

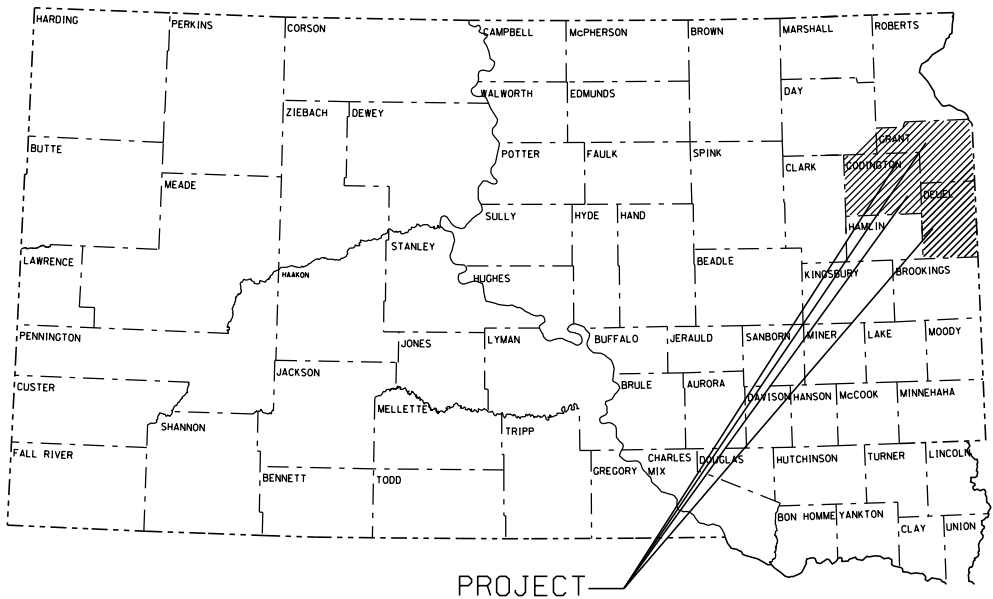
STATE OF SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION
PLANS FOR PROPOSED

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	029N-171, 029S-171 012-172, 212E-171	1	30

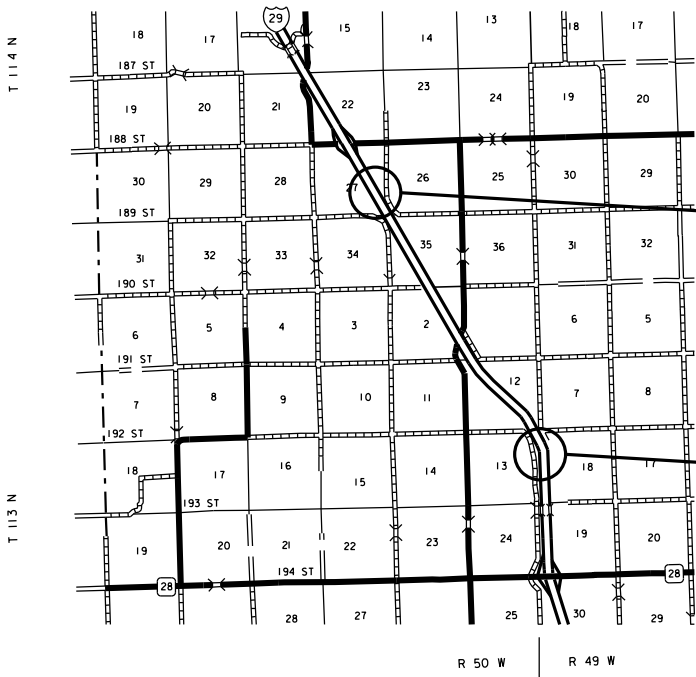
PROJECT NO. 029N-171,
029S-171, 012-172, 212E-171
DEUEL, GRANT,
& CODINGTON COUNTIES
CONCRETE PAVEMENT REPAIR
PCN i897, i898, i899, i89A

INDEX OF SHEETS

Sheet No. 1	Title Sheet
Sheet No. 2	Project Layout Maps
Sheet No. 3-4	Estimate of Quantities & Environmental Commitments
Sheet No. 5-11	Plan Notes and Tables
Sheet No. 12-13	Typical Sections
Sheet No. 14-25	Typical Steel Bar Layouts
Sheet No. 26-28	Traffic Control Sheets
Sheet No. 29-30	Standard Plates



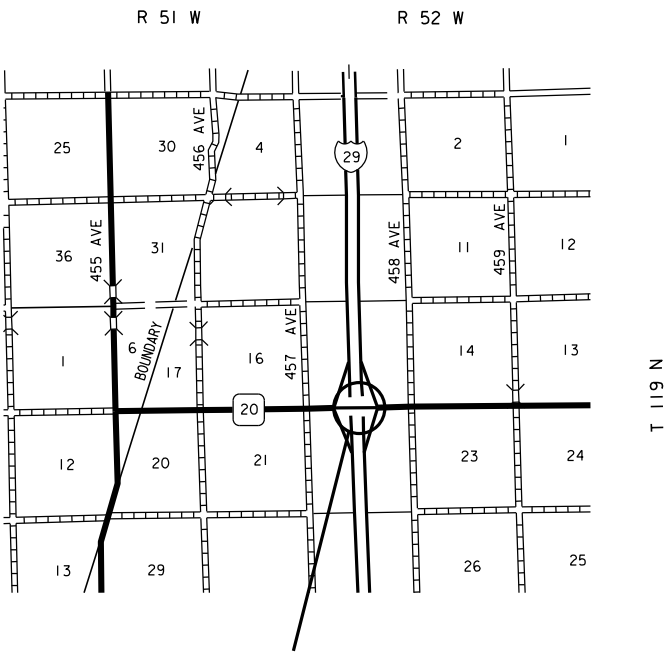
029S-171
PCN i897



REPAIR AREA
MRM i56.03 SB, DL
MRM i56.11 SB, DL
MRM i56.20 SB, DL
MRM i56.70 SB, DL

REPAIR AREA
MRM i52.03 SB, DL

029N-171
PCN i898



REPAIR AREA
MRM i93.03 NB

Legend:
DL = Driving Lane
PL = Passing Lane
TL = Turn Lane
EB = East Bound
WB = West Bound
NB = North Bound
SB = South Bound

DESIGN DESIGNATION

ADT (2025)	4775
ADT (2045)	7182
DHV	898
D	50%
T DHV	10.0%
T ADT	21.9%

DESIGN DESIGNATION

ADT (2025)	3701
ADT (2045)	5511
DHV	689
D	50%
T DHV	9.5%
T ADT	20.8%

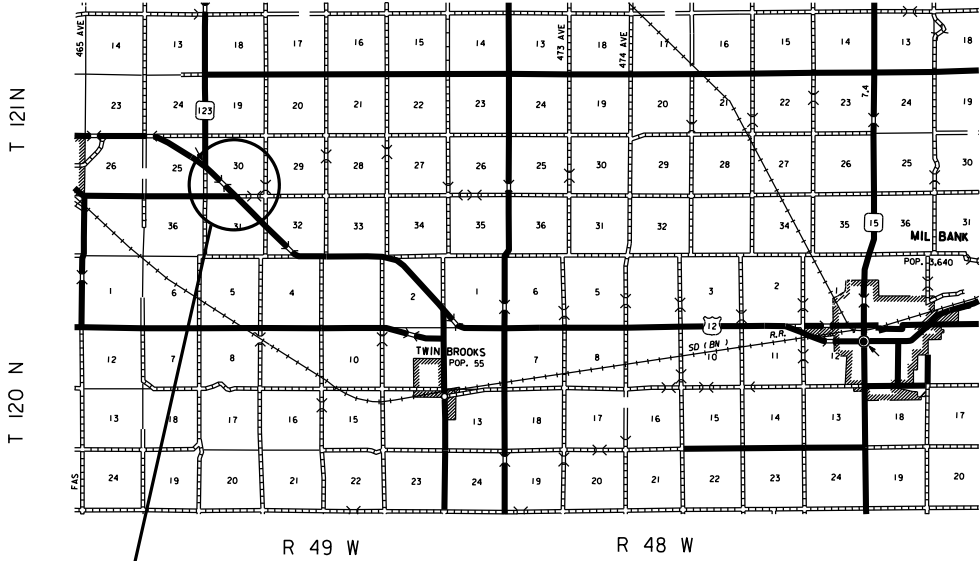
STORM WATER PERMIT
(None Required)

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	029N-171, 029S-171 012-172, 212E-171	2	30

PROJECT LAYOUT MAPS



012-172
PCN i899



REPAIR AREA
MRM 377.09 EB & WB

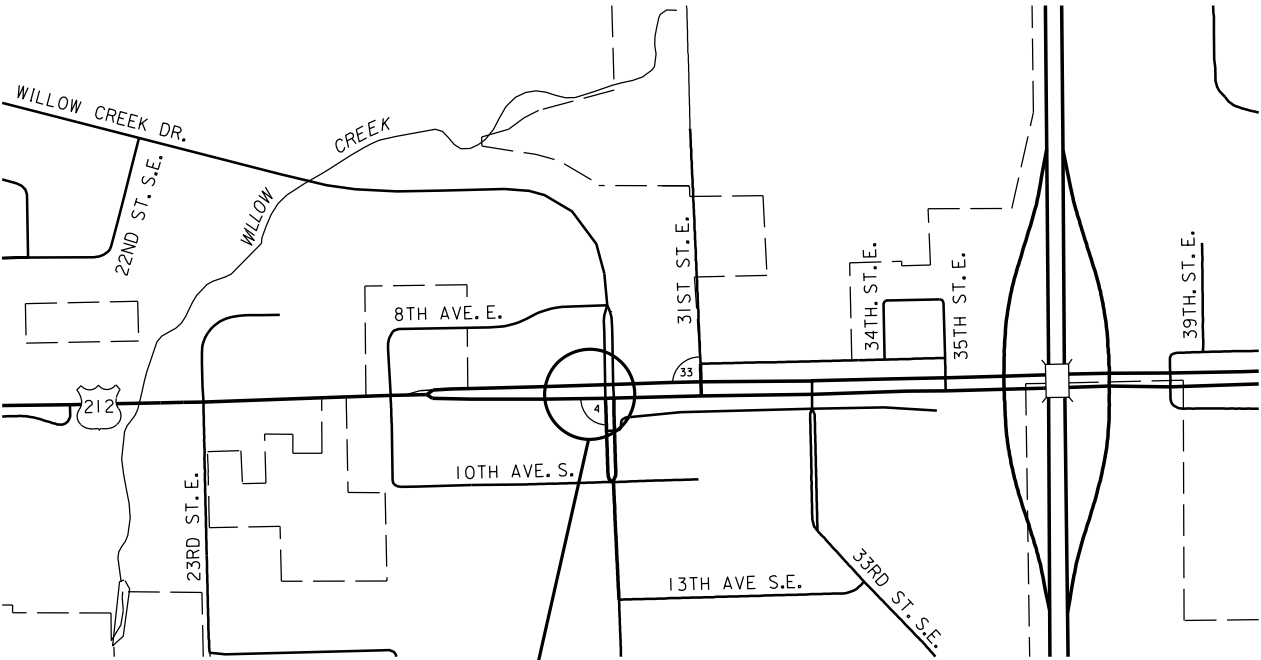
Legend:
DL = Driving Lane
PL = Passing Lane
TL = Turn Lane
EB = East Bound
WB = West Bound
NB = North Bound
SB = South Bound

DESIGN DESIGNATION		
ADT (2025)	1411	
ADT (2045)	1927	
DHV	214	
D	50%	
T DHV	11.2%	
T ADT	24.6%	



212E-171
PCN i89A

WATERTOWN



REPAIR AREA
MRM 279.10 EB

DESIGN DESIGNATION		
ADT (2025)	11611	
ADT (2045)	16627	
DHV	1867	
D	50%	
T DHV	3.5%	
T ADT	7.6%	

PLOTTED FROM - TRWAINT14

ESTIMATE OF QUANTITIES AND ENVIRONMENTAL COMMITMENTS

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	029N-171, 029S-171 012-172, 212E-171	3	30

PCN i897

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
110E1100	Remove Concrete Pavement	146.6	SqYd
380E5030	Nonreinforced PCC Pavement Repair	146.6	SqYd
380E6000	Dowel Bar	40	Each
380E6110	Insert Steel Bar in PCC Pavement	67	Each
634E0010	Flagging	5.0	Hour
634E0110	Traffic Control Signs	380.0	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0275	Type 3 Barricade	1	Each
634E0420	Type C Advance Warning Arrow Board	1	Each
634E0640	Temporary Pavement Marking	2,560	Ft

PCN i898

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
110E1100	Remove Concrete Pavement	63.6	SqYd
380E5100	Continuously Reinforced PCC Pavement Repair	63.6	SqYd
380E6110	Insert Steel Bar in PCC Pavement	20	Each
634E0010	Flagging	5.0	Hour
634E0110	Traffic Control Signs	190.0	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0275	Type 3 Barricade	2	Each
634E0420	Type C Advance Warning Arrow Board	2	Each
634E0640	Temporary Pavement Marking	2,560	Ft

PCN i899

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
110E1100	Remove Concrete Pavement	62.2	SqYd
380E5020	Fast Track Concrete for PCC Pavement Repair	62.2	SqYd
380E6110	Insert Steel Bar in PCC Pavement	33	Each
634E0010	Flagging	50.0	Hour
634E0110	Traffic Control Signs	105.0	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0275	Type 3 Barricade	1	Each

PCN i89A

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
110E1100	Remove Concrete Pavement	31.1	SqYd
380E5020	Fast Track Concrete for PCC Pavement Repair	31.1	SqYd
380E6110	Insert Steel Bar in PCC Pavement	33	Each
634E0110	Traffic Control Signs	121.0	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0275	Type 3 Barricade	1	Each
634E0420	Type C Advance Warning Arrow Board	1	Each
634E0640	Temporary Pavement Marking	600	Ft

SPECIFICATIONS

Standard Specifications for Roads and Bridges, 10-1-25 Version, Required Provisions, and Special Provisions as included in the Proposal. The Standard Specifications for Roads and Bridges are available for download and viewing at <https://dot.sd.gov/doing-business/contractors/standard-specifications>.

ENVIRONMENTAL COMMITMENTS

The SDDOT is committed to protecting the environment and uses Environmental Commitments as a communication tool for the Engineer and Contractor to ensure that attention is given to avoid, minimize, and/or mitigate an environmental impact. Environmental commitments to various agencies and the public have been made to secure approval of this project. An agency with permitting authority can delay a project if identified 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. During construction, the Project Engineer will verify that the Contractor has met Environmental Commitment requirements. These environmental commitments are not subject to change without prior written approval from the SDDOT Environmental Office.

Additional guidance on SDDOT's Environmental Commitments can be accessed through the Environmental Procedures Manual found at: <<https://dot.sd.gov/doing-business/environmental/about-environmental/>>

For questions regarding change orders in the field that may have an effect on an Environmental Commitment, the Project Engineer will contact the Environmental Engineer at 605-773-3180 or 605-773-4336 to determine whether an environmental analysis and/or resource agency coordination is necessary.

Once construction is complete, the Project Engineer will review all environmental commitments for the project and document their completion.

COMMITMENT B: FEDERALLY THREATENED, ENDANGERED, AND PROTECTED SPECIES

COMMITMENT B2: WHOOPING CRANE

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

Action Taken/Required:

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

COMMITMENT C: WATER SOURCE

The Contractor will not withdraw water with equipment previously used outside the State of South Dakota or previously used in aquatic invasive species (AIS) positive waters within South Dakota without prior approval from the SDDOT Environmental Office. To prevent and control the introduction and spread of invasive species into the project vicinity, all equipment will be power washed

with hot water (≥140 °F) and completely dried for a minimum of 7 days prior to subsequent use. South Dakota administrative rule 41:10:04:02 forbids the possession and transport of AIS; therefore, all attached dirt, mud, debris and vegetation must be removed and all compartments and tanks capable of holding standing water must be drained. This includes, but is not limited to, all equipment, pumps, lines, hoses and holding tanks.

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

Action Taken/Required:

Construction and/or demolition debris may not be disposed of within the Public ROW.

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

The waste disposal site(s) will 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 Environmental Office and the Project Engineer.

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

1. Construction and/or demolition debris consisting of concrete, asphalt concrete, or other similar materials will be buried in a trench separate from wood debris. The final cover over the construction and/or demolition debris will consist of a minimum of 1 foot of soil capable of supporting vegetation. Waste disposal sites provided outside of the Public ROW will be seeded in accordance with Natural Resources Conservation Service recommendations. The seeding recommendations may be obtained through the appropriate County NRCS Office. The Contractor will control the access to waste disposal sites not within the Public ROW with 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 not to exceed the duration of the project. Prior to project completion, the waste will be removed from view of the ROW or buried, and the waste disposal site reclaimed as noted above.

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	029N-171, 029S-171 012-172, 212E-171		
		4	30

The above requirements will not apply to waste disposal sites that are covered by an individual solid waste permit as specified in SDCL 34A-6-58, SDCL 34A-6-1.13, and ARSD 74:27:10:06. Failure to comply with the requirements stated above may result in civil penalties in accordance with South Dakota Solid Waste Law, SDCL 34A-6-1.31.

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

COMMITMENT I: HISTORIC PRESERVATION OFFICE CLEARANCES

State Historic Preservation Office (SHPO or THPO) concurrence has not been obtained for this project.

Action Taken/Required:

All earth disturbing activities require a cultural resource review prior to scheduling the pre-construction meeting. 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 will arrange and pay for a record search and when necessary, a cultural resource survey. 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 if the site was previously surveyed; however, a cultural resources survey may need to be conducted by a qualified archaeologist.

The Contractor will provide ARC with the following: a topographical map or aerial view in 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 will submit the cultural resources survey report to SDDOT Environmental Office, 700 East Broadway Avenue, Pierre, SD 57501-2586. 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.

In the event of an inadvertent discovery of human remains, funerary objects, or if evidence of cultural resources is identified during project construction activities, then such activities within 100 feet of the inadvertent discovery will immediately cease and the Project Engineer will be immediately notified. The Project Engineer will contact the SDDOT Environmental Office, who will contact the appropriate SHPO/THPO within 48 hours of the discovery to determine an appropriate course of action.

The Contractor is responsible 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 will not utilize a site known or suspected of having contaminated soil or water. The Contractor will provide the required permits and clearances to the Project Engineer at the preconstruction meeting.

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	029N-171, 029S-171 012-172, 212E-171	5	30

PCCP Repair Areas

029N-171

PCN i897

MRM	Dimensions		SQYD	Description	Bars			Dowel Bar (EACH)	Comment
	L (ft)	W (ft)			#5	#9	1 1/4"		
193.03	60	14	93.3	NB DL	10		28	28	
193.03	40	12	53.3	NB PL	5		24	12	
Total			146.6		15	0	52	40	

012-172

PCN i899

MRM	Dimensions		Fastrack SQYD	Description	Bars			Dowel Bar (EACH)	Comment
	L (ft)	W (ft)			#5	#9	1 1/4"		
377.09	20	14	31.1	EB	5		14		Fastrack
377.09	20	14	31.1	WB			14		Fastrack
Totals			62.2		5	0	28	0	

029S-171

PCN i898

MRM	Dimensions		CRCP SQYD	Description	Bars			Dowel Bar (EACH)	Comment
	L (ft)	W (ft)			#5	#9	1 1/4"		
152.03	8	14	12.4	SB DL	4				CRCP
156.03	8	14	12.4	SB DL	4				CRCP
156.11	9	14	14.0	SB DL	4				CRCP
156.20	8	14	12.4	SB DL	4				CRCP
156.70	8	14	12.4	SB DL	4				CRCP
Total			63.6		20	0	0	0	

212E-171

PCN i89A

MRM	Dimensions		Fastrack SQYD	Description	Bars			Dowel Bar (EACH)	Comment
	L (ft)	W (ft)			#5	#9	1 1/4"		
379.10	20	14	31.1	EB DL	5		28		Fastrack
Total			31.1		5	0	28	0	

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

Note: Dowel Bars placed into fresh concrete to establish working joints will be paid for at the contract unit price per each for DOWEL BAR.

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

SCOPE OF WORK

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

MAINTENANCE OF TRAFFIC

The Contractor will submit a traffic control and phasing plan for all repairs, a minimum of 1 week prior to the preconstruction meeting. The traffic control and phasing plan will be approved by the Engineer prior to starting any work on the project.

The traffic control and phasing plan will meet the following requirements:

- Reflectorized drums or Type 2 Barricades will be used to maintain a minimum of two-way traffic at intersecting roads or streets. The Contractor will mark and maintain alternating one-way access to businesses and residences along the project with cones, drums, or Type 1 Barricades. The Contractor will advise affected businesses before a restriction to the business is installed, as well as the anticipated duration of the restriction.
- Open repairs will not be permitted overnight.
- Construction debris will not be permitted within the ROW overnight.
- For 2 lane roadways, lanes may be reduced to one lane during working hours with the use of flaggers and pilot cars. During nighttime and non-working hours, every effort will be made to return traffic to the normal lane, unless the repair is located in the middle of the lane, in which case flagging will be required overnight.
- Work Zones may be up to 1,000 feet in length with a minimum of 2,000 feet between work zones. The maximum delay for a vehicle at a flagging station will not exceed 15 minutes.

The Contractor will accommodate over-width vehicles up to 16’ through the work areas.

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

A maximum of four traffic control closures will be paid for. If more closures are utilized, additional cost of signing will be at the Contractor’s expense. No payment will be made for signs being reused at different repair areas.

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

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

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

Type 3 Barricades 8’ wide will protect PCC Pavement replacement during open excavation and concrete cure periods.

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

Maintenance of existing delineators will be the Contractor’s responsibility.

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

All costs associated with furnishing and installing interim white and/or yellow edge line for a lane closure and/or for tapers and stop bars will be incidental to the contract unit price per foot for TEMPORARY PAVEMENT MARKING. Removal of interim white and/or yellow edge line for a lane closure will also be incidental to the contract unit price per foot for TEMPORARY PAVEMENT MARKING.

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

Portable sign supports will not be located on sidewalks, bicycle facilities, or other areas designated for pedestrian or bicycle traffic.

The Contractor will designate an employee to maintain traffic as described in Section 634.3 of the Specification. This person will be required to do weekend checks to ensure traffic control devices are in satisfactory condition. The Contractor will submit a weekly log stating time and date of all such inspections. The log will be signed by the person doing the inspections. The cost of the traffic control person will be incidental to the contract lump sum price for TRAFFIC CONTROL MISCELLANEOUS. The employee selected must be approved by the Engineer.

A night inspection of traffic control signing will be done by the Contractor's designated employee after the signs are revised for each phase of construction. The Contractor will submit additional log information for this inspection to the Engineer.

Flaggers and pilot car operators will all have radio or telephone contact with one another. This equipment is to be used to assist with traffic movement and in the event that an emergency vehicle needs to pass through the project in an expedient manner. All costs associated with this equipment will be incidental to the contract lump sum price for TRAFFIC CONTROL, MISCELLANEOUS.

The Contractor will designate an individual(s) to be on the project 24/7 to be

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	029N-171, 029S-171 012-172, 212E-171	6	30

in charge of Flagging. This person(s) will have experience as a Flagger and have experience in supervision of others. This person(s) will be approved by the Engineer. This person will work with the Engineer, monitor traffic flow, and have the authority to call in additional flagging personnel. This person may be one of the Flaggers actively working on the project.

Warning lights will be placed on top of flagging station signing and will be yellow in color. This will be incidental to the contract lump sum price for TRAFFIC CONTROL, MISCELLANEOUS.

The Flagging stations will be lighted during nighttime operations. The light will be located and adjusted such as not to impact any nearby residences. All costs associated with the flagging station lighting will be incidental to the contract lump sum price for TRAFFIC CONTROL, MISCELLANEOUS.

The Contractor will be responsible for maintaining all existing traffic control signing for the safety of the traveling public.

All traffic control devices used on this project will be new or in like-new condition, as approved by the Engineer.

Channelizing Devices, Drums and/or Type 2 Barricades will be maintained to a minimum height of 3’ above the surface which is being used to maintain traffic.

EXISTING PCC PAVEMENT

The existing pavement on US 12 and US 212 is Non-reinforced PCC Pavement. The existing pavement on I29 is Continuously Reinforced Concrete Pavement.

Existing contraction joints are spaced at approximately 15 to 20'. Longitudinal joints are reinforced with No. 5 x 24” deformed tie bars spaced 30” to 48” center to center. Transverse joints are reinforced with 1¼” x 18” plain round dowel bars spaced 12” center to center.

The aggregate in the PCC Pavement is quartzite or granite.

REMOVE CONCRETE PAVEMENT

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

Approximate locations of existing continuously reinforced concrete pavement to be removed are provided in the Table of PCCP Repair Areas. Prior to the removal of continuously reinforced concrete pavement, the Contractor shall saw cut full depth at a distance of 22 inches inside the ends of the removal areas as directed by the Engineer. At the ends of the removal areas a partial depth saw cut (2 inch) shall be made in order to preserve a minimum of 22 inches of the longitudinal reinforcing steel for lap splices. During Concrete breakout, care shall be taken not to damage the reinforcing steel to be reused. Concrete shall be chipped out to expose existing reinforcing steel.

PLOTTED FROM - TRWAINT14

REMOVE CONCRETE PAVEMENT (Continued)

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

Care will be exercised in the removal of concrete slab panels to avoid damage to adjacent pavement, manholes, and growth joints. Damage to adjacent pavement, manholes, and/or growth joints will be repaired to the satisfaction of the Engineer at the Contractor's expense.

There is a location on US 212 which is close to an existing detector loop. The existing detector loops located in the panel to be removed are no longer in use and can be removed within the limits of the panel. Removal of concrete in these locations needs to be done with care to avoid damaging existing detector loops in adjacent concrete panels. Any damage to adjacent concrete sections during concrete removal will be repaired or replaced by the Contractor to the satisfaction of the Engineer at no expense to the SDDOT.

After concrete removal has been accomplished, the Contractor shall shape, water and recompact the remaining granular material prior to placement of concrete. Payment for this work shall be incidental to the contract unit price per square yard for REMOVE CONCRETE PAVEMENT. Any additional gravel cushion required to prepare the area shall be furnished and placed by the Contractor and shall be incidental to the contract unit price per square yard for REMOVE CONCRETE PAVEMENT.

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

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

The Contractor will take extra care in locations adjacent to existing block retaining wall, manholes, and vault lids. Existing block retaining wall, manholes, and vault lids will be removed and reset at the direction of the Engineer. Payment for removing and resetting block retaining wall, manhole frame and lids, and vault frames and lids will be incidental to various other project items.

PCC PAVEMENT REPAIR - GENERAL

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

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

Existing concrete pavement in the replacement areas will be removed by the lift out method or by means that minimize damage to the base and sides of remaining in place concrete. Removed material will be removed from within the right-of-way by the end of the workday. Damage to adjacent concrete caused by the Contractor's operations will 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 will 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 asphalt concrete shoulders will be formed full depth to match the width of existing concrete pavement. Asphalt concrete shoulders adjacent to concrete pavement replacements will 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 will 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 will meet the requirements of AASHTO M33. Cost for this material will be incidental to the contract unit price per square yard for NONREINFORCED PCC PAVEMENT REPAIR.

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

Joints (longitudinal and transverse) through and around the repair areas will be sawed and sealed in accordance with the details shown in these plans.

NONREINFORCED PCC PAVEMENT REPAIR

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

The fine aggregate will 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 will contain 4.5% to 7.0% entrained air. The concrete will contain a minimum of 50% coarse aggregate by weight. Coarse aggregate will 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 will 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 will be 4,000 psi. The Contractor is responsible for the mix design used. The Contractor will 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 will be cured with white pigmented curing compound (ASTM C309, Type 2) applied as soon as practical at a rate of 125 square feet per gallon. Concrete will 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 surface temperature falls below 60°F, the cure time will be extended, or other measures taken, at no additional cost to the State. A strength of 2,500 psi must be attained prior to opening to traffic.

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

Concrete will 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 will have an R-value of at least 0.5, as rated by the manufacturer. Insulation blanket will be left in place, except for joint sawing operations, until the 2,500 psi is attained. Insulation blanket will 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 asphalt concrete shoulders, labor, tools and equipment will be included in the contract unit price per square yard for NONREINFORCED PCC PAVEMENT REPAIR.

CONTINUOUSLY REINFORCED PCC PAVEMENT REPAIR

New pavement thickness will equal existing pavement thickness (T_N = T).

Locations and size (length or width) of pavement 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.

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

Full Lane Width Repair and Partial Lane Width Repair
 The Contractor will saw the in-place concrete transversely at four locations for each repair area. Two saw cuts will be full depth. The other two saw cuts will be partial depth saw cuts and will be made to a depth just above the in-place reinforcing steel and be placed outside of the previous full depth saw cuts. The outside cuts will be a minimum of 6" from the nearest tight crack outside of the patch.

PLOTTED FROM - TRVAINT14

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	029N-171, 029S-171 012-172, 212E-171	8	30

CONTINUOUSLY REINFORCED PCC PAVEMENT REPAIR (Continued)

The Contractor will lift out or break out the center section (including reinforcing steel). In the salvaged rebar sections of the repair areas, the use of 30- or 60-pound hammers will be allowed outside of one foot from the newly created header joint. To prevent damage to the joint and surrounding concrete, only light chipping hammers (not exceeding 15 pounds) will be allowed within the last foot adjacent to the newly created header joint to remove the remaining concrete at each end of the repair area, leaving the reinforcing steel in place.

Small Repair – Existing Steel Retained
The Contractor will saw the in-place concrete around the periphery of each repair area to a depth of 2” (above the in-place reinforcing steel). The cuts will be a minimum of 6” from the nearest tight crack outside of the patch.

Light chipping hammers (not exceeding 15 pounds) will be used to remove the concrete from the repair area, leaving the reinforcing steel in place.

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

Care will be taken not to cut, bend or otherwise damage the in-place reinforcing steel. Damage to in-place reinforcing steel or to in-place concrete beyond the repair area will be replaced at the Contractor’s expense, to the satisfaction of the Engineer.

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

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

Place reinforcing steel according to the notes for Reinforcing Steel and Steel Bar Insertion.

Concrete placed adjacent to asphalt concrete shoulders will be formed full depth to match the width of existing concrete pavement. The excavated area of the asphalt concrete shoulder adjacent to repair areas will be filled with asphalt concrete.

Concrete will not be placed in the repair areas before 12:00pm and should be placed in the late afternoon. Temperature of the concrete at the time of placement will be between 50°F and 90°F. The temperature of the concrete will be maintained above 40°F during the curing period.

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

The fine aggregate will 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 will contain 4.5% to 7.0% entrained air. The concrete will contain a minimum of 50% coarse aggregate by weight. Coarse aggregate will 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 will 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 will be 4,000 psi. The Contractor is responsible for the mix design used. The Contractor will 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 will 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 will be cured 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 will be extended, or other measures taken, at no additional cost to the State. A strength of 2,500 psi must be attained prior to opening to traffic.

Concrete will 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 will have an R-value of at least 0.5, as rated by the manufacturer. Insulation blanket will be left in place, except for joint sawing operations until 2,500 psi is attained. Insulation blanket will 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.

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

Cost for performing the aforementioned work including sawing, chipping and removing concrete, sandblasting, cleaning, furnishing and placing concrete and reinforcing steel, finishing and curing, replacing asphalt concrete shoulders, labor and equipment will be included in the contract unit price per square yard for CONTINUOUSLY REINFORCED PCC PAVEMENT REPAIR.

FAST TRACK CONCRETE FOR PCC PAVEMENT REPAIR

Fast Track Concrete will be used repairs on US 12 and US 212 to ensure that the pavement repair area has obtained 2,500 psi 7:00am the day after placement so it can be opened to traffic.

An initial cylinder will be made, and the Engineer will calibrate a Swiss Hammer to it. Subsequent strength tests will be by Swiss Hammer. Cylinders will be made according to Materials Manual requirements and the Swiss Hammer calibration regularly updated according to the early break cylinders.

The Engineer will test the repair areas after an initial 8-hour cure period by Swiss Hammer. If the area does not meet strength after the 8-hour cure period, the area will be tested every 2 hours until nightfall, then not again until 7:00am. No section is to be opened to traffic without the permission of the Engineer.

The fine aggregate will 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 prior to use of a set accelerator or super-plasticizer will be limited to 2" maximum. After the addition of admixtures, the maximum slump will be 8” and the concrete will contain 4.5% to 7.5% entrained air. The concrete will contain a minimum of 50% coarse aggregate by weight. Coarse aggregate will 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 will contain at least 700 lbs. of Type I or II cement or 650 lbs. of Type III cement per cubic yard. The minimum 28-day compressive strength will be 4,000 psi. The Contractor is responsible for the mix design used. The Contractor will submit a mix design and supporting documentation for approval at least 2 weeks prior to use.

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

Fast Track Concrete will 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.

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

Concrete will be immediately covered with suitable insulation blanket consisting of a layer of closed cell polystyrene foam protected by at least one layer of plastic. Insulation blanket will have an R value of at least 0.5, as rated by the manufacturer. Insulation blanket will be left in place, except for joint sawing operations, until 2,500 psi strength is attained. Insulation blanket will 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.

Once concrete is placed, if it does not achieve 2,500 psi prior to nightfall, the Contractor will maintain traffic control and provide temporary pavement marking on centerline until the Engineer determines that the 2,500 psi has been achieved.

If the concrete does not achieve 2,500 psi by 7 a.m. the day after placement, the Contractor will provide proper traffic control needed (at no cost to the State) until the Engineer determines the 2,500 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 will be removed and replaced at no cost to the State.

Cost for performing the aforementioned work including sawing and removing concrete, furnishing and placing Fast Track Concrete, sawing and sealing joints, repairing asphalt concrete shoulders, labor, tools and equipment will be included in the contract unit price per square yard for FAST TRACK CONCRETE FOR PCC PAVEMENT REPAIR.

PLOTTED FROM - TRWAINT14

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	029N-171, 029S-171 012-172, 212E-171	9	30

REINFORCING STEEL (CRCP)

Reinforcing steel shall conform to Section 1010.

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

At full lane and partial lane width repair areas:

New longitudinal bars shall be lap spliced with the preserved in place longitudinal bars (New bar diameter to match in place bar diameter)

Additional transverse bars shall be centered between the in place transverse bars throughout the length of the repair area. The spacing of transverse bars in the completed repair area should be half the spacing of the in place transverse reinforcing steel.

The additional transverse bars shall be lap spliced with No. 5 x 24" epoxy coated deformed tie bars inserted 9" into the existing concrete. Drilled holes will be required. Tie bars shall be inserted according to the notes for STEEL BAR INSERTION (CRCP)

At full lane width repair areas:

Additional longitudinal bars shall be centered between every other set of two spliced longitudinal bars throughout the width of the repair area. These additional bars will extend 9" into the existing concrete on both sides of the repair area. Drilled holes will be required and the additional longitudinal bars shall be inserted in accordance with the notes STEEL BAR INSERTION (CRCP). The additional longitudinal bars shall then be lap spliced.

Cost for this work, including reinforcing steel, ties, labor and equipment shall be incidental to the contract unit price per square yard for CONTINUOUSLY REINFORCED PCC PAVEMENT REPAIR.

STEEL BAR INSERTION (CRCP)

Steel bars shall conform to Section 1010.

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.

Longitudinal deformed tie bars shall be inserted 9 inches into the in place concrete at the transverse joint and centered between every other set of two spliced longitudinal bars throughout the with of the repair area. Transverse deformed bars shall be lap spliced with deformed tie bars which are inserted 9" into the in place concrete at the longitudinal joint throughout the length of the repair area. Refer to the notes for REINFORCING STEEL (CRCP). An epoxy resin adhesive must be used to anchor the steel bar in the drilled hole as per Section 380.3 C.1.

Holes drilled into the existing concrete pavement shall be located at mid-depth of the slab and true and normal except that in transverse joints, the drilled in longitudinal steel bar angle will be slightly under 90 degrees to allow for centering of the lap splice between existing longitudinal steel.

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 reinforcing steel (except the inserted No. 5 x 24" epoxy coated deformed tie bars) shall be incidental to the contract unit price per square yard for CONTINUOUSLY REINFORCED PCC PAVEMENT REPAIR.

Cost for drilling holes, furnishing and applying epoxy resin adhesive, furnishing and inserting No. 5 x 24" epoxy coated deformed tie bars into the drilled holes and inserting all other reinforcing steel bars into the drilled holes, and any incidentals necessary to complete the work shall be included in the contract unit price per each for INSERT STEEL BAR in PCC PAVEMENT.

SAW AND SEAL JOINTS (CRCP)

Longitudinal joints (in line with existing longitudinal joints) at concrete repair areas shall be sawed and sealed.

Joint sealing shall conform to Section 380.3 P.

Longitudinal joints shall be sealed Hot Poured Elastic Joint Sealer

Acceptance of the Hot Poured Elastic Joint Sealer will be based on visual inspection by the Engineer.

Cost for sawing and sealing longitudinal construction joints shall be incidental to the contract unit price per square yard for CONTINOULSY REINFORCED PCC PAVEMENT REPAIR.

STEEL BAR INSERTION (NRCP)

Steel bars shall conform to Section 1010.

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 as per Section 380. C.1.

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 as per Section 380. C.1.

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 as per Section 380. C.1.

Steel Bars shall be inserted in the transverse joint of 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.

SAW AND SEAL JOINTS (NRCP)

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

Joint sealing shall conform to Section 380.3 P.

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

Acceptance of the Low Modulus Silicone Sealant or Hot Poured Elastic Joint Sealer will be based on visual inspection by the Engineer.

Cost for sawing and sealing longitudinal construction joints shall be incidental to the contract unit price per square yard for NONREINFORCED PCC PAVEMENT REPAIR.

ASPHALT CONCRETE SHOULDERS

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

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

ASPHALT CONCRETE COMPOSITE

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

All other requirements in the specifications for Asphalt Concrete Composite shall apply except Asphalt for Flush Seal will NOT be required.

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	029N-171, 029S-171 012-172, 212E-171	10	30

PCN i897 ITEMIZED LIST FOR TRAFFIC CONTROL SIGNS

SIGN CODE	SIGN DESCRIPTION	EXPRESSWAY / INTERSTATE			
		NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
R2-1	SPEED LIMIT 65	4	36" x 48"	12.0	48.0
R2-1	SPEED LIMIT 80	2	36" x 48"	12.0	24.0
R2-1	SPEED LIMIT 45	2	36" x 48"	12.0	24.0
R2-6aP	FINES DOUBLE (plaque)	2	36" x 24"	6.0	12.0
W3-5	SPEED REDUCTION AHEAD (__ MPH)	6	48" x 48"	16.0	96.0
W4-2	LEFT or RIGHT LANE ENDS (symbol)	4	48" x 48"	16.0	64.0
W20-1	ROAD WORK AHEAD	4	48" x 48"	16.0	64.0
W20-7	FLAGGER (symbol)	2	48" x 48"	16.0	32.0
G20-2	END ROAD WORK	2	48" x 24"	8.0	16.0
		EXPRESSWAY / INTERSTATE TRAFFIC CONTROL SIGNS SQFT			
		380.0			

PCN i898 ITEMIZED LIST FOR TRAFFIC CONTROL SIGNS

SIGN CODE	SIGN DESCRIPTION	EXPRESSWAY / INTERSTATE			
		NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
R2-1	SPEED LIMIT 65	2	36" x 48"	12.0	24.0
R2-1	SPEED LIMIT 80	1	36" x 48"	12.0	12.0
R2-1	SPEED LIMIT 45	1	36" x 48"	12.0	12.0
R2-6aP	FINES DOUBLE (plaque)	1	36" x 24"	6.0	6.0
W3-5	SPEED REDUCTION AHEAD (__ MPH)	3	48" x 48"	16.0	48.0
W4-2	LEFT or RIGHT LANE ENDS (symbol)	2	48" x 48"	16.0	32.0
W20-1	ROAD WORK AHEAD	2	48" x 48"	16.0	32.0
W20-7	FLAGGER (symbol)	1	48" x 48"	16.0	16.0
G20-2	END ROAD WORK	1	48" x 24"	8.0	8.0
		EXPRESSWAY / INTERSTATE TRAFFIC CONTROL SIGNS SQFT			
		190.0			

PCN i899 ITEMIZED LIST FOR TRAFFIC CONTROL SIGNS

SIGN CODE	SIGN DESCRIPTION	CONVENTIONAL ROAD			
		NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
W20-1	ROAD WORK AHEAD	2	48" x 48"	16.0	32.0
W20-4	ONE LANE CLOSED AHEAD	2	48" x 48"	16.0	32.0
W20-7	FLAGGER (symbol)	2	48" x 48"	16.0	32.0
G20-2	END ROAD WORK	2	36" x 18"	4.5	9.0
		CONVENTIONAL ROAD TRAFFIC CONTROL SIGNS SQFT			
		105.0			

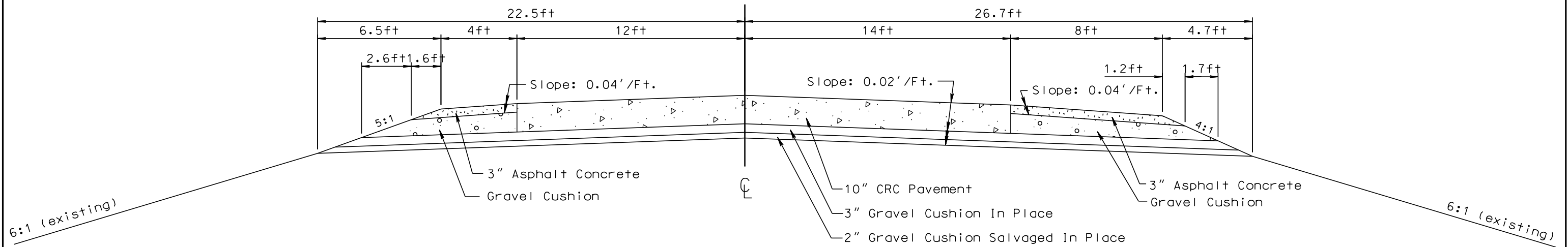
PCN i89A ITEMIZED LIST FOR TRAFFIC CONTROL SIGNS

SIGN CODE	SIGN DESCRIPTION	CONVENTIONAL ROAD			
		NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
W4-2	LEFT or RIGHT LANE ENDS (symbol)	2	48" x 48"	16.0	32.0
W20-1	ROAD WORK AHEAD	3	48" x 48"	16.0	48.0
W20-5	LT / RT LANE CLOSED AHEAD	2	48" x 48"	16.0	32.0
G20-2	END ROAD WORK	2	36" x 18"	4.5	9.0
		CONVENTIONAL ROAD TRAFFIC CONTROL SIGNS SQFT			
		121.0			

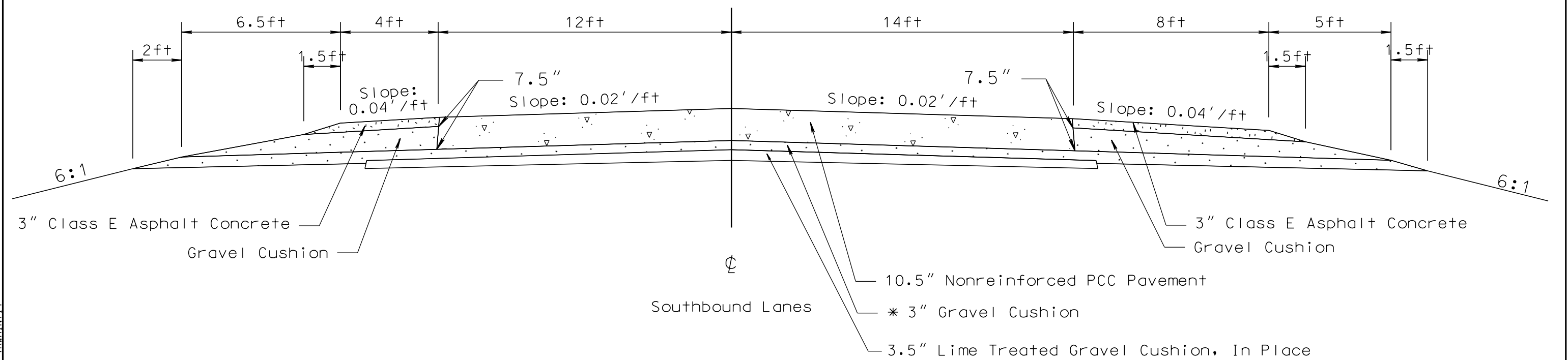
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	029N-171, 029S-171 012-172, 212E-171	11	30

TYPICAL SECTIONS

Interstate 29
MRM 151.7 to MRM 165.3



Interstate 29
MRM 179.3 to MRM 193.7



LEGEND

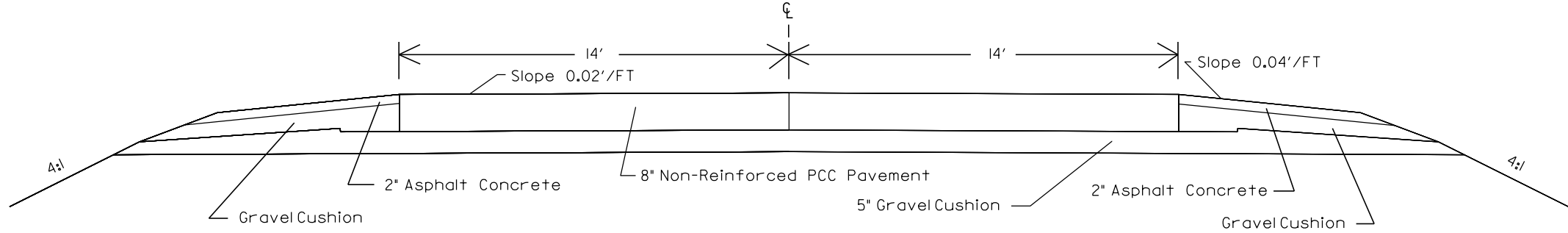
L - Joint does not include rebar tie

LT - Joint includes rebar tie

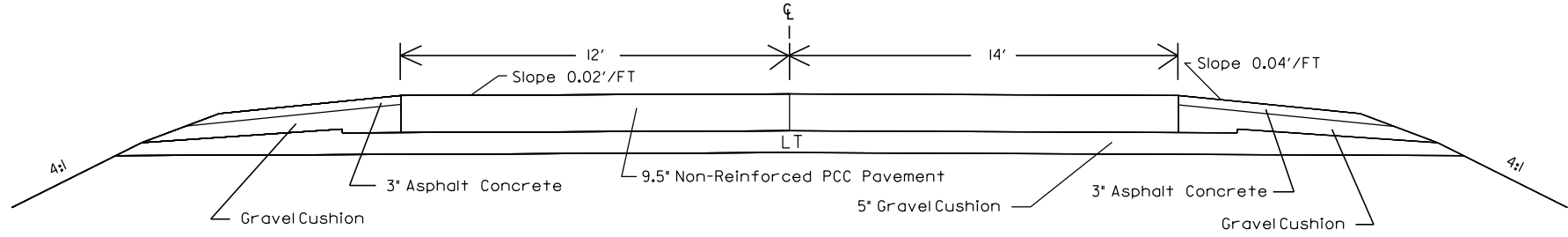
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	029N-171, 029S-171 012-172, 212E-171	12	30

TYPICAL SECTIONS

012-172
US HIGHWAY 12
MRM 368.81 to MRM 387.50
IN PLACE SURFACING SECTION

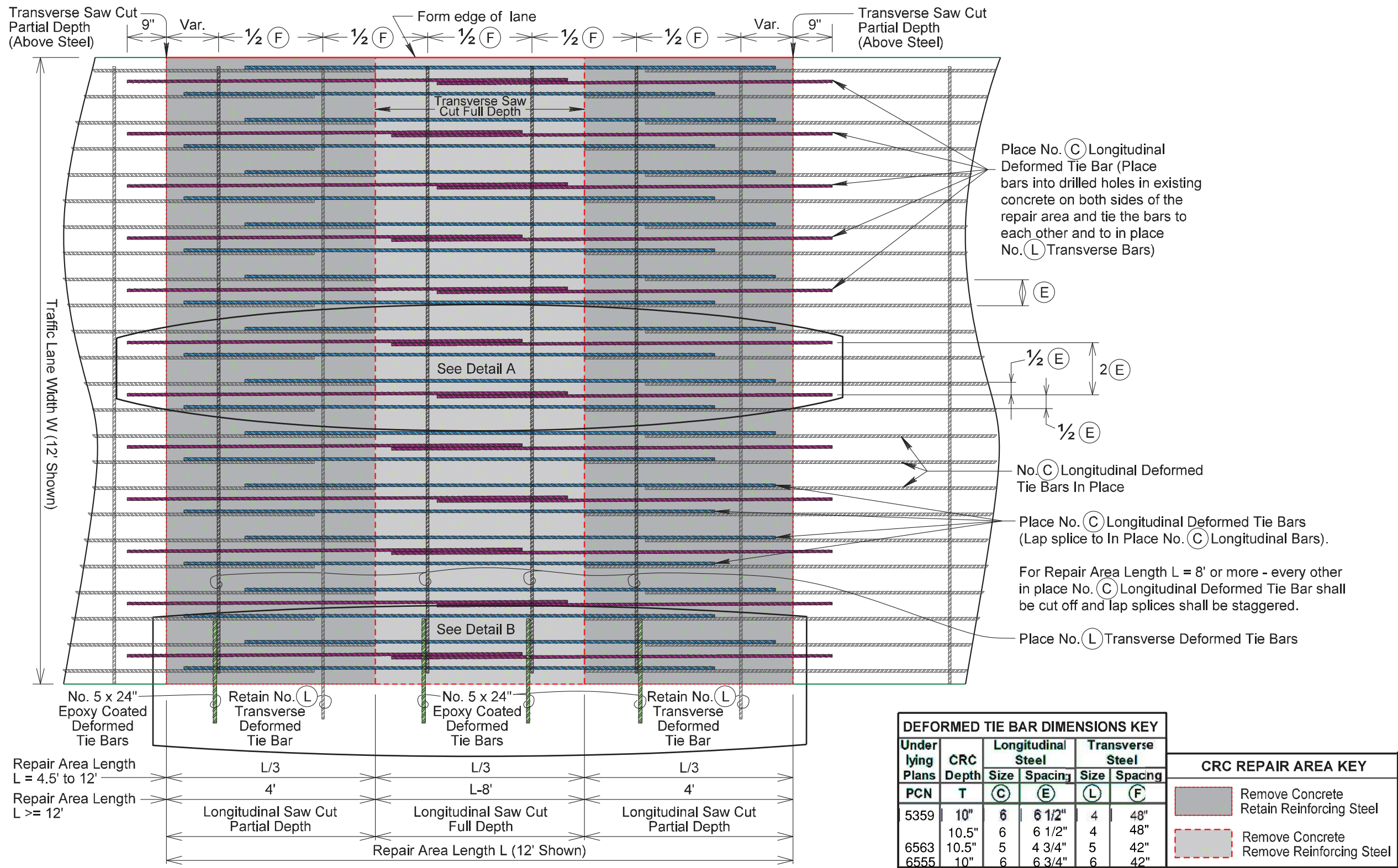


212E-171
US HIGHWAY 212
MRM 378.89 to MRM 380.68
IN PLACE SURFACING SECTION
(Divided Highway)

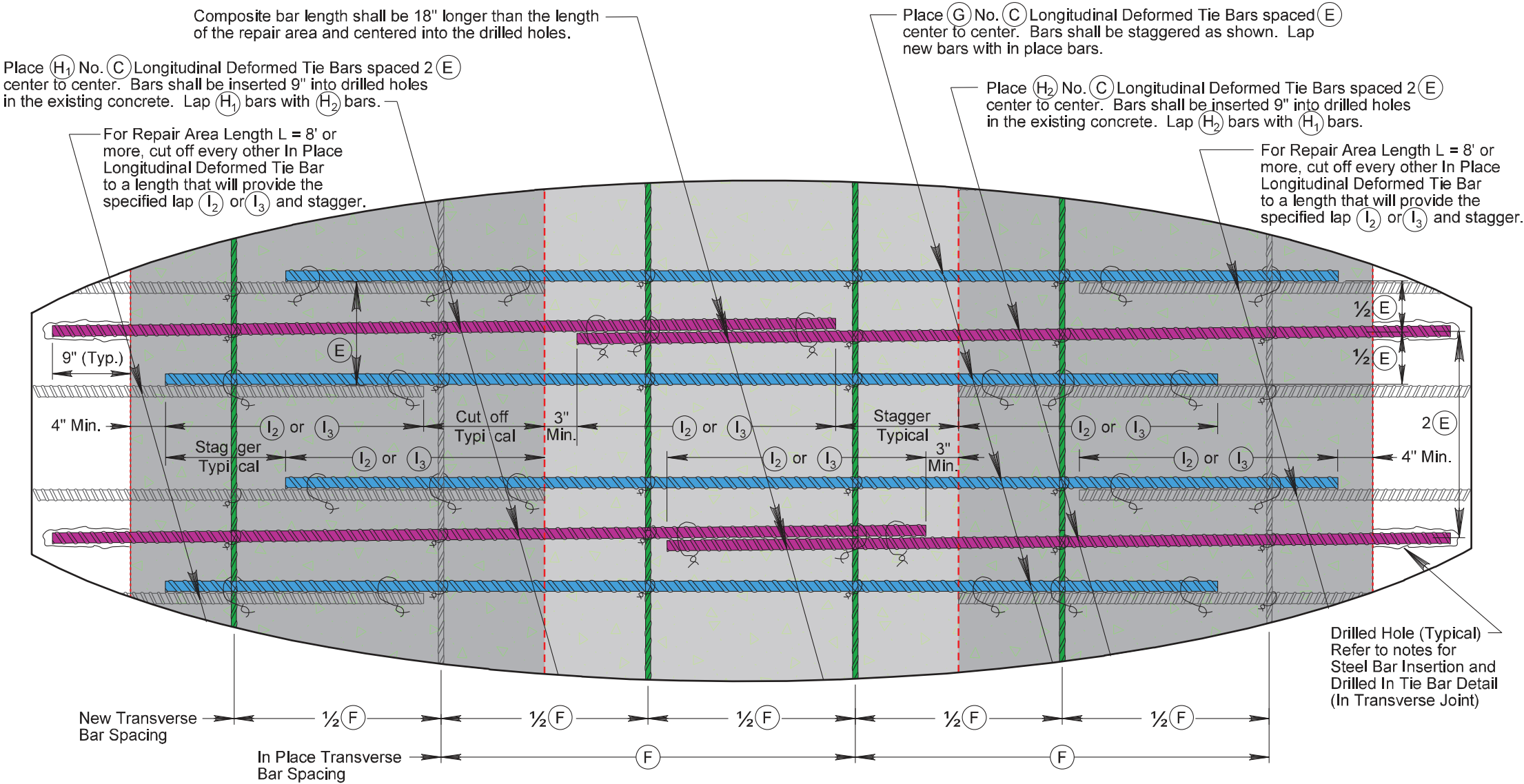


LEGEND
L - Joint does not include rebar tie
LT - Joint includes rebar tie

CRC PAVEMENT REPAIR (FULL LANE WIDTH) - TYPICAL



CRC PAVEMENT REPAIR (FULL LANE WIDTH)
Detail A



DEFORMED TIE BAR KEY			
	No. (C) Longitudinal Deformed Tie Bar In Place (Retain)		No. (L) Transverse Deformed Tie Bar In Place (Retain)
	Place No. (C) Longitudinal Deformed Tie Bar (Tie to In Place No. (C) Longitudinal Bars)		
	Place No. (C) Longitudinal Deformed Tie Bar (Place bars into drilled holes in existing concrete on both sides of the repair area and tie the bars to each other and to No. (L) Transverse Bars)		Place No. (L) Transverse Deformed Tie Bar (Tie to No. (C) Longitudinal Bars)

DEFORMED TIE BAR DIMENSIONS KEY						
Underlying Plans	CRC Depth	Longitudinal Steel		Transverse Steel		
		Size	Spacing	Size	Spacing	
PCN	T	(C)	(E)	(L)	(F)	
5359	10"	6	6 1/2"	4	48"	
	10.5"	6	6 1/2"	4	48"	
6563	10.5"	5	4 3/4"	5	42"	
6555	10"	6	6 3/4"	6	42"	

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

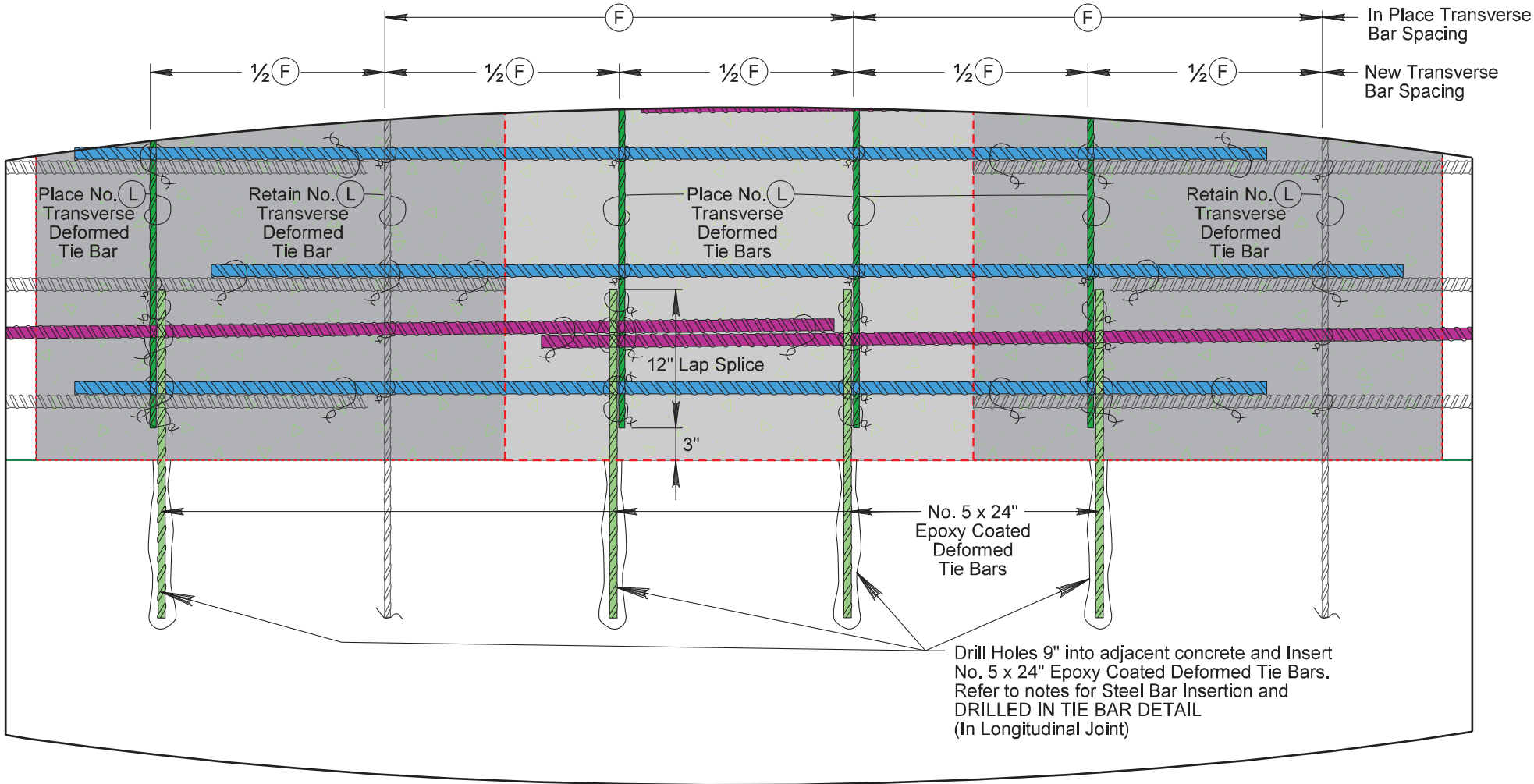
LAP SPLICE LENGTH KEY	
(I ₁)	Lap Splice length for Repair Area Length L < 4.5' (Not Available).
(I ₂)	Lap Splice length for Repair Area Length L = 4.5' to 8'.
(I ₃)	Lap Splice length for Repair Area Length L > 8'.

See CRC Pavement Repair - Reinforcing Steel Details for Longitudinal Bar Counts: (G), (H ₁) & (H ₂)	
CRC REPAIR AREA KEY	
	Remove Concrete Retain Reinforcing Steel
	Remove Concrete Remove Reinforcing Steel

PLOTTED FROM - TRWAINT14

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	029N-171, 029S-171 012-172, 212E-171	15	30

CRC PAVEMENT REPAIR (FULL LANE WIDTH) Detail B



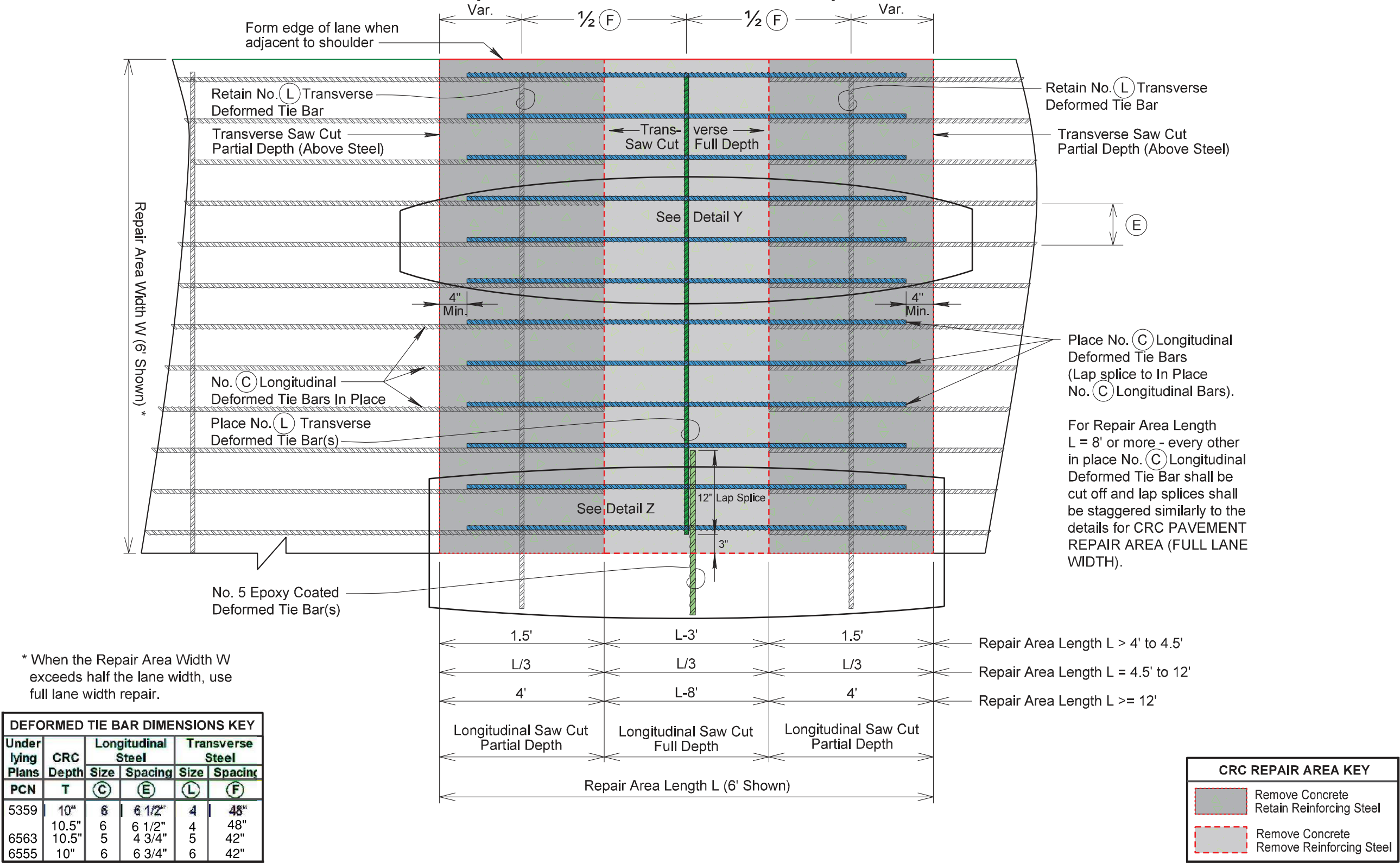
DEFORMED TIE BAR KEY			
	No. (C) Longitudinal Deformed Tie Bar In Place (Retain)		No. (L) Transverse Deformed Tie Bar In Place (Retain)
	Place No. (C) Longitudinal Deformed Tie Bar (Tie to In Place No. (C) Longitudinal Bars)		
	Place No. (C) Longitudinal Deformed Tie Bar (Place bars into drilled holes in existing concrete on both sides of the repair area and tie the bars to each other and to No. (L) Transverse Bars)		Place No. (L) Transverse Deformed Tie Bar (Tie to No. (C) Longitudinal Bars)

DEFORMED TIE BAR DIMENSIONS KEY						
Under lying Plans	CRC Depth	Longitudinal Steel		Transverse Steel		
		Size	Spacing	Size	Spacing	
PCN	T	(C)	(E)	(L)	(F)	
5359	10"	6	6 1/2"	4	48"	
	10.5"	6	6 1/2"	4	48"	
6563	10.5"	5	4 3/4"	5	42"	
6555	10"	6	6 3/4"	6	42"	

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

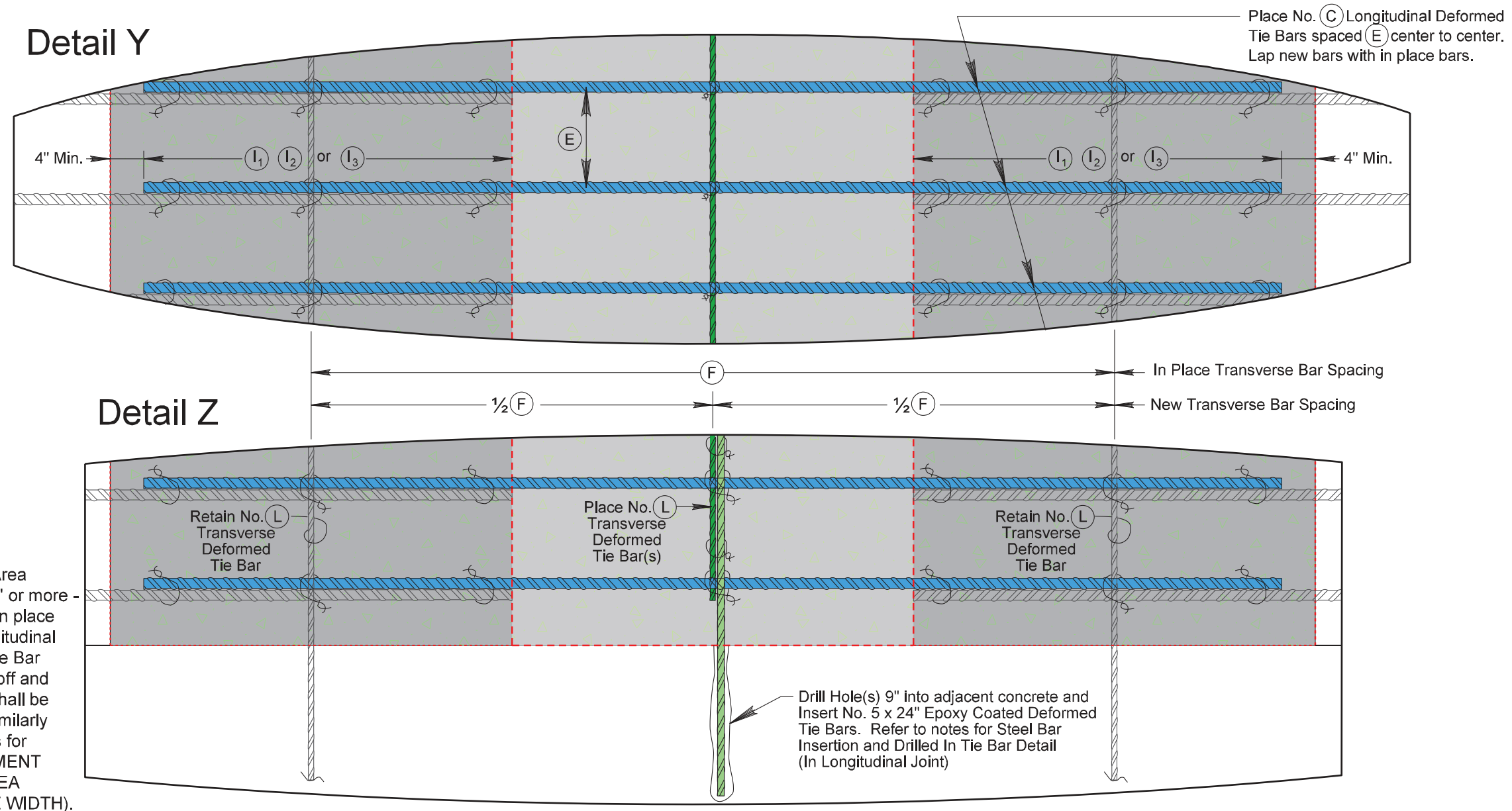
CRC REPAIR AREA KEY	
	Remove Concrete Retain Reinforcing Steel
	Remove Concrete Remove Reinforcing Steel

CRC PAVEMENT REPAIR (PARTIAL LANE WIDTH) - TYPICAL



* When the Repair Area Width W exceeds half the lane width, use full lane width repair.

CRC PAVEMENT REPAIR (PARTIAL LANE WIDTH)



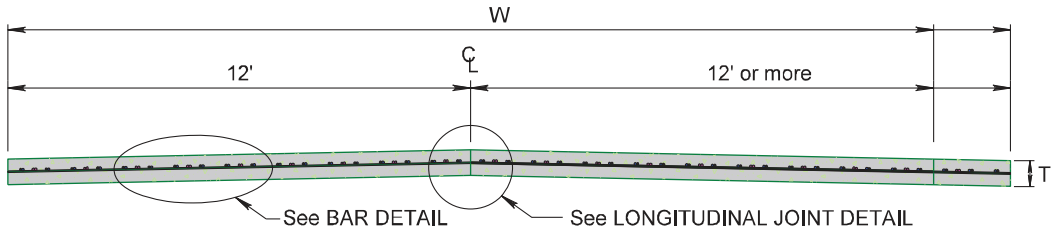
DEFORMED TIE BAR DIMENSIONS KEY										LAP SPLICE LENGTH KEY		
	No. (L) Transverse Deformed Tie Bar In Place (Retain)		No. (C) Longitudinal Deformed Tie Bar In Place (Retain)	Under lying Plans	CRC Depth	Longitudinal Steel		Transverse Steel		(1)	Lap Splice length for Repair Area Length L = 4' to 4.5'.	
						Size	Spacing	Size	Spacing			
	Place No. (L) Transverse Deformed Tie Bar (Tie to No. (C) Longitudinal Bars)		Place No. (C) Longitudinal Deformed Tie Bar (Tie to In Place No. (C) Longitudinal Bars)	PCN	T	(C)	(E)	(L)	(F)	(2)	Lap Splice length for Repair Area Length L = 4.5' to 8'.	
				5359	10"	6	6 1/2"	4	48"			
					10.5"	6	6 1/2"	4	48"			
				6563	10.5"	5	4 3/4"	5	42"	(3)	Lap Splice length for Repair Area Length L > 8'.	
				6555	10"	6	6 3/4"	6	42"			

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

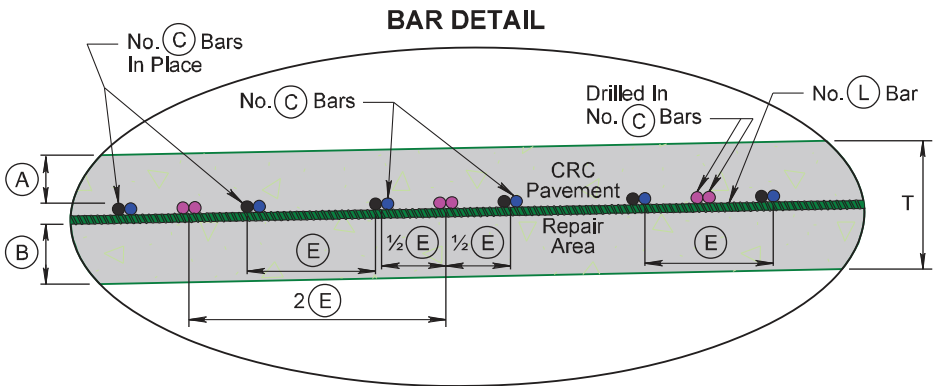
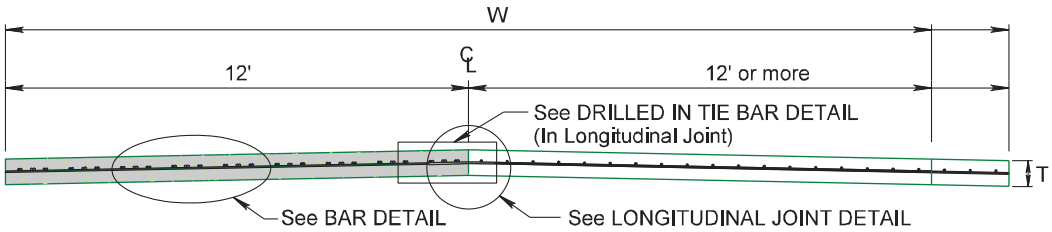
CRC REPAIR AREA KEY	
	Remove Concrete Retain Reinforcing Steel
	Remove Concrete Remove Reinforcing Steel

CRC PAVEMENT REPAIR - REINFORCING STEEL DETAILS

TRANSVERSE SECTION SHOWING STEEL PLACEMENT



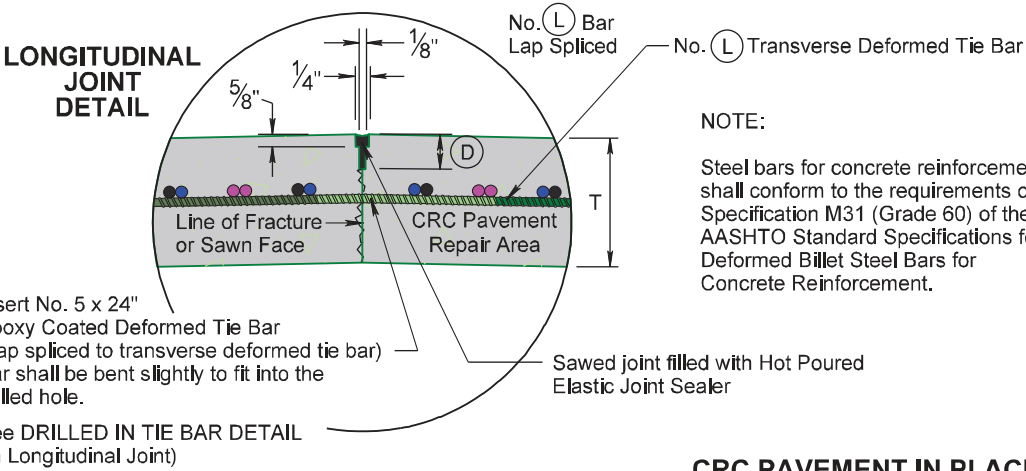
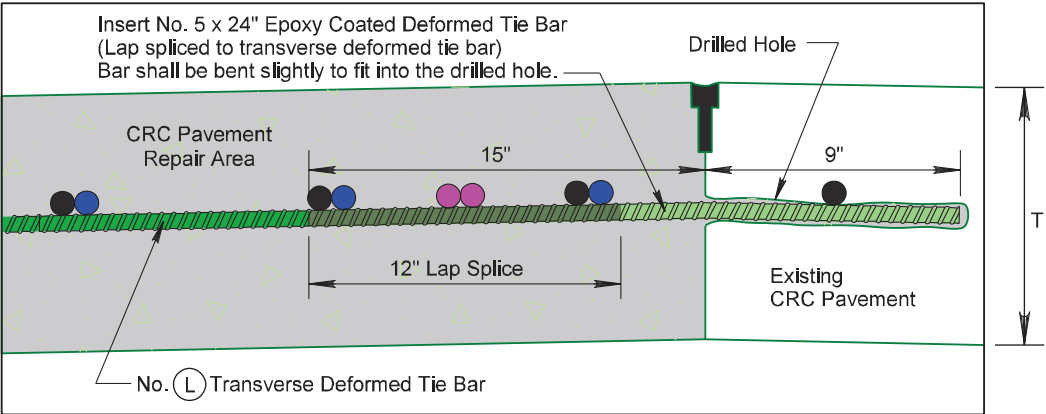
TRANSVERSE SECTION SHOWING STEEL PLACEMENT



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

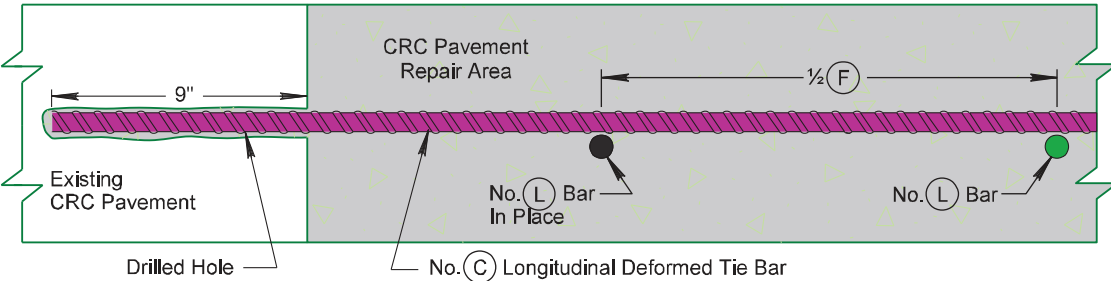
The transverse deformed steel bars will be positioned on acceptable chairs.

DRILLED IN TIE BAR DETAIL
(In Longitudinal Joint)



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

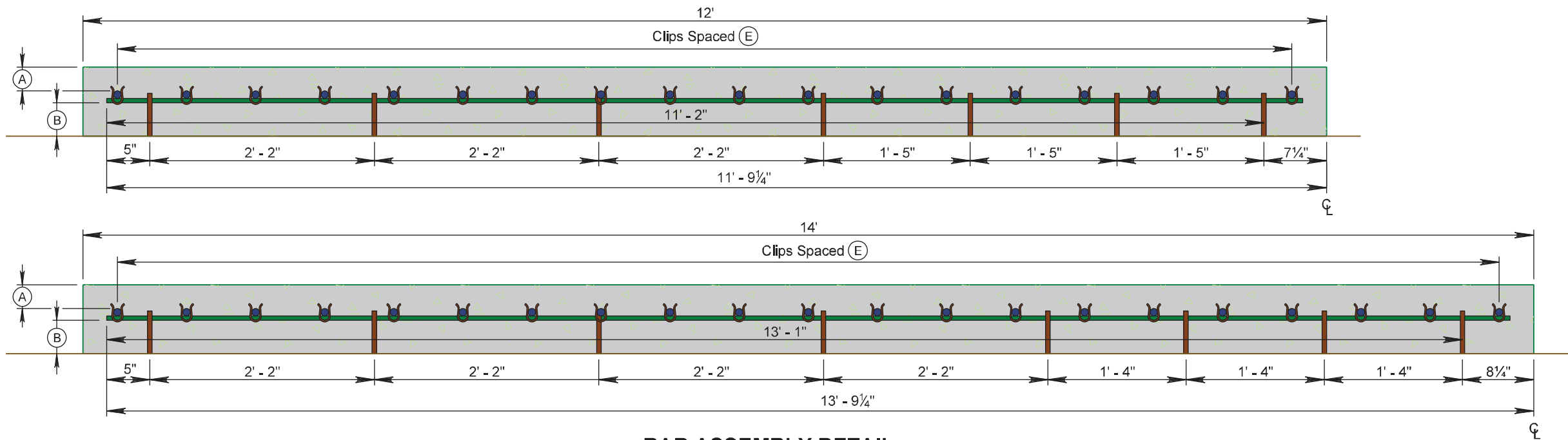
LONGITUDINAL SECTION SHOWING STEEL PLACEMENT
DRILLED IN TIE BAR DETAIL
(In Transverse Joint)



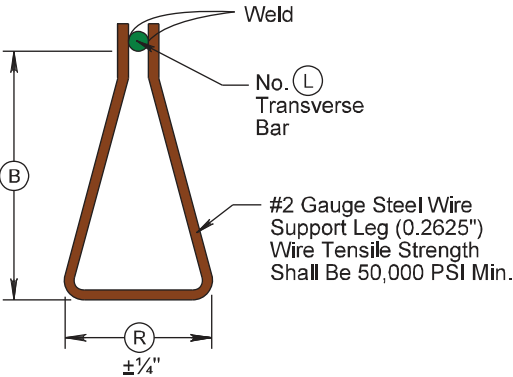
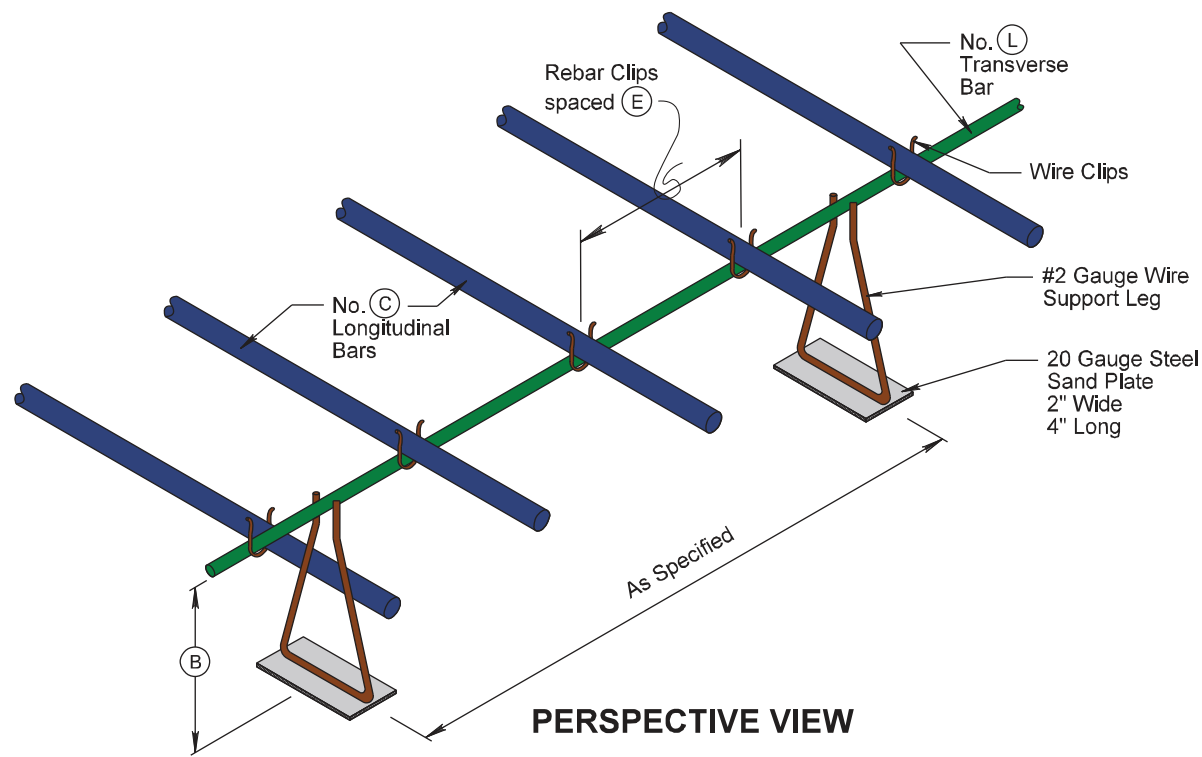
CRC PAVEMENT IN PLACE & CRC PAVEMENT REPAIR KEY & DIMENSIONS

	Under lying Plans	CRC Depth	CRC Width	Clearance		Longitudinal Steel		Saw Cut Depth	Transverse Steel		Longitudinal Bar Count (full lane width repair)						Lap Splice Length (for Repair Length L)			Not Assig red	Perimeter Bar Spacing					Chair Width
				Top	Bottom	Size	Spacing		Size	Spacing	12' Wide Slab			14' Wide Slab			L<4.5'	L= 4.5' to 8' 9"	L>=8' 9"		(K)	(M)	(N)	(P)	(R)	
											(A)	(B)	(C)	(E)	(D)	(L)										
PCN	T	W	(A)	(B)	(C)	(E)	(D)	(L)	(F)	(G)	(H ₁)	(H ₂)	(G)	(H ₁)	(H ₂)	(I ₁)	(I ₂)	(I ₃)	-	(K)	(M)	(N)	(P)	(R)		
5359	10"	26'	3 1/2"	5 1/4"	6	6 1/2"	2 1/2"	4	48"	22	11	11	26	13	13	14"	14" to 25"	25"	-	3 3/4"	6 1/2"	6 1/2"	4 1/2"	5"		
6563	10.5"	26'	4"	5 1/4"	6	6 1/2"	2 1/2"	5	48"	22	11	11	26	13	13	14"	14" to 25"	25"		3 3/4"	6 1/2"	6 1/2"	4 1/2"	5"		
6555	10"	26'	3 1/8"	4 3/4"	5	4 3/4"	2 1/2"	6	42"																	
			3"	6 1/4"	5	6 3/4"	2 1/2"																			

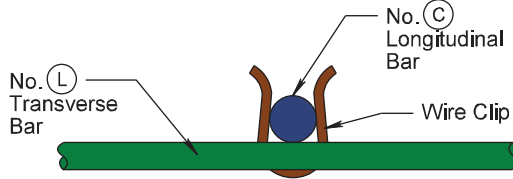
CRC PAVEMENT CHAIR DETAILS



BAR ASSEMBLY DETAIL



CHAIR DETAIL



CLIP DETAIL

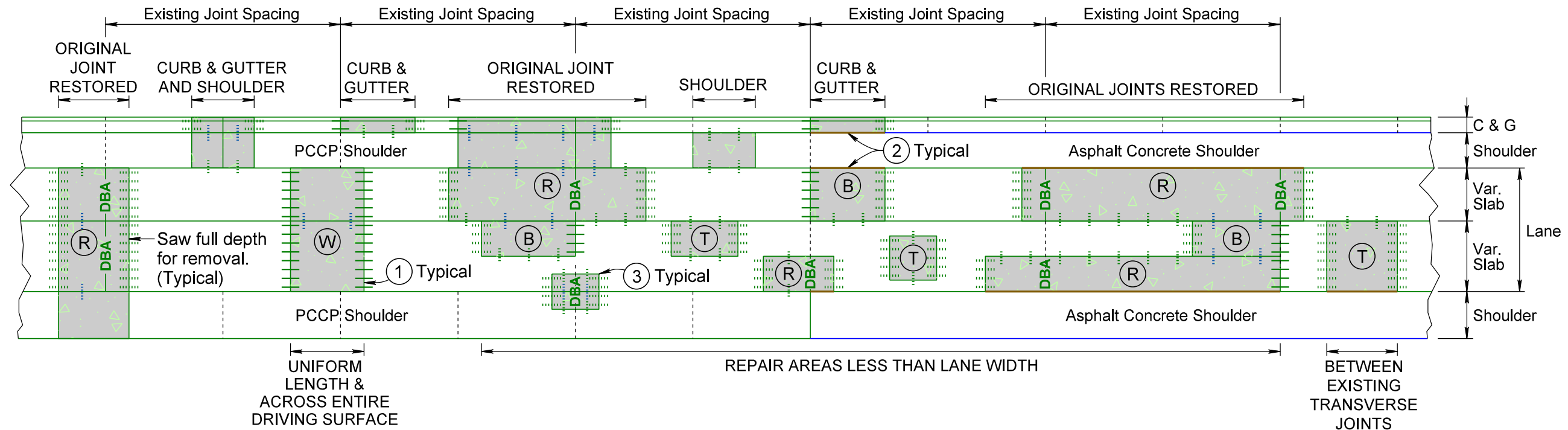
DEFORMED TIE BAR DIMENSIONS KEY										
Under lying Plans	CRC Depth	CRC Width	Clearance		Longitudinal Steel		Saw Cut Depth	Transverse Steel		Chair Width
			Top	Bottom	Size	Spacing		Size	Spacing	
PCN	T	W	(A)	(B)	(C)	(E)	(D)	(L)	(F)	(R)
5359	10"	26'	3 1/2"	5 1/4"	6	6 1/2"	2 1/2"	4	48"	5"
	10.5"	26'	4"	5 1/4"	6	6 1/2"	2 1/2"	4	48"	5"
6563	10.5"	26'	3 1/8"	4 3/4"	5	4 3/4"	2 1/2"	5	42"	5"
6555	10"	26'	3"	6 1/4"	5	6 3/4"	2 1/2"	6	42"	5"

NONREINFORCED PCC PAVEMENT REPAIR

ANY SINGLE LANE ROADWAY (RAMPS, ETC.)

TYPICAL REPAIR AREAS

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	029N-171, 029S-171 012-172, 212E-171	20	30



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.
Sawed Joint - spaced 48" center to center.
Construction Joint - spaced 48" center to center.

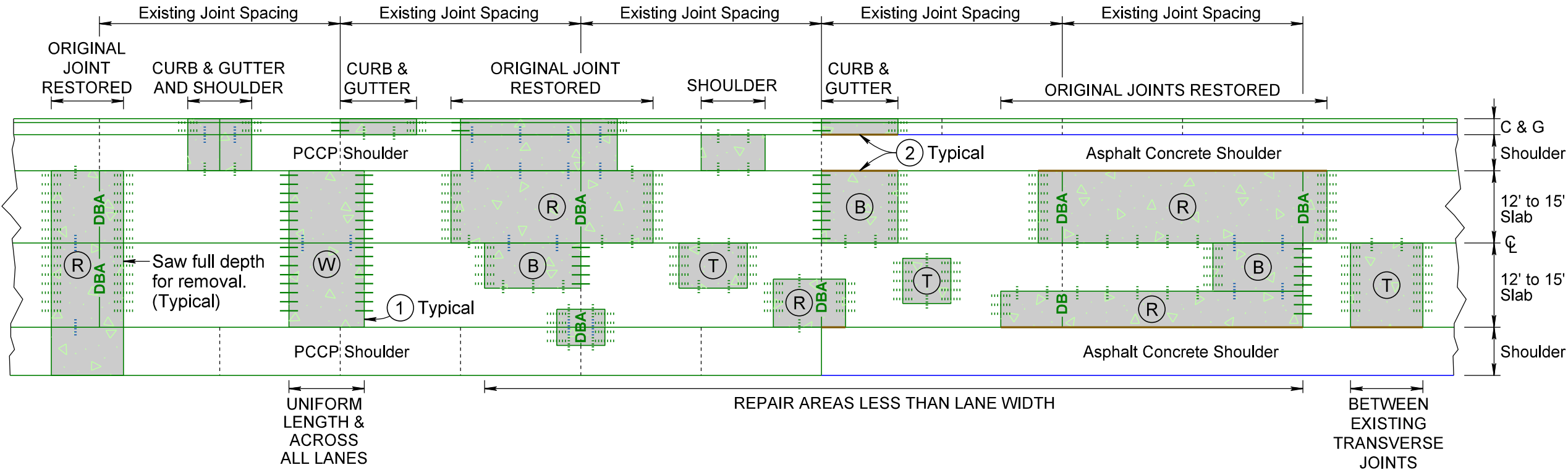
..... No. 5 x 24" epoxy coated deformed tie bars.
Drilled In - spaced 30" center to center.

NOTES: Saw around repair areas full depth for removal.

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

NONREINFORCED PCC PAVEMENT REPAIR
UP TO TWO LANE ROADWAY OR UP TO FOUR LANE DIVIDED ROADWAY
TYPICAL REPAIR AREAS

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	029N-171, 029S-171 012-172, 212E-171	21	30



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

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.
Sawed Joint - spaced 48" center to center.
Construction Joint - spaced 48" center to center.

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

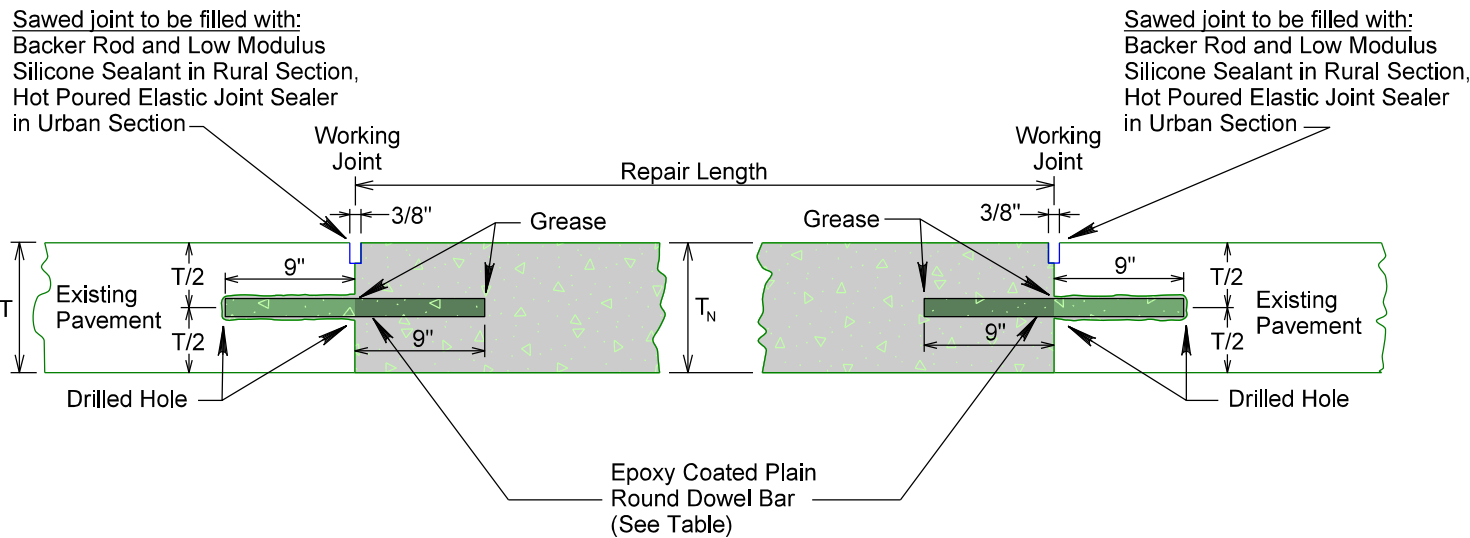
NOTES: Saw around repair areas full depth for removal.

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

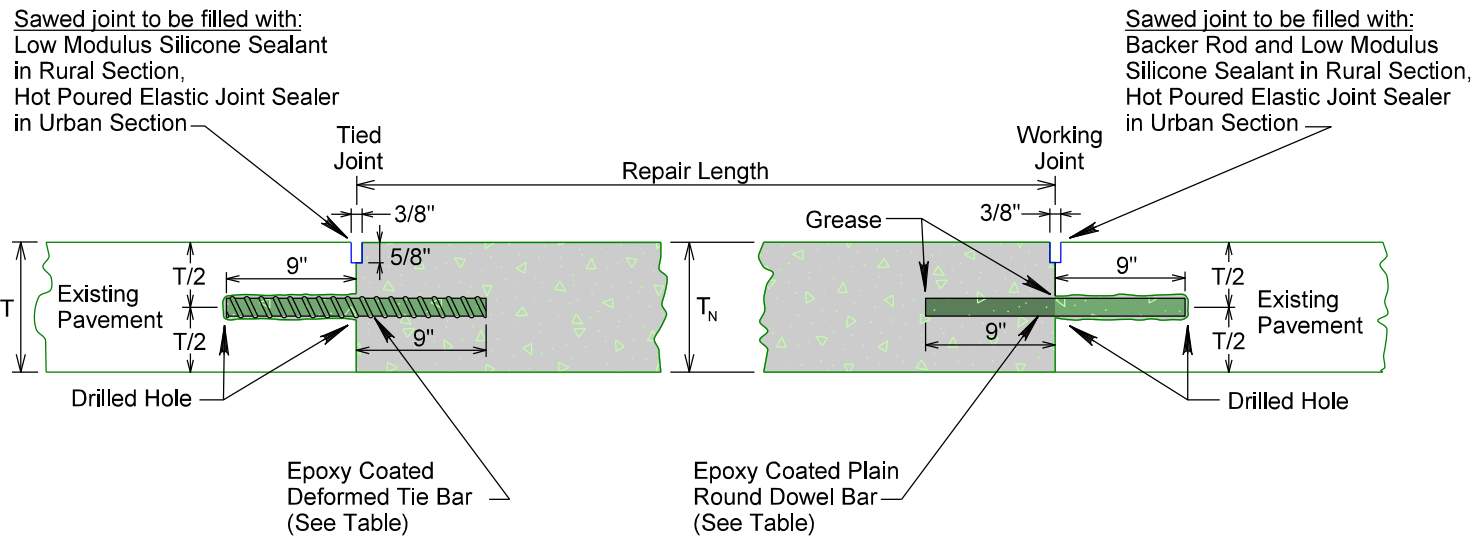
NONREINFORCED PCC PAVEMENT REPAIR

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	029N-171, 029S-171 012-172, 212E-171	22	30

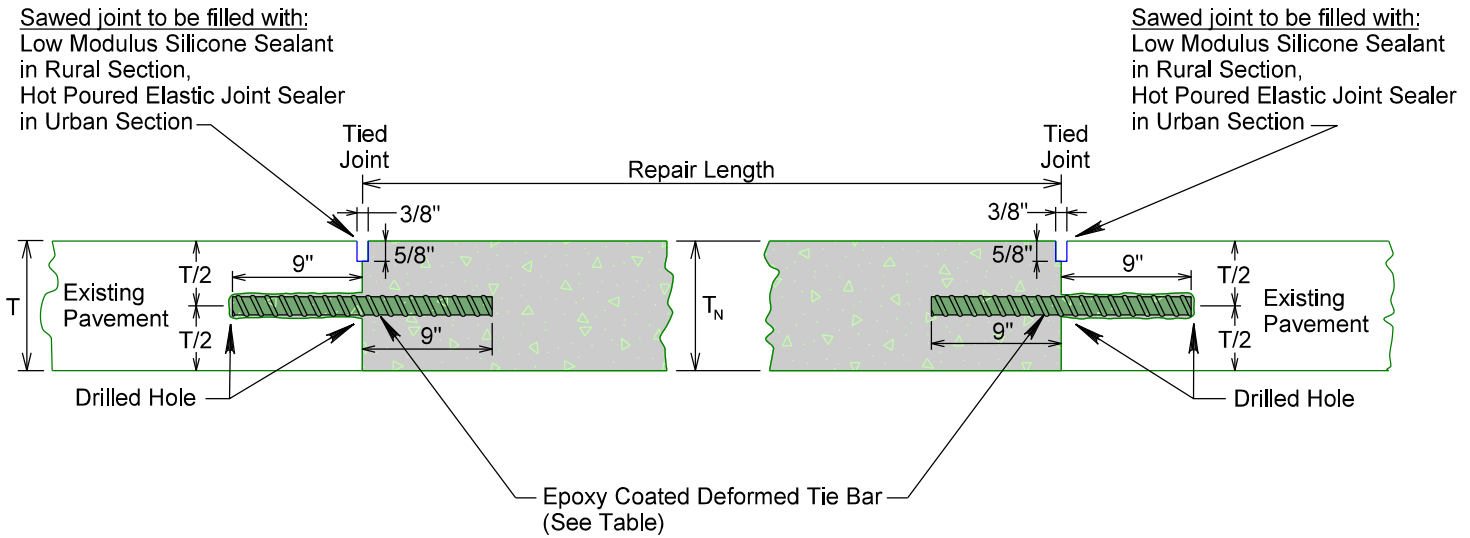
PLAIN ROUND DOWEL BAR INSERTION
TYPE W - (TWO WORKING JOINTS)



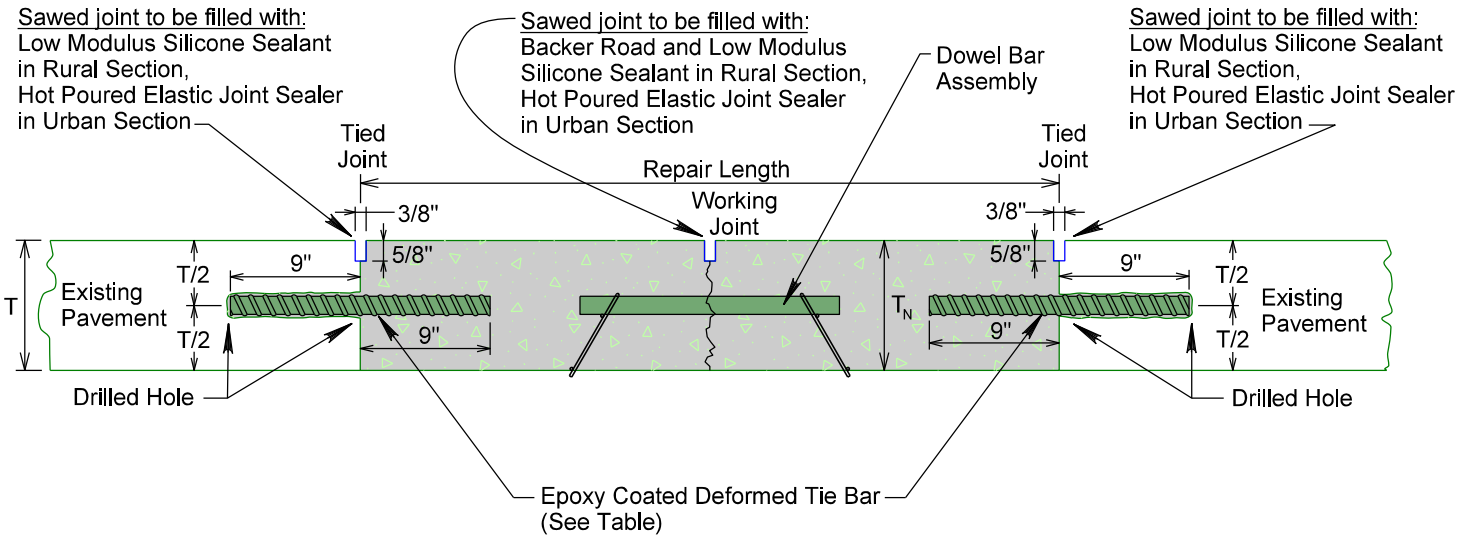
DEFORMED TIE BAR AND PLAIN ROUND DOWEL BAR INSERTION
TYPE B - (ONE TIED JOINT AND ONE WORKING JOINT)



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



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



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

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.

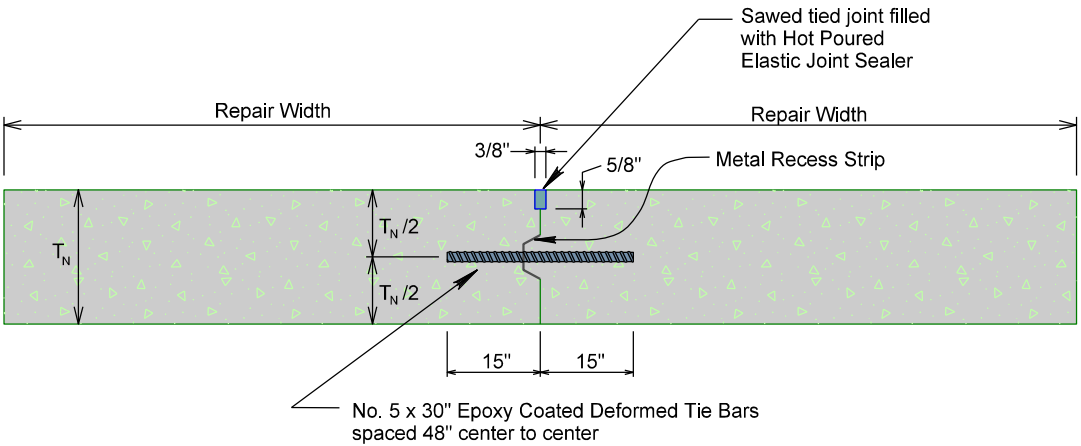
Existing Pavement Thickness	Epoxy Coated Deformed Tie Bar Size	Epoxy Coated Plain Round Dowel Bar Size
T ≥ 10.5"	No. 11 x 18"	1½" x 18"
T ≥ 8.5" & T < 10.5"	No. 9 x 18"	1¼" x 18"
T < 8.5"	No. 8 x 18"	1" x 18"

T_N = T
(top of new pavement shall be flush with top of existing pavement)

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	029N-171, 029S-171 012-172, 212E-171	23	30

NONREINFORCED PCC PAVEMENT REPAIR

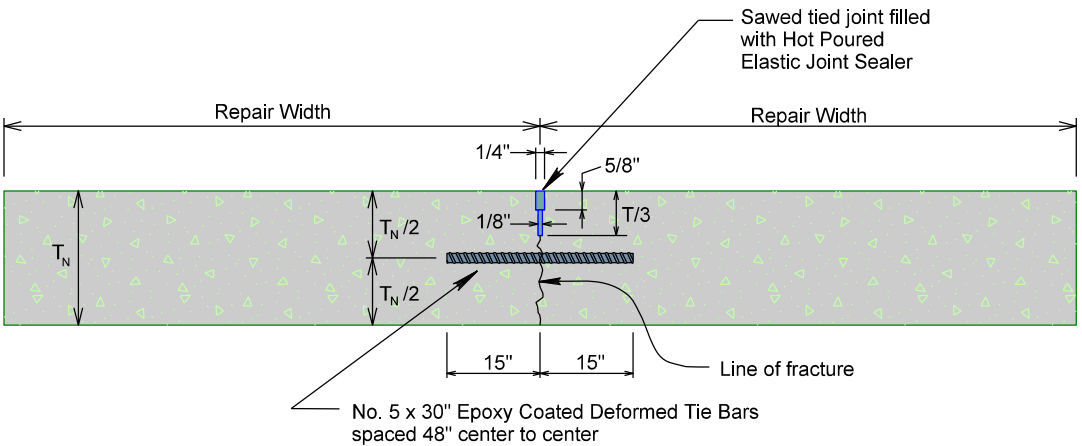
LONGITUDINAL CONSTRUCTION JOINT WITH TIE BARS & KEYWAY



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 and/or Fast Track Concrete for PCC Pavement Repair.

SAWED LONGITUDINAL JOINT

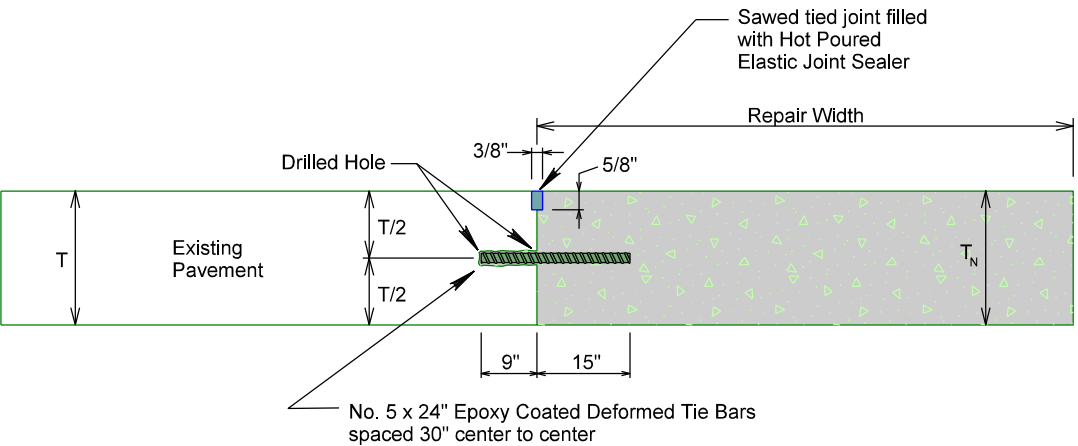


T_N = New pavement thickness.

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 and/or Fast Track Concrete for PCC Pavement Repair.

LONGITUDINAL CONSTRUCTION JOINT WITH DRILLED IN TIE BARS



T = Existing pavement thickness.

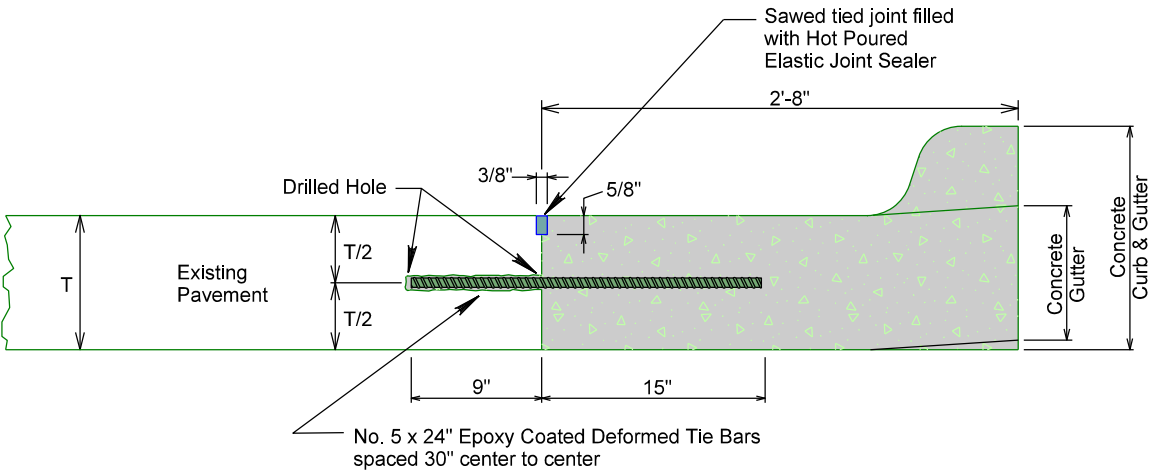
T_N = New pavement thickness.

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.

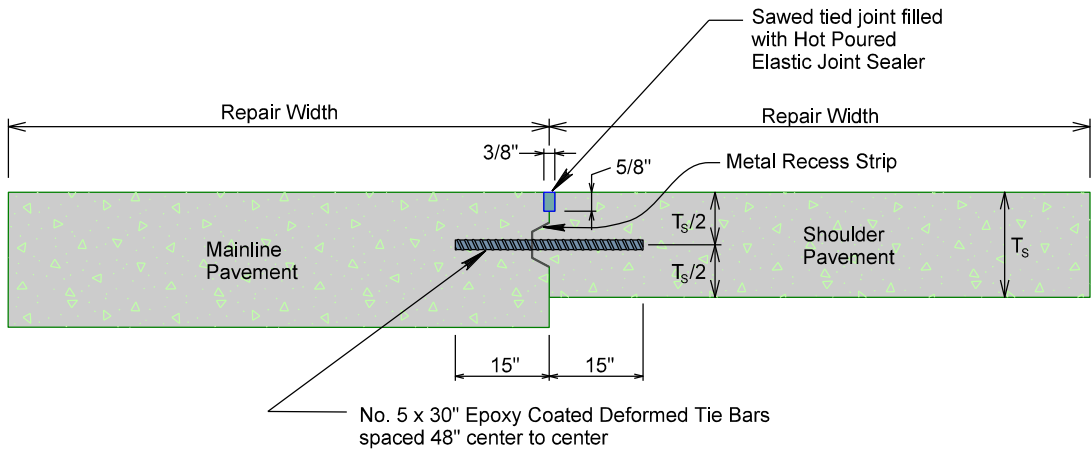
Bars will be placed a minimum of 15 inches from existing transverse contraction joints.

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

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	029N-171, 029S-171 012-172, 212E-171	24	30

NONREINFORCED PCC PAVEMENT REPAIR

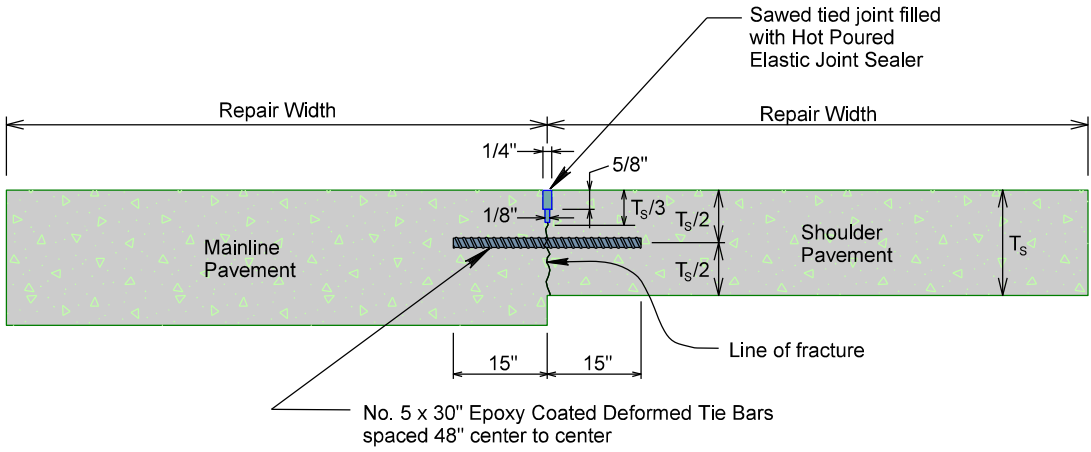
LONGITUDINAL SHOULDER CONSTRUCTION JOINT WITH TIE BARS & KEYWAY



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

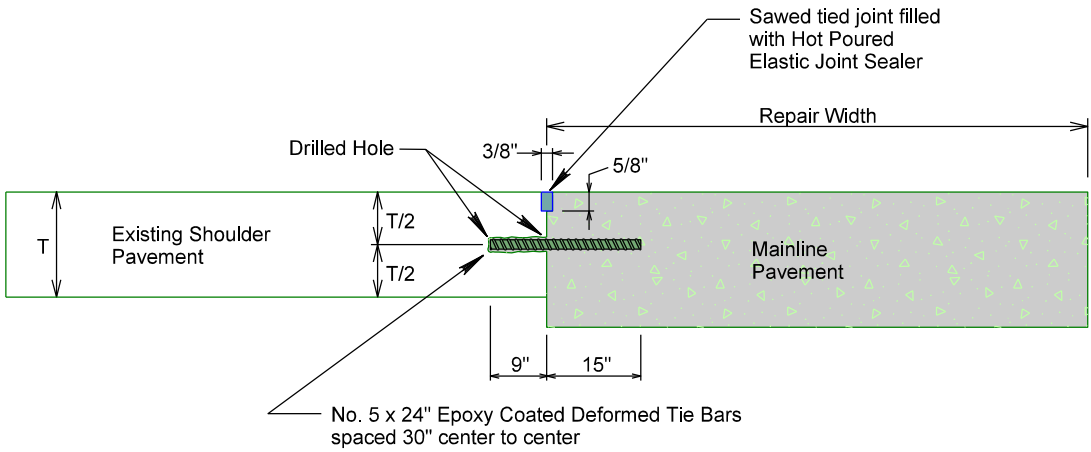


T_s = New shoulder pavement thickness.

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



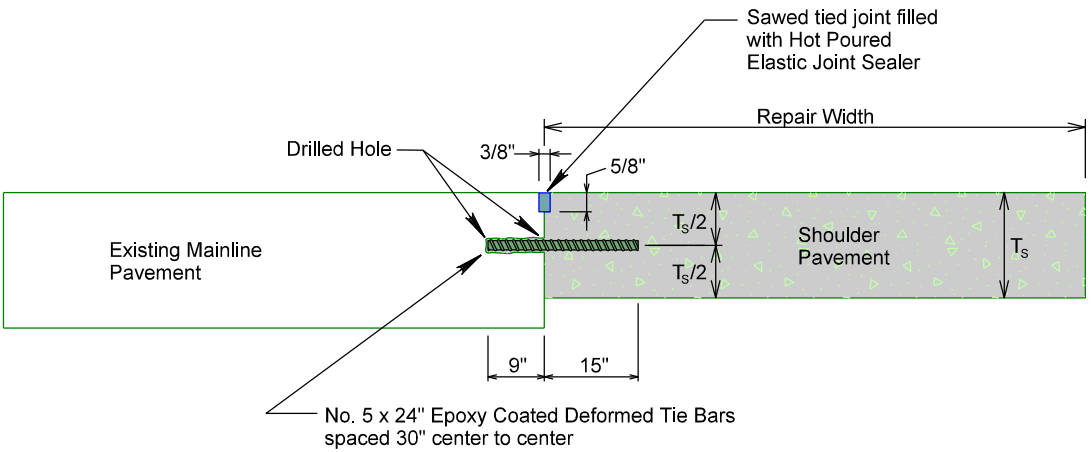
T = Existing shoulder pavement thickness.

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

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

Cost for furnishing and inserting drilled in tie bars will 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.

PLOTTED FROM - TRWAINT14

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	500	25
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) will 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 will 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.

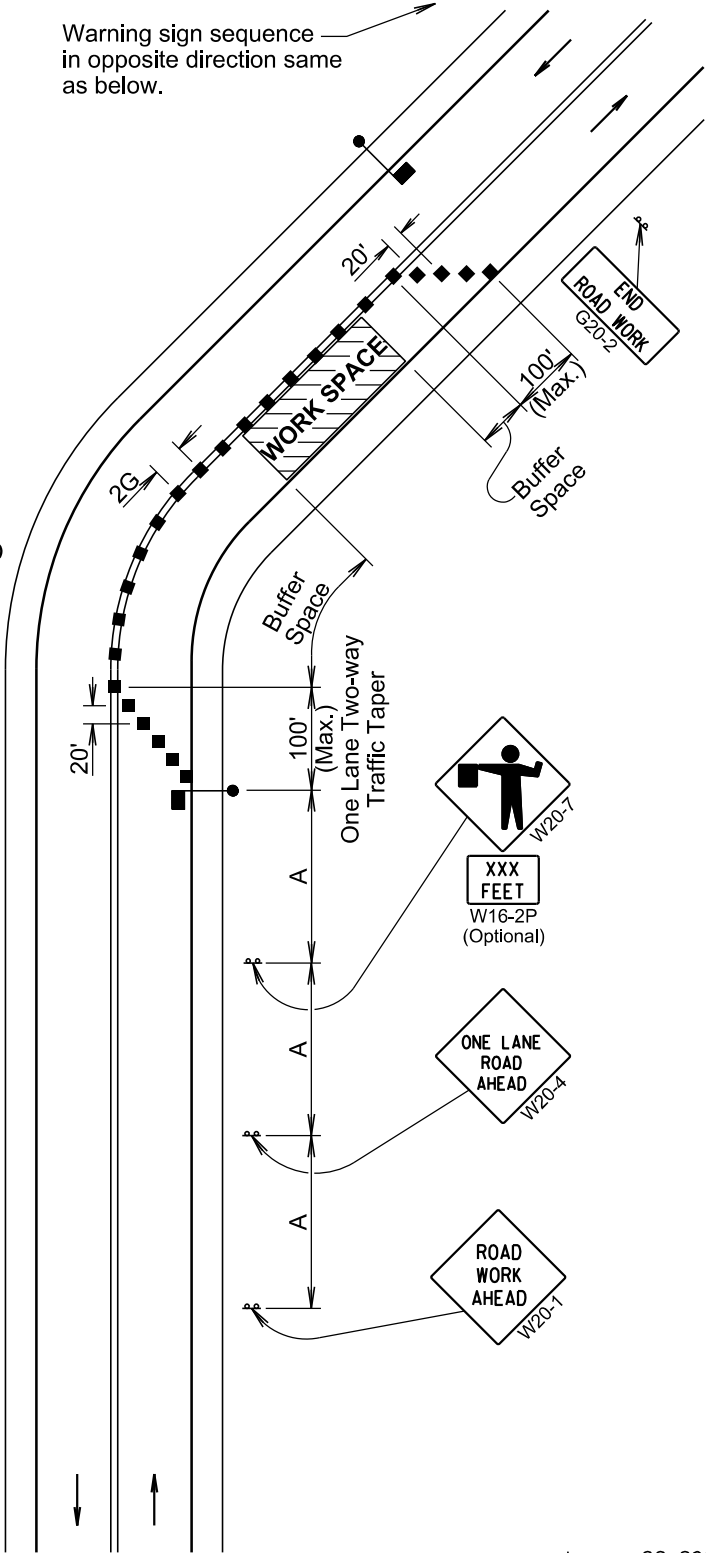
END ROAD WORK
G20-2

Channelizing devices and flaggers will 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.



January 22, 2021

Published Date: 2027	S D D O T	LANE CLOSURE WITH FLAGGER PROVIDED	PLATE NUMBER 634.23
			Sheet 1 of 1

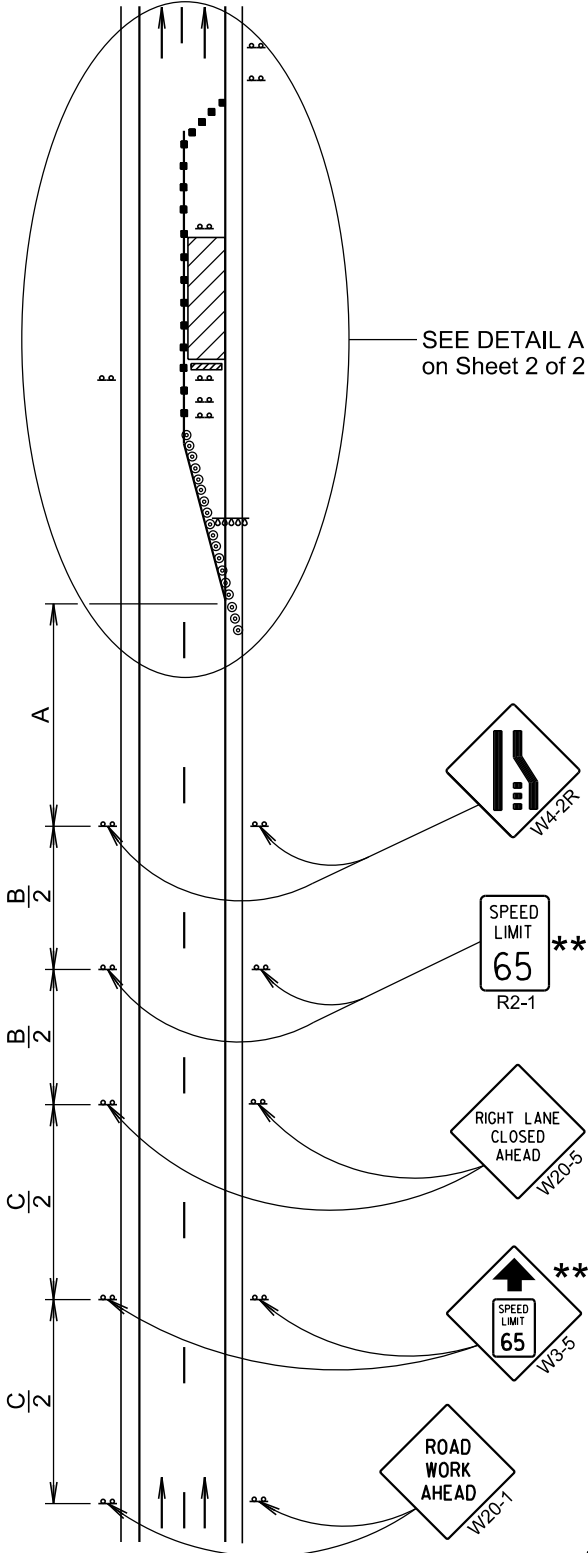
Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet) (A) (B) (C)		
0 - 30	200		
35 - 40	350		
45 - 50	500		
55	750		
60 - 65	1000		
70 - 80	1000	1500	2640

** 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.

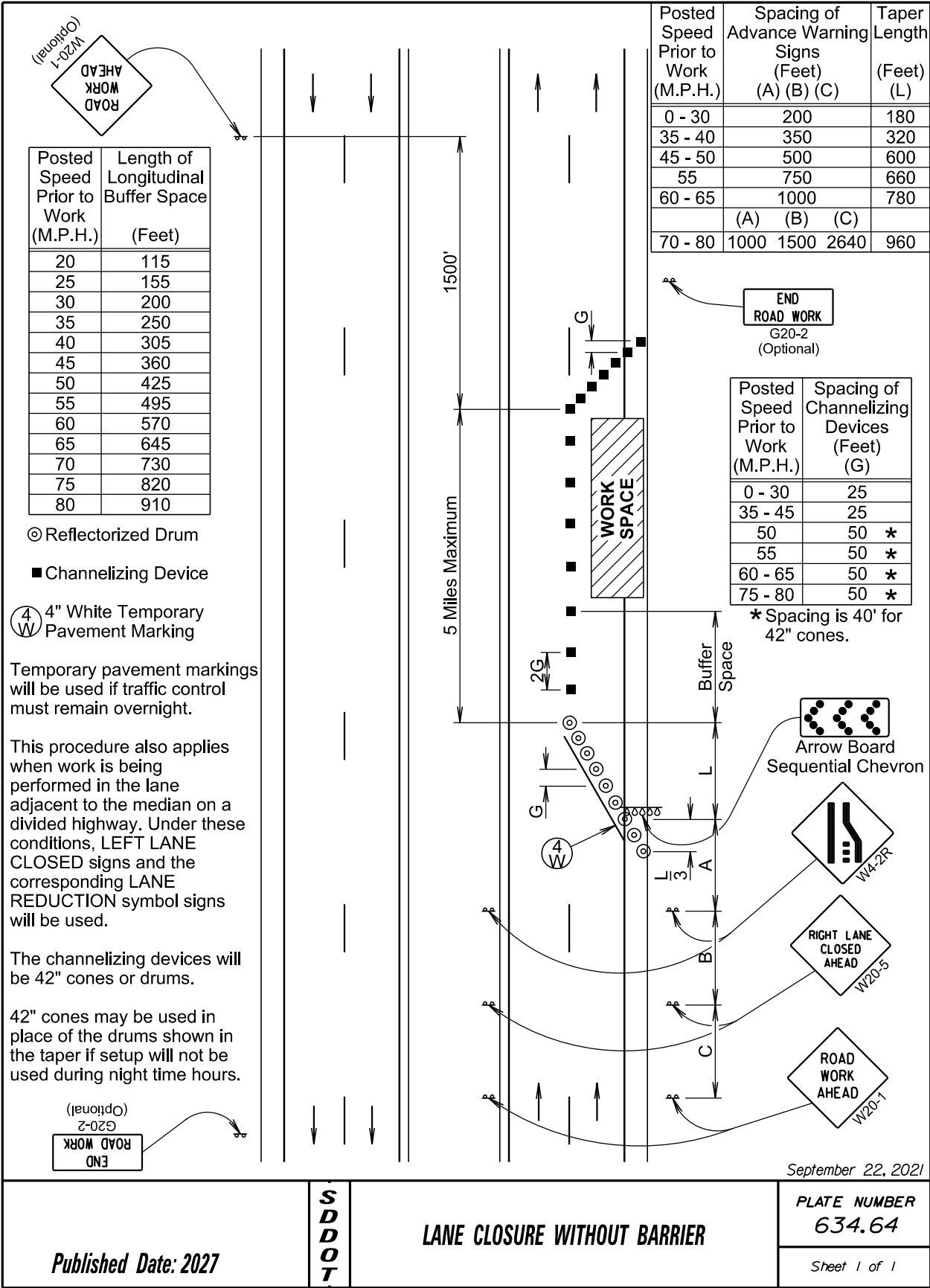
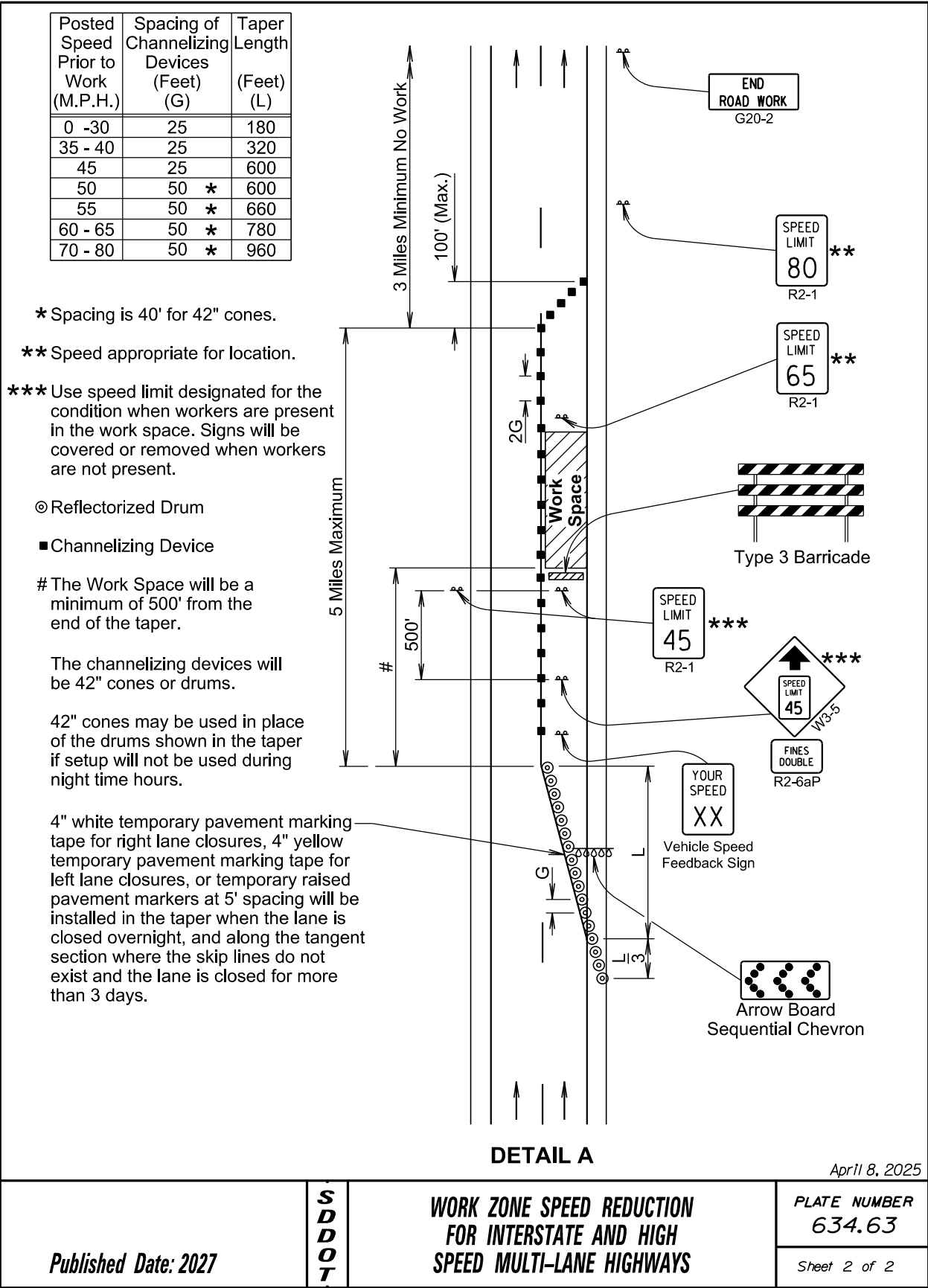


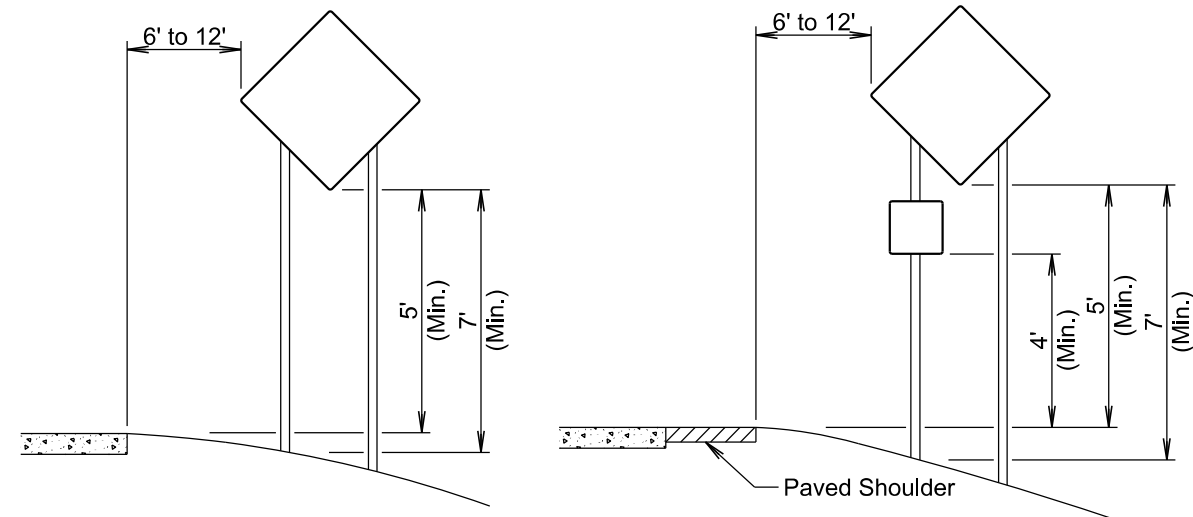
April 8, 2025

Published Date: 2027	S D D O T	WORK ZONE SPEED REDUCTION FOR INTERSTATE AND HIGH SPEED MULTI-LANE HIGHWAYS	PLATE NUMBER 634.63
			Sheet 1 of 2

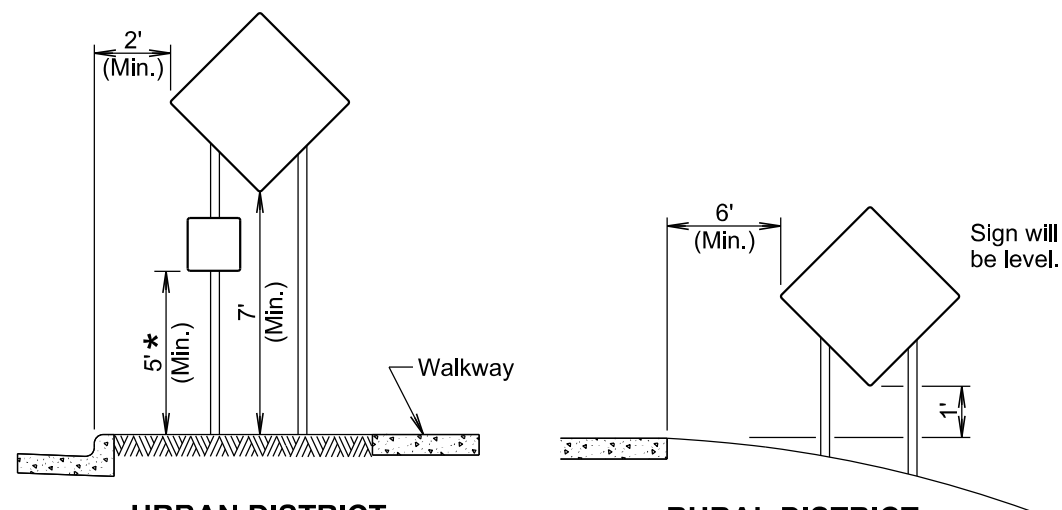
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	029N-171, 029S-171 012-172, 212E-171	25	30

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	029N-171, 029S-171 012-172, 212E-171	26	30





RURAL DISTRICT

RURAL DISTRICT WITH
SUPPLEMENTAL PLATE

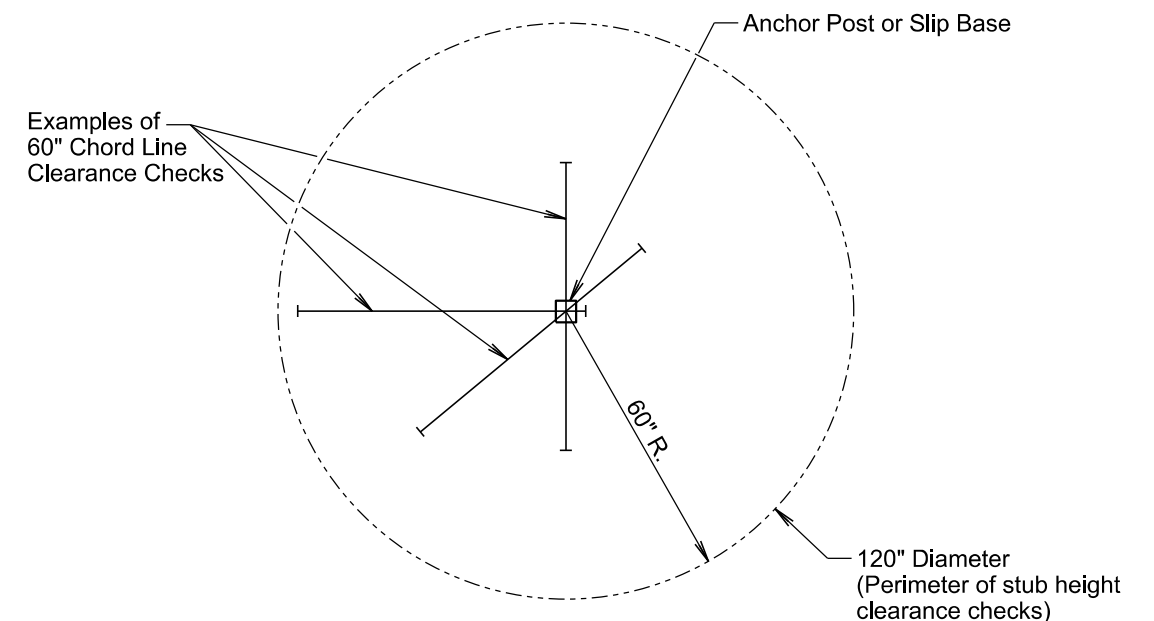
URBAN DISTRICT

**RURAL DISTRICT
3 DAY MAXIMUM**
(Not applicable to regulatory signs)

* 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.

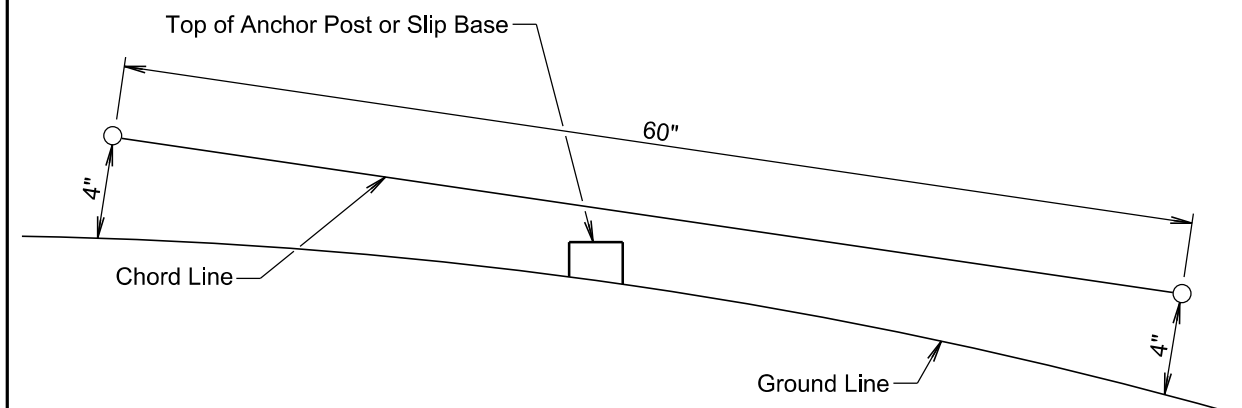
January 22, 2021

<i>Published Date: 2027</i>	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 WILL 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 will be a maximum of 4" above the ground line at the localized area adjacent to the breakaway support stub.

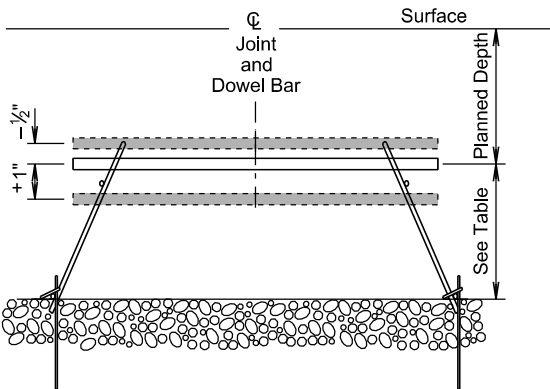
The 4" stub height clearance is not necessary for U-channel lap splices where the support is designed to yield (bend) at the base.

January 22, 2021

<i>Published Date: 2027</i>	S D D O T	BREAKAWAY SUPPORT STUB CLEARANCE	PLATE NUMBER 634.99
			Sheet 1 of 1

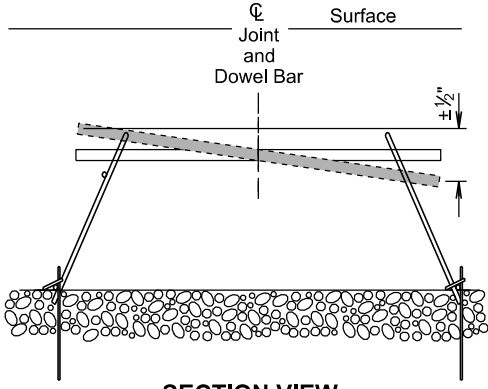
PLOTTED FROM - TRWAINT14

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	029N-171, 029S-171 012-172, 212E-171	28	30



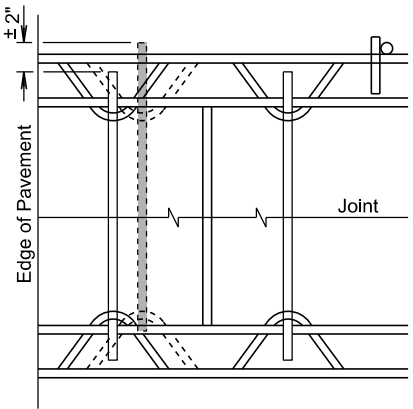
SECTION VIEW
VERTICAL TRANSLATION

Depth: mid-depth + 1 inch or $-\frac{1}{2}$ inch



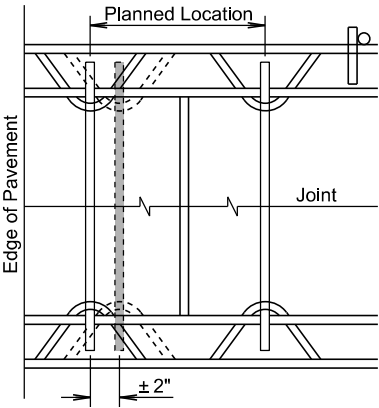
SECTION VIEW
VERTICAL TILT

Vertical rotational alignment: $\frac{1}{2}$ inch over 18 inch



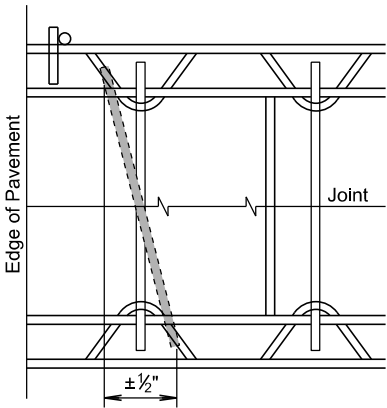
PLAN VIEW
LONGITUDINAL TRANSLATION

Longitudinal side shift: ± 2 inch for
18 inch bars



PLAN VIEW
HORIZONTAL TRANSLATION

Side shift ± 2 inch



PLAN VIEW
HORIZONTAL SKEW

Horizontal rotational alignment:
 $\frac{1}{2}$ inch over 18 inch

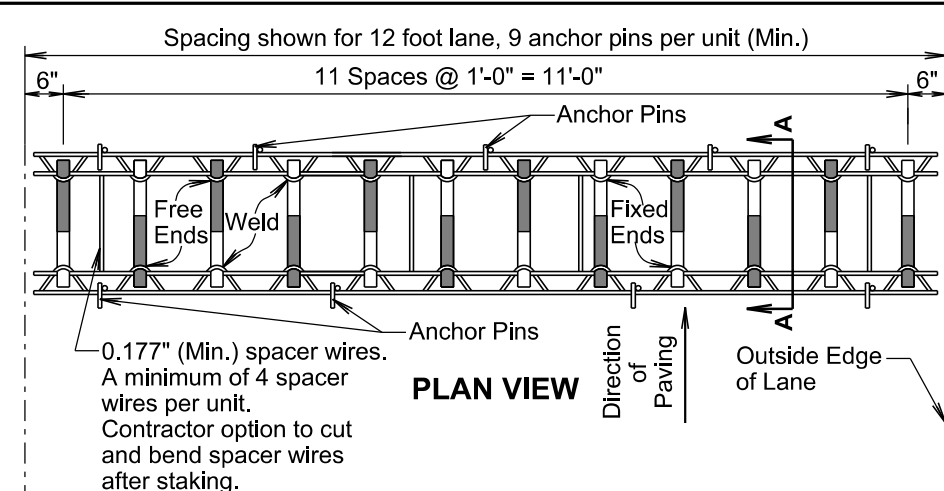
PAVEMENT THICKNESS	EPOXY COATED DOWEL BAR SIZE	HEIGHT TO CENTER
7" to 7½"	1" x 18"	3.0"
8" to 10"	1¼" x 18"	4.0"
10½" to 13"	1½" x 18"	5.0"

GENERAL NOTE:

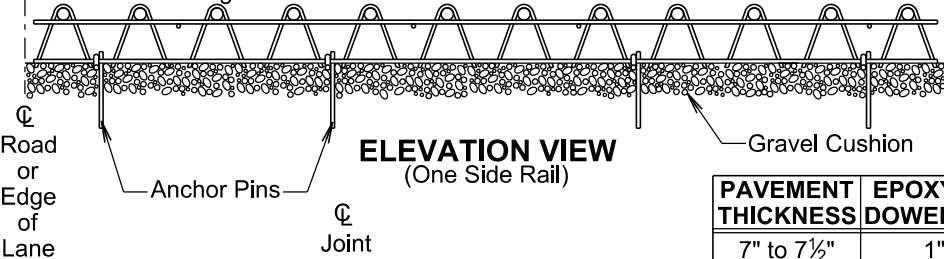
The tolerances shown above represent the maximum deviation for acceptance of dowel bar placement.

November 19, 2022

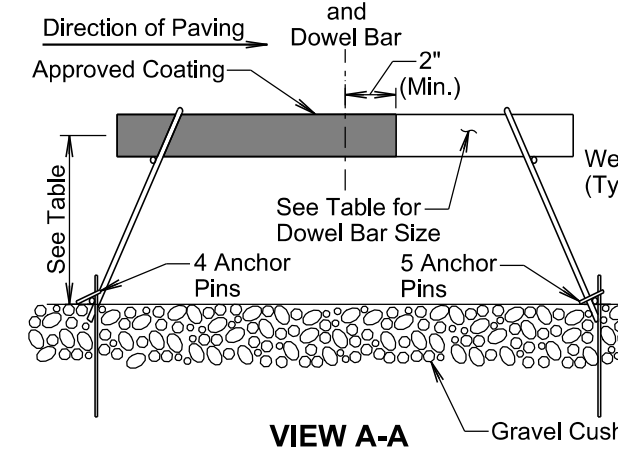
Published Date: 2027	S D D O T	PCC PAVEMENT DOWEL BAR ALIGNMENT TOLERANCES	PLATE NUMBER 380.01
			Sheet 1 of 1



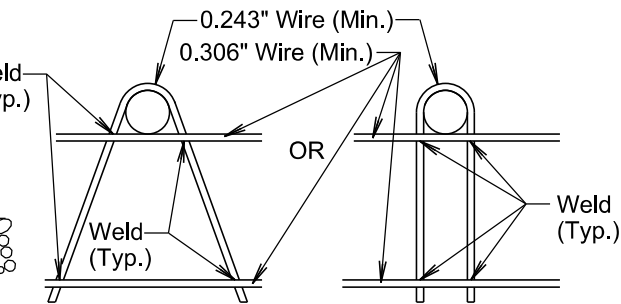
PLAN VIEW



ELEVATION VIEW
(One Side Rail)



VIEW A-A



SIDE RAIL DETAIL OPTIONS

PAVEMENT THICKNESS	EPOXY COATED DOWEL BAR SIZE	HEIGHT TO CENTER
7" to 7½"	1" x 18"	3.0"
8" to 10"	1¼" x 18"	4.0"
10½" to 13"	1½" x 18"	5.0"

GENERAL NOTES:

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

The transverse contraction joints will be sawed perpendicular to the centerline of the roadway. The transverse sawed joint will be centered over the dowel bars.

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

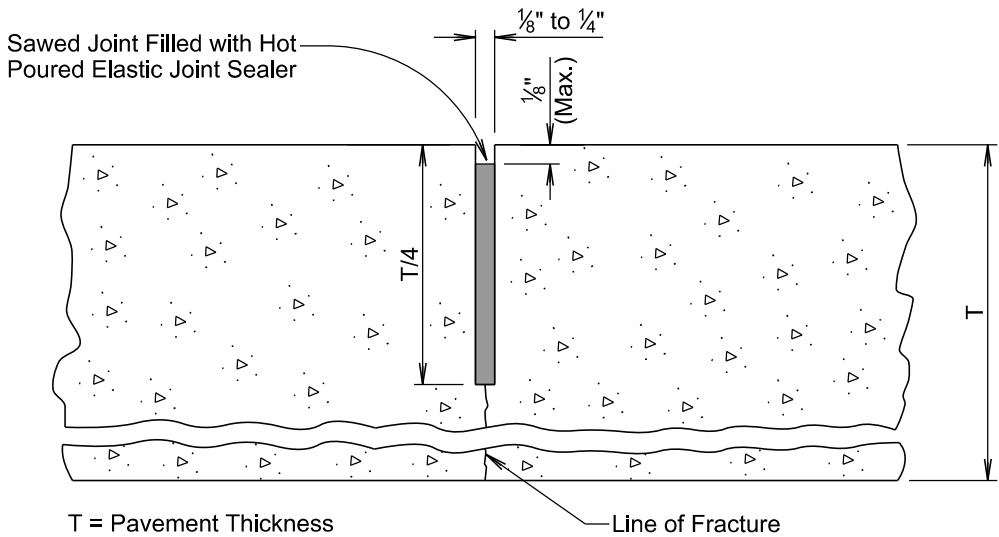
All dowel bar alignment tolerances will be as shown in the PCC Pavement Dowel Bar Alignment Tolerances standard plate.

November 19, 2022

Published Date: 2027	S D D O T	PCC PAVEMENT DOWEL BAR ASSEMBLY FOR TRANSVERSE CONTRACTION JOINTS 12 Bar Assembly on Granular Base Material	PLATE NUMBER 380.04
			Sheet 1 of 1

PLOTTED FROM - TRWAINT14

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	029N-171, 029S-171 012-172, 212E-171	29	30



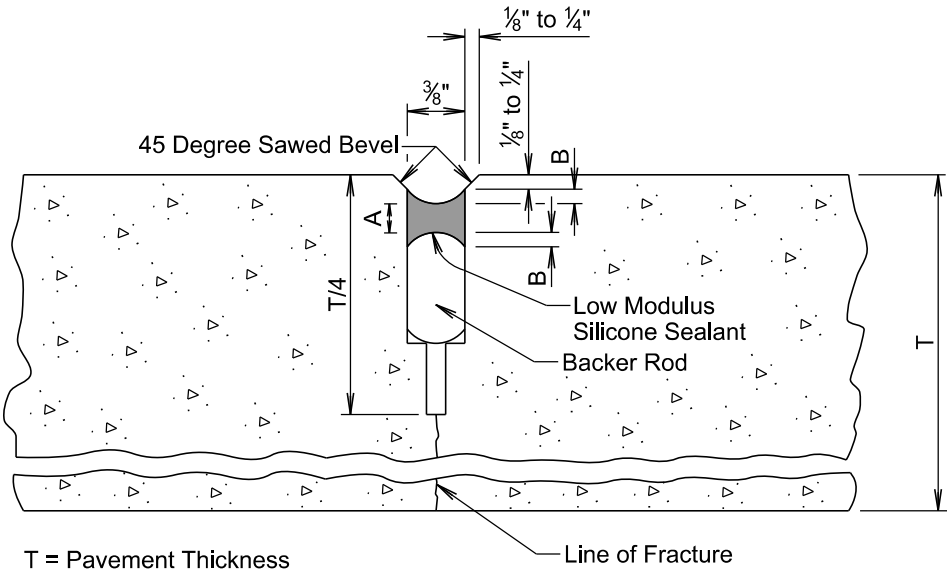
GENERAL NOTES:

If an early entrance saw cut does not develop the full transverse crack, then the saw cut to control cracking will be a minimum ¼ of the thickness of the pavement.

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

November 19, 2022

Published Date: 2027	S D D O T	PCC PAVEMENT TRANSVERSE CONTRACTION JOINT WITH OR WITHOUT DOWEL BAR ASSEMBLY	PLATE NUMBER 380.12
			Sheet 1 of 1



LOW MODULUS SILICONE SEALANT ALLOWABLE CONSTRUCTION TOLERANCES			
A (Min.) (in.)	A (Max.) (in.)	B (Min.) (in.)	B (Max.) (in.)
3/16	5/16	1/8	1/4

GENERAL NOTES:

The first saw cut to control cracking will be a minimum of ¼ the thickness of the pavement. Additional sawing for widening the saw cut to provide the width for the installation of the low modulus silicone joint sealant will be necessary.

The backer rod will be a non-moisture absorbing resilient material approximately 25% larger in diameter than the width of the joint to be sealed.

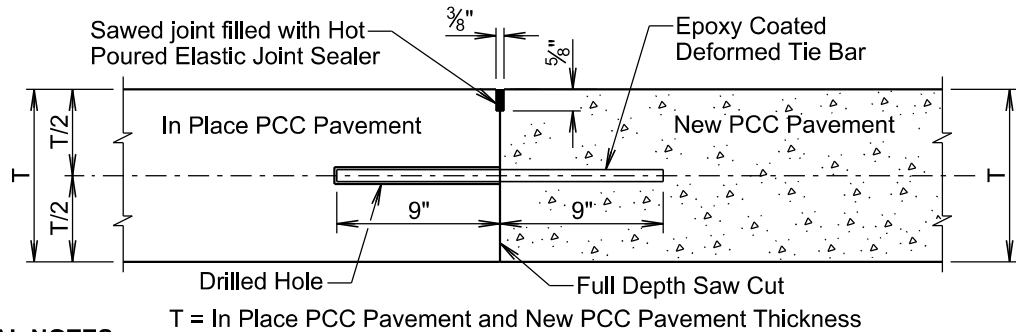
November 19, 2022

Published Date: 2027	S D D O T	PCC PAVEMENT BEVELED TRANSVERSE CONTRACTION JOINT WITH OR WITHOUT DOWEL BAR ASSEMBLY	PLATE NUMBER 380.13
			Sheet 1 of 1

PLOTTED FROM - TRWAINT14

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	029N-171, 029S-171 012-172, 212E-171	30	30

DETAIL A TRANSVERSE CONSTRUCTION JOINT WITH TIE BARS



GENERAL NOTES:

T = In Place PCC Pavement and New PCC Pavement Thickness

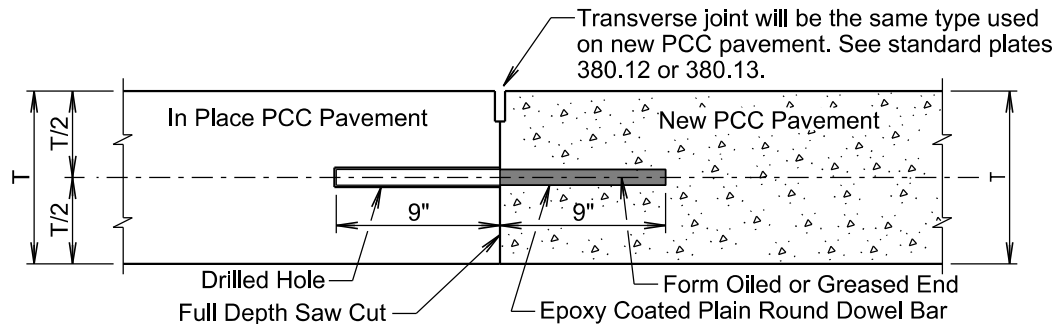
The term "In Place PCC Pavement" in the above drawing indicates that the in place PCC pavement was placed on a previous project.

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

The tie bars will be embedded a minimum depth of 9 inches into the in place PCC pavement and anchored with an epoxy resin adhesive or a non-shrink grout.

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

DETAIL B TRANSVERSE CONSTRUCTION JOINT WITH DOWEL BARS



GENERAL NOTES:

T = In Place PCC Pavement and New PCC Pavement Thickness

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

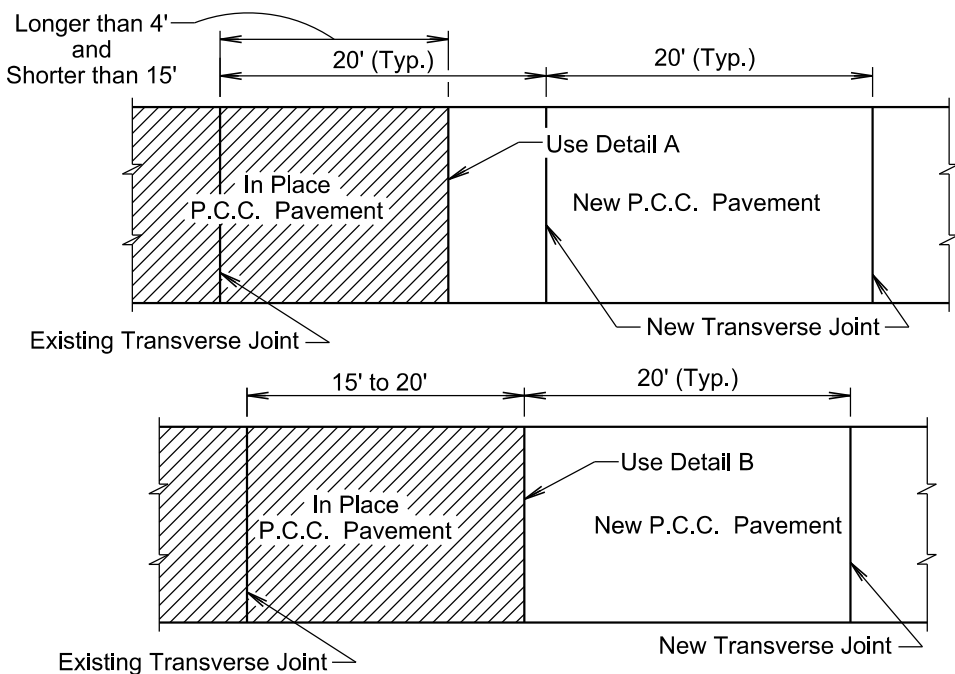
See sheet 2 of 2 of this standard plate to determine if Detail B will be used.

The plain round dowel bars will be embedded a minimum depth of 9 inches into the in place PCC pavement and anchored with an epoxy resin adhesive or a non-shrink grout.

The epoxy coated plain round dowel bar size, number, and spacing will be the same as detailed on the corresponding dowel bar assembly standard plate (380.04, 380.05, 380.06, or 380.07). The epoxy coated plain round dowel bars will be a minimum of 3 inches and a maximum of 6 inches from the pavement edges.

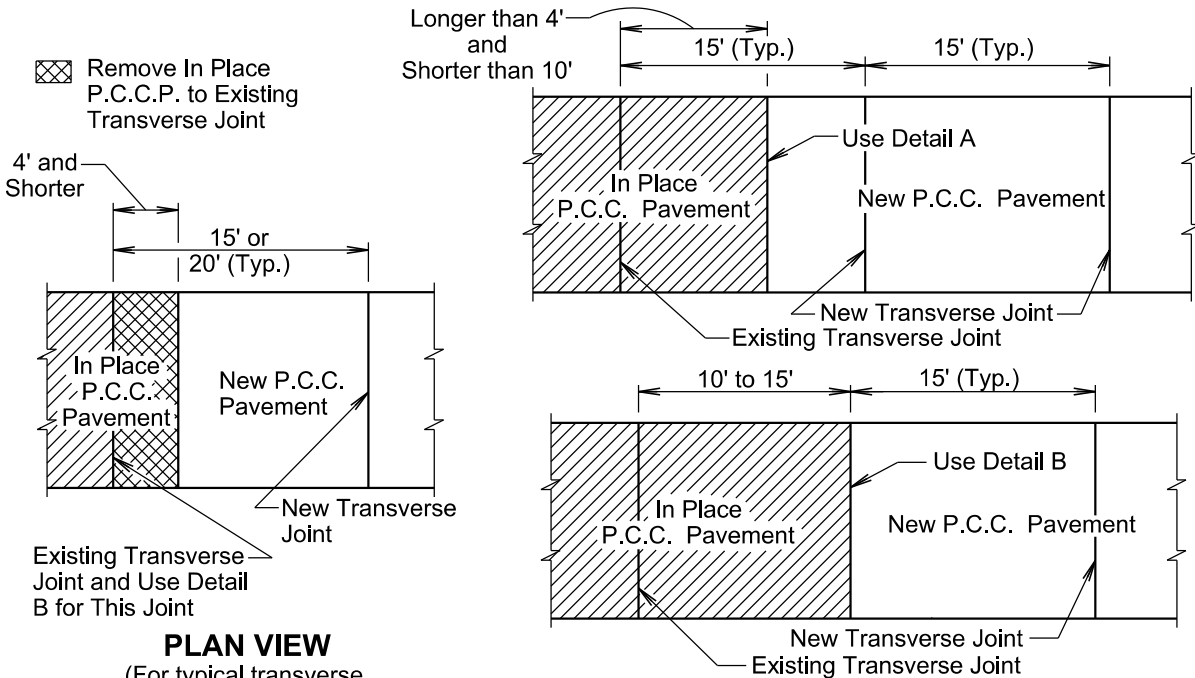
January 22, 2023

Published Date: 2027	S D D O T	PCC PAVEMENT TRANSVERSE CONSTRUCTION JOINTS WITH TIE BARS OR DOWEL BARS	PLATE NUMBER 380.15
			Sheet 1 of 2



PLAN VIEW

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



PLAN VIEW

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

PLAN VIEW

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

January 22, 2023

Published Date: 2027	S D D O T	PCC PAVEMENT TRANSVERSE CONSTRUCTION JOINTS WITH TIE BARS OR DOWEL BARS	PLATE NUMBER 380.15
			Sheet 2 of 2