SECTION B: GRADING PLANS

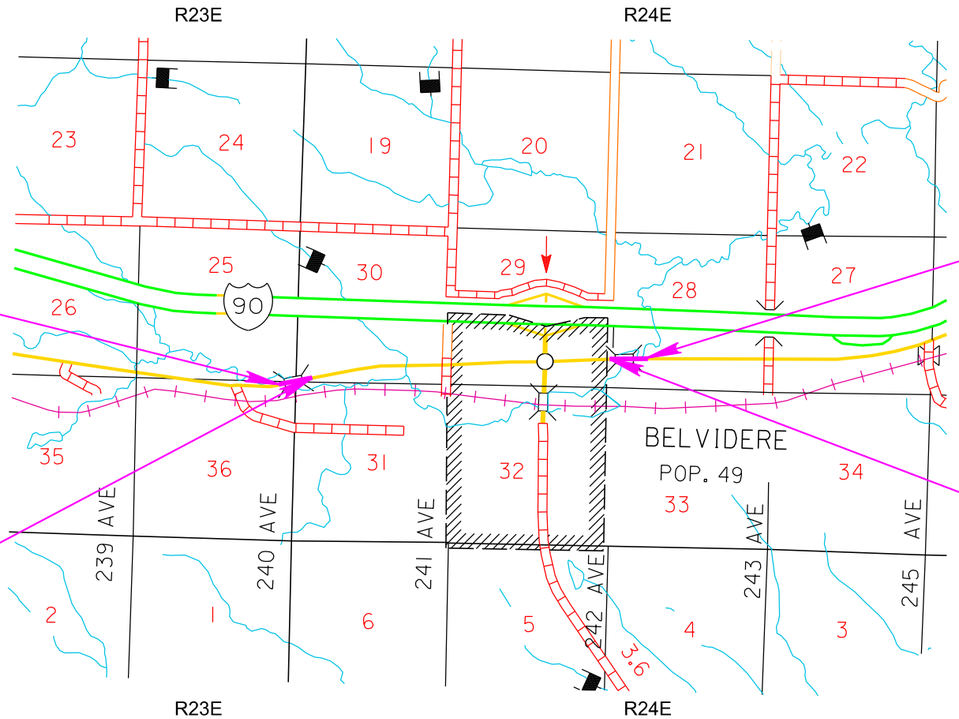
FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P-B 0248(16)173	B1	B23

Plotting Date: 9/1/2026

INDEX OF SHEETS

B1	General Layout with Index
B2-B5	Estimate of Quantities and General Notes
B6	Table of Fence Quantities
B7-B8	Typical Grading Section
B9	Control Data
B10	Horizontal Control Data
B11	Legend
B12-B15	Plan and Profile Sheets
B16	Cutoff Drain Installation
B17	Typical Cutoff Drain Installation
B18-B23	Standard Plates



BEGIN PROJECT P-B 0248(16)173

Station 20+20.00
Located 113.64' North and
25.11 feet East of the Southwest Corner
Section 30, Township 2 S, Range 24 E
of the Black Hills Meridian

BEGIN EXCEPTION

Station 26+75.00

END PROJECT P-B 0248(16)173

Station 139+00.00
Located 1119 feet North and
438 feet East of the Southwest Corner of
Section 28, Township 2 S, Range 243 E
of the Black Hills Meridian

END EXCEPTION

Station 130+00.00

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 8744
RICHARD A. SUDMEIER
SOUTH DAKOTA
09-01-26

Plot Scale - 1:200

Plotted From - jschreter

File - ...\CAD\Design Drawings\titleb.dgn

FOR BIDDING PURPOSES ONLY

SECTION B ESTIMATE OF QUANTITIES

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
004E0030	Maintenance of Traffic Diversion(s)	Lump Sum	LS
004E0050	Remove Traffic Diversion(s)	Lump Sum	LS
009E0010	Mobilization	Lump Sum	LS
009E3220	Reestablish Right-of-Way and Property Corner	28	Each
009E3230	Grade Staking	0.797	Mile
009E3250	Miscellaneous Staking	0.502	Mile
009E3280	Slope Staking	0.502	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
110E0600	Remove Fence	3,637	Ft
110E0730	Remove Beam Guardrail	1,083.0	Ft
110E1010	Remove Asphalt Concrete Pavement	4,184.5	SqYd
120E0010	Unclassified Excavation	17,468	CuYd
120E0600	Contractor Furnished Borrow Excavation	11,903	CuYd
120E2000	Undercutting	7,624	CuYd
120E6100	Water for Embankment	371.0	MGal
270E0110	Salvage and Stockpile Granular Material	1,847.0	Ton
430E0700	Precast Concrete Headwall for Drain	4	Each
600E0200	Type II Field Laboratory	1	Each
620E0020	Type 2 Right-of-Way Fence	3,936	Ft
620E0510	Type 1 Temporary Fence	3,344	Ft
620E0515	Type 1A Temporary Fence	1,173	Ft
620E1020	2 Post Panel	35	Each
620E1030	3 Post Panel	6	Each
680E0304	4" Perforated Dual Wall HDPE Pipe	90	Ft
680E0324	4" Dual Wall HDPE Pipe	32	Ft
680E2500	Porous Backfill	26.0	Ton
831E0110	Type B Drainage Fabric	116	SqYd
831E0400	Impermeable Plastic Membrane	50	SqYd

GRADING OPERATIONS

Water for Embankment is estimated at the rate of 15 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.

Temporary fence and/or permanent fence will be placed ahead of the grading operation unless otherwise directed by the Engineer.

TYPE II FIELD LABORATORY

The Contractor will provide high-speed broadband internet connection to the field lab. The multiport internet connection may be hardwired, through a cellular method, or other approved service that allows Wi-Fi connection. Prior to obtaining the internet connection, the Contractor will submit the internet connection's technical data to the Area Office to check for compatibility with the state's computer equipment. The Contractor's personnel are prohibited from using the internet connection unless pre-approved by the Project Engineer. The internet service will be incidental to the contract unit price per each for "Type II 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.

A 20" steel water main parallels the project along the south side of the highway. Excavation will occur near the 20" steel water main. Before Excavation the Contractor shall notify the Mini Wiconi Core Line Operations Personal in Ft. Pierre, SD. Their office number is 605.223.9292. The depth of the water main is not known.

A fiber optic line runs above the 20" steel water main. It will be protected during excavation. Any damage will be repaired at no cost to the Department.

Golden West Telecommunications has a fiber optic cable running along the north side of the project. This line will be abandoned and can be removed by the contractor as necessary.

TRAFFIC DIVERSION

The traffic diversion is located at Sta. 24+28. The traffic diversion will be constructed according to Section 5.14 B of the Specifications. Installation and removal of the traffic diversion will meet all requirements as set forth in the South Dakota Surface Water Quality Standards.

The traffic diversion located at Station 24+28 will be constructed according to the geometric layouts shown in the plans with the temporary drainage structure(s) provided in the following table. The temporary structure sizes are designed to pass the design flood frequency flows without overtopping the traffic diversion grade, to minimize potential upstream flooding, and are sized to meet FEMA (Federal Emergency Management Agency) requirements where applicable. The structure(s) will be placed at the flowline elevation and location as stated in the "Table of Temporary Drainage Structures in Traffic Diversions". If the Contractor proposes to use a different size drainage structure and/or a different geometric layout for the temporary diversion, the proposal must be submitted to the Engineer during the project preconstruction meeting. This information will be forwarded to the DOT Hydraulics Office for review. Construction of the traffic diversion(s) will not be allowed until approval of the proposal is obtained from the Hydraulics Office.

Table of Temporary Drainage Structures in Traffic Diversions

Traffic Diversion Location	Design Flood Frequency	* Flowline Elevation	Ordinary High Water Elevation	Temporary Structure Option 1
24+28	2 year	2322.5	2322.8	3-48" CMP

* The flowline elevation is at the inlet of the traffic diversion.

Costs to provide temporary drainage structures will be incidental to the contract lump sum price for "Maintenance of Traffic Diversion(s)". For information only the temporary drainage structure will be 3-48" diameter 16 Gauge CMP, 52' long.

Traffic diversions in waterways will be constructed such that erodible material placed below the ordinary high water elevation will be lined with a 2.75' thick layer of class B riprap. Type B drainage fabric will be placed under the riprap and under any diversion embankment that is placed in a wetland as shown in the construction plans. In the event flowing water is present, only riprap will be allowed to be placed or removed below the ordinary high water elevation. The quantity of riprap used in the traffic diversion is included in the quantity for "Class B Riprap" in Section E-Structures estimate of quantities. The quantity of riprap used for the traffic diversion will be reused as riprap for the structure and all costs incurred to place and remove the riprap at the traffic diversion and subsequently place the riprap at the structure will be incidental to the contract unit price per ton for "Class B Riprap". The traffic diversions will be built in close conformity to the plan gradeline. Unless otherwise shown in the plans, the traffic diversions will be removed such that the original ground surface contours and elevations are restored and the hydraulic capacity of the waterway is maintained. The removal will be done in such a manner that there is minimal disturbance to the channel bed.

The traffic diversion must remain in place during the construction of the roadway embankment. The removed traffic diversion embankment will be disposed of offsite unless otherwise approved by the Engineer.

Traffic Diversion Excavation as shown on the plans profile sheets is the excavation required to construct the traffic diversion portion that is located inside the mainline cross section work limits. The Traffic Diversion Excavation quantity is included in the mainline excavation quantity in the Table of Excavation Quantities by Balances and in the Table of Unclassified Excavation.

TABLE OF TRAFFIC DIVERSION RIPRAP AND DRAINAGE FABRIC

Station	L/R	Ordinary High Water Elevation	Traffic Diversion Riprap (Ton)	Section E Class B Riprap (Ton)	Type B Drainage Fabric (SqYd)
24+28	R	2322.8	60.0	60.0	115.5
		Totals	60.0	60.0	115.5

REGISTERED PROFESSIONAL ENGINEER
REG. NO.
8744
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SOUTH DAKOTA
09-01-26

INSLOPE TRANSITIONS

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

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

Station	L/R	Type
24+22	L/R	2
133+46	L/R	2

SHRINKAGE FACTOR: Embankment +35%

TABLE OF EXCAVATION QUANTITIES BY BALANCES

Station to	Station	Excavation (CuYd)	* Undercut (CuYd)	* Contractor Furnished Borrow Exc. (CuYd)	Total Excavation (CuYd)
20+20	26+75	2172	3761	3800	9733
130+00	139+00	984	3863	5498	10,345
Traffic Diversion					
201+50	212+43	1173		2605	3778
	Totals:	4329	7624	11,903	23,856

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

TABLE OF UNCLASSIFIED EXCAVATION

	(CuYd)
Excavation	3156
Undercut	7624
Topsoil	1956
Excavation for RCBC Installation	2582
Added Traffic Diversion Excavation	1173
Salvaged Granular Base Material (from cut sections)	977
Salvaged Granular Base Material (from fill sections)	0
Total	17,468

GENERAL GEOLOGY

The project alignment is underlain by Pierre Shale. The South Dakota Geologic Survey describes the Pierre Shale as outlined below:

The Pierre Shale consists of blue-gray to dark gray, fissile to blocky shale with persistent beds of bentonite, black organic shale, and light-brown chalky shale. Contains minor sandstone, conglomerate, and abundant carbonate and ferruginous concretions.

CLASSIFICATION OF EXCAVATION

Most of the material encountered should be able to be excavated using conventional methods associated with normal Unclassified Excavation.

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 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 Unstable Material Excavation quantity is included in the Excavation quantity listed in the Table of Unclassified Excavation. When finaling a project, the Unstable Material Excavation quantity will be added to the Excavation quantity to compute the Unclassified Excavation quantity.

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 and/or salvaged.

Granular Base Material will be paid for at the contract unit price per ton and is also included in and paid for once as Unclassified Excavation. As shown in the Table of Unclassified Excavation, the estimated quantity of 0 cubic yards of Granular Base Material from fill sections and 0 cubic yards of Granular Base Material from off-alignment roadways or obliterated old roads will be added to the Excavation quantity to determine the Unclassified Excavation quantity. When finaling a project, the quantities of Granular Base Material from fill sections will not be adjusted according to field measurements. The quantity of Granular Base Material from cut sections will not be added to the Excavation quantity as it is already in the cuts on the final cross sections.

When finaling a project, the estimated quantity of 656 cubic yards 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.

UNDERCUTTING

In all cut sections the earthen subgrade will be undercut 3 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 3 feet in height measured at the finished subgrade shoulders, will be undercut to ensure a minimum 3 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 for 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
20+20		23+00
25+00		26+75
130+00		133+00
135+00		139+00

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04-01-26

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.

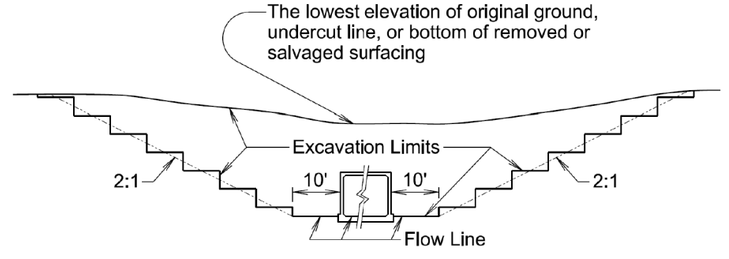
Restoration of the Contractor furnished borrow excavation site will be the responsibility of the Contractor.

EXCAVATION FOR REINFORCED CONCRETE BOX CULVERT INSTALLATION

Included in the quantity of “Unclassified Excavation” are 2582 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.



FOR BIDDING PURPOSES ONLY

TABLE OF EXCAVATION FOR REINFORCED CONCRETE BOX CULVERT INSTALLATION

Station	Quantity (CuYd)
24+22	1324
136+46	1258
Total:	2582

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 4184.5 Sq. Yd. of the in-place asphalt concrete surfacing will be removed from the existing highway according to the in-place surfacing typical sections and become the property of the Contractor for disposal. Care will be taken not to waste the in-place granular material. The remaining in-place granular material will be salvaged and stockpiled.

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.

SALVAGE AND STOCKPILE GRANULAR MATERIAL

An estimated 1,847.0 tons (977.3 Cubic Yards) of granular material will be salvaged from the existing highway according to the in-place surfacing typical sections and stockpiled at a site furnished by the Contractor and satisfactory to the Engineer.

Salvaged material will be processed to meet the requirements of Section 884.2 D.8 prior to stockpiling. The Contractor will ensure that no vegetation, topsoil, subgrade, or other foreign material is incorporated into the salvaged granular material.

The quantity of salvaged granular material may vary from the plans.

The quantity of salvageable material is estimated from the in-place surfacing typical sections. This estimated quantity was included in the unclassified excavation quantities.

TABLE OF SALVAGE AND STOCKPILE GRANULAR BASE MATERIAL

Location	Remove Asphalt Concrete Pavement	Salvage and Stockpile Granular Base Material
	Sq. Yd.	Tons (Cu.Yds.)
Sta. 20+20.0 to Sta. 23+85.7	1138.7	502.7 (266.0)
Sta. 24+56.7 to Sta. 26+75.0	678.2	300.1 (158.8)
Sta. 130+00.0 to Sta. 133+01.1	939.6	413.9 (219.0)
Sta. 134+41.5 to Sta. 139+00.0	1428.0	630.3 (333.5)
Total	4184.5	1,847.0 (977.3)

CUTOFF DRAIN

Cutoff drains will be installed in conjunction with the grading for the structure replacement. After construction of the subgrade and placement of the base course has been completed, cutoff drains will be installed perpendicular to the centerline across both lanes at the following locations:

Station 131+00±
Station 136+50±

Cutoff drains will be installed prior to placement of asphaltic surfacing. Cutoff drains will be installed in a trench 2 feet wide by 3 feet deep. The trench will be graded to maintain a minimum of 0.01ft/ft. or 1% drop from centerline to the ditches. Once the trench is excavated, place Impermeable Plastic Membrane on the trench bottom and against the downgrade side of the trench the entire width of the finished subgrade surface. The membrane will extend upward through the base course overlying the subgrade. The membrane will be folded, not cut, to fit against the bottom and the downgrade side of the trench. This may be done by rolling out the membrane perpendicular to centerline, folding the membrane into the trench, and cutting off the excess membrane from the top of the trench after backfilling. After the membrane is placed into the trench, place 4” Perforated Dual Wall HDPE Pipe on top of the membrane in the center of the trench bottom. Using a coupler, connect 4” Dual Wall HDPE Pipe to both ends of the 4” Perforated Dual Wall HDPE Pipe and place in the center of the unlined trench. The 4” Dual Wall HDPE Pipe will daylight at a headwall placed above the ditch bottom so as to provide positive drainage from the outlet and blend into the inslope. The depth of the trench may be adjusted to maintain the minimum grade needed to maintain positive drainage and proper placement of the headwalls. Backfill the membrane lined trench containing the 4” Perforated Dual Wall HDPE Pipe with porous backfill and 12” of Base Course. The remainder of the trench from the edge of the subgrade top to the headwall will be backfilled with compacted soil.

Estimate of Quantities:

Impermeable Plastic Membrane	50 sq. yd.
4 inch Perforated Dual Wall HDPE Pipe	90 ft.
4 inch Dual Wall HDPE Pipe	32 ft.
Porous Backfill	26 tons
Headwalls (See Standard Plate No. 430.50)	4 each

Dual Wall HDPE Pipe and Perforated Dual Wall HDPE Pipe will conform to the requirements of ASTM D3350 and AASHTO M252, Type SP. All labor, tools, equipment, and incidentals necessary for the installation of the Dual Wall HDPE Pipe will be incidental to the contract unit price per foot for each pipe type.

Care must be taken to ensure that the membrane and drainpipe are not damaged during construction. Sufficient cover material is to be paced over the cutoff drain before heavy equipment is allowed to work over the underdrain. Damaged pipe will be replaced by the contractor at no additional cost to the Department.

The drain location and depth given are based on the information available to the Geotechnical Engineering Activity. The actual field conditions may require that adjustments be made by the Engineer during construction to provide for sufficient drainage. The Geotechnical Engineering Activity will be available for onsite assistance if necessary.

The cutoff drain trench will be graded to maintain a minimum of 0.01ft/ft. or 1% drop from beginning to outlet. The Contractor will ensure all segments of the pipe are positively connected and remain soil tight during installation of the cutoff drain system. The Outlet Headwall will be placed to blend in with the surrounding topography with the outlet pipe placed above the bottom of the drainage to permit proper flow from the outlet.

The cutoff drain headwalls must be cleared of topsoil, straw, or other debris after seeding operations have been completed. The as built headwall locations will be recorded and submitted to the Engineer. Each headwall location will be identified by GPS coordinates and Station and Offset. The headwall locations will be cataloged in the Winner Area office for reference in post construction maintenance.

TEMPORARY FENCE

The Contractor will verify the location of the temporary fence with the landowner prior to installation of the fence.

BRACE PANELS FOR ROW FENCE

The E-Z Brace or an approved equal may be utilized as an alternate horizontal brace in the brace panels if approved by the Engineer. The E-Z Brace will be attached to each wood post utilizing two 5/16” x 3” lag screws. Holes of appropriate diameter, based on wood post condition, will be drilled before placement of lag screws. The following is the contact regarding the E-Z Brace:

Charlie Mack
Macksteel E-Z Braces
415 20th Ave. SE.
Watertown, SD 57201
605-882-2177

REMOVE BEAM GUARDRAIL

Steel beam rail, end terminals, posts and blocks, and hardware items will become the property of the Contractor and will be removed from the project limits.

Payment for removing the guardrail items will be incidental to the contract unit price per foot for “Remove Beam Guardrail”.

REGISTERED PROFESSIONAL ENGINEER
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SOUTH DAKOTA
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TABLE OF GUARDRAIL

Location	Remove Beam Guardrail (Ft)
Structure No. 36-421-109	
Sta. 23+04 to 25+39 Lt.	236
Sta. 23+05 to 25+39 Rt.	235
Structure No. 36-441-108	
Sta. 132+19 to 135+25 Lt.	306
Sta. 132+19 to 135+24 Rt.	306
Totals:	1083

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 ROW and 28 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 CONSTRUCTION STAKING

(See Special Provision for Contractor Staking)

Roadway and Description	Begin Station	End Station	Number of Lanes	Length (Ft)	Grade Staking: Length (Mile)	Grade Staking: Lane Factor	Grade Staking: *Sets of Stakes	Grade Staking: **Grade Staking Quantity (Mile)	Miscellaneous Staking Quantity (Mile)	Slope Staking Quantity (Mile)	Structure Staking Quantity (Each)
SD 248 (2 Lanes AC Pavement)	20+20	26+75	2	655	0.124	1	2	0.248	0.124	0.124	
Traffic Diversion	201+50	212+43	2	1093	0.207	1	1	0.207	0.207	0.207	
US 14 (RCBC Installation)	24+22										1
SD 248 (2 Lanes AC Pavement)	130+00	139+00	2	900	0.171	1	2	0.342	0.171	0.171	
SD 248 (RCBC Installation)	133+46										1
							Totals:	0.797	0.502	0.502	2

* 1 = Blue Top Stakes and Top of Base Course Stakes

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

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SOUTH DAKOTA
09-01-26

TABLE OF FENCE QUANTITIES

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P-B 0248(16)173	B6	B23

Plotting Date: 9/1/2026

Station to Station		Side (L/R)	Right-of-Way Fence					Temporary Fence			Post Panels		
				Type 2 (Ft)	Stream Crossing (Ft)			Type 1 (Ft)	Type 1A (Ft)		2 Post Panel (Each)	3 Post Panel (Each)	Remove Fence (Ft)
18+90	29+26	L							1173				
18+90	24+73	L		575	133						1	1	575
22+36	26+81	R		484	70			740			7		503
24+42	29+26	L											
24+73	25+12	L		166								1	166
24+73	29+26	L		450				460			1	1	450
129+76	139+33	R		1024	113			984			12	2	946
129+83	139+58	L		1175	104			1160			12	1	997
136+47	136+54	R		62							2		
TOTALS:				3936	420			3344	1173		35	6	3637

Post Type and Sequence:

Right-of-way fence shall be constructed using alternate wood and steel posts except as noted.

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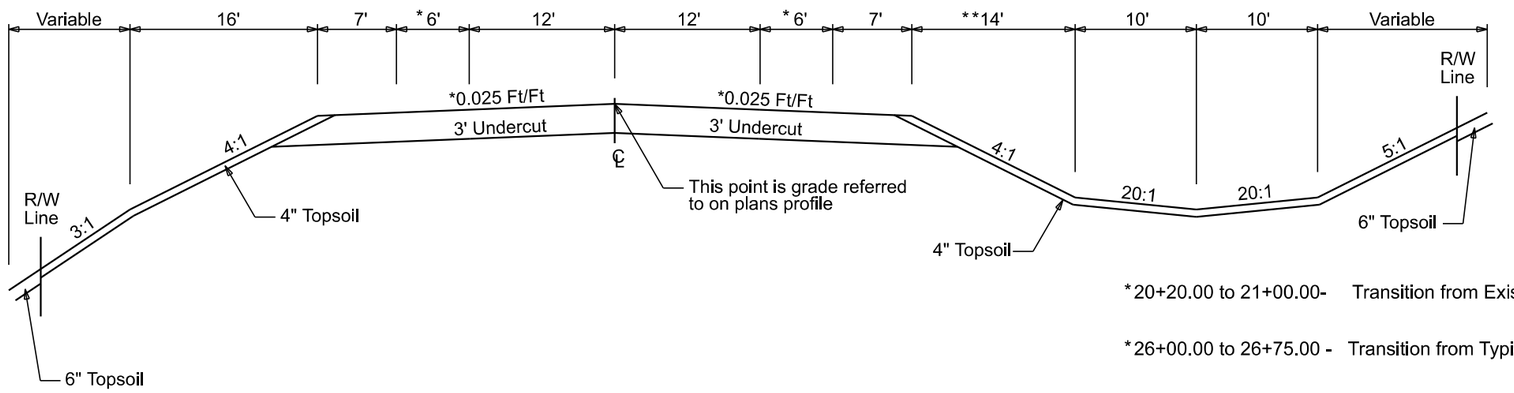
TYPICAL GRADING SECTION

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P-B 0248(16)173	B7	B23

Plotting Date: 9/1/2026

Sta. 20+20 to 26+75



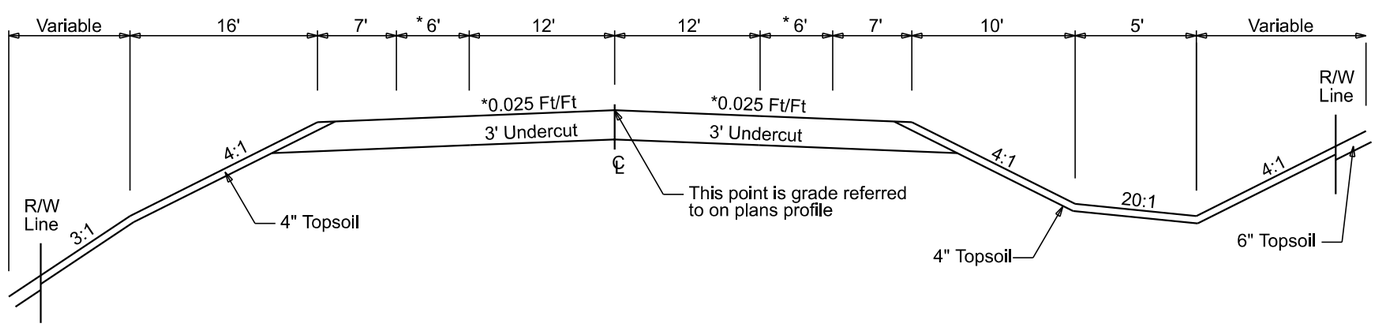
*20+20.00 to 21+00.00- Transition from Existing Width and Slope to Typical Width and Slope

*26+00.00 to 26+75.00 - Transition from Typical Width and Slope to Existing Width and Slope

**20+20.00 to 20+82.25 - Transition from Existing Width to Typical Width

**26+00.00 to 26+75.00 - Transition from Existing Width to Typical Width

Sta. 130+00 to 136+50



*130+00 to 132+40- Transition from Existing Width and Slope to Typical Width and Slope

136+50 to 137+00 - Transition Ditch and Fill Sections Between Stations 136+50 and 137+00

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 8744
RICHARD A. SUDMEIER
SOUTH DAKOTA
09-01-26

Plot Scale - 1:200

Plotted From - ischneter

File - ...\CAD\Design Drawings\typ.dgn

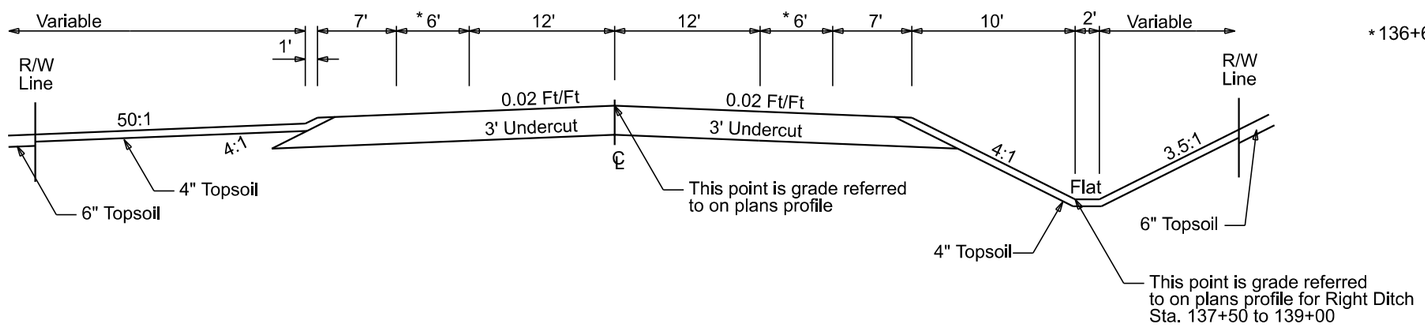
TYPICAL GRADING SECTION

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0248(16)173	B8	B23

Plotting Date: 9/1/2026

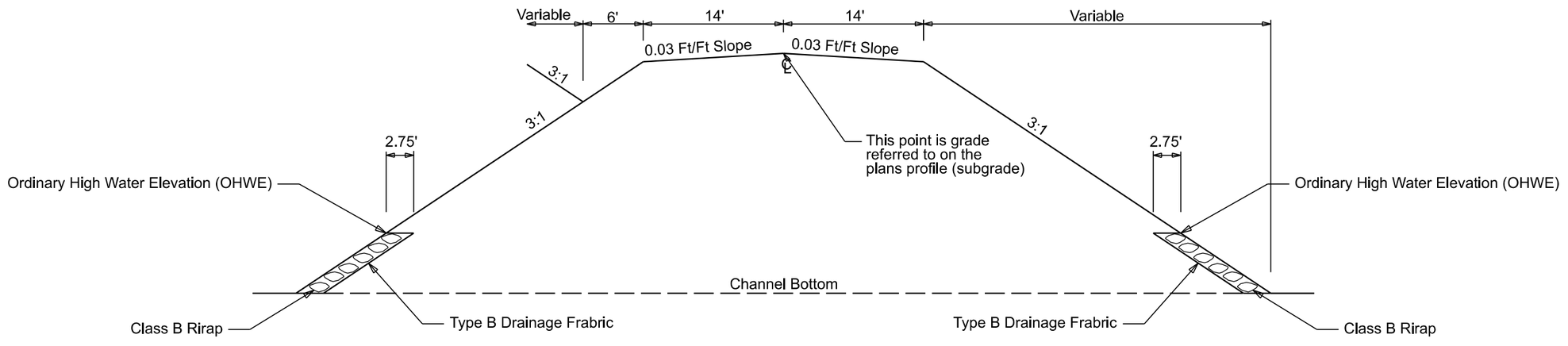
Sta. 137+00 to 139+00



*136+60 to 139+00 - Transition from Typical Width and Slope to Existing Width and Slope

Traffic Diversion

18+50.68 to 28+95.93 Mainline Sta.
(201+50.27 to 212+41.73) Diversion A
(OHWE TBD)





Plot Scale - 1:200

Plotted From - ischneter

File - ...\CAD\Design Drawings\typ.dgn

CONTROL DATA

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P-B 0248(16)173	B9	B23

Plotting Date: 9/1/2026

HORIZONTAL AND VERTICAL CONTROL POINTS						
POINT	**STATION**	**OFFSET**	**DESCRIPTION**	**NORTHING**	**EASTING**	**ELEVATION**
CP 1	16+34.72	54.80'L	5/8" Rebar w/ Alum Cap	549126.0830	1711866.1340	2343.34
CP 2	40+02.70	59.98'R	5/8" Rebar w/ Alum Cap	549504.2320	1714200.7910	2325.48
CP 3	116+86.97	135.01'R	5/8" Rebar w/ Alum Cap	549936.9120	1721851.1510	2318.86
CP 3A	129+40.47	72.96'R	5/8" Rebar w/ Alum Cap	550201.6180	1723093.8850	2295.84
CP 4	139+15.86	47.92'R	5/8" Rebar w/ Alum Cap	550220.3600	1724069.4110	2295.89
I-90 164.48	NA	NA	NGS Harn Point	551288.1600	1728700.5100	2306.60

The coordinates shown on this sheet are based on the South Dakota State Plane Coordinate System Grid North. South Zone NAD 83(2011) epoch 2010.00; Geoid12A; SF = 0.9998062309
The elevations shown on this sheet are based on NAVD 88.

REGISTERED PROFESSIONAL ENGINEER
REG. NO.
8744
RICHARD A. SUDMEIER
SOUTH DAKOTA
09-01-26

Plot Scale - 1:200
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File - ...\Design Drawings\control.dgn

STATE OF SOUTH DAKOTA | PROJECT P-B 0248(16)173 | SHEET B10 | TOTAL SHEETS B23
Plotting Date: 9/1/2026

FOR BIDDING PURPOSES ONLY

HORIZONTAL ALIGNMENT DATA

MAINLINE

Type	Station			Northing	Easting
POB	-1+09.90			549129.3020	1710131.1830
		TL= 1023.17	S 85°55'04" E		
PC	9+13.27			549056.4653	1711151.7522
PI	15+01.95	R = 4000.00	Delta = 16°44'40" L	549014.5580	1711738.9461
PT	20+82.25			549143.6003	1712313.3163
		TL= 612.03	N 77°20'16" E		
PC	26+94.28			549277.7590	1712910.4595
PI	26+99.43	R = 4000.00	Delta = 00°08'52" R	549278.8897	1712915.4925
PT	27+04.59			549280.0075	1712920.5283
		TL= 1754.88	N 77°29'08" E		
PC	44+59.47			549660.2657	1714633.7146
PI	49+57.91	R = 5730.00	Delta = 09°56'35" R	549768.2706	1715120.3111
PT	54+53.85			549790.6332	1715618.2480
		TL= 10,418.08	N 87°25'43" E		
POE	158+71.93			550258.0440	1726025.8360

DIVERSION A

Type	Station			Northing	Easting
POB	200+00.00			549077.7441	1711936.9314
		TL= 53.90	N 81°58'59" E		
PC	200+53.90			549085.2605	1711990.2998
PI	201+15.87	R = 353.00	Delta = 19°54'56" L	549093.9039	1712051.6696
PT	201+76.60			549122.9351	1712106.4250
		TL= 469.75	N 62°04'03" E		
PC	206+46.35			549342.9819	1712521.4519
PI	207+65.14	R = 370.00	Delta = 35°35'54" R	549398.6257	1712626.4009
PT	208+76.23			549382.7801	1712744.1270
		TL= 338.82	S 82°20'03" E		
PC	212+15.05			549337.5834	1713079.9206
PI	212+77.87	R = 353.00	Delta = 20°10'49" L	549329.2042	1713142.1753
PT	213+39.38			549342.8160	1713203.4990
		TL = 5.55	N 77°29'08" E		
POE	213+44.93			549344.0180	1713208.9165

The coordinates shown on this sheet are based on the South Dakota State Plane Coordinate System Grid North. South Zone NAD 83(2011); epoch 2010.00; Geoid12A; SF = 0.9998062309

REGISTERED PROFESSIONAL ENGINEER
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RICHARD A. SUDMEIER
SOUTH DAKOTA
09-01-26

Plot Scale - 1:200
Plotted From - ischneter
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FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P-B 0248(16)173	B11	B23

Plotting Date: 9/1/2026

EXISTING TOPOGRAPHY SYMBOLOGY AND LEGEND

- Anchor
- Antenna
- Approach
- Assumed Corner
- Azimuth Marker
- BBQ Grill/ Fireplace
- Bearing Tree
- Bench Mark
- Box Culvert
- Bridge
- Brush
- Buildings
- Bulk Tank
- Cattle Guard
- Cemetery
- Centerline
- Cistern
- Clothes Line
- Commercial Sign Double Face
- Commercial Sign One Post
- Commercial Sign Overhead
- Commercial Sign Two Post
- Concrete Symbol
- 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
- Elec. Trans./Power Jct. Box
- Fence Barbwire
- Fence Chainlink
- Fence Electric
- Fence Misc.
- Fence Rock
- Fence Snow
- Fence Wood
- Fence Woven
- Fire Hydrant
- Flag Pole
- Flower Bed
- Gas Valve Or Meter
- Gas Pump Island
- Grain Bin
- Guardrail
- Guide Sign One Post
- Guide Sign Two Post
- Gutter
- Guy Pole
- Haystack
- Hedge
- Highway R.O.W. Marker
- Interstate Close Gate
- Iron Pin
- Irrigation Ditch
- Lake Edge
- Lawn Sprinkler
- Mailbox
- Manhole Electric
- Manhole Gas
- Manhole Misc
- Manhole Sanitary Sewer
- Manhole Storm Sewer
- Manhole Telephone
- Manhole Water
- Merry-Go-Round
- Microwave Radio Tower
- Misc. Line
- Misc. Property Corner
- Misc. Post
- Overhang Or Encroachment
- Overhead Utility Line
- Parking Meter
- 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 R.O.W. Marker
- Railroad Signs
- Railroad Switch
- Railroad Track
- Railroad Trestle
- Rebar
- Rebar With Cap
- Reference Mark
- Regulatory Sign One Post
- Regulatory Sign Two Post
- 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
- Telephone Junction Box
- Telephone Pole
- Television Cable Jct Box
- Television Tower
- Test Wells/Bore Holes
- Traffic Signal
- Trash Barrel
- Tree Belt
- Tree Coniferous
- Tree Deciduous
- Tree Stumps
- Triangulation Station
- Underground Electric Line
- Underground Gas Line
- Underground High Pressure Gas Line
- Underground Sanitary Sewer
- Underground Storm Sewer
- Underground Tank
- Underground Telephone Line
- Underground Television Cable
- Underground Water Line
- Warning Sign One Post
- Warning Sign Two Post
- 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
- R. O. W. Line
- New R. O. W. Line
- Cut and Fill Limits
- Control of Access
- New Control of Access
- Proposed ROW (After Property Disposal)

REGISTERED PROFESSIONAL ENGINEER
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RICHARD A. SUDMEIER
SOUTH DAKOTA
09-01-26

Plot Scale - 1:200

Plotted From - jschreter

File - ...\Design Drawings\toposymb.dgn

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P-B 0248(16)173	B12	B23

FOR BIDDING PURPOSES ONLY

24+27.71
Take Out Bridge
(See Section E)

24+22 (4.34 sq. mi.)
Alternate A: Install 3-12' X 9', 118' RCBC
Alternate B: Install 3-12' X 9' 116' Precast RCBC
(See Section E)

Aaron J. Mansfield
Parcel A1

SE1/4 of Section 25
T2S - R23E B.H.M.
Except Highway Right of Way and
Except Railroad Right of Way

Sec 25 - T2S - R23E

SE1/4

Diversion A

PI	201+15.87
N	549093.90
E	1712051.67
Del	19°54'56" L
T	61.98'
L	122.70'
R	353.00'

Diversion A

PI	207+65.14
N	549398.63
E	1712626.40
Del	35°35'54" R
T	118.79'
L	229.88'
R	370.00'

Brave Bull Creek

BEGIN P 0248(16)173
Station 20+20.00

18+90.74'L
Begin Type 2 Fence

Stream Crossing

25+12-229'L
Begin Type 2 Fence

24+73-68'L
Fence Corner

Sec 30 - T2S - R24E

Diversion A

PI	212+77.87
N	549329.20
E	1713142.18
Del	20°10'49" L
T	62.82'
L	124.33'
R	353.00'

Jeannie Faye Smith

Lots Three (3) and Four (4), and the East Half
of the Southwest Quarter (E1/2SW1/4),
Section Thirty (30), Township Two (2) South,
Range Twenty Four (24) East, Black Hills Meridian,
Except Highway Right of Way and Except Railroad Right of Way
Jackson County, South Dakota

Parcel 1
0.02 ac. R.O.W.
(2029 sq. ft.) more or less

BEGIN EXCEPTION
Station 26+75.00

1/16 Line

Government Lot 4

E1/2 SW1/4

29+26-66'L
End Type 2 Fence

3 PP
2 PP
Type 2 Fence
N62°04'03"E
S82°20'03"E
N81°56'59"E
N77°20'16"E
N77°29'08"E
205+00
210+00
215+00
200+00
15+00
20+00
25+00
30+00
35+00
40+00
45+00
33'
100'

Present SD Hwy 248

28+75 - 82'R
Do Not Disturb
Water Valve Box

2-2PP
26+81-64'R
End Type 2 Fence

24+63-52'R
Fence Corner

24+63-93'R
Fence Corner

22+36-93'R
Begin Type 2 Fence

Stream Crossing

Section Line

RINGNECK & WESTERN RAILWAY

Mainline

PI	15+01.95
N	549014.56
E	1711738.95
Del	16°44'40" L
T	588.69'
L	1168.98'
R	4000.00'

Sec 36 - T2S - R23E

Jeffery Willert
Parcel A2

The NE1/4 of Section 36
Township 2 North
Range 23 East of the B.H.M.,
Except Railroad Right Of Way and
Except S.D. Highway 248 Lot H

Government Lot 1

Mainline

PI	26+99.43
N	549278.89
E	1712915.49
Del	00°08'52" R
T	5.16
L	10.32
R	4000.00'

Sec 31 - T2S - R24E

Jeffery Willert
(FOR INFORMATION ONLY)

Lot 1 in Section 31 -
Township 2 South
Range 24 East of the B.H.M.,
Except Railroad Right Of Way

Parcel A1
18+27.58 to 24+18.18 L
Temporary Easement containing
1.15 ac. more or less

Parcel 1
24+54.16 to 29+57.45 L
Temporary Easement containing
1.17 ac. more or less

Parcel A2
19+70.84 to 21+47.33 R
Temporary Easement containing
0.07 ac. more or less

Parcel A2
22+69.78 to 23+51.48 R
Temporary Easement containing
0.02 ac. more or less

Parcel 1
24+59.65 to 29+53.73 R
Temporary Easement containing
0.34 ac. more or less

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 8744
RICHARD A. SUDMEIER
SOUTH DAKOTA
09-01-26

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P-B 0248(16)173	B13	B23

Plotting Date: 9/1/2026

DIVERSION A

201+50.04
Begin Diversion

212+42.98
End Diversion

Excavation 1173
Contractor Furnished Borrow 2605
3778

Embankment 2799
+35% 979
3778

PVI 201+50.04
Elev 2342.33

PVI 203+87.24
Elev 2332.35
L 150.00
G1 -4.2097%
G2 -1.0379%
K 47

PVI 207+57.94
Elev 2328.50
L 100.00
G1 -1.0379%
G2 +0.7896%
K 55

PVI 212+42.98
Elev 2332.33

-4.2097%
-1.0379%
+0.7896%

2342.33 2340.23 2336.02 2332.62 2331.18 2330.14 2329.10 2328.84 2329.62 2330.41 2331.20 2331.99 2332.33

200+00 205+00 210+00

20+20
Begin Work

26+75.00
Begin Exception

Excavation 2172
Undercut 3761
Contractor Furnished Borrow 3800
9733

Embankment 3449
+35% 1207
Undercut 3761
+35% 1316
9733

PVI 20+20.00
Elev 2336.70

PVI 22+60.00
Elev 2331.00
L 470.00
G1 -2.3768%
G2 +0.1579%
K 185

PVI 26+75.00
Elev 2331.66

-2.3768%
+0.1579%

FL 2320.10

Flow			Elevation
Qd =	480	cfs	2325.0'
Q100 =	870	cfs	2326.3'
Q_{o} =	>Q100	cfs	2333.0'

2336.70 2334.95 2333.25 2332.09 2331.46 2331.38 2331.54 2331.66

15+00 20+00 25+00 30+00 35+00 40+00

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 8744
RICHARD A. SUDMEIER
SOUTH DAKOTA
04-03-26

Plot Scale - 1:0.0840004

Plotted From - jschreter

File - ...\CAD\Open Roads\d04PH.dgn

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0248(16)173	B14	B23

Plotting Date: 9/1/2026

FOR BIDDING PURPOSES ONLY

133+64.40
Take Out Bridge
(See Section E)

131+00
Install Cutoff Drain
45' - 4" Perforated PVC Pipe
20' - PVC Outlet Pipe
2 - Precast Headwalls
13 Tons - Porous Backfill
25 Sq. Yds. - Impermeable Plastic Membrance

133+46.00 (9.72 sq. mi.)
Alternate A: Install 4 - 14'X 8', 120'-4 5/8" RCBC
Alternate B: Install 4 - 14' X 8', 120'-0" Precast RCBC
(See Section E)

136+50
Install Cutoff Drain
45' - 4" Perforated PVC Pipe
20' - PVC Outlet Pipe
2 - Precast Headwalls
13 Tons - Porous Backfill
25 Sq. Yds. - Impermeable Plastic Membrance

Gerald A. Sanftner

The SW 1/4, including Lot A in the SW1/4, of Section 28 - Township 2 South - Range 24 East of the B.H.M. except interstate Highway 90 right of way and except S.D. Highway 248 right of way

Parcel 2
0.19 ac. R.O.W.
(8310 sq. ft.) more or less

SE1/4

Sec 29 - T2S - R24E

Sec 28 - T2S - R24E

END EXCEPTION
Station 130+00.00

END P-B 0248(16)173
Station 139+00.00

Section Line 33' 33'

129+83-75' L
Begin Type 2 Fence

132+72-90' L
Fence Corner

132+72-54' L
Fence Corner

Stream Crossing

Brave Bull Creek

129+80.59-49.74'
129+82.02-75.38'
132+83.59-49.71'
132+83.06-75.35'
132+83.73-95.89'
132+83.60-93.71'
133+68.42-110.82'
133+78.60-93.70'
133+78.59-49.70'
134+42.76-75.33'
136+57.47-75.31'
136+57.47-102.74'
139+57.41-102.76'
139+57.40-49.64'

129+81-56' L
Fence Corner
3-2PP
2-2PP

133+81-109' L
Fence Corner
3-2PP
133+82-54' L
Fence Corner

LOT A

SW1/4

Type 2 Fence
3 PP

139+58-66' L
End Type 2 Fence

Present SD Hwy 248

N87°25'43"E

100'

120+00 125+00 130+00 135+00 140+00 145+00 150+00

2-2PP
Type 2 Fence
133+00-54' R
Fence Corner
3-2PP
3-2PP
2-2PP
3 PP
3 PP
2 PP
2 PP

133+00-85' R
Fence Corner

129+76-55' R
Begin Type 2 Fence

134+13-53' R
Fence Corner

134+13-85' R
Fence Corner

139+33-69' R
End Type 2 Fence

129+45.17

129+73.95-69.62'
129+75.02-50.26'
132+98.89-69.65'
132+98.02-50.29'
132+99.59-85.26'
134+17.59-85.27'
134+16.89-69.67'
134+16.02-50.30'
136+54.24-114.51'
138+51.88-109.54'
139+69.66-50.36'

132+87.75'R
Do Not Disturb
Fire Hydrant and Valve Box

136+47-53'R
Begin Type 2 Fence

136+54-115'R
End Type 2 Fence

Brave Bull Creek

Stream Crossing

33' 33'

SE1/4

SW1/4

Parcel 2
129+80.59 to 139+57.40 L
Temporary Easement containing
0.75 ac. more or less

Parcel 2
129+73.96 to 132+98.89 R
Temporary Easement containing
0.14 ac. more or less

Parcel 2
134+16.89 to 139+69.66 R
Temporary Easement containing
0.59 ac. more or less

REGISTERED PROFESSIONAL ENGINEER
REG. NO.
8744
RICHARD A. SUDMEIER
SOUTH DAKOTA
09-01-26

Plot Scale = 1.0.0833333

Plotted From = jachvein

File = ...\CAD\Open Roads\d04PH.dgn

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P-B 0248(16)173	B15	B23

Plotting Date: 9/1/2026

130+00.00
Begin Work

Excavation 984
Undercut 3863
Contractor Furnished Borrow 5498
10,345

Embankment 3800
+35% 1330
Undercut 3863
+35% 1352
10,345

139+00.00
End Work

PVI 130+00.00
Elev 2293.23

PVI 133+48.16
Elev 2285.00
L 680.00
G1 -2.3628%
G2 +2.0981%
K 152

PVI 139+00.00
Elev 2296.58

-2.3628%

+2.0981%

Right Ditch Grade +2.3248%

Right Dirch
PVI 139+00.00
Elev 2294.00

Right Ditch
PVI 137+50.00
Elev 2290.51

FL 2277.90

Flow			Elevation
Qd =	762	cfs	A. 2283.1' B. 2283.0'
Q100 =	1373	cfs	A. and B. 2284.4'
Q_{ot} =	>Q100	cfs	2290.1'

2293.23 2291.14 2289.71 2288.93 2288.81 2289.35 2290.54 2292.38 2294.48 2296.58

REGISTERED PROFESSIONAL ENGINEER
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RICHARD A. SUDMEIER
SOUTH DAKOTA
04-01-26

Plot Scale - 1:0.0840004

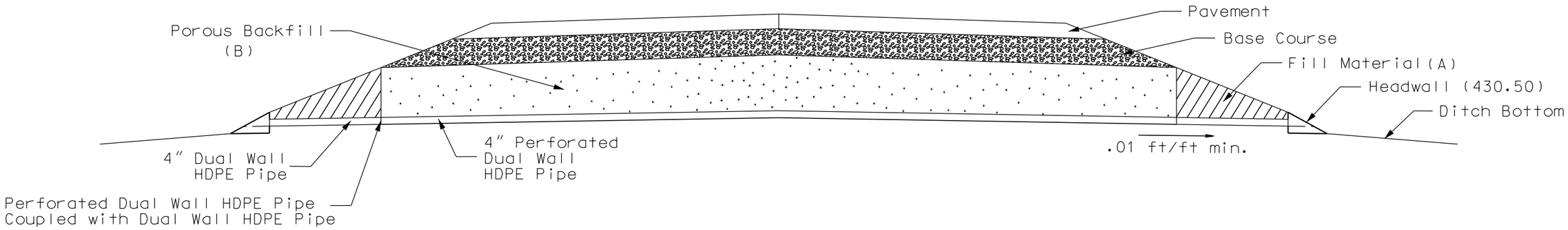
Plotted From - jschreter

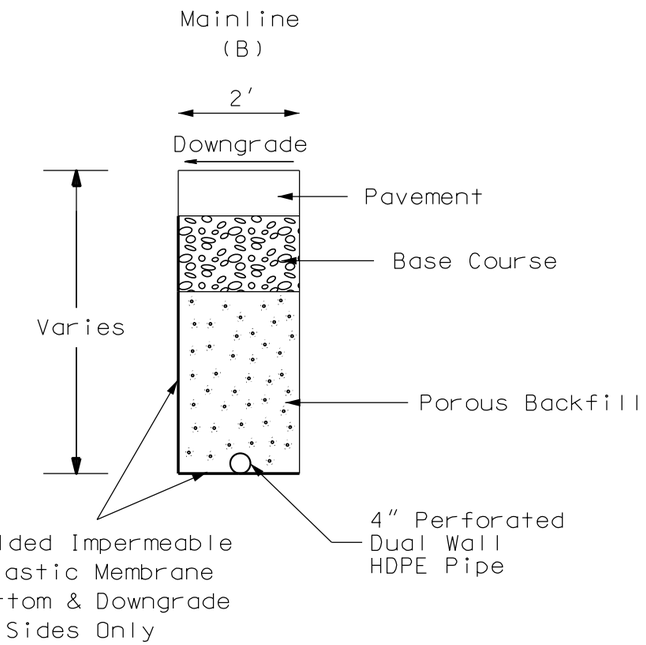
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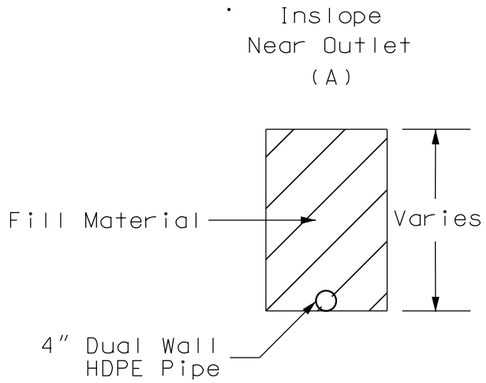
STATE OF SOUTH DAKOTA | PROJECT P-B 0248(16)173 | SHEET B16 | TOTAL SHEETS B23
Plotting Date: 9/1/2026

FOR BIDDING PURPOSES ONLY

Typical Cutoff Drain Installation







REGISTERED PROFESSIONAL ENGINEER
REG. NO. 8744
RICHARD A. SUDMEIER
SOUTH DAKOTA
09-01-26

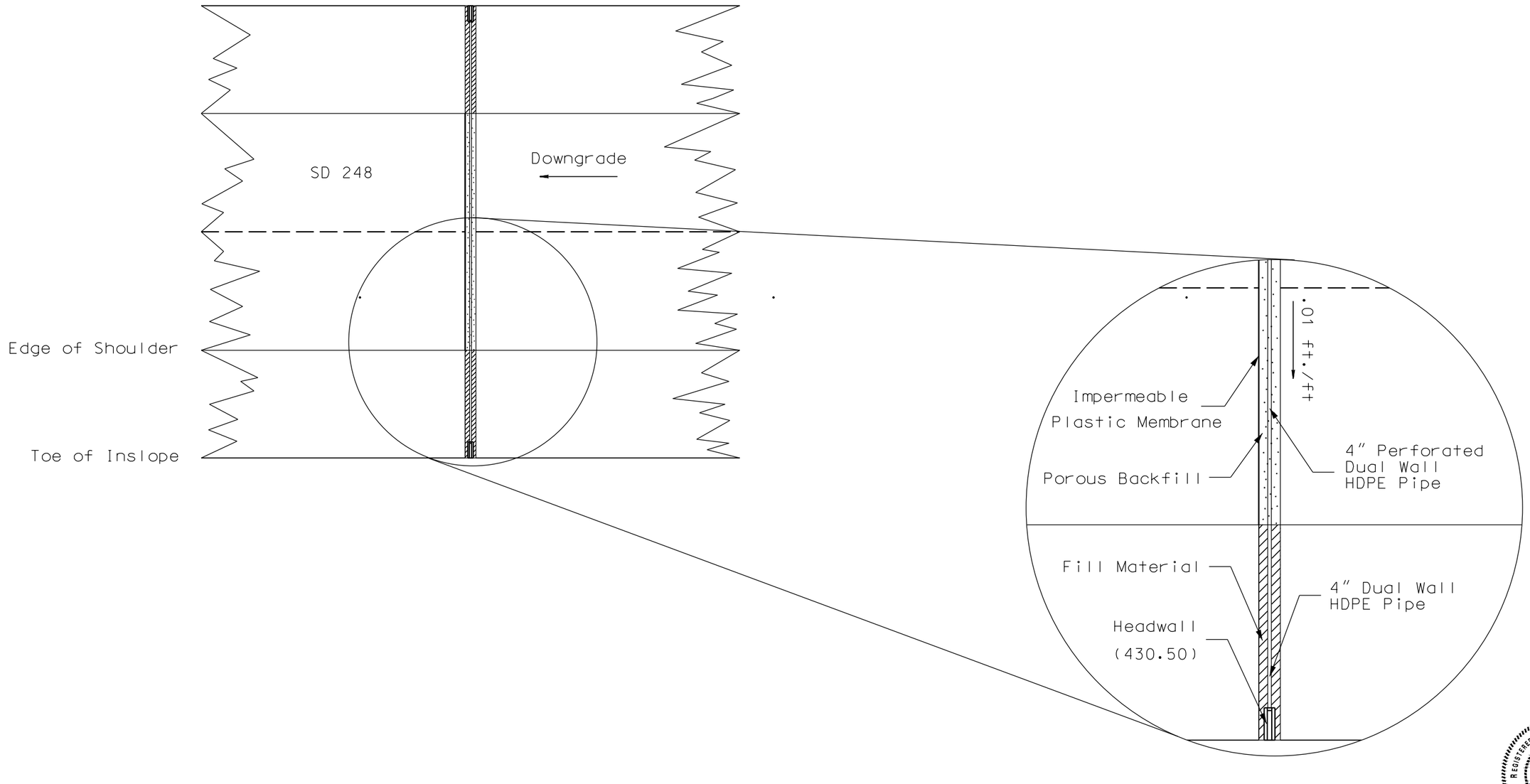
Plot Scale - 1:5
Plotted From - ischreter
File - ...\PVC Cutoff Drain.dgn

Typical Cutoff Drain Installation

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P-B 0248(16)173	B17	B23

Plotting Date: 9/1/2026



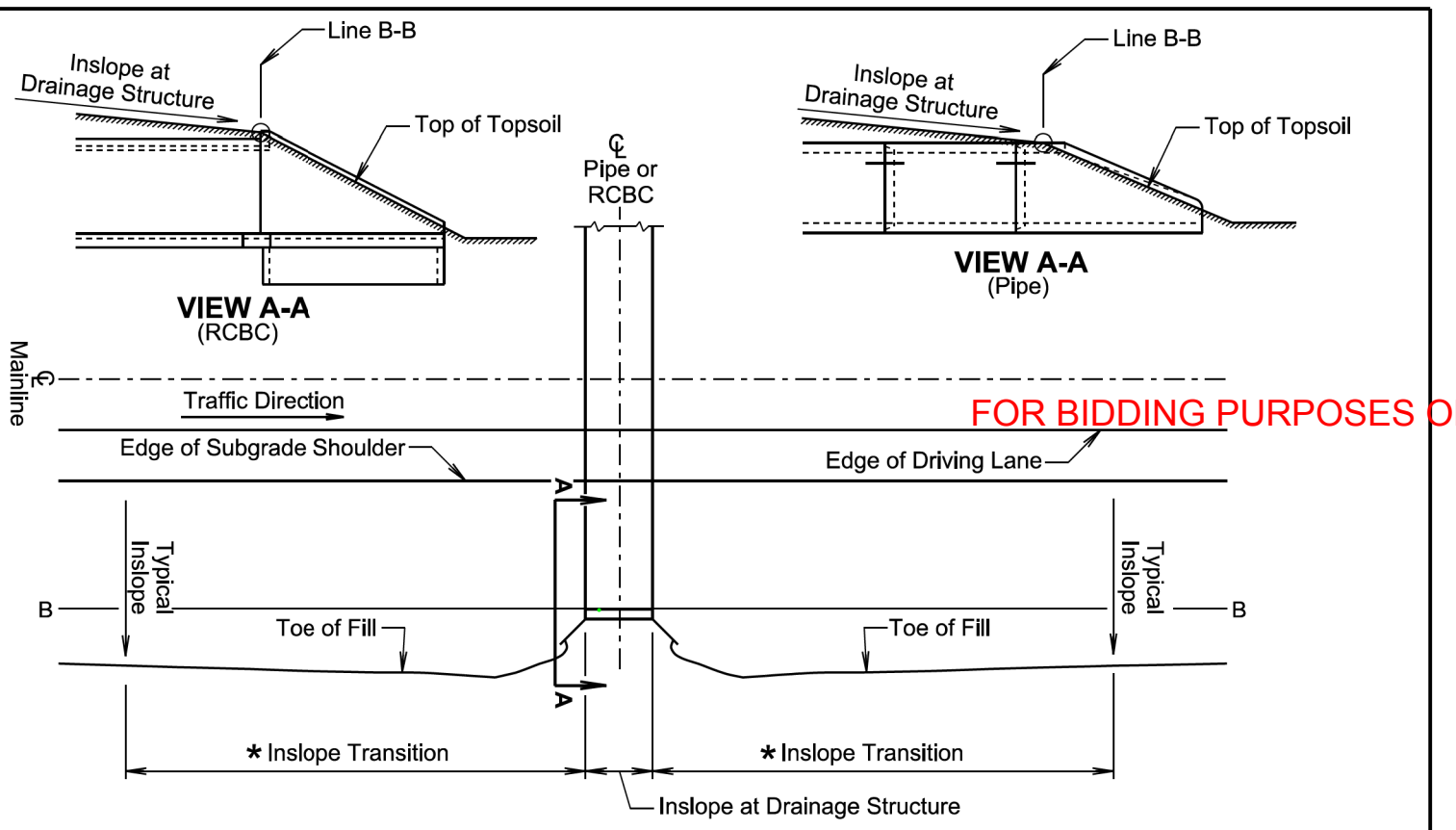
REGISTERED PROFESSIONAL ENGINEER
REG. NO. 8744
RICHARD A. SUDMEIER
SOUTH DAKOTA
04-01-26

Plot Scale - 1:5

Plotted From - jschreter

File - ...\PVC Cutoff Drain.dgn

Plotted From - jschneter
File - ...\CAD\Open Roads\06NH_Plates.dgn



TYPE 1 INSLOPE TRANSITION

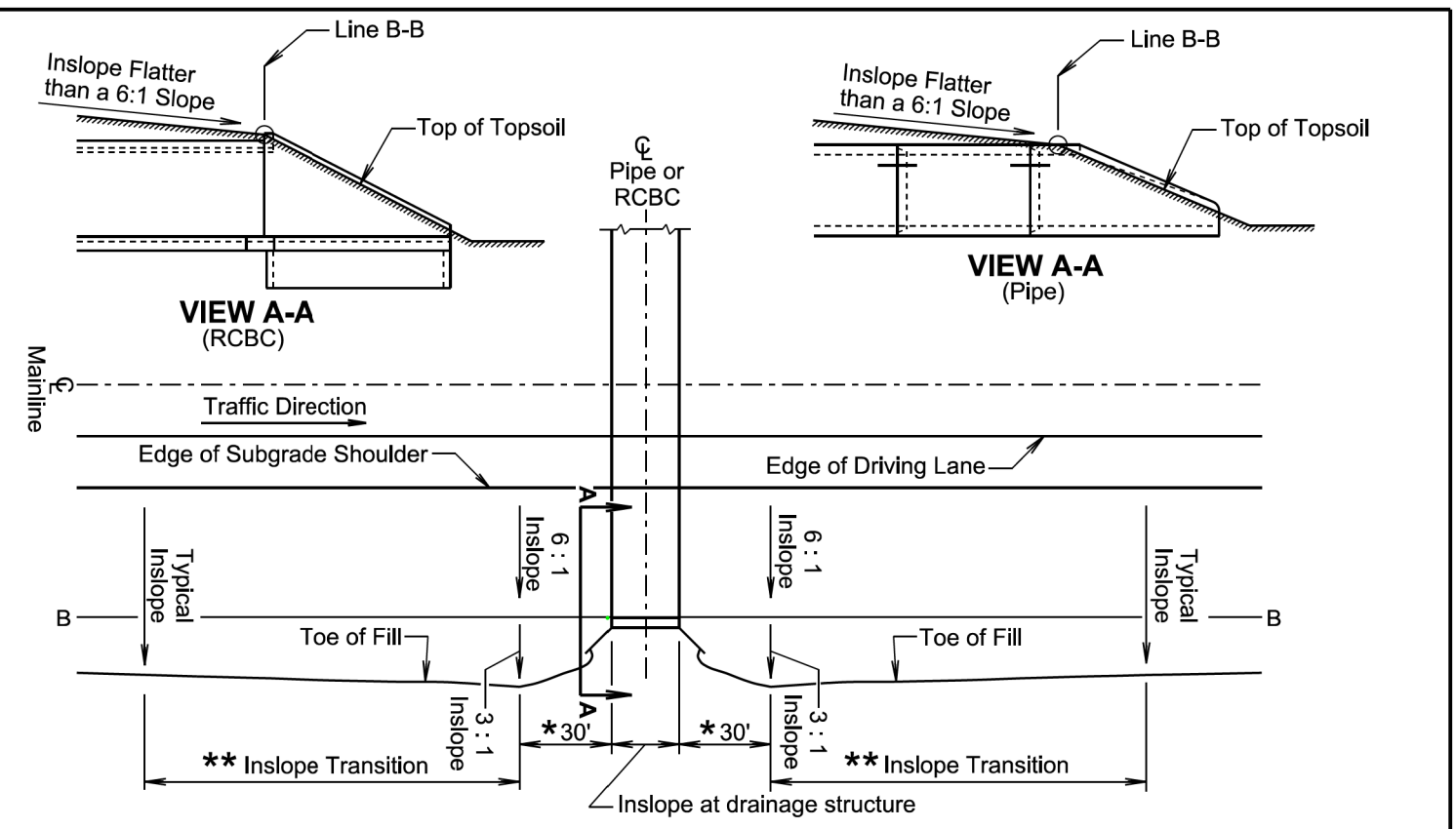
GENERAL NOTES:

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.

FOR BIDDING PURPOSES ONLY



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.

INSLOPE TRANSITIONS AT PIPE CULVERTS OR REINFORCED CONCRETE BOX CULVERTS

SDDOT

Published Date: 2027

PLATE NUMBER 120.05

Sheet 1 of 2

Sheet 2 of 2

September 14, 2018

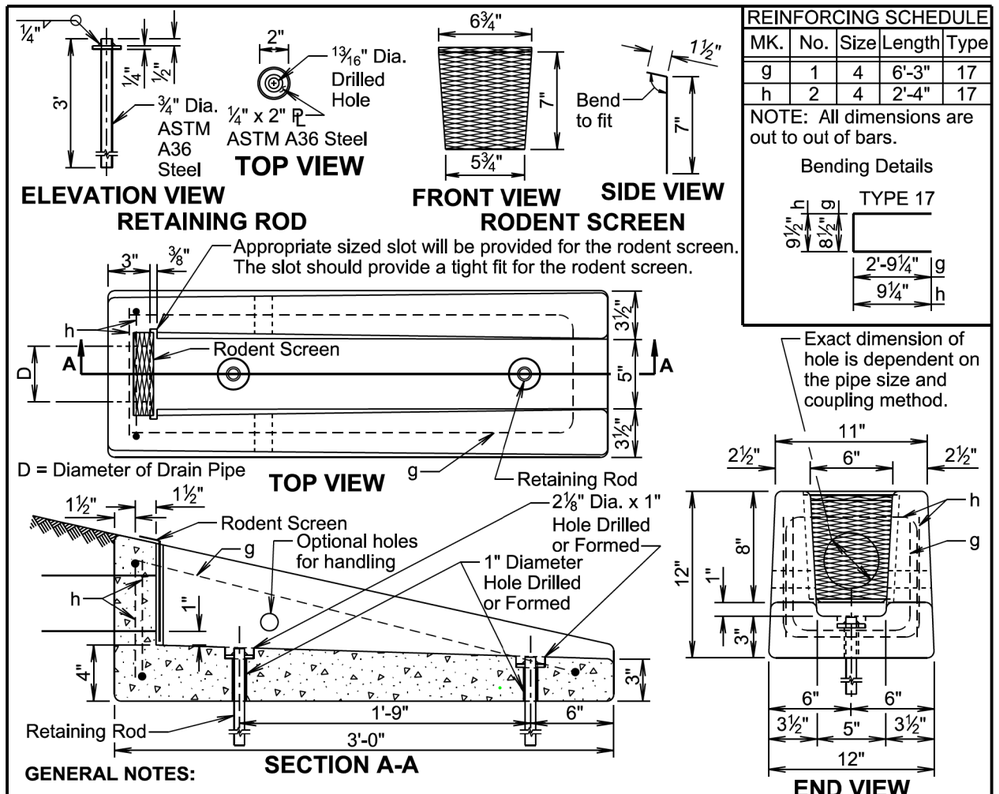
STATE OF SOUTH DAKOTA

PROJECT P-B 0248(16)173

SHEET B18

TOTAL SHEETS B23

Plotting Date: 9/1/2026



REINFORCING SCHEDULE				
MK.	No.	Size	Length	Type
g	1	4	6'-3"	17
h	2	4	2'-4"	17

NOTE: All dimensions are out to out of bars.

Bending Details

GENERAL NOTES:

The concrete will be Class M6. The concrete will conform to the requirements of Section 462 of the Specifications. It is estimated that each unit weighs approximately 210 pounds.

All reinforcing steel will conform to ASTM A615, Grade 60 and will be epoxy coated. The reinforcing steel will be securely retained to prevent displacement during placement of concrete. It is estimated that 7.3 pounds of reinforcing steel is required for each unit.

The pipe will be placed in the concrete headwall with the pipe end flush with the concrete surface adjacent to the rodent screen.

The rodent screen will be galvanized 13 Ga. steel with a diamond shaped flattened mesh pattern. The size will be ½". The size refers to the measurement across the smallest diamond shaped opening measured from the centers of the wires.

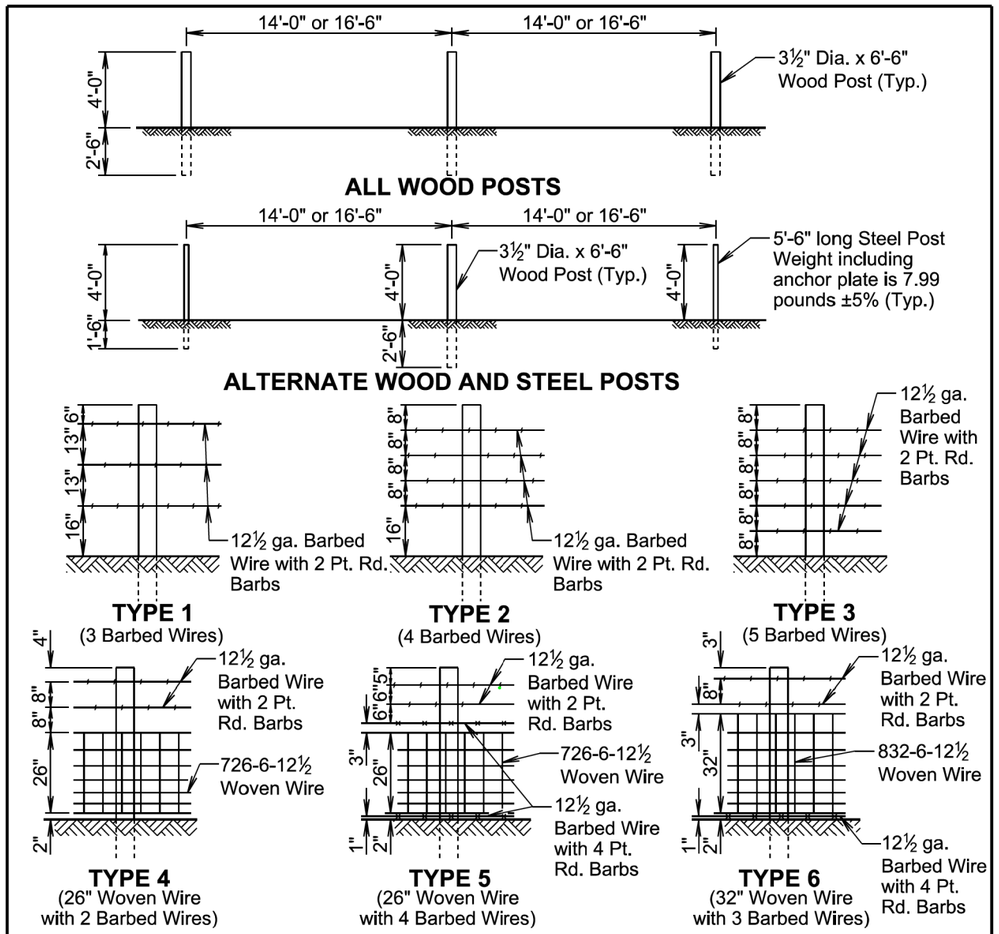
The retaining rod will be galvanized in accordance with ASTM A123 after all shop welding has been completed.

The drawing indicates using ½" fillets; however, ¾" chamfers may be substituted for the ½" fillets.

All costs for furnishing and installing the concrete headwall including equipment, labor, and materials including concrete, reinforcing steel, retaining rods, and rodent screen will be incidental to the contract unit price per each for "Precast Concrete Headwall for Drain".

November 19, 2021

Published Date: 2027	SDDOT	PRECAST CONCRETE HEADWALL FOR DRAIN	PLATE NUMBER 430.50
			Sheet 1 of 1



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

GENERAL NOTES:

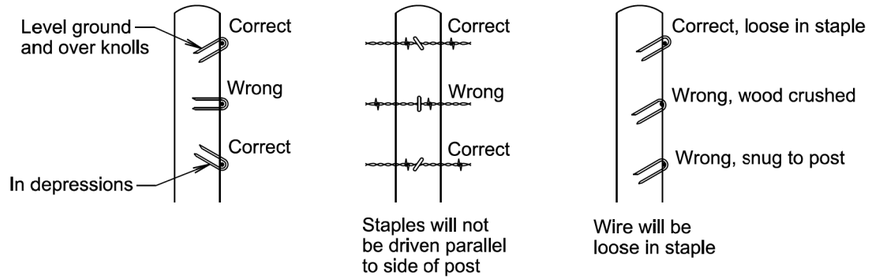
Fence types designated on the plans that are followed by the letter S will have smooth (barbless) wires.

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

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

April 8, 2025

Published Date: 2027	SDDOT	RIGHT-OF-WAY FENCE	PLATE NUMBER 620.01
			Sheet 1 of 1



STAPLE INSTALLATION

GENERAL NOTES:

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

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

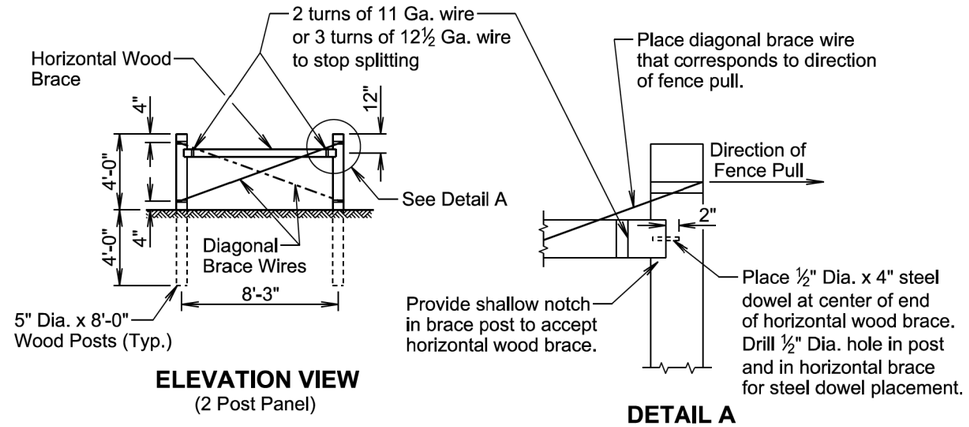
Right-of-Way fence other than on Interstate Projects will be constructed within one foot of the Right-of-Way on the Landowner's side except at bridge openings, cattle passes, and as otherwise directed by the Engineer.

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

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

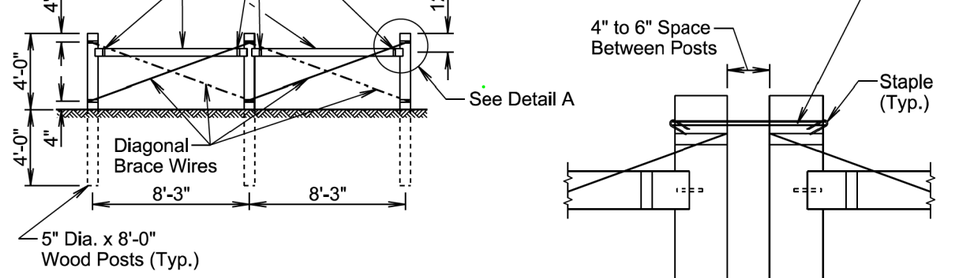
June 26, 2019

Published Date: 2027	SDDOT	STAPLE INSTALLATION AND GENERAL RIGHT-OF-WAY FENCE NOTES	PLATE NUMBER 620.02
			Sheet 1 of 1



ELEVATION VIEW
(2 Post Panel)

DETAIL A



ELEVATION VIEW
(3 Post Panel)

DETAIL B

GENERAL NOTES:

Two Post Panels will be installed at least every 1320' between corners.

Two Post Panels will be installed at any sharp vertical angle crest points and as directed by the Engineer.

Horizontal wood braces will consist of 4" dia. x 8' wood posts or rough 4" x 4" x 8' timbers.

Diagonal brace wires will be fabricated with 4 strands of 9 Ga. galvanized wire twisted tight. The diagonal brace wires will be installed in accordance with the direction of the fence pull. Two diagonal brace wires are required if fence pull is in both directions.

March 31, 2024

Published Date: 2027	SDDOT	BRACE PANELS AND APPLICATIONS OF BRACE PANELS	PLATE NUMBER 620.03
			Sheet 1 of 3

SPACING OF 2 POST PANELS WITHIN CURVES	
RADIUS OF CURVE	SPACING OF 2 POST PANEL
Greater than 1800 Ft.	** 1320'
Less than 1800 Ft.	** At P.C., P.T., and at every 1320' between P.C. and P.T.

** Fence lengths greater than 1320' and less than 2640' place 2 Post Panel approximately at midpoint.

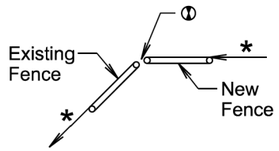
① See Detail B on Sheet 1 of 3.

GENERAL NOTE:

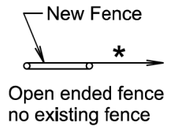
All radius of curvature stated for fence are at centerline of roadway.

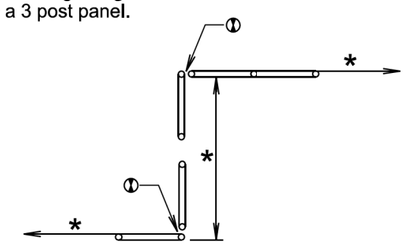
If fence length is less than 600' to next corner use a 2 post panel.

* If fence length is greater than 600' to next corner use a 3 post panel.

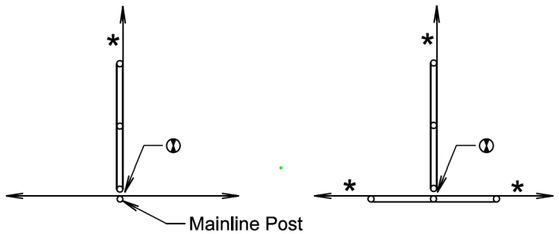


BEGIN OR END FENCE
(Where new fence ties into existing fence)

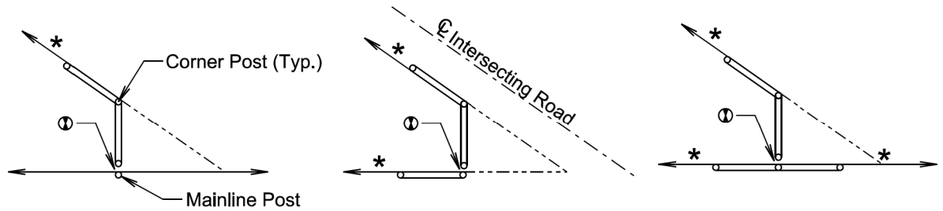




SHORT JOGS IN FENCE



CROSS FENCE



SHARP ANGLES IN CROSS FENCE



Additional fence panel is NOT required when an angle in the mainline fence is 10° and less.

Additional fence panel is required when an angle in the mainline fence is greater than 10°.

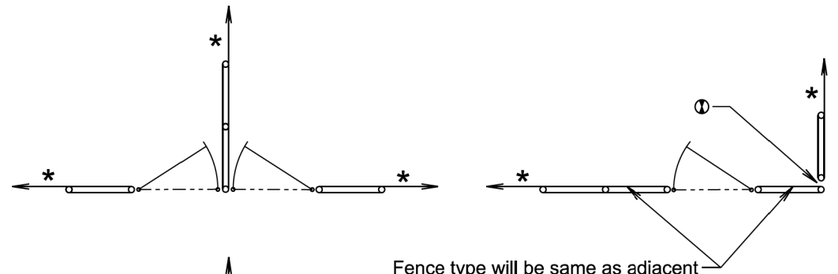
ANGLES IN MAINLINE FENCE

March 31, 2024

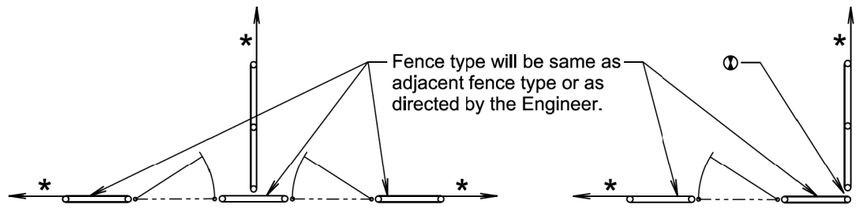
Published Date: 2027	SDDOT	BRACE PANELS AND APPLICATIONS OF BRACE PANELS	PLATE NUMBER 620.03 Sheet 2 of 3



ENTRANCE
(Not on corner)



Fence type will be same as adjacent fence type or as directed by the Engineer.



DOUBLE ENTRANCES

ENTRANCES AT CORNERS

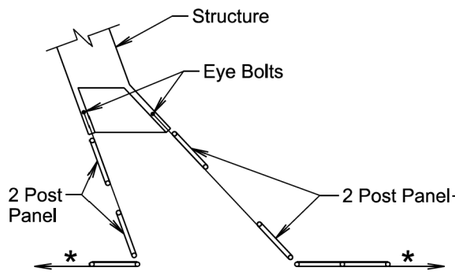
GATES

* If fence length is less than 600' to next corner use a 2 post panel.
If fence length is greater than 600' to next corner use a 3 post panel.

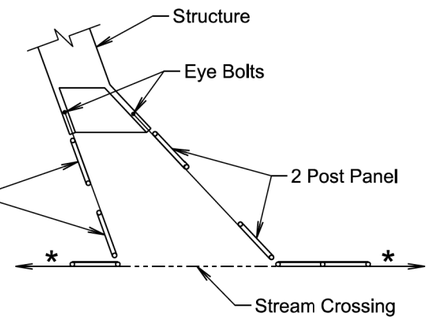
① See Detail B on Sheet 1 of 3.

March 31, 2024

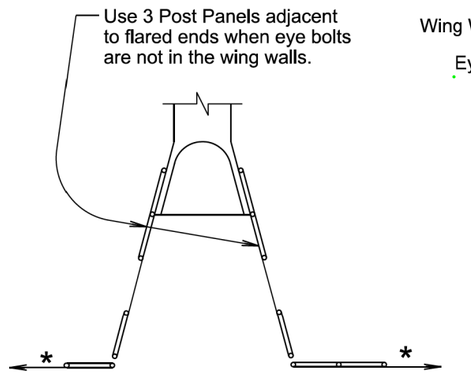
Published Date: 2027	SDDOT	BRACE PANELS AND APPLICATIONS OF BRACE PANELS	PLATE NUMBER 620.03 Sheet 3 of 3



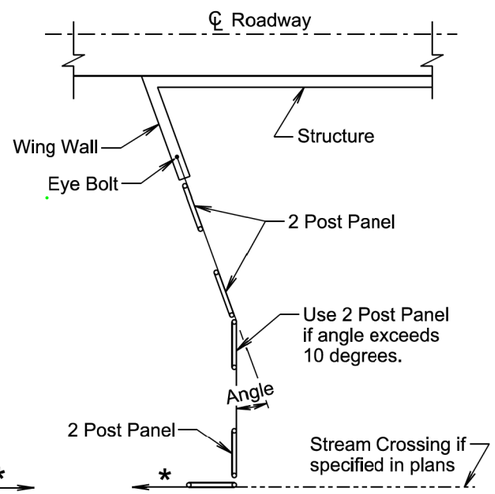
R.C. BOX CULVERT OR CATTLE PASS



STRUCTURE WITH STREAM CROSSING FENCE



R.C. BOX CULVERT OR CATTLE PASS

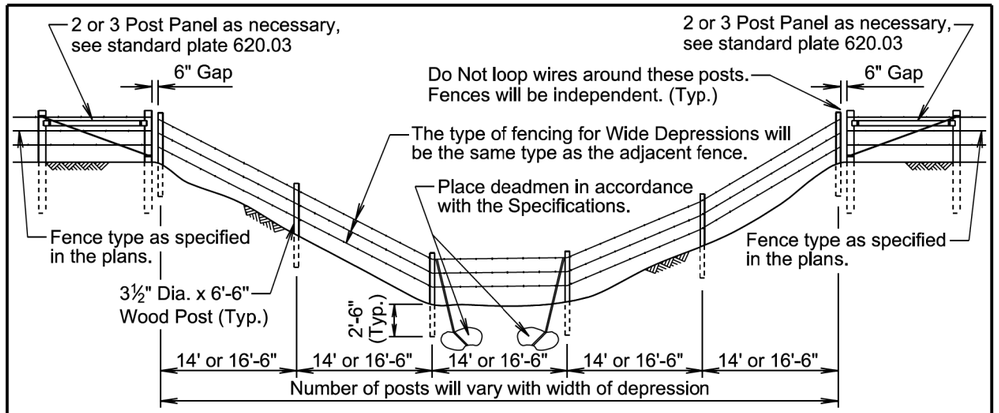


BRIDGE

* If fence length is less than 600' to next corner use a 2 post panel.
If fence length is greater than 600' use a 3 post panel.

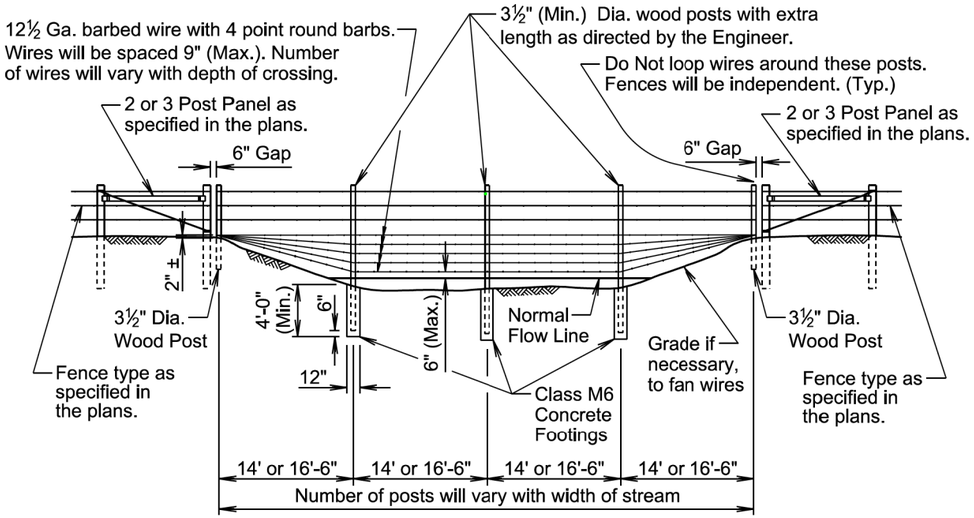
June 26, 2019

Published Date: 2027	SDDOT	BRACE PANEL APPLICATIONS AT STRUCTURES	PLATE NUMBER 620.04
			Sheet 1 of 1



This installation will be made when requested by the Engineer.

FENCING AT WIDE DEPRESSION
(Subject to Flooding)



This installation will be made only when stated in the plans.

FENCING AT STREAM CROSSING

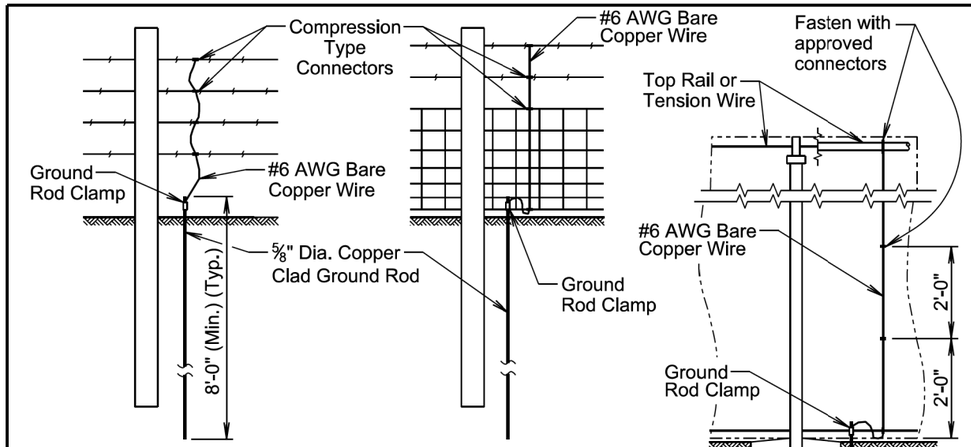
GENERAL NOTES:

There will be no extra payment for the additional work and materials required to construct the fencing at the wide depression(s) and/or the fencing at the stream crossing(s). The deadmen will be paid for in accordance with 620.5 A of the Specifications.

Measurement and payment for the fencing at the wide depression(s) and/or the fencing at the stream crossing(s) will be at the contract unit price per foot for the corresponding Right-of-Way fence contract item.

June 26, 2019

Published Date: 2027	SDDOT	FENCING AT WIDE DEPRESSION(S) AND STREAM CROSSING(S)	PLATE NUMBER 620.10
			Sheet 1 of 1



BARBED WIRE FENCE **WOVEN WIRE FENCE**

CHAIN LINK FENCE

GENERAL NOTES:

Details shown on this standard plate will apply to all types of Right-of-Way fence constructed with all wood posts or chain link fence.

Continuous fence in urban areas will be grounded at maximum intervals of 500 feet. Continuous fence in rural areas will be grounded at maximum intervals of 1000 feet. There will be a ground at a maximum of 100 feet from a gate in each adjacent section of fence.

Fence placed under a power line will be grounded with three grounds. One ground will be placed directly below the crossing and the other two will be placed 25 feet to 50 feet away, one on each side.

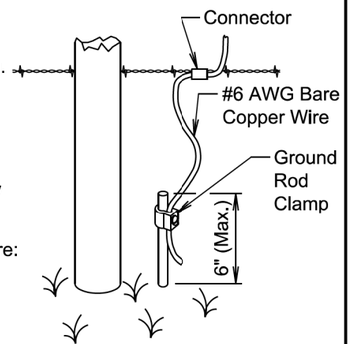
One ground will be placed directly below each telephone or cable crossing.

Ground rods will be located on the post side of the fence and will be as close as possible to the post and fence.

The cost of furnishing and placing all materials for grounding will be incidental to the contract unit price per foot for the respective Right-of-Way fence or chain link fence contract item.

The approximate quantites of materials per each installation of a ground are:

1 ground rod clamp.
1 ⅝" diameter x 8' long copper clad ground rod
1 #6 AWG bare copper wire; 7' long for Right-of-Way fence or 10' long for chain link fence.

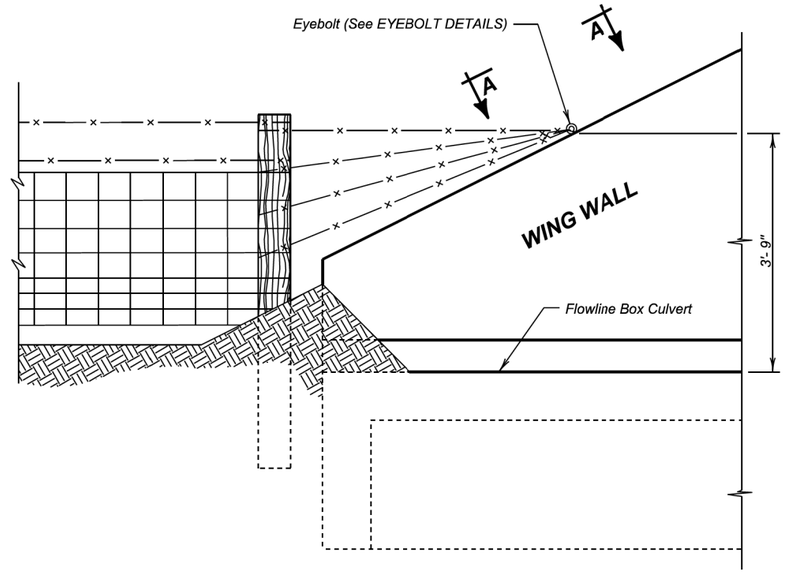


GROUND ROD DETAIL

Compression type or other type of connectors:
26" woven wire will have a total of two connectors, one secured to the top and one secured to the bottom.
32" woven wire will have a total of three connectors, one secured to the top, one secured to the middle, and one secured to the bottom.
One connector will be used for each strand of barbed wire.
A minimum of 3 connectors will be installed on chain link fence, the connectors will be placed vertically at every 2-foot increment and connectors will be placed on the top and bottom tension wires or top rail.

June 26, 2019

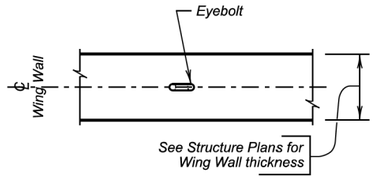
Published Date: 2027	SDDOT	FENCE GROUNDING	PLATE NUMBER 620.11
			Sheet 1 of 1



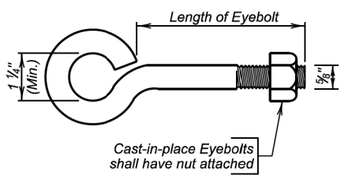
DETAIL FOR FENCE ANCHORS

GENERAL NOTES:

1. *The fence and post details shown are for illustrative purpose only. The fence shall be as specified elsewhere in the plans.*
2. *Eyebolts shall be placed on all of the box culvert wing walls.*
3. *Eyebolts shall be ⅞ inch diameter and shall conform to ASTM A307.*
4. *Eyebolts, nuts, and concrete inserts shall be galvanized in accordance with AASHTO M232 (ASTM A153). Concrete inserts of corrosion resistant material need not be galvanized.*
5. *Cast-in-place eyebolts shall have a nut attached, be 4 ½ inches (Min.) in length and shall be embedded such that the eye of the bolt is flush with the concrete surface. (See Eyebolt Details) As an alternate, cast-in-place concrete inserts, capable of developing the full strength of the ⅞ inch diameter threaded eyebolt, may be used and shall be set in the concrete in accordance with the manufacturer's recommendations. The eyebolt shall be of sufficient length to develop its full strength. The eye of the eyebolt shall be flush with the concrete surface.*
6. *The cost for furnishing and installing eyebolts and/or concrete inserts shall be incidental to various contract items.*



VIEW A - A



EYEBOLT DETAILS

December 23, 2012

Published Date: 2027	SDDOT	FENCE ANCHORS FOR BOX CULVERT WING WALLS	PLATE NUMBER 620.16
			Sheet 1 of 1