

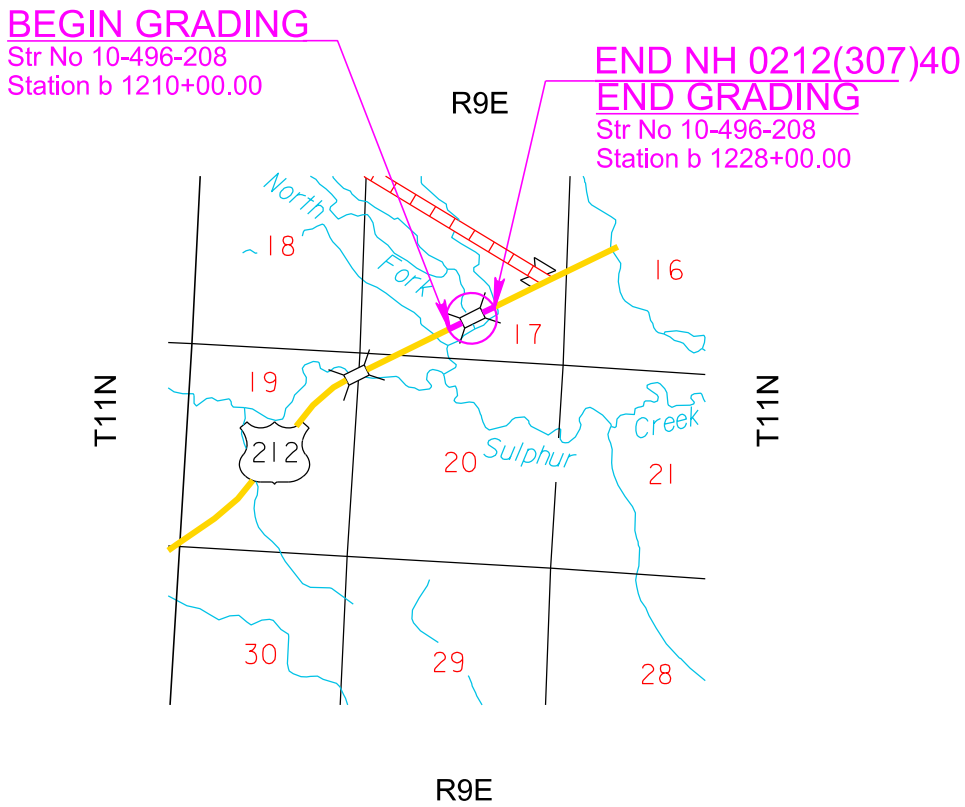
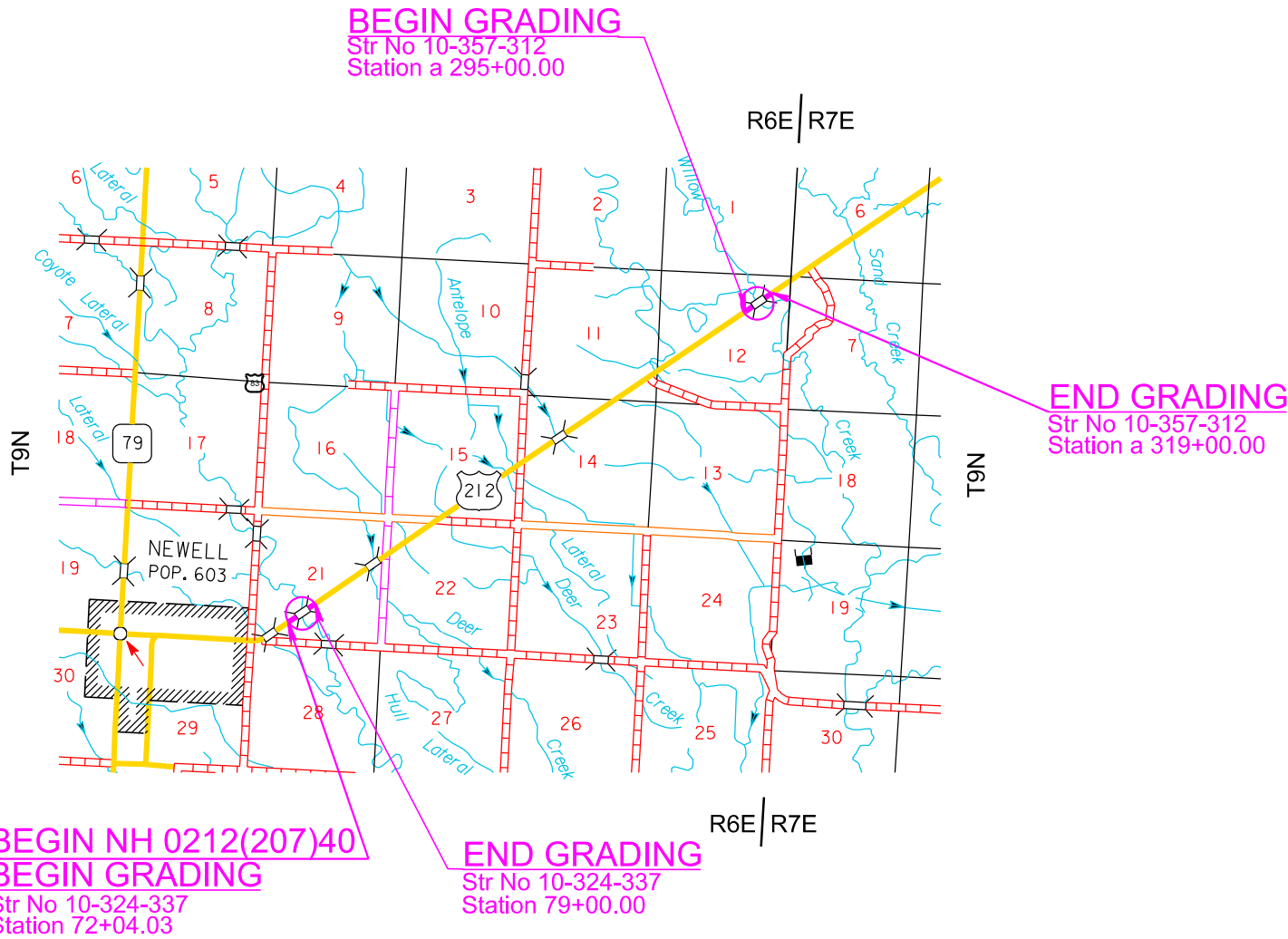
SECTION B: GRADING PLANS

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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	41	Each
009E3230	Grade Staking	2.405	Mile
009E3245	Final Cross Section Survey	2.405	Mile
009E3250	Miscellaneous Staking	2.405	Mile
009E3280	Slope Staking	2.405	Mile
009E3290	Structure Staking	3	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	9,233	Ft
110E0730	Remove Beam Guardrail	2,076.0	Ft
110E1010	Remove Asphalt Concrete Pavement	17,095.9	SqYd
120E0010	Unclassified Excavation	48,147	CuYd
120E0500	Option Borrow Excavation	124,694	CuYd
120E0600	Contractor Furnished Borrow Excavation	11,942	CuYd
120E1000	Muck Excavation	449	CuYd
120E2000	Undercutting	15,153	CuYd
120E6100	Water for Embankment	2,027.0	MGal
250E0020	Incidental Work, Grading	Lump Sum	LS
270E0110	Salvage and Stockpile Granular Material	16,297.6	Ton
430E0700	Precast Concrete Headwall for Drain	4	Each
450E0122	18" RCP Class 2, Furnish	106	Ft
450E0130	18" RCP, Install	106	Ft
450E0242	72" RCP Class 2, Furnish	38	Ft
450E0250	72" RCP, Install	38	Ft
450E0452	72" RCP Bend, Furnish	1	Each
450E0453	72" RCP Bend, Install	1	Each
450E2052	72" RCP Flared End, Furnish	2	Each
450E2053	72" RCP Flared End, Install	2	Each
450E2304	18" RCP Safety End, Furnish	1	Each
450E2307	18" RCP Safety End, Install	1	Each
450E4758	18" CMP 14 Gauge, Furnish	138	Ft
450E4760	18" CMP, Install	138	Ft
450E5010	18" CMP Elbow, Furnish	2	Each
450E5011	18" CMP Elbow, Install	2	Each
450E5211	18" CMP Flared End, Furnish	3	Each
450E5212	18" CMP Flared End, Install	3	Each
450E5406	18" CMP Safety End, Furnish	3	Each
450E5407	18" CMP Safety End, Install	3	Each
450E8009	18" RCP to CMP Transition, Furnish	1	Each

SECTION B ESTIMATE OF QUANTITIES (CONTINUED)

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
450E8010	18" Pipe Transition, Install	1	Each
455E0010	Cleanout for Culvert Treatment	1	Each
455E1072	72" Pipe Lining	118	Ft
600E0200	Type II Field Laboratory	1	Each
620E0020	Type 2 Right-of-Way Fence	1,692	Ft
620E0030	Type 3 Right-of-Way Fence	7,019	Ft
620E0520	Type 2 Temporary Fence	8,722	Ft
620E1020	2 Post Panel	57	Each
620E1030	3 Post Panel	3	Each
630E0500	Type 1 MGS	256.3	Ft
630E1010	Straight Class A W Beam Guardrail with Wood Posts	50.0	Ft
630E1025	Curved Class A W Beam Guardrail with CRT Posts	25.0	Ft
630E1500	Type 1 Guardrail Transition	7	Each
630E2017	MGS MASH Flared End Terminal	7	Each
630E2035	W Beam Guardrail Special Anchor Assembly	1	Each
670E0200	Type A Frame and Grate	4	Each
670E1010	2' x 3' Type B Drop Inlet	4	Each
670E5400	Precast Drop Inlet Collar	4	Each
680E0204	4" Perforated PVC Drain Pipe with Sleeve	90	Ft
680E0224	4" PVC Outlet Pipe	40	Ft
680E2500	Porous Backfill	26.0	Ton
720E1010	PVC Coated Bank and Channel Protection Gabion	4.5	CuYd
831E0110	Type B Drainage Fabric	731	SqYd
831E0400	Impermeable Plastic Membrane	50	SqYd

MACHINE CONTROL GRADING & MODEL INFORMATION

Electronic design files are made available by the SDDOT Bid Letting Office through the SDDOT's SharePoint Directory for Contractors. The roadway subgrade models xml files provided for this project includes the following highway features: guardrail widening and inslope transitions at pipes and box culverts. It is the Contractor's responsibility to verify the features listed as being incorporated in the model are actually included. If any discrepancy exists, the plans will govern over the provided electronic information, regardless of the features listed above.

Highway features not included in the roadway subgrade models xml files are the following: intersecting roads and entrances, undercutting, muck excavation, and unstable excavation.

Other subgrade models xml files provided for this project include channel work and borrow pits.

These files are provided for informational purposes only. The information shown in the plans will govern over the provided electronic information. The Contractor assumes the risk of error if the information is used for any purposes for which the information was not intended. The Contractor assumes all risk of any assumptions or manipulations made of the electronic information.

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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.

The estimated excavation required for placing the Granular Bridge End Backfill and/or Bridge End Embankment, and for constructing the Bridge Berm(s) between bridge abutments and shaping the bridge waterway channel(s) are listed in the Table of Unclassified Excavation. Overburden Excavation for Riprap is not included in the Unclassified Excavation quantity. Refer to Section E for information regarding the Overburden Excavation for Riprap. The excavated material from the construction of the Bridge Berm(s) and shaping the bridge waterway channel(s) should be disposed of at a site provided by the Contractor and approved by the Engineer. This waste material is not included in the Waste shown in the Table of Excavation Quantities by Balances.

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.

As per Section 120.3 B.3.a of the Specifications, soil used to construct the roadway embankment within the area bounded by the toe of the berm slope and extending to a line 100 feet back from the bridge end will have an optimum moisture of less than 25%. The Contractor is advised that it is unlikely any soil meeting this requirement will be available within the project limits. Mixing a more suitable material with the onsite soils will likely be required to meet this specification. No additional compensation will be made to the Contractor for producing the suitable material.

One-point results for Option Borrow Nox. 1 and 2 indicate the clay soils have an optimum moisture greater than 25%. The Contractor may have to use selective excavation/stockpiling/blending/etc. to lower the optimum moisture for bridge end embankment use.

One-point results for Option Borrow No. 3 indicate the clay soils have an optimum moisture below 25%, but should be monitored to assure compliance with specifications.

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

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GENERAL GEOLOGY

The project alignment underlain by Pierre Shale and Quaternary Alluvium Deposits. The South Dakota Geologic Survey describes the deposits/formations that will be encountered on the project as outlined below:

Quaternary Alluvium deposits consist of clay to boulder sized clasts with locally abundant organic material. Alluvial material will be encountered with grading for St. No. 10-496-208.

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. Muck Excavation will be required at the areas shown in the plans or as 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.

TRAFFIC DIVERSIONS

The traffic diversions are located at Sta's. 76+00, a 303+00, and b 1217+00. The traffic diversions will be constructed according to Section 5.14 B of the Specifications. Installation and removal of the traffic diversions will meet all requirements as set forth in the South Dakota Surface Water Quality Standards.

The traffic diversions located at Stations 76+00, a 303+00, and b 1217+00 will be constructed according to the geometric layouts shown in the plans with the temporary drainage structures 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 structures 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 diversions 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 Channel	Temporary Structure Overbank
76+21	2 year	2777.2	2779.9	1-72" CMP	
a 303+02	2 year	2775.0	2774.6	2-60" CMP	1-36" CMP (Inlet Elev. 2777.3)
b 1217+23	2 year	2735.0	2736.2	1-72" CMP	3-36" CMP (Inlet Elev. 2738.8)

* 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)".

Traffic diversions in waterways will be constructed such that any material placed below the ordinary high water elevation will conform to the requirements of class B riprap. Type B drainage fabric will be placed under the riprap and under the diversion embankment that is placed in a wetland as shown in the construction plans. The Type B drainage fabric will also be placed above the riprap. 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 removed traffic diversion embankment will be used in the mainline embankment unless otherwise approved by the Engineer.

Added Traffic Diversion Excavation as shown on the plans profile sheets is the excavation required to construct the traffic diversion portion that is located outside the mainline cross section work limits. The Added Traffic Diversion Excavation quantity is added to the unclassified excavation quantity in the Table of Unclassified Excavation.

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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)
76+00	R	2779.9	142	142	120
a 303+00	R	2774.6	827	827	427
b 1217+23	L	2736.2	219	219	169
		Totals	1,188	1,188	716

INSLOPE TRANSITIONS

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

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

Station	L/R	Type
75+95	R	1
76+58	L	1

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SHRINKAGE FACTOR: Embankment +35%

TABLE OF EXCAVATION QUANTITIES BY BALANCES

		Excavation	* Undercut	* Muck Exc.	* Option Borrow Exc.	* Contractor Furnished Borrow Exc.	Total Excavation	** Waste	** Dead Haul	** Option Borrow Haul	** Haul
Station to	Station	(CuYd)	(CuYd)	(CuYd)	(CuYd)	(CuYd)	(CuYd)	(CuYd)	(CuYdSta)	(CuYdSta)	(CuYdSta)
72+04	79+00	810	4,041		10,904		15,755	6,899	32,712	17,093	271
a 295+00	a 319+00		4,454		77,000	10,238	91,692		269,500	596,798	
b 1210+00	b 1228+00		6,658	449	30,000	1,704	38,811	4,227	180,000	143,825	
Totals:		810	15,153	449	117,904	11,942	146,258	11,126	482,212	757,716	271

- * 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.

TABLE OF UNCLASSIFIED EXCAVATION

	(CuYd)
Excavation	810
Undercut	15,153
Topsoil	12,768
Exc. for RCBC Installation	3,546
Added Traffic Diversion Excavation	4,684
Exc. for Granular Bridge End Backfill and/or Bridge End Embankment	274
Exc. for Bridge Berm(s) between bridge abutments and channel shaping	2,289
Salvaged Granular Base Material (from cut sections)	6,271
Salvaged Granular Base Material (from fill sections)	2,352
Total	48,147

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.

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 2,352 cubic yards of Salvaged Granular Base Material from fill sections and 6,271 cubic yards of Salvaged Granular Base Material will be added to the Excavation quantity to determine the Unclassified Excavation quantity. When finaling a project, the quantities of Salvaged Asphalt Mix and Granular Base Material from fill sections will not be adjusted according to field measurements. The quantity of Salvaged Asphalt Mix and 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.

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 concrete pavement and asphalt pavement that will be removed.

When finaling a project, the estimated quantity of 8,820 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.

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.

TABLE OF OPTION BORROW EXCAVATION

	(CuYd)
Option Borrow Excavation	117,904
Topsoil in Borrow Pits	6,790
Total:	124,694

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HAUL

Included in the Table of Excavation Quantities by Balances are Dead Haul, Borrow Haul, and Haul. They are not pay items and are for informational purposes only. Haul was not estimated for moving Contractor Furnished Borrow Excavation. The mass haul diagram is available as part of the bid package for use in figuring this haul.

Dead Haul: Estimated quantity (CuYdSta) for moving borrow excavation material or option borrow excavation material from the borrow or option borrow site to the centerline mainline station listed in the Table of Borrow Pits.

Option Borrow Haul: Estimated quantity (CuYdSta) for moving option borrow excavation material from the centerline mainline station listed in the Table of Borrow Pits to the locations where it is needed throughout the earthwork balance.

Haul: Estimated quantity (CuYdSta) for moving unclassified excavation material to the locations where it is needed throughout the earthwork balance.

For Purpose of Extra Haul Computations:

Average Haul = (Haul + Out-of-Balance Haul)/Unclassified Excavation = 271/48,147 = 0.1 Sta.

Average Option Borrow Haul = (Option Borrow Haul + Dead Haul)/Total Option Borrow Excavation = 1,239,928/124,694 = 9.9 Sta.

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
72+04		79+00
a 295+00		a 319+00
b 1210+00		b 1228+00

UNSTABLE MATERIAL EXCAVATION

The areas of unstable material excavation are drawn on the cross sections with a normal depth of 2 feet. The estimated quantity of 1,158 cubic yards of unstable material excavation will be paid for at the contract unit price per cubic yard for “Unclassified Excavation”.

All areas designated as Unstable will be excavated. The unstable material excavated on this project will be placed outside the subgrade shoulder in fill sections or stockpiled and used as topsoil.

Field measurement of unstable material excavation will not be made. However, if there are additional areas of unstable material excavation 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 UNSTABLE MATERIAL EXCAVATION

Station	to	Station	L/R	Depth (Ft)	Quantity (CuYd)
a 298+50		a 302+00	L	2	749
a 298+50		a 301+00	R	2	409
				Total:	1,158

MUCK EXCAVATION

The areas of muck excavation are drawn on the cross sections with a normal depth of 3 feet. The estimated quantity of 449 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

Alignment	Station	to	Station	L/R	Depth (Ft)	Quantity (CuYd)
Div b 1217	4+00		6+00	R	3	449
						Total: 449

REMOVE ASPHALT CONCRETE PAVEMENT

The Los Angeles Abrasion Loss value on the aggregate used for the in-place asphalt concrete was 24. This value was obtained from testing during construction of the in-place asphalt concrete.

An estimated 2,692.4 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 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.

TABLE OF REMOVE ASPHALT CONCRETE PAVEMENT

			Remove Asphalt Concrete Pavement	
Station	to	Station	cuyds	sqyds
US212				
72+04.0	to	75+44.5	196.6	1,324.2
76+96.0	to	79+00.0	117.8	793.3
a 295+00.0	to	a 302+45.3	430.3	2,898.0
a 304+41.8	to	a 319+00.0	841.9	5,671.2
b 1210+00.0	to	b 1216+01.3	414.9	2,404.8
b 1217+98.8	to	b 1228+00.0	690.9	4,004.4
			2,692.4	17,095.9

SAW TRANSVERSE JOINTS IN ASPHALT CONCRETE

Prior to the removal of in place asphalt concrete, the existing pavement will be sawed full depth to a true line with a vertical face, see typical sections. If approved by the Engineer, the Contractor may elect to use a different method to create this vertical face. All costs to saw joint will be incidental to the contract unit price per square yard for “Remove Asphalt Concrete Pavement”.

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SALVAGE AND STOCKPILE GRANULAR MATERIAL

An estimated 16,297.6 Tons (8,623.1 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 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 MATERIAL

			Salvage and Stockpile Granular Material	
Station	to	Station	cuyds	tons
US212				
70+04.0	to	75+44.5	605.3	1,144.0
76+96.0	to	79+00.0	362.7	685.5
a 295+00.0	to	a 302+45.25	1,325.0	2,504.3
a 304+41.75	to	a 319+00.0	2,915.2	5,509.7
b 1210+00.0	to	b 1216+01.25	1,158.8	2,190.1
b 1217+98.75	to	b 1228+00.0	2,256.1	4,264.0
			8,623.1	16,297.6

BORROW PITS

See the Grading Operations Note on Sheet B2 for borrow pit material usability.

The Contractor will provide temporary fence around the borrow pits to protect livestock if needed. The Temporary Fence will be paid for at the contract unit price per foot for "Type 2 Temporary Fence".

TABLE OF BORROW PITS

Site	Station	L/R	Dead Haul Distance (Sta)	Option Borrow Exc. (CuYd)	Dead Haul (CuYdSta)
1	82+50	L/R	3.0	10,904	32,712
2	a 315+00	L/R	3.5	77,000	269,500
3	b 1225+00	R	6.0	30,000	180,000
Totals:				117,904	482,212

Stations in the above table are not pit locations, but stations where the borrow is interjected into the earthwork balance for haul calculations.

The quantities listed in the above table for Dead Haul are for information only. The Dead Haul quantities are also included in the Table of Excavation Quantities by Balances.

The quantities listed in the above table for Borrow Excavation are also included in the Table of Excavation Quantities by Balances.

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 3,546 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.

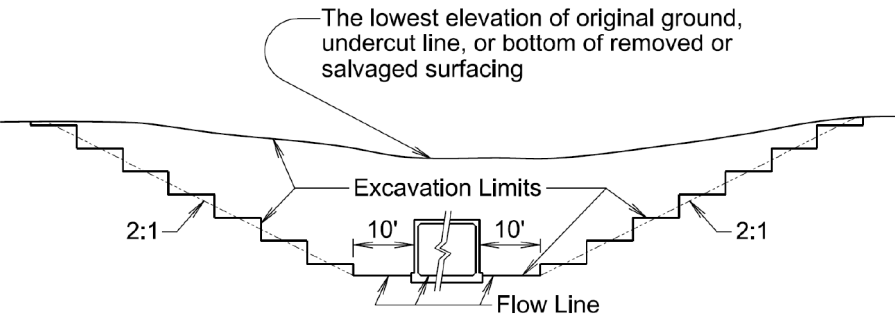


TABLE OF EXCAVATION FOR REINFORCED CONCRETE BOX CULVERT INSTALLATION

Station	Quantity (CuYd)
76+26	3,546
Total:	3,546

INCIDENTAL WORK, GRADING

Station	L/R	Remarks
70+77	R	Remove Concrete Headwall
70+77	L	Remove Concrete Headwall
77+11	L	Take Out 18"-32' CMP
83+77	R	Remove Concrete Headwall
a 301+66	R	Take Out 18"-56' RCP
b 1223+99		Take Out 2 End Sections

CLEANOUT FOR CULVERT TREATMENT

Cleanout of pipe culvert will be done in advance of the culvert structural lining.

Material in existing pipe culvert will be cleaned out by water flushing or other approved methods.

Material removed from the pipe culvert will become property of the Contractor for disposal.

The Contractor will implement appropriate sediment control measures prior to water flushing to prevent discharges from the project boundaries.

The pipe culvert will be cleaned to the satisfaction of the Engineer.

All costs to dewater, clean pipe, and dispose of removed materials will be incidental to the contract unit price per each for "Cleanout for Culvert Treatment".

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Plot Scale - 1:200

Plotted From - TRPR17190

CUTOFF DRAIN

Cutoff drains will be installed in conjunction with the proposed 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 a298+00±
Station a316+00±

The 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 PVC Drainpipe with a filter fabric drain sleeve on top of the membrane in the center of the trench bottom. Using a coupler, connect 4” PVC Outlet Pipe to both ends of the 4” Perforated PVC Drainpipe and place in the center of the unlined trench. The 4” PVC Outlet 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 PVC Drainpipe 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 PVC Drain Pipe with Filter Fabric Drain Sleeve	90 ft.
4 inch PVC Outlet Pipe	40 ft.
Porous Backfill	26 tons
Headwalls (See Standard Plate No. 430.50)	4 each

The Perforated PVC Drainpipe will be PS 46 Solvent Weld PVC pipe conforming to ASTM F758 or SDR 35 Solvent Weld PVC Pipe conforming to ASTM D3034 with perforations in accordance with ASTM F758. The PVC Outlet Pipe will be Schedule 40 PVC Pipe conforming to ASTM D1785 designated as PVC 1120, PVC 1220, or PVC 2120. Pipe sections will be connected using a PVC Solvent Cement conforming to ASTM D2564. The Drain Sleeve will conform to ASTM D6707. All labor, tools, equipment, and incidentals necessary for the installation of the PVC 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 placed 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 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 outlet 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 will 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 Belle Fourche Area office for reference in post construction maintenance.

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.

Areas within the project have soils that are highly corrosive to steel. Corrugated metal pipe in these areas will be polymer coated 14 gauge steel as specified in the Table of Pipe Quantities. Any required connection bands, elbows, tees, crosses, wyes, reducers, and transitions will also be polymer coated. The connection bands will be 24 inches wide. All polymer coated corrugated metal pipe and components will be in conformance with AASHTO M245. Riveted pipe will not be allowed.

All damage to the polymer coating will be repaired in accordance with the manufacturer’s recommendations prior to installation of the pipe.

All costs associated with the polymer coating including repair of polymer coating will be incidental to the corresponding CMP contract items.

Metal pipe end sections connected to polymer coated CMP will be aluminum-coated (Type 2) in accordance with AASHTO M36 as specified in the Table of Pipe Quantities. All costs associated for gauge, coating, and connections will be incidental to the corresponding CMP End Section contract items

PIPE FOR APPROACHES

Class 2 reinforced concrete pipe, high density polyethylene pipe, polypropylene pipe (will be in conformance with AASHTO M330), or steel reinforced polyethylene pipe may be substituted for corrugated metal pipe at approaches at no additional cost to the State.

If corrugated metal pipes are provided, the pipes will be as specified in the CORRUGATED METAL PIPE note.

If high density polyethylene pipe, polypropylene pipe (will be in conformance with AASHTO M330), or steel reinforced polyethylene pipe are provided, then the end sections will be metal, be compatible, and conform to the type of end section as shown in the plans.

PIPE FOR DOWNSPOUTS

The substitution of Class 2 reinforced concrete pipe, high density polyethylene pipe, polypropylene pipe, or steel reinforced polyethylene pipe for corrugated metal downspout pipes is not allowed.

REINFORCED CONCRETE PIPE

High sulfate levels are likely to be encountered on this project. The type of cement will be either a Type V or a Type II with 20% to 25% Class F Modified Fly Ash substituted for cement in accordance with Section 605 of the Specifications. The Water/Cementitious material ratio will not exceed 0.45 as defined in Section 460.3 C of the Specifications. The mix will be as per the fabricator's design; however, minimum compressive strength will not be less than 4500 psi at 28 days. The pipe must be marked in an acceptable way to designate meeting requirements for sulfate resistance.

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 2’ x 3’ Type B Drop Inlet, 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	Precast Drop Inlet Collar (Each)	Frame and Grate/Lid Type
a 302+18.52	L	2’x3’	B	1	A
a 302+18.52	R	2’x3’	B	1	A
b 1215+94.94	L	2’x3’	B	1	A
b 1215+94.94	R	2’x3’	B	1	A
Totals:				4	
Total Type A Frame and Grate					4
Total 2 'x 3' Type B Drop Inlet					4

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0212(207)40	B7	B73

Plotting Date: 07/16/2025

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Plot Scale -
TRPR17190
Plotted From -

TABLE OF PVC COATED BANK AND CHANNEL PROTECTION GABIONS AND DRAINAGE FABRIC

Station	L/R	PVC Coated Bank and Channel Protection Gabion (CuYd)	Type B Drainage Fabric (SqYd)
a 302+19	R	4.5	15
Totals:		4.5	15

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

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 0 PLSS corners and 41 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> >

The SDDOT Region Land Surveyor will furnish the ROW corner caps, property corner caps, and guard posts for ROW corners in rural areas. All costs associated with furnishing and installing rebar, PLSS corner caps, and all other materials associated with setting, reestablishing, or verifying PLSS corners, 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)	Type 1A Guardrail Transition (Each)	MGS MASH Flared End Terminal (Each)	Straight Class A W Beam Guardrail with Wood Posts (Ft)	Curved Class A W Beam Guardrail with CRT Posts (Ft)	W Beam Guardrail Special Anchor Assembly (Each)
Sta. 74+62 to Sta. 77+79 Rt	317							
Sta. 74+62 to Sta. 77+79 Lt.	317							
Sta. a 301+63 to Sta. a 305+23 Rt.	360							
Sta. a 301+63 to Sta. a 305+24 Lt.	360							
Sta. b 1215+19 to Sta. b 1218+80 Rt.	361							
Sta. b 1215+19 to Sta. b 1218+80 Lt.	361							
Structure No. 10-354-312								
Begin Bridge Lt.		12.5	1		1			
Begin Bridge Rt.				1		50.0	25.0	1
End Bridge Lt.		68.75	1		1			
End Bridge Rt.		12.5	1		1			
Structure No. 10-496-208								
Begin Bridge Lt.		12.5	1		1			
Begin Bridge Rt.		68.75	1		1			
End Bridge Lt.		68.75	1		1			
End Bridge Rt.		12.5	1		1			
Totals:	2,076	256.25	7	1	7	50.0	25.0	1

1:200
Plot Scale -

Plotted From -
TRPR17190

TABLE OF CONSTRUCTION STAKING
(See Special Provision for Contractor Staking)

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0212(207)40	B9	B73

Plotting Date: 07/16/2025

Roadway and Description	Begin Station	End Station	Number of Lanes	Length (Ft)	Grade Staking				Miscellaneous Staking Quantity (Mile)	Slope Staking Quantity (Mile)	Final Cross Section Survey Quantity (Mile)	Structure Staking Quantity (Each)
					Length (Mile)	Lane Factor	*Sets of Stakes	**Grade Staking Quantity (Mile)				
US 212 (2 Lanes AC Pavement)	72+04	79+00	2	696	0.132	1	2	0.264	0.264	0.264	0.264	
Diversion – Div 76 (2 Lanes Gravel Surfacing)	2+50	13+00	2	1050	0.199	1	1	0.199	0.199	0.199	0.199	
Str No 10-324-337												1
US 212 (2 Lanes AC Pavement)	a 295+00	a 319+00	2	2400	0.455	1	2	0.910	0.910	0.910	0.910	
Diversion – Div a303 (2 Lanes Gravel Surfacing)	2+50	11+50	2	900	0.170	1	1	0.170	0.170	0.170	0.170	
Str No 10-357-312												1
US 212 (2 Lanes AC Pavement)	b 1210+00	b 1228+00	2	1800	0.341	1	2	0.682	0.682	0.682	0.682	
Diversion – Div b1217 (2 Lanes Gravel Surfacing)	1+50	11+00	2	950	0.180	1	1	0.180	0.180	0.180	0.180	
Str No 10-496-208												1
Totals:								2.405	2.405	2.405	2.405	3

- * 2 = Blue Top and Paving Hub Stakes (Asphalt Concrete Pavement)
- ** Grade Staking Quantity = (Length) x (Lane Factor) x (Sets of Stakes)

Plot Scale - 1:200

Plotted From - TRPR17190

PIPE QUANTITIES

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0212(207)40	B10	B73

Plotting Date: 08/22/2025

Station	Offset (L/R)	Reinforced Concrete												Corrugated Metal												Pipe Transtions			
		Circular				Circular Safety Ends			Circular Flared Ends			Circular Bend			Circular			Circular Safety Ends			Circular Flared Ends			Circular Elbows			Round RCP to CMP Transition		
			18" Cl. 2	72" Cl. 2			18"			72"			72"			18" 14 Ga			18"			18"			18"			18" Outlet	
		Ft	Ft			Each			Each			20° Each		Ft			Each			Each			15.0° Each			Each			
70+77 R																													
70+77 L																													
83+77 R																													
* a 301+41-62' R														110			2												
a 302+19		34																											
* a 302+19 R		10												28			1							2			1		
b 1215+95		34																											
b 1215+95 R		28				1																							
b 1223+99			38						2			1																	
Subtotal:		106	38			1			2			1		138			3			3			2			1			

Pipes denoted with an asterisk(*) indicate that the entire length or a portion of the pipe requires polymer coating in accordance with the CORRUGATED METAL PIPE plan note.

FENCE QUANTITIES

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0212(207)40	B11	B73

Plotting Date: 06/16/2025

Station to Station		Side (L/R)	Right-of-Way Fence					Temporary Fence			Post Panels			Gates					Remove Fence (Ft)	
			Type 2 (Ft)	Type 3 (Ft)				Type 2 (Ft)			2 Post Panel (Each)	3 Post Panel (Each)				Barb Wire 24' (Each)	Barbed Wire 36' (Each)			
76+63	79+18	L	210					260			3								200	
a 295+00	a 302+21	L		792				740			3	2							760	
a 304+83	a 318+86	L		1334				1345			7								1347	
b 1210+00	b 1214+73	L		617				625			2								631	
b 1214+73	b 1223+75	L		624				640			8				2				644	
70+39	76+24	L	593					600			5						1		569	
71+30	80+20	R	889					1112			5	1							884	
a 295+00	a 304+01	R		966				980			6						1		1456	
a 304+01	a 317+34	R		1376				1390			8								1395	
b 1210+00	b 1213+90	R		624				372			3								635	
b 1213+90	b 1225+07	R		686				658			7				2				712	
TOTALS:			1692	7019				8722			57	3			4	2			9233	

Post Type and Sequence:
Right-of-way fence will be constructed using alternate wood and steel posts except as noted.

Plot Scale - 1:200

Plotted From - TRRCH1626

PIT INFORMATION SHEET BORROW

E1/2 SW1/4 Sec. 21 - T 9 N - R 6 E

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
		B12	B73

Plotting Date: 9/2/2025 Rev 09/02/2025 RU

PIT NO. Option Borrow 01

PROJECT NO. NH 0212(207)40, PCN 06JD COUNTY Butte

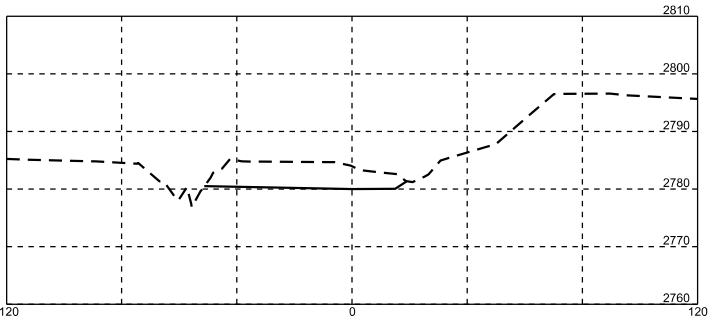
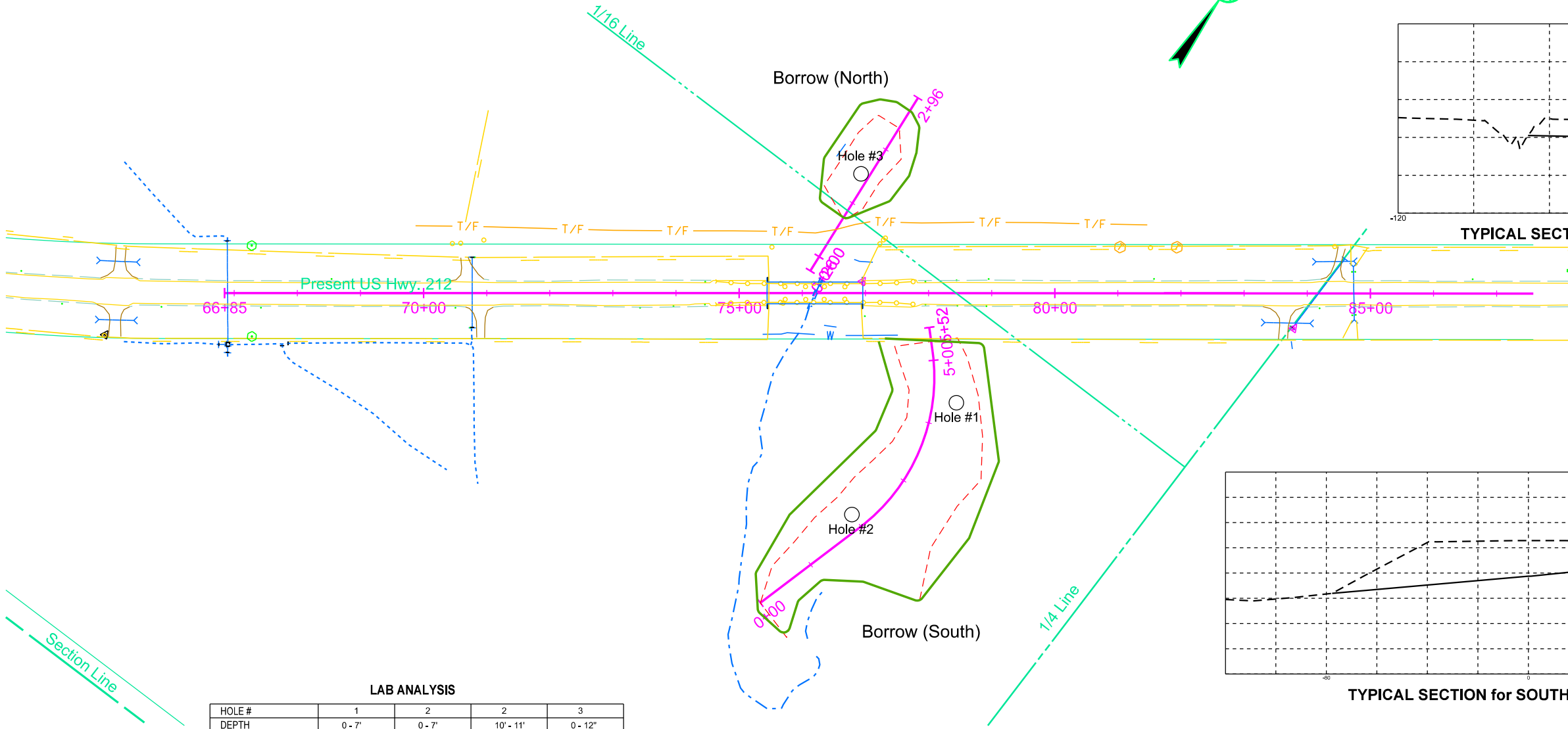
LOCATION Part of E1/2 of the SW1/4 SEC. 21 TOWNSHIP 9N RANGE 6E

PIT OWNER Spotted Mile Ranch, LLC. ADDRESS Belle Fourche, SD

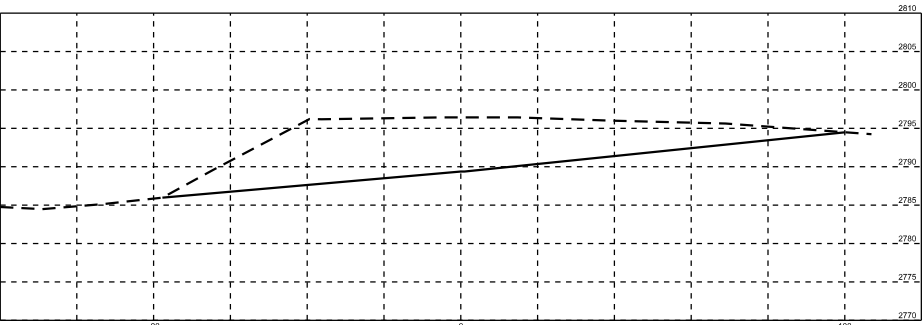
AVERAGE DEPTH OF MATERIAL 3.5 Ft. AVERAGE DEPTH OF TOPSOIL 4 Inches

MATERIAL AVAILABLE 11,000 CU. YARDS. ESTIMATED CU. YARDS OF TOPSOIL 1,040

300 Ft. DEADHAUL TO STATION 82+50



TYPICAL SECTION for NORTH BORROW



TYPICAL SECTION for SOUTH BORROW

LAB ANALYSIS

HOLE #	1	2	2	3
DEPTH	0 - 7"	0 - 7"	10' - 11"	0 - 12"
wt. cu. ft.	69.1	73.8	69.1	70.7
% passing 3/8	100.0	100.0	100.0	100.0
% passing #4	100.0	100.0	100.0	100.0
% passing #10	100.0	99.4	100.0	100.0
% coarse sand	0.6	3.3	0.6	0.7
% fine sand	1.4	10.5	2.0	1.8
% silt	37.7	31.8	35.0	37.1
% clay	60.4	53.9	62.4	60.4
% passing #40	99.4	96.2	99.4	99.3
% passing #200	98.0	85.7	97.4	97.5
% coarse & fine sand	1.9	13.7	2.6	2.5
	71	59	74	75
liquid plastic limit	27	22	28	26
P.I.	44	36	46	49
texture classification	Clay	Clay	Clay	Clay
AASHTO Classification	A-7-6	A-7-6	A-7-6	A-7-6
Group Index	20	20	20	20

100 ft

STANDARD PIT INFORMATION SHEET

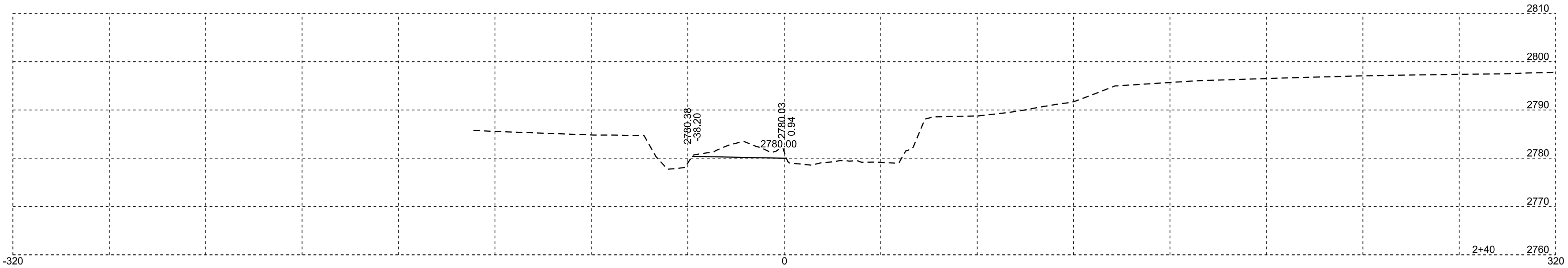
SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION

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Option Borrow 01 (Borrow North)

Plotting Date: 05/29/2025

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
		B13	B73

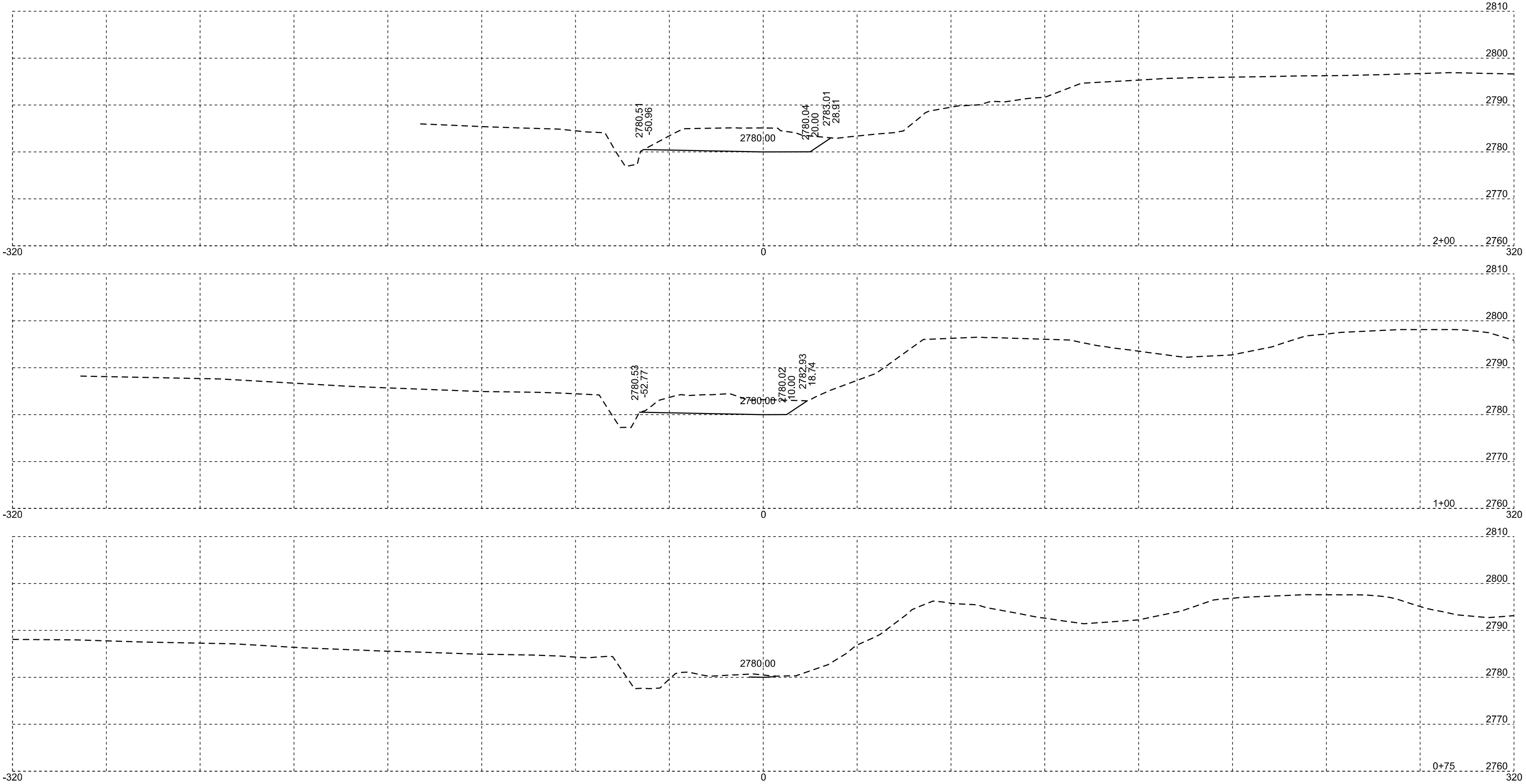


Option Borrow 01

(Borrow North)

Plotting Date: 05/29/2025

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
		B14	B73

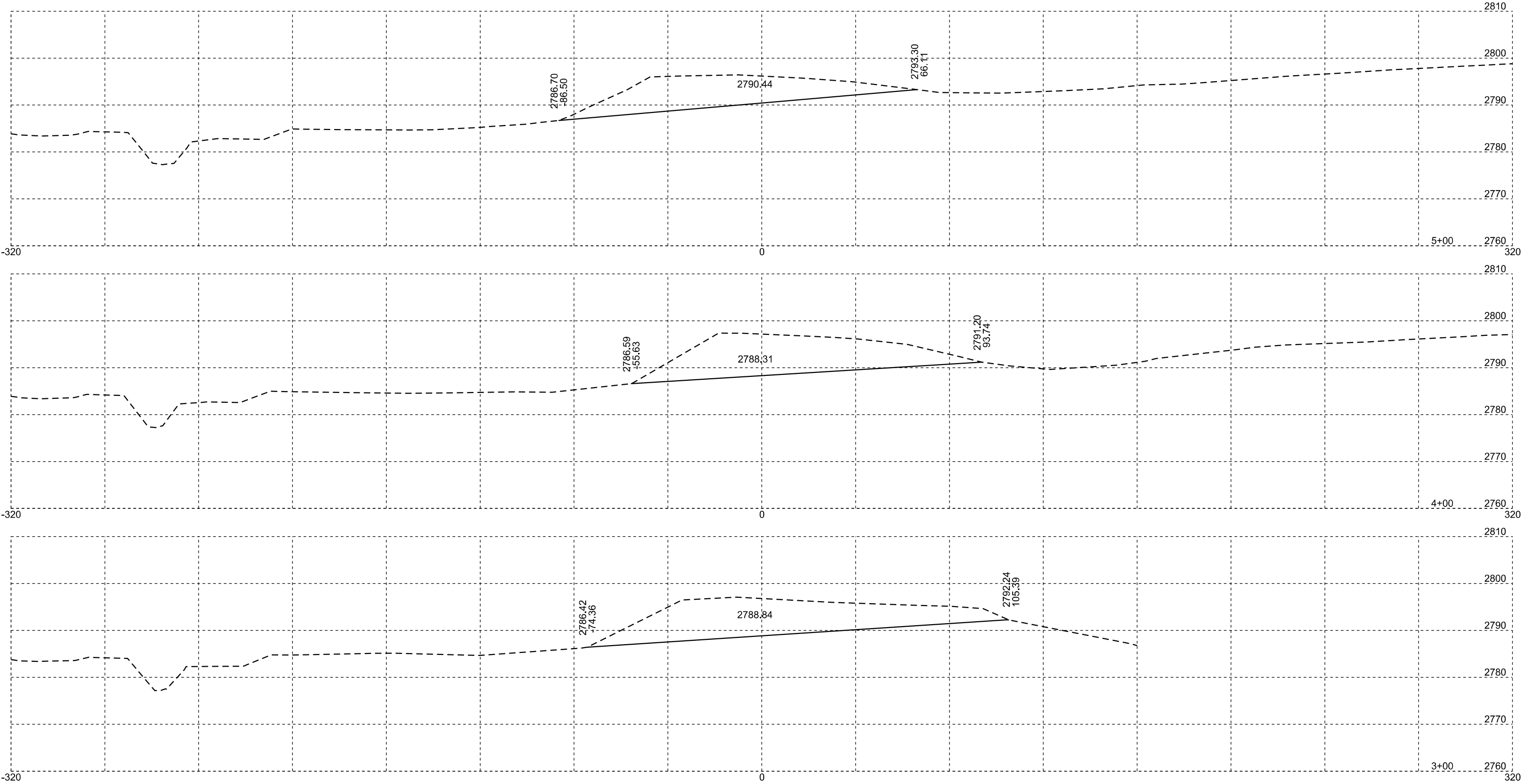


Option Borrow 01

(Borrow South)

Plotting Date: 05/29/2025

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
		B15	B73

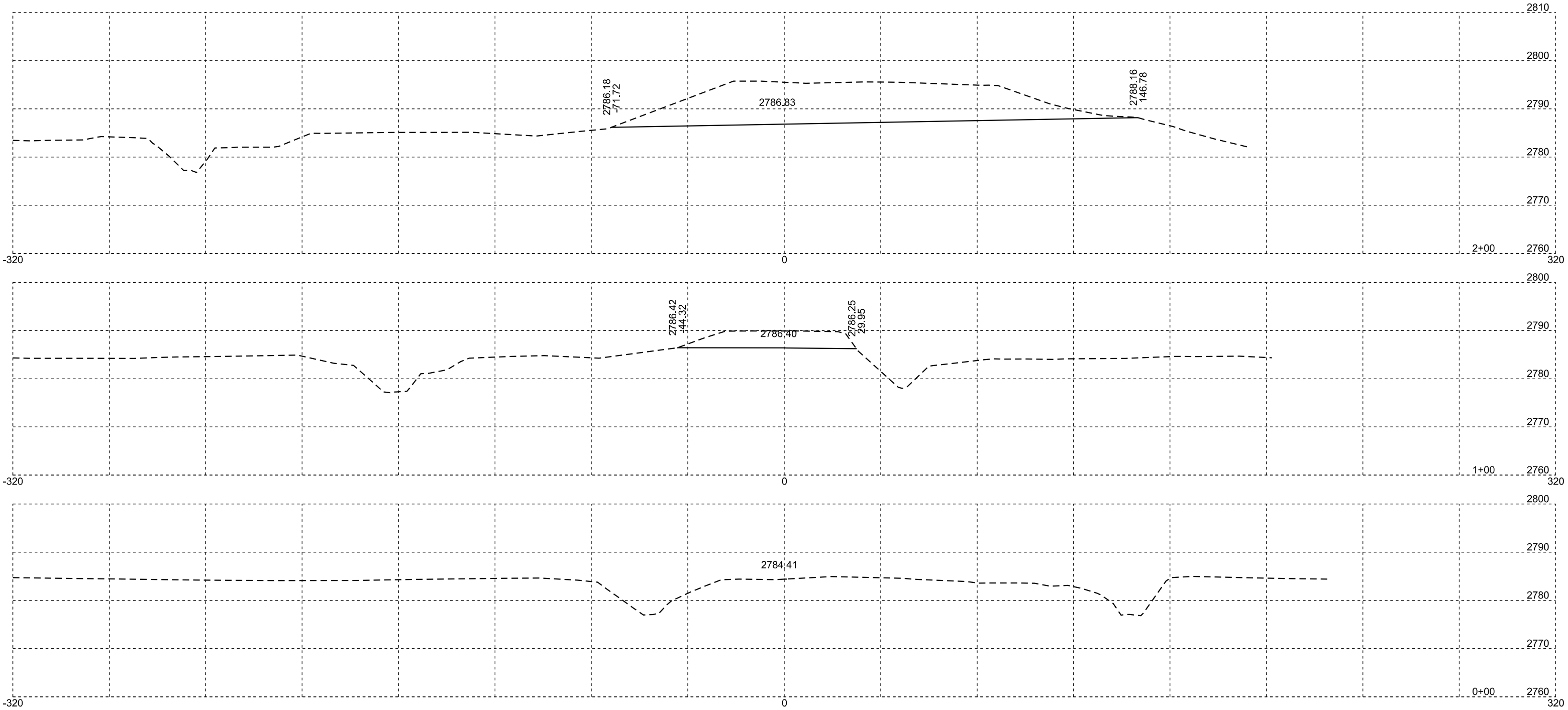


Option Borrow 01

(Borrow South)

Plotting Date: 05/29/2025

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
		B16	B73



PIT INFORMATION SHEET
BORROW

Parts of Sec. 12, 1, 6, 7 - T 9 N - R 6 E

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
		B17	B73

Plotting Date: 9/2/2025 Rev 09/02/2025 RU

PIT NO. Option Borrow 02

PROJECT NO. NH 0212(207)40, PCN 06JD COUNTY Meade

LOCATION Part of NE1/4 of the NE1/4 SEC. 12 TOWNSHIP 9N RANGE 6E

LOCATION Part of SE1/4 of the SE1/4 SEC. 1 TOWNSHIP 9N RANGE 6E

LOCATION Part of SW1/4 of the SW1/4 SEC. 6 TOWNSHIP 9N RANGE 6E

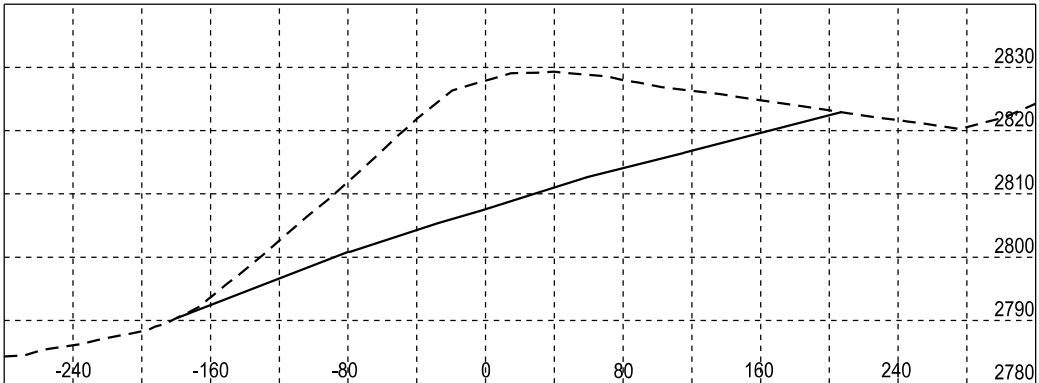
LOCATION Part of NW1/4 of the NW1/4 SEC. 7 TOWNSHIP 9N RANGE 6E

PIT OWNER Jeffery & Jeril Kessel ADDRESS Newell, SD

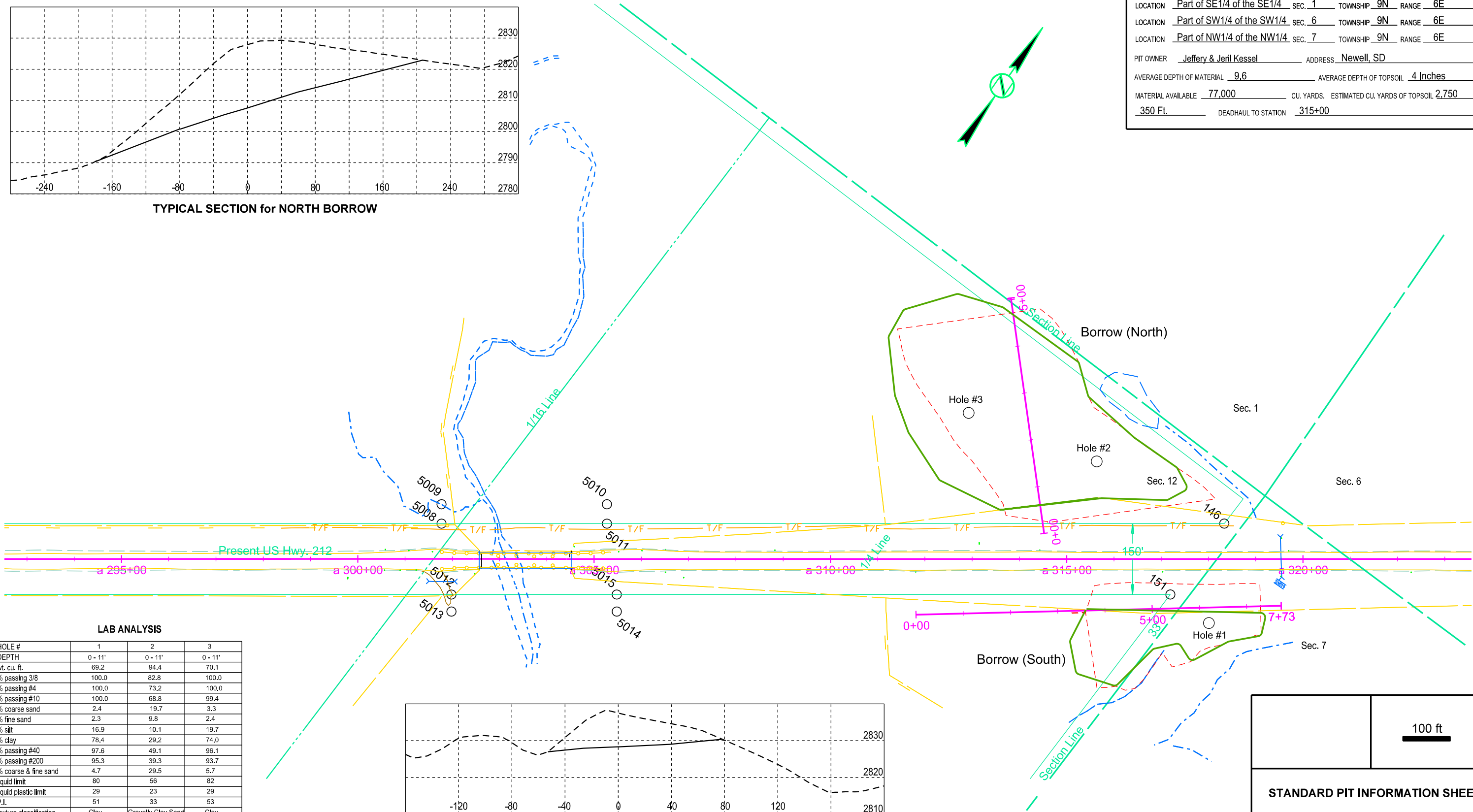
AVERAGE DEPTH OF MATERIAL 9.6 AVERAGE DEPTH OF TOPSOIL 4 Inches

MATERIAL AVAILABLE 77,000 CU. YARDS. ESTIMATED CU. YARDS OF TOPSOIL 2,750

350 Ft. DEADHAUL TO STATION 315+00

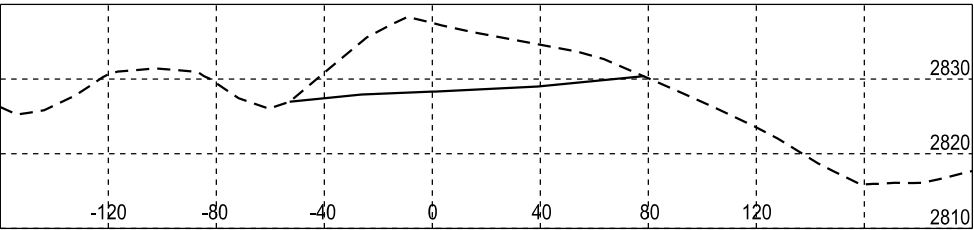


TYPICAL SECTION for NORTH BORROW



LAB ANALYSIS

HOLE #	1	2	3
DEPTH	0 - 11'	0 - 11'	0 - 11'
wt. cu. ft.	69.2	94.4	70.1
% passing 3/8	100.0	82.8	100.0
% passing #4	100.0	73.2	100.0
% passing #10	100.0	68.8	99.4
% coarse sand	2.4	19.7	3.3
% fine sand	2.3	9.8	2.4
% silt	16.9	10.1	19.7
% clay	78.4	29.2	74.0
% passing #40	97.6	49.1	96.1
% passing #200	95.3	39.3	93.7
% coarse & fine sand	4.7	29.5	5.7
liquid limit	80	56	82
liquid plastic limit	29	23	29
P.I.	51	33	53
texture classification	Clay	Gravelly Clay Sand	Clay
AASHTO Classification	A-7-6	A-7-6	A-7-6
Group Index	20	6	20



TYPICAL SECTION for SOUTH BORROW

100 ft

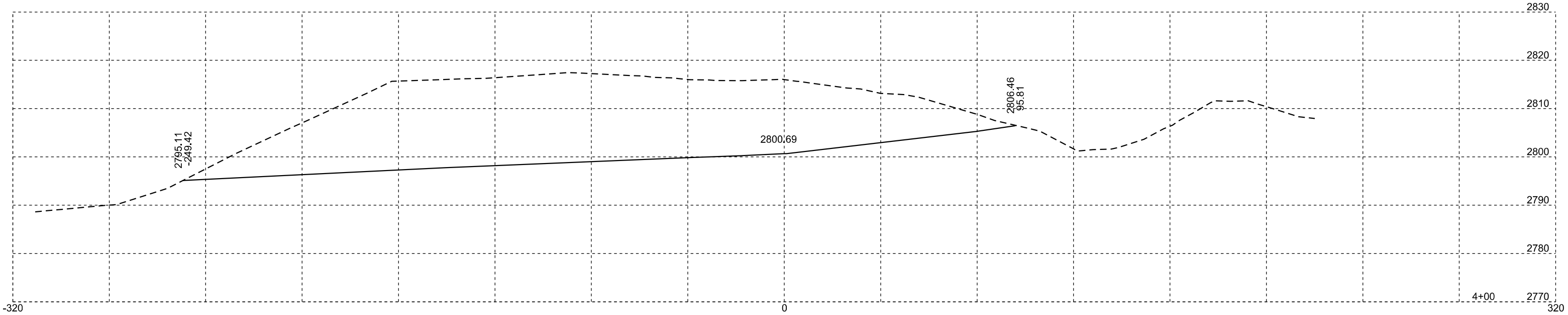
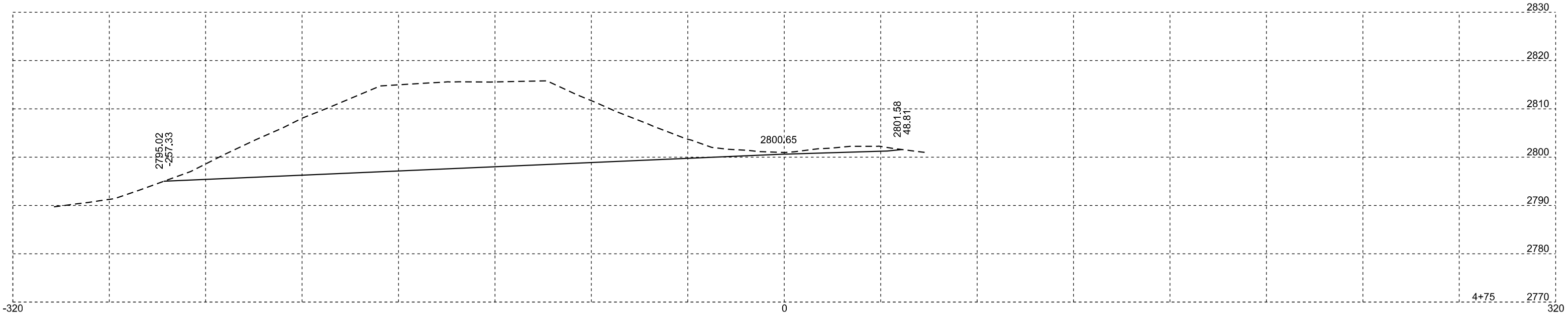
STANDARD PIT INFORMATION SHEET

SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION

Option Borrow 02 (Borrow North)

Plotting Date: 05/29/2025

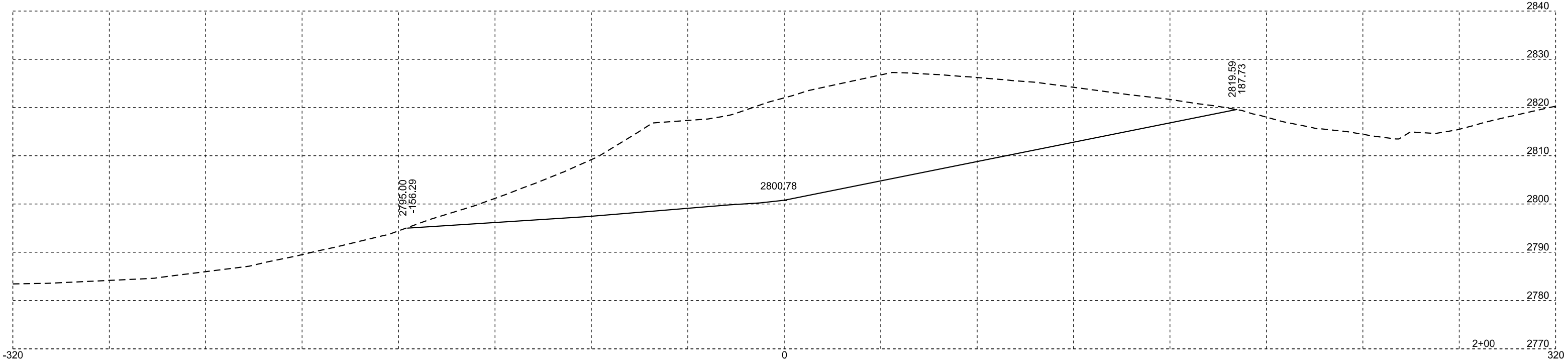
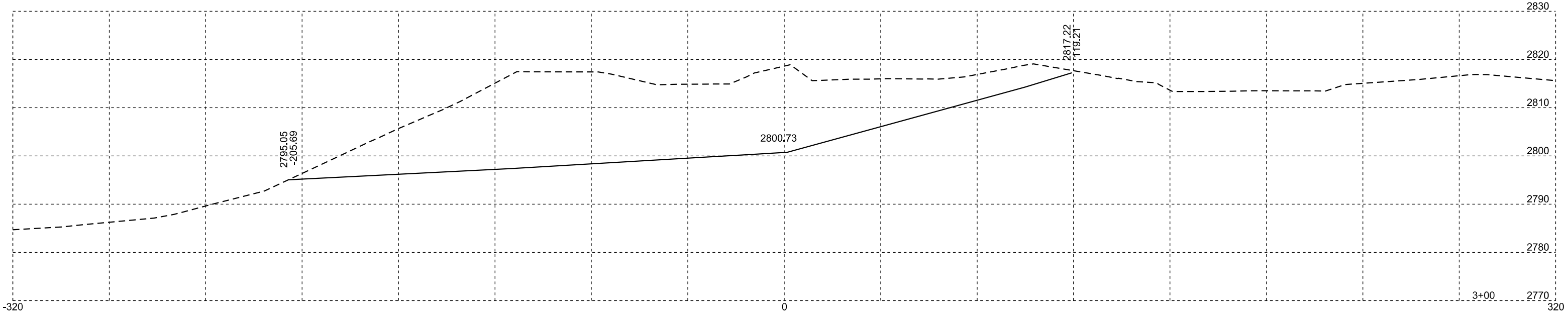
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
		B18	B73



Option Borrow 02 (Borrow North)

Plotting Date: 05/29/2025

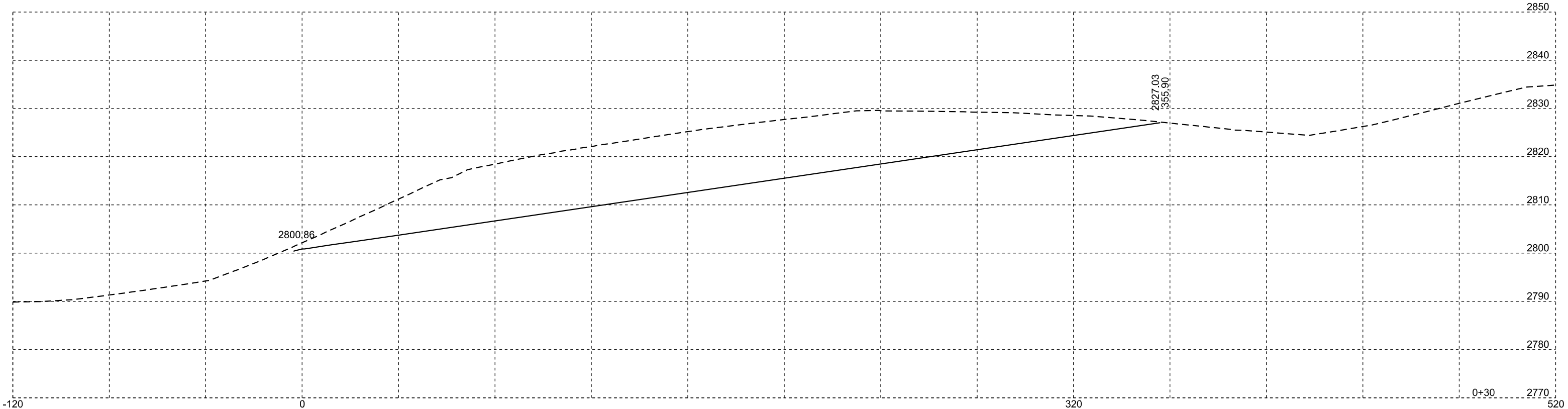
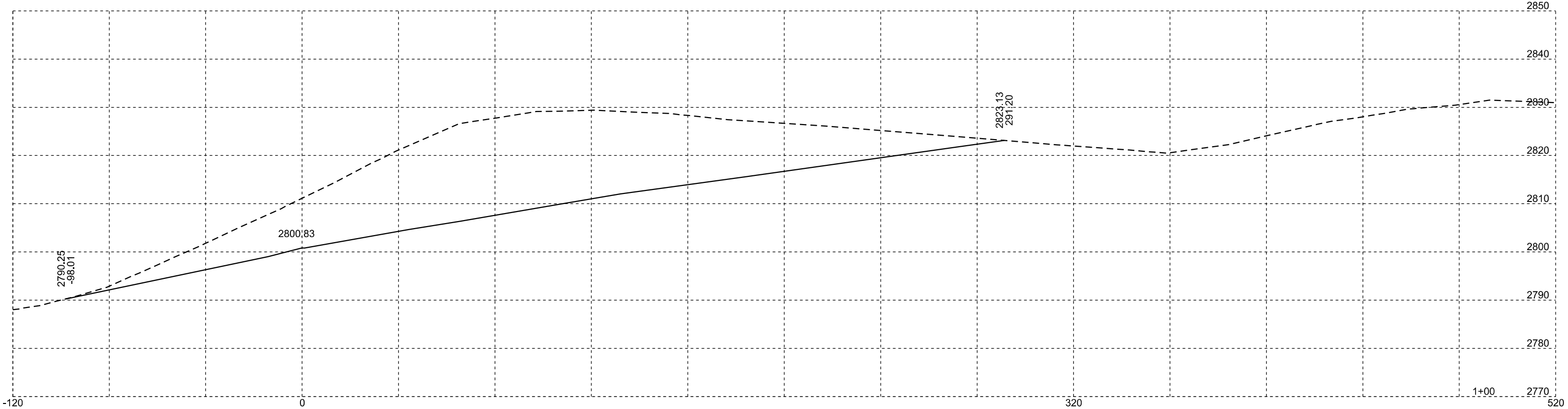
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
		B19	B73



Option Borrow 02 (Borrow North)

Plotting Date: 05/29/2025

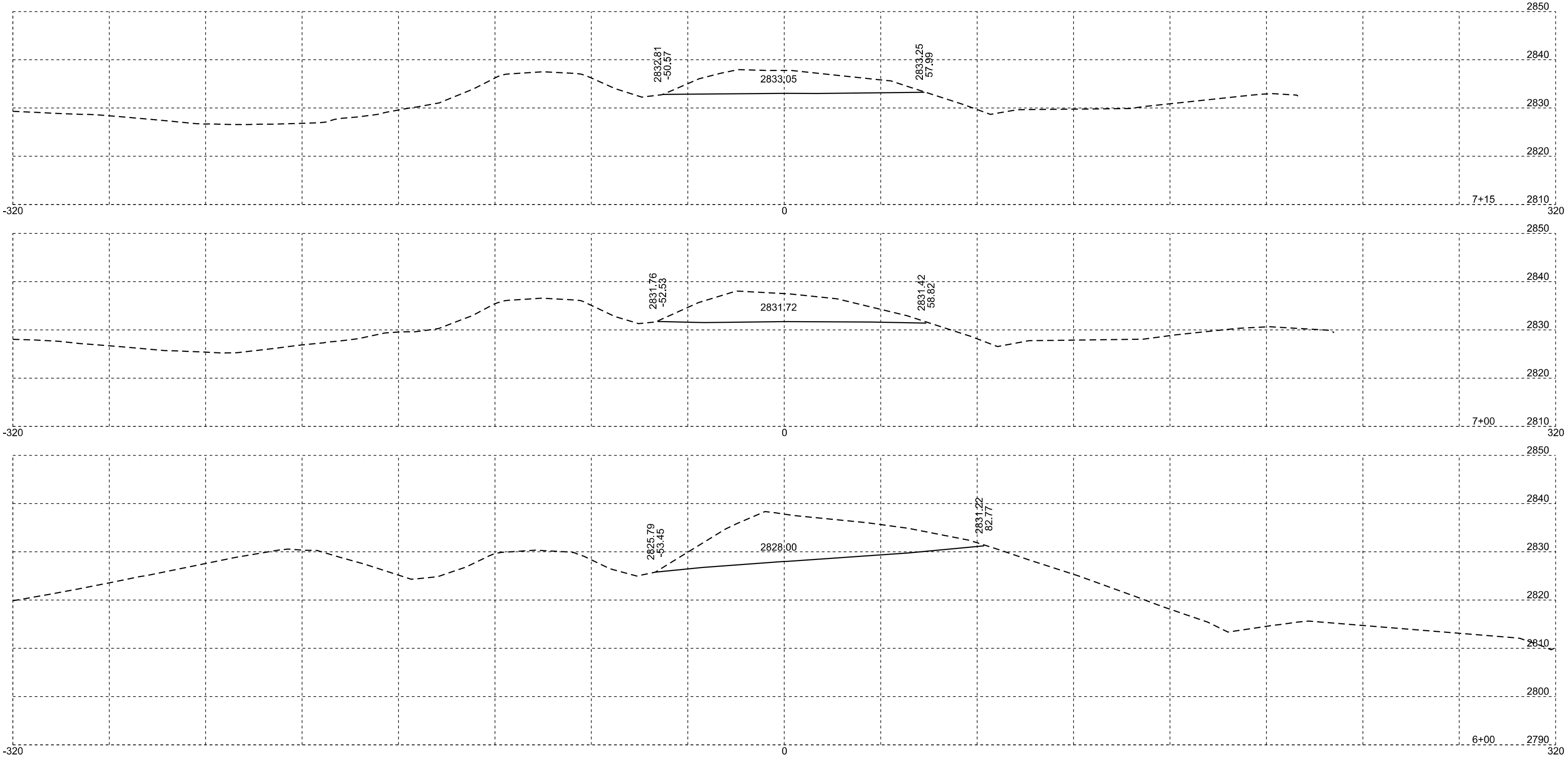
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
		B20	B73



Option Borrow 02 (Borrow South)

Plotting Date: 05/29/2025

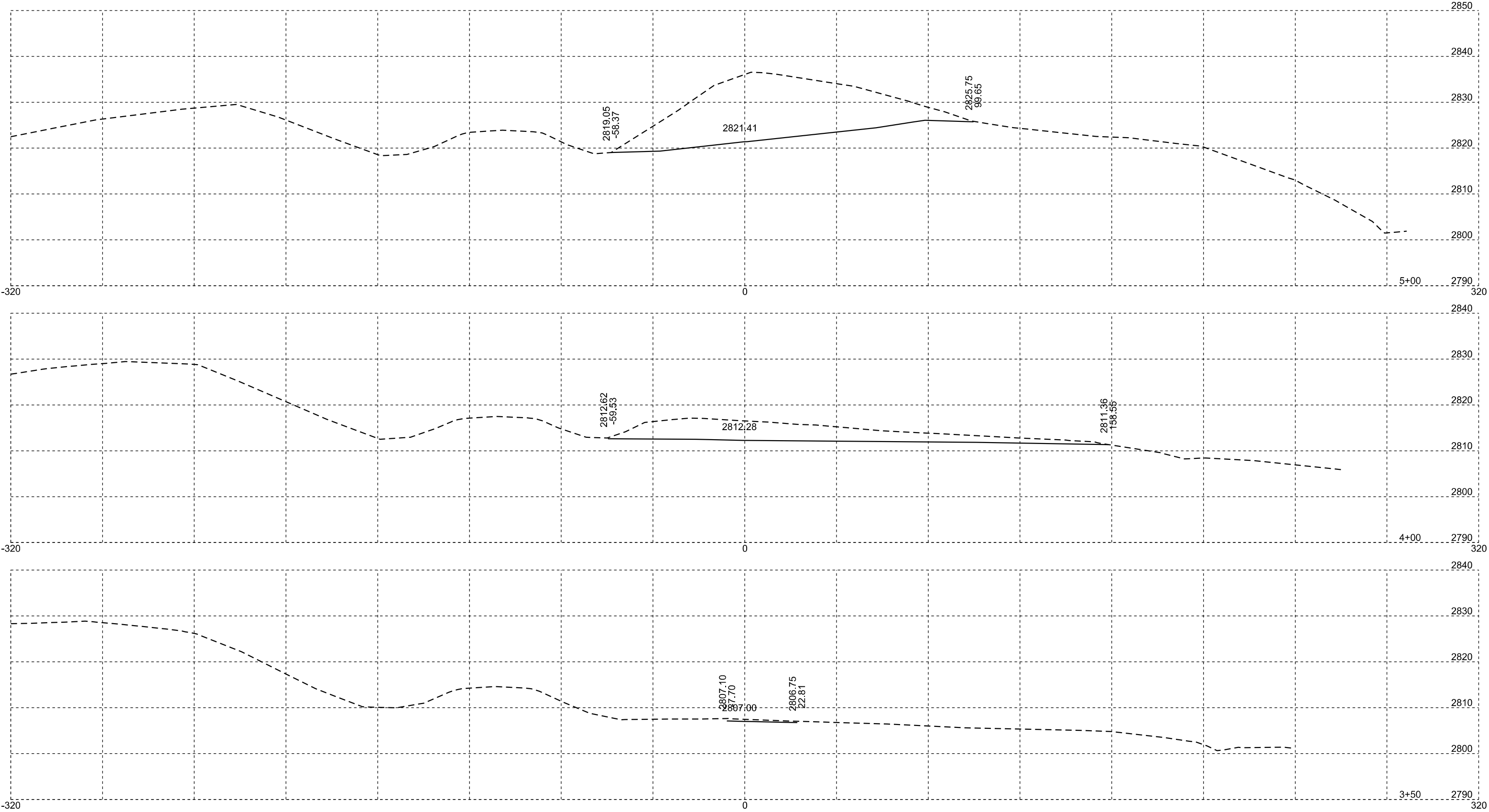
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
		B21	B73



Option Borrow 02 (Borrow South)

Plotting Date: 05/29/2025

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
		B22	B73



Plot Scale - 1:300

Plotted From - TR011626

PIT INFORMATION SHEET BORROW

W1/2 of SE1/4 of Sec. 17 - T11N - R9E

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
		B23	B73

Plotting Date: 9/2/2025 Rev 09/02/2025 RU

PIT NO. Option Borrow 03

PROJECT NO. NH 0212(207)40, PCN 06JD COUNTY Butte

LOCATION Part of W1/2 of SE1/4 of SEC. 17 TOWNSHIP 11N RANGE 9E

PIT OWNER Weinreis Brothers Land, LLC ADDRESS Belle Fourche, SD

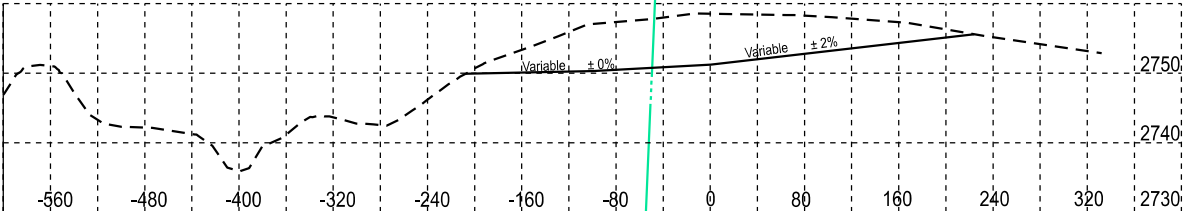
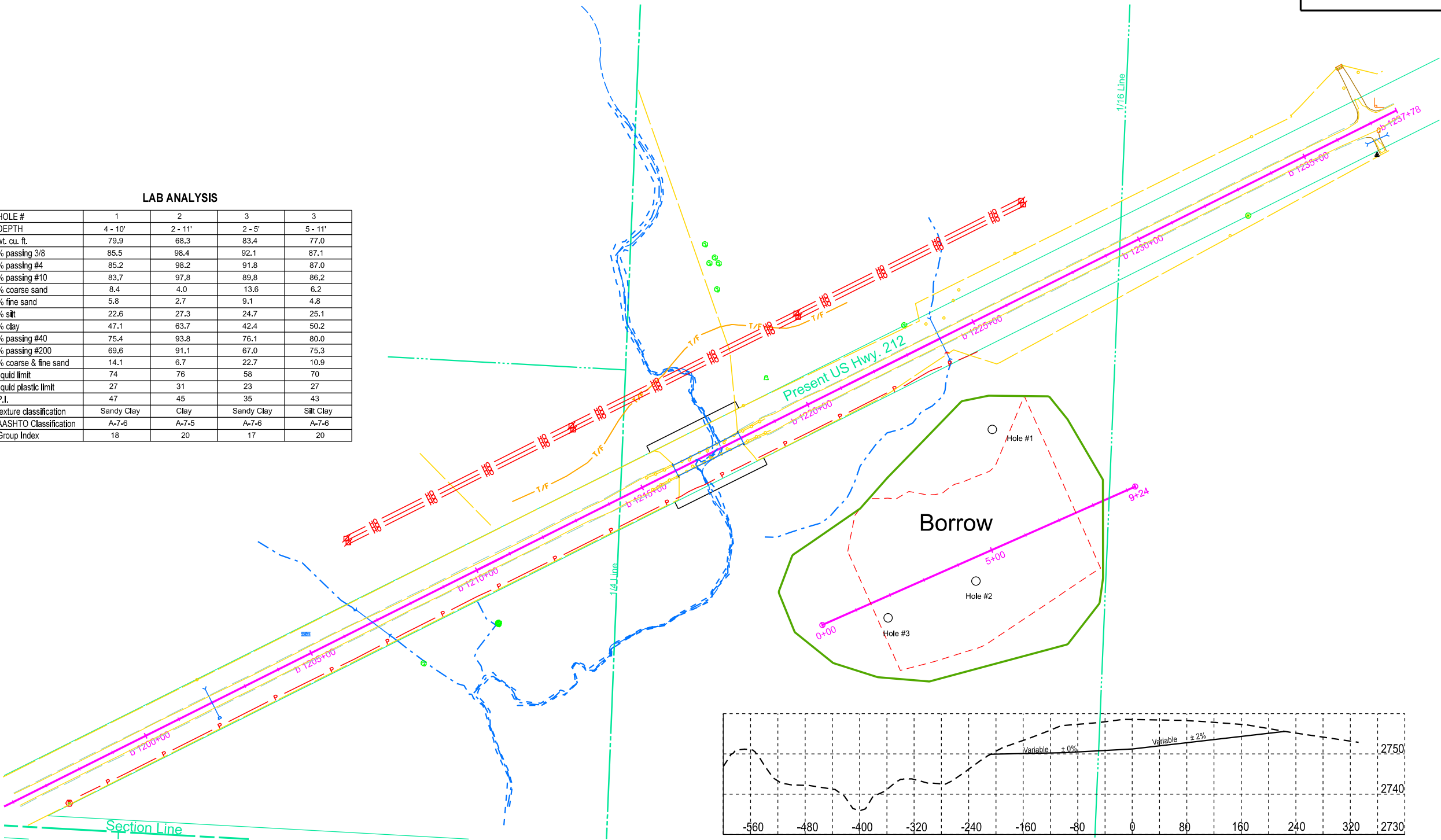
AVERAGE DEPTH OF MATERIAL 6.8 AVERAGE DEPTH OF TOPSOIL 4 inches

MATERIAL AVAILABLE 30,000 CU. YARDS. ESTIMATED CU. YARDS OF TOPSOIL 3,000

600 Ft. DEADHAUL TO STATION 1225+00

LAB ANALYSIS

HOLE #	1	2	3	3
DEPTH	4 - 10'	2 - 11'	2 - 5'	5 - 11'
wt. cu. ft.	79.9	68.3	83.4	77.0
% passing 3/8	85.5	98.4	92.1	87.1
% passing #4	85.2	98.2	91.8	87.0
% passing #10	83.7	97.8	89.8	86.2
% coarse sand	8.4	4.0	13.6	6.2
% fine sand	5.8	2.7	9.1	4.8
% silt	22.6	27.3	24.7	25.1
% clay	47.1	63.7	42.4	50.2
% passing #40	75.4	93.8	76.1	80.0
% passing #200	69.6	91.1	67.0	75.3
% coarse & fine sand	14.1	6.7	22.7	10.9
liquid limit	74	76	58	70
liquid plastic limit	27	31	23	27
P.L.	47	45	35	43
texture classification	Sandy Clay	Clay	Sandy Clay	Silt Clay
AASHTO Classification	A-7-6	A-7-5	A-7-6	A-7-6
Group Index	18	20	17	20



100 ft

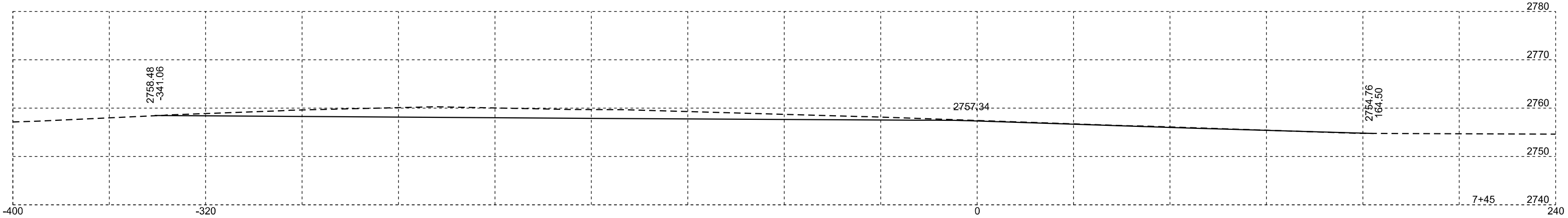
STANDARD PIT INFORMATION SHEET

SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION

Option Borrow 03

Plotting Date: 05/29/2025

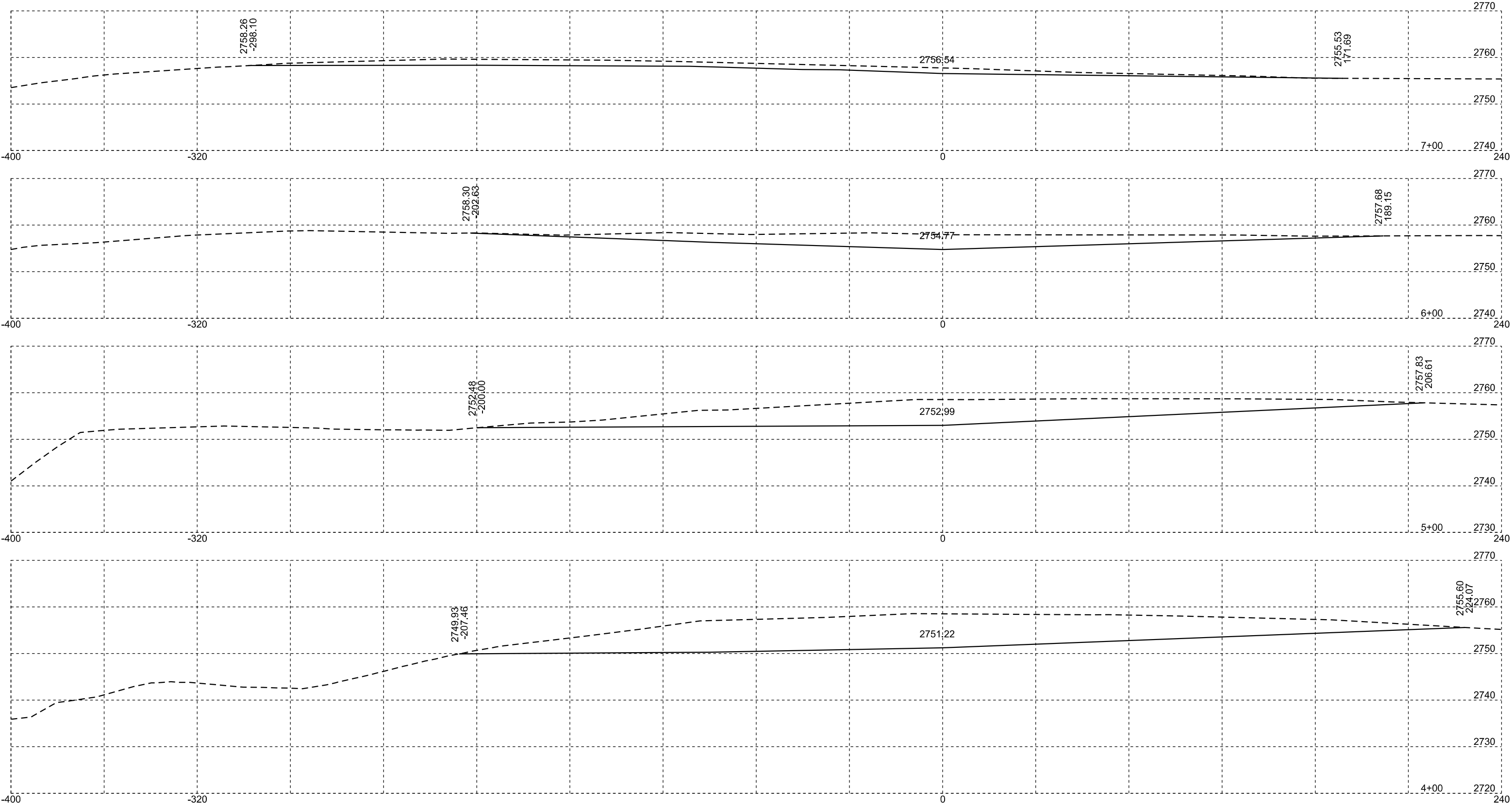
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
		B24	B73



Option Borrow 03

Plotting Date: 05/29/2025

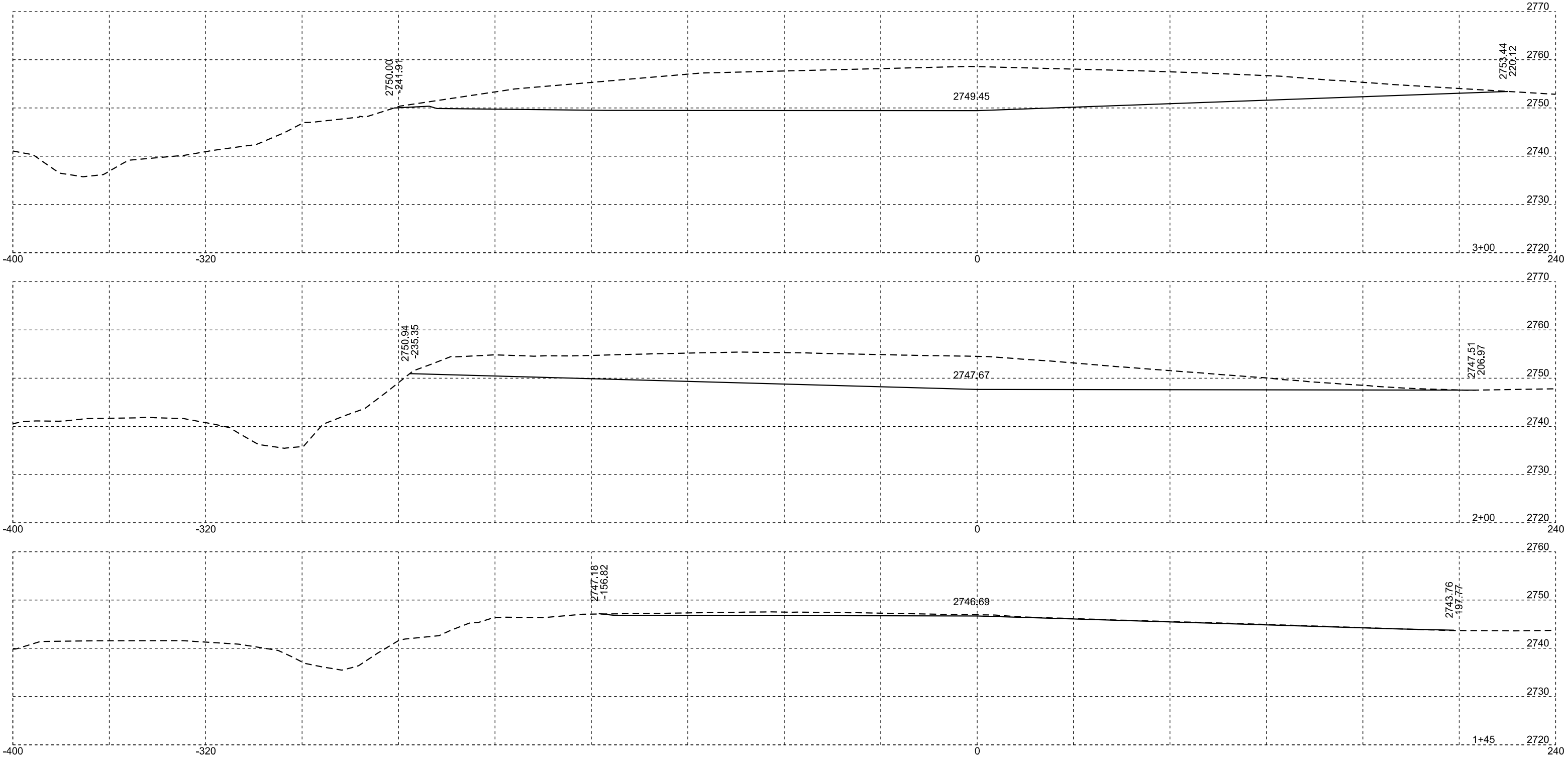
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
		B25	B73



Option Borrow 03

Plotting Date: 05/29/2025

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
		B26	B73



STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0212(207)40	B27	B73

* Place Type B Drainage Fabric under all Riprap and any embankment that is placed in wetland areas as shown in Section B.

Plotted From -

File - U:\rd\prj\bute06JD\typ.dgn

Plot Scale - 1:200

Plotted From - TRPR17192

HORIZONTAL ALIGNMENT DATA

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0212(207)40	B28	B73

Plotting Date: 06/16/2025

MAINLINE				
Type	Station		Northing	Easting
POB	66+84.68		342345.338	1084927.006
		TL= 859.13	N 55°12'25" E	
PI	75+43.81		342835.571	1085632.539
		TL= 152.68	N 55°07'05" E	
PI	76+96.49		342922.887	1085757.788
		TL= 1984.36	N 55°14'52" E	
PI	96+80.85		344054.025	1087388.188
EQNBK	283+91.15		354720.634	1102760.202
EQNAHD	a 286+07.48		354720.634	1102760.202
		TL= 18710.30	N 55°14'36" E	
PI	a 286+07.48		354720.636	1102760.204
		TL= 1637.49	N 55°12'14" E	
PI	a 302+44.97		355655.085	1104104.892
		TL= 197.00	N 55°17'35" E	
PI	a 304+41.97		355767.252	1104266.839
		TL= 1981.28	N 55°13'06" E	
PI	a 324+23.26		356897.476	1105894.129
		TL= 80489.98	N 55°14'34" E	
PC	a 1129+13.23		402784.998	1172022.580
PI	a 1135+03.75	R = 3820.00	Delta = 17°34'31" L	403121.655
PT	a 1140+85.00		403589.094	1172868.590
		TL= 2495.47	N 37°40'03" E	
PC	a 1165+80.47		405564.436	1174393.516
PI	a 1172+44.94	R = 2900.00	Delta = 25°48'38" R	406090.409
PT	a 1178+86.86		406387.122	1175394.097
EQNBK	a 1194+72.21		407095.051	1176812.612
EQNAHD	b 1196+11.99		407095.051	1176812.612
		TL= 1585.36	N 63°28'40" E	
PI	b 1196+11.99		407095.052	1176812.614
		TL= 1988.35	N 63°25'27" E	
PI	b 1216+00.34		407984.602	1178590.882
		TL= 198.22	N 63°29'09" E	
PI	b 1217+98.56		408073.092	1178768.256
		TL= 1979.31	N 63°26'49" E	
POE	b 1237+77.88		408957.898	1180538.790

Div76				
Type	Station		Northing	Easting
POB	0+00.00		342468.203	1085103.831
		TL= 100.54	N 55°12'30" E	
PC	1+00.54		342525.567	1085186.394
PI	2+49.18	R = 400.00	Delta = 40°46'15" R	342610.382
PT	3+85.17		342594.899	1085456.298
		TL= 88.57	S 84°01'15" E	
PC	4+73.74		342585.672	1085544.388
PI	8+56.76	R = 400.00	Delta = 87°30'54" L	342545.775
PT	10+84.71		342924.621	1085981.697
		TL= 0.15	N 8°27'51" E	
PC	10+84.86		342924.772	1085981.720
PI	12+57.89	R = 400.00	Delta = 46°47'02" R	343095.915
PT	14+11.48		343194.546	1086149.352
		TL= 126.93	N 55°14'52" E	
POE	15+38.41		343266.902	1086253.645

dr76				
Type	Station		Northing	Easting
POB	0+00.00		342817.481	1085705.521
		TL= 49.08	S 4°52'53" E	
POE	0+49.08		342768.579	1085709.698

dr77				
Type	Station		Northing	Easting
POB	0+00.00		342956.349	1085687.806
		TL= 36.94	N 33°00'07" W	
PC	0+36.94		342987.332	1085667.684
PI	0+47.59	R = 20.00	Delta = 56°04'17" L	342996.264
PT	0+56.52		342996.436	1085651.234
		TL= 23.52	N 89°04'24" W	
POE	0+80.04		342996.816	1085627.715

The coordinates shown on this sheet are based on the South Dakota State Plane Coordinate System. North Zone (NAD 83/2011); epoch 2010.00; Geoid 12A; SF = 0.99980990

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Plot Scale -
Plotted From - TRPR17192

HORIZONTAL ALIGNMENT DATA

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0212(207)40	B29	B73

Plotting Date: 06/16/2025

Div a303						Div b1217				
Type	Station			Northing	Easting	Type	Station		Northing	Easting
POB	0+00.00			355344.090	1103657.366	POB	0+00.00		407716.019	1178053.969
		TL= 158.01	N 55°12'19" E					TL= 81.66	N 63°28'32" E	
PC	1+58.01			355434.257	1103787.123	PC	0+81.66		407752.488	1178127.036
PI	3+00.00	R = 400.00	Delta = 39°05'14" R	355515.282	1103903.726	PI	1+76.57	R = 400.00	Delta = 26°41'44" L	407794.872
PT	4+30.89			355504.654	1104045.318	PT	2+68.03		407870.888	1178268.780
		TL= 0.61	S 85°42'27" E					TL= 200.72	N 36°46'47" E	
PC	4+31.50			355504.609	1104045.925	PC	4+68.75		408031.653	1178388.959
PI	7+32.07	R = 400.00	Delta = 73°50'40" L	355482.112	1104345.654	PI	7+02.59	R = 400.00	Delta = 60°37'13" R	408218.942
PT	9+47.03			355763.745	1104450.660	PT	8+91.96		408188.825	1178760.855
		TL= 63.68	N 20°26'52" E					TL= 68.86	S 82°36'00" E	
PC	10+10.72			355823.417	1104472.909	PC	9+60.82		408179.957	1178829.137
PI	11+35.96	R = 400.00	Delta = 34°46'14" R	355940.765	1104516.661	PI	10+82.79	R = 400.00	Delta = 33°55'01" L	408164.247
PT	12+53.46			356012.207	1104619.524	PT	11+97.60		408218.704	1179059.240
		TL= 128.62	N 55°13'06" E					TL= 276.05	N 63°28'59" E	
POE	13+82.08			356085.579	1104725.164	POE	14+73.65		408341.950	1179306.251

The coordinates shown on this sheet are based on the South Dakota State Plane Coordinate System. North Zone (NAD 83/2011); epoch 2010.00; Geoid 12A; SF = 0.99980990

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CONTROL DATA

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0212(207)40	B30	B73

Plotting Date: 07/22/2025

HORIZONTAL AND VERTICAL CONTROL POINTS						
POINT	STATION	OFFSET	DESCRIPTION	NORTHING	EASTING	ELEVATION
AC7931	a 861.72	106' L	REFMRK	387626.8	1149992	2955.49
AD8989	a 1126+72	99' L	REFMRK	402728.5	1171768	2836.36
AC7951	Off	project	REFMRK	430301.4	1212702	2772.56
AC7910	Off	project	REFMRK	342182.8	1084809	2786.56
212 062.44	b 1232+93	75' R	REFMRK	408674.1	1180139	2760.062
212 062.56	b 1236+78	84' R	REFMRK	408837.7	1180487	2768.275
CP20	a 370+05	31' L	REFMRK	359535	1109641	2874.72
CP21	a 373+10	31'R	REFMRK	359658.2	1109927	2879.25
CP22	a 425+10	31' R	REFMRK	362622.2	1114199	2910.14
CP24	a 472+55	71' R	REFMRK	365294.7	1118120	2894.96
212 041.88	142+43	73' L	REFMRK	346715.3	1091095	2842.349
212 045.35	A 327+86	89' L	REFMRK	357177.7	1106141	2875.775

The coordinates shown on this sheet are based on the South Dakota State Plane Coordinate System. North Zone (NAD 83/2011); epoch 2010.00
Geoid 12A; SF = 0.99980990
The elevations shown on this sheet are based on NAVD 88.

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Plot Scale -
TRPR17192
Plotted From -

LEGEND

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0212(207)40	B31	B73

Plotting Date: 06/16/2025

Anchor		Mailbox		Subsurface Utility Exploration Test Hole		State and National Line	
Antenna		Manhole Electric		Telephone Fiber Optics		County Line	
Approach		Manhole Gas		Telephone Junction Box		Section Line	
Assumed Corner		Manhole Miscellaneous		Telephone Pole		Quarter Line	
Azimuth Marker		Manhole Sanitary Sewer		Television Cable Jct Box		Sixteenth Line	
BBQ Grill/ Fireplace		Manhole Storm Sewer		Television Tower		Property Line	
Bearing Tree		Manhole Telephone		Test Wells/Bore Holes		Construction Line	
Bench Mark		Manhole Water		Traffic Sign Double Face		ROW Line	
Box Culvert		Merry-Go-Round		Traffic Sign One Post		New ROW Line	
Bridge		Microwave Radio Tower		Traffic Sign Two Post		Cut and Fill Limits	
Brush/Hedge		Miscellaneous Line		Traffic Signal		Control of Access	
Buildings		Miscellaneous Property Corner		Trash Barrel		New Control of Access	
Bulk Tank		Miscellaneous Post		Tree Belt		Proposed ROW	
Cattle Guard		Overhang Or Encroachment		Tree Coniferous		(After Property Disposal)	
Cemetery		Overhead Utility Line		Tree Deciduous			
Centerline		Parking Meter		Tree Stumps			
Cistern		Pedestrian Push Button Pole		Triangulation Station		Drainage Arrow	
Clothes Line		Pipe With End Section		Underground Electric Line			
Concrete Symbol		Pipe With Headwall		Underground Gas Line		Remove Concrete Pavement	
Control Point		Pipe Without End Section		Underground High Pressure Gas Line			
Creek Edge		Playground Slide		Underground Sanitary Sewer		Remove Concrete Driveway Pavement	
Curb/Gutter		Playground Swing		Underground Storm Sewer			
Curb		Power And Light Pole		Underground Tank		Remove Asphalt Concrete Pavement	
Dam Grade/Dike/Levee		Power And Telephone Pole		Underground Telephone Line			
Deck Edge		Power Meter		Underground Television Cable		Remove Concrete Sidewalk	
Ditch Block		Power Pole		Underground Water Line			
Doorway Threshold		Power Pole And Transformer		Water Fountain		Remove Concrete Median Pavement	
Drainage Profile		Power Tower Structure		Water Hydrant			
Drop Inlet		Propane Tank		Water Meter		Remove Concrete Curb and/or Gutter	
Edge Of Asphalt		Property Pipe		Water Tower			
Edge Of Concrete		Property Pipe With Cap		Water Valve			
Edge Of Gravel		Property Stone		Water Well			
Edge Of Other		Public Telephone		Weir Rock			
Edge Of Shoulder		Railroad Crossing Signal		Windmill			
Electric Transformer/Power Junction Box		Railroad Milepost Marker		Wingwall			
Fence Barbwire		Railroad Profile		Witness Corner			
Fence Chainlink		Railroad ROW Marker				Detectable Warning	
Fence Electric		Railroad Signs				Pedestrian Push Button Pole	
Fence Miscellaneous		Railroad Switch				and 30" x 48" Clear Space	
Fence Rock		Railroad Track				with 1.5% slope	
Fence Snow		Railroad Trestle					
Fence Wood		Rebar					
Fence Woven		Rebar With Cap					
Fire Hydrant		Reference Mark					
Flag Pole		Retaining Wall					
Flower Bed		Riprap					
Gas Valve Or Meter		River Edge					
Gas Pump Island		Rock And Wire Baskets					
Grain Bin		Rockpiles					
Guardrail		Satellite Dish					
Gutter		Septic Tank					
Guy Pole		Shrub Tree					
Haystack		Sidewalk					
Highway ROW Marker		Sign Face					
Interstate Close Gate		Sign Post					
Iron Pin		Slough Or Marsh					
Irrigation Ditch		Spring					
Lake Edge		Stream Gauge					
Lawn Sprinkler		Street Marker					

Plot Scale - 1:200

Plotted From - TRPR17190

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70+77
Retain 18"-112' CMP

70+77 R
Remove Concrete Headwall
(Incidental Work, Grading)

70+77 L
Remove Concrete Headwall
(Incidental Work, Grading)

70+77
Install 2 - 18" CMP Flared Ends

76+20
Take Out 151.5'- Bridge
(Incidental Work, Structure)

Remove Steel Guardrail
at the following locations:
74+62 to 77+79 R
74+62 to 77+79 L

76+44 R
Take Out 18"-20' CMP
(Incidental Work, Grading)

76+26.00 (38.2 sq mi)
Install Triple 12"x12" - 154'-0 7/16" RCBC
30° LHF Skew
(See Section E)

77+11 L
Take Out 18"-32' CMP
(Incidental Work, Grading)

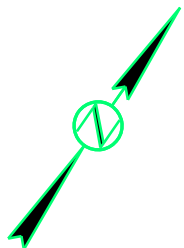
83+77 R
Remove Concrete Headwall
(Incidental Work, Grading)

83+77 R
Install 18" CMP Flared End

84+18
Retain 18"-138' CMP
Skewed 53° LHF

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0212(207)40	B32	B73

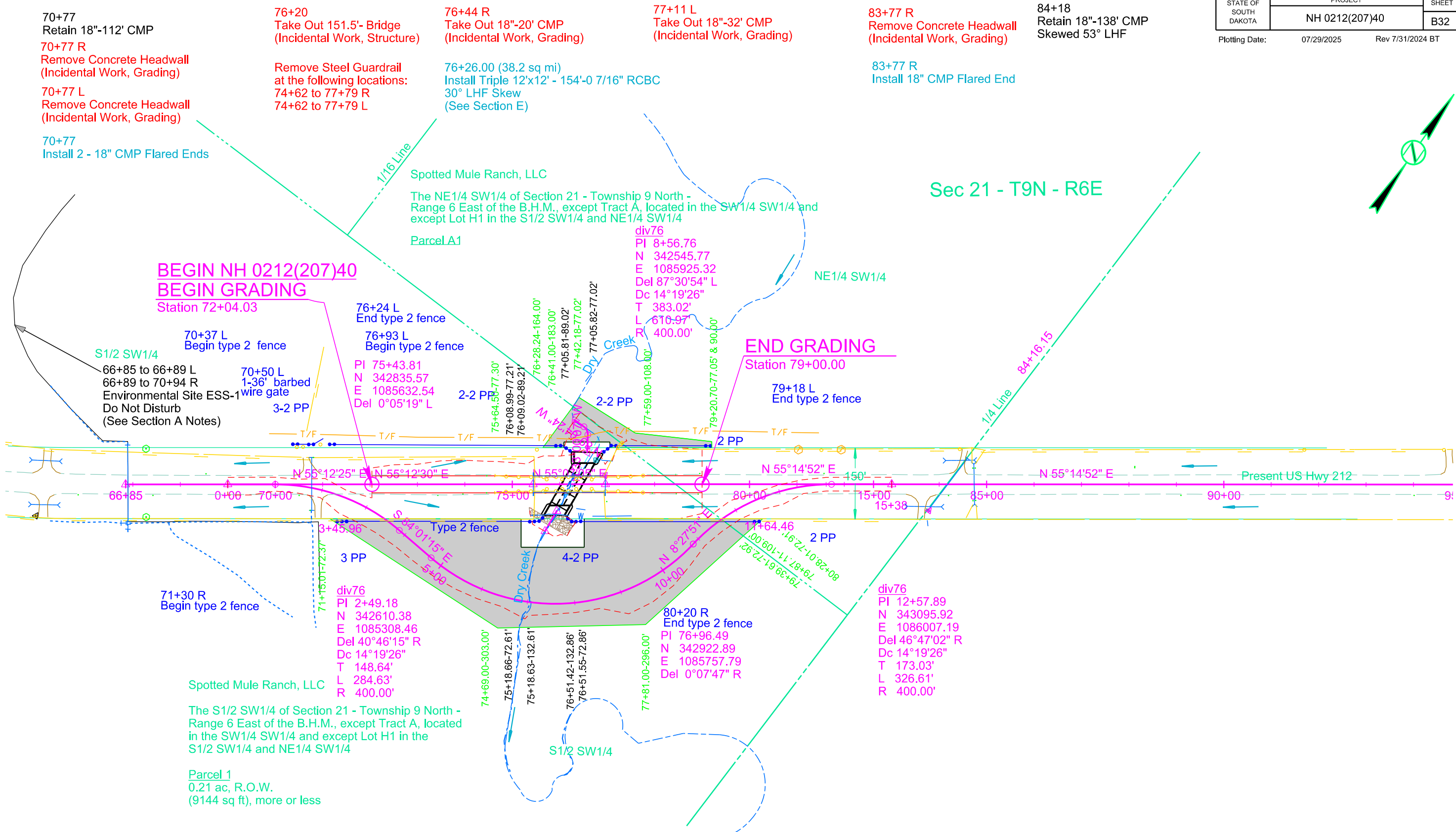
Plotting Date: 07/29/2025 Rev 7/31/2024 BT



Sec 21 - T9N - R6E

BEGIN NH 0212(207)40
BEGIN GRADING
Station 72+04.03

END GRADING
Station 79+00.00

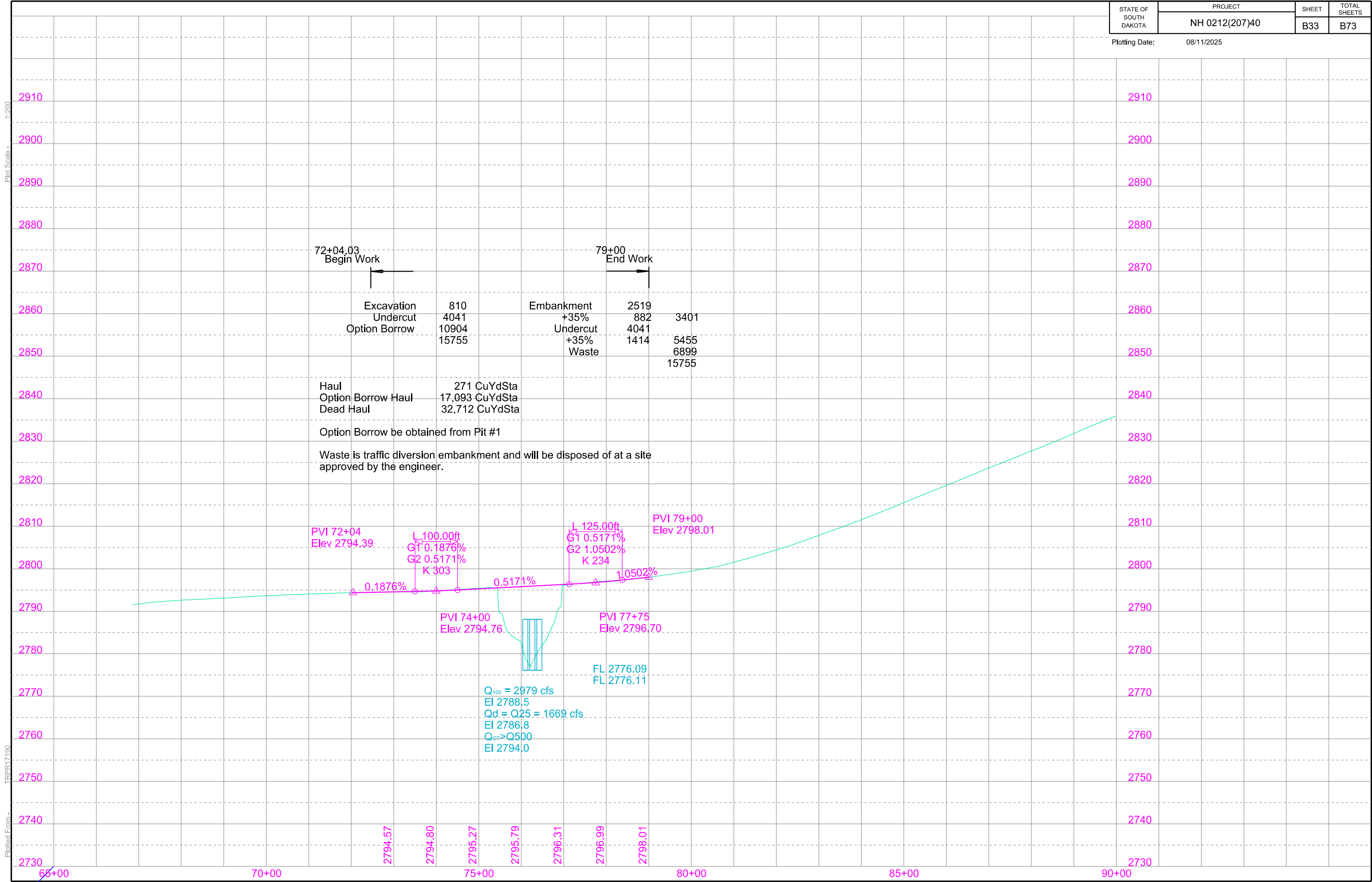


Parcel 1
75+64.50 to 77+42.18 L
Temporary Easement containing
0.2 ac, more or less

Parcel 1
71+15.01 to 79+87.11 R
Temporary Easement containing
3.0 ac, more or less

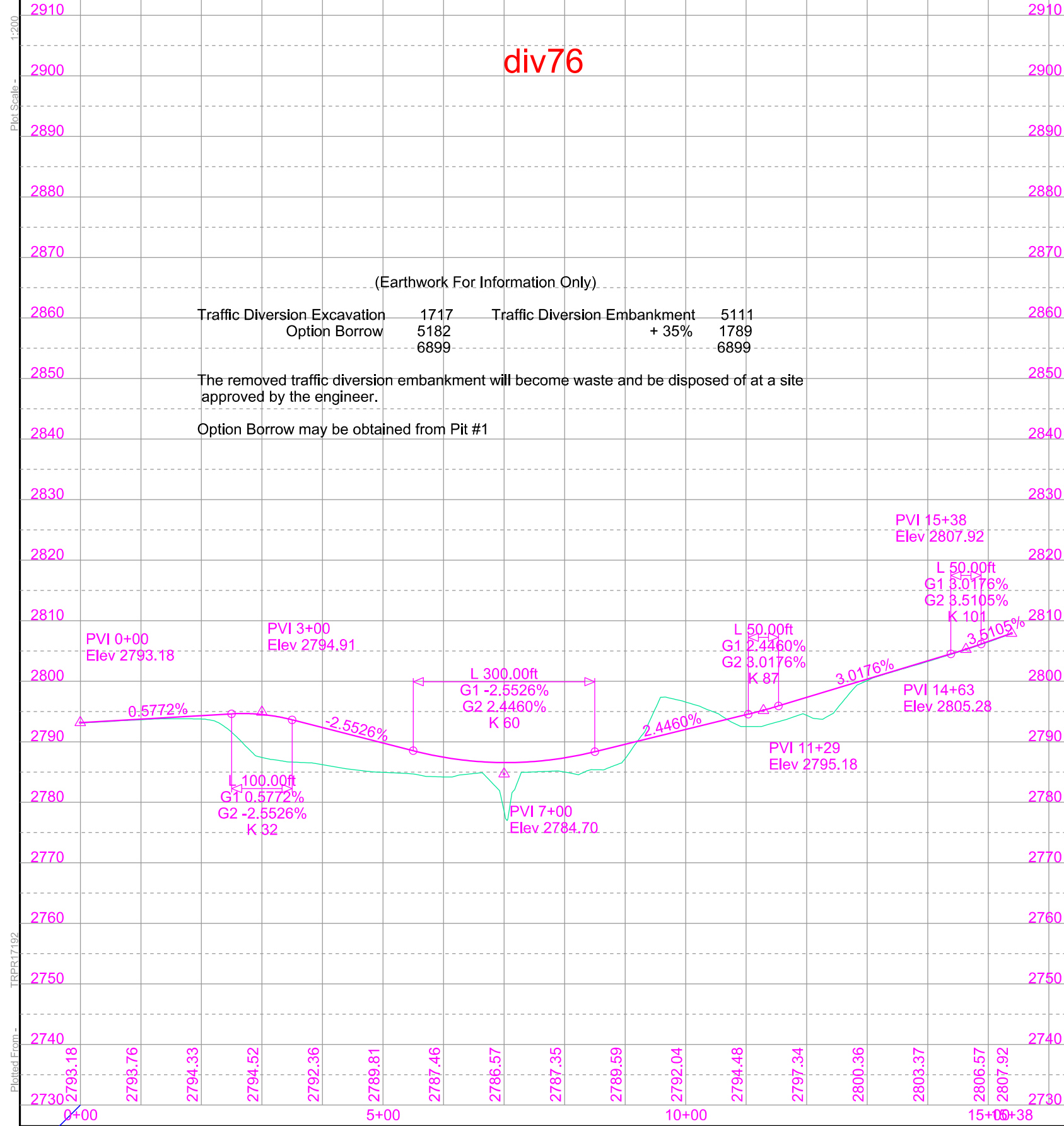
Parcel A1
76+28.24 to 79+20.70 L
Temporary Easement containing
0.2 ac, more or less

Parcel A1
79+39.61 to 80+28.01 R
Temporary Easement containing
0.1 ac, more or less



STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0212(207)40	B34	B73

Plotting Date: 06/16/2025



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Plot Scale - 1:200

Plotted From - TRPR17190

Plot Scale - 1:200

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0212(207)40	B35	B73

Plotting Date: 08/22/2025

Remove Steel Guardrail
at the following locations:
a 301+63 to a 305+23 R
a 301+63 to a 305+24 L

a 301+66 R
Take Out 18"-56' RCP
(Incidental Work, Grading)

a 303+43 R
Take Out 196.5' Bridge
(Incidental Work, Structure)

a 302+19
Install 18" - 34' RCP
(Between Drop Inlets)

Install 2'x3' Type B Drop Inlet
with 6" Concrete Collar
and Type A Frame & Grate
at following locations:
a 302+18.52-18.97' R
a 302+18.52-18.91' L

a 302+19 R
Install 18"-10' RCP
Install 18"-28' CMP (20' & 8')
And 2-15.0° Elbows
& 1-18" RCP to CMP Outlet Transition
& 1 CMP Safety End
(Outlet from Drop Inlet)

a 302+19 R
Install Bank and Channel
Protection Gabions (4.5 CuYd)
and Type B Drainage Fabric
(15 SqYd)

a 316+00
Install Cutoff Drain with
Concrete Headwalls Left & Right
(See Details and Section X)

a 298+00
Install Cutoff Drain with
Concrete Headwalls Left & Right
(See Details and Section X)

a 301+41-62' R (1 ac)
Install 18"-110' CMP
& 2 Safety Ends

a 302+33.27 to a 304+92.18 (88.1 sq mi)
Install 258' - 10 7/8" Prestr. Girder Bridge
(See Section E)

Sec 12 - T9N - R6E

END GRADING
Station a 319+00.00

BEGIN GRADING
Station a 295+00.00

Del Raisanen and Debbie Raisanen

The W1/2 NE1/4 of Section 12 -
Township 9 North - Range 6 East of the
B.H.M., except Lot H1 therein

Parcel 2
0.05 ac, R.O.W.
(2279 sq ft), more or less

div a303
PI 11+35.96
N 355940.76
E 1104516.66
Del 34°46'14" R
Dc 14°19'26"
T 125.24'
L 242.74'
R 400.00'

E1/2 NE1/4

a 304+83 L
Begin type 3 fence

a 318+86 L
End type 3 fence

a 295+00 L
Begin type 3 fence

3 PP

2 PP

3 PP

2-2 PP

a 302+21 L
End type 3 fence

2-2 PP

a 305+27.17-74.92' & 115.92'
a 305+27.00-126.00'

a 313+99.00
284.00'

a 313+39.00
126.00'

a 314+66.08
126.00'

a 315+95.10-126.00'

a 316+44.23-74.97'

a 317+34 R
End type 3 fence

4-2 PP

a 318+17.92

a 315+30.00-75.04' & 111.04'

a 314+98.07-75.04' & 111.04'

a 313+99.00
284.00'

a 314+66.08
126.00'

a 315+95.10-126.00'

a 316+44.23-74.97'

a 317+34 R
End type 3 fence

4-2 PP

a 318+17.92

a 315+30.00-75.04' & 111.04'

a 314+98.07-75.04' & 111.04'

a 313+99.00
284.00'

a 314+66.08
126.00'

a 315+95.10-126.00'

a 316+44.23-74.97'

a 317+34 R
End type 3 fence

4-2 PP

a 318+17.92

a 315+30.00-75.04' & 111.04'

a 314+98.07-75.04' & 111.04'

a 313+99.00
284.00'

a 314+66.08
126.00'

a 315+95.10-126.00'

a 316+44.23-74.97'

a 317+34 R
End type 3 fence

4-2 PP

a 318+17.92

a 315+30.00-75.04' & 111.04'

a 314+98.07-75.04' & 111.04'

a 313+99.00
284.00'

a 314+66.08
126.00'

a 315+95.10-126.00'

a 316+44.23-74.97'

a 317+34 R
End type 3 fence

4-2 PP

a 318+17.92

a 315+30.00-75.04' & 111.04'

a 314+98.07-75.04' & 111.04'

a 313+99.00
284.00'

a 314+66.08
126.00'

a 315+95.10-126.00'

a 316+44.23-74.97'

a 317+34 R
End type 3 fence

4-2 PP

a 318+17.92

a 315+30.00-75.04' & 111.04'

a 314+98.07-75.04' & 111.04'

a 313+99.00
284.00'

a 314+66.08
126.00'

a 315+95.10-126.00'

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a 317+34 R
End type 3 fence

4-2 PP

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a 315+30.00-75.04' & 111.04'

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284.00'

a 314+66.08
126.00'

a 315+95.10-126.00'

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a 317+34 R
End type 3 fence

4-2 PP

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284.00'

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End type 3 fence

4-2 PP

a 318+17.92

a 315+30.00-75.04' & 111.04'

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284.00'

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End type 3 fence

4-2 PP

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a 317+34 R
End type 3 fence

4-2 PP

a 318+17.92

a 315+30.00-75.04' & 111.04'

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284.00'

a 314+66.08
126.00'

a 315+95.10-126.00'

a 316+44.23-74.97'

a 317+34 R
End type 3 fence

4-2 PP

a 318+17.92

a 315+30.00-75.04' & 111.04'

a 314+98.07-75.04' & 111.04'

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284.00'

a 314+66.08
126.00'

a 315+95.10-126.00'

a 316+44.23-74.97'

a 317+34 R
End type 3 fence

4-2 PP

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a 315+30.00-75.04' & 111.04'

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284.00'

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126.00'

a 315+95.10-126.00'

a 316+44.23-74.97'

a 317+34 R
End type 3 fence

4-2 PP

a 318+17.92

a 315+30.00-75.04' & 111.04'

a 314+98.07-75.04' & 111.04'

a 313+99.00
284.00'

a 314+66.08
126.00'

a 315+95.10-126.00'

a 316+44.23-74.97'

a 317+34 R
End type 3 fence

4-2 PP

a 318+17.92

a 315+30.00-75.04' & 111.04'

a 314+98.07-75.04' & 111.04'

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284.00'

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126.00'

a 315+95.10-126.00'

a 316+44.23-74.97'

a 317+34 R
End type 3 fence

4-2 PP

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a 317+34 R
End type 3 fence

4-2 PP

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a 315+30.00-75.04' & 111.04'

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284.00'

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126.00'

a 315+95.10-126.00'

a 316+44.23-74.97'

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End type 3 fence

4-2 PP

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a 315+30.00-75.04' & 111.04'

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a 317+34 R
End type 3 fence

4-2 PP

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284.00'

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End type 3 fence

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a 317+34 R
End type 3 fence

4-2 PP

a 318+17.92

a 315+30.00-75.04' & 111.04'

a 314+98.07-75.04' & 111.04'

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284.00'

a 314+66.08
126.00'

a 315+95.10-126.00'

a 316+44.23-74.97'

a 317+34 R
End type 3 fence

4-2 PP

a 318+17.92

a 315+30.00-75.04' & 111.04'

a 314+98.07-75.04' & 111.04'

a 313+99.00
284.00'

a 314+66.08
126.00'

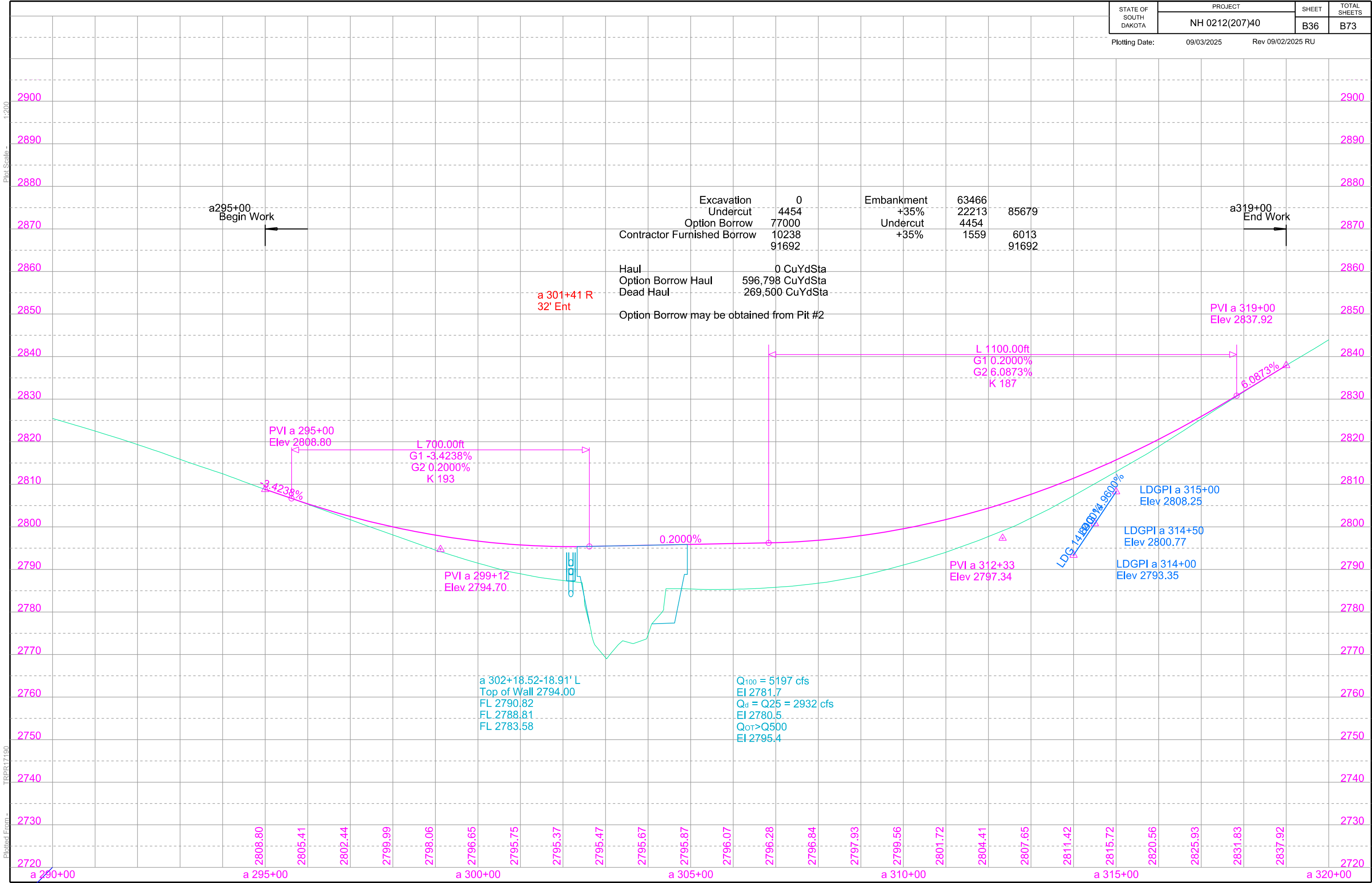
a 315+95.10-126.00'

a 316+44.23-74.97'

a 317+34 R
End type 3 fence

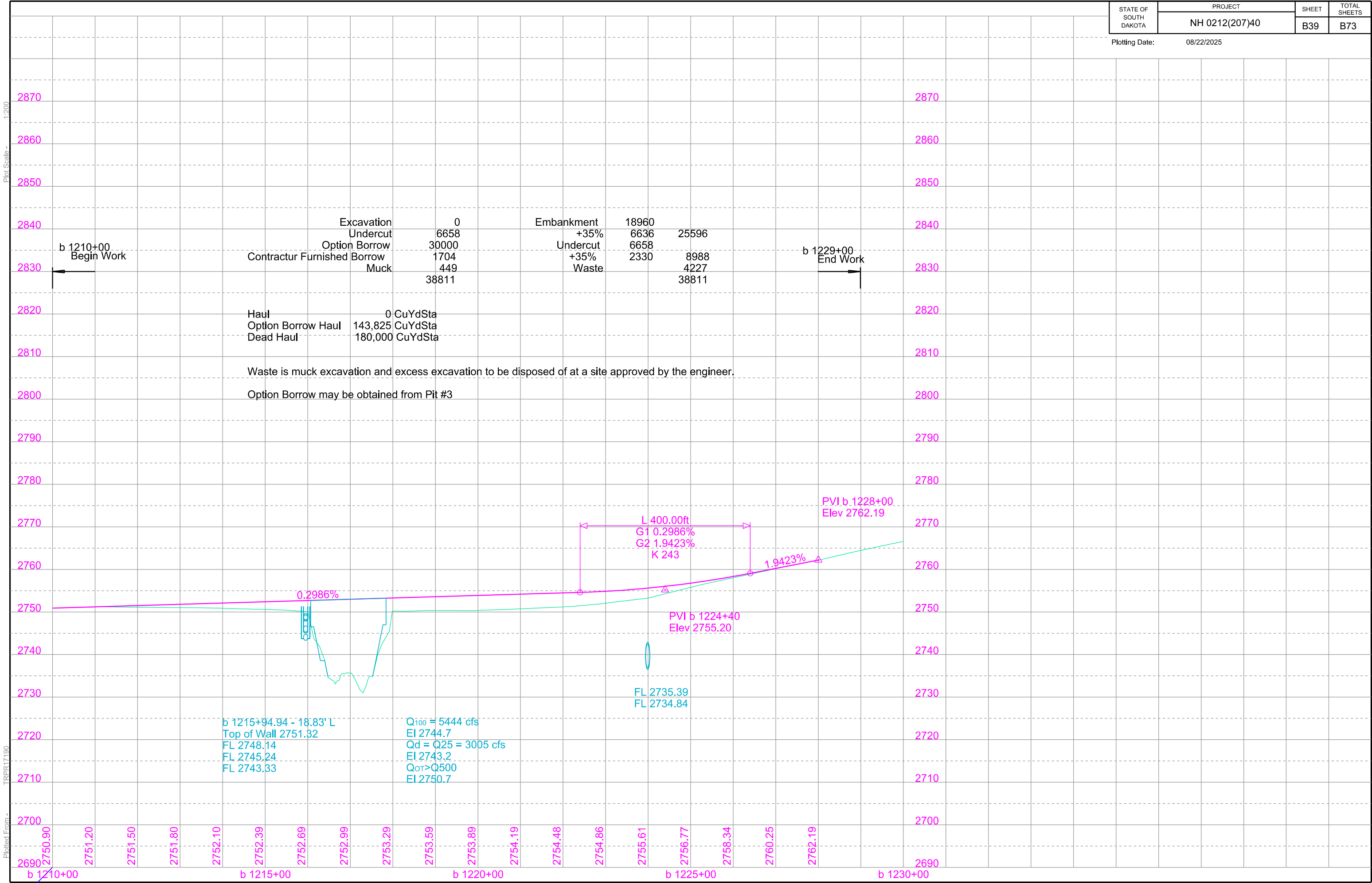
4-2 PP

a 318+17.92



Plotting Date: 09/03/2025 Rev 09/02/2025 RU



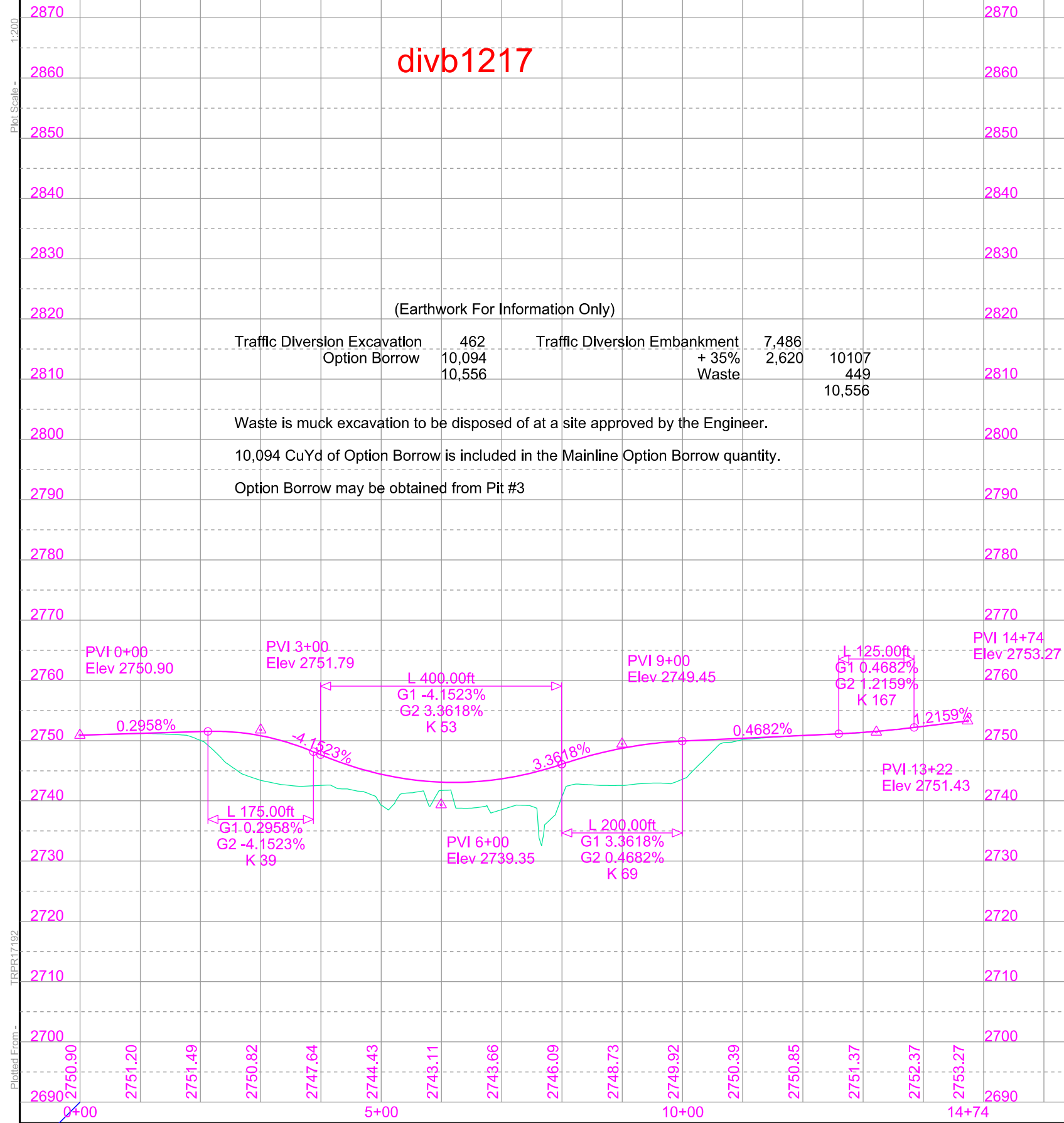


STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0212(207)40	B40	B73

Plotting Date: 06/16/2025



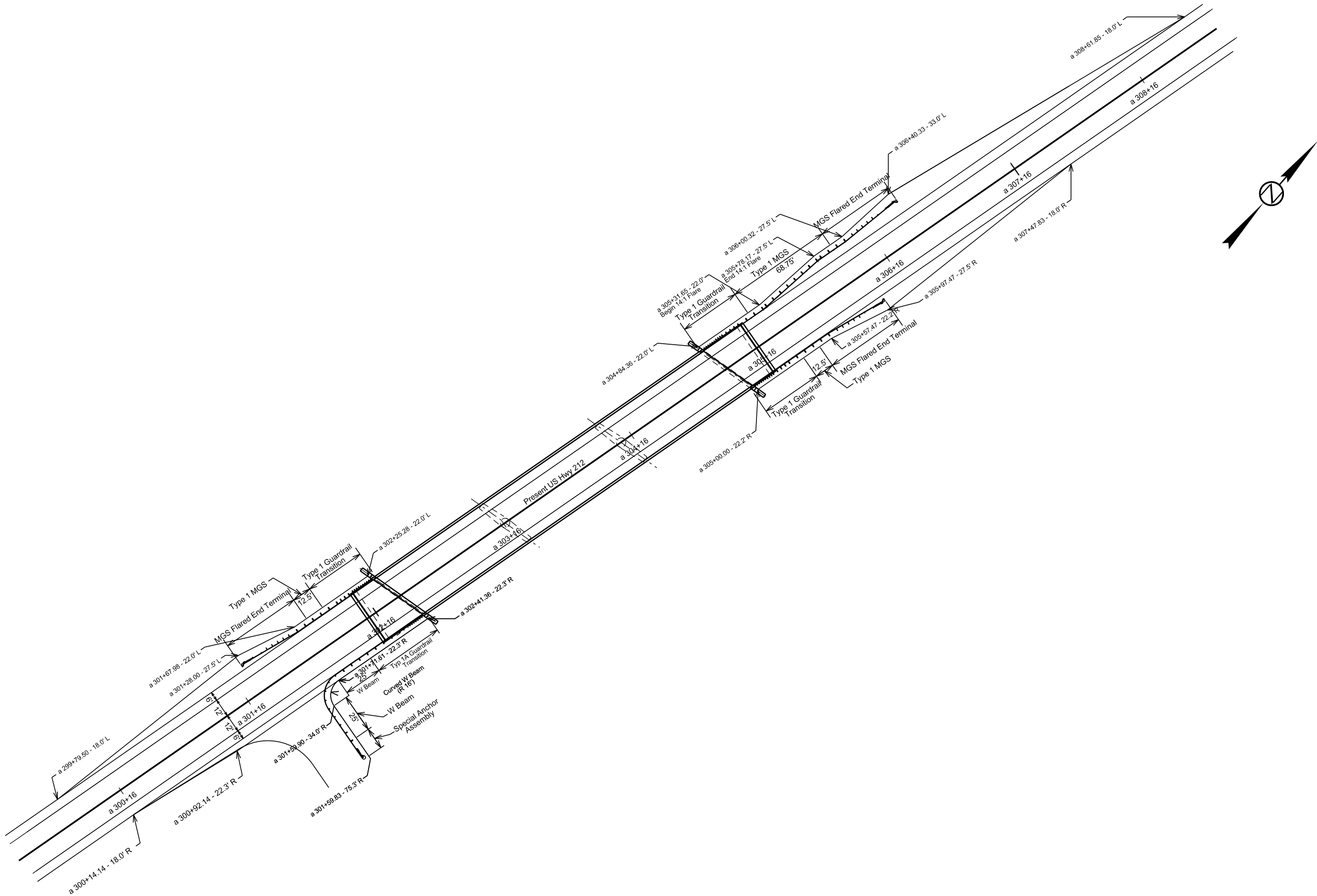
TRPR17192



GUARDRAIL LAYOUT

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0212(207)40	B41	B73

Plotting Date: 08/22/2025



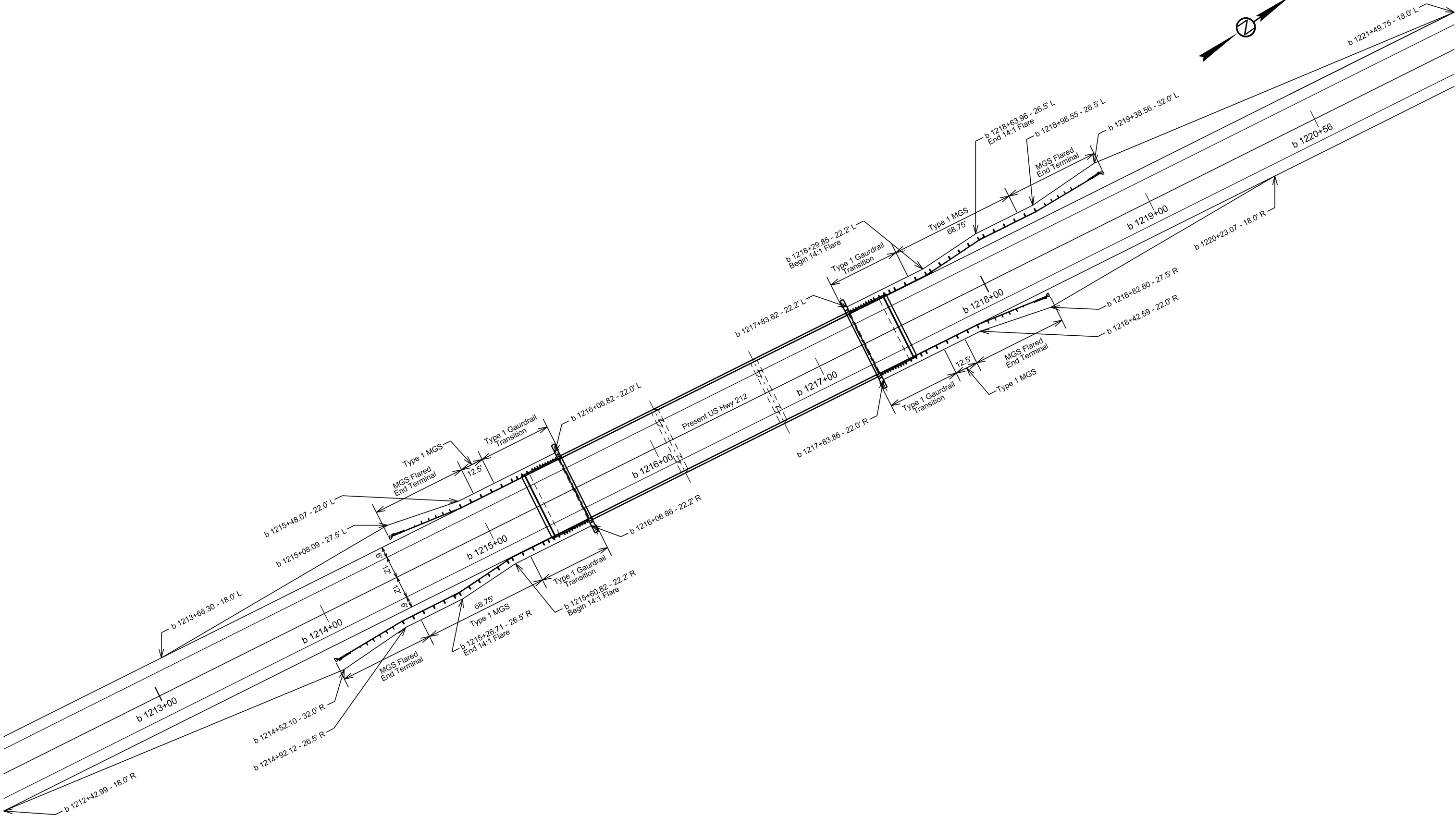
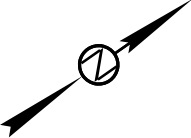
Plot Scale - 1:60

Plotted From - TRPR17190

GUARDRAIL LAYOUT

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0212(207)40	B42	B73

Plotting Date: 08/22/2025



1:50

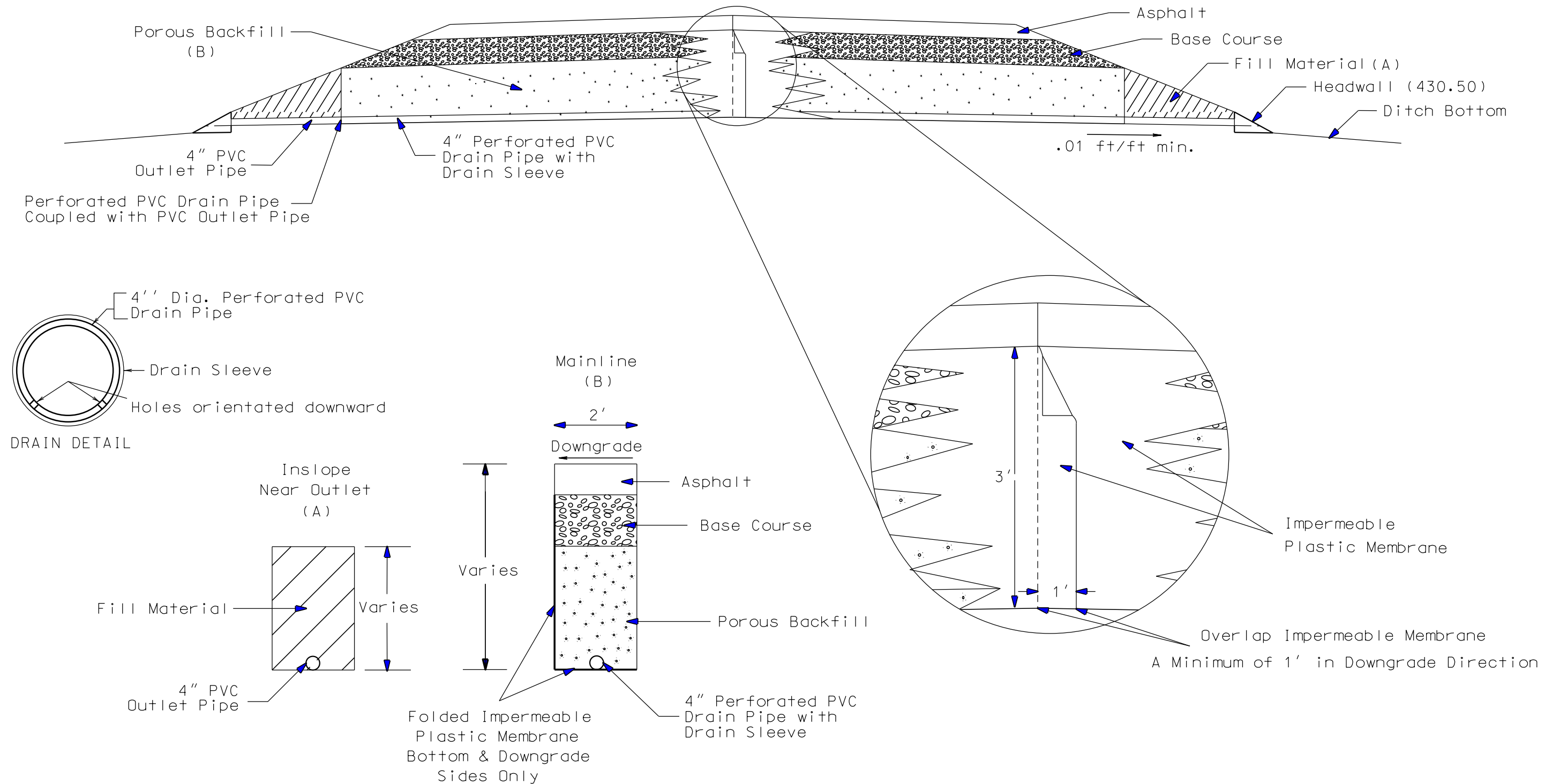
Plot Scale -

Plotted From - TRPR17190

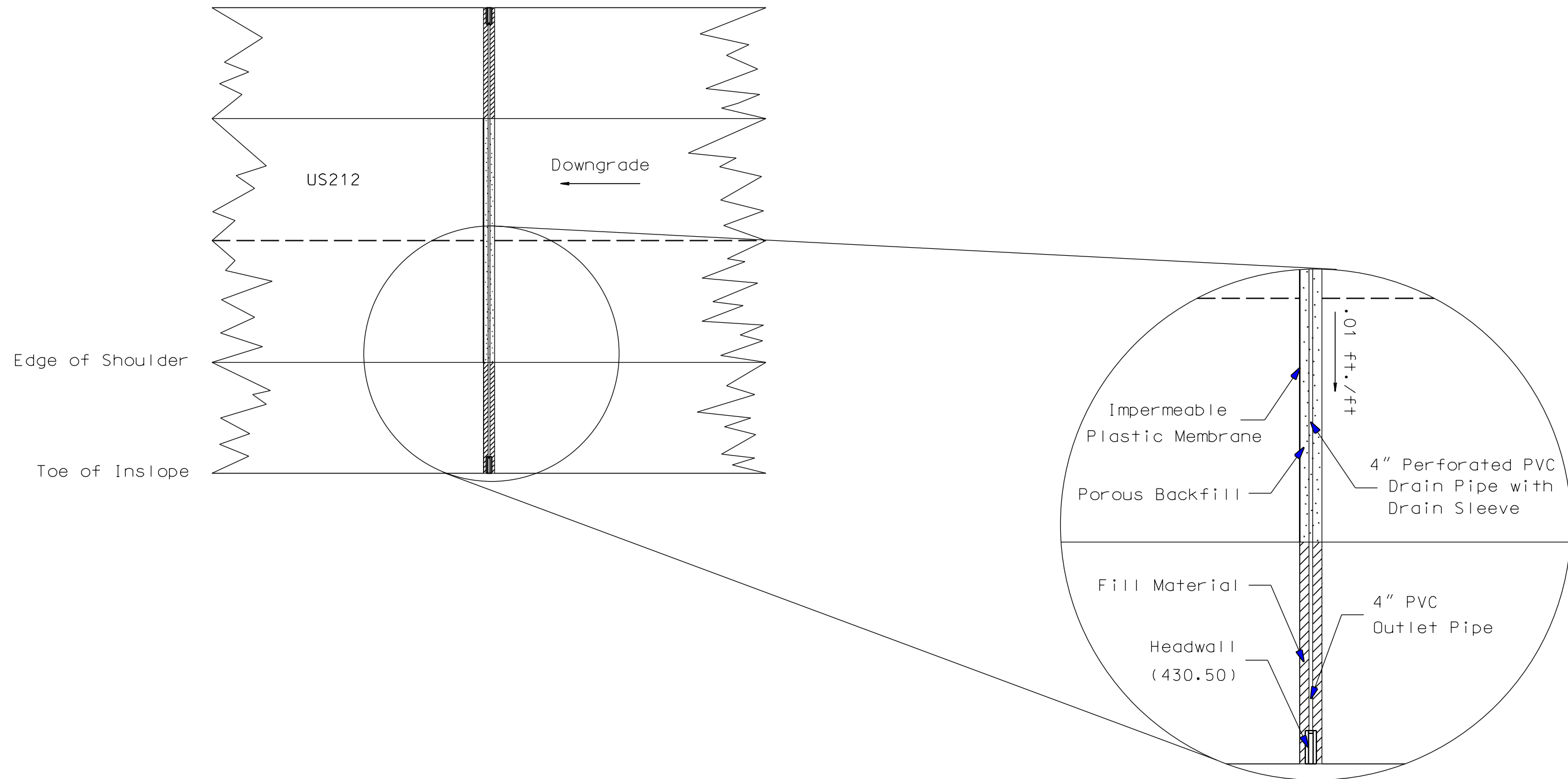
Plotted From -

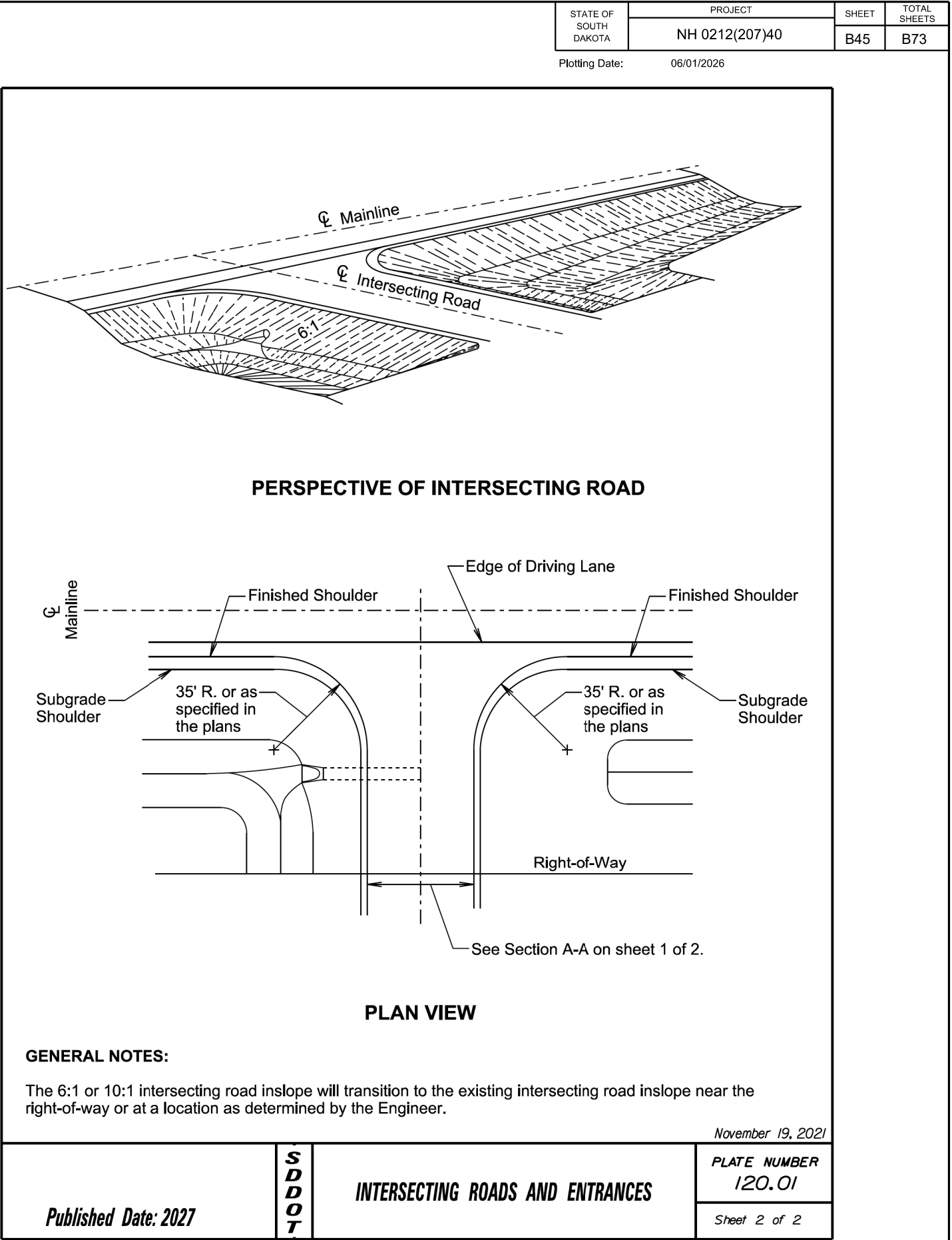
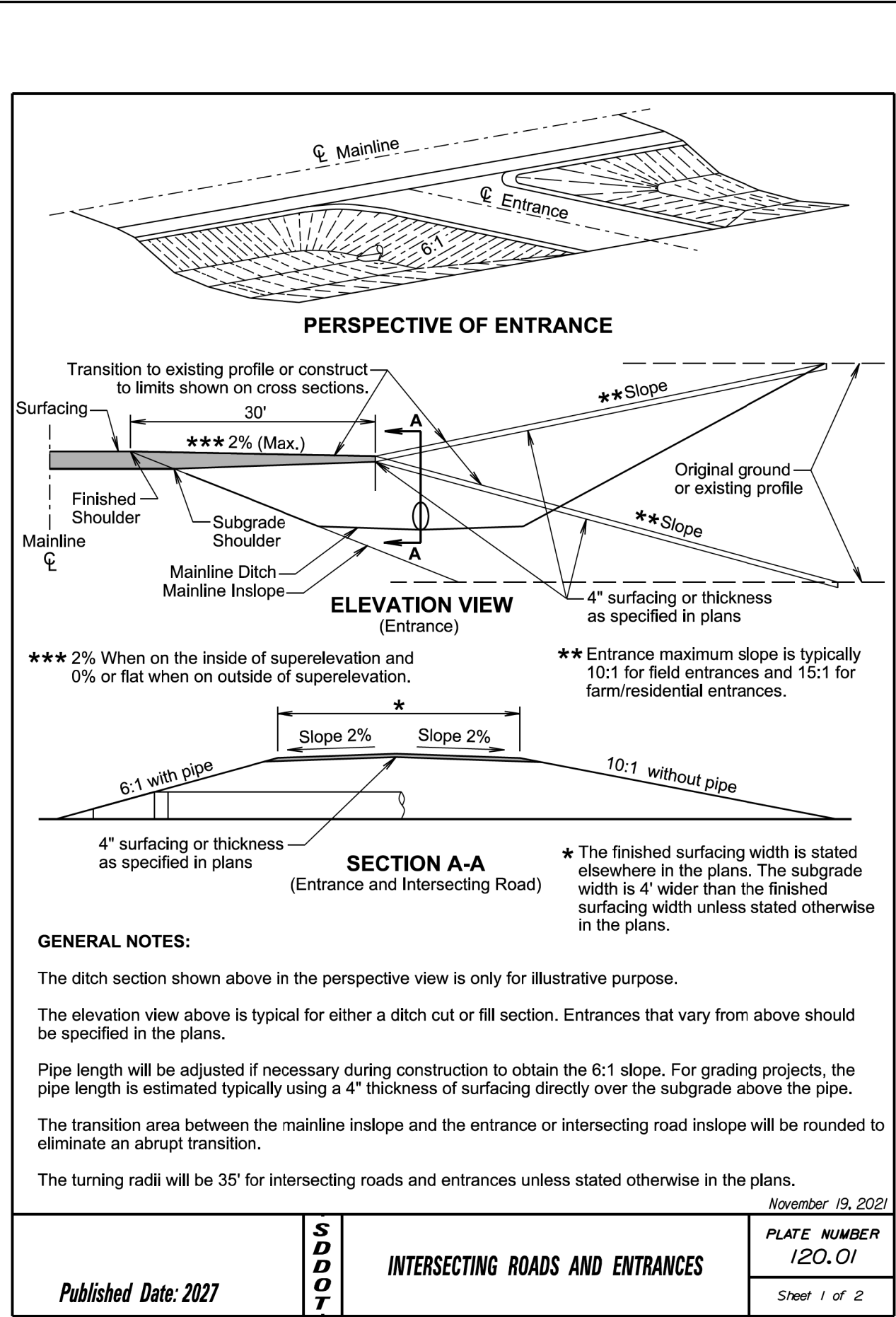
File - U:\rd\prj\route06\JD\1213gr.dgn

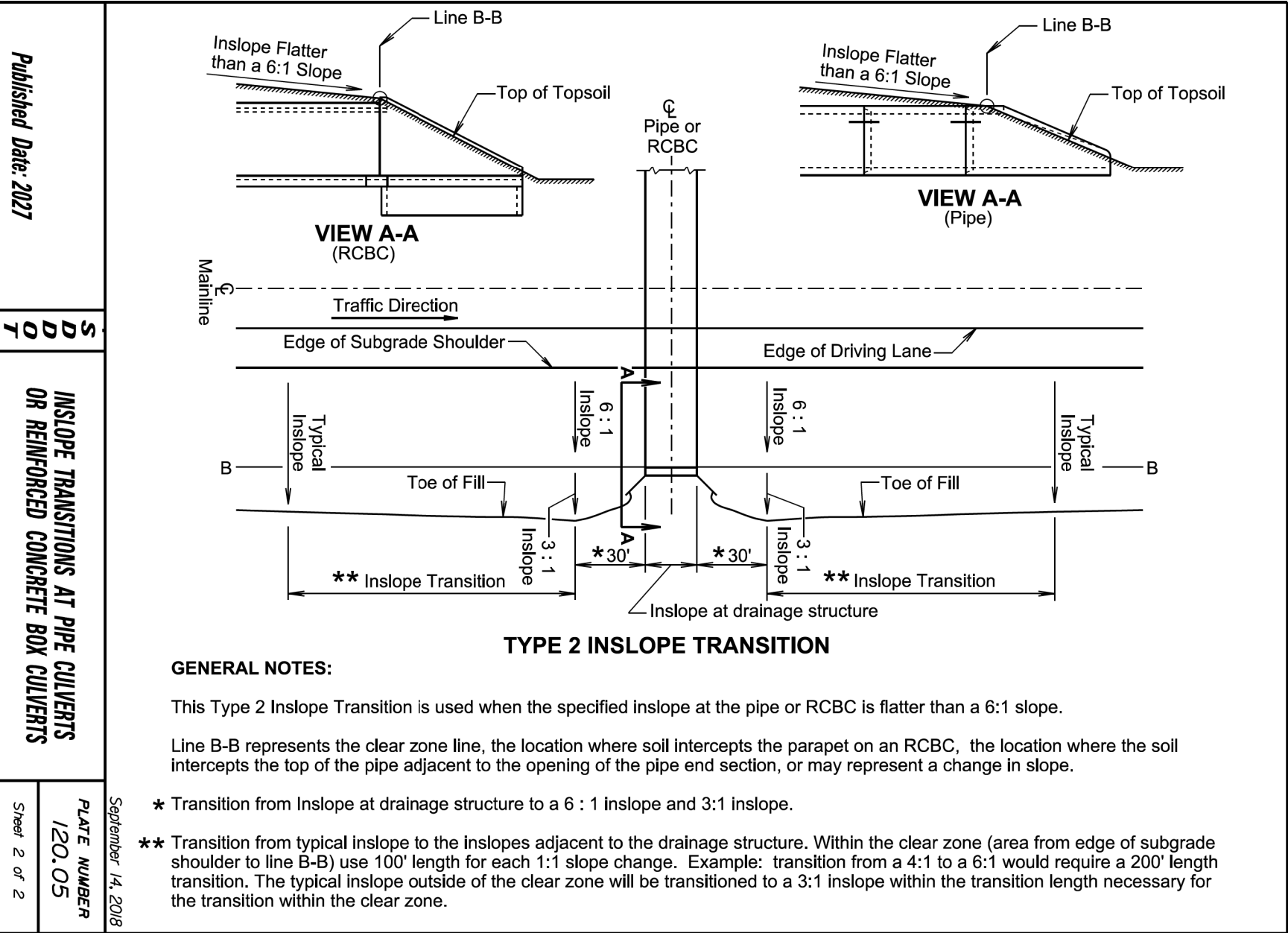
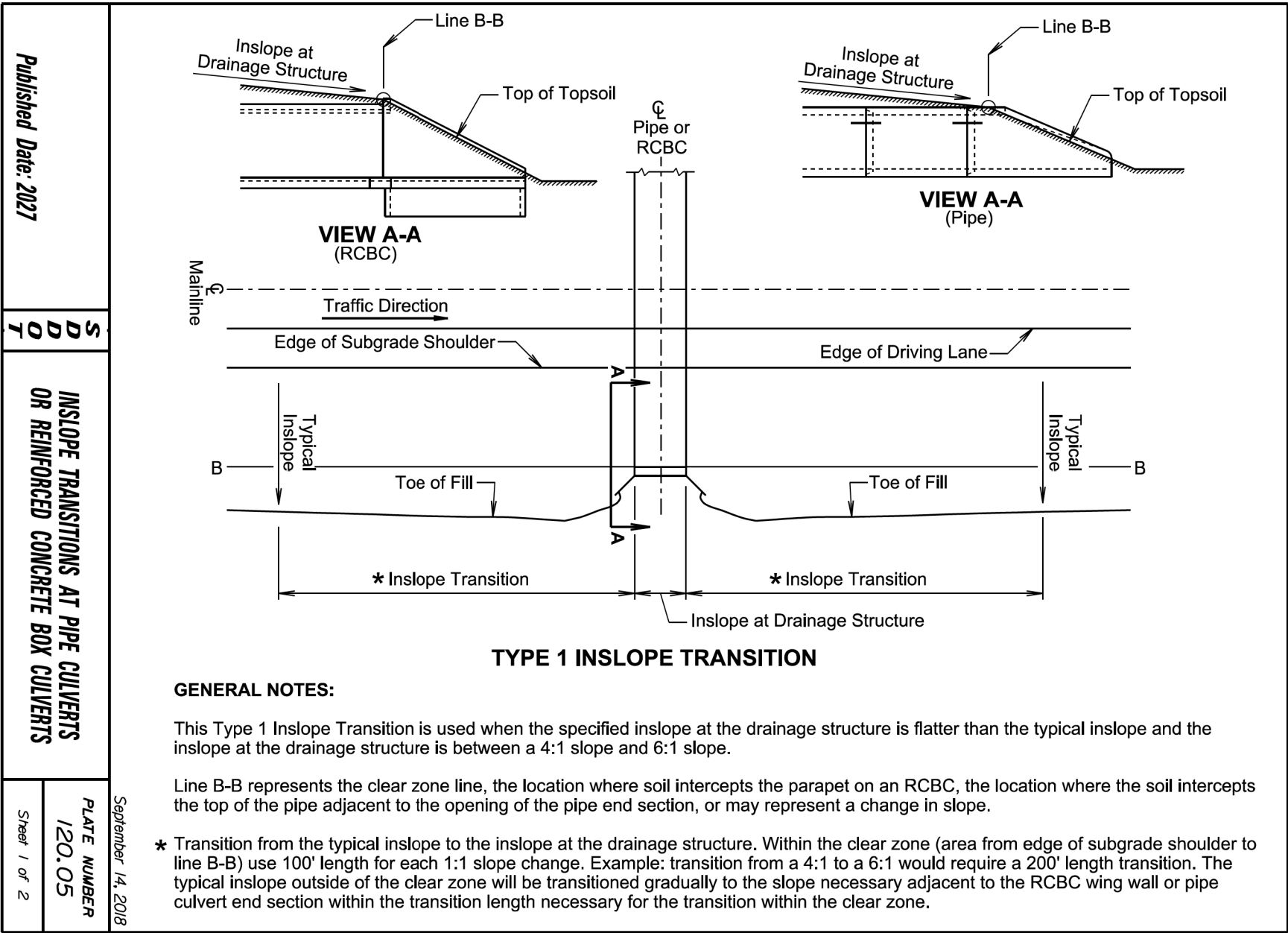
Typical Cutoff Drain Installation



Typical Cutoff Drain Installation

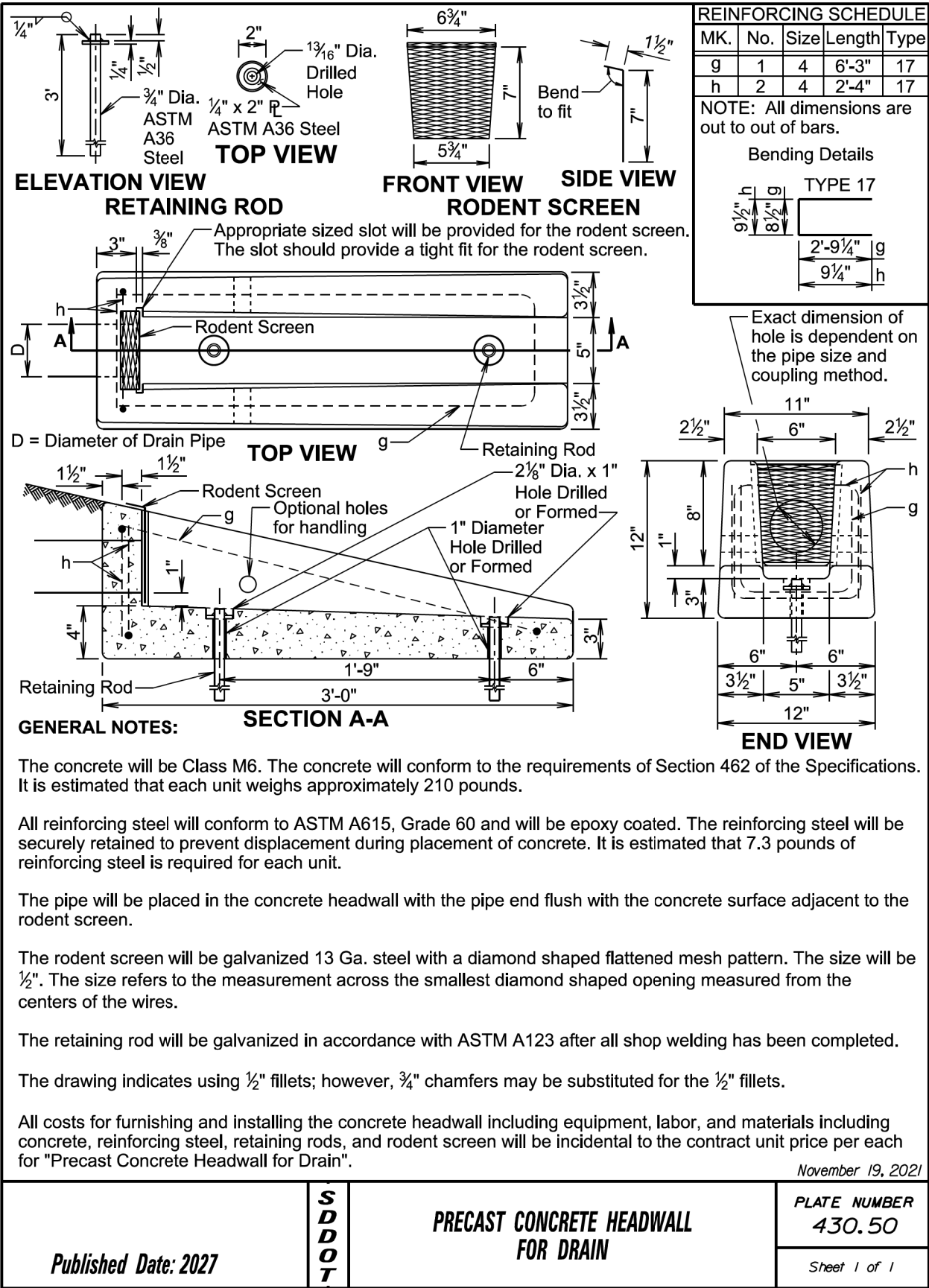
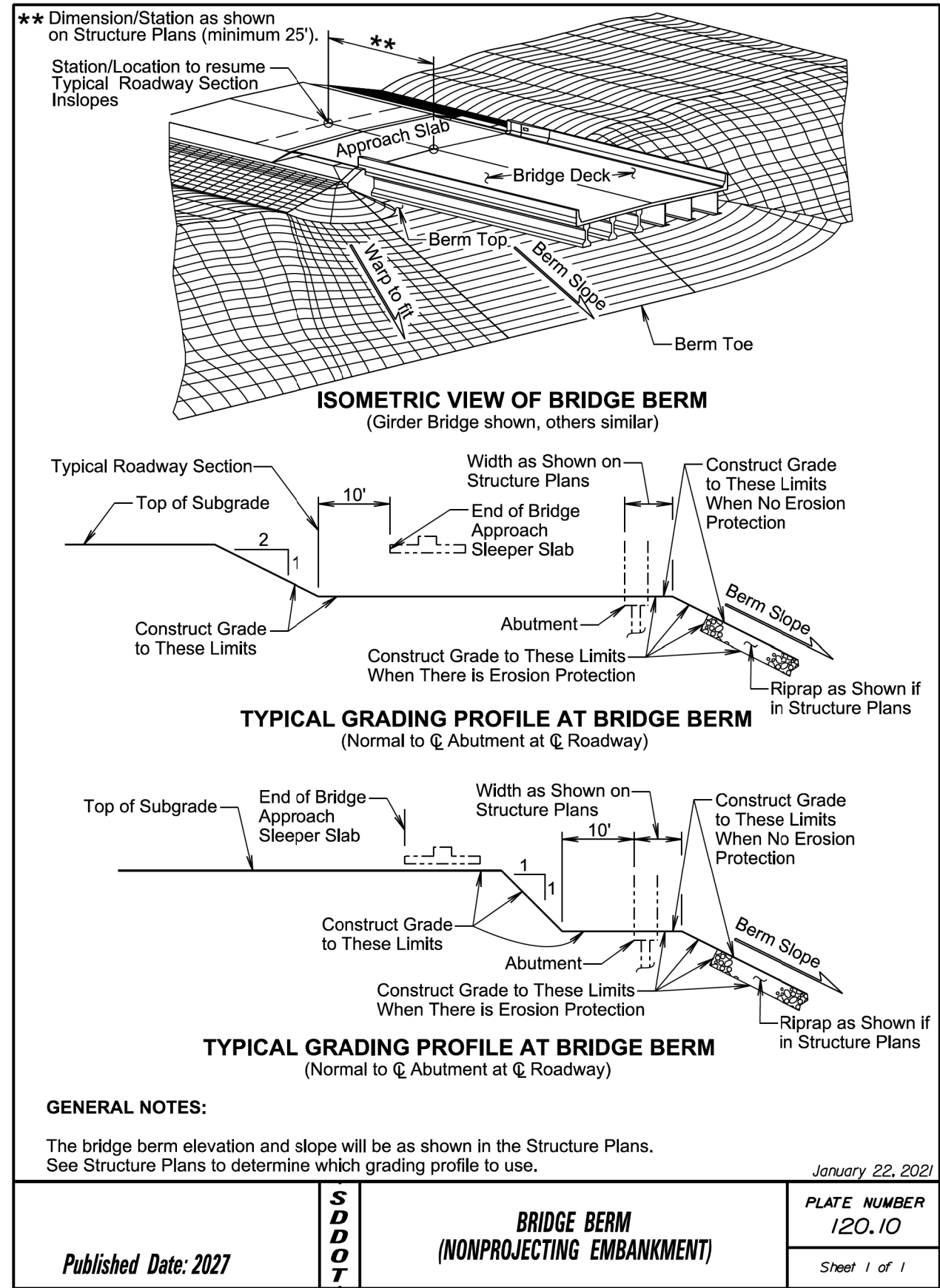






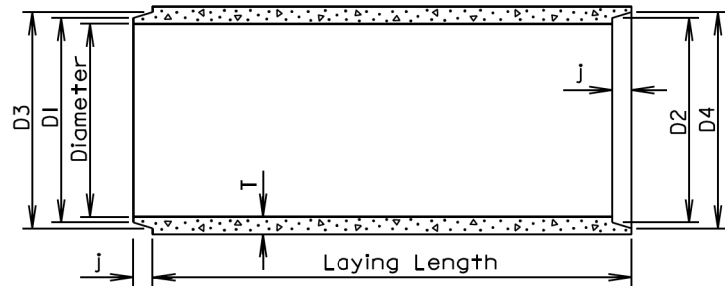
STATE OF SOUTH DAKOTA	PROJECT NH 0212(207)40	SHEET B46	TOTAL SHEETS B73

Plotting Date: 06/01/2026

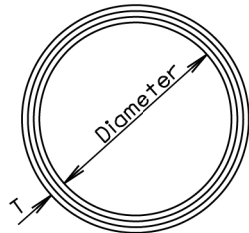


TOLERANCES IN DIMENSIONS

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
(* Tongue and Groove Style Shown)



END VIEW

GENERAL NOTES:

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

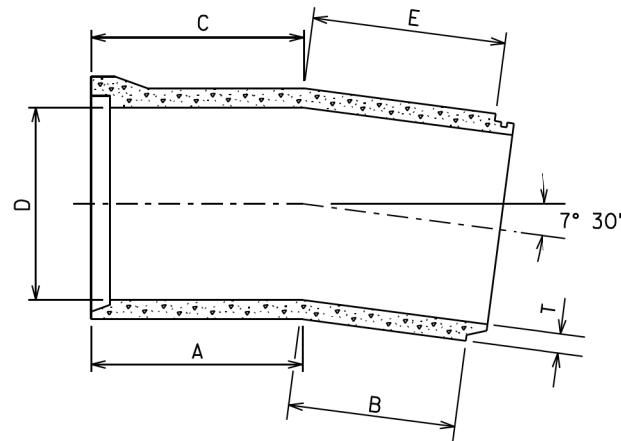
Not more than 2 four-foot sections shall be permitted near the ends of any culvert. Four-foot lengths shall be used only to secure the required length of culvert.

* Unless otherwise specified in the plans, the RCP may be either tongue and groove or bell and spigot style.

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 7/8	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

April 17, 2026

Published Date: 2027	S D D O T	REINFORCED CONCRETE PIPE	PLATE NUMBER 450.01
			Sheet 1 of 1



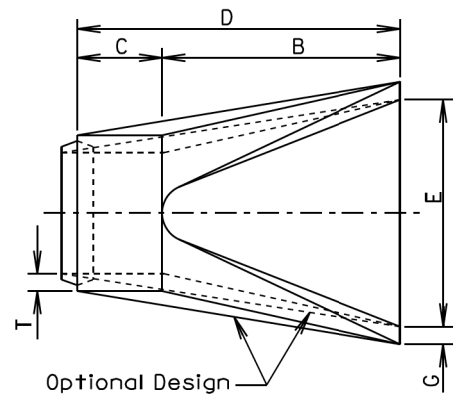
GENERAL NOTE:

Centerline laying length: 4'-0
Radius of Curve: 30.5'

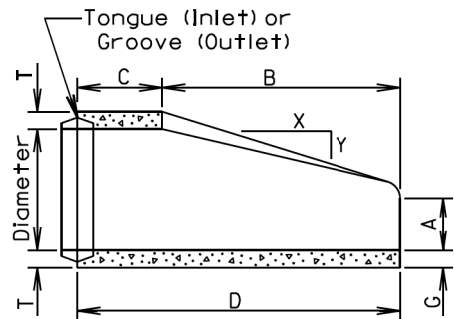
D (in.)	T (in.)	A (in.)	B (in.)	C (in.)	E (in.)	Weight of Section (lbs.)
12	2	36 5/32	10 15/32	37 17/32	11 17/32	368
15	2 1/4	36 1/2	10 1/4	37 3/4	11 1/2	508
18	2 1/2	24 1/2	22	26	23 1/2	672
21	2 3/4	24 1/2	21 3/4	26 1/4	23 1/2	856
24	3	25 1/32	21 1/32	26 3/32	22 3/32	1060
27	3 1/4	25 1/32	20 25/32	27 7/32	22 3/32	1288
30	3 1/2	25 1/32	20 17/32	27 15/32	22 3/32	1536
33	3 3/4	24 15/16	20 7/16	27 9/16	23 1/16	1808
36	4	24 13/16	20 5/16	27 11/16	23 3/16	2096
42	4 1/2	24 27/32	19 27/32	28 5/32	23 5/32	2740
48	5	24 19/32	19 19/32	28 13/32	23 13/32	3468
54	5 1/2	24 5/8	19 1/8	29 11/32	23 3/8	4280
60	6	24 2/32	18 2/32	29 1/32	23 11/32	5184
66	6 1/2	24 11/16	18 3/16	29 13/16	23 5/16	6168
72	7	24 1/8	18 1/8	29 7/8	23 7/8	7240
84	8	24 1/4	17 1/4	30 3/4	23 3/4	9640
96	9	23 5/16	17 5/16	30 11/16	24 11/16	12400

March 31, 2000

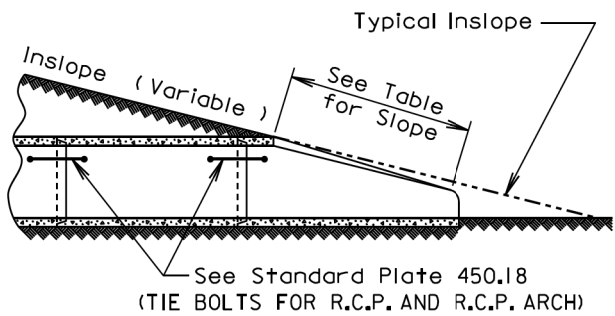
Published Date: 2027	S D D O T	REINFORCED CONCRETE PIPE LONG RADIUS BEND	PLATE NUMBER 450.04
			Sheet 1 of 1



TOP VIEW



LONGITUDINAL SECTION

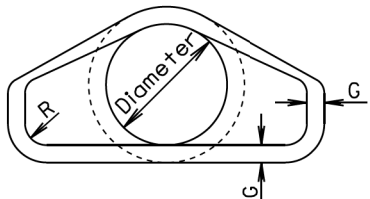


SLOPE DETAIL

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.

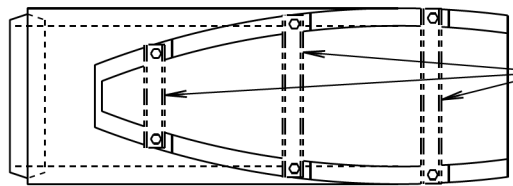


END VIEW

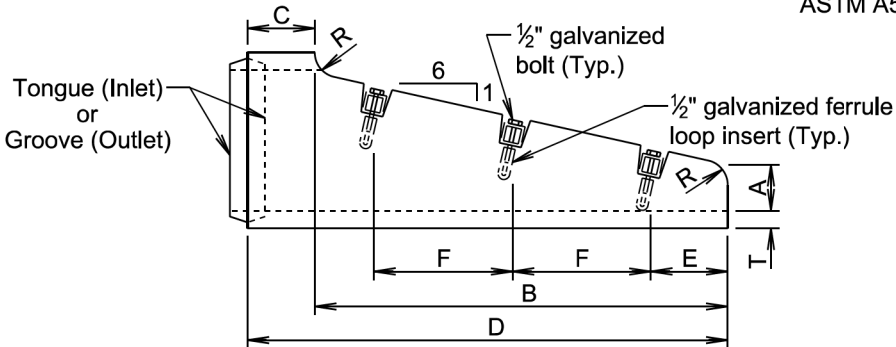
Dia. (in.)	Approx. Wt. of Section (lbs.)	Approx. Slope (X to Y)	T (in.)	A (in.)	B (in.)	C (in.)	D (in.)	E (in.)	G (in.)	R (in.)
12	530	2.4: 1	2	4	24	48 7/8	72 7/8	24	2	1 1/2
15	740	2.4: 1	2 1/4	6	27	46	73	30	2 1/4	1 1/2
18	990	2.3: 1	2 1/2	9	27	46	73	36	2 1/2	1 1/2
21	1280	2.4: 1	2 3/4	9	36	37 1/2	73 1/2	42	2 3/4	1 1/2
24	1520	2.5: 1	3	9 1/2	43 1/2	30	73 1/2	48	3	1 1/2
27	1930	2.5: 1	3 1/4	10 1/2	49 1/2	24	73 1/2	54	3 1/4	1 1/2
30	2190	2.5: 1	3 1/2	12	54	19 3/4	73 3/4	60	3 1/2	1 1/2
36	4100	2.5: 1	4	15	63	34 3/4	97 3/4	72	4	1 1/2
42	5380	2.5: 1	4 1/2	21	63	35	98	78	4 1/2	1 1/2
48	6550	2.5: 1	5	24	72	26	98	84	5	1 1/2
54	8240	2: 1	5 1/2	27	65	33 1/4	98 1/4	90	5 1/2	1 1/2
60	8730	1.9: 1	6	35	60	39	99	96	5	1 1/2
66	10710	1.7: 1	6 1/2	30	72	27	99	102	5 1/2	1 1/2
72	12520	1.8: 1	7	36	78	21	99	108	6	1 1/2
78	14770	1.8: 1	7 1/2	36	90	21	111	114	6 1/2	1 1/2
84	18160	1.6: 1	8	36	90 1/2	21	111 1/2	120	6 1/2	1 1/2
90	20900	1.5: 1	8 1/2	41	87 1/2	24	111 1/2	132	6 1/2	6

June 26, 2015

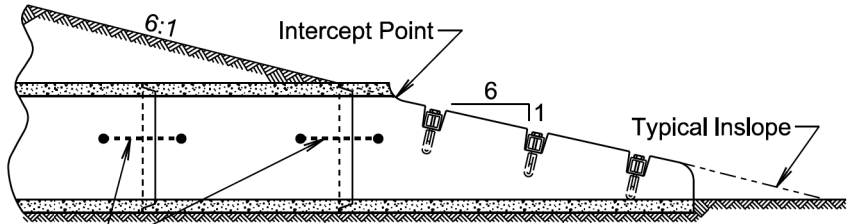
Published Date: 2027	S D D O T	R. C. P. FLARED ENDS	PLATE NUMBER 450.10
			Sheet 1 of 1



TOP VIEW



SIDE VIEW



Tie Bolt (Typ.)
See Standard Plate 450.18

ELEVATION VIEW

R. C. P. SAFETY ENDS										
Dia. (in.)	T (in.)	R (in.)	A (in.)	B (in.)	C (in.)	D (in.)	E (in.)	F (in.)	No. Sections	No. Bars
FOR CIRCULAR PIPE										
15	2 1/4	3	6	48	9	57	6	18	1	3
18	2 1/2	3	6	69	9	78	9	24	1	3
* 24	3	3	6	111	9	120	6	24	1 or 2	5
FOR ARCH PIPE										
** 18	2 1/2	1	6	39	33	72	6	24	1	2

* The use of 2 sections must be an approved design.
** Equivalent Diameter of Circular R.C.P.

GENERAL NOTES:

The length of concrete pipe shown on the plans is between safety ends.

Safety ends without bars are acceptable with or without the bar notches.

Bars will be galvanized after fabrication in accordance with ASTM A123.

April 8, 2025

Published Date: 2027	S D D O T	R.C.P. SAFETY ENDS WITH OR WITHOUT BARS	PLATE NUMBER 450.12
			Sheet 1 of 1

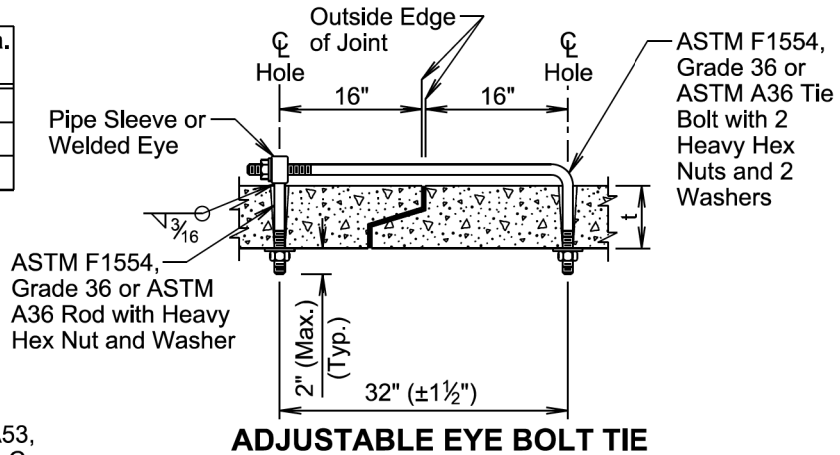
Wall "t" (in.)	Rod Dia. (in.)	Pipe Sleeve Dia. (nominal)
≤ 3¼	⅝	¾
3½-6½	¾	1
≥ 7	1	1¼

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.



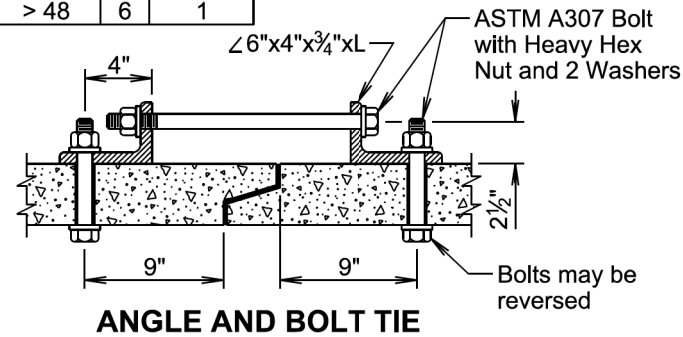
Pipe Dia. (in.)	"L" (in.)	Bolt Dia. (in.)
≤ 48	4	¾
> 48	6	1

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.



GENERAL NOTES:

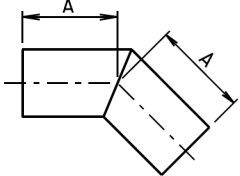
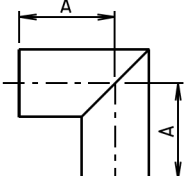
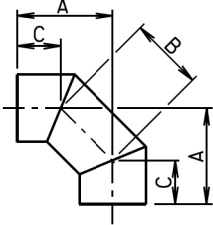
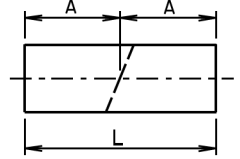
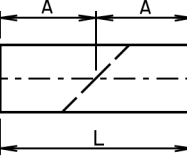
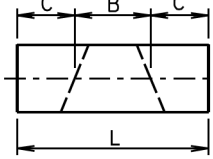
In lieu of the tie bolts detailed above other types of tie bolt connections may be installed as approved by the Office of Bridge Design.

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: 2027	S D D O T	TIE BOLTS FOR R.C.P. AND R.C.P. ARCH	PLATE NUMBER 450.18
			Sheet 1 of 1

		
2 Piece	2 Piece	3 Piece
		
5° to 45° Elbow	50° to 90° Elbow	90° Elbow

Diameter	A	L	Diameter	A	L	Diameter	A	B	C	L
Inches	Feet	Feet	Inches	Feet	Feet	Inches	Inches			Feet
12	1	2	12	2	4	12	25½	11	18½	4
15	1	2	15	2	4	15	26½	12	18	4
18	1	2	18	2	4	18	27	14	17	4
21	2	4	21	2	4	21	27	15	16½	4
24	2	4	24	2	4	24	27½	16	16	4
27	2	4	27	2	4	27	27½	17	15½	4
30	2	4	30	3	6	30	40	19	26½	6
33	2	4	33	3	6	33	40	20	26	6
36	2	4	36	3	6	36	40½	21	25½	6
42	2	4	42	3	6	42	41	23	24½	6
48	2	4	48	4	8	48	53½	26	35	8
54	3	6	54	4	8	54	54	28	34	8
60	3	6	60	4	8	60	54½	31	32½	8
66	3	6	66	4	8	66	54	33	31½	8
72	3	6	72	5	10	72	67½	36	42	10
78	3	6	78	5	10	78	68	39	40½	10
84	3	6	84	5	10	84	68½	41	39½	10
90	3	6	90	6	12	90	70	46	37	10
96	3	6	96	6	12	96	82	46	49	12

FABRICATED ELBOW LENGTHS FOR ALL CORRUGATIONS

GENERAL NOTES:

All dimensions shown are nominal.

L = Linear Feet of C.M.P. required to fabricate fitting.

June 26, 2001

Published Date: 2027	S D D O T	C.M.P. FABRICATED LENGTHS FOR ELBOWS	PLATE NUMBER 450.32
			Sheet 1 of 1

ARCH C.M.P. SAFETY ENDS										
Equiv. Dia. (Inch)	(Inches)		(Min.) Thick.		Dimensions (Inches)			L Dimensions		
	Span	Rise	Inch	Gage	A	H	W	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.		Dimensions (Inches)			L Dimensions		
	Inch	Gage	A	H	W	Overall Width	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.

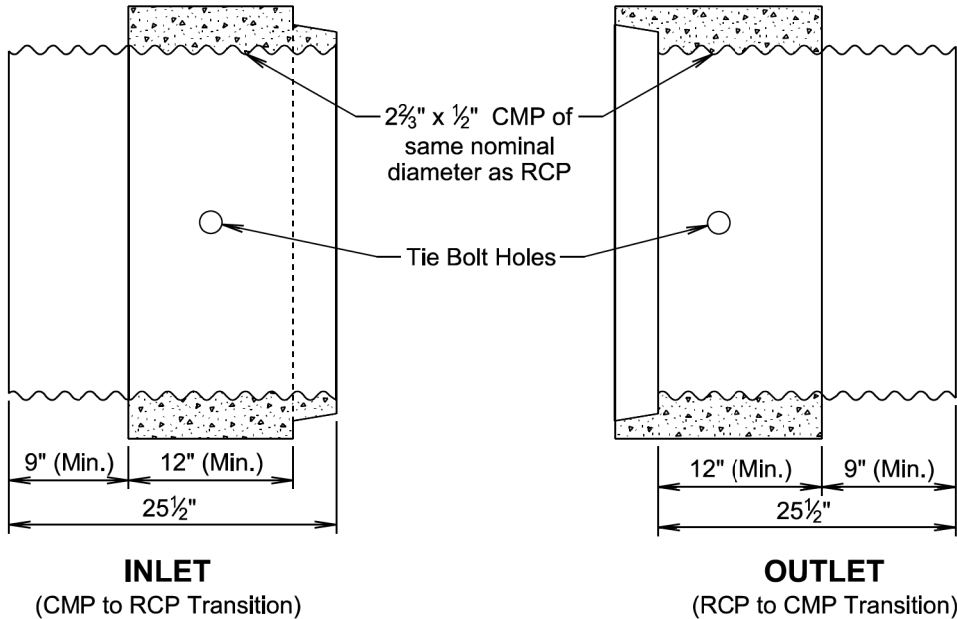
When stated in the plans, optional toe plate extension will be punched and bolted to end section apron lip with 3/8" diameter galvanized bolts. Steel for toe plate extension will be same gauge as end section. Dimensions will be overall width less 6" by 8" high.

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.

April 8, 2025

<i>Published Date: 2027</i>	S D D O T	C.M.P. SAFETY ENDS	PLATE NUMBER 450.38
			Sheet 2 of 2



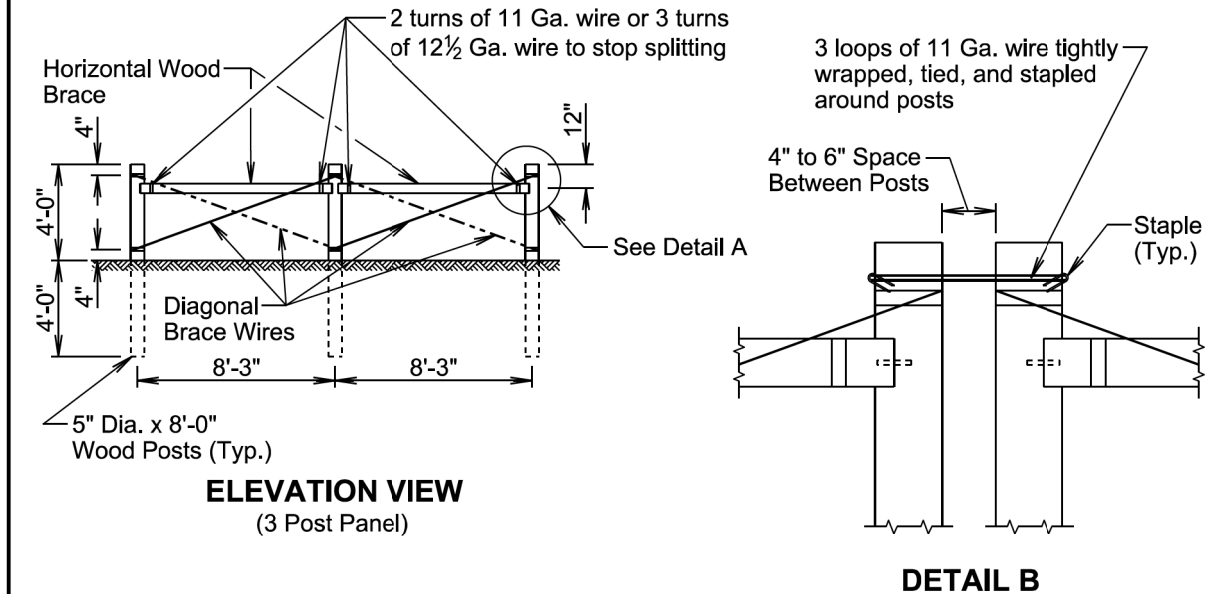
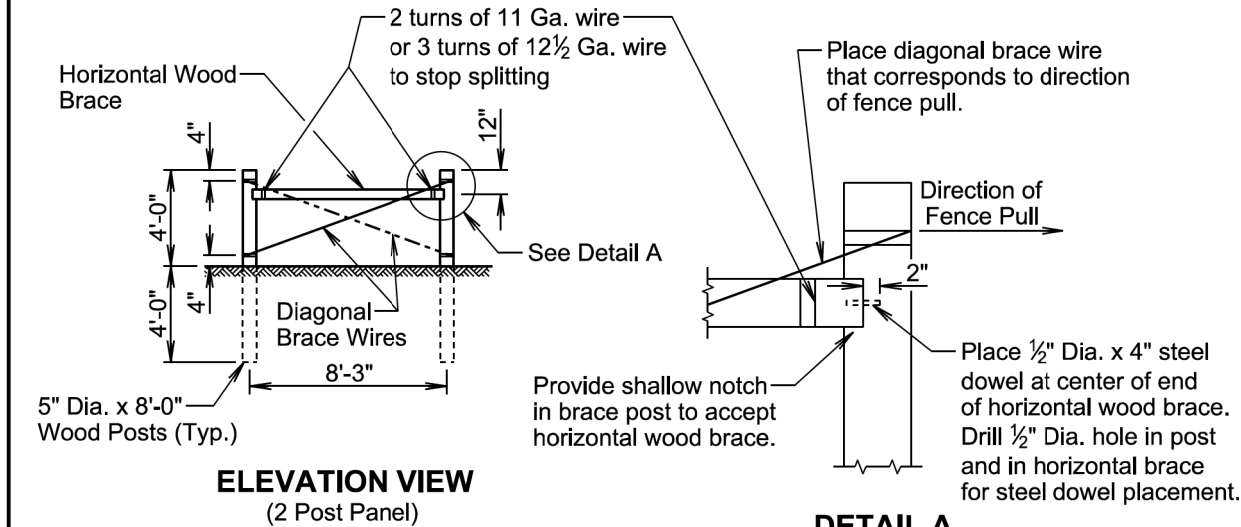
GENERAL NOTE:

Arch pipe transitions will be fabricated similar to the round transition shown above.

All pipe transitions will be precast as shown. Alternate designs other than shown will need to be approved by the Engineer.

November 19, 2022

<i>Published Date: 2027</i>	S D D O T	C.M.P. TO R.C.P. TRANSITION AND R.C.P. TO C.M.P. TRANSITION	PLATE NUMBER 450.50
			Sheet 1 of 1



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.

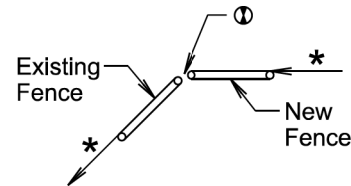
March 31, 2024

Published Date: 2027	S D D O T	BRACE PANELS AND APPLICATIONS OF BRACE PANELS	PLATE NUMBER 620.03
			Sheet 1 of 3

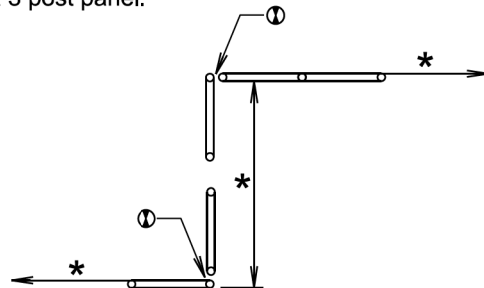
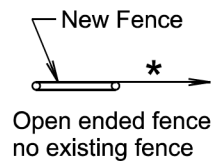
RADIUS OF CURVE	SPACING OF 2 POST PANEL
Greater than 1800 Ft.	** 1320'
Less than 1800 Ft.	** At P.C., P.T., and at every 1320' between P.C. and P.T.

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

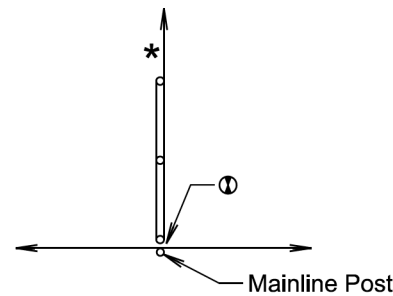
① See Detail B on Sheet 1 of 3.



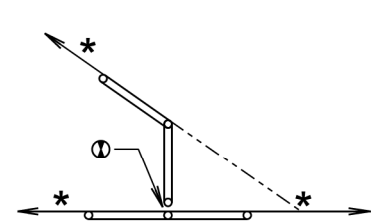
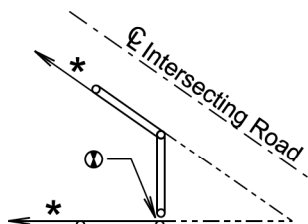
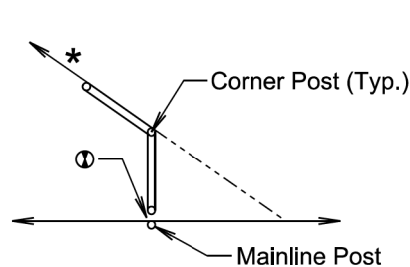
BEGIN OR END FENCE
(Where new fence ties into existing fence)



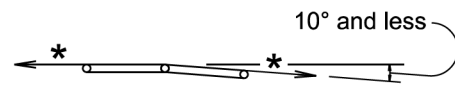
SHORT JOGS IN FENCE



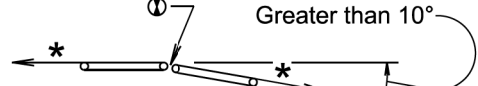
CROSS FENCE



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°.

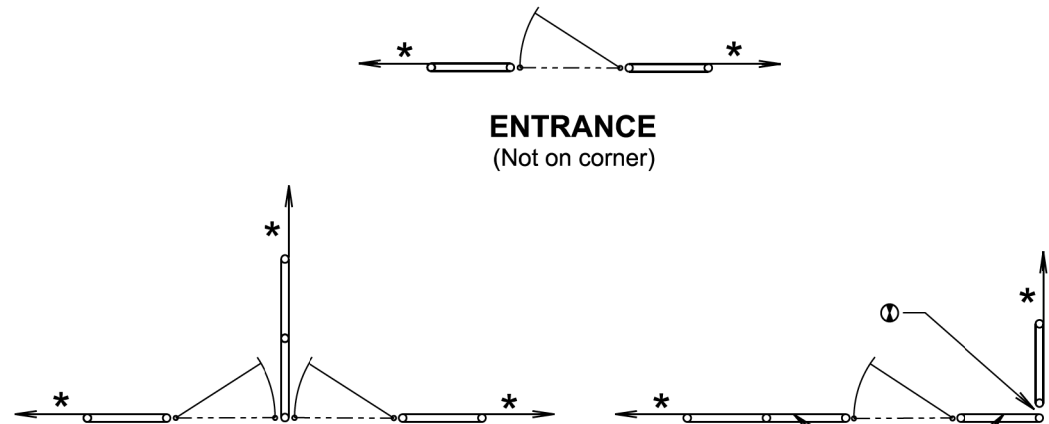
ANGLES IN MAINLINE FENCE

March 31, 2024

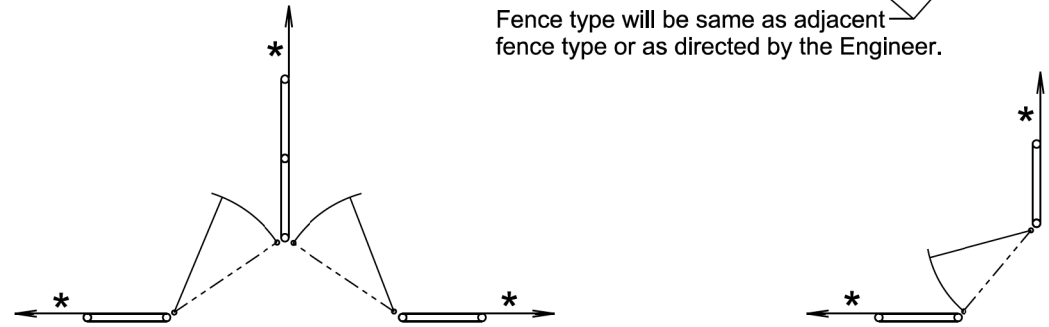
Published Date: 2027	S D D O T	BRACE PANELS AND APPLICATIONS OF BRACE PANELS	PLATE NUMBER 620.03
			Sheet 2 of 3

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0212(207)40	B55	B73

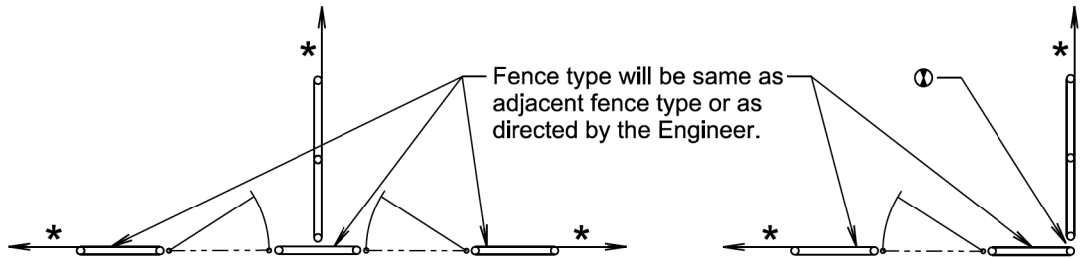
Plotting Date: 06/01/2026



ENTRANCE
(Not on corner)



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



DOUBLE ENTRANCES

ENTRANCES AT CORNERS

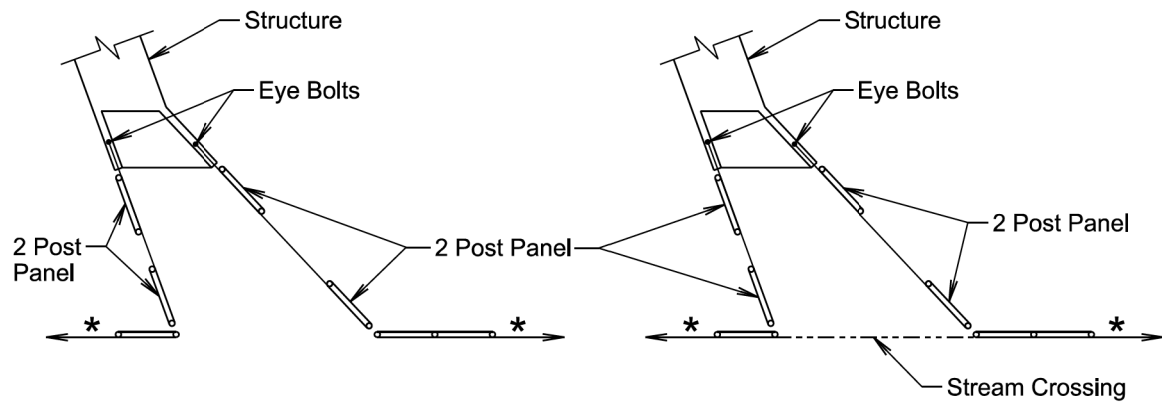
GATES

- * 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.

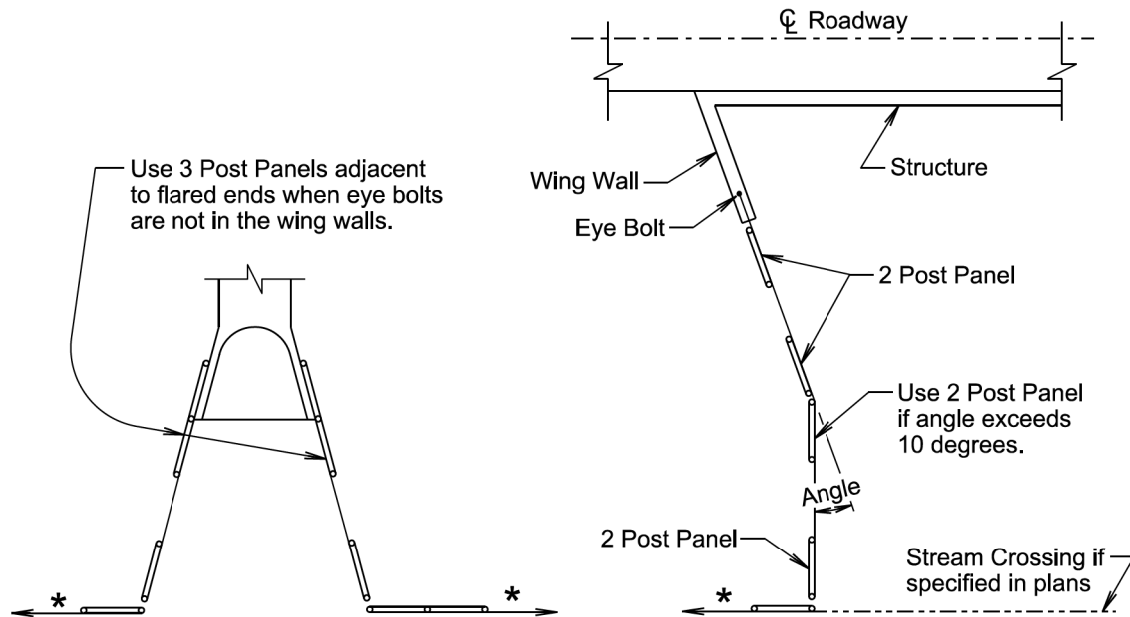
March 31, 2024

Published Date: 2027	S D D O T	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**



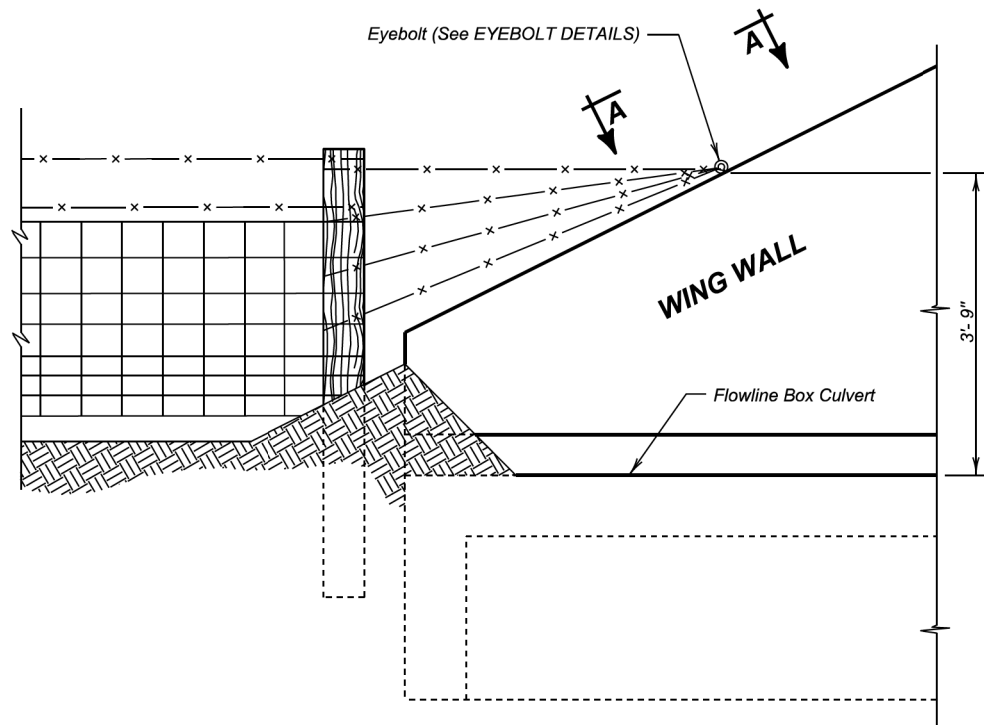
**R.C. BOX CULVERT
OR CATTLE PASS**

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

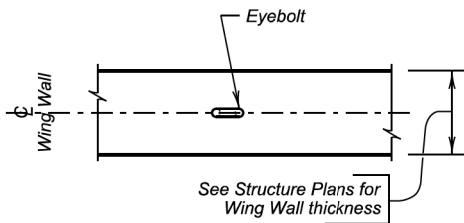
Published Date: 2027	S D D O T	BRACE PANEL APPLICATIONS AT STRUCTURES	PLATE NUMBER 620.04
			Sheet 1 of 1



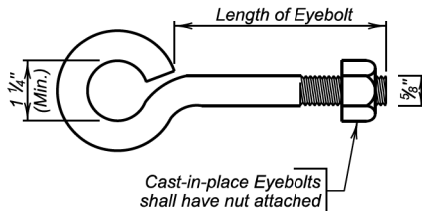
DETAIL FOR FENCE ANCHORS

GENERAL NOTES:

- The fence and post details shown are for illustrative purpose only. The fence shall be as specified elsewhere in the plans.
- Eybolls shall be placed on all of the box culvert wing walls.
- Eybolls shall be 5/8 inch diameter and shall conform to ASTM A307.
- Eybolls, nuts, and concrete inserts shall be galvanized in accordance with AASHTO M232 (ASTM A153). Concrete inserts of corrosion resistant material need not be galvanized.
- Cast-in-place eyebolts shall have a nut attached, be 4 1/2 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 5/8 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.
- The cost for furnishing and installing eyebolts and/or concrete inserts shall be incidental to various contract items.



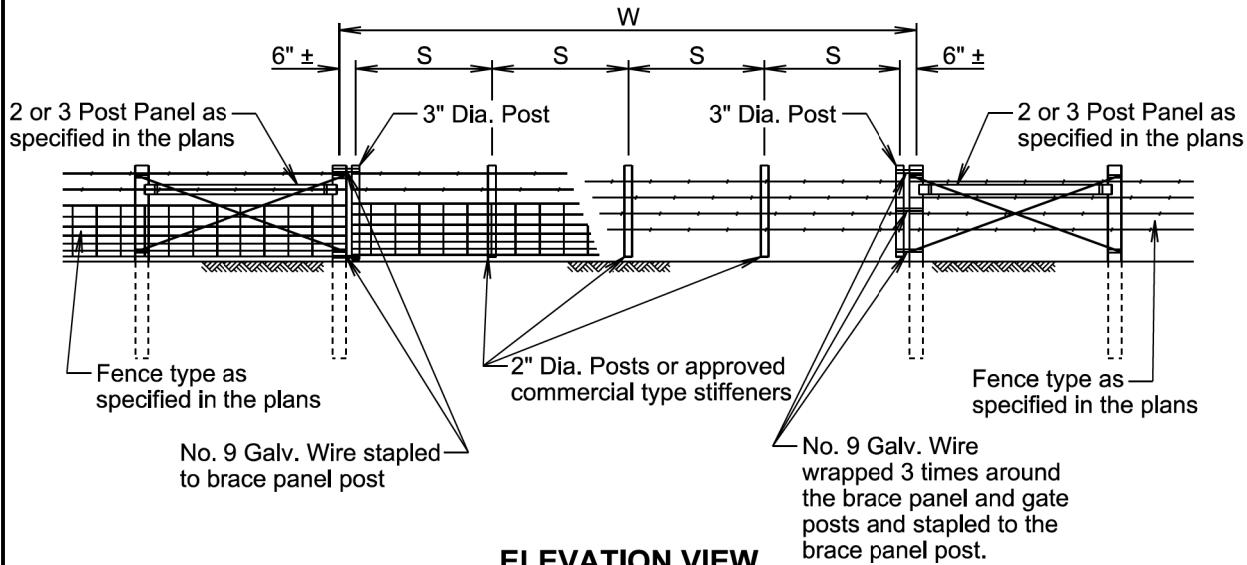
VIEW A - A



EYEBOLT DETAILS

December 23, 2012

Published Date: 2027	S D D O T	FENCE ANCHORS FOR BOX CULVERT WING WALLS	PLATE NUMBER 620.16
			Sheet 1 of 1



ELEVATION VIEW

W Gate Width (Ft.)	S Post Spacing
16	3 @ 5'-0" ±
20	4 @ 4'-9" ±
24	4 @ 5'-9" ±
30	5 @ 5'-10" ±
40	6 @ 6'-6" ±

GENERAL NOTES:

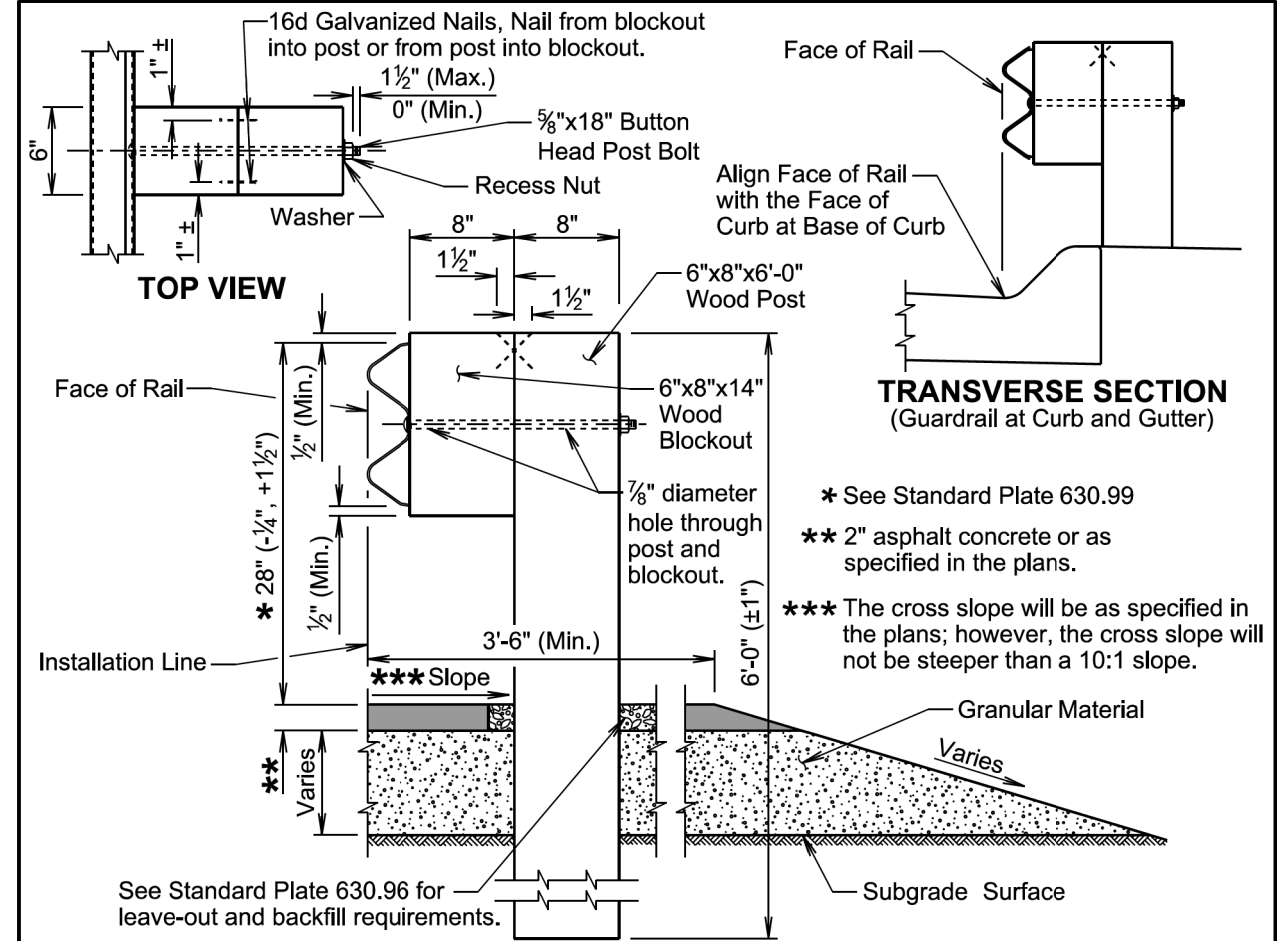
Creosote treatment of the gate posts will not be accepted.

The type of fencing in the gate will be of the same type as specified for the adjacent Right-of-Way fence.

All costs for furnishing and constructing the wire gate(s) will be incidental to the contract unit price per foot for the respective Right-of-Way fence contract item.

June 26, 2019

Published Date: 2027	S D D O T	WIRE GATES	PLATE NUMBER 620.20
			Sheet 1 of 1



GENERAL NOTES:

TRANSVERSE SECTION

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.

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

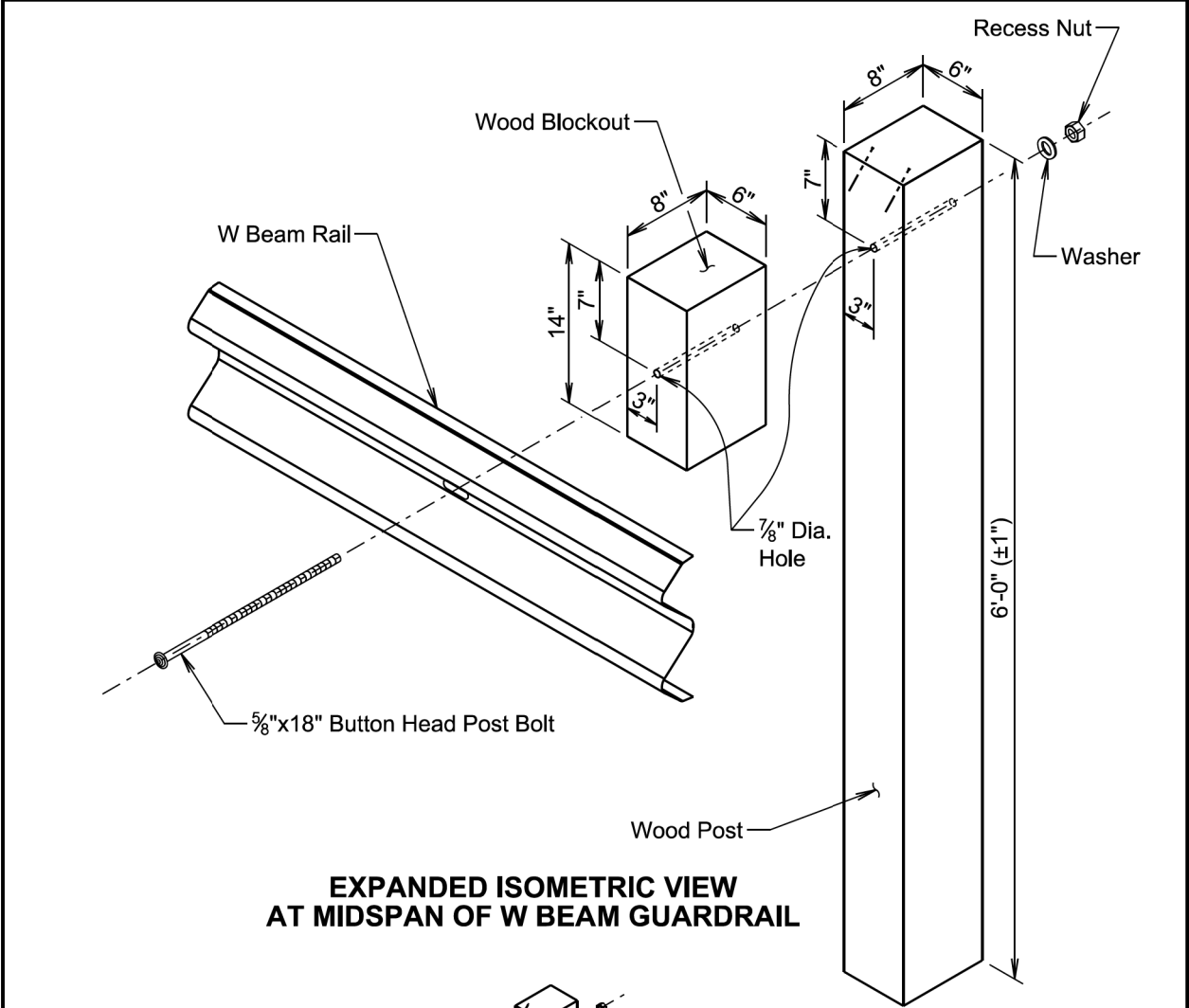
W beam rail section lengths may be 12'-6" and/or 25'-0". The combination of section lengths used will be compatible with the total length of rail per site as shown in the plans.

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.

The top of post and top of block will have a true square cut. The top of block will be a maximum of ± 1/2 inch from the top of the post.

September 14, 2019

<i>Published Date: 2027</i>	S D D O T	W BEAM GUARDRAIL	PLATE NUMBER 630.10
			Sheet 1 of 5

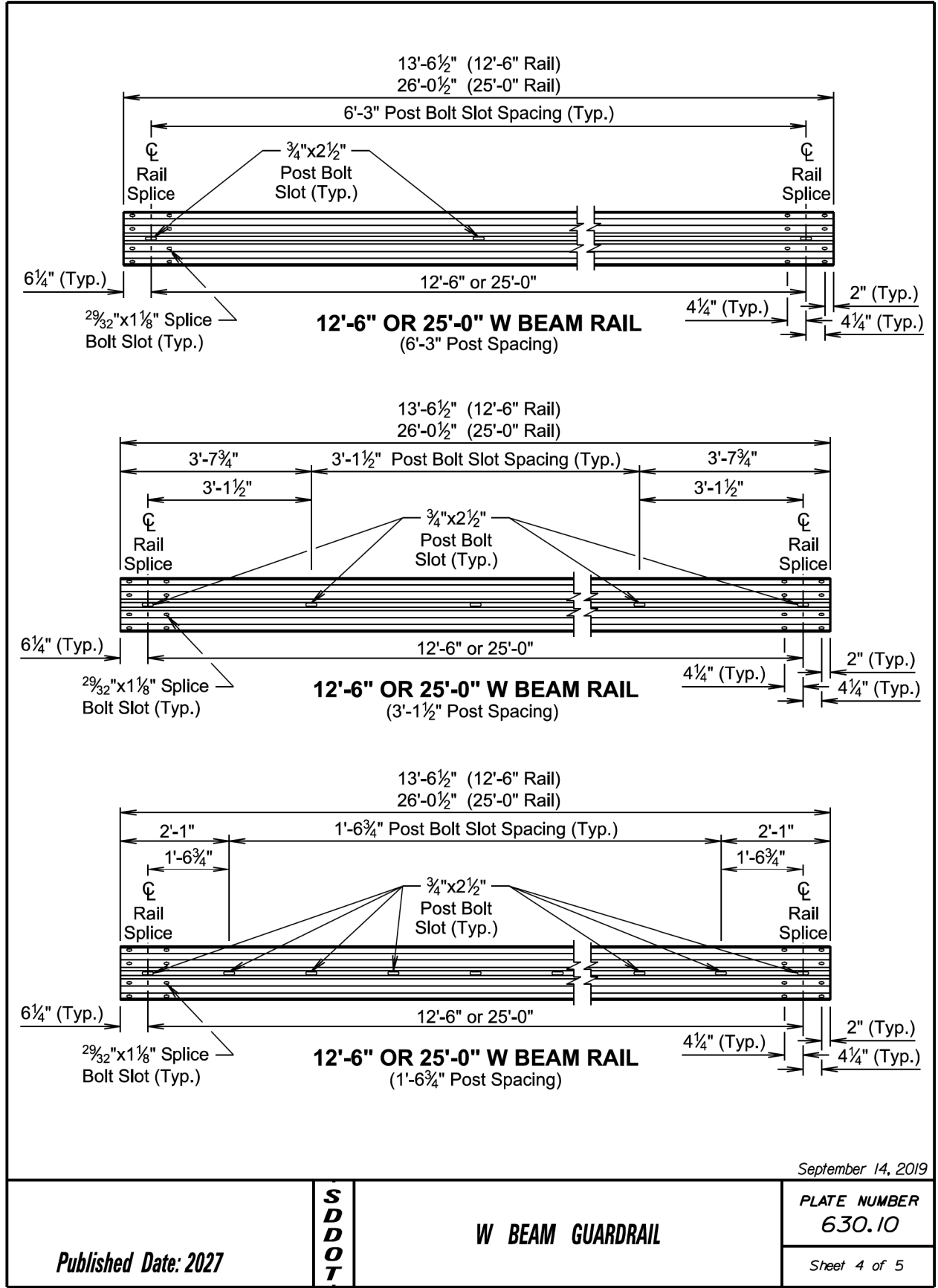
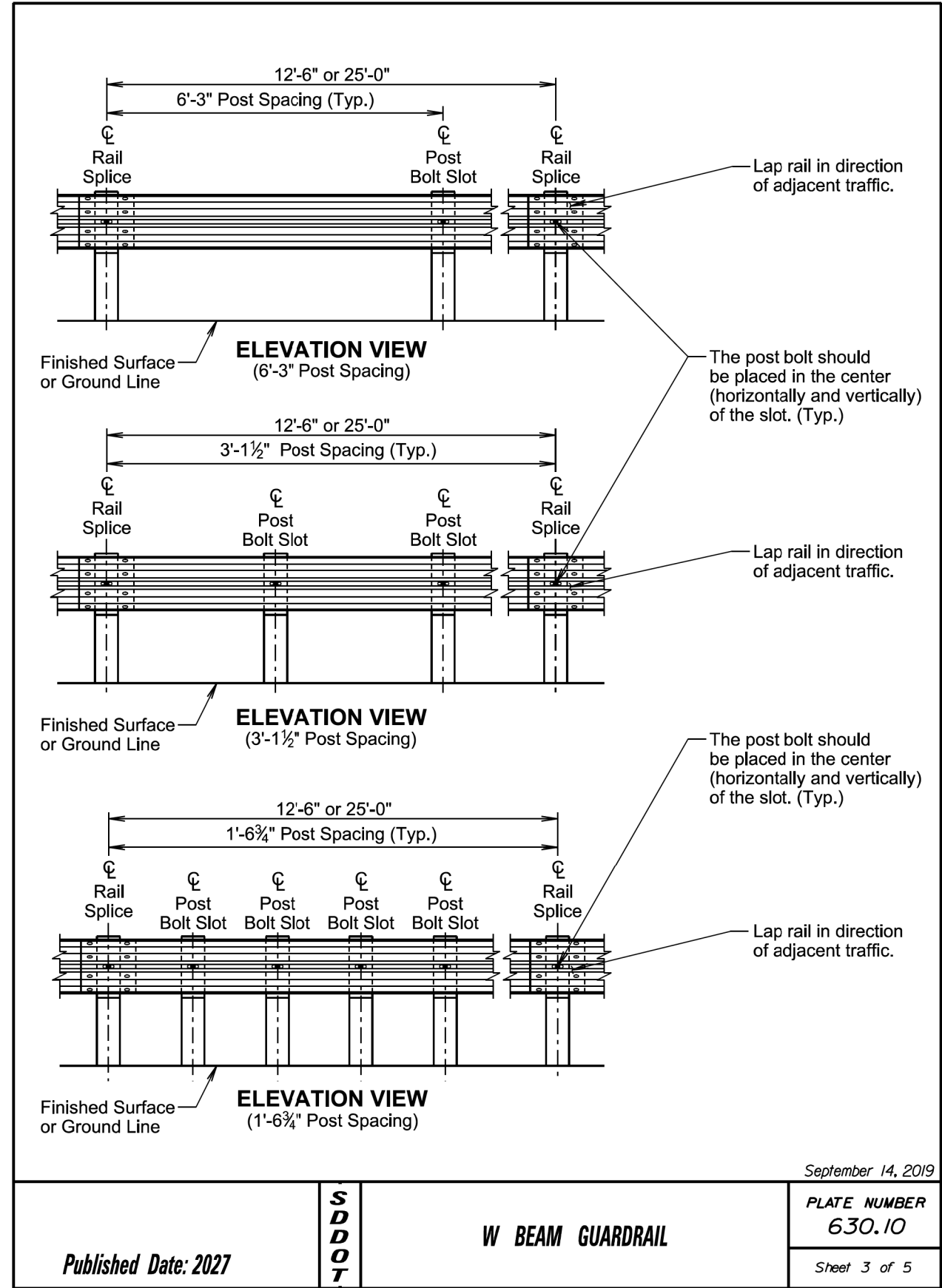


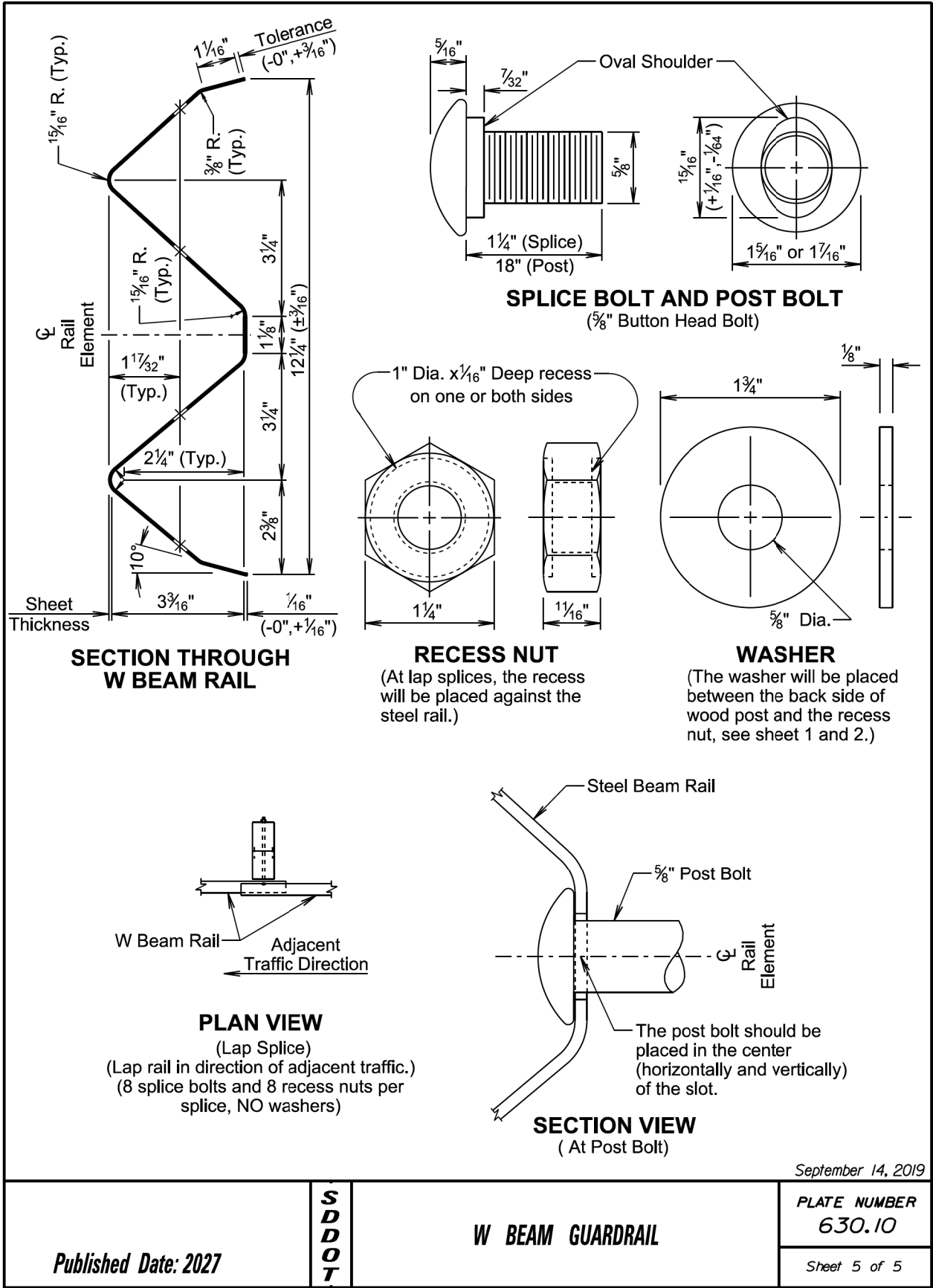
**EXPANDED ISOMETRIC VIEW
AT MIDSPAN OF W BEAM GUARDRAIL**

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

September 14, 2019

<i>Published Date: 2027</i>	S D D O T	W BEAM GUARDRAIL	PLATE NUMBER 630.10
			Sheet 2 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'-1 1/2"
3	Single	6"x12"x14"	Wood	6"x8"x6'-0"	Wood	1'-6 3/4"
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.

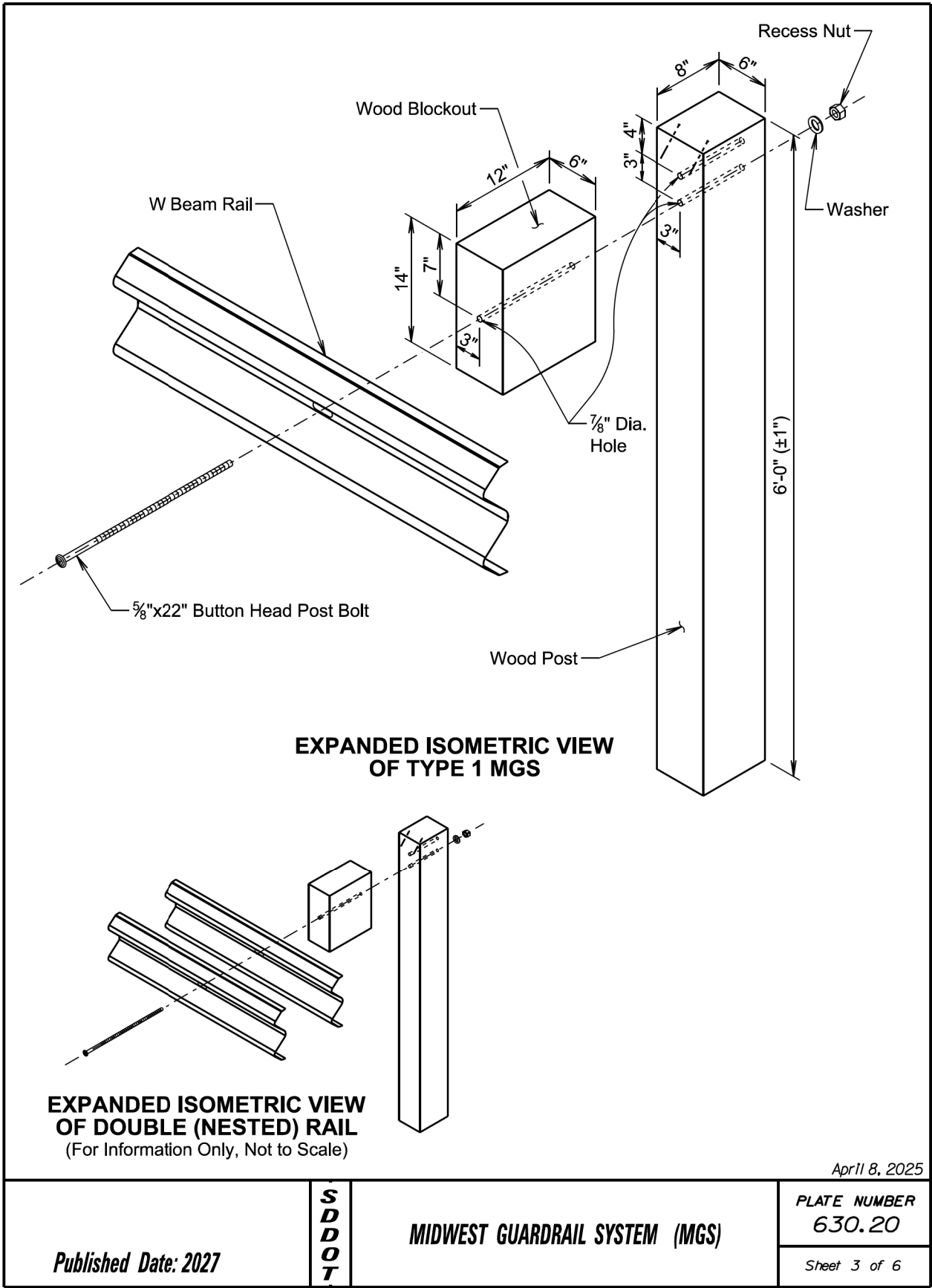
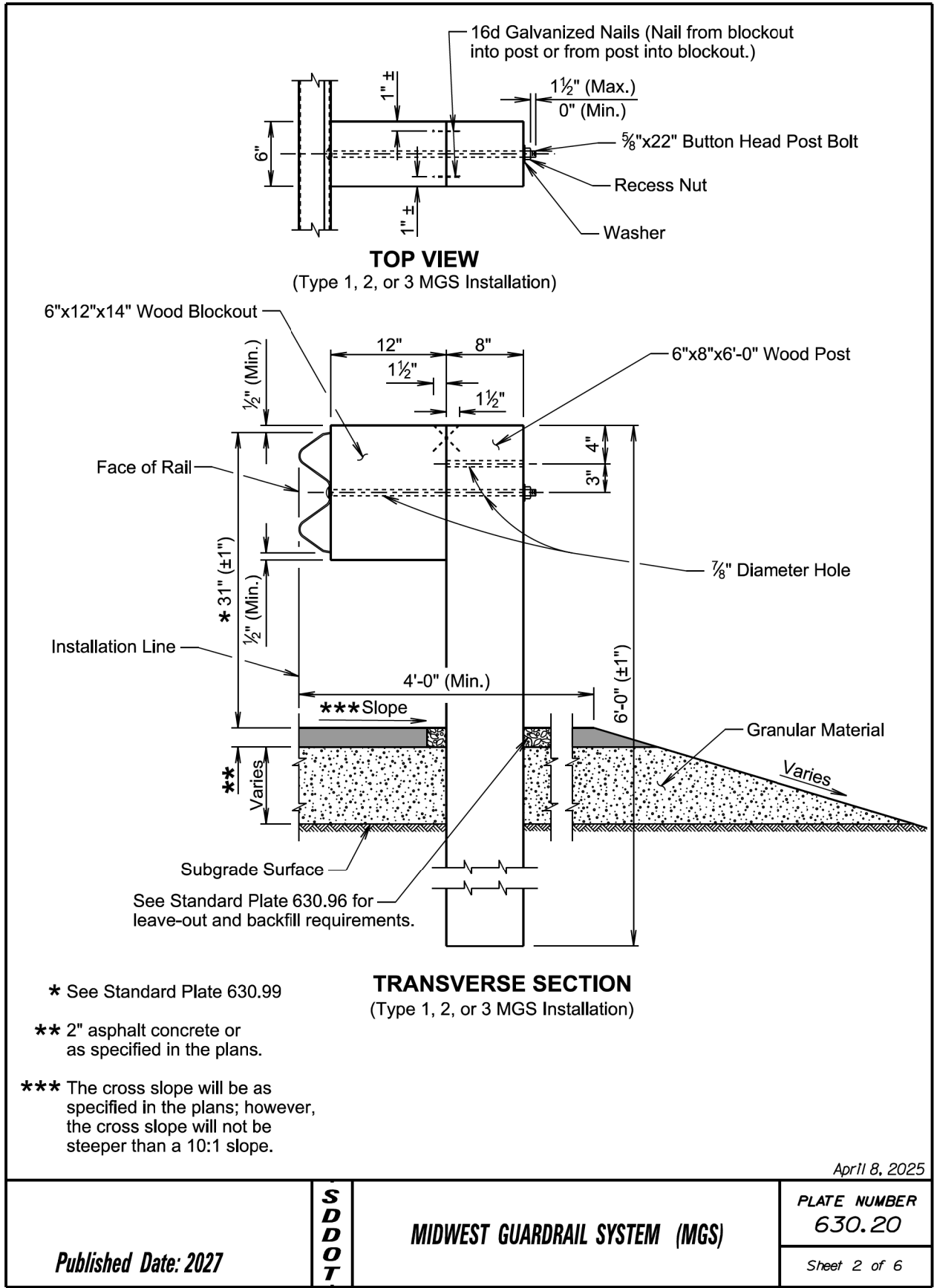
W beam rail section lengths may be 12'-6" and/or 25'-0". The combination of section lengths used will be compatible with the total length of rail per site as shown in the plans.

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.

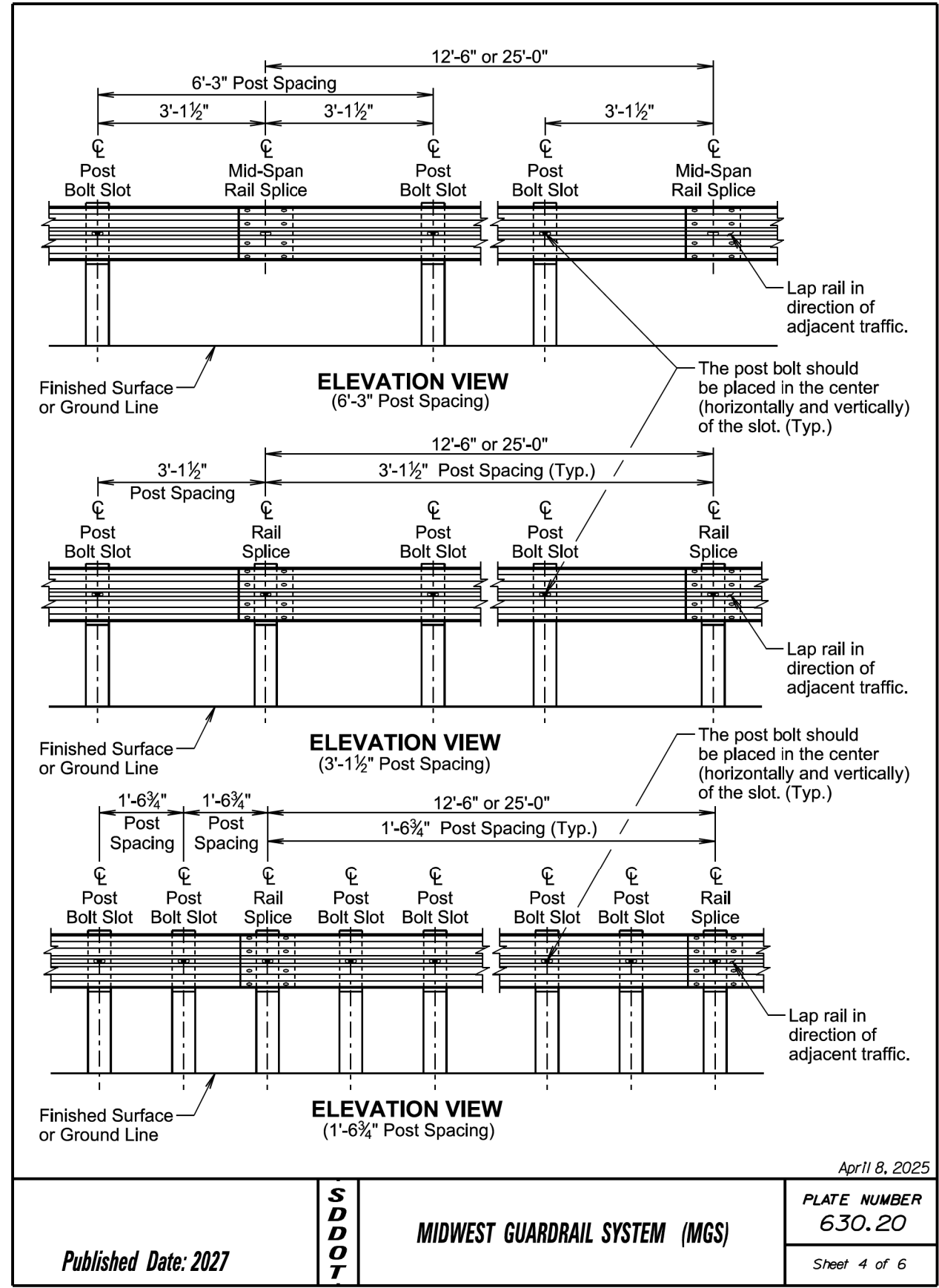
April 8, 2025

Published Date: 2027	S D D O T	MIDWEST GUARDRAIL SYSTEM (MGS)	PLATE NUMBER 630.20
			Sheet 1 of 6



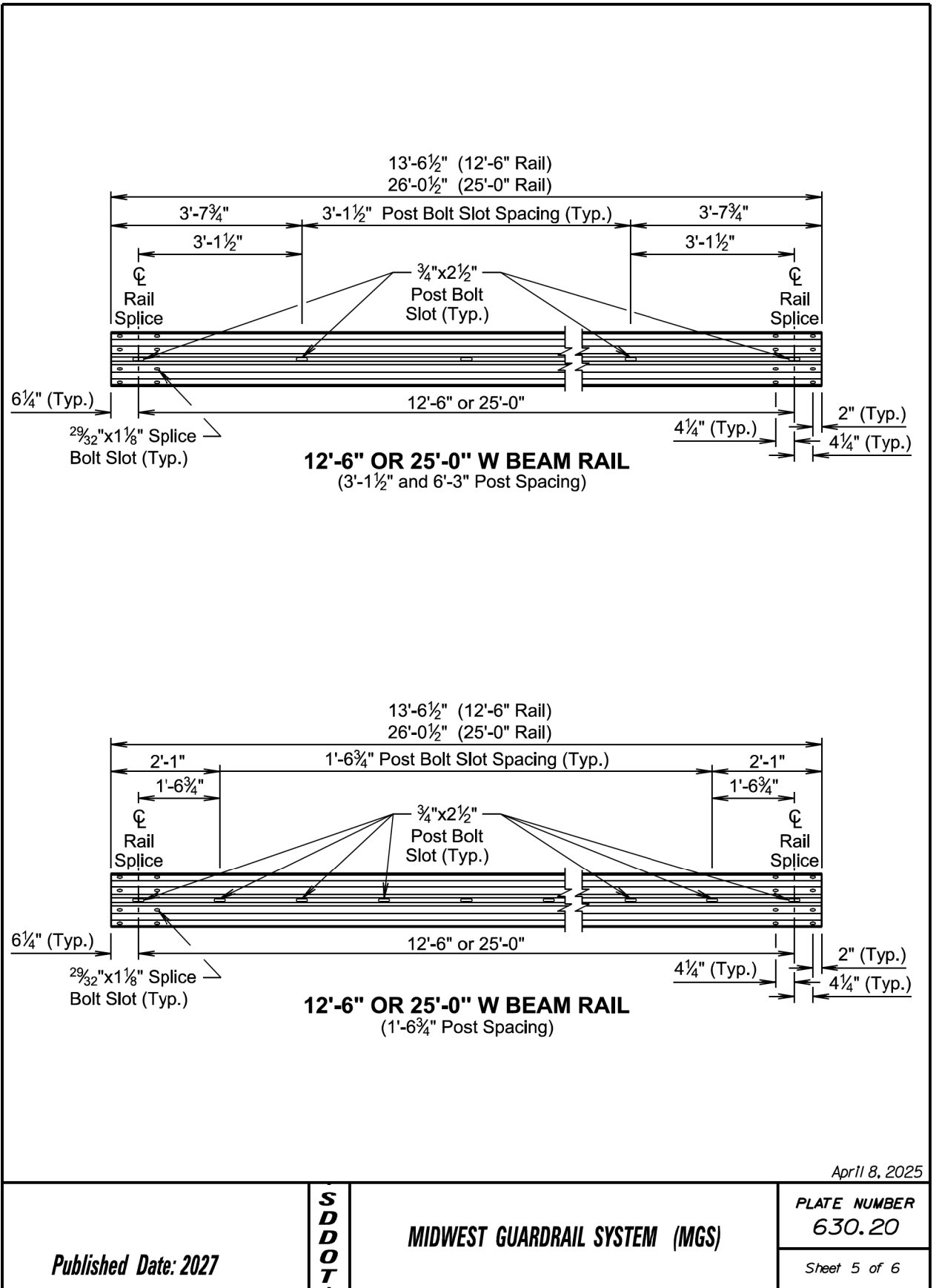
Plot Scale - 1:200

Plotted From - TRPR17190

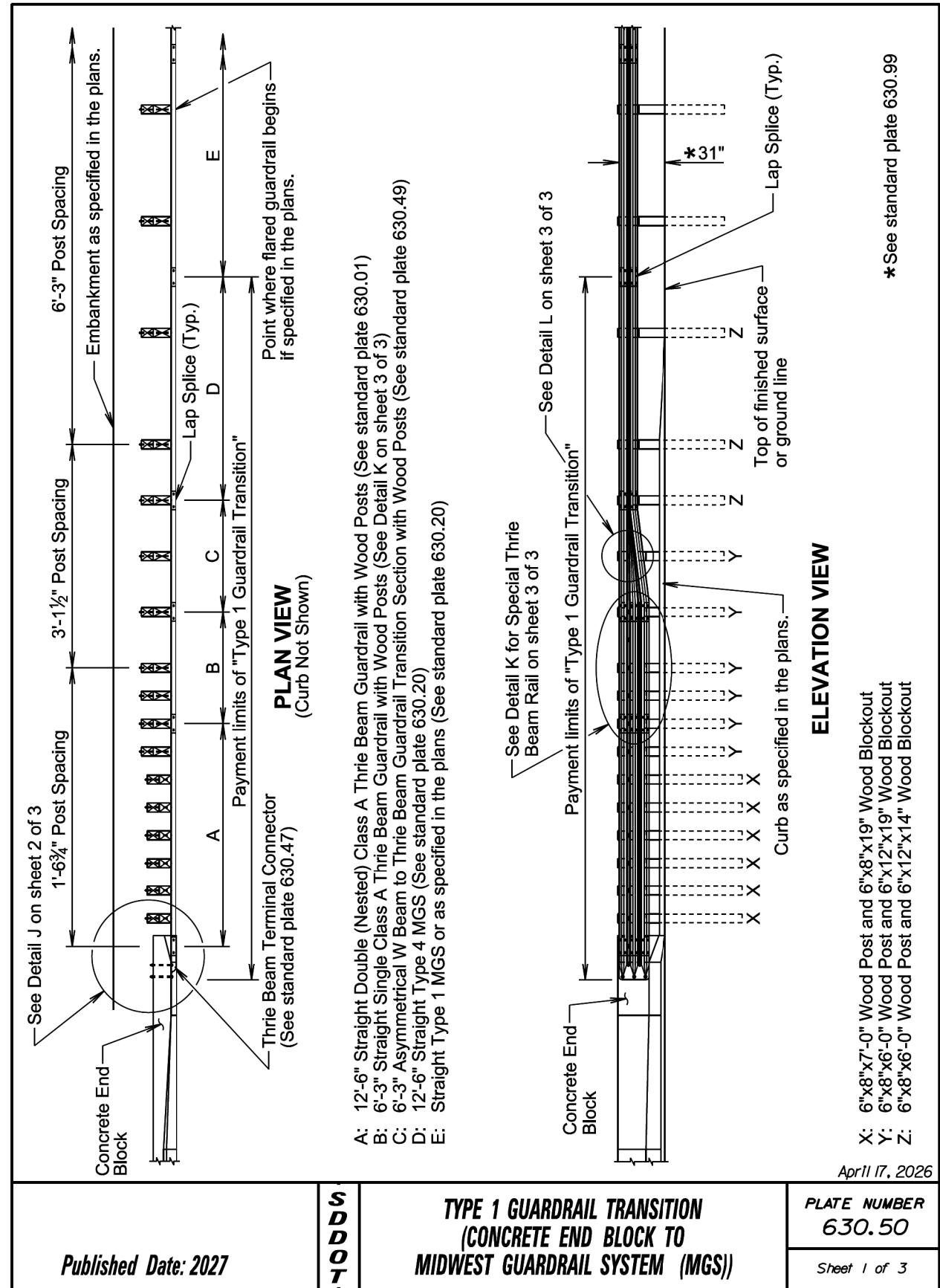
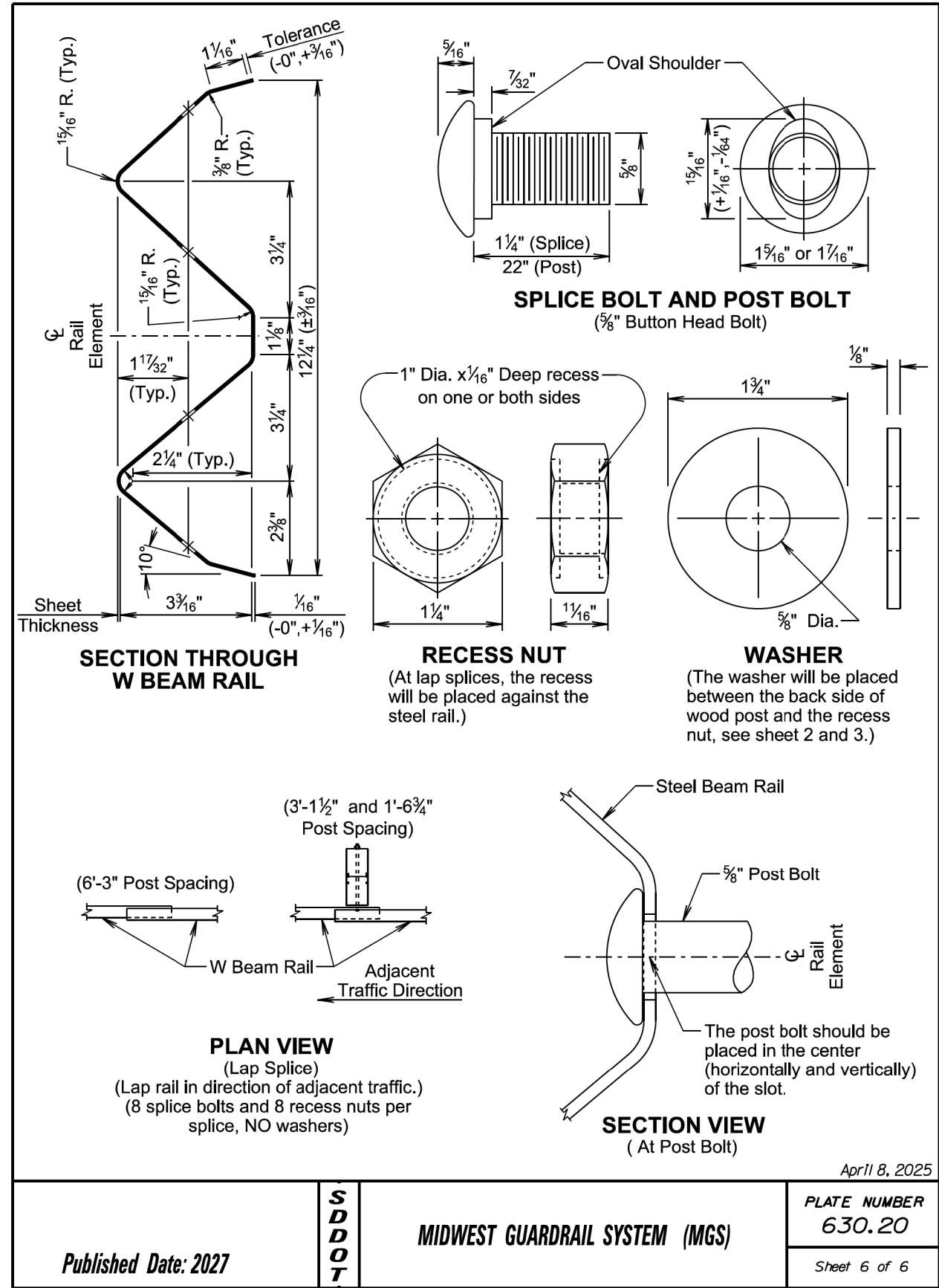


STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0212(207)40	B61	B73

Plotting Date: 06/01/2026

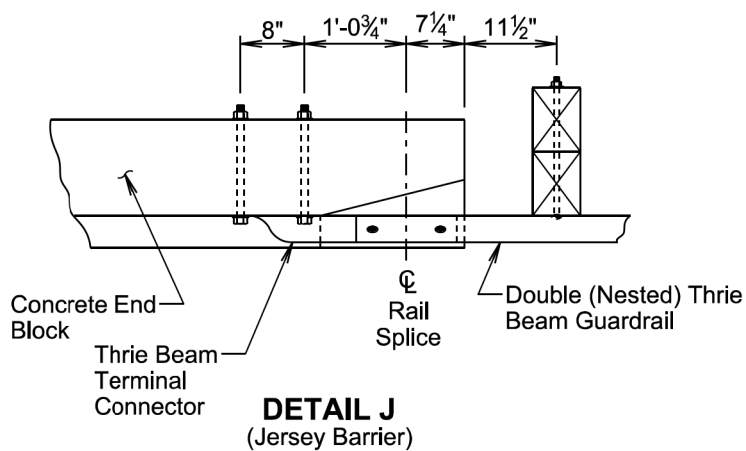
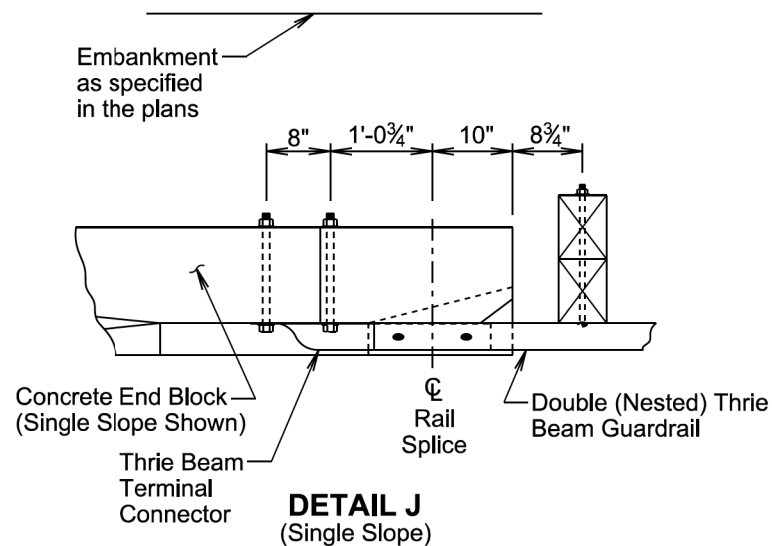


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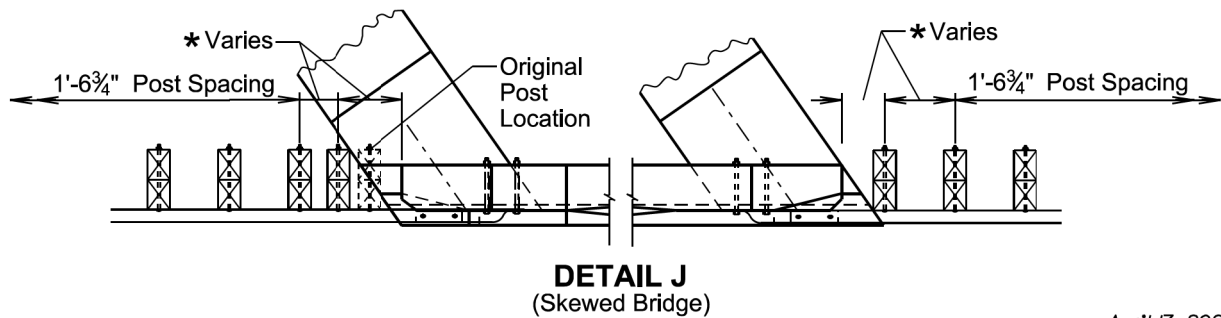


STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0212(207)40	B63	B73

Plotting Date: 06/01/2026

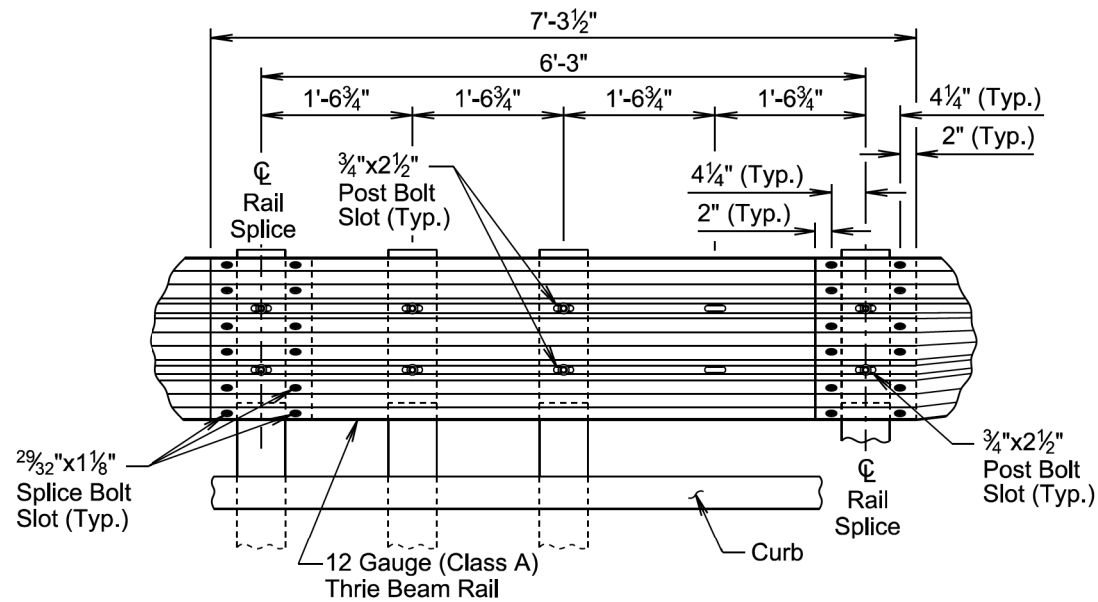
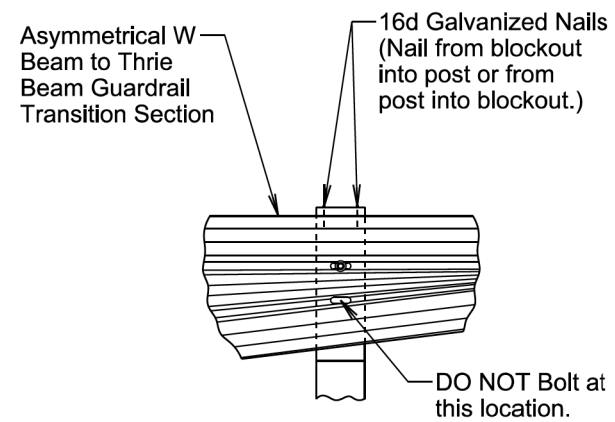


*Due to the skew of the bridge, the placement of the first "X" post and blockout will need to be moved from the original location. It will need to be installed as close as possible to the wingwall provided that the second "X" post and blockout is located in its original location.



April 17, 2026

<i>Published Date: 2027</i>	S D D O T	TYPE 1 GUARDRAIL TRANSITION (CONCRETE END BLOCK TO MIDWEST GUARDRAIL SYSTEM (MGS))	PLATE NUMBER 630.50
			Sheet 2 of 3



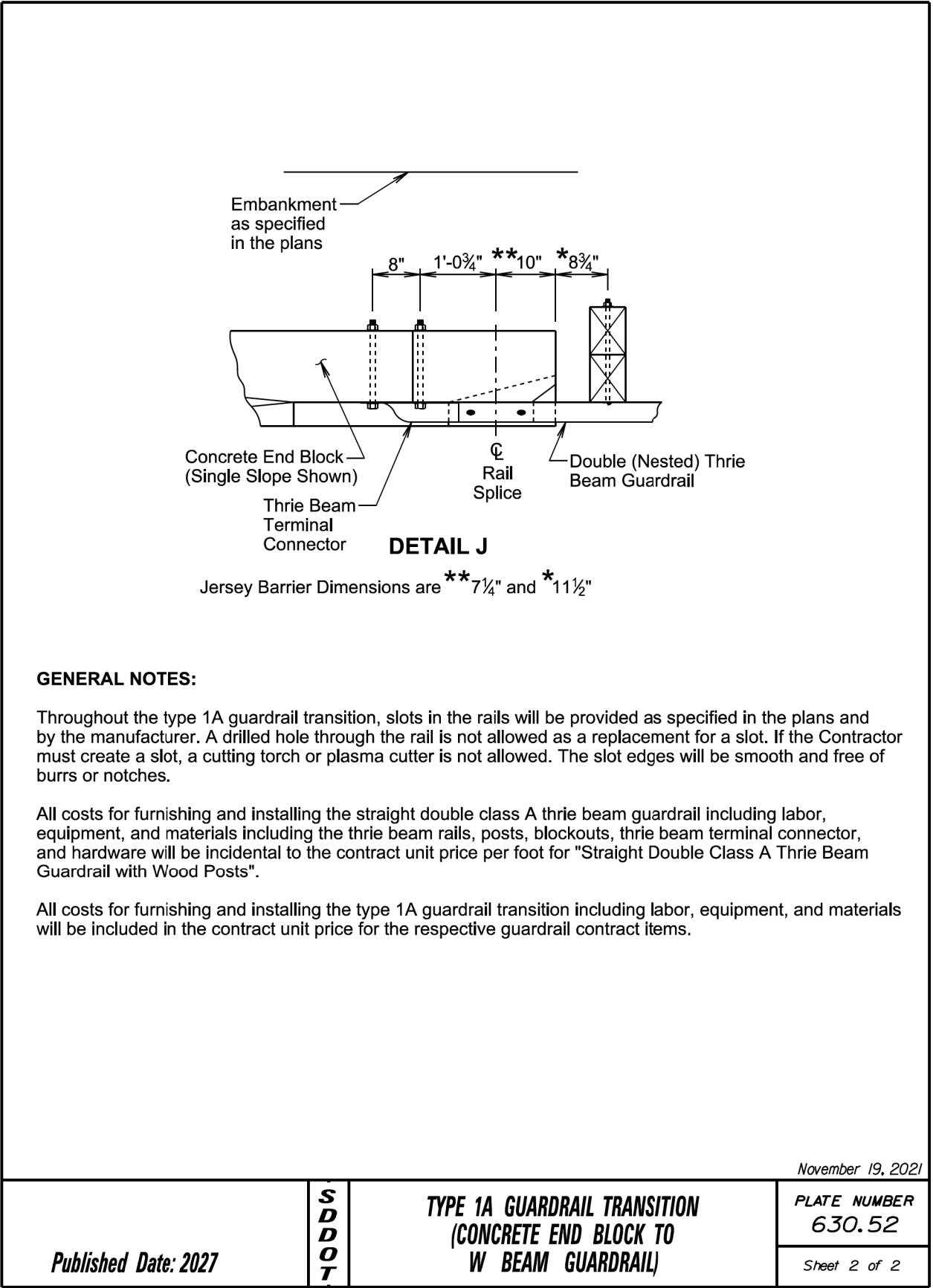
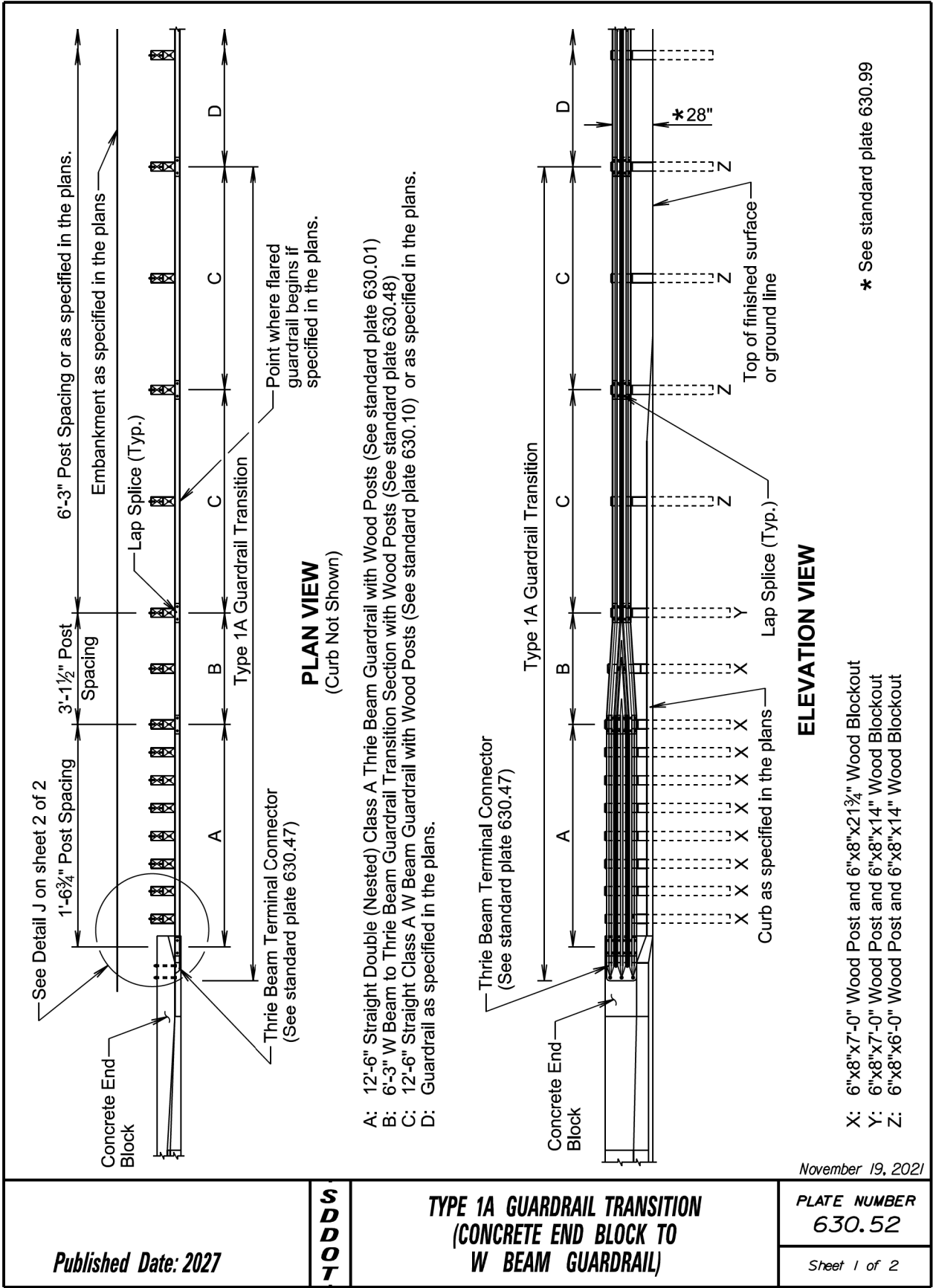
GENERAL NOTES:

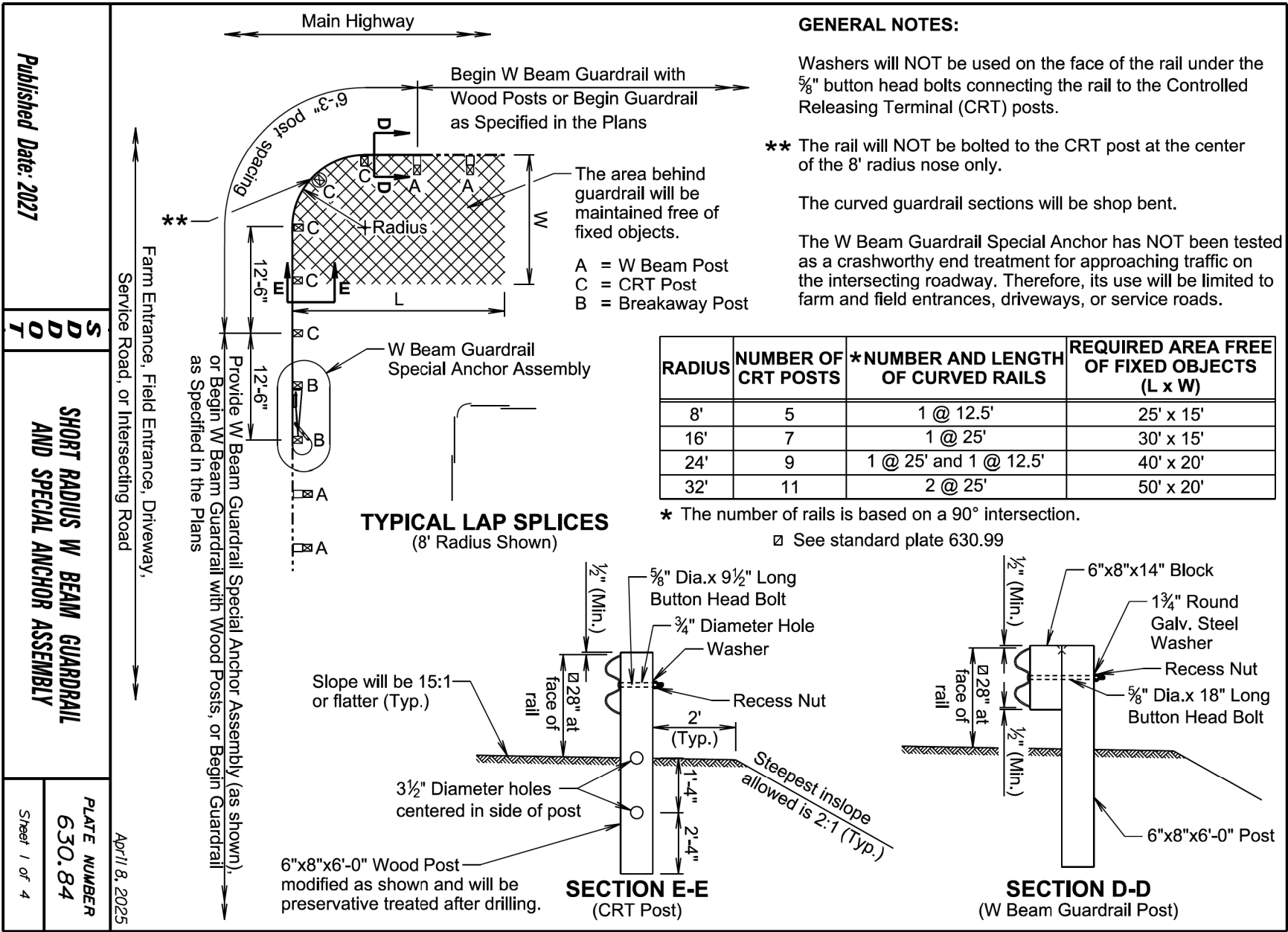
Throughout the type 1 guardrail transition, slots in the rails will be provided as specified in the plans and by the manufacturer. A drilled hole through the rail is not allowed as a replacement for a slot. If the Contractor must create a slot, a cutting torch or plasma cutter is not allowed. The slot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

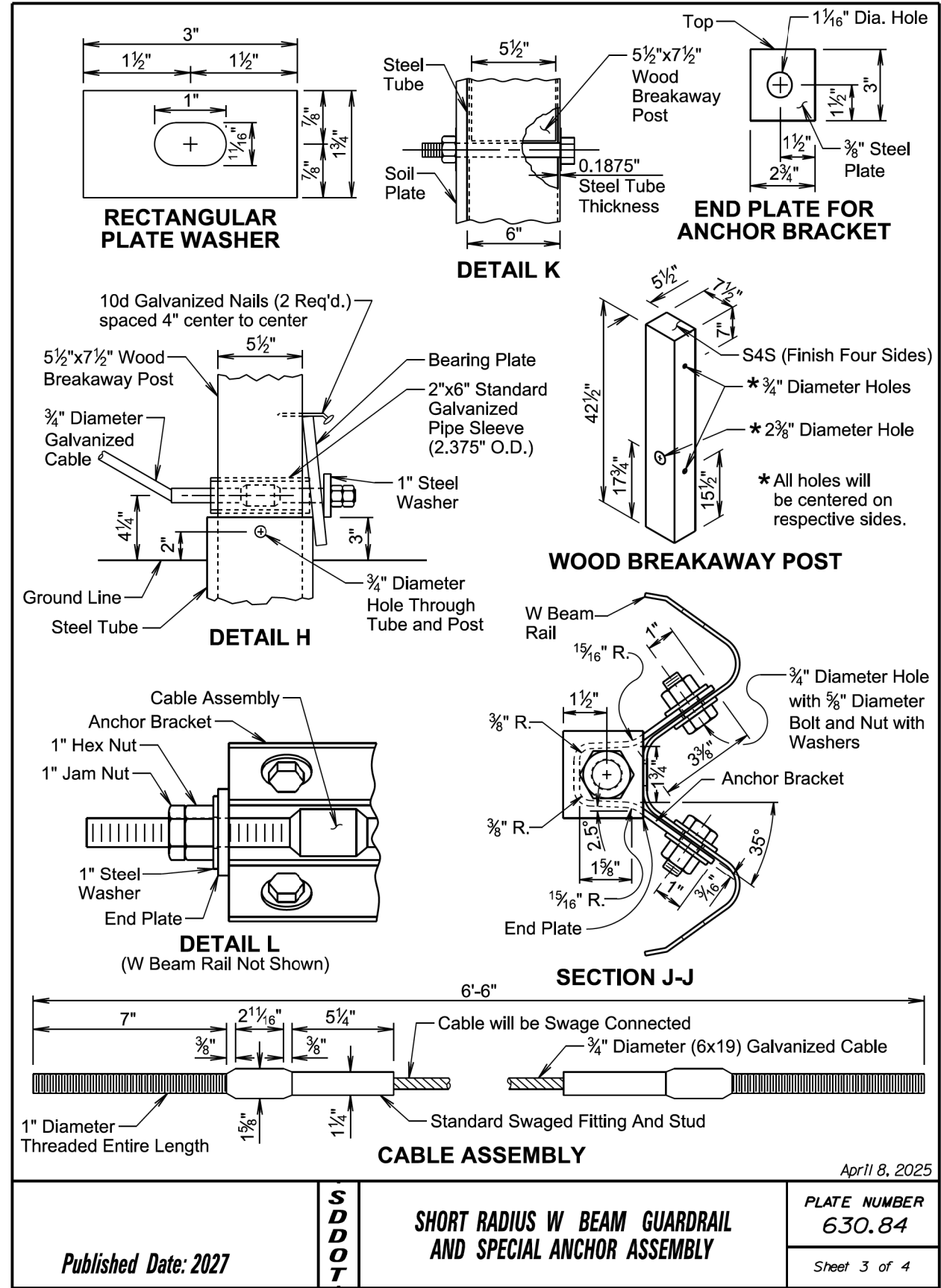
All costs for furnishing and installing the type 1 guardrail transition including labor, equipment, and materials which includes all rail sections, posts and blockouts, hardware, and incidentals will be included in the contract unit price per each for "Type 1 Guardrail Transition".

April 17, 2026

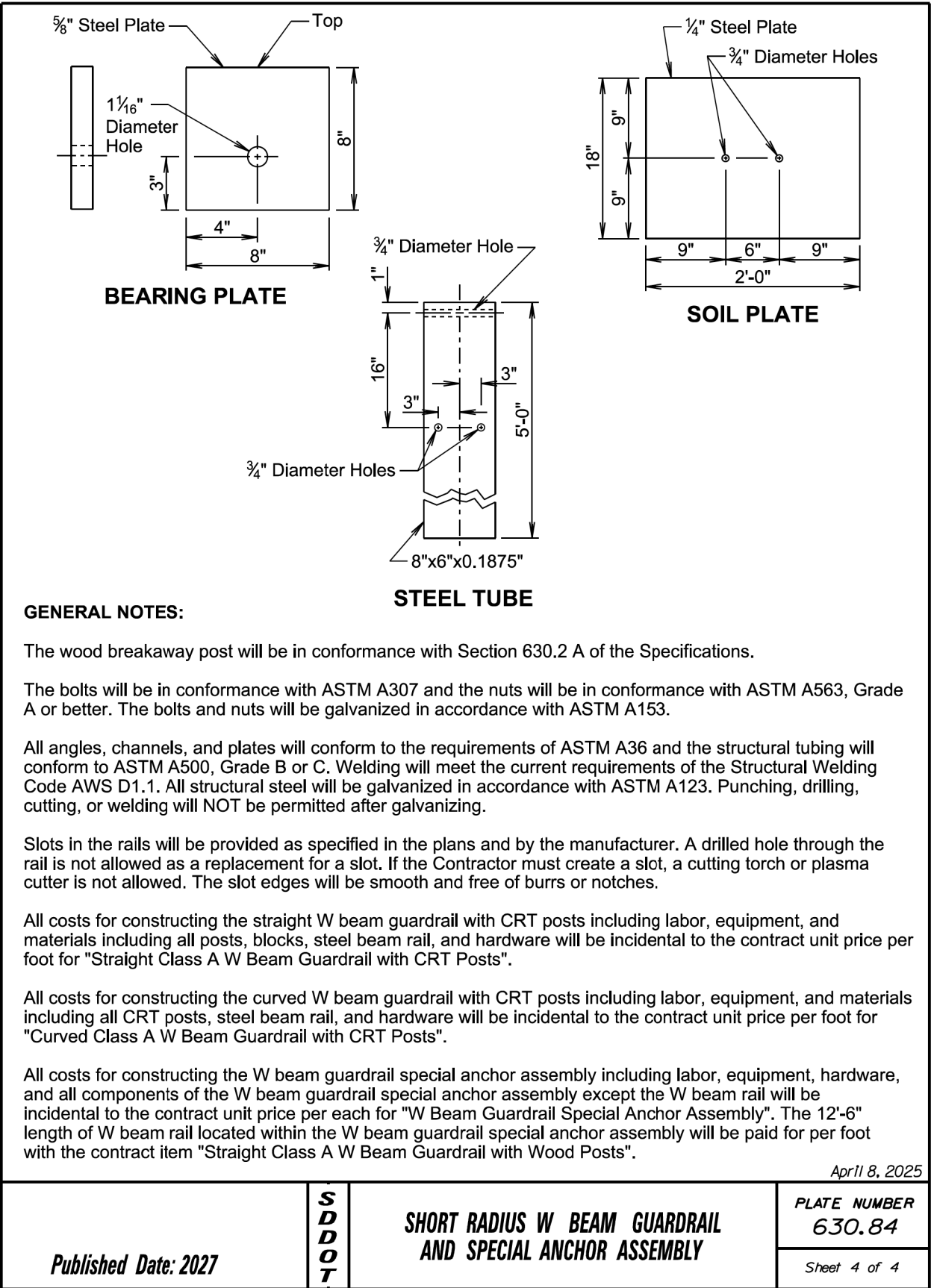
<i>Published Date: 2027</i>	S D D O T	TYPE 1 GUARDRAIL TRANSITION (CONCRETE END BLOCK TO MIDWEST GUARDRAIL SYSTEM (MGS))	PLATE NUMBER 630.50
			Sheet 3 of 3



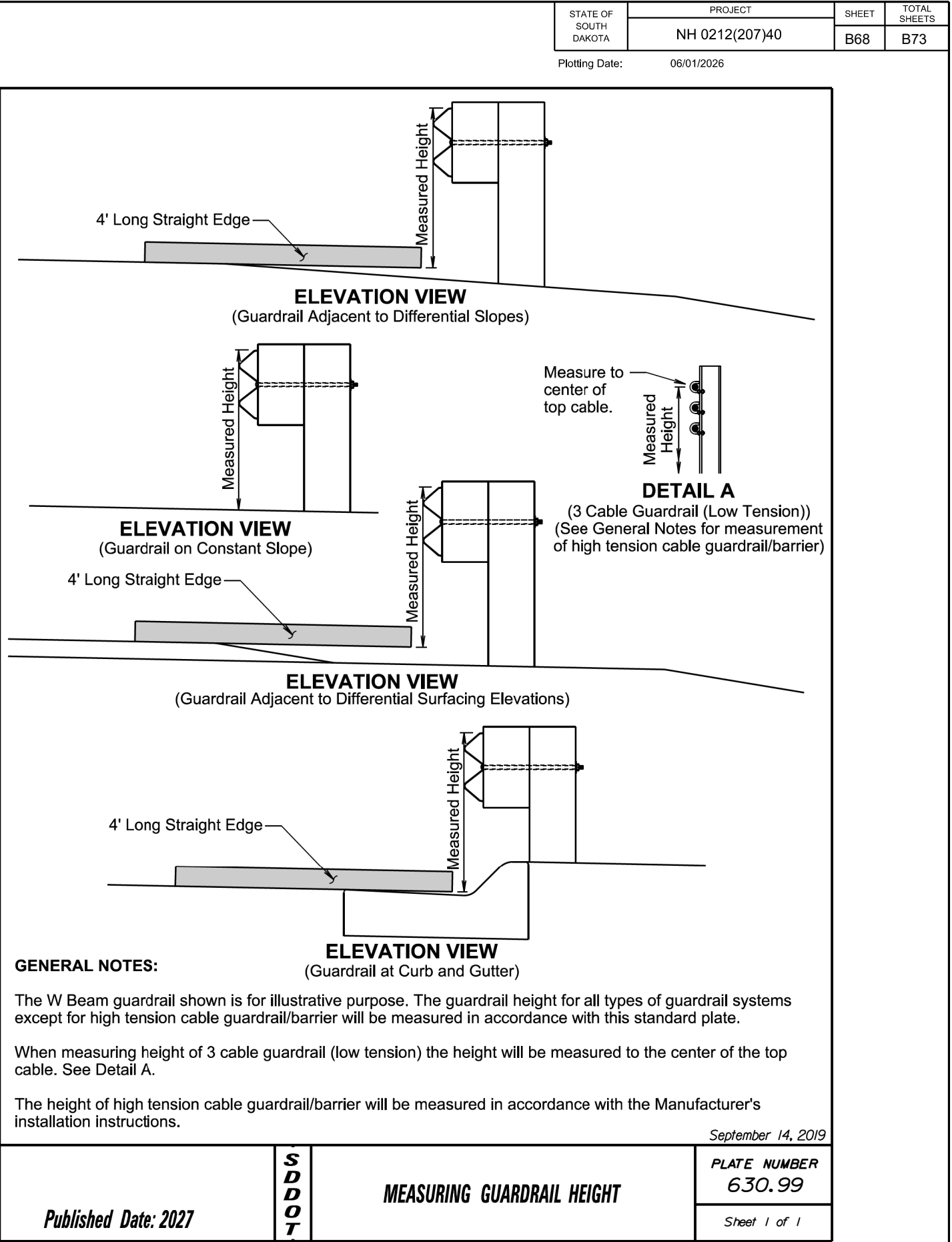
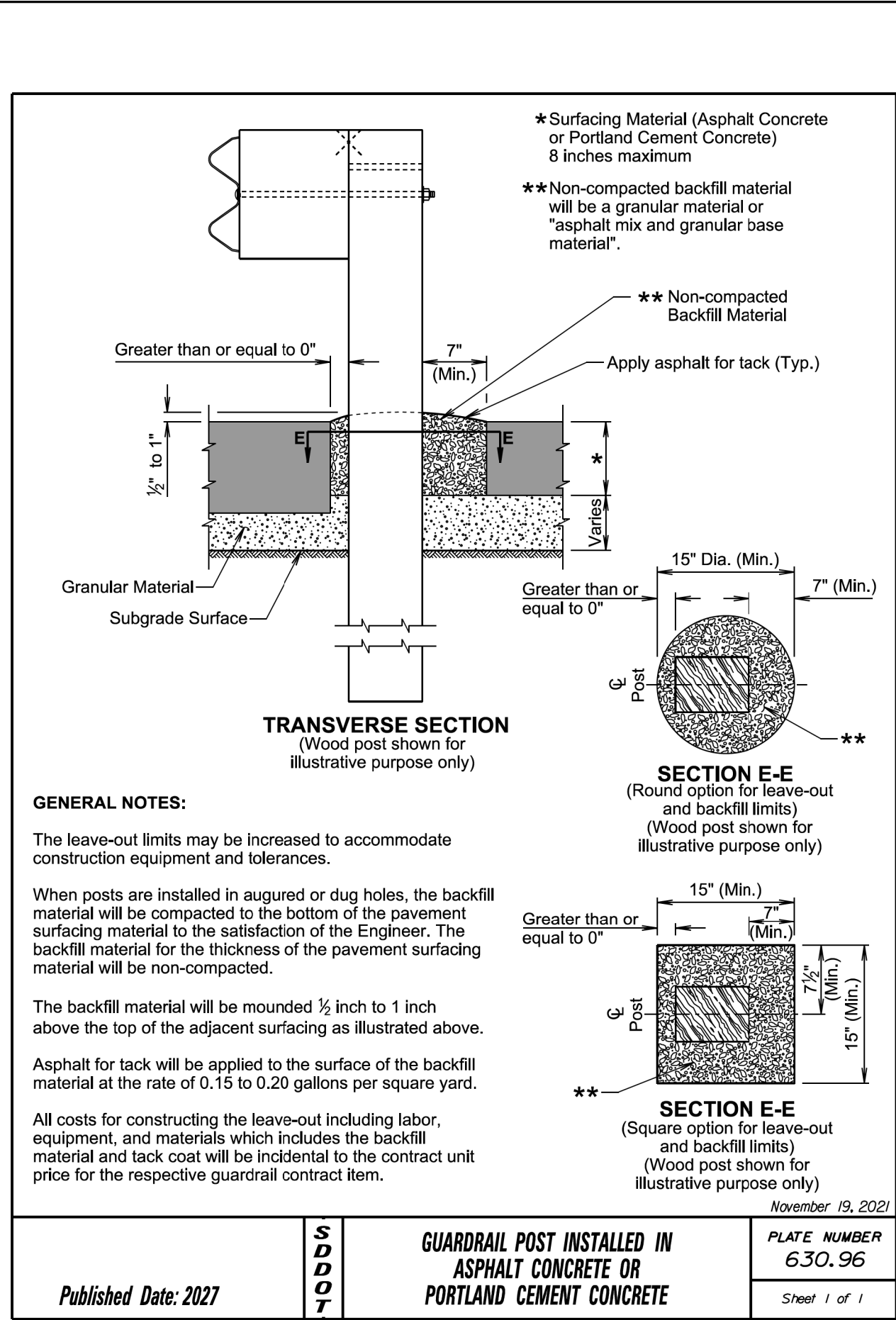


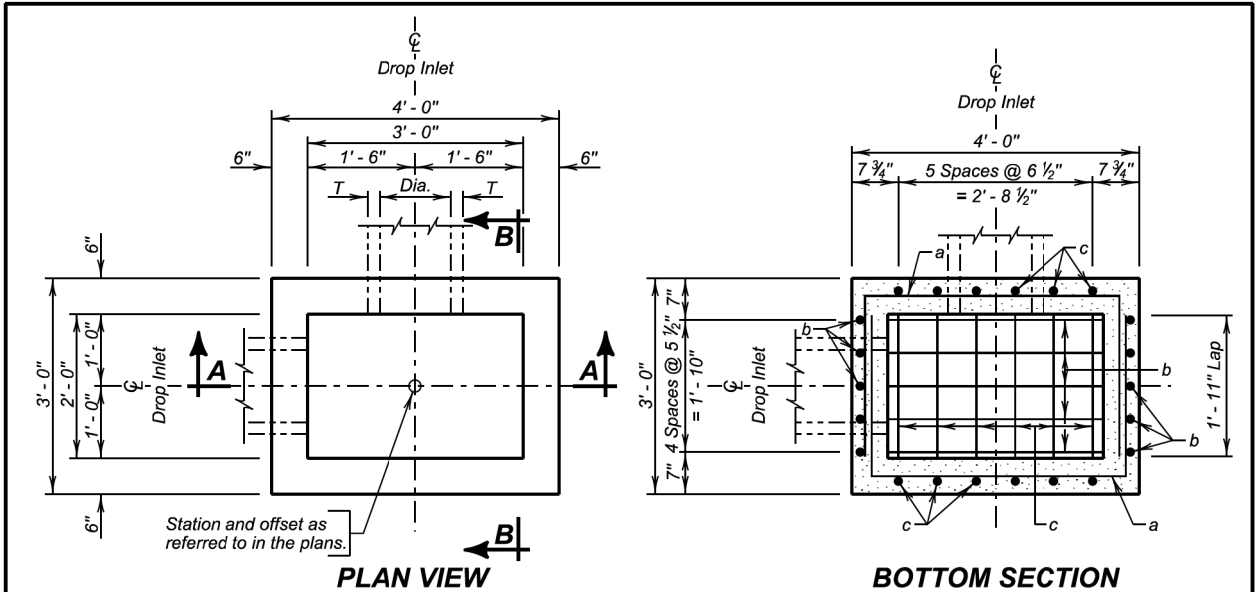


Published Date: 2027	S D D O T	SHORT RADIUS W BEAM GUARDRAIL AND SPECIAL ANCHOR ASSEMBLY	PLATE NUMBER 630.84
			Sheet 3 of 4



Published Date: 2027	S D D O T	SHORT RADIUS W BEAM GUARDRAIL AND SPECIAL ANCHOR ASSEMBLY	PLATE NUMBER 630.84
			Sheet 4 of 4





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 Version, Required Provisions, 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.

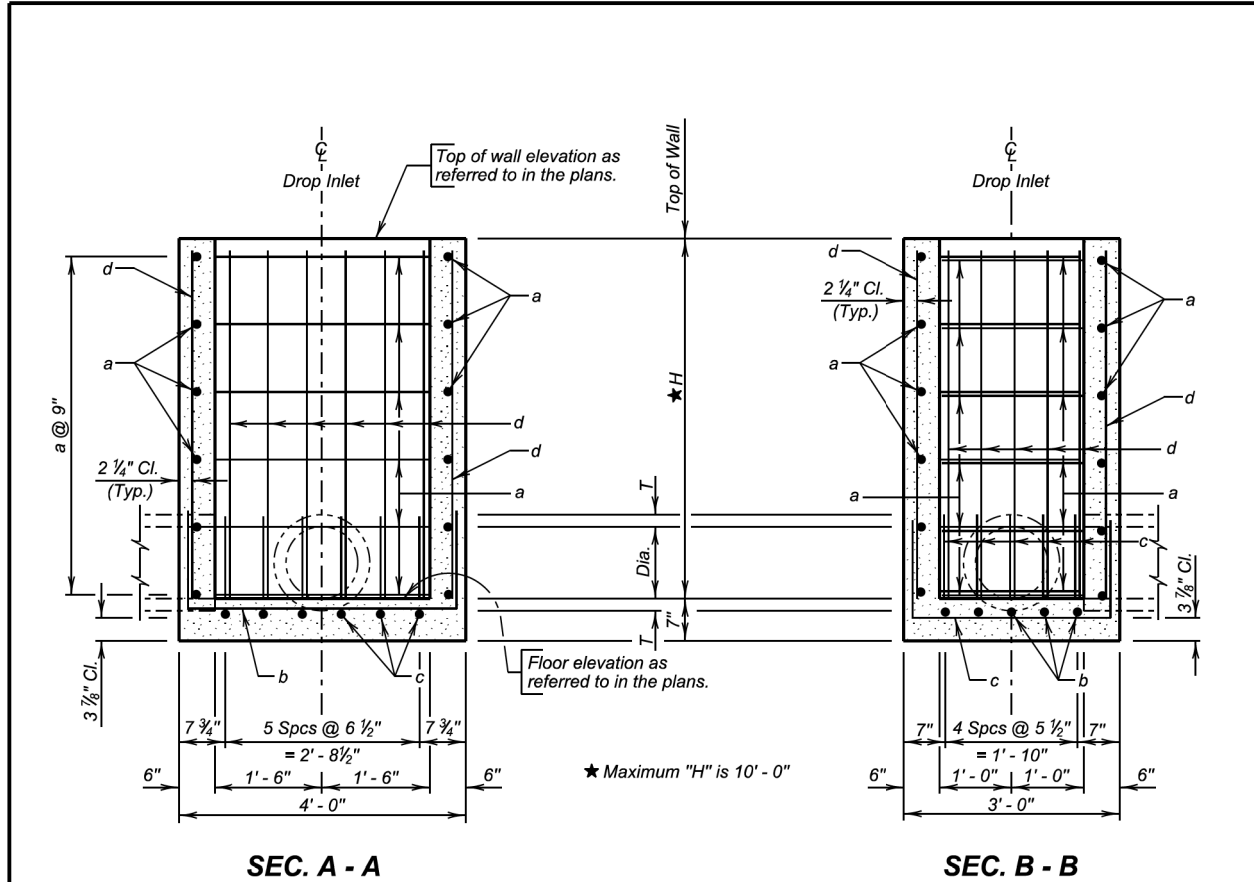
Drop inlet shown may be modified by the addition or omission of connecting pipes as noted elsewhere in the plans. All pipes entering drop inlet must fit between the inside face of walls and shall not enter through the corners.

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.

Apr11 17, 2026

Published Date: 2027	S D D O T	2' X 3' TYPE B REINFORCED CONCRETE DROP INLET	PLATE NUMBER 670.01
			Sheet 1 of 2



SEC. A - A

SEC. B - B

REINFORCING SCHEDULE				
Mk.	No.	Size	Length	Type
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.

Apr11 17, 2026

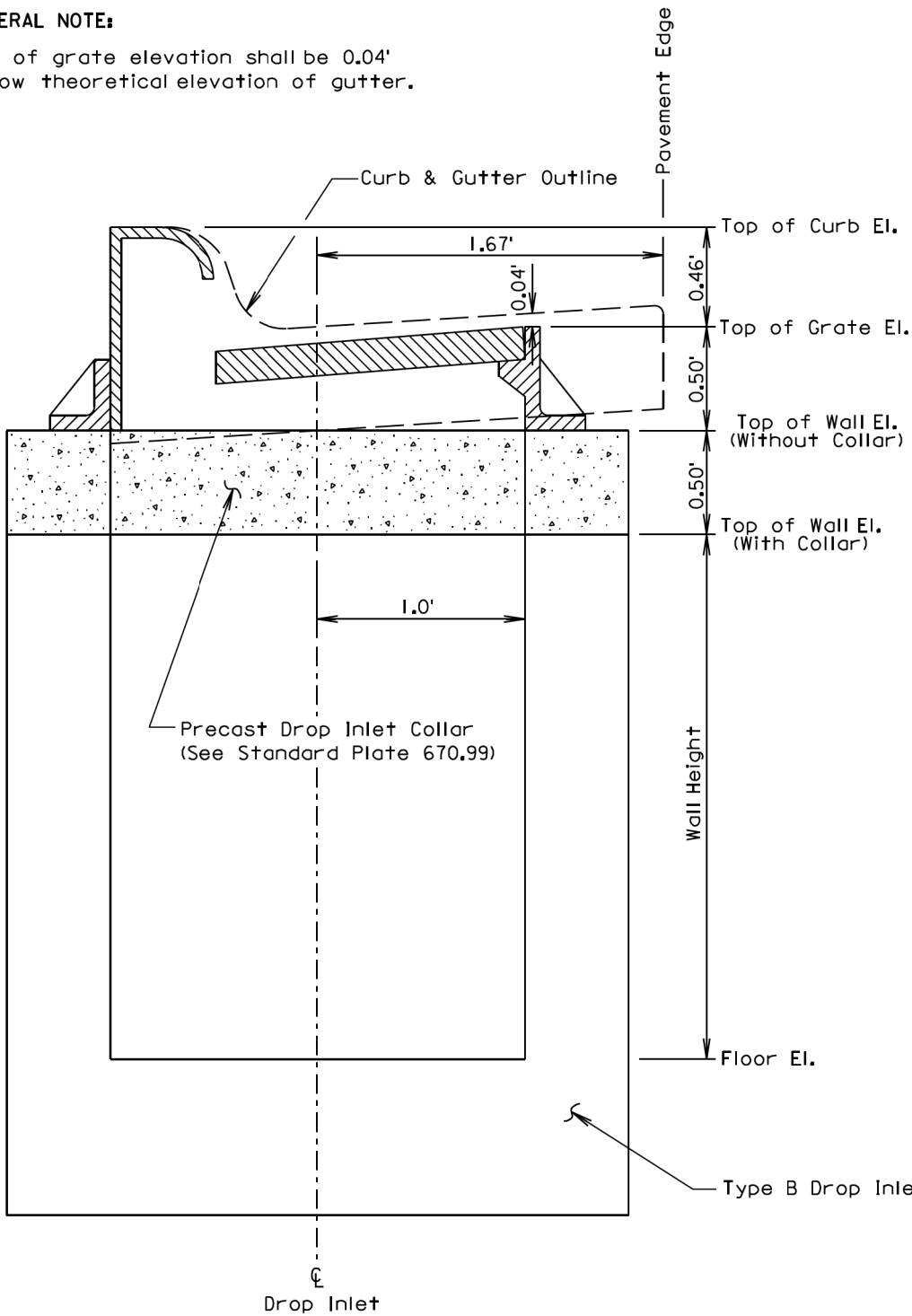
Published Date: 2027	S D D O T	2' X 3' TYPE B REINFORCED CONCRETE DROP INLET	PLATE NUMBER 670.01
			Sheet 2 of 2

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0212(207)40	B70	B73

Plotting Date: 06/01/2026

GENERAL NOTE:

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



June 26, 2011

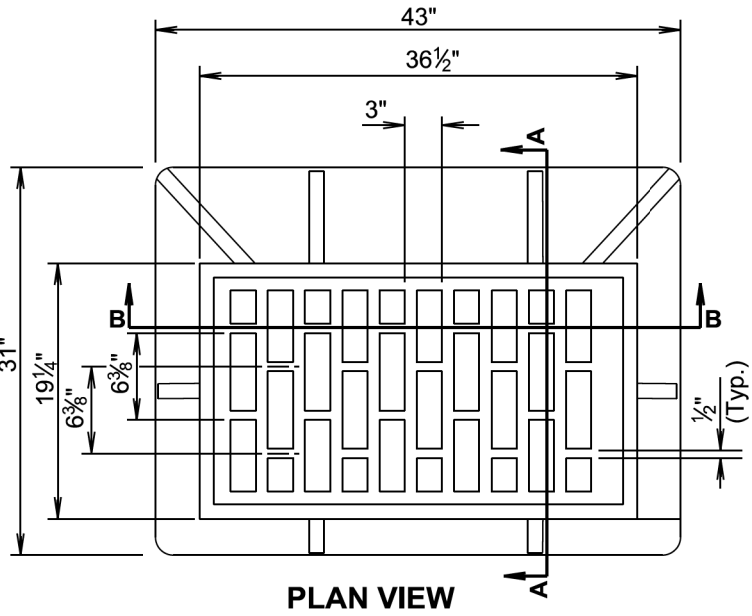
Published Date: 2027

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INSTALLATION OF TYPE B DROP INLET

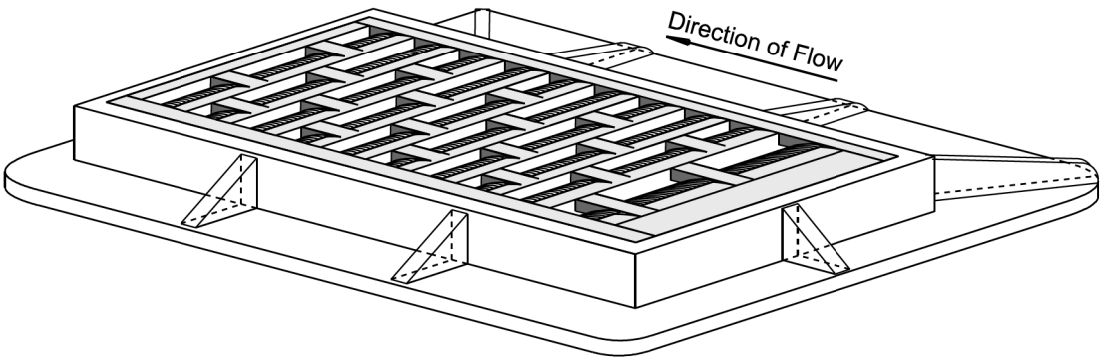
PLATE NUMBER
670.75

Sheet 1 of 1



SECTION B-B

SECTION A-A



ISOMETRIC VIEW

March 31, 2024

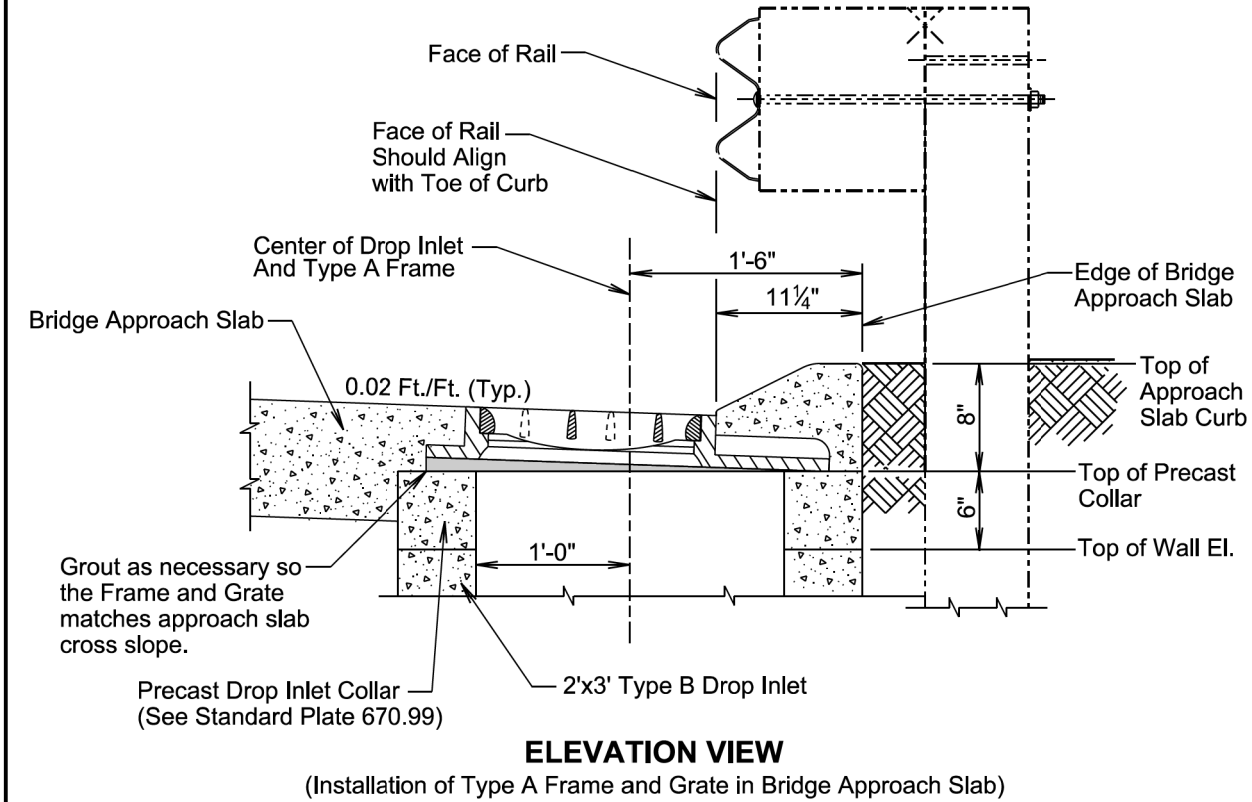
Published Date: 2027

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TYPE A FRAME AND GRATE

PLATE NUMBER
670.78

Sheet 1 of 2



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.

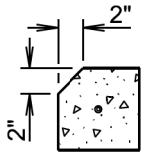
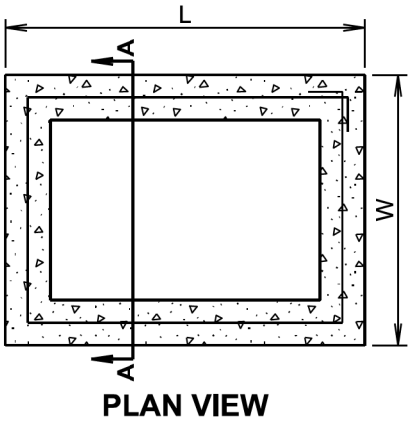
Design load for the grate will meet the requirements of AASHTO HL-93.

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.

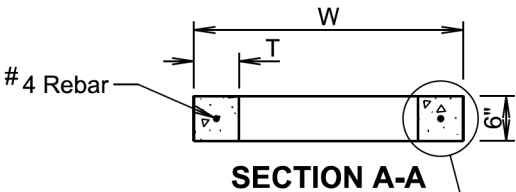
March 31, 2024

<i>Published Date: 2027</i>	S D D O T	TYPE A FRAME AND GRATE	PLATE NUMBER 670.78
			Sheet 2 of 2



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

DETAIL B



See Detail B
(For Type D
Drop Inlets Only)

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:

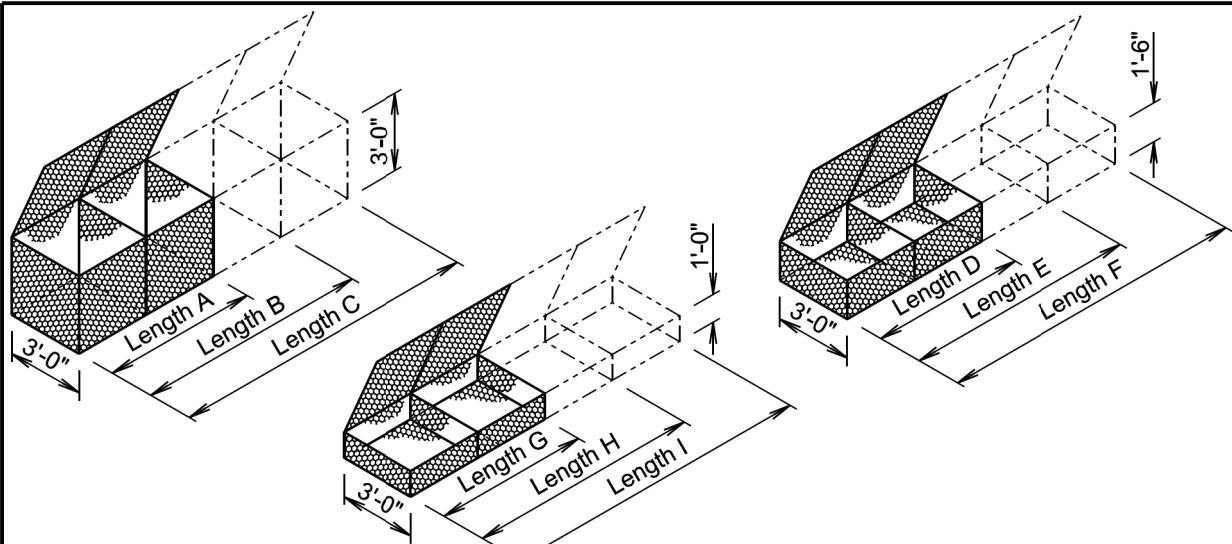
All reinforcing steel will conform to ASTM A615, Grade 60.

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

<i>Published Date: 2027</i>	S D D O T	PRECAST DROP INLET COLLAR	PLATE NUMBER 670.99
			Sheet 1 of 1



GABION DETAILS

STANDARD SIZES					
SIZE	LENGTH	WIDTH	HEIGHT	NUMBER OF CELLS	CAPACITY (Cu. Yd.)
A	6'-0"	3'-0"	3'-0"	2	2.0
B	9'-0"	3'-0"	3'-0"	3	3.0
C	12'-0"	3'-0"	3'-0"	4	4.0
D	6'-0"	3'-0"	1'-6"	2	1.0
E	9'-0"	3'-0"	1'-6"	3	1.5
F	12'-0"	3'-0"	1'-6"	4	2.0
G	6'-0"	3'-0"	1'-0"	2	0.7
H	9'-0"	3'-0"	1'-0"	3	1.0
I	12'-0"	3'-0"	1'-0"	4	1.3

GENERAL NOTES:

Above dimensions subject to mill tolerances.

Lacing and internal connecting wire will be 0.0866 inch diameter steel wire ASTM A641, Class 3 soft temper measured after galvanizing and for PVC coated gabions will be 0.0866 inch diameter steel wire measured after galvanizing but before PVC coating.

The lacing procedure is as follows:

1. Cut a length of lacing wire approximately 1½ times the distance to be laced but not exceeding 5 feet.
2. Secure the wire terminal at the corner by looping and twisting.
3. Proceed lacing with alternating single and double loops at a spacing not to exceed 6 inches.
4. Securely fasten the other lacing wire terminal.

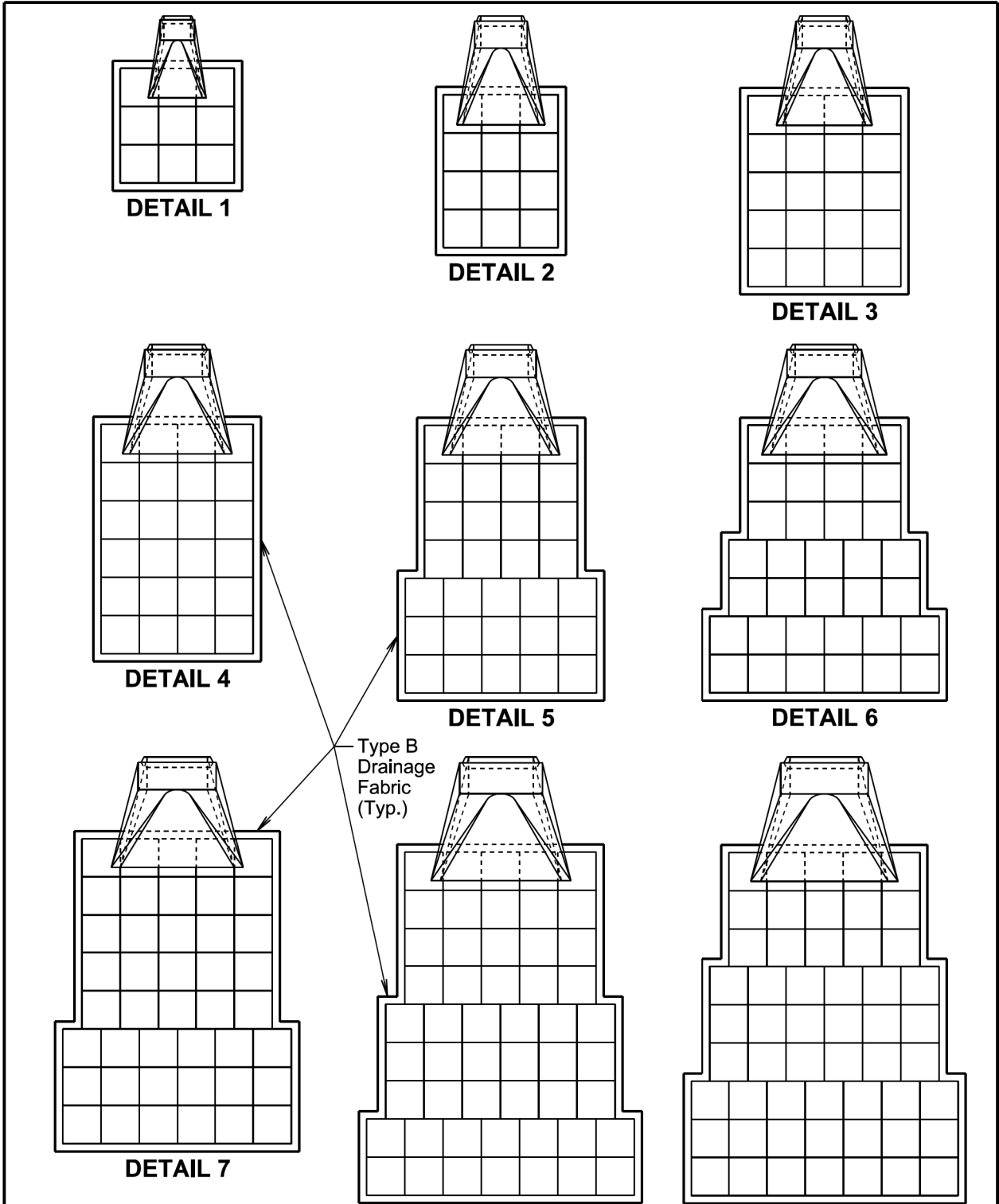
Wire lacing or interlocking type fasteners will be used for gabion assembly and final construction of gabion structures. Interlocking fasteners for galvanized gabions will be high tensile 0.120 inch diameter galvanized steel wire measured after galvanizing. The galvanizing will conform to ASTM A641-92, Class 3 coating. Fasteners will also be in accordance with ASTM A764, Class II, Type III.

Interlocking fasteners for PVC coated gabions will be high tensile 0.120 inch diameter stainless steel wire conforming to ASTM A313, Type 302, Class 1. The spacing of the interlocking fasteners during all phases of assembly and construction will not exceed 6 inches.

All fasteners will be placed where the mesh weaves around the selvage wire at the vertical and horizontal joints.

February 14, 2020

Published Date: 2027	S D D O T	BANK AND CHANNEL PROTECTION GABIONS	
		PLATE NUMBER 720.01	
		Sheet 1 of 1	



February 14, 2020

Published Date: 2027	S D D O T	BANK AND CHANNEL PROTECTION GABION PLACEMENT UNDER PIPE END SECTIONS	
		PLATE NUMBER 720.03	
		Sheet 1 of 2	

		* ESTIMATED QUANTITIES			
		Detail	Pipe Diameter (Inches)	Gabion (Cu. Yd.)	Type B Drainage Fabric (Sq. Yd.)
RCP, RCP Arch, CMP, and CMP Arch	1	12, 18, and 24	4.5	15	
	2	30 and 36	6.0	19	
	3	42	10.0	29	
	4	48 and 54	12.0	34	
	5	60	15.5	43	
	6	66	17.0	47	
	7	72	21.5	57	
	8	78	26.0	68	
	9	84	27.0	70	

GENERAL NOTES:

Gabions at outlets of CMP and RCP will be placed under the end section a distance of 2 feet from the outlet end. For CMP end section installations, the upper fabric of the gabions will be modified to accommodate the metal end section as approved by the Engineer.

★ Gabion and type B drainage fabric quantities on this standard plate are based on standard gabion sizes D, E, and F as depicted on standard plate 720.01.

Type B drainage fabric will be placed under the gabions and around the exterior sides (perimeter) of the gabions as approved by the Engineer. The type B drainage fabric will be in conformance with Section 831 of the Specifications. Measurement and payment of the type B drainage fabric will be in conformance with Section 720 of the Specifications.

February 14, 2020

Published Date: 2027	S D D O T	BANK AND CHANNEL PROTECTION GABION PLACEMENT UNDER PIPE END SECTIONS	PLATE NUMBER 720.03
			Sheet 2 of 2