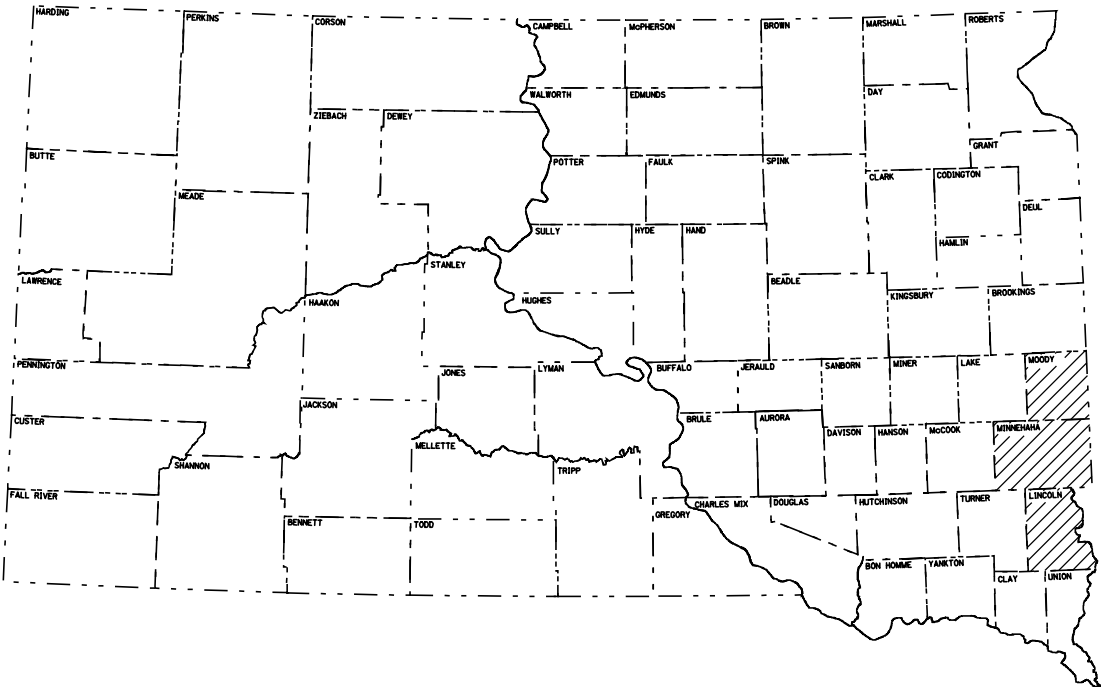


PLOT SCALE - 200,000,000:1,000,000

PLOTTED FROM - TRM111118



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, LINCOLN  
& MOODY COUNTIES

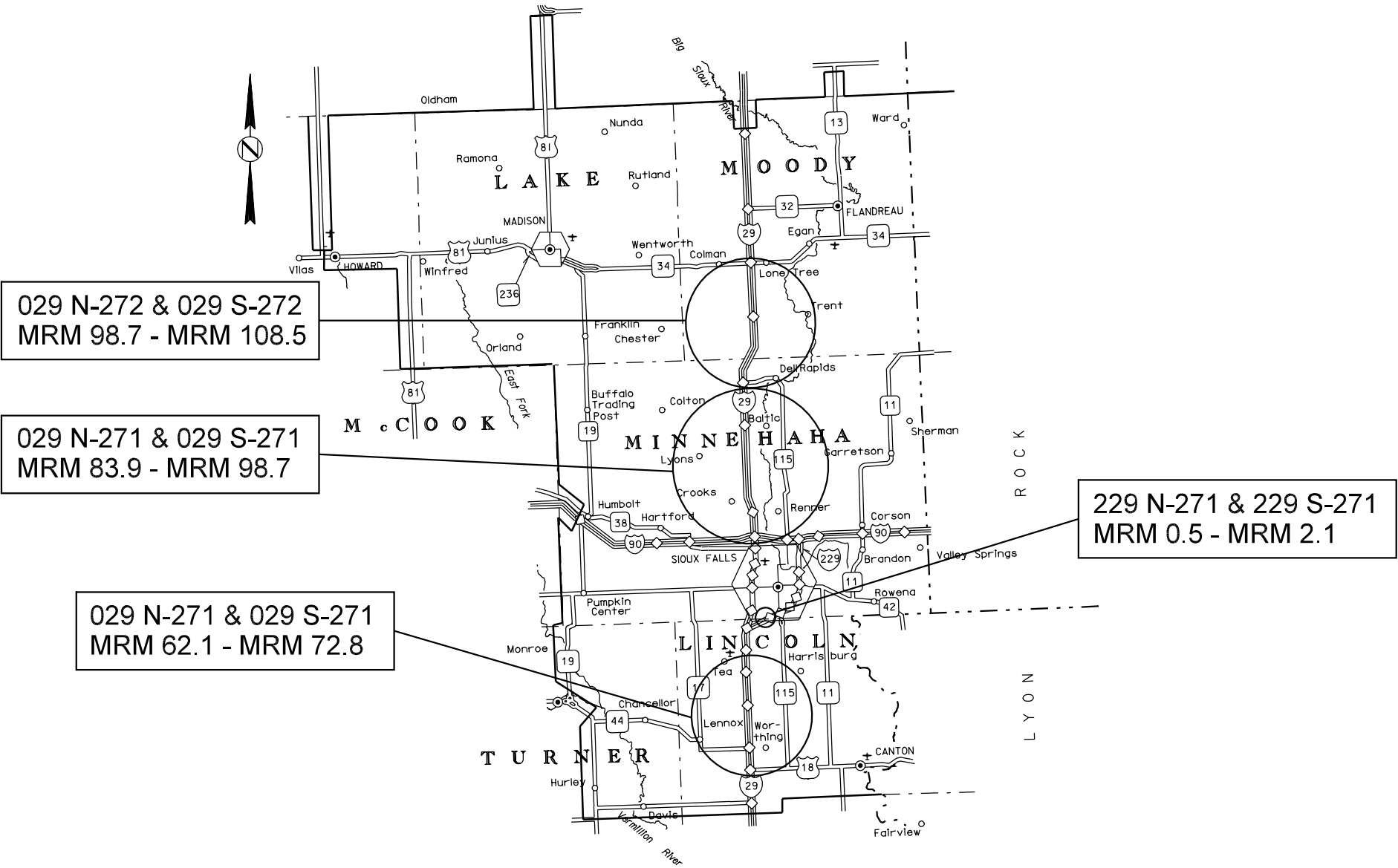
PCC & CRC PAVEMENT REPAIR  
PCN I0CN, I0CP, I0CQ, I0CR, I0CT AND I0CU

STATE OF SOUTH DAKOTA	PROJECT				SHEET NO.	TOTAL SHEETS
	229	N	271	229		
	029	N	271	029		
	029	N	272	029	1	26

Plotting Date: 17-MAY-2006

INDEX OF SHEETS

Sheet 1	Layout Map & Index of Sheets
Sheet 2	Estimate of Quantities
Sheets 3-4	Table for PCC Pavement Repair
Sheets 5-8	Table for CRC Pavement Repair
Sheets 9-12	Plan Notes
Sheets 13-15	Traffic Control
Sheet 16	Spall Repair Details
Sheets 16-20	PCC Pavement Repair Details
Sheet 21	Route and Seal Detail
Sheets 21-26	CRC Pavement Repair Details



ADT

I229 MRM 0.5 - MRM 2.1  
ADT (2005) = 28470

I29 MRM 62.1 - MRM 72.8  
ADT (2005) = 19625

I29 MRM 83.9 - MRM 98.7  
ADT (2005) = 16300

I29 MRM 98.7 - MRM 108.5  
ADT (2005) = 13410

FILE - U:\REGION\DESIGN\MAINT\2006\PCCP REPAIR\2006SFPCCPREPAIR\TTL-2006SEDCMREPAIR\INDEX

# 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	260	260	261	261	260	260	1,562	Unit
634E0120	Traffic Control Miscellaneous	<----- Lump Sum ----->						Lump Sum	LS
634E0310	Temporary Road Markers	1,950	1,950	7,200	7,200	1,350	1,350	21,000	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	98.4	100.3	-	-	-	-	198.7	SqYd
380E5100	Continuously Reinforced PCC Pavement Repair	-	-	22.0	102.3	9.3	13.9	147.5	SqYd
380E6000	Dowel Bar	72	96	-	-	-	-	168	Each
380E6110	Insert Steel Bar in PCC Pavement	118	172	75	279	25	47	716	Each
380E6310	Seal Random Cracks in PCC Pavement	310	206	3,820	3,190	-	-	7,526	Ft
390E0100	Saw and Seal Joint	-	-	200	-	-	-	200	Ft
390E0200	Repair Type A Spall	57	66	8	-	-	-	131	SqFt
480E0506	No. 6 Rebar Splice	-	-	132	416	42	62	652	Each

### SPECIFICATIONS

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

NONREINFORCED PCC PAVEMENT REPAIR Minnehaha and Lincoln Counties 229 N - 271												
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
0.404	Driving	—	—	—	9'	12'	12.0	—	—	7	7	—
0.404	Passing	—	—	—	4'	12'	5.3	—	—	7	7	—
0.437	Driving	—	—	—	4'	4'	1.8	—	—	—	4	3
0.567	Driving	—	—	—	4'	4'	1.8	—	—	—	4	3
0.710	Driving	—	—	—	4'	4'	1.8	—	—	—	4	3
0.722	Driving	—	—	—	4'	4'	1.8	—	—	—	4	3
0.819	Passing	—	—	—	4'	12'	5.3	—	—	—	14	12
0.959	Driving	—	—	—	4'	4'	1.8	—	—	—	4	3
0.968	Driving	2'	2'	4	—	—	—	—	—	—	—	—
0.970	Driving	2'	2'	4	—	—	—	—	—	—	—	—
0.976	Driving	2'	2'	4	—	—	—	—	—	—	—	—
0.987	Driving	—	—	—	4'	8'	3.6	—	2	—	4	3
0.996	Driving	2'	2'	4	—	—	—	—	—	—	—	—
0.990	Driving	—	—	—	20'	12'	26.7	—	—	—	14	12
0.990	Passing	—	—	—	20'	12'	26.7	—	—	—	14	12
0.997	Driving	—	—	—	4'	4'	1.8	—	—	—	4	3
1.008	Driving	2'	2'	4	—	—	—	—	—	—	—	—
1.154	Driving	—	—	—	4'	6'	2.7	—	—	—	4	3
1.357	Driving	2'	2'	4	—	—	—	—	—	—	—	—
1.376	Driving	2'	2'	4	—	—	—	—	—	—	—	—
1.404	Driving	—	—	—	4'	12'	5.3	—	—	—	14	12
1.456	Driving	2'	2'	4	—	—	—	—	—	—	—	—
1.512	Driving	—	—	—	—	—	—	120	—	—	—	—
1.886	Driving	—	—	—	—	—	—	45	—	—	—	—
1.938	Driving	—	—	—	—	—	—	60	—	—	—	—
1.946	Driving	5'	5'	25	—	—	—	—	—	—	—	—
1.971	Driving	—	—	—	—	—	—	40	—	—	—	—
1.982	Driving	—	—	—	—	—	—	45	—	—	—	—
229 N - 271 Totals:				57			98.4	310	2	14	102	72

NONREINFORCED PCC PAVEMENT REPAIR Minnehaha and Lincoln Counties 229 S - 271												
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
2.022	Driving	2'	2'	4	—	—	—	—	—	—	—	—
2.022	Driving	—	—	—	4'	4'	1.8	—	—	2	3	—
2.005	Driving	1'	1'	1	—	—	—	—	—	—	—	—
2.005	Driving	2'	2'	4	—	—	—	—	—	—	—	—
1.972	Passing	—	—	—	4'	4'	1.8	—	—	3	3	—
1.883	Driving	2'	2'	4	—	—	—	—	—	—	—	—
1.750	Auxiliary	—	—	—	—	—	—	14	—	—	—	—
1.750	Driving	—	—	—	—	—	—	10	—	—	—	—
1.653	Auxiliary	—	—	—	—	—	—	20	—	—	—	—
1.567	Driving	2'	6'	12	—	—	—	—	—	—	—	—
1.531	Passing	—	—	—	—	—	—	90	—	—	—	—
1.445	Passing	2'	2'	4	—	—	—	—	—	—	—	—
1.402	Auxiliary	1'	1'	1	—	—	—	—	—	—	—	—
1.400	Driving	1'	1'	1	—	—	—	—	—	—	—	—
1.386	Driving	2'	2'	4	—	—	—	—	—	—	—	—
1.375	Driving	1'	4'	4	—	—	—	—	—	—	—	—
1.341	Driving	—	—	—	4'	12'	5.3	—	—	—	14	12
1.341	Passing	—	—	—	4'	12'	5.3	—	—	—	14	12
1.341	Passing	—	—	—	4'	14'	6.2	60	12	—	—	—
1.312	Driving	—	—	—	6'	12'	8.0	—	—	—	14	—
1.312	Passing	—	—	—	6'	12'	8.0	—	—	—	14	—
1.273	Driving	1'	1'	1	—	—	—	—	—	—	—	—
1.143	Driving	1'	3'	3	—	—	—	—	—	—	—	—
1.015	Driving	—	—	—	6'	12'	8.0	—	—	—	14	12
0.921	Driving	2'	2'	4	—	—	—	—	—	—	—	—
0.890	Driving	2'	2'	4	—	—	—	—	—	—	—	—
0.885	Driving	2'	2'	4	—	—	—	—	—	—	—	—
0.885	Passing	1'	3'	3	—	—	—	—	—	—	—	—
0.879	Driving	1'	1'	1	—	—	—	—	—	—	—	—
0.877	Driving	1'	1'	1	—	—	—	—	—	—	—	—
0.809	Driving	—	—	—	6'	12'	8.0	—	1	—	14	—
0.601	Driving	1'	1'	1	—	—	—	—	—	—	—	—
0.596	Passing	1'	2'	2	—	—	—	—	—	—	—	—
0.591	Passing	1'	3'	3	—	—	—	—	—	—	—	—
0.516	Driving	—	—	—	10'	12'	13.3	—	1	—	12	12
0.516	Passing	—	—	—	10'	12'	13.3	—	1	—	12	12
0.485	Auxiliary	—	—	—	—	—	—	12	—	—	—	—
0.442	Passing	—	—	—	4'	12'	5.3	—	—	—	12	12
0.442	Driving	—	—	—	4'	12'	5.3	—	—	—	12	12
0.428	Driving	—	—	—	8'	12'	10.7	—	—	—	14	12
229 S - 271 Totals:				66			100.3	206	15	5	152	96

CRC PAVEMENT REPAIR Minnehaha and Lincoln Counties											
029 N - 271											
LOCATION		TYPE A SPALL			CRC PAVEMENT			SEAL RANDOM CRACKS IN PCCP	INSERT STEEL BAR IN PCC PAVEMENT		NO.6 REBAR SPLICE
				REPAIR			REPAIR		NO. 6 LONGI- TUDINAL DEFORMED TIE BAR EACH	NO. 4 TRANS- VERSE DEFORMED TIE BAR EACH	
MRM	LANE	LENGTH	WIDTH	SQFT	LENGTH	WIDTH	SQYD	FT			EACH
91.367	Passing	2'	2'	4	—	—	—	—	—	—	—
90.206	Driving	2'	2'	4	—	—	—	—	—	—	—
72.367	Driving	—	—	—	—	—	—	100	—	—	—
72.189	Driving	—	—	—	—	—	—	200	—	—	—
72.105	Driving	—	—	—	—	—	—	20	—	—	—
71.877	Driving	—	—	—	6'	7'	4.7	—	14	3	28
71.651	Driving	—	—	—	—	—	—	200	—	—	—
71.330	Driving	—	—	—	—	—	—	40	—	—	—
71.238	Passing	—	—	—	—	—	—	20	—	—	—
71.101	Driving	—	—	—	—	—	—	20	—	—	—
71.011	Driving	—	—	—	—	—	—	100	—	—	—
70.645	Passing	—	—	—	6'	12'	8.0	—	24	3	48
70.365	Driving	—	—	—	—	—	—	10	—	—	—
70.250	Driving	—	—	—	—	—	—	50	—	—	—
70.208	Driving	—	—	—	—	—	—	50	—	—	—
70.052	Driving	—	—	—	—	—	—	20	—	—	—
69.962	Driving	—	—	—	—	—	—	10	—	—	—
69.639	Driving	—	—	—	—	—	—	20	—	—	—
69.550	Driving	—	—	—	—	—	—	40	—	—	—
68.990	Driving	—	—	—	—	—	—	20	—	—	—
68.091	Driving	—	—	—	—	—	—	40	—	—	—
68.043	Driving	—	—	—	—	—	—	200	—	—	—
67.980	Driving	—	—	—	—	—	—	50	—	—	—
67.975	Driving	—	—	—	—	—	—	30	—	—	—
67.775	Driving	—	—	—	—	—	—	200	—	—	—
67.559	Driving	—	—	—	—	—	—	30	—	—	—
67.283	Driving	—	—	—	—	—	—	100	—	—	—
67.239	Driving	—	—	—	—	—	—	20	—	—	—
67.229	Driving	—	—	—	—	—	—	60	—	—	—
67.211	Driving	—	—	—	—	—	—	40	—	—	—
67.192	Passing	—	—	—	—	—	—	20	—	—	—
67.182	Driving	—	—	—	—	—	—	40	—	—	—
67.170	Driving	—	—	—	—	—	—	60	—	—	—
66.950	Driving	—	—	—	—	—	—	40	—	—	—
66.940	Driving	—	—	—	—	—	—	40	—	—	—
66.920	Driving	—	—	—	—	—	—	30	—	—	—
66.880	Driving	—	—	—	—	—	—	50	—	—	—
66.520	Driving	—	—	—	—	—	—	100	—	—	—
66.440	Driving	—	—	—	—	—	—	100	—	—	—
66.400	Driving	—	—	—	—	—	—	20	—	—	—
64.443	Driving	—	—	—	—	—	—	80	—	—	—
64.330	Driving	—	—	—	—	—	—	100	—	—	—
64.105	Driving	—	—	—	—	—	—	80	—	—	—

CRC PAVEMENT REPAIR Minnehaha and Lincoln Counties 029 N - 271 (CONTINUED)											
LOCATION		TYPE A SPALL			CRC PAVEMENT			SEAL RANDOM CRACKS IN PCCP	INSERT STEEL BAR IN PCC PAVEMENT		NO.6 REBAR SPLICE
				REPAIR			REPAIR		NO. 6 LONGI- TUDINAL DEFORMED TIE BAR EACH	NO. 4 TRANS- VERSE DEFORMED TIE BAR EACH	
MRM	LANE	LENGTH	WIDTH	SQFT	LENGTH	WIDTH	SQYD	FT			EACH
63.965	Driving	—	—	—	—	—	—	80	—	—	—
63.945	Driving	—	—	—	—	—	—	100	—	—	—
63.882	Driving	—	—	—	—	—	—	60	—	—	—
63.805	Passing	—	—	—	—	—	—	40	—	—	—
63.778	Driving	—	—	—	—	—	—	120	—	—	—
63.746	Driving	—	—	—	—	—	—	100	—	—	—
63.481	Driving	—	—	—	—	—	—	100	—	—	—
62.604	Driving	—	—	—	—	—	—	30	—	—	—
62.597	Driving	—	—	—	—	—	—	20	—	—	—
62.582	Driving	—	—	—	—	—	—	140	—	—	—
62.561	Driving	—	—	—	—	—	—	40	—	—	—
62.477	Driving	—	—	—	—	—	—	100	—	—	—
62.317	Driving	—	—	—	—	—	—	40	—	—	—
62.269	Passing	—	—	—	—	—	—	100	—	—	—
62.248	Driving	—	—	—	—	—	—	20	—	—	—
62.199	Driving	—	—	—	—	—	—	100	—	—	—
62.189	Driving	—	—	—	6'	14'	9.3	—	28	3	56
62.186	Driving	—	—	—	—	—	—	100	—	—	—
62.098	Driving	—	—	—	—	—	—	20	—	—	—
62.065	Driving	—	—	—	—	—	—	60	—	—	—
029 N - 271 Totals:				8			22.0	3820	66	9	132

CRC PAVEMENT REPAIR Minnehaha and Lincoln Counties											
029 S - 271											
LOCATION		TYPE A SPALL			CRC PAVEMENT			SEAL RANDOM CRACKS IN PCCP	INSERT STEEL BAR IN PCC 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
97.675	Passing	—	—	—	6'	5'	3.3	—	8	3	14
95.058	Driving	—	—	—	6'	5'	3.3	—	8	3	14
87.951	Driving	—	—	—	6'	6'	4.0	—	8	3	16
87.608	Passing	—	—	—	6'	5'	3.3	—	8	3	14
86.409	Driving	—	—	—	6'	6'	4.0	—	8	3	16
84.600	Driving	—	—	—	16'	14'	24.9	* 200	22	9	42
84.213	Driving	—	—	—	8'	6'	5.3	—	8	4	16
84.100	Driving	—	—	—	6'	5'	3.3	—	8	3	14
84.090	Driving	—	—	—	6'	5'	3.3	—	8	3	14
83.968	Driving	—	—	—	6'	5'	3.3	—	8	3	14
72.731	Driving	—	—	—	8'	14'	12.4	—	26	4	52
71.792	Driving	—	—	—	6'	6'	4.0	—	12	3	24
71.569	Driving	—	—	—	—	—	—	100	—	—	—
71.505	Driving	—	—	—	—	—	—	30	—	—	—
70.335	Driving	—	—	—	—	—	—	50	—	—	—
70.335	Passing	—	—	—	—	—	—	40	—	—	—
70.305	Driving	—	—	—	—	—	—	40	—	—	—
69.697	Driving	—	—	—	—	—	—	50	—	—	—
69.552	Driving	—	—	—	—	—	—	80	—	—	—
69.073	Driving	—	—	—	—	—	—	20	—	—	—
68.635	Driving	—	—	—	—	—	—	100	—	—	—
68.614	Driving	—	—	—	—	—	—	40	—	—	—
68.607	Driving	—	—	—	—	—	—	20	—	—	—
68.596	Driving	—	—	—	—	—	—	100	—	—	—
68.427	Driving	—	—	—	—	—	—	20	—	—	—
68.324	Driving	—	—	—	—	—	—	40	—	—	—
68.308	Driving	—	—	—	—	—	—	20	—	—	—
68.273	Driving	—	—	—	—	—	—	100	—	—	—
68.263	Driving	—	—	—	6'	8'	5.3	—	14	3	30
68.263	Driving	—	—	—	—	—	—	100	—	—	—
68.095	Driving	—	—	—	—	—	—	30	—	—	—
68.095	Passing	—	—	—	—	—	—	100	—	—	—
68.067	Driving	—	—	—	—	—	—	130	—	—	—
68.037	Driving	—	—	—	—	—	—	40	—	—	—
68.027	Driving	—	—	—	—	—	—	200	—	—	—
67.987	Passing	—	—	—	—	—	—	30	—	—	—
67.947	Driving	—	—	—	—	—	—	40	—	—	—
67.934	Driving	—	—	—	—	—	—	300	—	—	—
67.912	Driving	—	—	—	6'	6'	4.0	—	12	3	24
67.906	Driving	—	—	—	6'	6'	4.0	—	12	3	24
67.899	Driving	—	—	—	6'	6'	4.0	300	12	3	24
67.878	Driving	—	—	—	6'	5'	3.3	—	10	3	20

\* Actually a longitudinal joint.

CRC PAVEMENT REPAIR Minnehaha and Lincoln Counties 029 S - 271 (CONTINUED)											
LOCATION		TYPE A SPALL			CRC PAVEMENT			SEAL RANDOM CRACKS IN PCCP	INSERT STEEL BAR IN PCC 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
67.875	Driving	—	—	—	6'	6'	4.0	—	12	3	24
66.534	Driving	—	—	—	6'	5'	3.3	80	10	3	20
65.866	Driving	—	—	—	—	—	—	30	—	—	—
65.695	Driving	—	—	—	—	—	—	100	—	—	—
65.179	Driving	—	—	—	—	—	—	100	—	—	—
64.801	Driving	—	—	—	—	—	—	120	—	—	—
64.574	Passing	—	—	—	—	—	—	40	—	—	—
64.558	Passing	—	—	—	—	—	—	30	—	—	—
64.528	Driving	—	—	—	—	—	—	30	—	—	—
64.491	Driving	—	—	—	—	—	—	40	—	—	—
64.338	Driving	—	—	—	—	—	—	100	—	—	—
64.086	Driving	—	—	—	—	—	—	200	—	—	—
029 S - 271 Totals:				—			102.3	3190	214	65	416

CRC PAVEMENT REPAIR Moody County 029 N - 272											
LOCATION		TYPE A SPALL			CRC PAVEMENT			SEAL RANDOM CRACKS IN PCCP	INSERT STEEL BAR IN PCC 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 PCC 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'	5'	3.3	—	8	3	14
108.210	Driving	—	—	—	6'	8'	5.3	—	12	6	24
103.364	Driving	—	—	—	6'	8'	5.3	—	12	6	24
029 S - 272 Totals:				—			13.9	—	32	15	62

**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.

**COMPLETION DATE**

All work shall be completed on or before November 3, 2006.

**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 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.

**WASTE DISPOSAL SITE (CONTINUED)**

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 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 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**

The existing pavement is 10” 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 Lincoln County**

The existing pavement is 11” continuously reinforced PCC Pavement. The longitudinal reinforcing steel consists of No. 6 deformed bars spaced 6” center to center, and the transverse reinforcing steel consists of No. 4 deformed bars spaced 4’ center to center.

**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 shall be 11" (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. Mix proportions shall be as follows, dependent upon type of cement the Contractor elects to use:

	<b><u>LB./CUYD</u></b>	<b><u>LB./CUYD</u></b>
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.

**NONREINFORCED PCC PAVEMENT REPAIR (CONTINUED)**

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.

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.

**STEEL BAR INSERTION – NONREINFORCED PCC PAVEMENT (CONTINUED)**

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

Cost for sawing and sealing of the longitudinal construction joint and both transverse joints 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 (4"+ in Lincoln County and 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.

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 (11" in Lincoln County and 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.

CONTINUOUSLY REINFORCED PCC PAVEMENT REPAIR  
(CONTINUED)

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. Mix proportions shall be as follows, dependent upon type of cement the Contractor elects to use:

	<u>LB./CU.YD.</u>	<u>LB./CU.YD.</u>
CEMENT	800 (TYPE I or II)	710 (TYPE III)
FLY ASH	112	112
WATER	255	270
FINE AGGREGATE	1035	1110
COARSE AGGREGATE	1645	1590

The concrete mix design shall be approved by the Engineer before beginning repair operations.

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.

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 subgrade, 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.

REINFORCING STEEL (CONTINUED)

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 2' in Lincoln County and 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 keyway.

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.

MECHANICAL REBAR SPLICES

Mechanical rebar splices shall conform to Section 480.3.D.

Cost 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 also 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 specified lap splices shall be incidental to the contract unit price per each for No. 6 Rebar Splice.

STEEL BAR INSERTION - CRC 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.

**STEEL BAR INSERTION - CRC PAVEMENT (CONTINUED)**

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.

**SAW AND SEAL LONGITUDINAL JOINTS - CRC 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.

**REPAIR TYPE A SPALLS**

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

Spalls which are repaired according to plans and specifications and exhibit partial respalling or cracking, shall be repaired to the satisfaction of the Engineer at no additional cost to the Department of Transportation.

**ROUTING AND SEALING RANDOM CRACKS IN PCC/CRC PAVEMENT**

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

Routed cracks shall be sealed with Low Modulus Silicone Sealant. The sealant shall fit the joint such that after cooling, 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 OF ASPHALT CONCRETE SHOULDERS**

Cost for asphalt concrete 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.

**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 (19 workspaces with 900' tapers on I29 and 5 workspaces with 780' tapers on I229 equals 21000').

**SEQUENCE OF OPERATION**

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

- Northbound lanes from Friday, Aug. 4 through Friday, Aug. 11.
- Southbound lanes from Thursday, Aug. 10 through Monday, Aug. 14.

**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 III 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 prior to opening the lane to traffic. Hot-mix asphalt concrete shall be furnished by the Contractor.

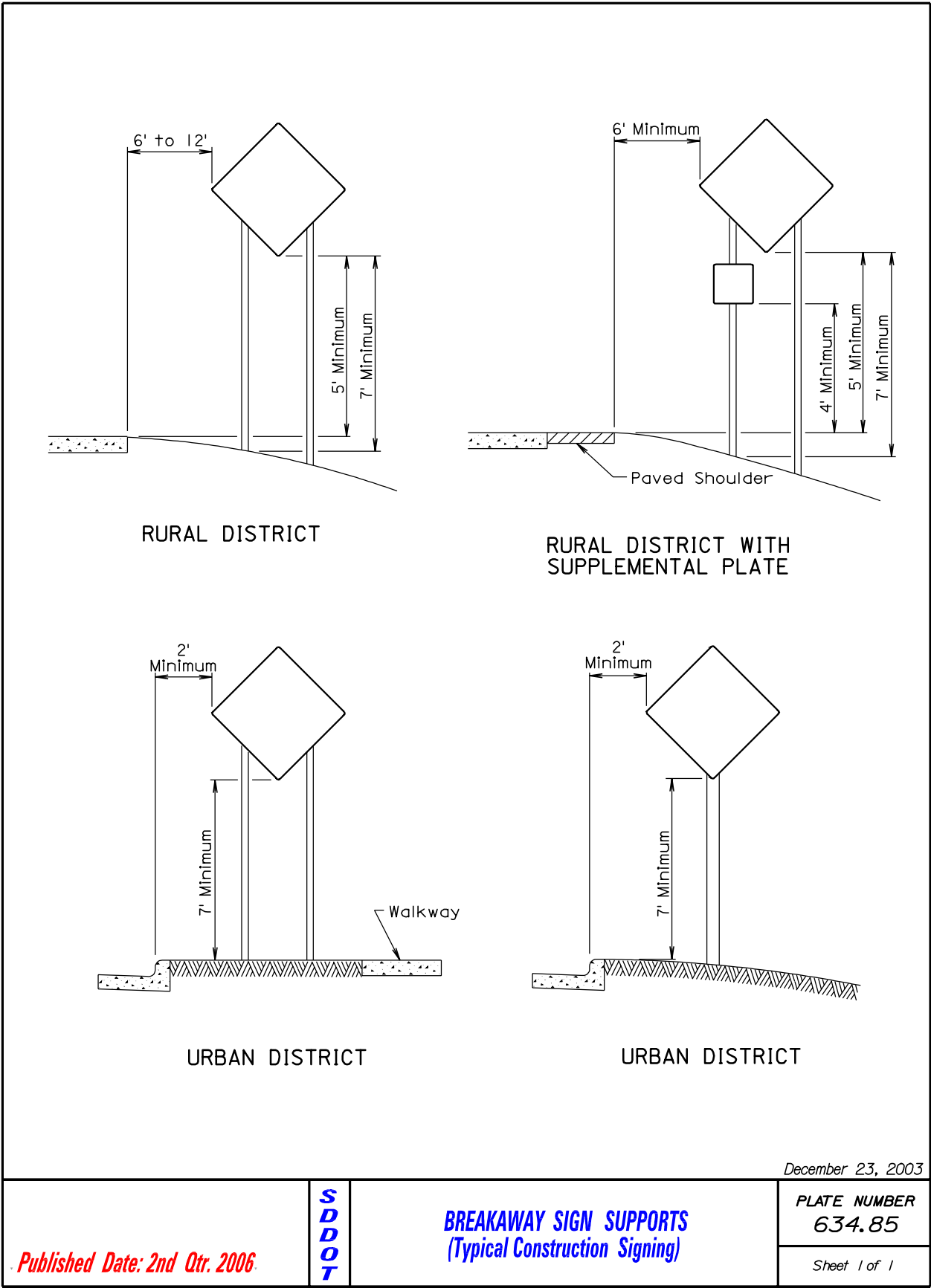
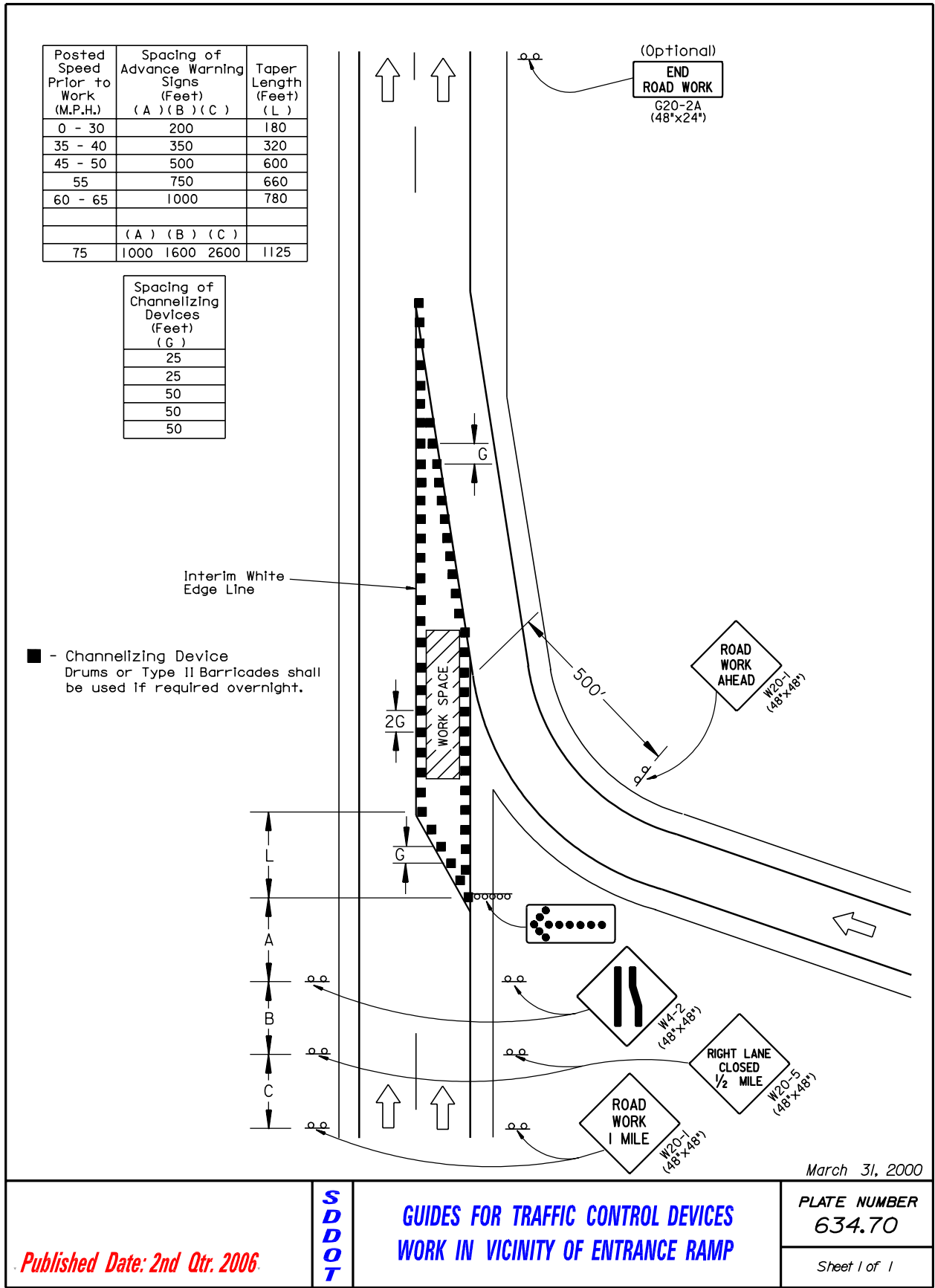
Cost for furnishing, hauling and placing asphalt concrete shall be incidental to the contract unit price per square yard for Nonreinforced PCC Pavement Repair or Continuously Reinforced PCC Pavement Repair.

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

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. This includes the routing of traffic onto these shoulders around the work zones.

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.

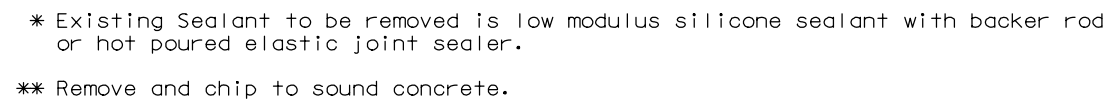






Plotting Date: 17-MAY-2006

## SPALL REMOVAL



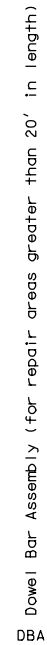
\*\* Remove and chip to sound concrete.

## Form Material-

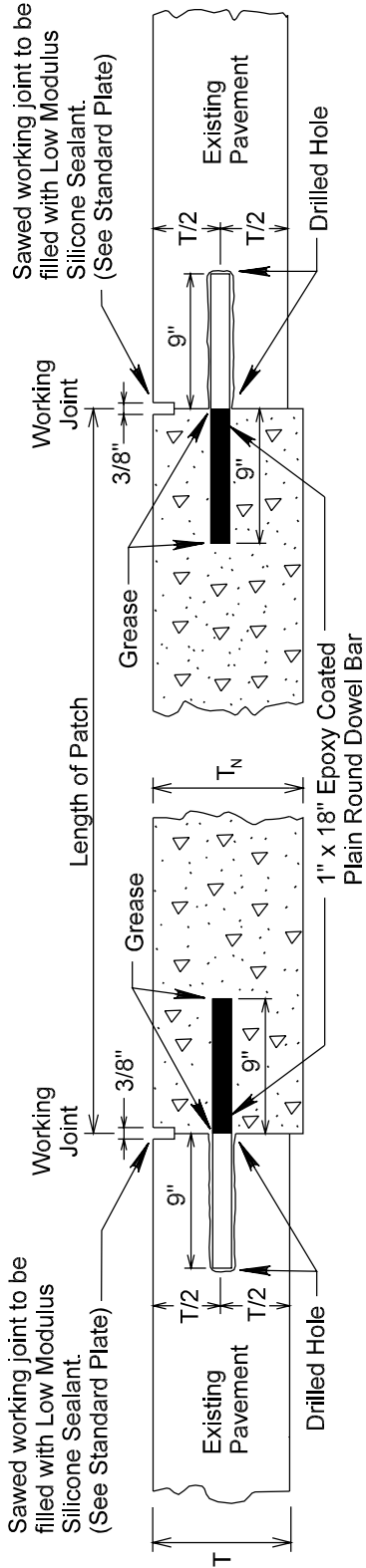


## NONREINFORCED PCC PAVEMENT REPAIR

### FOUR LANE DIVIDED - TYPICAL REPAIR AREAS



NONREINFORCED PCC PAVEMENT REPAIR  
 PLAIN ROUND DOWEL BAR INSERTION  
 (TWO WORKING JOINTS)

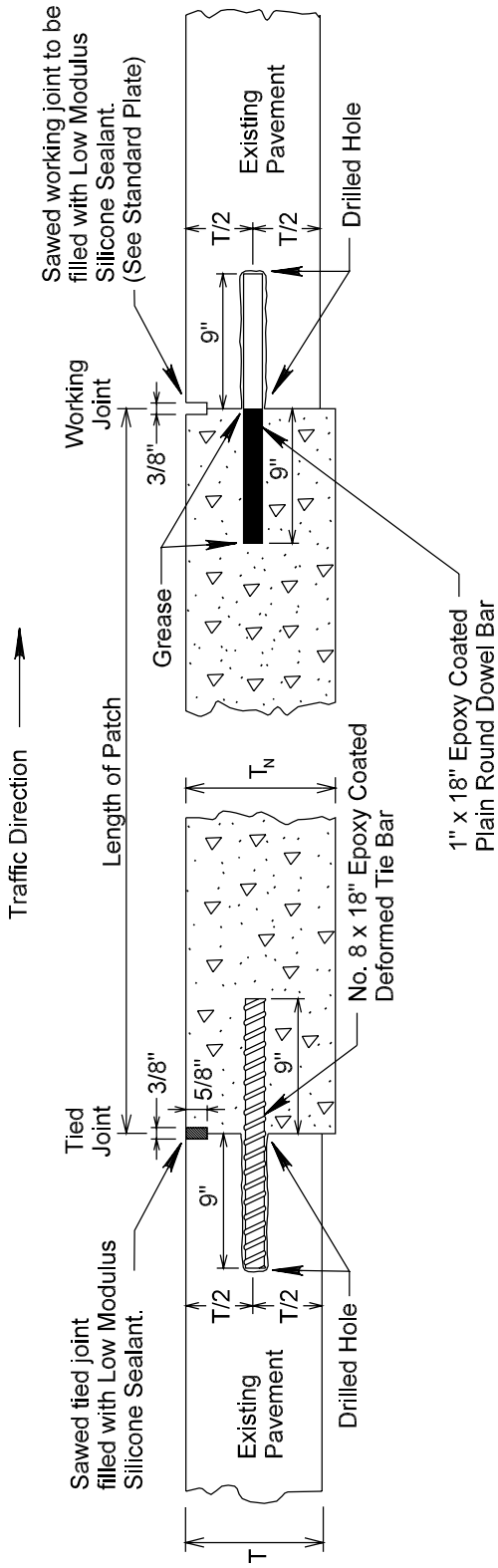


T = Existing pavement thickness.  
 T<sub>N</sub> = New pavement thickness (11").

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<sub>N</sub> = New pavement thickness (11").

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

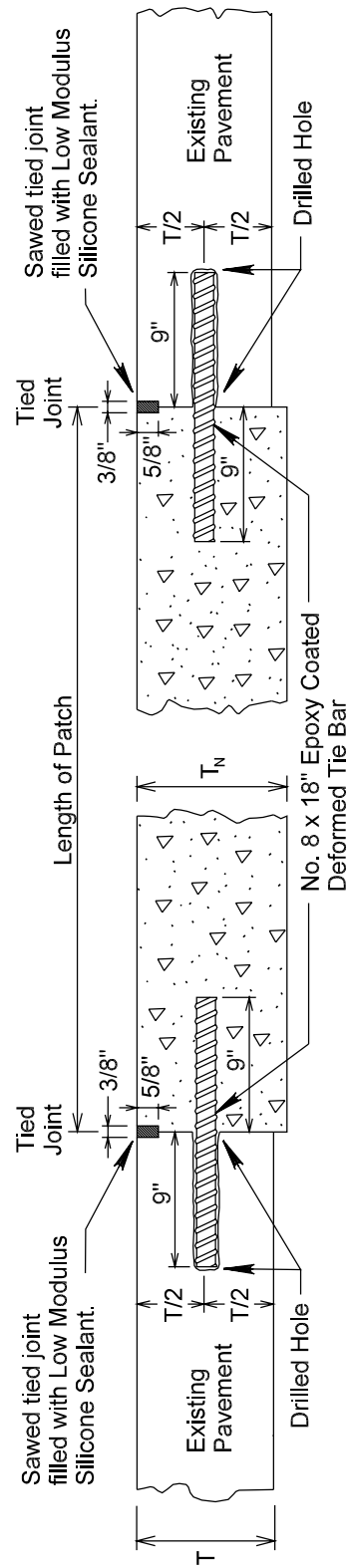
Cost for furnishing and inserting steel bars (deformed tie and plain round dowel) shall be included in the contract unit price per each for Insert Steel Bar in PCC Pavement.

STATE OF SOUTH DAKOTA	PROJECT						SHEET NO.	TOTAL SHEETS
	229	N	271	•	229	S	271	
029	N	271	•	029	S	271		
029	N	272	&	029	S	272	17	26

Plotting Date: 17-MAY-2006

# NONREINFORCED PCC PAVEMENT REPAIR

## DEFORMED TIE BAR INSERTION (TWO TIED JOINTS)



T = Existing pavement thickness.  
T<sub>N</sub> = New pavement thickness (11").

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

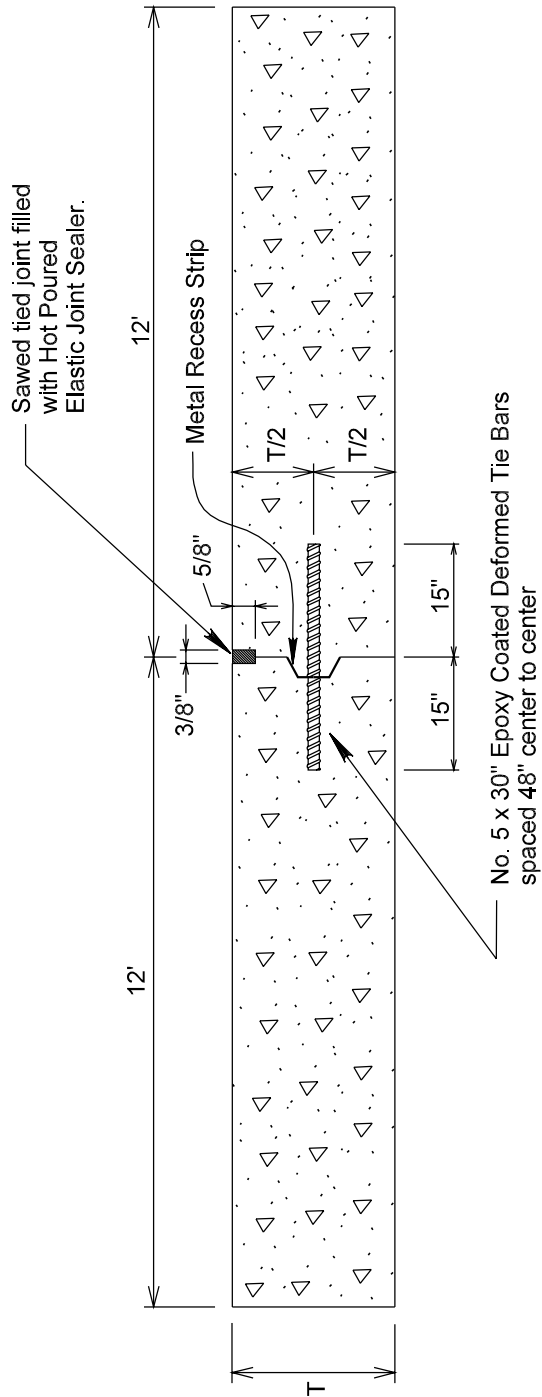
Cost for furnishing and inserting epoxy coated deformed tie bars shall be included in the contract unit price per each for Insert Steel Bar in PCC Pavement.

STATE OF SOUTH DAKOTA	PROJECT			SHEET NO.	TOTAL SHEETS
	229 N 271,	229 S 271,			
	029 N 271,	029 S 271,			
	029 N 272 &	029 S 272		18	26

Plotting Date: 17-MAY-2006

# NONREINFORCED PCC PAVEMENT REPAIR

## LONGITUDINAL CONSTRUCTION JOINT WITH TIE BARS & KEYWAY

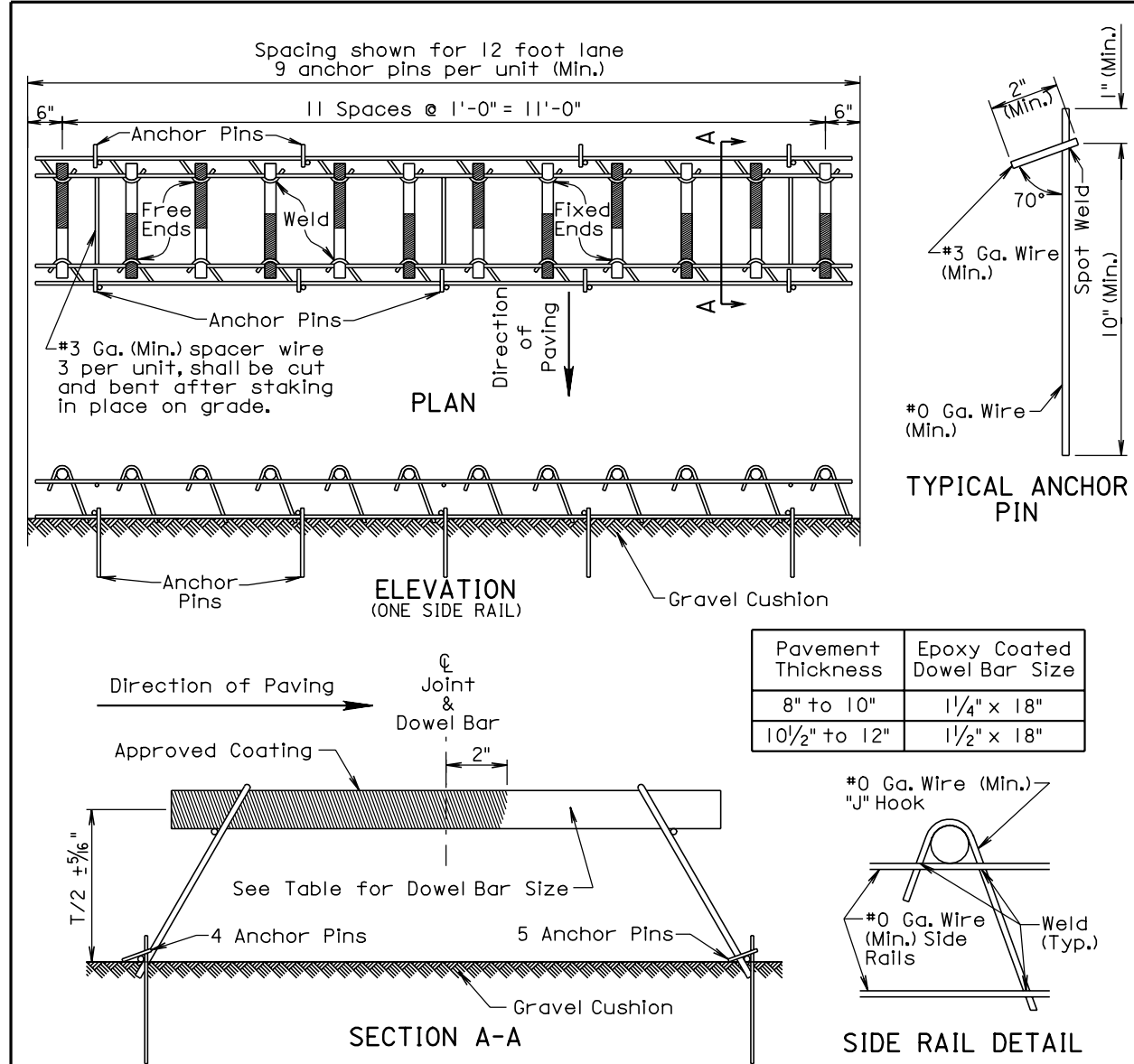


T = New pavement thickness.

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.





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  $\pm 1/8$  inch in 18 inches and to all other dowel bars in the assembly  $\pm 1/16$  inch in 18 inches.

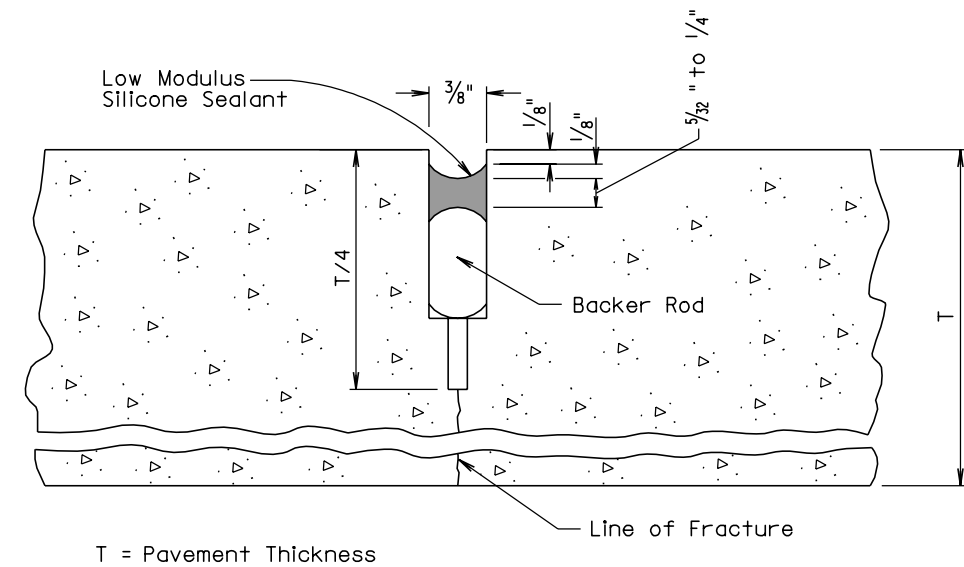
Centerline of individual dowel bars shall be parallel to the centerline of the roadway  $\pm 1/2$  inch in 18 inches.

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  $\pm 1$  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: 2nd Qtr. 2006.	S D D O T	PCC PAVEMENT DOWEL BAR ASSEMBLY FOR TRANSVERSE CONTRACTION JOINTS	PLATE NUMBER
			380.01
			Sheet 1 of 1



GENERAL NOTES:

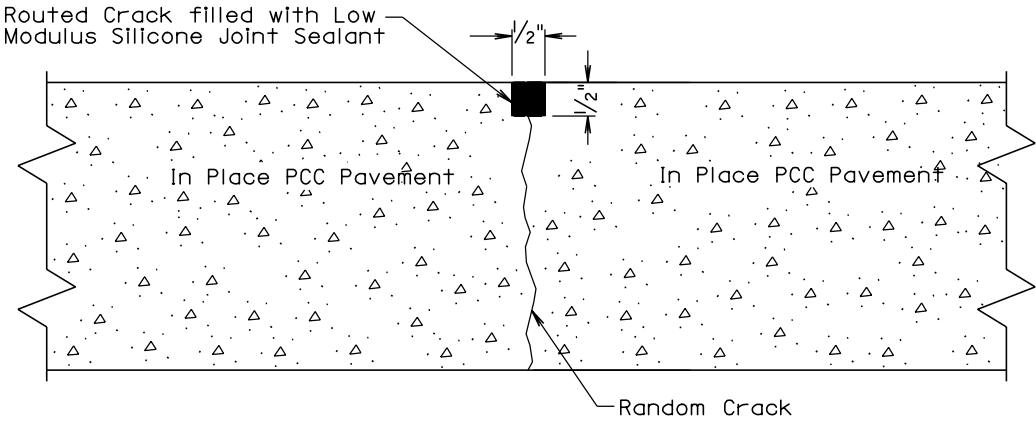
The first saw cut to control cracking shall be a minimum of  $1/4$  the thickness of the pavement. Additional sawing for widening the saw cut to provide the width for the installation of the low modulus silicone joint sealant will be necessary.

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

September 14, 2001

Published Date: 2nd Qtr. 2006.	S D D O T	PCC PAVEMENT TRANSVERSE CONTRACTION JOINT WITH OR WITHOUT DOWEL BAR ASSEMBLY	PLATE NUMBER
			380.03
			Sheet 1 of 1

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.

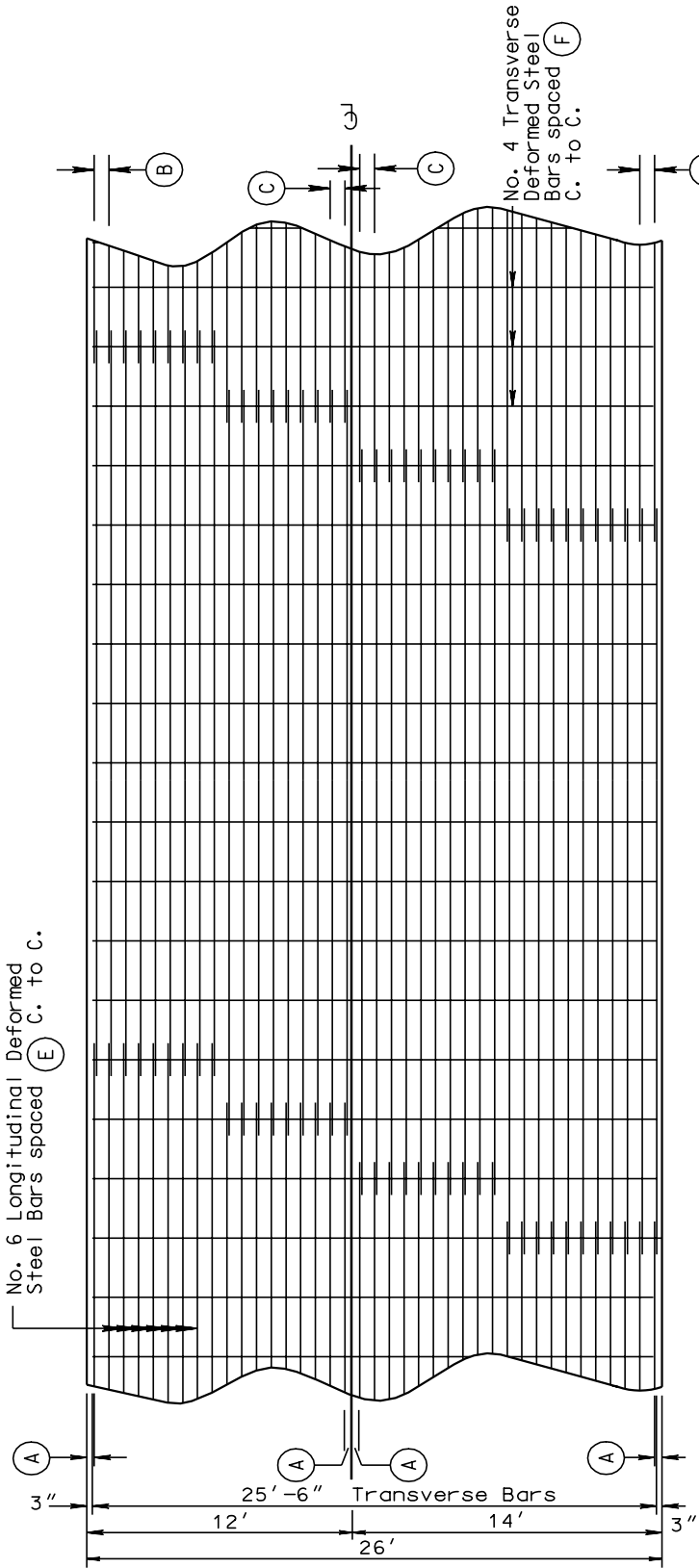
Each random crack shall be routed and the joint and roadway surface immediately cleaned by flushing with water or compressed air. The use of a concrete saw to route the crack will not be allowed. If there is any existing joint filler remaining in the cracks following routing, it shall be satisfactorily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

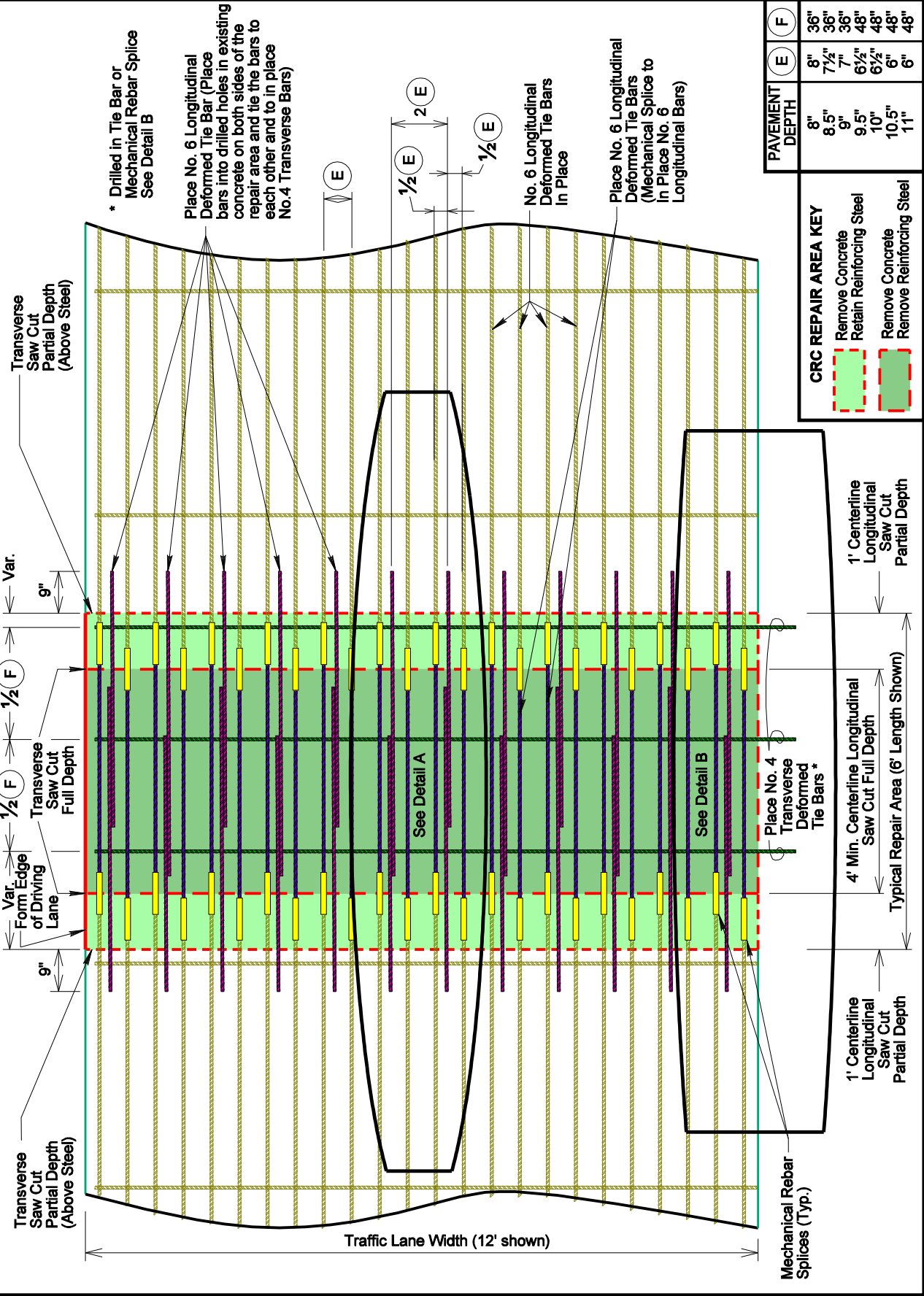


Depth of Pavement	(A)	(B)	(C)	(D)	(E)	(F)
8"	4"	8"	8"	8"	8"	36"
8.5"	4"	4"	4 1/2"	5 1/2"	7 1/2"	36"
9"	4"	5"	5"	8"	7"	36"
9.5"	3 3/4"	6 1/2"	6 1/2"	4 1/2"	6 1/2"	48"
10"	3 3/4"	6 1/2"	6 1/2"	4 1/2"	6 1/2"	48"
10.5"	4"	5"	5"	5"	6"	48"
*11"	4"	5"	5"	5"	6"	48"

\*Exception for Southbound Lanes on 129 from MRM 62.1 to MRM 72.8.

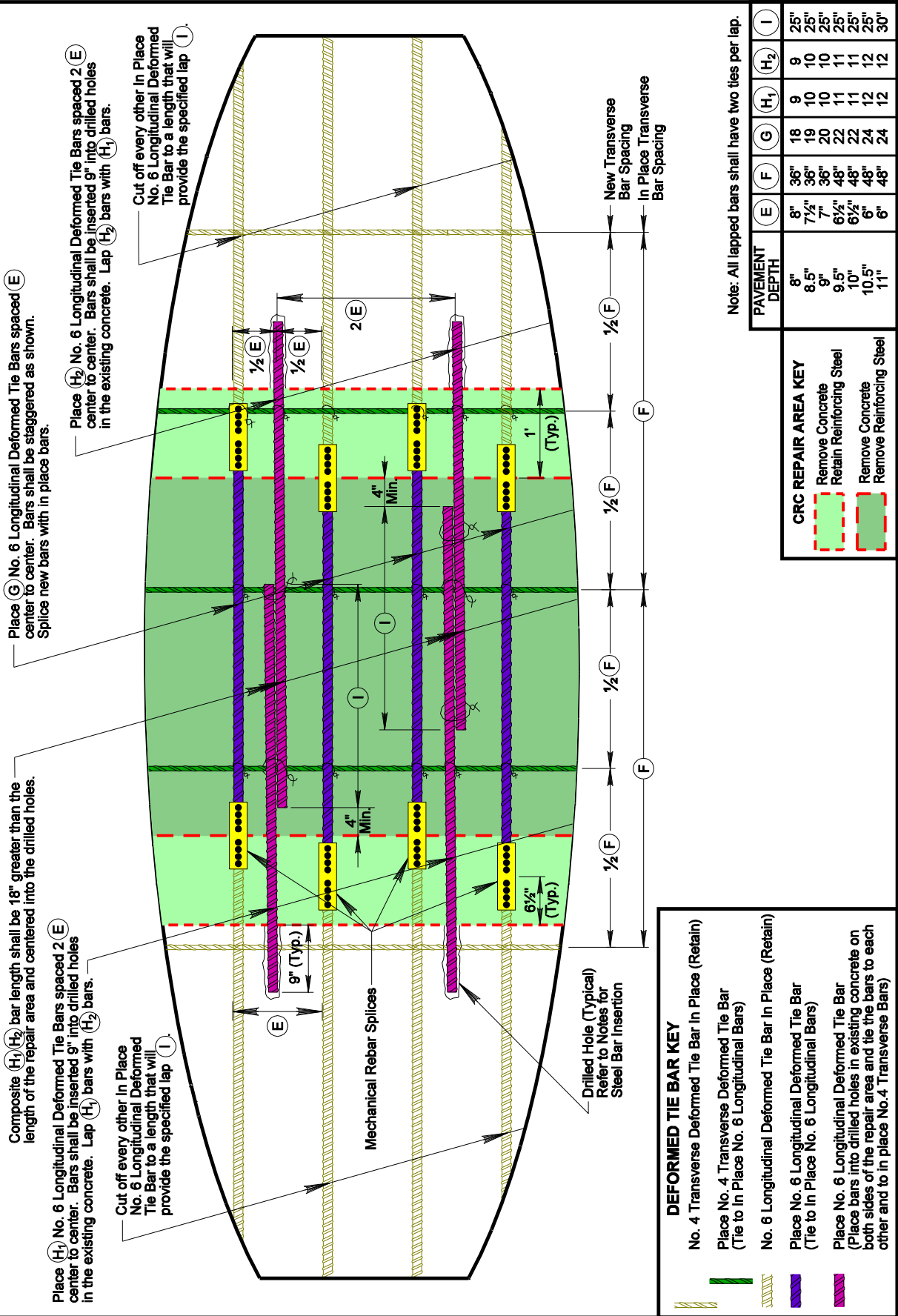
A = 3 3/4"  
B = 6 1/2"  
C = 6 1/2"  
D = 4 1/2"  
E = 6 1/2"  
F = 48"

CRC PAVEMENT REPAIR AREA - TYPICAL



CRC REPAIR AREA KEY			PAVEMENT DEPTH		F
	Remove Concrete	Retain Reinforcing Steel		E	
			8"	8"	36"
			8.5"	7 1/2"	36"
			9"	7"	36"
			9.5"	6 1/2"	48"
			10"	6 1/2"	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)

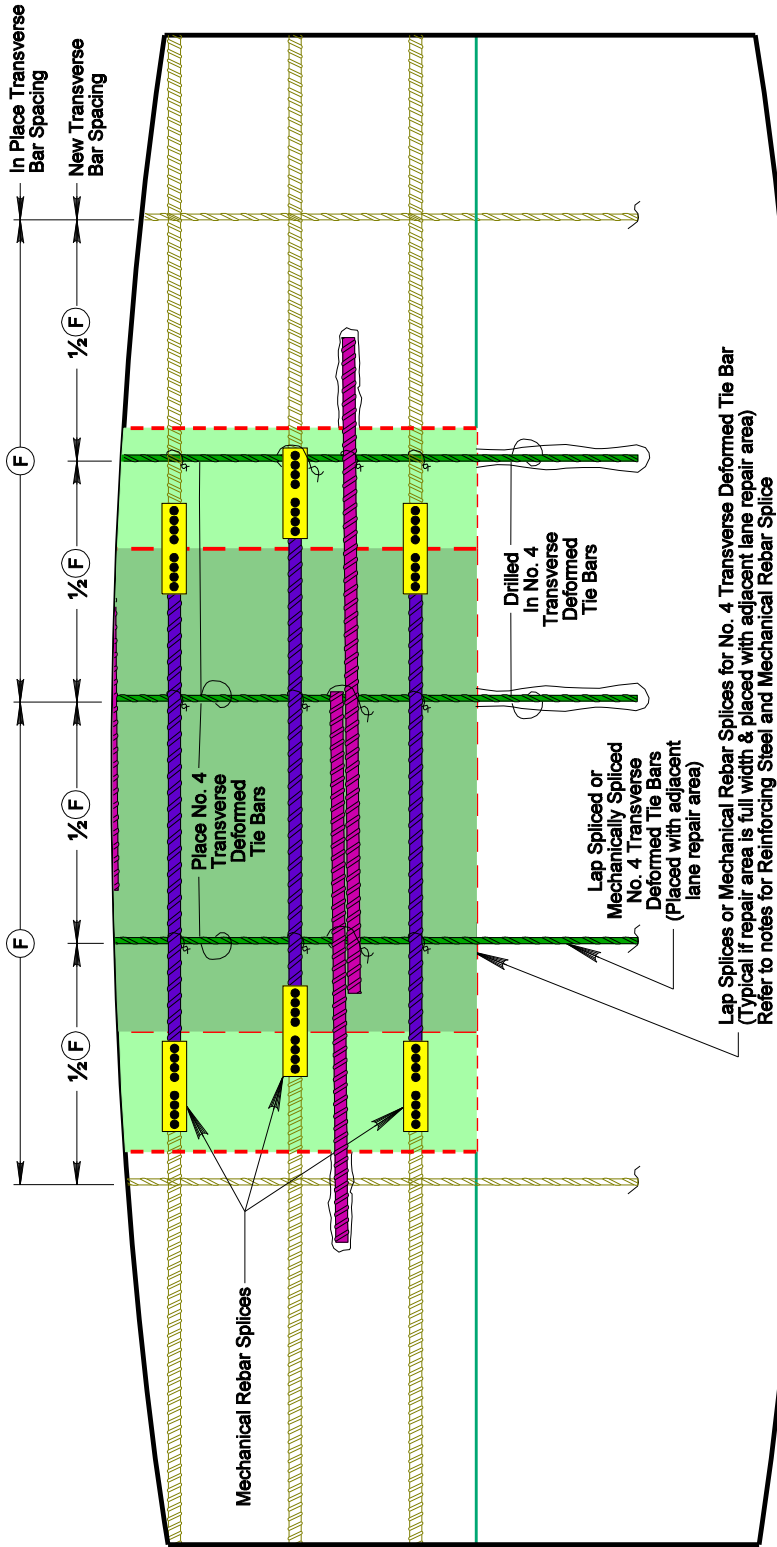
CRC REPAIR AREA KEY	
	Remove Concrete
	Retain Reinforcing Steel
	Remove Concrete
	Remove Reinforcing Steel

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

PAVEMENT DEPTH	E	F	G	H1	H2	I
8"	8"	36"	18	9	9	25"
8.5"	7 1/2"	36"	19	10	10	25"
9"	7"	36"	20	10	11	25"
9.5"	6 1/2"	48"	22	11	11	25"
10"	6 1/2"	48"	22	11	11	25"
10.5"	6"	48"	24	12	12	30"
11"	6"	48"	24	12	12	30"

# CRC PAVEMENT REPAIR AREA

Detail B (Scaled vertically for clarity)

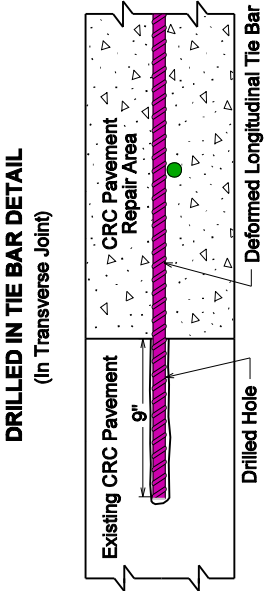


Note: All lapped bars shall have two ties per lap.

CRC REPAIR AREA KEY	PAVEMENT DEPTH	F
Remove Concrete	8"	36"
Retain Reinforcing Steel	8.5"	36"
Remove Concrete	9"	36"
Retain Reinforcing Steel	9.5"	36"
Remove Concrete	10"	48"
Retain Reinforcing Steel	10.5"	48"
Remove Concrete	11"	48"

## DEFORMED TIE BAR KEY

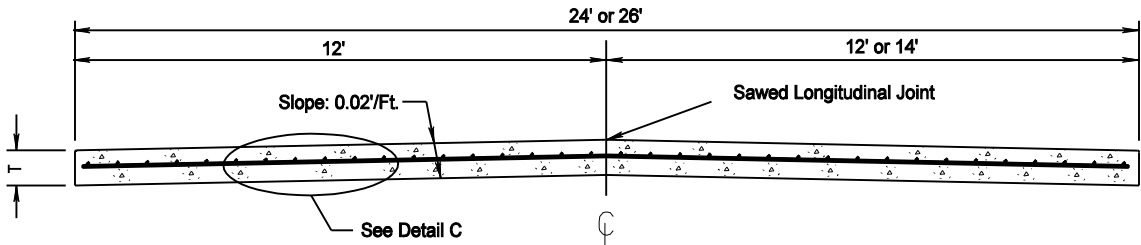
- No. 4 Transverse Deformed Tie Bar In Place (Retain)
- Place No. 4 Transverse Deformed Tie Bar (Tie to In Place No. 6 Longitudinal Bars)
- No. 6 Longitudinal Deformed Tie Bar In Place (Retain)
- Place No. 6 Longitudinal Deformed Tie Bar (Tie to In Place No. 6 Longitudinal Bars)
- Place No. 6 Longitudinal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



## DRILLED IN TIE BAR DETAIL

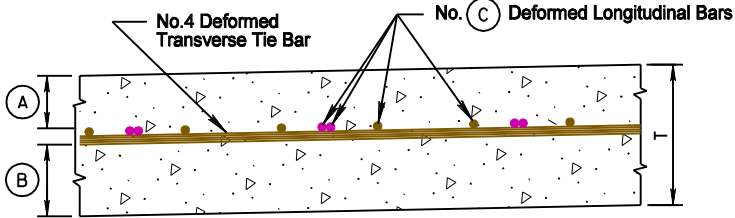
(In Transverse Joint)

## TRANSVERSE SECTION SHOWING STEEL PLACEMENT



Depth of Pavement (T)	(A)	(B)	(C)	(D)
#8"	3"	3 3/4"	6"	2"
8.5"	3 1/4"	4"	6"	2 1/8"
9"	3 1/2"	4 1/4"	6"	2 1/4"
9.5"	3 1/2"	4 3/4"	6"	2 3/8"
10"	3 1/2"	5 1/4"	6"	2 1/2"
10.5"	3 3/4"	5 1/2"	6"	2 5/8"
11"	4"	5 3/4"	6"	2 3/4"
11.5"	4"	5 7/8"	7"	2 7/8"
12"	4"	6 3/8"	7"	3"

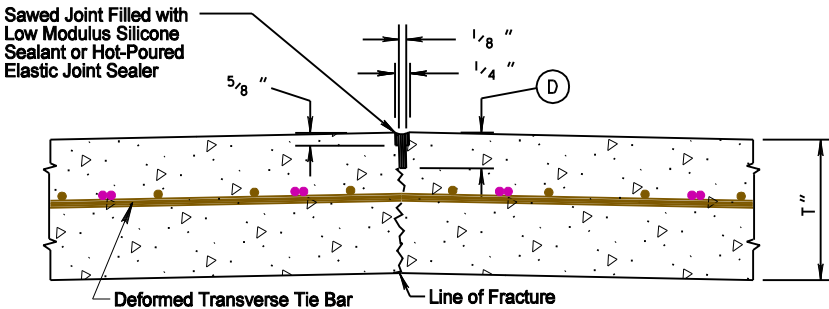
## DETAIL C



\*Exception for Southbound Lane on I29 from MRM 83.9 to MRM 98.7.

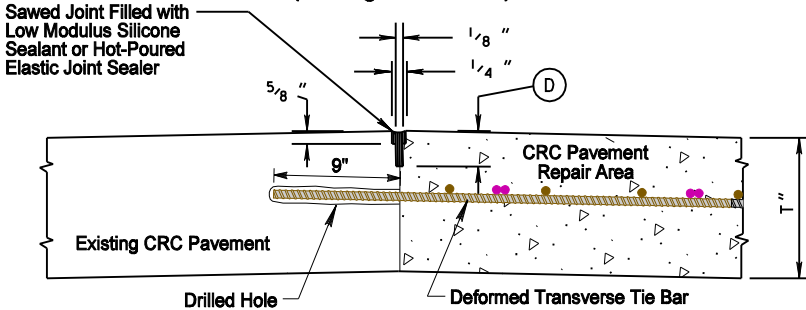
- A = 3 1/4"
- B = 3 1/2"
- C = 6"
- D = 2"

## 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.

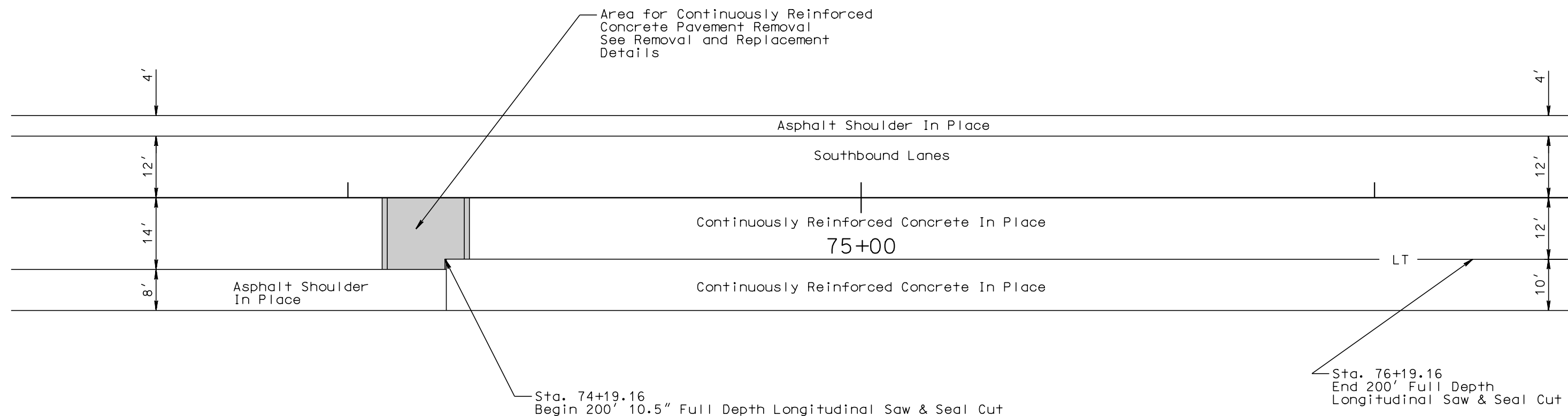
STATE OF SOUTH DAKOTA	PROJECT					SHEET NO.	TOTAL SHEETS
	229 N	271 S	229 S	271 S	271 S		
	029 N	271 S	029 S	271 S	271 S	24	26
	029 N	272 S	029 S	272 S	272 S		

Plotting Date: 17-MAY-2006

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

Sheet 1 of 3

I29 & I90 INTERCHANGE  
RAMP H



PLOT SCALE - 6.66666611.000000

PLOTTED FROM - TRM111118

STATE OF SOUTH DAKOTA	PROJECT				SHEET NO.	TOTAL SHEETS
	229 N 271	229 S 271	029 N 271	029 S 271		
	029 N 272	029 S 272	029 N 272	029 S 272	25	26

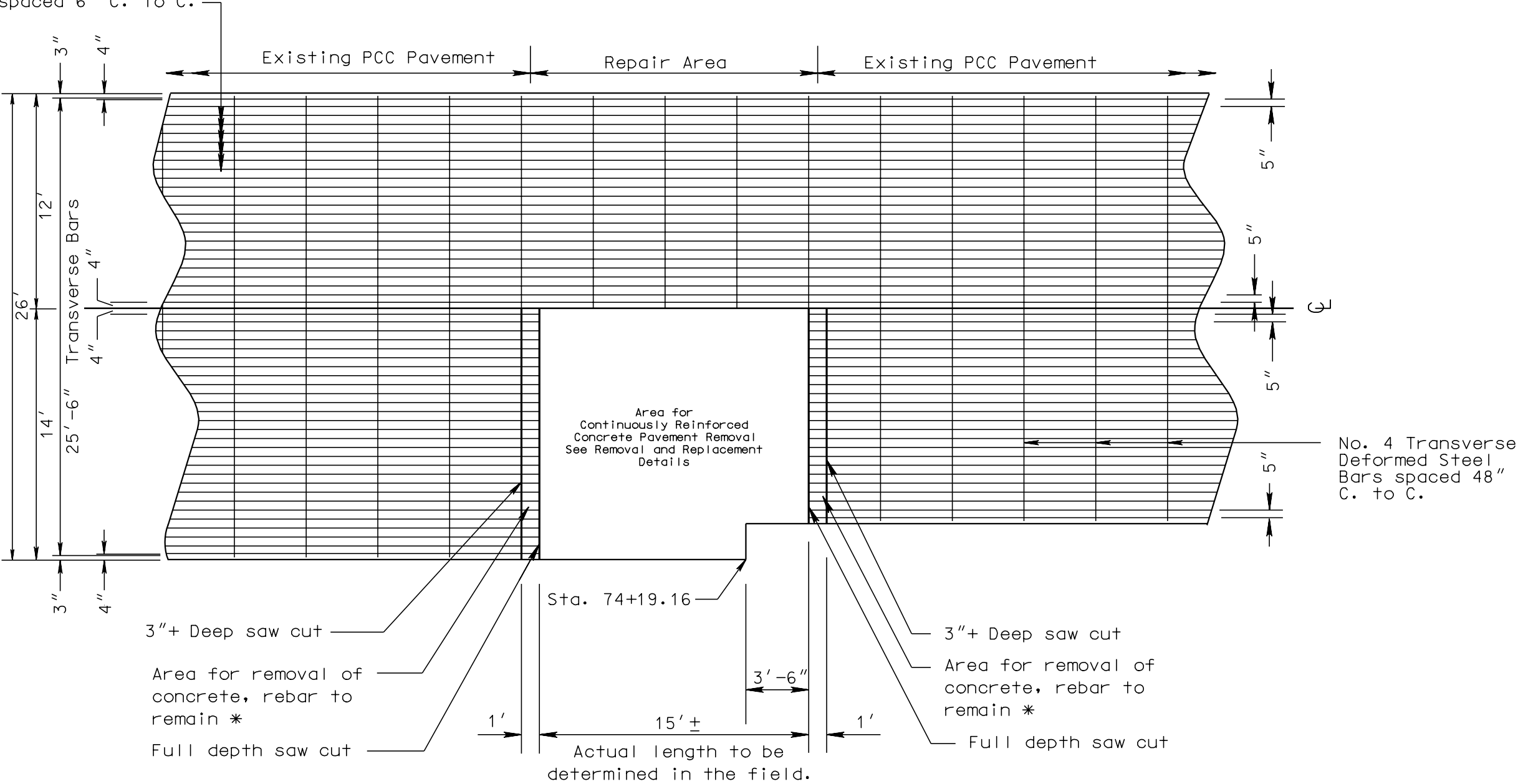
Plotting Date: 17-MAY-2006

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

Sheet 2 of 3

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

No. 6 Longitudinal Deformed Steel Bars spaced 6" C. to C.



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