PLOT SCALE = 7400.000000:1.000000

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	2011 SIOUX FALLS AREA CONCRETE REPAIR	1	42

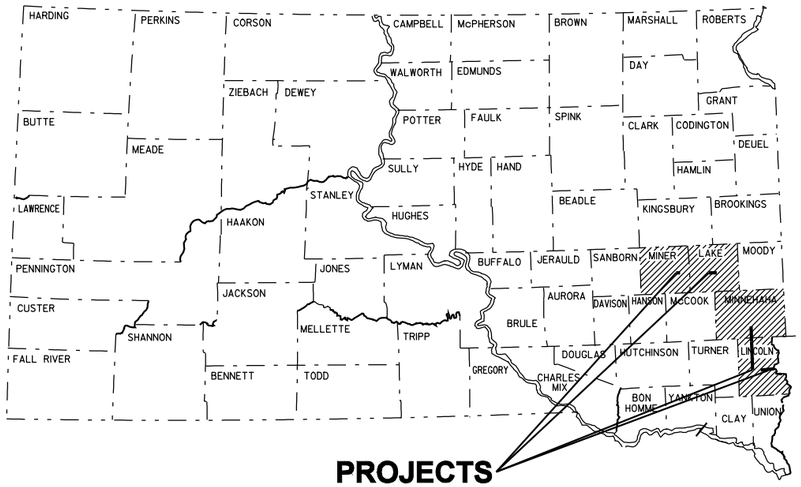
Plotting Date: 16-MAY-2011

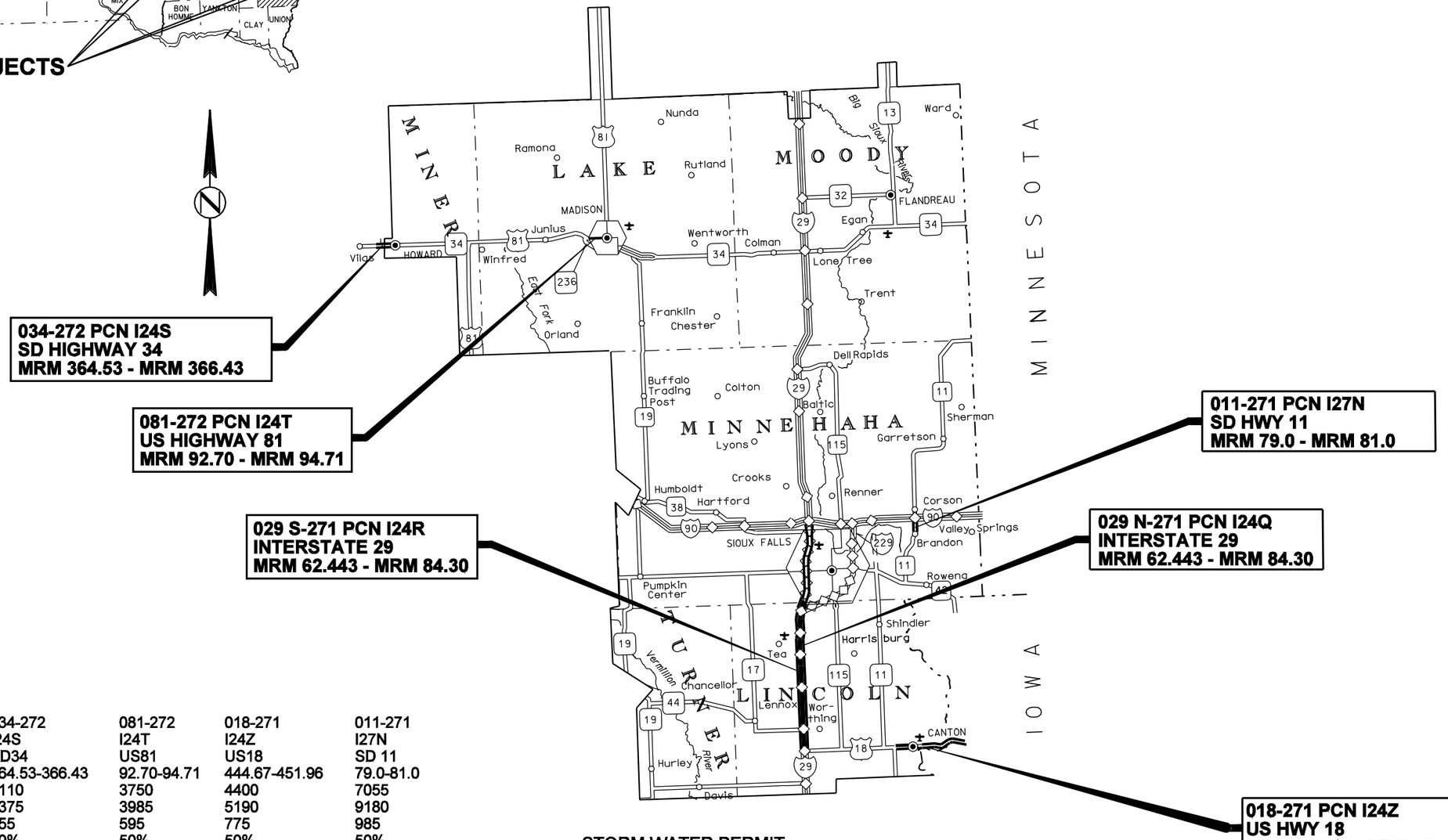
STATE OF SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION
PLANS FOR PROPOSED

029 N-271, 029 S-271, 034-272, 081-272, 018-271 & 011-271
MINNEHAHA, LINCOLN, MINER & LAKE COUNTIES
PCN I24Q, I24R, I24S, I24T, I24Z & I27N

PCC PAVEMENT REPAIR, DROP INLET REPAIR & CURB & GUTTER REPAIR

INDEX OF SHEETS





DESIGN DESIGNATION

PROJECT	029 N-271	029 S-271	034-272	081-272	018-271	011-271
PCN	I24Q	I24R	I24S	I24T	I24Z	I27N
ROUTE	I29 N	I29 S	SD34	US81	US18	SD 11
MRM-MRM	62.443-84.30	62.443-84.30	364.53-366.43	92.70-94.71	444.67-451.96	79.0-81.0
ADT(2010)	15340	15340	2110	3750	4400	7055
ADT(2030)	20315	20315	2375	3985	5190	9180
DHV	2845	2845	355	595	775	985
D	100%	100%	50%	50%	50%	50%
T DHV	7.8%	7.8%	5.8%	2.6%	5.3%	3.4%
T ADT	17.2%	17.2%	12.7%	5.7%	11.7%	7.5%

STORM WATER PERMIT :

None Required

PLOTTED FROM - TRSF12115

FILE - N:\PROJMAINTENANCE PROJECTS\2011\CONCRETE PVMT REPAIR\TITLE2011SFPCCPCREPAIR.DGN

ESTIMATE OF QUANTITIES

BID ITEM NUMBER	ITEM	029 N-271 PCN I24Q QUANTITY	029 S-271 PCN I24R QUANTITY	034-272 PCN I24S QUANTITY	081-272 PCN I24T QUANTITY	018-271 PCN I24Z QUANTITY	011-271 PCN I27N QUANTITY	TOTAL QUANTITY	UNIT
009E0010	Mobilization	<----------LUMP SUM---------->						Lump Sum	LS
110E0300	Remove Concrete Curb and Gutter	-	-	14	7	20.0	-	41	Ft
110E0420	Remove Drop Inlet Frame and Grate Assembly	-	-	2	1	-	-	3	Each
110E0500	Remove Pipe Culvert	-	-	-	-	3	-	3	Ft
120E0010	Unclassified Excavation	-	-	-	-	76	-	76	CuYd
260E2010	Gravel Cushion	-	-	-	-	150.0	-	150.0	Ton
380E5030	Nonreinforced PCC Pavement Repair	52.2	24.0	-	-	94.0	16.0	186.2	SqYd
380E5100	Continously Reinforced PCC Pavement Repair	207.1	149.4	-	-	-	-	356.5	SqYd
380E6000	Dowel Bar	14	-	-	-	24	12	50	Each
380E6110	Insert Steel Bar in PCC Pavement	521	350	12	6	50	24	963	Each
480E0100	Reinforcing Steel	-	-	30	15	-	-	45	Lb
633E0030	Cold Applied Plastic Pavement Marking, 24"	-	-	-	-	-	24	24	Ft
633E5015	Grooving For Cold Applied Plastic Pavement Marking, 24"	-	-	-	-	-	24	24	Ft
634E0010	Flagging	40	40	-	-	-	5	85	Hour
634E0100	Traffic Control	1337	1337	238	119	306	196	3533	Unit
634E0120	Traffic Control, Miscellaneous	<----------LUMP SUM---------->						Lump Sum	LS
634E0310	Temporary Road Markers	8,250	4900	360	320	1800	180	15810	Ft
634E0420	Type C Advance Warning Arrow Panel	1	1	2	1	2	1	8	Each
650E0080	Type B68 Concrete Curb and Gutter	-	-	14	7	20	-	41	Ft
670E1010	2' X 3' Type B Drop Inlet	-	-	-	-	1	-	1	Each
670E1200	Type B Frame and Grate Assembly	-	-	2	1	1	-	4	Each
680E0440	4" Slotted Corrugated Polyethylene Drainage Tubing	-	-	-	-	94	-	94	Ft

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	2011 SIOUX FALLS AREA CONCRETE REPAIR	3	42

TABLE OF MATERIALS QUANTITIES FOR PAVEMENT REPAIR AREAS

		PCC Pavement						CRC Pavement						
Location	Ramp Repair Area Width	Ramp Repair Area Length	Nonreinforced PCC Pavement Repair (9")	Insert Steel Bar (1¼" x 18" Epoxy Coated Plain Round Dowels)	Insert Steel Bar (No. 9 x 18" Epoxy Coated Deformed Tie Bars)	Insert Steel Bar (No. 5 x 24" Epoxy Coated Deformed Tie Bars)	Dowel Bar	Passing Lane Repair Area Width	Driving Lane Repair Area Width	Passing Lane Repair Area Length	Driving Lane Repair Area Length	Continuously Reinforced PCC Pavement Repair (8")	Insert Steel Bar (No. 6 Deformed Tie Bars)	Insert Steel Bar (No. 4 Deformed Tie Bars)
029 N-271 PCN I24Q MRM	Ft	Ft	SqYd	Each	Each	Each	Each	Ft	Ft	Ft	Ft	SqYd	Each	Each
62.115	4	4	1.8		4	4								
62.172	4	4	1.8	2	2									
62.185	6	6	4		8	8								
62.196	4	4	1.8	2	2		3							
62.208	4	4	1.8	2	2		3							
62.243	18	12	24	16	16									
63.781									14		4	6.2	28	2
63.786								14		4		6.2	28	2
64.301									6		20	13.3		20
64.617									14		6	9.3	28	3
65.872									14		4	6.2	28	2
66.385									6		164	109.3		164
66.599									8		4	3.6		4
67.159								6		10		6.7		10
67.783									6		6	4		6
67.804									4		8	3.6		8
67.905								4		4		1.8		4
67.984	4	6	2.7			4								
68.103									4		26	11.6		26
68.352	12	4	5.3		10									
68.360	4	4	1.8			4								
68.369	4	4	1.8		4	2	2							
70.523									4		5	2.2		5
72.103									4		22	9.8		22
73.204	4	4	1.8		4	4	2							
73.219	4	4	1.8		4	4	2							
73.253	4	4	1.8		4	4	2							
Ramp C @ I 90				7		8			6		20	13.3		
TOTALS:			52.2	29	60	42	14					207.1	112	278
029 S-271 PCN I24R MRM	Ft	Ft	SqYd	Each	Each	Each	Each	Ft	Ft	Ft	Ft	SqYd	Each	Each
72.815									5		32	17.8		32
71.072								4		4		1.8		4
71.070								4		4		1.8		4
70.708									14		6	9.3	28	3
69.390									14		4	6.2	28	2
68.634									14		20	31.1	28	10
68.102									4		16	7.1		16
68.103								5.5		62		37.9		62
64.190									14		8	12.4	28	8
62.539	6	14	9.3	4	4	8								
62.228									14		6	9.3	28	3
On Ramp 83.33	11	12	14.7	14		5								
Ramp H @ I 90						3			4		8	3.6	7	
Ramp E @ I90						3			4		11	4.9	7	
Ramp F @ I 90						4			4		14	6.2	7	
TOTALS:			24	18	4	23	0					149.4	161	144

TABLE FOR PCC PAVEMENT REPAIR ON 018-371 PCN I24Z

MRM	LANE	EB LEFT LANE L Ft	EB LEFT LANE W Ft	EB RIGHT LANE L Ft	EB RIGHT LANE W Ft	PCCP SqYds	REMOVE CONCRETE CURB & GUTTER Ft	TYPE B68 CONCRETE CURB & GUTTER EB Ft	INSERT STEEL BAR IN PCC PAVEMENT 1" x 18" PLAIN ROUND DOWEL BARS Each	INSERT STEEL BAR IN PCC PAVEMENT No. 8 x 18" DEFORMED TIE BARS Each	INSERT STEEL BAR IN PCC PAVEMENT No. 5 x 24" DEFORMED TIE BARS Each	DOWEL BAR Each
447.000		35	12	35.5	12	94.0	20	20	16	16	18	24
TOTALS:		**35**	**12**	**35.5**	**12**	**94.0**	**20**	**20**	**16**	**16**	**18**	**24**

TABLE FOR PCC PAVEMENT REPAIR ON 011-271 PCN I27N

MRM	LANE	NB LEFT LANE L Ft	NB LEFT LANE W Ft	PCCP SqYds	NEW JOINT CON-FIG.	INSERT STEEL BAR IN PCC PAVEMENT No. 9 x 18" DEFORMED TIE BARS Each	INSERT STEEL BAR IN PCC PAVEMENT No. 5 x 24" DEFORMED TIE BARS Each	DOWEL BAR Each
79.882		12	12	16.0	R	16	8	12
TOTALS:		**12**	**12**	**16.0**	**1**	**16**	**8**	**12**

PCC PAVEMENT REPAIR AREA TYPES

W = Two Working Joints (Use only if repair is full roadway width and uniform length (across all lanes))
T = Two Tied Joints
B = One Working & One Tied Joint
R = Two Tied Joints with Original Joint Restored with Dowel Bar Assembly

ESTIMATE OF QUANTITIES

029 N-271 PCN I24Q

Bid Item Number	Item	Quantity	Unit
009E0010	Mobilization	Lump Sum	LS
380E5030	Nonreinforced PCC Pavement Repair	52.2	SqYd
380E5100	Continuously Reinforced PCC Pavement Repair	207.1	SqYd
380E6000	Dowel Bar	14	Each
380E6110	Insert Steel Bar in PCC Pavement	521	Each
634E0010	Flagging	40	Hour
634E0100	Traffic Control	1,337	Unit
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0310	Temporary Road Markers	8,250	Ft
634E0420	Type C Advance Warning Arrow Panel	1	Each

029 S-271 PCN I24R

Bid Item Number	Item	Quantity	Unit
009E0010	Mobilization	Lump Sum	LS
380E5030	Nonreinforced PCC Pavement Repair	24.0	SqYd
380E5100	Continuously Reinforced PCC Pavement Repair	149.4	SqYd
380E6110	Insert Steel Bar in PCC Pavement	350	Each
634E0010	Flagging	40	Hour
634E0100	Traffic Control	1,337	Unit
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0310	Temporary Road Markers	4,900	Ft
634E0420	Type C Advance Warning Arrow Panel	1	Each

034-272 PCN I24S

Bid Item Number	Item	Quantity	Unit
009E0010	Mobilization	Lump Sum	LS
110E0300	Remove Concrete Curb and Gutter	14	Ft
110E0420	Remove Drop Inlet Frame and Grate Assembly	2	Each
380E6110	Insert Steel Bar in PCC Pavement	16	Each
480E0100	Reinforcing Steel	30	Lb
634E0100	Traffic Control	238	Unit
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0310	Temporary Road Markers	360	Ft
634E0420	Type C Advance Warning Arrow Panel	2	Each
650E0080	Type B68 Concrete Curb and Gutter	14	Ft
670E1200	Type B Frame and Grate Assembly	2	Each

081-272 PCN I24T

Bid Item Number	Item	Quantity	Unit
009E0010	Mobilization	Lump Sum	LS
110E0300	Remove Concrete Curb and Gutter	7	Ft
110E0420	Remove Drop Inlet Frame and Grate Assembly	1	Each
380E6110	Insert Steel Bar in PCC Pavement	8	Each
480E0100	Reinforcing Steel	15	Lb
634E0100	Traffic Control	119	Unit
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0310	Temporary Road Markers	320	Ft
634E0420	Type C Advance Warning Arrow Panel	1	Each
650E0080	Type B68 Concrete Curb and Gutter	7	Ft
670E1200	Type B Frame and Grate Assembly	1	Each

018-271 PCN I24Z

Bid Item Number	Item	Quantity	Unit
009E0010	Mobilization	Lump Sum	LS
110E0300	Remove Concrete Curb and Gutter	20	Ft
110E0500	Remove Pipe Culvert	3	Ft
120E0010	Unclassified Excavation	76	CuYd
260E2010	Gravel Cushion	150.0	Ton
380E5030	Nonreinforced PCC Pavement Repair	94.0	SqYd
380E6000	Dowel Bar	24	Each
380E6110	Insert Steel Bar in PCC Pavement	50	Each
634E0010	Flagging	10	Hour
634E0100	Traffic Control	306	Unit
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0310	Temporary Road Markers	2,940	Ft
634E0420	Type C Advance Warning Arrow Panel	2	Each
650E0080	Type B68 Concrete Curb and Gutter	20	Ft
670E1010	2' x 3' Type B Drop Inlet	1	Each
670E1200	Type B Frame and Grate Assembly	1	Each
680E0440	4" Slotted Corrugated Polyethylene Drainage Tubing	94	Ft

011-271 PCN I27N

Bid Item Number	Item	Quantity	Unit
009E0010	Mobilization	Lump Sum	LS
380E5030	Nonreinforced PCC Pavement Repair	16.0	SqYd
380E6000	Dowel Bar	12	Each
380E6110	Insert Steel Bar in PCC Pavement	24	Each
633E0030	Cold Applied Plastic Pavement Marking, 24"	24	Ft
633E5015	Grooving for Cold Applied Plastic Pavement Marking, 24"	24	Ft
634E0010	Flagging	5	Hour
634E0100	Traffic Control	196	Unit
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0310	Temporary Road Markers	180	Ft
634E0420	Type C Advance Warning Arrow Panel	1	Each

SPECIFICATIONS

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

UTILITIES

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

Utilities are not planned to be affected on this project. If utilities are identified near the improvement area through the SD One Call Process as required by South Dakota Codified Law 49-7A and Administrative Rule Article 20:25, the Contractor shall contact the Project Engineer to determine modifications that will be necessary to avoid utility impacts.

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 4 feet.

This project consists of full depth replacement of Continuously Reinforced Concrete (CRC) Pavement in areas where major failures have occurred. Full depth areas may vary in length and width, however the minimum length is 4 feet.

COORDINATION BETWEEN CONTRACTORS

A separate contract for Project No. PH 000S(184) - PCN 012X has been or will be awarded to another Contractor for pavement marking on US 18 from MRM 445.50 to MRM 451.96.

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 pavement marking project.

The Contractor will need coordinate work on 011-271-PCN I27N, so City of Brandon can install detector loop and its leads to junction box.

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 the DOT Environmental Engineer, 700 East Broadway Avenue, Pierre, SD 57501-2586 (605-773-3268). 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.

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.

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

SURFACING THICKNESS DIMENSIONS

Plans quantity will be applied even though the thickness may vary from that shown on the plans.

At those locations where material must be placed to achieve a required elevation, plans quantity may be varied to achieve the required elevation.

RESTORATION OF GRAVEL CUSHION

An inspection of the remaining gravel cushion subgrade shall be made after excavation of each terminal replacement location, pavement repair area and shoulder strengthening area. Areas of excess moisture shall be dried to the satisfaction of the Engineer. Loose material shall be removed. Each terminal replacement location, pavement repair area and shoulder strengthening area shall be leveled and compacted to the satisfaction of the Engineer.

If additional gravel cushion is required beyond the limits shown in the plans, it shall be placed at the contract unit price per ton for Gravel Cushion.

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

GRAVEL CUSHION

If quarried ledge rock is used in the Gravel Cushion, a maximum blend of 40% quarried ledge rock will be allowed.

ASPHALT CONCRETE COMPOSITE

Mineral aggregate for the Asphalt Concrete Composite shall conform to the requirements of the Standard Specifications for Class E, Type 1.

All other requirements in the Standard Specifications for Asphalt Concrete Composite shall apply.

The asphalt binder used in the mixture shall be PG 58-28, PG 64-22, PG 64-28 or PG 64-34 Asphalt Binder.

EXISTING PCC PAVEMENT

018-271 PCN I24Z

The existing pavement is 8” Nonreinforced PCC Pavement. Existing contraction joints are spaced at approximately 20'. Longitudinal joints are reinforced with No. 5 x 24” 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 aggregate in the existing PCC Pavement is quartzite.

RAMPS - 029 N-271 PCN I24Q & 029 S-271 PCN I24R

The existing pavement is 9” Nonreinforced PCC Pavement. Existing contraction joints are spaced at approximately 20'. Longitudinal joints are reinforced with No. 5 x 24” deformed tie bars spaced 30” to 48” center to center. Transverse joints are reinforced with 1¼” x 18” plain round dowel bars spaced 12” center to center.

The aggregate in the existing PCC Pavement is quartzite.

011-271 PCN I27N

The existing pavement is 8.5” Nonreinforced PCC Pavement. Existing contraction joints are spaced at approximately 20'. Longitudinal joints are reinforced with No. 5 x 24” deformed tie bars spaced 48” center to center. Transverse joints are reinforced with 1¼” x 18” plain round dowel bars spaced 12” center to center.

The aggregate in the existing PCC Pavement is quartzite.

EXISTING CRC PAVEMENT

The existing pavement on NB I-29 from MRM 62.443 to 72.853 is 11” Continuously Reinforced PCC Pavement. The longitudinal reinforcing steel consists of No. 6 deformed bars spaced 6” center to center, and the transverse reinforcing steel consists of No. 4 deformed bars spaced 4’ center to center.

The existing pavement on SB I-29 from MRM 62.443 to 72.853 is 11” Continuously Reinforced PCC Pavement. The longitudinal reinforcing steel consists of No. 6 deformed bars spaced 6 1/2” center to center, and the transverse reinforcing steel consists of No. 4 deformed bars spaced 4’ center to center.

The aggregate in the existing CRC/PCC Pavement is quartzite.

NONREINFORCED PCC PAVEMENT REPAIR - GENERAL

Locations and size (length or width) of pavement repair areas are subject to change in the field, at the discretion of the Engineer. Payment will be based on actual area replaced.

The Engineer will mark the location of the area to be repaired on construction. Where repair crosses both lanes, the passing lane should be repaired first.

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

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

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

Concrete placed adjacent to asphalt shoulders shall be formed full depth to match the width of existing concrete pavement. Asphalt shoulders adjacent to concrete pavement repair areas shall be replaced with Asphalt Concrete Composite.

NONREINFORCED PCC PAVEMENT REPAIR – GENERAL (CONTINUED)

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 the SAW AND SEAL JOINTS and SAW AND SEAL SHOULDER JOINTS notes.

NONREINFORCED PCC PAVEMENT REPAIR

New pavement thickness shall be 1” thicker than existing pavement.

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 if required by the Engineer.

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

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

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

Concrete shall be cured 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 60º F or higher throughout the cure period. If the concrete temperature falls below 60º 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.

NONREINFORCED PCC PAVEMENT REPAIR (C0NTINUED)

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

CONTINUOUSLY REINFORCED PCC PAVEMENT REPAIR

Locations and size (length or width) of pavement repair areas are subject to change in the field, at the discretion of the Engineer. Payment will be based on actual area replaced.

The Engineer will mark the location of the area to be repaired on construction. Where repair crosses both lanes, the passing lane should be repaired first.

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

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

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

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

Place reinforcing steel according to the notes for REINFORCING STEEL – PAVEMENT REPAIR and STEEL BAR INSERTION.

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 repair areas shall be replaced with Asphalt Concrete Composite.

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

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

CONTINUOUSLY REINFORCED PCC PAVEMENT REPAIR (CONTINUED)

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

New pavement thickness shall be equal to existing pavement thickness

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 if required by the Engineer.

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

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

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

Concrete shall be cured 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 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. In addition to the curing requirements a strength of 4,000 psi must be obtained 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’.

Cost for performing the aforementioned work including sawing, chipping and removing concrete, sandblasting, cleaning, furnishing and placing concrete and reinforcing steel, finishing and curing, replacing asphalt shoulders, labor and equipment shall be included in the contract unit price per square yard for Continuously Reinforced PCC Pavement Repair.

REINFORCING STEEL – PAVEMENT REPAIR

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

1. New No. 6 longitudinal bars shall be lap spliced with the preserved in place longitudinal bars.
2. At full lane width repair areas, additional No. 6 longitudinal bars shall be centered between every other set of two spliced longitudinal bars throughout the width of the repair area. The additional longitudinal bars shall overlap into the existing concrete 9” on both sides of the repair area. Drilled holes will be required and the additional longitudinal bars shall be inserted in accordance with the notes for STEEL BAR INSERTION. The additional longitudinal bars shall then be lap spliced.
3. Additional No. 4 transverse bars shall be centered between the in place transverse bars throughout the length of the repair area. The spacing of transverse bars in the completed repair area should be half the spacing of the in place transverse reinforcing steel (New spacing will be 1.5’).
   - For less than full lane width repair areas and repair areas adjacent to tied longitudinal joints, the additional transverse bars shall overlap into the existing concrete 9”. Drilled holes will be required and the additional transverse bars shall be inserted according to the notes for STEEL BAR INSERTION.
   - For full roadway width repair areas, a keyway with factory bent No. 4 lap spliced transverse bars shall be constructed in the longitudinal joint to tie to the transverse bars that will be placed in the adjacent lane.

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

SAW AND SEAL JOINTS

All longitudinal joints shall be sawed and sealed. Transverse joints in Nonreinforced PCC Pavement Repair areas shall also be sawed and sealed.

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

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

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

STEEL BAR INSERTION

Locations and quantities for pavement repair are subject to change in the field at the discretion of the Engineer.

The Contractor will be responsible for ordering the actual quantity of steel bars necessary to complete the work.

The Contractor shall insert Steel 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.

In CRC Pavement – Full Lane Width Pavement Repair

MAINLINE - 029 N-271 PCN I24Q & 029 S-271 PCN I24R

Steel bars (No. 6 longitudinal deformed tie bars) shall be inserted 9 inches into the in place concrete at the transverse joint and centered between every other set of two spliced longitudinal bars throughout the width of the repair area. Refer to the notes for REINFORCING STEEL.

In Nonreinforced PCC Pavement – Pavement Repair

018-271 PCN I24Z

On 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.

RAMPS - 029 N-271 PCN I24Q & 029 S-271 PCN I24R

On 9” 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 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).

Plain round dowel 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)

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. (CRC Pavement exception: In the transverse joints, the drilled in longitudinal steel bar angle will be slightly under 90° to allow for centering of the lap splice between existing longitudinal steel). The drilled holes shall be blown out with compressed air using a device that will reach to the back of the hole to ensure that all debris or loose material has been removed prior to epoxy injection.

A rigid frame or mechanical device will be required to guide the drill to ensure proper horizontal and vertical alignment of the steel bars in the drilled holes.

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

Fill the drilled holes 1/3 to 1/2 full of epoxy, or as recommended by the manufacturer, prior to 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 steel bars to be inserted in CRC Pavement shall be incidental to the contract unit price per square yard for Continuously Reinforced PCC Pavement Repair.

Cost for the epoxy resin adhesive, steel bars to be inserted in Nonreinforced PCC Pavement, drilling of holes, inserting the steel bars into the drilled holes in either CRC or Nonreinforced PCC Pavement 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.

SEQUENCE OF OPERATION

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

- Northbound lanes of I29 from Wednesday, August 3 through Tuesday, August 9, 2011.
- Southbound lanes of I29 from Thursday, August 11 through Monday, August 15, 2011.

Lane closures and/or narrowing of lanes will **NOT** be allowed as follows:

I29 Southbound for ramp work at I-90 Interchange

- 6:30 a.m. to 8.30 a.m.
- 4:00 p.m. to 7:00 p.m.

I29 Northbound for ramp work at I-90 Interchange

- 4:00 pm to 7:00 p.m.

TEMPORARY PAVEMENT MARKING

Temporary pavement marking on lane closure tapers shall consist of Temporary Road Markers. (Five workspaces with a 780' taper & 4350' of Interim White Edgelines for Ramp Work on 029 N-271 PCN I24Q, Five workspaces with a 780' taper & 1000' of Interim White Edgelines for Ramp Work on 029 S-271 PCN I24R. One workspace requiring 1000' double yellow & 940' of Interim White Edgeline on 018-271 PCN I24Z. One workspace requiring 180' taper on 011-271 PCN I27N.

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 or MASH 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 1 workspace on a two-lane highway and 2 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 reflectorized cones (42" minimum height) or two reflectorized drums. In areas containing numerous concrete repair locations, two reflectorized drums should be installed at a spacing of 660' alternating with the Type lll Barricades.

Signs may be mounted on portable supports.

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.

When work is in progress within an intersection, Flaggers will be required to direct traffic.

Holes adjacent to centerline in the lane open to traffic created during removal and replacement of PCC Pavement Repair areas shall be filled with gravel and cold-mix asphalt concrete prior to opening the lane to traffic. Gravel and cold-mix asphalt concrete Gravel and cold-mix asphalt concrete shall be furnished by the Contractor.

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

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

Routing traffic onto the 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 concrete shoulders on 029 N-271 & 029 S-271. In all workspaces in these areas, the same channelizing devices and spacing used on centerline, will also be required on the shoulders. These channelizing devices shall be placed in locations to adequately keep traffic completely off these shoulders. Continuous maintenance of the shoulder devices will be required to keep them in place. Cost for these extra channelizing devices shall be incidental to the contract lump sum price for Traffic Control, Miscellaneous.

MAINTENANCE OF TRAFFIC (INTERSTATE HIGHWAYS)

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

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

The use of interstate maintenance crossovers will not be permitted.

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

MAINTENANCE OF TRAFFIC (URBAN)

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

Reflectorized cones (42" minimum height), reflectorized drums or Type II Barricades shall be used to maintain a minimum of two-way traffic at intersecting roads or 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.

WORK DESCRIPTION FOR COLD APPLIED PAVEMENT MARKING

Work on this project consists of replacing existing cross walk pavement markings with new pavement markings at their existing location for repair on 011-271 MRM 79.882.

COLD APPLIED PLASTIC PAVEMENT MARKING

The cold applied plastic pavement marking material shall be 3M ESWR or an approved equal. The tape shall meet the requirements of Type A as defined in Section 983 of the Standard Specifications.

GROOVING FOR PAVEMENT MARKING

Pavement grooving as per the Standard Specifications shall be done to remove the existing cold applied plastic pavement marking. The grooving shall provide for a clean surface with 100% of the existing markings removed.

DEBRIS REMOVAL

The Contractor shall pick up debris during the cold applied plastic pavement marking work. The disposal of the debris will be the responsibility of the Contractor. Brooming will be required to clean the roadway surface as per manufacturer's recommendations. Cost for brooming shall be incidental to the contract unit price per foot for Groove Pavement for Pavement Marking, 24".

ITEMIZED LIST OF TRAFFIC CONTROL

029 N-271 PCN I24Q

SIGN CODE	SIGN SIZE	DESCRIPTION	NUMBER REQUIRED	UNITS PER SIGN	UNITS
E5-1	36" x 32"	EXIT GORE SIGN	1	24	24
G20-2a	36" x 18"	END ROAD WORK	1	17	17
R1-2	48" x 48"	YIELD	1	34	34
R2-1	30" x 36"	SPEED LIMIT 65	2	23	46
R2-1	30" x 36"	SPEED LIMIT 45	1	23	23
R2-1	30" x 36"	SPEED LIMIT 75	1	23	23
W3-5	48" x 48"	SPEED REDUCTION (__ MPH)	2	34	68
W4-1	48" x 48"	MERGE (SYMBOL)	1	34	34
W4-2	48" x 48"	LEFT OR RIGHT LANE ENDS (SYMBOL)	2	34	68
W5-4	48" x 48"	RAMP NARROWS	1	34	34
W13-1	24" x 24"	ADVISORY SPEED PLATE	1	16	16
W13-4	24" x 24"	ON RAMP	1	16	16
W20-1	48" x 48"	ROAD WORK AHEAD	2	34	68
W20-5	48" x 48"	LT. OR RT. LANE CLOSED AHEAD	2	34	68
W20-7a	48" x 48"	FLAGGER	1	34	34
SPECIAL	30" x 24"	FINES DOUBLED	2	18	36
*****	*****	TYPE III BARRICADE - 8 FT. DOUBLE SIDE	13	56	728
				TOTAL UNITS	1337

029 S-271 PCN I24R

SIGN CODE	SIGN SIZE	DESCRIPTION	NUMBER REQUIRED	UNITS PER SIGN	UNITS
E5-1	36" x 32"	EXIT GORE SIGN	1	24	24
G20-2a	36" x 18"	END ROAD WORK	1	17	17
R1-2	48" x 48"	YIELD	1	34	34
R2-1	30" x 36"	SPEED LIMIT 65	2	23	46
R2-1	30" x 36"	SPEED LIMIT 45	1	23	23
R2-1	30" x 36"	SPEED LIMIT 75	1	23	23
W3-5	48" x 48"	SPEED REDUCTION (__ MPH)	2	34	68
W4-1	48" x 48"	MERGE (SYMBOL)	1	34	34
W4-2	48" x 48"	LEFT OR RIGHT LANE ENDS (SYMBOL)	2	34	68
W5-4	48" x 48"	RAMP NARROWS	1	34	34
W13-1	24" x 24"	ADVISORY SPEED PLATE	1	16	16
W13-4	24" x 24"	ON RAMP	1	16	16
W20-1	48" x 48"	ROAD WORK AHEAD	2	34	68
W20-5	48" x 48"	LT. OR RT. LANE CLOSED AHEAD	2	34	68
W20-7a	48" x 48"	FLAGGER	1	34	34
SPECIAL	30" x 24"	FINES DOUBLED	2	18	36
*****	*****	TYPE III BARRICADE - 8 FT. DOUBLE SID	13	56	728
				TOTAL UNITS	1337

034-272 PCN I24S

SIGN CODE	SIGN SIZE	DESCRIPTION	NUMBER REQUIRED	UNITS PER SIGN	UNITS
G20-2a	36" x 18"	END ROAD WORK	2	17	34
W4-2	48" x 48"	LEFT OR RIGHT LANE ENDS (SYMBOL)	2	34	68
W20-1	48" x 48"	ROAD WORK AHEAD	2	34	68
W20-5	48" x 48"	LT. OR RT. LANE CLOSED AHEAD	2	34	68
				TOTAL UNITS	238

081-272 PCN I24T

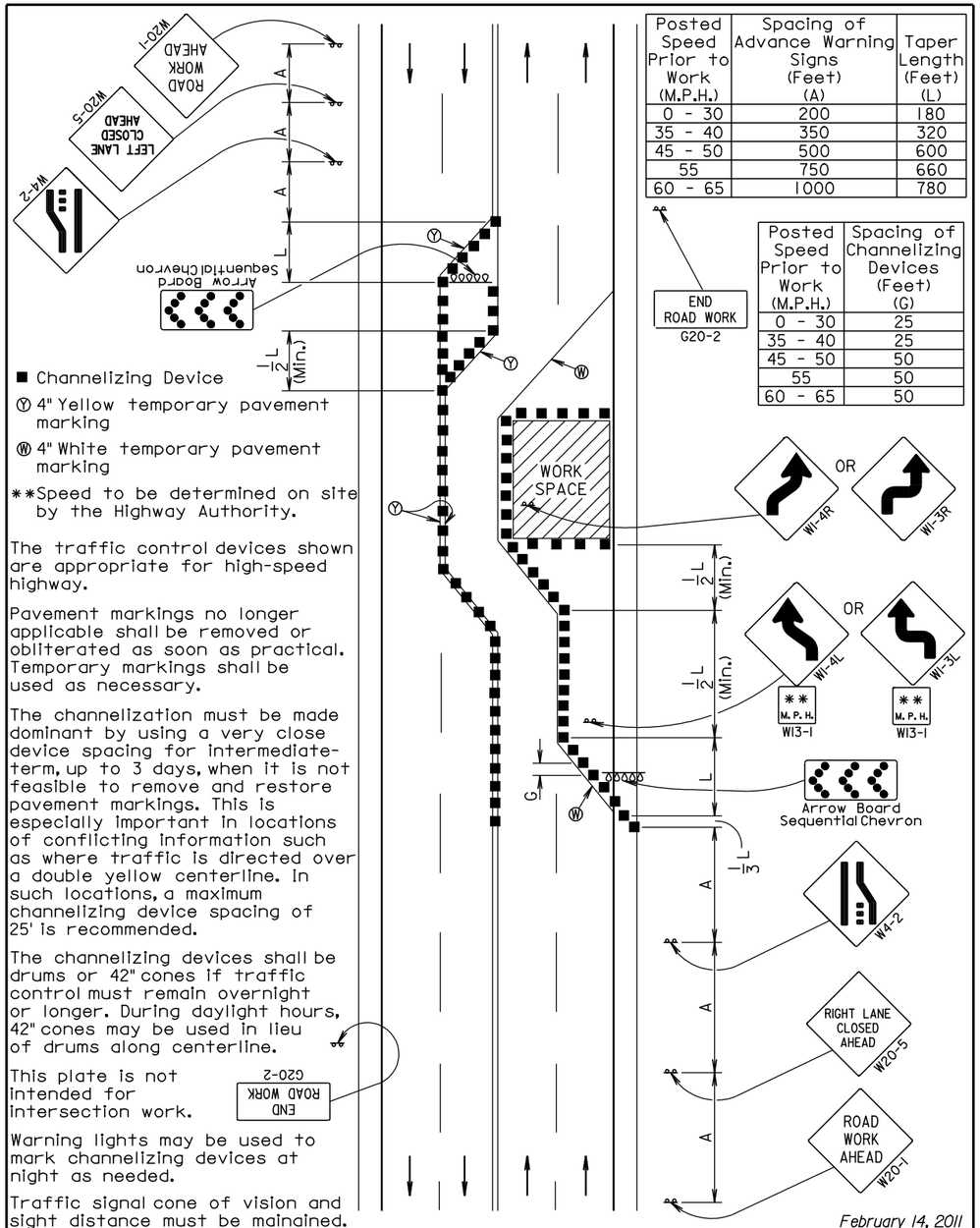
SIGN CODE	SIGN SIZE	DESCRIPTION	NUMBER REQUIRED	UNITS PER SIGN	UNITS
G20-2a	36" x 18"	END ROAD WORK	1	17	17
W4-2	48" x 48"	LEFT OR RIGHT LANE ENDS (SYMBOL)	1	34	34
W20-1	48" x 48"	ROAD WORK AHEAD	1	34	34
W20-5	48" x 48"	LT. OR RT. LANE CLOSED AHEAD	1	34	34
				TOTAL UNITS	119

018-271 PCN I24Z

SIGN CODE	SIGN SIZE	DESCRIPTION	NUMBER REQUIRED	UNITS PER SIGN	UNITS
G20-2a	36" x 18"	END ROAD WORK	2	17	34
W1-4a	48" x 48"	REVERSE CURVE SIGN (LEFT OR RIGHT	2	34	68
W4-2	48" x 48"	LEFT OR RIGHT LANE ENDS (SYMBOL)	2	34	68
W20-1	48" x 48"	ROAD WORK AHEAD	2	34	68
W20-5	48" x 48"	LT. OR RT. LANE CLOSED AHEAD	2	34	68
				TOTAL UNITS	306

011-271 PCN I27N

SIGN CODE	SIGN SIZE	DESCRIPTION	NUMBER REQUIRED	UNITS PER SIGN	UNITS
G20-2a	36" x 18"	END ROAD WORK	1	17	17
R3-7	30" x 30"	LEFT LANE MUST TURN LEFT	1	21	21
W4-2	48" x 48"	LEFT OR RIGHT LANE ENDS (SYMBOL)	1	34	34
W20-1	48" x 48"	ROAD WORK AHEAD	1	34	34
W20-5	48" x 48"	LT. OR RT. LANE CLOSED AHEAD	1	34	34
*****	*****	TYPE III BARRICADE - 8 FT. DOUBLE SID	1	56	56
				TOTAL UNITS	196



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

Posted Speed Prior to Work (M.P.H.)	Spacing of Channelizing Devices (Feet) (G)
0 - 30	25
35 - 40	25
45 - 50	50
55	50
60 - 65	50

■ Channelizing Device

Ⓨ 4" Yellow temporary pavement marking

Ⓦ 4" White temporary pavement marking

**Speed to be determined on site by the Highway Authority.

The traffic control devices shown are appropriate for high-speed highway.

Pavement markings no longer applicable shall be removed or obliterated as soon as practical. Temporary markings shall be used as necessary.

The channelization must be made dominant by using a very close device spacing for intermediate-term, up to 3 days, when it is not feasible to remove and restore pavement markings. This is especially important in locations of conflicting information such as where traffic is directed over a double yellow centerline. In such locations, a maximum channelizing device spacing of 25' is recommended.

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

This plate is not intended for intersection work.

Warning lights may be used to mark channelizing devices at night as needed.

Traffic signal cone of vision and sight distance must be mainained.

February 14, 2011

Published Date: 2nd Qtr. 2011	SDDOT	GUIDES FOR TRAFFIC CONTROL DEVICES HALF ROAD CLOSURE ON MULTILANE HIGHWAY	PLATE NUMBER 634.46
			Sheet 1 of 1

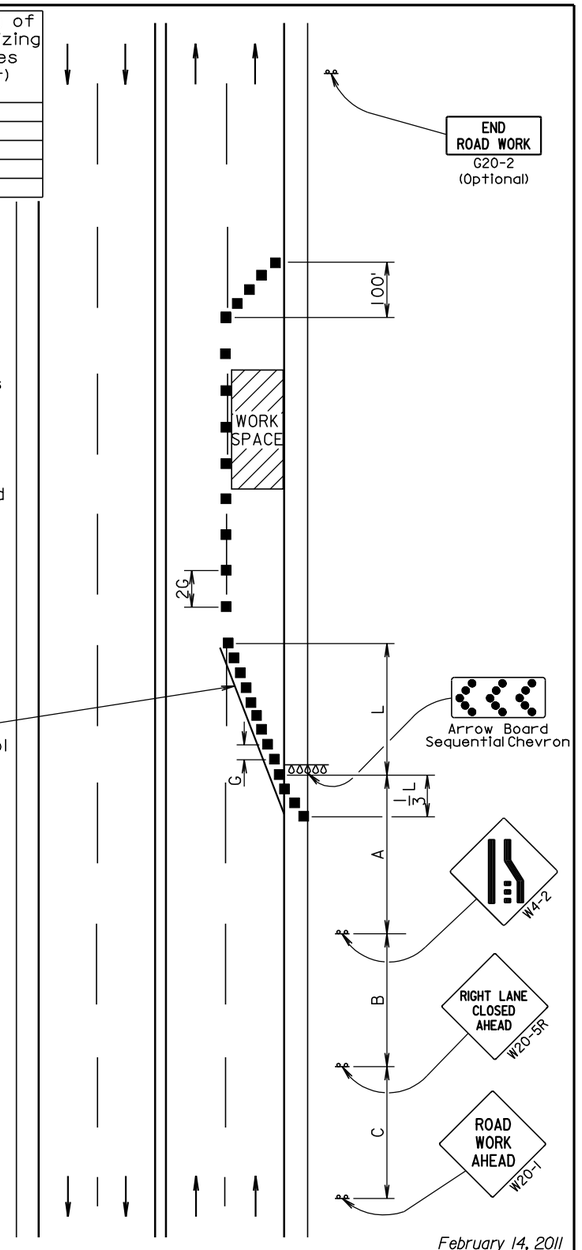
Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet) (A) (B) (C)	Taper Length (Feet) (L)	Spacing of Channelizing Devices (Feet) (G)
0 - 30	200	180	25
35 - 40	350	320	25
45 - 50	500	600	50
55	750	660	50
60 - 65	1000	780	50

■ Channelizing Device

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



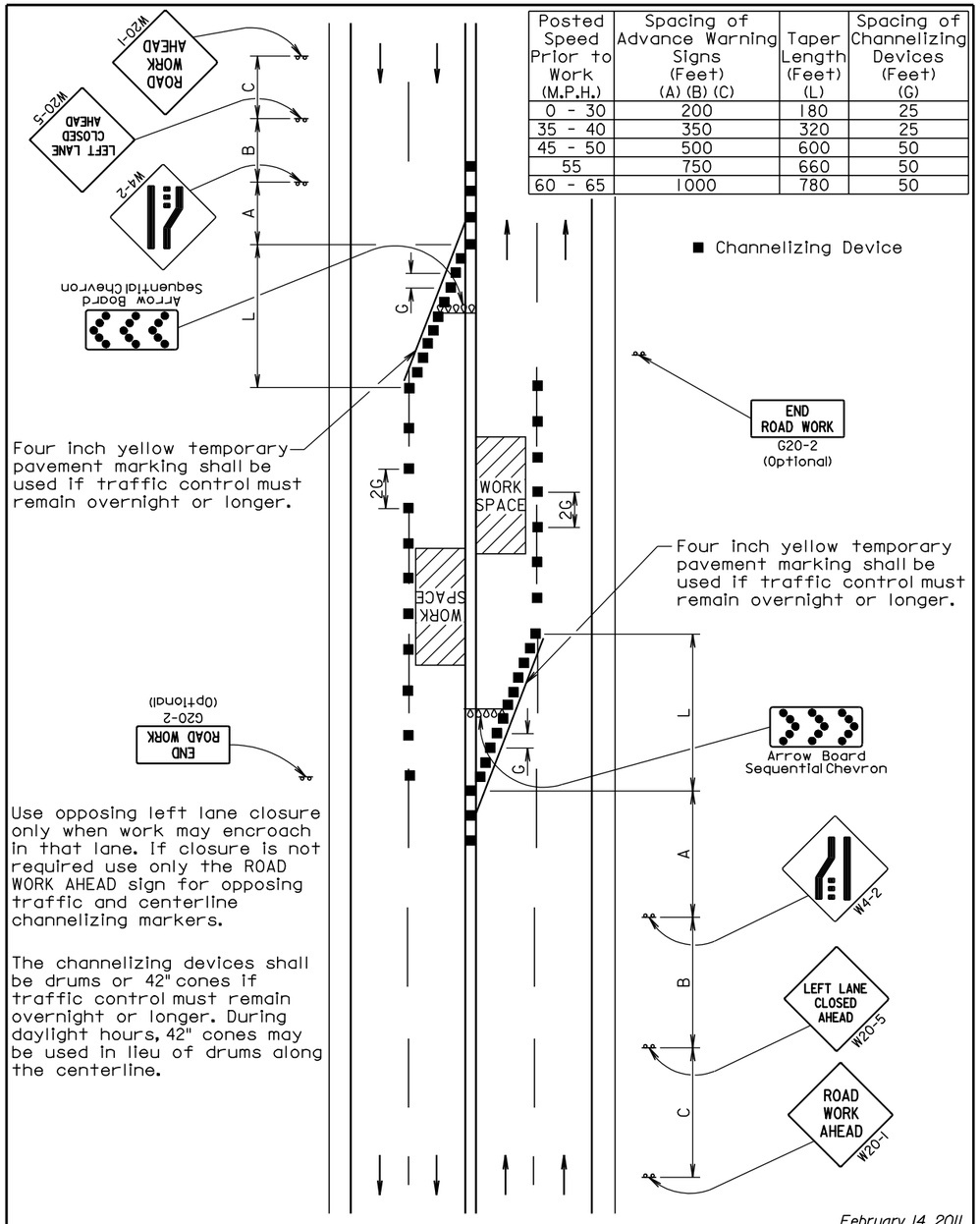
February 14, 2011

Published Date: 2nd Qtr. 2011	SDDOT	GUIDES FOR TRAFFIC CONTROL DEVICES 4-LANE UNDIVIDED, RIGHT LANE CLOSED	PLATE NUMBER 634.47
			Sheet 1 of 1

Username - trsf12115

Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet) (A) (B) (C)	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



Use opposing left lane closure only when work may encroach in that lane. If closure is not required use only the ROAD WORK AHEAD sign for opposing traffic and centerline channelizing markers.

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

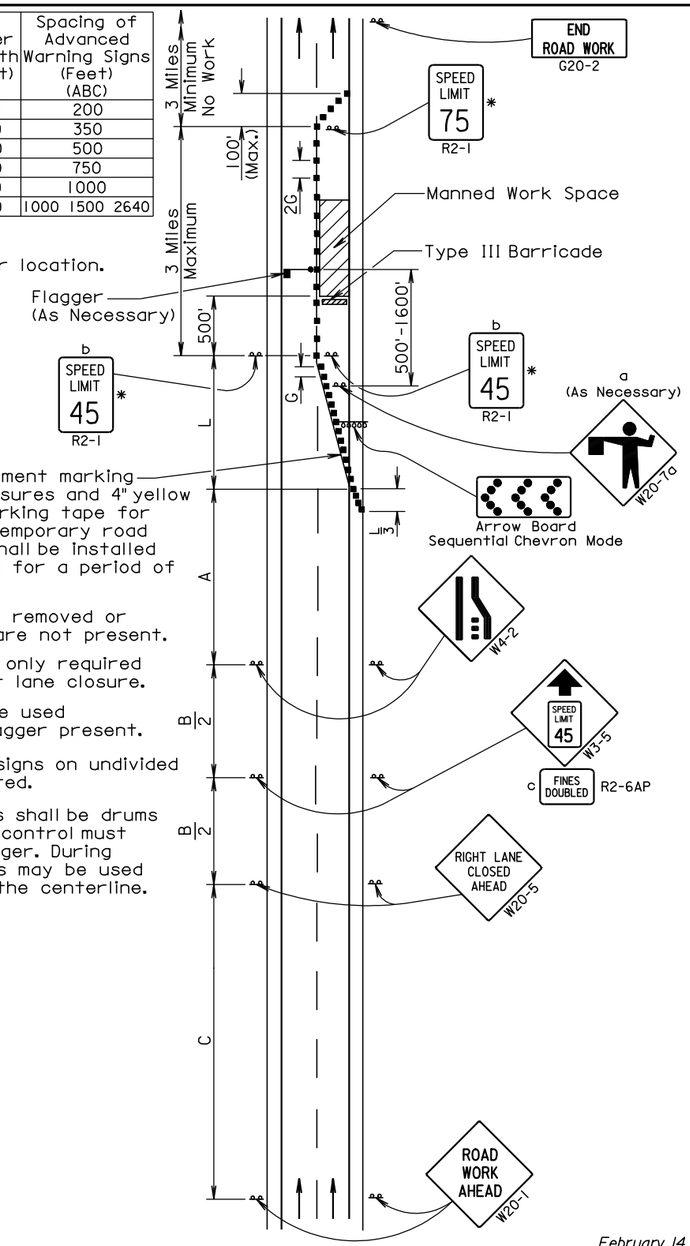
February 14, 2011

Published Date: 2nd Qtr. 2011	SDDOT	GUIDES FOR TRAFFIC CONTROL DEVICES 4-LANE UNDIVIDED, LEFT LANE CLOSED	PLATE NUMBER 634.48 Sheet 1 of 1

Posted Speed Prior to Work (M.P.H.)	Spacing of Channelizing Devices (Feet) (G)	Taper Length (Feet) (L)	Spacing of Advanced Warning Signs (Feet) (ABC)
0 - 30	25	180	200
35 - 40	25	320	350
45 - 50	50	600	500
55	50	660	750
60 - 65	50	780	1000
70 - 75	50	900	1000 1500 2640

■ 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.

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 42" cones if traffic control must remain overnight or longer. During daylight hours, 42" cones may be used in lieu of drums along the centerline.

February 14, 2011

Published Date: 2nd Qtr. 2011	SDDOT	MANNED WORK SPACE SIGNING FOR DIVIDED AND UNDIVIDED HIGHWAYS	PLATE NUMBER 634.63 Sheet 1 of 1

Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet) (A) (B)	L
45 - 50	500	600
55	750	660
60 - 65	1000	780
	(A) (B)	
70 - 75	1000 1600	1125

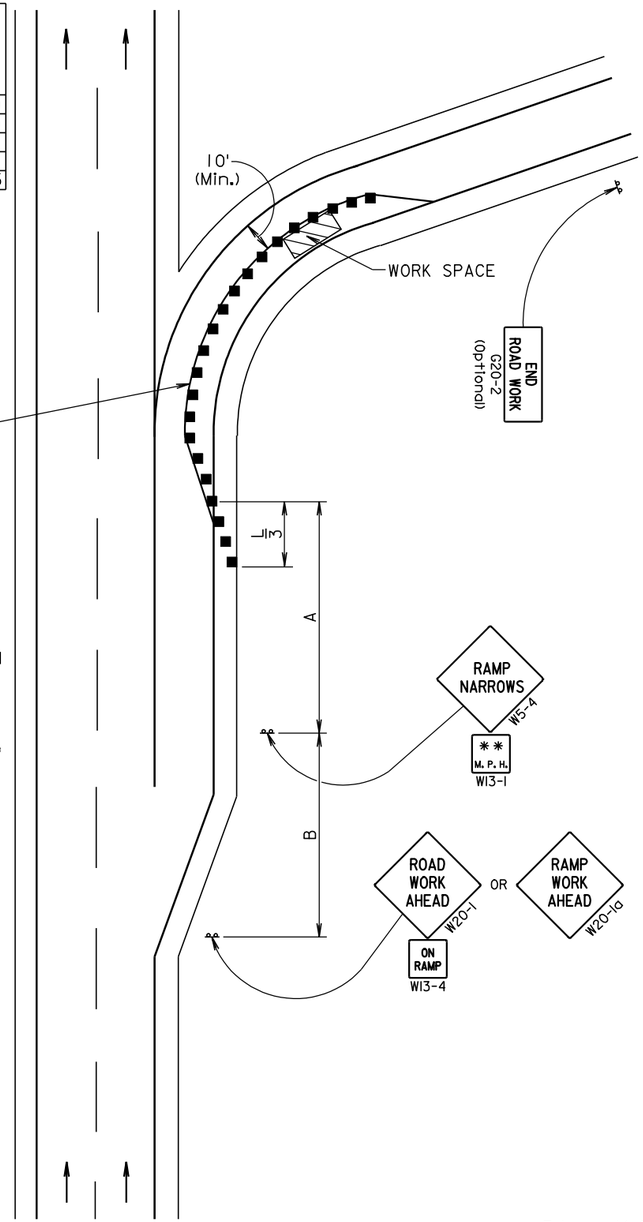
■ Channelizing Device

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

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

The channelizing devices shall be drums or 42" cones if traffic control must remain overnight or longer.

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



February 14, 2011

Published Date: 2nd Qtr. 2011

SDDOT

GUIDES FOR TRAFFIC CONTROL DEVICES
PARTIAL EXIT RAMP CLOSURE

PLATE NUMBER 634.69

Sheet 1 of 1

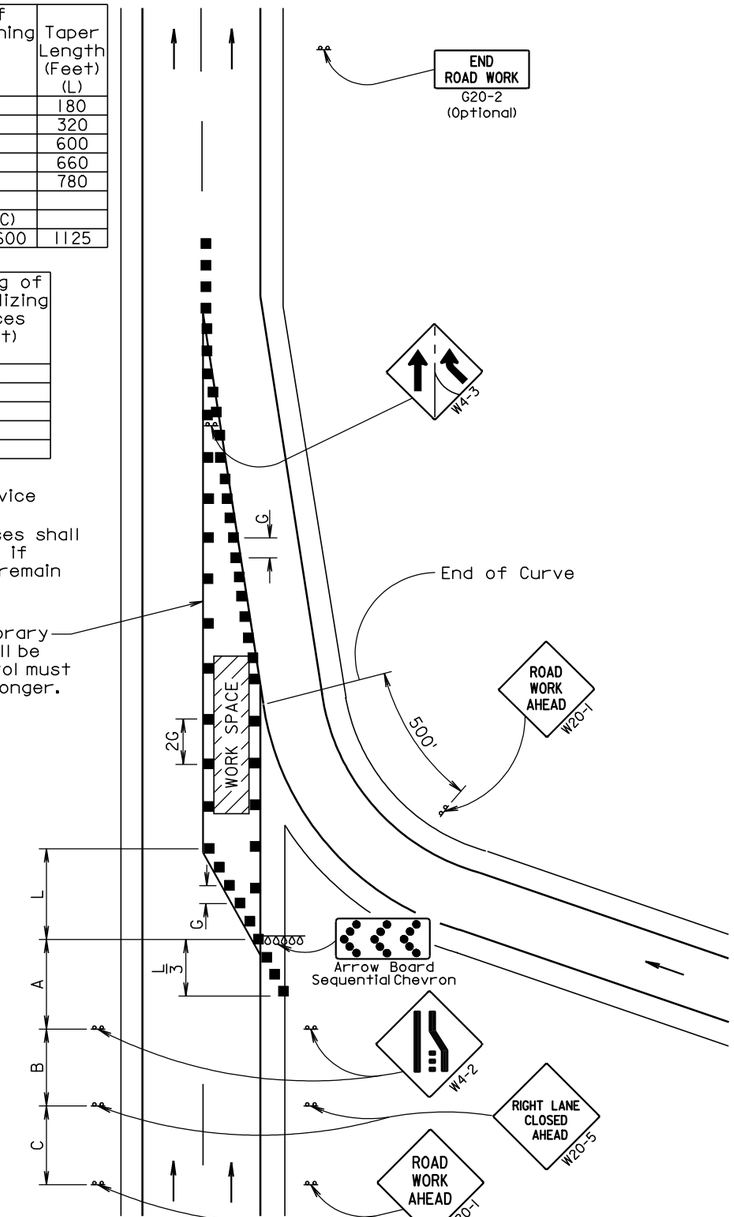
Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet) (A) (B) (C)	Taper Length (Feet) (L)
0 - 30	200	180
35 - 40	350	320
45 - 50	500	600
55	750	660
60 - 65	1000	780
	(A) (B) (C)	
70 - 75	1000 1600 2600	1125

Posted Speed Prior to Work (M.P.H.)	Spacing of Channelizing Devices (Feet) (G)
0 - 30	25
35 - 40	25
45 - 50	50
55	50
60 - 65	50

■ Channelizing Device

The channelizing devices shall be drums or 42" cones if traffic control must remain overnight or longer.

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



February 14, 2011

Published Date: 2nd Qtr. 2011

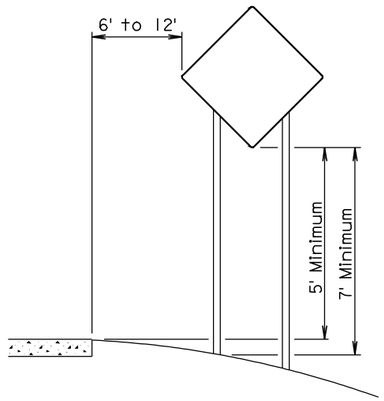
SDDOT

GUIDES FOR TRAFFIC CONTROL DEVICES
WORK IN VICINITY OF ENTRANCE RAMP

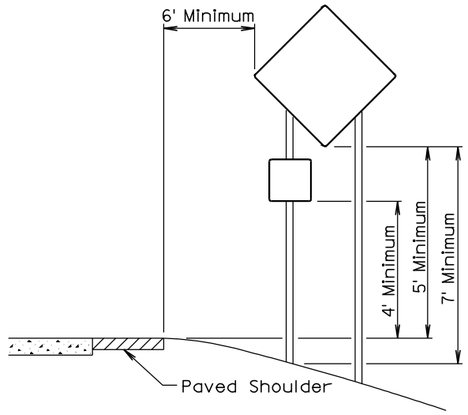
PLATE NUMBER 634.70

Sheet 1 of 1

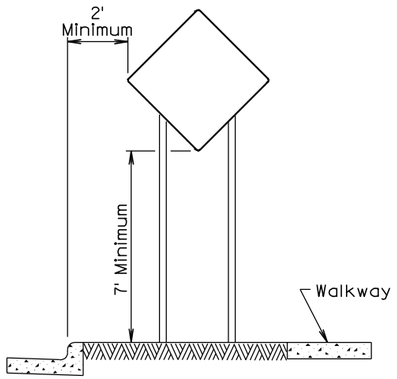
Username - trsfi2115



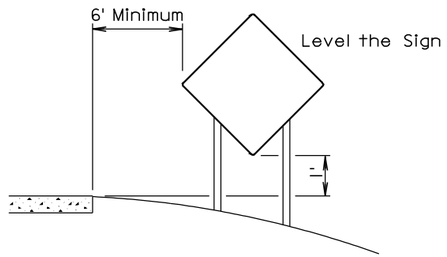
RURAL DISTRICT



RURAL DISTRICT WITH SUPPLEMENTAL PLATE



URBAN DISTRICT



RURAL DISTRICT 3 DAY MAXIMUM

February 14, 2011

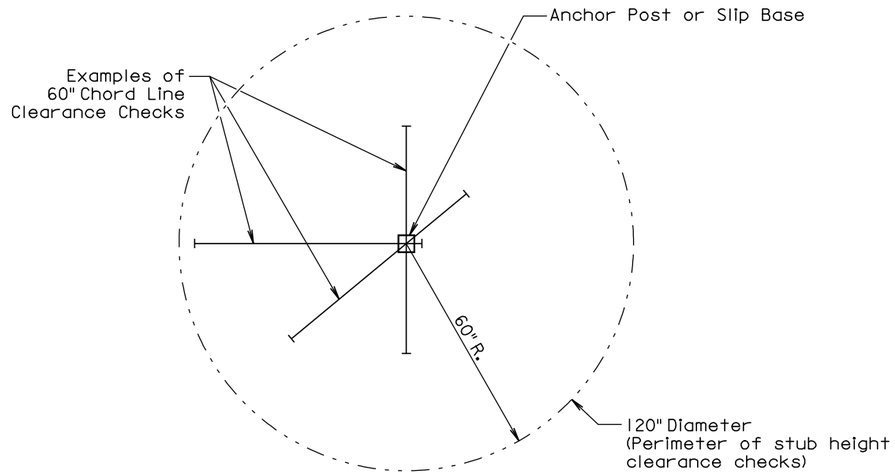
Published Date: 2nd Qtr. 2011

SDDOT

CRASHWORTHY SIGN SUPPORTS (Typical Construction Signing)

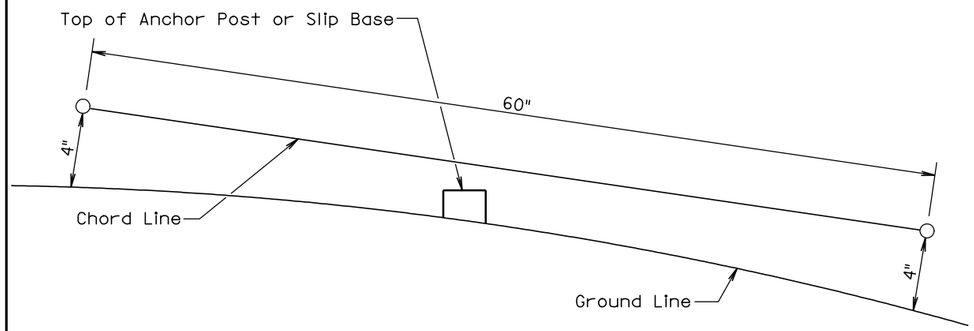
PLATE NUMBER 634.85

Sheet 1 of 1



PLAN VIEW

(Examples of stub height clearance checks)



ELEVATION VIEW

GENERAL NOTES:

The top of anchor posts and slip bases 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. 2011

SDDOT

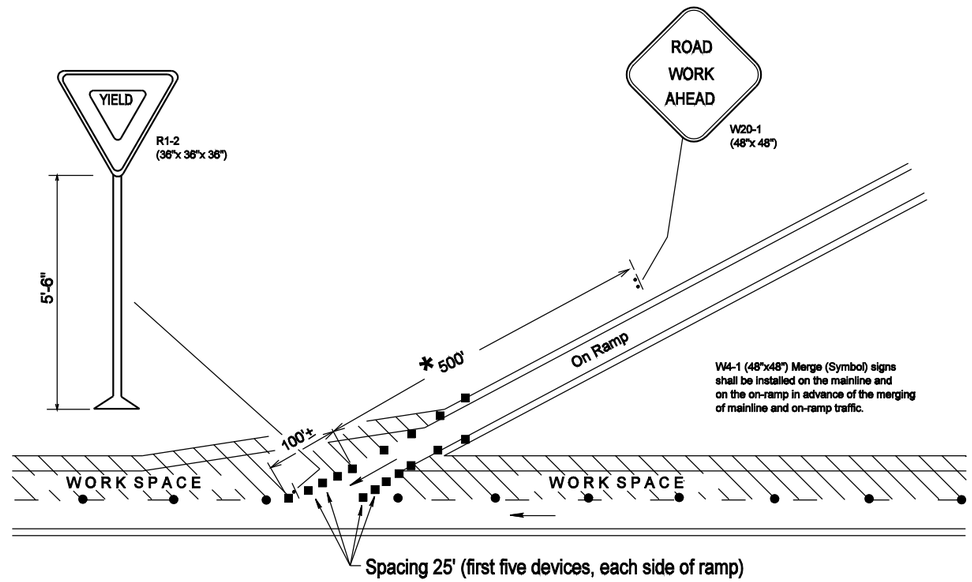
BREAKAWAY SUPPORT STUB CLEARANCE

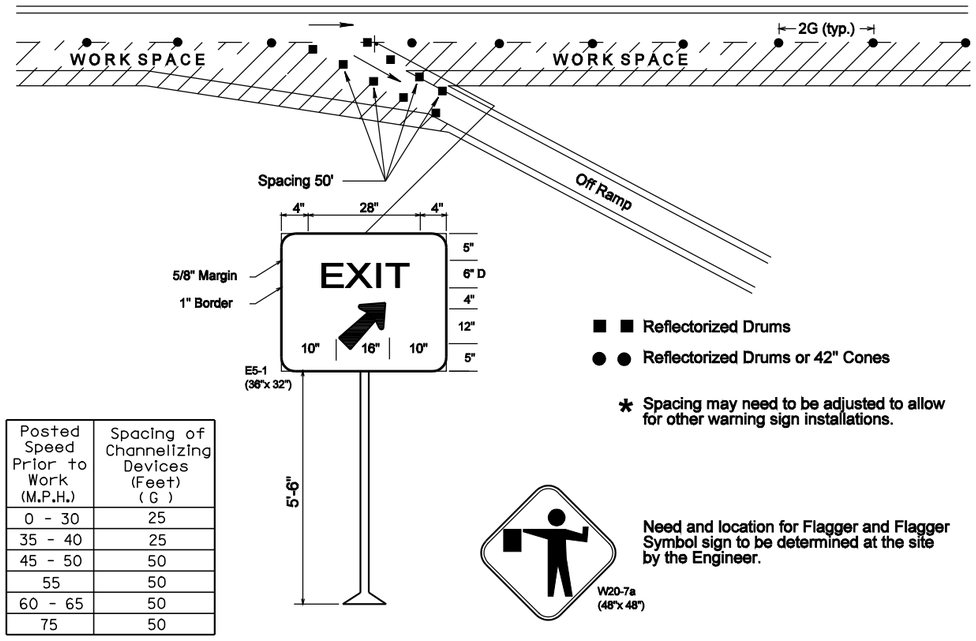
PLATE NUMBER 634.99

Sheet 1 of 1

TRAFFIC CONTROL

ON-RAMP AND OFF-RAMP DETAILS

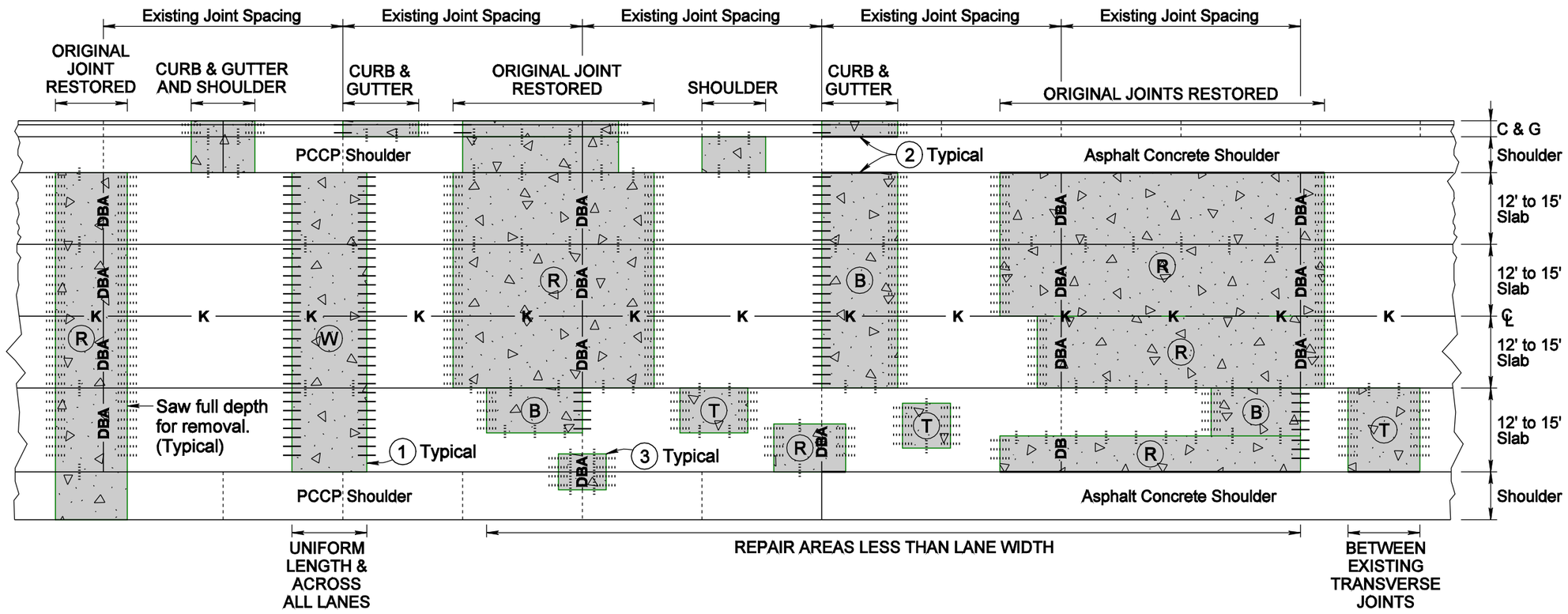




Posted Speed Prior to Work (M.P.H.)	Spacing of Channelizing Devices (Feet) (G)
0 - 30	25
35 - 40	25
45 - 50	50
55	50
60 - 65	50
75	50

NONREINFORCED PCC PAVEMENT REPAIR

UP TO FOUR LANE ROADWAY OR UP TO EIGHT LANE DIVIDED ROADWAY
TYPICAL REPAIR AREAS



KEY:

PCC Pavement Repair Area

PCC PAVEMENT REPAIR AREA TYPES:

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

(T) Two Tied Joints

(B) One Working & One Tied Joint

(R) Two Tied Joints with Original Joint Restored with Dowel Bar Assembly

Longitudinal Keyway Joints Without Bars

— K — Where a repair area intersects an existing longitudinal keyway joint without tie bars, the newly constructed joint should also be a keyway without tie bars.

Steel Bars for Transverse Joints

Pavement Thickness >= 8.5"

— Drilled in 1¼" x 18" epoxy coated deformed tie bars spaced 18" center to center.

..... Drilled in No. 9 x 18" epoxy coated deformed tie bars spaced 18" center to center.

Pavement Thickness < 8.5"

— Drilled in 1" x 18" epoxy coated deformed tie bars spaced 18" center to center.

..... Drilled in No. 8 x 18" epoxy coated deformed tie bars spaced 18" center to center.

DBA Dowel Bar Assembly

Steel Bars for Longitudinal Joints

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

No. 5 x 24" epoxy coated deformed tie bars.
Drilled In - spaced 30" center to center.

NOTES: Saw around repair areas full depth for removal.

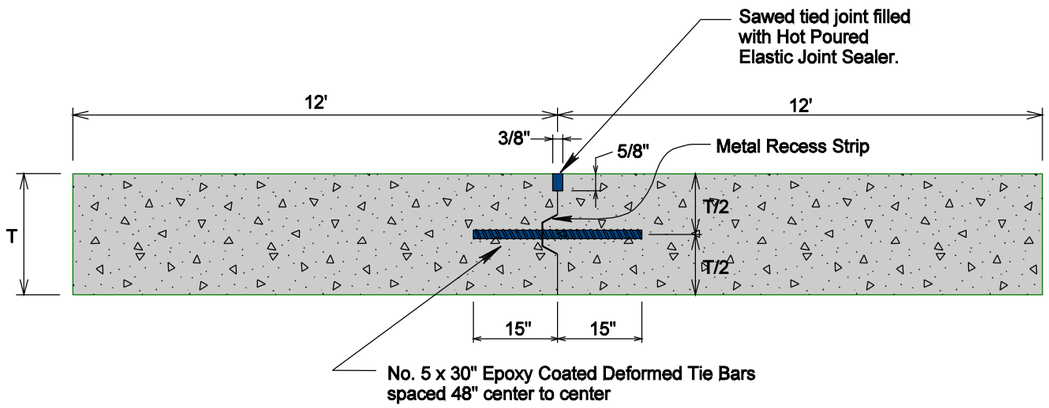
(1) Where possible, transverse joints shall be constructed/maintained full roadway width.

(2) Edges of repair areas shall be formed to match the width of the existing concrete pavement.

(3) Need for bars in small repair areas on/near the shoulder to be determined on a case-by-case basis, on construction by the Engineer.

NONREINFORCED PCC PAVEMENT REPAIR

LONGITUDINAL CONSTRUCTION JOINT WITH TIE BARS & KEYWAY

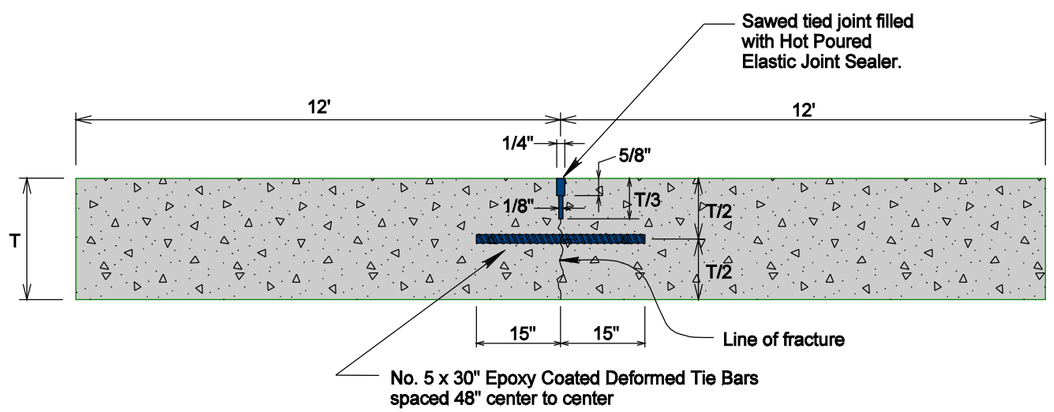


T = New pavement thickness.

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 and/or Fast Track Concrete for PCC Pavement Repair.

SAWED LONGITUDINAL JOINT

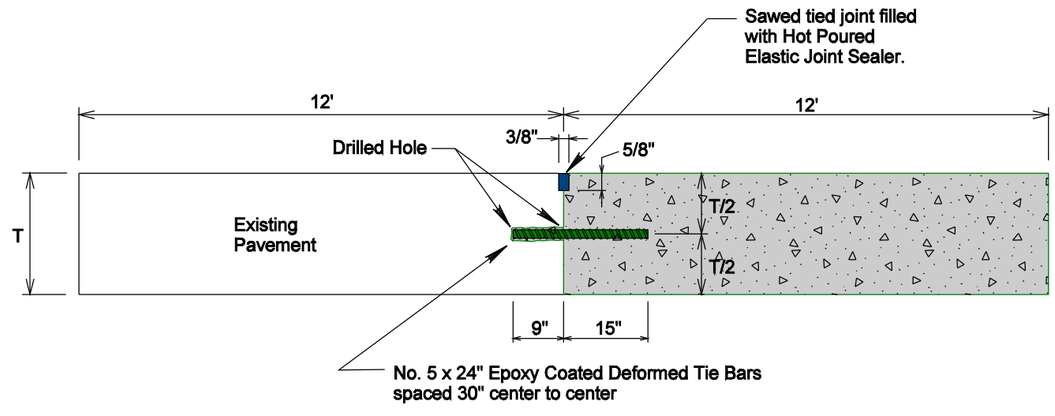


T = New pavement thickness.

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 and/or Fast Track Concrete for PCC Pavement Repair.

LONGITUDINAL CONSTRUCTION JOINT WITH DRILLED IN TIE BARS



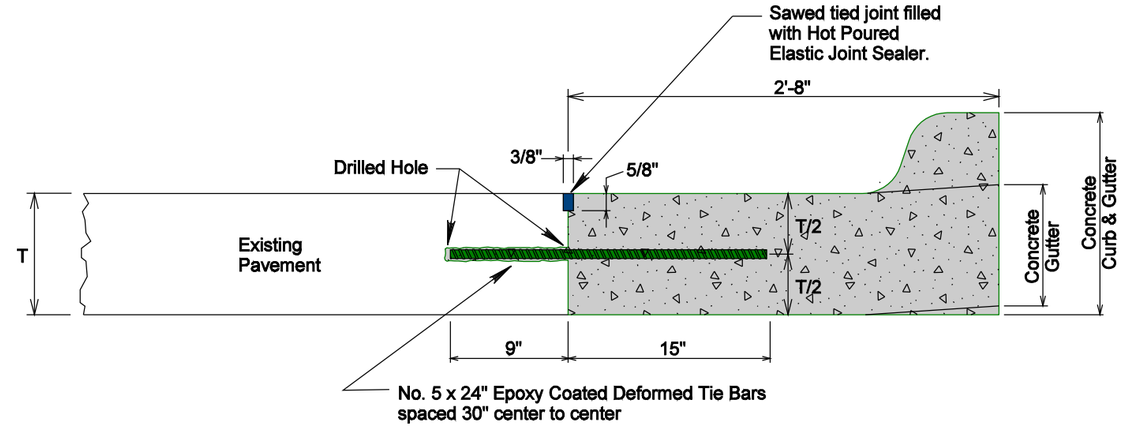
T = Existing and new pavement thickness.

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

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

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

LONGITUDINAL CONSTRUCTION JOINT WITH DRILLED IN TIE BARS



T = Existing and new pavement thickness.

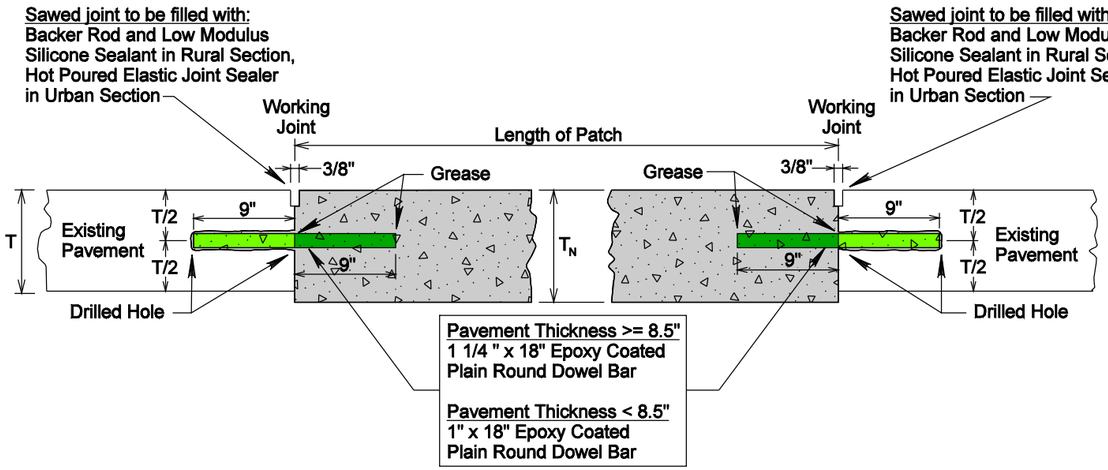
Bar embedded a minimum depth of 9 inches into the existing pavement by utilizing an epoxy resin adhesive.

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

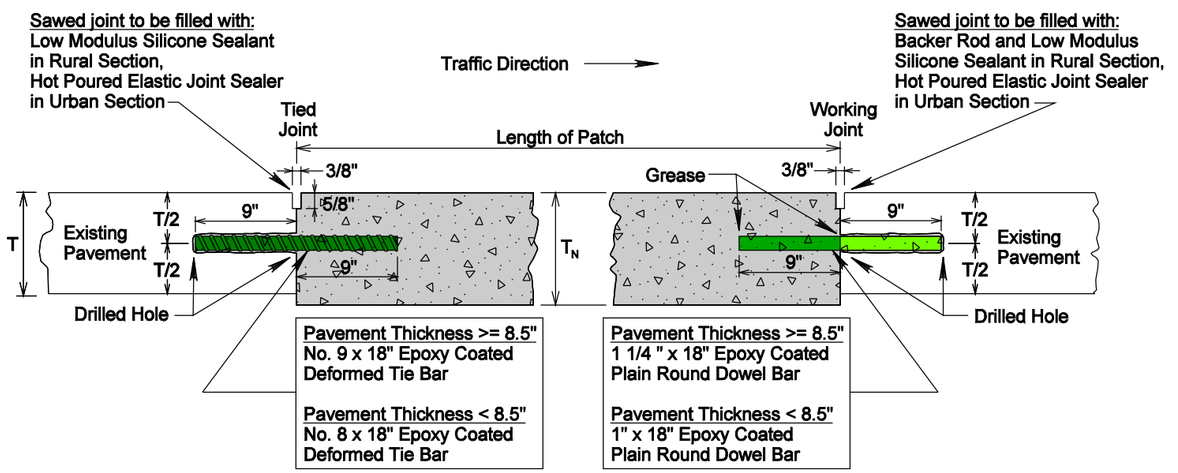
Cost for furnishing and inserting drilled in tie bars shall be included in the contract unit price per each for Insert Steel Bar in PCC Pavement.

NONREINFORCED PCC PAVEMENT REPAIR

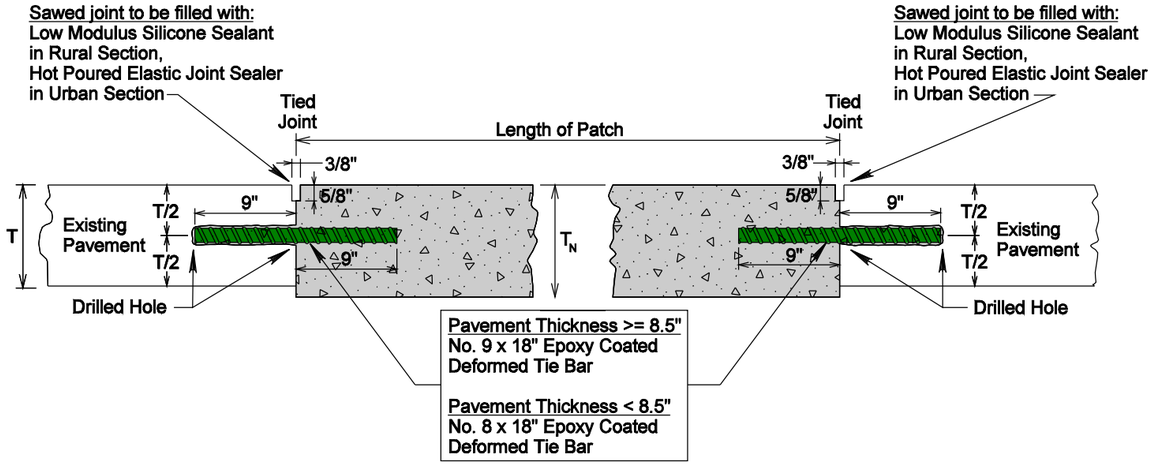
PLAIN ROUND DOWEL BAR INSERTION
TYPE W - (TWO WORKING JOINTS)



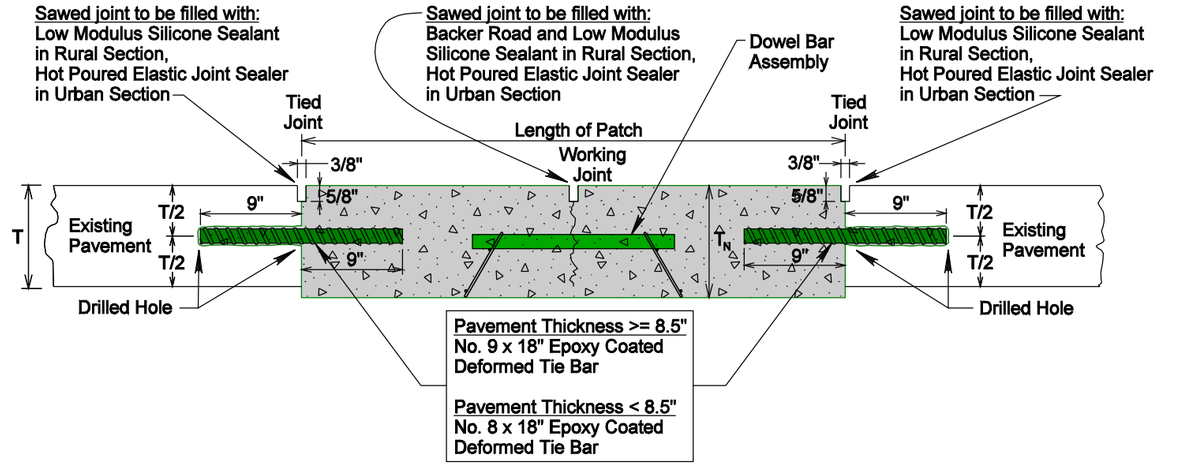
DEFORMED TIE BAR AND PLAIN ROUND DOWEL BAR INSERTION
TYPE B - (ONE TIED JOINT AND ONE WORKING JOINT)



DEFORMED TIE BAR INSERTION
TYPE T - (TWO TIED JOINTS)



DEFORMED TIE BAR INSERTION WITH DOWEL BAR ASSEMBLY
TYPE R - (TWO TIED JOINTS AND ONE WORKING JOINT - ORIGINAL JOINT RESTORED)

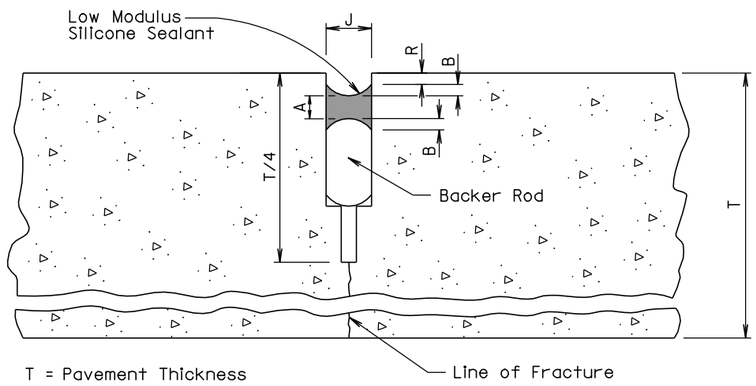


T = Existing pavement thickness.
T_N = New pavement thickness (1" thicker than existing).

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

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

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



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

GENERAL NOTE:

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

February 14, 2011

Published Date: 2nd Qtr. 2011

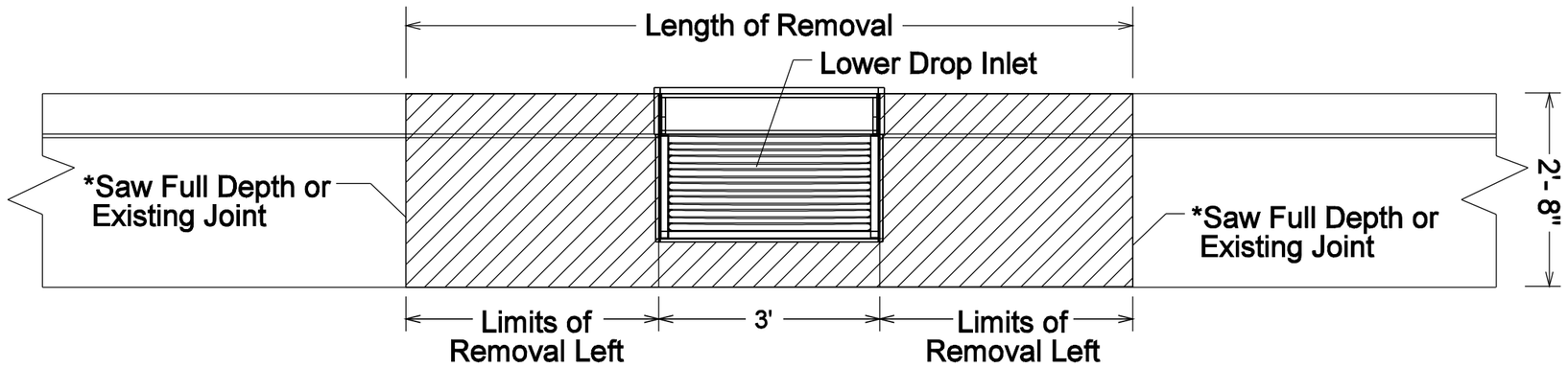
SDDOT

RESEAL PCC PAVEMENT JOINT (SILICONE)

PLATE NUMBER
380.13

Sheet 1 of 1

LAYOUT FOR LOWERING DROP INLETS AND REMOVAL OF CONCRETE CURB & GUTTER

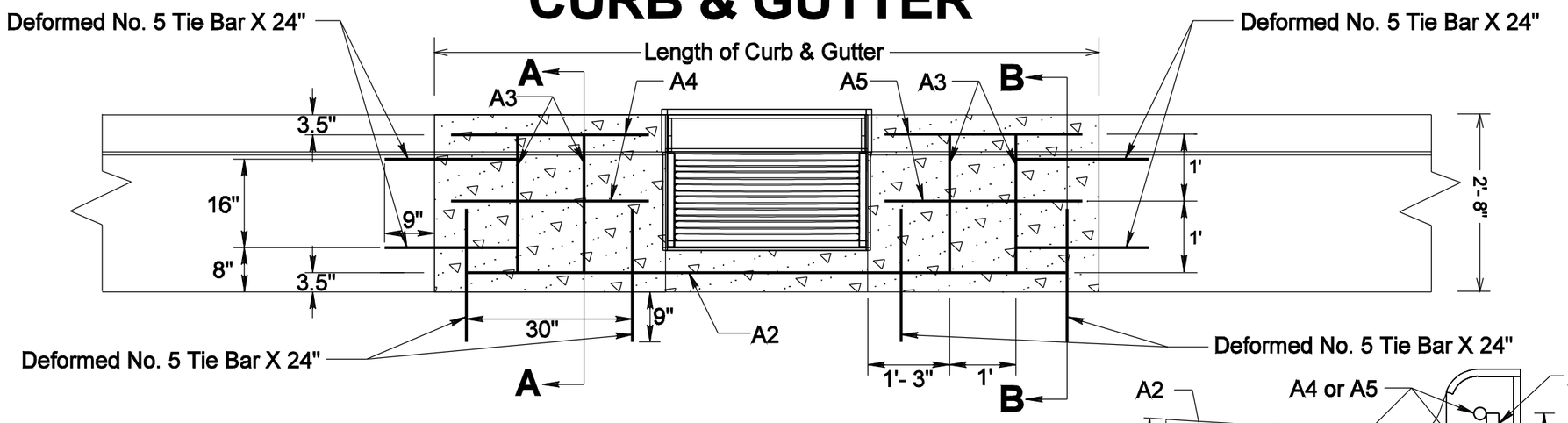


* If Saw Full Depth is required, cost shall be incidental to the contract unit price per foot for Remove Concrete Curb & Gutter.

Remove Curb & Gutter

Location	Lower Drop Inlet	Limits of Removal Left	Limits of Removal Right	Remove Concrete Curb & Gutter	Remove Frame & Grate	Furnish & Install Type B Frame & Grate
US 81 MRM 94.682 RIGHT	-	2'	2'	7'	1	1
SD 34 MRM 366.361 LEFT	-	2'	2'	7'	1	1
SD 34 MRM 366.244 RIGHT	-	2'	2'	7'	1	1
			TOTAL:	21	3	3

LAYOUT FOR INSTALLATION OF CONCRETE CURB & GUTTER

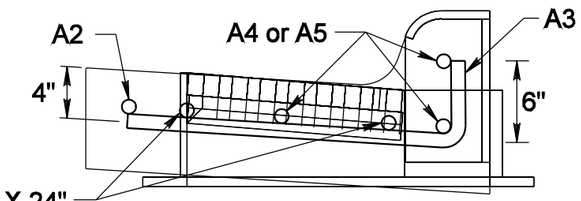


*Class M6 Concrete

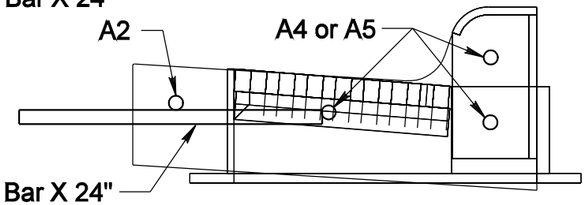
Location	Reinforcing Schedule			
	MK.	NO.	SIZE	LENGTH
US 81 MRM 94.682 RIGHT	A2	1	4	6'-8"
	A3	2	4	2'-10"
	A4	3	4	1'-8"
	A5	3	4	1'-8"
SD 34 MRM 366.361 LEFT	A2	1	4	6'-8"
	A3	2	4	2'-10"
	A4	3	4	1'-8"
	A5	3	4	1'-8"
SD 34 MRM 366.244 RIGHT	A2	1	4	6'-8"
	A3	2	4	2'-10"
	A4	3	4	1'-8"
	A5	3	4	1'-8"

*For the forming of Class M6 Concrete, refer to the standard plate for Type B Concrete Curb and Gutter.

Sec. A-A



Sec. B-B



Location	Reinforcing Steel (Lb)	No. 5x24" Deformed Tie Bars (Each)
US 81 MRM 94.682 RIGHT	14.9	8
SD 34 MRM 366.361 LEFT	14.9	8
SD 34 MRM 366.244 RIGHT	14.9	8
TOTAL:	44.7	24

PLOT SCALE - 28.124569:1.000000

PCC PAVEMENT REPAIR 018-271 PCN I24Z

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	2011 SIOUX FALLS AREA CONCRETE REPAIR	22	42

Plotting Date: 16-MAY-2011

KEY:

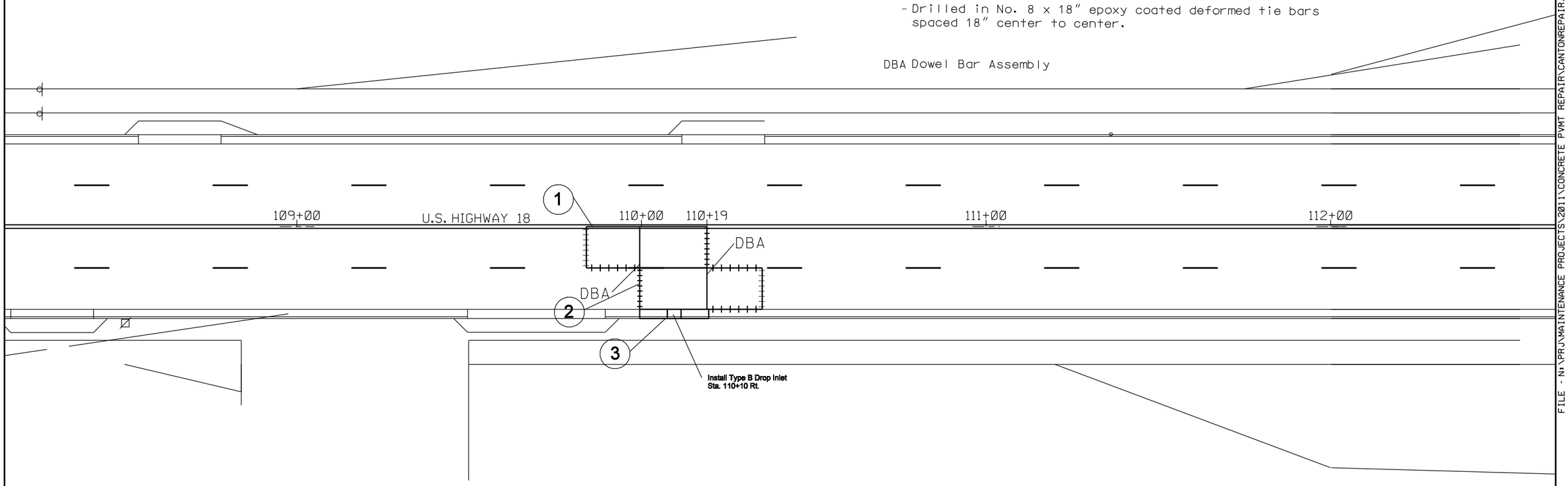
Steel Bars for Longitudinal Joints (for repair areas greater than 4 feet in length)

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

DBA Dowel Bar Assembly



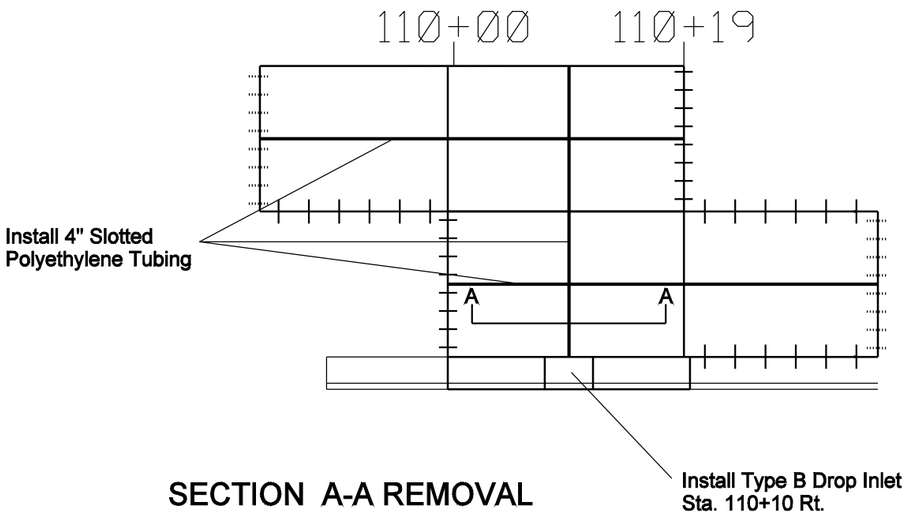
Location	Length (Ft.)	Width (Ft.)	Nonreinforced PCC Pavement Repair (Sq.Yds.)	Insert Steel Bar In PCC Pavement: 1" x 18" Plain Round Dowel Bars (Each)	No. 8 x 18" Deformed Tie Bars (Each)	No. 5 x 24" Deformed Tie Bars (Each)	Dowel Bar (Each)	Type B68 Concrete Curb and Gutter
1	35	12	46.7	8	8	6	12	
2	35.5	12	47.3	8	8	12	12	
3								20
		Total:	**94.0**	**16**	**16**	**18**	**24**	**20**

PLOTTED FROM - TRSF12115

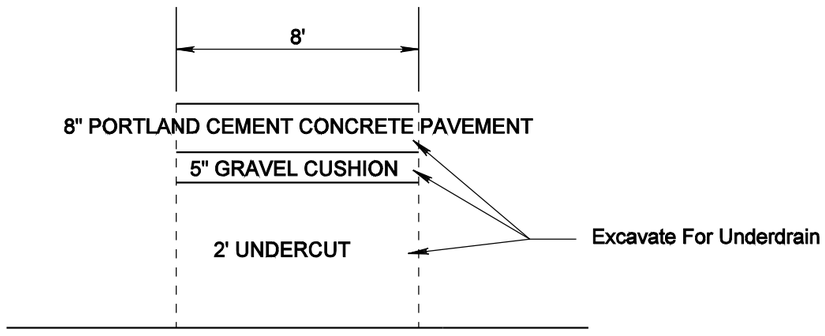
FILE - N:\PRJ\MAINTENANCE PROJECTS\2011\CONCRETE PVMT REPAIR\CANTONREPAIR.DGN DGN NAME - 22

PCC PAVEMENT REPAIR 018-271 PCN I24Z

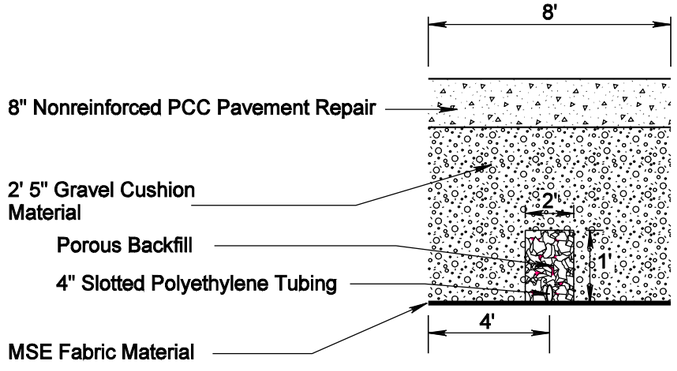
4" SLOTTED TUBING PLAN VIEW



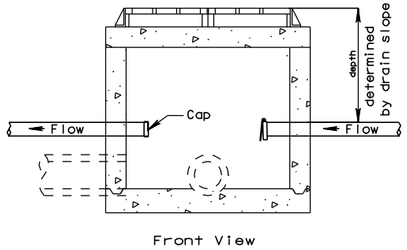
SECTION A-A REMOVAL



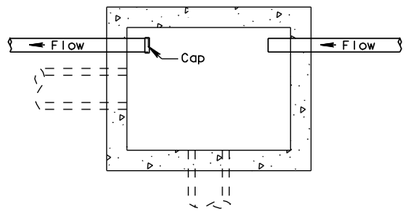
SECTION A-A INSTALL



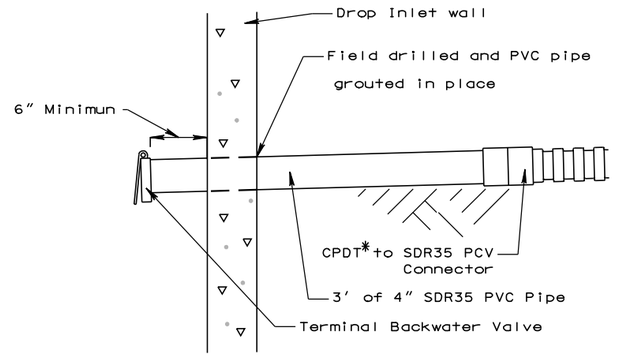
DETAIL FOR CONNECTION TO DROP INLET



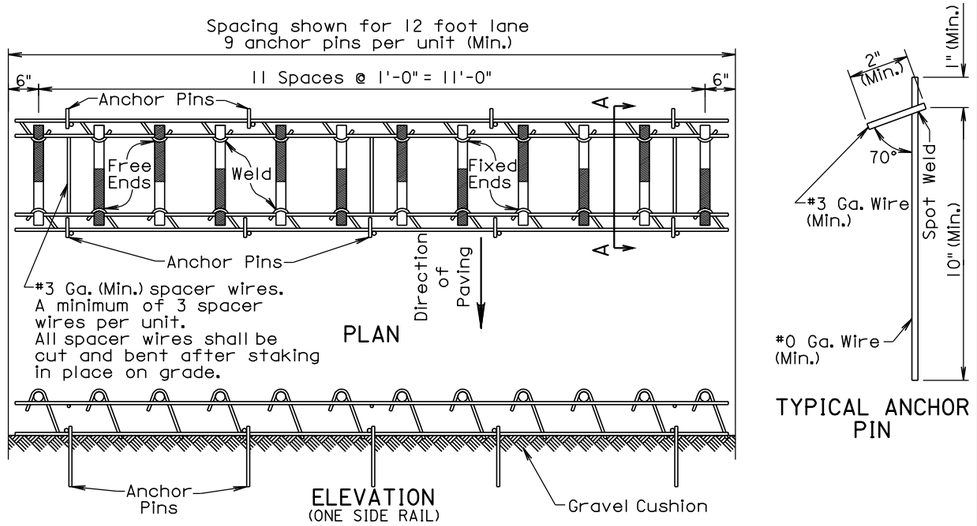
Front View

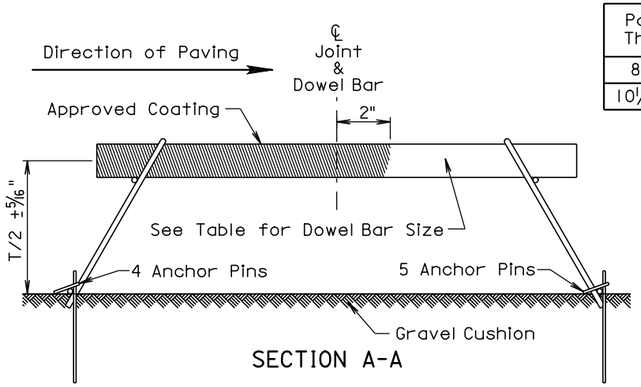


Plan View

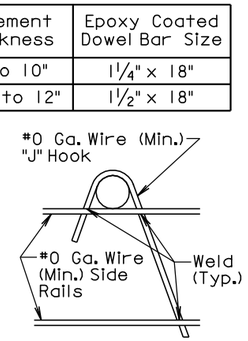


* CPDT = Corrugated Polyethylene Drainage Tubing





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



GENERAL NOTES:

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

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

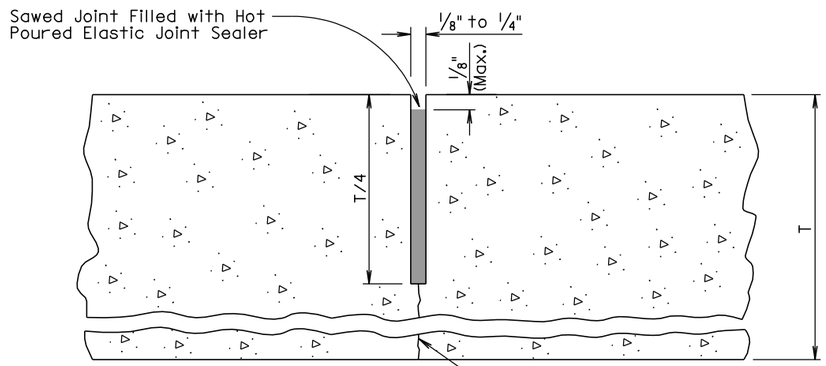
Centerline of individual dowel bars shall be parallel to the centerline of the roadway ±1/2 inch in 18 inches.

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

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

December 23, 2007

Published Date: 2nd Qtr. 2011	SDDOT	PCC PAVEMENT DOWEL BAR ASSEMBLY FOR TRANSVERSE CONTRACTION JOINTS	PLATE NUMBER 380.01 Sheet 1 of 1



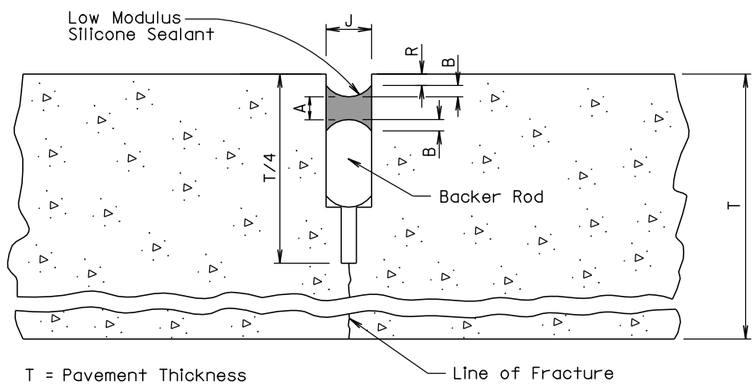
GENERAL NOTES:

The saw cut to control cracking shall be a minimum of ¼ the thickness of the pavement.

All hot poured elastic joint sealer material spilled on the surface of the concrete pavement shall be removed as soon as the material has cooled. The extent of removal of material shall be to the satisfaction of the Engineer. All costs for removal of the spilled joint sealer material shall be borne by the Contractor.

December 23, 2007

Published Date: 2nd Qtr. 2011	SDDOT	PCC PAVEMENT TRANSVERSE CONTRACTION JOINT WITH OR WITHOUT DOWEL BAR ASSEMBLY	PLATE NUMBER 380.03 Sheet 1 of 1



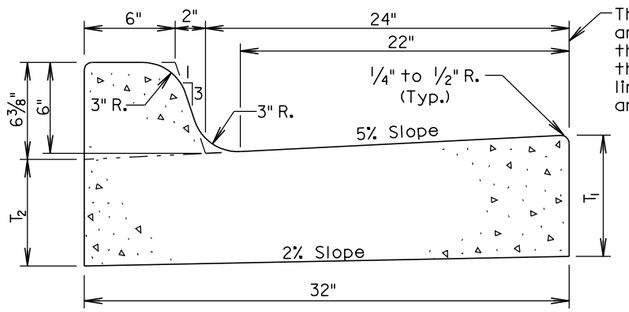
LOW MODULUS SILICONE SEALANT ALLOWABLE CONSTRUCTION TOLERANCES				
J = 3/8"				
A (Min.) (In)	A (Max.) (In)	B (Min.) (In)	B (Max.) (In)	R (In)
3/16	5/16	1/8	1/4	1/4
J = 1/2"				
A (Min.) (In)	A (Max.) (In)	B (Min.) (In)	B (Max.) (In)	R (In)
3/16	3/8	1/8	1/4	1/4
J = 5/8"				
A (Min.) (In)	A (Max.) (In)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

GENERAL NOTE:

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

February 14, 2011

Published Date: 2nd Qtr. 2011	SDDOT	RESEAL PCC PAVEMENT JOINT (SILICONE)	PLATE NUMBER 380.13
			Sheet 1 of 1



The stated radii on the plans and cross sections refer to this line and it shall also be the basis for horizontal linear foot measurement and payment.

Type	T_1 (Inches)	T_2 (Inches)	Cu. Yd. Per Lin. Ft.	Lin. Ft. Per Cu. Yd.
B66	6	5 1/16	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

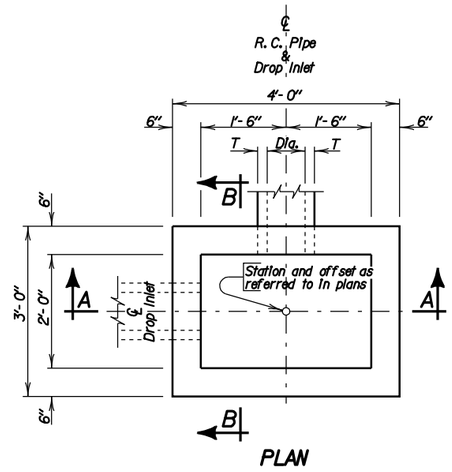
GENERAL NOTES:

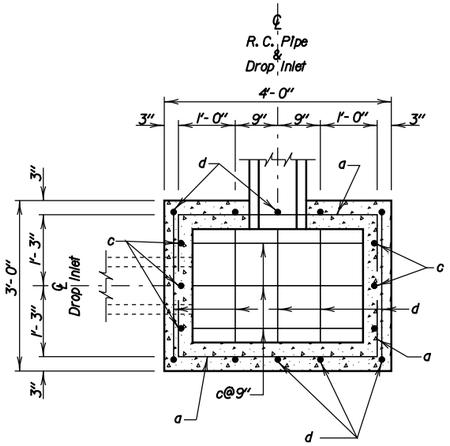
When concrete curb and gutter longitudinally adjoins new concrete pavement, the method of attachment shall be by one of the methods shown on Standard Plate 380.11.

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

September 6, 2008

Published Date: 2nd Qtr. 2011	SDDOT	TYPE B CONCRETE CURB AND GUTTER	PLATE NUMBER 650.01
			Sheet 1 of 1





PIPE DISPLACEMENT REDUCTIONS

R.C. Pipe Diameter Inches	T Inches	Class M6 Concrete Cu'd
12	2	0.03
15	2 1/4	0.04
18	2 1/2	0.05
24	3	0.09
27	3 1/4	0.11

ESTIMATED QUANTITIES

ITEM	UNIT	CONSTANT QUANTITY	VARIABLE QUANTITY
⚹ Class M6 Concrete	Cu'd	0.26	0.22H
Reinforcing Steel	Lb	37	20.04H
Frame and Grate Assembly	Each	1	———

DROP INLETS FOR 12" TO 27" DIAMETER PIPE

GENERAL NOTES:

⚹ Reduce total quantities of concrete by the amount of concrete displaced by the pipe. The total quantity of concrete shall be computed to the nearest hundredth of a cubic yard. The total quantity of reinforcing steel shall be computed to the nearest pound.

Drop inlets shown may be modified by the addition or omission of connecting pipes as shown on the layouts.

Reinforcing steel shall conform to ASTM A615 Grade 60. The b bars shall be lapped 12 inches. Cut and bend reinforcing steel as required to place pipe(s) through the drop inlet wall.

Pipe shall not enter through a corner of the drop inlet.

Use 2" clear cover on all reinforcing steel unless otherwise noted.

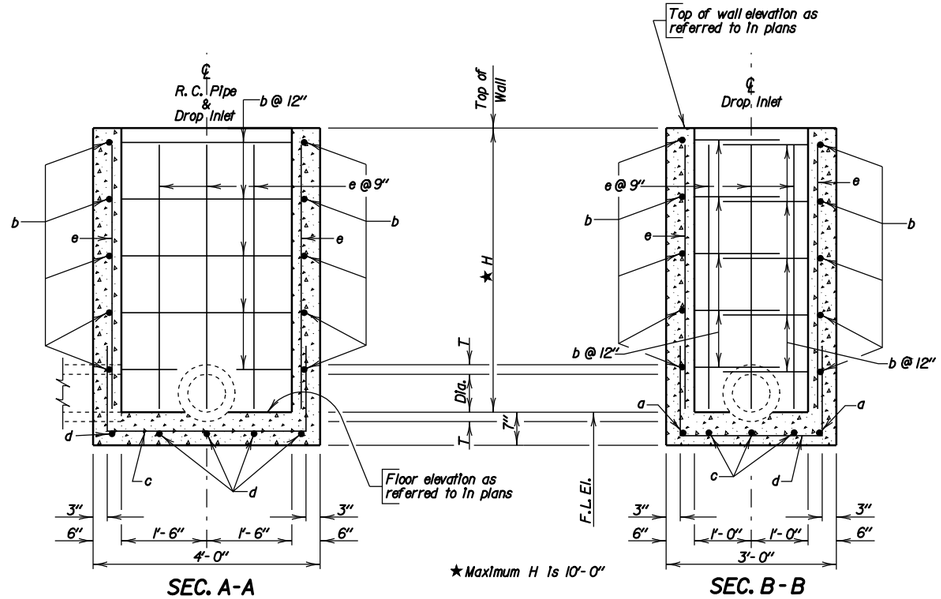
Precasting of reinforced drop inlets will be permissible. Prior to precasting, the Contractor shall submit details to the Engineer for approval.

Maximum pipe diameter shall not exceed 18 inches on the 3 foot wide side and shall not exceed 27 inches on the 4 foot wide side of the drop inlet.

The dimension of H is in feet.

December 23, 2009

Published Date: 2nd Qtr. 2011	SDDOT	2'X 3' TYPE B REINFORCED CONCRETE DROP INLET	PLATE NUMBER 670.01
			Sheet 1 of 2

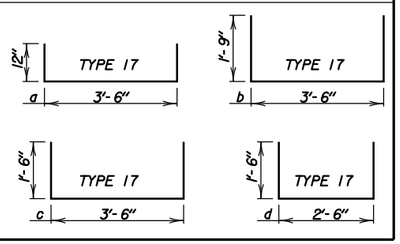


DROP INLETS FOR 12" TO 27" DIAMETER PIPE

REINFORCING SCHEDULE

MK.	No.	Size	Length	Type	Bending Details
a	2	4	5'-6"	17	
b	2H	4	7'-0"	17	
c	3	4	6'-6"	17	
d	5	4	5'-6"	17	
e	16	4	H - 2"	Str.	

NOTE:
All dimensions are out to out of bars.

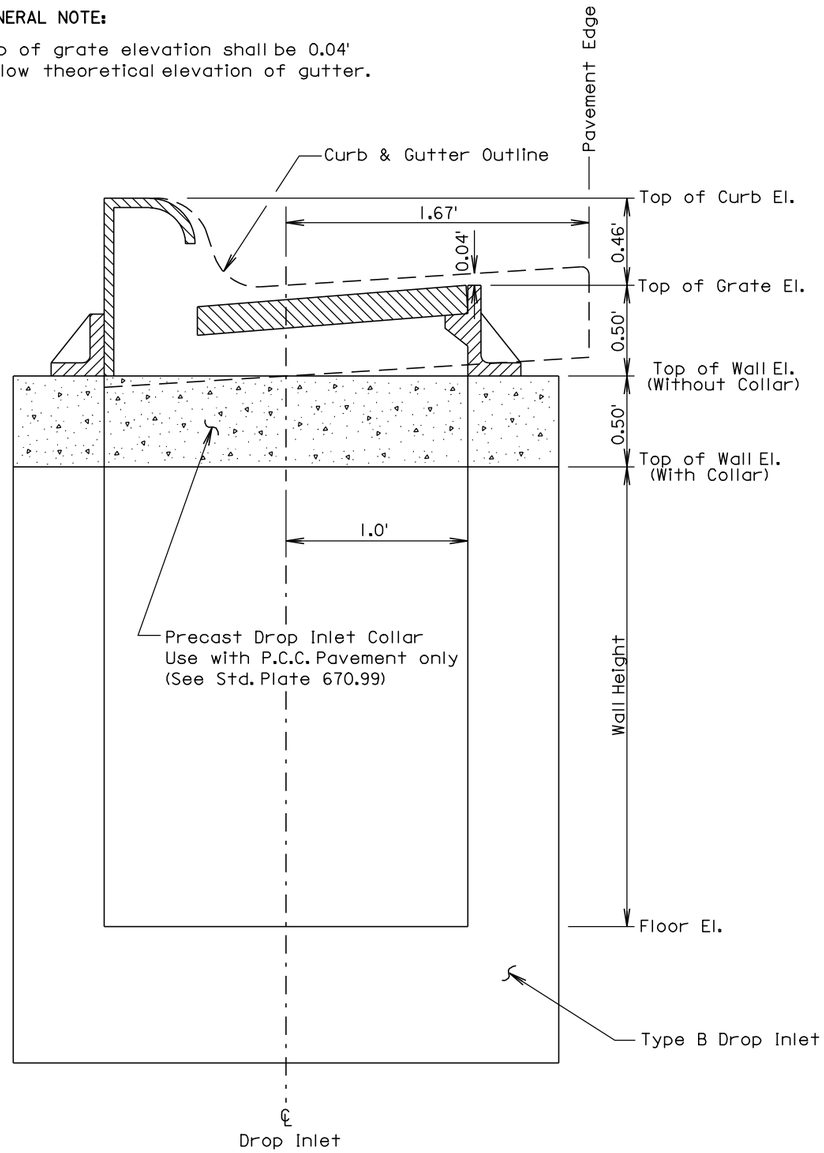


December 23, 2009

Published Date: 2nd Qtr. 2011	SDDOT	2'X 3' TYPE B REINFORCED CONCRETE DROP INLET	PLATE NUMBER 670.01
			Sheet 2 of 2

GENERAL NOTE:

Top of grate elevation shall be 0.04' below theoretical elevation of gutter.



March 31, 2000

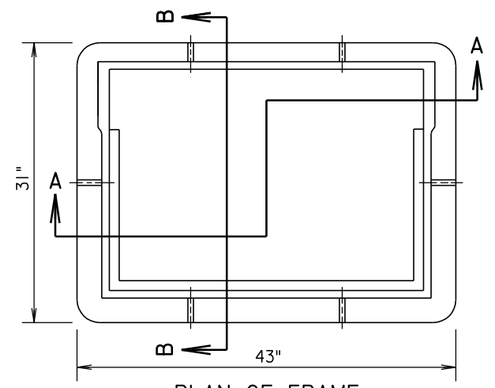
Published Date: 2nd Qtr. 2011

SDDOT

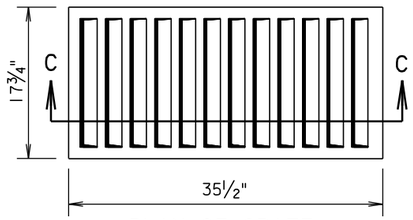
INSTALLATION OF TYPE B DROP INLET

PLATE NUMBER 670.75

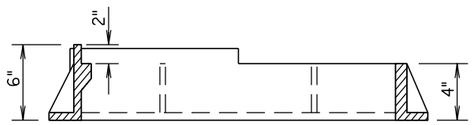
Sheet 1 of 1



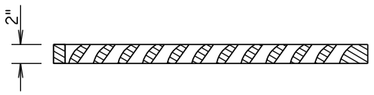
PLAN OF FRAME



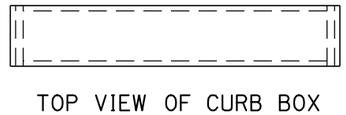
PLAN OF GRATE



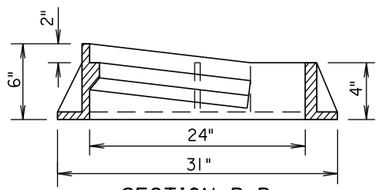
SECTION A-A



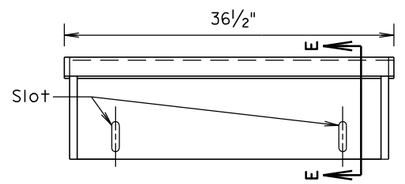
SECTION C-C



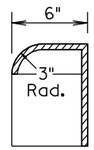
TOP VIEW OF CURB BOX



SECTION B-B



ELEVATION OF CURB BOX



SECTION E-E

GENERAL NOTE:

Total weight of the assembly shall be 490 Lbs. minimum and the curb box shall be adjustable 6" to 9".

March 31, 2000

Published Date: 2nd Qtr. 2011

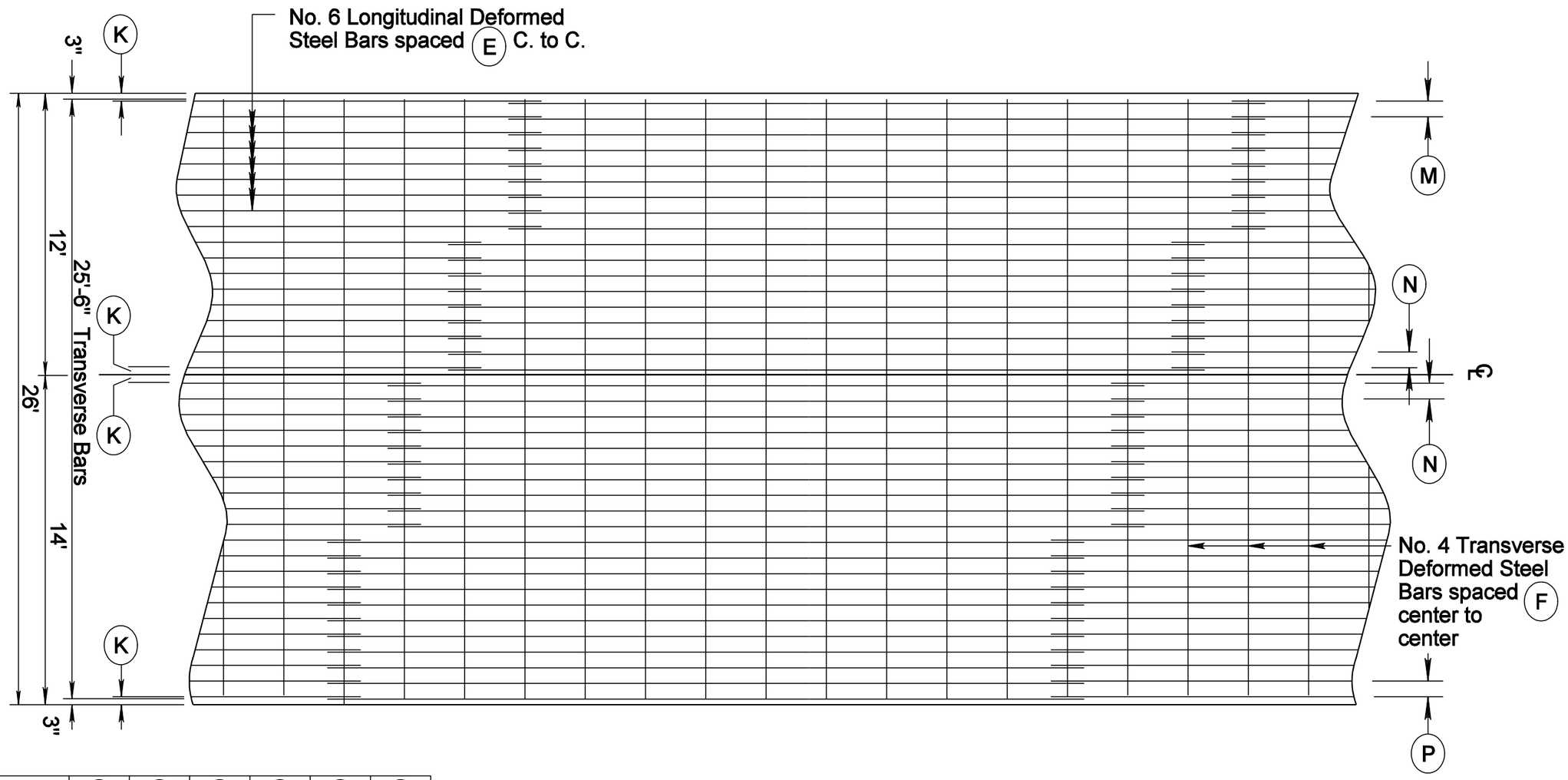
SDDOT

TYPE B FRAME AND GRATE ASSEMBLY

PLATE NUMBER 670.80

Sheet 1 of 1

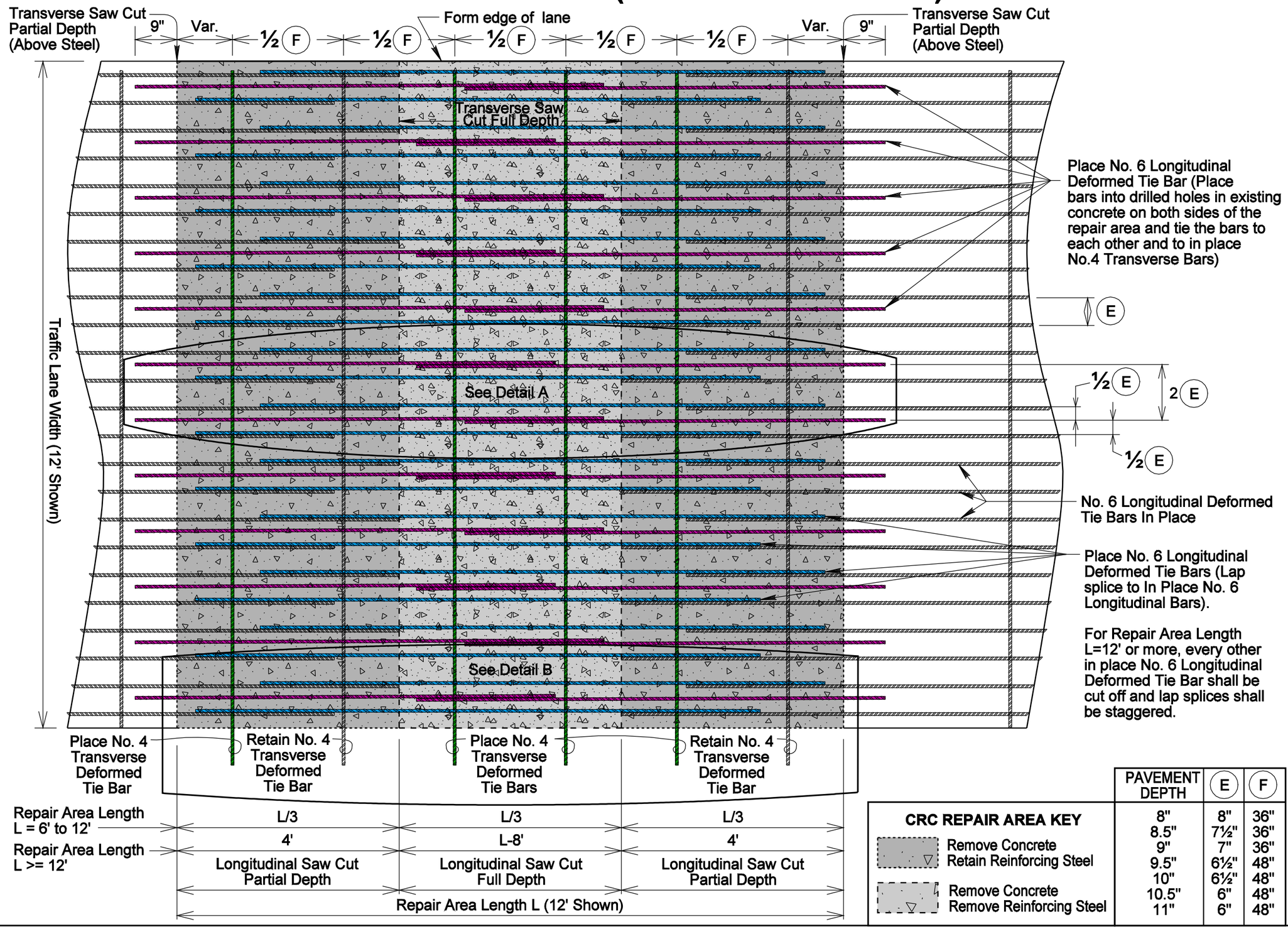
26' CONTINUOUSLY REINFORCED PCC PAVEMENT - IN PLACE



Depth of Pavement	E	F	K	M	N	P
8"	8"	36"	4"	8"	8"	8"
8.5"	7½"	36"	4"	4"	4½"	5½"
9"	7"	36"	4"	5"	5"	8"
9.5"	6½"	48"	3¾"	6½"	6½"	4½"
10"	6½"	48"	3¾"	6½"	6½"	4½"
10.5"	6"	48"	4"	5"	5"	5"
*11"	6"	48"	4"	5"	5"	5"

*Exception for Southbound Lanes on I29 from MRM 62.1 to MRM 72.8.
E = 6 1/2"
F = 48"
K = 3 3/4"
M = 6 1/2"
N = 6 1/2"
P = 4 1/2"

CRC PAVEMENT REPAIR (FULL LANE WIDTH) - TYPICAL



CRC REPAIR AREA KEY

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

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

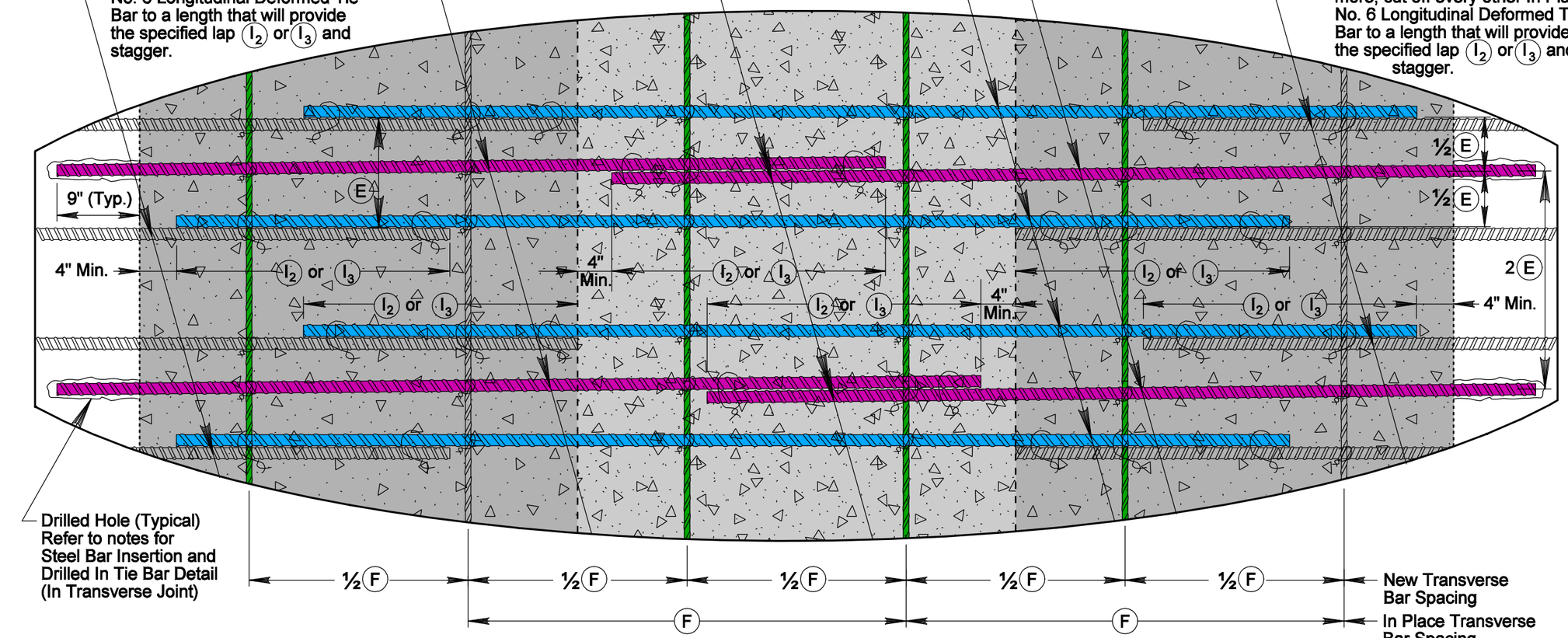
PLOT SCALE - 1.074998:1.000000

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	2011 SIOUX FALLS AREA CONCRETE REPAIR	30	42

Plotting Date: 16-MAY-2011

CRC PAVEMENT REPAIR (FULL LANE WIDTH)

Detail A



DEFORMED TIE BAR KEY

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

CRC REPAIR AREA KEY

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

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

PAVEMENT DEPTH	E	F	G	H_1	H_2	I_2	I_3
8"	8"	36"	18	9	9	20" to 25"	25"
8.5"	7½"	36"	19	10	10	20" to 25"	25"
9"	7"	36"	20	10	10	20" to 25"	25"
9.5"	6½"	48"	22	11	11	20" to 25"	25"
10"	6½"	48"	22	11	11	20" to 25"	25"
10.5"	6"	48"	24	12	12	20" to 25"	25"
11"	6"	48"	24	12	12	20" to 25"	30"

LAP SPLICE LENGTH KEY

- I_1 Not Available.
- I_2 Lap Splice length for Repair Area Length from 6' to 8'.
- I_3 Lap Splice length for Repair Area Length 8' or longer.

PLOTTED FROM - TRSF12115

FILE - N:\PRJ\MAINTENANCE PROJECTS\2011\CONCRETE PVMT REPAIR\DGN\PCC REPAIR\CRC FULL WIDTH REPAIR LAP 2.DGN

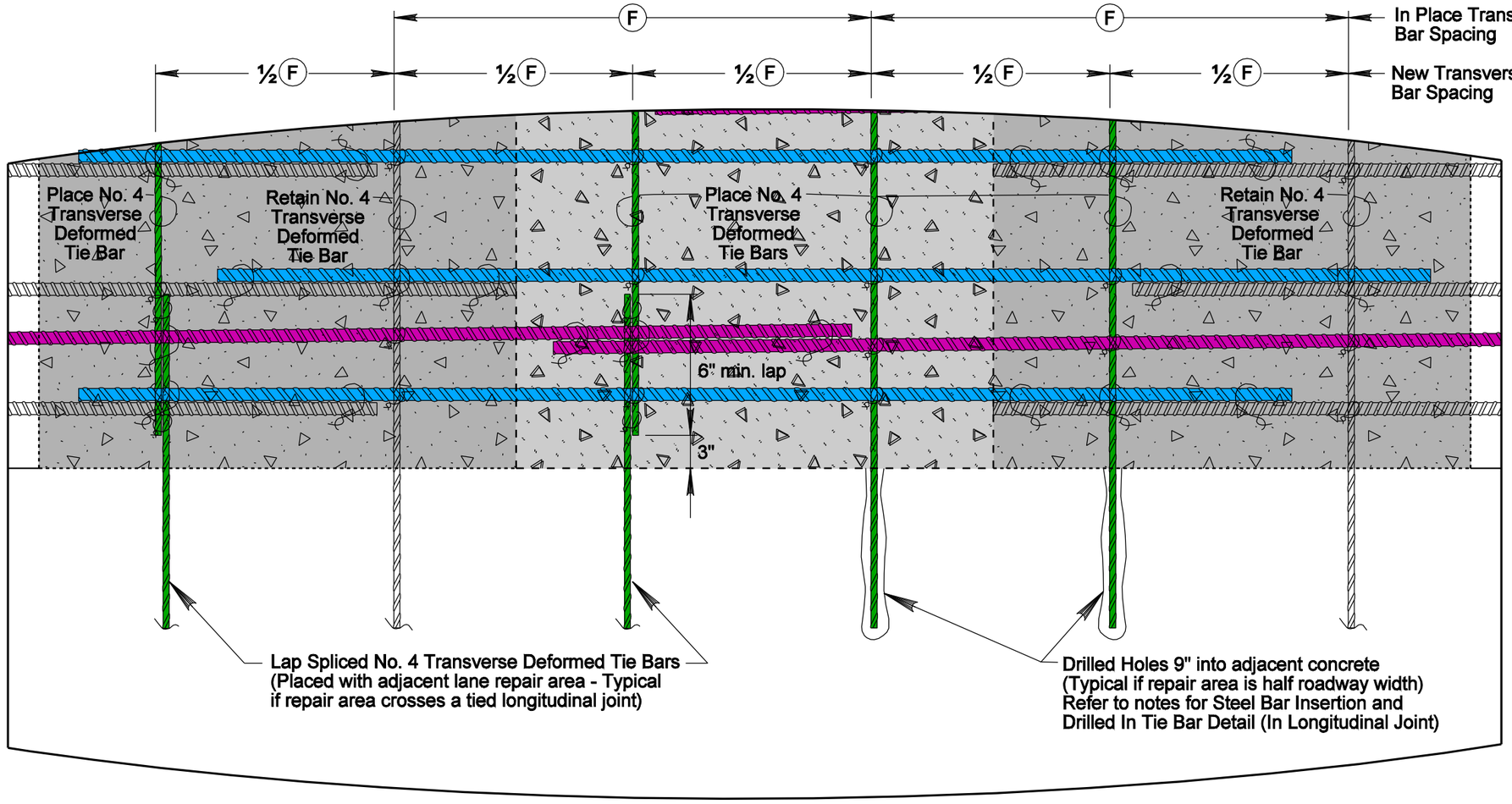
PLOT SCALE - 1.074998:1.000000

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	2011 SIOUX FALLS AREA CONCRETE REPAIR	31	42

Plotting Date: 16-MAY-2011

CRC PAVEMENT REPAIR (FULL LANE WIDTH)

Detail B



DEFORMED TIE BAR KEY

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

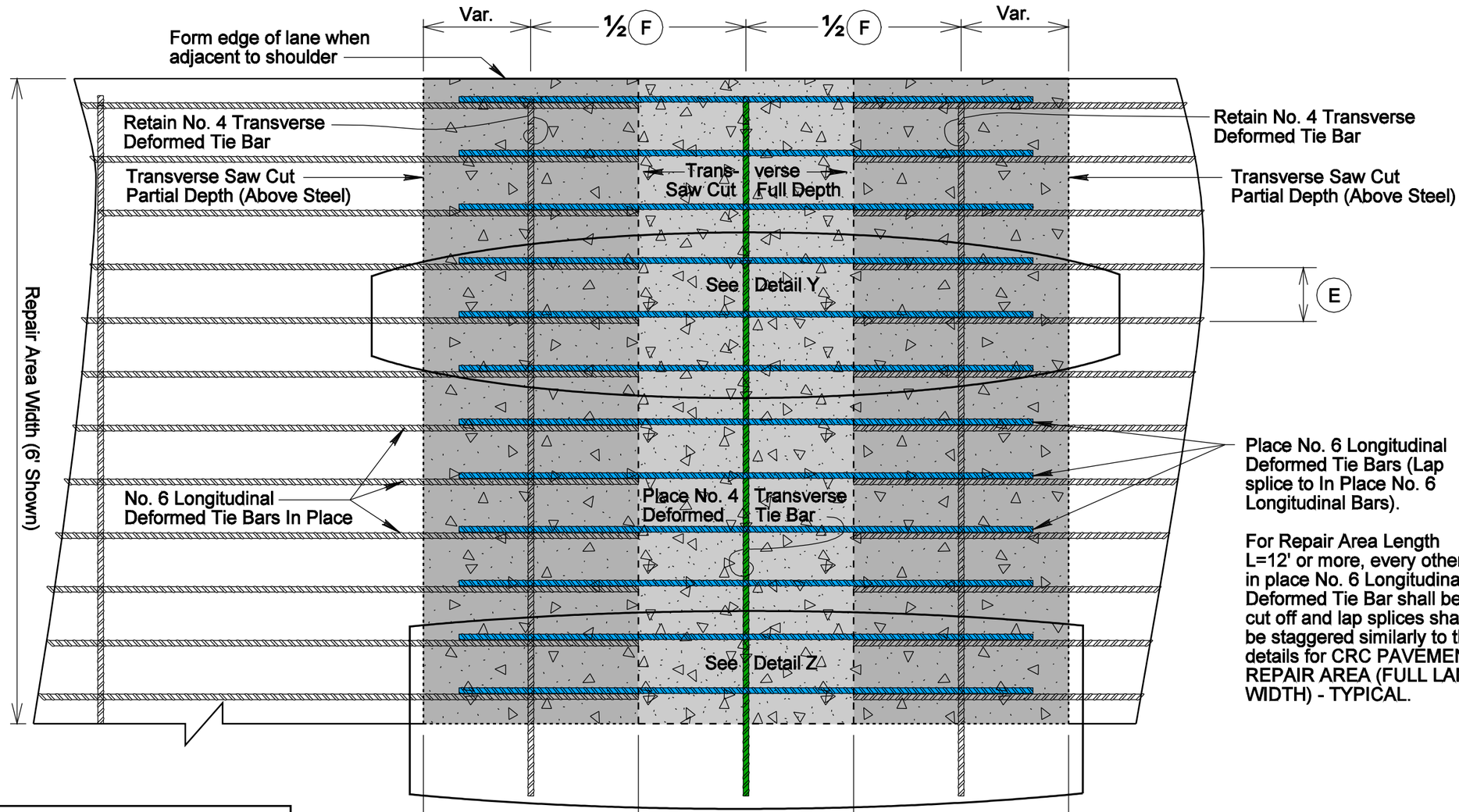
Note: All lapped bars shall have a minimum of two ties per lap.

CRC REPAIR AREA KEY	PAVEMENT DEPTH	E	F
Remove Concrete, Retain Reinforcing Steel	8"	8"	36"
	8.5"	7½"	36"
	9"	7"	36"
	9.5"	6½"	48"
	10"	6½"	48"
Remove Concrete, Remove Reinforcing Steel	10.5"	6"	48"
	11"	6"	48"

PLOTTED FROM - TRSF12115

FILE - N:\PRJ\MAINTENANCE PROJECTS\2011\CONCRETE PVMT REPAIR\DGN\PCC REPAIR\CRC FULL WIDTH REPAIR LAP 2.DGN

CRC PAVEMENT REPAIR (PARTIAL LANE WIDTH) - TYPICAL



DEFORMED TIE BAR KEY

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

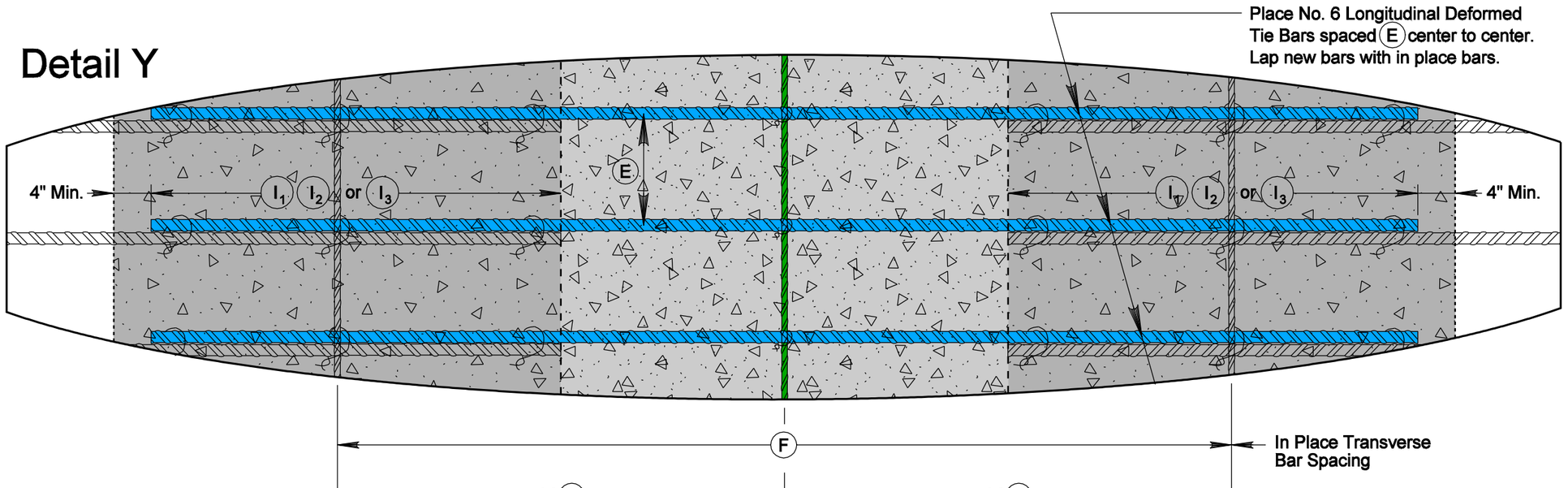
CRC REPAIR AREA KEY

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

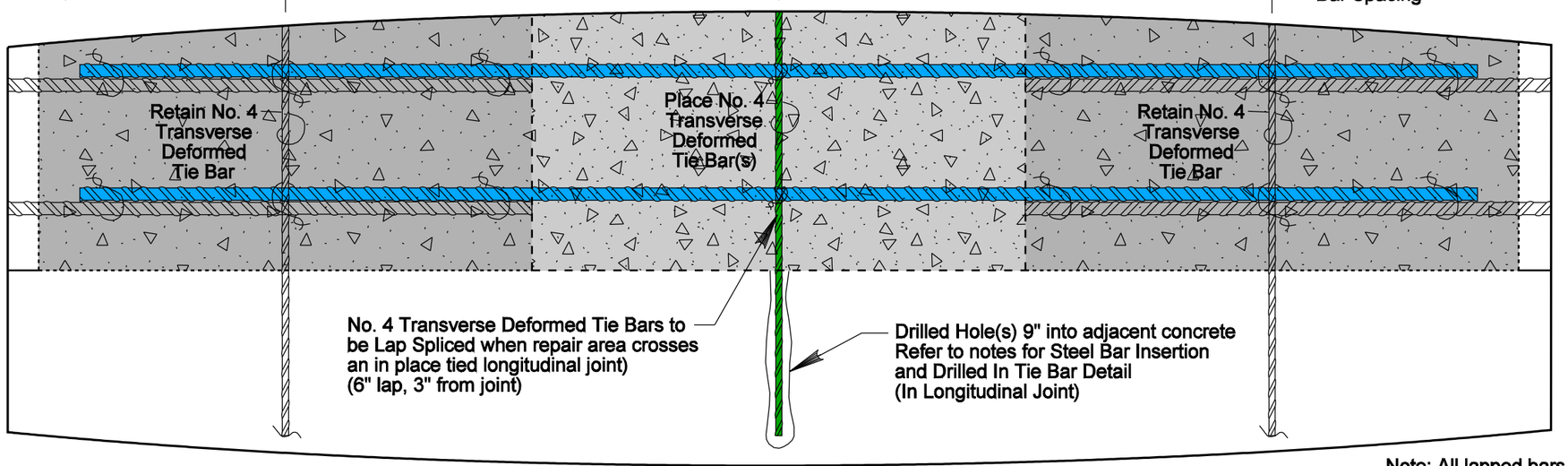
PAVEMENT DEPTH	E	F
8"	8"	36"
8.5"	7½"	36"
9"	7"	36"
9.5"	6½"	48"
10"	6½"	48"
10.5"	6"	48"
11"	6"	48"

CRC PAVEMENT REPAIR (PARTIAL LANE WIDTH)

Detail Y



Detail Z



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

DEFORMED TIE BAR KEY

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

CRC REPAIR AREA KEY

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

PAVEMENT DEPTH	E	F	l_1	l_2	l_3
8"	8"	36"	14"	20" to 25"	25"
8.5"	7½"	36"	14"	20" to 25"	25"
9"	7"	36"	14"	20" to 25"	25"
9.5"	6½"	48"	14"	20" to 25"	25"
10"	6½"	48"	14"	20" to 25"	25"
10.5"	6"	48"	14"	20" to 25"	25"
11"	6"	48"	14"	20" to 25"	30"

LAP SPLICE LENGTH KEY

- l_1 Lap Splice length for Repair Area Length L less than 6'.
- l_2 Lap Splice length for Repair Area Length from 6' to 8'.
- l_3 Lap Splice length for Repair Area Length 8' or longer.

PLOT SCALE - 8.333333:1.000000

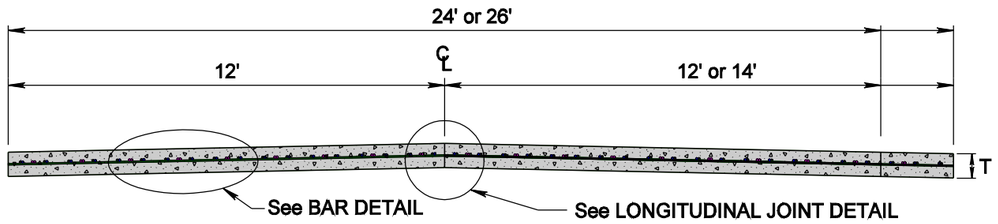
PLOTTED FROM - TRSF12115

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	2011 SIOUX FALLS AREA CONCRETE REPAIR	34	42

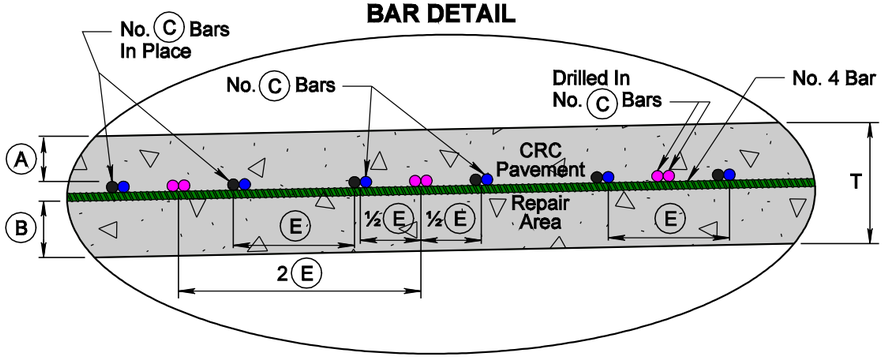
Plotting Date: 16-MAY-2011

CRC PAVEMENT REPAIR

TRANSVERSE SECTION SHOWING STEEL PLACEMENT



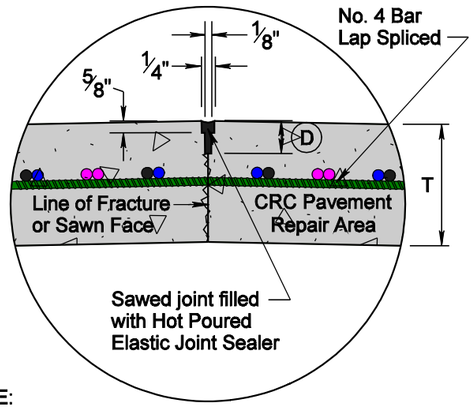
BAR DETAIL



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

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

LONGITUDINAL JOINT DETAIL



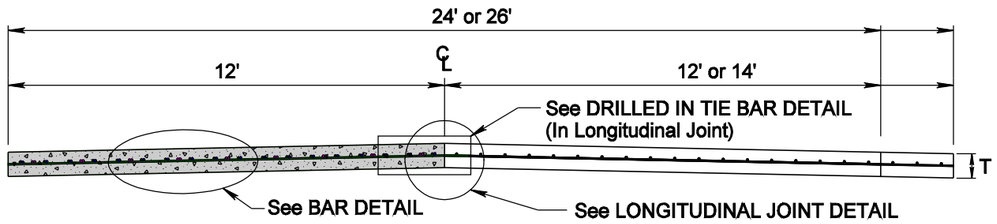
Depth of CRC (T)	A	B	C	D	E
*8"	3"	3¾"	6	2"	8"
8.5"	3¼"	4"	6	2⅛"	7½"
9"	3½"	4¼"	6	2¼"	7"
9.5"	3½"	4¾"	6	2⅜"	6½"
10"	3½"	5¼"	6	2½"	6½"
10.5"	3¾"	5½"	6	2⅝"	6"
11"	4"	5⅜"	7	2¾"	6"
11.5"	3½"	6⅞"	5	2⅞"	_"
11.5"	4"	5⅞"	7	2⅞"	_"
12"	4"	6⅜"	7	3"	_"

* Exception for I29 SBL MRM 83.8 to MRM 97.8
(A) = 3¼" (B) = 3½"

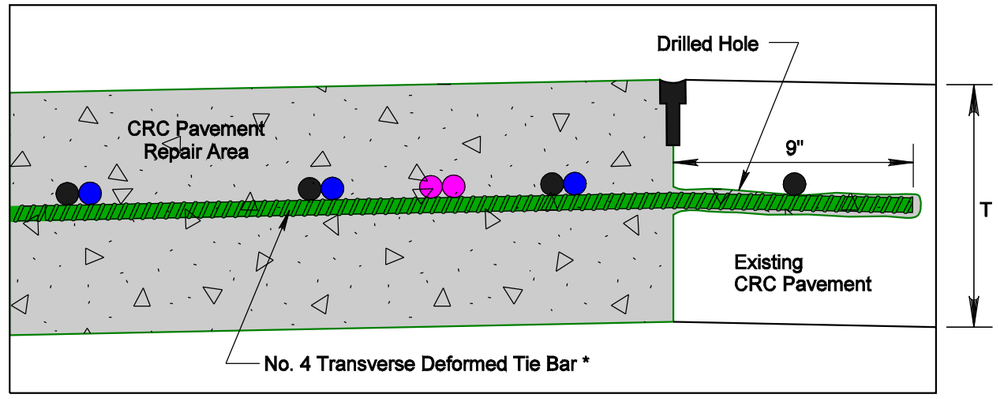
NOTE:

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

TRANSVERSE SECTION SHOWING STEEL PLACEMENT



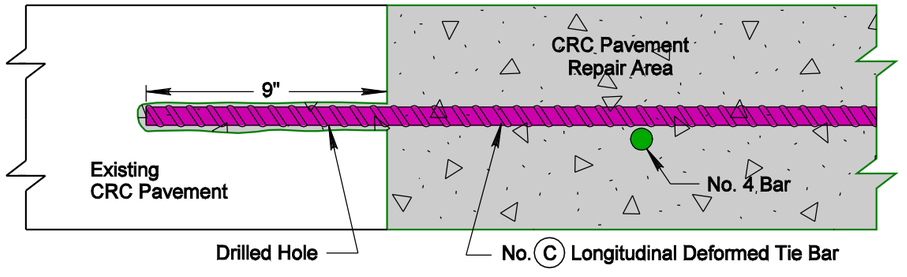
DRILLED IN TIE BAR DETAIL (In Longitudinal Joint)



* Transverse Deformed Tie Bar shall be bent slightly to fit into the drilled hole

LONGITUDINAL SECTION SHOWING STEEL PLACEMENT

DRILLED IN TIE BAR DETAIL (In Transverse Joint)



FILE - N:\PRJ\MAINTENANCE PROJECTS\2011\CONCRETE PVMT REPAIR\DGN\PCC REPAIR\CRC BARS.DGN

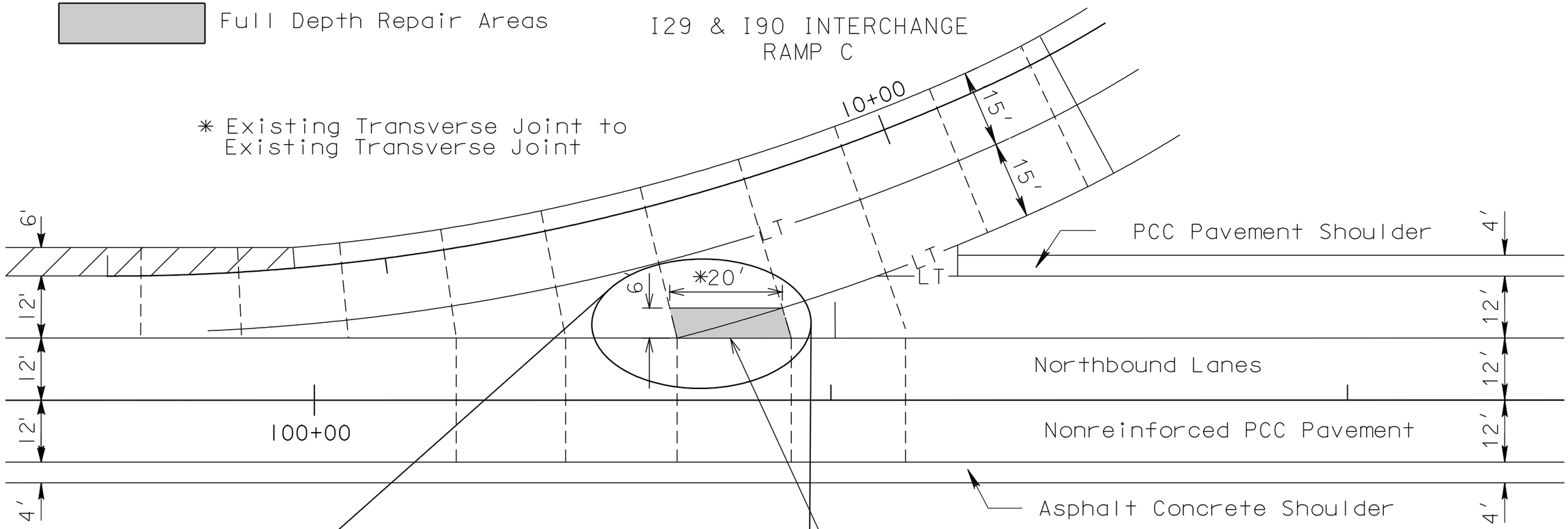
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	2011 SIOUX FALLS AREA CONCRETE REPAIR	35	42

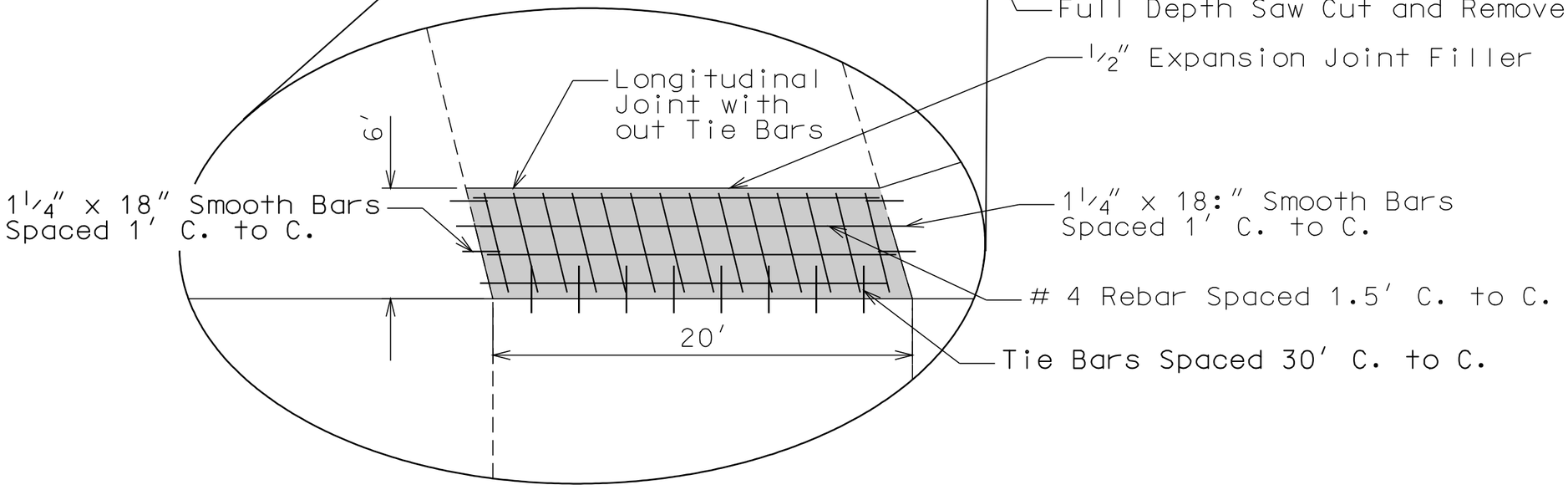
Plotting Date: 16-MAY-2011

Full Depth Repair Areas

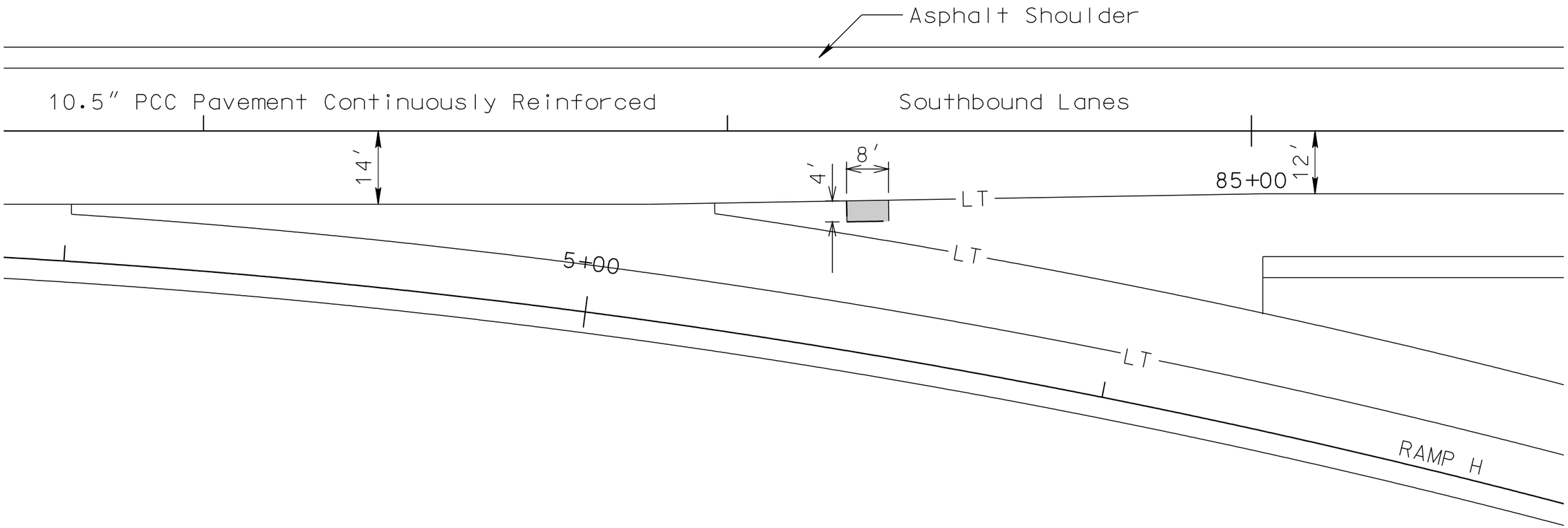
I29 & I90 INTERCHANGE RAMP C

* Existing Transverse Joint to Existing Transverse Joint





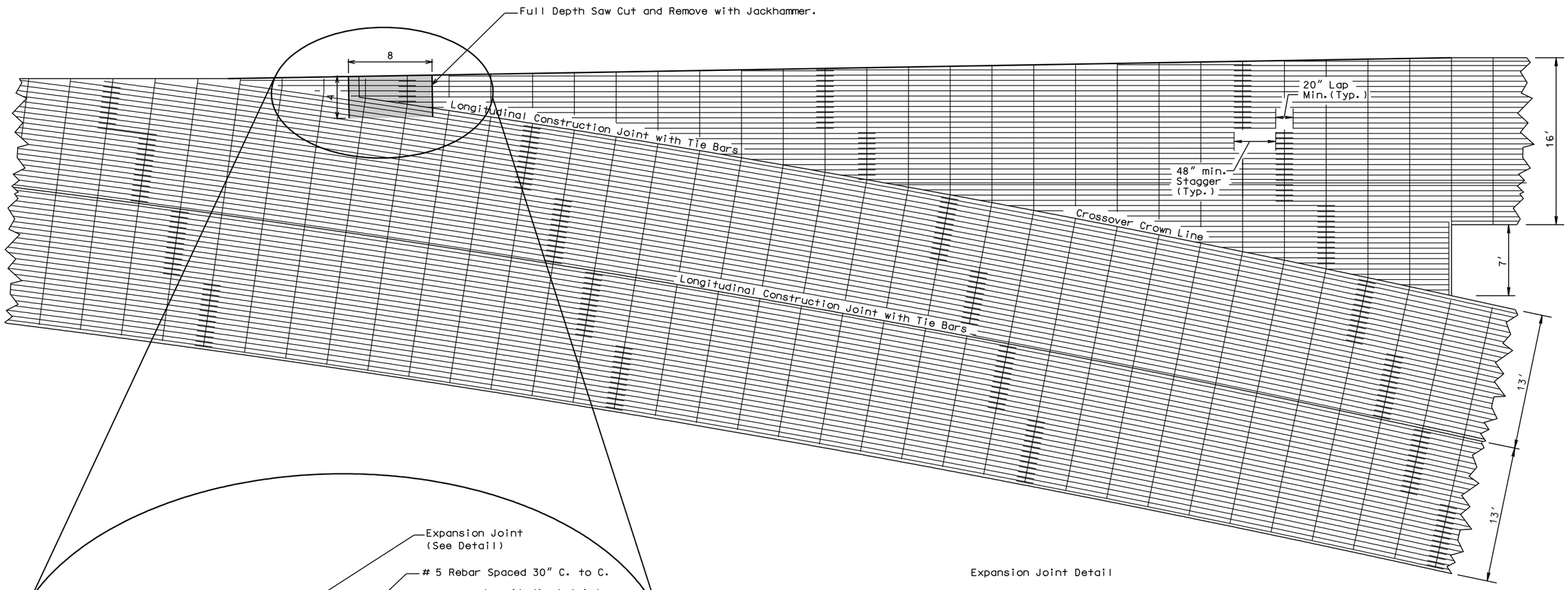
I29 & I90 INTERCHANGE
RAMP H

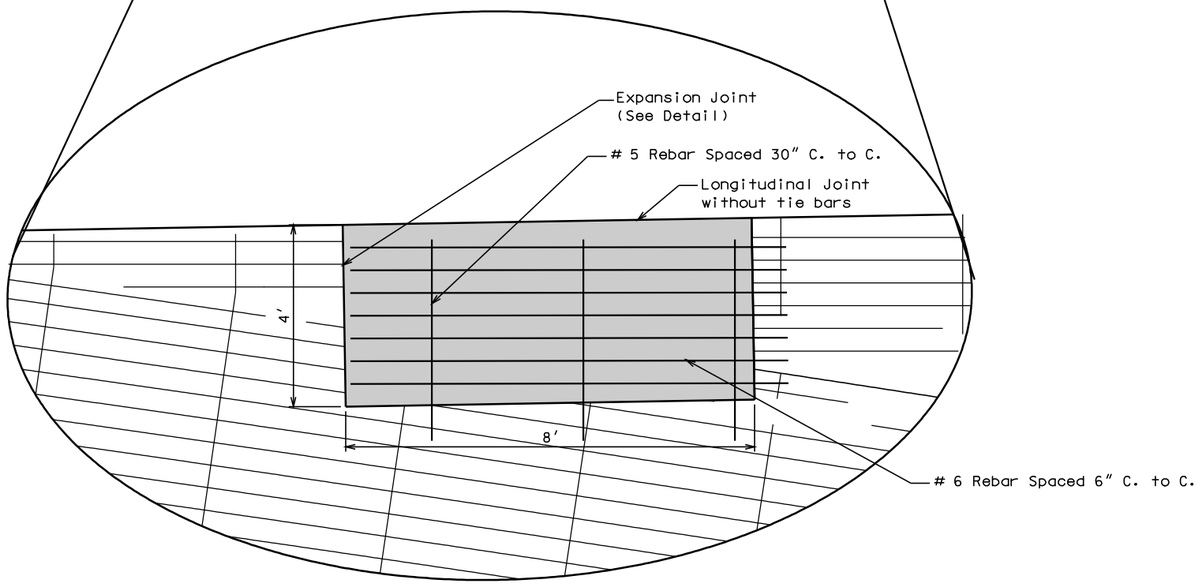


Plotting Date: 16-MAY-2011

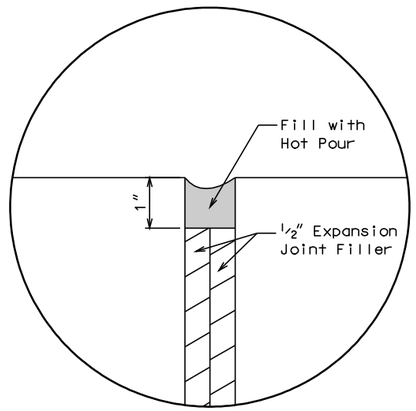
I29 & I90 INTERCHANGE
RAMP H

Full Depth Repair Areas

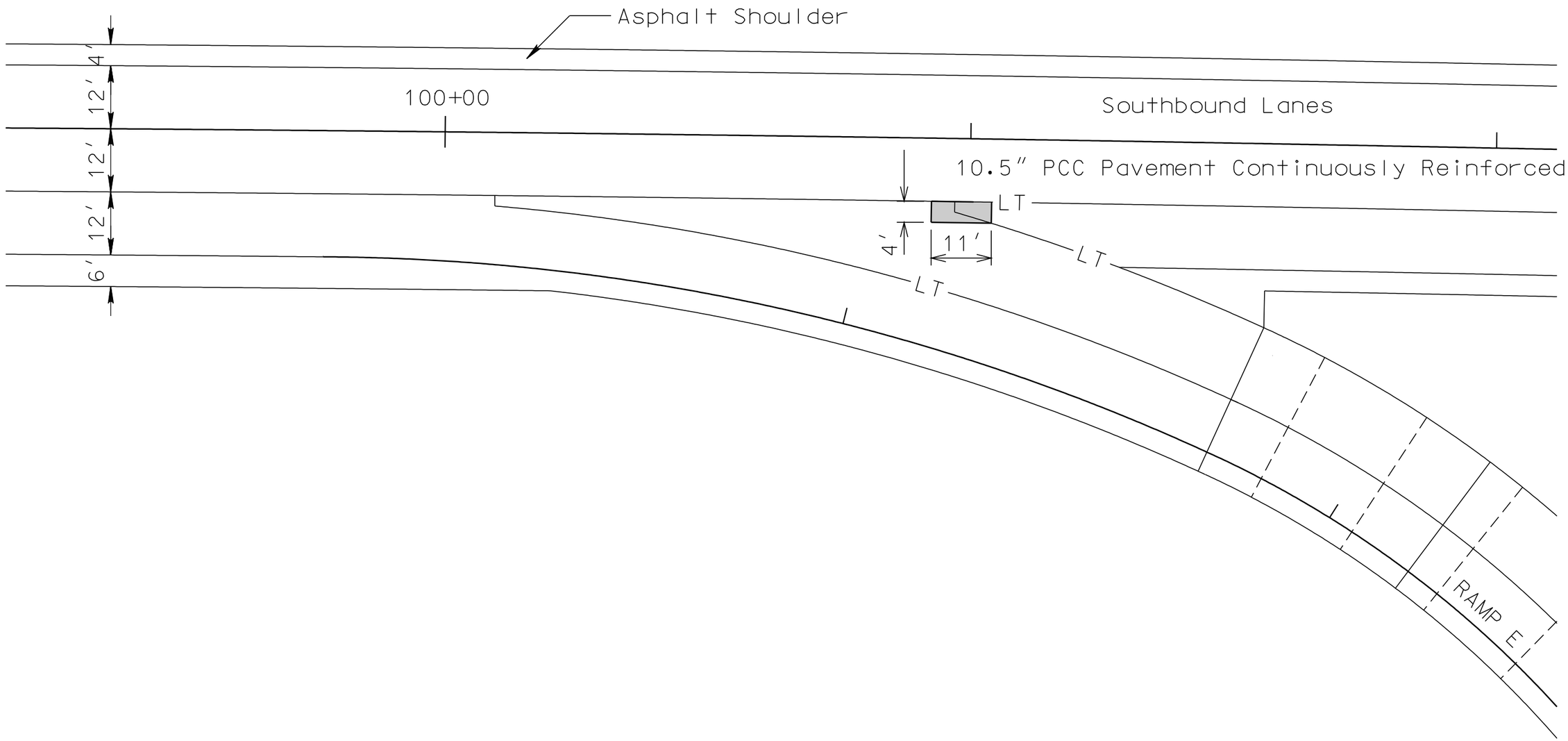




Expansion Joint Detail



I29 & I90 INTERCHANGE
RAMP E

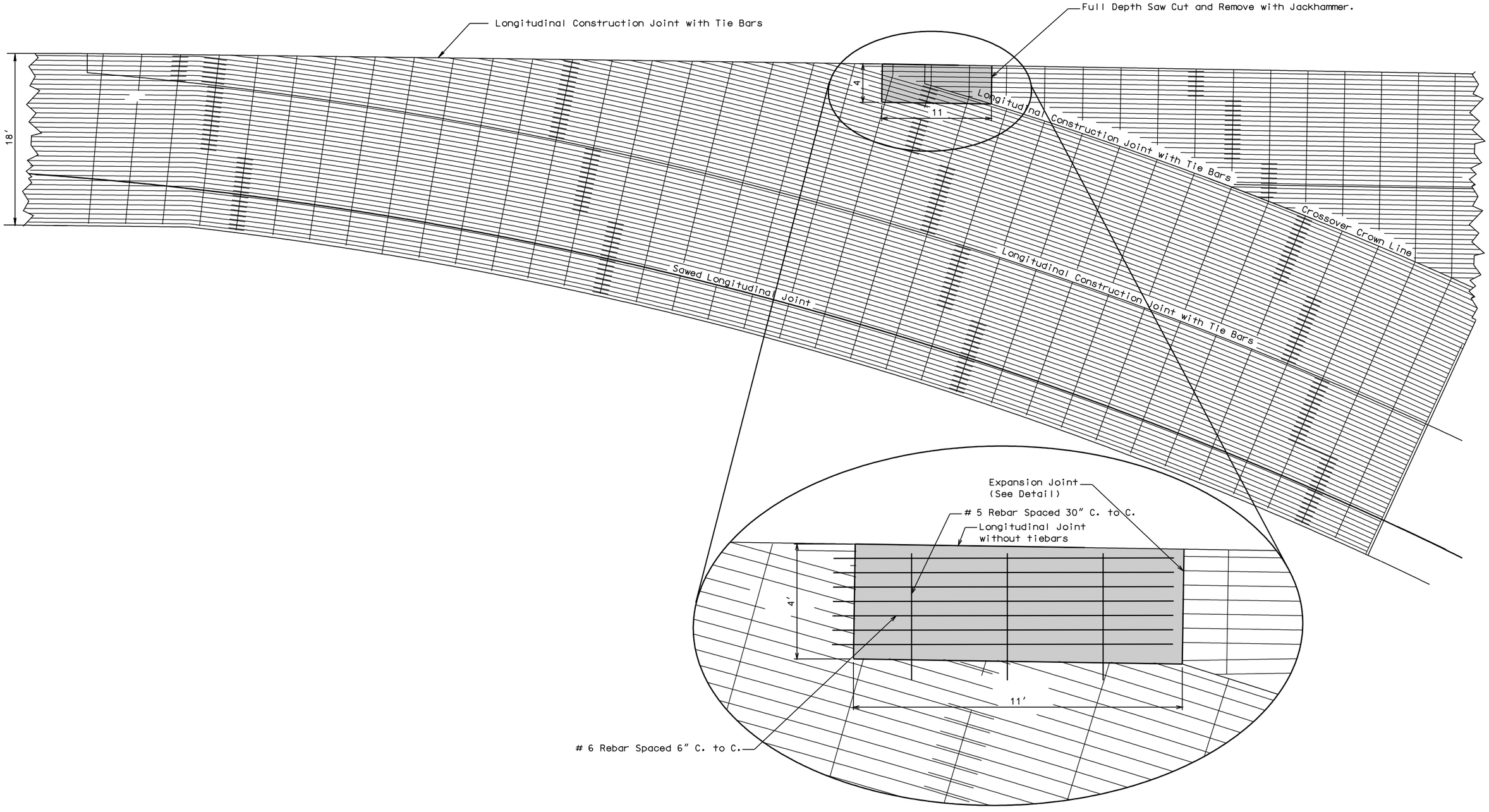


STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	2011 SIOUX FALLS AREA CONCRETE REPAIR	39	42

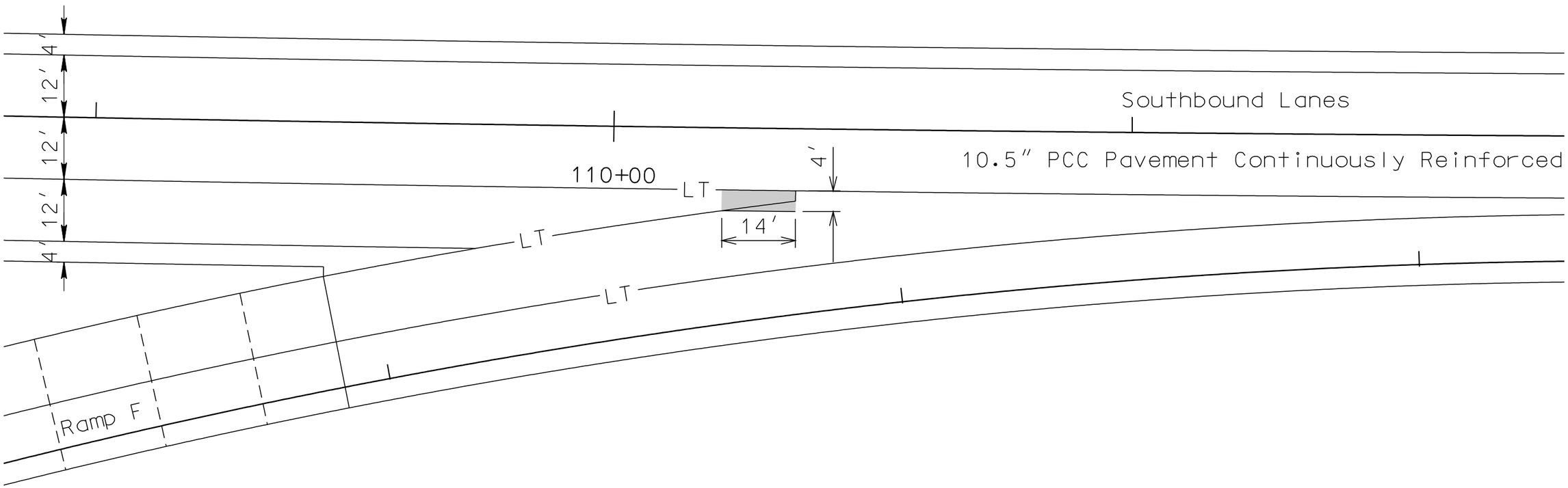
Plotting Date: 16-MAY-2011

I29 & I90 INTERCHANGE
RAMP E

Full Depth Repair Areas



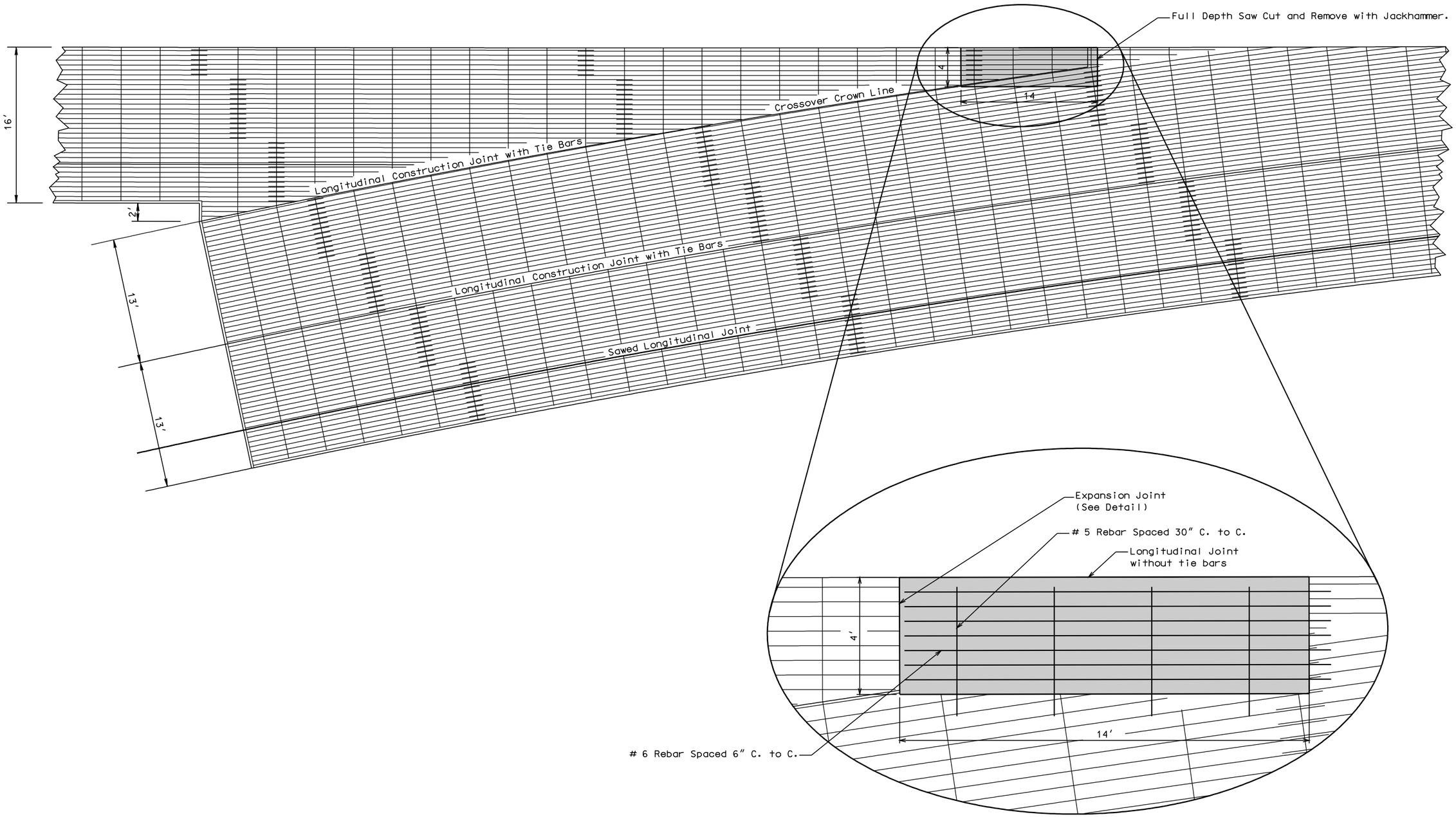
I29 & I90 INTERCHANGE
RAMP F



Plotting Date: 16-MAY-2011

I29 & I90 INTERCHANGE
RAMP F

Full Depth Repair Areas

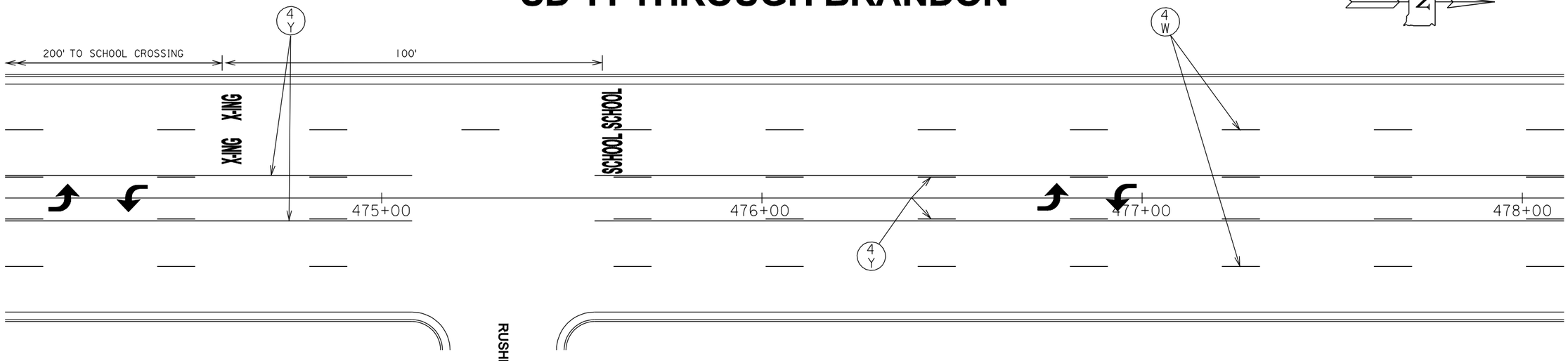


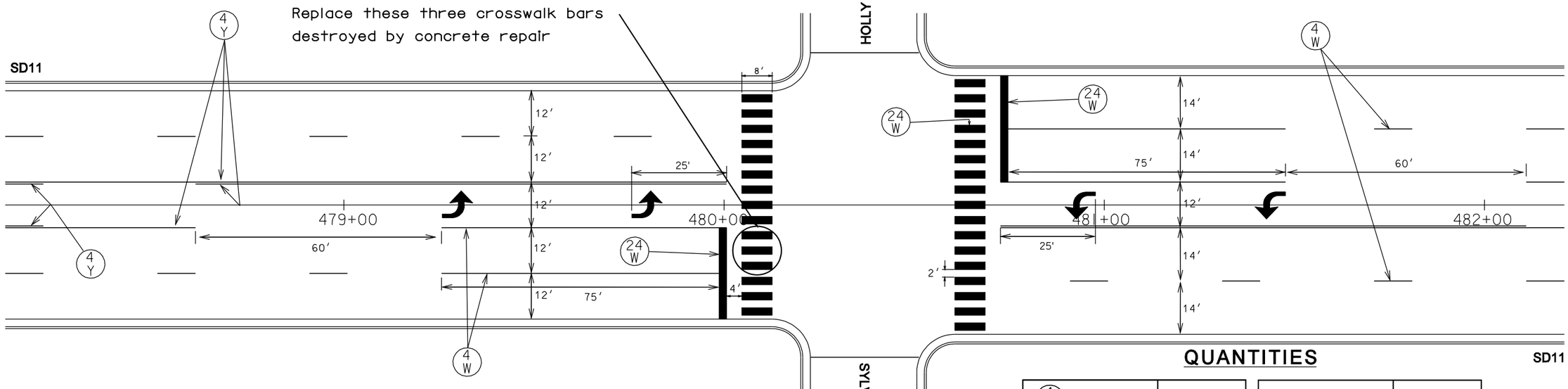
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	2011 SIOUX FALLS AREA CONCRETE REPAIR	42	42

Plotting Date: 16-MAY-2011

PAVEMENT MARKING LAYOUT

SD 11 THROUGH BRANDON





QUANTITIES

SD11

4 W	4" WHITE	0 FT	SOLID YELLOW AREA	0 SQ FT
24 W	24" WHITE	24 FT	MESSAGE	0 WORD
4 Y	4" YELLOW	0 FT	ARROWS	0 EACH
24 Y	24" YELLOW	0 FT		