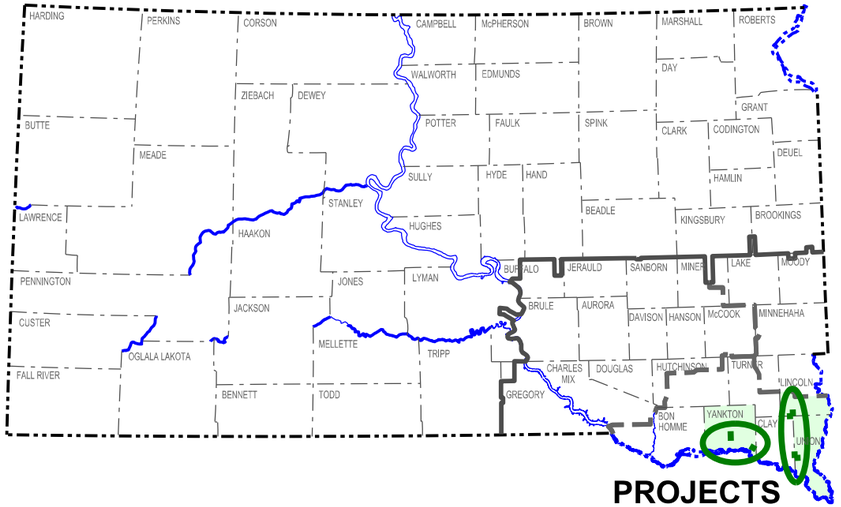
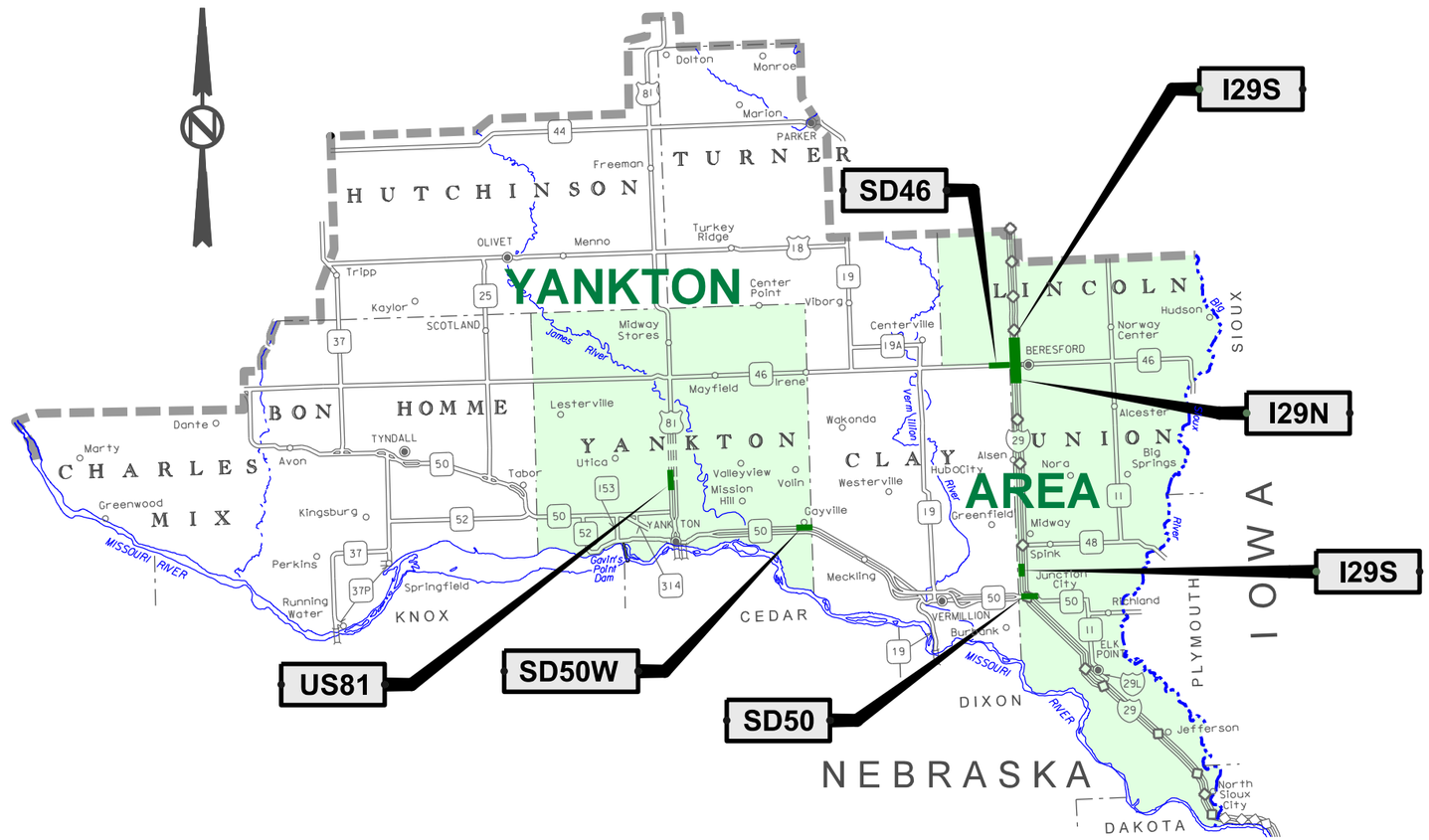
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	046-291, 050-291, 050W-292, 081-292, 029N-291, 029S-291	1	35

STATE OF SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION
PLANS FOR PROPOSED

PROJECTS 046-291, 050-291, 050W-292, 081-292, 029N-291, 029S-291 & 029S-291
SD HWY 46, SD HWY 50, SD HWY 50W, US HWY 81, INTERSTATE 29 NBL, INTERSTATE 29 SBL & INTERSTATE 29 SBL
LINCOLN, UNION & YANKTON COUNTIES
CRC & NRC PAVEMENT REPAIR
PCN I6MU, I6MW, I6MV, I6MY, I6N2, I6N1 & I6N0



INDEX OF SHEETS



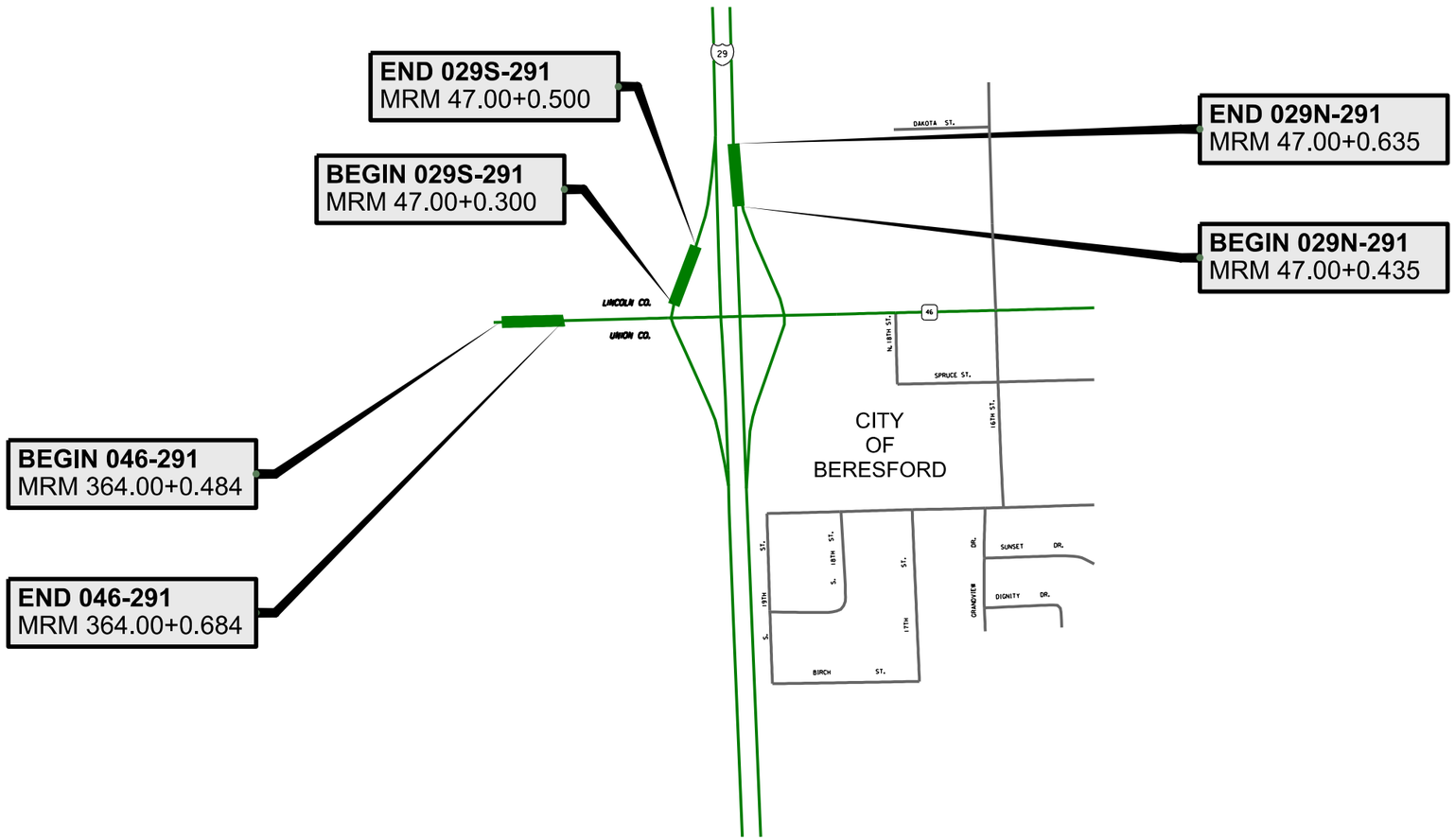
STORM WATER PERMIT
(None required)

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	046-291, 050-291, 050W-292, 081-292, 029N-291, 029S-291	2	35

046-291
SD HWY 46
LINCOLN COUNTY
NRC PAVEMENT REPAIR
LENGTH: 0.200 MILE
PCN I6MU

029S-291
INTERSTATE 29 SBL
LINCOLN COUNTY
NRC PAVEMENT REPAIR
LENGTH: 0.200 MILE
PCN I6N1

029N-291
INTERSTATE 29 NBL
LINCOLN COUNTY
NRC PAVEMENT REPAIR
LENGTH: 0.200 MILE
PCN I6N2



DESIGN DESIGNATION

ADT (2021)	3,902
D	51%
T ADT	8.5%
SPEED	45 MPH

DESIGN DESIGNATION

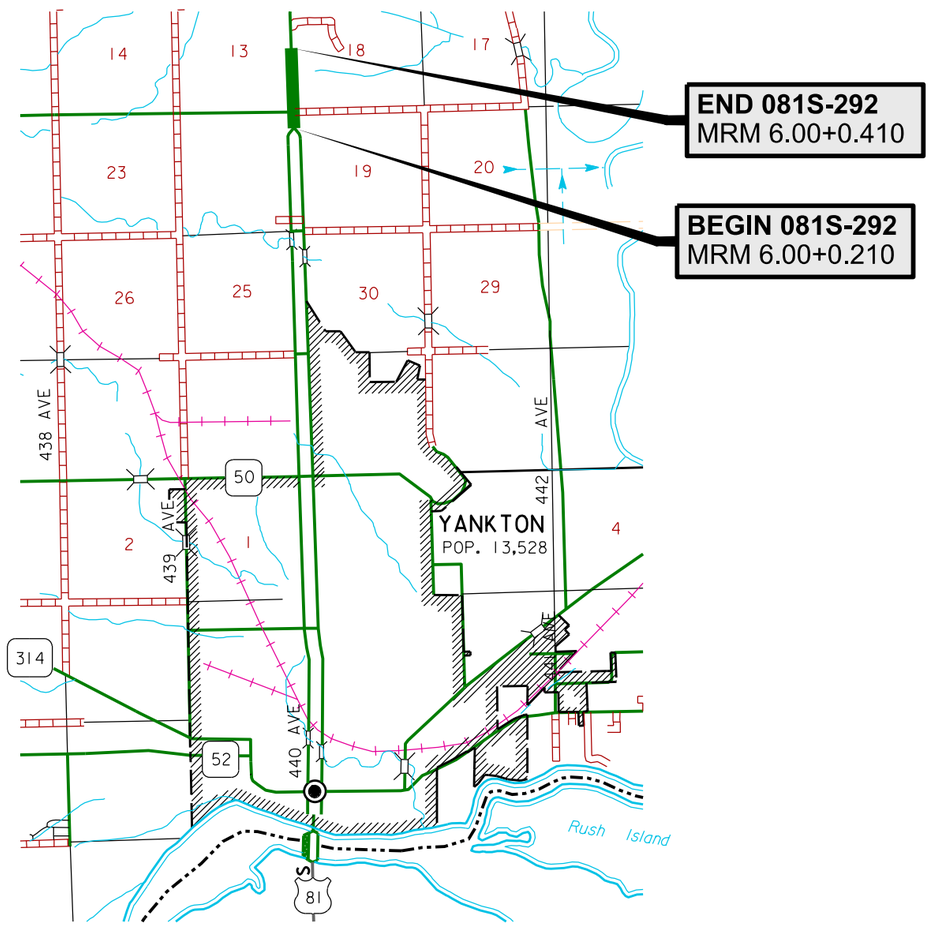
ADT (2021)	8,900
D	50%
T ADT	22.2%
SPEED	80 MPH

DESIGN DESIGNATION

ADT (2021)	8,900
D	50%
T ADT	22.2%
SPEED	80 MPH

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	046-291, 050-291, 050W-292, 081-292, 029N-291, 029S-291	3	35

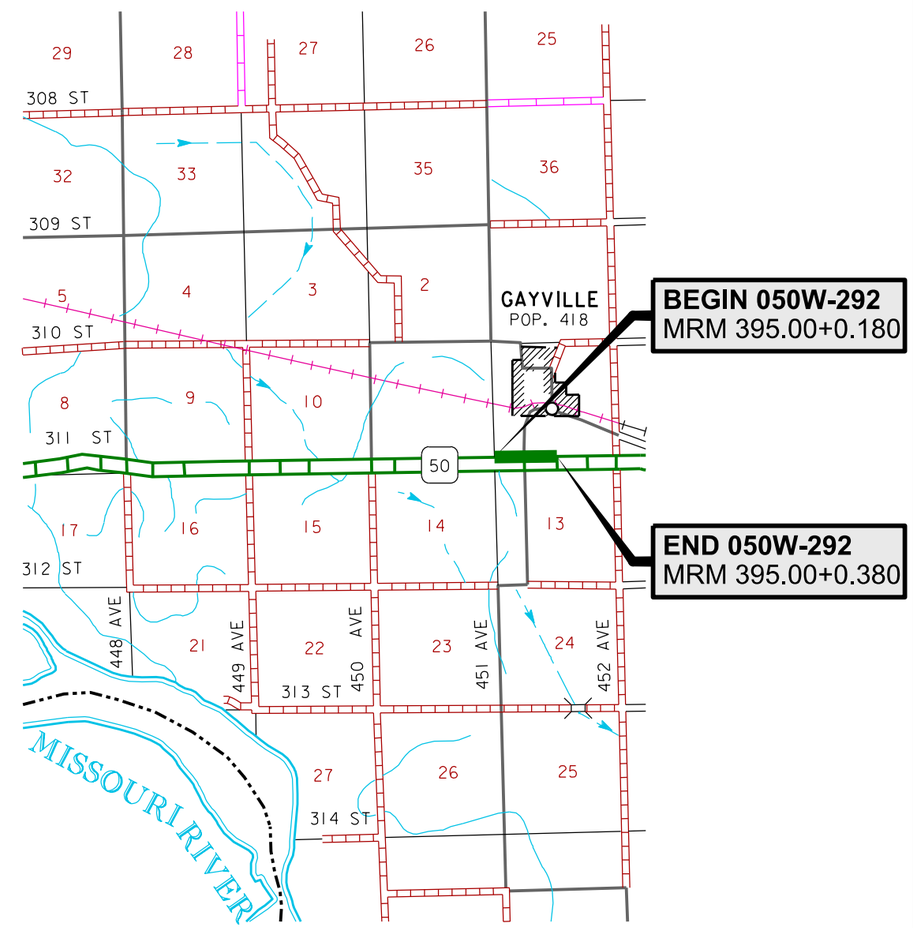
081-292
US HWY 81
YANKTON COUNTY
NRC PAVEMENT REPAIR
LENGTH: 0.200 MILE
PCN I6MY



DESIGN DESIGNATION

ADT (2021)	3,709
D	51%
T ADT	19.3%
SPEED	65 MPH

050W-292
SD HWY 50
YANKTON COUNTY
NRC PAVEMENT REPAIR
LENGTH: 0.200 MILE
PCN I6MV

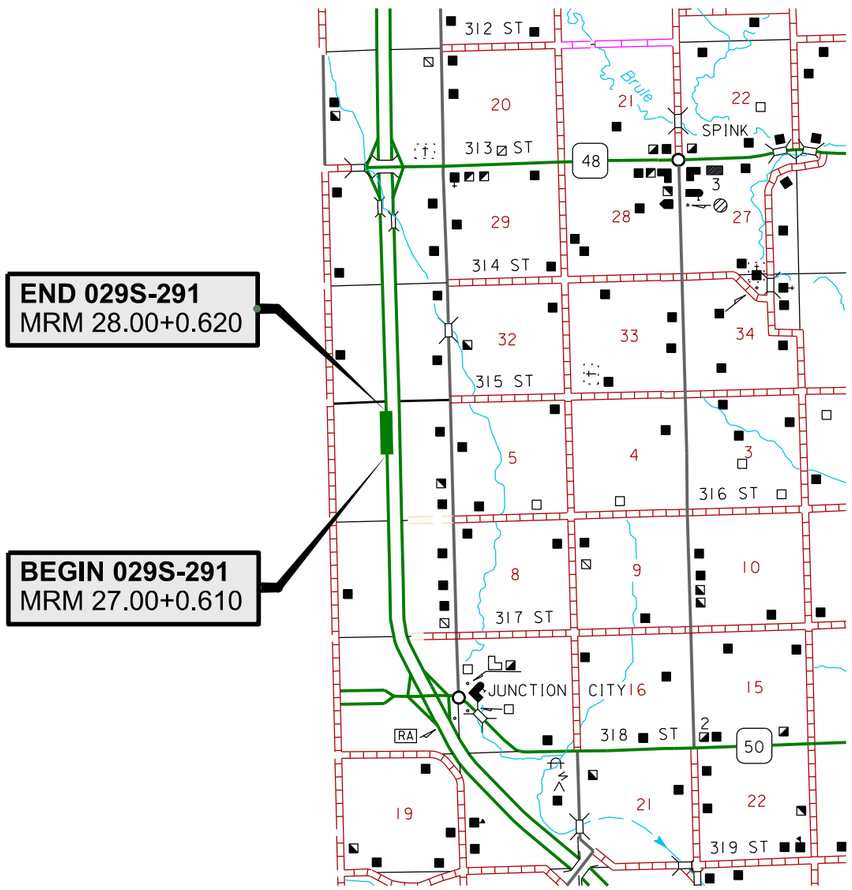


DESIGN DESIGNATION

ADT (2021)	3,114
D	51%
T ADT	10.6%
SPEED	70 MPH

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	046-291, 050-291, 050W-292, 081-292, 029N-291, 029S-291	4	35

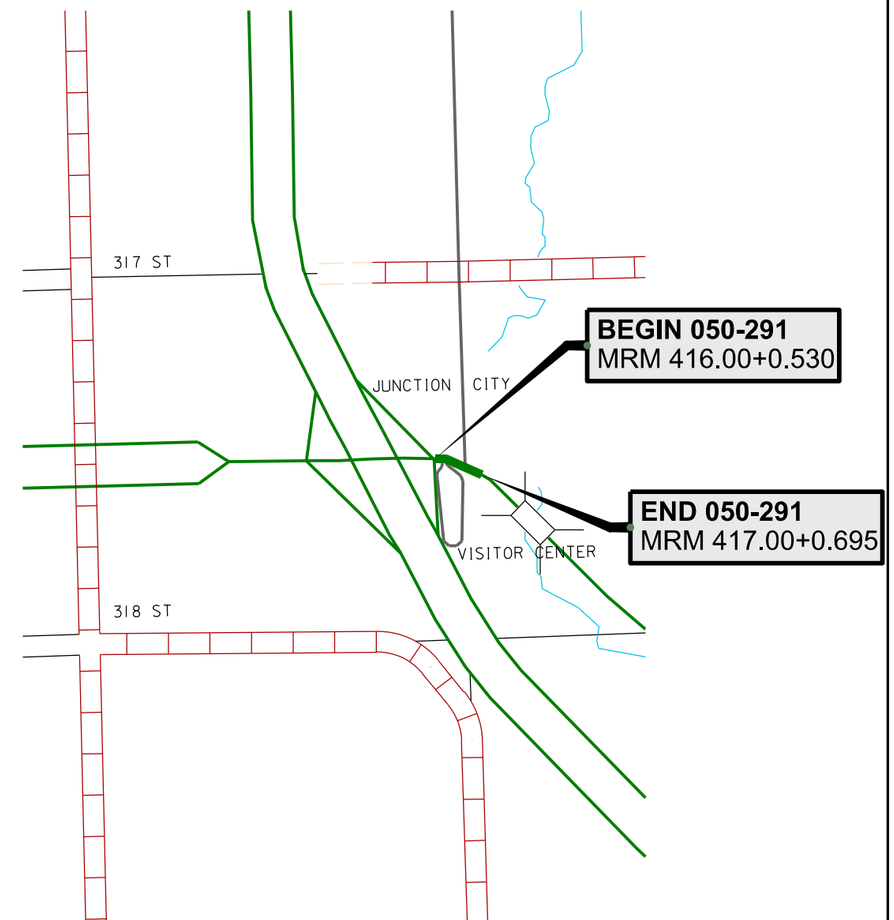
029S-291
INTERSTATE 29 SBL
UNION
CRC PAVEMENT REPAIR
LENGTH: 1.010 MILE
PCN I6N0



DESIGN DESIGNATION

ADT (2021)	7,210
D	50%
T ADT	30.1%
SPEED	80 MPH

050-291
SD HWY 50
UNION COUNTY
NRC PAVEMENT REPAIR
LENGTH: 1.165 MILE
PCN I6MW



DESIGN DESIGNATION

ADT (2021)	1,020
D	51%
T ADT	22.4%
SPEED	45 MPH

ESTIMATE OF QUANTITIES

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	046-291, 050-291, 050W-292, 081-292, 029N-291, 029S-291	5	35

046-291 PCN I6MU

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
380E5030	Nonreinforced PCC Pavement Repair	32.7	SqYd
380E6110	Insert Steel Bar in PCC Pavement	32	Each
634E0010	Flagging	10.0	Hour
634E0110	Traffic Control Signs	131.4	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0275	Type 3 Barricade	1	Each
634E0600	4" Temporary Pavement Marking Tape Type I	144	Ft
634E0640	Temporary Pavement Marking	2,200	Ft

081-292 PCN I6MY

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
380E5030	Nonreinforced PCC Pavement Repair	56.7	SqYd
380E6000	Dowel Bar	24	Each
380E6110	Insert Steel Bar in PCC Pavement	29	Each
634E0010	Flagging	10.0	Hour
634E0110	Traffic Control Signs	188.1	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0275	Type 3 Barricade	2	Each
634E0310	Temporary Flexible Vertical Markers (Tabs)	780	Ft

029S-291 PCN I6N0

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
380E5100	Continuously Reinforced PCC Pavement Repair	8.7	SqYd
634E0010	Flagging	10.0	Hour
634E0110	Traffic Control Signs	250.0	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0275	Type 3 Barricade	1	Each
634E0310	Temporary Flexible Vertical Markers (Tabs)	960	Ft
634E0420	Type C Advance Warning Arrow Board	1	Each

050-291 PCN I6MW

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
380E5030	Nonreinforced PCC Pavement Repair	32.6	SqYd
380E6000	Dowel Bar	18	Each
380E6110	Insert Steel Bar in PCC Pavement	46	Each
634E0010	Flagging	10.0	Hour
634E0110	Traffic Control Signs	131.4	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0275	Type 3 Barricade	1	Each
634E0600	4" Temporary Pavement Marking Tape Type I	144	Ft
634E0640	Temporary Pavement Marking	4,400	Ft

029N-291 PCN I6N2

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
380E5030	Nonreinforced PCC Pavement Repair	4.0	SqYd
380E6000	Dowel Bar	6	Each
380E6110	Insert Steel Bar in PCC Pavement	12	Each
634E0010	Flagging	10.0	Hour
634E0110	Traffic Control Signs	278.6	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0310	Temporary Flexible Vertical Markers (Tabs)	1,125	Ft
634E0420	Type C Advance Warning Arrow Board	1	Each

050W-292 PCN I6MV

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
380E5030	Nonreinforced PCC Pavement Repair	45.0	SqYd
380E6110	Insert Steel Bar in PCC Pavement	76	Each
634E0010	Flagging	10.0	Hour
634E0110	Traffic Control Signs	230.0	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0275	Type 3 Barricade	1	Each
634E0310	Temporary Flexible Vertical Markers (Tabs)	1,920	Ft
634E0420	Type C Advance Warning Arrow Board	1	Each

029S-291 PCN I6N1

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
380E5030	Nonreinforced PCC Pavement Repair	2.7	SqYd
380E6000	Dowel Bar	6	Each
380E6110	Insert Steel Bar in PCC Pavement	10	Each
634E0010	Flagging	10.0	Hour
634E0110	Traffic Control Signs	55.3	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0310	Temporary Flexible Vertical Markers (Tabs)	600	Ft

SPECIFICATIONS

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

ENVIRONMENTAL COMMITMENTS

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 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 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 shall be removed from view of the ROW or buried, and the waste disposal site reclaimed as noted above.

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

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

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

COMMITMENT I: HISTORIC PRESERVATION OFFICE CLEARANCES

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

Action Taken/Required:

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

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

The Contractor will provide ARC with the following: a topographical map or aerial view 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.

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

TABLES FOR PAVEMENT REPAIR

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	046-291, 050-291, 050W-292, 081-292, 029N-291, 029S-291	7	35

046-291, PCN I6MU

TABLE FOR NRC PAVEMENT REPAIR ON 046-291 - PCN I6MU

		WB DRIVING LANE		MEDIAN		EB DRIVING LANE				INSERT STEEL BAR IN PCC PAVEMENT (NRCP)		
MRM	DISP	L Ft	W Ft			L Ft	W Ft	NRCP REPAIR SqYds	NEW JOINT CON-FIG. (NRCP)	No. 8 x 18" DEFORMED TIE BARS Each	No. 5 x 24" DEFORMED TIE BARS Each	INSERT STEEL BAR IN NRCP TOTAL Each
364.00	0.584	4	4	15	12	7	14	32.7	X	18	14	32
TOTALS:								**32.7**		**18**	**14**	**32**

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
X = One Non-Reinforced Header and One Tied Joint

050-291, PCN I6MW

TABLE FOR NRC PAVEMENT REPAIR ON 050-291 - PCN I6MW WB & EB

		WB DRIVING LANE		EB DRIVING LANE				INSERT STEEL BAR IN PCC PAVEMENT (NRCP)				
MRM	DISP	L Ft	W Ft	L Ft	W Ft	NRCP REPAIR SqYds	NEW JOINT CON-FIG. (NRCP)	1¼" x 18" PLAIN ROUND DOWEL BARS Each	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
417.00	0.030			6	14	9.3	R		16	2	18	12
417.00	0.030			12	2	2.7				2	2	
417.00	0.050			17	9	17.0		7		7	14	6
417.00	0.195	4	8			3.6	B	5	5	2	12	
TOTALS:						**32.6**		**12**	**21**	**13**	**46**	**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

050W-292, PCN I6MV

TABLE FOR NRC PAVEMENT REPAIR ON 050W-292 - PCN I6MV WB

MRM	DISP	WB PASSING LANE L Ft	WB PASSING LANE W Ft	WB DRIVING LANE L Ft	WB DRIVING LANE W Ft	NRCP REPAIR SqYds	NEW JOINT CON-FIG. (NRCP)	INSERT STEEL BAR IN PCC PAVEMENT (NRCP): 1" x 18" PLAIN ROUND DOWEL BARS Each	No. 8 x 18" DEFORMED TIE BARS Each	No. 5 x 24" DEFORMED TIE BARS Each	INSERT STEEL BAR IN NRCP TOTAL Each
395.00	0.280	16	5			8.9	W	6		6	12
395.00	0.284	5.5	12	5.5	14	15.9	B	16	16		32
395.00	0.288	7	12	7	14	20.2	B	16	16		32
TOTALS:						**45.0**		**38**	**32**	**6**	**76**

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

081-292, PCN I6MY

TABLE FOR NRC PAVEMENT REPAIR ON 081-292 - PCN I6MY WB & EB

MRM	DISP	SB DRIVING LANE L Ft	SB 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	No. 5 x 24" DEFORMED TIE BARS Each	INSERT STEEL BAR IN NRCP TOTAL Each	DOWEL BAR Each
6.00	0.310	34	15	56.7	R	16	13	29	24
TOTALS:				**56.7**		**16**	**13**	**29**	**24**

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

029N-291, PCN I6N2

TABLE FOR NRC PAVEMENT REPAIR ON 029N-291 - PCN I6N2

DMI	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	INSERT STEEL BAR IN PCC PAVEMENT (NRCP) No. 5 x 24" DEFORMED TIE BARS Each	INSERT STEEL BAR IN PCC PAVEMENT (NRCP) INSERT STEEL BAR IN NRCP TOTAL Each	DOWEL BAR Each
47.535	6	6	4.0	R	8	4	12	6
TOTALS:			**4.0**		**8**	**4**	**12**	**6**

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

029S-291, PCN I6N1

TABLE FOR NRC PAVEMENT REPAIR ON 029S-291 - PCN I6N1

DMI	SB EXIT RAMP L Ft	SB EXIT RAMP 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 PCC PAVEMENT (NRCP) INSERT STEEL BAR IN NRCP TOTAL Each	DOWEL BAR Each
47.400	4	6	2.7	R	8	2	10	6
TOTALS:			**2.7**		**8**	**2**	**10**	**6**

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

029S-291, PCN I6N0

TABLE FOR CRC PAVEMENT REPAIR ON 029S-291 - PCN I6N0 SB

		REINFORCING STEEL (CRCP) FOR SB DRIVING LANE (STEEL FOR CRCP IS NOT A BID ITEM - ACTUAL STEEL QUANTITIES WILL VARY DUE TO LOCATION AND SIZE OF INDIVIDUAL REPAIR AREAS)								INSERT STEEL BAR IN PCC PAVEMENT (CRCP) SB DRIVING LANE	
MRM	DISP	No. 6 Longitudinal Bars to be lap spliced with existing bars # bars @ length	Length	Lap Splice Length	Lap Stagger & Cutoff	No. 4 Transverse Bars to be lap spliced with No. 5 x 24" bars # bars @ length	Length	New Trans Bar Spacing	Reinforcing Steel Lbs	INSERT No. 5 x 24" TIE BARS Each	INSERT BAR TOTAL Each
28.00	0.110	13 bars @ 62" =	67.17'	19"	-	3 bars @ 78" =	19.50'	2'	113.915	0	
28.00	0.112	11 bars @ 62" =	56.83'	19"	-	3 bars @ 66" =	16.50'	2'	96.381	0	
TOTALS:		**24 bars**	**124'**			**6 bars**	**36'**		**210 Lbs**	**-**	**-**

		SB DRIVING LANE		
MRM	DISP	L Ft	W Ft	CRCP REPAIR SqYds
28.00	0.110	6	7	4.7
28.00	0.112	6	6	4.0
TOTALS:				**8.7**

PLAN NOTES

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.

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 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) and Continuously Reinforced Concrete Pavement (CRCP) in areas where concrete pavement blowups or major failures have occurred.

Full depth NRCP and CRCP areas vary in length and width. However, for NRCP, the minimum length is 6 feet. For CRCP, the minimum length is typically 4 feet for partial lane width repair areas and the minimum length is typically 4.5 feet for full lane width repair areas. Minimum size for small repair areas – existing steel maintained, is 1 foot x 1 foot.

EXISTING NRC PAVEMENT

SD46: The existing pavement is 8” NRC Pavement.

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

SD50W (MRM 395): The existing pavement is 7” NRC Pavement over 2” AC over 8” NRCP.

Existing contraction joints are spaced at approximately 12’. Longitudinal joints are reinforced with No. 5 x 30” deformed tie bars. Transverse joints are reinforced with 1” x 18” round dowel bars spaced 12” center to center.

SD50 (MRM 417): 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. Transverse joints are reinforced with 1¼” x 18” round dowel bars spaced 12” center to center.

US81: The existing pavement is 8.5” x 40’ NRC Pavement.

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

I29N (On-Ramp): The existing pavement is 8” x 24’ NRC Pavement.

Existing contraction joints are spaced at approximately 19’. Longitudinal joints are reinforced with No. 5 x 30” deformed tie bars. Transverse joints are reinforced with 1¼” x 18” plain round dowel bars spaced 12” center to center.

I29S (Off-Ramp): The existing pavement is 8” x 24’ NRC Pavement.

Existing contraction joints are spaced at approximately 19’. Longitudinal joints are reinforced with No. 5 x 30” deformed tie bars. 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.

EXISTING CRC PAVEMENT

I29S (MRM 28): The existing pavement is 10” x 26’ CRC Pavement. The longitudinal reinforcing steel consists of No. 6 deformed bars spaced 6½” center to center, and the transverse reinforcing steel consists of No. 4 deformed bars spaced 48” center to center.

The aggregate in the existing CRC Pavement is quartzite.

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 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 throughout the area. Contact the Project Engineer for direction.

Cost for this work will be incidental to the contract unit prices per square yard for Nonreinforced PCC Pavement Repair and Continuously Reinforced PCC Pavement Repair.

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 asphalt concrete 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.

NONREINFORCED PCC PAVEMENT REPAIR – GENERAL (CONTINUED)

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 3,500 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 3,500 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.

NONREINFORCED PCC PAVEMENT REPAIR (CONTINUED)

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

CONTINUOUSLY REINFORCED PCC PAVEMENT REPAIR

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

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. Where repair crosses both lanes, the passing lane should be repaired first.

Full Lane Width Repair and Partial Lane Width Repair
The Contractor will saw the in place concrete transversely at four locations for each repair area. Two saw cuts will be full depth. The other two saw cuts will be partial depth saw cuts and will be made to a depth just above the in place reinforcing steel and be placed outside of the previous full depth saw cuts. The outside cuts will be a minimum of 6” from the nearest tight crack outside of the patch.

The Contractor will lift out or break out the center section (including reinforcing steel). In the salvaged rebar sections of the repair areas, the use of 30 or 60 pound hammers will be allowed outside of one foot from the newly created header joint. To prevent damage to the joint and surrounding concrete, only light chipping hammers (not exceeding 15 pounds) will be allowed within the last foot adjacent to the newly created header joint to remove the remaining concrete at each end of the repair area, leaving the reinforcing steel in place.

Small Repair – Existing Steel Retained
The Contractor will saw the in place concrete around the periphery of each repair area to a depth of 2” (above the in place reinforcing steel). The cuts will be a minimum of 6” from the nearest tight crack outside of the patch.

Light chipping hammers (not exceeding 15 pounds) will be used to remove the concrete from the repair area, leaving the reinforcing steel in place.

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

Care will 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.

The Contractor will remove and dispose of the in place concrete and in place asphalt concrete.

Existing exposed reinforcing steel and concrete faces will 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 (CRCP) and STEEL BAR INSERTION (CRCP).

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

CONTINUOUSLY REINFORCED PCC PAVEMENT REPAIR (CONTINUED)

Concrete will 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 will be between 50°F and 90°F. The temperature of the concrete will be maintained above 40°F during the curing period.

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 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 3,500 psi must be attained prior to opening to traffic.

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 3,500 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.

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’.

Cost for performing the aforementioned 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 will be included in the contract unit price per square yard for Continuously Reinforced PCC Pavement Repair.

REINFORCING STEEL (CRCP)

Reinforcing steel will conform to Section 1010.

After removal of the in place concrete and repair of the gravel cushion, new reinforcing steel will be installed. Refer to the CRC Pavement Repair Area layouts for details.

At full lane and partial lane width repair areas:
New longitudinal bars will be lap spliced with the preserved in place longitudinal bars (New bar diameter to match in place bar diameter).

Additional transverse bars will be centered between the in place transverse bars throughout the length of the repair area. The spacing of transverse bars in the completed repair area should be half the spacing of the in place transverse reinforcing steel.

The additional transverse bars will be lap spliced with No. 5 x 24” epoxy coated deformed tie bars inserted 9” into the existing concrete. Drilled holes will be required. Tie bars will be inserted according to the notes for STEEL BAR INSERTION (CRCP).

At full lane width repair areas:
Additional longitudinal bars will be centered between every other set of two spliced longitudinal bars throughout the width of the repair area. These additional bars will extend 9” into the existing concrete on both sides of the repair area. Drilled holes will be required and the additional longitudinal bars will be inserted in accordance with the notes for STEEL BAR INSERTION (CRCP). The additional longitudinal bars will then be lap spliced.

Cost for this work, including reinforcing steel, ties, labor and equipment will be incidental to the contract unit price per square yard for Continuously Reinforced PCC Pavement Repair.

STEEL BAR INSERTION (CRCP)

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.

Longitudinal deformed tie bars will be inserted 9 inches into the in place concrete at the transverse joint and centered between every other set of two spliced longitudinal bars throughout the width of the repair area. Transverse deformed bars will be lap spliced with deformed tie bars which are inserted 9 inches into the in place concrete at the longitudinal joint throughout the length of the repair area. Refer to the notes for REINFORCING STEEL (CRCP). An epoxy resin adhesive must be used to anchor the steel bar in the drilled hole as per Section 380.3 C.1.

Holes drilled into the existing concrete pavement will be located at mid-depth of the slab and true and normal except that in transverse joints, the drilled in longitudinal steel bar angle will be slightly under 90° to allow for centering of the lap splice between existing longitudinal steel.

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.

STEEL BAR INSERTION (CRCP) (CONTINUED)

Cost for reinforcing steel (except the inserted No. 5 x 24” epoxy coated deformed tie bars) will be incidental to the contract unit price per square yard for Continuously Reinforced PCC Pavement Repair.

Cost for drilling holes, furnishing and applying epoxy resin adhesive, furnishing and inserting No. 5 x 24” epoxy coated deformed tie bars into the drilled holes and inserting reinforcing steel bars into the drilled holes, and any incidentals necessary to complete the work will be included in the contract unit price per each for Insert Steel Bar in PCC Pavement.

SAW AND SEAL LONGITUDINAL JOINTS (CRCP)

Longitudinal joints (in line with existing longitudinal joints) at concrete repair areas will be sawed and sealed.

Joint sealing will conform to Section 380.3 P.

Longitudinal joints will be sealed with Low Modulus Silicone Sealant or Hot Poured Elastic Joint Sealer.

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 will be incidental to the contract unit price per square yard for Continuously Reinforced PCC Pavement Repair.

STEEL BAR INSERTION (NRCP)

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 BAR INSERTION (NRCP) (CONTINUED)

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 (NRCP)

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

Joint sealing will conform to Section 380.3 P.

Longitudinal and transverse 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.

TEMPORARY PAVEMENT MARKING

Temporary pavement marking on lane closure tapers will consist of temporary flexible vertical markers (tabs). Estimate one workspace on SD46 and two workspaces on SD50 with 550’ double yellow centerlines. Two workspaces with 960’ tapers on SD50W. One workspace with 780’ tapers on US81, one workspace with 1125’ taper on I29N, one workspace with 600’ taper on I29S off-ramp, and one workspace with 960’ tapers on I29S.

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).

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.

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.

TRAFFIC CONTROL FOR PCCP REPAIR (CONTINUED)

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.

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”, and “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.

Extra care will be taken to protect the in-place asphalt concrete shoulders on Interstate 29. 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.

046-291 PCN I6MU

ITEMIZED LIST FOR TRAFFIC CONTROL SIGNS

SIGN CODE	SIGN DESCRIPTION	CONVENTIONAL ROAD NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
R1-1	STOP	2	30"	5.2	10.4
W1-3	REVERSE TURN (L or R)	1	48" x 48"	16.0	16.0
W3-1	STOP AHEAD (symbol)	2	48" x 48"	16.0	32.0
W20-1	ROAD WORK AHEAD	2	48" x 48"	16.0	32.0
W20-4	ONE LANE ROAD AHEAD	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			131.4

050W-292 PCN I6MV

ITEMIZED LIST FOR TRAFFIC CONTROL SIGNS

SIGN CODE	SIGN DESCRIPTION	EXPRESSWAY / INTERSTATE NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
R2-1	SPEED LIMIT 45	1	36" x 48"	12.0	12.0
R2-1	SPEED LIMIT 65	2	36" x 48"	12.0	24.0
R2-1	SPEED LIMIT 70	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 (45 MPH)	1	48" x 48"	16.0	16.0
W3-5	SPEED REDUCTION AHEAD (65 MPH)	2	48" x 48"	16.0	32.0
W4-2	LEFT or RIGHT LANE ENDS (symbol)	2	48" x 48"	16.0	32.0
W20-1	ROAD WORK AHEAD	3	48" x 48"	16.0	48.0
W20-5	LEFT or RIGHT LANE CLOSED AHEAD	2	48" x 48"	16.0	32.0
G20-2	END ROAD WORK	2	48" x 24"	8.0	16.0
		EXPRESSWAY / INTERSTATE TRAFFIC CONTROL SIGNS SQFT			230.0

050-291 PCN I6MW

ITEMIZED LIST FOR TRAFFIC CONTROL SIGNS

SIGN CODE	SIGN DESCRIPTION	CONVENTIONAL ROAD NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
R1-1	STOP	2	30"	5.2	10.4
W1-3	REVERSE TURN (L or R)	1	48" x 48"	16.0	16.0
W3-1	STOP AHEAD (symbol)	2	48" x 48"	16.0	32.0
W20-1	ROAD WORK AHEAD	2	48" x 48"	16.0	32.0
W20-4	ONE LANE ROAD AHEAD	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			131.4

081-292 PCN I6MY

ITEMIZED LIST FOR TRAFFIC CONTROL SIGNS

SIGN CODE	SIGN DESCRIPTION	EXPRESSWAY / INTERSTATE NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
R1-1	STOP	1	36"	7.5	7.5
R2-1	SPEED LIMIT 45	2	36" x 48"	12.0	24.0
W1-4	REVERSE CURVE (L and R)	2	48" x 48"	16.0	32.0
W3-5	SPEED REDUCTION AHEAD (45 MPH)	2	48" x 48"	16.0	32.0
W9-3	CENTER LANE CLOSED AHEAD	1	48" x 48"	16.0	16.0
W13-1P	ADVISORY SPEED (plaque, 45mph)	2	30" x 30"	6.3	12.6
W20-1	ROAD WORK AHEAD	3	48" x 48"	16.0	48.0
G20-2	END ROAD WORK	2	48" x 24"	8.0	16.0
		EXPRESSWAY / INTERSTATE TRAFFIC CONTROL SIGNS SQFT			188.1

TRAFFIC CONTROL

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	046-291, 050-291, 050W-292, 081-292, 029N-291, 029S-291	15	35

029N-291 PCN I6N2

ITEMIZED LIST FOR TRAFFIC CONTROL SIGNS

SIGN CODE	SIGN DESCRIPTION	EXPRESSWAY / INTERSTATE NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
R2-1	SPEED LIMIT 45	2	36" x 48"	12.0	24.0
R2-1	SPEED LIMIT 65	2	36" x 48"	12.0	24.0
R2-1	SPEED LIMIT 80	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 (45 MPH)	1	48" x 48"	16.0	16.0
W3-5	SPEED REDUCTION AHEAD (65 MPH)	2	48" x 48"	16.0	32.0
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
W13-1P	ADVISORY SPEED (plaque, 45mph)	2	30" x 30"	6.3	12.6
W20-1	ROAD WORK AHEAD	3	48" x 48"	16.0	48.0
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			278.6

029N-291 PCN I6N0

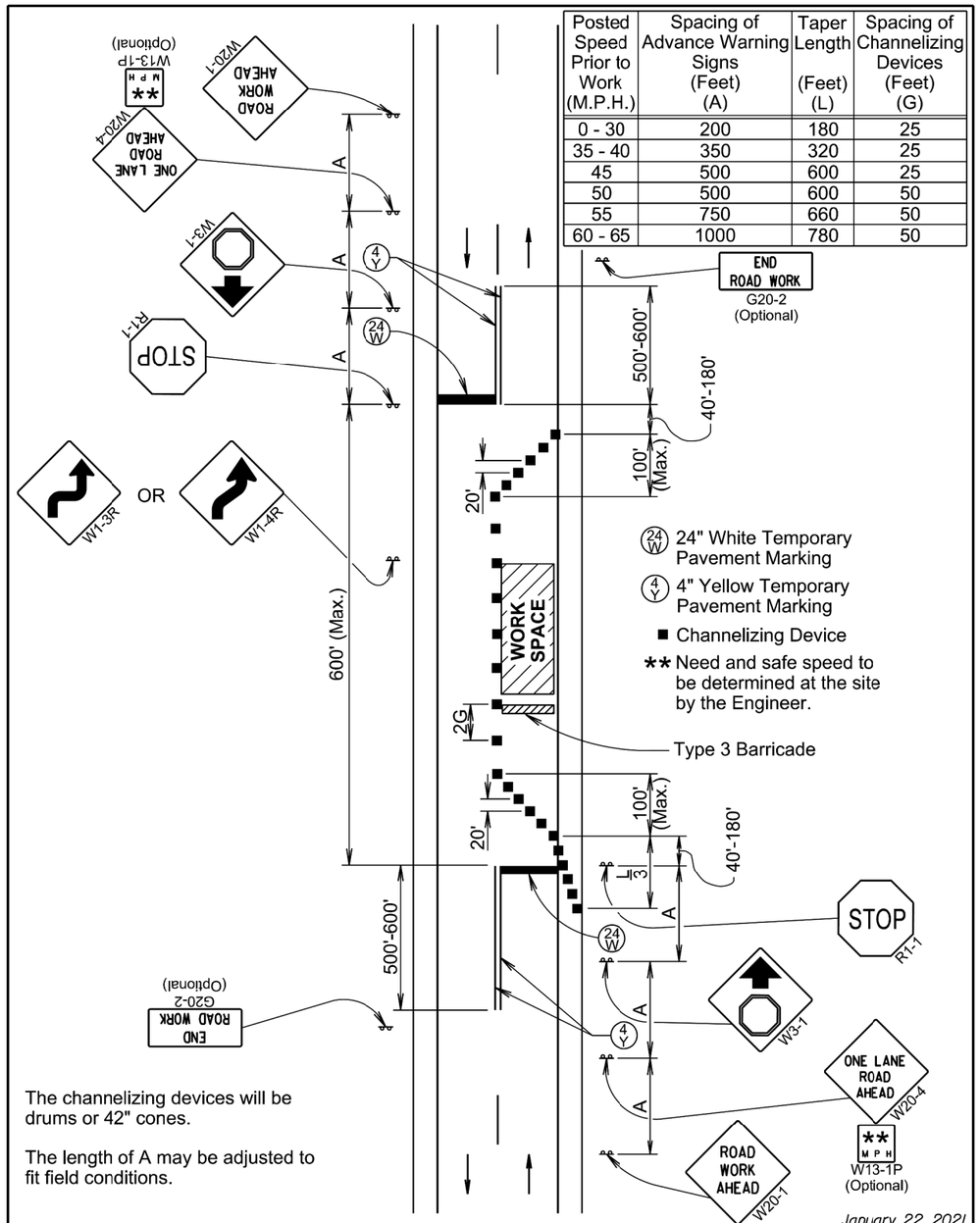
ITEMIZED LIST FOR TRAFFIC CONTROL SIGNS

SIGN CODE	SIGN DESCRIPTION	EXPRESSWAY / INTERSTATE NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
R2-1	SPEED LIMIT 45	2	36" x 48"	12.0	24.0
R2-1	SPEED LIMIT 65	2	36" x 48"	12.0	24.0
R2-1	SPEED LIMIT 80	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 (45 MPH)	1	48" x 48"	16.0	16.0
W3-5	SPEED REDUCTION AHEAD (65 MPH)	2	48" x 48"	16.0	32.0
W4-1	MERGE (symbol)	1	48" x 48"	16.0	16.0
W4-2	LEFT or RIGHT LANE ENDS (symbol) (2 RIGHT)	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 RIGHT)	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			250.0

029N-291 PCN I6N1

ITEMIZED LIST FOR TRAFFIC CONTROL SIGNS

SIGN CODE	SIGN DESCRIPTION	EXPRESSWAY / INTERSTATE NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
W5-4	RAMP NARROWS	1	48" x 48"	16.0	16.0
W13-1P	ADVISORY SPEED (plaque, 35mph)	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	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			55.3



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

The channelizing devices will be drums or 42" cones.

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

January 22, 2021

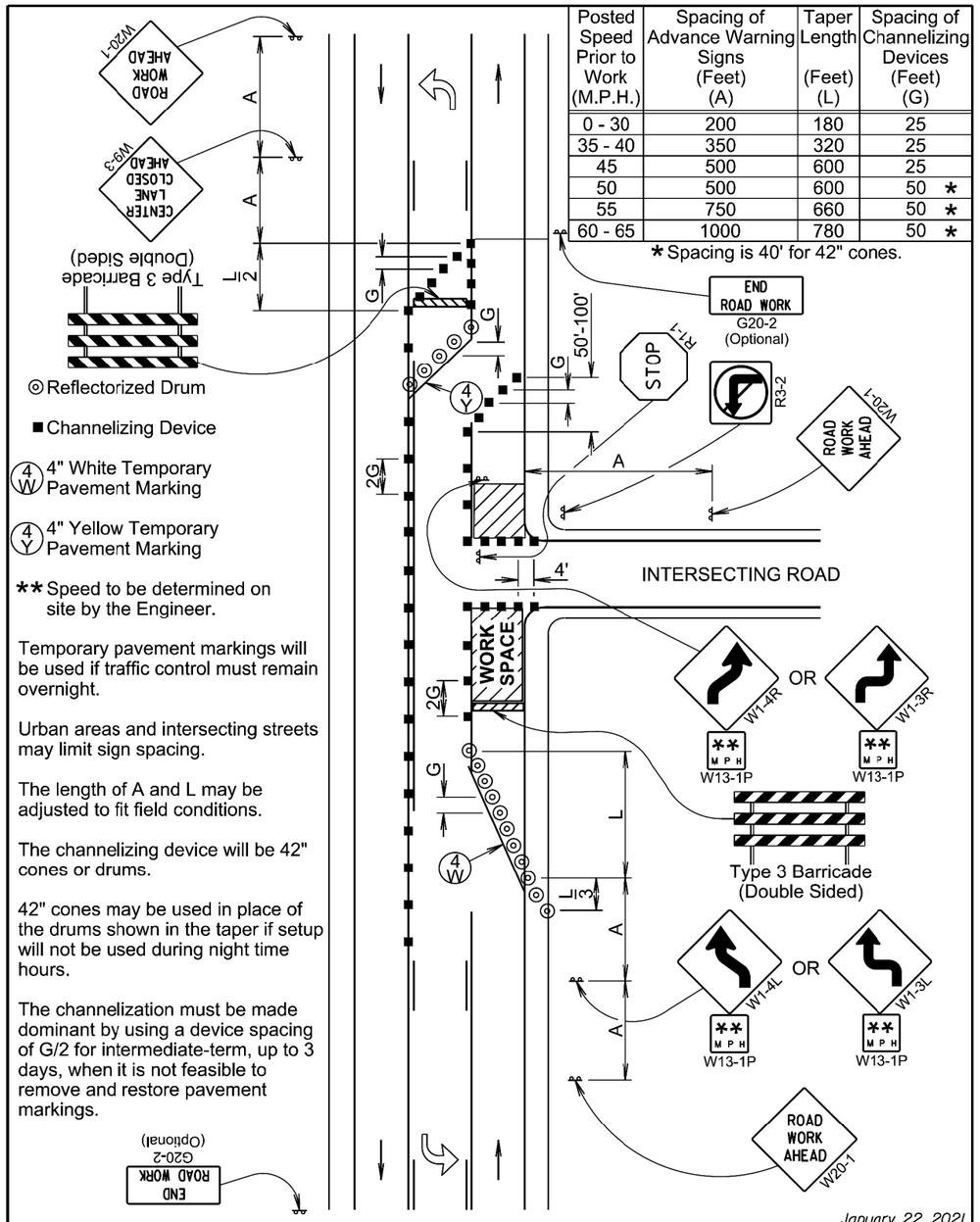
Published Date: 1st Qtr. 2022

SDDOT

LANE CLOSURE USING STOP SIGNS

PLATE NUMBER 634.25

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.

January 22, 2021

Published Date: 1st Qtr. 2022

SDDOT

3-LANE, OUTSIDE LANE CLOSED

PLATE NUMBER 634.53

Sheet 1 of 1

◎ Reflectorized Drum

■ Channelizing Device

(4 W) 4" White Temporary Pavement Marking

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.

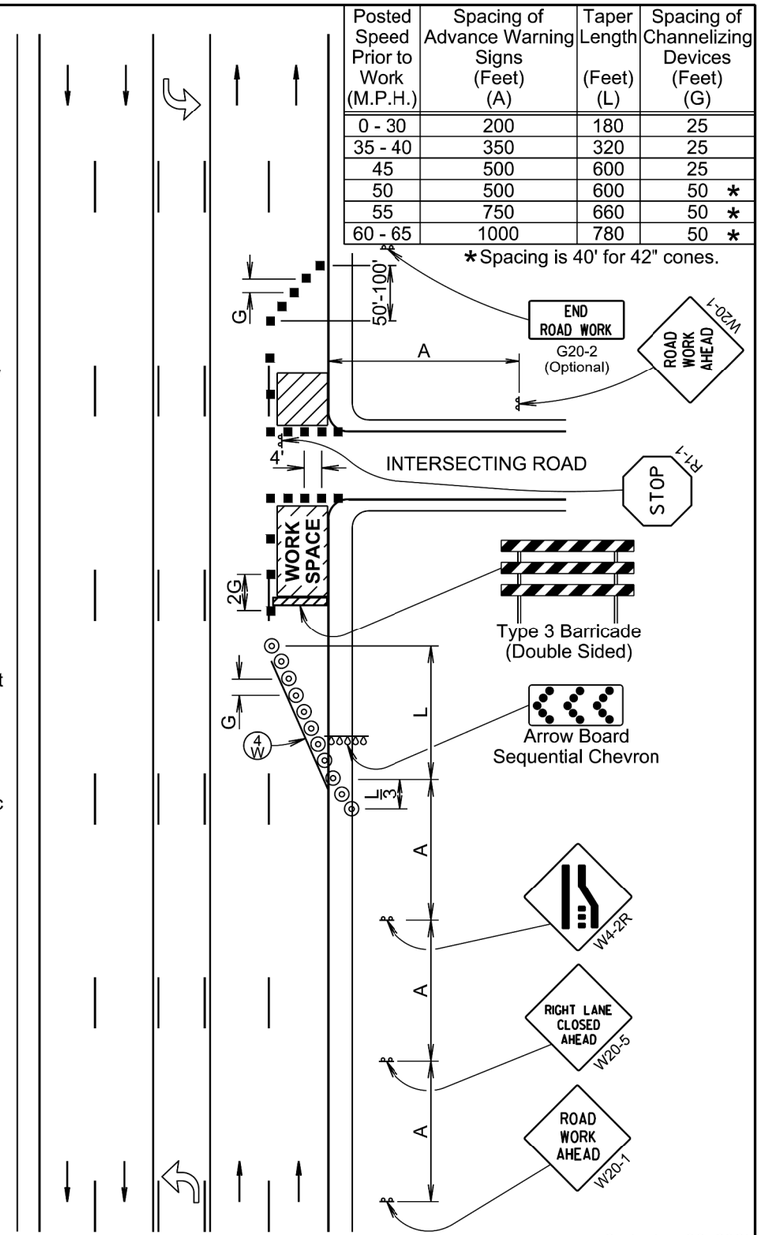
The channelizing devices will be 42" cones or drums.

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

Additional channelizing devices at 4' spacing may be needed to control traffic entering and leaving intersections.

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.



September 22, 2021

Published Date: 1st Qtr. 2022	SDDOT	5-LANE, OUTSIDE LANE CLOSED	PLATE NUMBER 634.60
			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

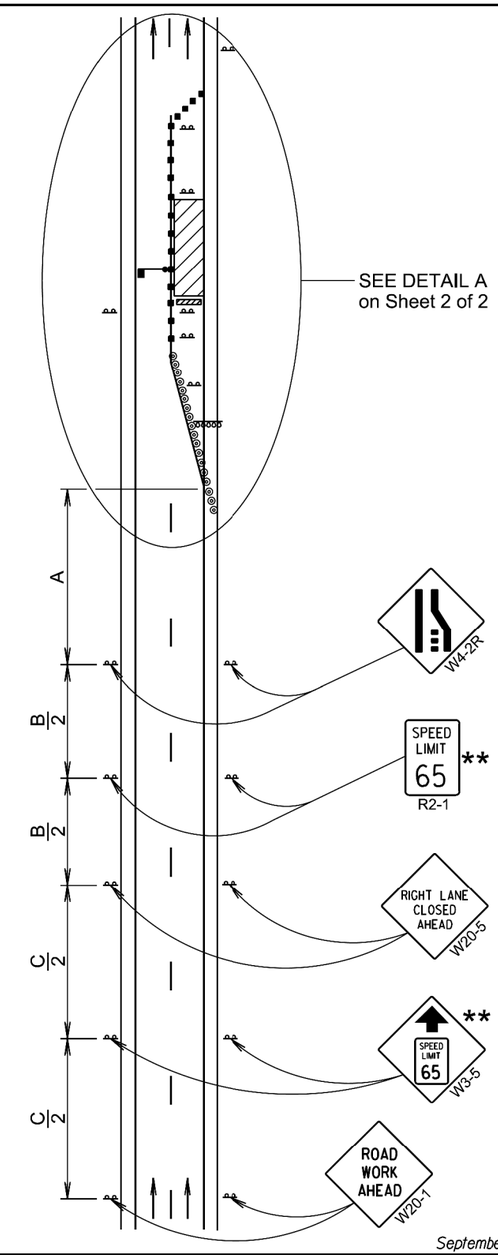
** Speed appropriate for location.

◎ 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: 1st Qtr. 2022	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

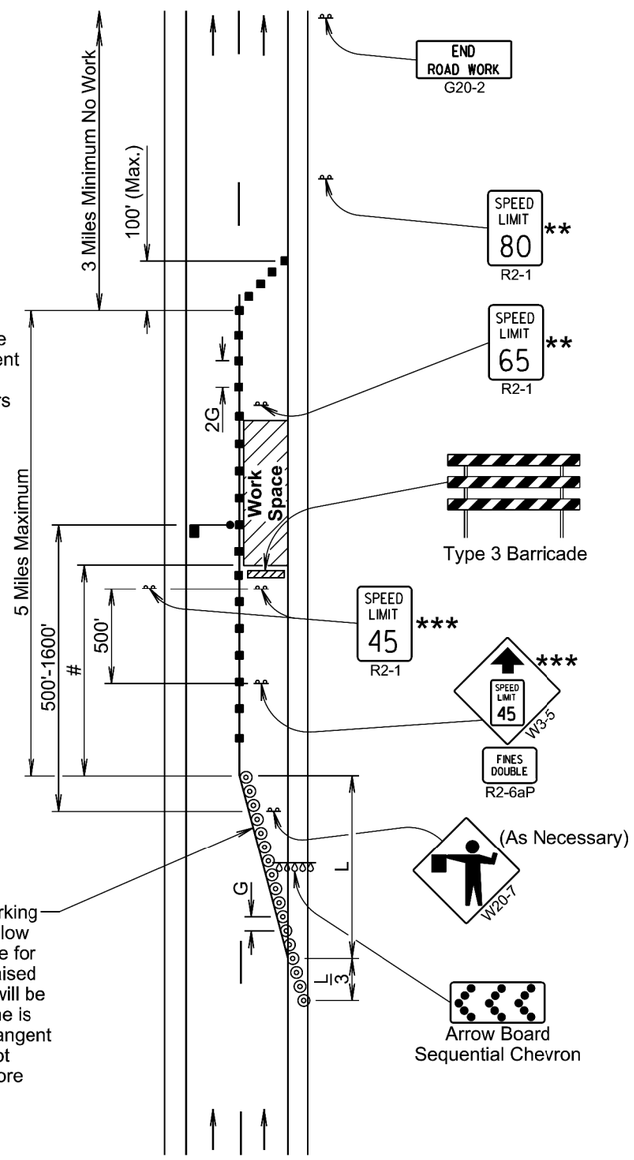
The Work Space will be a minimum of 500' from the end of the taper.

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: 1st Qtr. 2022

SDDOT

WORK ZONE SPEED REDUCTION FOR INTERSTATE AND HIGH SPEED MULTI-LANE HIGHWAYS

PLATE NUMBER 634.63

Sheet 2 of 2

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

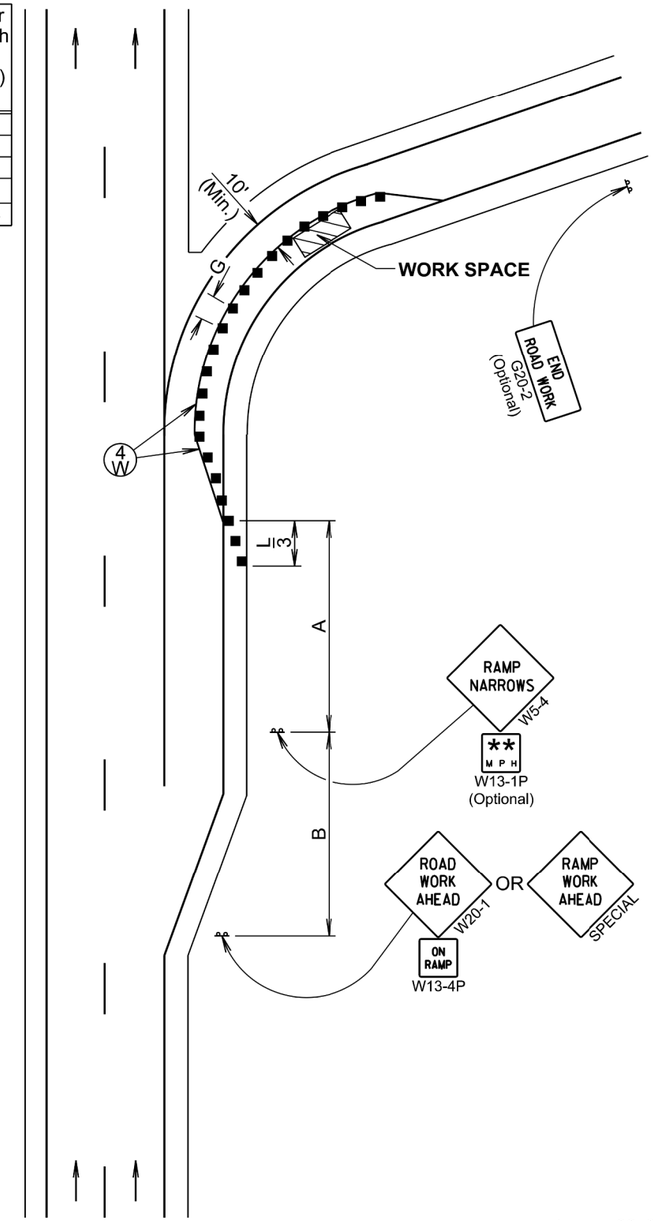
(4 W) 4" White Temporary Pavement Marking

** 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: 1st Qtr. 2022

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

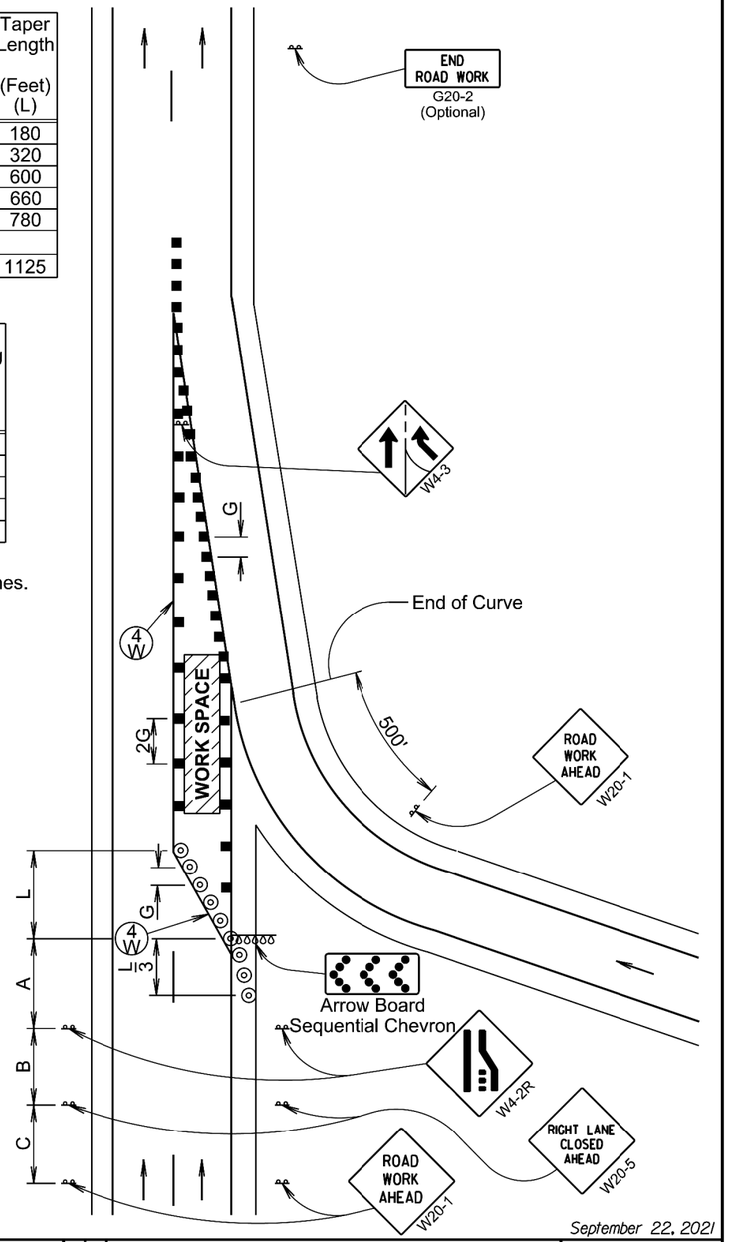
■ Channelizing Device

(4 W) 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

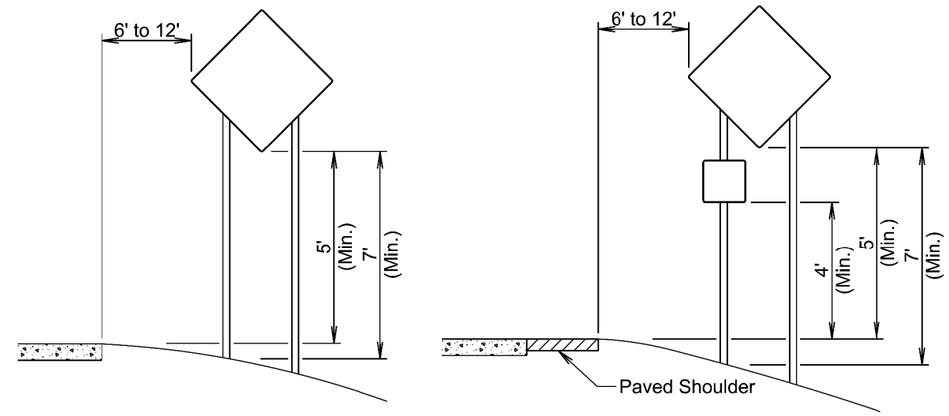
Published Date: 1st Qtr. 2022

SDDOT

WORK IN VICINITY OF ENTRANCE RAMP

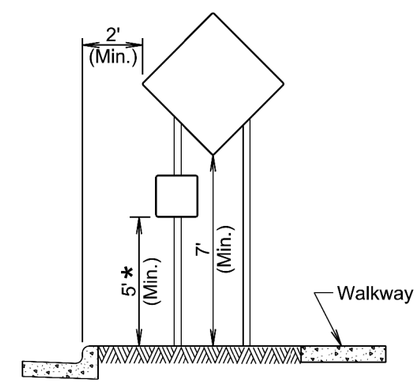
PLATE NUMBER 634.70

Sheet 1 of 1

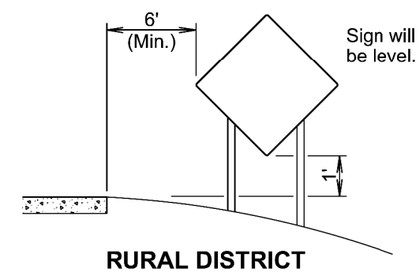


RURAL DISTRICT

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.

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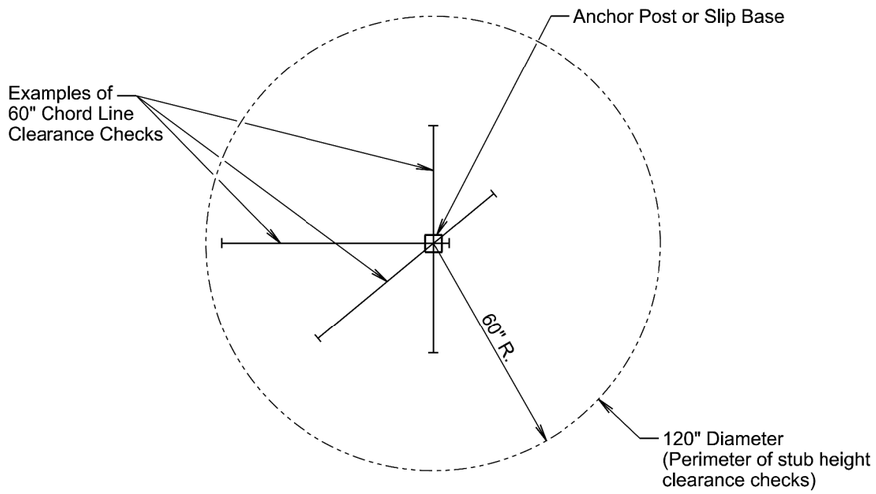
SDDOT

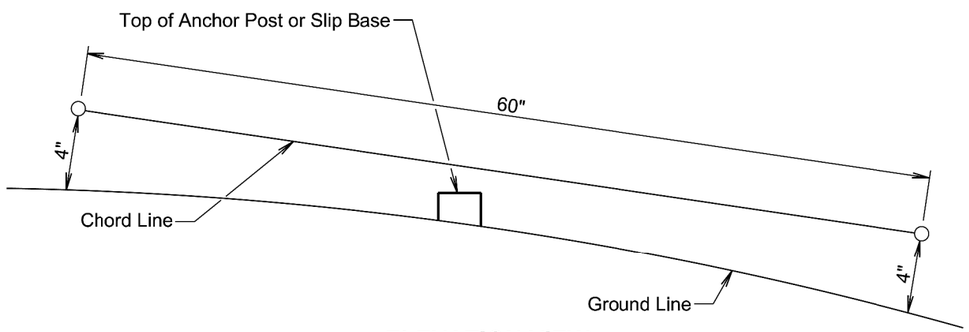
CRASHWORTHY SIGN SUPPORTS (Typical Construction Signing)

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.

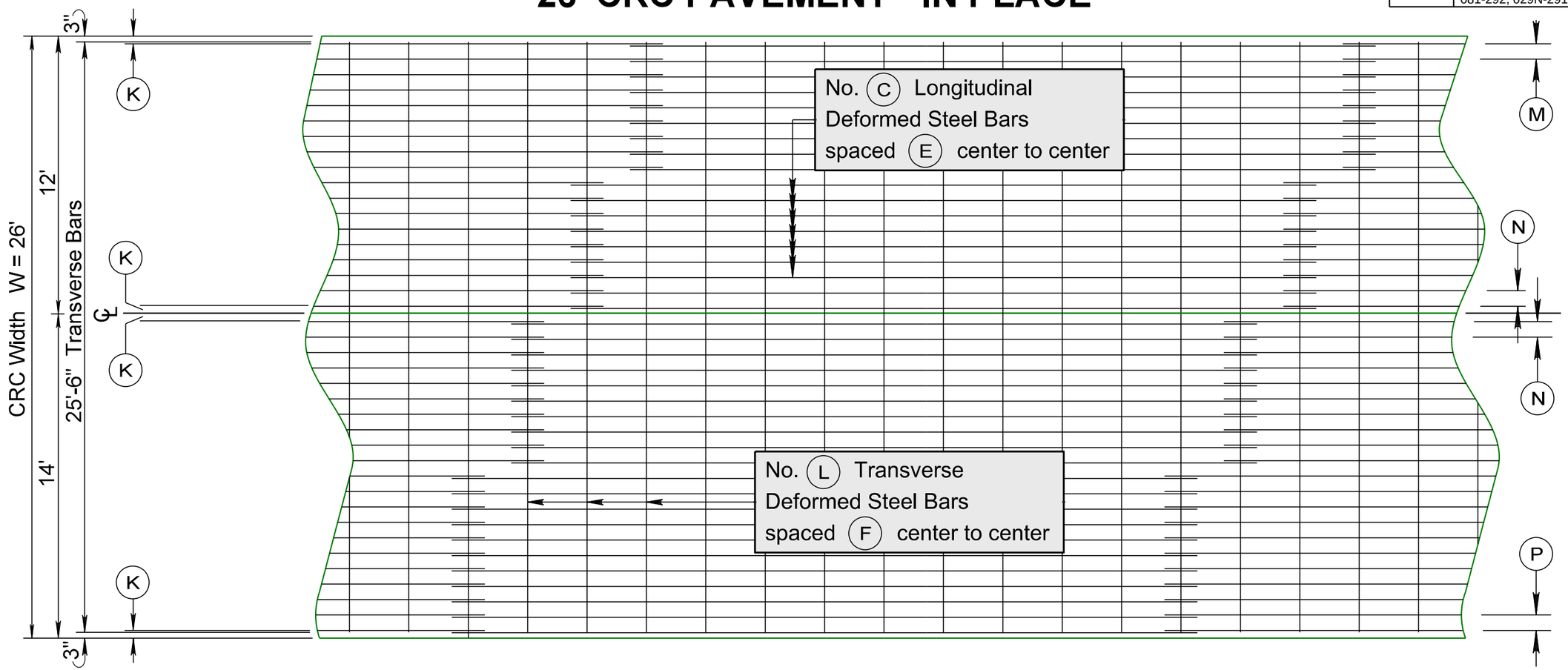
The 4" stub height clearance is not necessary for U-channel lap splices where the support is designed to yield (bend) at the base.

January 22, 2021

Published Date: 1st Qtr. 2022	SDDOT	*BREAKAWAY SUPPORT STUB CLEARANCE*	*PLATE NUMBER* 634.99
			Sheet 1 of 1

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	046-291, 050-291, 050W-292, 081-292, 029N-291, 029S-291	21	35

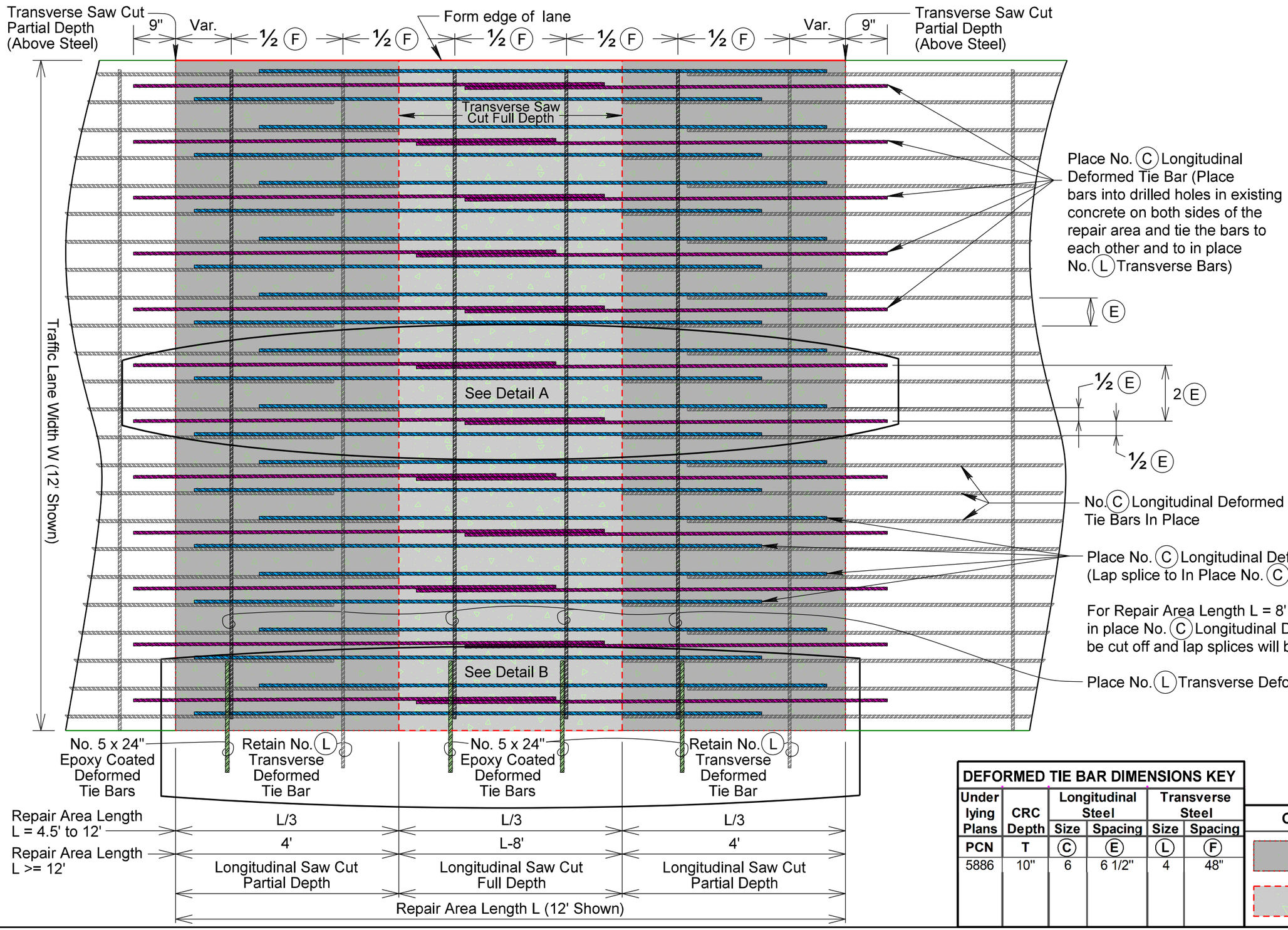
26' CRC PAVEMENT - IN PLACE



MITCHELL REGION INTERSTATE CRC PAVEMENT KEY & DIMENSIONS	Underlying Plans	CRC Depth	CRC Width	Longitudinal Steel Size	Longitudinal Steel Spacing	Transverse Steel Size	Transverse Steel Spacing	Perimeter Bar Spacing			
Location	PCN	T	W	C	E	L	F	K	M	N	P
I29S MRM 27.00 + 0.058 to 37.32 +0.138 & I90W MRM 353.07 +0.006 to 362.00 +0.045	5886 & 5359	10"	26'	6	6½"	4	48"	3¾"	6½"	6½"	4½"

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	046-291, 050-291, 050W-292, 081-292, 029N-291, 029S-291	22	35

CRC PAVEMENT REPAIR (FULL LANE WIDTH) - TYPICAL



DEFORMED TIE BAR DIMENSIONS KEY

Under lying Plans	CRC Depth	Longitudinal Steel		Transverse Steel	
		Size	Spacing	Size	Spacing
PCN	T	(C)	(E)	(L)	(F)
5886	10"	6	6 1/2"	4	48"

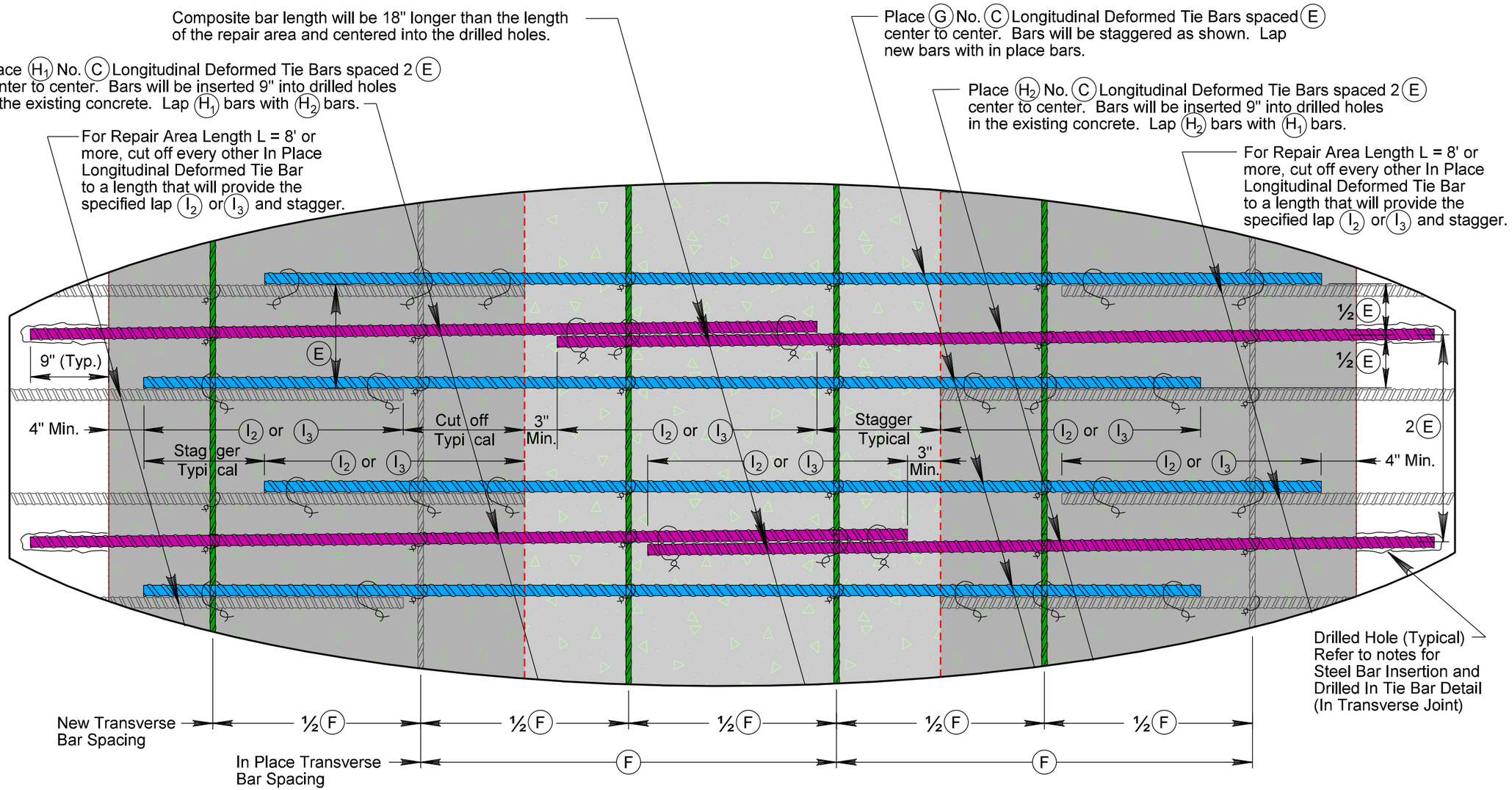
CRC REPAIR AREA KEY

- Remove Concrete Retain Reinforcing Steel
- Remove Concrete Remove Reinforcing Steel

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	046-291, 050-291, 050W-292, 081-292, 029N-291, 029S-291	23	35

CRC PAVEMENT REPAIR (FULL LANE WIDTH)

Detail A



DEFORMED TIE BAR KEY

- No. (C) Longitudinal Deformed Tie Bar In Place (Retain)
- Place No. (C) Longitudinal Deformed Tie Bar (Tie to In Place No. (C) Longitudinal Bars)
- Place No. (C) Longitudinal Deformed Tie Bar (Place bars into drilled holes in existing concrete on both sides of the repair area and tie the bars to each other and to No. (L) Transverse Bars)
- No. (L) Transverse Deformed Tie Bar In Place (Retain)
- Place No. (L) Transverse Deformed Tie Bar (Tie to No. (C) Longitudinal Bars)

DEFORMED TIE BAR DIMENSIONS KEY

Under lying Plans	CRC Depth	Longitudinal Steel		Transverse Steel	
		Size	Spacing	Size	Spacing
PCN	T	(C)	(E)	(L)	(F)
5886	10"	6	6 1/2"	4	48"

Note: All lapped bars will have a minimum of two ties per lap.

LAP SPLICE LENGTH KEY

- (l1) Lap Splice length for Repair Area Length L < 4.5' (Not Available).
- (l2) Lap Splice length for Repair Area Length L = 4.5' to 8'.
- (l3) Lap Splice length for Repair Area Length L > 8'.

See CRC Pavement Repair - Reinforcing Steel Details for Longitudinal Bar Counts: (G), (H1) & (H2)

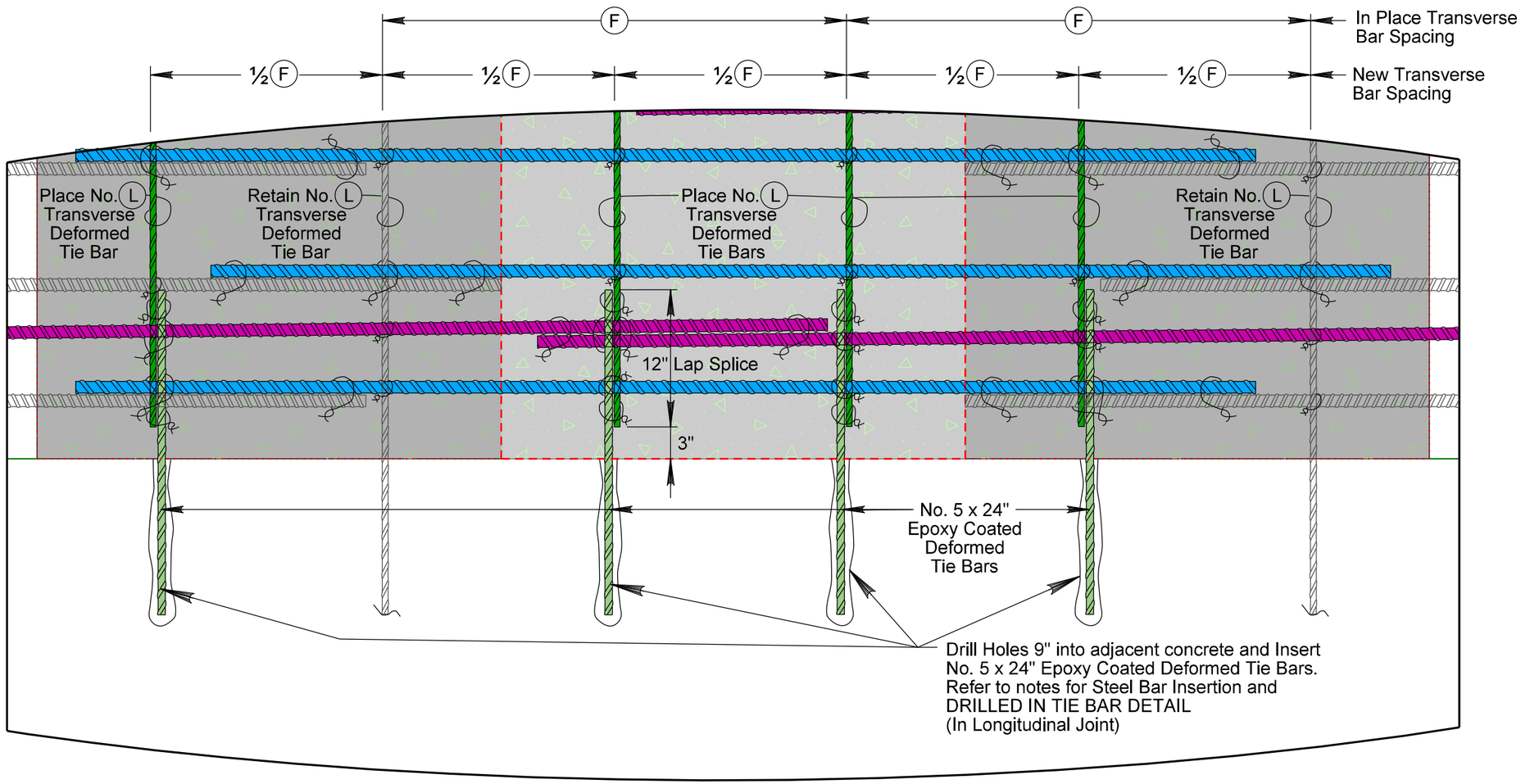
CRC REPAIR AREA KEY

- Remove Concrete Retain Reinforcing Steel
- Remove Concrete Remove Reinforcing Steel

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	046-291, 050-291, 050W-292, 081-292, 029N-291, 029S-291	24	35

CRC PAVEMENT REPAIR (FULL LANE WIDTH)

Detail B



DEFORMED TIE BAR KEY

- No. C Longitudinal Deformed Tie Bar In Place (Retain)
- Place No. C Longitudinal Deformed Tie Bar (Tie to In Place No. C Longitudinal Bars)
- Place No. C Longitudinal Deformed Tie Bar (Place bars into drilled holes in existing concrete on both sides of the repair area and tie the bars to each other and to No. L Transverse Bars)
- No. L Transverse Deformed Tie Bar In Place (Retain)
- Place No. L Transverse Deformed Tie Bar (Tie to No. C Longitudinal Bars)

DEFORMED TIE BAR DIMENSIONS KEY

Under lying Plans	CRC Depth	Longitudinal Steel		Transverse Steel	
		Size	Spacing	Size	Spacing
PCN	T	C	E	L	F
5886	10"	6	6 1/2"	4	48"

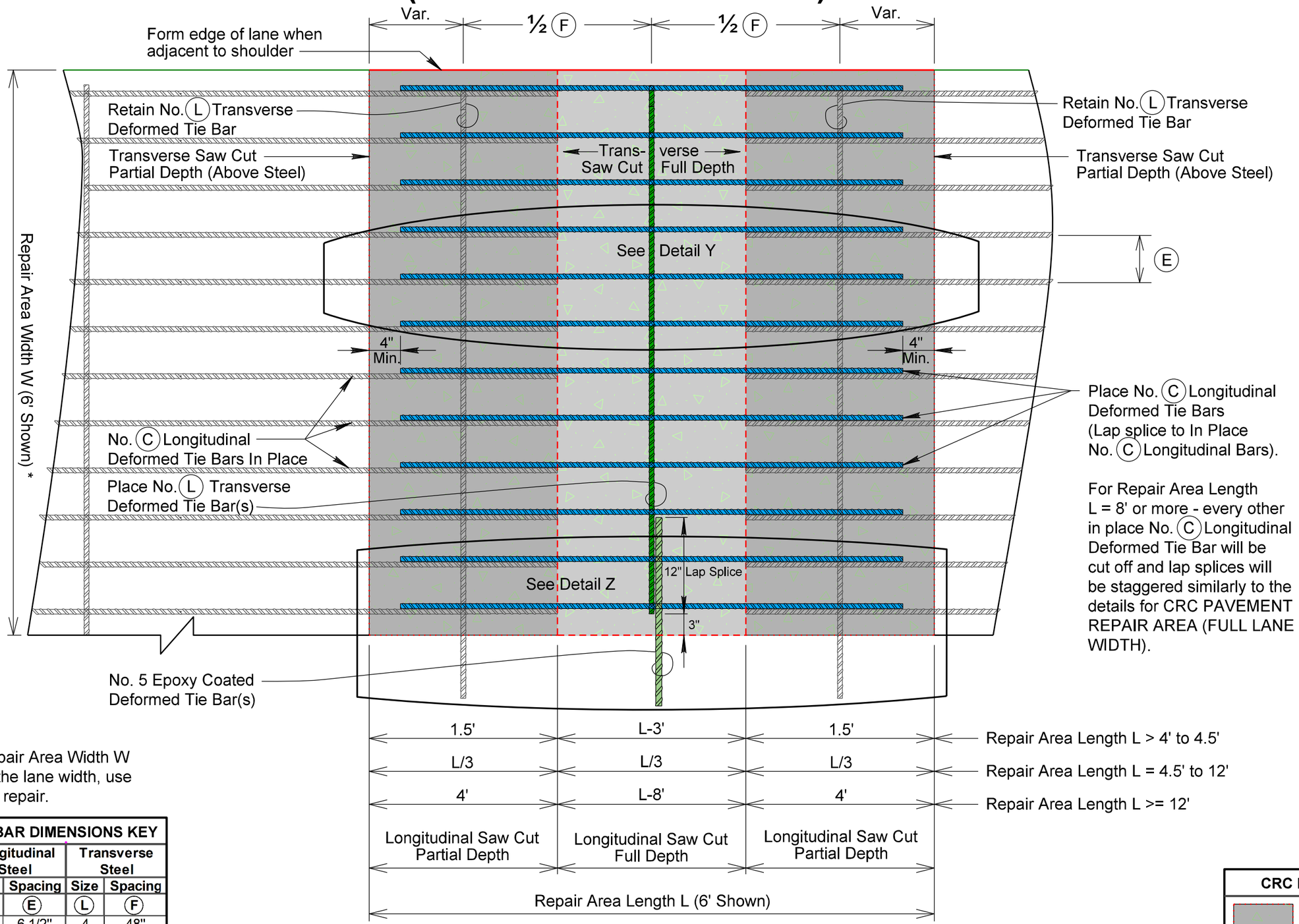
Note: All lapped bars will have a minimum of two ties per lap.

CRC REPAIR AREA KEY

- Remove Concrete Retain Reinforcing Steel
- Remove Concrete Remove Reinforcing Steel

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	046-291, 050-291, 050W-292, 081-292, 029N-291, 029S-291	25	35

CRC PAVEMENT REPAIR (PARTIAL LANE WIDTH) - TYPICAL



* When the Repair Area Width W exceeds half the lane width, use full lane width repair.

DEFORMED TIE BAR DIMENSIONS KEY

Under lying Plans	CRC Depth	Longitudinal Steel		Transverse Steel	
		Size	Spacing	Size	Spacing
PCN	T	(C)	(E)	(L)	(F)
5886	10"	6	6 1/2"	4	48"

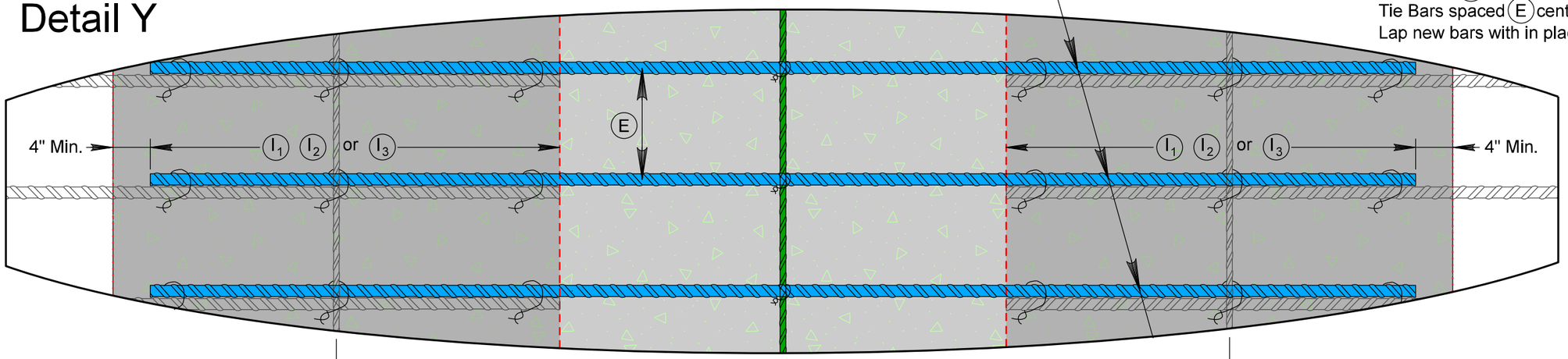
CRC REPAIR AREA KEY

- Remove Concrete Retain Reinforcing Steel
- Remove Concrete Remove Reinforcing Steel

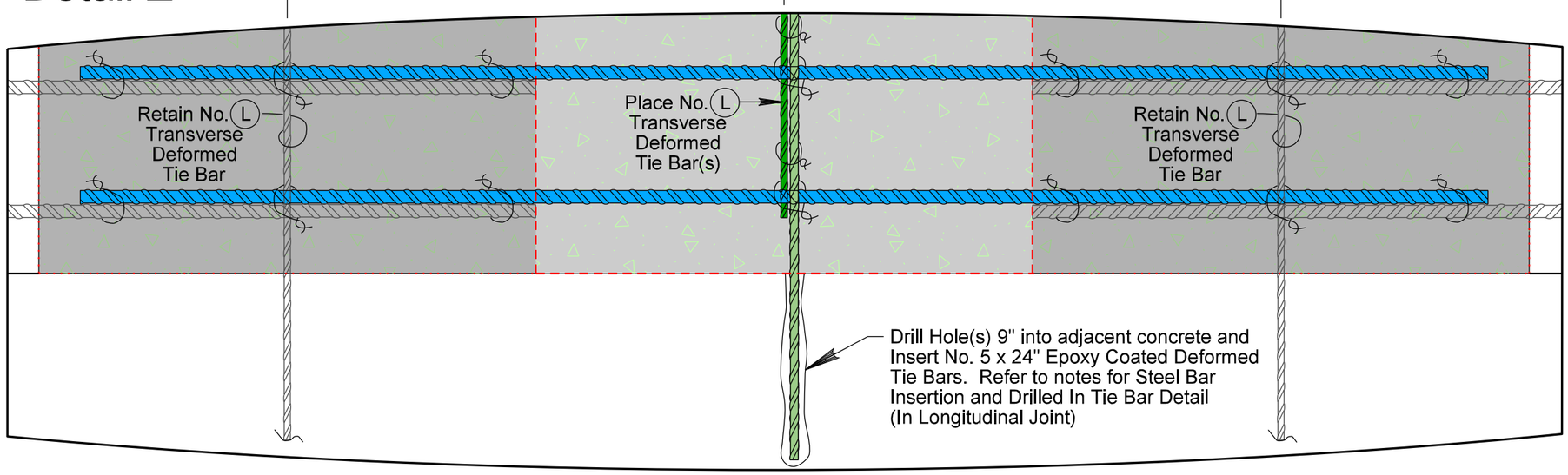
CRC PAVEMENT REPAIR (PARTIAL LANE WIDTH)

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	046-291, 050-291, 050W-292, 081-292, 029N-291, 029S-291	26	35

Detail Y



Detail Z



For Repair Area Length L = 8' or more - every other in place No. C Longitudinal Deformed Tie Bar will be cut off and lap splices will be staggered similarly to the details for CRC PAVEMENT REPAIR AREA (FULL LANE WIDTH).

DEFORMED TIE BAR DIMENSIONS KEY

- No. L Transverse Deformed Tie Bar In Place (Retain)
- Place No. L Transverse Deformed Tie Bar (Tie to No. C Longitudinal Bars)
- No. C Longitudinal Deformed Tie Bar In Place (Retain)
- Place No. C Longitudinal Deformed Tie Bar (Tie to In Place No. C Longitudinal Bars)

Under lying Plans	CRC Depth	Longitudinal Steel		Transverse Steel	
		Size	Spacing	Size	Spacing
PCN	T	C	E	L	F
5886	10"	6	6 1/2"	4	48"

LAP SPLICE LENGTH KEY

- l_1 Lap Splice length for Repair Area Length L = 4' to 4.5'.
- l_2 Lap Splice length for Repair Area Length L = 4.5' to 8'.
- l_3 Lap Splice length for Repair Area Length L > 8'.

Note: All lapped bars will have a minimum of two ties per lap.

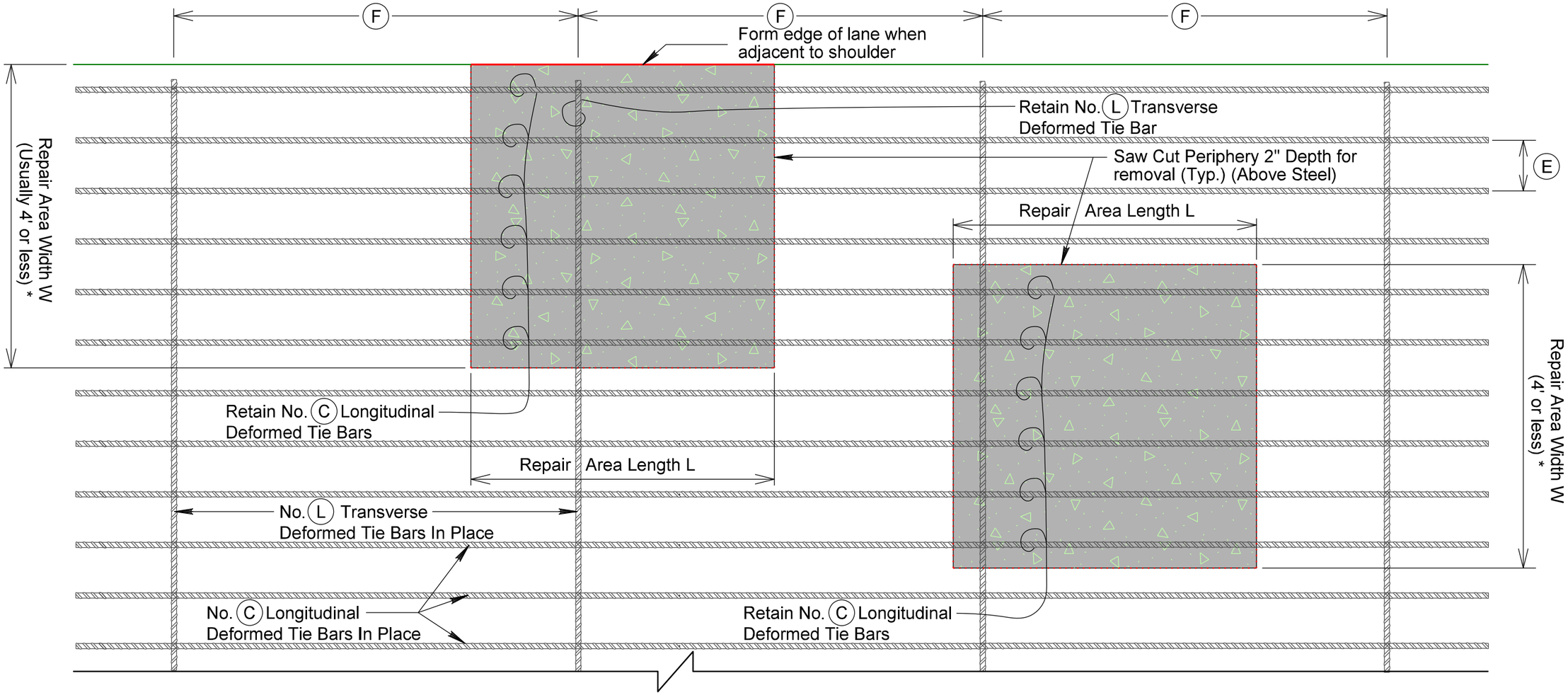
CRC REPAIR AREA KEY

- Remove Concrete Retain Reinforcing Steel
- Remove Concrete Remove Reinforcing Steel

CRC PAVEMENT REPAIR - EXISTING STEEL RETAINED (TYPICAL)

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	046-291, 050-291, 050W-292, 081-292, 029N-291, 029S-291	27	35

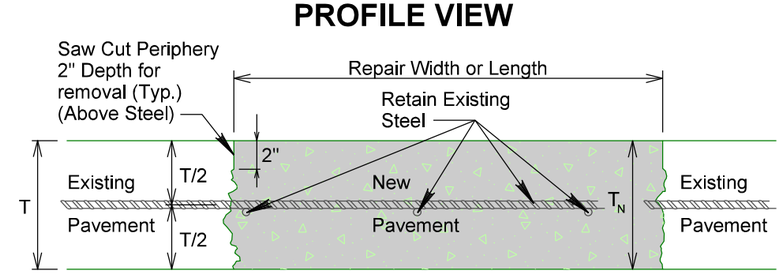
PLAN VIEW



* When Repair Width W exceeds 4', usually use partial lane width repair.
When Repair Width W exceeds half the lane width, usually use full lane width repair.

However, a Repair Width W exceeding 4' might be used when doing a small repair adjacent to an existing repair, in order to match the width of the existing repair.

PROFILE VIEW



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

DEFORMED TIE BAR DIMENSIONS KEY

No. L Transverse Deformed Tie Bar In Place (Retain)

No. C Longitudinal Deformed Tie Bar In Place (Retain)

Under lying Plans	CRC Depth	Longitudinal Steel		Transverse Steel	
		Size	Spacing	Size	Spacing
PCN	T	C	E	L	F
5886	10"	6	6 1/2"	4	48"

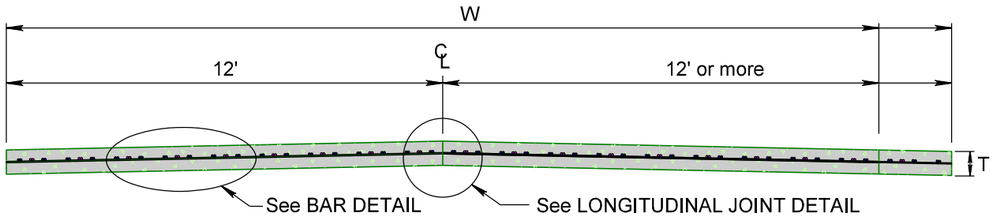
CRC REPAIR AREA KEY

Remove Concrete
Retain Reinforcing Steel

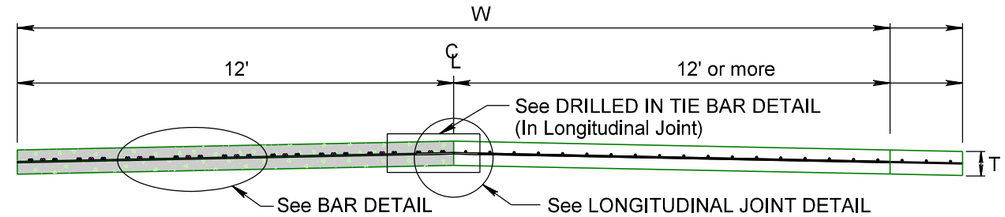
CRC PAVEMENT REPAIR - REINFORCING STEEL DETAILS

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	046-291, 050-291, 050W-292, 081-292, 029N-291, 029S-291	28	35

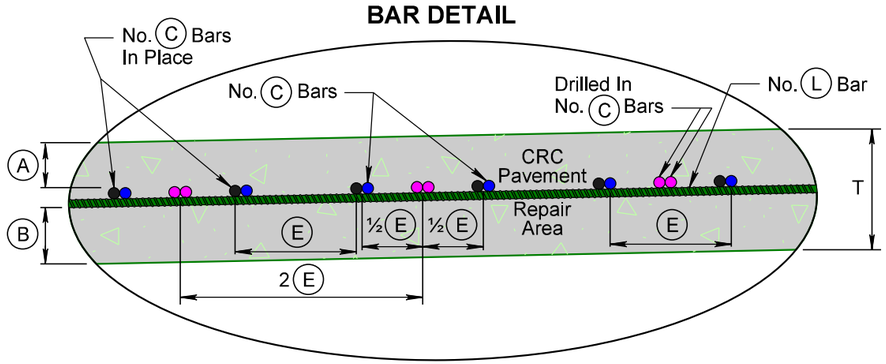
TRANSVERSE SECTION SHOWING STEEL PLACEMENT



TRANSVERSE SECTION SHOWING STEEL PLACEMENT



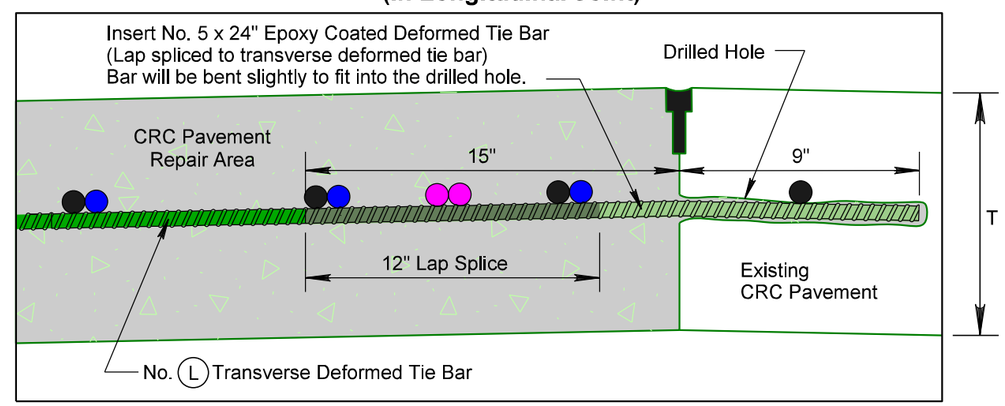
BAR DETAIL



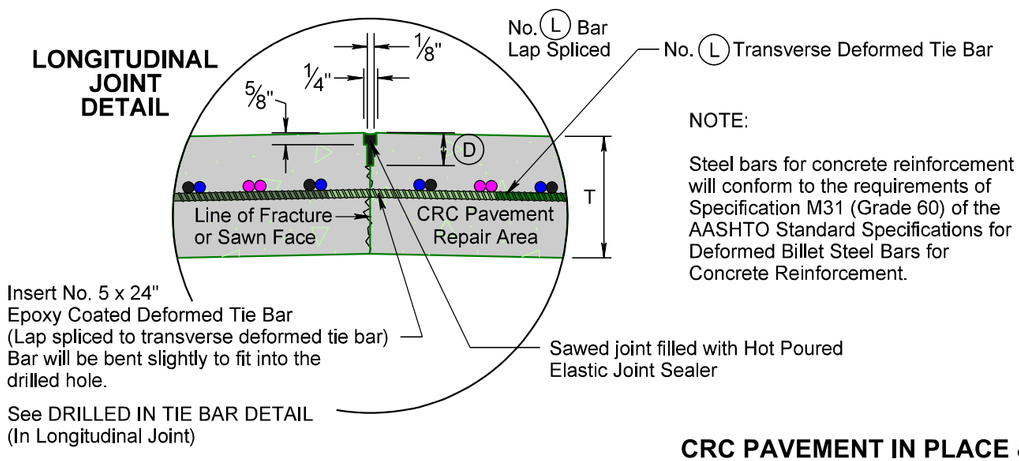
Placement of longitudinal steel bars may vary from +1/2" to -1/2" vertically and 3/4" horizontally.
Placement of transverse steel bars may vary from +1/2" to -1/2" vertically and 2" horizontally.

The transverse deformed steel bars will be positioned on acceptable chairs.

DRILLED IN TIE BAR DETAIL
(In Longitudinal Joint)



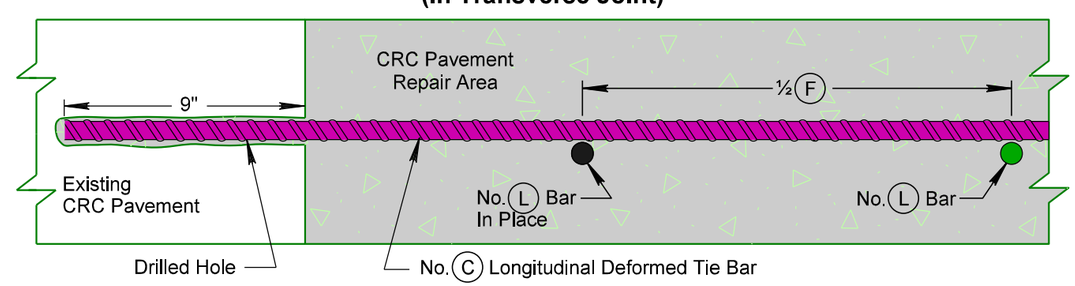
LONGITUDINAL JOINT DETAIL



NOTE:

Steel bars for concrete reinforcement will conform to the requirements of Specification M31 (Grade 60) of the AASHTO Standard Specifications for Deformed Billet Steel Bars for Concrete Reinforcement.

LONGITUDINAL SECTION SHOWING STEEL PLACEMENT
DRILLED IN TIE BAR DETAIL
(In Transverse Joint)

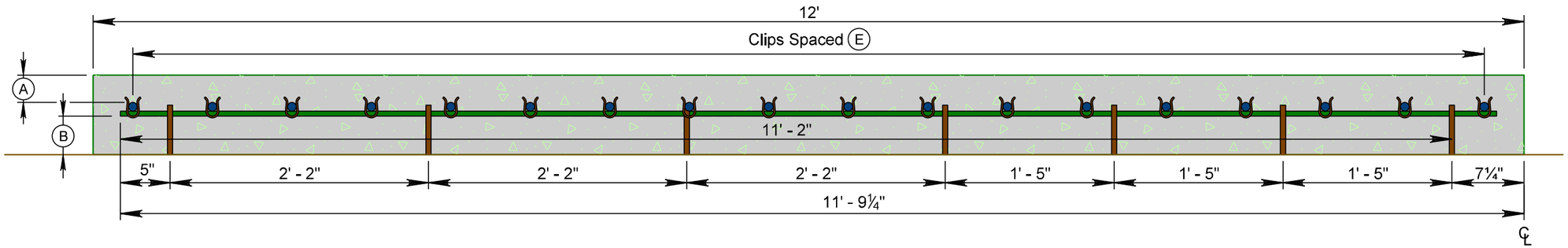


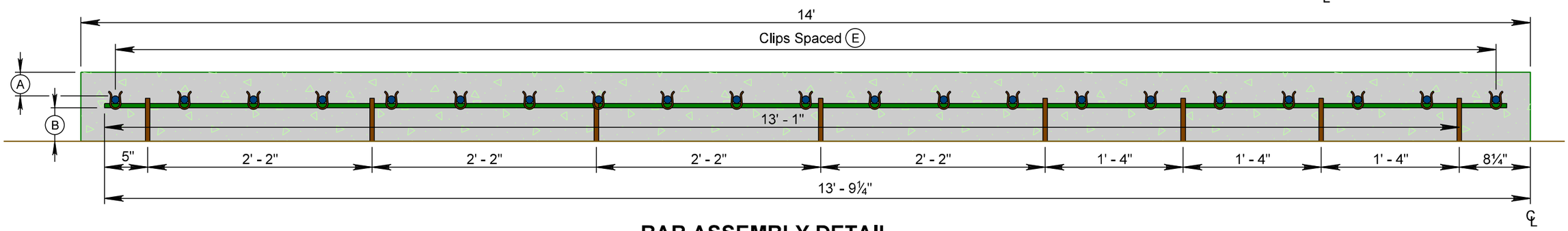
CRC PAVEMENT IN PLACE & CRC PAVEMENT REPAIR KEY & DIMENSIONS

Location	Underlying Plans	CRC Depth	CRC Width	Clearance		Longitudinal Steel		Saw Cut Depth	Transverse Steel		Longitudinal Bar Count (full lane width repair)						Lap Splice Length (for Repair Length L)			Not Assigned	Perimeter Bar Spacing				Chair Width
				Top	Bottom	Size	Spacing		Size	Spacing	12' Wide Slab			14' Wide Slab			L<4.5'	L= 4.5' to 8'/9'	L>=8'/9'						
	PCN	T	W	A	B	C	E	D	L	F	G	H_1	H_2	G	H_1	H_2	I_1	I_2	I_3	-	K	M	N	P	R
I29S MRM 27.00 + 0.058 to MRM 37.32 +0.138	5886	10"	26'	3 1/2"	5 1/4"	6	6 1/2"	2 1/2"	4	48"	22	11	11	26	13	13	14"	14" to 25"	25"	-	3 3/4"	6 1/2"	6 1/2"	4 1/2"	5"

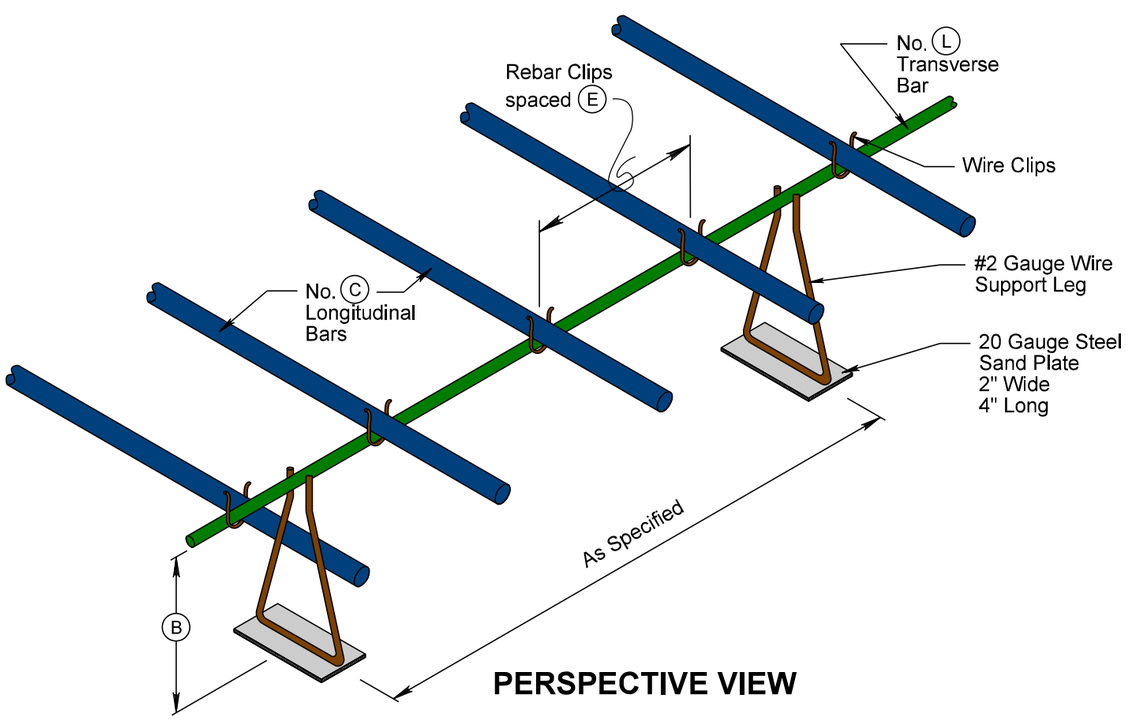
CRC PAVEMENT CHAIR DETAILS

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	046-291, 050-291, 050W-292, 081-292, 029N-291, 029S-291	29	35

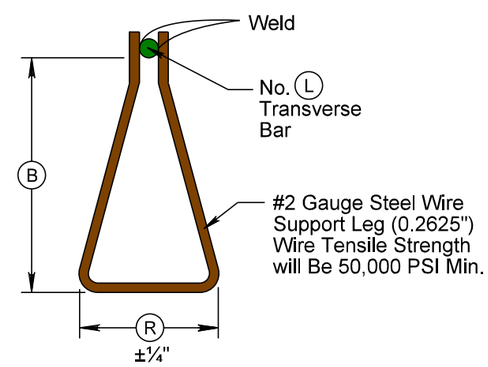




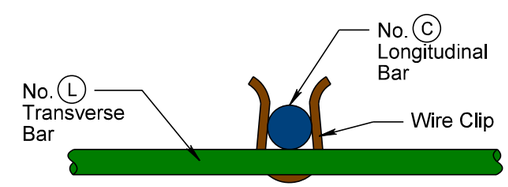
BAR ASSEMBLY DETAIL



PERSPECTIVE VIEW



CHAIR DETAIL



CLIP DETAIL

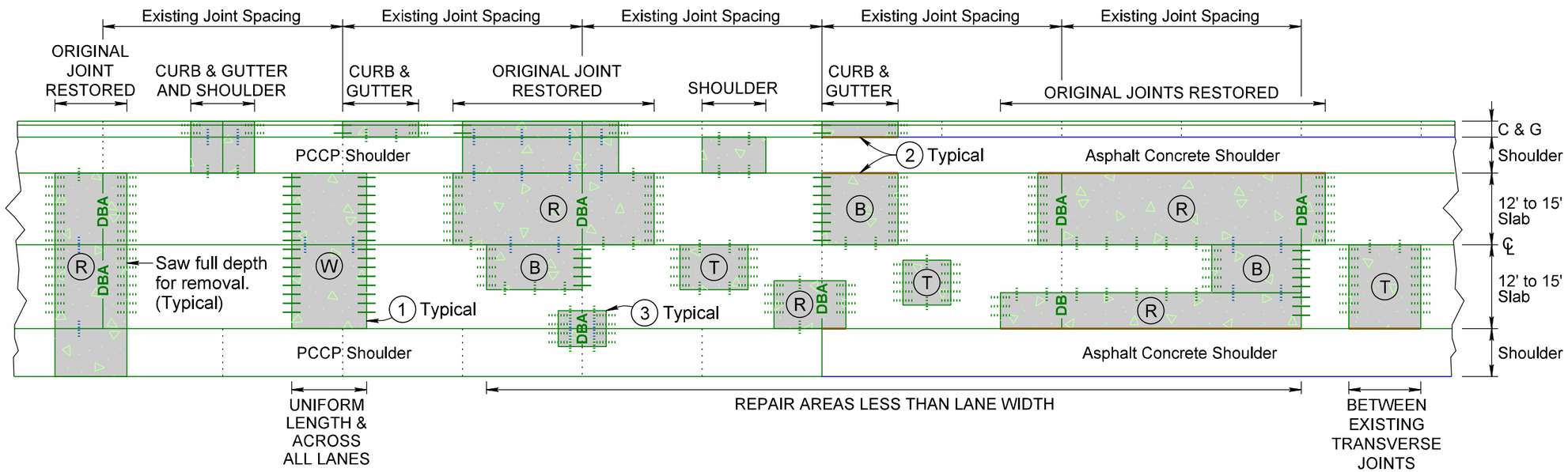
DEFORMED TIE BAR DIMENSIONS KEY

Under lying Plans	CRC Depth	CRC Width	Clearance		Longitudinal Steel		Saw Cut Depth	Transverse Steel		Chair Width
			Top	Bottom	Size	Spacing		Size	Spacing	
PCN	T	W	A	B	C	E	D	L	F	R
5886	10"	26'	3 1/2"	5 1/4"	6	6 1/2"	2 1/2"	4	48"	5"

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	046-291, 050-291, 050W-292, 081-292, 029N-291, 029S-291	30	35

NONREINFORCED PCC PAVEMENT REPAIR

UP TO TWO LANE ROADWAY OR UP TO FOUR 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

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.

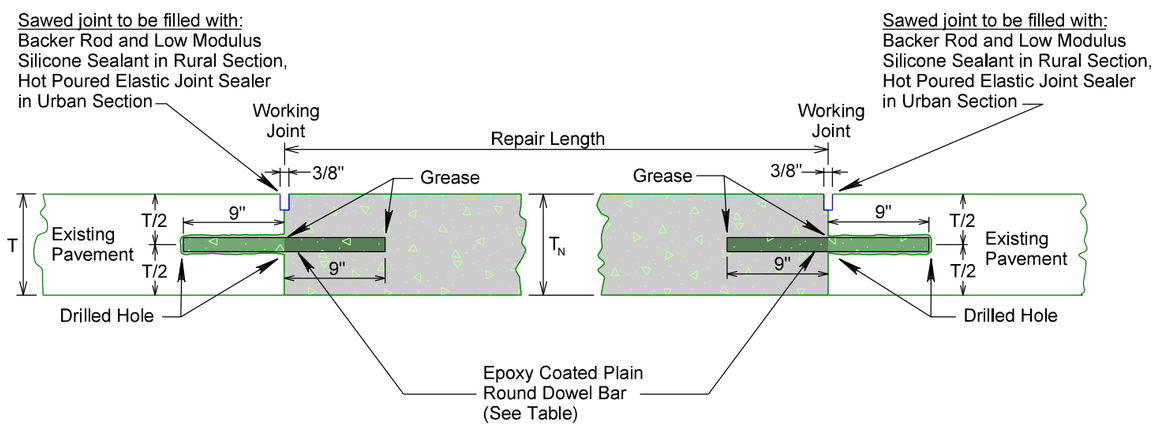
NOTES: Saw around repair areas full depth for removal.

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.

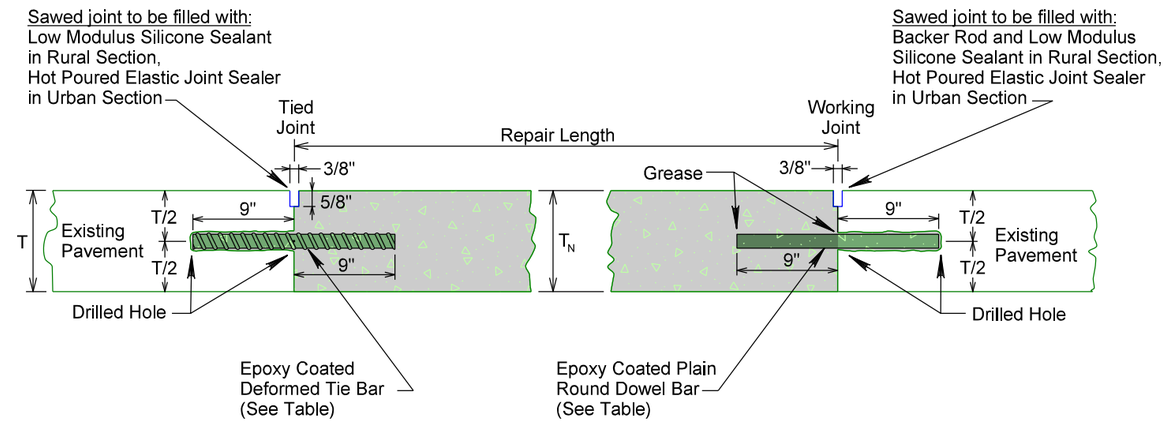
NONREINFORCED PCC PAVEMENT REPAIR

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	046-291, 050-291, 050W-292, 081-292, 029N-291, 029S-291	31	35

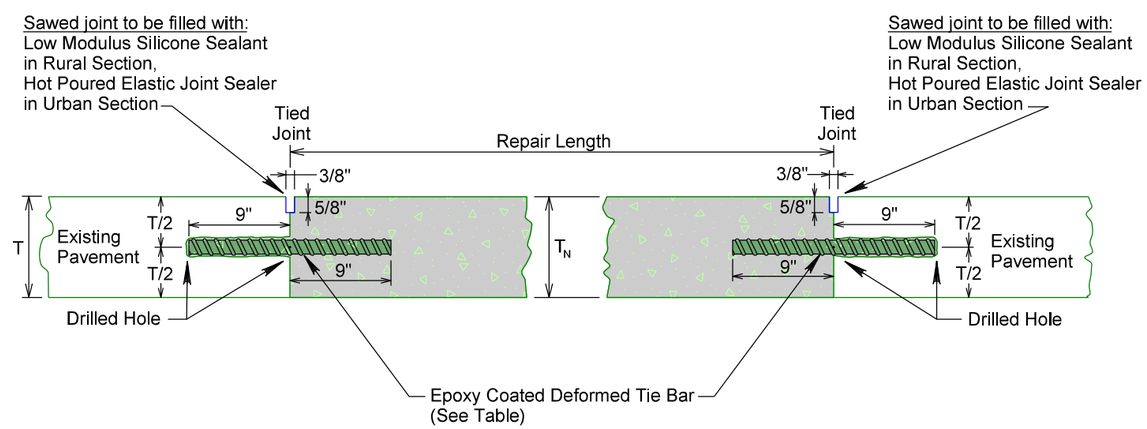
PLAIN ROUND DOWEL BAR INSERTION
TYPE W - (TWO WORKING JOINTS)



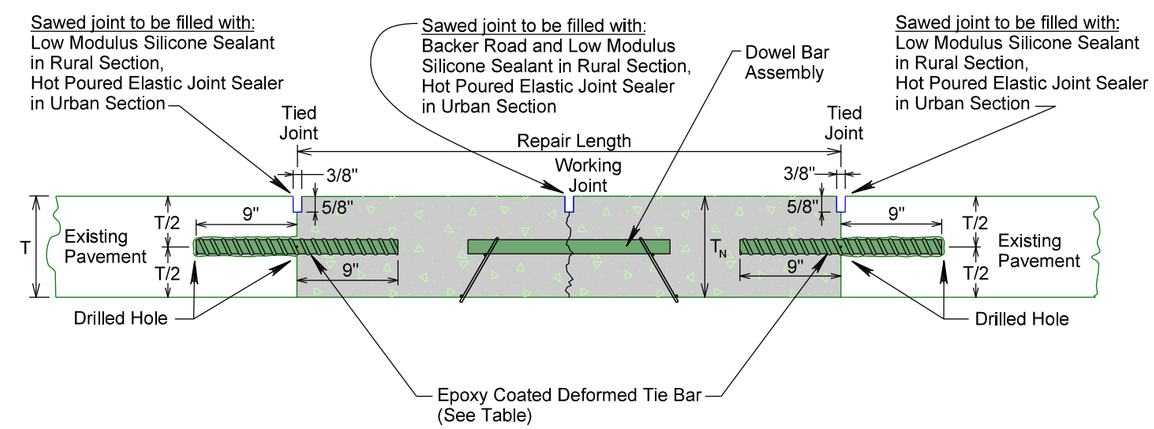
DEFORMED TIE BAR AND PLAIN ROUND DOWEL BAR INSERTION
TYPE B - (ONE TIED JOINT AND ONE WORKING JOINT)



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.

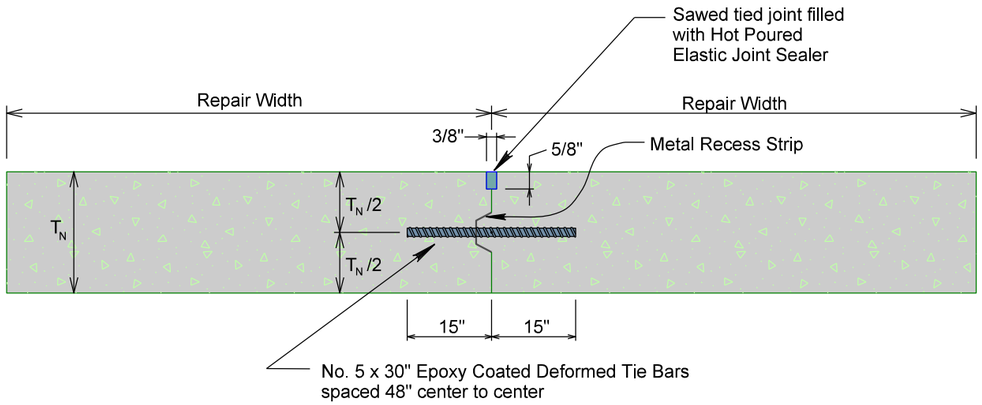
Cost for furnishing and installing dowel bar assembly will be included in the contract unit price per each for Dowel Bar.

T_N = T

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

NONREINFORCED PCC PAVEMENT REPAIR

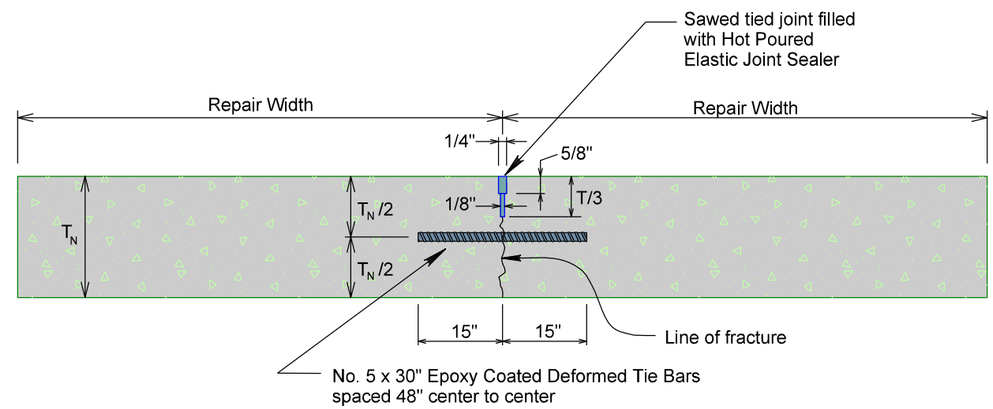
LONGITUDINAL CONSTRUCTION JOINT WITH TIE BARS & KEYWAY



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

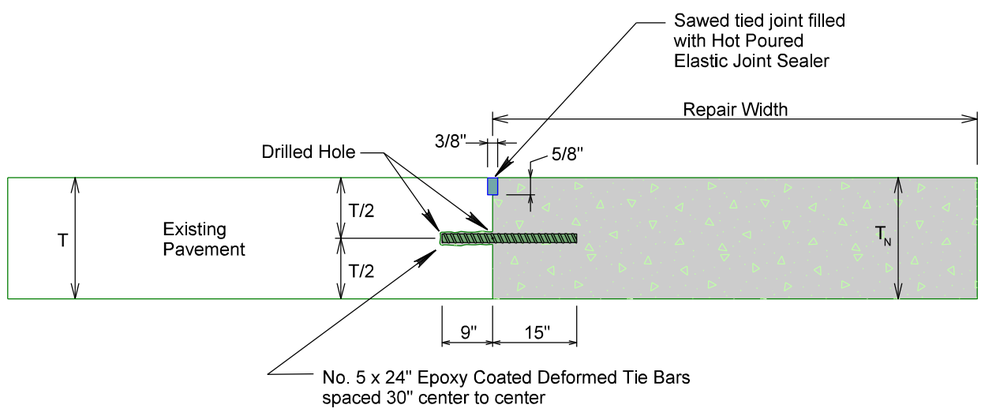


T_N = New pavement thickness.

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



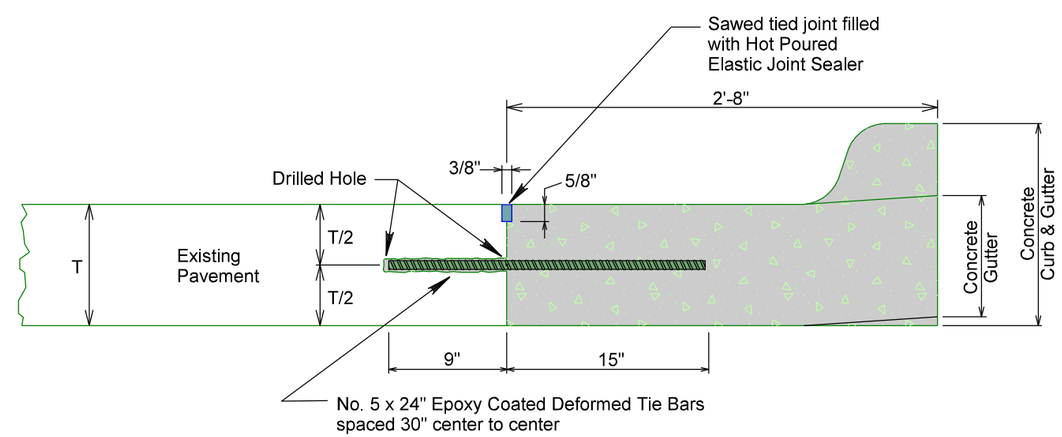
T = Existing pavement thickness.
T_N = New pavement thickness.

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.

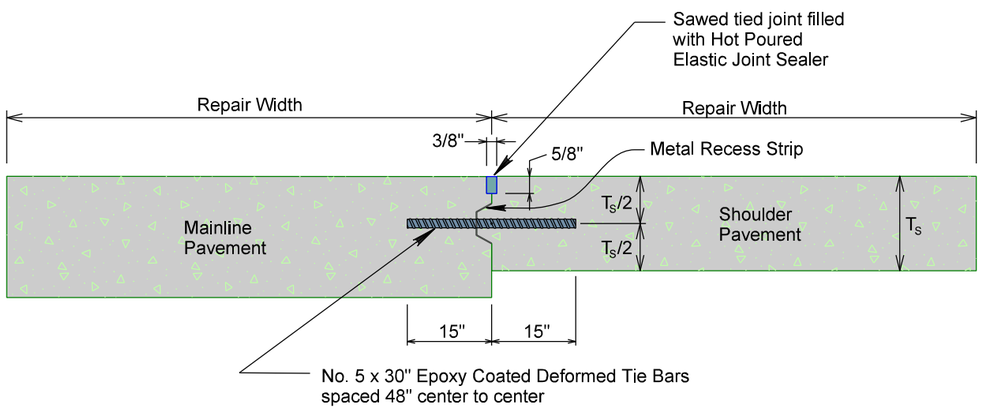
Bars will be placed a minimum of 15 inches from existing transverse contraction joints.

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.

NONREINFORCED PCC PAVEMENT REPAIR

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	046-291, 050-291, 050W-292, 081-292, 029N-291, 029S-291	33	35

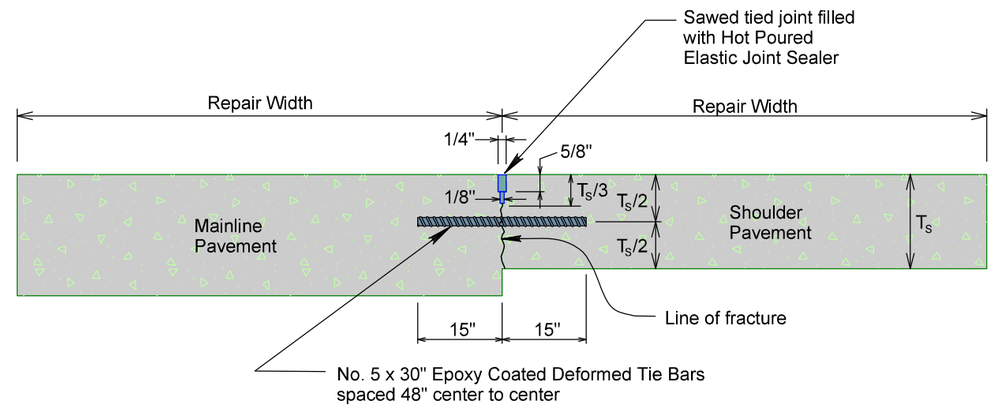
LONGITUDINAL SHOULDER CONSTRUCTION JOINT WITH TIE BARS & KEYWAY



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

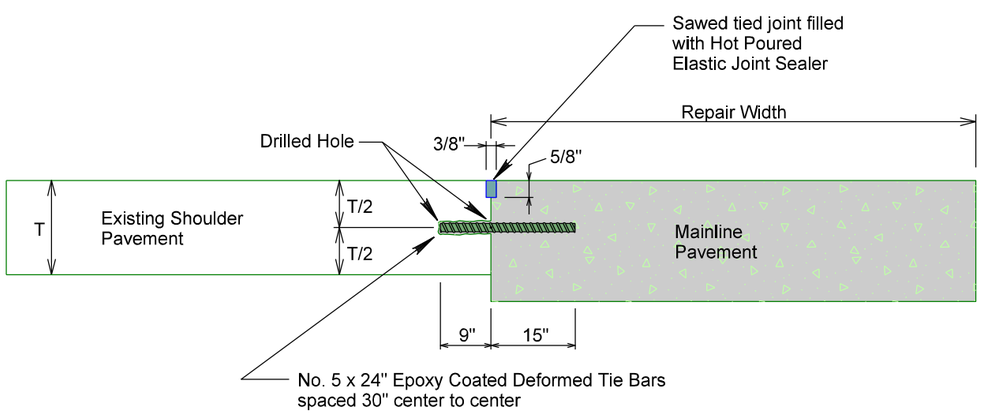


T_S= New shoulder pavement thickness.

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



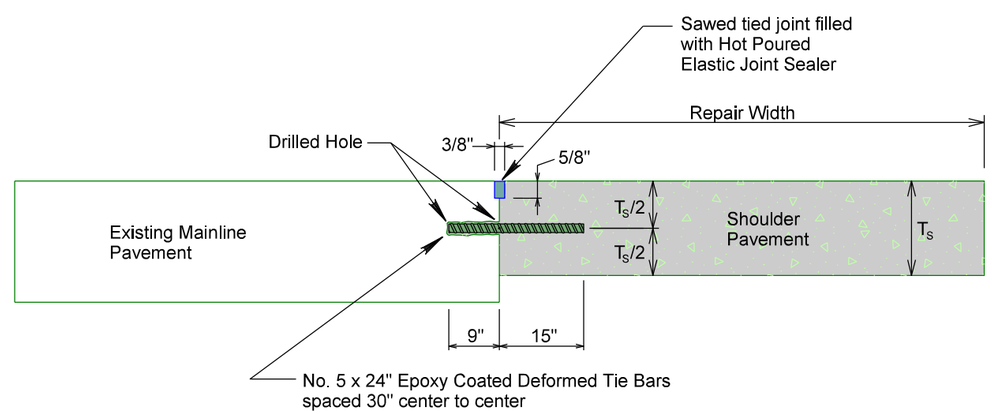
T = Existing shoulder pavement thickness.

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.

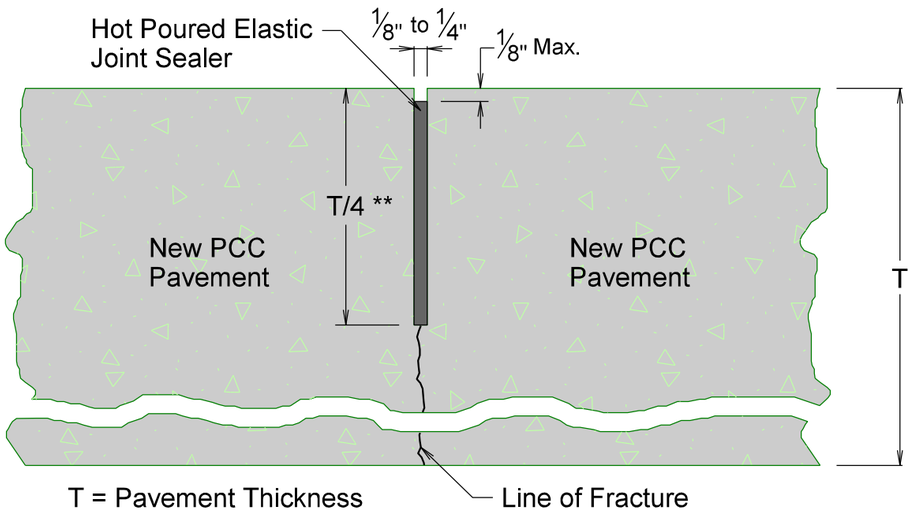
Bars will be placed a minimum of 15 inches from existing transverse contraction joints.

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.

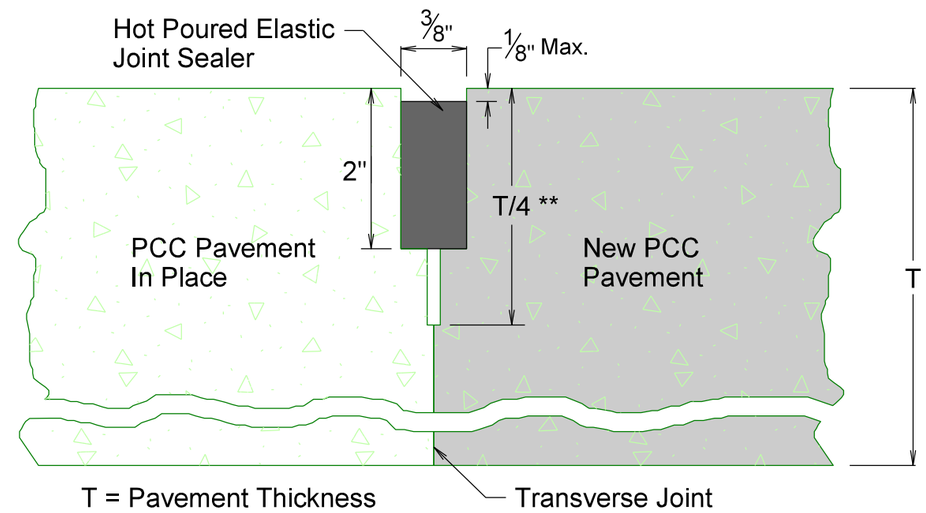
NONREINFORCED PCC PAVEMENT REPAIR

SAW & SEAL TRANSVERSE JOINTS

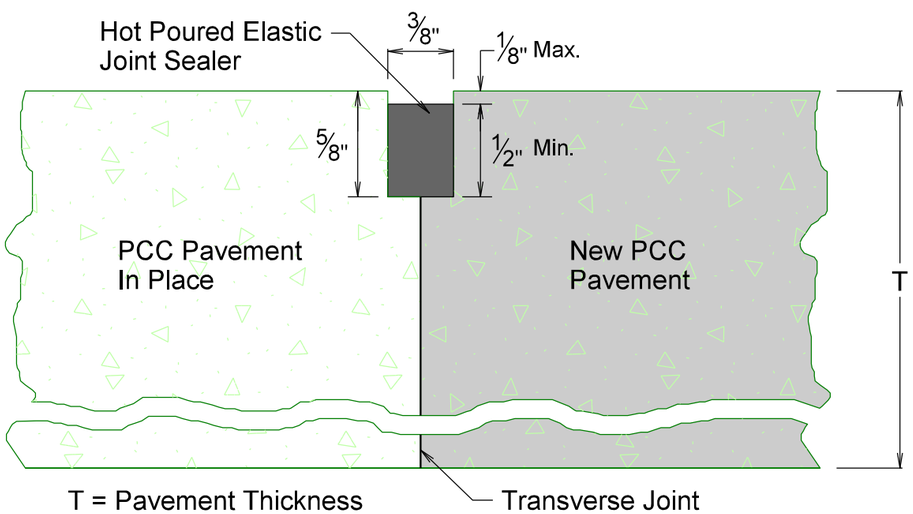
WITH HOT POURED ELASTIC JOINT SEALER AT WORKING JOINTS ENTIRELY WITHIN REPAIR AREAS



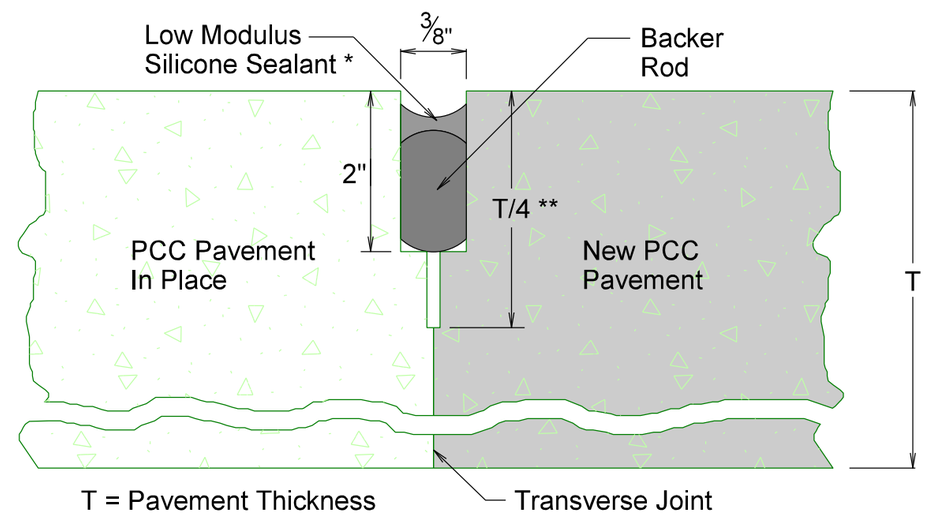
WITH HOT POURED ELASTIC JOINT SEALER AT WORKING JOINTS (TYPICALLY URBAN)



WITH HOT POURED ELASTIC JOINT SEALER AT TIED JOINTS

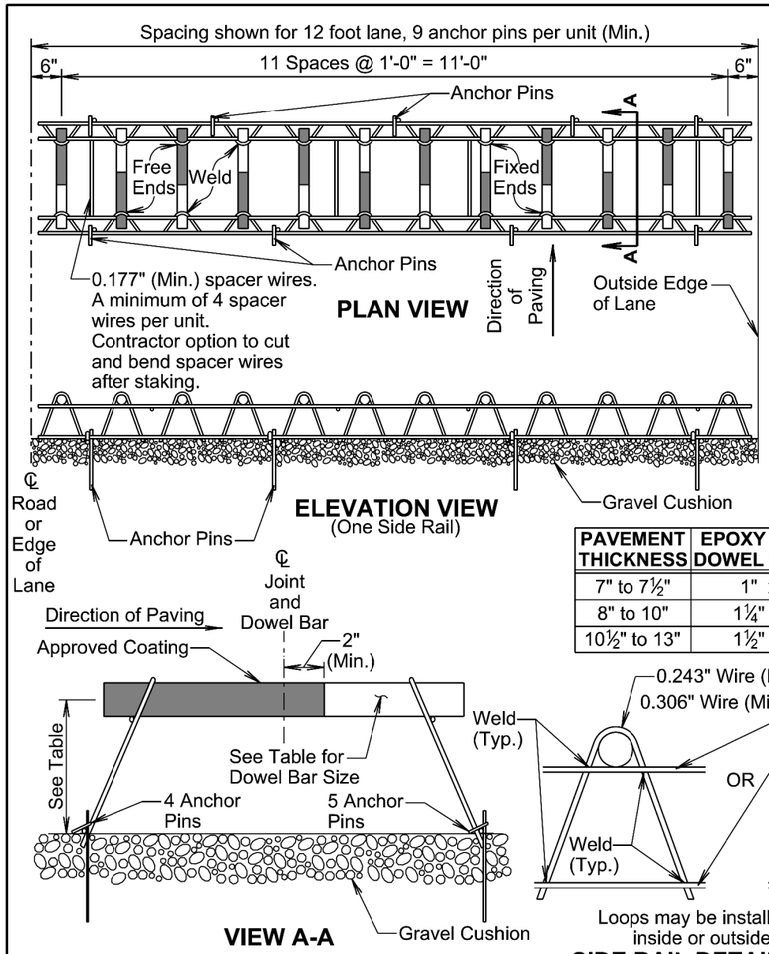


WITH LOW MODULUS SILICONE SEALANT AT WORKING JOINTS (TYPICALLY RURAL)



* Refer to Standard Plate 380.13 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.



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 NOTES:

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

Centerline of individual dowel bars will be parallel to top of subgrade ±1/8 inch in 18 inches and to all other dowel bars in the assembly ±1/16 inch in 18 inches.

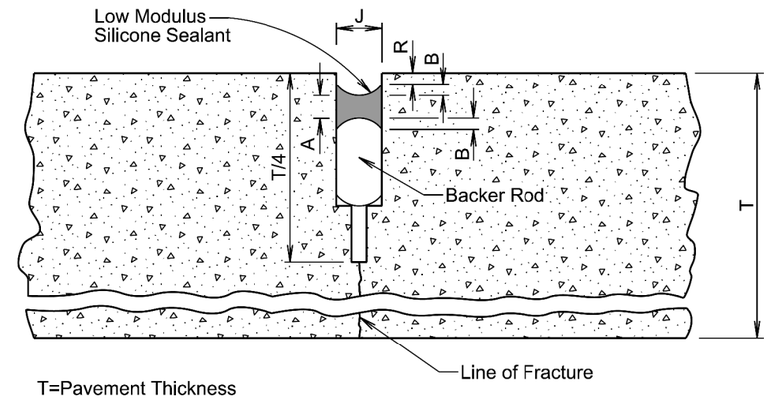
Centerline of individual dowel bars will be parallel to the centerline of the roadway ±1/2 inch in 18 inches.

The transverse contraction joints will be sawed perpendicular to the centerline of the roadway and the dowel bars will be centered on the sawed joint ±1 inch.

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.

June 26, 2019

Published Date: 1st Qtr. 2022	SDDOT	PCC PAVEMENT DOWEL BAR ASSEMBLY FOR TRANSVERSE CONTRACTION JOINTS 12 Bar Assembly on Granular Base Material	PLATE NUMBER 380.01 Sheet 1 of 1



LOW MODULUS SILICONE SEALANT ALLOWABLE CONSTRUCTION TOLERANCES

J=⅜"				
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=½"				
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=⅝"				
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=¾"				
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.

June 26, 2019

Published Date: 1st Qtr. 2022	SDDOT	RESEAL PCC PAVEMENT JOINT (SILICONE)	PLATE NUMBER 380.13 Sheet 1 of 1