SD DOT	PROJECT	SECTION	SHEET
	P-B 0079(91)178 & NH 0073(86)19	F	1/32

Plotting Date: 08/10/2026

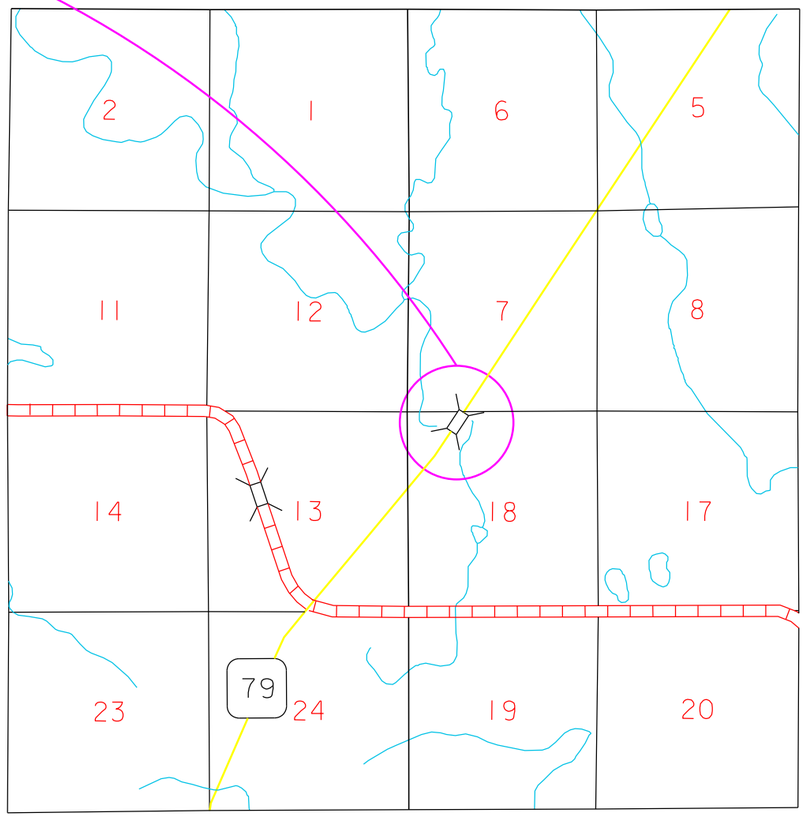
SECTION F: SURFACING PLANS

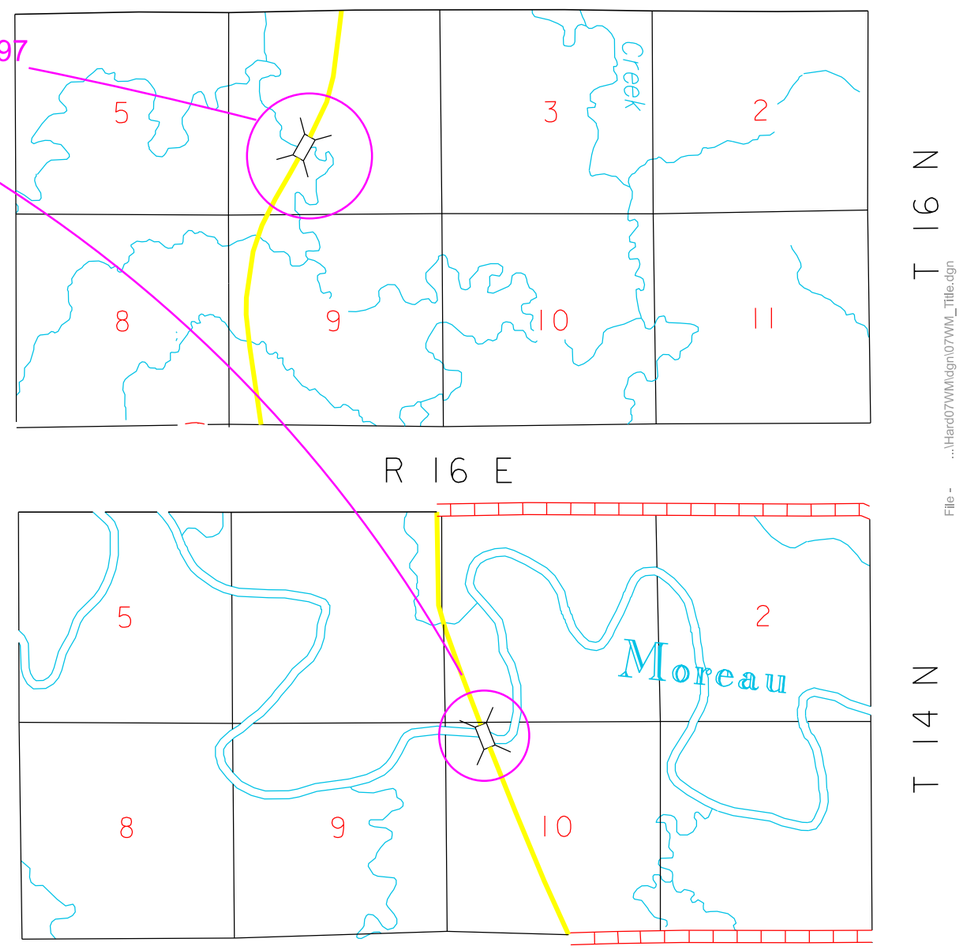
INDEX OF SHEETS

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F2-F4	Estimate With General Notes & Tables
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PROJECT
P-B 0079(91)178
Harding County
SD Highway 79
MRM 178.08
Str. No. 32-423-471

PROJECT
NH 0073(86)19
Perkins County
SD Highway 73
MRM 202.78
Str. No. 53-383-397
MRM 190.11
Str. No. 53-392-521





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Revised 9/4/26 GDS

SECTION F ESTIMATE OF QUANTITIES

07WM – SD 79

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
009E4100	Construction Schedule, Category I	Lump Sum	LS
110E0730	Remove Beam Guardrail	575.0	Ft
110E0810	Remove Rubrail	48.0	Ft
320E1200	Asphalt Concrete Composite	161.0	Ton
332E0010	Cold Milling Asphalt Concrete	1,433	SqYd
630E0500	Type 1 MGS	375.0	Ft
630E1501	Type 1 Retrofit Guardrail Transition	4	Each
630E2018	MGS MASH Tangent End Terminal	4	Each
632E2220	Guardrail Delineator	16	Each
633E1220	High Build Waterborne Pavement Marking Paint, 4" White	910	Ft
633E1222	High Build Waterborne Pavement Marking Paint, 4" Yellow	114	Ft
734E0010	Erosion Control	Lump Sum	LS
734E0630	Floating Silt Curtain	240	Ft

09E0 – SD 73

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
009E4100	Construction Schedule, Category I	Lump Sum	LS
110E0300	Remove Concrete Curb and/or Gutter	78	Ft
110E0730	Remove Beam Guardrail	900.0	Ft
110E1010	Remove Asphalt Concrete Pavement	328.0	SqYd
110E7700	Remove Drop Inlet Frame and Grate Assembly for Reset	6	Each
120E0100	Unclassified Excavation, Digouts	111	CuYd
260E1010	Base Course	246.0	Ton
320E1200	Asphalt Concrete Composite	451.5	Ton
332E0010	Cold Milling Asphalt Concrete	3,000	SqYd
630E0500	Type 1 MGS	750.0	Ft
630E1501	Type 1 Retrofit Guardrail Transition	8	Each
630E2018	MGS MASH Tangent End Terminal	8	Each
632E2220	Guardrail Delineator	32	Each
633E1220	High Build Waterborne Pavement Marking Paint, 4" White	1,948	Ft
633E1222	High Build Waterborne Pavement Marking Paint, 4" Yellow	282	Ft
650E4360	Type D46 Concrete Curb and Gutter	78	Ft
670E7000	Reset Drop Inlet Frame and Grate Assembly	6	Each
734E0010	Erosion Control	Lump Sum	LS

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.

UNCLASSIFIED EXCAVATION, DIGOUTS

The locations and extent of digout areas will be determined in the field by the Engineer. The backfilling material for the digouts will be Asphalt Concrete Composite and Base Course. The depth of asphalt will be as shown in the typical section.

The digouts will be extended through the shoulder and backfilled with granular material that will daylight to the inslope to allow water to escape the subsurface.

WATER FOR COMPACTION

The cost of water for compaction of the granular material will be incidental to the various other contract items. A minimum of 4% moisture will be required at the time of compaction unless otherwise directed by the Engineer.

PROTECTION OF BRIDGE JOINTS

The Contractor and Engineer will inspect all bridge/pavement expansion joints for preexisting damage prior to pavement removals. The Engineer will inspect all joints for work-related damage following removals and again following completion of final surfacing.

It may be necessary to use special methods and equipment to remove/place material as close as practical to structure appurtenances. Also, the Contractor will mask all expansion joints prior to any removal/placement of material near the joints. The joints will be protected throughout completion of the work. Once the masking has been removed any loose material contained within the joint will be cleaned from the joint. Any damage to the expansion joints along with any existing structure appurtenances will be repaired by the Contractor to the satisfaction of the Engineer at no cost to the Department. All costs related to this work will be incidental to various contract items.

At locations with membrane sealant expansion joints use plywood or other material to protect concrete adjacent to the joint from spalling before any equipment is moved across the joint. Any spall areas will be repaired at the Contractor's expense by breaking out and replacing adjacent concrete, as approved by the Engineer.

COLD MILLING ASPHALT CONCRETE

Cold milling asphalt concrete will be done according to the typical section(s). In areas where maintenance patches have raised and/or widened the road, additional asphalt concrete will be milled to provide a uniform typical section from centerline to the edge of the finished shoulder. These areas also include farm, residential, field entrances and intersecting roads. Milling will be daylighted to the outside edge of the roadway. Any additional costs associated with this additional cold milling will be incidental to the contract unit price per square yard for Cold Milling Asphalt Concrete.

All Paving will be completed within 14 days after the pavement has been cold milled. If any pavement repairs or digouts are required by the Engineer after that time frame they will be repaired by the Contractor at their own expense.

The asphalt millings produced from Cold Milling Asphalt Concrete pavement will become the property of the Contractor for disposal.

ASPHALT CONCRETE COMPOSITE

Asphalt Concrete Composite will include MC-70 asphalt for prime placed at the rate of 0.30 gallons per square yard. The asphalt for prime will be applied to the Base Course for the full width of the bottom layer of Asphalt Concrete Composite plus one foot additional on the outside shoulder or the width of the Asphalt Concrete Composite lift in areas with curb and gutter. Blotting sand for prime required for maintenance of traffic will be applied at a rate of 10 pounds per square yard.

Asphalt for tack will be applied at a rate of 0.06 gallons per square yard on primed base course. The asphalt for tack will be applied for the full width of the subsequent layers of Asphalt Concrete Composite plus one-half foot additional on the outside shoulder or the width of the Asphalt Concrete Composite lift in areas with curb and gutter.

The Contractor will use PG 58H-34, PG 58V-34, PG 58-34, or PG 64-34 binder, otherwise Section 324 will apply.

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.

Mycorrihizal 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 lump sum price for Erosion Control..

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

Product	Manufacturer
MycoApply	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:

Product	Manufacturer
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

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:

http://apps.sd.gov/HC60ApprovedProducts/main.aspx

FLOATING SILT CURTAIN

Floating silt curtains will be installed at locations noted in the table and at locations determined by the Engineer during construction.

The Contractor will determine the water depth and other waterway characteristics such as stream flow velocity and seek technical advice from the manufacturer before ordering the floating silt curtain so that the floating silt curtain installed is the correct type for the individual sites.

The Contractor will install the floating silt curtain in accordance with the manufacturer's installation instructions or as directed by the Engineer.

The Contractor will maintain the floating silt curtains for the duration of the project to ensure continuous protection of the waterway.

The Floating Silt Curtain provided will be from the approved product list. The approved product list may be viewed at the following internet site:

https://apps.sd.gov/HC60ApprovedProducts/main.aspx

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 Material Quantities

PCN	Route	MRM	Structure Number	Length of Asphalt (Both Sides Combined)	Width of Asphalt	Depth of Asphalt	Cold Milling Asphalt Concrete	Remove Asphalt Concrete Pavement	Unclassified Excavation, Digouts	Asphalt Concrete Composite	Base Course	Remove Concrete Curb and/or Gutter	Type D46 Concrete Curb and Gutter	Remove Drop Inlet Frame and Grate Assembly for Reset	Reset Drop Inlet Frame and Grate Assembly	Erosion Control	Floating Silt Curtain
				(Ft)	(Ft)	(In)	(SqYd)	(SqYd)	(CuYd)	(Ton)	(Ton)	(Ft)	(Ft)	(Each)	(Each)	(LS)	(Ft)
07WM	SD 79	178.08	32-423-471	300	43	2	1433			161						LS	240
09E0	SD 73	190.11	53-392-521	300	45	2	1500	152	51	229	133	54	54	4	4	LS	
	SD 73	202.78	53-383-397	300	45	2	1500	176	60	222.5	113	24	24	2	2	LS	
			Total				3000	328	111	451.5	246	78	78	6	6		

Table of Guardrail

PCN	Route	MRM	Structure Number	Remove Beam Guardrail	Remove Rubrail	Type 1 Retrofit Guardrail Transition	Type 1 MGS	MGS MASH Tangent End Terminal	Guardrail Delineator
				(Ft)	(Ft)	(Each)	(Ft)	(Each)	(Each)
07WM	SD 79	178.08	32-423-471	575	48	4	375	4	16
09E0	SD 73	190.11	53-392-521	300		4	375	4	16
	SD 73	202.78	53-383-397	600		4	375	4	16
			Total	900		8	750	8	32

Table of Pavement Marking

PCN	Route	MRM	Structure Number	High Build Waterborne Pavement Marking Paint, 4" White	High Build Waterborne Pavement Marking Paint, 4" Yellow
				(Ft)	(Ft)
07WM	SD 79	178.08	32-423-471	910	114
09E0	SD 73	190.11	53-392-521	1090	174
	SD 73	202.78	53-383-397	858	108
			Total	1948	282

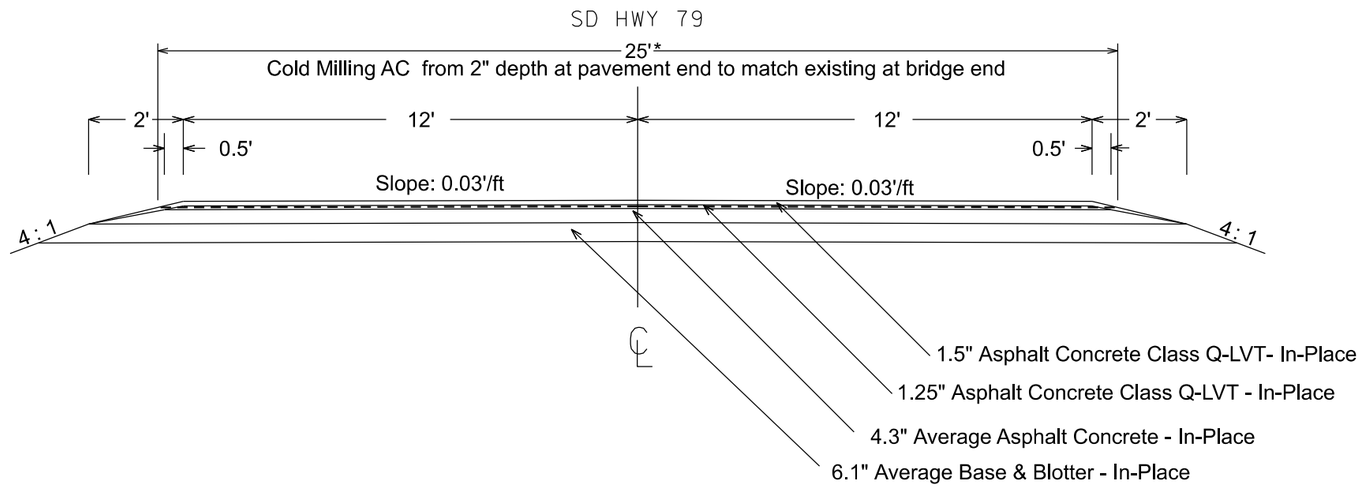
TYPICAL SECTION

STR. NO. 32-423-471

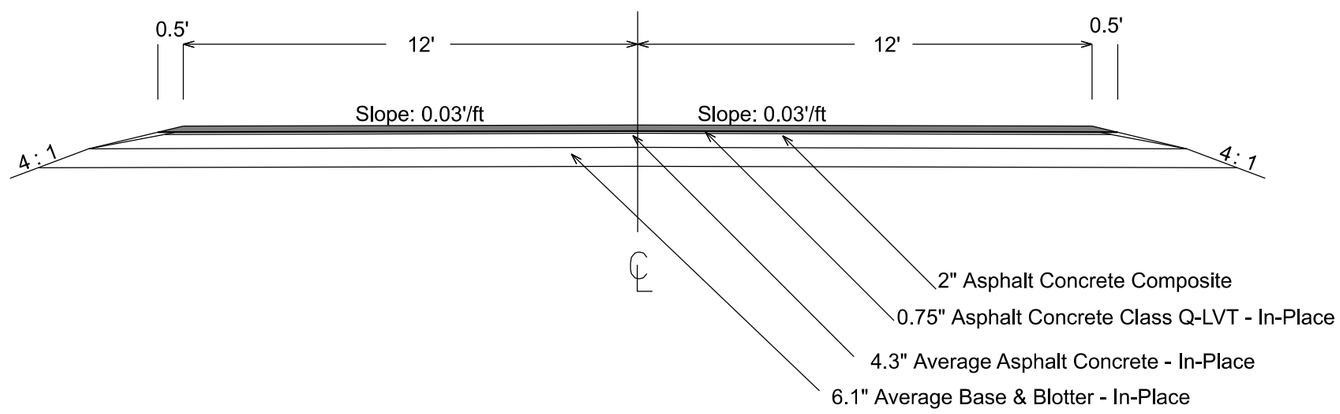
SD HIGHWAY 79 - MRM 178.08

*Additional Cold Milling width will be required for guardrail installations. (See Milling Details)

In-Place Approach Pavement and Cold Milling Asphalt Section
Structure No. 32-423-471
SD 79



Approach Pavement Resurfacing Section
Structure No. 32-423-471
SD 79



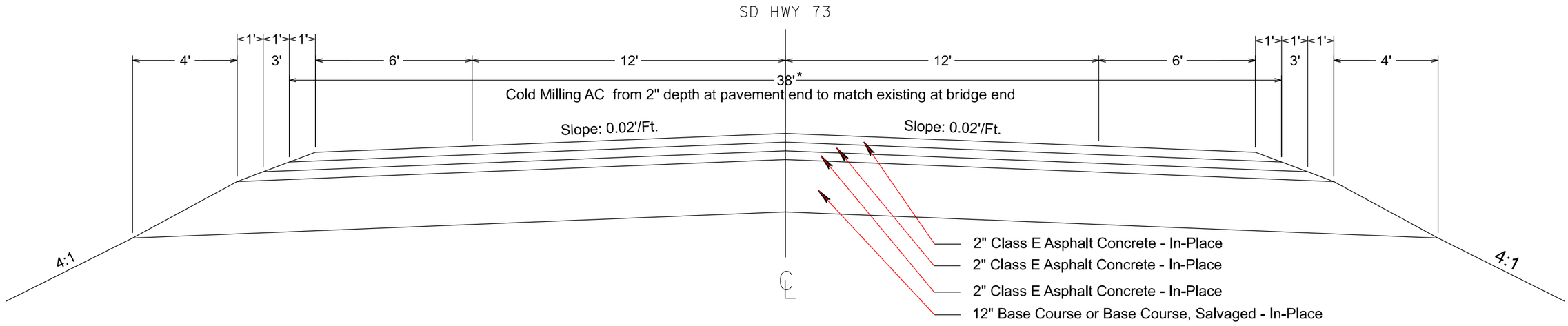
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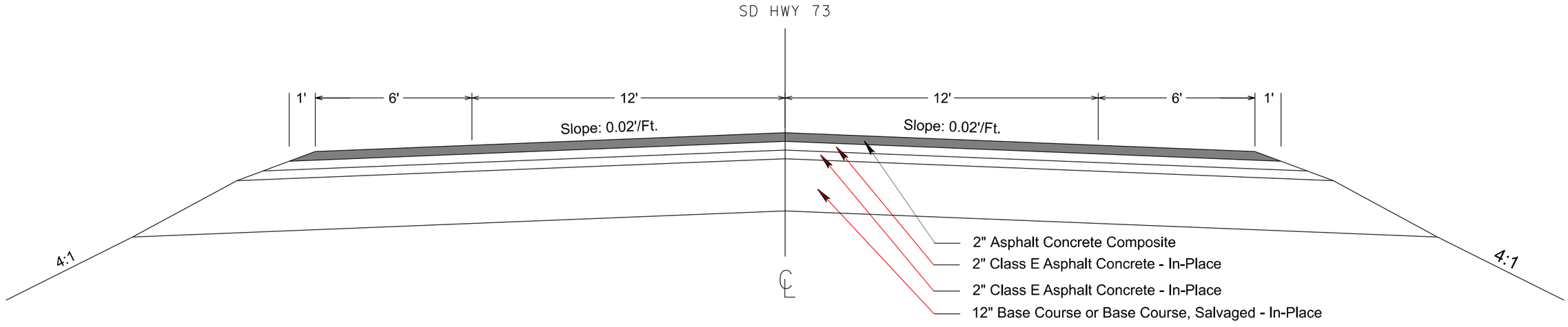
SD HIGHWAY 73 - MRM 190.11

Structure No. 53-392-521
SD 73
In-Place Approach Pavement and Cold Milling Asphalt Section

*Additional Cold Milling width will be required for guardrail installations. (See Milling Details)



Structure No. 53-392-521
SD 73
Approach Pavement Resurfacing Section



TYPICAL SECTION

Str. No. 53-392-521

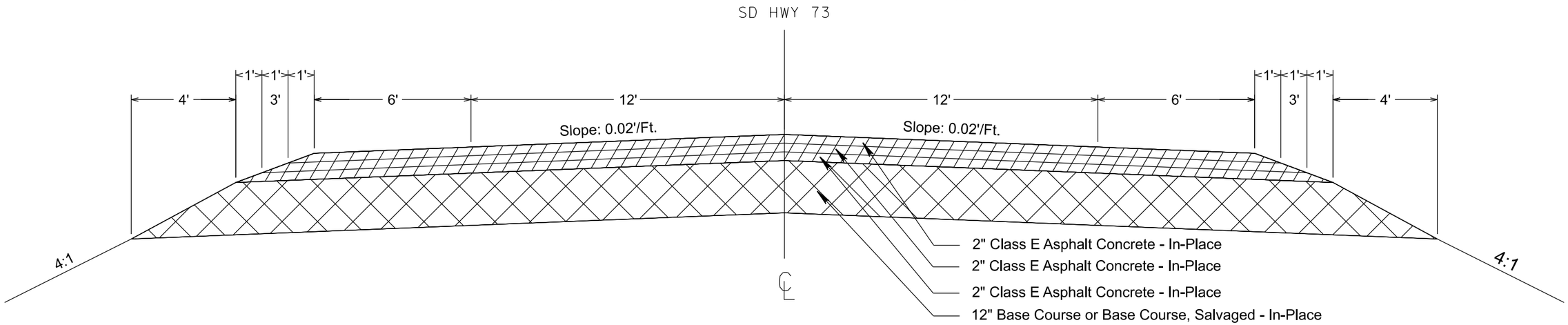
SD HIGHWAY 73 - MRM 190.11

Remove Asphalt Concrete

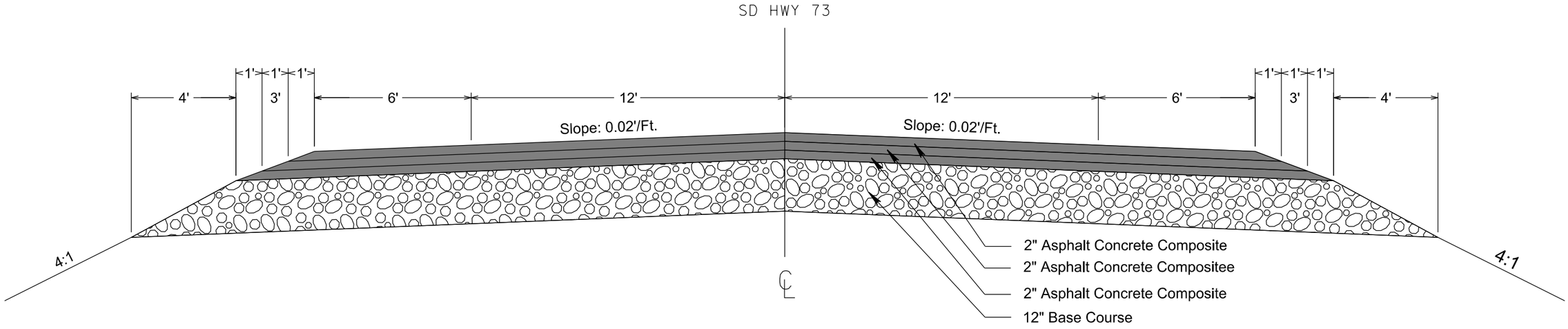
Unclassified Excavation, Digouts

Structure No. 53-392-521
SD 73

In-Place Approach Pavement and Removal for 20' adjacent to structure approach slab



Structure No. 53-392-521
SD 73
Approach Pavement Surfacing for 20' adjacent to structure approach slab



TYPICAL SECTION

SD DOT	PROJECT	SECTION	SHEET
	P-B 0079(91)178 & NH 0073(86)19	F	8/32

Plotting Date: 08/10/2026

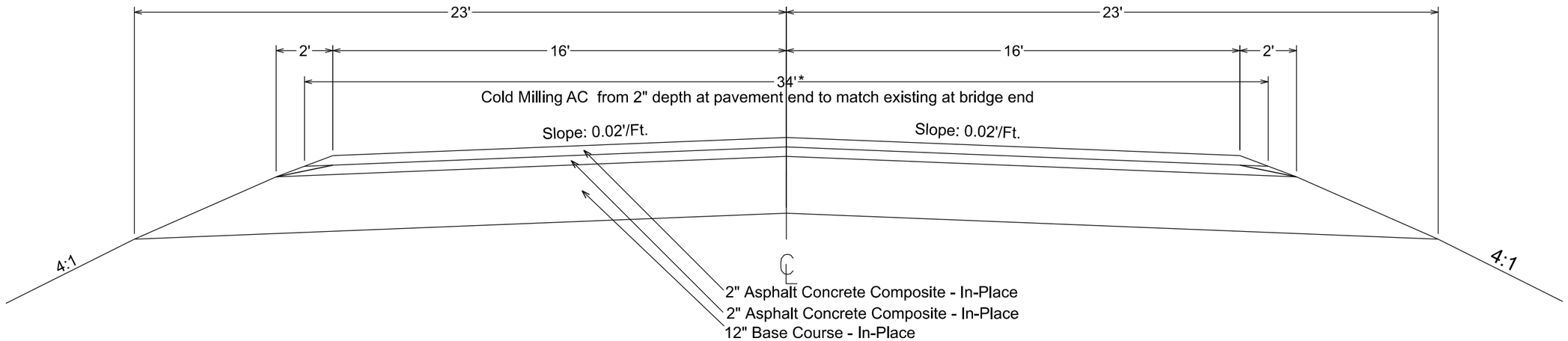
Str. No. 53-383-397

SD HIGHWAY 73 - MRM 202.78

In-Place Approach Pavement and Cold Milling Asphalt Section
Structure No. 53-383-397
SD 73

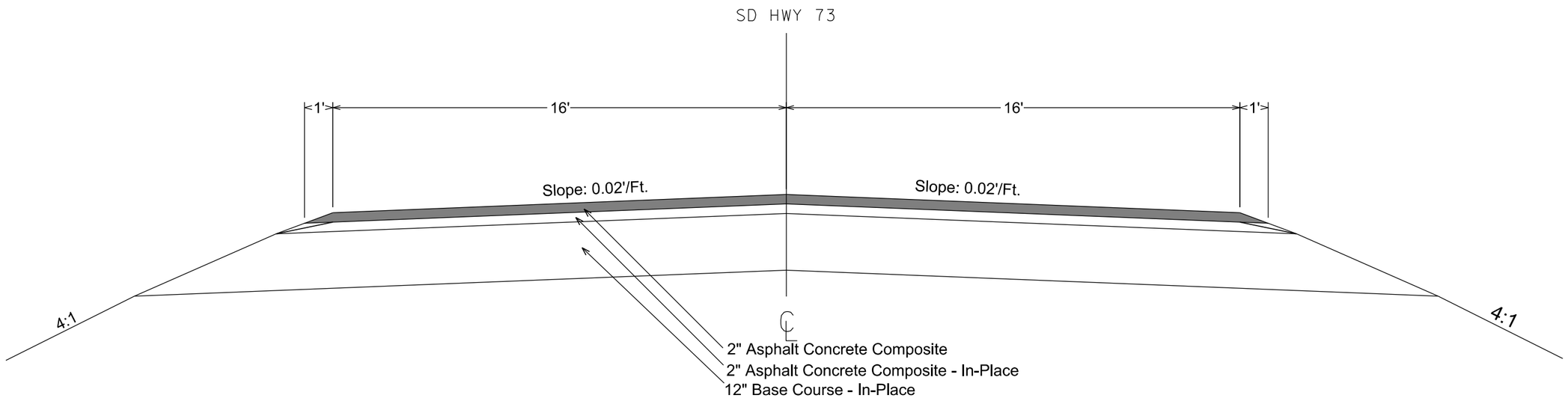
SD HWY 73

*Additional Cold Milling width will be required for guardrail installations. (See Milling Details)



Approach Pavement Resurfacing Section
Structure No. 53-383-397
SD 73

SD HWY 73



TYPICAL SECTION

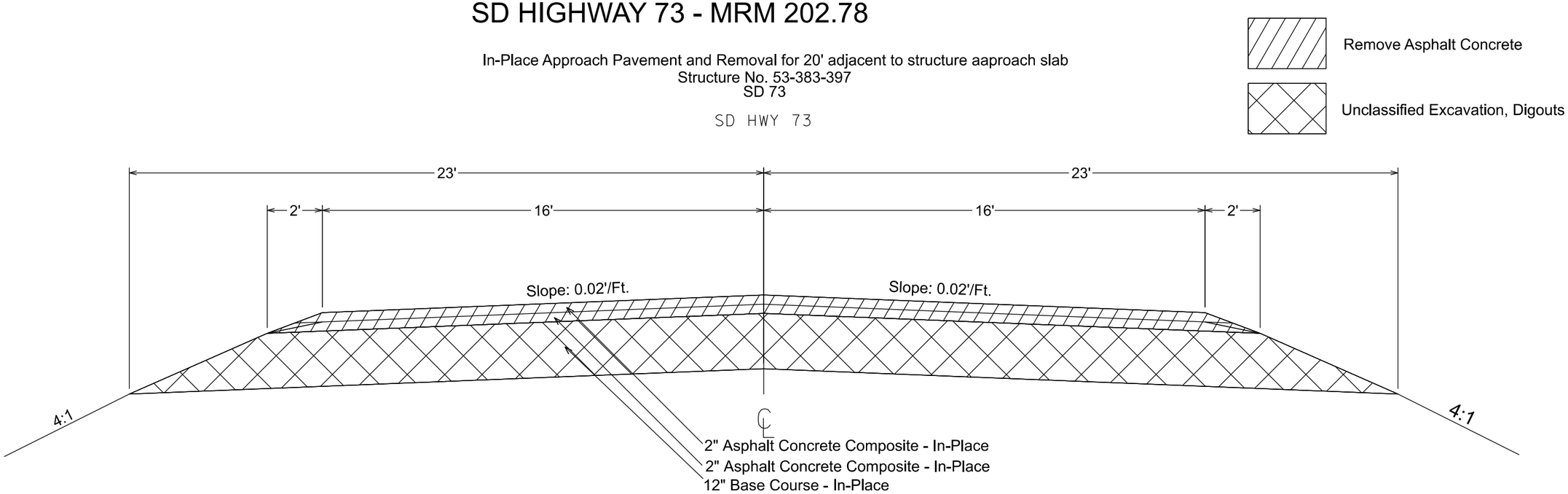
SD DOT	PROJECT	SECTION	SHEET
	P-B 0079(91)178 & NH 0073(86)19	F	9/32

Plotting Date: 08/10/2026

Str. No. 53-383-397
SD HIGHWAY 73 - MRM 202.78

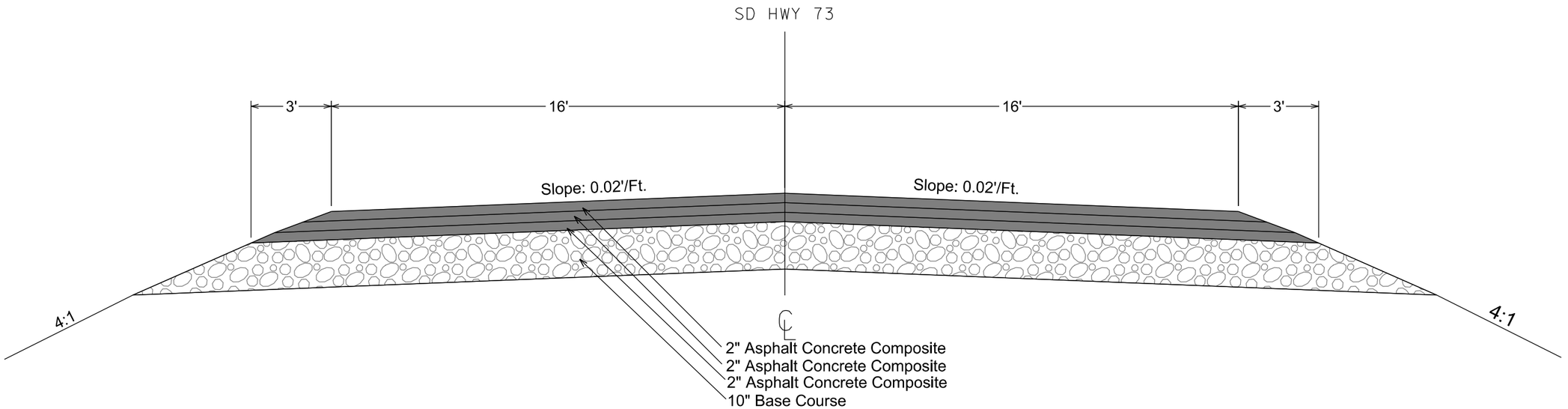
In-Place Approach Pavement and Removal for 20' adjacent to structure aaproach slab
Structure No. 53-383-397
SD 73

SD HWY 73



Approach Pavement Resurfacing Section for 20' adjacent to structure approach slab
Structure No. 53-383-397
SD 73

SD HWY 73



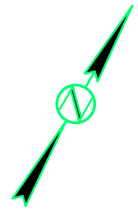
MILLING DETAILS

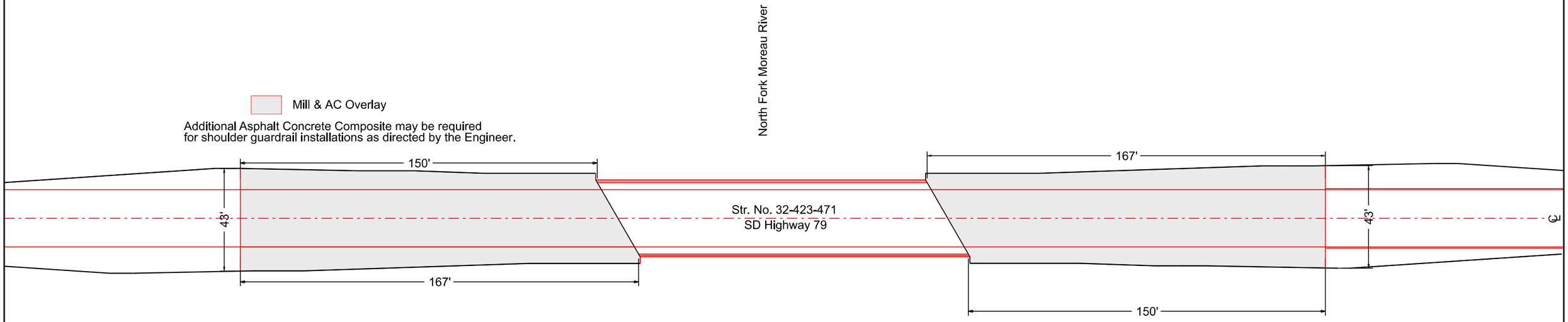
SD DOT	PROJECT	SECTION	SHEET
	P-B 0079(91)178 & NH 0073(86)19	F	10/32

Plotting Date: 08/10/2026

STR. NO. 32-423-471

SD HIGHWAY 79 - MRM 178.08





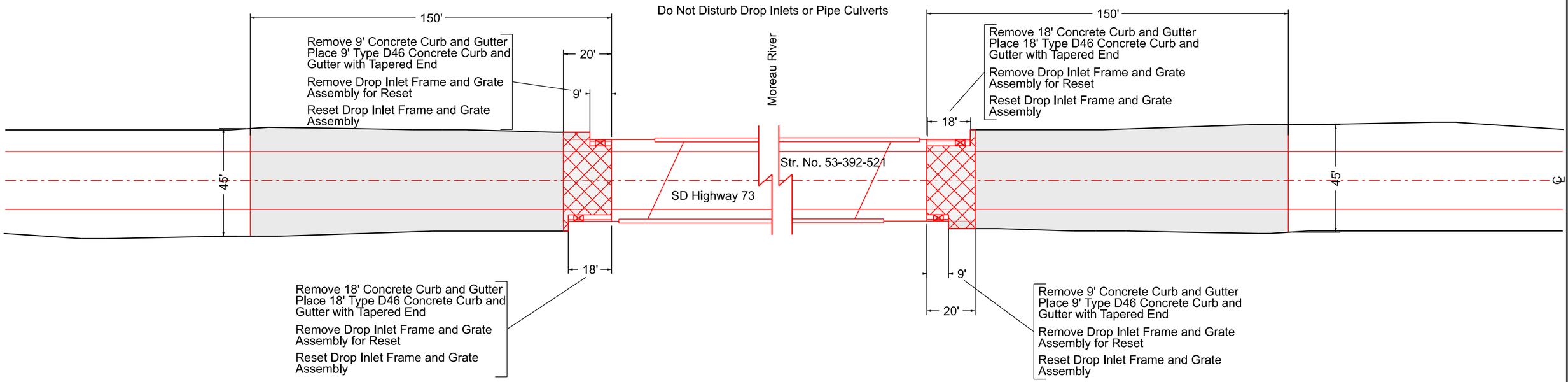
SD DOT	PROJECT	SECTION	SHEET
	P-B 0079(91)178 & NH 0073(86)19	F	11/32

Plotting Date: 08/10/2026

MILLING DETAILS

Str. No. 53-392-521

SD HIGHWAY 73 - MRM 190.11



Additional Asphalt Concrete Composite may be required
for shoulder guardrail installations as directed by the Engineer.

Mill & AC Overlay

Remove Asphalt Concrete, Unclassified Excavation, Digouts and Place Asphalt Concrete Composite

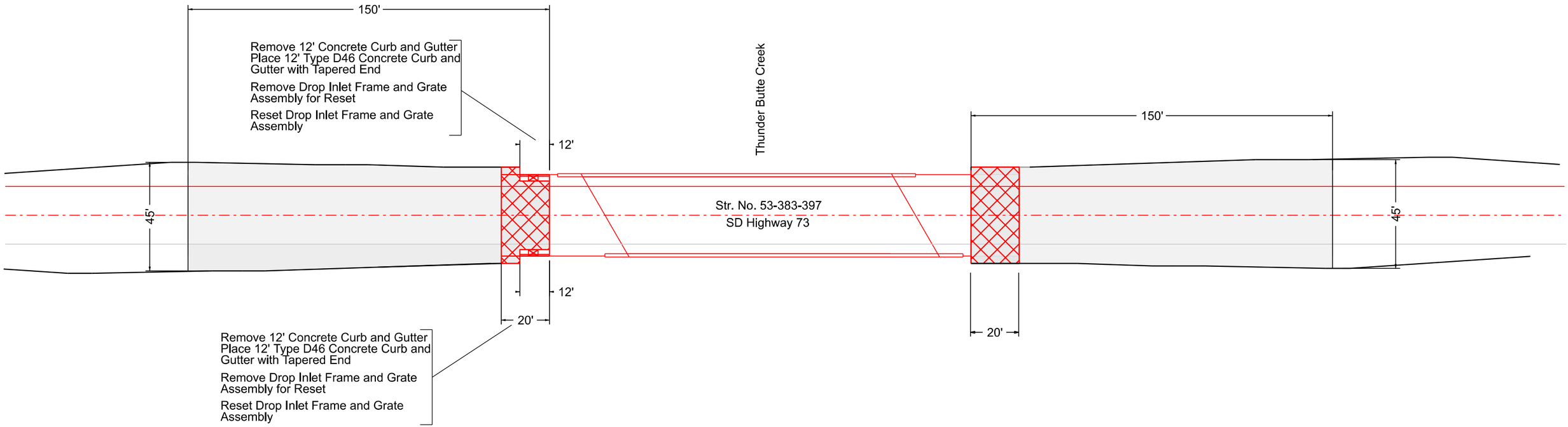
MILLING DETAILS

SD DOT	PROJECT	SECTION	SHEET
	P-B 0079(91)178 & NH 0073(86)19	F	12/32

Plotting Date: 09/04/2026 Revised 9/4/26 GDS

Str. No. 53-383-397

SD HIGHWAY 73 - MRM 202.78



Additional Asphalt Concrete Composite may be required for shoulder guardrail installations as directed by the Engineer.

Mill & AC Overlay

Remove Asphalt Concrete, Unclassified Excavation, Digouts and Place Asphalt Concrete Composite

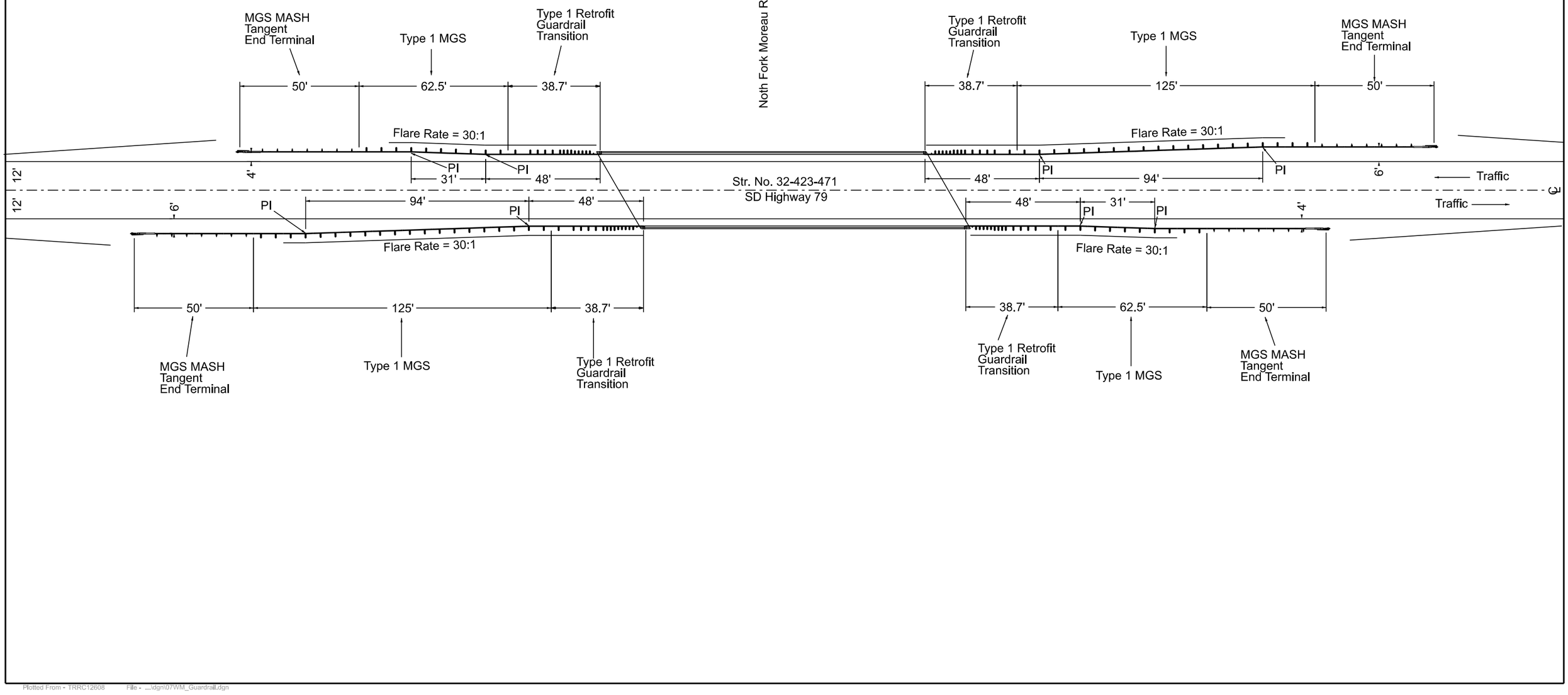
GUARDRAIL LAYOUT

SD DOT	PROJECT	SECTION	SHEET
	P-B 0079(91)178 & NH 0073(86)19	F	13/32

Plotting Date: 08/10/2026

STR. NO. 32-423-471

SD HIGHWAY 79 - MRM 178.08



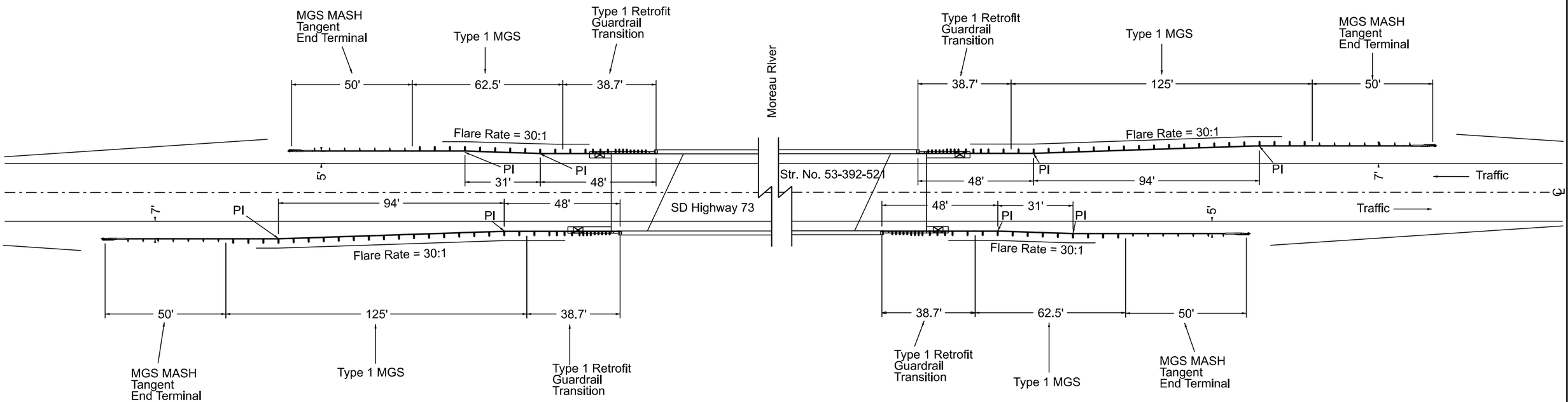
SD DOT	PROJECT	SECTION	SHEET
	P-B 0079(91)178 & NH 0073(86)19	F	14/32

Plotting Date: 08/10/2026

GUARDRAIL LAYOUT

Str. No. 53-392-521

SD HIGHWAY 73 - MRM 190.11



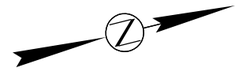
GUARDRAIL LAYOUT

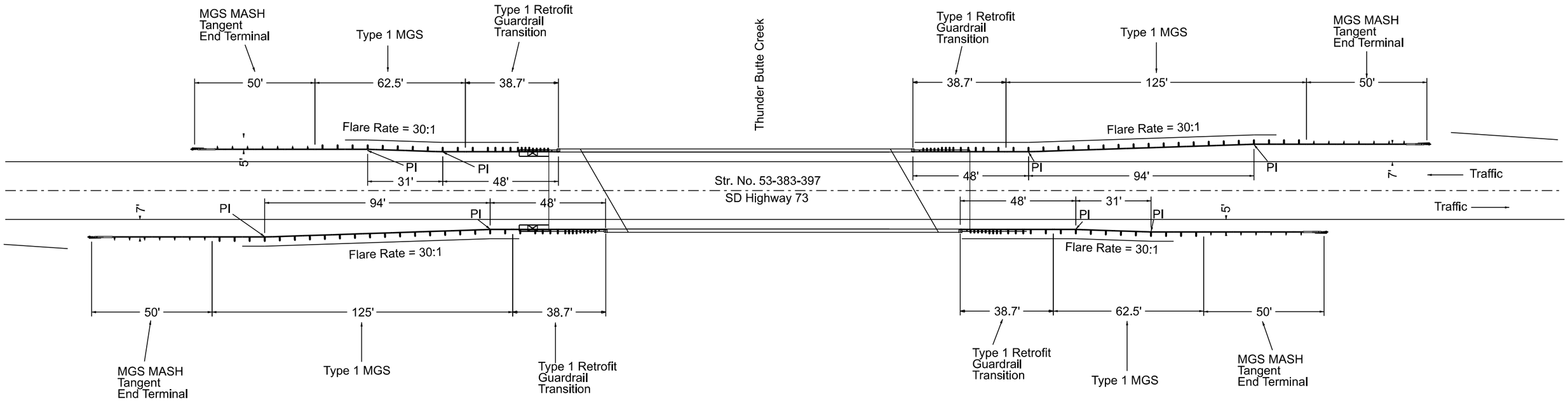
SD DOT	PROJECT	SECTION	SHEET
	P-B 0079(91)178 & NH 0073(86)19	F	15/32

Plotting Date: 08/10/2026

Str. No. 53-383-397

SD HIGHWAY 73 - MRM 202.78



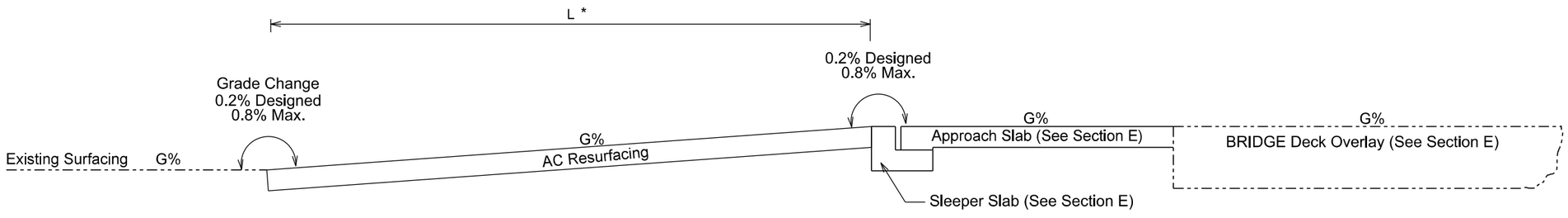


ASPHALT CONCRETE RESURFACING AT BRIDGE ENDS

G% = Longitudinal Grade
L = Length of Resurfacing (see table in plan notes)

* Increase the Length of Resurfacing if the elevation change exceeds 1" elevation change per 40'

APPROACH PAVEMENT PROFILE



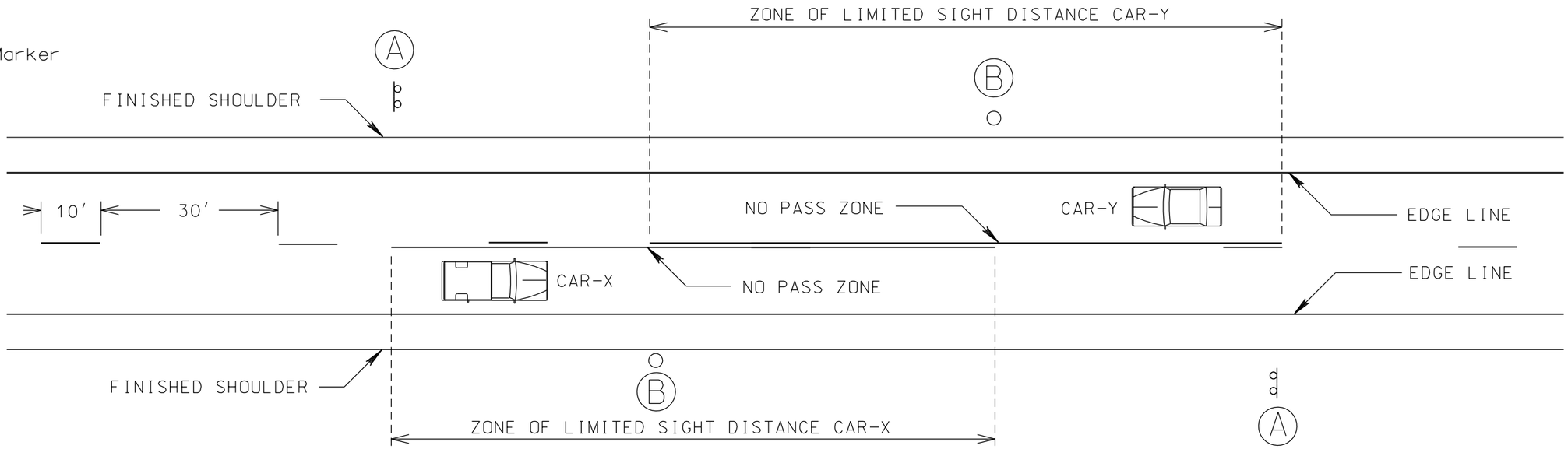
TYPICAL PAVEMENT MARKING LAYOUT

SD DOT	PROJECT	SECTION	SHEET
	P-B 0079(91)178 P 0045(70)224 & NH 0073(86)19	F	17/32

Plotting Date: 08/10/2026

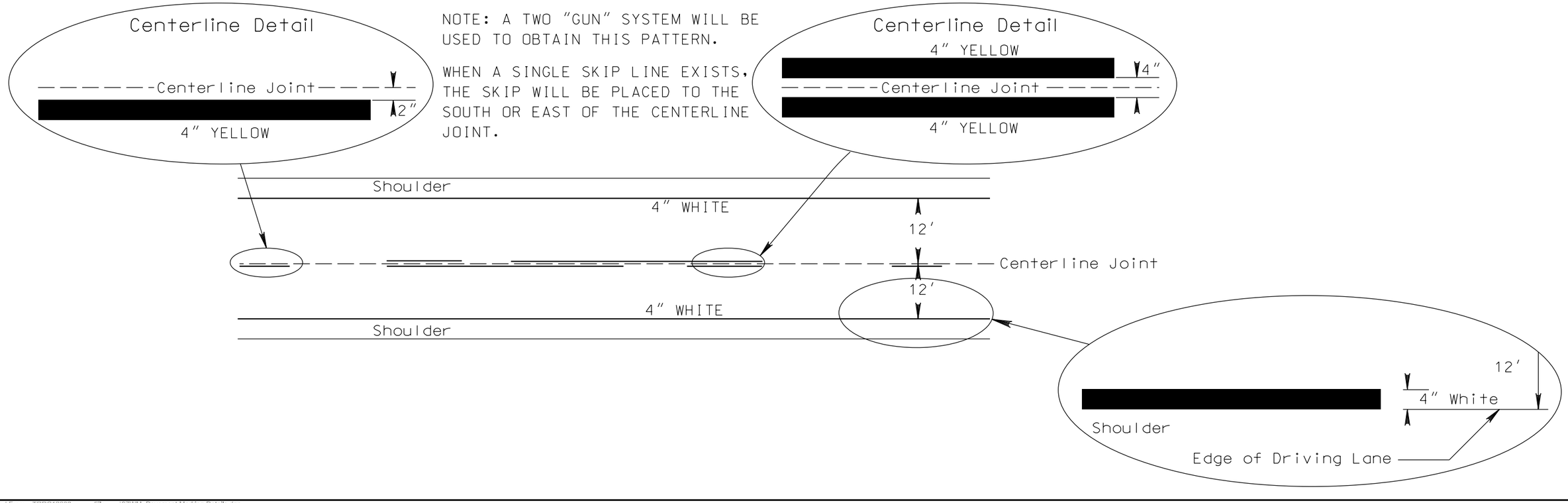
(A) NO PASSING ZONE

(B) End of Zone Marker



NOTE: A TWO "GUN" SYSTEM WILL BE USED TO OBTAIN THIS PATTERN.

WHEN A SINGLE SKIP LINE EXISTS, THE SKIP WILL BE PLACED TO THE SOUTH OR EAST OF THE CENTERLINE JOINT.



SD DOT	PROJECT	SECTION	SHEET
	P-B 0079(91)178 & NH 0073(86)19	F	18/32

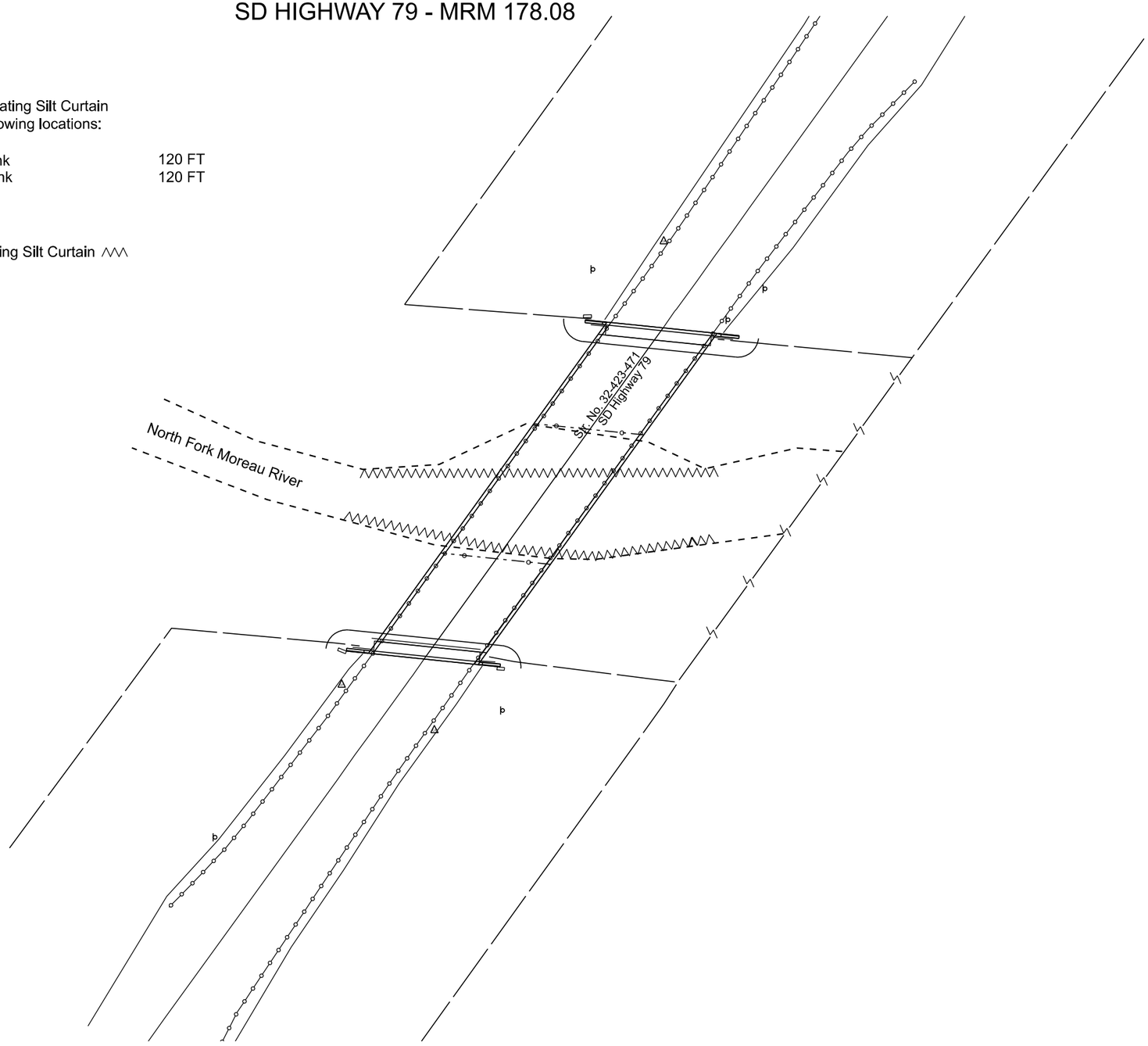
EROSION CONTROL DETAILS

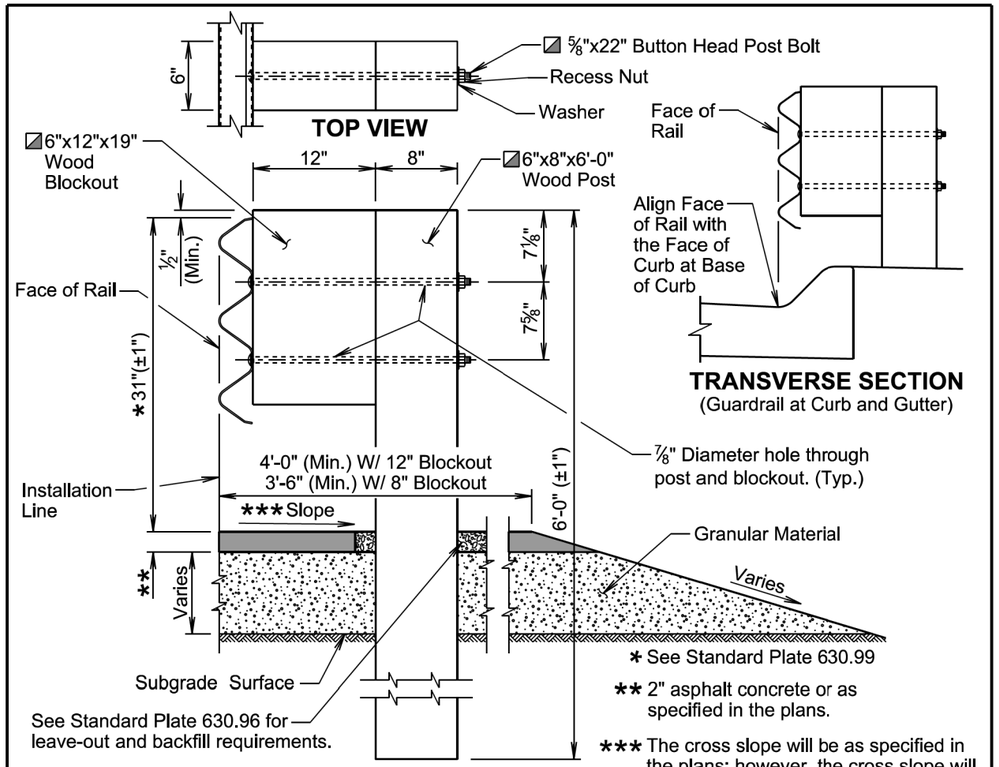
STR. NO. 32-423-471
SD HIGHWAY 79 - MRM 178.08

Install Floating Silt Curtain
at the following locations:

North Bank	120 FT
South Bank	120 FT

Floating Silt Curtain ^^^





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.

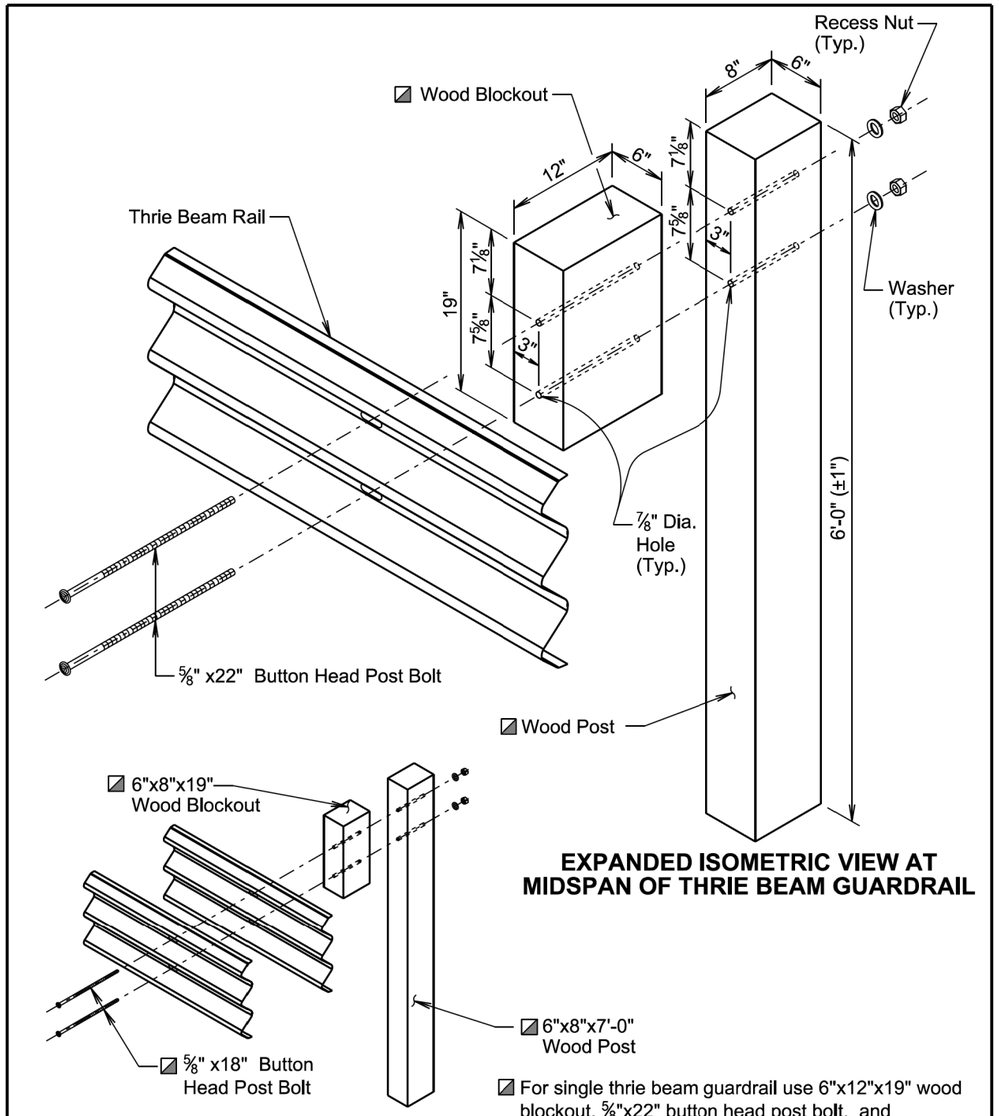
☑ The post and blockout illustrated above is typical for single thrie beam guardrail. When other variations of posts and blockouts are specified on other standard plates (e.g. transitions) then the posts and blockouts will be as specified on the other standard plates or as specified in the plans.

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.

The top of post and top of block will have a true square cut. The top of block will be a maximum of ±½ inch from the top of the post.

April 8, 2025

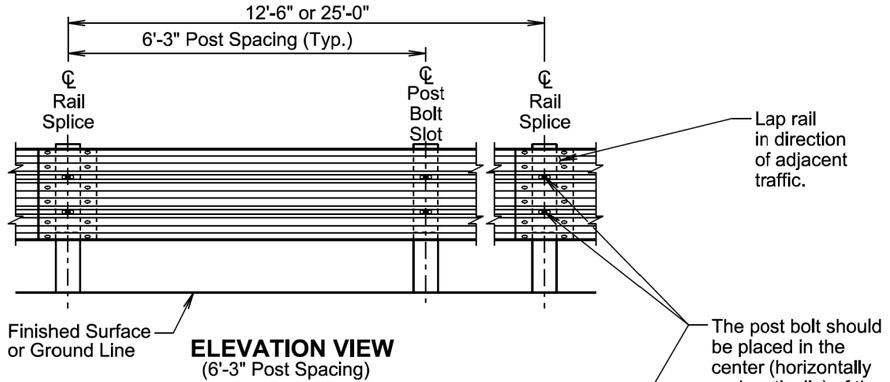
Published Date: 2027	SDDOT	THRIE BEAM GUARDRAIL	PLATE NUMBER 630.01
			Sheet 1 of 5



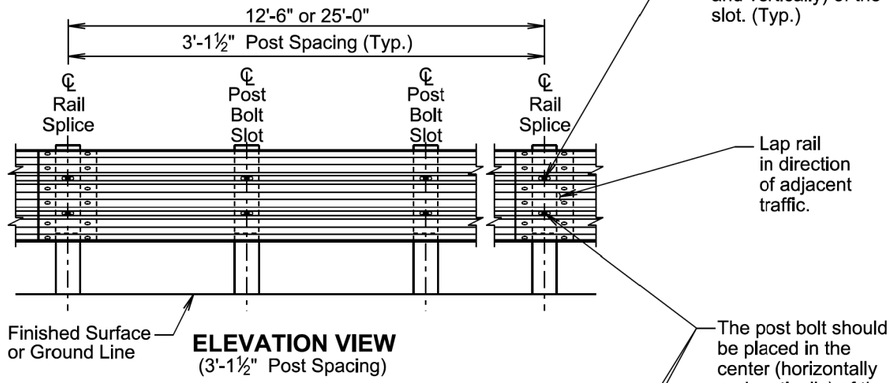
☑ For single thrie beam guardrail use 6"x12"x19" wood blockout, ⅝"x22" button head post bolt, and 6"x8"x6'-0" wood post. For double (nested) thrie beam guardrail use 6"x8"x19" wood blockout, ⅝"x18" button head post bolt, and 6"x8"x7'-0" wood post.

April 8, 2025

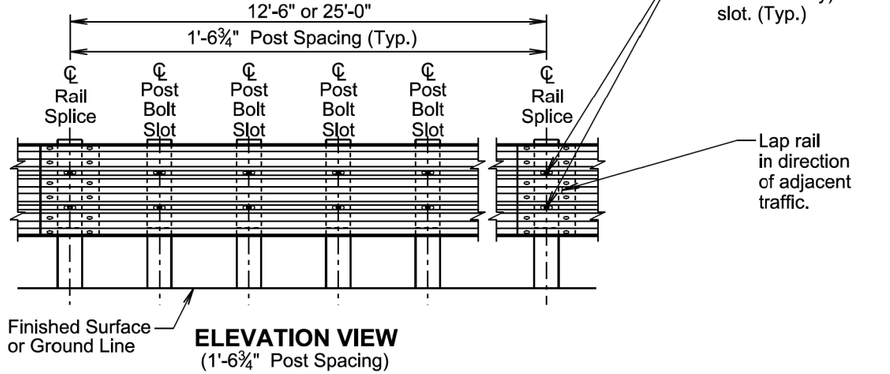
Published Date: 2027	SDDOT	THRIE BEAM GUARDRAIL	PLATE NUMBER 630.01
			Sheet 2 of 5



ELEVATION VIEW
(6'-3" Post Spacing)



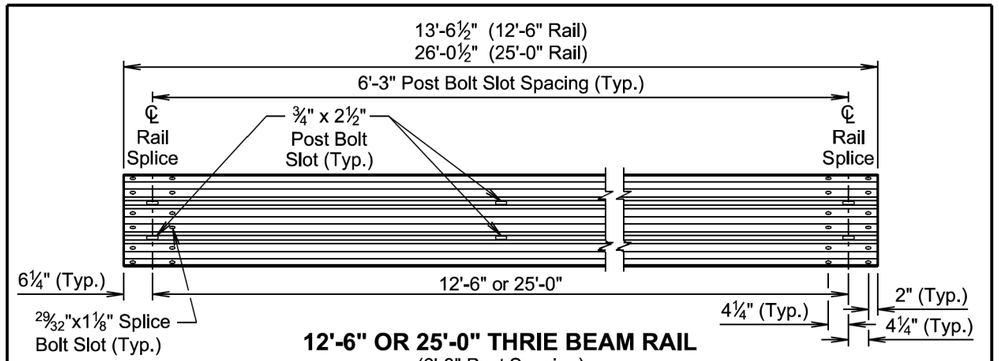
ELEVATION VIEW
(3'-1½" Post Spacing)



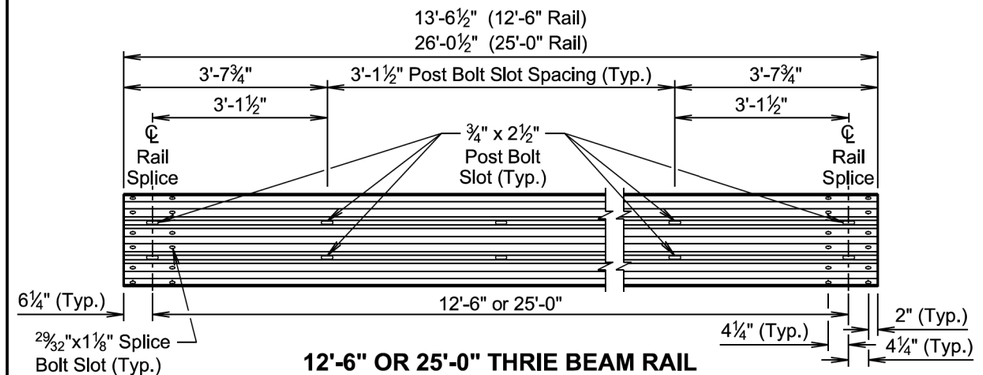
ELEVATION VIEW
(1'-6¾" Post Spacing)

April 8, 2025

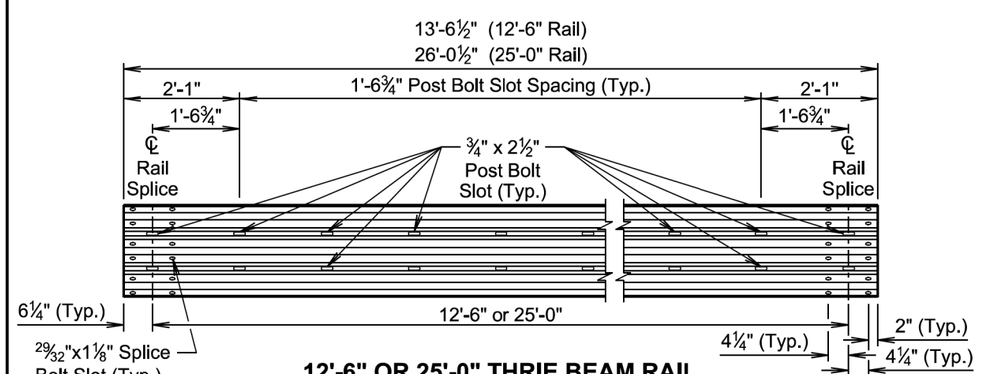
Published Date: 2027	SDDOT	THRIE BEAM GUARDRAIL	PLATE NUMBER 630.01
			Sheet 3 of 5



12'-6" OR 25'-0" THRIE BEAM RAIL
(6'-3" Post Spacing)



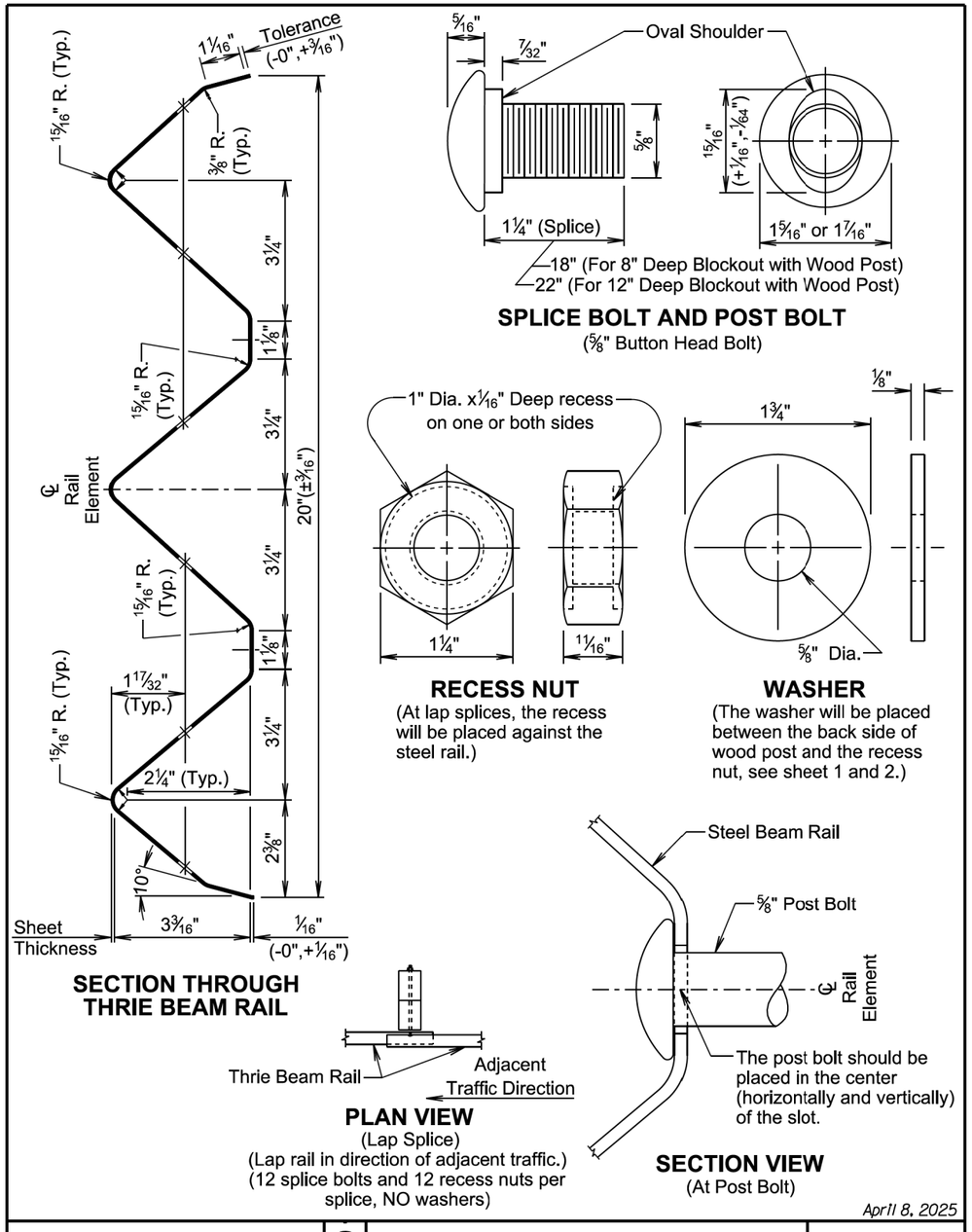
12'-6" OR 25'-0" THRIE BEAM RAIL
(3'-1½" Post Spacing)



12'-6" OR 25'-0" THRIE BEAM RAIL
(1'-6¾" Post Spacing)

April 8, 2025

Published Date: 2027	SDDOT	THRIE BEAM GUARDRAIL	PLATE NUMBER 630.01
			Sheet 4 of 5



SPLICE BOLT AND POST BOLT
(5/8" Button Head Bolt)

RECESS NUT
(At lap splices, the recess will be placed against the steel rail.)

WASHER
(The washer will be placed between the back side of wood post and the recess nut, see sheet 1 and 2.)

SECTION THROUGH THRIE BEAM RAIL

PLAN VIEW
(Lap Splice)
(Lap rail in direction of adjacent traffic.)
(12 splice bolts and 12 recess nuts per splice, NO washers)

SECTION VIEW
(At Post Bolt)

April 8, 2025

Published Date: 2027	SDDOT	THRIE BEAM GUARDRAIL	PLATE NUMBER 630.01
			Sheet 5 of 5

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.

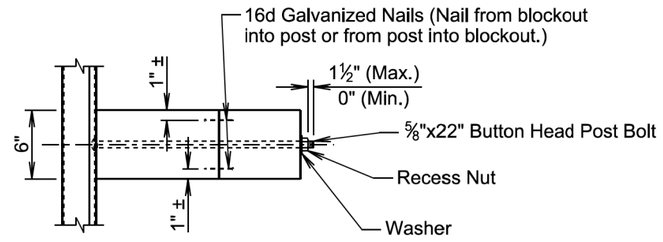
W beam rail section lengths may be 12'-6" and/or 25'-0". The combination of section lengths used will be compatible with the total length of rail per site as shown in the plans.

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.

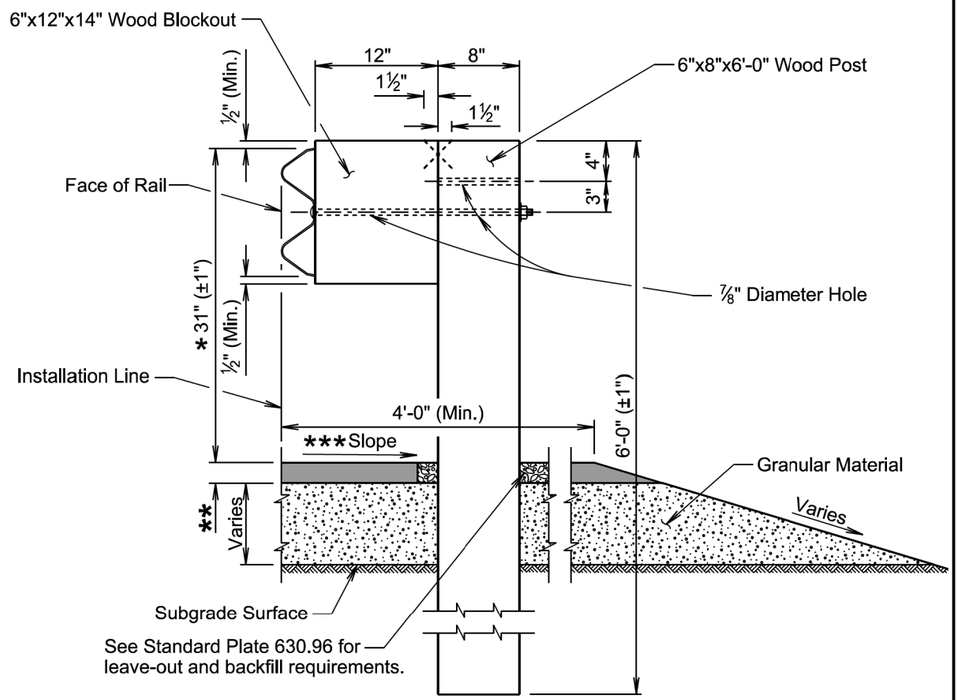
All costs for constructing the MGS including labor, equipment, and materials including all posts, blockouts, steel beam rail, and hardware will be incidental to the contract unit price per foot for the respective MGS contract item.

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Published Date: 2027	SDDOT	MIDWEST GUARDRAIL SYSTEM (MGS)	PLATE NUMBER 630.20
			Sheet 1 of 6



TOP VIEW
(Type 1, 2, or 3 MGS Installation)



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

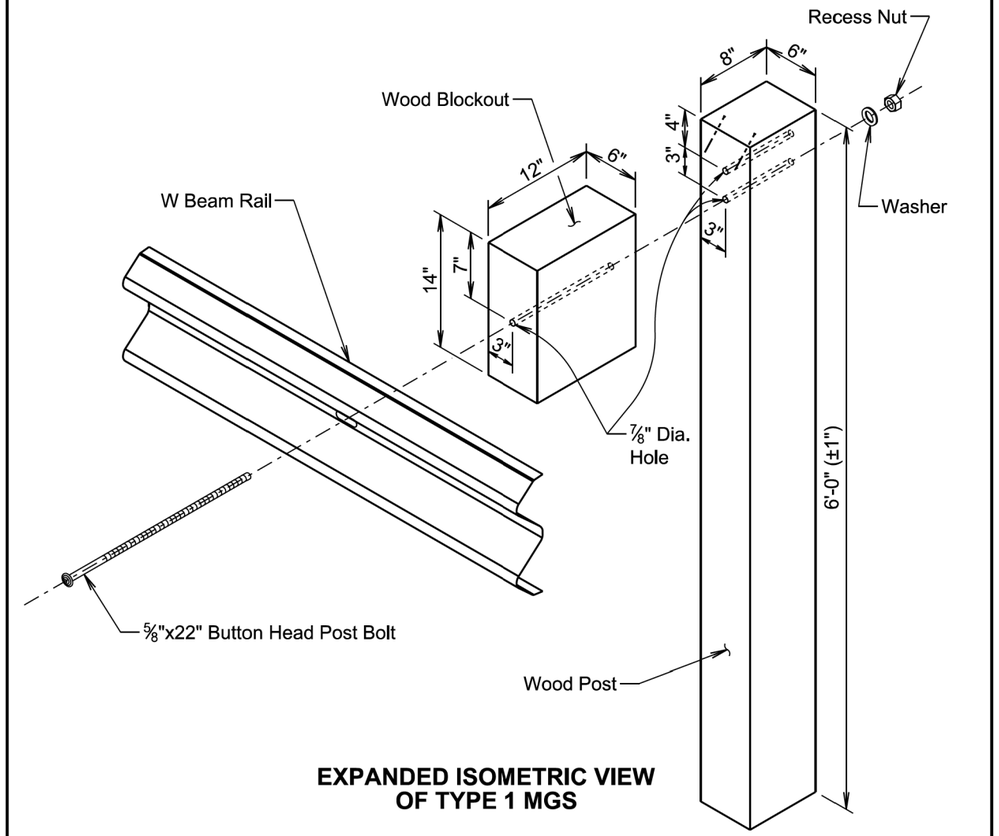
* See Standard Plate 630.99

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

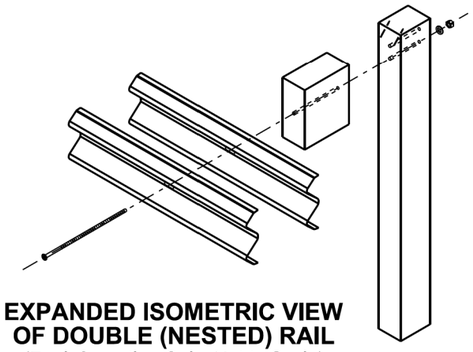
*** The cross slope will be as specified in the plans; however, the cross slope will not be steeper than a 10:1 slope.

April 8, 2025

Published Date: 2027	SDDOT	MIDWEST GUARDRAIL SYSTEM (MGS)	PLATE NUMBER 630.20
			Sheet 2 of 6



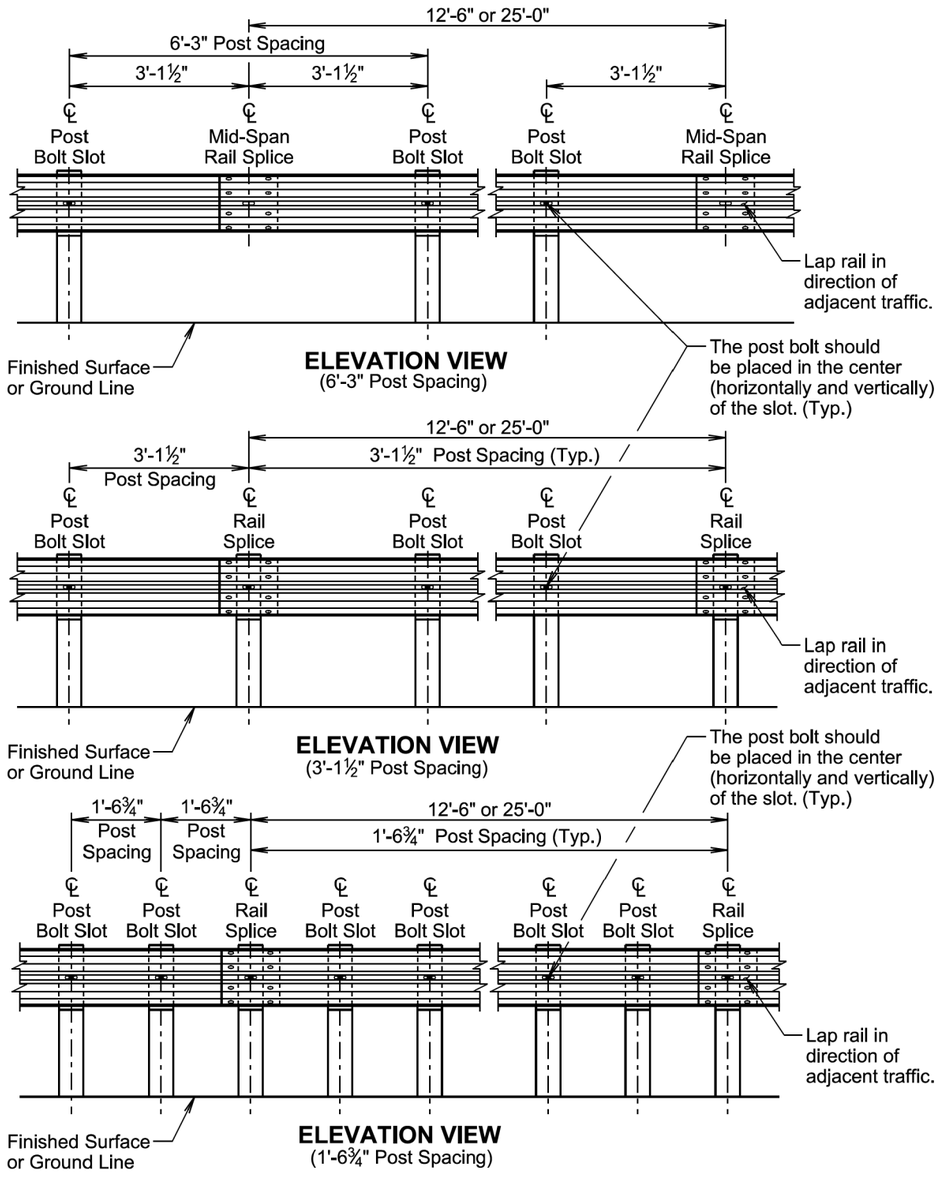
EXPANDED ISOMETRIC VIEW OF TYPE 1 MGS



EXPANDED ISOMETRIC VIEW OF DOUBLE (NESTED) RAIL
(For Information Only, Not to Scale)

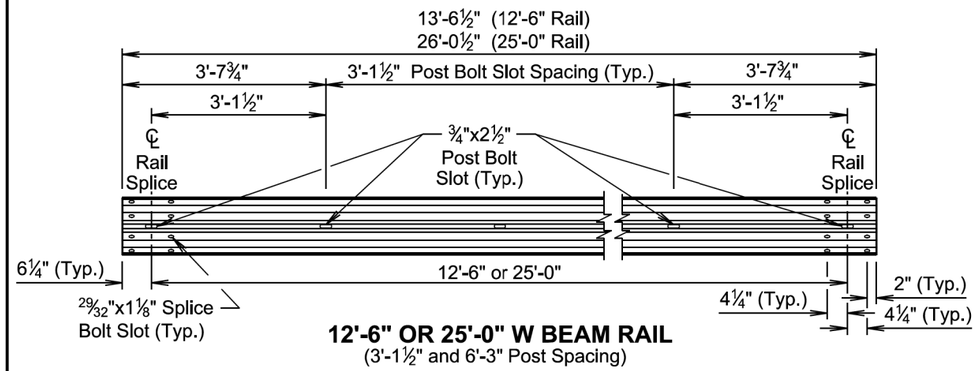
April 8, 2025

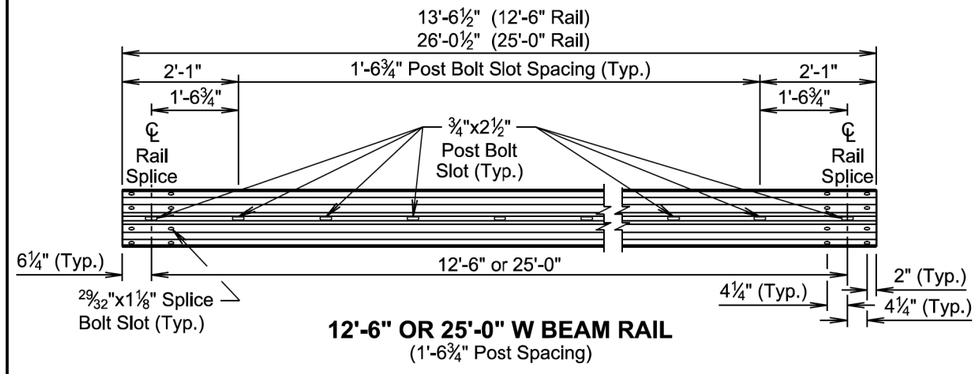
Published Date: 2027	SDDOT	MIDWEST GUARDRAIL SYSTEM (MGS)	PLATE NUMBER 630.20
			Sheet 3 of 6



April 8, 2025

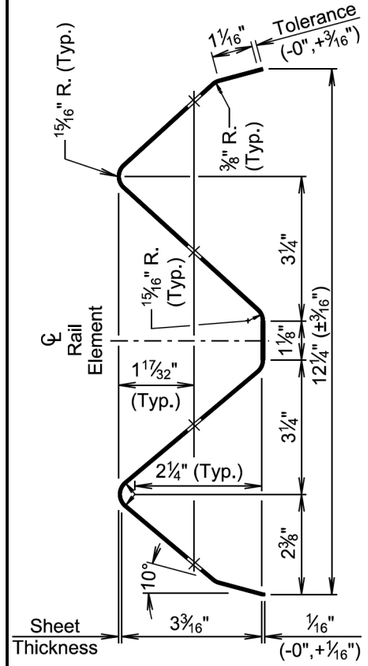
Published Date: 2027	SDDOT	MIDWEST GUARDRAIL SYSTEM (MGS)	PLATE NUMBER 630.20
			Sheet 4 of 6



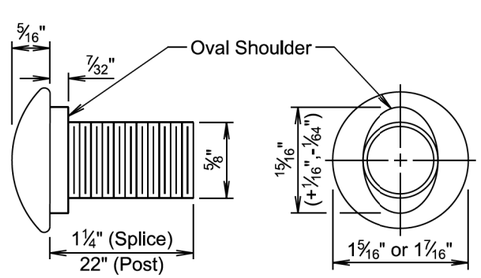


April 8, 2025

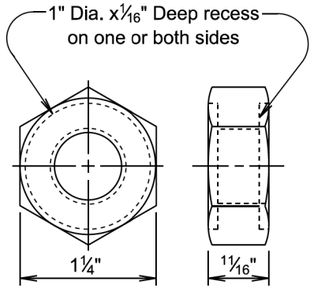
Published Date: 2027	SDDOT	MIDWEST GUARDRAIL SYSTEM (MGS)	PLATE NUMBER 630.20
			Sheet 5 of 6



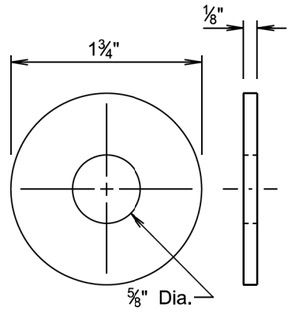
SECTION THROUGH W BEAM RAIL



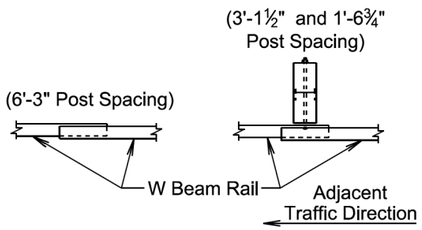
SPLICE BOLT AND POST BOLT
(5/8" Button Head Bolt)



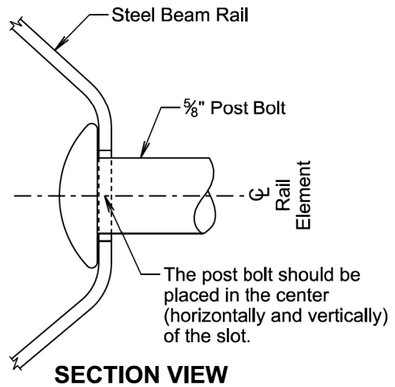
RECESS NUT
(At lap splices, the recess will be placed against the steel rail.)



WASHER
(The washer will be placed between the back side of wood post and the recess nut, see sheet 2 and 3.)



PLAN VIEW
(Lap Splice)
(Lap rail in direction of adjacent traffic.)
(8 splice bolts and 8 recess nuts per splice, NO washers)

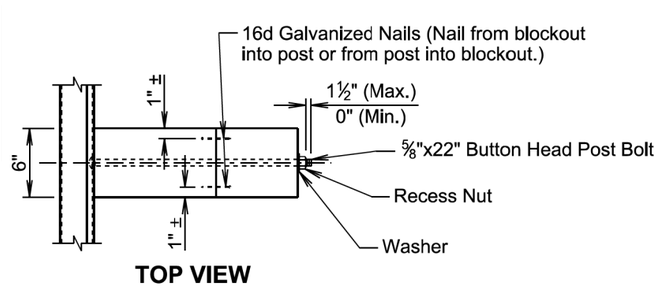


SECTION VIEW
(At Post Bolt)

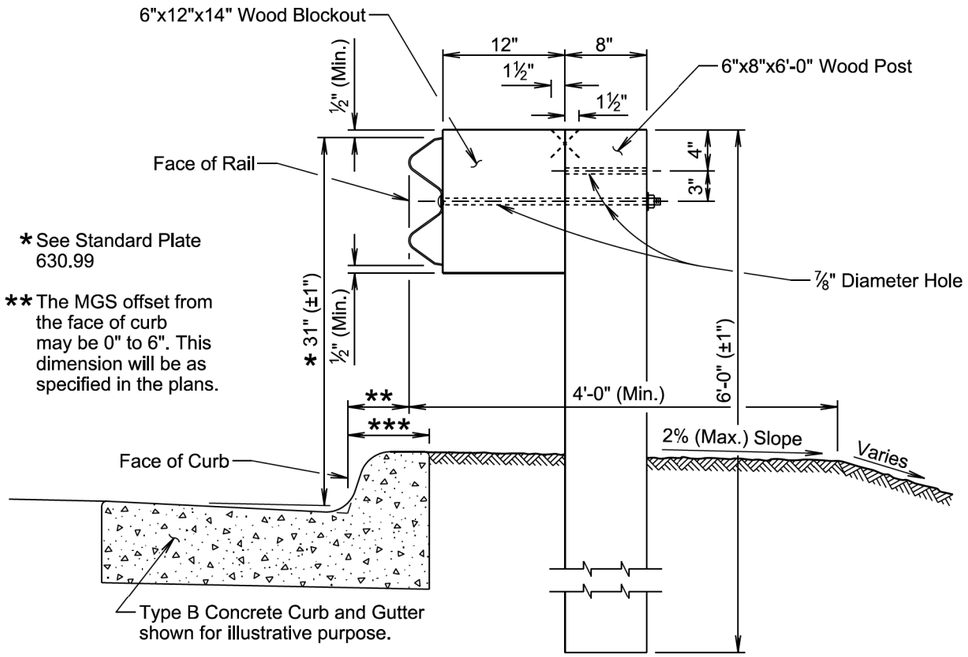
April 8, 2025

Published Date: 2027	SDDOT	MIDWEST GUARDRAIL SYSTEM (MGS)	PLATE NUMBER 630.20
			Sheet 6 of 6

CONCRETE CURB AND GUTTER TYPE	DIMENSION *** (in.)
B and BL	8
D	12
F and FL	10
R	11



TOP VIEW



TRANSVERSE SECTION

* See Standard Plate 630.99

** The MGS offset from the face of curb may be 0" to 6". This dimension will be as specified in the plans.

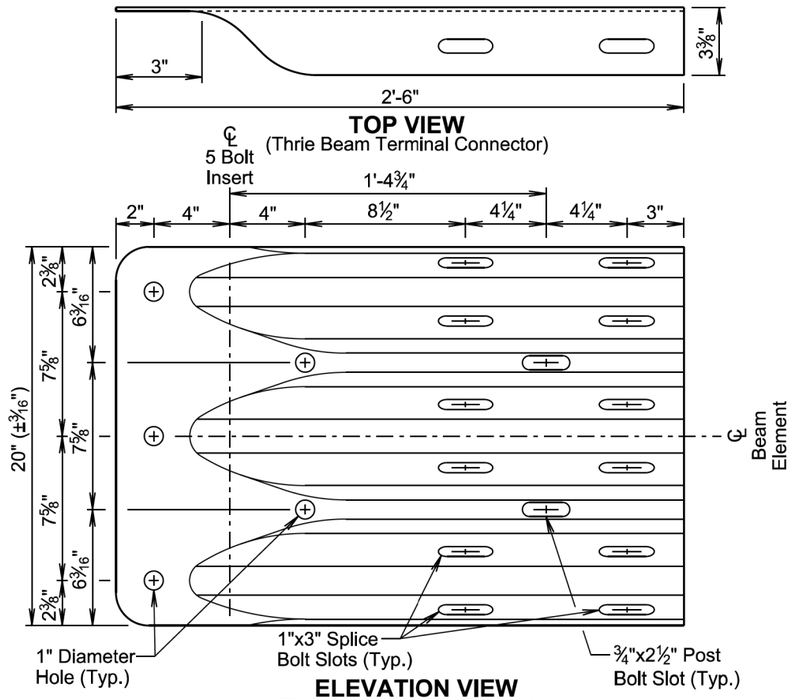
GENERAL NOTES:

The guardrail on this standard plate is Type 1 MGS. See standard plate 630.20 for specifications regarding Type 1 MGS.

When PCC pavement or asphalt concrete pavement is adjacent to the post, see standard plate 630.96 for leave-out and backfill requirements.

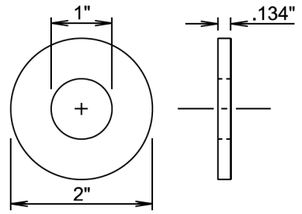
April 8, 2025

Published Date: 2027	SDDOT	MIDWEST GUARDRAIL SYSTEM (MGS) AT CURB AND GUTTER	PLATE NUMBER 630.22
			Sheet 1 of 1

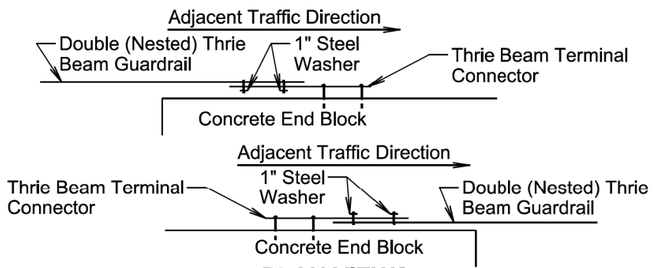


TOP VIEW
(Thrie Beam Terminal Connector)

ELEVATION VIEW
(Thrie Beam Terminal Connector)



1" STEEL WASHER
(12 washers required)



PLAN VIEWS
(Typical Locations of 1" Steel Washers)
(Washers are required at these lap splices)

GENERAL NOTES:

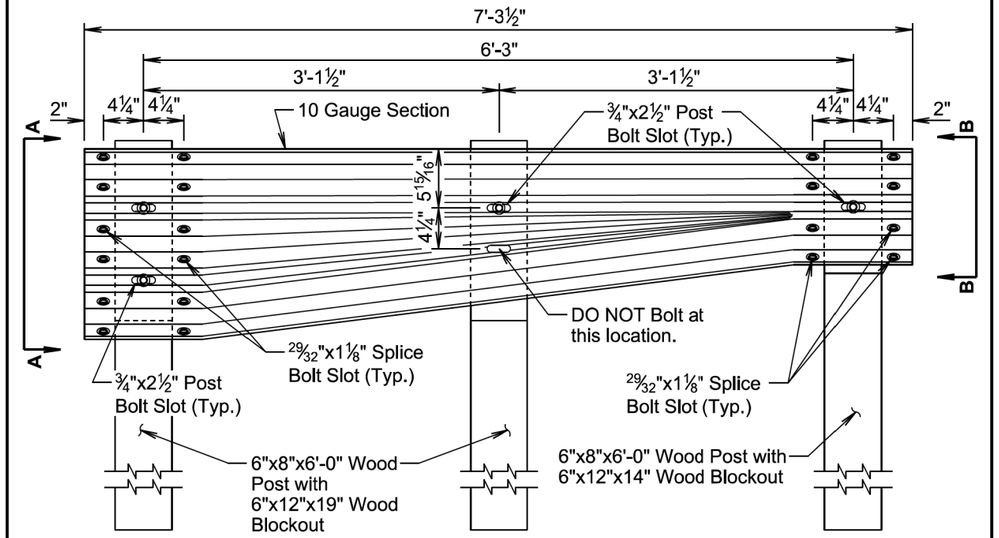
Thrie Beam Terminal Connectors will be 10 gauge.

When the thrie beam terminal connector is used to connect the rail to the bridge or concrete end block, 1" steel washers will be used at the lap splice and the washers will be in direct contact with the 3" slots of the thrie beam terminal connector. See the drawings above for the typical locations of the 1" steel washers.

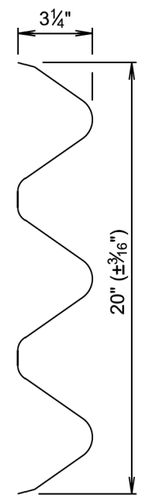
There will be no separate payment for furnishing and installing the thrie beam terminal connector. All costs for furnishing and installing the thrie beam terminal connector will be incidental to the contract unit price of the respective guardrail item it is attached to.

September 14, 2019

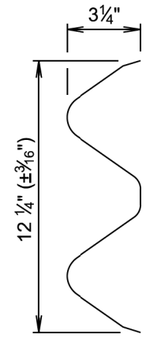
Published Date: 2027	SDDOT	THRIE BEAM TERMINAL CONNECTOR	PLATE NUMBER 630.47
			Sheet 1 of 1



ELEVATION VIEW



VIEW A-A



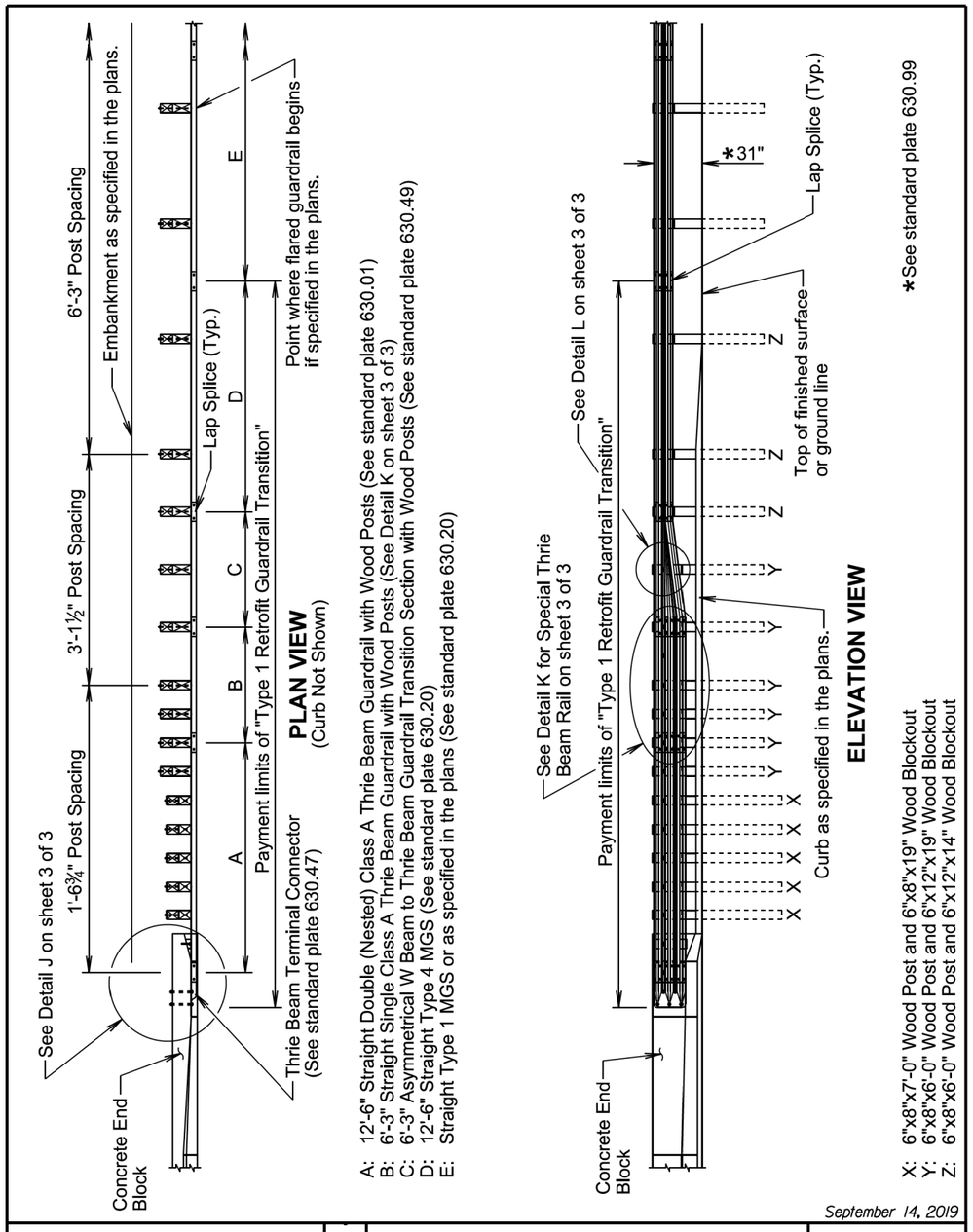
VIEW B-B

GENERAL NOTES:

All costs for furnishing and installing the asymmetrical W beam to thrie beam guardrail transition including labor, equipment, and materials including two posts, two blocks, asymmetrical W beam to thrie beam transition section, and hardware will be incidental to the contract unit price per each for the corresponding guardrail transition contract item.

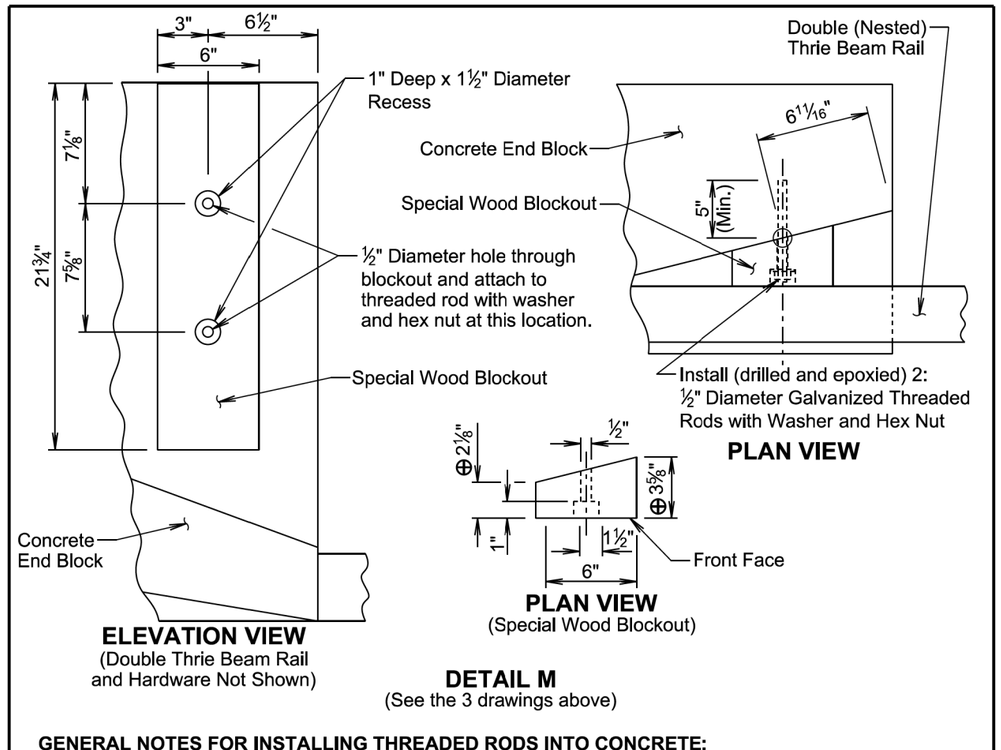
September 14, 2019

Published Date: 2027	SDDOT	ASYMMETRICAL W BEAM TO THRIE BEAM GUARDRAIL TRANSITION SECTION	PLATE NUMBER 630.49
			Sheet 1 of 1



September 14, 2019

Published Date: 2027	SDDOT	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 blockout will be cut as necessary such that the front face of the special wood blockout will align with the vertical front face of the concrete end block ±½".

The threaded rods will be ½" 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 ⅛" greater or more than ⅜" 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.

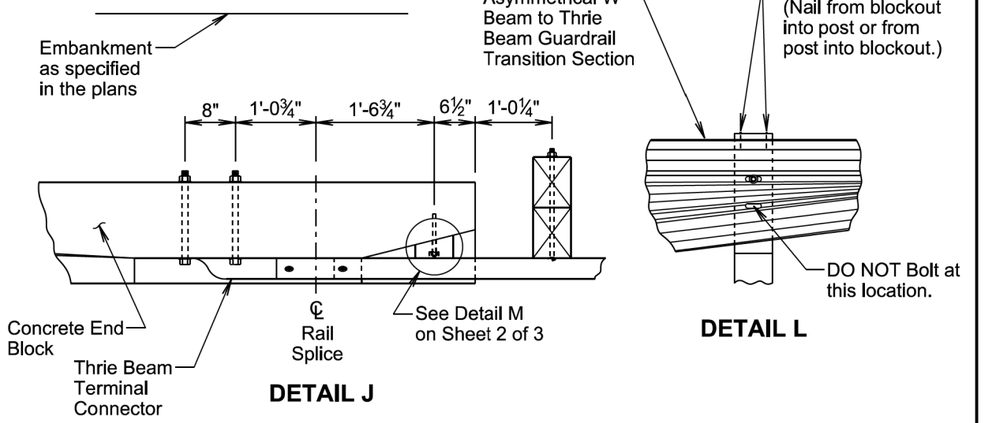
The epoxy resin mixture will be of a type for bonding steel to hardened concrete and will conform to AASHTO M235 Type IV, Grade 3 (Equivalent to ASTM C881, Type IV, Grade 3).

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 ⅓ to ½ 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.

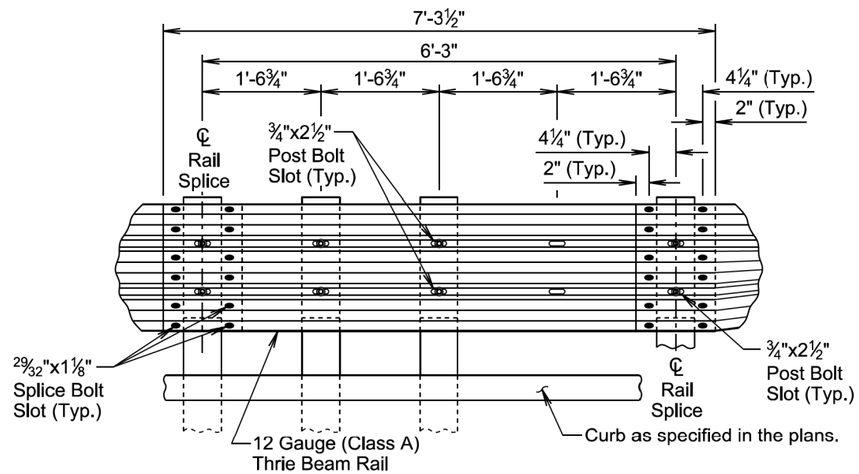
September 14, 2019

Published Date: 2027	SDDOT	TYPE 1 RETROFIT GUARDRAIL TRANSITION (CONCRETE END BLOCK TO MIDWEST GUARDRAIL SYSTEM (MGS))	PLATE NUMBER 630.51	Sheet 2 of 3



DETAIL J

DETAIL L



DETAIL K
(Special Thrie Beam Rail)

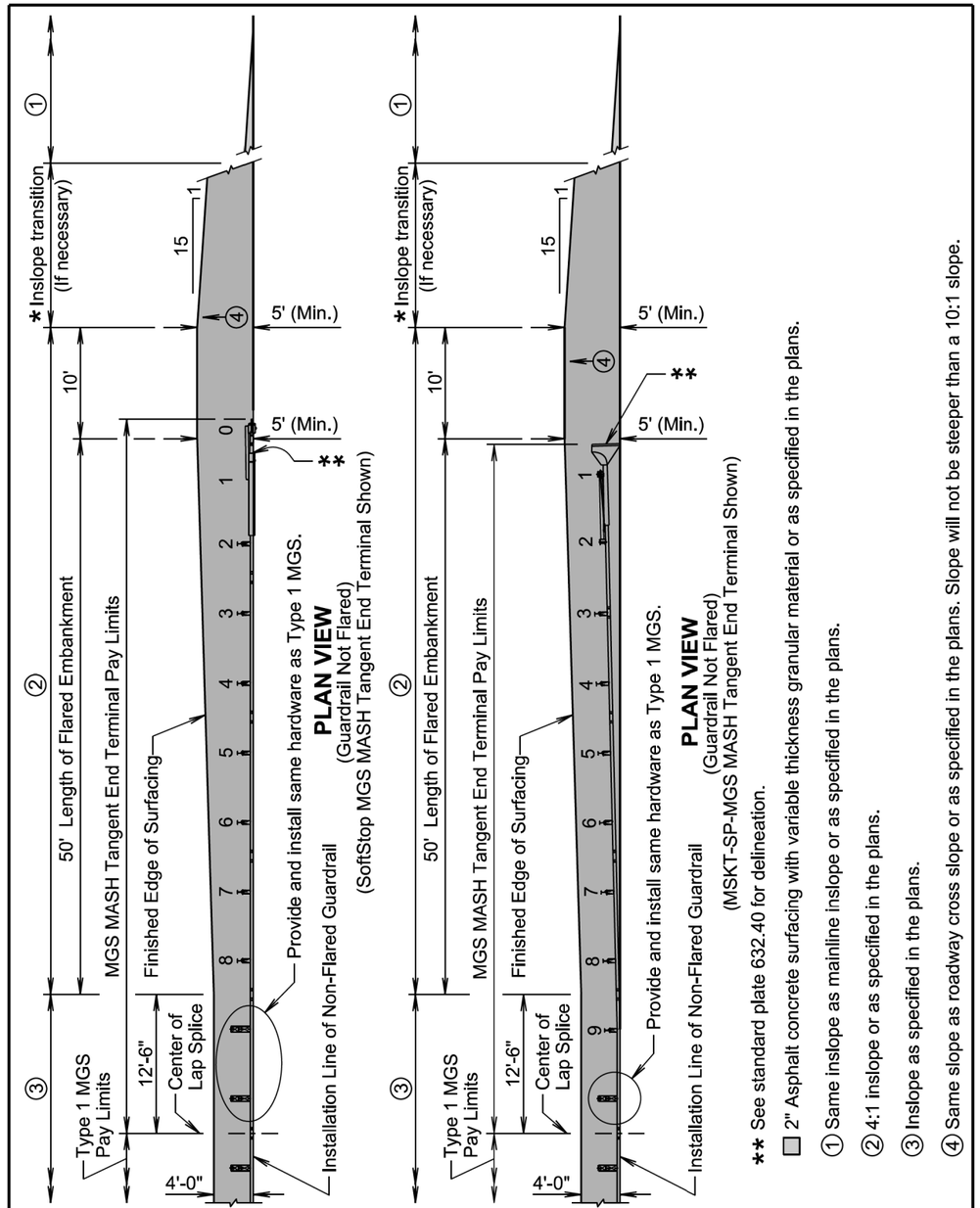
GENERAL NOTES:

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".

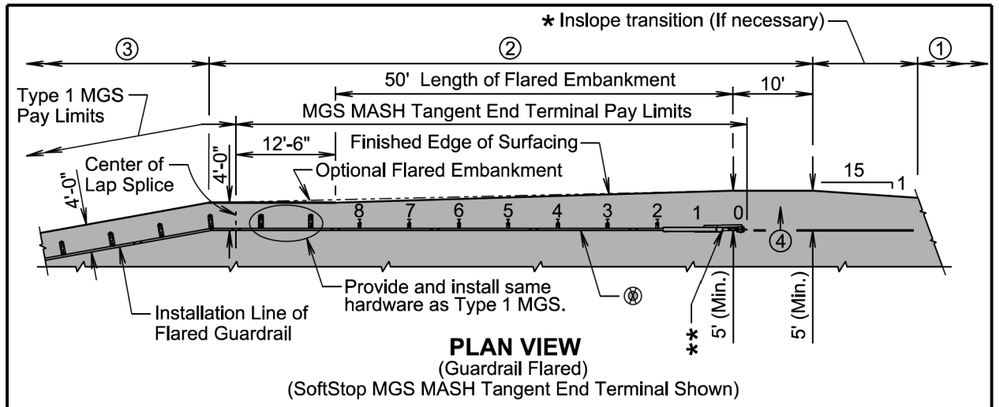
September 14, 2019

Published Date: 2027	SDDOT	TYPE 1 RETROFIT GUARDRAIL TRANSITION (CONCRETE END BLOCK TO MIDWEST GUARDRAIL SYSTEM (MGS))	PLATE NUMBER 630.51
			Sheet 3 of 3

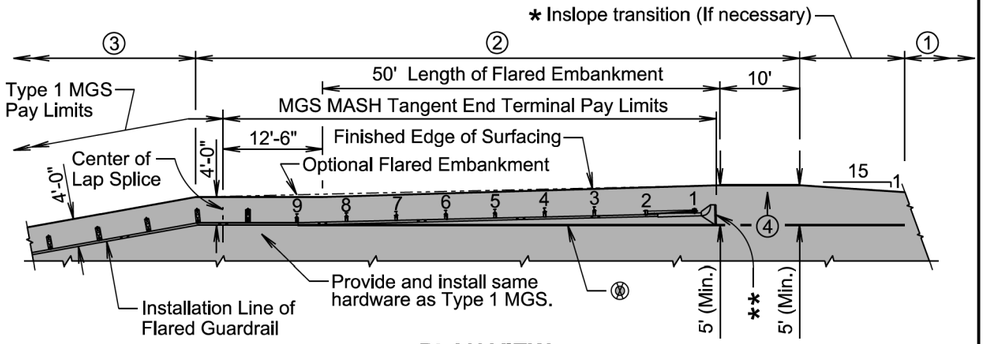


April 8, 2025

Published Date: 2027	SDDOT	EMBANKMENT, SURFACING, AND PAYMENT LIMITS FOR MGS MASH TANGENT END TERMINAL	PLATE NUMBER 630.89
			Sheet 1 of 3



PLAN VIEW
(Guardrail Flared)
(SoftStop MGS MASH Tangent End Terminal Shown)



PLAN VIEW
(Guardrail Flared)
(MSKT-SP-MGS MASH Tangent End Terminal Shown)

GENERAL NOTES:

The MGS MASH tangent end terminals above are for illustrative purpose only. Pay limit length of the MGS MASH tangent end terminal is 62'-6".

* The length of inslope transition varies with the amount of change between inslopes. The length of the transition will change 100' for every whole number change in the inslope. For Example: If the inslope changes from a 5:1 to a 4:1 the length of the inslope transition would be 100'. If the inslope changes from a 6:1 to a 4:1 the length of the inslope transition would be 200'.

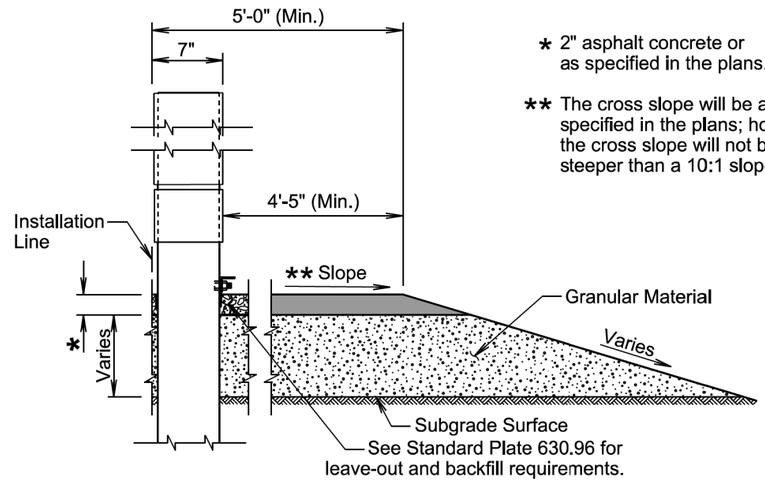
Ⓜ The installation reference line for MGS MASH tangent end terminals will always be parallel to the roadway.

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."

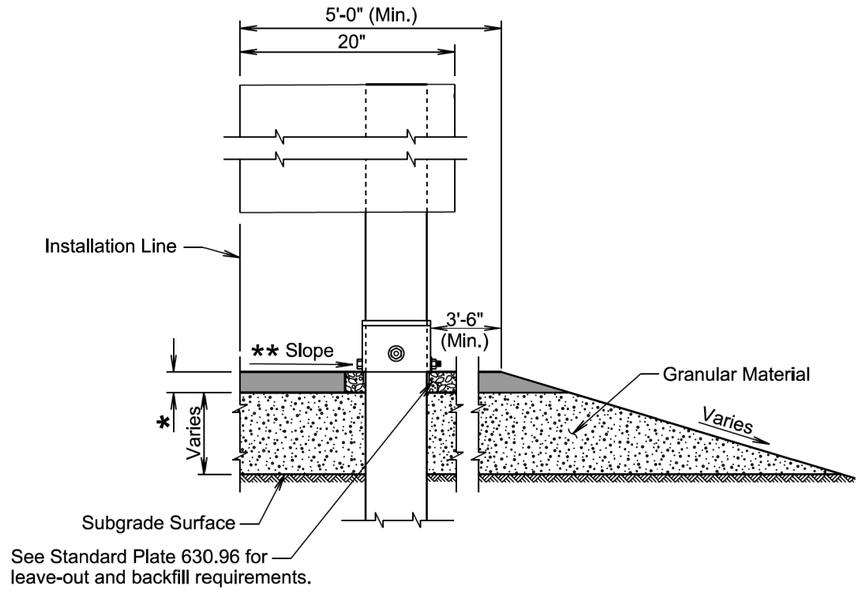
Granular material will be the same type used elsewhere on the project or will be as specified in the plans. If granular material type is not specified in the plans, the material will conform to the Specifications for "Base Course". The granular material will be placed the same thickness as the mainline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

April 8, 2025

Published Date: 2027	SDDOT	EMBANKMENT, SURFACING, AND PAYMENT LIMITS FOR MGS MASH TANGENT END TERMINAL	PLATE NUMBER 630.89	Sheet 2 of 3



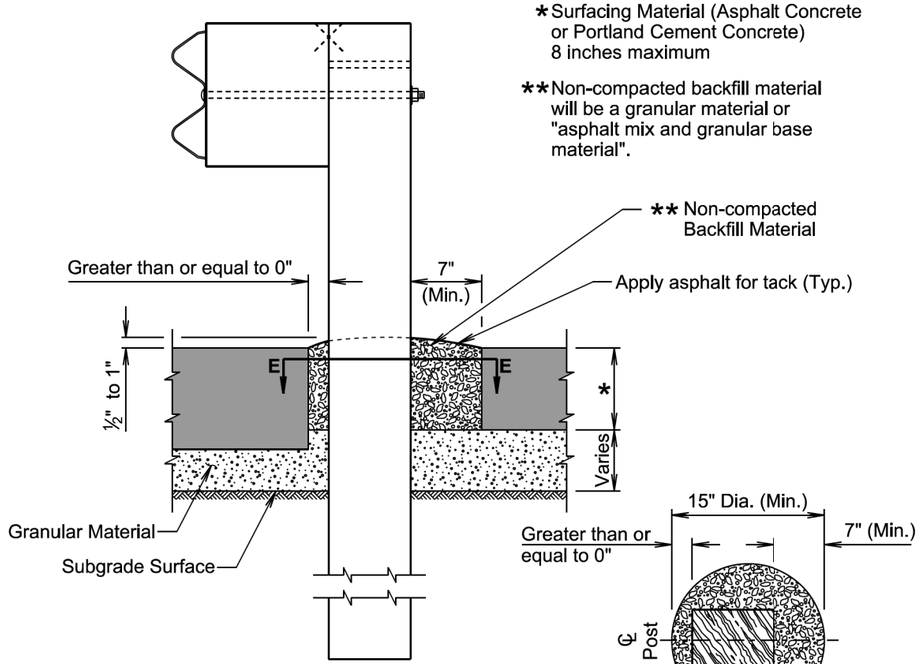
TRANSVERSE SECTION
(SoftStop MGS MASH Tangent End Terminal Shown)



TRANSVERSE SECTION
(MSKT-SP-MGS MASH Tangent End Terminal Shown)

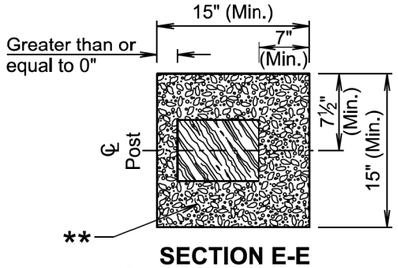
April 8, 2025

Published Date: 2027	SDDOT	EMBANKMENT, SURFACING, AND PAYMENT LIMITS FOR MGS MASH TANGENT END TERMINAL	PLATE NUMBER 630.89	Sheet 3 of 3



TRANSVERSE SECTION
(Wood post shown for illustrative purpose only)

SECTION E-E
(Round option for leave-out and backfill limits)
(Wood post shown for illustrative purpose only)



SECTION E-E
(Square option for leave-out and backfill limits)
(Wood post shown for illustrative purpose only)

GENERAL NOTES:

The leave-out limits may be increased to accommodate construction equipment and tolerances.

When posts are installed in augured or dug holes, the backfill material will be compacted to the bottom of the pavement surfacing material to the satisfaction of the Engineer. The backfill material for the thickness of the pavement surfacing material will be non-compacted.

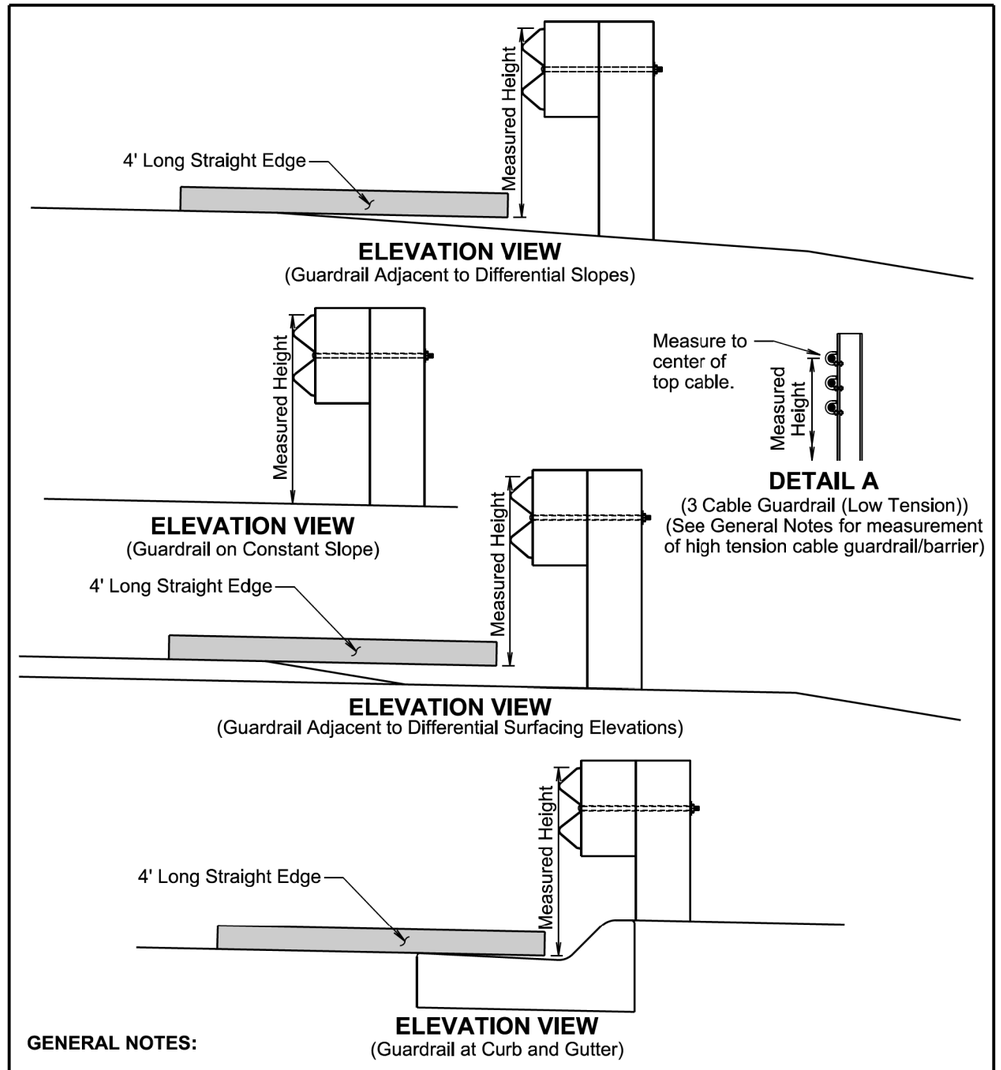
The backfill material will be mounded ½ inch to 1 inch above the top of the adjacent surfacing as illustrated above.

Asphalt for tack will be applied to the surface of the backfill material at the rate of 0.15 to 0.20 gallons per square yard.

All costs for constructing the leave-out including labor, equipment, and materials which includes the backfill material and tack coat will be incidental to the contract unit price for the respective guardrail contract item.

November 19, 2021

Published Date: 2027	SDDOT	GUARDRAIL POST INSTALLED IN ASPHALT CONCRETE OR PORTLAND CEMENT CONCRETE	PLATE NUMBER 630.96
			Sheet 1 of 1



ELEVATION VIEW
(Guardrail Adjacent to Differential Slopes)

ELEVATION VIEW
(Guardrail on Constant Slope)

DETAIL A
(3 Cable Guardrail (Low Tension))
(See General Notes for measurement of high tension cable guardrail/barrier)

ELEVATION VIEW
(Guardrail Adjacent to Differential Surfacing Elevations)

ELEVATION VIEW
(Guardrail at Curb and Gutter)

GENERAL NOTES:

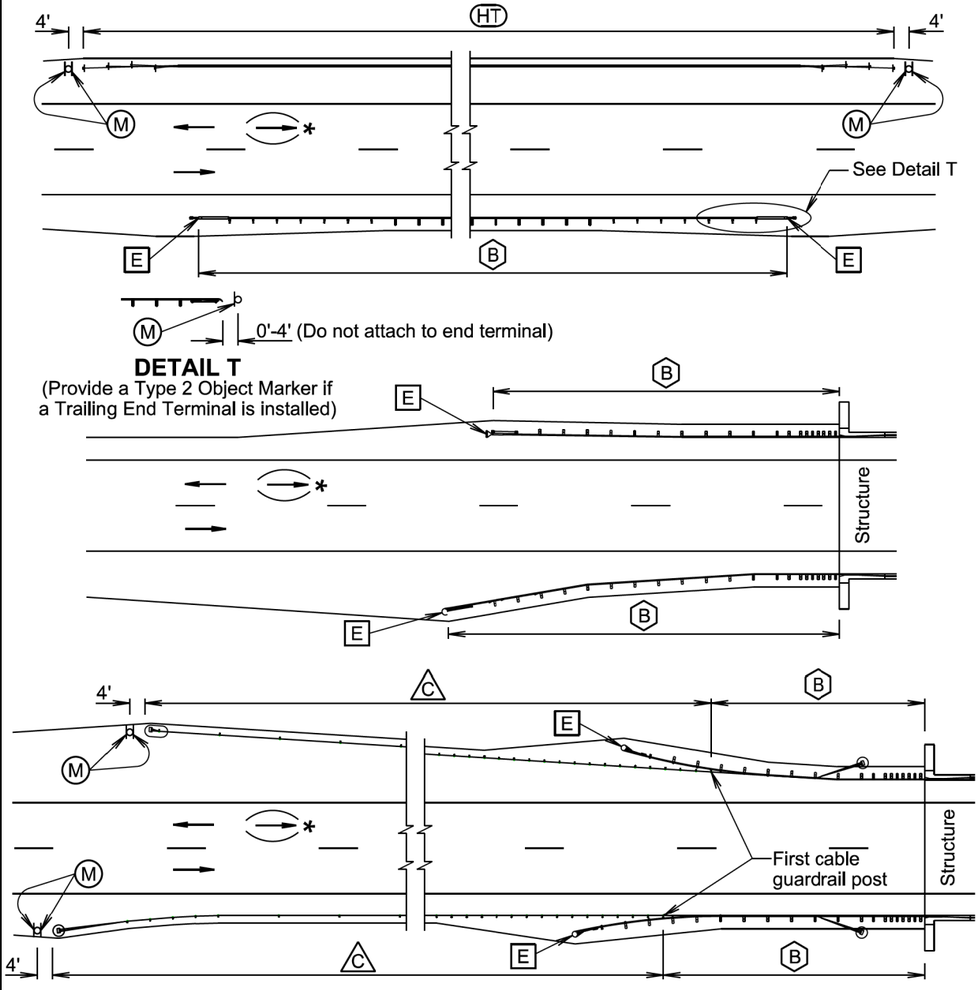
The W Beam guardrail shown is for illustrative purpose. The guardrail height for all types of guardrail systems except for high tension cable guardrail/barrier will be measured in accordance with this standard plate.

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: 2027	SDDOT	MEASURING GUARDRAIL HEIGHT	PLATE NUMBER 630.99
			Sheet 1 of 1



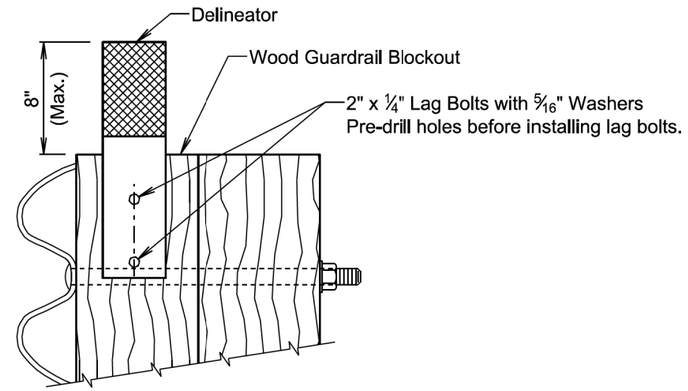
PLAN VIEW
(Typical Guardrail Layouts)

- (B) Steel Beam Guardrail Delineation
- [E] Guardrail End Terminal Object Marker
- (C) 3 Cable Guardrail (Low Tension) Delineation
- (HT) High Tension Cable Guardrail Delineation
- (M) Type 2 Object Marker

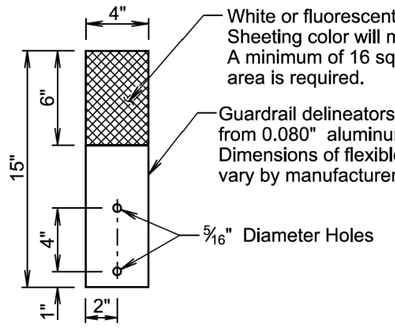
*For two-way traffic, install delineation at the opposite end of structure the same as shown. Back-to-back delineation is required for two-way traffic, single-sided delineation for one-way traffic.

April 8, 2025

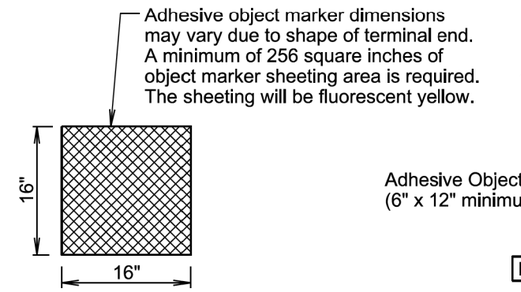
Published Date: 2027	SDDOT	DELINEATION OF GUARDRAIL	PLATE NUMBER 632.40
			Sheet 1 of 4



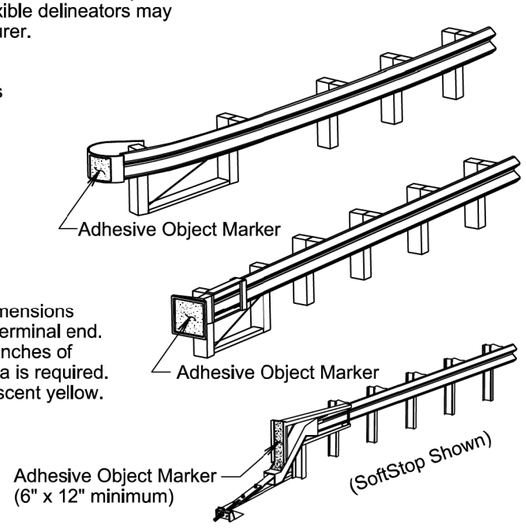
(B) STEEL BEAM GUARDRAIL DELINEATION



DELINEATOR
(For Steel Beam Guardrail)



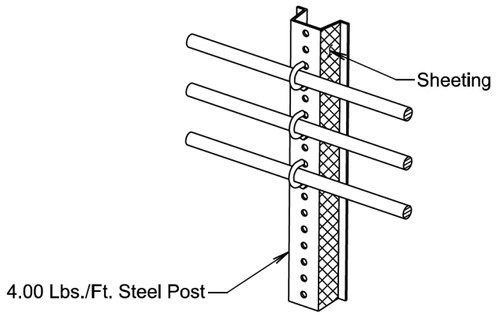
ADHESIVE OBJECT MARKER



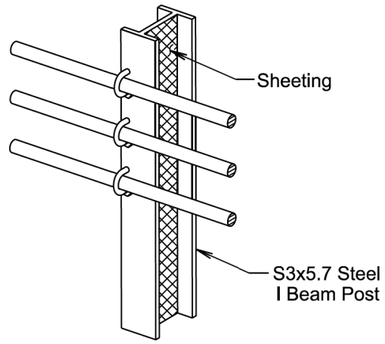
[E] GUARDRAIL END TERMINAL OBJECT MARKER

April 8, 2025

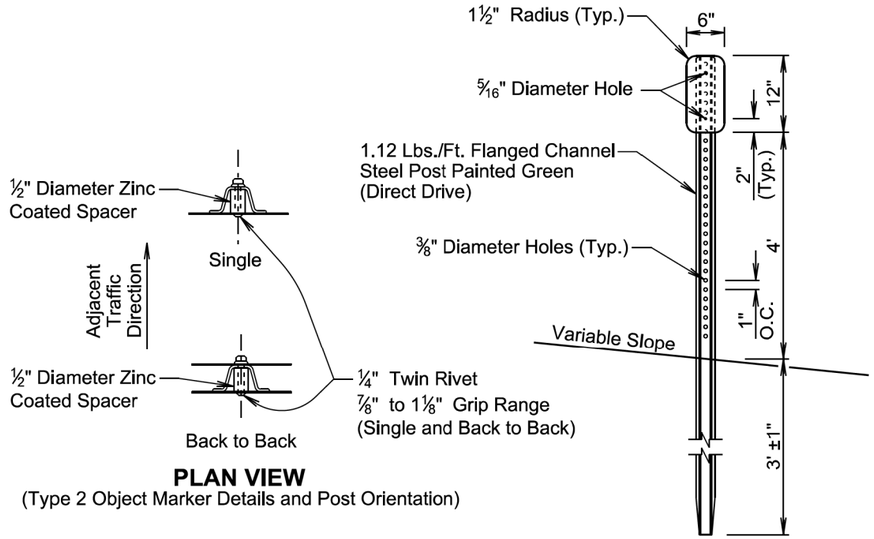
Published Date: 2027	SDDOT	DELINEATION GUARDRAIL	PLATE NUMBER 632.40
			Sheet 2 of 4



Ⓒ 3 CABLE GUARDRAIL (LOW TENSION) DELINEATION



Ⓒ 3 CABLE GUARDRAIL (LOW TENSION) DELINEATION



PLAN VIEW
(Type 2 Object Marker Details and Post Orientation)

ELEVATION VIEW
Ⓜ (Type 2 Object Marker)
(For Marking 3 Cable Guardrail (Low Tension) Anchor, High Tension Cable Guardrail Anchor, and Trailing End Terminal)

April 8, 2025

Published Date: 2027	SDDOT	DELINEATION OF GUARDRAIL	PLATE NUMBER 632.40
			Sheet 3 of 4

GENERAL NOTES:

The delineation of high tension cable guardrail will be reflective sheeting placed back to back on every third post cap or cable spacer. Maximum spacing of delineation will not exceed 35 feet. The sheeting will be type XI in conformance with ASTM D4956. The color of the reflective sheeting will be the same as the nearest pavement marking.

The delineators for steel beam guardrail and sheeting on 3 cable guardrail (low tension) posts will be covered with a minimum of 16 square inches of reflective sheeting. The reflective sheeting will be type XI in conformance with ASTM D4956. Along two-way roadways the sheeting will be on both sides of the delineators and guardrail posts and will be white in color. For one-way roadways the sheeting will only be required on the side facing traffic and the color will be the same as the nearest pavement marking, yellow on the left side of the roadway and white on the right side.

When steel beam guardrail is attached to a bridge the first delineator will be attached to the post nearest the bridge.

At bridges with guardrail less than 200 feet in length, a minimum of 4 delineators will be placed in addition to the end terminal yellow object marker. The spacing between the delineators will be approximately one third of the length of the guardrail.

At bridges with guardrail 200 feet and greater in length, including bridges that have steel beam guardrail transitioning to 3 cable guardrail (low tension), the delineators will be placed at a spacing of approximately 50 feet. Delineation will extend throughout the length of the guardrail system.

Steel beam guardrail that is not attached to a bridge and is less than 200 feet in length, a minimum of 4 delineators will be placed in addition to the end terminal yellow object markers. The spacing between the delineators will be approximately one third of the length of the guardrail.

Steel beam guardrail that is not attached to a bridge and is 200 feet and greater in length, including steel beam guardrail transitioning to 3 cable guardrail (low tension), the delineators will be placed at a spacing of approximately 50 feet. Delineation will extend throughout the length of the guardrail system.

All costs for furnishing and installing single or back to back guardrail delineation on 3 cable guardrail and steel beam guardrail will be included in the contract unit price per each for "Guardrail Delineator".

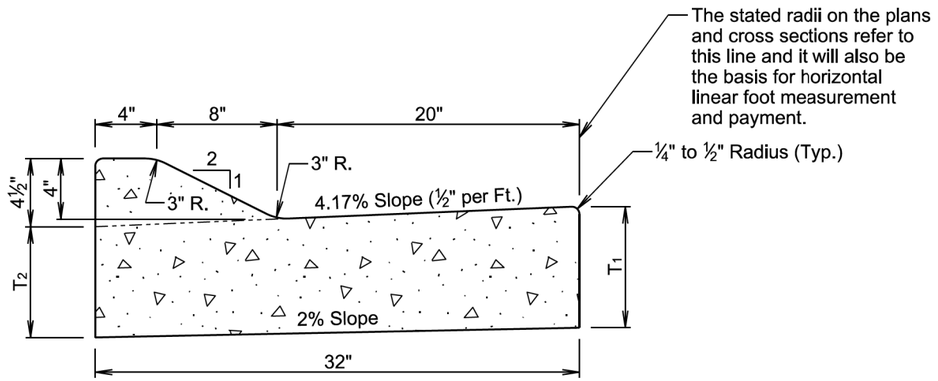
All costs for furnishing and installing the reflective sheeting on the cable spacers or post caps for the high tension cable guardrail will be incidental to the respective high tension cable guardrail contract item.

An adhesive object marker will be placed on the end of the W beam guardrail or MGS end terminal. The adhesive object marker dimensions may vary due to the shape of the terminal end. A minimum of 256 square inches of object marker reflective sheeting area is required on end terminals with sufficient surface area. Other end terminals (SoftStop) will require an adhesive object marker with a minimum size of 6" x 12". The reflective sheeting will be fluorescent yellow type XI sheeting in conformance with ASTM D4956. All costs for furnishing and installing the adhesive object marker will be incidental to various contract items.

A type 2 object marker will be placed such that the edges of the type 2 object marker and the 3 cable guardrail (low tension) anchor, high tension cable guardrail anchor, or the trailing end terminal that are nearest to the roadway will be installed in line with the same lateral offset from the traveled way at the location as noted on sheet 1 of this standard plate. The type 2 object marker (6" x 12") will have fluorescent yellow type XI sheeting in conformance with ASTM D4956. All costs for furnishing and installing the type 2 object marker including the steel post, 6" x 12" reflective panel, and hardware will be included in the contract unit price per each for "Type 2 Object Marker" for single-sided and "Type 2 Object Marker Back to Back" for back to back type 2 object markers.

April 8, 2025

Published Date: 2027	SDDOT	DELINEATION OF GUARDRAIL	PLATE NUMBER 632.40
			Sheet 4 of 4



TYPE D CONCRETE CURB AND GUTTER				
Type	T_1 (Inches)	T_2 (Inches)	Cu. Yd. Per Lin. Ft.	Lin. Ft. Per Cu. Yd.
D46	6	5 5/16	0.056	18.0
D47	7	6 5/16	0.064	15.7
D48	8	7 5/16	0.072	13.9
D48.5	8.5	7 13/16	0.076	13.1
D49	9	8 5/16	0.080	12.5
D49.5	9.5	8 13/16	0.084	11.9
D410	10	9 5/16	0.088	11.3
D410.5	10.5	9 13/16	0.093	10.8
D411	11	10 5/16	0.097	10.3
D411.5	11.5	10 13/16	0.101	9.9
D412	12	11 5/16	0.105	9.5

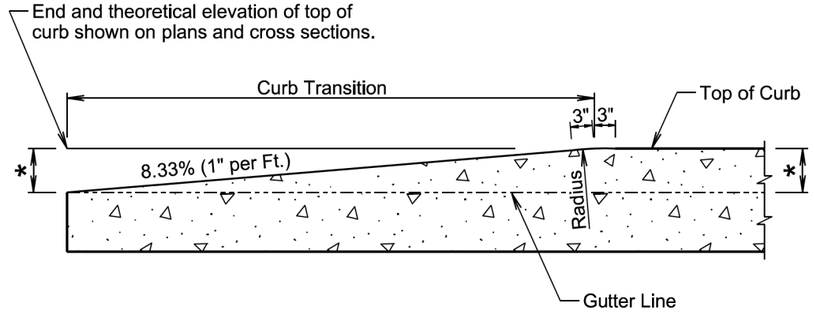
GENERAL NOTES:

When concrete curb and gutter longitudinally adjoins new concrete pavement, the method of attachment will be by one of the methods shown on standard plate 380.21.

See standard plate 650.90 for expansion and contraction joints in the curb and gutter.

January 22, 2023

Published Date: 2027	SDDOT	TYPE D CONCRETE CURB AND GUTTER	PLATE NUMBER 650.15 Sheet 1 of 1



* Height of Curb

LONGITUDINAL SECTION
(Concrete Curb Taper)

December 23, 2019

Published Date: 2027	SDDOT	CONCRETE CURB TAPER	PLATE NUMBER 650.35 Sheet 1 of 1