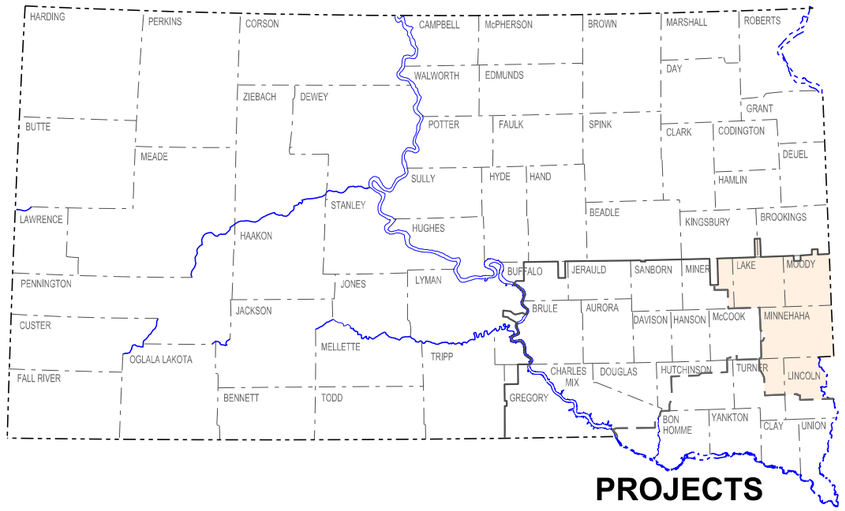
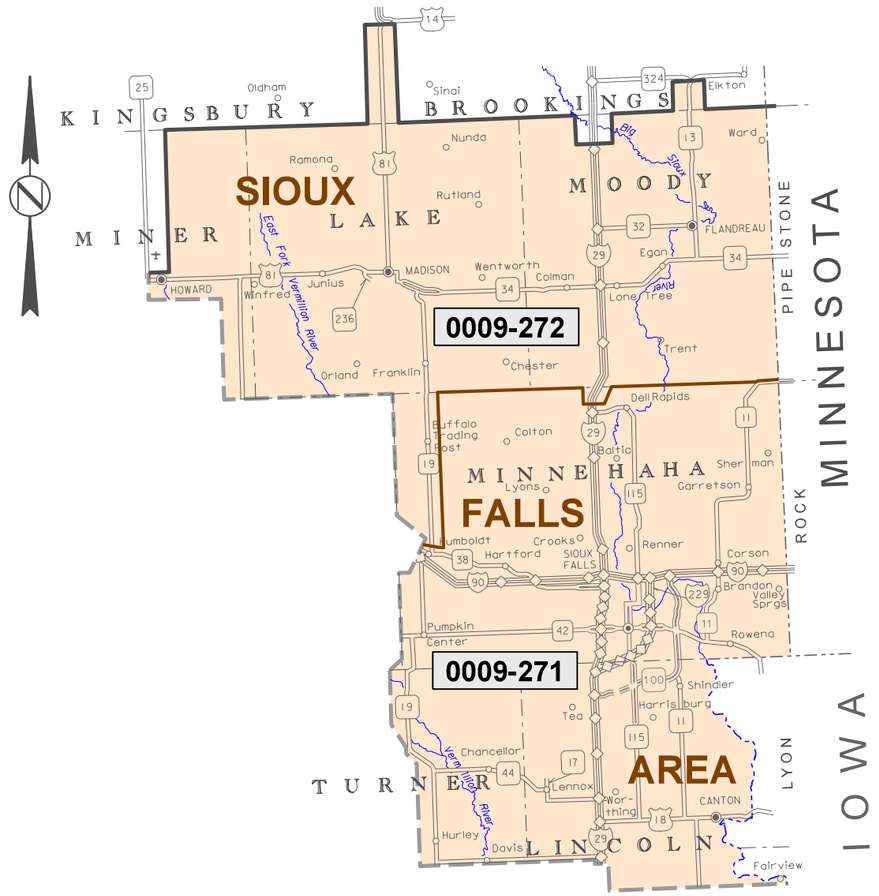


PROJECTS

STATE OF SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION
PLANS FOR PROPOSED
PROJECTS
0009–271 & 0009–272
VARIOUS ROUTES IN THE SIOUX FALLS AREA
ON-CALL PAVEMENT REPAIR
PCN I7X2 & I7X3



STORM WATER PERMIT
(None required)

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	0009-271 & 0009-272	1	32

Plotting Date: 06/06/2025

INDEX OF SHEETS

ESTIMATE OF QUANTITIES

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	0009-271 & 0009-272	2	32

PCN I7X2

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0197	Mobilization 1	5	Each
380E5030	Nonreinforced PCC Pavement Repair	50.0	SqYd
380E5100	Continuously Reinforced PCC Pavement Repair	50.0	SqYd
380E6000	Dowel Bar	36	Each
380E6110	Insert Steel Bar in PCC Pavement	75	Each
634E0010	Flagging	10.0	Hour
634E0110	Traffic Control Signs	482.0	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0126	Traffic Control for Pavement Repair	5	Site
634E0275	Type 3 Barricade	5	Each
634E0420	Type C Advance Warning Arrow Board	2	Each
634E0600	4" Temporary Pavement Marking Tape Type I	288	Ft
634E0640	Temporary Pavement Marking	2,070	Ft
634E0900	Portable Temporary Traffic Control Signal	2	Unit
634E1215	Contractor Furnished Portable Changeable Message Sign	2	Each
634E1255	Contractor Furnished Speed Monitoring Radar Trailer	1	Each

PCN I7X3

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0197	Mobilization 1	10	Each
380E5030	Nonreinforced PCC Pavement Repair	455.0	SqYd
380E5100	Continuously Reinforced PCC Pavement Repair	205.0	SqYd
380E6000	Dowel Bar	372	Each
380E6110	Insert Steel Bar in PCC Pavement	1,380	Each
634E0010	Flagging	50.0	Hour
634E0110	Traffic Control Signs	482.0	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0126	Traffic Control for Pavement Repair	15	Site
634E0275	Type 3 Barricade	15	Each
634E0420	Type C Advance Warning Arrow Board	3	Each
634E0600	4" Temporary Pavement Marking Tape Type I	288	Ft
634E0640	Temporary Pavement Marking	3,840	Ft
634E0900	Portable Temporary Traffic Control Signal	2	Unit
634E1215	Contractor Furnished Portable Changeable Message Sign	4	Each
634E1255	Contractor Furnished Speed Monitoring Radar Trailer	1	Each

SPECIFICATIONS

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

ENVIRONMENTAL COMMITMENTS

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	0009-271 & 0009-272	3	32

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/media/documents/EnvironmentalProceduresManual.pdf >

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 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.

The Contractor will not withdraw water directly from streams of the James, Big Sioux, and Vermillion watersheds without prior approval from the SDDOT Environmental Office.

Action Taken/Required:

The Contractor will obtain the necessary permits from the regulatory agencies such as the South Dakota Department of Agriculture and Natural Resources (DANR) and the United States Army Corps of Engineers (USACE) prior to water extraction activities.

Additional information and mapping of water sources impacted by Aquatic Invasive Species in South Dakota can be accessed at:
< https://sdleastwanted.sd.gov/maps/default.aspx>

< South Dakota Administrative Rule 41:10:04 Aquatic Invasive Species:
https://sdlegislature.gov/rules/DisplayRule.aspx?Rule=41:10:04 >

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.

Construction and/or demolition debris may 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.

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) 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.

UTILITIES

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

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 will contact the Project Engineer to determine if project changes are necessary to avoid utility impacts.

SCOPE OF WORK

This project consists of nonreinforced and continuously reinforced PCCP repair as well as on-call nonreinforced and continuously reinforced PCCP repair. Once a repair is identified, the Contractor will be given notification of the needed repair, and the Contractor will have 21 calendar days from the date of notification to fully complete the identified repair. On call repair needs may exceed estimated quantities.

Full depth areas may vary in length and width; however, the minimum length is 4 feet for partial lane width repair areas and the minimum length is 6 feet for full lane width repair areas on these projects. Minimum size for small repair areas – existing steel maintained, is 1 foot x 1 foot.

MOBILIZATION

Mobilization for the on-call nonreinforced and continuously reinforced PCCP repair as included in PCNs I7X2 & I7X3 will be measured by each mobilization. A mobilization will be considered each time the Contractor has to mobilize to a route or location on which they are not currently working. Only one mobilization will be measured at each new location regardless of the amount of pavement repair needed unless Contractor completes all the work and must return at a later date to complete additional repairs that occurred after the completion of the initial repairs. Additional mobilizations will not be paid at locations where premature failure occur or low cylinder breaks that require removal and replacement. The Engineer will determine the extent of each repair. Pavement repair locations on the same route within 5 miles of each other will be considered one mobilization.

ESTIMATED PCCP REPAIR QUANTITIES

It is estimated that:

Approximately 340.0 of SqYd of NRC Pavement Repair will be on I90, EB & WB lanes from MRM 395.00 to MRM 396.40.

Approximately 130.0 of SqYd of CRC Pavement Repair will be on I29, NB & SB lanes from MRM 63.40 to MRM 71.00.

EXISTING NRC PAVEMENT – I90 NB & SB

The existing pavement is 11.5” x 26’ NRC Pavement in the EB lanes & 11.5” x 38’ NRC Pavement in the WB lanes. Pavement dimensions at other locations will vary.

Existing contraction joints are spaced 20’. Longitudinal joints are reinforced with No. 5 x 30” deformed tie bars spaced 48” center to center.

The aggregate in the existing NRC Pavement is quartzite.

EXISTING CRC PAVEMENT – I29 NB & SB

The existing pavement is 11” x 26’ CRC Pavement. The longitudinal reinforcing steel consists of No. 6 deformed bars spaced 6” center to center, and the transverse reinforcing steel consist of No. 4 deformed bars spaced 48” center to center. Pavement dimensions at other locations will vary.

The aggregate in the existing CRC Pavement is quartzite.

RESTORATION OF GRAVEL CUSHION

An inspection of the gravel cushion will be made after removing concrete from each pavement replacement area. Areas of excess moisture will be dried to the satisfaction of the Engineer. Loose material will be removed. Each replacement area will be leveled and compacted to the satisfaction of the Engineer at no additional cost.

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

NONREINFORCED PCC PAVEMENT REPAIR -GENERAL

New pavement thickness will equal existing pavement thickness (Tn=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 the 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. Use only for full roadway width repairs (across all lanes).

Concrete placed adjacent to gravel and 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 existing working joint material along the longitudinal joint from existing working joint to the new working joint. The expansion joint material will meet the new 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. Refer to Saw and Seal Joints notes.

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 (AASHTO M148, 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 60ºF or higher throughout the cure period. If the concrete temperature falls below 60ºF, 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 gravel and asphalt concrete shoulders, labor, tools and equipment will be included in the contract unit price per square yard for Nonreinforced PCC Pavement Repair.

SAW AND SEAL JOINTS (NRCP)

Longitudinal and transverse joints at concrete repair areas will be sawed and sealed. Joint sealing will conform to Section 380.3 P.

Longitudinal and transverse joints in urban sections will be sealed with Hot Poured Elastic Joint Sealer. Transverse joints in rural sections will 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.

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

Cost for sawing and sealing of the longitudinal construction joint and both transverse joints will be incidental to the contract unit prices 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.

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.

CONTINUOUSLY REINFORCED PCC PAVEMENT REPAIR (CONTINUED)

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 60ºF or higher throughout the cure period. If the concrete temperature falls below 60ºF, 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.

SAW AND SEAL LONGITUDINAL JOINTS (CRCP)

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

Joint sealing will conform to Section 380.3 P.

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

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

REINFORCING STEEL (CRCP)

Reinforcing steel will conform to Section 1010.

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

At full lane and partial lane width repair areas:
New longitudinal bars will be lap spliced with the preserved in place longitudinal bars (New bar diameter to match in place bar diameter).

Additional transverse bars will 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 will 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 will be inserted according to the notes for STEEL BAR INSERTION (CRCP).

At full lane width repair areas:
Additional longitudinal bars will 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 will be inserted in accordance with the notes for STEEL BAR INSERTION (CRCP). The additional longitudinal bars will then be lap spliced.

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

STEEL BAR INSERTION (CRCP)

Steel bars will 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 will be inserted 9 inches into the in place concrete at the transverse joint and centered between every other set of two spliced longitudinal bars throughout the width of the repair area. Transverse deformed bars will be lap spliced with deformed tie bars which are inserted 9 inches 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.

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

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) will 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, inserting reinforcing steel bars into the drilled holes, and any incidentals necessary to complete the work will be included in the contract unit price per each for Insert Steel Bar in PCC Pavement.

STEEL BAR INSERTION (NRCP)

Steel bars will conform to Section 1010.

Locations and quantities of concrete 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 work.

For existing pavement thickness greater than or equal to 10.5” (T>= 10.5”):
The Contractor will insert the steel bars (1 ¼” x 18” epoxy coated 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 380.3 C.1.

Steel bars will be inserted in the transverse joint on 18” centers. The first steel bar in the transverse joint will be placed 9” from the edge of the slab closest to centerline. Steel bars will be inserted in the longitudinal joint on 30” centers and will 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 hole

WORK ZONE SPEED REDUCTION

The Department is required to obtain a speed reduction resolution prior to the installation of any SPEED LIMIT (R2-1) signs shown on standard plate 634.63 or as shown in the plans. To provide adequate time for the resolution to be enacted, the Contractor will inform the Engineer a minimum of 3 weeks prior to the scheduled installation of any work zone speed reduction signs on the project. The information provided by the Contractor will include the anticipated date of sign installation, the newly reduced speed limit, the location of the work zone, and the anticipated completion date of work requiring the speed reduction.

TEMPORARY PAVEMENT MARKING

Temporary pavement marking on centerline will consist of temporary flexible vertical markers (tabs) and will be used as depicted on Standard Plate 634.25 when the stop condition must remain in place during nighttime hours 9:00 PM to 6:00 AM.

Cost for temporary pavement marking will be included in the contract unit price per foot for Temporary Pavement Marking.

Temporary pavement marking for stop bars will consist of 4” Temporary Pavement Marking Tape Type I. Placement of each 24” white stop bar may 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.

Cost for temporary pavement marking for stop bars will be included in the contract unit price per foot for 4” Temporary Pavement Marking Tape Type I.

CONTRACTOR FURNISHED PORTABLE CHANGEABLE MESSAGE SIGN

One week prior to starting work affecting the traveling public, portable changeable message signs (PCMs) will be installed at locations detailed in the plans to notify drivers of the upcoming construction. The Contractor will program the portable changeable message signs with the following message:

ROAD WORK
STARTS(Date)

When work begins that will affect traffic patterns, the Contractor will re-program the PCMs with the following message:

LANE CLOSURE
AHEAD

REDUCE SPEED

LANE CLOSURES

Interstate lane closures shorter than 5 miles will be used if 5 miles is greater than the length of work that can be accomplished in one day’s production. More than one lane closure may be permitted; however, there will be a minimum of a three-mile section between lane closures, excluding tapers.

Interstate lane closures will be removed when work will not be occurring for a period of 3 or more calendar days. Activities that do not involve workers being present such as curing time for concrete, constitute work. Lane closures will not be set up on a Friday if no work will be occurring on Saturday or Sunday. In these cases, the lane closure will be installed on Monday.

MAINTENANCE OF TRAFFIC – PCC PAVEMENT REPAIR

Quantities for Traffic Control for Pavement Repair per site have been included for the on-call pavement repair PCNs I7X2 & I7X3. A site will be measured for each traffic control lane closure set up necessary for pavement repairs. A site will not be measured for pavement for modifications to lane closures such as switching lanes or changing the length. All Specifications associated with the item Traffic Control Miscellaneous as per section 634 will apply to Traffic Control for Pavement Repair. Cost included in the item Traffic Control, Miscellaneous as per section 634 will be included in the cost for Traffic Control for Pavement Repair per each site.

Additional Type 3 barricades will be installed facing traffic within the closed lane at a spacing of 1/4 mile. At intersection roadways, two additional Type 3 barricades will be used to block the entire closed lane and shoulder.

Each mainline concrete repair location from which the in-place concrete has been removed will be marked with a minimum of two reflectorized drums.

Construction workspaces on undivided roadways will be limited to 300 feet in Length for lane closures using stop signs. Drivers in two-way traffic workspaces must be able to see approaching traffic through and beyond the work zone. If traffic cannot see approaching vehicles, 24-hour flagging will be required.

Construction workspaces in urban areas will be limited to 3 blocks in length. The minimum distance between workspaces will 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 will be filled with gravel cushion material and cold-mix asphalt concrete prior to opening the lane to traffic. Gravel cushion material and cold-mix asphalt concrete will be furnished by the Contractor.

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

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

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

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 apparent routing of traffic onto these shoulders around the work zones.

Traffic approaching the project from intersecting roadways, streets and approaches must be adequately accommodated. Major intersections or large commercial entrances may require additional signing, flaggers and other traffic control devices on a temporary basis until work activities pass these areas.

Cost for material (except signs, corresponding supports and hardware), labor, delivery, set up and maintenance of all necessary traffic control devices for each site will be included in the contract unit price per site for Traffic Control for Pavement Repair. Cost for signs, corresponding supports and hardware will be included in the contract unit price per square foot for Traffic Control Signs, per Specification.

PCN I7X2

ITEMIZED LIST FOR TRAFFIC CONTROL SIGNS

		CONVENTIONAL ROAD				EXPRESSWAY / INTERSTATE			
SIGN CODE	SIGN DESCRIPTION	NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT	NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
R1-1	STOP	2	30"	5.2	10.4		36"	7.5	
R2-1	SPEED LIMIT 45		24" x 30"	5.0		2	36" x 48"	12.0	24.0
R2-1	SPEED LIMIT 65		24" x 30"	5.0		3	36" x 48"	12.0	36.0
R2-1	SPEED LIMIT 80		24" x 30"	5.0		1	36" x 48"	12.0	12.0
R2-6aP	FINES DOUBLE (plaque)		24" x 18"	3.0		1	36" x 24"	6.0	6.0
R10-6	STOP HERE ON RED	2	24" x 36"	6.0	12.0				
W1-3	REVERSE TURN (L or R)	2	48" x 48"	16.0	32.0		48" x 48"	16.0	
W1-4	REVERSE CURVE (L or R)	1	48" x 48"	16.0	16.0		48" x 48"	16.0	
W3-1	STOP AHEAD (symbol)	2	48" x 48"	16.0	32.0		48" x 48"	16.0	
W3-3	SIGNAL AHEAD (symbol)	2	48" x 48"	16.0	32.0		48" x 48"	16.0	
W3-5	SPEED REDUCTION AHEAD (45 MPH)		48" x 48"	16.0		1	48" x 48"	16.0	16.0
W3-5	SPEED REDUCTION AHEAD (65 MPH)		48" x 48"	16.0		2	48" x 48"	16.0	32.0
W4-2	LEFT or RIGHT LANE ENDS (symbol)		48" x 48"	16.0		2	48" x 48"	16.0	32.0
W13-1P	ADVISORY SPEED (plaque)	2	30" x 30"	6.3	12.6		30" x 30"	6.3	
W20-1	ROAD WORK AHEAD	2	48" x 48"	16.0	32.0	2	48" x 48"	16.0	32.0
W20-4	ONE LANE ROAD AHEAD	2	48" x 48"	16.0	32.0		48" x 48"	16.0	
W20-5	LEFT or RIGHT LANE CLOSED AHEAD		48" x 48"	16.0		2	48" x 48"	16.0	32.0
W20-7	FLAGGER (symbol)	2	48" x 48"	16.0	32.0		48" x 48"	16.0	
G20-2	END ROAD WORK	2	36" x 18"	4.5	9.0	1	48" x 24"	8.0	8.0
		CONVENTIONAL ROAD TRAFFIC CONTROL SIGNS SQFT			252.0	EXPRESSWAY / INTERSTATE TRAFFIC CONTROL SIGNS SQFT			230.0

PCN I7X3

ITEMIZED LIST FOR TRAFFIC CONTROL SIGNS

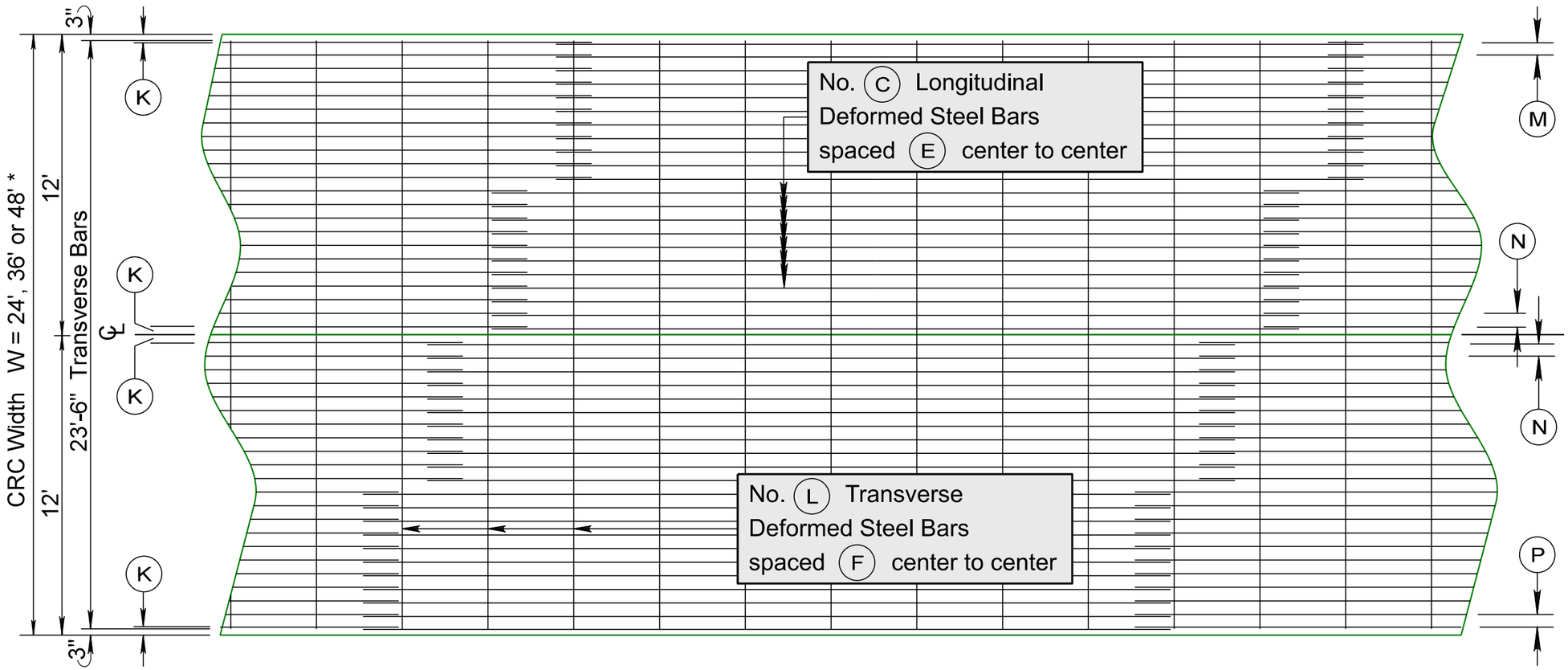
		CONVENTIONAL ROAD				EXPRESSWAY / INTERSTATE			
SIGN CODE	SIGN DESCRIPTION	NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT	NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
R1-1	STOP	2	30"	5.2	10.4		36"	7.5	
R2-1	SPEED LIMIT 45		24" x 30"	5.0		2	36" x 48"	12.0	24.0
R2-1	SPEED LIMIT 65		24" x 30"	5.0		3	36" x 48"	12.0	36.0
R2-1	SPEED LIMIT 80		24" x 30"	5.0		1	36" x 48"	12.0	12.0
R2-6aP	FINES DOUBLE (plaque)		24" x 18"	3.0		1	36" x 24"	6.0	6.0
R10-6	STOP HERE ON RED	2	24" x 36"	6.0	12.0				
W1-3	REVERSE TURN (L or R)	2	48" x 48"	16.0	32.0		48" x 48"	16.0	
W1-4	REVERSE CURVE (L or R)	1	48" x 48"	16.0	16.0		48" x 48"	16.0	
W3-1	STOP AHEAD (symbol)	2	48" x 48"	16.0	32.0		48" x 48"	16.0	
W3-3	SIGNAL AHEAD (symbol)	2	48" x 48"	16.0	32.0		48" x 48"	16.0	
W3-5	SPEED REDUCTION AHEAD (45 MPH)		48" x 48"	16.0		1	48" x 48"	16.0	16.0
W3-5	SPEED REDUCTION AHEAD (65 MPH)		48" x 48"	16.0		2	48" x 48"	16.0	32.0
W4-2	LEFT or RIGHT LANE ENDS (symbol)		48" x 48"	16.0		2	48" x 48"	16.0	32.0
W13-1P	ADVISORY SPEED (plaque)	2	30" x 30"	6.3	12.6		30" x 30"	6.3	
W20-1	ROAD WORK AHEAD	2	48" x 48"	16.0	32.0	2	48" x 48"	16.0	32.0
W20-4	ONE LANE ROAD AHEAD	2	48" x 48"	16.0	32.0		48" x 48"	16.0	
W20-5	LEFT or RIGHT LANE CLOSED AHEAD		48" x 48"	16.0		2	48" x 48"	16.0	32.0
W20-7	FLAGGER (symbol)	2	48" x 48"	16.0	32.0		48" x 48"	16.0	
G20-2	END ROAD WORK	2	36" x 18"	4.5	9.0	1	48" x 24"	8.0	8.0
		CONVENTIONAL ROAD TRAFFIC CONTROL SIGNS SQFT			252.0	EXPRESSWAY / INTERSTATE TRAFFIC CONTROL SIGNS SQFT			230.0

24', 36' & 48' * CRC PAVEMENT - IN PLACE

*** And other miscellaneous widths (may include CRC shoulders)**

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	0009-271 & 0009-272	8	32

Plotting Date: 04/17/2025

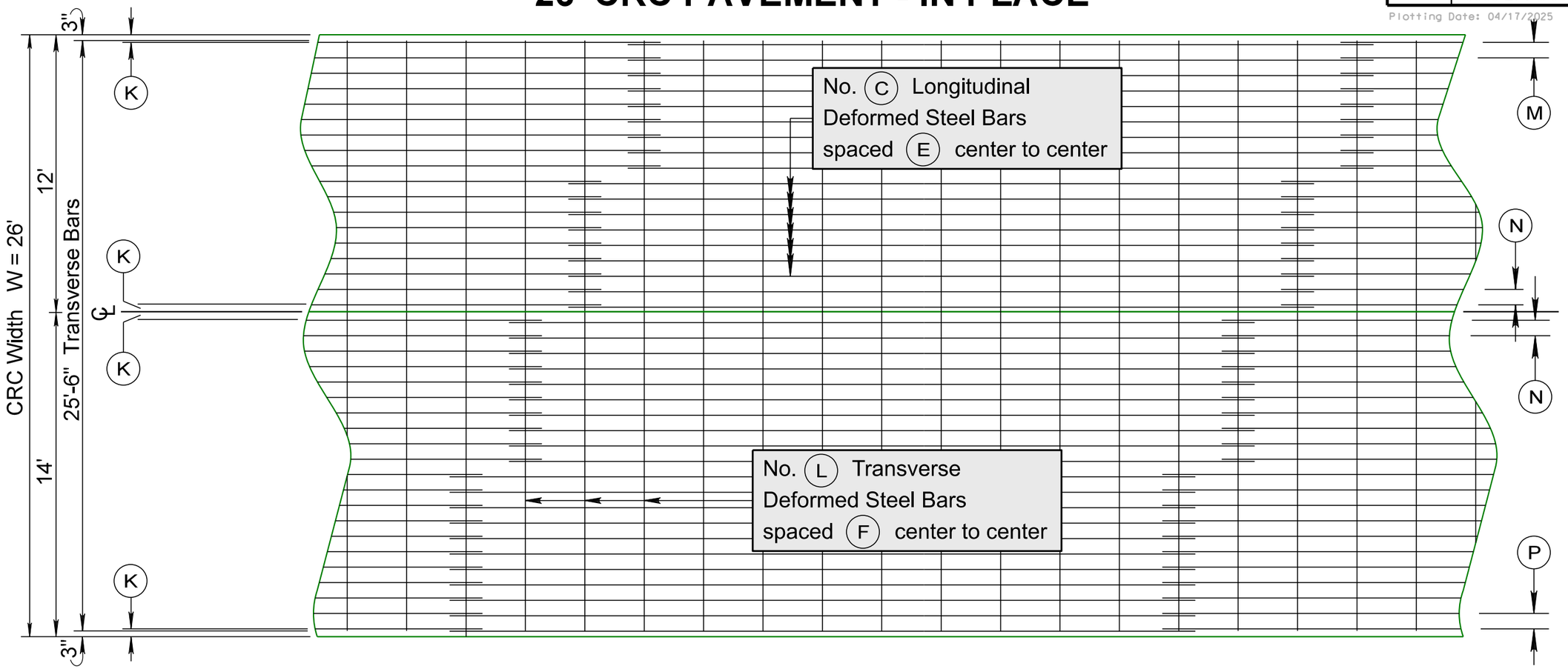


MITCHELL REGION INTERSTATE CRC PAVEMENT KEY & DIMENSIONS	Underlying Plans	CRC Depth	CRC Width	Longitudinal Steel Size	Longitudinal Steel Spacing	Transverse Steel Size	Transverse Steel Spacing	Perimeter Bar Spacing			
Location	PCN	T	W	C	E	L	F	K	M	N	P
I90E/W MRM 263.53 +0.010 to 265.00 +0.428	3781	9.5"	24'/36'	6	6½"	6	48"	3¾"	6½"	6½"	6½"
I90E MRM 251.09 +0.506 to 259.52 & MRM 259.60 to 259.90	3028	10"	24'	6	6½"	6	48"	3¾"	6½"	6½"	6½"
I90W MRM 251.09 +0.509 to 259.52 & MRM 259.60 to 259.88	4766	10"	24'	6	6½"	4	48"	3¾"	6½"	6½"	6½"
I229N/S Approach Slabs for 57th St Tunnel (Double Matte Steel)	0549	10"	52'	4&8	18"&6"	4&6	18"&12"	3"	6"	6"	6"
I229N/S Approach Pavement and Pavement over 57th St Tunnel	0549	10"	52'	7	6"	4	16"	3"	6"	6"	6"
I229N/S MRM 2.08 to 5.32 +0.067 & MRM 5.68 +0.090 to 8.28 +0.687	1231	10.5"	24'/36'	6	6"	4	48"	4"	5"	5"	5"
I29S MRM 83.00 +0.790 to 84.39	3785	10.5"	40'/42'	6	6"	4	48"	4"	5"	5"	5"
I29N/S MRM 73.38 to MRM 73.38 +0.634	1948	11"	34'/36'	7	7"	4	36"	6"	6"	7"	6"
I29N MRM 79.26 +0.246 to 80.29 +0.246 & I29S MRM 79.26 +0.246 to 80.29 +0.251	A443 & 02P3	12"	36'/48'	7	6½"	4	36"	4"	6"	6½"	6"
I29N MRM 80.29 +0.246 to 83.00 +0.790 & I29S MRM 80.29 +0.251 to 83.00 +0.790	1177 & 02P3	12"	36'/48'	7	6½"	4	36"	4"	6"	6½"	6"

26' CRC PAVEMENT - IN PLACE

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	0009-271 & 0009-272	9	32

Plotting Date: 04/17/2025



MITCHELL REGION INTERSTATE CRC PAVEMENT KEY & DIMENSIONS	Underlying Plans	CRC Depth	CRC Width	Longitudinal Steel Size	Longitudinal Steel Spacing	Transverse Steel Size	Transverse Steel Spacing	Perimeter Bar Spacing			
Location	PCN	T	W	C	E	L	F	K	M	N	P
I29N MRM 85.00 +0.405 to 110.10 +0.123 & I29S MRM 85.00 +0.435 to 110.11 +0.093 I90E MRM 401.61 +0.124 to 412.52 & I90W MRM 401.61 +0.123 to 412.52	3784, 3785, 203P, 4428, 3945 & 3467	8"	26'	6	8"	4	36"	4"	8"	8"	8"
I90E MRM 353.07 +0.006 to 362.00 +0.040	3944	10"	26'	6	6¼"	4	42"	3"	6¾"	6¼"	5¾"
I29N MRM 27.00 + 0.041 to 37.32 +0.144	5587	10"	26'	6	6½"	4	42"	3¾"	6½"	6½"	4½"
I29S MRM 27.00 + 0.058 to 37.32 +0.138 & I90W MRM 353.07 +0.006 to 362.00 +0.045	5886 & 5359	10"	26'	6	6½"	4	48"	3¾"	6½"	6½"	4½"
I90E/W MRM 334.54 +0.004 to 353.07 +0.006	5363, 4431, 5365 & 5364	10.5"	26'	6	6"	4	42"	3"	6"	6"	6"
I29S MRM 84.39 to 84.00 +0.910	3785	10.5"	26'	6	6"	4	48"	4"	5"	5"	5"
I29N MRM 61.00 +0.888 to 72.00 +0.866 & I29S MRM 61.00 +0.888 to 62.00 +0.443	5360	11"	26'	6	6"	4	48"	4"	5"	5"	5"
I29S MRM 62.00 +0.443 to MRM 72.00 +0.875	5367	11"	26'	6	6½"	4	48"	3¾"	6½"	6½"	4½"
I29N MRM 72.00 +0.866 to 73.38 & I29S MRM 72.00 +0.875 to 73.38	1948	11"	26'	7	7"	4	36"	6"	6"	7"	9"
I29N MRM 4.35 +0.463 to 17.00 +0.406 & I29S MRM 37.32 +0.138 to 46.31 +0.600	6176 & 6181	11.5"	26'	5	4½"	4	42"	3"	3"	4½"	4½"

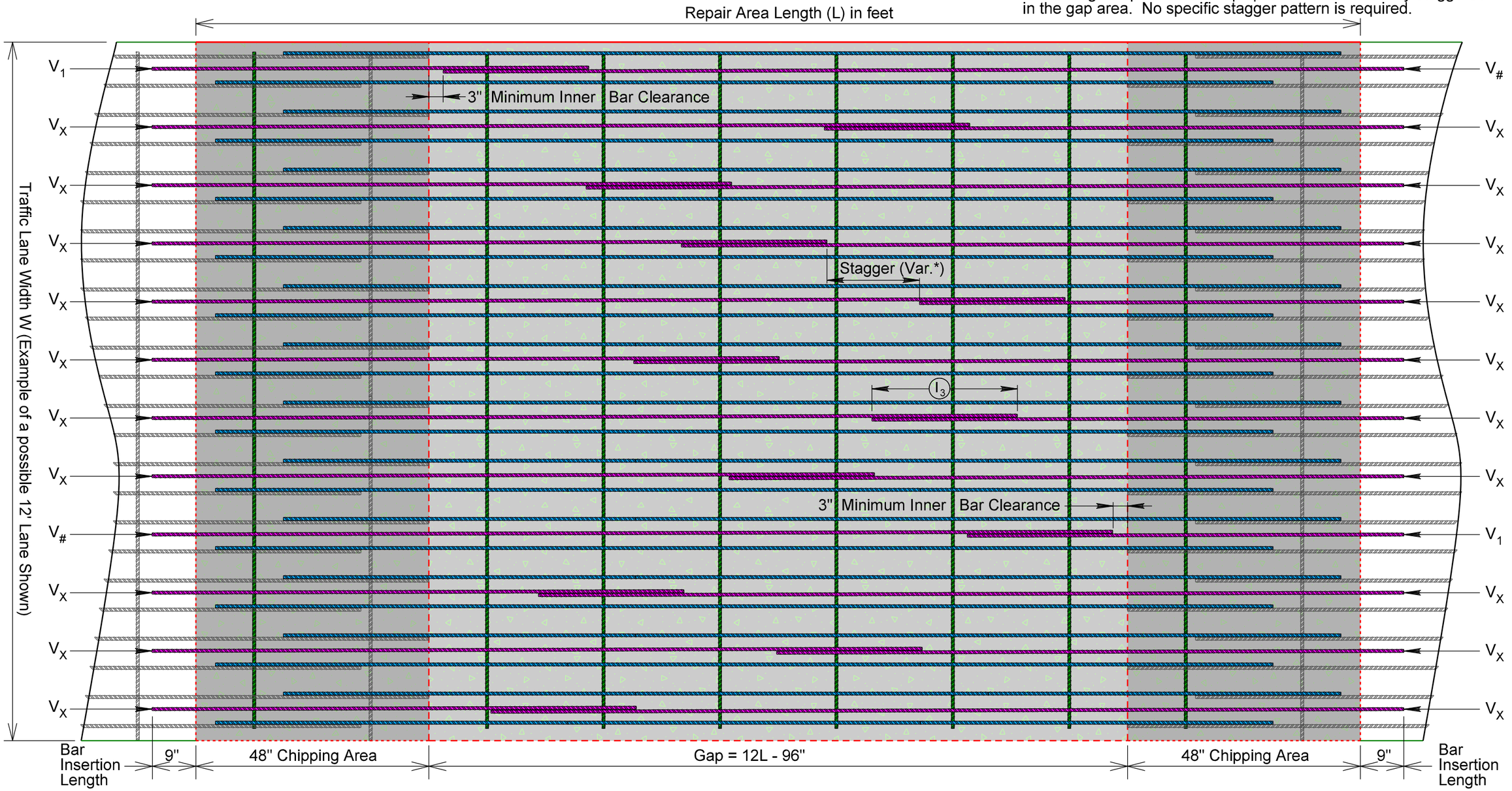
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	0009-271 & 0009-272	10	32

Plotting Date: 04/17/2025

CRC PAVEMENT REPAIR - INSERTED LONGITUDINAL BAR LENGTHS

(For Full Width Repair Area Length L >= 16') - TYPICAL

* In order to minimize concentration of steel, bar lengths will be cut to the lengths specified and lap splices will be randomly staggered in the gap area. No specific stagger pattern is required.

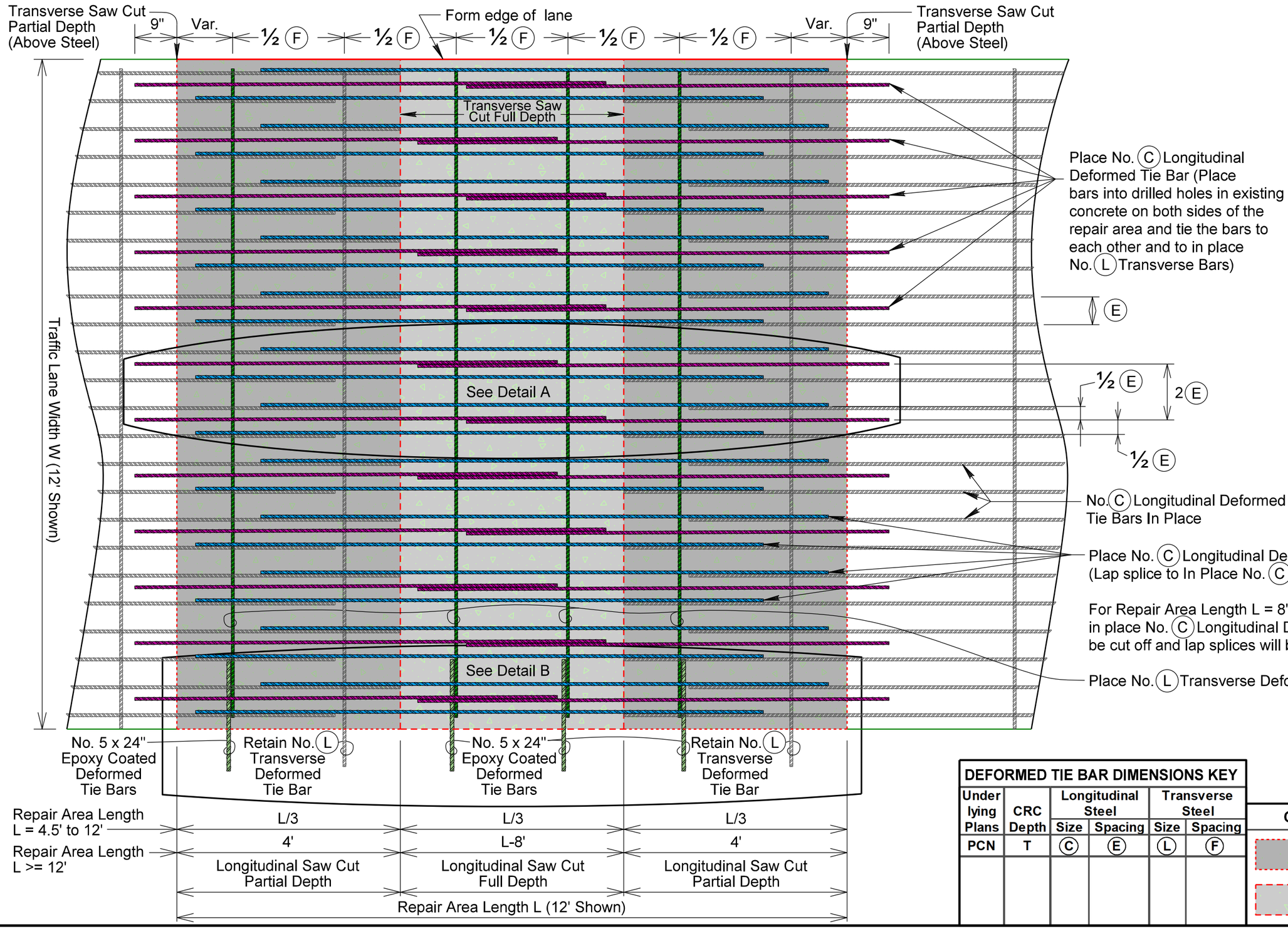


V_1 = Shortest Bar Length	$V_\#$ = Longest Bar Length	V_X = Any Other Inserted Longitudinal Bar Length	LAP SPLICE LENGTH KEY	CRC REPAIR AREA KEY
V_1 = Bar Insertion Length 9" + Chipping Area +48" + Inner Bar Clearance +3" + Lap Splice Length + I_3	$V_\#$ = Bar Insertion Length +9" + Chipping Area +48" + Gap +12L - 96" - Inner Bar Clearance - 3"	$V_X = V_1 + \frac{(X - 1) \times (V_\# - V_1)}{(\# - 1)}$ where X is the number of any bar from the shortest to the longest, and where # is the number of bars required on each side of the repair area.	I_3 Lap Splice Length For CRC Depth < 11" I_3 = 25" For CRC Depth >= 11" I_3 = 30"	Remove Concrete Retain Reinforcing Steel Remove Concrete Remove Reinforcing Steel
V_1 = 60" + I_3	$V_\#$ = 12L - 42"			

CRC PAVEMENT REPAIR (FULL LANE WIDTH) - TYPICAL

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	0009-271 & 0009-272	11	32

Plotting Date: 04/17/2025



DEFORMED TIE BAR DIMENSIONS KEY

Underlying Plans	CRC Depth	Longitudinal Steel		Transverse Steel	
		Size	Spacing	Size	Spacing
PCN	T	C	E	L	F

CRC REPAIR AREA KEY

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

PLOT SCALE - 1:1.7

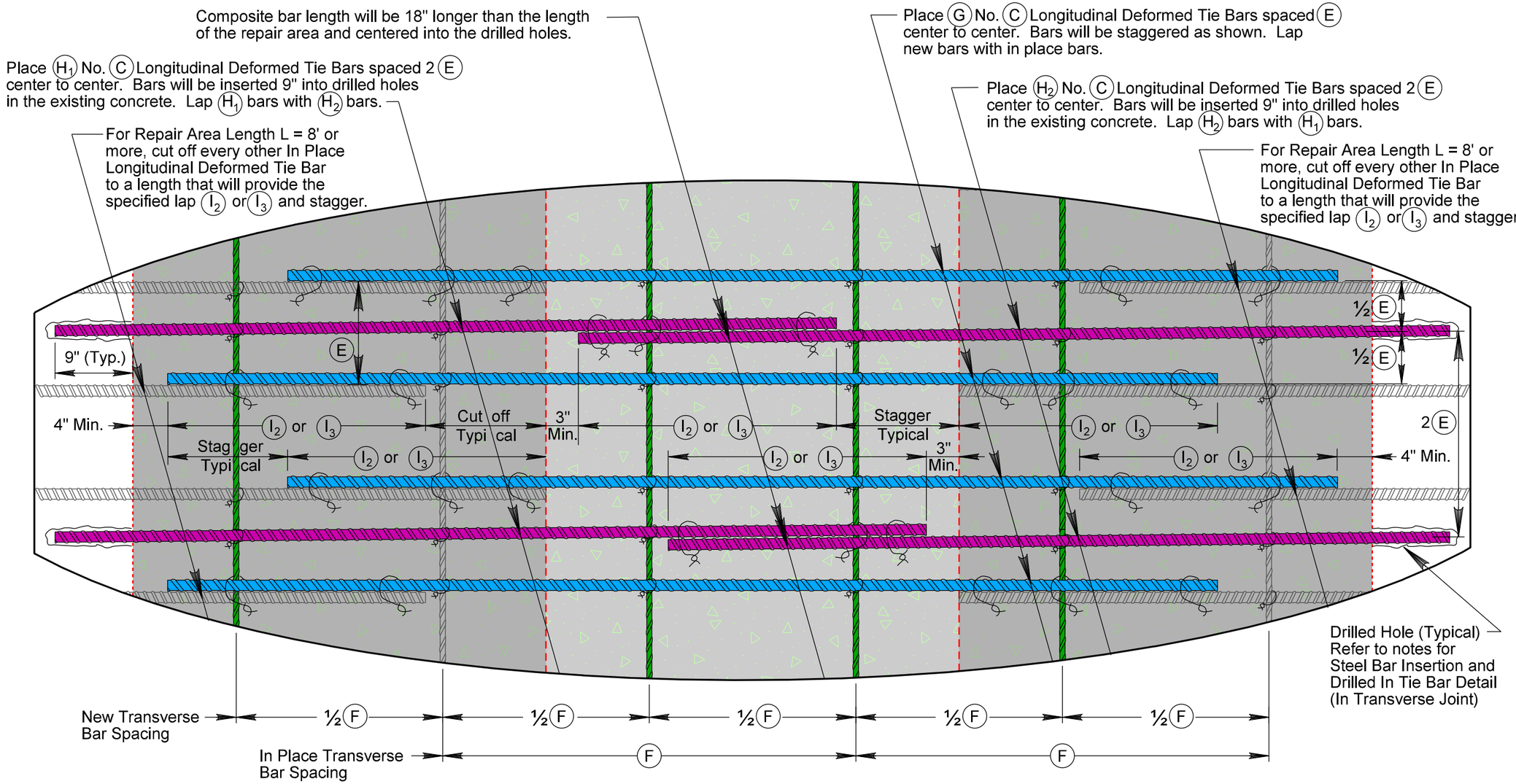
PLOTTED FROM - TRSF12113

PLOT NAME - $$PLOTNAME$$

FILE - ...\CRC FULL WIDTH REPAIR.DGN

CRC PAVEMENT REPAIR (FULL LANE WIDTH)

Detail A



DEFORMED TIE BAR KEY

- No. (C) Longitudinal 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)
- No. (L) Transverse Deformed Tie Bar In Place (Retain)
- 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)

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

LAP SPLICE LENGTH KEY

- (I1) Lap Splice length for Repair Area Length L < 4.5' (Not Available).
- (I2) Lap Splice length for Repair Area Length L = 4.5' to 8'.
- (I3) Lap Splice length for Repair Area Length L > 8'.

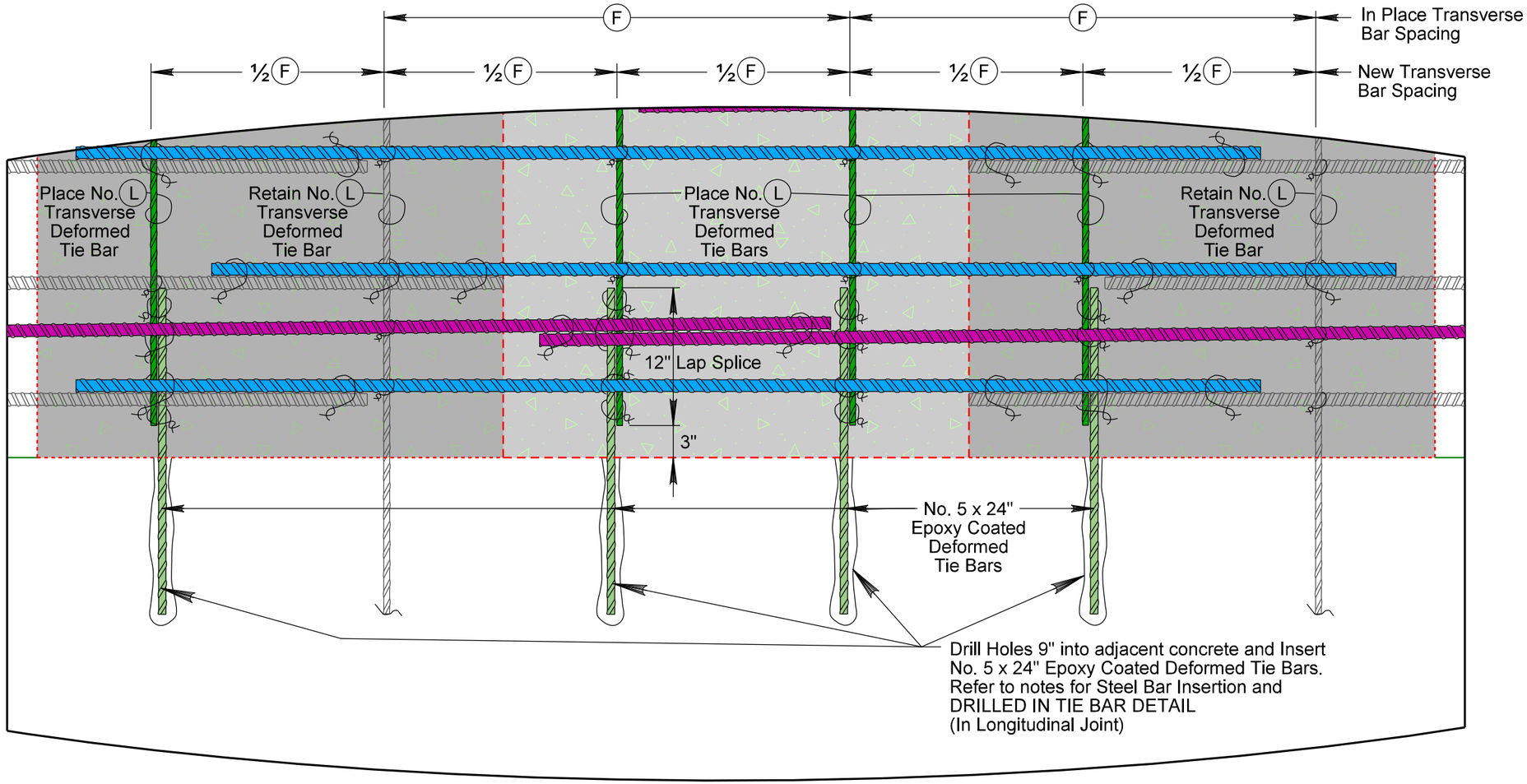
See CRC Pavement Repair - Reinforcing Steel Details for Longitudinal Bar Counts: (G), (H1) & (H2)

CRC REPAIR AREA KEY

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

CRC PAVEMENT REPAIR (FULL LANE WIDTH)

Detail B



DEFORMED TIE BAR KEY

- No. (C) Longitudinal 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)
- No. (L) Transverse Deformed Tie Bar In Place (Retain)
- 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)

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

CRC REPAIR AREA KEY

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

PLOT SCALE - 1:1.07

PLOTTED FROM - TRSF12113

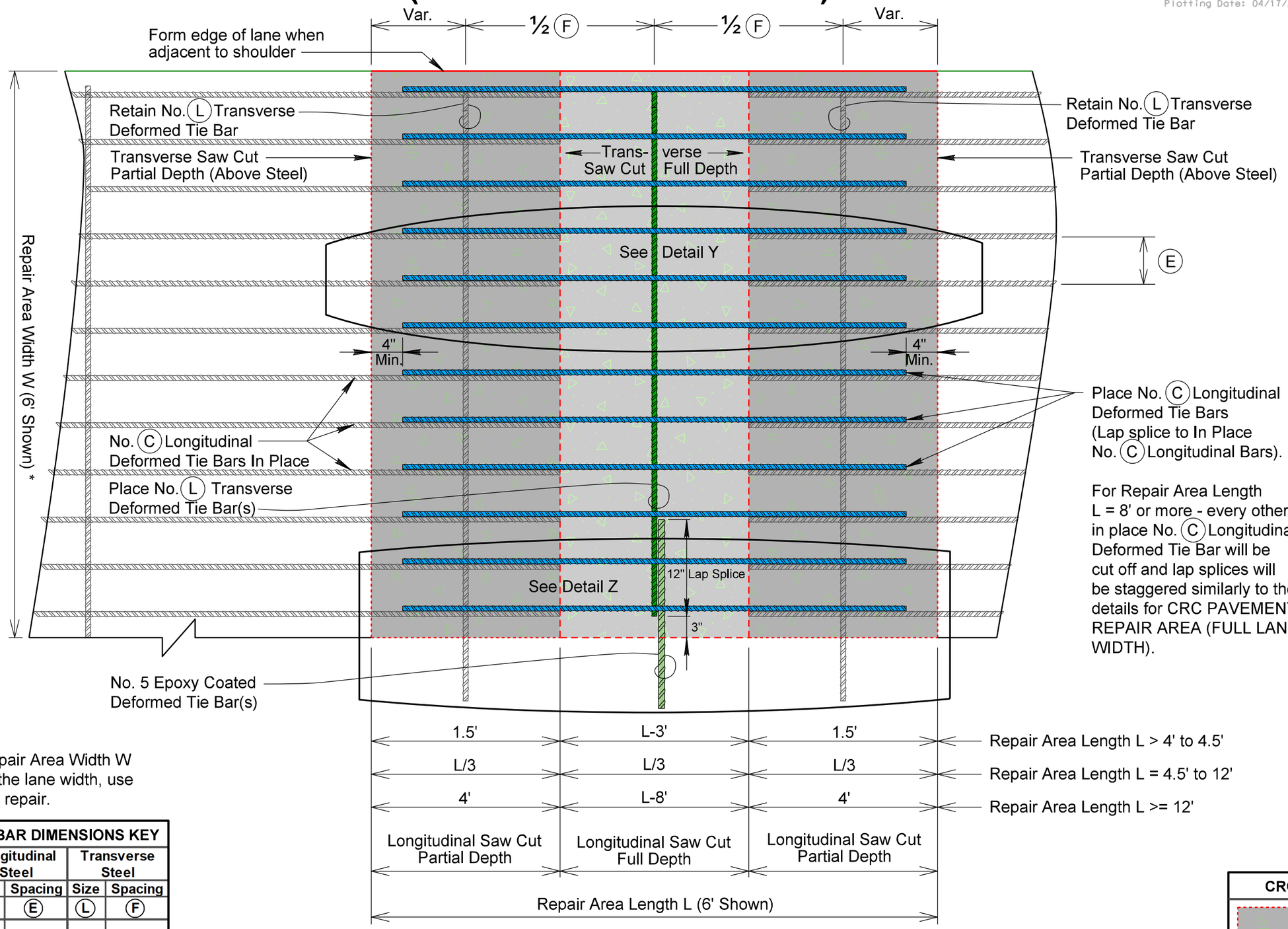
PLOT NAME - $$PLOTNAME$$

FILE - ...\CRC FULL WIDTH REPAIR.DGN

CRC PAVEMENT REPAIR (PARTIAL LANE WIDTH) - TYPICAL

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	0009-271 & 0009-272	14	32

Plotting Date: 04/17/2025



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

DEFORMED TIE BAR DIMENSIONS KEY

Underlying Plans	CRC Depth	Longitudinal Steel		Transverse Steel	
		Size	Spacing	Size	Spacing
PCN	T	C	E	L	F

CRC REPAIR AREA KEY

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

PLOT SCALE - 1:1.06

PLOTTED FROM - TRSF12113

PLOT NAME - $$PLOTNAME$$

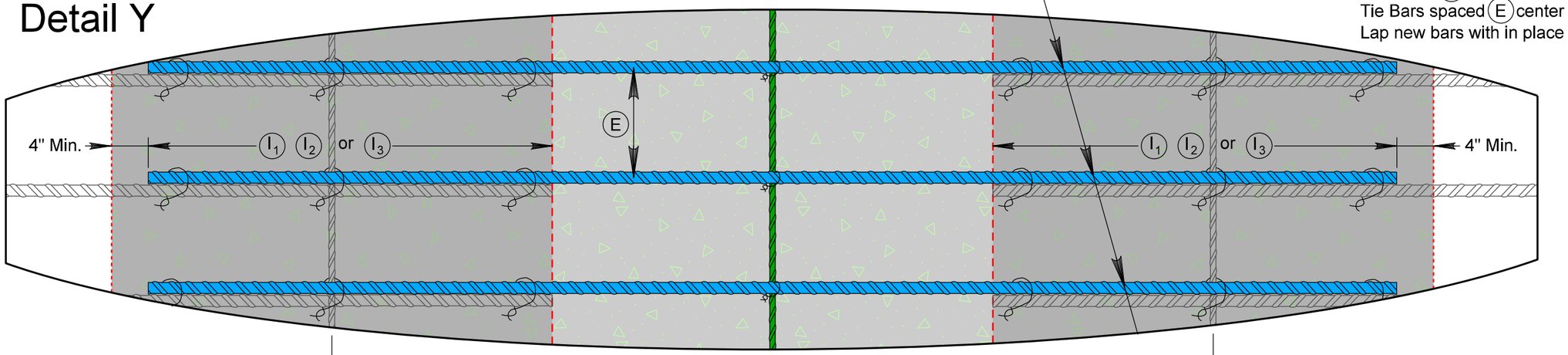
FILE - ...\CRC PARTIAL WIDTH REPAIR.DGN

CRC PAVEMENT REPAIR (PARTIAL LANE WIDTH)

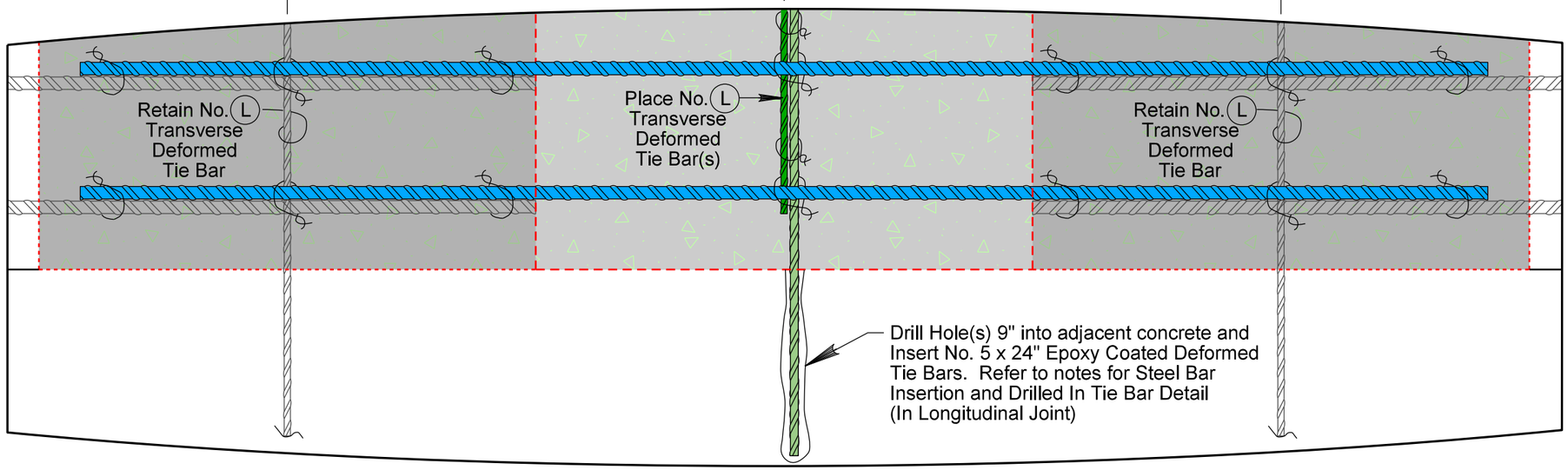
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	0009-271 & 0009-272	15	32

Plotting Date: 04/17/2025

Detail Y



Detail Z



For Repair Area Length L = 8' or more - every other in place No. C Longitudinal Deformed Tie Bar will be cut off and lap splices will be staggered similarly to the details for CRC PAVEMENT REPAIR AREA (FULL LANE WIDTH).

DEFORMED TIE BAR DIMENSIONS KEY

- No. L Transverse Deformed Tie Bar In Place (Retain)
- Place No. L Transverse Deformed Tie Bar (Tie to No. C Longitudinal Bars)
- No. C Longitudinal Deformed Tie Bar In Place (Retain)
- Place No. C Longitudinal Deformed Tie Bar (Tie to In Place No. C Longitudinal Bars)

Underlying Plans	CRC Depth	Longitudinal Steel		Transverse Steel	
		Size	Spacing	Size	Spacing
PCN	T	C	E	L	F

LAP SPLICE LENGTH KEY

- l_1 Lap Splice length for Repair Area Length L = 4' to 4.5'.
- l_2 Lap Splice length for Repair Area Length L = 4.5' to 8'.
- l_3 Lap Splice length for Repair Area Length L > 8'.

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

CRC REPAIR AREA KEY

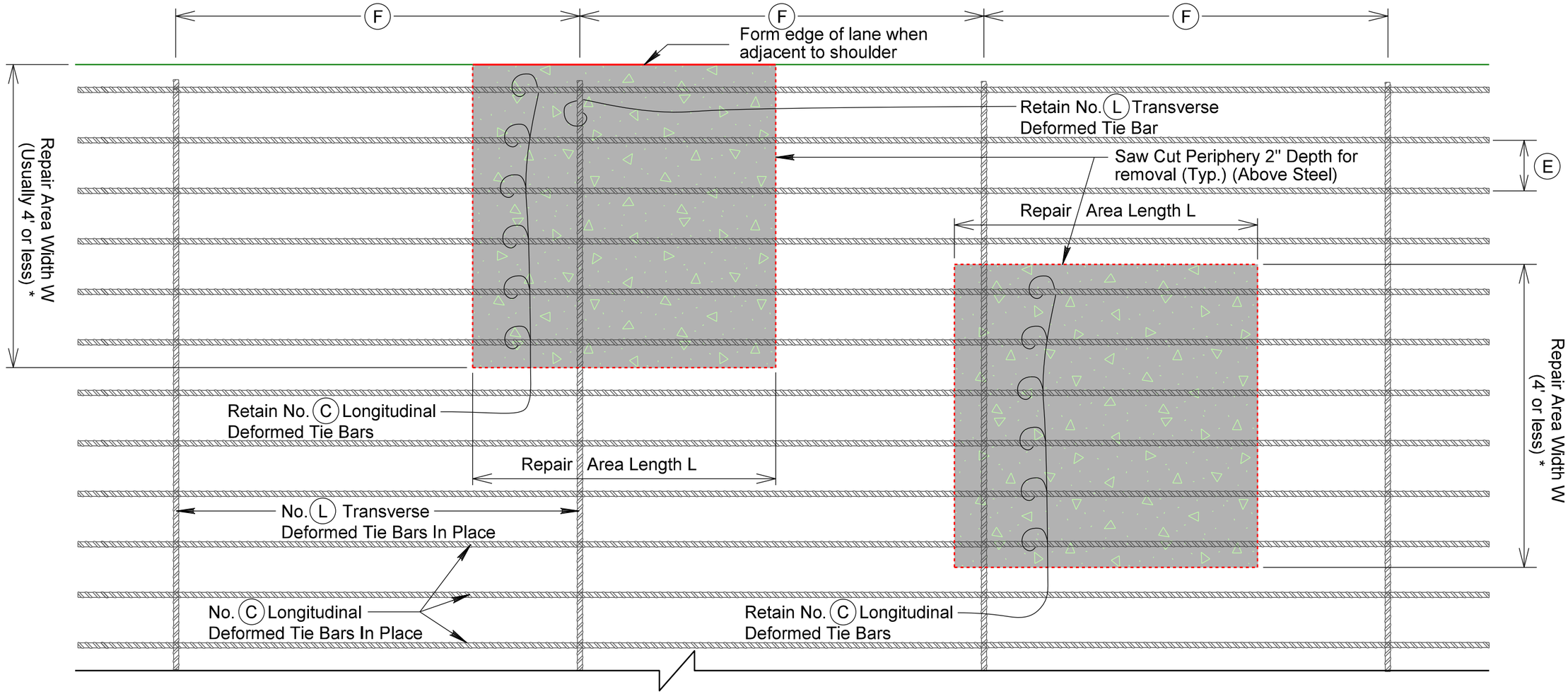
- Remove Concrete Retain Reinforcing Steel
- Remove Concrete Remove Reinforcing Steel

CRC PAVEMENT REPAIR - EXISTING STEEL RETAINED (TYPICAL)

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	0009-271 & 0009-272	16	32

Plotting Date: 04/17/2025

PLAN VIEW



* When Repair Width W exceeds 4', usually use partial lane width repair.
When Repair Width W exceeds half the lane width, usually use full lane width repair.

However, a Repair Width W exceeding 4' might be used when doing a small repair adjacent to an existing repair, in order to match the width of the existing repair.

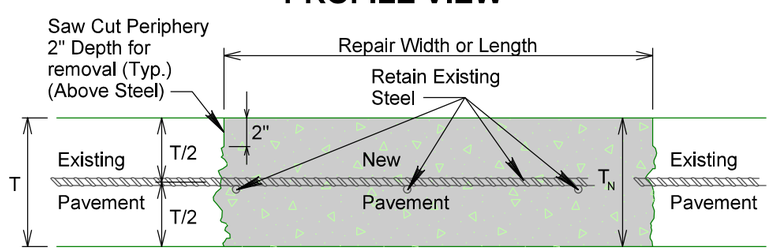
DEFORMED TIE BAR DIMENSIONS KEY

No. L Transverse Deformed Tie Bar In Place (Retain)

No. C Longitudinal Deformed Tie Bar In Place (Retain)

Underlying Plans	CRC Depth	Longitudinal Steel		Transverse Steel	
		Size	Spacing	Size	Spacing
PCN	T	C	E	L	F

PROFILE VIEW



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

CRC REPAIR AREA KEY

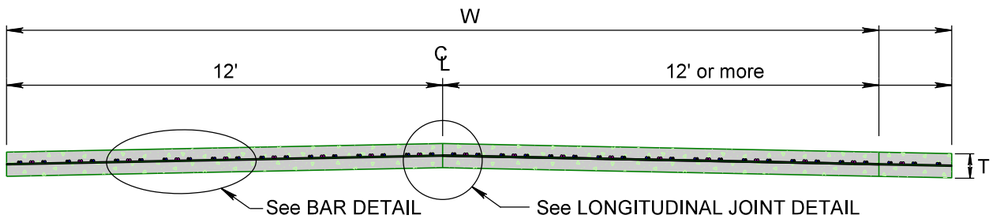
Remove Concrete
Retain Reinforcing Steel

CRC PAVEMENT REPAIR - REINFORCING STEEL DETAILS

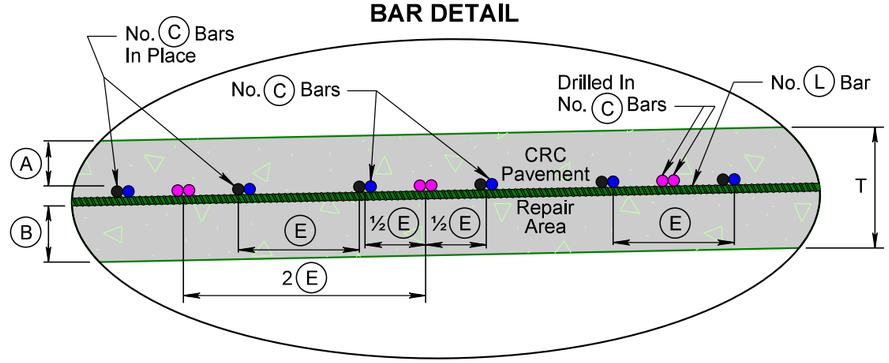
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	0009-271 & 0009-272	17	32

Plotting Date: 04/17/2025

TRANSVERSE SECTION SHOWING STEEL PLACEMENT



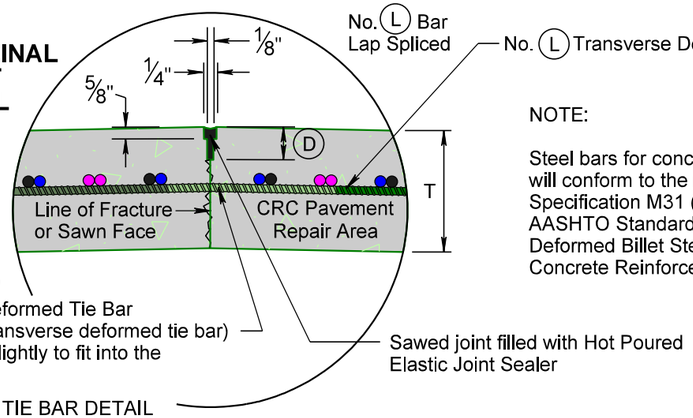
BAR DETAIL



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

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

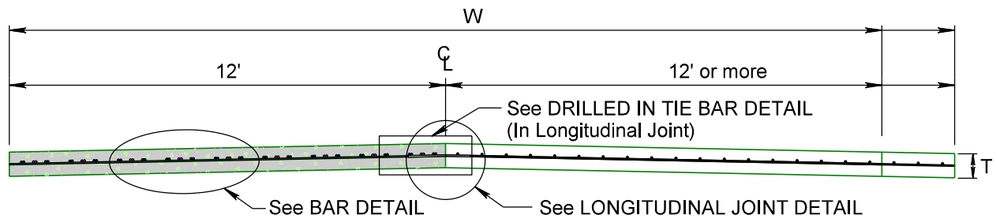
LONGITUDINAL JOINT DETAIL



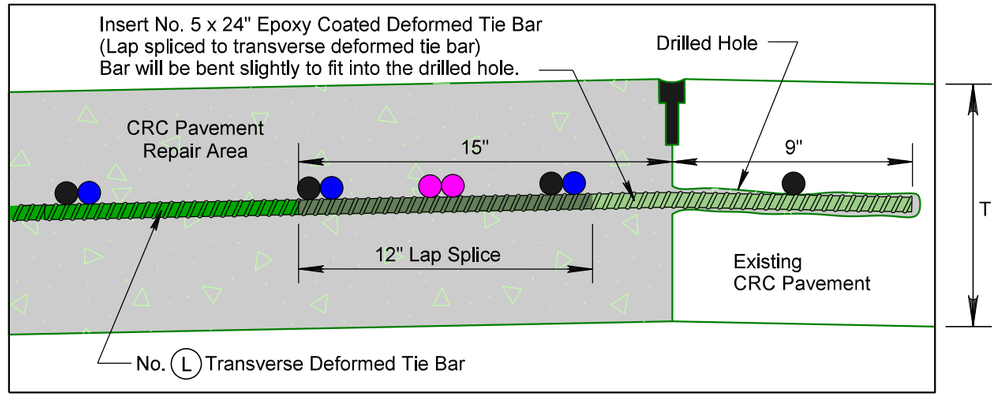
NOTE:

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

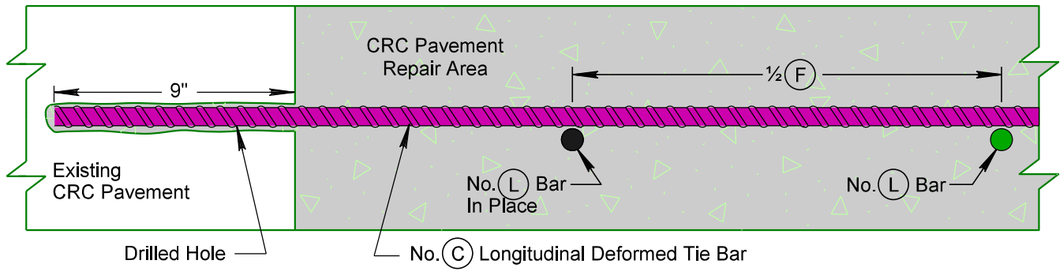
TRANSVERSE SECTION SHOWING STEEL PLACEMENT



DRILLED IN TIE BAR DETAIL (In Longitudinal Joint)



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



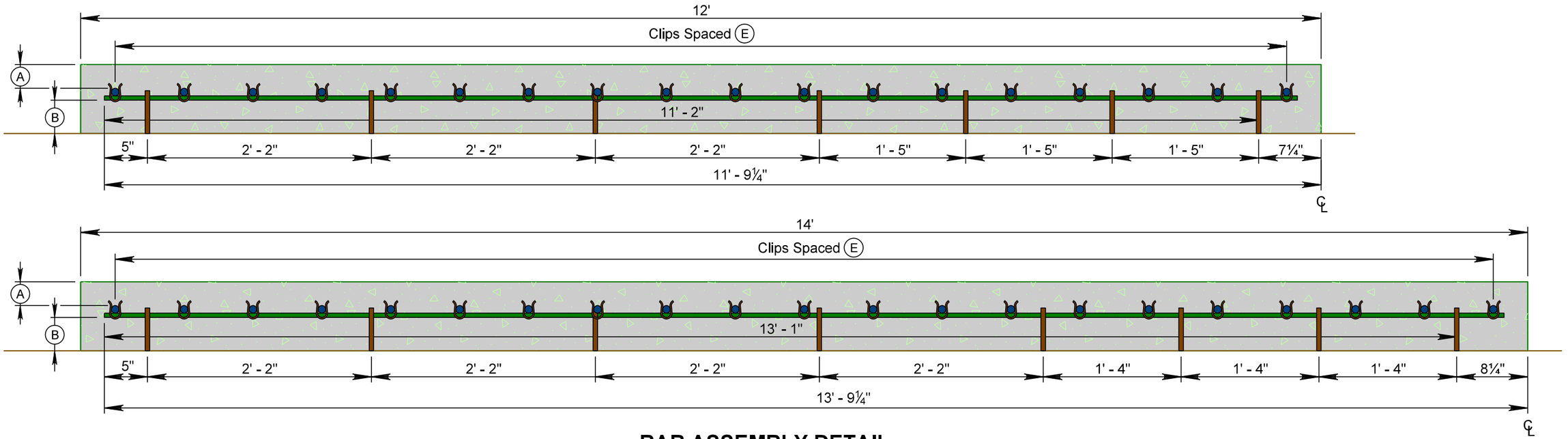
CRC PAVEMENT IN PLACE & CRC PAVEMENT REPAIR KEY & DIMENSIONS

Location	Underlying 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 Assigned	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'						
	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

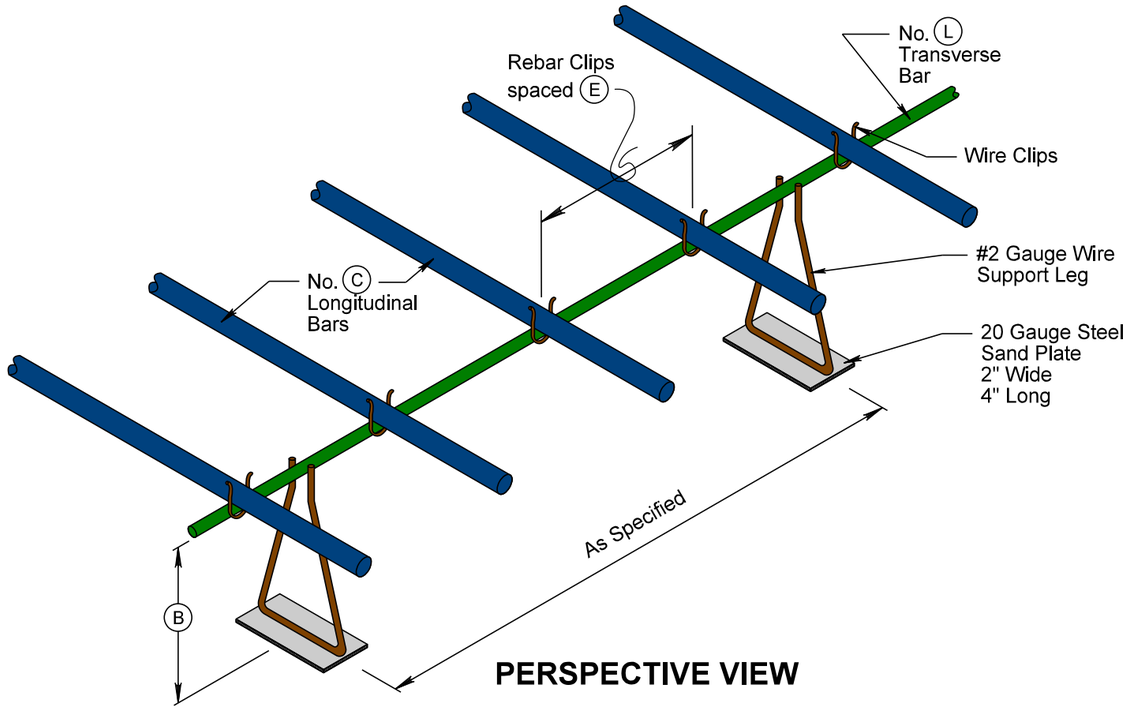
CRC PAVEMENT CHAIR DETAILS

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	0009-271 & 0009-272	18	32

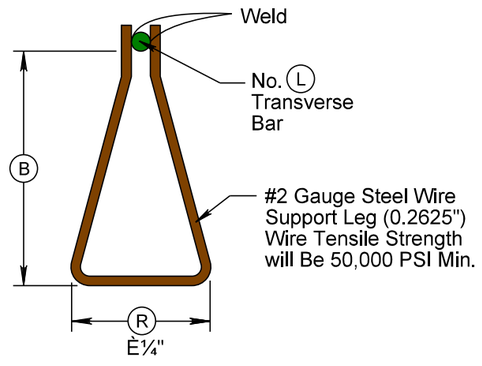
Plotting Date: 04/17/2025



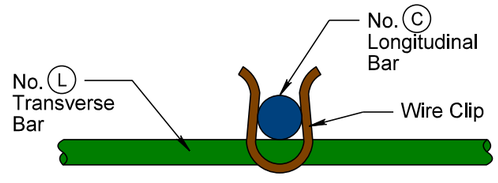
BAR ASSEMBLY DETAIL



PERSPECTIVE VIEW



CHAIR DETAIL



CLIP DETAIL

DEFORMED TIE BAR DIMENSIONS KEY

Underlying 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

PLOT SCALE - 1=1

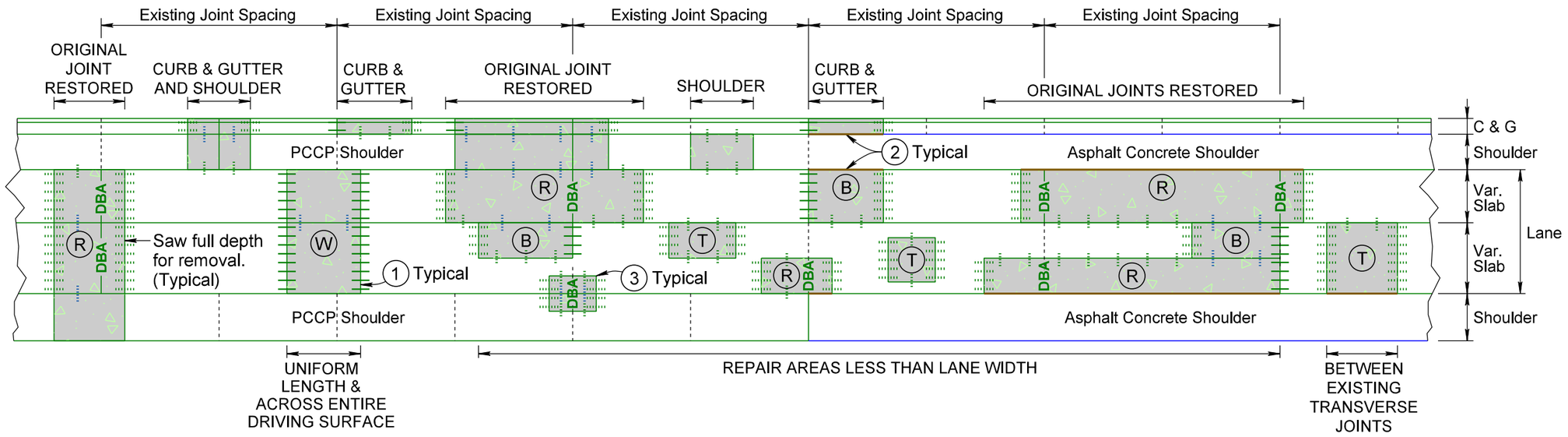
PLOT NAME - $$PLOTNAME$$

FILE - ...\CRC CHAIR DETAILS.DGN

PLOTTED FROM - TRSF12113

NONREINFORCED PCC PAVEMENT REPAIR

ANY SINGLE LANE ROADWAY (RAMPS, ETC.)
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 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 >= 10.5"

— Drilled in 1½" x 18" epoxy coated plain round dowel bars spaced 18" center to center.

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

Pavement Thickness >= 8.5" and < 10.5"

— Drilled in 1¼" x 18" epoxy coated plain round dowel bars spaced 18" center to center.

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

Pavement Thickness < 8.5"

— Drilled in 1" x 18" epoxy coated plain round dowel bars spaced 18" center to center.

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

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.

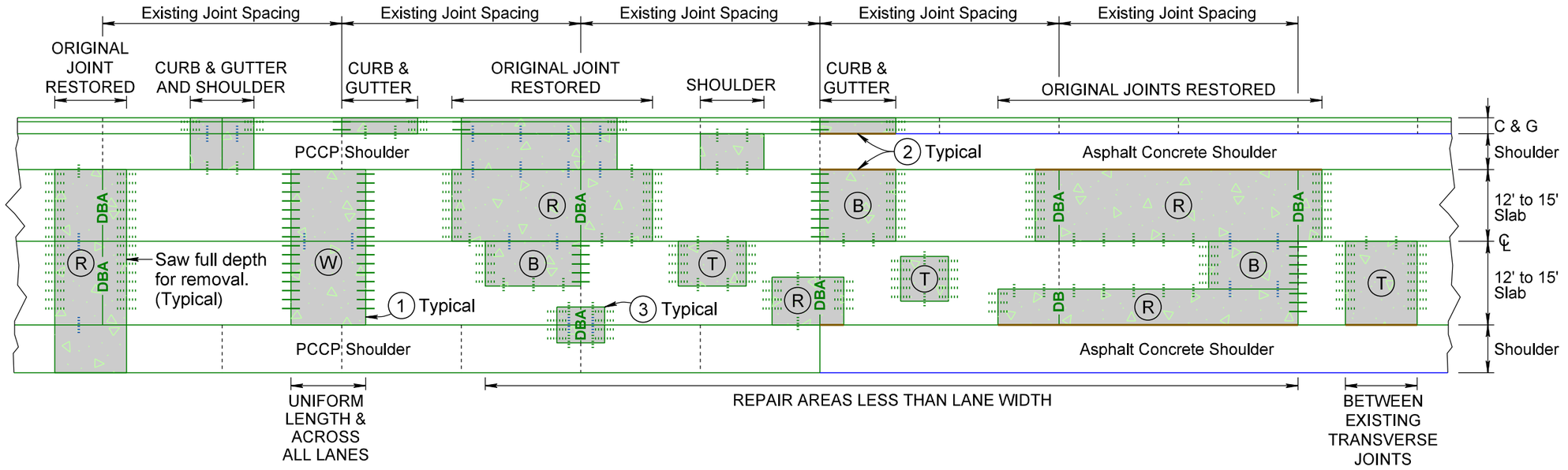
No. 5 x 24" epoxy coated deformed tie bars.
Drilled In - spaced 30" center to center.

NOTES: Saw around repair areas full depth for removal.

1. Where possible, transverse joints will be constructed/maintained full roadway width.
2. Edges of repair areas will 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



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 >= 10.5"
- Drilled in 1½" x 18" epoxy coated plain round dowel bars spaced 18" center to center.
- Drilled in No. 11 x 18" epoxy coated deformed tie bars spaced 18" center to center.

Pavement Thickness >= 8.5" and < 10.5"
- Drilled in 1¼" x 18" epoxy coated plain round dowel bars spaced 18" center to center.
- Drilled in No. 9 x 18" epoxy coated deformed tie bars spaced 18" center to center.

Pavement Thickness < 8.5"
- Drilled in 1" x 18" epoxy coated plain round dowel bars spaced 18" center to center.
- Drilled in No. 8 x 18" epoxy coated deformed tie bars spaced 18" center to center.

DBA Dowel Bar Assembly

Steel Bars for Longitudinal Joints

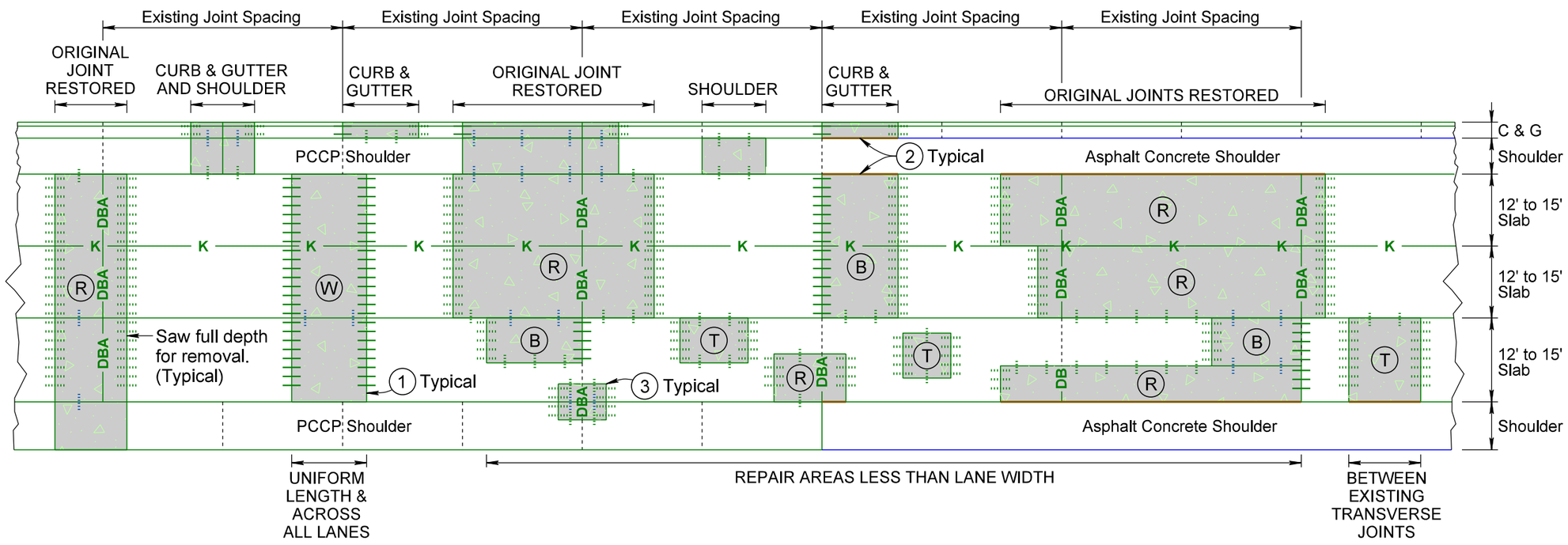
- No. 5 x 30" epoxy coated deformed tie bars. Sawed Joint - spaced 48" center to center. Construction Joint - spaced 48" center to center.
- No. 5 x 24" epoxy coated deformed tie bars. Drilled In - spaced 30" center to center.

NOTES: Saw around repair areas full depth for removal.

1. Where possible, transverse joints will be constructed/maintained full roadway width.
2. Edges of repair areas will 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 WITH CENTER LANE OR UP TO SIX 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 >= 10.5"

— Drilled in 1½" x 18" epoxy coated plain round dowel bars spaced 18" center to center.

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

Pavement Thickness >= 8.5" and < 10.5"

— Drilled in 1¼" x 18" epoxy coated plain round dowel bars spaced 18" center to center.

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

Pavement Thickness < 8.5"

— Drilled in 1" x 18" epoxy coated plain round dowel bars spaced 18" center to center.

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

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.

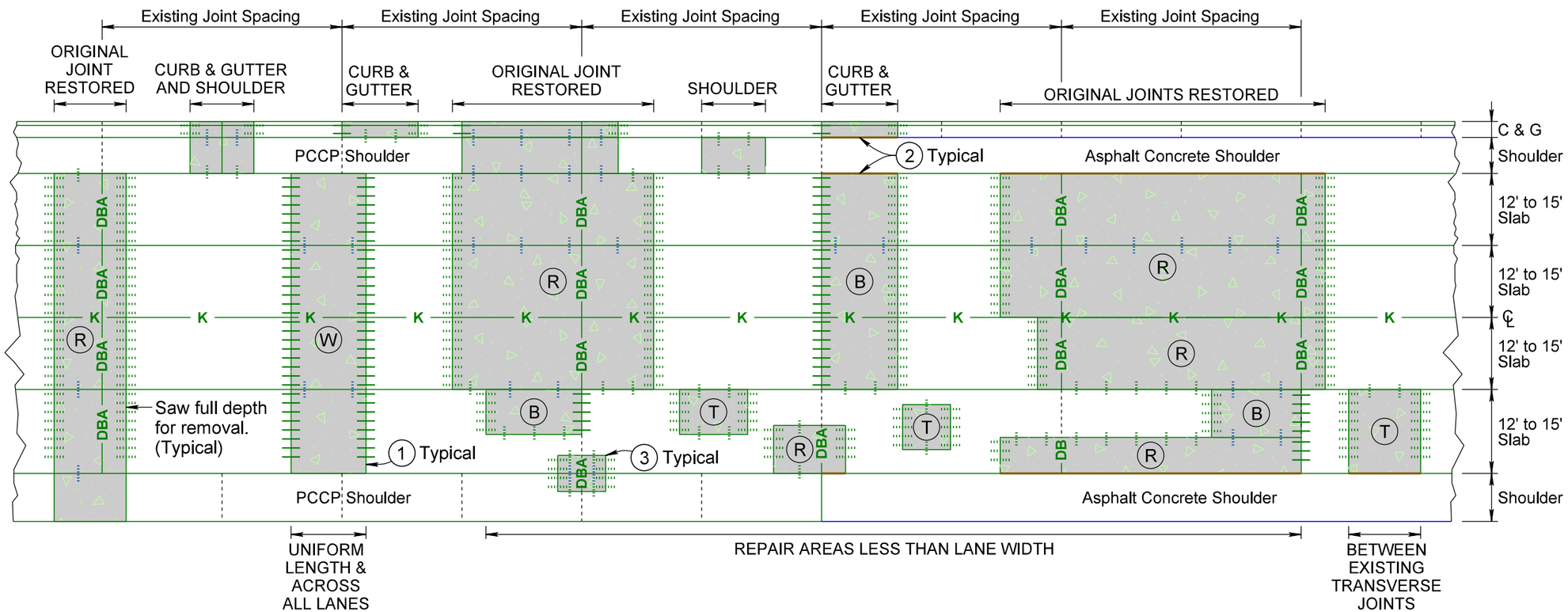
No. 5 x 24" epoxy coated deformed tie bars.
Drilled In - spaced 30" center to center.

NOTES: Saw around repair areas full depth for removal.

1. Where possible, transverse joints will be constructed/maintained full roadway width.
2. Edges of repair areas will 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 FOUR LANE ROADWAY OR UP TO EIGHT LANE DIVIDED ROADWAY
TYPICAL REPAIR AREAS



KEY:

PCC Pavement Repair Area

PCC PAVEMENT REPAIR AREA TYPES:

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

(T) Two Tied Joints

(B) One Working & One Tied Joint

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

Longitudinal Keyway Joints Without Bars

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

Steel Bars for Transverse Joints

Pavement Thickness >= 10.5"
- Drilled in 1½" x 18" epoxy coated plain round dowel bars spaced 18" center to center.
- Drilled in No. 11 x 18" epoxy coated deformed tie bars spaced 18" center to center.

Pavement Thickness >= 8.5" and < 10.5"
- Drilled in 1¼" x 18" epoxy coated plain round dowel bars spaced 18" center to center.
- Drilled in No. 9 x 18" epoxy coated deformed tie bars spaced 18" center to center.

Pavement Thickness < 8.5"
- Drilled in 1" x 18" epoxy coated plain round dowel bars spaced 18" center to center.
- Drilled in No. 8 x 18" epoxy coated deformed tie bars spaced 18" center to center.

DBA Dowel Bar Assembly

Steel Bars for Longitudinal Joints

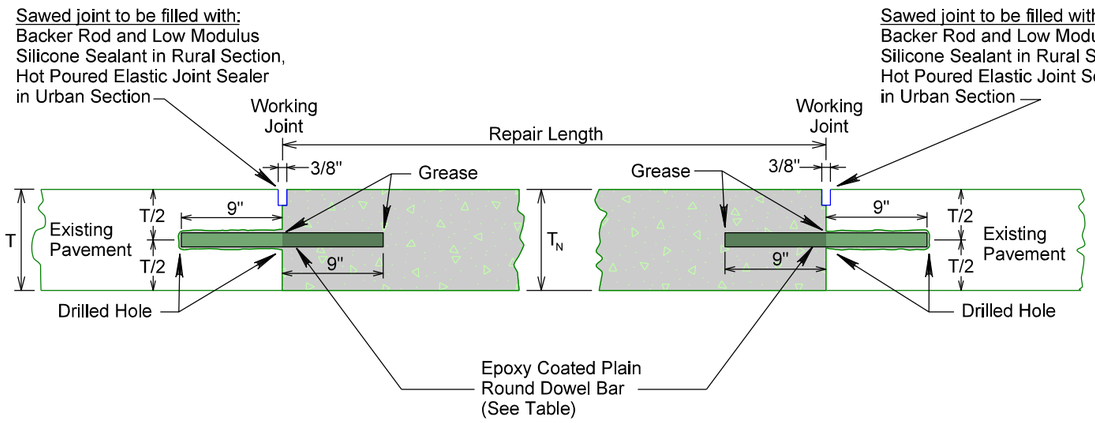
- No. 5 x 30" epoxy coated deformed tie bars. Sawed Joint - spaced 48" center to center. Construction Joint - spaced 48" center to center.
- No. 5 x 24" epoxy coated deformed tie bars. Drilled In - spaced 30" center to center.

NOTES: Saw around repair areas full depth for removal.

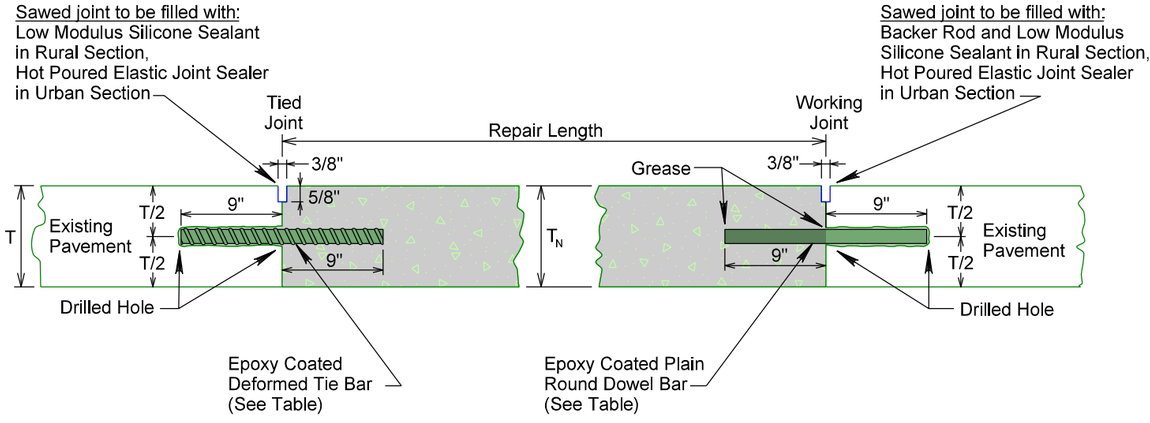
1. Where possible, transverse joints will be constructed/maintained full roadway width.
2. Edges of repair areas will be formed to match the width of the existing concrete pavement.
3. Need for bars in small repair areas on/near the shoulder to be determined on a case-by-case basis, on construction by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

NONREINFORCED PCC PAVEMENT REPAIR

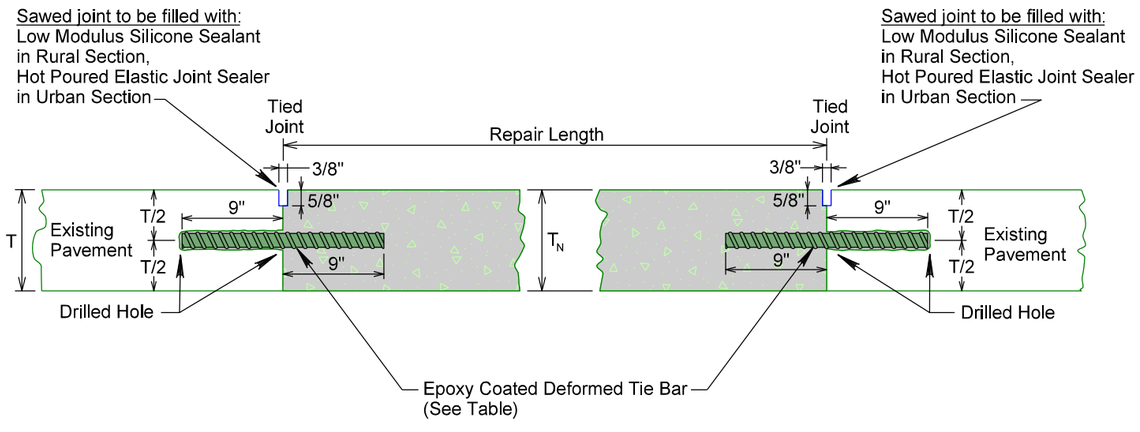
PLAIN ROUND DOWEL BAR INSERTION
TYPE W - (TWO WORKING JOINTS)



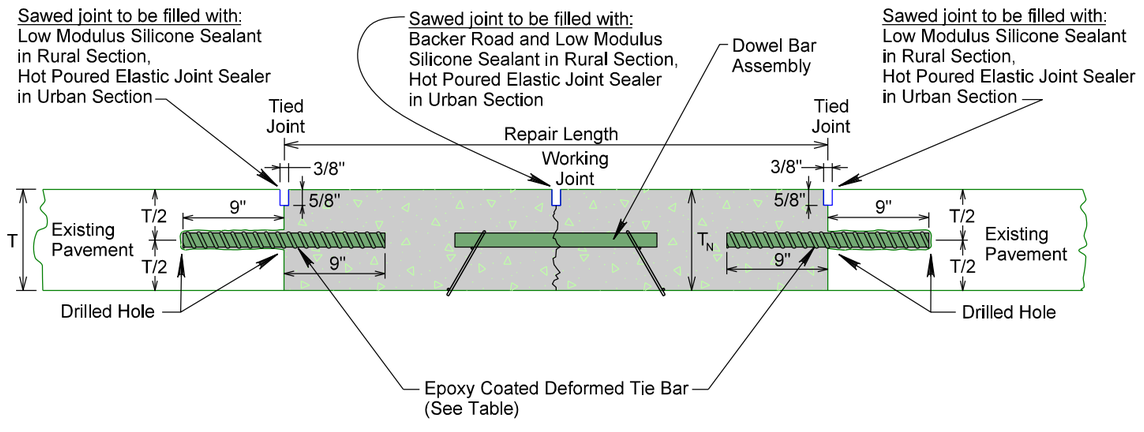
DEFORMED TIE BAR AND PLAIN ROUND DOWEL BAR INSERTION
TYPE B - (ONE TIED JOINT AND ONE WORKING JOINT)



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_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) will be included in the contract unit price per each for Insert Steel Bar in PCC Pavement.

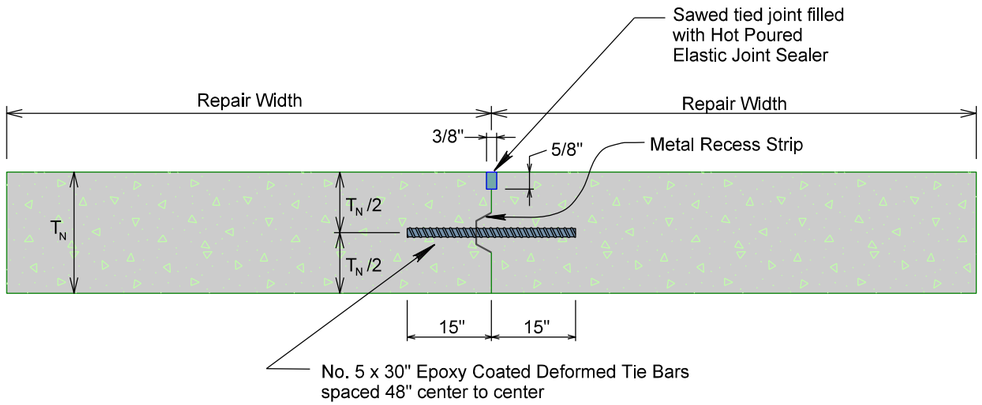
Cost for furnishing and installing dowel bar assembly will be included in the contract unit price per each for Dowel Bar.

T_N = T

(top of new pavement will be flush with top of existing pavement)

NONREINFORCED PCC PAVEMENT REPAIR

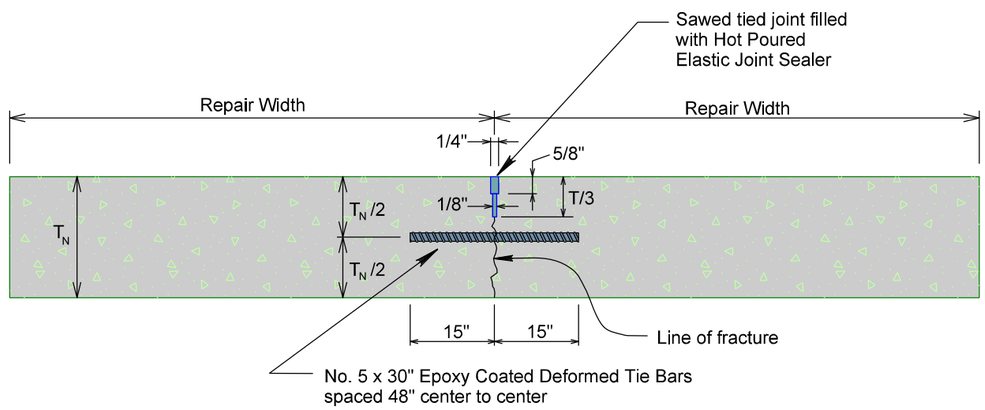
LONGITUDINAL CONSTRUCTION JOINT WITH TIE BARS & KEYWAY



T_N = New pavement thickness.

Cost for furnishing and inserting tie bars will 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

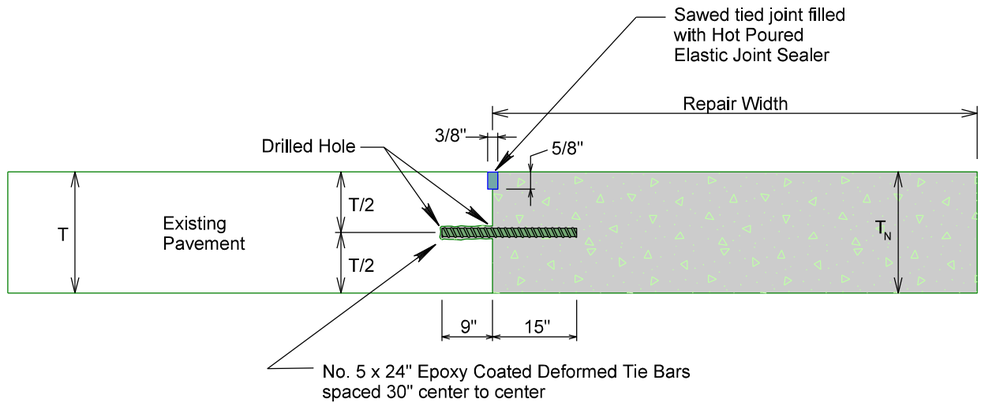


T_N = New pavement thickness.

The first saw cut to control cracking will 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 will 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



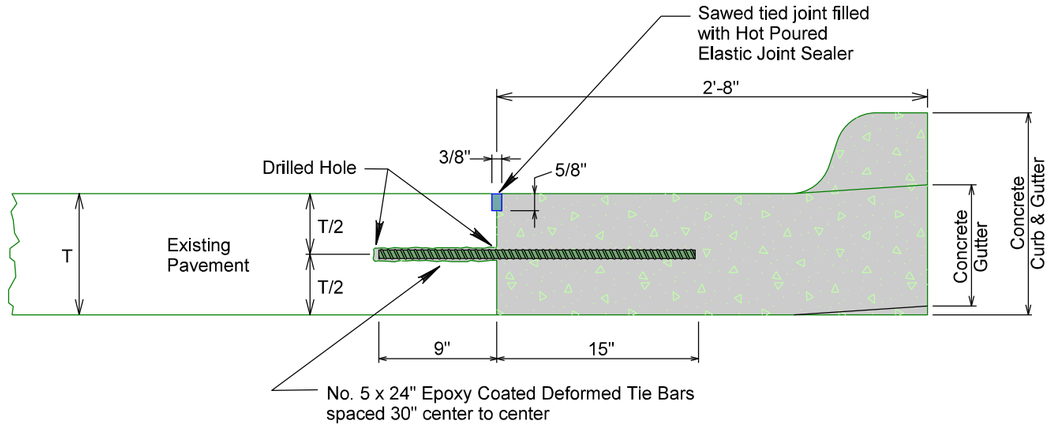
T = Existing pavement thickness.
T_N = New pavement thickness.

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

Bars 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 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.

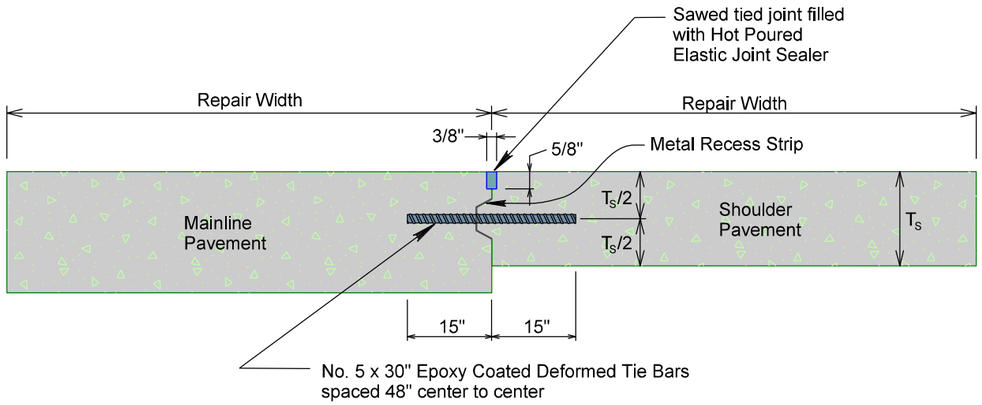
Bars will be placed a minimum of 15 inches from existing transverse contraction joints.

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.

Plotting Date: 04/17/2025

NONREINFORCED PCC PAVEMENT REPAIR

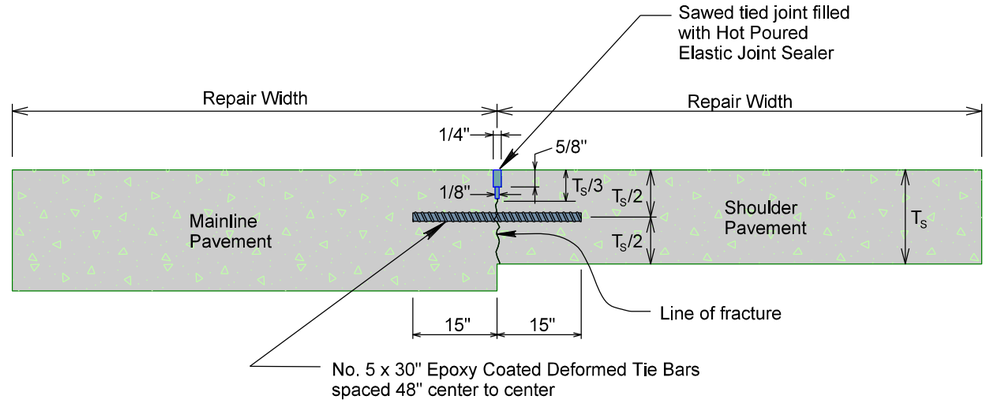
LONGITUDINAL SHOULDER CONSTRUCTION JOINT WITH TIE BARS & KEYWAY



T_S = New shoulder pavement thickness.

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

SAWED LONGITUDINAL SHOULDER JOINT

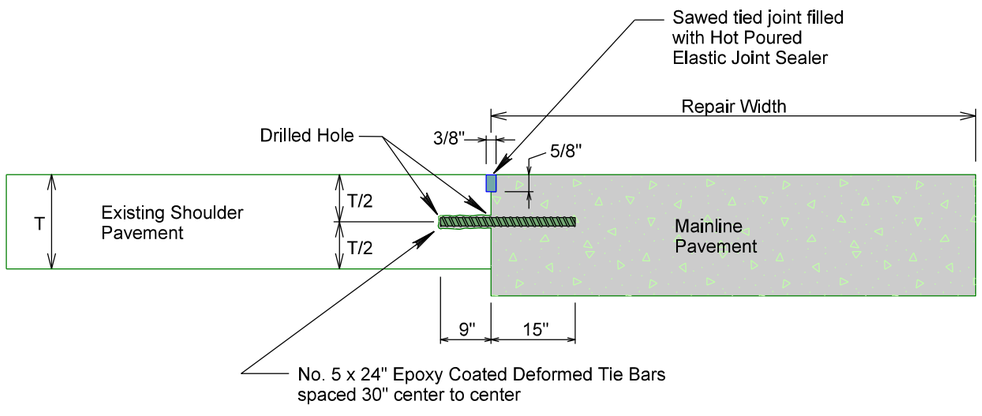


T_S= New shoulder pavement thickness.

The first saw cut to control cracking will 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 will be incidental to the contract unit price per square yard for Nonreinforced PCC Pavement Repair.

LONGITUDINAL SHOULDER JOINT WITH DRILLED IN TIE BARS



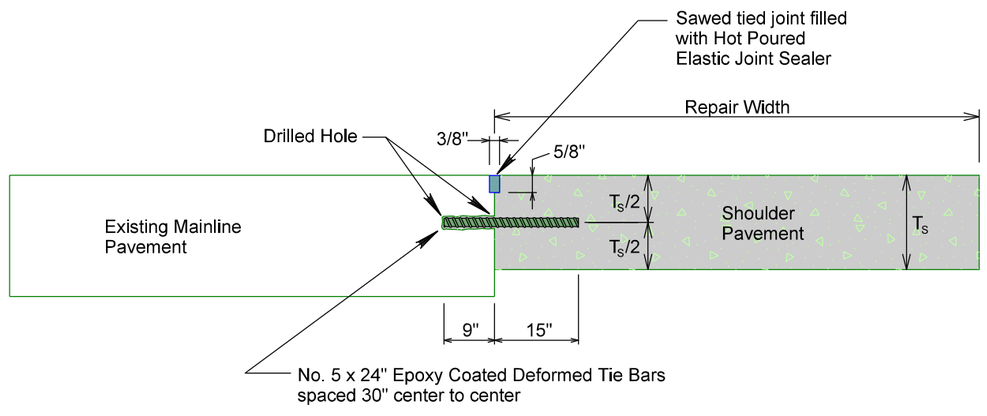
T = Existing shoulder pavement thickness.

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

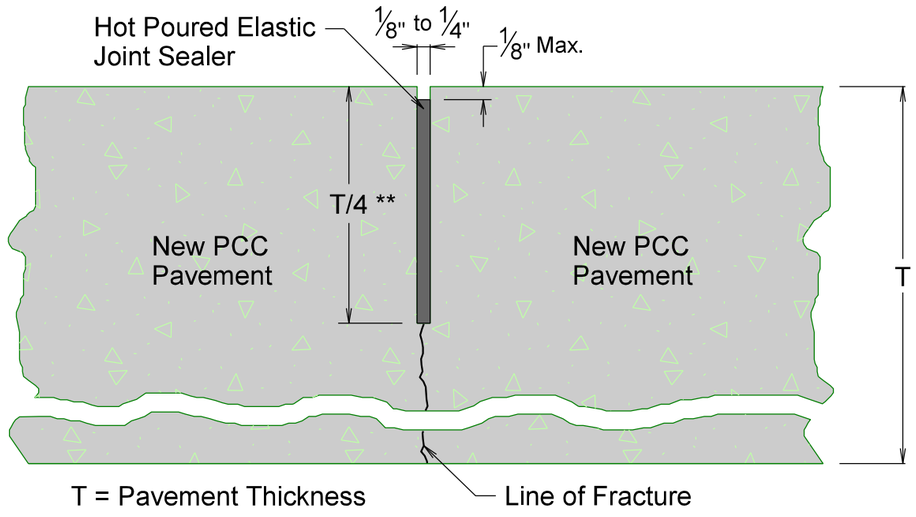
Cost for furnishing and inserting drilled in tie bars will be included in the contract unit price per each for Insert Steel Bar in PCC Pavement.

NONREINFORCED PCC PAVEMENT REPAIR
SAW & SEAL TRANSVERSE JOINTS

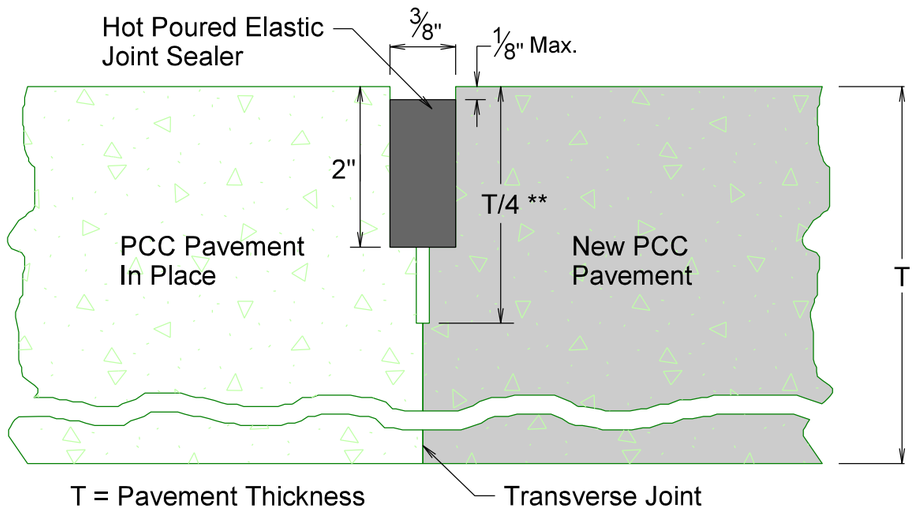
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	0009-271 & 0009-272	26	32

Plotting Date: 04/17/2025

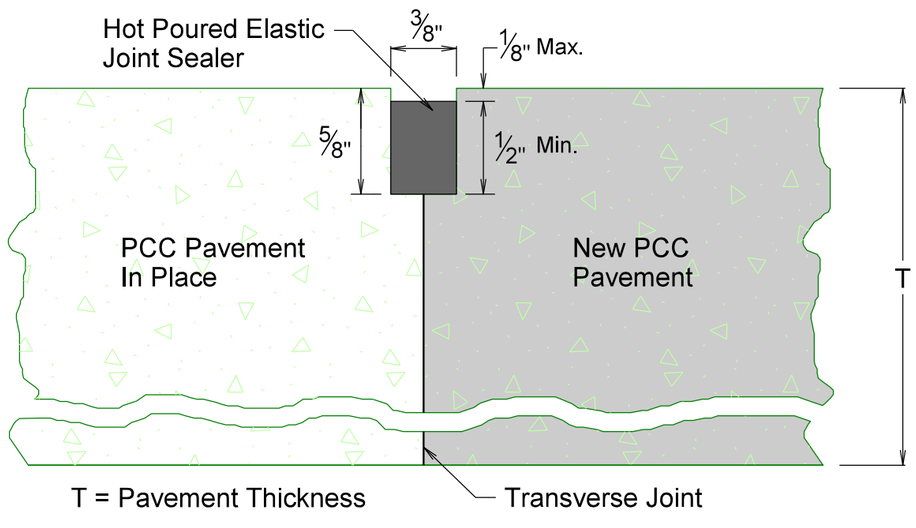
WITH HOT POURED ELASTIC JOINT SEALER AT WORKING JOINTS ENTIRELY WITHIN REPAIR AREAS



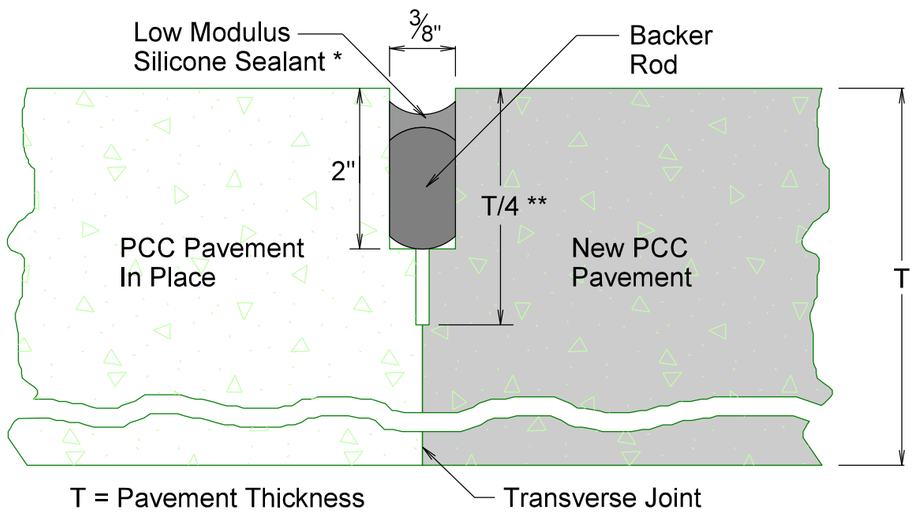
WITH HOT POURED ELASTIC JOINT SEALER AT WORKING JOINTS (TYPICALLY URBAN)



WITH HOT POURED ELASTIC JOINT SEALER AT TIED JOINTS

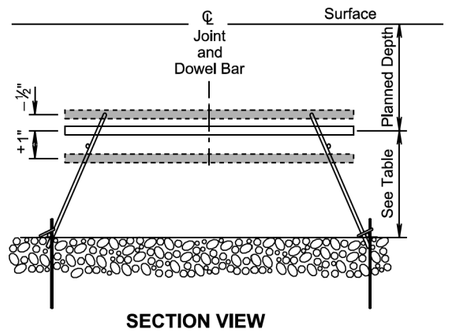


WITH LOW MODULUS SILICONE SEALANT AT WORKING JOINTS (TYPICALLY RURAL)



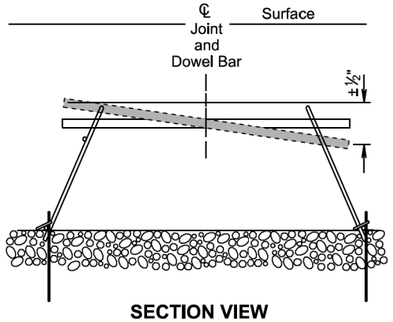
* Refer to Standard Plate 380.13 for installation details using Joint Width J=3/8".

** The saw cut to control cracking will be a minimum of 1/4 the thickness of the pavement.



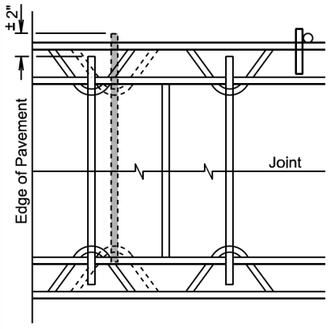
SECTION VIEW
VERTICAL TRANSLATION

Depth: mid-depth + 1 inch or – ½ inch



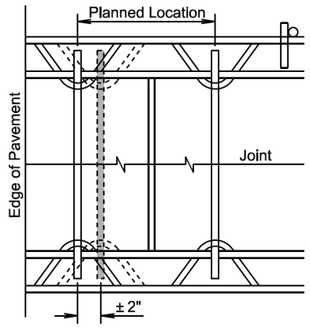
SECTION VIEW
VERTICAL TILT

Vertical rotational alignment: ½ inch over 18 inch



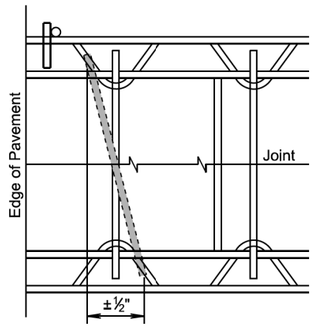
PLAN VIEW
LONGITUDINAL TRANSLATION

Longitudinal side shift: ± 2 inch for 18 inch bars



PLAN VIEW
HORIZONTAL TRANSLATION

Side shift ± 2 inch



PLAN VIEW
HORIZONTAL SKEW

Horizontal rotational alignment: ½ inch over 18 inch

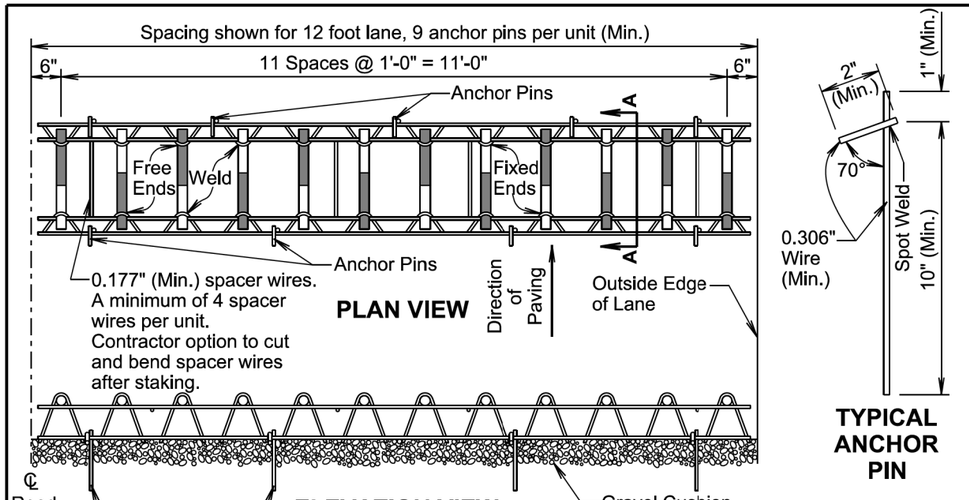
PAVEMENT THICKNESS	EPOXY COATED DOWEL BAR SIZE	HEIGHT TO CENTER
7" to 7½"	1" x 18"	3.0"
8" to 10"	1¼" x 18"	4.0"
10½" to 13"	1½" x 18"	5.0"

GENERAL NOTE:

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

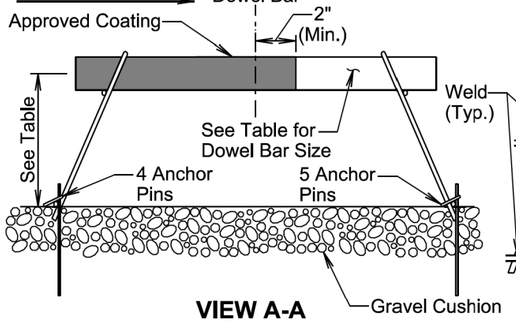
November 19, 2022

Published Date: 2026	SDDOT	PCC PAVEMENT DOWEL BAR ALIGNMENT TOLERANCES	PLATE NUMBER 380.01 Sheet 1 of 1

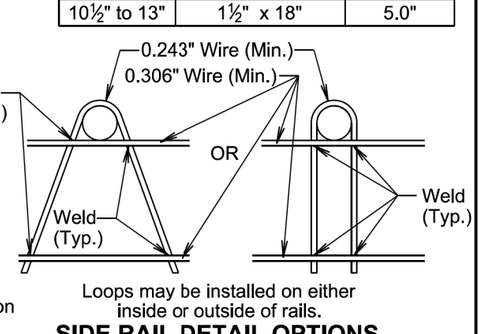


TYPICAL ANCHOR PIN

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"



VIEW A-A



Loops may be installed on either inside or outside of rails.

SIDE RAIL DETAIL OPTIONS

GENERAL NOTES:

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

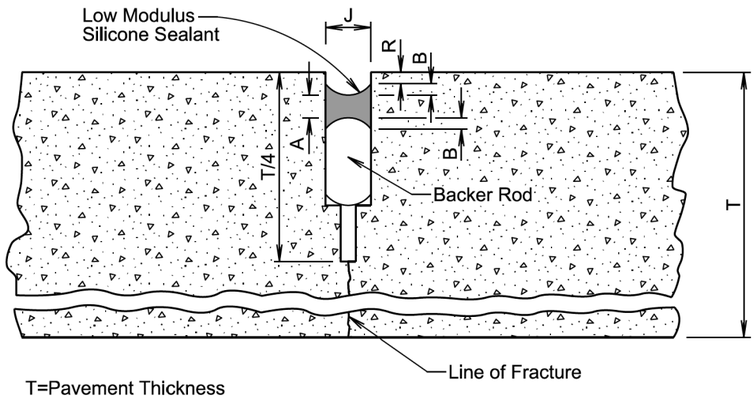
The transverse contraction joints will be sawed perpendicular to the centerline of the roadway. The transverse sawed joint will be centered over the dowel bars.

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: 2026	SDDOT	PCC PAVEMENT DOWEL BAR ASSEMBLY FOR TRANSVERSE CONTRACTION JOINTS 12 Bar Assembly on Granular Base Material	PLATE NUMBER 380.04 Sheet 1 of 1



T=Pavement Thickness

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

November 19, 2022

Published Date: 2026	SDDOT	RESEAL PCC PAVEMENT JOINT (SILICONE)	PLATE NUMBER 380.16 Sheet 1 of 1

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.

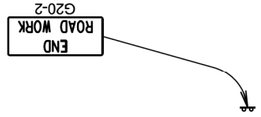
The ROAD WORK AHEAD and the END ROAD WORK signs may be omitted for short duration operations (1 hour or less).

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.

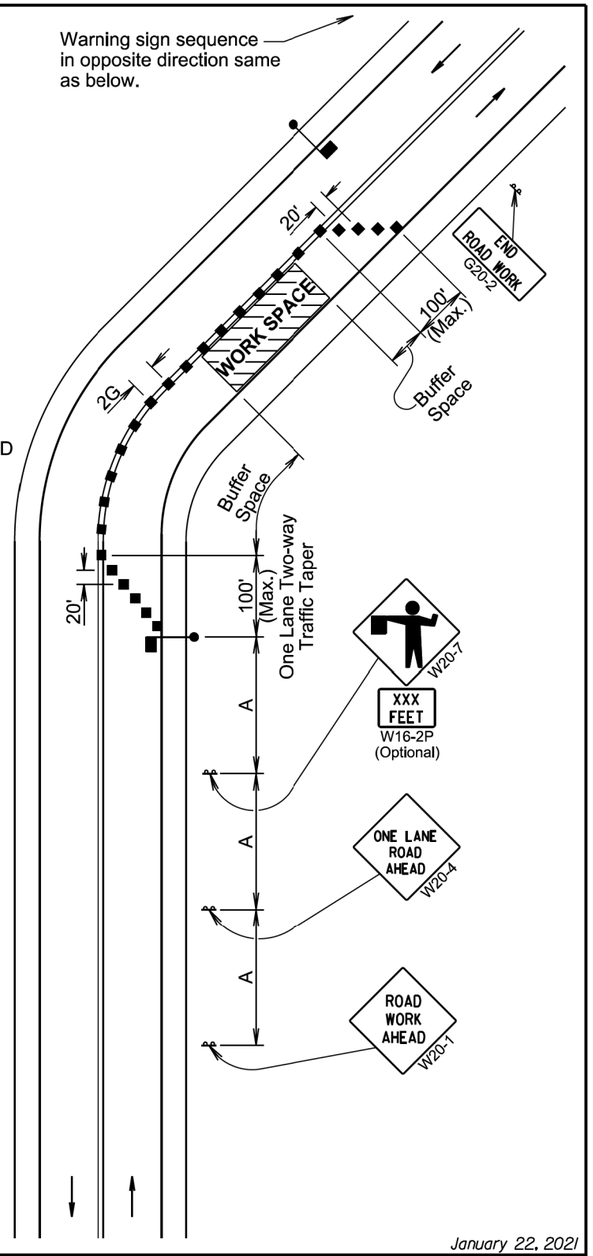
Channelizing devices are not required along the centerline adjacent to work area when pilot cars are utilized for escorting traffic through the work area.



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.

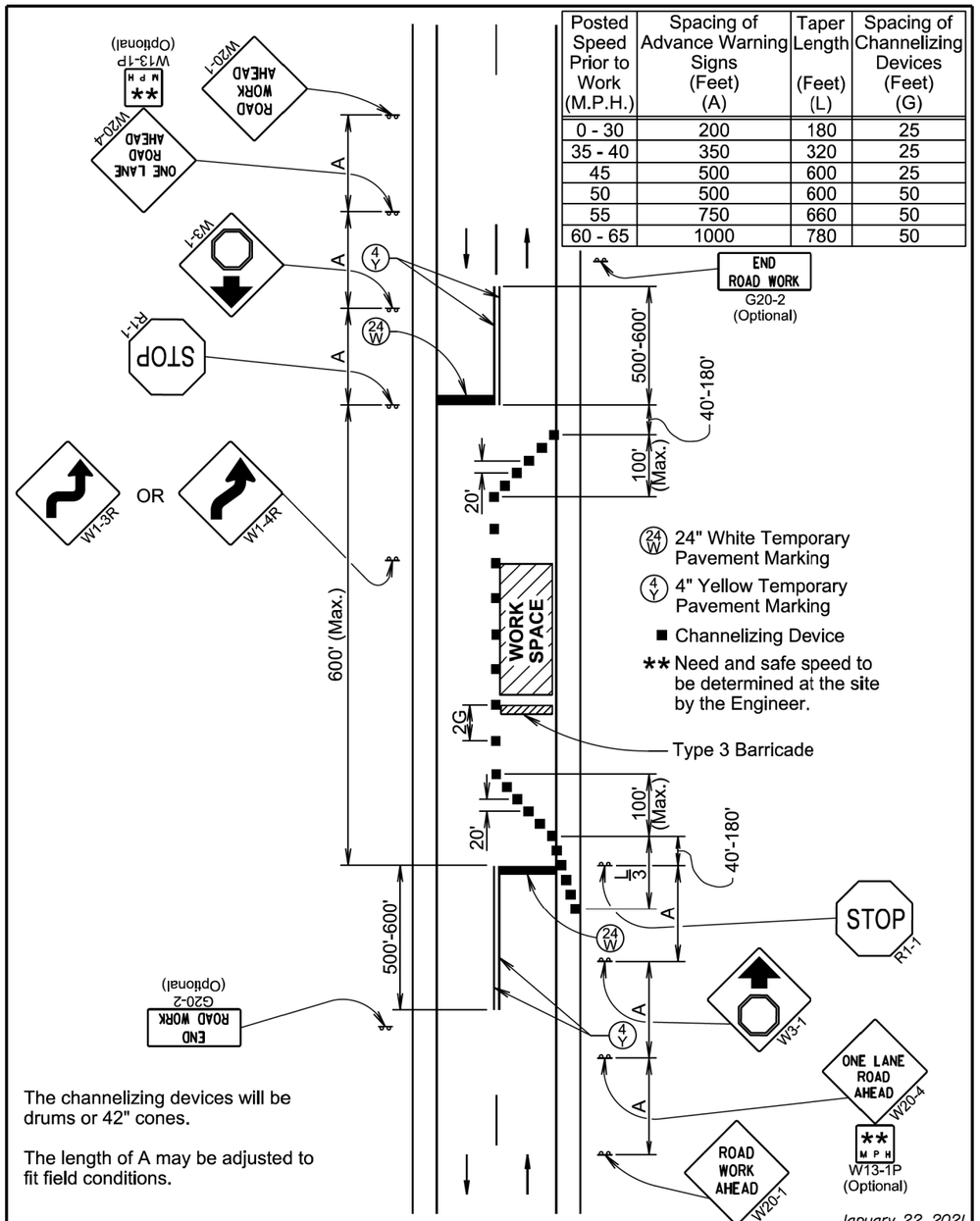
The length of A may be adjusted to fit field conditions.



January 22, 2021

Published Date: 2026	SDDOT	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)	Taper Length (Feet) (L)	Spacing of Channelizing Devices (Feet) (G)
0 - 30	200	180	25
35 - 40	350	320	25
45	500	600	25
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 Engineer.

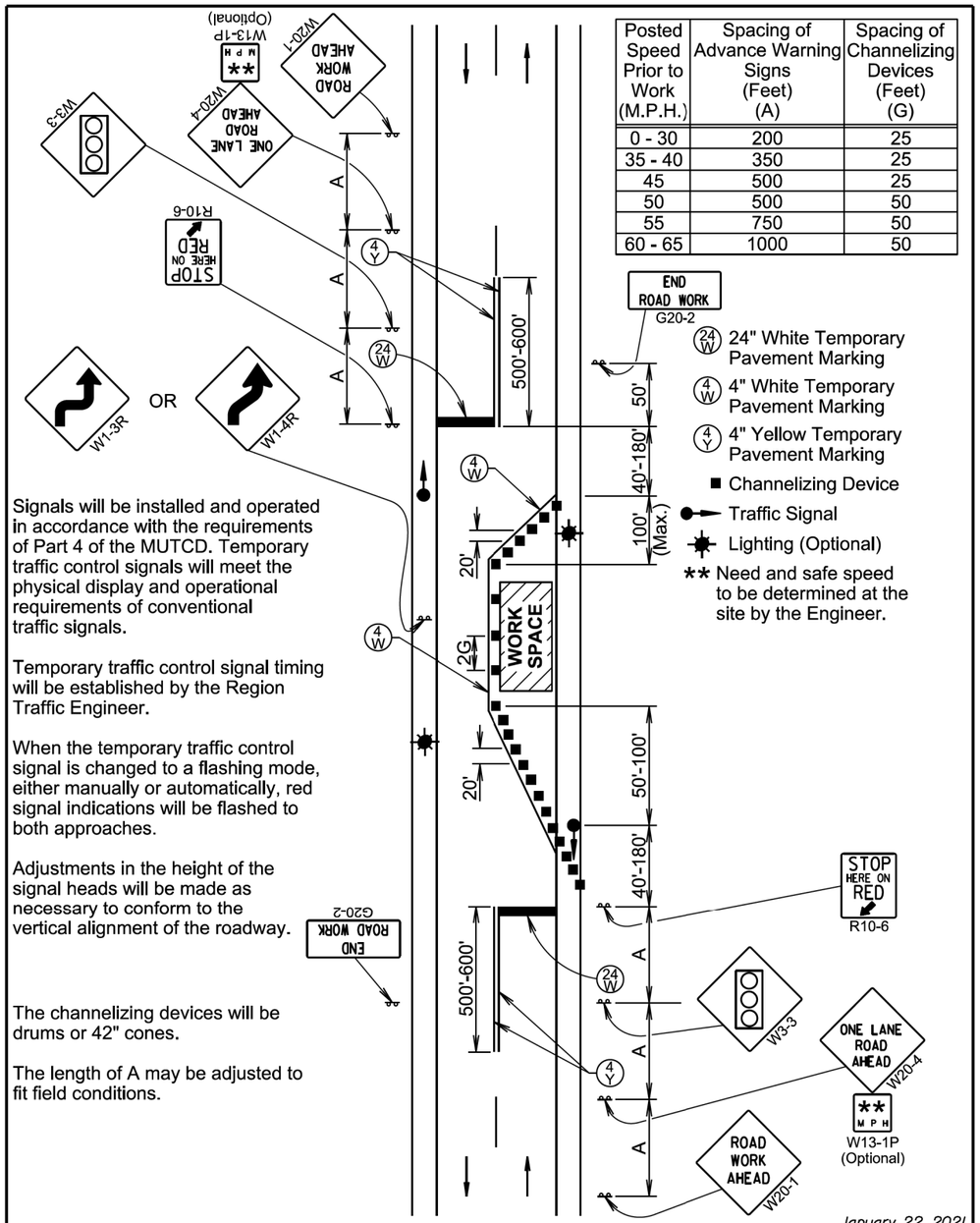
The channelizing devices will be drums or 42" cones.

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

January 22, 2021

Published Date: 2026	SDDOT	LANE CLOSURE USING STOP SIGNS	PLATE NUMBER 634.25
			Sheet 1 of 1

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



Signals will be installed and operated in accordance with the requirements of Part 4 of the MUTCD. Temporary traffic control signals will meet the physical display and operational requirements of conventional traffic signals.

Temporary traffic control signal timing will be established by the Region Traffic Engineer.

When the temporary traffic control signal is changed to a flashing mode, either manually or automatically, red signal indications will be flashed to both approaches.

Adjustments in the height of the signal heads will be made as necessary to conform to the vertical alignment of the roadway.

The channelizing devices will be drums or 42" cones.

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

24" White Temporary Pavement Marking

4" White Temporary Pavement Marking

4" Yellow Temporary Pavement Marking

■ Channelizing Device

Traffic Signal

Lighting (Optional)

** Need and safe speed to be determined at the site by the Engineer.

January 22, 2021

Published Date: 2026	SDDOT	LANE CLOSURE USING TRAFFIC SIGNALS	PLATE NUMBER 634.26
			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
	(A) (B) (C)
70 - 80	1000 1500 2640

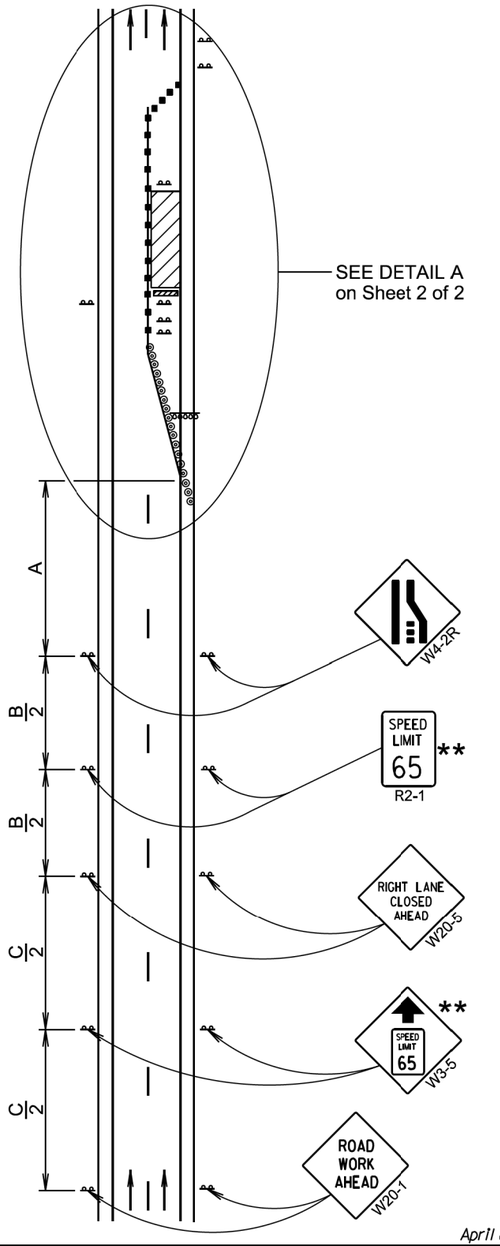
** Speed appropriate for location.

◎ 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 8, 2025

Published Date: 2026	SDDOT	WORK ZONE SPEED REDUCTION FOR INTERSTATE AND HIGH SPEED MULTI-LANE HIGHWAYS	PLATE NUMBER 634.63
			Sheet 1 of 2

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	25	600
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 will be covered or removed when workers are not present.

◎ Reflectorized Drum

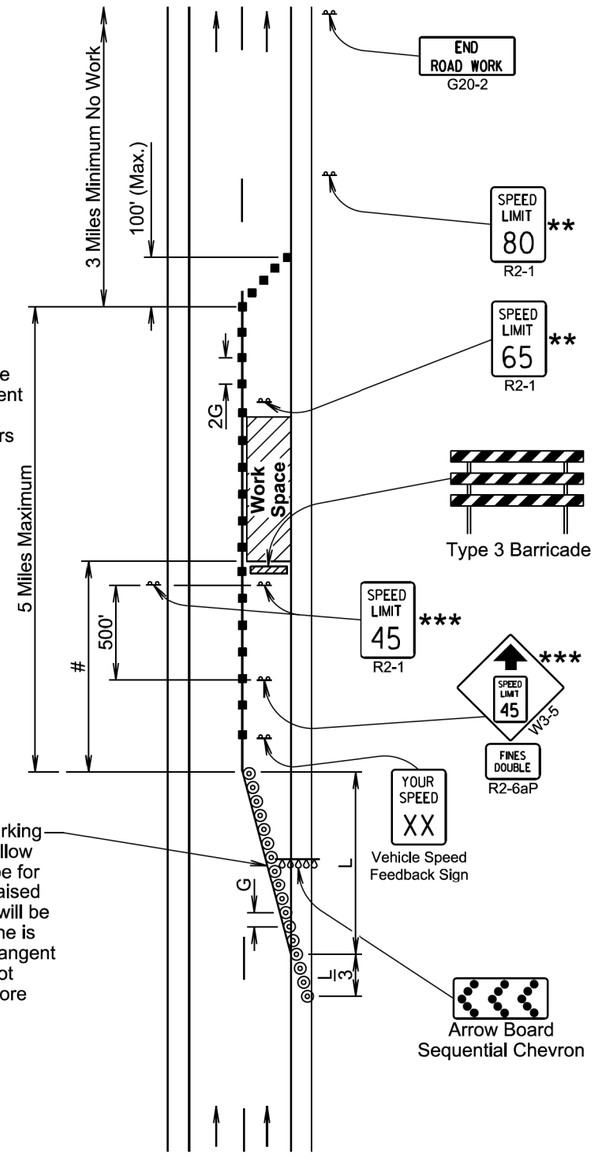
■ Channelizing Device

The Work Space will be a minimum of 500' from the end of the taper.

The channelizing devices will 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.

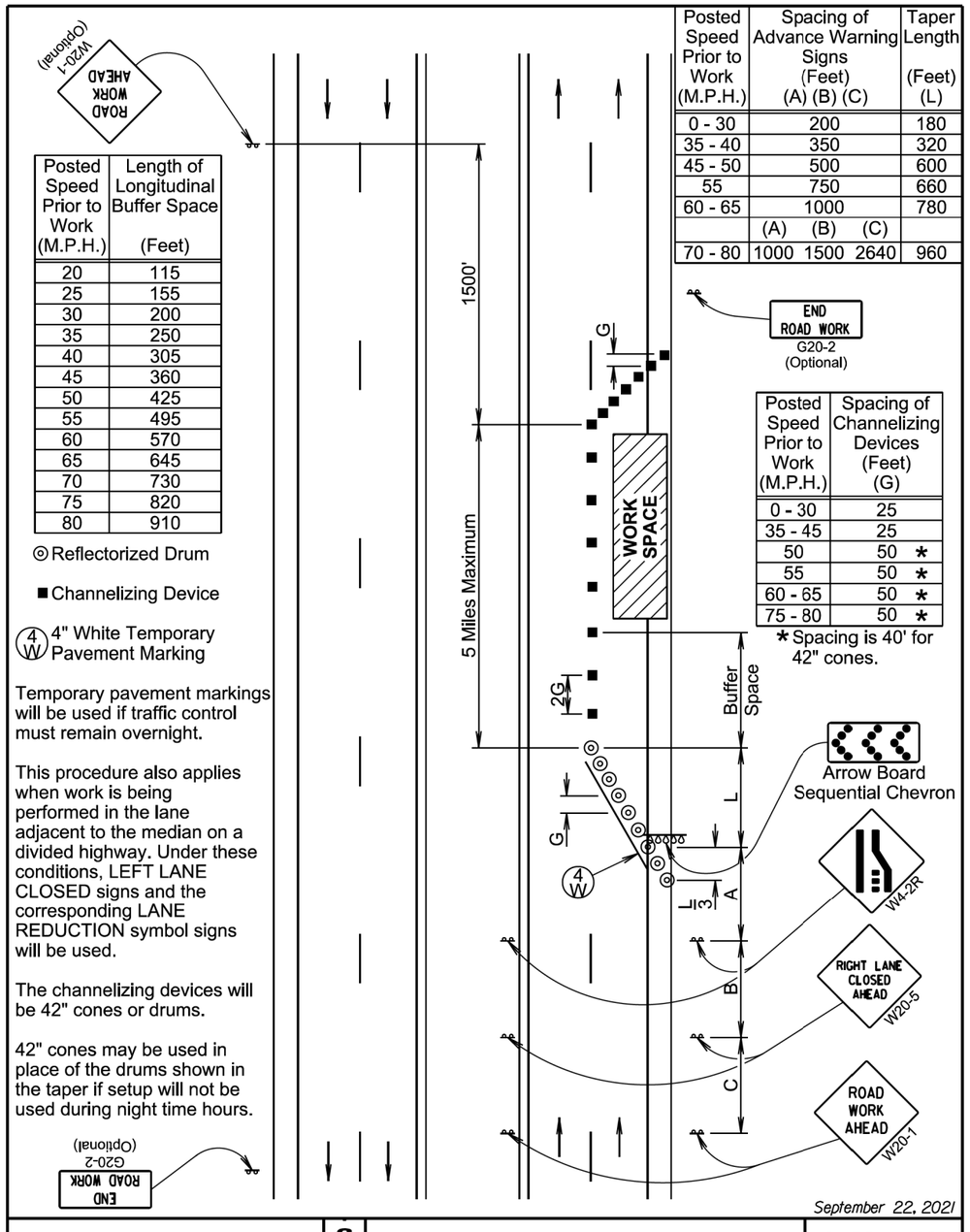
4" white temporary pavement marking tape for right lane closures, 4" yellow temporary pavement marking tape for left lane closures, or temporary raised pavement markers at 5' spacing will be installed in the taper when the lane is closed overnight, and along the tangent section where the skip lines do not exist and the lane is closed for more than 3 days.



DETAIL A

April 8, 2025

Published Date: 2026	SDDOT	WORK ZONE SPEED REDUCTION FOR INTERSTATE AND HIGH SPEED MULTI-LANE HIGHWAYS	PLATE NUMBER 634.63
			Sheet 2 of 2



Posted Speed Prior to Work (M.P.H.)	Length of Longitudinal Buffer Space (Feet)
20	115
25	155
30	200
35	250
40	305
45	360
50	425
55	495
60	570
65	645
70	730
75	820
80	910

◎ Reflectorized Drum

■ Channelizing Device

(4W) 4" White Temporary Pavement Marking

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

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

The channelizing devices will 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.

Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet) (A) (B) (C)	Taper Length (Feet) (L)
0 - 30	200	180
35 - 40	350	320
45 - 50	500	600
55	750	660
60 - 65	1000	780
	(A) (B) (C)	
70 - 80	1000 1500 2640	960

Posted Speed Prior to Work (M.P.H.)	Spacing of Channelizing Devices (Feet) (G)
0 - 30	25
35 - 45	25
50	50 *
55	50 *
60 - 65	50 *
75 - 80	50 *

* Spacing is 40' for 42" cones.

September 22, 2021

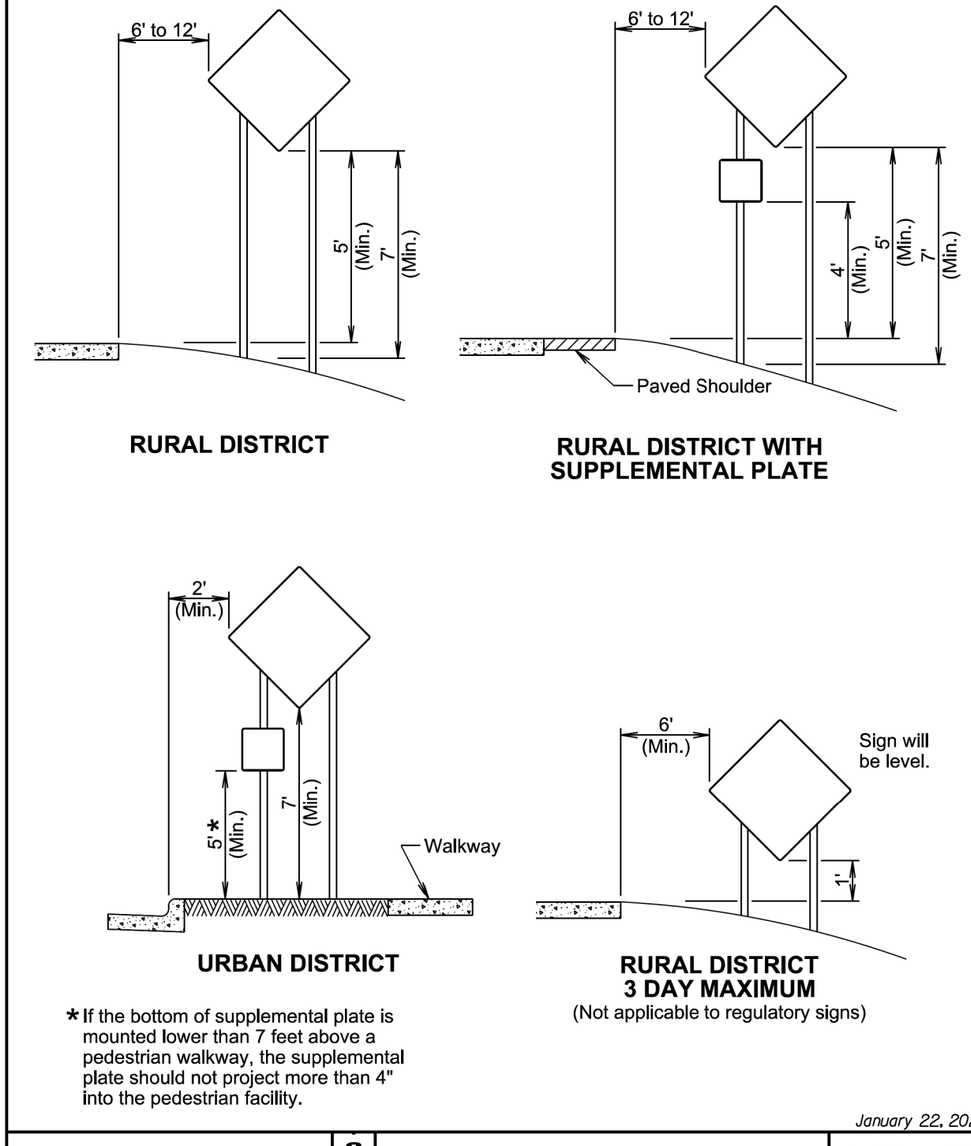
Published Date: 2026

SDDOT

LANE CLOSURE WITHOUT BARRIER

PLATE NUMBER 634.64

Sheet 1 of 1



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

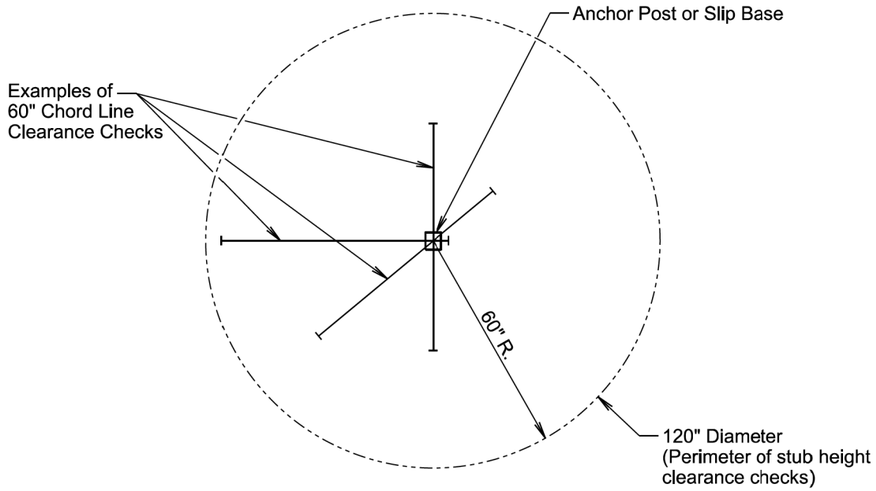
Published Date: 2026

SDDOT

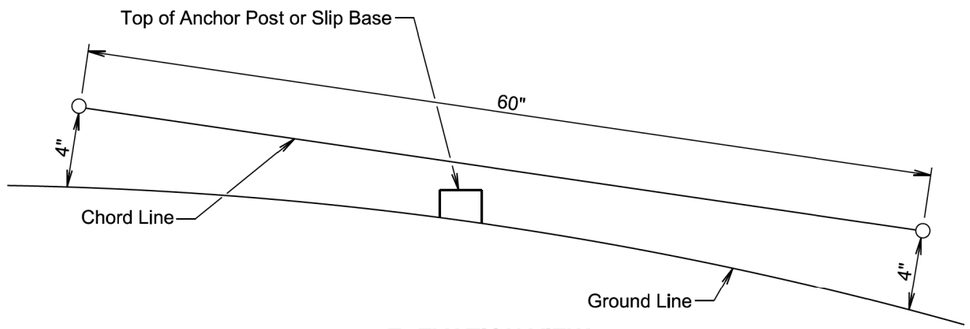
CRASHWORTHY SIGN SUPPORTS (Typical Construction Signing)

PLATE NUMBER 634.85

Sheet 1 of 1



PLAN VIEW
(Examples of stub height clearance checks)



ELEVATION VIEW

GENERAL NOTES:

The top of anchor posts and slip bases 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

Published Date: 2026	SDDOT	BREAKAWAY SUPPORT STUB CLEARANCE	PLATE NUMBER 634.99 Sheet 1 of 1