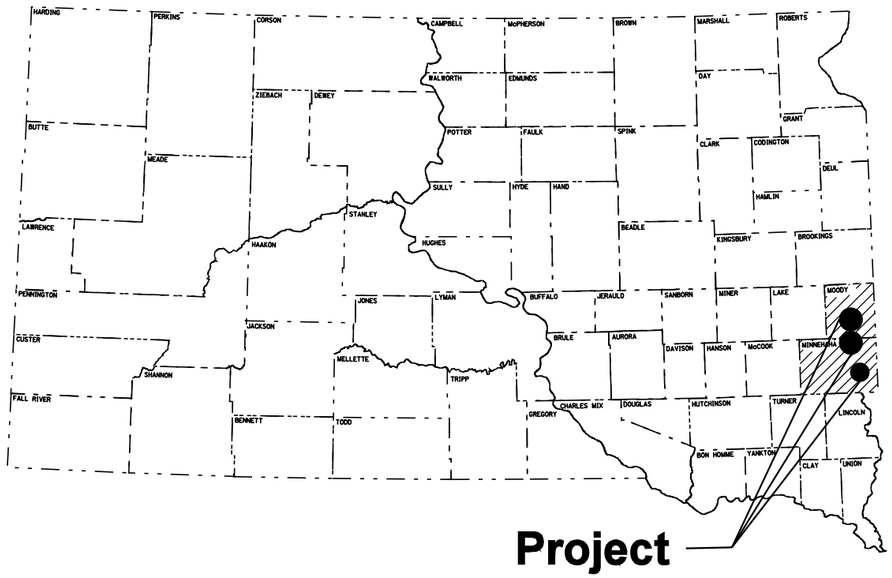


STATE OF SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION
PLANS FOR PROPOSED

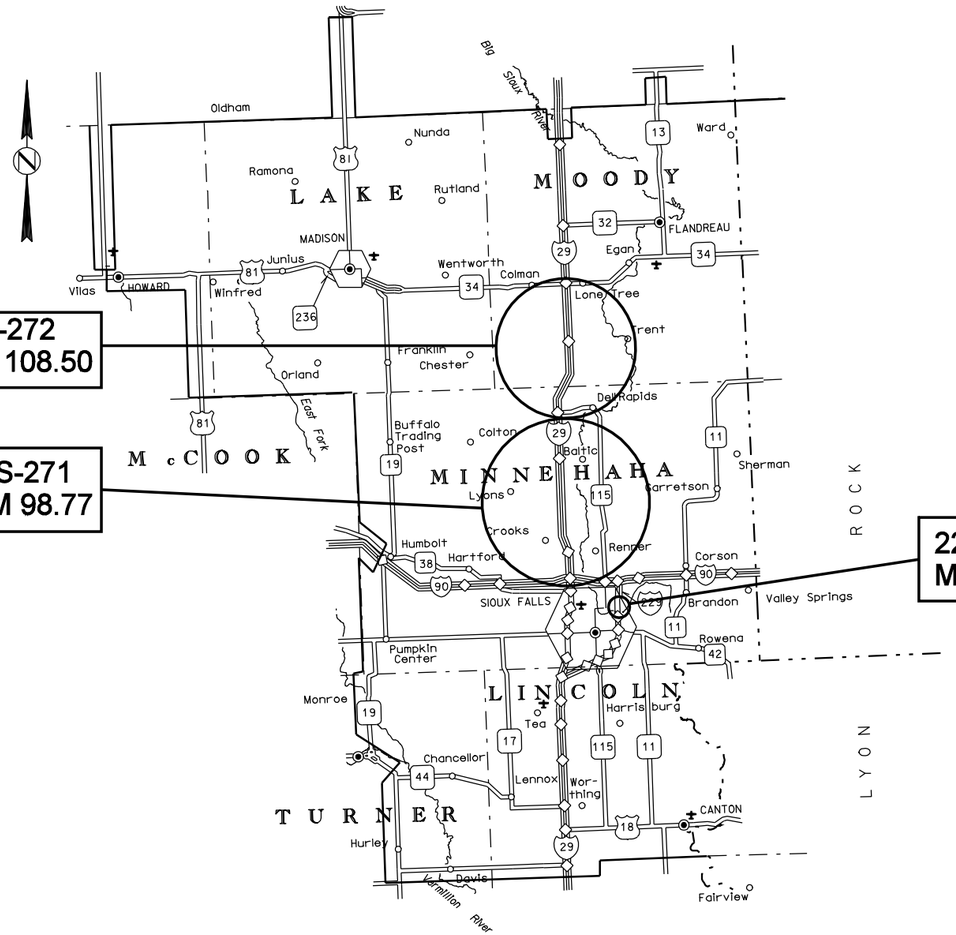
PROJECTS 229 N–271, 229 S–271, 029 N–271, 029 S–271, 029 N–272 & 029 S–272
MINNEHAHA & MOODY COUNTIES

PCC & CRC PAVEMENT REPAIR
PCN I0MM, I0MN, I0MP, I0MQ, I0MR, I0MT

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	2007 SIOUX FALLS AREA PAVEMENT REPAIR	1	27

Plotting Date: 15-MAR-2007

INDEX OF SHEETS



ADT

I229 MRM 8.80 - MRM 10.00
ADT (2005) = 25670

I29 MRM 83.90 - MRM 98.77
ADT (2005) = 16300

I29 MRM 98.77 - MRM 108.50
ADT (2005) = 13410

ESTIMATE OF QUANTITIES

TRAFFIC CONTROL

BID ITEM NUMBER	ITEM	229 N-271 QUANTITY	229 S-271 QUANTITY	029 N-271 QUANTITY	029 S-271 QUANTITY	029 N-272 QUANTITY	029 S-272 QUANTITY	TOTAL QUANTITY	UNIT
634E0010	Flagging	35	35	35	35	35	35	210	Hour
634E0100	Traffic Control	493	492	492	493	492	492	2,954	Unit
634E0120	Traffic Control Miscellaneous	<---------- Lump Sum ---------->						Lump Sum	LS
634E0310	Temporary Road Markers	3,120	3,120	1,800	3,600	900	1,800	14,340	Ft
634E0420	Type C Advance Warning Arrow Panel	<---------- 2 ---------->						2	Each

SURFACING

BID ITEM NUMBER	ITEM	229 N-271 QUANTITY	229 S-271 QUANTITY	029 N-271 QUANTITY	029 S-271 QUANTITY	029 N-272 QUANTITY	029 S-272 QUANTITY	TOTAL QUANTITY	UNIT
009E0010	Mobilization	<---------- Lump Sum ---------->						Lump Sum	LS
380E5030	Nonreinforced PCC Pavement Repair	172.6	62.3	10.2	3.6	-	-	248.7	SqYd
380E5100	Continuously Reinforced PCC Pavement Repair	-	-	-	62.2	9.3	13.9	85.4	SqYd
380E6000	Dowel Bar	119	59	20	8	-	-	206	Each
380E6110	Insert Steel Bar in PCC Pavement	275	137	31	183	25	47	698	Each
380E6310	Seal Random Cracks in PCC Pavement	119	161	-	371	-	-	651	Ft
390E0100	Saw and Seal Joint	-	-	-	200	-	-	200	Ft
390E0200	Repair Type A Spall	-	-	13	-	-	-	13	SqFt
480E0506	No. 6 Rebar Splice	-	-	-	255	42	62	359	Each

SPECIFICATIONS

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

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	2007 Sioux Falls Area Pavement Repair	3	27

NONREINFORCED PCC PAVEMENT REPAIR Minnehaha County
229 N-271 @ BENSON ROAD NORTHBOUND LANES

LOCATION		TYPE A SPALL			PCC PAVEMENT			SEAL RANDOM CRACKS IN PCCP	INSERT STEEL BAR IN PCC PAVEMENT			DOWEL BAR
				REPAIR			REPAIR		No. 5 x 24" DEFORMED TIE BAR	1¼" x 18" PLAIN ROUND DOWEL BAR	No. 9 x 18" DEFORMED TIE BAR	
MRM	LANE	LENGTH	WIDTH	SQFT	LENGTH	WIDTH	SQYD	FT	EACH	EACH	EACH	EACH
8.836	Driving	—	—	—	4'	12'	5.3	—	—	16	—	—
8.907	Driving	—	—	—	—	—	—	13	—	—	—	—
8.966	Driving	—	—	—	—	—	—	13	—	—	—	—
9.143	Passing	—	—	—	—	—	—	19	—	—	—	—
9.230	Driving	—	—	—	—	—	—	14	—	—	—	—
9.414	DL&PL	—	—	—	—	—	—	24	—	—	—	—
9.514	DL&PL	—	—	—	—	—	—	24	—	—	—	—
				0			**5.3**	**107**	**0**	**16**	**0**	**0**

NONREINFORCED PCC PAVEMENT REPAIR Minnehaha County
229 S-271 @ BENSON ROAD SOUTHBOUND LANES

LOCATION		TYPE A SPALL			PCC PAVEMENT			SEAL RANDOM CRACKS IN PCCP	INSERT STEEL BAR IN PCC PAVEMENT			DOWEL BAR
				REPAIR			REPAIR		No. 5 x 24" DEFORMED TIE BAR	1¼" x 18" PLAIN ROUND DOWEL BAR	No. 9 x 18" DEFORMED TIE BAR	
MRM	LANE	LENGTH	WIDTH	SQFT	LENGTH	WIDTH	SQYD	FT	EACH	EACH	EACH	EACH
9.934	Driving	—	—	—	10'	4'	4.4	—	3	7	4	4
9.900	Driving	—	—	—	22'	4'	9.8	—	14	7	4	4
9.803	Passing	—	—	—	16'	4'	7.1	—	10	—	4	—
9.777	Driving	—	—	—	4'	4'	1.8	—	1	—	4	—
9.406	Passing	—	—	—	—	—	—	12	—	—	—	—
9.398	Driving	—	—	—	—	—	—	12	—	—	—	—
9.393	DL&PL	—	—	—	4'	24'	10.7	—	—	—	16	24
9.383	Driving	—	—	—	4'	4'	1.8	—	1	—	4	4
9.376	Passing	—	—	—	4'	12'	5.3	—	1	16	—	—
9.365	Driving	—	—	—	4'	4'	1.8	—	—	—	4	4
9.323	DL&PL	—	—	—	—	—	—	24	—	—	—	—
9.227	Driving	—		—	4'	12'	5.3	—	1	16		—
9.227	Passing	—	—	—	—	—	—	—	—	—	—	—
9.081	Passing	—	—	—	—	—	—	15	—	—	—	—
9.067	DL&PL	—	—	—	—	—	—	24	—	—	—	—
9.055	Driving	—	—	—	4'	4'	1.8	—	—	—	4	3
9.055	Driving	—	—	—	—	—	—	—	—	—	—	—
9.044	Driving	—	—	—	4'	4'	1.8	—	—	—	4	4
8.909	Driving	—	—	—	—	—	—	8	—	—	—	—
8.876	Driving	—	—	—	—	—	—	10	—	—	—	—
8.868	Driving	—	—	—	—	—	—	20	—	—	—	—
				0			**51.6**	**125**	**31**	**46**	**48**	**47**

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	2007 Sioux Falls Area Pavement Repair	4	27

NONREINFORCED PCC PAVEMENT REPAIR Minnehaha County
229 N-271 @ BENSON ROAD SOUTHWEST RAMP

LOCATION	TYPE A SPALL			PCC PAVEMENT			SEAL RANDOM CRACKS IN PCCP	INSERT STEEL BAR IN PCC PAVEMENT			DOWEL BAR
			REPAIR			REPAIR		No. 5 x 24" DEFORMED TIE BAR	1¼" x 18" PLAIN ROUND DOWEL BAR	No. 9 x 18" DEFORMED TIE BAR	
LANE	LENGTH	WIDTH	SQFT	LENGTH	WIDTH	SQYD	FT	EACH	EACH	EACH	EACH
TOP	—	—	—	4'	6'	2.7	—	—	—	6	5
TOP	—	—	—	6'	20'	13.3	—	—	—	26	19
TOP	—	—	—	6'	10'	6.7	—	6	—	4	9
LT&RT	—	—	—	4'	22'	9.8	—	1	30	—	21
			0			**32.4**	**0**	**7**	**30**	**36**	**54**

NONREINFORCED PCC PAVEMENT REPAIR Minnehaha County
229 S-271 @ BENSON ROAD NORTHWEST RAMP

LOCATION	TYPE A SPALL			PCC PAVEMENT			SEAL RANDOM CRACKS IN PCCP	INSERT STEEL BAR IN PCC PAVEMENT			DOWEL BAR
			REPAIR			REPAIR		No. 5 x 24" DEFORMED TIE BAR	1¼" x 18" PLAIN ROUND DOWEL BAR	No. 9 x 18" DEFORMED TIE BAR	
LANE	LENGTH	WIDTH	SQFT	LENGTH	WIDTH	SQYD	FT	EACH	EACH	EACH	EACH
TOP	—	—	—	—	—	—	20	—	—	—	—
			0			**0.0**	**20**	**0**	**0**	**0**	**0**

NONREINFORCED PCC PAVEMENT REPAIR Minnehaha County
229 S-271 @ BENSON ROAD NORTHEAST RAMP

LOCATION	TYPE A SPALL			PCC PAVEMENT			SEAL RANDOM CRACKS IN PCCP	INSERT STEEL BAR IN PCC PAVEMENT			DOWEL BAR
			REPAIR			REPAIR		No. 5 x 24" DEFORMED TIE BAR	1¼" x 18" PLAIN ROUND DOWEL BAR	No. 9 x 18" DEFORMED TIE BAR	
LANE	LENGTH	WIDTH	SQFT	LENGTH	WIDTH	SQYD	FT	EACH	EACH	EACH	EACH
TOP	—	—	—	4'	4'	1.8	—	—	—	4	4
TOP	—	—	—	4'	4'	1.8	—	—	—	4	4
TOP	—	—	—	—	—	—	10	—	—	—	—
RT	—	—	—	6'	4'	2.7	—	—	—	4	4
LT	—	—	—	10'	4'	4.4	6	—	—	—	—
			0			**10.7**	**16**	**0**	**0**	**12**	**12**

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	2007 Sioux Falls Area Pavement Repair	5	27

NONREINFORCED PCC PAVEMENT REPAIR Minnehaha County
229 N-271 @ BENSON ROAD SOUTHEAST RAMP

LOCATION	TYPE A SPALL			PCC PAVEMENT			SEAL RANDOM CRACKS IN PCCP	INSERT STEEL BAR IN PCC PAVEMENT			DOWEL BAR
			REPAIR			REPAIR		No. 5 x 24" DEFORMED TIE BAR	1¼" x 18" PLAIN ROUND DOWEL BAR	No. 9 x 18" DEFORMED TIE BAR	
LANE	LENGTH	WIDTH	SQFT	LENGTH	WIDTH	SQYD	FT	EACH	EACH	EACH	EACH
RT	–	–	–	12'	12'	16.0	–	4	16	16	12
LT	–	–	–	4'	4'	1.8	–	–	–	4	4
LT	–	–	–	–	–	–	12	–	–	–	–
RT	–	–	–	97'	4'	43.1	–	72	–	8	20
LT	–	–	–	10'	14'	15.6	–	3	20	–	–
RT	–	–	–	20'	25'	55.6	–	7	32	–	24
TOP	–	–	–	4'	6'	2.7	–	–	–	4	5
			0			**134.8**	**12**	**86**	**68**	**32**	**65**

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	2007 Sioux Falls Area Pavement Repair	6	27

PCC\CRC PAVEMENT REPAIR Minnehaha and Lincoln Counties
029 N - 271

LOCATION		TYPE A SPALL			PCC PAVEMENT			SEAL RANDOM CRACKS IN PCCP	INSERT STEEL BAR IN CRC PAVEMENT		NO.6 REBAR SPLICE	INSERT STEEL BAR IN PCC PAVEMENT			DOWEL BAR
				REPAIR			REPAIR		NO. 6 LONGI-TUDINAL DEFORMED TIE BAR	NO. 4 TRANS-VERSE DEFORMED TIE BAR		NO. 5 X 24" DEFORMED TIE BAR	1 1/4" X 18" PLAIN ROUND DOWEL BAR	NO. 9 X 18" DEFORMED TIE BAR	
MRM	LANE	LENGTH	WIDTH	SQFT	LENGTH	WIDTH	SQYD	FT	EACH	EACH	EACH	EACH	EACH	EACH	EACH
91.367	Passing	3'	3'	9	–	–	–	–	–	–	–				
90.383	Driving	–	–	–	4'	14'	6.2	–	–	–	–	1		18	14
90.379	Driving	–	–	–	4'	5'	2.2	–	–	–	–	2		4	3
90.379	Passing	–	–	–	4'	4'	1.8	–	–	–	–	2		4	3
90.206	Driving	2'	2'	4	–	–	–	–	–	–	–				
029 N - 271 Totals:				**13**			**10.2**	**0**	**0**	**0**	**0**	**5**		**26**	**20**

PCC\CRC PAVEMENT REPAIR Minnehaha and Moody Counties
029 S-271

LOCATION		PCC PAVEMENT			CRC PAVEMENT			SEAL RANDOM CRACKS IN PCCP	SAW AND SEAL JOINT	INSERT STEEL BAR IN CRC PAVEMENT		NO.6 REBAR SPLICE	INSERT STEEL BAR IN PCC PAVEMENT			DOWEL BAR
				REPAIR			REPAIR			NO. 6 LONGI-TUDINAL DEFORMED TIE BAR	NO. 4 TRANS-VERSE DEFORMED TIE BAR		NO. 5 X 24" DEFORMED TIE BAR	1 1/4" X 18" PLAIN ROUND DOWEL BAR	NO. 9 X 18" DEFORMED TIE BAR	
MRM	LANE	LENGTH	WIDTH	SQYD	LENGTH	WIDTH	SQYD	FT	FT	EACH	EACH	EACH	EACH	EACH	EACH	EACH
97.675	Passing	–	–	–	6'	6'	4.0	–		12	4	22				
95.058	Driving	–	–	–	6'	6'	4.0	–		12	4	22				
87.951	Driving	–	–	–	6'	6'	4.0	–		12	4	22				
87.608	Passing	–	–	–	6'	6'	4.0	–		12	4	22				
87.397	Driving	–	–	–	–	–	–	25		–	–	–				
86.409	Driving	–	–	–	6'	6'	4.0	–		12	4	22				
85.061	Driving	–	–	–	–	–	–	5		–	–	–				
85.080	Driving\Pass	4'	4'	1.8	–	–	–	–		–	–	–			4	4
85.117	Driving	–	–	–	–	–	–	15		–	–	–				
85.123	Driving	–	–	–	–	–	–	15		–	–	–				
85.461	Passing	–	–	–	–	–	–	15		–	–	–				
85.429	Passing	–	–	–	–	–	–	10		–	–	–				
85.425	Passing	–	–	–	–	–	–	5		–	–	–				
85.388	Passing	–	–	–	–	–	–	14		–	–	–				
85.388	Driving	–	–	–	–	–	–	14		–	–	–				
85.375	Passing	–	–	–	–	–	–	14		–	–	–				
85.375	Driving	–	–	–	–	–	–	14		–	–	–				
85.365	Driving	–	–	–	–	–	–	20		–	–	–				
85.365	Passing	–	–	–	–	–	–	10		–	–	–				
85.323	Driving	4'	4'	1.8	–	–	–	–		–	–	–			4	4
85.263	Driving	–	–	–	–	–	–	70		–	–	–				
85.179	Driving	–	–	–	–	–	–	10		–	–	–				
85.150	Driving	–	–	–	–	–	–	30		–	–	–				
85.140	Driving	–	–	–	–	–	–	15		–	–	–				
85.128	Driving	–	–	–	–	–	–	20		–	–	–				
85.122	Driving	–	–	–	–	–	–	15		–	–	–				
84.608	Driving	–	–	–	–	–	–	35		–	–	–				
84.600*	Driving	–	–	–	16'	14'	24.9	–	* 200	22	9	57				
84.213	Driving	–	–	–	8'	6'	5.3	–		12	4	22				
84.100	Driving	–	–	–	6'	6'	4.0	–		12	4	22				
84.090	Driving	–	–	–	6'	6'	4.0	–		12	4	22				
83.968	Driving	–	–	–	6'	6'	4.0	–		12	4	22				
029 S - 271 Totals:				**3.6**			**62.2**	**371**	**200**	**130**	**45**	**255**	**0**	**0**	**8**	**8**

"* = Longitudinal joint @ Sta. 74+19.16. See detail sheet No. 25)."

CRC PAVEMENT REPAIR Moody County
029 N - 272

LOCATION		TYPE A SPALL			CRC PAVEMENT			SEAL RANDOM CRACKS IN PCCP	INSERT STEEL BAR IN CRC PAVEMENT		NO.6 REBAR SPLICE
				REPAIR			REPAIR		NO. 6 LONGI-TUDINAL DEFORMED TIE BAR	NO. 4 TRANS-VERSE DEFORMED TIE BAR	
MRM	LANE	LENGTH	WIDTH	SQFT	LENGTH	WIDTH	SQYD	FT	EACH	EACH	EACH
104.497	Driving	–	–	–	6'	14'	9.3	–	22	3	42
029 N - 272 Totals:				–			**9.3**	–	**22**	**3**	**42**

CRC PAVEMENT REPAIR Moody County
029 S - 272

LOCATION		TYPE A SPALL			CRC PAVEMENT			SEAL RANDOM CRACKS IN PCCP	INSERT STEEL BAR IN CRC PAVEMENT		NO.6 REBAR SPLICE
				REPAIR			REPAIR		NO. 6 LONGI-TUDINAL DEFORMED TIE BAR	NO. 4 TRANS-VERSE DEFORMED TIE BAR	
MRM	LANE	LENGTH	WIDTH	SQFT	LENGTH	WIDTH	SQYD	FT	EACH	EACH	EACH
108.492	Driving	–	–	–	6'	6'	4.0	–	12	4	22
108.210	Driving	–	–	–	6'	8'	5.3	–	12	6	24
103.364	Driving	–	–	–	6'	8'	5.3	–	12	6	24
029 S - 272 Totals:				–			**14.6**	–	**36**	**16**	**70**

UTILITIES

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

SCOPE OF WORK

This project consists of:

- Full depth replacement of concrete pavement in areas where concrete pavement blowups or major failures have occurred. Full depth areas vary in length and width, however:
    - The minimum length in Nonreinforced PCC Pavement is 4 feet.
    - The minimum length in Continuously Reinforced Concrete (CRC) is 6 feet.
- Joints shall be sawed and sealed where sealant has failed.
- Seal random cracks in concrete pavement.

COMPLETION DATE

All work shall be completed on or before October 13, 2007.

COORDINATION BETWEEN CONTRACTORS

A separate contract for Project No. IM 0909(69)390 - PCN 3783 has been awarded to Fred Carlson Company (P.O.Box 48 Decorah, IA 52101-0048 Phone Number: 563-382-4249) for grading, Nonreinforced PCC Pavement, Structure, Deck Overlay, Approach Modification, Asphalt Concrete Resurfacing and Guardrail on I-90 from MRM 390 to MRM 398.

The Contractor shall schedule his work so as not to interfere with or hinder the progress of the work performed by other Contractors on the concrete pavement /asphalt concrete resurfacing project.

TEMPORARY PAVEMENT MARKING

Temporary pavement marking shall consist of Temporary Road Markers and shall be paid for at the contract unit price per foot for Temporary Road Markers (9 workspaces with 900’ tapers on I29 and 8 workspaces with 780’ tapers on I229 equals 14340’).

SEQUENCE OF OPERATION

Due to the Sturgis Motorcycle Rally, no lane closures will be allowed (except for emergency repair) in the following locations:

- I -29 Northbound lanes from Thursday, August 9th through Sunday, August 12th.
- I -29 Southbound lanes from Wednesday, August 1st through Thursday, August 9th.

In addition:

- Work activities on I-229 NBL Benson Road Off Ramp will be conducted between Friday 8:30 a.m. and Monday 6:00 a.m. only.
- Work activities on I-229 SBL Benson Road On Ramp will be conducted between Friday 6:00 p.m. and Monday 3:00 p.m. only.

GENERAL MAINTENANCE OF TRAFFIC

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

Storage of vehicles and equipment shall be outside the clear zone and as near as possible to the right-of-way line. Contractor’s employees should mobilize at a location off the right-of-way and arrive at the work sites in a minimum number of vehicles necessary to perform the work.

Indiscriminate driving and parking of vehicles within the right-of-way will not be permitted. Any damage to the vegetation, surfacing, embankment, delineators and existing signs resulting from such indiscriminate use shall be repaired and/or restored by the Contractor, at no expense to the State, and to the satisfaction of the Engineer.

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

Sufficient traffic control devices have been included in these plans to sign two workspaces. If the Contractor elects to work on additional sites simultaneously, the cost for additional traffic control devices shall be incidental to the contract unit price per unit for Traffic Control.

MAINTENANCE OF TRAFFIC – PCC PAVEMENT REPAIR

A Type III Barricade shall be installed at the end of a lane closure taper as detailed in these plans. Additional Type III Barricades shall be installed facing traffic within the closed lane at a spacing of 1/4 mile. Each mainline concrete repair location from which the in place concrete has been removed shall be marked with a minimum of two drums. In areas containing numerous concrete repair locations, drums should be installed at a spacing of 660’ alternating with the Type lll Barricades.

Signs may be mounted on portable supports.

Holes adjacent to centerline in the lane open to traffic created during removal and replacement of PCC Pavement repair areas shall be filled with cold asphalt mix during the cure of concrete placed in a repair area, and until the lane open to traffic is closed.

Holes in the asphalt concrete shoulders created during removal and replacement of PCC Pavement repair areas shall be filled with hot-mix asphalt concrete (to match the shoulder surfacing) prior to opening the lane to traffic. Hot-mix asphalt concrete shall be furnished by the Contractor.

Cost for furnishing asphalt concrete, hauling and placing asphalt shall be incidental to the contract unit price per square yard for Nonreinforced PCC Pavement Repair or Continuously Reinforced PCC Pavement Repair.

Damage to the shoulders, median or ditch due to the Contractor's operations shall be repaired by the Contractor, to the satisfaction of the Engineer, at no expense to the State. Routing traffic onto the asphalt shoulders during any phase of the construction will not be allowed.

In all work zones in these areas, the same channelizing devices and spacing used on centerline, will also be required on the shoulders. These channelizing devices shall be placed in locations to adequately keep traffic completely off these shoulders. Continuous maintenance of the shoulder devices will be required to keep them in place. Cost for these extra channelizing devices shall be incidental to the contract lump sum price for Traffic Control, Miscellaneous.

MAINTENANCE OF TRAFFIC (INTERSTATE HIGHWAYS)

Lane closures shall be limited to 3 miles in length. The distance between the closest points of any two-lane closures, excluding taper, shall not be less than 3 miles.

Work activities shall not be conducted simultaneously on the median and outside shoulders of the same directional set of lanes.

The use of interstate maintenance crossovers will not be permitted.

Traffic will be permitted on the ramp shoulders when necessary to allow traffic around a workspace.

WASTE DISPOSAL SITE

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

Construction/demolition debris may not be disposed of within the State "Right-of-Way (ROW)."

All construction/demolition debris generated by this project shall be cleaned up and disposed of by the Contractor.

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

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

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

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

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

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

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

Cost for furnishing waste disposal site(s), disposing of waste, maintaining control of access (fence, gates & signs) and reclamation of the waste disposal site(s) shall be incidental to the contract unit prices for the various items.

RESTORATION OF GRAVEL CUSHION

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

If additional gravel cushion material is required, the Contractor shall furnish, place and compact gravel cushion to the satisfaction of the Engineer at no additional cost to the State. Cost for this work shall be incidental to the contract unit prices per square yard for Nonreinforced PCC Pavement Repair and Continuously Reinforced PCC Pavement Repair.

RESTORATION OF ASPHALT CONCRETE BOND BREAKER

An inspection of the asphalt concrete bond breaker is to be made after removing concrete from each pavement replacement area. Loose material shall be removed. Each replacement area shall be leveled and compacted to the satisfaction of the Engineer.

If additional asphalt concrete material is required, the Contractor shall furnish, place and compact asphalt concrete to the satisfaction of the Engineer at no additional cost to the State.

Cost for this work shall be incidental to the contract unit price per square yard for Continuously Reinforced PCC Pavement Repair.

EXISTING PCC PAVEMENT

229-271 Minnehaha County

The existing mainline pavement is 10.5" Nonreinforced PCC Pavement. The existing ramp pavement is 9.5" Nonreinforced PCC Pavement.

Existing contraction joints are spaced at approximately 20'. Longitudinal joints are reinforced with No. 5 x 24" deformed tie bars spaced 30" to 48" center to center. Transverse joints are reinforced with 1¼" x 18" plain round dowel bars and with No. 9/10 x 18" deformed tie bars spaced 12" to 18" center to center.

The aggregate in the existing PCC Pavement is quartzite.

029-271 Minnehaha County

The existing mainline pavement is 11" Nonreinforced PCC Pavement.

Existing contraction joints are spaced at approximately 20'. Longitudinal joints are reinforced with No. 5 x 24" deformed tie bars spaced 30" to 48" center to center. Transverse joints are reinforced with 1¼" x 18" plain round dowel bars and with No. 9/10 x 18" deformed tie bars spaced 12" to 18" center to center.

The aggregate in the existing PCC Pavement is quartzite.

EXISTING CRC PAVEMENT

0291-271 Minnehaha County

The existing pavement is 8" continuously reinforced PCC Pavement. The longitudinal reinforcing steel consists of No. 6 deformed bars spaced 8" center to center, and the transverse reinforcing steel consists of No. 4 deformed bars spaced 3' center to center.

0291-272 Moody County

The existing pavement is 8" continuously reinforced PCC Pavement. The longitudinal reinforcing steel consists of No. 6 deformed bars spaced 8" center to center, and the transverse reinforcing steel consists of No. 4 deformed bars spaced 3' center to center.

The aggregate in the existing PCC Pavement is quartzite.

NONREINFORCED PCC PAVEMENT REPAIR - GENERAL

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

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

If the pavement replacement area is entirely on either side of the existing contraction joint, the location of one of the working joints will be at the original location. Any existing dowel bar assemblies shall be sawed off or removed.

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

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

All joints (longitudinal and transverse) through and around the repair areas 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

New pavement thickness on the Interstate 229 shall be 10.5” on Ramps and 11.5” on mainline (1” thicker than existing). New pavement thickness on the Interstate 29 shall be 12.” (1” thicker than existing).

Concrete shall meet the requirements of the Standard Specifications Section 380, except as modified by the following notes:

The slump requirement will be limited to 3" maximum after water reducer is added and the concrete shall contain 4.5% to 7.0% entrained air. Coarse aggregate shall be crushed ledge rock, Size No. 1. The Contractor is responsible for the mix design used. The Contractor shall submit a mix design and supporting documentation for approval at least 2 weeks prior to use. In lieu of submitting a mix design the Contractor may use one of the following dependent upon type of cement to be used:

	LB./CU.YD.	LB./CU.YD.
CEMENT	800 (TYPE I or II)	710 (TYPE III)
WATER	282	300
FINE AGGREGATE	1039	1114
COARSE AGGREGATE	1726	1668

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

Concrete shall be cured for a minimum of 48 hours before opening to traffic. The 48 hours is based upon a concrete surface temperature of 60 degrees Fahrenheit or higher throughout the cure period. If the concrete temperature falls below 60 degrees Fahrenheit, the cure time shall be extended or other measures shall be taken, at no additional cost to the State, to insure that strength of 4,000 psi is attained prior to opening to traffic.

Concrete shall be covered with suitable insulation blanket consisting of a layer of closed cell polystyrene foam protected by at least one layer of plastic. Insulation blanket shall have an R-value of at least 0.5, as rated by the manufacturer. Insulation blanket shall be left in place, except for joint sawing operations. Insulation blanket shall be overlapped on to the existing concrete by 4’.

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

STEEL BAR INSERTION – NONREINFORCED PCC PAVEMENT

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

The Contractor shall insert the steel bars (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.

Steel bars shall be cut to the specified length by sawing and shall be free from burring or other deformations. Shearing will not be permitted.

Epoxy resin adhesive shall be of the type intended for horizontal applications, and shall conform to the requirements of ASTM C 881, Type IV, Grade 3 (equivalent to AASHTO M235, Type IV, Grade 3).

Steel bars shall be inserted in the transverse joint on 18" centers. The first steel bar in the transverse joint shall be placed 9" from the outside edge of the slab. Steel bars shall be inserted in the longitudinal joint on 30" centers and shall 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).

The diameter of the drilled holes in the existing concrete pavement for the steel bars shall not be less than 1/8 inch nor more than 3/8 inch greater than the overall diameter of the steel bar. Holes drilled into the existing concrete pavement shall be located at mid-depth of the slab and true and normal. The drilled holes shall be blown out with compressed air using a device that will reach to the back of the hole to ensure that all debris or loose material has been removed prior to epoxy injection.

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.

Mix the epoxy resin as recommended by the manufacturer and apply by an injection method approved by the Engineer. If an epoxy pump is utilized, it shall be capable of metering the components at the manufacturer’s designated rate and be equipped with an automatic shut-off. The pump shall shut off when any of the components are not being metered at the designated rate.

Fill the drilled holes 1/3 to 1/2 full of epoxy, or as recommended by the manufacturer, prior to insertion of the steel bar. Care shall be taken to prevent epoxy from running out of the horizontal holes prior to steel bar insertion. Rotate the steel bar during insertion to eliminate voids and ensure complete bonding of the bar. Insertion by the dipping method will not be allowed.

Cost for the epoxy resin adhesive, steel bars, drilling of holes, inserting the steel bars into the drilled holes and all other items incidental to the insertion of the steel bars shall be included in the contract unit price per each for Insert Steel Bar In PCC Pavement.

SAW AND SEAL JOINTS - NONREINFORCED PCC PAVEMENT

All longitudinal and transverse joints at concrete repair areas shall be sawed and sealed.

Joints shall not be sealed unless they are thoroughly clean and dry. Cleaning shall be accomplished by sand blasting and other tools as necessary. Just prior to sealing, each joint shall be blown out using a jet of compressed air to remove all traces of dust.

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

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

CONTINUOUSLY REINFORCED PCC PAVEMENT REPAIR

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.

The Contractor shall saw the in place concrete transversely at four locations for each repair area. Two saw cuts, spaced a minimum of 4’, shall be full depth. The other two saw cuts shall be partial depth saw cuts and shall be made to a depth just above the in place reinforcing steel (3”+ in Minnehaha and Moody Counties), and be placed 1’ outside of the previous full depth saw cuts. The outside cuts shall be a minimum of 6” from the nearest tight crack outside of the patch.

The Contractor shall lift out or break out the center section (including reinforcing steel) and then use light chipping hammers (not exceeding 15 pounds) to remove the remaining 1’ of concrete at each end of the repair area, leaving the reinforcing steel in place. Care shall be taken not to cut, bend or otherwise damage the in place reinforcing steel. Damage to in place reinforcing steel or to in place concrete beyond the repair area will be replaced at the Contractor’s expense, to the satisfaction of the Engineer.

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

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

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

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

CONTINUOUSLY REINFORCED PCC PAVEMENT REPAIR – (CONTINUED)

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

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

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

New pavement thickness shall be equal to existing pavement thickness (8" in Minnehaha and Moody Counties).

Concrete shall meet the requirements of the Standard Specifications Section 380, except as modified by the following notes:

The fine aggregate shall be screened over a one-inch square-opening screen just prior to introduction into the concrete paving mix.

The slump requirement will be limited to 3" maximum after water reducer is added and the concrete shall contain 4.5% to 7.0% entrained air. Coarse aggregate shall be crushed ledge rock, Size No. 1. The Contractor is responsible for the mix design used. The Contractor shall submit a mix design and supporting documentation for approval at least 2 weeks prior to use. In lieu of submitting a mix design the Contractor may use one of the following dependent upon type of cement to be used:

	LB./CU.YD.	LB./CU.YD.
CEMENT	800 (TYPE I or II)	710 (TYPE III)
WATER	282	300
FINE AGGREGATE	1039	1114
COARSE AGGREGATE	1726	1668

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

Concrete shall be cured a minimum of 48 hours before opening to traffic. The 48 hours is based upon a concrete surface temperature of 60 degrees Fahrenheit or higher throughout the cure period. If the concrete temperature falls below 60 degrees Fahrenheit, the cure time shall be extended or other measures shall be taken, at no additional cost to the State, to insure that a strength of 4,000 psi is attained prior to opening to traffic.

CONTINUOUSLY REINFORCED PCC PAVEMENT REPAIR – (CONTINUED)

Concrete shall be covered with suitable insulation blanket consisting of a layer of closed cell polystyrene foam protected by at least one layer of plastic. Insulation blanket shall have an R-value of at least 0.5, as rated by the manufacturer. Insulation blanket shall be left in place, except for joint sawing operations. Insulation blanket shall be overlapped on to the existing concrete by 4'.

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 shoulders, labor and equipment shall be included in the contract unit price per square yard for Continuously Reinforced PCC Pavement Repair.

REINFORCING STEEL

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

1. New No. 6 longitudinal bars shall be mechanically rebar spliced with the preserved in place longitudinal bars.

2. Additional No. 6 longitudinal bars shall be centered between every other set of two spliced longitudinal bars throughout the width of the repair area. The additional longitudinal bars shall overlap into the existing concrete 9" on both sides of the repair area. Drilled holes will be required and the additional longitudinal bars shall be inserted in accordance with the notes for Steel Bar Insertion. The additional longitudinal bars shall then be lap spliced or be mechanically spliced in accordance with the notes for Mechanical Rebar Splice.

3. Additional No. 4 transverse bars shall 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 (New spacing will be 1.5' in Minnehaha and Moody Counties).

    - For half roadway width repair areas, the additional transverse bars shall overlap into the existing concrete 9" at centerline. Drilled holes will be required and the additional transverse bars shall be inserted according to the notes for Steel Bar Insertion.

    - For full roadway width repair areas, a keyway with factory bent No. 4 or 5 lap spliced transverse bars shall be constructed in the longitudinal joint to tie the additional transverse bars. The Contractor may elect to use a Mechanical Rebar Splice in lieu of the lap splice.

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

STEEL BAR INSERTION - CONTINUOUSLY REINFORCED PCC PAVEMENT

The Contractor shall insert steel bars into drilled holes in the joints as specified. An epoxy resin adhesive must be used to anchor the steel bar in the drilled hole.

The steel bars shall be cut to the specified length by sawing and shall be free from burring or other deformations. Shearing will not be permitted.

Epoxy resin adhesive shall be of the type intended for horizontal applications, and shall conform to the requirements of ASTM C 881, Type IV, Grade 3 (equivalent to AASHTO M235, Type IV, Grade 3).

The diameter of the drilled holes in the existing concrete pavement for the steel bars shall not be less than 1/8 inch nor more than 3/8 inch greater than the overall diameter of the steel bar. Holes drilled into the existing concrete pavement shall be located at mid-depth of the slab and true and normal (Exceptions: In the centerline longitudinal joint, the drilled in transverse steel bar slope will be maintained 9" into the adjacent slab. In the 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). The drilled holes shall be blown out with compressed air using a device that will reach to the back of the hole to ensure that all debris or loose material has been removed prior to epoxy injection.

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.

Mix the epoxy resin as recommended by the manufacturer and apply by an injection method approved by the Engineer. If an epoxy pump is utilized, it shall be capable of metering the components at the manufacturer's designated rate and be equipped with an automatic shut-off. The pump shall shut off when any of the components are not being metered at the designated rate.

Fill the drilled holes 1/3 to 1/2 full of epoxy, or as recommended by the manufacturer, prior to steel bar insertion. Care shall be taken to prevent epoxy from running out of the horizontal holes prior to steel bar insertion. Rotate the steel bar during insertion to eliminate voids and ensure complete bonding of the bar. Insertion of the bars by the dipping method will not be allowed.

Cost for steel bars shall be incidental to the contract unit price per square yard for Continuously Reinforced PCC Pavement Repair.

Cost for the epoxy resin adhesive, drilling of holes, applying the adhesive, inserting the steel bars into the drilled holes and all other items incidental to the insertion of the steel bars shall be incidental to the contract unit price per each for Insert Steel Bar in PCC Pavement.

MECHANICAL REBAR SPLICES

Mechanical rebar splices shall conform to Section 480.3.D of the Standard Specifications.

Costs for furnishing and installing required No. 6 mechanical rebar splices shall be included in the contract unit price per each for No. 6 Rebar Splice.

Mechanical rebar splices may be used in lieu of the splicing methods detailed in the Reinforcing Steel notes.

Cost for furnishing and installing mechanical rebar splices in lieu of the specified lap splices shall be incidental to the contract unit price per each for No. 6 Rebar Splice.

SAW AND SEAL LONGITUDINAL JOINTS - CONTINUOUSLY REINFORCED PCC PAVEMENT

All longitudinal joints at concrete repair areas shall be sawed and sealed.

Joints shall not be sealed unless they are thoroughly clean and dry. Cleaning shall be accomplished by sand blasting and other tools as necessary. Just prior to sealing, each joint shall be blown out using a jet of compressed air to remove all traces of dust.

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

Cost for sawing and sealing of the longitudinal construction joint shall be incidental to the contract unit price per square yard for Continuously Reinforced PCC Pavement Repair.

ROUTING AND SEALING RANDOM CRACKS IN PCC/CRC PAVEMENT

Refer to the ROUTING AND SEALING RANDOM CRACKS IN PCC/CRC PAVEMENT detail.

Random cracks shall be repaired in accordance with the detail for Sealing Random Cracks In PCC/CRC Pavement. Reservoir dimensions may vary slightly from the details, due to the nature of this operation. However, any variance due to Contractor negligence will be repaired at the Contractor's expense. Routing shall be performed with a saw designed for that purpose.

Routed cracks shall be sealed with Low Modulus Silicone Sealant if joint is a working joint. Hot pour elastic joint sealant will be allowed to be used on all joints that are non-working joints. The sealant shall fit the joint such that after curing, the level of the sealant will not be greater than 1/8" below the pavement surface. Care shall be taken so that joints shall not be overfilled. Sealant shall not be spread over the pavement surface.

Cost for routing and seal random cracks will be paid for at the contract unit price per foot for Seal Random Cracks in PCC Pavement.

REPAIR TYPE A AND TYPE B SPALLS

Spall repair locations will be marked in the field by the Engineer.

Type A spalls shall conform to section 390 with the following exceptions:

Concrete patching material shall be packaged, dry, rapid-hardening cementitious mortar or concrete materials conforming to the requirements of ASTM C928, Type R-3 and shall contain no chloride ions.

Grout for bonding the concrete patching material to the existing concrete shall consist of equal parts by weight of Portland Cement and sand, mixed with sufficient water to form a thick slurry. A grout admixture shall be added to the grout mixture in accordance with the manufacturer's recommendations.

Grout admixture shall be a one component acrylic bonding additive. The additive shall be one of the grout admixtures from the Approved Products List, or an approved equal as determined by the Office of Bridge Design.

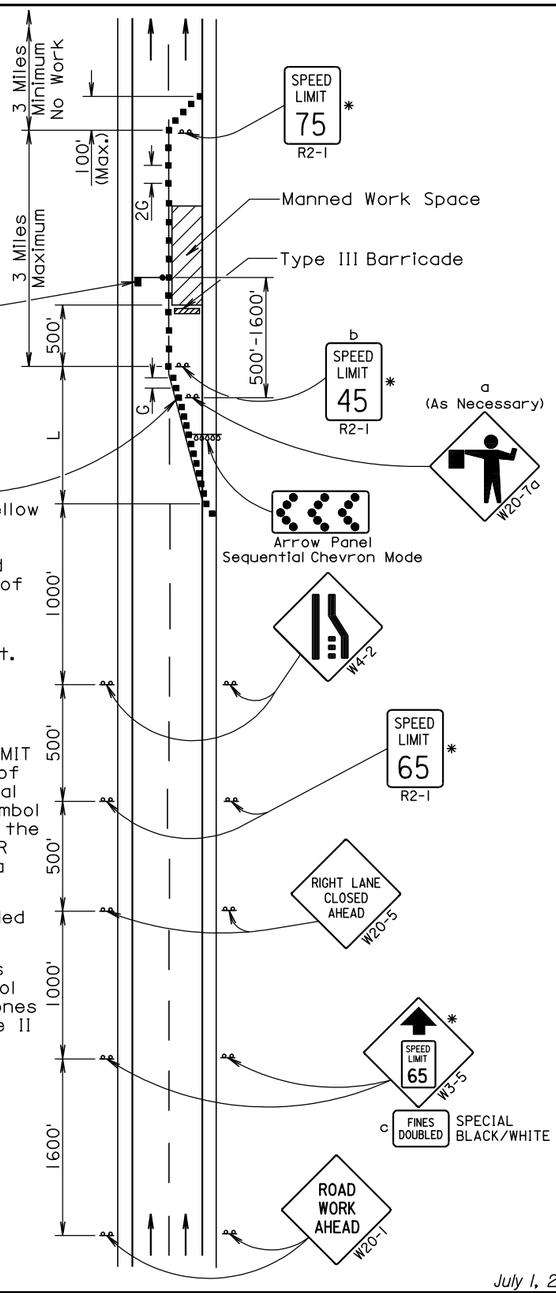
Grout shall be applied on all of the existing concrete surfaces within the removal area immediately prior to placement of the concrete patching material. The grout shall be scrubbed into the surface with a stiff bristle brush in a thin and uniform coat. Care shall be taken to ensure that excess grout does not collect in low areas, that the grout is confined only to the immediate area in which concrete patching material is to be placed, and that the rate of application is limited to an amount such that the grout will be covered with concrete patching material before the grout dries.

The concrete patching material shall be mixed and placed in accordance with the manufacturer's technical data sheet. The Contractor shall provide a manufacturer's technical data sheet to the Engineer prior to performing the work. The concrete patching material shall be maintained at or above 45° F (7° C) for at least 72 hours after placement.

REPAIR OF ASPHALT CONCRETE SHOULDERS

Cost for asphalt concrete repair required on the shoulder adjacent to full depth pavement replacement sections that are not in areas where traffic has damaged the shoulder shall be incidental to the contract unit prices per square yard for Nonreinforced PCC Pavement Repair and Continuously Reinforced PCC Pavement Repair.

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 - 50	50	600
55	50	660
60 - 65	50	780
70 - 75	50	900



▪ Channelizing Device

* Speed appropriate for location.

4" white temporary pavement marking tape for right lane closures and 4" yellow temporary pavement marking tape for left lane closures or temporary road markers at 5' spacing shall be installed when the lane is closed for a period of 24 hours or more.

Signs a, b, and c shall be removed or covered when workers are not present.

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

If the spacing between manned work spaces is 1 mile or greater, a SPEED LIMIT 65(*) sign shall be posted at the end of the first manned work space. Additional SPEED LIMIT 45(*) sign(s) and FLAGGER symbol sign(s) shall be installed in advance of the next manned work space(s). The FLAGGER sign shall be used whenever there is a Flagger present.

Left mounted advance signs on undivided highways are not required.

The channelizing devices shall be drums or type II barricades if traffic control must remain overnight or longer. 42" cones may be used in lieu of drums or type II barricades only along the centerline.

July 1, 2005

Published Date: 1st Qtr. 2007

SDDOT

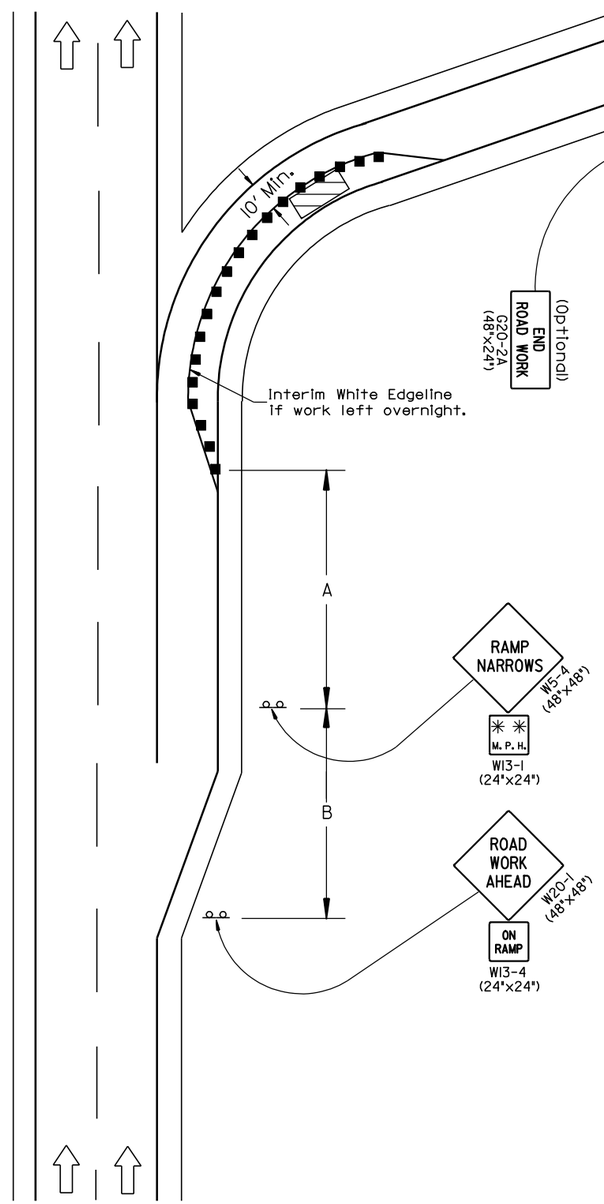
MANNED WORK SPACE SIGNING FOR DIVIDED AND UNDIVIDED HIGHWAYS

PLATE NUMBER 634.63

Sheet 1 of 1

▪ - Drums at 25 foot spacing

Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet) (A)(B)
45 - 50	500
55	750
60 - 65	1000
	(A) (B)
75	1000 1600



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

* * Need and safe speed to be determined by Highway Authority.

March 31, 2000

Published Date: 1st Qtr. 2007

SDDOT

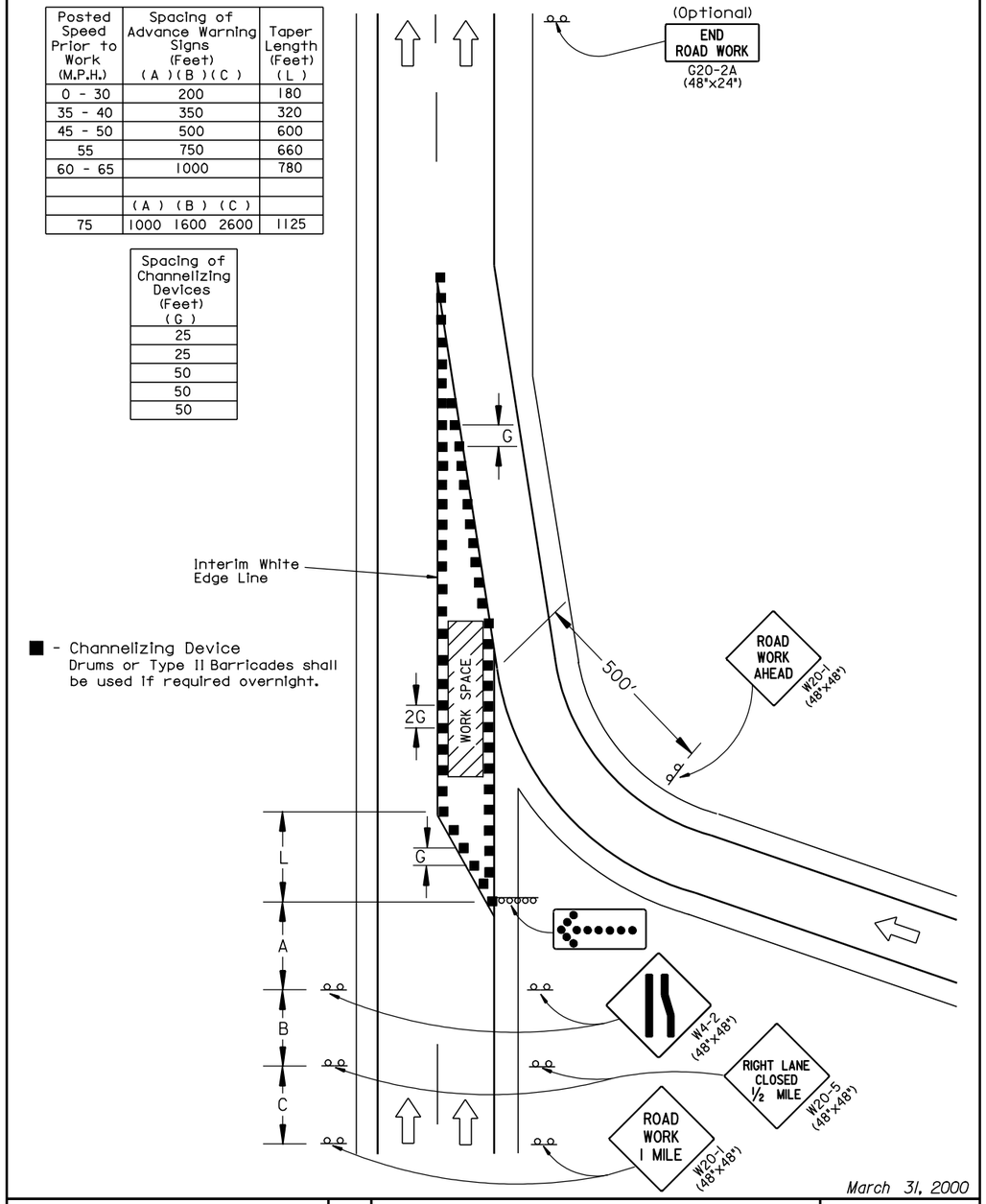
GUIDES FOR TRAFFIC CONTROL DEVICES PARTIAL EXIT RAMP CLOSURE

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)	
75	1000 1600 2600	1125

Spacing of Channelizing Devices (Feet) (G)
25
25
50
50
50



March 31, 2000

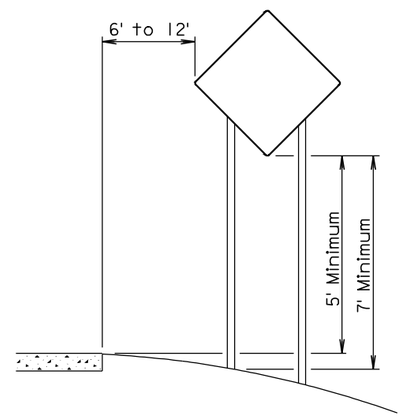
Published Date: 1st Qtr. 2007

SDDOT

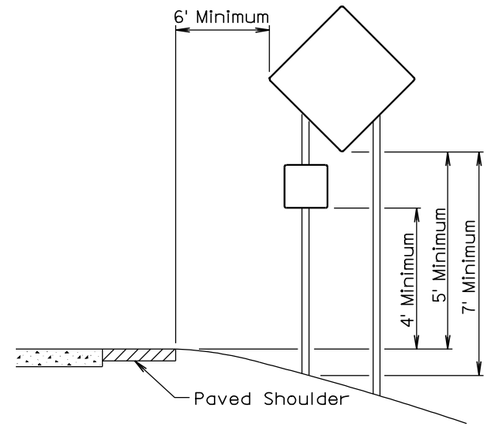
GUIDES FOR TRAFFIC CONTROL DEVICES WORK IN VICINITY OF ENTRANCE RAMP

PLATE NUMBER 634.70

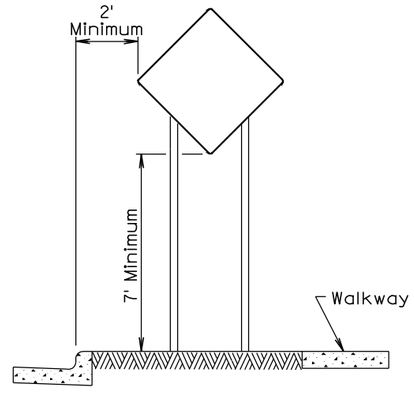
Sheet 1 of 1



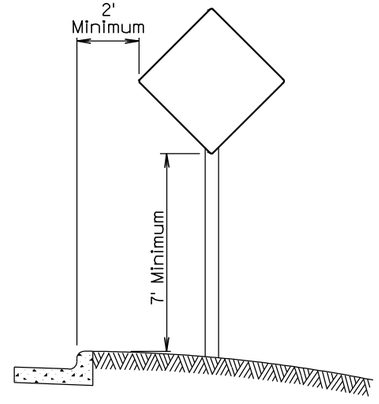
RURAL DISTRICT



RURAL DISTRICT WITH SUPPLEMENTAL PLATE



URBAN DISTRICT



URBAN DISTRICT

December 23, 2003

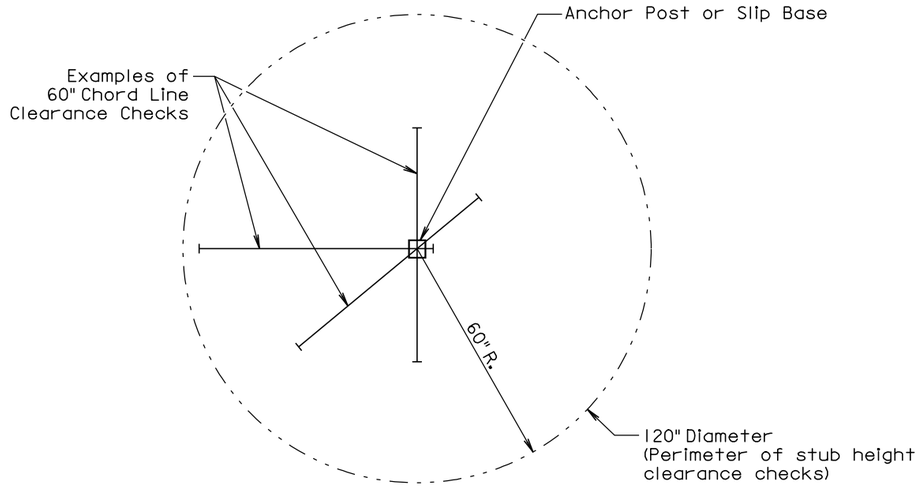
Published Date: 1st Qtr. 2007

SDDOT

BREAKAWAY SIGN SUPPORTS (Typical Construction Signing)

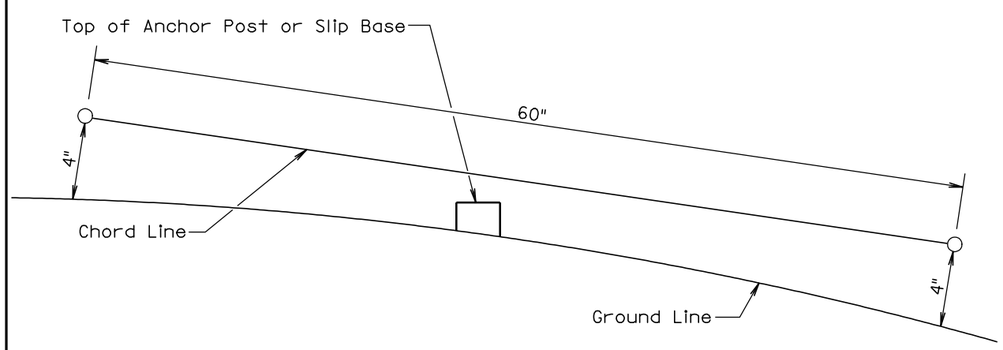
PLATE NUMBER 634.85

Sheet 1 of 1



PLAN VIEW

(Examples of stub height clearance checks)



ELEVATION VIEW

GENERAL NOTES:

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

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

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

July 1, 2005

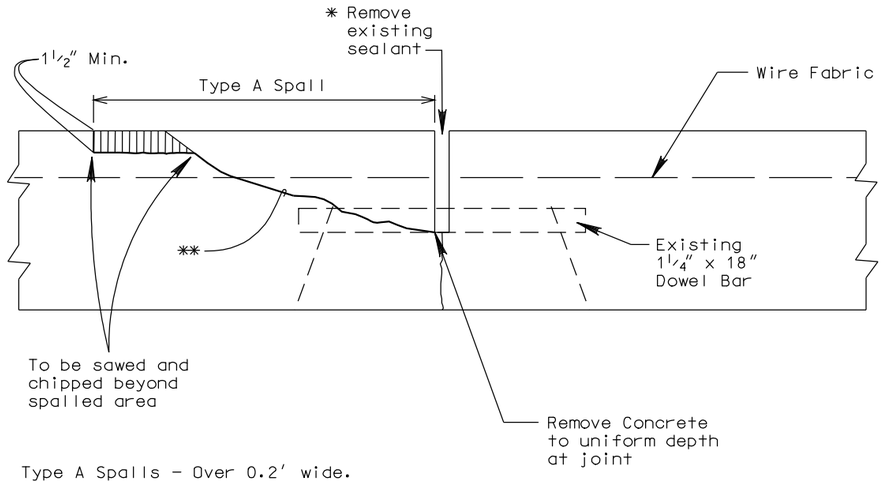
Published Date: 2nd Qtr. 2006	SDDOT	BREAKAWAY SUPPORT STUB CLEARANCE	PLATE NUMBER 634.99 Sheet 1 of 1

ITEMIZED LIST FOR TRAFFIC CONTROL

SIGN CODE	SIGN SIZE	DESCRIPTION	NUMBER REQUIRED	UNITS PER SIGN	UNITS
E5-1	36" x 32"	EXIT GORE SIGN	4	24	96
G20-2a	36" x 18"	END ROAD WORK	6	17	102
R1-1	48" x 48"	STOP		34	
R1-2	48" x 48"	YIELD		34	
R2-1	36" x 48"	SPEED LIMIT 45	2	29	58
R2-1	36" x 48"	SPEED LIMIT 55	4	29	116
R2-1	36" x 48"	SPEED LIMIT 65	4	29	116
R2-1	36" x 48"	SPEED LIMIT 75	2	29	58
R4-7	24" x 30"	KEEP RIGHT (SYMBOL)		18	
R5-1	48" x 48"	DO NOT ENTER		34	
R5-1a	48" x 36"	WRONG WAY		29	
R10-6	24" x 36"	STOP HERE ON RED		20	
R11-2	48" x 30"	ROAD CLOSED		27	
R11-3a	60" x 30"	ROAD CLOSED __ MILES AHEAD LOCAL TRAFFIC ONLY		30	
R11-4	60" x 30"	ROAD CLOSED TO THRU TRAFFIC		30	
SW12-1b	120" x 60"	HIGHWAY WORKERS GIVE'EM A BRAKE		80	
W1-1	48" x 48"	LEFT OR RIGHT TURN ARROW		34	
W1-2	48" x 48"	LEFT OR RIGHT CURVE ARROW		34	
W1-3	48" x 48"	REVERSE TURN SIGN (LEFT OR RIGHT)		34	
W1-4a	48" x 48"	REVERSE CURVE SIGN (LEFT OR RIGHT)		34	
W3-1a	48" x 48"	STOP AHEAD (SYMBOL)		34	
W3-2a	48" x 48"	YIELD AHEAD (SYMBOL)		34	
W3-3	48" x 48"	SIGNAL AHEAD (SYMBOL)		34	
W3-5	48" x 48"	SPEED REDUCTION (__ MPH)	4	34	136
W4-1	48" x 48"	MERGE (SYMBOL)		34	
W4-2	48" x 48"	LEFT OR RIGHT LANE ENDS (SYMBOL)	4	34	136
W5-2	48" x 48"	NARROW BRIDGE		34	
W5-4	48" x 48"	RAMP NARROWS	2	34	68
W7-3a	30" x 24"	NEXT __ MILES		18	
W8-1	36" x 36"	BUMP		27	
W8-6	48" x 48"	TRUCK CROSSING		34	
W8-7	36" x 36"	LOOSE GRAVEL		27	
W8-9a	48" x 48"	SHOULDER DROP-OFF		34	
W13-1	24" x 24"	ADVISORY SPEED PLATE	2	16	32
W13-4	24" x 24"	ON RAMP	2	16	32
W20-1	48" x 48"	ROAD WORK AHEAD	6	34	204
W20-2	48" x 48"	DETOUR AHEAD		34	
W20-3	48" x 48"	ROAD CLOSED AHEAD		34	
W20-4	48" x 48"	ONE LANE ROAD AHEAD		34	
W20-5	48" x 48"	LT. OR RT. LANE CLOSED AHEAD	4	34	136
W20-7a	48" x 48"	FLAGGER	4	34	136
W20-7b	48" x 48"	BE PREPARED TO STOP		34	
W21-1a	48" x 48"	WORKERS (SYMBOL)		34	
W21-2	36" x 36"	FRESH OIL		27	
W21-3	48" x 48"	ROAD MACHINERY AHEAD		34	
W21-5	48" x 48"	SHOULDER WORK		34	
W21-5a	48" x 48"	RIGHT SHOULDER CLOSED		34	
W21-5b	48" x 48"	RIGHT SHOULDER CLOSED AHEAD		34	
SPECIAL	30" x 24"	FINES DOUBLED	4	18	72
*****	12" x 36"	TYPE III OBJECT MARKER		15	
*****	*****	TYPE III BARRICADE - 8 FT. SINGLE SIDED		40	
*****	*****	TYPE III BARRICADE - 8 FT. DOUBLE SIDED	26	56	1456
				TOTAL UNITS	**2954**

REPAIR OF TYPE A SPALLS

SPALL REMOVAL

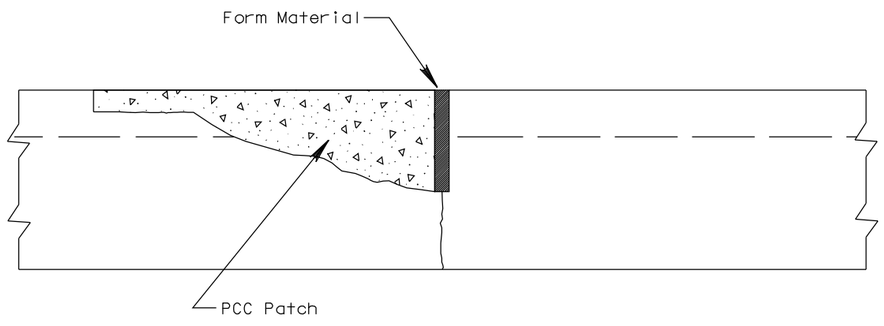


Type A Spalls - Over 0.2' wide.

* Existing Sealant to be removed is low modulus silicone sealant with backer rod or hot poured elastic joint sealer.

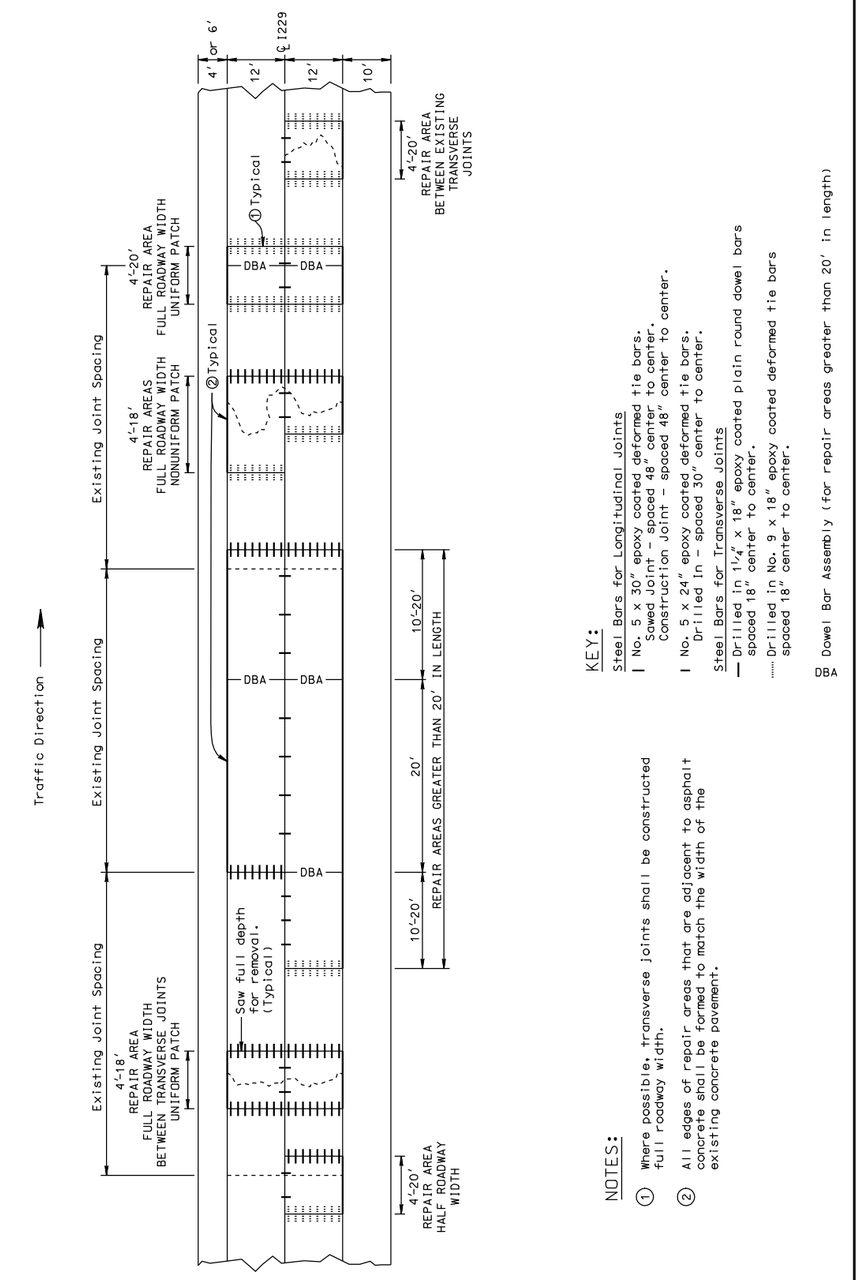
** Remove and chip to sound concrete.

SPALL PATCH



NONREINFORCED PCC PAVEMENT REPAIR

FOUR LANE DIVIDED - TYPICAL REPAIR AREAS



KEY:

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.

Steel Bars for Transverse Joints
- 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.

Dowel Bar Assembly (for repair areas greater than 20' in length)

DBA

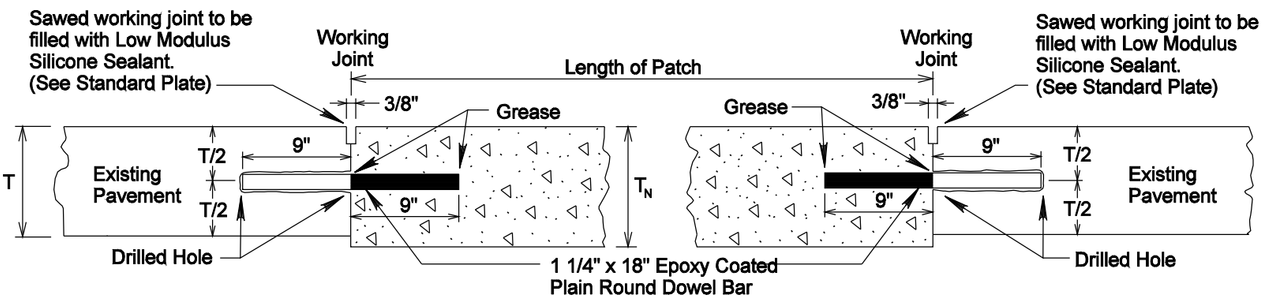
NOTES:

① Where possible, transverse joints shall be constructed full roadway width.

② All edges of repair areas that are adjacent to asphalt concrete shall be formed to match the width of the existing concrete pavement.

NONREINFORCED PCC PAVEMENT REPAIR

PLAIN ROUND DOWEL BAR INSERTION
(TWO WORKING JOINTS)



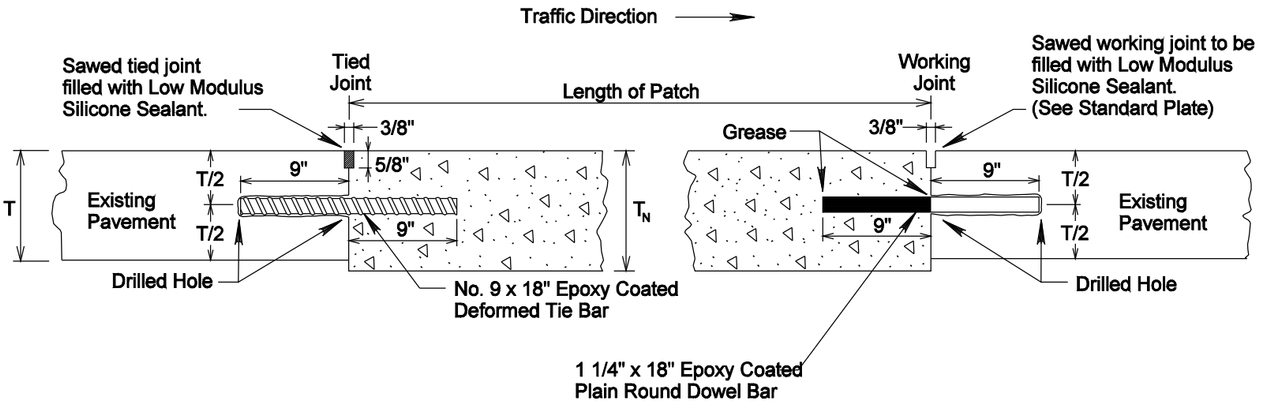
T = Existing pavement thickness.
T_N= New pavement thickness shall be 1" thicker than existing.

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

Cost for furnishing and inserting epoxy coated plain round dowel bars shall be included in the contract unit price per each for Insert Steel Bar in PCC Pavement.

NONREINFORCED PCC PAVEMENT REPAIR

STEEL BAR INSERTION
(ONE TIED JOINT AND ONE WORKING JOINT)



T = Existing pavement thickness.
T_N= New pavement thickness shall be 1" thicker than existing.

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

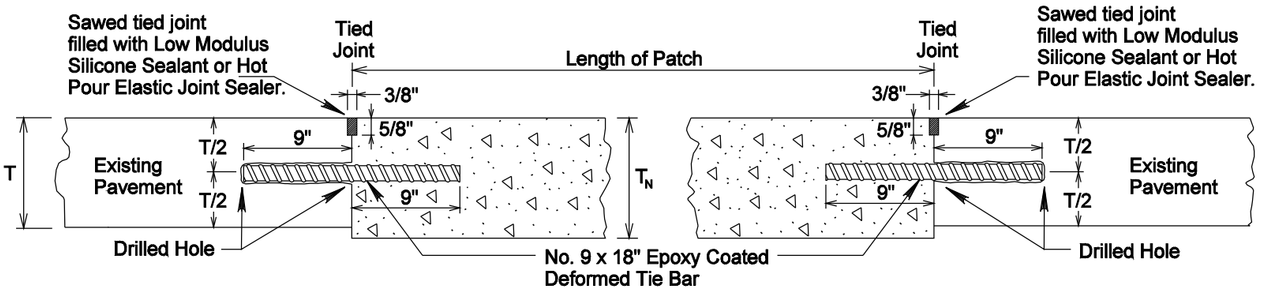
Cost for furnishing and inserting steel bars (deformed tie and plain round dowel) shall be included in the contract unit price per each for Insert Steel Bar in PCC Pavement.

Plotting Date: 15-MAR-2007

STATE OF SOUTH DAKOTA	PROJECT 2007 SIOUX FALLS AREA PAVEMENT REPAIR	SHEET NO. 18	TOTAL SHEETS 27

NONREINFORCED PCC PAVEMENT REPAIR

DEFORMED TIE BAR INSERTION
(TWO TIED JOINTS)



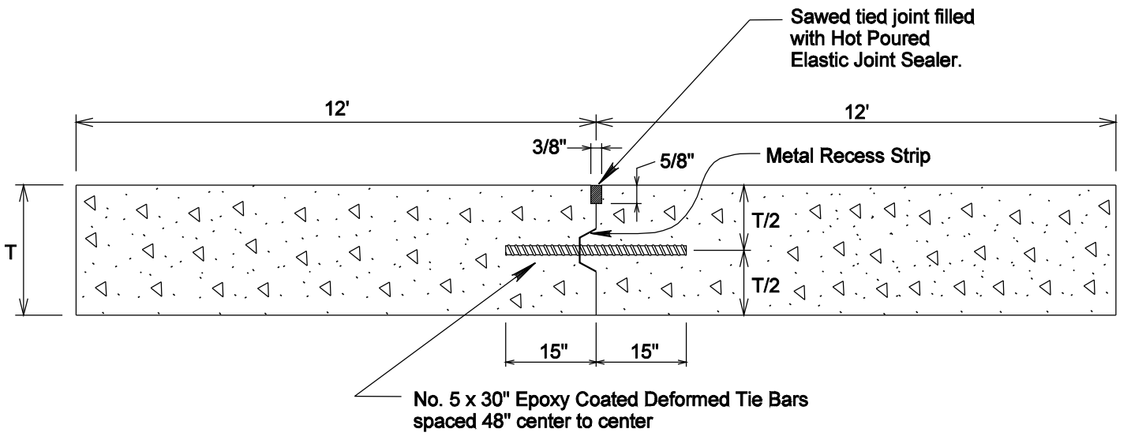
T = Existing pavement thickness.
T_N= New pavement thickness shall be 1" thicker than existing.

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

Cost for furnishing and inserting epoxy coated deformed tie bars shall be included in the contract unit price per each for Insert Steel Bar in PCC Pavement.

NONREINFORCED PCC PAVEMENT REPAIR

LONGITUDINAL CONSTRUCTION JOINT WITH TIE BARS & KEYWAY



T = New pavement thickness.

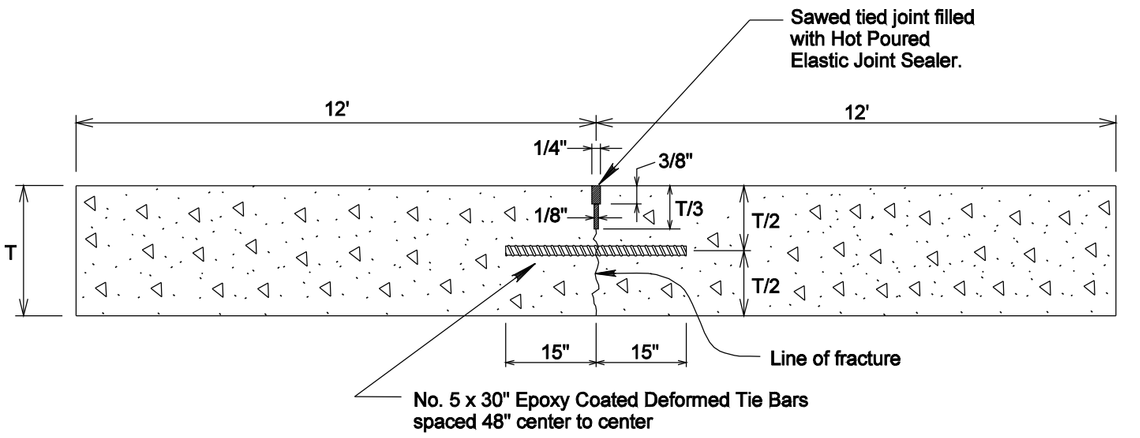
Deformed tie bars will only be inserted on centerline when there is full width pavement removal.

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

STATE OF SOUTH DAKOTA
PROJECT 2007 SIOUX FALLS AREA PAVEMENT REPAIR
SHEET NO. 19
TOTAL SHEETS 27
Plotting Date: 15-MAR-2007

NONREINFORCED PCC PAVEMENT REPAIR

SAWED LONGITUDINAL JOINT



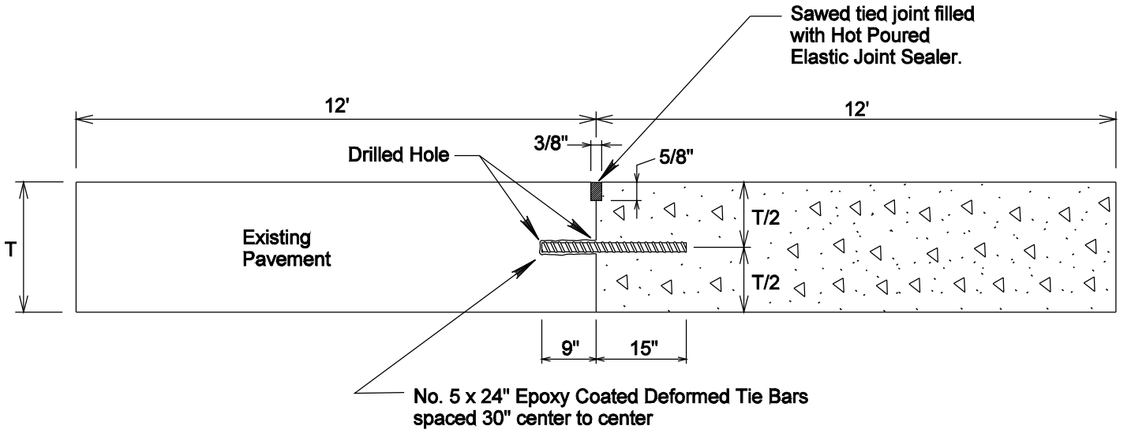
T = New pavement thickness.

The first saw cut to control cracking shall be a minimum of 1/3 the depth of the pavement. Additional sawing for widening the saw cut to provide the width for the installation of the Hot Poured Elastic Joint Sealer will be necessary.

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

NONREINFORCED PCC PAVEMENT REPAIR

LONGITUDINAL CONSTRUCTION JOINT WITH DRILLED IN TIE BARS



T = Existing and new pavement thickness.

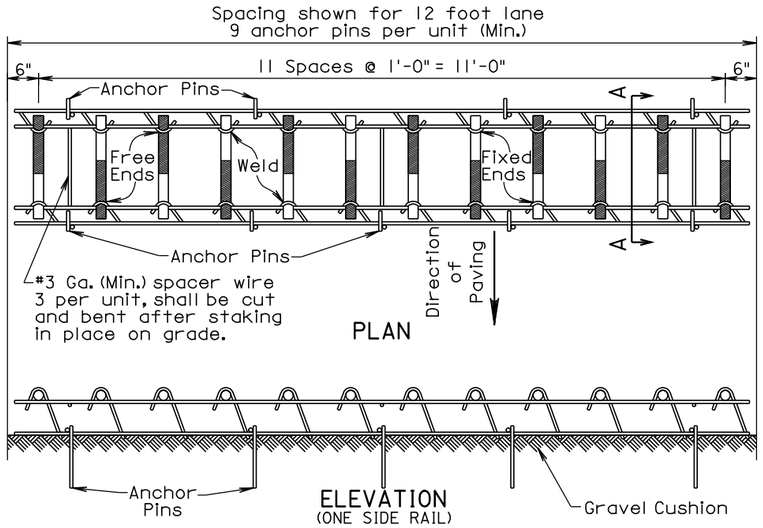
Bar embedded a minimum depth of 9 inches into the existing pavement by utilizing an epoxy resin adhesive.

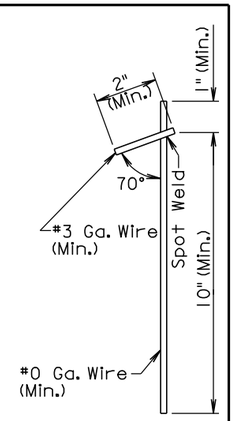
Bars shall be placed a minimum of 15 inches from existing transverse contraction joints.

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

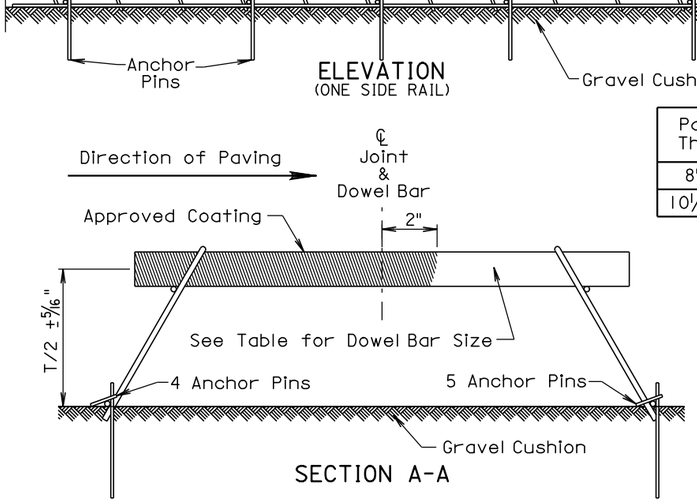
Plotting Date: 15-MAR-2007

STATE OF SOUTH DAKOTA	PROJECT 2007 SIOUX FALLS AREA PAVEMENT REPAIR	SHEET NO. 20	TOTAL SHEETS 27

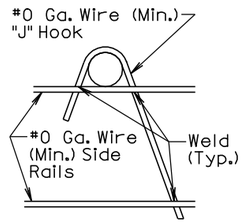




TYPICAL ANCHOR PIN



Pavement Thickness	Epoxy Coated Dowel Bar Size
8" to 10"	1¼" x 18"
10½" to 12"	1½" x 18"



SIDE RAIL DETAIL

GENERAL NOTES:

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

Centerline of individual dowel bars shall 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.

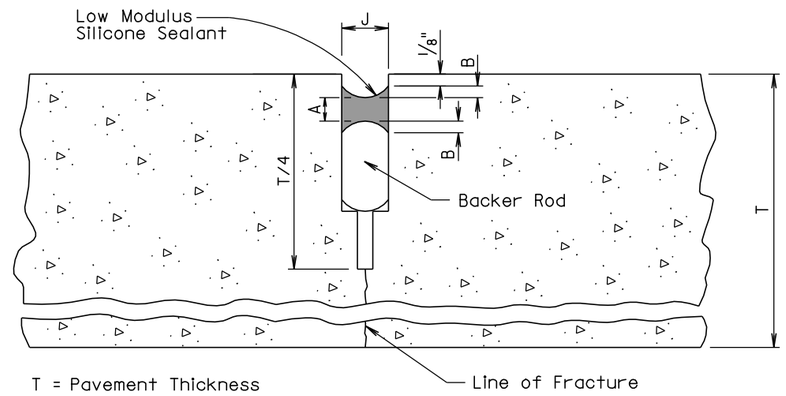
Centerline of individual dowel bars shall be parallel to the centerline of the roadway ±1/2 inch in 18 inches.

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

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

December 23, 2004

Published Date: 1st Qtr. 2007	SDDOT	PCC PAVEMENT DOWEL BAR ASSEMBLY FOR TRANSVERSE CONTRACTION JOINTS	PLATE NUMBER 380.01
			Sheet 1 of 1



LOW MODULUS SILICONE SEALANT ALLOWABLE CONSTRUCTION TOLERANCES			
J = 3/8"			
A (Min.) (In)	A (Max.) (In)	B (Min.) (In)	B (Max.) (In)
5/32	9/32	3/32	3/16
J = 1/2"			
A (Min.) (In)	A (Max.) (In)	B (Min.) (In)	B (Max.) (In)
3/16	11/32	1/8	1/4
J = 5/8"			
A (Min.) (In)	A (Max.) (In)	B (Min.) (In)	B (Max.) (In)
7/32	13/32	1/8	9/32

GENERAL NOTE:

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

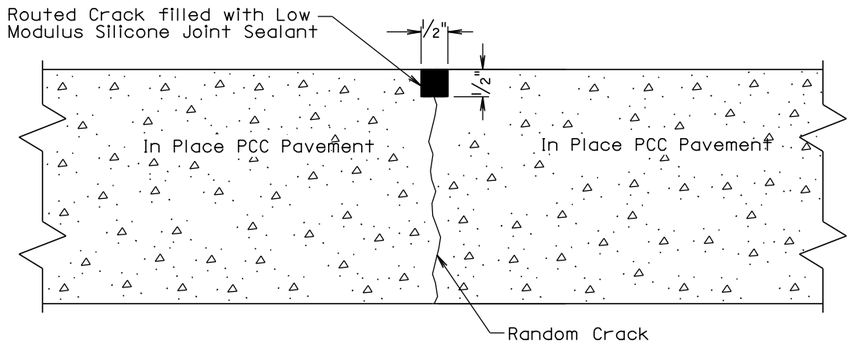
September 6, 2006

Published Date: 1st Qtr. 2007	SDDOT	RESEAL PCC PAVEMENT JOINT	PLATE NUMBER 380.13
			Sheet 1 of 1

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	2007 SIOUX FALLS AREA PAVEMENT REPAIR	22	27

Plotting Date: 15-MAR-2007

ROUTING AND SEALING RANDOM CRACKS IN PCC/CRC PAVEMENT



GENERAL NOTE:

Reservoir dimensions may vary slightly from the detail, due to the nature of this operation. However, any variance due to Contractor's negligence will be repaired at the Contractor's expense.

Only those Random Cracks in the existing concrete pavement with joints that are open and accept water and incompressibles as selected by the Engineer shall be prepared and sealed with low modulus silicone sealant.

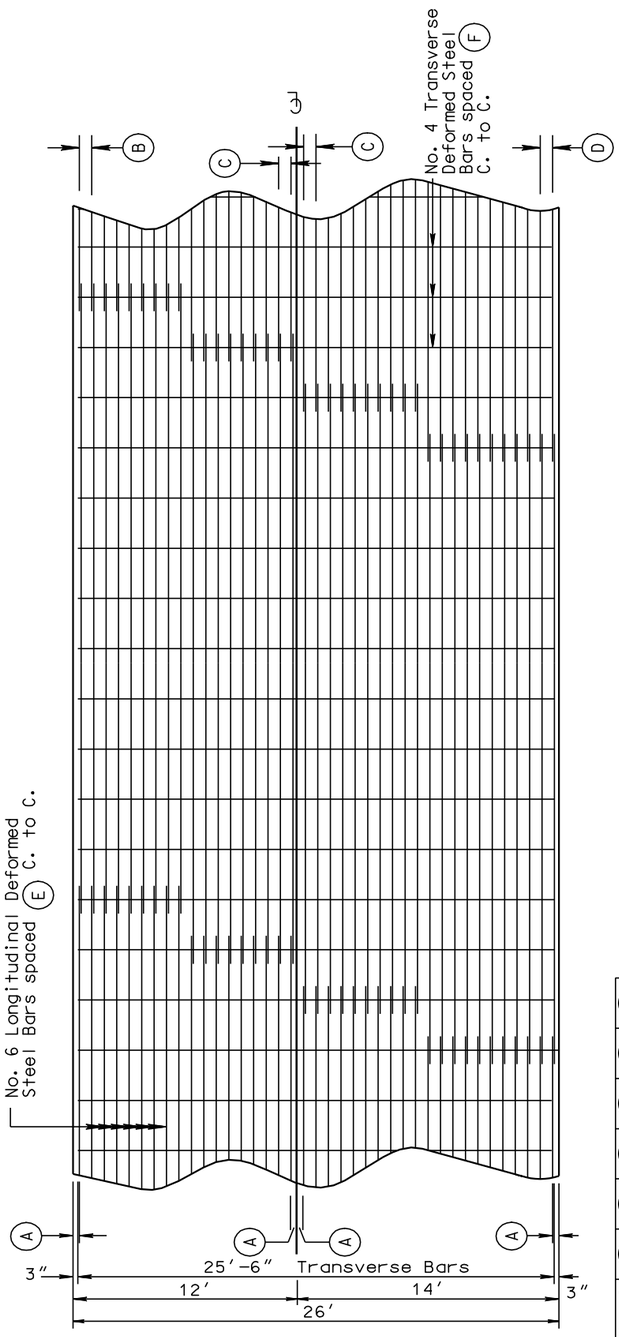
Each random crack shall be routed and the joint and roadway surface immediately cleaned by flushing with water or compressed air. The use of a concrete saw to route the crack will not be allowed. If there is any existing joint filler remaining in the cracks following routing, it shall be satisfactorily removed prior to sealing. Just prior to sealing, the sides of the routed crack shall be cleaned by sandblasting and the routed reservoir blown clean with compressed air.

The sealant shall be placed in the routed reservoir with equipment and by methods that insure complete and uniform filling. Backer rod may be used in wider random cracks.

Sealing Random Cracks in PCC Pavement will be measured to the nearest 0.1 foot of random cracks sealed and accepted on the project.

Cost for routing and sealing random cracks shall be incidental to the contract unit price per foot for SEAL RANDOM CRACKS IN PCC PAVEMENT.

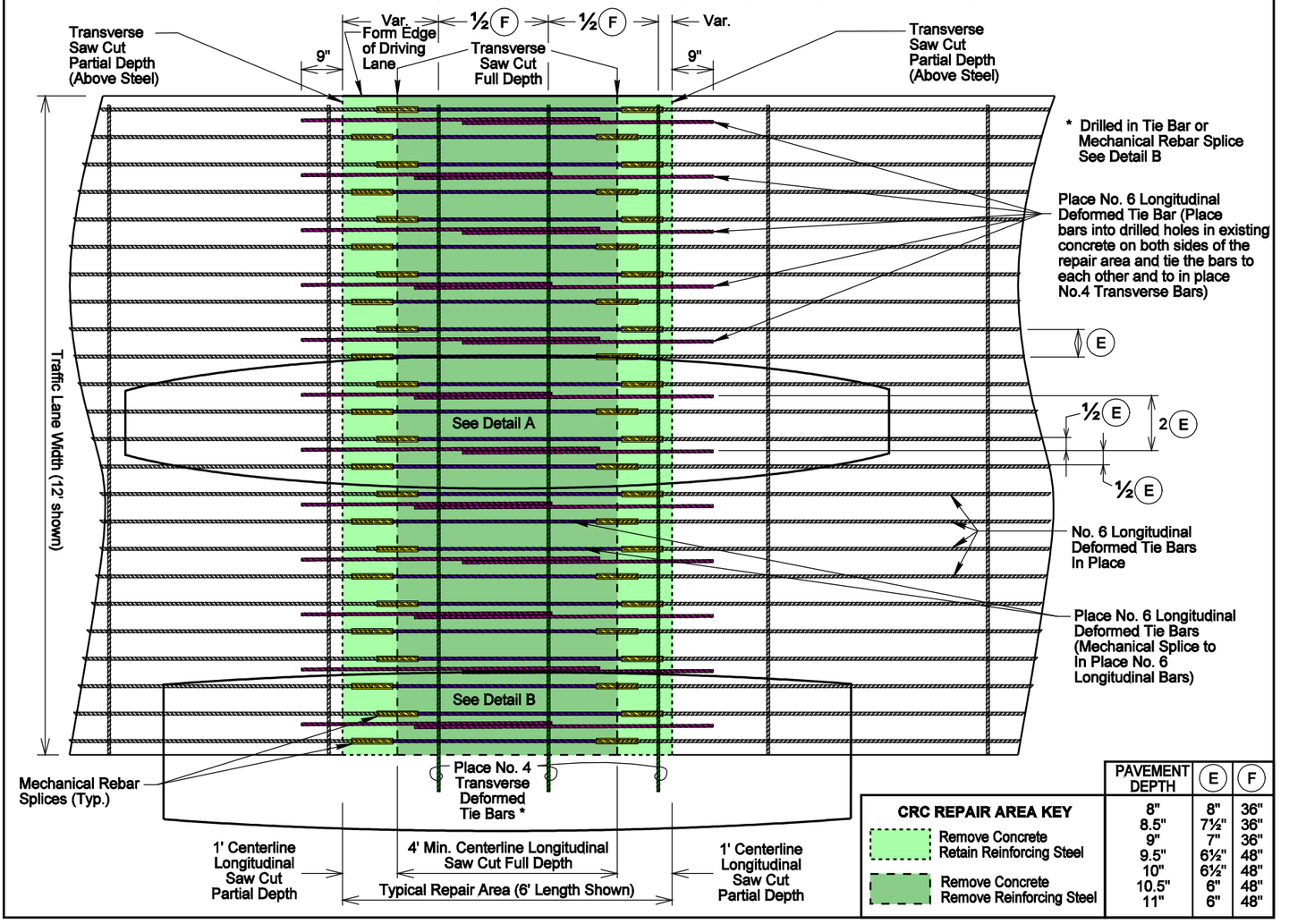
26' CONTINUOUSLY REINFORCED PCC PAVEMENT - IN PLACE



*Exception for Southbound Lanes on I29 from MRM 62.1 to MRM 72.8.
A = 3 3/4"
B = 6 1/2"
C = 6 1/2"
D = 4 1/2"
E = 6 1/2"
F = 48"

Depth of Pavement	A	B	C	D	E	F
8"	4"	8"	8"	8"	8"	36"
8.5"	4"	4"	4½"	5½"	7½"	36"
9"	4"	5"	5"	8"	7"	36"
9.5"	3¾"	6½"	6½"	4½"	6½"	48"
10"	3¾"	6½"	6½"	4½"	6½"	48"
10.5"	4"	5"	5"	5"	6"	48"
*11"	4"	5"	5"	5"	6"	48"

CRC PAVEMENT REPAIR AREA - TYPICAL

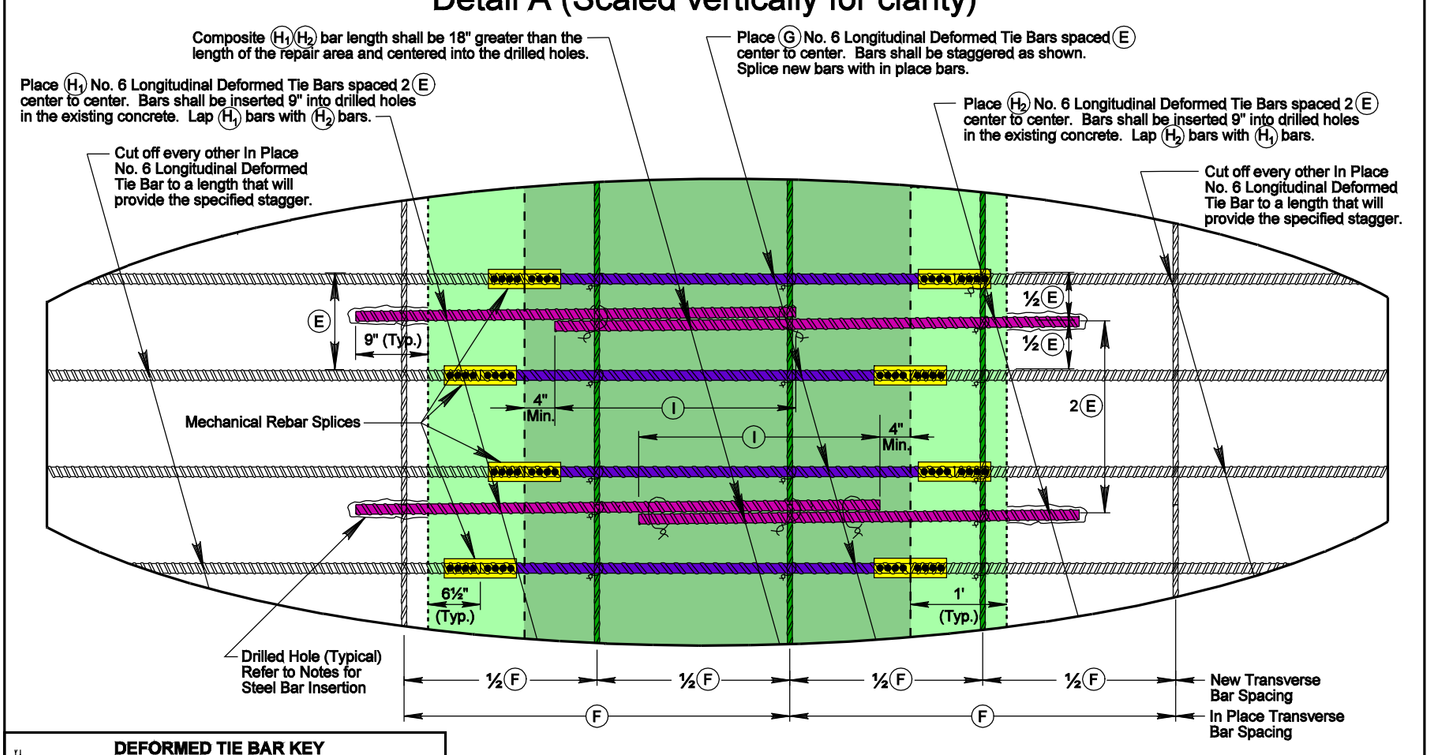


CRC REPAIR AREA KEY

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

PAVEMENT DEPTH	E	F
8"	8"	36"
8.5"	7½"	36"
9"	7"	36"
9.5"	6½"	48"
10"	6½"	48"
10.5"	6"	48"
11"	6"	48"

CRC PAVEMENT REPAIR AREA
Detail A (Scaled vertically for clarity)



DEFORMED TIE BAR KEY

- No. 4 Transverse Deformed Tie Bar In Place (Retain)
- Place No. 4 Transverse Deformed Tie Bar (Tie to In Place No. 6 Longitudinal Bars)
- No. 6 Longitudinal Deformed Tie Bar In Place (Retain)
- Place No. 6 Longitudinal Deformed Tie Bar (Tie to In Place No. 6 Longitudinal Bars)
- Place No. 6 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 in place No.4 Transverse Bars)

Note: All lapped bars shall have two ties per lap.

CRC REPAIR AREA KEY

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

PAVEMENT DEPTH	E	F	G	H_1	H_2	I
8"	8"	36"	18	9	9	25"
8.5"	7½"	36"	19	10	10	25"
9"	7"	36"	20	10	10	25"
9.5"	6½"	48"	22	11	11	25"
10"	6½"	48"	22	11	11	25"
10.5"	6"	48"	24	12	12	25"
11"	6"	48"	24	12	12	30"

STATE OF SOUTH DAKOTA

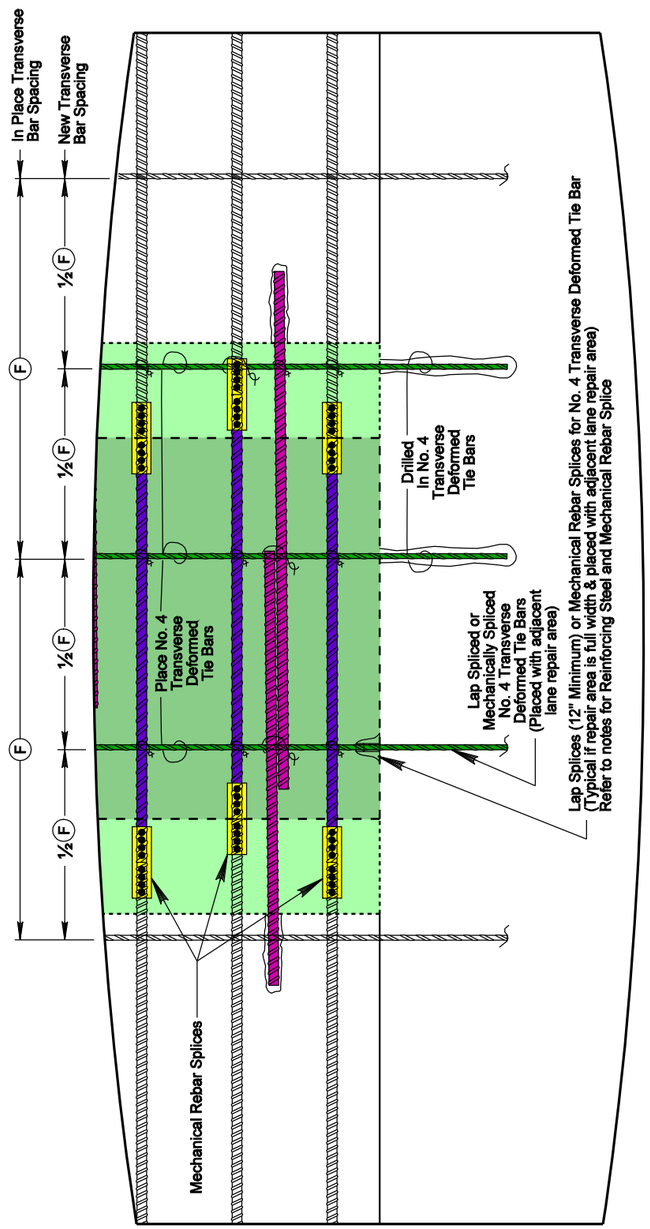
PROJECT: 2007 SIOUX FALLS AREA PAVEMENT REPAIR

SHEET NO. 23

TOTAL SHEETS 27

Plotting Date: 15-MAR-2007

CRC PAVEMENT REPAIR AREA
Detail B (Scaled vertically for clarity)



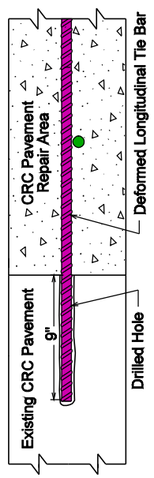
Note: All lapped bars shall have two ties per lap.

PAVEMENT DEPTH	E	F
8"	8"	36"
8.5"	7½"	36"
9"	7"	36"
9.5"	6½"	48"
10"	6½"	48"
10.5"	6"	48"
11"	6"	48"

CRC REPAIR AREA KEY

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

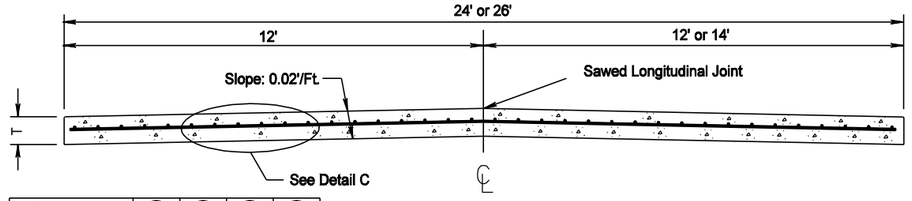
DRILLED IN TIE BAR DETAIL
(In Transverse Joint)



DEFORMED TIE BAR KEY
No. 4 Transverse Deformed Tie Bar In Place (Retain)

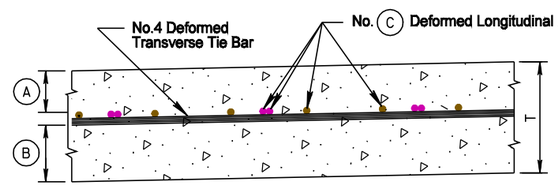
- Place No. 4 Transverse Deformed Tie Bar (Tie to In Place No. 6 Longitudinal Bars)
- No. 6 Longitudinal Deformed Tie Bar In Place (Retain)
- Place No. 6 Longitudinal Deformed Tie Bar (Tie to In Place No. 6 Longitudinal Bars)
- Place No. 6 Longitudinal Deformed Tie Bar (Place bars into drilled holes in existing concrete on both sides of the repair area and tie the bars to each other and to in place No.4 Transverse Bars)

TRANSVERSE SECTION SHOWING STEEL PLACEMENT



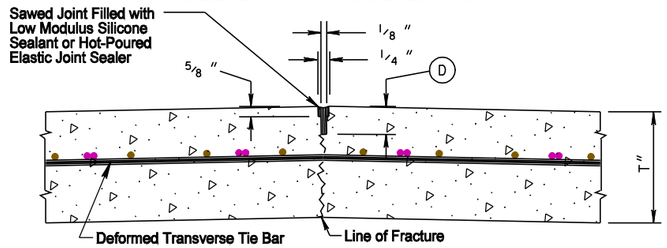
Depth of Pavement (T)	A	B	C	D
*8"	3"	3¾"	6	2"
8.5"	3¼"	4"	6	2⅛"
9"	3½"	4¼"	6	2¼"
9.5"	3½"	4¾"	6	2⅜"
10"	3½"	5¼"	6	2½"
10.5"	3¾"	5½"	6	2⅝"
11"	4"	5¾"	6	2¾"
11.5"	4"	5⅞"	7	2⅞"
12"	4"	6⅜"	7	3"

DETAIL C

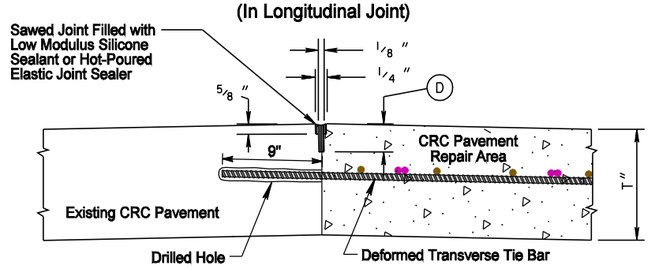


*Exception for Southbound Lane on I29 from MRM 83.9 to MRM 98.7.
A = 3¼"
B = 3½"
C = 6
D = 2"

SAWED LONGITUDINAL JOINT



DRILLED IN TIE BAR DETAIL
(In Longitudinal Joint)



NOTES:

Steel bars for concrete reinforcement shall conform to the requirements of Specification M 31 (Grade 60) of the AASHTO Standard Specifications for Deformed Billet Steel Bars for Concrete Reinforcement.

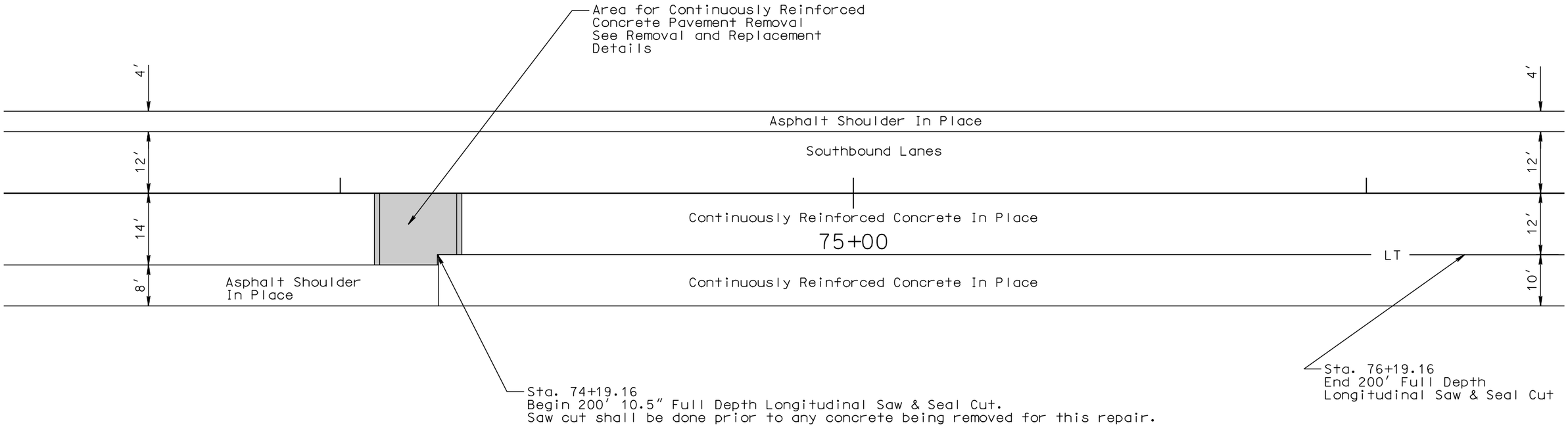
Placement of longitudinal steel bars may vary from + 1/2 inch to - 1/2 inch vertically and 3/4 inch horizontally. Placement of transverse steel bars may vary from + 1/2 inch to - 1/2 inch vertically and 2 inches horizontally.

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

26′ CONTINUOUSLY REINFORCED PCC PAVEMENT REPAIR AREA @ Sta. 74+19.16

Sheet 1 of 3

I29 & I90 INTERCHANGE

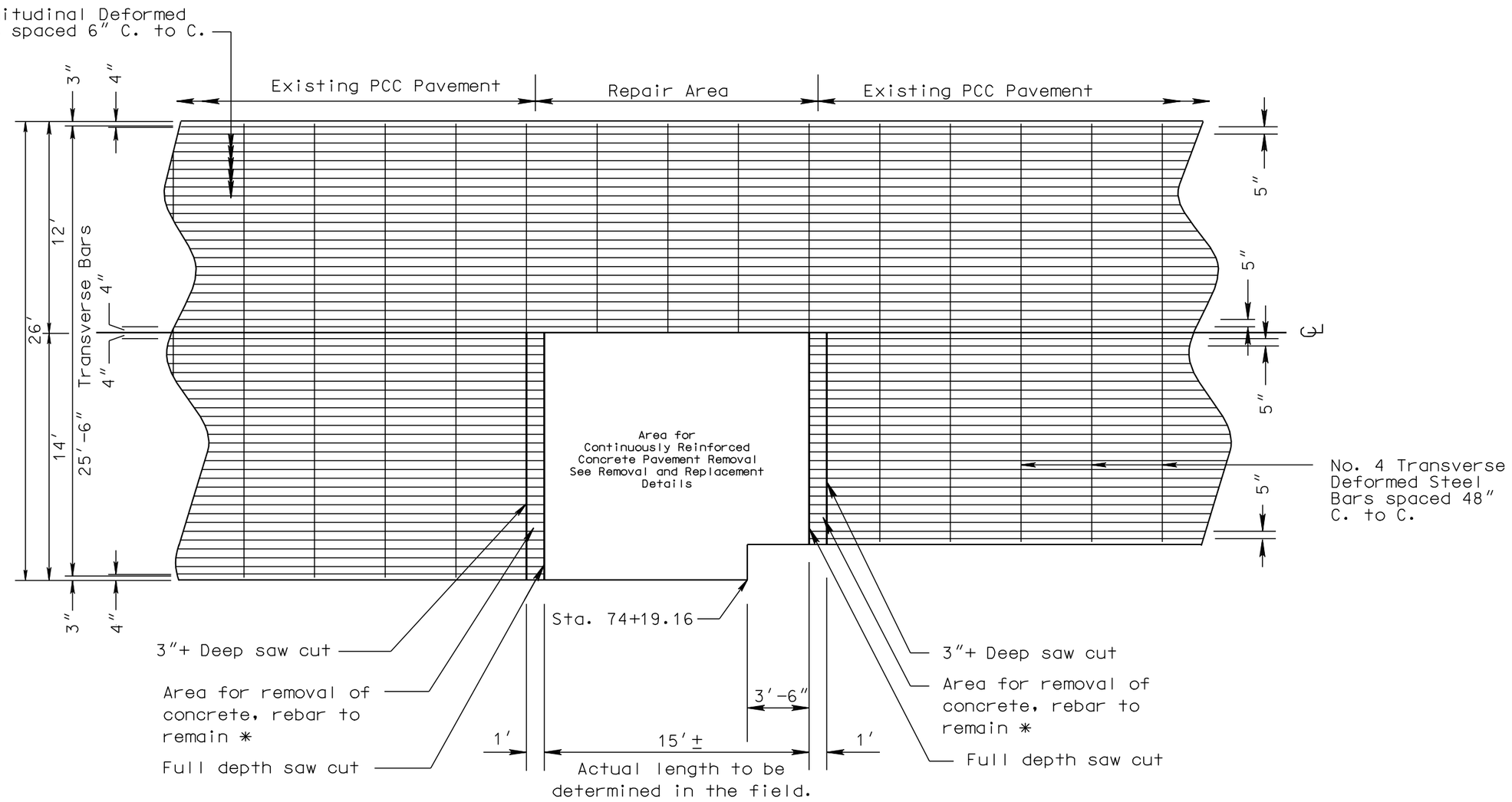


26′ CONTINUOUSLY REINFORCED PCC PAVEMENT REPAIR AREA @ Sta. 74+19.16

Sheet 2 of 3

I29 & I90 INTERCHANGE

* All Bent, Broken or Damaged rebar shall be straightened or replaced to the satisfaction of the Engineer.



26′ CONTINUOUSLY REINFORCED PCC PAVEMENT REPAIR AREA @ Sta. 74+19.16

Sheet 3 of 3

I29 & I90 INTERCHANGE