

STATE OF SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION

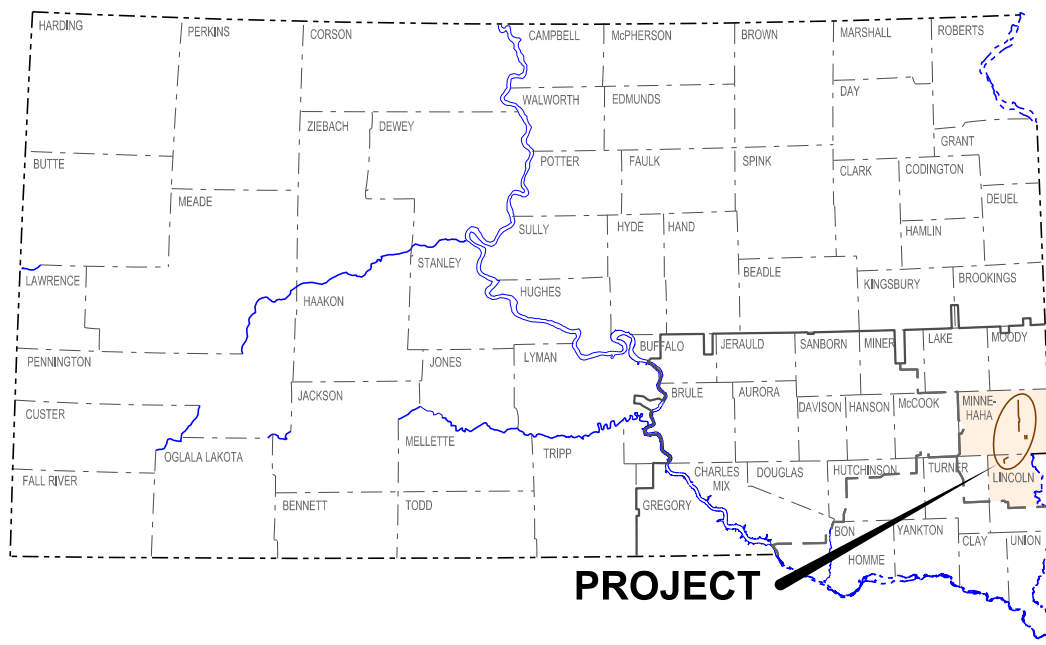
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM-NH-P 0022(100)	1	49

Plotting Date: 02/06/2025

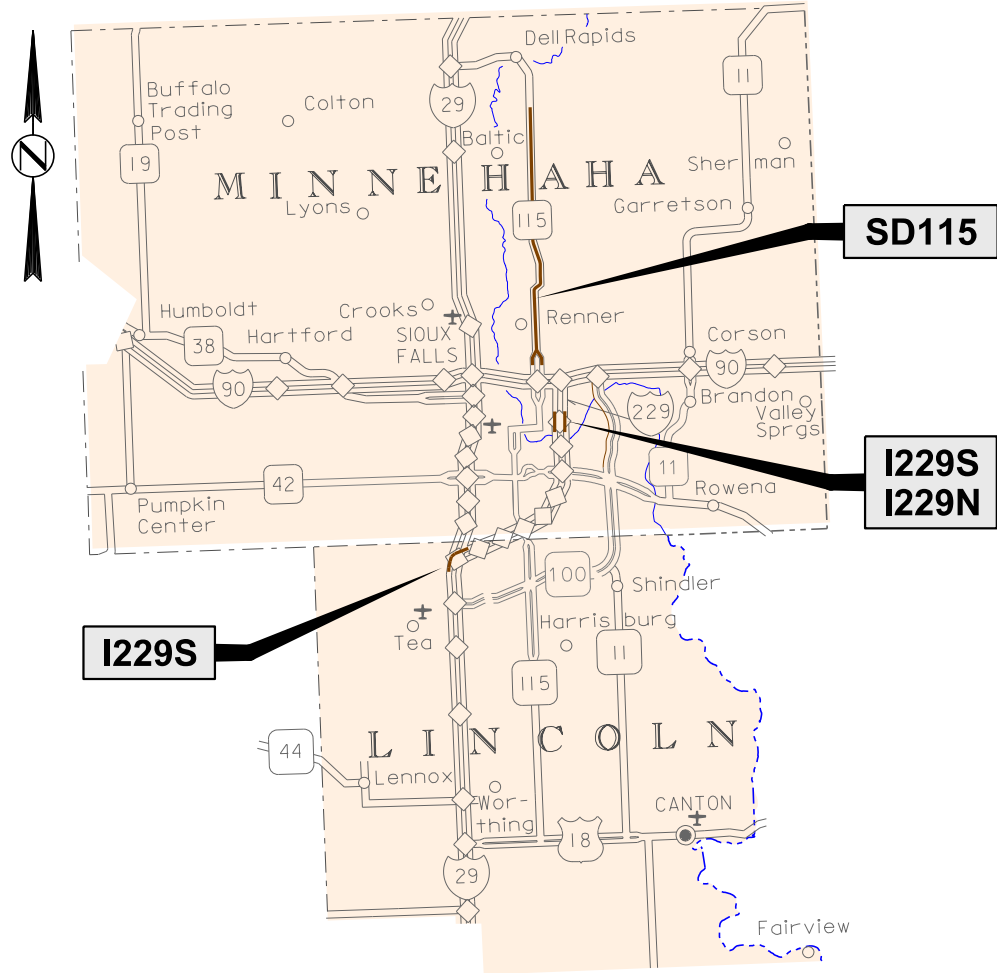
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PLANS FOR PROPOSED
PROJECTS IM-NH-P 0022(100)
INTERSTATE 229 & SD HIGHWAY 115
LINCOLN & MINNEHAHA COUNTIES
NRC PAVEMENT REPAIR, SPALL REPAIR,
TIE BAR RETROFIT, SEALING RANDOM CRACKS,
& RESEALING JOINTS
PCN 09LD



PROJECT



STORM WATER PERMIT
(None required)

PLOT SCALE - 1"=7000'

PLOTTED FROM - TRSF12133

PLOT NAME - 1

FILE - ... \MINNH09LD\MONTEVITL09LD.DGN

**INTERSTATE 229S
LINCOLN COUNTY**
NRC PAVEMENT REPAIR, SPALL REPAIR,
SEALING RANDOM CRACKS & RESEALING JOINTS
I229S LENGTH: 1.751 MILES

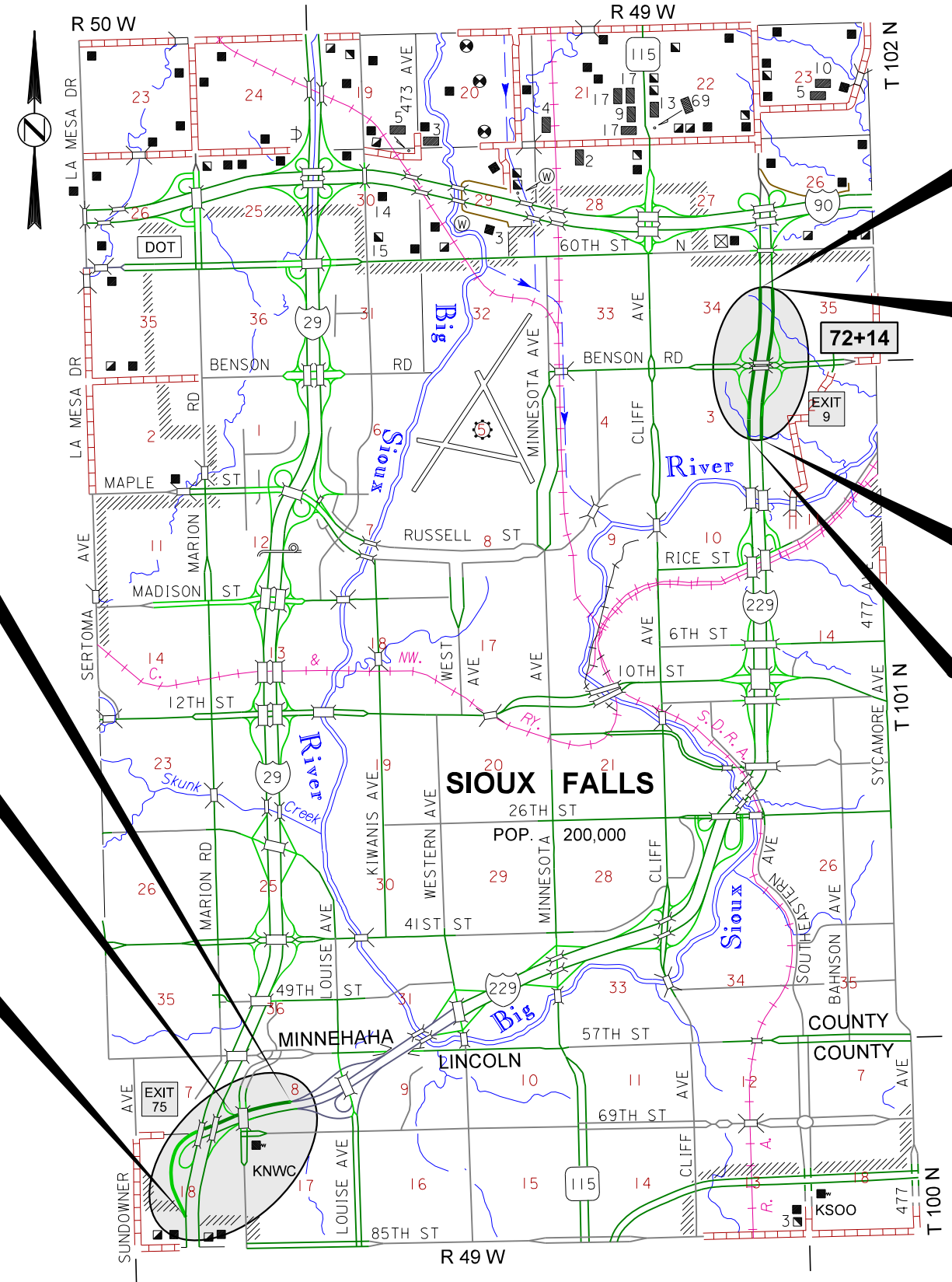
**INTERSTATE 229S
MINNEHAHA COUNTY**
NRC PAVEMENT REPAIR, SPALL REPAIR,
SEALING RANDOM CRACKS & RESEALING JOINTS
I229S LENGTH: 1.157 MILES
I229N LENGTH: 1.161 MILES

STATE OF SOUTH DAKOTA	PROJECT IM-NH-P 0022(100)	SHEET 2	TOTAL SHEETS 49
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Plotting Date: 02/06/2025

PLOT SCALE - 1:7000

PLOT NAME - 2



END I229S
STA. 101+24
MRM 0.85 +0.457
(At Begin AC)

**END I229S RAMPC
BEGIN I229S**
STA. 74+28
MRM 0+00 +1.240

BEGIN I229S RAMP C
STA. 8+77
MRM 0.00 +0.000
(At Jct I29S)

I229S (I29 TO LOUISE AVE) ADT (2023) 20,030
I229S (NEAR BENSON RD) ADT (2023) 13,148
I299N (NEAR BENSON RD) ADT (2023) 13,143

BEGIN I229S
STA. 42+10
MRM 9.00 +0.979
(At Concrete Change)

BEGIN I229N
STA. 42+05
MRM 9.00 +0.984
(At Concrete Change)

END I229N
STA. 103+35
MRM 8.28 +0.565
(At Concrete Change)

END I229S
STA. 103+20
MRM 8.28 +0.564
(At Concrete Change)

PLOTTED FROM - TRSF12133

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STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM-NH-P 0022(100)	3	49

Plotting Date: 02/06/2025

SD HIGHWAY 115 MINNEHAHA COUNTY

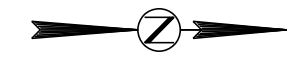
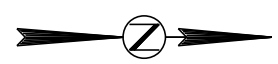
NRC PAVEMENT REPAIR, TIE BAR RETROFIT, SEALING RANDOM CRACKS & RESEALING JOINTS

LENGTH: 12.392 MILES

PLOT SCALE - 1:7000

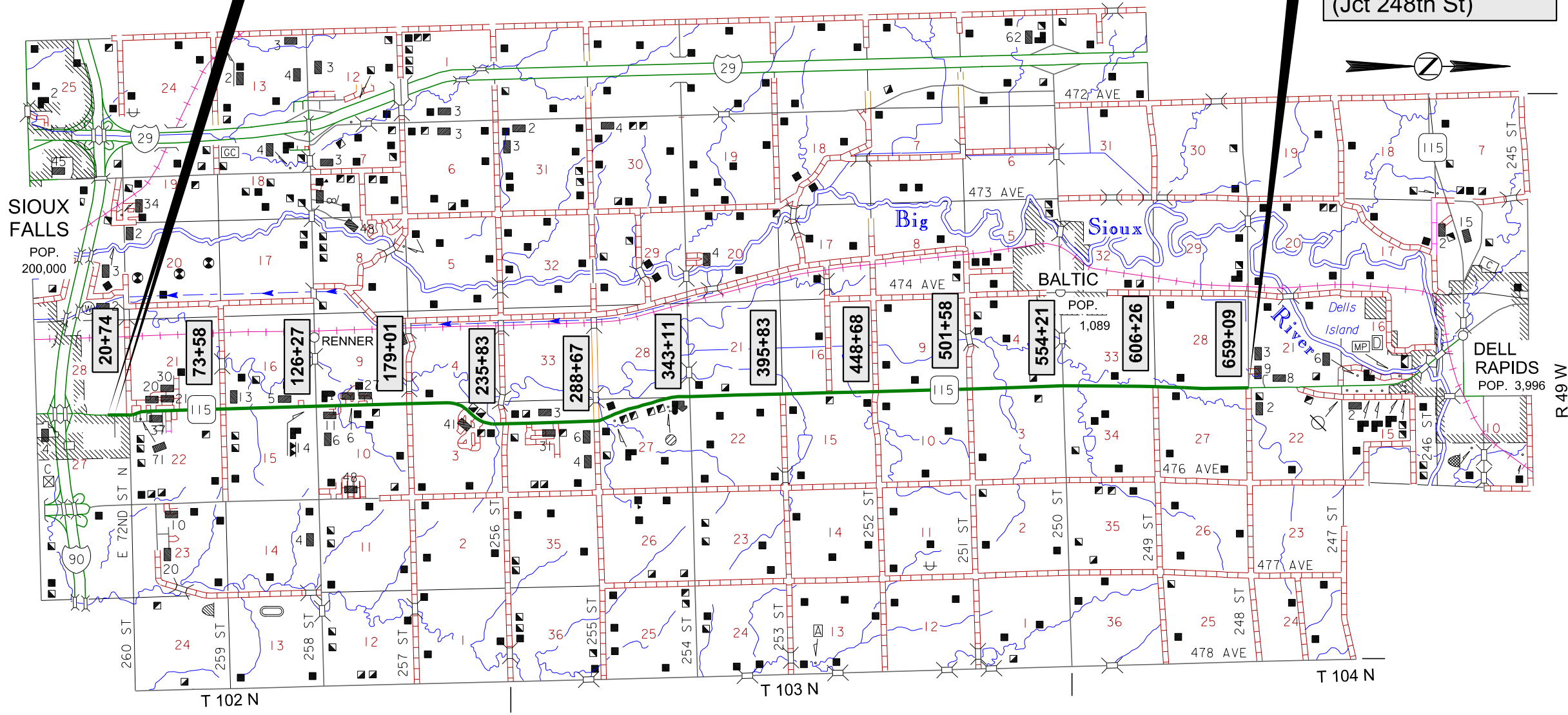
PLOT NAME - 3

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<p>BEGIN SD115 SB STA. 2+32 1854' S OF MRM 89.87 (140' N of New Concrete Lanes)</p>	<p>BEGIN SD115 NB STA. 7+29 NB 1345' S OF MRM 89.87 (Jct E 67th St N)</p>
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END SD115 SB/NB
STA. 659+09
MRM 102.00 +0.051
(Jct 248th St)



ADT (2023) 4,678

ESTIMATE OF QUANTITIES

REV: 2/11/25

STATE OF SOUTH DAKOTA	PROJECT IM-NH-P 0022(100)	SHEET 4	TOTAL SHEETS 49
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PCN 09LD

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
320E1200	Asphalt Concrete Composite	200.0	Ton
380E5030	Nonreinforced PCC Pavement Repair	2,756.3	SqYd
380E6000	Dowel Bar	3,530	Each
380E6110	Insert Steel Bar in PCC Pavement	6,381	Each
380E6200	Tie Bar Retrofit, Stitching	40	Each
380E6302	Reseal PCC Pavement Joint - Hot Pour	21,800	Ft
380E6310	Seal Random Cracks in PCC Pavement	450	Ft
390E0200	Repair Type A Spall	60.0	SqFt
634E0010	Flagging	500.0	Hour
634E0020	Pilot Car	250.0	Hour
634E0110	Traffic Control Signs	957.7	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0275	Type 3 Barricade	20	Each
634E0330	Temporary Raised Pavement Markers	21,500	Ft
634E0380	Tubular Marker	500	Each
634E0390	Replace Tubular Marker	50	Each
634E0420	Type C Advance Warning Arrow Board	2	Each
634E0600	4" Temporary Pavement Marking Tape Type I	144	Ft
634E0900	Portable Temporary Traffic Control Signal	2	Unit
634E1215	Contractor Furnished Portable Changeable Message Sign	2	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
	IM-NH-P 0022(100)	5	49

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.

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.

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

The SDDOT has obtained concurrence with the State Historic Preservation Office (SHPO or THPO) for all work included within the project limits and all department designated sources and designated option material sources, stockpile sites, storage areas, and waste sites provided within the plans.

Action Taken/Required:

All earth disturbing activities not designated within the plans require 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.

SHPO/THPO review does not relieve the Contractor of the responsibility for obtaining any additional permits and clearances for Contractor furnished material sources, material processing sites, stockpile sites, storage areas, plant sites, and waste areas that affect wetlands, threatened and endangered species, or waterways. The Contractor 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.

SCOPE OF WORK

This project consists of full depth replacement of Nonreinforced Concrete Pavement (NRCP) in areas where concrete pavement blowups or major failures have occurred. Numerous other forms of pavement repair are also contained herein.

Joints will be sawed and sealed where sealant has failed.

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 Engineer to determine modifications that will be necessary to avoid utility impacts.

EXISTING PCC PAVEMENT

SD 115 north of Sioux Falls

The existing pavement is 8" NRC Pavement. Existing contraction joints are spaced at approximately 20'. Longitudinal joints are reinforced with No. 4 x 30" deformed tie bars spaced 48" center to center. Transverse joints are reinforced with 1 1/4" x 18" plain round dowel bars spaced 12" center to center.

I229 SB MRM SOUTH SEGMENT

The existing pavement is 12" NRC Pavement. Existing contraction joints are spaced at approximately 20'. Longitudinal joints are reinforced with No. 5 x 30" deformed tie bars spaced 48" center to center. Transverse joints are reinforced with 1 1/2" x 18" plain round dowel bars spaced 12" center to center.

I229 SB and NB MRM NORTH SEGMENT

The existing pavement is 10.5" NRC Pavement. Existing contraction joints are spaced at approximately 20'. Longitudinal joints are reinforced with No. 5 x 30" deformed tie bars spaced 48" center to center. Transverse joints are reinforced with 1 1/4" x 18" plain round dowel bars spaced 12" center to center.

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.

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

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.

GRAVEL CUSHION

If quarried ledge rock is used in the Gravel Cushion, a maximum blend of 40% quarried ledge rock will be allowed.

NONREINFORCED 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 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 1/4" preformed asphalt expansion joint material along the longitudinal joint from the existing working joint to the new working joint. The expansion joint material 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. Refer to Saw and Seal Joints notes.

NONREINFORCED PCC PAVEMENT REPAIR (NRCP)

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 3,000 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 3,000 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".

STEEL BAR INSERTION (NRCP)

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.

For existing pavement thickness greater than or equal to 10.5" (T >= 10.5"):
The Contractor will 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 380.3 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 will 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 380.3 C.1.

For existing pavement thickness less than 8.5" (T < 8.5"):
The Contractor will 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 380.3 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 holes.

SAW AND SEAL JOINTS

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 or the type of sealant directed by the Engineer. Longitudinal joints in rural sections may be sealed with either Hot Poured Elastic Joint Sealer or Low Modulus Silicone Sealant.

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

REPAIR TYPE A SPALLS

Concrete Patch Material will be Type III conforming to Section 390.2 B.3.

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

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

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

TIE BAR RETROFIT, STITCHING

Drilling of holes and epoxy resin adhesive will conform to Section 380. Steel bars will conform to Section 1010.

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

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

The diameter of the drilled holes in the existing concrete pavement for the steel bars will not be less than 1/8 inch nor more than 3/8 inch greater than the overall diameter of the steel bar. The holes will be drilled at an angle alternating from opposite sides of the joint to produce a cross-stitching pattern.

Fill the drilled holes sufficiently with epoxy prior to the insertion of the tie bar such that the epoxy will be level with the top of the concrete pavement after insertion of the tie bar. Rotate the steel bar during insertion to eliminate voids and ensure complete bonding of the bar. Insertion of the bars by the dipping method will not be allowed. The top of the drilled hole will be filled with epoxy or excess epoxy removed such that the epoxy is level with the existing pavement.

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

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

REPAIR OF ASPHALT CONCRETE SHOULDERS

An estimated 200 tons of Asphalt Concrete Composite is included in the Estimate of Quantities for repairing the asphalt concrete shoulders due to damage caused by Interstate traffic during lane closures. Damaged areas that are four feet or greater in width and greater than 100 feet in length will be blade laid.

Cost for asphalt concrete required on the shoulder adjacent to full depth pavement replacement sections that are not in areas where traffic has damaged the shoulder will be incidental to the contract unit prices per square yard for Nonreinforced PCC Pavement Repair.

RESEAL PCC PAVEMENT JOINT

Existing transverse joints will be cleaned and resealed for the full width of the joint (28' to 36' depending on number of lanes) with Hot Poured Elastic Joint Sealer.

Existing longitudinal joints will be cleaned and resealed with Hot Poured Elastic Joint Sealer.

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

Final joint width is to be kept as narrow as possible and may only be widened to provide a clean surface. Each joint will not be widened more than 1/8 inch if sawing is utilized to prepare the joint for sealant. If sawing is used this may require 2 passes with the saw, one pass for each side of the joint.

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

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

Reseal PCC Pavement Joint – Hot Pour will be measured by the foot to the nearest 0.1 foot of joints sealed and accepted and will be paid for at the contract unit price per foot measured for payment. Payment will be full compensation for labor, equipment, material and incidentals required for crack routing, cleaning, furnishing and installing backer rod when necessary, furnishing and placing sealant and removing routed and foreign material from the roadway.

SEAL RANDOM CRACKS IN PCC PAVEMENT

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

Only those random cracks in the existing concrete pavement that are open and accept water and incompressible materials as selected by the Engineer will be prepared and sealed with Hot Poured Elastic Joint Sealer.

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

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

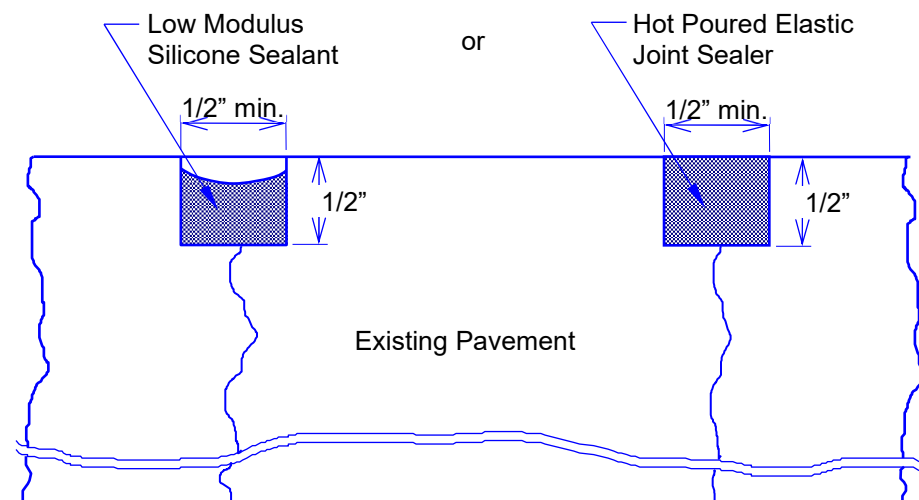
Random cracks wider than 1/2 inch may require the placement of a backer rod prior to sealing. Use of backer rod should be limited to locations where, once placed, the top of the backer rod will be a minimum of 2/4 inches below the top surface of the pavement. The hot pour in cracks wider than 1/2" should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

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

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

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

SEALING RANDOM CRACKS (NRCP)



SUMMARY OF PCC PAVEMENT REPAIR

HWY	BEGIN MRM	DISP	END MRM	DISP	BEGIN DMI	END DMI	NRCP REPAIR (SqYd)	NO. 8 X 18" EPOXY COATED DEFORMED TIE BARS (Each)	NO. 11 X 18" EPOXY COATED DEFORMED TIE BARS (Each)	NO. 5 X 24" EPOXY COATED DEFORMED TIE BARS (Each)	INSERT STEEL BAR IN CONCRETE PAVEMENT (Each)	DOWEL BAR (Each)	REPAIR TYPE A SPALL (IN NRCP) (SqFt)	TIE BAR RETROFIT STITCHING (Each)	SEAL RANDOM CRACKS IN PCC PAVEMENT (Ft)	RESEAL PCC PAVEMENT LONGITUDINAL JOINTS HOT POUR (Ft)	RESEAL PCC PAVEMENT TRANSVERSE JOINTS HOT POUR (Ft)
SD 115	89.86	0.000	102.00	0.055	89.86	102.06	2,070.8	3,236		1,527	4,763	2,756		40	200	300	300
I229 NB	8.28	0.584	9.74	0.262	8.86	10	59.1		72	54	126	56	20		100	10,000	300
I229 SB	8.28	0.584	9.83	0.176	8.86	10	615.6		788	638	1,426	684	20		100	10,000	300
I229 SB South	0.00	0.000	0.85	0.457	0	1.03	10.8		34	32	66	34	20		50	300	300
GRAND TOTALS:							2,756.3	3,236	894	2,251	6,381	3,530	60	40	450	20,600	1,200

SEQUENCE OF OPERATIONS

1. Install Traffic Control devices per the details in these plans.
2. Complete all concrete repair work.
3. Reseal Joints.

The Contractor will submit a sequence of operations for approval two weeks prior to the preconstruction meeting. If changes to the sequence of operations are proposed during the project, these must be submitted for review a minimum of one week prior to potential implementation. Approval for changes to the sequence of operations will only be allowed when the proposed changes meet with the Department's intent for traffic control and sequencing of the work.

GENERAL TRAFFIC CONTROL

Existing guide, route, informational logo, regulatory, and warning signs will be temporarily reset and maintained during construction. Removing, relocating, covering, salvaging, and resetting of existing traffic control devices, including delineation, will be the responsibility of the Contractor. Cost for this work will be incidental to the contract unit prices for the various items unless otherwise specified in the plans. Any delineators and signs damaged or lost will be replaced by the Contractor at no cost to the State.

All temporary traffic control sign locations will be set in the field by the Contractor and verified by the Engineer prior to installation.

All temporary speed limit signs will have a minimum mounting height of 5 feet in rural locations, even when mounted on portable supports.

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

All construction operations will be conducted in the general direction of traffic movement.

If there is a discrepancy between the traffic control plans, standard plates, and the MUTCD, whichever is more stringent will be used, as determined by the Engineer.

Unless otherwise stated in these plans, work will not be allowed during hours of darkness.

Fixed location signing placed more than 4 calendar days prior to the start of construction will be covered or laid down until the time of construction. The covers must be approved by the Engineer prior to installation. The cost of materials, labor, and equipment necessary to complete this work will be incidental to other contract items. No separate payment will be made.

All fixed location signs, sign posts, and breakaway bases will be removed within 7 calendar days following pavement marking.

All haul trucks will be equipped with an additional flashing amber light that is visible from the backside of the haul truck. The costs for the flashing amber lights will be incidental to the various related contract items.

Traffic will be maintained on the driving lanes. Use of the shoulder as a driving lane will not be permitted. Any damage to the shoulder due to rerouted traffic or Contractor's equipment will be repaired at no expense to the Department.

GENERAL TRAFFIC CONTROL (CONTINUED)

A Type 3 Barricade will be installed at the end of a lane closure taper as detailed in these plans. Additional Type 3 Barricades will be installed facing traffic within the closed lane at a spacing of ¼ mile.

Construction vehicles will exit or enter the construction work zone at locations identified by the Engineer. At no time will construction vehicles utilize the maintenance crossovers or the Interstate median to exit or enter Interstate traffic.

On Interstate projects with more than one construction site, slow moving equipment that operates at a speed less than 40 MPH may mobilize between sites if the equipment travels on the shoulder. The slow-moving equipment will also display a flashing amber light and a slow-moving sign.

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 the 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.

FLAGGING

Operations will be conducted so that the traveling public will not have to wait longer than 15 minutes at the flagger station.

Additional flagger warning signs and flagger hours have been included in the Estimate of Quantities for use on intersecting roads. These flaggers will be used as directed by the Engineer and will be used primarily during daytime hours. Also included in the Estimate of Quantities are WAIT FOLLOW PILOT CAR signs for use on low volume intersecting roads as determined by the Engineer. WAIT FOLLOW PILOT CAR signs will not block the view of the stop sign.



It is required that the flaggers and pilot car operators be able to communicate with one another. If an emergency vehicle needs to pass through the project, the Contractor will be required to expedite traffic movement. All costs associated with this will be incidental to the contract unit price per hour for "Flagging".

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 TAPE, TYPE I

Temporary pavement marking for stop lines will consist of 4" Temporary Pavement Marking Tape Type I. Placement of each 24" white stop line will be accomplished by placing six pieces of 4" x 12' tape adjacent to one another. Each workspace requires two stop lines which is an equivalent of approximately 144' of 4" tape. Temporary Pavement Marking Tape Type I will be required for centerline markings shown on standard plate 634.25. Temporary tape will be removed upon completion of the project.

TEMPORARY RAISED PAVEMENT MARKERS

Temporary raised pavement markers will be used for marking edge lines, lane lines, and centerlines. Temporary raised pavement markers will be used on all new permanent surfacing sections of roadway and on existing surfacing where temporary marking locations are different than existing marking locations, unless noted or as directed by the Engineer.

Temporary raised pavement markers will be attached to the roadway surface with a flexible non-permanent bituminous adhesive capable of being removed from the roadway surface or with an adhesive approved by the Engineer.

All costs to furnish, install, replace if necessary, and remove the markers will be incidental to the contract unit price per mile for "Temporary Raised Pavement Markers".

TUBULAR MARKERS

The color of the tubular markers on centerline will be predominately orange. The color of the tubular markers installed on the shoulders will be predominately white. The white tubular markers will be installed 2.0 feet from the existing edge line at intervals of approximately 480 feet.

All tubular markers will be a minimum of 28 inches in height. The base of the tubular marker should be attached to the roadway surface with a flexible non-permanent bituminous adhesive capable of being removed from the roadway surface after use. The pin used to connect the marker to the base will be of a type that will not puncture a vehicle tire if it should become dislodged from the base.

All costs for furnishing, installing, maintaining, and removing the tubular markers will be incidental to the contract unit price per each for "Tubular Marker".

TRAFFIC CONTROL FOR PCCP REPAIR

Each mainline concrete repair location, from which the in-place concrete has been removed, will be marked with a minimum of two reflectorized drums. In areas containing numerous concrete repair locations, two reflectorized drums should be installed at a spacing of 660 feet alternating with the Type 3 Barricades.

Construction workspaces on divided roadways will be limited to 5 miles in length. Construction workspaces on undivided roadways will be limited to 1,320 feet in length. The distance between the closest points of any two construction workspaces, including channeling devices, will not be less than 3 miles. Drivers in two-way traffic workspaces must be able to see approaching traffic through and beyond the work zone. Flagger controlled workspaces will be limited to 2 miles in length.

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.

The Contractor will use Flaggers during peak traffic hours and at times specified by the Engineer to supplement the traffic signals and signing shown on standard plate 634.25. Peak traffic hours are assumed to be 6:30 am to 8:30 am and 4:30 pm to 6:00 pm. It is possible that Flagging will be required during all daytime hours. Advance warning Flagger signs will be required when Flaggers are present and removed when no Flaggers are present.

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 gravel and 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. Gravel cushion material and hot-mix asphalt concrete will be furnished and installed by the Contractor at no additional cost to the State.

All costs for furnishing, hauling, and placing gravel cushion material and 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 the shoulders around the work zones.

Extra care will be taken to protect the in place asphalt concrete shoulders on SD 115. In all workspaces in these areas, flexible delineators will be required on the shoulders and will also be placed in locations to adequately keep traffic completely off the shoulders. Continuous maintenance will be required to keep them in place.

TRAFFIC CONTROL FOR PCCP REPAIR (CONTINUED)

Type B warning lights will be placed on top of FLAGGER (W20-7) symbol signs.

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

The Contractor will be required to contact the Engineer two weeks in advance so that the Region Traffic Engineer can arrange for signal timings to be adjusted to accommodate traffic when a lane is closed near a signalized intersection.

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.

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

PORTABLE TEMPORARY TRAFFIC CONTROL SIGNAL

The Contractor will furnish, install, operate, and maintain a portable temporary traffic control signal during construction phases as determined by the Engineer. There will be one controller and one slave unit per location.

The portable temporary traffic control signal will be set up to dwell in red. Detection will be video, microwave, or radar. The green time may be adjusted as needed. The initial timings for the construction sites are given below:

Temporary Traffic Signal Timing Plans - PCN09LD

PHASING AND SEQUENCING							
INTERVAL	1	2	3	4	5	6	FLASH DISPLAY
SIGNAL HEADS							
SD115 NB ϕ A	G	Y	R	R	R	R	R
SD115 SB ϕ B	R	R	R	G	Y	R	R
TIMINGS BASED ON MAXIMUM 1320 FT* DISTANCE BETWEEN OPPOSING STOP LINES AND TRAFFIC SPEED OF 35 MPH.							FLASH TIME
CYCLE LENGTH = 102 Seconds							
PHASES	ϕ A			ϕ B			
MOVEMENTS	→			←			FAILURE OR EMERGENCY ONLY
MIN. GREEN (SEC)	8			8			
EXTENSION GREEN (SEC)	3			3			
MAX GREEN(SEC)	19			19			
YELLOW (SEC)	6			6			
ALL RED (SEC)	26			26			

* - The timings may be adjusted if the length between the stop lines varies from the 1320 ft value used in calculations. The all red times may be recalculated as follows:

PORTABLE TEMPORARY TRAFFIC CONTROL SIGNAL (CONTINUED)

The portable temporary traffic control signal will be set up to dwell in red. Detection will be video, microwave, or radar. The green time may be adjusted as needed. The Engineer will contact the Region Traffic Engineer one week prior to activation to obtain the appropriate signal timings.

All vehicle signal heads will have backplates with retroreflective border. The vehicle signal head backplates will have a factory applied 3-inch wide yellow retroreflective border. Sheeting for the border will be Type IX or Type XI in conformance with ASTM D4956.

Signal backplates will be polycarbonate, aluminum, or aluminum-composite. Minimum material thicknesses are:

- Polycarbonate, 0.10-inch
- Aluminum, 0.06-inch
- Aluminum-Composite, 0.08-inch

Signal backplates will extend not less than 5 inches from the edge of the signal head at the top, bottom, and sides.

All traffic signal equipment and materials will meet the requirements of Sections 635 and 985 of the Specifications except the controller requirements.

All costs involved with constructing the portable temporary traffic control signal as specified above and on the plans, will be included in the contract unit price per unit for "Portable Temporary Traffic Control Signal".

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 messages as detailed in the plans.

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM-NH-P 0022(100)	12	49

INCIDENTS

An incident is an emergency road user occurrence, a natural disaster, or other unplanned event that affects or impedes the normal flow of traffic such as a crash, hazardous materials spill, or other event.

The Contractor will set up a meeting prior to start of work to plan and coordinate responses to an incident. The Contractor will invite the Department of Transportation, the South Dakota Highway Patrol, the Minnehaha County Sheriff and local emergency response entities to the meeting.

The Contractor will assist to maintain traffic as required by these plan notes and as agreed to at that meeting.

Emergency vehicle access through the project will be considered and discussed at the meeting.

The Contractor may be required to modify messages on portable changeable message signs or relocate portable changeable message signs, and to provide flaggers to direct or detour traffic. The Contractor should be prepared to relocate advance warning signs if determined to be necessary for a major traffic incident lasting more than two hours. Fixed location ground mounted signs may be covered and additional portable signs provided.

No additional payment will be made for the modification of portable changeable message sign messages or the relocation of portable changeable message signs. Cost for the relocation of an advance warning sign due to an incident will be 50% of the designated sign rate. Flaggers will be paid for at the contract unit price per hour for "Flagging".

PRESS RELEASE ANNOUNCEMENTS

The SDDOT will prepare a press release to be released 5 days prior to any phase change or any other major change that affects traffic flow. The SDDOT will be responsible to keep law enforcement, emergency services, and the traveling public notified of changes in project access. The Contractor will provide the Engineer with pertinent information 7 days prior to any phase change or any other major change that affects traffic flow.

ITEMIZED LIST FOR TRAFFIC CONTROL SIGNS

SIGN CODE	SIGN DESCRIPTION	CONVENTIONAL ROAD				EXPRESSWAY / INTERSTATE					
		NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT	NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT		
R1-1	STOP	1	30"	5.2	5.2		36"	7.5			
R1-2	YIELD		36"	3.9		1	36"	3.9	3.9		
R2-1	SPEED LIMIT 45		24" x 30"	5.0		2	36" x 48"	12.0	24.0		
R2-1	SPEED LIMIT 55		24" x 30"	5.0		4	36" x 48"	12.0	48.0		
R2-1	SPEED LIMIT 65		24" x 30"	5.0		2	36" x 48"	12.0	24.0		
R2-1	SPEED LIMIT 80		24" x 30"	5.0		2	36" x 48"	12.0	24.0		
R2-6aP	FINES DOUBLE (plaque)		24" x 18"	3.0		2	36" x 24"	6.0	12.0		
R3-2	LEFT TURN PROHIBITION (symbol)	1	24" x 24"	4.0	4.0		36" x 36"	9.0			
R3-7R	RIGHT LANE MUST TURN RIGHT	2	30" x 30"	6.3	12.6						
R4-7	KEEP RIGHT (symbol)	4	24" x 30"	5.0	20.0		36" x 48"	12.0			
R4-9	STAY IN LANE		24" x 24"	4.0		2	36" x 48"	12.0	24.0		
R10-6	STOP HERE ON RED	2	24" x 36"	6.0	12.0						
W1-4	REVERSE CURVE (L or R)	1	48" x 48"	16.0	16.0	2	48" x 48"	16.0	32.0		
W1-4b	REVERSE CURVE (two lanes shift) (L or R)		48" x 48"	16.0		4	48" x 48"	16.0	64.0		
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		2	48" x 48"	16.0	32.0		
W3-5	SPEED REDUCTION AHEAD (55 MPH)		48" x 48"	16.0		2	48" x 48"	16.0	32.0		
W4-1	MERGE (symbol)		48" x 48"	16.0		1	48" x 48"	16.0	16.0		
W4-2	LEFT or RIGHT LANE ENDS (symbol)	1	48" x 48"	16.0	16.0	2	48" x 48"	16.0	32.0		
W4-3	ADDED LANE (symbol)		48" x 48"	16.0		1	48" x 48"	16.0	16.0		
W5-4	RAMP NARROWS		48" x 48"	16.0		1	48" x 48"	16.0	16.0		
W7-3aP	NEXT __ MILES (plaque)		36" x 30"	7.5		2	36" x 30"	7.5	15.0		
W9-2	LANE ENDS MERGE LEFT	1	48" x 48"	16.0	16.0		48" x 48"	16.0			
W9-3L	CENTER LANE CLOSED AHEAD	2	48" x 48"	16.0	32.0	2	48" x 48"	16.0	32.0		
W12-1	DOUBLE ARROW		30" x 30"	6.3		1	48" x 48"	16.0	16.0		
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	1	48" x 48"	16.0	16.0	2	48" x 48"	16.0	32.0		
W20-7	FLAGGER (symbol)		48" x 48"	16.0		2	48" x 48"	16.0	32.0		
W21-5a	LEFT or RIGHT SHOULDER CLOSED	2	48" x 48"	16.0	32.0	2	48" x 48"	16.0	32.0		
W21-5b	LEFT or RIGHT SHOULDER CLOSED AHEAD	2	48" x 48"	16.0	32.0	2	48" x 48"	16.0	32.0		
G20-2	END ROAD WORK	2	36" x 18"	4.5	9.0	2	48" x 24"	8.0	16.0		
		CONVENTIONAL ROAD TRAFFIC CONTROL SIGNS SQFT				318.8	EXPRESSWAY / INTERSTATE TRAFFIC CONTROL SIGNS SQFT				638.9

SPECIAL DETAIL FOR WORK IN LANE 2 (3-LANE SECTION) (TYPICAL)

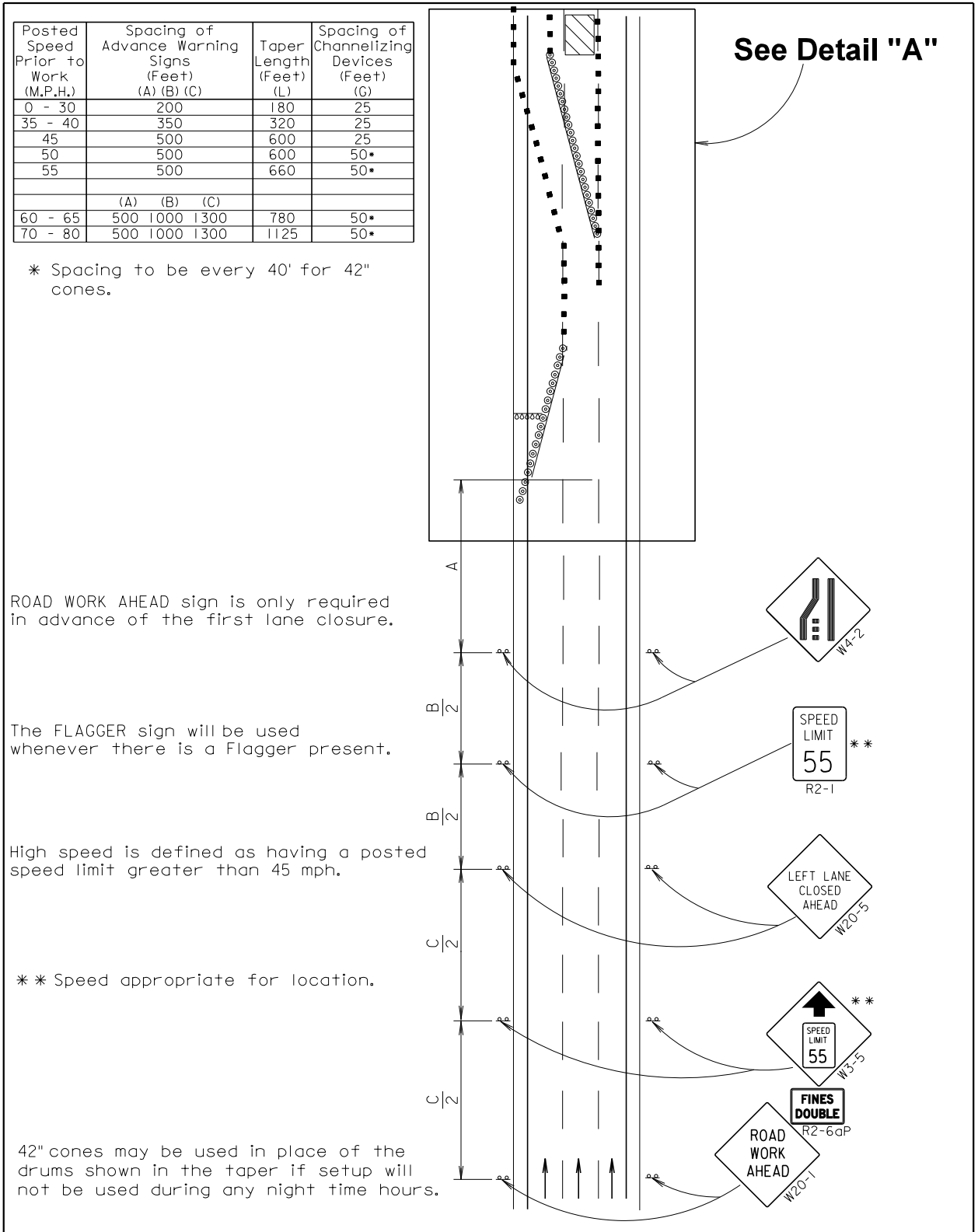
Plotting Date: 02/06/2025

PLOT SCALE - 1:200

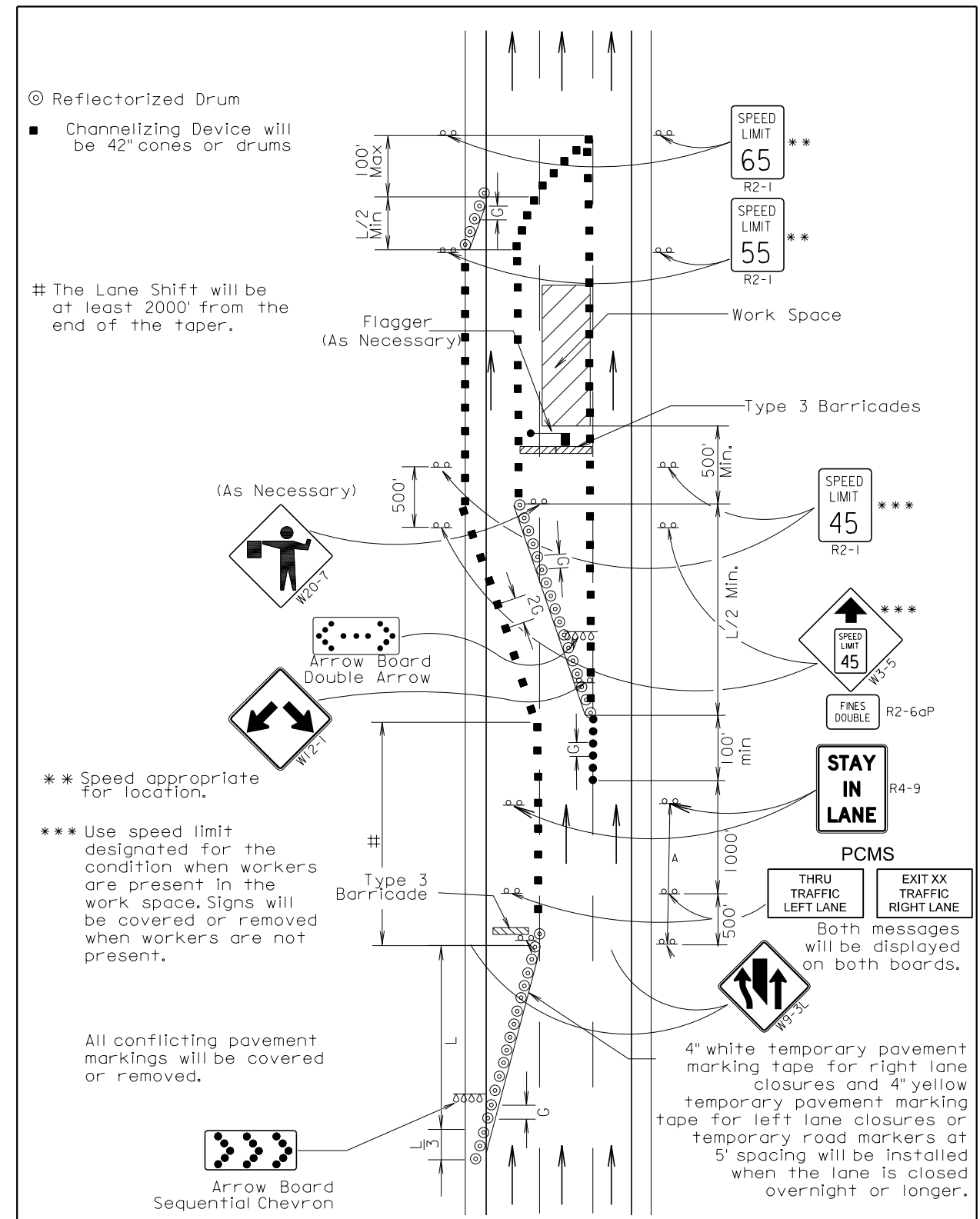
PLOT NAME - 3

FILE - ... \TC\MIDDLE LANE CLOSURE2D.DGN

PLOTTED FROM - TRSF12133

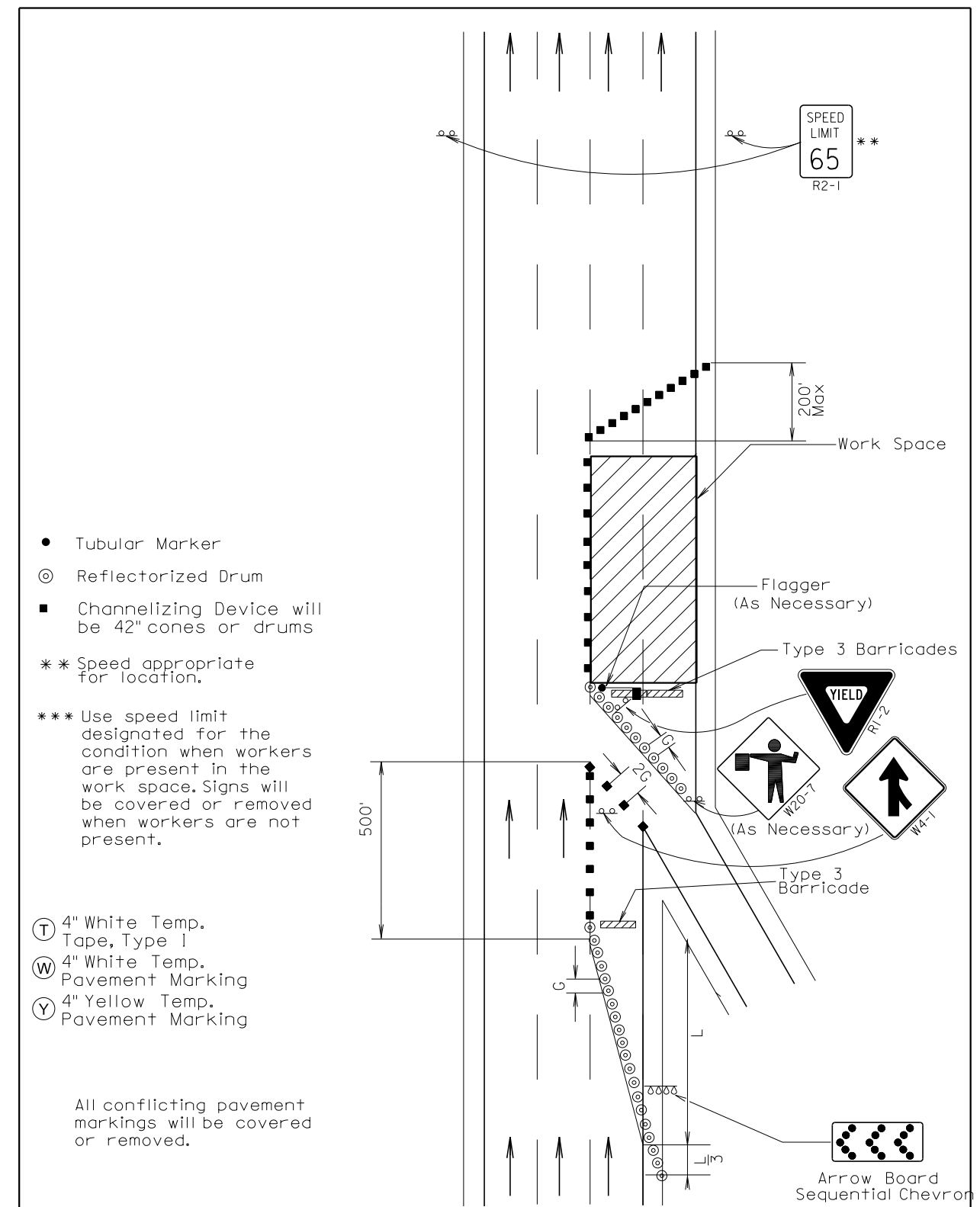
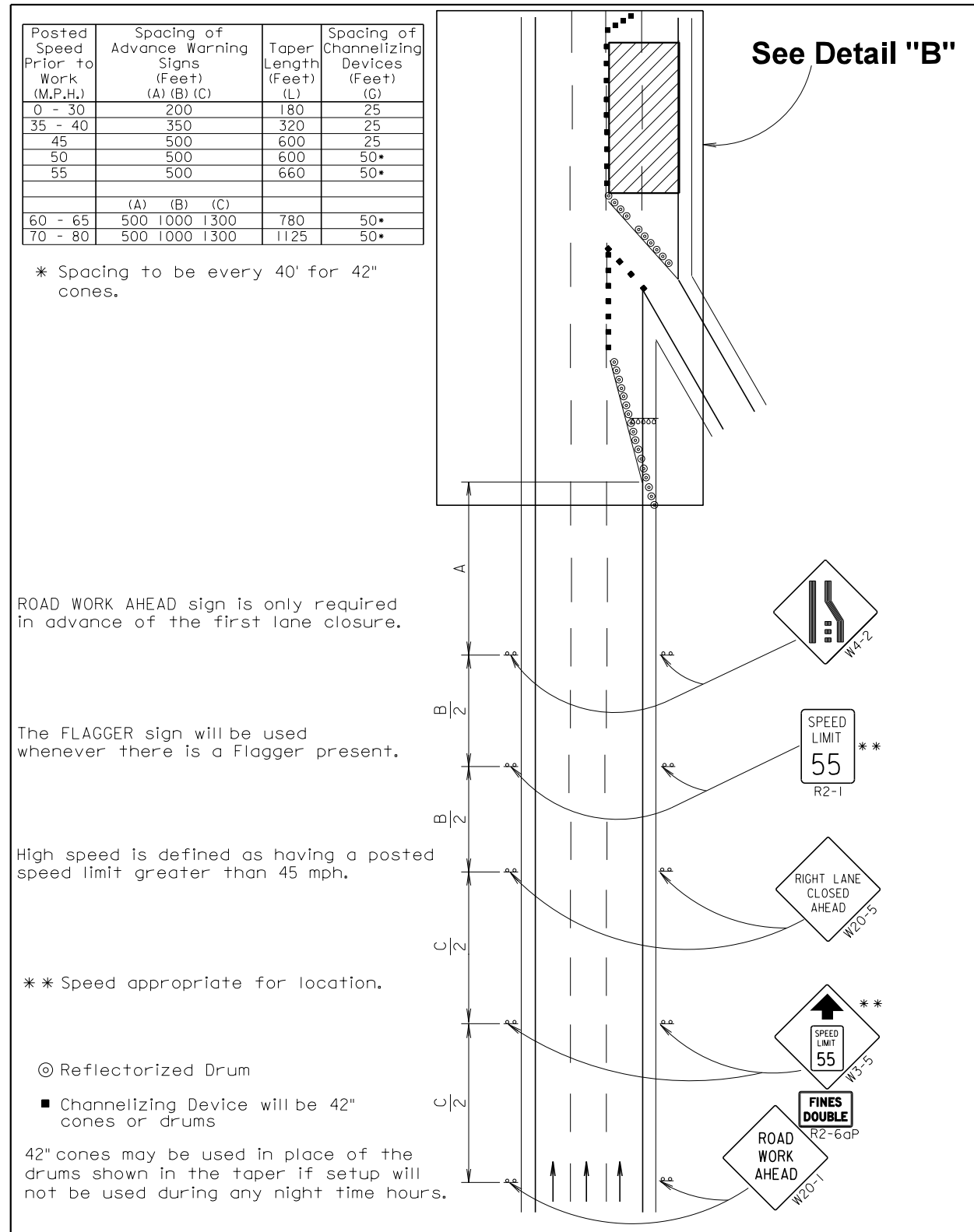


Detail "A"



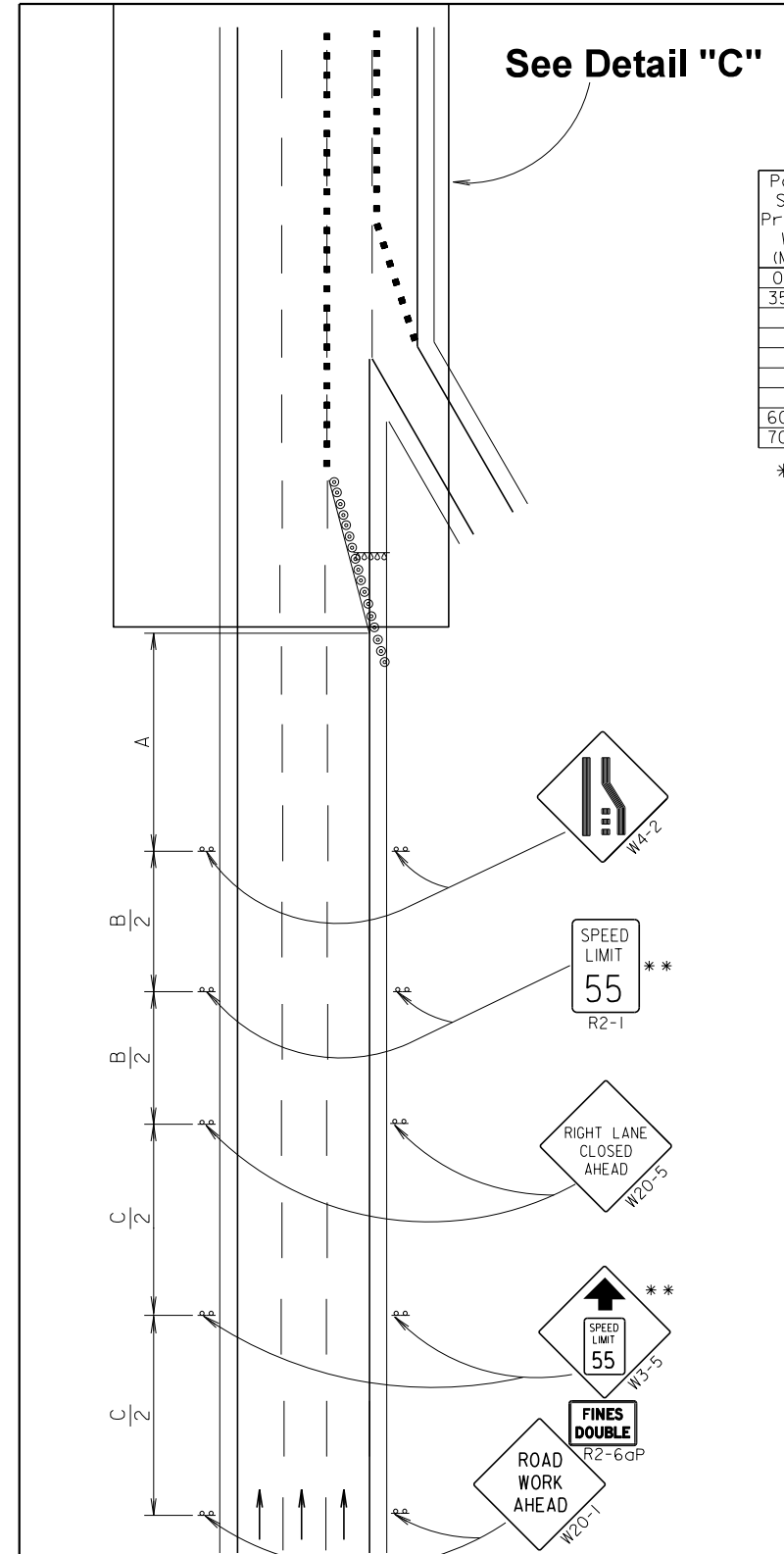
SPECIAL DETAIL FOR WORK IN LANE 3 AND 4 NEAR ON RAMP (TYPICAL)

Detail "B"



SPECIAL DETAIL FOR WORK IN LANE 3 AND 4 NEAR OFF RAMP (TYPICAL)

Detail "C"

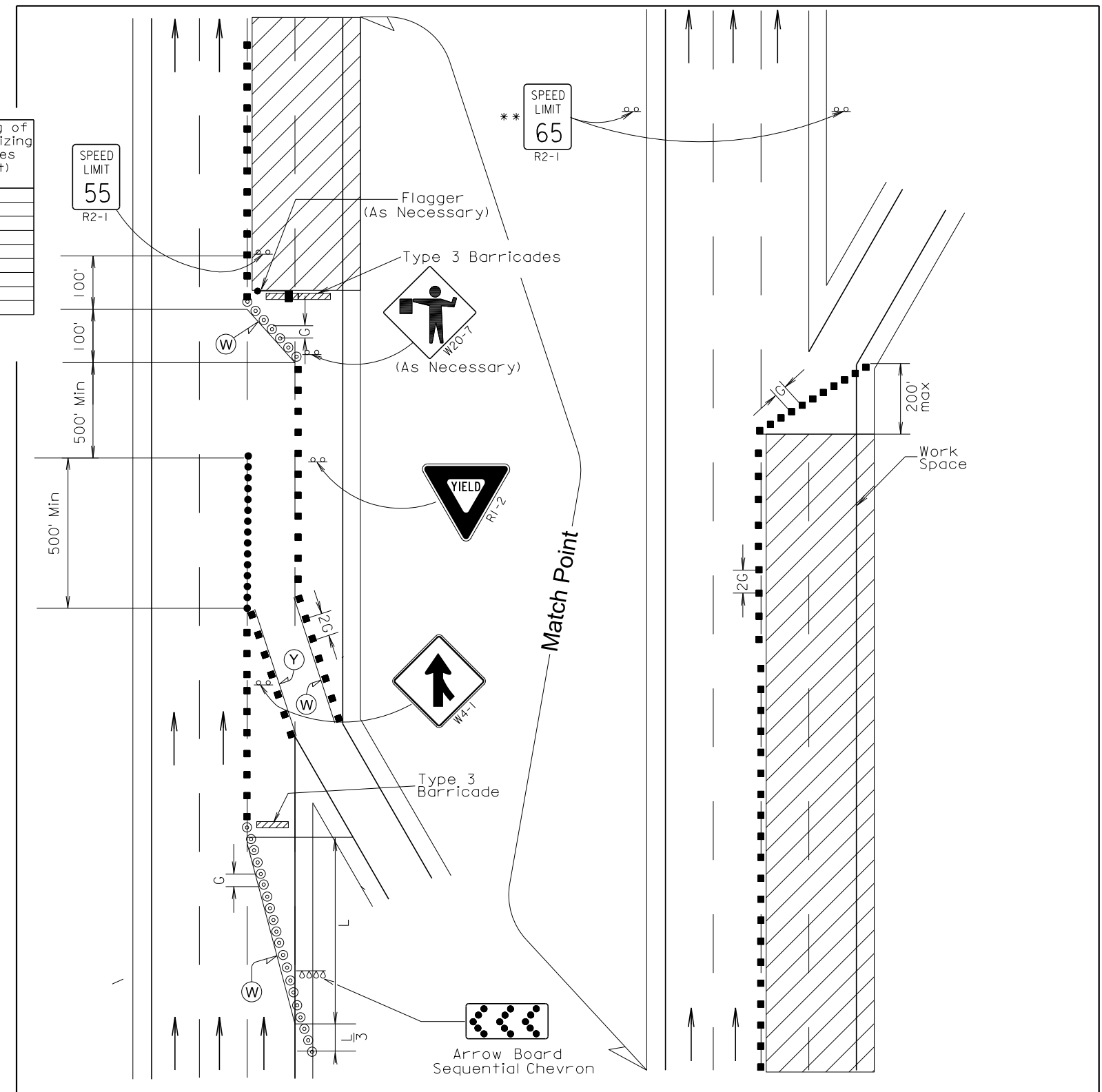


Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet)			Taper Length (Feet) (L)	Spacing of Channelizing Devices (Feet) (G)
	(A)	(B)	(C)		
0 - 30	200			180	25
35 - 40	350			320	25
45	500			600	25
50	500			600	50*
55	500			660	50*
	(A)	(B)	(C)		
60 - 65	500	1000	1300	780	50*
70 - 80	500	1000	1300	1125	50*

* Spacing to be every 40' for 42" cones.

- Tubular Marker
 - ⊙ Reflectorized Drum
 - Channelizing Device will be 42" cones or drums
- ** 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.
- Ⓣ 4" White Temp. Tape, Type I
 - Ⓦ 4" White Temp. Pavement Marking
 - Ⓨ 4" Yellow Temp. Pavement Marking

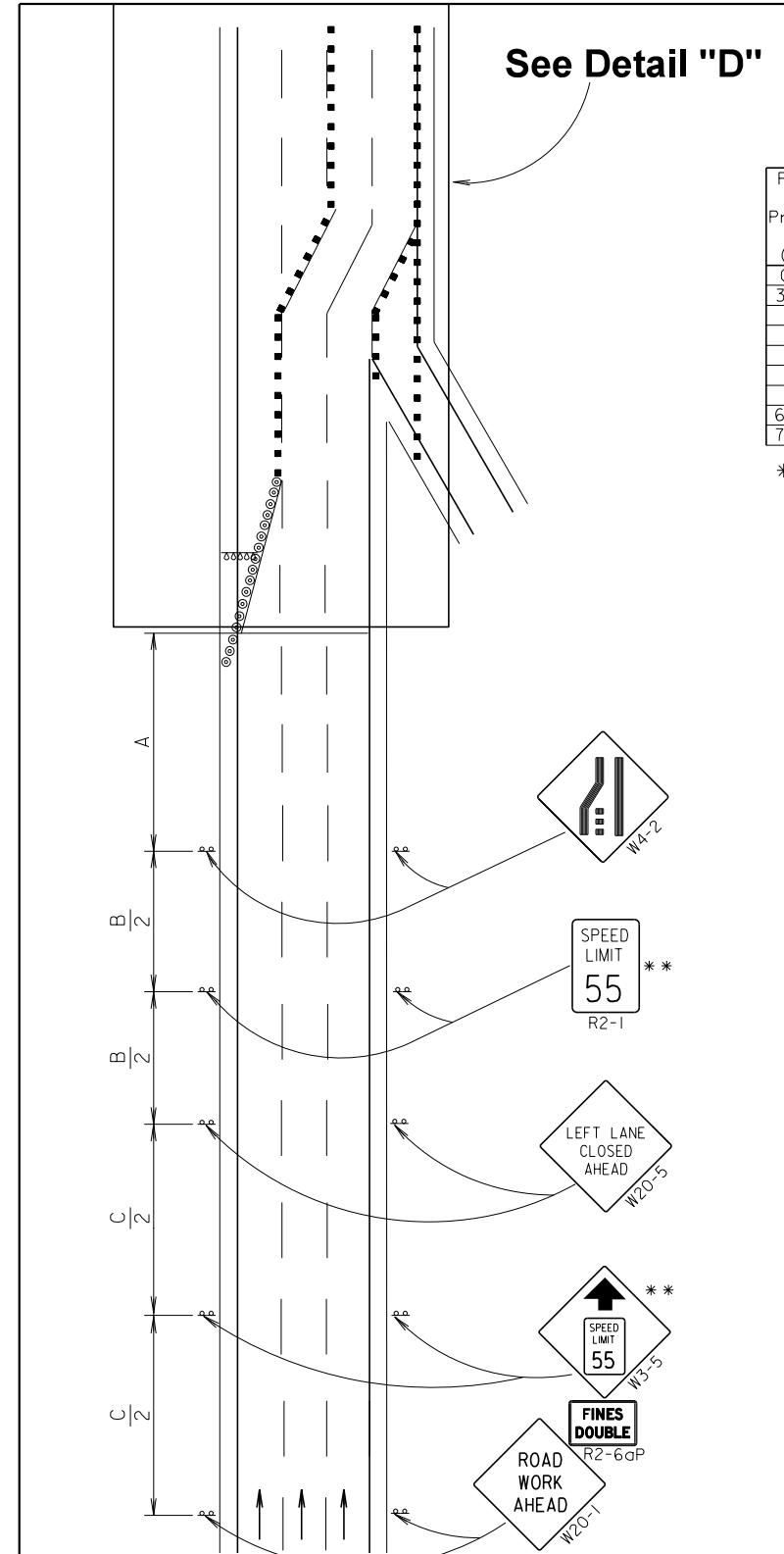
All conflicting pavement markings will be covered or removed.



SPECIAL DETAIL FOR WORK IN LANE 1 AND 2 BETWEEN EXITS (TYPICAL)

Plotting Date: 02/06/2025

Detail "D"



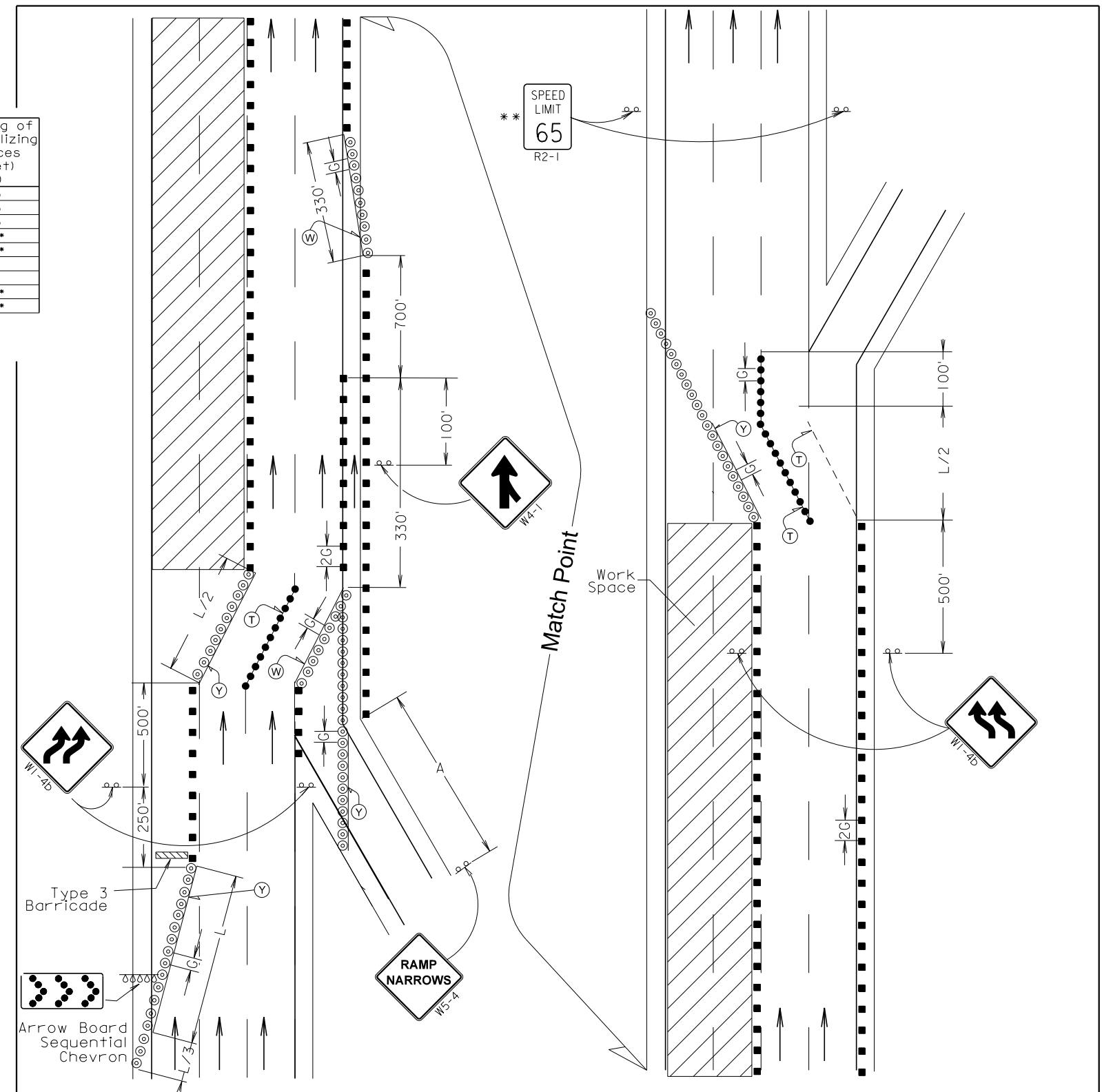
Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet)			Taper Length (Feet) (L)	Spacing of Channelizing Devices (Feet) (G)
	(A)	(B)	(C)		
0 - 30	200			180	25
35 - 40	350			320	25
45	500			600	25
50	500			600	50*
55	500			660	50*
	(A)	(B)	(C)		
60 - 65	500	1000	1300	780	50*
70 - 80	500	1000	1300	1125	50*

* Spacing to be every 40' for 42" cones.

- Tubular Marker
 - ⊙ Reflectorized Drum
 - Channelizing Device will be 42" cones or drums
- ** 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.

- Ⓣ 4" White Temp. Tape, Type I
- Ⓦ 4" White Temp. Pavement Marking
- Ⓨ 4" Yellow Temp. Pavement Marking

All conflicting pavement markings will be covered or removed.



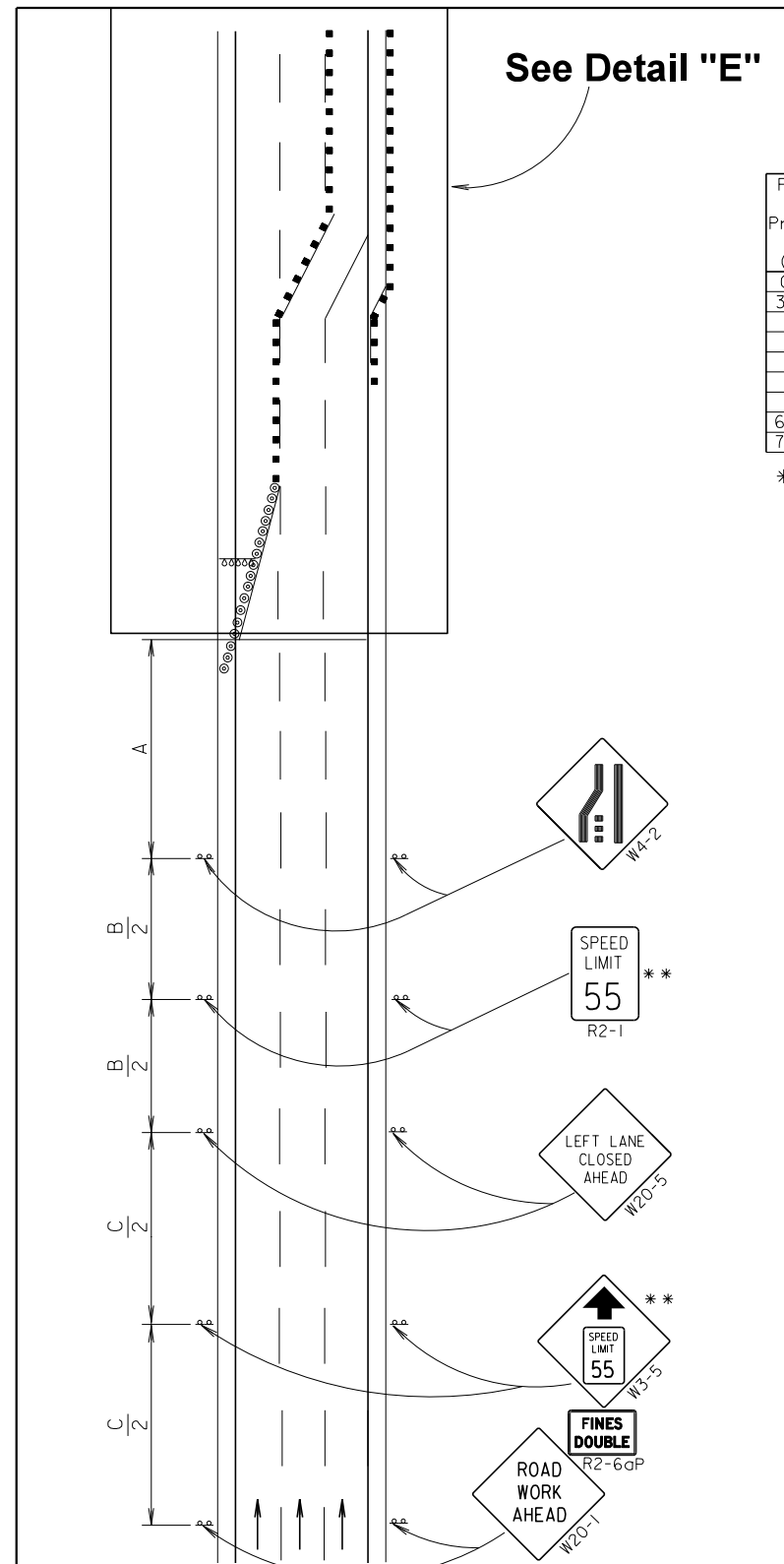
PLOT SCALE - 1:200

PLOTTED FROM - IRSE12133

PLOT NAME - 5

FILE - ... \TC\MIDDLE LANE CLOSED2.DGN

SPECIAL DETAIL FOR WORK IN LANE 1 AND 2 (3-LANE SECTION) (TYPICAL)



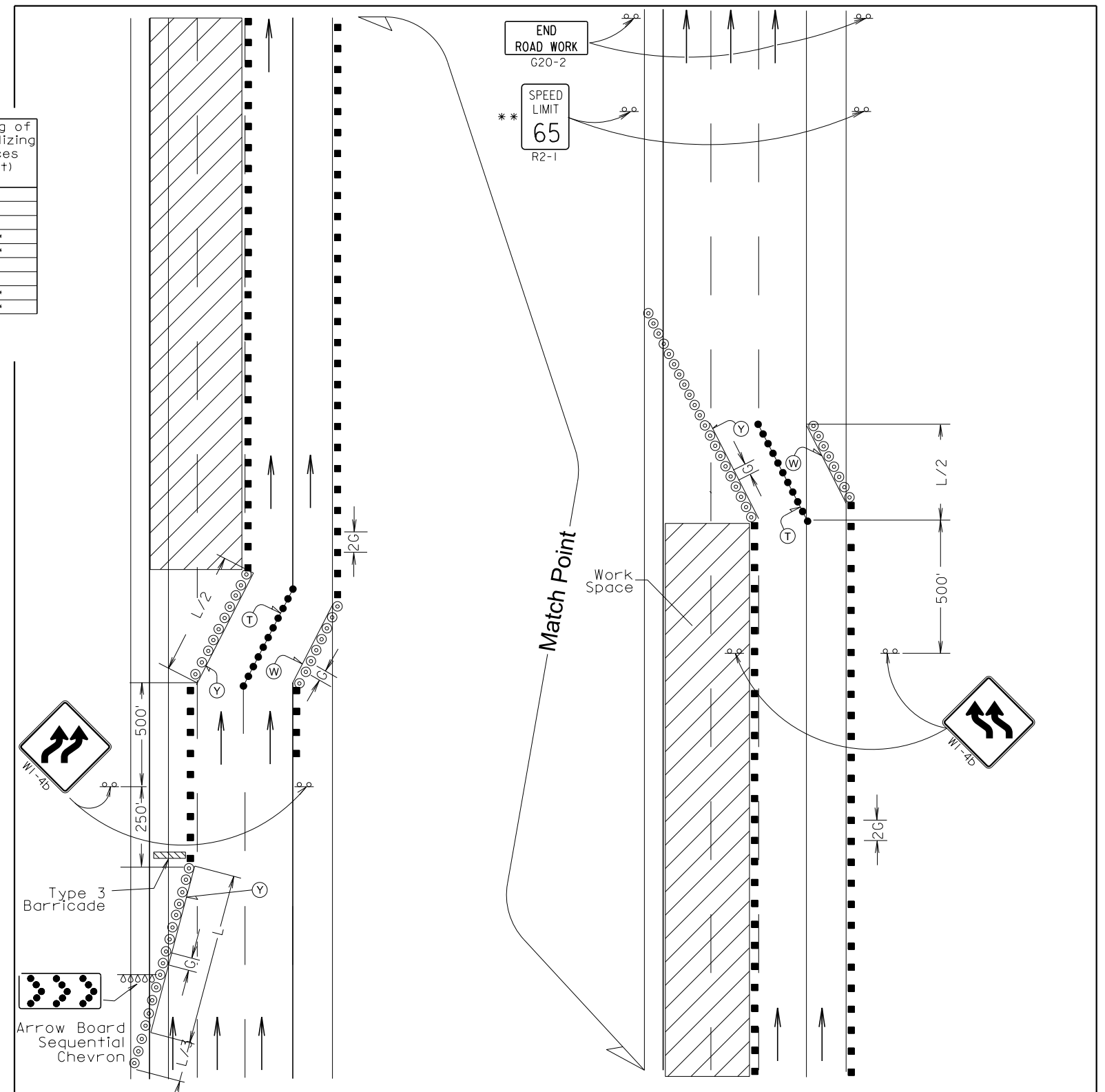
Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet)			Taper Length (Feet) (L)	Spacing of Channelizing Devices (Feet) (G)
	(A)	(B)	(C)		
0 - 30	200			180	25
35 - 40	350			320	25
45	500			600	25
50	500			600	50*
55	500			660	50*
	(A)	(B)	(C)		
60 - 65	500	1000	1300	780	50*
70 - 80	500	1000	1300	1125	50*

* Spacing to be every 40' for 42" cones.

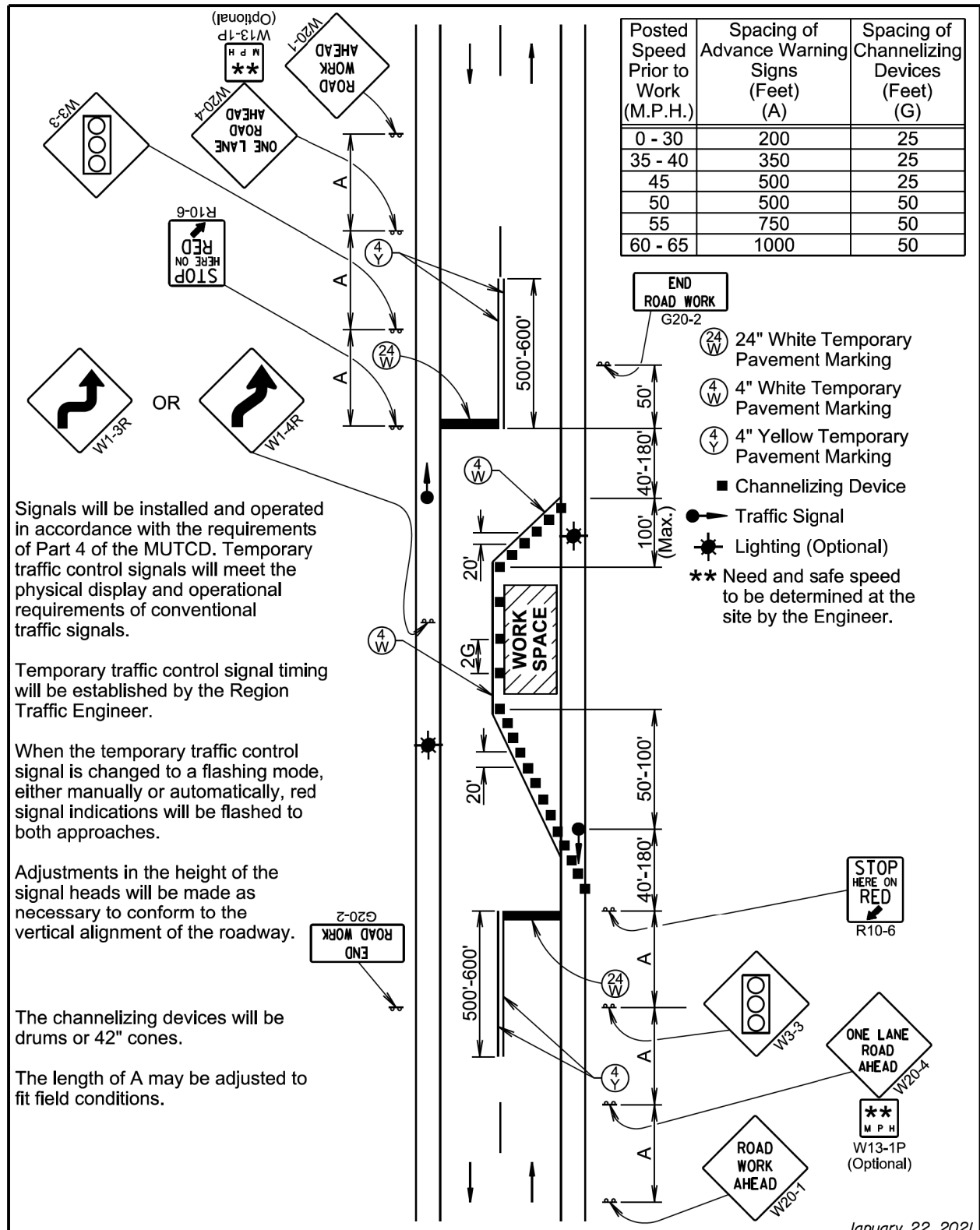
- Tubular Marker
 - ⊙ Reflectorized Drum
 - Channelizing Device will be 42" cones or drums
- ** Speed appropriate for location.
- *** Use speed limit designated for the condition when workers are present in the work space. Signs will be covered or removed when workers are not present.

- Ⓣ 4" White Temp. Tape, Type I
- Ⓦ 4" White Temp. Pavement Marking
- Ⓨ 4" Yellow Temp. Pavement Marking

All conflicting pavement markings will be covered or removed.



Plotting Date: 12/11/2024



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.

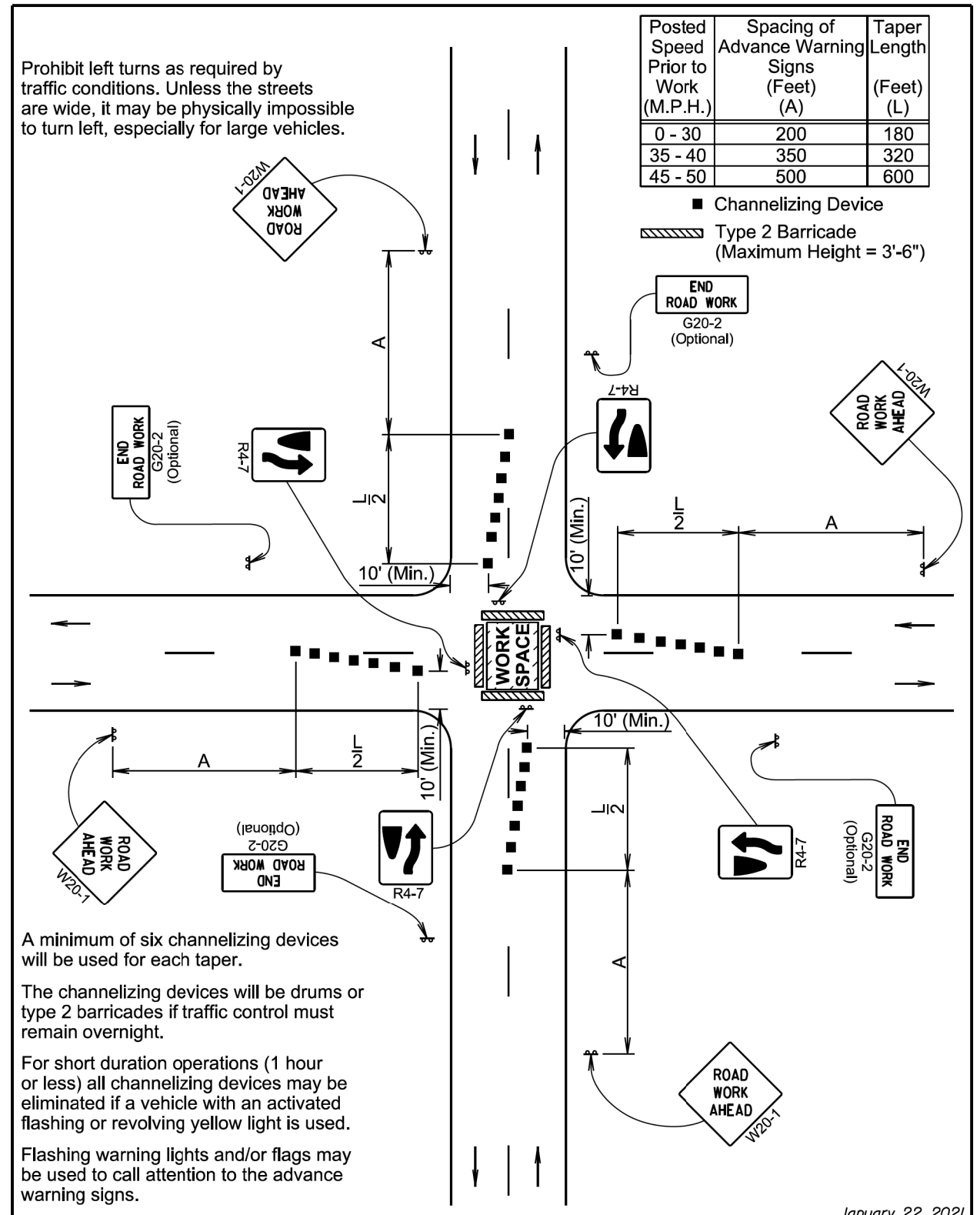
When the temporary traffic control signal is changed to a flashing mode, either manually or automatically, red signal indications will be flashed to both approaches.

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.

S D D O T	LANE CLOSURE USING TRAFFIC SIGNALS	PLATE NUMBER 634.26
	Published Date: 2025	Sheet 1 of 1



Prohibit left turns as required by traffic conditions. Unless the streets are wide, it may be physically impossible to turn left, especially for large vehicles.

A minimum of six channelizing devices will be used for each taper.

The channelizing devices will be drums or type 2 barricades if traffic control must remain overnight.

For short duration operations (1 hour or less) all channelizing devices may be eliminated if a vehicle with an activated flashing or revolving yellow light is used.

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

S D D O T	CLOSURE IN CENTER OF INTERSECTION	PLATE NUMBER 634.35
	Published Date: 2025	Sheet 1 of 1

PLOT SCALE - 1:199,992

PLOT NAME - 1

FILE - ... \16XU-177W STD PLATES.DGN

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 *

* Spacing is 40' for 42" cones.

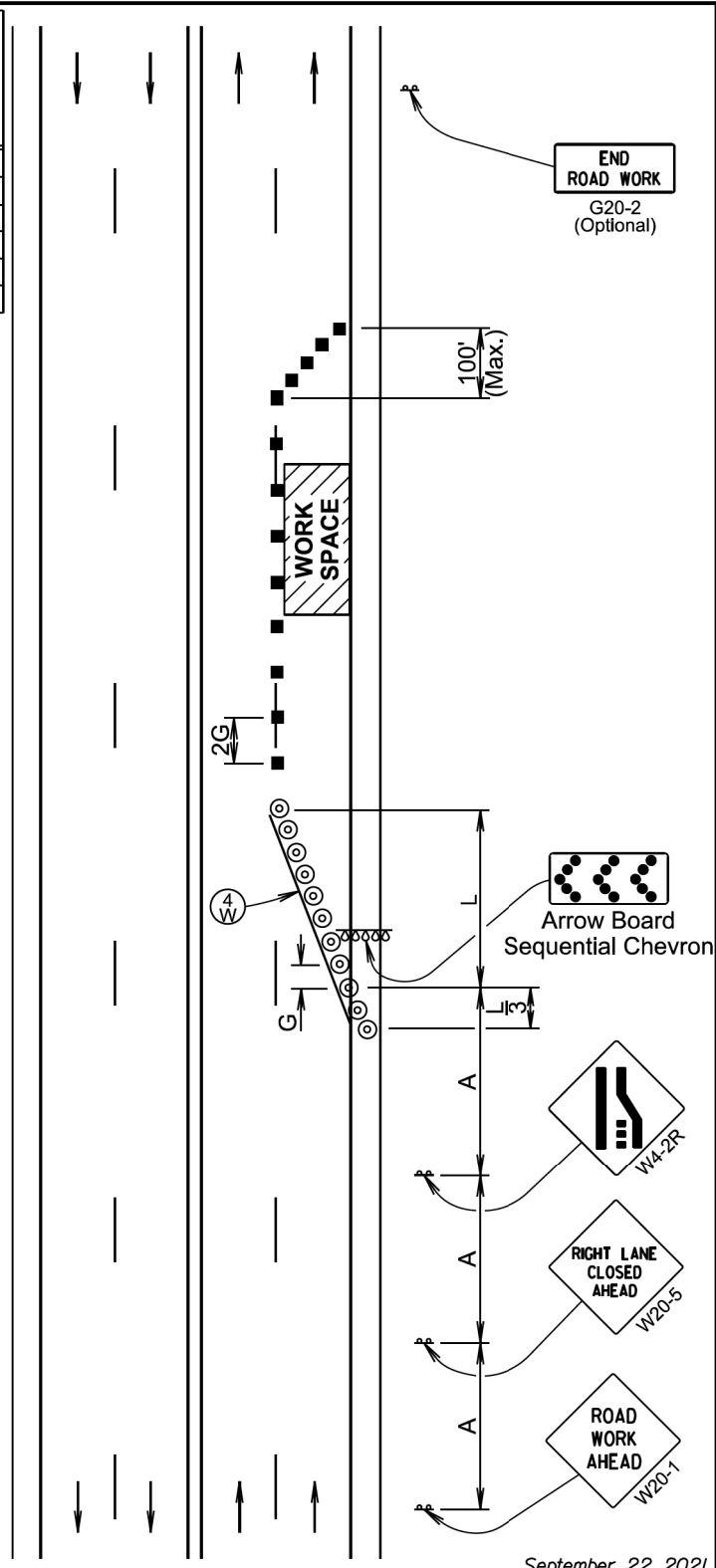
⊙ Reflectorized Drum
 ■ Channelizing Device
 (4) 4" White Temporary Pavement Marking

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.

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

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



September 22, 2021

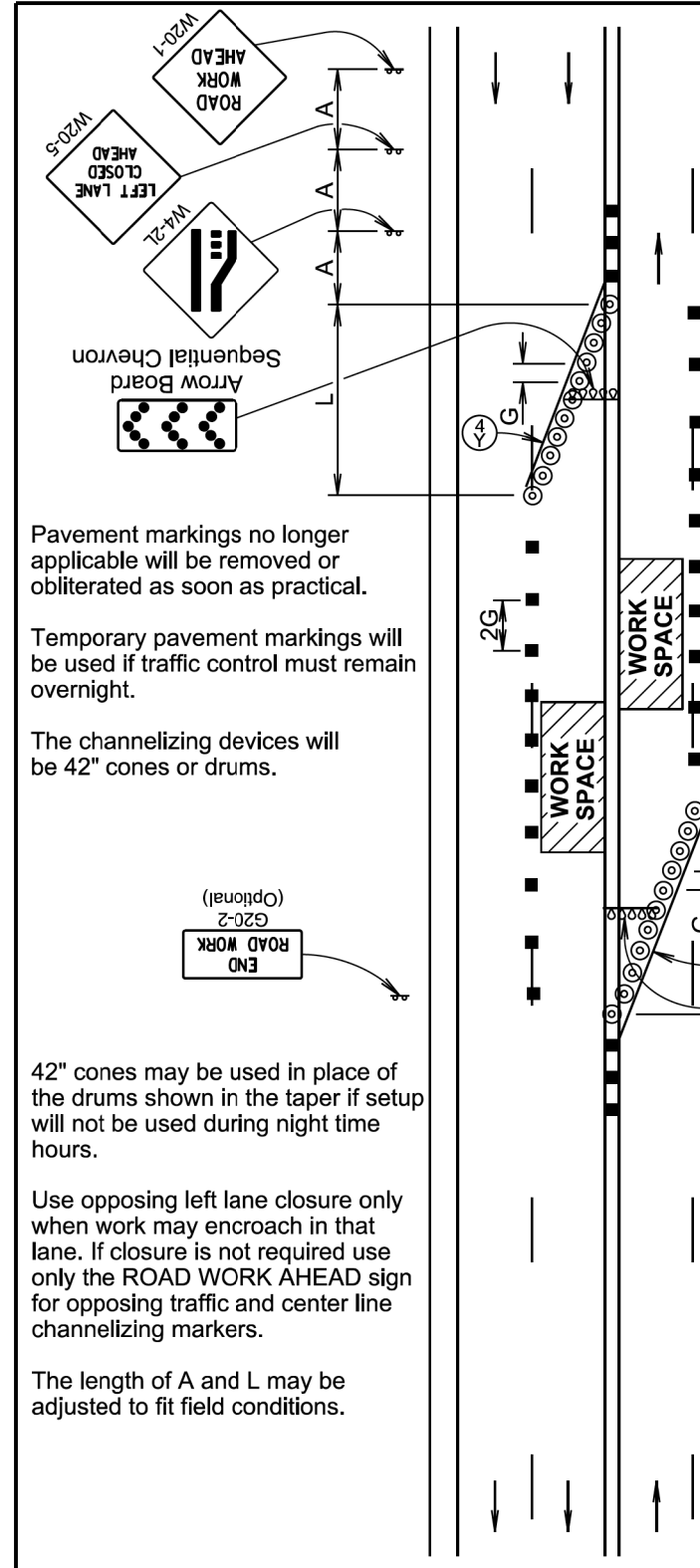
S D D O T	4-LANE UNDIVIDED, RIGHT LANE CLOSED	PLATE NUMBER 634.47
		Sheet 1 of 1

Published Date: 2025

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 *

* Spacing is 40' for 42" cones.

⊙ Reflectorized Drum
 ■ Channelizing Device
 (4) 4" Yellow Temporary Pavement Marking



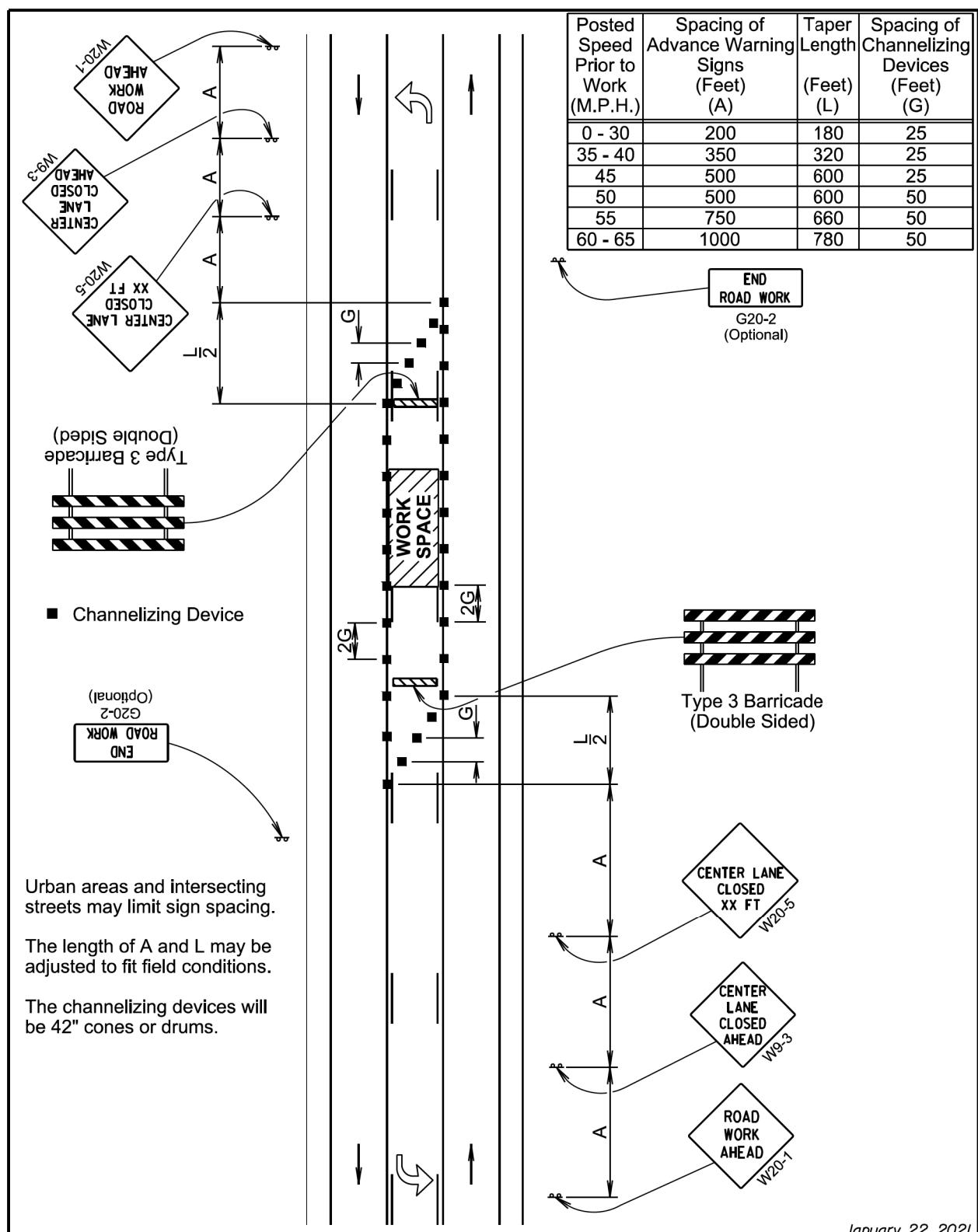
August 31, 2022

S D D O T	4-LANE UNDIVIDED, LEFT LANE CLOSED	PLATE NUMBER 634.48
		Sheet 1 of 1

Published Date: 2025

Plotting Date: 12/11/2024

PLOT SCALE - 1" = 199.992'



Urban areas and intersecting streets may limit sign spacing.

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

The channelizing devices will be 42" cones or drums.

January 22, 2021

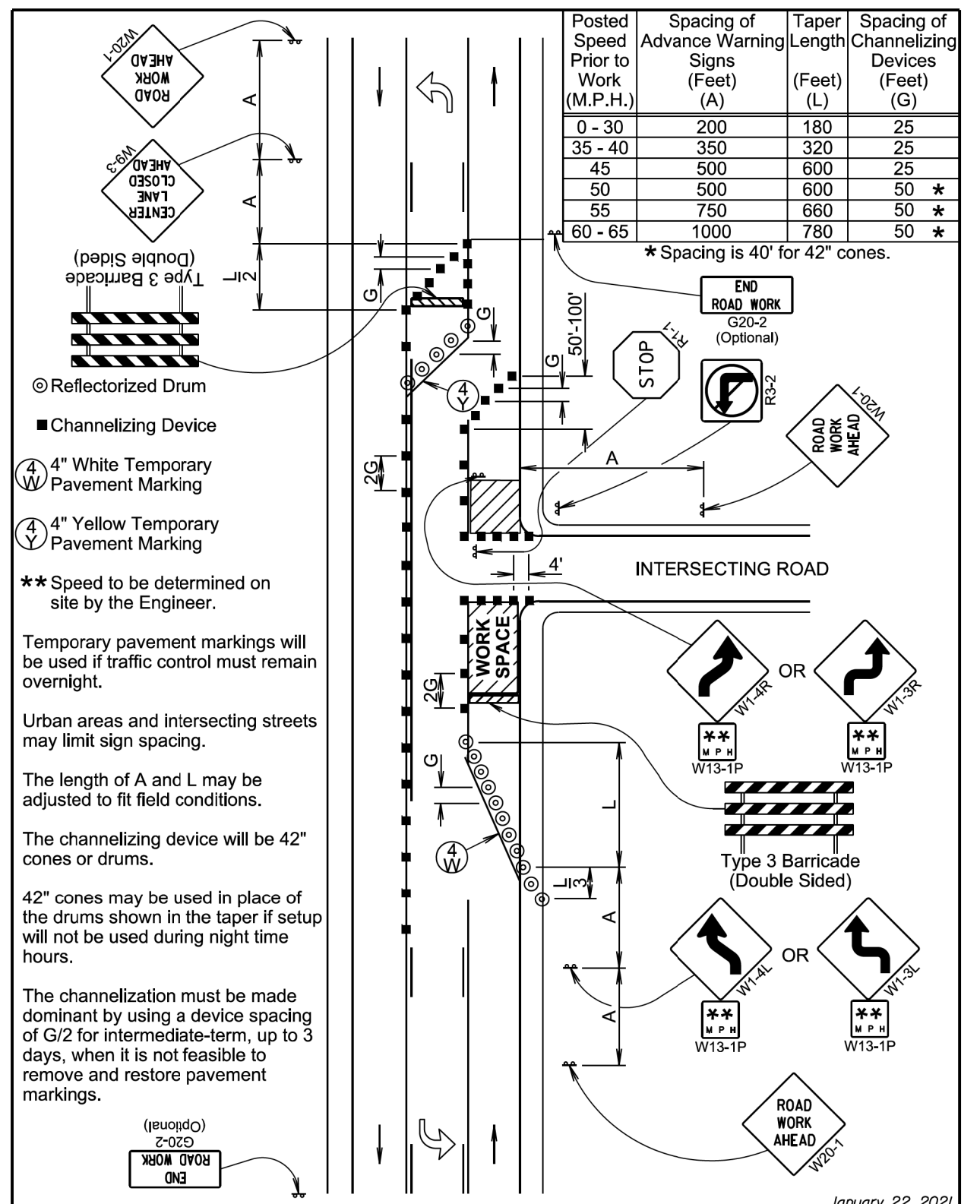
SDOT

3-LANE, CENTER LANE CLOSED

PLATE NUMBER
634.52

Sheet 1 of 1

Published Date: 2025



Urban areas and intersecting streets may limit sign spacing.

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

The channelizing device 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.

The channelization must be made dominant by using a device spacing of G/2 for intermediate-term, up to 3 days, when it is not feasible to remove and restore pavement markings.

January 22, 2021

SDOT

3-LANE, OUTSIDE LANE CLOSED

PLATE NUMBER
634.53

Sheet 1 of 1

Published Date: 2025

PLOTTED FROM - TRSF12133

PLOT NAME - 3

FILE - ... \16XU-177WSTD PLATES.DGN

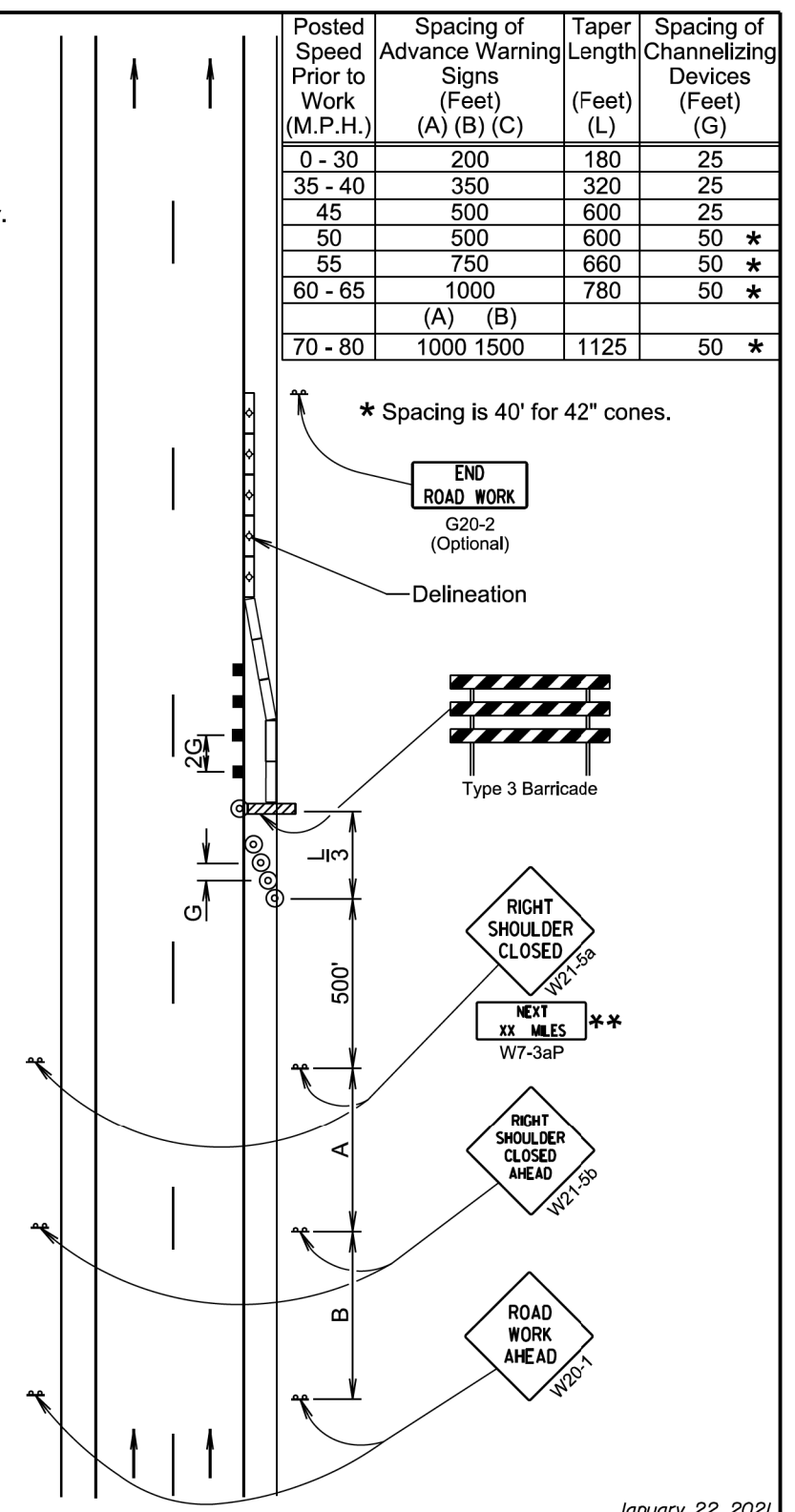
Plotting Date: 12/11/2024

PLOT SCALE - 1:199,992

- ⊙ Reflectorized Drum
- Channelizing Device
- ▭ Movable Concrete Barrier
- ** For distances 1/2 mile or greater.

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

This standard plate shows one method which may be used to close a shoulder of a roadway for a long term project. The Engineer will determine if the use of barriers is required. If barriers are required, the layout details will be included elsewhere in the plans.



Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet)			Taper Length (Feet) (L)	Spacing of Channelizing Devices (Feet) (G)
	(A)	(B)	(C)		
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 *
	(A)	(B)			
70 - 80	1000	1500		1125	50 *

* Spacing is 40' for 42" cones.

January 22, 2021

S D D O T	SHOULDER CLOSED	PLATE NUMBER 634.61
	Published Date: 2025	Sheet 1 of 1

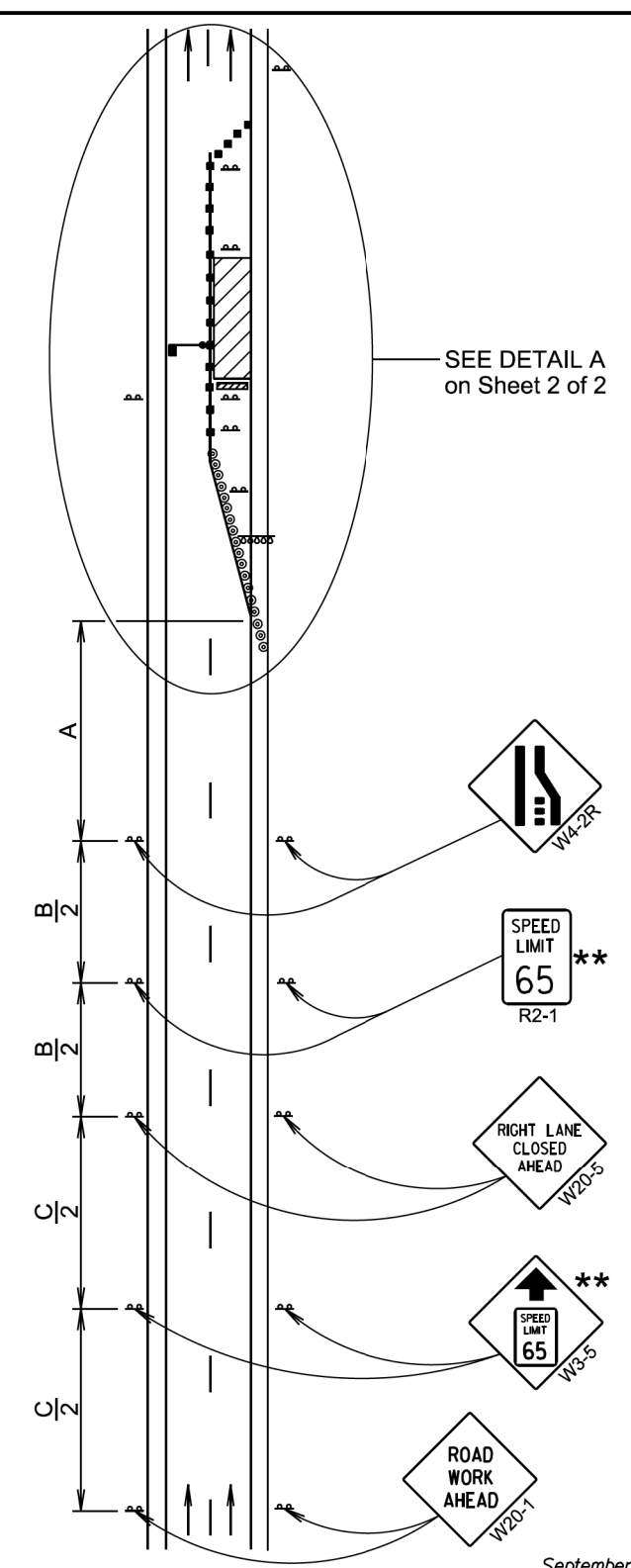
Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet)		
	(A)	(B)	(C)
0 - 30	200		
35 - 40	350		
45 - 50	500		
55	750		
60 - 65	1000		
	(A)	(B)	(C)
70 - 80	1000	1500	2640

** 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.



SEE DETAIL A on Sheet 2 of 2

September 22, 2021

S D D O T	WORK ZONE SPEED REDUCTION FOR INTERSTATE AND HIGH SPEED MULTI-LANE HIGHWAYS	PLATE NUMBER 634.63
	Published Date: 2025	Sheet 1 of 2

PLOTTED FROM - TRSF12133

PLOT NAME - 4

FILE - ... \16XU-177W\STD PLATES.DGN

Plotting Date: 12/11/2024

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.

- Flagger (As Necessary)
- ⊙ Reflectorized Drum
- Channelizing Device

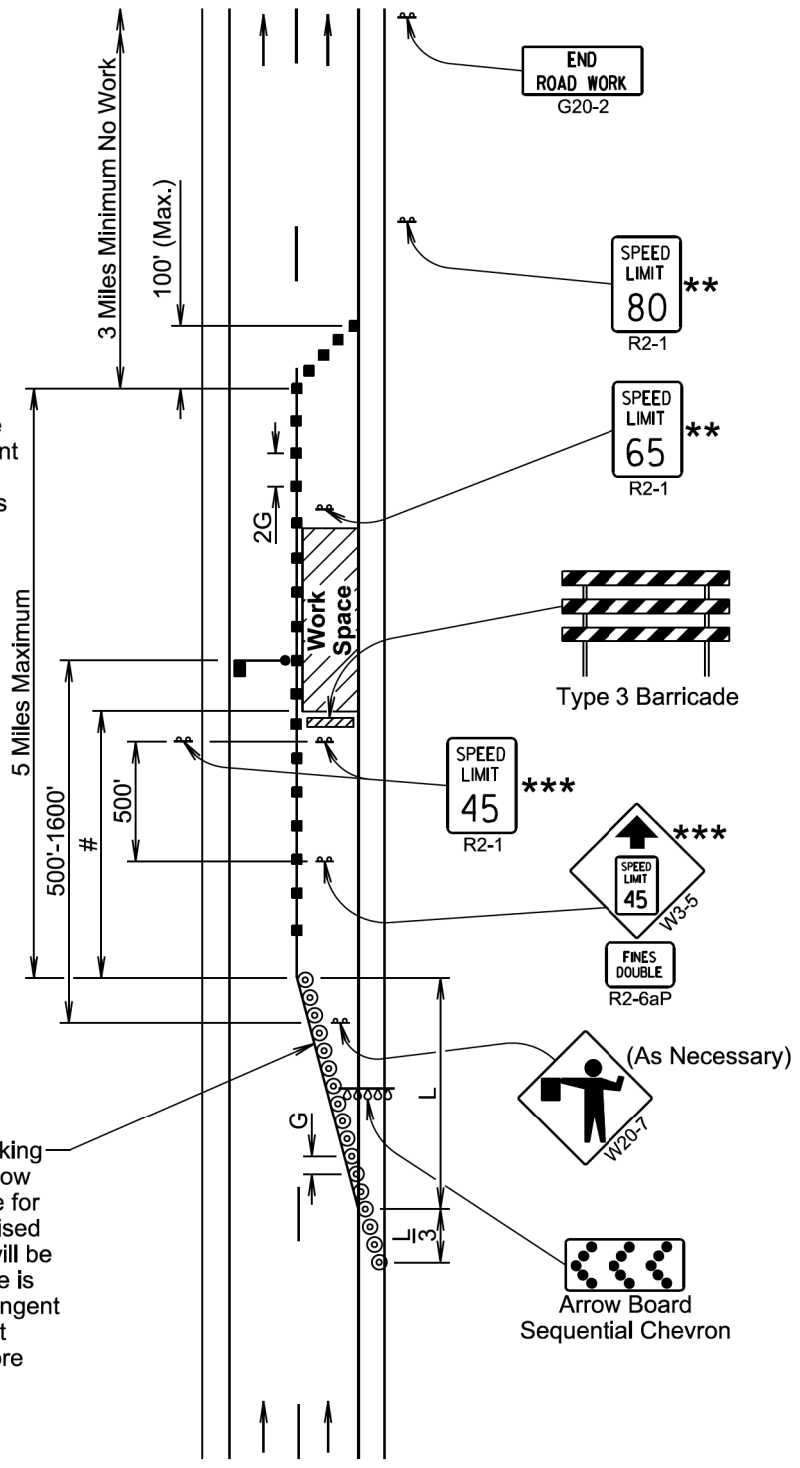
The Work Space will be a minimum of 500' from the end of the taper.

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

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

September 22, 2021

S D D O T	WORK ZONE SPEED REDUCTION FOR INTERSTATE AND HIGH SPEED MULTI-LANE HIGHWAYS	PLATE NUMBER 634.63
	Published Date: 2025	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

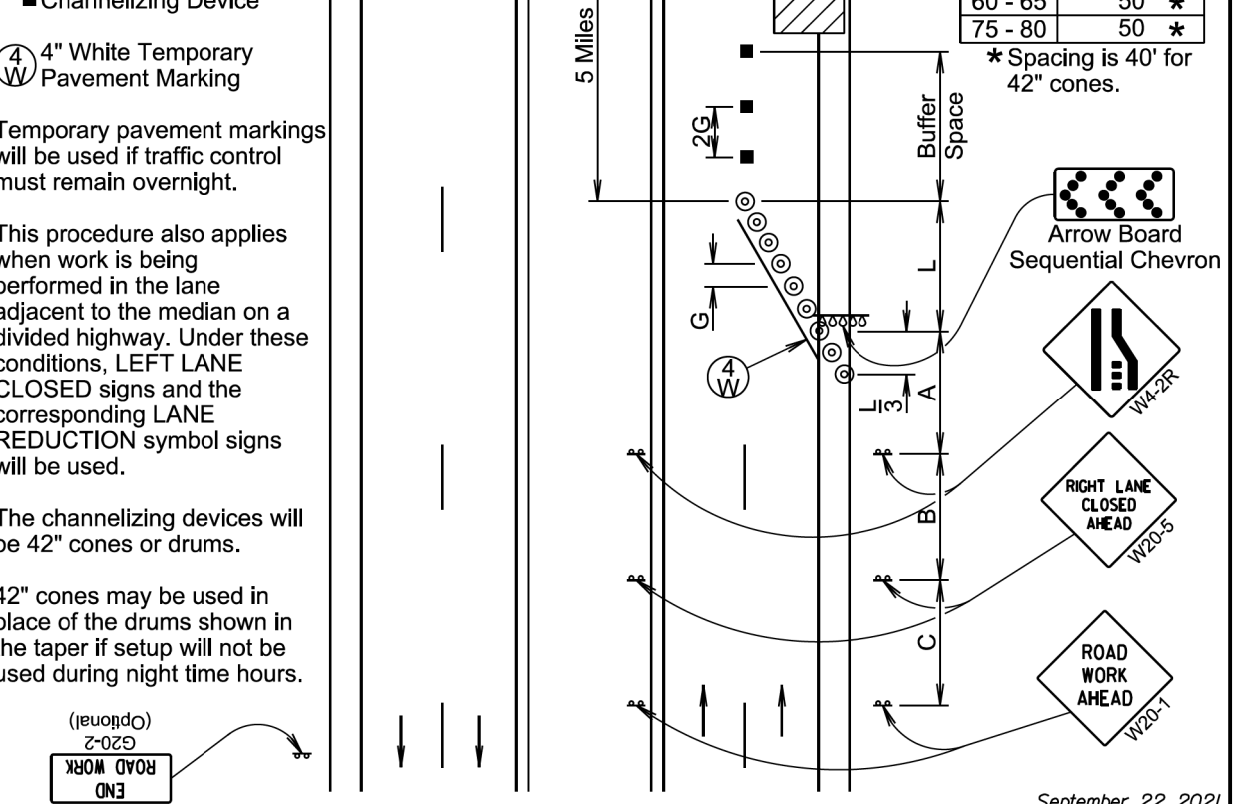
- ⊙ Reflectorized Drum
- Channelizing Device
- ④ 4" White Temporary Pavement Marking

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

S D D O T	LANE CLOSURE WITHOUT BARRIER	PLATE NUMBER 634.64
	Published Date: 2025	Sheet 1 of 1

PLOT SCALE - 1:199,992

PLOTTED FROM - TRSF12133

PLOT NAME - 5

FILE - ... \16XU-177W\STD PLATES.DGN

PLOT SCALE - 1:199,992

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

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

* Spacing is 40' for 42" cones.

■ Channelizing Device

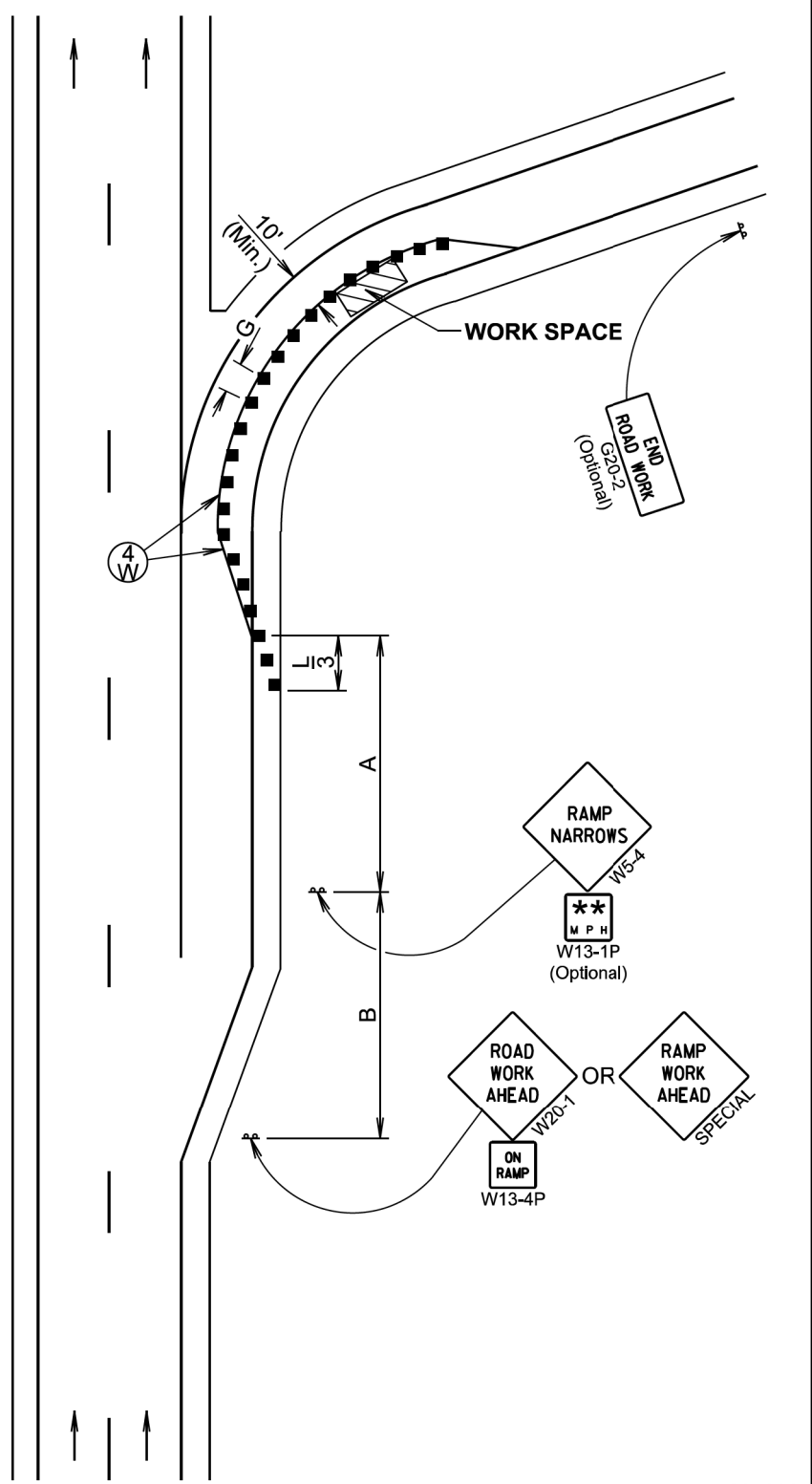
Ⓞ 4" White Temporary Pavement Marking

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

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

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

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



January 22, 2021

S D D O T	PARTIAL EXIT RAMP CLOSURE	PLATE NUMBER 634.69
	Published Date: 2025	Sheet 1 of 1

-PLOTTED FROM - TRSF12133

FILE - ... \16XU-177W\STD PLATES.DGN

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

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

* Spacing is 40' for 42" cones.

Ⓞ Reflectorized Drum

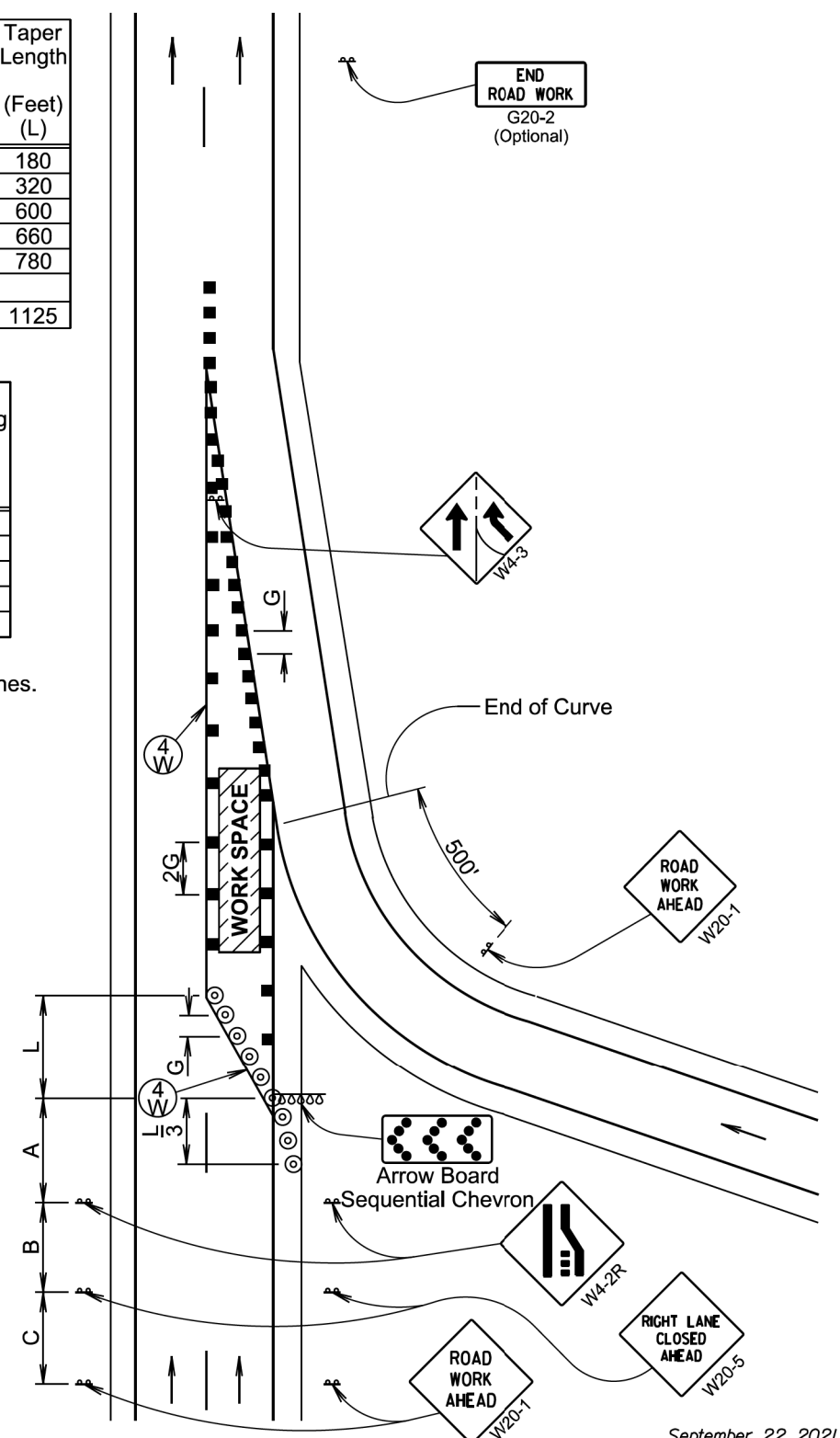
■ Channelizing Device

Ⓞ 4" White Temporary Pavement Marking

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

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

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



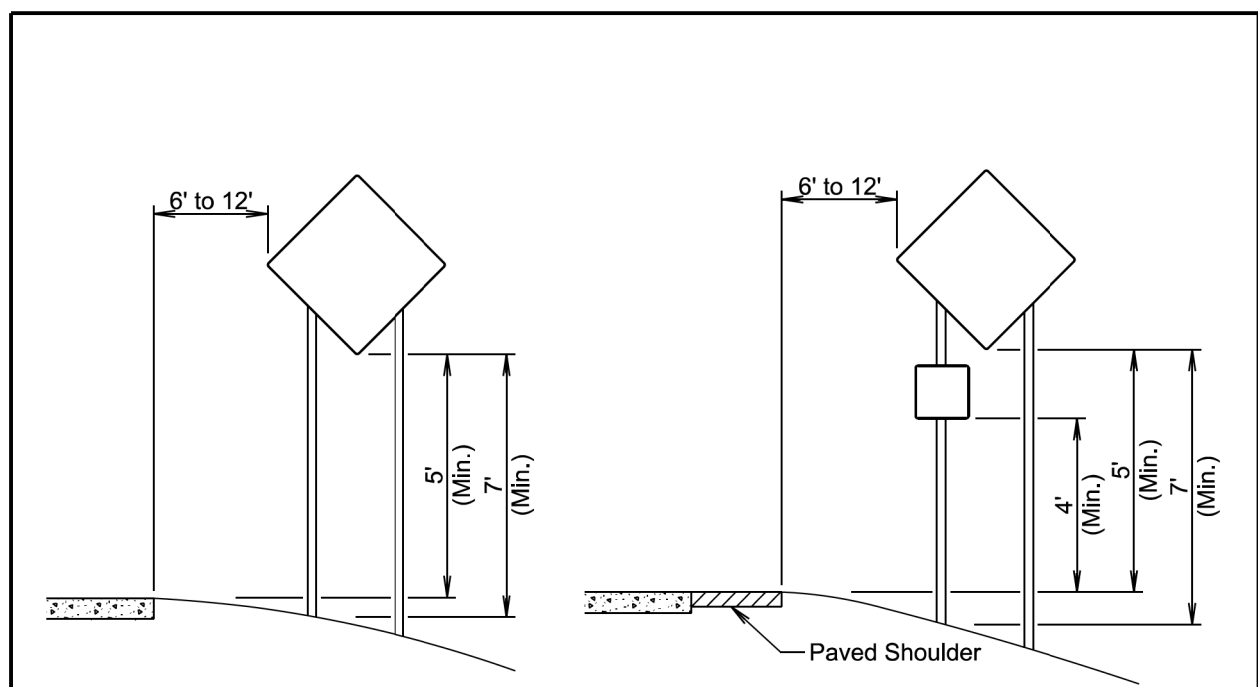
September 22, 2021

S D D O T	WORK IN VICINITY OF ENTRANCE RAMP	PLATE NUMBER 634.70
	Published Date: 2025	Sheet 1 of 1

PLOT SCALE - 1:199,992

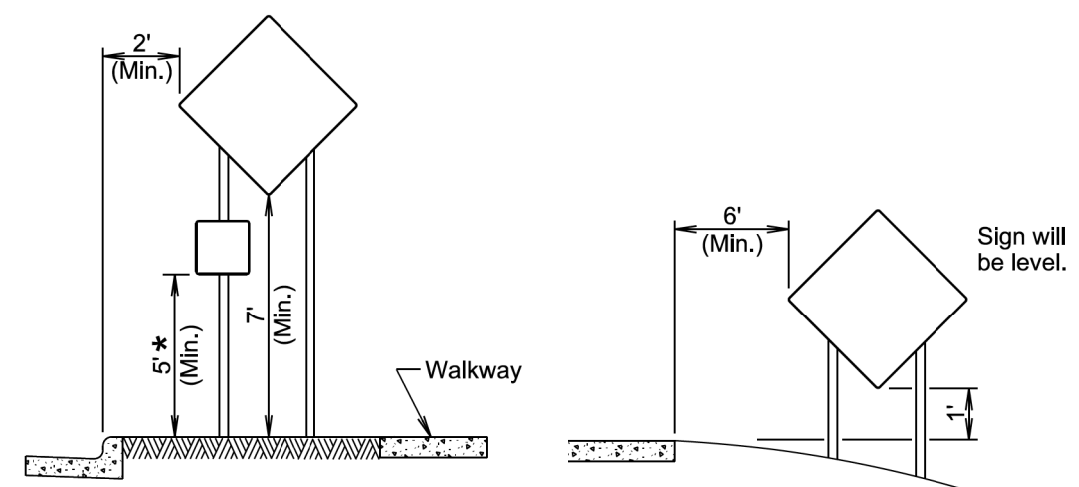
PLOT NAME - 2

FILE - ... \16XU-177W\STD PLATES.DGN



RURAL DISTRICT

RURAL DISTRICT WITH SUPPLEMENTAL PLATE



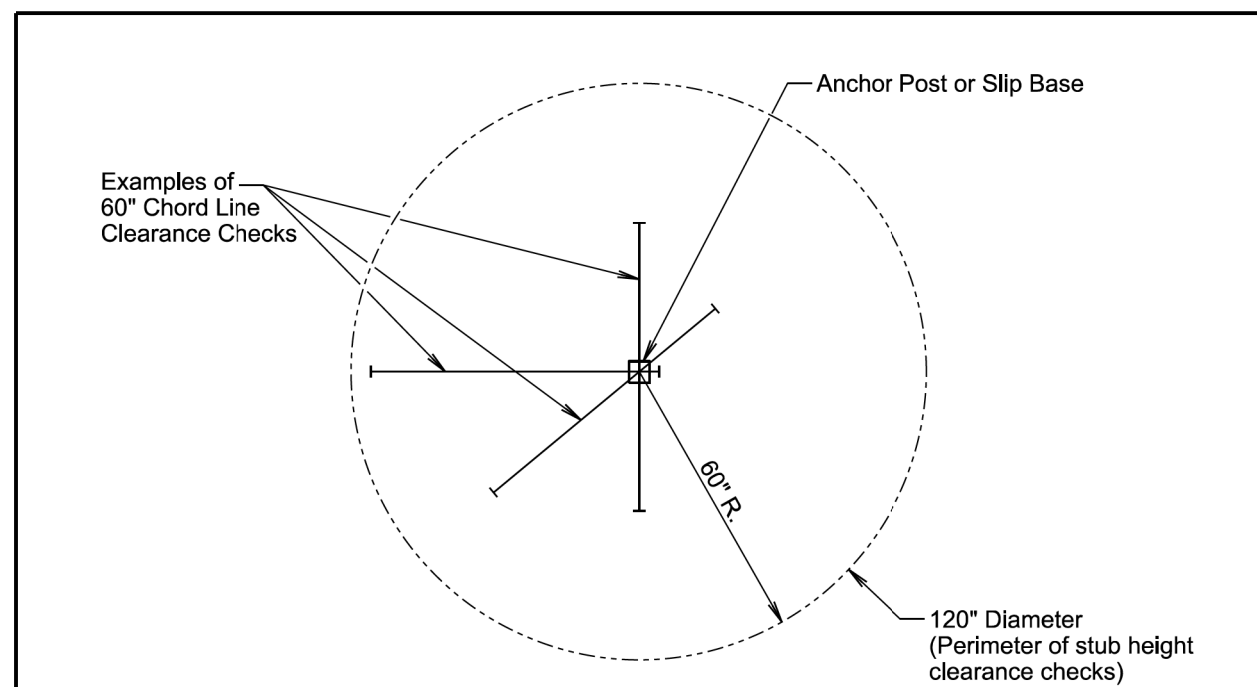
URBAN DISTRICT

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

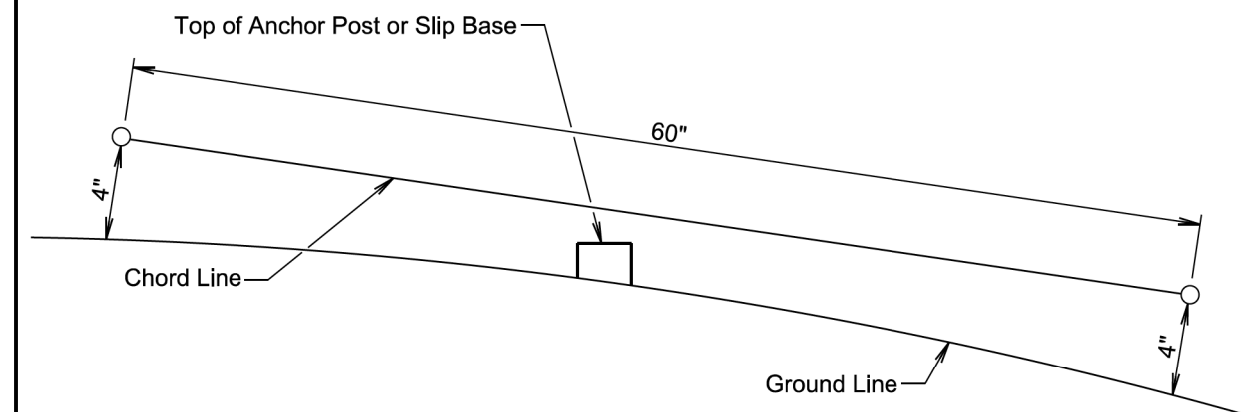
* If the bottom of supplemental plate is mounted lower than 7 feet above a pedestrian walkway, the supplemental plate should not project more than 4" into the pedestrian facility.

January 22, 2021

Published Date: 2025	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

Published Date: 2025	S D D O T	BREAKAWAY SUPPORT STUB CLEARANCE	PLATE NUMBER 634.99
			Sheet 1 of 1

TABLE FOR NRC PAVEMENT REPAIR ON SD115 SB & NB

MRM	DISP	DMI	SB DRIVING LANE		CENTER TURN LANE		NB DRIVING LANE		NRCP REPAIR SqYds	NEW JOINT CON-FIG. (NRCP)	INSERT STEEL BAR IN PCC PAVEMENT (NRCP)		INSERT STEEL BAR IN NRCP TOTAL Each	DOWEL BAR Each	COMMENTS
			L	W	L	W	L	W			No. 8 x 18" DEFORMED TIE BARS Each	No. 5 x 24" DEFORMED TIE BARS Each			
			Ft	Ft	Ft	Ft	Ft	Ft							
89.00	0.864	89.864	4	4					1.8	R	4	2	6	4	
89.00	0.868	89.868	4	4					1.8	R	4	2	6	4	
89.00	0.871	89.871	4	4			4	4	3.6	R	8	6	14	8	
89.00	0.875	89.875	4	4					1.8	R	4	2	6	4	
89.00	0.879	89.879	4	4					1.8	R	4	2	6	4	
89.00	0.883	89.883	4	4					1.8	R	4	2	6	4	
89.00	0.890	89.890	4	4					1.8	R	4	2	6	4	
89.00	0.894	89.894	4	8					3.6	R	10	2	12	8	
89.00	0.898	89.898	4	4					1.8	R	4	2	6	4	
89.00	0.902	89.902	4	8			4	4	5.3	R	14	6	20	12	
89.00	0.905	89.905	4	6					2.7	R	8	2	10	6	
89.00	0.909	89.909	4	6					2.7	R	8	2	10	6	
89.00	0.913	89.913	4	4					1.8	R	4	2	6	4	
89.00	0.917	89.917	4	4					1.8	R	4	2	6	4	
89.00	0.921	89.921	4	4					1.8	R	4	2	6	4	
89.00	0.924	89.924	4	4			4	4	3.6	R	8	6	14	8	
89.00	0.932	89.932	4	4					1.8	R	4	2	6	4	
89.00	0.940	89.940	4	4					1.8	R	4	2	6	4	
89.00	0.951	89.951	4	4	6	6	6	14	15.1	R	28	8	36	22	
89.00	0.970	89.970	8	6					5.3	R	8	3	11	6	
89.00	0.981	89.981	4	4					1.8	R	4	2	6	4	
89.00	0.985	89.985	4	4					1.8	R	4	2	6	4	
89.00	0.989	89.989	4	4					1.8	R	4	2	6	4	
89.00	0.993	89.993	4	4					1.8	R	4	2	6	4	
90.00	0.000	90.000	4	4			4	4	3.6	R	8	6	14	8	
90.00	0.023	90.023	4	4					1.8	R	4	2	6	4	
90.00	0.042	90.042	4	4					1.8	R	4	2	6	4	
90.00	0.118	90.118	4	4					1.8	R	4	2	6	4	
90.00	0.121	90.121	4	4					1.8	R	4	2	6	4	
90.00	0.197	90.197	4	4					1.8	R	4	2	6	4	
90.00	0.201	90.201	4	4					1.8	R	4	2	6	4	
90.00	0.205	90.205	4	6					2.7	R	8	2	10	6	
90.00	0.212	90.212	6	8					5.3	R	10	2	12	8	
90.00	0.220	90.220	4	4					1.8	R	4	2	6	4	
90.00	0.231	90.231	4	4					1.8	R	4	2	6	4	
90.00	0.239	90.239	4	4					1.8	R	4	2	6	4	
90.00	0.322	90.322					4	4	1.8	R	4	4	8	4	
90.00	0.330	90.330	4	4					1.8	R	4	2	6	4	
90.00	0.333	90.333	6	6			4	4	5.8	R	12	6	18	10	
90.00	0.341	90.341	4	8					3.6	R	10	2	12	8	
90.00	0.352	90.352					4	4	1.8	R	4	4	8	4	
90.00	0.368	90.368	4	4					1.8	R	4	2	6	4	
90.00	0.432	90.432	4	4					1.8	R	4	2	6	4	
90.00	0.451	90.451	4	4					1.8	R	4	2	6	4	
90.00	0.470	90.470					4	4	1.8	R	4	4	8	4	
90.00	0.618	90.618					6	14	9.3	R	16	2	18	12	
90.00	0.731	90.731	6	14					9.3	R	16	2	18	12	
90.00	0.743	90.743					4	4	1.8	R	4	4	8	4	
90.00	0.746	90.746					4	4	1.8	R	4	4	8	4	
90.00	0.792	90.792					6	14	9.3	R	16	2	18	12	
90.00	0.811	90.811			6	12	6	14	17.3	R	32	2	34	24	
90.00	0.940	90.940	4	4					1.8	R	4	2	6	4	
90.00	0.962	90.962			12	12	6	14	25.3	R	32	6	38	24	
91.00	0.019	91.019	4	4					1.8	R	4	2	6	4	
91.00	0.042	91.042	4	4					1.8	R	4	2	6	4	
91.00	0.110	91.110					6	14	9.3	R	16	2	18	12	

TABLE FOR NRC PAVEMENT REPAIR ON SD115 SB & NB

MRM	DISP	DMI	SB DRIVING LANE		CENTER TURN LANE		NB DRIVING LANE		NRCP REPAIR SqYds	NEW JOINT CON- FIG. (NRCP)	INSERT STEEL BAR IN PCC PAVEMENT (NRCP)		DOWEL BAR Each	COMMENTS	
			L	W	L	W	L	W			No. 8 x 18" DEFORMED TIE BARS Each	No. 5 x 24" DEFORMED TIE BARS Each			INSERT STEEL BAR IN NRCP TOTAL Each
			Ft	Ft	Ft	Ft	Ft	Ft							
91.00	0.121	91.121	4	4					1.8	R	4	2	6	4	
91.00	0.190	91.190					4	4	1.8	R	4	4	8	4	
91.00	0.231	91.231	4	4					1.8	R	4	2	6	4	
91.00	0.235	91.235	6	14					9.3	R	16	2	18	12	
91.00	0.383	91.383	4	6					2.7	R	8	2	10	6	
91.00	0.421	91.421	4	4					1.8	R	4	2	6	4	
91.00	0.519	91.519	4	4					1.8	R	4	2	6	4	
91.00	0.561	91.561	4	4					1.8	R	4	2	6	4	
91.00	0.690	91.690					4	4	1.8	R	4	4	8	4	
91.00	0.720	91.720					4	4	1.8	R	4	4	8	4	
91.00	0.739	91.739					4	4	1.8	R	4	4	8	4	
91.00	0.750	91.750					4	4	1.8	R	4	4	8	4	
91.00	0.792	91.792					6	14	9.3	R	16	2	18	12	
91.00	0.811	91.811			6	12	6	14	17.3	R	32	2	34	24	
91.00	0.830	91.830	4	4			4	4	3.6	R	8	6	14	8	
91.00	0.849	91.849	18	6	6	12	6	14	29.3	R	40	9	49	30	
91.00	0.871	91.871			4	4	4	4	3.6	R	8	8	16	8	
91.00	0.890	91.890	6	4					2.7	R	4	2	6	4	
91.00	0.909	91.909	6	14			4	4	11.1	R	20	6	26	16	
91.00	0.928	91.928	4	4					1.8	R	4	2	6	4	
91.00	0.940	91.940	4	4					1.8	R	4	2	6	4	
91.00	0.951	91.951	4	4			4	4	3.6	R	8	6	14	8	
91.00	0.955	91.955	4	4					1.8	R	4	2	6	4	
91.00	0.958	91.958	18	14					28.0	R	16	7	23	12	
91.00	0.970	91.970	4	4					1.8	R	4	2	6	4	
91.00	0.989	91.989	4	4					1.8	R	4	2	6	4	
92.00	0.008	92.008	8	14					12.4	R	16	3	19	12	
92.00	0.061	92.061					4	4	1.8	R	4	4	8	4	
92.00	0.129	92.129	30	4					13.3	R	4	12	16	4	
92.00	0.140	92.140					4	4	1.8	R	4	4	8	4	
92.00	0.171	92.171					4	4	1.8	R	4	4	8	4	
92.00	0.341	92.341					4	4	1.8	R	4	4	8	4	
92.00	0.470	92.470					4	4	1.8	R	4	4	8	4	
92.00	0.720	92.720					4	4	1.8	R	4	4	8	4	
92.00	0.958	92.958					4	4	1.8	R	4	4	8	4	
93.00	0.140	93.140					4	4	1.8	R	4	4	8	4	
93.00	0.159	93.159					4	4	1.8	R	4	4	8	4	
93.00	0.231	93.231					4	4	1.8	R	4	4	8	4	
93.00	0.318	93.318					16	14	24.9	R	16	6	22	12	
93.00	0.330	93.330					6	14	9.3	R	16	2	18	12	
TOTALS:									434.7		744	308	1052	640	
ADDITIONAL QUANTITIES:									130.0		220	90	310	190	
GRAND TOTALS									564.7		964	398	1362	830	

NRC PAVEMENT REPAIR AREA TYPES

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

T = Two Tied Joints

B = One Working & One Tied Joint

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

TABLE FOR NRC PAVEMENT REPAIR ON SD115 SB & NB

MRM	DISP	DMI	SB DRIVING LANE		CENTER TURN LANE		NB DRIVING LANE		NRCP REPAIR SqYds	NEW JOINT CON- FIG. (NRCP)	INSERT STEEL BAR IN PCC PAVEMENT (NRCP)		INSERT STEEL BAR IN NRCP TOTAL Each	DOWEL BAR Each	COMMENTS
			L	W	L	W	L	W			No. 8 x 18" DEFORMED TIE BARS Each	No. 5 x 24" DEFORMED TIE BARS Each			
			Ft	Ft	Ft	Ft	Ft	Ft							
93.00	0.398	93.398					4	4	1.8	R	4	4	8	4	
93.00	0.830	93.830					4	6	2.7	R	8	4	12	6	
93.00	0.951	93.951	4	4					1.8	R	4	2	6	4	
94.00	0.020	94.020					4	4	1.8	R	4	4	8	4	
94.00	0.039	94.039	4	4					1.8	R	4	2	6	4	
94.00	0.110	94.110					6	14	9.3	R	16	2	18	12	
94.00	0.114	94.114	4	4					1.8	R	4	2	6	4	
94.00	0.289	94.289					30	6	20.0	R	8	24	32	6	
94.00	0.360	94.360					4	4	1.8	R	4	4	8	4	
94.00	0.379	94.379	18	6					12.0	R	8	7	15	6	
94.00	0.789	94.789					4	4	1.8	R	4	4	8	4	
94.00	0.830	94.830	6	10					6.7	R	12	2	14	10	
94.00	0.860	94.860	30	4			4	4	15.1	R	8	16	24	8	
95.00	0.001	95.001	30	14					46.7	R	16	12	28	12	
95.00	0.020	95.020	4	4					1.8	R	4	2	6	4	
95.00	0.039	95.039	4	4					1.8	R	4	2	6	4	
95.00	0.160	95.160					4	4	1.8	R	4	4	8	4	
95.00	0.209	95.209	4	4					1.8	R	4	2	6	4	
95.00	0.239	95.239					6	14	9.3	R	16	2	18	12	
95.00	0.251	95.251	4	4					1.8	R	4	2	6	4	
95.00	0.289	95.289	4	4					1.8	R	4	2	6	4	
95.00	0.311	95.311	6	6					4.0	R	8	2	10	6	
95.00	0.720	95.720	4	6					2.7	R	8	2	10	6	
95.00	0.751	95.751					6	14	9.3	R	16	2	18	12	
95.00	0.811	95.811					30	14	46.7	R	16	12	28	12	
95.00	0.819	95.819	4	4			6	4	4.4	R	8	6	14	8	
95.00	0.872	95.872					16	4	7.1	R	4	12	16	4	
95.00	0.879	95.879					4	4	1.8	R	4	4	8	4	
95.00	0.883	95.883					6	4	2.7	R	4	4	8	4	
95.00	0.887	95.887					4	4	1.8	R	4	4	8	4	
95.00	0.902	95.902			4	4			1.8	R	4	4	8	4	
95.00	0.914	95.914			4	4			1.8	R	4	4	8	4	
95.00	0.925	95.925			4	4			1.8	R	4	4	8	4	
95.00	0.929	95.929	4	4					1.8	R	4	2	6	4	
95.00	0.932	95.932					4	4	1.8	R	4	4	8	4	
95.00	0.951	95.951			4	4	4	4	3.6	R	8	8	16	8	
95.00	0.959	95.959	16	6			30	6	30.7	R	16	30	46	12	
95.00	0.970	95.970	12	4					5.3	R	4	4	8	4	
95.00	0.974	95.974	4	4					1.8	R	4	2	6	4	
95.00	0.978	95.978	4	4			4	4	3.6	R	8	6	14	8	
95.00	0.982	95.982	4	4					1.8	R	4	2	6	4	
95.00	0.985	95.985	6	14					9.3	R	16	2	18	12	
95.00	0.989	95.989	4	4					1.8	R	4	2	6	4	
96.00	0.001	96.001	16	14			6	14	34.2	R	32	8	40	24	
96.00	0.012	96.012	4	4			4	4	3.6	R	8	6	14	8	
96.00	0.016	96.016	4	14					6.2	R	16	2	18	12	
96.00	0.020	96.020	6	14			4	4	11.1	R	20	6	26	16	
96.00	0.031	96.031	4	4					1.8	R	4	2	6	4	
96.00	0.039	96.039					4	4	1.8	R	4	4	8	4	
96.00	0.061	96.061	4	4			4	4	3.6	R	8	6	14	8	
96.00	0.092	96.092					4	4	1.8	R	4	4	8	4	
96.00	0.179	96.179					4	4	1.8	R	4	4	8	4	
96.00	0.190	96.190	4	4					1.8	R	4	2	6	4	
96.00	0.194	96.194	4	4					1.8	R	4	2	6	4	
96.00	0.220	96.220	4	4					1.8	R	4	2	6	4	
96.00	0.349	96.349	4	4					1.8	R	4	2	6	4	

TABLE FOR NRC PAVEMENT REPAIR ON SD115 SB & NB

MRM	DISP	DMI	SB DRIVING LANE		CENTER TURN LANE		NB DRIVING LANE		NRCP REPAIR SqYds	NEW JOINT CON-FIG. (NRCP)	INSERT STEEL BAR IN PCC PAVEMENT (NRCP)		INSERT STEEL BAR IN NRCP TOTAL	DOWEL BAR	COMMENTS	
			L	W	L	W	L	W			No. 8 x 18" DEFORMED TIE BARS	No. 5 x 24" DEFORMED TIE BARS				
			Ft	Ft	Ft	Ft	Ft	Ft			Each	Each				Each
96.00	0.360	96.360	4	6			4	4	2.7	R	8	2	10	6		
96.00	0.391	96.391					6	14	1.8	R	4	4	8	4		
96.00	0.398	96.398					6	14	9.3	R	16	2	18	12		
96.00	0.421	96.421					6	14	9.3	R	16	2	18	12		
96.00	0.440	96.440					8	14	12.4	R	16	3	19	12		
96.00	0.451	96.451	4	4					1.8	R	4	2	6	4		
96.00	0.470	96.470	6	14					9.3	R	16	2	18	12		
96.00	0.701	96.701					6	14	9.3	R	16	2	18	12		
96.00	0.728	96.728					4	6	2.7	R	8	4	12	6		
96.00	0.739	96.739	4	4					1.8	R	4	2	6	4		
96.00	0.789	96.789	4	6					2.7	R	8	2	10	6		
TOTALS:									428.8			532	304	836	450	
ADDITIONAL QUANTITIES:									130.0			160	90	250	140	
GRAND TOTALS									558.8			692	394	1086	590	

NRC PAVEMENT REPAIR AREA TYPES

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

TABLE FOR NRC PAVEMENT REPAIR ON SD115 SB & NB

MRM	DISP	DMI	SB DRIVING LANE		NB DRIVING LANE		NRCP REPAIR SqYds	NEW JOINT CON-FIG. (NRCP)	INSERT STEEL BAR IN PCC PAVEMENT (NRCP)		INSERT STEEL BAR IN NRCP TOTAL Each	DOWEL BAR Each	COMMENTS
			L Ft	W Ft	L Ft	W Ft			No. 8 x 18" DEFORMED TIE BARS Each	No. 5 x 24" DEFORMED TIE BARS Each			
			97.00	0.119	97.119	12			4				
97.00	0.312	97.312			4	4	1.8	R	4	4	8	4	
97.00	0.350	97.350	4	4			1.8	R	4	2	6	4	
97.00	0.399	97.399			4	4	1.8	R	4	4	8	4	
97.00	0.672	97.672	4	6			2.7	R	8	2	10	6	
97.00	0.709	97.709			6	14	9.3	R	16	2	18	12	
97.00	0.721	97.721	6	14			9.3	R	16	2	18	12	
97.00	0.759	97.759	10	4			4.4	R	4	4	8	4	
97.00	0.838	97.838	4	6			2.7	R	8	2	10	6	
97.00	0.929	97.929	6	10			6.7	R	12	2	14	10	
97.00	0.952	97.952	6	14			9.3	R	16	2	18	12	
97.00	0.956	97.956	6	14			9.3	R	16	2	18	12	
97.00	0.990	97.990	4	8			3.6	R	10	2	12	8	
98.00	0.009	98.009	4	6			2.7	R	8	2	10	6	
98.00	0.031	98.031	4	6	4	4	4.4	R	12	6	18	10	
98.00	0.081	98.081	16	6			10.7	R	8	6	14	6	
98.00	0.119	98.119	4	4			1.8	R	4	2	6	4	
98.00	0.130	98.130	4	4			1.8	R	4	2	6	4	
98.00	0.221	98.221			4	4	1.8	R	4	4	8	4	
98.00	0.251	98.251			30	4	13.3	R	4	24	28	4	
98.00	0.270	98.270			4	4	1.8	R	4	4	8	4	
98.00	0.300	98.300			6	14	9.3	R	16	2	18	12	
98.00	0.361	98.361	4	4			1.8	R	4	2	6	4	
98.00	0.441	98.441	6	4			2.7	R	4	2	6	4	
98.00	0.482	98.482	4	4			1.8	R	4	2	6	4	
98.00	0.679	98.679	30	4			13.3	R	4	12	16	4	
98.00	0.751	98.751			6	14	9.3	R	16	2	18	12	
98.00	0.819	98.819			4	4	1.8	R	4	4	8	4	
98.00	0.850	98.850			4	4	1.8	R	4	4	8	4	
98.00	0.910	98.910			4	4	1.8	R	4	4	8	4	
98.00	0.922	98.922			4	4	1.8	R	4	4	8	4	
98.00	0.941	98.941	4	6			2.7	R	8	2	10	6	
98.00	0.971	98.971	4	4			1.8	R	4	2	6	4	
99.00	0.020	99.020			4	4	1.8	R	4	4	8	4	
99.00	0.149	99.149	4	4			1.8	R	4	2	6	4	
99.00	0.361	99.361	4	4	4	4	3.6	R	8	6	14	8	
99.00	0.399	99.399			4	4	1.8	R	4	4	8	4	
99.00	0.410	99.410	4	4	4	4	3.6	R	8	6	14	8	
99.00	0.448	99.448			4	4	1.8	R	4	4	8	4	
99.00	0.471	99.471	4	4			1.8	R	4	2	6	4	
99.00	0.501	99.501	4	4			1.8	R	4	2	6	4	
99.00	0.531	99.531	4	4			1.8	R	4	2	6	4	
99.00	0.660	99.660	4	4			1.8	R	4	2	6	4	
99.00	0.721	99.721	4	4			1.8	R	4	2	6	4	
99.00	0.770	99.770			10	6	6.7	R	8	8	16	6	
99.00	0.831	99.831			4	4	1.8	R	4	4	8	4	
99.00	0.834	99.834			16	6	10.7	R	8	12	20	6	
99.00	0.838	99.838			4	4	1.8	R	4	4	8	4	
99.00	0.842	99.842			4	4	1.8	R	4	4	8	4	
99.00	0.869	99.869	4	4			1.8	R	4	2	6	4	
99.00	0.891	99.891	4	6			2.7	R	8	2	10	6	
99.00	0.899	99.899			6	6	4.0	R	8	4	12	6	
99.00	0.910	99.910	16	4	4	4	8.9	R	8	10	18	8	
99.00	0.941	99.941			4	4	1.8	R	4	4	8	4	
99.00	0.990	99.990	4	6			2.7	R	8	2	10	6	
100.00	0.020	100.020			4	4	1.8	R	4	4	8	4	

TABLE FOR NRC PAVEMENT REPAIR ON SD115 SB & NB

MRM	DISP	DMI	SB DRIVING LANE		NB DRIVING LANE		NEW JOINT CON-FIG. (NRCP)	INSERT STEEL BAR IN PCC PAVEMENT (NRCP)		INSERT STEEL BAR IN NRCP TOTAL	DOWEL BAR	COMMENTS	
			L	W	L	W		NRCP REPAIR SqYds	No. 8 x 18" DEFORMED TIE BARS Each				No. 5 x 24" DEFORMED TIE BARS Each
			Ft	Ft	Ft	Ft							
100.00	0.024	100.024			6	4	2.7	R	4	4	8	4	
100.00	0.031	100.031			4	6	2.7	R	8	4	12	6	
100.00	0.039	100.039			4	4	1.8	R	4	4	8	4	
100.00	0.069	100.069	6	14	6	14	18.7	R	32	4	36	24	
100.00	0.077	100.077			6	14	9.3	R	16	2	18	12	
100.00	0.081	100.081	4	4	6	14	11.1	R	20	4	24	16	
100.00	0.092	100.092	4	4			1.8	R	4	2	6	4	
100.00	0.096	100.096	4	4			1.8	R	4	2	6	4	
100.00	0.100	100.100	4	4			1.8	R	4	2	6	4	
100.00	0.111	100.111	4	4	4	4	3.6	R	8	6	14	8	
100.00	0.130	100.130	6	14			9.3	R	16	2	18	12	
100.00	0.141	100.141	4	4			1.8	R	4	2	6	4	
100.00	0.149	100.149	10	14	4	4	17.3	R	20	8	28	16	
100.00	0.168	100.168			4	4	1.8	R	4	4	8	4	
100.00	0.209	100.209			4	4	1.8	R	4	4	8	4	
100.00	0.251	100.251			4	4	1.8	R	4	4	8	4	
100.00	0.361	100.361			6	6	4.0	R	8	4	12	6	
100.00	0.369	100.369			4	4	1.8	R	4	4	8	4	
100.00	0.422	100.422			4	4	1.8	R	4	4	8	4	
TOTALS:							322.8		542	292	834	464	
ADDITIONAL QUANTITIES:							100.0		160	90	250	140	
GRAND TOTALS							422.8		702	382	1084	604	

NRC PAVEMENT REPAIR AREA TYPES

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

TABLE FOR NRC PAVEMENT REPAIR ON SD115 SB & NB

MRM	DISP	DMI	SB DRIVING LANE		CENTER TURN LANE		NB DRIVING LANE		NRCP REPAIR SqYds	NEW JOINT CON- FIG. (NRCP)	INSERT STEEL BAR IN PCC PAVEMENT (NRCP)		INSERT STEEL BAR IN NRCP TOTAL Each	DOWEL BAR Each	COMMENTS
			L	W	L	W	L	W			No. 8 x 18" DEFORMED TIE BARS Each	No. 5 x 24" DEFORMED TIE BARS Each			
			Ft	Ft	Ft	Ft	Ft	Ft							
100.00	0.528	100.528	26	14					40.4	R	16	10	26	12	
100.00	0.699	100.699					4	4	1.8	R	4	4	8	4	
100.00	0.808	100.808	4	4					1.8	R	4	2	6	4	
100.00	0.812	100.812					4	4	1.8	R	4	4	8	4	
100.00	0.899	100.899					4	4	1.8	R	4	4	8	4	
100.00	0.930	100.930	6	14			4	4	11.1	R	20	6	26	16	
100.00	0.949	100.949					4	4	1.8	R	4	4	8	4	
100.00	0.960	100.960					4	8	3.6	R	10	4	14	8	
100.00	0.998	100.998	4	4					1.8	R	4	2	6	4	
101.00	0.028	101.028	6	14			4	4	11.1	R	20	6	26	16	
101.00	0.039	101.039	6	14					9.3	R	16	2	18	12	
101.00	0.051	101.051					4	4	1.8	R	4	4	8	4	
101.00	0.058	101.058					4	4	1.8	R	4	4	8	4	
101.00	0.111	101.111	4	4			4	6	4.4	R	12	6	18	10	
101.00	0.149	101.149	4	4					1.8	R	4	2	6	4	
101.00	0.191	101.191					4	4	1.8	R	4	4	8	4	
101.00	0.221	101.221					4	4	1.8	R	4	4	8	4	
101.00	0.271	101.271					4	4	1.8	R	4	4	8	4	
101.00	0.278	101.278	20	14					31.1	R	16	8	24	12	
101.00	0.282	101.282					6	4	2.7	R	4	4	8	4	
101.00	0.286	101.286					6	14	9.3	R	16	2	18	12	
101.00	0.301	101.301	6	14					9.3	R	16	2	18	12	
101.00	0.399	101.399	4	4					1.8	R	4	2	6	4	
101.00	0.422	101.422					6	14	9.3	R	16	2	18	12	
101.00	0.449	101.449					4	4	1.8	R	4	4	8	4	
101.00	0.502	101.502	4	4			4	4	3.6	R	8	6	14	8	
101.00	0.505	101.505	4	6					2.7	R	8	2	10	6	
101.00	0.509	101.509	4	4					1.8	R	4	2	6	4	
101.00	0.513	101.513	4	4					1.8	R	4	2	6	4	
101.00	0.517	101.517	6	14					9.3	R	16	2	18	12	
101.00	0.532	101.532	4	4					1.8	R	4	2	6	4	
101.00	0.551	101.551	6	14					9.3	R	16	2	18	12	
101.00	0.558	101.558	6	14					9.3	R	16	2	18	12	
101.00	0.562	101.562	6	14					9.3	R	16	2	18	12	
101.00	0.570	101.570	4	6					2.7	R	8	2	10	6	
101.00	0.574	101.574	4	4					1.8	R	4	2	6	4	
101.00	0.577	101.577	4	6					2.7	R	8	2	10	6	
101.00	0.581	101.581	4	6					2.7	R	8	2	10	6	
101.00	0.585	101.585	4	8					3.6	R	10	2	12	8	
101.00	0.600	101.600	6	14					9.3	R	16	2	18	12	
101.00	0.604	101.604	6	14					9.3	R	16	2	18	12	
101.00	0.619	101.619	6	6			4	4	5.8	R	12	6	18	10	
101.00	0.642	101.642					4	4	1.8	R	4	4	8	4	
101.00	0.649	101.649					4	4	1.8	R	4	4	8	4	
101.00	0.653	101.653					4	4	1.8	R	4	4	8	4	
101.00	0.789	101.789	4	4					1.8	R	4	2	6	4	
101.00	0.801	101.801					4	4	1.8	R	4	4	8	4	
101.00	0.831	101.831	4	4			6	6	5.8	R	12	6	18	10	
101.00	0.869	101.869	4	4					1.8	R	4	2	6	4	
101.00	0.892	101.892	12	14					18.7	R	16	4	20	12	
101.00	0.911	101.911					6	14	9.3	R	16	2	18	12	
101.00	0.930	101.930	4	10			6	4	7.1	R	16	6	22	14	
101.00	0.933	101.933					6	6	4.0	R	8	4	12	6	
101.00	0.941	101.941	4	4			4	4	3.6	R	8	6	14	8	
101.00	0.945	101.945	8	14					12.4	R	16	3	19	12	
101.00	0.949	101.949					4	4	1.8	R	4	4	8	4	

TABLE FOR NRC PAVEMENT REPAIR ON SD115 SB & NB

MRM	DISP	DMI	SB DRIVING LANE		CENTER TURN LANE		NB DRIVING LANE		NRCP REPAIR SqYds	NEW JOINT CON- FIG. (NRCP)	INSERT STEEL BAR IN PCC PAVEMENT (NRCP)		INSERT STEEL BAR IN NRCP TOTAL Each	DOWEL BAR Each	COMMENTS
			L	W	L	W	L	W			No. 8 x 18" DEFORMED TIE BARS Each	No. 5 x 24" DEFORMED TIE BARS Each			
			Ft	Ft	Ft	Ft	Ft	Ft							
101.00	0.952	101.952					4	4	1.8	R	4	4	8	4	
101.00	0.956	101.956					4	4	1.8	R	4	4	8	4	
101.00	0.960	101.960					4	4	1.8	R	4	4	8	4	
101.00	0.964	101.964					4	8	3.6	R	10	4	14	8	
101.00	0.968	101.968					4	4	1.8	R	4	4	8	4	
101.00	0.971	101.971	6	14			6	14	18.7	R	32	4	36	24	
101.00	0.979	101.979					4	6	2.7	R	8	4	12	6	
101.00	0.983	101.983					4	18	8.0	R	16	4	20	12	
101.00	0.990	101.990					4	8	3.6	R	10	4	14	8	
102.00	0.002	102.002			4	8			3.6	R	10	4	14	8	
102.00	0.005	102.005			6	14			9.3	R	16	4	20	12	
102.00	0.009	102.009			4	6			2.7	R	8	4	12	6	
102.00	0.013	102.013			4	4			1.8	R	4	4	8	4	
102.00	0.021	102.021	4	4	4	4			3.6	R	8	6	14	8	
102.00	0.024	102.024	4	4			4	4	3.6	R	8	6	14	8	
102.00	0.028	102.028	4	4			4	4	3.6	R	8	6	14	8	
102.00	0.032	102.032	4	4					1.8	R	4	2	6	4	
102.00	0.036	102.036	4	4					1.8	R	4	2	6	4	
102.00	0.039	102.039	4	4					1.8	R	4	2	6	4	
TOTALS:									404.5		678	273	951	562	
ADDITIONAL QUANTITIES:									120.0		200	80	280	170	
GRAND TOTALS									524.5		878	353	1231	732	

NRC PAVEMENT REPAIR AREA TYPES

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

T = Two Tied Joints

B = One Working & One Tied Joint

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

TABLE FOR NRC PAVEMENT REPAIR ON I229 SOUTH SEGMENT SB

MRM	DISP	DMI	SB PASSING LANE		SB DRIVING LANE		NRCP REPAIR SqYds	NEW JOINT CON-FIG. (NRCP)	INSERT STEEL BAR IN PCC PAVEMENT (NRCP)		INSERT STEEL BAR IN NRCP TOTAL Each	DOWEL BAR Each	COMMENTS	
			L Ft	W Ft	L Ft	W Ft			No. 11 x 18" DEFORMED TIE BARS Each	No. 5 x 24" DEFORMED TIE BARS Each				
			0.00	0.356	0.356	4			4					
0.00	0.349	0.349			4	4	1.8	R	4	4	8	4		
0.00	0.330	0.330			4	4	1.8	R	4	4	8	4		
0.00	0.326	0.326			4	4	1.8	R	4	4	8	4		
0.00	0.277	0.277			4	4	1.8	R	4	4	8	4		
0.00	0.231	0.231			4	4	1.8	R	4	4	8	4		
TOTALS:							10.8			24	22	46	24	
ADDITIONAL QUANTITIES:							-			10	10	20	10	
GRAND TOTALS							10.8			34	32	66	34	

NRC PAVEMENT REPAIR AREA TYPES

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

T = Two Tied Joints

B = One Working & One Tied Joint

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

TABLE FOR NRC PAVEMENT REPAIR ON I229 SB

MRM	DISP	DMI	SB MEDIAN SHOULDER		SB PASSING LANE		SB DRIVING LANE		SB OUTSIDE SHOULDER		NRCP REPAIR SqYds	NEW JOINT CON-FIG. (NRCP)	INSERT STEEL BAR IN PCC PAVEMENT (NRCP)		INSERT STEEL BAR IN NRCP TOTAL Each	DOWEL BAR Each	COMMENTS
			L	W	L	W	L	W	L	W			No. 11 x 18" DEFORMED TIE BARS Each	No. 5 x 24" DEFORMED TIE BARS Each			
			Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft							
9.00	0.979	9.979	4	4							1.8	R		2	2		
9.00	0.975	9.975					6	6			4.0	R	8	4	12	6	
9.00	0.945	9.945	4	4							1.8	R		2	2		
9.00	0.938	9.938					6	12			8.0	R	16	4	20	12	
9.00	0.930	9.930			4	4	4	4			3.6	R	8	6	14	8	
9.00	0.926	9.926					4	4			1.8	R	4	4	8	4	
9.00	0.904	9.904					4	4			1.8	R	4	4	8	4	
9.00	0.900	9.900					4	4			1.8	R	4	4	8	4	
9.00	0.873	9.873					4	4			1.8	R	4	4	8	4	
9.00	0.869	9.869			4	4	4	4			3.6	R	8	6	14	8	
9.00	0.866	9.866			4	4	4	6			4.4	R	12	6	18	10	
9.00	0.850	9.850					6	12			8.0	R	16	4	20	12	
9.00	0.847	9.847					4	4			1.8	R	4	4	8	4	
9.00	0.839	9.839					4	4			1.8	R	4	4	8	4	
9.00	0.835	9.835					4	4			1.8	R	4	4	8	4	
9.00	0.832	9.832					4	4			1.8	R	4	4	8	4	
9.00	0.828	9.828					4	4			1.8	R	4	4	8	4	
9.00	0.794	9.794			4	4	4	4			3.6	R	8	6	14	8	
9.00	0.790	9.790					4	4			1.8	R	4	4	8	4	
9.00	0.786	9.786					6	12			8.0	R	16	4	20	12	
9.00	0.775	9.775					6	12			8.0	R	16	4	20	12	
9.00	0.771	9.771					4	4			1.8	R	4	4	8	4	
9.00	0.718	9.718					4	4			1.8	R	4	4	8	4	
9.00	0.691	9.691					6	6			4.0	R	8	4	12	6	
9.00	0.688	9.688					4	4			1.8	R	4	4	8	4	
9.00	0.684	9.684					4	4			1.8	R	4	4	8	4	
9.00	0.680	9.680					4	4			1.8	R	4	4	8	4	
9.00	0.676	9.676					4	4			1.8	R	4	4	8	4	
9.00	0.672	9.672					4	4			1.8	R	4	4	8	4	
9.00	0.669	9.669					4	4			1.8	R	4	4	8	4	
9.00	0.631	9.631					6	12			8.0	R	16	4	20	12	
9.00	0.619	9.619					4	4			1.8	R	4	4	8	4	
9.00	0.536	9.536			4	4	4	4			3.6	R	8	6	14	8	
9.00	0.532	9.532	6	6			6	12			12.0	R	16	6	22	12	
9.00	0.529	9.529			4	4					1.8	R	4	2	6	4	
9.00	0.506	9.506					4	4			1.8	R	4	4	8	4	
9.00	0.487	9.487							6	6	4.0	R		4	4		
9.00	0.483	9.483							6	6	4.0	R		4	4		
9.00	0.479	9.479	6	6							4.0	R		2	2		
9.00	0.475	9.475	20	6							13.3	R		8	8		
9.00	0.472	9.472	20	6	4	8					16.9	R	10	10	20	8	
9.00	0.464	9.464	20	6							13.3	R		8	8		
9.00	0.460	9.460	20	6							13.3	R		8	8		
9.00	0.457	9.457			10	12					13.3	R	16	4	20	12	
9.00	0.453	9.453					6	12			8.0	R	16	4	20	12	
9.00	0.449	9.449	20	6							13.3	R		8	8		
9.00	0.445	9.445	10	6							6.7	R		4	4		
9.00	0.419	9.419					4	4			1.8	R	4	4	8	4	
9.00	0.415	9.415					4	4			1.8	R	4	4	8	4	
9.00	0.404	9.404	4	4	4	4					3.6	R	4	4	8	4	
9.00	0.396	9.396	4	4							1.8	R		2	2		
9.00	0.385	9.385					4	4			1.8	R	4	4	8	4	
9.00	0.366	9.366			4	4	4	4			3.6	R	8	6	14	8	
9.00	0.347	9.347					4	4			1.8	R	4	4	8	4	
9.00	0.343	9.343					4	4			1.8	R	4	4	8	4	
9.00	0.332	9.332					6	12			8.0	R	16	4	20	12	

TABLE FOR NRC PAVEMENT REPAIR ON I229 SB

MRM	DISP	DMI	SB MEDIAN SHOULDER		SB PASSING LANE		SB DRIVING LANE		SB OUTSIDE SHOULDER		NRCP REPAIR SqYds	NEW JOINT CON-FIG. (NRCP)	INSERT STEEL BAR IN PCC PAVEMENT (NRCP)		INSERT STEEL BAR IN NRCP TOTAL Each	DOWEL BAR Each	COMMENTS	
			L	W	L	W	L	W	L	W			No. 11 x 18" DEFORMED TIE BARS Each	No. 5 x 24" DEFORMED TIE BARS Each				
			Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft								
9.00	0.301	9.301			4	4	4	4			3.6	R	8	6	14	8		
9.00	0.294	9.294					6	12			8.0	R	16	4	20	12		
9.00	0.290	9.290					6	12			8.0	R	16	4	20	12		
9.00	0.286	9.286			4	4					1.8	R	4	2	6	4		
9.00	0.260	9.260			4	4					1.8	R	4	2	6	4		
9.00	0.252	9.252			4	4					1.8	R	4	2	6	4		
9.00	0.222	9.222			4	4					1.8	R	4	2	6	4		
9.00	0.199	9.199			4	4	4	4			3.6	R	8	6	14	8		
9.00	0.180	9.180	4	6							2.7	R		2	2			
9.00	0.161	9.161			4	4					1.8	R	4	2	6	4		
9.00	0.116	9.116			4	4					1.8	R	4	2	6	4		
9.00	0.108	9.108			4	4	4	6			4.4	R	12	6	18	10		
9.00	0.093	9.093					4	4			1.8	R	4	4	8	4		
9.00	0.089	9.089					4	6			2.7	R	8	4	12	6		
9.00	0.085	9.085			4	4	4	4			3.6	R	8	6	14	8		
9.00	0.078	9.078					4	6			2.7	R	8	4	12	6		
9.00	0.074	9.074	8	6	4	4	4	6			9.8	R	12	9	21	10		
9.00	0.070	9.070					6	4			2.7	R	4	4	8	4		
9.00	0.066	9.066					6	8			5.3	R	10	4	14	8		
9.00	0.063	9.063					4	4			1.8	R	4	4	8	4		
9.00	0.055	9.055	4	4							1.8	R		2	2			
9.00	0.047	9.047	4	4							1.8	R		2	2			
9.00	0.044	9.044	4	4							1.8	R		2	2			
8.00	0.930	8.930					6	12			8.0	R	16	4	20	12		
8.00	0.915	8.915			4	4					1.8	R	4	2	6	4		
8.00	0.911	8.911			6	6	4	4			5.8	R	12	6	18	10		
8.00	0.907	8.907	30	6	14	4					26.2	R	4	17	21	4		
8.00	0.896	8.896			4	6	4	4			4.4	R	12	6	18	10		
8.00	0.892	8.892					4	4			1.8	R	4	4	8	4		
8.00	0.885	8.885			4	6					2.7	R	8	2	10	6		
8.00	0.873	8.873			4	4					1.8	R	4	2	6	4		
8.00	0.866	8.866					4	4			1.8	R	4	4	8	4		
8.00	0.862	8.862					4	4			1.8	R	4	4	8	4		
8.00	0.854	8.854			4	4					1.8	R	4	2	6	4		
8.00	0.843	8.843					4	4			1.8	R	4	4	8	4		
8.00	0.839	8.839			6	12	6	12			16.0	R	32	2	34	24		
8.00	0.835	8.835			10	12	4	4			15.1	R	20	4	24	16		
8.00	0.794	8.794					6	4			2.7	R	4	4	8	4		
8.00	0.377	8.377							4	4	1.8	R		4	4			
8.00	0.350	8.350	4	6							2.7	R		2	2			
8.00	0.339	8.339							100	4	44.4	R		80	80			
TOTALS:												475.6		608	488	1096	524	
ADDITIONAL QUANTITIES:												140.0		180	150	330	160	
GRAND TOTALS												615.6		788	638	1426	684	

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

TABLE FOR NRC PAVEMENT REPAIR ON I229 NB

MRM	DISP	DMI	NB PASSING LANE		NB DRIVING LANE		NB OUTSIDE SHOULDER		NRCP REPAIR SqYds	NEW JOINT CON-FIG. (NRCP)	INSERT STEEL BAR IN PCC PAVEMENT (NRCP)		INSERT STEEL BAR IN NRCP TOTAL Each	DOWEL BAR Each	COMMENTS
			L	W	L	W	L	W			No. 11 x 18" DEFORMED TIE BARS Each	No. 5 x 24" DEFORMED TIE BARS Each			
			Ft	Ft	Ft	Ft	Ft	Ft							
8.00	0.967	8.967			6	12			8.0	R	16	4	20	12	
9.00	0.122	9.122	4	4					1.8	R	4	2	6	4	
9.00	0.164	9.164			4	4			1.8	R	4	4	8	4	
9.00	0.190	9.190					20	10	22.2	R		8	8		
9.00	0.202	9.202	4	4					1.8	R	4	2	6	4	
9.00	0.304	9.304	4	4					1.8	R	4	2	6	4	
9.00	0.452	9.452					4	4	1.8	R		4	4		
9.00	0.456	9.456					4	4	1.8	R		4	4		
9.00	0.581	9.581	4	4	4	4			3.6	R	8	6	14	8	
9.00	0.641	9.641			4	6			2.7	R	8	4	12	6	
9.00	0.645	9.645			4	4			1.8	R	4	4	8	4	
TOTALS:									49.1		52	44	96	46	
ADDITIONAL QUANTITIES:									10.0		20	10	30	10	
GRAND TOTALS									59.1		72	54	126	56	

NRC 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

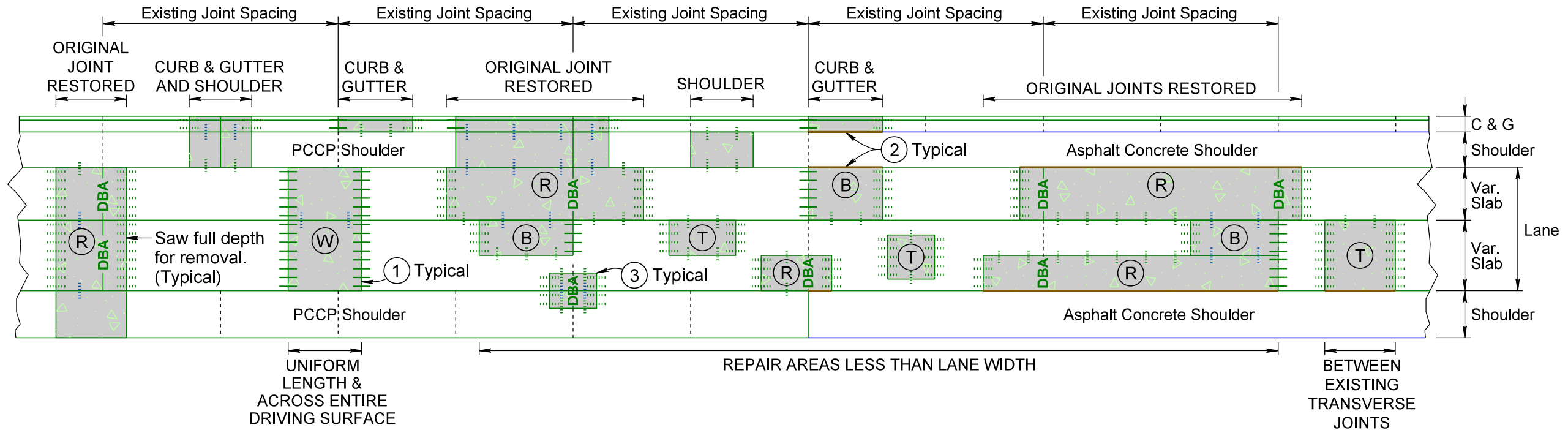
R = Two Tied Joints with Original Joint Restored with Dowel Bar Assembly

NONREINFORCED PCC PAVEMENT REPAIR

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

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM-NH-P 0022(100)	38	49

Plotting Date: 01/15/2025



KEY:

PCC Pavement Repair Area

PCC PAVEMENT REPAIR AREA TYPES:

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

Steel Bars for Transverse Joints

- Pavement Thickness ≥ 10.5 "
 - Drilled in $1\frac{1}{2}$ " x 18" epoxy coated plain round dowel bars spaced 18" center to center.
 - Drilled in No. 11 x 18" epoxy coated deformed tie bars spaced 18" center to center.
- Pavement Thickness ≥ 8.5 " and < 10.5 "
 - Drilled in $1\frac{1}{4}$ " x 18" epoxy coated plain round dowel bars spaced 18" center to center.
 - Drilled in No. 9 x 18" epoxy coated deformed tie bars spaced 18" center to center.
- Pavement Thickness < 8.5 "
 - Drilled in 1" x 18" epoxy coated plain round dowel bars spaced 18" center to center.
 - Drilled in No. 8 x 18" epoxy coated deformed tie bars spaced 18" center to center.

DBA Dowel Bar Assembly

Steel Bars for Longitudinal Joints

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

NOTES: Saw around repair areas full depth for removal.

- ① Where possible, transverse joints 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.

PLOT SCALE - 1:10

PLOT NAME - 1

FILE - ... \PCCREPAIR\PATCH1.DGN

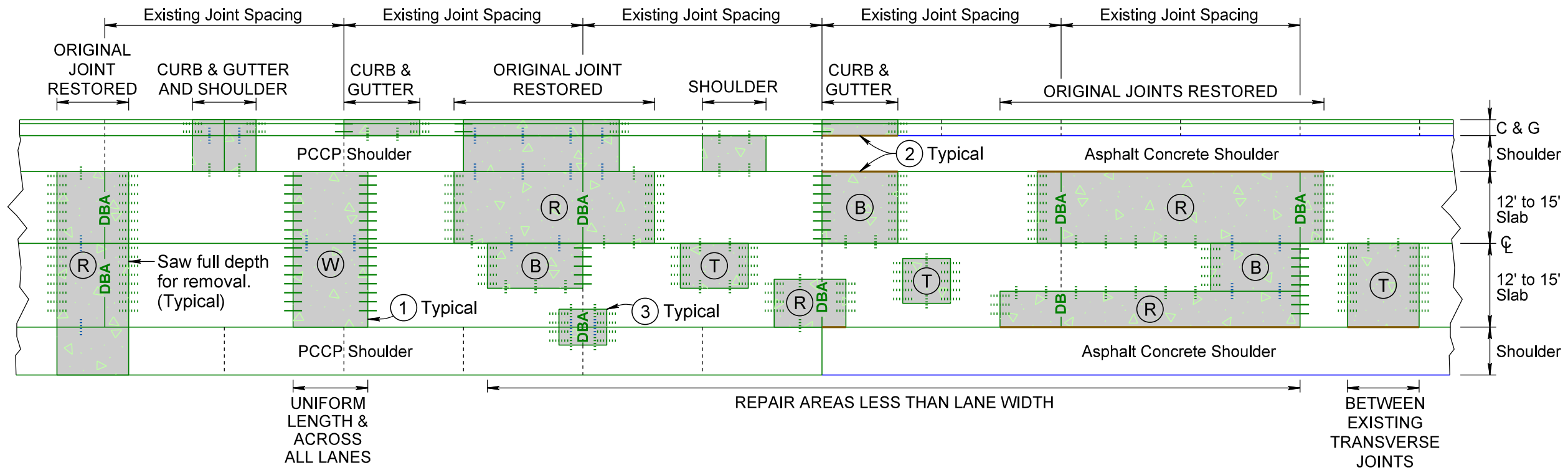
PLOTTED FROM - TRSF12133

NONREINFORCED PCC PAVEMENT REPAIR

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

TYPICAL REPAIR AREAS

Plotting Date: 01/15/2025



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 $1\frac{1}{2}$ " x 18" epoxy coated plain round dowel bars spaced 18" center to center.
 - Drilled in No. 11 x 18" epoxy coated deformed tie bars spaced 18" center to center.
- Pavement Thickness ≥ 8.5 " and < 10.5 "**
 - Drilled in $1\frac{1}{4}$ " x 18" epoxy coated plain round dowel bars spaced 18" center to center.
 - Drilled in No. 9 x 18" epoxy coated deformed tie bars spaced 18" center to center.
- Pavement Thickness < 8.5 "**
 - Drilled in 1" x 18" epoxy coated plain round dowel bars spaced 18" center to center.
 - Drilled in No. 8 x 18" epoxy coated deformed tie bars spaced 18" center to center.

DBA Dowel Bar Assembly

Steel Bars for Longitudinal Joints

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

NOTES: Saw around repair areas full depth for removal.

- ① Where possible, transverse joints 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.

PLOT SCALE - 1:10

PLOT NAME - 9

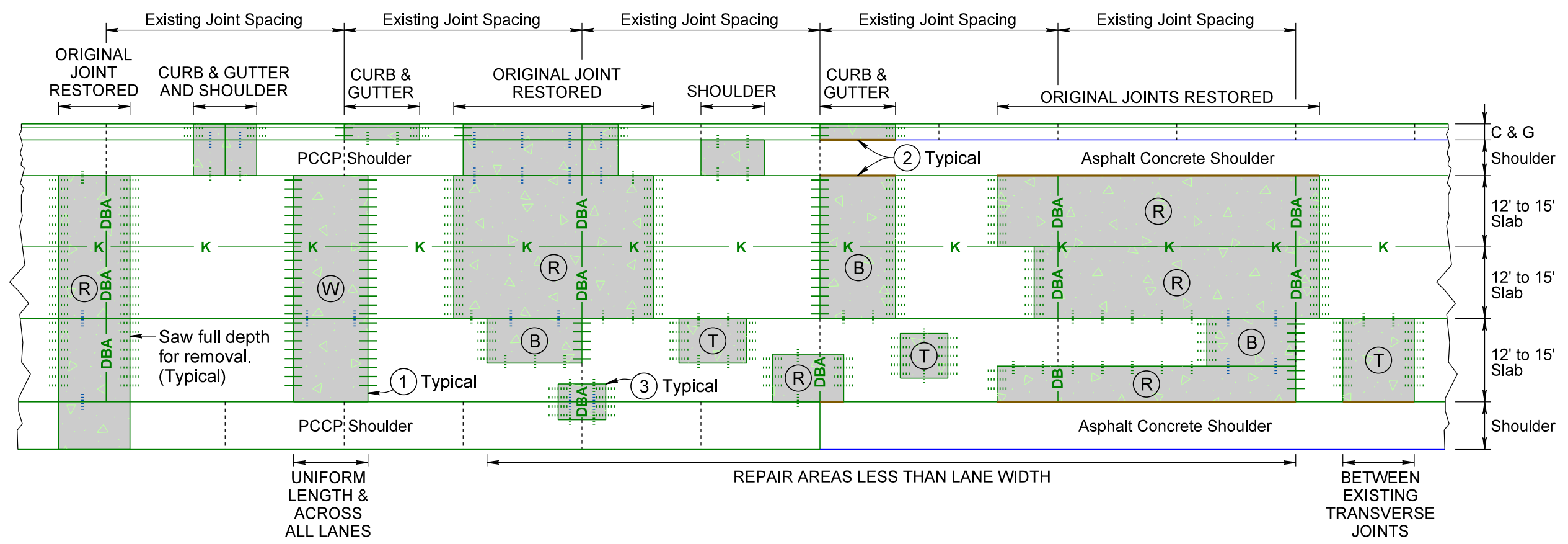
FILE - ... \PCCREPAIR\PATCH2.DGN

PLOTTED FROM - TRSF12133

NONREINFORCED PCC PAVEMENT REPAIR

UP TO TWO LANE ROADWAY WITH CENTER LANE OR UP TO SIX LANE DIVIDED ROADWAY
TYPICAL REPAIR AREAS

Plotting Date: 01/15/2025



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 $1\frac{1}{2}$ " x 18" epoxy coated plain round dowel bars spaced 18" center to center.
 - Drilled in No. 11 x 18" epoxy coated deformed tie bars spaced 18" center to center.
- Pavement Thickness ≥ 8.5 " and < 10.5 "**
 - Drilled in $1\frac{1}{4}$ " x 18" epoxy coated plain round dowel bars spaced 18" center to center.
 - Drilled in No. 9 x 18" epoxy coated deformed tie bars spaced 18" center to center.
- Pavement Thickness < 8.5 "**
 - Drilled in 1" x 18" epoxy coated plain round dowel bars spaced 18" center to center.
 - Drilled in No. 8 x 18" epoxy coated deformed tie bars spaced 18" center to center.

DBA Dowel Bar Assembly

Steel Bars for Longitudinal Joints

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

NOTES: Saw around repair areas full depth for removal.

- ① Where possible, transverse joints 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.

PLOT SCALE - 1:10

PLOT NAME - 1

PLOTTED FROM - TRSF12133

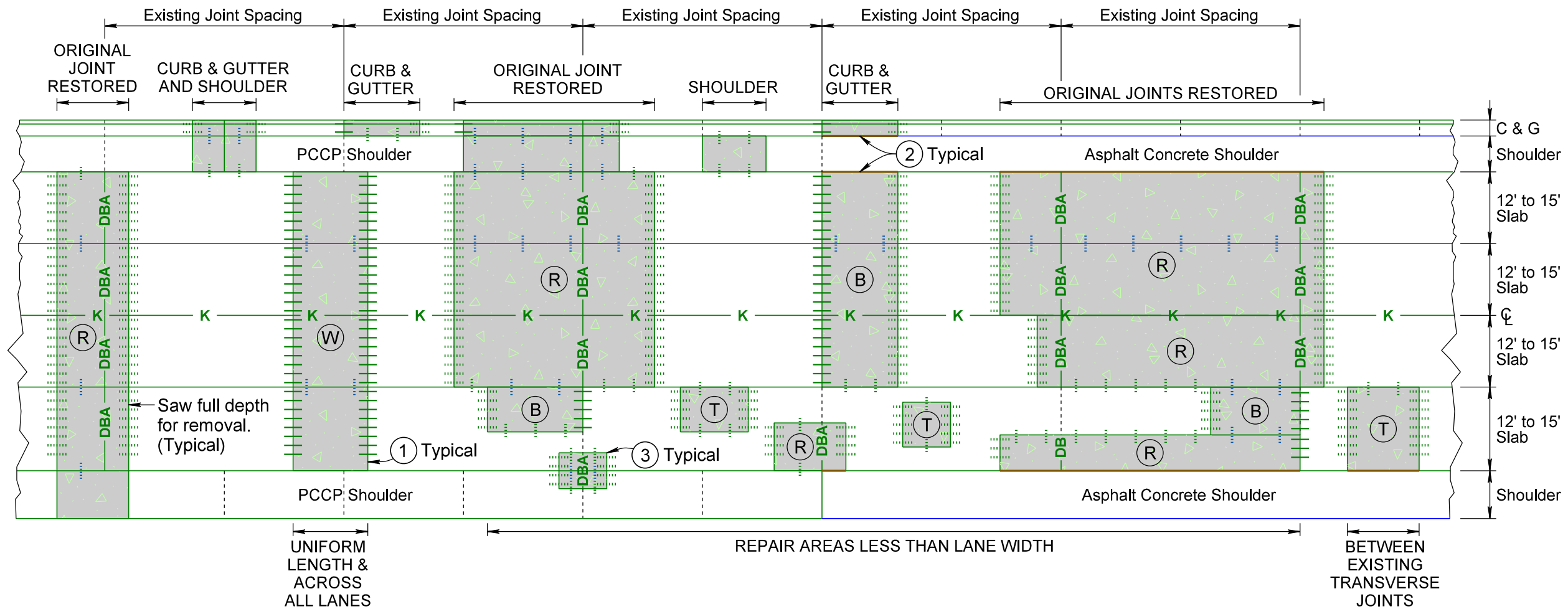
FILE - ... \PCCREPAIR\PATCH3.DGN

NONREINFORCED PCC PAVEMENT REPAIR

UP TO FOUR LANE ROADWAY OR UP TO EIGHT LANE DIVIDED ROADWAY

TYPICAL REPAIR AREAS

Plotting Date: 01/15/2025



KEY:

PCC Pavement Repair Area

PCC PAVEMENT REPAIR AREA TYPES:

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

Longitudinal Keyway Joints Without Bars

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 $1\frac{1}{2}$ " x 18" epoxy coated plain round dowel bars spaced 18" center to center.
 - Drilled in No. 11 x 18" epoxy coated deformed tie bars spaced 18" center to center.
- Pavement Thickness ≥ 8.5 " and < 10.5 "**
 - Drilled in $1\frac{1}{4}$ " x 18" epoxy coated plain round dowel bars spaced 18" center to center.
 - Drilled in No. 9 x 18" epoxy coated deformed tie bars spaced 18" center to center.
- Pavement Thickness < 8.5 "**
 - Drilled in 1" x 18" epoxy coated plain round dowel bars spaced 18" center to center.
 - Drilled in No. 8 x 18" epoxy coated deformed tie bars spaced 18" center to center.

Dowel Bar Assembly

Steel Bars for Longitudinal Joints

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

NOTES: Saw around repair areas full depth for removal.

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

PLOT SCALE - 1:10

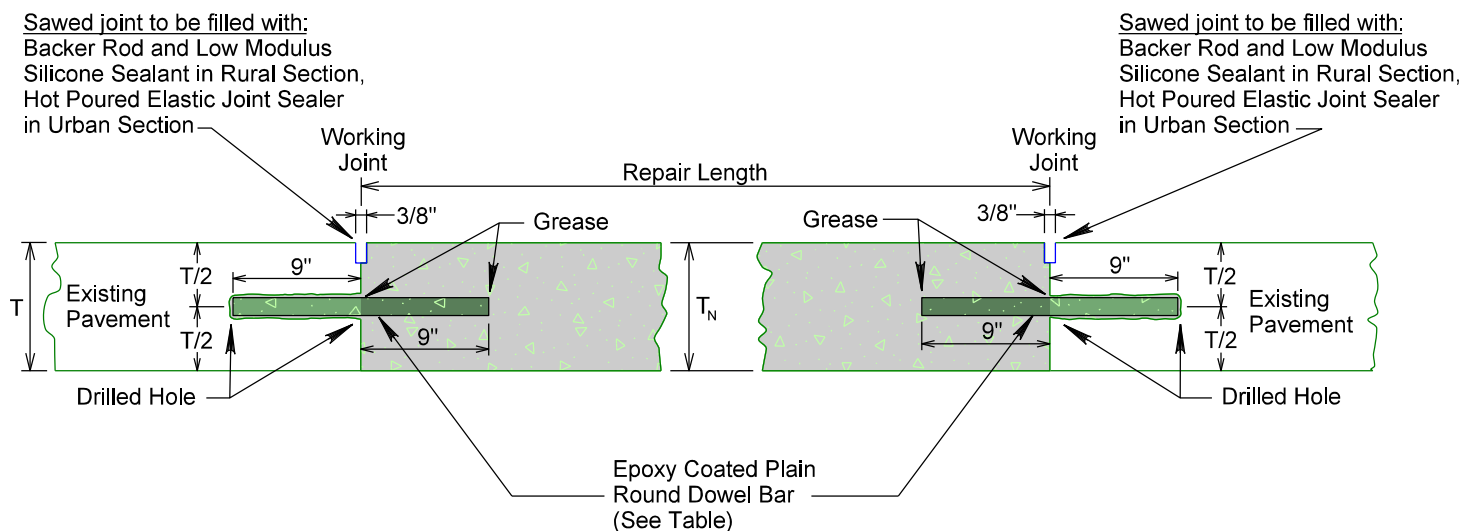
PLOTTED FROM - TRSF12133

PLOT NAME - I FILE - ... \PCCREPAIR\PATCH4.DGN

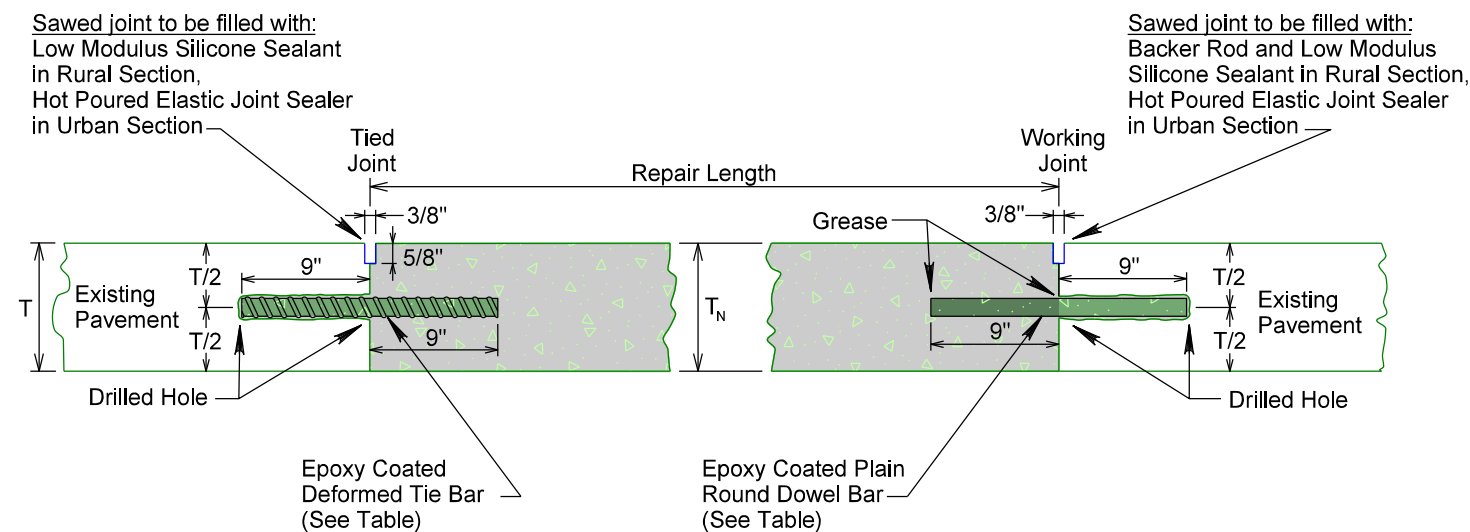
NONREINFORCED PCC PAVEMENT REPAIR

Plotting Date: 01/15/2025

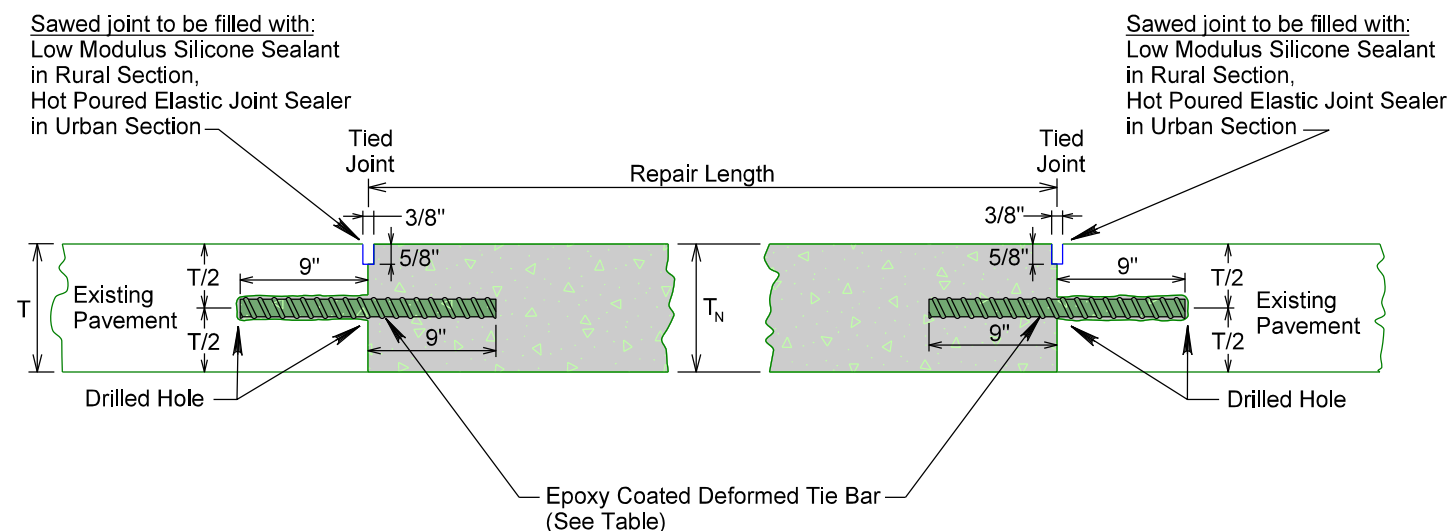
PLAIN ROUND DOWEL BAR INSERTION
TYPE W - (TWO WORKING JOINTS)



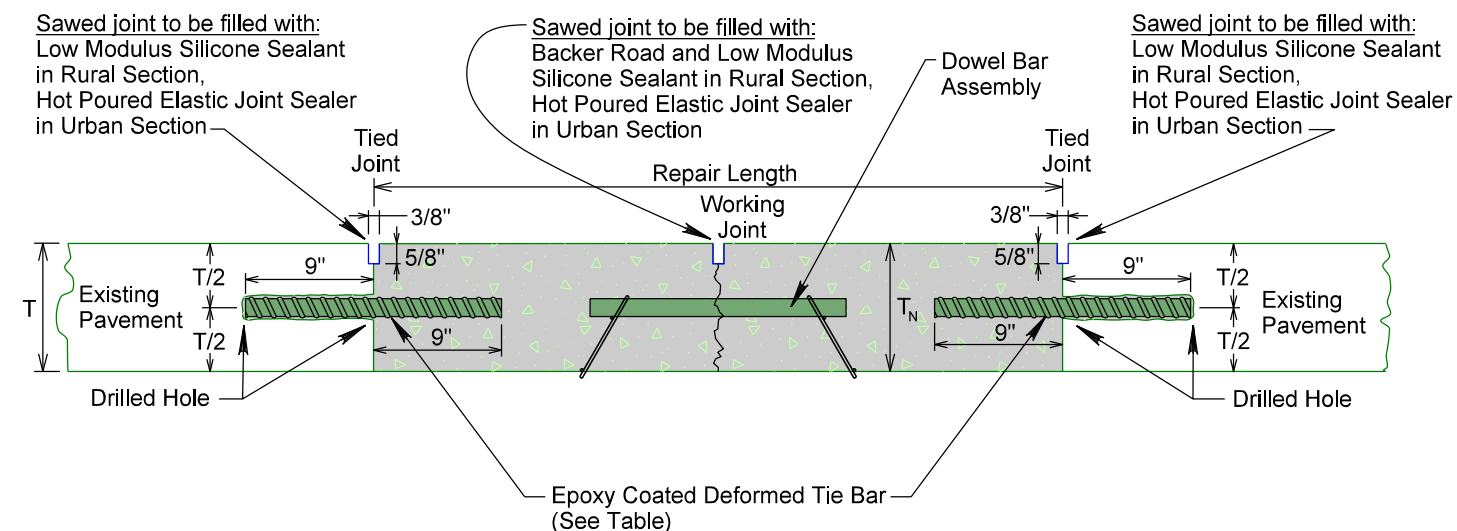
DEFORMED TIE BAR AND PLAIN ROUND DOWEL BAR INSERTION
TYPE B - (ONE TIED JOINT AND ONE WORKING JOINT)



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
$T \geq 10.5"$	No. 11 x 18"	1½" x 18"
$T \geq 8.5"$ & $T < 10.5"$	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)

PLOT SCALE - 1/4"=1'-0"

PLOTTED FROM - TRSF12133

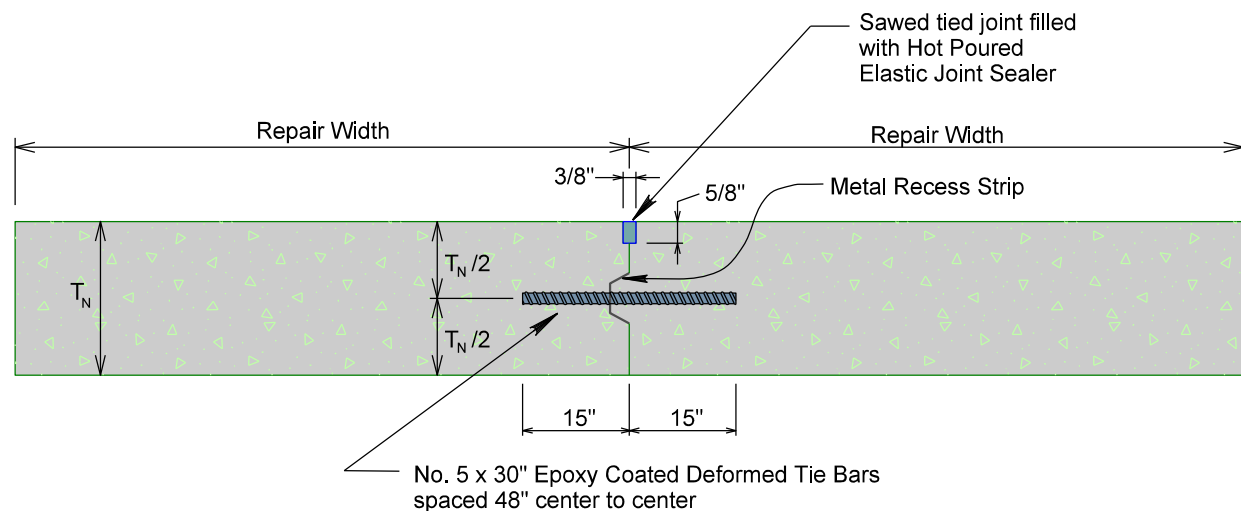
FILE - ... \16XU-177W\PCPREPAIR\BARS.DGN

NONREINFORCED PCC PAVEMENT REPAIR

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM-NH-P 0022(100)	43	49

Plotting Date: 01/15/2025

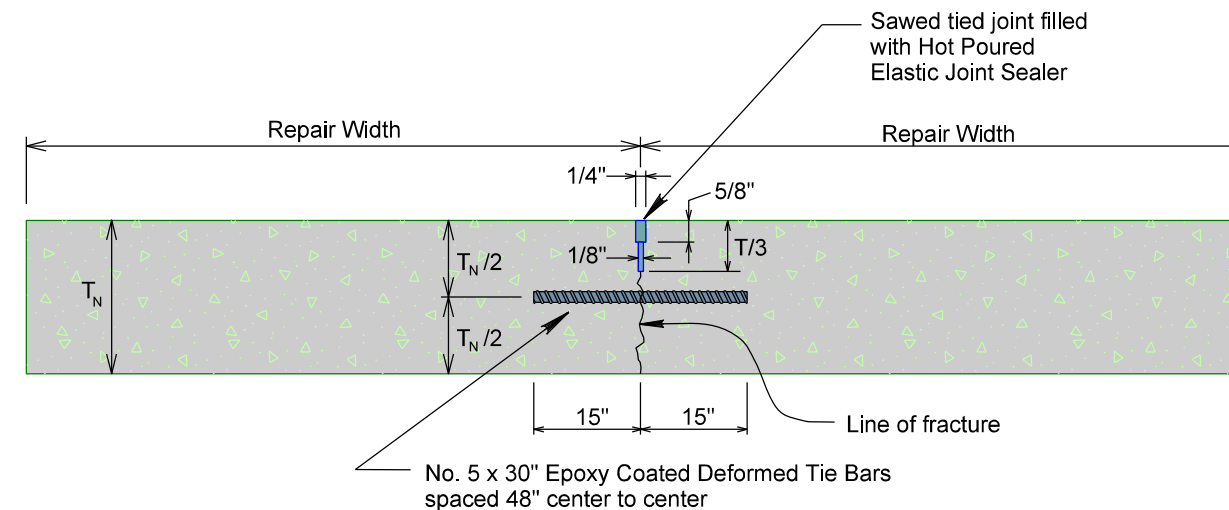
LONGITUDINAL CONSTRUCTION JOINT WITH TIE BARS & KEYWAY



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.

SAWED LONGITUDINAL JOINT

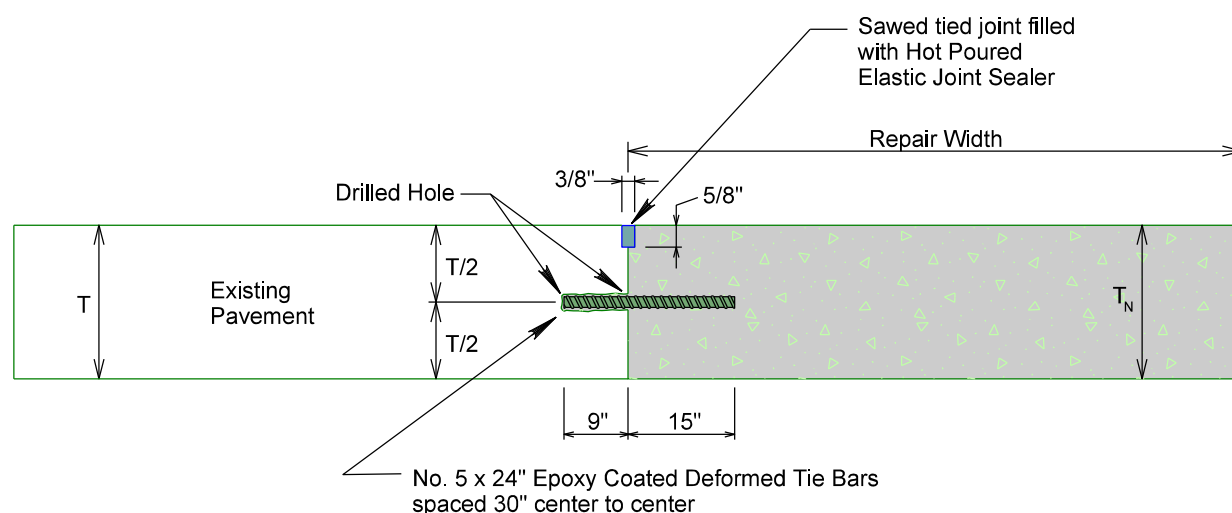


T_N = New pavement thickness.

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.

LONGITUDINAL CONSTRUCTION JOINT WITH DRILLED IN TIE BARS



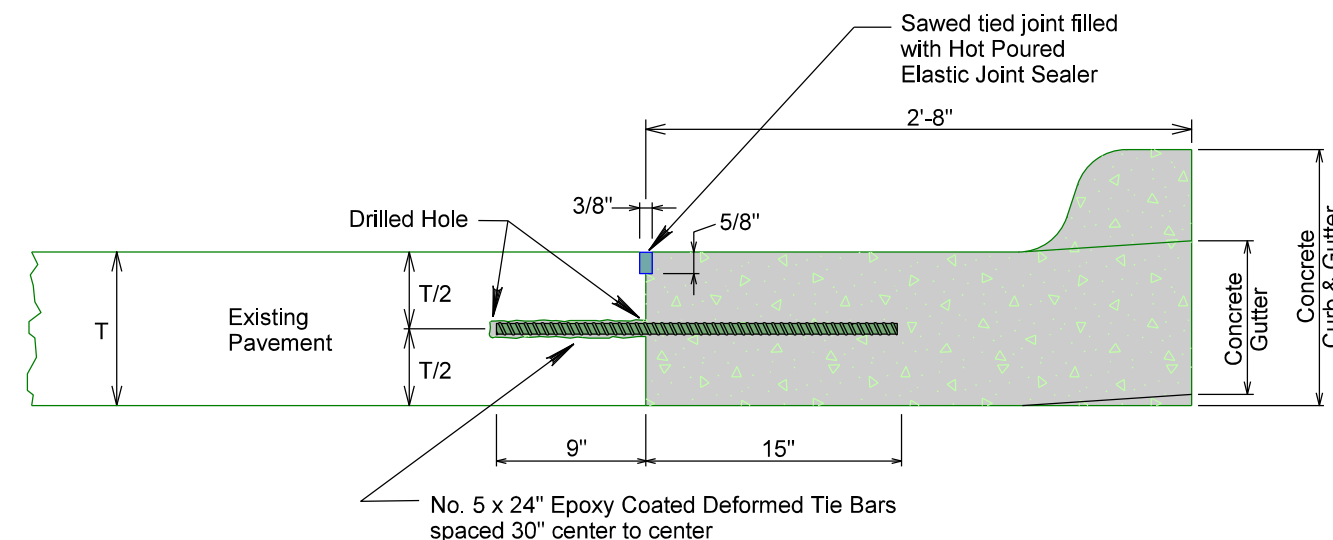
T = Existing pavement thickness.
 T_N = New pavement thickness.

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.

PLOT SCALE - 1:11.25

PLOTTED FROM - TRSF12133

PLOT NAME - 15

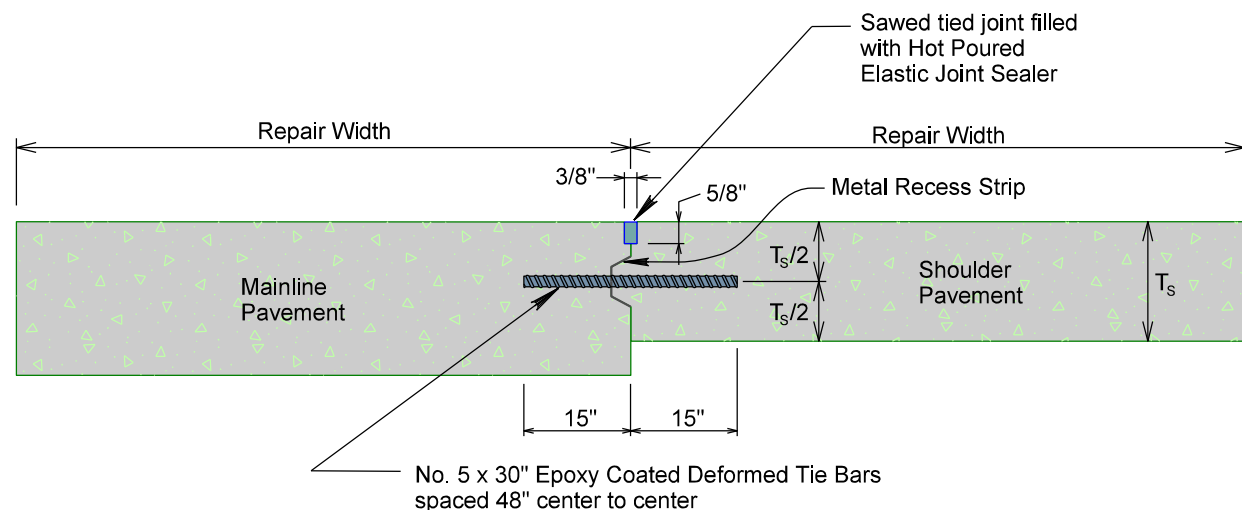
FILE - ... \16XU-177W\PCPREPAIR\BARS.DGN

NONREINFORCED PCC PAVEMENT REPAIR

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM-NH-P 0022(100)	44	49

Plotting Date: 01/15/2025

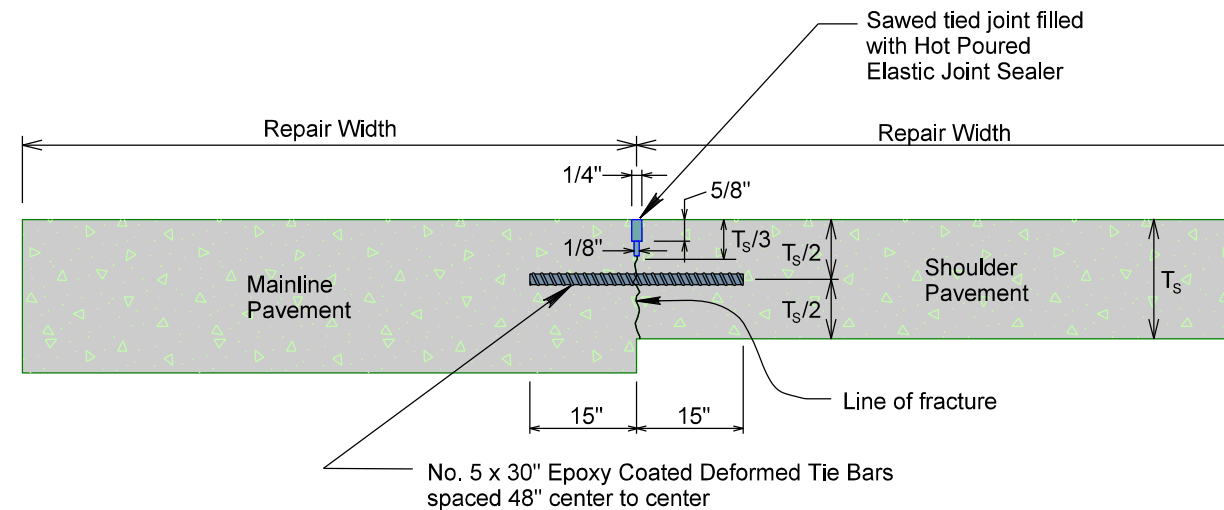
LONGITUDINAL SHOULDER CONSTRUCTION JOINT WITH TIE BARS & KEYWAY



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

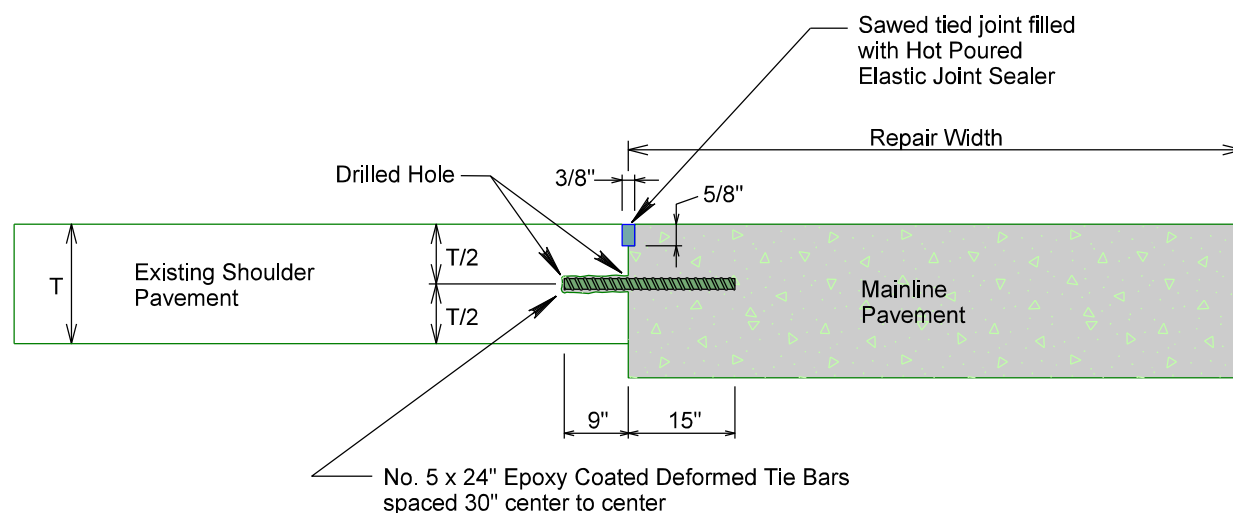


T_s = New shoulder pavement thickness.

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



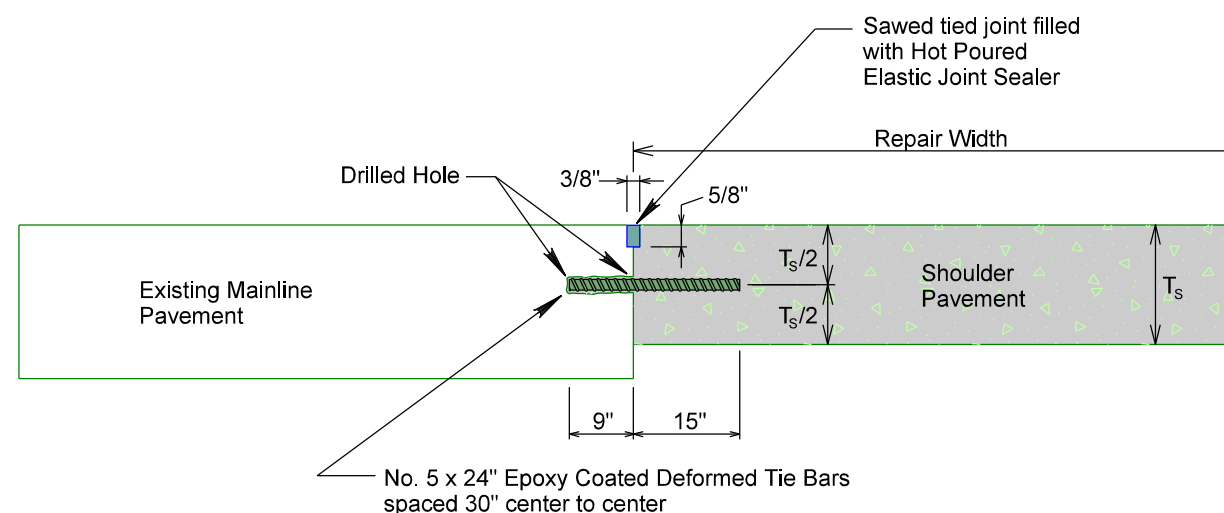
T = Existing shoulder pavement thickness.

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.

PLOT SCALE - 1:11.25

PLOTTED FROM - TRSF12133

PLOT NAME - 14

FILE - ... \16XU_177W\PCPREPAIR\BARS.DGN

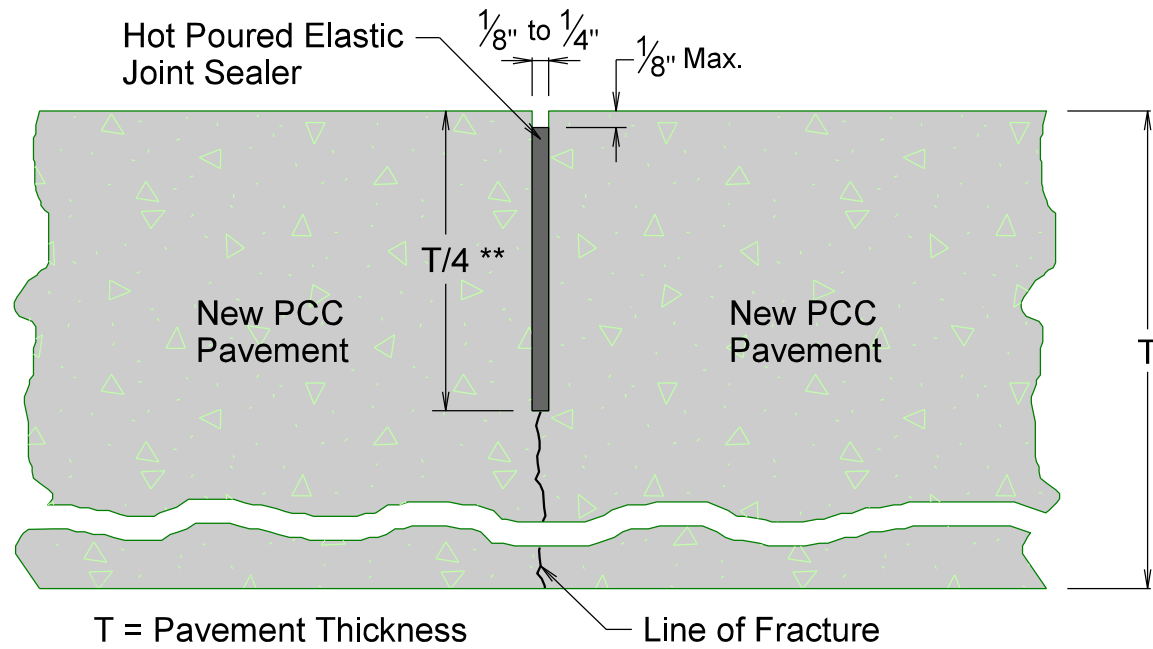
NONREINFORCED PCC PAVEMENT REPAIR

SAW & SEAL TRANSVERSE JOINTS

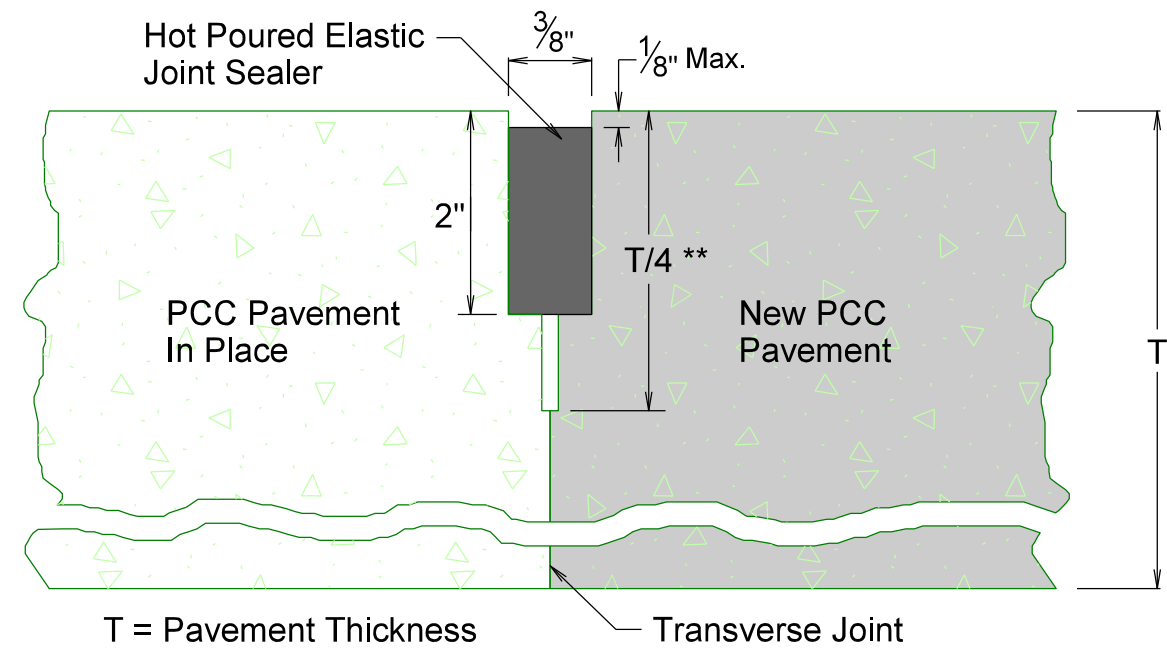
STATE OF SOUTH DAKOTA	PROJECT IM-NH-P 0022(100)	SHEET 45	TOTAL SHEETS 49
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Plotting Date: 01/15/2025

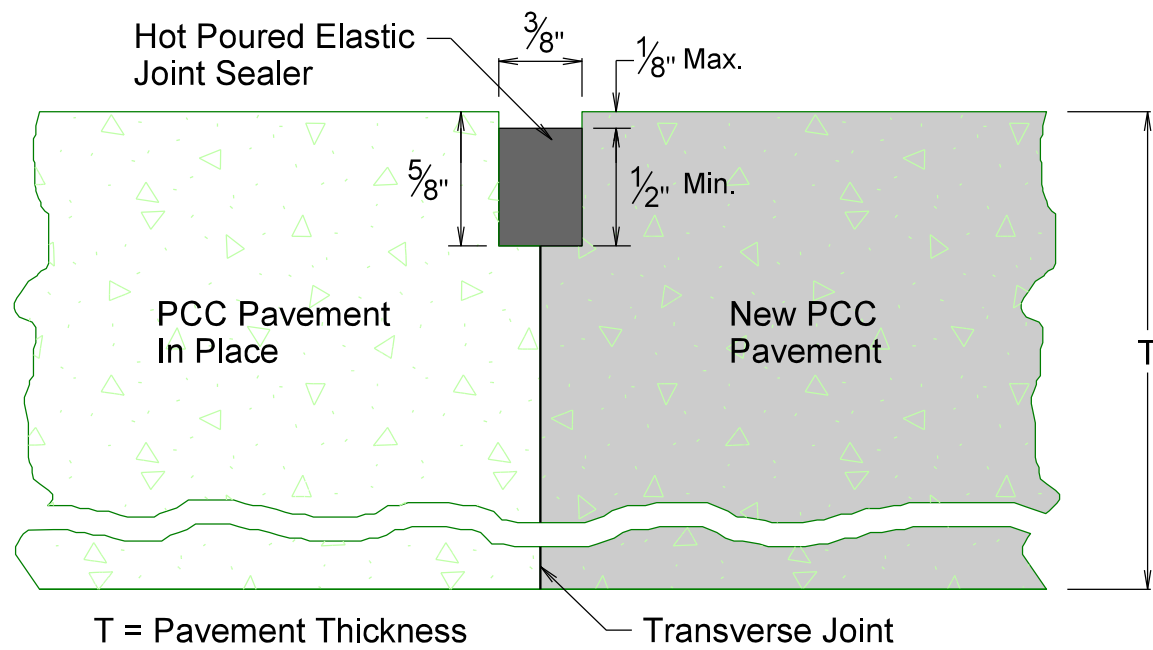
WITH HOT POURED ELASTIC JOINT SEALER AT WORKING JOINTS ENTIRELY WITHIN REPAIR AREAS



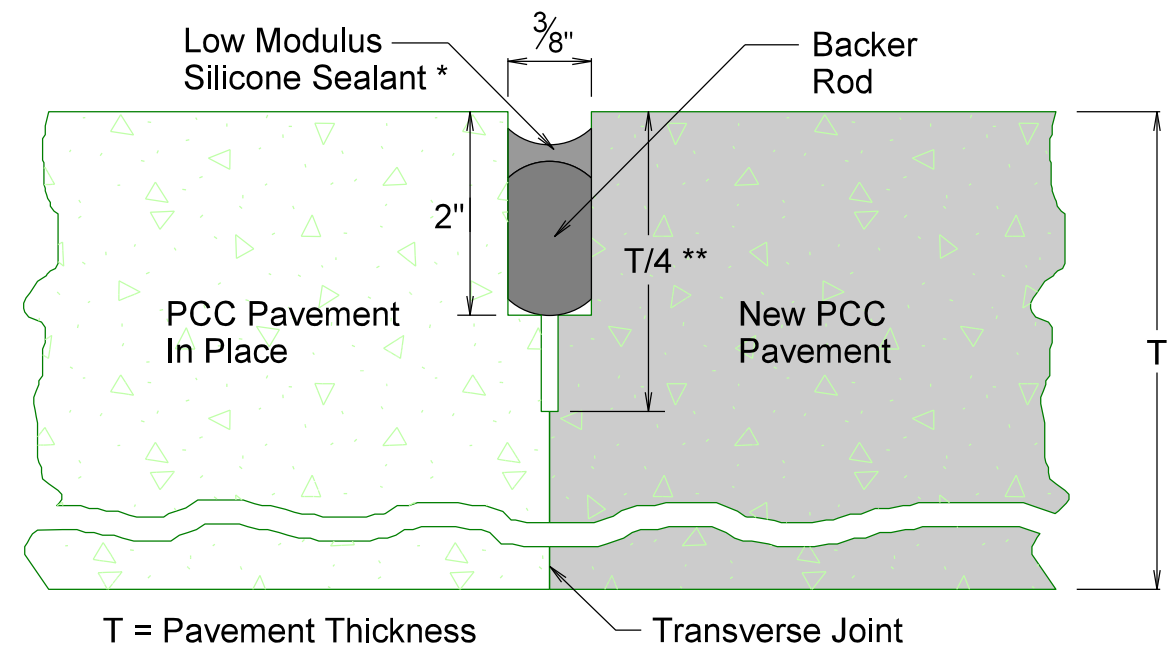
WITH HOT POURED ELASTIC JOINT SEALER AT WORKING JOINTS (TYPICALLY URBAN)



WITH HOT POURED ELASTIC JOINT SEALER AT TIED JOINTS



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



* Refer to Standard Plate 380.16 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.

PLOT SCALE - 1:0.12

PLOTTED FROM - TRSF12133

FILE - ... \REPAIR AREA - TRANSVERSE JOINT DETAILS.DGN

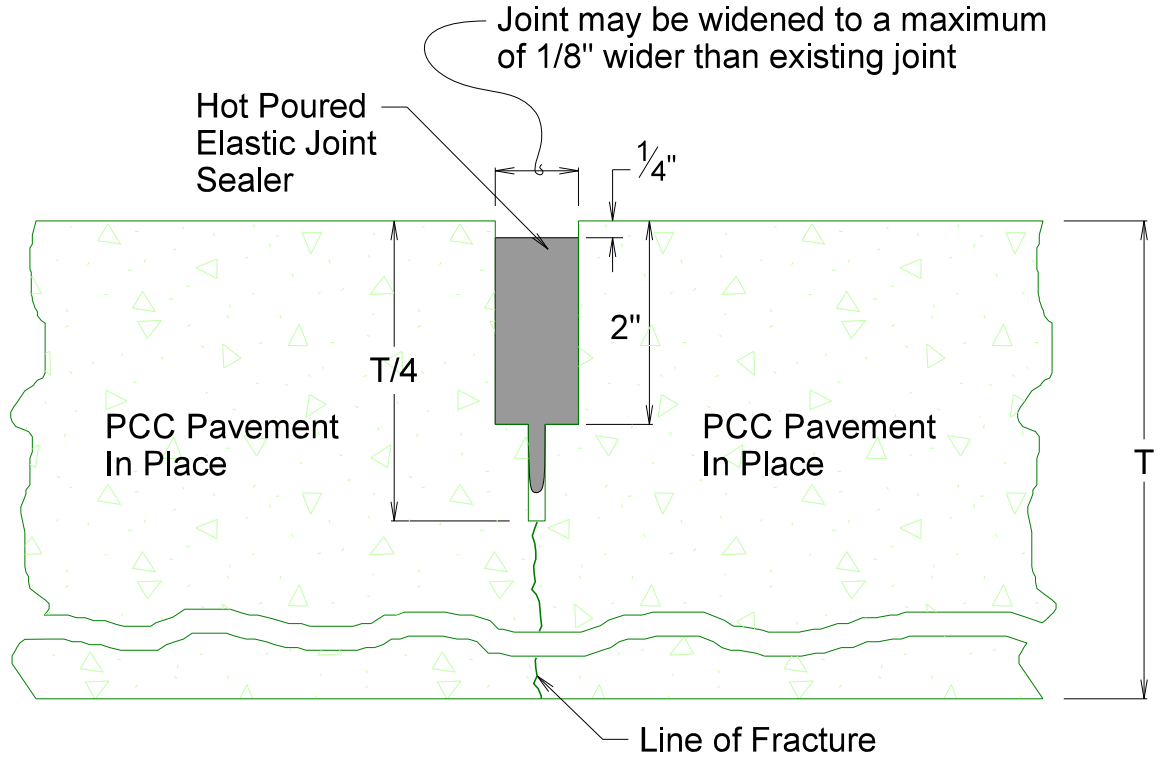
PLOT NAME - 1

RESEAL PCC PAVEMENT JOINTS

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM-NH-P 0022(100)	46	49

Plotting Date: 02/06/2025

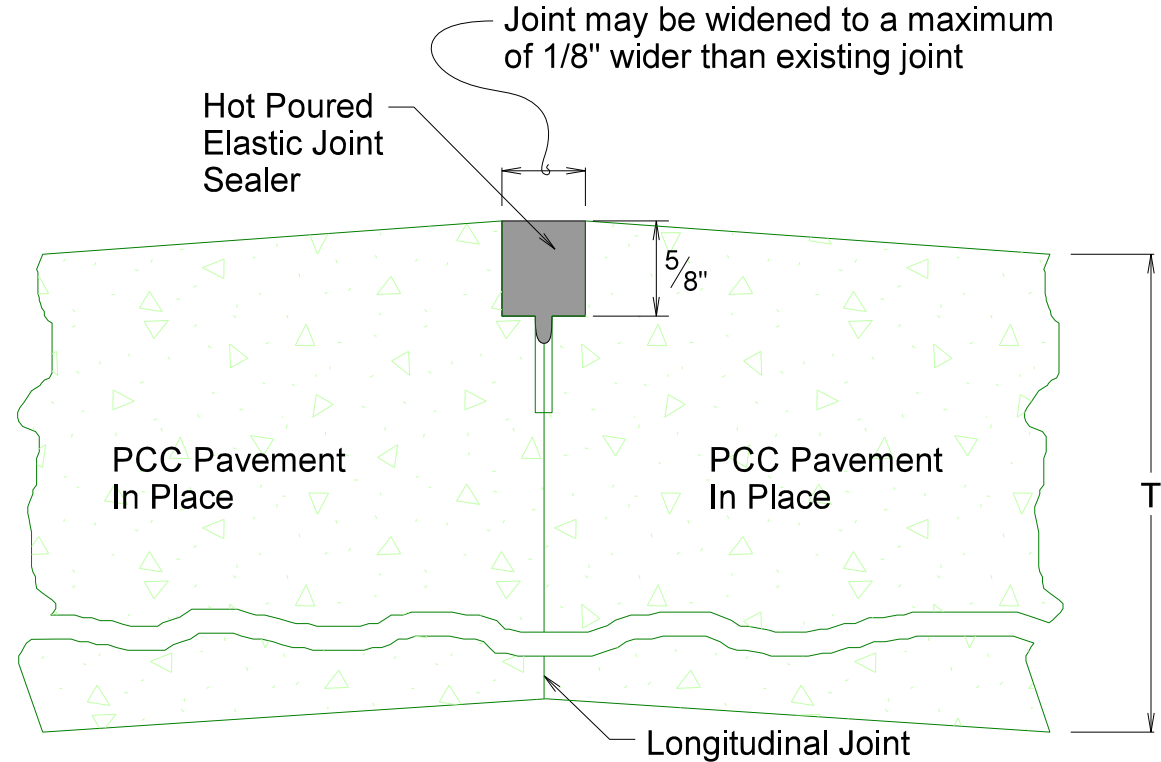
RESEAL TRANSVERSE JOINT WITH HOT Poured ELASTIC JOINT SEALER



T = Pavement Thickness

Additional sawing for widening the saw cut to provide the width for the installation of the Hot Poured Elastic Joint Sealer will be necessary.

RESEAL LONGITUDINAL JOINT WITH HOT Poured ELASTIC JOINT SEALER



T = Pavement Thickness

Additional sawing for widening the saw cut to provide the width for the installation of the Hot Poured Elastic Joint Sealer will be necessary.

PLOT SCALE - 1:0.12

PLOTTED FROM - TRSF12133

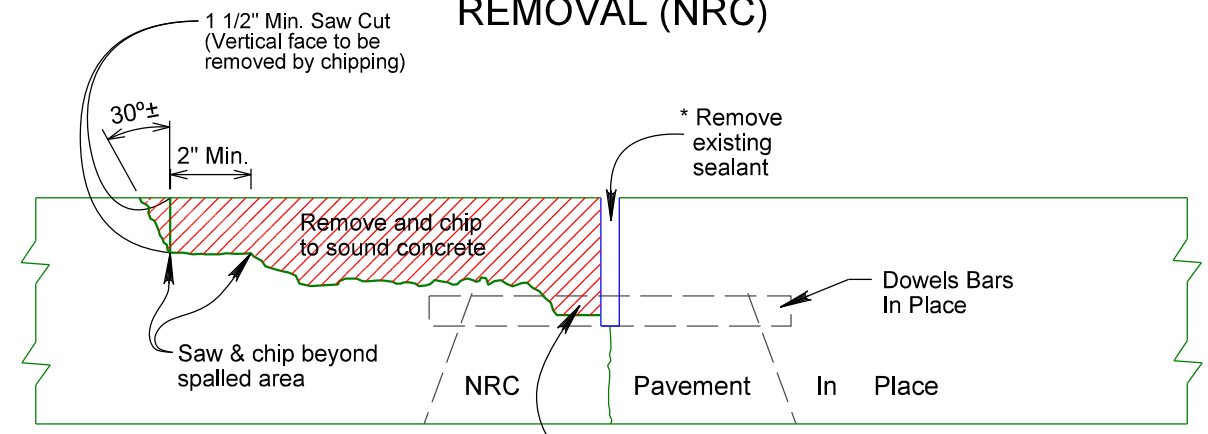
PLOT NAME - 2

FILE - ... \PCCREPAIR\JOINT RESEALING.DGN

PARTIAL DEPTH PATCH

WHEN PATCHED WITH CONCRETE

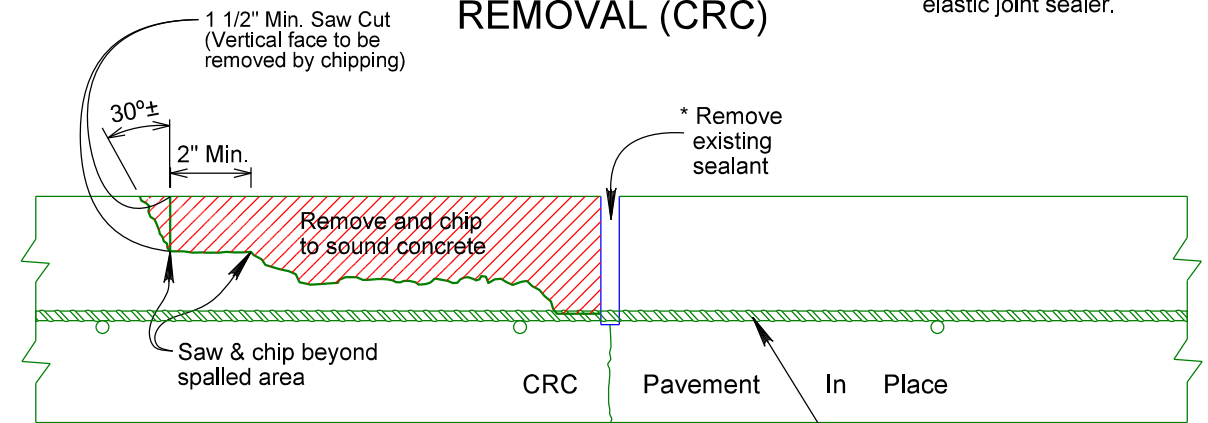
REMOVAL (NRC)



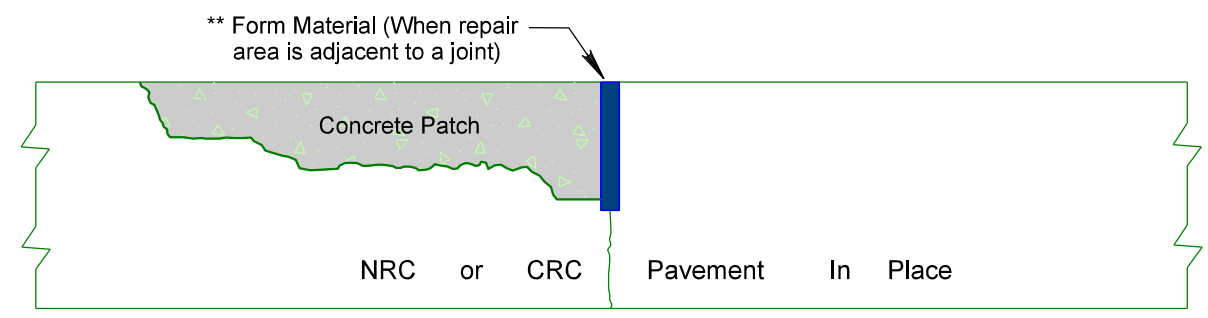
If Dowel Bar is exposed coat the bar with duct tape as a bond breaker

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

REMOVAL (CRC)



PATCHING

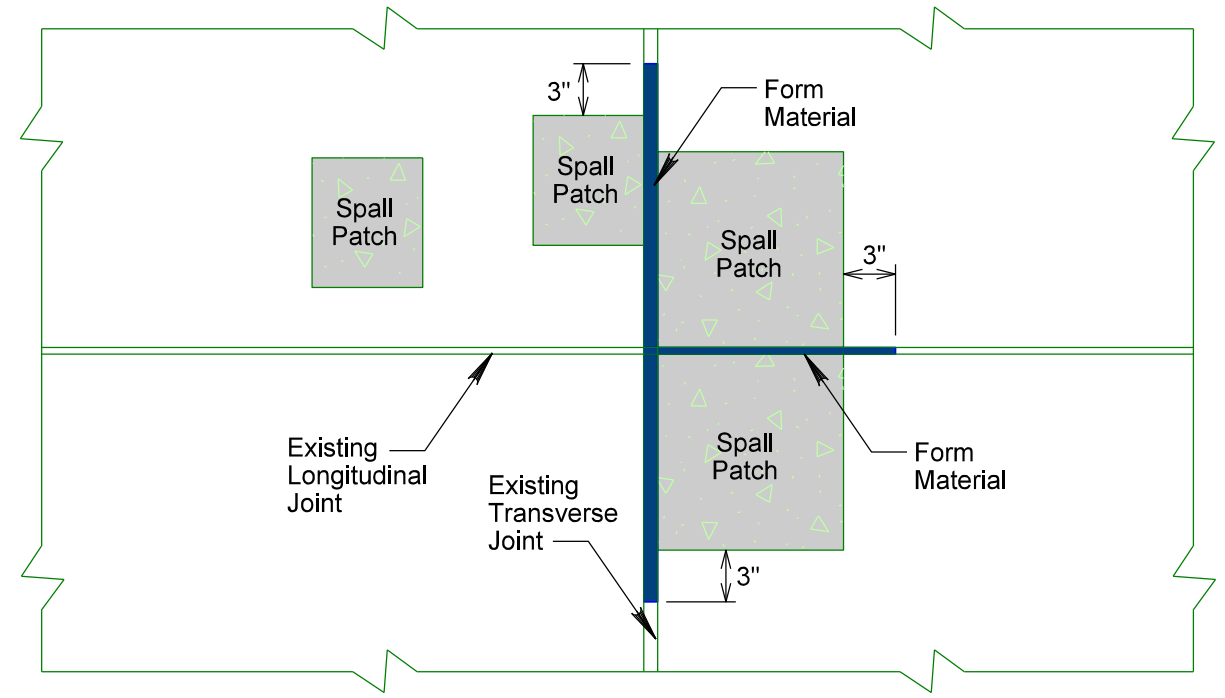


** Form Material will be removed by sawing or other means approved by the Engineer. Spall repaired joints will then be sealed with Backer Rod and Low Modulus Silicone Sealant.

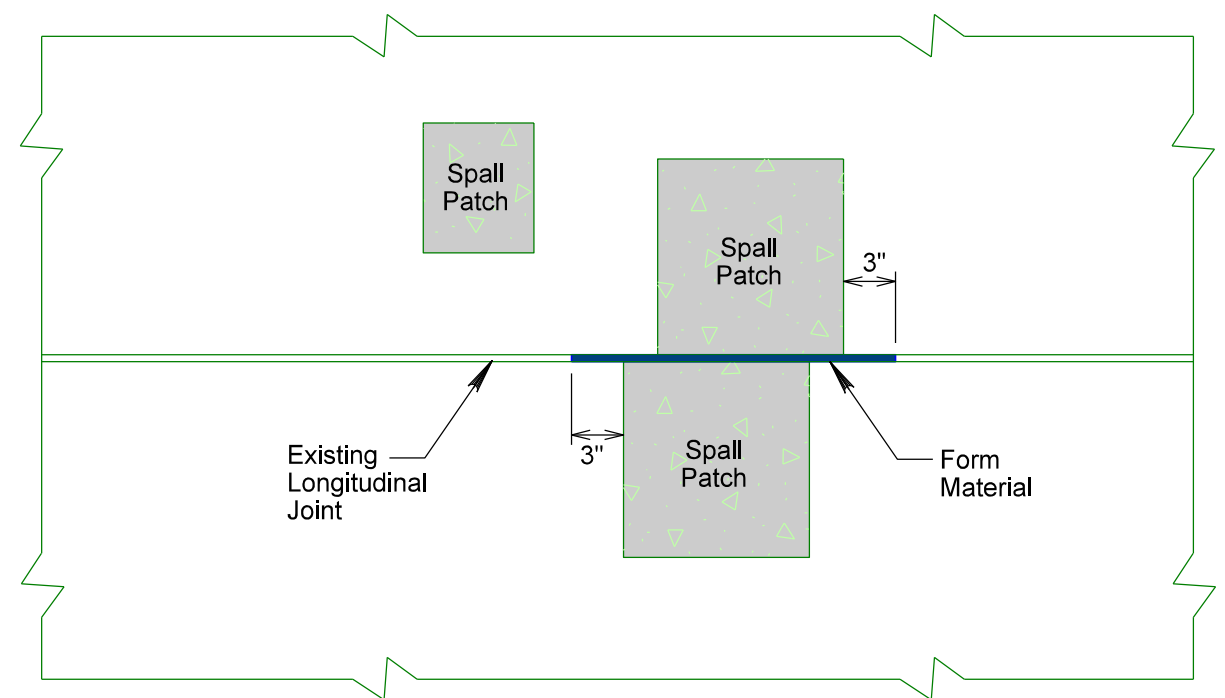
PARTIAL DEPTH PATCH

WHEN PATCHED WITH CONCRETE

NRC SPALL PATCHES (PLAN VIEW)



CRC SPALL PATCHES (PLAN VIEW)



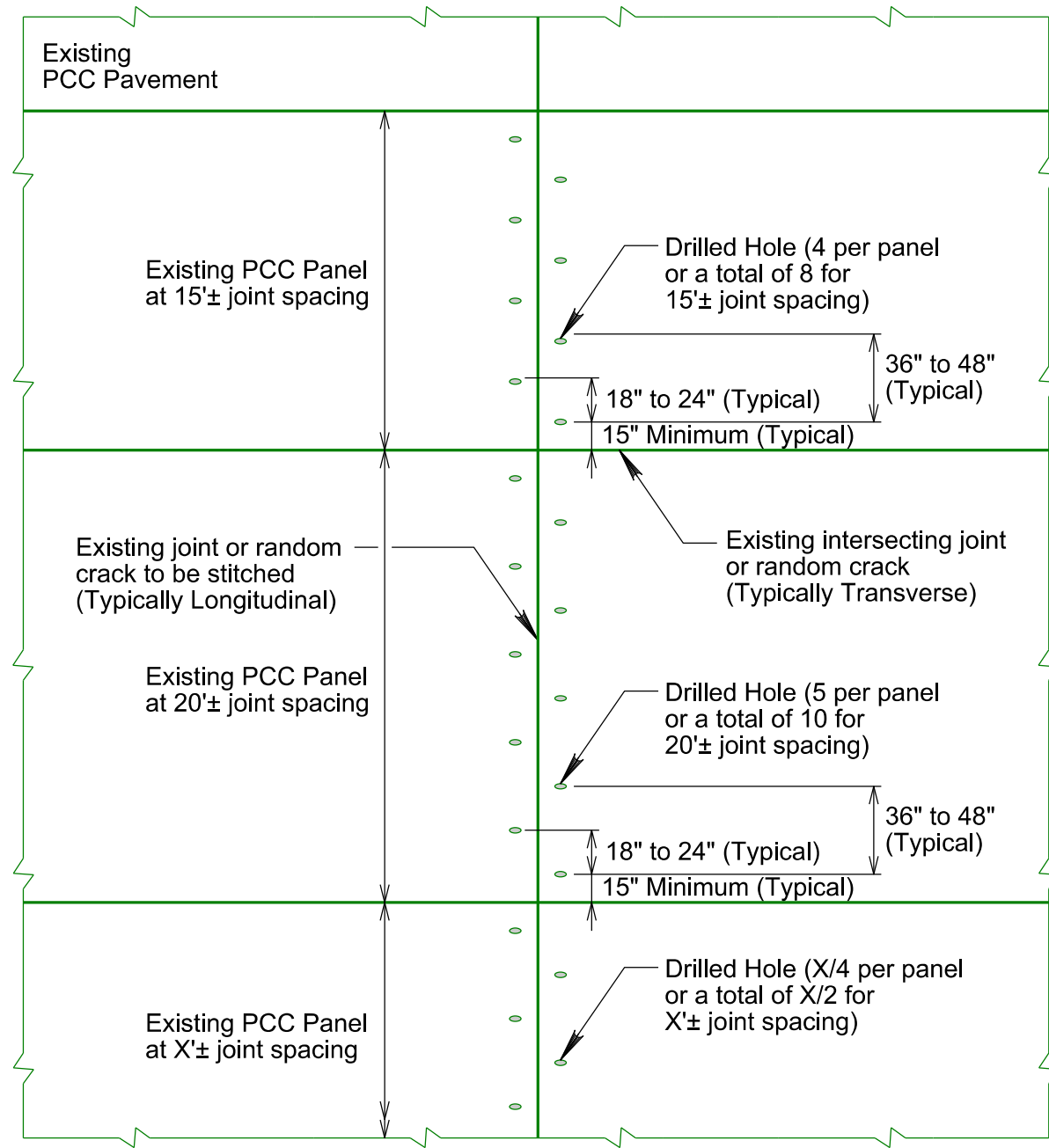
PLOT SCALE - 1:10

PLOTTED FROM - IRSE12133

PLOT NAME - 8

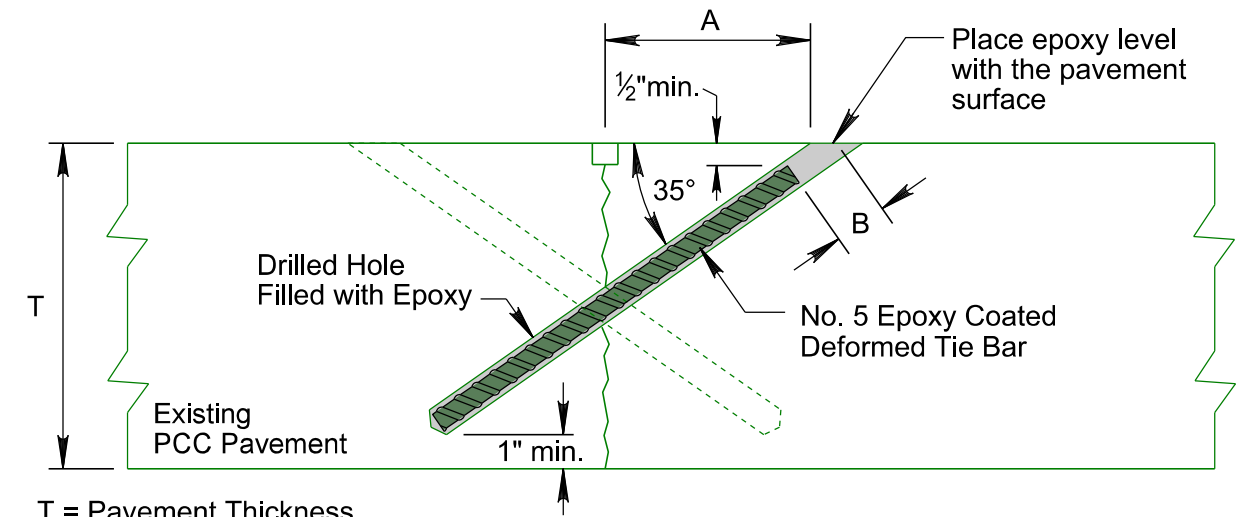
FILE - ... \PCCREPAIR\PARTIAL.DGN

TIE BAR RETROFIT (STITCHING)



PLAN VIEW

TIE BAR RETROFIT (STITCHING)



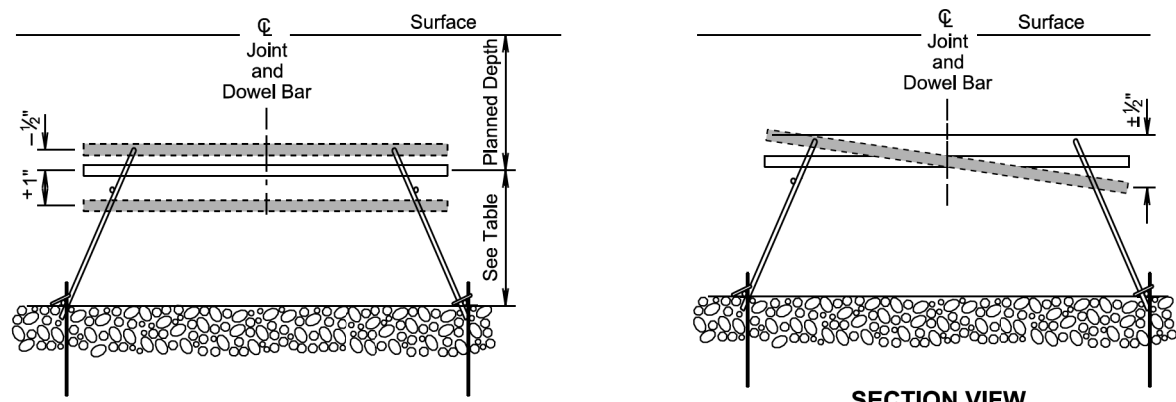
T = Pavement Thickness

ELEVATION VIEW

TABLE OF STITCHING DIMENSIONS			
T	A	B	Length of Tie Bar
8"	5"	1 1/2"±	10"
8 1/2"	5 1/4"	1 3/8"±	11"
9"	5 5/8"	1 1/4"±	12"
9 1/2"	6"	1 5/8"±	12 1/2"
10"	6 3/8"	1 1/2"±	13 1/2"
10 1/2"	6 3/4"	1 3/8"±	14 1/2"
11"	7"	1 1/4"±	15 1/2"
11 1/2"	7 3/8"	1 3/8"±	16"
12"	7 3/4"	1 3/8"±	16 1/2"
12 1/2"	8 1/8"	1 1/4"±	17 1/2"

Stitch Bar Spacing 24" Max.

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

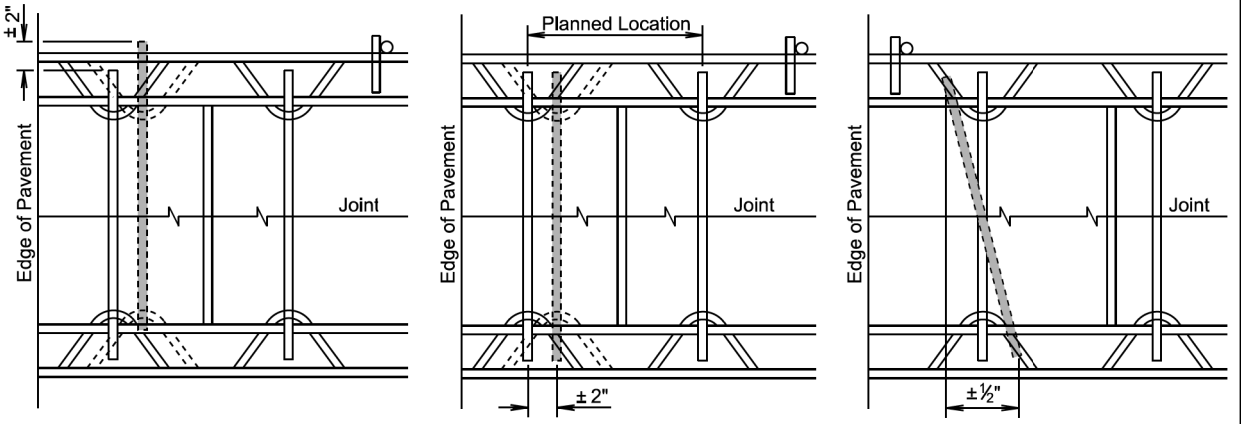


SECTION VIEW VERTICAL TRANSLATION

Depth: mid-depth + 1 inch or - 1/2 inch

SECTION VIEW VERTICAL TILT

Vertical rotational alignment: 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: 1/2 inch over 18 inch

PAVEMENT THICKNESS	EPOXY COATED DOWEL BAR SIZE	HEIGHT TO CENTER
7" to 7 1/2"	1" x 18"	3.0"
8" to 10"	1 1/4" x 18"	4.0"
10 1/2" to 13"	1 1/2" x 18"	5.0"

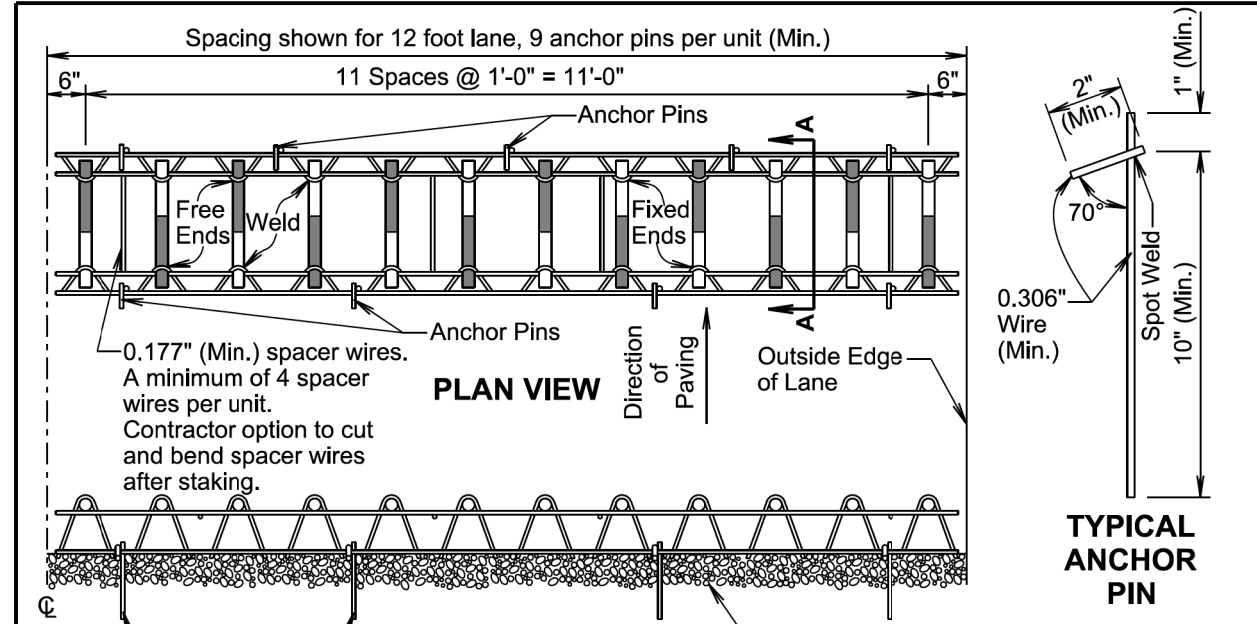
GENERAL NOTE:

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

November 19, 2022

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

Published Date: 2025

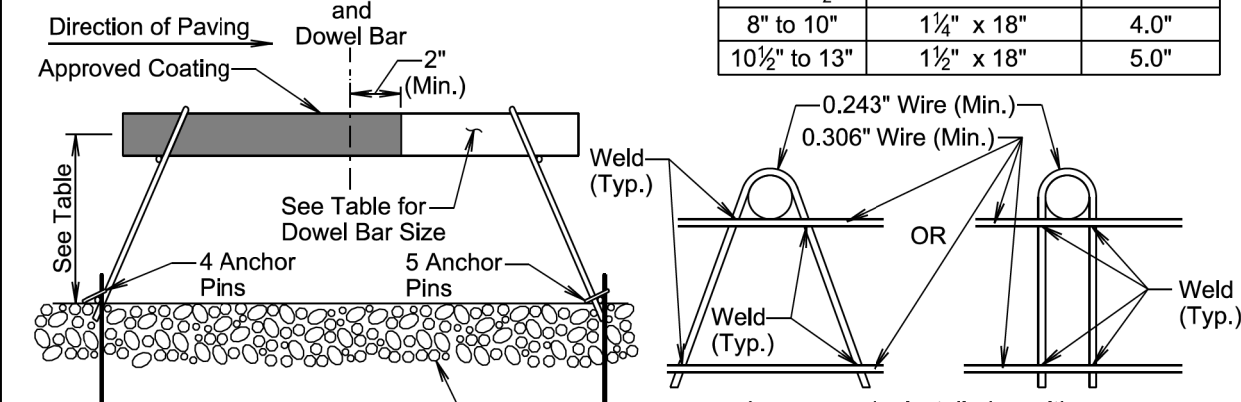


PLAN VIEW

ELEVATION VIEW (One Side Rail)

TYPICAL ANCHOR PIN

PAVEMENT THICKNESS	EPOXY COATED DOWEL BAR SIZE	HEIGHT TO CENTER
7" to 7 1/2"	1" x 18"	3.0"
8" to 10"	1 1/4" x 18"	4.0"
10 1/2" to 13"	1 1/2" x 18"	5.0"



VIEW A-A

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

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

Published Date: 2025

PLOT SCALE - 1:199,992

PLOTTED FROM - IRSE12133

PLOT NAME - 1

FILE - ... \16XU-177W STD PLATES.DGN