


SECTION F: SURFACING PLANS

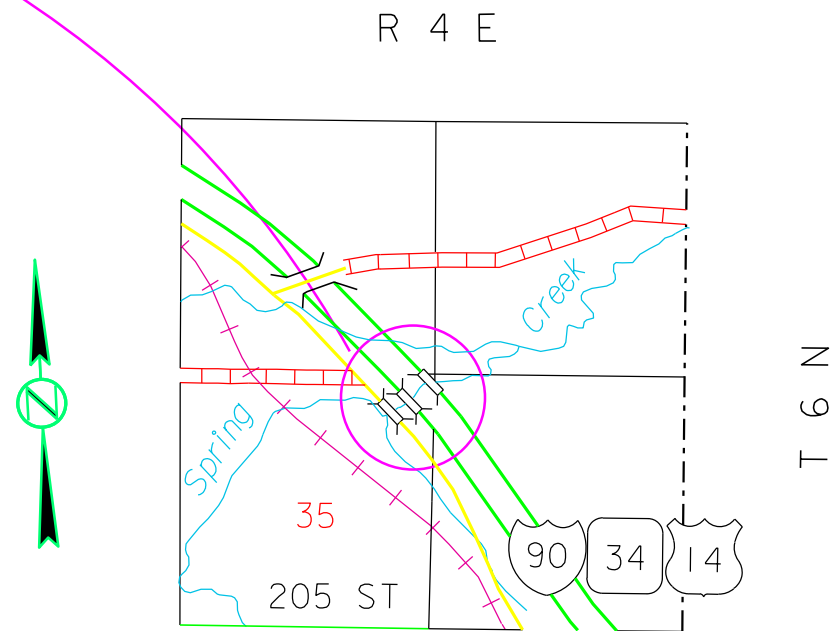
	PROJECT	SECTION	SHEET
	IM 0901(202)26	F	1/29

Plotting Date: 11/4/2024

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PROJECT
I90E & I90W
Str. No. 41-229-112
Str. No. 41-229-111
MRM 26.74



ESTIMATE OF QUANTITIES – SECTION F

Revised 11/4/24 GDS

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
110E0420	Remove Drop Inlet Frame and Grate Assembly	2	Each
110E1010	Remove Asphalt Concrete Pavement	3,985.4	SqYd
110E6410	Remove Type 1 MGS for Reset	1,212.5	Ft
110E6501	Remove Type 1 Retrofit Guardrail Transition for Reset	4	Each
110E6617	Remove MGS Tangent End Terminal for Reset	4	Each
110E7802	Remove Fence for Reset	80	Ft
120E0010	Unclassified Excavation	892	CuYd
230E0100	Remove and Replace Topsoil	Lump Sum	LS
250E0020	Incidental Work, Grading	Lump Sum	LS
260E2010	Gravel Cushion	832.0	Ton
320E1200	Asphalt Concrete Composite	267.4	Ton
380E0800	PCC Shoulder Pavement	3,206.0	SqYd
380E5100	Continuously Reinforced PCC Pavement Repair	231.2	SqYd
380E6000	Dowel Bar	2,400	Each
380E6110	Insert Steel Bar in PCC Pavement	832	Each
410E2600	Membrane Sealant Expansion Joint	159.5	Ft
460E0700	Joint Nosing Material	32	SqFt
480E0504	No. 4 Rebar Splice	20	Each
620E4100	Reset Fence	80	Ft
630E5010	Reset Type 1 MGS	1,212.5	Ft
630E5206	Reset MGS Tangent End Terminal	4	Each
630E5301	Reset Type 1 Retrofit Guardrail Transition	4	Each
633E1220	High Build Waterborne Pavement Marking Paint, 4" White	434	Ft
633E1222	High Build Waterborne Pavement Marking Paint, 4" Yellow	346	Ft
670E0200	Type A Frame and Grate	2	Each
700E0310	Class C Riprap	35.0	Ton
734E0010	Erosion Control	Lump Sum	LS
831E0110	Type B Drainage Fabric	30	SqYd

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.

ASPHALT CONCRETE COMPOSITE

Asphalt for tack SS-1h or CSS-1h will be applied prior to each lift of Asphalt Concrete Composite. Asphalt for tack will be applied at a rate of 0.09 gallons per square yard on existing pavement or milled asphalt concrete surfaces and at a rate of 0.06 gallons per square yard on primed base course or new asphalt concrete pavement. The Asphalt for tack will be applied for the full width of the bottom layer of Asphalt Concrete Composite plus one-half foot additional on the outside shoulder.

A Flush Seal will not be required.

EXISTING PCC PAVEMENT

The existing pavement for I-90 immediately adjacent to the structures is 11" Nonreinforced PCC Pavement with limestone aggregate. Longitudinal joints are reinforced with No. 5x30" deformed tie bars spaced 48" center to center. The transverse joints are spaced at 20' apart. Transverse joints are reinforced with 1" plain round dowel bars and with No. 9 deformed tie bars spaced 12" to 18" center to center.

The existing mainline pavement for I90 EB and WB is 10" Continuously Reinforced PCC Pavement with limestone aggregate. The longitudinal steel is a #6 deformed steel bar spaced 6" center to center. The transverse steel is a #4 deformed steel bar spaced 48" center to center.

UNCLASSIFIED EXCAVATION

Unclassified Excavation is provided for the removal of base material where PCC Pavement will replace Asphalt Concrete Pavement.

The plans quantity will be the basis of payment.

PCC SHOULDER PAVEMENT

PCC Shoulder Pavement will be 9" thickness.

In lieu of an automatic subgrader operating from a preset grade line, a motor grader or other suitable equipment may be used to bring the gravel cushion to final grade prior to placement of the concrete.

Provide a heavy carpet drag finish, a metal-tine finish will be required on the shoulders.

The aggregate may require screening as determined by the Engineer.

The concrete mix used in the PCC Pavement will conform to Section 380.

There will be no direct payment for trimming of the gravel cushion or base course for PCC pavement. The trimming will be considered incidental to the related items required for PCC Pavement. Trimming will be performed as required by Section 380.3 C of the Specifications.

A construction joint will be sawed whenever new concrete pavement is placed adjacent to existing concrete pavement.

The transverse construction joints will be handled in accordance with Standard Plate 380.15.

INCIDENTAL WORK, GRADING

Incidental Work, Grading includes, but is not limited to, the removal and reset of all drop inlet collars to the satisfaction of the Engineer.

CONTINUOUSLY REINFORCED PCC PAVEMENT REPAIR – 11"

In the salvaged rebar sections of the repair areas, the use of 30 or 60 pound hammers will be allowed. To prevent damage to the joint and surrounding reinforcing steel, only light chipping hammers (not exceeding 15 pounds) will be allowed.

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

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

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

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

Place reinforcing steel according to the notes for REINFORCING STEEL (CRCP) and STEEL BAR INSERTION (CRCP).

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

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

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

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

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

Concrete will be cured a minimum of 48 hours before opening to traffic. The 48 hours is based upon a concrete surface temperature of 60°F or higher throughout the cure period. If the concrete temperature falls below 60°F, the cure time will be extended, or other measures taken, at no additional cost to the State. A strength of 3,000 psi must be attained prior to opening to traffic.

Concrete will be cured with white pigmented curing compound (AASHTO M148, Type 2) applied as soon as practical at a rate of 125 square feet per gallon.

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

Cost for performing the aforementioned work including sawing, chipping and removing concrete, sandblasting, cleaning, furnishing and placing concrete and reinforcing steel, finishing and curing, labor and equipment will be included in the contract unit price per square yard for Continuously Reinforced PCC Pavement Repair.

REINFORCING STEEL (CRCP)

Reinforcing steel will conform to Section 1010.

After removal of the in-place concrete and repair of the gravel cushion, new reinforcing steel will be installed. Reinforcing steel will be placed at mid-depth of the slab.

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

5" SAW CUT IN CRC FOR MEMBRANE SEALANT EXPANSION JOINT

A 5" opening saw cut is required in the CRC at membrane sealant expansion joint locations and will be a multi-step process. The Contractor will be required to cut a 2.5" opening across the right lane. As soon as possible and on the same day, the Contractor will be required to adjust traffic control to install a lane closure to provide a 2.5" opening saw cut across the left lane. At that time, the lane closure shall be removed. After the Continuously Reinforced PCC Pavement Repair and at a time approved by the Engineer, the Contractor shall saw cut to provide a 5" opening across the lanes in the same method as described for the original 2.5" cut. The same method will be required to install the Membrane Sealant Expansion Joint. The Membrane Sealant Expansion Joint material shall only be installed once the 5" opening has been made across the full width of the roadway.

The Contractor may be allowed to make the initial saw cut to the full 5", provided it can be demonstrated that the final joint will be a uniform 5", when the membrane is installed. Joints wider or narrower by 0.5", or joints that fluctuate by more than 1" from one end to the other will not be accepted. If the Contractor is not able to produce the 5" joint within tolerance, then the joint will be removed and recreated, which may involve full removal and replacement of the CRC, drilling and installing new bars, saw-cutting, etc., all at the Contractor's expense.

The membrane shall not be installed during, or for three hours after, the daily temperature minimum/maximum.

SAW AND SEAL JOINTS

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

Longitudinal and transverse joints at concrete repair areas and PCC shoulders will be sawed and sealed.

Joint sealing will conform to Section 380.3 P.

Transverse joints in rural sections will be sealed with Hot Poured Elastic Joint Sealer.

Longitudinal joints will be sealed with Hot Poured Elastic Joint Sealer.

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

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

STEEL BAR INSERTION

The Contractor will insert the Steel Bars (No. 5 x 24 inch epoxy coated deformed tie bars and No. 5 x 18 inch epoxy coated deformed tie bars) into drilled holes in the existing concrete pavement. Anchoring of the steel bars in the drilled holes will conform to the Specifications.

The steel bars will be cut to the specified length by sawing or shearing and will be free from burring or other deformations.

The No. 5 x 18 inch epoxy coated deformed tie bars will be inserted vertically as shown on the Continuously Reinforced PCCP Repair and Membrane Sealant Expansion Joint Installation at In Place Pavement Terminal Anchor detail sheets.

The No. 5 x 24 inch epoxy coated deformed tie bars will be inserted on 48-inch centers in the longitudinal joint between the existing PCC pavement and the new PCC shoulder pavement. The bard will be placed a minimum of 15 inches from the existing transverse contraction joint.

REMOVE AND REPLACE TOPSOIL

Prior to beginning operations, a 4" depth of topsoil will be removed or bladed to the edges of the work area. Following completion of construction, topsoil will be spread evenly over the disturbed areas.

All costs associated with removing and replacing the topsoil along areas to be resurfaced will be incidental to the contract lump sum price for Remove and Replace Topsoil.

EROSION CONTROL

All costs for the erosion control work for furnishing, placing, and maintaining erosion control including equipment, labor, seeding and fertilizing will be incidental to the contract lump sum price for "Erosion Control".

The limits of erosion control work will be determined by the Engineer during construction.

Mycorrhizal Inoculum

Mycorrhizal inoculum will consist of mycorrhizal fungi spores and mycorrhizal fungi-infected root fragments in a solid carrier. The carrier may include organic materials, calcinated clay, or other materials consistent with application and good plant growth. The supplier will provide certification of the fungal species claimed and the live propagule count. The inoculum will include a minimum 25% the fungal species *Rhizophagus intraradices*. The remaining 75% may include other endomycorrhizal fungal species.

All seed will be inoculated by the seed supplier with a minimum of 100,000 live propagules of mycorrhizal fungi per acre. All costs of inoculating the seed will be incidental to the contract unit price per pound for the corresponding permanent seed mixture.

The mycorrhizal inoculum will be as shown below or an approved equal:

<u>Product</u>	<u>Manufacturer</u>
MycApply	Mycorrhizal Applications, Inc. Grants Pass, OR Phone: 1-866-476-7800 www.mycorrhizae.com
AM 120 Multi Species Blend	Reforestation Technologies Int. Gilroy, CA Phone: 1-800-784-4769 www.reforest.com

LALRISE Prime and Max WP

Lallemand Specialties Inc.
Milwaukee, WI
Phone: 1-844-590-7781
www.lallemandplantcare.com

Fertilizing

The Contractor will apply an all-natural slow-release fertilizer prior to seeding or placing sod. The all-natural fertilizer will have a minimum guaranteed analysis of 4-4-4 and be USDA Certified BioBased. It should provide a minimum of 4% (N) nitrogen with a minimum water insoluble nitrogen (WIN) fraction of 2.07%, a minimum of 4% (P2O5) available phosphate, a minimum of 4% (K2O) soluble potash, and a maximum carbon to nitrogen ratio (C:N ratio) of 5:1. The all-natural fertilizer will be free of weed-seed and pathogens accomplished through thermophilic composting, and not mechanical or chemical sterilization, to assure presence of beneficial soil microbiology. The fertilizer will have a near neutral pH, a low salt index, a low biological oxygen demand, contain organic humic and fulvic acids, and have high aerobic organism counts. The fertilizer will also be stable, free of bad odors, and be unattractive as a food source for animals. It should also be in a granular form that is easily spread.

The fertilizer will be applied at a rate of 1,500 pounds per acre in accordance with the manufacturer's recommended method of application.

The all-natural slow-release fertilizer will be as shown below or an approved equal:

<u>Product</u>	<u>Manufacturer</u>
Sustane	Sustane Corporate Headquarters Cannon Falls, Minnesota Phone: 1-800-352-9245 www.sustane.com
Perfect Blend	Perfect Blend, LLC Bellevue, WA Phone: 1-866-456-8890 www.perfect-blend.com
Nature Safe	Nature Safe Fertilizers Irving, TX Phone: 1-605-759-5622 www.naturesafe.com

EROSION CONTROL(CONTINUED)

Permanent Seeding

The areas to be seeded consist of all newly graded areas within the project limits except for the top of roadways.

Type F Permanent Seed Mixture will consist of the following:

Grass Species	Variety	Pure Live Seed (PLS) (Pounds/Acre)
Western Wheatgrass	Arriba, Flintlock, Rodan, Rosana, Walsh	7
Green Needlegrass	Lodorm, AC Mallard Ecovar	4
Sideoats Grama	Butte, Pierre	3
Blue Grama	Bad River	2
Oats or Spring Wheat: April through May; Winter Wheat: August through November		10
Total:		26

Fiber Mulching

Fiber mulch will be applied in a separate operation following permanent seeding.

An additional 2% by weight of tackifier will be added to the fiber mulch product selected from the approved product list. If the product selected has guar gum tackifier included, then the additional 2% of tackifier will be guar gum. If the product selected has synthetic tackifier included, then the additional 2% of tackifier will be synthetic.

The Contractor will allow the fiber mulch to cure a minimum of 18 hours prior to watering or any storm event to ensure proper cohesion between the soil and fiber particles.

All costs for the additional tackifier added to the fiber mulch including labor, equipment, and materials will be incidental to the contract lump sum price for "Erosion Control".

The fiber mulch provided will be from the approved product list. The approved product list for fiber mulch may be viewed at the following internet site:

Table of Surfacing Quantities

Structure No.	MRM	Direction	Remove Asphalt Concrete Pavement	Remove Drop Inlet Frame and Grate Assembly	Remove and Reset Drop Inlet Collar (Incidental Work)	Type A Frame and Grate	Unclassified Excavation	Gravel Cushion	Joint Nosing Material	#5x18" Deformed Bars	#5x24" Deformed Bars	Insert Steel Bar in PCC Pavement	Dowel Bars	No. 4 Rebar Splice	PCC Shoulder Pavement	Continuously Reinforced PCC Pavement Repair	Asphalt Concrete Composite	Membrane Sealant Expansion Joint
			SqYd	Each	LS	Each	CuYd	Ton	SqFt	Each	Each	Each	Each	Each	SqYd	SqYd	Ton	Ft
41-229-111	26.74	WB	1992.7	1	1	1	446	416	16	16	400	416	1200	10	1603	115.6	133.7	79.75
41-229-112	26.74	EB	1992.7	1	1	1	446	416	16	16	400	416	1200	10	1603	115.6	133.7	79.75
		Total	3985.4	2		2	892	832	32	32	800	832	2400	20	3206	231.2	267.4	159.5

Table of Guardrail Quantities

MRM	Structure Number	Direction	Remove Type 1 Retrofit Guardrail Transition for Reset	Remove Type 1 MGS for Reset	Remove MGS Tangent End Terminal for Reset	Reset Type 1 Retrofit Guardrail Transition	Reset Type 1 MGS	Reset MGS Tangent End Terminal
			(Each)	(Ft)	(Each)	(Each)	(Ft)	(Each)
26.74	41-229-111	WB	2	625	2	2	625	2
26.74	41-229-112	EB	2	587.5	2	2	587.5	2
		Total	4	1212.5	4	4	1212.5	4

HIGH BUILD WATERBORNE PAVEMENT MARKING PAINT

All materials will be applied as per manufacturer's recommendations. High build waterborne pavement marking paint will conform to the supplemental specifications for Section 980.1 B.

Reflective media will consist of glass beads. Reflective media will require a Certificate of Compliance for Certification for each source and lot. Acceptance sampling will not be required.

RATES OF MATERIALS FOR HIGH BUILD WATERBORNE PAVEMENT MARKING PAINT

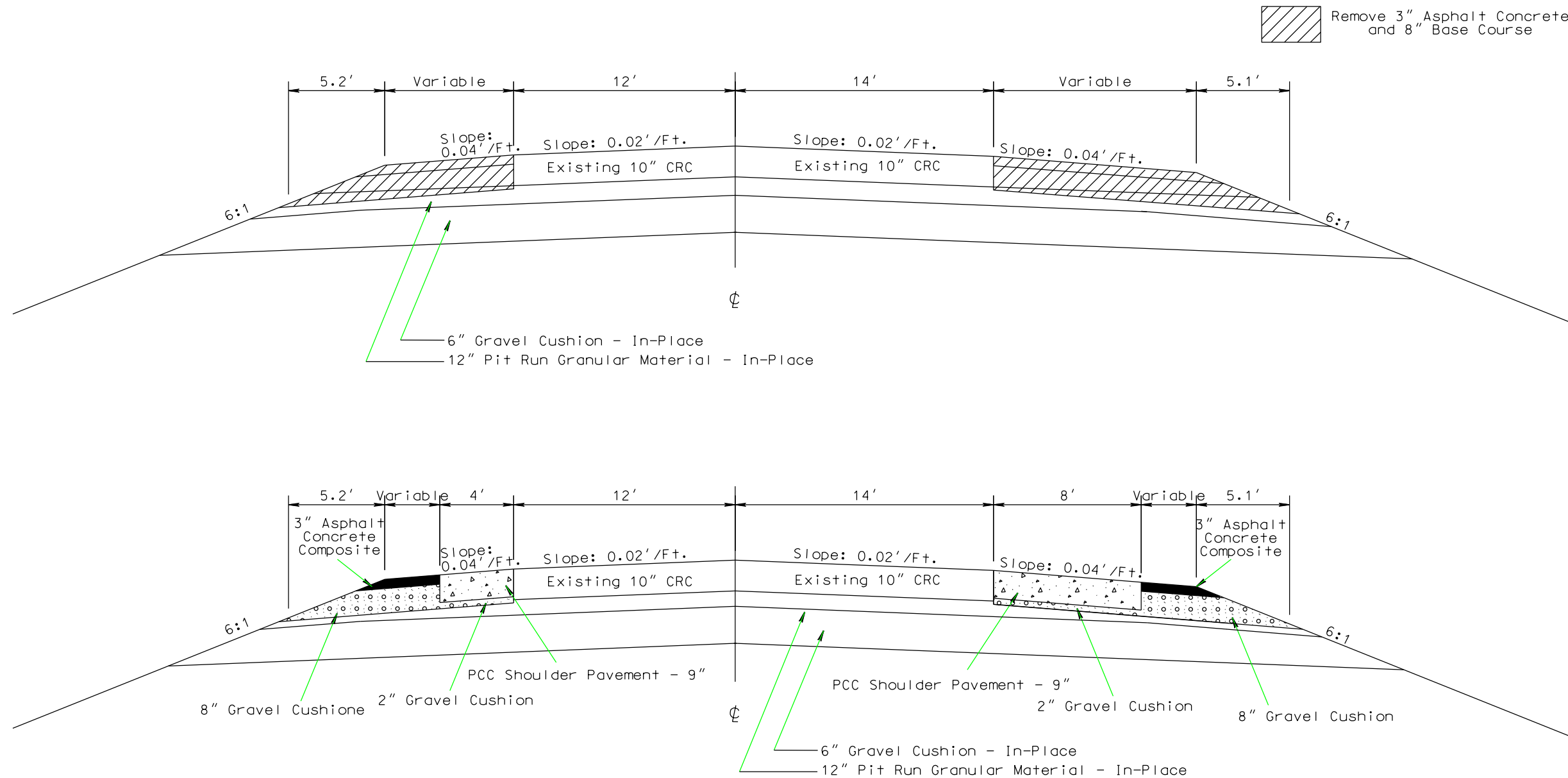
Solid 4" line = 22.5 Gals/Mile
 Dashed 4" line = 6.2 Gal/Mile
 Glass Beads = 8 Lbs/Gal.

All cost for materials, labor, and equipment necessary to furnish and install the pavement markings will be incidental to the contract unit price for the respective High Build Waterborne Pavement Marking Paint items.

Table of Pavement Marking

Structure No.	MRM	Direction	High Build Waterborne Pavement Marking Paint, 4" White	High Build Waterborne Pavement Marking Paint, 4" Yellow
			Ft	Ft
41-229-111	26.74	WB	217	173
41-229-112	26.74	EB	217	173
		Total	434	346

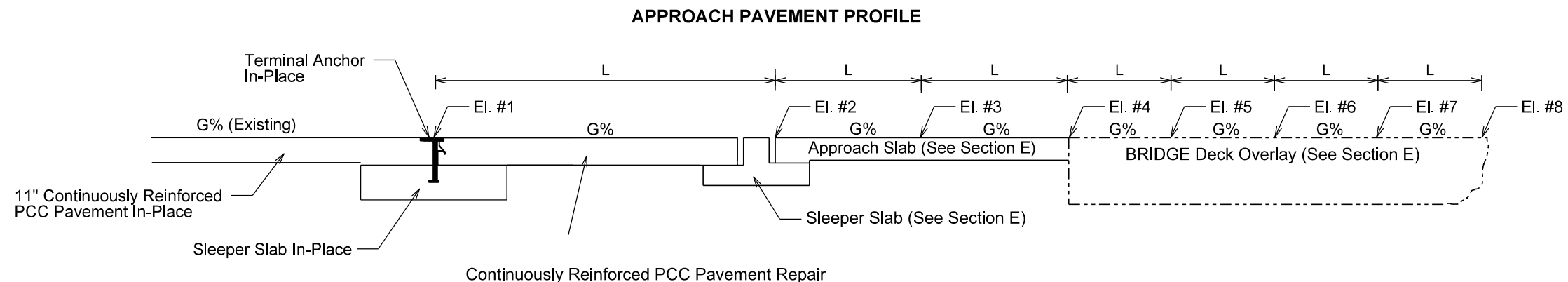
TYPICAL SECTION I-90 - MRM 24.74



See "Table of Approach Pavement Elevations" for these values

El. # = Elevation Point Number
 L = Length between Elevation Points
 G% = % Grade between Elevation Points

Note: Adjust Elevations as needed to meet 0.2% grade change. 0.4% grade change allowed near Terminal Anchor.



Begin Bridge Str. 41-229-111				
Point #	L (Ft.)	Elevation	%G	%G Change
		Existing Grade	0.0%	-0.2%
1	22.25	7.63	0.2%	-0.2%
2	10	7.67	0.4%	0.1%
3	10	7.71	0.3%	-0.1%
4	7.25	7.74	0.4%	0.1%
5	7.25	7.77	0.3%	-0.1%
6	7.25	7.79	0.4%	0.0%
7	7.25	7.82	0.4%	
8	7.25	7.85		
Add 3500 to all elevations				

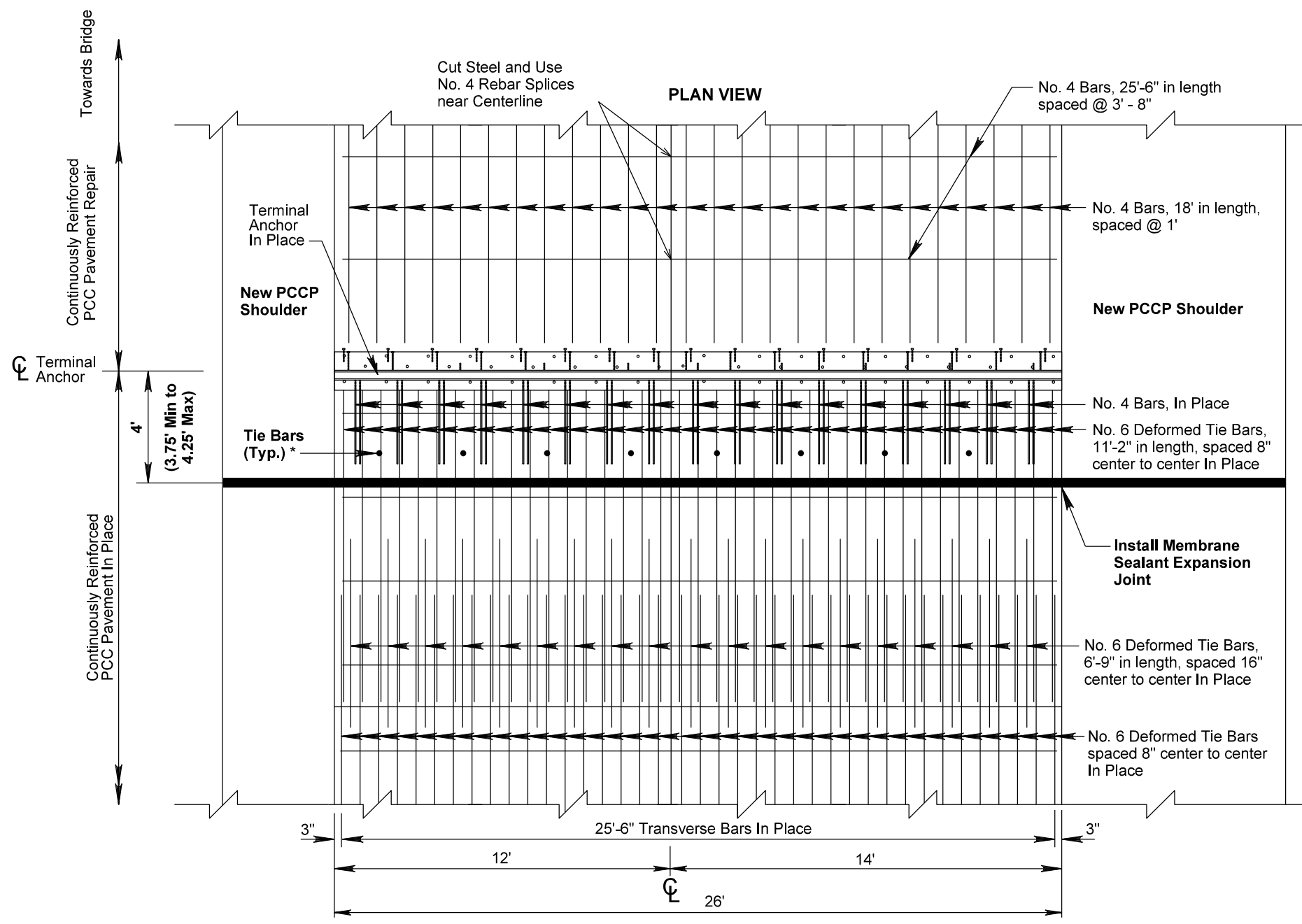
End Bridge Str. 41-229-111				
Point #	L (Ft.)	Elevation	%G	%G Change
		Existing Grade	-1.3%	-0.4%
1	22.25	8.36	-0.9%	-0.4%
2	10	8.16	-0.5%	-0.4%
3	10	8.11	-0.1%	0.2%
4	7.25	8.1	-0.3%	0.1%
5	7.25	8.08	-0.4%	0.0%
6	7.25	8.05	-0.4%	0.0%
7	7.25	8.02	-0.4%	
8	7.25	7.99		
Add 3500 to all elevations				

Begin Bridge Str. 41-229-112				
Point #	L (Ft.)	Elevation	%G	%G Change
		Existing Grade	0.1%	-0.4%
1	22.25	10.98	0.5%	-0.4%
2	10	11.09	0.9%	-0.1%
3	10	11.18	1.0%	0.2%
4	7.25	11.28	0.8%	0.0%
5	7.25	11.34	0.8%	0.1%
6	7.25	11.4	0.7%	0.0%
7	7.25	11.45	0.7%	
8	7.25	11.5		
Add 3500 to all elevations				

End Bridge Str. 41-229-112				
Point #	L (Ft.)	Elevation	%G	%G Change
		Existing Grade	-0.6%	-0.2%
1	22.25	12.05	-0.4%	0.0%
2	10	11.96	-0.4%	0.0%
3	10	11.92	-0.4%	0.2%
4	7.25	11.88	-0.6%	0.1%
5	7.25	11.84	-0.7%	-0.1%
6	7.25	11.79	-0.6%	0.0%
7	7.25	11.75	-0.6%	
8	7.25	11.71		
Add 3500 to all elevations				

CONTINUOUSLY REINFORCED PCCP REPAIR AND MEMBRANE SEALANT EXPANSION JOINT INSTALLATION AT IN PLACE PAVEMENT TERMINAL ANCHOR

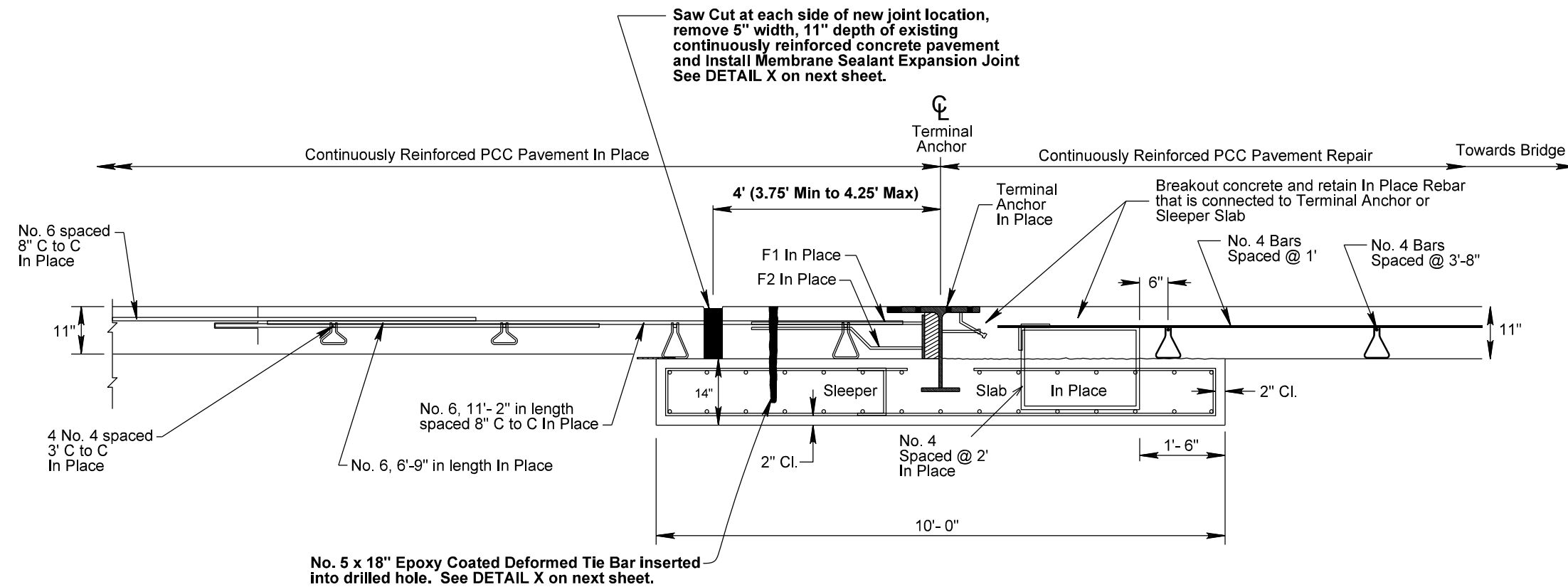
SHEET 1 OF 3



CONTINUOUSLY REINFORCED PCCP REPAIR AND MEMBRANE SEALANT EXPANSION JOINT INSTALLATION AT IN PLACE PAVEMENT TERMINAL ANCHOR

SHEET 2 OF 3

PROFILE VIEW

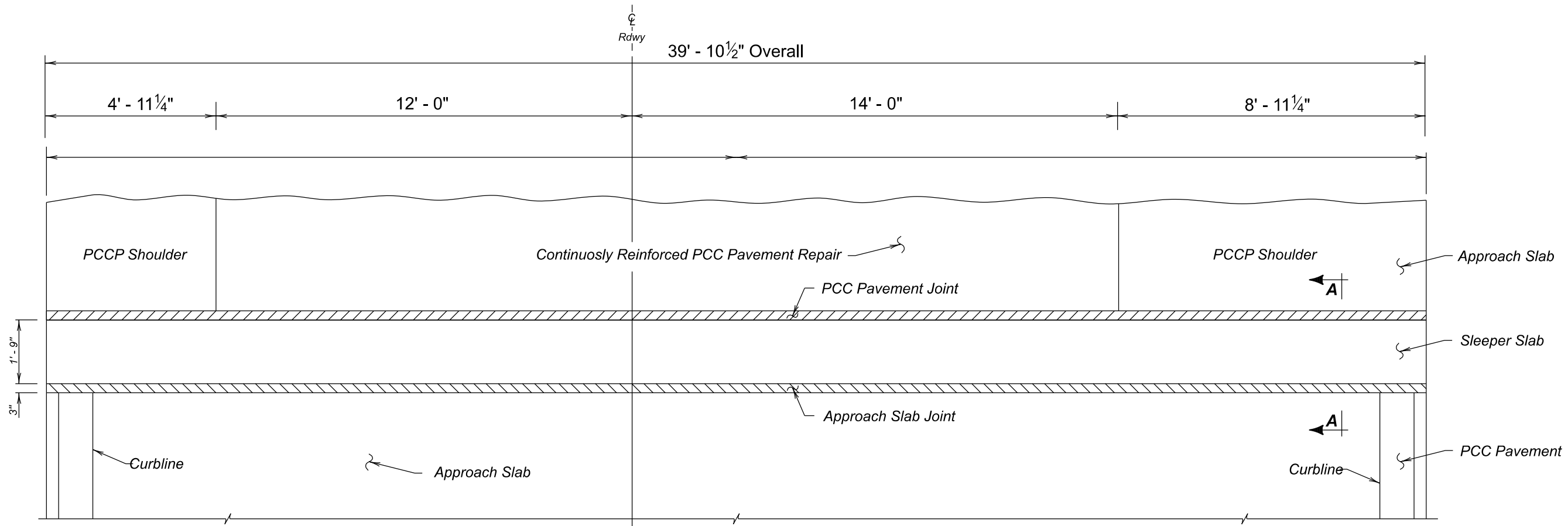


Cost for sawing, removing concrete, and installing the new joint including material, equipment and labor will be incidental to the contract unit price per foot for Membrane Sealant Expansion Joint.

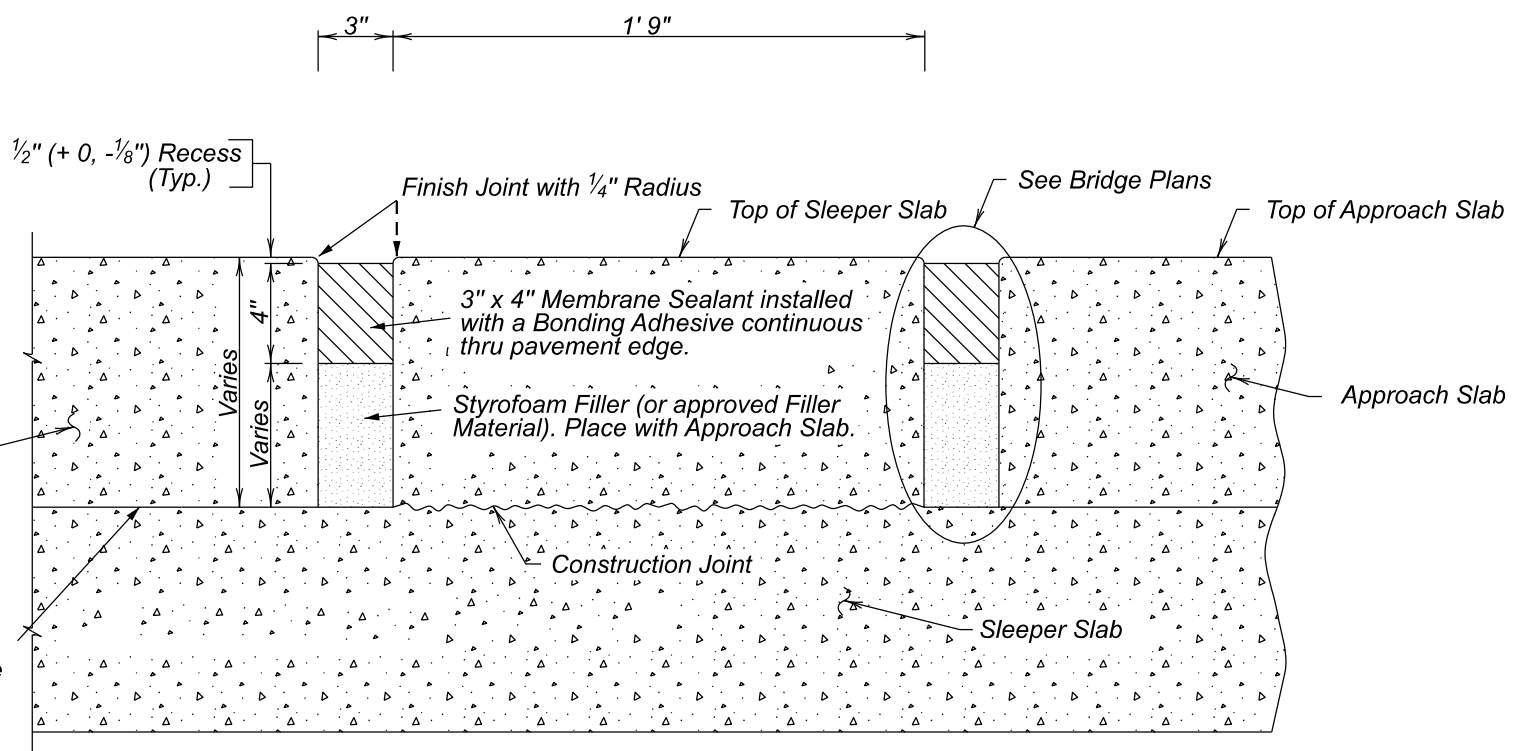
MEMBRANE SEALANT EXPANSION JOINT INSTALLATION AT BRIDGE SLEEPER SLAB

SD DOT	PROJECT	SECTION	SHEET
	IM 0901(202)26	F	11/29

Plotting Date: 10/16/2024



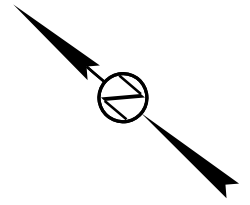
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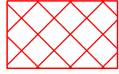
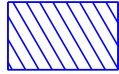


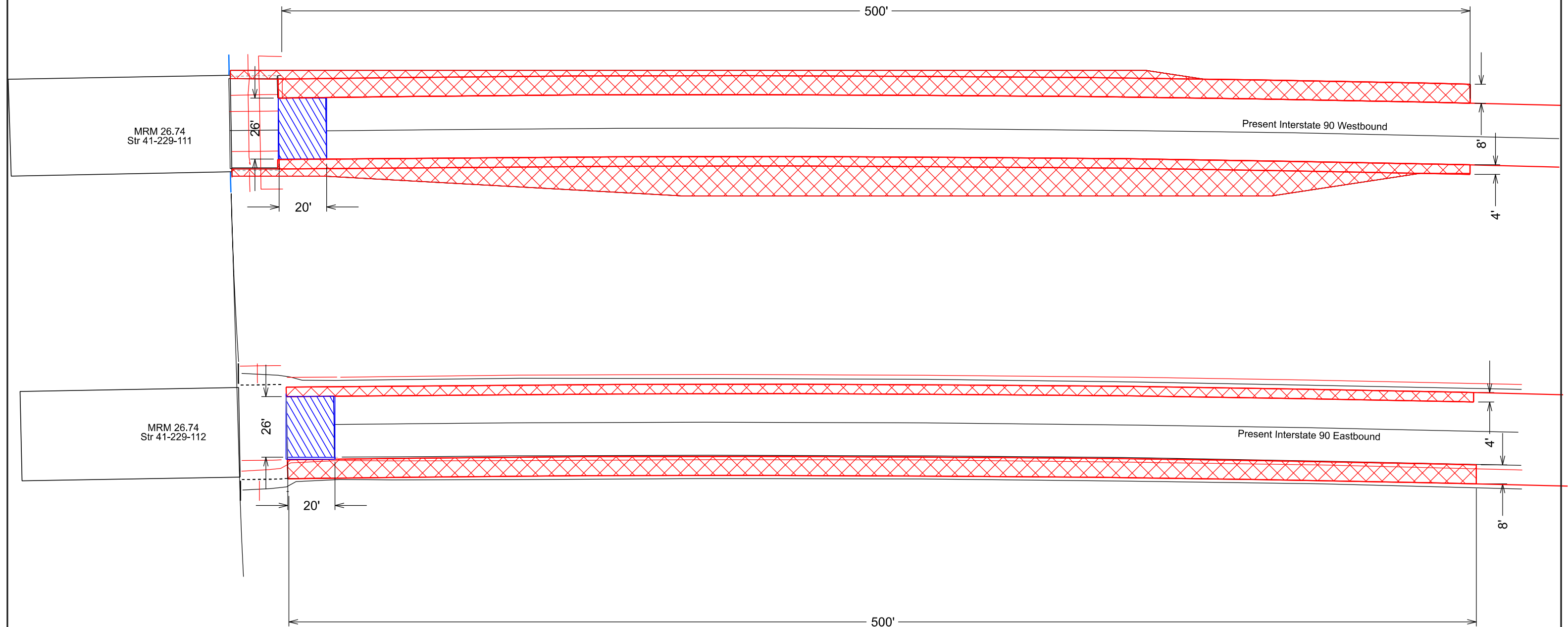
SEC. A - A

This portion of the sleeper slab directly under the PCC Pavement will be smooth. Coat with asphalt paint or place 6 mil polyethylene sheeting to prevent bonding of concrete.


MRM 26.74 Str 41-229-111 & Str 41-229-112 Shoulder Strengthening Asphalt Concrete and Base Material Removal



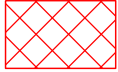
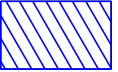
-  Remove 3" Asphalt Concrete and 8" Base Course
-  Continuously Reinforced PCC Pavement Repair

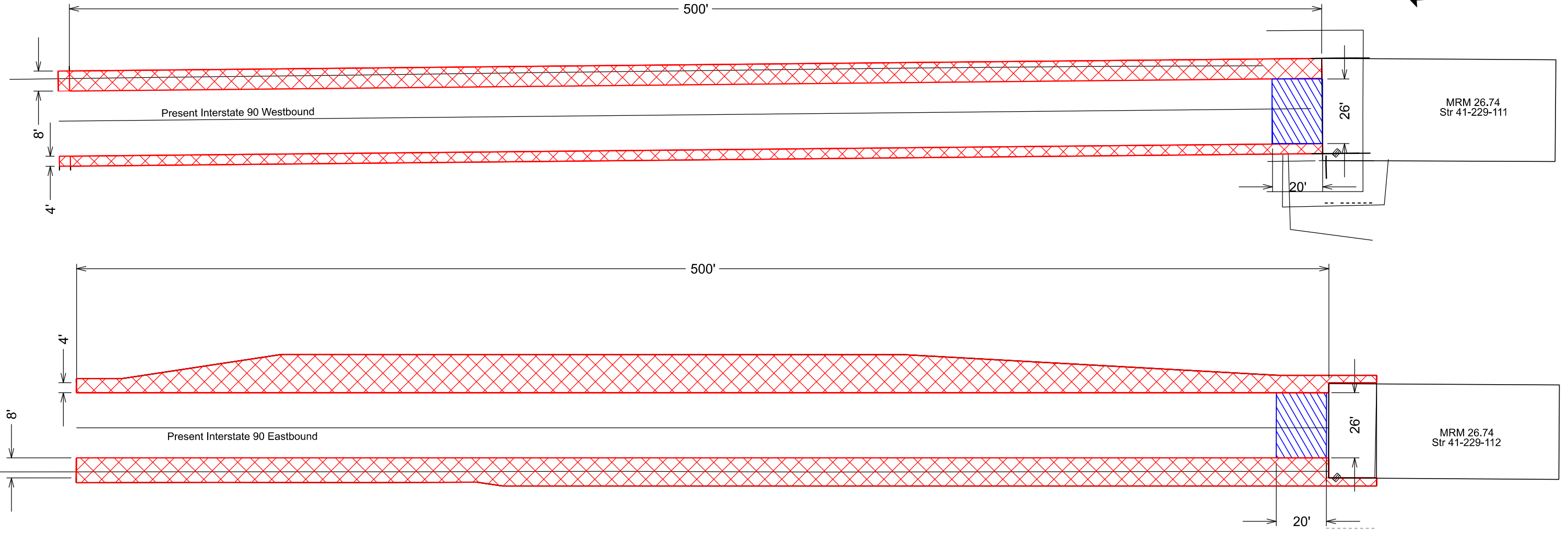
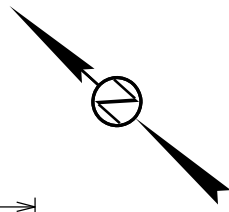


MRM 26.74
 Str 41-229-111 & Str 41-229-112
 Shoulder Strengthening
 Asphalt Concrete and Base Material Removal

	PROJECT	SECTION	SHEET
	IM 0901(202)26	F	13/29

Plotting Date: 10/16/2024

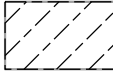




-  Remove 3" Asphalt Concrete and 8" Base Course
-  Continuously Reinforced PCC Pavement Repair

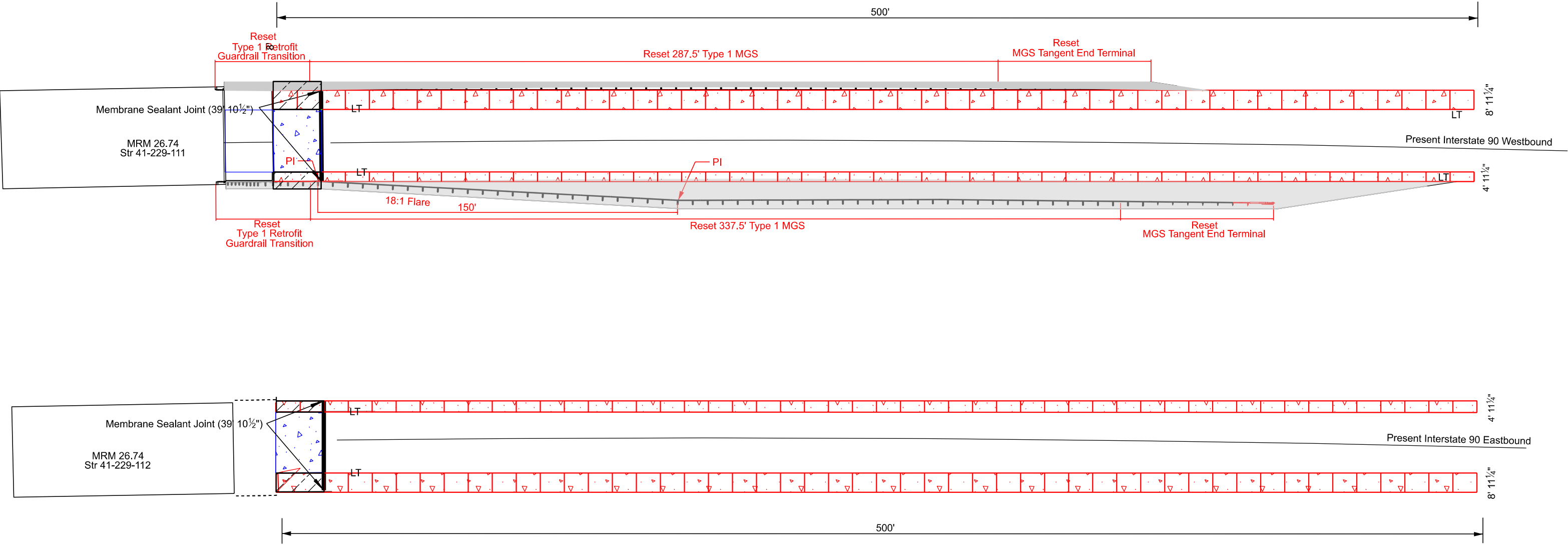
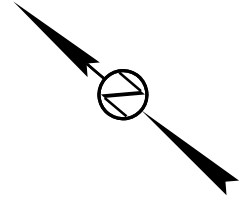


GUARDRAIL AND PAVEMENT LAYOUTS

MRM 26.74

Str 41-229-111 & Str 41-229-112

-  Directly adjacent to the structure, PCC Pavement will have to be removed and place once and Asphalt Concrete Composite will have to be removed and placed twice during the project to allow for traffic control and approach slab construction. Quantities for this work are included in the respective contract items.
-  Longitudinal Construction Joint With Tie Bars (No. 5 x 24" epoxy coated deformed tie bars. Drilled In - spaced 30" center to center)
-  Place 3" Asphalt Concrete Composite.
-  Place PCC Shoulder Pavement and 2" Granular Material with 10' Transverse Joint Spacing with Dowel Bars.
-  Continuously Reinforced PCC Pavement Repair 20' Long by 26' Wide.



GUARDRAIL AND PAVEMENT LAYOUTS

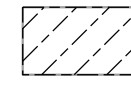
MRM 26.74

Str 41-229-111 & Str 41-229-112



PROJECT	SECTION	SHEET
IM 0901(202)26	F	15/29

Plotting Date: 10/16/2024



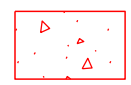
Directly adjacent to the structure, PCC Pavement will have to be removed and place once and Asphalt Concrete Composite will have to be removed and placed twice during the project to allow for traffic control and approach slab construction. Quantities for this work are included in the respective contract items.



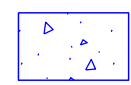
Longitudinal Construction Joint With Tie Bars
(No. 5 x 24" epoxy coated deformed tie bars.
Drilled In - spaced 30" center to center).



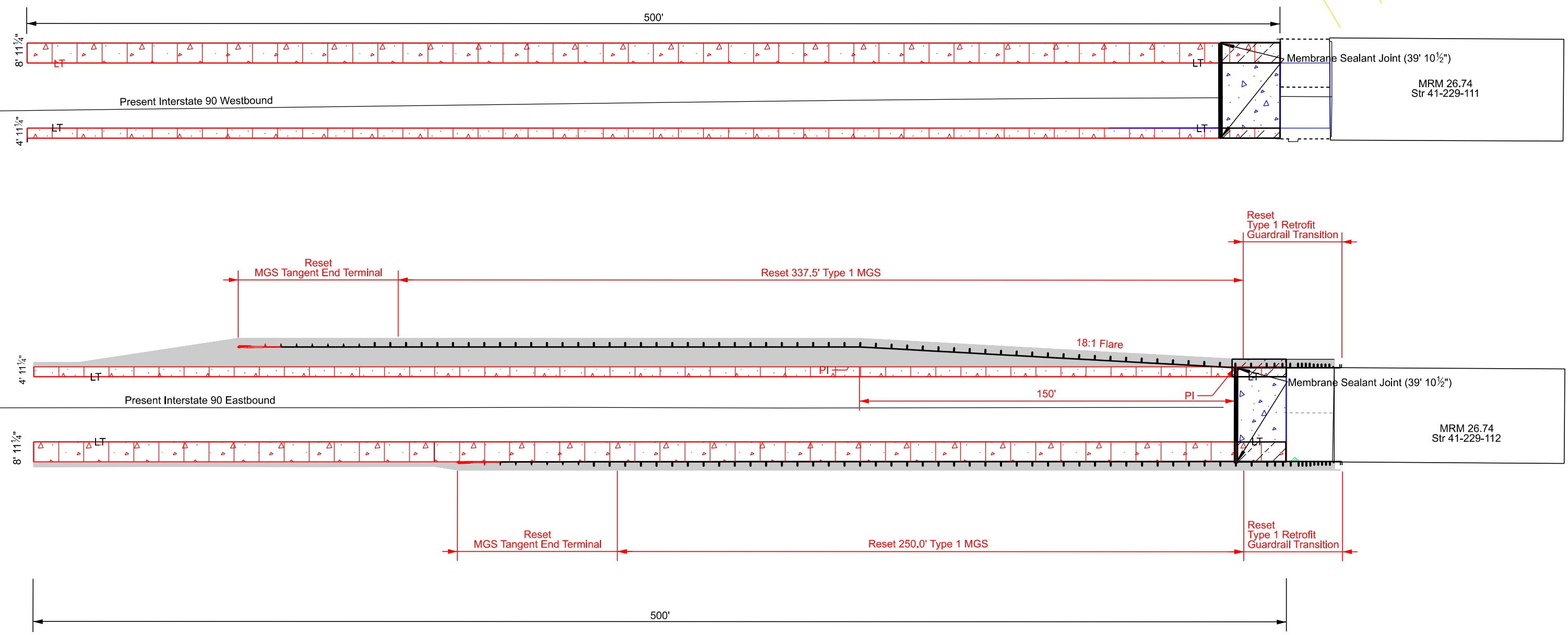
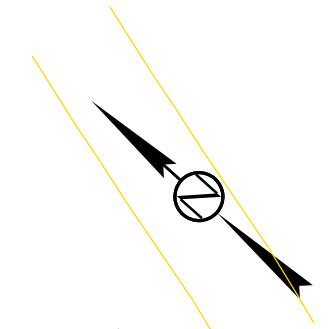
Place 3" Asphalt Concrete Composite.



Place PCC Shoulder Pavement and 2" Granular Material with 10' Transverse Joint Spacing with Dowel Bars.

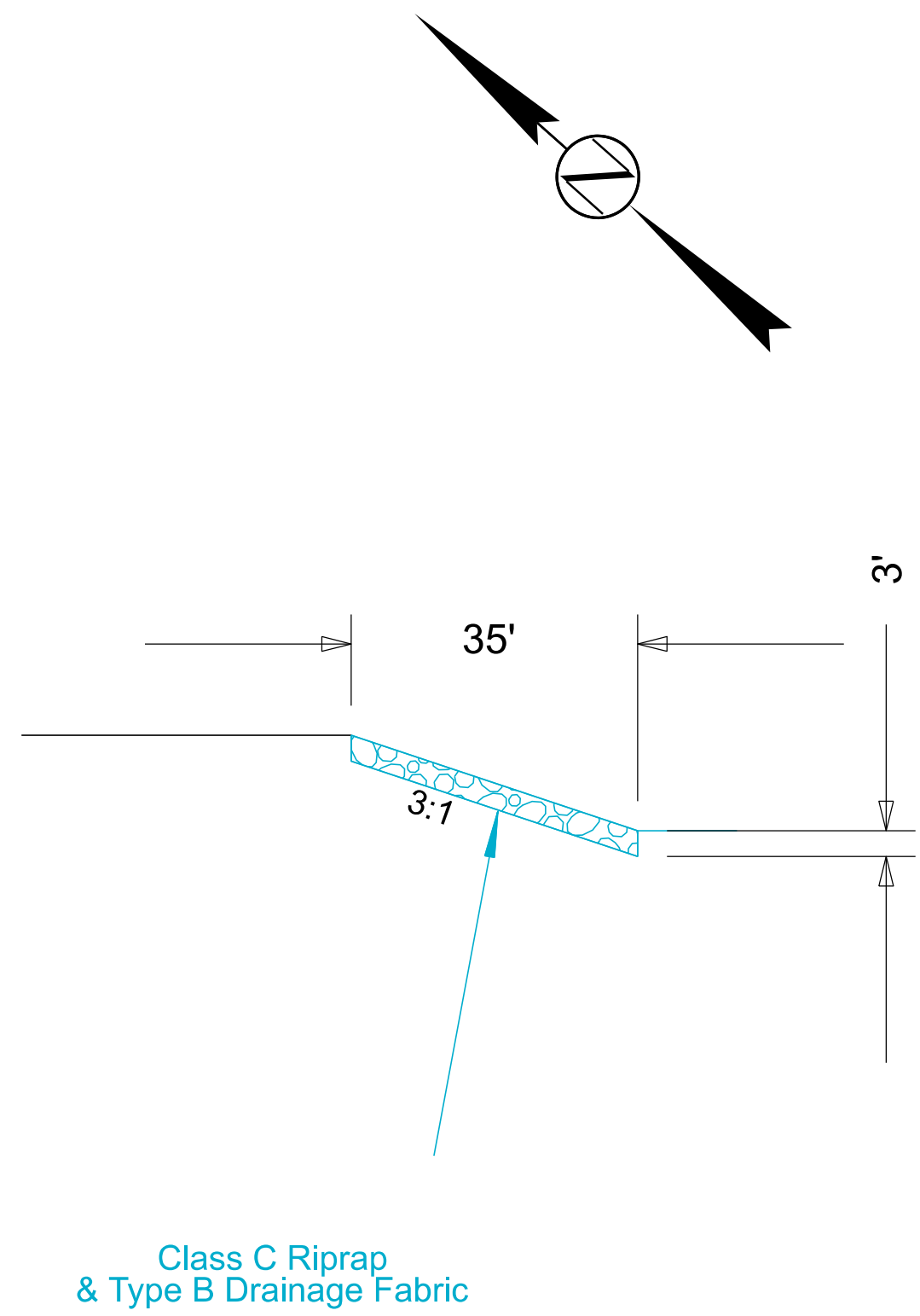
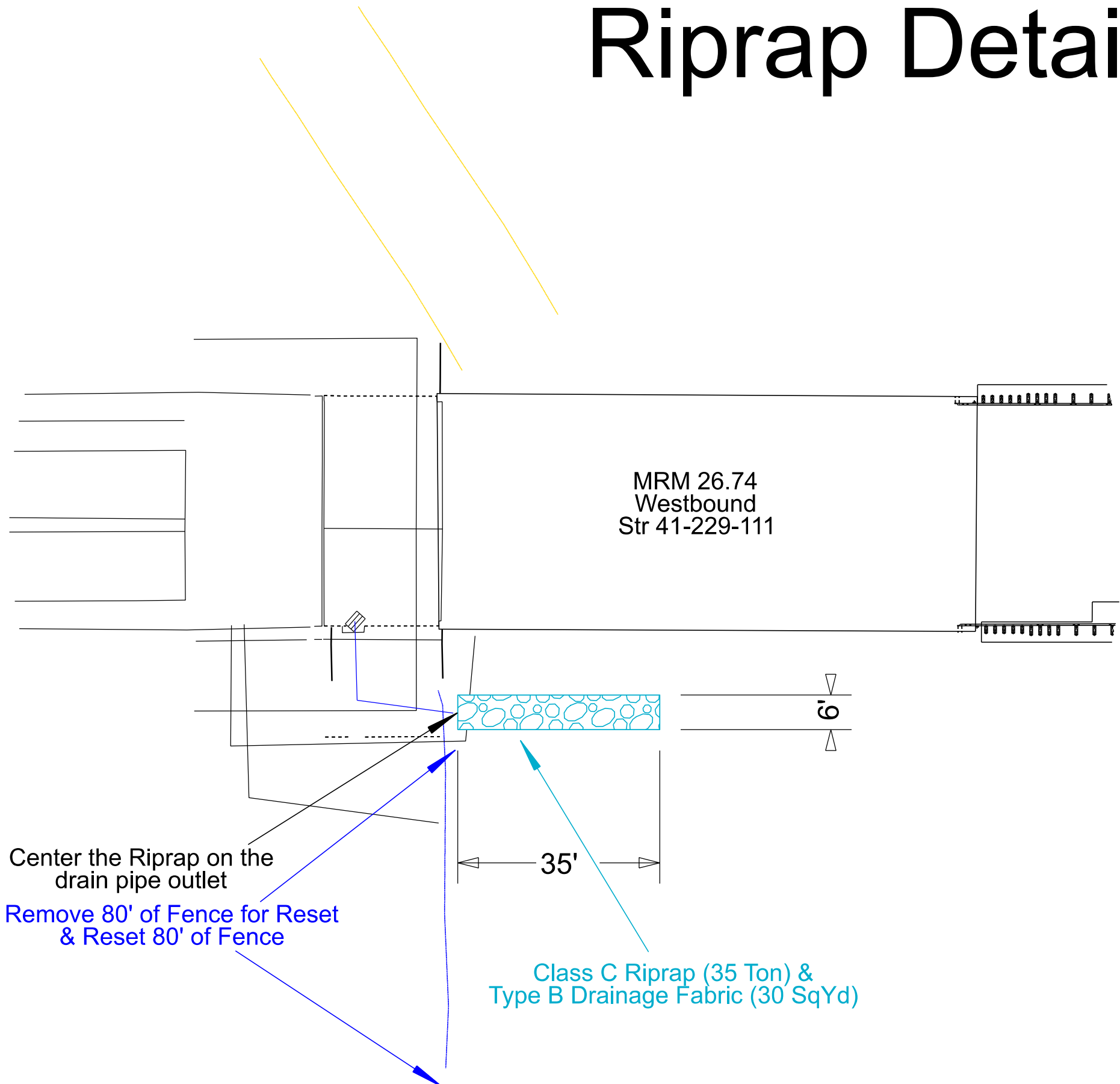


Continuously Reinforced PCC Pavement Repair
20' Long by 26' Wide.




Riprap Details

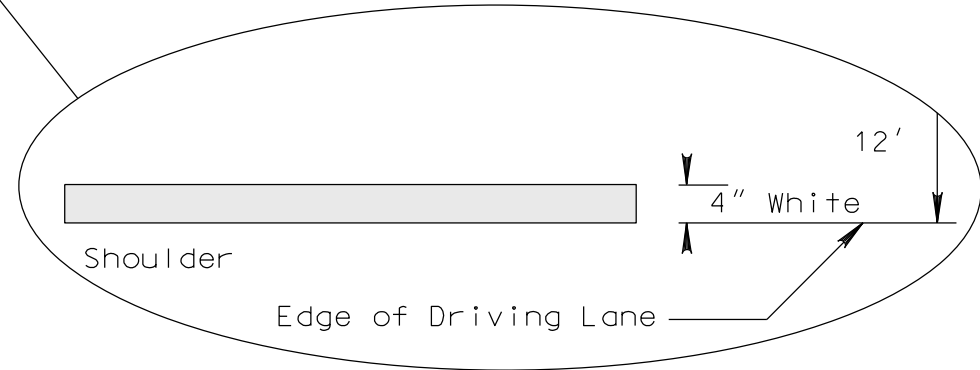
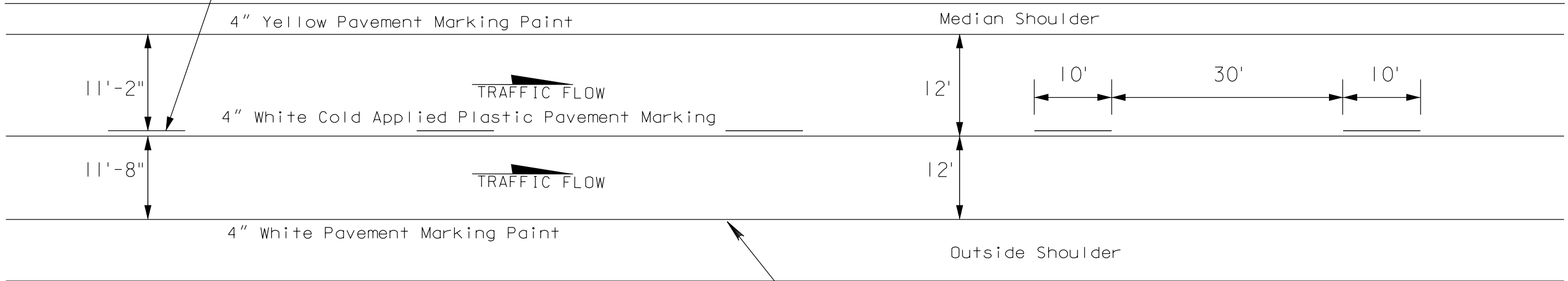
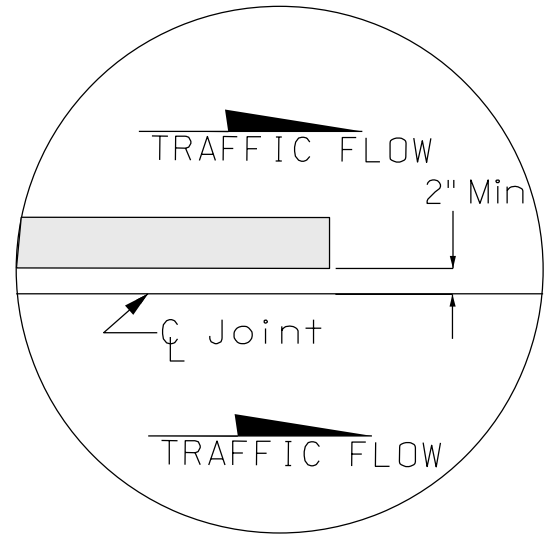
SD DOT	PROJECT	SECTION	SHEET
	IM 0901(202)26	F	16/29
Plotting Date: 10/16/2024			

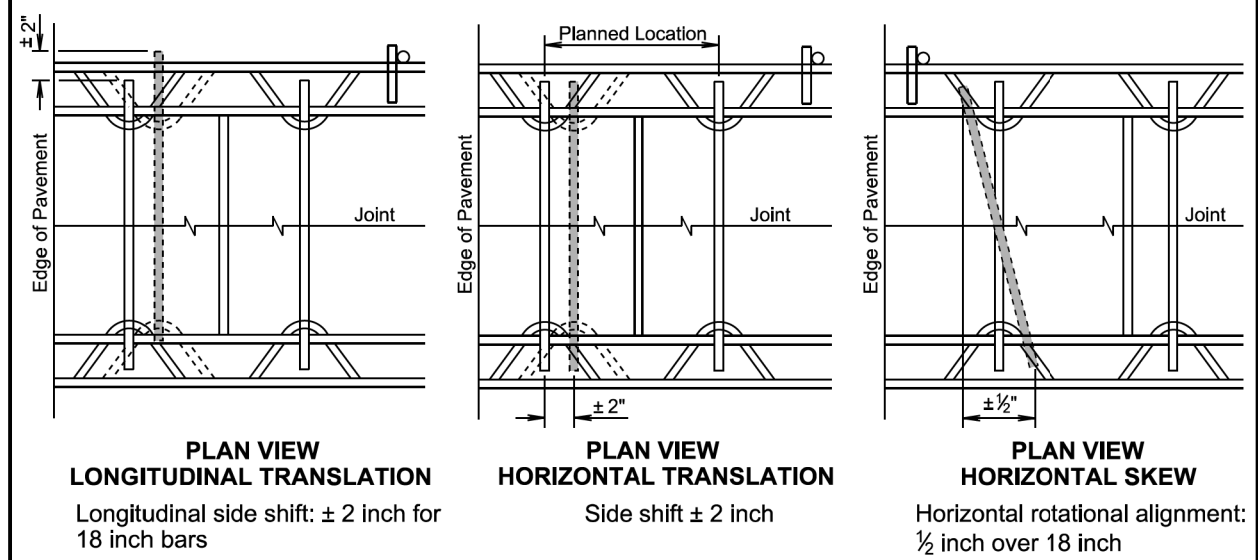
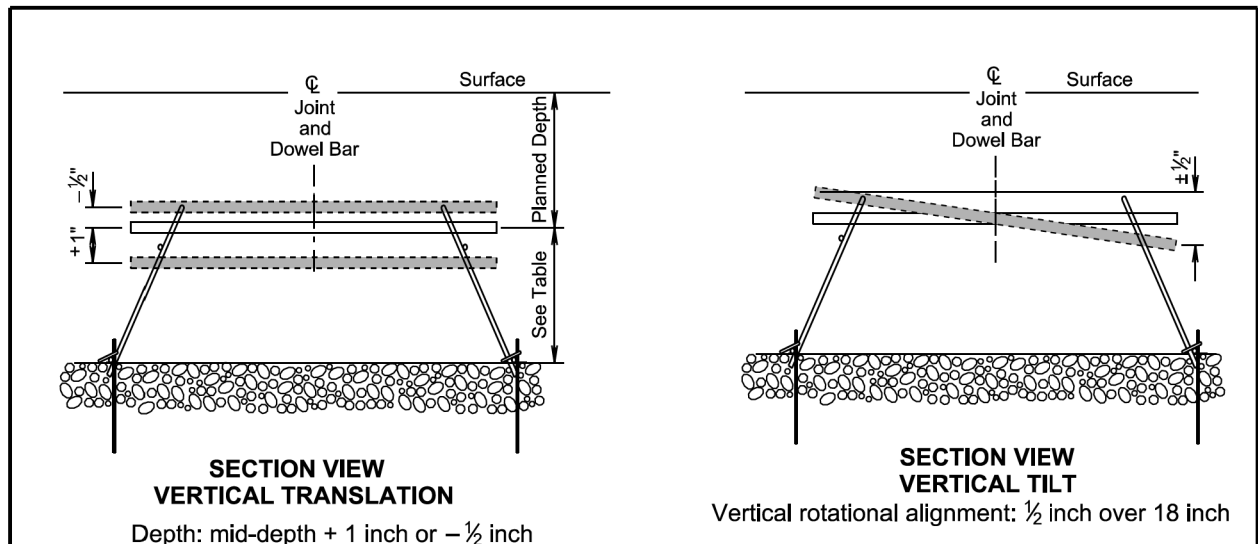


TYPICAL PAVEMENT MARKING LAYOUT

4 LANE DIVIDED HIGHWAY (4" Marking)

	PROJECT	SECTION	SHEET
	IM 0901(202)26	F	17/29
Plotting Date: 10/16/2024			





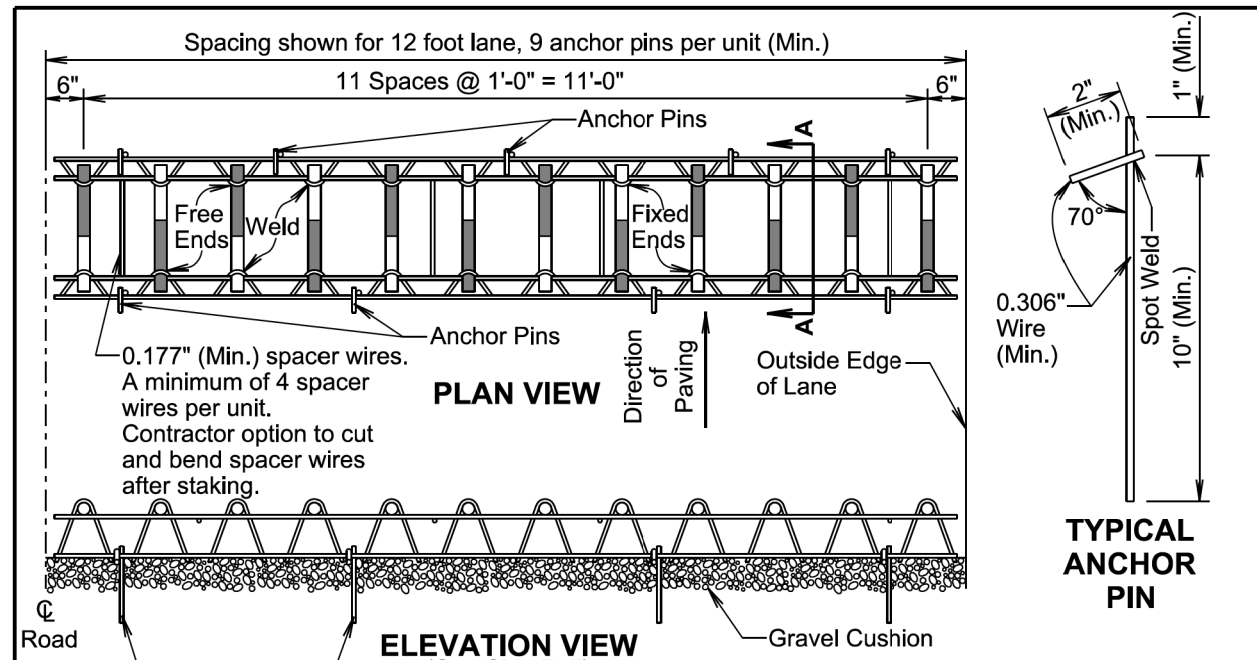
PAVEMENT THICKNESS	EPOXY COATED DOWEL BAR SIZE	HEIGHT TO CENTER
7" to 7 1/2"	1" x 18"	3.0"
8" to 10"	1 1/4" x 18"	4.0"
10 1/2" to 13"	1 1/2" x 18"	5.0"

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

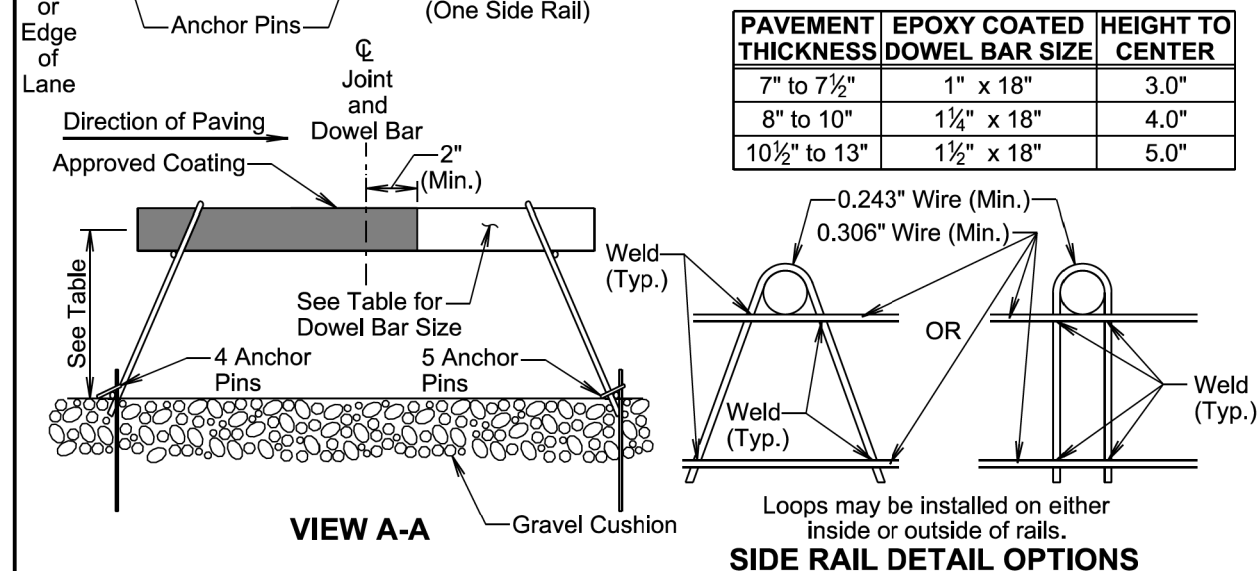
November 19, 2022

	PCC PAVEMENT DOWEL BAR ALIGNMENT TOLERANCES	PLATE NUMBER 380.01
		Sheet 1 of 1

Published Date: 2025



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 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.

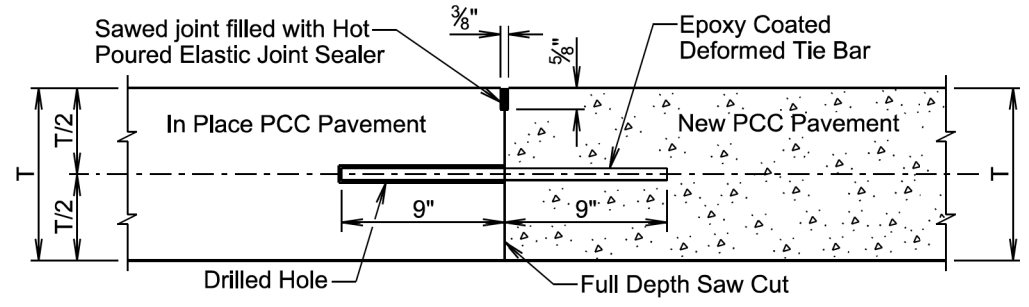
All dowel bar alignment tolerances will be as shown in the PCC Pavement Dowel Bar Alignment Tolerances standard plate.

November 19, 2022

	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

DETAIL A TRANSVERSE CONSTRUCTION JOINT WITH TIE BARS



T = In Place PCC Pavement and New PCC Pavement Thickness

GENERAL NOTES:

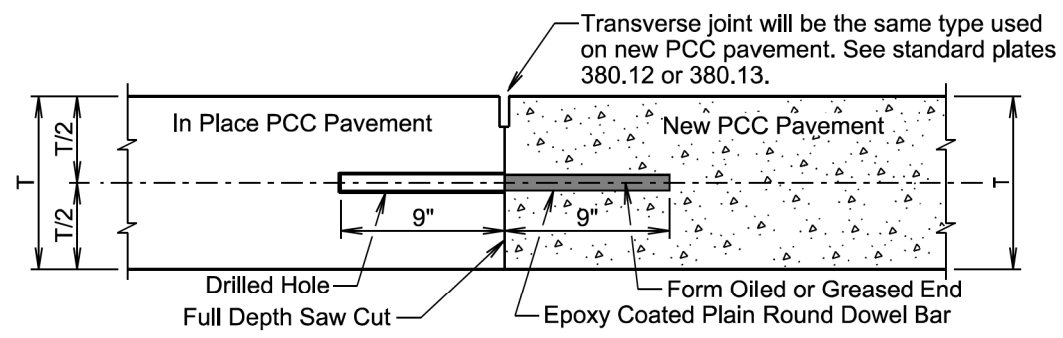
The term "In Place PCC Pavement" in the above drawing indicates that the in place PCC pavement was placed on a previous project.

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

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

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

DETAIL B TRANSVERSE CONSTRUCTION JOINT WITH DOWEL BARS



T = In Place PCC Pavement and New PCC Pavement Thickness

GENERAL NOTES:

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

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

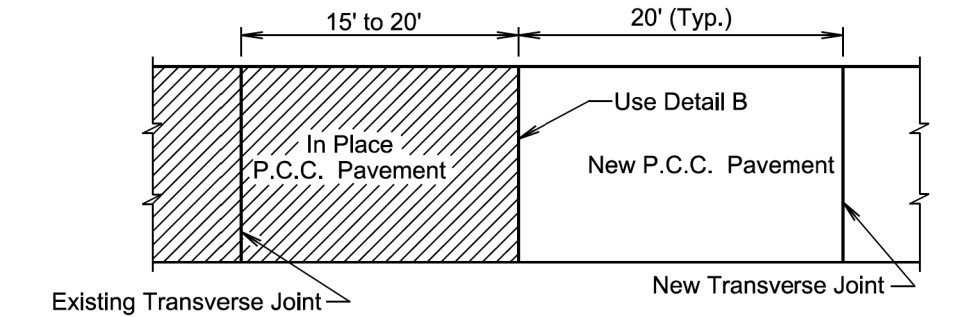
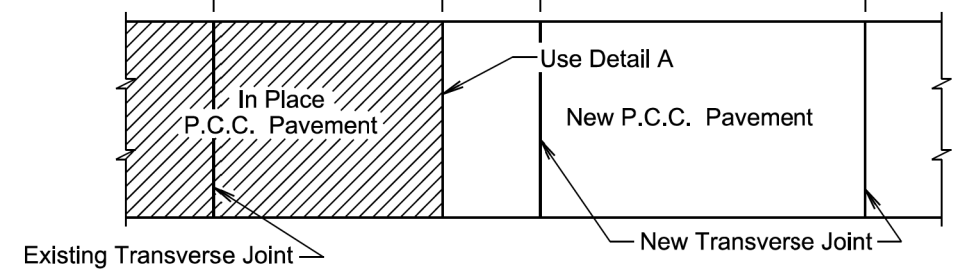
The plain round dowel bars will be embedded a minimum depth of 9 inches into the in place PCC pavement and anchored with an epoxy resin adhesive or a non-shrink grout.

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

January 22, 2023

	PCC PAVEMENT TRANSVERSE CONSTRUCTION JOINTS WITH TIE BARS OR DOWEL BARS	PLATE NUMBER 380.15
		Sheet 1 of 2
Published Date: 2025		

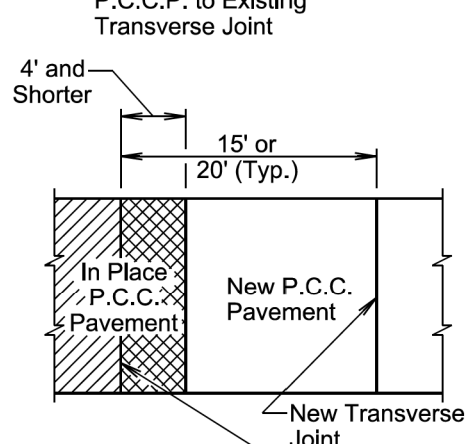
Longer than 4' and Shorter than 15' 20' (Typ.) 20' (Typ.)



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

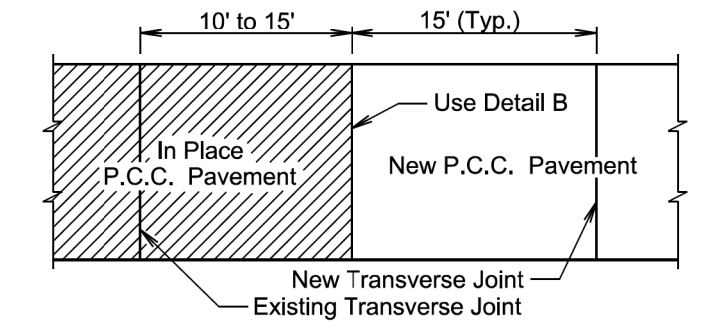
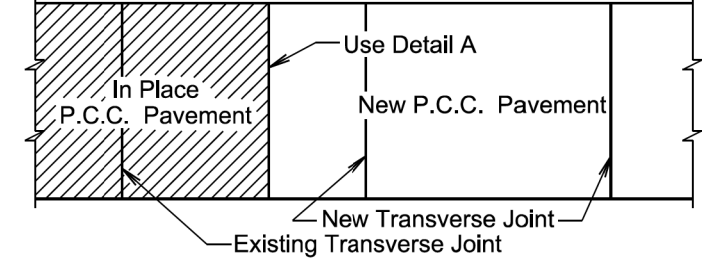
Remove In Place P.C.C.P. to Existing Transverse Joint

4' and Shorter 15' or 20' (Typ.)



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

Longer than 4' and Shorter than 10' 15' (Typ.) 15' (Typ.)

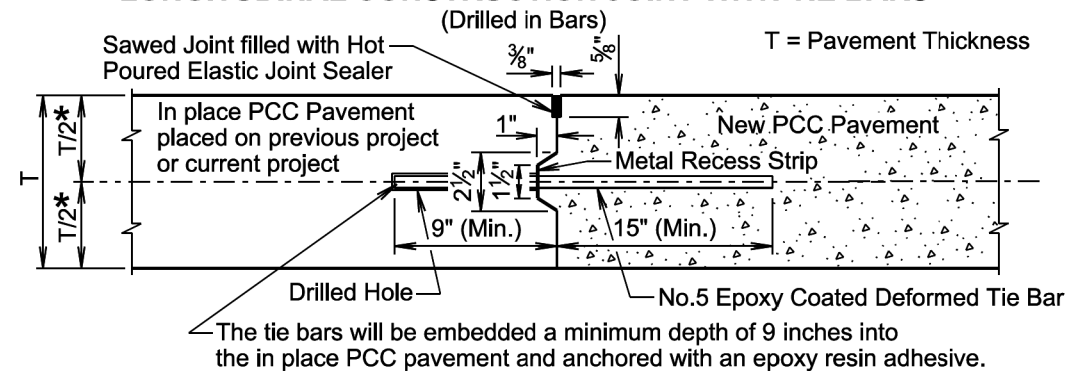


PLAN VIEW
(For typical transverse joint spacing of 15' on the current project)

January 22, 2023

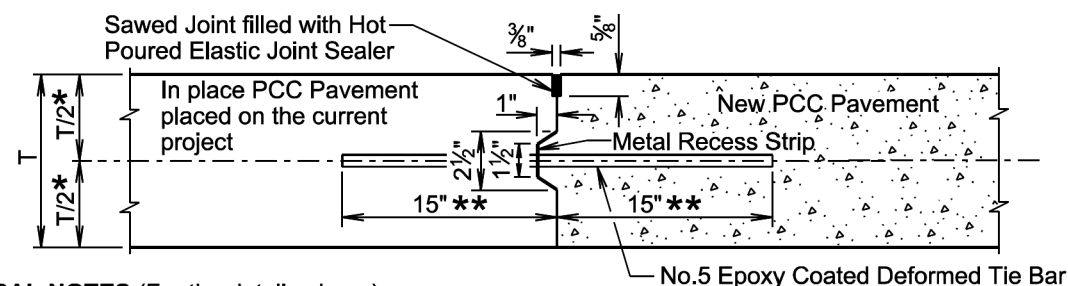
	PCC PAVEMENT TRANSVERSE CONSTRUCTION JOINTS WITH TIE BARS OR DOWEL BARS	PLATE NUMBER 380.15
		Sheet 2 of 2
Published Date: 2025		

LONGITUDINAL CONSTRUCTION JOINT WITH TIE BARS



LONGITUDINAL CONSTRUCTION JOINT WITH TIE BARS

(Inserted or Formed in Bars)



GENERAL NOTES (For the details above):

The epoxy coated deformed tie bars will be spaced in accordance with the following tables:

TIE BAR SPACING 48" MAXIMUM	
Transverse Contraction Joint Spacing	Number of Tie Bars
6.5' to 10'	2
10.5' to 14'	3
14.5' to 18'	4
18.5' to 22'	5

TIE BAR SPACING 30" MAXIMUM	
Transverse Contraction Joint Spacing	Number of Tie Bars
5' to 7'	2
7.5' to 9.5'	3
10' to 12'	4
12.5' to 14.5'	5
15' to 17'	6
17.5' to 19.5'	7
20' to 22'	8

The tie bars will be placed a minimum of 15 inches from transverse contraction joints.

The required number of tie bars as shown in the table will be uniformly spaced within each panel. The uniformly spaced tie bars will be spaced a maximum of 48 inches center to center for a female keyway and will be spaced a maximum of 30 inches center to center for a vertical face and male keyway. The maximum tie bar spacing will apply to tie bars within each panel.

The keyway illustrated in the above details depict a female keyway.

The keyway is optional and is not required. When concrete pavement is formed and a keyway is provided, a metal recess strip will be used. When concrete pavement is slip formed, a metal recess strip is not required.

- * The vertical placement tolerance for any part of the tie bar will be $\pm T/6$.
- ** The transverse placement (side shift) tolerance will be ± 3 inches when measured perpendicular to the longitudinal joint line.

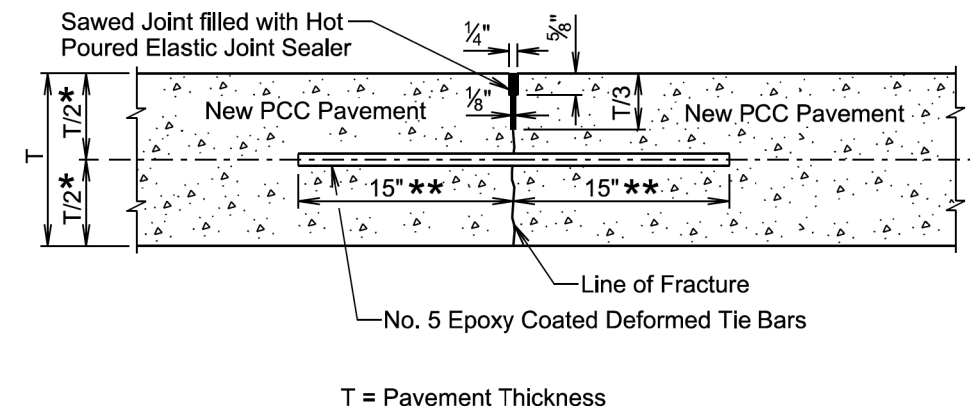
November 19, 2022

	PCC PAVEMENT LONGITUDINAL JOINTS WITH TIE BARS	PLATE NUMBER 380.20
		Sheet 1 of 2

Published Date: 2025

SAWED LONGITUDINAL JOINT WITH TIE BARS

(Poured Monolithically)



GENERAL NOTES (For the detail above):

The epoxy coated deformed tie bars will be spaced in accordance with the following table:

TIE BAR SPACING 48" MAXIMUM	
Transverse Contraction Joint Spacing	Number of Tie Bars
6.5' to 10'	2
10.5' to 14'	3
14.5' to 18'	4
18.5' to 22'	5

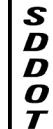
The tie bars will be placed a minimum of 15 inches from the transverse contraction joints.

The required number of tie bars as shown in the table will be uniformly spaced within each panel with a maximum space of 48 inches center to center. The maximum tie bar spacing will apply to tie bars within each panel.

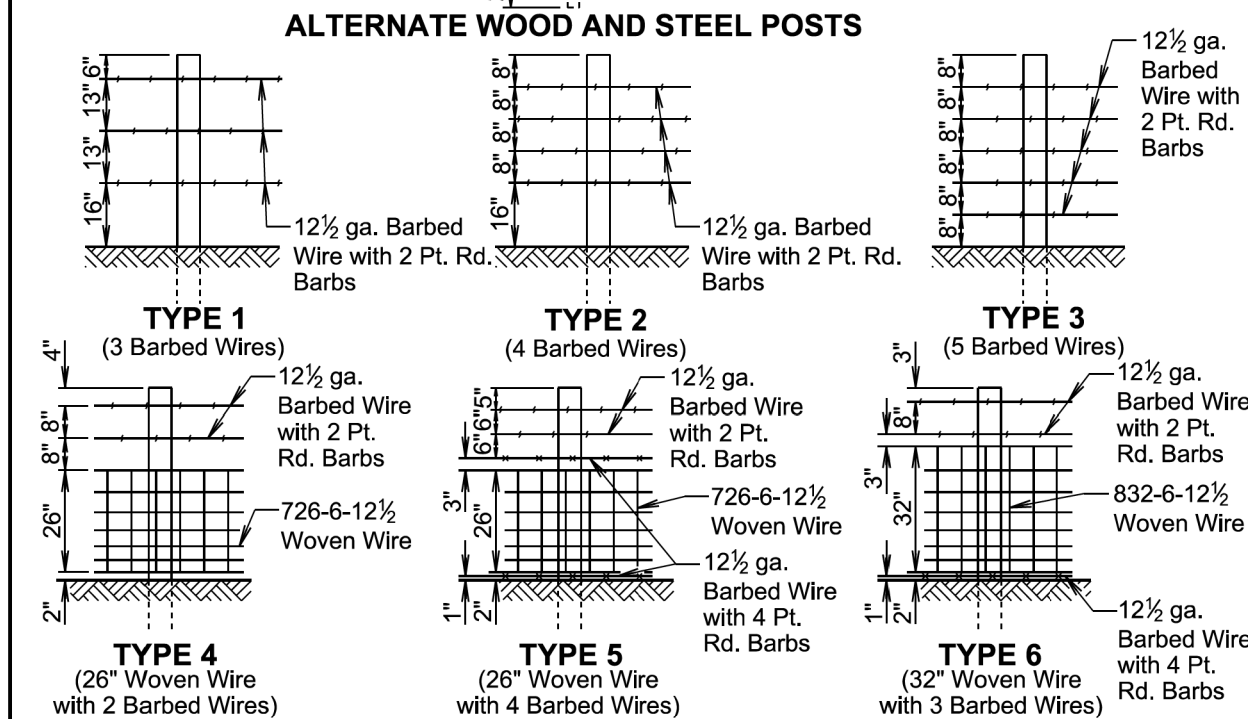
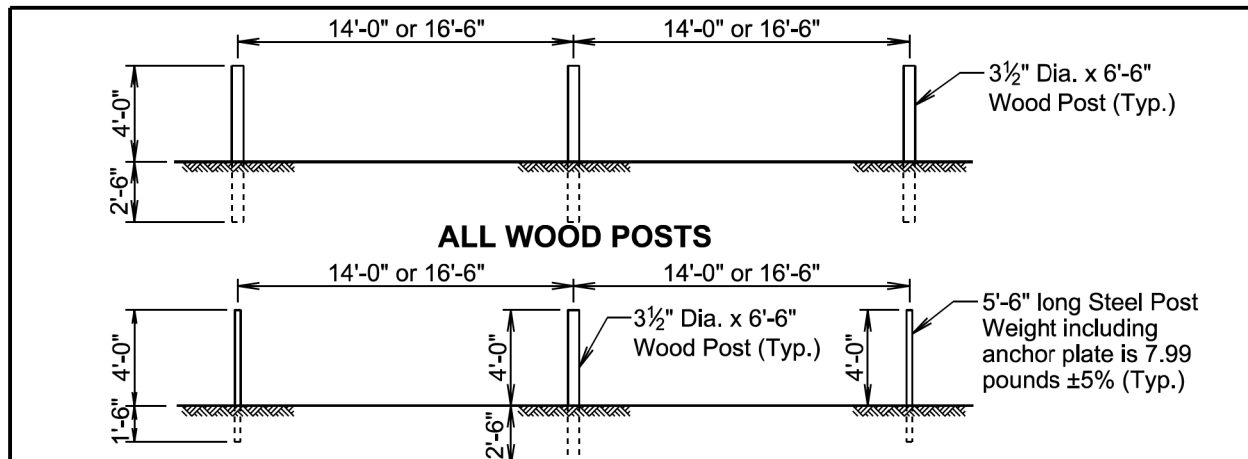
The first saw cut to control cracking will be a minimum of 1/3 the thickness of the pavement. Additional sawing for widening the saw cut to provide the width for the installation of the hot poured elastic joint sealer is necessary.

- * The vertical placement tolerance for any part of the tie bar will be $\pm T/6$.
- ** The transverse placement (side shift) tolerance will be ± 3 inches when measured perpendicular to the longitudinal joint line.

November 19, 2022

	PCC PAVEMENT LONGITUDINAL JOINTS WITH TIE BARS	PLATE NUMBER 380.20
		Sheet 2 of 2

Published Date: 2025



TYPE OF FENCE		LINE POST SPACING	WIRE GAGE	BARBED WIRE		WOVEN WIRE
TYPE	DESCRIPTION			NUMBER AND SHAPE OF BARBS	STYLE OR DESIGN NO.	
1	3 Barbed Wires	16'-6"	12½	2 Point Round	—	—
2	4 Barbed Wires	16'-6"	12½	2 Point Round	—	—
3	5 Barbed Wires	16'-6"	12½	2 Point Round	—	—
4	26" Woven Wire with 2 Barbed Wires	14'-0"	12½	2 Point Round	726-6-12½	—
5	26" Woven Wire with 4 Barbed Wires	14'-0"	12½	2 wires with 2 Pt. Rd. 2 wires with 4 Pt. Rd.	726-6-12½	—
6	32" Woven Wire with 3 Barbed Wires	14'-0"	12½	2 wires with 2 Pt. Rd. 1 wire with 4 Pt. Rd.	832-6-12½	—

GENERAL NOTES:

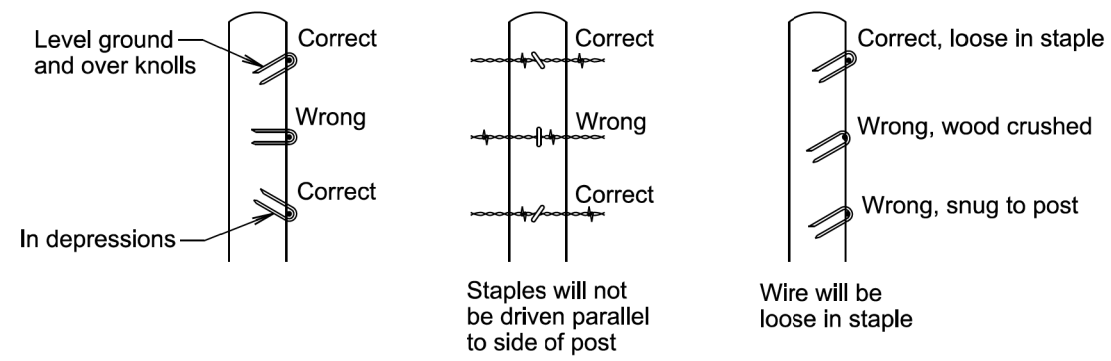
Fence types designated on the plans that are followed by the letter S will have smooth (barbless) wires.

When type 5S or 6S is designated the bottom wire may be barbed, smooth, or left off.

All degrees of curvature stated for fence are at centerline of roadway.

June 26, 2019

Published Date: 2025	SD DOT	RIGHT-OF-WAY FENCE	PLATE NUMBER 620.01
			Sheet 1 of 1



STAPLE INSTALLATION

GENERAL NOTES:

The Right-of-Way fence will consist of barbed wire or a combination of woven wire and barbed wire. The barbed wire and/or woven wire will be fastened to all wood posts or fastened to alternating wood and steel posts. Only wood posts will be used for brace panels. Gates will be of the type designated in the plans or as otherwise directed by the Engineer. Fence will be constructed conforming to the details on the standard plates and in the plans unless otherwise directed by the Engineer.

Right-of-Way fence on Interstate Projects will be constructed one foot within the Interstate Right-of-Way lines except at bridge openings, cattle passes, and as otherwise directed by the Engineer.

Right-of-Way fence other than on Interstate Projects will be constructed within one foot of the Right-of-Way on the Landowner's side except at bridge openings, cattle passes, and as otherwise directed by the Engineer.

Barbs will be fabricated from zinc coated 14 ga. wire. Two point barbs will be wrapped twice around one main strand at four-inch spacings and the four point barbs will be interlocked and wrapped around both main strands at five-inch spacings.

The gages of wire and wood post lengths and sizes are the minimum acceptable unless otherwise specified in the plans. The tolerances for steel posts will be as stated in AASHTO M281. Woven wire will conform to design and specifications of ASTM A116 and barbed wire will conform to ASTM A121.

Published Date: 2025	SD DOT	STAPLE INSTALLATION AND GENERAL RIGHT-OF-WAY FENCE NOTES	PLATE NUMBER 620.02
			Sheet 1 of 1

TYPE AND DETAILS OF MGS						
Type of MGS	W Beam Rail Single or Double (Nested)	Blockout Size	Blockout Material	Post Size	Post Material	Post Spacing
1	Single	6"x12"x14"	Wood	6"x8"x6'-0"	Wood	6'-3"
1C	Single	6"x12"x14"	Wood	6"x8"x7'-6"	Wood	6'-3"
2	Single	6"x12"x14"	Wood	6"x8"x6'-0"	Wood	3'-1½"
3	Single	6"x12"x14"	Wood	6"x8"x6'-0"	Wood	1'-6¾"
4	Double	6"x12"x14"	Wood	6"x8"x6'-0"	Wood	6'-3"

STANDARD PLATE REFERENCE	
Type of MGS	See Standard Plate(s)
1	630.20, 630.22
1C	630.20, 630.25
2	630.20
3	630.20
4	630.20

GENERAL NOTES:

Asphalt concrete will be the same type used elsewhere on the project or will be as specified in the plans. If asphalt concrete is not specified in the plans, the asphalt concrete will conform to the Specifications for "Asphalt Concrete Composite".

Granular material will be the same type used elsewhere on the project or will be as specified in the plans. If granular material type is not specified in the plans, the material will conform to the Specifications for "Base Course". The granular material will be placed the same thickness as the mainline surfacing or as specified in the plans.

Topsoil is not shown in the transverse section drawing on sheet 2 of 6.

All W beam rail will be Type 1 and Class A (12 Ga.) unless specified otherwise in the plans.

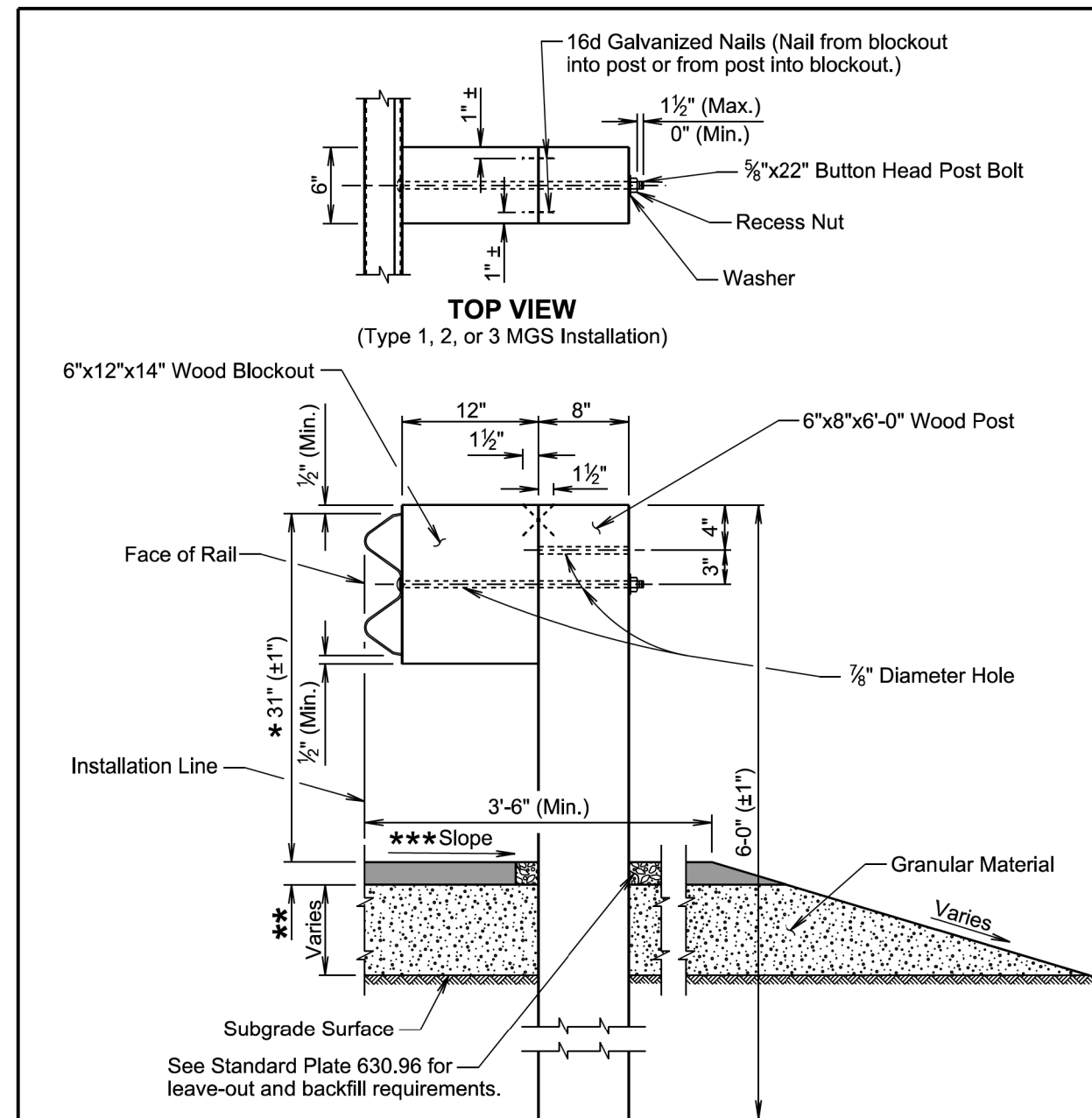
W beam rail section lengths may be 12'-6" and/or 25'-0". The combination of section lengths used will be compatible with the total length of rail per site as shown in the plans.

Slots in the rails will be provided as specified in the plans and by the manufacturer. A drilled hole through the rail is not allowed as a replacement for a slot. If the Contractor must create a slot, a cutting torch or plasma cutter is not allowed. The slot edges will be smooth and free of burrs or notches.

All costs for constructing the MGS including labor, equipment, and materials including all posts, blockouts, steel beam rail, and hardware will be incidental to the contract unit price per foot for the respective MGS contract item.

September 14, 2019

Published Date: 2025	SD DOT	MIDWEST GUARDRAIL SYSTEM (MGS)	PLATE NUMBER 630.20
			Sheet 1 of 6



TRANSVERSE SECTION
(Type 1, 2, or 3 MGS Installation)

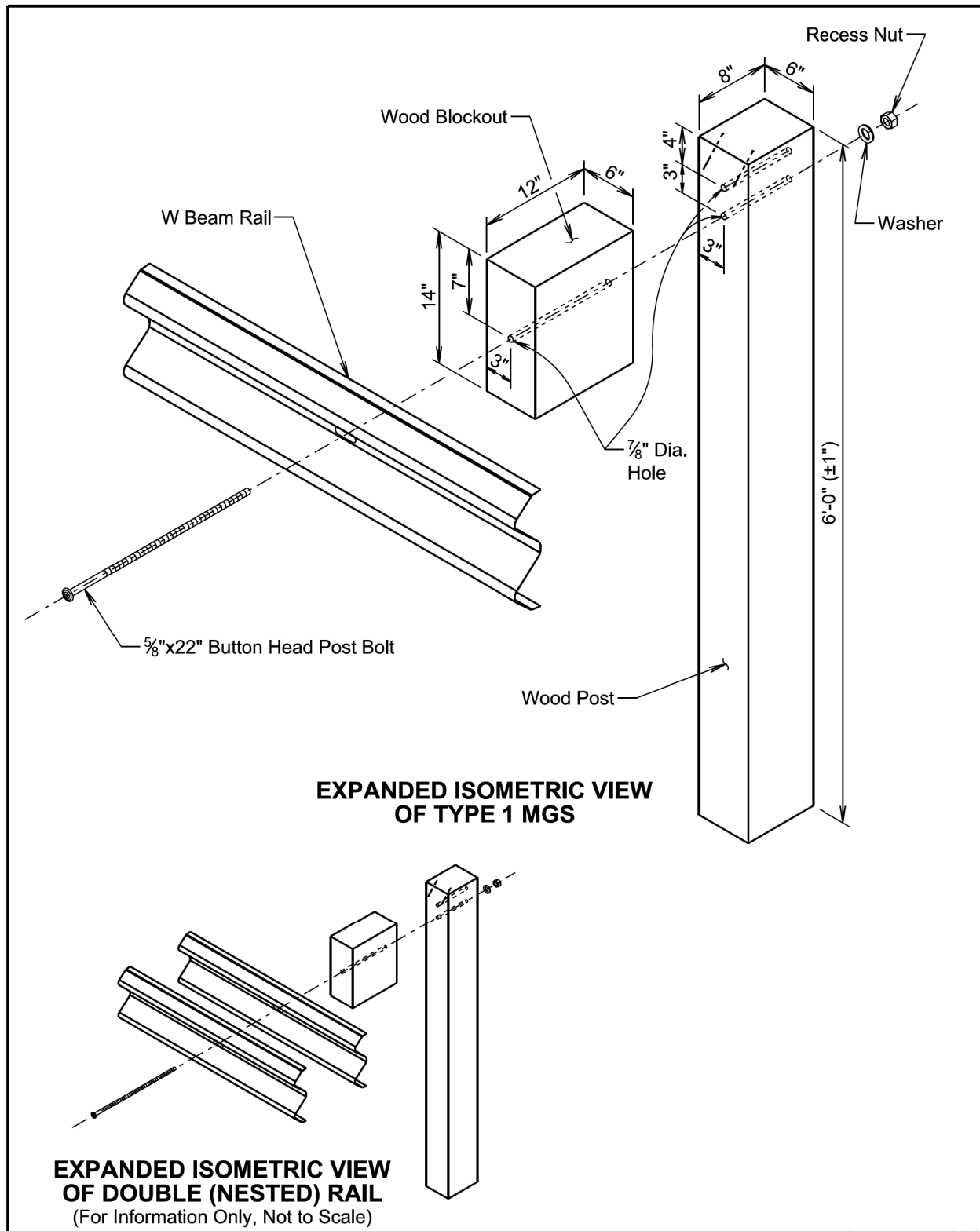
* See Standard Plate 630.99

** 2" asphalt concrete or as specified in the plans.

*** The cross slope will be as specified in the plans; however, the cross slope will not be steeper than a 10:1 slope.

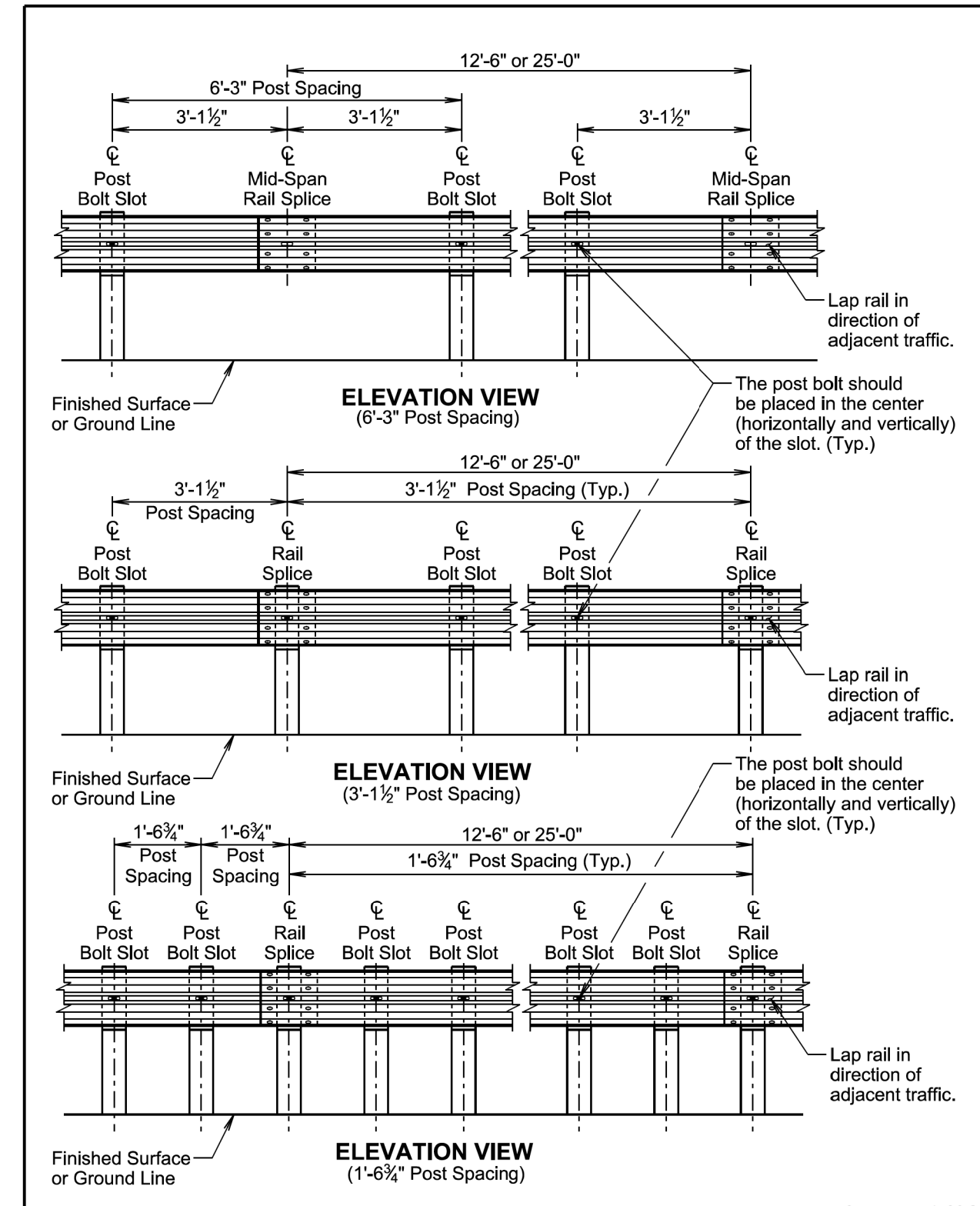
September 14, 2019

Published Date: 2025	SD DOT	MIDWEST GUARDRAIL SYSTEM (MGS)	PLATE NUMBER 630.20
			Sheet 2 of 6



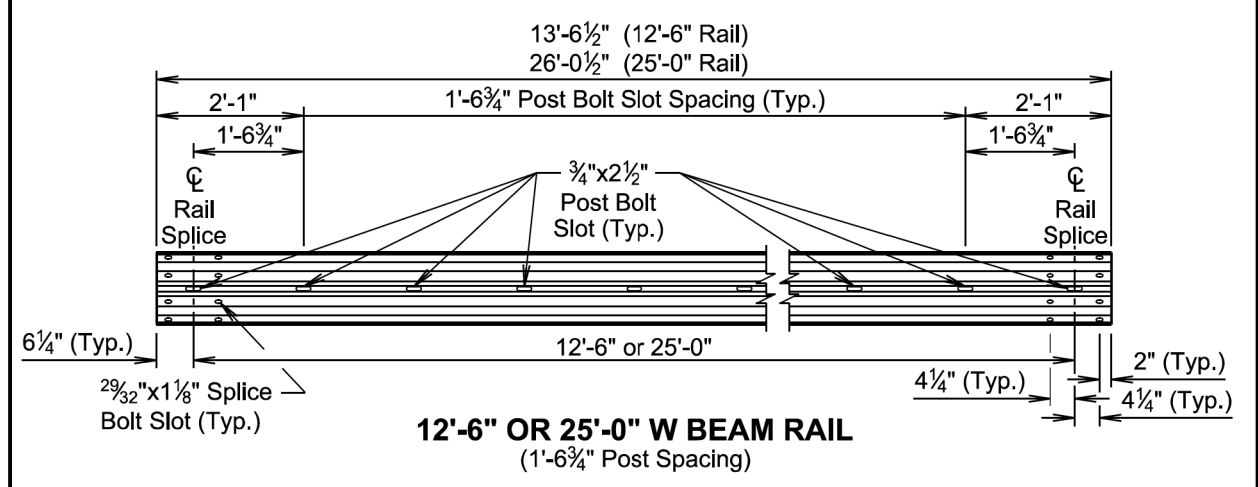
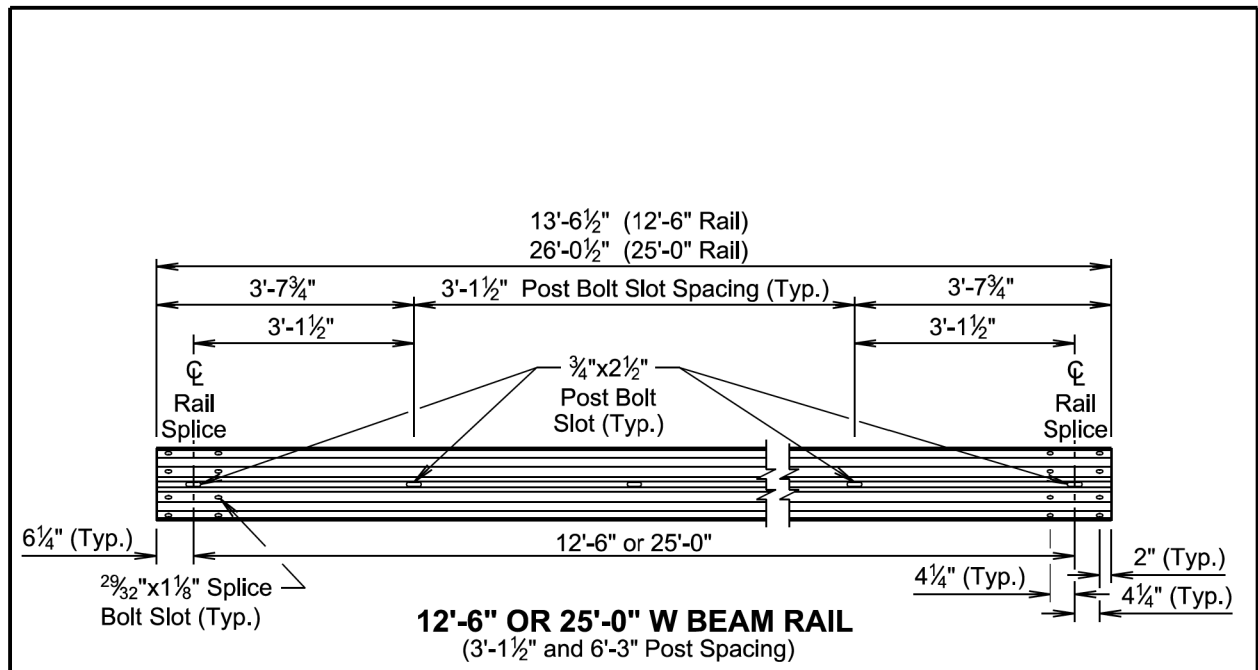
September 14, 2019

	MIDWEST GUARDRAIL SYSTEM (MGS)	PLATE NUMBER 630.20
		Sheet 3 of 6
Published Date: 2025		



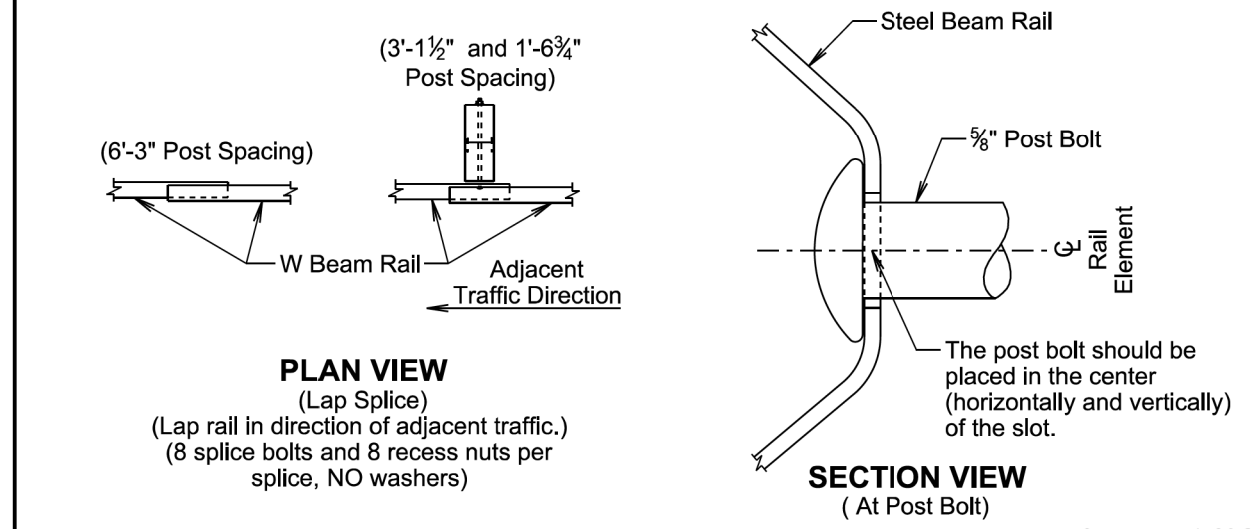
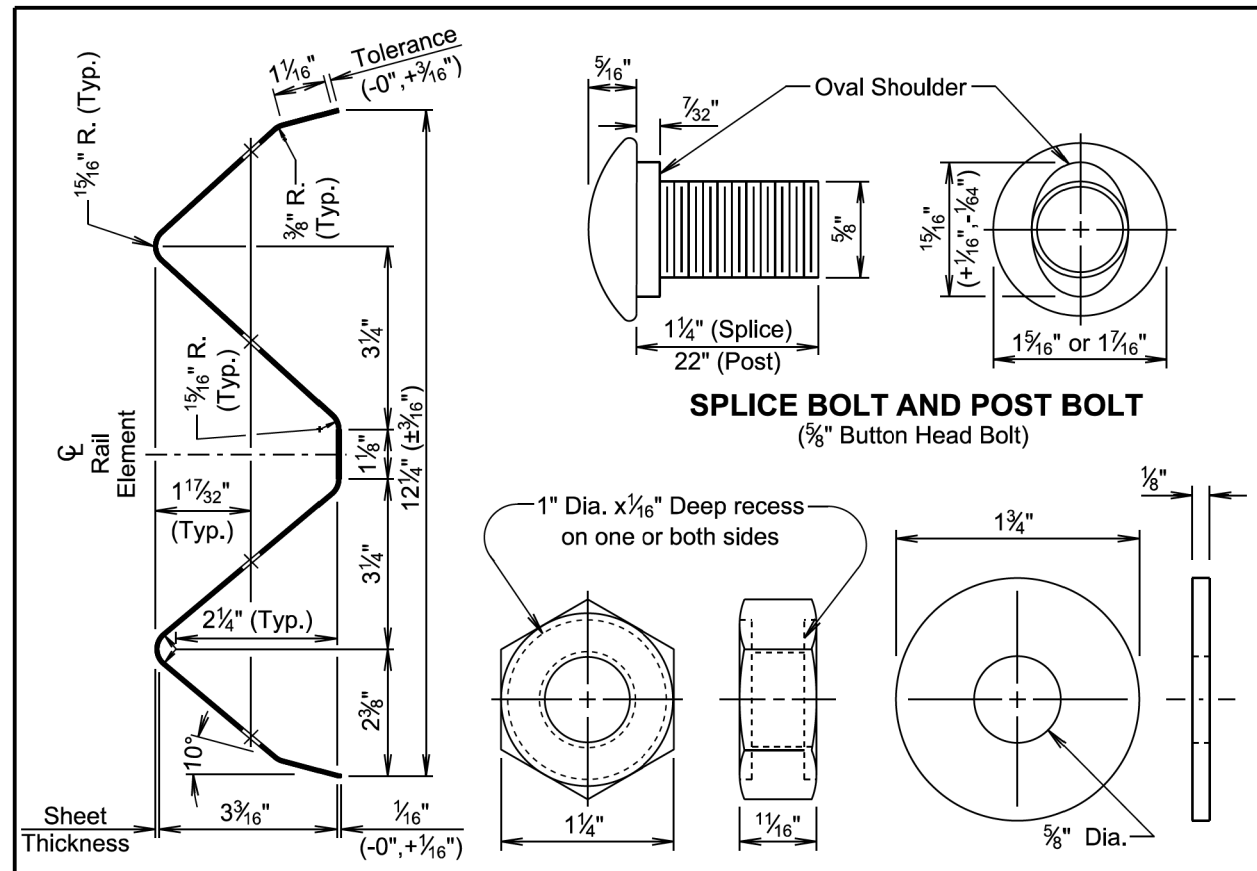
September 14, 2019

	MIDWEST GUARDRAIL SYSTEM (MGS)	PLATE NUMBER 630.20
		Sheet 4 of 6
Published Date: 2025		



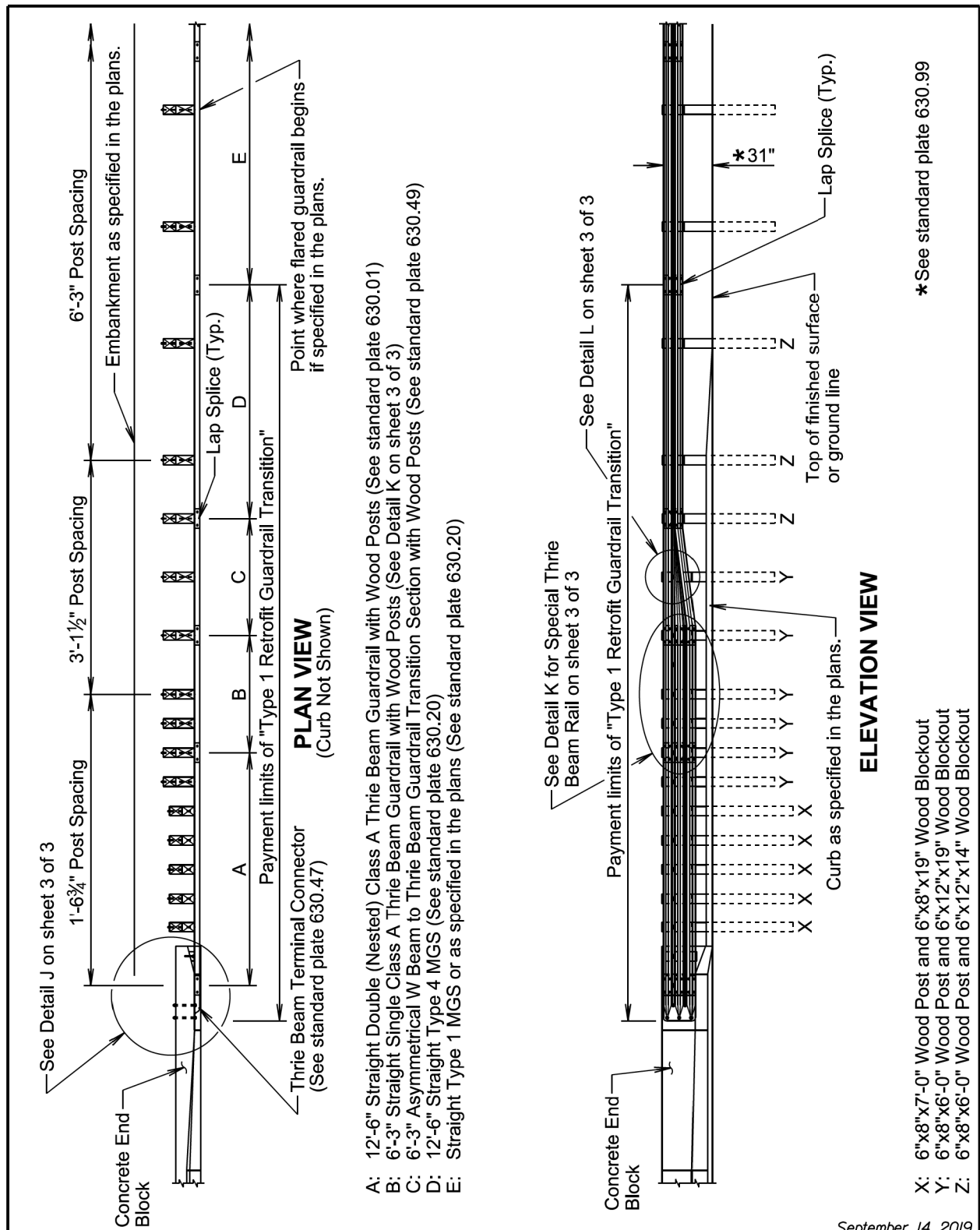
September 14, 2019

	MIDWEST GUARDRAIL SYSTEM (MGS)	PLATE NUMBER 630.20
		Sheet 5 of 6
Published Date: 2025		



September 14, 2019

	MIDWEST GUARDRAIL SYSTEM (MGS)	PLATE NUMBER 630.20
		Sheet 6 of 6
Published Date: 2025		

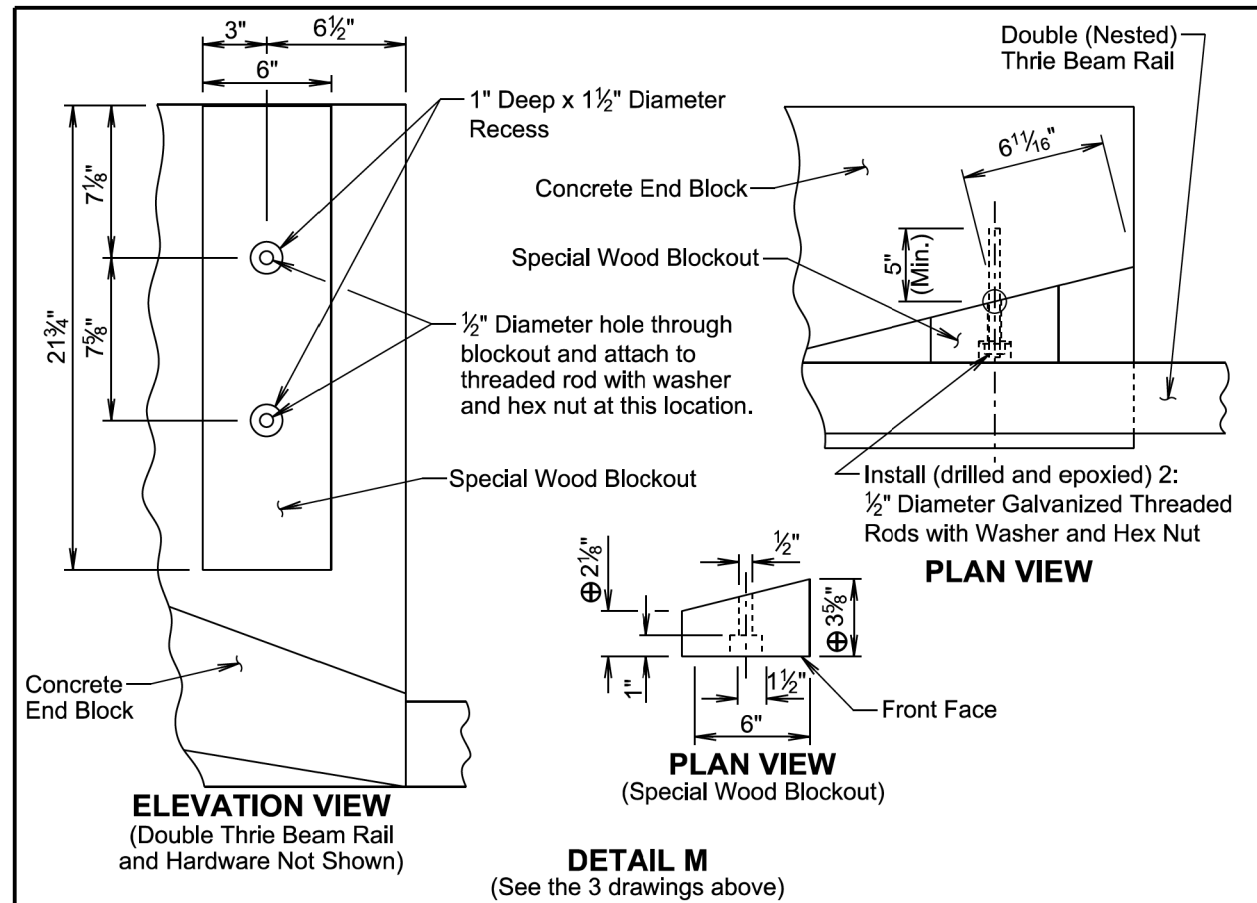


SD DOT

**TYPE 1 RETROFIT GUARDRAIL TRANSITION
(CONCRETE END BLOCK TO
MIDWEST GUARDRAIL SYSTEM (MGS))**

PLATE NUMBER
630.51

Sheet 1 of 3



GENERAL NOTES FOR INSTALLING THREADED RODS INTO CONCRETE:

⊕ The dimensions shown are estimated based on original construction plans of the concrete end block. The special wood blackout will be cut as necessary such that the front face of the special wood blackout will align with the vertical front face of the concrete end block ± 1/2\".

The threaded rods will be 1/2\" diameter and conform to ASTM F1554, Grade 55. The threaded rods will be embedded a minimum of 5\" into the concrete.

The diameter of the drilled holes will not be less than 1/8\" greater or more than 3/8\" greater than the diameter of the threaded rods or as per the Manufacturer's recommendations. The holes will not be drilled using core bits. The drilled holes will be blown out with compressed air using a device that will reach the back of the hole to ensure that all debris or loose material has been removed prior to the epoxy injection.

The epoxy resin mixture will be of a type for bonding steel to hardened concrete and will conform to AASHTO M235 Type IV, Grade 3 (Equivalent to ASTM C881, Type IV, Grade 3).

Mix epoxy resin as recommended by the Manufacturer and apply by an injection method as approved by the Engineer. Beginning at the back of the drilled holes, fill the holes 1/3 to 1/2 full of epoxy, or as recommended by the Manufacturer, prior to insertion of the steel rod. Rotate the steel rod during installation to eliminate voids and ensure complete bonding of the rod. Insertion of the rods by the dipping or painting methods will not be allowed.

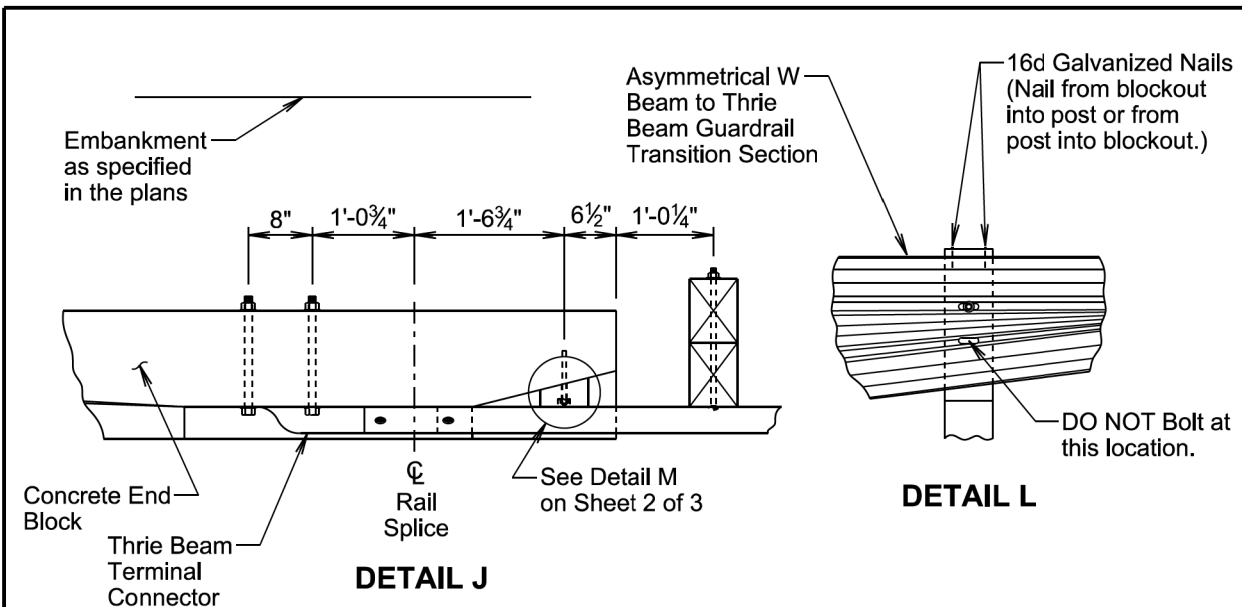
Loads will not be applied to the epoxy grouted threaded rods until the epoxy resin has had sufficient time to cure as specified by the epoxy resin Manufacturer.

SD DOT

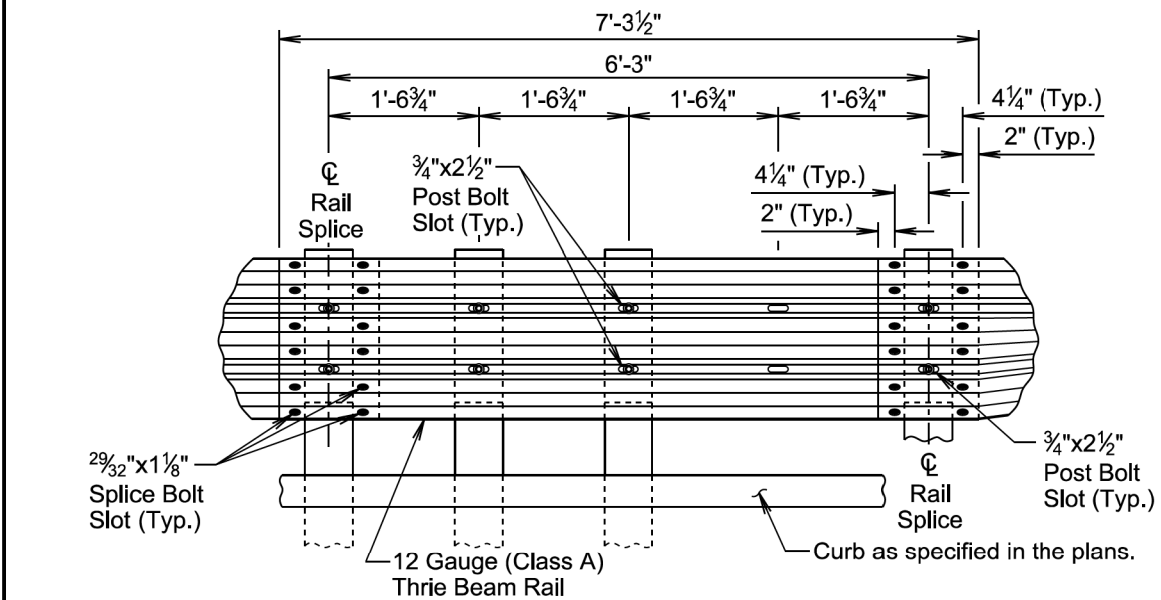
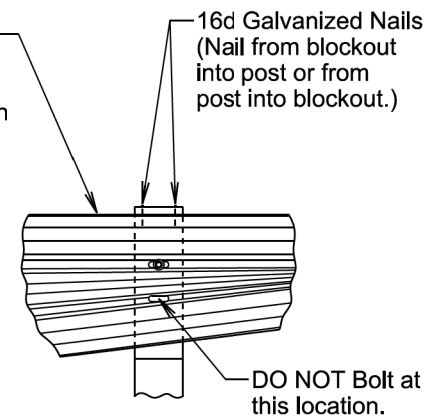
**TYPE 1 RETROFIT GUARDRAIL TRANSITION
(CONCRETE END BLOCK TO
MIDWEST GUARDRAIL SYSTEM (MGS))**

PLATE NUMBER
630.51

Sheet 2 of 3



DETAIL L



DETAIL K
(Special Thrie Beam Rail)

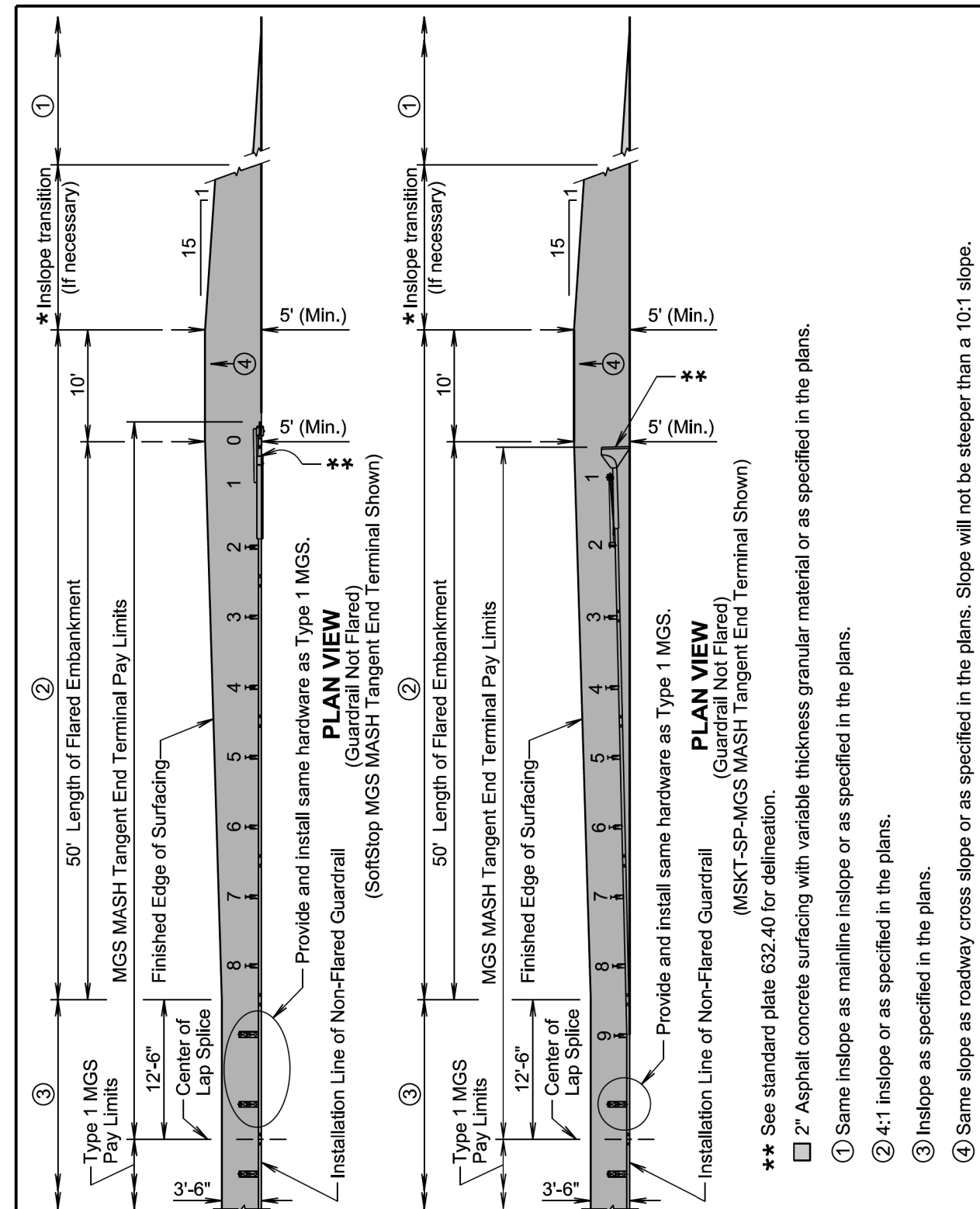
GENERAL NOTES:

Throughout the type 1 retrofit guardrail transition, slots in the rails will be provided as specified in the plans and by the Manufacturer. A drilled hole through the rail is not allowed as a replacement for a slot. If the Contractor must create a slot, a cutting torch or plasma cutter is not allowed. The slot edges will be smooth and free of burrs or notches.

All costs for furnishing and installing the type 1 retrofit guardrail transition including labor, equipment, and materials which includes all rail sections, posts and blockouts, special blockout, hardware, and incidentals will be included in the contract unit price per each for "Type 1 Retrofit Guardrail Transition".

September 14, 2019

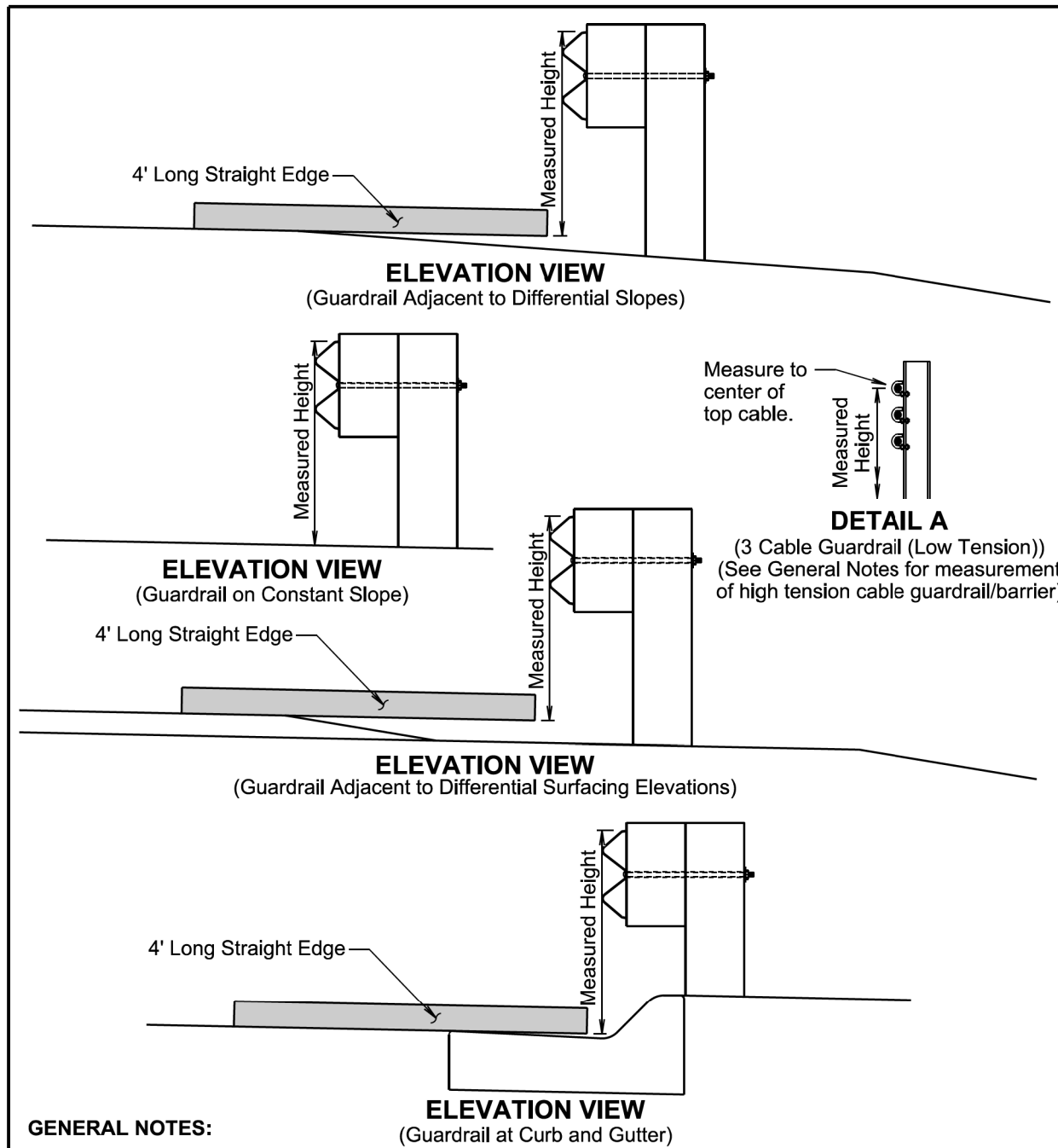
SD DOT Published Date: 2025	TYPE 1 RETROFIT GUARDRAIL TRANSITION (CONCRETE END BLOCK TO MIDWEST GUARDRAIL SYSTEM (MGS))	PLATE NUMBER 630.51
		Sheet 3 of 3



- ** See standard plate 632.40 for delineation.
- 2" Asphalt concrete surfacing with variable thickness granular material or as specified in the plans.
- ① Same inslope as mainline inslope or as specified in the plans.
- ② 4:1 inslope or as specified in the plans.
- ③ Inslope as specified in the plans.
- ④ Same slope as roadway cross slope or as specified in the plans. Slope will not be steeper than a 10:1 slope.

November 19, 2021

SD DOT Published Date: 2025	EMBANKMENT, SURFACING, AND PAYMENT LIMITS FOR MGS MASH TANGENT END TERMINAL	PLATE NUMBER 630.89
		Sheet 1 of 2



GENERAL NOTES:

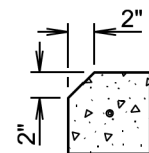
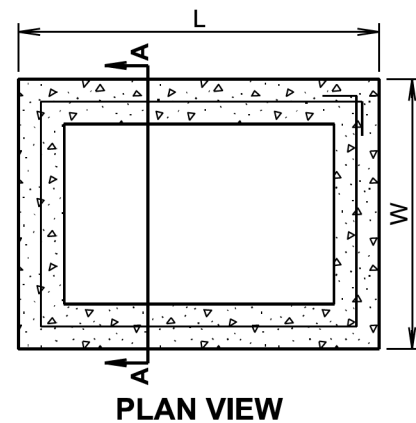
The W Beam guardrail shown is for illustrative purpose. The guardrail height for all types of guardrail systems except for high tension cable guardrail/barrier will be measured in accordance with this standard plate.

When measuring height of 3 cable guardrail (low tension) the height will be measured to the center of the top cable. See Detail A.

The height of high tension cable guardrail/barrier will be measured in accordance with the Manufacturer's installation instructions.

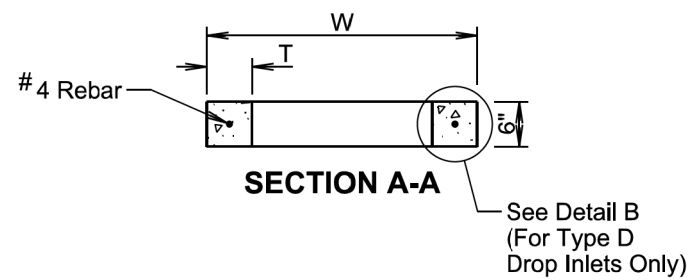
September 14, 2019

Published Date: 2025	SD DOT	MEASURING GUARDRAIL HEIGHT	PLATE NUMBER 630.99
			Sheet 1 of 1



For Type D Drop Inlets only:
Use Precast Drop Inlet Collar with
2" chamfer on L sides only.

DETAIL B



INFORMATIONAL QUANTITIES					
FRAME AND GRATE TYPE	L (Ft-in)	W (Ft-in)	T (in)	CLASS M6 CONCRETE (CuYd)	REINFORCING STEEL (Lb)
TYPE A, B, and E	4'-0"	3'-0"	6	0.11	9
TYPE C	5'-0"	4'-0"	6	0.15	11
TYPE D	4'-0"	2'-6"	6	0.10	8

GENERAL NOTES:

All reinforcing steel will conform to ASTM A615, Grade 60.

The 1/2" diameter bar will lap 6"± and will be centered in the concrete.

The cost of furnishing and installing Precast Drop Inlet Collars, including labor, materials, and incidentals will be incidental to the contract unit price per Each for "Precast Drop Inlet Collar".

June 1, 2022

	<p>PRECAST DROP INLET COLLAR</p>	<p>PLATE NUMBER 670.99</p>
		<p>Sheet 1 of 1</p>

Published Date: 2025