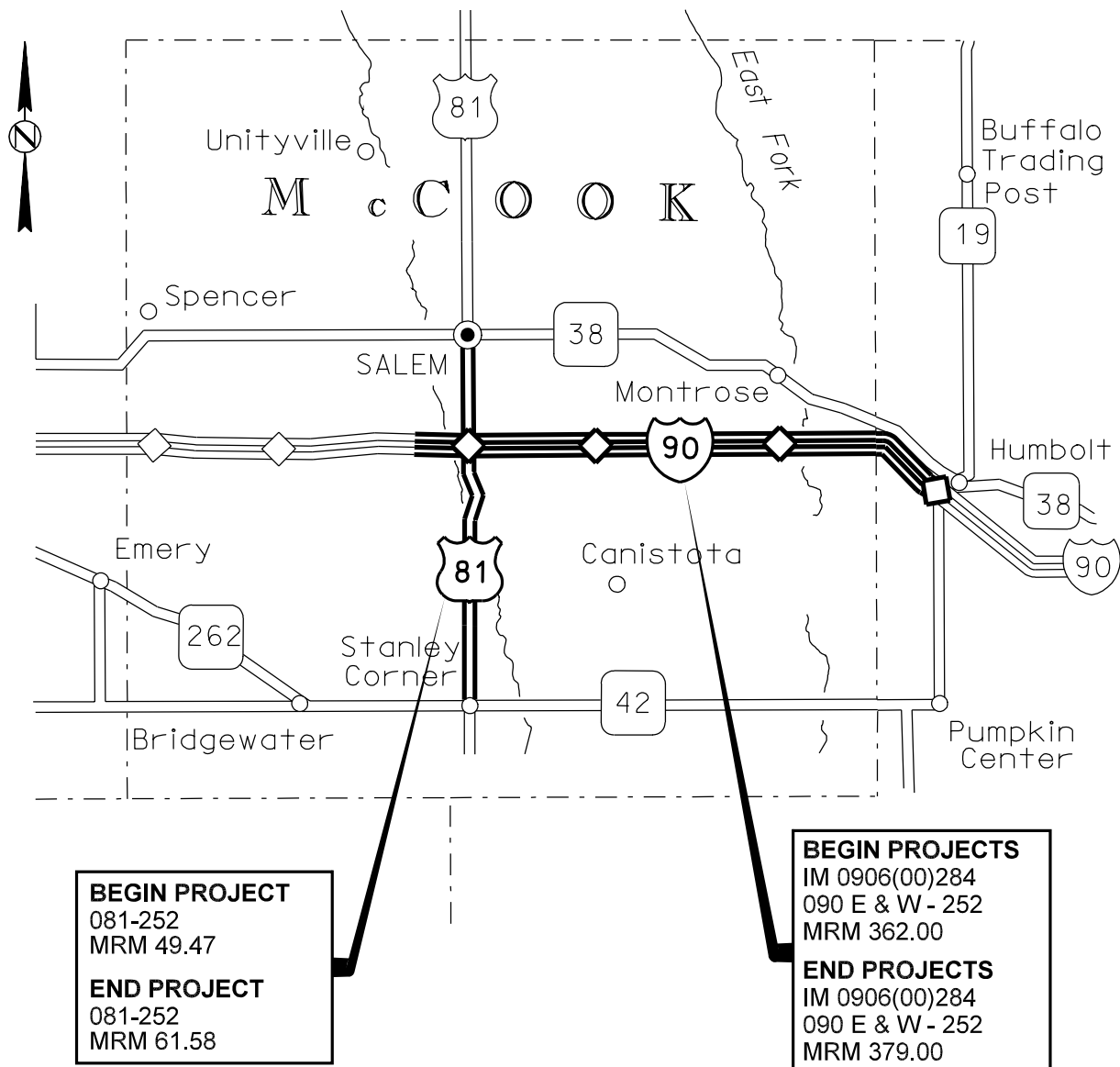
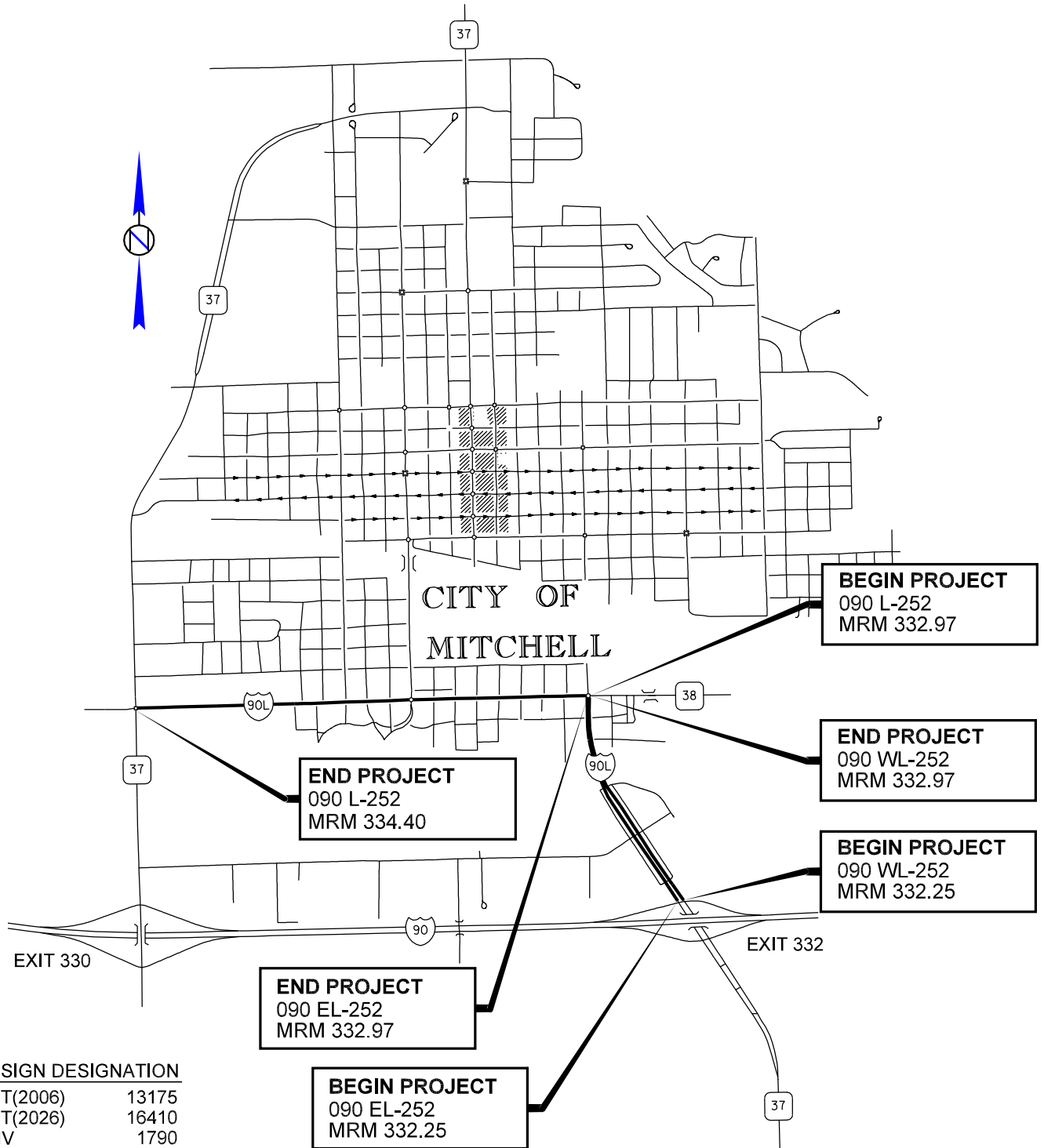


# IM 0906(00)284, 090 E-252, 090 W-252 & 081-252 **McCOOK & MINNEHAHA COUNTIES** **PCC PAVEMENT REPAIR** **PCN 001C, IOM5, IOM6 & IOLZ**



DESIGN DESIGNATION	IM 0906(00)284 & 090 E&W-252	081-252
ADT(2006)	5025	1325
ADT(2026)	7240	1990
DHV	1000	310
D	100%	50%
T DHV	9.9%	11.0%
T ADT	21.8%	24.1%
V	75 MPH	70 MPH

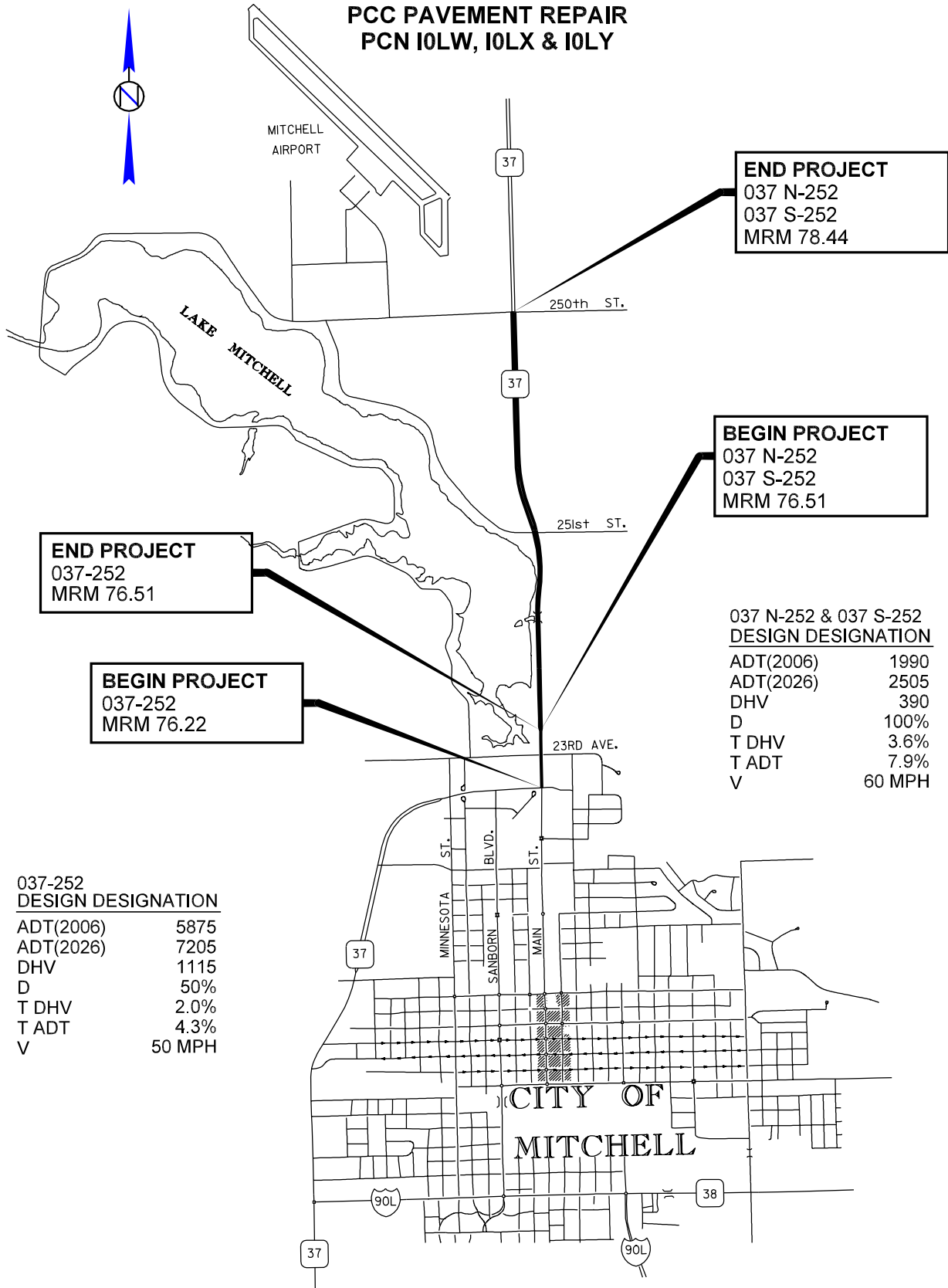
**090 L-252, 090 EL-252 & 090 WL-252  
DAVISON COUNTY  
PCC PAVEMENT REPAIR  
PCN I0M0, I0PK & I0PL**



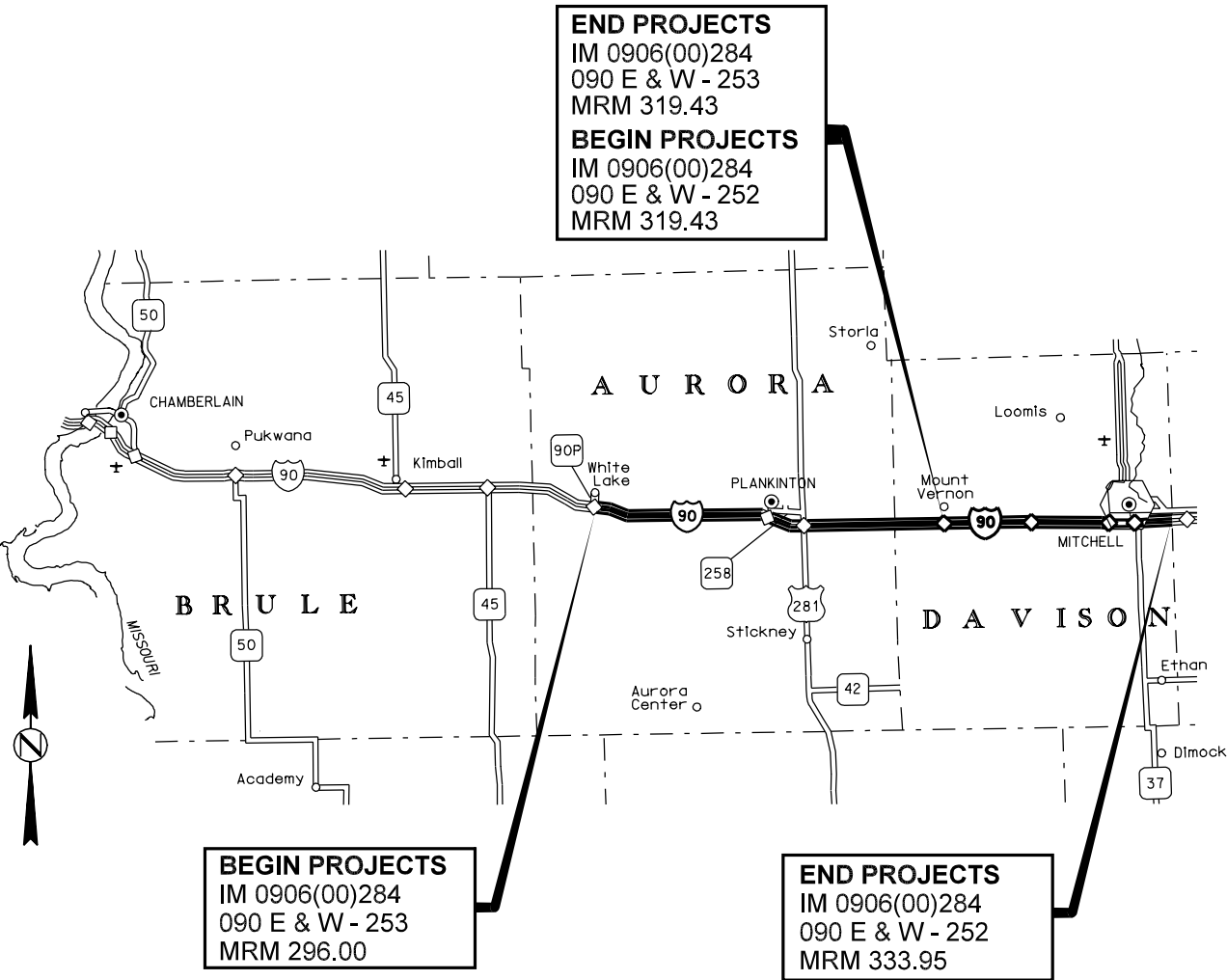
**DESIGN DESIGNATION**

ADT(2006)	13175
ADT(2026)	16410
DHV	1790
D	50%
T DHV	2.8%
T ADT	6.1%
V	50 MPH

**037-252, 037 N-252 & 037 S-252  
DAVISON COUNTY  
PCC PAVEMENT REPAIR  
PCN IOLW, IOLX & IOLY**



# IM 0906(00)284, 090 E-253, 090 W-253, 090 E-252 & 090 W-252 AURORA & DAVISON COUNTIES PCC PAVEMENT REPAIR PCN 001C, I0M1, I0M2, I0M3 & I0M4



DESIGN DESIGNATION	IM 0906(00)284 & 090 E&W-253	IM 0906(00)284 & 090 E&W-252
ADT(2006)	3900	4330
ADT(2026)	6210	6890
DHV	860	950
D	100%	100%
T DHV	11.6%	10.6%
T ADT	25.4%	23.2%
V	75 MPH	75 MPH

## **INDEX OF SHEETS**

Sheet 1 to 4	Layout Maps
Sheet 5	Index of Sheets
Sheet 6	Estimate of Quantities
Sheets 7 to 16	Tables for PCC Pavement Repair
Sheets 17 to 24	Plan Notes
Sheets 25 to 34	PCC Pavement Repair Details
Sheets 35 to 47	Traffic Control

ESTIMATE OF QUANTITIES

IM 0906(00)284 IM 0906(00)284 & 090 E-252 & 090 W-252										
BID ITEM NUMBER	ITEM	001C & IOM5	001C & IOM6	IOLZ	090 L-252 IOM0	090 EL-252 IOPK	090 WL-252 IOPK	090 WL-252 IOLW	037-252 IOLW	
009E0010	Mobilization	60.8	55.1	---	---	---	---	---	---	Lump Sum
320E1200	Asphalt Concrete Composite	1,368	1,230	---	---	---	---	---	---	---
380E5000	Saw and Seal Joint in Asphalt Concrete	---	---	265.5	---	---	---	---	---	---
380E5020	Fast Track Concrete for PCC Pavement Repair	---	---	---	---	---	---	---	---	---
380E5030	Nonreinforced PCC Pavement Repair	304	276	---	133.3	78.7	64	106.7	106.7	---
380E6000	Dowel Bar	---	---	36	12	12	12	12	12	---
380E6110	Insert Steel Bar in PCC Pavement	640	560	359	241	133	127	210	210	---
634E0010	Flagging	20	20	20	20	20	20	20	20	---
634E0100	Traffic Control	---	---	---	---	---	---	---	---	6678
634E0120	Traffic Control Miscellaneous	---	---	---	---	---	---	---	---	Lump Sum
634E0310	Temporary Road Markers	5,400	4,500	14,400	1,620	1,600	960	720	720	---
634E0420	Type C Advance Warning Arrow Panel	---	---	---	---	---	---	---	---	4 Each
634E0610	4" Temporary Pavement Marking Tape Type 2	---	---	1,728	---	---	---	---	---	---
IM 0906(00)284 IM 0906(00)284 IM 0906(00)284 IM 0906(00)284 IM 0906(00)284 & 090 E-253 & 090 W-253 & 090 E-252 & 090 W-252										
BID ITEM NUMBER	ITEM	037 N-252 IOLX	037 S-252 IOLY	001C & IOM1	001C & IOM2	001C & IOM3	001C & IOM4	001C & IOM4	TOTAL QUANTITY	
009E0010	Mobilization	---	---	---	---	---	---	---	Lump Sum	115.9 Ton
320E1200	Asphalt Concrete Composite	---	---	---	---	---	---	---	---	2,598 Ft
320E5000	Saw and Seal Joint in Asphalt Concrete	---	---	---	---	---	---	---	---	265.5 SqYd
380E5020	Fast Track Concrete for PCC Pavement Repair	---	---	---	---	---	---	---	---	6,056.7 SqYd
380E5030	Nonreinforced PCC Pavement Repair	300	196	1,302	1,593	1,212	491	12	192 Each	13,813 Each
380E6000	Dowel Bar	12	12	24	24	24	12	1,093	380 Hour	6,678 Unit
380E6110	Insert Steel Bar in PCC Pavement	571	359	3,034	3,675	2,811	30	---	Lump Sum	71,800 Ft
634E0010	Flagging	30	20	50	60	50	---	---	---	4 Each
634E0100	Traffic Control	---	---	---	---	---	---	---	---	1,728 Ft
634E0120	Traffic Control Miscellaneous	---	---	---	---	---	---	---	---	---
634E0310	Temporary Road Markers	2,400	2,400	9,900	6,300	10,800	10,800	---	---	---
634E0420	Type C Advance Warning Arrow Panel	---	---	---	---	---	---	---	---	---
634E0610	4" Temporary Pavement Marking Tape Type 2	---	---	---	---	---	---	---	---	---

# TABLE FOR PCC PAVEMENT REPAIR

037-252 & 037 N-252, PCN I0LW & I0LX

NBL

MRM	LENGTH OF REPAIRS IN PASSING LANE EACH	LENGTH OF REPAIRS IN DRIVING LANE EACH	PCCP QUANTITY SQ.YDS.	1¼" x 18" PLAIN ROUND DOWEL BARS Each	NO. 5 DEFORMED TIE BARS EACH
<b>037-252 PCN I0LW</b>					
76.22 NBL	6	6	16.0	32	
76.22 SBL	6	6	16.0	32	
76.24 SBL	6	6	16.0	32	
76.31 NBL	7	7	18.7	32	
76.42 SBL	6	6	16.0	32	
76.51 SBL	6	6	16.0	32	
<b>ADDITIONAL QUANTITIES:</b>			<b>8.0</b>	<b>16</b>	<b>2</b>

**037-252 PCN I0LW TOTALS: 106.7 208 2**

An additional 12 Dowel Bars are also included in the Estimate of Quantities  
should any pavement replacement areas greater than 20' in length be needed.

## 037 N-252 PCN I0LX

76.55	7	6	17.3	32	
76.61	6	6	16.0	32	
76.71	6		8.0	16	2
76.75	6	6	16.0	32	
76.76	10	10	26.7	32	
76.79	6		8.0	16	2
76.84	6		8.0	16	2
77.05	6	6	16.0	32	
77.10		6	8.0	16	2
77.19	9	9	24.0	32	
77.27	6	6	16.0	32	
77.40	6		8.0	16	2
77.53	6	6	16.0	32	
77.63		6	8.0	16	2
77.70		6	8.0	16	2
77.85	6		8.0	16	2
77.92	6		8.0	16	2
78.05	6	6	16.0	32	
78.15		6	8.0	16	2
78.19	6	6	16.0	32	
78.27	6	6	16.0	32	
<b>ADDITIONAL QUANTITIES:</b>			<b>24.0</b>	<b>32</b>	<b>7</b>

**037 N-252 PCN I0LX TOTALS: 300.0 544 27**

An additional 12 Dowel Bars are also included in the Estimate of Quantities  
should any pavement replacement areas greater than 20' in length be needed.

**TABLE FOR PCC PAVEMENT REPAIR**

037 S-252, PCN IOLY

SBL

MRM	LENGTH OF REPAIRS IN PASSING LANE EACH	LENGTH OF REPAIRS IN DRIVING LANE EACH	PCCP QUANTITY SQ.YDS.	1¼" x 18" PLAIN ROUND DOWEL BARS Each	NO. 5 DEFORMED TIE BARS EACH
78.36		8	10.7	16	2
78.28		6	8.0	16	2
78.18	8	8	21.3	32	
78.07		6	8.0	16	2
78.05		6	8.0	16	2
77.70	7	6	17.3	32	
77.58		6	8.0	16	2
77.50	7	7	18.7	32	
77.38		6	8.0	16	2
76.88	6	6	16.0	32	
76.84		6	8.0	16	2
76.74	6	6	16.0	32	
76.64	6	6	16.0	32	
<b>ADDITIONAL QUANTITIES:</b>			<b>32.0</b>	<b>32</b>	<b>9</b>

**037 S-252 PCN IOLY TOTALS:      196.0                      336                      23**

An additional 12 Dowel Bars are also included in the Estimate of Quantities  
should any pavement replacement areas greater than 20' in length be needed.



**TABLE FOR PCC PAVEMENT REPAIR**

090 L-252, 090 EL-252 & 090 WL-252 PCN IOM0, IOPK & IOPL

MRM	LENGTH OF REPAIRS IN PASSING LANE EACH	LENGTH OF REPAIRS IN DRIVING LANE EACH	PCCP QUANTITY SQ.YDS.	1¼" x 18" PLAIN ROUND DOWEL BARS Each	NO. 5 DEFORMED TIE BARS EACH
<b>090 WL-252 PCN IOPL</b>					
332.35		6	8.0	16	2
332.45		8	10.7	16	2
332.46	6		8.0	16	2
332.61		7	9.3	16	2
332.63	6		8.0	16	2
332.77		6	8.0	16	2
<b>ADDITIONAL QUANTITIES:</b>			<b>12.0</b>	<b>16</b>	<b>3</b>

**090 WL-252 PCN IOPL TOTALS:      64.0                  112                  15**

An additional 12 Dowel Bars are also included in the Estimate of Quantities should any pavement replacement areas greater than 20' in length be needed.

**090 L-252 PCN IOM0**

333.04 WBL	6	6	16.0	32	
333.37 WBL	6		8.0	16	2
333.63 WBL	6	6	16.0	32	
333.68 WBL	6		8.0	16	2
333.76 WBL		6	8.0	16	2
333.96 WBL	6	6	16.0	32	
334.06 WBL	8	8	21.3	32	
334.3 WBL		6	8.0	16	2
333.35 EBL	6		8.0	16	2
<b>ADDITIONAL QUANTITIES:</b>			<b>24.0</b>	<b>16</b>	<b>7</b>

**090 L-252 PCN IOM0 TOTALS:      133.3                  224                  17**

An additional 12 Dowel Bars are also included in the Estimate of Quantities should any pavement replacement areas greater than 20' in length be needed.

**090 EL-252 PCN IOPK**

332.76	6	6	16.0	32	
332.48	6		8.0	16	2
332.35	6	6	16.0	32	
332.25	10	10	26.7	32	
<b>ADDITIONAL QUANTITIES:</b>			<b>12.0</b>	<b>16</b>	<b>3</b>

**090 EL-252 PCN IOPK TOTALS:      78.7                  128                  5**

An additional 12 Dowel Bars are also included in the Estimate of Quantities should any pavement replacement areas greater than 20' in length be needed.

**TABLE FOR PCC PAVEMENT REPAIR**

081-252, PCN IOLZ

MRM	LENGTH OF REPAIRS IN SOUTHBOUND LANE EACH	LENGTH OF REPAIRS IN NORTHBOUND LANE EACH	FAST TRACK PCCP QUANTITY SQ.YDS.	1" x 18" PLAIN ROUND DOWEL BARS Each	NO. 5 DEFORMED TIE BARS EACH
55.22		6	9.3	18	2
55.78		6	9.3	18	2
56.75	6		9.3	18	2
57.68	6		9.3	18	2
57.74	24	24	74.7	36	
57.97		24	37.3	18	10
57.98	8	8	24.9	36	
58.00		6	9.3	18	2
58.08	6		9.3	18	2
60.93		6	9.3	18	2
60.97	10	6	24.9	36	1
61.21		6	9.3	18	2
61.33	6		9.3	18	2
<b>ADDITIONAL QUANTITIES:</b>			<b>20.0</b>	<b>36</b>	<b>6</b>
<b>081-252 PCN IOLZ TOTALS:</b>			<b>265.5</b>	<b>324</b>	<b>35</b>

An additional 36 Dowel Bars are also included in the Estimate of Quantities should any pavement replacement areas greater than 20' in length be needed.

**TABLE FOR PCC PAVEMENT REPAIR**

IM 0906(00)284 & 090 W-252, PCN 001C & I0M4  
WBL

MRM	REPAIRS IN PASSING LANE Each	REPAIRS IN DRIVING LANE Each	PCCP QUANTITY SqYd	1 1/4" x 18" PLAIN ROUND DOWEL BARS Each	NO. 5 DEFORMED TIE BARS Each
334-333	0	0	0	0	0
333-332	0	0	0	0	0
332-331	0	0	0	0	0
331-330	1	5	51.0	96	13
330-329	2	3	42.0	80	10
329-328	3	1	33.0	64	10
328-327	0	1	8.0	16	2
327-326	1	3	33.0	64	9
326-325	0	1	8.0	16	2
325-324	0	0	0.0	0	0
324-323	0	5	42.0	80	11
323-322	0	5	42.0	80	11
322-321	0	3	26.0	48	7
321-320	0	2	16.0	32	4
320-319	3	10	110.0	208	28
<b>ADDITIONAL QUANTITIES:</b>			<b>80.0</b>	<b>178</b>	<b>24</b>
<b>IM 0906(00)284 &amp; 090 W-252</b>					
<b>PCN 001C &amp; I0M4 TOTALS:</b>			<b>491.0</b>	<b>962</b>	<b>131</b>

An additional 12 Dowel Bars are also included in the Estimate of Quantities  
should any pavement replacement areas greater than 20' in length be needed.

**IM 0906(00)284, 090 E-252, 090 W-252, 081-252, 090 L-252, 090 EL-252, 090 WL-252, 037-252,  
037 N-252, 037 S-252, 090 E-253, 090 W-253, 090 E-252 & 090 W-252  
AURORA, DAVISON, McCOOK & MINNEHAHA COUNTIES**

**TABLE FOR PCC PAVEMENT REPAIR**

IM 0906(00)284 & 090 W-253 , PCN 001C & I0M2  
WBL

MRM	REPAIRS IN PASSING LANE Each	REPAIRS IN DRIVING LANE Each	PCCP QUANTITY SqYd	1 1/4" x 18" PLAIN ROUND DOWEL BARS Each	NO. 5 DEFORMED TIE BARS Each
319-318	0	0	0.0	0	0
318-317	0	2	17.0	32	5
317-316	0	10	85.0	160	24
316-315	0	0	0.0	0	0
315-314	0	2	17.0	32	5
314-313	0	5	42.0	80	12
313-312	0	3	26.0	48	7
312-311	0	1	8.0	16	2
311-310	0	5	42.0	80	10
310-309	0	5	42.0	80	10
309-308	3	4	60.0	112	14
308-307	2	14	138.0	256	36
307-306	4	7	92.0	176	24
306-305	1	6	58.0	112	16
305-304	2	18	178.0	320	44
304-303	0	14	123.0	224	30
303-302	5	13	156.0	288	36
302-301	4	13	146.0	272	38
301-300	1	2	26.0	48	8
300-299	4	2	50.0	96	14
299-298	3	7	85.0	160	24
298-297	1	8	85.0	144	24
297-296	0	2	17	32	4
<b>ADDITIONAL QUANTITIES:</b>			<b>100.0</b>	<b>490</b>	<b>30</b>
<b>IM 0906(00)284 &amp; 090 W-253</b>					
<b>PCN 001C &amp; I0M2 TOTALS:</b>			<b>1593.0</b>	<b>3258</b>	<b>417</b>

An additional 24 Dowel Bars are also included in the Estimate of Quantities should any pavement replacement areas greater than 20' in length be needed.

**IM 0906(00)284, 090 E-252, 090 W-252, 081-252, 090 L-252, 090 EL-252, 090 WL-252, 037-252,  
037 N-252, 037 S-252, 090 E-253, 090 W-253, 090 E-252 & 090 W-252  
AURORA, DAVISON, McCOOK & MINNEHAHA COUNTIES**

**TABLE FOR PCC PAVEMENT REPAIR**

IM 0906(00)284 & 090 E-253, PCN 001C & I0M1  
EBL

MRM	REPAIRS IN PASSING LANE Each	REPAIRS IN DRIVING LANE Each	PCCP QUANTITY SqYd	1¼" x 18" PLAIN ROUND DOWEL BARS Each	NO. 5 DEFORMED TIE BARS Each
296-297	0	3	26.0	48	7
297-298	0	3	26.0	48	7
298-299	0	2	16.0	32	5
299-300	0	2	16.0	32	5
300-301	0	4	34.0	64	9
301-302	0	1	8.0	16	2
302-303	0	3	26.0	48	7
303-304	2	13	130.0	240	34
304-305	3	9	100.0	192	28
305-306	2	9	92.0	176	25
306-307	1	20	178.0	336	46
307-308	7	11	160.0	288	39
308-309	0	2	16.0	32	5
309-310	0	0	0.0	0	0
310-311	0	1	8.0	16	2
311-312	1	6	58.0	112	15
312-313	1	4	42.0	80	12
313-314	1	7	68.0	128	18
314-315	0	1	8.0	16	2
315-316	2	10	100.0	192	26
316-317	0	5	42.0	80	11
317-318	0	2	16.0	32	5
<b>ADDITIONAL QUANTITIES:</b>			<b>132.0</b>	<b>477</b>	<b>39</b>
<b>IM 0906(00)284 &amp; 090 E-253</b>					
<b>PCN 001C &amp; I0M1 TOTALS:</b>			<b>1302.0</b>	<b>2685</b>	<b>349</b>

An additional 24 Dowel Bars are also included in the Estimate of Quantities should any pavement replacement areas greater than 20' in length be needed.

**TABLE FOR PCC PAVEMENT REPAIR**

IM 0906(00)284 & 090 E-252, PCN 001C & I0M3  
EBL

MRM	REPAIRS IN PASSING LANE Each	REPAIRS IN DRIVING LANE Each	PCCP QUANTITY SqYd	1 1/4" x 18" PLAIN ROUND DOWEL BARS Each	NO. 5 DEFORMED TIE BARS Each
318-319	1	8	76.0	144	20
319-320	0	5	42.0	80	11
320-321	0	6	51.0	96	14
321-322	2	10	100.0	192	26
322-323	1	15	140.0	256	35
323-324	2	9	94.0	176	24
324-325	0	5	42.0	80	11
325-326	0	7	59.0	112	16
326-327	0	2	16.0	32	5
327-328	2	0	16.0	32	5
328-329	1	7	68.0	128	17
329-330	4	22	228.0	416	60
330-331	7	7	122.0	224	30
331-332	2	1	26.0	48	6
332-333	2	2	34.0	64	9
333-334	3	3	50.0	96	11
<b>ADDITIONAL QUANTITIES:</b>			<b>48.0</b>	<b>321</b>	<b>14</b>
<b>IM 0906(00)284 &amp; 090 E-252</b>					
<b>PCN 001C &amp; I0M3 TOTALS:</b>			<b>1212.0</b>	<b>2497</b>	<b>314</b>

An additional 24 Dowel Bars are also included in the Estimate of Quantities  
should any pavement replacement areas greater than 20' in length be needed.

**TABLE FOR PCC PAVEMENT REPAIR**

IM 0906(00)284 & 090 E-252, PCN 001C & I0M5

EBL

MRM	LENGTH OF REPAIRS IN PASSING LANE EACH	LENGTH OF REPAIRS IN DRIVING LANE EACH	PCCP QUANTITY SQ.YDS.	1¼" x 18" PLAIN ROUND DOWEL BARS Each	NO. 5 DEFORMED TIE BARS EACH	ASPHALT CONCRETE COMPOSITE TONS
363.62		6	8.0	16	2	1.6
363.73		6	8.0	16	2	1.6
364.05	6	6	16.0	32		3.2
364.89	6		8.0	16	2	1.6
366.02	6	6	16.0	32		3.2
366.17		6	8.0	16	2	1.6
366.31	6		8.0	16	2	1.6
366.56		6	8.0	16	2	1.6
366.73		6	8.0	16	2	1.6
366.93		6	8.0	16	2	1.6
367.19		6	8.0	16	2	1.6
367.26		6	8.0	16	2	1.6
367.39		6	8.0	16	2	1.6
367.52	6	6	16.0	32		3.2
367.84		6	8.0	16	2	1.6
367.89		6	8.0	16	2	1.6
368.22		6	8.0	16	2	1.6
368.43	6	6	16.0	32		3.2
368.73		6	8.0	16	2	1.6
368.75		6	8.0	16	2	1.6
368.83		6	8.0	16	2	1.6
368.89		6	8.0	16	2	1.6
368.90		6	8.0	16	2	1.6
368.91		6	8.0	16	2	1.6
368.99		6	8.0	16	2	1.6
371.65	6	6	16.0	32		3.2
373.83		6	8.0	16	2	1.6
373.84		6	8.0	16	2	1.6
373.80		6	8.0	16	2	1.6
373.94		6	8.0	16	2	1.6
ADDITIONAL QUANTITIES:			24.0	24	6	4.8
IM 0906(00)284 & 090 E-252						
PCN 001C & I0M5 TOTALS:			304.0	584	56	60.8

**TABLE FOR PCC PAVEMENT REPAIR**

IM 0906(00)284 & 090 W-252, PCN 001C & IOM6

WBL

MRM	LENGTH OF REPAIRS IN PASSING LANE EACH	LENGTH OF REPAIRS IN DRIVING LANE EACH	PCCP QUANTITY SQ.YDS.	1¼" x 18" PLAIN ROUND DOWEL BARS Each	NO. 5 DEFORMED TIE BARS EACH	ASPHALT CONCRETE COMPOSITE TONS
375.22		6	8.0	16	2	1.6
368.84		6	8.0	16	2	1.6
368.55		6	8.0	16	2	1.6
368.54		6	8.0	16	2	1.6
368.04	6	6	16.0	32		3.2
367.96	6	6	16.0	32		3.2
367.91	6	7	17.3	32		3.4
367.43	6	8	18.7	32		3.7
366.95		6	8.0	16	2	1.6
366.59		6	8.0	16	2	1.6
366.57	6	6	16.0	32		3.2
366.48		6	8.0	16	2	1.6
366.31	6		8.0	16	2	1.6
365.74		6	8.0	16	2	1.6
364.53	6	6	16.0	32		3.2
363.22		6	8.0	16	2	1.6
363.19		6	8.0	16	2	1.6
363.14		6	8.0	16	2	1.6
363.16		6	8.0	16	2	1.6
362.95		6	8.0	16	2	1.6
362.80		6	8.0	16	2	1.6
362.50	6		8.0	16	2	1.6
362.49		6	8.0	16	2	1.6
362.46	6	6	16.0	32		3.2
<b>ADDITIONAL QUANTITIES:</b>			<b>24.0</b>	<b>24</b>	<b>6</b>	<b>4.8</b>
<b>IM 0906(00)284 &amp; 090 W-252</b>						
<b>PCN 001C &amp; IOM6 TOTALS:</b>			<b>276.0</b>	<b>520</b>	<b>40</b>	<b>55.1</b>



## **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.

## **COMPLETION DATE**

All work on I90 Loop, PCN I0M0, shall be completed on or before October 15, 2007.

All work on the remaining contract shall be completed on or before June 30, 2008.

## **COORDINATION BETWEEN CONTRACTORS**

Separate contracts for Project Nos. NH0037(89)72, PH90-7(50)332, and PH2090(09)333 for Ramp Widening, PCC Paving, Signal Upgrade, Roadway Lighting, Pavement Marking, & Permanent Signing and Project No. PH 000S(163) for Durable Pavement Marking have been awarded to other Contractors.

The Contractor shall schedule his work so as not to interfere with or hinder the progress of the work performed by other Contractors on the other projects.

## **WASTE DISPOSAL SITE**

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

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

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

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

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

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

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

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

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

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

### **RESTORATION OF GRAVEL CUSHION**

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

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

Cost for this work shall be incidental to the contract unit prices per square yard for Nonreinforced PCC Pavement Repair and Fast Track Concrete for PCC Pavement Repair.

### **EXISTING PCC PAVEMENT**

The existing pavement on US 81 is 8" Nonreinforced PCC Pavement.

Existing contraction joints are spaced at approximately 20'. Longitudinal joints are reinforced with No. 4 x 30" deformed tie bars spaced 48" center to center. Transverse joints are reinforced with 1¼" x 18" plain round dowel bars spaced 12" center to center.

The existing pavement on I90 Loop is 9" Nonreinforced PCC Pavement.

The existing 9" PCC Pavement is reinforced with welded wire fabric. The welded wire fabric weighs not less than 60 pounds per 100 square feet, the longitudinal wires are No. 1 gauge and are spaced 6" center to center and the transverse wires are No. 4 gauge and are spaced 12" center to center.

Existing contraction joints are spaced at approximately 46.5' on Havens Ave. and 40' on Burr St. 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 or 10 x 18" deformed tie bars spaced 12" to 18" center to center.

The existing pavement on I90 is 9" Nonreinforced PCC Pavement.

The existing 9" PCC Pavement is reinforced with welded wire fabric. The welded wire fabric weighs not less than 60 pounds per 100 square feet, the longitudinal wires are No. 1 gauge and are spaced 6" center to center and the transverse wires are No. 4 gauge and are spaced 12" center to center.

Existing contraction joints are spaced at approximately 46.5'. 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 or 10 x 18" deformed tie bars spaced 12" to 18" center to center.

In addition, the existing 9" PCC Pavement on I90 from MRM 362 to MRM 379 is covered with asphalt concrete. The existing asphalt concrete pavement consists of a 2" lift and a 1½" lift of asphalt concrete. The aggregate in the asphalt concrete is quartzite.

The aggregate in the existing 8" & 9" 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.

**NONREINFORCED PCC PAVEMENT REPAIR – GENERAL (CONTINUED)**

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.

A working joint will be reconstructed at both ends of each pavement replacement area as shown in these plans.

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 a minimum thickness of 8" where the existing pavement thickness is 8" and 9" where the existing pavement thickness is 9".

Concrete for four-lane roadway repair shall meet the requirements of the Standard Specifications Section 380, except as modified by the following notes:

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

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

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

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

The curing method used on 090 E-252, PCN I0M5 and 090 W-252, PCN I0M6 shall be the Cotton or Burlap Mats and White Polyethylene Sheeting method in accordance with Section 380.3 P.1. of the Standard Specifications. The Impervious Membrane Method will not be allowed due to the application of tack prior to the placement of Asphalt Concrete Composite for the Asphalt Concrete Pavement Repair areas.

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.

### **FAST TRACK CONCRETE FOR PCC PAVEMENT REPAIR**

New pavement thickness shall be a minimum thickness of 8" where the existing pavement thickness is 8".

Fast Track Concrete shall be used for two-lane roadway repair locations to ensure that the pavement repair area can be opened to traffic within 6 to 8 hours after placement.

The slump requirement prior to use of a set accelerator or super-plasticizer will be limited to 2" maximum. After the addition of the super-plasticizer the concrete shall have a maximum slump of 8" and an air content of 4.5% to 7.0%. Coarse Aggregate shall be size No. 1, unless an alternative gradation is approved as part of the mix design submittal. The Contractor is responsible for the mix design used. The Contractor shall submit a mix design and supporting documentation for approval at least 2 weeks prior to use. In lieu of submitting a mix design the Contractor may use the following:

	<u>LB./CU.YD.</u>
CEMENT (TYPE II or III)	784
FINE AGGREGATE	1162
COARSE AGGREGATE	1650

The use of a set accelerator and super-plasticizer at manufacturer's recommended dosage will be required. The super-plasticizer shall be added at the project site.

The special mix has been designed to produce a minimum compressive strength of 3,800 psi in 6 to 8 hours of curing time.

Fast Track 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. In addition, the concrete shall be immediately covered with suitable insulation blanket consisting of a layer of closed cell polystyrene foam protected by at least one layer of plastic. The insulation blanket shall have an R value of at least 0.5, as rated by the manufacturer. The insulation blanket shall be left in place, except for joint sawing operations, until the 3,800 psi strength is attained.

The contraction joint sawing shall be performed as soon as possible after placement of concrete to avoid random cracking. Contraction joints shall be initially sawed to the plans detailed depth and to a width of 1/8".

The concrete repair area shall be removed, replaced, and opened to traffic in the same day during daylight hours. If the repair cannot be accomplished within the same day the Contractor shall place and compact gravel cushion within the repair area prior to night fall and the roadway shall be open to normal traffic. The Contractor shall be responsible for the additional cost for providing, placing and compacting the gravel cushion.

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

### **STEEL BAR INSERTION**

On 8" concrete repair areas:

The Contractor shall insert the steel bars (1" x 18" epoxy coated plain round dowel 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.

On 9" concrete repair areas:

The Contractor shall insert the steel bars (1 1/4" x 18" epoxy coated plain round dowel 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 BAR INSERTION (CONTINUED)**

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 in a 12' wide patch and 12" from the outside edge of the slab in a 14' wide patch. 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). A typical one-lane patch 14' wide and 6' long will require 20 steel bars (9 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 traces of dust.

The joints shall be sawed and sealed using one of the two following options:

OPTION 1: 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. This work shall be done as per the layout for Nonreinforced PCC Pavement Repair Longitudinal Construction Joint with Drilled in Tie Bars and the Details for PCCP Transverse Contraction Joint.

OPTION 2: Seal both the transverse and longitudinal joints using Hot Poured Elastic Joint Sealer as per the layout for Nonreinforced PCC Pavement Repair Longitudinal Construction Joint with Drilled in Tie Bars and the layout for PCC Pavement Transverse Contraction Joint With or Without Dowel Bar Assembly (Option 2). If, as determined by the Engineer, the 1/8" wide sawcut is not wide enough to obtain a clean joint with true edges, a 1/4" wide sawcut may be required.

Cost for sawing and sealing of the longitudinal construction joint and both transverse joints shall be incidental to the contract unit prices per square yard for Nonreinforced PCC Pavement Repair and/or Fast Track Concrete for PCC Pavement Repair.

### **ASPHALT CONCRETE PAVEMENT REPAIR**

The asphalt concrete pavement repair areas shall be approximately the same dimensions as the concrete repair areas.

See previous notes for disposal of debris.

### **ASPHALT CONCRETE PAVEMENT REPAIR (CONTINUED)**

New asphalt concrete pavement thickness shall be approximately 3½" placed in a 2" bottom lift and a 1½" top lift (adjust thickness to match existing). Asphalt for Tack SS-1h or CSS-1h shall be applied to the new concrete surface and all vertical contact faces prior to placement of the bottom lift. Tack shall also be applied to the bottom lift and all vertical contact faces prior to placement of the top lift. Extreme care shall be taken during concrete placement and asphalt concrete placement so as not to damage the sawed asphalt concrete face.

The surface of each lift shall be free of waves and irregularities. The final lift surface shall be checked with a 10 foot straightedge. The variation of the surface from the straightedge between any two contact points shall not exceed 0.02 foot. If the variation is greater than 0.02 foot the Contractor will be required to grind the area to meet the specification. This will be done at no additional cost to the State.

The asphalt concrete for the repair areas shall be Asphalt Concrete Composite and shall be furnished by the Contractor.

Mineral aggregate for the Asphalt Concrete Composite shall conform to the requirements of the Standard Specifications for Class E or G, Type I.

Asphalt Concrete Composite may be obtained from a hot plant producing asphalt concrete for the SDDOT in accordance to Class Q medium or high volume traffic asphalt concrete specifications. All other requirements in the Standard Specifications for Asphalt Concrete Composite Section 324 shall apply.

The asphalt binder used in the mixture shall be a PG 64-22 Asphalt Binder.

The Contractor shall provide a Job-Mix Formula to the Bituminous Engineer with supporting mix design data prior to production.

The asphalt binder content may be adjusted by the Engineer.

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 Joint In Asphalt Concrete notes for details on sawing and sealing joints.

Cost for performing the aforementioned work including furnishing and placing tack, furnishing and placing asphalt concrete, labor, tools and equipment shall be included in the contract unit price per ton for Asphalt Concrete Composite. The quantity of Asphalt Concrete Composite to be paid for shall be computed using the dimensions of the repair area times an average depth of 3½" times the average weight of the mix per cubic ft. from the Mix Design for asphalt concrete composite.

### **SAW AND SEAL JOINT IN ASPHALT CONCRETE**

All longitudinal and transverse joints at repair areas shall be sawed and sealed. At a typical patch this will be two transverse joints (typically cold joints) and two longitudinal joints (1 at centerline-typically a cold joint and 1 at the 12' line-typically a hot joint). See the Asphalt Concrete Pavement Repair Joint Details in these plans.

Joint sealant material shall be from the South Dakota Department of Transportation's approved products list for Sealant Approved for Asphalt Concrete Over Long Jointed Concrete Pavement. A listing of acceptable products may be obtained on the Internet at the following address:  
[www.state.sd.us/Applications/HC54ApprovedProducts/main.asp](http://www.state.sd.us/Applications/HC54ApprovedProducts/main.asp)

Saw cuts may be made wet or dry and shall be accurately located by pins and stringline subject to approval of the Engineer.

The dimension of the saw cut shall be ⅛" wide by 1½" deep directly above the underlying PCCP joint to facilitate cracking. A sealant reservoir ⅝" wide by ⅝" deep shall be sawed in and centered directly over the underlying ⅛" saw cut.

Dry sawed joints shall be cleaned with high-pressure air. Wet sawed joints shall be cleaned with high pressure water followed by high pressure air. The air compressor shall produce a minimum of 125 CFM output and shall be equipped with a ⅝" nozzle

The sealant shall be placed in accordance with the manufacturer's recommendations. The sealant shall fit the joint such that after cooling, the level of the sealant will not be greater than ⅛" below the pavement surface.

### **SAW AND SEAL JOINT IN ASPHALT CONCRETE (CONTINUED)**

Care shall be taken so that the joints shall not be overfilled. Sealant shall not be spread over the pavement surface. Blotting material, such as toilet paper, shall be placed over the sealant material where traffic is allowed to cross a sealed area before track free status has been achieved.

Payment for sawing and sealing joints will be at the contract unit price per foot for Saw and Seal Joints in Asphalt Concrete inclusive of costs for marking existing joints, sawing, cleaning, sealing, equipment, labor and incidentals necessary to complete the work.

### **SEQUENCE OF OPERATION**

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

- Westbound lanes from Thursday, August 2 through Wednesday, August 8.
- Eastbound lanes from Thursday, August 9 through Monday, August 13.

### **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 three workspaces on a two-lane highway and four workspaces on a four-lane highway. 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, two drums should be installed at a spacing of 660' alternating with the Type III Barricades.

Signs may be mounted on portable supports except for the Road Work Next XX Miles and End Road Work signs on Interstate. One Road Work Next XX Miles sign and one End Road Work sign shall be ground mounted at fixed locations in advance and after each project on Interstate. The Road Work Next XX Miles signs shall be installed a minimum of 1000' in advance of the Road Work Ahead sign location.

Construction workspaces on divided roadways shall be limited to 3 miles in length. Construction workspaces on undivided roadways shall be limited to 300 feet in length. The distance between the closest points of any two construction workspaces, including channeling devices, shall not be less than 3 miles. Drivers in two-way traffic workspaces must be able to see approaching traffic through and beyond the work zone.

Construction workspaces in urban areas shall be limited to 3 blocks in length. The minimum distance between workspaces shall be 3 blocks.

Holes in the asphalt or gravel 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. Hot-mix asphalt concrete and gravel shall be furnished by the Contractor.

**MAINTENANCE OF TRAFFIC – PCC PAVEMENT REPAIR (CONTINUED)**

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

Routing traffic onto the asphalt or gravel shoulders during any phase of the construction will not be allowed except on ramp shoulders.

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.

**MAINTENANCE OF TRAFFIC (INTERSTATE HIGHWAYS)**

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

The use of interstate maintenance crossovers will not be permitted.

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

**MAINTENANCE OF TRAFFIC (URBAN)**

Joints in approaches to signalized intersections containing vehicle detector loops shall not be sawed, sealed or otherwise disturbed.

The Contractor will be required to contact the Region Traffic Engineer to adjust signal timings to accommodate traffic when a lane is closed near a signalized intersection.

Tall reflectorized cones (42" minimum height) or Reflectorized drums or Type II Barricades shall be used to maintain a minimum of two-way traffic at intersecting streets. The Contractor shall mark and maintain alternating one-way access to businesses and residences along the project with cones, drums or Type I Barricades. The Contractor shall advise affected businesses before restriction and anticipated duration of construction time.

The Contractor shall maintain pedestrian access at crosswalk locations. Additional traffic control devices shall be used as necessary to accommodate the pedestrian traffic if work activities block an existing crosswalk.

**TEMPORARY PAVEMENT MARKING**

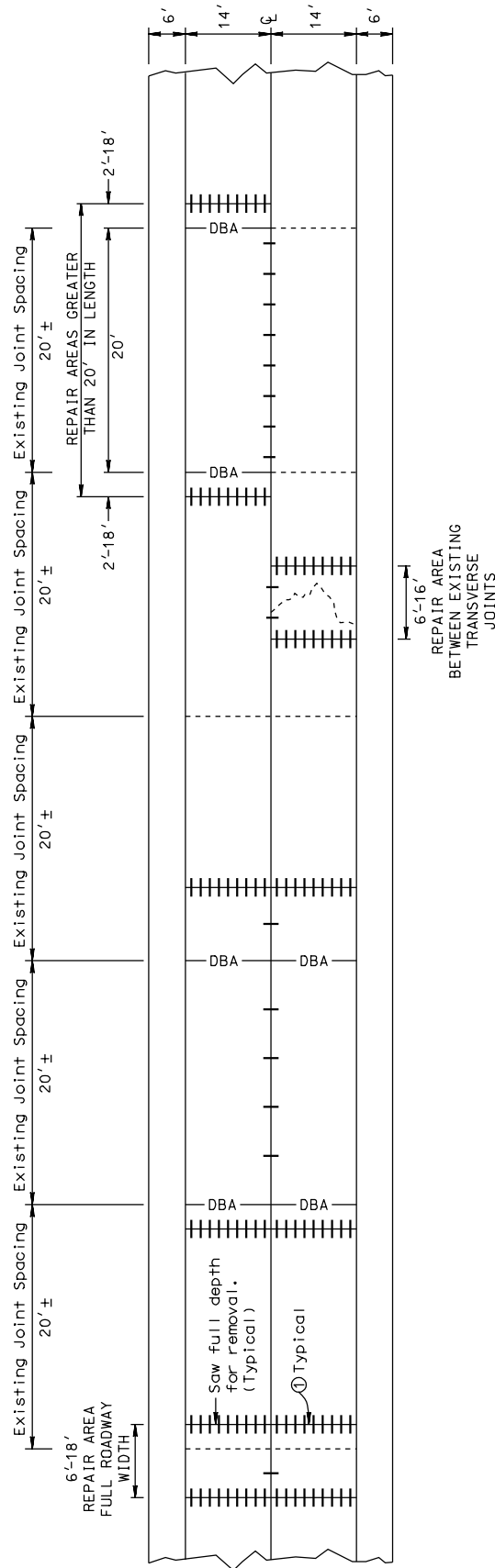
Temporary pavement marking (except stop bars) shall consist of Temporary Road Markers and shall be included in the contract unit price per foot for Temporary Road Markers.

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. (Twelve workspaces at 144' = 1728').



# NONREINFORCED PCC PAVEMENT REPAIR

## TWO LANE - TYPICAL REPAIR AREAS



### KEY:

Steel Bars for Longitudinal Joints (for repair areas greater than 4 feet in length)

- I No. 5 x 30" epoxy coated deformed tie bars.  
Sawed Joint - spaced 48" center to center.  
Construction Joint - spaced 48" center to center.
- I No. 5 x 24" epoxy coated deformed tie bars.  
Drilled In - spaced 30" center to center.

Steel Bars for Transverse Joints

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

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

### NOTE:

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



- 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.

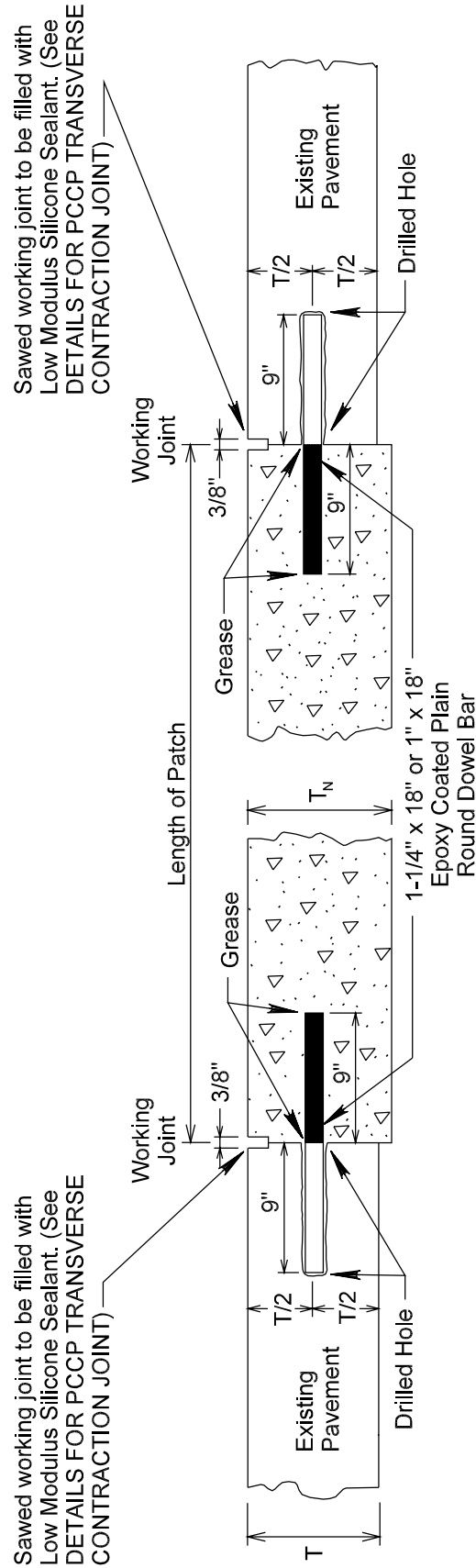
KEY:

## 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 1/4" x 18" epoxy coated plain round dowel bars spaced 18" center to center

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

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



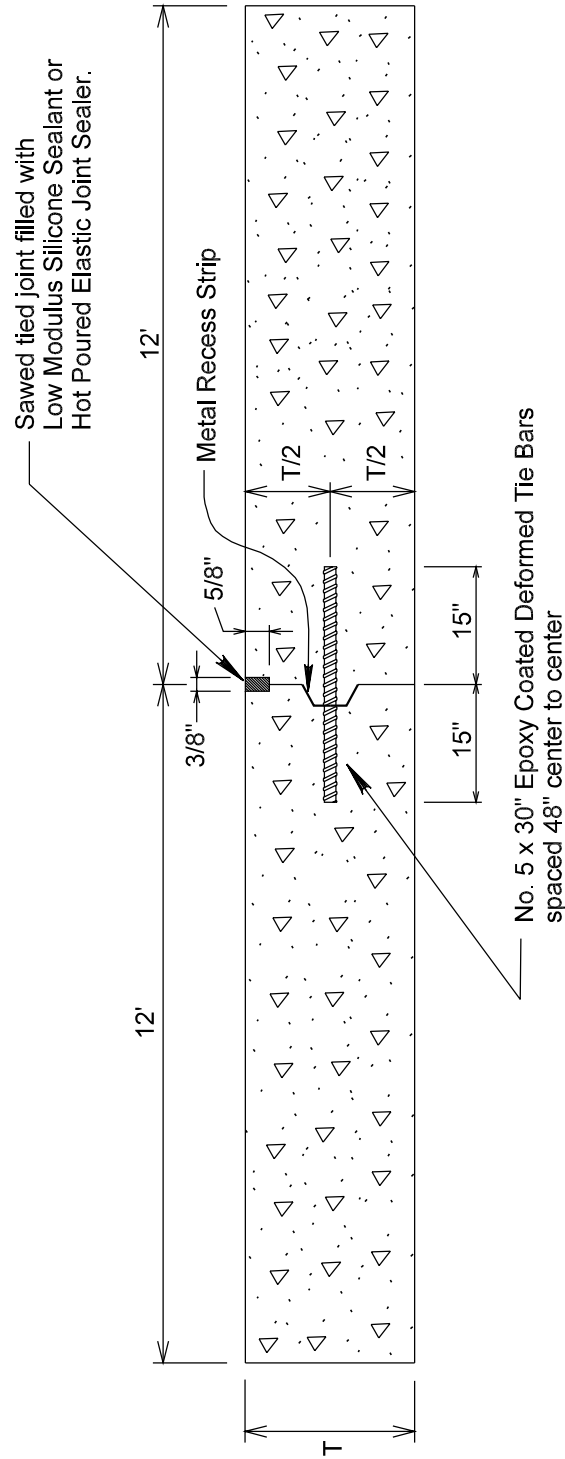
T = Existing pavement thickness.

T<sub>N</sub> = New pavement thickness.

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

Cost for furnishing and inserting 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** LONGITUDINAL CONSTRUCTION JOINT WITH TIE BARS & KEYWAY

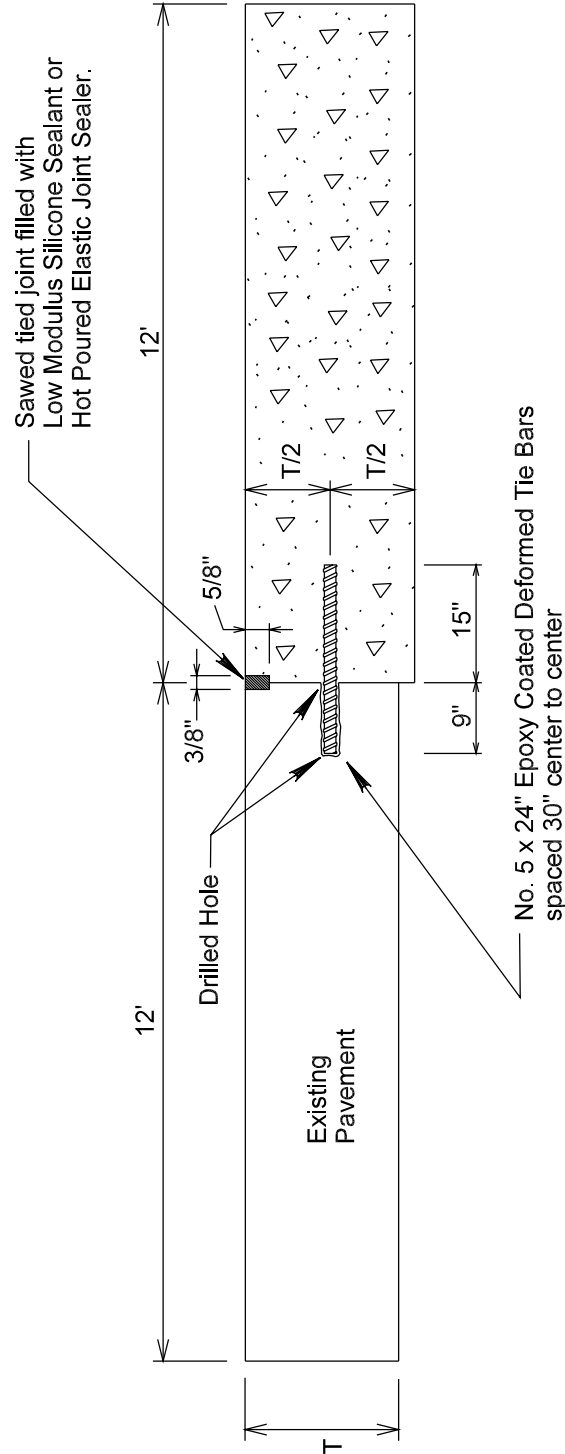


T = New pavement thickness.

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** LONGITUDINAL CONSTRUCTION JOINT WITH DRILLED IN TIE BARS



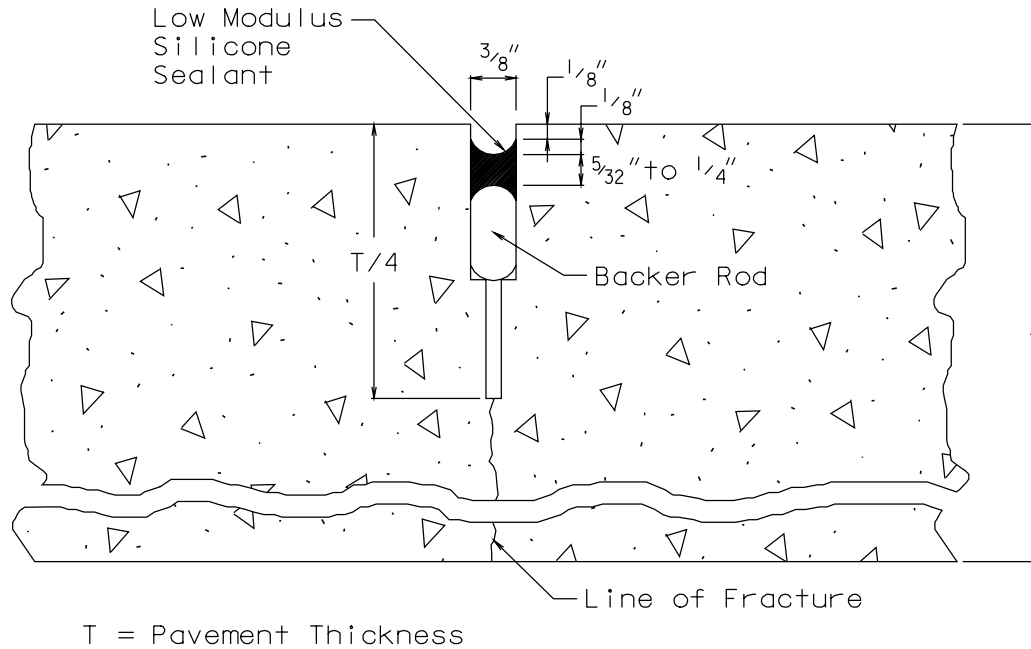
T = Existing pavement thickness.

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

Bars 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 (OPTION 1)

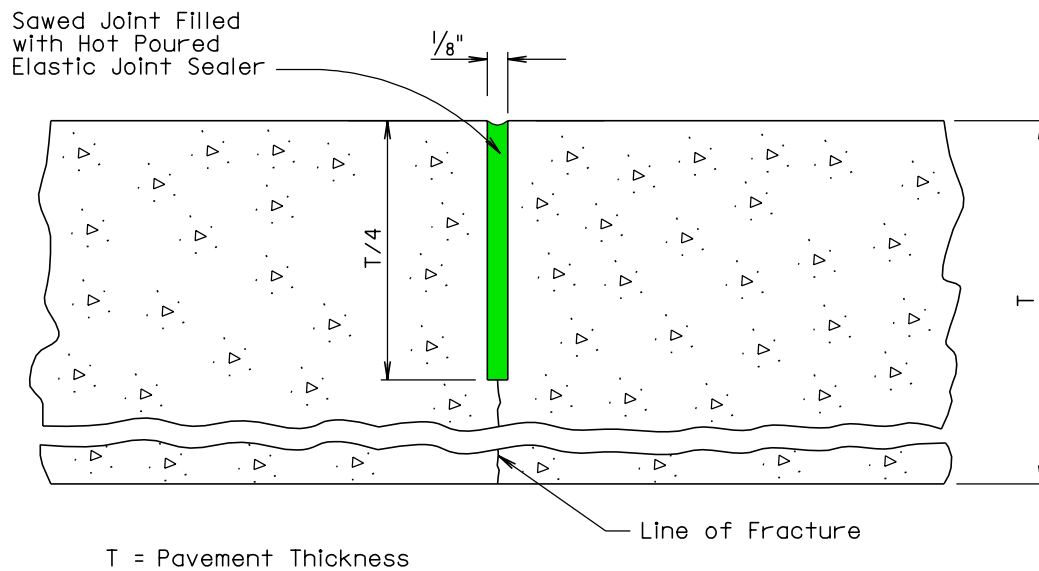


### GENERAL NOTES:

The first saw cut to control cracking shall be a minimum of  $\frac{1}{4}$  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.

## PCC PAVEMENT TRANSVERSE CONTRACTION JOINT WITH OR WITHOUT DOWEL BAR ASSEMBLY (OPTION 2)

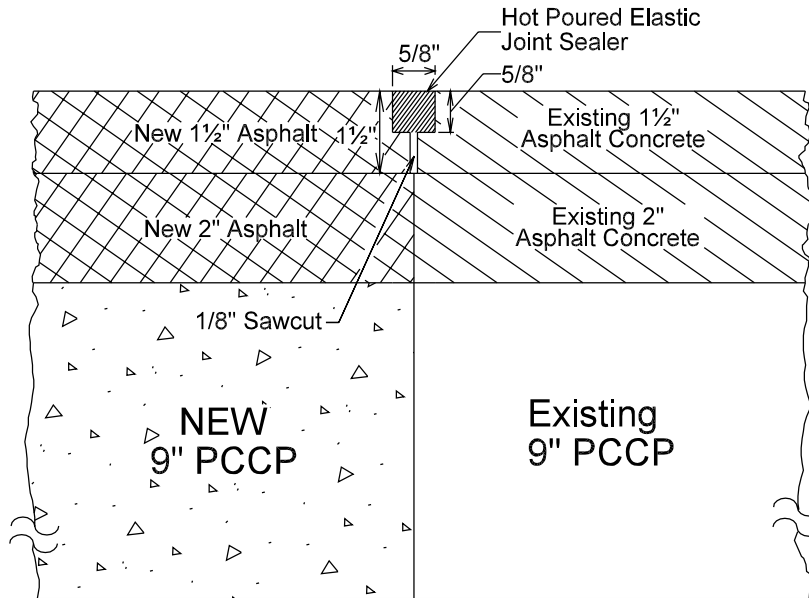


### GENERAL NOTE:

The saw cut to control cracking shall be a minimum of  $\frac{1}{4}$  the thickness of the pavement.

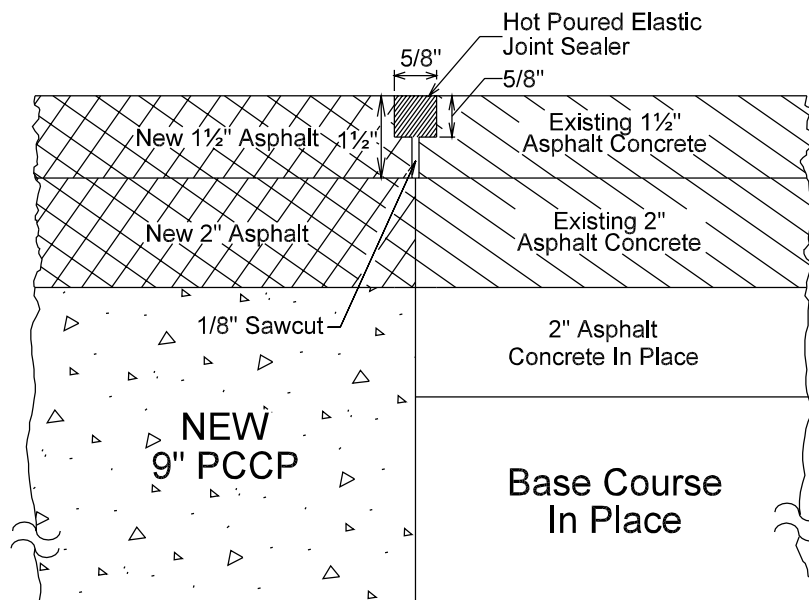
## ASPHALT CONCRETE PAVEMENT REPAIR JOINT DETAIL

### SAW AND SEAL TRANSVERSE AND LONGITUDINAL JOINT IN ASPHALT CONCRETE

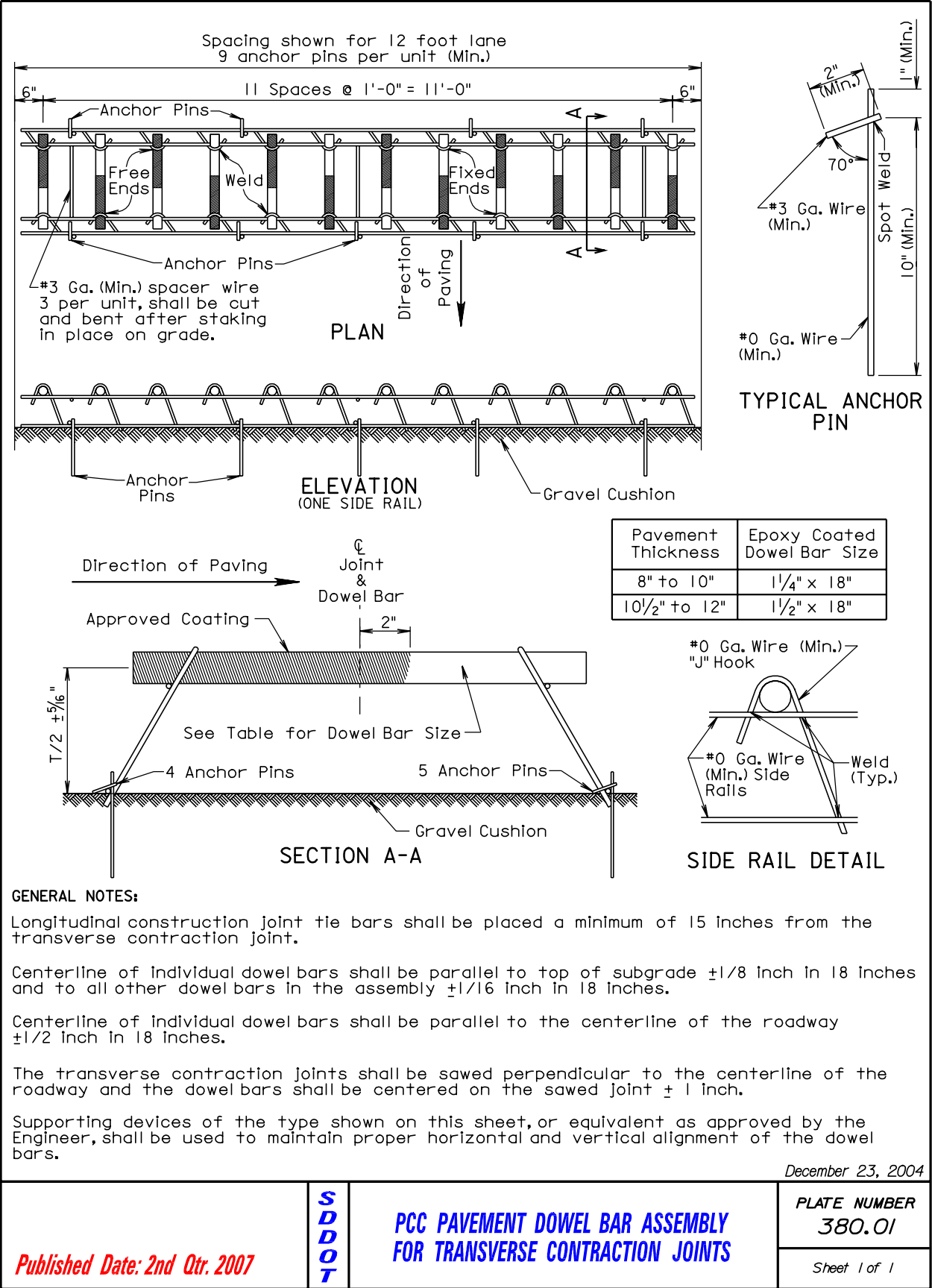


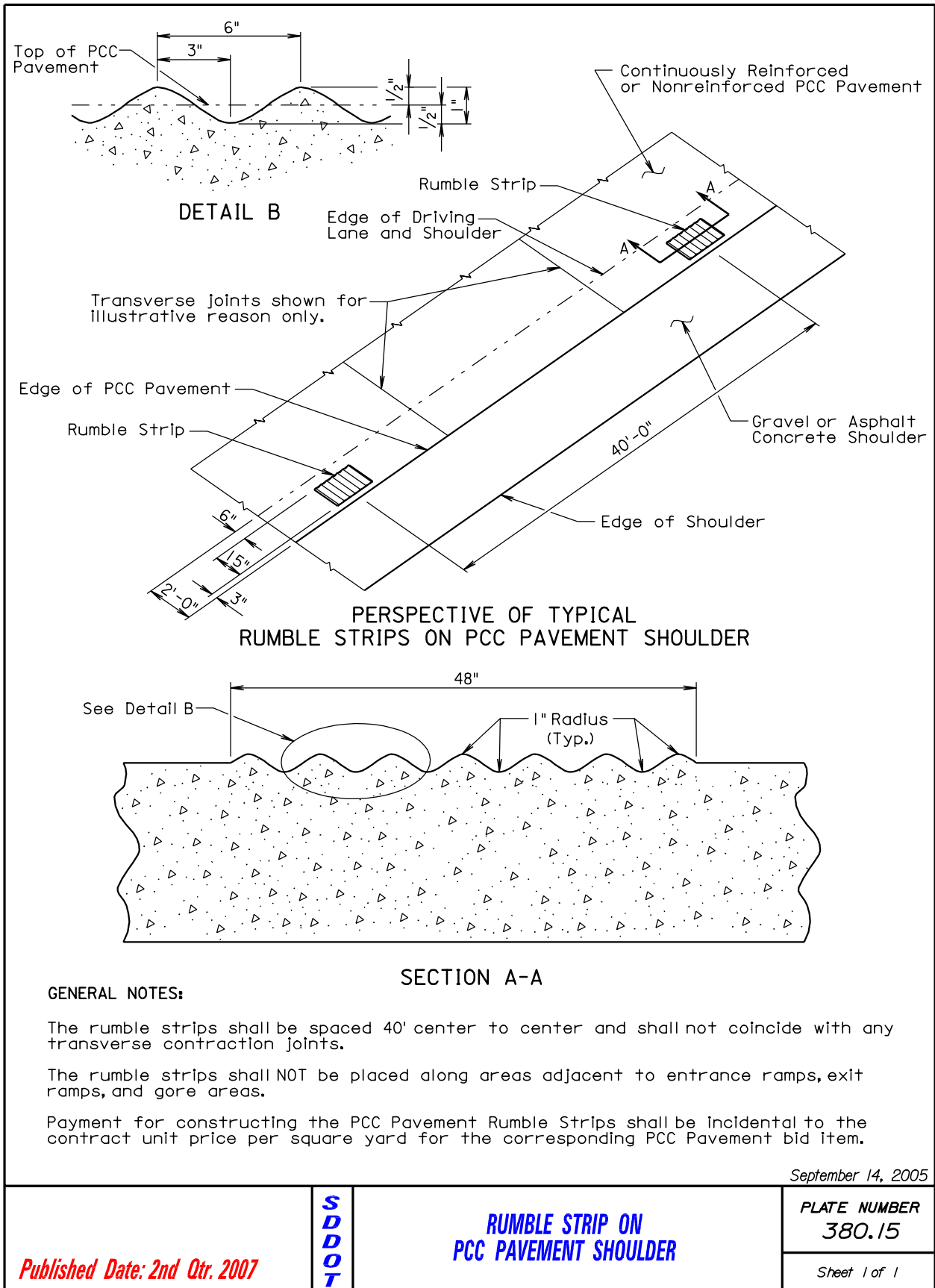
## ASPHALT CONCRETE PAVEMENT REPAIR JOINT DETAIL

### SAW AND SEAL LONGITUDINAL JOINT AT SHOULDER IN ASPHALT CONCRETE







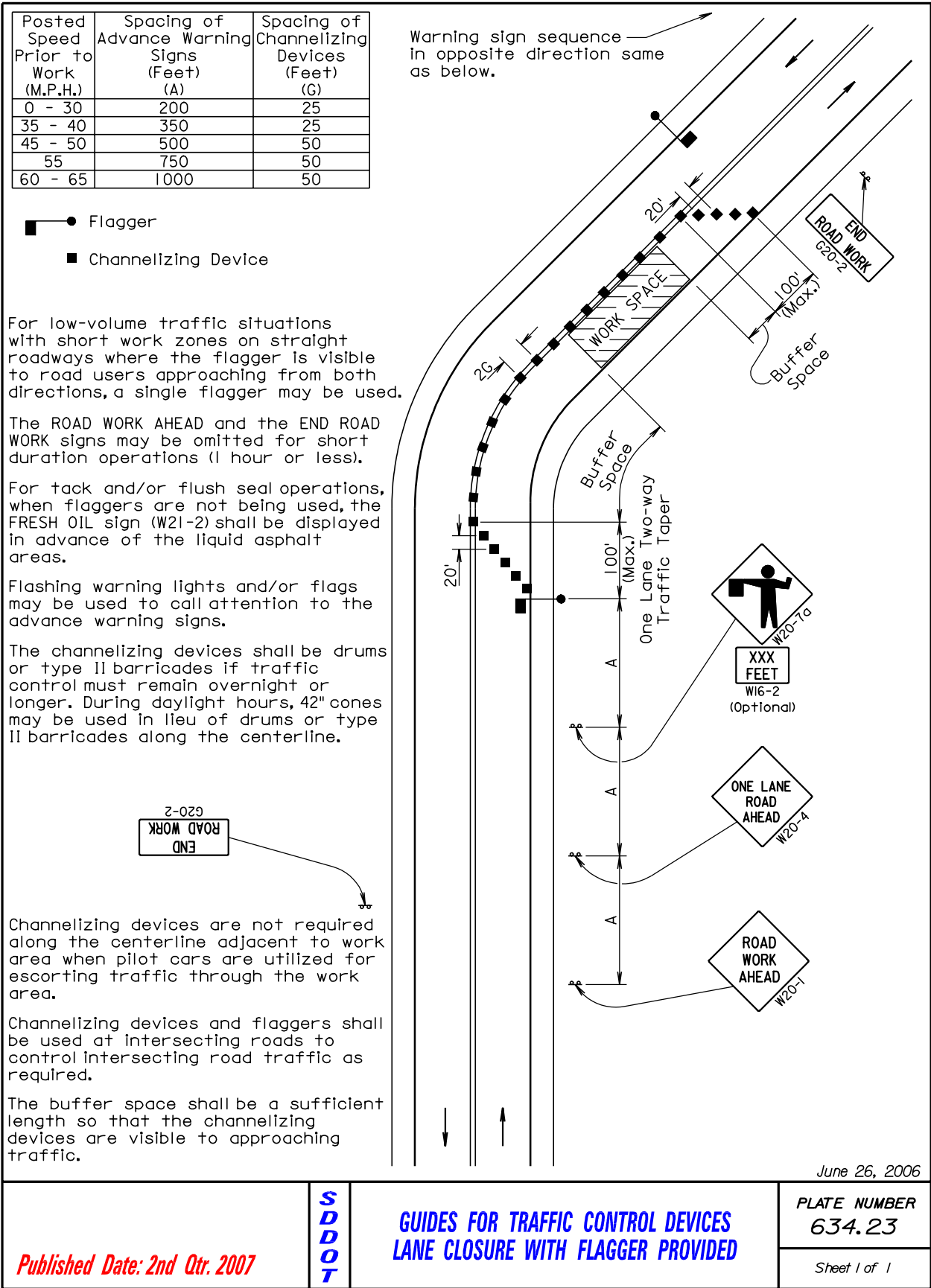


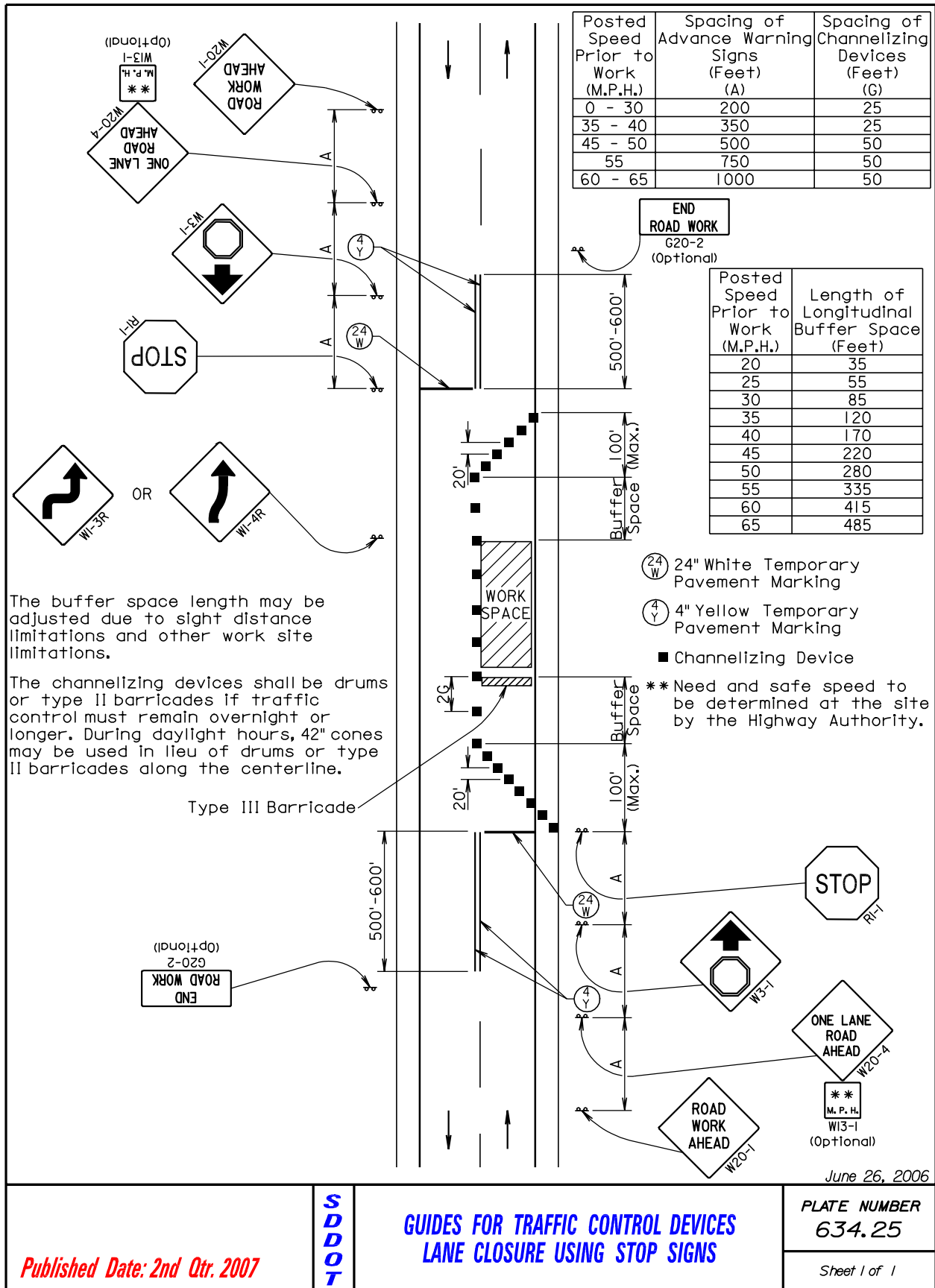
Plotting Date: 12-JUN-2007

**IM 0906(00)284, 090 E-252, 090 W-252, 081-252, 090 L-252, 090 EL-252, 090 WL-252, 037-252,  
037 N-252, 037 S-252, 090 E-253, 090 W-253, 090 E-252 & 090 W-252  
AURORA, DAVISON, McCOOK & MINNEHAHA COUNTIES**

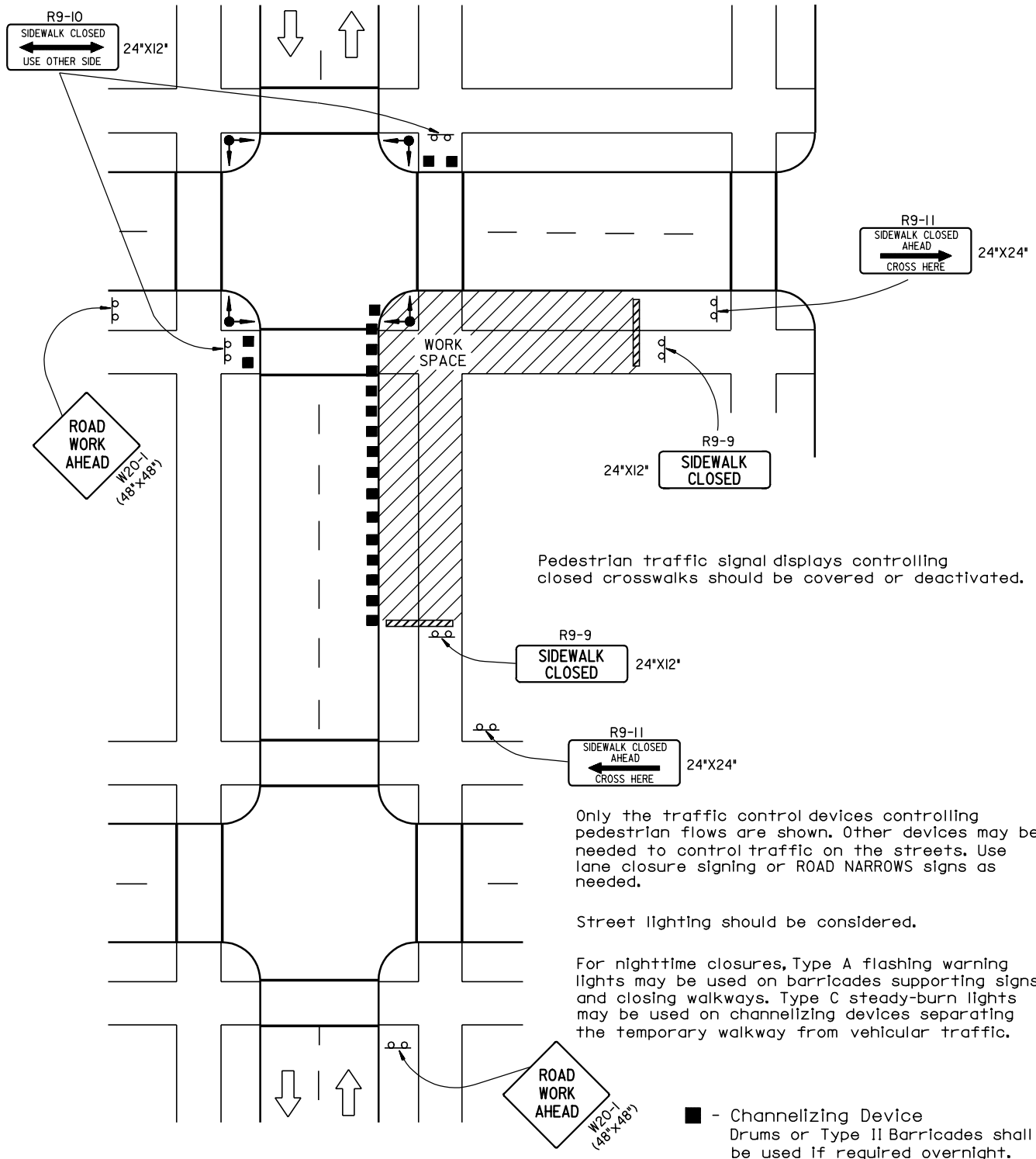
**ITEMIZED LIST FOR TRAFFIC CONTROL**

SIGN CODE	SIGN SIZE	DESCRIPTION	NUMBER REQUIRED	UNITS PER SIGN	UNITS
E5-1	36" x 32"	EXIT GORE SIGN	4	24	96
G20-1	48" x 24"	ROAD WORK NEXT 17 MILES	2	24	48
G20-1	48" x 24"	ROAD WORK NEXT 38 MILES	2	24	48
G20-2	36" x 18"	END ROAD WORK	20	17	340
R1-1	48" x 48"	STOP	6	34	204
R1-2	48" x 48"	YIELD	4	34	136
R2-1	30" x 36"	SPEED LIMIT 45	12	23	276
R2-1	30" x 36"	SPEED LIMIT 65	16	23	368
R2-1	30" x 36"	SPEED LIMIT 75	4	23	92
R3-7	30" x 30"	LEFT LANE MUST TURN LEFT	4	21	84
R3-7R	30" x 30"	RIGHT LANE MUST TURN RIGHT	8	21	168
R4-7	24" x 30"	KEEP RIGHT (SYMBOL)		18	
R5-1	48" x 48"	DO NOT ENTER		34	
R5-1a	48" x 36"	WRONG WAY		29	
R9-9	24" x 12"	SIDEWALK CLOSED	4	15	60
R9-10	24" x 12"	SIDEWALK CLOSED, ARROW, USE OTHER SIDE	4	15	60
R9-11	24" x 12"	SIDEWALK CLOSED AHEAD, ARROW, CROSS HERE	4	15	60
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)	3	34	102
W1-4a	48" x 48"	REVERSE CURVE SIGN (LEFT OR RIGHT)		34	
W3-1a	48" x 48"	STOP AHEAD (SYMBOL)	6	34	204
W3-2a	48" x 48"	YIELD AHEAD (SYMBOL)		34	
W3-3	48" x 48"	SIGNAL AHEAD (SYMBOL)		34	
W3-5	48" x 48"	SPEED REDUCTION (__ MPH)	8	34	272
W4-1a	48" x 48"	MERGE (SYMBOL)	4	34	136
W4-2	48" x 48"	LEFT OR RIGHT LANE ENDS (SYMBOL)	8	34	272
W5-2	48" x 48"	NARROW 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	
W13-1	24" x 24"	ADVISORY SPEED PLATE		16	
W20-1	48" x 48"	ROAD WORK AHEAD	16	34	544
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	6	34	204
W20-5	48" x 48"	LT. OR RT. LANE CLOSED AHEAD	8	34	272
W20-7a	48" x 48"	FLAGGER	8	34	272
W20-7b	48" x 48"	BE PREPARED TO STOP		34	
W21-1a	48" x 48"	WORKERS (SYMBOL)		34	
W21-2	36" x 36"	FRESH OIL		27	
W21-3	48" x 48"	ROAD MACHINERY AHEAD		34	
W21-5	48" x 48"	SHOULDER WORK		34	
W21-5a	48" x 48"	RIGHT SHOULDER CLOSED		34	
W21-5b	48" x 48"	RIGHT SHOULDER CLOSED AHEAD		34	
SPECIAL	30" x 24"	FINES DOUBLED	8	18	144
SPECIAL	48" x 48"	SINGLE LANE AHEAD	4	34	136
*****	*****	TYPE I BARRICADE - 6 FT. SINGLE SIDED	8	20	160
*****	*****	TYPE III BARRICADE - 8 FT. SINGLE SIDED	48	40	1920
*****	*****	TYPE III BARRICADE - 8 FT. DOUBLE SIDED		56	
<b>TOTAL UNITS</b>					<b>6678</b>





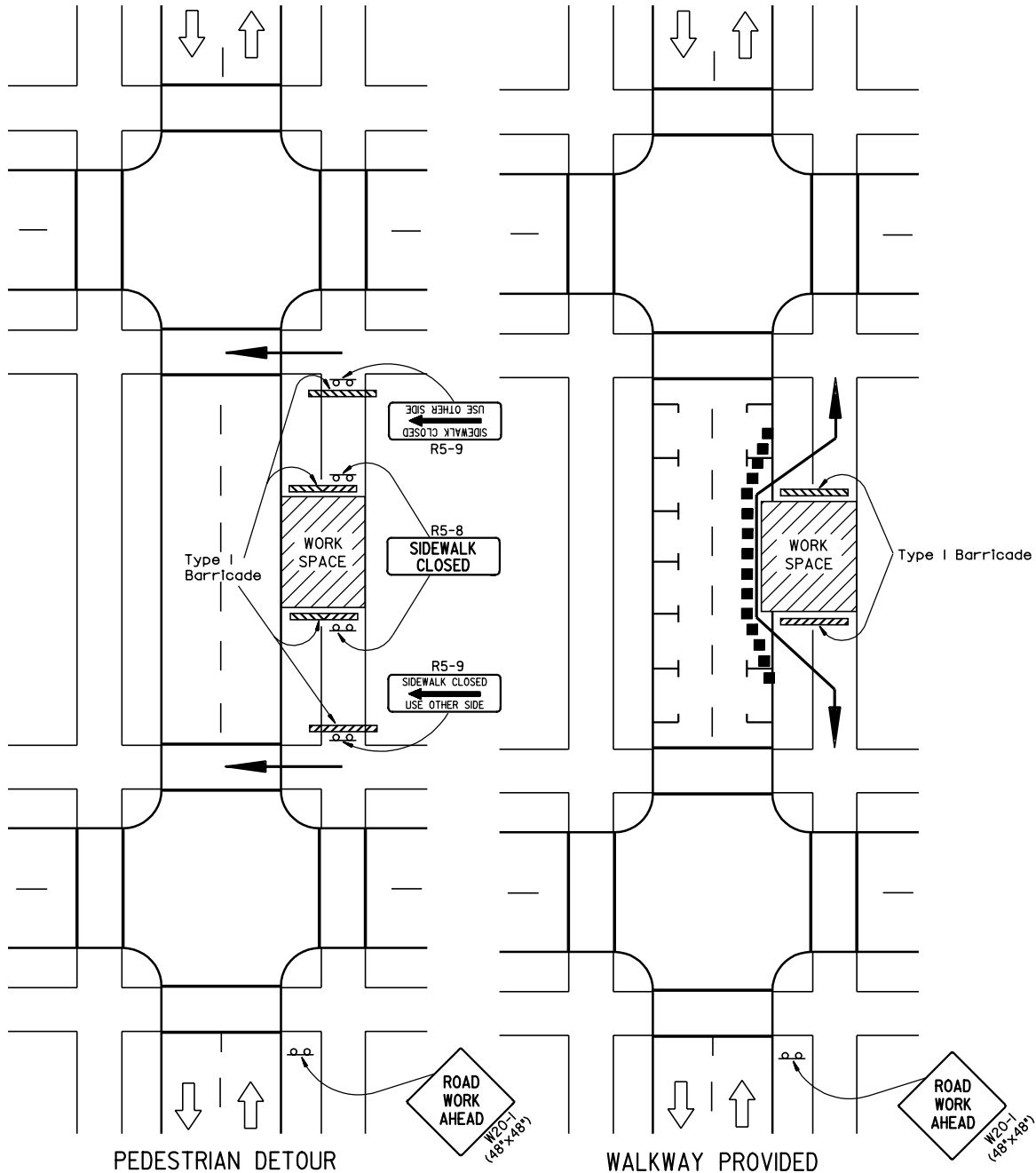
Plotting Date: 12-JUN-2007



## GUIDES FOR TRAFFIC CONTROL DEVICES SIDEWALK CLOSURES AND PEDESTRIAN DETOURS

1. Only the traffic control devices controlling pedestrian flows are shown. Other devices may be needed to control traffic on the streets. Use lane closure signing or ROAD NARROWS signs, as needed.
2. Signs may be placed along a temporary walkway to guide or direct pedestrians. Examples include KEEP RIGHT and KEEP LEFT signs.
3. Additional advance warning may be necessary.

4. For nighttime closures, Type A flashing warning lights may be used on barricades supporting signs and closing walkways. Type C steady-burn lights may be used on channelizing devices separating the temporary walkway from vehicular traffic.
5. Where high speeds may be anticipated, use a barrier to separate the temporary walkway from vehicular traffic.
6. Street lighting should be considered.



March 31, 2000

Published Date: 2nd Qtr. 2007

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**GUIDES FOR TRAFFIC CONTROL DEVICES  
SIDEWALK CLOSURES AND BYPASS WALKWAY**

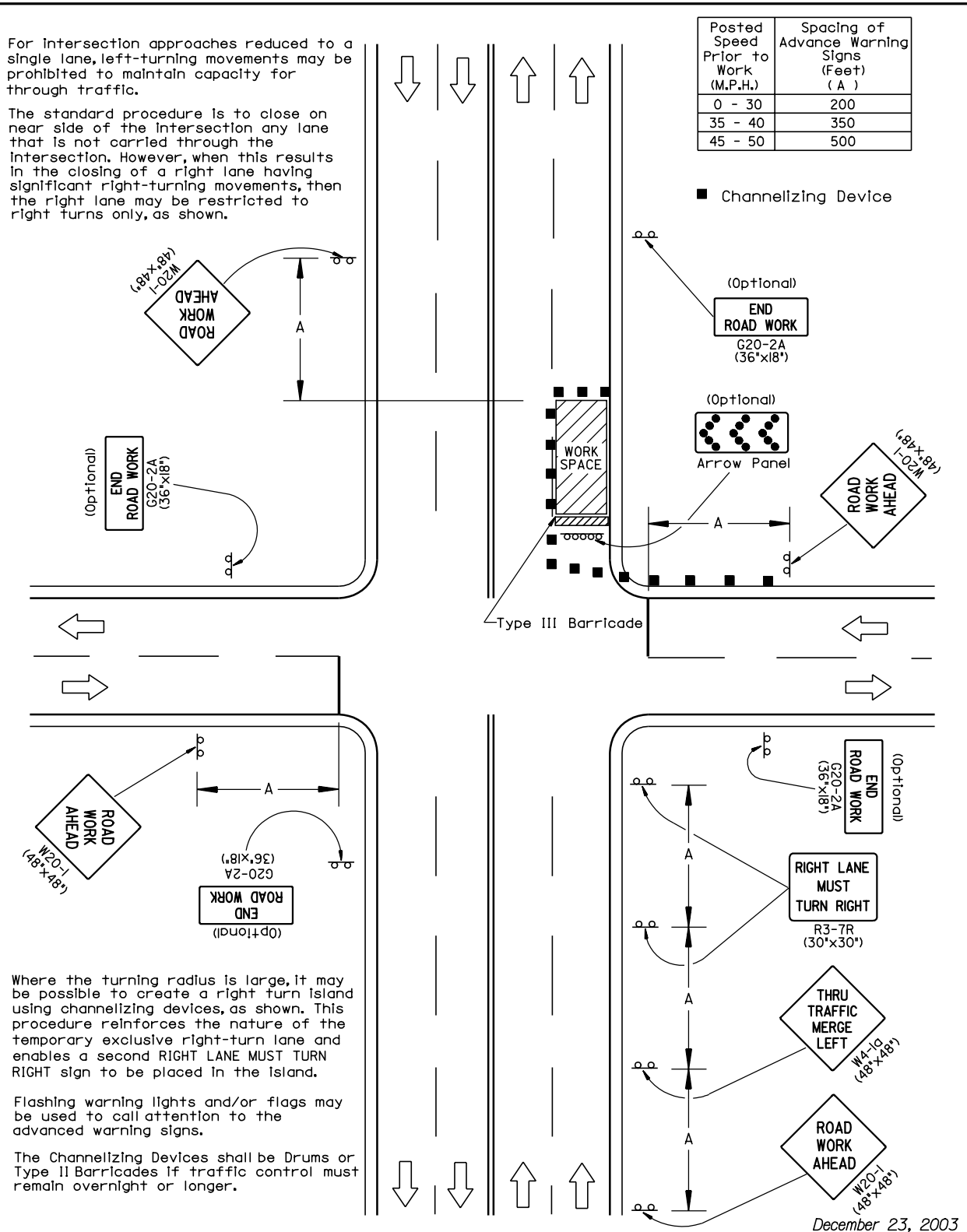
PLATE NUMBER  
634.35

Sheet 1 of 1

Plotting Date: 12-JUN-2007

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

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



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

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

The Channelizing Devices shall be Drums or Type II Barricades if traffic control must remain overnight or longer.

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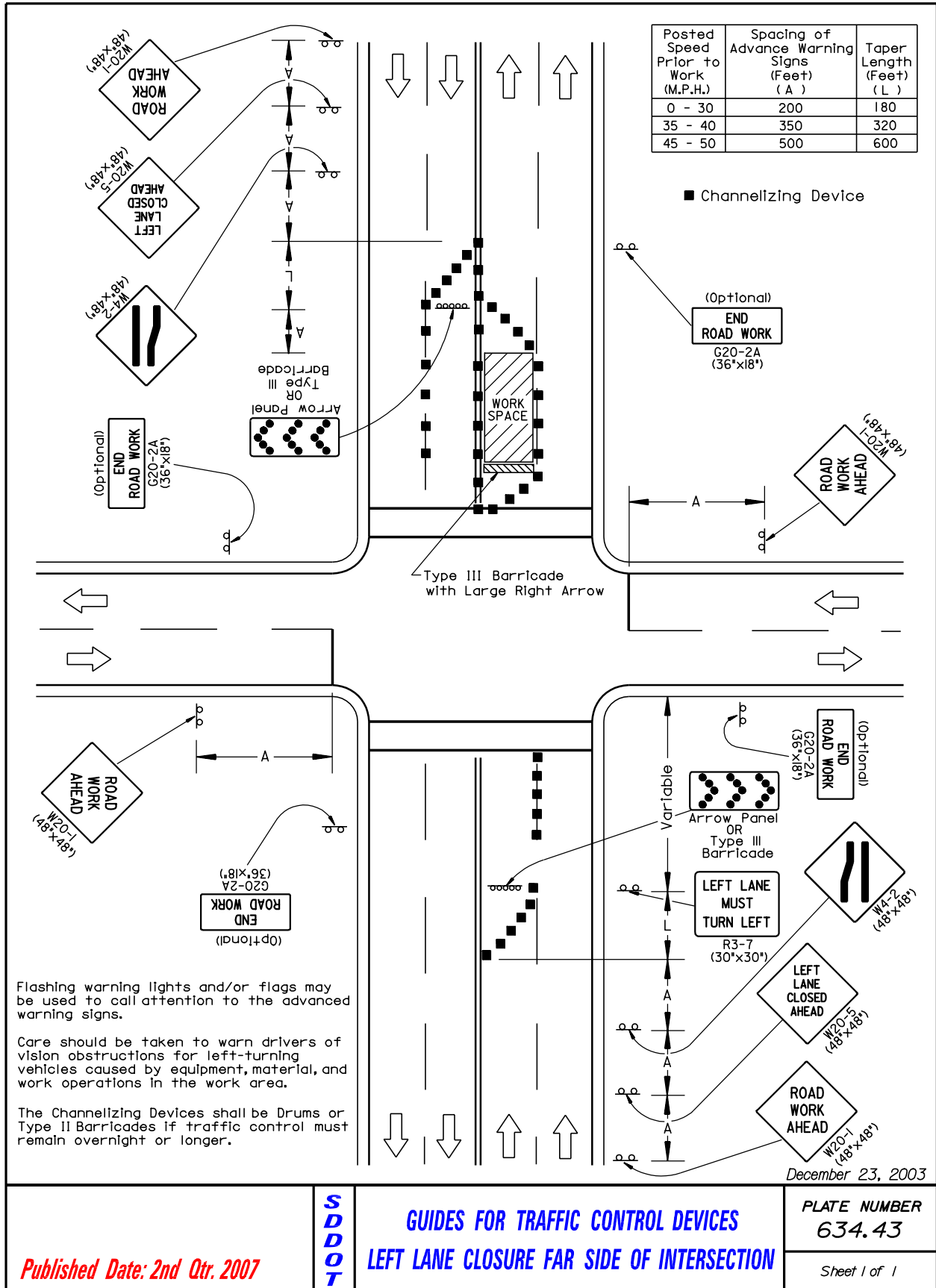
# GUIDES FOR TRAFFIC CONTROL DEVICES RIGHT LANE CLOSURE FAR SIDE OF INTERSECTION

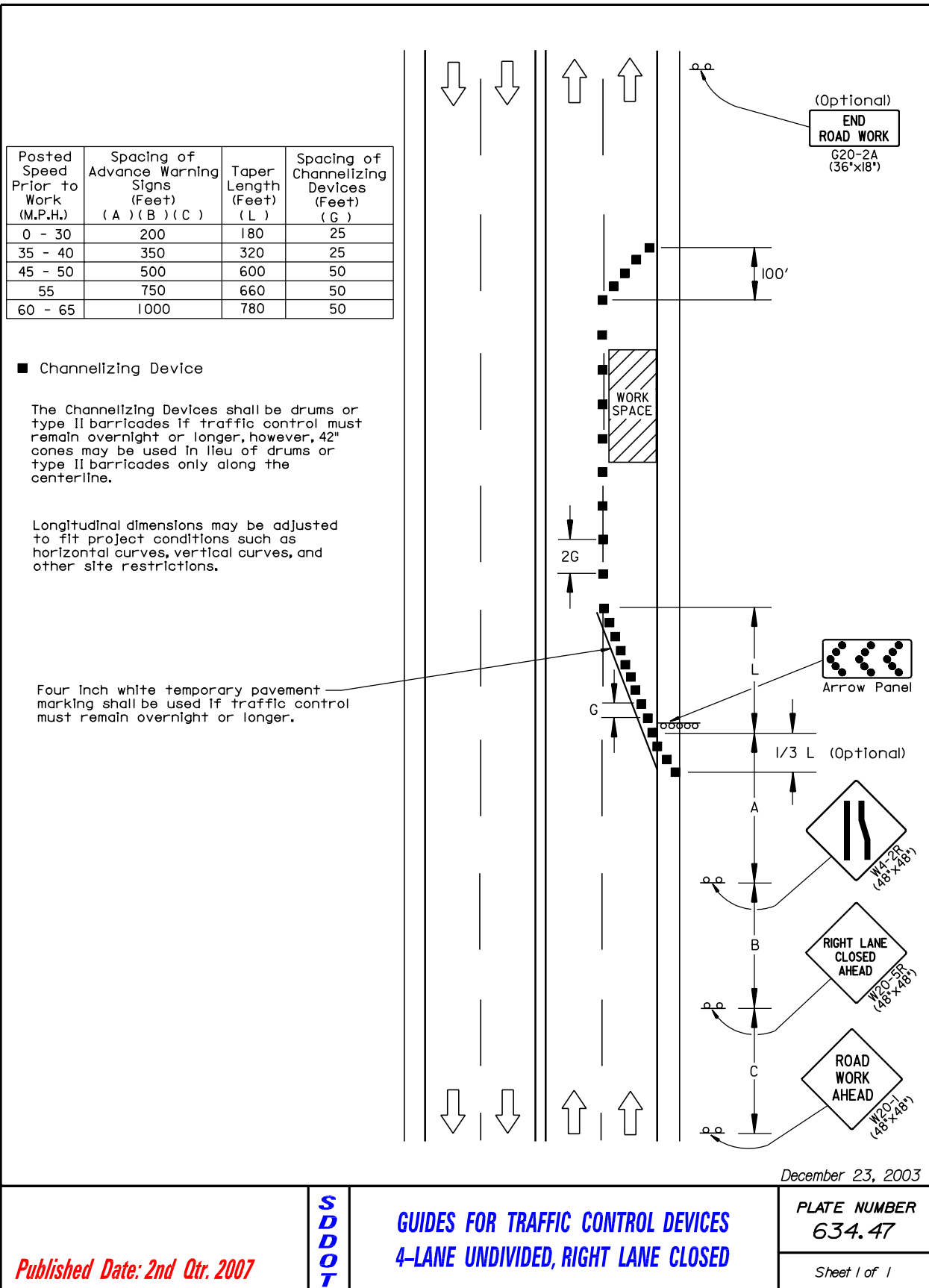
PLATE NUMBER  
 634.42

Sheet 1 of 1

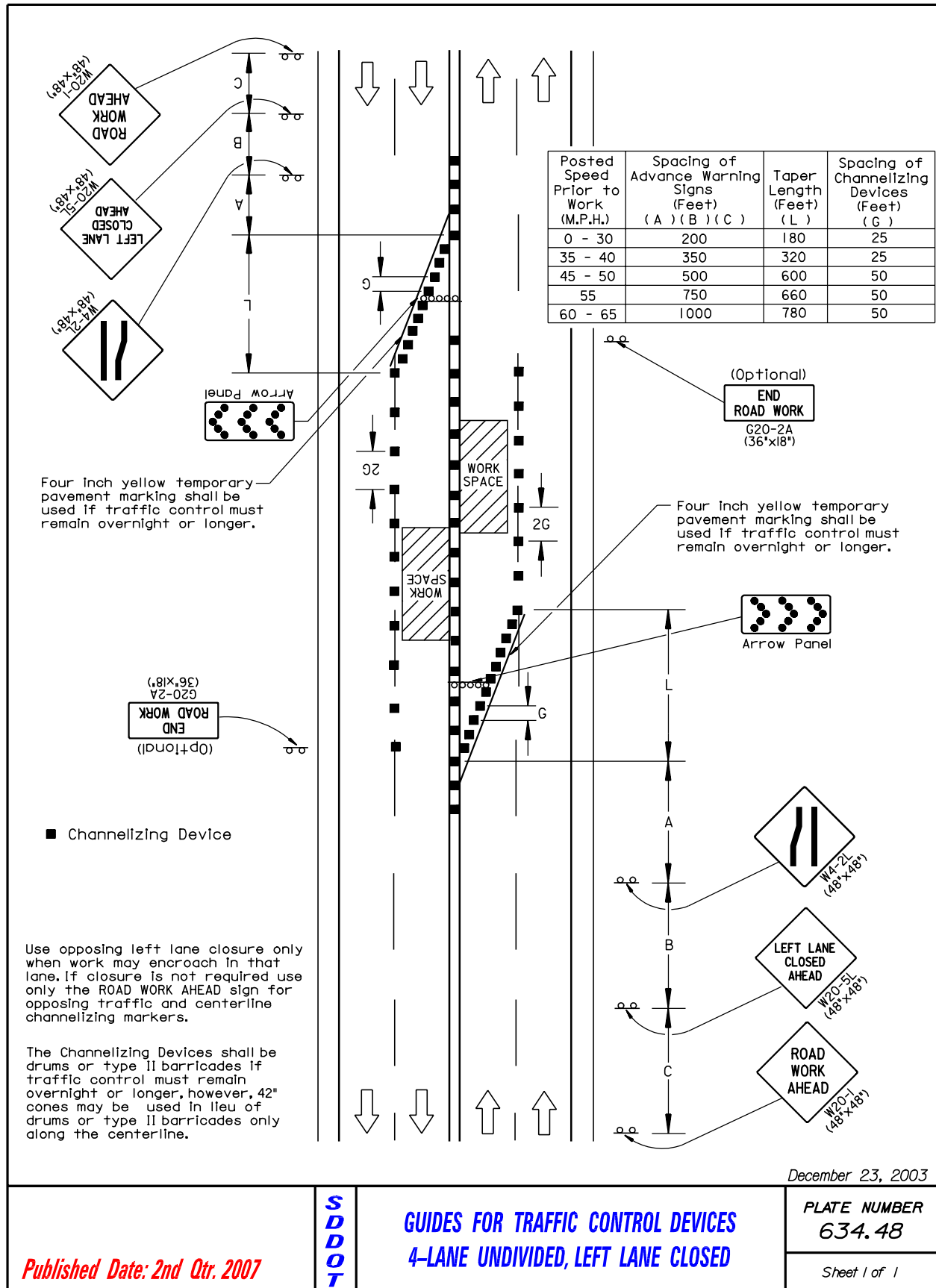
Plotting Date: 12-JUN-2007







Plotting Date: 12-JUN-2007



Plotting Date: 12-JUN-2007

Posted Speed Prior to Work (M.P.H.)	Spacing of Channelizing Devices (Feet) (G)	Taper Length (Feet) (L)
0 - 30	25	180
35 - 40	25	320
45 - 50	50	600
55	50	660
60 - 65	50	780
70 - 75	50	900

■ Channelizing Device

\* Speed appropriate for location.

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

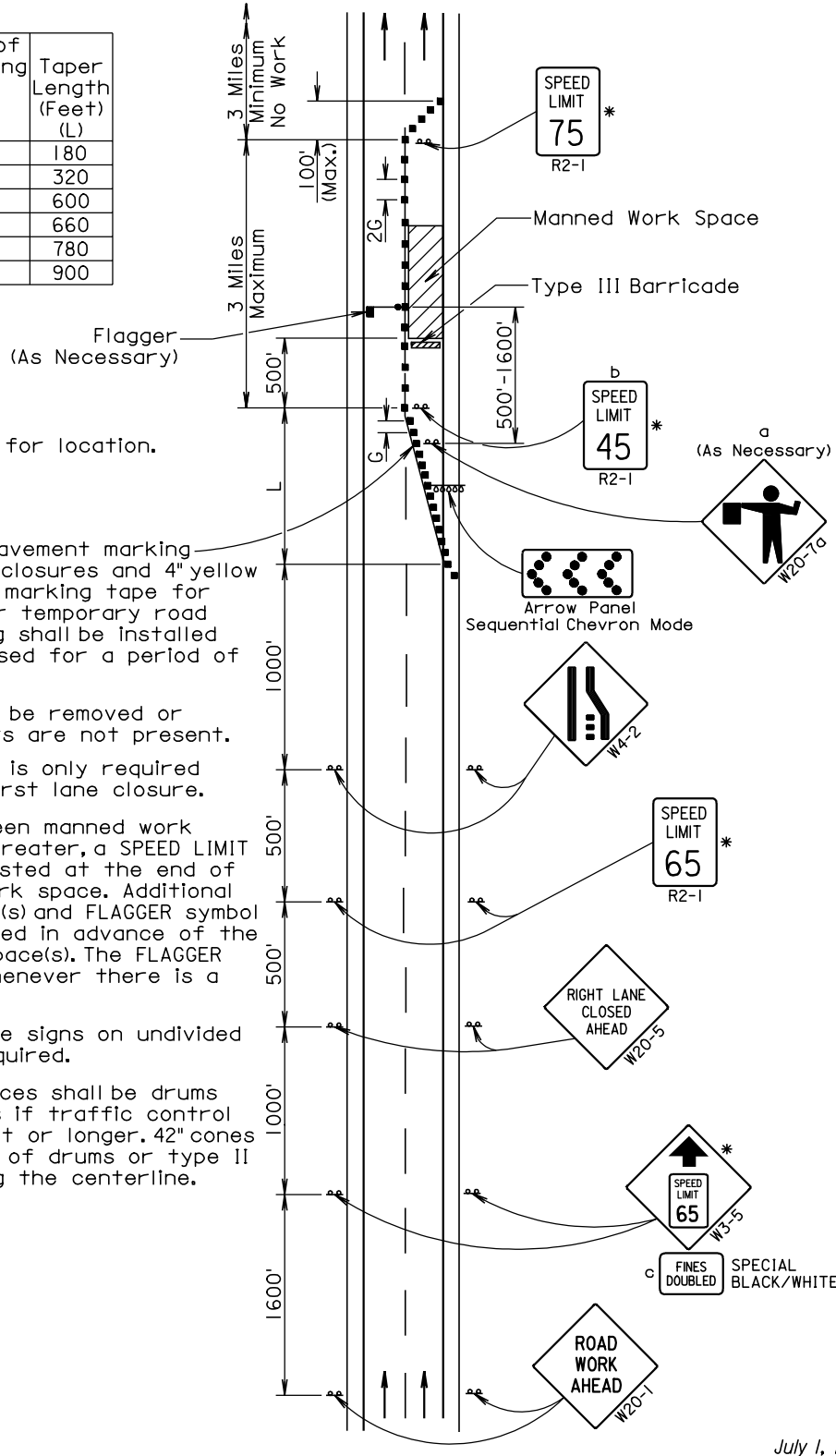
Signs a, b, and c shall be removed or covered when workers are not present.

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

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

Left mounted advance signs on undivided highways are not required.

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



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SDOT

MANNED WORK SPACE SIGNING  
FOR DIVIDED AND UNDIVIDED HIGHWAYS

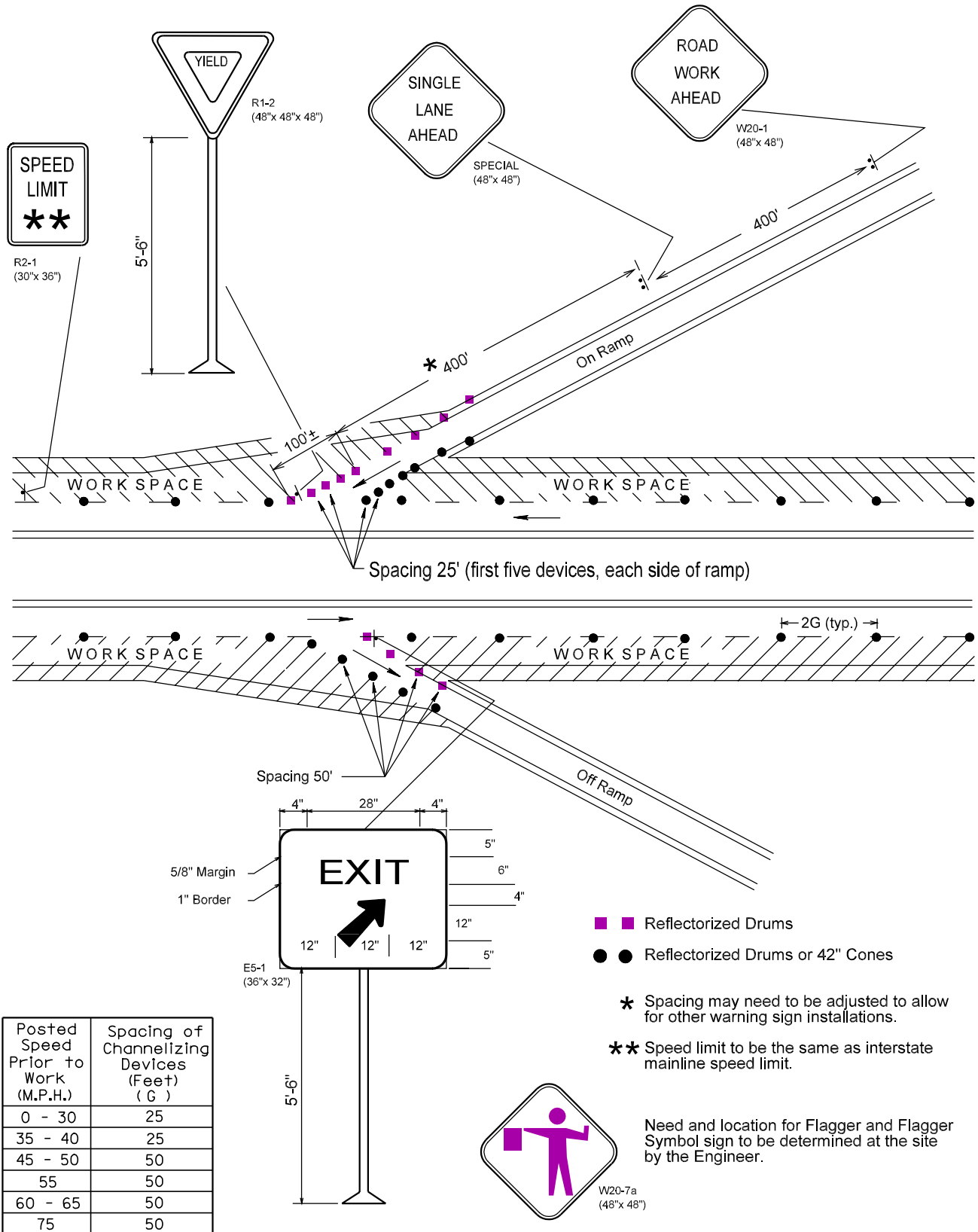
PLATE NUMBER  
634.63

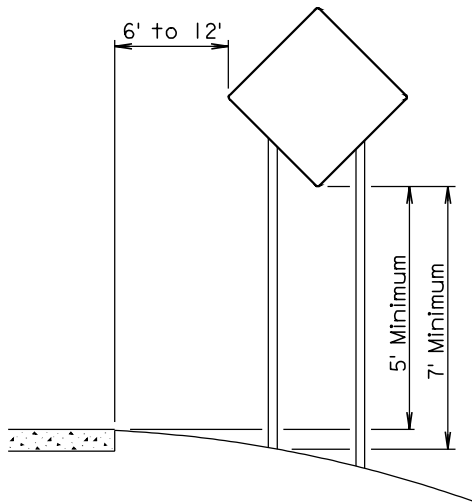
Sheet 1 of 1

Plotting Date: 12-JUN-2007

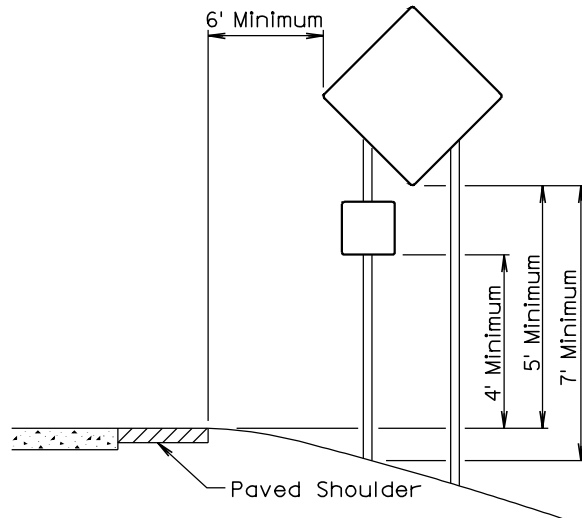
# TRAFFIC CONTROL

## ON-RAMP AND OFF-RAMP DETAILS

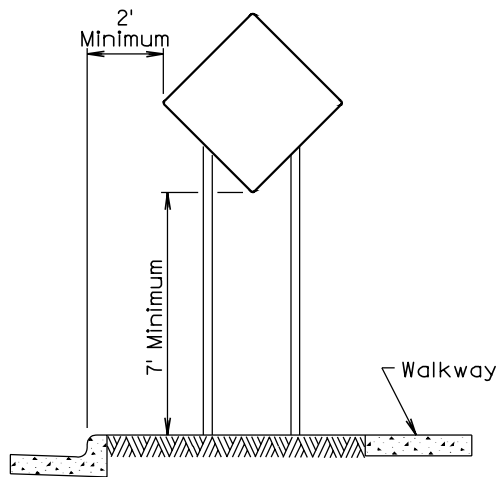




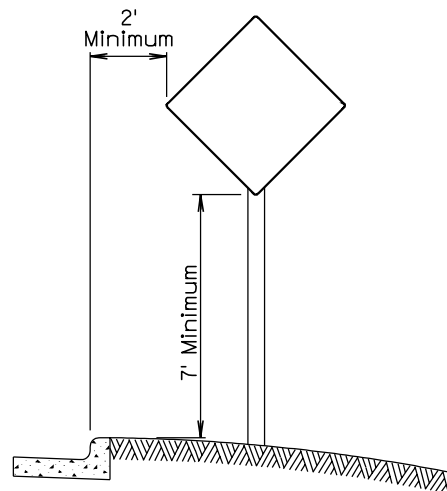
RURAL DISTRICT



RURAL DISTRICT WITH  
 SUPPLEMENTAL PLATE



URBAN DISTRICT



URBAN DISTRICT

December 23, 2003

*Published Date: 2nd Qtr. 2007*

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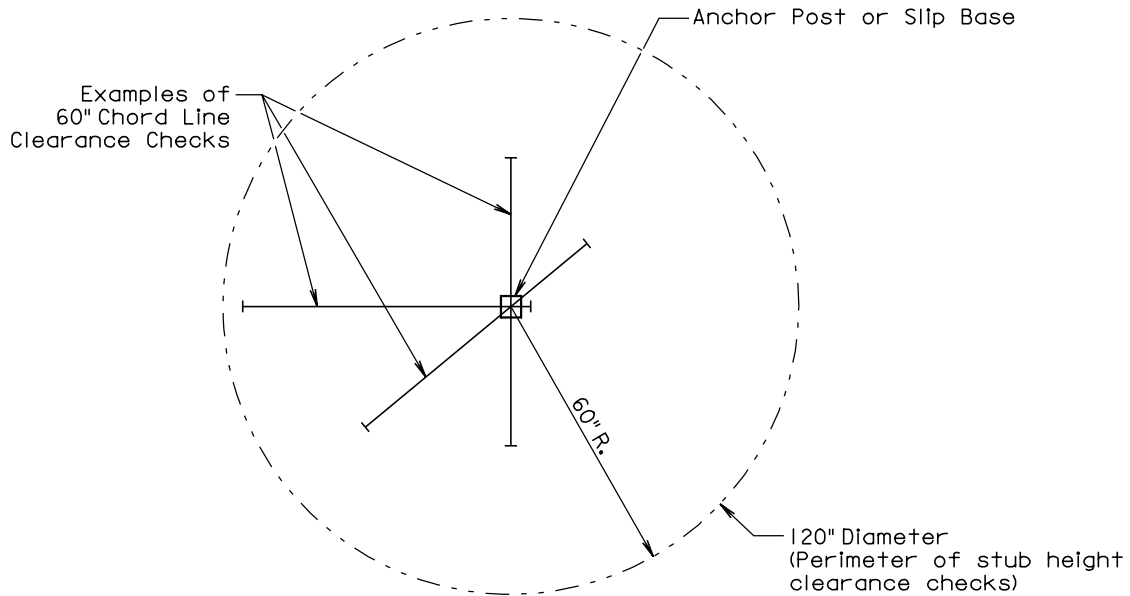
**BREAKAWAY SIGN SUPPORTS**  
 (Typical Construction Signing)

**PLATE NUMBER**  
**634.85**

Sheet 1 of 1

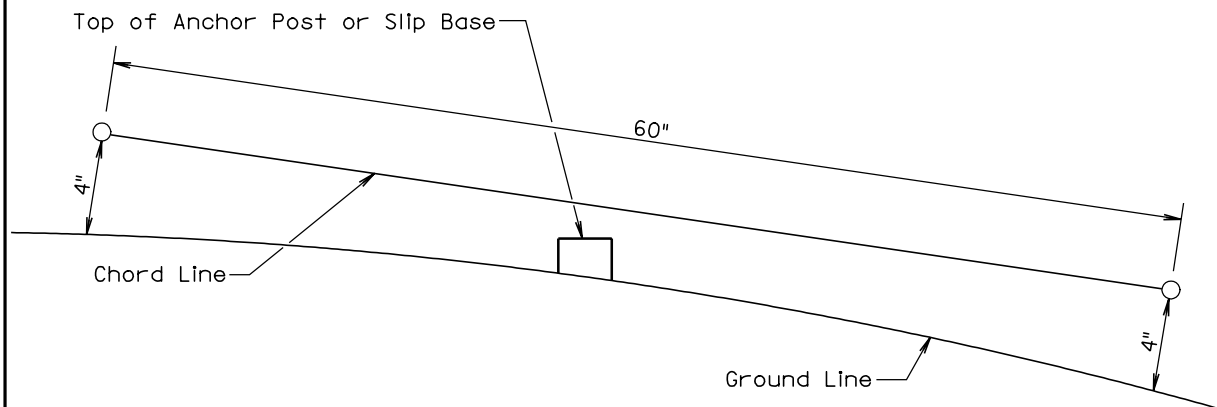
Plotting Date: 12-JUN-2007

Username - TRM11118



### PLAN VIEW

(Examples of stub height clearance checks)



### ELEVATION VIEW

#### GENERAL NOTES:

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

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

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

July 1, 2005

*Published Date: 2nd Qtr. 2007*

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**BREAKAWAY SUPPORT STUB CLEARANCE**

**PLATE NUMBER**  
**634.99**

Sheet 1 of 1

Plotting Date: 12-JUN-2007