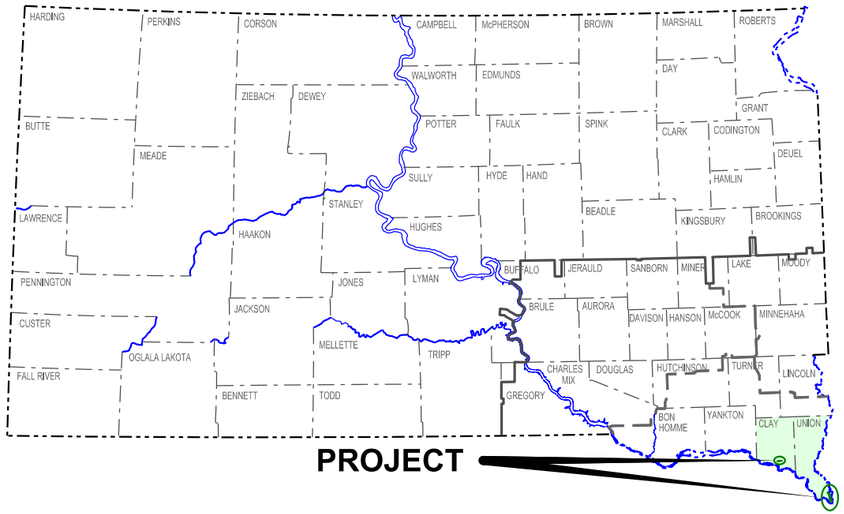
PLOT SCALE - 1:70000



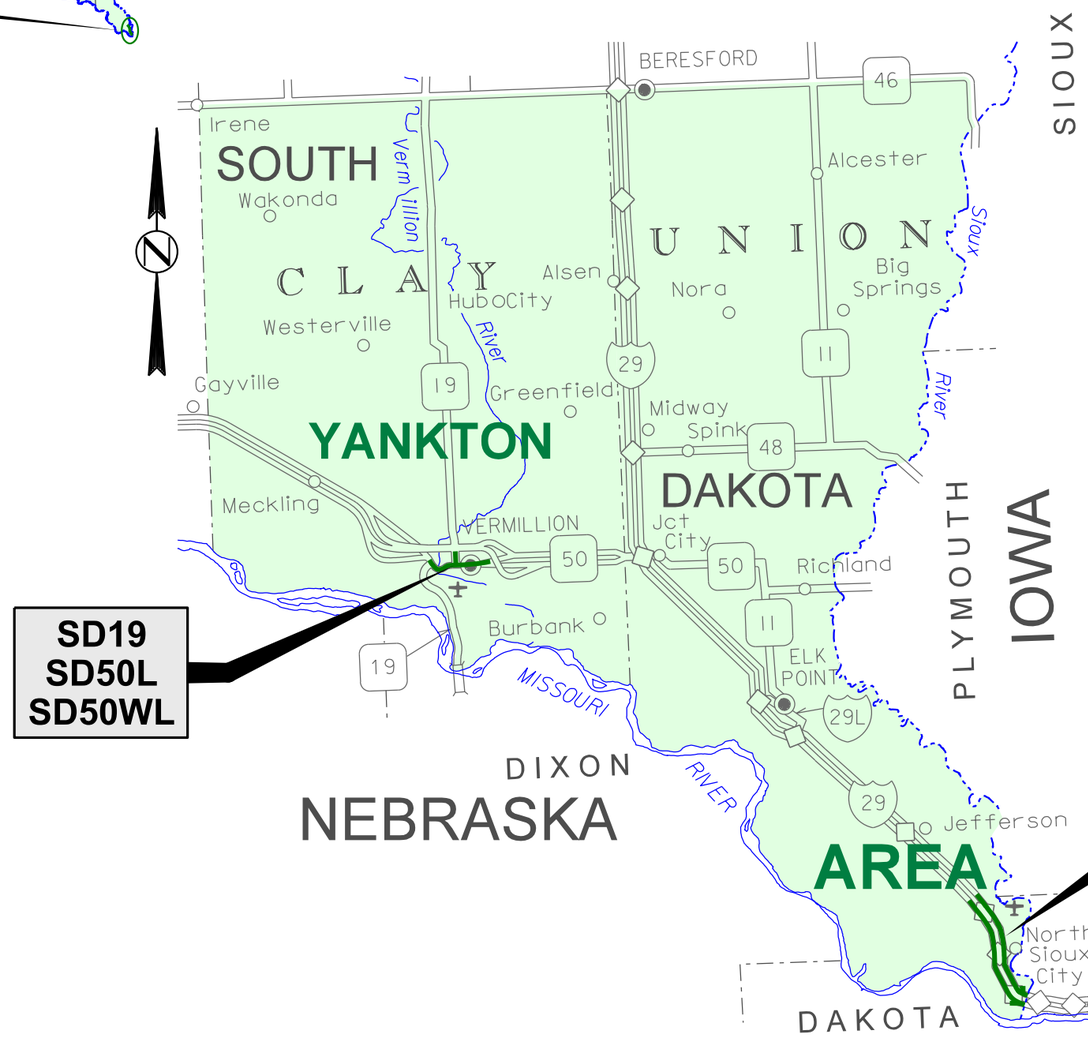
STATE OF SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION
PLANS FOR PROPOSED

PROJECT IM–NH–P 0023(69)
INTERSTATE 29,
SD HIGHWAYS 19, 50L & 50WL
CLAY & UNION COUNTIES
NRC PAVEMENT REPAIR & JOINT RESEALING
PCN 097F

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM-NH-P 0023(69)	1	34

Plotting Date: 03/18/2024

INDEX OF SHEETS



STORM WATER PERMIT
(None required)

August 21, 2024

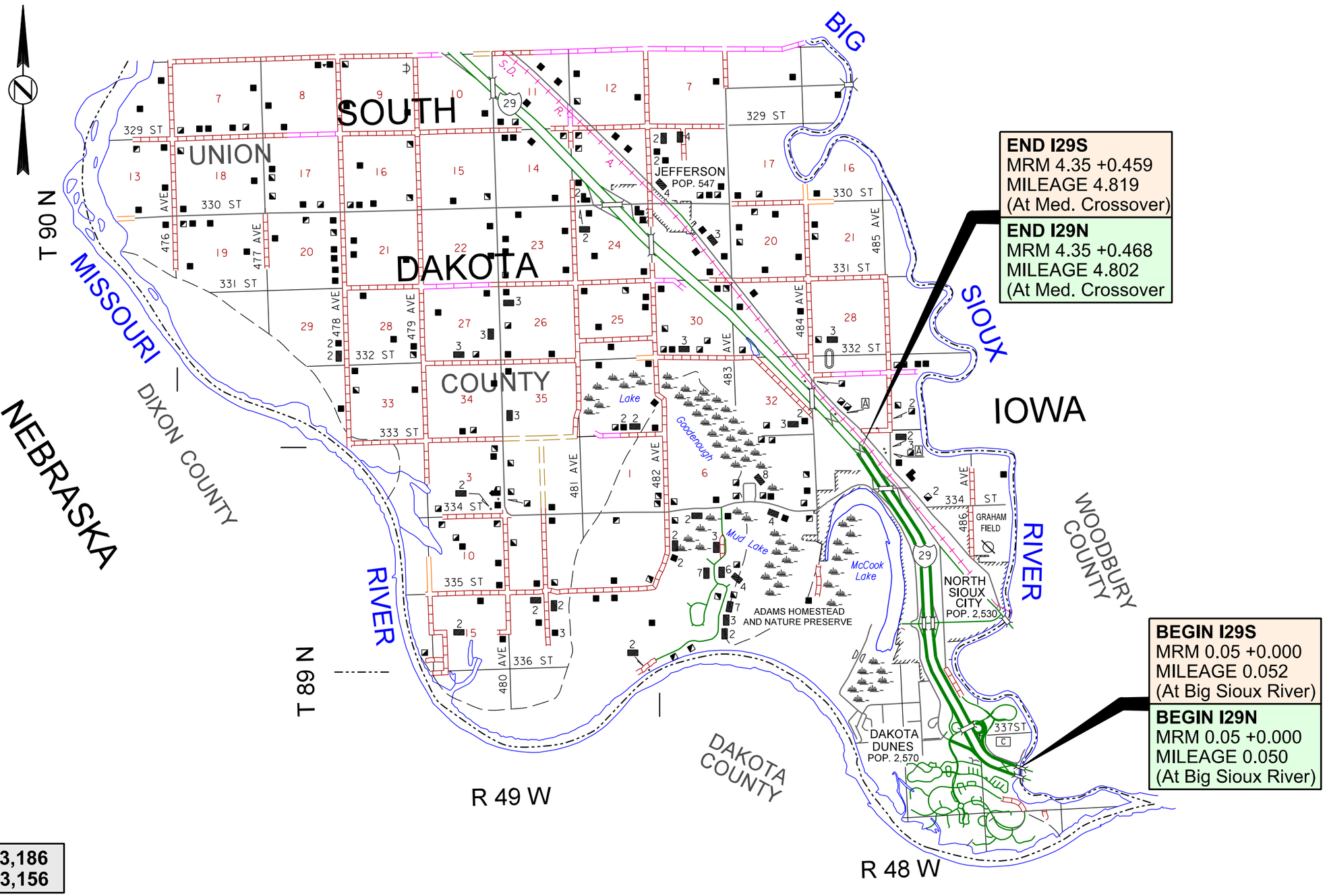
PLOTTED FROM - TRM11NT15
PLOT NAME - 1
FILE - ...\UNIN097FNTTL097F.DGN

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM-NH-P 0023(69)	2	34

Plotting Date: 03/18/2024

INTERSTATE 29S
UNION COUNTY
NRC PAVEMENT REPAIR
LENGTH: 4.767 MILES

INTERSTATE 29N
UNION COUNTY
NRC PAVEMENT REPAIR
LENGTH: 4.752 MILES



END I29S
MRM 4.35 +0.459
MILEAGE 4.819
(At Med. Crossover)

END I29N
MRM 4.35 +0.468
MILEAGE 4.802
(At Med. Crossover

BEGIN I29S
MRM 0.05 +0.000
MILEAGE 0.052
(At Big Sioux River)

BEGIN I29N
MRM 0.05 +0.000
MILEAGE 0.050
(At Big Sioux River)

I29S ADT (2023) 13,186
I29N ADT (2023) 13,156

PLOT SCALE - 1:70000
PLOTTED FROM - TRMIINT15
PLOT NAME - 2
FILE - ...\UNIN0097F\TITL0097F.DGN

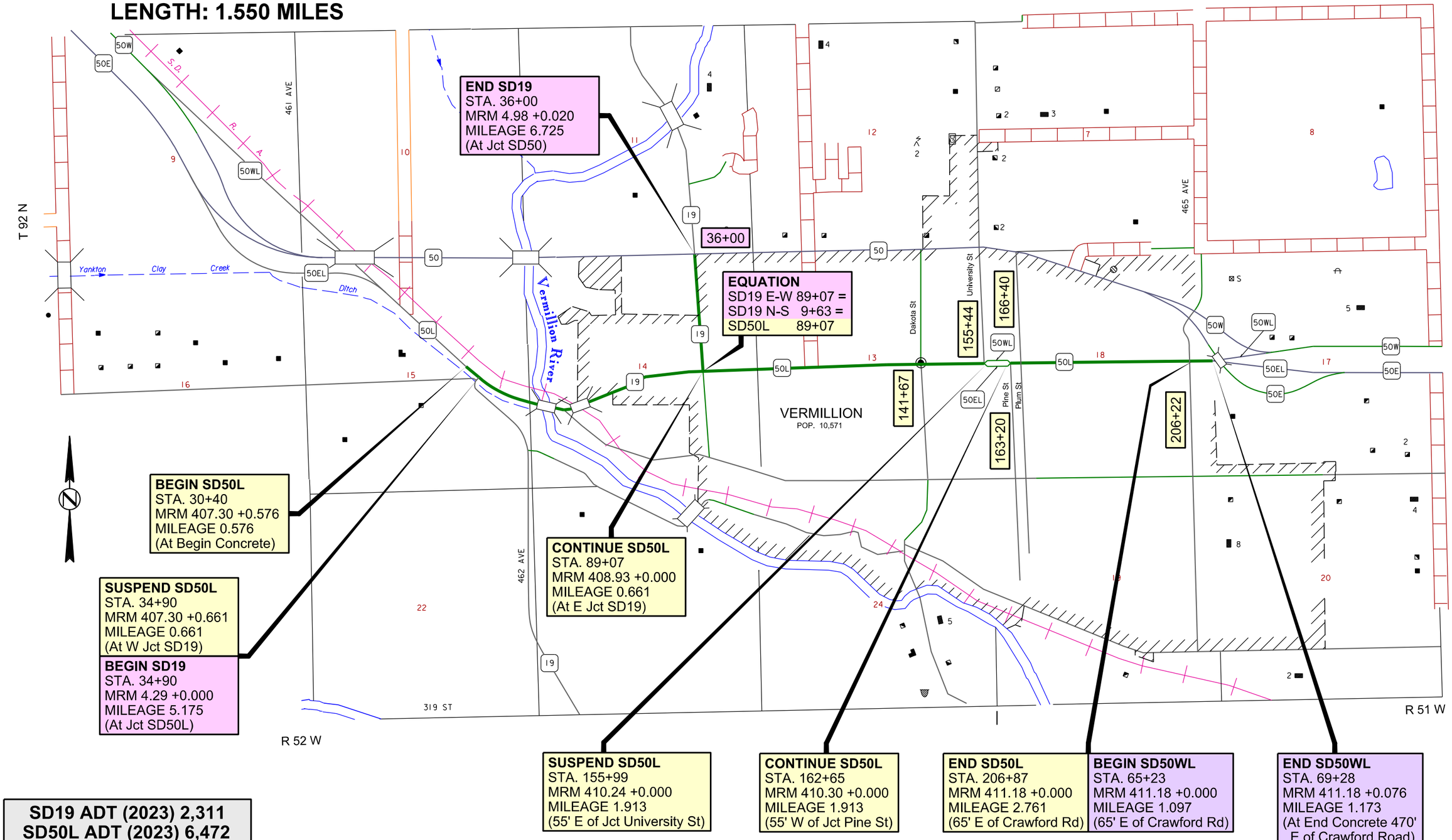
SD HIGHWAY 19
CLAY COUNTY
NRC PAVEMENT REPAIR & JOINT RESEALING
LENGTH: 1.550 MILES

SD HIGHWAY 50L
CLAY COUNTY
NRC PAVEMENT REPAIR
LENGTH: 2.185 MILES

SD HIGHWAY 50WL
CLAY COUNTY
NRC PAVEMENT REPAIR
LENGTH: 0.076 MILE

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM-NH-P 0023(69)	3	34

Plotting Date: 03/18/2024



SD19 ADT (2023) 2,311
SD50L ADT (2023) 6,472
SD50WL ADT (2023) 2,123

PLOT SCALE - 1:8750
PLOTTED FROM - TRM1INT15
PLOT NAME - 3
FILE - ...\UNIN097F\TITL097F.DGN

ESTIMATE OF QUANTITIES

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
380E5030	Nonreinforced PCC Pavement Repair	1,075.9	SqYd
380E6000	Dowel Bar	1,412	Each
380E6110	Insert Steel Bar in PCC Pavement	2,543	Each
380E6302	Reseal PCC Pavement Joint - Hot Pour	17,864	Ft
634E0010	Flagging	60.0	Hour
634E0110	Traffic Control Signs	1,447.6	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0275	Type 3 Barricade	8	Each
634E0310	Temporary Flexible Vertical Markers (Tabs)	10,980	Ft
634E0420	Type C Advance Warning Arrow Board	4	Each

ESTIMATE OF QUANTITIES BREAKDOWN (PER ROUTE)

BID ITEM NUMBER	ITEM	I29 QUANTITY	SD50L QUANTITY	SD19 QUANTITY	TOTAL QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	Lump Sum	Lump Sum	Lump Sum	LS
380E5030	Nonreinforced PCC Pavement Repair	306.3	250.7	518.9	1075.9	SqYd
380E6000	Dowel Bar	446	256	710	1412	Each
380E6110	Insert Steel Bar in PCC Pavement	826	597	1120	2543	Each
380E6302	Reseal PCC Pavement Joint - Hot Pour	-	-	17864	17864	Ft
634E0010	Flagging	20	20	20	60	Hour
634E0110	Traffic Control Signs	611.2	418.2	418.2	1447.6	SqFt
634E0120	Traffic Control Miscellaneous	Lump Sum	Lump Sum	Lump Sum	Lump Sum	LS
634E0275	Type 3 Barricade	4	2	2	8	Each
634E0310	Temporary Flexible Vertical Markers (Tabs)	5340	2710	2930	10980	Ft
634E0420	Type C Advance Warning Arrow Board	2	1	1	4	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

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM-NH-P 0023(69)	5	34

ENVIRONMENTAL COMMITMENTS

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

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

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

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

COMMITMENT 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 (AIS) positive waters within South Dakota without prior approval from the SDDOT Environmental Office. To prevent and control the introduction and spread of invasive species into the project vicinity, all equipment will be power washed with hot water (≥140 °F) and completely dried for a minimum of 7 days prior to subsequent use. South Dakota administrative rule 41:10:04:02 forbids the possession and transport of AIS; therefore, all attached dirt, mud, debris and vegetation must be removed and all compartments and tanks capable of holding standing water must be drained. This includes, but is not limited to, all equipment, pumps, lines, hoses and holding tanks.

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

Action Taken/Required:

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

Additional information and mapping of water sources impacted by Aquatic Invasive Species in South Dakota can be accessed at:
https://sdleastwanted.com/maps/default.aspx

South Dakota Administrative Rule 41:10:04 Aquatic Invasive Species:
https://sdlegislature.gov/rules/DisplayRule.aspx?Rule=41:10:04

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 Agriculture and Natural Resources.

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

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

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

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

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

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

COMMITMENT I: HISTORIC PRESERVATION OFFICE CLEARANCES

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

Action Taken/Required:

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

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

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

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

In the event of an inadvertent discovery of human remains, funerary objects, or if evidence of cultural resources is identified during project construction activities, then such activities within 100 feet of the inadvertent discovery will immediately cease and the Project Engineer will be immediately notified. The Project Engineer will contact the SDDOT Environmental Office, who will contact the appropriate SHPO/THPO within 48 hours of the discovery to determine an appropriate course of action.

SHPO/THPO review does not relieve the Contractor of the responsibility 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.

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM-NH-P 0023(69)	6	34

TABLE FOR NRC PAVEMENT REPAIR ON I29

		SB DRIVING LANE		SB PASSING LANE		NB PASSING LANE		NB DRIVING LANE				INSERT STEEL BAR IN PCC PAVEMENT (NRCP)			
MRM	DISP	L Ft	W Ft	L Ft	W Ft	L Ft	W Ft	L Ft	W Ft	NRCP REPAIR SqYds	NEW JOINT CON-FIG. (NRCP)	No. 11 x 18" DEFORMED TIE BARS Each	No. 5 x 24" DEFORMED TIE BARS Each	INSERT STEEL BAR IN NRCP TOTAL Each	DOWEL BAR Each
0.00	0.133							6	6	4.0	R	8	4	12	6
0.00	0.228							6	6	4.0	R	8	4	12	6
0.00	0.289							6	6	4.0	R	8	4	12	6
0.00	0.421					6	6			4.0	R	8	2	10	6
0.00	0.436			6	6					4.0	R	8	4	12	6
0.00	0.448							6	6	4.0	R	8	4	12	6
0.00	0.505			6	6					4.0	R	8	4	12	6
0.00	0.550			6	6					4.0	R	8	4	12	6
0.00	0.573			6	6					4.0	R	8	4	12	6
0.00	0.584							6	6	4.0	R	8	4	12	6
0.00	0.622			6	6					4.0	R	8	4	12	6
0.00	0.679			6	6					4.0	R	8	4	12	6
0.00	0.823							6	6	4.0	R	8	4	12	6
0.00	0.827			6	6					4.0	R	8	4	12	6
1.00	0.099			6	6					4.0	R	8	4	12	6
1.00	0.103			6	6					4.0	R	8	4	12	6
1.00	0.107			6	6					4.0	R	8	4	12	6
1.00	0.111			6	6					4.0	R	8	4	12	6
1.00	0.190					6	6			4.0	R	8	2	10	6
1.00	0.262							6	14	9.3	R	16	4	20	12
1.00	0.429			6	6					4.0	R	8	4	12	6
1.00	0.455			6	6					4.0	R	8	4	12	6
1.00	0.637							6	6	4.0	R	8	4	12	6
1.00	0.880					6	12	6	14	17.3	R	32	2	34	24
1.00	0.952							6	14	9.3	R	16	4	20	12
1.00	0.955	6	6							4.0	R	8	4	12	6
2.00	0.001	6	6							4.0	R	8	4	12	6
TOTALS:										**131.9**		**256**	**102**	**358**	**192**
ADDITIONAL QUANTITIES:										**50.0**		**100**	**40**	**140**	**80**
GRAND TOTALS										**181.9**		**356**	**142**	**498**	**272**

NRC PAVEMENT REPAIR AREA TYPES

W = Two Working Joints (Use only if repair is full roadway width and uniform length (across all lanes))
T = Two Tied Joints
B = One Working & One Tied Joint
R = Two Tied Joints with Original Joint Restored with Dowel Bar Assembly

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM-NH-P 0023(69)	7	34

TABLE FOR NRC PAVEMENT REPAIR ON I29

MRM	DISP	SB DRIVING LANE L Ft	SB DRIVING LANE W Ft	SB PASSING LANE L Ft	SB PASSING LANE W Ft	NB DRIVING LANE L Ft	NB DRIVING LANE W Ft	NRCP REPAIR SqYds	NEW JOINT CON-FIG. (NRCP)	INSERT STEEL BAR IN PCC PAVEMENT (NRCP) No. 11 x 18" DEFORMED TIE BARS Each	No. 5 x 24" DEFORMED TIE BARS Each	INSERT STEEL BAR IN NRCP TOTAL Each	DOWEL BAR Each
2.00	0.795					6	6	4.0	R	8	4	12	6
2.00	0.860			6	6			4.0	R	8	4	12	6
3.00	0.042					6	6	4.0	R	8	4	12	6
3.00	0.076			10	4			4.4	R	4	8	12	4
3.00	0.167			6	6			4.0	R	8	4	12	6
3.00	0.197	6	6					4.0	R	8	2	10	6
3.00	0.788					6	6	4.0	R	8	4	12	6
4.00	0.515	6	6					4.0	R	8	2	10	6
4.00	0.625	6	6					4.0	R	8	2	10	6
4.00	0.640	6	6					4.0	R	8	2	10	6
4.00	0.754					6	6	4.0	R	8	4	12	6
TOTALS:								**44.4**		**84**	**40**	**124**	**64**
ADDITIONAL QUANTITIES:								**20.0**		**30**	**20**	**50**	**30**
GRAND TOTALS								**64.4**		**114**	**60**	**174**	**94**

NRC PAVEMENT REPAIR AREA TYPES

W = Two Working Joints (Use only if repair is full roadway width and uniform length (across all lanes))
T = Two Tied Joints
B = One Working & One Tied Joint
R = Two Tied Joints with Original Joint Restored with Dowel Bar Assembly

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM-NH-P 0023(69)	8	34

TABLE FOR NRC PAVEMENT REPAIR ON I29 EXIT 1 - NB OFF RAMP

MRM	DISP	NB OFF RAMP RIGHT LANE L Ft	W Ft	NRCP REPAIR SqYds	NEW JOINT CON-FIG. (NRCP)	COMMENTS	INSERT STEEL BAR IN PCC PAVEMENT (NRCP) No. 9 x 18" DEFORMED TIE BARS Each	No. 5 x 24" DEFORMED TIE BARS Each	INSERT STEEL BAR IN NRCP TOTAL Each	DOWEL BAR Each
0.00	0.642	6	6	4.0	R	Repair straddles centerline	8	4	12	6
0.00	0.646	6	6	4.0	R	Repair straddles centerline	8	4	12	6
0.00	0.680	6	6	4.0	R	Repair straddles centerline	8	4	12	6
0.00	0.858	6	6	4.0	R	Repair straddles centerline	8	4	12	6
TOTALS:				**16.0**			**32**	**16**	**48**	**24**
ADDITIONAL QUANTITIES:				**10.0**			**10**	**10**	**20**	**10**
GRAND TOTALS				**26.0**			**42**	**26**	**68**	**34**

TABLE FOR NRC PAVEMENT REPAIR ON I29 EXIT 1 - SB ON RAMP

MRM	DISP	SB ON RAMP LEFT SIDE L Ft	W Ft	NRCP REPAIR SqYds	NEW JOINT CON-FIG. (NRCP)	INSERT STEEL BAR IN PCC PAVEMENT (NRCP) No. 9 x 18" DEFORMED TIE BARS Each	No. 5 x 24" DEFORMED TIE BARS Each	INSERT STEEL BAR IN NRCP TOTAL Each	DOWEL BAR Each
0.00	0.140	6	12	8.0	R	16	2	18	12
TOTALS:				**8.0**		**16**	**2**	**18**	**12**

TABLE FOR NRC PAVEMENT REPAIR ON I29 EXIT 1 - NB LOOP ON RAMP

MRM	DISP	NB ON RAMP RIGHT SIDE L Ft	W Ft	NRCP REPAIR SqYds	NEW JOINT CON-FIG. (NRCP)	COMMENTS	INSERT STEEL BAR IN PCC PAVEMENT (NRCP) No. 9 x 18" DEFORMED TIE BARS Each	No. 5 x 24" DEFORMED TIE BARS Each	INSERT STEEL BAR IN NRCP TOTAL Each	DOWEL BAR Each
0.00	0.663	6	6	4.0	R	Repair straddles centerline	8	4	12	6
0.00	0.751	6	6	4.0	R	Repair straddles centerline	8	4	12	6
0.00	0.771	6	6	4.0	R	Repair straddles centerline	8	4	12	6
0.00	0.790	6	6	4.0	R	Repair straddles centerline	8	4	12	6
TOTALS:				**16.0**			**32**	**16**	**48**	**24**
ADDITIONAL QUANTITIES:				**10.0**			**10**	**10**	**20**	**10**
GRAND TOTALS				**26.0**			**42**	**26**	**68**	**34**

NRC PAVEMENT REPAIR AREA TYPES

W = Two Working Joints (Use only if repair is full roadway width and uniform length (across all lanes))
T = Two Tied Joints
B = One Working & One Tied Joint
R = Two Tied Joints with Original Joint Restored with Dowel Bar Assembly

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM-NH-P 0023(69)	9	34

TABLE FOR NRC PAVEMENT REPAIR ON SD50L

MRM	DISP	WB DRIVING LANE L Ft	WB DRIVING LANE W Ft	WB PASSING LANE L Ft	WB PASSING LANE W Ft	CENTER TURN LANE L Ft	CENTER TURN LANE W Ft	EB DRIVING LANE L Ft	EB DRIVING LANE W Ft	NRCP REPAIR SqYds	NEW JOINT CON-FIG. (NRCP)	INSERT STEEL BAR IN PCC PAVEMENT (NRCP) No. 9 x 18" DEFORMED TIE BARS Each	INSERT STEEL BAR IN PCC PAVEMENT (NRCP) No. 5 x 24" DEFORMED TIE BARS Each	INSERT STEEL BAR IN NRCP TOTAL Each	DOWEL BAR Each
407.00	0.880	4	8							3.6	T	10	2	12	
407.00	0.921							4	8	3.6	R	10	4	14	8
407.00	0.933	6	14			6	12	6	14	26.7	T	48	8	56	
407.00	0.937					6	12	6	14	17.3	R	32	6	38	24
408.00	0.482							8	14	12.4	T	16	3	19	
408.00	0.660	4	4							1.8	R	4	2	6	4
408.00	0.698							8	14	12.4	R	16	3	19	12
408.00	0.702					8	12			10.7	T	16	6	22	
408.00	0.706	8	14							12.4	T	16	3	19	
410.00	0.471							4	4	1.8	R	4	4	8	4
410.00	0.592							4	4	1.8	R	4	4	8	4
410.00	0.653							6	14	9.3	R	16	2	18	12
410.00	0.721			4	4					1.8	R	4	4	8	4
410.00	0.781			6	12					8.0	R	16	4	20	12
410.00	0.819	6	14							9.3	R	16	2	18	12
410.00	0.857	6	12							8.0	R	16	2	18	12
410.00	0.891	6	12							8.0	R	16	2	18	12
410.00	0.910			4	4					1.8	R	4	4	8	4
410.00	0.925	4	4	4	4					3.6	R	8	6	14	8
411.00	0.001	4	4							1.8	R	4	2	6	4
411.00	0.039	4	4							1.8	R	4	2	6	4
411.00	0.062			6	12					8.0	R	16	4	20	12
411.00	0.141			4	4					1.8	R	4	4	8	4
411.00	0.156			4	4					1.8	R	4	4	8	4
411.00	0.171	4	4							1.8	R	4	2	6	4
411.00	0.179	4	4							1.8	R	4	2	6	4
TOTALS:										**173.1**		**312**	**91**	**403**	**168**
ADDITIONAL QUANTITIES:										**70.0**		**120**	**40**	**160**	**70**
GRAND TOTALS										**243.1**		**432**	**131**	**563**	**238**

TABLE FOR NRC PAVEMENT REPAIR ON SD50L

MRM	DISP	WB DRIVING LANE L Ft	WB DRIVING LANE W Ft	WB PASSING LANE L Ft	WB PASSING LANE W Ft	NRCP REPAIR SqYds	NEW JOINT CON-FIG. (NRCP)	INSERT STEEL BAR IN PCC PAVEMENT (NRCP) No. 9 x 18" DEFORMED TIE BARS Each	INSERT STEEL BAR IN PCC PAVEMENT (NRCP) No. 5 x 24" DEFORMED TIE BARS Each	INSERT STEEL BAR IN NRCP TOTAL Each	DOWEL BAR Each
411.00	0.180			4	4	1.8	R	4	4	8	4
411.00	0.229	4	4			1.8	R	4	2	6	4
TOTALS:						**3.6**		**8**	**6**	**14**	**8**
ADDITIONAL QUANTITIES:						**4.0**		**10**	**10**	**20**	**10**
GRAND TOTALS						**7.6**		**18**	**16**	**34**	**18**

NRC PAVEMENT REPAIR AREA TYPES

W = Two Working Joints (Use only if repair is full roadway width and uniform length (across all lanes))
T = Two Tied Joints
B = One Working & One Tied Joint
R = Two Tied Joints with Original Joint Restored with Dowel Bar Assembly

TABLE FOR NRC PAVEMENT REPAIR ON SD19

EAST-WEST SEGMENT (9" NRC PAVEMENT)

MRM	DISP	SB DRIVING LANE L Ft	SB DRIVING LANE W Ft	CENTER TURN LANE L Ft	CENTER TURN LANE W Ft	NB DRIVING LANE L Ft	NB DRIVING LANE W Ft	NRCP REPAIR SqYds	NEW JOINT CON-FIG. (NRCP)	INSERT STEEL BAR IN PCC PAVEMENT (NRCP) No. 9 x 18" DEFORMED TIE BARS Each	INSERT STEEL BAR IN PCC PAVEMENT (NRCP) No. 5 x 24" DEFORMED TIE BARS Each	INSERT STEEL BAR IN NRCP TOTAL Each	DOWEL BAR Each
4.00	0.305			6	12			8.0	R	16	4	20	12
4.00	0.313			6	12			8.0	R	16	4	20	12
4.00	0.317					6	14	9.3	R	16	2	18	12
4.00	0.320					6	6	4.0	R	8	4	12	6
4.00	0.324			6	12	6	14	17.3	R	32	2	34	24
4.00	0.328			6	12	6	14	17.3	R	32	2	34	24
4.00	0.332			6	12	6	6	12.0	R	24	4	28	18
4.00	0.335			6	12	6	14	17.3	R	32	2	34	24
4.00	0.339					6	6	4.0	R	8	4	12	6
4.00	0.351			6	12	6	14	17.3	R	32	2	34	24
4.00	0.370			6	12			8.0	R	16	4	20	12
4.00	0.373			6	12	6	6	12.0	R	24	4	28	18
4.00	0.388			6	12			8.0	R	16	4	20	12
4.00	0.400			6	12			8.0	R	16	4	20	12
4.00	0.404			6	12			8.0	R	16	4	20	12
4.00	0.419			6	6			4.0	R	8	4	12	6
4.00	0.434					6	6	4.0	R	8	4	12	6
4.00	0.442	6	14					9.3	R	16	2	18	12
4.00	0.453	6	14					9.3	R	16	2	18	12
4.00	0.457	6	6					4.0	R	8	2	10	6
4.00	0.460	6	14					9.3	R	16	2	18	12
4.00	0.464	6	6					4.0	R	8	2	10	6
4.00	0.468	6	6					4.0	R	8	2	10	6
4.00	0.476					6	6	4.0	R	8	4	12	6
4.00	0.479	6	14			6	6	13.3	R	24	6	30	18
4.00	0.483	6	6			6	14	13.3	R	24	4	28	18
4.00	0.506	6	14					9.3	R	16	2	18	12
4.00	0.510					6	14	9.3	R	16	2	18	12
TOTALS:								**255.6**		**480**	**88**	**568**	**360**
ADDITIONAL QUANTITIES:								**100.0**		**190**	**40**	**230**	**140**
GRAND TOTALS								**355.6**		**670**	**128**	**798**	**500**

NRC PAVEMENT REPAIR AREA TYPES

W = Two Working Joints (Use only if repair is full roadway width and uniform length (across all lanes))
T = Two Tied Joints
B = One Working & One Tied Joint
R = Two Tied Joints with Original Joint Restored with Dowel Bar Assembly

TABLE FOR NRC PAVEMENT REPAIR ON SD19

NORTH-SOUTH SEGMENT (8" NRC PAVEMENT)

MRM	DISP	SB DRIVING LANE L Ft	SB DRIVING LANE W Ft	NB DRIVING LANE L Ft	NB DRIVING LANE W Ft	NRCP REPAIR SqYds	NEW JOINT CON-FIG. (NRCP)	INSERT STEEL BAR IN PCC PAVEMENT (NRCP) No. 8 x 18" DEFORMED TIE BARS Each	INSERT STEEL BAR IN PCC PAVEMENT (NRCP) No. 5 x 24" DEFORMED TIE BARS Each	INSERT STEEL BAR IN NRCP TOTAL Each	DOWEL BAR Each
4.00	0.635	6	6			4.0	R	8	2	10	6
4.00	0.638	6	14			9.3	R	16	2	18	12
4.00	0.654	6	14			9.3	R	16	2	18	12
4.00	0.657	6	14	6	6	13.3	R	24	6	30	18
4.00	0.665	6	14			9.3	R	16	2	18	12
4.00	0.839	6	14	6	14	18.7	R	32	4	36	24
4.00	0.896	6	14	6	14	18.7	R	32	4	36	24
4.00	0.907			4	6	2.7	R	8	4	12	6
4.00	0.911			6	14	9.3	R	16	2	18	12
4.00	0.926	6	14	6	14	18.7	R	32	4	36	24
TOTALS:						**113.3**		**200**	**32**	**232**	**150**
ADDITIONAL QUANTITIES:						**50.0**		**80**	**10**	**90**	**60**
GRAND TOTALS						**163.3**		**280**	**42**	**322**	**210**

NRC PAVEMENT REPAIR AREA TYPES

W = Two Working Joints (Use only if repair is full roadway width and uniform length (across all lanes))
T = Two Tied Joints
B = One Working & One Tied Joint
R = Two Tied Joints with Original Joint Restored with Dowel Bar Assembly

SUMMARY TABLE FOR PAVEMENT REPAIR

PAVEMENT REPAIR THICKNESS	DESCRIPTION & LOCATION	NRCP REPAIR SqYds	INSERT STEEL BAR IN PCC PAVEMENT					DOWEL BAR (1¼")	DOWEL BAR (1½")	DOWEL BAR TOTAL
			No. 8 x 18" DEFORMED TIE BARS	No. 9 x 18" DEFORMED TIE BARS	No. 11 x 18" DEFORMED TIE BARS	No. 5 x 24" DEFORMED TIE BARS	INSERT STEEL BAR IN PCCP TOTAL			
			Each	Each	Each	Each	Each	Each	Each	Each
	I29									
11.5"	NRC PAVEMENT REPAIR ON I29	181.9	-	-	356	142	**498**	-	272	**272**
11.5"	NRC PAVEMENT REPAIR ON I29	64.4	-	-	114	60	**174**	-	94	**94**
9"	NRC PAVEMENT REPAIR ON I29 EXIT 1 - NB OFF RAMP	26.0	-	42	-	26	**68**	34	-	**34**
9"	NRC PAVEMENT REPAIR ON I29 EXIT 1 - SB ON RAMP	8.0	-	16	-	2	**18**	12	-	**12**
9"	NRC PAVEMENT REPAIR ON I29 EXIT 1 - NB LOOP ON RAMP	26.0	-	42	-	26	**68**	34	-	**34**
	SUBTOTALS FOR I29:	**306.3**	**-**	**100**	**470**	**256**	**826**	**80**	**366**	**446**
	SD50L									
9"	NRC PAVEMENT REPAIR ON SD50L	243.1	-	432	-	131	**563**	238	-	**238**
9"	NRC PAVEMENT REPAIR ON SD50L	7.6	-	18	-	16	**34**	18	-	**18**
	SUBTOTALS FOR SD50L:	**250.7**	**-**	**450**	**-**	**147**	**597**	**256**	**-**	**256**
	SD19									
9"	NRC PAVEMENT REPAIR ON SD19 EAST-WEST SEGMENT	355.6	-	670	-	128	**798**	500	-	**500**
8"	NRC PAVEMENT REPAIR ON SD19 NORTH-SOUTH SEGMENT	163.3	280	-	-	42	**322**	210	-	**210**
	SUBTOTALS FOR SD19:	**518.9**	**280**	**670**	**-**	**170**	**1120**	**710**	**-**	**710**
	GRAND TOTALS:	**1075.9**	**280**	**1220**	**470**	**573**	**2543**	**1046**	**366**	**1412**

UTILITIES

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

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 will contact the Project Engineer to determine if project changes are necessary to avoid utility impacts.

SCOPE OF WORK

This project consists of full depth replacement of Nonreinforced Concrete Pavement (NRCP) in areas where concrete pavement blowups or major failures have occurred.

Joints on the N-S Segment of SD19 (Stanford St.) from Jct SD50L (Cherry St) to Jct SD50 will be cleaned and resealed.

COORDINATION BETWEEN CONTRACTORS

A separate contract for Project IM-CR 0291(139)4 - PCN 09E7 may be awarded to another Contractor for milling and resurfacing of shoulders on I29 from the median crossover just North of Exit 4 (McCook Lake) to the median crossover just North of Exit 26 (Jct City).

A separate contract for Project EM 8064(32) - PCN 097K may be awarded to another Contractor for grading, surfacing and possible structure work on Northshore Drive over I29 at Exit 4 (McCook Lake).

The Contractor will schedule work so as not to interfere with or hinder the progress of the work performed by other Contractors on PCN 09E7 & 097K.

EXISTING NRC PAVEMENT

I29
The existing pavement is 11.5" NRC Pavement.

Existing contraction joints are spaced at approximately 20'. Longitudinal joints are reinforced with No. 5 x 30" deformed tie bars spaced 48" center to center. Transverse joints are reinforced with 1¼" x 18" plain round dowel bars spaced 12" center to center.

I29 Exit 1 Accel/Decel
The existing pavement is 10" NRC Pavement.

Existing contraction joints are spaced at approximately 20'. Longitudinal joints are reinforced with No. 5 x 30" deformed tie bars spaced 48" center to center. Transverse joints are reinforced with 1¼" x 18" plain round dowel bars spaced 12" center to center.

I29 Exit 1 Ramps
The existing pavement is 9" NRC Pavement.

Existing contraction joints are spaced at approximately 15'. Longitudinal joints are reinforced with No. 5 x 30" deformed tie bars spaced 48" center to center. Transverse joints are reinforced with 1¼" x 18" plain round dowel bars spaced 12" center to center.

SD50L, SD50WL & SD19 E-W Segment
The existing pavement is 9" NRC Pavement.

Existing contraction joints are spaced at approximately 20' & 15'. Longitudinal joints are reinforced with No. 5 x 30" deformed tie bars spaced 48" center to center. Transverse joints are reinforced with 1¼" x 18" plain round dowel bars spaced 12" center to center.

EXISTING NRC PAVEMENT (CONTINUED)

SD19 N-S Segment
The existing pavement is 8" NRC Pavement on the N-S Segment.

Existing contraction joints are spaced at approximately 20'. Longitudinal joints are reinforced with No. 5 x 30" deformed tie bars spaced 48" center to center. Transverse joints are reinforced with 1¼" x 18" plain round dowel bars spaced 12" center to center.

The aggregate in the existing NRC Pavement is quartzite.

NONREINFORCED PCC PAVEMENT REPAIR - GENERAL

New pavement thickness will equal existing pavement thickness ($T_N = T$).

Locations and size (length or width) of concrete 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.

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

Saw cuts that extend beyond the repair area will be minimized and filled with a non-shrinkage mortar mix at the Contractor's expense.

Existing concrete pavement in the replacement areas will be removed by the lift out method or by means that minimize damage to the base and sides of remaining in place concrete. Removed material will be removed from within the right-of-way by the end of the workday. Damage to adjacent concrete caused by the Contractor's operations will 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. Any existing dowel bar assemblies/steel bars will be sawed off and removed.

At full roadway width repairs and when specified, a working joint will be reconstructed at both ends of each pavement replacement area as shown in these plans.

Concrete placed adjacent to shoulders will be formed full depth to match the width of existing concrete pavement. Asphalt concrete shoulders adjacent to concrete pavement replacements will be repaired with new hot-mix asphalt concrete.

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

The initial contraction joint sawing will be performed as soon as practical after placement to avoid random cracking.

Joints (longitudinal and transverse) through and around the repair areas will be sawed and sealed in accordance with the details shown in these plans. Refer to Saw and Seal Joints notes.

NONREINFORCED PCC PAVEMENT REPAIR

Concrete will meet the requirements stated in Section 380 of the specifications, except as modified by the following notes:

The fine aggregate will be screened over a one-inch square-opening screen just prior to introduction into the concrete paving mix if required by the Engineer.

The slump requirement will be limited to 3" maximum after water reducer is added and the concrete will contain 4.5% to 7.0% entrained air. The concrete will contain a minimum of 50% coarse aggregate by weight. Coarse aggregate will 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 mix design will contain at least 650 lbs of Type I or II cement or 600 lbs of Type III cement per cubic yard. The minimum 28 day compressive strength will be 4,000 psi. The Contractor is responsible for the mix design used. The Contractor will 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 will 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 will be cured for a minimum of 48 hours before opening to traffic. The 48 hours is based upon a concrete surface temperature of 60ºF or higher throughout the cure period. If the concrete temperature falls below 60ºF, the cure time will be extended, or other measures taken, at no additional cost to the State. A strength of 3,000 psi must be attained prior to opening to traffic.

Upon placement of the concrete, repair areas will be straight edged to ensure a smooth riding surface and will be textured longitudinally with the pavement by finishing with a stiff broom. Repair areas will then be checked with a 10' foot straight edge. The permissible longitudinal and transverse surface deviation will be 1/8" in 10'.

Concrete will 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 will have an R-value of at least 0.5, as rated by the manufacturer. Insulation blanket will be left in place, except for joint sawing operations, until the 3,000 psi is attained. Insulation blanket will be overlapped on to the existing concrete by 4'. This requirement for covering repair areas with insulation blankets may be waived during periods of hot weather upon approval of the Engineer.

Cost for performing the aforementioned work including sawing and removing concrete, furnishing and placing concrete, sawing and sealing joints, repairing shoulders, labor, tools and equipment will be included in the contract unit price per square yard for Nonreinforced PCC Pavement Repair.

DETECTOR LOOPS

Detector Loops are in place in the pavement at various locations throughout the project routes in Vermillion.

It will be the Contractor's responsibility to locate and protect the detector loops from damage during the Contractor's operations.

Any damage to detector loops due to the Contractor's operations will be replaced in-kind by the Contractor, at the Contractor's expense.

RESTORATION OF GRAVEL CUSHION

An inspection of the gravel cushion will be made after removing concrete from each pavement replacement area. Areas of excess moisture will be dried to the satisfaction of the Engineer. Loose material will be removed. Each replacement area will be leveled and compacted to the satisfaction of the Engineer.

If additional gravel cushion material is required, the Contractor will furnish, place and compact gravel cushion to the satisfaction of the Engineer at no additional cost to the State. Additional gravel cushion can be obtained from the Department of Transportation Maintenance shops located in Junction City.

Cost for this work will be incidental to the contract unit price per square yard for Nonreinforced PCC Pavement Repair.

STEEL BAR INSERTION

Steel bars will conform to Section 1010.

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.

For existing pavement thickness greater than or equal to 10.5" (T >= 10.5"):
The Contractor will insert the steel bars (1½" x 18" epoxy coated plain round dowel bars and No. 11 x 18" epoxy coated deformed tie 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.

For existing pavement thickness greater than or equal to 8.5" and less than 10.5" (T >= 8.5" and T < 10.5"):
The Contractor will insert the steel bars (1¼" x 18" epoxy coated plain round dowel bars and No. 9 x 18" epoxy coated deformed tie 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.

For existing pavement thickness less than 8.5" (T < 8.5"):
The Contractor will insert the steel bars (1" x 18" epoxy coated plain round dowel bars and No. 8 x 18" epoxy coated deformed tie 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.

Steel bars will be inserted in the transverse joint on 18" centers. The first steel bar in the transverse joint will be placed 9" from the edge of the slab closest to centerline. Steel bars will be inserted in the longitudinal joint on 30" centers and will be a minimum of 15" from either transverse joint. A typical one-lane patch 12' wide and 6' long will require 18 steel bars (8 in each transverse joint and 2 in the longitudinal 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.

SAW AND SEAL JOINTS

Longitudinal and transverse joints at concrete repair areas will be sawed and sealed.

Joint sealing will conform to Section 380.3 P.

Joints will be sealed with either Hot Poured Elastic Joint Sealer or Low Modulus Silicone Sealant.

Acceptance of the Low Modulus Silicone Sealant and Hot Poured Elastic Joint Sealer will be based on visual inspection by the Engineer.

Cost for sawing and sealing of the longitudinal construction joint and both transverse joints will be incidental to the contract unit price per square yard for Nonreinforced PCC Pavement Repair.

RESEAL PCC PAVEMENT JOINT

Reseal PCC Pavement Joints will be done on the N-S Segment of SD19 (Stanford St.) from Jct SD50L (W Cherry St.) North to Jct SD50.

Existing transverse joints will be cleaned and resealed for the full width of the joint (126 joints @ 62') with Hot Poured Elastic Joint Sealer.

Existing longitudinal joints (4 joints @ 2,513') will be cleaned and resealed with Hot Poured Elastic Joint Sealer.

Joints will not be sealed unless they are thoroughly clean and dry. Cleaning will be accomplished by sandblasting and other tools as necessary. Sand blasting of both sides of the vessel will be accomplished simultaneously with a mechanical device approved by the Engineer. Just prior to sealing, each joint will be blown out using a jet of compressed air to remove all traces of dust.

Final joint width is to be kept as narrow as possible and may only be widened to provide a clean surface. Each joint will not be widened more than 1/8 inch if sawing is utilized to prepare the joint for sealant. If sawing is used this may require 2 passes with the saw, one pass for each side of the joint.

It is not essential that all of the sealant be removed. Remaining sealant adhering to the sides may remain in place if the Engineer determines that it is not detrimental to the joint.

Cost for cleaning and resealing joints will be included in the contract unit price per foot for Reseal PCC Pavement Joint – Hot Pour.

TRAFFIC CONTROL FOR PCCP REPAIR

Sufficient traffic control devices have been included in these plans to sign:

One workspace in the I29 Northbound lanes
One workspace in the I29 Southbound lanes
One workspace in the SD50L Eastbound lanes or SD19 EB/NB
One workspace in the SD50L Westbound lanes or SD19 WB/SB

If the Contractor elects to work on additional sites simultaneously, the cost for additional traffic control devices will be incidental to the contract unit price per square foot for Traffic Control Signs.

Each mainline concrete repair location, from which the in-place concrete has been removed, will be marked with a minimum of two reflectorized drums.

Construction workspaces on divided roadways will be limited to 5 miles in length. The distance between the closest points of any two construction workspaces, including channeling devices, will not be less than 3 miles.

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 can be obtained from the Department of Transportation Maintenance shops located throughout the area. Contact the Project Engineer for direction.

Holes in the 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. Additional gravel cushion can be obtained from the Department of Transportation Maintenance shops located throughout the area. Contact the Project Engineer for direction. Hot-mix asphalt concrete will be furnished by the Contractor.

Cost for furnishing, hauling and placing asphalt concrete as well as hauling and placing gravel cushion material will be incidental to the contract unit prices per square yard for Nonreinforced 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.

Extra care will be taken to protect the in-place asphalt concrete shoulders on the project. In all workspaces in these areas, the same channelizing devices and spacing used on centerline, will also be required on the shoulders. These channelizing devices will be placed in locations to adequately keep traffic completely off these shoulders. Continuous maintenance will be required to keep them in place.

While Interstate 29 repairs are being performed in the driving lane, the channelizing devices will be placed on the driving lane side of the centerline skips to encourage traffic to stay off the asphalt shoulders.

Type 3 Barricades will be used in front of the first repair area approached by traffic at all locations until concrete has achieved adequate strength to be open to traffic.

TEMPORARY PAVEMENT MARKING

Temporary pavement marking on lane closure tapers will consist of temporary flexible vertical markers (tabs). Estimate:

Temporary flexible vertical markers (tabs)	
Two workspaces with 960’ tapers on I29 Northbound lanes	1,920’
Two workspaces with 960’ tapers on I29 Southbound lanes	1,920’
Two workspaces with varying length tapers on SD19 E-W Segment	980’
Two workspaces with 600’ tapers on SD19 N-S Segment	1,200’
Two workspaces with varying length tapers on SD50L Westbound lanes	980’
Two workspaces with varying length tapers on SD50L Eastbound lanes	980’
Additional *	3,000’
Total:	**10,980’**

* An additional 3000’ of tabs has been included in the estimate of quantities to be used for tapers near entrance and exit ramps, for tapers on ramps being repaired, divided to undivided highway transitions, etc., as needed.

Temporary flexible vertical markers (tabs) may be used as detailed in the specifications.

Cost will be included in the contract unit price per foot for Temporary Flexible Vertical Markers (Tabs).

ITEMIZED LIST FOR TRAFFIC CONTROL SIGNS - I29

		EXPRESSWAY / INTERSTATE			
SIGN CODE	SIGN DESCRIPTION	NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
R1-2	YIELD	1	36"	3.9	3.9
R2-1	SPEED LIMIT 45	4	36" x 48"	12.0	48.0
R2-1	SPEED LIMIT 65	6	36" x 48"	12.0	72.0
R2-1	SPEED LIMIT 80	2	36" x 48"	12.0	24.0
R2-6aP	FINES DOUBLE (plaque)	2	36" x 24"	6.0	12.0
W3-2	YIELD AHEAD (symbol)	1	48" x 48"	16.0	16.0
W3-5	SPEED REDUCTION AHEAD (45 MPH)	2	48" x 48"	16.0	32.0
W3-5	SPEED REDUCTION AHEAD (65 MPH)	4	48" x 48"	16.0	64.0
W4-1	MERGE (symbol)	1	48" x 48"	16.0	16.0
W4-2	LEFT or RIGHT LANE ENDS (symbol)	4	48" x 48"	16.0	64.0
W4-3	ADDED LANE (symbol)	1	48" x 48"	16.0	16.0
W5-4	RAMP NARROWS	1	48" x 48"	16.0	16.0
W13-1P	ADVISORY SPEED (plaque)	1	30" x 30"	6.3	6.3
W13-4P	ON RAMP (plaque)	1	36" x 36"	9.0	9.0
W20-1	ROAD WORK AHEAD	5	48" x 48"	16.0	80.0
W20-5	LEFT or RIGHT LANE CLOSED AHEAD	4	48" x 48"	16.0	64.0
W20-7	FLAGGER (symbol)	2	48" x 48"	16.0	32.0
E5-1	EXIT GORE	1	60" x 48"	20.0	20.0
G20-2	END ROAD WORK	2	48" x 24"	8.0	16.0
		EXPRESSWAY / INTERSTATE TRAFFIC CONTROL SIGNS SQFT			611.2

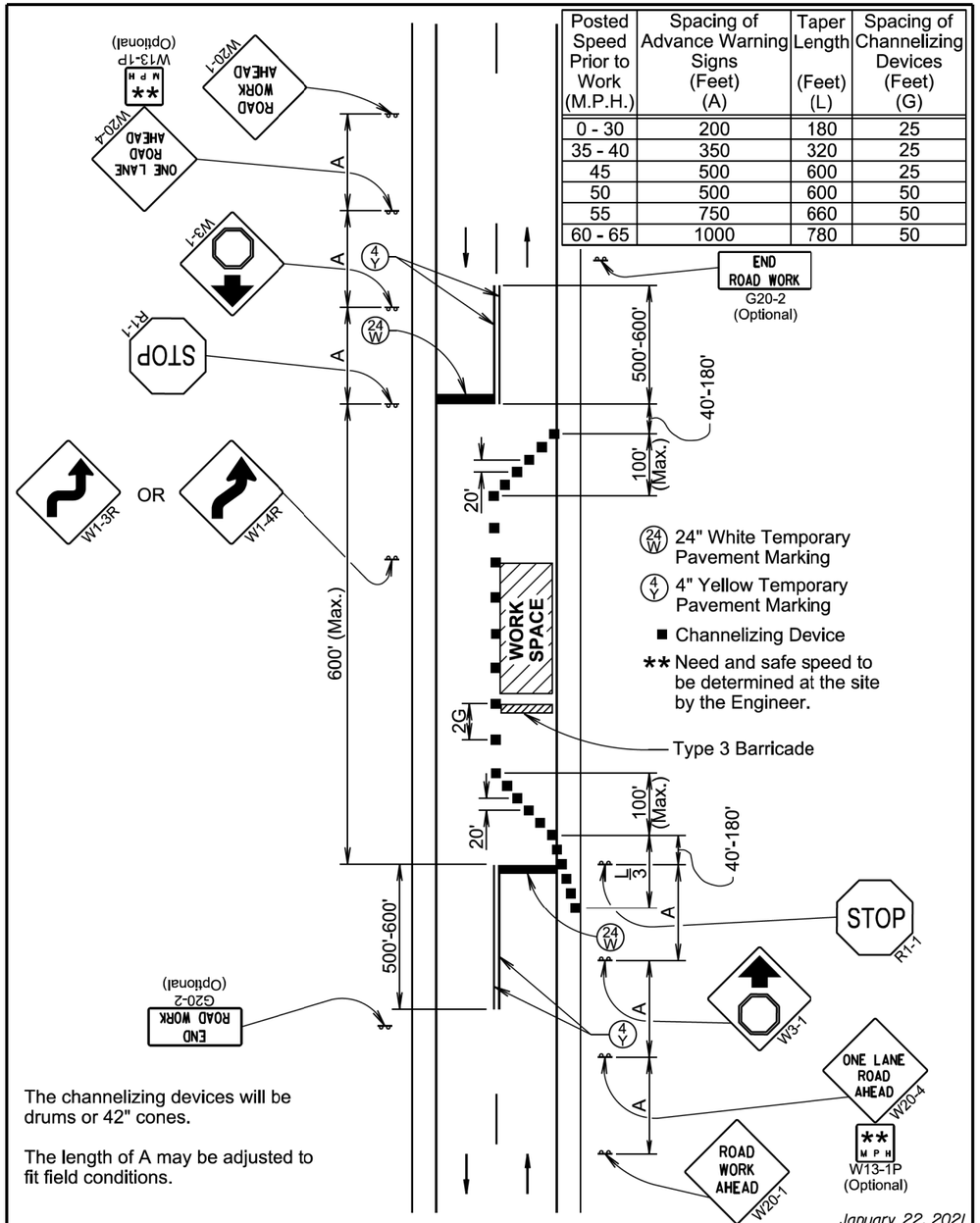
ITEMIZED LIST FOR TRAFFIC CONTROL SIGNS - SD50L

		CONVENTIONAL ROAD			
SIGN CODE	SIGN DESCRIPTION	NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
R1-1	STOP	2	30"	5.2	10.4
R3-7R	RIGHT LANE MUST TURN RIGHT	2	30" x 30"	6.3	12.6
R3-7L	LEFT LANE MUST TURN LEFT	2	30" x 30"	6.3	12.6
W1-3	REVERSE TURN (L or R)	2	48" x 48"	16.0	32.0
W1-4	REVERSE CURVE (L or R)	2	48" x 48"	16.0	32.0
W3-1	STOP AHEAD (symbol)	2	48" x 48"	16.0	32.0
W4-2	LEFT or RIGHT LANE ENDS (symbol) (2 RIGHT)	2	48" x 48"	16.0	32.0
W9-3	CENTER LANE CLOSED AHEAD	2	48" x 48"	16.0	32.0
W13-1P	ADVISORY SPEED (plaque)	2	30" x 30"	6.3	12.6
W20-1	ROAD WORK AHEAD	4	48" x 48"	16.0	64.0
W20-4	ONE LANE ROAD AHEAD	2	48" x 48"	16.0	32.0
W20-5	LEFT or RIGHT LANE CLOSED AHEAD	2	48" x 48"	16.0	32.0
W20-5	CENTER LANE CLOSED __ FT	2	48" x 48"	16.0	32.0
W20-7	FLAGGER (symbol)	2	48" x 48"	16.0	32.0
G20-2	END ROAD WORK	4	36" x 18"	4.5	18.0
		CONVENTIONAL ROAD TRAFFIC CONTROL SIGNS SQFT			418.2

ITEMIZED LIST FOR TRAFFIC CONTROL SIGNS - SD19

		CONVENTIONAL ROAD			
SIGN CODE	SIGN DESCRIPTION	NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
R1-1	STOP	2	30"	5.2	10.4
R3-7R	RIGHT LANE MUST TURN RIGHT	2	30" x 30"	6.3	12.6
R3-7L	LEFT LANE MUST TURN LEFT	2	30" x 30"	6.3	12.6
W1-3	REVERSE TURN (L or R)	2	48" x 48"	16.0	32.0
W1-4	REVERSE CURVE (L or R)	2	48" x 48"	16.0	32.0
W3-1	STOP AHEAD (symbol)	2	48" x 48"	16.0	32.0
W4-2	LEFT or RIGHT LANE ENDS (symbol) (2 RIGHT)	2	48" x 48"	16.0	32.0
W9-3	CENTER LANE CLOSED AHEAD	2	48" x 48"	16.0	32.0
W13-1P	ADVISORY SPEED (plaque)	2	30" x 30"	6.3	12.6
W20-1	ROAD WORK AHEAD	4	48" x 48"	16.0	64.0
W20-4	ONE LANE ROAD AHEAD	2	48" x 48"	16.0	32.0
W20-5	LEFT or RIGHT LANE CLOSED AHEAD	2	48" x 48"	16.0	32.0
W20-5	CENTER LANE CLOSED __ FT	2	48" x 48"	16.0	32.0
W20-7	FLAGGER (symbol)	2	48" x 48"	16.0	32.0
G20-2	END ROAD WORK	4	36" x 18"	4.5	18.0
		CONVENTIONAL ROAD TRAFFIC CONTROL SIGNS SQFT			418.2

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



24 W 24" White Temporary Pavement Marking

4 Y 4" Yellow Temporary Pavement Marking

■ Channelizing Device

** Need and safe speed to be determined at the site by the Engineer.

The channelizing devices will be drums or 42" cones.

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

January 22, 2021

Published Date: 2024

SDDOT

LANE CLOSURE USING STOP SIGNS

PLATE NUMBER 634.25

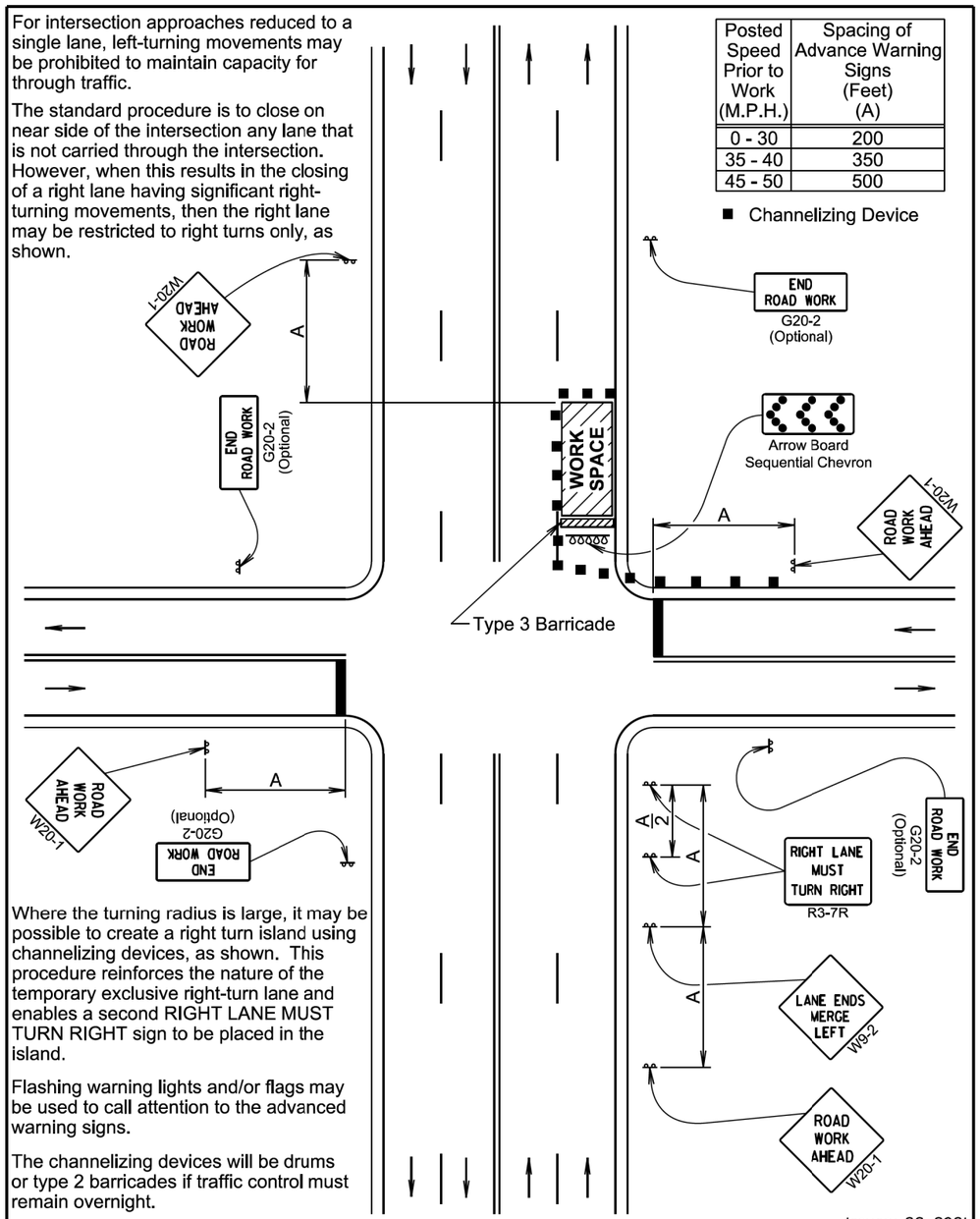
Sheet 1 of 1

For intersection approaches reduced to a single lane, left-turning movements may be prohibited to maintain capacity for through traffic.

The standard procedure is to close on near side of the intersection any lane that is not carried through the intersection. However, when this results in the closing of a right lane having significant right-turning movements, then the right lane may be restricted to right turns only, as shown.

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

■ Channelizing Device



Where the turning radius is large, it may be possible to create a right turn island using channelizing devices, as shown. This procedure reinforces the nature of the temporary exclusive right-turn lane and enables a second RIGHT LANE MUST TURN RIGHT sign to be placed in the island.

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

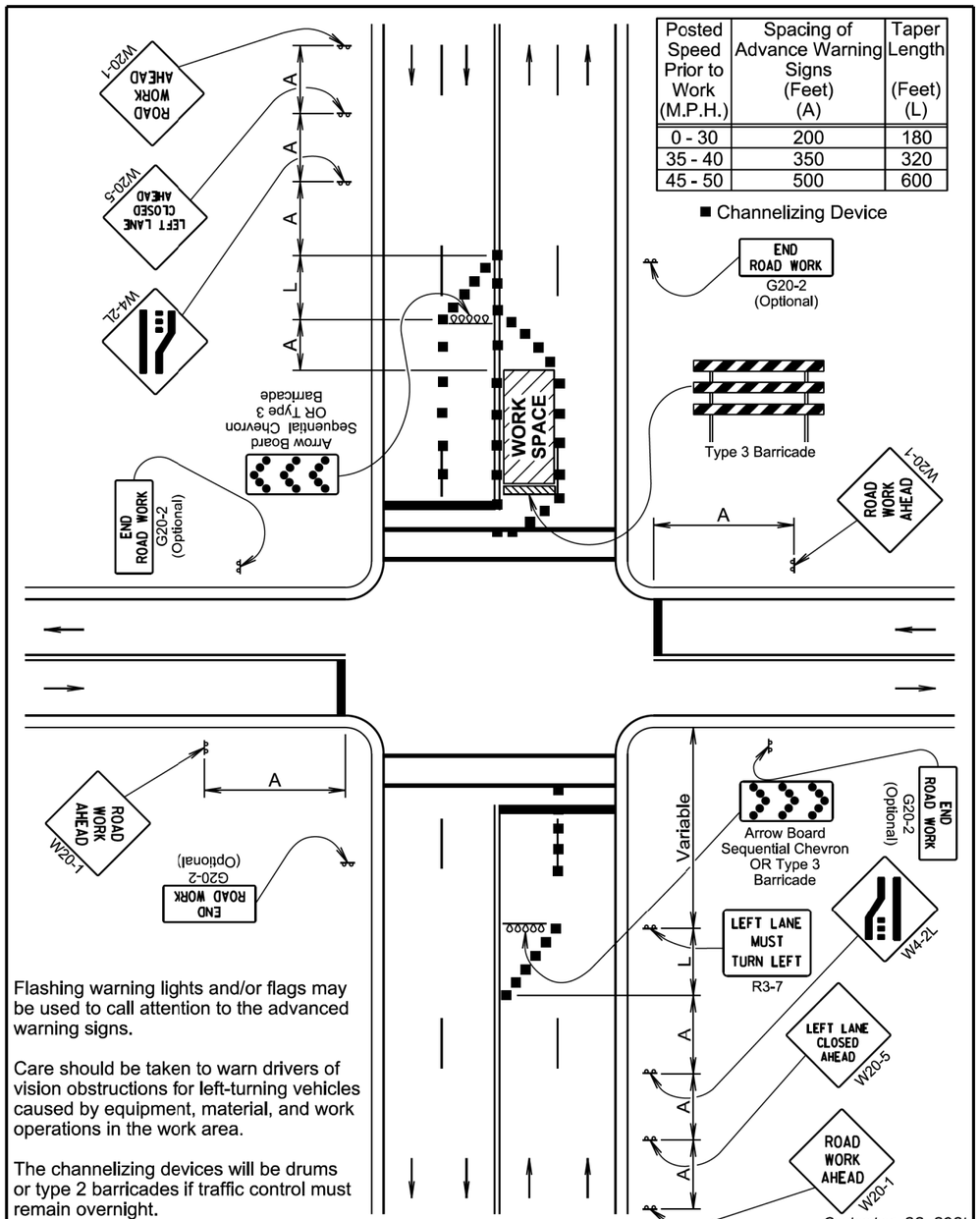
The channelizing devices will be drums or type 2 barricades if traffic control must remain overnight.

January 22, 2021

Published Date: 2024	SDDOT	RIGHT LANE CLOSURE FAR SIDE OF INTERSECTION	PLATE NUMBER 634.42
			Sheet 1 of 1

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



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

Care should be taken to warn drivers of vision obstructions for left-turning vehicles caused by equipment, material, and work operations in the work area.

The channelizing devices will be drums or type 2 barricades if traffic control must remain overnight.

September 22, 2021

Published Date: 2024	SDDOT	LEFT LANE CLOSURE FAR SIDE OF INTERSECTION	PLATE NUMBER 634.43
			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

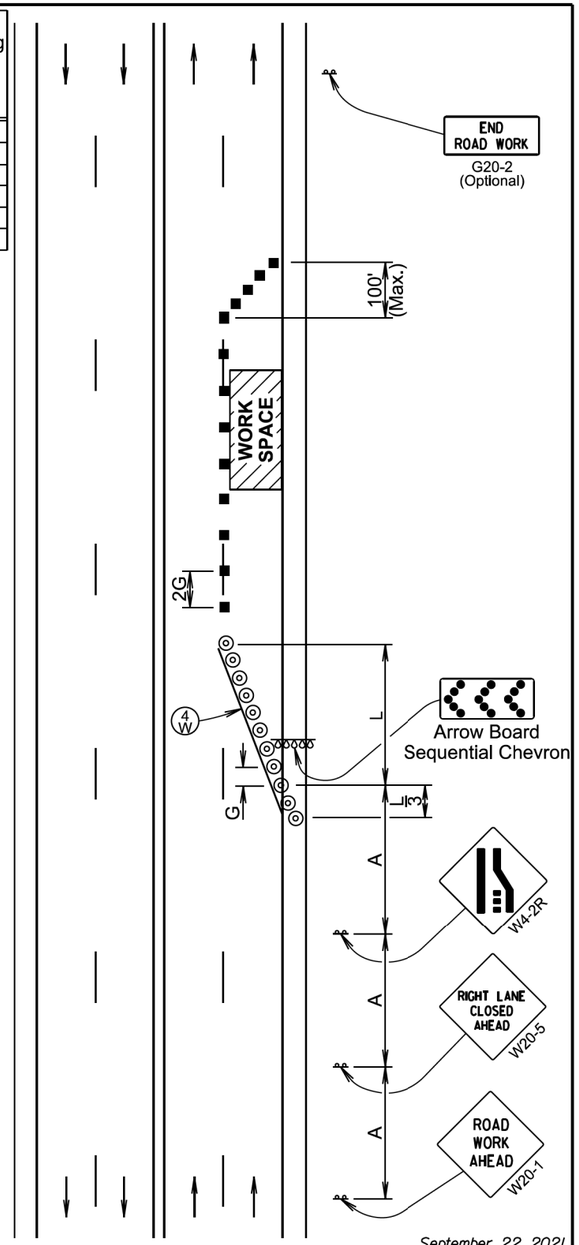
(4W) 4" White Temporary Pavement Marking

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.

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

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



September 22, 2021

Published Date: 2024

SDDOT

4-LANE UNDIVIDED, RIGHT LANE CLOSED

PLATE NUMBER 634.47

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

(4Y) 4" Yellow Temporary Pavement Marking

Pavement markings no longer applicable will be removed or obliterated as soon as practical.

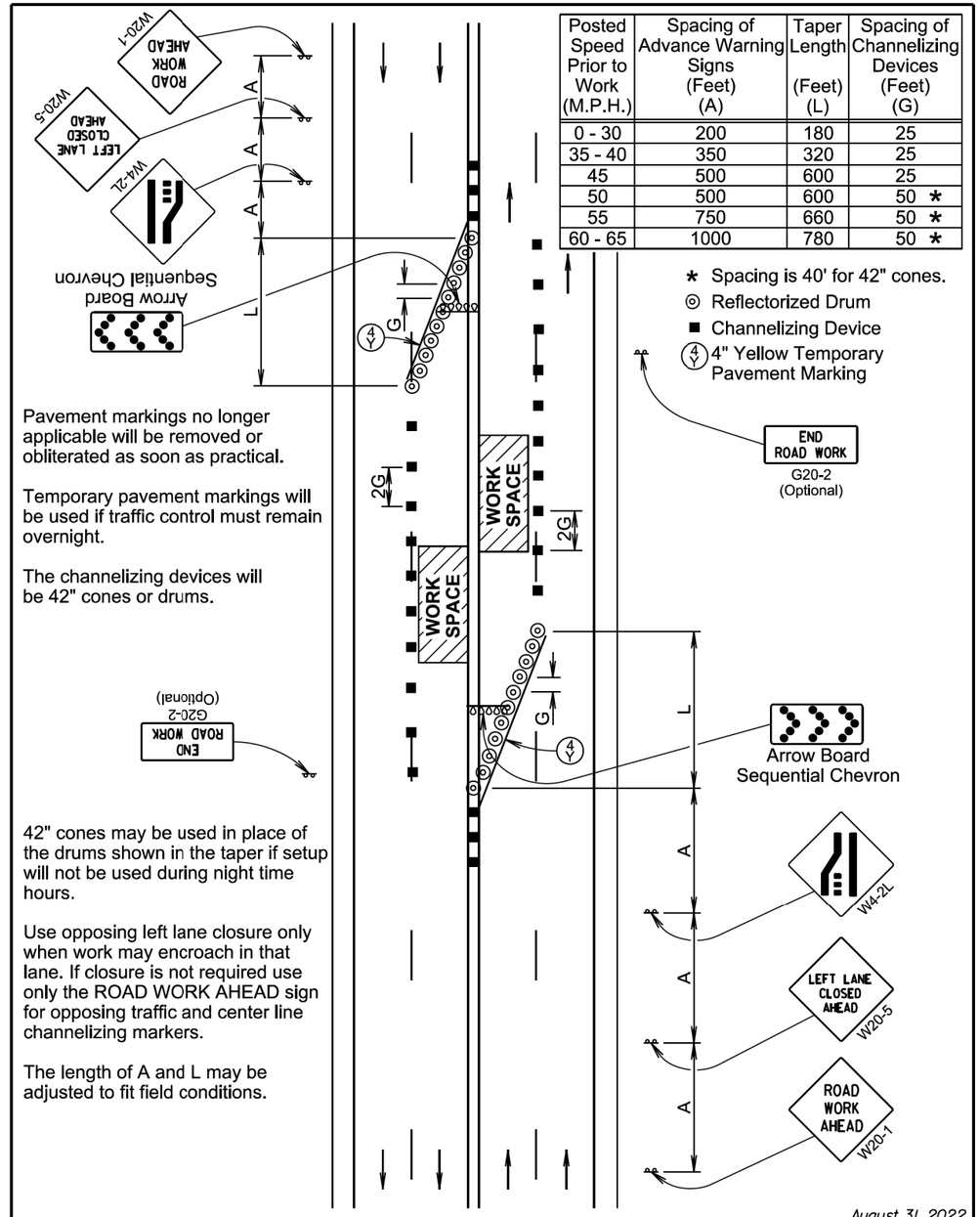
Temporary pavement markings will be used if traffic control must remain overnight.

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.

Use opposing left lane closure only when work may encroach in that lane. If closure is not required use only the ROAD WORK AHEAD sign for opposing traffic and center line channelizing markers.

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



August 31, 2022

Published Date: 2024

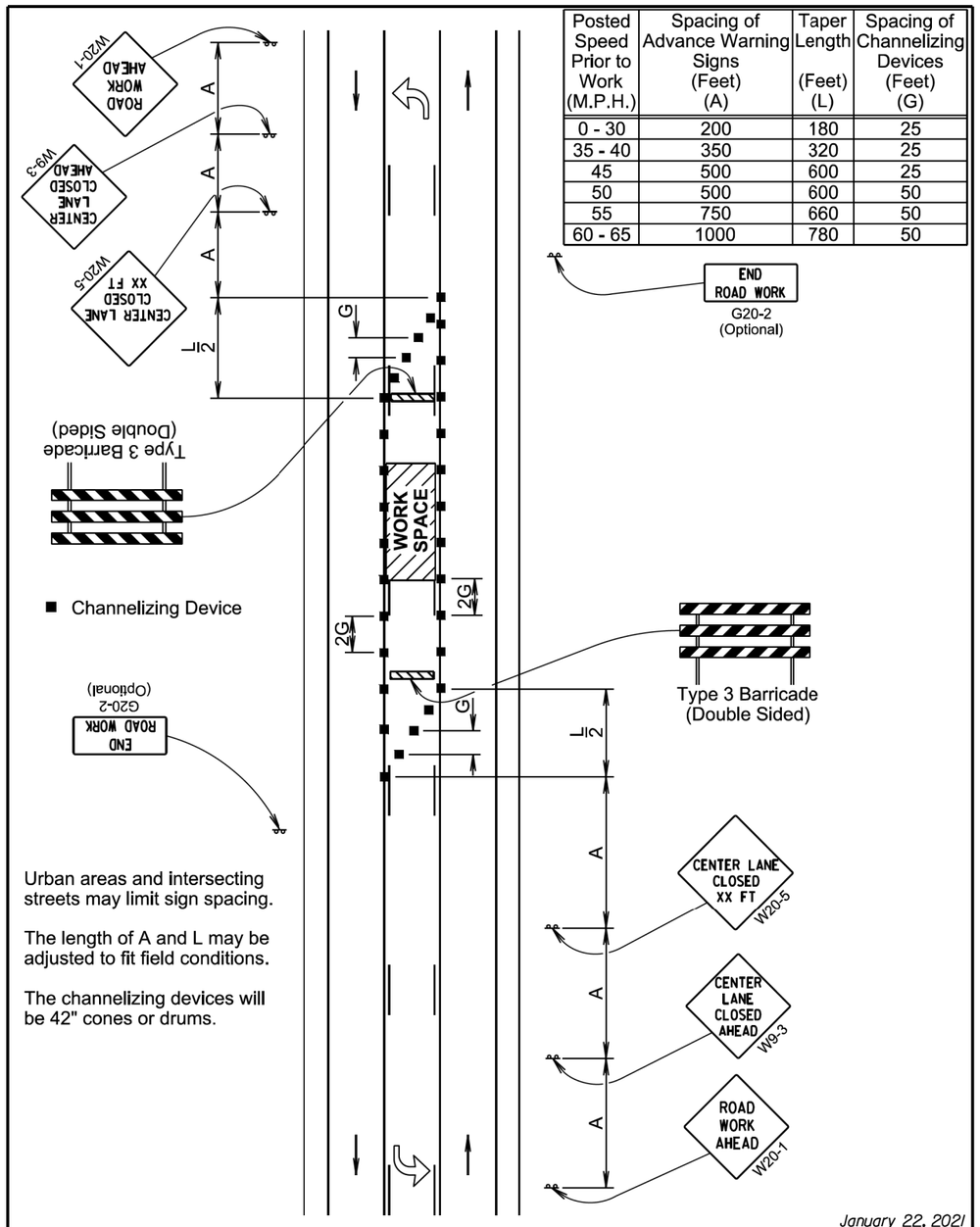
SDDOT

4-LANE UNDIVIDED, LEFT LANE CLOSED

PLATE NUMBER 634.48

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



Urban areas and intersecting streets may limit sign spacing.

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

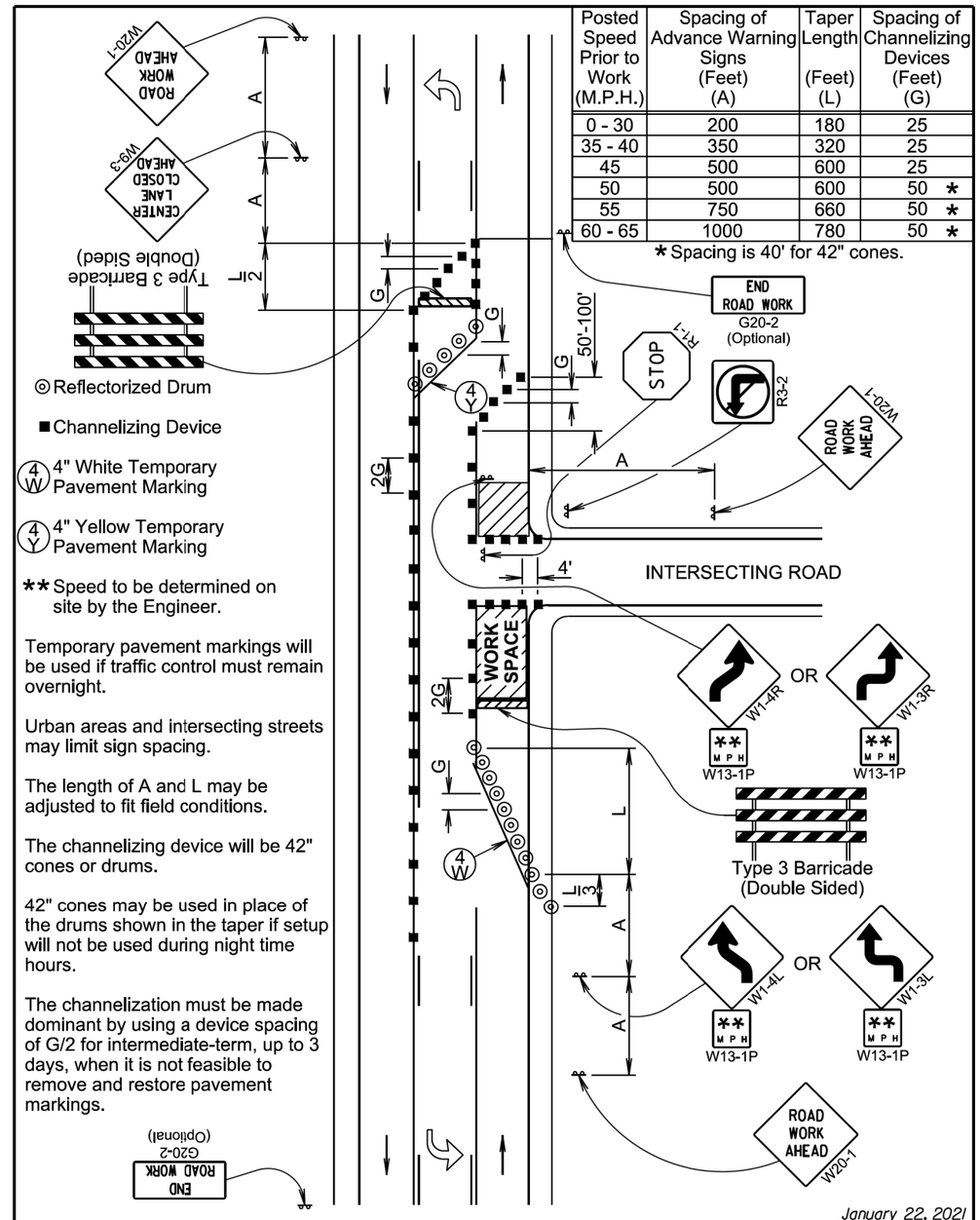
The channelizing devices will be 42" cones or drums.

January 22, 2021

Published Date: 2024	SDDOT	3-LANE, CENTER LANE CLOSED	PLATE NUMBER 634.52 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.



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

Urban areas and intersecting streets may limit sign spacing.

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

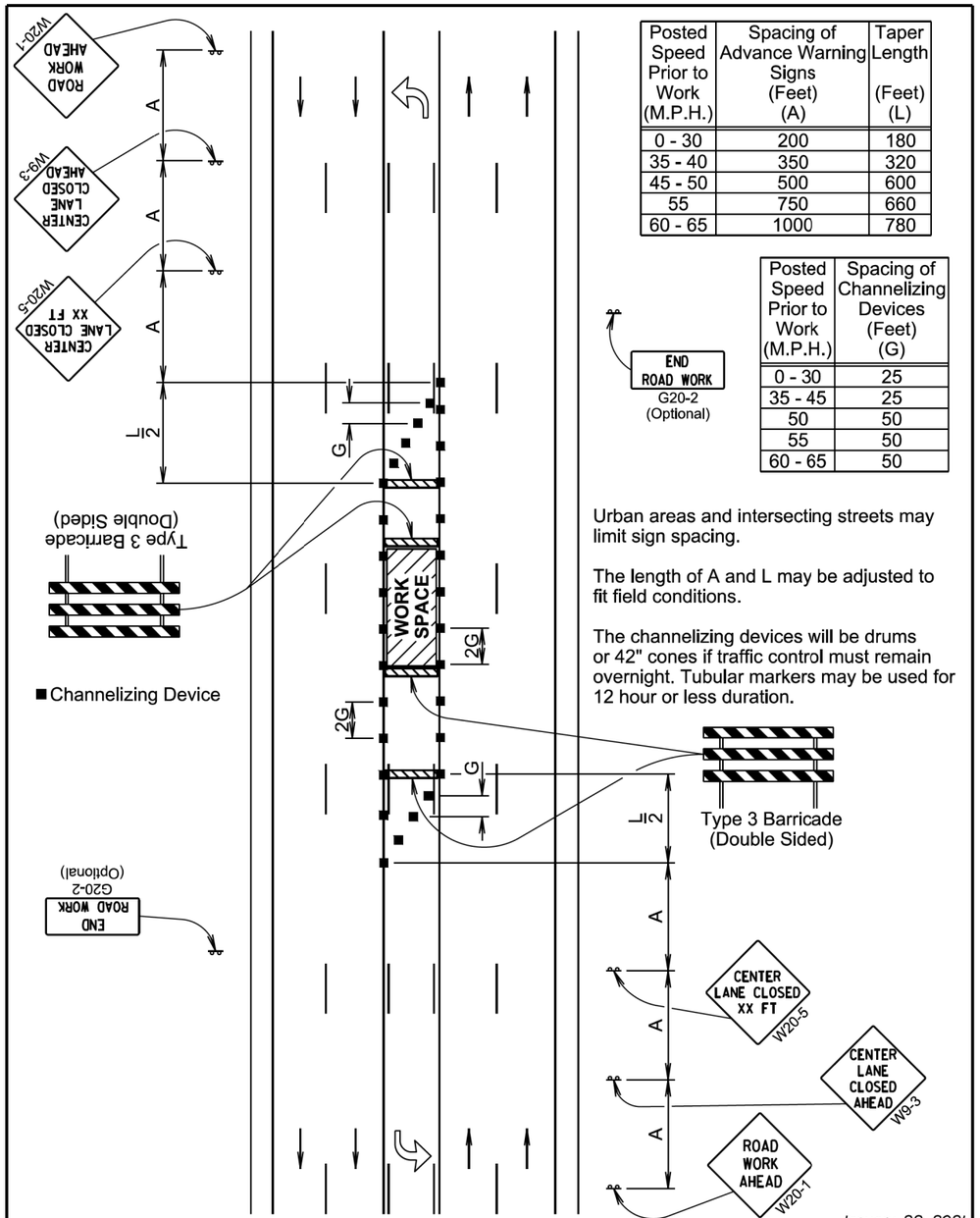
The channelizing device will be 42" cones or drums.

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

The channelization must be made dominant by using a device spacing of G/2 for intermediate-term, up to 3 days, when it is not feasible to remove and restore pavement markings.

January 22, 2021

Published Date: 2024	SDDOT	3-LANE, OUTSIDE LANE CLOSED	PLATE NUMBER 634.53 Sheet 1 of 1



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
55	750	660
60 - 65	1000	780

Posted Speed Prior to Work (M.P.H.)	Spacing of Channelizing Devices (Feet) (G)
0 - 30	25
35 - 45	25
50	50
55	50
60 - 65	50

Urban areas and intersecting streets may limit sign spacing.

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

The channelizing devices will be drums or 42" cones if traffic control must remain overnight. Tubular markers may be used for 12 hour or less duration.

January 22, 2021

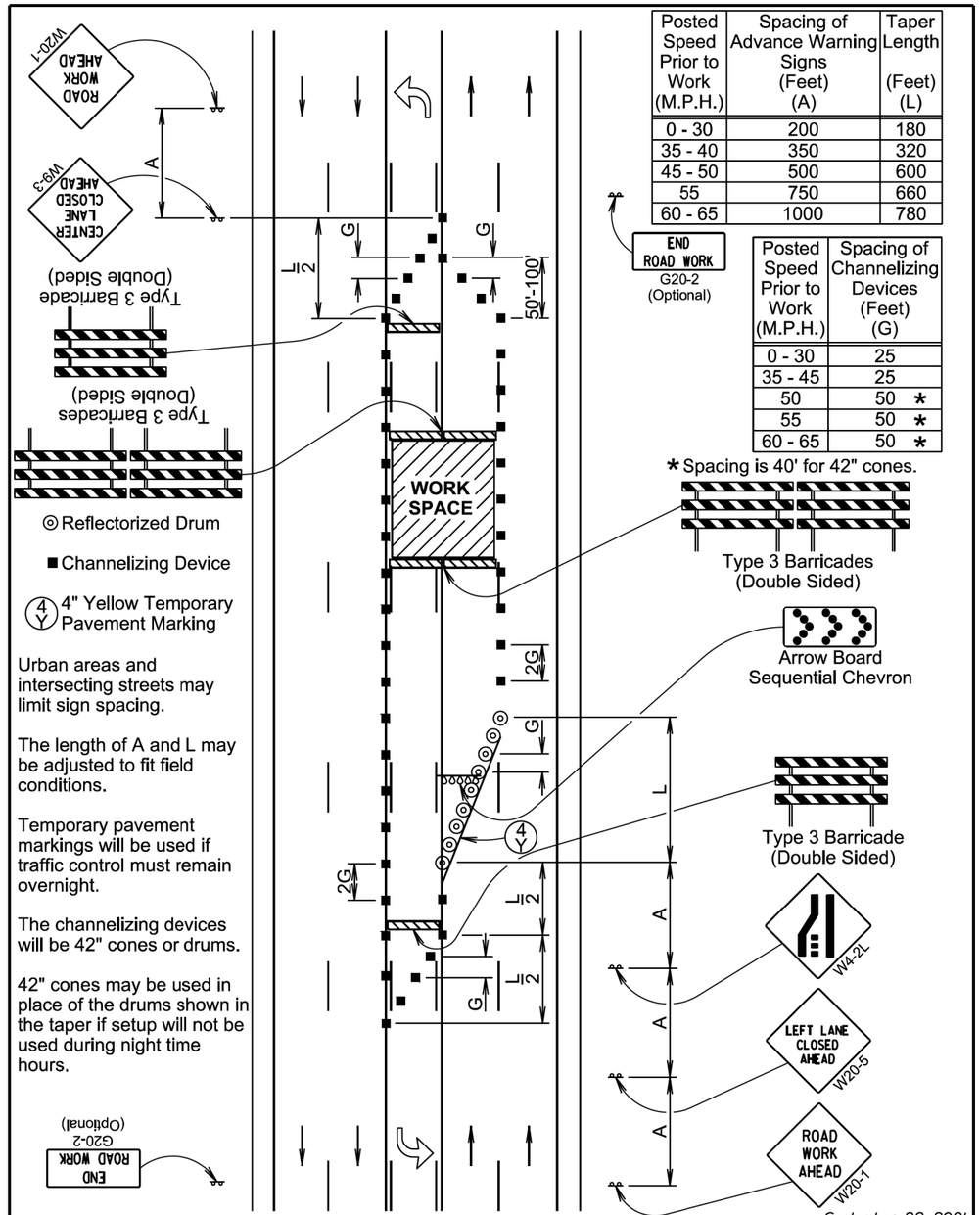
Published Date: 2024

SDDOT

5-LANE, CENTER LANE CLOSED

PLATE NUMBER 634.55

Sheet 1 of 1



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
55	750	660
60 - 65	1000	780

Posted Speed Prior to Work (M.P.H.)	Spacing of Channelizing Devices (Feet) (G)
0 - 30	25
35 - 45	25
50	50 *
55	50 *
60 - 65	50 *

Urban areas and intersecting streets may limit sign spacing.

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

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

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.

September 22, 2021

Published Date: 2024

SDDOT

5-LANE, INSIDE 2 LANES CLOSED

PLATE NUMBER 634.56

Sheet 1 of 1

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

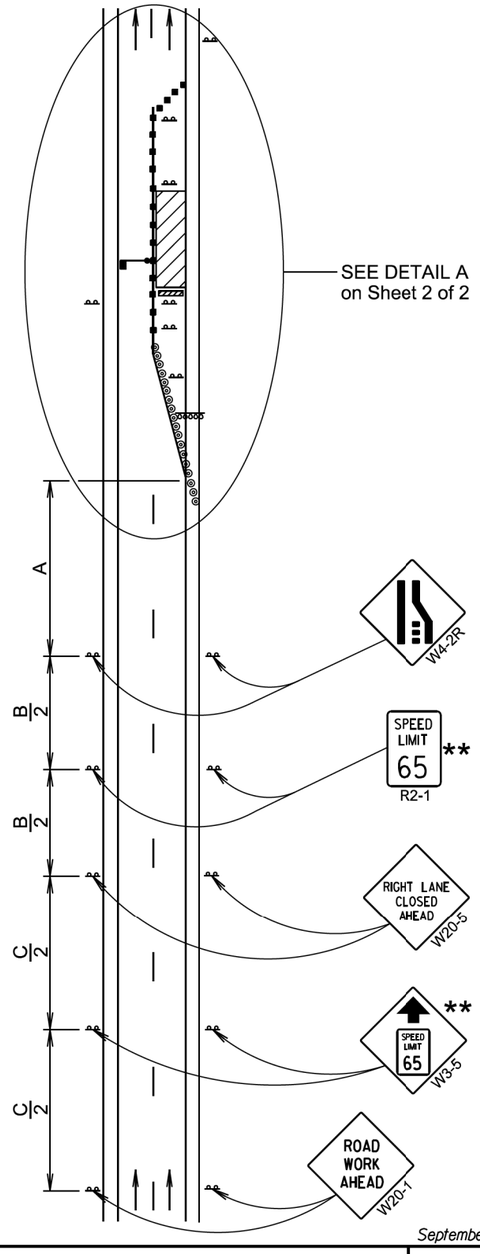
** Speed appropriate for location.

◎ Reflectorized Drum

■ Channelizing Device

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

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



September 22, 2021

Published Date: 2024	SDDOT	WORK ZONE SPEED REDUCTION FOR INTERSTATE AND HIGH SPEED MULTI-LANE HIGHWAYS	PLATE NUMBER 634.63
			Sheet 1 of 2

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

* Spacing is 40' for 42" cones.

** Speed appropriate for location.

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

■● Flagger (As Necessary)

◎ Reflectorized Drum

■ Channelizing Device

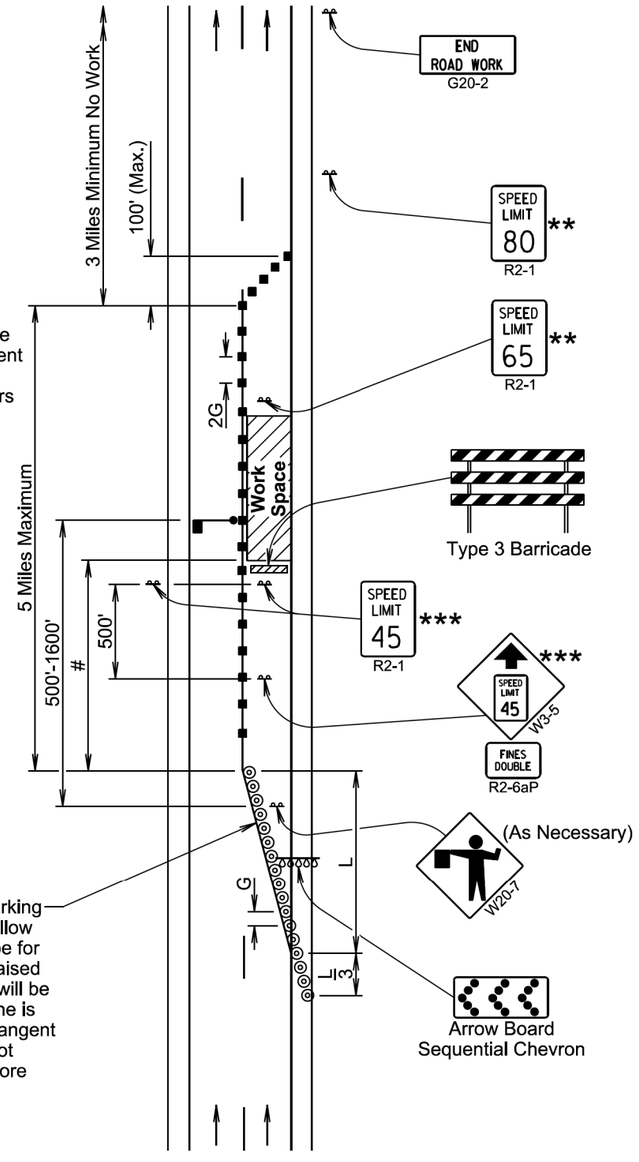
The Work Space will be a minimum of 500' from the end of the taper.

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 raised pavement markers at 5' spacing will be installed in the taper when the lane is closed overnight, and along the tangent section where the skip lines do not exist and the lane is closed for more than 3 days.



DETAIL A

September 22, 2021

Published Date: 2024	SDDOT	WORK ZONE SPEED REDUCTION FOR INTERSTATE AND HIGH SPEED MULTI-LANE HIGHWAYS	PLATE NUMBER 634.63
			Sheet 2 of 2

PLOT SCALE - 1:200

PLOT NAME - 6

FILE - ...\UNIN0937F\STD 634 PLATES.DGN

PLOTTED FROM - TRMI1NT15

Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet) (A) (B) (C)	Taper Length (Feet) (L)
0 - 30	200	180
35 - 40	350	320
45 - 50	500	600
55	750	660
60 - 65	1000	780
	(A) (B) (C)	
70 - 80	1000 1500 2640	1125

Posted Speed Prior to Work (M.P.H.)	Spacing of Channelizing Devices (Feet) (G)
0 - 30	25
35 - 45	25
50	50 *
55	50 *
60 - 80	50 *

* Spacing is 40' for 42" cones.

◎ Reflectorized Drum

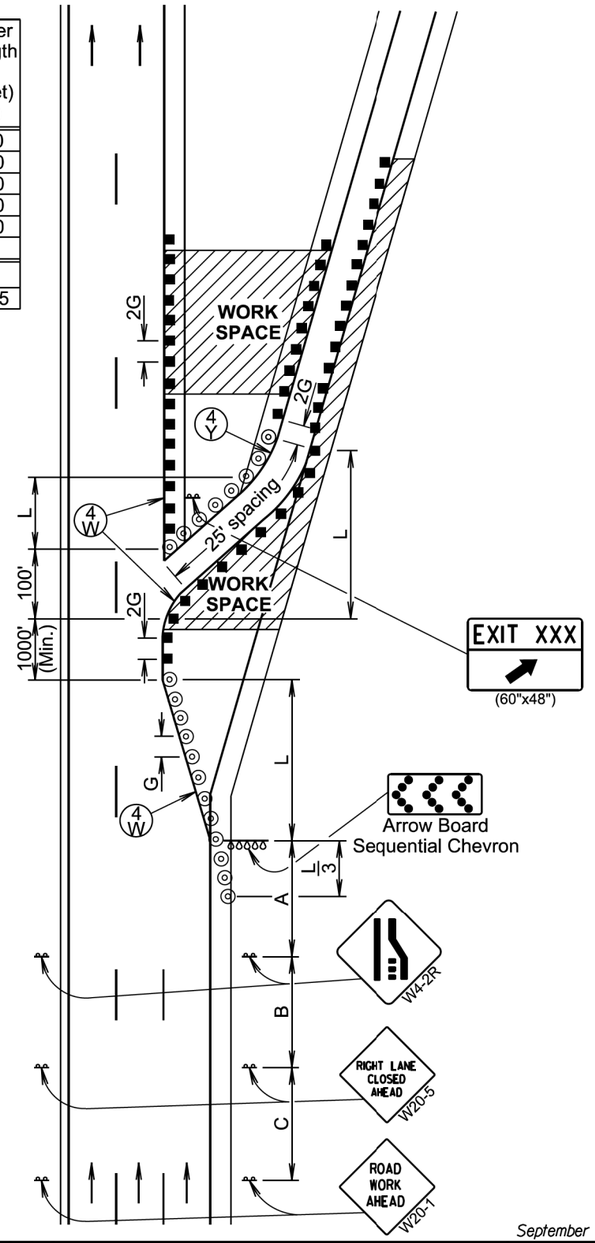
■ Channelizing Device

(4W) 4" White Temporary Pavement Marking

(4Y) 4" Yellow Temporary Pavement Marking

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

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



September 22, 2021

Published Date: 2024

SDDOT

WORK IN VICINITY OF EXIT RAMP

PLATE NUMBER 634.68

Sheet 1 of 1

Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet) (A) (B)	Taper Length (Feet) (L)
45 - 50	500	600
55	750	660
60 - 65	1000	780
	(A) (B)	
70 - 80	1000 1500	1125

Posted Speed Prior to Work (M.P.H.)	Spacing of Channelizing Devices (Feet) (G)
0 - 30	25
35 - 45	25
50	50 *
55	50 *
60 - 80	50 *

* Spacing is 40' for 42" cones.

■ Channelizing Device

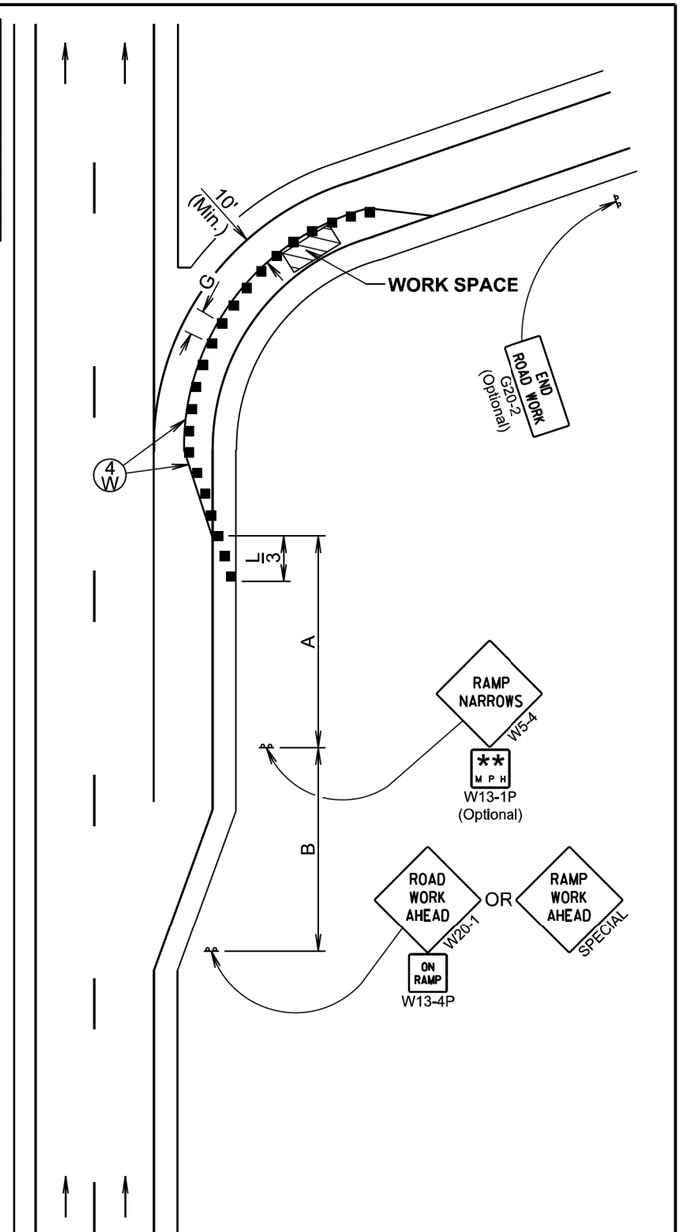
(4W) 4" White Temporary Pavement Marking

** Need and safe speed to be determined by the Engineer.

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

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

Truck off-tracking should be considered when determining whether the 10-foot minimum lane width is adequate.



January 22, 2021

Published Date: 2024

SDDOT

PARTIAL EXIT RAMP CLOSURE

PLATE NUMBER 634.69

Sheet 1 of 1

Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet) (A) (B) (C)	Taper Length (Feet) (L)
0 - 30	200	180
35 - 40	350	320
45 - 50	500	600
55	750	660
60 - 65	1000	780
	(A) (B) (C)	
70 - 80	1000 1500 2640	1125

Posted Speed Prior to Work (M.P.H.)	Spacing of Channelizing Devices (Feet) (G)
0 - 30	25
35 - 45	25
50	50 *
55	50 *
60 - 80	50 *

* Spacing is 40' for 42" cones.

◎ Reflectorized Drum

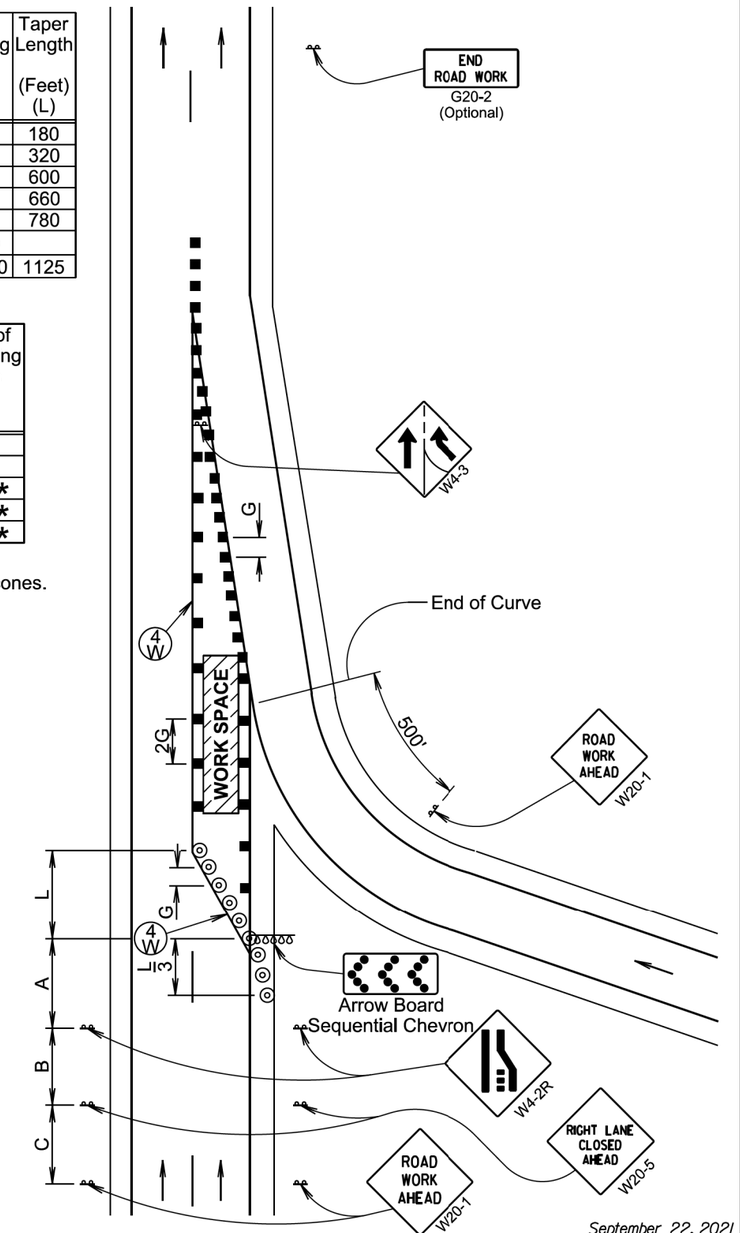
■ Channelizing Device

(4W) 4" White Temporary Pavement Marking

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

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

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



September 22, 2021

Published Date: 2024

SDDOT

WORK IN VICINITY OF ENTRANCE RAMP

PLATE NUMBER 634.70

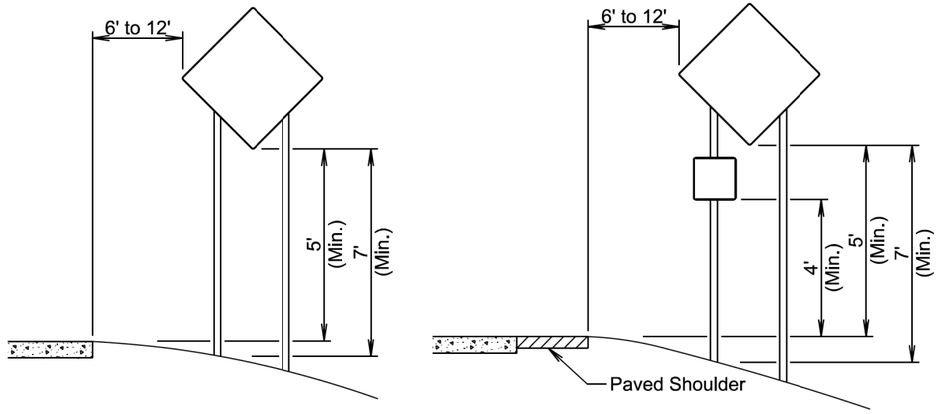
Sheet 1 of 1

PLOT SCALE - 1:200

PLOTTED FROM - TRM11NT15

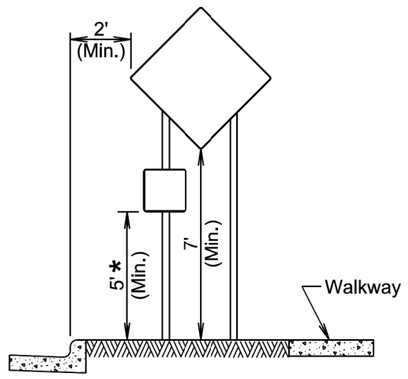
PLOT NAME - 8

FILE - ...\UNTN097F\STD 634 PLATES.DGN

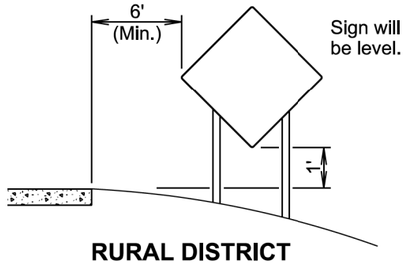


RURAL DISTRICT

RURAL DISTRICT WITH SUPPLEMENTAL PLATE



URBAN DISTRICT

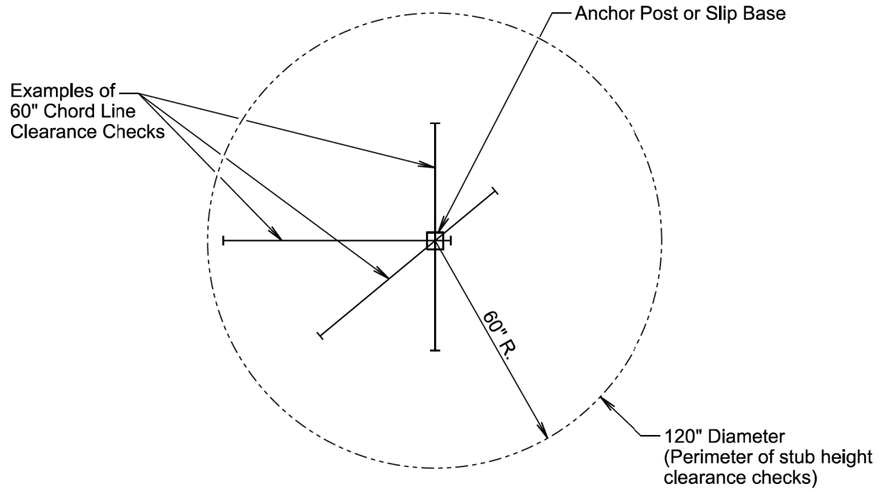


RURAL DISTRICT
3 DAY MAXIMUM
(Not applicable to regulatory signs)

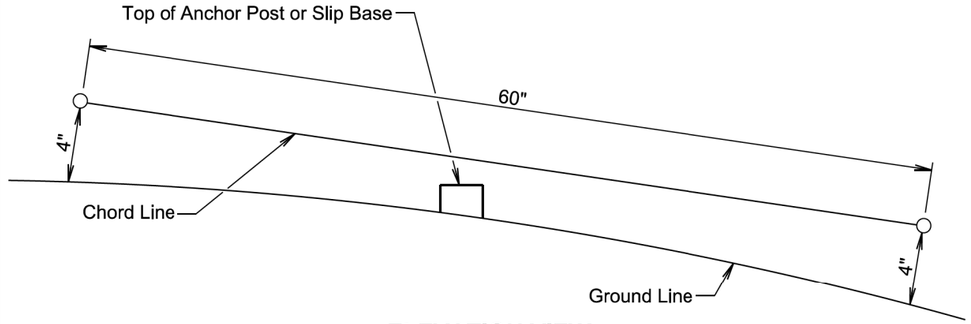
* If the bottom of supplemental plate is mounted lower than 7 feet above a pedestrian walkway, the supplemental plate should not project more than 4" into the pedestrian facility.

January 22, 2021

Published Date: 2024	SDDOT	CRASHWORTHY SIGN SUPPORTS (Typical Construction Signing)	PLATE NUMBER 634.85
			Sheet 1 of 1



PLAN VIEW
(Examples of stub height clearance checks)



ELEVATION VIEW

GENERAL NOTES:

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

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

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

January 22, 2021

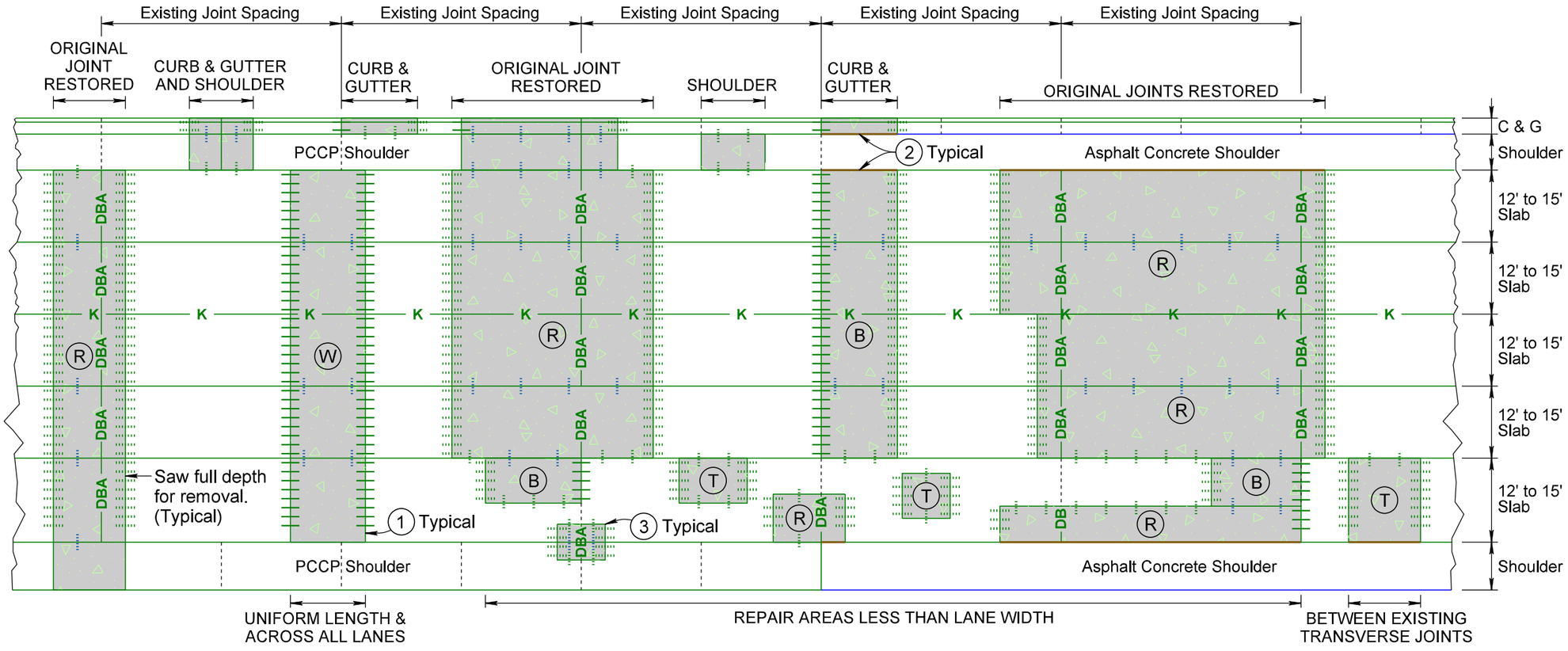
Published Date: 2024	SDDOT	BREAKAWAY SUPPORT STUB CLEARANCE	PLATE NUMBER 634.99
			Sheet 1 of 1

Plotting Date: 03/18/2024

NONREINFORCED PCC PAVEMENT REPAIR

UP TO FOUR LANE ROADWAY WITH CENTER TURN LANE OR UP TO TEN LANE DIVIDED ROADWAY

TYPICAL REPAIR AREAS



KEY:

PCC Pavement Repair Area

PCC PAVEMENT REPAIR AREA TYPES:

(W) Two Working Joints (Use only if repair is full roadway width and uniform length (across all lanes))

(T) Two Tied Joints

(B) One Working & One Tied Joint

(R) Two Tied Joints with Original Joint Restored with Dowel Bar Assembly

Longitudinal Keyway Joints Without Bars

— K — Where a repair area intersects an existing longitudinal keyway joint without tie bars, the newly constructed joint should also be a keyway without tie bars.

Steel Bars for Transverse Joints

Pavement Thickness >= 10.5"

— Drilled in 1½" x 18" epoxy coated plain round dowel bars spaced 18" center to center.

..... Drilled in No. 11 x 18" epoxy coated deformed tie bars spaced 18" center to center.

Pavement Thickness >= 8.5" and < 10.5"

— Drilled in 1¼" x 18" epoxy coated plain round dowel bars spaced 18" center to center.

..... Drilled in No. 9 x 18" epoxy coated deformed tie bars spaced 18" center to center.

Pavement Thickness < 8.5"

— Drilled in 1" x 18" epoxy coated plain round dowel bars spaced 18" center to center.

..... Drilled in No. 8 x 18" epoxy coated deformed tie bars spaced 18" center to center.

DBA Dowel Bar Assembly

Steel Bars for Longitudinal Joints

No. 5 x 30" epoxy coated deformed tie bars.
Sawed Joint - spaced 48" center to center.
Construction Joint - spaced 48" center to center.

No. 5 x 24" epoxy coated deformed tie bars.
Drilled In - spaced 30" center to center.

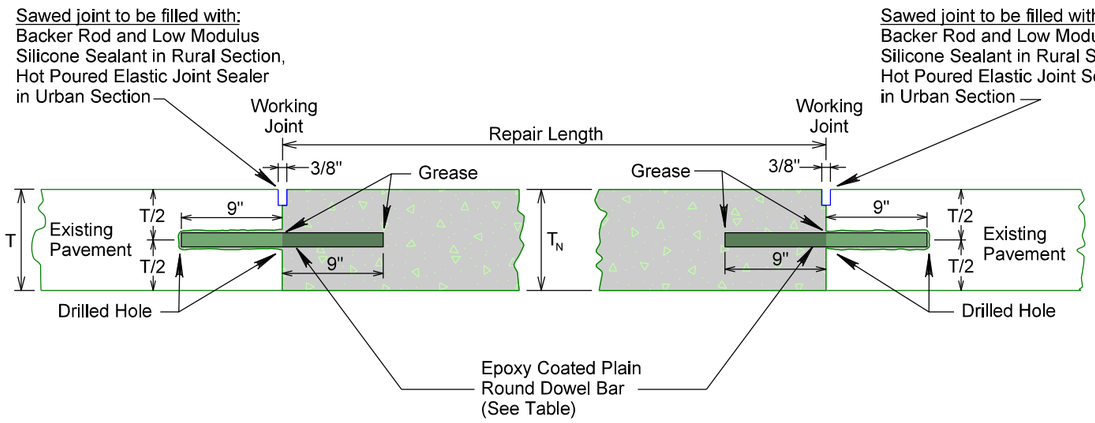
NOTES: Saw around repair areas full depth for removal.

1. Where possible, transverse joints will be constructed/maintained full roadway width.
2. Edges of repair areas will be formed to match the width of the existing concrete pavement.
3. Need for bars in small repair areas on/near the shoulder to be determined on a case-by-case basis, on construction by the Engineer.

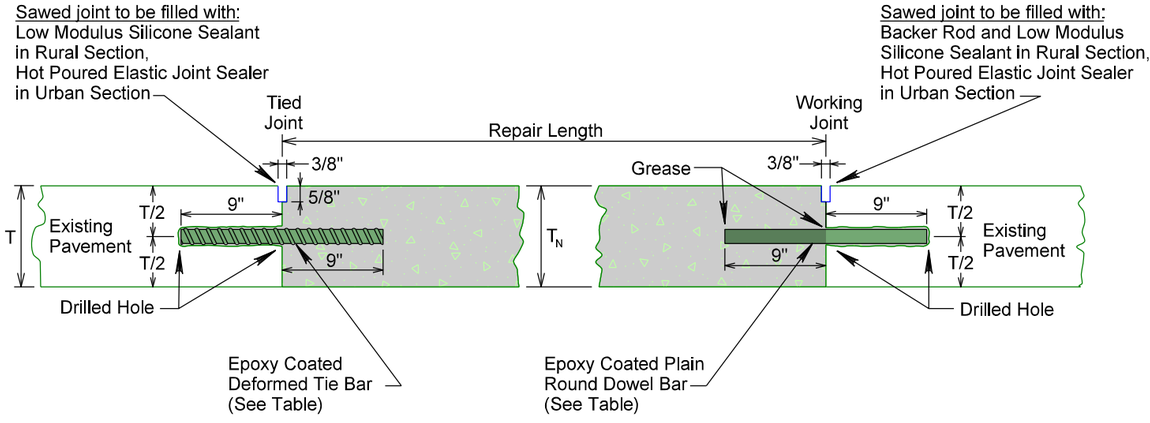
Plotting Date: 03/18/2024

NONREINFORCED PCC PAVEMENT REPAIR

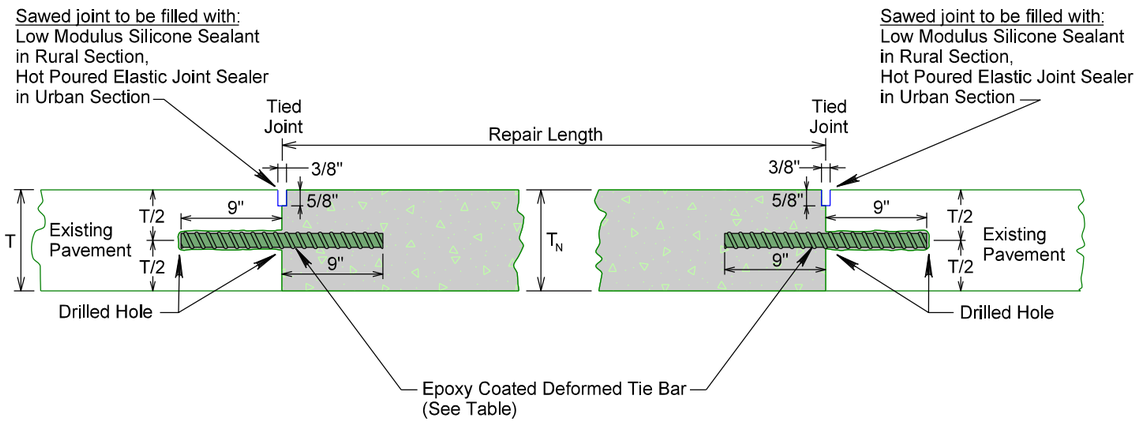
PLAIN ROUND DOWEL BAR INSERTION
TYPE W - (TWO WORKING JOINTS)



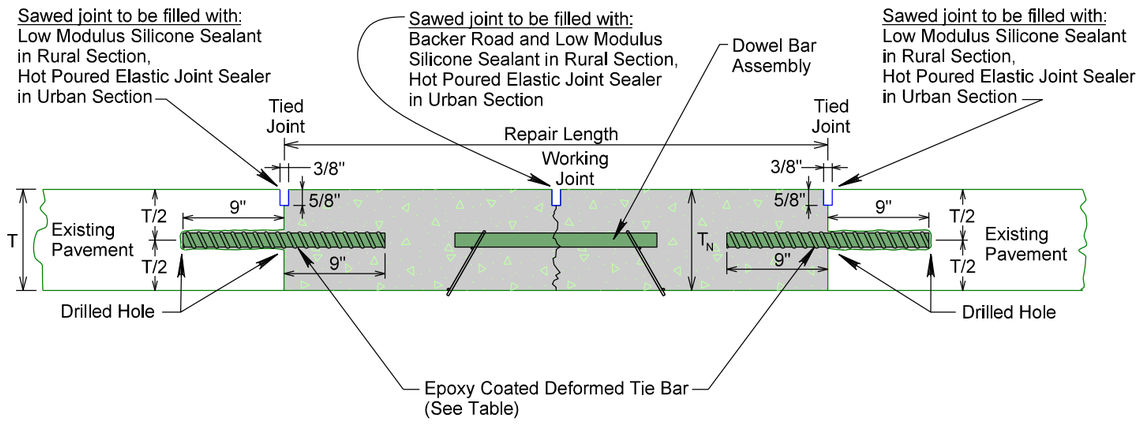
DEFORMED TIE BAR AND PLAIN ROUND DOWEL BAR INSERTION
TYPE B - (ONE TIED JOINT AND ONE WORKING JOINT)



DEFORMED TIE BAR INSERTION
TYPE T - (TWO TIED JOINTS)



DEFORMED TIE BAR INSERTION WITH DOWEL BAR ASSEMBLY
TYPE R - (TWO TIED JOINTS AND ONE WORKING JOINT - ORIGINAL JOINT RESTORED)



Existing Pavement Thickness	Epoxy Coated Deformed Tie Bar Size	Epoxy Coated Plain Round Dowel Bar Size
T >= 10.5"	No. 11 x 18"	1½" x 18"
T >= 8.5" & T < 10.5"	No. 9 x 18"	1¼" x 18"
T < 8.5"	No. 8 x 18"	1" x 18"

T = Existing pavement thickness.
T_N = New pavement thickness.

Bar embedded to a minimum depth of 9 inches into the existing pavement by utilizing an epoxy resin adhesive.

Cost for furnishing and inserting steel bars (deformed tie and plain round dowel) will be included in the contract unit price per each for Insert Steel Bar in PCC Pavement.

Cost for furnishing and installing dowel bar assembly will be included in the contract unit price per each for Dowel Bar.

T_N = T

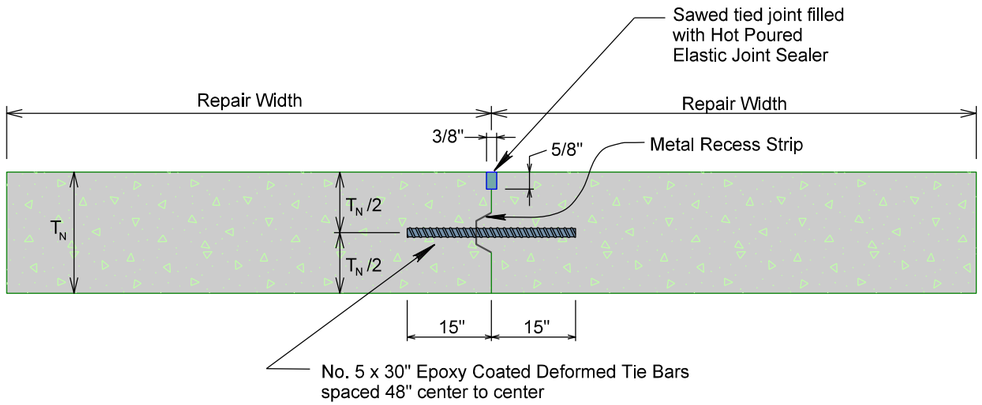
(top of new pavement will be flush with top of existing pavement)

NONREINFORCED PCC PAVEMENT REPAIR

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM-NH-P 0023(69)	28	34

Plotting Date: 03/18/2024

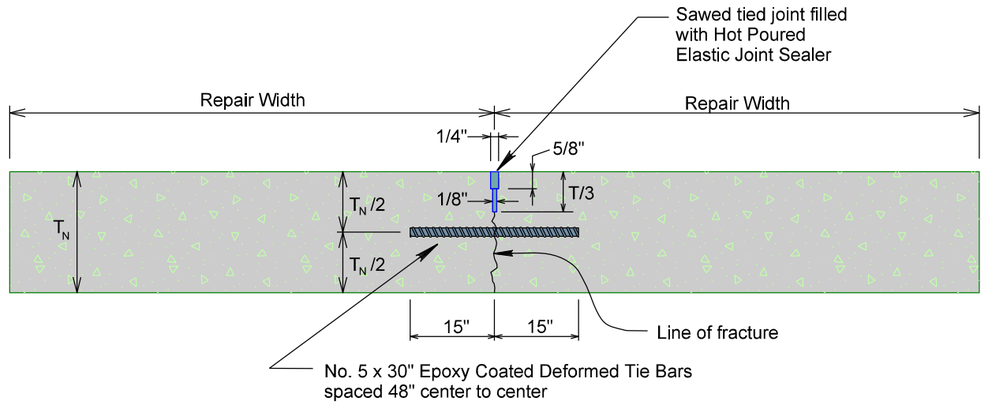
LONGITUDINAL CONSTRUCTION JOINT WITH TIE BARS & KEYWAY



T_N = New pavement thickness.

Cost for furnishing and inserting tie bars will be incidental to the contract unit price per square yard for Nonreinforced PCC Pavement Repair.

SAWED LONGITUDINAL JOINT

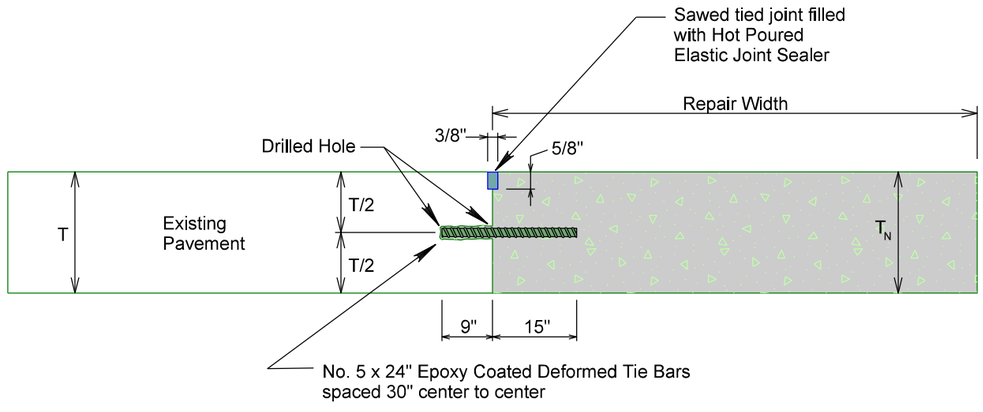


T_N = New pavement thickness.

The first saw cut to control cracking will be a minimum of 1/3 the depth of the pavement. Additional sawing for widening the saw cut will be necessary.

Cost for furnishing and inserting tie bars will be incidental to the contract unit price per square yard for Nonreinforced PCC Pavement Repair.

LONGITUDINAL CONSTRUCTION JOINT WITH DRILLED IN TIE BARS



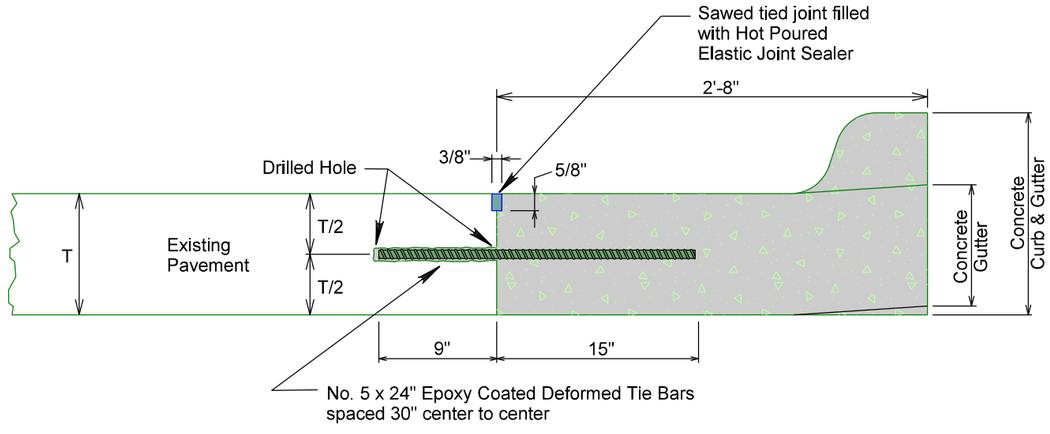
T = Existing pavement thickness.
T_N = New pavement thickness.

Bar embedded a minimum depth of 9 inches into the existing pavement by utilizing an epoxy resin adhesive.

Bars will be placed a minimum of 15 inches from existing transverse contraction joints.

Cost for furnishing and inserting drilled in tie bars will be included in the contract unit price per each for Insert Steel Bar in PCC Pavement.

LONGITUDINAL CONSTRUCTION JOINT WITH DRILLED IN TIE BARS



T = Existing pavement thickness.

Bar embedded a minimum depth of 9 inches into the existing pavement by utilizing an epoxy resin adhesive.

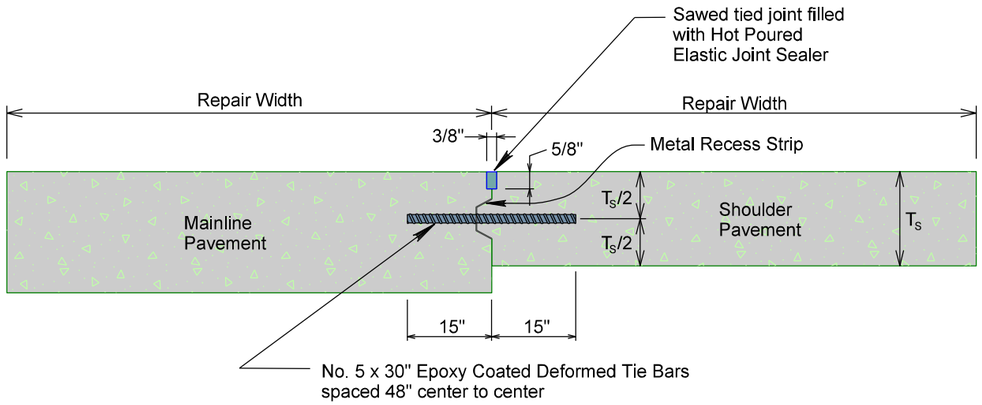
Bars will be placed a minimum of 15 inches from existing transverse contraction joints.

Cost for furnishing and inserting drilled in tie bars will be included in the contract unit price per each for Insert Steel Bar in PCC Pavement.

Plotting Date: 03/18/2024

NONREINFORCED PCC PAVEMENT REPAIR

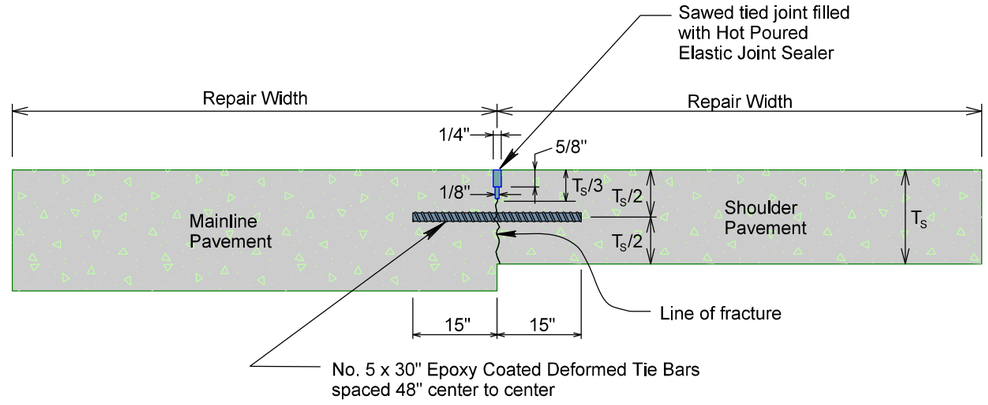
LONGITUDINAL SHOULDER CONSTRUCTION JOINT WITH TIE BARS & KEYWAY



T_S = New shoulder pavement thickness.

Cost for furnishing and inserting tie bars will be incidental to the contract unit price per square yard for Nonreinforced PCC Pavement Repair.

SAWED LONGITUDINAL SHOULDER JOINT

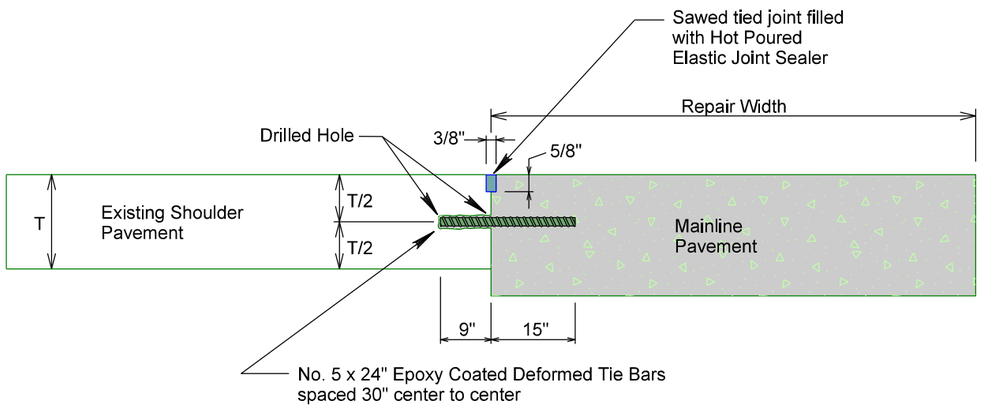


T_S= New shoulder pavement thickness.

The first saw cut to control cracking will be a minimum of 1/3 the depth of the pavement. Additional sawing for widening the saw cut will be necessary.

Cost for furnishing and inserting tie bars will be incidental to the contract unit price per square yard for Nonreinforced PCC Pavement Repair.

LONGITUDINAL SHOULDER JOINT WITH DRILLED IN TIE BARS



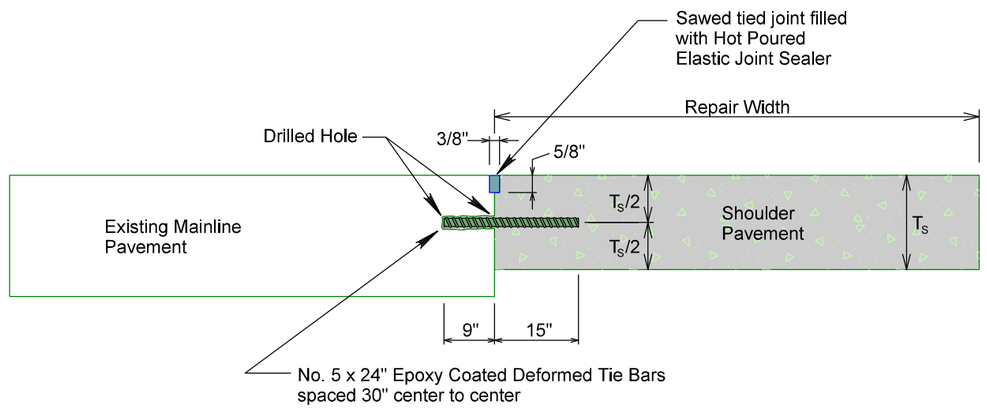
T = Existing shoulder pavement thickness.

Bar embedded a minimum depth of 9 inches into the existing pavement by utilizing an epoxy resin adhesive.

Bars will be placed a minimum of 15 inches from existing transverse contraction joints.

Cost for furnishing and inserting drilled in tie bars will be included in the contract unit price per each for Insert Steel Bar in PCC Pavement.

LONGITUDINAL SHOULDER JOINT WITH DRILLED IN TIE BARS



T_S = New shoulder pavement thickness.

Bar embedded a minimum depth of 9 inches into the existing pavement by utilizing an epoxy resin adhesive.

Bars will be placed a minimum of 15 inches from existing transverse contraction joints.

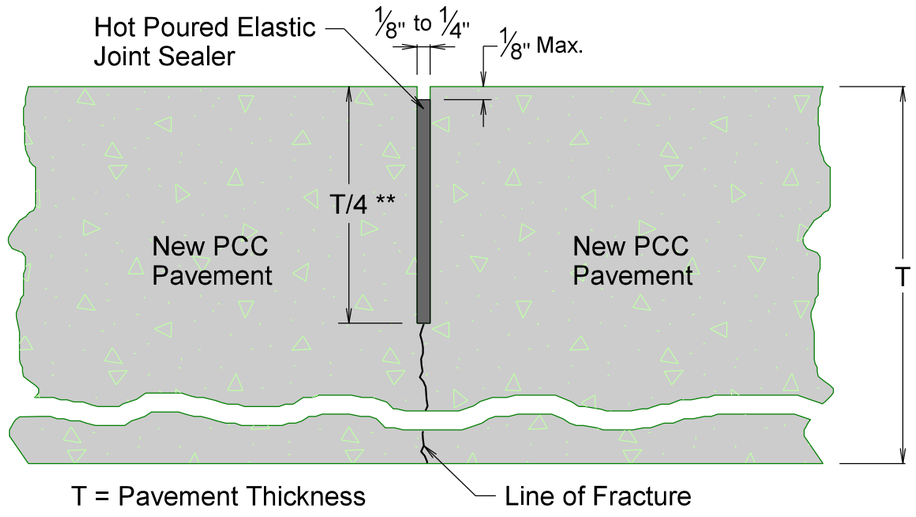
Cost for furnishing and inserting drilled in tie bars will be included in the contract unit price per each for Insert Steel Bar in PCC Pavement.

NONREINFORCED PCC PAVEMENT REPAIR
SAW & SEAL TRANSVERSE JOINTS

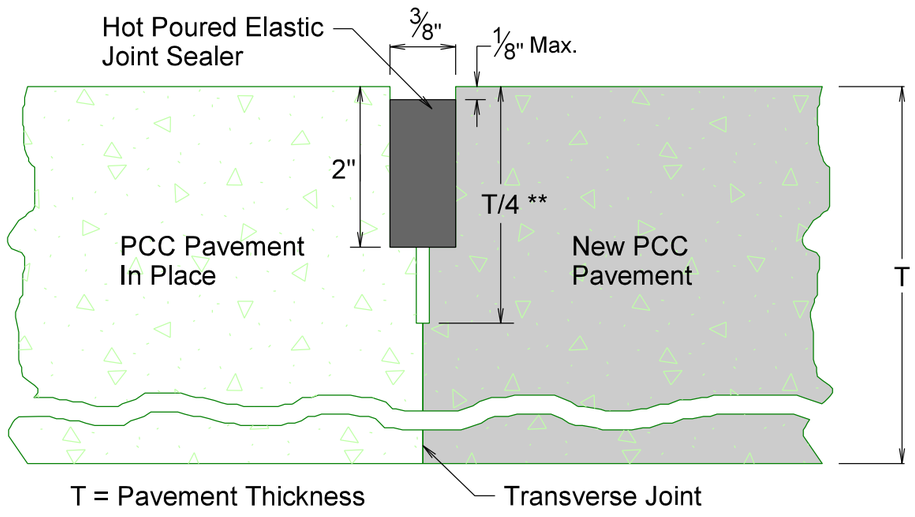
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM-NH-P 0023(69)	30	34

Plotting Date: 03/18/2024

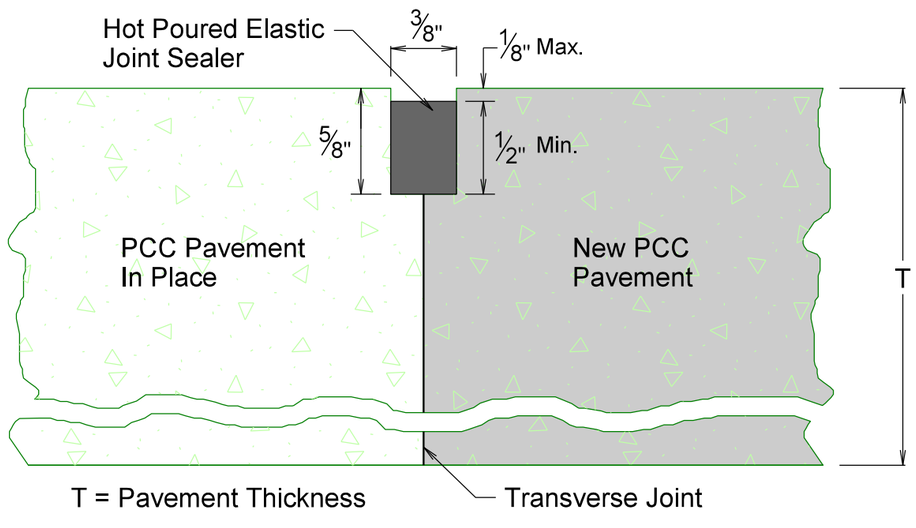
WITH HOT POURED ELASTIC JOINT SEALER AT WORKING JOINTS ENTIRELY WITHIN REPAIR AREAS



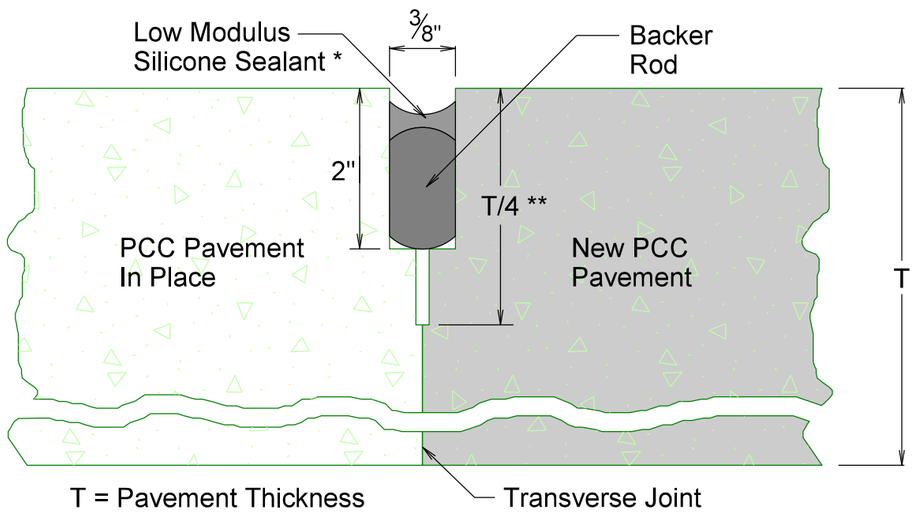
WITH HOT POURED ELASTIC JOINT SEALER AT WORKING JOINTS (TYPICALLY URBAN)



WITH HOT POURED ELASTIC JOINT SEALER AT TIED JOINTS



WITH LOW MODULUS SILICONE SEALANT AT WORKING JOINTS (TYPICALLY RURAL)

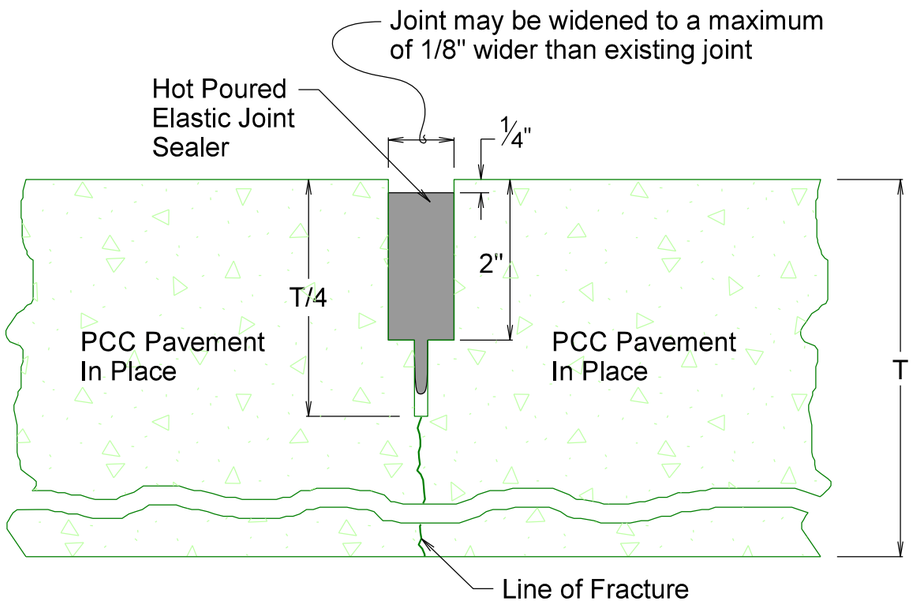


* Refer to Standard Plate 380.16 for installation details using Joint Width J=3/8".

** The saw cut to control cracking will be a minimum of 1/4 the thickness of the pavement.

RESEAL PCC PAVEMENT JOINTS

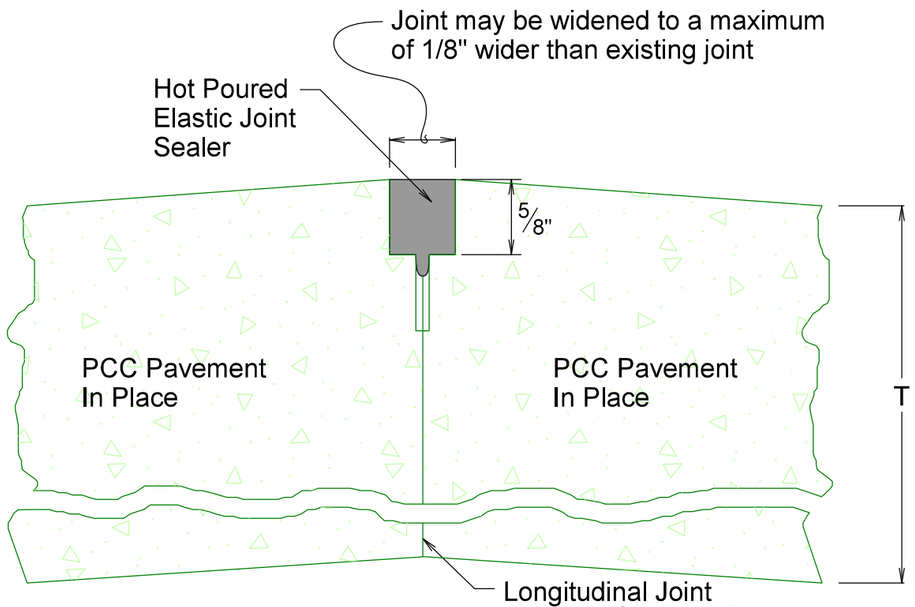
RESEAL TRANSVERSE JOINT WITH HOT POURED ELASTIC JOINT SEALER



T = Pavement Thickness

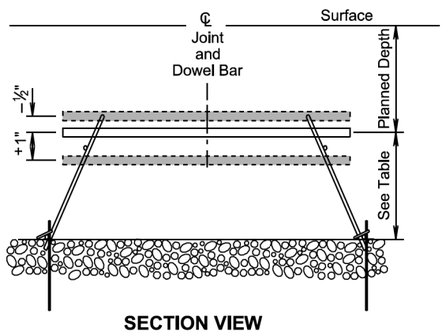
Additional sawing for widening the saw cut to provide the width for the installation of the Hot Poured Elastic Joint Sealer may be necessary.

RESEAL LONGITUDINAL JOINT WITH HOT POURED ELASTIC JOINT SEALER



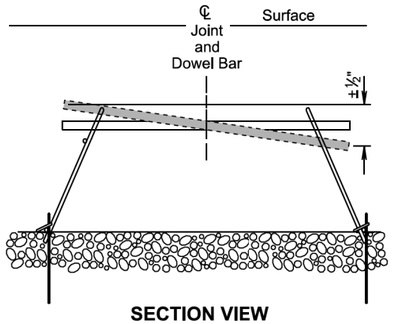
T = Pavement Thickness

Additional sawing for widening the saw cut to provide the width for the installation of the Hot Poured Elastic Joint Sealer may be necessary.



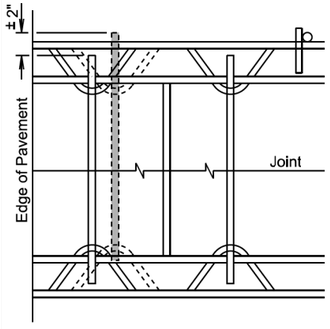
SECTION VIEW
VERTICAL TRANSLATION

Depth: mid-depth + 1 inch or − ½ inch



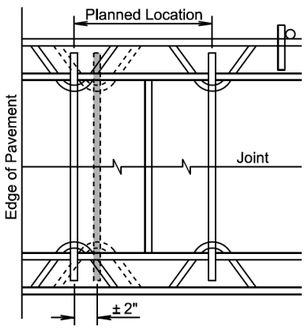
SECTION VIEW
VERTICAL TILT

Vertical rotational alignment: ½ inch over 18 inch



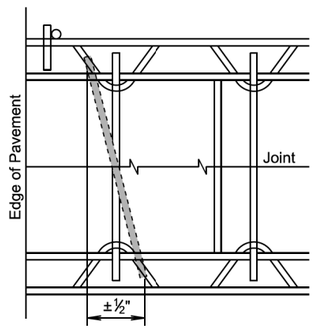
PLAN VIEW
LONGITUDINAL TRANSLATION

Longitudinal side shift: ± 2 inch for 18 inch bars



PLAN VIEW
HORIZONTAL TRANSLATION

Side shift ± 2 inch



PLAN VIEW
HORIZONTAL SKEW

Horizontal rotational alignment: ½ inch over 18 inch

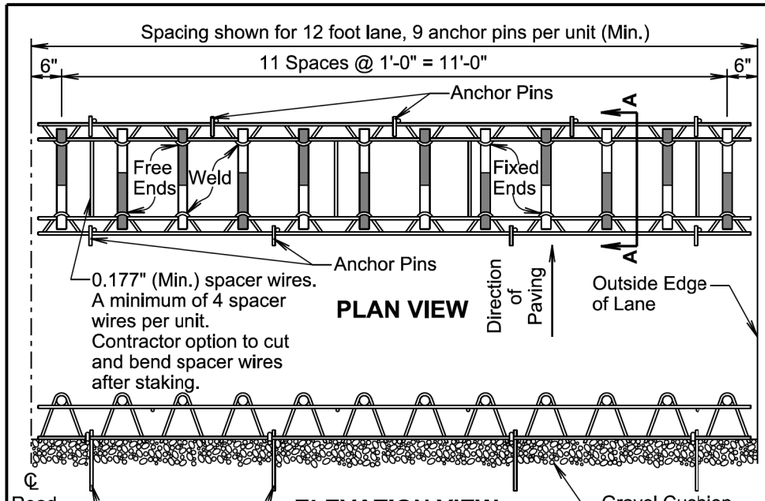
PAVEMENT THICKNESS	EPOXY COATED DOWEL BAR SIZE	HEIGHT TO CENTER
7" to 7½"	1" x 18"	3.0"
8" to 10"	1¼" x 18"	4.0"
10½" to 13"	1½" x 18"	5.0"

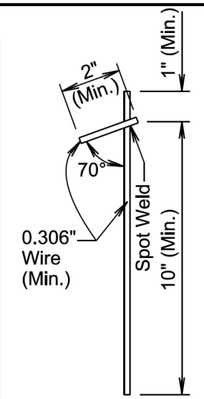
GENERAL NOTE:

The tolerances shown above represent the maximum deviation for acceptance of dowel bar placement.

November 19, 2022

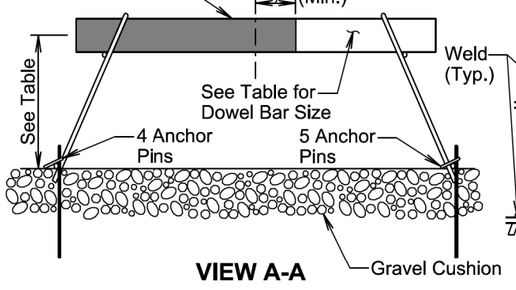
Published Date: 2024	SDDOT	**PCC PAVEMENT DOWEL BAR ALIGNMENT TOLERANCES**	PLATE NUMBER 380.01 Sheet 1 of 1



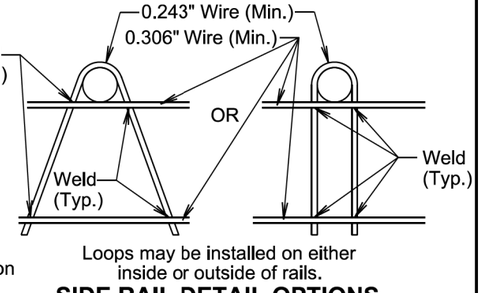


TYPICAL ANCHOR PIN

PAVEMENT THICKNESS	EPOXY COATED DOWEL BAR SIZE	HEIGHT TO CENTER
7" to 7½"	1" x 18"	3.0"
8" to 10"	1¼" x 18"	4.0"
10½" to 13"	1½" x 18"	5.0"



VIEW A-A



Loops may be installed on either inside or outside of rails.

SIDE RAIL DETAIL OPTIONS

GENERAL NOTES:

Longitudinal joint tie bars will be placed a minimum of 15 inches from the transverse contraction joint.

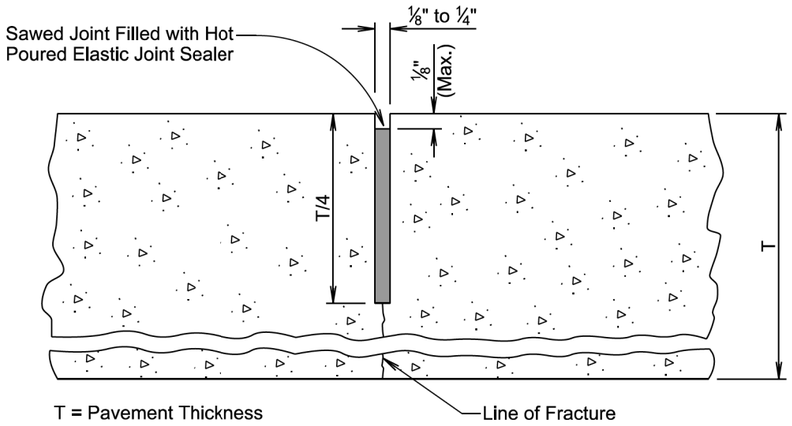
The transverse contraction joints will be sawed perpendicular to the centerline of the roadway. The transverse sawed joint will be centered over the dowel bars.

Supporting devices as shown on this sheet, or equivalent as approved by the Engineer, will be used to maintain proper horizontal and vertical alignment of the dowel bars.

All dowel bar alignment tolerances will be as shown in the PCC Pavement Dowel Bar Alignment Tolerances standard plate.

November 19, 2022

Published Date: 2024	SDDOT	**PCC PAVEMENT DOWEL BAR ASSEMBLY FOR TRANSVERSE CONTRACTION JOINTS 12 Bar Assembly on Granular Base Material**	PLATE NUMBER 380.04 Sheet 1 of 1



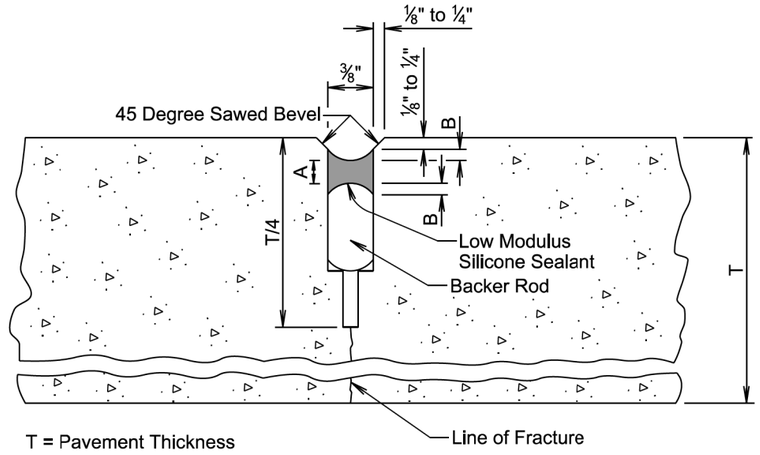
GENERAL NOTES:

If an early entrance saw cut does not develop the full transverse crack, then the saw cut to control cracking will be a minimum ¼ of the thickness of the pavement.

All hot poured elastic joint sealer material spilled on the surface of the concrete pavement will be removed as soon as the material has cooled. The extent of removal of material will be to the satisfaction of the Engineer. All costs for removal of the spilled joint sealer material will be borne by the Contractor.

November 19, 2022

Published Date: 2024	SDDOT	PCC PAVEMENT TRANSVERSE CONTRACTION JOINT WITH OR WITHOUT DOWEL BAR ASSEMBLY	PLATE NUMBER 380.12
			Sheet 1 of 1



LOW MODULUS SILICONE SEALANT ALLOWABLE CONSTRUCTION TOLERANCES			
A (Min.) (in.)	A (Max.) (in.)	B (Min.) (in.)	B (Max.) (in.)
3/16	5/16	⅛	¼

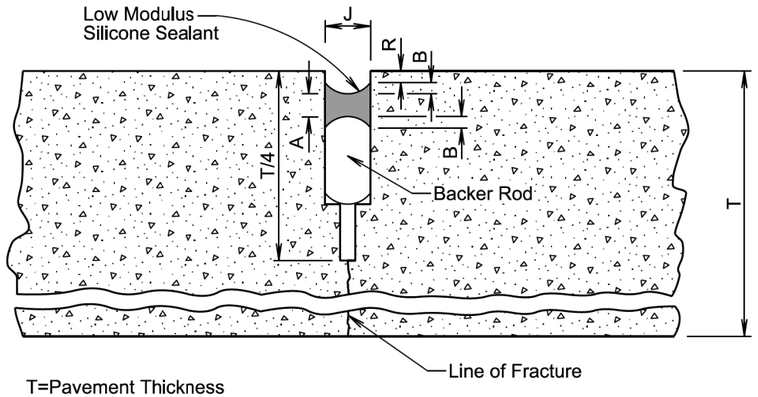
GENERAL NOTES:

The first saw cut to control cracking will be a minimum of ¼ the thickness of the pavement. Additional sawing for widening the saw cut to provide the width for the installation of the low modulus silicone joint sealant will be necessary.

The backer rod will be a non-moisture absorbing resilient material approximately 25% larger in diameter than the width of the joint to be sealed.

November 19, 2022

Published Date: 2024	SDDOT	PCC PAVEMENT BEVELED TRANSVERSE CONTRACTION JOINT WITH OR WITHOUT DOWEL BAR ASSEMBLY	PLATE NUMBER 380.13
			Sheet 1 of 1



T=Pavement Thickness

LOW MODULUS SILICONE SEALANT ALLOWABLE CONSTRUCTION TOLERANCES

J=3/8"				
A (Min.) (in.)	A (Max.) (in.)	B (Min.) (in.)	B (Max.) (in.)	R (in.)
3/16	5/16	1/8	1/4	1/4

J=1/2"				
A (Min.) (in.)	A (Max.) (in.)	B (Min.) (in.)	B (Max.) (in.)	R (in.)
3/16	3/8	1/8	1/4	1/4

J=5/8"				
A (Min.) (in.)	A (Max.) (in.)	B (Min.) (in.)	B (Max.) (in.)	R (in.)
1/4	7/16	1/8	5/16	1/4

J=3/4"				
A (Min.) (in.)	A (Max.) (in.)	B (Min.) (in.)	B (Max.) (in.)	R (in.)
5/16	1/2	3/16	3/8	5/16

J=1"				
A (Min.) (in.)	A (Max.) (in.)	B (Min.) (in.)	B (Max.) (in.)	R (in.)
3/8	5/8	3/16	1/2	5/16

GENERAL NOTE:

The backer rod will be a nonmoisture absorbing resilient material approximately 25% larger in diameter than the width of the joint to be sealed.

November 19, 2022

Published Date: 2024	SDDOT	RESEAL PCC PAVEMENT JOINT (SILICONE)	PLATE NUMBER 380.16
			Sheet 1 of 1