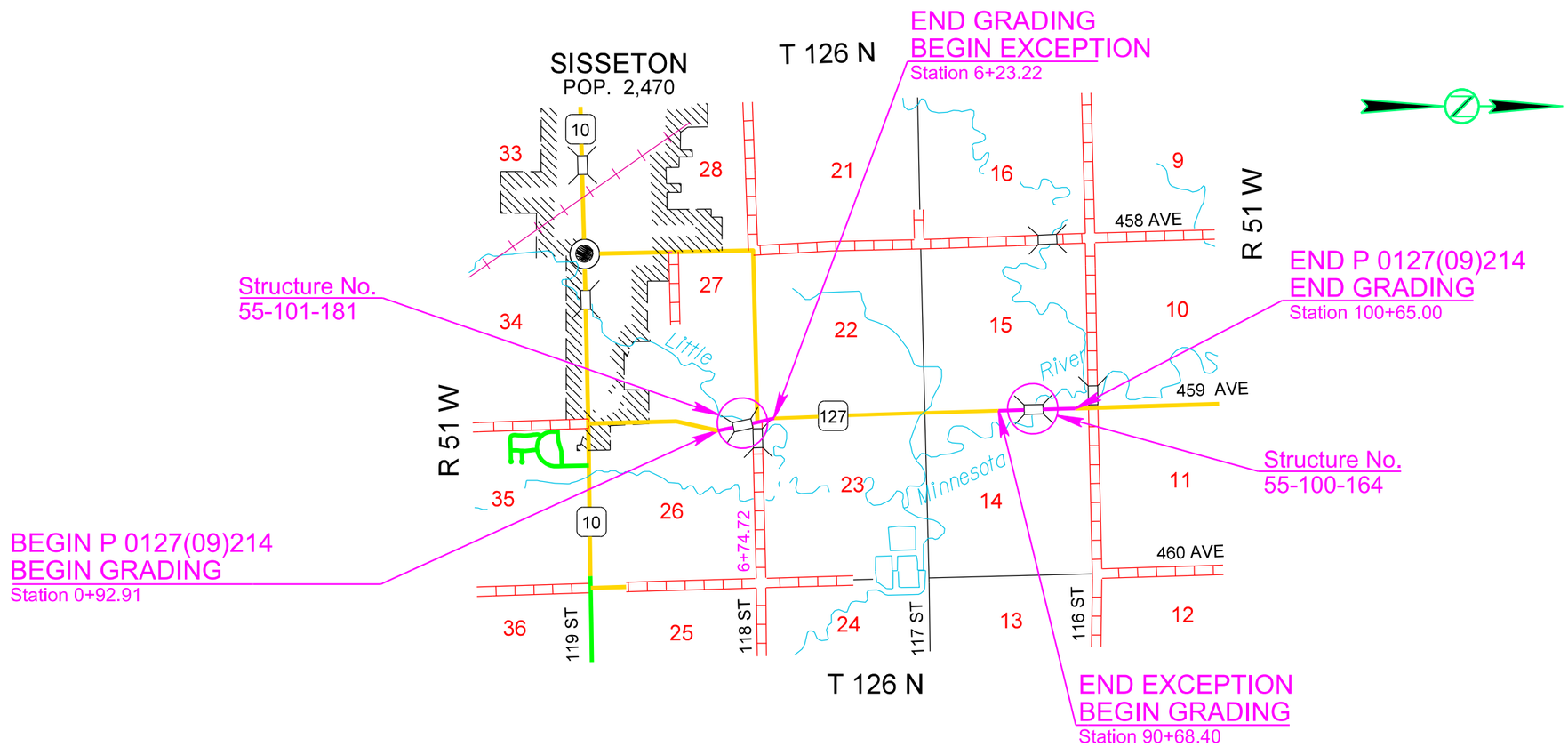
SECTION B: GRADING PLANS

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0127(09)214	B1	B33

Plotting Date: 09/04/2025
Revised Date: 09/04/2025 MDJ

INDEX OF SHEETS



SECTION B ESTIMATE OF QUANTITIES

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
009E3220	Reestablish Right-of-Way and Property Corner	37	Each
009E3225	Reestablish Public Land Survey System Corner	4	Each
009E3230	Grade Staking	0.245	Mile
009E3250	Miscellaneous Staking	0.245	Mile
009E3280	Slope Staking	0.245	Mile
009E3290	Structure Staking	2	Each
009E3301	Engineer Directed Surveying/Staking	40.0	Hour
009E4200	Construction Schedule, Category II	Lump Sum	LS
100E0100	Clearing	Lump Sum	LS
110E0730	Remove Beam Guardrail	764.0	Ft
110E1010	Remove Asphalt Concrete Pavement	5,353.0	SqYd
120E0010	Unclassified Excavation	20,007	CuYd
120E0600	Contractor Furnished Borrow Excavation	9,790	CuYd
120E1000	Muck Excavation	2,334	CuYd
120E2000	Undercutting	6,441	CuYd
120E6100	Water for Embankment	253.0	MGal
250E0020	Incidental Work, Grading	Lump Sum	LS
450E0122	18" RCP Class 2, Furnish	52	Ft
450E0130	18" RCP, Install	52	Ft
450E2008	18" RCP Flared End, Furnish	1	Each
450E2009	18" RCP Flared End, Install	1	Each
450E4769	24" CMP 16 Gauge, Furnish	132	Ft
450E4770	24" CMP, Install	132	Ft
450E5410	24" CMP Safety End, Furnish	4	Each
450E5411	24" CMP Safety End, Install	4	Each
462E0100	Class M6 Concrete	3.6	CuYd
480E0100	Reinforcing Steel	525	Lb
600E0300	Type III Field Laboratory	1	Each
630E0500	Type 1 MGS	325.0	Ft
630E1500	Type 1 Guardrail Transition	4	Each
630E2017	MGS MASH Flared End Terminal	4	Each
670E0200	Type A Frame and Grade	2	Each
670E5400	Precast Drop Inlet Collar	2	Each

GRADING OPERATIONS

Water for Embankment is estimated at the rate of 10 gallons of water per cubic yard of Embankment minus Waste.

The estimated cubic yards of excavation and/or embankment required to construct outlet ditches, ditch blocks, and approaches are included in the earthwork balance notes on the profile sheets.

Special ditch grades and other sections of the roadway different than the typical section(s) will be constructed to the limits shown on the cross sections. If significant changes to the cross sections are necessary during construction, the Engineer will contact the Designer for the proposed change.

Generally, all shallow inlet and outlet ditches as noted on the plan sheets will be cut with a 10-foot wide bottom with 5:1 backslopes. However, the Engineer may direct the Contractor to adjust the ditch width for proper alignment with the drainage structure.

TYPE III FIELD LABORATORY

The lab will be equipped with an internet connection such as DSL, cable modem, or other approved service. The internet connection will be provided with a multi-port wireless router. The internet connection will be a minimum speed of 5 Mbps unless limited by job location and approved by the DOT. Prior to installing the wireless router, the Contractor will submit the wireless router's technical data to the Area Office to check for compatibility with the state's computer equipment. The internet connection is intended for state personnel usage only. The Contractor's personnel are prohibited from using the internet connection unless pre-approved by the Project Engineer. These items will be incidental to the contract unit price per each for "Type III Field Laboratory".

UTILITIES

The Contractor will be aware that the existing utilities shown in the plans were surveyed prior to the design of this project and might have been relocated or replaced by a new utility facility prior to construction of this project, might be relocated or replaced by a new utility facility during the construction of this project, or might not require adjustment and may remain in its current location. The Contractor will contact each utility owner and confirm the status of all existing and new utility facilities. The utility contact information is provided elsewhere in the plans or bidding documents.

GENERAL GEOLOGY

The project alignment traverses glacial terrain typical of eastern South Dakota. Included within this terrain may be areas of loess, shale, sand, gravel, glacial till and boulder till. As is the case with most glacial terrain, the materials throughout the project can vary greatly in a short distance.

CLASSIFICATION OF EXCAVATION

Large glacial boulders may be encountered sporadically within the project limits. Very large boulders could require more effort to excavate. Most of the material encountered should be able to be excavated using conventional methods associated with normal Unclassified Excavation. Muck Excavation will be required at the areas shown in the plans or as directed by the Engineer.

POSSIBLE FIELDSTONE REMOVAL

At approximate Stations 1+00 to 2+00 Right, adjacent to mainline a layer of 1' to 2' diameter fieldstone was noted in and along the tree line. Fieldstone is not noted in the plans at this location. If required, excavation of the fieldstone may require extra effort. Removal of Fieldstone will be paid for as "Incidental Work, Grading". The Contractor will work with the Engineer to determine what efforts will be required to remove the fieldstone.

INSLOPE TRANSITIONS

Inslope transitions will be required at one drainage structure. Refer to Standard Plate 120.05 for details.

TABLE OF INSLOPE TRANSITIONS AT PIPE CULVERTS OR REINFORCED CONCRETE BOX CULVERTS

Station	L/R	Type
3+64	L/R	2

SHRINKAGE FACTOR: Embankment +25% to +30%

0+92.91 to 6+23.22	+25%
90+68.40 to 100+65	+30%

TABLE OF EXCAVATION QUANTITIES BY BALANCES

Station to	Station	Excavation (CuYd)	* Undercut (CuYd)	* Muck Exc. (CuYd)	* Contractor Furnished Borrow Exc. (CuYd)	Total Excavation (CuYd)	** Waste (CuYd)
0+92.91	6+23.22	3534	2698	2334	6224	14790	2334
90+68.40	100+65	5478	3743		3566	12787	
	Totals:	9012	6441	2334	9790	27577	2334

* The quantities for these items are in the Estimate of Quantities under their respective contract items.
** The quantities for these items are for information only.
27577

TABLE OF UNCLASSIFIED EXCAVATION

	(CuYd)
Excavation	9012
Undercut	6441
Topsoil	882
Exc. for RCBC Installation	3672
Total	20007

PROCEDURES FOR DETERMINING UNCLASSIFIED EXCAVATION QUANTITY

When plan quantities are used for payment, the Unclassified Excavation quantity will be used for final payment and the plans quantity of Topsoil and salvaged surfacing items listed in the Table of Unclassified Excavation will not be adjusted according to field measurements. “The plans quantity for Unclassified Excavation” as shown in the Estimate of Quantities will be the basis of payment for this item.

The following paragraphs are general earthwork information and information in regard to computing the Unclassified Excavation quantity when final cross sections are taken in the field:

The Topsoil quantity in the Table of Unclassified Excavation is an estimate. When finaling a project, the total quantity of field measured Topsoil will be used in place of the estimated Topsoil quantity. The quantity of Topsoil from the cuts will be paid for twice as Unclassified Excavation, as it will be in both the Excavation and Topsoil quantities. This will be full compensation for Excavation, which includes necessary undercutting to provide space for placement of topsoil.

The Excavation quantities from individual balances and the Table of Unclassified Excavation have been reduced by the volume of in place surfacing that will be removed.

The volume of in place Asphalt Surfacing removed will NOT be paid for as Unclassified Excavation.

The Excavation quantities from individual balances and the table above have been reduced by the volume of in place asphalt pavement that will be removed.

When finaling a project, the estimated quantity of 5353 sq. yd. of Asphalt Pavement removed from the cut sections will be subtracted from the Unclassified Excavation quantity for final payment. The quantity of Asphalt Pavement from cut sections subtracted from the Unclassified Excavation quantity will be plans quantity and will not be adjusted according to field measurements.

WASTE EXCAVATION

The quantity of waste in the Table of Excavation Quantities by Balances that is muck excavation or excess excavation material will be disposed of at a Contractor furnished site acceptable to the Engineer.

UNDERCUTTING

In all grading sections the earthen subgrade will be undercut 2 feet below the earthen subgrade surface. The undercut material or other suitable material, as directed by the Engineer, will then be replaced and compacted to the density specified for the section being constructed.

Shallow embankment sections, fills less than 2 feet in height measured at the finished subgrade shoulders, will be undercut to ensure a minimum 2-foot height of earth embankment for the entire width of roadbed. The upper 6 inches of undercut material that consists of topsoil with a high humus content will be used as topsoil placed in the fill slopes outside the shoulders of the earthen subgrade, or placed in the lower portion (below 4 foot depth) in fills which are greater than 4 feet in height. The remaining undercut soil and soil obtained from adjacent excavation (excluding the upper 6 inches) will then be replaced and compacted to the density specified to the section being constructed.

The plan shown quantity will be the basis of payment. However, if there are additional areas of undercut other than what is shown in the plans, the Engineer will direct removal of these areas and the additional areas will be measured according to the Engineer.

TABLE OF UNDERCUTTING LOCATIONS

Station	to	Station
0+92.91		6+23.22
90+68.40		100+65

MUCK EXCAVATION

The areas of muck excavation are drawn on the cross sections with a normal depth of 3 feet. The estimated quantity of 2334 cubic yards of muck excavation will be paid for at the contract unit price per cubic yard for “Muck Excavation”.

Muck excavation consists of the removal of highly organic and/or highly saturated material from the designated areas shown on the cross sections. Highly organic muck material will not be used in the embankment but may be used as topsoil. Non-organic muck material may be used as embankment outside of the fill subgrade shoulder if it is properly handled and dried prior to placement in the embankment.

Field measurement of muck excavation will not be made unless the Engineer orders additional excavation, or when the Engineer determines, in accordance with Section 120.3 A.1 of the Specifications, that the classification of excavation be changed.

If the areas designated as muck excavation can be removed with similar equipment and procedures as used for unclassified excavation, the material will be measured and paid for as “Unclassified Excavation”.

TABLE OF MUCK EXCAVATION

Station	to	Station	L/R	Depth (Ft)	Quantity (CuYd)
4+00		4+50	L\R	3	2334
				Total:	2334

REMOVE ASPHALT CONCRETE PAVEMENT

The Los Angeles Abrasion Loss value on the aggregate used for the in-place asphalt concrete was 26. This value was obtained from testing during construction of the in-place asphalt concrete.

An estimated 1097 Cubic Yards of the in-place asphalt concrete surfacing will be removed from the existing highway according to the in-place surfacing typical sections and wasted as directed by the Engineer.

The quantity of removed asphalt material is estimated from the in-place surfacing typical sections. This estimated quantity is not included in the unclassified excavation quantities.

CONTRACTOR FURNISHED BORROW EXCAVATION

The Contractor will provide a suitable site for Contractor furnished borrow excavation material. The Contractor is responsible for obtaining all required permits and clearances for the borrow site. The borrow material will be approved by the Engineer. The plans quantity for "Contractor Furnished Borrow Excavation" as shown in the Estimate of Quantities will be the basis of payment for this item.

Restoration of the Contractor furnished borrow excavation site will be the responsibility of the Contractor.

EXCAVATION FOR REINFORCED CONCRETE BOX CULVERT INSTALLATION

Included in the quantity of "Unclassified Excavation" are 3672 cubic yards of excavation for installation of reinforced concrete box culverts.

All work necessary to excavate a trench for installation of reinforced concrete box culverts including labor, equipment, and incidentals will be incidental to the contract unit price per cubic yard for "Unclassified Excavation". Payment for excavation of reinforced concrete box culverts will be based only on plans quantity and measurement of these excavation quantities during construction will not be performed.

The excavation quantities for installation of reinforced concrete box culverts are not included with the earthwork balance quantities on the plans profile sheets. The quantities computed for excavation of the reinforced concrete box culverts are based on the limits shown in the drawing below.

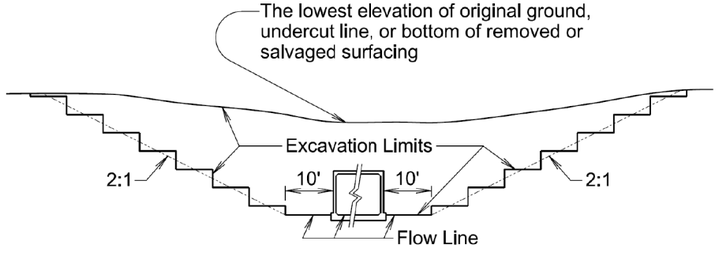


TABLE OF EXCAVATION FOR REINFORCED CONCRETE BOX CULVERT INSTALLATION

Station	Quantity (CuYd)
3+64	3672
Total:	3672

INCIDENTAL WORK, GRADING

Station	L/R	Remarks
1+00 to 2+00	R	Possible Fieldstone Removal
93+61	L	Take Out 24"-96' RCP
93+56	R	Take Out 24-97' RCP

DROP INLETS

Where drop inlets are constructed within areas of curb and gutter, the Contractor will construct weep holes of at least 3 inches in diameter in the drop inlet walls. The weep holes will be constructed at the same elevation as the adjacent top of the earthen subgrade and will be maintained clean and open at all times until the permanent surfacing is placed. The drop inlets will be covered throughout construction operations as necessary with an Engineer approved cover to provide safe travel for motorists and to prevent materials from entering the storm sewer system. After the permanent surfacing has been placed, the Contractor will seal the weep holes with grout and remove all debris from the drop inlet. All costs involved with the coverings, weep holes, and removing debris from the drop inlets will be incidental to the contract unit prices for the components of the drop inlets.

The plan shown quantities of the drop inlet components such as Class M6 Concrete, Reinforcing Steel, Type A Frame and Grate and Precast Drop Inlet Collar will be the basis of payment for these items.

If additions or reductions to the number of drop inlets are ordered by the Engineer, payment for the components required to construct the drop inlets will be made at the contract unit prices for the components of the drop inlets.

TABLE OF DROP INLETS AND QUANTITIES

Station	L / R	Drop Inlet Size	Drop Inlet Type	Class M6 Concrete (CuYd)	Reinf. Steel (Lb)	Precast Drop Inlet Collar (Each)	Frame and Grate/Lid Type
94+44	L	2'x3'	B	1.88	271	1	A
94+44	R	2'x3'	B	1.71	254	1	A
			Totals:	3.59	525	2	

Total Type A Frame and Grate 2

CORRUGATED METAL PIPE

Corrugated metal pipes will have 2 ⅔-inch x ½-inch corrugations for 42-inch and smaller round pipe and 48-inch and smaller arch pipe unless otherwise stated in the plans. Corrugated metal pipes will have 3-inch x 1-inch or 5-inch x 1-inch corrugations for 48-inch and larger round pipe and 54-inch and larger arch pipe unless otherwise stated in the plans.

The gauge of the corrugated metal ends will match the thickest gauge of corrugated metal pipe it is connected to.

TABLE OF PIPE QUANTITIES

Station	18" RCP (Ft)	18" RCP Flared End (Each)	24" CMP 16 Gauge (Ft)	24" CMP Safety End (Each)
91+00-73' L			62	2
91+00-73' R			70	2
94+44-17.44' L to 17.44' R	34			
94+44-17.44' R to 41.25' R	18	1		
	52	1	132	4

TABLE OF SUPERELEVATION

Station	to	Station		
Before Project				1907' Radius Curve
Project Starts at 0+92.91				0.0600/' Superelevation Rate
				Point of Rotation at Centerline
0+00		1+92	-	Superelevation Transition
1+92		6+23.22	-	Normal Crown Section
90+68.40		100+65	-	Normal Crown Section

PUBLIC LANDS SURVEY SYSTEM, RIGHT OF WAY, AND PROPERTY CORNERS

The Contractor will have a Land Surveyor, licensed in the State of South Dakota, to set, reestablish or verify public land survey system (PLSS) corners, right of way (ROW) corners, and property corners as directed by the appropriate SDDOT Region Land Surveyor. It is estimated that 4 PLSS corners and 37 ROW and property corners will be set, reestablished, or verified for this project. The Contractor's Land Surveyor, under the direction of the Region Land Surveyor, will set, reestablish, or verify all corner monuments after surfacing and fencing operations are completed in accordance with the PUBLIC LANDS SURVEY SYSTEM CORNERS section and the RIGHT OF WAY AND PROPERTY CORNERS section in Chapter 8 of the SDDOT Survey Manual.
< https://dot.sd.gov/doing-business/engineering/design-services/surveyors >

All costs associated with furnishing and installing PLSS caps, rebar, and all other materials associated with setting, reestablishing, or verifying PLSS, ROW corners, and property corners in accordance with the SDDOT Survey Manual will be incidental to the contract unit price per each for "Reestablish Public Land Survey System Corner" and/or "Reestablish Right-of-Way and Property Corner".

TABLE OF GUARDRAIL

Location	Remove Beam Guardrail (Ft)	Type 1 MGS (Ft)	Type 1 Guardrail Transition (Each)	MGS MASH Flared End Terminal (Each)
Structure No. 55-101-181				
Begin Bridge Lt.	78			
Begin Bridge Rt.	116			
End Bridge Lt.	118			
End Bridge Rt.	81			
Structure No. 55-100-164				
Begin Bridge Lt.	80	25	1	1
Begin Bridge Rt.	92	137.5	1	1
End Bridge Lt.	118	137.5	1	1
End Bridge Rt.	81	25	1	1
Totals:	764	325	4	4

TABLE OF CONSTRUCTION STAKING

(See Special Provision for Contractor Staking)

Roadway and Description	Begin Station	End Station	Number of Lanes	Length (Ft)	Grade Staking				Miscellaneous Staking Quantity (Mile)	Slope Staking Quantity (Mile)	Structure Staking Quantity (Each)
					Length (Mile)	Lane Factor	*Sets of Stakes	**Grade Staking Quantity (Mile)			
SD 127 (2 Lanes AC)	0+92.91	6+23.22	2	531	0.101	1	1	0.101	0.101	0.101	
SD 127 (2 Lanes AC)	90+68.40	94+57.00	2	389	0.074	1	1	0.074	0.074	0.074	
SD 127 (2 Lanes AC)	96+97.00	100+65.00	2	368	0.070	1	1	0.070	0.070	0.070	
Str No. 55-101-181											1
Str No. 55-100-164											1
							Totals:	0.245	0.245	0.245	2

* 1 = Blue Top Stakes Only (Asphalt Concrete Pavement)
2 = Blue Top and Paving Hub Stakes (PCC Pavement)

** Grade Staking Quantity = (Length) x (Lane Factor) x (Sets of Stakes)

TYPICAL GRADING SECTION

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* Widening for Guardrail
(See GUARDRAIL LAYOUTS)

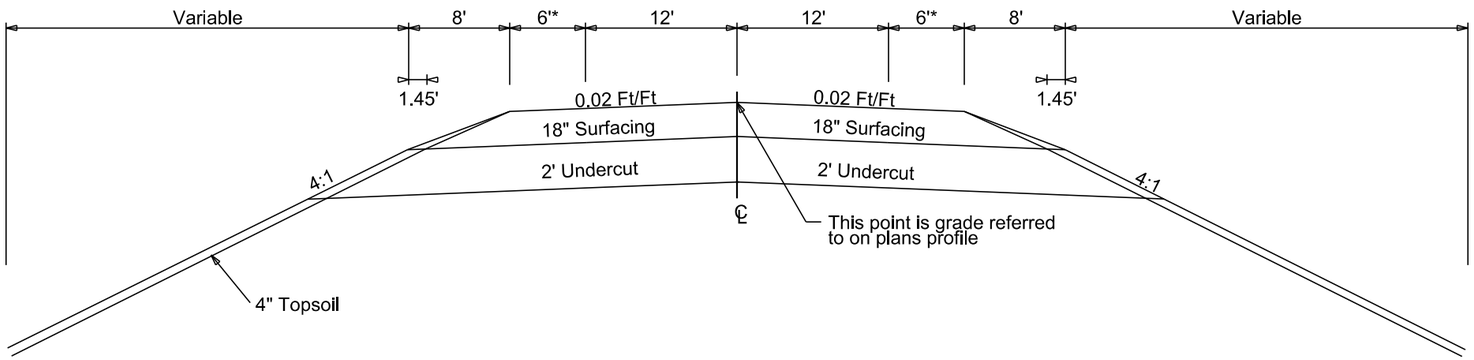
Lt

6' to 15'	92+14.81 to 93+49.81
15' to 9.5'	93+49.81 to 93+89.81
9.5' to 9.5'	93+89.81 to 94+61.03
9.5' to 9.5'	97+01.13 to 98+94.11
9.5' to 15'	98+84.11 to 99+24.09
15' to 6'	99+24.09 to 100+59.13

Rt

6' to 15'	90+68.40 to 92+30.79
15' to 9.5'	92+30.79 to 92+70.79
9.5' to 9.5'	92+70.79 to 94+53.42
9.5' to 9.5'	96+93.45 to 97+64.18
9.5' to 15'	97+64.18 to 98+05.18
15' to 6'	98+05.18 to 99+40.25

0+92.91 to 6+23.22
90+68.40 to 100+65



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HORIZONTAL ALIGNMENT DATA

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MAINLINE

Type	Station			Northing	Easting
POB	0+00.00			684750.181	2730510.733
		TL= 705.31	N 16°12'55" W		
PC	7+05.31			685427.433	2730313.777
PI	13+90.63	R = 5730.00	Delta = 13°38'26" R	686085.487	2730122.405
PT	20+69.46			686770.112	2730091.618
		TL= 3966.03	N 2°34'29" W		
PI	60+35.50			690732.141	2729913.453
		TL= 2675.66	N 2°35'48" W		
PI	87+11.16			693405.055	2729792.237
		TL= 1101.81	N 2°40'57" W		
PI	98+12.97			694505.662	2729740.673
		TL= 236.06	N 2°27'07" W		
POE	100+49.03			694741.506	2729730.574

The coordinates shown on this sheet are based on the South Dakota State Plane Coordinate System. North Zone (NAD 83/11); epoch 2010.00; Geoid 12A; SF = 0.99994812

CONTROL DATA

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HORIZONTAL AND VERTICAL CONTROL POINTS

POINT	STATION	OFFSET	DESCRIPTION	NORTHING	EASTING	ELEVATION
52037	5+83.60	110.15 R	BENCHMARK - REBAR NEXT TO GUIDE WIRE	685341.324	2730453.528	1153.355
52039	95+17.81	182.28 L	BENCHMARK - POINT FOR BASE	694202.296	2729572.404	1144.346

The coordinates shown on this sheet are based on the South Dakota State Plane Coordinate System. North Zone (NAD 83/11); epoch 2010.00
Geoid 12A; SF = 0.99994812
The elevations shown on this sheet are based on NAVD 88.

LEGEND

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- Anchor
- Antenna
- Approach
- Assumed Corner
- Azimuth Marker
- BBQ Grill/ Fireplace
- Bearing Tree
- Bench Mark
- Box Culvert
- Bridge
- Brush/Hedge
- Buildings
- Bulk Tank
- Cattle Guard
- Cemetery
- Centerline
- Cistern
- Clothes Line
- Concrete Symbol
- Control Point
- Creek Edge
- Curb/Gutter
- Curb
- Dam Grade/Dike/Levee
- Deck Edge
- Ditch Block
- Doorway Threshold
- Drainage Profile
- Drop Inlet
- Edge Of Asphalt
- Edge Of Concrete
- Edge Of Gravel
- Edge Of Other
- Edge Of Shoulder
- Electric Transformer/Power Junction Box
- Fence Barbwire
- Fence Chainlink
- Fence Electric
- Fence Miscellaneous
- Fence Rock
- Fence Snow
- Fence Wood
- Fence Woven
- Fire Hydrant
- Flag Pole
- Flower Bed
- Gas Valve Or Meter
- Gas Pump Island
- Grain Bin
- Guardrail
- Gutter
- Guy Pole
- Haystack
- Highway ROW Marker
- Interstate Close Gate
- Iron Pin
- Irrigation Ditch
- Lake Edge
- Lawn Sprinkler
- Mailbox
- Manhole Electric
- Manhole Gas
- Manhole Miscellaneous
- Manhole Sanitary Sewer
- Manhole Storm Sewer
- Manhole Telephone
- Manhole Water
- Merry-Go-Round
- Microwave Radio Tower
- Miscellaneous Line
- Miscellaneous Property Corner
- Miscellaneous Post
- Overhang Or Encroachment
- Overhead Utility Line — OH —
- Parking Meter
- Pedestrian Push Button Pole
- Pipe With End Section
- Pipe With Headwall
- Pipe Without End Section
- Playground Slide
- Playground Swing
- Power And Light Pole
- Power And Telephone Pole
- Power Meter
- Power Pole
- Power Pole And Transformer
- Power Tower Structure
- Propane Tank
- Property Pipe
- Property Pipe With Cap
- Property Stone
- Public Telephone
- Railroad Crossing Signal
- Railroad Milepost Marker
- Railroad Profile
- Railroad ROW Marker
- Railroad Signs
- Railroad Switch
- Railroad Track
- Railroad Trestle
- Rebar
- Rebar With Cap
- Reference Mark
- Retaining Wall
- Riprap
- River Edge
- Rock And Wire Baskets
- Rockpiles
- Satellite Dish
- Septic Tank
- Shrub Tree
- Sidewalk
- Sign Face
- Sign Post
- Slough Or Marsh
- Spring
- Stream Gauge
- Street Marker
- Subsurface Utility Exploration Test Hole
- Telephone Fiber Optics — T/F —
- Telephone Junction Box
- Telephone Pole
- Television Cable Jct Box
- Television Tower
- Test Wells/Bore Holes
- Traffic Sign Double Face
- Traffic Sign One Post
- Traffic Sign Two Post
- Traffic Signal
- Trash Barrel
- Tree Belt
- Tree Coniferous
- Tree Deciduous
- Tree Stumps
- Triangulation Station
- Underground Electric Line — P —
- Underground Gas Line — G —
- Underground High Pressure Gas Line — HG —
- Underground Sanitary Sewer — S —
- Underground Storm Sewer — S —
- Underground Tank
- Underground Telephone Line — T —
- Underground Television Cable — TV —
- Underground Water Line — W —
- Water Fountain
- Water Hydrant
- Water Meter
- Water Tower
- Water Valve
- Water Well
- Weir Rock
- Windmill
- Wingwall
- Witness Corner

- State and National Line
- County Line
- Section Line
- Quarter Line
- Sixteenth Line
- Property Line
- Construction Line
- ROW Line
- New ROW Line
- Cut and Fill Limits
- Control of Access
- New Control of Access
- Proposed ROW (After Property Disposal)

- Drainage Arrow

- Remove Concrete Pavement
- Remove Concrete Driveway Pavement
- Remove Asphalt Concrete Pavement
- Remove Concrete Sidewalk
- Remove Concrete Median Pavement
- Remove Concrete Curb and/or Gutter

- Detectable Warning
- Pedestrian Push Button Pole and 30" x 48" Clear Space with 1.5% slope

Plot Scale - 1:200

Plotted From - TRSF12140

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Remove Beam Guardrail
at the Following Locations:
2+70.27-20.56' L to 3+47.71-14.52' L
2+32.67-22.39' R to 3+47.86-15.02' R
4+29.98-14.87' L to 5+47.16-22.75' L
4+29.94-14.60' R to 5+09.81-20.07' R

1+00 to 2+00 R
Possible Fieldstone Removal
(See Note on Sheet B2)
(Incidental Work, Grading)

3+48 to 4+30
Take Out 83'-0" Continuous Concrete Bridge
(See Section E)

3+64
Total DA = 29.45 Sq. Mi.
Contributing DA = 14.78 Sq. Mi.
Install 3-11' x 11' x 143'-9 13/16" RCBC
Skewed 25° RHF
(See Section E)

Sec 27 - T126N - R51W

Sec 22 - T126N - R51W

CODY & SHAWN
HANSON'S ADDITION

Gary D. Hanson & Angela G. Hanson
(INFORMATION ONLY)

SE1/4 SE1/4

NE1/4

END GRADING
BEGIN EXCEPTION
Station 6+23.22

Tributary to Little Minnesota River

Section Line

33'

R.O.W. Line

20+54.08

150'

20+00

15+00

10+00

Present SD Hwy 127

BEGIN P 0127(09)214
BEGIN GRADING
Station 0+92.91

W1/2 NW1/4

Cuttoff

N 46° 11' 35" W

5+00

0+00

1/16 Line

SW1/4 SW1/4

Little Minnesota River Tributary

PI 13+90.63
N 686085.49
E 2730122.40
Del 13°38'26" R
Dc 1°00'00"
T 685.32'
L 1364.15'
R 5730.00'

6+74.72

Gary D. Hanson

The W1/2 NW1/4 of Section 26 - Township 126 North - Range 51 West of the 5th P.M., except Lot H1 therein

Parcel 1
0.36 ac, R.O.W.
(15877 sq ft), more or less

W1/2 NW1/4

Sec 26 - T126N - R51W

Sec 23 - T126N - R51W

Parcel 1
5+06 to 6+23 L
Temporary easement containing
0.1 ac, more or less

Plot Scale - 1:200

Plotted From - TRSF12140

File - U:\drdp\rrob\067\D\000.dgn

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0127(09)214	B11	B33

Plotting Date: 03/11/2025

Plot Scale - 1:200

Excavation	3534	Embankment	7266		
Undercut	2698	25.00%	1817	5193	
Contractor Furnished Borrow	6224	Undercut	2698		
		25.00%	675	3373	
Muck	2334	Waste		2334	
	14790			14790	

Waste is muck excavation to be disposed of at a site approved by the Engineer

0+92.91
Begin Grading

6+23.22
End Grading
Begin Exception

PVI 0+93
Elev 1162.69

L 400.00ft
G1 -1.0081%
G2 0.0244%
K 387

PVI 6+23
Elev 1160.06

-1.0081%

0.0244%

PVI 3+60
Elev 1160.00

RDG 3.0080%

RDGPI 6+23
Elev 1155.20

RDGPI 5+80
Elev 1153.90

FLL 1144.65
FLR 1144.36

Q100 = 1367 cfs
EI = 1154.0'
Q25 = 813 cfs
EI = 1152.8'

52037
5+83.60-110.15' R
Benchmark-Rebar Next to Guide Wire
Elev 1153.35

1162.62 1161.63 1160.86 1160.34 1160.08 1160.06

1270 1260 1250 1240 1230 1220 1210 1200 1190 1180 1170 1160 1150 1140 1130 1120 1110 1100

0+00 5+00 10+00 15+00 20+00 25+00 30+00

TRSF12140

Plotted From -

File - U:\rdprj\robt067D\000v.dgn

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0127(09)214	B12	B33

Plotting Date: 03/11/2025 Revised 06/17/2023 JWF

91+00-73' L (57 ac)
Install 24" - 62' CMP
& 2 Safety Ends

91+00-73' R (7 ac)
Install 24" - 70' CMP
& 2 Safety Ends

93+61 L
Take Out 24"-96' RCP
(Incidental work, Grading)

93+56 R
Take Out 24"-97' RCP
(Incidental work, Grading)

94+44-17.44' L to 17.44' R
Install 18" - 34' RCP

94+44-17.44' R to 41.25' R
Install 18" - 18' RCP
& Flared End

Remove Beam Guardrail
at the Following Locations:
94+03.12-20.12' L to 94+80.60-15.06' L
93+90.70-20.15' R to 94+80.85-14.67' R
96+88.65-15.01' L to 98+04.35-21.63' L
96+88.56-14.69' R to 97+67.10-19.75' R

94+81 to 96+84
Take Out 209'-0" Continuous Concrete Bridge
(See Section E)

94+57.22 to 96+97.26 (246.67 Sq Mi)
Install 240' - 0$\frac{3}{8}$" Cont. Concrete Bridge
Skewed 10° LHF
(See Section E)

Install 2' x 3' Type B Drop Inlet
with 6" Concrete Collar and
Type A Frame & Grate
at the following locations:
94+44 - 17.44' L
94+44 - 17.44' R

Sec 15 - T126N - R51W

Roger and Joyce Arbach Land Trust

The S1/2 NE1/4 of Section 15 -
Township 126 North - Range 51 West of the 5th P.M.,
except Lot H1 in the SE1/4 NE1/4

Parcel 2
0.12 ac, R.O.W.
(5102 sq ft), more or less

END EXCEPTION
BEGIN GRADING
Station 90+68.40

Paul Gravdahl, Marshall Gravdahl,
Vincent Gravdahl and Charles Gravdahl
(INFORMATION ONLY)

END P 0127(09)214
END GRADING
Station 100+65.00

S1/2 NE1/4

NE1/4 NE1/4

1/4 Line

1/16 Line

Section Line

Little Minnesota River

93+61 L
Elim Ent

90+44-75.04'
90+80-160'
91+30-160'
91+75-100'
93+00-100'
93+60-165'
94+23.97-74.55'
94+24.01-103.55'
95+41.97-74.40'
95+42.01-103.40'
96+34.97-74.28'
96+34.99-88.28'
97+54.97-74.13'
97+54.99-88.13'

100+49.03

33' 113+86.89

N 2°40'57" W

150'

108'

N 2°27'07" W

Present SD Hwy 127

85+00
90+00
95+00
100+00
105+00
110+00

OH

T/F

42'

33'

113+87

94+44-74.96'
90+75-150'
91+25-150'
91+75-110'
93+56 R
Elim Ent
93+98-77' R
Do Not Disturb
Power Pole
93+97.63-75.41'
93+97.59-107.41'
95+25.59-107.58'
95+25.63-75.58'
95+25.63-75.110'
96+61.62-87.75'
96+61.63-75.75'
97+28.62-87.84'
97+28.63-75.84'
100+47.75-75.30'
113+52.27-75.00'

97+27-77' R
Do Not Disturb
Power Pole

NW1/4

Dixie Heinecke

The NW1/4 of Section 14 -
Township 126 North - Range 51 West of the 5th P.M.,
except Lot H1 in the SW1/4 NW1/4

Parcel 3
1.37 ac, R.O.W.
(59702 sq ft), more or less

PI 87+11.16
N 693405.06
E 2729792.24
Del 0°05'09" L

PI 98+12.97
N 694505.66
E 2729740.67
Del 0°13'50" R

Sec 14 - T126N - R51W

Parcel 2
90+44 to 94+34.99 L
Temporary easement containing
0.6 ac, more or less

Parcel 3
90+44 to 93+61.63 R
Temporary easement containing
0.5 ac, more or less

Plot Scale - 1:200

Plotted From - TRSF12140

File - U:\rdlprjrobt067D\085.dgn

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0127(09)214	B13	B33

Plotting Date: 03/11/2025

Excavation	5478	Embankment	6093	
Undercut	3743	30.00%	1828	7921
Contractor Furnished Borrow	3566	Undercut	3743	
		30.00%	1123	4866
	12787			12787

90+68.40
End Exception
Begin Grading

100+65
End Grading

91+00 L
24' Ent

91+00 R
24' Ent

PVI 90+68
Elev 1147.76

PVI 99+15
Elev 1147.69

PVI 100+65
Elev 1147.47

-0.0084%

-0.1510%

See Section E: Structures
for details of Bridge

Q100 = 6996 cfs
El = 1143.3'
Q25= 3915 cfs
El = 1141.7'

52039
95+17.81-182.28' L
Benchmark-Point for Base
Elev 1144.35

1147.76 1147.75 1147.74 1147.74 1147.73 1147.72 1147.71 1147.70 1147.69

1260 1250 1240 1230 1220 1210 1200 1190 1180 1170 1160 1150 1140 1130 1120 1110 1100 1090

85+00 90+00 95+00 100+00 105+00 110+00 115+00

Plot Scale - 1:200

TRSF12140

Plotted From -

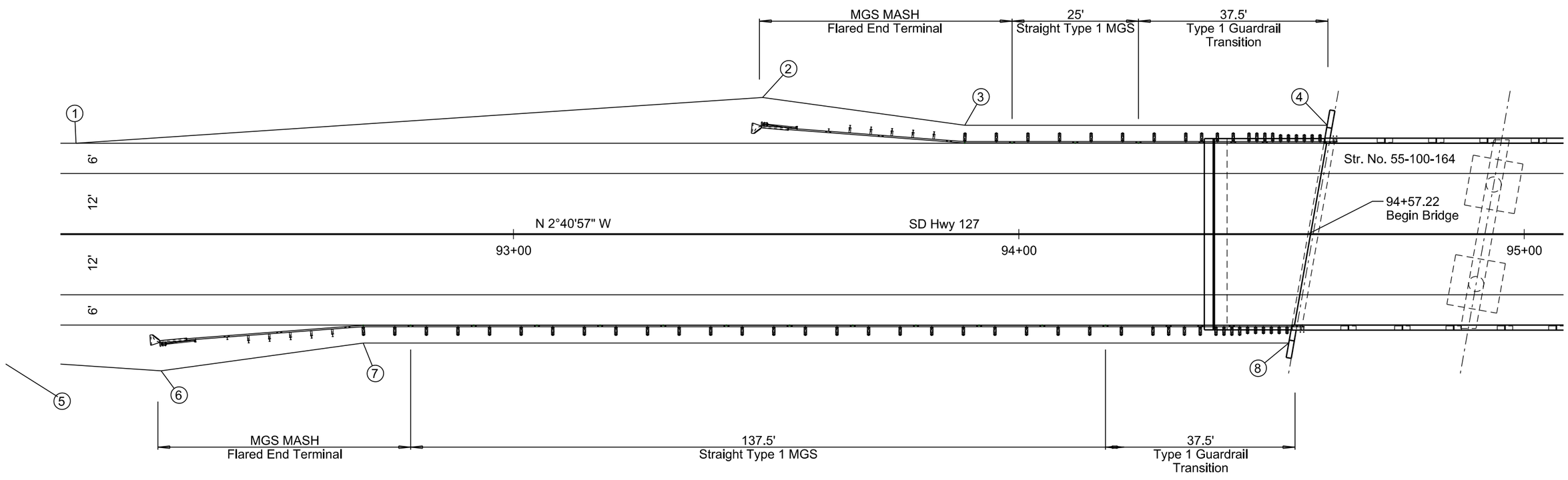
File - U:\rdprj\robt067D\085v.dgn

GUARDRAIL LAYOUTS

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0127(09)214	B14	B33

Plotting Date: 03/11/2025

1 92+14.81-18.00' L
2 93+49.81-27.00' L
3 93+89.81-21.50' L
4 94+61.03-21.50' L



5 90+95.79-18.00' R (Off Sheet)
6 92+30.79-27.00' R
7 92+70.79-21.50' R
8 94+53.42-21.50' R

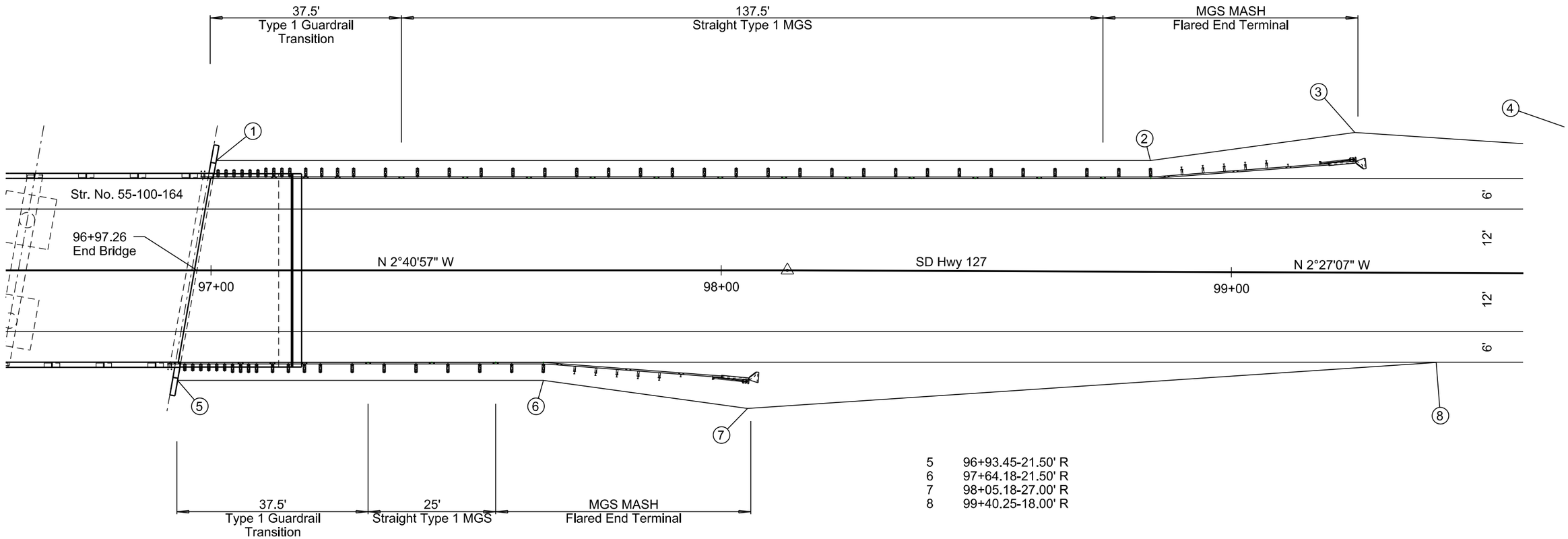
Plot Scale - 1:20
Plotted From - TRSF12140
File - U:\rdplh\robt067D\094gr.dgn

GUARDRAIL LAYOUTS

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0127(09)214	B15	B33

Plotting Date: 03/11/2025

1 97+01.13-21.50' L
2 98+84.11-21.50' L
3 99+24.09-27.00' L
4 100+59.13-18.00' L (Off Sheet)



5 96+93.45-21.50' R
6 97+64.18-21.50' R
7 98+05.18-27.00' R
8 99+40.25-18.00' R

Plot Scale - 1:20

Plotted From - TRSF12140

File - U:\rdplrj\rob\b067D\096gr.dgn

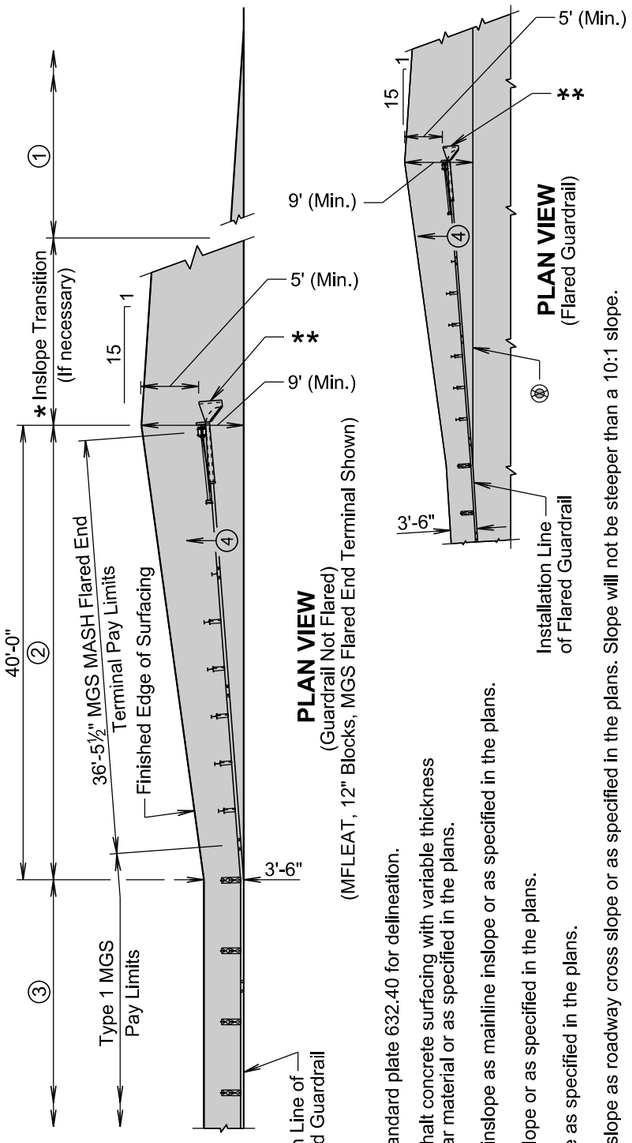
Guardrail Details

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0127(09)214	B16	B33

Plotting Date: 09/04/2025
Revised Date: 09/04/2025 MDJ

EMBANKMENT, SURFACING, AND PAYMENT LIMITS FOR MGS MASH FLARED END TERMINAL

Sheet 1 of 2



** 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.

GENERAL NOTES:

The flared guardrail end terminals above are for illustrative purpose only.

* The length of inslope transition varies with the amount of change between inslopes. The length of the transition will change 100 feet 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 feet. If the inslope changes from a 6:1 to a 4:1 the length of the inslope transition would be 200 feet.

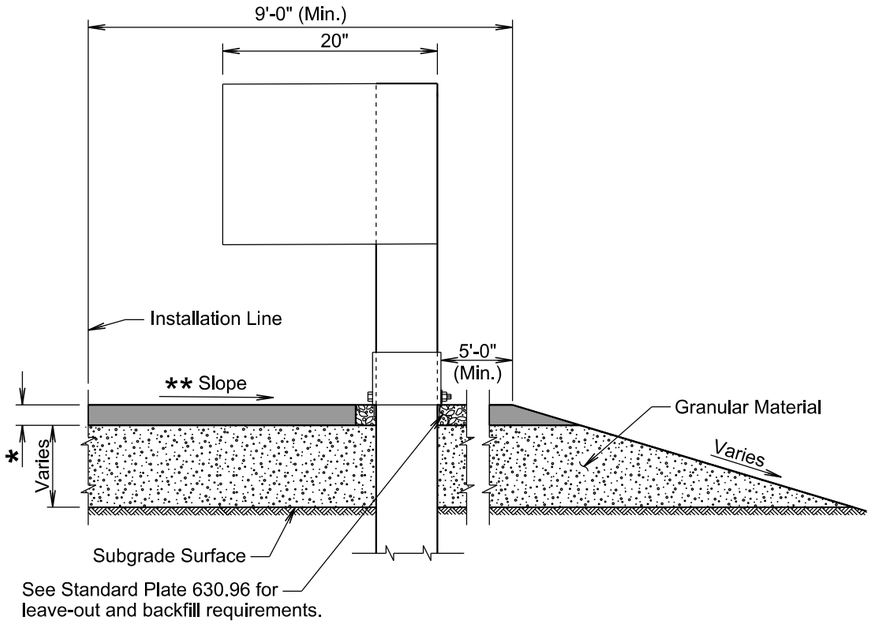
Ⓡ The installation reference line for flared guardrail end terminals will always be parallel to the roadway.

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.

EMBANKMENT, SURFACING, AND PAYMENT LIMITS FOR MGS MASH FLARED END TERMINAL

Sheet 2 of 2



TRANSVERSE SECTION
(MFLEAT MGS Flared End Terminal Shown)

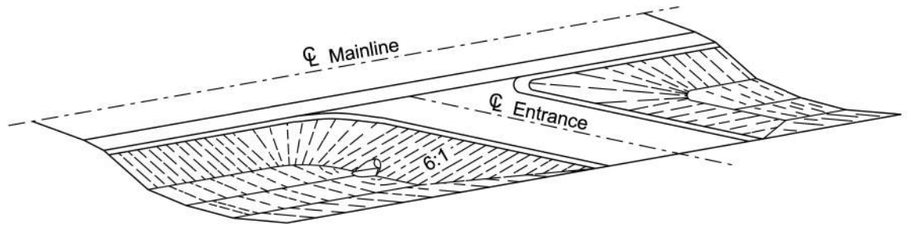
* 2" asphalt concrete or as specified in the plans.

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

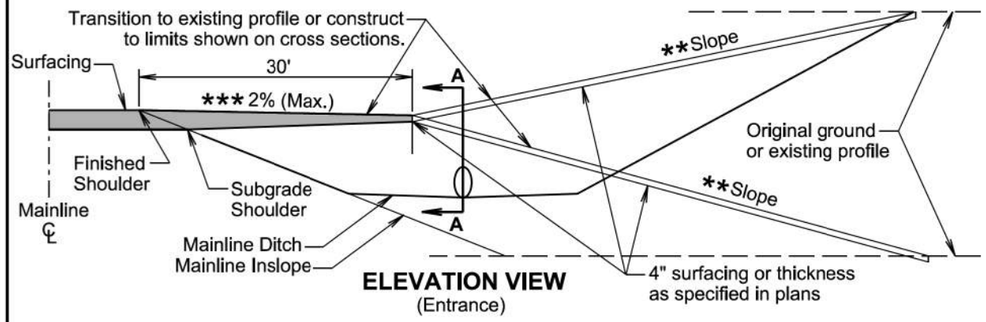
Plot Scale - 1:200

Plotted From - TRSF12141

File - ...\robt067\DStdPlateSectionB.dgn



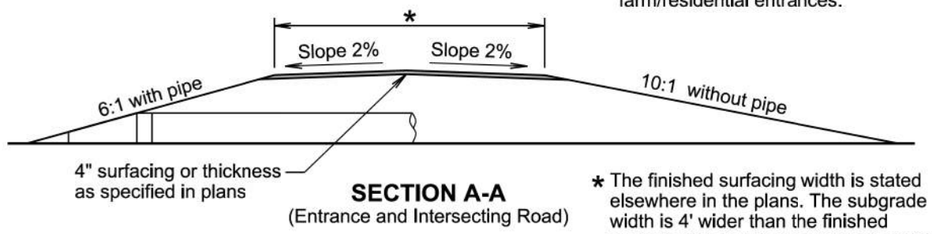
PERSPECTIVE OF ENTRANCE



ELEVATION VIEW
(Entrance)

*** 2% When on the inside of superelevation and 0% or flat when on outside of superelevation.

** Entrance maximum slope is typically 10:1 for field entrances and 15:1 for farm/residential entrances.



SECTION A-A
(Entrance and Intersecting Road)

* The finished surfacing width is stated elsewhere in the plans. The subgrade width is 4' wider than the finished surfacing width unless stated otherwise in the plans.

GENERAL NOTES:

The ditch section shown above in the perspective view is only for illustrative purpose.

The elevation view above is typical for either a ditch cut or fill section. Entrances that vary from above should be specified in the plans.

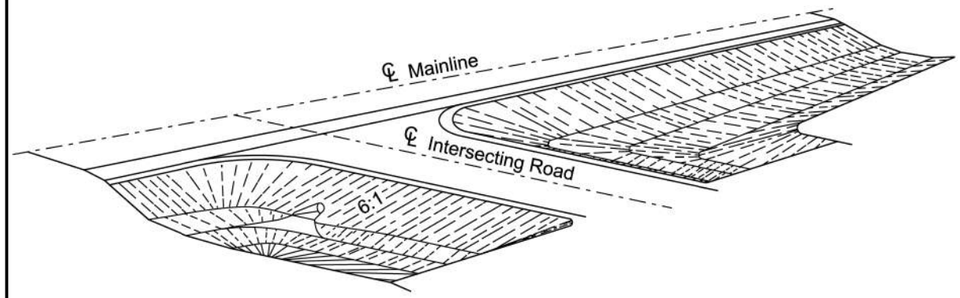
Pipe length will be adjusted if necessary during construction to obtain the 6:1 slope. For grading projects, the pipe length is estimated typically using a 4" thickness of surfacing directly over the subgrade above the pipe.

The transition area between the mainline inslope and the entrance or intersecting road inslope will be rounded to eliminate an abrupt transition.

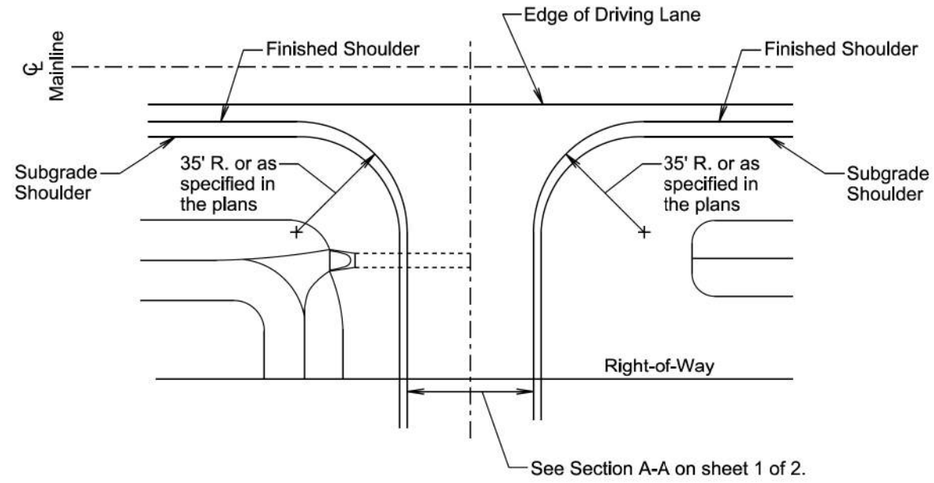
The turning radii will be 35' for intersecting roads and entrances unless stated otherwise in the plans.

November 19, 2021

Published Date: 2026	SDDOT	INTERSECTING ROADS AND ENTRANCES	PLATE NUMBER 120.01 Sheet 1 of 2



PERSPECTIVE OF INTERSECTING ROAD



PLAN VIEW

GENERAL NOTES:

The 6:1 or 10:1 intersecting road inslope will transition to the existing intersecting road inslope near the right-of-way or at a location as determined by the Engineer.

November 19, 2021

Published Date: 2026	SDDOT	INTERSECTING ROADS AND ENTRANCES	PLATE NUMBER 120.01 Sheet 2 of 2

Published Date: 2026

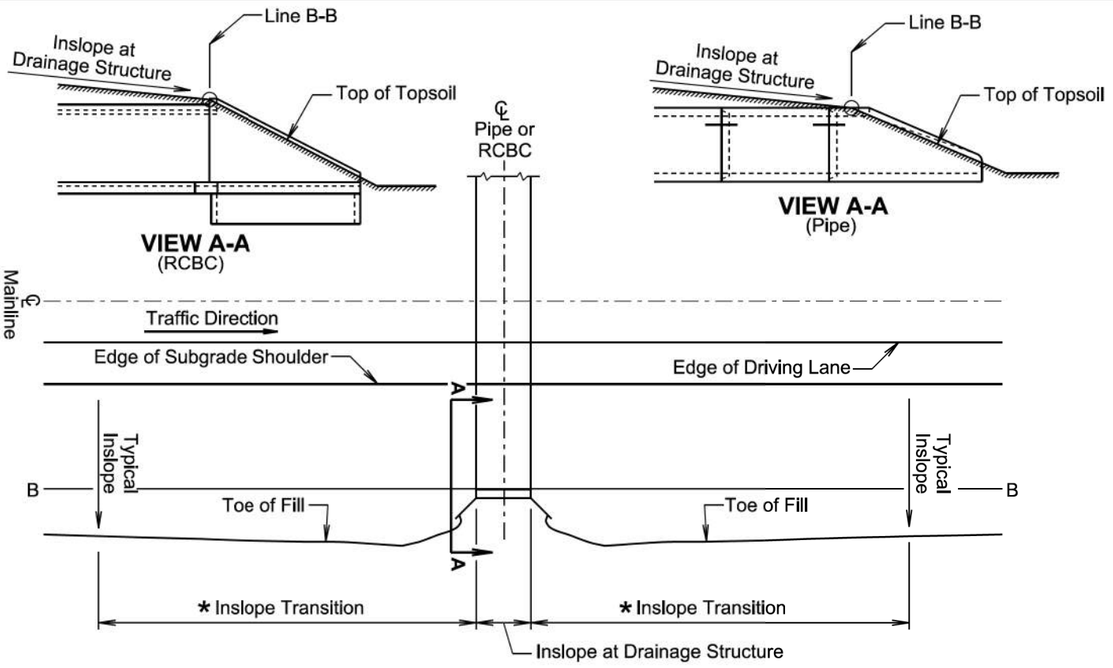
SDDOT

INSLOPE TRANSITIONS AT PIPE CULVERTS OR REINFORCED CONCRETE BOX CULVERTS

PLATE NUMBER 120.05

Sheet 1 of 2

September 14, 2018



TYPE 1 INSLOPE TRANSITION

GENERAL NOTES:

This Type 1 Inslope Transition is used when the specified inslope at the drainage structure is flatter than the typical inslope and the inslope at the drainage structure is between a 4:1 slope and 6:1 slope.

Line B-B represents the clear zone line, the location where soil intercepts the parapet on an RCBC, the location where the soil intercepts the top of the pipe adjacent to the opening of the pipe end section, or may represent a change in slope.

* Transition from the typical inslope to the inslope at the drainage structure. Within the clear zone (area from edge of subgrade shoulder to line B-B) use 100' length for each 1:1 slope change. Example: transition from a 4:1 to a 6:1 would require a 200' length transition. The typical inslope outside of the clear zone will be transitioned gradually to the slope necessary adjacent to the RCBC wing wall or pipe culvert end section within the transition length necessary for the transition within the clear zone.

Published Date: 2026

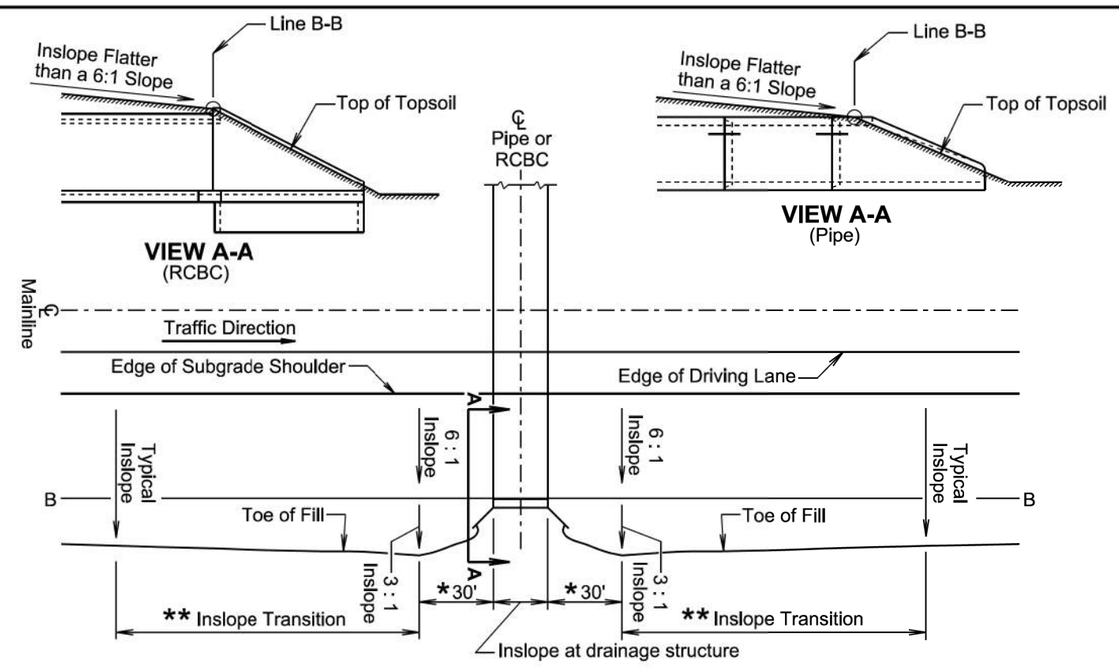
SDDOT

INSLOPE TRANSITIONS AT PIPE CULVERTS OR REINFORCED CONCRETE BOX CULVERTS

PLATE NUMBER 120.05

Sheet 2 of 2

September 14, 2018



TYPE 2 INSLOPE TRANSITION

GENERAL NOTES:

This Type 2 Inslope Transition is used when the specified inslope at the pipe or RCBC is flatter than a 6:1 slope.

Line B-B represents the clear zone line, the location where soil intercepts the parapet on an RCBC, the location where the soil intercepts the top of the pipe adjacent to the opening of the pipe end section, or may represent a change in slope.

* Transition from Inslope at drainage structure to a 6 : 1 inslope and 3:1 inslope.

** Transition from typical inslope to the inslopes adjacent to the drainage structure. Within the clear zone (area from edge of subgrade shoulder to line B-B) use 100' length for each 1:1 slope change. Example: transition from a 4:1 to a 6:1 would require a 200' length transition. The typical inslope outside of the clear zone will be transitioned to a 3:1 inslope within the transition length necessary for the transition within the clear zone.

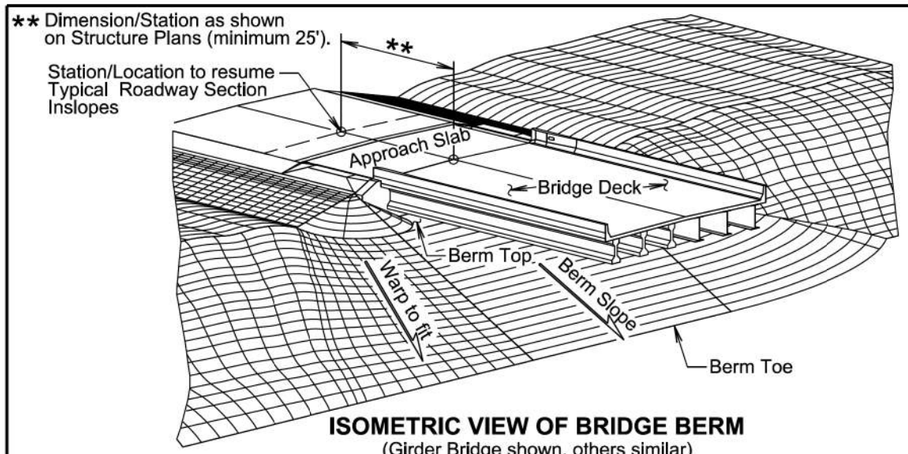
Plotting Date: 09/04/2025

STATE OF SOUTH DAKOTA

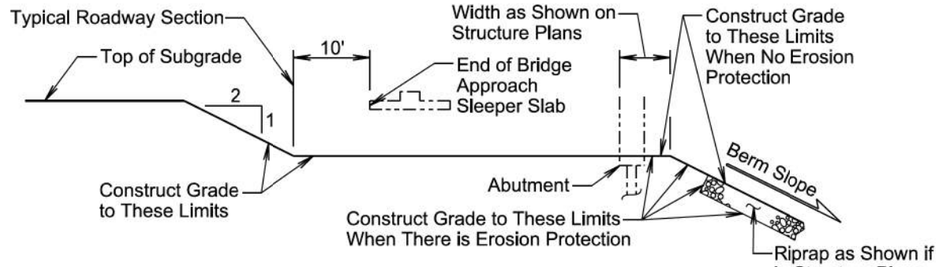
PROJECT P 0127(09)214

SHEET B18

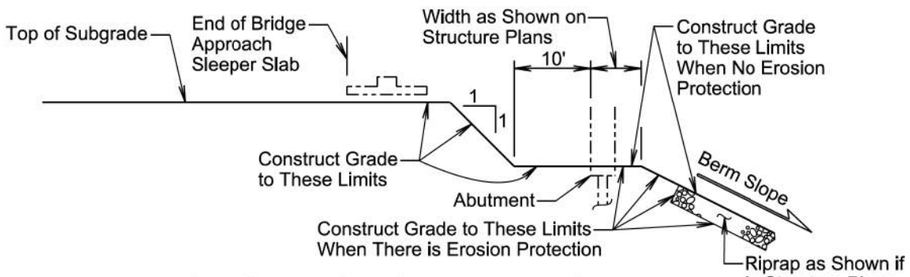
TOTAL SHEETS B33



ISOMETRIC VIEW OF BRIDGE BERM
(Girder Bridge shown, others similar)



TYPICAL GRADING PROFILE AT BRIDGE BERM
(Normal to ℄ Abutment at ℄ Roadway)



TYPICAL GRADING PROFILE AT BRIDGE BERM
(Normal to ℄ Abutment at ℄ Roadway)

GENERAL NOTES:

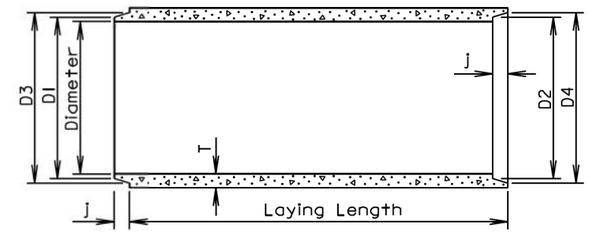
The bridge berm elevation and slope will be as shown in the Structure Plans.
See Structure Plans to determine which grading profile to use.

January 22, 2021

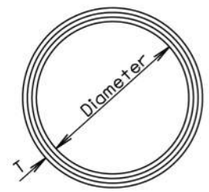
Published Date: 2026	SDDOT	BRIDGE BERM (NONPROJECTING EMBANKMENT)	PLATE NUMBER 120.10
			Sheet 1 of 1

TOLERANCES IN DIMENSIONS

Diameter: ±1.5% for 24" Dia. or less and ±1% or 3/8" whichever is more for 27" Dia. or greater.
Diameters at joints: ± 3/16" for 30" Dia. or less and ± 1/4" for 36" or greater.
Length of joint (j): ± 1/4".
Wall thickness (T): not less than design T by more than 5% or 3/16", whichever is greater.
Laying length: shall not underrun by more than 1/2".



LONGITUDINAL SECTION



END VIEW

GENERAL NOTES:

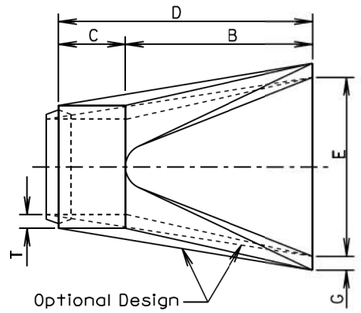
Construction of R.C.P. shall conform to the requirements of Section 990 of the Specifications.

Not more than 2 four-foot sections shall be permitted near the ends of any culvert. Four-foot lengths shall be used only to secure the required length of culvert.

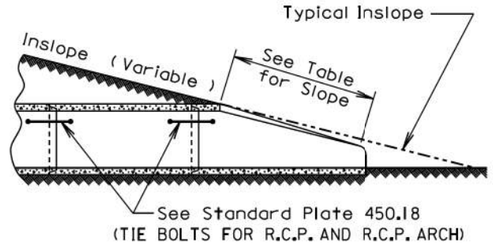
Diam. (in.)	Approx. Wt. /Ft. (lb.)	T (in.)	J (in.)	D1 (in.)	D2 (in.)	D3 (in.)	D4 (in.)
12	92	2	1 3/4	13 1/4	13 5/8	13 7/8	14 1/4
15	127	2 1/4	2	16 1/2	16 7/8	17 1/4	17 5/8
18	168	2 1/2	2 1/4	19 5/8	20	20 3/8	20 3/4
21	214	2 3/4	2 1/2	22 7/8	23 1/4	23 3/4	24 1/8
24	265	3	2 3/4	26	26 3/8	27	27 3/8
27	322	3 1/4	3	29 1/4	29 5/8	30 1/4	30 5/8
30	384	3 1/2	3 1/4	32 3/8	32 3/4	33 1/2	33 7/8
36	524	4	3 3/4	38 3/4	39 1/4	40	40 1/2
42	685	4 1/2	4	45 1/8	45 5/8	46 1/2	47
48	867	5	4 1/2	51 1/2	52	53	53 1/2
54	1070	5 1/2	4 1/2	57 1/8	58 3/8	59 3/8	59 7/8
60	1296	6	5	64 1/4	64 3/4	66	66 1/2
66	1542	6 1/2	5 1/2	70 5/8	71 1/8	72 1/2	73
72	1810	7	6	77	77 1/2	79	79 1/2
78	2098	7 1/2	6 1/2	83 3/8	83 7/8	85 5/8	86 1/8
84	2410	8	7	89 3/4	90 1/4	92 1/8	92 5/8
90	2740	8 1/2	7	95 3/4	96 1/4	98 1/8	98 5/8
96	2950	9	7	102 1/8	102 5/8	104 1/2	105
102	3075	9 1/2	7 1/2	109	109 1/2	111 1/2	112
108	3870	10	7 1/2	115 1/2	116	118	118 1/2

June 26, 2015

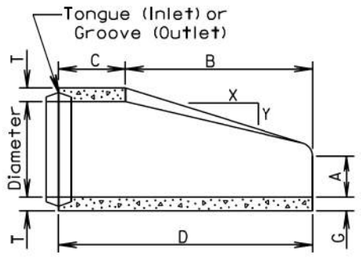
Published Date: 2026	SDDOT	REINFORCED CONCRETE PIPE	PLATE NUMBER 450.01
			Sheet 1 of 1



TOP VIEW



SLOPE DETAIL

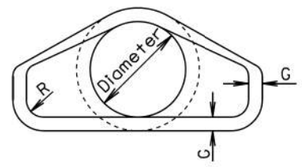


LONGITUDINAL SECTION

GENERAL NOTES:

Lengths of concrete pipe shown on plan sheets are between flared ends only.

Construction of R.C.P. Flared End shall conform to the requirements of Section 990 of the Specifications.



END VIEW

Dia. (in.)	Approx. Wt. of Section (lbs.)	Approx. Slope (X to Y)	T (in.)	A (in.)	B (in.)	C (in.)	D (in.)	E (in.)	G (in.)	R (in.)
12	530	2.4:1	2	4	24	48⅞	72⅞	24	2	1½
15	740	2.4:1	2¼	6	27	46	73	30	2¼	1½
18	990	2.3:1	2½	9	27	46	73	36	2½	1½
21	1280	2.4:1	2¾	9	36	37½	73½	42	2¾	1½
24	1520	2.5:1	3	9½	43½	30	73½	48	3	1½
27	1930	2.5:1	3¼	10½	49½	24	73½	54	3¼	1½
30	2190	2.5:1	3½	12	54	19¾	73¾	60	3½	1½
36	4100	2.5:1	4	15	63	34¾	97¾	72	4	1½
42	5380	2.5:1	4½	21	63	35	98	78	4½	1½
48	6550	2.5:1	5	24	72	26	98	84	5	1½
54	8240	2:1	5½	27	65	33¼	98¼	90	5½	1½
60	8730	1.9:1	6	35	60	39	99	96	5	1½
66	10710	1.7:1	6½	30	72	27	99	102	5½	1½
72	12520	1.8:1	7	36	78	21	99	108	6	1½
78	14770	1.8:1	7½	36	90	21	111	114	6½	1½
84	18160	1.6:1	8	36	90½	21	111½	120	6½	1½
90	20900	1.5:1	8½	41	87½	24	111½	132	6½	6

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Published Date: 2026	SDDOT	R. C. P. FLARED ENDS	PLATE NUMBER 450.10
			Sheet 1 of 1

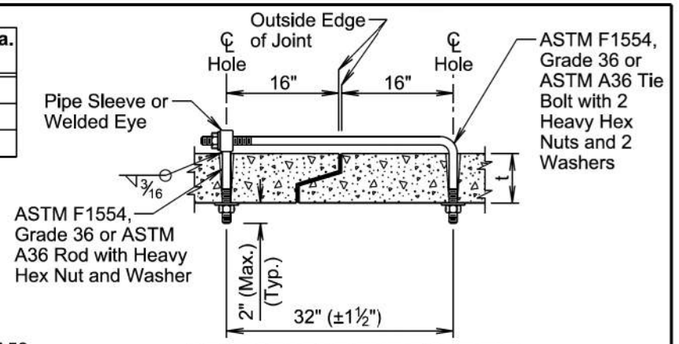
Wall "t" (in.)	Rod Dia. (in.)	Pipe Sleeve Dia. (nominal)
≤ 3¼	⅝	¾
3½-6½	¾	1
≥ 7	1	1¼

GENERAL NOTES:

Tie bolts will conform to ASTM F1554, Grade 36 or ASTM A36. Nuts will be heavy hex conforming to ASTM A563. Washers will conform to ASTM F436.

Pipe Sleeve will conform to ASTM A53, Grade B or ASTM A500, Grade B or C.

Galvanize adjustable eye bolt tie assembly in accordance with ASTM A153.



ADJUSTABLE EYE BOLT TIE

Pipe Dia. (in.)	"L" (in.)	Bolt Dia. (in.)
≤ 48	4	¾
> 48	6	1

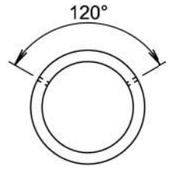
ANGLE AND BOLT TIE

GENERAL NOTES:

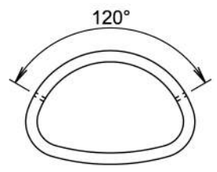
Angles will conform to ASTM A36.

Bolts will conform to ASTM A307. Nuts will be heavy hex conforming to ASTM A563. Washers will conform to ASTM F436.

Galvanize angles, bolts, nuts, and washers in accordance with ASTM A153.



END VIEW
(Circular)



END VIEW
(Arch)

GENERAL NOTES:

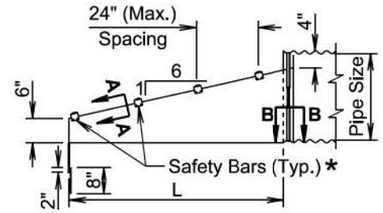
In lieu of the tie bolts detailed above other types of tie bolt connections may be installed as approved by the Office of Bridge Design.

All pipe sections of R.C.P. and R.C.P. Arch will be tied with tie bolts except for pipe located between drop inlets, manholes, and junction boxes. All pipe sections of pipes that only enter or exit drop inlets, manholes, and junction boxes will be tied with tie bolts.

There will be no separate measurement or payment for the tie bolts. The cost for furnishing and installing the tie bolts will be incidental to the contract unit price per foot for the corresponding bid item for R.C.P. or R.C.P. Arch.

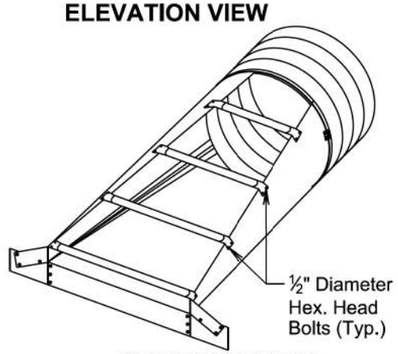
April 8, 2025

Published Date: 2026	SDDOT	TIE BOLTS FOR R.C.P. AND R.C.P. ARCH	PLATE NUMBER 450.18
			Sheet 1 of 1

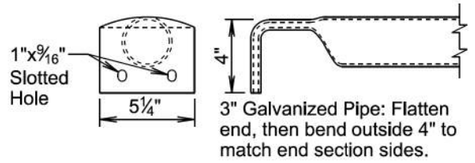


* Number of bars required will vary depending on the length of the end section.

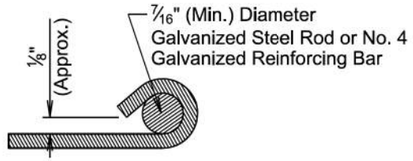
ELEVATION VIEW



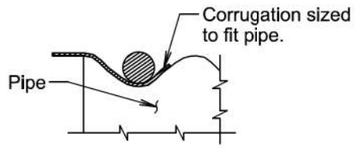
ISOMETRIC VIEW



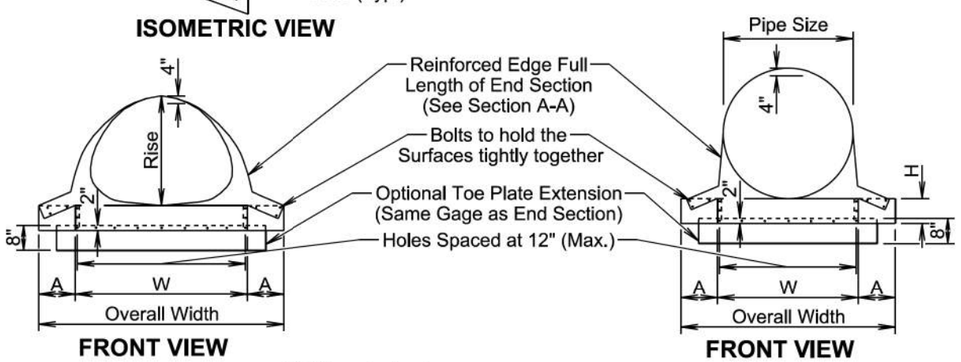
DETAIL OF SAFETY BARS



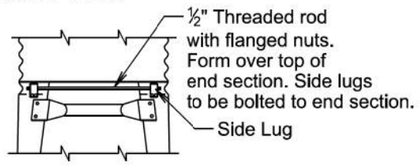
SECTION A-A



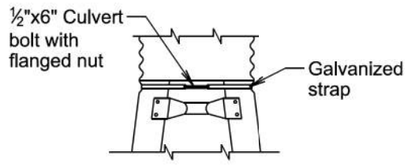
SECTION B-B



FRONT VIEW **FRONT VIEW**



TYPE #2 CONNECTOR DETAIL
(For 30" and Larger)
(For 21"x15" and Larger)



TYPE #1 CONNECTOR DETAIL
(For 15" Through 24")

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Published Date: 2026	SDDOT	C.M.P. SAFETY ENDS	PLATE NUMBER 450.38
			Sheet 1 of 2

ARCH C.M.P. SAFETY ENDS

Equlv. Dia. (Inch)	(Inches) Span	Rise	(Min.) Thick. Inch	Gage	Dimensions (Inches) A	H	W	L Dimensions Overall Width	Slope	Length (Inch)
18	21	15	.064	16	8	6	27	43	6:1	30
21	24	18	.064	16	8	6	30	46	6:1	48
24	28	20	.064	16	8	6	34	50	6:1	60
30	35	24	.079	14	12	9	41	65	6:1	84
36	42	29	.109	12	12	9	48	72	6:1	114
42	49	33	.109	12	16	12	55	87	6:1	138
48	57	38	.109	12	16	12	63	95	6:1	168
54	64	43	.109	12	16	12	70	102	6:1	198
60	71	47	.109	12	16	12	77	109	6:1	222
72	83	57	.109	12	16	12	89	121	6:1	282

CIRCULAR C.M.P. SAFETY ENDS

Pipe Dia. (Inch)	(Min.) Thick. Inch	Gage	Dimensions (Inches) A	H	W	Overall Width	L Dimensions Slope	Length (Inch)
15	.064	16	8	6	21	37	6:1	30
18	.064	16	8	6	24	40	6:1	48
21	.064	16	8	6	27	43	6:1	66
24	.064	16	8	6	30	46	6:1	84
30	.109	12	12	9	36	60	6:1	120
36	.109	12	12	9	42	66	6:1	156
42	.109	12	16	12	48	80	6:1	192
48	.109	12	16	12	54	86	6:1	228
54	.109	12	16	12	60	92	6:1	264
60	.109	12	16	12	66	98	6:1	300

GENERAL NOTES:

Safety bars will be provided when specified in the plans.

Safety ends will be fabricated from galvanized steel conforming to the requirements of the Specifications.

Safety bars will be fabricated from steel schedule 40 pipe in conformance with ASTM A53, grade B or HSS 3.5x.216 in conformance with ASTM A500, grade B or C.

Slotted holes for safety bar attachment will be provided for all end sections.

Attachment to circular pipes 15" through 24" diameter will be made with Type #1 straps. All other sizes will be attached with Type #2 rods and lugs.

When stated in the plans, optional toe plate extension will be punched and bolted to end section apron lip with ⅜" diameter galvanized bolts. Steel for toe plate extension will be same gauge as end section. Dimensions will be overall width less 6" by 8" high.

Installation will be performed in accordance with the Specifications.

Cost of all work and materials required for fabrication and installation of safety ends will be incidental to the bid items for the various sizes of safety ends.

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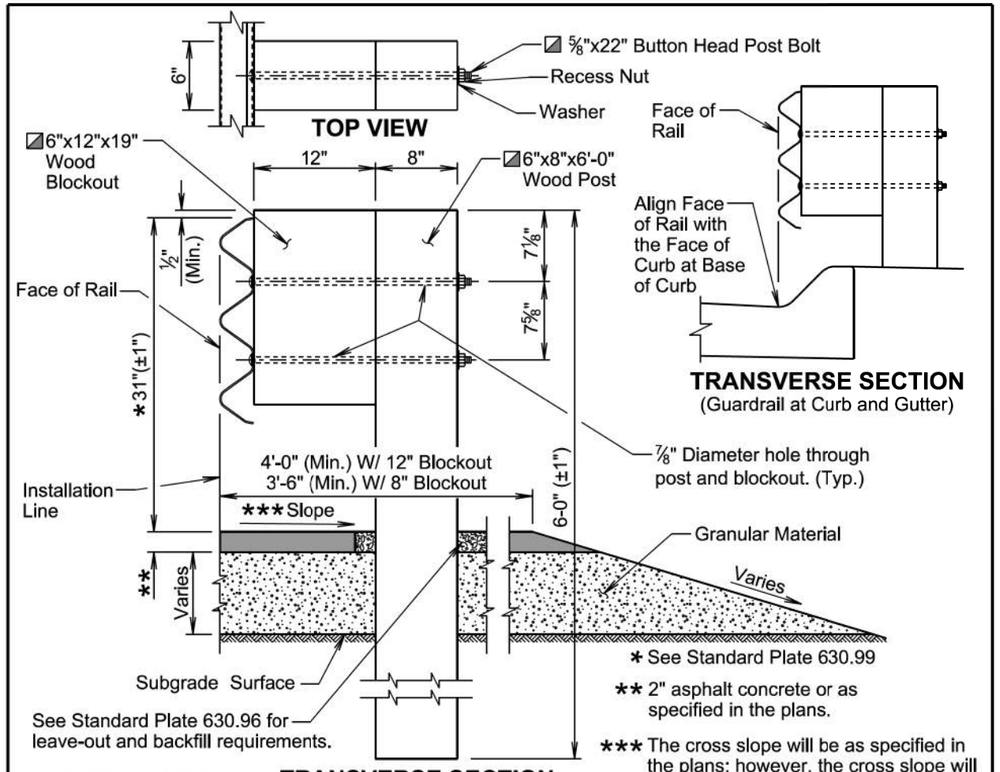
Published Date: 2026	SDDOT	C.M.P. SAFETY ENDS	PLATE NUMBER 450.38
			Sheet 2 of 2



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.

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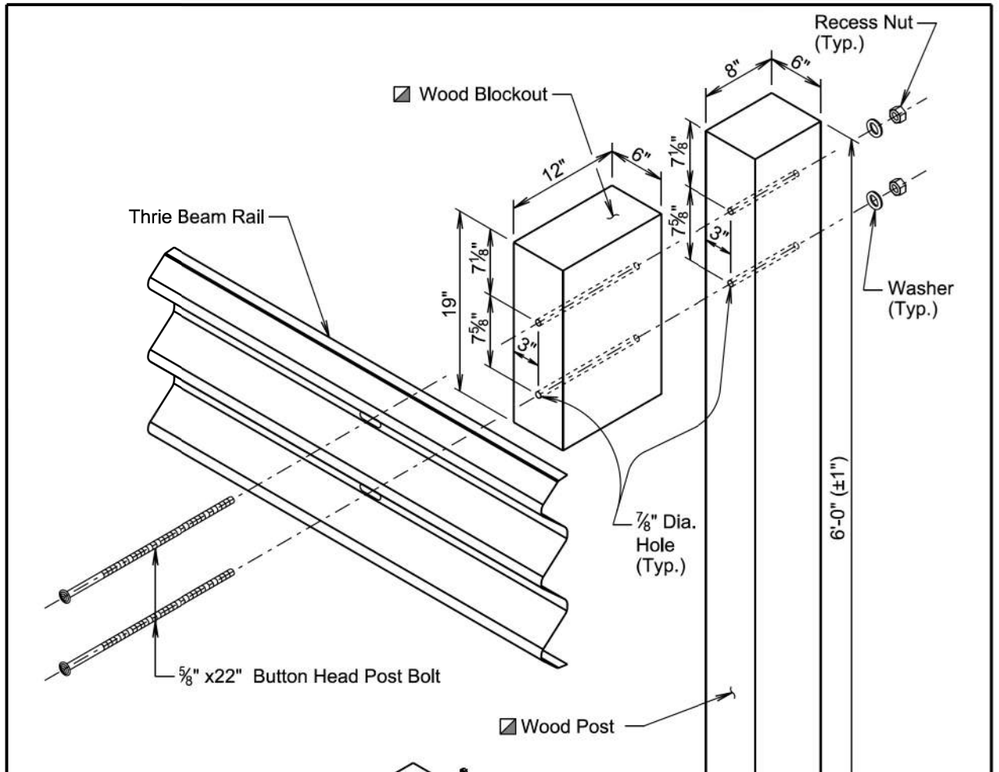
Published Date: 2026	SDDOT	THRIE BEAM GUARDRAIL	PLATE NUMBER 630.01
			Sheet 1 of 5



EXPANDED ISOMETRIC VIEW AT MIDSPAN OF THRIE BEAM GUARDRAIL

EXPANDED ISOMETRIC VIEW OF DOUBLE (NESTED) THRIE BEAM GUARDRAIL AT MIDSPAN
(For Information Only, Not to Scale)

⧄ 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.

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Published Date: 2026	SDDOT	THRIE BEAM GUARDRAIL	PLATE NUMBER 630.01
			Sheet 2 of 5

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0127(09)214	B23	B33

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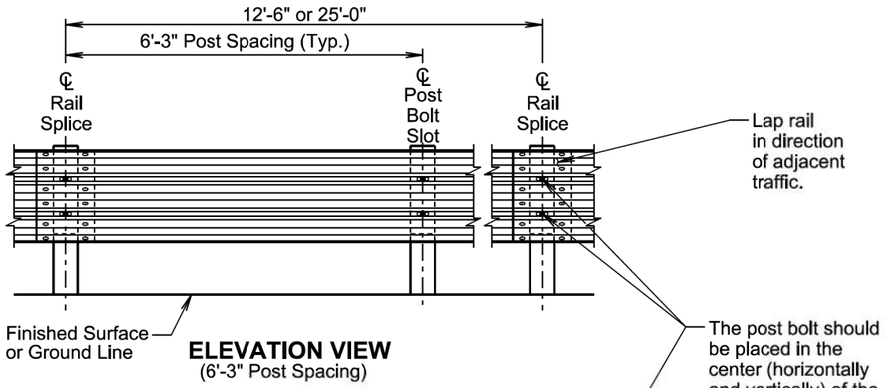
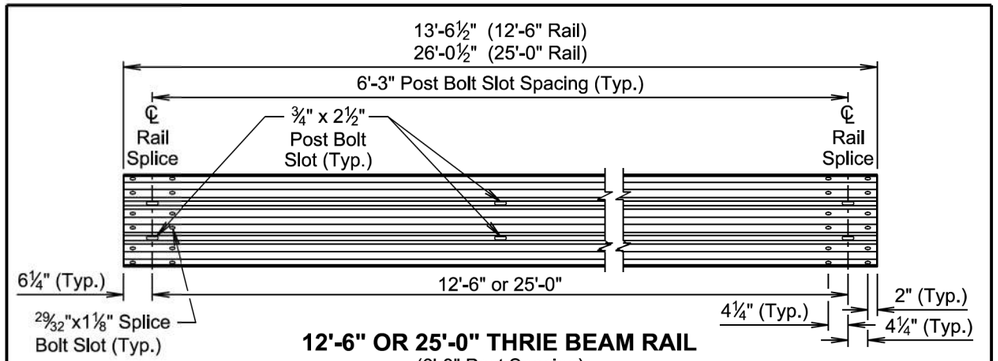


April 8, 2025

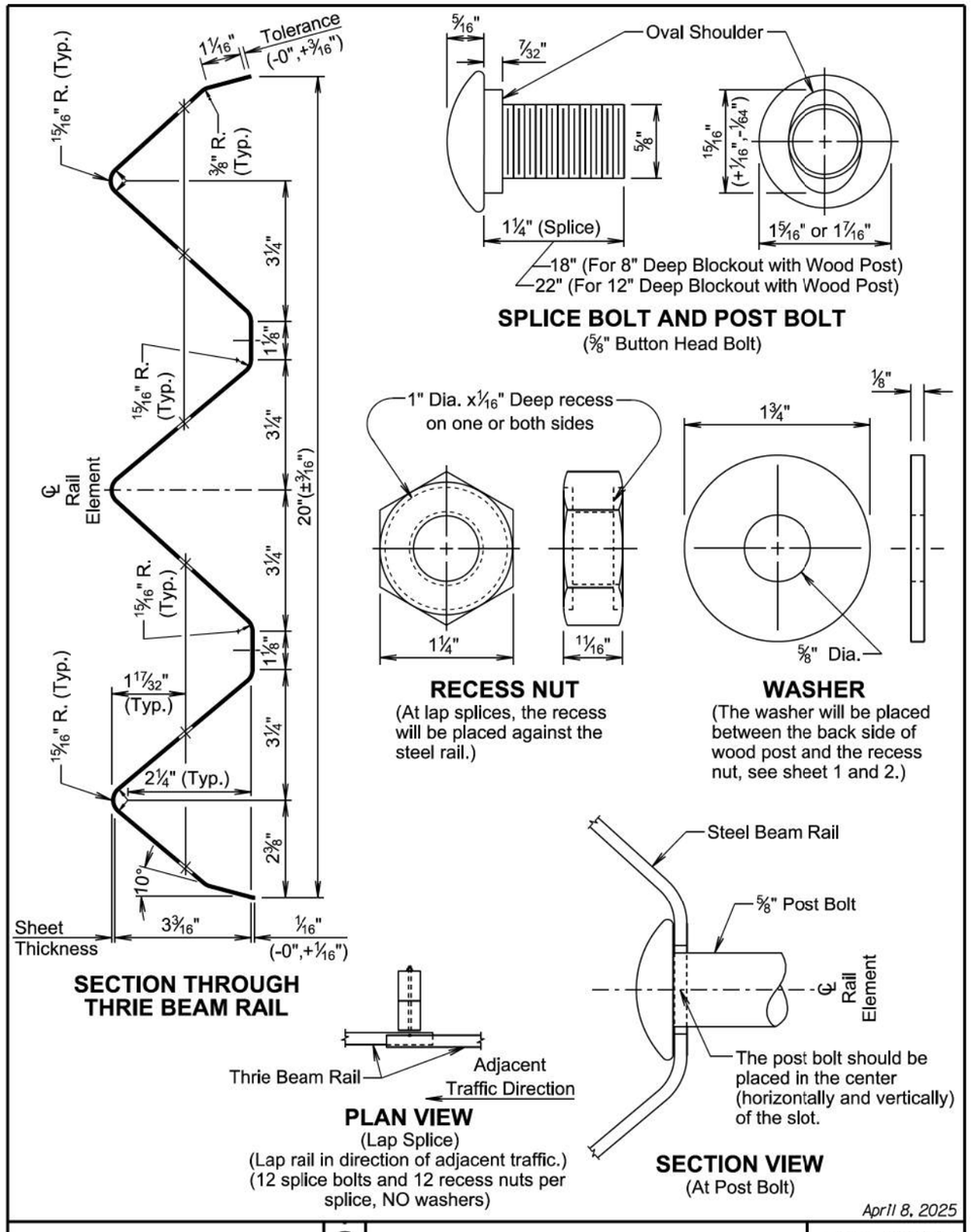
Published Date: 2026	SDDOT	THRIE BEAM GUARDRAIL	PLATE NUMBER 630.01
			Sheet 3 of 5



April 8, 2025

Published Date: 2026	SDDOT	THRIE BEAM GUARDRAIL	PLATE NUMBER 630.01
			Sheet 4 of 5

Plot Scale - 1:200
Plotted From - TRSF12141
File - ...\rob\0677D\StdPlateSectionB.dgn



SPLICE BOLT AND POST BOLT
(⅝" 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: 2026	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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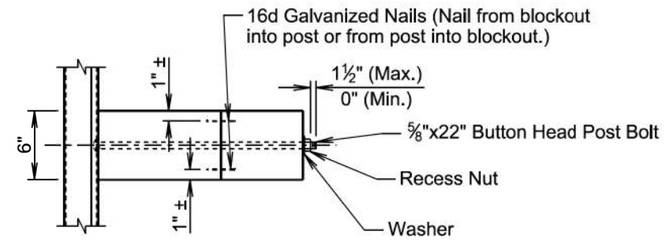
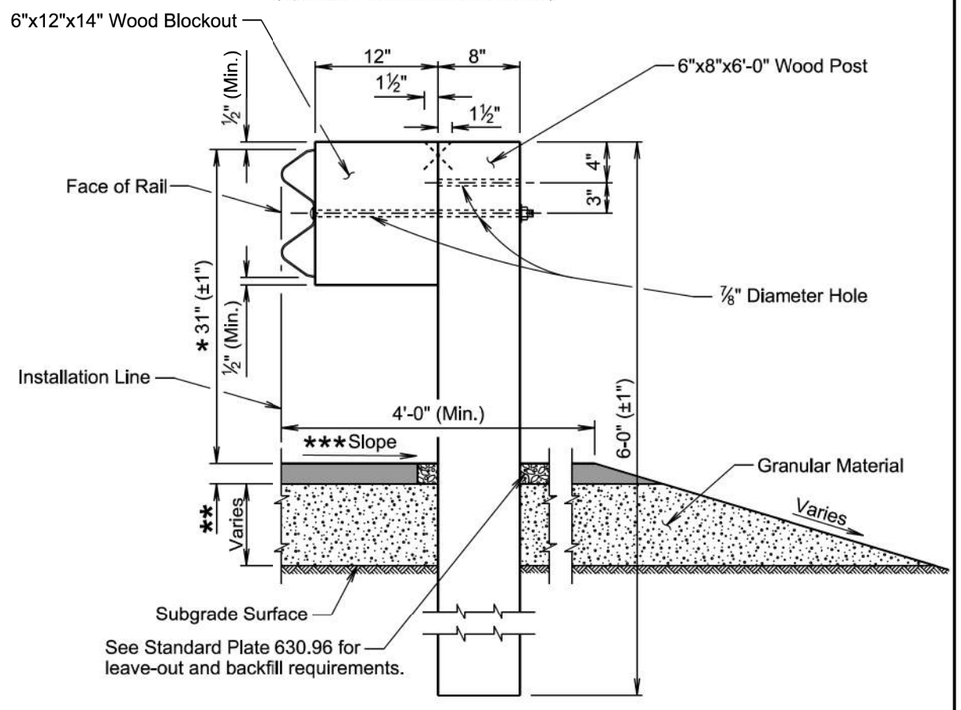
Published Date: 2026	SDDOT	MIDWEST GUARDRAIL SYSTEM (MGS)	PLATE NUMBER 630.20
			Sheet 1 of 6



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.

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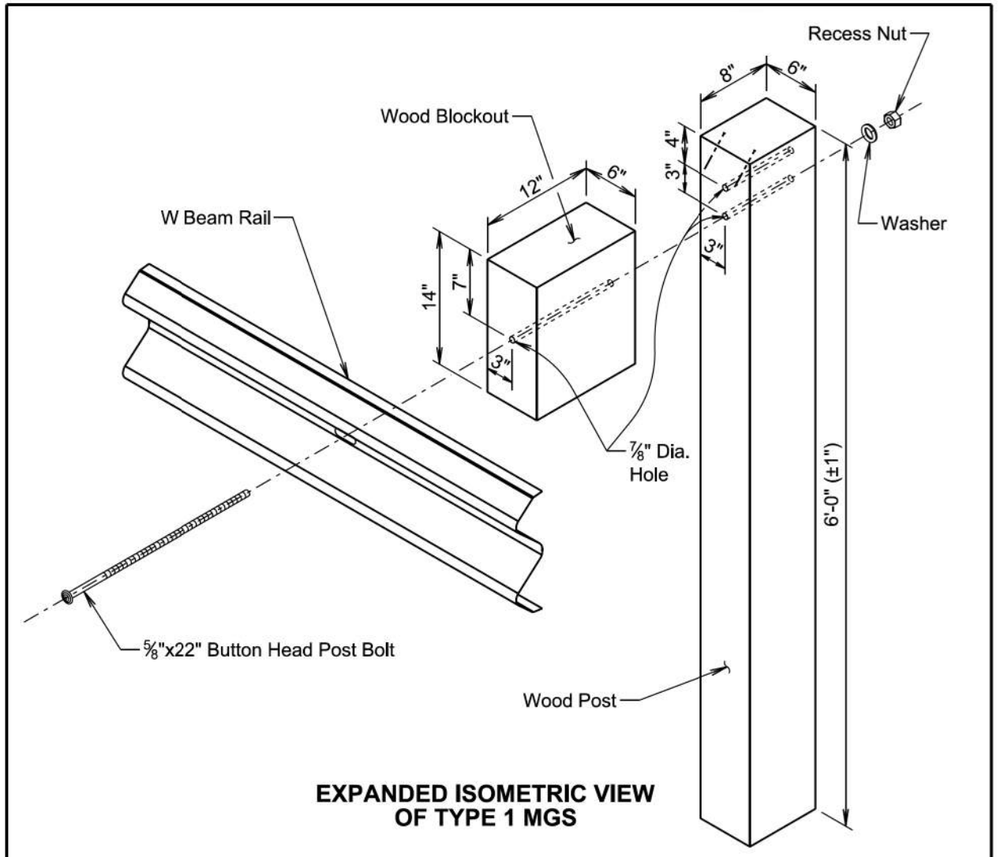
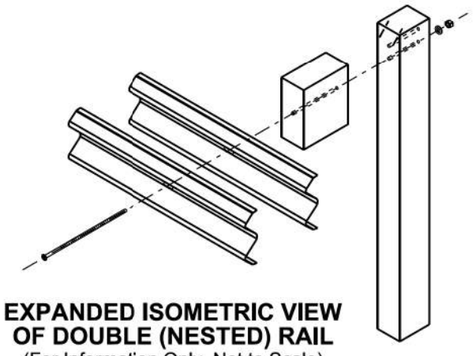
Published Date: 2026	SDDOT	MIDWEST GUARDRAIL SYSTEM (MGS)	PLATE NUMBER 630.20
			Sheet 2 of 6



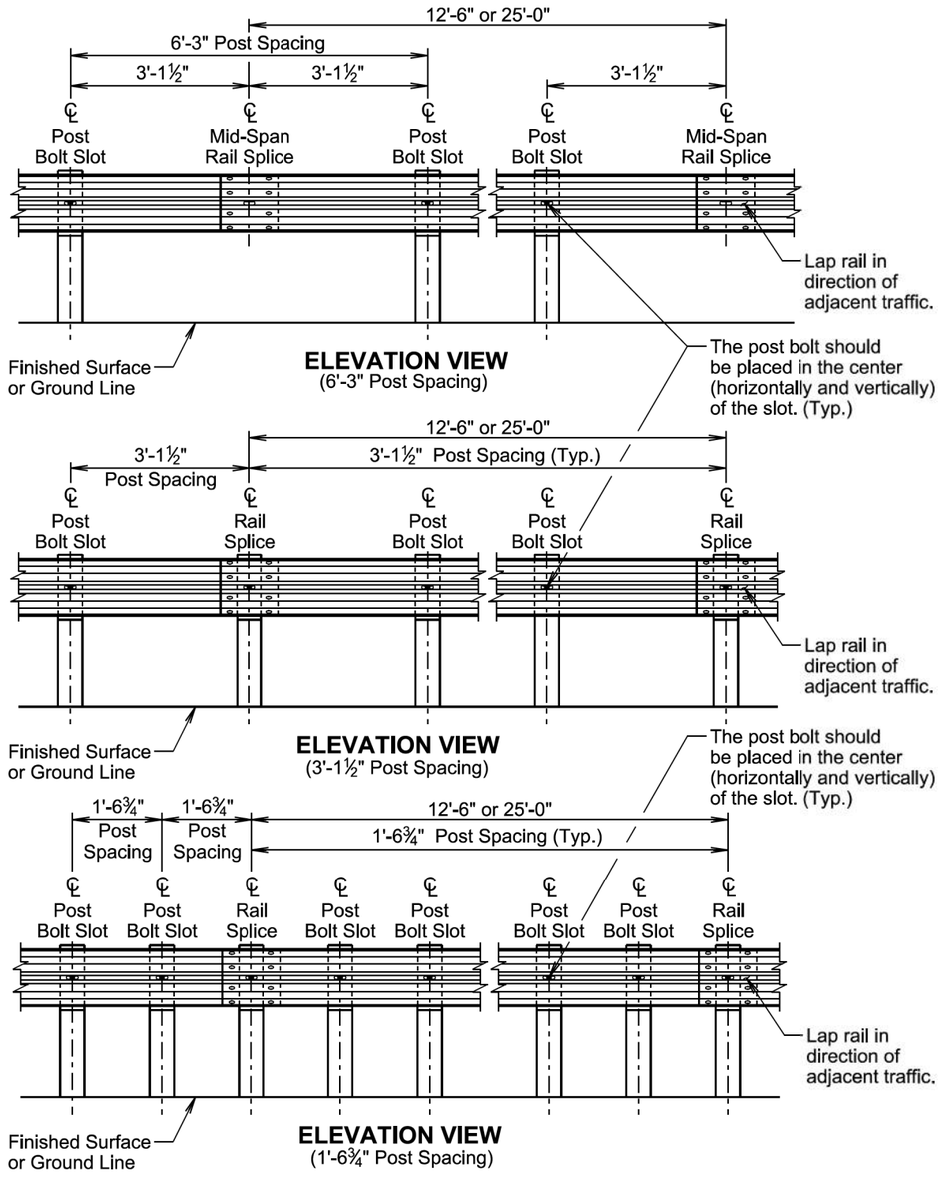
EXPANDED ISOMETRIC VIEW OF TYPE 1 MGS



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

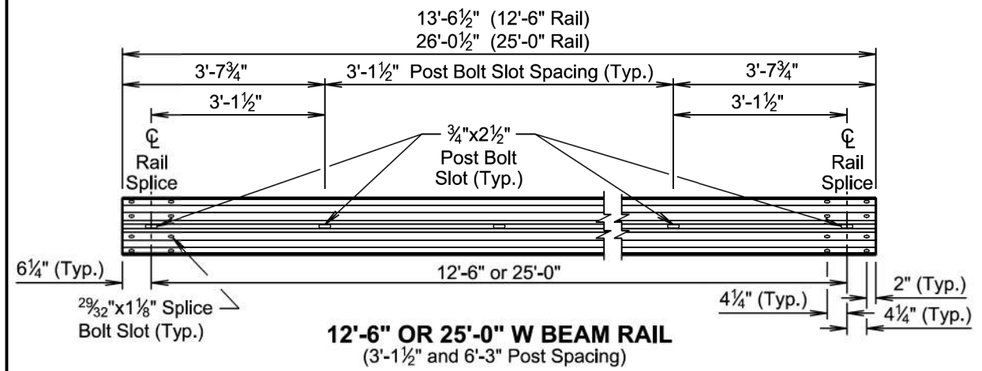
April 8, 2025

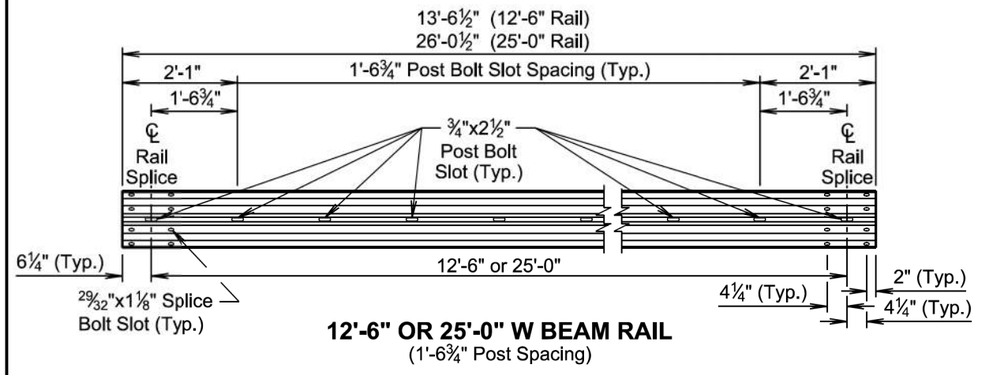
Published Date: 2026	SDDOT	MIDWEST GUARDRAIL SYSTEM (MGS)	PLATE NUMBER 630.20
			Sheet 3 of 6



April 8, 2025

Published Date: 2026	SDDOT	MIDWEST GUARDRAIL SYSTEM (MGS)	PLATE NUMBER 630.20
			Sheet 4 of 6





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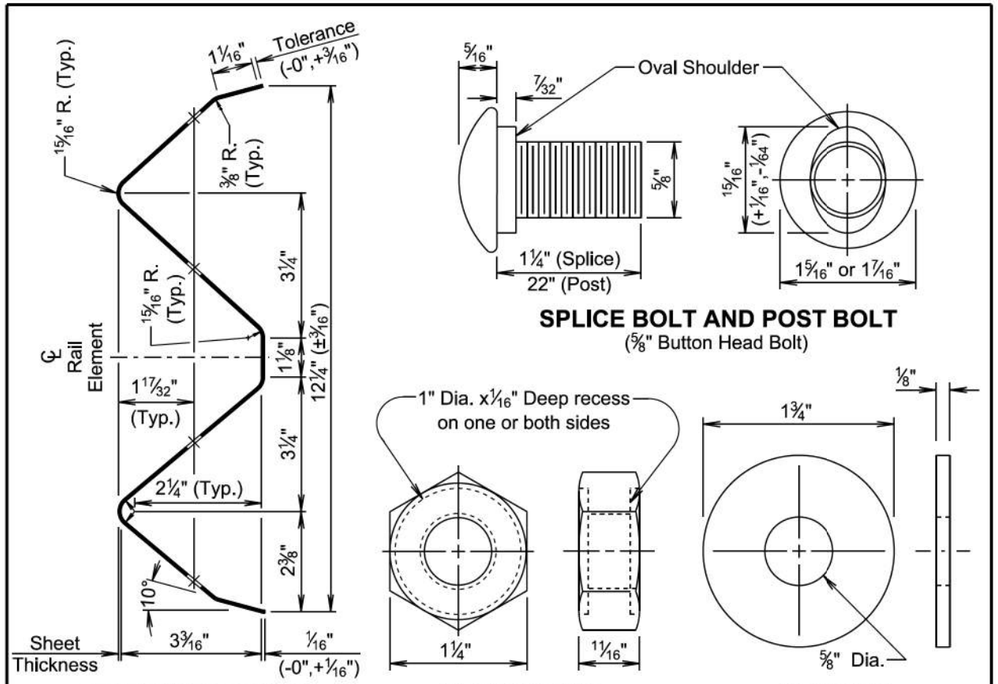
Published Date: 2026	SDDOT	MIDWEST GUARDRAIL SYSTEM (MGS)	PLATE NUMBER 630.20
			Sheet 5 of 6

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0127(09)214	B27	B33

Plotting Date: 09/04/2025
Revised Date: 03/11/2025 MDJ

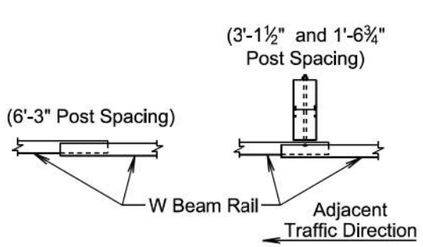


SECTION THROUGH W BEAM RAIL

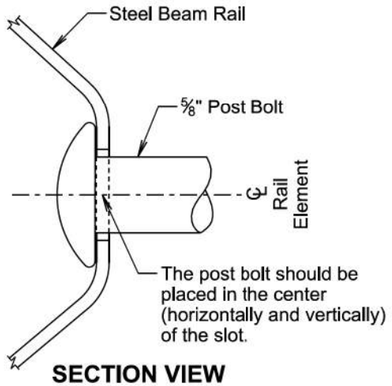
SPLICE BOLT AND POST BOLT
(5/8" Button Head Bolt)

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.)



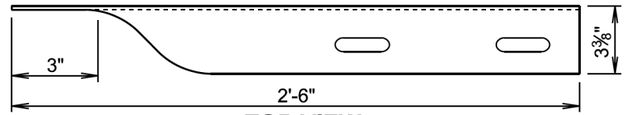
PLAN VIEW
(Lap Splice)
(Lap rail in direction of adjacent traffic.)
(8 splice bolts and 8 recess nuts per splice, NO washers)



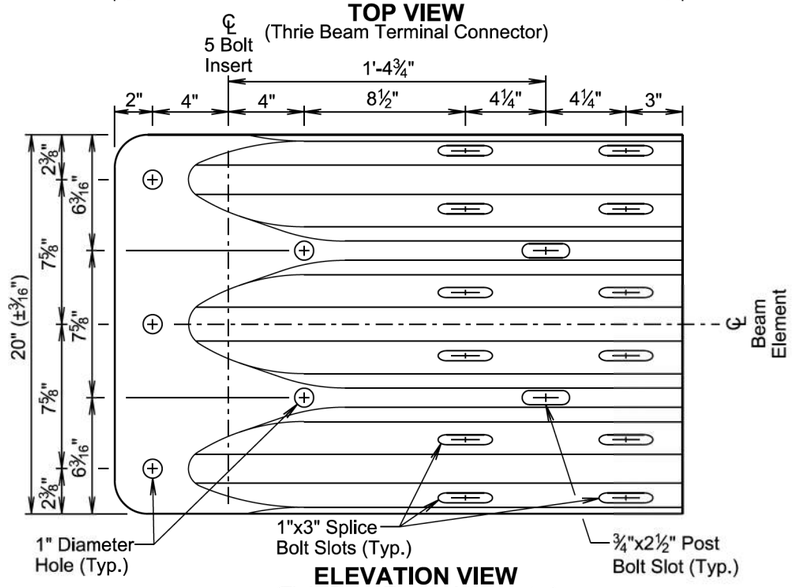
SECTION VIEW
(At Post Bolt)

April 8, 2025

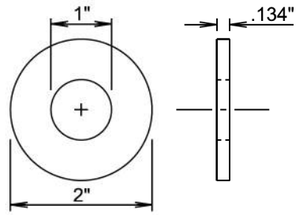
Published Date: 2026	SDDOT	MIDWEST GUARDRAIL SYSTEM (MGS)	PLATE NUMBER 630.20
			Sheet 6 of 6



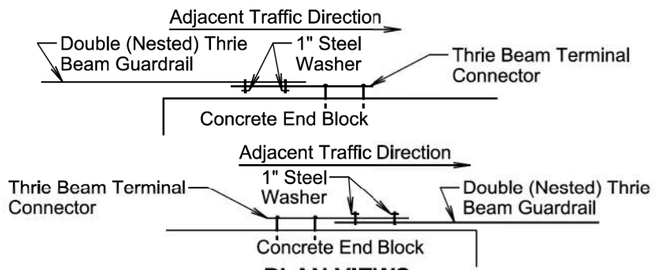
TOP VIEW
(Thrie Beam Terminal Connector)



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.

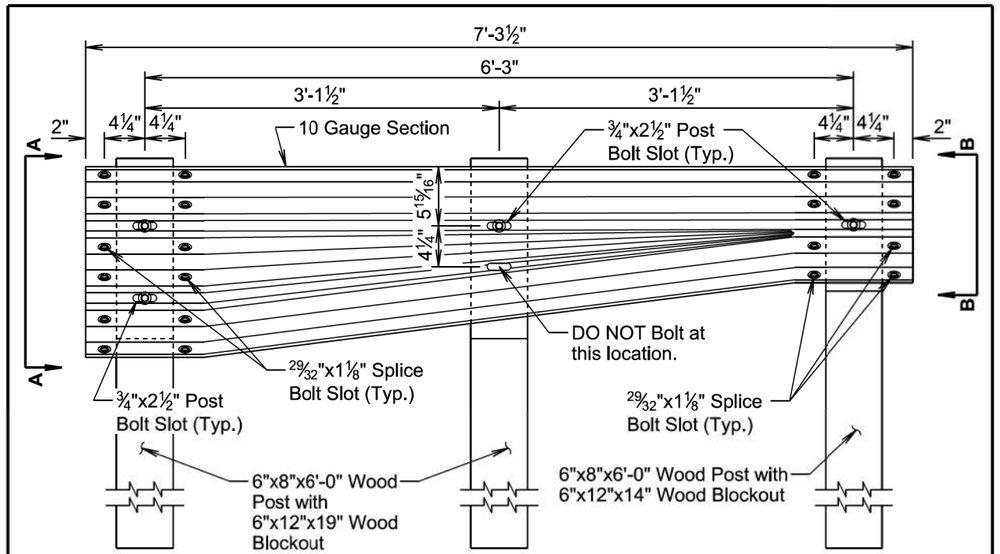
September 14, 2019

Published Date: 2026	SDDOT	THRIE BEAM TERMINAL CONNECTOR	PLATE NUMBER 630.47
			Sheet 1 of 1

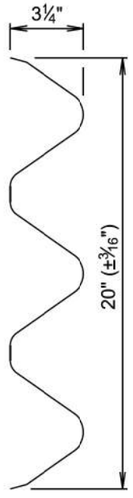
Plot Scale - 1:200
Plotted From - TRSF12141
File - ...\rob0607\StdPlateSectionB.dgn

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0127(09)214	B28	B33

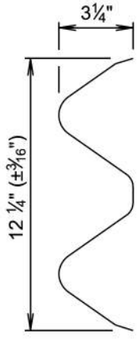
Plotting Date: 09/04/2025
Revised Date: 03/11/2025 MDJ



ELEVATION VIEW



VIEW A-A



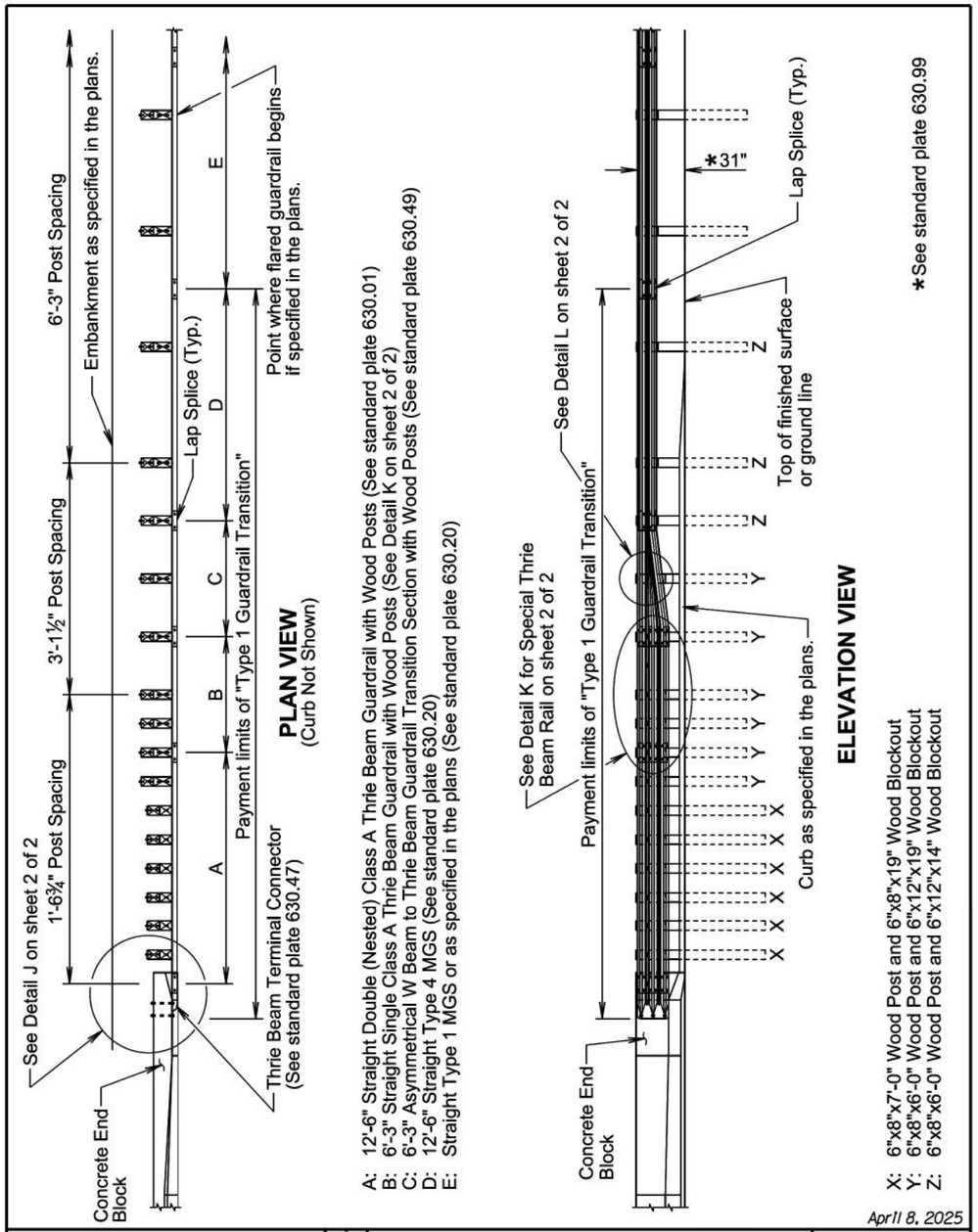
VIEW B-B

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: 2026	SDDOT	**ASYMMETRICAL W BEAM TO THRIE BEAM GUARDRAIL TRANSITION SECTION**	PLATE NUMBER 630.49 Sheet 1 of 1



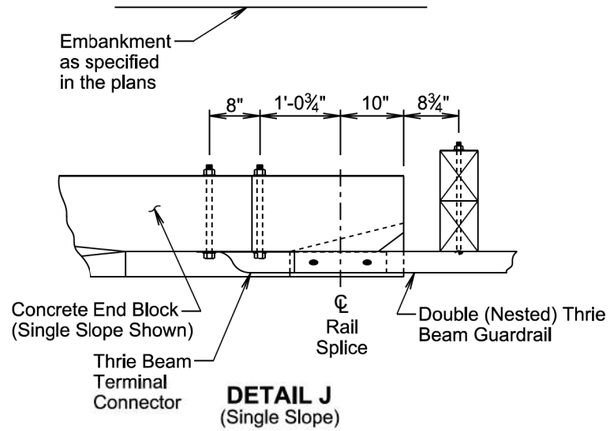
April 8, 2025

Published Date: 2026	SDDOT	**TYPE 1 GUARDRAIL TRANSITION (CONCRETE END BLOCK TO MIDWEST GUARDRAIL SYSTEM (MGS))**	PLATE NUMBER 630.50 Sheet 1 of 3

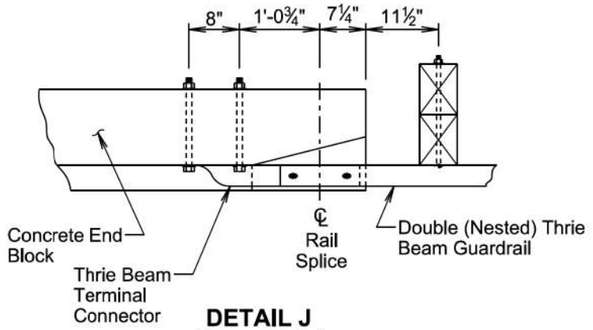
Plot Scale - 1:200
Plotted From - TRSF12141
File - ...\rob0667D\StdPlateSectionB.dgn

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0127(09)214	B29	B33

Plotting Date: 09/04/2025
Revised Date: 03/11/2025 MDJ

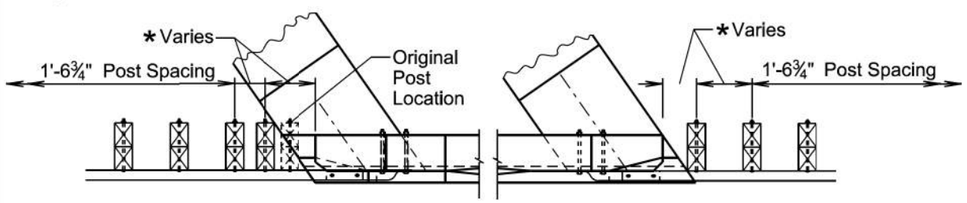


DETAIL J
(Single Slope)



DETAIL J
(Jersey Barrier)

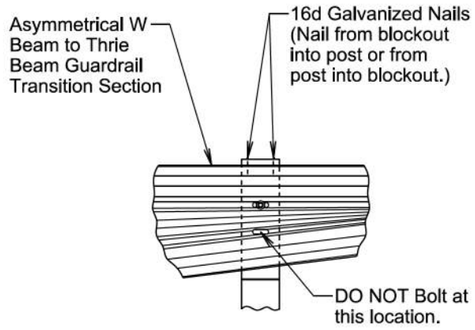
*Due to the skew of the bridge, the placement of the first "X" post and blockout will need to be moved from the original location. It will need to be installed as close as possible to the wingwall provided that the second "X" post and blockout is located in it's original location.



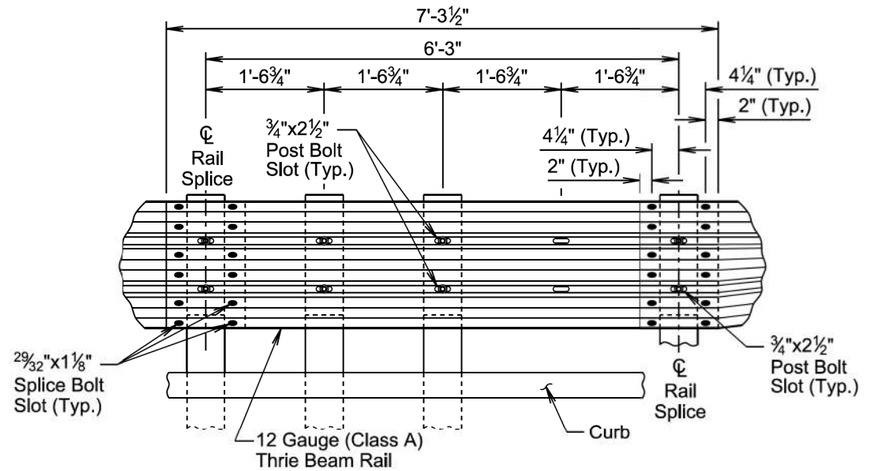
DETAIL J
(Skewed Bridge)

April 8, 2025

Published Date: 2026	SDDOT	TYPE 1 GUARDRAIL TRANSITION (CONCRETE END BLOCK TO MIDWEST GUARDRAIL SYSTEM (MGS))	PLATE NUMBER 630.50
			Sheet 2 of 3



DETAIL L



DETAIL K
(Special Thrie Beam Rail)

GENERAL NOTES:

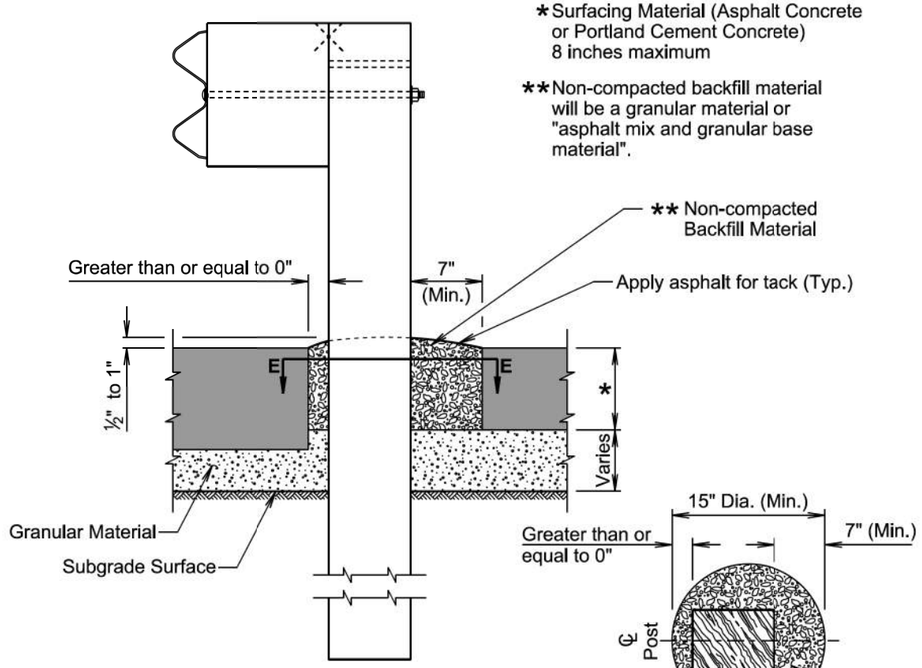
Throughout the type 1 guardrail transition, slots in the rails will be provided as specified in the plans and by the manufacturer. A drilled hole through the rail is not allowed as a replacement for a slot. If the Contractor must create a slot, a cutting torch or plasma cutter is not allowed. The slot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

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

April 8, 2025

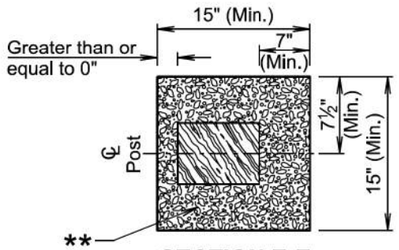
Published Date: 2026	SDDOT	TYPE 1 GUARDRAIL TRANSITION (CONCRETE END BLOCK TO MIDWEST GUARDRAIL SYSTEM (MGS))	PLATE NUMBER 630.50
			Sheet 3 of 3

Plot Scale - 1:200
Plotted From - TRSF12141
File - ...\rob0607D\StdPlateSectionB.dgn



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.

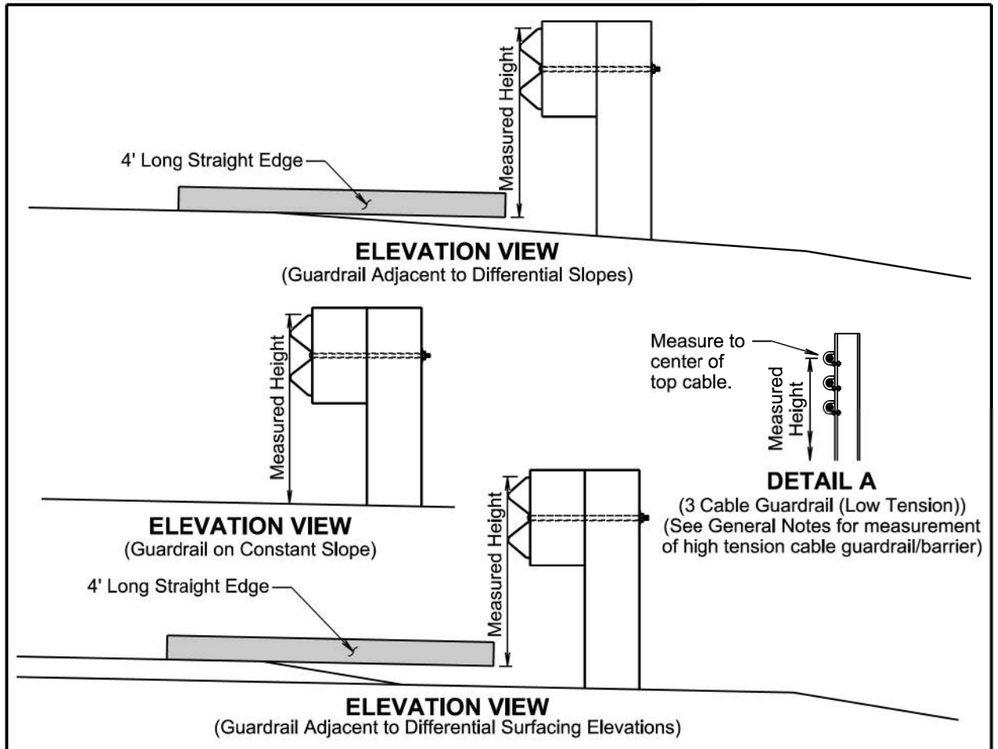
The backfill material will be mounded ½ inch to 1 inch above the top of the adjacent surfacing as illustrated above.

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: 2026	SDDOT	GUARDRAIL POST INSTALLED IN ASPHALT CONCRETE OR PORTLAND CEMENT CONCRETE	PLATE NUMBER 630.96
			Sheet 1 of 1

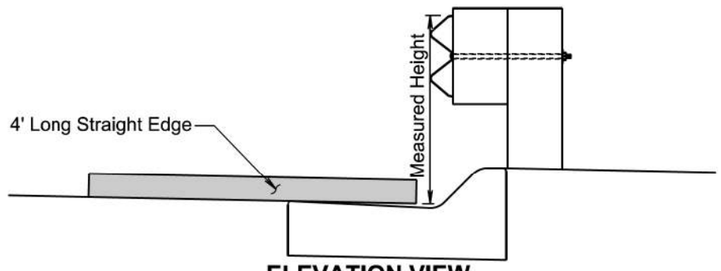


ELEVATION VIEW
(Guardrail Adjacent to Differential Slopes)

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.

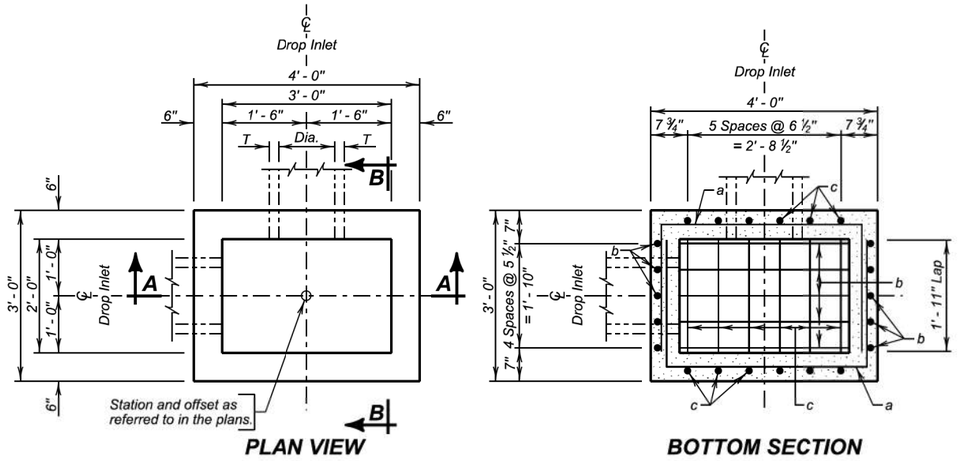
The height of high tension cable guardrail/barrier will be measured in accordance with the Manufacturer's installation instructions.

September 14, 2019

Published Date: 2026	SDDOT	MEASURING GUARDRAIL HEIGHT	PLATE NUMBER 630.99
			Sheet 1 of 1

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0127(09)214	B31	B33

Plotting Date: 09/04/2025
Revised Date: 03/11/2025 MDJ



ESTIMATED QUANTITIES			
ITEM	UNIT	CONSTANT QUANTITY	VARIABLE QUANTITY
✳ Class M6 Concrete	Cu. Yd.	0.26	0.22H
Reinforcing Steel	Lb.	51.19	28.97H
Frame and Grate Assembly	Each	1	———

DROP INLETS FOR 12" TO 24" DIAMETER PIPE

SPECIFICATIONS

Design Specifications: AASHTO LRFD Bridge Design Specifications, 2012 Edition.

Construction Specifications: South Dakota Standard Specifications for Roads and Bridges, Current Edition and required Provisions, Supplemental Specifications, and Special Provisions as included in the Proposal.

GENERAL NOTES:

Design Live Load: HL-93. No construction loading in excess of legal load was considered.

Reinforcing steel shall conform to ASTM A615 grade 60. The d bars shall be lapped 12 inches with the b and c bars. Cut and bend reinforcing steel as required to place pipe(s) through the drop inlet wall.

Drop inlet may be precast. If precast drop inlet details differ from this standard plate, submit a checked design done by a SD registered P.E. and shop plans to the Office of Bridge Design for approval.

✳ Reduce total quantities of concrete by the amount of concrete displaced by the pipe(s). The total quantity of concrete shall be computed to the nearest hundredth of a cubic yard. The total quantity of reinforcing steel shall be computed to the nearest pound.

Drop inlet shown may be modified by the addition or omission of connecting pipes as noted elsewhere in the plans. All pipes entering drop inlet must fit between the inside face of walls and shall not enter through the corners.

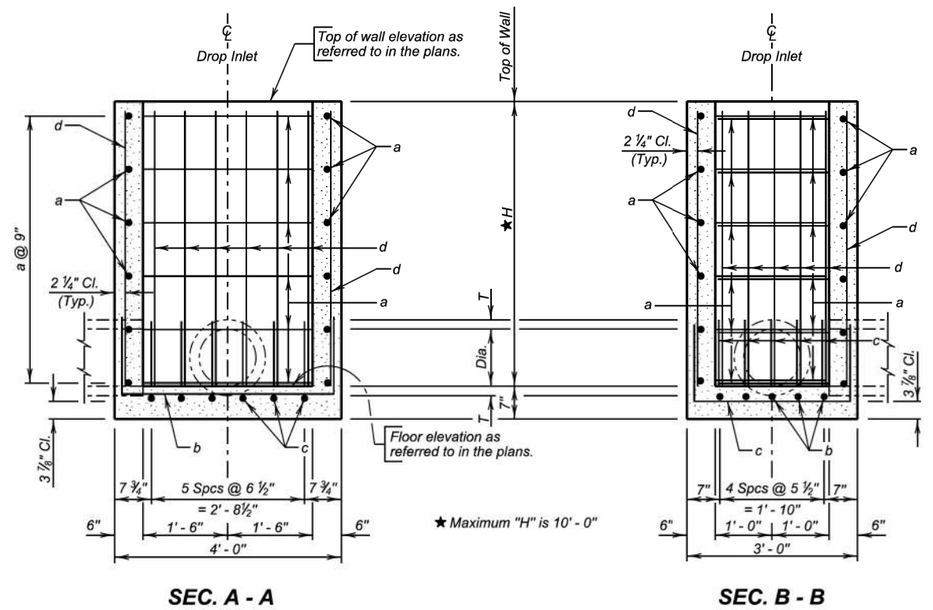
Maximum R.C.P. diameter shall not exceed 18 inches on the 2-foot wide side and shall not exceed 24 inches (24 inches for R.C. arch) on the 3-foot wide side of the drop inlet.

The dimension of H is in feet. Maximum H is 10 feet.

PIPE DISPLACEMENT REDUCTIONS			
	Diameter (Inches)	Wall T (Inches)	Class M6 Concrete (Cu. Yd.)
R.C.P.	12	2	0.03
	15	2 ¼	0.04
	18	2 ½	0.05
	24	3	0.09
R.C. ARCH	18	2 ½	0.05
	24	3 ½	0.09

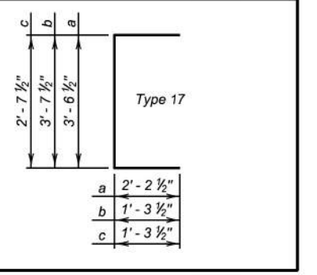
March 31, 2024

Published Date: 2026	SDDOT	2'X 3' TYPE B REINFORCED CONCRETE DROP INLET	PLATE NUMBER 670.01
			Sheet 1 of 2



REINFORCING SCHEDULE					
Mk.	No.	Size	Length	Type	Bending Details
a	2.67H	4	8' - 0"	17	
b	5	5	6' - 3"	17	
c	6	4	5' - 3"	17	
d	22	4	H - 2"	Str.	

NOTE:
All dimensions are out to out of bars.



March 31, 2024

Published Date: 2026	SDDOT	2'X 3' TYPE B REINFORCED CONCRETE DROP INLET	PLATE NUMBER 670.01
			Sheet 2 of 2

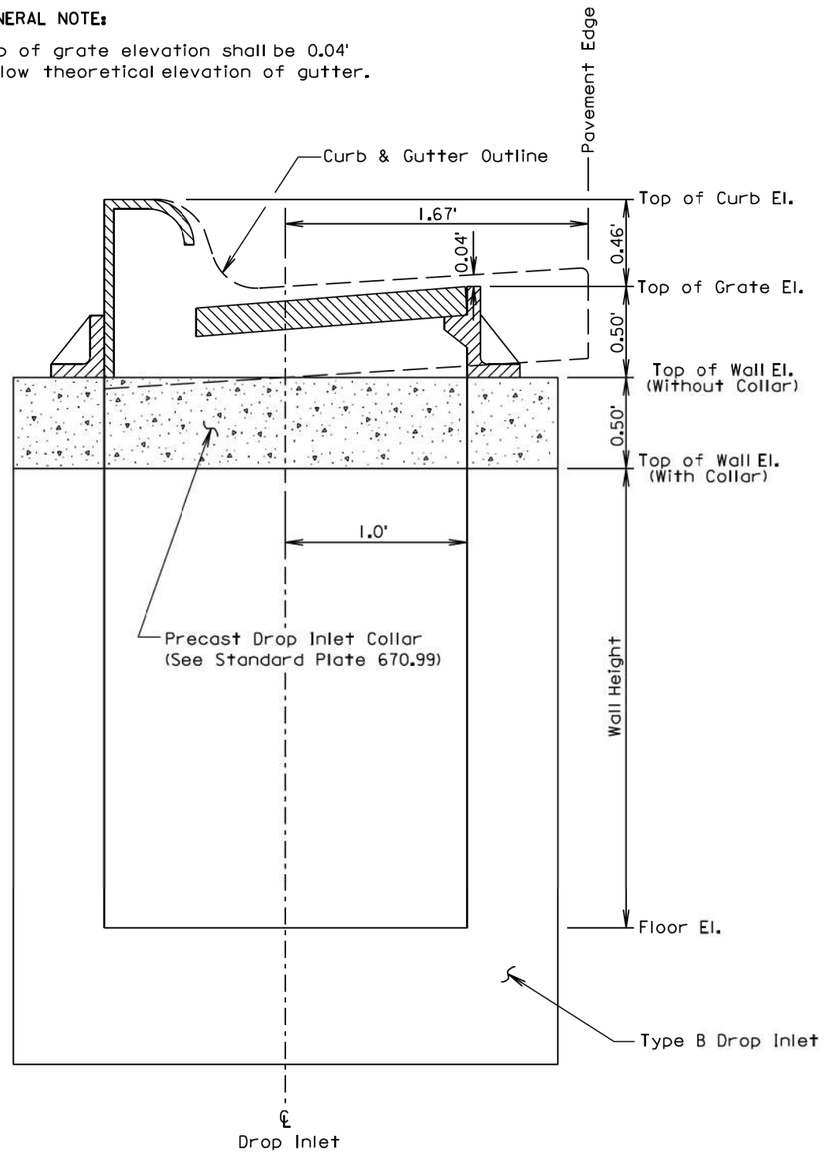
Plot Scale - 1:200
Plotted From - TRSF12141
File - ...\robt0667D\StdPlateSectionB.dgn

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0127(09)214	B32	B33

Plotting Date: 09/04/2025

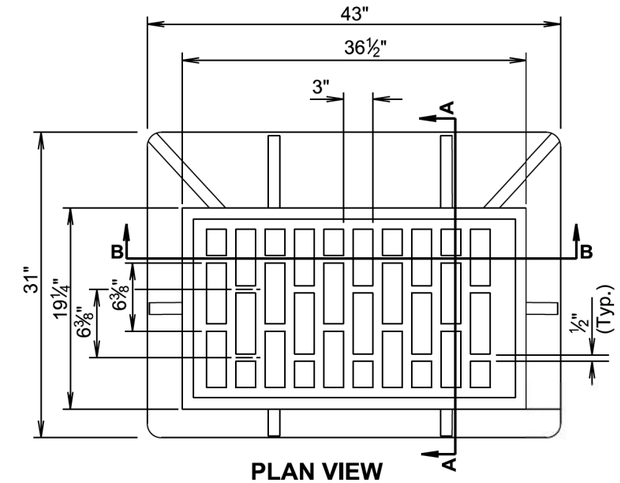
GENERAL NOTE:

Top of grate elevation shall be 0.04' below theoretical elevation of gutter.

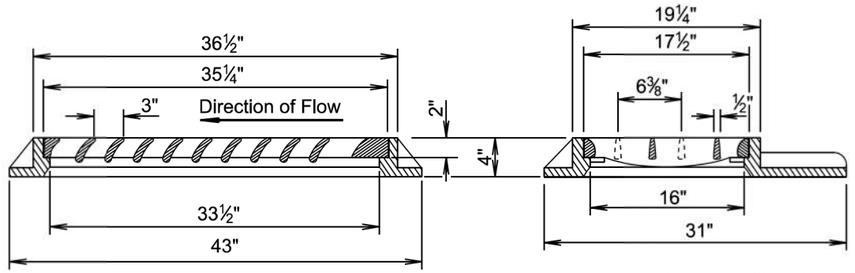


June 26, 2011

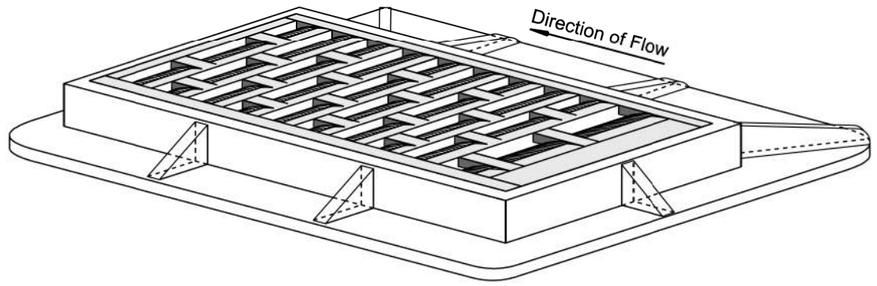
Published Date: 2026	SDDOT	INSTALLATION OF TYPE B DROP INLET	PLATE NUMBER 670.75
			Sheet 1 of 1



PLAN VIEW



SECTION B-B **SECTION A-A**



ISOMETRIC VIEW

March 31, 2024

Published Date: 2026	SDDOT	TYPE A FRAME AND GRATE	PLATE NUMBER 670.78
			Sheet 1 of 2

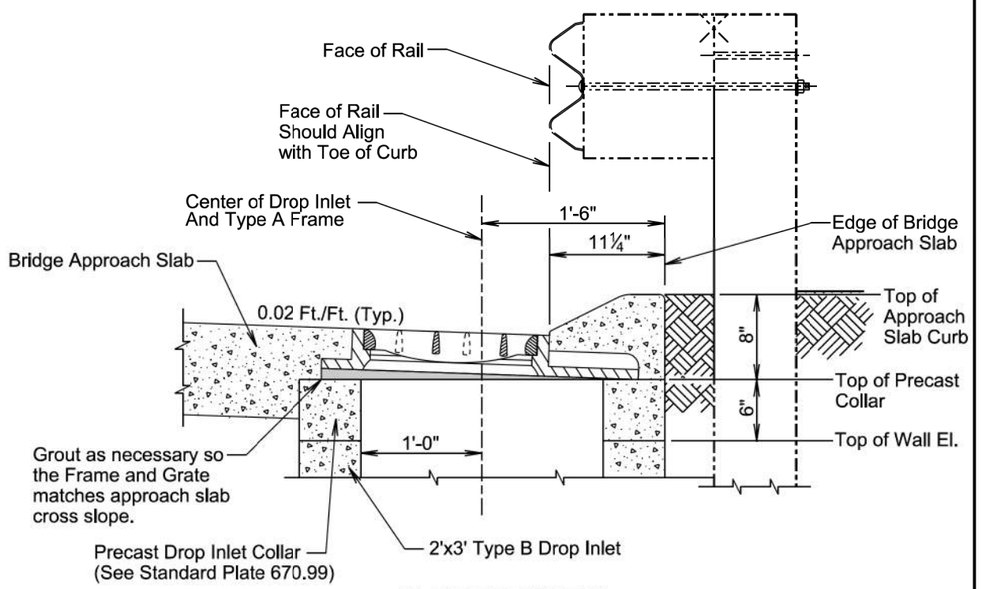
Plot Scale - 1:200

Plotted From - TRSF12141

File - ...\robt0667D\StdPlateSectionB.dgn

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0127(09)214	B33	B33

Plotting Date: 09/04/2025
Revised Date: 03/11/2025 MDJ



ELEVATION VIEW
(Installation of Type A Frame and Grate in Bridge Approach Slab)

GENERAL NOTES:

The product dimensions may vary from those shown on the standard plate depending on the manufacturer. Grate size and configuration will be similar to the standard plate for hydraulic capacity and bicycle safety. Any variation in dimensions will be approved by the Engineer and the type A frame and grate will be from a manufacturer on the approved products list.

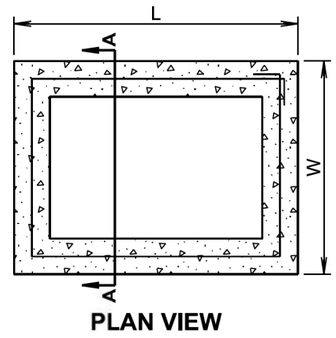
Design load for the grate will meet the requirements of AASHTO HL-93.

The type A frame and grate will be installed on a 2'x3' type B drop inlet.

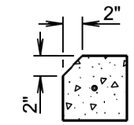
The direction of flow is shown for illustrative purpose only. The grate will be installed to intercept the direction of flow.

March 31, 2024

Published Date: 2026	SDDOT	TYPE A FRAME AND GRATE	PLATE NUMBER 670.78 Sheet 2 of 2

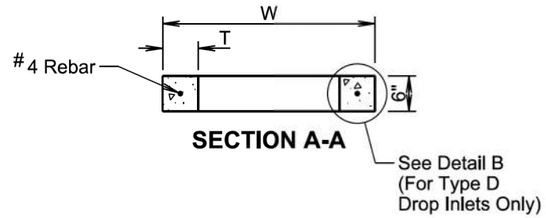


PLAN VIEW



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

DETAIL B



SECTION A-A

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 ½" 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

Published Date: 2026	SDDOT	PRECAST DROP INLET COLLAR	PLATE NUMBER 670.99 Sheet 1 of 1

Plot Scale - 1:200
Plotted From - TRSF12141
File - ...\rob\067D\StdPlateSectionB.dgn