

STATE OF SOUTH DAKOTA  
DEPARTMENT OF TRANSPORTATION

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM-NH-P 0023(44)	1	67

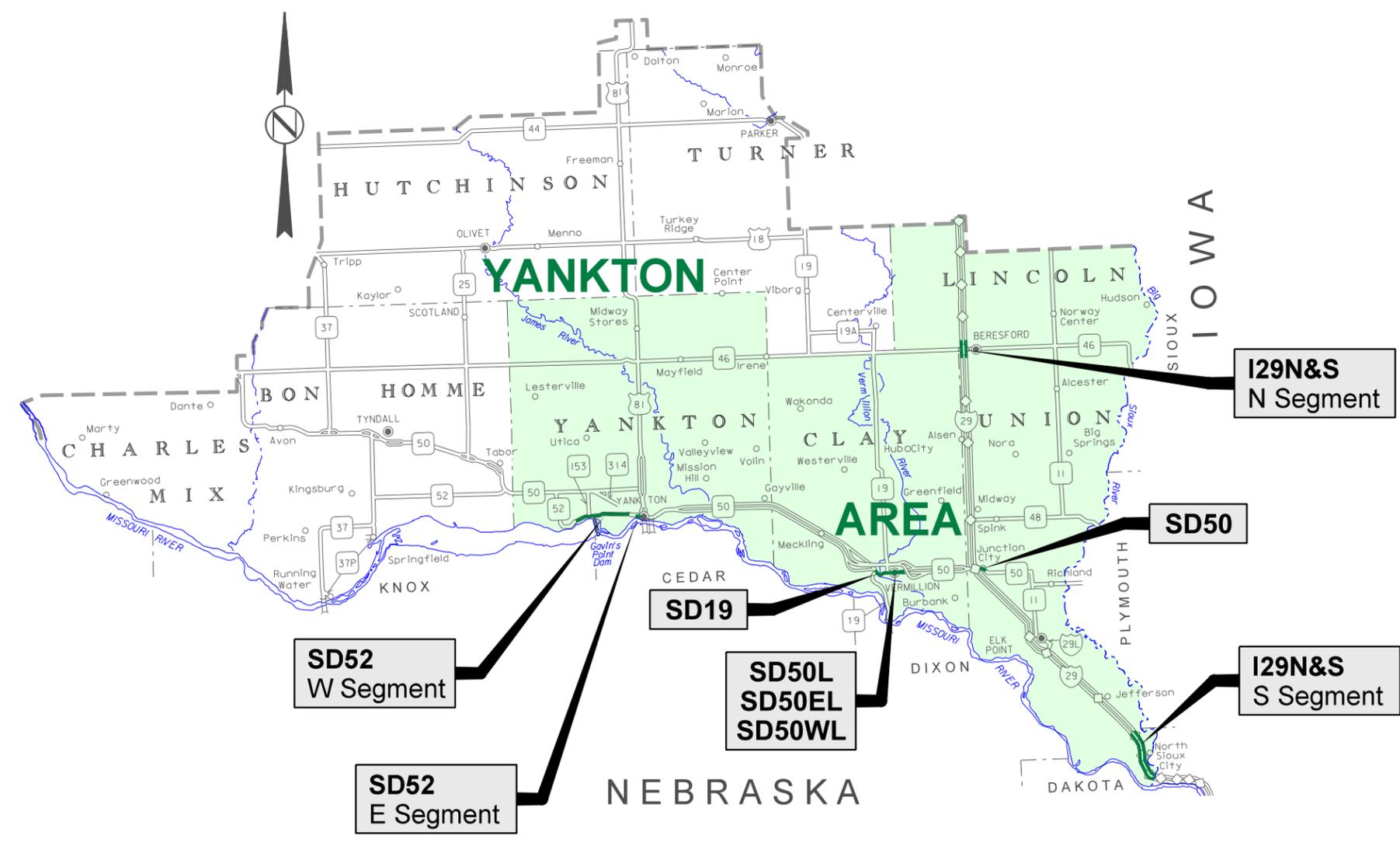
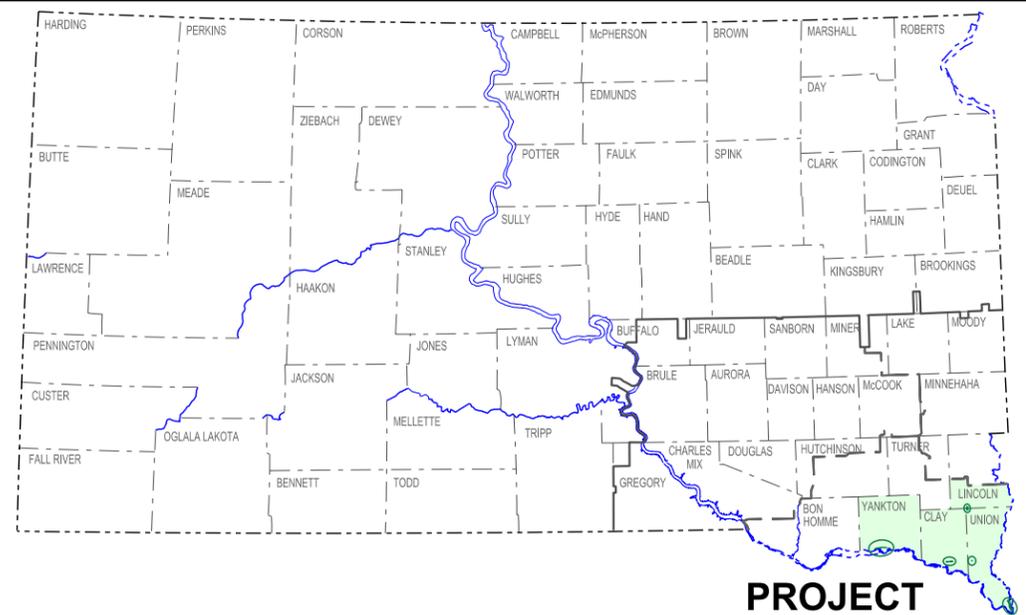
Rev (prj# on all sheets) 2-22-16 MR

PLANS FOR PROPOSED

PROJECT IM-NH-P 0023(44)  
INTERSTATE 29N & 29S,  
SD HIGHWAYS 19, 50, 50L, 50EL, 50WL & 52  
CLAY, LINCOLN, UNION & YANKTON COUNTIES  
YANKTON AREA  
PCC PAVEMENT REPAIR  
PCN 052V

INDEX OF SHEETS

Sheet 1	Title Sheet
Sheets 2 - 5	Layout Maps
Sheets 6 & 7	Estimate of Quantities
Sheet 8	Environmental Commitments
Sheets 9 - 13	Plan Notes
Sheets 14 - 39	Tables for NRC Pavement Repair
Sheets 40- 54	Traffic Control
Sheets 55 - 59	NRC Pavement Repair Details
Sheets 60 - 63	Misc. Pavement Repair Details
Sheets 64 - 67	Standard Plates

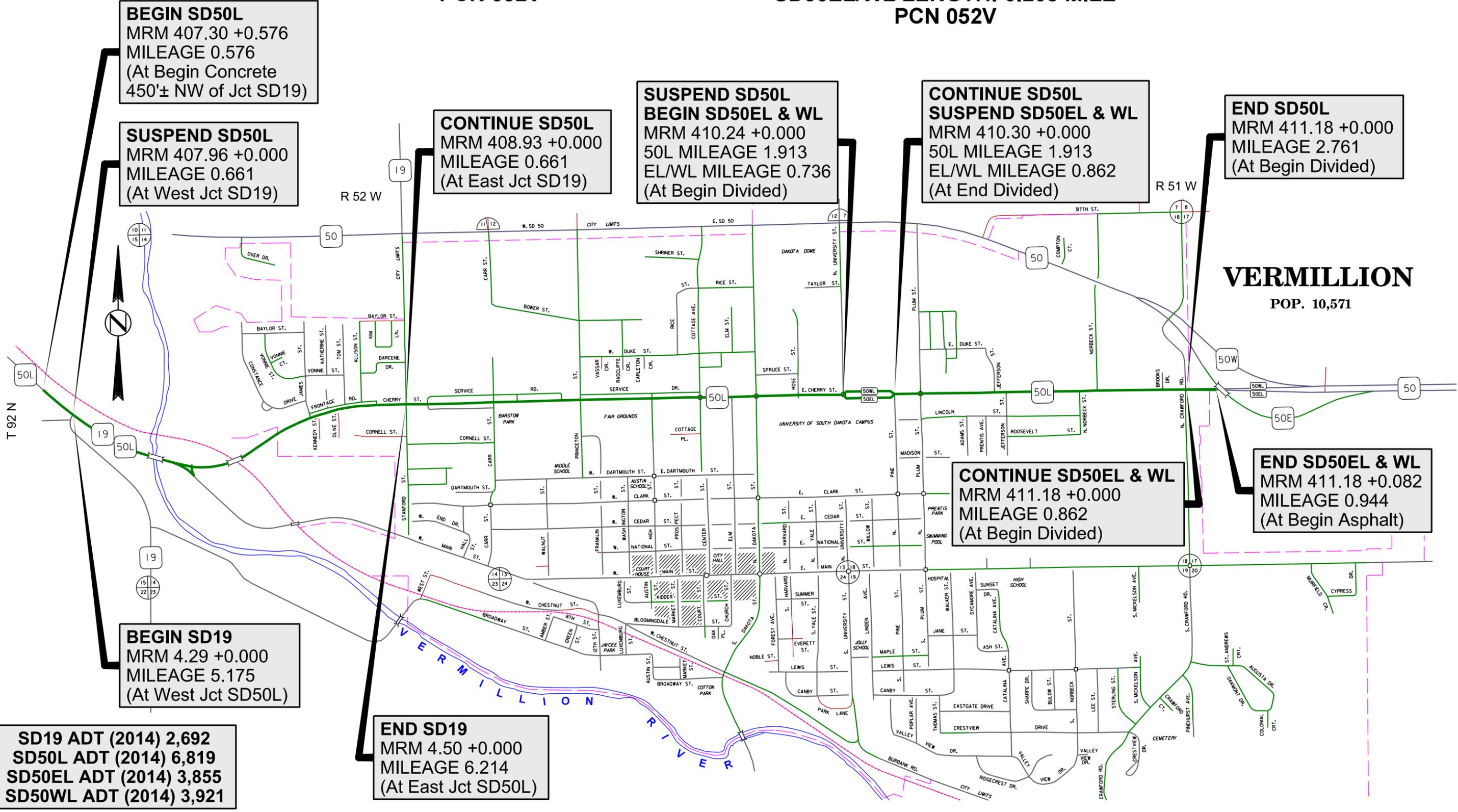


**STORM WATER PERMIT**  
(None required)

**SD HIGHWAYS 19  
CLAY COUNTY  
YANKTON AREA  
PCC PAVEMENT REPAIR  
SD19 LENGTH: 1.039 MILES  
PCN 052V**

**SD HIGHWAYS 50L, 50EL & 50WL  
CLAY COUNTY  
YANKTON AREA  
PCC PAVEMENT REPAIR  
SD50L LENGTH: 2.185 MILES  
SD50EL/WL LENGTH: 0.208 MILE  
PCN 052V**

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM-NH-P 0023(44)	2	67



**BEGIN SD50L**  
MRM 407.30 +0.576  
MILEAGE 0.576  
(At Begin Concrete  
450'± NW of Jct SD19)

**SUSPEND SD50L**  
MRM 407.96 +0.000  
MILEAGE 0.661  
(At West Jct SD19)

**CONTINUE SD50L**  
MRM 408.93 +0.000  
MILEAGE 0.661  
(At East Jct SD19)

**SUSPEND SD50L  
BEGIN SD50EL & WL**  
MRM 410.24 +0.000  
50L MILEAGE 1.913  
EL/WL MILEAGE 0.736  
(At Begin Divided)

**CONTINUE SD50L  
SUSPEND SD50EL & WL**  
MRM 410.30 +0.000  
50L MILEAGE 1.913  
EL/WL MILEAGE 0.862  
(At End Divided)

**END SD50L**  
MRM 411.18 +0.000  
MILEAGE 2.761  
(At Begin Divided)

**CONTINUE SD50EL & WL**  
MRM 411.18 +0.000  
MILEAGE 0.862  
(At Begin Divided)

**END SD50EL & WL**  
MRM 411.18 +0.082  
MILEAGE 0.944  
(At Begin Asphalt)

**BEGIN SD19**  
MRM 4.29 +0.000  
MILEAGE 5.175  
(At West Jct SD50L)

**END SD19**  
MRM 4.50 +0.000  
MILEAGE 6.214  
(At East Jct SD50L)

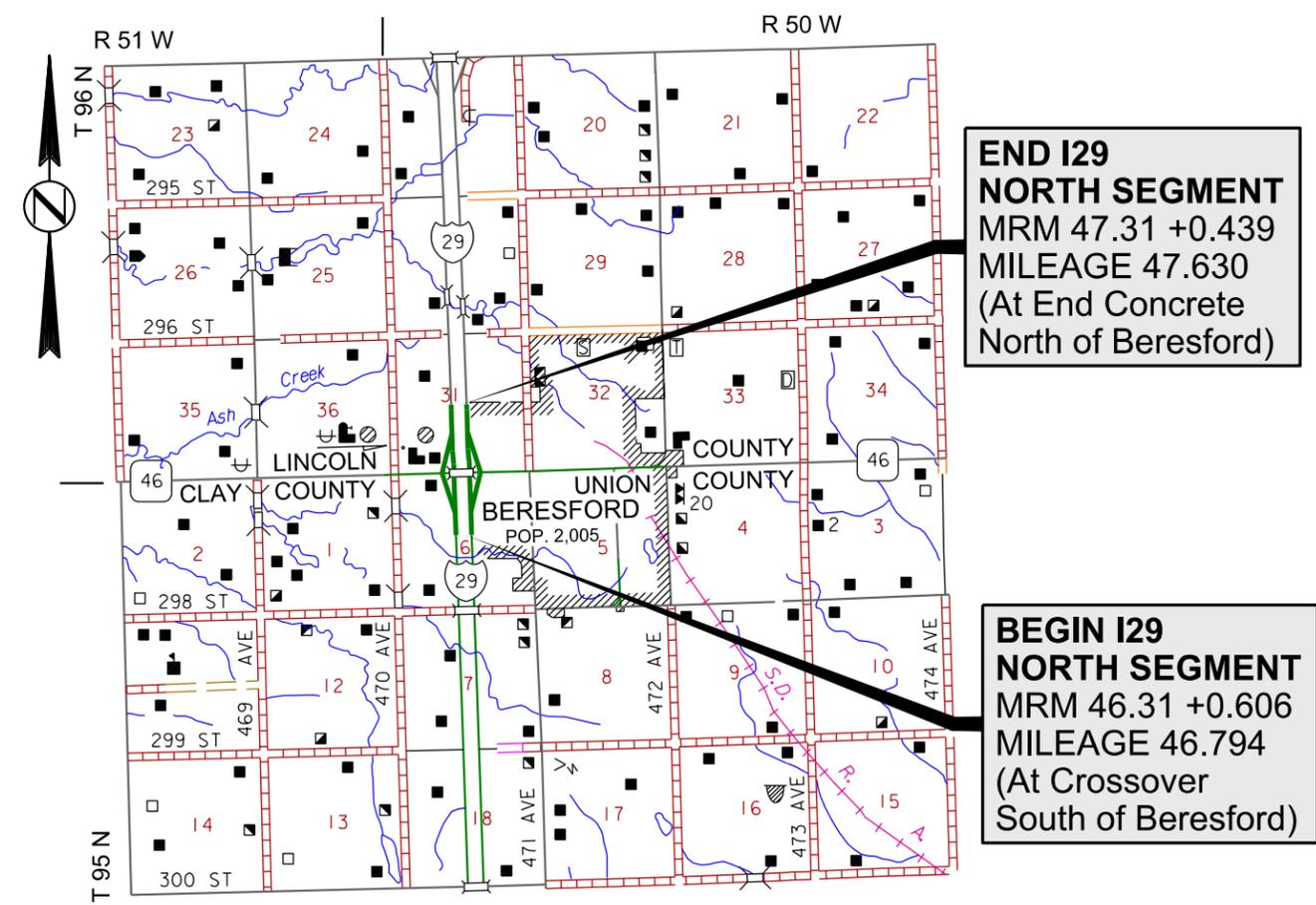
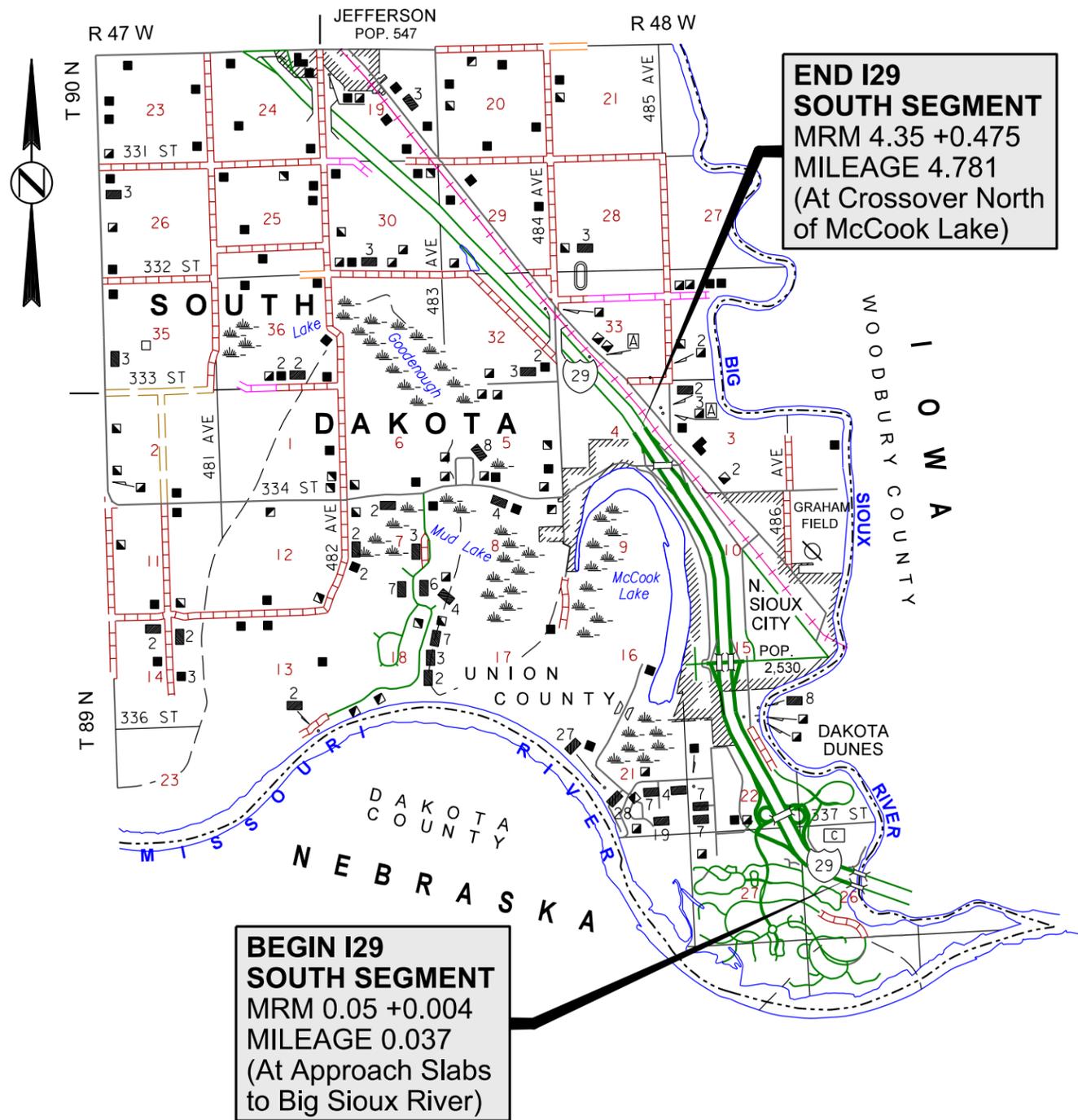
**SD19 ADT (2014) 2,692  
SD50L ADT (2014) 6,819  
SD50EL ADT (2014) 3,855  
SD50WL ADT (2014) 3,921**

**VERMILLION**  
POP. 10,571

**INTERSTATE 29N & 29S  
UNION COUNTY  
YANKTON AREA  
PCC PAVEMENT REPAIR  
LENGTH: 4.744 MILES  
PCN 052V**

**INTERSTATE 29N & 29S  
UNION & LINCOLN COUNTIES  
YANKTON AREA  
PCC PAVEMENT REPAIR  
LENGTH: 0.836 MILE  
PCN 052V**

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM-NH-P 0023(44)	3	67

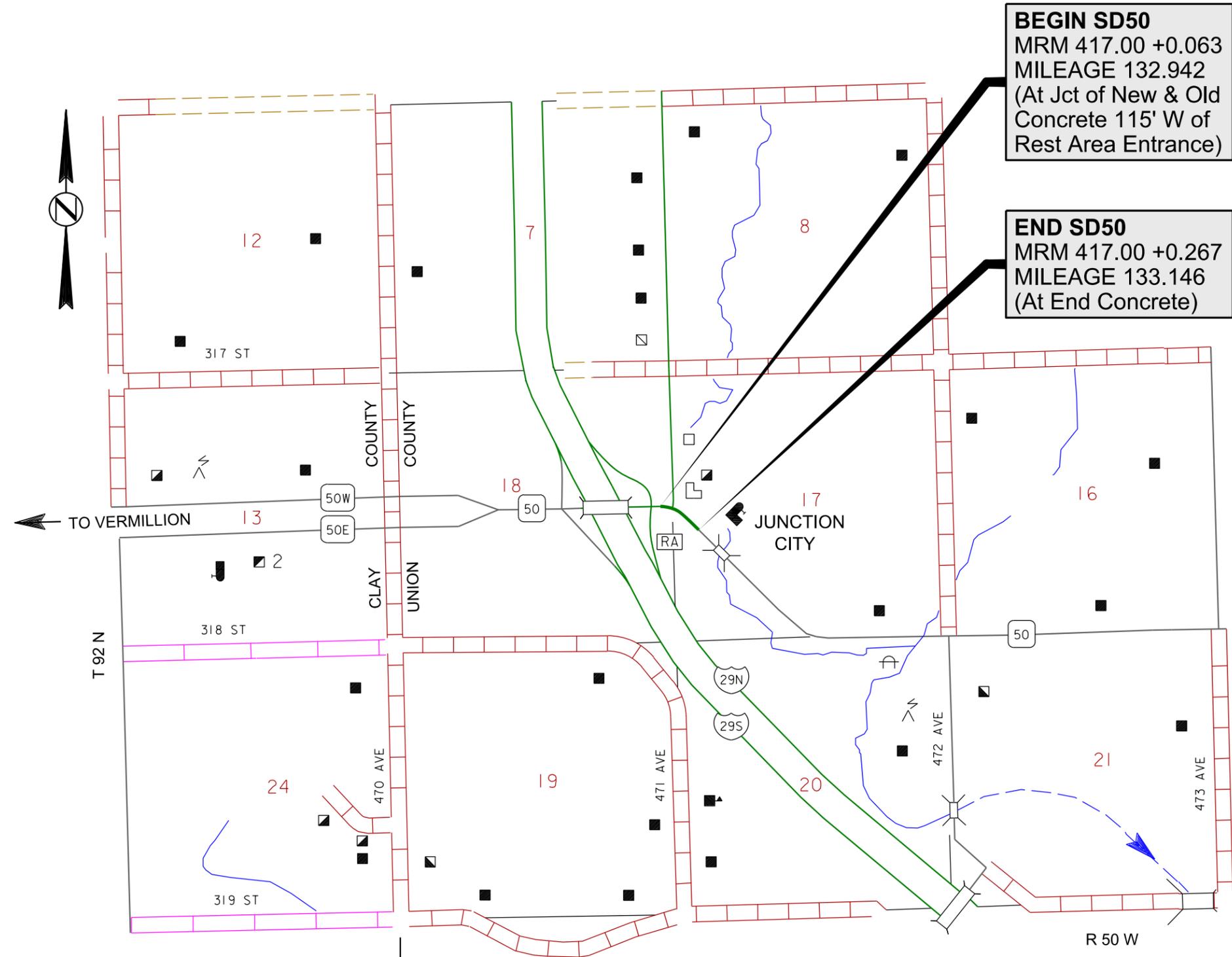


**I29N SOUTH SEGMENT ADT (2014) 9,010**  
**I29S SOUTH SEGMENT ADT (2014) 8,992**

**I29N NORTH SEGMENT ADT (2014) 6,948**  
**I29S NORTH SEGMENT ADT (2014) 6,952**

**SD HIGHWAY 50  
UNION COUNTY  
YANKTON AREA  
PCC PAVEMENT REPAIR  
LENGTH: 0.204 MILE  
PCN 052V**

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM-NH-P 0023(44)	4	67



**SD HIGHWAY 52 WEST SEGMENT  
YANKTON COUNTY  
YANKTON AREA  
PCC PAVEMENT REPAIR  
LENGTH: 5.447 MILES  
PCN 052V**

**SD HIGHWAY 52 EAST SEGMENT  
YANKTON COUNTY  
YANKTON AREA  
PCC PAVEMENT REPAIR  
LENGTH: 0.796 MILE  
PCN 052V**

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM-NH-P 0023(44)	5	67

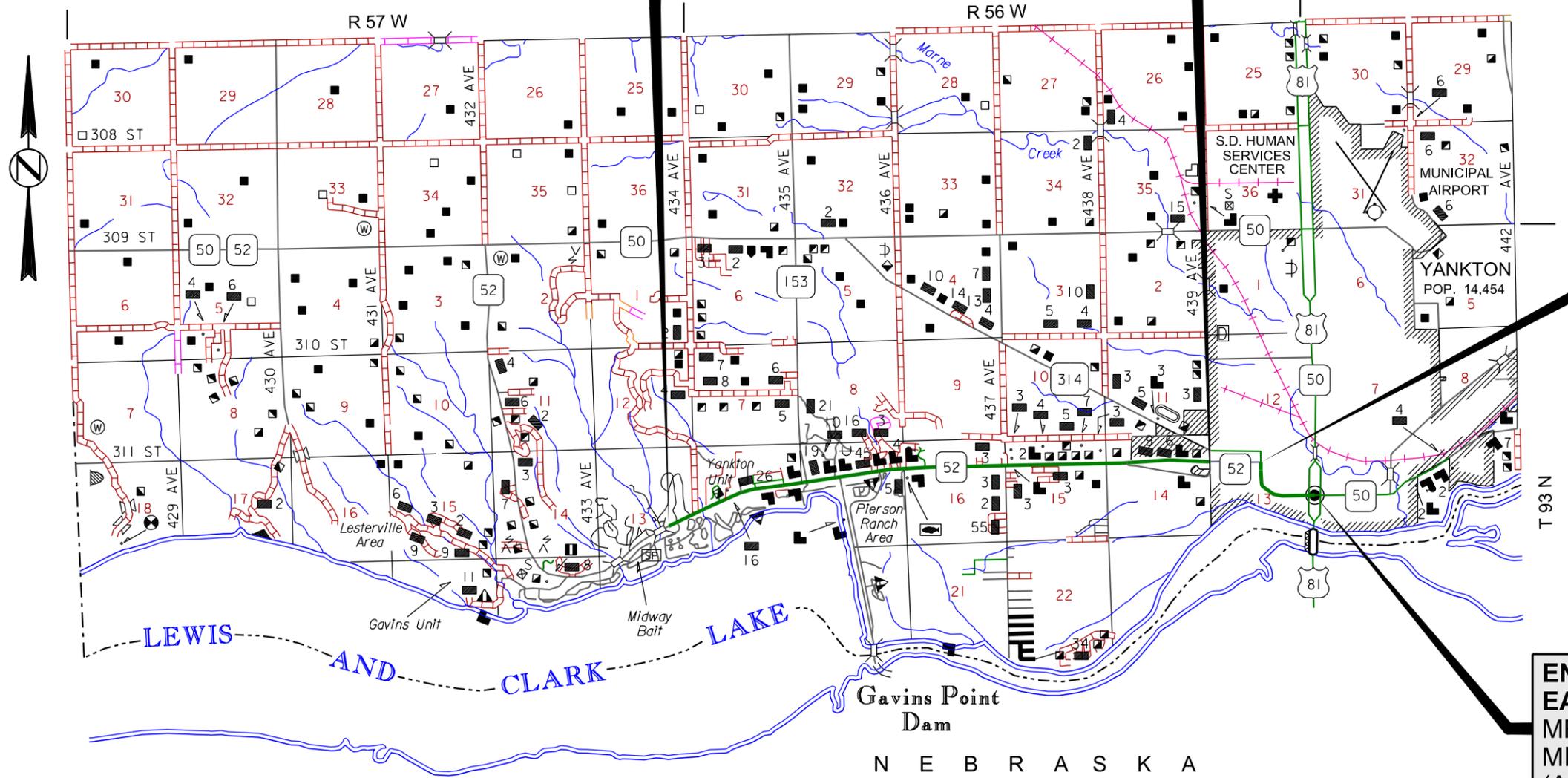
**BEGIN SD52  
WEST SEGMENT**  
MRM 336.80 +0.081  
MILEAGE 16.899  
(At Begin Concrete)

**END SD52  
WEST SEGMENT**  
MRM 342.00 +0.309  
MILEAGE 22.346  
(At End Concrete)

**BEGIN SD52  
EAST SEGMENT**  
MRM 342.00 +0.811  
MILEAGE 22.848  
(At Jct Summit St)

**END SD52  
EAST SEGMENT**  
MRM 343.70 +0.027  
MILEAGE 23.644  
(At Jct US81/SD50)

**SD52 W SEGMENT ADT (2014) 4,648  
SD52 E SEGMENT ADT (2014) 7,184**



N E B R A S K A

# ESTIMATE OF QUANTITIES

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM-NH-P 0023(44)	6	67

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
110E0300	Remove Concrete Curb and Gutter	152	Ft
110E0320	Remove Concrete Gutter	50	Ft
110E1100	Remove Concrete Pavement	72.9	SqYd
110E7710	Remove Manhole Frame and Lid for Reset	2	Each
320E1200	Asphalt Concrete Composite	35.7	Ton
380E5030	Nonreinforced PCC Pavement Repair	3,349.1	SqYd
380E6000	Dowel Bar	2,771	Each
380E6110	Insert Steel Bar in PCC Pavement	5,774	Each
380E6200	Tie Bar Retrofit, Stitching	1,269	Each
380E6300	Reseal PCC Pavement Joint - Silicone	238,537	Ft
380E6302	Reseal PCC Pavement Joint - Hot Pour	45,135	Ft
380E6310	Seal Random Cracks in PCC Pavement	2,517	Ft
390E0200	Repair Type A Spall	1,390.5	SqFt
390E0210	Repair Type B Spall	48.5	SqFt
634E0010	Flagging	460.0	Hour
634E0020	Pilot Car	140.0	Hour
634E0110	Traffic Control Signs	1,807	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0280	Type 3 Barricade, 8' Single Sided	54	Each
634E0285	Type 3 Barricade, 8' Double Sided	8	Each
634E0420	Type C Advance Warning Arrow Board	4	Each
634E0600	4" Temporary Pavement Marking Tape Type I	432	Ft
634E0640	Temporary Pavement Marking	39,280	Ft
650E0090	Type B69 Concrete Curb and Gutter	152	Ft
650E4690	Type P9 Concrete Gutter	50	Ft
671E7000	Reset Manhole Frame and Lid	2	Each

## SPECIFICATIONS

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

### QUANTITY BREAKDOWN BY PROJECT

BID ITEM NUMBER ITEM	SD19 QUANTITY	I29S: South project QUANTITY	I29N: South project QUANTITY	I29S: North project QUANTITY	I29N: North project QUANTITY	SD50 QUANTITY	SD50L QUANTITY	SD52: West Project QUANTITY	SD52: East project QUANTITY	TOTAL QUANTITY UNIT
009E0010 Mobilization	-----Lump Sum----->									Lump Sum LS
110E0300 Remove Concrete Curb and Gutter	-	-	-	-	-	-	-	-	152	152 Ft
110E0320 Remove Concrete Gutter	-	-	-	-	-	-	-	-	50	50 Ft
110E1100 Remove Concrete Pavement	-	-	-	-	-	-	-	72.9	-	72.9 SqYd
110E7710 Remove Manhole Frame and Lid for Reset	-	-	-	-	-	-	-	-	2	2 Each
320E1200 Asphalt Concrete Composite	-	-	-	-	-	-	-	35.7	-	35.7 Ton
380E5030 Nonreinforced PCC Pavement Repair	142.8	108.7	279.3	12.0	186.6	66.2	294.0	2,177.5	82.0	3349.1 SqYd
380E6000 Dowel Bar	157	30	211	18	107	18	338	1,788	104	2,771 Each
380E6110 Insert Steel Bar in PCC Pavement	296	324	638	32	314	128	768	3,054	220	5,774 Each
380E6200 Tie Bar Retrofit, Stitching	-	220	158	19	304	53	12	285	218	1,269 Each
380E6300 Reseal PCC Pavement Joint - Silicone	4,839	62,669	65,399	10,368	10,498	1,736	-	83,028	-	238,537 Ft
380E6302 Reseal PCC Pavement Joint - Hot Pour	4,576	-	-	-	-	-	31,541	-	9,018	45,135 Ft
380E6310 Seal Random Cracks in PCC Pavement	-	428	118	48	613	114	109	825	262	2,517 Ft
390E0200 Repair Type A Spall	37.9	248.2	283.3	9.4	66.8	-	62.5	637.6	47.8	1390.5 SqFt
390E0210 Repair Type B Spall	-	-	48	-	-	-	-	0.5	-	48.5 SqFt
634E0010 Flagging	200	40	40	20	20	80	20	20	20	460 Hour
634E0020 Pilot Car	100	-	-	-	-	40	-	-	-	140 Hour
634E0100 Traffic Control Signs	-----1807----->									1,807 SqFt
634E0120 Traffic Control, Miscellaneous	-----Lump Sum----->									Lump Sum LS
634E0280 Type 3 Barricade, 8' Single Sided	-----54----->									54 Each
634E0285 Type 3 Barricade, 8' Double Sided	-----8----->									8 Each
634E0420 Type C Advance Warning Arrow Board	-----4----->									4 Each
634E0600 4" Temporary Pavement Marking Tape Type 1	288	-	-	-	-	144	-	-	-	432 Ft
634E0640 Temporary Pavement Marking	7,140	5400	3480	1920	1920	7160	2300	9240	720	39,280 Ft
650E0090 Type B69 Curb and Gutter	-	-	-	-	-	-	-	-	152	152 Ft
650E4690 Type P9 Concrete Gutter	-	-	-	-	-	-	-	-	50	50 Ft
671E7000 Reset Manhole Frame and Lid	-	-	-	-	-	-	-	-	2	2 Each

# ENVIRONMENTAL COMMITMENTS

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM-NH-P 0023(44)	8	67

## 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 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:

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 State ROW shall be seeded in accordance with Natural Resources Conservation Service recommendations. The seeding recommendations may be obtained through the appropriate County NRCS Office. The Contractor shall control the access to waste disposal sites not within the State ROW through the use of fences, gates, and placement of a sign or signs at the entrance to the site stating No Dumping Allowed.
2. Concrete and asphalt concrete debris may be stockpiled within view of the ROW for a period of time not to exceed the duration of the project. Prior to project completion, the waste shall be removed from view of the ROW or buried and the waste disposal site reclaimed as noted above.

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

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

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

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

## **UTILITIES**

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

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

## **SCOPE OF WORK**

This project consists of crack sealing, tie bar retrofit (stitching), spall repair, curb and gutter repair and full depth replacement of concrete pavement in areas where concrete pavement blowups or major failures have occurred. Full depth areas vary in length and width; however the minimum length is 6 feet. Spall repairs will be a minimum of 6 inches square.

All existing transverse joints shall be sawed and sealed. In addition, all joints at repair areas shall be sawed and sealed.

## **COORDINATION BETWEEN CONTRACTORS**

Separate contracts for Project NH-P 0023(45) - PCN 053L, NH 0050(99)383 - PCN 6926, and IM 0291(126)1 - PCN 03RK have been awarded to other Contractors for asphalt surface treatment of shoulders on SD52 from MRM 336.81 to MRM 342.31, urban reconstruction from Broadway Avenue to Burleigh St in Yankton, and traffic signal and sidewalk ramps at the intersection of 2 Rivers Drive and Sioux Point Road near Exit 1 of Interstate 29 southbound on-ramp.

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

## **PERMANENT VEHICLE CLASSIFICATION SYSTEM**

The SDDOT has a vehicle classification system in the existing asphalt concrete shoulders, EB and WB lanes on SD52 at MRM 340.00+0.979. PCC Pavement Repair shall not be completed over the systems.

Any damage to the Permanent Vehicle Classification System shall be repaired at the Contractor's expense.

## **EXISTING PCC PAVEMENT**

**SD19:** The existing pavement is 9" x 28' Nonreinforced PCC Pavement. Existing contraction joints are spaced at approximately 20'. Longitudinal joints are reinforced with No. 5 x 30" deformed tie bars spaced 48" center to center. Transverse joints are reinforced with 1¼" x 18" plain round dowel bars spaced 12" center to center.

**I29S: South project:** The existing pavement is 11.5" x 38' Nonreinforced PCC Pavement. Existing contraction joints are spaced at approximately 20'. Longitudinal joints are reinforced with No. 5 x 30" deformed tie bars spaced 48" center to center. Transverse joints are reinforced with 1¼" x 18" plain round dowel bars spaced 12" center to center.

**I29N: South project:** The existing pavement is 11.5" x 38' Nonreinforced PCC Pavement from the Iowa line to Exit 2 and is 11.5" x 26' Nonreinforced PCC Pavement from Exit 2 to the north end of the project. Existing contraction joints are spaced at approximately 20'. Longitudinal joints are reinforced with No. 5 x 30" deformed tie bars spaced 48" center to center. Transverse joints are reinforced with 1¼" x 18" plain round dowel bars spaced 12" center to center.

## **EXISTING PCC PAVEMENT (CONTINUED)**

**I29S: North project:** The existing pavement is 10.5" x 26' Nonreinforced PCC Pavement. Existing contraction joints are spaced at approximately 19'. Longitudinal joints are reinforced with No. 5 x 30" deformed tie bars spaced 48" center to center. Transverse joints are reinforced with 1¼" x 18" plain round dowel bars spaced 12" center to center.

**I29N: North project:** The existing pavement is 10.5" x 26' Nonreinforced PCC Pavement. Existing contraction joints are spaced at approximately 19'. Longitudinal joints are reinforced with No. 5 x 30" deformed tie bars spaced 48" center to center. Transverse joints are reinforced with 1¼" x 18" plain round dowel bars spaced 12" center to center.

**SD50:** The existing pavement is 8" x 28' Nonreinforced PCC Pavement. Existing contraction joints are spaced at approximately 20'. Longitudinal joints are reinforced with No. 4 x 30" deformed tie bars spaced 48" center to center. Transverse joints are reinforced with 1¼" x 18" plain round dowel bars spaced 12" center to center.

**SD50L:** The existing pavement is 9"x 40' Nonreinforced PCC Pavement from Stanford St. to west of Cottage St., 9"x 40' Nonreinforced PCC Pavement with B69 Curb and Gutter from Cottage Street to University St. and Pine St. to Plum St.; 9"x24' Nonreinforced PCC Pavement with a grass and concrete raised median having DL49 Median and B69 Outside edge Curb and Gutter; 9"x57' Nonreinforced PCC Pavement with B69 Curb and Gutter from Plum St. to Crawford Rd.; and 9"x63" Nonreinforced PCC Pavement from Crawford Rd. to the east end of the project. Existing contraction joints are spaced at approximately 20'. Longitudinal joints are reinforced with No. 5 x 30" deformed tie bars spaced 48" center to center. Transverse joints are reinforced with 1¼" x 18" plain round dowel bars spaced 12" center to center.

**SD52: West project:** The existing pavement is 8.5" x 40' Nonreinforced PCC Pavement from the west end of the project to 1.35 miles east and 8.5" x 64' for the remainder of the project. Existing contraction joints are spaced at approximately 20'. Longitudinal joints are reinforced with No. 5 x 30" deformed tie bars spaced 48" center to center, except for the north joint of the center turn lane in the 5-lane section, which is untied. Transverse joints are reinforced with 1¼" x 18" plain round dowel bars spaced 12" center to center.

**SD52: East project:** The existing pavement is 9" x 48' Nonreinforced PCC Pavement with B69 Curb and Gutter. Existing contraction joints are spaced at approximately 20'. Longitudinal joints are reinforced with No. 5 x 30" deformed tie bars spaced 48" center to center. Transverse joints are reinforced with 1¼" x 18" plain round dowel bars spaced 12" center to center.

The aggregate in the existing PCC Pavement is quartzite.

## **RESTORATION OF GRAVEL CUSHION**

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

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

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

## **GROWTH JOINTS**

The growth joints as shown on the Layout for Sawing in Growth Joints sheets shall be constructed by sawing and removing a full depth section of existing PCC pavement 12 inches wide by full width of existing PCC pavement. The removed concrete shall be filled with full depth of Asphalt Concrete Composite material placed in lifts not to exceed 3 inches and compacted to the satisfaction of the Engineer. See the detail Layout for Sawing in Growth Joints.

There are 11 growth joints that will be constructed on SD52 west segment project route at locations designated by the Engineer.

It is estimated that 35.7 tons of Asphalt Concrete Composite is needed to accomplish this work.

Growth Joints that are constructed will be paid for at the representative contract unit prices for Remove Concrete Pavement and Asphalt Concrete Composite. Payment shall be full compensation for necessary sawing, labor, equipment, material and incidentals necessary to construct the growth joint.

## **NONREINFORCED PCC PAVEMENT REPAIR - GENERAL**

New pavement thickness shall equal existing pavement thickness ( $T_N = T$ ).

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

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

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

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

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

At full roadway width repairs and when specified, a working joint will be reconstructed at both ends of each pavement replacement area as shown in these plans.

Concrete placed adjacent to gravel and 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 new hot-mix asphalt concrete.

At repair locations where the new working joint is not opposite the existing working joint, the Contractor shall place a ¼" 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.

### **NONREINFORCED PCC PAVEMENT REPAIR – GENERAL (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. Refer to Saw and Seal Joints notes.

### **NONREINFORCED PCC PAVEMENT REPAIR**

Concrete shall meet the requirements stated in Section 380 of the specifications, except as modified by the following notes:

The fine aggregate shall be screened over a one-inch square-opening screen just prior to introduction into the concrete paving mix if required by the Engineer.

The slump requirement will be limited to 3" maximum after water reducer is added and the concrete shall contain 4.5% to 7.0% entrained air. The concrete shall contain a minimum of 50% coarse aggregate by weight. Coarse aggregate shall be crushed ledge rock, Size No. 1 unless an alternative gradation is approved by the Concrete Engineer as part of the mix design submittal. The mix design shall contain at least 650 lbs of Type I or II cement or 600 lbs of Type III cement per cubic yard. The minimum 28 day compressive strength shall be 4,000 psi. The Contractor is responsible for the mix design used. The Contractor shall submit a mix design and supporting documentation for approval at least 2 weeks prior to use.

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

Concrete shall be cured with white pigmented curing compound (AASHTO M148, Type 2) applied as soon as practical at a rate of 125 square feet per gallon. Concrete shall be cured for a minimum of 48 hours before opening to traffic. The 48 hours is based upon a concrete surface temperature of 60°F or higher throughout the cure period. If the concrete temperature falls below 60°F, the cure time shall be extended or other measures taken, at no additional cost to the State. A strength of 4,000 psi must be attained prior to opening to traffic.

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

Concrete shall be covered with suitable insulation blanket consisting of a layer of closed cell polystyrene foam protected by at least one layer of plastic. Insulation blanket shall have an R-value of at least 0.5, as rated by the manufacturer. Insulation blanket shall be left in place, except for joint sawing operations, until the 3,800 psi is attained. Insulation blanket shall be overlapped on to the existing concrete by 4'. This requirement for covering repair areas with insulation blankets may be waived during periods of hot weather upon approval of the Engineer.

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

### **FORMED RUMBLE STRIP IN PCCP**

If 2 or more consecutive rumble strips are removed, all shall be replaced in that repair location as detailed in these plans, except that the spacing shall be 60' to match the existing rumble strips. New formed rumble strips shall be in the original locations.

Cost for Formed Rumble Strip in PCCP 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.

For existing pavement thickness greater than or equal to 10.5" (T >= 10.5"):  
The Contractor shall insert the steel bars (1½" x 18" epoxy coated plain round dowel bars and No. 11 x 18" epoxy coated deformed tie bars for transverse joints and No. 5 x 24" epoxy coated deformed tie bars for longitudinal joints) into drilled holes in the existing concrete pavement. An epoxy resin adhesive must be used to anchor the steel bar in the drilled hole.

For existing pavement thickness greater than or equal to 8.5" and less than 10.5" (T >= 8.5" and T < 10.5"):

The Contractor shall insert the steel bars (1¼" x 18" epoxy coated plain round dowel bars and No. 9 x 18" epoxy coated deformed tie bars for transverse joints and No. 5 x 24" epoxy coated deformed tie bars for longitudinal joints) into drilled holes in the existing concrete pavement. An epoxy resin adhesive must be used to anchor the steel bar in the drilled hole.

For existing pavement thickness less than 8.5" (T < 8.5"):

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

Plain round dowel bars shall be cut to the specified length by sawing and shall be free from burring or other deformations. Shearing will not be permitted.

Steel bars shall be inserted in the transverse joint on 18" centers. The first steel bar in the transverse joint shall be placed 9" from the edge of the slab closest to centerline. Steel bars shall be inserted in the longitudinal joint on 30" centers and shall be a minimum of 15" from either transverse joint. A typical one-lane patch 12' wide and 6' long will require 18 steel bars (8 in each transverse joint and 2 in the longitudinal joint). It will be necessary to laterally adjust the location of some of the inserted steel bars when the dimensions above interfere with existing steel bar locations.

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.

Cost for the epoxy resin adhesive, steel bars, drilling of holes, inserting the steel bars into the drilled holes and all other items incidental to the insertion of the steel bars shall be included in the contract unit price per each for Insert Steel Bar in PCC Pavement.

### **SAW AND SEAL JOINTS**

All longitudinal and transverse joints at concrete repair areas shall be sawed and sealed.

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

Longitudinal and transverse joints in urban sections shall be sealed with Hot Poured Elastic Joint Sealer. Transverse joints in rural sections shall be sealed with Low Modulus Silicone Sealant. Longitudinal joints in rural sections may be sealed with either Hot Poured Elastic Joint Sealer or Low Modulus Silicone Sealant.

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

### **REPAIR TYPE A SPALLS**

Type A Spall Concrete Patch Material shall conform to Section 390.B.3 (Type III).

As an alternative, the Contractor may remove concrete by milling, provided it produces results similar to the sawing and chipping process described in the Specifications.

The form material placed at an existing joint shall extend below the bottom of the joint and conform to the existing joint width.

If the patch material does not achieve 3,800 psi by 7am the day after placement, the Contractor shall provide required traffic control (at no cost to the State) until the Engineer determines the 3,800 psi has been obtained. No additional work zones will be set up until strength requirement is met. If strength requirement has not been met by 36 hours after placement, the patches shall be removed and replaced at no cost to the State.

It is anticipated that a number of locations scheduled for Type A Spall Repair will have deteriorated to the point of needing full depth repair. Additional Quantities are included in the Table(s) for PCC Pavement Repair for this work. The Engineer will determine these locations on construction.

Spalls which are repaired according to plans and specifications and exhibit partial respalling or cracking, shall be repaired to the satisfaction of the Engineer at no additional cost to the State.

### **TIE BAR RETROFIT, STITCHING**

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

The Contractor shall insert No. 5 epoxy coated deformed tie bars into drilled holes in the existing concrete pavement. An epoxy resin adhesive must be used to anchor the steel bar in the drilled hole. A rotary drill or other approved drill shall be used that will not damage the concrete surface. The diameter of the disturbed surface from drilling shall be less than 2 inches. A rigid frame or mechanical device will be required to guide the drill to ensure the proper angle of the steel bars in the drilled holes.

Epoxy resin adhesive shall be of the type intended for horizontal applications, conform to section 380.2.L of the 2015 Standard Specifications for Roads and Bridges, and the dried color of the epoxy shall be grey or black.

No bars shall be inserted within 15" of an existing transverse contraction joint. Any bars not functioning or damaged shall be repaired or replaced at the Contractor's expense.

**TIE BAR RETROFIT, STITCHING (CONTINUED)**

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

**CONCRETE CURB AND GUTTER**

All areas to be replaced shall be designated by the Engineer.

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

Existing foundation material shall be shaped and compacted to a firm, uniform bearing surface, conforming to the existing section or established grades as set by the Engineer. Unsuitable foundation material shall be removed and replaced as directed. Gravel shall be furnished by the Contractor.

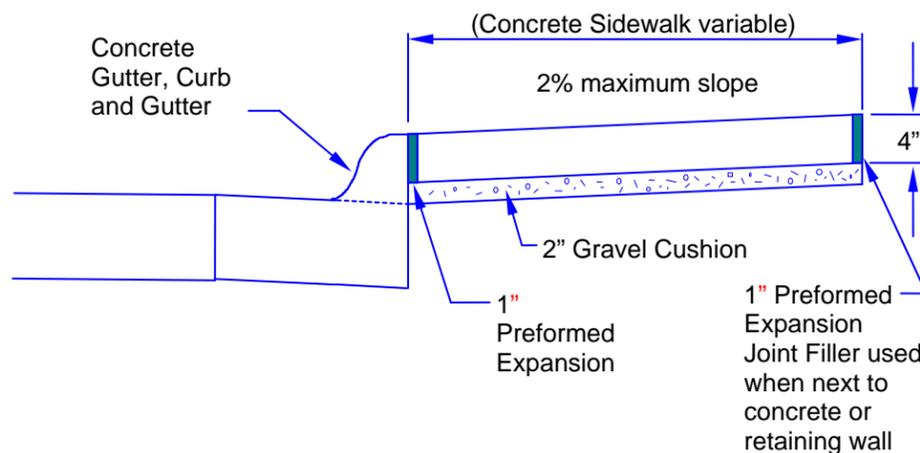
Cost for labor, equipment, material and incidentals required for excavation and providing cushion material shall be incidental to the contract unit prices for the various items.

Curb and Gutter shall be tied to existing PCC pavement with drilled in No. 5 x 24" epoxy coated deformed tie bars spaced 30" center to center or by salvaged in place tie bars. Also, one No. 5 x 24" epoxy coated deformed tie bar shall be drilled into the existing curb and gutter at each end of the replacement area. Refer to the notes for Steel Bar Insertion.

Cost for this work shall be included in the contract unit price per each for Insert Steel Bar in Concrete Pavement.

There will be no separate payment for Curb and sidewalk ramps and/or curb openings and curb ramp tapers. Cost for this work shall be included in the contract unit prices for the various items.

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



**SEAL RANDOM CRACKS IN PCC PAVEMENT**

Random cracks shall be repaired in accordance with the detail for Sealing Random Cracks. Reservoir dimensions may vary slightly from the details, due to the nature of this operation. However, any variance due to Contractor negligence will be repaired at the Contractor's expense.

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

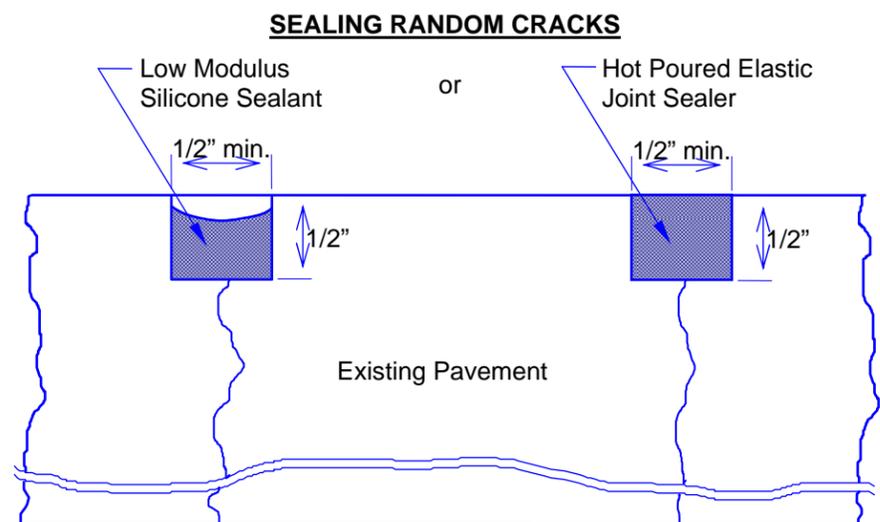
Prior to sealing, each random crack shall be routed and thoroughly cleaned with compressed air or by other methods satisfactory to the Engineer. Routing shall be performed with a saw designed for that purpose.

Random cracks narrower than 1/2 inch shall be routed and sealed 1/2 inch wide by 1/2 inch deep.

Random cracks wider than 1/2 inch may require the placement of a backer rod prior to sealing. Use of backer rod should be limited to locations where, once placed, the top of the backer rod will be a minimum of 2 1/4 inches below the top surface of the pavement. The hot pour in cracks wider than 1/2" should be placed 2 inch thick with the final surface of the hot pour remaining recessed 1/4 inch below the top surface of the pavement.

Sealant shall be placed in the routed reservoir with equipment and by methods that insure complete and uniform filling. Hot Poured Elastic Joint Sealer shall be placed level with the driving surface of the concrete for cracks 1/2" or narrower. Low Modulus Silicone Sealant shall have a tooled surface with the top middle portion of the sealant recessed. Any excess or overrun of sealant shall be removed by the Contractor at no additional cost to the state.

Seal Random Cracks in PCC Pavement will be measured by the foot to the nearest 0.1 foot of random cracks sealed and accepted on the project and will be paid for at the contract unit price per foot measured for payment. Payment shall be full compensation for all labor, equipment, material and incidentals required for crack routing, cleaning, furnishing and installing backer rod when necessary, furnishing and placing sealant and removing routed and foreign material from the roadway.



**PCC PAVEMENT REPAIR AROUND MANHOLES**

PCC Pavement Repair shall be done around existing manholes. Work shall be done in accordance with the notes for Nonreinforced PCC Pavement Repair – General and Nonreinforced PCC Pavement Repair.

PCC Pavement replacement depth shall be 9".

The manhole frame and lid will have to be removed for insertion of steel bars. Refer to the layout for PCC PAVEMENT REPAIR AROUND MANHOLES. The steel bars may be bent as necessary to reset the manhole frame and lid as shown in the plans.

Cost for pavement repair shall be included in the contract unit price per square yard for Nonreinforced PCC Pavement Repair.

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

Cost for removing and resetting manhole frame and lid shall be included in the contract unit prices per each for Remove Manhole Frame and Lid; and Reset Manhole Frame and Lid.

Locations for PCC Pavement Repair around manholes are shown in the table below:

**TABLE FOR PCC PAVEMENT REPAIR AROUND MANHOLES**

LOCATION :	REMOVE AND RESET MANHOLE FRAME AND LID	NONREINFORCED PCC PAVEMENT REPAIR	INSTALL STEEL BAR IN PCC PCC PAVEMENT No. 5 x 18"
SD52 EAST SEGMENT	Each	SqYds	Each
Maple St to Green St.	2	24*	8*
<b>TOTALS:</b>	<b>2</b>	<b>24</b>	<b>8</b>

\* Nonreinforced PCC Pavement Repair and Install Steel Bar in PCC Pavement are included in the pavement repair tables.

**ASPHALT CONCRETE COMPOSITE**

Mineral aggregate for the Asphalt Concrete Composite shall conform to the requirements of the specifications for Class E, Type 2.

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

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

**RESEAL PCC PAVEMENT JOINT**

Existing transverse joints in urban sections shall be cleaned and resealed with Hot Poured Elastic Joint Sealer. Curb and Gutter joints will not require resealing. Existing transverse joints in rural sections shall be cleaned and resealed with Low Modulus Silicone Sealant.

Joints shall not be sealed unless they are thoroughly clean and dry. Cleaning shall be accomplished by sandblasting and other tools as necessary. Sand blasting of both sides of the vessel shall be accomplished simultaneously with a mechanical device approved by the Engineer. Just prior to sealing, each joint shall be blown out using a jet of compressed air to remove all traces of dust.

**RESEAL PCC PAVEMENT JOINT (CONTINUED)**

In certain areas the joint may be wider than the original construction. It may be necessary to provide backer rod in the wide areas. Any additional cost to perform this work shall be at no additional cost to the State. The Contractor shall be responsible to verify joint widths prior to establishing the contract unit price.

It is not essential that all of the sealant be removed. Remaining sealant adhering to the sides may remain in place if the Engineer determines that it is not detrimental to the joint.

Cost for cleaning and resealing transverse joints in urban sections shall be included in the contract unit price per foot for Reseal PCC Pavement Joint – Hot Pour.

Cost for cleaning and resealing transverse joints in rural sections shall be included in the contract unit price per foot for Reseal PCC Pavement Joint – Silicone.

**TABLE FOR RESEAL PCC PAVEMENT JOINTS**

	SILICONE (FEET)	HOT POUR (FEET)
SD19:		
Mainline	4839	4,576
I29S South project:		
Mainline	36,300	0
Exit 1 On Ramp (south)	3,034	0
Exit 1 On Ramp (north)	3,210	0
Exit 1 Off Ramp	3,640	0
Exit 2 On Ramp	1,692	0
Exit 2 Off Ramp	702	0
Exit 2 Crossroad	4172	0
Exit 4 On Ramp	762	0
Exit 4 Off Ramp	593	0
Exit 1 Crossroad	4,424	0
Sioux Point Road	4,140	0
I29N South project:		
Mainline	43,956	0
Exit 1 Off Ramp	5,497	0
Exit 1 On Ramp (south)	2,274	0
Exit 1 On Ramp (north)	3,034	0
Exit 2 Off Ramp	1,749	0
Exit 2 On Ramp	801	0
Exit 2 Crossroad	2712	0
Exit 4 Off Ramp	620	0
Exit 4 On Ramp	740	0
Exit 1 Crossroad	4,016	0
I29S North project:		
Mainline	5,954	0
Exit 46 On Ramp	2,407	0
Exit 46 Off Ramp	2,007	0
I29N North project:		
Mainline	6,006	0
Exit 46 Off Ramp	2,032	0
Exit 46 On Ramp	2,460	0
SD50:		
Mainline	1,736	0
SD50L:		
Mainline	0	31,541
SD52 West project:		
Mainline	83,028	0
SD52 East project:		
Mainline	0	9,018
<b>TOTALS:</b>	<b>238,537</b>	<b>45,135</b>

**TEMPORARY PAVEMENT MARKING**

Temporary pavement marking on lane closure tapers shall consist of temporary road markers. (Estimate six workspaces with 960' tapers on I29, eight workspaces with 780' tapers on I29, 20 workspaces with 660' tapers on SD19 and SD52, six workspaces with 600' tapers on SD19, SD50L, SD50 & SD52; ten workspaces with 320' tapers on SD50L; and 16 workspaces with 180' tapers on I29, SD50L and SD52 in Vermillion and Yankton undivided.

Temporary pavement marking on centerline shall consist of temporary road markers and shall be used as depicted on Standard Plate 634.25 when the stop condition must remain in place during nighttime hours 9:00PM to 6:00AM (Estimate 2 workspaces remaining during nighttime hours x 2,200' per workspace = 4,400').

Cost shall be included in the contract unit price per foot for Temporary Pavement Marking.

Temporary pavement marking for stop bars shall consist of 4" Temporary Pavement Marking Tape Type 1. Placement of each 24" white stop bar shall be accomplished by placing six pieces of 4" x 12' tape adjacent to one another. Each workspace requires two stop bars which is an equivalent of approximately 144' of 4" tape (3 workspaces at 144' = 432').

Cost shall be included in the contract unit price per foot for 4" Temporary Pavement Marking Tape Type 1.

**GENERAL MAINTENANCE OF TRAFFIC**

Sufficient traffic control devices have been included in these plans to sign 2 stop sign controlled workspaces on a two-lane highway and 4 lane closure controlled workspaces on a multi-lane highway. If the Contractor elects to work on additional sites simultaneously, the cost for additional traffic control devices shall be incidental to the contract unit price per unit for Traffic Control.

Closures will not be allowed to be setup until work is anticipated in that respective closure as approved by the Engineer. Closures shall be removed from the roadway by the end of the work day that the work in that respective closure has been completed and all curing periods have been met as ordered by the Engineer.

**MAINTENANCE OF TRAFFIC – PCC PAVEMENT REPAIR**

Fixed Location signs, as shown in the details in these plans, shall not be placed on a specific route until work is planned to start on that route. Also, these signs shall be removed, in a timely manner, after work on each respective route has been completed.

A Type 3 Barricade shall be installed at the end of a lane closure taper as detailed in these plans. Additional Type 3 Barricades shall be installed facing traffic within the closed lane at a spacing of 1/4 mile. At intersecting roadways, two additional Type 3 Barricades shall be used to block the entire closed lane and shoulder.

Each mainline concrete repair location from which the in place concrete has been removed shall be marked with a minimum of two reflectorized cones (42" minimum height) or two reflectorized drums. In areas containing numerous concrete repair locations, two reflectorized drums should be installed at a spacing of 660' alternating with the Type 3 Barricades.

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

Signs may be mounted on portable supports for a period of 3 days or less. The bottom of signs on portable supports may be a minimum of one foot above the pavement in rural areas, except regulatory signs, which shall have a minimum mounting height of five feet in rural areas. The minimum mounting height for portable supports in urban areas shall be seven feet.

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

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

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

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

Holes in the asphalt concrete shoulders created during removal and replacement of PCC Pavement Repair areas shall be filled with gravel and hot-mix asphalt concrete (to match the shoulder surfacing) prior to opening the lane to traffic. Gravel and hot-mix asphalt concrete shall be furnished and installed by the Contractor at no additional cost to the State.

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

Routing traffic onto the shoulders during any phase of the construction will not be allowed.

Damage to the shoulders, median or ditch due to the Contractor's operations shall be repaired by the Contractor, to the satisfaction of the Engineer, at no expense to the State. This includes the apparent routing of traffic onto these shoulders around the work zones.

Extra care shall be taken to protect the in place asphalt concrete shoulders. In all workspaces in these areas, the same channelizing devices and spacing used on centerline, will also be required on the shoulders. These channelizing devices shall be placed in locations to adequately keep traffic completely off these shoulders. Continuous maintenance of the shoulder devices will be required to keep them in place. Cost for these extra channelizing devices shall be incidental to the contract lump sum price for Traffic Control, Miscellaneous.

The Contractor shall notify businesses/homeowners a minimum of two weeks prior to construction to inform them of upcoming construction and again a minimum of 48 hours prior to any blocked access to make appropriate arrangements.

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

The use of interstate maintenance crossovers will not be permitted.

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

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM-NH-P 0023(44)	13	67

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

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

The Contractor will be required to contact the City of Vermillion to adjust signal timings to accommodate traffic when a lane is closed near a signalized intersection.

Reflectorized cones (42" minimum height), reflectorized drums or Type 2 Barricades shall be used to maintain a minimum of two-way traffic at intersecting roads or streets. The Contractor shall mark and maintain alternating one-way access to businesses and residences along the project with cones, drums or Type 1 Barricades. The Contractor shall advise affected businesses before restriction and anticipated duration of construction time.

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

**REFLECTORIZED SHEETING REQUIREMENTS FOR TEMPORARY TRAFFIC CONTROL DEVICES**

Delete the first paragraph of Section 984.1 and replace with the following:

Temporary traffic control devices, including signs, drums, cones, tubular markers, barricades, vertical panels and direction indicator barricades shall be reflectorized with sheeting applied to a satisfactory backing. For all temporary traffic control warning signs, the reflective sheeting shall meet or exceed the standards of Type VII, Type VIII, Type IX or Type XI as defined by AASHTO M 268 (ASTM D4956). For all other temporary traffic control signs, the reflective sheeting shall meet or exceed the standards of Type IV, Type V, Type VII, Type VIII, Type IX or Type XI as defined by AASHTO M 268 (ASTM D4956). For barricades, vertical panels and direction indicator barricades; the reflective sheeting shall meet or exceed the standards of Type III as defined by AASHTO M 268 (ASTM D4956). Round surfaced temporary traffic control devices including, but not limited to; drums, cones and tubular markers shall be reflectorized with reflectorized sheeting meeting or exceeding the standards of Type IV as defined by AASHTO M 268 (ASTM D4956). All orange colored material shall be fluorescent.

**TABLE FOR PCC PAVEMENT REPAIR ON SD19 SB & NB LANES**

MRM	DISP.	LANE	SB DRIVING LANE		CENTER TURN LANE		NB DRIVING LANE		NRCP REPAIR SqYds	NEW JOINT CON-FIG. (NRCP)	INSERT STEEL BAR IN PCC PAVEMENT (NRCP)			DOWEL BAR Each	TYPE A SPALL SIZE		REPAIR TYPE A SPALL SqFt	COMMENTS		
			L Ft	W Ft	L Ft	W Ft	L Ft	W Ft			1 1/4" x 18" PLAIN ROUND DOWEL BARS Each	No. 9 x 18" DEFORMED TIE BARS Each	No. 5 x 24" DEFORMED TIE BARS Each		INSERT STEEL BAR IN NRCP TOTAL Each	L			W	
4.29	0.009	NBL					6	14	9.3	R			16	2	18	12				
4.29	0.009	CTL			6	12			8.0	R			16	4	20	12				
4.29	0.013	CTL														12"	12"	1.00		
4.29	0.013	CTL														6"	12"	0.50		
4.29	0.016	NBL					6	14	9.3	R			16	2	18	12				
4.29	0.016	CTL														12"	6"	0.50		
4.29	0.020	CTL														12"	12"	1.00		
4.29	0.061	CTL			6	12			8.0	R			16	4	20	12				
4.29	0.077	CTL														12"	12"	1.00		
4.29	0.092	CTL														12"	24"	2.00		
4.29	0.099	CTL														12"	12"	1.00		
4.29	0.099	SBL														12"	12"	1.00		
4.29	0.133	CTL														12"	12"	1.00		
4.29	0.141	CTL														6"	18"	0.75		
4.29	0.156	SBL	6	14					9.3	R			16	4	20	12				
4.29	0.160	CTL														12"	12"	1.00		
4.29	0.183	SBL														6"	18"	0.75		
4.29	0.186	SBL														18"	18"	2.25		
4.29	0.198	SBL	6	6					4.0	R			8	4	12	6				
4.29	0.205	BOTH	6	14			6	7	14.0	R			24	8	32	19				
4.29	0.209	NBL					6	7	4.7	R			8	4	12	7				
4.29	0.213	BOTH	6	7			6	7	9.3	R			16	8	24	14				
4.29	0.329	BOTH	6	7			6	7	9.3	R			16	8	24	14				
4.29	0.333	SBL														12"	12"	1.00		
4.29	0.458	SBL														12"	12"	1.00		
4.29	0.630	NBL					6	7	4.7	R			8	4	12	7				
4.29	0.680	CTL														12"	24"	2.00		
4.29	0.762	SBL														8"	18"	1.00		
4.29	0.793	NBL/CTL														12"	36"	3.00		
4.29	0.800	SBL														12"	12"	1.00		
4.29	0.834	NBL														12"	12"	1.00		
4.29	0.879	CTL														6"	12"	0.50		
4.29	0.887	CTL														12"	12"	1.00		
4.29	0.912	CTL														16"	16"	1.78		
4.29	0.972	NBL														6"	12"	0.50		
4.29	0.983	CTL														12"	30"	2.50		
4.29	1.023	SBL														8"	28"	1.56		
4.29	1.027	RAMP					20	13	28.9	B			8	8	16	32				
4.29	1.031	RAMP					6	6	4.0	B			4	4	4	12				
<b>SHEET TOTALS:</b>									<b>122.8</b>				<b>12</b>	<b>172</b>	<b>72</b>	<b>256</b>	<b>127</b>		<b>31.59</b>	
<b>TOTALS:</b>									<b>122.8</b>				<b>12</b>	<b>172</b>	<b>72</b>	<b>256</b>	<b>127</b>		<b>31.6</b>	
<b>ADDITIONAL QUANTITIES:</b>									<b>20.0</b>				<b>-</b>	<b>30</b>	<b>10</b>	<b>40</b>	<b>30</b>		<b>6.3</b>	
<b>GRAND TOTALS:</b>									<b>142.8</b>				<b>12</b>	<b>202</b>	<b>82</b>	<b>296</b>	<b>157</b>		<b>37.9</b>	

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

TABLE FOR PCC PAVEMENT REPAIR ON I29 SOUTH SEGMENT SB LANES

MRM	DISP.	LANE	SB DRIVING LANE		SB PASSING LANE		NRCP REPAIR SqYds	NEW JOINT CON-FIG. (NRCP)	INSERT STEEL BAR IN PCC PAVEMENT (NRCP)			DOWEL BAR Each	TIE BAR RETROFIT STITCHING Each	TYPE A SPALL SIZE		REPAIR TYPE A SPALL SqFt	SEAL RANDOM CRACKS IN PCC PAVEMENT Ft	
			L Ft	W Ft	L Ft	W Ft			1 1/2" x 18" PLAIN ROUND DOWEL BARS Each	No. 11 x 18" DEFORMED TIE BARS Each	No. 5 x 24" DEFORMED TIE BARS Each			INSERT STEEL BAR IN NRCP TOTAL Each	L			W
0.05	0.025	DL						R					21				42	
0.05	0.027	DL											6				12	
0.05	0.055	DL	6	14			9.3		16	16	4	36						
0.05	0.115	DL												12"	20"		1.67	
0.05	0.182	PL												18"	15"		1.88	
0.05	0.344	PL												15"	12"		1.25	
0.05	0.408	PL												18"	12"		1.50	
0.05	0.456	PL												12"	12"		1.00	
0.05	0.473	PL												12"	12"		1.00	
0.05	0.475	PL												12"	12"		1.00	
0.05	0.491	DL											5				10	
0.05	0.491	DL	6	6			4.0	R		8	4	12	6					
0.05	0.505	PL			6	6	4.0	R		8	2	10	6					
0.05	0.508	DL												24"	24"	4.00		
0.05	0.533	DL											5				10	
0.05	0.531	DL												12"	24"	2.00		
0.05	0.539	PL												12"	12"	1.00		
0.05	0.555	PL												20"	12"	1.67		
0.05	0.559	DL												15"	12"	1.25		
0.05	0.586	RAMP												12"	12"	1.00		
0.05	0.617	DL												12"	15"	1.25		
0.05	0.625	PL												18"	12"	1.50		
0.05	0.633	PL												12"	12"	1.00		
0.05	0.648	PL												18"	12"	1.50		
0.05	0.652	PL												12"	12"	1.00		
0.05	0.677	PL												30"	12"	2.50		
0.05	0.688	PL												12"	12"	1.00		
0.05	0.709	PL												12"	36"	3.00		
0.05	0.752	PL												30"	15"	3.13		
0.05	0.768	PL												30"	15"	3.13		
0.05	0.775	RAMP												18"	15"	1.88		
0.05	0.848	RAMP												15"	15"	1.56		
0.05	0.867	DL												12"	15"	1.25		
0.05	0.902	RAMP												18"	6"	0.75		
0.05	0.906	RAMP												30"	12"	2.50		
0.05	0.910	PL												18"	15"	1.88		
0.05	0.925	PL												15"	15"	1.56		
0.98	0.010	RAMP												24"	12"	2.00		
0.98	0.010	PL												15"	15"	1.56		
1.00	0.000	PL												30"	12"	2.50		
1.00	0.011	PL												15"	15"	1.56		
1.00	0.038	PL												12"	30"	2.50		
1.00	0.060	GORE											10				20	
1.00	0.062	PL												18"	10"	1.25		
1.00	0.085	PL												18"	12"	1.50		
1.00	0.097	PL												12"	12"	1.00		
1.00	0.100	PL												6"	12"	0.50		
1.00	0.108	PL												12"	18"	1.50		
1.00	0.112	PL												6"	18"	0.75		
1.00	0.119	DL												15"	20"	2.08		
1.00	0.165	DL												15"	15"	1.56		
1.00	0.204	DL												12"	24"	2.00		
1.00	0.212	DL												8"	12"	0.67		
1.00	0.231	DL												12"	24"	2.00		
1.00	0.235	DL												20"	10"	1.39		
<b>SHEET TOTALS:</b>							17.3		16	32	10	58	12	47			76.93	94

TABLE FOR PCC PAVEMENT REPAIR ON I29 SOUTH SEGMENT SB LANES

MRM	DISP.	LANE	SB DRIVING LANE		SB PASSING LANE		NRCP REPAIR SqYds	NEW JOINT CON-FIG. (NRCP)	INSERT STEEL BAR IN PCC PAVEMENT (NRCP)			DOWEL BAR Each	TIE BAR RETROFIT STITCHING Each	TYPE A SPALL SIZE		REPAIR TYPE A SPALL SqFt	SEAL RANDOM CRACKS IN PCC PAVEMENT Ft
			L Ft	W Ft	L Ft	W Ft			1 1/2" x 18" PLAIN ROUND DOWEL BARS Each	No. 11 x 18" DEFORMED TIE BARS Each	No. 5 x 24" DEFORMED TIE BARS Each			INSERT STEEL BAR IN NRCP TOTAL Each	L		
1.00	0.340	RAMP												15"	6"	0.63	
1.00	0.399	PL			6	6	4.0	B	4	4	2	10					
1.00	0.401	DL											9				18
1.00	0.434	PL												10"	6"	0.42	
1.00	0.528	PL												18"	6"	0.75	
1.00	0.610	PL			6	6	4.0	B	4	4	4	12					
1.00	0.688	PL															72
1.00	0.721	DL												6"	12"	0.50	
1.00	0.759	DL												6"	18"	0.75	
1.00	0.767	DL												10"	24"	1.67	
1.00	0.846	DL												10"	18"	1.25	
1.00	0.854	DL												8"	12"	0.67	
1.00	0.869	DL												8"	12"	0.67	
1.00	0.876	PL												36"	12"	3.00	
1.00	0.907	DL												6"	15"	0.63	
1.00	0.955	DL												6"	12"	0.50	
1.00	0.967	DL												20"	24"	3.33	
1.00	0.974	PL												12"	30"	2.50	
1.00	0.982	DL												10"	24"	1.67	
1.00	0.988	DL												6"	15"	0.63	
2.00	0.000	DL												6"	12"	0.50	
2.00	0.000	DL												6"	15"	0.63	
2.00	0.065	DL												6"	12"	0.50	
2.00	0.069	DL												6"	12"	0.50	
2.00	0.073	DL												15"	24"	2.50	
2.00	0.080	PL												15"	15"	1.56	
2.00	0.130	RAMP												30"	15"	3.13	
2.00	0.141	DL	6	6			4.0	R		8	4	12	6				
2.00	0.149	DL												6"	15"	0.63	
2.00	0.153	PL												10"	24"	1.67	
2.00	0.270	RAMP												6"	20"	0.83	
2.00	0.274	RAMP												24"	8"	1.33	
2.00	0.278	DL												15"	18"	1.88	
2.00	0.281	DL												24"	12"	2.00	
2.00	0.325	DL												6"	15"	0.63	
2.00	0.341	DL															8
2.00	0.506	PL												4			
2.00	0.673	DL	15	6			10.0	B	4	4	12	20					
2.00	0.732	PL												15"	12"	1.25	
2.00	0.754	DL												6"	6"	0.25	
2.00	0.824	PL												24"	12"	2.00	
2.00	0.913	DL												8			17
3.00	0.088	PL												5			10
3.00	0.124	PL												30"	24"	5.00	
3.00	0.167	PL			6	12	8.0	B	8	8	2	18					
3.00	0.167	PL												3			6
3.00	0.255	DL												4			8
3.00	0.276	PL															
3.00	0.298	DL												24"	24"	4.00	
3.00	0.362	DL	6	7			4.7	B	4	4	4	12		24"	24"	4.00	
3.00	0.432	DL															
3.00	0.716	DL												15"	10"	1.04	
4.00	0.178	DL												6"	15"	0.63	
4.35	0.145	DL												30"	6"	1.25	
4.35	0.155	DL												12"	36"	3.00	
														6"	18"	0.75	
<b>SHEET TOTALS:</b>							34.7		24	32	28	84	6	69		62.03	139

**TABLE FOR PCC PAVEMENT REPAIR ON I29 SOUTH SEGMENT SB LANES**

MRM	DISP.	LANE	SB DRIVING LANE		SB PASSING LANE		NRCP REPAIR SqYds	NEW JOINT CON-FIG. (NRCP)	INSERT STEEL BAR IN PCC PAVEMENT (NRCP)			INSERT STEEL BAR IN NRCP TOTAL Each	DOWEL BAR Each	TIE BAR RETROFIT STITCHING Each	TYPE A SPALL SIZE		REPAIR TYPE A SPALL SqFt	SEAL RANDOM CRACKS IN PCC PAVEMENT Ft	
			L Ft	W Ft	L Ft	W Ft			1½" x 18" PLAIN ROUND DOWEL BARS Each	No. 11 x 18" DEFORMED TIE BARS Each	No. 5 x 24" DEFORMED TIE BARS Each				L	W			
4.35	0.179	DL													10"	12"	0.83		
4.35	0.179	DL													6"	18"	0.75		
4.35	0.224	DL													24"	18"	3.00		
4.35	0.231	DL													10"	18"	1.25		
4.35	0.231	DL													12"	24"	2.00		
4.35	0.265	DL													12"	24"	2.00		
4.35	0.328	DL												5			10		
4.35	0.340	PL													12"	6"	0.50		
4.35	0.343	PL												18			37		
4.35	0.347	PL													18"	6"	0.75		
4.35	0.355	DL												5			10		
4.35	0.361	PL												9			18		
4.35	0.367	PL													24"	15"	2.50		
4.35	0.393	DL													12"	36"	3.00		
<b>SHEET TOTALS:</b>							0.0		0	0	0	0	0	0	37		16.58	75	
<b>TOTALS:</b>							52.0		40	64	38	142	18	153				155.5	308
<b>ADDITIONAL QUANTITIES:</b>							10.0		10	10	10	30	0	30				31.1	60
<b>GRAND TOTALS:</b>							62.0		50	74	48	172	18	183				186.6	368

**PCC PAVEMENT REPAIR AREA TYPES**

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

**TABLE FOR PCC PAVEMENT REPAIR ON I29 SOUTH SEGMENT SBL RAMPS**

JOINT NO.	LANE	SB RAMP & CROSS ROAD		SB RAMP & CROSS ROAD		NRCP REPAIR SqYds	NEW JOINT CON-FIG. (NRCP)	INSERT STEEL BAR IN PCC PAVEMENT (NRCP)			INSERT STEEL BAR IN NRCP TOTAL Each	DOWEL BAR Each	TIE BAR RETROFIT STITCHING Each	TYPE A SPALL SIZE		REPAIR TYPE A SPALL SqFt	SEAL RANDOM CRACKS IN PCC PAVEMENT Ft	COMMENTS
		L Ft	W Ft	L Ft	W Ft			1 1/2" x 18" PLAIN ROUND DOWEL BARS Each	No. 11 x 18" DEFORMED TIE BARS Each	No. 5 x 24" DEFORMED TIE BARS Each				L	W			
18	Exit 1 Off													12"	24"	2.00		Joints begin at bottom of Ramp
74	Exit 1 Off													6"	6"	0.25		
89	Exit 1 Off													12"	12"	1.00		
92	Exit 1 Off													12"	12"	1.00		
95	Exit 1 Off													12"	12"	1.00		
110	Exit 1 Off													12"	6"	0.50		
115	Exit 1 Off													12"	12"	1.00		
151	Exit 1 Off			6	6	4.0	R		8	4	12	6						End of Exit 1 Off Ramp
21	Exit 1 X Rd													12"	12"	1.00		
35	Exit 1 X Rd													12"	12"	1.00		
73	Exit 1 X Rd	11	12			14.7		16	16	8	40					1.00		
26	Exit 1 On													30"	30"	6.25		Joint count at intersection of
105	Exit 1 On													12"	12"	1.00		Two Rivers Drive
109	Exit 1 On													6"	6"	0.25		
116	Exit 1 On	6	12			8.0		16	16	4	36			12"	12"	1.00		
127	Exit 1 On													12"	12"	1.00		
128	Exit 1 On													24"	12"	2.00		
130	Exit 1 On													18"	12"	1.50		
131	Exit 1 On													18"	18"	2.25		
133	Exit 1 On			6	6	4.0	R		8	4	12	6						
135	Exit 1 On	9	6			6.0		8	8	6	22		2	12"	12"	1.00		
169	Exit 1 On						R							12"	12"	1.00		
185	Exit 1 On													12"	12"	1.00		
193	Exit 1 On													15"	30"	3.13		End of Diamond Ramp
11	Exit 1 On													18"	12"	1.50		Circular Ramp Joints begin at drop inlet
67	Exit 1 On													12"	12"	1.00		on Two Rivers Drive
88	Exit 1 On													12"	12"	1.00		
94	Exit 1 On													24"	12"	2.00		
102	Exit 1 On													12"	12"	1.00		
108	Exit 1 On													20"	20"	2.78		
109	Exit 1 On													18"	24"	3.00		
110	Exit 1 On												25			50		End of Circular Ramp
3	Exit 2 On													12"	12"	1.00		
5	Exit 2 On													12"	12"	1.00		
9	Exit 2 On													15"	12"	1.25		
14	Exit 2 On													15"	8"	0.83		
16	Exit 2 On													8"	12"	0.67		
22	Exit 2 On													8"	12"	0.67		
23	Exit 2 On													10"	12"	0.83		
48	Exit 2 On													10"	24"	1.67		
<b>SHEET TOTALS:</b>						<b>36.7</b>		<b>40</b>	<b>56</b>	<b>26</b>	<b>122</b>	<b>12</b>	<b>27</b>			<b>51.33</b>	<b>50</b>	
<b>TOTALS:</b>						<b>36.7</b>		<b>40</b>	<b>56</b>	<b>26</b>	<b>122</b>	<b>12</b>	<b>27</b>			<b>51.3</b>	<b>50</b>	
<b>ADDITIONAL QUANTITIES:</b>						<b>10.0</b>		<b>10</b>	<b>10</b>	<b>10</b>	<b>30</b>	<b>0</b>	<b>10</b>			<b>10.3</b>	<b>10</b>	
<b>GRAND TOTALS:</b>						<b>46.7</b>		<b>50</b>	<b>66</b>	<b>36</b>	<b>152</b>	<b>12</b>	<b>37</b>			<b>61.6</b>	<b>60</b>	

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

**TABLE FOR PCC PAVEMENT REPAIR ON I29 SOUTH SEGMENT NB LANES**

MRM	DISP.	LANE	NB PASSING LANE		NB DRIVING LANE		NRCP REPAIR SqYds	NEW JOINT CON-FIG. (NRCP)	INSERT STEEL BAR IN PCC PAVEMENT (NRCP)			DOWEL BAR Each	TIE BAR RETROFIT STITCHING Each	TYPE A SPALL SIZE		REPAIR TYPE A SPALL SqFt	SEAL RANDOM CRACKS IN PCC PAVEMENT Ft	COMMENTS	
			L Ft	W Ft	L Ft	W Ft			1 1/2" x 18" PLAIN ROUND DOWEL BARS Each	No. 11 x 18" DEFORMED TIE BARS Each	No. 5 x 24" DEFORMED TIE BARS Each			INSERT STEEL BAR IN NRCP TOTAL Each	L				W
0.00	0.093	PL												12"	18"	1.50			
0.00	0.112	PL												12"	20"	1.67			
0.05	0.132	PL												12"	24"	2.00			
0.05	0.132	DL												10"	20"	1.39			
0.05	0.136	DL												12"	12"	1.00			
0.05	0.155	PL	6	12			8.0	R		16	4	20	12						
0.05	0.160	DL												12"	18"	1.50			
0.05	0.166	PL/DL												16"	27"	3.00			
0.05	0.198	DL												15"	48"	5.00			
0.05	0.207	DL												30"	12"	2.50			
0.05	0.232	DL			6	6	4.0	R		8	4	12	6						
0.05	0.270	PL	6	6			4.0	B	4	4	4	12		12"	12"	1.00			
0.05	0.293	DL												18"	12"	1.50			
0.05	0.321	PL	6	6			4.0	B	4	4	4	12							
0.05	0.321	DL	6	12			8.0	R		16	4	20	12						
0.05	0.361	DL												12"	12"	1.00			
0.05	0.372	DL			6	6	4.0	B	4	4	4	12							
0.05	0.391	DL												18"	12"	1.50			
0.05	0.398	DL												12"	12"	1.00			
0.05	0.417	DL												12"	20"	1.67			
0.05	0.419	DL												6"	6"	0.25			
0.05	0.427	DL												12"	24"	2.00			
0.05	0.463	DL												12"	12"	1.00			
0.05	0.495	DL			6	14	9.3	R		16	2	18	12						
0.05	0.507	DL			6	6	4.0	B	4	4	4	12							
0.05	0.518	DL			6	6	4.0	B	4	4	4	12							
0.05	0.522	DL			6	6	4.0	B	4	4	4	12							
0.05	0.530	PL												12"	28"	2.33			
0.05	0.585	PL												10"	24"	1.67			
0.05	0.593	DL			6	6	4.0	R		8	4	12	6						
0.05	0.593	PL			6	6	4.0	R		8	4	12	6						
0.05	0.670	DL												12"	12"	1.00			
0.05	0.681	PL	6	6			4.0	R		8	4	12	6						
0.05	0.704	PL	6	6			4.0	R		8	4	12	6						
0.05	0.786	DL	6	6			4.0	R		8	4	12	6						
0.05	0.808	PL	6	6			4.0	R		8	4	12	6						
0.05	0.867	DL												30"	15"	3.13			
0.05	0.894	PL												12"	18"	1.50			
1.00	0.049	DL												12"	12"	1.00			
1.00	0.079	DL			36	14	56.0	B	8	8	14	30	12						
1.00	0.118	DL												15"	12"	1.25			
1.00	0.140	DL			6	6	4.0	R		8	4	12	6						
1.00	0.180	DL												12"	12"	1.00			
1.00	0.325	PL												15"	24"	2.50			
1.00	0.337	DL												12"	12"	1.00			
1.00	0.430	DL												18"	12"	1.50			
1.00	0.454	DL			6	7	4.7	R		8	4	12	7	8"	15"	0.83			
1.00	0.521	DL												8"	15"	0.83			
1.00	0.542	DL												12"	12"	1.00			
1.00	0.560	DL												12"	12"	1.00			
1.00	0.564	DL												10"	18"	1.25			
1.00	0.632	DL			6	6	4.0	R		8	4	12	6						
1.00	0.651	DL												15"	15"	1.56			
1.00	0.676	DL												10"	15"	1.04			
1.00	0.727	DL												15"	12"	1.25			
<b>SHEET TOTALS:</b>							146.0			32	160	88	280	109	0		57.12	0	

TABLE FOR PCC PAVEMENT REPAIR ON I29 SOUTH SEGMENT NB LANES

MRM	DISP.	LANE	NB PASSING LANE		NB DRIVING LANE		NRCP REPAIR SqYds	NEW JOINT CON-FIG. (NRCP)	INSERT STEEL BAR IN PCC PAVEMENT (NRCP)			DOWEL BAR Each	TIE BAR RETROFIT STITCHING Each	TYPE A SPALL SIZE		REPAIR TYPE A SPALL SqFt	SEAL RANDOM CRACKS IN PCC PAVEMENT Ft	COMMENTS	
			L Ft	W Ft	L Ft	W Ft			1 1/2" x 18" PLAIN ROUND DOWEL BARS Each	No. 11 x 18" DEFORMED TIE BARS Each	No. 5 x 24" DEFORMED TIE BARS Each			INSERT STEEL BAR IN NRCP TOTAL Each	L				W
1.00	0.730	DL			6	6	4.0	R		8	4	12	6		30"	15"	3.13		
1.00	0.734	DL													18"	24"	3.00		
1.00	0.740	DL													12"	12"	1.00		
1.00	0.755	DL																	
1.00	0.770	DL			6	14	9.3	R		16	2	18	12						
1.00	0.788	DL			6	6	4.0	R		8	4	12	6						
1.00	0.821	PL													15"	12"	1.25		
1.00	0.846	PL													30"	12"	2.50		
1.00	0.865	DL			6	6	4.0	R		8	4	12	6						
1.00	0.927	DL													15"	15"	1.56		
1.00	0.931	PL													15"	12"	1.25		
1.00	0.961	DL													18"	10"	1.25		
1.00	0.972	DL													15"	12"	1.25		
1.00	0.980	DL			6	6	4.0	R		8	4	12	6						
2.00	0.000	DL													24"	18"	3.00		
2.00	0.038	DL													15"	8"	0.83		
2.00	0.070	DL													12"	12"	1.00		
2.00	0.088	DL													10"	12"	0.83		
2.00	0.181	DL													10"	12"	0.83		
2.00	0.202	PL													10"	12"	0.83		
2.00	0.220	DL													12"	24"	2.00		
2.00	0.364	DL			6	6	4.0	B	4	4	4	12							
2.48	0.016	DL													8"	18"	1.00		
2.48	0.166	DL													8"	15"	0.83		
2.48	0.173	DL													8"	20"	1.11		
2.48	0.177	DL													12"	20"	1.67		
2.48	0.192	DL													8"	15"	0.83		
2.48	0.201	PL												4			6		
2.48	0.299	DL													12"	18"	1.50		
2.48	0.331	DL													10"	15"	1.04		
3.00	0.040	DL													12"	12"	1.00		
3.00	0.555	PL													8"	15"	0.83		
3.00	0.574	PL													6"	18"	0.75		
3.00	0.598	DL													15"	15"	1.56		
3.00	0.600	DL													18"	15"	1.88		
3.00	0.616	PL													12"	18"	1.50		
3.00	0.653	DL													12"	18"	1.50		
3.00	0.665	PL	6	6			4.0	B	4	4	4	12							
3.00	0.687	PL													15"	24"	2.50		
3.00	0.692	DL												13					
3.00	0.732	DL			6	6	4.0	R		8	4	12	6						
3.00	0.747	DL													12"	18"	1.50		
3.00	0.754	DL													12"	24"	2.00		
3.00	0.773	DL			6	6	4.0	R		8	4	12	6						
3.00	0.784	DL													12"	15"	1.25		
3.00	0.792	DL													10"	18"	1.25		
3.00	0.803	DL													12"	18"	1.50		
3.00	0.855	DL													12"	15"	1.25		
3.00	0.884	DL													6"	12"	0.50		
3.00	0.973	DL													10"	15"	1.04		
3.00	0.979	DL													12"	12"	1.00		
3.00	0.979	PL													6"	18"	0.75		
3.00	0.991	DL													12"	18"	1.50		
3.00	0.998	PL													12"	18"	1.50		
4.00	0.007	DL													12"	20"	1.67		
<b>SHEET TOTALS:</b>							41.3		8	72	34	114	48		17		61.72	6	

**TABLE FOR PCC PAVEMENT REPAIR ON I29 SOUTH SEGMENT NB LANES**

MRM	DISP.	LANE	NB PASSING LANE		NB DRIVING LANE		NRCP REPAIR SqYds	NEW JOINT CON-FIG. (NRCP)	INSERT STEEL BAR IN PCC PAVEMENT (NRCP)			DOWEL BAR Each	TIE BAR RETROFIT STITCHING Each	TYPE A SPALL SIZE		REPAIR TYPE A SPALL SqFt	SEAL RANDOM CRACKS IN PCC PAVEMENT Ft	COMMENTS
			L Ft	W Ft	L Ft	W Ft			1 1/2" x 18" PLAIN ROUND DOWEL BARS Each	No. 11 x 18" DEFORMED TIE BARS Each	No. 5 x 24" DEFORMED TIE BARS Each			INSERT STEEL BAR IN NRCP TOTAL Each	L			
4.00	0.035	PL												24"	18"	3.00		
4.00	0.070	PL												12"	12"	1.00		
4.00	0.780	DL												10"	15"	1.04		
4.00	0.083	DL												12"	12"	1.00		
4.00	0.116	DL			6	6	4.0	R		8	4	12	6					
4.00	0.135	DL			6	6	4.0	R		8	4	12	6					
4.00	0.174	DL												12"	15"	1.25		
4.00	0.226	DL												15"	12"	1.25		
4.35	0.192	DL												15"	12"	1.25		
4.35	0.226	DL												6"	18"	0.75		
4.35	0.275	DL												10"	30"	2.08		
4.35	0.316	DL												10"	15"	1.04		
4.35	0.316	PL												6"	15"	0.63		
4.35	0.418	DL												18"	24"	3.00		
<b>SHEET TOTALS:</b>							8.0		0	16	8	24	12	0		17.29	0	
<b>TOTALS:</b>							195.3		40	248	130	418	169	17		136.1	6	
<b>ADDITIONAL QUANTITIES:</b>							40.0		10	50	30	90	30	-		27.2	-	
<b>GRAND TOTALS:</b>							235.3		50	298	160	508	199	17		163.3	6	

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

TABLE FOR PCC PAVEMENT REPAIR ON I29 SOUTH SEGMENT NBL RAMPS

JOINT NO.	LANE	NB RAMP AND CROSS RD		NB RAMP AND CROSS RD		NRCP REPAIR SqYds	NEW JOINT CON-FIG. (NRCP)	INSERT STEEL BAR IN PCC PAVEMENT (NRCP)			DOWEL BAR Each	TIE BAR RETROFIT STITCHING Each	TYPE A SPALL SIZE		REPAIR TYPE A SPALL SqFt	TYPE B SPALL SIZE		REPAIR TYPE B SPALL SqFt	SEAL RANDOM CRACKS IN PCC PAVEMENT Ft	COMMENTS		
		L Ft	W Ft	L Ft	W Ft			1 1/2" x 18" PLAIN ROUND DOWEL BARS Each	No. 11 x 18" DEFORMED TIE BARS Each	No. 5 x 24" DEFORMED TIE BARS Each			INSERT STEEL BAR IN NRCP TOTAL Each	L		W	L				W	
3	Exit 1 Off			12	7.5	10.0	B	5	5	8	18								4	Joint Location 20' N. of Gas Sign		
6	Exit 1 Off													18"	24"	3.00				4		
8	Exit 1 Off																			4		
9	Exit 1 Off													24"	18"	3.00				5		
10	Exit 1 Off																			5		
11	Exit 1 Off																			12		
17	Exit 1 Off	6	6			4.0	B	4	4	4	12											
29	Exit 1 Off													18"	18"	2.25						
30	Exit 1 Off													24"	24"	4.00						
31	Exit 1 Off													24"	18"	3.00						
33	Exit 1 Off													12"	12"	1.00						
50	Exit 1 Off													12"	12"	1.00						
57	Exit 1 Off													24"	24"	4.00						
62	Exit 1 Off																12"	48"	4.00		Patch exposed tie bar	
63	Exit 1 Off																12"	48"	4.00		Patch exposed tie bar	
64	Exit 1 Off																12"	48"	4.00		Patch exposed tie bar	
65	Exit 1 Off																12"	48"	4.00		Patch exposed tie bar	
66	Exit 1 Off																12"	48"	4.00		Patch exposed tie bar	
67	Exit 1 Off																12"	48"	4.00		Patch exposed tie bar	
68	Exit 1 Off																12"	48"	4.00		Patch exposed tie bar	
69	Exit 1 Off																12"	48"	4.00		Patch exposed tie bar	
70	Exit 1 Off																12"	48"	4.00		Patch exposed tie bar	
71	Exit 1 Off																12"	48"	4.00		Patch exposed tie bar	
121	Exit 1 Off													20"	20"	2.78						
122	Exit 1 Off													30"	18"	3.75						
9	Exit 1 On													12"	24"	2.00						Gore Area
10	Exit 1 On													12"	18"	1.50						
28	Exit 1 On													8"	8"	0.44						
36	Exit 1 On													12"	6"	0.50						
42	Exit 1 On													15"	15"	1.56						
43	Exit 1 On													15"	12"	1.25						
44	Exit 1 On													12"	20"	1.67						
45	Exit 1 On													8"	8"	0.44						
49	Exit 1 On													8"	8"	0.44						
50	Exit 1 On													18"	24"	3.00						
51	Exit 1 On													18"	18"	2.25						
52	Exit 1 On													24"	12"	2.00						
53	Exit 1 On													15"	18"	1.88						
54	Exit 1 On													15"	15"	1.56						
60	Exit 1 On													12"	12"	1.00						
61	Exit 1 On													18"	12"	1.50						
62	Exit 1 On													12"	12"	1.00						
63	Exit 1 On													20"	20"	2.78						
64	Exit 1 On													18"	18"	2.25						
68	Exit 1 On													24"	24"	4.00						
69	Exit 1 On													20"	20"	2.78						
70	Exit 1 On													24"	12"	2.00						
71	Exit 1 On	6	6			4.0		8	8	4	20											
72	Exit 1 On													15"	15"	1.56						
78	Exit 1 On													12"	12"	1.00						
89	Exit 1 On													12"	12"	1.00						
96	Exit 1 On													12"	12"	1.00						
<b>SHEET TOTALS:</b>						18.0		17	17	16	50	0	90			70.14			40.00	30		

TABLE FOR PCC PAVEMENT REPAIR ON I29 SOUTH SEGMENT NBL RAMPS

JOINT NO.	LANE	NB RAMP AND CROSS RD		NB RAMP AND CROSS RD		NRCP REPAIR SqYds	NEW JOINT CON-FIG. (NRCP)	INSERT STEEL BAR IN PCC PAVEMENT (NRCP)			DOWEL BAR Each	TIE BAR RETROFIT STITCHING Each	TYPE A SPALL SIZE		REPAIR TYPE A SPALL SqFt	TYPE B SPALL SIZE		REPAIR TYPE B SPALL SqFt	SEAL RANDOM CRACKS IN PCC PAVEMENT Ft	COMMENTS	
		L Ft	W Ft	L Ft	W Ft			1½" x 18" PLAIN ROUND DOWEL BARS Each	No. 11 x 18" DEFORMED TIE BARS Each	No. 5 x 24" DEFORMED TIE BARS Each			INSERT STEEL BAR IN NRCP TOTAL Each	L		W	L				W
97	Exit 1 On												6"	12"	0.50						
99	Exit 1 On												12"	12"	1.00						
116	Exit 1 On												15"	15"	1.56						
120	Exit 1 On	6	6			4.0		8	8	4	20										
11	Exit 1 On											12							25	Circular Ramp	
97	Exit 1 On												6"	15"	0.63					Circular Ramp	
102	Exit 1 On												12"	12"	1.00					Circular Ramp	
106	Exit 1 On												12"	12"	1.00					Circular Ramp	
107	Exit 1 On												12"	12"	1.00					Circular Ramp	
108	Exit 1 On												24"	24"	4.00					Circular Ramp	
109	Exit 1 On											14							27	Circular Ramp	
110	Exit 1 On												24"	24"	4.00					Circular Ramp	
2	Exit 1 XRd											5							10	Joint 0 starts at Raised Median Nose	
6	Exit 1 XRd												12"	12"	1.00					EBL	
28	Exit 1 XRd			6	6	4.0	T		8	4	12									Monolithic Curb and Gutter Repair	
42	Exit 1 XRd												24"	12"	2.00						
53	Exit 1 XRd												12"	12"	1.00					Joint 81 at Bridge Approach	
55	Exit 2 Off												12"	15"	1.25						
56	Exit 2 Off												8"	30"	1.67						
57	Exit 2 Off												12"	12"	1.00						
35	Exit 2 XRd												15"	24"	2.50						
36	Exit 2 XRd												18"	18"	2.25						
37	Exit 2 XRd			6	12	8.0	R		16	2	18	12									
<b>SHEET TOTALS:</b>						<b>16.0</b>		<b>8</b>	<b>32</b>	<b>10</b>	<b>50</b>	<b>12</b>	<b>31</b>			<b>27.36</b>			<b>0.00</b>	<b>62</b>	
<b>TOTALS:</b>						<b>34.0</b>		<b>25</b>	<b>49</b>	<b>26</b>	<b>100</b>	<b>12</b>	<b>121</b>			<b>97.5</b>			<b>40.00</b>	<b>92</b>	
<b>ADDITIONAL QUANTITIES:</b>						<b>10.0</b>		<b>10</b>	<b>10</b>	<b>10</b>	<b>30</b>	<b>0</b>	<b>20</b>			<b>19.5</b>			<b>8.00</b>	<b>20</b>	
<b>GRAND TOTALS:</b>						<b>44.0</b>		<b>35</b>	<b>59</b>	<b>36</b>	<b>130</b>	<b>12</b>	<b>141</b>			<b>117.0</b>			<b>48.00</b>	<b>112</b>	

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

**TABLE FOR PCC PAVEMENT REPAIR ON I29 NORTH SEGMENT SB LANES**

MRM	DISP.	LANE	SB DRIVING LANE		NRCP REPAIR SqYds	NEW JOINT CON- FIG. (NRCP)	INSERT STEEL BAR IN PCC PAVEMENT (NRCP)		INSERT STEEL BAR IN NRCP TOTAL Each	DOWEL BAR Each	TIE BAR RETROFIT STITCHING Each	TYPE A SPALL SIZE		REPAIR TYPE A SPALL SqFt	SEAL RANDOM CRACKS IN PCC PAVEMENT Ft	COMMENTS
			L Ft	W Ft			No. 11 x 18" DEFORMED TIE BARS Each	No. 5 x 24" DEFORMED TIE BARS Each				L	W			
47.00	0.063	DL										6"	18"	0.75		
47.00	0.138	PL	6	6	4.0	R	8	4	12	6						
47.31	0.060	DL									8					16
47.31	0.093	DL									7					14
47.31	0.092	DL										12"	12"	1.00		
47.31	0.352	DL										12"	12"	1.00		
<b>SHEET TOTALS:</b>					4.0		8	4	12	6	15			2.75	30	
<b>TOTALS:</b>					4.0		8	4	12	6	15			2.8	30	
<b>ADDITIONAL QUANTITIES:</b>					-		-	-	-	0	-			-	10	
<b>GRAND TOTALS:</b>					4.0		8	4	12	6	15			2.8	40	

**PCC PAVEMENT REPAIR AREA TYPES**

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

T = Two Tied Joints

B = One Working & One Tied Joint

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

**TABLE FOR PCC PAVEMENT REPAIR ON I29 NORTH SEGMENT SB RAMPS**

JOINT NO.	LANE	SB RAMP LEFT SIDE		NRCP REPAIR SqYds	NEW JOINT CON- FIG. (NRCP)	INSERT STEEL BAR IN PCC PAVEMENT (NRCP)		INSERT STEEL BAR IN NRCP TOTAL Each	DOWEL BAR Each	TIE BAR RETROFIT STITCHING Each	TYPE A SPALL SIZE		REPAIR TYPE A SPALL SqFt	SEAL RANDOM CRACKS IN PCC PAVEMENT Ft	COMMENTS
		L Ft	W Ft			No. 11 x 18" DEFORMED TIE BARS Each	No. 5 x 24" DEFORMED TIE BARS Each				L	W			
11	On Ramp										12"	12"	1.00		Begin at Top of Ramp
72	On Ramp										6"	15"	0.63		
22	Off Ramp									4				8	Begin at Base of Ramp
34	Off Ramp										12"	12"	1.00		
35	Off Ramp										12"	12"	1.00		
73	Off Ramp	6	12	8.0	R	16	4	20	12						
83	Off Ramp										6"	12"	0.50		
85	Off Ramp										10"	36"	2.50		
<b>SHEET TOTALS:</b>				<b>8.0</b>		<b>16</b>	<b>4</b>	<b>20</b>	<b>12</b>	<b>4</b>			<b>6.63</b>	<b>8</b>	
<b>TOTALS:</b>				<b>8.0</b>		<b>16</b>	<b>4</b>	<b>20</b>	<b>12</b>	<b>4</b>			<b>6.6</b>	<b>8</b>	

**PCC PAVEMENT REPAIR AREA TYPES**

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

T = Two Tied Joints

B = One Working & One Tied Joint

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

**TABLE FOR PCC PAVEMENT REPAIR ON I29 NORTH SEGMENT NB LANES**

MRM	DISP.	LANE	NB DRIVING LANE		NRCP REPAIR SqYds	NEW JOINT CON-FIG. (NRCP)	INSERT STEEL BAR IN PCC PAVEMENT (NRCP)			DOWEL BAR Each	TIE BAR RETROFIT STITCHING Each	TYPE A SPALL SIZE		REPAIR TYPE A SPALL SqFt	SEAL RANDOM CRACKS IN PCC PAVEMENT Ft	COMMENTS	
			L Ft	W Ft			1 1/2" x 18" PLAIN ROUND DOWEL BARS Each	No. 11 x 18" DEFORMED TIE BARS Each	No. 5 x 24" DEFORMED TIE BARS Each			INSERT STEEL BAR IN NRCP TOTAL Each	L				W
46.31	0.004	DL										10"	16"	1.11			
46.31	0.015	DL	6	14	9.3	R				12							
46.31	0.015	PL	6	6	4.0	B	4	4	4	12							
46.31	0.023	DL	6	14	9.3	R				12							
46.31	0.030	DL										24"	30"	5.00			
46.31	0.030	PL										10"	18"	1.25			
46.31	0.041	PL										12"	24"	2.00			
46.31	0.060	DL										10"	36"	2.50			
46.31	0.060	PL										6"	15"	0.63			
46.31	0.083	DL									7				14		
46.31	0.109	PL										24"	12"	2.00			
46.31	0.109	DL										30"	6"	1.25			
46.31	0.233	DL	8	14	12.4	R			16	3	19						
46.31	0.223	PL										10	6"	24"	1.00	20	
46.31	0.236	BOTH										25				50	
46.31	0.286	DL										15				30	
46.31	0.298	BOTH										13				26	
47.31	0.006	DL										7				14	
47.31	0.211	DL										16	16"	1.78			
47.31	0.218	DL										12"	12"	1.00			
47.31	0.241	DL									14					28	
47.31	0.248	DL	6	6	4.0	B	4	4	4	12							
47.31	0.251	DL										12"	12"	1.00			
47.31	0.252	DL										4				8	
47.31	0.258	DL										12"	12"	1.00			
47.31	0.273	DL										12"	20"	1.67			
47.31	0.290	DL	8	14	12.4	R			16	3	19						
47.31	0.292	DL										4				8	
47.31	0.307	DL	6	14	9.3	R			16	2	18						
47.31	0.333	DL	6	8	5.3	R			10	4	14						
47.31	0.333	DL											12"	12"	1.00		
47.31	0.371	DL											12"	20"	1.67		
47.31	0.375	DL											24"	24"	4.00		
47.31	0.390	DL											10"	18"	1.25		
47.31	0.394	DL											24"	24"	4.00		
47.31	0.399	DL											18"	24"	3.00		
47.31	0.399	DL	6	7	4.7	R			8	4	12						
47.31	0.407	DL											8"	18"	1.00		
47.31	0.414	DL											24"	24"	4.00		
47.31	0.414	DL											16"	16"	1.78		
47.31	0.414	PL											6"	12"	0.50		
47.31	0.429	DL											12"	30"	2.50		
47.31	0.433	BOTH														26	
<b>TOTALS:</b>					<b>70.7</b>			<b>8</b>	<b>106</b>	<b>28</b>	<b>142</b>	<b>75</b>	<b>122</b>		<b>47.9</b>	<b>244</b>	
<b>ADDITIONAL QUANTITIES:</b>					<b>10.0</b>			<b>-</b>	<b>20</b>	<b>10</b>	<b>30</b>	<b>20</b>	<b>20</b>		<b>9.6</b>	<b>50</b>	
<b>GRAND TOTALS:</b>					<b>80.7</b>			<b>8</b>	<b>126</b>	<b>38</b>	<b>172</b>	<b>95</b>	<b>142</b>		<b>57.5</b>	<b>294</b>	

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

**TABLE FOR PCC PAVEMENT REPAIR ON I29 NORTH SEGMENT NB RAMPS**

JOINT NO.	LANE	NB RAMP LEFT SIDE		NB RAMP RIGHT SIDE		NRCP REPAIR SqYds	NEW JOINT CON-FIG. (NRCP)	INSERT STEEL BAR IN PCC PAVEMENT (NRCP)			INSERT STEEL BAR IN NRCP TOTAL Each	DOWEL BAR Each	TIE BAR RETROFIT STITCHING Each	TYPE A SPALL SIZE		REPAIR TYPE A SPALL SqFt	SEAL RANDOM CRACKS IN PCC PAVEMENT Ft	COMMENTS
		L Ft	W Ft	L Ft	W Ft			1 1/2" x 18" PLAIN ROUND DOWEL BARS Each	No. 11 x 18" DEFORMED TIE BARS Each	No. 5 x 24" DEFORMED TIE BARS Each				L	W			
1	On Ramp			8	6	5.3	B	4	4	6	14			12"	8"	0.67		
1	On Ramp												7				15	
1	On Ramp	22	13.5			33.0	B	8	8	16	32	12						
2	On Ramp												10				20	
26	On Ramp						B						11				22	
29	On Ramp			14	13.5	21.0	B	8	8	10	26		6				13	
43	On Ramp													10"	12"	0.83		
44	On Ramp												15				30	
52	On Ramp													16"	16"	1.78		
57	On Ramp			10	4	4.4	B	2	2	8	12							
58	On Ramp												15				30	
63	On Ramp												13				26	
64	On Ramp			16	12.5	22.2	B	8	8	12	28							
64	On Ramp													6"	12"	0.50		
68	On Ramp												10				20	
71	On Ramp												10				20	
72	On Ramp												8				17	
24	Off Ramp													12"	12"	1.00		
35	Off Ramp													12"	12"	1.00		
35	Off Ramp												7				15	
49	Off Ramp													6"	12"	0.50		
79	Off Ramp													6"	12"	0.50		
82	Off Ramp													12"	12"	1.00		
82	Off Ramp												10				20	
84	Off Ramp												10				21	
84	Off Ramp													6"	36"	1.50		
<b>SHEET TOTALS:</b>						<b>85.9</b>		<b>30</b>	<b>30</b>	<b>52</b>	<b>112</b>	<b>12</b>	<b>132</b>			<b>9.28</b>	<b>269</b>	
<b>TOTALS:</b>						<b>85.9</b>		<b>30</b>	<b>30</b>	<b>52</b>	<b>112</b>	<b>12</b>	<b>132</b>			<b>9.3</b>	<b>269</b>	
<b>ADDITIONAL QUANTITIES:</b>						<b>20.0</b>		<b>10</b>	<b>10</b>	<b>10</b>	<b>30</b>	<b>0</b>	<b>30</b>			<b>-</b>	<b>50</b>	
<b>GRAND TOTALS:</b>						<b>105.9</b>		<b>40</b>	<b>40</b>	<b>62</b>	<b>142</b>	<b>12</b>	<b>162</b>			<b>9.3</b>	<b>319</b>	

**PCC PAVEMENT REPAIR AREA TYPES**

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

T = Two Tied Joints

B = One Working & One Tied Joint

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

**TABLE FOR PCC PAVEMENT REPAIR ON SD50 WB & EB LANES**

MRM	DISP.	LANE	WB DRIVING LANE		EB DRIVING LANE		NRCP REPAIR SqYds	NEW JOINT CON-FIG. (NRCP)	INSERT STEEL BAR IN PCC PAVEMENT (NRCP)			DOWEL BAR Each	TIE BAR RETROFIT STITCHING Each	SEAL RANDOM CRACKS IN PCC PAVEMENT Ft	COMMENTS
			L Ft	W Ft	L Ft	W Ft			1" x 18" PLAIN ROUND DOWEL BARS Each	No. 8 x 18" DEFORMED TIE BARS Each	No. 5 x 24" DEFORMED TIE BARS Each				
417.00	0.072	EBL			22	14	34.2	R		16	8	24	12		
417.00	0.074	EBL			60	2	13.3		2	2	48	52	6		
417.00	0.088	WBL												7	14
417.00	0.111	EBL			6	6	4.0	B	4	4	4	12			
417.00	0.135	WBL												30	60
417.00	0.153	WBL												6	10
417.00	0.191	WBL	6	7			4.7		8	8	4	20			
417.00	0.259	WBL												5	10
<b>TOTALS:</b>							<b>56.2</b>		<b>14</b>	<b>30</b>	<b>64</b>	<b>108</b>	<b>18</b>	<b>43</b>	<b>94</b>
<b>ADDITIONAL QUANTITIES:</b>							<b>10.0</b>		<b>-</b>	<b>10</b>	<b>10</b>	<b>20</b>	<b>0</b>	<b>10</b>	<b>20</b>
<b>GRAND TOTALS:</b>							<b>66.2</b>		<b>14</b>	<b>40</b>	<b>74</b>	<b>128</b>	<b>18</b>	<b>53</b>	<b>114</b>

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

TABLE FOR PCC PAVEMENT REPAIR ON SD50L WB & EB LANES

MRM	DISP.	LANE	WB DRIVING LANE		WB PASSING LANE		CENTER TURN LANE		EB PASSING LANE		EB DRIVING LANE		NRCP REPAIR SqYds	NEW JOINT CON-FIG. (NRCP)	INSERT STEEL BAR IN PCC PAVEMENT (NRCP)			INSERT STEEL BAR IN NRCP TOTAL Each	DOWEL BAR Each	TIE BAR RETROFIT STITCHING Each	TYPE A SPALL SIZE		REPAIR TYPE A SPALL SqFt	SEAL RANDOM CRACKS IN PCC PAVEMENT Ft	COMMENTS
			L Ft	W Ft	L Ft	W Ft	L Ft	W Ft	L Ft	W Ft	L Ft	W Ft			1 1/4" x 18" PLAIN ROUND DOWEL BARS Each	No. 9 x 18" DEFORMED TIE BARS Each	No. 5 x 24" DEFORMED TIE BARS Each				L	W			
407.30	0.576	WBL																		6"	6"	0.25			
407.30	0.610	CTL																		6"	12"	0.50			
407.30	0.633	CTL																		6"	6"	0.25			
407.30	0.640	EBL																		6"	12"	0.50			
408.93	0.056	WBL																		6"	12"	0.50			
408.93	0.067	CTL																		6"	12"	0.50			
409.00	0.029	CTL					6	12					8.0	R		16	4	20	12						
409.00	0.058	CTL					6	6	6	6			8.0	R		16	8	24	12						
409.00	0.159	WBL																			20"	24"	3.33		
409.00	0.187	CTL/EBL							6	12	6	6	12.0	R		24	4	28	18						
409.00	0.201	EBL																		7			12		
409.00	0.208	CTL																		5			11		
409.00	0.218	WBL																					14		
409.00	0.261	CTL							6	12			8.0	R		16	4	20	12						
409.00	0.272	CTL																			12"	18"	1.50		
409.00	0.279	CTL					6	12					8.0	R		16	4	20	12						
409.00	0.293	CTL					6	12					8.0	R		16	4	20	12						
409.00	0.305	CTL					6	12					8.0	R		16	4	20	12						
409.00	0.330	CTL/EBL							6	7	6	6	8.7	R		16	8	24	13						
409.00	0.349	CTL																			12"	12"	1.00		
409.00	0.366	CTL					6	6					4.0	B	4	4	4	12							
409.00	0.413	EBL																			24"	12"	2.00		PRINCETON ST INTERSECTION
409.00	0.414	EBL																			24"	12"	2.00		PRINCETON ST INTERSECTION
409.00	0.495	CTL					6	12					8.0	R		16	4	20	12						
409.00	0.569	CTL																			18"	18"	2.25		
409.00	0.714	CTL					6	6					4.0	B	4	4	4	12							
409.00	0.750	WBL			6	7							4.7	R		8	2	10	7						
409.00	0.829	EBL																			12"	20"	1.67	14	
410.00	0.004	CTL					6	12					8.0	R		16	4	20	12						
410.00	0.183	WBL																			18"	24"	3.00		
410.00	0.318	EBL																					24		
410.30	0.026	CTL																			12"	18"	1.50		
410.30	0.033	CTL																			12"	24"	2.00		
410.30	0.070	EBL-PL																			20"	12"	1.67		
410.30	0.070	CTL																			10"	18"	1.25		
410.30	0.083	EBL-DL									6	6	4.0	B	4	4	4	12							
410.30	0.104	WBL	6	14									9.3			16	16	4	36						
410.30	0.123	WBL-PL																			6"	12"	0.50		
410.30	0.170	CTL					6	12					8.0	R		16	4	20	12						
410.30	0.178	CTL					6	6					4.0	B	4	4	4	12							
410.30	0.208	CTL																			12"	20"	1.67		
410.30	0.216	WBL-PL			6	12							8.0	R		16	4	20	12						
410.30	0.231	WBL-DL	6	14									9.3	R		16	4	20	12						
410.30	0.231	WBL-PL			6	6							4.0	R		8	2	10	6						
410.30	0.265	WBL-DL	6	6									4.0	R		8	4	12	6						
410.30	0.274	WBL-DL																			24"	24"	4.00		
410.30	0.277	EBL-DL																			12"	18"	1.50		
410.30	0.281	CTL					6	12					8.0	R		16	4	20	12						
410.30	0.289	EBL-PL							6	6			4.0	R		8	8	4	12	6					
410.30	0.298	CTL					6	12					8.0	B	8	8	4	20							
410.30	0.302	WBL-PL			6	6	6	12					12.0	B	12	12	6	30							
410.30	0.309	CTL					6	6					4.0	B	4	4	4	12							
410.30	0.315	EBL-DL																			16"	24"	2.67		
410.30	0.327	EBL-PL																			12"	12"	1.00		
410.30	0.339	EBL-DL																			12"	12"	1.00		

<b>SHEET TOTALS:</b>													184.0		56	320	110	486	200	12		38.01	75		
----------------------	--	--	--	--	--	--	--	--	--	--	--	--	-------	--	----	-----	-----	-----	-----	----	--	-------	----	--	--

**TABLE FOR PCC PAVEMENT REPAIR ON SD50L WB & EB LANES**

MRM	DISP.	LANE	WB DRIVING LANE		WB PASSING LANE		CENTER TURN LANE		EB PASSING LANE		EB DRIVING LANE		NRCP REPAIR SqYds	NEW JOINT CON-FIG. (NRCP)	INSERT STEEL BAR IN PCC PAVEMENT (NRCP)			DOWEL BAR Each	TIE BAR RETROFIT STITCHING Each	TYPE A SPALL SIZE		REPAIR TYPE A SPALL SqFt	SEAL RANDOM CRACKS IN PCC PAVEMENT Ft	COMMENTS	
			L Ft	W Ft	L Ft	W Ft	L Ft	W Ft	L Ft	W Ft	L Ft	W Ft			1 1/4" x 18" PLAIN ROUND DOWEL BARS Each	No. 9 x 18" DEFORMED TIE BARS Each	No. 5 x 24" DEFORMED TIE BARS Each			INSERT STEEL BAR IN NRCP TOTAL Each	L				W
410.30	0.339	CTL					6	12					8.0	R		16	4	20	12						
410.30	0.364	EBL-PL																		18"	20"	2.50			
410.30	0.366	CTL					6	6					4.0	B	4	4	4	12		7			14		
410.30	0.408	CTL					6	12					8.0	R		16	4	20	12						
410.30	0.436	CTL-EPL					6	12	6	6			12.0	R		24	4	28	18						
410.30	0.449	WBL-PL			6	6							4.0	B	4	4	4	12							
410.30	0.560	CTL					6	12					8.0	R		16	4	20	12						
410.30	0.578	CTL																		20"	12"	1.67			
411.00	0.612	WBL-PL																		12"	12"	1.00			
411.00	0.041	WBL-PL																		12"	12"	1.00			
411.00	0.045	WBL-PL																		8"	12"	0.67			
411.00	0.053	WBL-DL																		12"	24"	2.00			
411.00	0.078	CTL					6	12					8.0	R		16	4	20	12						
411.18	0.116	CTL					6	12					8.0	R		16	4	20	12						
411.18	0.125	WBL-PL																		12"	24"	2.00			
411.18	0.016	EBL-DL																		15"	15"	1.56			
411.18	0.016	EBL-DL																		12"	20"	1.67			
<b>SHEET TOTALS:</b>													<b>60.0</b>		<b>8</b>	<b>112</b>	<b>32</b>	<b>152</b>	<b>78</b>	<b>0</b>		<b>14.07</b>	<b>14</b>		
<b>TOTALS:</b>													<b>244.0</b>		<b>64</b>	<b>432</b>	<b>142</b>	<b>638</b>	<b>278</b>	<b>12</b>		<b>52.1</b>	<b>89</b>		
<b>ADDITIONAL QUANTITIES:</b>													<b>50.0</b>		<b>10</b>	<b>90</b>	<b>30</b>	<b>130</b>	<b>60</b>	<b>-</b>		<b>10.4</b>	<b>20</b>		
<b>GRAND TOTALS:</b>													<b>294.0</b>		<b>74</b>	<b>522</b>	<b>172</b>	<b>768</b>	<b>338</b>	<b>12</b>		<b>62.5</b>	<b>109</b>		

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

**TABLE FOR PCC PAVEMENT REPAIR ON SD52 WEST SEGMENT WB & EB LANES**

MRM	DISP.	LANE	WB DRIVING LANE		WB PASSING LANE		CENTER TURN LANE		EB PASSING LANE		EB DRIVING LANE		NRCP REPAIR SqYds	NEW JOINT CON-FIG. (NRCP)	INSERT STEEL BAR IN PCC PAVEMENT (NRCP)			DOWEL BAR Each	TIE BAR RETROFIT STITCHING Each	TYPE A SPALL SIZE		REPAIR TYPE A SPALL SqFt	TYPE B SPALL SIZE		REPAIR TYPE B SPALL SqFt	SEAL RANDOM CRACKS IN PCC PAVEMENT Ft
			L Ft	W Ft	L Ft	W Ft	L Ft	W Ft	L Ft	W Ft	L Ft	W Ft			1 1/4" x 18" PLAIN ROUND DOWEL BARS Each	No. 9 x 18" DEFORMED TIE BARS Each	No. 5 x 24" DEFORMED TIE BARS Each			INSERT STEEL BAR IN NRCP TOTAL Each	L		W	L		
336.80	0.090	WBL																							14	
336.80	0.105	EBL																							18	
336.80	0.122	EBL																		6"	18"	0.75				
336.80	0.149	EBL																		10"	18"	1.25				
336.80	0.155	EBL																		24"	12"	2.00				
336.80	0.170	EBL																						12		
336.80	0.176	EBL																		24"	12"	2.00				
336.80	0.210	EBL-CTL-WBL	103	14	103	12	103	12	103	12	103	14	732.4	R		80	41	121	300							
337.00	0.053	EBL																		18"	12"	1.50				
337.00	0.053	WBL																		28"	10"	1.94				
337.00	0.064	EBL									9	6	6.0	R		8	6	14	6							
337.00	0.064	WBL																		36"	24"	6.00				
337.00	0.079	EBL																		12"	12"	1.00				
337.00	0.101	EBL																						7		
337.00	0.113	EBL																		12"	12"	1.00				
337.00	0.132	EBL																		36"	48"	12.00				
337.00	0.155	EBL																		18"	12"	1.50				
337.00	0.173	EBL																		12"	12"	1.00				
337.00	0.188	EBL																		12"	12"	1.00				
337.00	0.252	EBL																		18"	12"	1.50				
337.00	0.289	EBL																		12"	18"	1.50				
337.00	0.305	CTL					6	12					8.0	R		16	4	20	12							
337.00	0.335	CTL																		24"	12"	2.00				
337.00	0.383	EBL																		6"	12"	0.50				
337.00	0.410	EBL									6	6	4.0	R		8	4	12	6							
337.00	0.410	WBL																		12"	12"	1.00				
337.00	0.455	CTL					6	6					4.0	R		8	4	12	6							
337.00	0.459	CTL																		18"	24"	3.00				
337.00	0.459	EBL																		12"	18"	1.50				
337.00	0.512	WBL																		12"	12"	1.00				
337.00	0.553	EBL									6	6	4.0	R		8	4	12	6							
337.00	0.620	EBL																						50		
337.00	0.637	CTL																		12"	24"	2.00				
337.00	0.677	WBL-CT	6	14			6	6					13.3	R		24	8	32	18							
337.00	0.693	EBL									6	6	4.0	R		8	4	12	6							
337.00	0.708	EBL																		12"	24"	2.00				
337.00	0.719	EBL																		12"	12"	1.00				
337.00	0.727	EBL																		6"	18"	0.75				
337.00	0.760	EBL																		18"	24"	3.00				
337.00	0.775	EBL																		36"	15"	3.75				
337.00	0.786	EBL																		24"	24"	4.00				
337.00	0.818	CTL																		48"	24"	8.00				
337.00	0.846	EBL																		12"	12"	1.00				
337.00	0.880	EBL																		8"	24"	1.33				
337.00	0.887	CTL																		12"	10"	0.83				
337.00	0.895	EBL																		12"	24"	2.00				
337.00	0.925	EBL																		12"	30"	2.50				
338.00	0.009	EBL																		12"	12"	1.00				
338.00	0.044	EBL									6	6	4.0	B		4	4	4	12							
338.00	0.051	EBL																		18"	18"	2.25				
338.00	0.067	EBL																		18"	12"	1.50				
338.00	0.081	CTL					6	6					4.0	R		8	4	12	6							
338.00	0.093	EBL																		12"	12"	1.00				
338.00	0.104	EBL																		20"	15"	2.08				
338.00	0.175	EBL																		15"	15"	1.56				
<b>SHEET TOTALS:</b>													<b>783.7</b>		<b>4</b>	<b>172</b>	<b>83</b>	<b>259</b>	<b>366</b>	<b>0</b>	<b>86.49</b>	<b>0.00</b>	<b>101</b>			

TABLE FOR PCC PAVEMENT REPAIR ON SD52 WEST SEGMENT WB & EB LANES

MRM	DISP.	LANE	WB DRIVING LANE		WB PASSING LANE		CENTER TURN LANE		EB PASSING LANE		EB DRIVING LANE		NRCP REPAIR SqYds	NEW JOINT CON-FIG. (NRCP)	INSERT STEEL BAR IN PCC PAVEMENT (NRCP)			DOWEL BAR Each	TIE BAR RETROFIT STITCHING Each	TYPE A SPALL SIZE		REPAIR TYPE A SPALL SqFt	TYPE B SPALL SIZE		REPAIR TYPE B SPALL SqFt	SEAL RANDOM CRACKS IN PCC PAVEMENT Ft			
			L Ft	W Ft	L Ft	W Ft	L Ft	W Ft	L Ft	W Ft	L Ft	W Ft			1 1/4" x 18" PLAIN ROUND DOWEL BARS Each	No. 9 x 18" DEFORMED TIE BARS Each	No. 5 x 24" DEFORMED TIE BARS Each			INSERT STEEL BAR IN NRCP TOTAL Each	L		W	L			W		
338.00	0.175	EBL																	20"	24"	3.33								
338.00	0.187	CTL																	18"	12"	1.50								
338.00	0.220	EBL-PL																	6"	15"	0.63								
338.00	0.240	CTL					8	12					10.7	R															
338.00	0.240	CTL					6	6					4.0	R															
338.00	0.240	EBL									6	7	4.7	R															
338.00	0.259	CTL																			18"	12"	1.50						
338.00	0.259	CTL																			6"	12"	0.50						
338.00	0.273	CTL					6	6					4.0	R															
338.00	0.273	EBL-PL							6	12			8.0	R															
338.00	0.302	WBL-PL																			8"	12"	0.67						
338.00	0.316	EBL																							12				
338.00	0.330	CTL																			12"	10"	0.83						
338.00	0.338	WBL-PL											8.0	R															
338.00	0.361	WBL-PL																			10"	10"	0.69						
338.00	0.373	EBL-PL/DL																							130				
338.00	0.375	EBL-PL																			20"	24"	3.33						
338.00	0.383	EBL-PL																			24"	24"	4.00						
338.00	0.409	EBL-PL																			15"	15"	1.56						
338.00	0.424	EBL-PL																			15"	15"	1.56						
338.00	0.424	CTL																			18"	18"	2.25						
338.00	0.432	EBL-PL																			12"	12"	1.00						
338.00	0.440	WBL-PL											4.0	R															
338.00	0.450																				12"	12"	1.00						
338.00	0.462	EBL-PL																			12"	12"	1.00						
338.00	0.474	EBL-PL																			18"	12"	1.50						
338.00	0.481	EBL-PL																			12"	12"	1.00						
338.00	0.483	CTL																			15"	24"	2.50						
338.00	0.483	WBL-DL	6	6									4.0	W															
338.00	0.522	WBL-PL											4.0	R															
338.00	0.522	CTL						6	6				4.0	R															
338.00	0.542	WBL-PL											11.3	W															
338.00	0.553	EBL-PL																											
338.00	0.571	EBL-PL																			12"	18"	1.50						
338.00	0.579	CTL																			12"	12"	1.00						
338.00	0.590	WBL-DL	6	14									9.3	R							15"	36"	3.75						
338.00	0.602	CTL						6	6				4.0	R															
338.00	0.602	EBL-PL																			18"	18"	2.25						
338.00	0.620	CTL																			20"	20"	2.78						
338.00	0.636	CTL																			12"	12"	1.00						
338.00	0.636	EBL-DL																			18"	30"	3.75						
338.00	0.665	CTL																							0.5" 14" 0.05				
338.00	0.671	EBL-DL											4.0	R															
338.00	0.671	WBL																							10				
338.00	0.688	WBL-DL	6	14									9.3	W															
338.00	0.711	EBL											4.0	R															
338.00	0.716	CTL																							20				
338.00	0.730	CTL																											
338.00	0.756	EBL-DL											9.3	R															
338.00	0.756	EBL-PL											8.0	R							12"	12"	1.00						
338.00	0.756	WBL-PL											4.0	R															
338.00	0.756	CTL						9	12				12.0	R															
338.00	0.869	EBL-PL																			18"	12"	1.50						
338.00	0.877	EBL-PL																			12"	24"	2.00						
338.00	0.903	CTL						6	6				4.0	W															
<b>SHEET TOTALS:</b>													<b>134.6</b>				<b>48</b>	<b>192</b>	<b>84</b>	<b>324</b>	<b>145</b>	<b>65</b>			<b>53.66</b>			<b>0.05</b>	<b>172</b>

**TABLE FOR PCC PAVEMENT REPAIR ON SD52 WEST SEGMENT WB & EB LANES**

MRM	DISP.	LANE	WB DRIVING LANE		WB PASSING LANE		CENTER TURN LANE		EB PASSING LANE		EB DRIVING LANE		NRCP REPAIR SqYds	NEW JOINT CON-FIG. (NRCP)	INSERT STEEL BAR IN PCC PAVEMENT (NRCP)			DOWEL BAR Each	TIE BAR RETROFIT STITCHING Each	TYPE A SPALL SIZE		REPAIR TYPE A SPALL SqFt	TYPE B SPALL SIZE		REPAIR TYPE B SPALL SqFt	SEAL RANDOM CRACKS IN PCC PAVEMENT Ft	
			L Ft	W Ft	L Ft	W Ft	L Ft	W Ft	L Ft	W Ft	L Ft	W Ft			1 1/4" x 18" PLAIN ROUND DOWEL BARS Each	No. 9 x 18" DEFORMED TIE BARS Each	No. 5 x 24" DEFORMED TIE BARS Each			INSERT STEEL BAR IN NRCP TOTAL Each	L		W	L			W
338.00	0.903	WBL-PL			6	6							4.0	W	8												
338.00	0.907	EBL-PL																			12"	12"			1.00		
338.00	0.911	CTL																		12"	18"			1.50			
338.00	0.952	WBL-PL			6	6							4.0	B	4	4	2	10									
338.00	0.952	WBL																							14		
338.00	0.952	WBL																			6"	12"			0.50		
338.00	0.964	EBL-PL																			18"	12"			1.50		
338.00	0.971	WBL																			12"	12"			1.00		
338.00	0.998	EBL-PL																			12"	12"			1.00		
339.00	0.011	CTL																			12"	30"			2.50		
339.00	0.019	CTL					6	6					4.0	R		8	4	12	6								
339.00	0.026	CTL																			12"	15"			1.25		
339.00	0.034	EBL-PL							6	6			4.0	R		8	4	12	6								
339.00	0.034	CTL																			36"	12"			3.00		
339.00	0.038	EBL-PL																			24"	24"			4.00		
339.00	0.038	WBL-PL/DL	6	12									8.0	R		16	4	20	12								
339.00	0.064	EBL-PL																			12"	36"			3.00		
339.00	0.076	EBL-PL							6	6			4.0	R		8	4	12	6								
339.00	0.092	WBL-PL			8	14							12.4	R		16	3	19	12								
339.00	0.092	WBL	8	14									12.4	R		16	6	22	12								
339.00	0.105	EBL/WBL/CTL																							64		
339.00	0.120	EBL-PL							6	6			4.0	R		8	4	12	6								
339.00	0.120	CTL					6	6					4.0	R		8	4	12	6								
339.00	0.153	EBL-PL																			12"	30"			2.50		
339.18	0.007	EBL-DL									7	6	4.7	R		8	4	12	6								
339.18	0.027	CTL																			24"	12"			2.00		
339.18	0.043	WBL-DL																			6"	12"			0.50		
339.18	0.061	EBL-PL																			18"	18"			2.25		
339.18	0.070	EBL-DL																			12"	12"			1.00		
339.18	0.080	CTL					6	6					4.0	R		8	4	12	6								
339.18	0.105	EBL-DL									6	14	9.3	R		16	2	18	12								
339.18	0.114	WBL-PL/DL	8	26									23.1	R		16	6	22	12								
339.18	0.148	CTL					9	12					12.0	R		16	6	22	12								
339.18	0.156	EBL-PL																			24"	24"			4.00		
339.18	0.186	CTL					6	6					4.0	R		8	4	12	6								
339.18	0.201	EBL-PL																			24"	18"			3.00		
339.18	0.213	WBL-PL			6	6							4.0	R		8	2	10	6								
339.18	0.228	WBL-PL			6	12							8.0	R		16	4	20	12								
339.18	0.243	EBL-PL																			12"	30"			2.50		
339.18	0.247	EBL-PL																			12"	24"			2.00		
339.18	0.255	EBL-PL																			12"	24"			2.00		
339.18	0.277	EBL-PL																			12"	12"			1.00		
339.18	0.277	CTL					6	6					4.0	R		8	4	12	6								
339.18	0.292	EBL=PL																			12"	18"			1.50		
339.18	0.319	CTL					12	6					8.0	R		8	8	16	6								
339.18	0.326	EBL-PL																			24"	12"			2.00		
339.18	0.341	WBL-DL																			12"	18"			1.50		
339.18	0.341	WBL-PL																			12"	12"			1.00		
339.18	0.352	EBL-PL																			20"	12"			1.67		
339.18	0.364	WBL-PL																			12"	12"			1.00		
339.18	0.364	WBL=DL	6	7									4.7	R		8	4	12	7								
339.18	0.379	WBL-DL																					20				
339.18	0.379	WBL-DL	6	7									4.7	R		8	4	12	7								
339.18	0.393	WBL-PL			6	6							4.0	R		8	2	10	6								
339.18	0.405	WBL-PL																			12"	18"			1.50		

<b>SHEET TOTALS:</b>													155.3		12	228	91	331	170	20		53.17	0.00	78
----------------------	--	--	--	--	--	--	--	--	--	--	--	--	-------	--	----	-----	----	-----	-----	----	--	-------	------	----

TABLE FOR PCC PAVEMENT REPAIR ON SD52 WEST SEGMENT WB & EB LANES

MRM	DISP.	LANE	WB DRIVING LANE		WB PASSING LANE		CENTER TURN LANE		EB PASSING LANE		EB DRIVING LANE		NRCP REPAIR SqYds	NEW JOINT CON-FIG. (NRCP)	INSERT STEEL BAR IN PCC PAVEMENT (NRCP)			DOWEL BAR Each	TIE BAR RETROFIT STITCHING Each	TYPE A SPALL SIZE		REPAIR TYPE A SPALL SqFt	TYPE B SPALL SIZE		REPAIR TYPE B SPALL SqFt	SEAL RANDOM CRACKS IN PCC PAVEMENT Ft
			L Ft	W Ft	L Ft	W Ft	L Ft	W Ft	L Ft	W Ft	L Ft	W Ft			1 1/4" x 18" PLAIN ROUND DOWEL BARS Each	No. 9 x 18" DEFORMED TIE BARS Each	No. 5 x 24" DEFORMED TIE BARS Each			INSERT STEEL BAR IN NRCP TOTAL Each	L		W	L		
339.18	0.405	CTL																	12"	12"	1.00					
339.18	0.416	WBL-DL	6	6									4.0	R			8	4	12	6						
339.18	0.428	CTL					9	12					12.0	R			16	6	22	12						
339.18	0.428	EBL-PL																		12"	18"	1.50				
339.18	0.428	WBL-PL																		12"	18"	1.50				
339.18	0.428	WBL-DL																		12"	12"	1.00				
339.18	0.447	WBL-DL	6	7									4.7	R			8	4	12	7						
339.18	0.447	WBL-PL																		24"	24"	4.00				
339.18	0.454	CTL																		12"	12"	1.00				
339.18	0.472	EBL-PL																		24"	12"	2.00				
339.18	0.481	EBL-PL							7	6			4.7	R			8	4	12	6						
339.18	0.484	WBL-PL			6	6							4.0	R			8	2	10	6						
339.18	0.484	WBL-DL	6	6									4.0	R			8	4	12	6						
339.18	0.503	WBL-DL	6	7									4.7	R			8	4	12	7						
339.18	0.515	CTL																		24"	30"	5.00				
339.18	0.556	WBL-PL																		18"	12"	1.50				
339.18	0.564	WBL-PL			6	6							4.0	R			8	2	10	6						
339.18	0.564	WBL-DL	6	6									4.0	R			8	4	12	6						
339.18	0.582	WBL-DL	6	6									4.0	R			8	4	12	6						
339.18	0.598	EBL-PL																		12"	12"	1.00				
339.18	0.617	CTR-EB/PL					6	6					4.0	R			8	4	12	6						
339.18	0.628	EBL-DL																		15"	15"	1.56				
339.18	0.628	EBL-PL																		12"	18"	1.50				
339.18	0.628	CTL					6	6					4.0	R			8	4	12	6						
339.18	0.628	WBL-DL	6	14									9.3	R			16	4	20	12						
339.18	0.636	EBL-PL																		12"	24"	2.00				
339.18	0.647	EBL-CTR																		12"	18"	1.50				
339.18	0.707	CTR																		12"	18"	1.50				
339.18	0.707	EBL-PL																		12"	12"	1.00				
339.18	0.722	EBL-PL																		12"	12"	1.00				
339.18	0.726	EBL-PL																		12"	8"	0.67				
339.18	0.726	CTR					6	6					4.0	R			8	4	12	6						
339.18	0.737	NBL-PL																		18"	18"	2.25				
339.18	0.737	WBL-PL																		24"	24"	4.00				
339.18	0.752	CTR					6	6					4.0	R			8	4	12	6						
339.18	0.752	WBL-DL	6	7									4.7	R			8	4	12	7						
339.18	0.752	WBL-PL			6	6							4.0	R			8	2	10	6						
339.18	0.772	EBL-PL																		12"	24"	2.00				
339.18	0.792	EBL-PL																		12"	18"	1.50				
339.18	0.798	EBL-PL																		24"	12"	2.00				
339.18	0.802	EBL-PL																		24"	12"	2.00				
339.18	0.806	EBL-PL/CTL							6	6			4.0	R			8	4	12	6						
339.18	0.806	WBL-DL	6	6									4.0	R			8	4	12	6						
340.00	0.004	EBL-PL																		24"	12"	2.00				
340.00	0.010	CTL					6	6					4.0	R			8	4	12	6						
340.00	0.048	WBL-DL																		24"	24"	4.00				
340.00	0.071	WBL-PL			6	6							4.0	B	4	4	2	10								
340.00	0.078	EBL-PL																		24"	12"	2.00				
340.00	0.097	EBL-PL																		24"	12"	2.00				
340.00	0.101	EBL-PL																		12"	12"	1.00				
340.00	0.105	EBL-PL																		12"	12"	1.00				
340.00	0.109	EBL-PL																		12"	12"	1.00				
340.00	0.109	WBL-PL																		12"	12"	1.00				
340.00	0.109	WBL-DL	6	4									2.7	R			4	4	8	4						
340.00	0.109	WBL-PL			6	4							2.7	R			4	2	6	4						
<b>SHEET TOTALS:</b>													<b>105.5</b>		<b>4</b>	<b>188</b>	<b>84</b>	<b>276</b>	<b>143</b>	<b>0</b>		<b>57.98</b>	<b>0.00</b>	<b>0</b>		

TABLE FOR PCC PAVEMENT REPAIR ON SD52 WEST SEGMENT WB & EB LANES

MRM	DISP.	LANE	WB DRIVING LANE		WB PASSING LANE		CENTER TURN LANE		EB PASSING LANE		EB DRIVING LANE		NRCP REPAIR SqYds	NEW JOINT CON-FIG. (NRCP)	INSERT STEEL BAR IN PCC PAVEMENT (NRCP)			DOWEL BAR Each	TIE BAR RETROFIT STITCHING Each	TYPE A SPALL SIZE		REPAIR TYPE A SPALL SqFt	TYPE B SPALL SIZE		REPAIR TYPE B SPALL SqFt	SEAL RANDOM CRACKS IN PCC PAVEMENT Ft
			L Ft	W Ft	L Ft	W Ft	L Ft	W Ft	L Ft	W Ft	L Ft	W Ft			1 1/4" x 18" PLAIN ROUND DOWEL BARS Each	No. 9 x 18" DEFORMED TIE BARS Each	No. 5 x 24" DEFORMED TIE BARS Each			INSERT STEEL BAR IN NRCP TOTAL Each	L		W	L		
340.00	0.116	EBL-PL																	15"	15"	1.56					
340.00	0.128	CTL																	24"	24"	4.00					
340.00	0.128	CTR					6	6					4.0	R			8	4	12	6						
340.00	0.147	WBL-DL	6	14								9.3	R			16	4	20	12							
340.00	0.177	CTL																	12"	30"	2.50					
340.00	0.181	EBL-PL																	24"	12"	2.00					
340.00	0.188	CTL					6	6				4.0	R			8	4	12	6							
340.00	0.188	WBL-DL	7	14								10.9	R			16	4	20	12							
340.00	0.188	CTL					6	6				4.0	R			8	4	12	6							
340.00	0.212	CTL																	12"	12"	1.00					
340.00	0.223	CTL																	18"	18"	2.25					
340.00	0.241	EBL-PL																	24"	12"	2.00					
340.00	0.241	WBL-PL																	12"	18"	1.50					
340.00	0.246	CTL																	24"	18"	3.00					
340.00	0.268	EBL-DL																	120"	12"	10.00					
340.00	0.300	WBL-PL																	60"	12"	5.00					
340.00	0.303	EBL-PL																	18"	12"	1.50					
340.00	0.311	EBL-PL							6	12		8.0	R			16	4	20	12							
340.00	0.311	EBL-DL																	12"	12"	1.00					
340.00	0.327	WBL-DL	6	12								8.0	R			16	4	20	12							
340.00	0.342	EBL-PL																	12"	12"	1.00					
340.00	0.349	EBL-PL																	15"	18"	1.88					
340.00	0.357	CTL																	15"	15"	1.56					
340.00	0.361	EBL-PL																	24"	24"	4.00					
340.00	0.370	CTL																	12"	18"	1.50					
340.00	0.388	EBL-PL							6	12		8.0	R			16	4	20	12							
340.00	0.390	WBL-DL	10	14								15.6	R			16	8	24	12							
340.00	0.390	WBL-PL			6	12						8.0	R			16	4	20	12							
340.00	0.390	CTL					6	6				4.0	R			8	4	12	6							
340.00	0.414	CTL					24	12				32.0	R			16	18	34	12							
340.00	0.414	EBL-PL																	12"	12"	1.00					
340.00	0.414	EBL-PL																	12"	12"	1.00					
340.00	0.427	CTL																	12"	12"	1.00					
340.00	0.444	WBL-PL																	4"	12"	0.33					
340.00	0.459	EBL-DL								6	6	4.0	R			8	4	12	6							
340.00	0.459	EBL-PL							6	6		4.0	R			8	4	12	6							
340.00	0.459	CTR																	12"	12"	1.00					
340.00	0.478	CTR																	24"	18"	3.00					
340.00	0.478	EBL-PL																	15"	12"	1.25					
340.00	0.531	EBL-PL																	24"	24"	4.00					
340.00	0.531	CTR																	30"	15"	3.13					
340.00	0.546	EBL-DL																	12"	12"	1.00					
340.00	0.550	EBL-DL																	30"	15"	3.13					
340.00	0.550	WBL-PL																	12"	12"	1.00					
340.00	0.576	EBL-PL							6	6		4.0	R			8	4	12	6							
340.00	0.576	WBL-DL	6	6								4.0	R			8	4	12	6							
340.00	0.576	WBL-PL			6	6						4.0	R			8	2	10	6							
340.00	0.583	EBL-PL																	15"	36"	3.75					
340.00	0.610	EBL-PL																	18"	18"	2.25					
340.00	0.614	EBL-DL																	12"	30"	2.50					
340.00	0.617	WBL-PL/CTL					6	6				4.0	R			8	4	12	6							
340.00	0.640	EBL-DL									7	14	10.9	R			16	2	18	12						
340.00	0.640	EBL-PL							8	12		10.7	R			16	6	22	12							
340.00	0.640	CTL					9	12				12.0	R			16	6	22	12							
340.00	0.640	WBL-DL/PL	6	14	7	12						18.7	R			32	4	36	24							

<b>SHEET TOTALS:</b>													192.1			0	288	106	394	216		0		76.59	0.00	0
----------------------	--	--	--	--	--	--	--	--	--	--	--	--	-------	--	--	---	-----	-----	-----	-----	--	---	--	-------	------	---

**TABLE FOR PCC PAVEMENT REPAIR ON SD52 WEST SEGMENT WB & EB LANES**

MRM	DISP.	LANE	WB DRIVING LANE		WB PASSING LANE		CENTER TURN LANE		EB PASSING LANE		EB DRIVING LANE		NRCP REPAIR SqYds	NEW JOINT CON-FIG. (NRCP)	INSERT STEEL BAR IN PCC PAVEMENT (NRCP)			DOWEL BAR Each	TIE BAR RETROFIT STITCHING Each	TYPE A SPALL SIZE		REPAIR TYPE A SPALL SqFt	TYPE B SPALL SIZE		REPAIR TYPE B SPALL SqFt	SEAL RANDOM CRACKS IN PCC PAVEMENT Ft
			L Ft	W Ft	L Ft	W Ft	L Ft	W Ft	L Ft	W Ft	L Ft	W Ft			1 1/4" x 18" PLAIN ROUND DOWEL BARS Each	No. 9 x 18" DEFORMED TIE BARS Each	No. 5 x 24" DEFORMED TIE BARS Each			INSERT STEEL BAR IN NRCP TOTAL Each	L		W	L		
340.00	0.670	CTL					6	12					8.0	R		16	4	20	12							
340.00	0.674	CTL					6	12					8.0	R		16	4	20	12							
340.00	0.693	WBL-PL												R						30"	24"	5.00				
340.00	0.708	WBL-DL	6	7									4.7	R		8	4	12	7							
340.00	0.723	WBL-DL	6	6									4.0	R		8	4	12	6							
340.00	0.723	WBL-PL			6	12							8.0		16	16	4	36			30"	24"	5.00			
340.00	0.733	EBL-DL												R						30					60	
340.00	0.737	EBL-PL/DL							6	12	6	6	12.0	R		24	4	28	18							
340.00	0.753	EBL-PL							6	6			4.0	R		8	4	12	6							
340.00	0.753	CTL																		24"	24"	4.00				
340.00	0.775	WBL-DL	6	14									9.3	R		16	4	20	12							
340.00	0.787	EBL-PL																		24"	12"	2.00				
340.00	0.807	CTL																		18"	6"	0.75				
340.00	0.836	CTL					6	6					4.0	R		8	4	12	6							
340.00	0.838	WBL-DL																		20						40
340.00	0.840	WBL-PL			6	6							4.0	R		8	2	10	6							
340.00	0.840	CTL																		15"	15"	1.56				
340.00	0.851	EBL-PL																		15"	12"	1.25				
340.00	0.860	EBL-PL																		20"	12"	1.67				
340.00	0.889	EBL-PL																		12"	24"	2.00				
340.00	0.900	WBL-PL			6	6							4.0	R		8	2	10	6							
340.00	0.912	EBL-PL																		12"	12"	1.00				
340.00	0.935	EBL-PL																		18"	12"	1.50				
340.00	0.947	EBL-DL																		48"	12"	4.00				
340.00	0.947	WBL-PL																		48"	12"	4.00				
340.00	0.947	WBL-DL																		60"	12"	5.00				
340.00	0.954	WBL-DL																		10						20
340.00	0.958	EBL-PL																		12"	12"	1.00				
340.00	0.979	EBL-DL/PL					10	12	10	12	10	14	42.2	R		48	4	52	36							
340.00	0.979	WBL-PL/DL	6	6	6.5	6							8.3	R		16	6	22	12							
341.00	0.005	WB PL																		36"	12"	3.00				
341.00	0.005	EB PL																		18"	12"	1.50				
341.00	0.009	EB PL							6	6			4.0	R		8	4	12	6							
341.00	0.019	EB PL																		12"	18"	1.50				
341.00	0.038	WB PL																		12"	6"	0.50				
341.00	0.045	EB PL																		12"	12"	1.00				
341.00	0.061	EB DL								6	6	4.0	R		8	4	12	6								
341.00	0.061	EB PL							6	12			8.0	R		16	4	20	12							
341.00	0.091	WB PL																		24"	12"	2.00				
341.00	0.112	WB PL/DL	6	14	6	12							17.3	R		32	4	36	24							
341.00	0.114	EB PL							6	7			4.7	R		8	4	12	7							
341.00	0.126	EB PL																		24"	24"	4.00				
341.00	0.132	EB PL																		6"	6"	0.25				
341.00	0.144	EB PL																		6"	6"	0.25				
341.00	0.144	WB PL																		24"	12"	2.00				
341.00	0.144	WB PL																		24"	12"	2.00				
341.00	0.149	CTL																		18"	12"	1.50				
341.00	0.167	WB PL																		30"	8"	1.67				
341.00	0.179	CTL																		12"	24"	2.00				
341.00	0.190	WB DL																		6"	6"	0.25				
341.00	0.205	EB PL																		30"	12"	2.50				
341.00	0.208	WB PL																		24"	12"	2.00				
341.00	0.212	CTL																		6"	8"	0.33				
341.00	0.212	EB PL																		30"	12"	2.50				
341.00	0.222	WB PL																								12

<b>SHEET TOTALS:</b>													158.5		16	272	70	358	194	60				70.48	0.00	132
----------------------	--	--	--	--	--	--	--	--	--	--	--	--	-------	--	----	-----	----	-----	-----	----	--	--	--	-------	------	-----

**TABLE FOR PCC PAVEMENT REPAIR ON SD52 WEST SEGMENT WB & EB LANES**

MRM	DISP.	LANE	WB DRIVING LANE		WB PASSING LANE		CENTER TURN LANE		EB PASSING LANE		EB DRIVING LANE		NRCP REPAIR SqYds	NEW JOINT CON-FIG. (NRCP)	INSERT STEEL BAR IN PCC PAVEMENT (NRCP)			INSERT STEEL BAR IN NRCP TOTAL Each	DOWEL BAR Each	TIE BAR RETROFIT STITCHING Each	TYPE A SPALL SIZE		REPAIR TYPE A SPALL SqFt	TYPE B SPALL SIZE		REPAIR TYPE B SPALL SqFt	SEAL RANDOM CRACKS IN PCC PAVEMENT Ft
			L Ft	W Ft	L Ft	W Ft	L Ft	W Ft	L Ft	W Ft	L Ft	W Ft			L	W	L				W						
341.00	0.222	WB DL	6	6									4.0	B	4	4	4	12									
341.00	0.222	EB PL							6	6			4.0	B	4	4	4	12									
341.00	0.246	EB PL																			12"	12"	1.00				
341.00	0.251	CTL					6	14					9.3	R		16	4	20	12								
341.00	0.255	EB PL																			24"	24"	4.00				
341.00	0.255	EB DL																			18"	18"	2.25				
341.00	0.263	CTL																			24"	18"	3.00				
341.00	0.270	WB PL			6	12							8.0	W	16		4	20									
341.00	0.279	EB PL																			18"	18"	2.25				
341.00	0.301	EB DL									12	14	18.7	R		16	4	20	12								
341.00	0.301	CTL					6	12					8.0	B	8	8	4	20									
341.00	0.306	CTL					7	12					9.3	R		16	4	20	12								
341.00	0.314	WB PL																			12"	12"	1.00				
341.00	0.318	EB PL																			18"	18"	2.25				
341.00	0.345	EB PL							12	6			8.0	R		8	8	16	6								
341.00	0.348	EB PL																			12"	24"	2.00				
341.00	0.356	EB PL																		20							
341.00	0.356	CTL																			12"	12"	1.00				
341.00	0.363	WB DL	6	14									9.3	R		16	4	20	12								
341.00	0.363	WB PL			6	12							8.0	R		16	4	20	12								
341.00	0.378	EB PL							6	6			4.0	R		8	4	12	6								
341.00	0.382	EB PL																			18"	18"	2.25				
341.00	0.397	EB PL																			24"	24"	4.00				
341.00	0.412	CTL EBP/DL					11	12	11	12	11	14	46.4	R		48	4	52	36								
341.00	0.412	WBPL			6	12							8.0	R		16	4	20	12								
341.00	0.424	EBPL																			12"	12"	1.00				
341.00	0.428	EBPL							6	6			4.0	R		8	4	12	6								
341.00	0.436	CTL																			18"	12"	1.50				
341.00	0.442	EBPL																			18"	18"	2.25				
341.00	0.450	EBPL																			12"	12"	1.00				
341.00	0.454	EBPL																			12"	24"	2.00				
341.00	0.461	WBPL			6	12							8.0	B	8	8	4	20									
341.00	0.461	CTL																			12"	12"	1.00				
341.00	0.465	EBPL							6	6			4.0	R		8	4	12	6								
341.00	0.496	EBPL																			6"	12"	0.50				
341.00	0.514	CTL EBP/L					7	7	7	7			10.9	R		16	8	24	14								
341.00	0.545	EBPL																			12"	12"	1.00				
341.00	0.549	WBPL																			30"	18"	3.75				
341.00	0.564	CTL					6	6					4.0	R		8	4	12	6								
341.00	0.624	CTL					10	12					13.3	R		16	8	24	12								
341.00	0.629	WBDL	6	6									4.0	R		8	4	12	6			18"	18"	2.25			
341.00	0.640	WBDL/PL			6	6							4.0	R		8	2	10	6		5					10	
341.00	0.652	EBDL																		10						20	
341.00	0.656	EBPL																			10"	10"	0.69				
341.00	0.667	EBPL																			18"	24"	3.00				
341.00	0.667	CTL																			24"	12"	2.00				
341.00	0.701	WBPL																		10	12"	30"	2.50				20
341.00	0.701	CTL					6	6					4.0	R		8	4	12	6								
341.00	0.732	CTL																			32"	24"	5.33				
341.00	0.732	WBPL																			30"	18"	3.75				
341.00	0.777	EBPL																			12"	12"	1.00				
341.00	0.784	WBPL																			15"	15"	1.56				
341.00	0.811	WBPL			6	6							4.0	R		8	2	10	6								
341.00	0.820	WBPL																			12"	6"	0.50				
341.00	0.828	WBPL/CTL			6	6	6	6					8.0	R		16	6	22	12								

<b>SHEET TOTALS:</b>													213.2		40	288	106	434	200	45			61.58			0.00	50
----------------------	--	--	--	--	--	--	--	--	--	--	--	--	-------	--	----	-----	-----	-----	-----	----	--	--	-------	--	--	------	----

**TABLE FOR PCC PAVEMENT REPAIR ON SD52 WEST SEGMENT WB & EB LANES**

MRM	DISP.	LANE	WB DRIVING LANE		WB PASSING LANE		CENTER TURN LANE		EB PASSING LANE		EB DRIVING LANE		NRCP REPAIR SqYds	NEW JOINT CON-FIG. (NRCP)	INSERT STEEL BAR IN PCC PAVEMENT (NRCP)			DOWEL BAR Each	TIE BAR RETROFIT STITCHING Each	TYPE A SPALL SIZE		REPAIR TYPE A SPALL SqFt	TYPE B SPALL SIZE		REPAIR TYPE B SPALL SqFt	SEAL RANDOM CRACKS IN PCC PAVEMENT Ft
			L Ft	W Ft	L Ft	W Ft	L Ft	W Ft	L Ft	W Ft	L Ft	W Ft			1 1/4" x 18" PLAIN ROUND DOWEL BARS Each	No. 9 x 18" DEFORMED TIE BARS Each	No. 5 x 24" DEFORMED TIE BARS Each			INSERT STEEL BAR IN NRCP TOTAL Each	L		W	L		
341.00	0.828	WBDL																	12"	30"	2.50					
341.00	0.859	WBPL																	12"	18"	1.50					
341.00	0.870	EBPL																	12"	18"	1.50					
341.00	0.870	EBDL																	24"	24"	4.00					
341.00	0.878	WBPL																	30"	15"	3.13					
341.00	0.878	WBDL																	30"	12"	2.50					
341.00	0.892	WBPL																	36"	36"	9.00					
341.00	0.908	CTL																	18"	18"	2.25					
341.00	0.912	EBPL																	5						10	
341.00	0.916	WBPL																	36"	24"	6.00					
341.00	0.948	EBDL									6	14	9.3	R		16	2	18	12							
341.00	0.948	CTL WBL																							50	
341.00	0.968	WBPL			6	6							4.0	R		8	2	10	6							
341.00	0.984	CTL																	18"	18"	2.25					
341.00	0.984	EBPL							6	12			8.0	R		16	4	20	12							
342.00	0.040	WBPL																	30"	24"	5.00					
342.00	0.068	WBPL																	36"	18"	4.50					
342.00	0.077	CTL																	18"	12"	1.50					
342.00	0.092	CTL																	12"	6"	0.50					
342.00	0.122	WBPL			6	12							8.0	R		16	4	20	12							
342.00	0.134	WBPL			6	12							8.0	B	8	8	4	20								
342.00	0.134	CTL																	18"	36"	4.50					
342.00	0.153	WBPL																	18"	36"	4.50					
342.00	0.157	EB CTL WB			6	6	6	12	6	12	6	14	29.3	B	28	28	4	60								
342.00	0.195	WBPL																	18"	36"	4.50					
342.00	0.214	EBPL																	24"	30"	5.00					
342.00	0.214	WBPL																	18"	30"	3.75					
342.00	0.226	WBPL																	12"	24"	2.00					
342.00	0.243	WBPL			6	12							8.0	R		16	4	20	12							
342.00	0.243	WBDL																	12"	12"	1.00					
342.00	0.254	EBPL																							12	
342.00	0.274	EBPL																	5							
342.00	0.300	WBPL																	35						10	
342.00	0.304																								70	
<b>SHEET TOTALS:</b>													74.6		36	108	24	168	54	45	71.38		0.00	152		
<b>TOTALS:</b>													1817.5		160	1736	648	2544	1488	235	531.3		0.5\$	685		
<b>ADDITIONAL QUANTITIES:</b>													360.0		30	350	130	510	300	50	106.3		\$()	40		
<b>GRAND TOTALS:</b>													2177.5		190	2086	778	3054	1788	285	637.6		0.50	825		

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

TABLE FOR PCC PAVEMENT REPAIR ON SD52 EAST SEGMENT WB & EB LANES

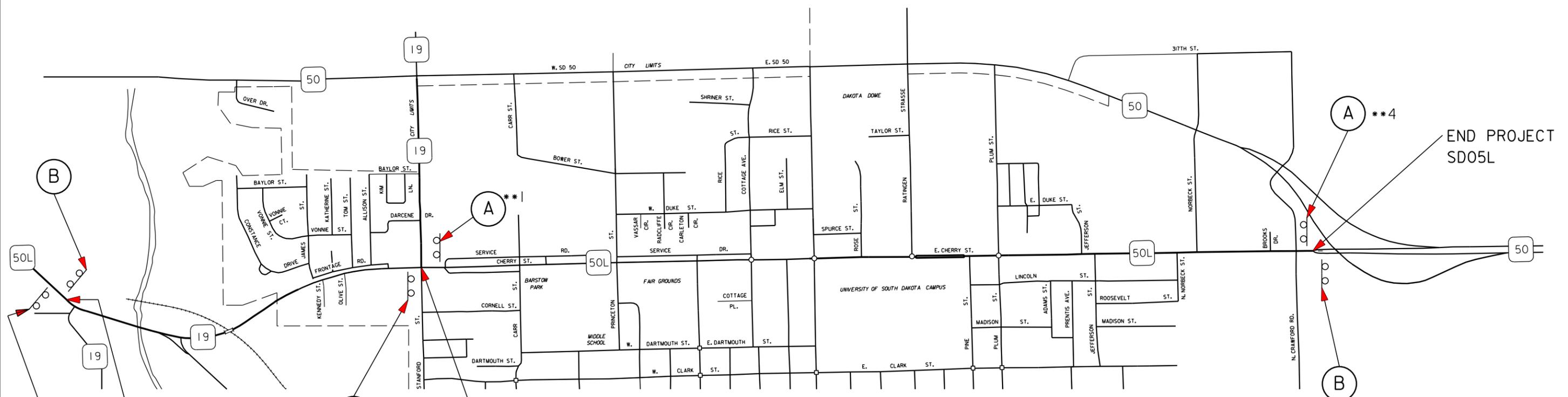
MRM	DISP.	LANE	WB DRIVING LANE		WB PASSING LANE		EB PASSING LANE		EB DRIVING LANE		NRCP REPAIR SqYds	NEW JOINT CON-FIG. (NRCP)	REMOVE CONCRETE CURB & GUTTER Ft	TYPE B69 CONCRETE C&G BY EB OUTSIDE SHOULDER Ft	INSERT STEEL BAR IN PCC PAVEMENT (NRCP)			TIE BAR RETROFIT STITCHING Each	TYPE A SPALL SIZE		REPAIR TYPE A SPALL SqFt	SEAL RANDOM CRACKS IN PCC PAVEMENT Ft	COMMENTS	
			L Ft	W Ft					1 1/4" x 18" PLAIN ROUND DOWEL BARS Each	No. 9 x 18" DEFORMED TIE BARS Each	No. 5 x 24" DEFORMED TIE BARS Each		INSERT STEEL BAR IN NRCP TOTAL Each	DOWEL BAR Each				L						
342.00	0.825	EBL																12"	12"	1.00				
342.00	0.896	CT																36"	6"	1.50				
342.00	0.933	EBL-PL															7				12			
343.00	0.035	EBL-DL																8"	30"	1.67				
343.00	0.048	EBL															13				24			
343.00	0.070	CT															50							
343.00	0.079	CT																24"	12"	2.00				
343.00	0.085	CT															7				12			
343.00	0.097	WBL-DL																24"	12"	2.00				
343.00	0.100	CT-EBL																18"	24"	3.00				
343.00	0.100	WBL-DL																24"	6"	1.00				
343.00	0.104	EBL-DL							6	12	8.0	R				16	4	20	12					
343.00	0.115	WBL-DL	6	12							8.0	R				16	4	20	12					
343.00	0.118	EBL																13				24		
343.00	0.144	EBL																13				24		
343.00	0.145	WBL-DL																11				22		
343.00	0.147	EBL-PL																12	12"	12"	1.00			
343.00	0.167	EBL-DL											56	56				6				12	P Gutter and B69 Gutter	
343.00	0.165	CTL																24"	12"	2.00				
343.00	0.168	EBL-DL																6				12		
343.00	0.173	EBL-DL											10	10										
343.00	0.184	EBL-PL																15				30		
343.00	0.210	WBL-DL											10	10				6				12		
343.00	0.214	EBL-DL																7				14		
343.00	0.220	WBLDLPL	6	12	6	12					16.0	R				32	4	36	24					
343.00	0.278	EBL					6	6			4.0	R				8	4	12	6				Curb and Gutter	
343.00	0.280	EBL																12"	12"	1.00			Curb and Gutter	
343.00	0.282	EBL-PL																48"	20"	6.67			Curb and Gutter	
343.00	0.301	EBL																16"	15"	1.67		24		
343.00	0.339	WBL-DL																18"	18"	2.25				
343.00	0.361	EB DL PL																12						
343.00	0.382	WBL-PL										R						48"	12"	4.00				
343.00	0.419	WBL-DL	6	12							8.0		6	6	16	16	4	36						
343.00	0.462	WBL-PL																12"	12"	1.00				
343.00	0.471	WBL-PL																18"	18"	2.25				
343.00	0.500	EBL-DL							6	6	4.0	R				8	4	12	6					
343.00	0.511	WBL-PL			6	12					8.0	R				16	4	20	12				Reset Manhole Frame & Lid	
343.00	0.547	WBL-DL	12	12							16.0	R				16	8	24	12				Reset Manhole Frame & Lid	
343.00	0.591	WBL-PL																18"	18"	2.25				
343.00	0.625	WBL-PL																12"	12"	1.00				
<b>SHEET TOTALS:</b>											<b>72.0</b>		<b>82</b>	<b>82</b>	<b>16</b>	<b>128</b>	<b>36</b>	<b>180</b>	<b>84</b>	<b>178</b>		<b>39.76</b>	<b>222</b>	
<b>TOTALS:</b>											<b>72.0</b>		<b>82</b>	<b>82</b>	<b>16</b>	<b>128</b>	<b>36</b>	<b>180</b>	<b>84</b>	<b>178</b>		<b>39.8</b>	<b>222</b>	
<b>ADDITIONAL QUANTITIES:</b>											<b>10.0</b>		<b>120 *</b>	<b>70 *</b>	<b>-</b>	<b>30</b>	<b>10</b>	<b>40</b>	<b>20</b>	<b>40</b>		<b>8.0</b>	<b>40</b>	
<b>GRAND TOTALS:</b>											<b>82.0</b>		<b>202</b>	<b>152</b>	<b>16</b>	<b>158</b>	<b>46</b>	<b>220</b>	<b>104</b>	<b>218</b>		<b>47.8</b>	<b>262</b>	

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

**NOTES**  
\* 50 ft of the curb and gutter additional quantities will be for the repair of P6 gutter only.

# TRAFFIC CONTROL FIXED LOCATION SIGNS (GROUND MOUNTED SUPPORTS)

## SD19 & SD50L CLAY COUNTY



BEGIN PROJECT  
SD19

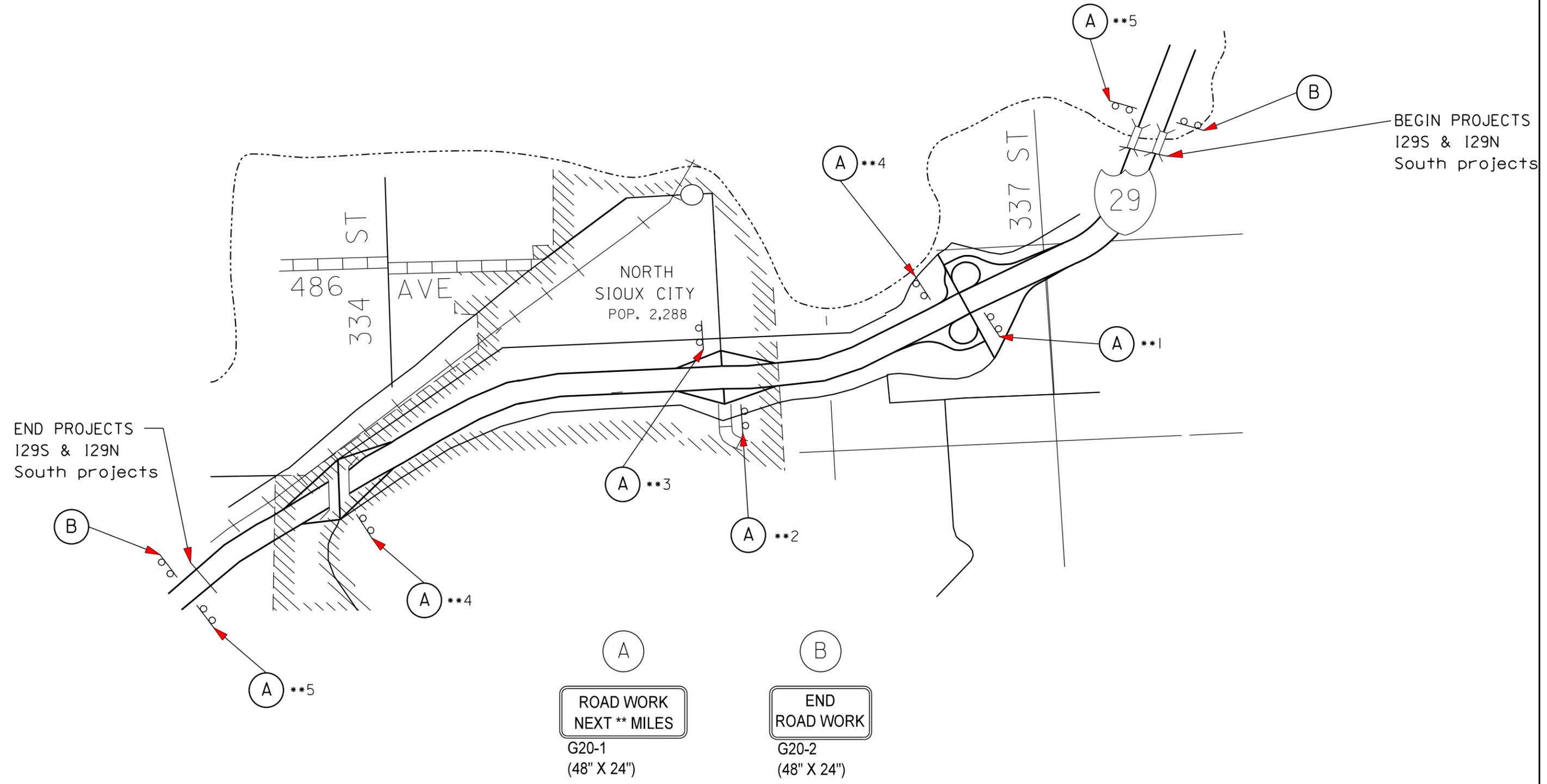
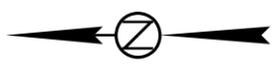
END PROJECT  
SD19  
BEGIN PROJECT  
SD05L

END PROJECT  
SD05L

<div style="border: 1px solid black; border-radius: 50%; width: 40px; height: 40px; margin: 0 auto; display: flex; align-items: center; justify-content: center; font-size: 24px; font-weight: bold;">A</div>	<div style="border: 1px solid black; border-radius: 50%; width: 40px; height: 40px; margin: 0 auto; display: flex; align-items: center; justify-content: center; font-size: 24px; font-weight: bold;">B</div>
<b>ROAD WORK NEXT ** MILE</b>	<b>END ROAD WORK</b>
G20-1 <sup>a</sup> (36" X 18")	G20-2 (36" X 18")

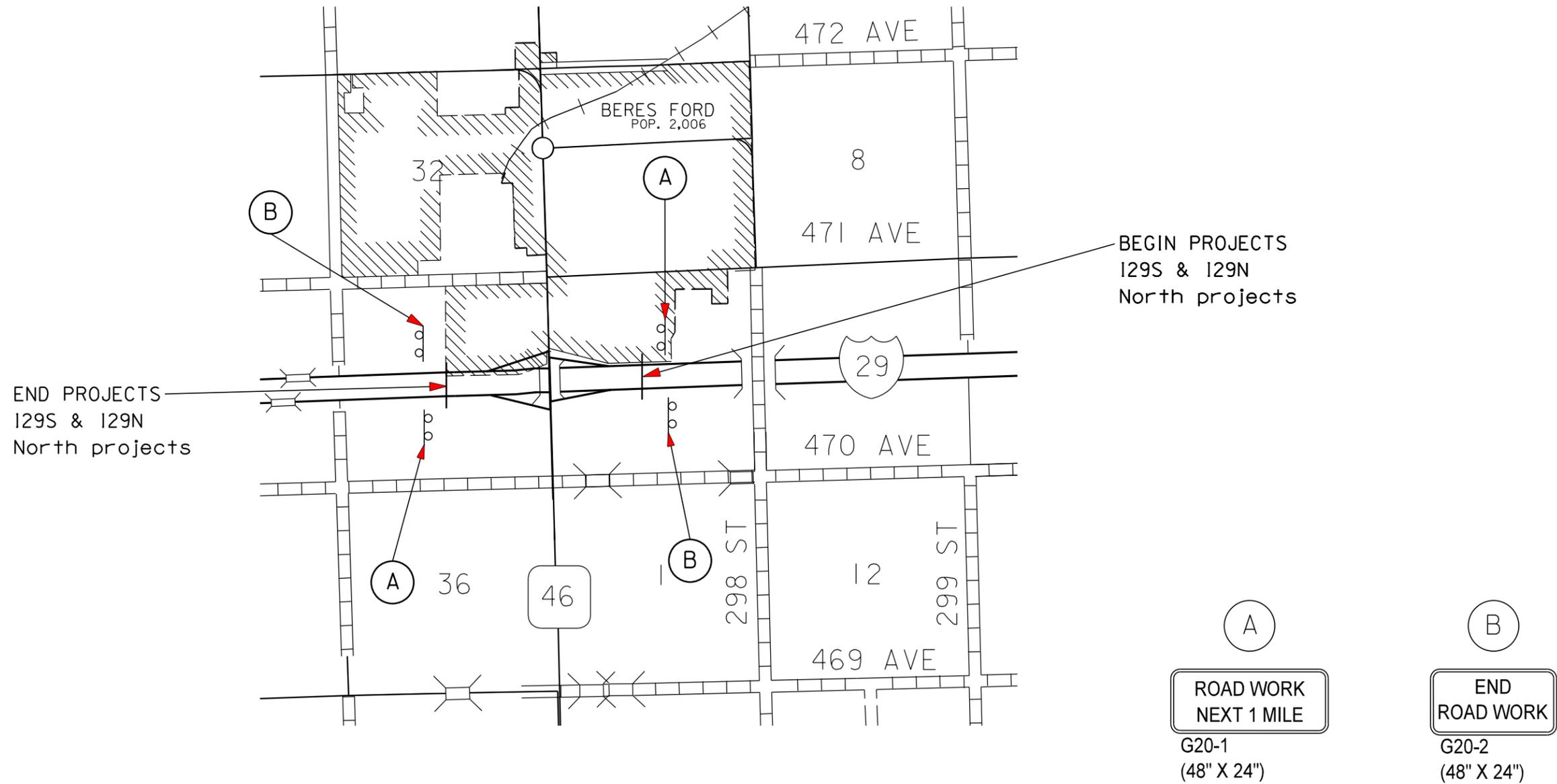
# TRAFFIC CONTROL FIXED LOCATION SIGNS (GROUND MOUNTED SUPPORTS)

## I29S & I29N South projects UNION COUNTY



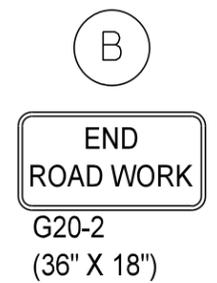
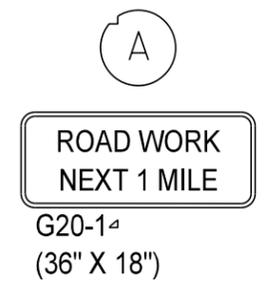
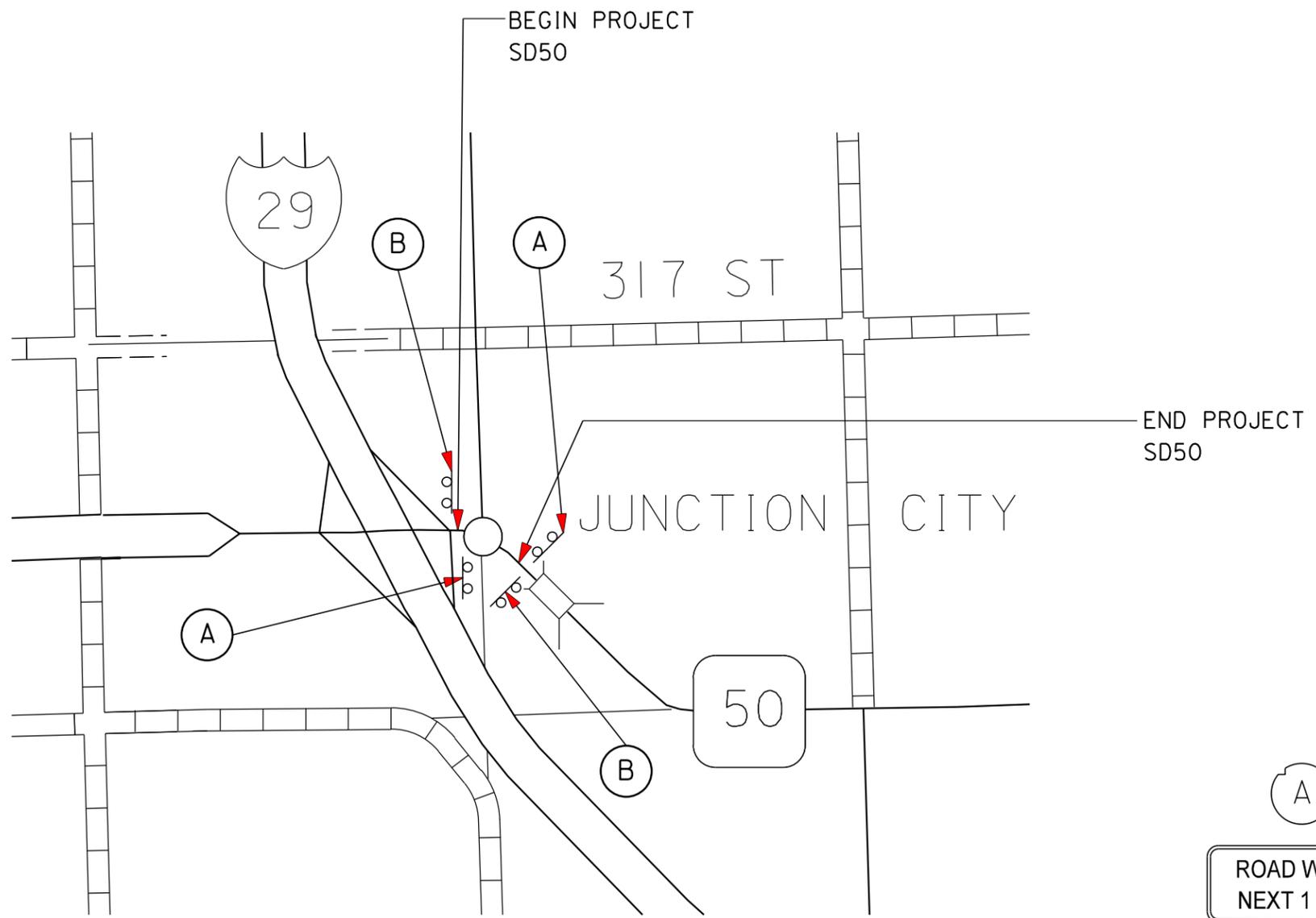
# TRAFFIC CONTROL FIXED LOCATION SIGNS (GROUND MOUNTED SUPPORTS)

## I29S & I29N North projects LINCOLN & UNION COUNTIES



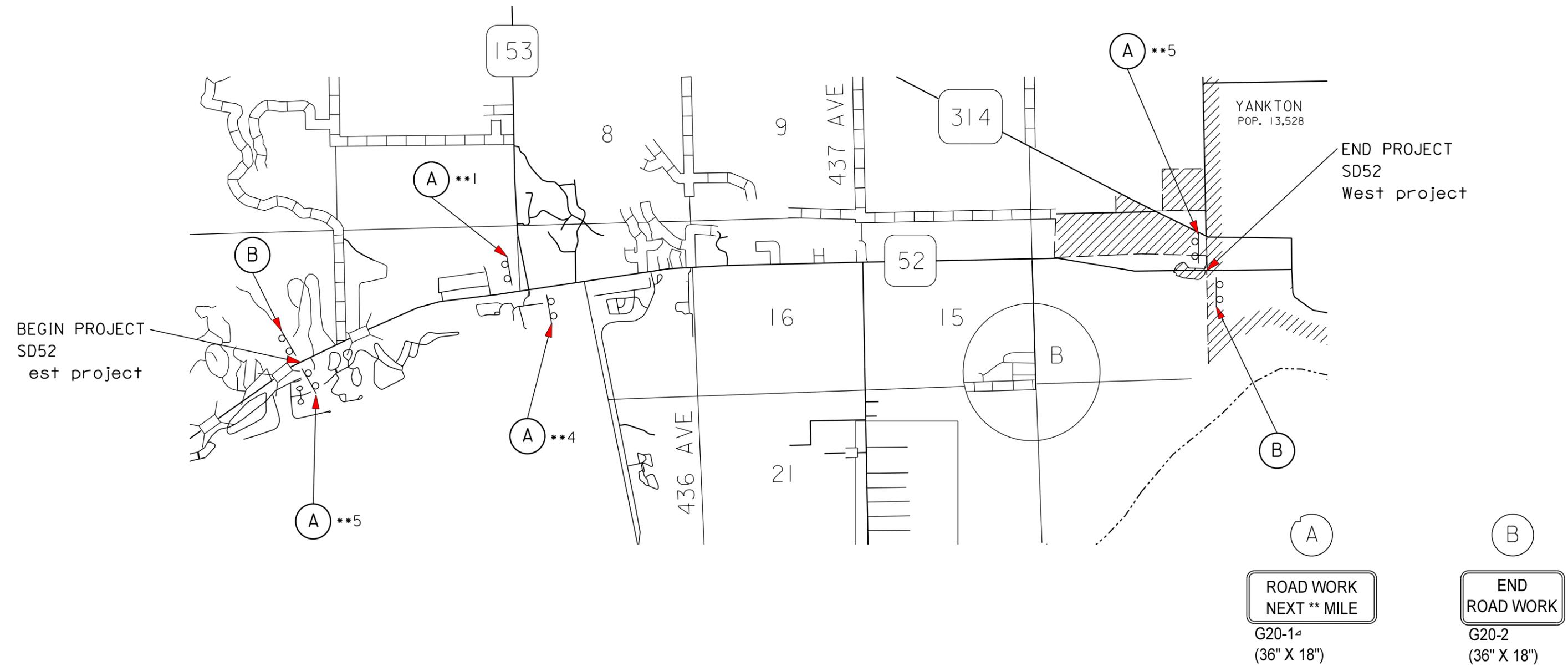
**TRAFFIC CONTROL  
FIXED LOCATION SIGNS  
(GROUND MOUNTED SUPPORTS)**

**SD50  
UNION COUNTY**



# TRAFFIC CONTROL FIXED LOCATION SIGNS (GROUND MOUNTED SUPPORTS)

## SD52 West project YANKTON COUNTY

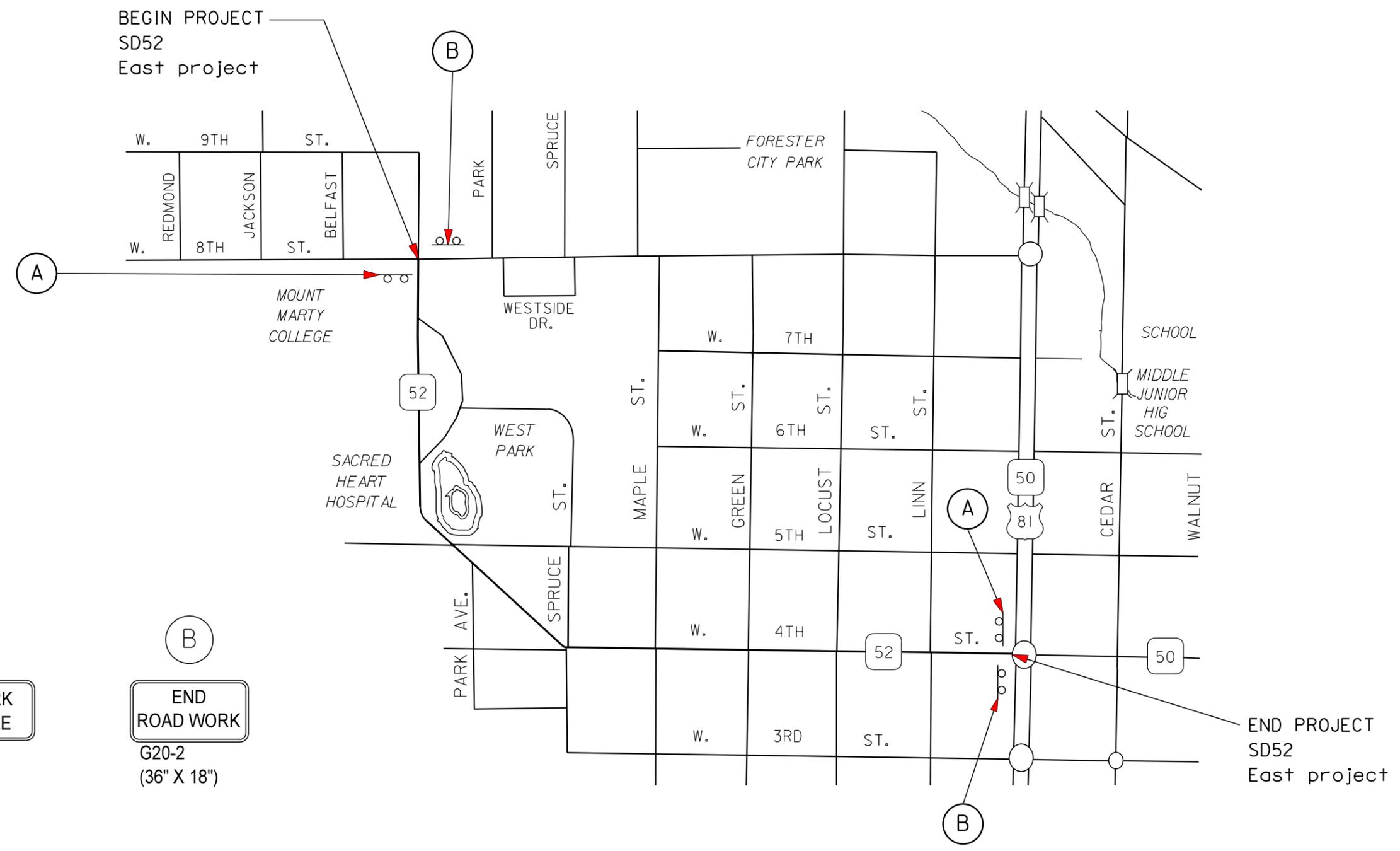


  
 G20-1<sup>a</sup>  
 (36" X 18")

  
 G20-2  
 (36" X 18")

# TRAFFIC CONTROL FIXED LOCATION SIGNS (GROUND MOUNTED SUPPORTS)

## SD52 East project YANKTON COUNTY



A

**ROAD WORK  
NEXT 1 MILE**

G20-1<sup>a</sup>  
(36" X 18")

B

**END  
ROAD WORK**

G20-2  
(36" X 18")

### ITEMIZED LIST FOR TRAFFIC CONTROL SIGNS

SIGN CODE	SIGN DESCRIPTION	CONVENTIONAL ROAD				EXPRESSWAY / INTERSTATE					
		NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT	NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT		
R1-1	STOP	4	30" x 30"	6	24		36" x 36"	9			
R2-1	SPEED LIMIT 45		24" x 30"	5		8	36" x 48"	12	96		
R2-1	SPEED LIMIT 65		24" x 30"	5		12	36" x 48"	12	144		
R2-1	SPEED LIMIT 80		24" x 30"	5		2	36" x 48"	12	24		
R2-6aP	FINES DOUBLE (plaque)		24" x 18"	3		4	36" x 24"	6	24		
R3-2	LEFT TURN PROHIBITION (symbol)	2	24" x 24"	4	8		36" x 36"	9			
R4-7	KEEP RIGHT (symbol)	3	24" x 30"	5	15		36" x 48"	12			
W1-3	REVERSE TURN (L or R)	3	48" x 48"	16	48		48" x 48"	16			
W3-1	STOP AHEAD (symbol)	4	48" x 48"	16	64		48" x 48"	16			
W3-5	SPEED REDUCTION AHEAD (8-65 MPH & 4-45 MPH)		48" x 48"	16		12	48" x 48"	16	192		
W4-2	LEFT or RIGHT LANE ENDS (symbol)	4	48" x 48"	16	64	4	48" x 48"	16	64		
W4-3	ADDED LANE (symbol)		48" x 48"	16		2	48" x 48"	16	32		
W5-4	RAMP NARROWS		48" x 48"	16		4	48" x 48"	16	64		
W9-3	CENTER LANE CLOSED AHEAD	2	48" x 48"	16	32		48" x 48"	16			
W13-1P	ADVISORY SPEED (plaque)	4	30" x 30"	6	24		30" x 30"	6			
W13-4P	ON RAMP (plaque)		36" x 36"	9		4	36" x 36"	9	36		
W20-1	ROAD WORK AHEAD	11	48" x 48"	16	176	8	48" x 48"	16	128		
SPECIAL	RAMP WORK AHEAD		48" x 48"	16		2	48" x 48"	16	32		
W20-4	ONE LANE ROAD AHEAD	4	48" x 48"	16	64		48" x 48"	16			
W20-5	LEFT or RIGHT LANE CLOSED AHEAD	4	48" x 48"	16	64	4	48" x 48"	16	64		
W20-7	FLAGGER (symbol)	1	48" x 48"	16	16	1	48" x 48"	16	16		
W20-5	CENTER LANE CLOSED XX FT	2	48" x 48"	16	32		48" x 48"	16			
G20-1	ROAD WORK NEXT __ MILES	12	36" x 18"	5	60	9	48" x 24"	8	72		
G20-2	END ROAD WORK	16	36" x 18"	5	80	6	48" x 24"	8	48		
		<b>CONVENTIONAL ROAD TRAFFIC CONTROL SIGNS SQFT</b>				<b>771</b>	<b>EXPRESSWAY / INTERSTATE TRAFFIC CONTROL SIGNS SQFT</b>				<b>1036</b>

#### TYPE 3 BARRICADES

ITEM DESCRIPTION	QUANTITY
Type 3 Barricade, 8' Single Sided	54 Each
Type 3 Barricade, 8' Double Sided	8 Each

#### ARROW BOARDS

ITEM DESCRIPTION	QUANTITY
Type C Advance Warning Arrow Board	4 Each

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

- Flagger
- Channelizing Device

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

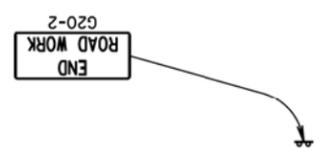
The ROAD WORK AHEAD and the END ROAD WORK signs may be omitted for short duration operations (1 hour or less).

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

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

The channelizing devices shall be drums or 42" cones.

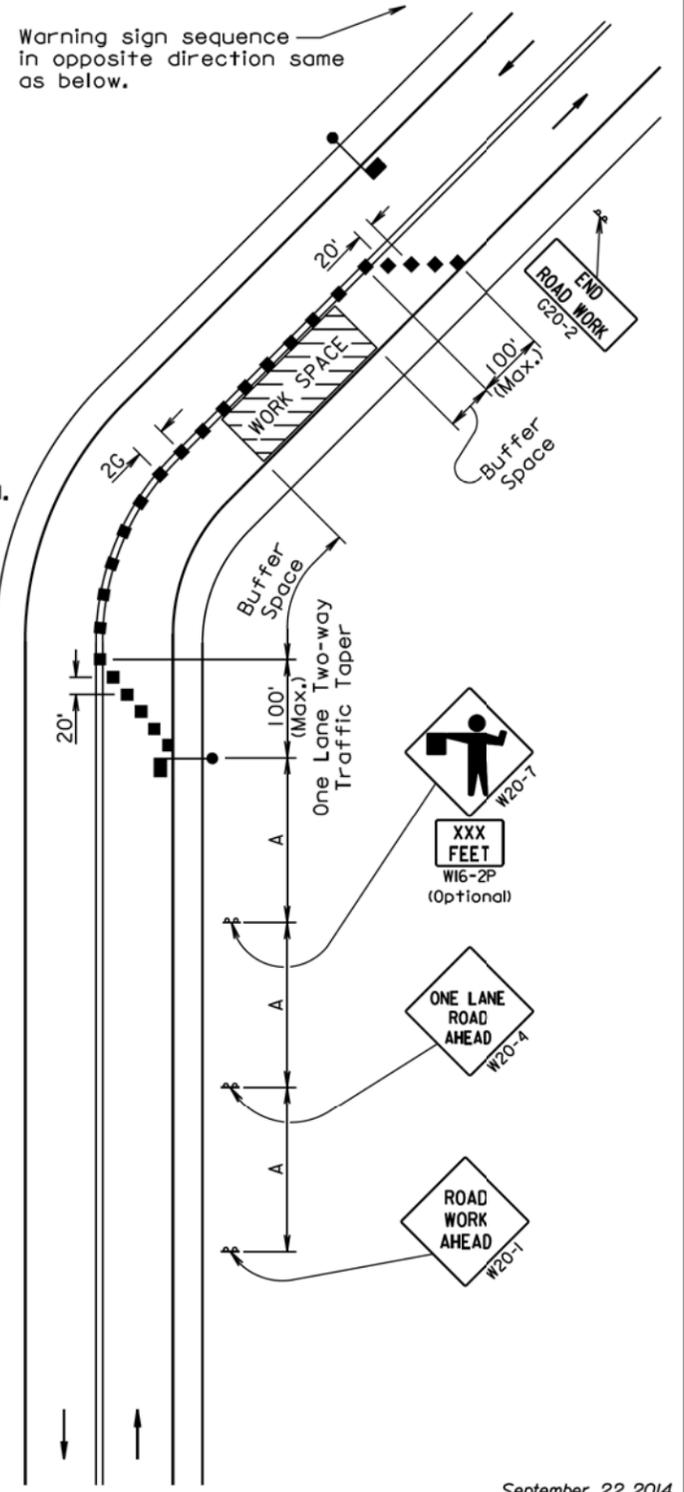
Channelizing devices are not required along the centerline adjacent to work area when pilot cars are utilized for escorting traffic through the work area.



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

The buffer space should be extended so that the two-way traffic taper is placed before a horizontal or vertical curve to provide adequate sight distance for the flagger and queue of stopped vehicles.

The length of A may be adjusted to fit field conditions.

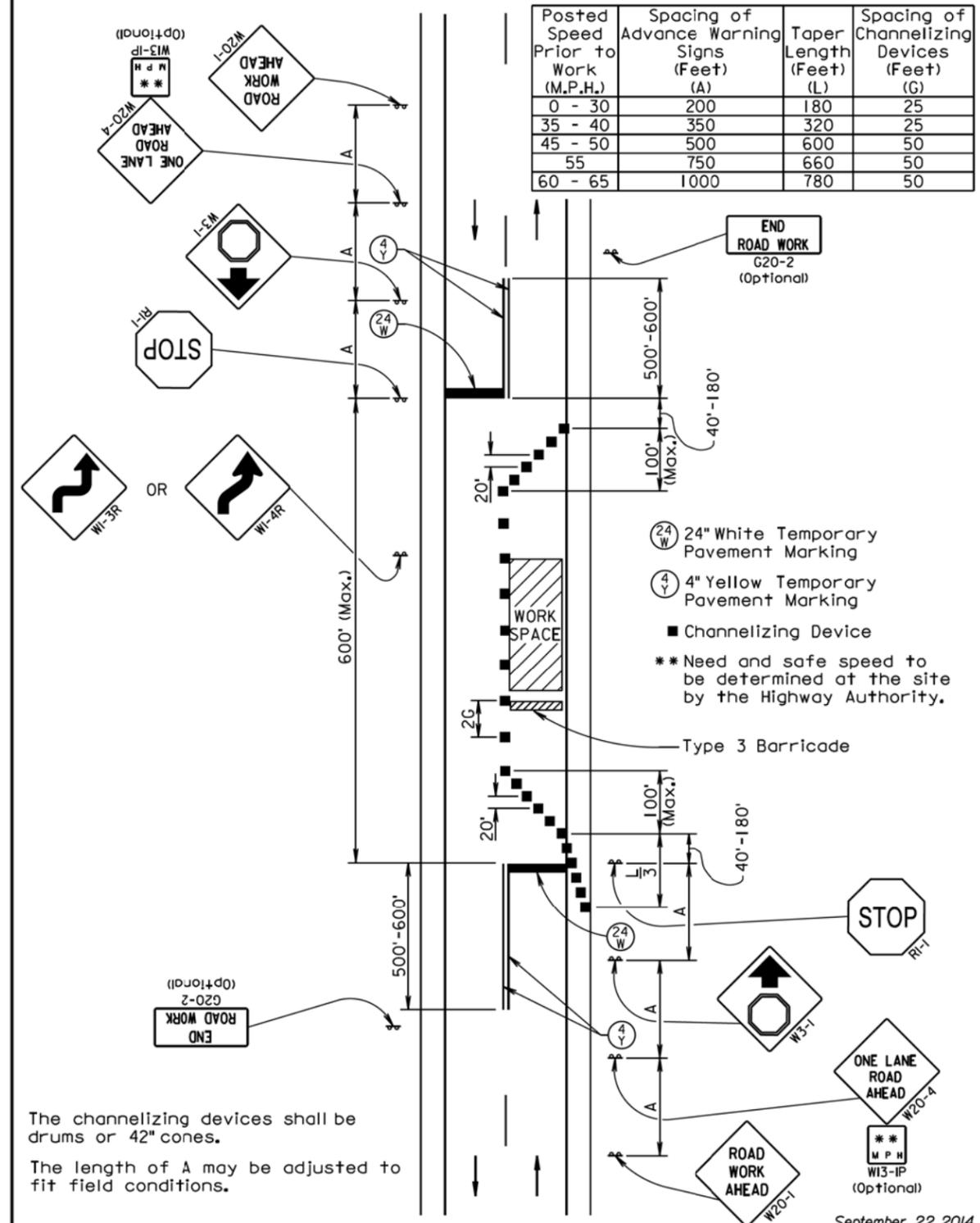


Warning sign sequence in opposite direction same as below.

September 22, 2014

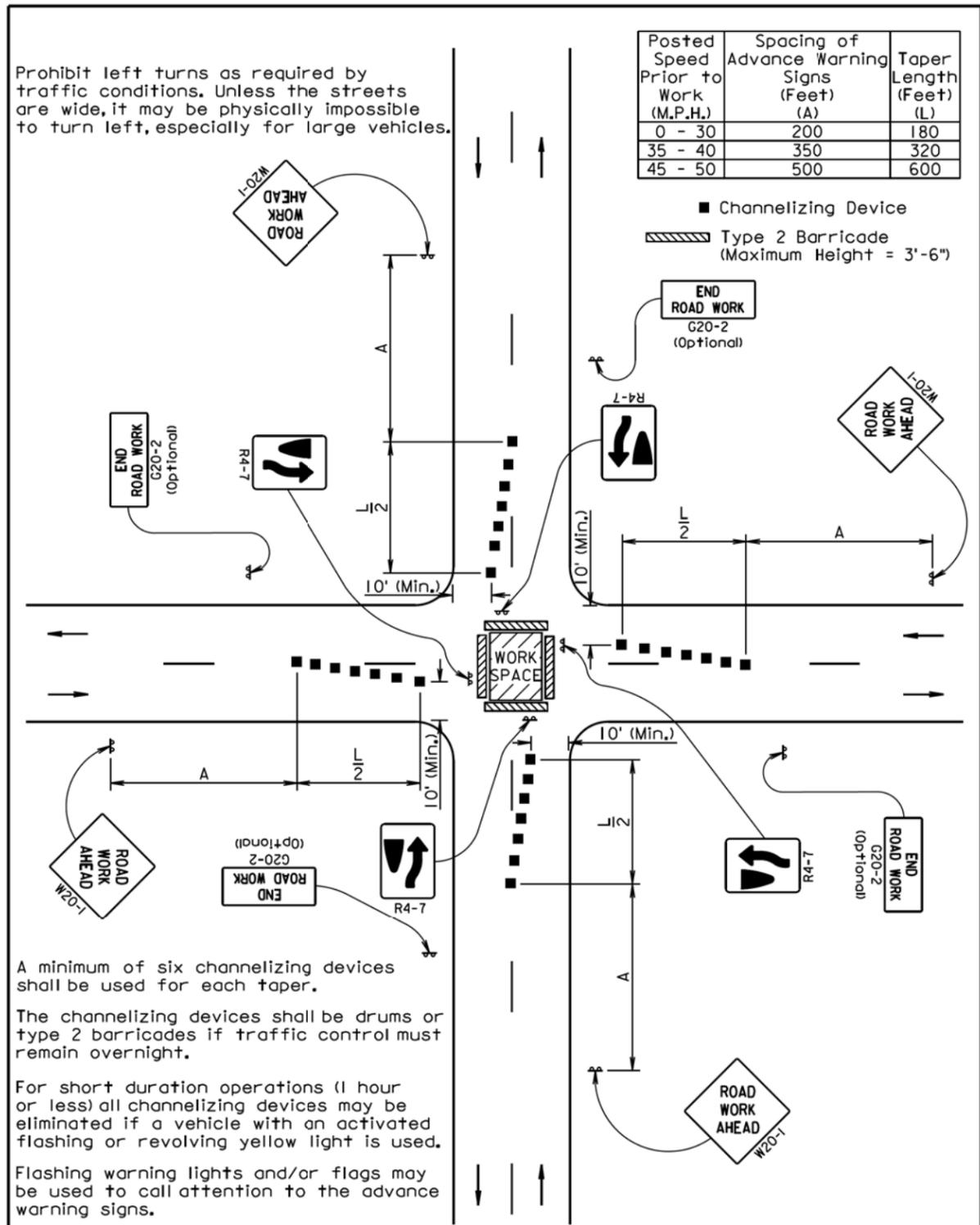
Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet) (A)	Taper Length (Feet) (L)	Spacing of Channelizing Devices (Feet) (G)
0 - 30	200	180	25
35 - 40	350	320	25
45 - 50	500	600	50
55	750	660	50
60 - 65	1000	780	50

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

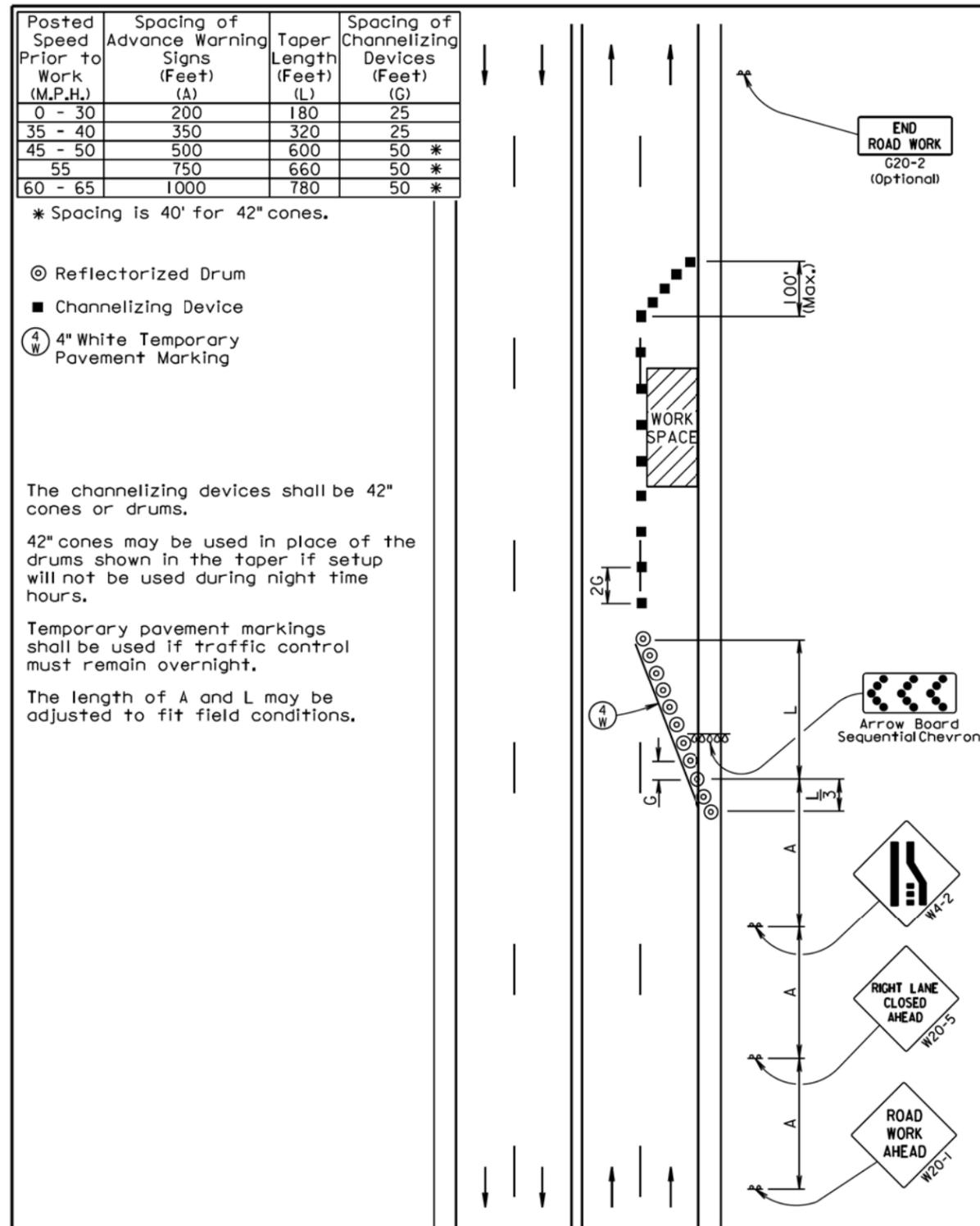


The channelizing devices shall be drums or 42" cones.  
The length of A may be adjusted to fit field conditions.

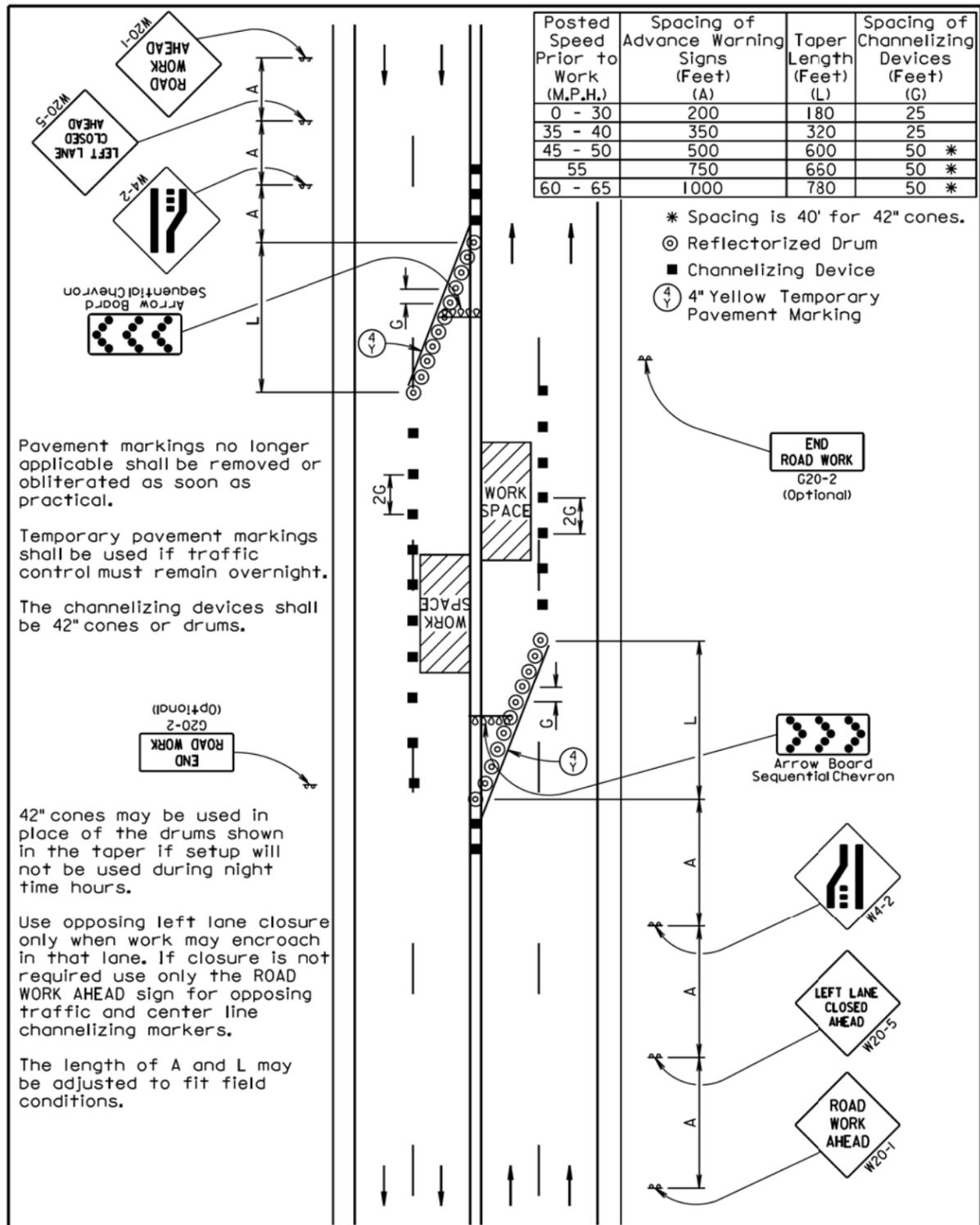
September 22, 2014



September 22, 2014



April 15, 2015



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

Temporary pavement markings shall be used if traffic control must remain overnight.

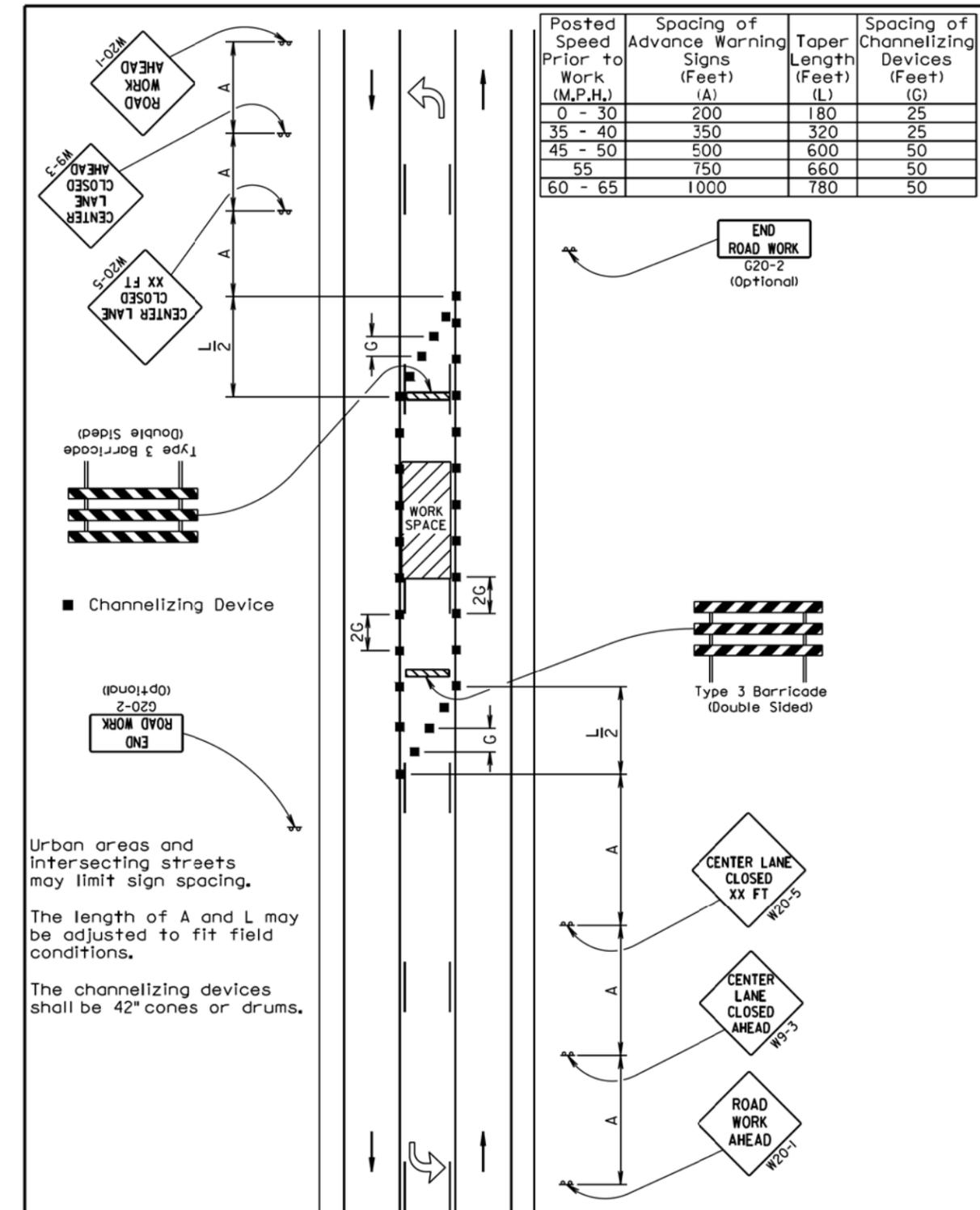
The channelizing devices shall be 42" cones or drums.

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

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

The length of A and L may be adjusted to fit field conditions.

April 15, 2015

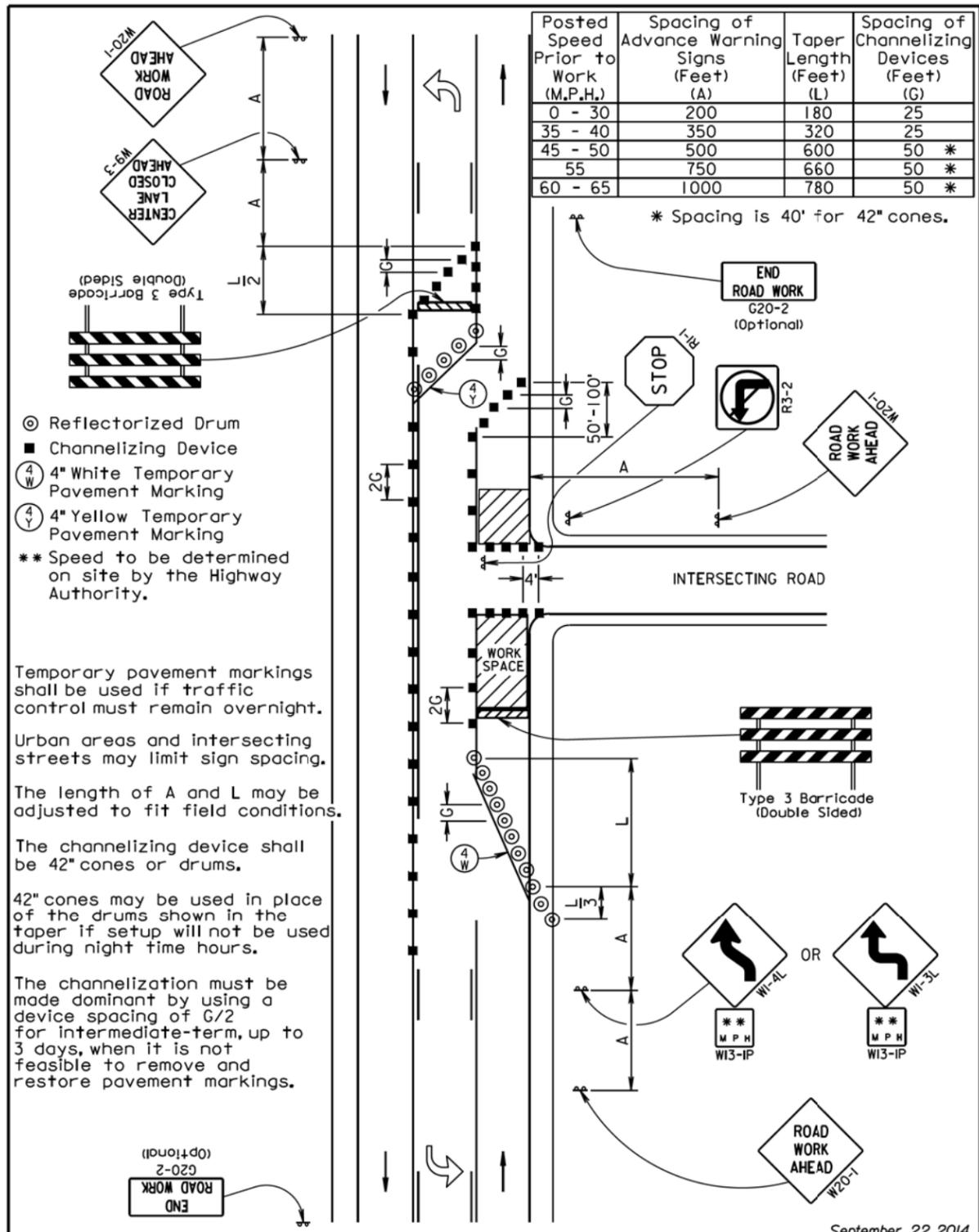


Urban areas and intersecting streets may limit sign spacing.

The length of A and L may be adjusted to fit field conditions.

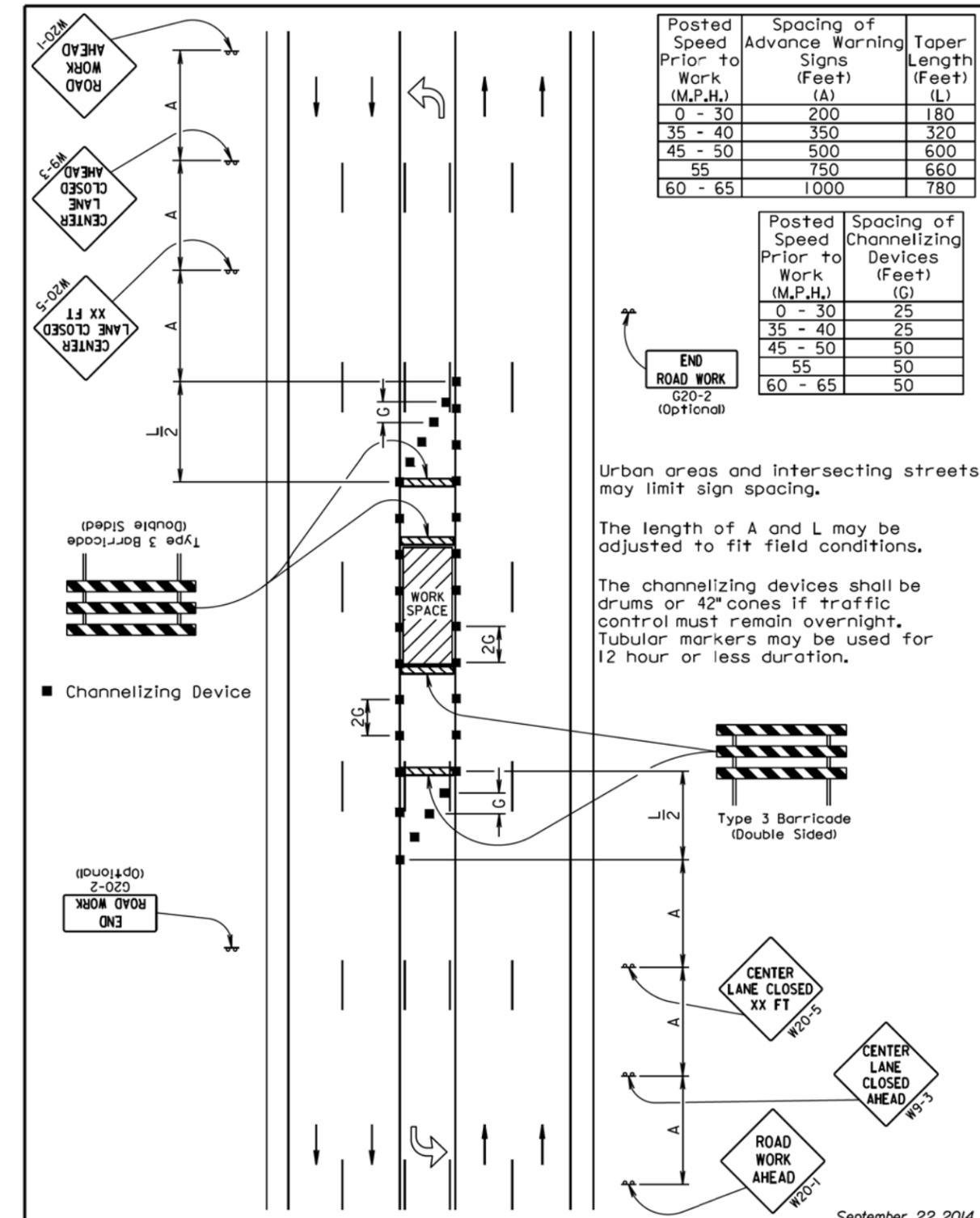
The channelizing devices shall be 42" cones or drums.

September 22, 2014

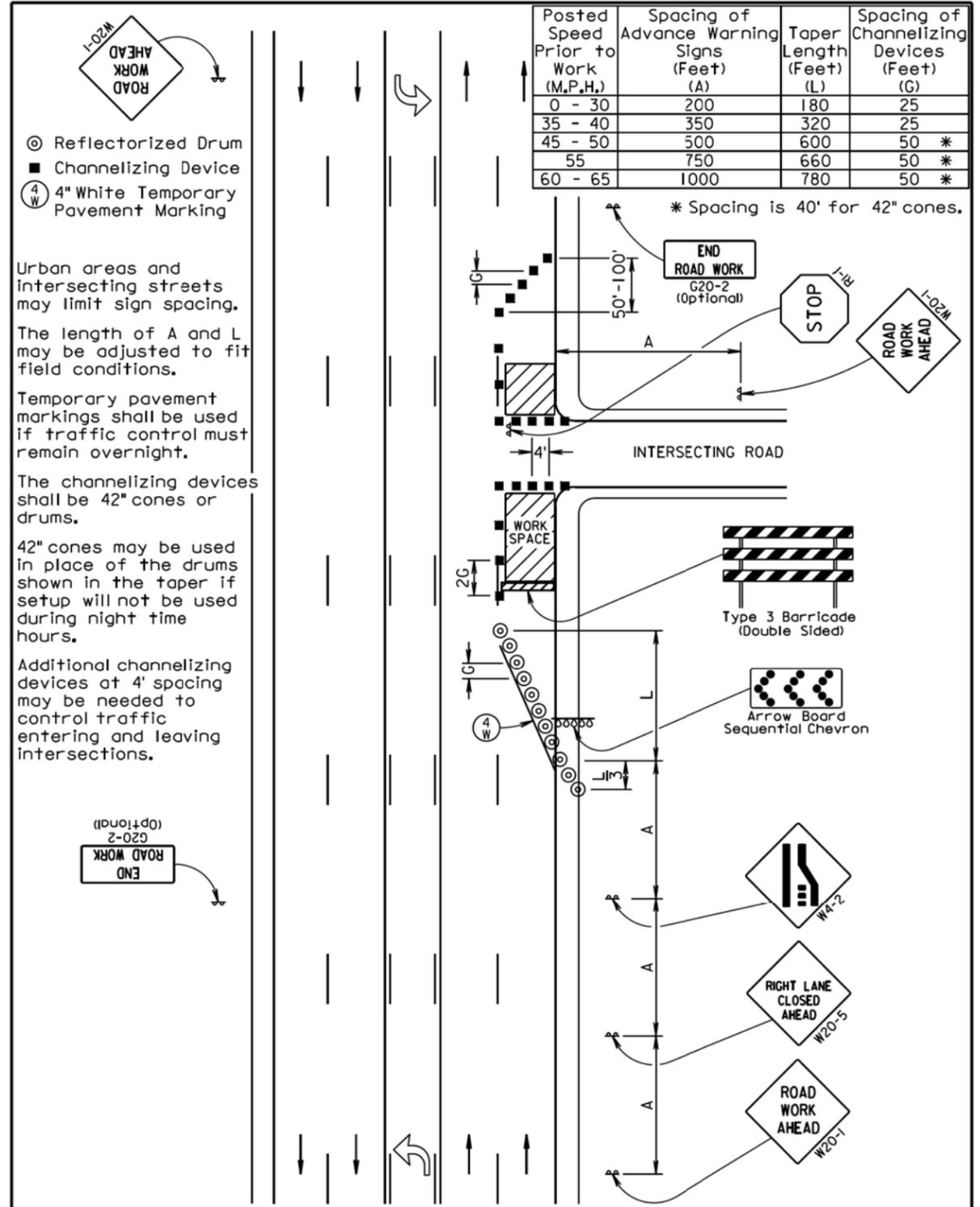


● Reflectorized Drum  
 ■ Channelizing Device  
 (4 W) 4" White Temporary Pavement Marking  
 (4 Y) 4" Yellow Temporary Pavement Marking  
 \*\* Speed to be determined on site by the Highway Authority.

Temporary pavement markings shall be used if traffic control must remain overnight.  
 Urban areas and intersecting streets may limit sign spacing.  
 The length of A and L may be adjusted to fit field conditions.  
 The 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 night time hours.  
 The channelization must be made dominant by using a device spacing of G/2 for intermediate-term, up to 3 days, when it is not feasible to remove and restore pavement markings.



Urban areas and intersecting streets may limit sign spacing.  
 The length of A and L may be adjusted to fit field conditions.  
 The channelizing devices shall be drums or 42" cones if traffic control must remain overnight. Tubular markers may be used for 12 hour or less duration.



Urban areas and intersecting streets may limit sign spacing.

The length of A and L may be adjusted to fit field conditions.

Temporary pavement markings shall be used if traffic control must remain overnight.

The channelizing devices 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 night time hours.

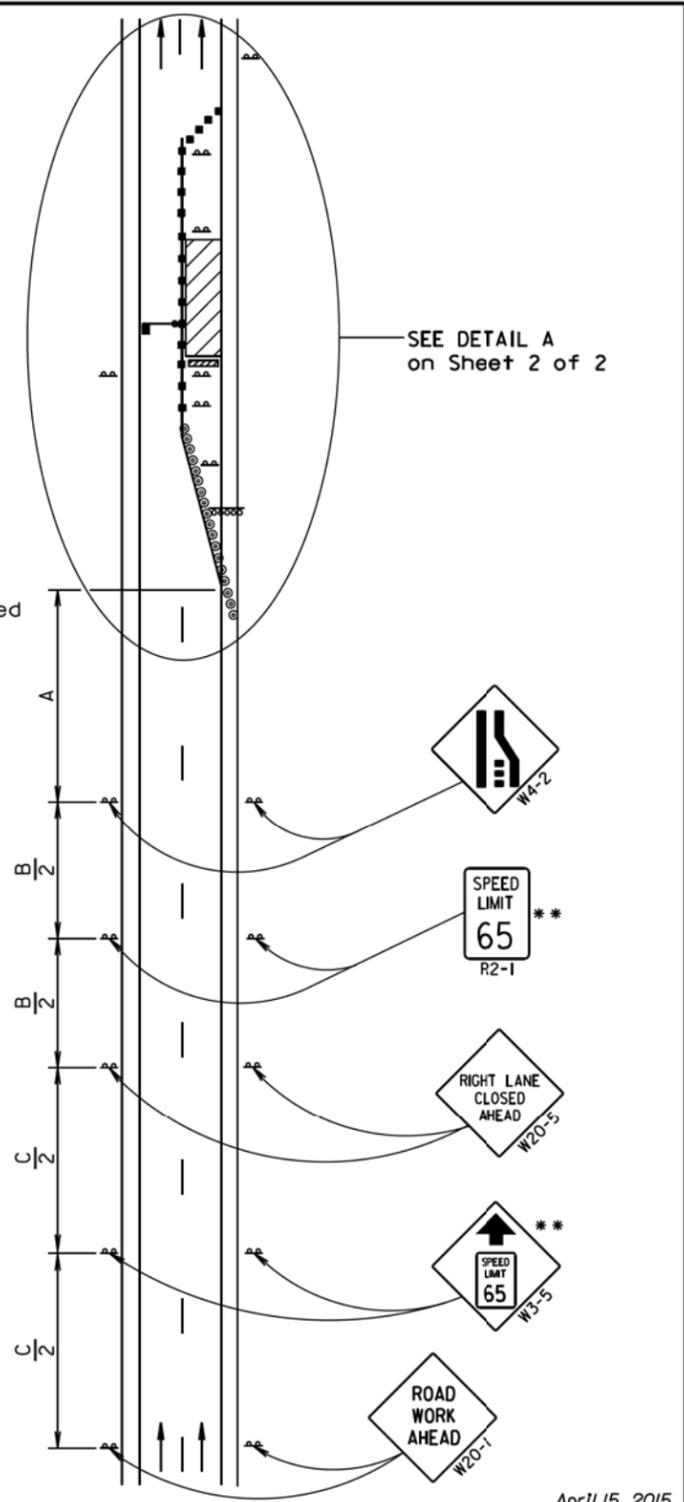
Additional channelizing devices at 4' spacing may be needed to control traffic entering and leaving intersections.

Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet)		
	(A)	(B)	(C)
0 - 30	200		
35 - 40	350		
45 - 50	500		
55	750		
60 - 65	1000		
	(A)	(B)	(C)
70 - 80	1000	1500	2640

- \*\* Speed appropriate for location.
- ⊙ Reflectorized Drum
- Channelizing Device

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

High speed is defined as having a posted speed limit greater than 45 mph.



April 15, 2015

Posted Speed Prior to Work (M.P.H.)	Spacing of Channelizing Devices (Feet) (G)	Taper Length (Feet) (L)
0 - 30	25	180
35 - 40	25	320
45 - 50	50 *	600
55	50 *	660
60 - 65	50 *	780
70 - 80	50 *	960

- \* Spacing is 40' for 42" cones.
- \*\* Speed appropriate for location.
- \*\*\* Use speed limit designated for the condition when workers are present in the work space. Signs shall be covered or removed when workers are not present.

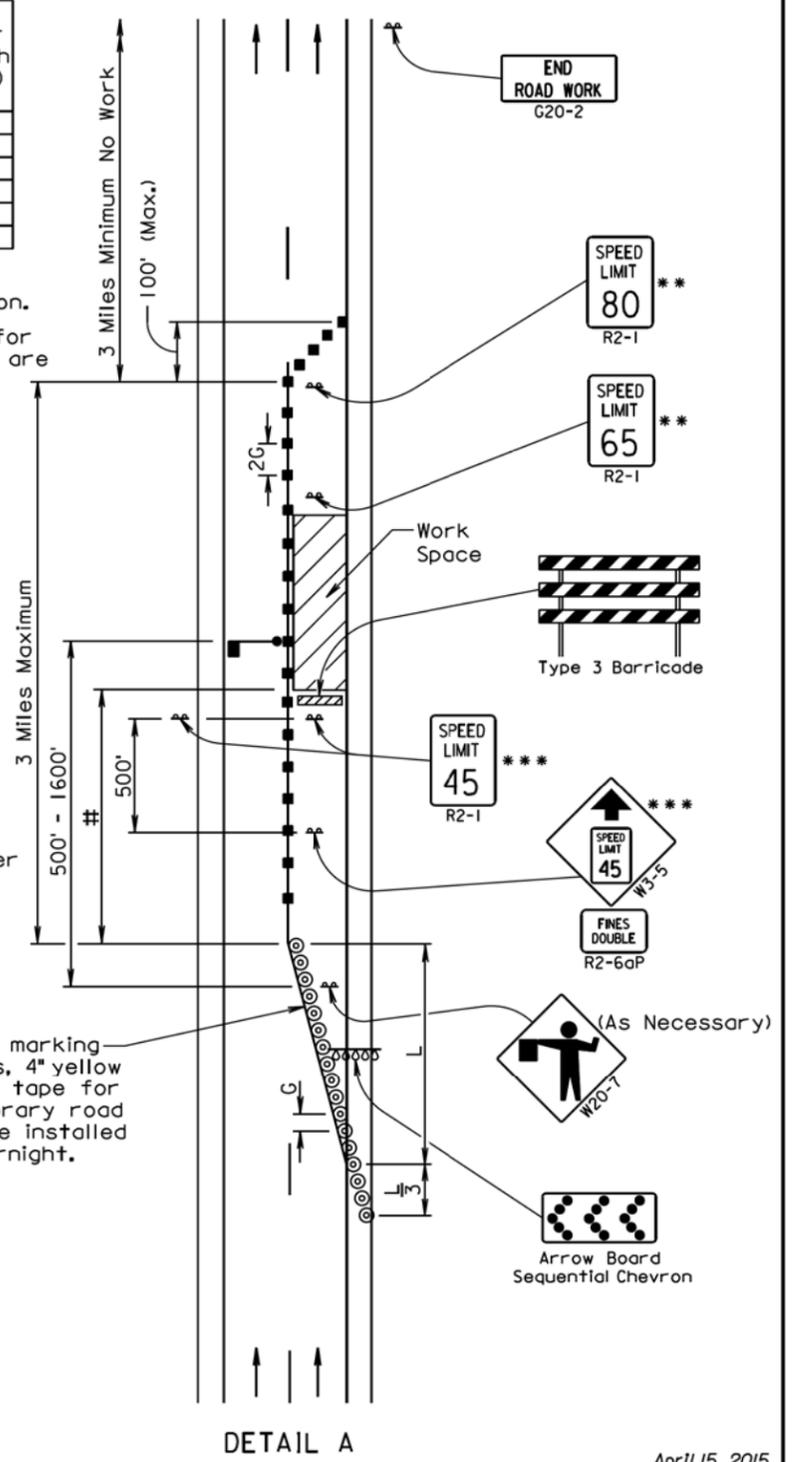
- Flagger (As Necessary)
- ⊙ Reflectorized Drum
- Channelizing Device
- # The Work Space shall be a minimum of 500' from the end of the taper.

The FLAGGER sign shall be used whenever there is a Flagger present.

The channelizing devices 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 night time hours.

4" white temporary pavement marking tape for right lane closures, 4" yellow temporary pavement marking tape for left lane closures, or temporary road markers at 5' spacing shall be installed when the lane is closed overnight.



April 15, 2015

Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet)		L (Feet)
	(A)	(B)	
45 - 50	500		600
55	750		660
60 - 65	1000		780
	(A)	(B)	
70 - 80	1000	1500	1125

Posted Speed Prior to Work (M.P.H.)	Spacing of Channelizing Devices (Feet)	
	(G)	(H)
0 - 30	25	
35 - 40	25	
45 - 50	50 *	
55	50 *	
60 - 80	50 *	

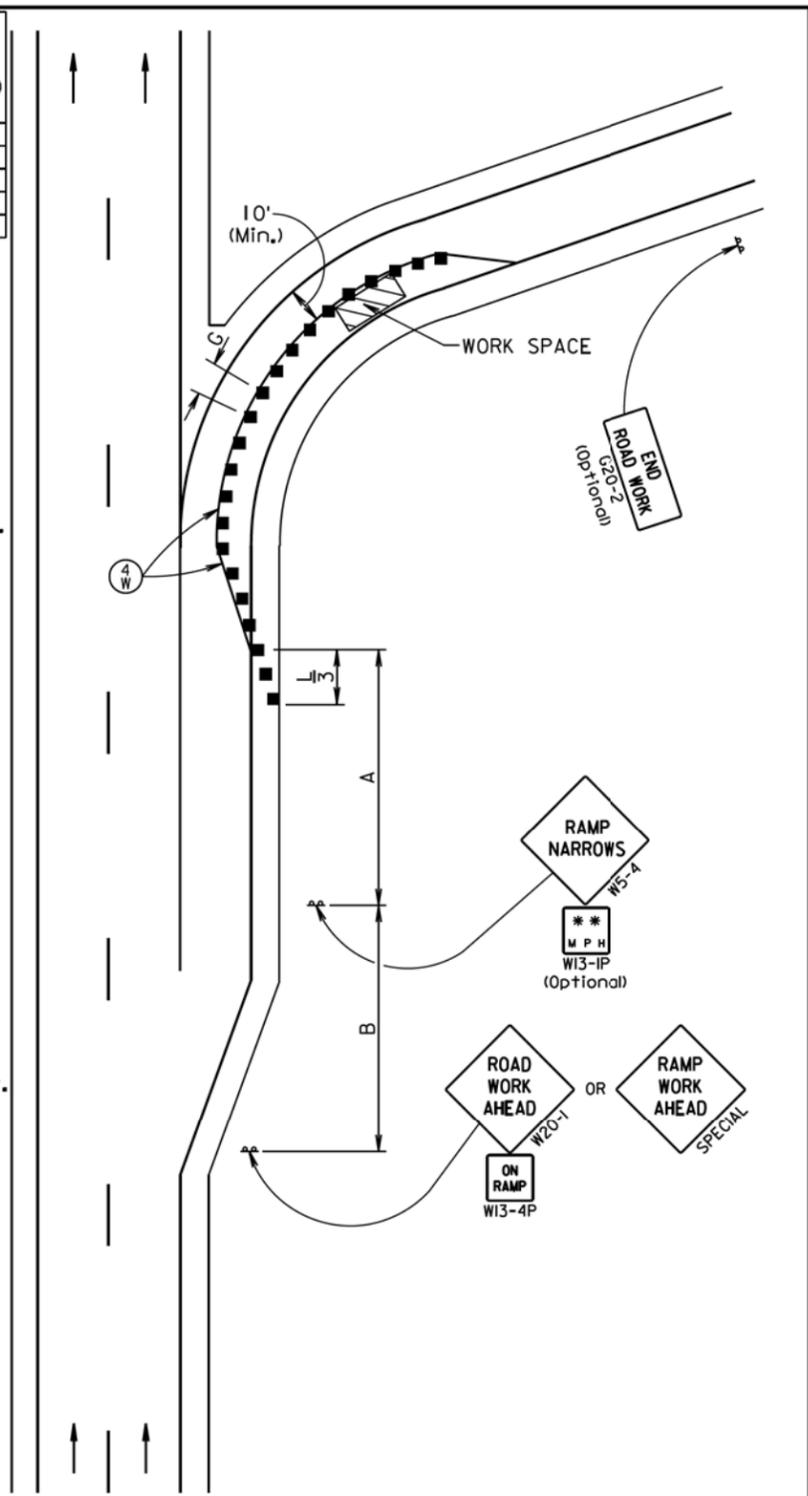
\* Spacing is 40' for 42" cones.

- Channelizing Device
- Ⓞ 4" White Temporary Pavement Marking
- \*\* Need and safe speed to be determined by the Highway Authority.

Temporary pavement markings shall be used if traffic control must remain overnight.

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

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



April 15, 2015

Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet)			Taper Length (Feet)
	(A)	(B)	(C)	
0 - 30	200			180
35 - 40	350			320
45 - 50	500			600
55	750			660
60 - 65	1000			780
	(A)	(B)	(C)	
70 - 80	1000	1500	2640	1125

Posted Speed Prior to Work (M.P.H.)	Spacing of Channelizing Devices (Feet)	
	(G)	(H)
0 - 30	25	
35 - 40	25	
45 - 50	50 *	
55	50 *	
60 - 80	50 *	

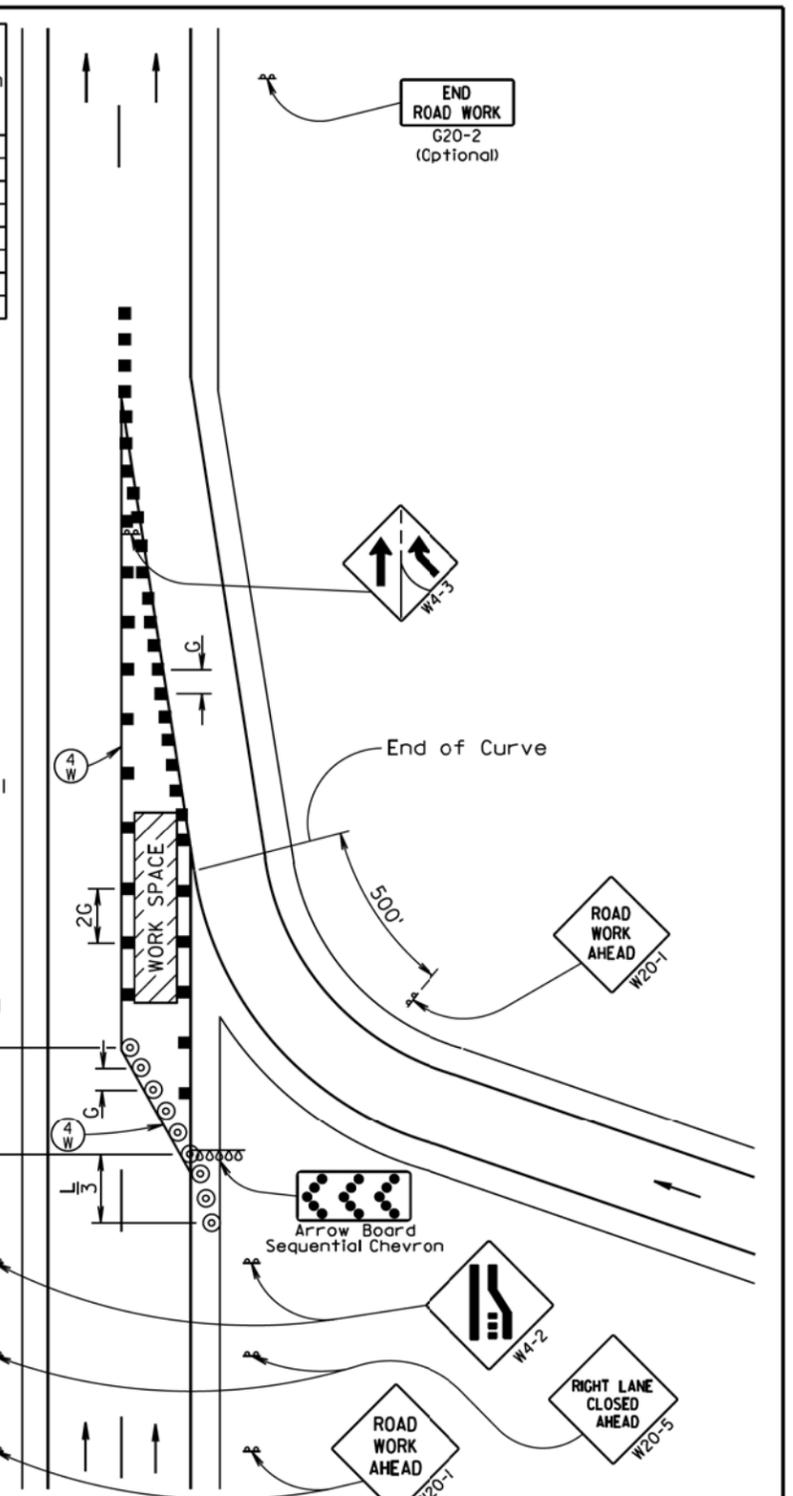
\* Spacing is 40' for 42" cones.

- Ⓞ Reflectorized Drum
- Channelizing Device
- Ⓞ 4" White Temporary Pavement Marking

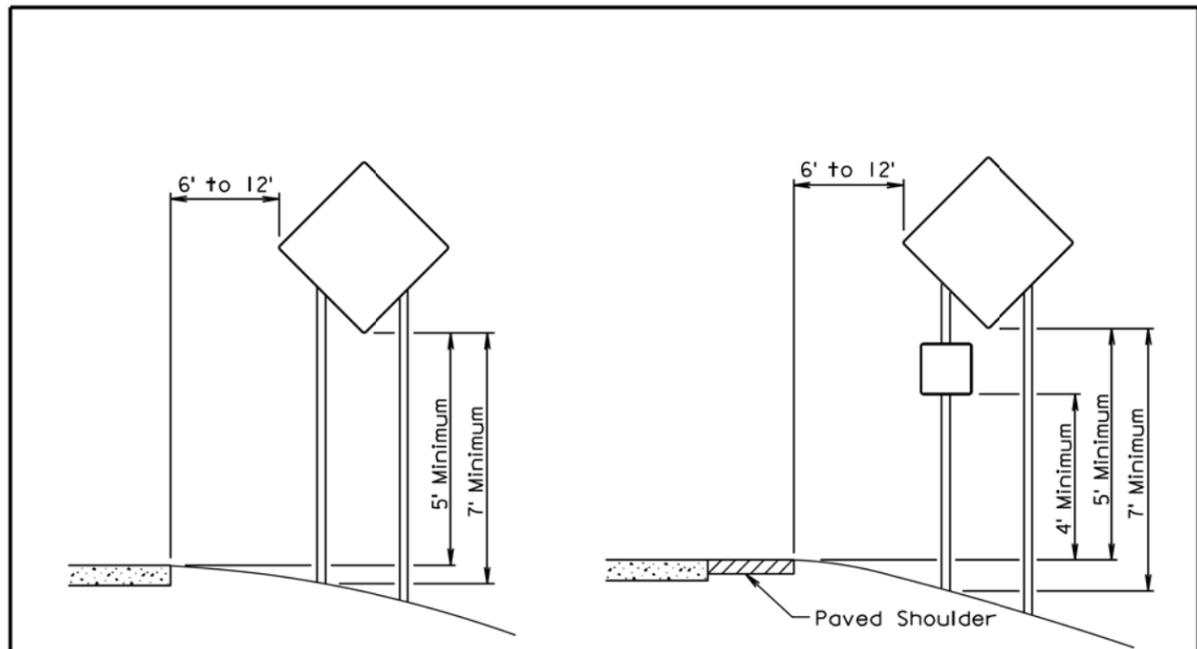
Temporary pavement markings shall be used if traffic control must remain overnight.

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

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

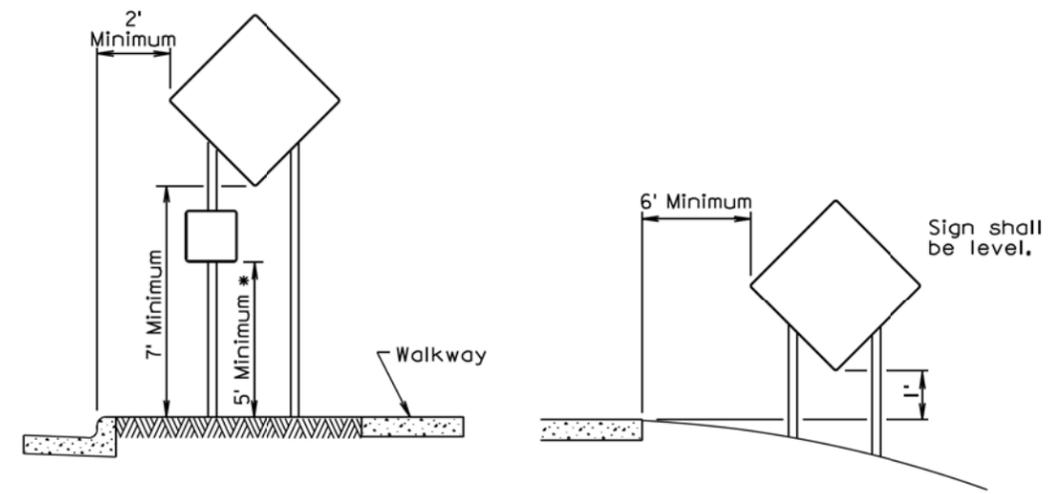


April 15, 2015



RURAL DISTRICT

RURAL DISTRICT WITH  
SUPPLEMENTAL PLATE



URBAN DISTRICT

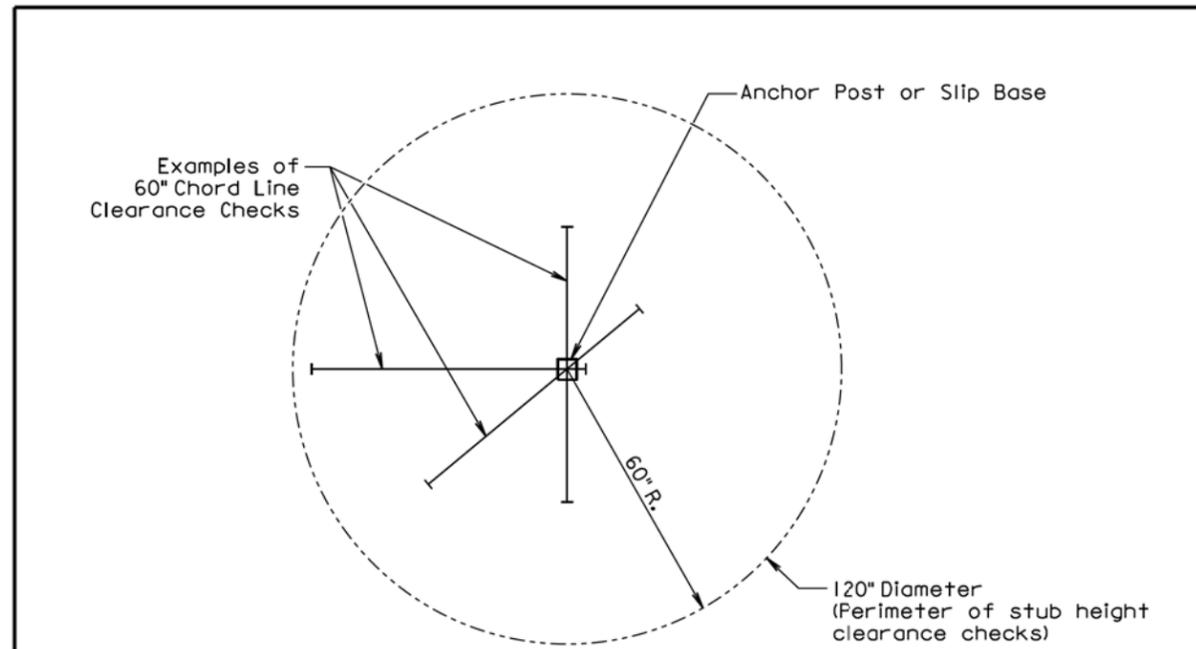
RURAL DISTRICT  
3 DAY MAXIMUM

\* If the bottom of supplemental plate is mounted lower than 7 feet above a pedestrian walkway, the supplemental plate should not project more than 4" into the pedestrian facility.

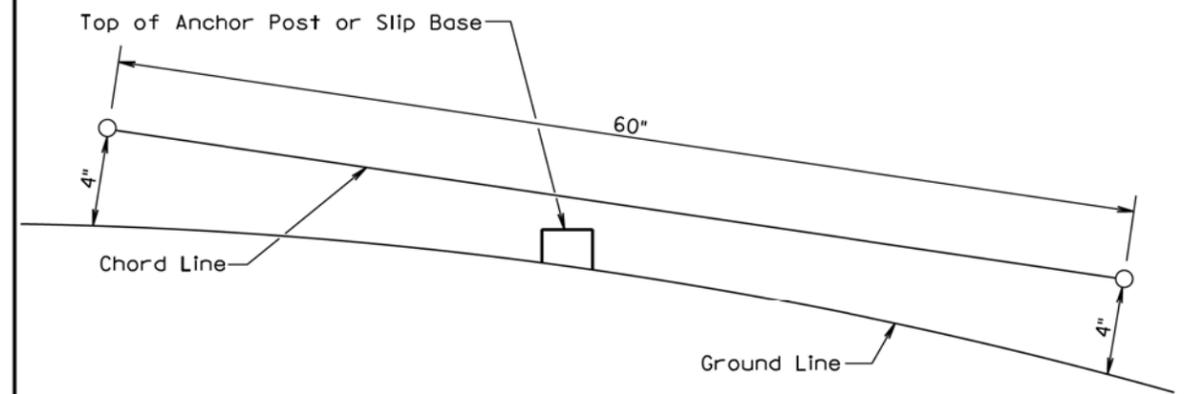
(Not applicable to regulatory signs)

September 22, 2014

Published Date: 1st Qtr. 2016	S D D O T	CRASHWORTHY SIGN SUPPORTS (Typical Construction Signing)	PLATE NUMBER 634.85
			Sheet 1 of 1



PLAN VIEW  
(Examples of stub height clearance checks)



ELEVATION VIEW

GENERAL NOTES:

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

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

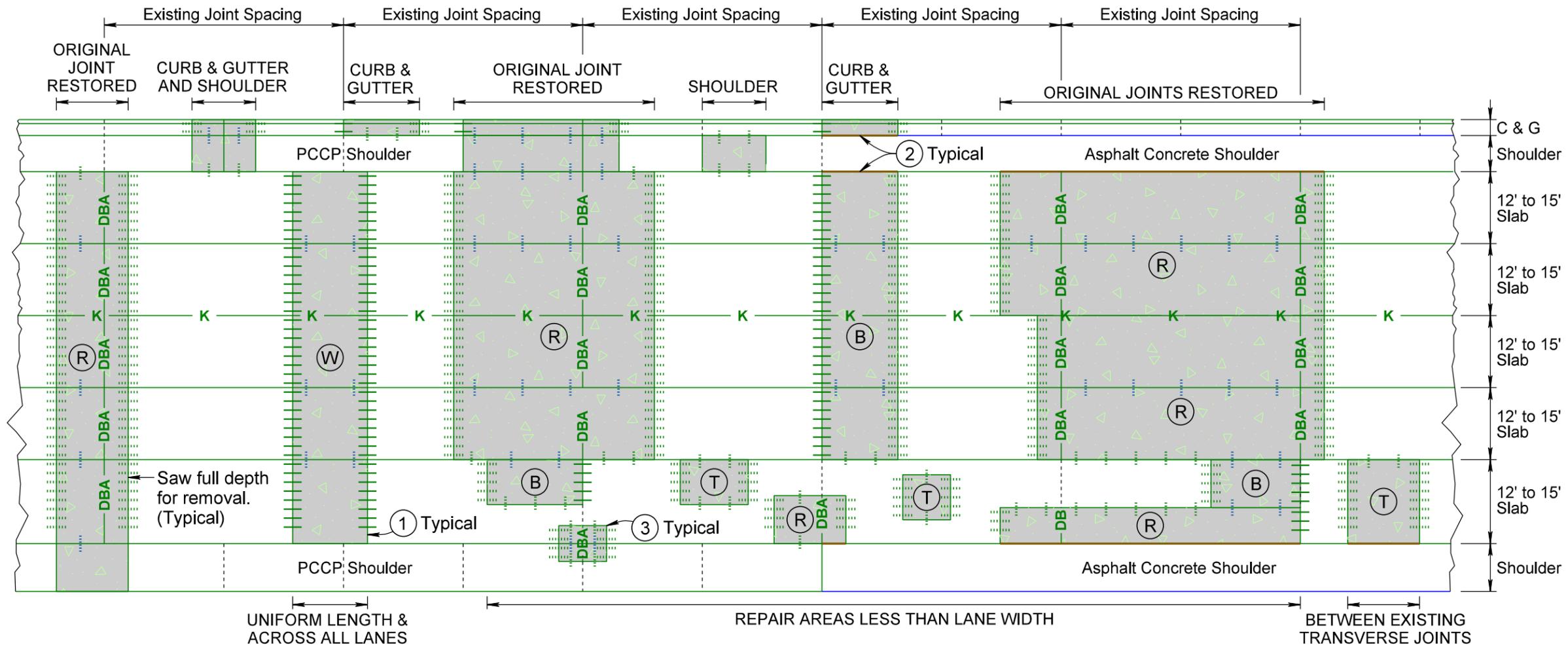
The 4" stub height clearance is not necessary for U-channel lap splices where the support is designed to yield (bend) at the base.

July 1, 2005

Published Date: 1st Qtr. 2016	S D D O T	BREAKAWAY SUPPORT STUB CLEARANCE	PLATE NUMBER 634.99
			Sheet 1 of 1

# NONREINFORCED PCC PAVEMENT REPAIR

## UP TO FOUR LANE ROADWAY WITH CENTER TURN LANE OR UP TO TEN LANE DIVIDED ROADWAY TYPICAL REPAIR AREAS



### KEY:

PCC Pavement Repair Area

### PCC PAVEMENT REPAIR AREA TYPES:

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

(T) Two Tied Joints

(B) One Working & One Tied Joint

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

### Longitudinal Keyway Joints Without Bars

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

### Steel Bars for Transverse Joints

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

— Drilled in  $1\frac{1}{2}" \times 18"$  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  $1\frac{1}{4}" \times 18"$  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  $1" \times 18"$  epoxy coated plain round dowel bars spaced 18" center to center.

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

DBA Dowel Bar Assembly

### 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.

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

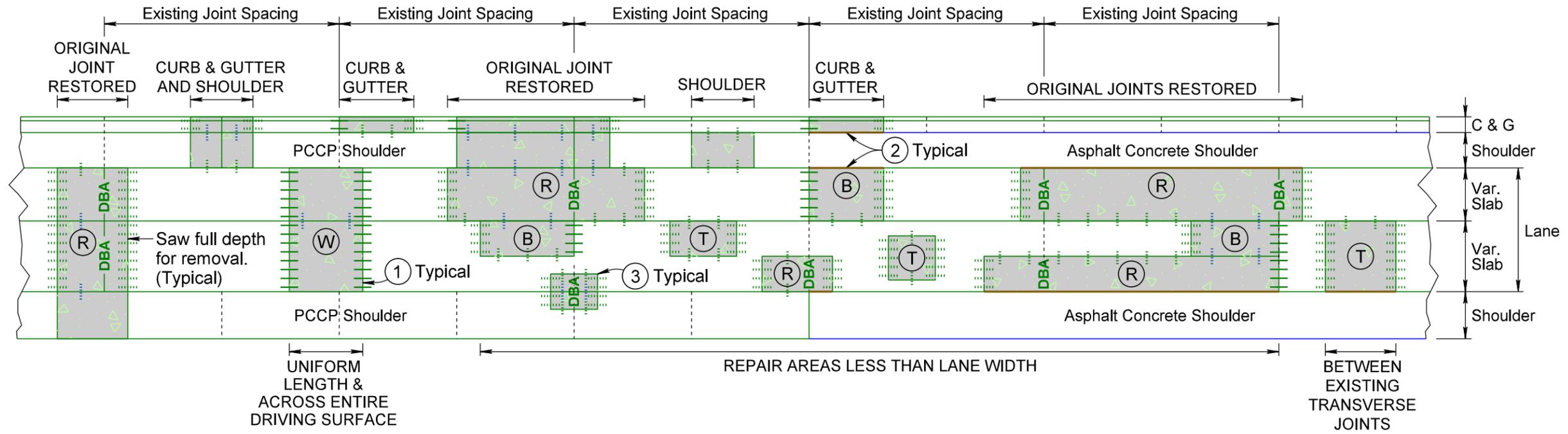
(2) Edges of repair areas shall be formed to match the width of the existing concrete pavement.

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

# NONREINFORCED PCC PAVEMENT REPAIR

## ANY SINGLE LANE ROADWAY (RAMPS, ETC.) TYPICAL REPAIR AREAS

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM-NH-P 0023(44)	56	67



**KEY:**

PCC Pavement Repair Area

**PCC PAVEMENT REPAIR AREA TYPES:**

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

**Steel Bars for Transverse Joints**

- Pavement Thickness  $\geq 10.5"$
- Drilled in  $1\frac{1}{2}" \times 18"$  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  $1\frac{1}{4}" \times 18"$  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  $1" \times 18"$  epoxy coated plain round dowel bars spaced 18" center to center.
  - ..... Drilled in No. 8 x 18" epoxy coated deformed tie bars spaced 18" center to center.

**DBA** Dowel Bar Assembly

**Steel Bars for Longitudinal Joints**

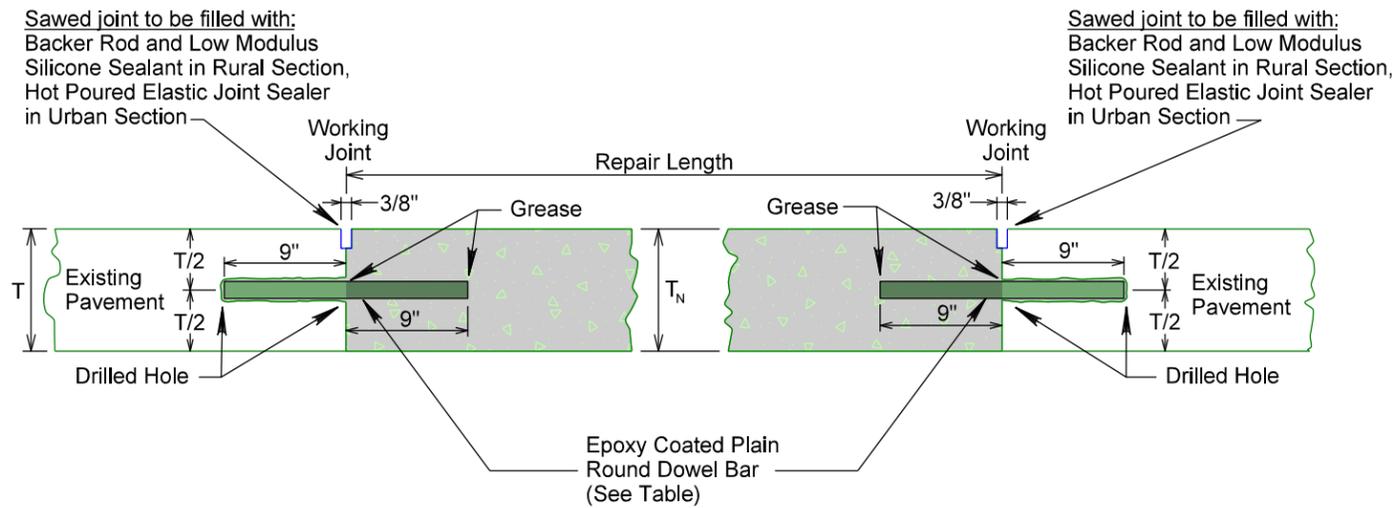
- ..... No. 5 x 30" epoxy coated deformed tie bars. Sawn Joint - spaced 48" center to center. Construction Joint - spaced 48" center to center.
- ..... No. 5 x 24" epoxy coated deformed tie bars. Drilled In - spaced 30" center to center.

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

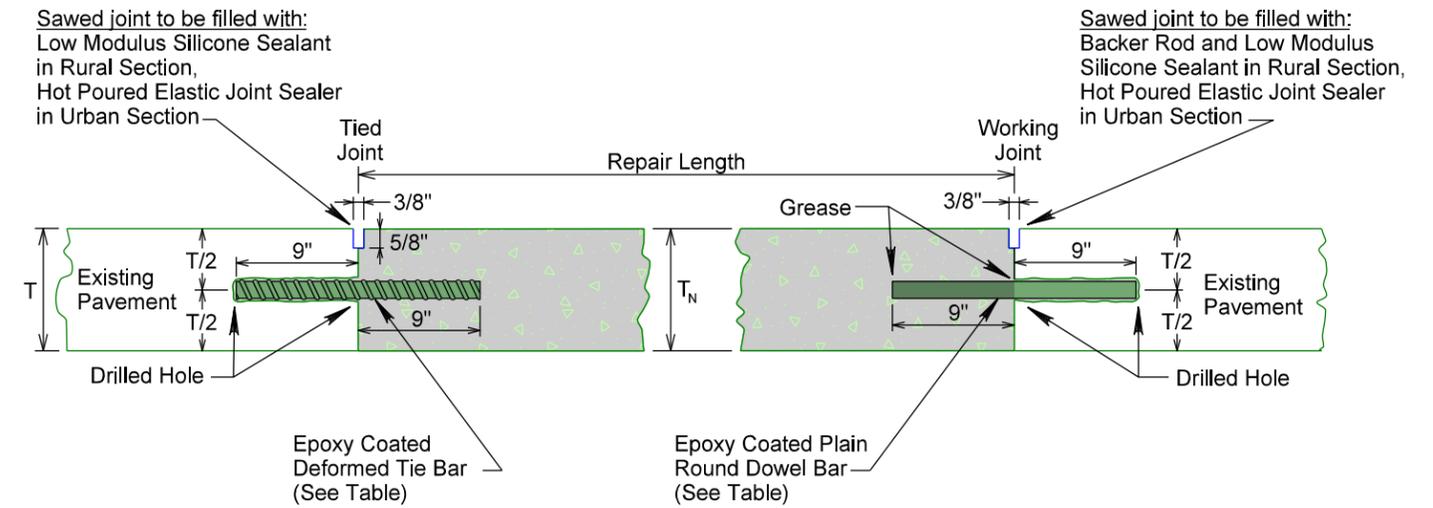
- (1) Where possible, transverse joints shall be constructed/maintained full roadway width.
- (2) Edges of repair areas shall be formed to match the width of the existing concrete pavement.
- (3) Need for bars in small repair areas on/near the shoulder to be determined on a case-by-case basis, on construction by the Engineer.

# NONREINFORCED PCC PAVEMENT REPAIR

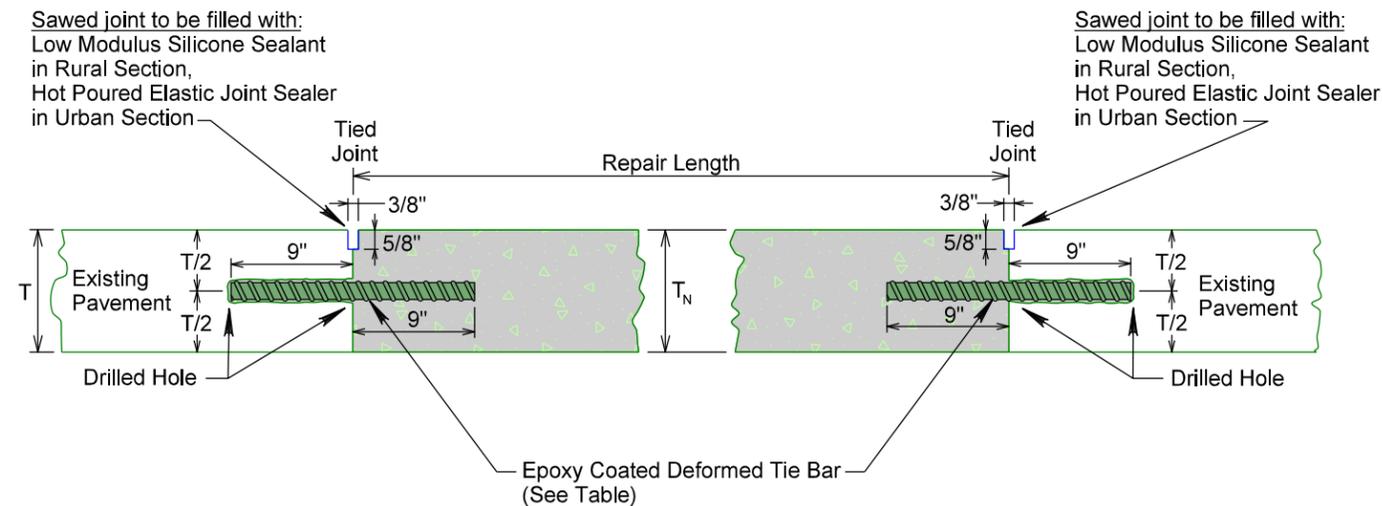
**PLAIN ROUND DOWEL BAR INSERTION  
TYPE W - (TWO WORKING JOINTS)**



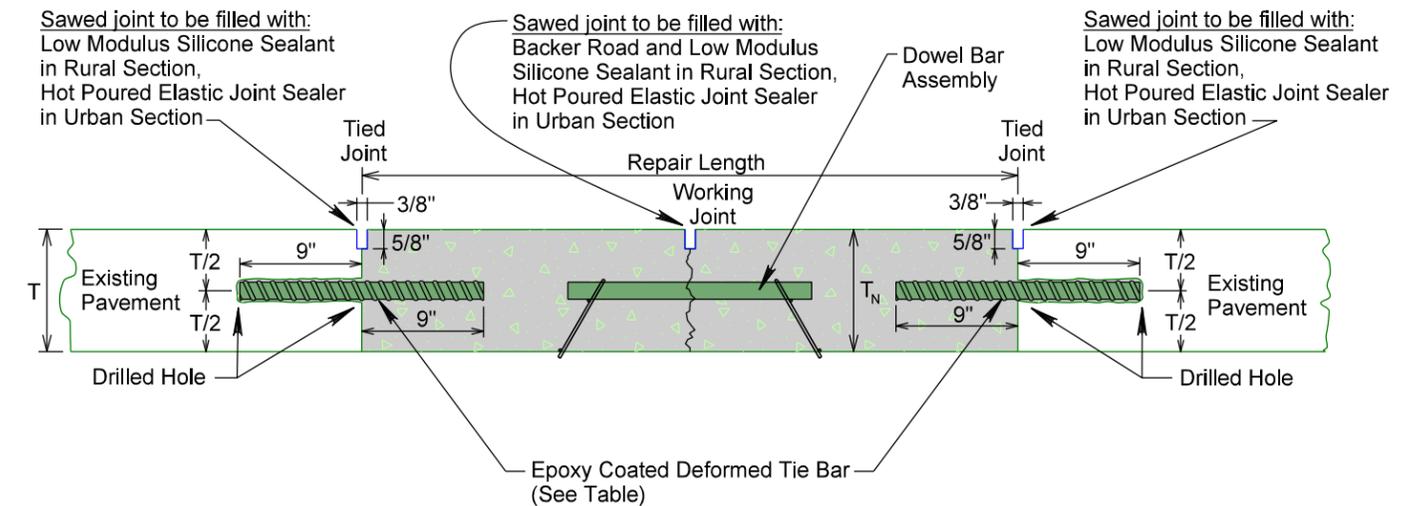
**DEFORMED TIE BAR AND PLAIN ROUND DOWEL BAR INSERTION  
TYPE B - (ONE TIED JOINT AND ONE WORKING JOINT)**



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



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



Existing Pavement Thickness	Epoxy Coated Deformed Tie Bar Size	Epoxy Coated Plain Round Dowel Bar Size
T ≥ 10.5"	No. 11 x 18"	1½" x 18"
T ≥ 8.5" & T < 10.5"	No. 9 x 18"	1¼" x 18"
T < 8.5"	No. 8 x 18"	1" x 18"

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

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

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

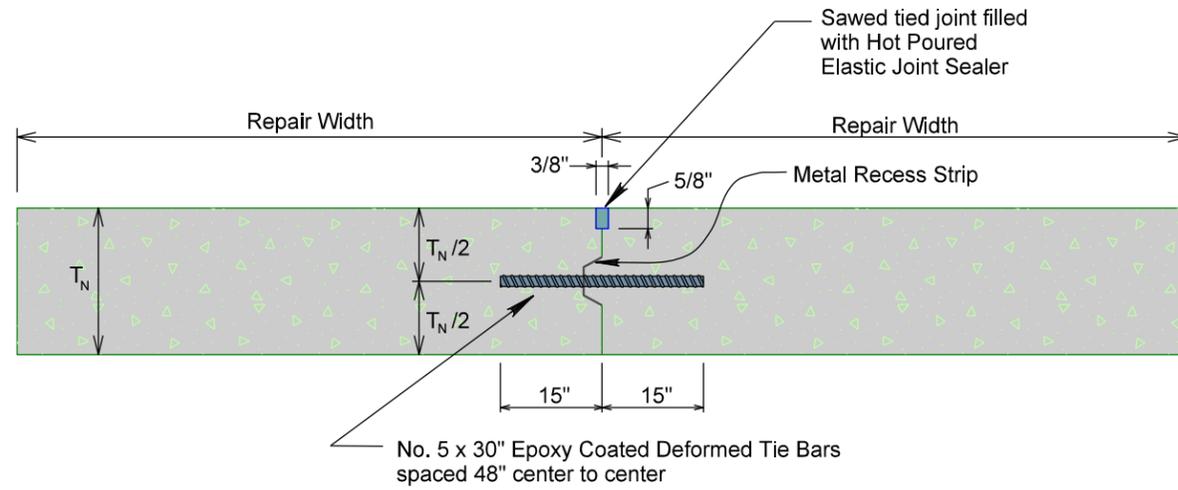
Cost for furnishing and installing dowel bar assembly shall be included in the contract unit price per each for Dowel Bar.

T<sub>N</sub> = T  
(top of new pavement shall be flush with top of existing pavement)

# NONREINFORCED PCC PAVEMENT REPAIR

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM-NH-P 0023(44)	58	67

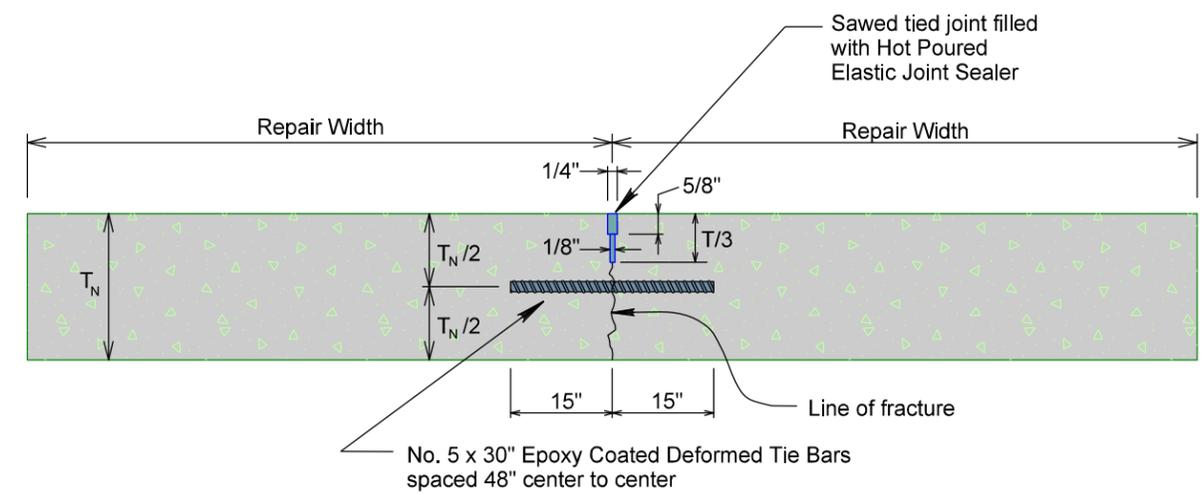
LONGITUDINAL CONSTRUCTION JOINT WITH TIE BARS & KEYWAY



$T_N$  = New pavement thickness.

Cost for furnishing and inserting tie bars shall be incidental to the contract unit price per square yard for Nonreinforced PCC Pavement Repair.

SAWED LONGITUDINAL JOINT

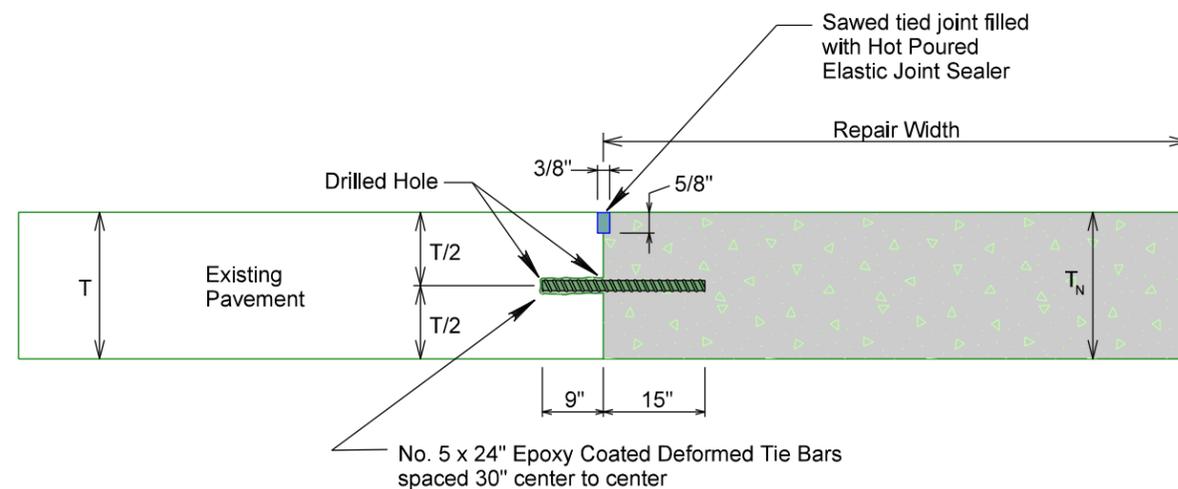


$T_N$  = New pavement thickness.

The first saw cut to control cracking shall be a minimum of 1/3 the depth of the pavement. Additional sawing for widening the saw cut will be necessary.

Cost for furnishing and inserting tie bars shall be incidental to the contract unit price per square yard for Nonreinforced PCC Pavement Repair.

LONGITUDINAL CONSTRUCTION JOINT WITH DRILLED IN TIE BARS



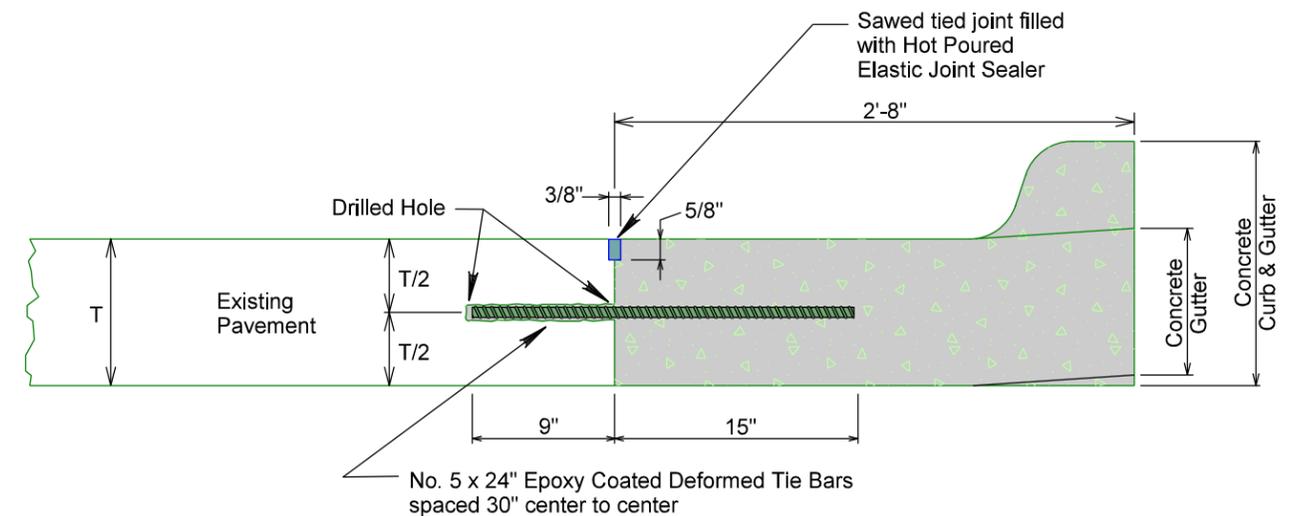
$T$  = Existing pavement thickness.  
 $T_N$  = New pavement thickness.

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

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

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

LONGITUDINAL CONSTRUCTION JOINT WITH DRILLED IN TIE BARS



$T$  = Existing pavement thickness.

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

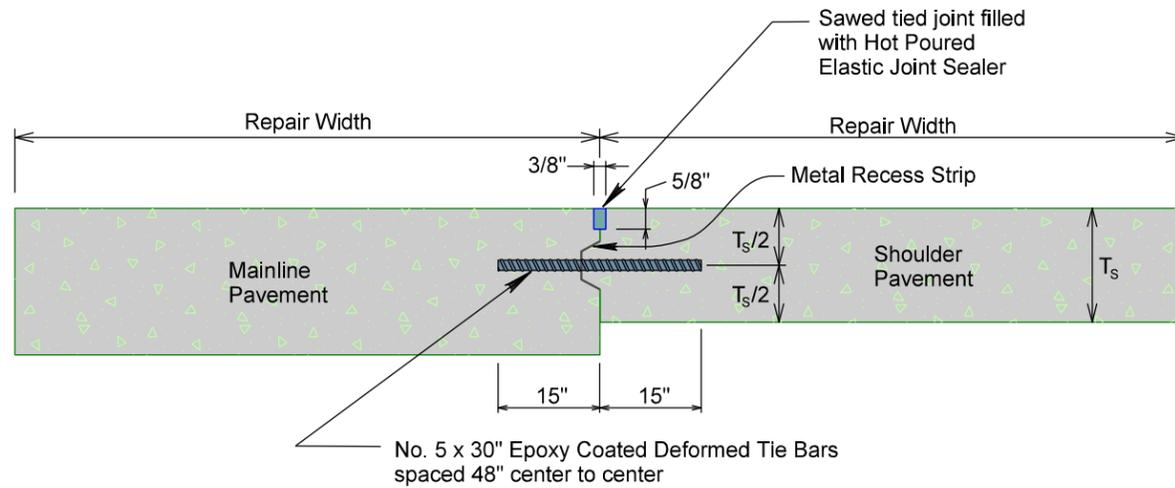
Bars shall be placed a minimum of 15 inches from existing transverse contraction joints.

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

# NONREINFORCED PCC PAVEMENT REPAIR

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM-NH-P 0023(44)	59	67

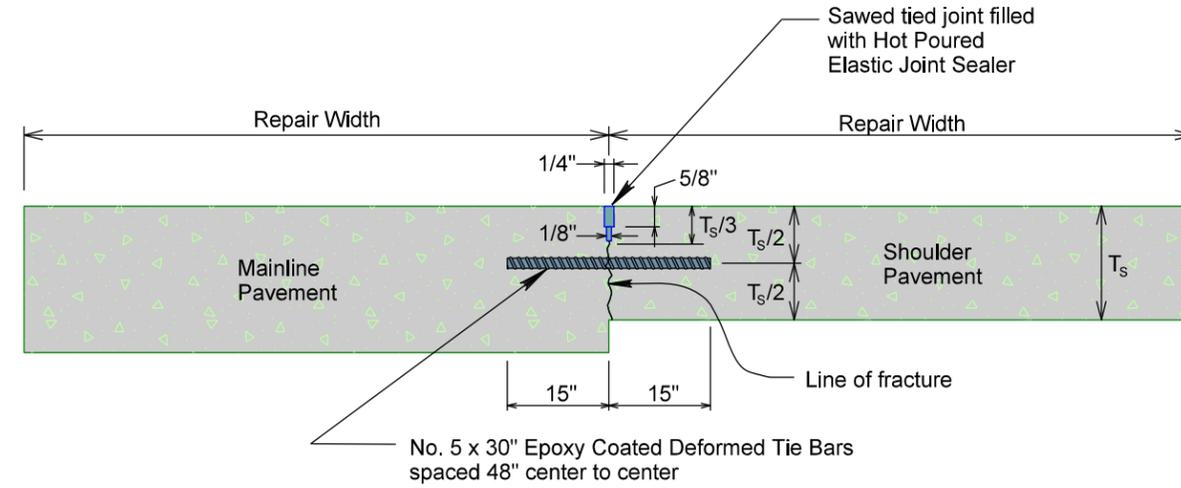
LONGITUDINAL SHOULDER CONSTRUCTION JOINT WITH TIE BARS & KEYWAY



$T_s$  = New shoulder pavement thickness.

Cost for furnishing and inserting tie bars shall be incidental to the contract unit price per square yard for Nonreinforced PCC Pavement Repair.

SAWED LONGITUDINAL SHOULDER JOINT

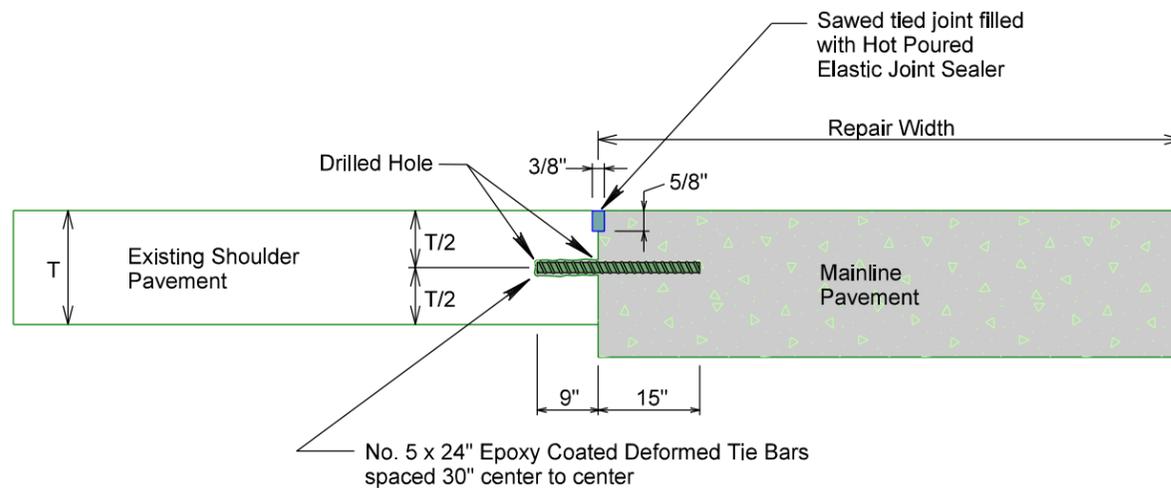


$T_s$  = New shoulder pavement thickness.

The first saw cut to control cracking shall be a minimum of 1/3 the depth of the pavement. Additional sawing for widening the saw cut will be necessary.

Cost for furnishing and inserting tie bars shall be incidental to the contract unit price per square yard for Nonreinforced PCC Pavement Repair.

LONGITUDINAL SHOULDER JOINT WITH DRILLED IN TIE BARS



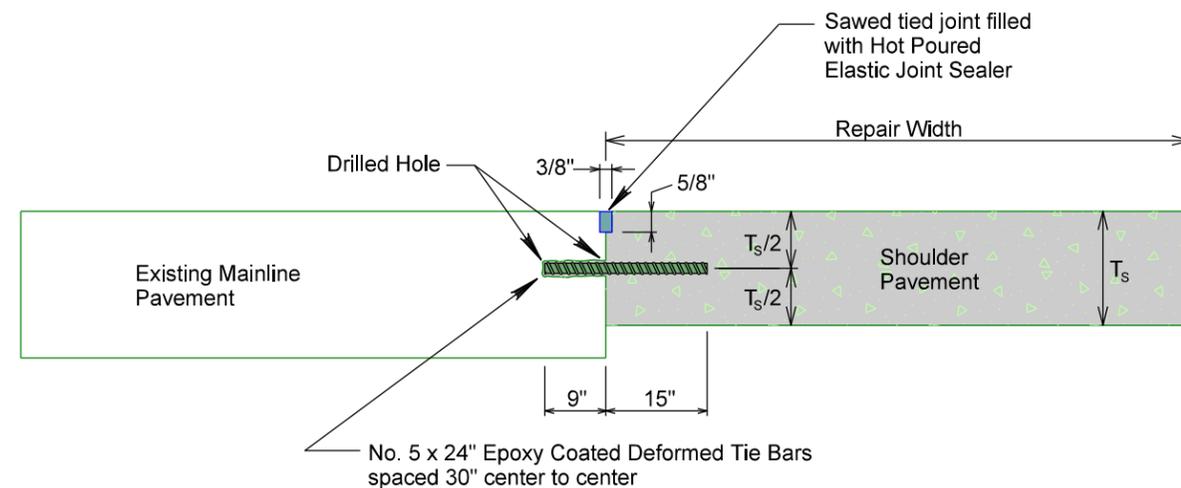
$T$  = Existing shoulder pavement thickness.

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

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

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

LONGITUDINAL SHOULDER JOINT WITH DRILLED IN TIE BARS



$T_s$  = New shoulder pavement thickness.

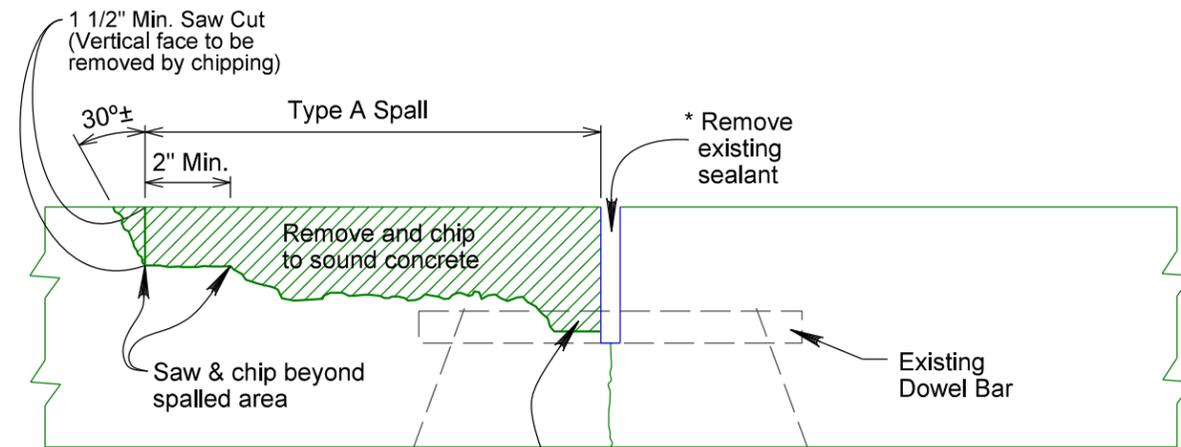
Bar embedded a minimum depth of 9 inches into the existing pavement by utilizing an epoxy resin adhesive.

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

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

# REPAIR OF TYPE A SPALLS

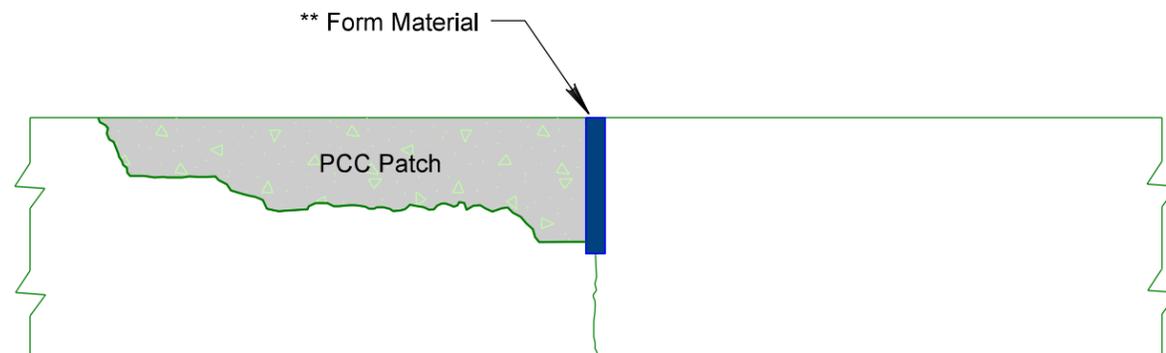
## SPALL REMOVAL



If Dowel Bar is exposed coat the bar with duct tape as a bond breaker

\* Existing Sealant to be removed is low modulus silicone sealant with backer rod or hot poured elastic joint sealer.

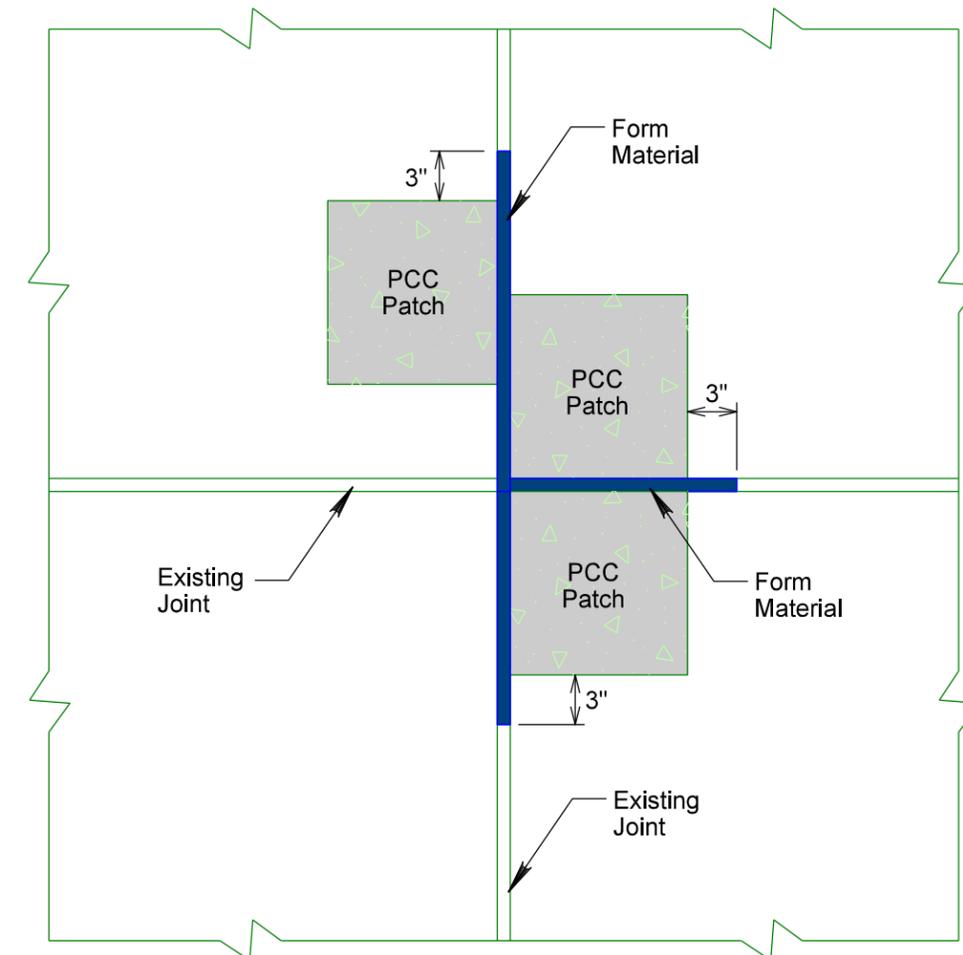
## SPALL PATCH



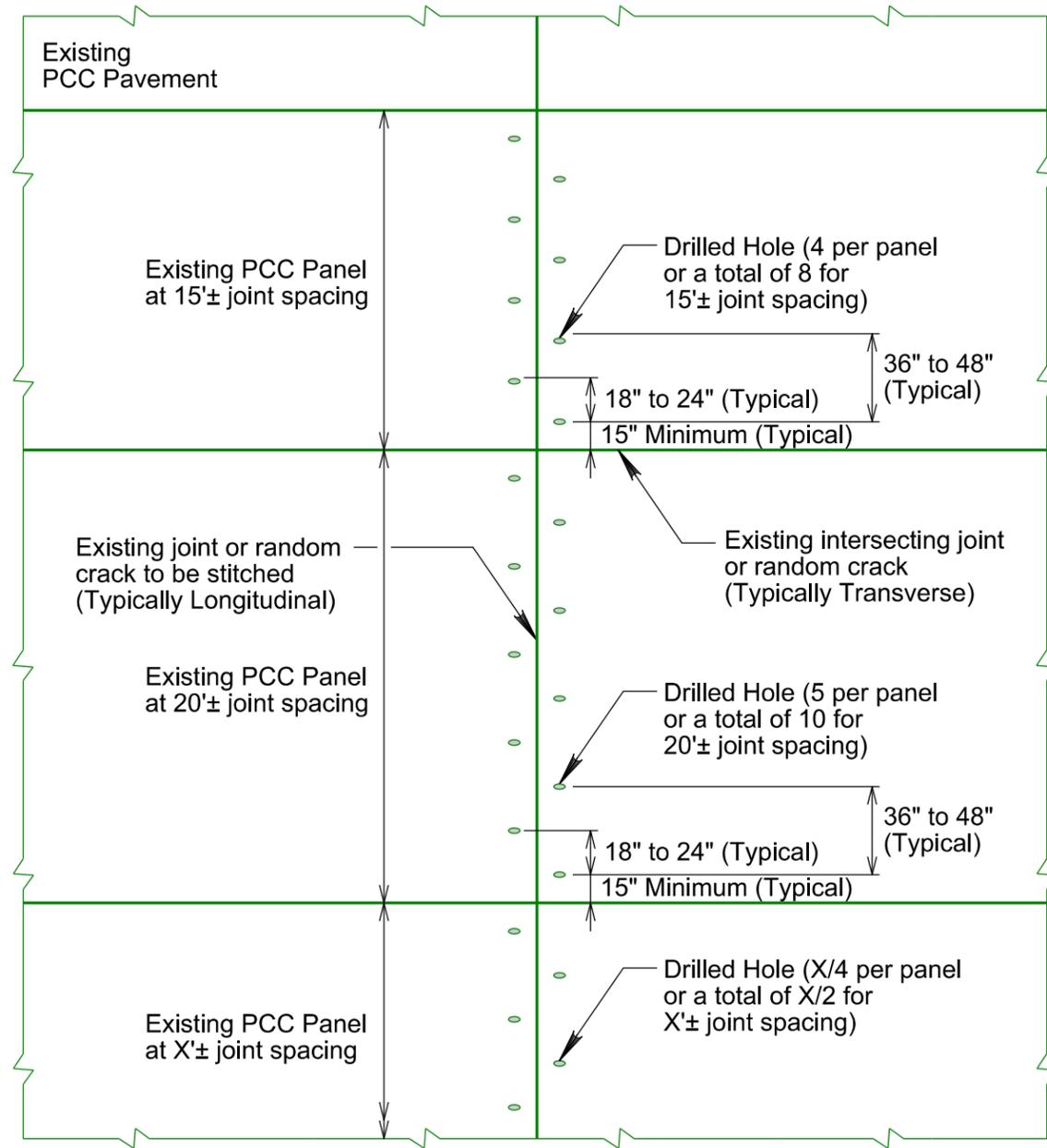
\*\* Form Material shall be removed by sawing or other means approved by the Engineer. Spall repaired joints shall then be sealed with Backer Rod and Low Modulus Silicone Sealant.

# REPAIR OF TYPE A SPALLS

## SPALL PATCHES (PLAN VIEW)

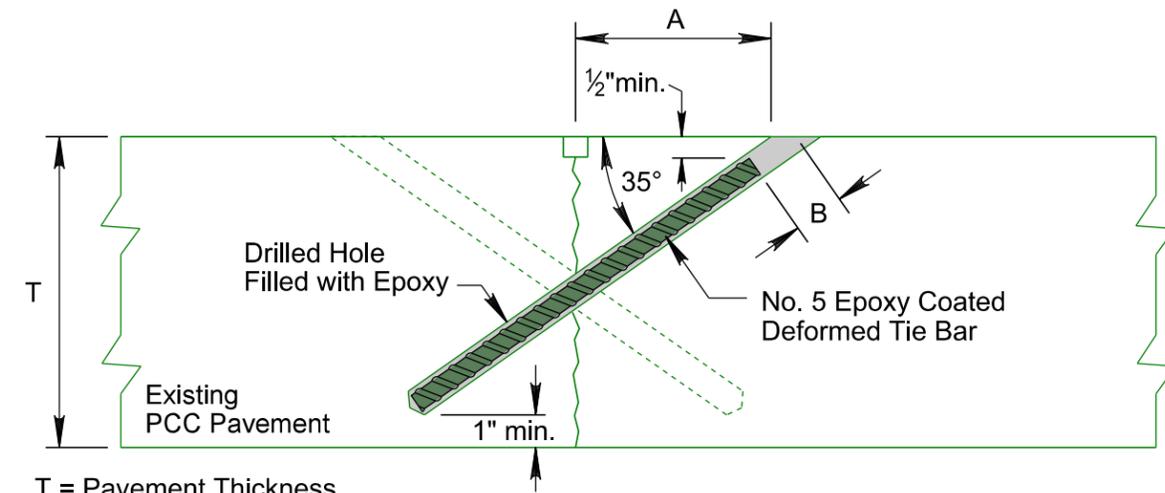


### TIE BAR RETROFIT (STITCHING)



PLAN VIEW

### TIE BAR RETROFIT (STITCHING)



T = Pavement Thickness

ELEVATION VIEW

**TABLE OF STITCHING DIMENSIONS**

T	A	B	Length of Tie Bar
8"	5"	1½"±	10"
8½"	5¼"	1¾"±	11"
9"	5⅝"	1¼"±	12"
9½"	6"	1⅝"±	12½"
10"	6⅜"	1½"±	13½"
10½"	6¾"	1¾"±	14½"
11"	7"	1¼"±	15½"
11½"	7⅜"	1¾"±	16"
12"	7¾"	1¾"±	16½"
12½"	8⅛"	1¼"±	17½"

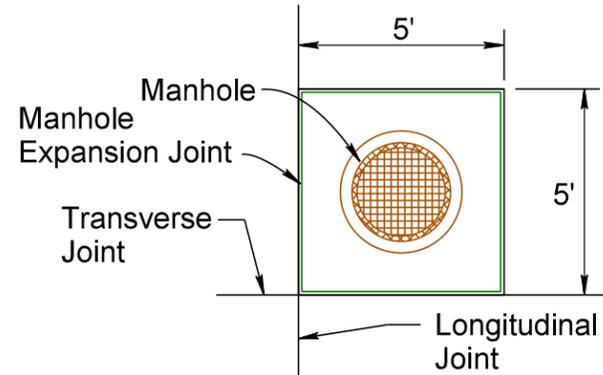
Stitch Bar Spacing 24" Max.

Joint Spacing	Number of Bars
3' to 4.5'	2
5' to 6.5'	3
7' to 8.5'	4
9' to 10.5'	5
11' to 12.5'	6
13' to 14.5'	7
15' to 16.5'	8
17' to 18.5'	9
19' to 20.5'	10
21 to 22.5'	11
23' to 24.5'	12
25' to 26.5'	13
27' to 28.5'	14
29' to 30.5'	15

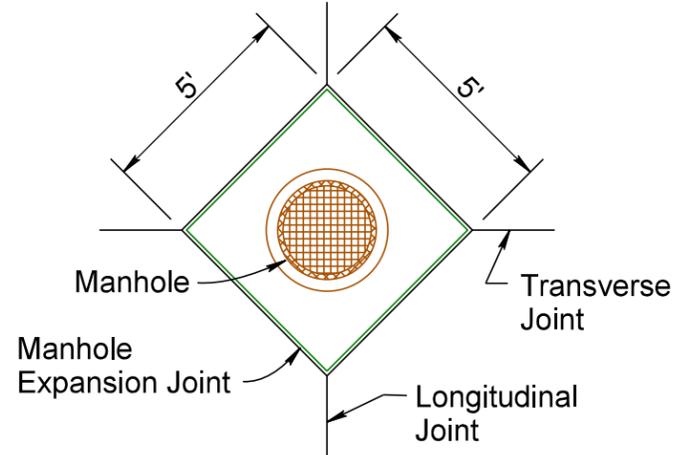
# TYPICAL PCC PAVEMENT REPAIR AROUND MANHOLES

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM-NH-P 0023(44)	62	67

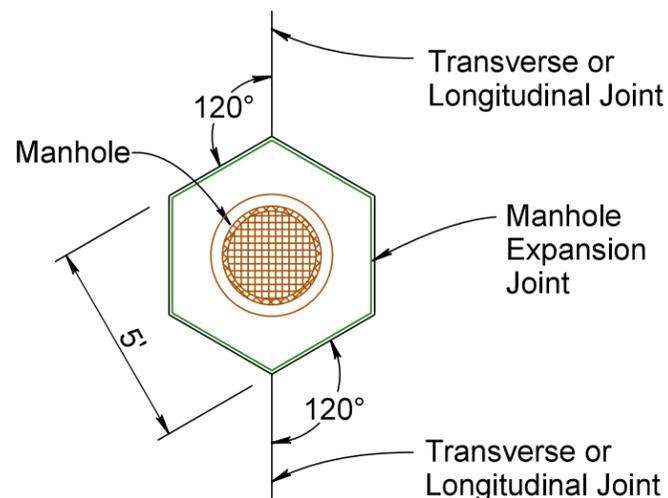
## BOX-OUT DETAIL IN PCC PAVEMENT



Where the utility access is offset from the longitudinal and transverse joints

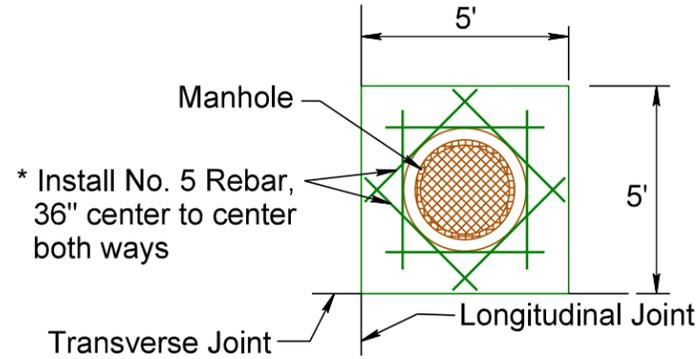


Where the utility access is intersected by the longitudinal and transverse joints

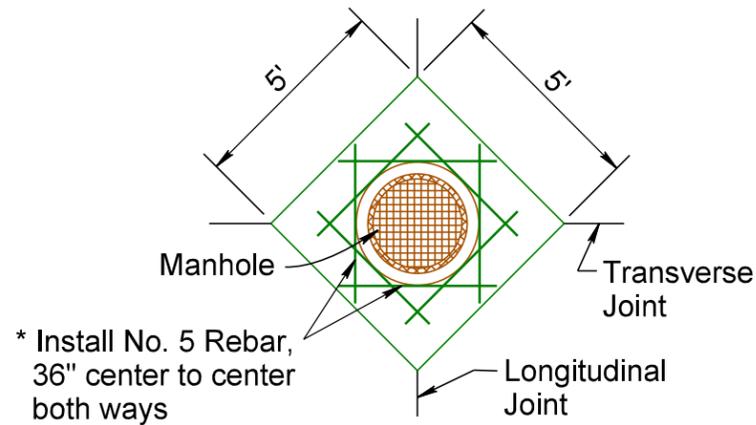


Where no Longitudinal or Transverse joints are present or at Longitudinal or Transverse joint.

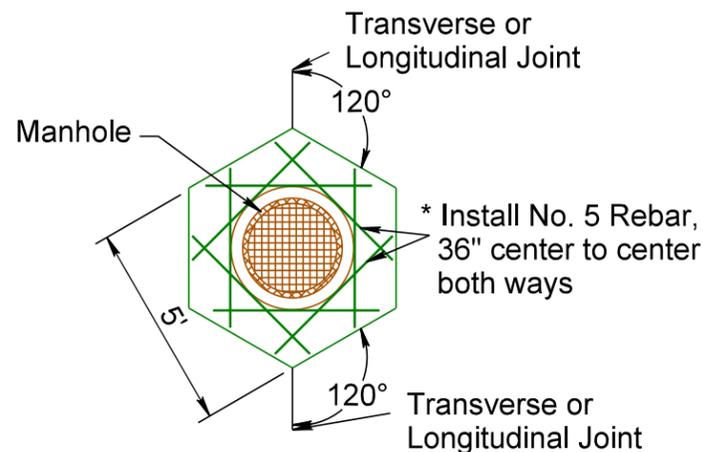
## REBAR LAYOUTS IN PCC PAVEMENT WITH BOX-OUT



Where the utility access is offset from the longitudinal and transverse joints

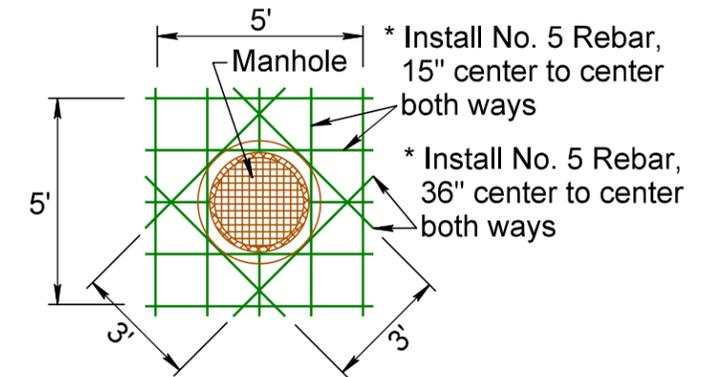


Where the utility access is intersected by the longitudinal and transverse joints



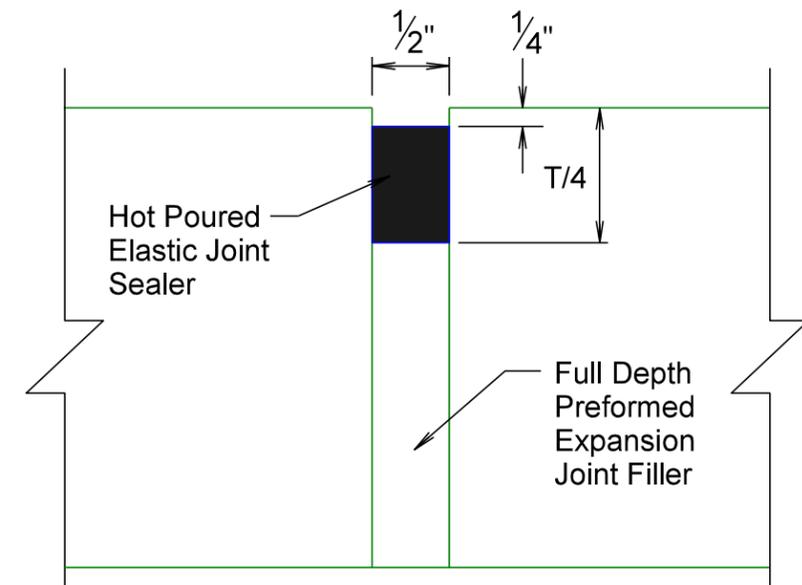
Where no Longitudinal or Transverse joints are present or at Longitudinal or Transverse joint.

## REBAR LAYOUT IN PCC PAVEMENT WITHOUT BOX-OUT



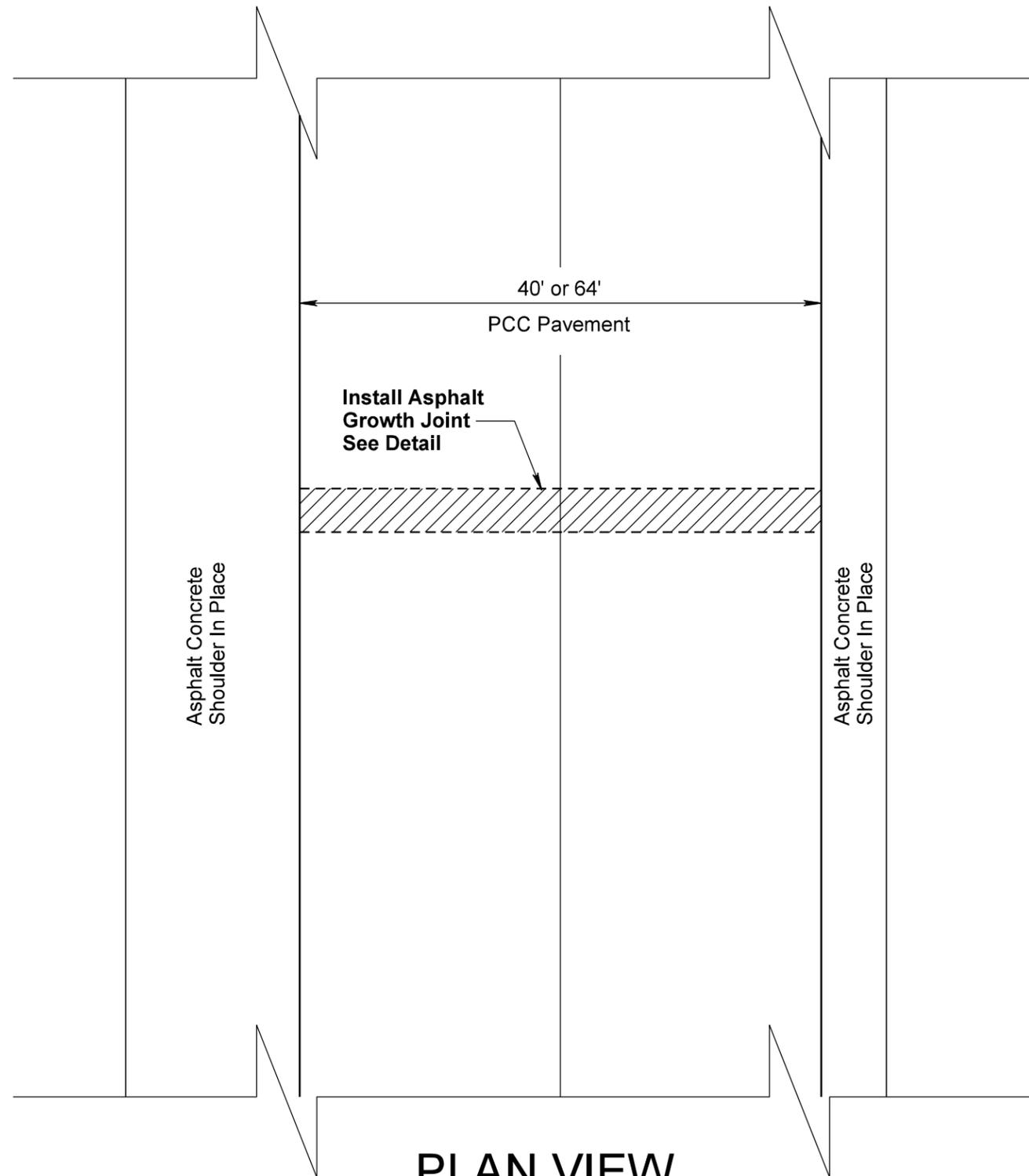
The rebar shall not cross any joint in the concrete pavement. If manhole is next to a joint in the concrete pavement the Engineer shall approve a revised layout of the rebar.

## MANHOLE EXPANSION JOINT DETAIL



\* Rebar will be placed at the midpoint depth of the PCC Pavement. Cost for furnishing & installing rebar and constructing box-outs shall be incidental to the contract unit price per square yard for Nonreinforced PCC Pavement Repair.

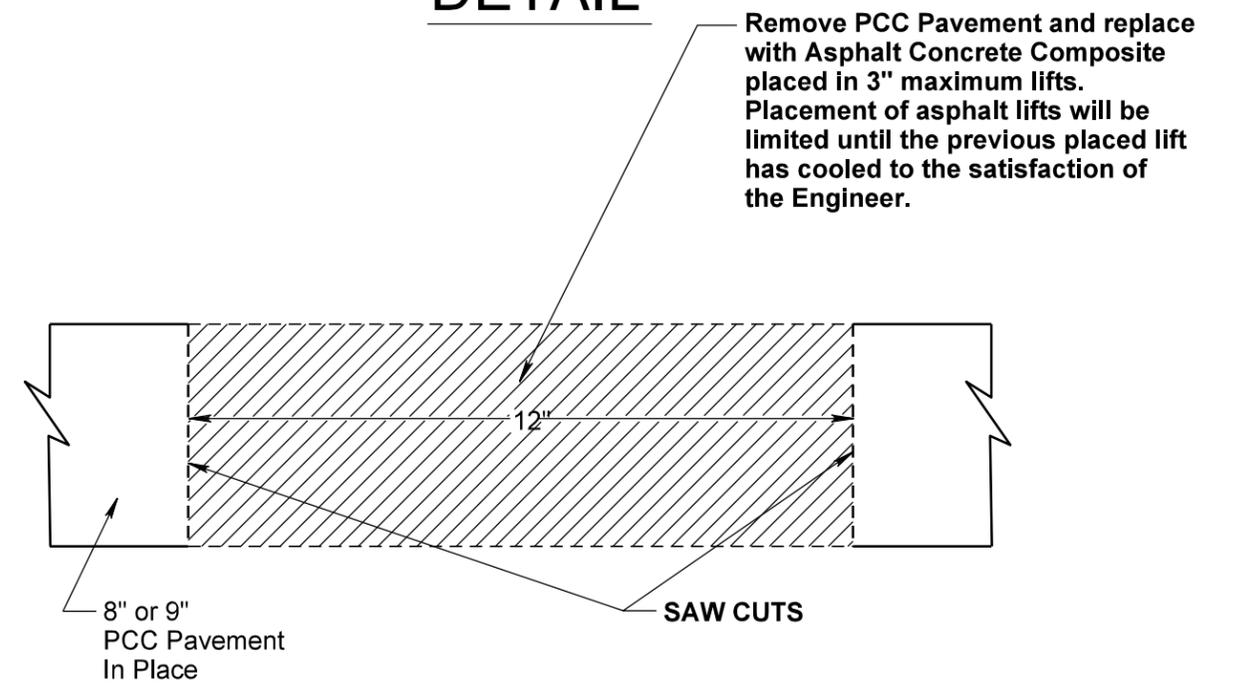
# LAYOUT FOR SAWING IN GROWTH JOINT



The Contractor shall install Growth Joints on SD52. The Engineer shall determine the locations of the Growth Joints on construction. It is estimated that there will be 11 Growth Joints (2 in the three lane section and 9 in the five lane sections) installed on SD52.

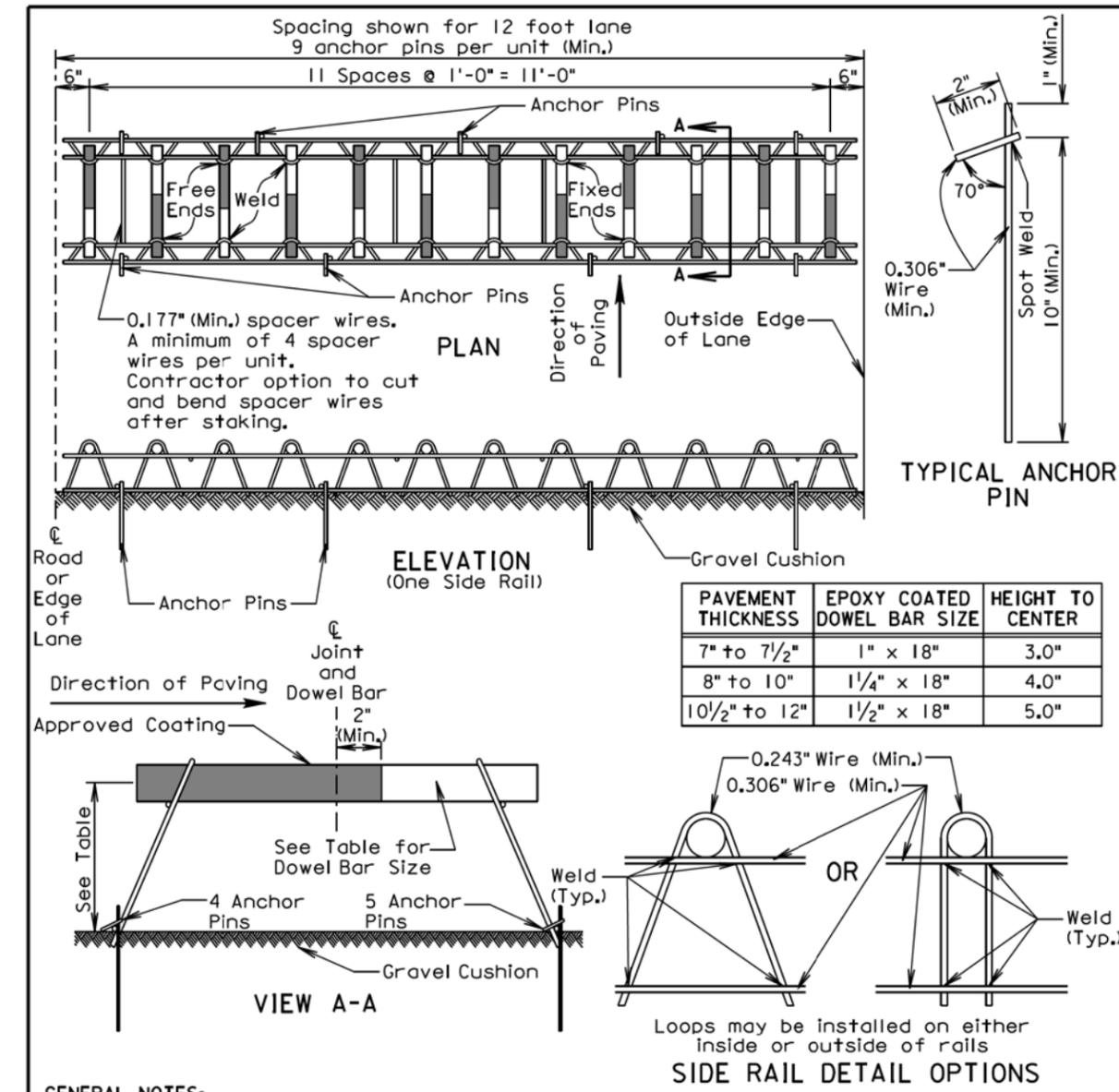
The Asphalt Concrete Composite placed in the Growth Joint shall be compacted to the satisfaction of the Engineer.

## DETAIL



Sawing PCC Pavement Ft	Remove Concrete Pavement SqYds	Asphalt Concrete Composite Tons
*1312	72.9	35.7

\*Cost for sawing PCC Pavement shall be incidental to the contract unit price for Remove Concrete Pavement.



**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.

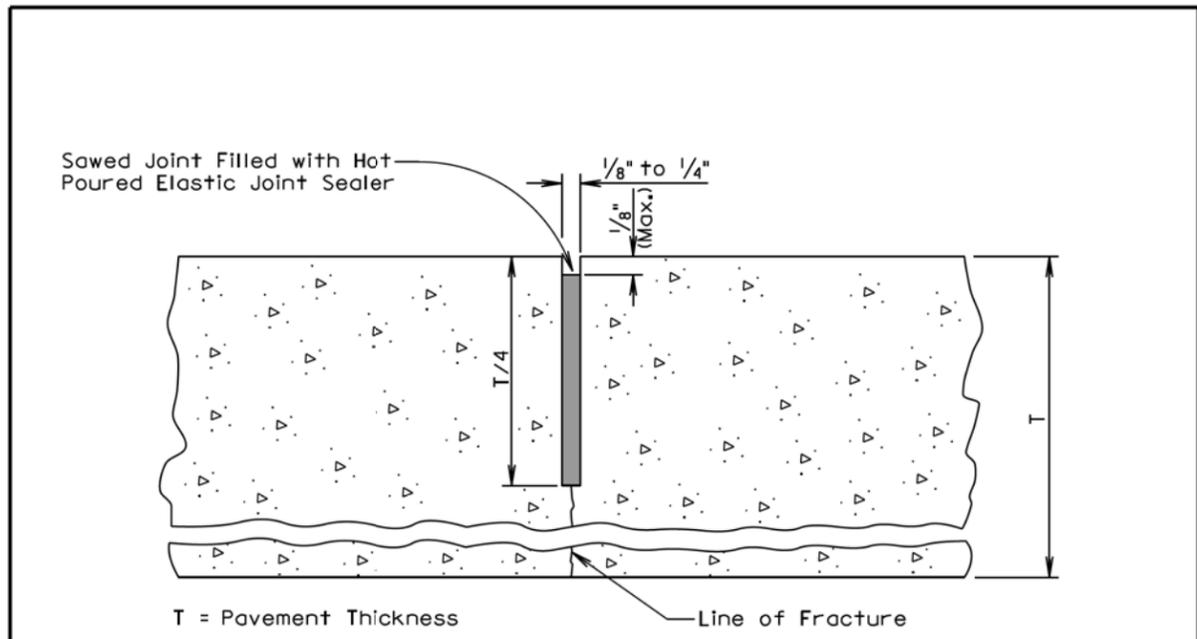
The transverse contraction joints shall be sawed perpendicular to the centerline of the roadway and the dowel bars shall be centered on the sawed joint  $\pm 1$  inch.

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

<b>S D D O T</b>	<b>PCC PAVEMENT DOWEL BAR ASSEMBLY FOR TRANSVERSE CONTRACTION JOINTS 12 Bar Assembly on Granular Base Material</b>	PLATE NUMBER <b>380.01</b>
		Sheet 1 of 1

Published Date: 1st Qtr. 2016



**GENERAL NOTES:**

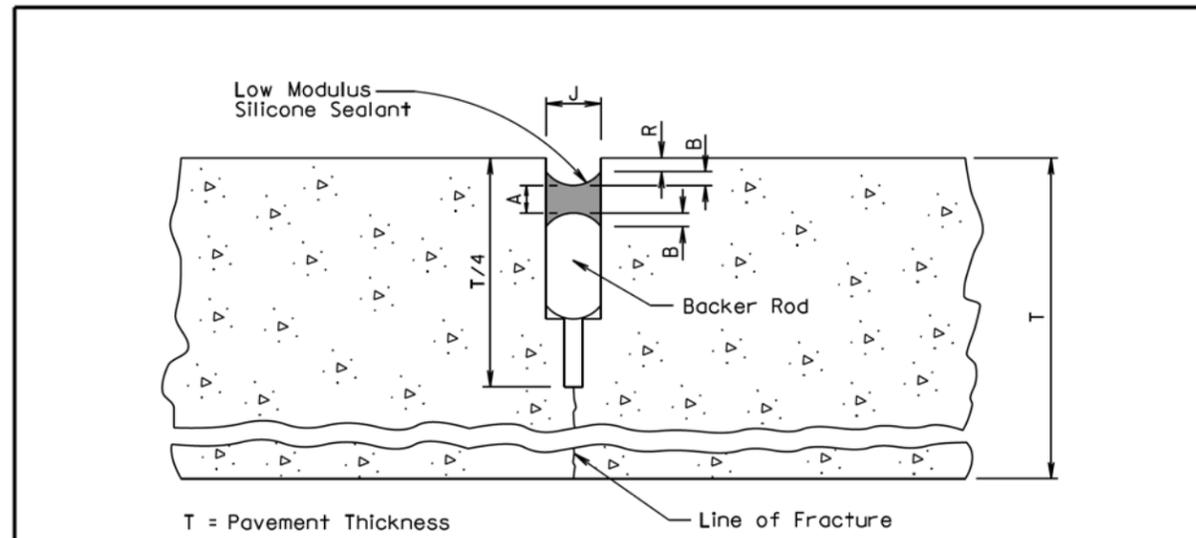
If an early entrance sawcut does not develop the full transverse crack, then the saw cut to control cracking shall be a minimum of 1/4 the thickness of the pavement.

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

<b>S D D O T</b>	<b>PCC PAVEMENT TRANSVERSE CONTRACTION JOINT WITH OR WITHOUT DOWEL BAR ASSEMBLY</b>	PLATE NUMBER 380.05
		Sheet 1 of 1

Published Date: 1st Qtr. 2016



**LOW MODULUS SILICONE SEALANT  
ALLOWABLE CONSTRUCTION TOLERANCES**

J = 3/8"				
A (Min.) (In)	A (Max.) (In)	B (Min.) (In)	B (Max.) (In)	R (In)
3/16	5/16	1/8	1/4	1/4
J = 1/2"				
A (Min.) (In)	A (Max.) (In)	B (Min.) (In)	B (Max.) (In)	R (In)
3/16	3/8	1/8	1/4	1/4
J = 5/8"				
A (Min.) (In)	A (Max.) (In)	B (Min.) (In)	B (Max.) (In)	R (In)
1/4	7/16	1/8	5/16	1/4
J = 3/4"				
A (Min.) (In)	A (Max.) (In)	B (Min.) (In)	B (Max.) (In)	R (In)
5/16	1/2	3/16	3/8	5/16
J = 1"				
A (Min.) (In)	A (Max.) (In)	B (Min.) (In)	B (Max.) (In)	R (In)
3/8	5/8	3/16	1/2	5/16

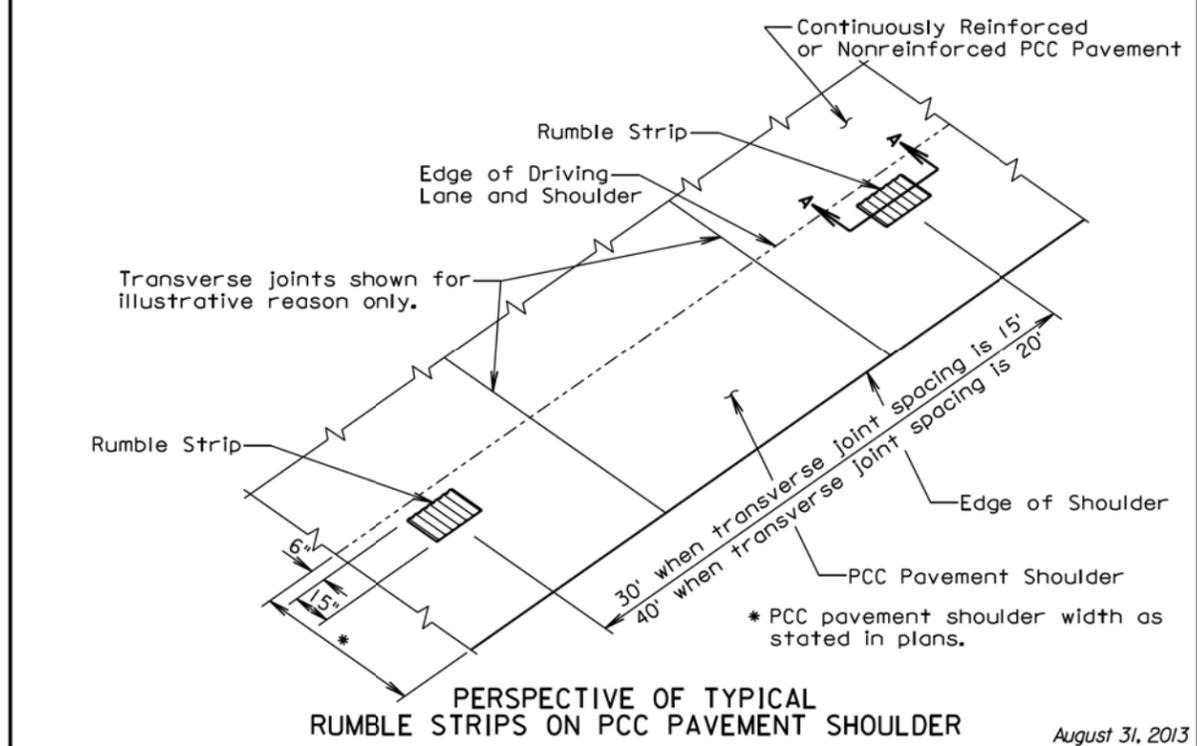
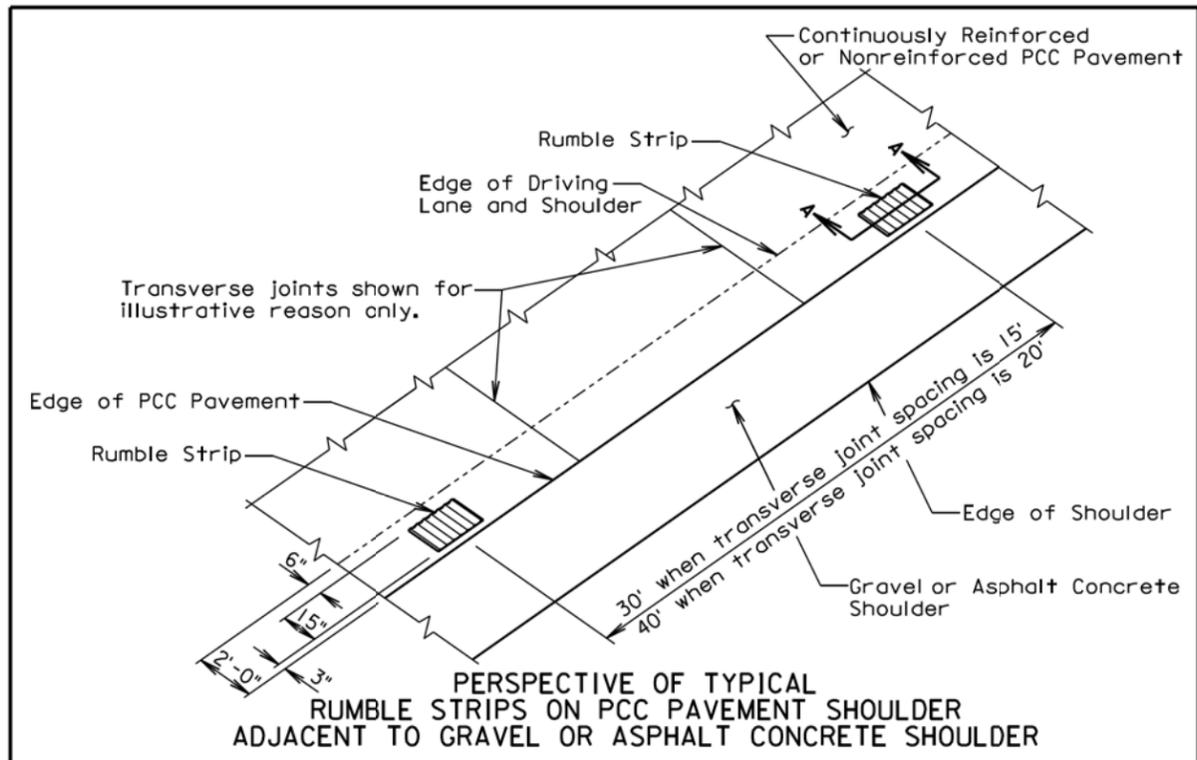
**GENERAL NOTE:**

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

February 14, 2011

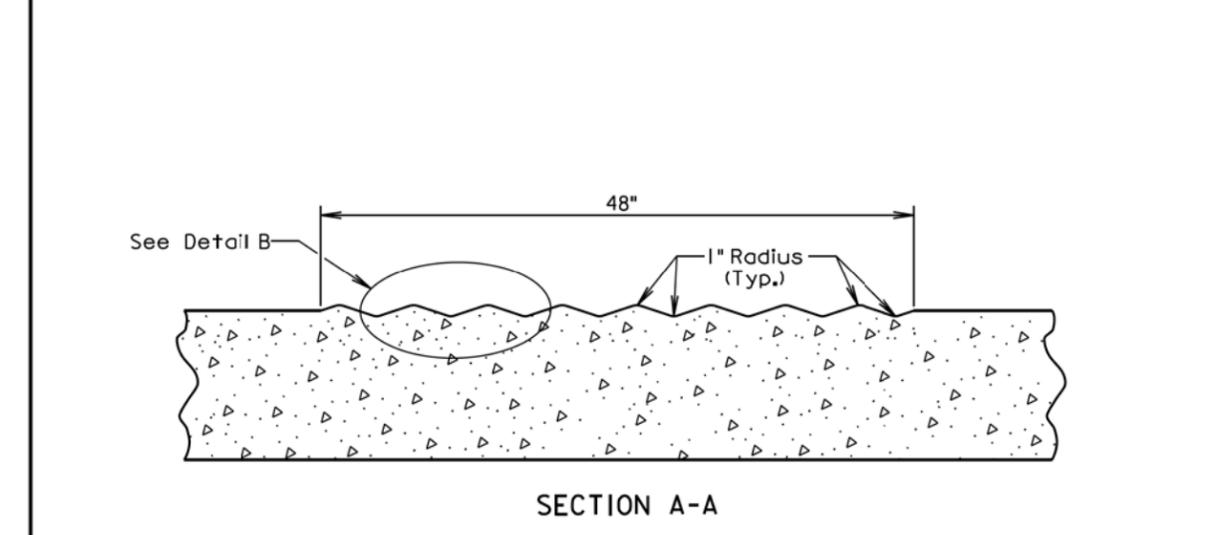
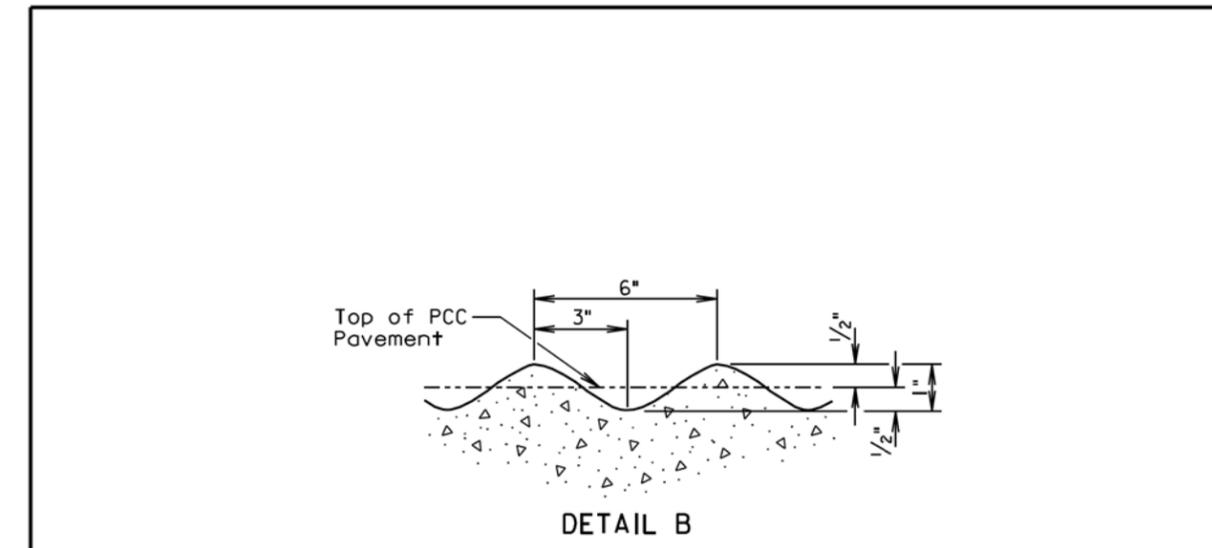
<b>S D D O T</b>	<b>RESEAL PCC PAVEMENT JOINT (SILICONE)</b>	PLATE NUMBER 380.13
		Sheet 1 of 1

Published Date: 1st Qtr. 2016



August 31, 2013

Published Date: 1st Qtr. 2016	S D D O T	RUMBLE STRIP ON PCC PAVEMENT SHOULDER	PLATE NUMBER 380.15
			Sheet 1 of 2

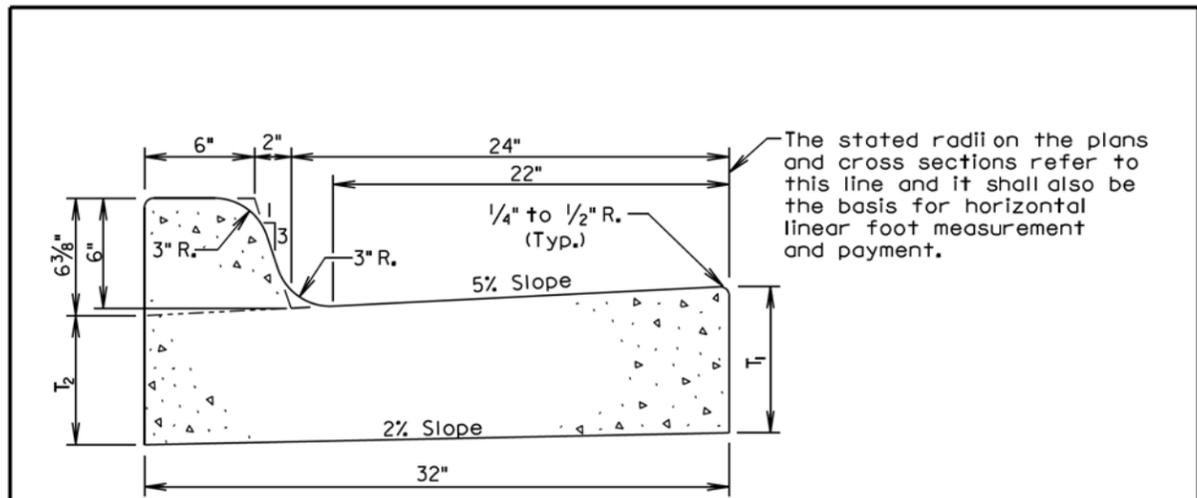


**GENERAL NOTES:**

- The rumble strips shall be evenly spaced and shall not coincide with any transverse contraction joints.
- The rumble strips shall NOT be placed along areas adjacent to entrance ramps, exit ramps, and gore areas.
- Payment for constructing the PCC Pavement Rumble Strips shall be incidental to the contract unit price per square yard for the corresponding PCC Pavement bid item.

August 31, 2013

Published Date: 1st Qtr. 2016	S D D O T	RUMBLE STRIP ON PCC PAVEMENT SHOULDER	PLATE NUMBER 380.15
			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	5/16	0.057	17.7
B67	7	6/16	0.065	15.4
B68	8	7/16	0.073	13.7
B68.5	8.5	7 9/16	0.077	13.0
B69	9	8/16	0.081	12.3
B69.5	9.5	8 9/16	0.085	11.7
B610	10	9/16	0.090	11.2
B610.5	10.5	9 9/16	0.094	10.7
B611	11	10/16	0.098	10.2
B611.5	11.5	10 9/16	0.102	9.8
B612	12	11/16	0.106	9.4

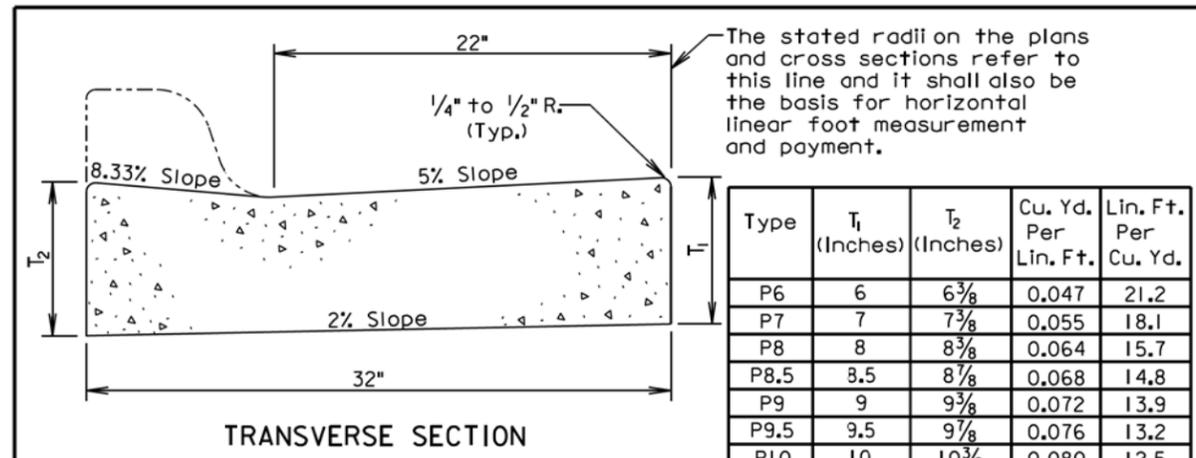
**GENERAL NOTES:**

When concrete curb and gutter longitudinally adjoins new concrete pavement, the method of attachment shall be by one of the methods shown on Standard Plate 380.11. See Standard Plate 650.90 for expansion and contraction joints in the curb and gutter.

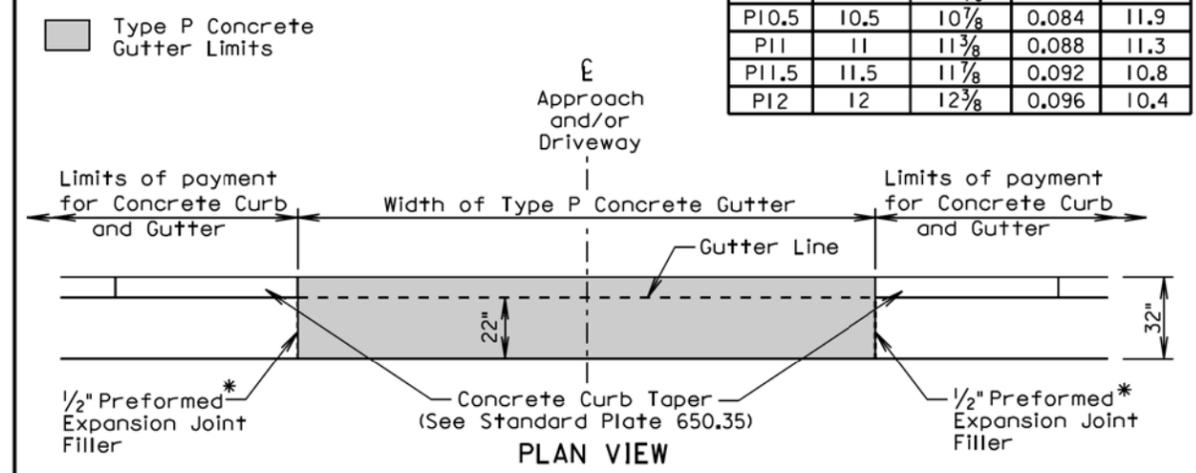
September 6, 2008

<b>S D D O T</b>	<b>TYPE B CONCRETE CURB AND GUTTER</b>	PLATE NUMBER <b>650.01</b>
		Sheet 1 of 1

Published Date: 1st Qtr. 2016



Type	T <sub>1</sub> (Inches)	T <sub>2</sub> (Inches)	Cu. Yd. Per Lin. Ft.	Lin. Ft. Per Cu. Yd.
P6	6	6 3/8	0.047	21.2
P7	7	7 3/8	0.055	18.1
P8	8	8 3/8	0.064	15.7
P8.5	8.5	8 7/8	0.068	14.8
P9	9	9 3/8	0.072	13.9
P9.5	9.5	9 7/8	0.076	13.2
P10	10	10 3/8	0.080	12.5
P10.5	10.5	10 7/8	0.084	11.9
P11	11	11 3/8	0.088	11.3
P11.5	11.5	11 7/8	0.092	10.8
P12	12	12 3/8	0.096	10.4



\* Joint will not be needed if concrete curb and gutter and type P concrete gutter is placed at the same time. If the 1/2" Preformed Expansion Joint Filler is provided, then the joint shall be sealed in accordance with Standard Plate 650.90.

**GENERAL NOTES:**

The concrete for the Type P Concrete Gutter shall comply with the requirements of the Specifications for Class M6 Concrete.

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

Transverse contraction joints shall be constructed at 10' intervals in the concrete gutter except when concrete gutter is constructed adjacent to mainline PCC pavement. When concrete gutter is constructed adjacent to mainline PCC pavement, a transverse contraction joint shall be constructed in the concrete gutter at each mainline PCC pavement transverse contraction joint location.

When concrete gutter is placed monolithically with mainline PCC pavement, the transverse contraction joints in the concrete gutter shall be sawed and sealed the same as the transverse contraction joints in the mainline PCC pavement.

When concrete gutter is not placed monolithically with the mainline PCC pavement and when the adjacent mainline surfacing is not PCC concrete, the transverse contraction joints in the concrete gutter shall be 1/2 inches deep if formed in the fresh concrete using a suitable grooving tool. If a saw is used to cut the contraction joints, then the depth of the joint shall be at least 1/4 the thickness of the concrete.

June 26, 2015

<b>S D D O T</b>	<b>TYPE P CONCRETE GUTTER</b>	PLATE NUMBER <b>650.30</b>
		Sheet 1 of 1

Published Date: 1st Qtr. 2016