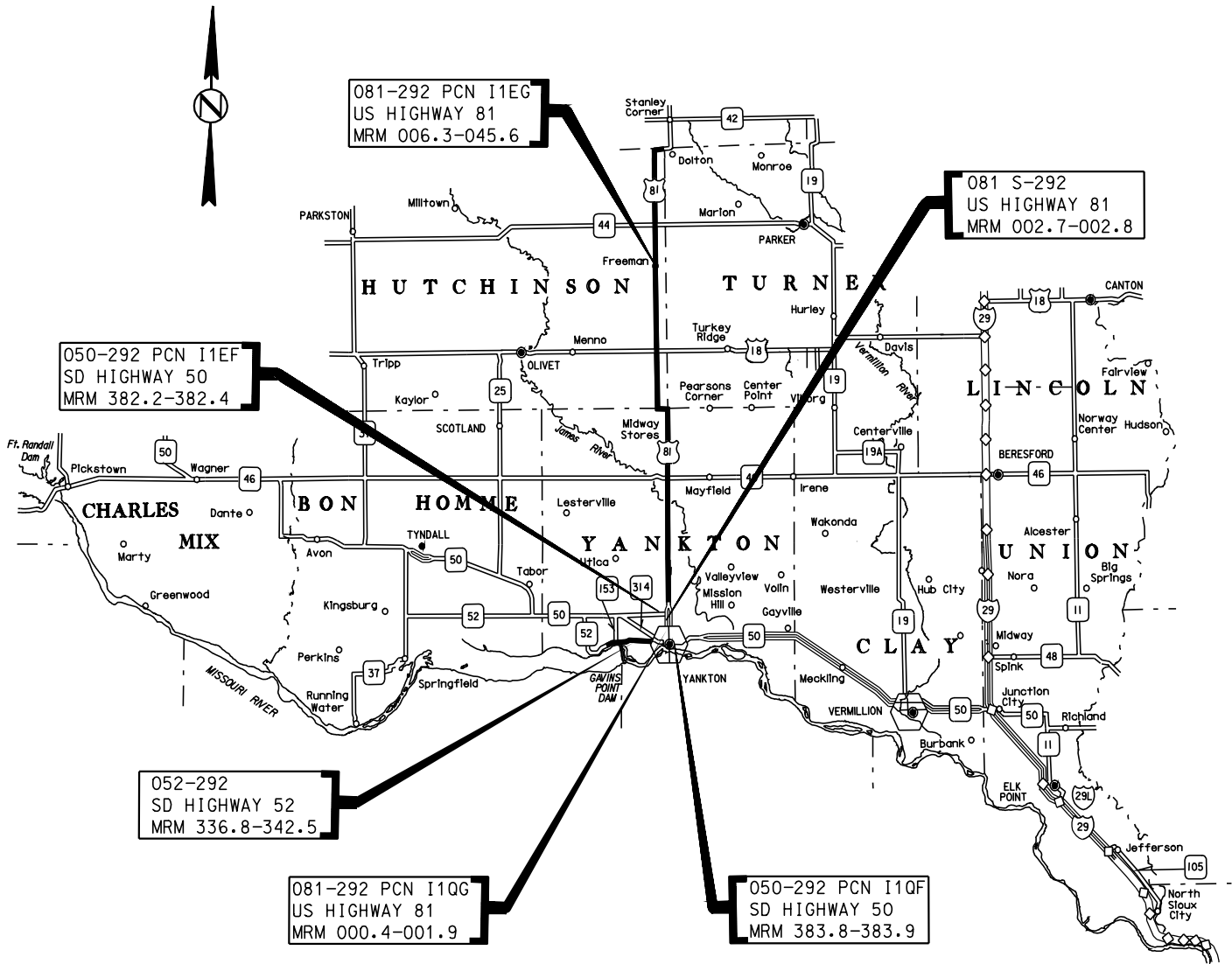


**050-292, 050-292, 052-292, 081-292, 081-292 & 081 S-292
 HUTCHINSON & YANKTON COUNTIES
 PCC PAVEMENT & CURB & GUTTER REPAIR
 PCN I1EF, I1QF, I1EH, I1QG, I1EG & I1QH**



Storm Water Permit - none required.

**050-292, 050-292, 052-292, 081-292, 081-292 & 081 S-292
HUTCHINSON & YANKTON COUNTIES**

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DESIGN DESIGNATION

PROJECT	050-292	050-292	052-292	081-292	081-292	081 S-292
PCN	I1EF	I1QF	I1EH	I1QG	I1EG	I1QH
ROUTE	SD50	SD50	SD52	US81	US81	US81
MRM-MRM	382.2-382.4	383.8-383.9	336.8-342.5	000.4-001.9	006.3-045.6	002.7-002.8
ADT(2009)	3370	10155	4890	16160	2180	13652
ADT(2029)	4295	14170	6000	22585	3065	19415
DHV	455	1505	900	2395	465	2060
D	50%	50%	50%	50%	50%	50%
T DHV	5.60%	2.0%	2.5%	2.1%	2.1%	3.3%
T ADT	12.4%	4.3%	5.4%	4.6%	4.6%	7.3%

ESTIMATE OF QUANTITIES

BID ITEM NUMBER	ITEM	050-292	050-292	052-292	081-292	081-292	081 S-292	TOTAL	
		PCN I1EF QUANTITY	PCN I1QF QUANTITY	PCN I1EH QUANTITY	PCN I1QG QUANTITY	PCN I1EG QUANTITY	PCN I1QH QUANTITY	QUANTITY	UNIT
009E0010	Mobilization	<-----LUMP SUM----->						Lump Sum	LS
380E5030	Nonreinforced PCC Pavement Repair	-	-	389.0	-	297.4	8.0	694.4	SqYd
380E6000	Dowel Bar	-	-	458	-	171	12	641	Each
380E6110	Insert Steel Bar in PCC Pavement	10	12	705	14	219	20	980	Each
380E6200	Tie Bar Retrofit, Stitching	-	-	150	-	-	-	150	Each
380E6310	Seal Random Cracks in PCC Pavement	-	-	121	-	-	-	121	Ft
390E0200	Repair Type A Spall	-	-	264.8	-	-	-	264.8	SqFt
634E0010	Flagging	5	5	25	5	25	5	70	Hour
634E0100	Traffic Control	229	229	1342	229	253	230	2512	Unit
634E0120	Traffic Control, Miscellaneous	<-----LUMP SUM----->						Lump Sum	LS
634E0310	Temporary Road Markers	600	180	6000	360	5460	600	13200	Ft
634E0420	Type C Advance Warning Arrow Panel	<-----2 each----->						2	Each
634E0610	4" Temporary Pavement Marking Tape Type 2	-	-	-	-	1008	-	1008	Ft
650E0070	Type B67 Concrete Curb and Gutter	7	25	-	25	-	-	57	Ft

Sheet 3 of 44

050-292, 050-292, 052-292, 081-292, 081-292 & 081 S-292
HUTCHINSON & YANKTON COUNTIES

**050-292, 050-292, 052-292, 081-292, 081-292 & 081 S-292
HUTCHINSON & YANKTON COUNTIES**

TABLE FOR PCC PAVEMENT REPAIR - PROJECT 052-292 PCN 11EH

JOINT NO.	LANE	CENTER PASSING DRIVING						PCCP SqYds	NEW JOINT CON-FIG.	INSERT STEEL BAR IN PCC PAVEMENT			TIE BAR RETROFIT STITCHING Each	REPAIR TYPE A SPALL SqFt	SEAL RANDOM CRACKS IN PCCP Ft	
		LANE		LANE		LANE				No. 9 x 18" DEFORMED TIE BARS Each	No. 5 x 24" DEFORMED TIE BARS Each	DOWEL BAR Each				
		L Ft	W Ft	L Ft	W Ft	L Ft	W Ft									
22	EB														14	
26	EB														15	
29	EB														15	
31	EB												0.63			
33	EB														15	
38	EB												0.49			
40	EB												0.50			
43	EBT												0.17			
48	EB												0.19			
51	EB												0.50			
66	EB												1.50			
70	EB														8	
70	CT&WB	4	6			4	6	5.3	R	16	8	12				
76	WB													3.75		
77	EB													1.00		
85	EB													0.25		
90	EB													1.00		
99	CT													0.44		
106	EB													1.50		
107	EB													0.56		
119	EB													0.75		
121	WB					4	6	2.7	R	8	4	6				
129	EB													2.50		
141	EB													2.50		
146	EB													1.50		
151	EB													2.00		
153	EB													0.50		
154	EB													1.00		
157	EB													2.50		
161	EB													2.00		
163	EB													0.83		
165	EB													0.25		
166	EB													0.75		
169	EB													1.13		
170	EB					4	6	2.7	R	8	4	6				
172	EB													0.75		
173	CT													0.50		
182	EB													0.50		
183	EB													0.50		
185	EB													2.00		
186	CT	5	6					3.3	R	8	4	6				
191	EB													2.00		
195	EB					8	6	5.3	R	8	3	6	40			
196	EB													0.50		
199	EB													1.00		
204	EB													2.00		
210	EB													1.50		
212	EB													2.00		
213	EB													2.00		
214	EB													0.33		
220	EB													0.50		
221	EB													2.00		
223	EB													1.13		
SHEET 4 TOTALS:								19.3			48	23	36	40	49.90	67

**050-292, 050-292, 052-292, 081-292, 081-292 & 081 S-292
HUTCHINSON & YANKTON COUNTIES**

TABLE FOR PCC PAVEMENT REPAIR - PROJECT 052-292 PCN 11EH

JOINT NO.	LANE	INSERT STEEL BAR IN PCC PAVEMENT						NEW JOINT CON-FIG.	PCCP SqYds	No. 9 x 18" DEFORMED TIE BARS Each	No. 5 x 24" DEFORMED TIE BARS Each	DOWEL BAR Each	TIE BAR RETROFIT STITCHING Each	REPAIR TYPE A SPALL SqFt	SEAL RANDOM CRACKS IN PCCP Ft
		CENTER LANE		PASSING LANE		DRIVING LANE									
		L Ft	W Ft	L Ft	W Ft	L Ft	W Ft								
224	EB												0.25		
228	EB												2.50		
230	EB												0.75		
232	CT												0.75		
233	EB												0.50		
234	EB												0.75		
235	EB												0.75		
236	EB												2.00		
238	EB												0.75		
240	EB												1.00		
242	EB												1.50		
246	EB												0.13		
247	EB												0.50		
249	EB												0.75		
252	EB												0.50		
254	EB												1.50		
255	EB												0.33		
257	EB												0.33		
258	EB												6.00		
260	EB												1.50		
261	EB												2.00		
267	EB												2.00		
271	EB												0.50		
273	EB												0.50		
275	EB												1.33		
277	EB												0.33		
278	EB												0.25		
280	EB												1.33		
282	EB												1.33		
284	EB												2.50		
286	EB												0.83		
287	EB												0.25		
288	EB												2.00		
290	EB												0.50		
291	EB												0.25		
293	EB												0.50		
294	EB												0.83		
295	EB												2.00		
296	EB												2.50		
297	EB												0.33		
298	EB												1.50		
300	EB												1.00		
302	EB												1.25		
304	EB												0.56		
306	EB												2.00		
307	EB												0.50		
308	EB												0.50		
310	EB												0.56		
312	EB												1.13		
314	EB												2.00		
316	EB												0.75		
317	EB												0.56		
318	EB												3.00		
320	EB												1.50		
SHEET 5 TOTALS:							0.0	0	0	0	0	0	61.91	0	

**050-292, 050-292, 052-292, 081-292, 081-292 & 081 S-292
HUTCHINSON & YANKTON COUNTIES**

TABLE FOR PCC PAVEMENT REPAIR - PROJECT 052-292 PCN 11EH

JOINT NO.	LANE	CENTER PASSING DRIVING						PCCP SqYds	NEW JOINT CON-FIG.	INSERT STEEL BAR IN PCC PAVEMENT			TIE BAR RETROFIT STITCHING Each	REPAIR TYPE A SPALL SqFt	SEAL RANDOM CRACKS IN PCCP Ft
		LANE		LANE		LANE				No. 9 x 18" DEFORMED TIE BARS Each	No. 5 x 24" DEFORMED TIE BARS Each	DOWEL BAR Each			
		L Ft	W Ft	L Ft	W Ft	L Ft	W Ft								
322	EB												1.50		
323	EB												2.00		
324	EB											20			
325	EB												1.13		
326	EB												1.13		
328	EB												1.13		
329	EB												0.50		
329	EB												0.25		
331	EB												1.13		
333	EB												3.75		
336	EB												1.00		
339	EB												1.50		
342	EB												1.00		
343	EB												2.00		
344	EB					6	14	9.3	R	18	2	14			
345	EB												2.00		
350	EB												2.00		
351	EB												0.25		
362	EBP												1.00		
364	EBP												1.00		
365	EBD													14	
367	EBP												1.00		
372	EBP												1.00		
374	EBP												0.75		
376	EBD												0.50		
376	WBP												4.00		
385	EBP												4.50		
389	EBD											10			
422	WBP												0.75		
427	EBP												0.75		
434	WBD			6	12	6	14	17.3	R	34		26			
466	EBD													14	
467	EBP												1.00		
468	EBD											10			
475	EBP												0.75		
476	EBP												0.75		
480	EBP												1.50		
480	EBD											20			
490	EBD					6	14	9.3	R	18	2	14			
500	EBD												6.00		
508	EBP												0.50		
511	EBP												0.50		
514	EBP												1.50		
527	EBP												1.50		
527	EBD												2.00		
538	EBP												0.75		
542	EBP												0.75		
550	EBP												0.25		
556	EBP												0.75		
572	EBP												0.75		
578	EBP												0.25		
585	WBD												0.25		
585	WBD												0.25		
SHEET 6 TOTALS:								35.9		70	4	54	60	57.52	28

**050-292, 050-292, 052-292, 081-292, 081-292 & 081 S-292
HUTCHINSON & YANKTON COUNTIES**

TABLE FOR PCC PAVEMENT REPAIR - PROJECT 052-292 PCN 11EH

JOINT NO.	LANE	CENTER PASSING DRIVING						PCCP SqYds	NEW JOINT CON-FIG.	INSERT STEEL BAR IN PCC PAVEMENT			TIE BAR RETROFIT STITCHING Each	REPAIR TYPE A SPALL SqFt	SEAL RANDOM CRACKS IN PCCP Ft
		LANE		LANE		LANE				No. 9 x 18" DEFORMED TIE BARS Each	No. 5 x 24" DEFORMED TIE BARS Each	DOWEL BAR Each			
		L Ft	W Ft	L Ft	W Ft	L Ft	W Ft								
587	WBP												5.00		
591	EBP												1.00		
592	EBP			4	6		2.7	R	8	2	6				
594	WBP			6	12		8.0	R	16	2	12				
603	EBP												0.75		
611	EBP												0.25		
612	EBP												2.00		
628	EBP												1.00		
629	EBP												1.00		
630	EBP												2.00		
636	EBP												1.00		
646	WBP			10	12		13.3	R	16	4	12				
646	EBD					6	4.0	R	8	4	6				
648	EBP												2.00		
650	EBP												1.00		
651	CT	6	12				8.0	R	16	2	12				
659	EBP												0.75		
663	EBP												0.75		
666	EBP												0.50		
666	EBP												0.75		
680	EBP												0.50		
684	EBP												0.75		
686	EBP												0.75		
687	EBD											20			
690	EBP												0.75		
692	EBP												1.50		
694	EBP												1.50		
698	CT												3.00		
701	EBP												0.75		
704	EBD			7	6	7	9.3	R	16	4	12				
706	EBP												0.75		
714	EBP												0.25		
717	WBD					7	4.7	R	8	4	6				
720	EBP												0.50		
722	EBP												1.50		
725	EBP												0.50		
743	EBD					4	2.7	R	8	4	6				
744	EBP												0.75		
749	EBP												2.00		
752	EBP												2.00		
757	WBD					6	4.0	R	8	4	6				
759	CT												1.50		
764	EBP												3.00		
766	CT&EBP	4	6	4	6		5.3	R	16	4	12				
782	EBP												1.00		
795	WBP			4	6		2.7	R	8	2	6				
804	WBP			6	12		8.0	R	16	2	12				
805	WBP			6	12		8.0	R	16	2	12				
820	EBP												0.75		
822	EBP												1.50		
834	EBP												0.75		
837	EBP												3.00		
SHEET 7 TOTALS:								80.7		160	40	120	20	49.00	0

**050-292, 050-292, 052-292, 081-292, 081-292 & 081 S-292
HUTCHINSON & YANKTON COUNTIES**

TABLE FOR PCC PAVEMENT REPAIR - PROJECT 052-292 PCN 11EH

JOINT NO.	LANE	CENTER LANE		PASSING LANE		DRIVING LANE		PCCP SqYds	NEW JOINT CON-FIG.	INSERT STEEL BAR IN PCC PAVEMENT			TIE BAR RETROFIT STITCHING Each	REPAIR TYPE A SPALL SqFt	SEAL RANDOM CRACKS IN PCCP Ft
		L Ft	W Ft	L Ft	W Ft	L Ft	W Ft			No. 9 x 18" DEFORMED TIE BARS Each	No. 5 x 24" DEFORMED TIE BARS Each	DOWEL BAR Each			
840	EBP													1.25	
852	WBP			6	12			8.0	R	16	2	12			
871	EBP													0.75	
883	EBP													1.50	
902	WBP			6	12			8.0	R	16	2	12			
922	EBP													1.50	
932	WBP&D			6	12	6	14	17.3	R	34		26			
935	CT	6	12					8.0	R	16	2	12			
935	EBP&D			6	12	6	14	17.3	R	34		26			
944	EBP													1.00	
950	EBP													1.00	
957	EBP													0.50	
959	EBD					10	14	15.6	R	18	4	14			
964	EBP												30	0.75	
971	CT														
1009	EBP													1.50	
1010	WBP&D			4	6	4	6	5.3	R	16	2	12			
1014	EBP													1.00	
1015	WBP													3.00	
1021	EBP													0.50	
1026	EBP													0.50	
1051	WBP													0.25	
1059	EBP													0.75	
1060	WBD					4	6	2.7	R	8	4	6			
1087	EBP													0.25	
1089	EBP													0.25	
1093	EBP													0.25	
1095	EBP													1.00	
1098	EBP													1.00	
1127	EBP													0.75	
1131	EBP													0.75	
1134	EBP													0.75	
1142	EBP													2.00	
1144	EBP													0.25	
1151	EBP													0.50	
1153	EBP													2.00	
1182	EBP													0.50	
1184	EBP													0.50	
1189	EBP													0.50	
1192	EBP													0.50	
1199	EBP													2.00	
1200	EBP&D														26
1214	EBP													1.00	
1214	WBP&D			8	6	8	14	17.8	R	26	3	20			
1216	EBP													2.00	
1219	EBP													2.00	
1235	EBP													2.00	
1246	EBP&D			20	12	20	14	57.8	R	34	7	26			
1280	EBP													3.00	
SHEET 8 TOTALS:								157.8		218	26	166	30	39.50	26

**050-292, 050-292, 052-292, 081-292, 081-292 & 081 S-292
HUTCHINSON & YANKTON COUNTIES**

TABLE FOR PCC PAVEMENT REPAIR - PROJECT 052-292 PCN 11EH

JOINT NO.	LANE	CENTER LANE		PASSING LANE		DRIVING LANE		PCCP SqYds	NEW JOINT CON-FIG.	INSERT STEEL BAR IN PCC PAVEMENT			TIE BAR RETROFIT STITCHING Each	REPAIR TYPE A SPALL SqFt	SEAL RANDOM CRACKS IN PCCP Ft
		L Ft	W Ft	L Ft	W Ft	L Ft	W Ft			No. 9 x 18" DEFORMED TIE BARS Each	No. 5 x 24" DEFORMED TIE BARS Each	DOWEL BAR Each			
1285	CT&EB	6	12	6	12	6	14	25.3	R	50		38			
1293	EBP													1.00	
1296	EBP													1.00	
1329	EBP													0.50	
1335	CT&EB	15	12	15	12	15	14	63.3	R	50		38			
1379	EBP													1.50	
1416	EBP													1.50	
1425	EBP													1.50	
1465	EBD					10	6	6.7	R	8	8	6			
SHEET 9 TOTALS:								95.3		108	8	82	0	7.00	0
TOTALS:								389.0		604	101	458	150	264.8	121

JOINT REPAIR CONFIGURATION KEY

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

T = Two Tied Joints

B = One Working & One Tied Joint

R = Two Tied Joints with Original Joint Restored with Dowel Bar Assembly

**050-292, 050-292, 052-292, 081-292, 081-292 & 081 S-292
HUTCHINSON & YANKTON COUNTIES**

TABLE FOR PCC PAVEMENT REPAIR - PROJECT 081-292 PCN I1EG

MRM	LANE	CT LANE		SB LANE		NB LANE		PCCP SqYds	NEW JOINT CON-FIG.	INSERT STEEL BAR IN PCC PAVEMENT		
		L	W	L	W	L	W			No. 8 x 18" DEFORMED TIE BARS	No. 5 x 24" DEFORMED TIE BARS	DOWEL BAR
		Ft	Ft	Ft	Ft	Ft	Ft			Each	Each	Each
6.381	NB					6	14	9.3	R	18	4	14
28.496	NB&SB			44	14	40	14	130.7	R	36	2	72
34.567	SB			6	15			10.0	T	20	2	
34.625	CT	38	6.6					27.9	R	8	30	18
34.638	NB					48	15	80.0	R	20	17	48
34.647	NB					29	4	12.9	R	4	20	8
34.654	CT	15	11					18.3	R	14	12	11
45.554	WB			triangle		10	15	8.3	T	6	6	
TOTALS:								297.4		126	93	171

JOINT REPAIR CONFIGURATION KEY

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

T = Two Tied Joints

B = One Working & One Tied Joint

R = Two Tied Joints with Original Joint Restored with Dowel Bar Assembly

TABLE FOR PCC PAVEMENT REPAIR - PROJECT 081 S-292 PCN I1QH

MRM	LANE	DRIVING LANE		PCCP SqYds	NEW JOINT CON-FIG.	INSERT STEEL BAR IN PCC PAVEMENT		
		L	W			No. 9 x 18" DEFORMED TIE BARS	No. 5 x 24" DEFORMED TIE BARS	DOWEL BAR
		Ft	Ft			Each	Each	Each
2.751	SBDL	6	12	8.0	R	18	2	12
TOTALS:				8.0		18	2	12

JOINT REPAIR CONFIGURATION KEY

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

T = Two Tied Joints

B = One Working & One Tied Joint

R = Two Tied Joints with Original Joint Restored with Dowel Bar Assembly

**050-292, 050-292, 052-292, 081-292, 081-292 & 081 S-292
HUTCHINSON & YANKTON COUNTIES**

TABLE FOR CURB AND GUTTER REPAIR

**PROJECT 050-292 PCN I1EF
SD50: MRM 382.2-382.4**

MRM	LANES	TYPE B67		REMARKS
		CONCRETE C&G REPAIR LENGTH (Ft)	INSERT STEEL BAR IN PCC PAVEMENT (Each)	
382.265	WBL	4	6	Both sides of drop inlet.
382.312	WBL	3	4	East side of drop inlet.
050-292 PCN I1EF TOTALS:		7	10	

**PROJECT 050-292 PCN I1QF
SD50: MRM 383.8-383.9**

MRM	LANES	TYPE B67		REMARKS
		CONCRETE C&G REPAIR LENGTH (Ft)	INSERT STEEL BAR IN PCC PAVEMENT (Each)	
383.890	WBL	25	12	
050-292 PCN I1QF TOTALS:		25	12	

**PROJECT 081-292 PCN I1QG
US81: MRM 000.4-001.9**

MRM	LANES	TYPE B67		REMARKS
		CONCRETE C&G REPAIR LENGTH (Ft)	INSERT STEEL BAR IN PCC PAVEMENT (Each)	
0.460	SBL	16	8	Around SW radius of 4th St.
1.804	SBL	9	6	On SW radius of 21st St.
081-292 PCN I1QG TOTALS:		25	14	

**050-292, 050-292, 052-292, 081-292, 081-292 & 081 S-292
HUTCHINSON & YANKTON COUNTIES**

SPECIFICATIONS

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

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 is 6 feet for full lane repairs and 4 feet for partial lane repairs.
- Sealing random cracks in concrete pavement.
- Tie Bar Retrofit, Stitching repair of random cracks in concrete pavement.
- Repair of spalls in concrete pavement.
- Full depth replacement of curb and gutter.

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.

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

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HISTORICAL PRESERVATION OFFICE CLEARANCES

To obtain State Historical Preservation Office (SHPO) clearance, a cultural resources survey may need to be conducted by a qualified archaeologist. In lieu of a cultural resources survey, the Contractor could request a records search from Jim Donohue, State Archaeological Research Center (SARC). Provide SARC with the following: a topographical map or aerial view on which the site is clearly outlined, site dimensions, project number, and PCN. If applicable, provide evidence that the site has been previously disturbed by farming, mining, or construction activities with a landowner statement that no artifacts have been found on the site. The Contractor shall arrange and pay for the cultural resource survey and/or records search.

If any earth disturbing activities occur within the current geographical or historic boundaries of any South Dakota reservation, the Contractor shall obtain Tribal Historical Preservation Office (THPO) clearance. If no THPO exists, the required SHPO clearance shall suffice, with documentation of Tribal contact efforts provided to SHPO.

To facilitate SHPO or THPO responses, the Contractor should submit a records search or cultural resources survey report to Tom Lehmkuhl, DOT Environmental Engineer, 700 East Broadway Avenue, Pierre, SD 57501-2586 (605-773-3180). Allow 30 days from the date this information is submitted to the Environmental Engineer for SHPO/THPO approval. The Contractor is responsible for obtaining all required permits and clearances for staging areas, borrow sites, waste disposal sites, and all material processing sites. The Contractor shall provide the required permits and clearances to the Engineer at the preconstruction meeting.

EXISTING PCC PAVEMENT

The existing PCC Pavement on all routes is nonreinforced. The aggregate in the existing PCC pavement is quartzite. The existing pavement thicknesses are as follows:

- 7.5" thick on 081-292 PCN I1EG between MRM 28.496 to 34.654.
- 8" thick on 081-292 PCN I1EG MRM 45.554.
- 8.5" thick on 052-292 PCN I1EH, 081 S-292 PCN I1QH & 081-292 PCN I1EG MRM 6.381.

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 obtain, place and compact gravel cushion to the satisfaction of the Engineer at no additional cost to the State. Additional gravel cushion can be obtained from the Department of Transportation Maintenance shops located in Menno or Yankton.

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

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.

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

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.

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NONREINFORCED PCC PAVEMENT REPAIR – GENERAL (CONTINUED)

Concrete placed adjacent to gravel or 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 a minimum thickness of 8" where the existing pavement thickness is 7.5" or 8" and shall be 8.5" where the existing pavement thickness is 8.5".

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. The concrete mix shall contain a minimum of 50% coarse aggregate by weight. Coarse aggregate shall be crushed ledge rock, Size No. 1 unless an alternative gradation is approved by the Concrete Engineer as part of the mix design submittal. The concrete mix shall contain at least 650 lbs of Type I or II or 600 lbs. of Type III cement per cubic yard. The minimum 28 day compressive strength shall be 4,000 psi. The Contractor is responsible for the mix design used. The Contractor shall submit a mix design and supporting documentation for approval at least 2 weeks prior to use.

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

Concrete shall be cured with white pigmented curing compound (AASHTO M148, Type 2) applied as soon as practical at a rate of 125 square feet per gallon. Concrete shall be cured for a minimum of 48 hours before opening to traffic. The 48 hours is based upon a concrete surface temperature of 60° F or higher throughout the cure period. If the concrete temperature falls below 60° F, the cure time shall be extended or other measures shall be taken, at no additional cost to the State. In addition to the curing requirements, a strength of 4,000 psi must be 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, until the 4000 psi is attained. Insulation blanket shall be overlapped on to the existing concrete by 4'. The initial contraction joint sawing shall be performed as soon as practical after placement to avoid random cracking.

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

STEEL BAR INSERTION

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

On 7" to 8" concrete repair areas:

The Contractor shall insert the steel bars (1" x 18" epoxy coated plain round dowel bars and No. 8 x 18" epoxy coated deformed tie bars for transverse joints and No. 5 x 24" epoxy coated deformed tie bars for longitudinal joints) into drilled holes in the existing concrete pavement. An epoxy resin adhesive must be used to anchor the steel bar in the drilled hole.

STEEL BAR INSERTION (CONTINUED)

On 8.5" concrete repair areas:

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

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 trace 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.

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

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

TIE BAR RETROFIT, STITCHING

Tie Bar Retrofit, Stitching shall be done on longitudinal random cracks as marked out by the Engineer.

The Contractor shall insert No. 5 epoxy coated deformed tie bars into drilled holes in the existing concrete pavement. An epoxy resin adhesive must be used to anchor the steel bar in the drilled hole. The drill used shall be hydraulic percussive type and not a hand held.

TIE BAR RETROFIT, STITCHING (CONTINUED)

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. The holes shall be drilled at an angle alternating from opposite sides of the joint to produce a cross-stitching pattern. 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. Damage to pavement shall be repaired to the satisfaction of the Engineer at the Contractor's expense.

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 sufficiently with epoxy prior to the insertion of the tie bar such that the epoxy will be level with the top of the concrete pavement after insertion of the tie bar. 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. The top of the drilled hole shall be filled with epoxy or excess epoxy removed such that the epoxy is level with the existing pavement.

No bars shall be inserted within 12" of an existing transverse contraction joint. Any bars not functioning or damaged shall be repaired or replaced at the Contractor's expense.

Cost for the epoxy resin adhesive, tie bars, drilling of holes, debris or loose material removal, applying the adhesive, inserting the tie bars into the drilled holes and incidentals necessary for the insertion of the tie bars shall be included in the contract unit price per each for Tie Bar Retrofit, Stitching.

REPAIR TYPE A SPALLS

The Contractor shall saw an area a minimum of 6" X 6" and remove the material to a minimum depth of 3" or until sound concrete is found, whichever is greater. Spalled areas smaller than 3" x 3" need not be repaired.

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

Type A Spalls shall conform to Section 390 with the following exceptions:

The Contractor shall be advised that the Supplemental Specification to Standard Specifications for Roads and Bridges require that the 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. It will not be an option to use the concrete patch mixture as provided in Section 390 of the Standard Specifications.

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. The bonding additive shall be compatible with the patching material as recommended by the manufacturer.

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.

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REPAIR TYPE A SPALLS (CONTINUED)

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.

Curing of the patched areas shall be done as per Section 390 of the Specifications, until the patch has attained 3,800 psi, unless a different curing method is listed on the manufacturer's technical data sheet.

The repair areas can be opened to traffic once the repair material meets 3,800 psi as long as the above requirement for temperature can be met.

Material used to form the joint shall be a foam core board or other stiff material capable of standing without deflection. The Contractor shall fill the area (with the foam core board or other approved material in place) with an approved patching material. The patching material shall be vibrated with a small hand held vibrator capable of thoroughly consolidating the patching compound into the area. The top surface of the filled area shall be trowel finished and cured.

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.

SEAL RANDOM CRACKS IN PCC PAVEMENT

Random cracks shall be repaired in accordance with the detail for Sealing Random Cracks In Concrete 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.

Only those random cracks in the existing concrete pavement that are open and accept water and incompressible materials as selected by the Engineer shall be prepared and sealed with either Low Modulus Silicone Sealant or Hot Poured Elastic Joint Sealant.

Prior to sealing, each random crack shall be routed and thoroughly cleaned with compressed air or by other methods satisfactory to the Engineer. Routing shall be performed with a saw designed for that purpose.

Random cracks narrower than ½ inch shall be routed and sealed ½ inch wide by ½ inch deep. Random cracks wider than ½ inch may require the placement of a backer rod prior to sealing.

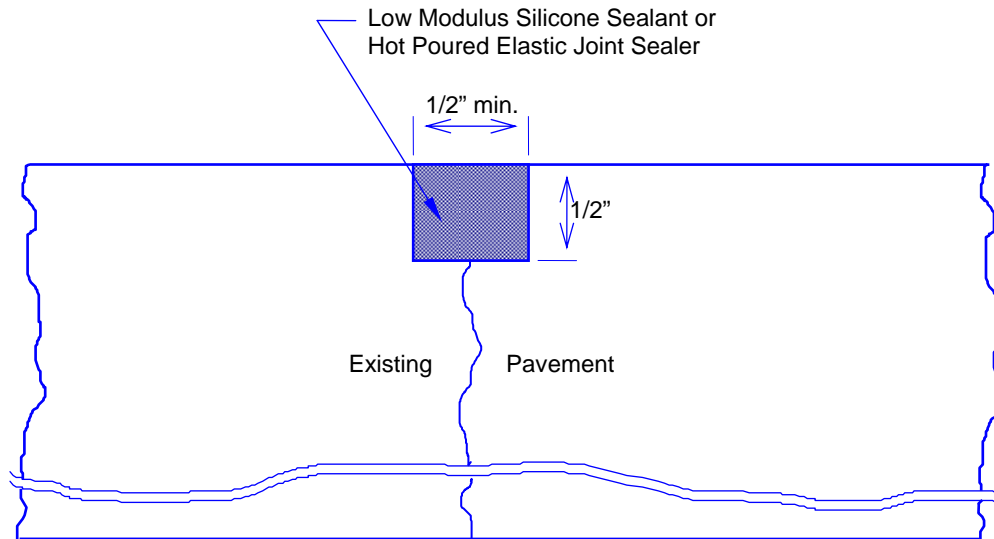
Sealant shall be placed in the routed reservoir with equipment and by methods that insure complete and uniform filling. Sealant shall be placed level with the driving surface of the concrete. Any excess or overrun of sealant shall be removed by the Contractor at no additional cost to the state.

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

Seal Random Cracks in PCC Pavement will be paid for at the contract unit price per foot measured for payment. Payment shall be full compensation for all labor, equipment, material and incidentals required for crack routing, cleaning, furnishing and installing backer rod when necessary, furnishing and placing sealant and removing routed and foreign material from the roadway.

SEAL RANDOM CRACKS IN PCC PAVEMENT (CONTINUED)

SEALING RANDOM CRACKS



TYPE B67 CONCRETE CURB AND GUTTER REPAIR

Existing Type B67 Concrete Curb and Gutter shall be removed and replaced as detailed in these plans or as directed by the Engineer. If the end of any section to be removed does not fall on an existing joint, a sawed joint (3" to 4" deep) must be made to provide a vertical face with the new joint.

Existing foundation material shall be shaped and compacted to a firm, uniform bearing surface, conforming to the existing section or established grades as set by the Engineer. Unsuitable foundation material shall be removed and replaced as directed. Cushion material can be obtained for the Department of Transportation Maintenance shop located in Menno or Yankton.

Cost for labor, equipment, material and incidentals required for excavation and placement of cushion material shall be incidental to the contract unit prices for the various items.

Curb and Gutter shall be tied to existing PCC pavement with drilled in No. 5 x 24" epoxy coated deformed tie bars spaced 30" center to center or by salvaged in place tie bars. Also, 1 – No. 5 x 24" epoxy coated deformed tie bar shall be drilled into the existing curb and gutter at each end of the replacement area. Refer to the notes for Steel Bar Insertion. Cost for this work shall be included in the contract unit price per each for Insert Steel Bar in PCC Pavement.

The Contractor shall satisfactorily restore all disturbed areas adjacent to the new concrete placement to the satisfaction of the Engineer. Cost for this restoration work shall be incidental to the contract unit prices for the various items.

Quantities shall be field verified for proper payment. All areas to be replaced shall be designated by the Engineer.

Cost for removing and replacing the concrete curb and gutter, including material, equipment, labor and incidentals necessary to complete the work shall be included in the unit price per foot for Type B67 Concrete Curb and Gutter.

TEMPORARY PAVEMENT MARKING

Temporary pavement marking (except stop bars) shall consist of Temporary Road Markers and shall be included in the contract unit price per foot for Temporary Road Markers (one workspace with a 180' taper and one workspace with a 600' taper on SD50 four-lane undivided, ten workspaces with 600' tapers on SD52 three or five-lane undivided, two workspaces with a 180' tapers on US81 five-lane undivided, seven workspaces with 780' tapers on US81 two-lane and one workspace with a 600' taper on US81 four-lane divided equals 13,200').

Temporary pavement marking for 24" white stop bars shall consist of 4" Temporary Pavement Marking Tape – Type 2 and shall be included in the contract unit price per foot for 4" Temporary Pavement Marking Tape – Type 2. (Seven workspaces at 144' =1,008').

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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 lane closures using stop signs, two lane closures for a 4-lane and one center lane closure. 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 full depth 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.

Construction workspaces on this project shall be limited to 3 miles in length.

Holes adjacent to centerline in the lane open to traffic created during removal and replacement of PCC Pavement repair areas, where work will be completed in the adjacent lane, 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. Cold asphalt mix can be obtained from the Department of Transportation Maintenance shop located at Yankton.

Holes in the gravel or asphalt concrete shoulders created during removal and replacement of PCC Pavement repair areas shall be filled with gravel or hot-mix asphalt concrete (to match the shoulder surfacing) prior to opening the lane to traffic. Gravel can be obtained from the Department of Transportation Maintenance shops located at Menno or Yankton. Hot-mix asphalt concrete shall be furnished by the Contractor.

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

Routing traffic onto the asphalt or gravel 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.

Extra care shall be taken to protect the in place asphalt shoulders. 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.

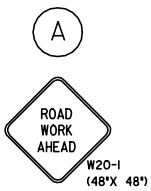
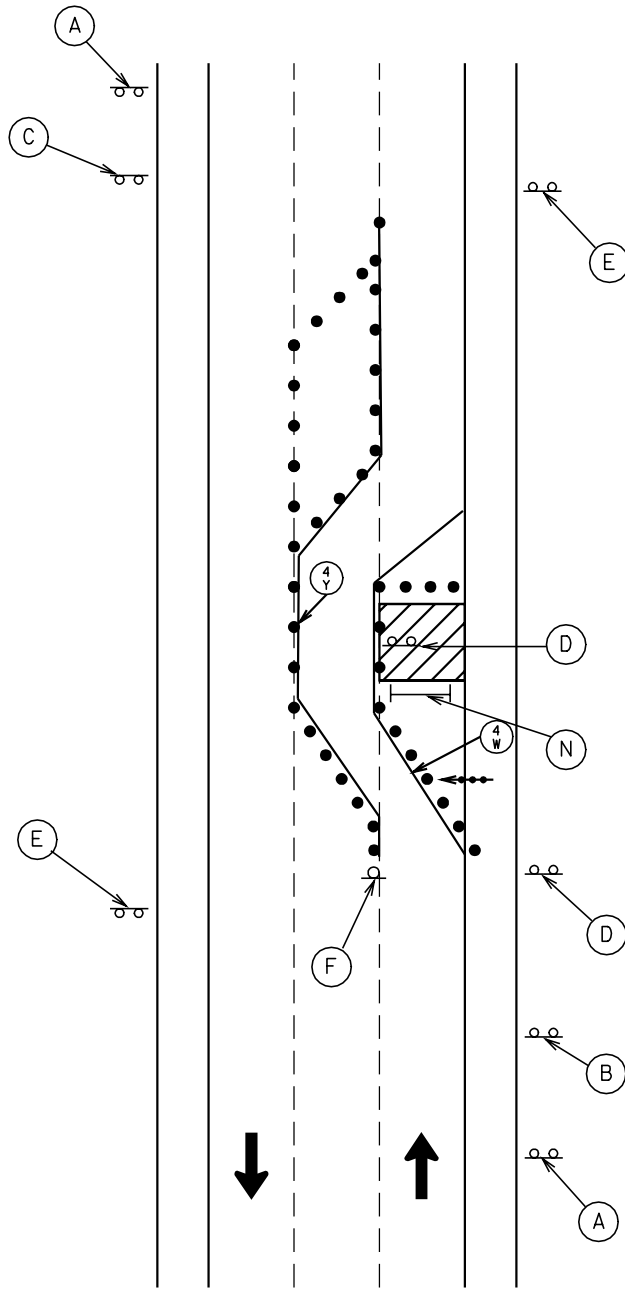
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ITEMIZED LIST FOR TRAFFIC CONTROL

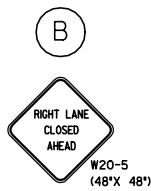
SIGN CODE	SIGN SIZE	DESCRIPTION	NUMBER REQUIRED	UNITS PER SIGN	UNITS
E5-1	36" x 32"	EXIT GORE SIGN		24	
G20-2	36" x 18"	END ROAD WORK	8	17	136
R1-1	48" x 48"	STOP	4	34	136
R1-2	48" x 48"	YIELD		34	
R2-1	30" x 36"	SPEED LIMIT __		23	
R2-6	24" x 24"	FINES DOUBLE		16	
R4-7	24" x 30"	KEEP RIGHT (SYMBOL)	1	18	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	
W1-4	48" x 48"	REVERSE CURVE SIGN (LEFT OR RIGHT)	4	34	136
W1-6	48" x 24"	LARGE ARROW	1	24	24
W3-1	48" x 48"	STOP AHEAD (SYMBOL)	4	34	136
W3-2	48" x 48"	YIELD AHEAD (SYMBOL)		34	
W3-3	48" x 48"	SIGNAL AHEAD (SYMBOL)		34	
W3-4	48" x 48"	BE PREPARED TO STOP		34	
W3-5	48" x 48"	SPEED REDUCTION (__ MPH)		34	
W4-1	48" x 48"	MERGE (SYMBOL)		34	
W4-2	48" x 48"	LEFT OR RIGHT LANE ENDS (SYMBOL)	2	34	68
W5-2	48" x 48"	NARROW BRIDGE		34	
W5-3	48" x 48"	ONE LANE BRIDGE		34	
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	
W8-11	48" x 48"	UNEVEN LANES		34	
W9-3	48" x 48"	CENTER LANE CLOSED AHEAD	1	34	34
W13-1	24" x 24"	ADVISORY SPEED PLATE		16	
W16-2	30" x 24"	SUPPLEMENTAL DISTANCE PLAQUE		18	
W20-1	48" x 48"	ROAD WORK AHEAD	10	34	340
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	4	34	136
W20-5	48" x 48"	LT. OR RT. LANE CLOSED AHEAD	3	34	102
W20-7a	48" x 48"	FLAGGER	5	34	170
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	2	34	68
W21-5a	48" x 48"	RIGHT SHOULDER CLOSED		34	
W21-5b	48" x 48"	RIGHT SHOULDER CLOSED AHEAD		34	
*****	12" x 36"	TYPE III OBJECT MARKER		15	
*****	*****	TYPE III BARRICADE - 8 FT. SINGLE SIDED	21	40	840
*****	*****	TYPE III BARRICADE - 8 FT. DOUBLE SIDED	3	56	168
TOTAL UNITS					2512

050-292, 050-292, 052-292, 081-292, 081-292 & 081 S-292
 HUTCHINSON & YANKTON COUNTIES

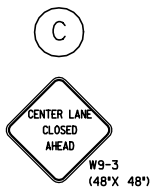
3-LANE TRAFFIC CONTROL TYPICAL



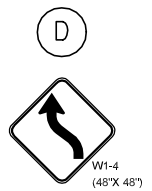
W20-1
(48"X 48")



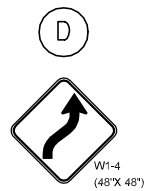
W20-5
(48"X 48")



W9-3
(48"X 48")



W1-4
(48"X 48")



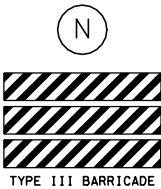
W1-4
(48"X 48")



G20-2A
(48"X 24")



R4-7
(24"X 30")



TYPE III BARRICADE

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



NOTES:

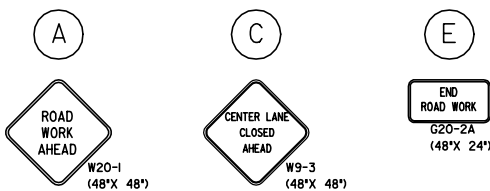
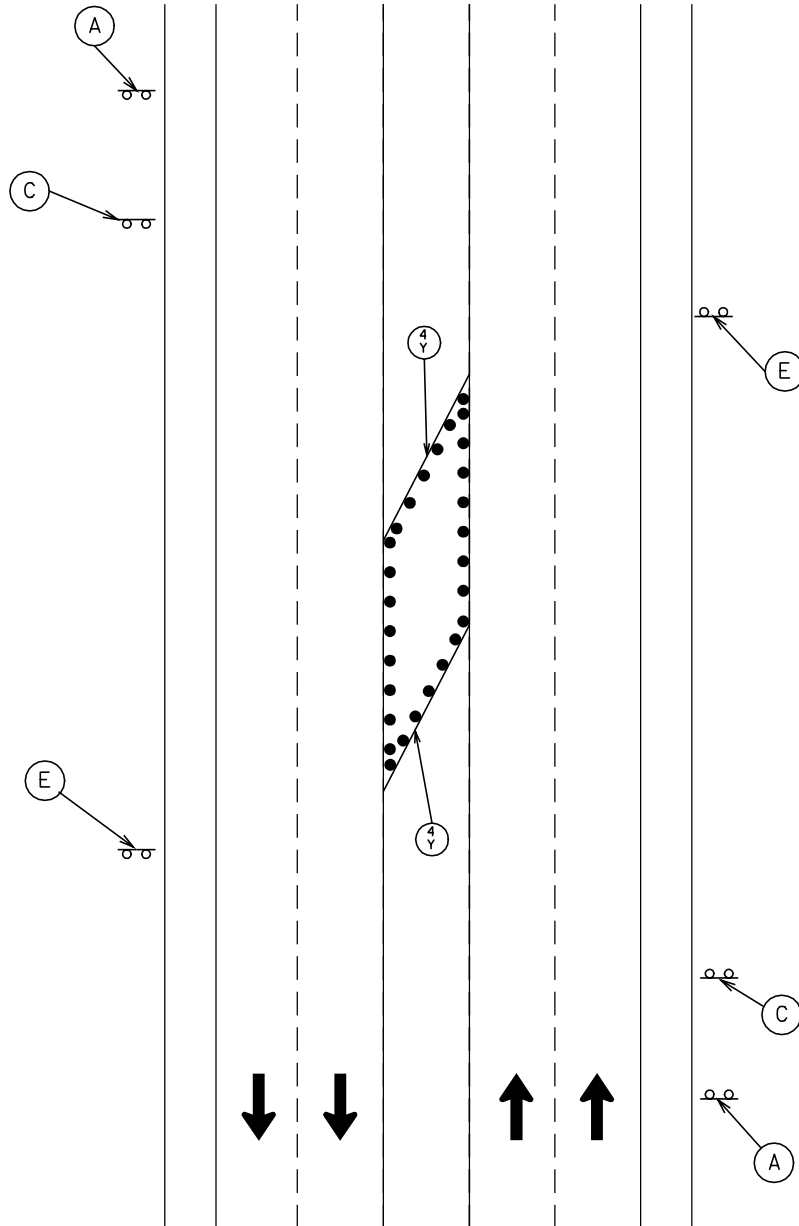
● REFLECTORIZED DRUMS - 25 ft. spacing on tapers & 50 ft maximum spacing on tangent, unless otherwise shown.

④ Y - 4" YELLOW TEMPORARY PAVEMENT MARKING

④ W - 4" WHITE TEMPORARY PAVEMENT MARKING

➡➡➡ - ADVANCE WARNING ARROW PANEL

5-LANE TRAFFIC CONTROL
 CENTER LANE CLOSED TYPICAL

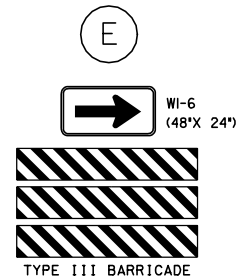
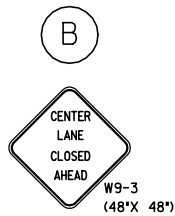
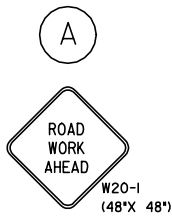
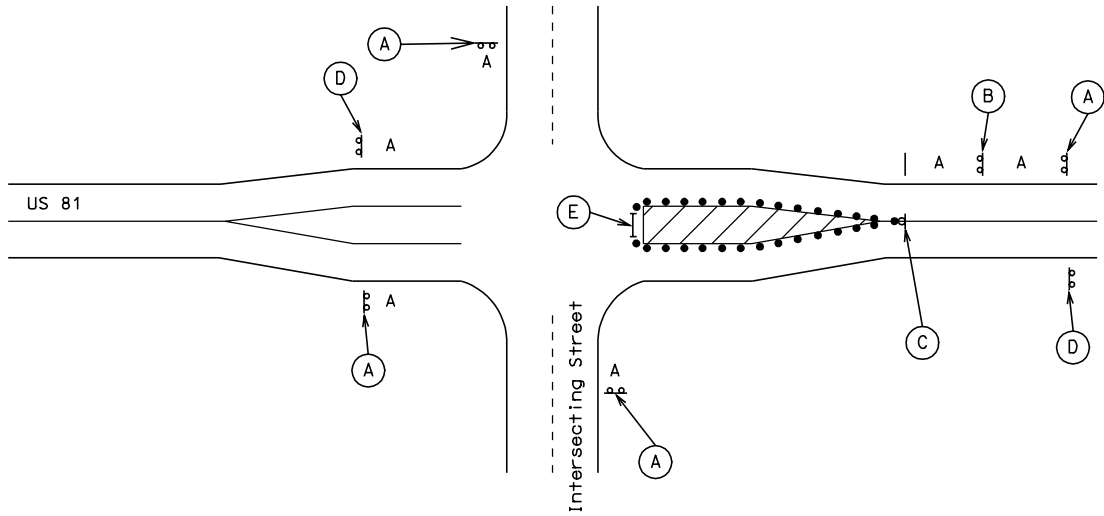


Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet)		Taper Length (Feet)
	(A)	(L)	
0 - 30	200	180	
35 - 40	200	320	
45 - 50	350	600	
55	500	660	
60 - 65	500	780	

NOTES:

- REFLECTORIZED DRUMS - 25 ft. spacing on tapers & 50 ft maximum spacing on tangent, unless otherwise shown.
- 4Y - 4" YELLOW TEMPORARY PAVEMENT MARKING

TRAFFIC CONTROL
 CENTER TURN LANE REPAIR - TYPICAL



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



● REFLECTORIZED DRUMS

050-292, 050-292, 052-292, 081-292, 081-292 & 081 S-292
HUTCHINSON & YANKTON COUNTIES

Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet) (A)	Taper Length (Feet) (L)	Spacing of Channelizing Devices (Feet) (G)
0 - 30	200	180	25
35 - 40	350	320	25
45 - 50	500	600	50
55	750	660	50
60 - 65	1000	780	50

■ Channelizing Device

END ROAD WORK
G20-2

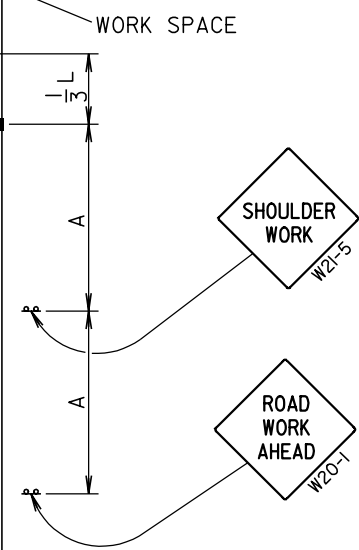
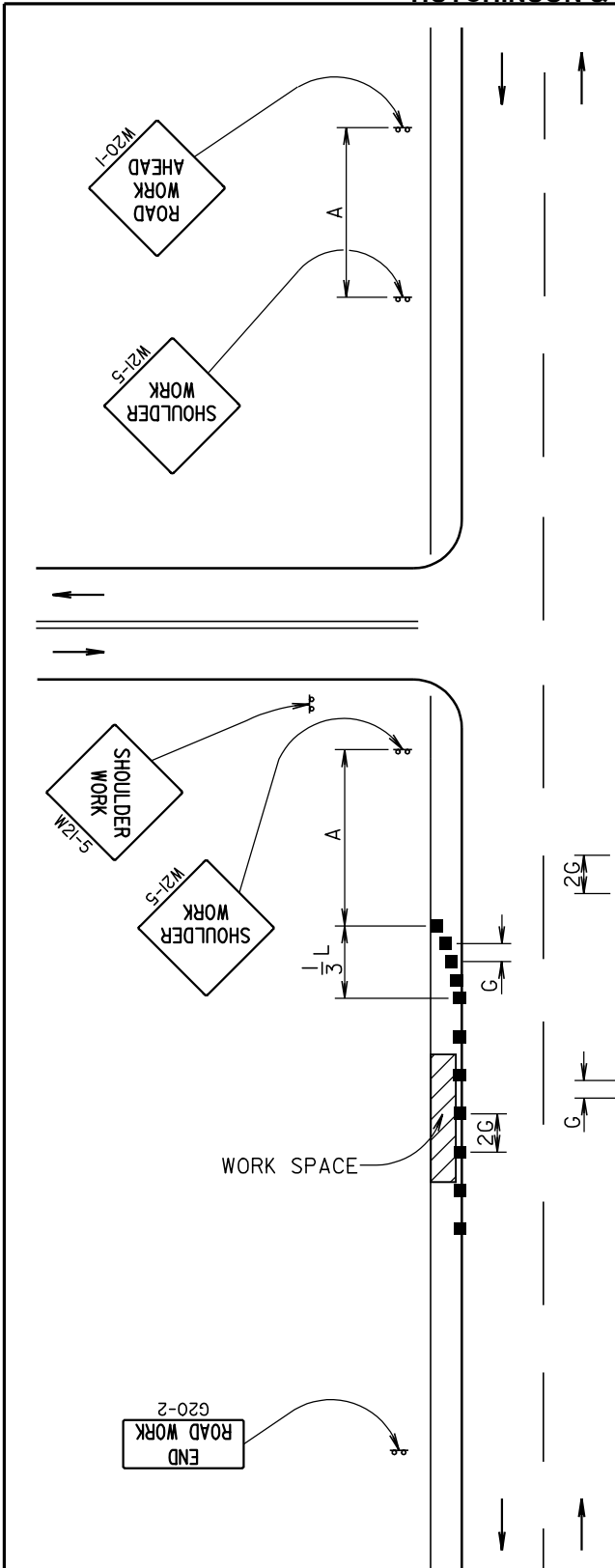
The channelizing devices shall be drums or type II barricades if traffic control must remain overnight or longer.

For short duration operations (1 hour or less) all signs and channelizing devices may be eliminated if a vehicle with an activated flashing or revolving yellow light is used.

Worker signs (W21-1 or W21-1a) may be used instead of SHOULDER WORK signs.

A SHOULDER WORK sign should be placed on the left side of a divided or one-way roadway only if the left shoulder is affected.

The SHOULDER WORK sign on an intersecting roadway is not required if drivers emerging from that roadway will encounter another advance warning sign before they reach a work activity area.



July 1, 2005

Published Date: 1st Qtr. 2010

SDDOT
GUIDES FOR TRAFFIC CONTROL DEVICES
WORK ON SHOULDERS

PLATE NUMBER
634.03
 Sheet 1 of 1

**050-292, 050-292, 052-292, 081-292, 081-292 & 081 S-292
HUTCHINSON & YANKTON COUNTIES**

Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet) (A)	Spacing of Channelizing Devices (Feet) (G)
0 - 30	200	25
35 - 40	350	25
45 - 50	500	50
55	750	50
60 - 65	1000	50

- Flagger
- Channelizing Device

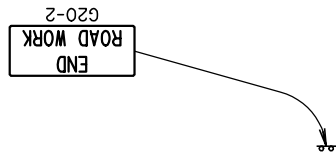
For low-volume traffic situations with short work zones on straight roadways where the flagger is visible to road users approaching from both directions, a single flagger may be used.

The ROAD WORK AHEAD and the END ROAD WORK signs may be omitted for short duration operations (1 hour or less).

For tack and/or flush seal operations, when flaggers are not being used, the FRESH OIL sign (W21-2) shall be displayed in advance of the liquid asphalt areas.

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

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

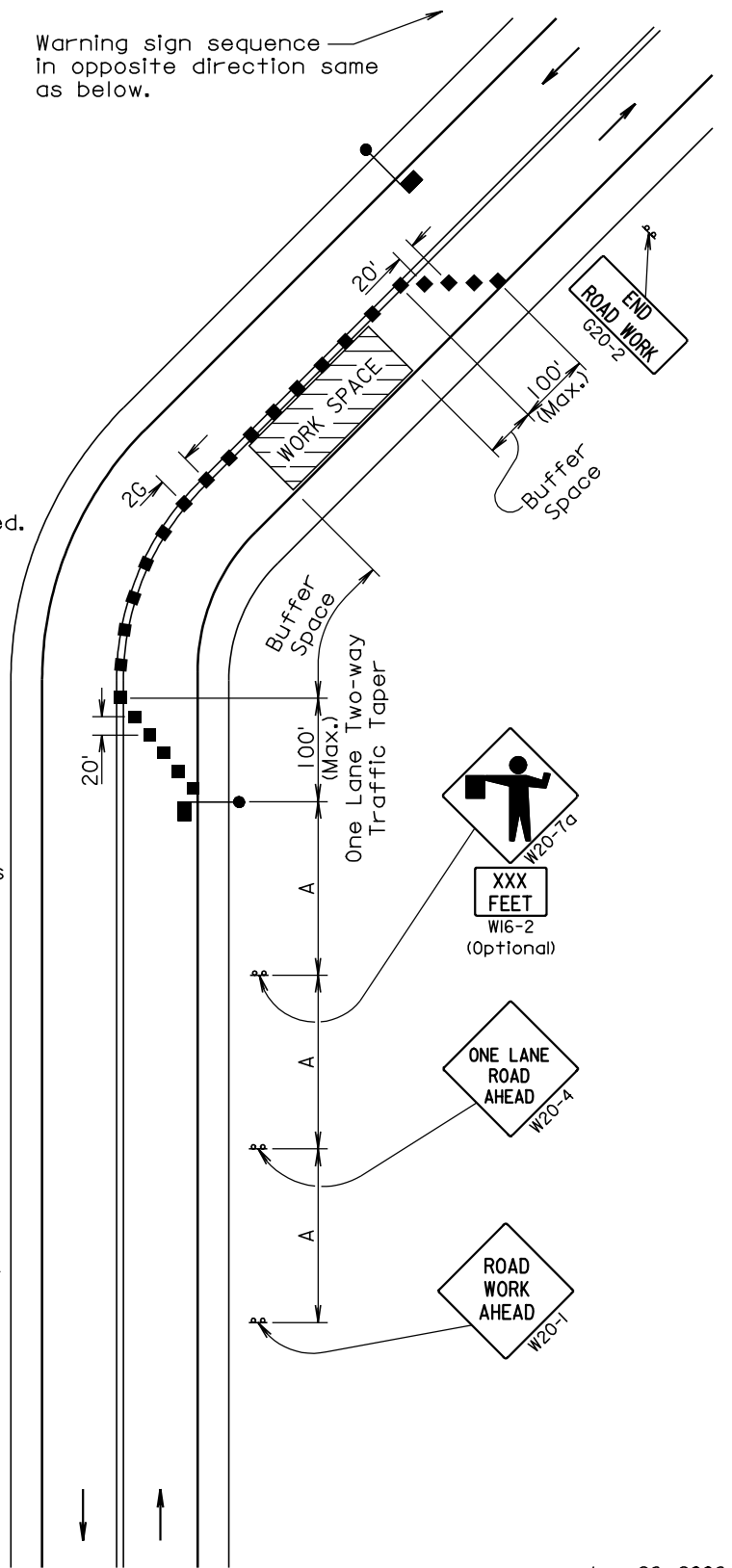


Channelizing devices are not required along the centerline adjacent to work area when pilot cars are utilized for escorting traffic through the work area.

Channelizing devices and flaggers shall be used at intersecting roads to control intersecting road traffic as required.

The buffer space shall be a sufficient length so that the channelizing devices are visible to approaching traffic.

Warning sign sequence in opposite direction same as below.



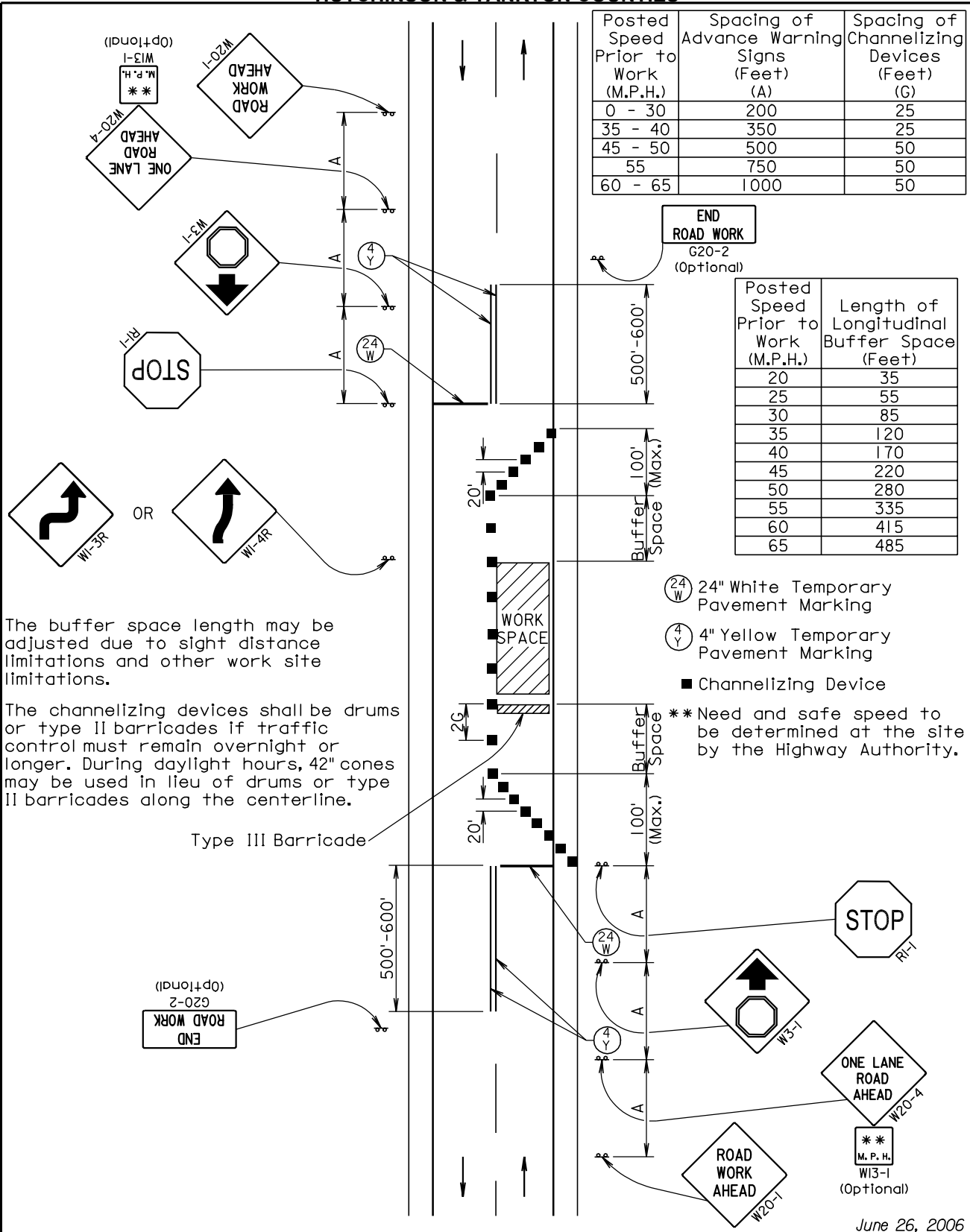
June 26, 2006

<p>Published Date: 1st Qtr. 2010</p>	<p>S D D O T</p>	<p>GUIDES FOR TRAFFIC CONTROL DEVICES LANE CLOSURE WITH FLAGGER PROVIDED</p>	<p>PLATE NUMBER 634.23</p> <hr/> <p>Sheet 1 of 1</p>
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050-292, 050-292, 052-292, 081-292, 081-292 & 081 S-292
HUTCHINSON & YANKTON COUNTIES

Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet) (A)	Spacing of Channelizing Devices (Feet) (C)
0 - 30	200	25
35 - 40	350	25
45 - 50	500	50
55	750	50
60 - 65	1000	50

Posted Speed Prior to Work (M.P.H.)	Length of Longitudinal Buffer Space (Feet)
20	35
25	55
30	85
35	120
40	170
45	220
50	280
55	335
60	415
65	485



The buffer space length may be adjusted due to sight distance limitations and other work site limitations.

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

- (24 W) 24" White Temporary Pavement Marking
 - (4 Y) 4" Yellow Temporary Pavement Marking
 - Channelizing Device
- ** Need and safe speed to be determined at the site by the Highway Authority.

June 26, 2006

<p><i>Published Date: 1st Qtr. 2010</i></p>	<p>S D D O T</p>	<p>GUIDES FOR TRAFFIC CONTROL DEVICES LANE CLOSURE USING STOP SIGNS</p>	<p>PLATE NUMBER 634.25</p>
			<p>Sheet 1 of 1</p>

**050-292, 050-292, 052-292, 081-292, 081-292 & 081 S-292
HUTCHINSON & YANKTON COUNTIES**

Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet)			Taper Length (Feet) (L)	Spacing of Channelizing Devices (Feet) (G)
	(A)	(B)	(C)		
0 - 30	200			180	25
35 - 40	350			320	25
45 - 50	500			600	50
55	750			660	50
60 - 65	1000			780	50

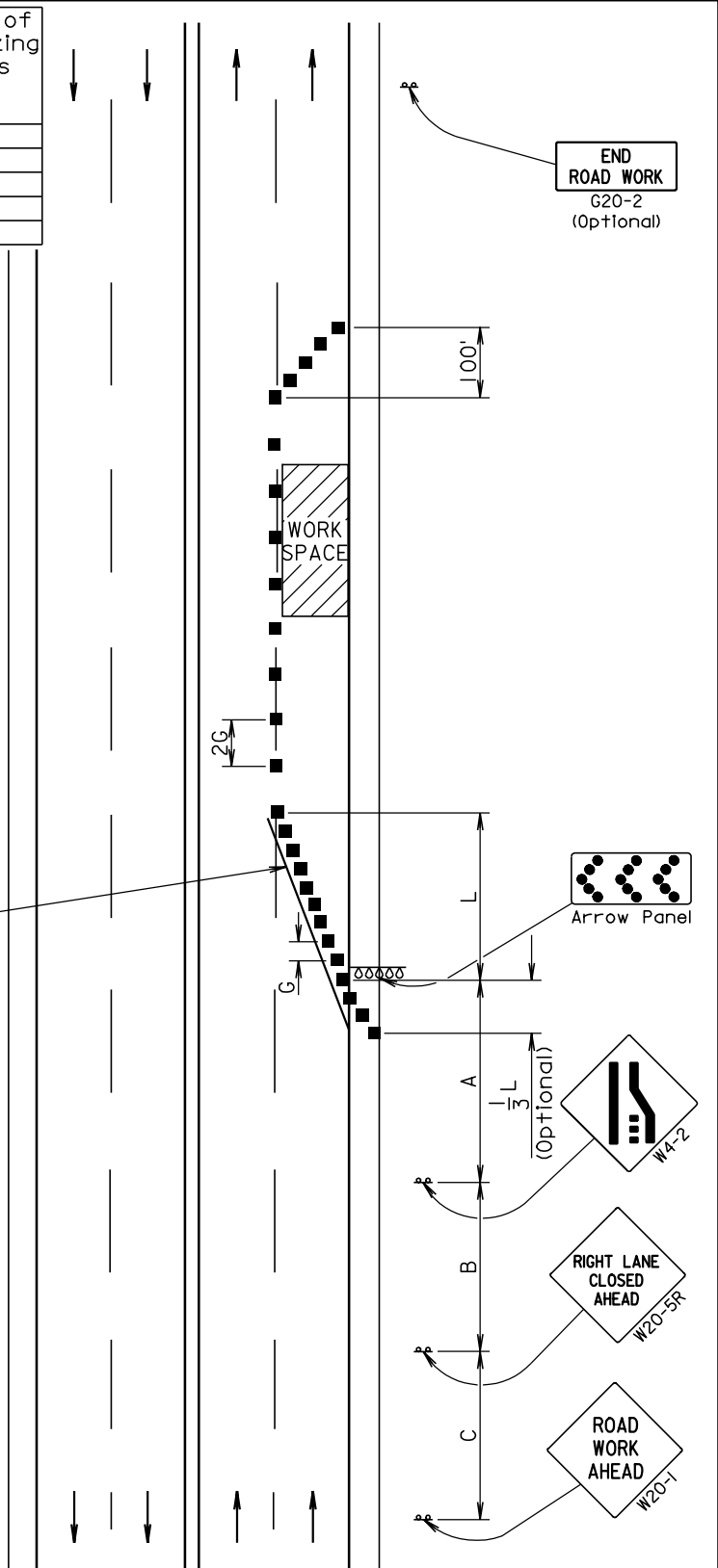
■ Channelizing Device

Drums or Type II Barricades shall be used if required overnight.

42" cones may be used along centerline

Longitudinal dimensions may be adjusted to fit project conditions such as horizontal curves, vertical curves, and other site restrictions.

Four inch white temporary pavement marking shall be used if traffic control must remain overnight or longer.



April 1, 2008

Published Date: 1st Qtr. 2010

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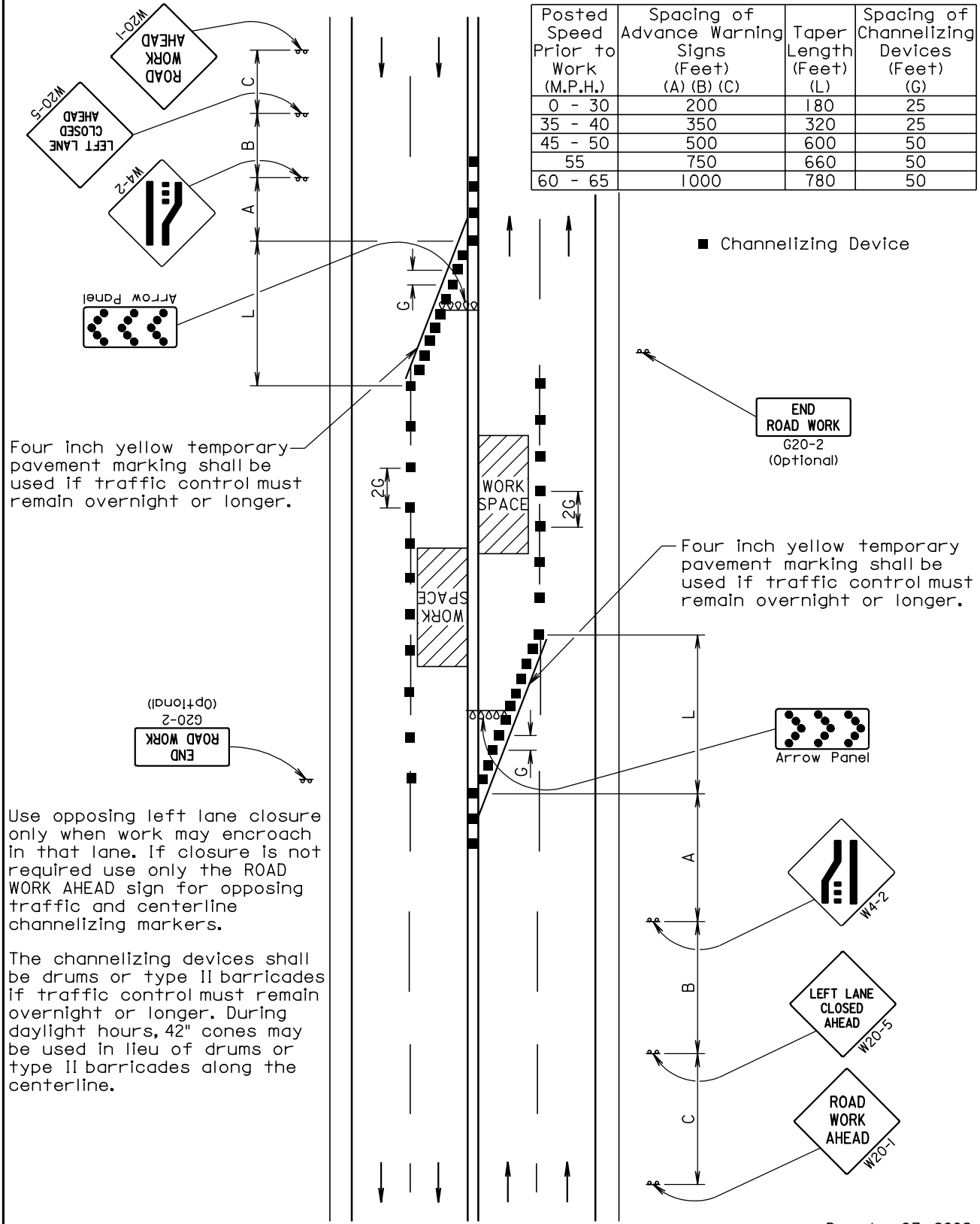
**GUIDES FOR TRAFFIC CONTROL DEVICES
4-LANE UNDIVIDED, RIGHT LANE CLOSED**

PLATE NUMBER
634.47

Sheet 1 of 1

050-292, 050-292, 052-292, 081-292, 081-292 & 081 S-292
HUTCHINSON & YANKTON COUNTIES

Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet)			Taper Length (Feet) (L)	Spacing of Channelizing Devices (Feet) (G)
	(A)	(B)	(C)		
0 - 30	200			180	25
35 - 40	350			320	25
45 - 50	500			600	50
55	750			660	50
60 - 65	1000			780	50



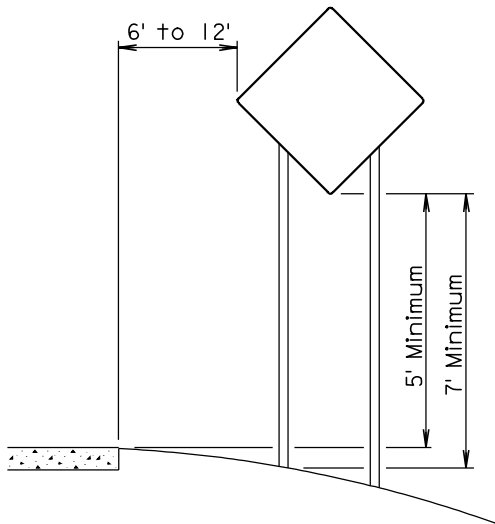
SDDOT

Published Date: 1st Qtr. 2010

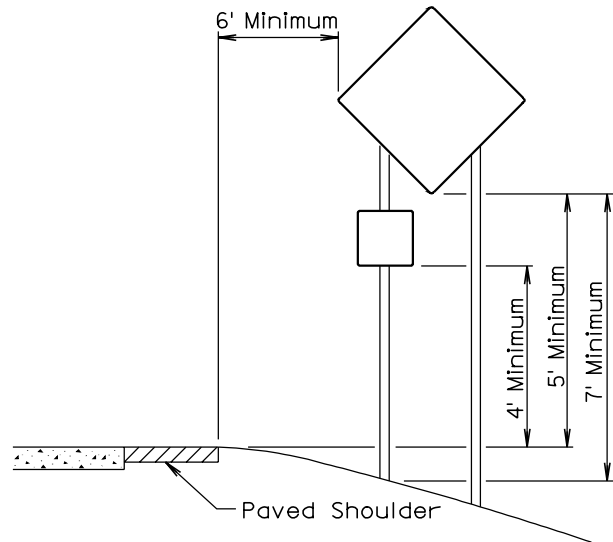
GUIDES FOR TRAFFIC CONTROL DEVICES
4-LANE UNDIVIDED, LEFT LANE CLOSED

PLATE NUMBER
634.48

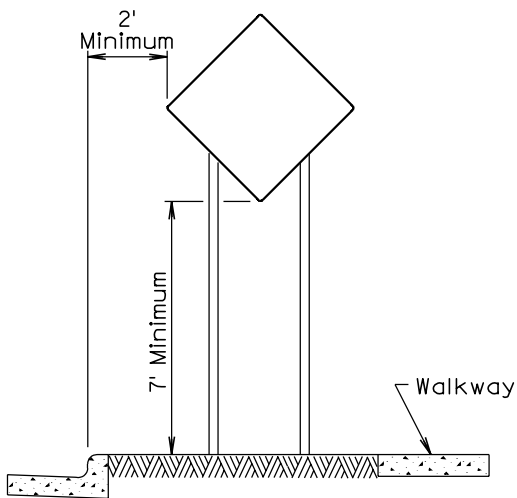
Sheet 1 of 1



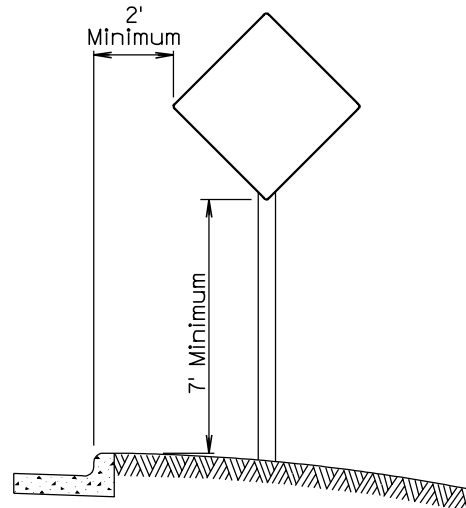
RURAL DISTRICT



RURAL DISTRICT WITH
 SUPPLEMENTAL PLATE



URBAN DISTRICT



URBAN DISTRICT

December 23, 2003

Published Date: 1st Qtr. 2010

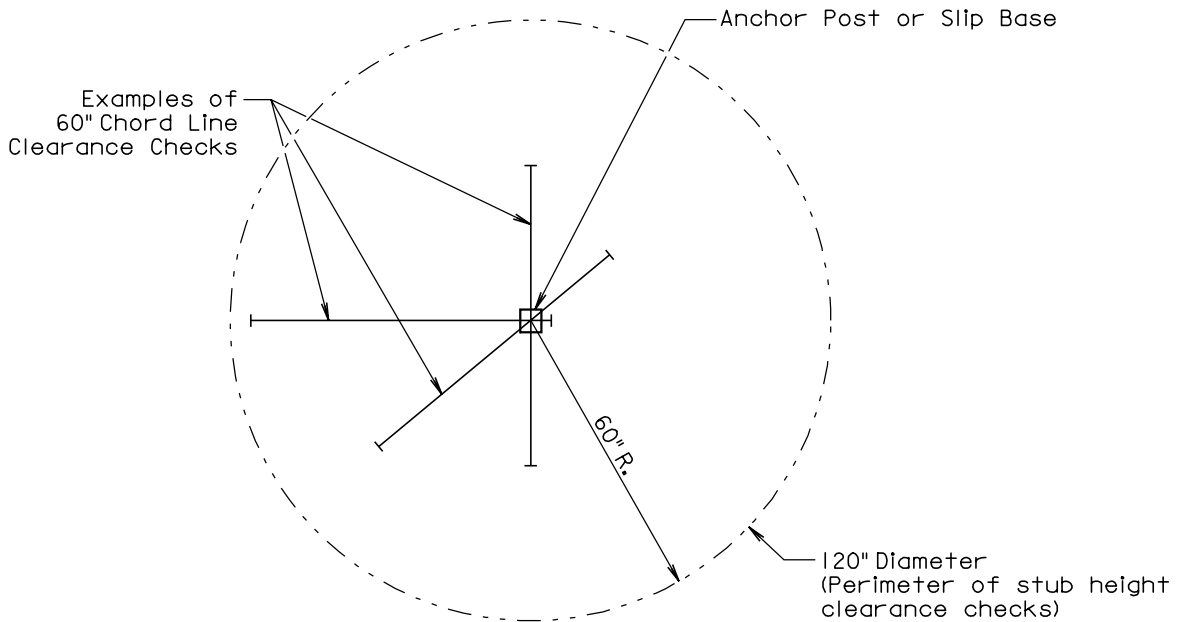
**S
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BREAKAWAY SIGN SUPPORTS
(Typical Construction Signing)

PLATE NUMBER
634.85

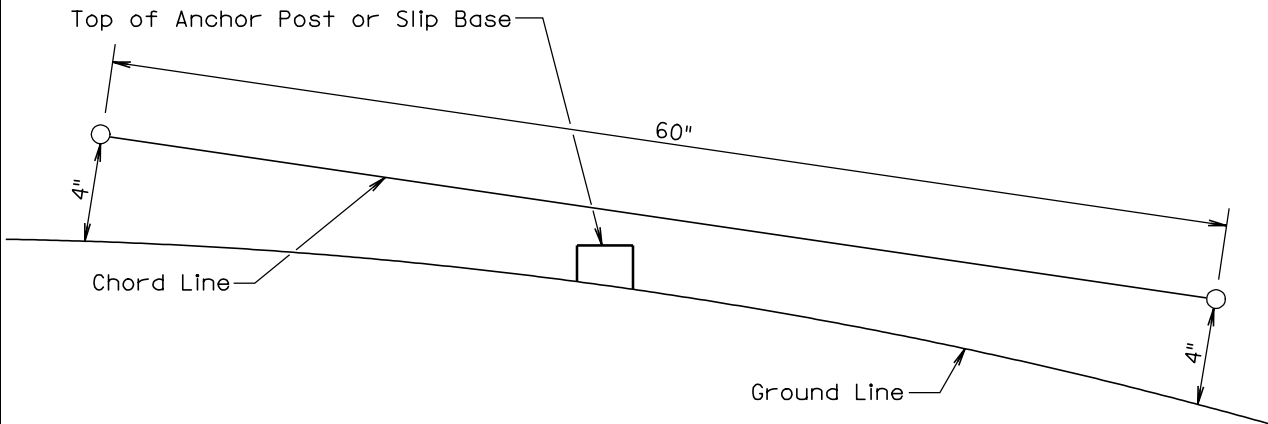
Sheet 1 of 1

050-292, 050-292, 052-292, 081-292, 081-292 & 081 S-292
HUTCHINSON & YANKTON COUNTIES



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.

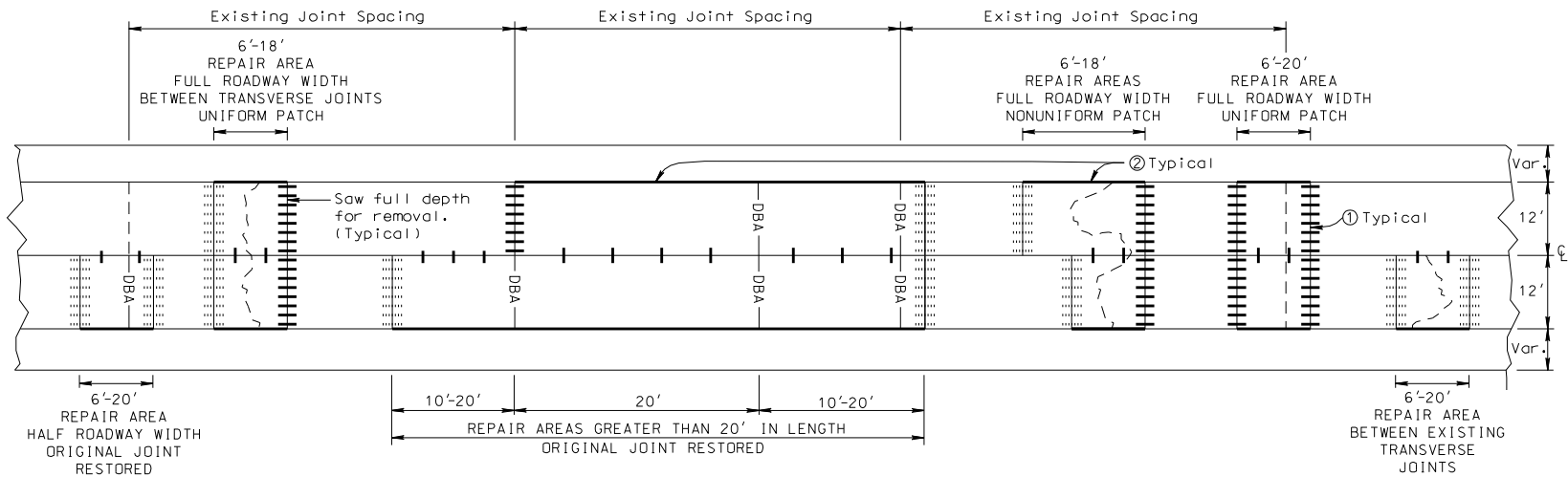
The 4" stub height clearance is not necessary for U-channel lap splices where the support is designed to yield (bend) at the base.

July 1, 2005

<p><i>Published Date: 1st Qtr. 2010</i></p>	<p>S D D O T</p>	<p>BREAKAWAY SUPPORT STUB CLEARANCE</p>	<p>PLATE NUMBER 634.99</p>
			<p>Sheet 1 of 1</p>

NONREINFORCED PCC PAVEMENT REPAIR

TWO LANE UNDIVIDED or FOUR LANE DIVIDED - TYPICAL REPAIR AREAS



Sheet 31 of 44

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.

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 1" or 1 1/4" x 18" epoxy coated plain round dowel bars spaced 18" center to center.
- Drilled in No. 8 or 9 x 18" epoxy coated deformed tie bars spaced 18" center to center.

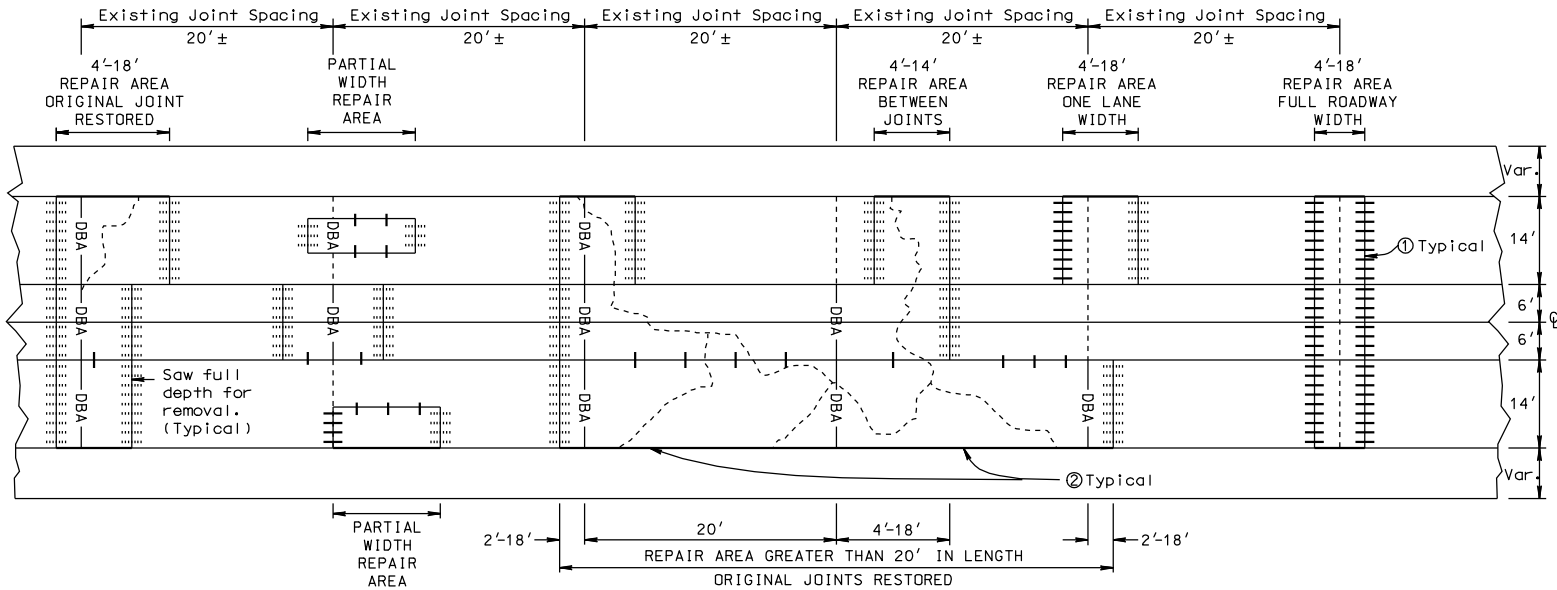
DBA Dowel Bar Assembly

050-292, 050-292, 052-292, 081-292, 081-292 & 081 S-292
HUTCHINSON & YANKTON COUNTIES

NONREINFORCED PCC PAVEMENT REPAIR

TWO LANE WITH CENTER TURN LANE & ASPHALT CONCRETE SHOULDERS

TYPICAL REPAIR AREAS



Sheet 32 of 44

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.

KEY:

Steel Bars for Longitudinal Joints (for repair areas greater than 5 feet in length)

- | 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 1" or 1 1/4" x 18" epoxy coated plain round dowel bars spaced 18" center to center.
- Drilled in No. 8 or 9 x 18" epoxy coated deformed tie bars spaced 18" center to center.

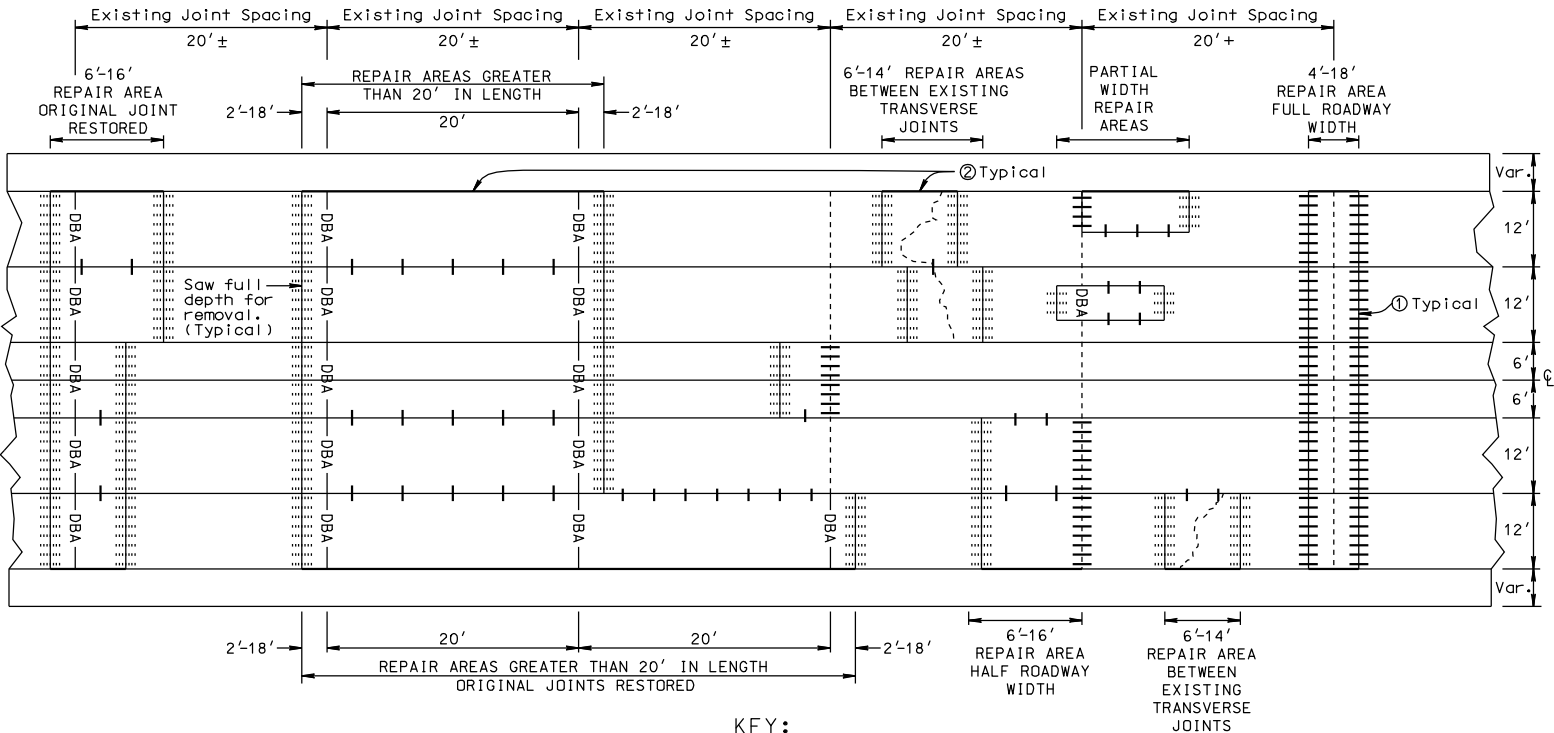
DBA Dowel Bar Assembly

050-292, 050-292, 052-292, 081-292, 081-292 & 081 S-292
HUTCHINSON & YANKTON COUNTIES

NONREINFORCED PCC PAVEMENT REPAIR

FOUR LANE WITH CENTER TURN LANE AND ASPHALT CONCRETE SHOULDERS

TYPICAL REPAIR AREAS



NOTES:

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

KEY:

Steel Bars for Longitudinal Joints (for repair areas greater than 5 feet in length)

- | 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 1" or 1 1/4" x 18" epoxy coated plain round dowel bars spaced 18" center to center.
- Drilled in No. 8 or 9 x 18" epoxy coated deformed tie bars spaced 18" center to center.

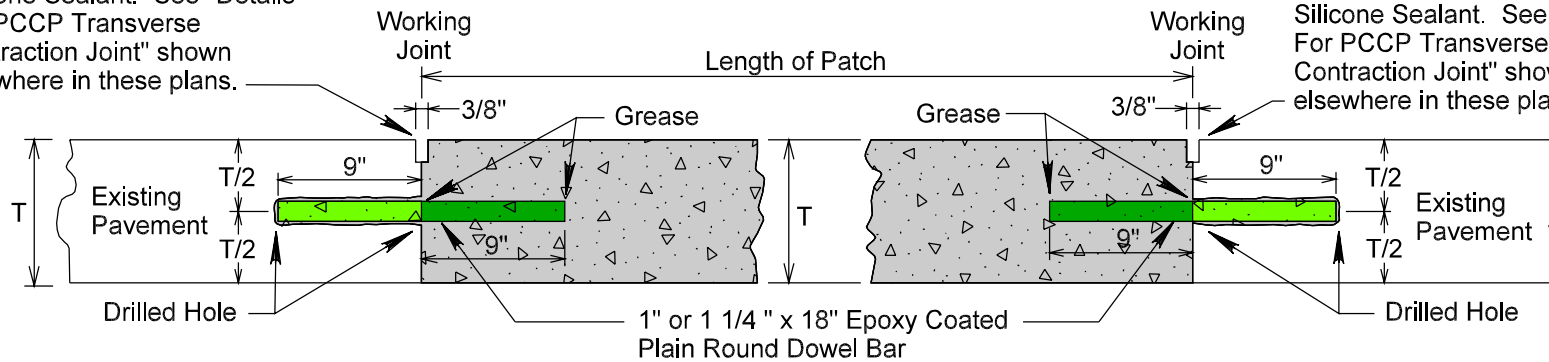
DBA Dowel Bar Assembly

NONREINFORCED PCC PAVEMENT REPAIR

PLAIN ROUND DOWEL BAR INSERTION (TWO WORKING JOINTS)

Sawed joint to be filled with Low Modulus Silicone Sealant. See "Details For PCCP Transverse Contraction Joint" shown elsewhere in these plans.

Sawed joint to be filled with Low Modulus Silicone Sealant. See "Details For PCCP Transverse Contraction Joint" shown elsewhere in these plans.



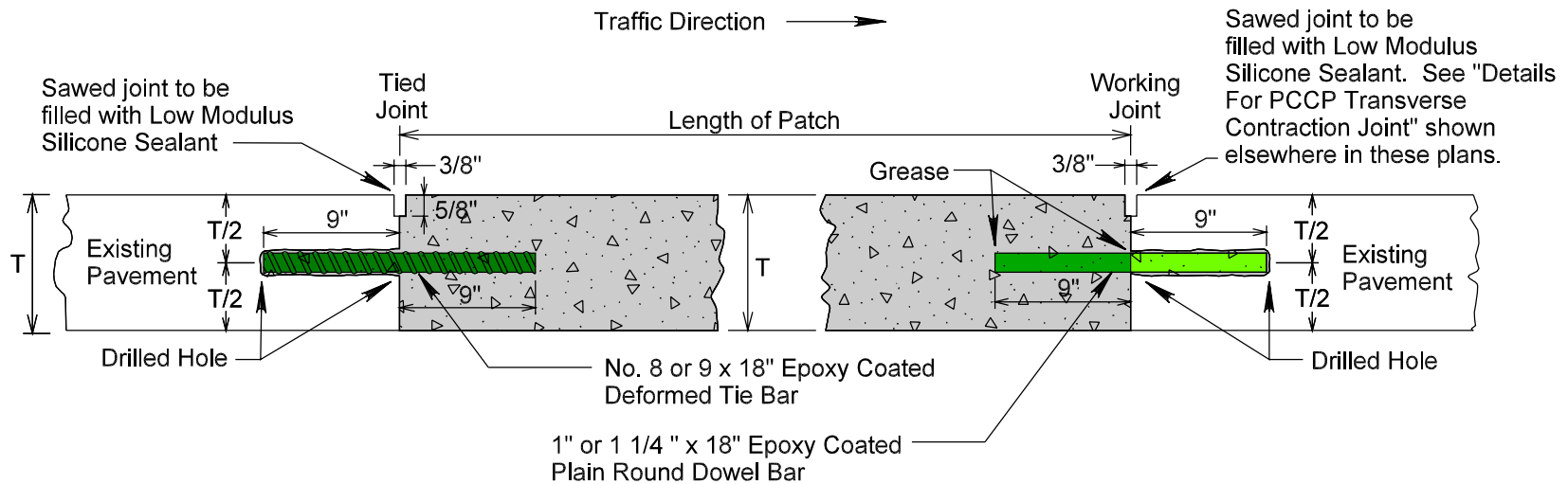
T = Existing and new pavement thickness. New pavement thickness is 8" where existing pavement thickness is less than 8". New pavement thickness is 8.5" where existing pavement thickness is 8.5".

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

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



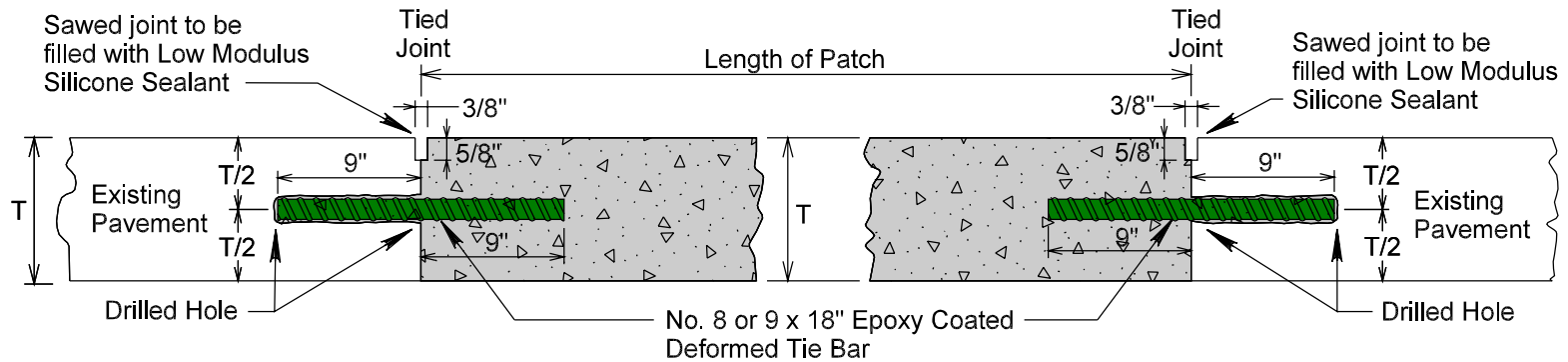
T = Existing and new pavement thickness. New pavement thickness is 8" where existing pavement thickness is less than 8". New pavement thickness is 8.5" where existing pavement thickness is 8.5".

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

DEFORMED TIE BAR INSERTION (TWO TIED JOINTS)



Sheet 36 of 44

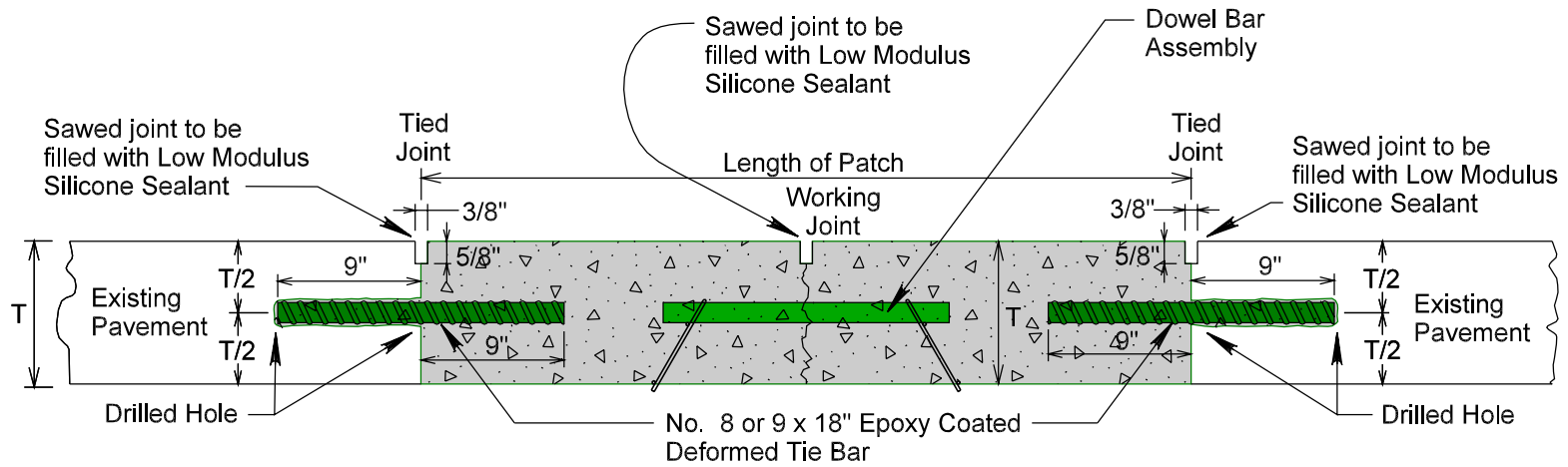
T = Existing and new pavement thickness. New pavement thickness is 8" where existing pavement thickness is less than 8". New pavement thickness is 8.5" where existing pavement thickness is 8.5".

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

DEFORMED TIE BAR INSERTION WITH DOWEL BAR ASSEMBLY
(TWO TIED JOINTS AND ONE WORKING JOINT)



T = Existing and new pavement thickness. New pavement thickness is 8" where existing pavement thickness is less than 8". New pavement thickness is 8.5" where existing pavement thickness is 8.5".

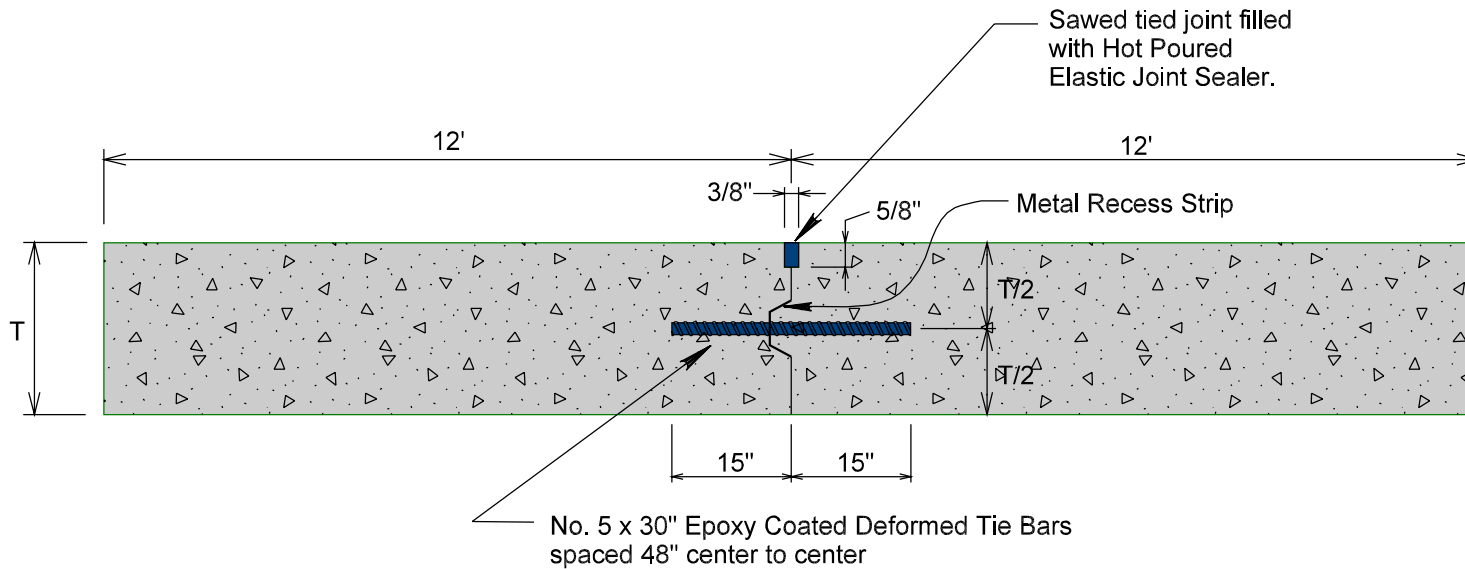
Bar embedded to a minimum depth of 9 inches into the existing pavement by utilizing an epoxy resin adhesive.

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.

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

NONREINFORCED PCC PAVEMENT REPAIR

LONGITUDINAL CONSTRUCTION JOINT WITH TIE BARS & KEYWAY



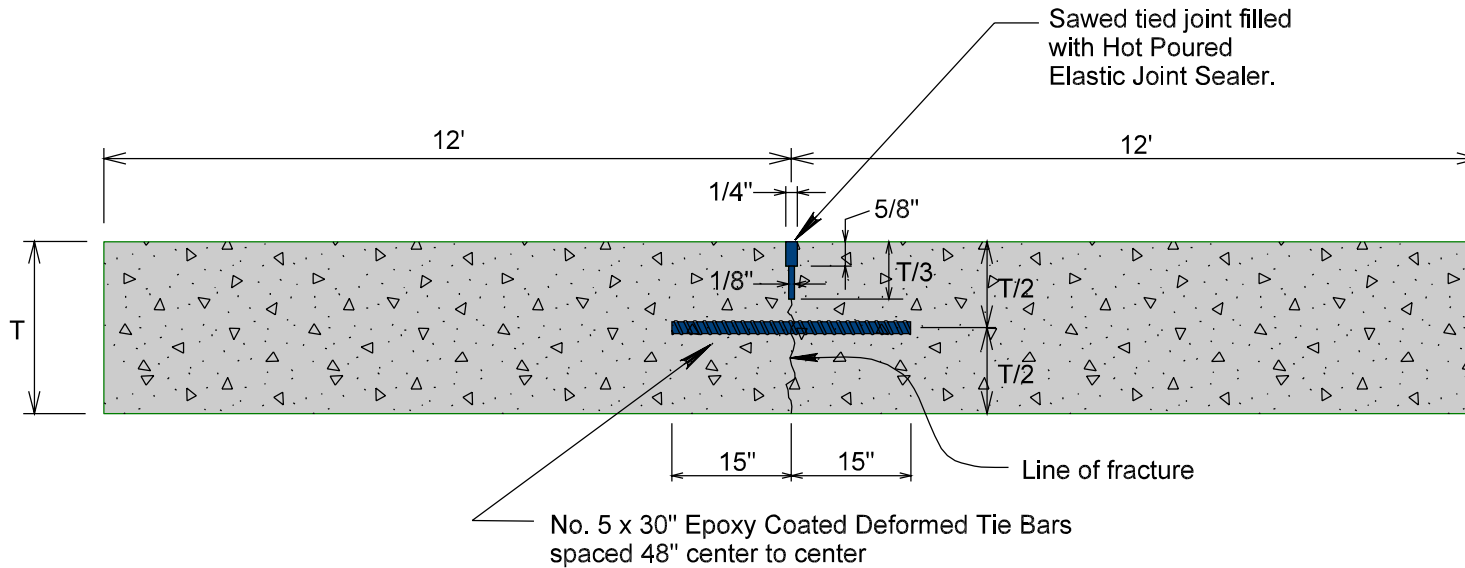
T = New pavement thickness.

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.

NONREINFORCED PCC PAVEMENT REPAIR

SAWED LONGITUDINAL JOINT



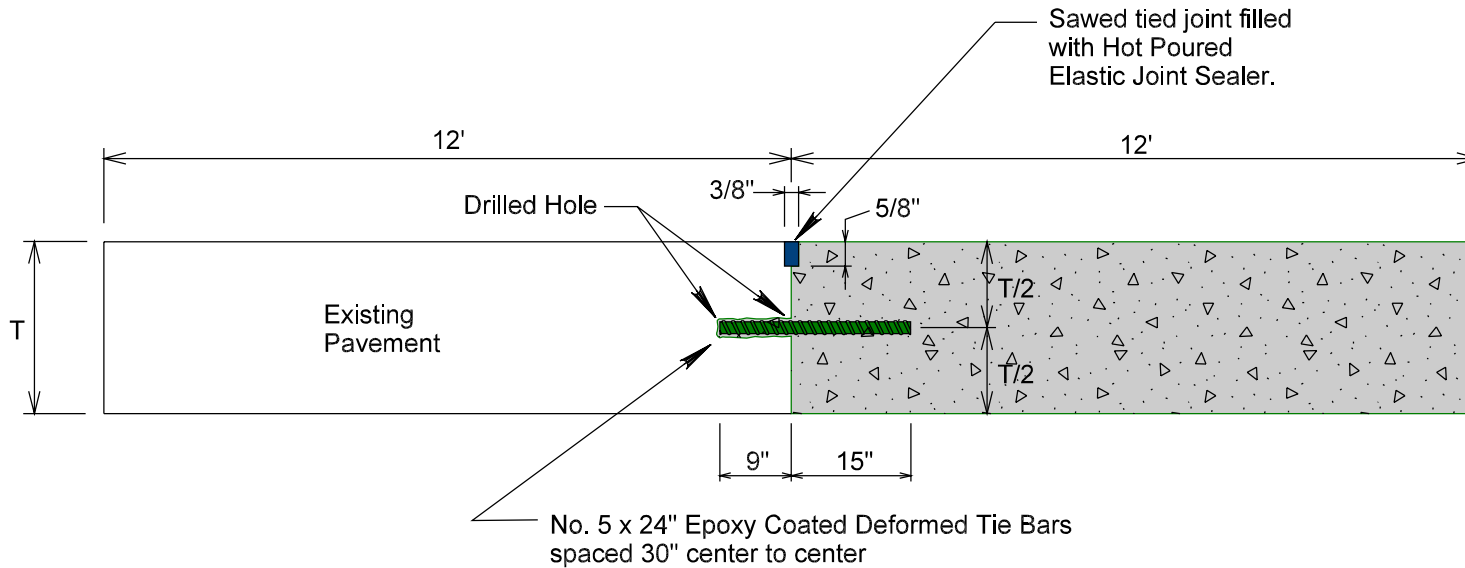
T = New pavement thickness.

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 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



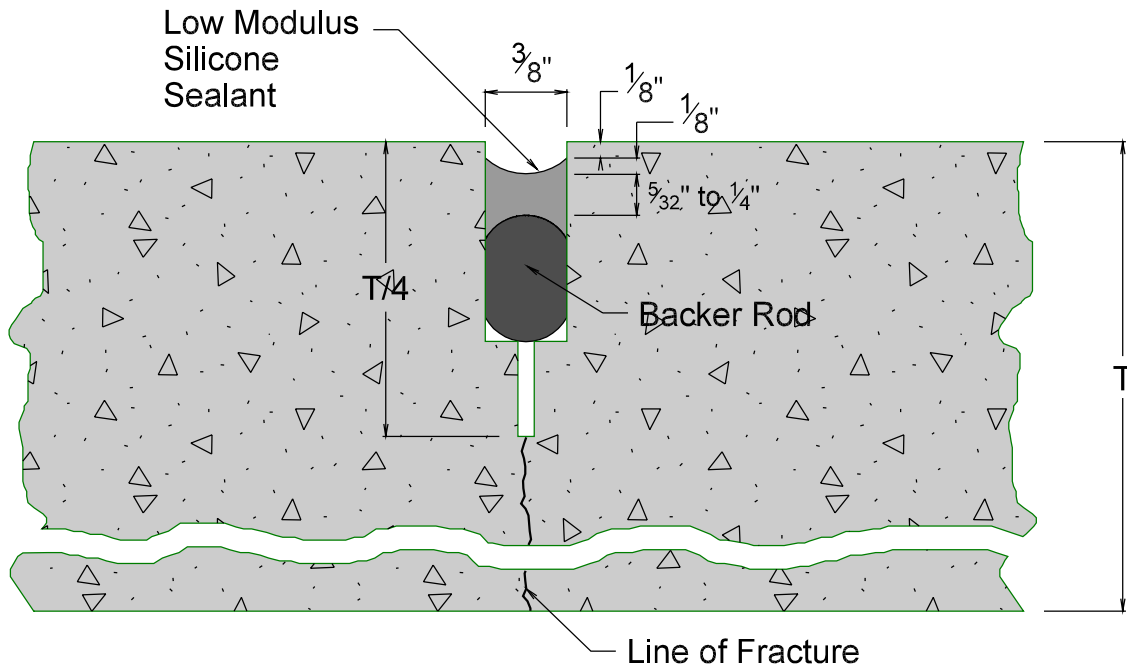
T = Existing and new pavement thickness. New pavement thickness is 8" where existing pavement thickness is less than 8". New pavement thickness is 8.5" where existing pavement thickness is 8.5".

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.

DETAILS FOR PCCP TRANSVERSE CONTRACTION JOINT



T = Pavement Thickness

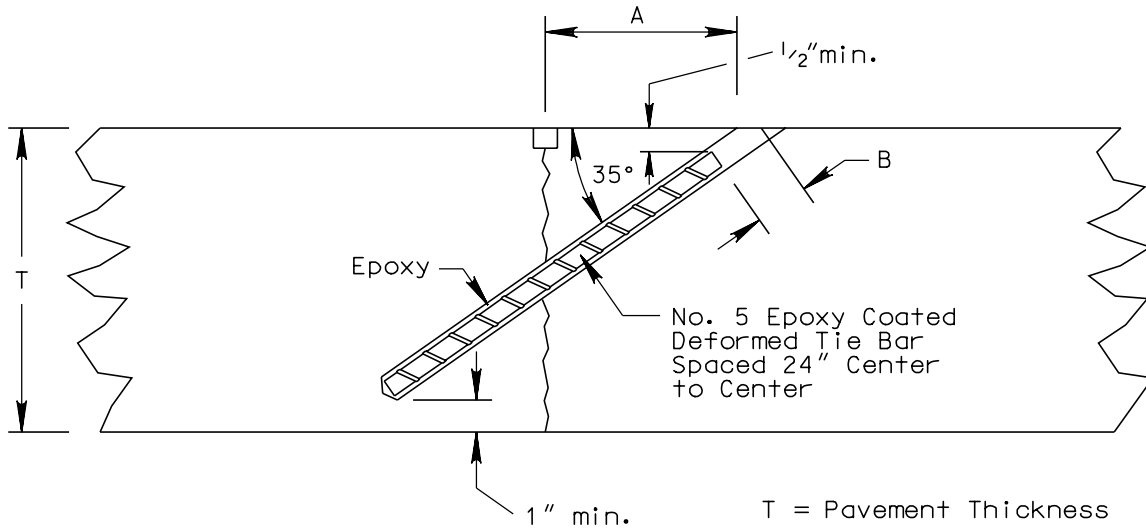
NOTES:

The first saw cut to control cracking shall be a minimum of 1/4 the depth 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.

Backer Rod shall be of nonmoisture absorbing resilient material approximately 25% larger in diameter than the width of the joint to be sealed.

TIE BAR RETROFIT, STITCHING

STITCHING DETAIL

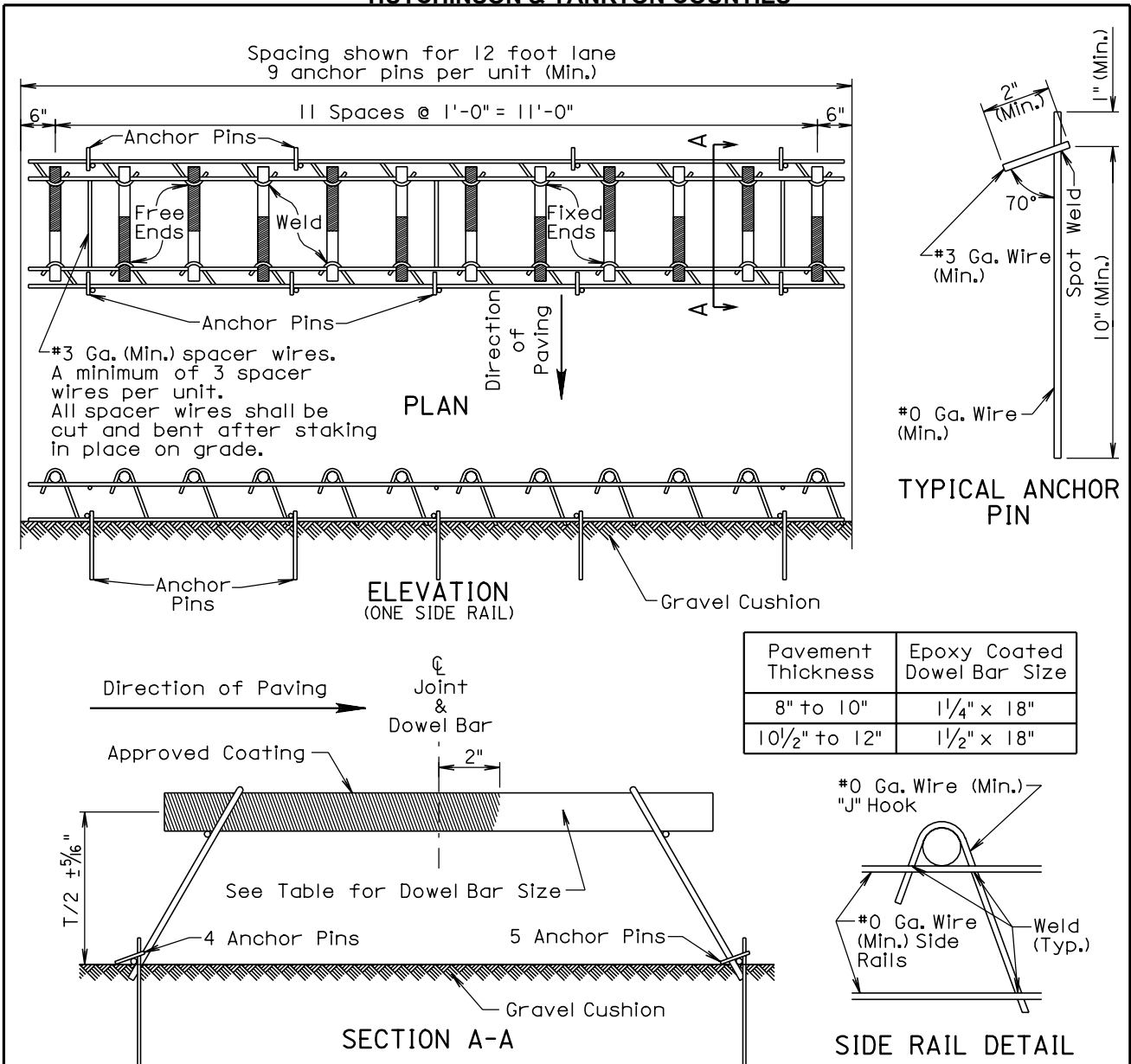


T	A	B	Length of Tie Bar
8"	5"	$1\frac{1}{2}" \pm$	10"
$8\frac{1}{2}"$	$5\frac{1}{4}"$	$1\frac{3}{8}" \pm$	11"
9"	$5\frac{5}{8}"$	$1\frac{1}{4}" \pm$	12"
$9\frac{1}{2}"$	6"	$1\frac{5}{8}" \pm$	$12\frac{1}{2}"$
10"	$6\frac{3}{8}"$	$1\frac{1}{2}" \pm$	$13\frac{1}{2}"$
$10\frac{1}{2}"$	$6\frac{3}{4}"$	$1\frac{3}{8}" \pm$	$14\frac{1}{2}"$
11"	7"	$1\frac{1}{4}" \pm$	$15\frac{1}{2}"$

GENERAL NOTES:

The tie bars shall alternate from opposite sides of the joint to produce a cross-stitching pattern

**050-292, 050-292, 052-292, 081-292, 081-292 & 081 S-292
HUTCHINSON & YANKTON COUNTIES**



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.

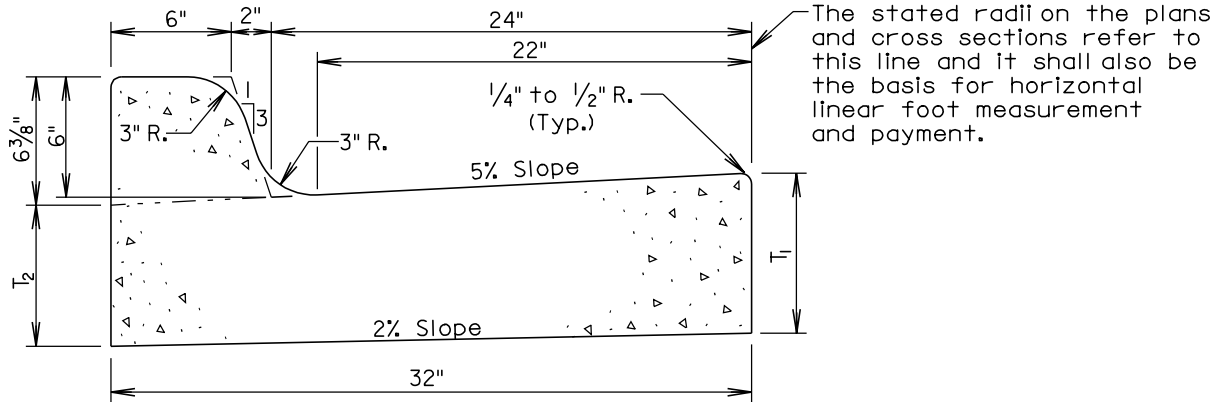
The transverse contraction joints shall be sawed perpendicular to the centerline of the roadway and the dowel bars shall be centered on the sawed joint ± 1 inch.

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, 2007

Published Date: 1st Qtr. 2010	S D D O T	PCC PAVEMENT DOWEL BAR ASSEMBLY FOR TRANSVERSE CONTRACTION JOINTS	PLATE NUMBER 380.01
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**050-292, 050-292, 052-292, 081-292, 081-292 & 081 S-292
HUTCHINSON & YANKTON COUNTIES**



Type	T ₁ (Inches)	T ₂ (Inches)	Cu. Yd. Per Lin. Ft.	Lin. Ft. Per Cu. Yd.
B66	6	5 ⁵ / ₁₆	0.057	17.7
B67	7	6 ¹ / ₁₆	0.065	15.4
B68	8	7 ¹ / ₁₆	0.073	13.7
B68.5	8.5	7 ⁹ / ₁₆	0.077	13.0
B69	9	8 ¹ / ₁₆	0.081	12.3
B69.5	9.5	8 ⁹ / ₁₆	0.085	11.7
B610	10	9 ¹ / ₁₆	0.090	11.2
B610.5	10.5	9 ⁹ / ₁₆	0.094	10.7
B611	11	10 ¹ / ₁₆	0.098	10.2
B611.5	11.5	10 ⁹ / ₁₆	0.102	9.8
B612	12	11 ¹ / ₁₆	0.106	9.4

GENERAL NOTES:

When concrete curb and gutter longitudinally adjoins new concrete pavement, the method of attachment shall be by one of the methods shown on Standard Plate 380.11.

See Standard Plate 650.90 for expansion and contraction joints in the curb and gutter.

September 6, 2008

Published Date: 1st Qtr. 2010	S D D O T	TYPE B CONCRETE CURB AND GUTTER	PLATE NUMBER 650.01
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