

Northern Hills Rest Area Sidewalk and PCCP Repair  
I-90E, MRM 1, PCN i5ev

**ESTIMATE OF QUANTITIES**

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
110E0300	Remove Concrete Curb and/or Gutter	20	Ft
110E1140	Remove Concrete Sidewalk	540.8	SqYd
250E0010	Incidental Work	Lump Sum	LS
380E5030	Nonreinforced PCC Pavement Repair	142.9	SqYd
380E6000	Dowel Bar	56	Each
380E6110	Insert Steel Bar in PCC Pavement	124	Each
634E0110	Traffic Control Signs	49.0	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0275	Type 3 Barricade	3	Each
650E0080	Type B68 Concrete Curb and Gutter	20	Ft
651E0040	4" Concrete Sidewalk	4,892	SqFt
651E7000	Type 1 Detectable Warnings	30	SqFt

**SPECIFICATIONS**

Standard Specifications for Roads and Bridges, 2015 Edition and Required Provisions, Supplemental Specifications, and Special Provisions as included in the Proposal.

**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 Public ROW.

The waste disposal site(s) shall be managed and reclaimed in accordance with the following from the General Permit for 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:

1. 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 Public 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 Public ROW through the use of fences, gates, and placement of a sign or signs at the entrance to the site stating "No Dumping Allowed".

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**COMMITMENT H: WASTE DISPOSAL SITE (CONTINUED)**

2. Concrete and asphalt concrete debris may be stockpiled within view of the ROW for a period of time not to exceed the duration of the project. Prior to project completion, the waste shall be removed from view of the ROW or buried and the waste disposal site reclaimed as noted above.

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

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

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 department designated sources and designated option material sources, stockpile sites, storage areas, and waste 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: Contractor furnished material sources, material processing sites, stockpile sites, storage areas, plant sites, and waste areas.

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.

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 Contractor furnished material sources, material processing sites, stockpile sites, storage areas, plant sites, and waste areas that affect wetlands, threatened and

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**COMMITMENT I: HISTORICAL PRESERVATION OFFICE CLEARANCES (CONTINUED)**

endangered species, or waterways. The Contractor shall provide the required permits and clearances to the Project Engineer at the preconstruction meeting.

**INCIDENTAL WORK**

The following are the incidental work items on the project:

- Cap water supply from rest area building
- Remove above-ground fixtures and plumbing located at the dump station island
- Remove waste drain and cap drain line to the wastewater lagoon at the dump station island
- Remove signs and posts associated with the dump station
- Waste Receptacles shall be temporary reset for new concrete. The waste receptacles shall be reset at their original location after the concrete has cured as approved by the Engineer.

**NONREINFORCED PCC PAVEMENT REPAIR**

New pavement thickness shall be 10" thick.

Locations and size (length or width) of concrete repair areas are subject to change in the field, at the discretion of the Engineer, at no additional cost to the state. Payment will be based on actual area replaced.

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

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

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

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/steel bars shall be sawed off and removed.

Concrete placed adjacent to asphalt concrete shoulders shall be formed full depth to match the width of existing concrete pavement. Asphalt concrete shoulders adjacent to concrete pavement replacements shall be repaired with Asphalt Concrete Composite. If rumble strips exist, they shall be formed in the asphalt to match existing.

At repair locations where the new working joint is not opposite the existing working joint, the Contractor shall place a 1/4" 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.

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**NONREINFORCED PCC PAVEMENT REPAIR (CONTINUED)**

The initial contraction joint sawing shall be performed as soon as practical after placement to avoid random cracking.

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.

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, unless an alternative gradation is approved by the concrete engineer as part of the mix design submittal. The concrete mixture shall contain a minimum of 50% coarse aggregate by weight. The concrete mix shall contain at least 600 lbs. of type I, II or III cement per cubic yard. The minimum 28 day compressive strength shall be 4,000 psi. The Contractor is responsible for the mix design used. The Contractor may need to modify the mix design to meet contract time requirements on the project. The Contractor shall submit a mix design and supporting documentation for approval at least 2 weeks prior to use.

Concrete shall be cured with white pigmented curing compound (AASHTO M148, Type 2) applied as soon as practical at a rate of 125 square feet per gallon. Concrete shall be cured for a minimum of 48 hours before opening to traffic. The 48 hours is based upon a concrete surface temperature of 60 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, strength of 3,500 psi must be obtained prior to opening to traffic.

All costs for performing this work including sawing and removing concrete, furnishing and placing concrete, #5 tie bars cast in place, curing, sawing and sealing joints, repairing asphalt shoulders, labor, tools and equipment shall be incidental to the contract unit price per square yard for "Nonreinforced PCC Pavement Repair".

**STEEL BAR INSERTION**

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

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.

**CURB AND GUTTER**

The curb and gutter for the project is provided to modify the ramp slopes on the central ADA access location.

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**PCCP QUANTITIES**

	W	L	Nonreinforced PCC Pavement Repair	Dowel Bar	Insert Steel Bar in PCC Pavement
Description	(Ft)	(Ft)	SqYd	Each	Each
RV dump station	9.0	140.3	140.3	54	112
Additional Pavement Removal	2.5	9.5	2.6	2	4
Bars for C&G		20.0			8
			<b>142.9</b>	<b>56.0</b>	<b>124</b>

**TYPE 1 DETECTABLE WARNINGS**

Detectable warnings shall be in compliance with the Americans with Disabilities Act regulations.

The detectable warnings shall be installed according to the manufacturer's installation instructions.

A concrete thickness equal to the adjacent concrete sidewalk thickness and 2 inches of granular cushion material shall be placed below the Type 1 Detectable Warnings. When concrete is placed below the detectable warnings then the concrete thickness shall be transitioned at the rate of 1" per foot to match the adjacent concrete sidewalk thickness.

Cast iron plates shall be a natural patina (weathered steel).

When Type 1 Detectable Warnings are specified, the Contractor shall furnish and install only one of the products listed in the Type 1 Detectable Warnings table.

Type 1 Detectable Warnings

<u>Product</u>	<u>Manufacturer</u>
Detectable Warning Plate Cast Iron Plate	Neenah Foundry Company Neenah, WI 800-558-5075 <a href="http://www.neenahfoundry.com/">http://www.neenahfoundry.com/</a>
Detectable Warning Plate Cast Iron Plate	Deeter Foundry Lincoln, NE 800-234-7466 <a href="http://www.deeter.com/">http://www.deeter.com/</a>
Detectable Warning Plate Cast Iron Plate(No Coating)	East Jordan Iron Works, Inc. 301 Spring Street East Jordan, MI 49727 800-626-4653 <a href="http://www.ejiw.com">http://www.ejiw.com</a>
TufTile (wet-set) Cast Iron Replaceable Tile	TufTile 1200 Flex Court Lake Zurich, IL 60047 888-960-8897 <a href="http://www.tuftile.com/">http://www.tuftile.com/</a>

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**TYPE 1 DETECTABLE WARNINGS (CONTINUED)**

Detectable Warnings shall be installed at the following locations:

- West ADA Access Ramp (10 sqft)
- Central ADA Access Ramp (10 sqft)
- East ADA Access Ramp (10 sqft)

**4" CONCRETE SIDEWALK**

Where new sidewalk meets existing sidewalk, rebar shall be used at the construction joint in accordance with Detail E on stand plate 651.01.

**TABLE OF SIDEWALK QUANTITIES**

		W	L	Remove Concrete Sidewalk	4" Concrete Sidewalk	
<u>Loc</u>	<u>Description</u>	(Ft)	(Ft)	<u>SqFt</u>	<u>SqFt</u>	
	main walkway	6.0	646.0	430.7	3876.0	
A	walkway to picnic table	3.5	4.0	1.6	14.0	
B	walkway to picnic table	3.9	4.0	1.7	15.6	
C	walkway to picnic shelter			3.1	28.1	
D	walkway to picnic shelter	4.0	10.0	4.4	40.0	
	waste receptacle station	3.0	16.0	2.6	48.0	
G	walkway to picnic table	4.0	4.6	2.0	18.4	
I	walkway to rest area building			0.3	2.4	
U	walkway to rest area building	5.3	2.5	1.5	13.5	
V	walkway near rest area building			0.0	0.0	
	main walkway	12.0	32.0	42.7	384.0	
J	entrance to rest area building			6.7	60.4	
L	walkway to rest area building			12.4	112.0	
K-L	walkway to rest area building	5.1	21.0	11.9	107.1	
M	walkway to picnic table			1.3	11.3	
P	landing near picnic table			4.4	40.0	
P	walkway near picnic table			1.7	15.7	
Q	landing near picnic table	4.0	5.7	2.5	22.8	
Q	landing near picnic table	5.3	10.0	5.9	53.0	
S	walkway to picnic table			1.4	13.0	
T	walkway near picnic table			1.8	16.3	
				<b>540.8</b>	<b>4891.6</b>	

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**TRAFFIC CONTROL**

Channelizing devices shall be used to divert traffic away from work areas and to close off parking stalls adjacent to work areas. The shoulder work sign on standard plate 634.03 will not be required.

The Contractor shall provide enough open parking stalls to provide reasonable access to the rest area for pedestrians as directed by the Project Engineer. Work zones directly adjacent to open parking stalls will not be allowed.

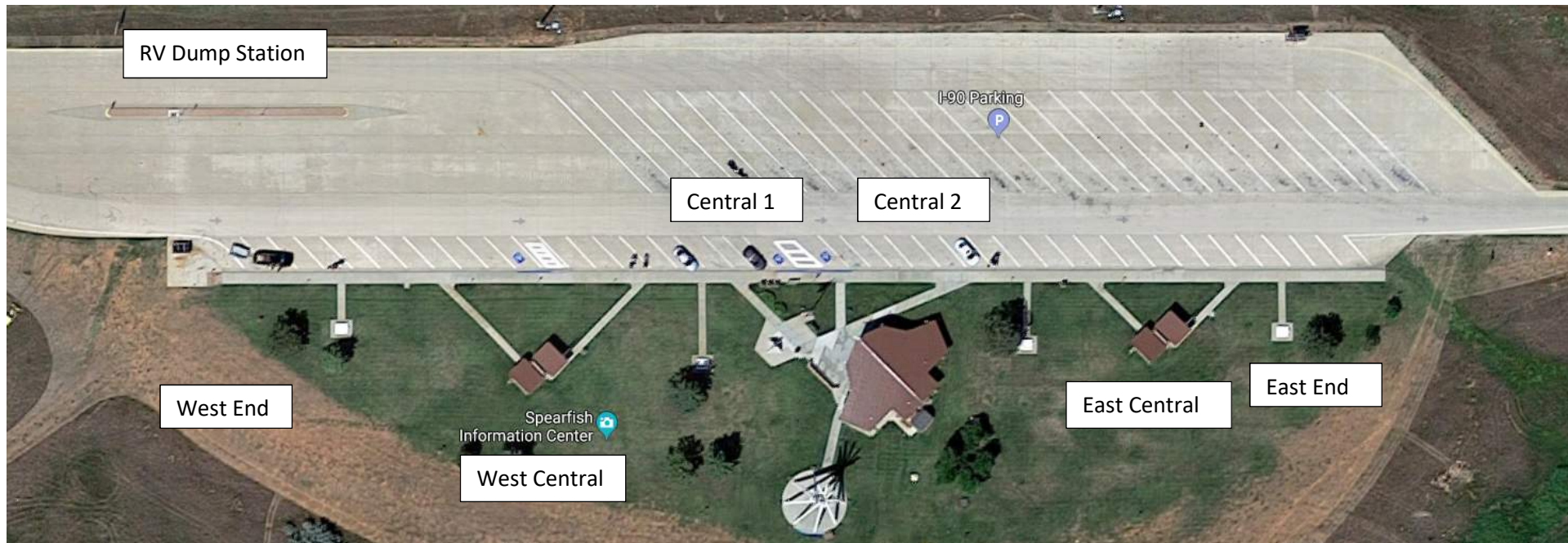
Type 3 Barricades shall be used in advance of the PCC Pavement Repair location to direct ramp traffic away from the work zone.

**ITEMIZED LIST FOR TRAFFIC CONTROL SIGNS**

SIGN CODE	SIGN DESCRIPTION	CONVENTIONAL ROAD			
		NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
R9-9	SIDEWALK CLOSED	4	24" x 12"	2.0	8.0
W20-1	ROAD WORK AHEAD	2	48" x 48"	16.0	32.0
G20-2	END ROAD WORK	2	36" x 18"	4.5	9.0
		CONVENTIONAL ROAD TRAFFIC CONTROL SIGNS <b>49.0</b> SQFT			

**TYPE 3 BARRICADES**

ITEM DESCRIPTION	QUANTITY
Type 3 Barricade, 8' Single Sided	3 Each





Include pins between existing concrete and new walkway to mitigate the potential for tripping hazards to develop in the future. The pinning design concept is presented in SDDOT Standard Plate 651.01 Type 1 Curb Ramp – see Detail E and associated notes.

<specifications, standard plate(s)>



#### RV Dump Station

Remove outlined area – approximately 140'-4" long x 9' wide including:

- curb & gutter

- signs and posts associated with the dump station

Cap water supply from rest area building; remove above-ground fixtures & plumbing located at the dump station island

Remove waste drain and cap drain line to the wastewater lagoon at the dump station island

Replace concrete pavement (~1263 sq ft) per SDDOT <specifications, standard plate(s)>



Detail of additional removal – approximately 2.5' x 9.5' (~23.8 sq ft)



West End of Rest Area





Location A

Remove and replace 3'-6" x 4' section (~14 sq ft)

Include pins between existing concrete and new walkway to mitigate the potential for tripping hazards to develop in the future. The pinning design concept is presented in SDDOT Standard Plate 651.01 Type 1 Curb Ramp – see Detail E and associated notes.





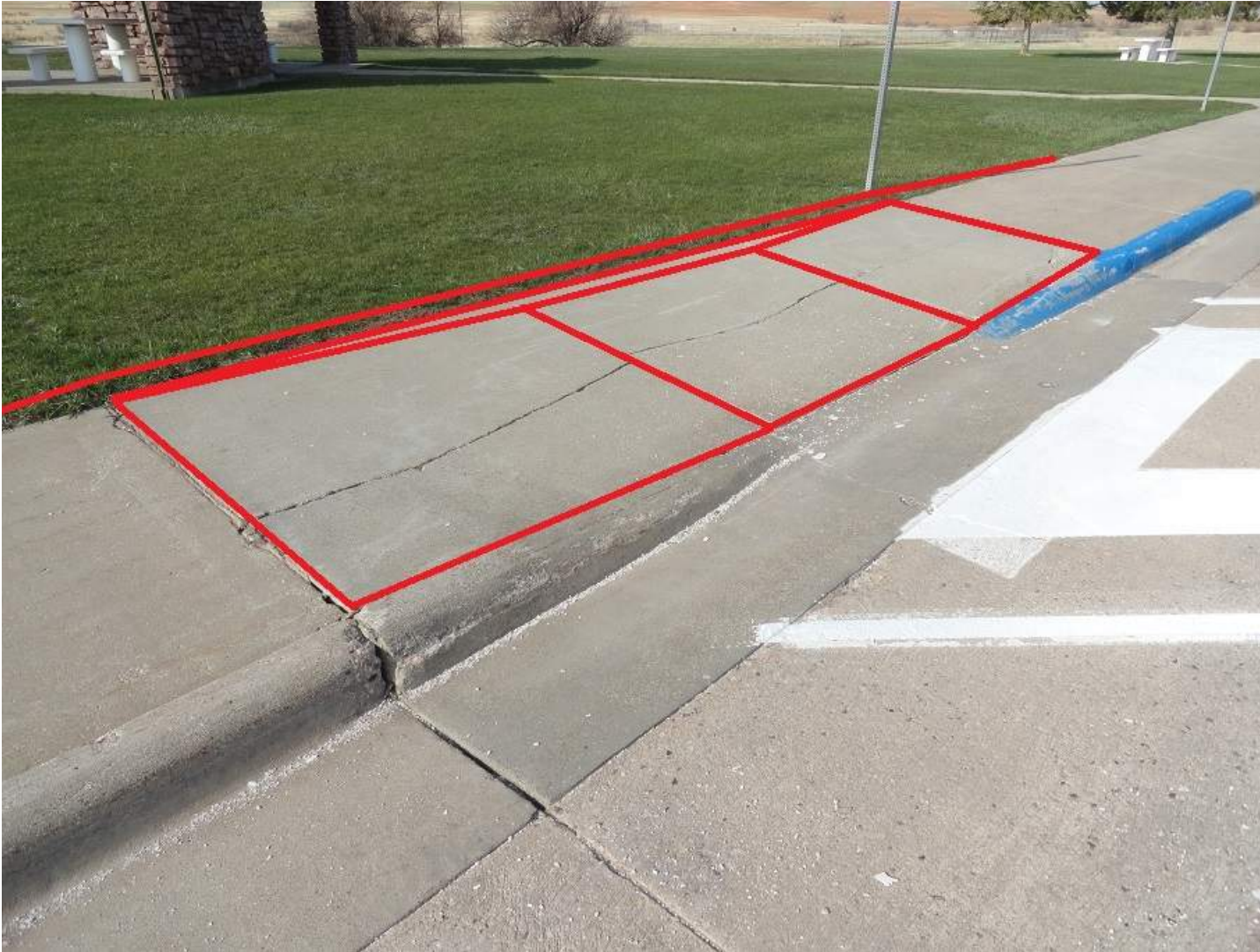
#### Location B

Remove and replace 3'-11" x 4' section adjacent to picnic table slab (~15.7 sq ft)

Include pins between existing concrete and new walkway to mitigate the potential for tripping hazards to develop in the future. The pinning design concept is presented in SDDOT Standard Plate 651.01 Type 1 Curb Ramp – see Detail E and associated notes.



West Central



West ADA access ramp

Install Type 3 Curb Ramp with detectable warnings per SDDOT Plate Number 651.03

Include pins between existing concrete and new walkway to mitigate the potential for tripping hazards to develop in the future. The pinning design concept is presented in SDDOT Standard Plate 651.01 Type 1 Curb Ramp – see Detail E and associated notes.





Location C

Remove and replace trapezoidal section (~22.8 sq ft) and triangular section (~5.3 sq ft)

Include pins between existing concrete and new walkway to mitigate the potential for tripping hazards to develop in the future. The pinning design concept is presented in SDDOT Standard Plate 651.01 Type 1 Curb Ramp – see Detail E and associated notes.





Location D

Remove and replace 4'x10' section (~40 sq ft)

Include pins between existing concrete and new walkway to mitigate the potential for tripping hazards to develop in the future. The pinning design concept is presented in SDDOT Standard Plate 651.01 Type 1 Curb Ramp – see Detail E and associated notes.



Central 1



Central ADA access ramp

Install Type 3 Curb Ramp with detectable warnings per SDDOT Plate Number 651.03

Include pins between existing concrete and new walkway to mitigate the potential for tripping hazards to develop in the future. The pinning design concept is presented in SDDOT Standard Plate 651.01 Type 1 Curb Ramp – see Detail E and associated notes.





#### Waste receptacle station

Place concrete platform for waste receptacles (approximately 16' long x 3' wide - ~48 sq ft)

Waste receptacles to be temporarily removed prior to work and installed on platform after work.

Sprinkler heads and plumbing in platform area to be removed/re-routed/replaced by SDDOT.

Include pins between existing concrete and new walkway to mitigate the potential for tripping hazards to develop in the future. The pinning design concept is presented in SDDOT Standard Plate 651.01 Type 1 Curb Ramp – see Detail E and associated notes.



Location G

Remove and replace 4'-7" x 4' section indicated (~18.3 sq ft)





#### Location I

Cut existing sidewalk to remove triangle section shown (~2.4 sq ft) and replace with concrete as part of waste receptacle platform shown on previous page

Include pins between existing concrete and new walkway to mitigate the potential for tripping hazards to develop in the future. The pinning design concept is presented in SDDOT Standard Plate 651.01 Type 1 Curb Ramp – see Detail E and associated notes.

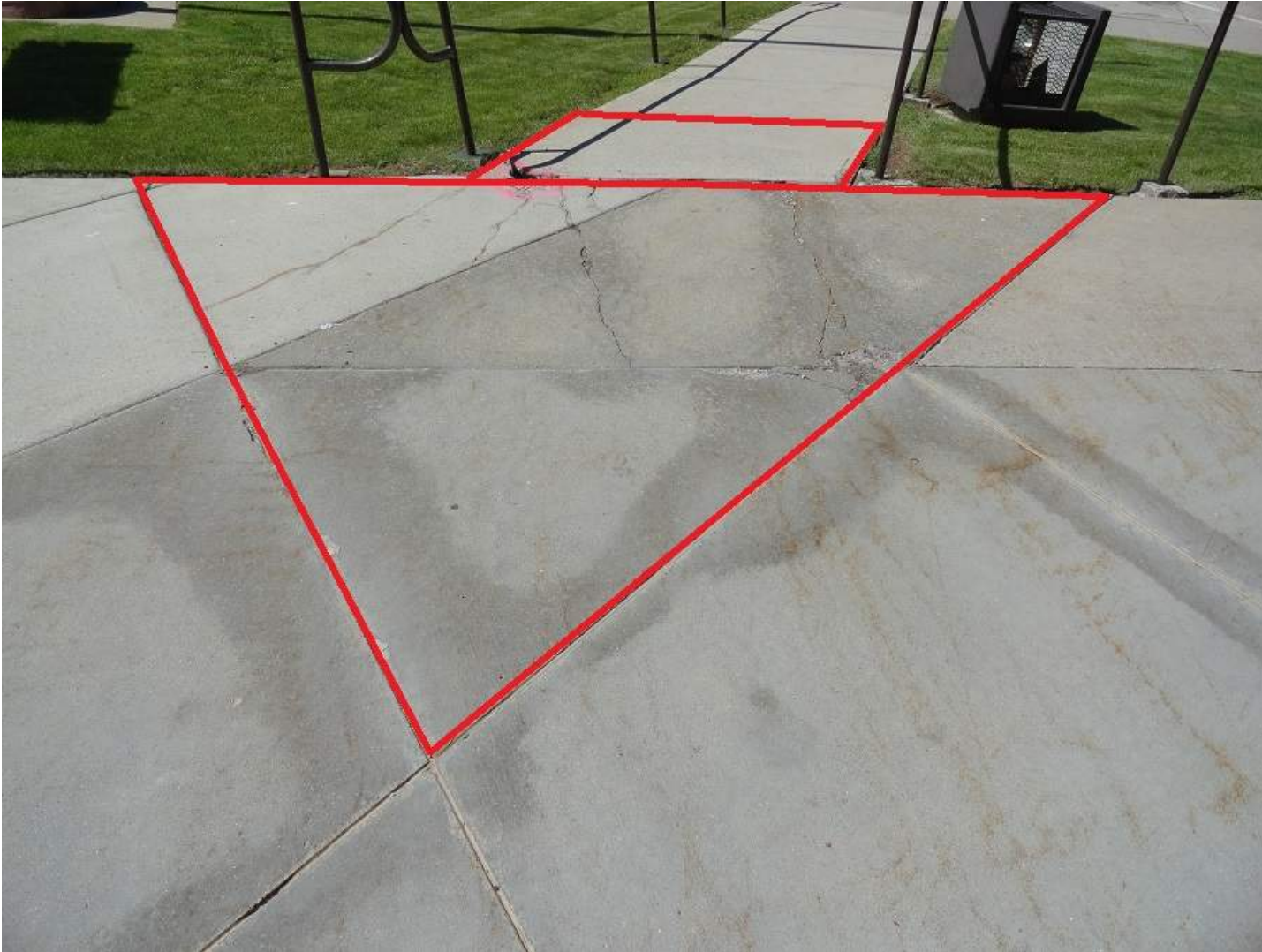


Location U

Cut walkway approximately as shown, remove and replace indicated section (~13.6 sq ft)

Include pins between existing concrete and new walkway to mitigate the potential for tripping hazards to develop in the future. The pinning design concept is presented in SDDOT Standard Plate 651.01 Type 1 Curb Ramp – see Detail E and associated notes.





Location V

Remove and replace triangular area shown (~69.8 sq ft)

Remove and replace trapezoidal area shown (~21.3 sq ft)

Include pins between existing concrete and new walkway to mitigate the potential for tripping hazards to develop in the future. The pinning design concept is presented in SDDOT Standard Plate 651.01 Type 1 Curb Ramp – see Detail E and associated notes.



Main entrance walkway

Remove and replace indicated section (12' avg width x 32' avg length – 384 sq ft)

Include pins between existing concrete and new walkway to mitigate the potential for tripping hazards to develop in the future. The pinning design concept is presented in SDDOT Standard Plate 651.01 Type 1 Curb Ramp – see Detail E and associated notes.





Location J

Remove and replace the indicated sections (~60.4 sq ft)

Include pins between existing concrete and new walkway to mitigate the potential for tripping hazards to develop in the future. The pinning design concept is presented in SDDOT Standard Plate 651.01 Type 1 Curb Ramp – see Detail E and associated notes.



Central 2



Location L

Remove and replace the section indicated (approximately 112 sq ft)

Include pins between existing concrete and new walkway to mitigate the potential for tripping hazards to develop in the future. The pinning design concept is presented in SDDOT Standard Plate 651.01 Type 1 Curb Ramp – see Detail E and associated notes.





Location K-L

Remove and replace the section indicated (5'-1" avg width x 21' avg length – 106.8 sq ft)

Include pins between existing concrete and new walkway to mitigate the potential for tripping hazards to develop in the future. The pinning design concept is presented in SDDOT Standard Plate 651.01 Type 1 Curb Ramp – see Detail E and associated notes.





Location M

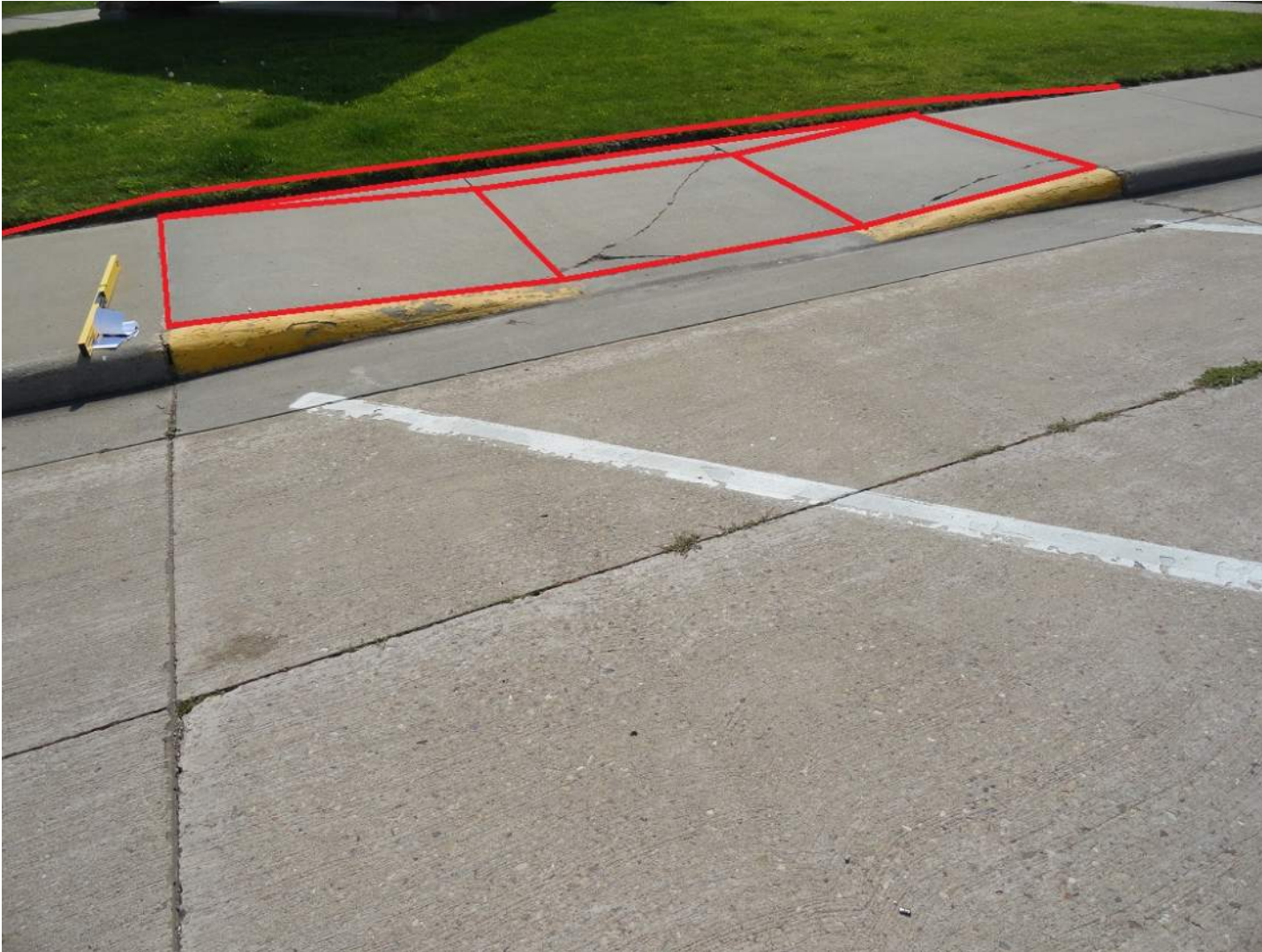
Remove and replace the section indicated (~11.3 sq ft)

Include pins between existing concrete and new walkway to mitigate the potential for tripping hazards to develop in the future. The pinning design concept is presented in SDDOT Standard Plate 651.01 Type 1 Curb Ramp – see Detail E and associated notes.



East Central





East access ramp

Install Type 3 Curb Ramp with detectable warnings per SDDOT Plate Number 651.03

Include pins between existing concrete and new walkway to mitigate the potential for tripping hazards to develop in the future. The pinning design concept is presented in SDDOT Standard Plate 651.01 Type 1 Curb Ramp – see Detail E and associated notes.



Location P

Remove and replace the indicated section (~40 sq ft)

Include pins between existing concrete and new walkway to mitigate the potential for tripping hazards to develop in the future. The pinning design concept is presented in SDDOT Standard Plate 651.01 Type 1 Curb Ramp – see Detail E and associated notes.





Location P

Remove and replace the indicated section (~15.7 sq ft)

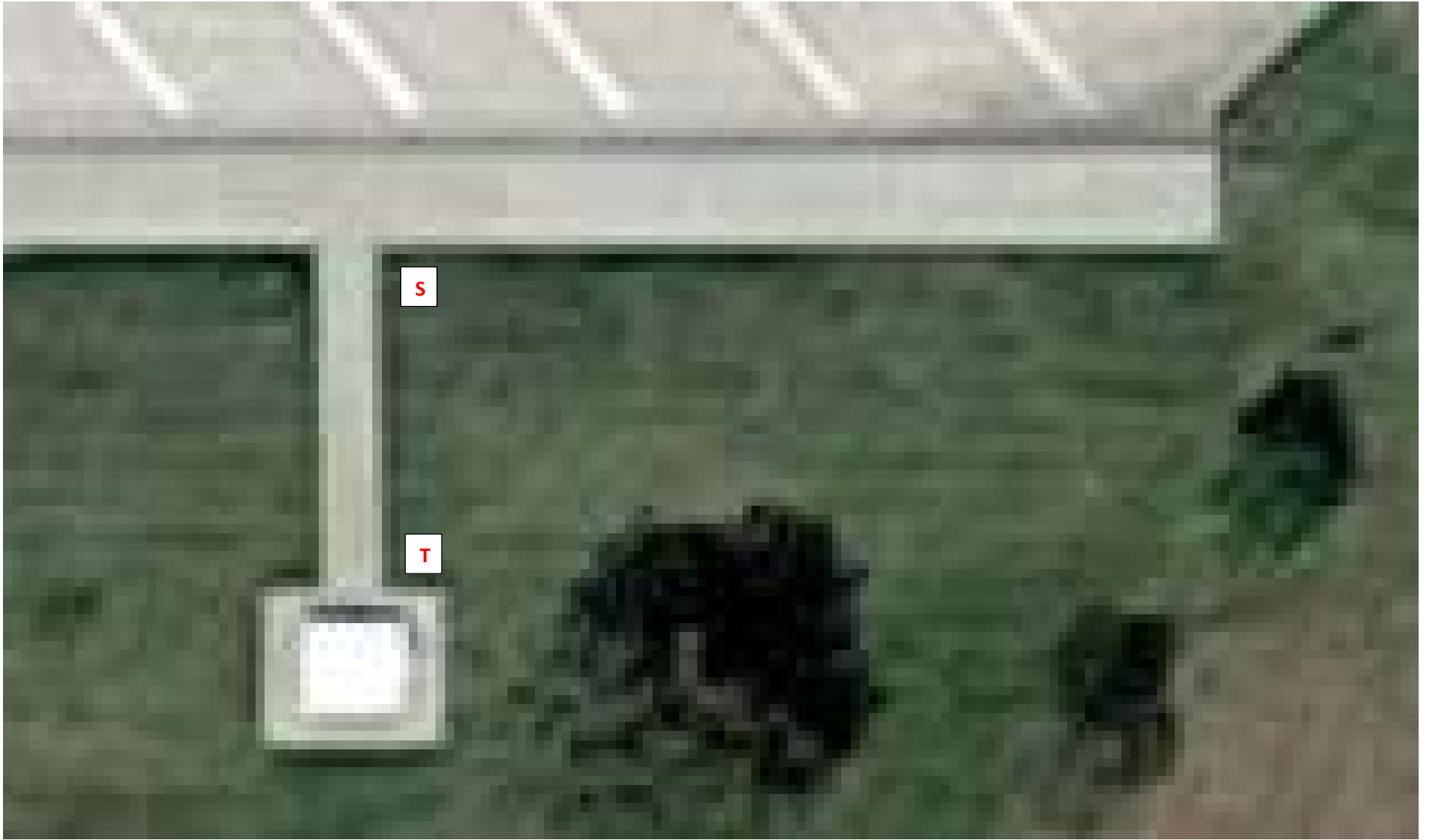
Include pins between existing concrete and new walkway to mitigate the potential for tripping hazards to develop in the future. The pinning design concept is presented in SDDOT Standard Plate 651.01 Type 1 Curb Ramp – see Detail E and associated notes.



#### Location Q

Remove and replace the two rectangular sections indicated (~76.0 sq ft total)

Include pins between existing concrete and new walkway to mitigate the potential for tripping hazards to develop in the future. The pinning design concept is presented in SDDOT Standard Plate 651.01 Type 1 Curb Ramp – see Detail E and associated notes.



East





Location S

Remove and replace the section indicated (~13.0 sq ft)

Include pins between existing concrete and new walkway to mitigate the potential for tripping hazards to develop in the future. The pinning design concept is presented in SDDOT Standard Plate 651.01 Type 1 Curb Ramp – see Detail E and associated notes.

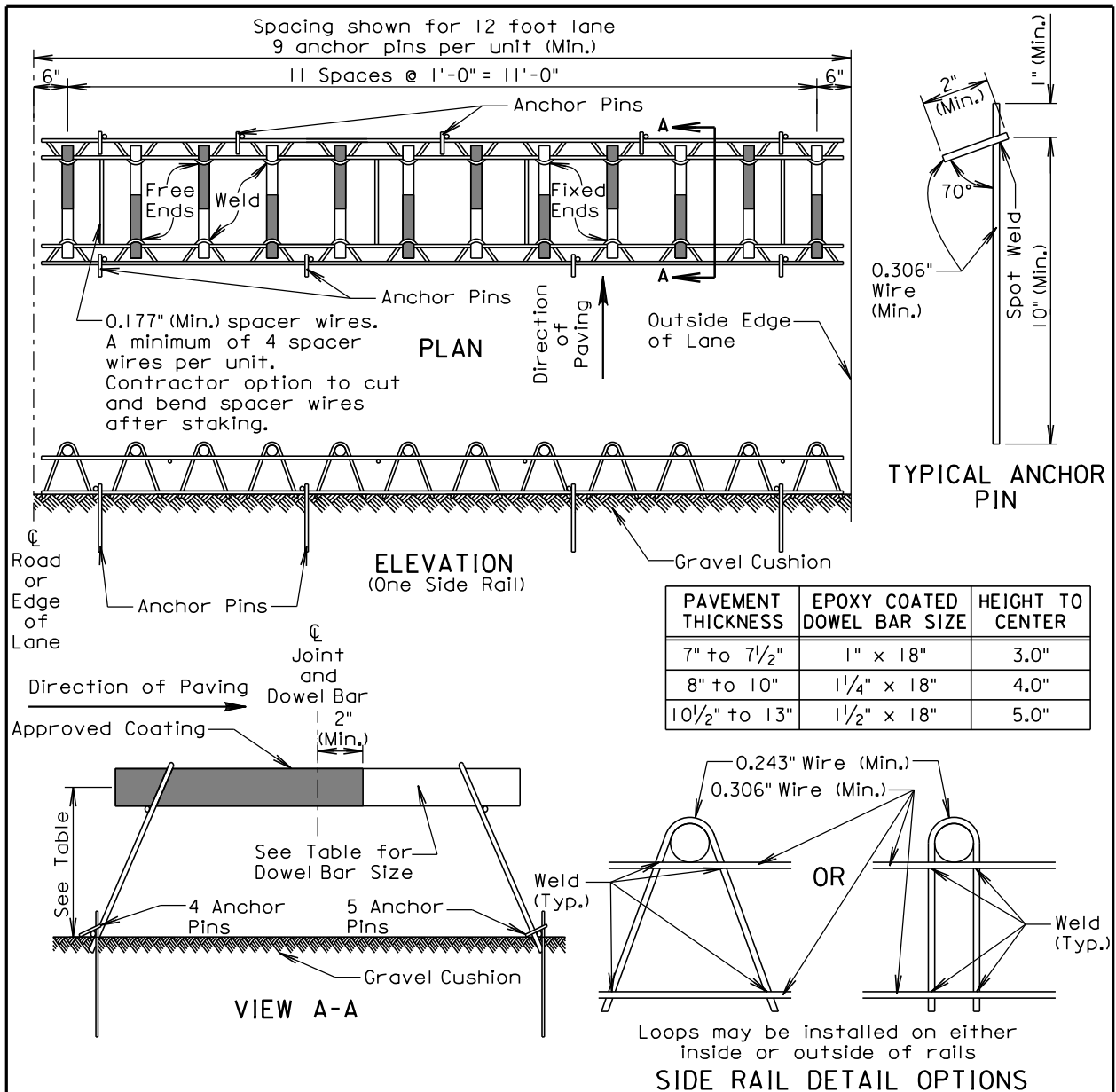


Location T

Remove and replace the section indicated (~16.3 sq ft)

Include pins between existing concrete and new walkway to mitigate the potential for tripping hazards to develop in the future. The pinning design concept is presented in SDDOT Standard Plate 651.01 Type 1 Curb Ramp – see Detail E and associated notes.





#### 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.

June 9, 2017

Published Date: 3rd Qtr. 2018

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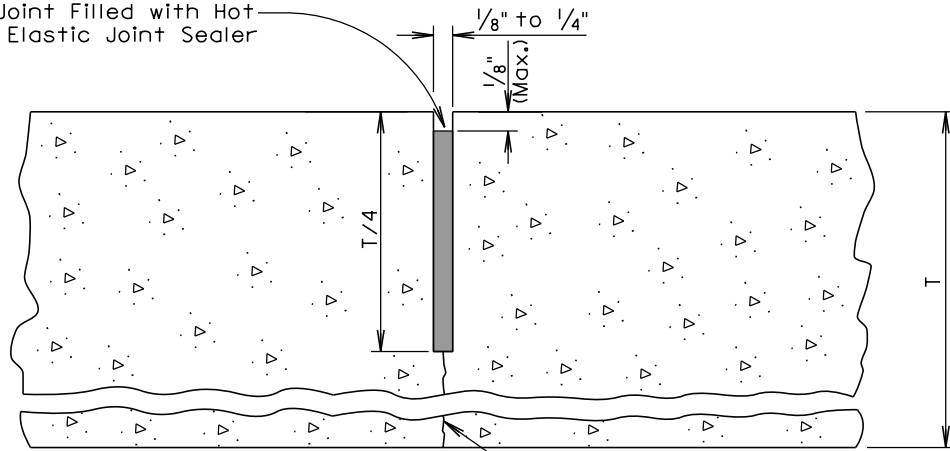
**PCC PAVEMENT DOWEL BAR ASSEMBLY  
FOR TRANSVERSE CONTRACTION JOINTS  
12 Bar Assembly on Granular Base Material**

**PLATE NUMBER  
380.01**

Sheet 1 of 1



Sawed Joint Filled with Hot  
Poured Elastic Joint Sealer



T = Pavement Thickness

Line of Fracture

#### GENERAL NOTES:

If an early entrance sawcut does not develop the full transverse crack, then the saw cut to control cracking shall be a minimum of  $\frac{1}{4}$  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, 2015

Published Date: 3rd Qtr. 2018

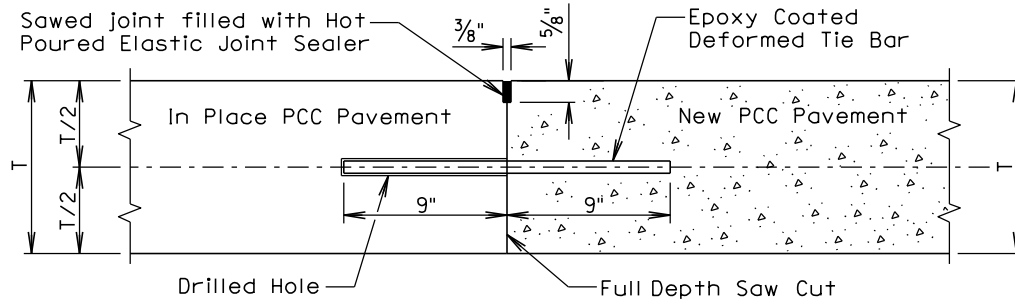
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**PCC PAVEMENT TRANSVERSE CONTRACTION  
JOINT WITH OR WITHOUT DOWEL BAR ASSEMBLY**

**PLATE NUMBER  
380.05**

Sheet 1 of 1

### DETAIL A TRANSVERSE CONSTRUCTION JOINT WITH TIE BARS



T = In Place PCC Pavement and New PCC Pavement Thickness

#### GENERAL NOTES:

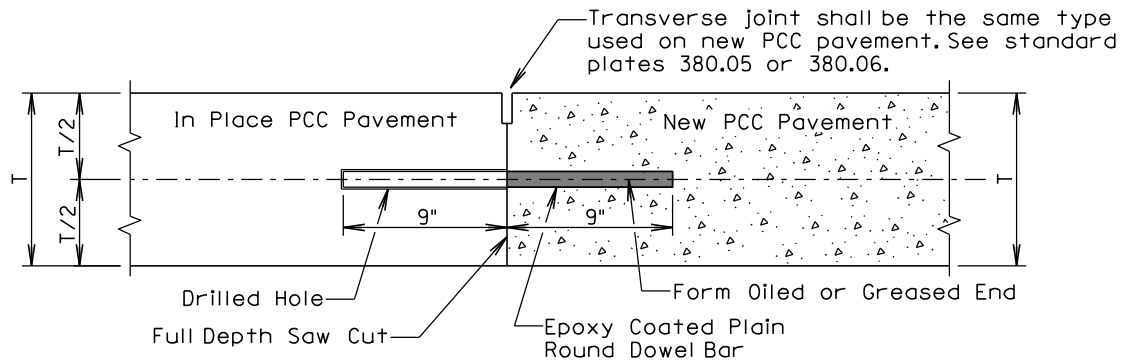
The term "In Place PCC Pavement" in the above drawing indicates that the in place PCC pavement was placed on a previous project.

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

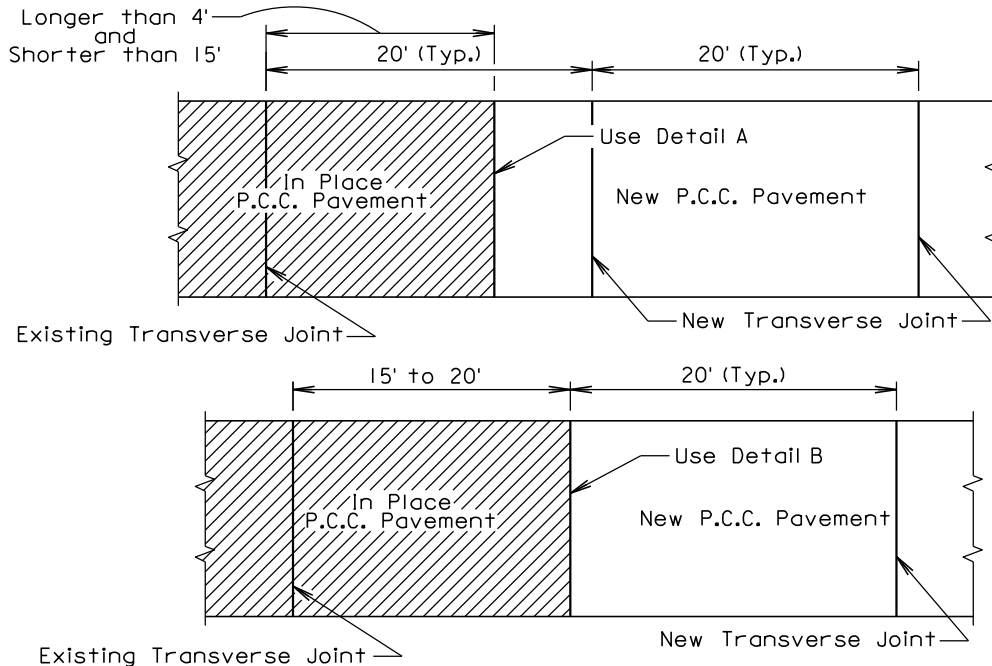
Published Date: 3rd Qtr. 2018

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**PCC PAVEMENT TRANSVERSE CONSTRUCTION  
JOINTS WITH TIE BARS OR DOWEL BARS**

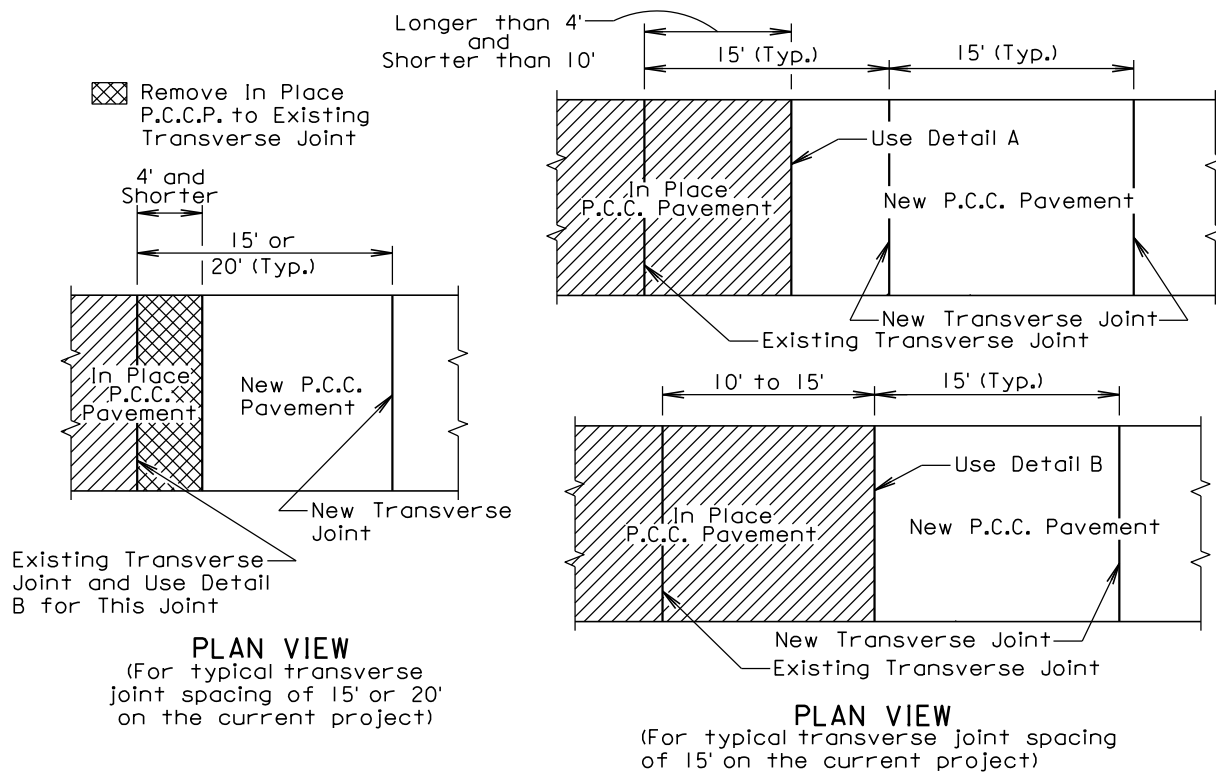
**PLATE NUMBER  
380.08**

Sheet 1 of 2



### PLAN VIEW

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



September 6, 2013

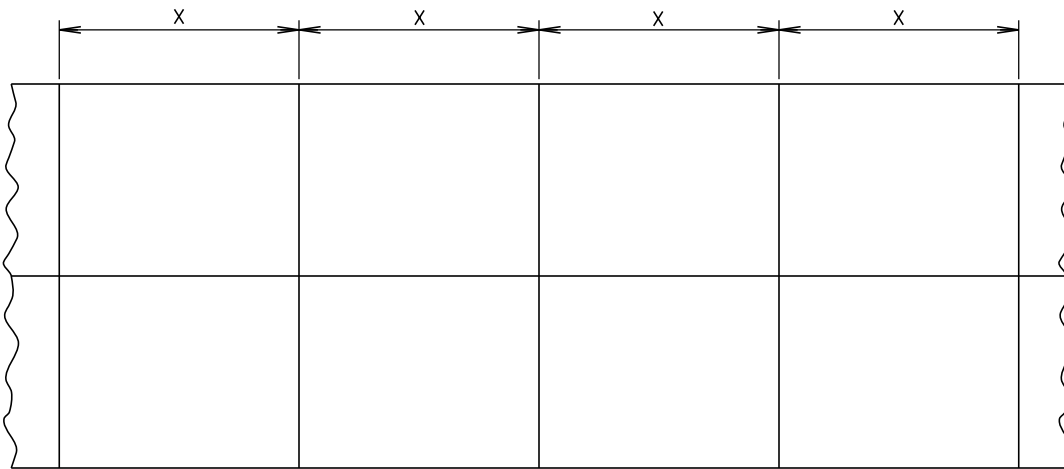
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**PCC PAVEMENT TRANSVERSE CONSTRUCTION  
JOINTS WITH TIE BARS OR DOWEL BARS**

**PLATE NUMBER  
380.08**

Sheet 2 of 2



PCCP Thickness	Transverse Contraction Joint Spacing (X)
8" to 9.5"	15'
10" and Thicker	20'

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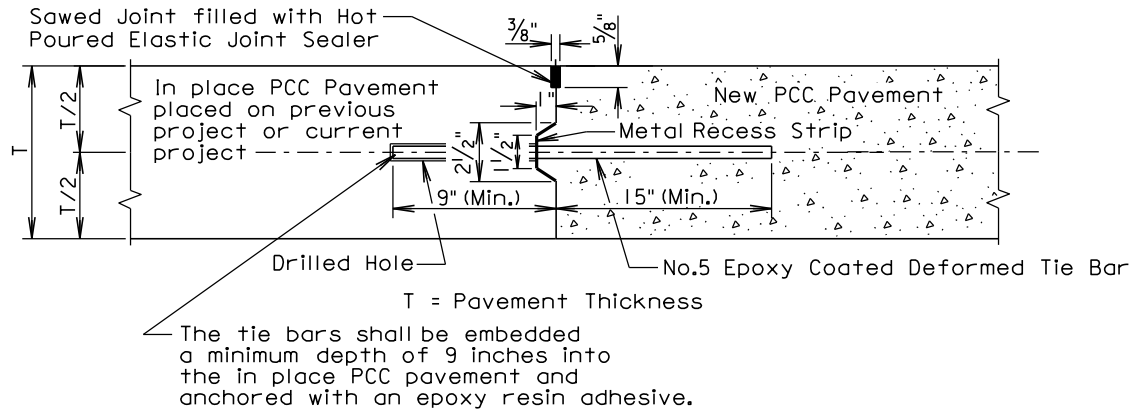
**PCC PAVEMENT TYPICAL  
CONTRACTION JOINT SPACING**

**PLATE NUMBER  
380.09**

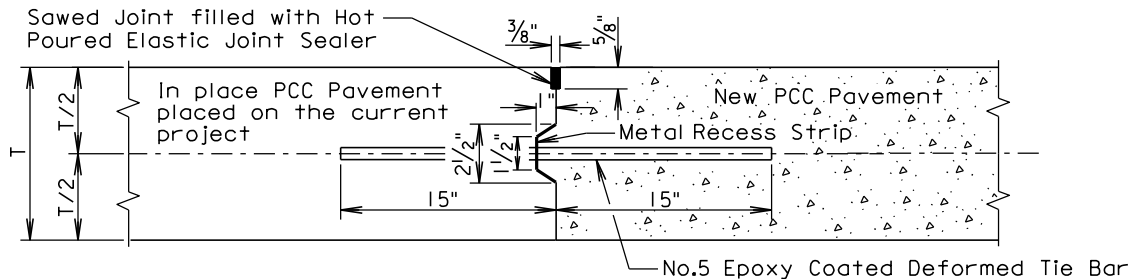
Sheet 1 of 1



## LONGITUDINAL CONSTRUCTION JOINT WITH TIE BARS (DRILLED IN BARS)



## 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: 3rd Qtr. 2018*

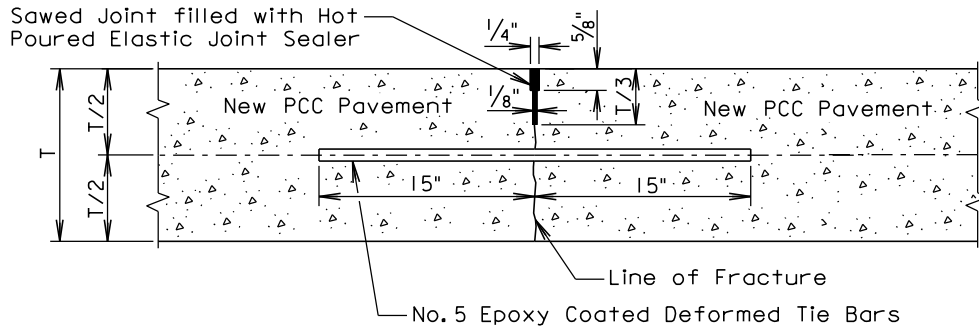
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**PCC PAVEMENT LONGITUDINAL  
JOINTS WITH TIE BARS**

**PLATE NUMBER  
380.10**

Sheet 1 of 2

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



T = Pavement Thickness

### 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

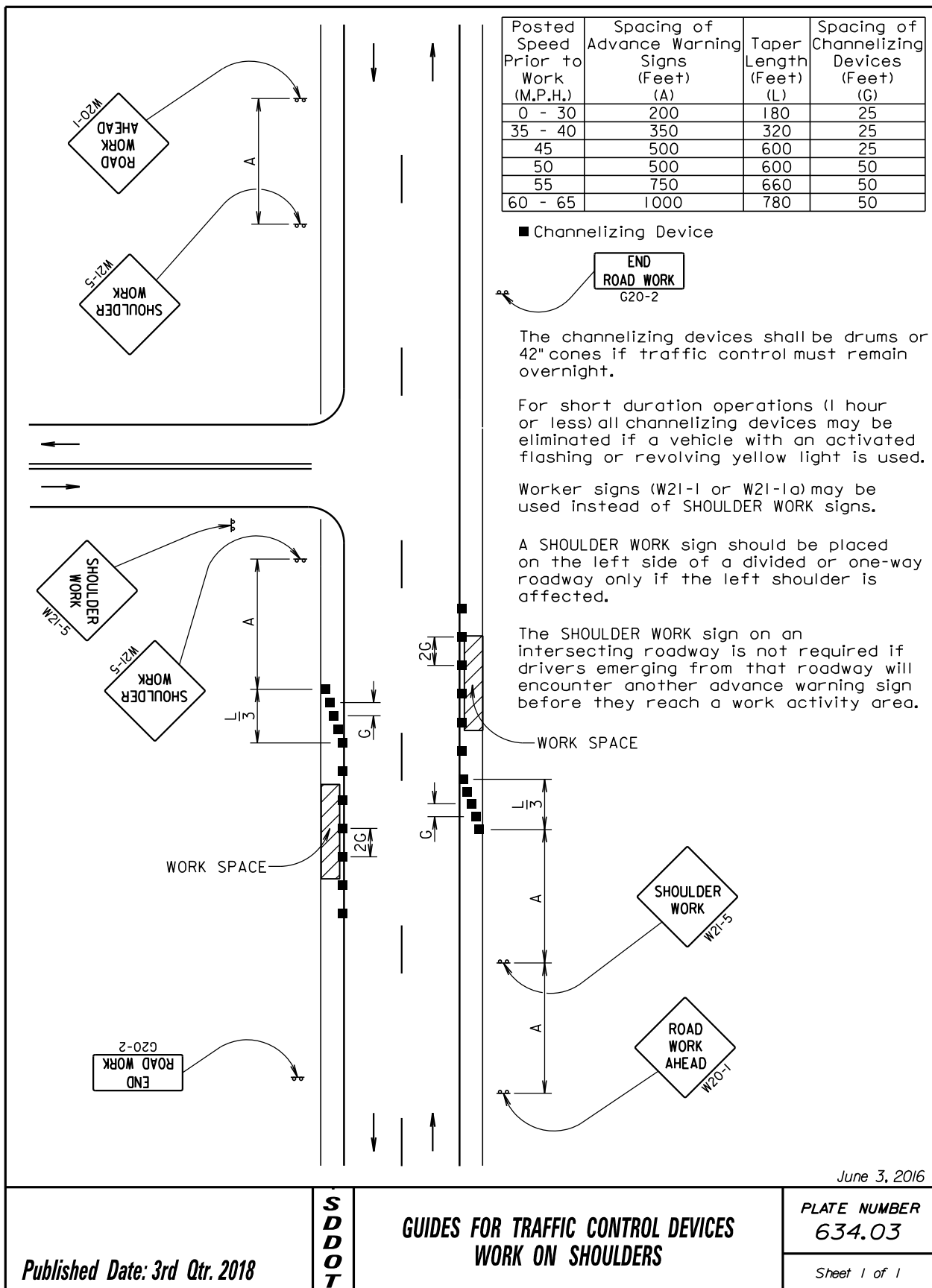
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**PCC PAVEMENT LONGITUDINAL  
JOINTS WITH TIE BARS**

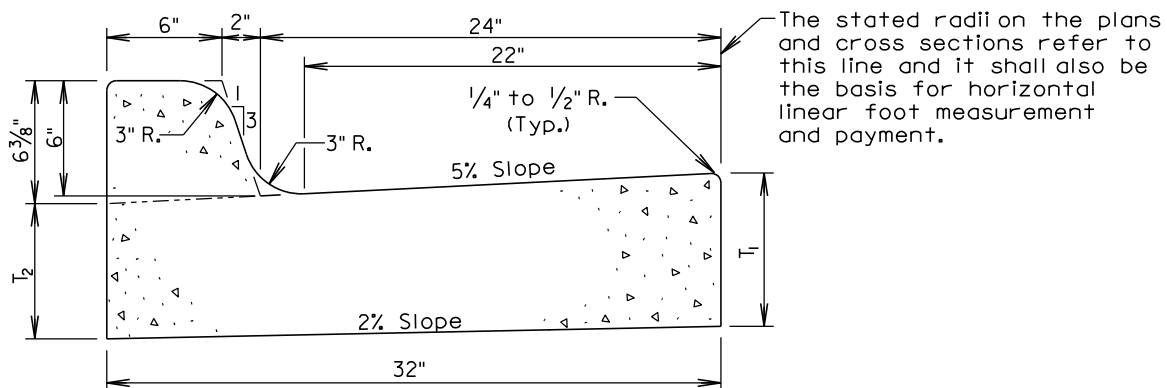
**PLATE NUMBER  
380.10**

Sheet 2 of 2









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

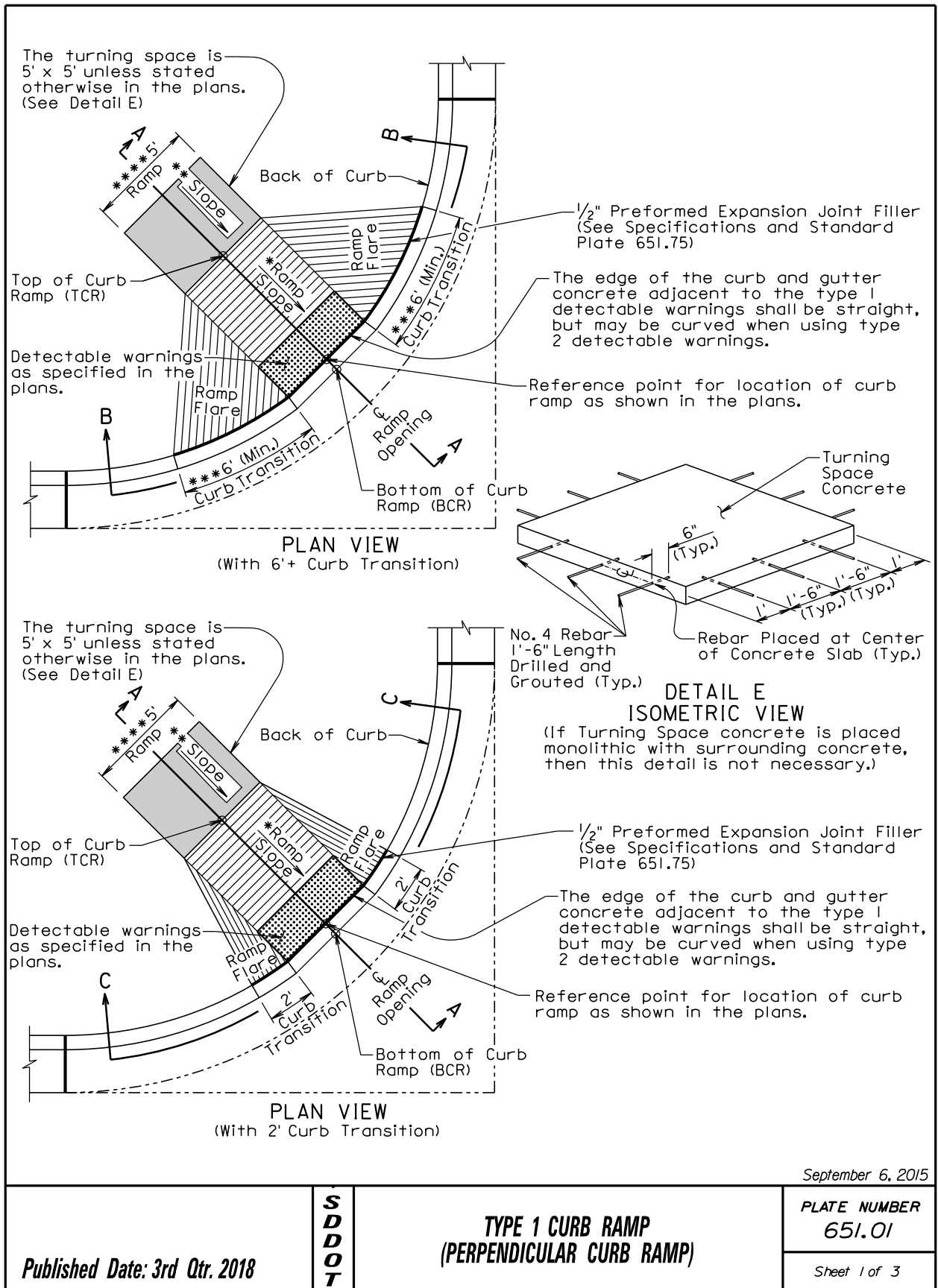
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**TYPE B CONCRETE CURB AND GUTTER**

**PLATE NUMBER  
650.01**

Sheet 1 of 1



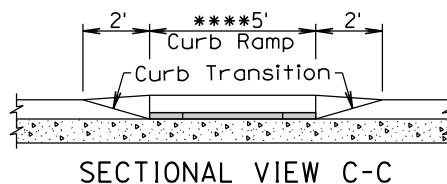
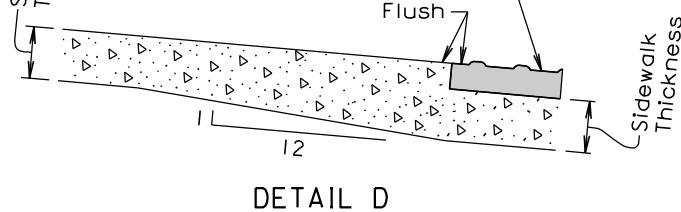
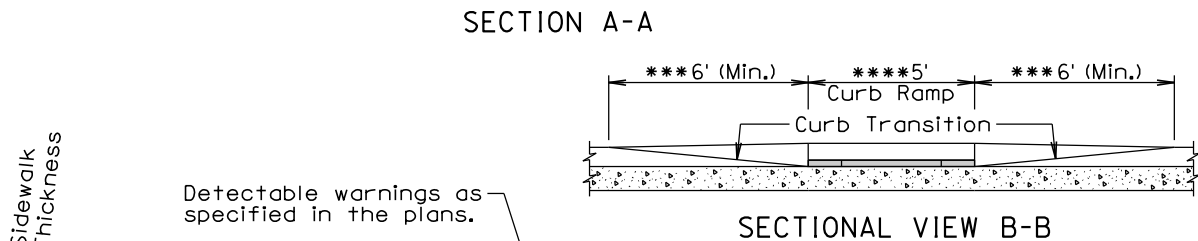
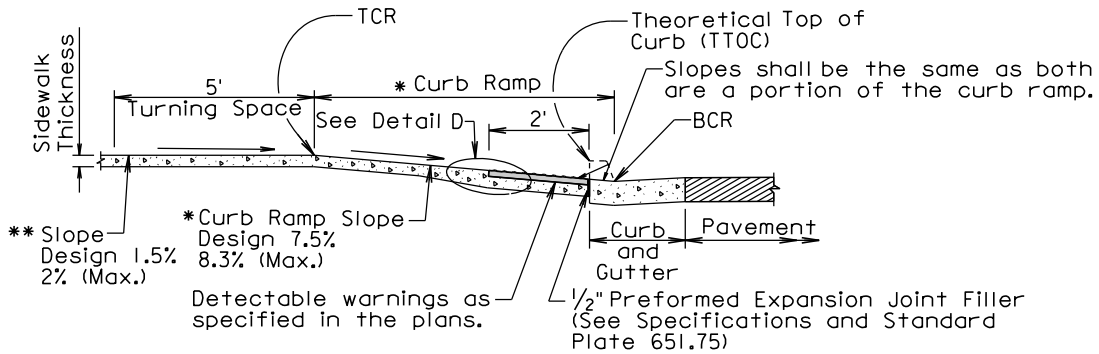


Curb ramp slopes are designed at 7.5% unless stated otherwise in the plans. The curb ramp may have a maximum slope of 8.3% and shall not exceed 15' in length unless stated otherwise in the plans.

- \* The curb ramp length may be computed based on the intersection of a continuous 1.5% theoretical slope from theoretical top of curb (TTOC) with the curb ramp using a continuous 7.5% curb ramp slope. The elevation of point TCR shall always be higher than the elevation of point TTOC unless specified otherwise in the plans. The curb ramp length dimension as shown in the plans shall be adjusted as necessary to meet all slope and length requirements based on field geometrics.

The cross slope of the ramp shall not be steeper than 2%. Plans are designed using a 1.5% slope unless stated otherwise in the plans.

- \*\* The slope in the turning space shall not be steeper than 2% in any direction of pedestrian travel. Plans are designed using a 1.5% slope unless stated otherwise in the plans.
- \*\*\* The curb transition shall be a minimum of 6' long, a maximum of 10' long, and the curb transition slope shall not be steeper than 10% unless stated otherwise in the plans. The curb transition length shall be adjusted as necessary to meet slope and length requirements based on field geometrics.
- \*\*\*\* The ramp width is 5' unless stated otherwise in the plans.



September 6, 2015

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**TYPE 1 CURB RAMP  
(PERPENDICULAR CURB RAMP)**

**PLATE NUMBER  
651.01**

Sheet 2 of 3

**GENERAL NOTES:**

For illustrative purpose only, type 1 detectable warnings are shown in the drawings.

For illustrative purpose only, PCC fillet sections are shown in the drawings. The curb ramp depicted on this standard plate may be used with a PCC fillet section or curb and gutter.

For illustrative purpose only, the curb ramp location is shown at the center of a PCC fillet section. The curb ramp shall be placed at the location stated in the plans.

Sidewalk shall not be placed adjacent to the curb ramp flares when a 2' curb transition is used unless shown otherwise in the plans.

\* Care shall be taken to ensure a uniform grade on the curb ramp, free of sags and short grade changes.

Surface texture of the curb ramp shall be obtained by coarse brooming transverse to the slope of the curb ramp.

The normal gutter line profile shall be maintained through the area of the ramp opening.

Joints shall be sawed or tooled into the concrete adjacent to the detectable warnings to alleviate possible corner cracking.

Care shall be taken to ensure that the surface of the detectable warnings are clean and maintains a uniform color.

The detectable warnings shall be cut as necessary to fit the plan specified limits of the detectable warnings. Cost for cutting the detectable warnings shall be incidental to the corresponding detectable warning bid item.

There will be no separate payment for curb ramps. The curb ramp shall be measured and paid for at the contract unit price per square foot for the corresponding concrete sidewalk bid item. The square foot area of the detectable warnings shall be included in the measured and paid for quantity of sidewalk.

If rebar is placed in the Turning Space as depicted in DETAIL E, the cost of the materials, labor, and equipment to furnish and install the rebar shall be incidental to the contract unit price per square foot for the corresponding concrete sidewalk bid item.

The curb transitions and ramp opening shall be measured and paid for at the contract unit price per foot for the corresponding curb and gutter bid item when curb and gutter is used. The curb transitions and ramp opening shall be measured and paid for at the contract unit price per square yard for the corresponding PCC fillet section bid item when a PCC fillet section is used.

The type 1 detectable warnings shall be measured to the nearest square foot. All costs for furnishing and installing the type 1 detectable warnings including labor, equipment, materials, and incidentals shall be paid for at the contract unit price per square foot for "Type 1 Detectable Warnings".

The type 2 detectable warnings shall be measured to the nearest square foot. All costs for furnishing and installing the type 2 detectable warnings including labor, equipment, and materials, including adhesive, necessary sealant or grout, and necessary grinding shall be paid for at the contract unit price per square foot for "Type 2 Detectable Warnings".

September 6, 2015

*Published Date: 3rd Qtr. 2018*

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**TYPE 1 CURB RAMP  
(PERPENDICULAR CURB RAMP)**

**PLATE NUMBER  
651.01**

*Sheet 3 of 3*



**TYPE 3 CURB RAMP  
(PARALLEL CURB RAMP)**



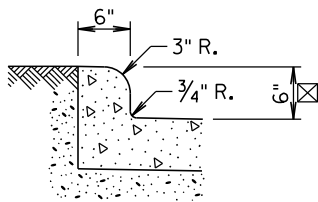
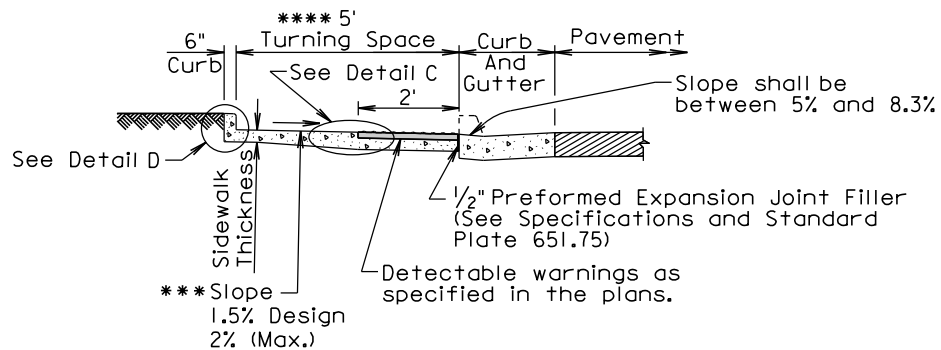
\* The curb transition slope shall match the curb ramp slope. Curb ramp slopes are designed at 7.5% unless stated otherwise in the plans. The curb ramp may have a maximum slope of 8.3% at any location of the curb ramp and shall not exceed 15' in length unless stated otherwise in the plans. The curb transitions and curb ramp lengths shall be adjusted as necessary to meet all slope and length requirements based on field geometrics.

\*\* The cross slope of the ramp shall not be steeper than 2% and the ramp width is 5' unless stated otherwise in the plans. Plans are designed using a 1.5% cross slope for the ramp unless stated otherwise in the plans.

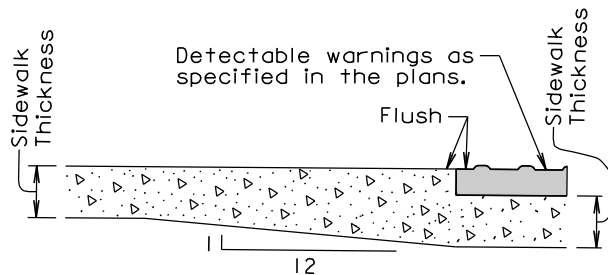
\*\*\* The slope in the turning space shall not be steeper than 2% in any direction of pedestrian travel. Plans are designed using a 1.5% slope unless stated otherwise in the plans.

\*\*\*\* The turning space is 5' x 5' unless stated otherwise in the plans.

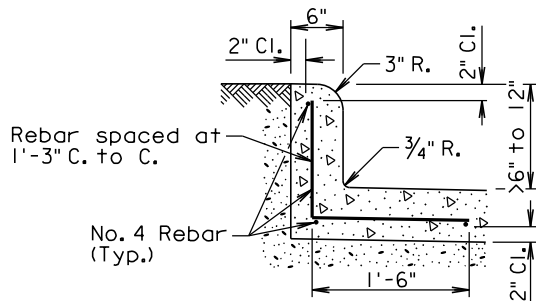
☒ The curb height shall be 6" unless stated otherwise in the plans.



DETAIL D

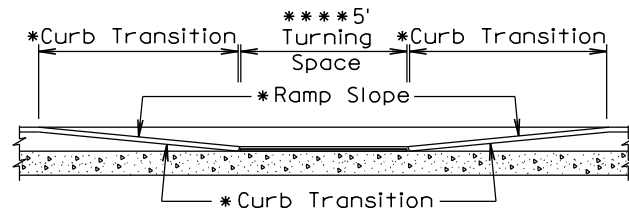


DETAIL C



DETAIL D

(Use this detail when the curb height is greater than 6" and less than 12")



SECTIONAL VIEW B-B

September 6, 2015

Published Date: 3rd Qtr. 2018

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**TYPE 3 CURB RAMP  
(PARALLEL CURB RAMP)**

**PLATE NUMBER  
651.03**

Sheet 2 of 3

**GENERAL NOTES:**

For illustrative purpose only, type 1 detectable warnings are shown in the drawings.

For illustrative purpose only, a PCC fillet section is shown in one of the drawings. The curb ramp depicted on this standard plate may be used with a PCC fillet section or with curb and gutter.

The curb ramp shall be placed at the location stated in the plans.

Sidewalk adjacent to the curb ramp shall be as shown in the plans.

Care shall be taken to ensure a uniform grade on the curb ramp, free of sags and short grade changes.

Surface texture of the curb ramp shall be obtained by coarse brooming transverse to the slope of the curb ramp.

The normal gutter line profile shall be maintained through the area of the ramp opening.

Joints shall be sawed or tooled into the concrete adjacent to the detectable warnings to alleviate possible corner cracking (see plan view for joint location).

Care shall be taken to ensure that the surface of the detectable warnings are clean and maintains a uniform color.

The detectable warnings shall be cut as necessary to fit the plan specified limits of the detectable warnings. Cost for cutting the detectable warnings shall be incidental to the corresponding detectable warning bid item.

When curb height is greater than 6" and less than 12", reinforcing steel is required in accordance with the detail on sheet 2 of 3. The reinforcing steel shall conform to ASTM A615, Grade 60. Cost for furnishing and installing the reinforcing steel shall be incidental to the contract unit price per square foot for the corresponding concrete sidewalk bid item.

There will be no separate payment for curb ramps. The curb ramp shall be measured and paid for at the contract unit price per square foot for the corresponding concrete sidewalk bid item. The square foot area of the detectable warnings and the curb along the short radius shall be included in the measured and paid for quantity of sidewalk.

The curb transitions and ramp opening shall be measured and paid for at the contract unit price per foot for the corresponding curb and gutter bid item when curb and gutter is used. The curb transitions and ramp opening shall be measured and paid for at the contract unit price per square yard for the corresponding PCC fillet section bid item when a PCC fillet section is used.

The type 1 detectable warnings shall be measured to the nearest square foot. All costs for furnishing and installing the type 1 detectable warnings including labor, equipment, materials, and incidentals shall be paid for at the contract unit price per square foot for "Type 1 Detectable Warnings".

The type 2 detectable warnings shall be measured to the nearest square foot. All costs for furnishing and installing the type 2 detectable warnings including labor, equipment, and materials, including adhesive, necessary sealant or grout, and necessary grinding shall be paid for at the contract unit price per square foot for "Type 2 Detectable Warnings".

September 6, 2015

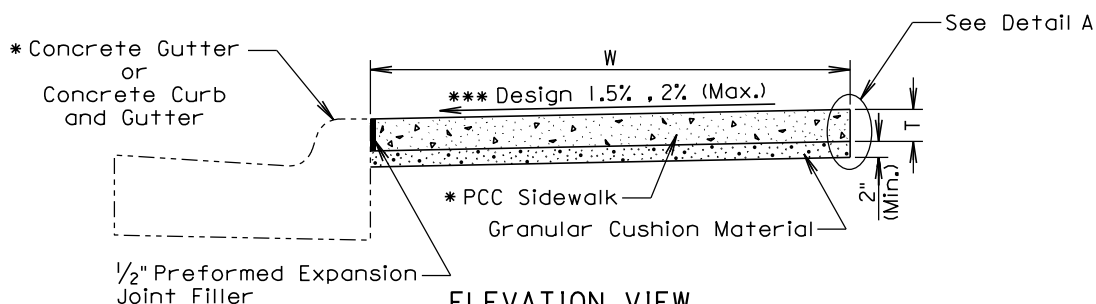
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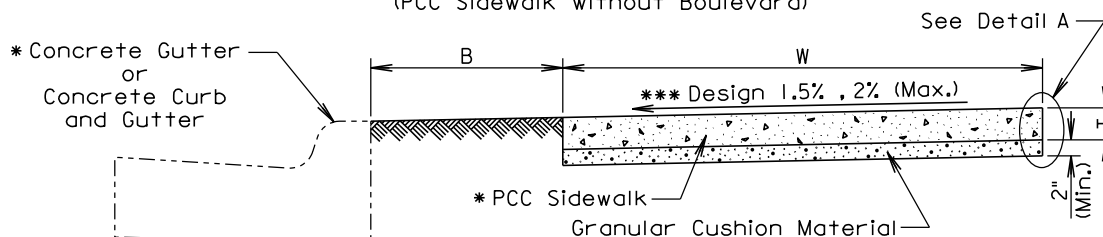
**TYPE 3 CURB RAMP  
(PARALLEL CURB RAMP)**

**PLATE NUMBER  
651.03**

*Sheet 3 of 3*

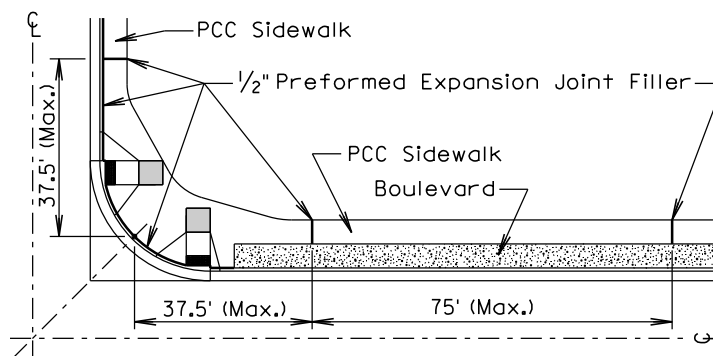


**ELEVATION VIEW**  
(PCC Sidewalk without Boulevard)



**ELEVATION VIEW**  
(PCC Sidewalk with Boulevard)

- B Width of boulevard as specified in the plans.  
 T Thickness of PCC sidewalk as specified in the plans.  
 W Width of PCC sidewalk as specified in the plans.  
 \* Type as specified in the plans.



**PLAN VIEW**

**GENERAL NOTES:**

The PCC sidewalk shall be constructed in accordance with Section 651 of the Specifications.

\*\*\*The cross slope of the sidewalk is designed at 1.5% and the maximum slope allowed is 2% unless specified otherwise in the plans.

The maximum length between expansion joints in PCC sidewalk is 75 feet.

PCC sidewalk placed adjacent to intersection of roadways shall have an expansion joint placed transversely a maximum of 37.5 feet from the intersection. See PLAN VIEW.

An expansion joint in PCC sidewalk shall consist of a 1/2 inch thick preformed expansion joint filler material placed full depth and width of the PCC sidewalk.

\*\* Large areas of PCC pavement adjacent to PCC sidewalk may require a different joint treatment than shown in the detail. If a different joint detail is necessary, plans will contain the joint detail and the Contractor shall construct the joint treatment in accordance with the plans.

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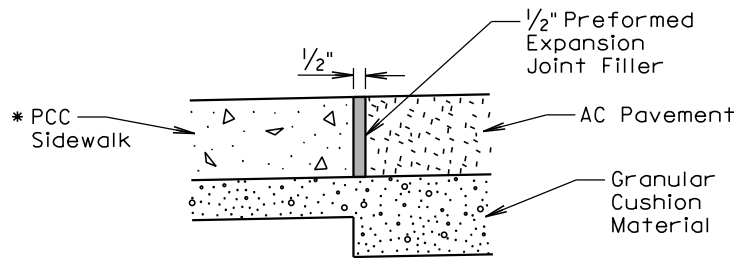
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**PCC SIDEWALK**

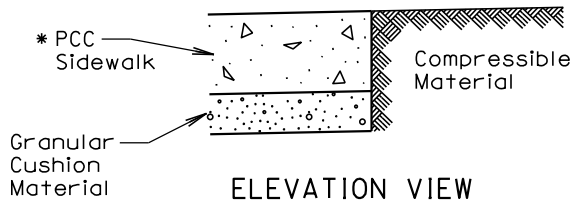
**PLATE NUMBER**  
**651.75**

Sheet 1 of 2

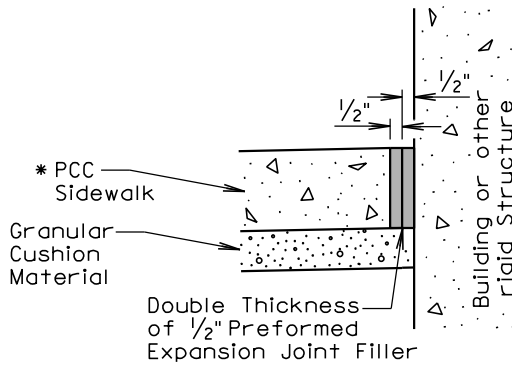




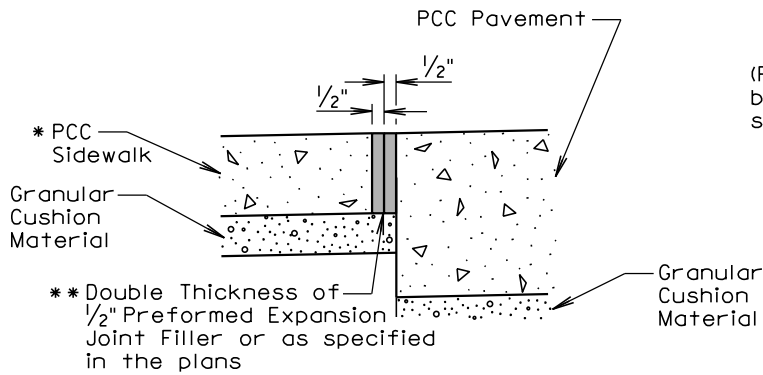
**ELEVATION VIEW**  
(PCC sidewalk adjacent to asphalt concrete pavement)



**ELEVATION VIEW**  
(PCC sidewalk adjacent to earthen material, landscape rock, or other compressible materials)



**ELEVATION VIEW**  
(PCC sidewalk adjacent to building or other rigid structure)



**ELEVATION VIEW**  
(PCC sidewalk adjacent to PCC pavement)

**Detail A**  
(Use Appropriate Detail(s))

September 6, 2015

Published Date: 3rd Qtr. 2018

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**PCC SIDEWALK**

**PLATE NUMBER**  
**651.75**

Sheet 2 of 2