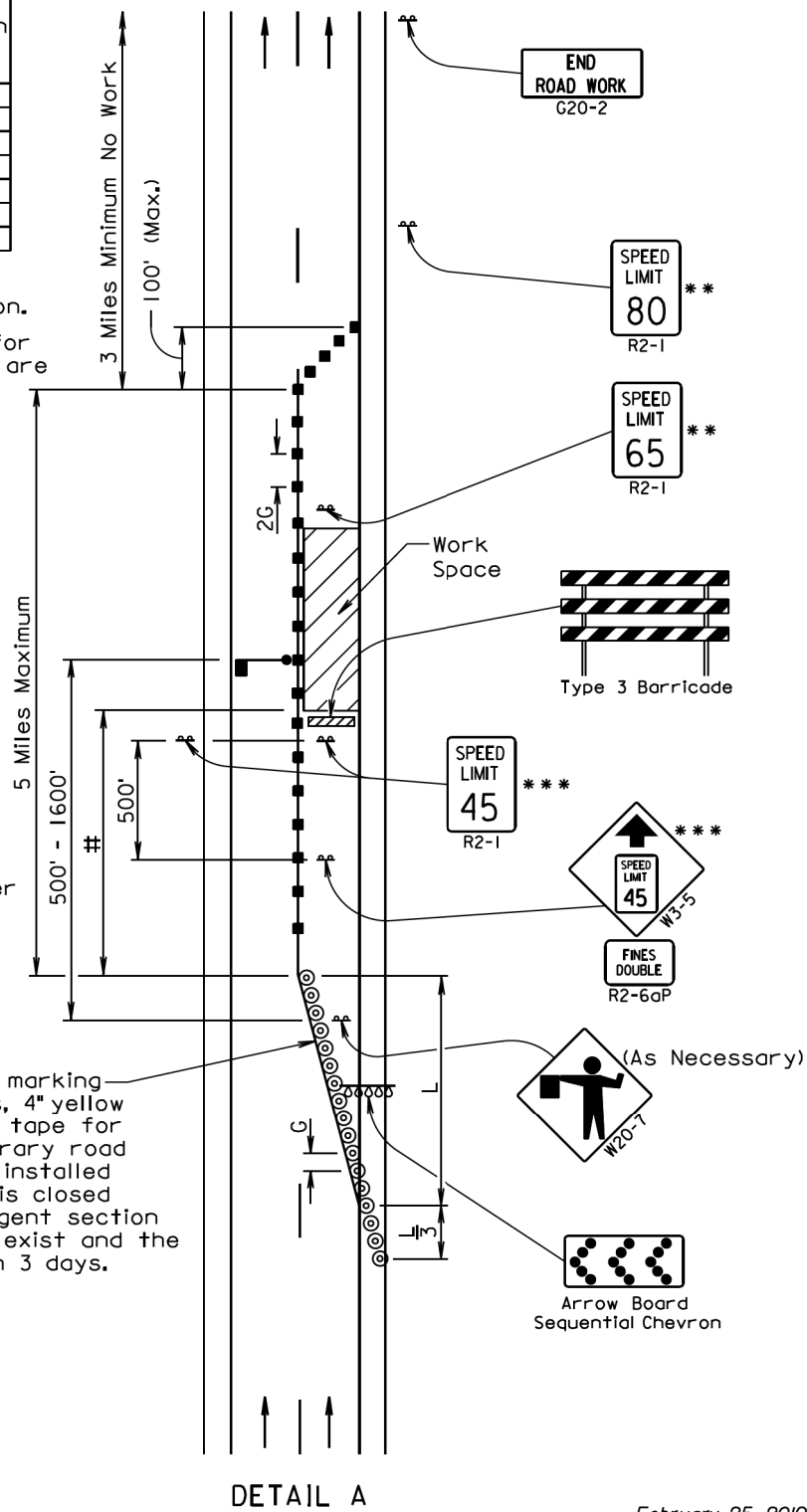
The Work Space will be a minimum of 500' from the end of the taper.

The FLAGGER sign will be used whenever there is a Flagger present.

The channelizing devices will be 42" cones or drums.

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

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

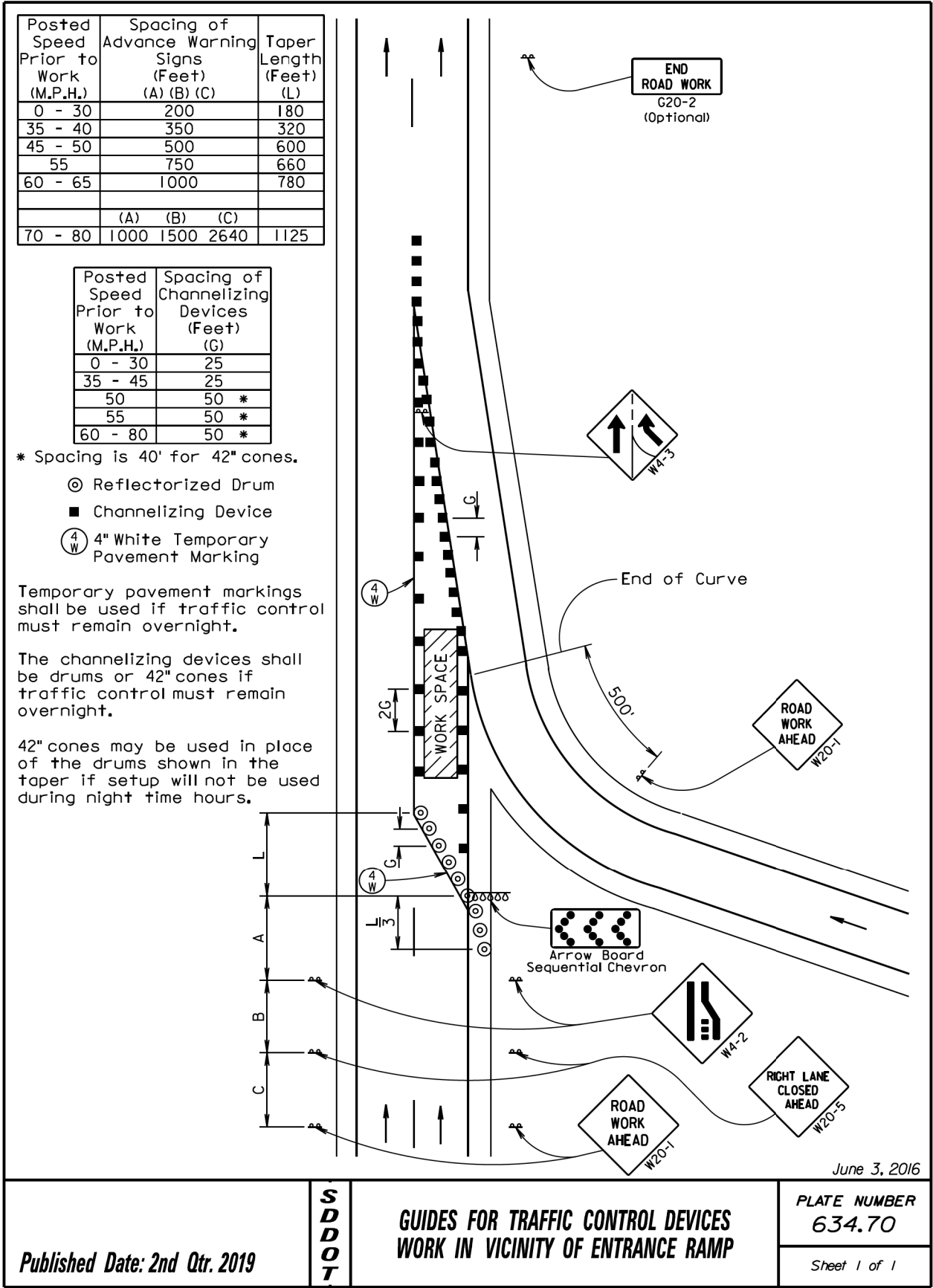


February 25, 2019

Published Date: 2nd Qtr. 2019	S D D O T	WORK ZONE SPEED REDUCTION FOR INTERSTATE AND HIGH SPEED MULTI-LANE HIGHWAYS	PLATE NUMBER 634.63
			Sheet 2 of 2

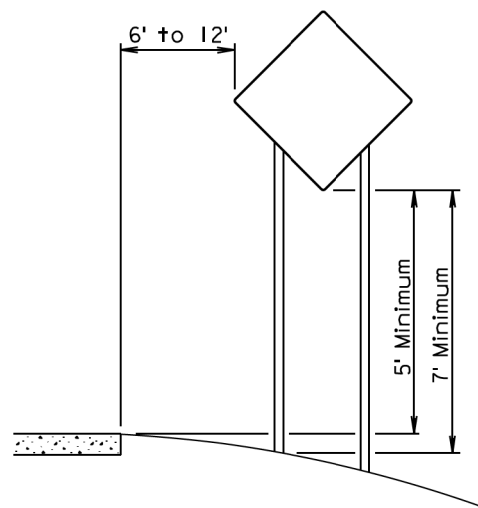
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	090 W-451, etc.	26	28

Plotting Date: 05/02/2019

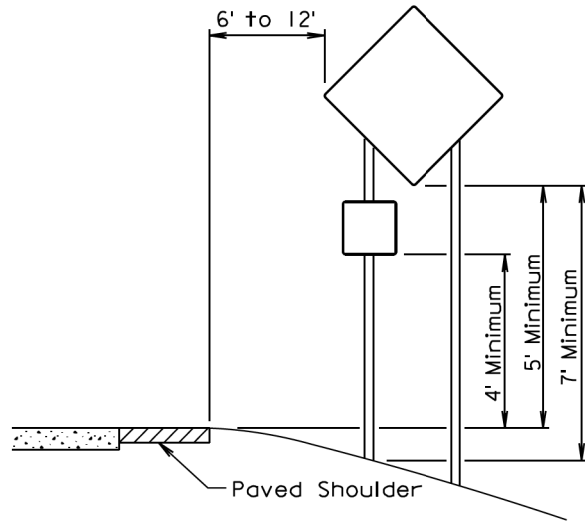


STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	090 W-451, etc.	27	28

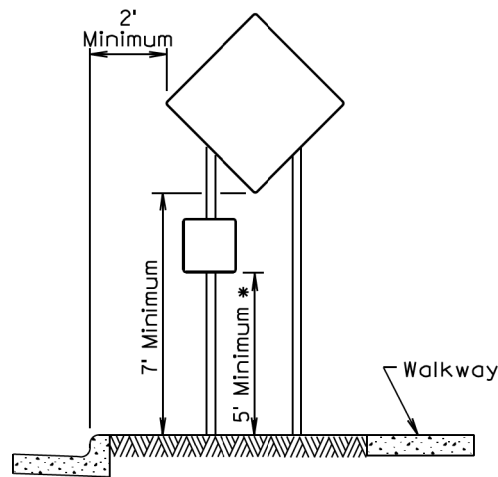
Plotting Date: 05/02/2019



RURAL DISTRICT

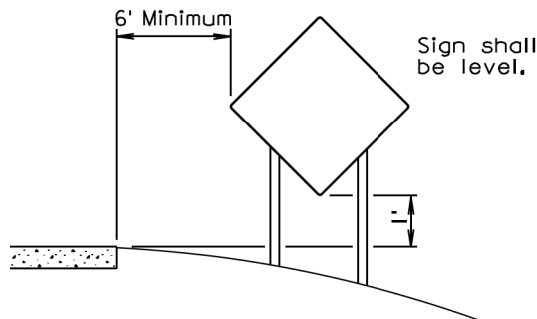


RURAL DISTRICT WITH
SUPPLEMENTAL PLATE



URBAN DISTRICT

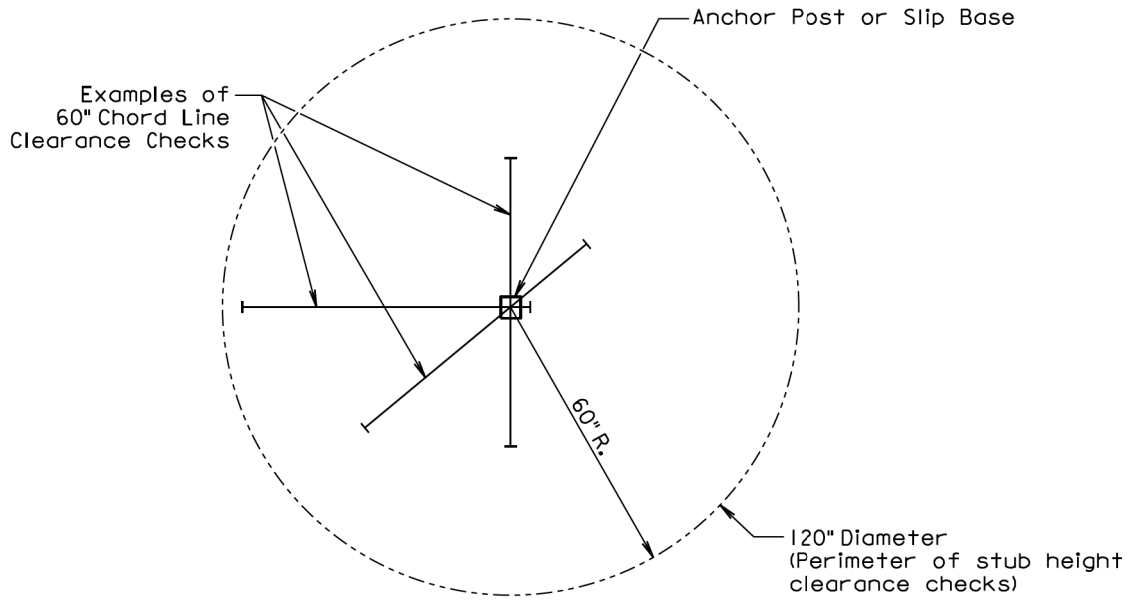
* If the bottom of supplemental plate is mounted lower than 7 feet above a pedestrian walkway, the supplemental plate should not project more than 4" into the pedestrian facility.



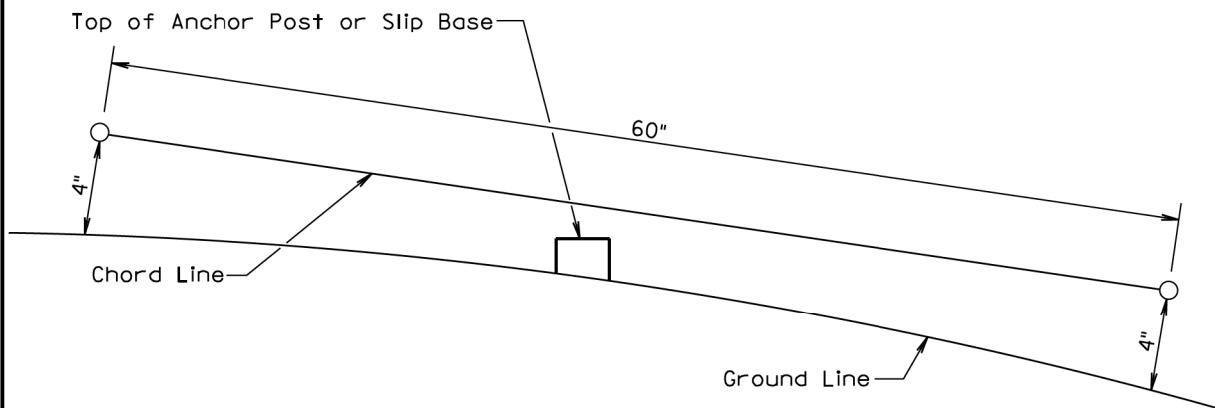
RURAL DISTRICT
3 DAY MAXIMUM
(Not applicable to regulatory signs)

September 22, 2014

Published Date: 2nd Qtr. 2019	S D D O T	CRASHWORTHY SIGN SUPPORTS (Typical Construction Signing)	PLATE NUMBER 634.85
			Sheet 1 of 1



PLAN VIEW
(Examples of stub height clearance checks)



ELEVATION VIEW

GENERAL NOTES:

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

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

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

July 1, 2005

Published Date: 2nd Qtr. 2019	S D D O T	BREAKAWAY SUPPORT STUB CLEARANCE	PLATE NUMBER 634.99
			Sheet 1 of 1

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	090 W-451, etc.	28	28

Plotting Date: 05/02/2019

