

SECTION B: GRADING PLANS

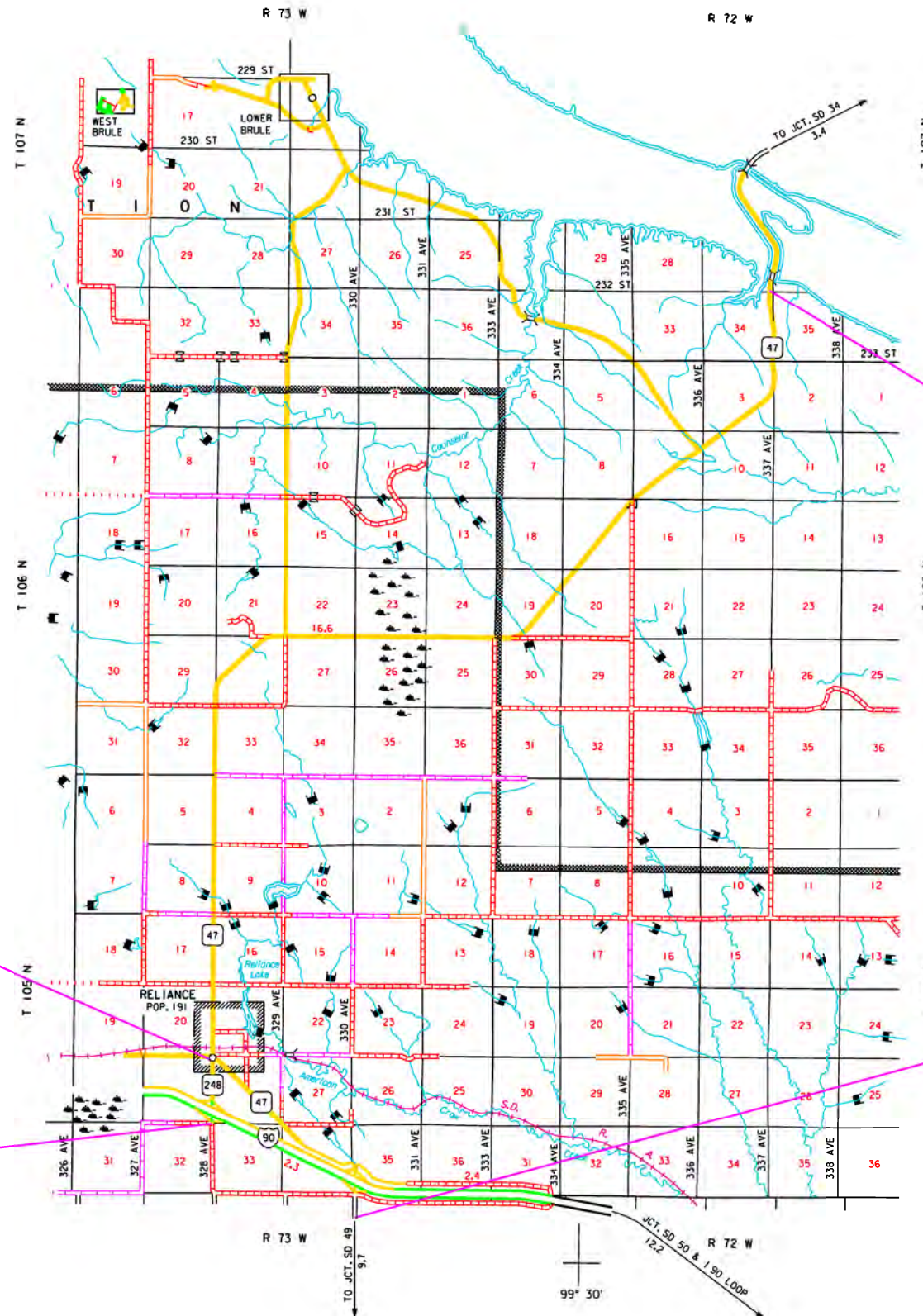
FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0047(117)67	B1	B55
	P 0248(13)261		

REV 12-4-24 JT

INDEX OF SHEETS

- B1 General Layout with Index
- B2-B7 Estimate with General Notes & Tables
- B8 Pipe Quantities
- B9 Fence Quantities
- B10 Typical Grading Sections
- B11 Horizontal Alignment Data
- B12 Control Data
- B13 Legend
- B14-B43 Plan Sheets
- B44-B45 Special Detail Sheets
- B46-B55 Standard Plates



BEGIN P 0047(117)67
Station -2+50.00
MRM 87.00 + 0.346

END P 0047(117)67
Station 1024+81.32
MRM 67.00 + 0.602

BEGIN P 0248(13)261
Station 0+00.00
MRM 261.77

END P 0248(13)261
Station 43+82.00
MRM 262.57



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SECTION B ESTIMATE OF QUANTITIES SD47 (PCN 069Q)

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
009E3230	Grade Staking	21.848	Mile
009E3240	Graded Centerline Staking	19.381	Mile
009E3250	Miscellaneous Staking	19.381	Mile
009E3280	Slope Staking	0.057	Mile
009E3301	Engineer Directed Surveying/Staking	40.0	Hour
009E4100	Construction Schedule, Category I	Lump Sum	LS
110E0500	Remove Pipe Culvert	502	Ft
110E0510	Remove Pipe End Section	14	Each
110E0595	Remove Cattle Pass End Section	10	Each
110E0600	Remove Fence	1,510	Ft
110E7500	Remove Pipe for Reset	278	Ft
110E7510	Remove Pipe End Section for Reset	49	Each
110E7530	Remove Cattle Pass for Reset	8	Ft
110E7540	Remove Cattle Pass End Section for Reset	2	Each
120E0010	Unclassified Excavation	13,365	CuYd
120E0600	Contractor Furnished Borrow Excavation	5,879	CuYd
120E2000	Undercutting	2,800	CuYd
120E4100	Reprofiling Ditch	14.0	Sta
120E6100	Water for Embankment	143.0	MGal
230E0010	Placing Topsoil	10,742	CuYd
260E1010	Base Course	272.1	Ton
421E0100	Pipe Culvert Undercut	84	CuYd
450E0142	24" RCP Class 2, Furnish	146	Ft
450E0150	24" RCP, Install	146	Ft
450E0162	30" RCP Class 2, Furnish	78	Ft
450E0170	30" RCP, Install	78	Ft
450E0182	36" RCP Class 2, Furnish	200	Ft
450E0190	36" RCP, Install	200	Ft
450E0202	48" RCP Class 2, Furnish	78	Ft
450E0210	48" RCP, Install	78	Ft
450E2016	24" RCP Flared End, Furnish	2	Each
450E2017	24" RCP Flared End, Install	2	Each
450E2024	30" RCP Flared End, Furnish	2	Each
450E2025	30" RCP Flared End, Install	2	Each
450E2028	36" RCP Flared End, Furnish	7	Each
450E2029	36" RCP Flared End, Install	7	Each
450E2036	48" RCP Flared End, Furnish	2	Each
450E2037	48" RCP Flared End, Install	2	Each
450E2200	24" RCP Sloped End, Furnish	1	Each
450E2201	24" RCP Sloped End, Install	1	Each
450E4768	24" CMP 14 Gauge, Furnish	204	Ft
450E4770	24" CMP, Install	204	Ft

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
450E5015	24" CMP Elbow, Furnish	2	Each
450E5016	24" CMP Elbow, Install	2	Each
450E5215	24" CMP Flared End, Furnish	1	Each
450E5216	24" CMP Flared End, Install	1	Each
450E7624	24" Steel Pipe, Furnish	352	Ft
450E8014	24" RCP to CMP Transition, Furnish	1	Each
450E8015	24" Pipe Transition, Install	1	Each
* 450E8900	Cleanout Pipe Culvert	2	Each
450E9000	Reset Pipe	278	Ft
450E9001	Reset Pipe End Section	49	Each
451E5124	Bore and Jack 24" Pipe	352	Ft
462E0250	Cellular Grout	334.0	CuYd
560E5100	Reset Reinforced Concrete Cattle Pass	8.0	Ft
560E5101	Reset Reinforced Concrete Cattle Pass End Section	2	Each
620E0020	Type 2 Right-of-Way Fence	1,510	Ft
620E0520	Type 2 Temporary Fence	2,716	Ft
620E1020	2 Post Panel	16	Each
720E1010	PVC Coated Bank and Channel Protection Gabion	9.0	CuYd
831E0110	Type B Drainage Fabric	30	SqYd
998E0100	Railroad Protective Insurance	Lump Sum	LS

* - Denotes Non-Participating

SECTION B ESTIMATE OF QUANTITIES SD248 (PCN 06YC)

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
009E3230	Grade Staking	0.819	Mile
009E3240	Graded Centerline Staking	0.819	Mile
009E3250	Miscellaneous Staking	0.819	Mile
009E3301	Engineer Directed Surveying/Staking	5.0	Hour
009E4100	Construction Schedule, Category I	Lump Sum	LS
110E0500	Remove Pipe Culvert	164	Ft
110E0510	Remove Pipe End Section	4	Each
120E0010	Unclassified Excavation	444	CuYd
230E0010	Placing Topsoil	444	CuYd
260E1010	Base Course	64.6	Ton
421E0100	Pipe Culvert Undercut	34	CuYd
450E0142	24" RCP Class 2, Furnish	142	Ft
450E0150	24" RCP, Install	142	Ft
450E2016	24" RCP Flared End, Furnish	4	Each
450E2017	24" RCP Flared End, Install	4	Each

TYPE III FIELD LABORATORY

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

connection unless pre-approved by the Project Engineer. These items will be incidental to the contract unit price per each for "Type III Field Laboratory".

UTILITIES

The Contractor will contact the involved utility companies through South Dakota One Call (1-800-781-7474) & Lower Brule Sioux Tribe (605-473-0163) prior to starting work. It will be the responsibility of the Contractor to coordinate work with the utility owners to avoid damage to existing facilities.

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.

GRADING OPERATIONS

Estimated application rate of water for compaction is 15 gallons of water per cubic yard of embankment.

The estimated cubic yards of excavation and/or embankment required to construct outlet ditches, fence berms and turning lanes are included in the excavation quantity table

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

UNDERCUTTING

The existing embankment will be undercut in a manner that allows 2 feet of new embankment to be constructed below the finished subgrade top. The remaining new embankment will be benched in to the existing inslope as per Section 120.3 B.2 of the Specifications.

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
522+85		540+24

GENERAL GEOLOGY

The project alignment is underlain by Pierre Shale and associated alluvial material. The South Dakota Geologic Survey describes Pierre Shale as outlined below:

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



CLASSIFICATION OF EXCAVATION

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

PROCEDURES FOR DETERMINING UNCLASSIFIED EXCAVATION QUANTITY

When plan quantities are used for payment, the Unclassified Excavation quantity will be used for final payment and the plans quantity of Topsoil and salvaged surfacing items listed in the Table of Unclassified Excavation will not be adjusted according to field measurements.

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

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

Out-of-Balance Excavation is material obtained from waste generated from excavation from other balances. The quantity of Out-of-Balance Excavation is included in the Excavation quantity in the balance where it is excavated and is paid for once as Unclassified Excavation.

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.

EMBANKMENT CONSTRUCTION

Embankment construction shall not begin until all unstable compressible materials have been excavated from the embankment footprint to the satisfaction of the Engineer. A suitable embankment foundation consists of compacted soil which does not pump, rut, or otherwise displace when traveled over with construction equipment. Each embankment shall be benched into the existing slopes in accordance with Section 120.3.B.2 of the Specifications.

SHRINKAGE FACTOR Embankment +50%

UNSTABLE MATERIAL EXCAVATION

Prior to embankment construction Unstable Excavation will be required to excavate displaced or weak compressible soils and other organic materials. A nominal 5 ft. depth of compressible material is anticipated to be removed from the embankment footprint prior to construction of the embankment. The depth of unstable excavation may be adjusted by the Engineer to ensure a solid foundation free of organic, soft, unstable material is prepared. Unstable and/or highly organic material shall be stockpiled for use as topsoil or wasted at a site approved by the Engineer.

SD47 (PCN 069Q)	Excavation (CuYd)	Topsoil (CuYd)	Undercut (CuYd)	Unstable Material (CuYd)	Contractor Furnished Borrow (CuYd)	Salvage Asphalt Mix and Granular Base Material (CuYd)
Turn Lane Construction Site 527+05.00 to 536+04.00	720	222	2,800	-	3636	156
Fence Berm Construction Sites						
112+88 Lt	-	116	-	926	641	-
127+04 Lt	-	43	-	741	580	-
211+68 Lt	-	185	-	956	675	-
Cattle Pass Plugging Locations						
187+16	-	-	-	-	68	-
234+17	-	-	-	-	56	-
279+16	-	-	-	-	56	-
373+12	-	-	-	-	59	-
845+03	-	-	-	-	72	-
Mainline Pipe Culvert Replacement						
13+77 to 14+17	762	18	-	-	-	-
102+68 to 103+08	165	-	-	-	-	-
413+92 to 414+32	443	13	-	-	-	-
432+92 to 433+32	468	13	-	-	-	-
821+79(2nd) to 822+19(2nd)	197	9	-	-	-	-
831+27(2nd) to 831+67(2nd)	220	11	-	-	-	-
877+74(2nd) to 878+14(2nd)	182	8	-	-	36	-
Roadway In slopes	-	10,104	-	-	-	-
Section Totals	3,157	10,742	2,800	2,623	5,879	156
SD248 (PCN 06YC)						
Mainline Pipe Culvert Replacement						
4+38 to 5+23	248 0	8	-	-	-	-
18+82 to 19+22	236 0	8	-	-	-	-
Roadway In slopes	-	428	-	-	-	-
Section Totals	484	444	0	0	0	0
Project Totals	3,641	11,186	2,800	2,623	5,879	156

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, no measurement will be taken.

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

FAULT HEAVES

Fault traced were noted in the ditches at the areas specified below. The ditches will be reshaped to correct the distortions caused by the fault traces and reestablish proper drainage.

All costs involved with reshaping and establishing proper drainage will be incidental to the contract unit price per each for "Reprofiling Ditch".

- 0+00 L&R
- 19+50 L&R
- 275+62 L&R
- 331+58 L&R
- 334+22 L&R
- 336+34 L&R
- 558+09 L&R



MAINLINE CROSS PIPE REPLACEMENT

Pipe culvert replacements will be installed in accordance with the following notes and as shown on the Pipe Installation Detail.

This work will be completed prior to beginning cold milling on the project.

After the existing pipe has been removed, the new pipe culvert will be undercut to a minimum depth of 1 foot. The depth of undercut is an estimate and the actual depth necessary will be determined during construction. The Engineer will determine how much undercut will be done in accordance with Section 421 of the Specifications, but will not reduce the undercut to less than 1 foot in depth.

Select fill material for backfilling the undercut area will conform to the gradation requirements of Base Course in Section 882. If groundwater is encountered during construction, the select fill material for backfilling the undercut area and Class B Bedding will conform to the gradation requirements of Section 421.2 A. until backfill placement is above the groundwater level. The Engineer will process a CCO to provide for compensation to the Contractor for the added cost of the changed material. All other requirements of Section 421 will apply. At the time of the investigation pipe culverts were partially/completely submerged on SD47 at stations 822+00 and 878+00, and on SD248 at stations 5+00 and 19+00. Seasonal changes in groundwater may affect other pipe culverts not listed. Extra dewatering effort is anticipated for these pipe replacements. Temporary barriers consisting of sheet pile, inflatable bladders, or other means of separation may be required to keep standing water out of the excavation for the pipe culverts.

Pipe culverts will be bedded in accordance with Section 450.3 F.2, Class B Bedding with the following exceptions. The excavated area will extend 2 feet from the outermost diameter on both sides of the pipe with the back of the excavated area being sloped 2:1 upward to the top of the roadway surface. Select fill material for Class B Bedding will conform to the gradation requirements of Base Course in Section 882.

After the minimum testing requirements of M.S.T. R Section 4.1.F.3.a.1 (SDDOT Materials Manual) have been met, the minimum density testing requirements will be one test per zone. Each zone will be 2 feet in depth. Moisture testing will remain as per M.S.T.R.

The remainder of the pipe culvert excavation will be backfilled with soils taken from the pipe removal excavation or other suitable material as approved by the Engineer. The backfill will be benched into 2:1 excavation slope. Compaction of the backfill material will be governed by the Specified Density Method

After the new pipe has been backfilled to the top of the subgrade, a 12" depth of Base Course and 5" (2-2.5" lifts) depth of asphalt concrete composite will be placed as a patch matching the existing asphalt concrete.

All costs to remove and dispose of asphalt concrete pavement, including full depth saw cutting of the asphalt concrete pavement, will be incidental to the contract unit price per square yard to Remove Asphalt Concrete Pavement. All excavation necessary for Class B Bedding and the pipe installation will be incidental to the contract unit price per foot for the corresponding pipe installation contract items. The excavation of material for pipe culvert undercut will be paid for at the contract unit price per cubic yard for Pipe Culvert Undercut.

MAINLINE CROSS PIPE REPLACEMENT Continued

The select fill material used for backfilling the pipe culvert undercut and Class B Bedding will be paid for at the contract unit price per ton for Base Course. The 3" layer of bedding material to form the cradle in the pipe foundation will be incidental to the corresponding pipe installation contract items. The cost for asphalt concrete composite installed over the pipe replacement will be paid for at the contract unit price per ton for Asphalt Concrete Composite.

REINFORCED CONCRETE PIPE

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

PIPE CULVERT UNDERCUT

The table includes undercut for 36 inch and larger pipe culverts. The depth of undercut is an estimate and the actual depth necessary will be determined during construction. Pipes listed may or may not require undercutting and pipes not listed may require undercutting. The Engineer will determine which pipe will be undercut in accordance with Section 421 of the Specifications.

Station	Undercut Depth (Ft)	Pipe Culvert Undercut (CuYd)	Granular Material (Ton)
424+12	1	19.9	37.6
443+12	1	19.3	36.5
922+04	1	17.6	33.3
968+51	1	26.8	50.7
Total:		83.60	158.1

The table below contains the rate for one-foot depth of pipe culvert undercut per foot of pipe length and should be used as an aid in determining the actual amount of undercut to be performed during construction. The table is derived from the drawing below and conforms to the Specifications. When calculating pipe culvert undercut, the length of pipe ends should be included in the overall pipe length.

Storm sewer and approach pipes do not require undercutting unless specified otherwise in these plans.

Pipe Diameter (In)	Round Pipe Undercut Rate for 1' Depth (CuYd/Ft)	Arch Pipe Undercut Rate for 1' Depth (CuYd/Ft)
24	0.2407	0.2577
30	0.2623	0.2847
36	0.2840	0.3110
42	0.3056	0.3337
48	0.3272	0.3596
54	0.3488	0.3827
60	0.3704	0.4105
66	0.3920	---
72	0.4136	0.4630
78	0.4352	---
84	0.4568	0.5123
90	0.4784	---

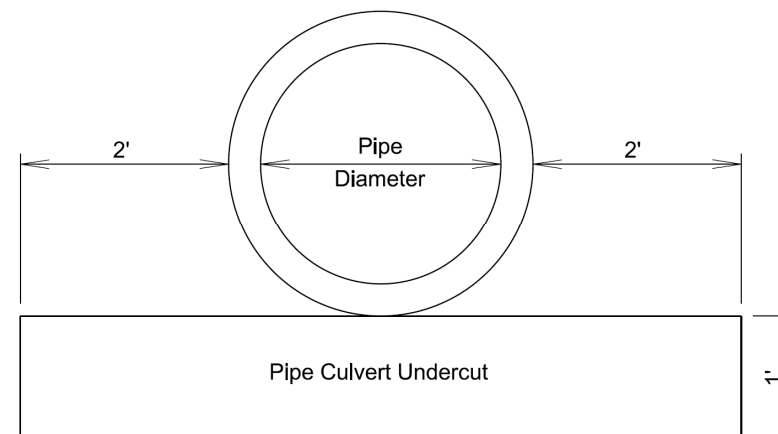


TABLE OF ASPHALT CONCRETE PAVEMENT REMOVAL

(See Section F)

Station	to	Station	L/R	Quantity (SqYd)
13+77		14+17	L/R	169
102+68		103+08	L/R	169
413+92		414+32	L/R	124
432+92		433+32	L/R	124
821+79(2 ND)		822+19(2 ND)	L/R	124
831+27(2 ND)		831+67(2 ND)	L/R	124
877+74(2 ND)		878+14(2 ND)	L/R	124
4+38(248)		5+23(248)	L/R	133
18+81(248)		19+22(248)	L/R	133
Digouts				62
Total:				328

CORRUGATED METAL PIPE

Corrugated metal pipes will have 2 2/3-inch x 1/2-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 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.

CELLULAR GROUT

The Contractor will submit a proposed grouting procedure to the Engineer at least two weeks prior to beginning this work.

Bulkheads will be constructed at each end of the pipe. Each bulkhead will be constructed to withstand the pressure of the grouting operation. The bulkhead will extend from the end of the existing pipe inward a minimum depth of 18 inches and will be free from leaks.

Pressure grouting will be done to ensure all the voids are filled including all breaks or holes in and around the existing pipe.

The grout will be a cellular grout (grout with pre-generated foam) with a minimum 28-day compressive strength of 100 pounds per square inch. If water is not present within the pipe a low-density grout with a minimum of 30 pounds per cubic foot wet density may be used. When it is not possible to dewater the existing pipe, a high-density grout with a minimum of 70 pounds per cubic foot will be used which may include approved sand. The foaming agent used will meet the requirements of ASTM C869 when tested in accordance with ASTM C796.

Both of the cellular grout mix designs will be submitted to the SDDOT Concrete Engineer for approval prior to use. The mix design submittal will include the base cement slurry mix per cubic yard, expansion factor from the foaming agent, and the cellular grout wet density (pounds per cubic foot).

The Contractor will install a bypass valve adjacent to the location where the pressure grouting hose is attached for obtaining samples to be checked for wet density. The wet density of the cellular grout will be checked by the Contractor to verify the proper minimum wet density before the cellular grout filling operations begin and at a minimum once every two hours during production. The SDDOT will document the results of the density checks.

Cellular grout will be wasted until the cellular grout meets the minimum wet density required; however, if 0.5 cubic yards or more of base cement slurry is



CELLULAR GROUT Continued

wasted trying to meet density requirements, then that quantity will not be included for payment.

If grout holes are utilized, cylindrical wooden plugs or other approved plugs will be inserted to plug holes until the grout has set. After the plugs are removed the holes will be filled with concrete.

The quantity of cellular grout was estimated based on volume of the existing pipe and voids outside the existing pipe.

The quantity of base cement slurry ordered will be approved by the Engineer. The quantity of base cement slurry needed will be calculated to the nearest tenth of a cubic yard using the approved mix design, expansion factor of the foaming agent, and estimated amount of cellular grout. The quantity for payment to the nearest tenth of a cubic yard of "Cellular Grout" is a calculated quantity based on the amount of base cement slurry used on the project to the nearest tenth of a cubic yard, expansion factor of the foaming agent, and approved mix design.

All costs for furnishing and installing the cellular grout including bulkhead construction, inlet bevel construction, and incidentals necessary to satisfactorily complete the work will be included in the contract unit price per cubic yard for "Cellular Grout".

TABLE OF CELLULAR GROUT

Station	Quantity (CuYd)
187+16	43
211+57	58
234+17	58
279+16	59
373+12	58
845+03	58
Total:	334

The quantity at each location includes an additional 15% to account for void volume outside the existing pipe.

BORE AND JACK STEEL PIPE

The Contractor will install steel pipe at station 211+68 by boring and jacking the pipe through the existing highway embankment. The pipe will be installed by boring and jacking methods as specified herein unless an alternate plan is submitted in writing and approved by the Engineer.

Steel pipe for boring and jacking will meet or exceed the requirements of ASTM A53 Grade B, ASTM A139 Grade B or ASTM A252 Grade 2. Hydrostatic testing will not be required for this application. The pipe will be required to have the minimum wall thickness as shown in the following table:

Pipe Diameter	Wall Thickness
48" & below	1/2"
54"	5/8"
60"	5/8"
66"	3/4"
72"	3/4"

The exterior of the steel pipe will be coated with a fusion bonded epoxy coating and an abrasion resistant overcoat or a two-component coal tar epoxy. The coal tar will meet the requirements of Sherwin-Williams Targuard, Tnemec Hi-Build Tneme-Tar, or an approved equal. Applications of the coatings will be in conformance with the manufacturer's recommendations.

The pipe joints will be welded by a certified welder in accordance with Section 410.3 D of the Specifications. After the welding has been completed, the exposed area will be coated with 3M Scotchkote Liquid Epoxy 328 or a two-component coal tar epoxy meeting the requirements of Sherwin-Williams Targuard, Tnemec Hi-Build Tneme-Tar, or an approved equal.

The jacking pit will be constructed of sufficient size to accommodate equipment and workmen. The pit walls will be sloped or shored to comply with all applicable State and Federal regulations. The Contractor will be responsible for the design of the pit floor and jacking thrust restraint wall to carry the cyclic loads and thrust applied by the Contractor's operation. Water will not be allowed to accumulate in the jacking pit. All components of the jacking pit will be removed after installation of the pipe unless otherwise allowed by the Engineer.

The pipe will be pushed into position from a jacking pit with hydraulic jacks while simultaneously excavating at the forward end of the pipe. Each pipe section will be jacked from the jacking pit as the excavation at the boring head progresses so that the excavation is supported by the boring head or the pipe at all points.

Jacking thrust will be applied to the pipe by means of a yoke or frame designed to distribute the thrust uniformly around the pipe joint. The thrust will be applied to the pipe joint only in the location and only to the maximum force recommended by the pipe manufacturer. The pipe will be jacked into place without visible damage to the pipe or joint.

The boring head excavation will be circular with a maximum diameter equal to the outside diameter of the jacking pipe plus 1 inch. The Contractor will take whatever corrective action is necessary to prevent running, flowing, or squeezing ground conditions at the cutting face from causing large voids or significant loss of soil that may cause surface settlement.

The Contractor will control the alignment and grade of the pipe installation to meet the following tolerances:

1. Maximum horizontal deviation from plan shown alignment will be less than 0.15% of pipe length from the downstream end of pipe to the point of measurement.
2. Maximum vertical deviation from plan shown alignment will be less than 0.075% of pipe length from the downstream end of pipe to the point of measurement.

All material excavated by the boring head for the pipe installation will be disposed of by the Contractor. The excavated material from the boring pit will be used as backfill for the pit and compacted into place to the satisfaction of the Engineer.

Steel casing will be installed horizontally through 352' of embankment. The pipes will be placed through an approximate 30' +/- vertical depth of silt clay material. The parent formation from which the embankment material was excavated consists of shale and may contain minor sandstone and concretions. Large boulders are not anticipated to be encountered within the bore and jack envelope.

Installation of CMP ends on the steel pipe will require the placement of a minimum of 2 welded stops at each pipe end to prevent the end from slipping off the steel pipe. The location and size will be determined in the field by the Engineer and installed by a certified welder. Stops will be coated with a coal tar epoxy. All costs, including labor and materials for the installation of the stops will be incidental to the contract unit price per foot for the corresponding steel pipe furnish contract item. Alternative methods of attachment may be allowed with the approval of the Engineer.

Payment for furnishing the pipe will be incidental to the contract unit price per foot for the corresponding steel pipe furnish contract item.

All costs involved with boring and jacking the pipe including labor, equipment, welding, materials, disposal of waste material, constructing and backfilling the jacking pit, and excavating and backfilling the roadway embankment will be incidental to the contract unit price per foot for the corresponding bore and jack pipe contract item.

STEEL PIPE TO RCP TRANSITION

Two steel pipe to RCP transitions are required for the pipe installation at Sta. 211+68. The length of each transition is assumed to be 2 feet long. The steel pipe used in the transition will meet the same requirements, including pipe specifications, coal tar epoxy coating, and welding to adjoining steel pipe sections as the steel pipe used in the bore and jack installation.

The transition section fabricator will submit 2 copies of the shop plans to the Office of Bridge Design for review 15 days prior to fabrication. One reviewed copy will be sent back to the fabricator who will then make changes, if any, and then send the Office of Bridge Design 7 final approved copies for distribution.

All costs for furnishing and installing the Steel to RCP transitions will be incidental to the contract unit price per each for the corresponding size "Concrete/Steel Pipe Transition, Furnish" and "Pipe Transition, Install" contract items.

STEEL PIPE

Steel pipe will meet the same requirements, including pipe specifications, welding and coal tar epoxy coating as the steel pipe used in the bore and jack installation.

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)
23+97	L	4.5	15
211+68	L	4.5	15
Totals:		9	30

TEMPORARY FENCE

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



FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0047(117)67 P 0248(13)261	B6	B55

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



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

Roadway and Description SD47 PCN 069Q	Begin Station	End Station	Number of Lanes	Length (Ft)	Grade Staking			Miscellaneous Staking Quantity (Mile)	Slope Staking Quantity (Mile)	Graded Centerline Staking Quantity (Mile)	
					Length (Mile)	Lane Factor	*Sets of Stakes				
SD 47 Section 2 (3 Lanes)	10+00.00	14+06.40	3	406.40'	0.077	1.5	1	0.115	0.077	0.077	
SD 47 Section 1 (3 Lanes)	14+06.40	31+68.70	3	1,762.30'	0.334	1.5	1	0.501	0.334	0.334	
SD 47 Section 3 (3 Lanes)	31+68.70	45+77.00	3	1,408.30'	0.267	1.5	1	0.400	0.267	0.267	
SD 47 Section 1 (3 Lanes)	45+77.00	50+23.00	3	446.00'	0.084	1.5	1	0.127	0.084	0.084	
SD 47 Section 2 (3 Lanes)	50+23.00	61+51.30	3	1,128.30'	0.214	1.5	1	0.321	0.214	0.214	
SD 47 Section 1 (3 Lanes)	61+51.30	74+20.90	3	1,269.60'	0.240	1.5	1	0.361	0.240	0.240	
SD 47 Section 3 (3 Lanes)	74+20.90	94+13.60	3	1,992.70'	0.377	1.5	1	0.566	0.377	0.377	
SD 47 Section 1 (3 Lanes)	94+13.60	126+00.00	3	3,186.40'	0.603	1.5	1	0.905	0.603	.019	
SD 47 Section 4 (3 Lanes)	126+00.00	154+00.00	2	2,800.00'	0.530	1	1	0.530	0.530	.019	
SD 47 Section 6 (3 Lanes)	154+00.00	183+00.00	2	2,900.00'	0.549	1	1	0.549	0.549		
SD 47 Section 1 (3 Lanes)	183+00.00	202+00.00	3	1,900.00'	0.360	1.5	1	0.540	0.360	0.360	
SD 47 Section 7 (3 Lanes)	202+00.00	211+18.60	3	918.60'	0.174	1.5	1	0.261	0.174	0.174	
SD 47 Section 8 (3 Lanes)	211+18.60	225+24.40	3	1,405.80'	0.266	1.5	1	0.399	0.266	.019	
SD 47 Section 7 (3 Lanes)	225+24.40	227+00.00	3	175.60'	0.033	1.5	1	0.050	0.033	0.033	
SD 47 Section 1 (3 Lanes)	227+00.00	232+00.00	3	500.00'	0.095	1.5	1	0.142	0.095	0.095	
SD 47 Section 4 (2 Lanes)	232+00.00	346+23.50	2	11,423.50'	2.164	1	1	2.164	2.164	2.164	
SD 47 Section 5 (2 Lanes)	346+23.50	359+39.90	2	1,316.40'	0.249	1	1	0.249	0.249	0.249	
SD 47 Section 4 (2 Lanes)	359+39.90	527+05.00	2	16,765.10'	3.175	1	1	3.175	3.175	3.175	
SD 47 Section 4A (3 Lanes)	527+05.00	536+04.00	3	899.00'	0.170	1.5	1	0.255	0.170	0.170	
SD 47 Section 4 (2 Lanes)	536+04.00	539+25.50	2	321.50'	0.061	1	1	0.061	0.061	0.061	
SD 47 Section 5 (2 Lanes)	539+25.50	549+67.10	2	1,041.60'	0.197	1	1	0.197	0.197	0.197	
SD 47 Section 4 (2 Lanes)	549+67.10	589+68.30	2	4,001.20'	0.758	1	1	0.758	0.758	0.758	
SD 47 Section 5 (2 Lanes)	589+68.30	601+26.10	2	1,157.80'	0.219	1	1	0.219	0.219	0.219	
SD 47 Section 4 (3 Lanes)	601+26.10	879+71.70	2	27,845.60'	5.274	1	1	5.274	5.274	5.274	
SD 47 Section 9 (2 Lanes)	789+14.44	894+90.00	2	10,575.56'	2.003	1	1	2.003	2.003	2.003	
SD 47 Section 11 (2 Lanes)	48+78.25	53+60.00	2	481.75'	0.091	1	1	0.091	0.091	0.091	
SD 47 Section 10 (2 Lanes)	53+60.00	70+82.82	2	1,722.82'	0.326	1	1	0.326	0.326	0.326	
SD 47 Section 11 (2 Lanes)	70+82.82	76+71.71	2	588.89'	0.112	1	1	0.112	0.112	0.112	
SD 47 Section 10 (2 Lanes)	76+71.71	83+60.87	2	689.16'	0.131	1	1	0.131	0.131	0.131	
SD 47 Section 11 (2 Lanes)	83+60.90	84+99.04	2	138.14'	0.026	1	1	0.026	0.026	0.026	
SD 47 Section 12 (2 Lanes)	9+06.73	11+87.13	2	280.40'	0.053	1	1	0.053	0.053	0.053	
SD 47 Section 12 (2 Lanes)	17+87.13	22+20.00	2	432.87'	0.082	1	1	0.082	0.082	0.082	
SD 47 Section 13 (2 Lanes)	8+50.00	7+00.00	2	150.00'	0.028	1	1	0.028	0.028	0.028	
SD 47 Section 13 (2 Lanes)	4+00.00	2+50.00	2	150.00'	0.028	1	1	0.028	0.028	0.028	
SD 47 Section 14 (2 Lanes)	7+00.00	4+00.00	2	150.00'	0.028	1	1	0.028	0.028	0.028	
Totals:								21.848	19.381	.057	19.381

Roadway and Description SD248 PCN 06YQ	Begin Station	End Station	Number of Lanes	Length (Ft)	Grade Staking			Miscellaneous Staking Quantity (Mile)	Slope Staking Quantity (Mile)	Graded Centerline Staking Quantity (Mile)
					Length (Mile)	Lane Factor	*Sets of Stakes			
SD 248 Section 15 (2 Lanes)	0+75	36+00	2	3525.00	0.668	1	1	0.668	0.668	0.668
SD 248 Section 16 (2 Lanes)	36+00	44+00	2	800.00	0.152	1	1	0.152	0.152	0.152
Totals:								0.819	0.819	0.819

* 1 = Blue Top Stakes Only (Asphalt Concrete Pavement)

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



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STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0047(117)67 P 0248(13)261	B9	B55

Plotting Date: 8/15/2024

FENCE QUANTITIES

Station to Station	Side (L/R)	Right-of-Way Fence		Temporary Fence		Post Panels		Remove Fence (Ft)	Gates								
		Type 2 (Ft)		Type 1A (Ft)	Type 1B (Ft)	Type 2 (Ft)	2 Post Panel (Each)										
112+13	113+63	L	150				265	2	150								
113+41	114+91	R	150				230	2	150								
125+64	127+14	R	150				180	2	150								
126+30	127+80	L	150				230	2	150								
165+03	166+53	R	150				350	2	150								
209+38	211+38	L	200				487	2	200								
212+17	213+62	R	150				326	2	150								
278+41	282+50	R	410				648	2	410								
TOTALS:			1510				2716	16	1510								

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



Plot Scale - 1:200

Plotted From - Justin

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TYPICAL GRADING SECTION

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0047(117)67 P 0248(13)261	B10	B55

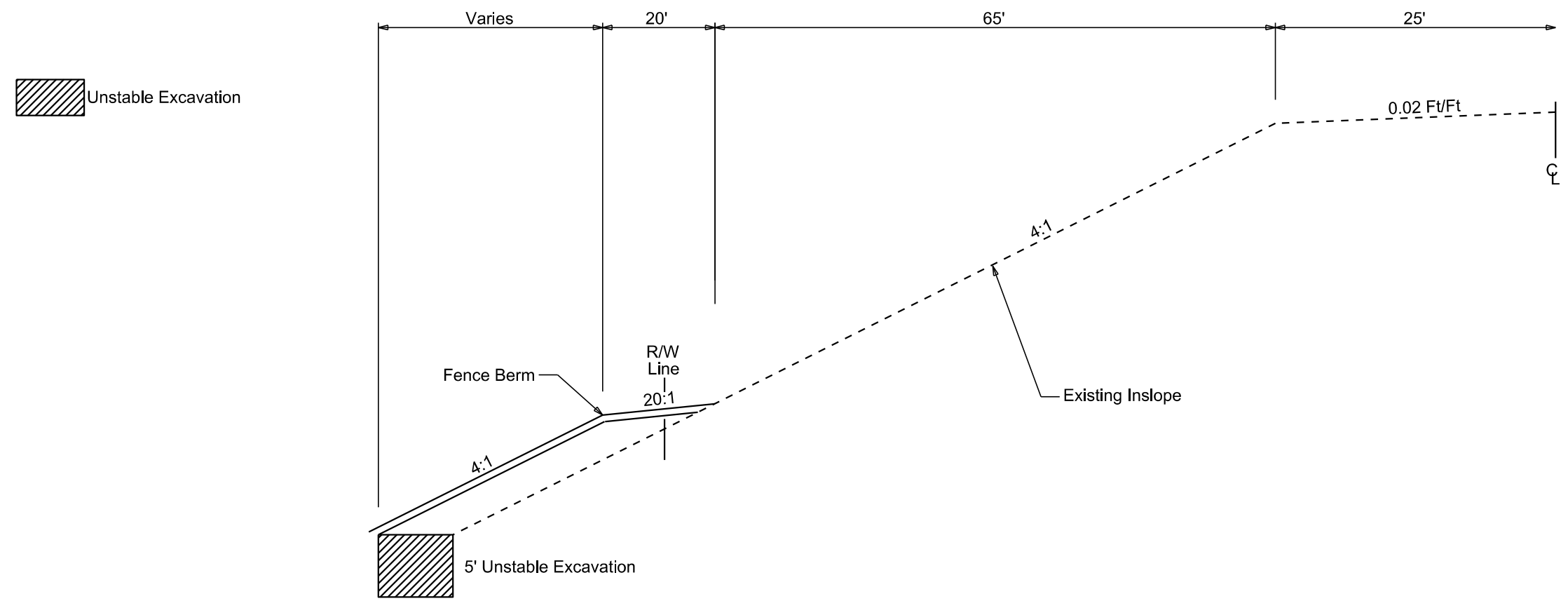
Plotting Date: 8/15/2024

Plot Scale - 1:200

Plotted From - Justin

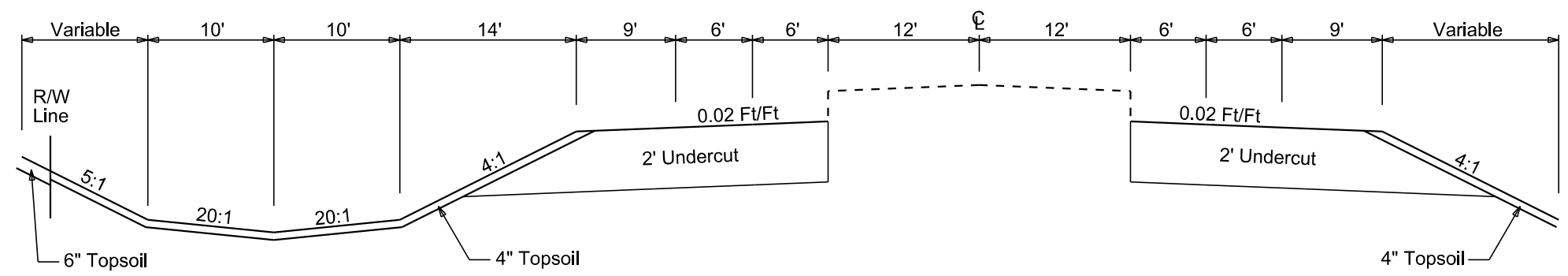
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113+08.00 to 114+08.00
126+17.00 to 127+17.00
211+07.00 to 212+07.00



527+05.00 to 536+04.00

Transitions:
522+85.00 to 527+05.00
536+04.00 to 540+24.00



Note: The existing embankment will be undercut in a manner that allows 2 feet of new embankment to be constructed below the finished subgrade top. The remaining new embankment will be benched in to the existing inslope as per Section 120.3 B.2 of the Specifications.



HORIZONTAL ALIGNMENT DATA

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0047(117)67 P 0248(13)261	B11	B55

MAINLINE

Type	Station		Northing	Easting					
POB	0+00.00		622477.19	2201609.92	SPI	551+53.53		594386.01	2163280.13
					ST	553+31.37		594263.1	2163151.48
		TL= 360.82 S 12°00'00" W			TS	585+67.86		592027.29	2160811.39
PC	3+60.82		622124.25	2201534.9			TL= 3236.49 S 46°18'20" W		
PI	8+97.86	R = 2865.00 Delta = 21°14'00" L	621598.96	2201423.24	SPI	588+34.68		591842.97	2160618.48
PT	14+22.57		621068.88	2201509.41	SC	589+67.86		591741.32	2160531.99
		TL= 1807.91 S 9°14'00" E			PI	596+13.84	R = 1938.00 Delta = 36°52'08" L	591249.33	2160113.38
PC	32+30.48		619284.4	2201799.5	CS	602+14.93		590604.57	2160073.67
PI	38+93.80	R = 5370.00 Delta = 14°05'00" R	618629.67	2201905.93	SPI	603+03.91		590515.76	2160068.21
PT	45+50.43		617968.73	2201849.85	ST	604+81.75		590337.84	2160069.51
		TL= 490.30 S 4°51'00" W					TL= 27489.95 S 0°25'14" E		
PC	50+40.73		617480.18	2201808.4	PI	879+71.70		562848.63	2160271.23
PI	56+06.77	R = 5730.00 Delta = 11°17'00" L	616916.17	2201760.54			TL= 52.34 S 65°06'28" E		
PT	61+69.15		616353.7	2201823.96	PC	880+24.04		562826.6	2160318.71
		TL= 916.45 S 6°26'00" E			PI	883+77.81	R = 2800.00 Delta = 14°24'07" R	562677.69	2160639.61
SC	74+35.60		615094.43	2201957.02	CS	887+27.85		562453.65	2160913.4
PI	85+40.04	R = 2300.00 Delta = 51°18'00" R	613990.71	2201996.99	SPI	888+94.65		562348.02	2161042.48
CS	94+94.91		613269.42	2201160.6	ST	892+27.85		562114.66	2161280.7
SPI	95+72.73		613218.6	2201101.67			TL= 9286.71 S 45°35'25" E		
ST	97+28.31		613123.08	2200978.82	PC	985+14.57		555615.95	2167914.69
		TL= 11407.15 S 52°08'00" W			PI	987+80.00	R = 1550.00 Delta = 19°26'05" L	555430.2	2168104.3
PC	211+35.46		606121.07	2191973.55	PT	990+40.33		555318.13	2168344.91
PI	218+42.06	R = 5730.00 Delta = 14°03'35" L	605687.34	2191415.73			TL= 1571.37 S 65°01'30" E		
PT	225+41.55		605131.09	2190980	TS	1006+11.69		554654.67	2169769.34
		TL= 11685.21 S 38°04'24" W			SPI	1008+11.76		554570.19	2169950.7
TS	342+26.76		595932.25	2183774.06	SC	1009+11.69		554535.43	2170044.53
SPI	344+93.58		595722.21	2183609.53	PI	1010+50.37	R = 1850.00 Delta = 8°34'25" L	554487.25	2170174.57
SC	346+26.76		595626.18	2183516.83	CS	1011+88.53		554459	2170310.33
PI	353+63.67	R = 1938.00 Delta = 41°38'16" R	595095.97	2183005.06	SPI	1012+88.59		554438.61	2170408.3
CS	360+35.14		595039.74	2182270.3	ST	1014+88.53		554413.85	2170606.83
SPI	361+24.12		595032.95	2182181.58			TL= 606.18 S 82°53'23" E		
ST	363+01.96		595031.61	2182003.66	PC	1020+94.70		554338.81	2171208.34
					PI	1021+64.25	R = 80.00 Delta = 82°00'10" R	554330.21	2171277.35
TS	535+18.01		594901.86	2164788.09	PT	1022+09.20		554260.67	2171278.43
		TL= 17216.06 S 89°34'05" W					TL= 140.39 S 0°53'14" E		
SPI	537+84.83		594899.85	2164521.29	POE	1023+49.60		554120.29	2171280.6
SC	539+18.01		594885.26	2164388.62					
PI	545+08.21	R = 1960.00 Delta = 33°30'59" L	594820.71	2163801.97					
CS	550+64.55		594442.96	2163348.49					

The coordinates shown on this sheet are based on the South Dakota State Plane Coordinate System. South Zone (NAD 83/11); epoch 2010.00; Geoid 18; SF = 0.99982



CONTROL DATA

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0047(117)67 P 0248(13)261	B12	B55

HORIZONTAL AND VERTICAL CONTROL POINTS						
POINT	STATION	OFFSET	DESCRIPTION	NORTHING	EASTING	ELEVATION
BASE1 OPUS	476+78	36' L	NAIL	594910.292	2170628.612	1816.844
BASE2	217+24	51' R	NAIL	605772.978	2191493.297	1887.401
CP1	882+71	100' L	5/8" REBAR	562799.498	2160587.191	1782.745
CP2	529+28	249' R	5/8" REBAR	595154.952	2165376.534	1903.184
CP3	86+96	127' L	5/8" REBAR	613822.852	2201774.41	1733.329
CP10	771+14	86' L	5/8" REBAR	573706.244	2160277.016	1825.443
CP11	664+87	60' R	5/8" REBAR	584332.638	2160053.539	1813.193
CP12	553+39	97' L	5/8" REBAR	594187.876	2163212.29	1908.233
CP13	371+38	69' R	5/8" REBAR	595094.331	2181166.684	1816.594
CP14	273+88	89' R	5/8" REBAR	601371.044	2187921.024	1798.139
CP15	155+34	71' L	5/8" REBAR	609503.18	2196439.432	1732.201
CP16	73+18	74' L	5/8" REBAR	615217.551	2202023.632	1710.976
CP17	40+71	68' R	5/8" REBAR	618447.094	2201801.166	1564.618

The coordinates shown on this sheet are based on the South Dakota State Plane Coordinate System. South Zone (NAD 83/11); epoch 2010.00
Geoid 18; SF = 0.99982 The elevations shown on this sheet are based on NAVD 88.



LEGEND

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0047(117)67 P 0248(13)261	B13	B55

Plotting Date: 8/15/2024

1:200
Plot Scale -

Justin
Plotted From -

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			
Control Point		Pipe Without End Section		Underground High Pressure Gas Line		Remove Concrete Pavement	
Creek Edge		Playground Slide		Underground Sanitary Sewer		Remove Concrete Driveway Pavement	
Curb/Gutter		Playground Swing		Underground Storm Sewer		Remove Asphalt Concrete Pavement	
Curb		Power And Light Pole		Underground Tank		Remove Concrete Sidewalk	
Dam Grade/Dike/Levee		Power And Telephone Pole		Underground Telephone Line		Remove Concrete Median Pavement	
Deck Edge		Power Meter		Underground Television Cable		Remove Concrete Curb and/or Gutter	
Ditch Block		Power Pole		Underground Water Line			
Doorway Threshold		Power Pole And Transformer		Water Fountain			
Drainage Profile		Power Tower Structure		Water Hydrant			
Drop Inlet		Propane Tank		Water Meter			
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					
Fence Electric		Railroad Signs					
Fence Miscellaneous		Railroad Switch					
Fence Rock		Railroad Track					
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					

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STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0047(117)67 P 0248(13)261	B14	B55
Plotting Date: 8/28/2024		Rev. 8/26/24 JT	

FOR BIDDING PURPOSES ONLY

19+49-68.6'L
Clean Out Pipe

23+97
Take Out 24"-124' CMP
& Downspout
& End Sections

0+00 L & R
Ditch Reprofilng

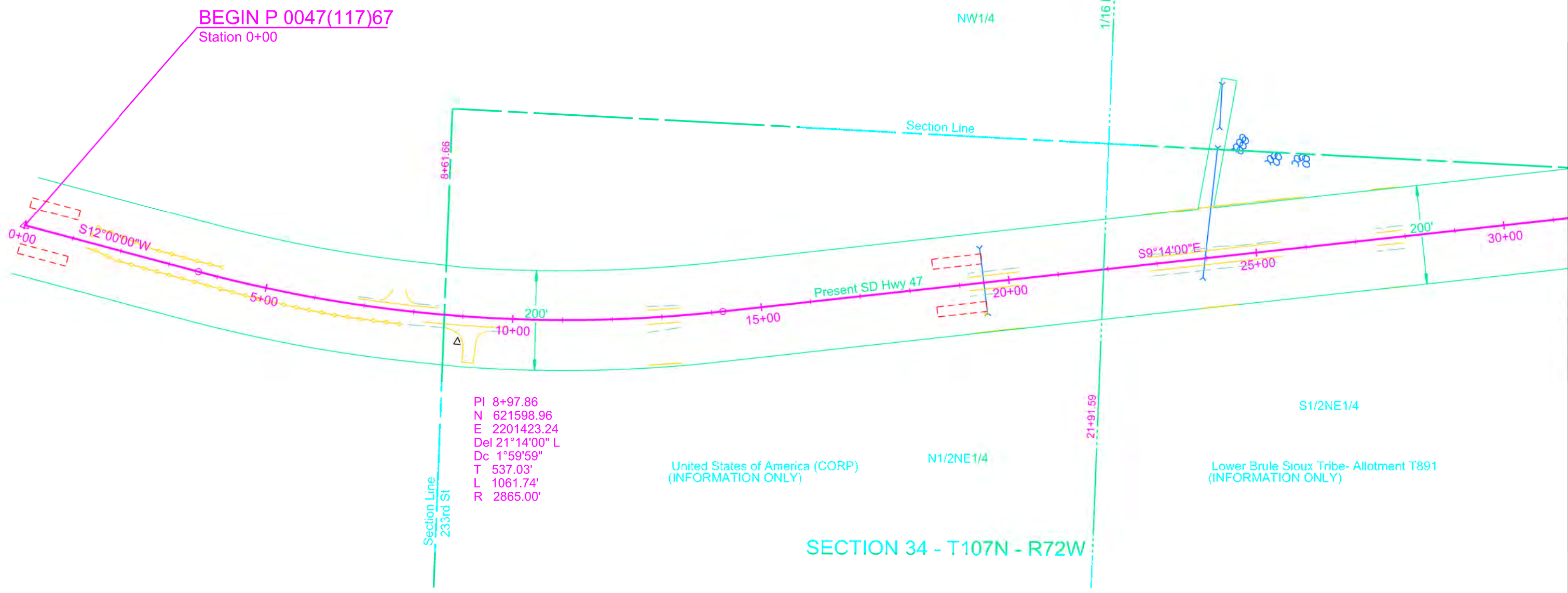
19+50 L & R
Ditch Reprofilng

23+97
Install 24" - 54' RCP
Install 24" 204' CMP (10' & 194')
And 2 - 10.0° Elbows
& 1 - 24" RCP to CMP Outlet Transition
& 1 RCP Sloped End
& 1 CMP Flared End
& PVC Coated Bank and Channel Protection Gabions (4.5 CY)



SECTION 35 - T107N - R72W

Lower Brule Sioux Tribe - Allotment T4010
(INFORMATION ONLY)



BEGIN P 0047(117)67
Station 0+00

PI 8+97.86
N 621598.96
E 2201423.24
Del 21°14'00" L
Dc 1°59'59"
T 537.03'
L 1061.74'
R 2865.00'

United States of America (CORP)
(INFORMATION ONLY)

Lower Brule Sioux Tribe- Allotment T891
(INFORMATION ONLY)

SECTION 34 - T107N - R72W

Plot Scale - 1:200

Plotted From - Justin

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STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0047(117)67 P 0248(13)261	B15	B55

Plotting Date: 8/15/2024

FOR BIDDING PURPOSES ONLY

112+88 Lt
Take Out 24" - 8' RCP
& 1 End Section

113+41 Rt
Begin Type 2 Fence

114+16 Rt
Take Out 24"-8' RCP

114+91 Rt
End Type 2 Fence

126+39 Rt
Take Out 24"-8' RCP

125+64 Rt
Begin Type 2 Fence

127+04 Lt
Take Out 24"-8' RCP

112+88 Lt
Install 24"- 44'RCP
& 1 Flared End

112+13 Lt
Begin Type 2 Fence

114+16 Rt
Remove End Section
for Reset

113+63 Lt
End Type 2 Fence

126+39 Rt
Remove End Section
for Reset

126+30 Lt
Begin Type 2 Fence

127+04 Lt
Remove End Section
for Reset

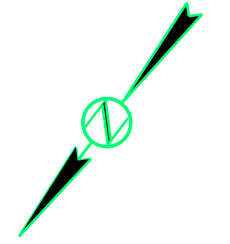
127+14 Rt
End Type 2 Fence

114+16 Rt
Install 24"-8' RCP
& Reset 1 Flared End

126+39 Rt
Install 24"-8' RCP
& Reset 1 Flared End

127+04 Lt
Install 24"-32' RCP
& Reset 1 Flared End

127+80 Lt
End Type 2 Fence



Sec 3 - T106N - R72W

Sec 10 - T106N - R72W

Lower Brule Sioux Tribe - Allotment T 570
SE1/4 of Section 3 - Township 106 North -
Range 72 West of the 5th P.M.
Parcel 1
0.06 ac, Permanent Easement
(2283 sq ft), more or less

Lower Brule Sioux Tribe - Allotment T 569
SW1/4 of Section 3 - Township 106 North -
Range 72 West of the 5th P.M.
Parcel 2
0.02 ac, Permanent Easement
(850 sq ft), more or less

Parcel 1
112+12.89 to 113+62.89 L
Temporary Easement containing
0.2 ac, more or less

Parcel 1
113+40.91 to 114+90.91 R
Temporary Easement containing
0.1 ac, more or less

Parcel 2
126+29.48 to 127+79.48 L
Temporary Easement containing
0.1 ac, more or less

Plot Scale: 1:200

Plotted From: Justin

File: ...:\plan and profiles\105.dgn



STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0047(117)67 P 0248(13)261	B16	B55

Plotting Date: 12/5/2024 REV 12-4-24 JT

FOR BIDDING PURPOSES ONLY

165+09 Rt
Take Out End Section

165+03 Rt
Begin Type 2 Fence

165+09 Rt
Remove 36"-16' RCP
for Reset

166+53 Rt
End Type 2 Fence

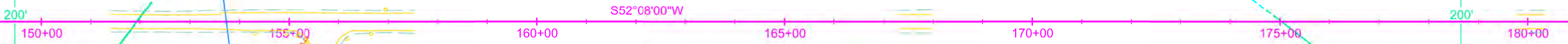
165+09 Rt
Reset 36"-16' RCP
& Install 1 Flared End

Sec 10 - T106N - R72W

NW1/4

SE1/4

S52°08'00"W



153+76.15 - 100.00'
153+66.96 - 173.07'

153+71.09 - 100.00'
153+87.40 - 229.68'
154+01.32 - 100.00'
154+17.17 - 225.94'

165+02.75
100.00' & 200'
165+39.94 - 100.00'
165+72.04 - 189.79'
165+71.80 - 100.00'
166+00.29 - 179.70'
166+52.75
100.00' & 200'



Lower Brule Sioux Tribe - Allotment T 432

NE1/4 of Section 9 - Township 106 North -
Range 72 West of the 5th P.M.

NE1/4

Sec 9 - T106N - R72W

Parcel 3
0.27 ac, Permanent Easement
(11975 sq ft), more or less

Parcel 3
165+02.75 to 166+52.75 R
Temporary Easement containing
0.3 ac, more or less



Final Scale - 1/2"=100'

Plotted From - Justin

Files - \open and profiles\150.dgn

182+36-46.3'L
Clean Out Pipe End

187+15 Rt
Take Out Cattle Pass End Section

187+16 Lt
Take Out Cattle Pass End Section

187+16
Fill Cattle Pass with Cellular Grout

193+92 Lt
Remove 24"-8' RCP
& End Section
for Reset

193+92 Lt
Reset 24"-8' RCP
& 1 Safety End

193+92 Rt
Remove End Section
for Reset

193+92 Rt
Reset 1 Safety End

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0047(117)67 P 0248(13)261	B17	B55

Plotting Date: 8/15/2024

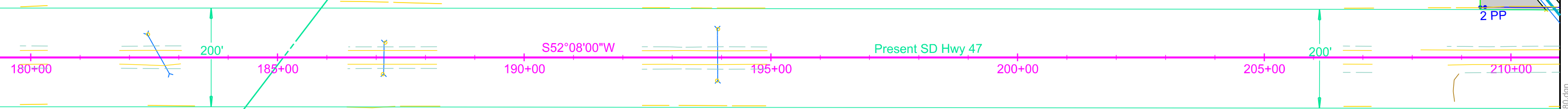
Plot Scale -
1:200

Sec 9 - T106N - R72W

SE1/4

Lower Brule Sioux Tribe - Allotment T432
(INFORMATION ONLY)

Lower Brule Sioux Tribe - Allotment T 455
Parcel4



1/4 Line

1/4 Line

SW1/4

Sec 9 - T106N - R72W

2 PP

File - ...\plan and profiles\180.dgn

Plotted From -
Justin



FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0047(117)67 P 0248(13)261	B18	B55
Plotting Date:		8/15/2024	

210+36 Lt
Take Out End Section

212+50 Rt
Take Out End Section

211+57
Fill Pipe with Cellular Grout

211+68
Skew 40° RHF
Bore and Jack 24"-352' RCP
& Install 2 Flared Ends
& PVC Coated Bank and Channel Protection Gabions (4.5 CY)

209+38 Lt
Begin Type 2 Fence

212+17 Rt
Begin Type 2 Fence

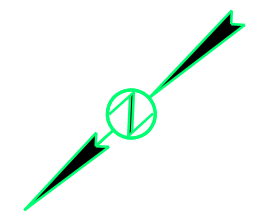
211+38 Lt
End Type 2 Fence

213+62 Rt
End Type 2 Fence

234+17 Rt
Take Out Cattle Pass End Section

234+17 Lt
Take Out Cattle Pass End Section

234+17
Fill Cattle Pass with Cellular Grout



Sec 16 - T106N - R72W

Sec 9 - T106N - R72W

Sec 17 - T106N - R72W

Sec 8 - T106N - R72W

Lower Brule Sioux Tribe - Allotment T430 (INFORMATION ONLY)

Lower Brule Sioux Tribe (INFORMATION ONLY)

Lower Brule Sioux Tribe - Allotment T558 (INFORMATION ONLY)

PI 218+42.06
N 605687.34
E 2191415.73
Del 14°03'35" L
Dc 1°00'00"
T 706.59'
L 1406.09'
R 5730.00'

SW1/4
209+37.71
100.00' & 240'
209+88.38 - 194.74'
210+11.41 - 213.97'
210+70.74 - 100.00'
211+09.69 - 100.00'
211+37.71
100.00' & 240'

212+17.43
100.00' & 190'
212+34.31 - 100.00'
212+71.89 - 100.00'
212+90.64 - 174.99'
213+13.55 - 156.44'
213+62.62
100.00' & 190'

Lower Brule Sioux Tribe - Allotment T 455
SW1/4 of Section 9 - Township 106 North - Range 72 West of the 5th P.M.

Parcel 4
0.16 ac, Permanent Easement (6646 sq ft), more or less

Parcel 4
212+17.43 to 213+62.62 R
Temporary Easement containing 0.2 ac, more or less

Parcel 4
209+37.71 to 211+37.71 L
Temporary Easement containing 0.4 ac, more or less

Plot Scale - 1:200

Plotted From - Justin

File - ...\plan and profiles\210.dgn



FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0047(117)67 P 0248(13)261	B19	B55
Plotting Date: 8/15/2024			

242+07 Rt
Remove 18"-8' RCP
& End Section for Reset

242+26 Lt
Clean Out Pipe End

255+25 Lt
Remove 18"-6' RCP
& End Section for Reset

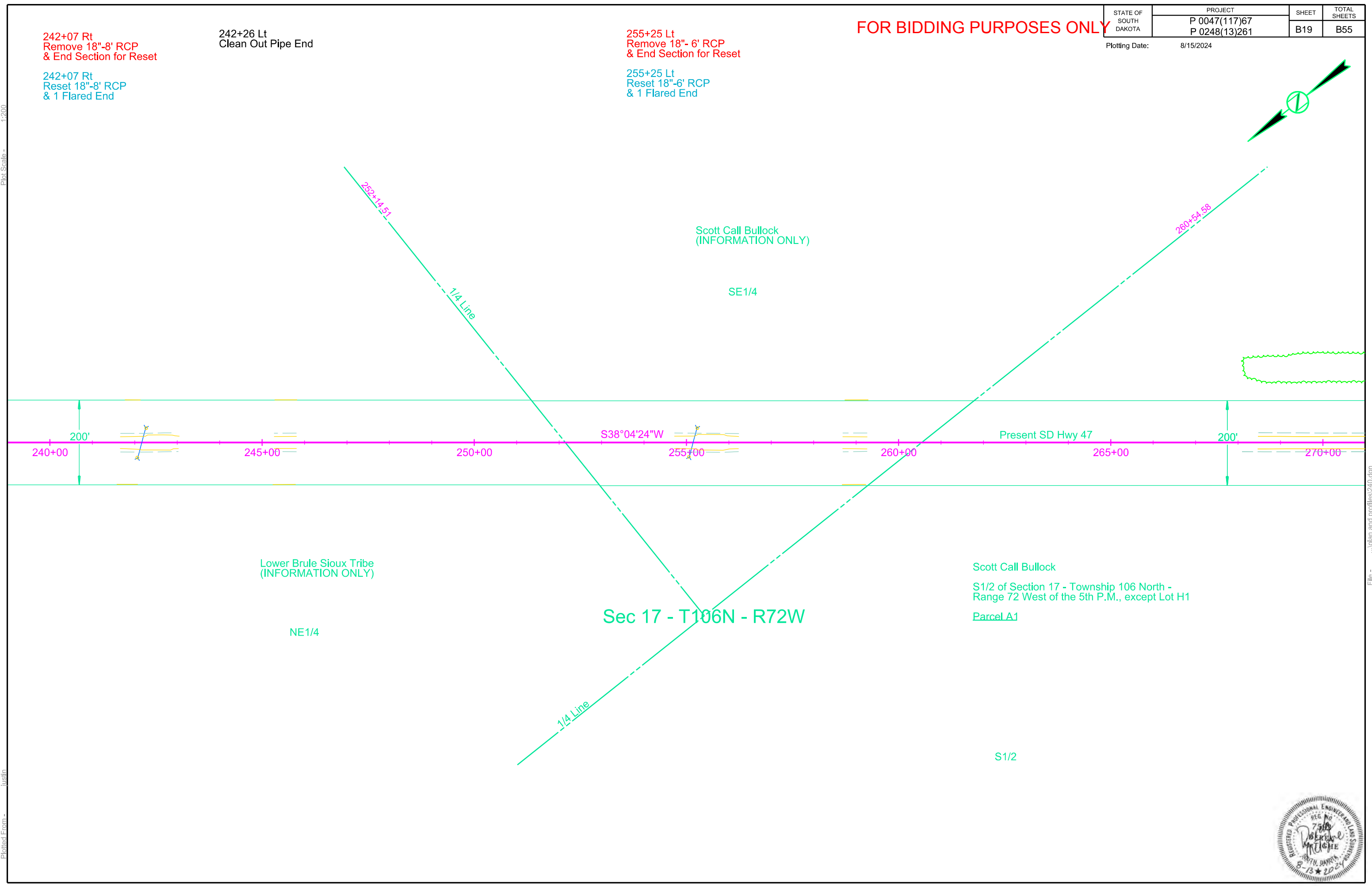
255+25 Lt
Reset 18"-6' RCP
& 1 Flared End

242+07 Rt
Reset 18"-8' RCP
& 1 Flared End

Plot Scale - 1:200

Plotted From - Justin

File - ...\plan and profiles\240.dgn



FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0047(117)67 P 0248(13)261	B20	B55
Plotting Date: 8/28/2024		Rev. 8/26/24 JT	

273+08 Lt
Remove 18"-16' RCP
& End Section
for Reset

273+25 Rt
Remove 18"-8' RCP
& End Section
for Reset

279+16 Lt
Take Out Cattle Pass End Section

279+17 Rt
Take Out Cattle Pass End Section

279+17
Fill Cattle Pass with Cellular Grout

273+08 Lt
Reset 18"-16' RCP
& 1 Flared End

273+25 Rt
Reset 18"-8' RCP
& 1 Flared End

275+60 Lt & Rt
Ditch Reprofiting

Sec 20 - T106N - R72W

Brad Karlen
(INFORMATION ONLY)

NW1/4

S38°04'24"W

Present SD Hwy 47

270+00 275+00 280+00 285+00 290+00 295+00 300+00

Scott Call Bullock
(INFORMATION ONLY)

Sec 17 - T106N - R72W

S1/2

Sec 19 - T106N - R72W



Plot Scale - 1"=200'

Plotted From - Justin

File - \open and profiles\270.dgn

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0047(117)67 P 0248(13)261	B21	B55

Plotting Date: 8/15/2024

FOR BIDDING PURPOSES ONLY

323+64 Rt
Remove 18"-8' RCP
& End Section
for Reset

323+64 Lt
Reset 18"-8' RCP
& 1 Flared End

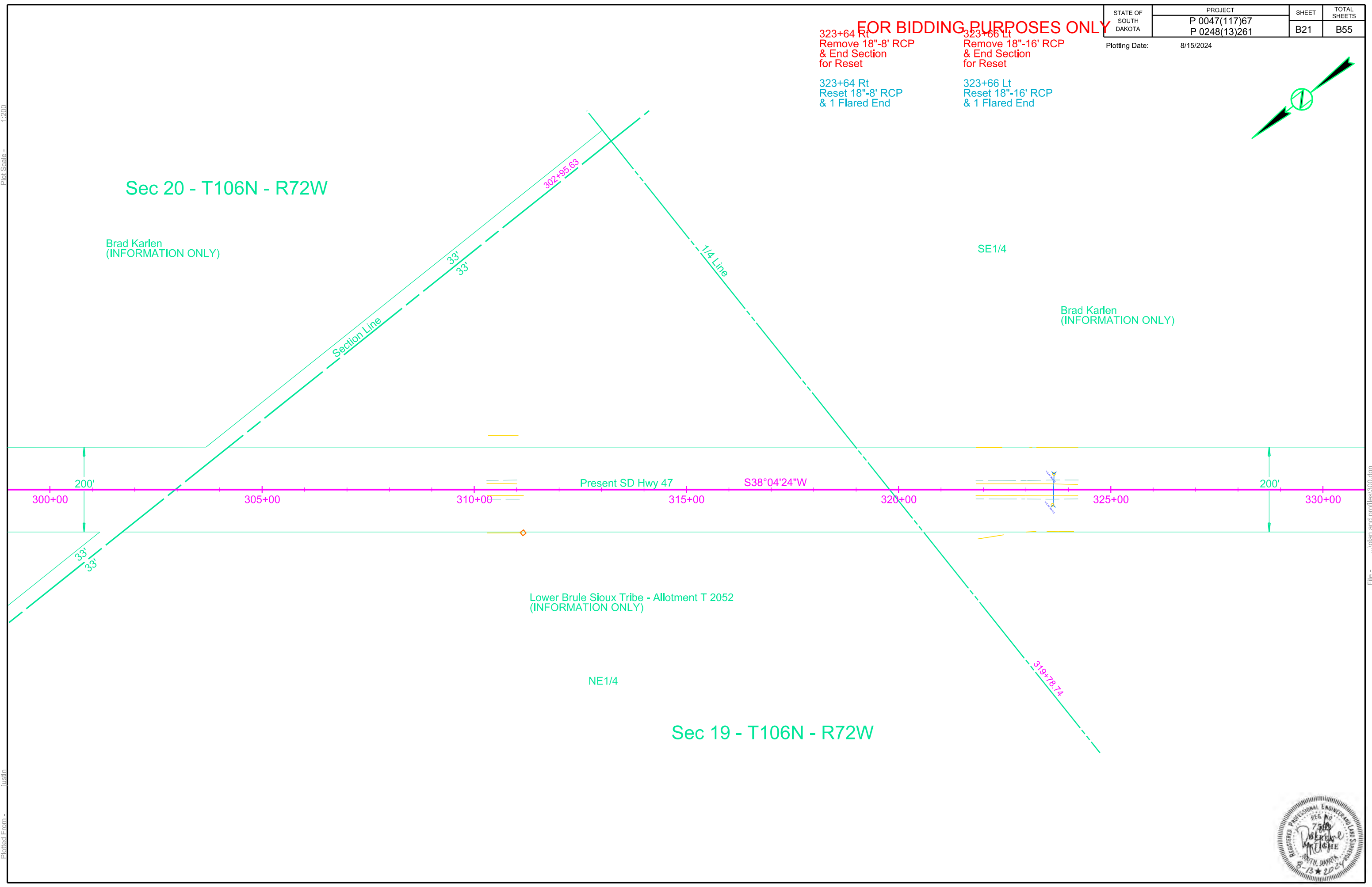
323+66 Lt
Remove 18"-16' RCP
& End Section
for Reset

323+66 Lt
Reset 18"-16' RCP
& 1 Flared End

Plot Scale - 1:200

Plotted From - Justin

File - ...\plan and profiles\300.dgn



STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0047(117)67 P 0248(13)261	B22	B55
Plotting Date: 8/28/2024		Rev. 8/26/24 JT	

FOR BIDDING PURPOSES ONLY

331+50 Lt & Rt Ditch Reprofilng
334+22 Lt & Rt Ditch Reprofilng
336+34 Lt & Rt Ditch Reprofilng

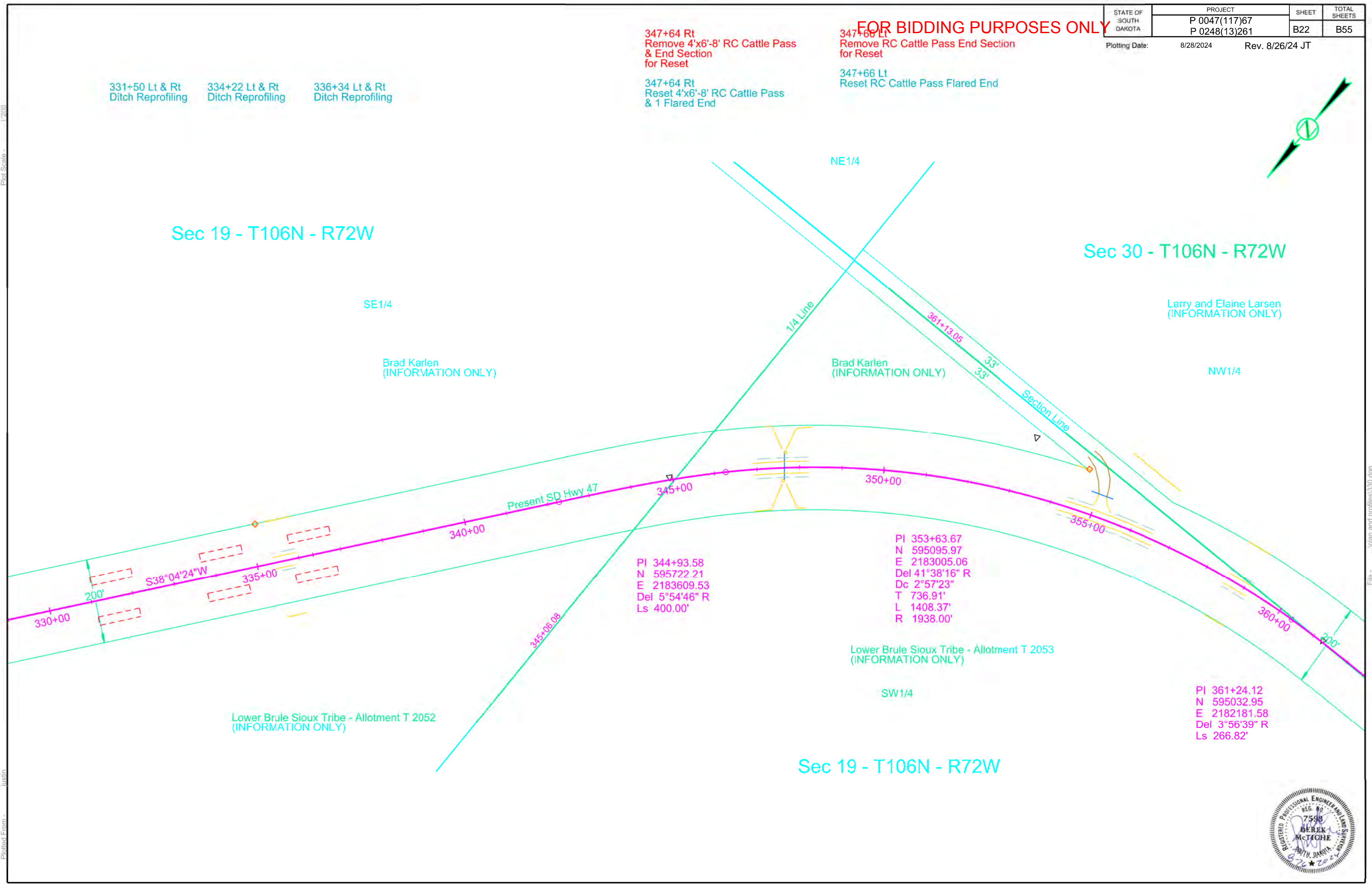
347+64 Rt Remove 4'x6'-8' RC Cattle Pass & End Section for Reset
347+64 Rt Reset 4'x6'-8' RC Cattle Pass & 1 Flared End

347+66 Lt Remove RC Cattle Pass End Section for Reset
347+66 Lt Reset RC Cattle Pass Flared End

Sec 19 - T106N - R72W

Sec 30 - T106N - R72W

Plot Scale - 1"=200'



Plotted From - Justin

...plan and profiles\330.dgn



FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0047(117)67 P 0248(13)261	B23	B55

Plotting Date: 8/15/2024

368+98 Lt
Remove 48"-8' RCP
& End Section
for Reset

368+98 Rt
Remove End Section
for Reset

373+12 Lt
Take Out Cattle Pass End Section

368+98 Lt
Reset 48"-8' RCP
& 1 Flared End

368+98 Rt
Reset Flared End

373+12 Rt
Take Out Cattle Pass End Section

373+12
Fill Cattle Pass with Cellular Grout



Sec 30 - T106N - R72W

Sec 25 - T106N - R73W

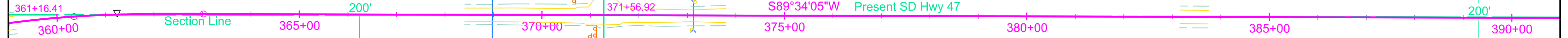
NW1/4

NE1/4

PI 361+24.12
N 595032.95
E 2182181.58
Del 3°56'39" R
Ls 266.82'

Larry and Elaine Larsen
(INFORMATION ONLY)

Karlen Family Partnership
(INFORMATION ONLY)



Lower Brule Sioux Tribe - Allotment T 2053
(INFORMATION ONLY)

Karlen Family Partnership
(INFORMATION ONLY)

SW1/4

SE1/4

Sec 19 - T106N - R72W

Sec 24 - T106N - R73W



Plot Scale - 1:200

Plotted From - Justin

File - ...\plan and profiles\360.dgn

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0047(117)67 P 0248(13)261	B24	B55

Plotting Date: 8/15/2024

FOR BIDDING PURPOSES ONLY

406+13 Lt
Remove 30"-8' RCP
& End Section
for Reset

406+13 Lt
Reset 30"-8' RCP
& 1 Flared End



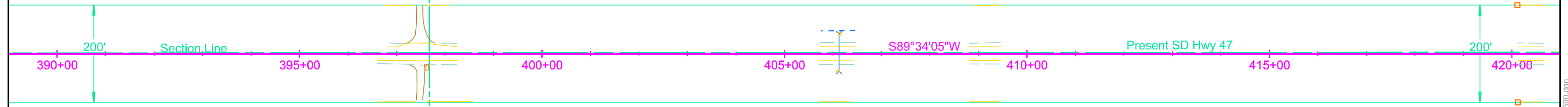
Sec 25 - T106N - R73W

NE1/4

NW1/4

Karlen Family Partnership
(INFORMATION ONLY)

Karlen Family Partnership
(INFORMATION ONLY)



Karlen Family Partnership
(INFORMATION ONLY)

Karlen Family Partnership
(INFORMATION ONLY)

SE1/4

SW1/4

Sec 24 - T106N - R73W

Plot Scale - 1:200

Plotted From - Justin

File - ...:\plan and profiles\390.dgn



424+12
Take Out 36"-78' CMP
& End Sections

424+12
Install 36" - 70' RCP
& 2 Flared Ends

FOR BIDDING PURPOSES ONLY

443+12
Take Out 36"-74' CMP
& End Sections

443+12
Install 36" - 68' RCP
& 2 Flared Ends

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0047(117)67 P 0248(13)261	B25	B55
Plotting Date:		8/15/2024	

Plot Scale - 1:200

Sec 25 - T106N - R73W

Sec 26 - T106N - R73W

NW1/4

NE1/4

Karlen Family Partnership
(INFORMATION ONLY)

Lower Brule Sioux Tribe
(INFORMATION ONLY)

424+08.04

33'33"

450+45.08



200'

200'

420+00 425+00 430+00 435+00 440+00 445+00 450+00

Present SD Hwy 47

Section Line

S89°34'05"W

Karlen Family Partnership
(INFORMATION ONLY)

Karlen Family Partnership
(INFORMATION ONLY)

SW1/4

SE1/4

Sec 24 - T106N - R73W

Sec 23 - T106N - R73W

33'33"

Section Line

1/4 Line

Plotted From - Justin

File - ...:\plan and profiles\20.dgn



STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0047(117)67 P 0248(13)261	B26	B55

Plotting Date: 8/15/2024

FOR BIDDING PURPOSES ONLY

489+69 Lt
Remove 18"-8' RCP
& End Section
for Reset

489+69 Lt
Reset 18"-8' RCP
& 1 Flared End

489+88 Rt
Clean Out Pipe End

Sec 27 - T106N - R73W

E1/2

Warren Hickory
(INFORMATION ONLY)

Karlen Family Partnership
(INFORMATION ONLY)

SE1/4

Sec 22 - T106N - R73W

Plot Scale - 1:200

Plotted From - Justin

File - ...plan and profiles\480.dgn



STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0047(117)67 P 0248(13)261	B27	B55

Plotting Date: 8/15/2024

FOR BIDDING PURPOSES ONLY

530+14 Rt
Remove 30"-8' RCP
& End Section
for Reset

530+13 Lt
Remove 30"-8' RCP
& End Section
for Reset

530+14 Rt
Install 30"-10' RCP
& Reset 1 Flared End

530+15 Lt
Install 30"-10' RCP
& Reset 1 Flared End

Sec 27 - T106N - R73W

Sec 28 - T106N - R73W

Sec 22 - T106N - R73W

Sec 21 - T106N - R73W

Warren Hickory
(INFORMATION ONLY)

Peggy Michalek
(INFORMATION ONLY)
W1/2E1/2
N1/2NW1/4
NW1/4NW1/4
W1/2N1/2NW1/4
NW1/4NW1/4

Karlen Family Partnership
(INFORMATION ONLY)

PI 537+84.83
N 594899.85
E 2164521.29
Del 5°50'47" L
Ls 400.00'

6 T's L.L.C.
(INFORMATION ONLY)

6 T's L.L.C.
(INFORMATION ONLY)

Plot Scale - 1:200

Plotted From - justin

File - ...plan and profiles\510.dgn



STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0047(117)67 P 0248(13)261	B28	B55

Plotting Date: 8/28/2024 Rev. 8/26/24 JT

FOR BIDDING PURPOSES ONLY

554+18 Rt
Remove 24"-8' RCP
& End Section
for Reset

554+18 Lt
Reset 24"-8' RCP
& 1 Flared End

554+19 Lt
Remove 24"-16' RCP
& End Section
for Reset

554+19 Lt
Reset 24"-16' RCP
& 1 Flared End

558+08 Rt
Remove 30"-8' RCP
& End Section
for Reset

558+08 Rt
Reset 30"-8' RCP
& 1 Flared End

558+09 Lt
Remove 30"-8' RCP
& End Section
for Reset

558+09 Lt
Reset 30"-8' RCP
& 1 Flared End

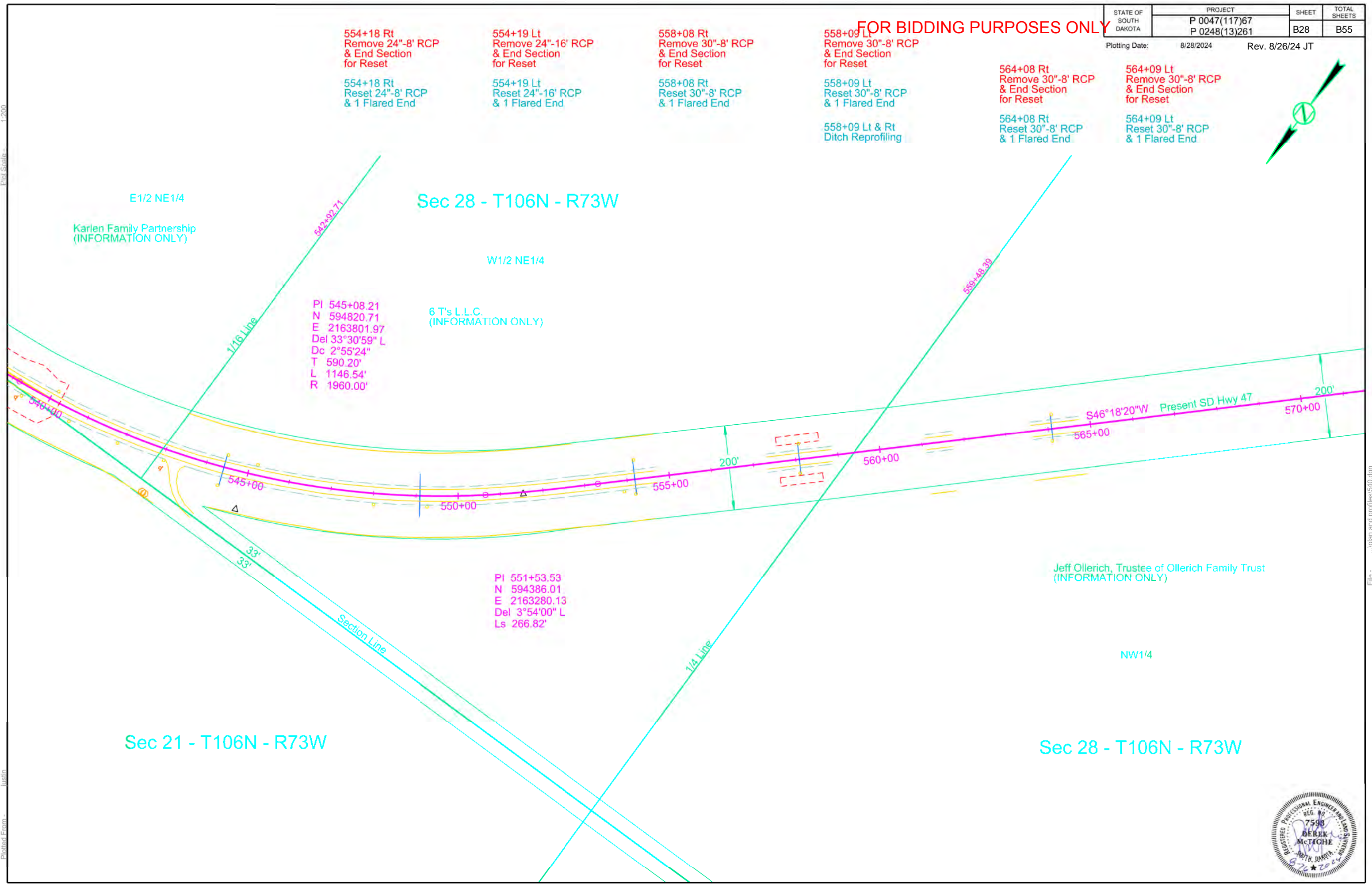
558+09 Lt & Rt
Ditch Reprofiting

564+08 Rt
Remove 30"-8' RCP
& End Section
for Reset

564+08 Rt
Reset 30"-8' RCP
& 1 Flared End

564+09 Lt
Remove 30"-8' RCP
& End Section
for Reset

564+09 Lt
Reset 30"-8' RCP
& 1 Flared End



Plot Scale - 1:200

Plotted From - Justin

File - ...plan and profiles(540).dgn



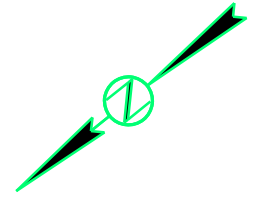
FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0047(117)67 P 0248(13)261	B29	B55

Plotting Date: 8/15/2024

588+07 Rt
Remove End Section
for Reset

595+07 Rt
Reset Flared End Section



Sec 28 - T106N - R73W

SW1/4

Sally Rohrback
(INFORMATION ONLY)

PI 588+34.68
N 591842.97
E 2160618.48
Del 5°54'46" L
Ls 400.00'

Jeff Ollerich, Trustee of Ollerich Family Trust
(INFORMATION ONLY)

Jeff Ollerich, Trustee of Ollerich Family Trust
(INFORMATION ONLY)

Sally Rohrback
(INFORMATION ONLY)

PI 596+13.84
N 591249.33
E 2160113.38
Del 36°52'08" L
Dc 2°57'23"
T 645.98'
L 1247.07'
R 1938.00'

SE1/4

Ollerich Family Trust
(INFORMATION ONLY)

Sec 28 - T106N - R73W

Sec 29 - T106N - R73W



Plot Scale - 1:200

Plotted From - Justin

File - ...:\plan and profiles\570.dgn

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0047(117)67 P 0248(13)261	B30	B55
Plotting Date: 8/15/2024			

FOR BIDDING PURPOSES ONLY

611+67 Lt
Remove End Section
for Reset

611+67 Rt
Remove End Section
for Reset

611+67 Lt
Reset Flared End Section

611+67 Rt
Reset Flared End Section



Sec 28 - T106N - R73W

Sec 33 - T106N - R73W

SW1/4

NW1/4

Sally Rohrback
(INFORMATION ONLY)

Sally Rohrback
(INFORMATION ONLY)

33'33"

33'33"

600+00 605+00 610+00 615+00 620+00 625+00 630+00

Section Line

S0°25'14"E

Present SD Hwy 47

Ollerich Family Trust
(INFORMATION ONLY)

Dorothy Ann Houska
(INFORMATION ONLY)

SE1/4

NE1/4

612+16.59

Sec 29 - T106N - R73W

Sec 32 - T106N - R73W

Section Line

Plot Scale - 1:200

Plotted From - Justin

File - ... \plan and profiles\600.dgn



FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0047(117)67 P 0248(13)261	B31	B55

Plotting Date: 8/15/2024



659+89 Lt
Remove End Section
for Reset

659+90 Rt
Remove End Section
for Reset

659+89 Lt
Reset Flared End Section

659+90 Rt
Reset Flared End Section

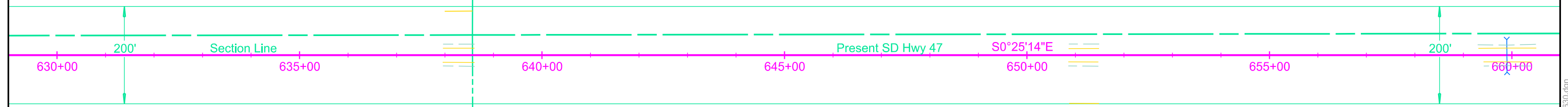
Sec 33 - T106N - R73W

NW1/4

SW1/4

Sally Rohrback
(INFORMATION ONLY)

Calvin Peterson
(INFORMATION ONLY)



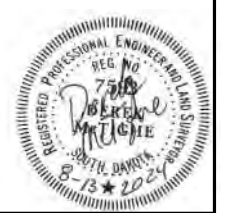
Sec 32 - T106N - R73W

NE1/4

SE1/4

Dorothy Ann Houska
(INFORMATION ONLY)

Karlen Family Partnership
(INFORMATION ONLY)



Plot Scale - 1:200

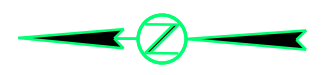
Plotted From - Justin

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FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0047(117)67 P 0248(13)261	B32	B55

Plotting Date: 8/15/2024



Plot Scale - 1:200

Plotted From - Justin

File - ... \plan and profiles\660.dgn

664+50 Lt
Remove 24"-8' RCP
& End Section
for Reset

664+50 Lt
Reset 24"-8' RCP
& 1 Flared End

664+51 Rt
Remove End Section
for Reset

664+51 Rt
Reset Flared End Section

Sec 33 - T106N - R73W

Sec 4 - T105N - R73W

SW1/4

NW1/4

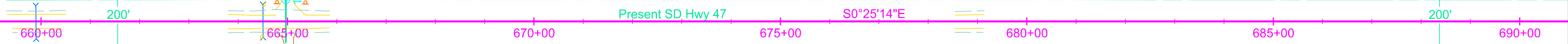
Calvin Peterson
(INFORMATION ONLY)

Karlen Family Partnership
(INFORMATION ONLY)

Section Line

Present SD Hwy 47

S0°25'14"E



Karlen Family Partnership
(INFORMATION ONLY)

Calvin Peterson
(INFORMATION ONLY)

SE1/4

NE1/4

Sec 32 - T106N - R73W

Sec 5 - T105N - R73W



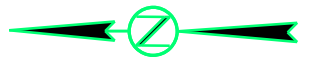
FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0047(117)67 P 0248(13)261	B33	B55

Plotting Date: 8/15/2024

699+32 Rt
Remove End Section
for Reset

699+32 Rt
Reset Flared End Section



Sec 4 - T105N - R73W

SW1/4

Karlen Family Partnership
(INFORMATION ONLY)

Section Line

Present SD Hwy 47

S0°25'14"E

Calvin Peterson
(INFORMATION ONLY)

SE1/4

Sec 5 - T105N - R73W

33'33"

33'33"

717+76.58

Section Line

691+36.58

1/4 Line

690+00

695+00

700+00

705+00

710+00

715+00

720+00

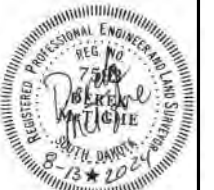
200'

200'

Plot Scale - 1:200

Plotted From - Justin

File - ...:\plan and profiles\690.dgn



Plot Scale - 1:200

Plotted From - Justin

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0047(117)67 P 0248(13)261	B34	B55

Plotting Date: 8/15/2024

FOR BIDDING PURPOSES ONLY

740+87 Lt
Remove 24"-8' RCP
& End Section
for Reset

740+88 Rt
Remove 24"-8' RCP
& End Section
for Reset

740+87 Lt
Reset 24"-8' RCP
& 1 Flared End

740+88 Rt
Reset 24"-8' RCP
& 1 Flared End



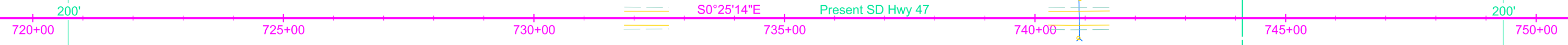
Sec 9 - T105N - R73W

NW1/4

SW1/4

Donald J Schindler Revocable Trust
(INFORMATION ONLY)

Section Line



Calvin Peterson
(INFORMATION ONLY)

NE1/4

SE1/4

Sec 8 - T105N - R73W

1/4 Line
745+14.50



File - ...\plan and profiles\720.dgn

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0047(117)67 P 0248(13)261	B35	B55

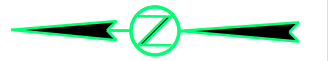
Plotting Date: 8/15/2024

752+51 Lt
Remove 48"-8' RCP
& End Section
for Reset

752+52 Rt
Remove 48"-8' RCP
& End Section
for Reset

752+51 Lt
Reset 48"-8' RCP
& 1 Flared End

752+52 Rt
Reset 48"-8' RCP
& 1 Flared End



Sec 9 - T105N - R73W

Sec 16 - T105N - R73W

SW1/4

NW1/4

Donald J Schindler Revocable Trust
(INFORMATION ONLY)

Donald J Schindler Revocable Trust
(INFORMATION ONLY)

Section Line

Present SD Hwy 47

750+00 755+00 760+00 765+00 770+00 775+00 780+00

S0°25'14"E

Trent & Laurie Schindler
(INFORMATION ONLY)

Trent & Laurie Schindler
(INFORMATION ONLY)

SE1/4

NE1/4

Sec 8 - T105N - R73W

Sec 17 - T105N - R73W

Section Line 770+56.58

33'33"

33'33"

Plot Scale - 1:200

Plotted From - Justin

File - ...:\plan and profiles\750.dgn



783+07 Lt
Remove End Section
for Reset

783+07 Lt
Reset Flared End Section

792+96 Lt
Remove 24"-8' RCP
& End Section
for Reset

792+96 Lt
Reset 24"-8' RCP
& 1 Flared End

792+97 Rt
Remove 24"-8' RCP
& End Section
for Reset

792+97 Rt
Reset 24"-8' RCP
& 1 Flared End

805+52 Lt
Remove 24"-8' RCP
& End Section
for Reset

805+52 Lt
Reset 24"-8' RCP
& 1 Flared End

FOR BIDDING PURPOSES ONLY

805+52 Rt
Remove End Section
for Reset

805+52 Rt
Reset Flared End Section

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0047(117)67 P 0248(13)261	B36	B55

Plotting Date: 8/15/2024



Sec 16 - T105N - R73W

NW1/4

SW1/4

Donald J Schindler Revocable Trust
(INFORMATION ONLY)

Donald J Schindler Revocable Trust
(INFORMATION ONLY)

Section Line

780+00 785+00 790+00 795+00 800+00 805+00 810+00

S0°25'14"E

Present SD Hwy 47

Trent & Laurie Schindler
(INFORMATION ONLY)

Steve & Ronda Schelske
(INFORMATION ONLY)

NE1/4

SE1/4

796+26.58
1/4 Line

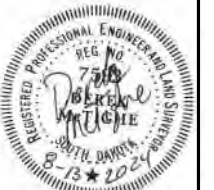
Sec 17 - T105N - R73W

Plot Scale - 1:200

Justin

Plotted From -

File - ...\plan and profiles\780.dgn



STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0047(117)67 P 0248(13)261	B37	B55

Plotting Date: 8/15/2024

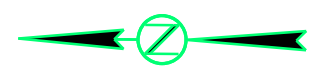
FOR BIDDING PURPOSES ONLY

829+75 Lt
Remove End Section
for Reset

829+75 Lt
Reset Flared End Section

829+75 Rt
Remove 18"-8' RCP
& End Section
for Reset

829+75 Rt
Reset 18"-8' RCP
& 1 Flared End



Sec 16 - T105N - R73W

Sec 21 - T105N - R73W

Sec 17 - T105N - R73W

Sec 20 - T105N - R73W

SW1/4

NW1/4

Town of Reliance (Cemetery)
(INFORMATION ONLY)

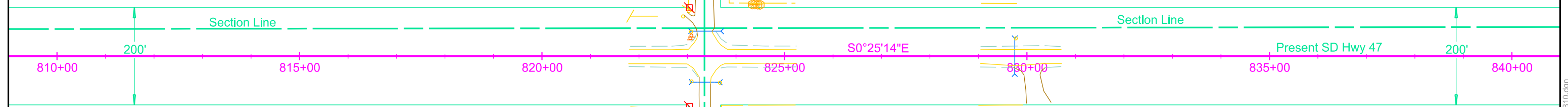
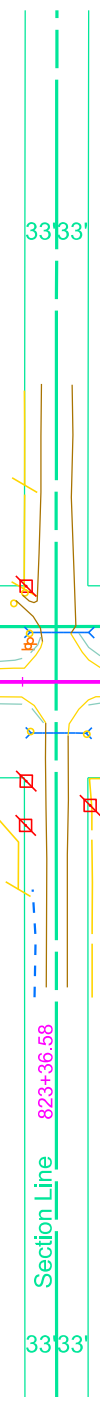
Donald J Schindler Revocable Trust
(INFORMATION ONLY)

Steve & Ronda Schelske
(INFORMATION ONLY)

Donald J Schindler Revocable Trust
(INFORMATION ONLY)

SE1/4

NE1/4



Plot Scale - 1:200

Plotted From - Justin

File - ...\plan and profiles\810.dgn



FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0047(117)67 P 0248(13)261	B38	B55

Plotting Date: 8/15/2024



- 842+98 Lt
Remove 36"-8' RCP & End Section for Reset
- 842+98 Lt
Reset 36"-8' RCP & 1 Flared End
- 842+99 Rt
Remove End Section for Reset
- 842+99 Rt
Reset Flared End Section
- 845+03 Lt
Take Out Cattle Pass End Section
- 845+03 Rt
Take Out Cattle Pass End Section
- 845+03
Fill Cattle Pass with Cellular Grout

Sec 21 - T105N - R73W

NW1/4

SW1/4

Donald J Schindler Revocable Trust (INFORMATION ONLY)

Curtis Wagaman and Tracey Clemens (INFORMATION ONLY)

Present SD Hwy 47

Section Line

S0°25'14"E

840+00 845+00 850+00 855+00 860+00 865+00 870+00

Donald J Schindler Revocable Trust (INFORMATION ONLY)

Donald J Schindler Revocable Trust (INFORMATION ONLY)

NE1/4

SE1/4

1/4 Line
849+06.58

Sec 20 - T105N - R73W

Plot Scale - 1:200

Plotted From - Justin

File - ... \plan and profiles\840.dgn



FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0047(117)67 P 0248(13)261	B39	B55

Plotting Date: 8/15/2024

874+79 Lt
Remove End Section
for Reset

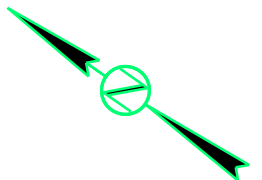
874+79 Rt
Remove 18"-8' RCP
& End Section
for Reset

877+85 Rt
Remove 24"-8' RCP
& End Section
for Reset

874+79 Lt
Reset Flared End Section

874+79 Rt
Reset 18"-8' RCP
& 1 Flared End

877+85 Rt
Reset 24"-8' RCP
& 1 Flared End



Sec 21 - T105N - R73W

Sec 28 - T105N - R73W

Lot E

SW1/4 SW1/4

Agtegra Cooperative
(INFORMATION ONLY)

N1/2 NW1/4

Gladys M Stewart
(INFORMATION ONLY)

Lowell S Hieb
(INFORMATION ONLY)

Lot 1

Robert J. & Connie A Muldoon
(INFORMATION ONLY)

E1/2 SE1/4

PI 888+94.65
N 562348.02
E 2161042.48
Del 5°06'57" R
Ls 500.00'

Eileen Wheeler Etal
(INFORMATION ONLY)

NW1/4

Sec 20 - T105N - R73W

Sec 28 - T105N - R73W

NE1/4 NE1/4

Kent J Stewart
(INFORMATION ONLY)

Sec 29 - T105N - R73W

Plot Scale - 1:200

Plotted From - Justin

File - ...\plan and profiles\870.dgn



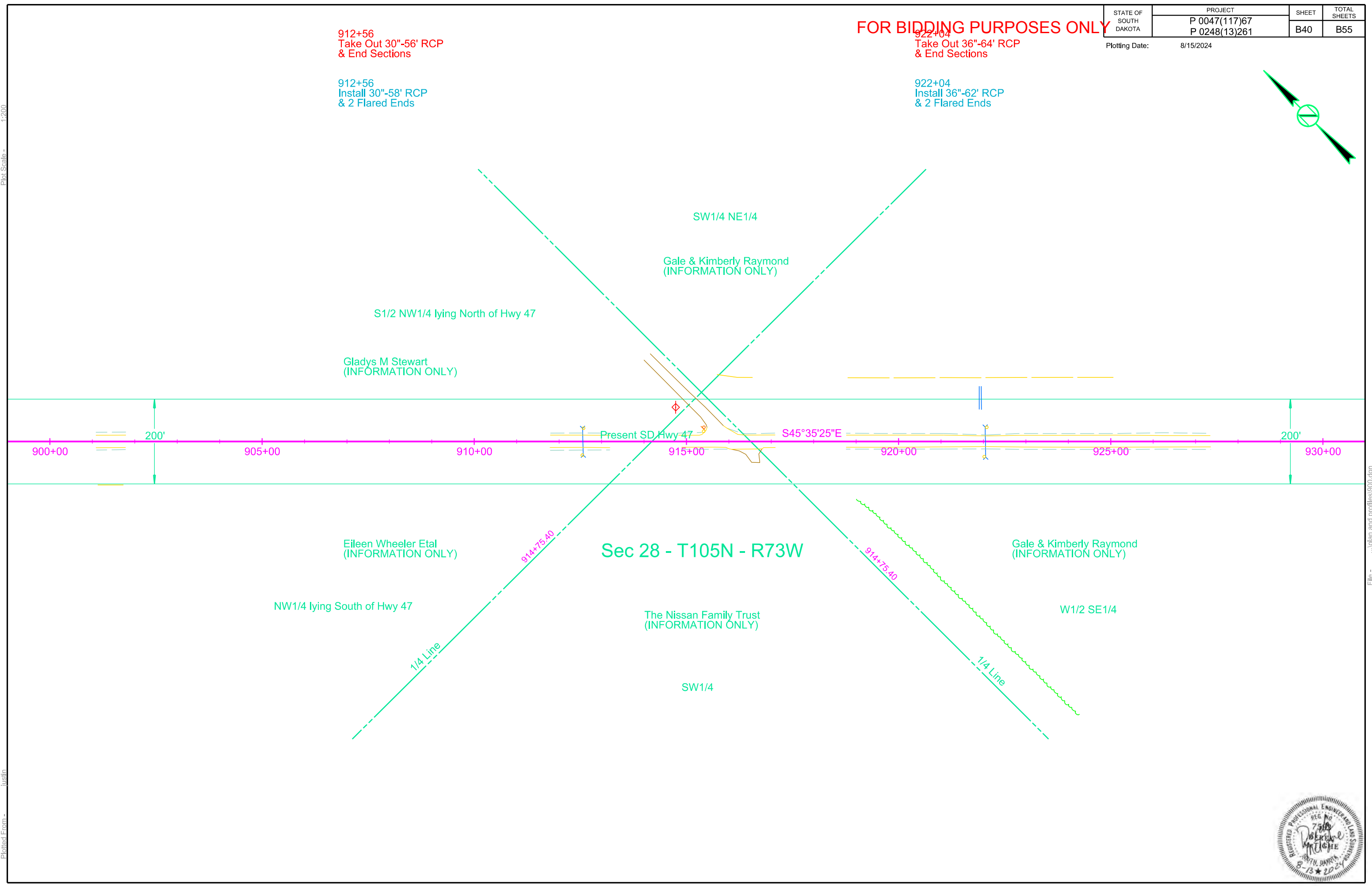
FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0047(117)67 P 0248(13)261	B40	B55

Plotting Date: 8/15/2024

Plot Scale - 1:200

Plotted From - Justin

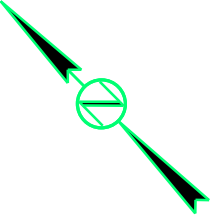


912+56
Take Out 30"-56' RCP
& End Sections

912+56
Install 30"-58' RCP
& 2 Flared Ends

922+04
Take Out 36"-64' RCP
& End Sections

922+04
Install 36"-62' RCP
& 2 Flared Ends



Sec 28 - T105N - R73W



File - ...\plan and profiles\900.dgn

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0047(117)67 P 0248(13)261	B41	B55
Plotting Date: 8/28/2024		Rev. 8/26/24 JT	

968+51
Take Out 48"-58' RCP
& End Sections

968+51
Install 48"-78' RCP
& 2 Flared Ends

Sec 34 - T105N - R73W

NW1/4

NE1/4

Deborah J Nissan
(INFORMATION ONLY)

Deborah J Nissan
(INFORMATION ONLY)

NW1/4

SW1/4

Present SD Hwy 47

S45°35'25"E

960+00

965+00

970+00

975+00

980+00

985+00

990+00

989+84.11

1/4 Line

1/4 Line

1194+68.6

PI 987+80.00
 N 555430.20
 E 2168104.30
 Del 19°26'05" L
 Dc 3°41'47"
 T 265.43'
 L 525.76'
 R 1550.00'

Plot Scale - 1"=200'

Plotted From - Justin

File - \\open and profiles\660.dgn



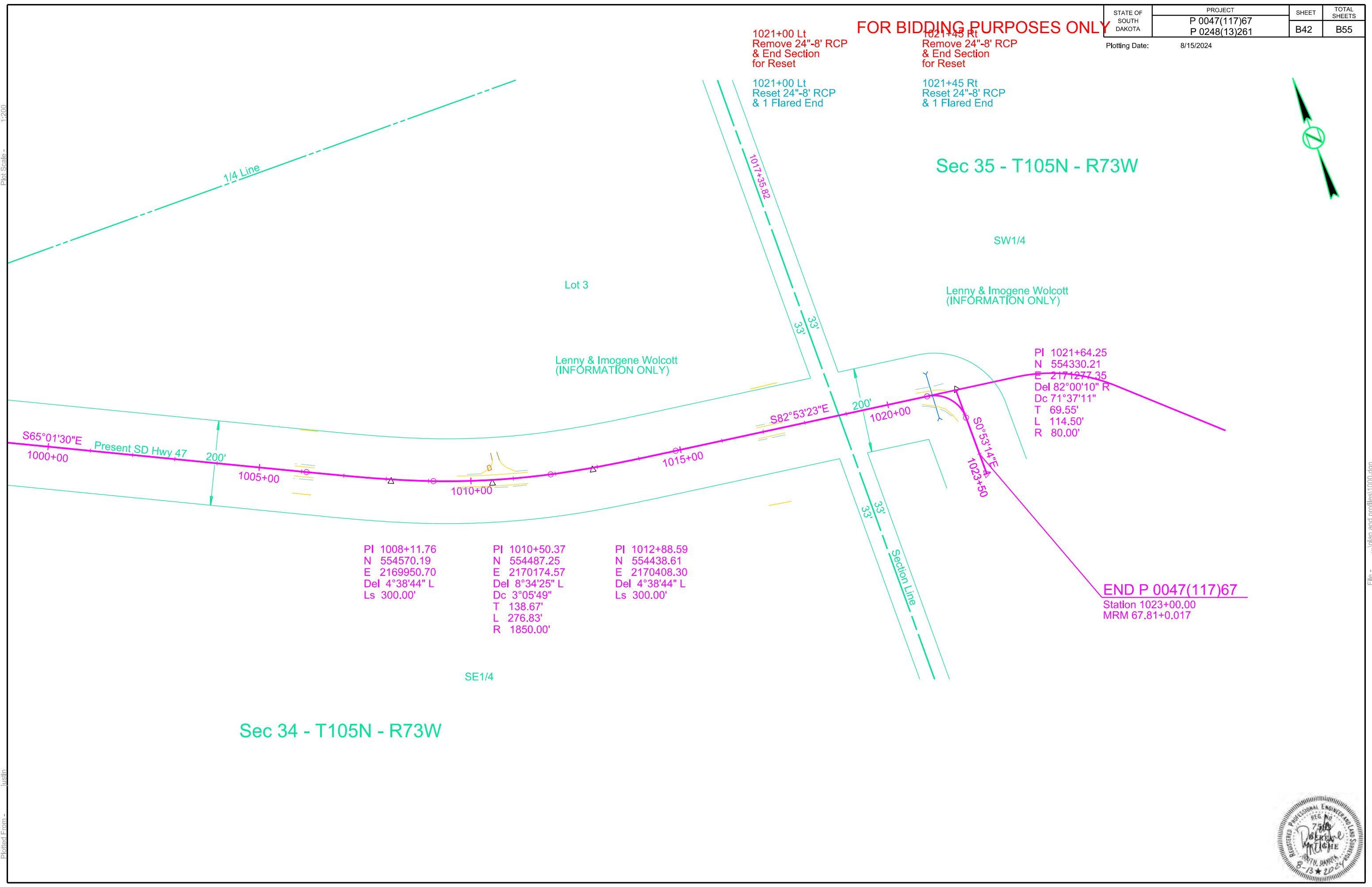
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0047(117)67 P 0248(13)261	B42	B55
Plotting Date: 8/15/2024			

FOR BIDDING PURPOSES ONLY

Plot Scale - 1:200

Plotted From - Justin

File - ...\plan and profiles\1000.dgn



1021+00 Lt
Remove 24"-8' RCP
& End Section
for Reset

1021+45 Rt
Remove 24"-8' RCP
& End Section
for Reset

1021+00 Lt
Reset 24"-8' RCP
& 1 Flared End

1021+45 Rt
Reset 24"-8' RCP
& 1 Flared End

Sec 35 - T105N - R73W

SW1/4

Lot 3

Lenny & Imogene Wolcott
(INFORMATION ONLY)

Lenny & Imogene Wolcott
(INFORMATION ONLY)

PI 1021+64.25
N 554330.21
E 2171277.35
Del 82°00'10" R
Dc 71°37'11"
T 69.55'
L 114.50'
R 80.00'

S65°01'30"E
1000+00
Present SD Hwy 47

1005+00

1010+00

1015+00

1020+00

1023+50

PI 1008+11.76
N 554570.19
E 2169950.70
Del 4°38'44" L
Ls 300.00'

PI 1010+50.37
N 554487.25
E 2170174.57
Del 8°34'25" L
Dc 3°05'49"
T 138.67'
L 276.83'
R 1850.00'

PI 1012+88.59
N 554438.61
E 2170408.30
Del 4°38'44" L
Ls 300.00'

END P 0047(117)67
Station 1023+00.00
MRM 67.81+0.017

SE1/4

Sec 34 - T105N - R73W



STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0047(117)67 P 0248(13)261	B43	B55

Plotting Date: 8/15/2024

FOR BIDDING PURPOSES ONLY
 19+02
 Take Out 24"-82' CMP
 & End Sections

19+02
 Install 24"-72' RCP
 & 2 Flared Ends

5+03
 Take Out 24"-82' CMP
 & End Sections

5+03
 Install 24"-70' RCP
 & 2 Flared Ends



Sec 28 - T105N - R73W

NW1/4

SW1/4

Eileen Wheeler Etal
(INFORMATION ONLY)

The Nissan Family Trust
(INFORMATION ONLY)

R.O.W. Line

Section Line

1/4 Line

R.O.W. Line

S0°25'14"E

Present SD Hwy 248

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

R.O.W. Line

R.O.W. Line

BEGIN P 0248(13)261
 Station 0+00.00
 MRM 262.57+0.000

Kent J Stewart
(INFORMATION ONLY)

Kent J Stewart
(INFORMATION ONLY)

NE1/4

SE1/4

Sec 29 - T105N - R73W



Plot Scale - 1:200

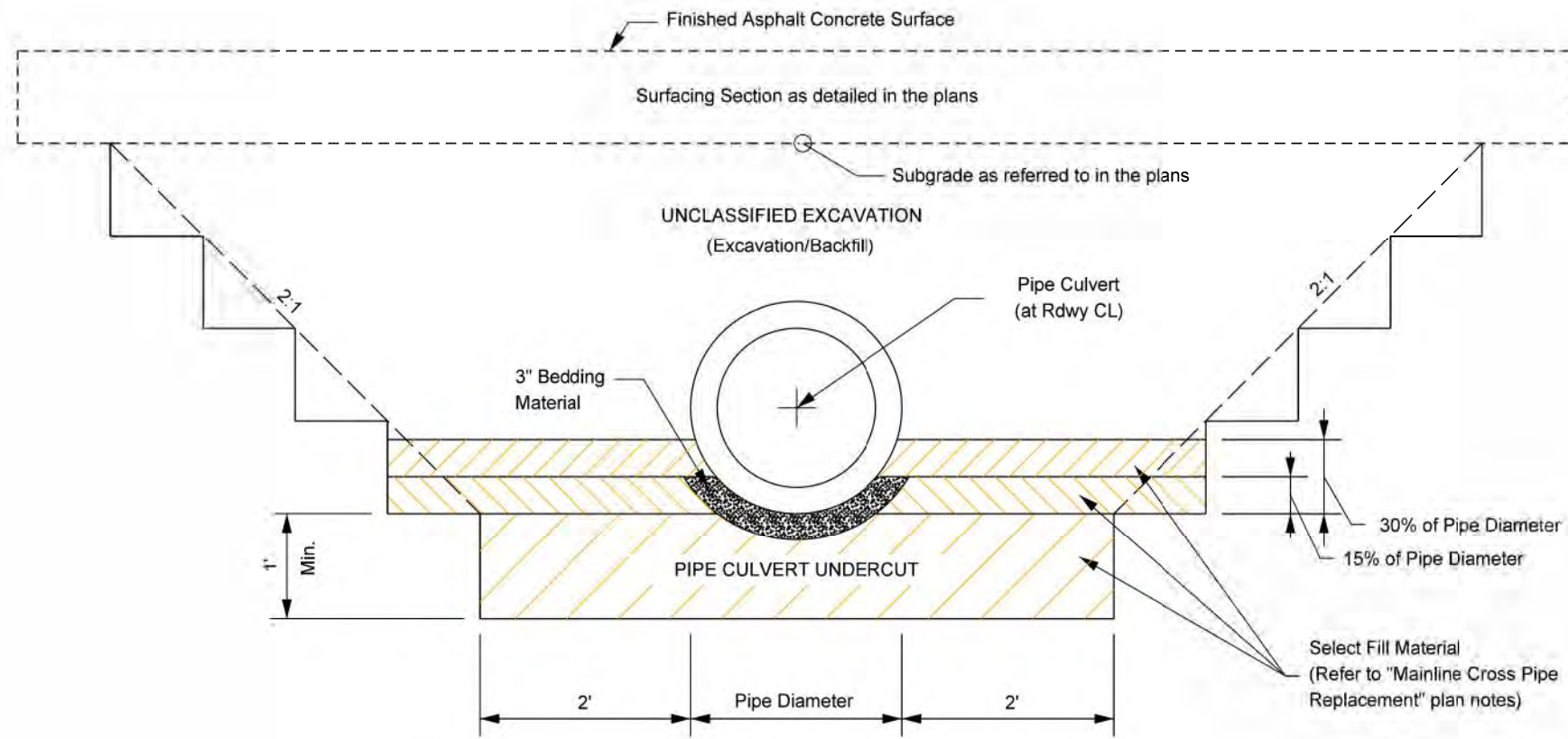
Plotted From - Justin

File - ... \plan and profiles\000_248.dgn

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0047(117)67 P 0248(13)261	B44	B55
Plotting Date:		8/15/2024	

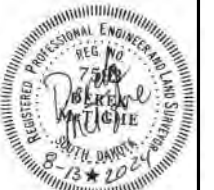
MAINLINE PIPE CULVERT INSTALLATION TRENCH DETAIL



Plot Scale - 1:200

Plotted From - Justin



File - ...IDesign\Section B\Details.dgn

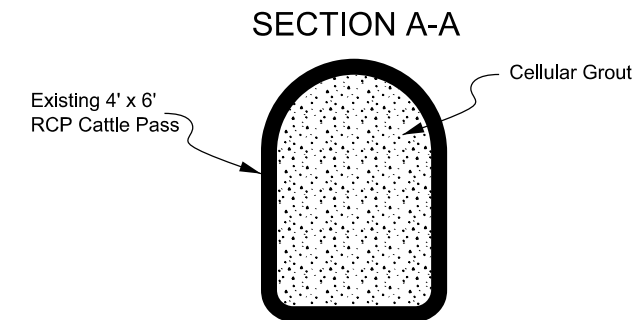
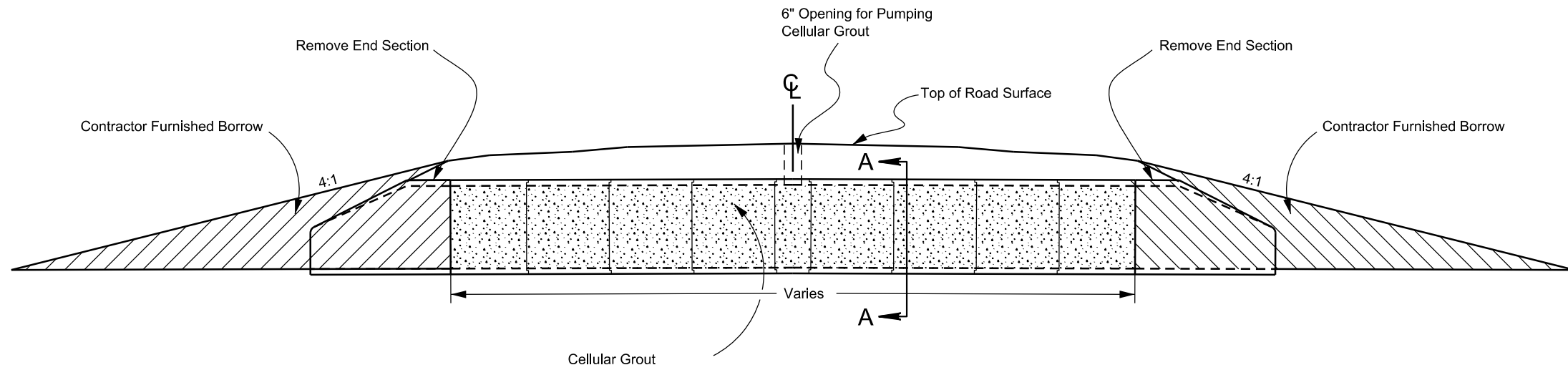


FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0047(117)67 P 0248(13)261	B45	B55
Plotting Date: 8/15/2024			

LAYOUT FOR PLUGGING EXISTING RC CATTLE PASS

-  Contractor Furnished Borrow
-  Cellular Grout



NOTE: Contractor shall match the existing roadway inslope to the satisfaction of the Engineer.



Plot Scale - 1:200

Plotted From - Justin

File - ...IDesign\Section B\Details.dgn

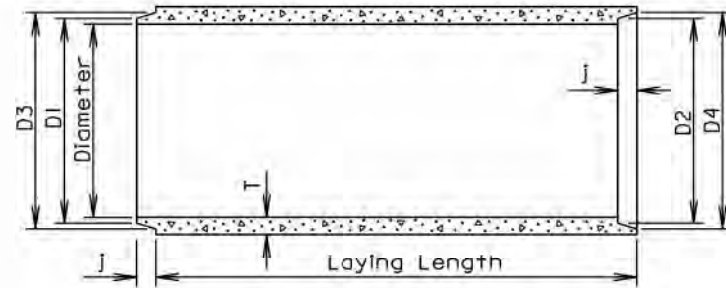
Published Date: 2025	
S D D O T	FOR BIDDING PURPOSES ONLY
INSLOPE TRANSITIONS AT PIPE CULVERTS OR REINFORCED CONCRETE BOX CULVERTS	<p>TYPE 1 INSLOPE TRANSITION</p> <p>GENERAL NOTES:</p> <p>This Type 1 Inslope Transition is used when the specified inslope at the drainage structure is flatter than the typical inslope and the inslope at the drainage structure is between a 4:1 slope and 6:1 slope.</p> <p>Line B-B represents the clear zone line, the location where soil intercepts the parapet on an RCBC, the location where the soil intercepts the top of the pipe adjacent to the opening of the pipe end section, or may represent a change in slope.</p> <p>* Transition from the typical inslope to the inslope at the drainage structure. Within the clear zone (area from edge of subgrade shoulder to line B-B) use 100' length for each 1:1 slope change. Example: transition from a 4:1 to a 6:1 would require a 200' length transition. The typical inslope outside of the clear zone will be transitioned gradually to the slope necessary adjacent to the RCBC wing wall or pipe culvert end section within the transition length necessary for the transition within the clear zone.</p>
PLATE NUMBER 120.05 Sheet 1 of 2	September 14, 2018

Published Date: 2025	
S D D O T	FOR BIDDING PURPOSES ONLY
INSLOPE TRANSITIONS AT PIPE CULVERTS OR REINFORCED CONCRETE BOX CULVERTS	<p>TYPE 2 INSLOPE TRANSITION</p> <p>GENERAL NOTES:</p> <p>This Type 2 Inslope Transition is used when the specified inslope at the pipe or RCBC is flatter than a 6:1 slope.</p> <p>Line B-B represents the clear zone line, the location where soil intercepts the parapet on an RCBC, the location where the soil intercepts the top of the pipe adjacent to the opening of the pipe end section, or may represent a change in slope.</p> <p>* Transition from Inslope at drainage structure to a 6 : 1 inslope and 3:1 inslope.</p> <p>** Transition from typical inslope to the inslopes adjacent to the drainage structure. Within the clear zone (area from edge of subgrade shoulder to line B-B) use 100' length for each 1:1 slope change. Example: transition from a 4:1 to a 6:1 would require a 200' length transition. The typical inslope outside of the clear zone will be transitioned to a 3:1 inslope within the transition length necessary for the transition within the clear zone.</p>
PLATE NUMBER 120.05 Sheet 2 of 2	September 14, 2018

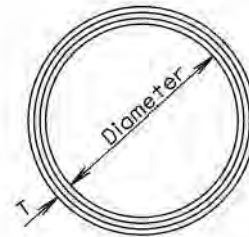
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
P 0047(117)67 P 0248(13)261	8/28/2024	B46	B55
Plotting Date:	Rev. 8/26/24 JT		

TOLERANCES IN DIMENSIONS

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



LONGITUDINAL SECTION



END VIEW

GENERAL NOTES:

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

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

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

June 26, 2015

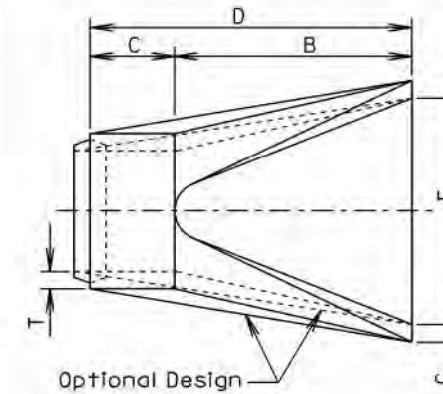
S
D
D
O
T

REINFORCED CONCRETE PIPE

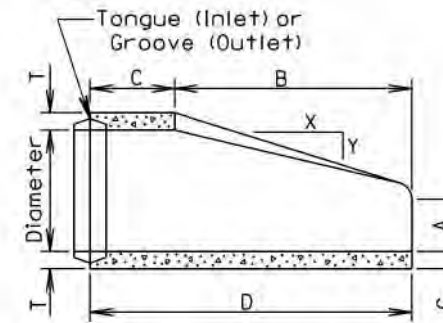
PLATE NUMBER
450.01

Sheet 1 of 1

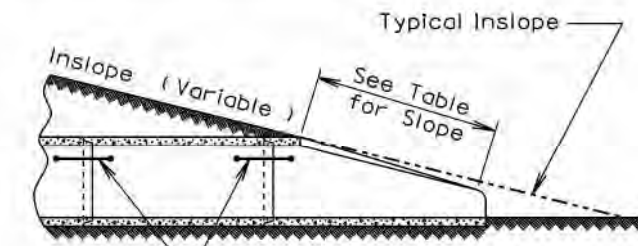
Published Date: 2025



TOP VIEW



LONGITUDINAL SECTION



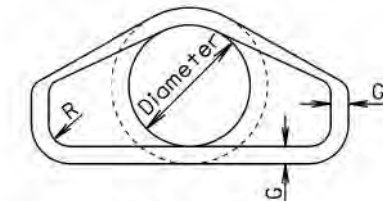
See Standard Plate 450.18
(TIE BOLTS FOR R.C.P. AND R.C.P. ARCH)

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 1/8	72 1/8	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

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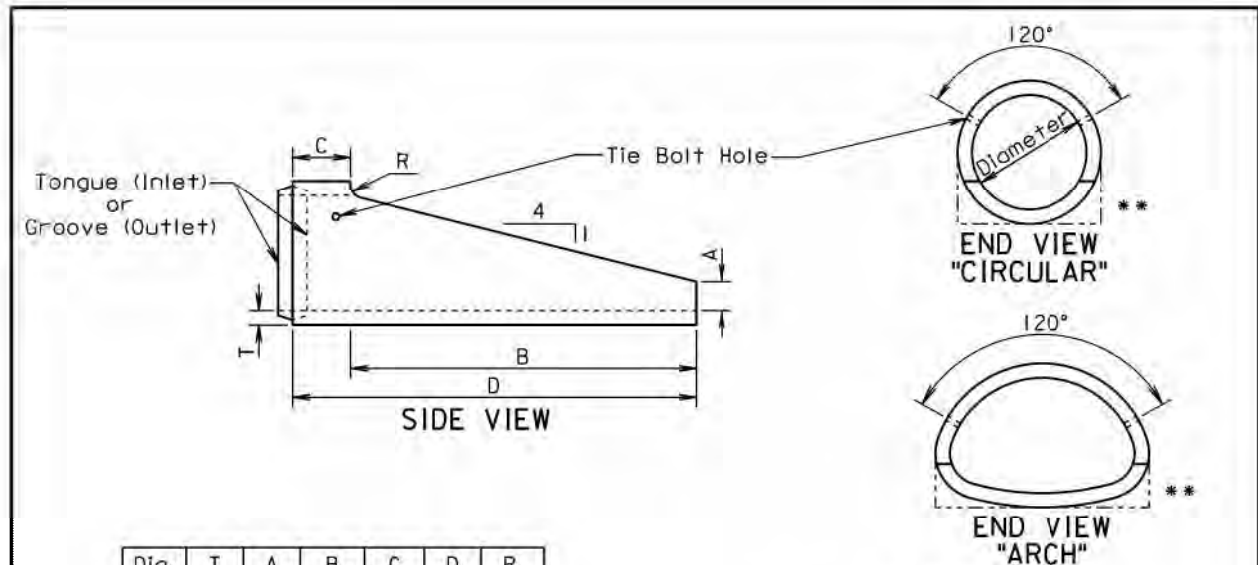
R. C. P. FLARED ENDS

PLATE NUMBER
450.10

Sheet 1 of 1

Published Date: 2025



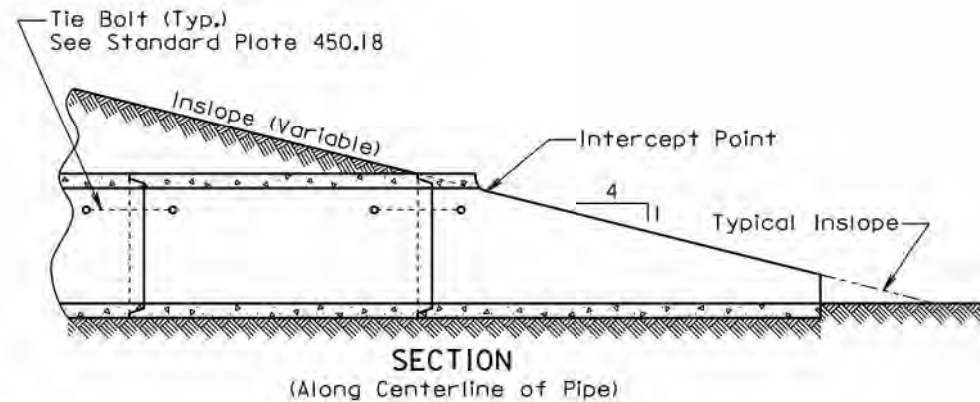


Dia. (in.)	T (in.)	A (in.)	B (in.)	C (in.)	D (in.)	R (in.)
FOR CIRCULAR PIPE						
24	3	6	72	12	84	3
30	3 1/2	7 1/2	90	12	102	3 1/2
FOR ARCH PIPE						
* 24	3	6	48	12	60	3
* 30	3 1/2	7 1/2	60	12	72	3 1/2
* 36	4 1/2	8 5/8	66	30	96	0
* 42	4 1/2	10	77 1/4	18 3/4	96	0

ALTERNATE

Dia. (in.)	T (in.)	A (in.)	B (in.)	C (in.)	D (in.)	R (in.)
FOR CIRCULAR PIPE						
24	3	9	72	12	84	0
30	3 1/2	11	90	12	102	0
FOR ARCH PIPE						
* 24	3	9	48	12	60	0
* 30	3 1/2	11	60	12	72	0

* Equivalent Diameter of Circular R.C.P.
 ** Acceptable Flat Bottom Alternate.



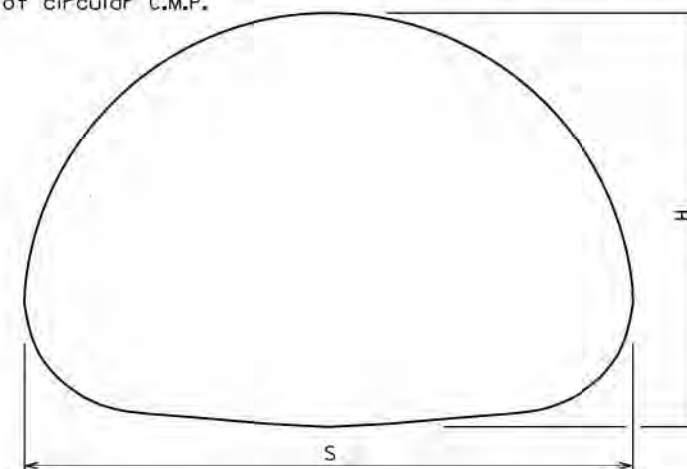
GENERAL NOTE:
 The length of concrete pipe shown in the construction plans is between sloped ends.

September 22, 2006

Published Date: 2025	S D D O T	R. C. P. SLOPED ENDS	PLATE NUMBER 450.13
			Sheet 1 of 1

* Dia. (in.)	2 2/3" x 1/2" CORRUGATIONS			3" X 1" CORRUGATIONS		
	S Span (in.)	H Rise (in.)	Area (Sq. Ft.)	S Span (in.)	H Rise (in.)	Area (Sq. Ft.)
15	17	13	1.1			
18	21	15	1.6			
21	24	18	2.2			
24	28	20	2.8			
30	35	24	4.4			
36	42	29	6.4	40	31	7.0
42	49	33	8.7	46	36	9.4
48	57	38	11.4	53	41	12.3
54	64	43	14.3	60	46	15.6
60	71	47	17.6	66	51	19.3
66	77	52	21.3	73	55	23.2
72	83	57	25.3	81	59	27.4
78				87	63	32.1
84				95	67	37.0
90				103	71	42.4
96				112	75	48.0
102				117	79	54.2
108				128	83	60.8
114				137	87	67.4
120				142	91	74.5

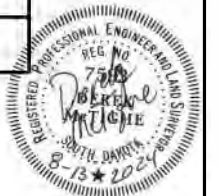
* Equivalent diameter of circular C.M.P.

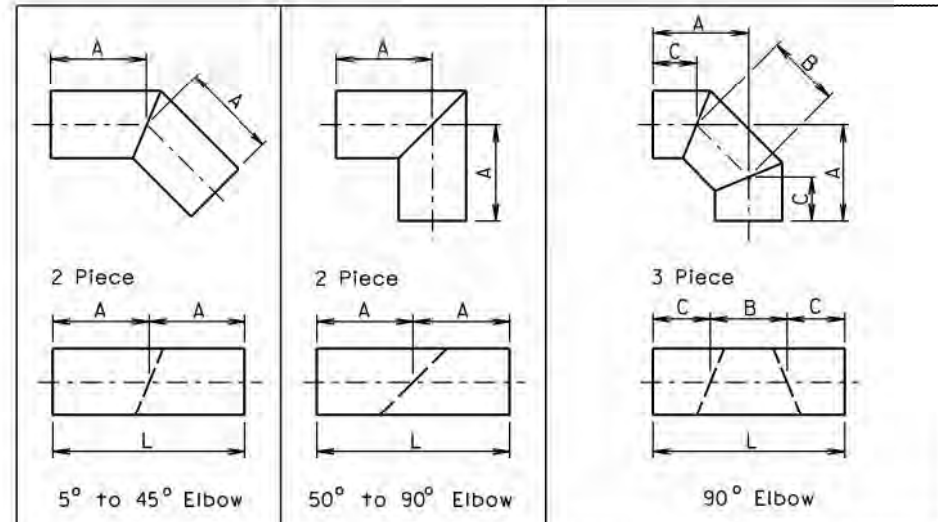


GENERAL NOTE:
 All dimensions measured from inside crest.

March 31, 2000

Published Date: 2025	S D D O T	CORRUGATED METAL PIPE ARCH CULVERT	PLATE NUMBER 450.30
			Sheet 1 of 1





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	25 1/2	11	18 1/2	4
15	1	2	15	2	4	15	26 1/2	12	18	4
18	1	2	18	2	4	18	27	14	17	4
21	2	4	21	2	4	21	27	15	16 1/2	4
24	2	4	24	2	4	24	27 1/2	16	16	4
27	2	4	27	2	4	27	27 1/2	17	15 1/2	4
30	2	4	30	3	6	30	40	19	26 1/2	6
33	2	4	33	3	6	33	40	20	26	6
36	2	4	36	3	6	36	40 1/2	21	25 1/2	6
42	2	4	42	3	6	42	41	23	24 1/2	6
48	2	4	48	4	8	48	53 1/2	26	35	8
54	3	6	54	4	8	54	54	28	34	8
60	3	6	60	4	8	60	54 1/2	31	32 1/2	8
66	3	6	66	4	8	66	54	33	31 1/2	8
72	3	6	72	5	10	72	67 1/2	36	42	10
78	3	6	78	5	10	78	68	39	40 1/2	10
84	3	6	84	5	10	84	68 1/2	41	39 1/2	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

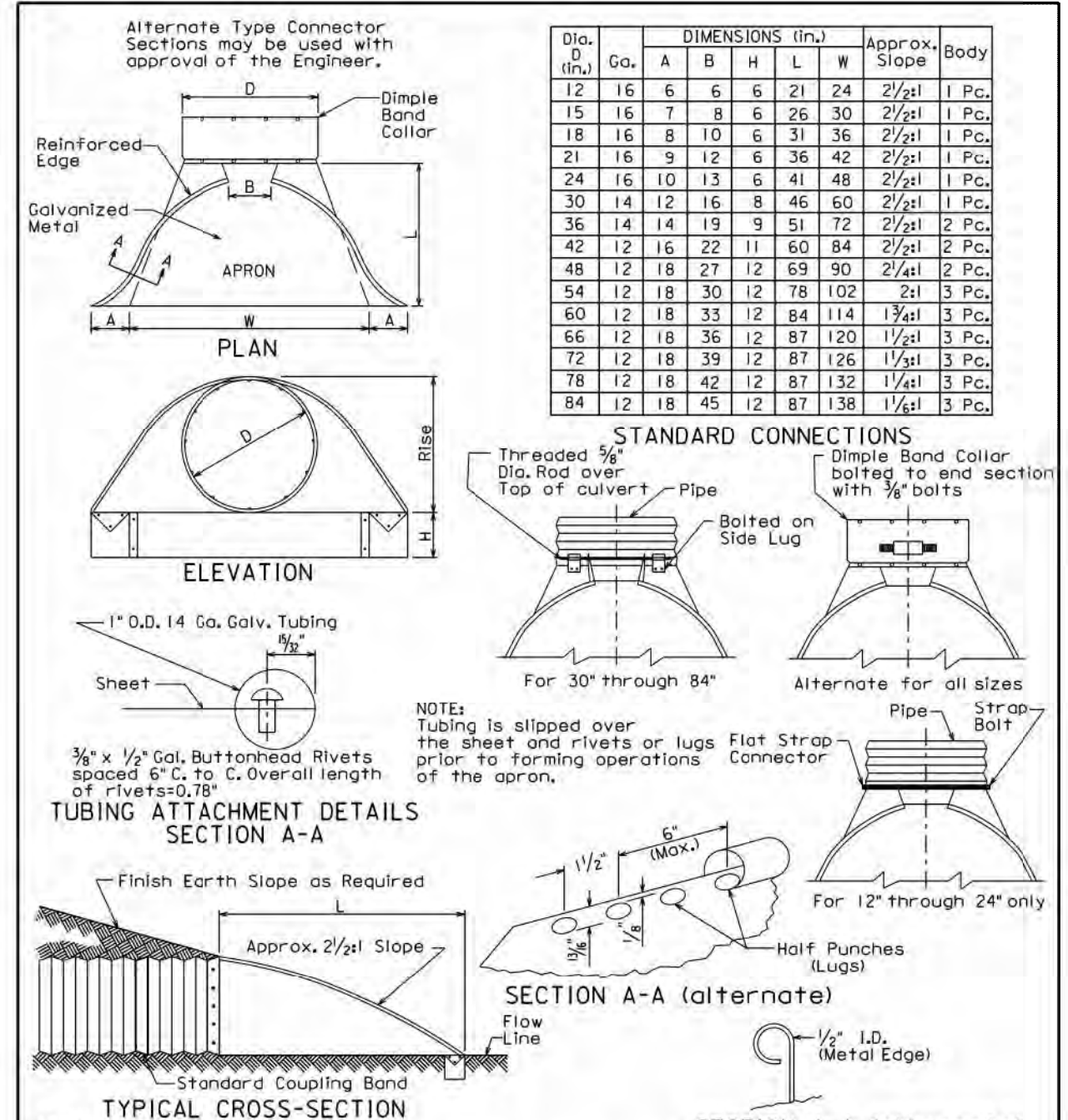
Published Date: 2025

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C.M.P. FABRICATED LENGTHS FOR ELBOWS

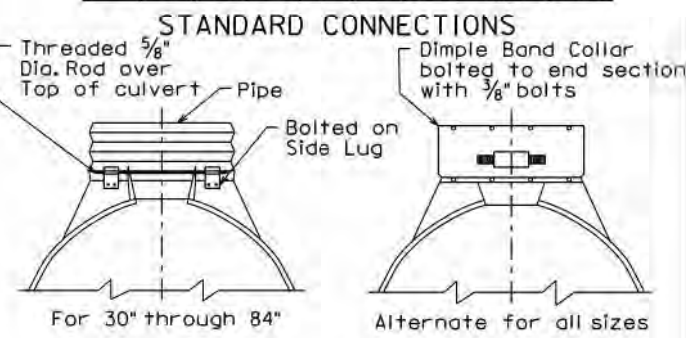
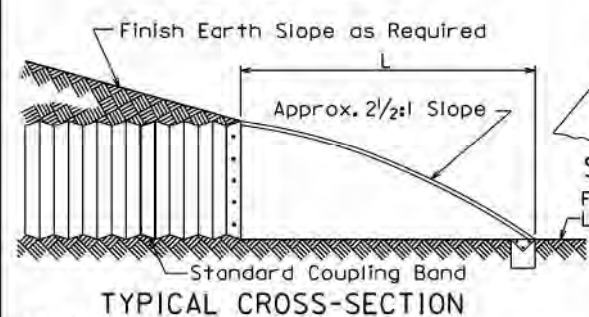
PLATE NUMBER
450.32

Sheet 1 of 1

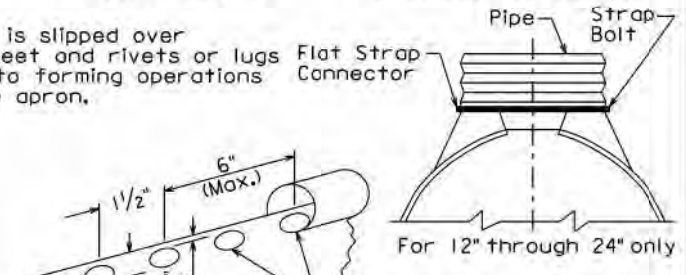


Dia. D (in.)	Ga.	DIMENSIONS (in.)					Approx. Slope	Body
		A	B	H	L	W		
12	16	6	6	6	21	24	2 1/2:1	1 Pc.
15	16	7	8	6	26	30	2 1/2:1	1 Pc.
18	16	8	10	6	31	36	2 1/2:1	1 Pc.
21	16	9	12	6	36	42	2 1/2:1	1 Pc.
24	16	10	13	6	41	48	2 1/2:1	1 Pc.
30	14	12	16	8	46	60	2 1/2:1	1 Pc.
36	14	14	19	9	51	72	2 1/2:1	2 Pc.
42	12	16	22	11	60	84	2 1/2:1	2 Pc.
48	12	18	27	12	69	90	2 1/4:1	2 Pc.
54	12	18	30	12	78	102	2:1	3 Pc.
60	12	18	33	12	84	114	1 3/4:1	3 Pc.
66	12	18	36	12	87	120	1 1/2:1	3 Pc.
72	12	18	39	12	87	126	1 1/3:1	3 Pc.
78	12	18	42	12	87	132	1 1/4:1	3 Pc.
84	12	18	45	12	87	138	1 1/6:1	3 Pc.

TUBING ATTACHMENT DETAILS SECTION A-A



NOTE: Tubing is slipped over the sheet and rivets or lugs prior to forming operations of the apron.



GENERAL NOTES:
 All 3 pc. bodies shall have 12 Ga. sides and 10 Ga. center panels. Width of center panels shall be greater than 20% of the pipe periphery. Multiple panel bodies to have lap seams tightly joined by 3/8" Dia. galvanized rivets or bolts.
 For 60" through 84" sizes, reinforced edges shall be supplemented with galvanized stiffener angles. The angles will be 2" x 2" x 1/4" for 60" through 72" diameters and 2 1/2" x 2 1/2" x 1/4" for 78" and 84" diameters. The angles shall be attached by 3/8" diameter galvanized nuts and bolts.
 Rivets and Bolts shall be 3/8" Dia. Min. for 10 Ga. and 12 Ga. sheet, and 5/16" Dia. Min. for 14 Ga. and 16 Ga. sheets. Tighten nuts with torque wrench to 25 lbs. torque.

March 31, 2000

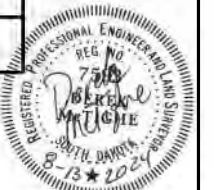
Published Date: 2025

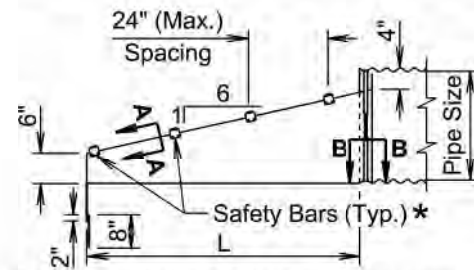
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C.M.P. FLARED ENDS

PLATE NUMBER
450.35

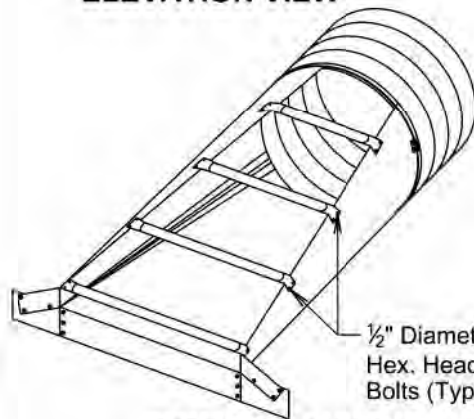
Sheet 1 of 1



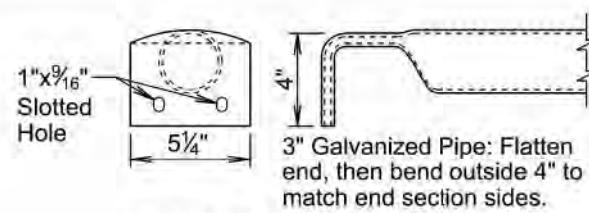


* Number of bars required will vary depending on the length of the end section.

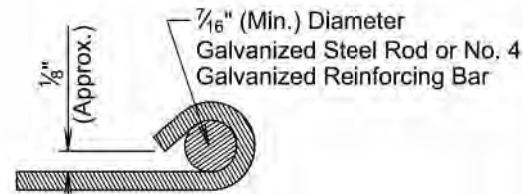
ELEVATION VIEW



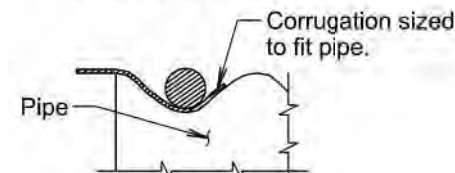
ISOMETRIC VIEW



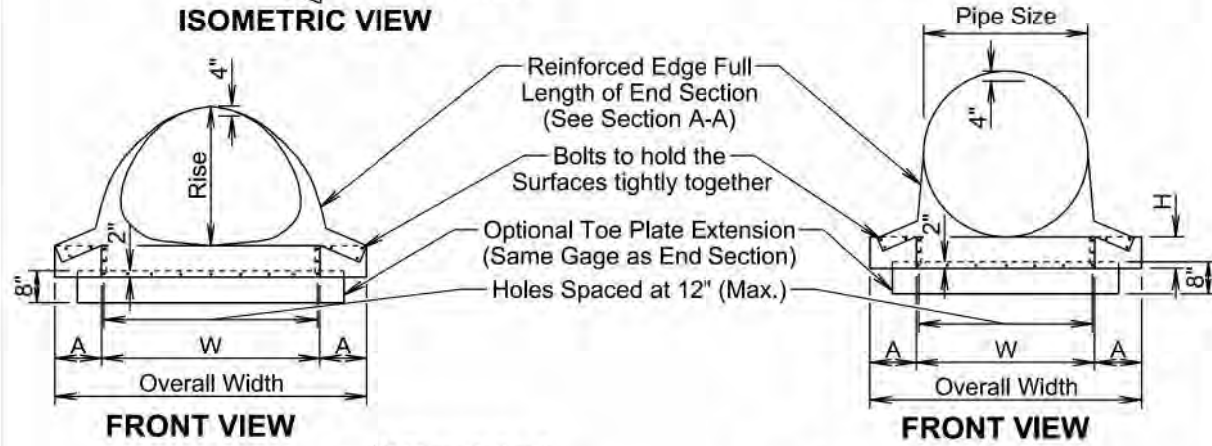
DETAIL OF SAFETY BARS



SECTION A-A

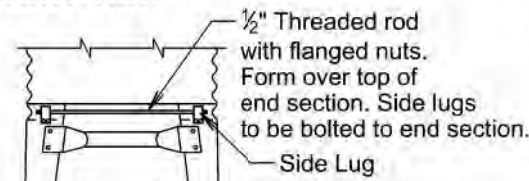


SECTION B-B



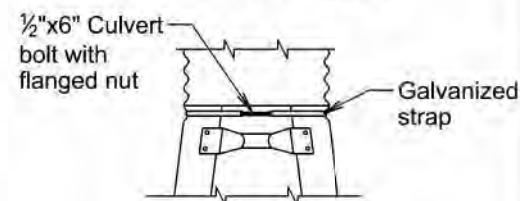
FRONT VIEW

FRONT VIEW



TYPE #2 CONNECTOR DETAIL

(For 30" and Larger)
(For 21"x15" and Larger)



TYPE #1 CONNECTOR DETAIL

(For 15" Through 24")

August 31, 2022

Published Date: 2025	S D D O T	C.M.P. SAFETY ENDS	PLATE NUMBER 450.38
			Sheet 1 of 2

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.

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.

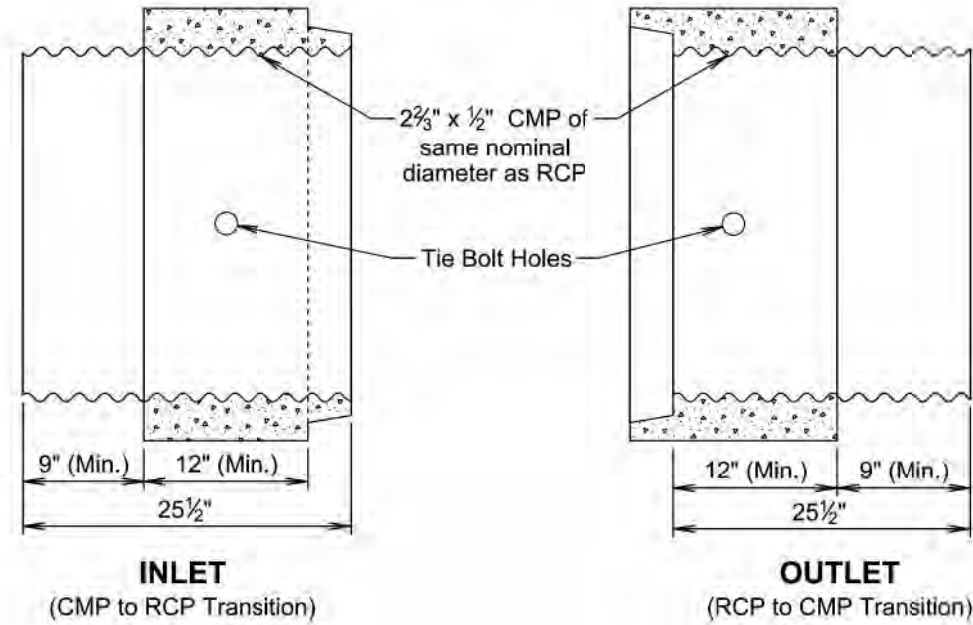
Installation will be performed in accordance with the Specifications.

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.

August 31, 2022

Published Date: 2025	S D D O T	C.M.P. SAFETY ENDS	PLATE NUMBER 450.38
			Sheet 2 of 2





GENERAL NOTE:

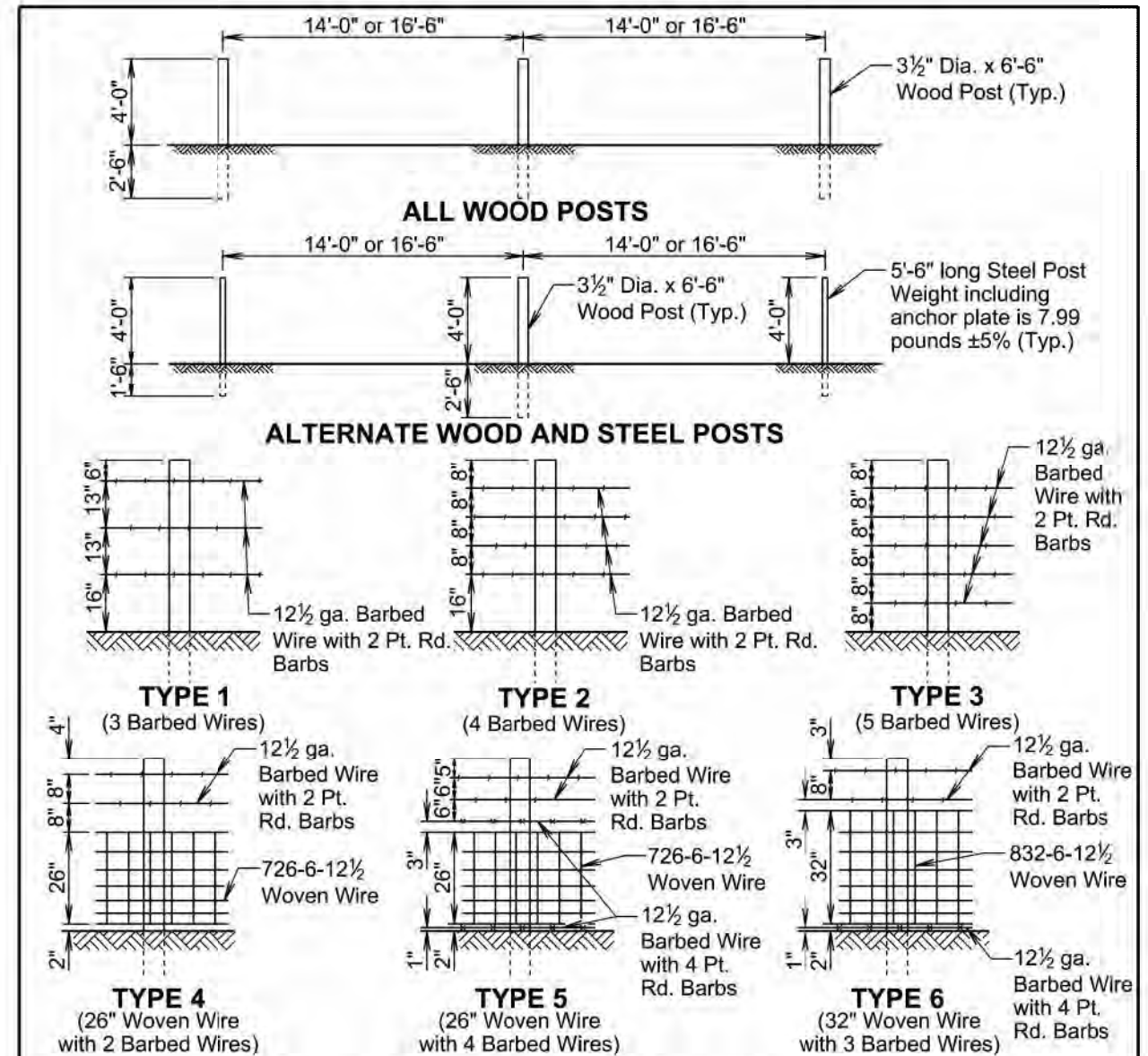
Arch pipe transitions will be fabricated similar to the round transition shown above.

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

November 19, 2022

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

Published Date: 2025



TYPE OF FENCE		LINE POST SPACING	WIRE GAGE	BARBED WIRE		WOVEN WIRE
TYPE	DESCRIPTION			NUMBER AND SHAPE OF BARBS	STYLE OR DESIGN NO.	
1	3 Barbed Wires	16'-6"	12 1/2	2 Point Round	—	—
2	4 Barbed Wires	16'-6"	12 1/2	2 Point Round	—	—
3	5 Barbed Wires	16'-6"	12 1/2	2 Point Round	—	—
4	26" Woven Wire with 2 Barbed Wires	14'-0"	12 1/2	2 Point Round	—	726-6-12 1/2
5	26" Woven Wire with 4 Barbed Wires	14'-0"	12 1/2	2 wires with 2 Pt. Rd. 2 wires with 4 Pt. Rd.	—	726-6-12 1/2
6	32" Woven Wire with 3 Barbed Wires	14'-0"	12 1/2	2 wires with 2 Pt. Rd. 1 wire with 4 Pt. Rd.	—	832-6-12 1/2

GENERAL NOTES:

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

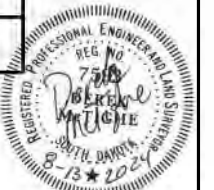
When type 5S or 6S is designated the bottom wire may be barbed, smooth, or left off.

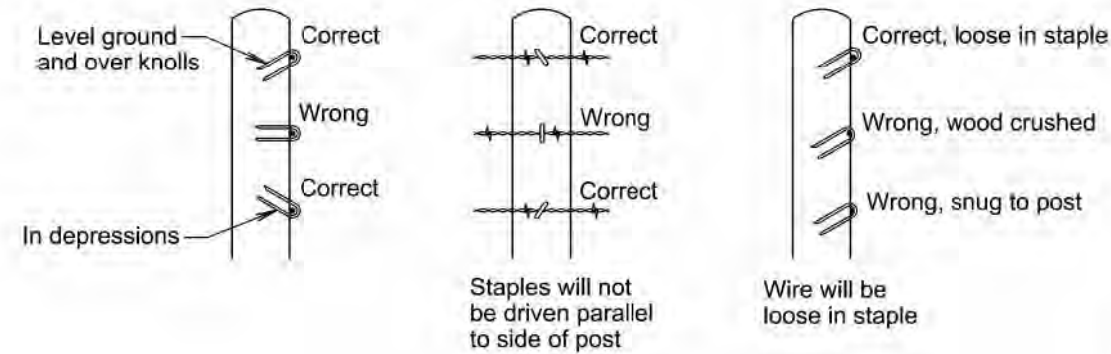
All degrees of curvature stated for fence are at centerline of roadway.

June 26, 2019

S D D O T	RIGHT-OF-WAY FENCE	PLATE NUMBER 620.01
		Sheet 1 of 1

Published Date: 2025





STAPLE INSTALLATION

GENERAL NOTES:

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

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

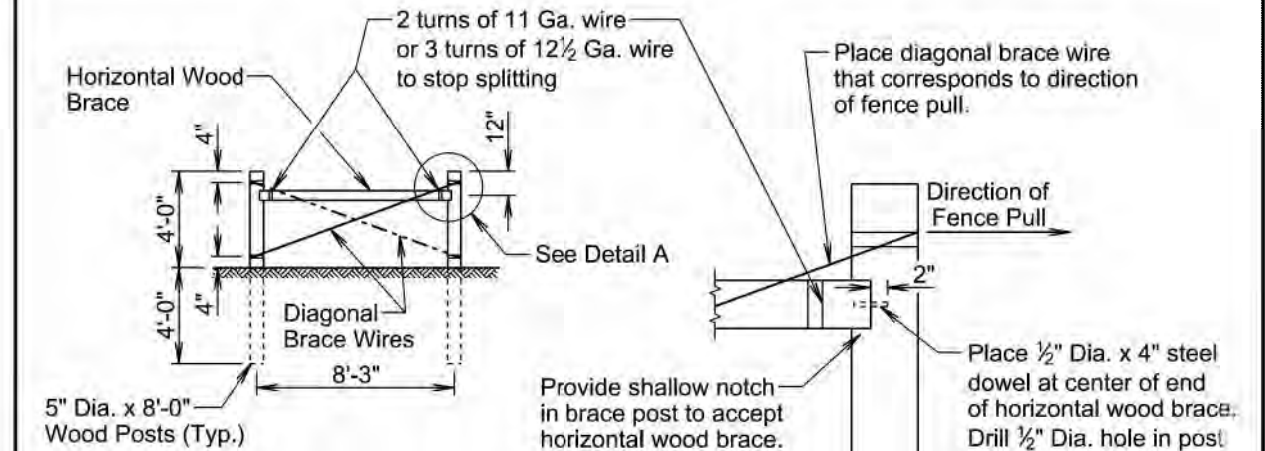
Right-of-Way fence other than on Interstate Projects will be constructed within one foot of the Right-of-Way on the Landowner's side except at bridge openings, cattle passes, and as otherwise directed by the Engineer.

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

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

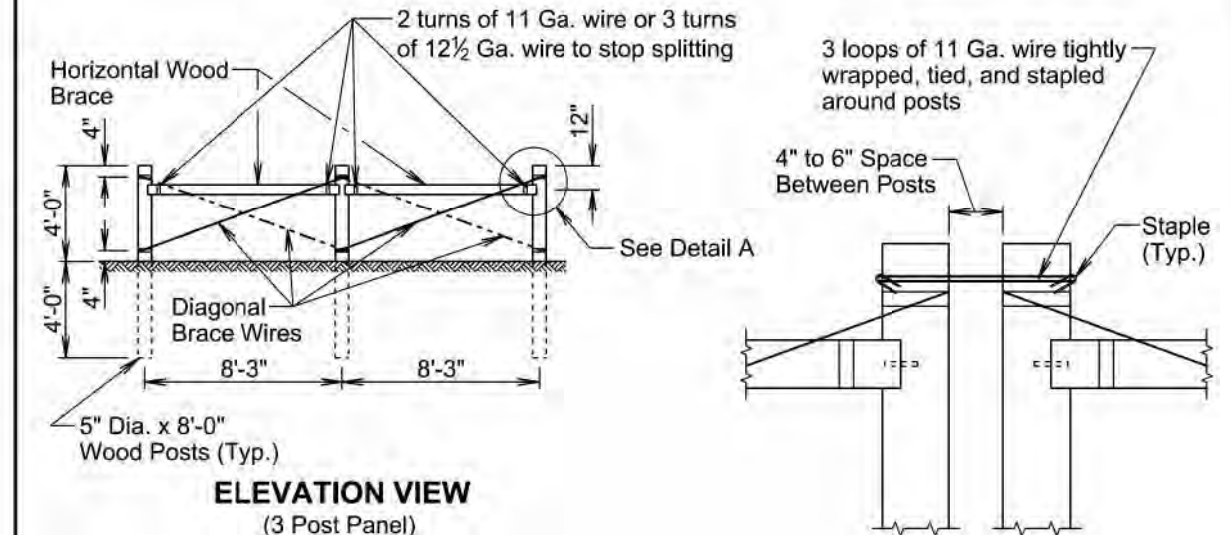
June 26, 2019

Published Date: 2025	S D D O T	STAPLE INSTALLATION AND GENERAL RIGHT-OF-WAY FENCE NOTES	PLATE NUMBER 620.02
			Sheet 1 of 1



ELEVATION VIEW
(2 Post Panel)

DETAIL A



ELEVATION VIEW
(3 Post Panel)

DETAIL B

GENERAL NOTES:

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

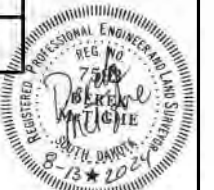
Two Post Panels will be installed at any sharp vertical angle crest points and as directed by the Engineer.

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

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

March 31, 2024

Published Date: 2025	S D D O T	BRACE PANELS AND APPLICATIONS OF BRACE PANELS	PLATE NUMBER 620.03
			Sheet 1 of 3



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

GENERAL NOTE:

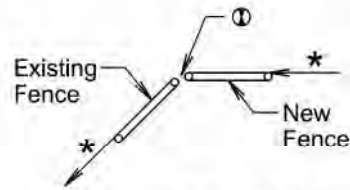
All radius of curvature stated for fence are at centerline of roadway.

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

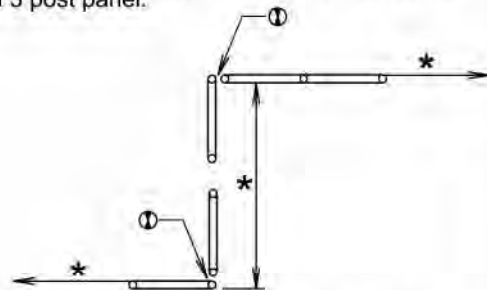
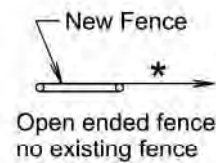
If fence length is greater than 600' to next corner use a 3 post panel.

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

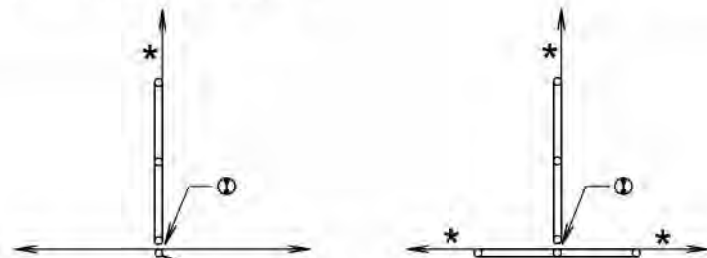
Ⓛ See Detail B on Sheet 1 of 3.



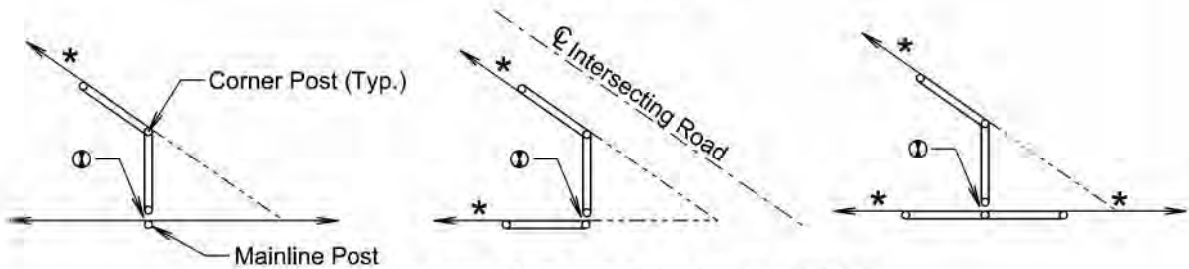
BEGIN OR END FENCE
(Where new fence ties into existing fence)



SHORT JOGS IN FENCE



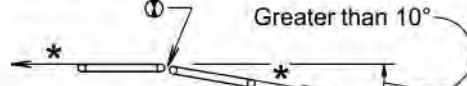
CROSS FENCE



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: 2025

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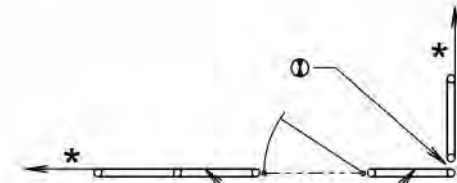
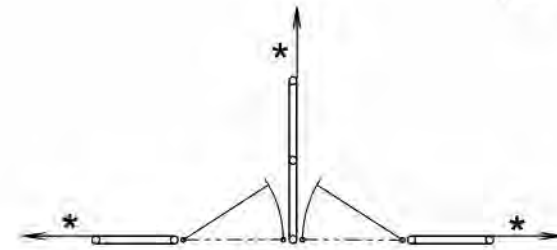
**BRACE PANELS AND
APPLICATIONS OF BRACE PANELS**

PLATE NUMBER
620.03

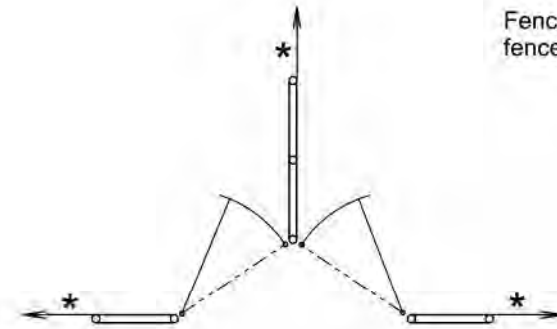
Sheet 2 of 3



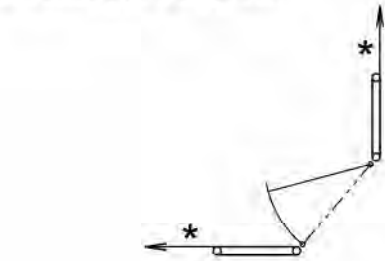
ENTRANCE
(Not on corner)



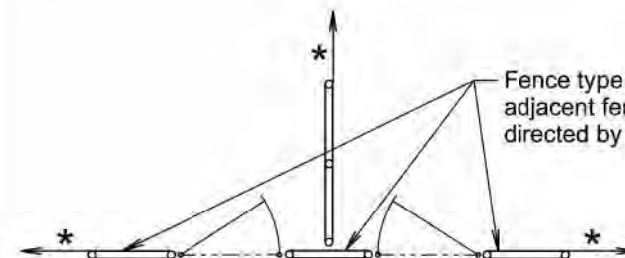
Fence type will be same as adjacent fence type or as directed by the Engineer.



DOUBLE ENTRANCES



ENTRANCES AT CORNERS



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

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.

Ⓛ See Detail B on Sheet 1 of 3.

March 31, 2024

Published Date: 2025

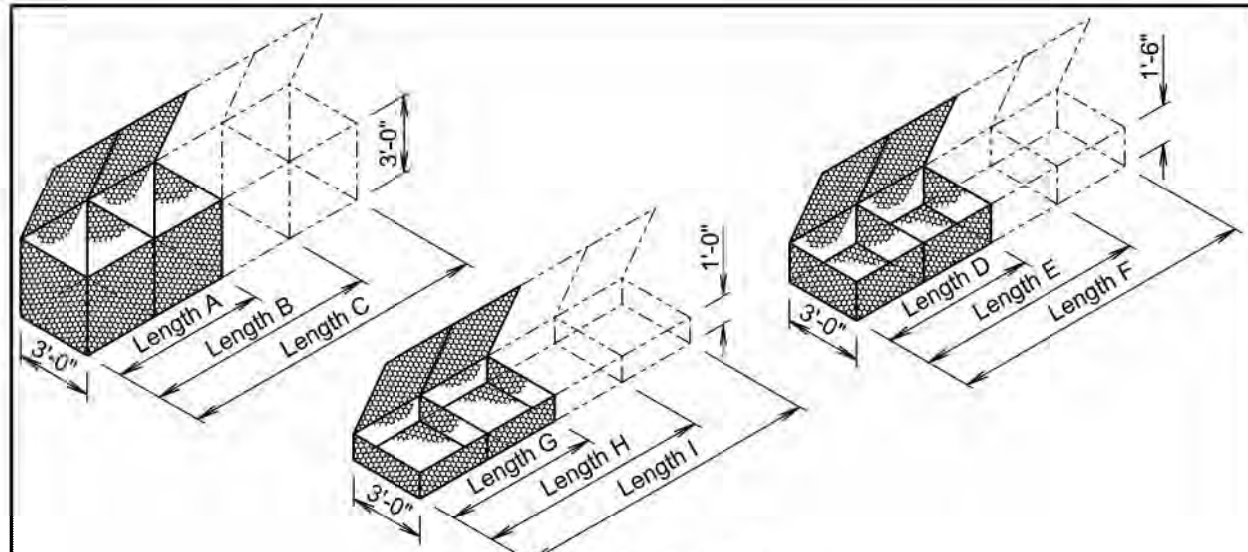
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**BRACE PANELS AND
APPLICATIONS OF BRACE PANELS**

PLATE NUMBER
620.03

Sheet 3 of 3





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.

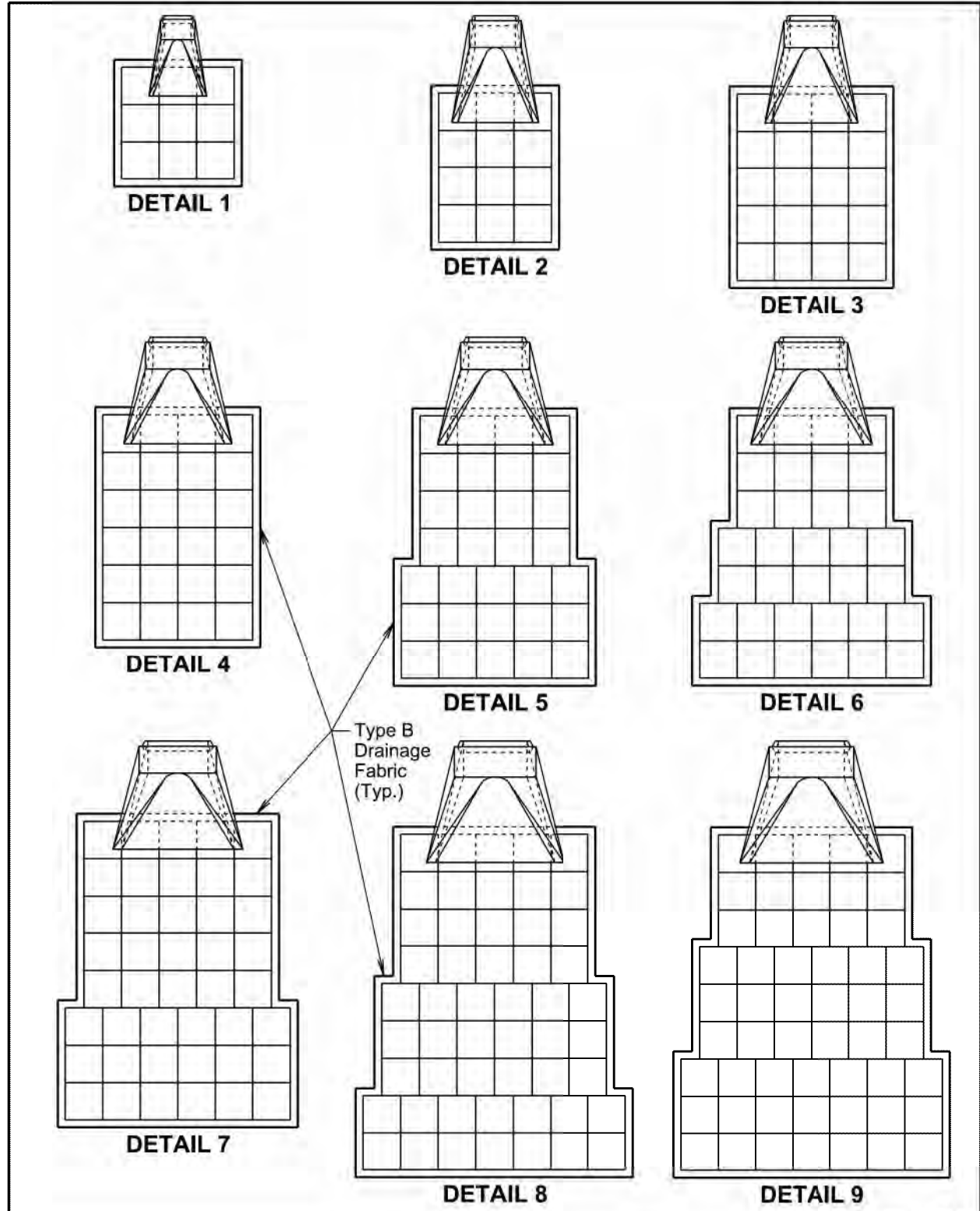
Interlocking fasteners for PVC coated gabions will be high tensile 0.120 inch diameter stainless steel wire conforming to ASTM A313, Type 302, Class 1. The spacing of the interlocking fasteners during all phases of assembly and construction will not exceed 6 inches.

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

February 14, 2020

S D D O T	BANK AND CHANNEL PROTECTION GABIONS	PLATE NUMBER 720.01
	Published Date: 2025	Sheet 1 of 1





* ESTIMATED QUANTITIES			
Detail	Pipe Diameter (Inches)	Gabion (Cu. Yd.)	Type B Drainage Fabric (Sq. Yd.)
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

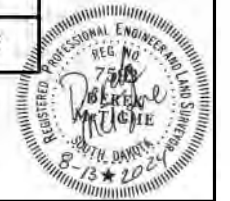
S D D O T	BANK AND CHANNEL PROTECTION GABION PLACEMENT UNDER PIPE END SECTIONS	PLATE NUMBER 720.03
		Sheet 1 of 2

Published Date: 2025

February 14, 2020

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

Published Date: 2025



Plot Scale - 1:200

Plotted From - Justin

File - ...Section B\StandardPlates.dgn