

STATE OF SOUTH DAKOTA  
DEPARTMENT OF TRANSPORTATION

PLANS FOR PROPOSED

PROJECT NO. 212-171, 212E-171,  
& 212W-171  
CODINGTON COUNTY

CONCRETE PAVEMENT REPAIR

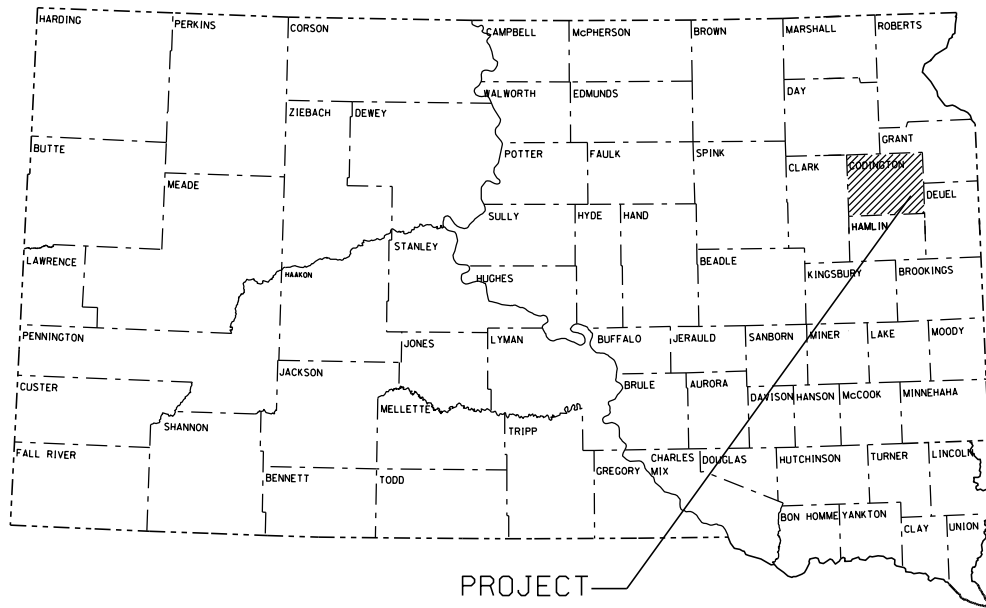
PCN i3+v, i3+w, & i3+x

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	212-171, 212E-171, 212W-171	1	16
Plotting Date: 05/08/2015			

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PLOT SCALE - 1:20000



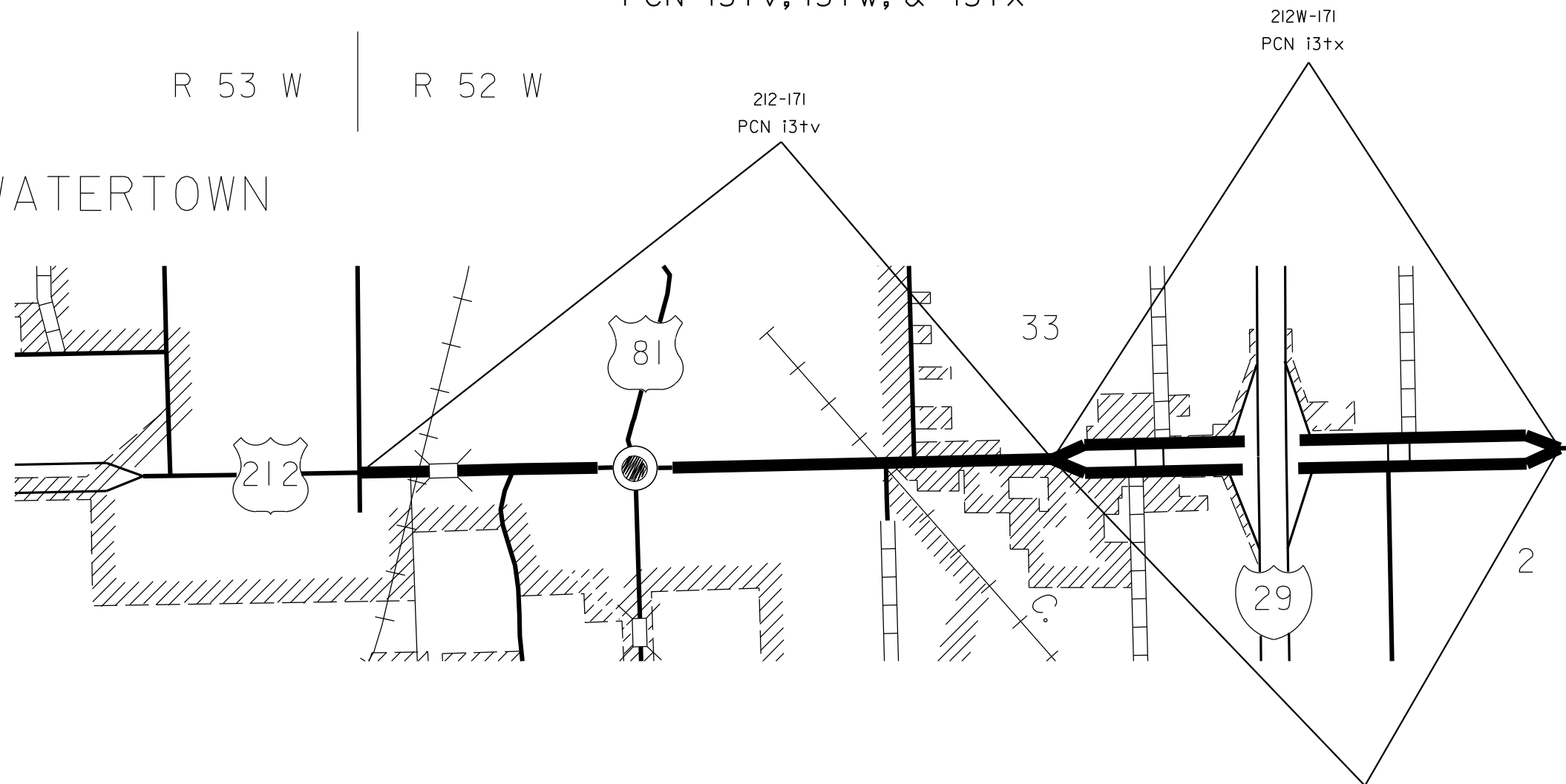
PROJECT

R 53 W | R 52 W

WATERTOWN



T 117 N  
T 116 N



STORM WATER PERMIT  
(None Required)

US 212 DESIGN DESIGNATION

ADT (2014)	15857
ADT (2034)	21454
DHV	2402.8
D	53%
T DHV	2.4%
T ADT	5.3%

US 212 (Divided) DESIGN DESIGNATION

ADT (2014)	5721
ADT (2034)	7718
DHV	864.4
D	53%
T DHV	5.2%
T ADT	11.4%

212E-171  
PCN i3+w

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SHEET - OF 16 SHEETS

PLOT NAME - 1

# ESTIMATE OF QUANTITIES AND ENVIRONMENTAL COMMITMENTS

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	212-171, 212E-171, 212W-171	2	16

## ESTIMATE OF QUANTITIES

### 212-171 PCN i3tv

BID ITEM	NUMBER	ITEM	QUANTITY	UNIT
	009E0010	Mobilization	Lump Sum	LS
	380E5030	Nonreinforced PCC Pavement Repair	301.6	SqYd
	380E6000	Dowel Bar	134	Each
	380E6110	Insert Steel Bar In PCC Pavement	888	Each
	634E0010	Flagging	20	Hour
	634E0100	Traffic Control	799	Unit
	634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
	634E0420	Type C Advanced Warning Arrow Panel	2	Each
	634E0640	Temporary Pavement Marking	6400	Ft
	650E0090	Type B69 Concrete Gutter	195	Each
	650E4690	Type P9 Concrete Gutter	33	Ft

### 212E-171 PCN i3tw

BID ITEM	NUMBER	ITEM	QUANTITY	UNIT
	009E0010	Mobilization	Lump Sum	LS
	380E5030	Nonreinforced PCC Pavement Repair	18.5	SqYd
	380E6110	Insert Steel Bar In PCC Pavement	53	Each
	634E0100	Traffic Control	294	Unit
	634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
	634E0420	Type C Advanced Warning Arrow Panel	1	Each
	634E0640	Temporary Pavement Marking	1980	Ft

### 212W-171 PCN i3tx

BID ITEM	NUMBER	ITEM	QUANTITY	UNIT
	009E0010	Mobilization	Lump Sum	LS
	380E5030	Nonreinforced PCC Pavement Repair	52.4	SqYd
	380E6000	Dowel Bar	6	Each
	380E6110	Insert Steel Bar In PCC Pavement	75	Each
	634E0100	Traffic Control	294	Unit
	634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
	634E0420	Type C Advanced Warning Arrow Panel	1	Each
	634E0640	Temporary Pavement Marking	2160	Ft

## SPECIFICATIONS

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

## ENVIRONMENTAL COMMITMENTS

An Environmental Commitment is a measure that SDDOT commits to implement in order to avoid, minimize, and/or mitigate a real or potential environmental impact. Environmental commitments to various agencies and the

public have been made to secure approval of this project. An agency mentioned below with permitting authority can influence a project if perceived environmental impacts have not been adequately addressed. Unless otherwise designated, the Contractor's primary contact regarding matters associated with these commitments will be the Project Engineer. These environmental commitments are not subject to change without prior written approval from the SDDOT Environmental Office. The environmental commitments associated with this project are as follows:

### COMMITMENT B2: WHOOPING CRANE

The Whooping Crane is a spring and fall migratory bird in South Dakota that is about 5 feet tall and typically stops on wetlands, rivers, and agricultural lands along their migration route. An adult Whooping Crane is white with a red crown and a long, dark, pointed bill. Immature Whooping Cranes are cinnamon brown. While in flight, their long necks are kept straight and their long dark legs trail behind. Adult Whooping Cranes' black wing tips are visible during flight.

#### Action Taken/Required:

Harassment or other measures to cause the Whooping Crane to leave the site is a violation of the Endangered Species Act. If a Whooping Crane is sighted roosting in the vicinity of the project, borrow pit, or staging site associated with the project, cease construction activities in the affected area until the Whooping Crane departs and contact the Project Engineer. The Project Engineer will contact the Environmental Office so that the sighting can be reported to USFWS.

### COMMITMENT E: STORM WATER

Construction activities constitute less than 1 acre of disturbance.

#### Action Taken/Required:

At a minimum and regardless of project size, appropriate erosion and sediment control measures must be installed to control the discharge of pollutants from the construction site.

### COMMITMENT H: WASTE DISPOSAL SITE

The Contractor shall furnish a site(s) for the disposal of construction and/or demolition debris generated by this project.

#### Action Taken/Required:

Construction and/or 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 Project Engineer.

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

- Construction and/or 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 and/or 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".

- 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.

### COMMITMENT I: HISTORICAL PRESERVATION OFFICE CLEARANCES

The SDDOT has obtained concurrence with the State Historical Preservation Office (SHPO or THPO) for all work included within the project limits and all designated option borrow sites provided within the plans.

#### Action Taken/Required:

All earth disturbing activities not designated within the plans require review of cultural resources impacts. This work includes, but is not limited to: staging areas, borrow sites, waste disposal sites, and all material processing sites.

The Contractor shall arrange and pay for a cultural resource survey and/or records search. The Contractor has the option to contact the state Archaeological Research Center (ARC) at 605-394-1936 or another qualified archaeologist, to obtain either a records search or a cultural resources survey. A record search might be sufficient for review; however, a cultural resources survey may need to be conducted by a qualified archaeologist.

# ESTIMATE OF QUANTITIES AND ENVIRONMENTAL COMMITMENTS

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	212-171, 212E-171, 212W-171	3	16

## COMMITMENT I: HISTORICAL PRESERVATION OFFICE CLEARANCES (cont.)

The Contractor shall provide ARC 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 artifacts have not been found on the site.

The Contractor shall submit the records search or cultural resources survey report and if the location of the site is within the current geographical or historic boundaries of any South Dakota reservation to SDDOT Environmental Engineer, 700 East Broadway Avenue, Pierre, SD 57501-2586 (605-773-3180). SDDOT will submit the information to the appropriate SHPO/THPO. Allow 30 Days from the date this information is submitted to the Environmental Engineer for SHPO/THPO review.

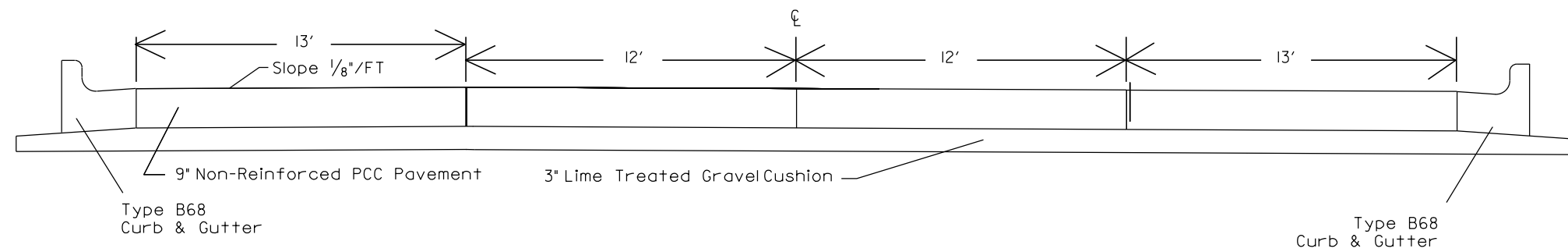
If evidence for cultural resources is uncovered during project construction activities, then such activities shall cease and the Project Engineer shall be immediately notified. The Project Engineer will contact the SDDOT Environmental Engineer in order to determine an appropriate course of action.

SHPO/THPO review does not relieve the Contractor of the responsibility for obtaining any additional permits and clearances for staging areas, borrow sites, waste disposal sites, or material processing sites that affect wetlands, threatened and endangered species, or waterways. The Contractor shall provide the required permits and clearances to the Project Engineer at the preconstruction meeting.

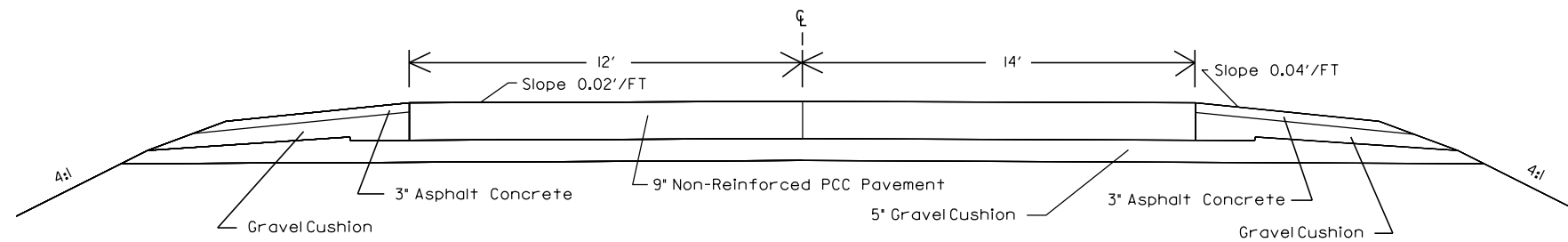
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	212-171, 212E-171, 212W-171	4	16
Plotting Date: 04/02/2015			

# TYPICAL SECTIONS

## 212-171 US HIGHWAY 212 MAINLINE IN PLACE SURFACING SECTION (Urban - Watertown)



## 212E-171 & 212W-171 US HIGHWAY 212 IN PLACE SURFACING SECTION (Divided Highway)



STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	212-171, 212E-171, 212W-171	5	16

### ESTIMATE OF QUANTITIES

BID ITEM NUMBER	ITEM	212-171 PCN i3tv Watertown	212E-171 PCN i3tw Watertown	212W-171 PCN i3tx Watertown	Totals	UNIT
009E0010	Mobilization	Lump Sum	Lump Sum	Lump Sum	Lump Sum	LS
380E5030	Nonreinforced PCC Pavement Repair	301.6	18.5	52.4	372.5	SqYd
380E6000	Dowel Bar	134	0	6	140	Each
380E6110	Insert Steel Bar In PCC Pavement	888	53	75	1016	Each
634E0010	Flagging	20	0	0	20	Hour
634E0100	Traffic Control	799	294	294	1387	Unit
634E0120	Traffic Control, Miscellaneous	Lump Sum	Lump Sum	Lump Sum	Lump Sum	LS
634E0420	Type C Advanced Warning Arrow Panel	2	1	1	4	Each
634E0640	Temporary Pavement Marking	6400	1980	2160	10540	Ft
650E0090	Type B69 Concrete Gutter	195	0	0	195	Ft
650E4690	Type P9 Concrete Gutter	33	0	0	33	Ft

# PCCP Repair Areas

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	212-171, 212E-171, 212W-171	6	16

## US 212 (Through Watertown)

Location	Dimensions		SQYD	Description	Bars			Dowel Bar (EACH)	C&G (FEET)
	L (ft)	W (ft)			#5	#9	1 1/4"		
	212-171 PCN i3tv <span style="float: right;">NABI</span>								
US 212 Eastbound									
E of 19th	15	14	23.3	EB, OL	5		20		
E of 19th			0.0	EB 15' C&G	5	2	2		15
17th to 19th			0.0	EB 25' P-Gutter	8	2	2		25
14th to 17th	5	5	2.8	EB, IL	3	4	4		
14th to 17th	5	5	2.8	EB, OL	3	4	4		
14th to 17th	5	5	2.8	EB, OL	3	4	4		
14th to 17th	5	5	2.8	EB, OL	3	4	4		
14th to 17th	6	13	8.7	EB, OL	4	16		12	
14th to 17th	6	8	5.3	EB, OL	4	10		8	
14th to 17th			0.0	EB 10' C&G	3	2	2		10
14th to 17th	6	18	12.0	EB OL,IL	4	28		18	
14th			0.0	EB 8' P-Gutter	4	2	2		8
13th to 14th	5	6	3.3	EB OL,IL	4	8		4	
13th to 14th	5	5	2.8	EB, OL	3	4	4		
13th to 14th	5	5	2.8	EB, OL	3	4	4		
13th to 14th	5	18	10.0	EB OL,IL	4	14	14		
12th to 13th	6	12	8.0	EB, IL	4	16		12	
12th to 13th			0.0	EB 5' C&G	2	2	2		5
12th to 13th			0.0	EB 15' C&G	5	2	2		15
12th	6	6	4.0	EB, OL	4	4	4		
11th	20	12	26.7	EB, IL	14	16		12	
11th	25	13	36.1	EB, OL	18	16		12	
10th to 11th	5	8	4.4	EB, IL	4	10		8	
8th to 9th			0.0	EB 5' C&G + GRATE	2	2	2		5
3rd to 4th	5	8	4.4	EB, IL	4	5	5		
3rd to 4th	5	12	6.7	EB, IL	4	8	8		
3rd to 4th	5	5	2.8	EB, IL	3	4	4		
2nd to 3rd			0.0	EB 5' C&G	2	2	2		5
1st to 2nd	5	25	13.9	EB OL,IL	4	16	16		
1st to 2nd	5	5	2.8	EB, OL	3	4	4		
1st to 2nd	5	5	2.8	EB, IL	3	4	4		
3rd to 2nd	5	9	5.0	EB OL,IL	4	20		9	
SD20 to 3rd	5	13	7.2	EB,OL	4	16		12	
US 212 Westbound									
17th to 19th	5	5	2.8	WB, IL	3	4	4		
17th to 19th			0.0	WB 15' C&G	5	2	2		15
17th to 19th	5	5	2.8	WB, IL	3	4	4		
14th to 17th			0.0	WB 20' C&G	6	2	2		20
14th to 17th			0.0	WB 65' C&G	25	2	4		65
14th to 17th			0.0	WB 40' C&G	12	2	2		40
14th to 17th	5	5	2.8	WB, OL	3	4	4		
13th to 14th	5	13	7.2	WB, OL	4	8	8		
13th to 14th	8	8	7.1	WB, IL	4	4	5		
11th to 12th	6	6	4.0	WB,IL	4	4	4		
10th to 11th	5	12	6.7	WB, OL	4	16		12	

8th to 9th	5	5	2.8	WB, IL	3	4	4		
7th to 8th	5	5	2.8	WB, IL	3	4	4		
7th to 8th	5	5	2.8	WB, IL	3	4	4		
3rd to 4th	6	5	3.3	WB, OL	4	4	4		
3rd to 4th	5	5	2.8	WB, IL	3	4	4		
2nd to 3rd	5	5	2.8	WB, OL	3	4	4		
1st to 2nd	5	8	4.4	WB, OL	4	10			
Broad to 1st	5	16	8.9	WB OL,IL	4	24		15	
2nd to Broad	5	5	2.8	WB, OL	3	4	4		
3rd to 2nd	5	25	13.9	WB OL,IL	4	16	16		
3rd to 2nd	5	25	13.9	WB OL,IL	4	16	16		
3rd to 2nd	5	5	2.8	WB, OL	3	4	4		
			0.0						
<b>Total</b>			<b>301.6</b>		<b>261.0</b>	<b>405.0</b>	<b>222.0</b>	<b>134.0</b>	<b>228.0</b>

## US 212 (Divided Section E of Watertown)

212E-171 PCN i3tw & 212W-171 PCN i3tx

Location	Dimensions		SQYD	Description	Bars			Dowel Bar (EACH)
	L (ft)	W (ft)			#5	#9	1 1/4"	
Front of DOT	15	8	15.9	WB		5	12	
W of DOT	10	26	12.9	EB, OL / IL	3	18	18	
W of DOT	5	5	5.6	WB, IL	3	8	4	
Front of Stones	15	14	16.6	WB, OL	5		20	
Front of Stones	5	6	5.7	WB, IL	2	8		6
Stones Appr	8	5	8.6	Approach - Stones		8		
W of I29	5	5	5.6	EB, OL	3	8	3	
			0.0					
			0.0					
			0.0					
			0.0					
			0.0					
			0.0					
			0.0					
			0.0					
			0.0					
			0.0					
<b>Totals</b>			<b>70.9</b>		<b>16</b>	<b>55</b>	<b>57</b>	<b>6</b>

LEGEND: EB (East Bound), WB (West Bound)  
 NB (North Bound), SB (South Bound)  
 DL (Driving Lane), PL (Passing Lane), TL (Turning Lane), OL (Outside Lane), IL (Inside Lane)

**Note: Number of steel bars is for information only. Actual quantity to be determined on construction. Quantity of steel bars shall be paid for at the contract unit price per each for INSERT STEEL BAR IN PCC PAVEMENT.**

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	212-171, 212E-171, 212W-171	7	16

**SCOPE OF WORK**

Work on this project includes, but is not limited to, removal and replacement of non-reinforced concrete pavement.

**MAINTENANCE OF TRAFFIC**

One lane of traffic shall be maintained in each direction on four-lane roadways. Standard Plate 634.56, 634.60, or 634.64 shall be utilized at four lane locations.

The Contractor shall accommodate over-width vehicles through the work areas.

Locations of signs on traffic control layouts are diagrammatic. Portable stands may be used on the shoulders or on driving lanes closed to traffic if the duration is less than 3 days. If the duration is more than 3 days, the signs shall be mounted on fixed location, ground mounted, breakaway supports. The bottom of signs on portable or temporary supports shall not be less than seven feet above the pavement in urban areas and one foot above the pavement in rural areas.

A maximum of four traffic control closures shall be paid for, two for the urban US 212 section in Watertown and two for the US 212 section east of Watertown. If more closures are utilized, additional cost of signing shall be at the Contractor's expense. No payment will be made for signs being reused at different repair areas.

The Contractor will be allowed to encroach on the traffic lane approximately 3 feet if FLAGGER signs and a flagger are used. The FLAGGER signs and flagging are included in the Estimate of Quantities.

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.

Type III Barricades 8' wide shall protect PCC Pavement replacement during open excavation and concrete cure periods.

Open excavations at repair area locations shall not be allowed to be left open overnight. The Contractor shall complete the placement of PCCP on the same day as the existing PCCP is removed.

Not more than four Type C Advanced Warning Arrow Panels will be measured and paid for.

Maintenance of existing delineators shall be the Contractor's responsibility.

Work activities during non-daylight hours are subject to prior approval.

A maximum closure length of 5 blocks for PCN i3tv shall be adhered to at all times. Quantities for Temporary Pavement Marking based on this maximum closure length are estimated to include a minimum of 26 different applications of Temporary Pavement Markings.

All costs associated with furnishing and installing interim white and/or yellow edge line for a lane closure and/or for tapers shall be incidental to the contract

unit price for TEMPORARY PAVEMENT MARKING. Removal of interim white and/or yellow edge line for a lane closure shall also be incidental to the contract unit price for TEMPORARY PAVEMENT MARKING.

The Contractor shall not park equipment on or alongside of the roadway within a 30 foot clear distance from the edge of the driving lane. The Contractor shall remove all equipment from the roadway during non-working hours.

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

**COORDINATION OF WORK**

US 212 West of SD 20

The portion of U.S. Highway 212 listed above is expected to be under construction during the 2015 season. This project NH 0212(159)367, PCN 023J is anticipated to be in work May thru July 2015. The Contractor will be responsible to coordinate work with the contractor Knife River so the schedules do not conflict. For more information regarding the awarded contract, contact Ron Sherman or Matt Brey at 605-882-5166.

**EXISTING PCC PAVEMENT**

The existing pavement is Non-reinforced PCC Pavement.

Route	Pavement Thickness	Pavement Type
US 212 (In Watertown)	9"	Jointed 20' - 60' Spacing
US 212 (E of Watertown)	9"	Jointed 20' Spacing

Existing contraction joints are spaced at approximately 20 to 40'. 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 PCC Pavement is quartzite.

**REMOVE CONCRETE PAVEMENT / CURB AND GUTTER**

Approximate locations of existing non-reinforced concrete pavement to be removed are provided in the Table of PCCP Repair Areas. Prior to removal the Contractor shall saw cut full depth at the limits of the removal area as directed by the Engineer.

The Contractor shall notify the Engineer two working days prior to beginning work at each location so the Engineer may mark out removal limits. The Engineer shall mark exact dimensions prior to removal of concrete pavement. Payment will be made for quantity marked out and measured in the field. Variations from plans estimated quantities and/or locations will not be considered cause for re-negotiation of the contract unit prices.

Care shall be exercised in the removal of concrete slab panels to avoid damage to adjacent pavement, manholes and growth joints. Damage to

adjacent pavement, manholes and/or growth joints shall be repaired to the satisfaction of the Engineer at the Contractor's expense.

After concrete or curb and gutter removal has been accomplished, the Contractor shall shape, water and recompact the remaining granular material prior to placement of concrete or curb and gutter. Any additional gravel cushion required to prepare the area shall be furnished and placed by the Contractor and shall be incidental to the contract unit price per square yard for NONREINFORCED PCC PAVEMENT REPAIR or per foot for TYPE B69 CONCRETE GUTTER or TYPE P9 CONCRETE GUTTER.

Gravel cushion material shall be from a Contractor furnished source. Water content and compaction shall be to the satisfaction of the Engineer.

Removal of Concrete Pavement or Curb and Gutter will be incidental to the contract unit bid price per square yard for NONREINFORCED PCC PAVEMENT REPAIR or per foot for TYPE B69 CONCRETE GUTTER or TYPE P9 CONCRETE GUTTER. This payment will be full compensation for full depth sawing, concrete breakout, removal of all PCC Pavement or Curb and Gutter, disposal of all removed material, and all equipment, labor, and incidentals necessary to satisfactorily complete work.

All removed concrete shall be removed from the right of way by the end of the workday and disposed of at the Contractor's waste disposal site.

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	212-171, 212E-171, 212W-171		

### STEEL BAR INSTALLATION

The Contractor shall install the steel bars (1 1/4 inch epoxy coated plain round dowel bars and No. 5 and No. 9 epoxy coated deformed tie bars) into drilled holes in the existing concrete pavement. An epoxy resin adhesive must be used to anchor the steel bar in the drilled hole.

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

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

The diameter of the drilled holes in the existing concrete pavement for the steel bars shall not be less than 1/8 inch nor more than 3/8 inch greater than the overall diameter of the steel bar. Holes drilled into the existing concrete pavement shall be located at mid-depth of the slab and true and normal. The drill used shall be a hydraulic percussive type and not a hand held. 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.

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 from the back to the front 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 hole prior to steel bar insertion. Rotate the steel bar during installation to eliminate voids and ensure complete bonding of the bar. Insertion of the bars by the dipping method will not be allowed.

Steel bars shall not be placed closer than 6 inches to any longitudinal joint or pavement edge, not closer than 18 inches to any transverse joint, and not closer than 15 inches to any construction joint.

Concrete shall be placed when the epoxy for anchoring the steel bars has hardened sufficiently to permit no movement of the steel bars as recommended by the manufacturer.

All costs for the installation of steel bars, equipment, labor, and incidentals necessary to complete work shall be incidental to the contract unit price per each for INSERT STEEL BAR IN PCC PAVEMENT.

### ASPHALT CONCRETE SHOULDERS

To allow for form placement at locations where full depth repairs are adjacent to asphalt concrete shoulders, the Contractor shall saw cut full depth existing asphalt concrete shoulder. The saw cut shall be parallel to and no more than one foot from existing pavement edge. All costs incurred in performing the above-mentioned work, and for equipment, labor, and incidentals necessary to complete work shall be incidental to the contract unit price per square yard for NONREINFORCED PCC PAVEMENT REPAIR.

Asphalt concrete shoulder work shall be anticipated on both 212E-171 and 212W-171.

Upon completion of pavement repair, the Contractor shall re-establish the asphalt concrete shoulder. Asphalt Concrete Composite shall be placed at a depth that matches that of the existing asphalt concrete shoulder. All costs for furnishing and installing granular material, for Asphalt Concrete Composite, and for all equipment, labor, and incidentals necessary to complete work shall be incidental to the contract unit price per square yard for NONREINFORCED PCC PAVEMENT REPAIR.

### 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, 64-22, or 64-28 Asphalt Binder.

### NONREINFORCED PCC PAVEMENT REPAIR

Nonreinforced PCC Pavement Repair shall be used for repair areas as shown in the Table of Pavement Repairs. Mix Design used shall be A45 Concrete. Class A45 concrete shall meet the requirements of Section 460, except the slump shall meet Section 380.3 A.

A broom finish will be required. A transverse metal tine finish will be required as specified by the Engineer. Prior to opening to traffic, transverse and longitudinal joints shall be temporarily sealed with a backer rod of sufficient size approved by the Engineer. The cost of the backer rod and its installation shall be incidental to the contract unit price per square yard for NONREINFORCED PCC PAVEMENT REPAIR. This backer rod shall be removed during permanent joint sealing operations.

All joints (longitudinal and transverse) through and around repair areas shall be sawed and sealed in accordance with the details shown in these plans. All costs incurred in performing the aforementioned work including furnishing and placing Concrete, sawing and sealing joints, labor, tools and equipment shall be incidental to the contract unit price per square yard for NONREINFORCED PCC PAVEMENT REPAIR.

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

The Contractor shall underpin the existing concrete in lieu of installing tie bars and dowel bars at locations where the condition of the surrounding concrete has deteriorated to the point when tie bar/dowel bar installation is not possible, as determined by the Engineer. The cost for underpinning shall be incidental to the various bid items

### CONCRETE CURB AND GUTTER

Concrete details and mix design utilized in concrete gutter repairs shall be as described in the Nonreinforced PCC Pavement Repair notes.

All joints (longitudinal and transverse) through and around repair areas shall be sawed and sealed in accordance with the details shown in these plans. All costs incurred in performing the aforementioned work including furnishing and placing concrete gutter, sawing and sealing joints, labor, tools and equipment shall be incidental to the contract unit price per foot for TYPE B69 CONCRETE GUTTER or TYPE P9 CONCRETE GUTTER.

### JOINT SEALANT

Low Modulus Silicone Sealant may be used in place of Hot Poured Elastic Joint Sealer on any Longitudinal or Transverse Joint. Details have been included to seal the transverse joints with either silicone or hot pour. The contractor has the option to use either hot pour or silicone detail for sealing transverse joints.

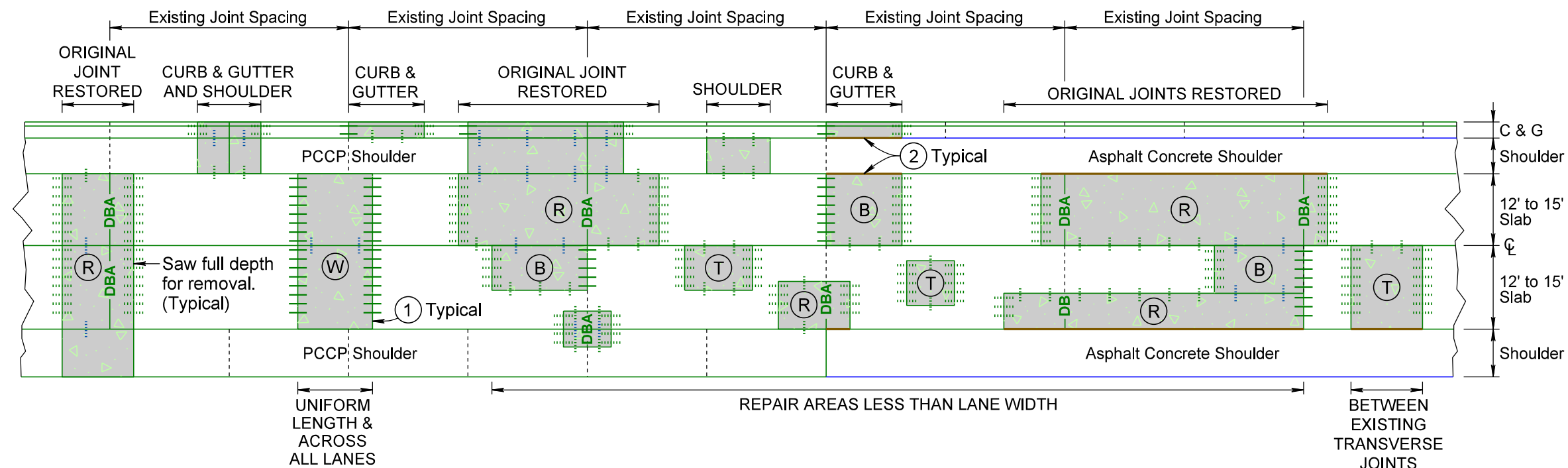
If standard plate 380.06 is utilized, no 45 degree bevel will be required.



# NONREINFORCED PCC PAVEMENT REPAIR

## UP TO TWO LANE ROADWAY OR UP TO FOUR LANE DIVIDED ROADWAY





### TYPICAL REPAIR AREAS



#### KEY:

 PCC Pavement Repair Area

#### PCC PAVEMENT REPAIR AREA TYPES:

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

#### Steel Bars for Transverse Joints

##### Pavement Thickness $\geq 10.5"$

— Drilled in  $1\frac{1}{2}"$  x 18" epoxy coated plain round dowel bars spaced 18" center to center.

..... Drilled in No. 11 x 18" epoxy coated deformed tie bars spaced 18" center to center.

##### Pavement Thickness $\geq 8.5"$ and $< 10.5"$

— Drilled in  $1\frac{1}{4}"$  x 18" epoxy coated plain round dowel bars spaced 18" center to center.

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

##### Pavement Thickness $< 8.5"$

— 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.




 Dowel Bar Assembly

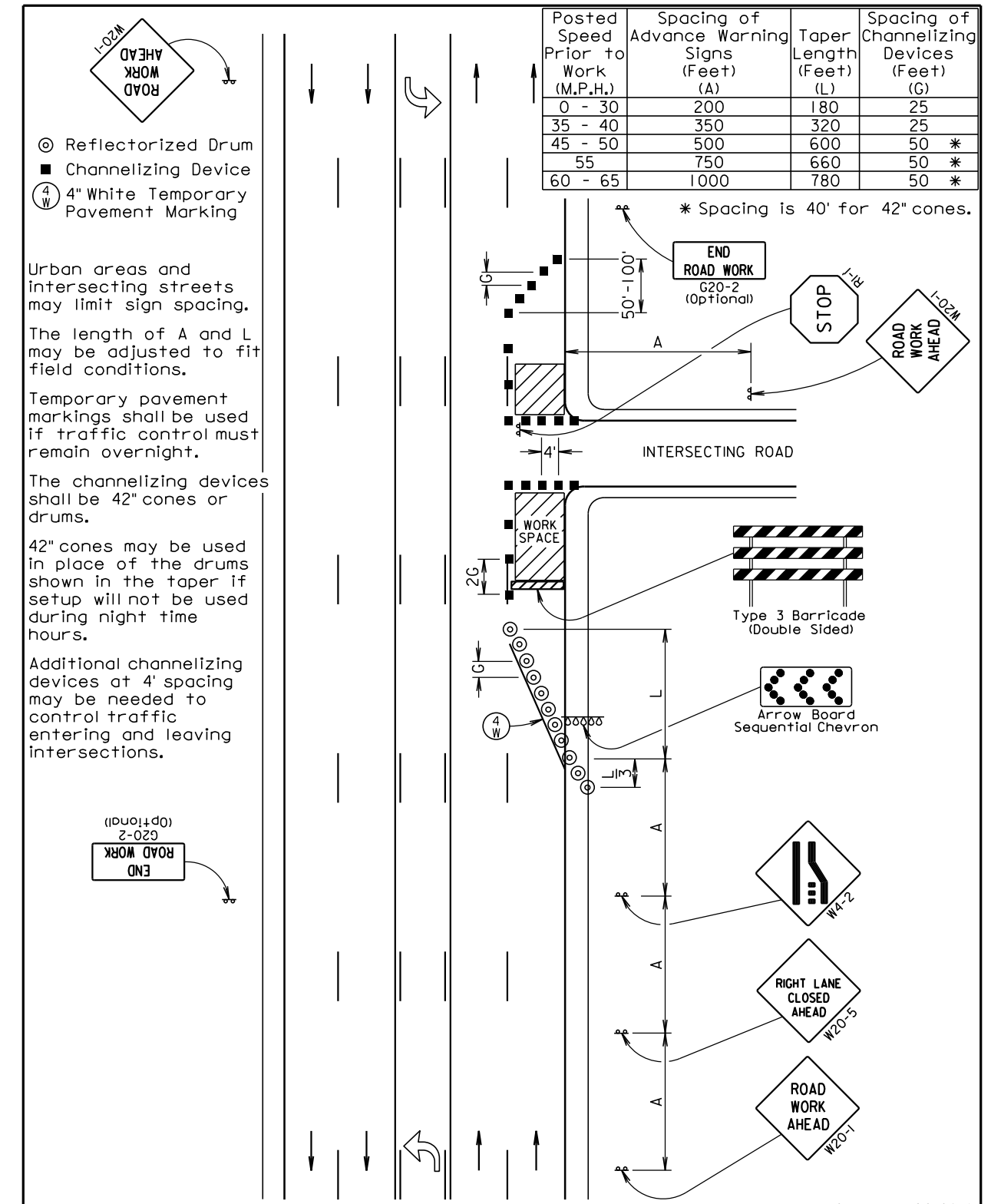
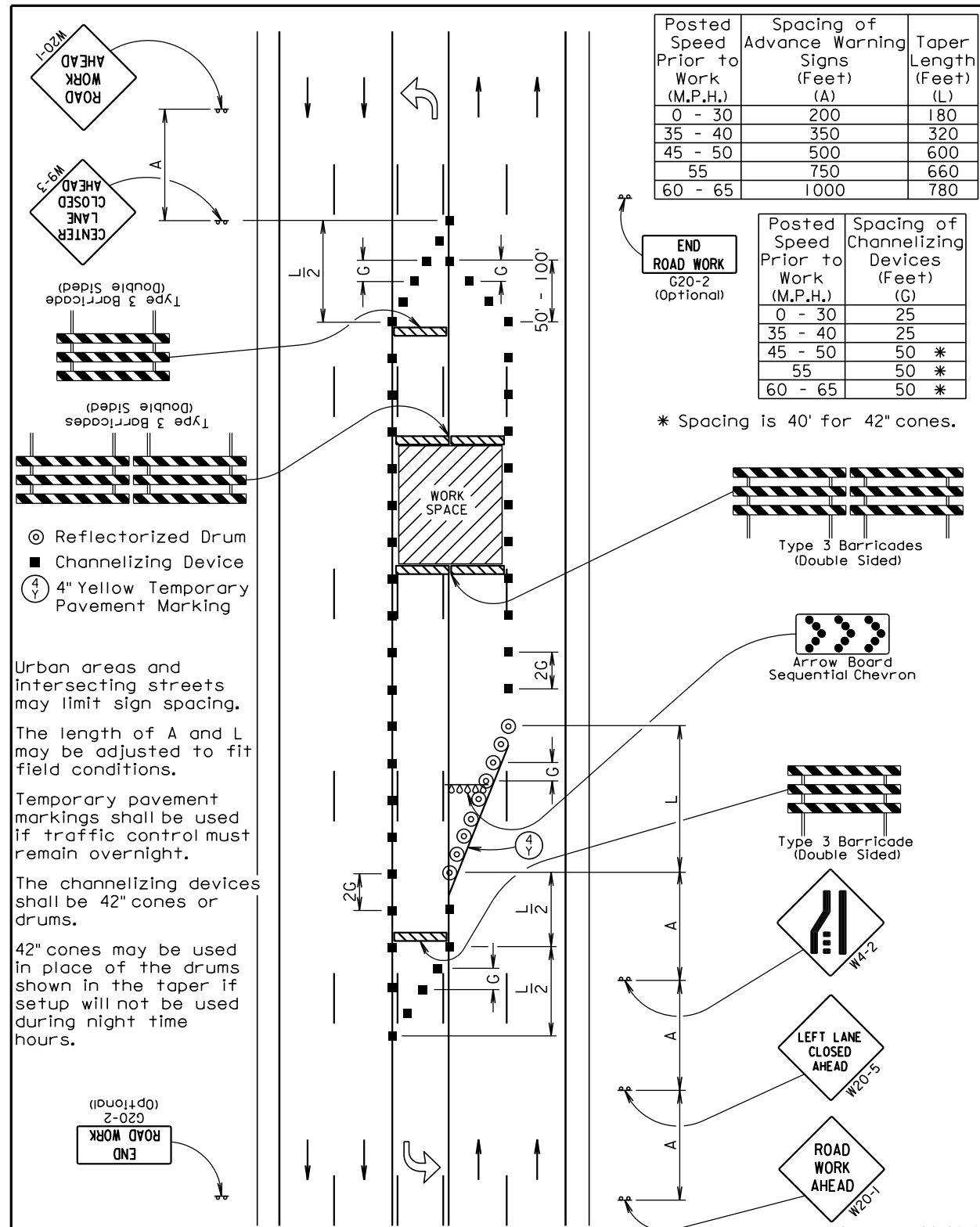
#### Steel Bars for Longitudinal Joints

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

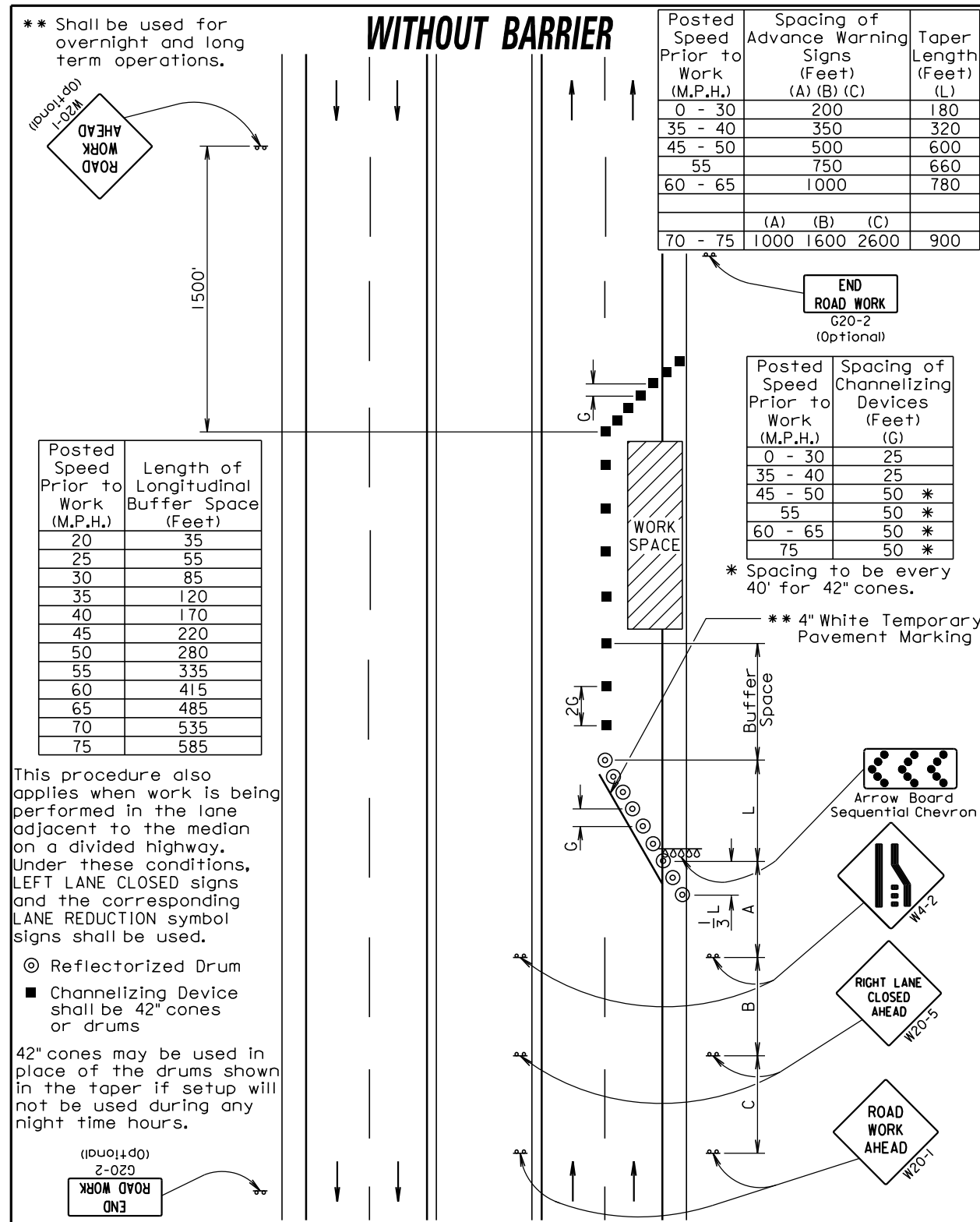
..... No. 5 x 24" epoxy coated deformed tie bars. Drilled In - spaced 30" center to center.

#### NOTES: Saw around repair areas full depth for removal.

-  Where possible, transverse joints shall be constructed/maintained full roadway width.
-  Edges of repair areas shall be formed to match the width of the existing concrete pavement.
-  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.



PLOTTED FROM - TRWAINT14

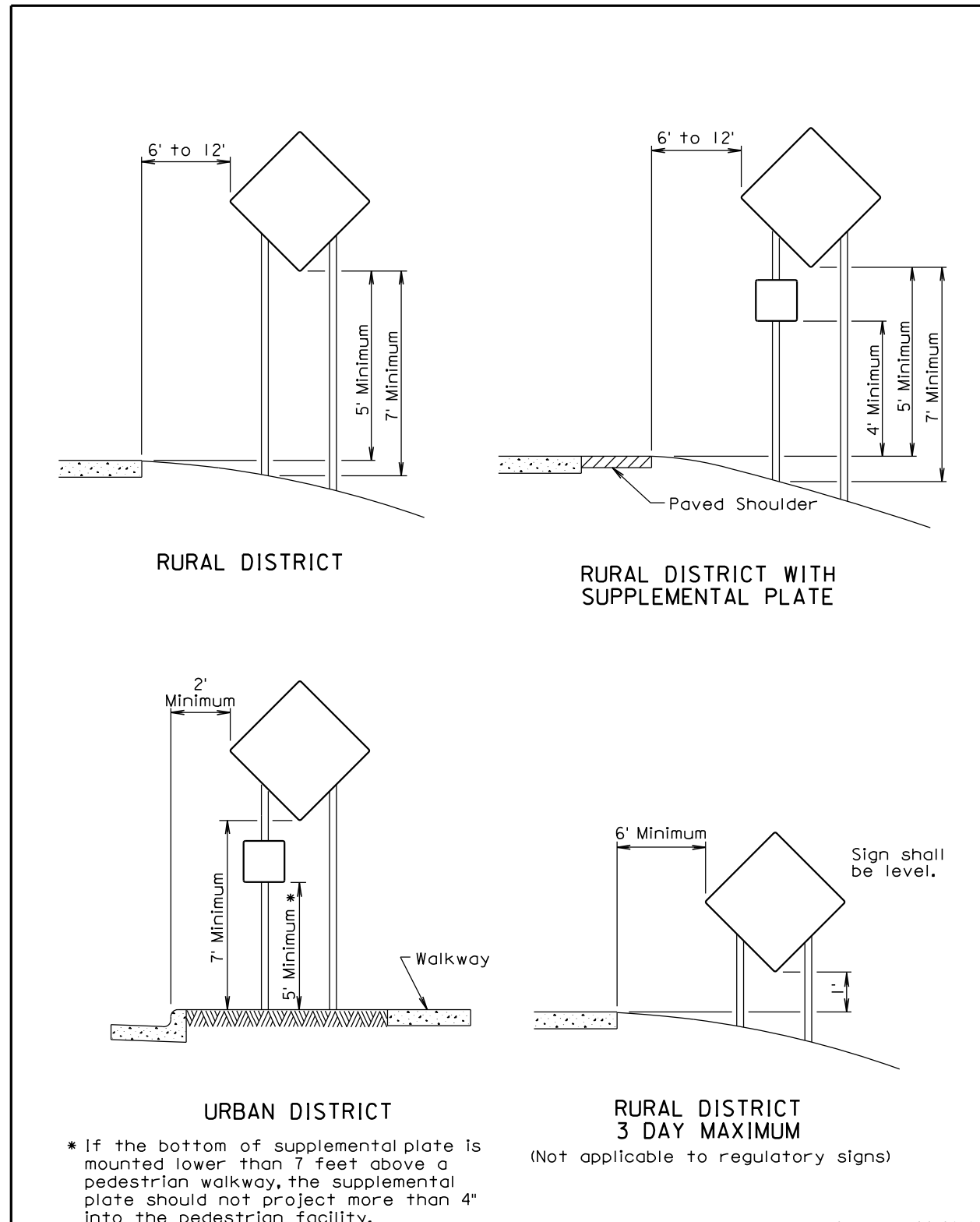


This procedure also applies when work is being performed in the lane adjacent to the median on a divided highway. Under these conditions, LEFT LANE CLOSED signs and the corresponding LANE REDUCTION symbol signs shall be used.

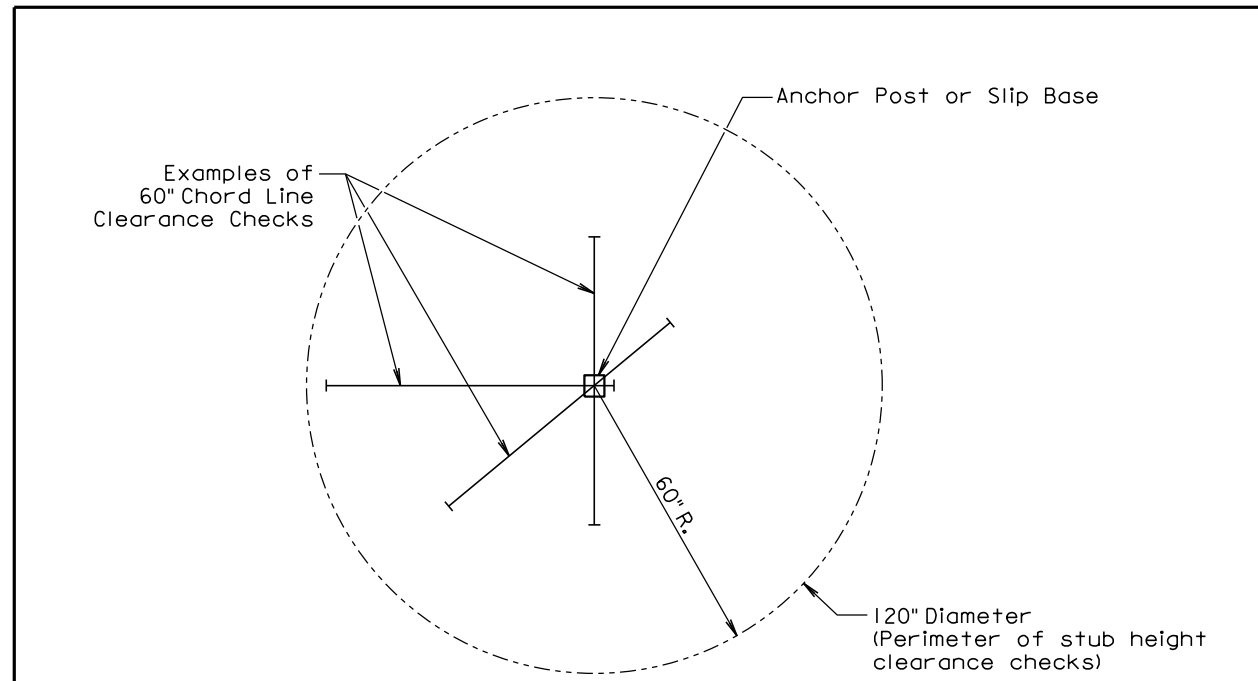
⊙ Reflectorized Drum

■ Channelizing Device shall be 42" cones or drums

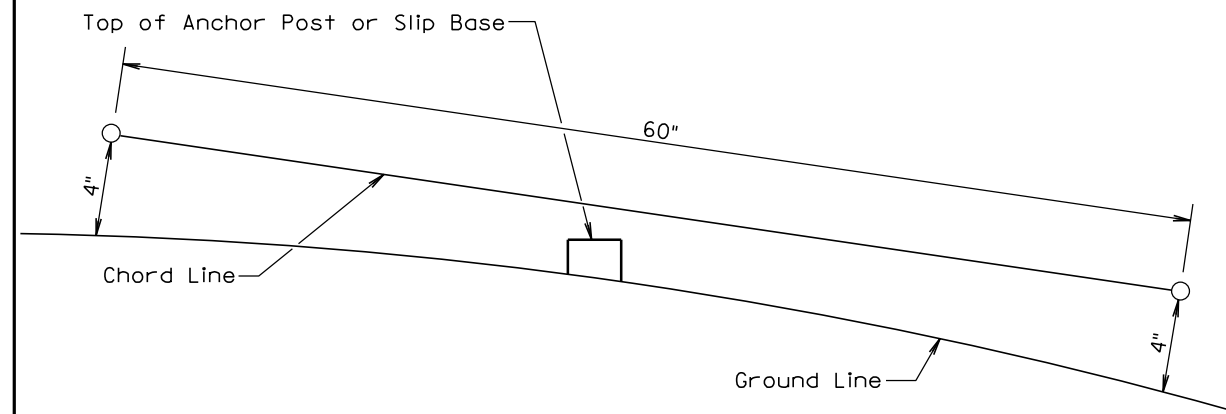
42" cones may be used in place of the drums shown in the taper if setup will not be used during any night time hours.



PLOTTED FROM - TRWAINT14



**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. 2015	S D D O T	BREAKAWAY SUPPORT STUB CLEARANCE	PLATE NUMBER 634.99
			Sheet 1 of 1

**ITEMIZED LIST FOR TRAFFIC CONTROL - PCN i3tv**

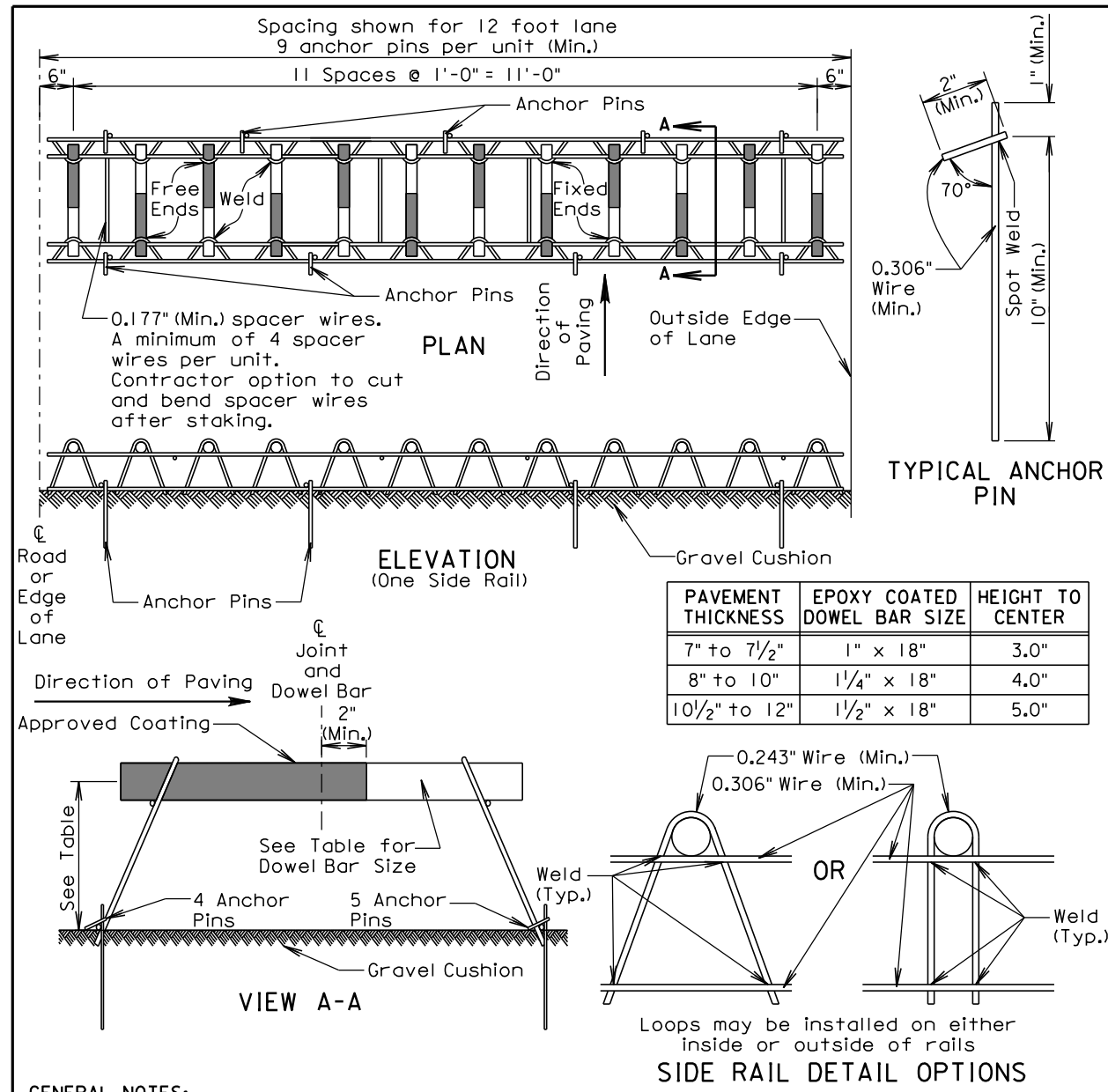
SIGN CODE	DESCRIPTION	CONVENTIONAL ROAD			
		NUMBER	SIGN SIZE	UNITS PER SIGN	UNITS
R1-1	STOP	1	30" x 30"	21	21
W4-2	LEFT or RIGHT LANE ENDS (symbol)	2	48" x 48"	34	68
W9-3	CENTER LANE CLOSED AHEAD	1	48" x 48"	34	34
W20-1	ROAD WORK AHEAD	5	48" x 48"	34	170
W20-5	LEFT or RIGHT LANE CLOSED AHEAD	2	48" x 48"	34	68
W20-7	FLAGGER (symbol)	2	48" x 48"	34	68
G20-2	END ROAD WORK	2	36" x 18"	17	34
-	TYPE 3 BARRICADE - 8' double sided	6		56	336
<b>TOTAL UNITS</b>					<b>799</b>

**ITEMIZED LIST FOR TRAFFIC CONTROL - PCN i3tw**

SIGN CODE	DESCRIPTION	CONVENTIONAL ROAD			
		NUMBER	SIGN SIZE	UNITS PER SIGN	UNITS
W4-2	LEFT or RIGHT LANE ENDS (symbol)	2	48" x 48"	34	68
W20-1	ROAD WORK AHEAD	2	48" x 48"	34	68
W20-5	LEFT or RIGHT LANE CLOSED AHEAD	2	48" x 48"	34	68
G20-2	END ROAD WORK	2	36" x 18"	17	34
-	TYPE 3 BARRICADE - 8' double sided	1		56	56
<b>TOTAL UNITS</b>					<b>294</b>

**ITEMIZED LIST FOR TRAFFIC CONTROL - PCN i3tx**

SIGN CODE	DESCRIPTION	CONVENTIONAL ROAD			
		NUMBER	SIGN SIZE	UNITS PER SIGN	UNITS
W4-2	LEFT or RIGHT LANE ENDS (symbol)	2	48" x 48"	34	68
W20-1	ROAD WORK AHEAD	2	48" x 48"	34	68
W20-5	LEFT or RIGHT LANE CLOSED AHEAD	2	48" x 48"	34	68
G20-2	END ROAD WORK	2	36" x 18"	17	34
-	TYPE 3 BARRICADE - 8' double sided	1		56	56
<b>TOTAL UNITS</b>					<b>294</b>

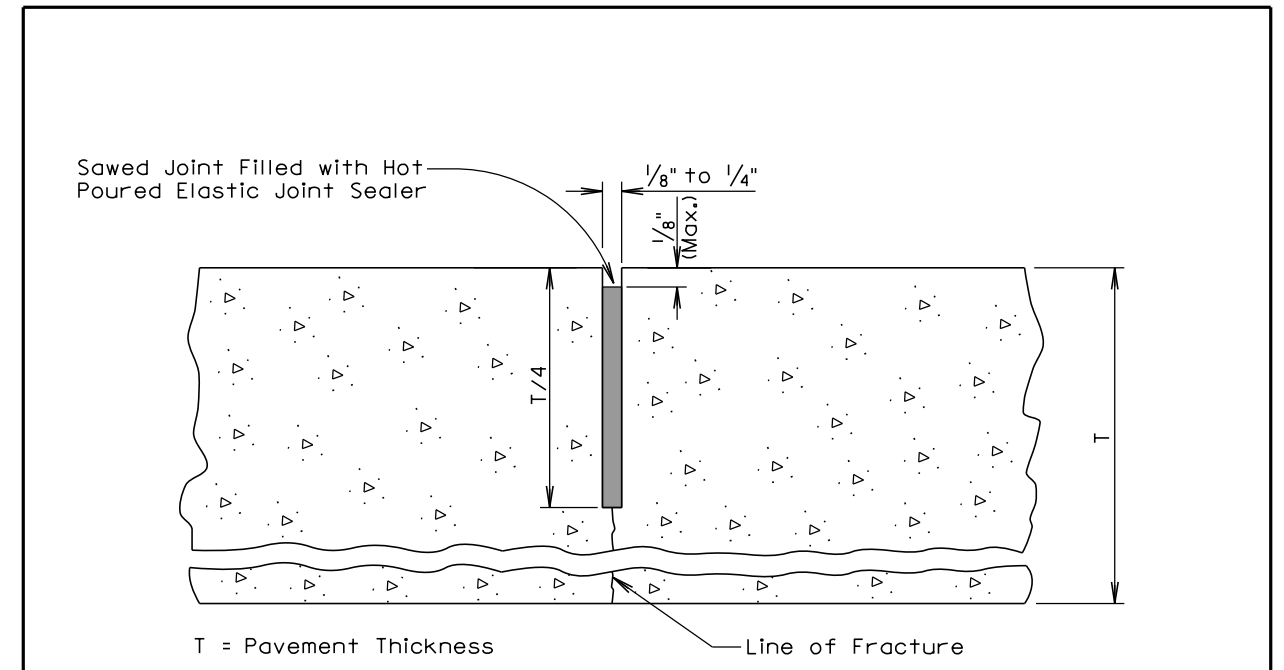


**GENERAL NOTES:**

- Longitudinal joint tie bars shall be placed a minimum of 15 inches from the transverse contraction joint.
- Centerline of individual dowel bars shall be parallel to top of subgrade  $\pm 1/8$  inch in 18 inches and to all other dowel bars in the assembly  $\pm 1/16$  inch in 18 inches.
- Centerline of individual dowel bars shall be parallel to the centerline of the roadway  $\pm 1/2$  inch in 18 inches.
- The transverse contraction joints shall be sawed perpendicular to the centerline of the roadway and the dowel bars shall be centered on the sawed joint  $\pm 1$  inch.
- Supporting devices as 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.

August 30, 2013

Published Date: 2nd Qtr. 2015	S D D O T	PCC PAVEMENT DOWEL BAR ASSEMBLY FOR TRANSVERSE CONTRACTION JOINTS 12 Bar Assembly on Granular Base Material	PLATE NUMBER 380.01
			Sheet 1 of 1

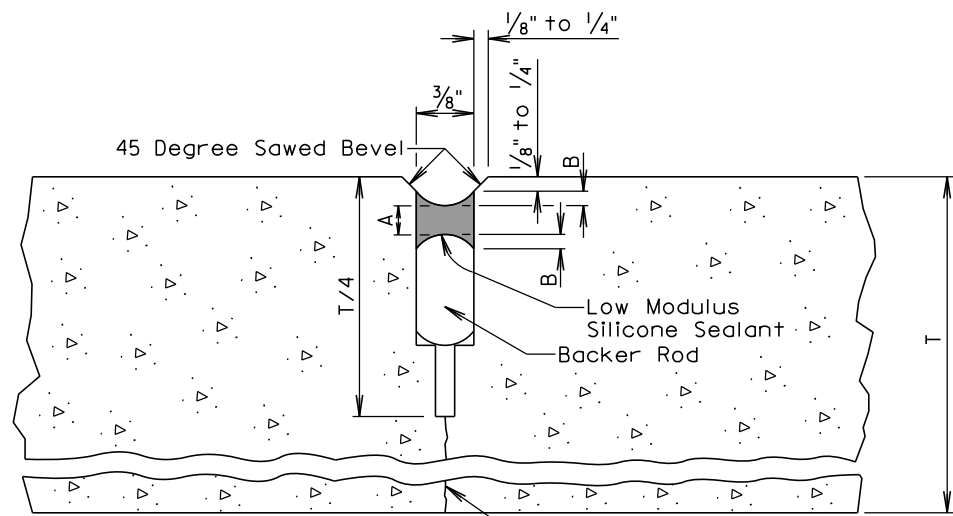


**GENERAL NOTES:**

- The saw cut to control cracking shall be a minimum of  $1/4$  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.

June 26, 2013

Published Date: 2nd Qtr. 2015	S D D O T	PCC PAVEMENT TRANSVERSE CONTRACTION JOINT WITH OR WITHOUT DOWEL BAR ASSEMBLY	PLATE NUMBER 380.05
			Sheet 1 of 1



T = Pavement Thickness

Line of Fracture

**LOW MODULUS SILICONE SEALANT  
ALLOWABLE CONSTRUCTION TOLERANCES**

A (Min.) (In.)	A (Max.) (In.)	B (Min.) (In.)	B (Max.) (In.)
3/16	5/16	1/8	1/4

**GENERAL NOTES:**

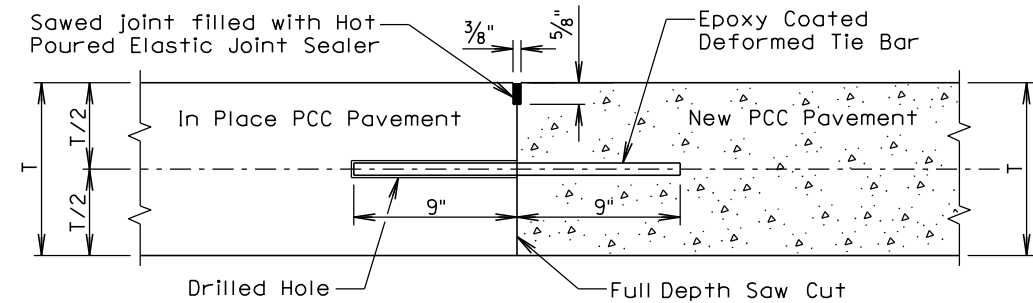
The first saw cut to control cracking shall be a minimum of 1/4 the thickness of the pavement. Additional sawing for widening the saw cut to provide the width for the installation of the low modulus silicone joint sealant will be necessary.

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

June 26, 2013

Published Date: 2nd Qtr. 2015	S D D O T	PCC PAVEMENT BEVELED TRANSVERSE CONTRACTION JOINT WITH OR WITHOUT DOWEL BAR ASSEMBLY	PLATE NUMBER 380.06
			Sheet 1 of 1

**DETAIL A  
TRANSVERSE CONSTRUCTION JOINT WITH TIE BARS**



T = In Place PCC Pavement and New PCC Pavement Thickness

**GENERAL NOTES:**

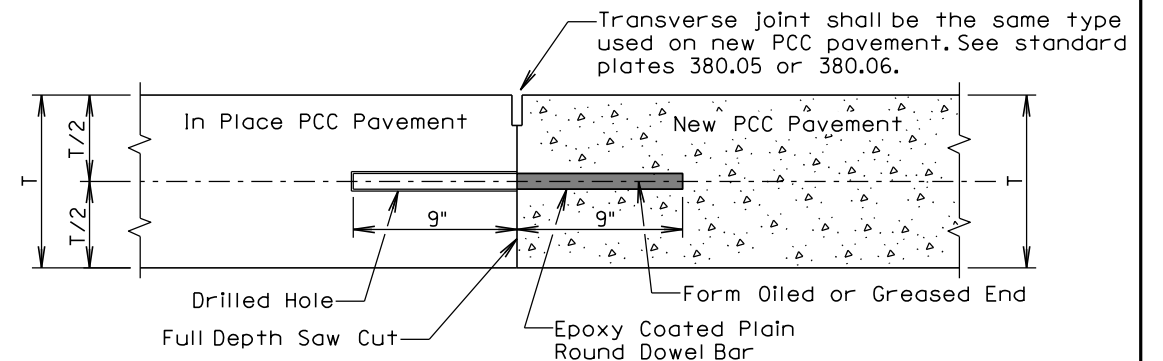
The term "In Place PCC Pavement" in the above drawing indicates that the in place PCC pavement was placed on a previous project.

See sheet 2 of 2 of this standard plate to determine if Detail A shall be used.

The tie bars shall be embedded a minimum depth of 9 inches into the in place PCC pavement and anchored with an epoxy resin adhesive.

No.9 epoxy coated deformed tie bars shall be used in 10 inch thickness and less PCC Pavement and No.11 epoxy coated deformed tie bars shall be used in 10.5 inch thickness and greater PCC Pavement. The tie bar spacing shall be 18 inches center to center and shall be a minimum of 3 inches and a maximum of 9 inches from the pavement edges.

**DETAIL B  
TRANSVERSE CONSTRUCTION JOINT WITH DOWEL BARS**



T = In Place PCC Pavement and New PCC Pavement Thickness

**GENERAL NOTES:**

The term "In Place PCC Pavement" in the above drawing indicates that the in place PCC pavement was placed on a previous project or current project.

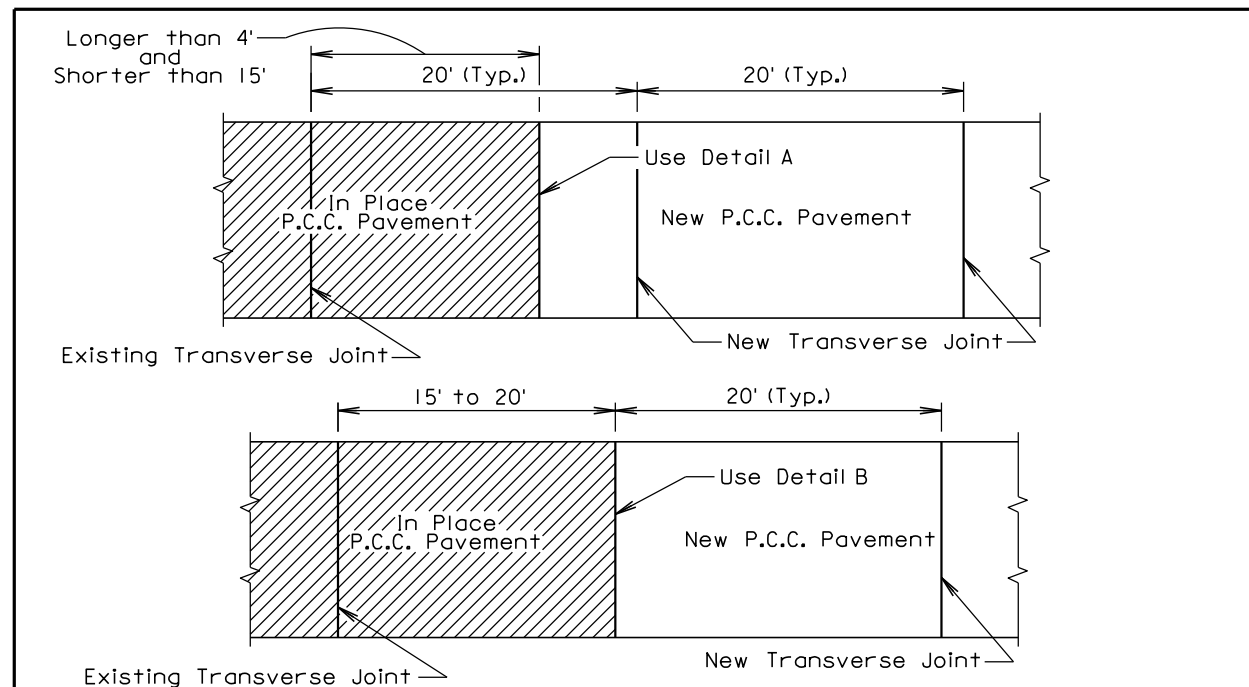
See sheet 2 of 2 of this standard plate to determine if Detail B shall be used.

The plain round dowel bars shall be embedded a minimum depth of 9 inches into the in place PCC pavement and anchored with an epoxy resin adhesive.

The epoxy coated plain round dowel bar size, number, and spacing shall be the same as detailed on the corresponding dowel bar assembly standard plate (380.01, 380.02, 380.03, or 380.04). The epoxy coated plain round dowel bars shall be a minimum of 3 inches and a maximum of 6 inches from the pavement edges.

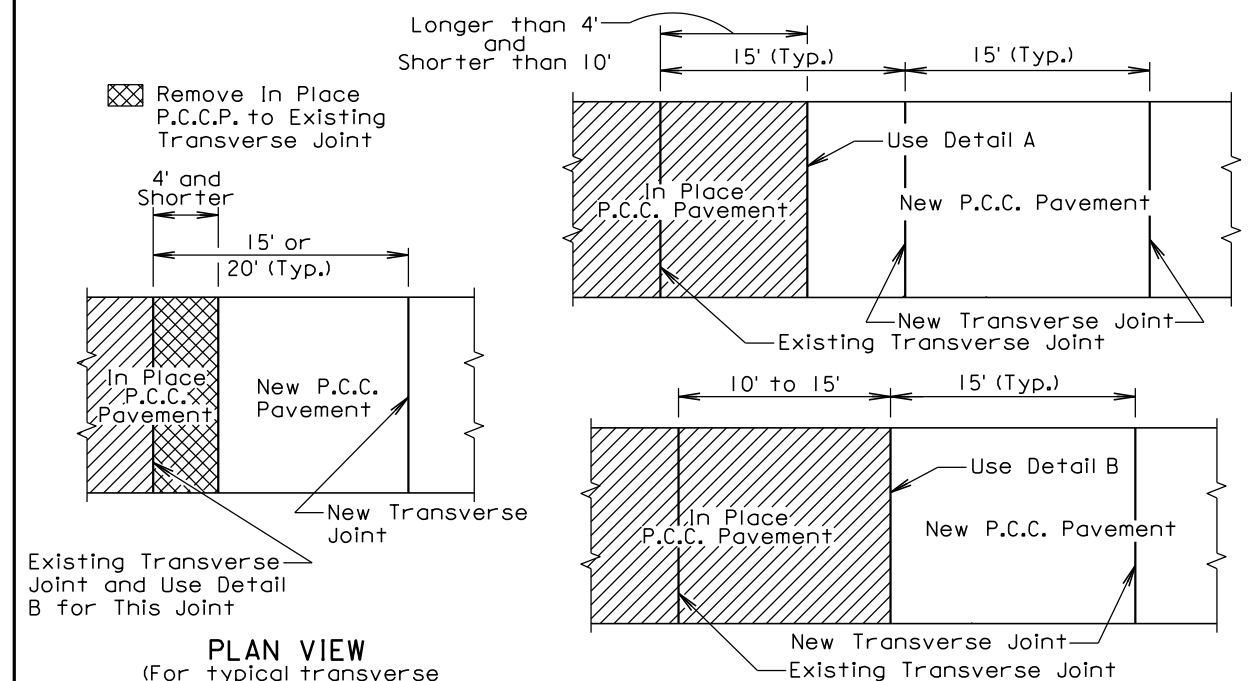
September 6, 2013

Published Date: 2nd Qtr. 2015	S D D O T	PCC PAVEMENT TRANSVERSE CONSTRUCTION JOINTS WITH TIE BARS OR DOWEL BARS	PLATE NUMBER 380.08
			Sheet 1 of 2



**PLAN VIEW**

(For typical transverse joint spacing of 20' on the current project)



**PLAN VIEW**

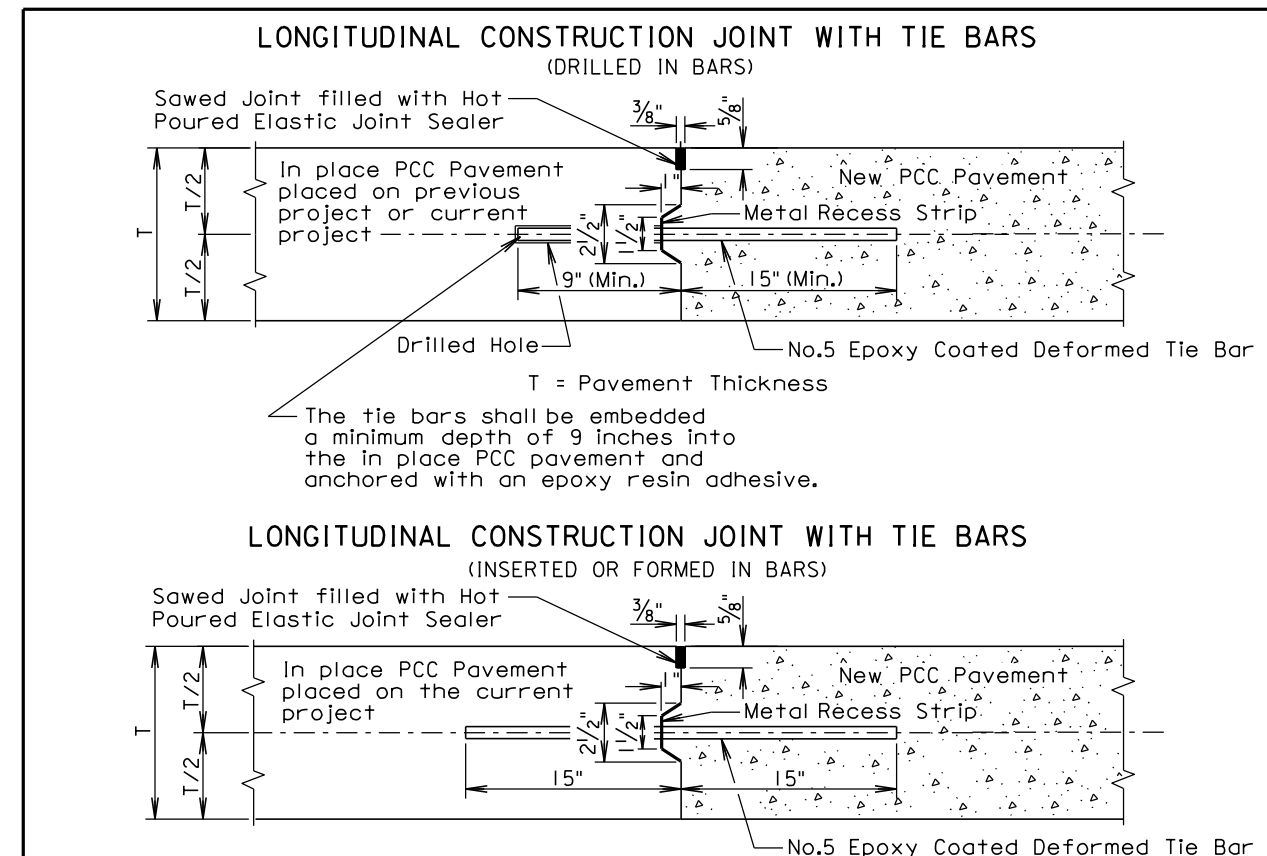
(For typical transverse joint spacing of 15' or 20' on the current project)

**PLAN VIEW**

(For typical transverse joint spacing of 15' on the current project)

September 6, 2013

Published Date: 2nd Qtr. 2015	S D D O T	PCC PAVEMENT TRANSVERSE CONSTRUCTION JOINTS WITH TIE BARS OR DOWEL BARS	PLATE NUMBER 380.08
			Sheet 2 of 2



**LONGITUDINAL CONSTRUCTION JOINT WITH TIE BARS**

(INSERTED OR FORMED IN BARS)

**GENERAL NOTES (For the details above):**

The epoxy coated deformed tie bars shall be spaced in accordance with the following tables:

Tie Bar Spacing 48" Maximum	
Transverse Contraction Joint Spacing	Number of Tie Bars
6.5' to 10'	2
10.5' to 14'	3
14.5' to 18'	4
18.5' to 22'	5

Tie Bar Spacing 30" Maximum	
Transverse Contraction Joint Spacing	Number of Tie Bars
5' to 7'	2
7.5' to 9.5'	3
10' to 12'	4
12.5' to 14.5'	5
15' to 17'	6
17.5' to 19.5'	7
20' to 22'	8

The tie bars shall be placed a minimum of 15 inches from transverse contraction joints.

The required number of tie bars as shown in the table shall be uniformly spaced within each panel. The uniformly spaced tie bars shall be spaced a maximum of 48 inches center to center for a female keyway and shall be spaced a maximum of 30 inches center to center for a vertical face and male keyway. The maximum tie bar spacing shall apply to tie bars within each panel.

The keyway illustrated in the above details depict a female keyway.

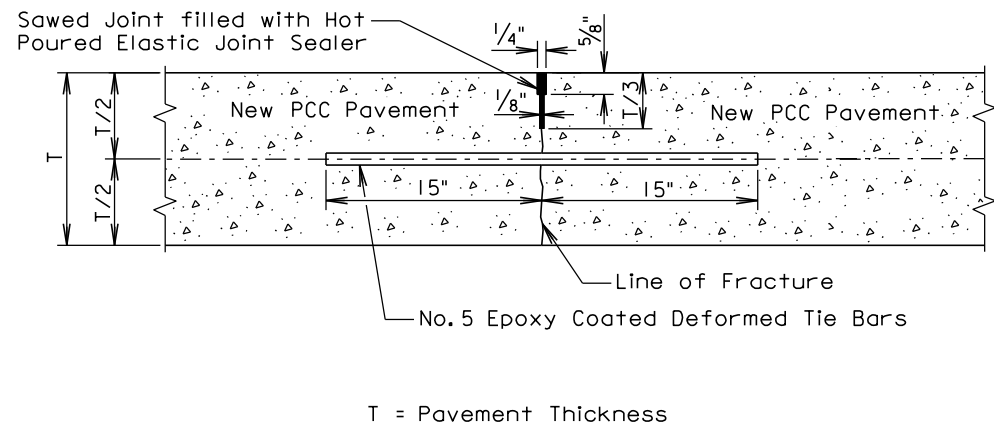
The keyway is optional and is not required. When concrete pavement is formed and a keyway is provided, a metal recess strip shall be used. When concrete pavement is slip formed, a metal recess strip is not required.

August 31, 2013

Published Date: 2nd Qtr. 2015	S D D O T	PCC PAVEMENT LONGITUDINAL JOINTS WITH TIE BARS	PLATE NUMBER 380.10
			Sheet 1 of 2

PLOTTED FROM - TRWAINT14

### SAWED LONGITUDINAL JOINT WITH TIE BARS (POURED MONOLITHICALLY)



**GENERAL NOTES (For the detail above):**

The epoxy coated deformed tie bars shall be spaced in accordance with the following table:

Tie Bar Spacing 48" Maximum	
Transverse Contraction Joint Spacing	Number of Tie Bars
6.5' to 10'	2
10.5' to 14'	3
14.5' to 18'	4
18.5' to 22'	5

The tie bars shall be placed a minimum of 15 inches from the transverse contraction joints.

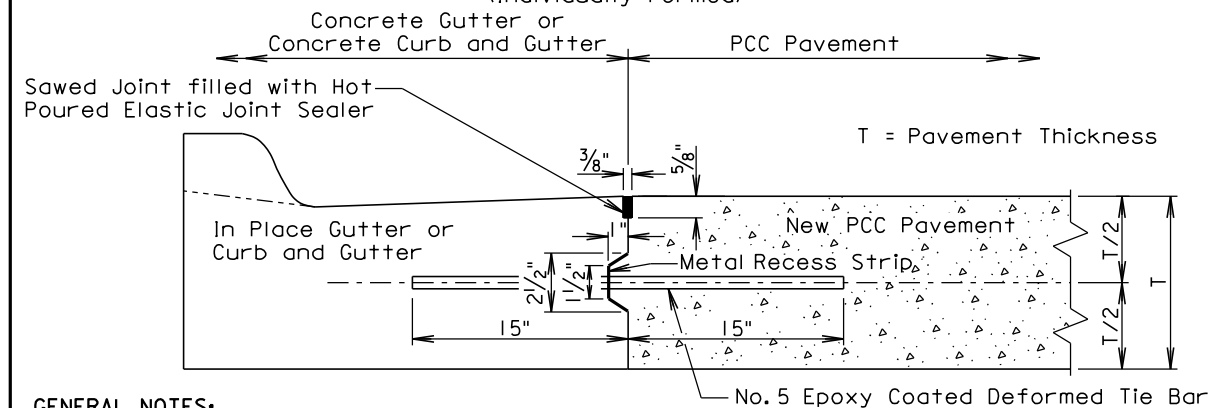
The required number of tie bars as shown in the table shall be uniformly spaced within each panel with a maximum space of 48 inches center to center. The maximum tie bar spacing shall apply to tie bars within each panel.

The first saw cut to control cracking shall be a minimum of 1/3 the thickness of the pavement. Additional sawing for widening the saw cut to provide the width for the installation of the hot poured elastic joint sealer is necessary.

August 31, 2013

Published Date: 2nd Qtr. 2015	S D D O T	PCC PAVEMENT LONGITUDINAL JOINTS WITH TIE BARS	PLATE NUMBER 380.10
			Sheet 2 of 2

### LONGITUDINAL CONSTRUCTION JOINT WITH TIE BARS (Individually Formed)



**GENERAL NOTES:**

No. 5 epoxy coated deformed tie bars shall be spaced 48 inches center to center. The keyway shown above is a female keyway.

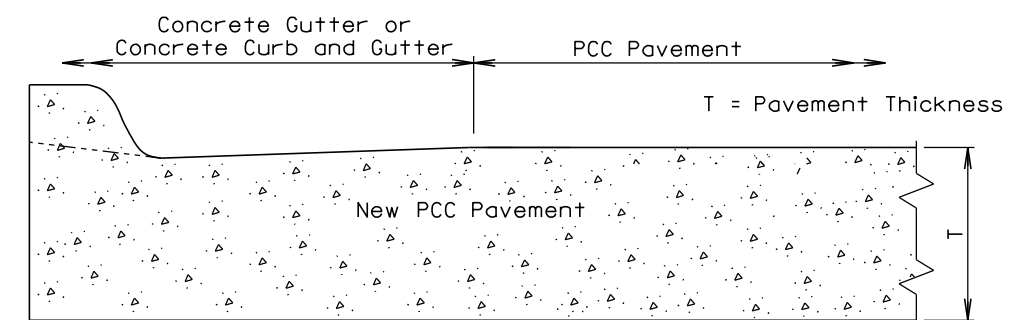
The tie bars shall be placed a minimum of 15 inches from existing transverse contraction joints.

The keyway is optional and is not required. When concrete pavement is formed and a keyway is provided, a metal recess strip shall be used. When concrete pavement is slip formed, a metal recess strip is not required.

The transverse contraction joints in the concrete gutter or concrete curb and gutter shall be placed at each mainline PCC pavement transverse contraction joint. The transverse contraction joints in the concrete gutter or the concrete curb and gutter shall be 1 1/2 inches deep if formed in fresh concrete using a suitable grooving tool. If a saw is used to cut the transverse contraction joints, then the depth of the joint shall be at least 1/4 the thickness of the concrete gutter or concrete curb and gutter.

The term "In Place Gutter or Curb and Gutter" in the above drawing indicates that the in place concrete gutter and concrete curb and gutter was placed on the current project.

### POURED MONOLITHICALLY



**GENERAL NOTES:**

The mainline curb and gutter may be placed monolithically with the PCC pavement if the mainline lane width is less than or equal to 12 feet. If this method of construction is used, the tie bars and the sawed joint between the curb and gutter and the PCC pavement shall be eliminated.

The gutter or curb and gutter shall be sawed transversely at each mainline transverse contraction joint. The transverse contraction joints in the gutter or curb and gutter shall be sawed and sealed same as the transverse contraction joints in the PCC pavement.

The slope of the gutter shall be the slope designated for the type of gutter or curb and gutter to be constructed. The bottom slope of the gutter or curb and gutter shall be constructed at the same slope as the mainline concrete pavement.

June 26, 2013

Published Date: 2nd Qtr. 2015	S D D O T	PCC PAVEMENT LONGITUDINAL CONSTRUCTION JOINTS WITH CONCRETE GUTTER OR CONCRETE CURB AND GUTTER	PLATE NUMBER 380.11
			Sheet 1 of 1