

SECTION B: GRADING PLANS

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT IM 2291(01)10	SHEET B1	TOTAL SHEETS B71
Plotting Date: 02-01-2022		REV 11/29/2021 KAO REV 02/02/2022 KAO	

INDEX OF SHEETS

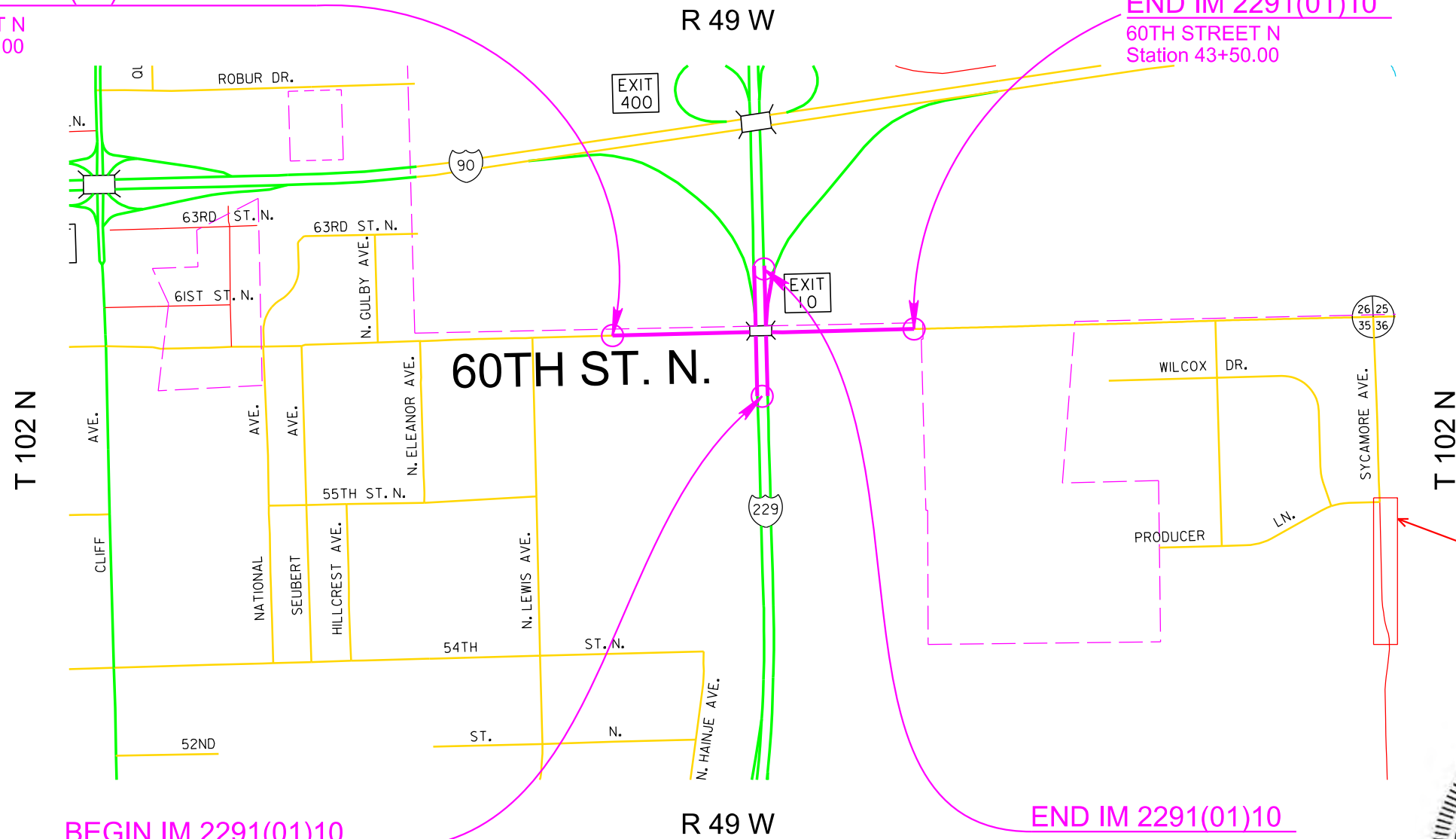
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BEGIN IM 2291(01)10

60TH STREET N
Station 15+50.00

END IM 2291(01)10

60TH STREET N
Station 43+50.00



BORROW PIT NO 1

NE 1/4 of
Sec 35 - T102N - R49W
NW 1/4 of
Sec 36 - T102N - R49W

BEGIN IM 2291(01)10

I-229
Station 105+50.00

END IM 2291(01)10

I-229
Station 116+50



Plot Scale - 1:1200

Plotted From - KODE

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SECTION B ESTIMATE OF QUANTITIES

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 2291(01)10	B2	B71

Plotting Date: 2/15/2022
 REV 07/19/2021 KAO
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BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
009E3230	Grade Staking	0.786	Mile
009E3250	Miscellaneous Staking	0.786	Mile
009E3280	Slope Staking	0.786	Mile
009E3290	Structure Staking	2	Each
009E3301	Engineer Directed Surveying/Staking	40.0	Hour
009E4200	Construction Schedule, Category II	Lump Sum	LS
100E0020	Clear and Grub Tree	54	Each
110E0300	Remove Concrete Curb and/or Gutter	94	Ft
110E0400	Remove Drop Inlet	4	Each
110E0550	Remove Cattle Guard	1	Each
110E0600	Remove Fence	5,148	Ft
110E0700	Remove 3 Cable Guardrail	2,645	Ft
110E0730	Remove Beam Guardrail	1,144.0	Ft
110E0745	Remove 3 Cable Guardrail Slip Base Anchor Assembly	7	Each
110E0770	Remove W Beam Guardrail Breakaway Cable Terminal	3	Each
110E0800	Remove W Beam Guardrail End Terminal	4	Each
110E1010	Remove Asphalt Concrete Pavement	1,407.2	SqYd
110E1130	Remove Concrete Driveway Pavement	51.9	SqYd
110E1160	Remove Concrete Barrier	218	Ft
110E1510	Remove Luminaire Pole	1	Each
110E1900	Remove Yard Hydrant	1	Each
110E7040	Remove Gate for Reset	1	Each
110E7500	Remove Pipe for Reset	40	Ft
110E7510	Remove Pipe End Section for Reset	2	Each
120E0010	Unclassified Excavation	36,131	CuYd
120E0300	Borrow Unclassified Excavation	141,800	CuYd
120E0600	Contractor Furnished Borrow Excavation	33,887	CuYd
120E1000	Muck Excavation	5,081	CuYd
120E2000	Undercutting	4,663	CuYd
120E6100	Water for Embankment	1,689.0	MGal
250E0020	Incidental Work, Grading	Lump Sum	LS
260E6010	Granular Material	70.0	Ton
270E0040	Salvage and Stockpile Asphalt Mix and Granular Base Material	9,887.1	Ton
421E0100	Pipe Culvert Undercut	73	CuYd
450E0104	12" RCP Class 4, Furnish	74	Ft
450E0110	12" RCP, Install	74	Ft
450E0122	18" RCP Class 2, Furnish	300	Ft
450E0123	18" RCP Class 3, Furnish	216	Ft
450E0130	18" RCP, Install	516	Ft
450E0142	24" RCP Class 2, Furnish	128	Ft
450E0150	24" RCP, Install	128	Ft
450E0162	30" RCP Class 2, Furnish	70	Ft

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
450E0170	30" RCP, Install	70	Ft
450E0182	36" RCP Class 2, Furnish	58	Ft
450E0190	36" RCP, Install	58	Ft
450E0204	48" RCP Class 4, Furnish	42	Ft
450E0205	48" RCP Class 5, Furnish	88	Ft
450E0210	48" RCP, Install	130	Ft
450E0408	18" RCP Bend, Furnish	2	Each
450E0409	18" RCP Bend, Install	2	Each
450E2000	12" RCP Flared End, Furnish	2	Each
450E2001	12" RCP Flared End, Install	2	Each
450E2008	18" RCP Flared End, Furnish	6	Each
450E2009	18" RCP Flared End, Install	6	Each
450E2016	24" RCP Flared End, Furnish	3	Each
450E2017	24" RCP Flared End, Install	3	Each
450E2024	30" RCP Flared End, Furnish	1	Each
450E2025	30" RCP Flared End, Install	1	Each
450E2028	36" RCP Flared End, Furnish	1	Each
450E2029	36" RCP Flared End, Install	1	Each
450E9000	Reset Pipe	40	Ft
450E9001	Reset Pipe End Section	2	Each
462E0100	Class M6 Concrete	12.5	CuYd
480E0100	Reinforcing Steel	2,374	Lb
600E0200	Type II Field Laboratory	1	Each
620E0040	Type 4 Right-of-Way Fence	1,607	Ft
620E0510	Type 1 Temporary Fence	1,251	Ft
620E1020	2 Post Panel	44	Each
620E2100	Reset Gate	1	Each
629E0110	High Tension Cable Guardrail	1,578	Ft
629E0290	High Tension Cable Guardrail Anchor Assembly	8	Each
630E0500	Type 1 MGS	387.5	Ft
630E1500	Type 1 Guardrail Transition	4	Each
630E2018	MGS MASH Tangent End Terminal	4	Each
650E4360	Type D46 Concrete Curb and Gutter	32	Ft
670E3200	Type D Frame and Grate	4	Each
670E5400	Precast Drop Inlet Collar	4	Each
671E0100	Adjust Junction Box	1	Each
671E6030	Type S Manhole Frame and Lid	1	Each
700E0110	Class A Riprap	60.0	Ton
700E0210	Class B Riprap	40.0	Ton
720E1015	Bank and Channel Protection Gabion	4.5	CuYd
831E0110	Type B Drainage Fabric	77	SqYd
900E0010	Refurbish Single Mailbox	1	Each
900E0012	Refurbish Double Mailbox	1	Each

GRADING OPERATIONS

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

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

The excavation and/or embankment quantity required for constructing the bridge berm(s) and to shape bridge waterway channel(s) will be incidental to the contract unit price per cubic yard of "Unclassified Excavation". The excavation required for placing the Granular Bridge End Backfill and Bridge End Embankment is listed in the Table of Unclassified Excavation.

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

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

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

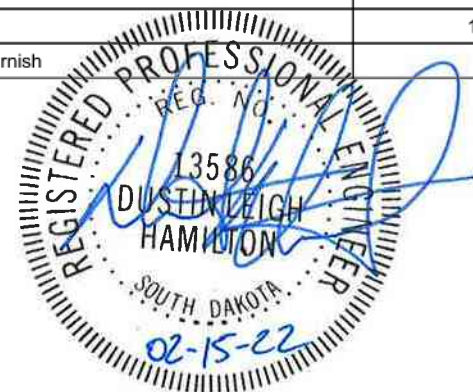
TYPE II FIELD LABORATORY

The 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 II Field Laboratory".

UTILITIES

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

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
900E2030	Miscellaneous Work	1	Site



FAA DETERMINATION

SDDOT has notified FAA of the proposed construction or alteration associated with this project. The filing with FAA included notifications of temporary crane and permanent structure (No. 50-221-170).

The Contractor must abide by the following FAA temporary structure (crane) determination requirements as set forth in FAA Determinations No. 2021-AGL-14701-OE, 2021-AGL-14702-OE, 2021-AGL-14703-OE, 2021-AGL-14704, 2021-AGL-14706, 2021-AGL-14707, 2021-AGL-14708, and 2021-AGL-14709.

The crane height must not exceed 136 feet above ground (1596 feet above mean sea level). This information is in the FAA Determination.

For questions regarding the FAA Determinations, contact Thomas Koch SDDOT Office of Aeronautics at 605-773-3764.

All costs incurred to adhere to the above listed requirements will be incidental to various contract items.

AERONAUTICAL NOTIFICATION (TEMPORARY STRUCTURE: CRANE)

The Contractor will notify Harry Johnston at the South Dakota Department of Transportation Sioux Falls Area Office (605) 367-5680 by 12/01/2022 if a crane remains at the project site beyond 12/23/2022. The SDDOT will file for a determination extension with the FAA.

All costs incurred to adhere to the above listed requirements will be incidental to various contract items.

AERONAUTICAL NOTIFICATION (BRIDGE)

The South Dakota Department of Transportation has received FAA Determinations for the permanent structures as listed in the FAA Determination plan note.

The Contractor will notify Harry Johnston at the SDDOT Sioux Falls Area Office (605) 367-5680 if alterations are proposed for the heights or coordinates of the bridge. The SDDOT will re-file for an updated FAA determination. The Contractor will not be allowed to proceed with construction of the proposed altered installation until notified by the SDDOT that FAA approval has been received.

The SDDOT is responsible for filing Part 2 of Federal Aviation Administration Form 7460-2, Notice of Actual Construction or Alteration within 5 days after the construction of the Bridge reaches its greatest height. The Contractor will notify Harry Johnston at the SDDOT Sioux Falls Area Office (605) 367-5680 within 24 hours after this has occurred to ensure filing is completed by the FAA deadline.

The Contractor will notify Harry Johnston at the SDDOT Sioux Falls Area Office (605) 367-5680 by 12/01/2022 if the construction of the structure has not reached its greatest height. The SDDOT will file the FAA required determination extension.

All costs incurred to adhere to the above listed requirements will be incidental to various contract items.

COORDINATION BETWEEN CONTRACTORS

A separate contract for Project IM-P 0022(85) – PCN 089K will be awarded to another Contractor for concrete pavement repair on I-229S from MRM 8.28+0.584 to MRM 10.84+0.000.

The Contractor will schedule work so as not to interfere with or hinder the progress of the work performed by other Contractors on the concrete pavement repair project.

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 2291(01)10	B3	B71

Plotting Date: 12/2/2021
 REV 07/19/2021 KAO
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	IM 2291(01)10	B4	B71

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SHRINKAGE FACTOR: Embankment +30%

TABLE OF EXCAVATION QUANTITIES BY BALANCES

Station to	Station	Excavation (CuYd)	* Undercut (CuYd)	* Muck Exc. (CuYd)	**Unstable Exc. (CuYd)	* Borrow Unclass Exc. (CuYd)	*Contractor Furnished Borrow Exc. (CuYd)	Total Excavation (CuYd)	**Dead Haul	** Borrow Haul (CuYdSta)	** Haul (CuYdSta)
15+00	18+05	1508	1295	324	0	0	0	3127	0	0	803
18+05	21+91	2727	1884	0	0	0	0	4611	0	0	4393
21+91	27+50	2087	211	0	1425	0	16152	19875	0	0	0
28+90	44+00	5897	1273	4757	9965	135000	17735	174627	8235000	1557987	0
Totals:		12219	4663	5081	11390	135000	33887	202240	8235000	1557987	5196

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

TABLE OF UNCLASSIFIED EXCAVATION

Excavation	(CuYd)	12219
Undercut		4663
Unstable Exc.		11390
Topsoil		4245
Exc. For Bridge End Backfill and/or Embankment		170
Salvaged Asphalt Mix and Granular Base Material (from fill sections)		3444
Total		36131



PROCEDURES FOR DETERMINING UNCLASSIFIED EXCAVATION QUANTITY

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

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

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

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

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

Salvaged Asphalt Mix and Granular Base Material will be paid for once as Unclassified Excavation. As shown in the Table of Unclassified Excavation, the estimated quantity of 3,444 cubic yards of Salvaged Asphalt Mix and Granular Base Material from fill sections will be added to the Excavation quantity to determine the Unclassified Excavation quantity. When finaling a project, the quantities of Salvaged Asphalt Mix and Granular Base Material from fill sections will not be adjusted according to field measurements. The quantity of Salvaged Asphalt Mix and Granular Base Material from cut sections will not be added to the Excavation quantity as it is already in the cuts on the final cross sections.

TABLE OF BORROW UNCLASSIFIED EXCAVATION

	(CuYd)
Borrow Excavation	135,000
Topsoil in Option Borrow Pits	6,800
Total:	141,800

HAUL

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

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

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

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

UNDERCUTTING

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

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

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

Undercut elevations from Station 15+50± to Station 17+00± will be below adjacent ditch grade elevations. To prevent constructability issues due to water within the undercut, the contractor is advised to minimize the amount of time the undercut is left open. If required, the contractor will dig drainage trenches to direct water away from the undercut.

Extra drying effort may be necessary to achieve moisture and density requirements for the undercut material. Seasonal changes may affect the groundwater elevations. The Contractor is encouraged to review the soils log table for additional water table information.

TABLE OF UNDERCUTTING

Station	to	Station	Quantity (CuYd)
15+00		18+05	1295
18+05		22+62	2095
28+90		44+00	1273
Total:			4663

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UNSTABLE MATERIAL EXCAVATION

The areas of unstable material excavation are drawn on the cross sections with a normal depth of 2 feet. The estimated quantity of 11390 cubic yards of unstable material excavation will be paid for at the contract unit price per cubic yard for "Unclassified Excavation".

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

Field measurement of unstable material excavation will not be made. However, if there are additional areas of unstable material excavation other than what is shown in the plans, the Engineer will direct removal of these areas and the additional areas will be measured according to the Engineer.

TABLE OF UNSTABLE MATERIAL EXCAVATION

Station	to	Station	L/R	Depth (Ft)	Quantity (CuYd)
24+75		26+58	L	2	1425
30+31		30+75	L	2	143
30+31		32+00	R	2	751
33+00		34+25	R	2	542
33+00		40+50	L	2	7141
34+75		37+25	R	2	833
37+75		39+75	R	2	555
Total:					11390

TABLE OF GROUNDWATER

Station	Offset (ft)	Depth (ft)	Description	Water Level (ft) as of October 2019
16+15	73 LT	0.5-6.0	Black to brown silt clay	1.4
		6.0-6.5	Brown Sand	
		6.5-10.0	Brown to gray clay silt	
16+50	140 RT	0.5-25.0	Brown to gray silt clay	13.0
41+50	80 RT	1.0-15.0	Brown to gray sandy clay	Dry/Caved at 13.5



MUCK EXCAVATION

The areas of muck excavation are drawn on the cross sections with a normal depth of 3 feet. The estimated quantity of 5081 cubic yards of muck excavation will be paid for at the contract unit price per cubic yard for "Muck Excavation".

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

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

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

TABLE OF MUCK EXCAVATION

Station	to	Station	L/R	Depth (Ft)	Quantity (CuYd)
15+00		17+00	R	3	324
30+75		33+00	L	3	3490
32+00		33+00	R	3	1267
Total:					5081

SALVAGE AND STOCKPILE ASPHALT MIX AND GRANULAR BASE MATERIAL

An estimated 9877.1 tons (5226 Cubic Yards) of asphalt mix and granular base material will be salvaged from the entire length of the existing highway and stockpiled at a site furnished by the Contractor and satisfactory to the Engineer. It has been assumed for bidding purposes that only 90% of calculated salvaged asphalt mix and granular base material will be used under the proposed roadway section.

The quantity of salvage asphalt mix and granular base material may vary from the plans. No adjustment will be made to the contract unit price for variations of the quantity of "Salvage and Stockpile Asphalt Mix and Granular Base Material."

It is estimated that there are 62 cubic yards of salvageable material per station. See "In Place Typical Sections" for additional information.

TABLE OF BORROW PITS

Site	Station	Dead Haul Distance (Sta)	Borrow Exc. (CuYd)	Dead Haul (CuYdSta)
1	44+00	61	135000	8235000
Totals:			135000	8235000

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

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

Borrow Unclassified Excavation will be completed on Sycamore Avenue to the lines and grades shown in the borrow pit sheets prior to using Contractor furnished borrow on the project.

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

CONTRACTOR FURNISHED BORROW EXCAVATION

The Contractor will provide a suitable site for Contractor furnished borrow excavation material. The Contractor is responsible for obtaining all required permits and clearances for the borrow site.

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

The Contractor furnished borrow excavation material will be uniform in texture and free from organic material. The liquid limit will not exceed 45 and the plastic index will not exceed 25.

The Contractor will be responsible for the following minimum testing prior to use of each borrow site:

A minimum of one test for liquid limit and plastic index and a 4 point for each location and soil type, with samples obtained according to SD201.

The Department will be responsible for the following minimum testing:

A minimum of one test for liquid limit and plastic index and a 4 point for every 100,000 cubic yards or a major change in soil type. Independent Assurance testing will not be required.

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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	to	Station	Quantity (CuYd)
16+87		17+43	20.5
32+70		32+46	34.5
32+74		32+73	18.0
Total:			73.0

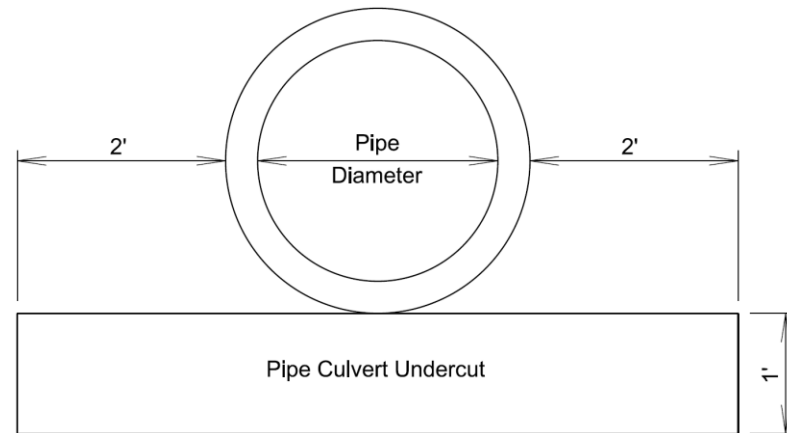
The table below contains the rate for one-foot depth of pipe culvert undercut per foot of pipe length and should be used as an aid in determining the actual amount of undercut to be performed during construction. The table is derived from the drawing below and conforms to the Specifications. When calculating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



PIPE CULVERT UNDERCUT, (continued)



During the subsurface investigation groundwater was encountered near the pipes proposed between Stations 15+50± to 18+00±. If groundwater is encountered during pipe culvert installation, material for backfilling the pipe culvert will conform to the gradation requirements of Section 421.2 A until backfill placement is above the groundwater level. This material will be paid for at the contract unit price per ton for Granular Material. 70 tons of Granular Material is included in the materials quantities for bidding purposes. This quantity can be adjusted or eliminated by CCO depending on field conditions. Groundwater may also be encountered at other pipe locations not listed. Sumps and/or other dewatering methods will likely be required.

INCIDENTAL WORK, GRADING

Station	L/R	Remarks
16+41 to 16+79	R to L	Take Out 42"-66' CMP
16+87 to 17+49	L	Take Out 48"-66' CMP
17+87 to 17+52	R	Take Out 18"-36' CMP
26+81 to 26+81	L to R	Take Out 12"-28' RCP
26+81 to 26+78	R	Take Out 12"-48' RCP
26+61 to 29+61	L to R	Take Out 12"-28' RCP
29+61 to 29+57	R	Take Out 12"-69' RCP
32+71	L	Take Out 48" RCP End Section
32+71	R	Take Out 48" RCP End Section
37+27 to 37+85	R	Take Out 12"-59' CMP
39+77 to 39+78	L to R	Take Out 24"-74' RCP
40+52 to 41+18	R	Take Out 18"-66' CMP
41+12	R	Take Out Sign

TABLE OF ASPHALT CONCRETE PAVEMENT REMOVAL

Station	to	Station	L/R	Quantity (SqYd)
109+71		110+86	R	41.5
111+91		113+06	R	34.8
111+95		113+17	L	50.9
Borrow Pit				1280.0
Total:				1407.2

TABLE OF CONCRETE CURB AND/OR GUTTER REMOVAL

Station	to	Station	L/R	Quantity (Ft)
26+75		26+96	R	21
26+78		26+96	L	19
29+41		29+66	R	26
29+40		29+69	L	28
Total:				94

TABLE OF CONCRETE DRIVEWAY PAVEMENT REMOVAL

Station	to	Station	L/R	Quantity (SqYd)
24+36		24+64	L	51.9
Total:				51.9

TABLE OF DROP INLET REMOVAL

All costs for removal of the frame and grate assembly will be incidental to the contract unit price per each for "Remove Drop Inlet".

Station	L/R	Quantity (Each)
26+81	L	1
26+81	R	1
29+61	L	1
29+61	R	1
Total:		4

PIPE COVER

The earthen subgrade cover for some pipe installations is less than one foot. The Contractor will take the necessary precautions to ensure the structural properties of the pipes are not damaged after installation and prior to the placement of final surfacing. Any additional costs for preventing damage to these pipes will be incidental to the contract unit price per foot for the corresponding pipe installation contract item.

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 2291(01)10	B7	B71
Plotting Date:	2/1/2022	REV 07/19/2021 KAO	
		REV 09/20/2021 KAO	
		REV 09/27/2021 KAO	
		REV 11/29/2021 KAO	
		REV 02/02/2022 KAO	

STORM SEWER

Reinforced concrete pipe may be bell and spigot. The pipe sections will be adjoined such that the ends are fully entered and the inner surfaces are reasonably flush and even.

Lift holes in the reinforced concrete pipe will be plugged with grout.

Watertight joints are required for reinforced concrete pipe, drop inlets, manholes, and junction boxes where storm sewers run parallel to and within 10 feet horizontally from existing or proposed water mains.

Watertight joints are required where reinforced concrete pipes, drop inlets, manholes, or junction boxes cross water mains and are separated a distance of 18 inches or less, above or below, the water main.

If watertight joints are required then the watertight joints will extend for a distance of 10 feet beyond the water main. This measurement will be from the sealed concrete joint to the outer most surface of the water main.

Watertight joint seals will conform to the following requirements:

1. **Reinforced Concrete Pipe (Circular):** Gasketed pipe will conform to the requirements of ASTM C443 and the gasket will be in conformance with Section 990 of the Specifications. Non-gasketed concrete pipe will be sealed with a mastic joint seal conforming to the requirements of ASTM C990 and encased with a minimum 2-foot wide by 6-inch thick M6 concrete collar reinforced with 6x6 W2.9 x W2.9 wire mesh.
2. **Reinforced Concrete Pipe (Arch):** Gasketed pipe will conform to the requirements of ASTM C443 and the gasket will be in conformance with Section 990 of the Specifications. Non-gasketed concrete pipe joints will be sealed with a hydrophilic flexible water stop seal and wrapped with a 1-foot wide strip of fabric above the cradle. The fabric will conform to the requirements of Section 831 of the Specifications for Type A Drainage Fabric. The hydrophilic flexible water stop will be from the list below.
3. **Drop Inlets, Manholes, and Junction Boxes:** Joints will be sealed with one of the following methods:
 - A. A flexible strip seal placed in the joints conforming to the requirements of ASTM C990 and the perimeter encased with a minimum 2-foot wide by 6-inch thick M6 concrete collar reinforced with 6x6 W2.9 x W2.9 wire mesh.
 - B. A hydrophilic flexible water stop seal placed in the joints and a 1-foot wide strip of fabric wrapped around the perimeter of the pipe. The fabric will conform to the requirements of Section 831 of the Specifications for Type A Drainage Fabric. The hydrophilic flexible water stop will be from the list below.
 - C. A self-adhesive external joint seal wrap. The seal wrap will be from the list below.



STORM SEWER, (continued)

Approved List of Self-adhesive Joint Wrap

Product	Manufacturer
Mar Mac Seal Wrap	Mar Mac Construction Products McBee, SC 843-335-5909 www.marmac.com
ConWrap CS-217	Concrete Sealants, Inc. Tipp City, OH 800-332-7325 conseal.com

Approved List of Hydrophilic Flexible Water Stop Seal:

Product	Manufacturer
Waterstop RX	Cetco Hoffman Estates, IL 800-527-9948 www.cetco.com
Conseal CS-231	Concrete Sealants, Inc. Tipp City, OH 800-332-7325 conseal.com

Gaskets and seals (mastic, waterstop, and seal wraps) will be installed in accordance with the Manufacturer's recommendations.

The cost for furnishing and installing all gaskets, mastic joint seal, water stop seal, seal wrap, concrete collars, and for plugging the lift holes will be incidental to the contract unit price per foot for the corresponding pipe contract item.

DROP INLETS

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

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

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

TABLE OF DROP INLETS AND QUANTITIES

Station	L / R	Drop Inlet Size	Drop Inlet Type	Class M6 Concrete (CuYd)	Reinf. Steel (Lb)	Precast Drop Inlet Collar (Each)	Frame and Grate/Lid Type
26+53	L	1.5'x3'	D	1.03	150.1	1	D
26+53	R	1.5'x3'	D	1.21	179.7	1	D
30+37	L	1.5'x3'	D	1.03	156.7	1	D
30+37	R	1.5'x3'	D	1.09	262.1	1	D
Totals:				4.36	748.6	4	
Total Type D Frame and Grate Assembly						4	

TABLE OF JUNCTION BOXES AND QUANTITIES

Station	L/R	Size L'xW'xH'	Frame and Lid (Type)	Class M6 Concrete (CuYd)	Reinforcing Steel (Lb)
16+87	L	7'x7'x6.7'	S	8.17	1625.2
Totals:				8.17	1625.2
Total Type S Manhole Frame and Lid					1

TABLE OF BANK AND CHANNEL PROTECTION GABIONS AND DRAINAGE FABRIC

Station	L/R	Bank and Channel Protection Gabion (CuYd)	Type B Drainage Fabric (SqYd)
22+34	L	4.5	15
Totals:		4.5	15

TABLE OF RIPRAP AND DRAINAGE FABRIC

Station	L/R	Class A Riprap (Ton)	Class B Riprap (Ton)	Type B Drainage Fabric (SqYd)
17+53	L	18		12
18+64	L	9		6
32+39	L		40	22
39+74	L	33		22
Totals:		60	40	62



FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 2291(01)10	B8	B71
Plotting Date:	2/1/2022	REV 07/19/2021 KAO	REV 09/20/2021 KAO
		REV 11/29/2021 KAO	REV 02/02/2022 KAO

MAILBOXES

The Contractor will reset the existing mailboxes on new posts with the necessary support hardware for single or double mailbox assemblies. The local Postmaster will determine the recommended mounting height of the mailboxes throughout the project. The Contractor will coordinate with the Engineer on the proper postal representative to contact.

All costs for removing existing mailboxes, providing temporary mailboxes, and resetting mailboxes with new posts and necessary support hardware will be incidental to the contract unit price per each for "Refurbish Single Mailbox" or "Refurbish Double Mailbox".

One single mailbox will be refurbished at Sta. 23+41 L and one double mailbox will be refurbished at Sta. 41+35 L.

MISCELLANEOUS WORK

The Contractor will remove and dispose of all existing I beams, fence, and continuous panels from the following stations:

Station	to	Station
16+80 - 50' L		21+22 - 45' L
17+44 - 50' L		17+44 - 185' L
19+75 - 41' L		19+80 - 185' L
21+22 - 45' L		21+22 - 185' L

The landowner will remove any items that the landowner determines to be salvageable. Contractor will not remove any of the items listed above until after April 15th 2022.

The Contractor will be allowed to determine to either remove or cut the I beams 1' below grade and bury. The I beams extend approximately 15' below existing grade. There are an estimated 15 I beams that the Contractor will be required to remove or bury.

The existing fence is SDDOT Type 6 and has an estimated length of 880 Ft.

The existing continuous panel fencing is estimated at 36 each.

The Contractor will remove and dispose of all trees, bushes, and shrubs from the area of Station 21+22-70' L; 21+22-235' L to Station 22+10-70' L; 22+10-235' L.

The payment will be per site and no change in the bid price will be paid if there are more or less items removed than what is estimated above.

REMOVE CATTLE GUARD

Contractor will not remove the existing cattle guard until after the landowner's replacement cattle guard is installed.



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	IM 2291(01)10	B9	B71

Plotting Date: 12/2/2021 REV 07/19/2021 KAO
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TABLE OF GUARDRAIL

Location	Remove Concrete Barrier (Ft)	Remove 3 Cable Guardrail (Ft)	Remove 3 Cable Guardrail Slip Base Anchor Assembly (Each)	Remove Beam Guardrail (Ft)	Remove W Beam Guardrail Breakaway Cable Terminal (Each)	Remove W Beam Guardrail End Terminal (Each)	High Tension Cable Guardrail (Ft)	High Tension Cable Guardrail Anchor Assembly (Each)	Type 1 MGS (Ft)	Type 1 Guardrail Transition (Each)	MGS MASH Tangent End Terminal (Each)
<i>Structure No. 50-221-170</i>				203		1					
Sta. 24+96 to Sta. 26+98 Rt.				154		1					
Sta. 25+46 to Sta. 26+99 Lt.				378		1					
Sta. 33+15 to Sta. 29+38 Lt.				154		1					
Sta. 29+38 to Sta. 30+91 Rt.											
Sta. 25+41 to Sta. 26+42 Lt.								100.0	1	1	
Sta. 25+42 to Sta. 26+42 Rt.								100.0	1	1	
Sta. 30+50 to Sta. 31+37 Lt.								87.5	1	1	
Sta. 30+50 to Sta. 31+50 Rt.								100.0	1	1	
<i>I229</i>											
Sta. 110+85 to Sta. 111+99 Lt.	114										
Sta. 110+86 to Sta. 111+90 Rt.	104										
Sta. 103+18 to Sta. 110+69 Rt.		752	1								
Sta. 104+60 to Sta. 115+17 Rt.		1058	2								
Sta. 110+05 to Sta. 110+90 Rt.				85	1						
Sta. 111+86 to Sta. 112+70 Rt.				85	1						
Sta. 112+06 to Sta. 113+95 Rt.		190	1								
Sta. 111+15 to Sta. 115+18 Lt.		404	2								
Sta. 111+95 to Sta. 112+79 Lt.				85	1						
Sta. 112+15 to Sta. 114+55 Lt.		241	1								
Sta. 105+85 to Sta. 112+39 Rt.							655	2			
Sta. 106+33 to Sta. 108+58 Rt.							226	2			
Sta. 111+77 to Sta. 114+48 Rt.							260	2			
Sta. 110+96 to Sta. 115+33 Lt.							437	2			
Totals:	218	2645	7	1144	3	4	1578	8	387.5	4	4



HIGH TENSION CABLE GUARDRAIL

The Contractor will furnish and install a high tension guardrail system that meets the Test Level 3 crash testing requirements of National Cooperative Highway Research Program (NCHRP) 350 or current Manual for Assessing Safety Hardware (MASH). The maximum dynamic deflection of the system will be less than 8 feet and the maximum post spacing will be 16 feet unless specified otherwise in the plans.

The high tension cable guardrail system will be in compliance with Specifications Section 6.9 Buy America.

The Contractor will install the system according to the manufacturer's installation recommendations except where stated otherwise in the plans. A copy of the detail drawings and installation instructions for the high tension cable guardrail and anchor assemblies will be given to the Engineer a minimum of 4 weeks prior to installation of the high tension cable guardrail system.

All posts will be galvanized and inserted into driven galvanized steel sleeves with soil plates.

Delineation of the high tension cable guardrail will be in conformance with standard plate 632.40.

The cables provided will be pre-stretched in the factory.

The Contractor will check and adjust the tension of the cables a minimum of 3 weeks after installation and not longer than 6 weeks after installation. Cost for this work will be incidental to the contract unit price per foot for "High Tension Cable Guardrail".

The lengths of high tension cable guardrail stated in the plans were based on an approach non-effective length of 26' and a departure non-effective length of 51' when installed adjacent to one-way traffic roadways. The length and location of the high tension cable guardrail at each site will need to be adjusted during construction as necessary if a system with a different non-effective length is used and it will be approved by the Design Engineer before installation.

The Contractor will provide a signed letter of compliance to the Engineer upon completion of the high tension cable guardrail installation(s) stating that the high tension cable barrier system has been installed in conformance to the installation instructions, specifications, and at a minimum meets the Test Level 3 crash test requirements of NCHRP 350 or MASH.

The high tension cable guardrail will be measured along the centerline of the cable guardrail from center of anchor assembly to center of anchor assembly to the nearest foot. Example: If the system utilizes 4 anchor footings in the anchor assembly, then the center of the anchor assembly would be centered between the 2nd and 3rd footing.

All costs for furnishing and installing the high tension cable guardrail system including all labor, materials, and equipment will be incidental to the contract unit price per foot for "High Tension Cable Guardrail".



FOR BIDDING PURPOSES ONLY

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	IM 2291(01)10	B10	B71

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HIGH TENSION CABLE GUARDRAIL ANCHOR ASSEMBLY

The beginning and end of each "run" of high tension cable guardrail will terminate with an anchor assembly that meets the Test Level 3 crash testing requirements of NCHRP 350 or MASH.

The footing(s) for the anchor assembly will be designed to allow for 1 inch maximum of lateral deflection. The allowable design soil pressure will be 1000 psf. The top 2 feet of soil pressure will be neglected in the design of the footing(s). The footing(s) will be a minimum of 5' deep. The footing(s) design will be submitted through proper channels to the Office of Bridge Design for a one-time approval. Any changes to the anchor assembly that could affect footing size including configuration changes such as different number of cables and different number of footings will be resubmitted for approval. The approval will be obtained a minimum of 4 weeks prior to construction of the anchor footing(s).

Delineation of the high tension cable guardrail anchor assembly will be in conformance with standard plate 632.40.

All costs for furnishing and installing the High Tension Cable Guardrail Anchor Assembly including all labor, equipment, and materials which include the anchor footing(s), hardware, and all attachments to the anchor footing(s), will be incidental to the contract unit price per each for "High Tension Cable Guardrail Anchor Assembly".



FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 2291(01)10	B11	B71

Plotting Date: 12/2/2021 REV 07/19/2021 KAO
REV 11/29/2021 KAO

TABLE OF CONSTRUCTION STAKING FOR PROJECT IM 2291(01)10
(See Special Provision for Contractor Staking)

Roadway and Description	Begin Station	End Station	Number of Lanes	Length (Ft)	Grade Staking			Miscellaneous Staking Quantity (Mile)	Slope Staking Quantity (Mile)	Structure Staking Quantity (Each)	
					Length (Mile)	Lane Factor	*Sets of Stakes				
East 60 th Street (2 Lanes AC Pavement)	15+50	43+50	2	2,800	0.530	1	1	0.530	0.530	2	
Sycamore Avenue (2 Lanes)	24+50	38+00	2	1350	0.256	1	1	0.256	0.256	0	
Totals:								0.786	0.786	0.786	2

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

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



FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 2291(01)10	B12	B71

Plotting Date: 2/1/2022
 REV 07/19/2021 KAO
 REV 11/29/2021 KAO
 REV 02/02/2022 KAO

PIPE QUANTITIES

Station	Offset (L/R)	Reinforced Concrete																
		Circular							Flared Ends					RC Bend		Reset Flared End	Reset Pipe	
		12" Cl. 4	18" Cl. 2	18" Cl. 3	24" Cl. 2	30" Cl. 2	36" Cl. 2	48" Cl. 4	48" Cl. 5	12"	18"	24"	30"	36"	18" 10°	18" 18°	48"	48"
Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Each	Each	Each	Each	Each	Each	Each	Each	Each	Ft	
16+24.04-29.95' R to 16+87.33-17.35' L					70							1						
16+79.26-39.99' L to 16+87.33-17.35' L				16							1							
16+87.33-17.35' L to 17+43.18-58.13' L						58							1					
18+88.75-30.94' R to 18+67.40-32.36' L		56								2								
22+34.21-211.13' L to 22+29.73-137.52' L	74								2									
26+53.53-19.75' L to 26+53.53-19.75' R		38																
26+53.53-19.75' R to 27+22.93-139.62' R		130								1				1				
30+36.85-19.75' L to 30+36.85-19.75' R		38																
30+36.85-19.75' L to 31+56.94-196.86' L			216							1				1				
32+74.05-169.07' R to 32+73.23-119.31' R							42									1		8
32+69.56-105.09' L to 32+45.73-194.91' L								88								1		32
39+76.17-51.54' R to 39+74.22-71.41' L				112							2							
41+46.28-47.12' R to 41+95.83-46.20' R		38								2								
Subtotal:		74	300	216	128	70	58	42	88	2	6	3	1	1	1	1	2	40



FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 2291(01)10	B13	B71

Plotting Date: 2/1/2022
 REV 07/19/2021 KAO
 REV 11/29/2021 KAO
 REV 02/02/2022 KAO

FENCE QUANTITIES

Station to Station	Side (L/R)	Right-of-Way Fence	Temporary Fence	Post Panels		Tubular Gate		Remove Fence (Ft)
		Type 4 (Ft)	Type 1 (Ft)	2 Posts (Each)	3 Post (Each)	Remove (Each)	Reset (Each)	
21+22 - 23+60	L							345
26+68 - 26+80	L	92		3				
26+68 - 27+00	L							114
26+74 - 26+82	R	64						
26+74 - 27+01	R			3				67
29+90 - 30+09	R	117		3				
29+90 - 29+97	L	68		4				
29+35 - 42+24	R							1367
29+35 - 40+63	L							1328
29+90 - 40+63	L	1170		22				
29+92 - 40+62	L		1251					
42+18 - 43+02	L							100
42+18 - 42+32	L	14		2				
42+32 - 42+32	L					1	1	
42+50 - 42+82	L	32		2				
42+82 - 42+82	L	17		1				
42+82 - 43+02	L	20		2				
43+02 - 43+02	L	13		2				
Borrow Pit No. 1								1827
TOTALS:		1607	1251	44	0	1	1	5148

CURB AND GUTTER QUANTITIES

Station to Station	Concrete Curb and Gutter	
	Type D	66 Ft
East 60th Street North		
26+53.53-21.00'R	26+58.53-21.00'R	8
26+53.53-21.00'L	26+58.53-21.00'L	8
30+31.03-21.00'R	30+36.03-21.00'R	8
30+31.03-21.00'L	30+36.03-21.00'L	8
TOTALS:		32

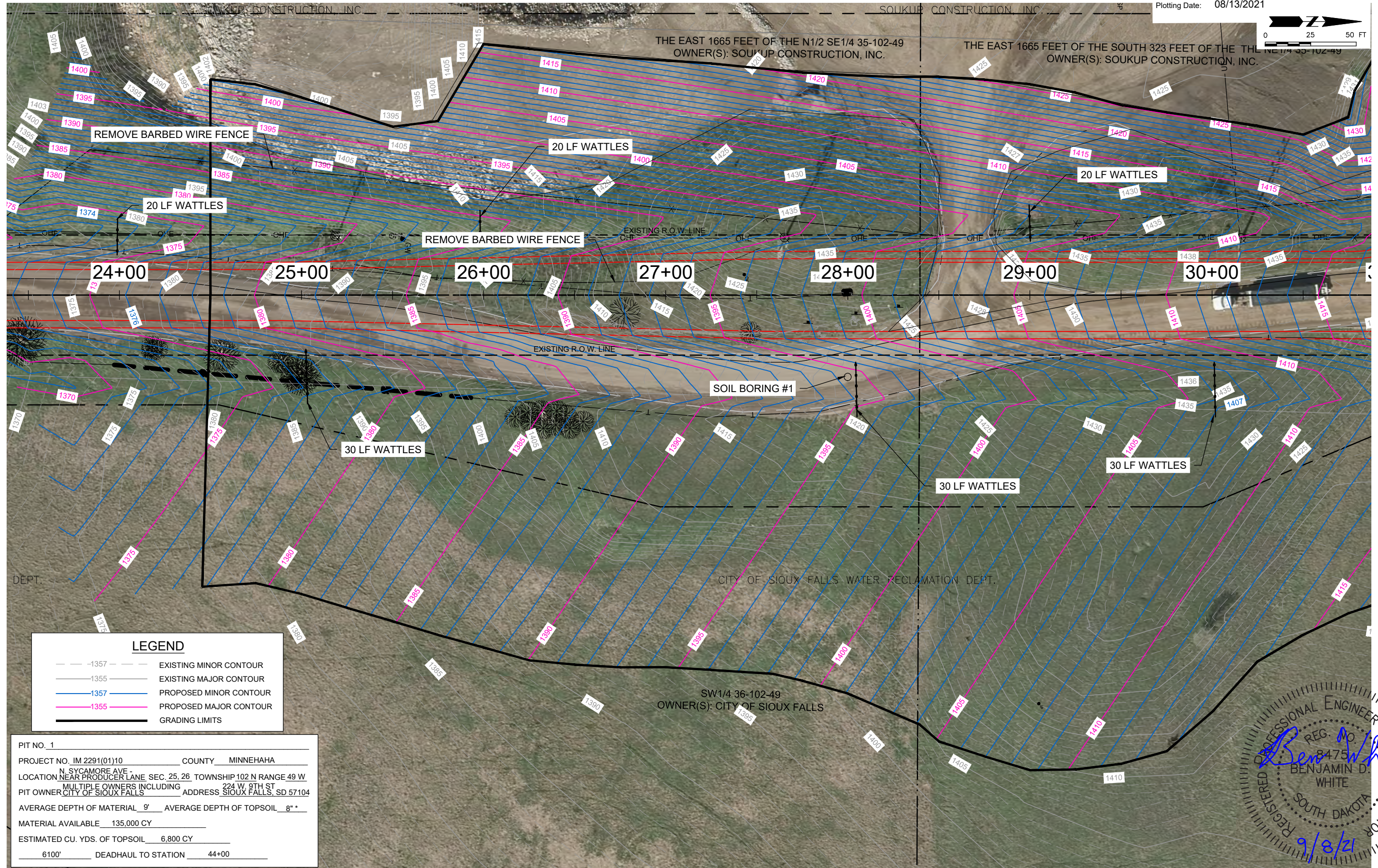


BORROW PIT NO.1

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT IM 2291(01)10	SHEET B14	TOTAL SHEETS B71
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Plotting Date: 08/13/2021



LEGEND

--- 1357 ---	EXISTING MINOR CONTOUR
--- 1355 ---	EXISTING MAJOR CONTOUR
--- 1357 ---	PROPOSED MINOR CONTOUR
--- 1355 ---	PROPOSED MAJOR CONTOUR
---	GRADING LIMITS

PIT NO. 1

PROJECT NO. IM 2291(01)10	COUNTY MINNEHAHA
N. SYCAMORE AVE -	
LOCATION NEAR PRODUCER LANE SEC. 25, 26 TOWNSHIP 102 N RANGE 49 W	
MULTIPLE OWNERS INCLUDING 224 W. 9TH ST	
PIT OWNER CITY OF SIOUX FALLS ADDRESS SIOUX FALLS, SD 57104	
AVERAGE DEPTH OF MATERIAL 9'	AVERAGE DEPTH OF TOPSOIL 8"
MATERIAL AVAILABLE 135,000 CY	
ESTIMATED CU. YDS. OF TOPSOIL 6,800 CY	
6100'	DEADHAUL TO STATION 44+00

* ESTIMATED - DEPTHS NOT TAKEN

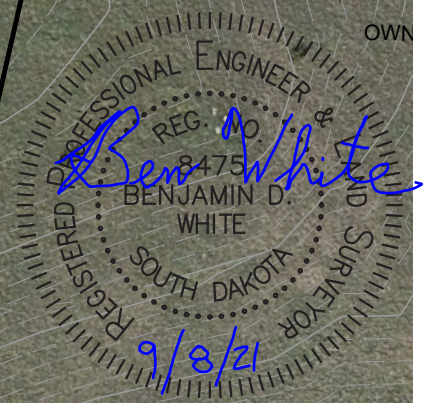
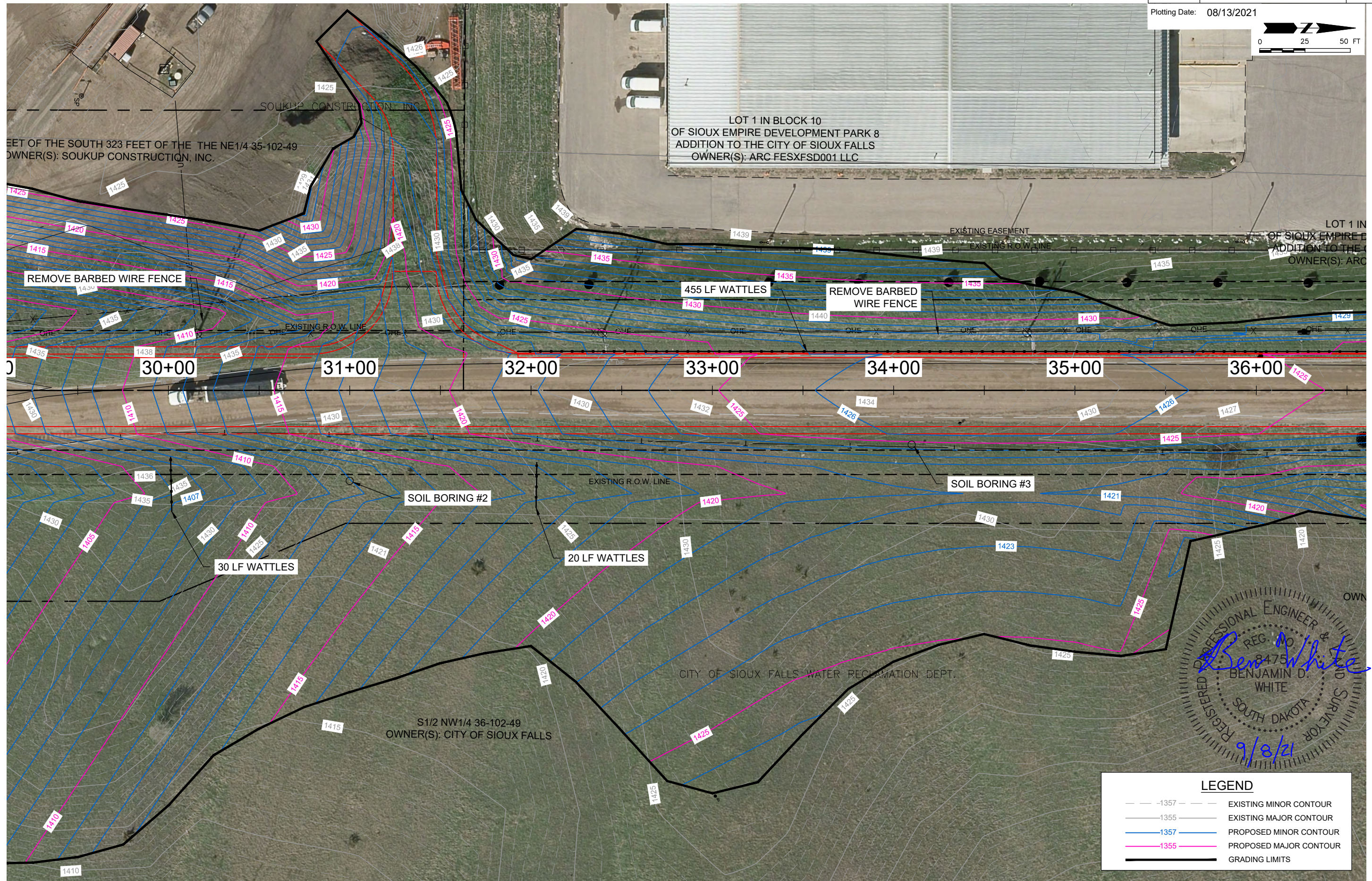
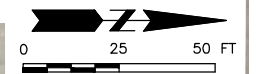


BORROW PIT NO.1

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 2291(01)10	B15	B71

Plotting Date: 08/13/2021



LEGEND	
	-1357 - - - - EXISTING MINOR CONTOUR
	-1355 - - - - EXISTING MAJOR CONTOUR
	-1357 - - - - PROPOSED MINOR CONTOUR
	-1355 - - - - PROPOSED MAJOR CONTOUR
	GRADING LIMITS

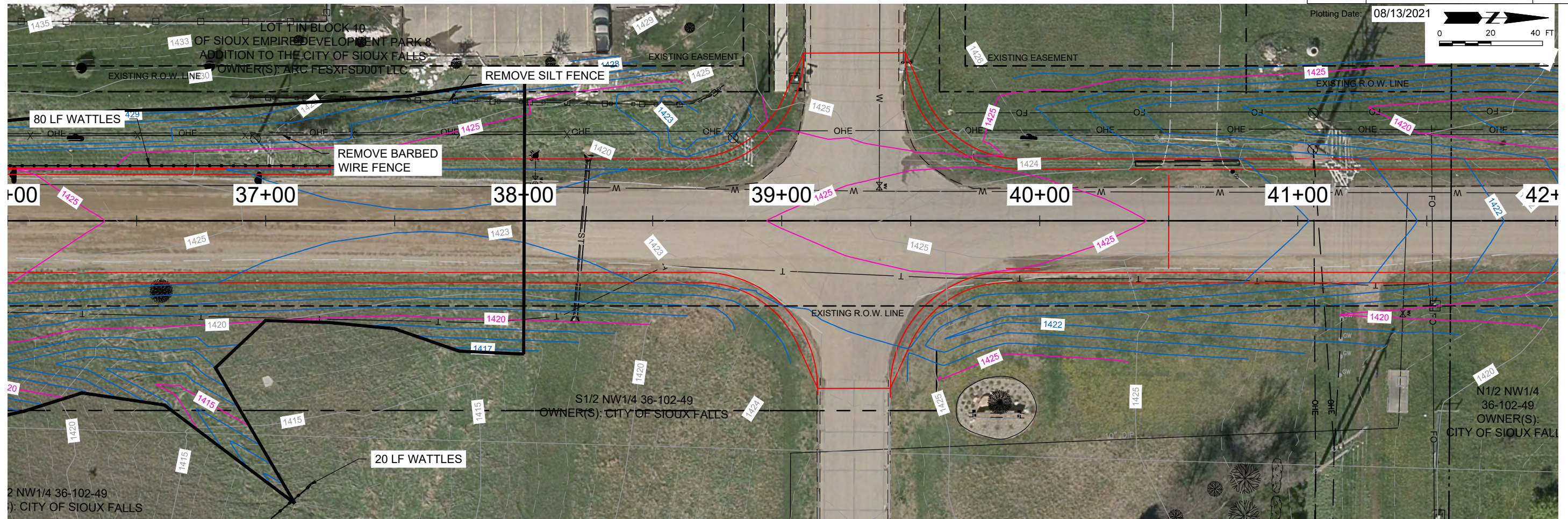


BORROW PIT NO.1

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 2291(01)10	B16	B71

Plotting Date: 08/13/2021



REGISTERED PROFESSIONAL ENGINEER & SURVEYOR
SOUTH DAKOTA
REG. NO. 8475
BENJAMIN D. WHITE
12/8/21



BORROW UNCLASSIFIED EXCAVATION - SYCAMORE AVENUE PIT

General -

Borrow Unclassified Excavation will be generated from Sycamore Avenue from Sta. 24+50 to Sta. 38+00. Contractor to grade Sycamore Avenue according to the lines and grades shown on the plans, with the following exception: Grading is to be completed to Top of Subgrade as labeled on the plans, below the proposed Sycamore Avenue surfacing. Within the excavation area, abandoned watermain may be discovered. The abandoned watermain will be disposed of by the Contractor. Payment for disposal of abandoned watermain will be incidental to Borrow Unclassified Excavation.

Topsoil -

All topsoil will be removed and stockpiled from the borrow pit. No topsoil depths were taken, but an 8" average depth is assumed for quantity calculations. The topsoil can be stockpiled in the adjacent WWTP property, at a location designated by the City. All topsoil will be replaced upon completion of borrow pit grading at an even depth throughout the disturbed area.

Fence -

The Contractor will Remove Fence prior to borrow pit operations. An estimated 1827 LF has been provided in the plans. As measured quantities will be the basis for final payment.

Erosion Control -

Quantities for seed and mulch have been estimated for 10 acres. As measured quantities will be the basis for final payment.

The Contractor will install 725 LF of 12" Diameter Erosion Control Wattles in the ditches as shown in the borrow pit plan view. Measured quantities for 12" Diameter Erosion Control Wattles will be the basis for final payment.

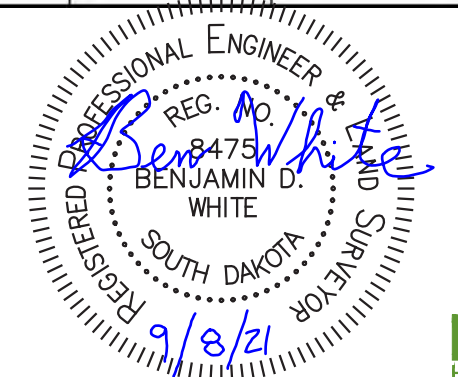
Asphalt Concrete Pavement Removal -

A portion of the existing Sycamore Avenue is surfaced with Asphalt Concrete material. An estimated 1,280 SY of Asphalt Concrete Pavement Removal is included in the Estimate of Quantities for removal of this material.

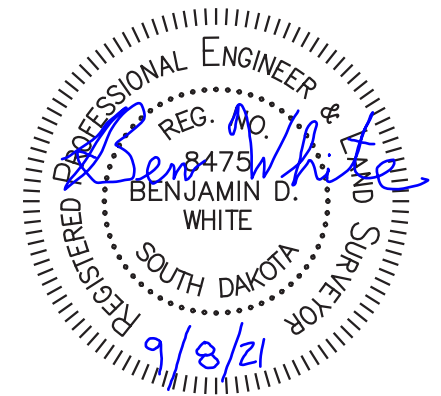
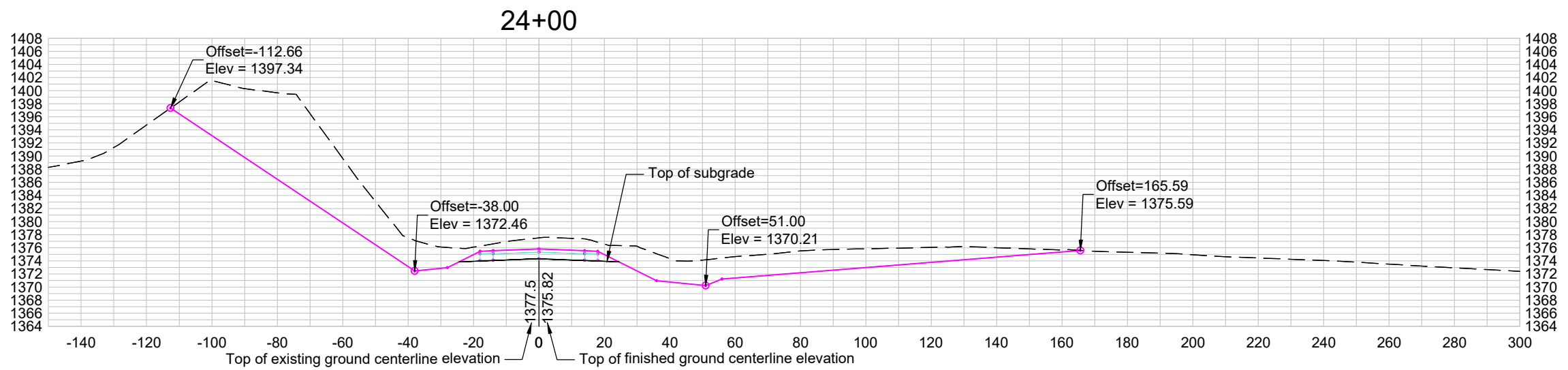
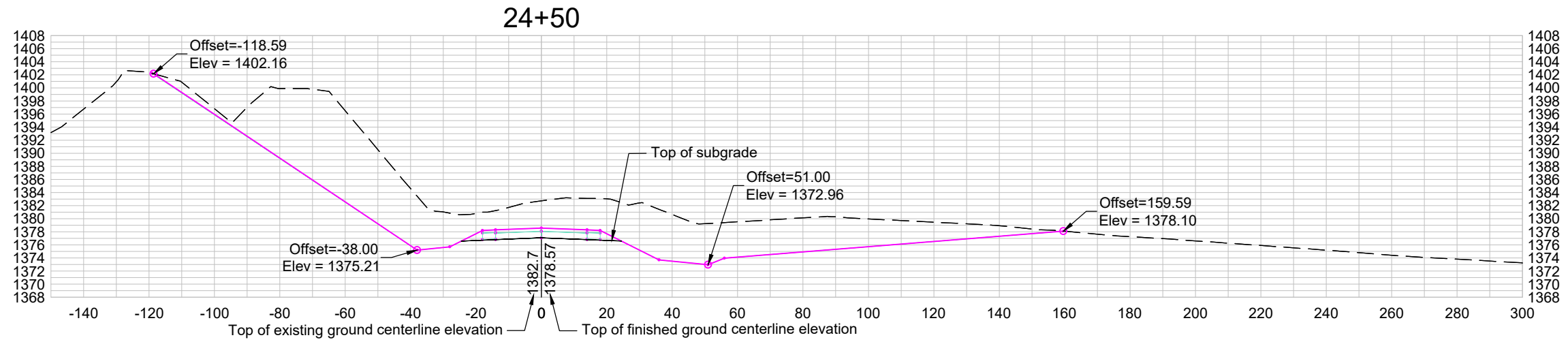
Estimate of Quantities for Sycamore Avenue Pit

- Remove Fence, 1827 LF
- Provide seed and mulch quantities for an estimated 10 acres
- 12" Diameter Erosion Control Wattle, 725 LF
- Asphalt Concrete Pavement Removal, 1,280 SY

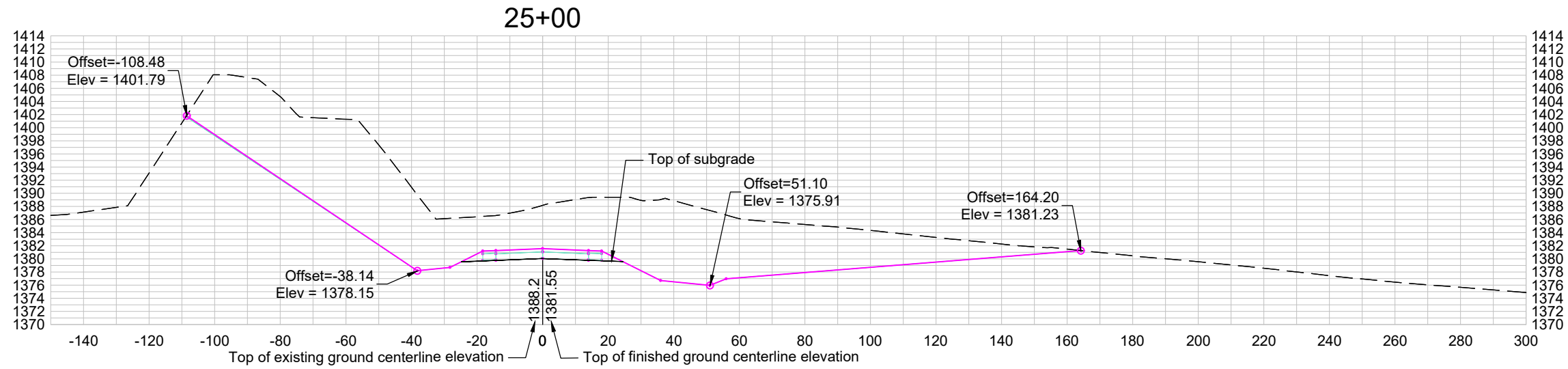
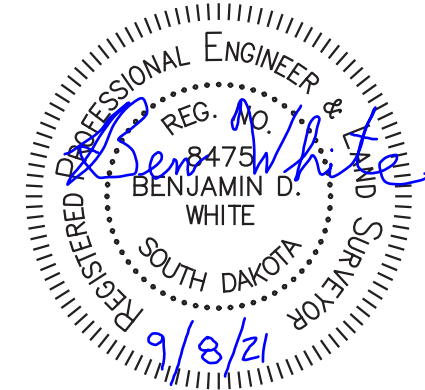
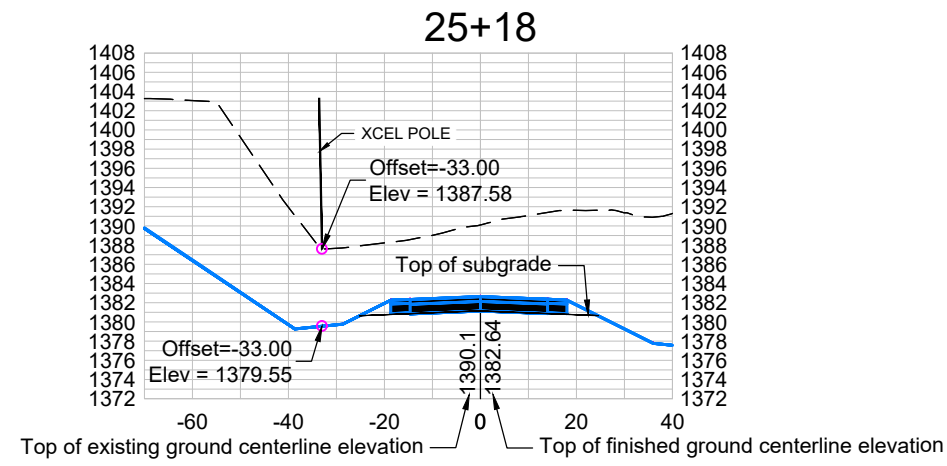
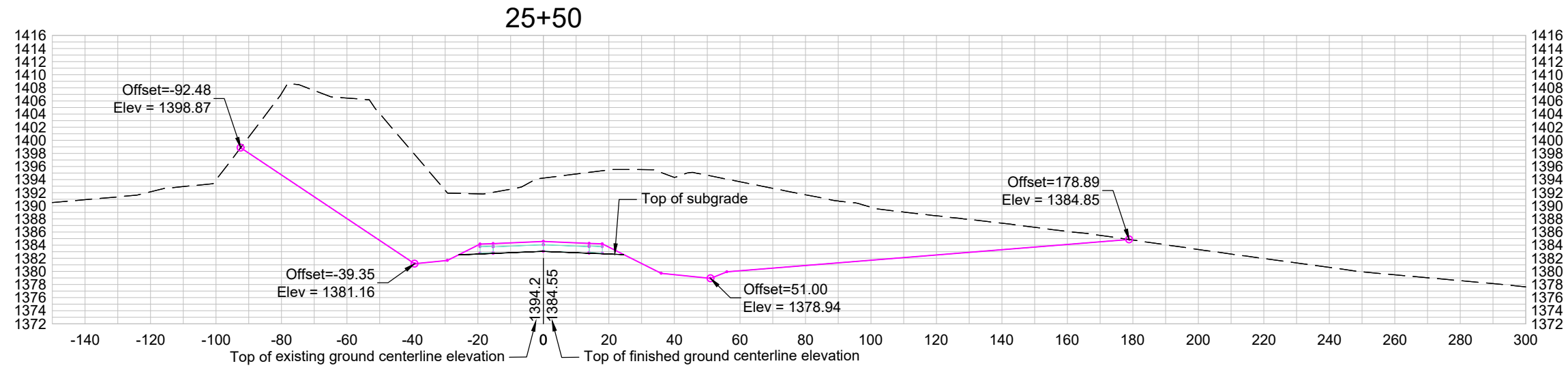
South Dakota Department of Transportation Geotechnical -Soils Central Laboratory 700 E. Broadway Pierre S.Dak. 57501						
Tests run according to SD101,SD102,SD207&SD103				Reported to : Bryce Kampa Reported By: Montana Mraz		
PROJECT :	IM229(01)10	PCN:	01QA	Date Sampled:	1/22/2021	
Submitted by :				Date Testing started:	1/29/2021	
Description: BORROW SAMPLES:				Date Testing Finished:	2/2/2021	
				COUNTY:	Minnehaha	
LAB. SAMPLE #	21-1048	21-1049	21-1050	21-1051	21-1052	21-1053
PIT NUMBER/NAME	Sycamore Rd. Pit	Sycamore Rd. Pit	Sycamore Rd. Pit	Sycamore Rd. Pit	Sycamore Rd. Pit	Sycamore Rd. Pit
HOLE#	1	1	2	2	3	3
FIELD SAMPLE #	1	2	3	4	5	6
DEPTH	0.5-10.0	11.0-21.0	0.5-6.0	6.0-21.0	0.5-10.0	10.0-21.0
FIELD MOISTURE	#NA	#NA	#NA	#NA	#NA	#NA
DRY LOOSE WT.	83.9	84.6	84.3	86.5	82.0	84.3
% passing 3/8	99.3	99.6	99.8	98.7	99.6	99.3
% passing # 4	98.6	99.2	99.8	98.4	99.3	99.1
% passing # 10	96.6	98.3	97.9	97.1	98.5	98.2
% coarse sand	11.8	7.5	12.8	7.1	5.2	7.1
% fine sand	22.6	22.2	20.1	21.2	15.2	20.9
% silt	31.0	36.6	35.2	36.3	44.3	38.4
% clay	31.3	31.8	29.7	32.4	33.9	31.8
% passing # 40	84.9	90.7	85.1	89.9	93.4	91.2
% passing # 200	62.3	68.5	65.0	68.7	78.2	70.2
% coarse & fine sand	34.4	29.8	32.9	28.4	20.4	28.0
liquid limit	32	32	34	32	37	32
liquid plastic limit	14	14	17	14	16	14
P. I.	18	19	17	18	21	18
TEX. CLASSIFICATION	SANDY CLAY	SANDY CLAY	CLAY SILT	SANDY CLAY	SILT CLAY	SILT CLAY
AA SHTO CLASS.	A-6	A-6	A-6	A-6	A-6	A-6
GP Index	9	10	9	10	12	10
Field Color	Tan	Tan	Dark Brown	Tan	Tan	Tan
DEPTH TO GROUNDWATER	0	0	0	0	0	0
OPT. MOISTURE						
MAX. DRY DENSITY						
DEPTH OF TOPSOIL						



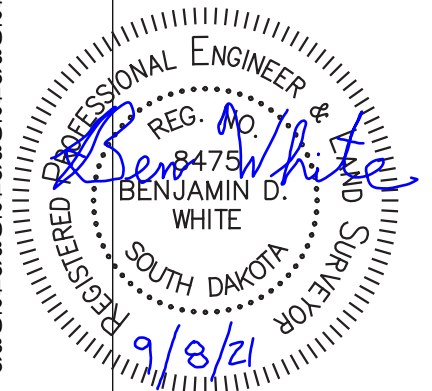
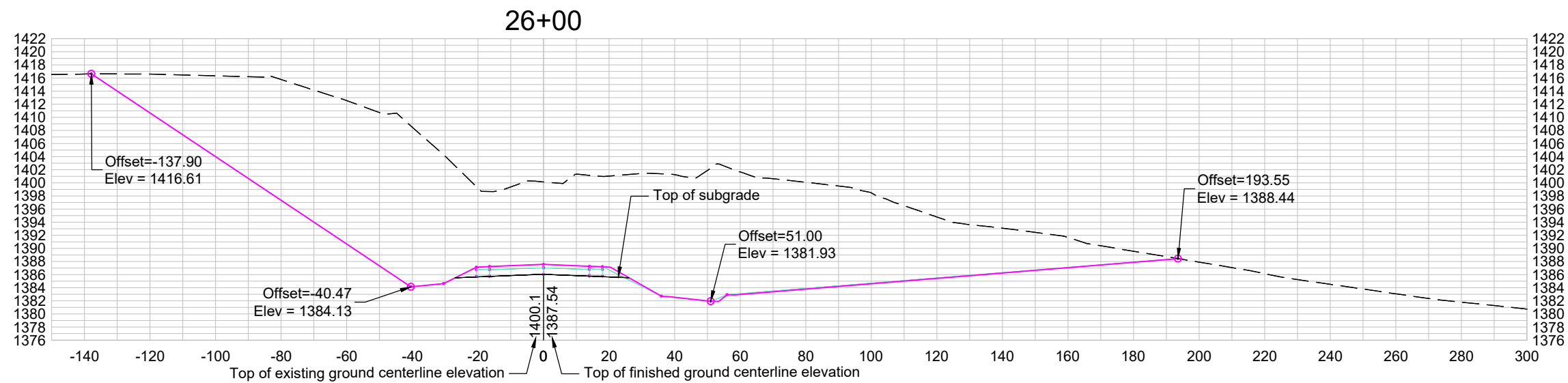
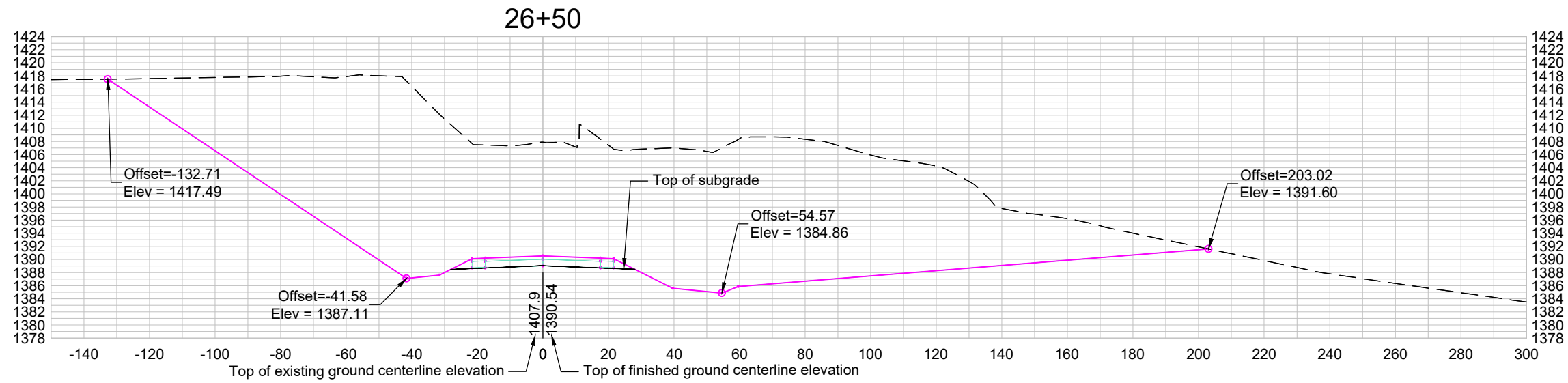
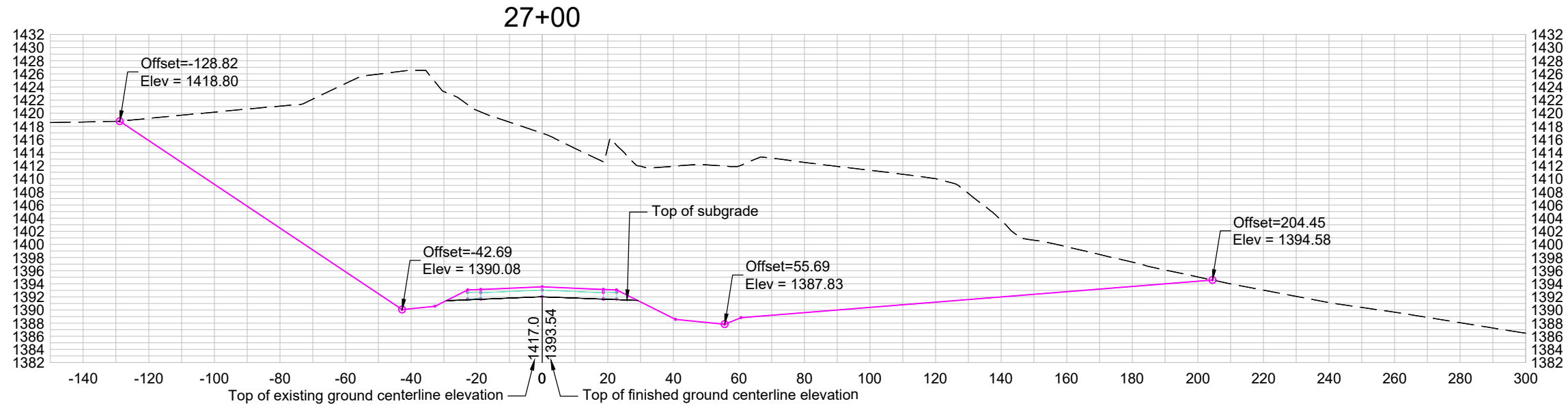
Plotting Date: 08/13/2021



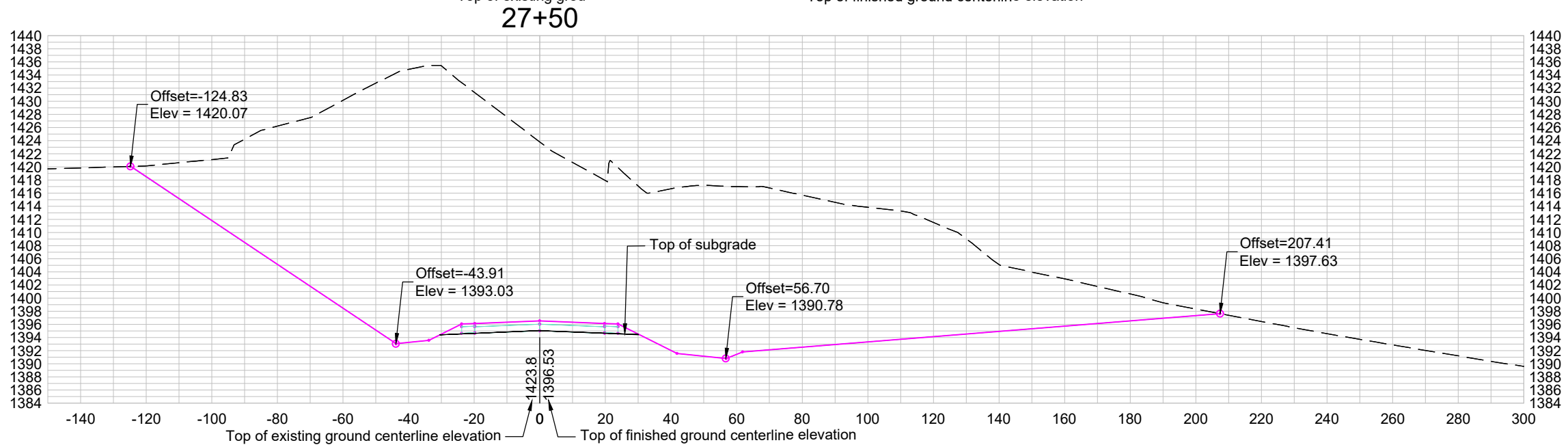
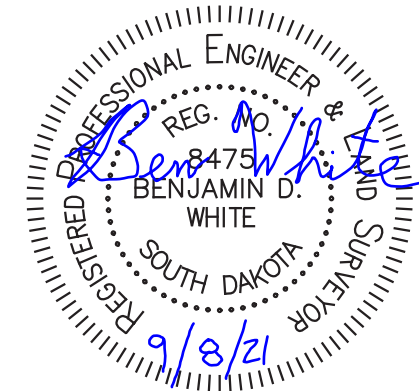
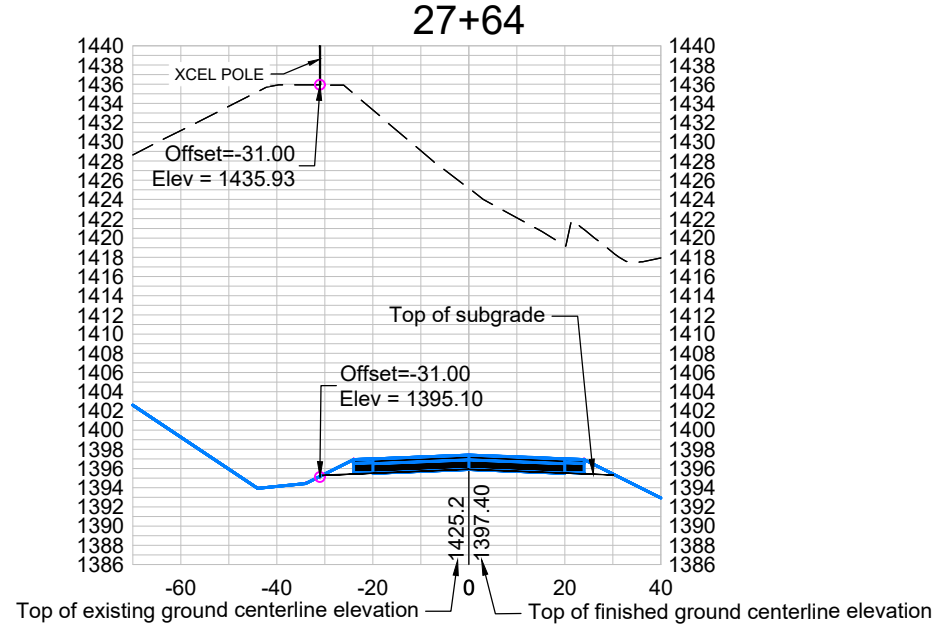
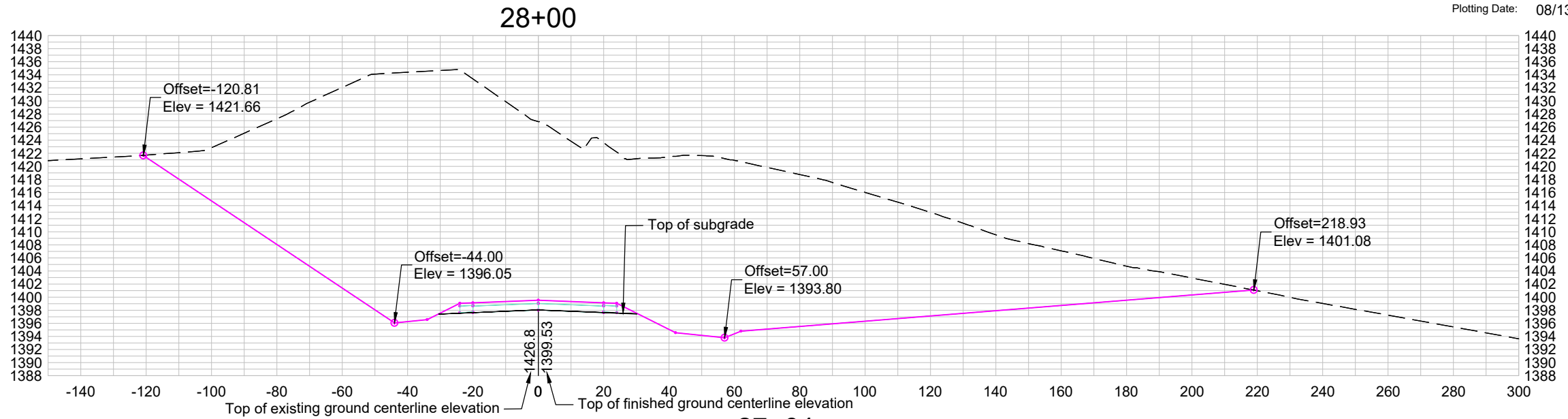
Plotting Date: 08/13/2021



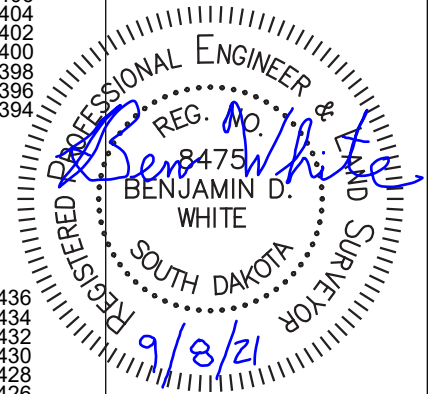
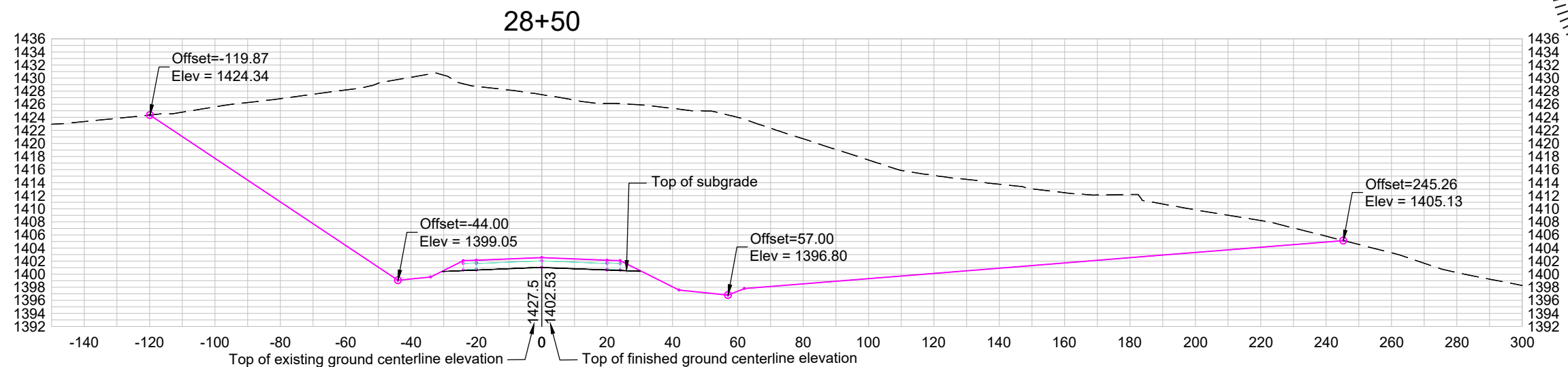
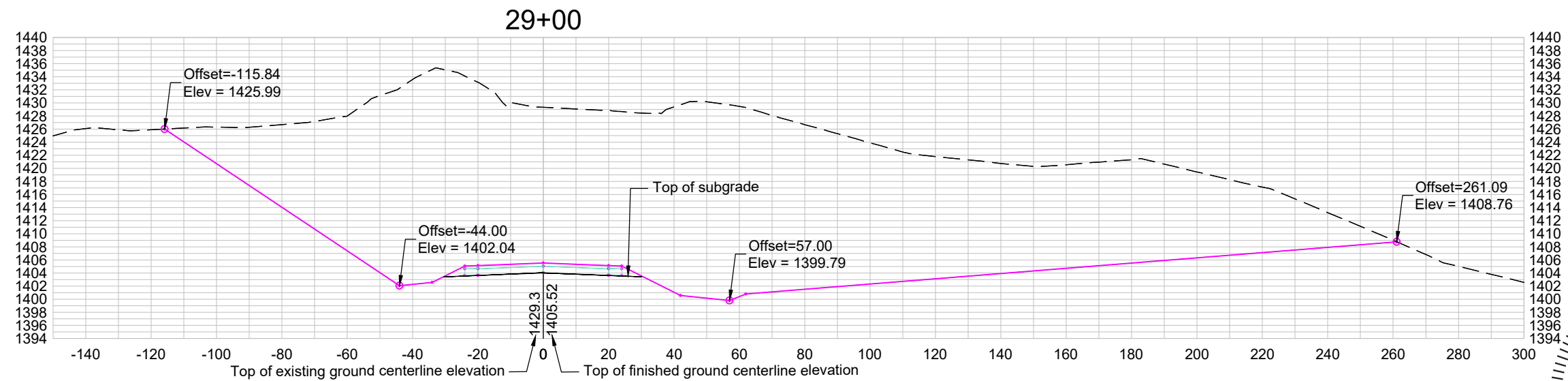
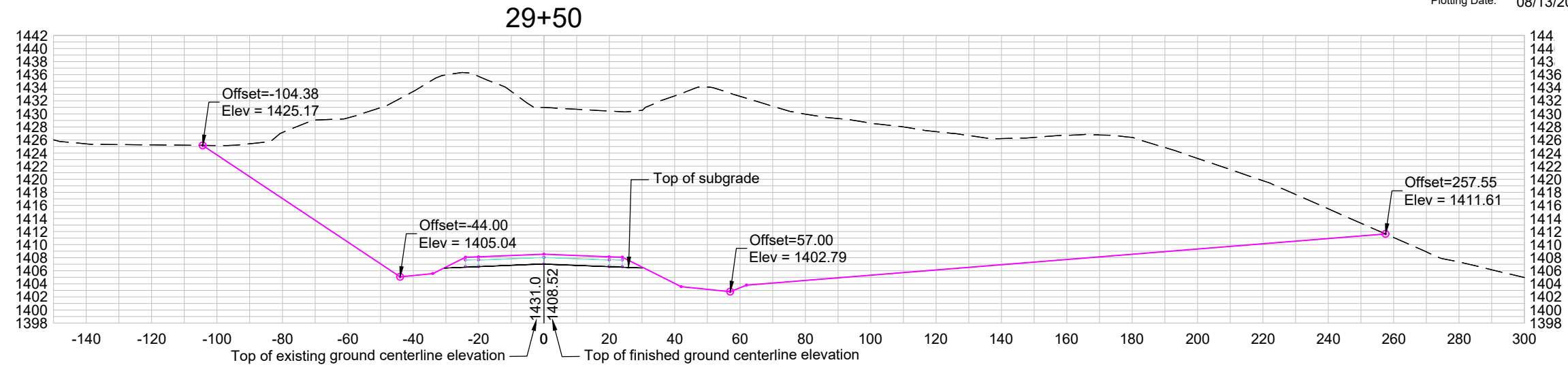
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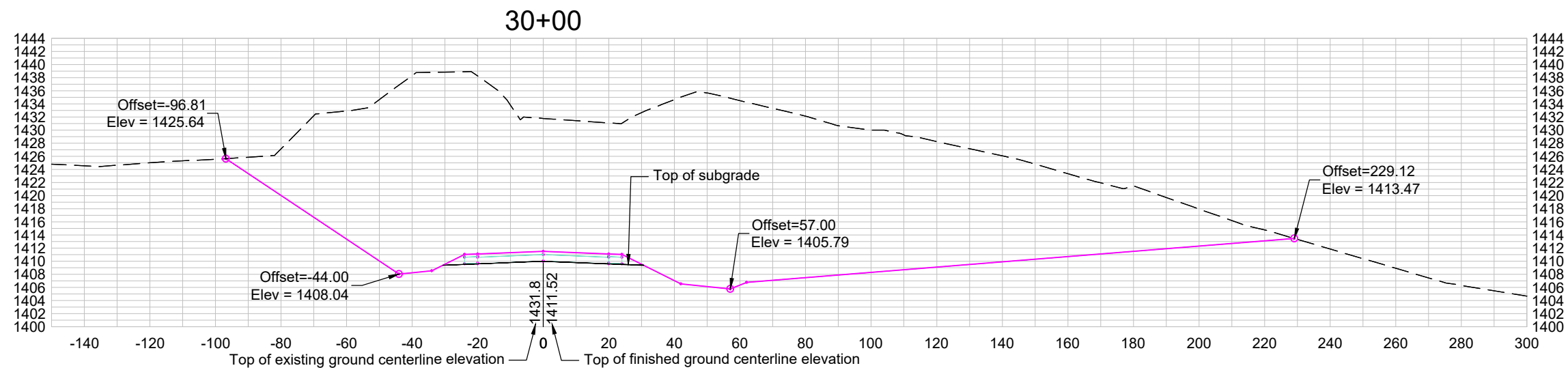
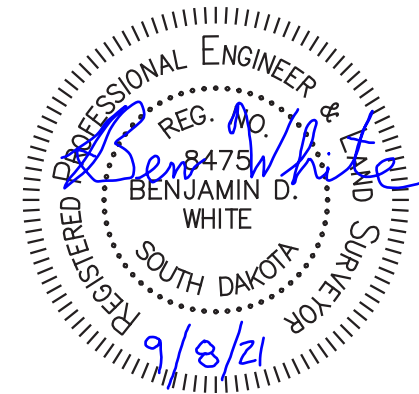
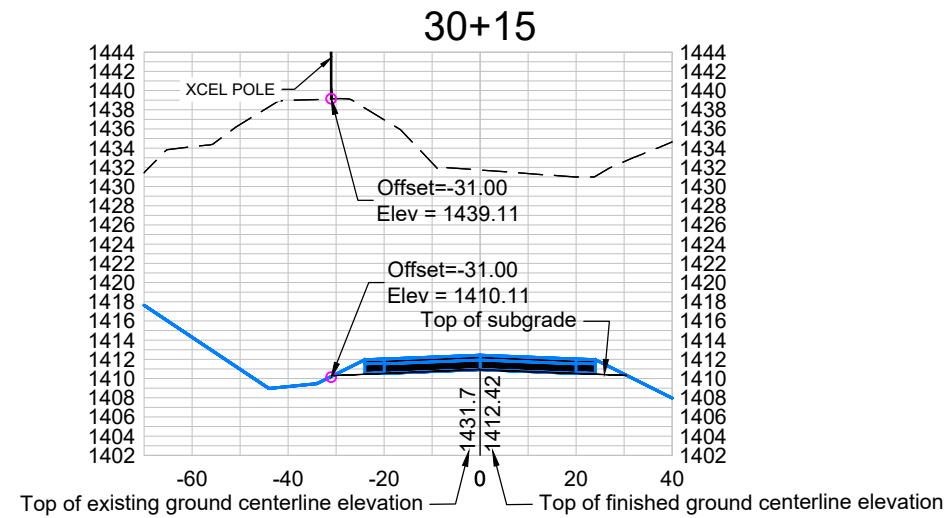
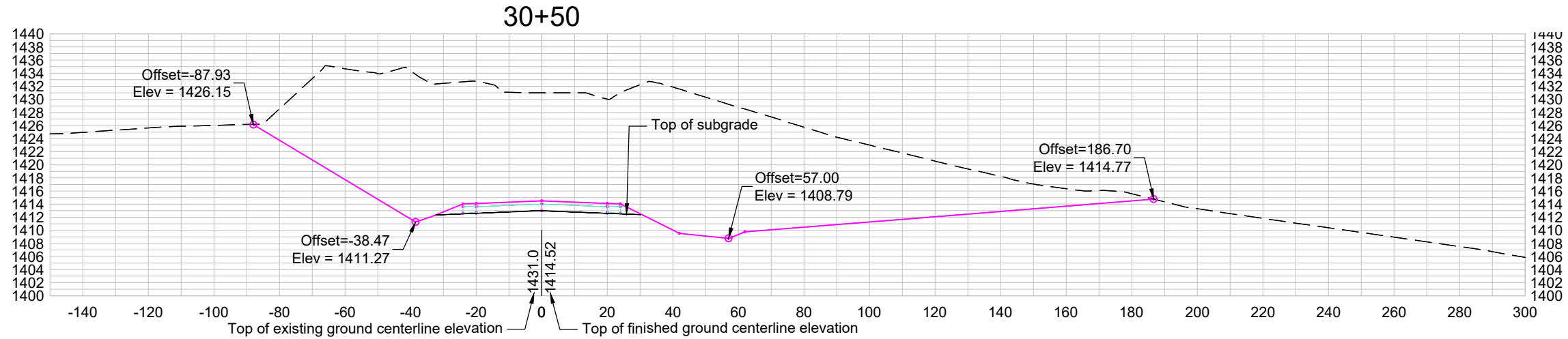


Plotting Date: 08/13/2021

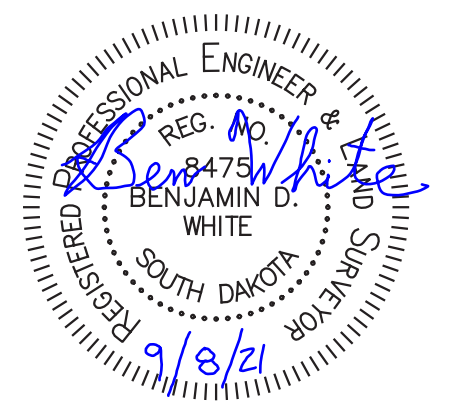
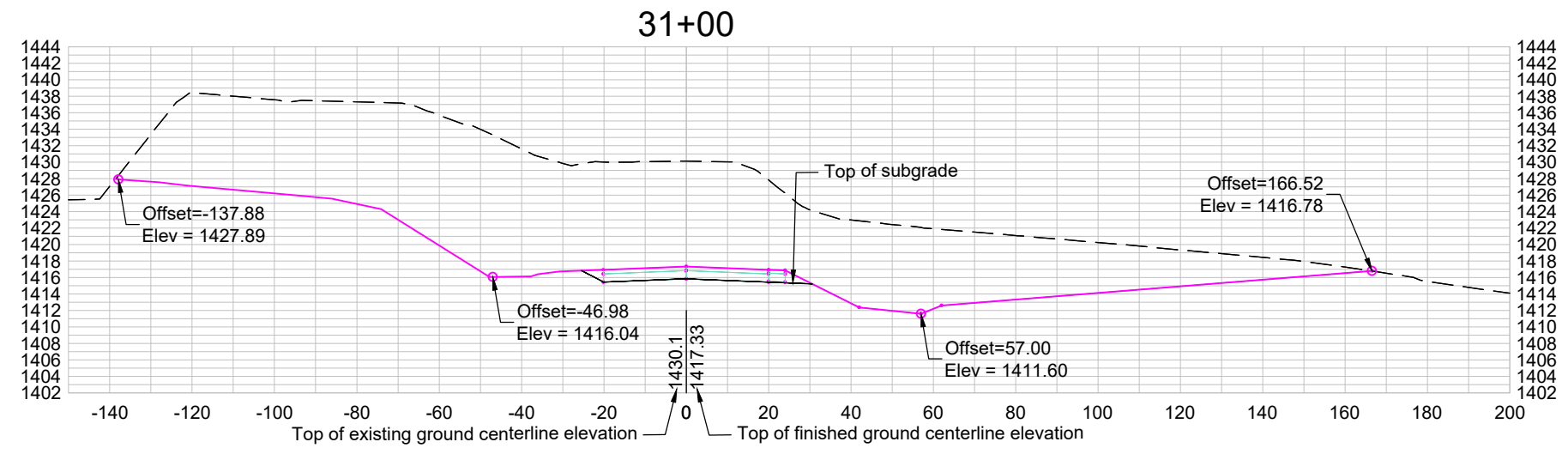
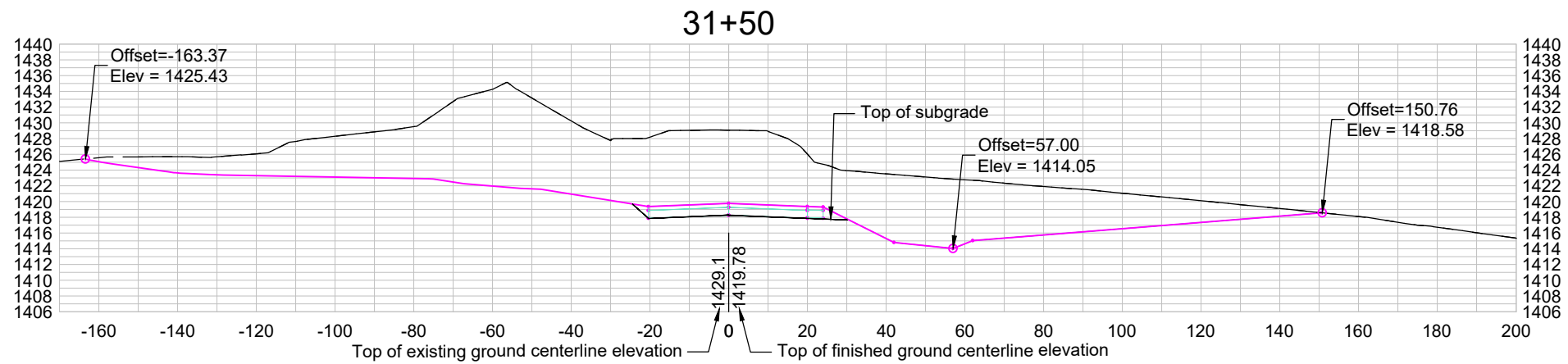
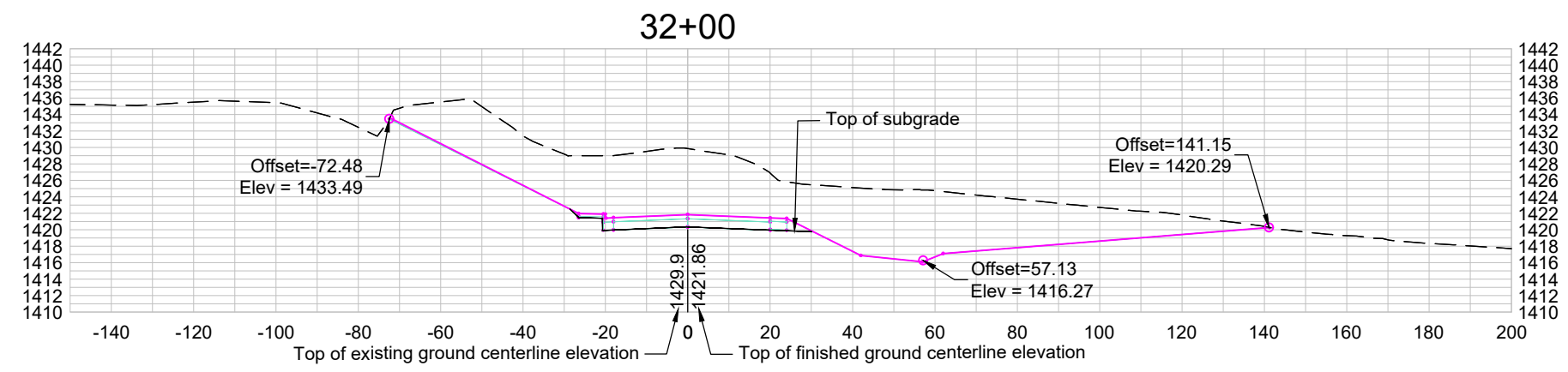


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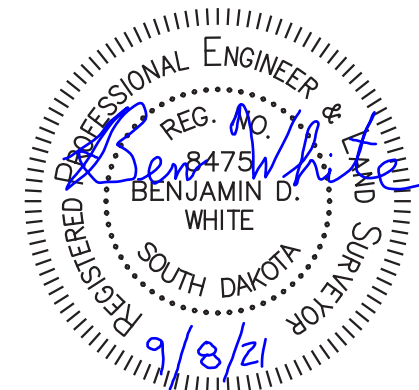
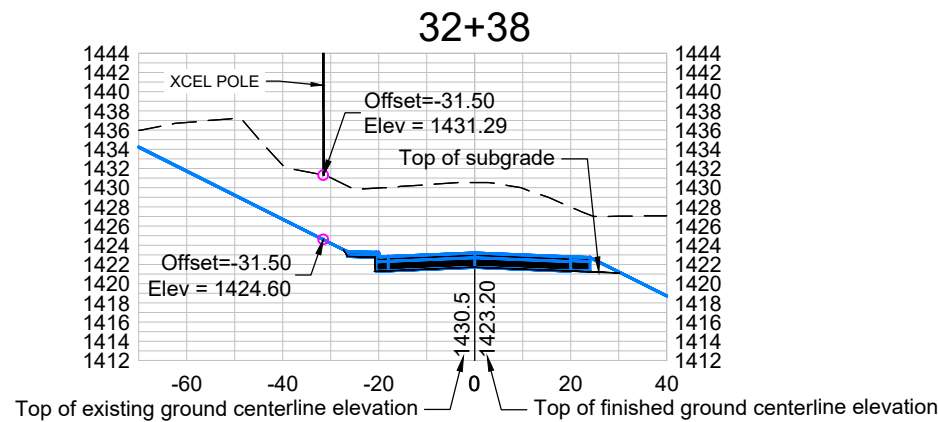
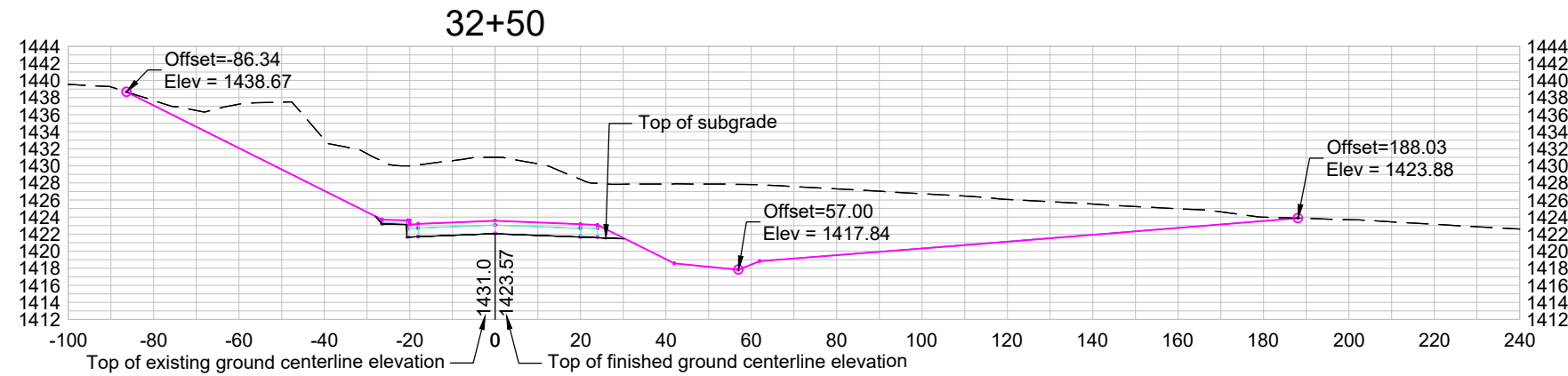
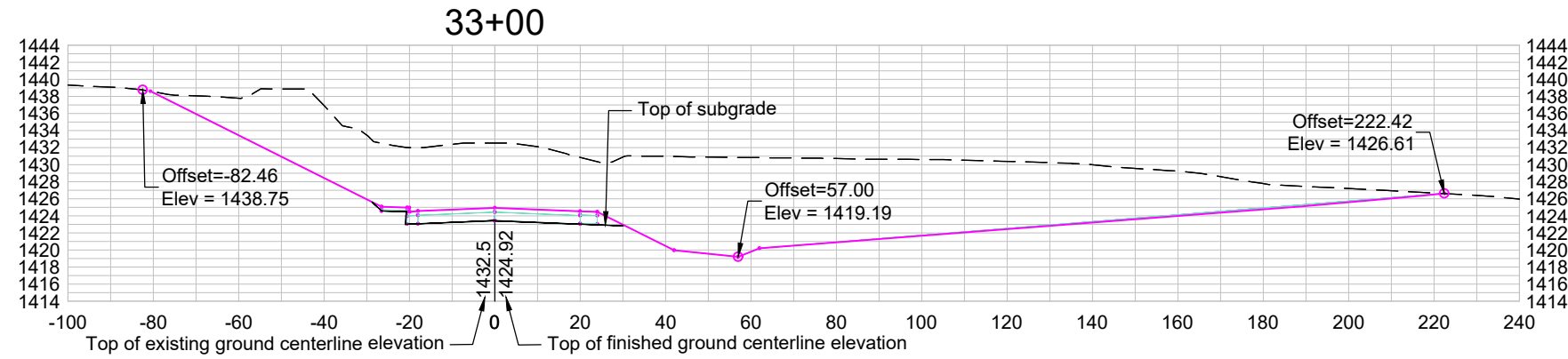
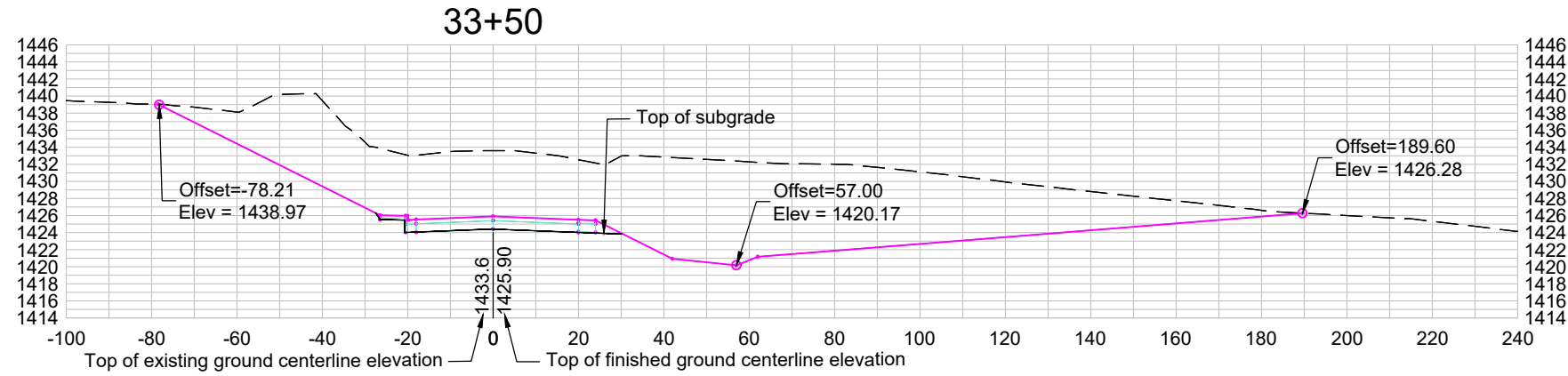




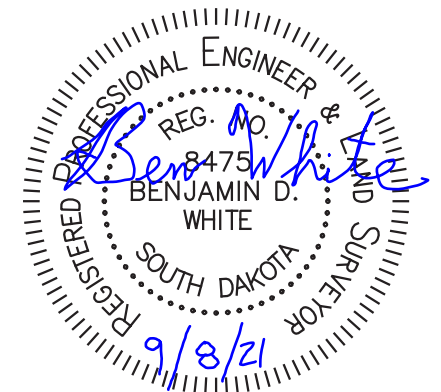
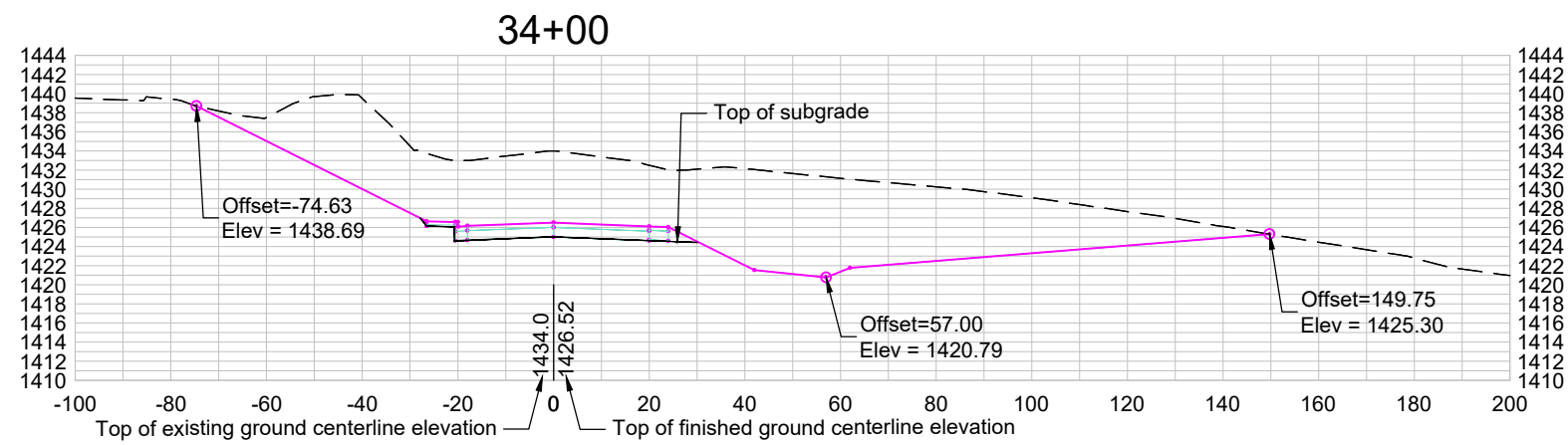
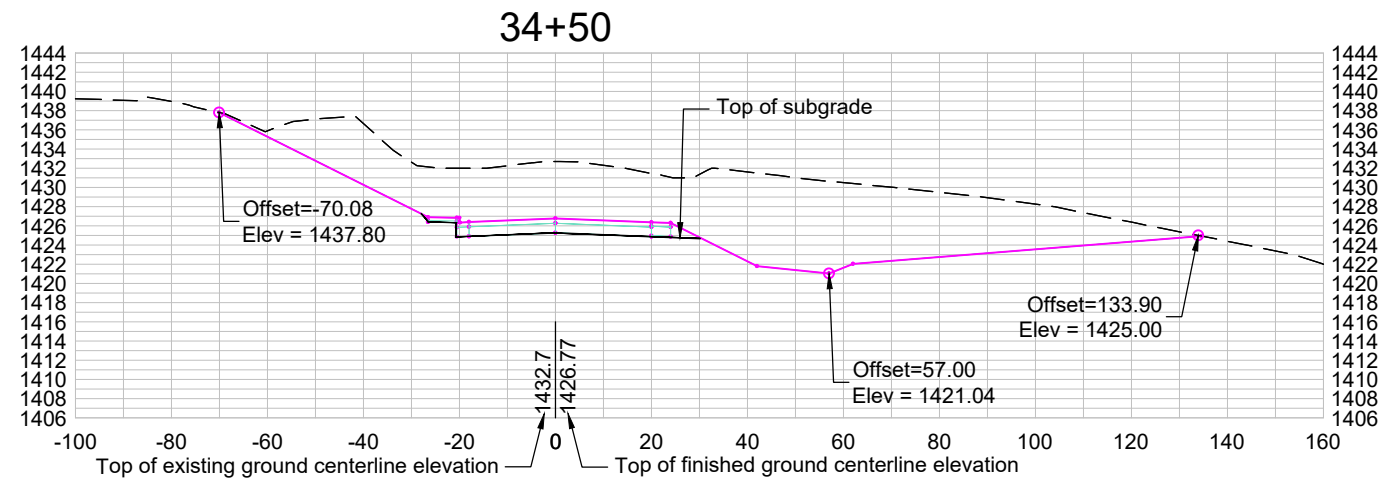
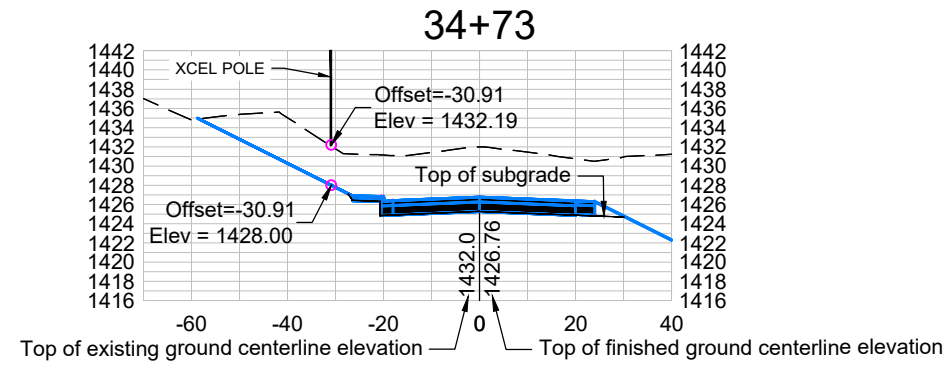
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Plotting Date: 08/13/2021



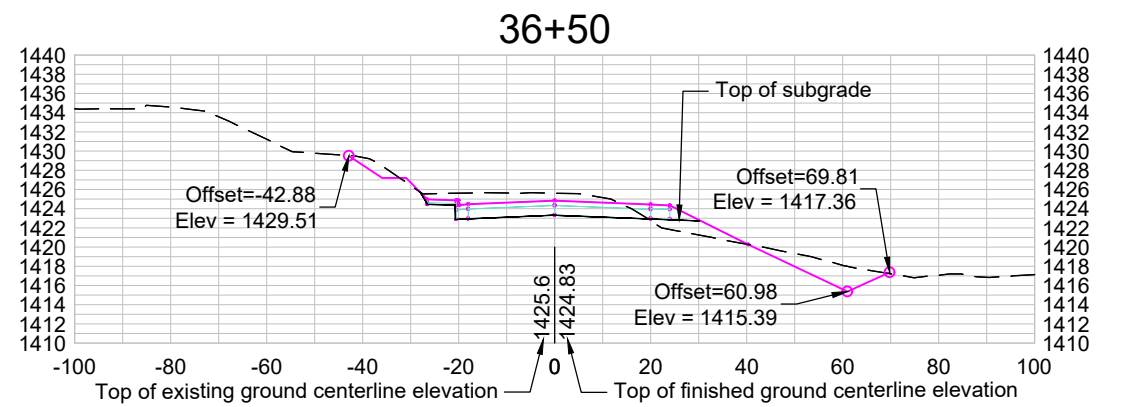
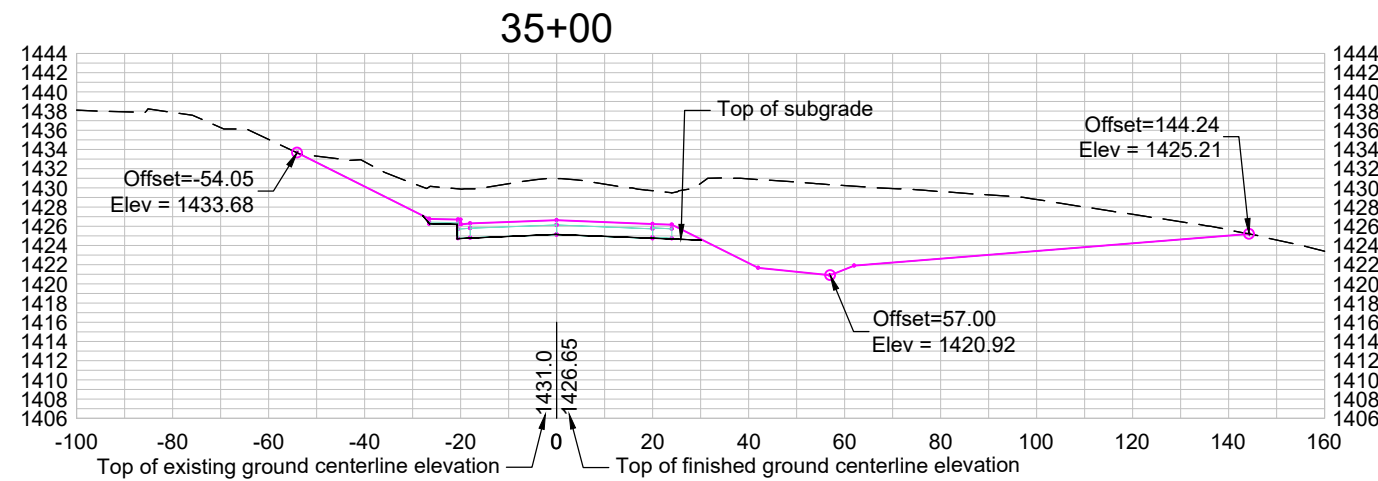
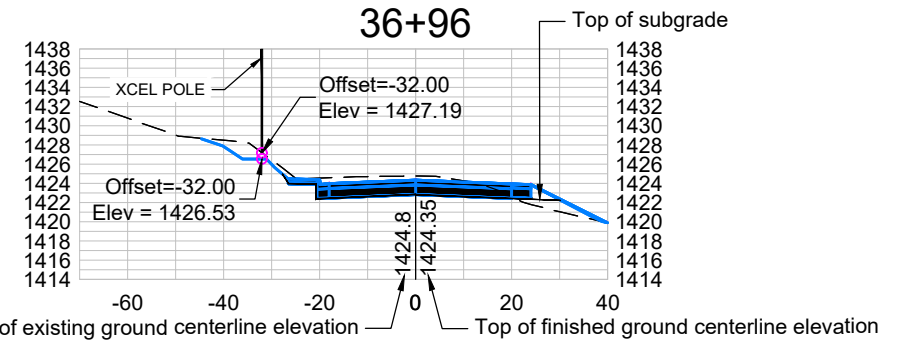
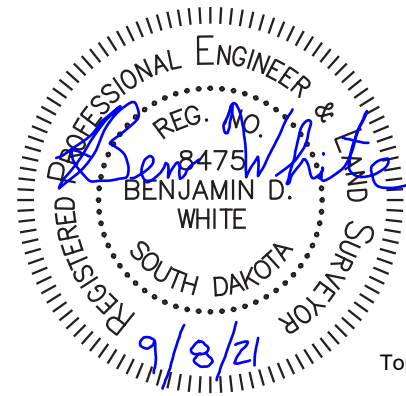
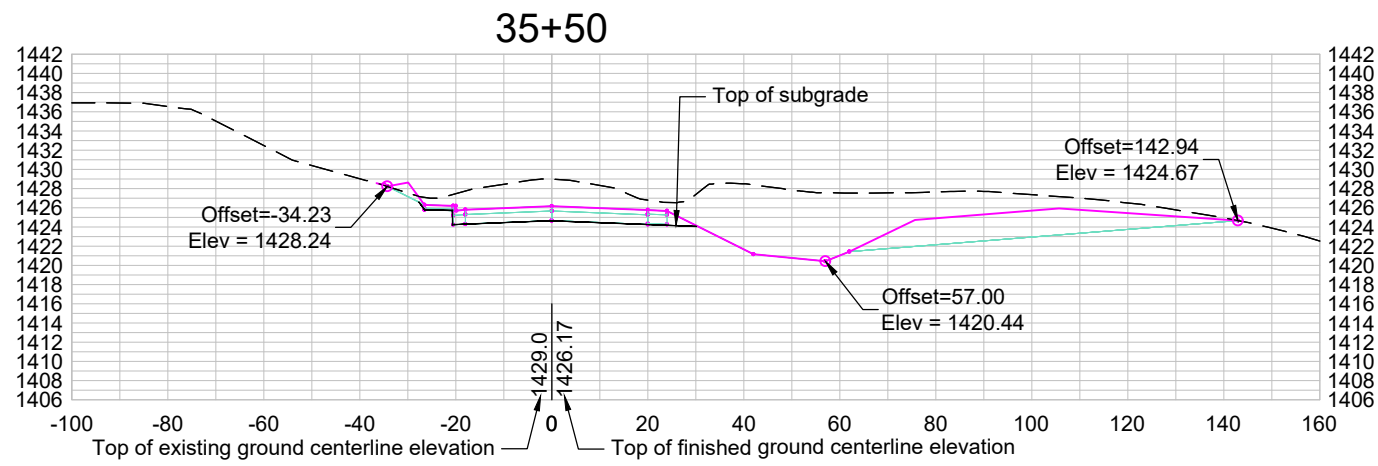
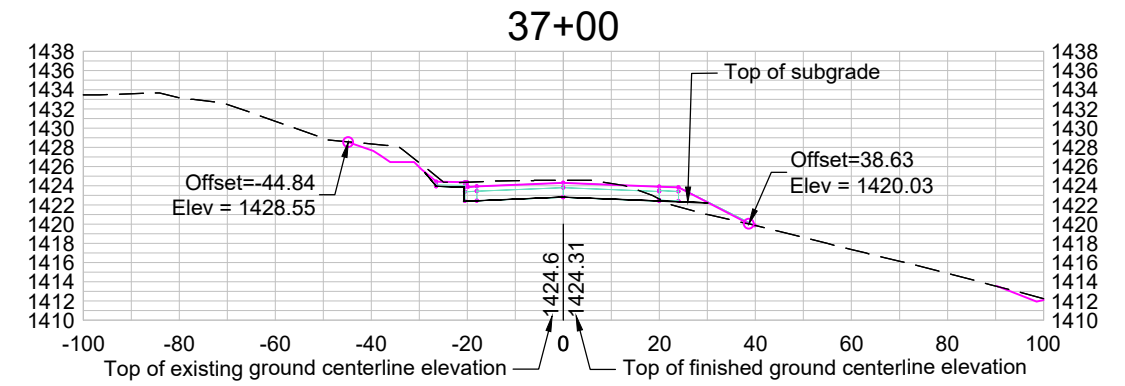
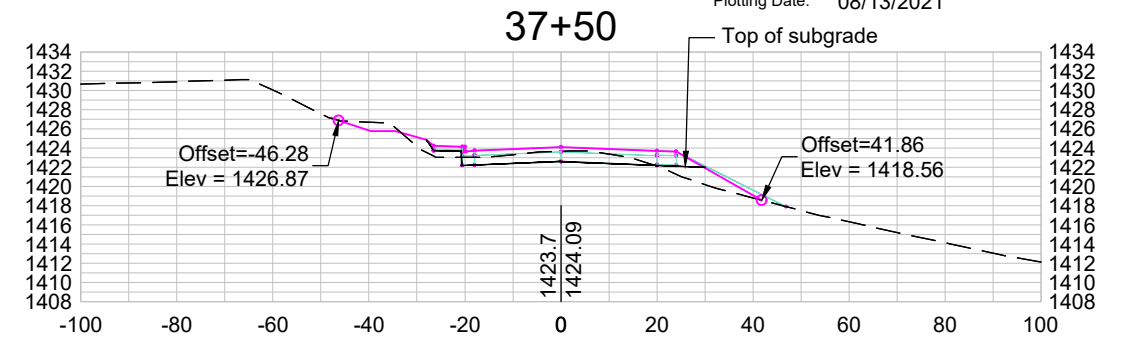
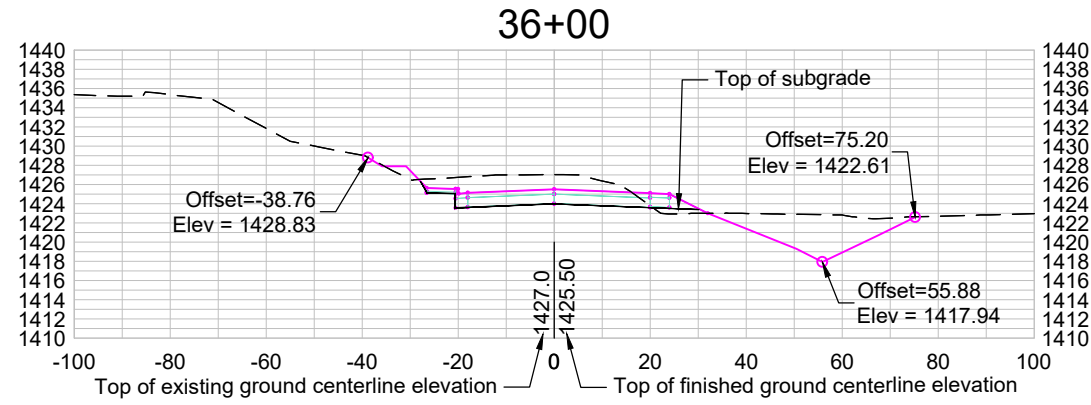
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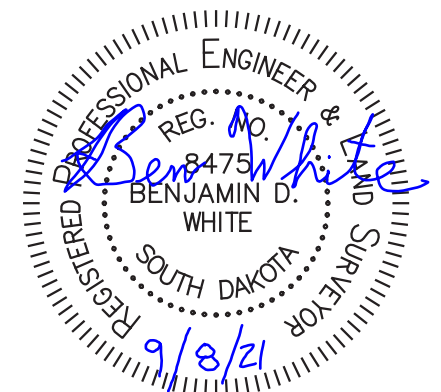
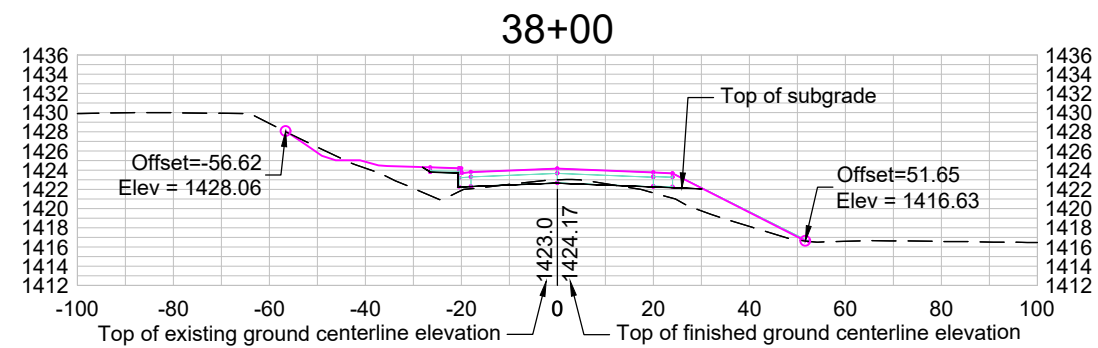
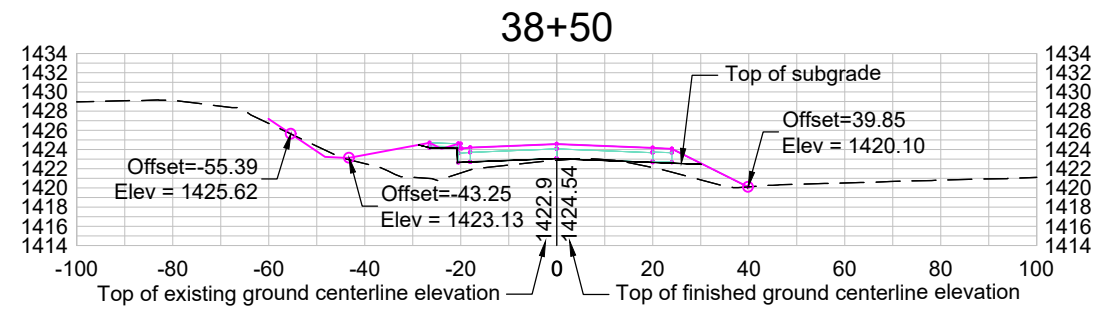
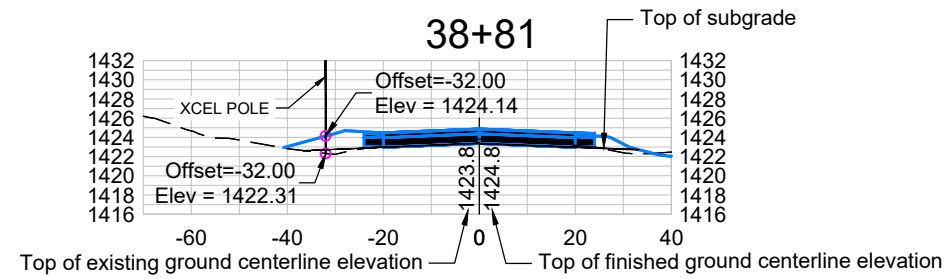
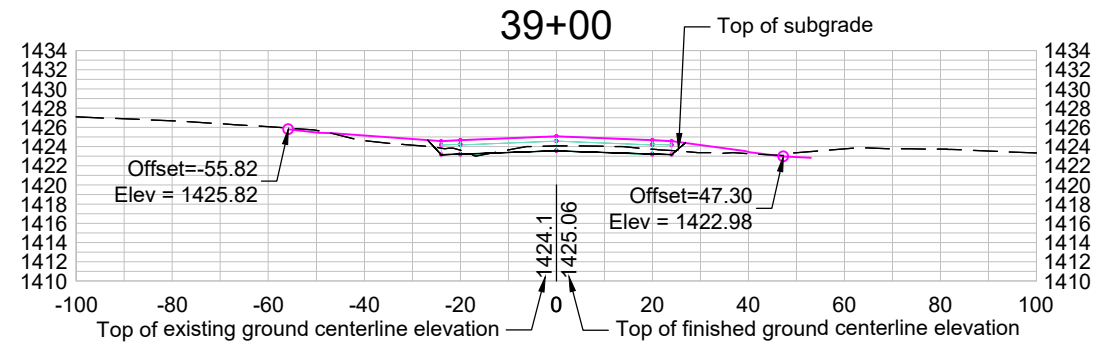


FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 2291(01)10		

Plotting Date: 08/13/2021



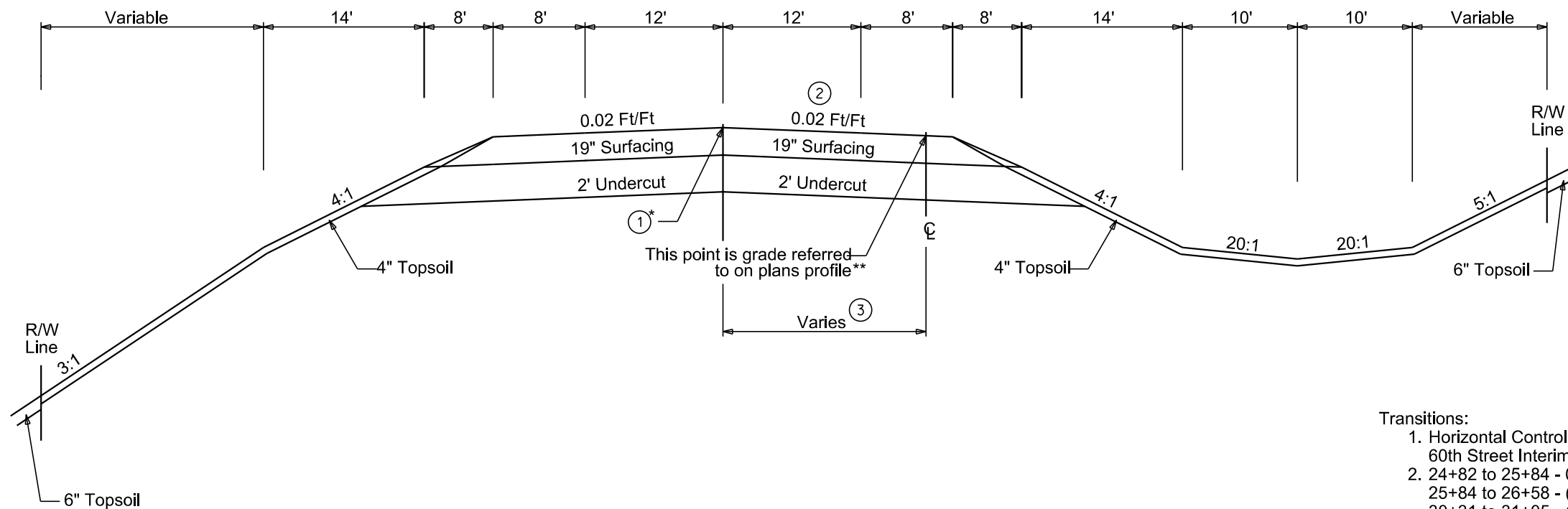


TYPICAL GRADING SECTION

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 2291(01)10	B29	B71
Plotting Date: 02-01-2022		REV 04/05/2021 JAL REV 02/02/2022 KAO	

60TH STREET N - TRANSITION SECTION
15+50.00 to 26+58.40
30+30.90 to 43+50.00



Transitions:

1. Horizontal Control Point
60th Street Interim Alignment
2. 24+82 to 25+84 - 0.02 Ft/Ft to -0.02 Ft/Ft
25+84 to 26+58 - (-)0.02 Ft/Ft
30+31 to 31+05 - (-)0.02 Ft/Ft
31+05 to 32+07 - (-)0.02 Ft/Ft to 0.02 Ft/Ft
3. 15+50 to 16+46 - 0 Ft
16+46 to 25+85 - 0 Ft to 15 Ft
25+85 to 26+58 - 15 Ft
30+31 to 31+05 - 15 Ft
31+05 to 40+26 - 15 Ft to 0 Ft
40+26 to 43+50 - 0 Ft

Alignment Notes:

- * The 60th Street Interim Alignment will be used as the station and offset for all installed items.
- ** The Existing 60th Street Centerline Alignment will be used as the station and offset for all removed items.



Plot Scale - 1:200

Plotted From - KODE

File - ...Section BTyp01.dgn

TYPICAL SECTION FOR BIDDING PURPOSES ONLY

(CURRENT & FUTURE SECTIONS - FOR INFORMATION ONLY)

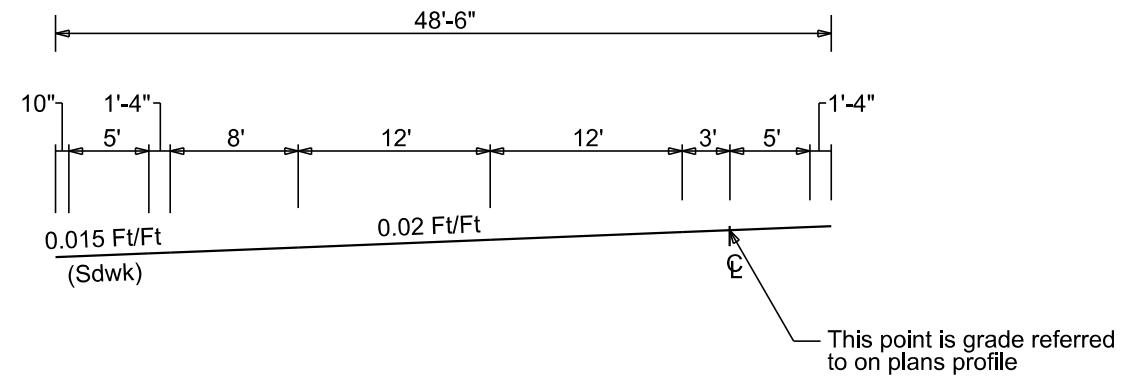
STATE OF SOUTH DAKOTA	PROJECT IM 2291(01)10	SHEET B31	TOTAL SHEETS B71
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Plotting Date: 11-29-2021

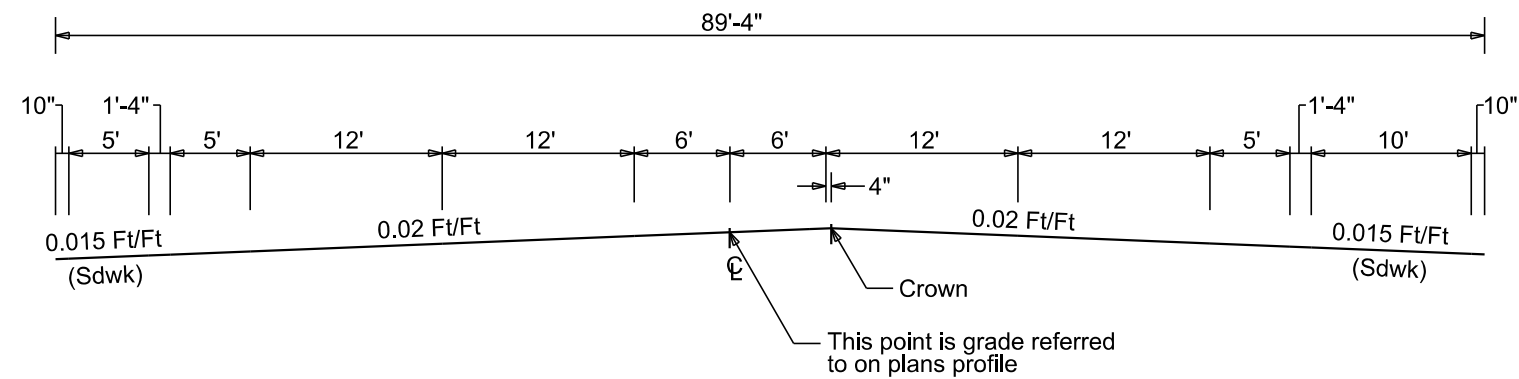
Plot Scale - 1:200

Plotted From - KODE

60TH STREET N - BRIDGE
26+80.65 to 30+12.90



60TH STREET N - BRIDGE
(FUTURE)



File - ... \Section B\Typ03.dgn

HORIZONTAL ALIGNMENT DATA

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT IM 2291(01)10	SHEET B32	TOTAL SHEETS B71
Plotting Date: 12/2/2021			

60th St CL

<u>Type</u>	<u>Station</u>	<u>Northing</u>	<u>Easting</u>
POB	0+00.00	483391.534	2930189.757
		TL = 2453.15	N 87°29'04" E
PI	24+53.15	483499.200	2932640.543
		TL = 735.00	N 87°31'12" E
PI	31+88.15	483531.003	2933374.854
		TL = 4725.69	N 87°31'55" E
POE	79+13.84	483734.499	2938096.165

xr 23

<u>Type</u>	<u>Station</u>	<u>Northing</u>	<u>Easting</u>
POB	0+00.00	483504.198	2932505.905
		TL = 45.31	N 3°28'48" W
PC	0+45.31	483549.428	2932503.154
PI	0+77.18	R = 35.00	Delta = 84°37'58" R
PRC	0+97.01	483586.136	2932532.707
PI	1+25.74	R = 35.00	Delta = 78°45'44" L
PT	1+45.13	483619.260	2932562.293
		TL = 84.61	N 2°23'26" E
POE	2+29.74	483703.799	2932565.822

xr 23 east

<u>Type</u>	<u>Station</u>	<u>Northing</u>	<u>Easting</u>
POB	0+00.00	483504.198	2932505.905
		TL = 45.31	N 3°28'48" W
PC	0+45.31	483549.428	2932503.154
PI	0+79.18	R = 35.00	Delta = 88°06'25" R
PT	0+99.14	483586.399	2932534.812
		TL = 117.49	N 84°37'37" E
POE	2+16.63	483597.401	2932651.789

xr 23 west

<u>Type</u>	<u>Station</u>	<u>Northing</u>	<u>Easting</u>
POB	0+00.00	483504.198	2932505.905
		TL = 55.01	N 3°28'48" W
PC	0+55.01	483559.103	2932502.566
PI	0+91.18	R = 35.00	Delta = 91°53'35" L
PT	1+11.14	483591.825	2932464.353
		TL = 197.68	S 84°37'37" W

POE 3+08.82 483573.314 2932267.546

Bahnon Ave

<u>Type</u>	<u>Station</u>	<u>Northing</u>	<u>Easting</u>
POB	0+00.00	483378.457	2934364.025
		TL = 195	N 2°28'05" W
POE	1+95.00	483573.276	2934355.628

60th St CL Interim

<u>Type</u>	<u>Station</u>	<u>Northing</u>	<u>Easting</u>
POB	15+00.00	483457.367	2931688.311
		TL = 146.01	N 87°29'04" E
PC	16+46.01	483463.776	2931834.185
PI	16+71.26	R = 3000.00	Delta = 0°57'52" L
PT	16+96.51	483466.417	2931884.614
		TL = 835.84	N 86°31'12" E
PC	25+32.35	483517.151	2932718.913
PI	25+58.53	R = 3000.00	Delta = 1°00'00" R
PT	25+84.71	483519.873	2932771.201
		TL = 520.14	N 87°31'12" E
PC	31+04.85	483542.379	2933290.855
PI	31+31.03	R = 3000.00	Delta = 1°00'00" R
PT	31+57.21	483544.188	2933343.178
		TL = 817.19	N 88°31'12" E
PC	39+74.40	483565.295	2934160.094
PI	40+00.26	R = 3000.00	Delta = 0°59'17" L
PT	40+26.13	483567.076	2934211.794
		TL = 374.13	N 87°31'55" E
POE	44+00.26	483583.187	2934585.580

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 12A; SF = 0.999841082
 The elevations shown on this sheet are based on NAVD 88.



CONTROL DATA

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 2291(01)10	B33	B71
Plotting Date		12/2/2021	

HORIZONTAL AND VERTICAL CONTROL POINTS						
POINT	STATION	OFFSET	DESCRIPTION	NORTHING	EASTING	ELEVATION
CP1	17+75.88	32.08' R	5/8" x 2' Rebar & 2" aluminum cap stamped "SDDOT CONTROL POINT"	483438.394	2931971.193	1449.419
CP2	28+15.18	673.25' R	5/8" x 2' Rebar & 2" aluminum cap stamped "SDDOT CONTROL POINT"	482843.216	2933037.234	1457.070
CP3	28+80.30	489.99' L	5/8" x 2' Rebar & 2" aluminum cap stamped "SDDOT CONTROL POINT"	484008.184	2933051.959	1434.400
CP4	42+18.84	34.62' L	5/8" x 2' Rebar & 2" aluminum cap stamped "SDDOT CONTROL POINT"	483610.937	2934408.971	1431.716
I90 400.4	17+30.73	2026.14' L	NGS Benchmark PID OQ1104	485492.656	2931835.757	1455.140
F449	29+82.82	2344.65' R	NGS Benchmark PID OQ1017	481180.623	2933277.034	1468.837



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 12A; SF = 0.999841082
The elevations shown on this sheet are based on NAVD 88.

LEGEND

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 2291(01)10	B34	B71
Plotting Date: 11-29-2021		REV 08/04/2020 JAL	

Plot Scale - 1:200

Plotted From - KODE

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



File - ...Section B\legend.dgn

16+24.04-29.95' R to 16+87.33-17.35' L
Install 70'-30" RCP
and 1 RCP Flared End Section
(Between Inlet and Junction Box)

18+88.75 -30.94' R - 18+67.40 -32.36' L (2.67 ac)
Install 56'-18" RCP
and 2 RCP Flared End Sections
(Between Inlet and Outlet)

16+41-26' R to 16+79-28' L
Take Out 42"-66" CMP
(Incidental Work, Grading)

17+87-24' R to 17+79-28' L
Take Out 18"-36" CMP
(Incidental Work, Grading)

16+79.26-39.99' L to 16+87.33-17.35' L
Install 16'-24" RCP
and 1 RCP Flared End Section
(Between Inlet and Junction Box)

Install 7'X7' Junction Box
with Manhole Frame and Lid at:
16+87.33-17.35' L

16+87-46' L to 17+49-69' L
Take Out 48"-66" CMP
(Incidental Work, Grading)

16+80 L to 21+22 L
Miscellaneous Work - Site

16+87.33-17.35' L to 17+43.18-58.13' L (1.89 ac)
Install 58'-36" RCP
and 1 RCP Flared End Section
(Between Outlet and Junction Box)

Adjust Junction Box:
16+87.33-17.35' L
17+52.98-65.09' L
Install Class A Riprap
and Type B Drainage Fabric
(Riprap dimensions 12' X 9' X 2.25')

18+63.63 - 43.67' L
Install Class A Riprap
and Type B Drainage Fabric
(Riprap dimensions 12' X 4.5' X 2.25')

15+50-60' L to 16+80-58' L
Do Not Disturb Fence

STATE OF SOUTH DAKOTA	PROJECT IM 2291(01)10	SHEET B35	TOTAL SHEETS B71
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Plotting Date: 02-01-2022
REV 04/05/2021 JAL
REV 05/17/2021 KAO
REV 07/19/2021 KAO
REV 02/02/2022 KAO

Edward E. Nolz

Parcel 1 Parcel 1A

0+00.00 (xr17) =
17+14.84-0.73' L (mainline)



MINNEHAHA COUNTY ADDITION

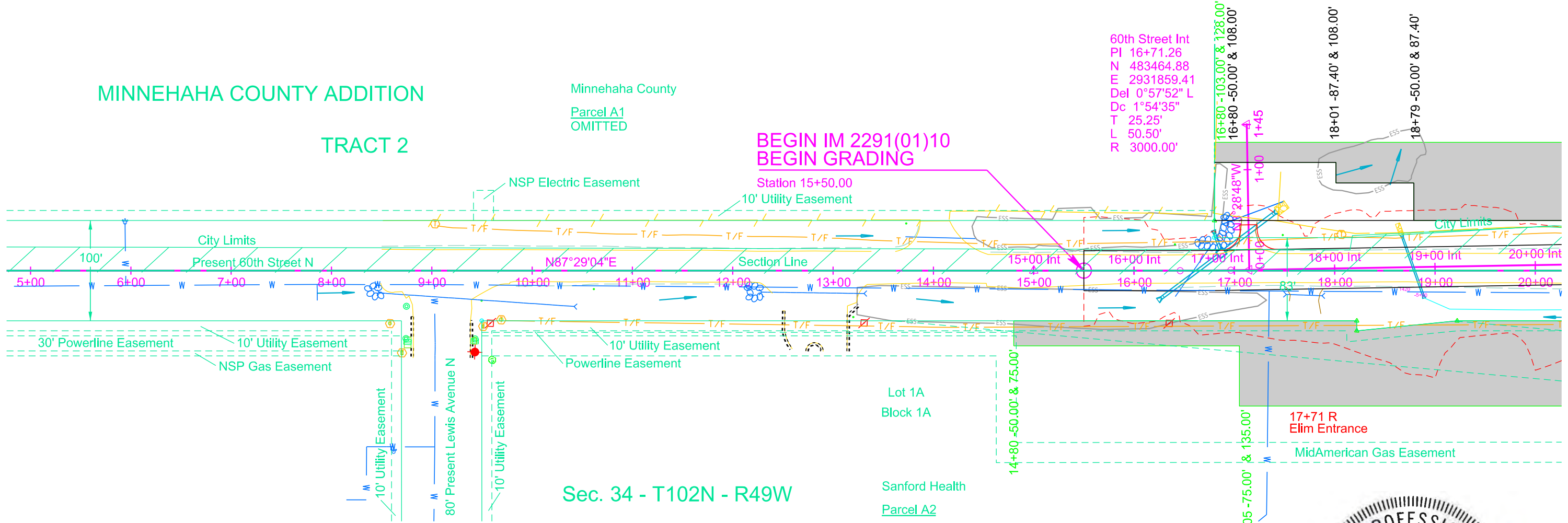
TRACT 2

Minnehaha County

Parcel A1
OMITTED

BEGIN IM 2291(01)10
BEGIN GRADING

60th Street Int
PI 16+71.26
N 483464.88
E 2931859.41
Del 0°57'52" L
Dc 1°54'35"
T 25.25'
L 50.50'
R 3000.00'



Sec. 34 - T102N - R49W

HUTCHINSON ADDITION

Parcel 1
16+80 to 21+64 L
Temporary Easement containing
0.6 ac (27787 sq ft), more or less

Parcel A2
14+80 to 26+05 R
Temporary Easement containing
1.4 ac (62314 sq ft), more or less



Plot Scale: 1"=100'

Plotted From: KODE

File: ...Sheet Files\Section B15.dgn

FOR BIDDING PURPOSES ONLY

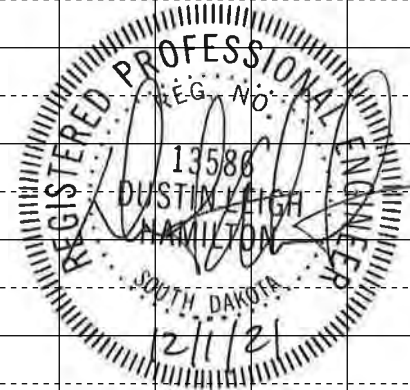
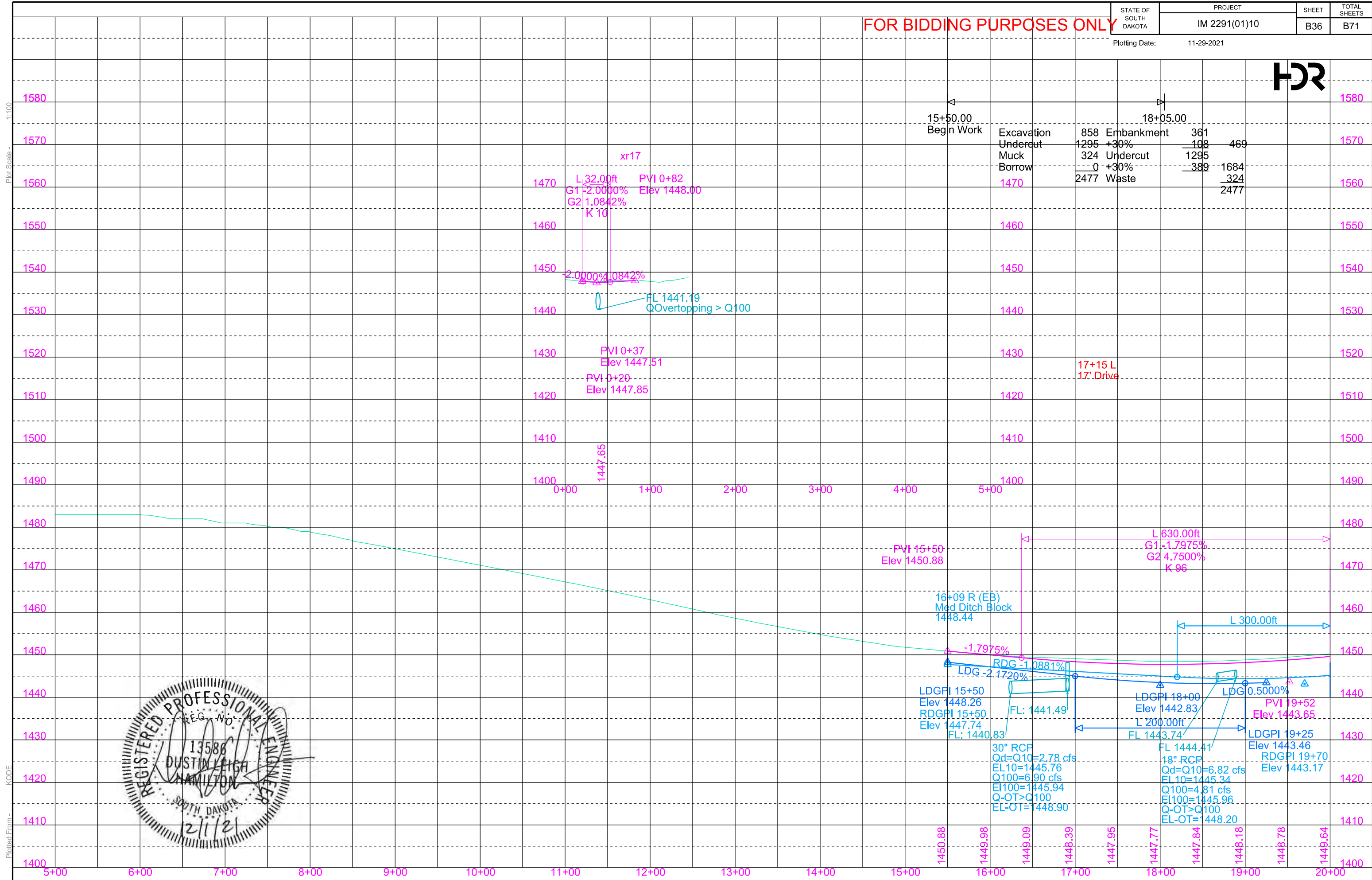
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 2291(01)10	B36	B71

Plotting Date: 11-29-2021



Plot Scale - 1:100

Plotted From - KODE



File - ...Sheet Files\Section B16v.dgn

FOR BIDDING PURPOSES ONLY

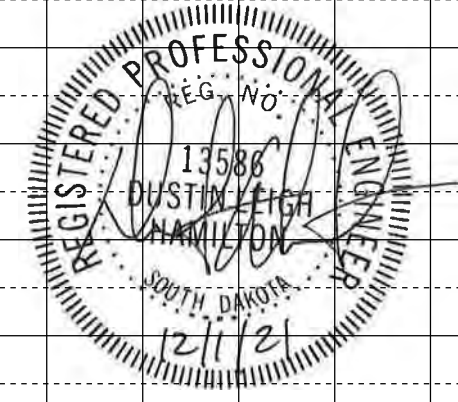
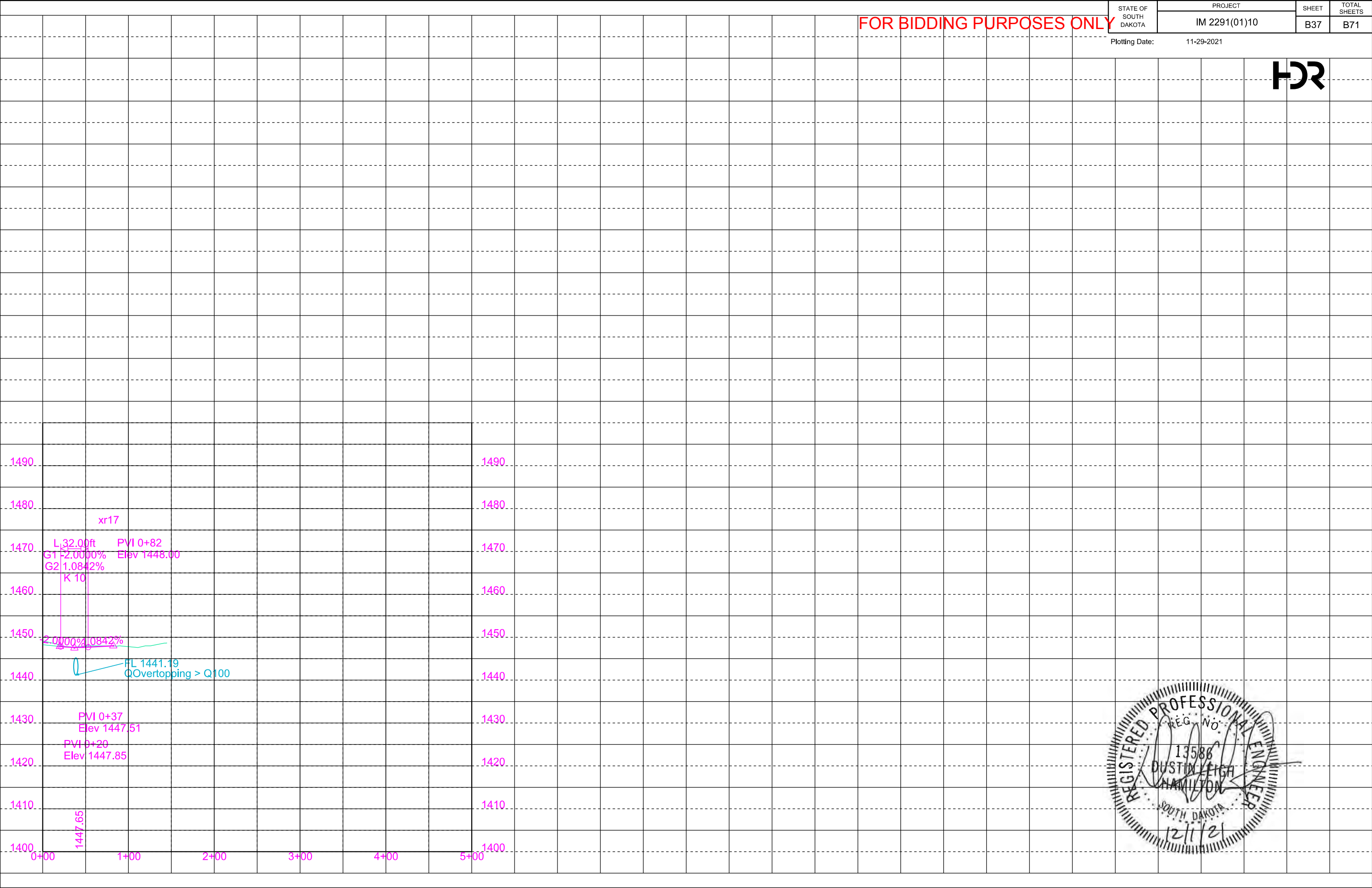
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 2291(01)10	B37	B71

Plotting Date: 11-29-2021



Plot Scale - 1:100

Plotted From - KCODE



File - ...Section B16v_drive.dgn

0+00.00 (xr23 east) = 3+59.70 (xr23)
 0+00.00 (xr23) = 21+63.82 (mainline)

xr23
 PI 1+75.02
 N 483669.63
 E 2932343.30
 Del 92°08'26" R
 Dc114°35'30"
 T 51.90'
 L 80.41'
 R 50.00'

xr23
 PI 3+71.14
 N 483671.18
 E 2932562.81
 Del 92°00'00" L
 Dc114°35'30"
 T 51.78'
 L 80.29'
 R 50.00'

26+81-15' L to 26+81-14' R
 Take Out 12"-28" RCP
 (Incidental Work, Grading)

26+81-14' R to 26+78-61' R
 Take Out 12"-48" RCP
 (Incidental Work, Grading)

Remove Fence
 at the following locations:
 21+22-45' L to 23+60-52' L - 345'
 26+68-135' L to 27+00-26' L - 114'
 26+74-82' R to 27+01-25' R - 67'

Remove Drop Inlets
 with Frame and Grate
 at the following locations:
 26+81-15' L
 26+81-14' R
 29+61-14' L
 29+61-15' R

60th Street Int
 PI 25+58.53
 N 483518.74
 E 2932745.05
 Del 1°00'00" R
 Dc 1°54'35"
 T 26.18'
 L 52.36'
 R 3000.00'

29+61-14' L to 29+61-15' R
 Take Out 12"-28" RCP
 (Incidental Work, Grading)

29+61-15' R to 29+57-80' R
 Take Out 12"-69" RCP
 (Incidental Work, Grading)

32+71-118' L
 Remove 48" RCP End Section
 (Incidental Work, Grading)

23+58-190' L
 Remove Yard Hydrant

Take Out Guardrail
 at the following locations:
 24+96-22' R to 26+98-14' R - 203 Ft
 25+46-22' L to 26+99-15' L - 154 Ft
 33+15-22' L to 29+38-16' L - 378 Ft
 29+38-15' R to 30+91-20' R - 154 Ft

Take Out Existing Bridge
 Str No. 50-221-170

Install New Bridge
 Str No. 50-221-170

23+40-80' R to 25+25.6-80' R
 Do Not Disturb
 Specialty Fence Inside of
 Temporary Easement and
 Outside of the Work Limits
 Required for Grading

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 2291(01)10	B38	B71

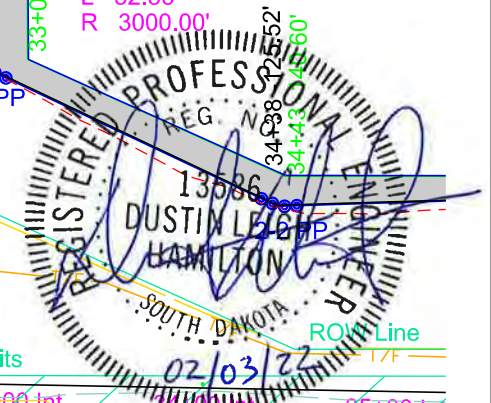
Plotting Date: 02-03-2022

REV 04/05/2021 JAL/CDK
 REV 04/13/2021 JAL
 REV 05/11/2021 KAO
 REV 05/25/2021 KAO
 REV 07/13/2021 KAO
 REV 09/27/2021 KAO
 REV 11/29/2021 KAO
 REV 02/02/2022 KAO

Sec. 26 - T102N - R49W

23+41 L Refurbish Mailbox

60th Street Int
 PI 31+31.03
 N 483543.51
 E 2933317.01
 Del 1°00'00" R
 Dc 1°54'35"
 T 26.18'
 L 52.36'
 R 3000.00'



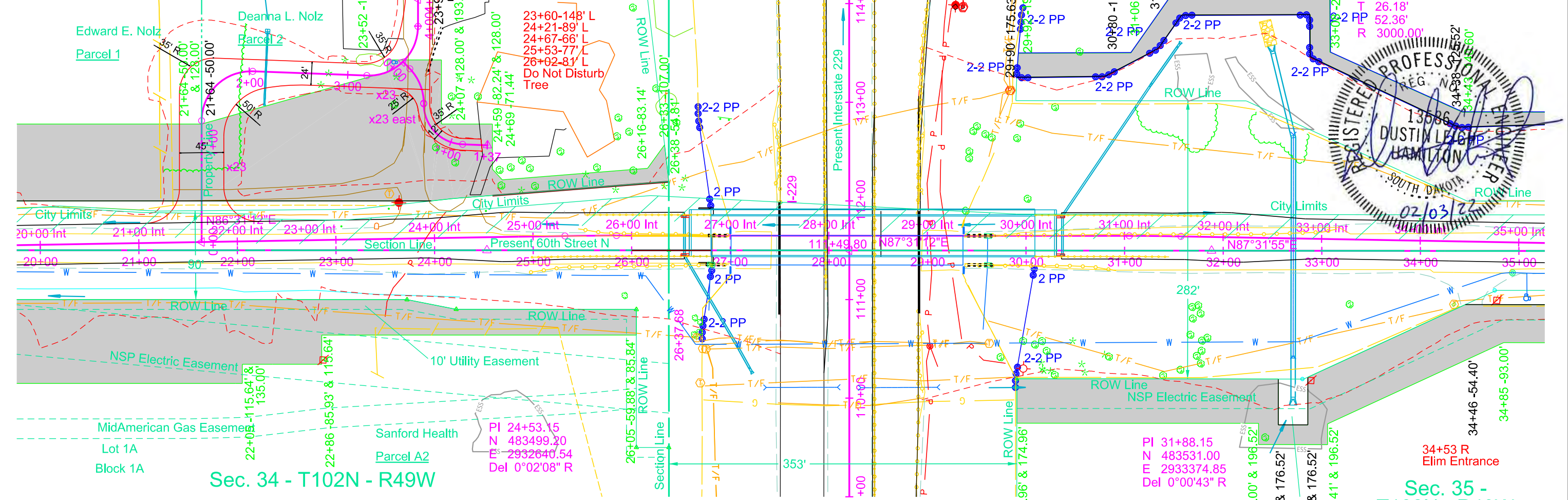
Sec. 27 - T102N - R49W

xr23 east
 PI 0+30.29
 N 483665.67
 E 2932569.05
 Del 44°13'20" R
 Dc114°35'30"
 T 20.31'
 L 38.59'
 R 50.00'

xr23 east
 PI 0+88.87
 N 483605.10
 E 2932571.59
 Del 88°00'00" L
 Dc139°44'45"
 T 39.59'
 L 62.97'
 R 41.00'

Install Retaining Wall
 at the following location:
 24+59-42' L to 26+38-55' L

21+34 L
 Remove Cattle Guard
 21+64-48' L
 Remove Luminaire Pole



Sec. 34 - T102N - R49W

HUTCHINSON ADDITION

22+34.21-211.13'L to 22+29.73-137.52'L (<1 ac)
 Install 74'-12" RCP and 2 RCP Flared Ends

22+34.15-210.14'L
 Install 4.5 CuYd Gabion and 15 SqYd Type B Drainage Fabric

Install 1.5'X3' Type D Drop Inlet with 6" Concrete Collar and Type D Frame and Grate at the following locations:
 26+53.53-19.75' L
 26+53.53-19.75' R
 30+36.85-19.75' L
 30+36.85-19.75' R

26+53.53-19.75' L to 26+53.53-19.75' R
 Install 38"-18" RCP (Between Drop Inlet and Drop Inlet)

26+53.53-19.75' R to 27+22.93-139.62' R (0.18 ac)
 Install 130"-18" RCP (108' & 22') And 1- 18" Elbows And 1 RCP Flared End Section (Between Drop Inlet and Outlet)

30+36.85-19.75' L to 30+36.85-19.75' R
 Install 38"-18" RCP (Between Drop Inlet and Drop Inlet)

30+36.85-19.75' L to 31+56.94 -196.86' L (0.24 ac)
 Install 216"-18" RCP (168' & 48') And 1- 18" Elbows And 1 RCP Flared End Section (Between Drop Inlet and Outlet)

Parcel 2
 21+64 to 26+38 L
 Temporary Easement containing 0.8 ac (34331 sq ft), more or less

Parcel 3
 29+90 to 43+02 L
 Temporary Easement containing 0.9 ac (40089 sq ft), more or less

Parcel 4
 29+91 to 41+30 R
 Temporary Easement containing 1.1 ac (49088 sq ft), more or less

32+39.09 - 219.99' L
 Install Class B Riprap and Type B Drainage Fabric (Riprap Dimensions: 22' x 9' x 2.75')

Sioux Falls Development Foundation, Inc.

Parcel 4

Sec. 35 - T102N - R49W

Clear and Grub Tree at the following locations:

22+85-168' L	26+51-64' L	29+65-114' L	30+21-102' R	31+73-56' R
22+92-180' L	26+54-73' L	29+74-109' R	30+30-145' L	31+73-107' R
23+09-192' L	26+64-68' R	29+91-114' L	30+47-92' R	31+77-64' R
23+61-175' L	26+70-73' R	29+94-129' L	30+56-115' R	31+77-92' R
24+02-104' L	29+39-40' L	29+97-93' R	30+80-105' R	31+77-102' R
24+88-61' L	29+43-93' L	30+02-52' L	30+84-108' R	31+77-115' R
25+02-65' L	29+43-101' L	30+09-96' R	31+39-127' R	31+84-88' R
25+84-61' L	29+47-121' L	30+15-114' R	31+57-121' R	33+29-54' R
25+93-46' R	29+51-126' L	30+16-92' R	31+67-85' R	
26+33-65' L	29+59-119' L	30+16-120' R	31+69-57' R	
		30+18-122' R	31+69-69' R	



Plot Scale - 1"=100'

KODE

Plotted From -

File - ...Sheet Files\Section B120.dgn

FOR BIDDING PURPOSES ONLY

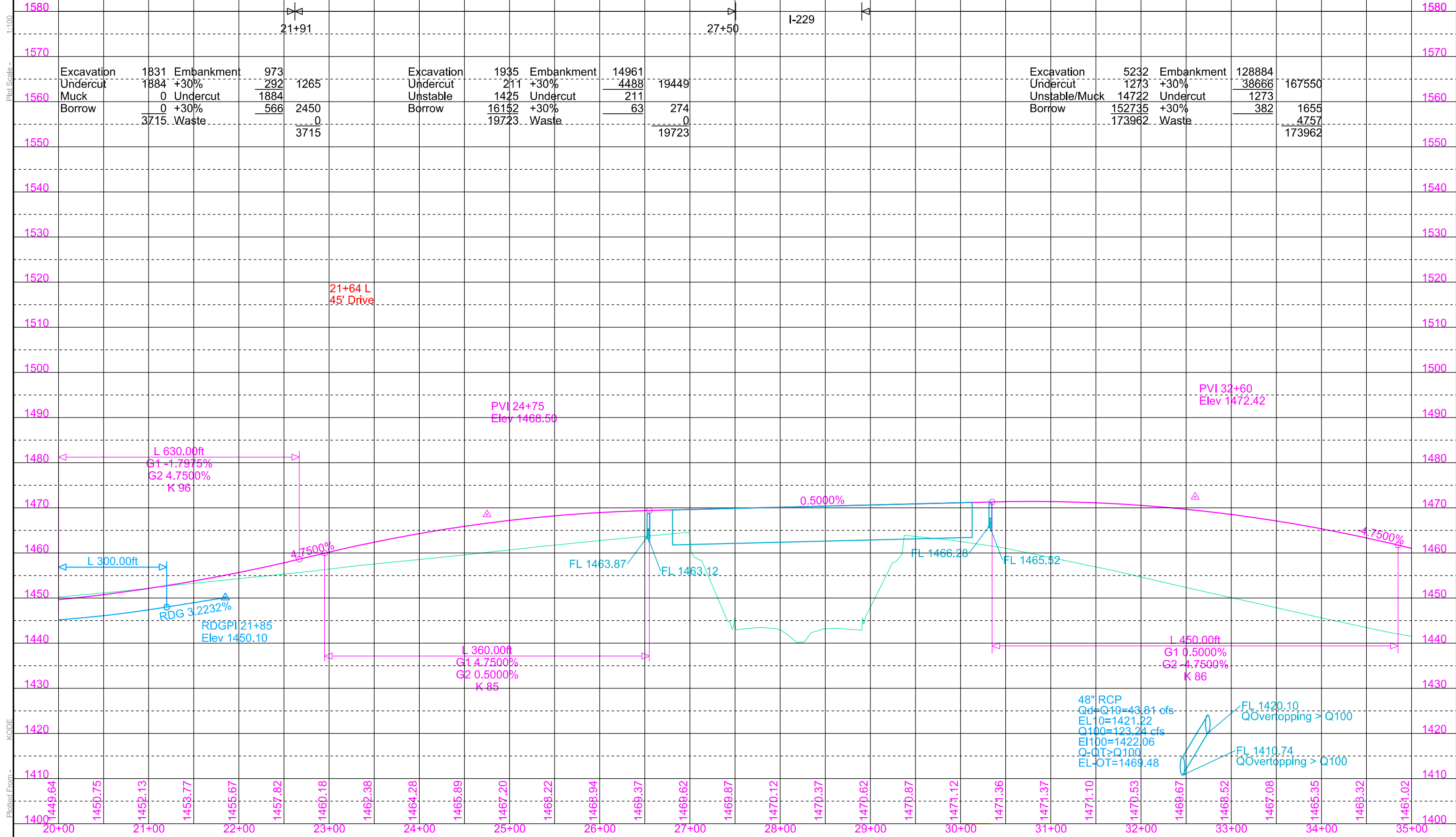
STATE OF SOUTH DAKOTA	PROJECT IM 2291(01)10	SHEET B39	TOTAL SHEETS B71
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Plotting Date: 02-02-2022
 REV 04/05/2021 JAL
 REV 11/29/2021 KAO
 REV 02/02/2022 KAO



Plot Scale - 1:100

KODE
Plotted From -



Excavation	1831	Embankment	973		Excavation	1935	Embankment	14961		Excavation	5232	Embankment	128884
Undercut	1884	+30%	292	1265	Undercut	211	+30%	4488	19449	Undercut	1273	+30%	38666
Muck	0	Undercut	1884		Unstable	1425	Undercut	211		Unstable/Muck	14722	Undercut	1273
Borrow	0	+30%	566	2450	Borrow	16152	+30%	63	274	Borrow	152735	+30%	382
	3715	Waste		0		19723	Waste		0		173962	Waste	
				3715					19723				
													167550
													382
													1655
													4757
													173962

21+64 L
45' Drive

PVI 24+75
Elev 1468.50

PVI 32+60
Elev 1472.42

48" RCP
Qd=Q10=43.81 cfs
EL10=1421.22
Q100=123.24 cfs
EI100=1422.06
Q-OT>Q100
EL-OT=1469.48

FL 1420.10
QOverlapping > Q100
FL 1410.74
QOverlapping > Q100

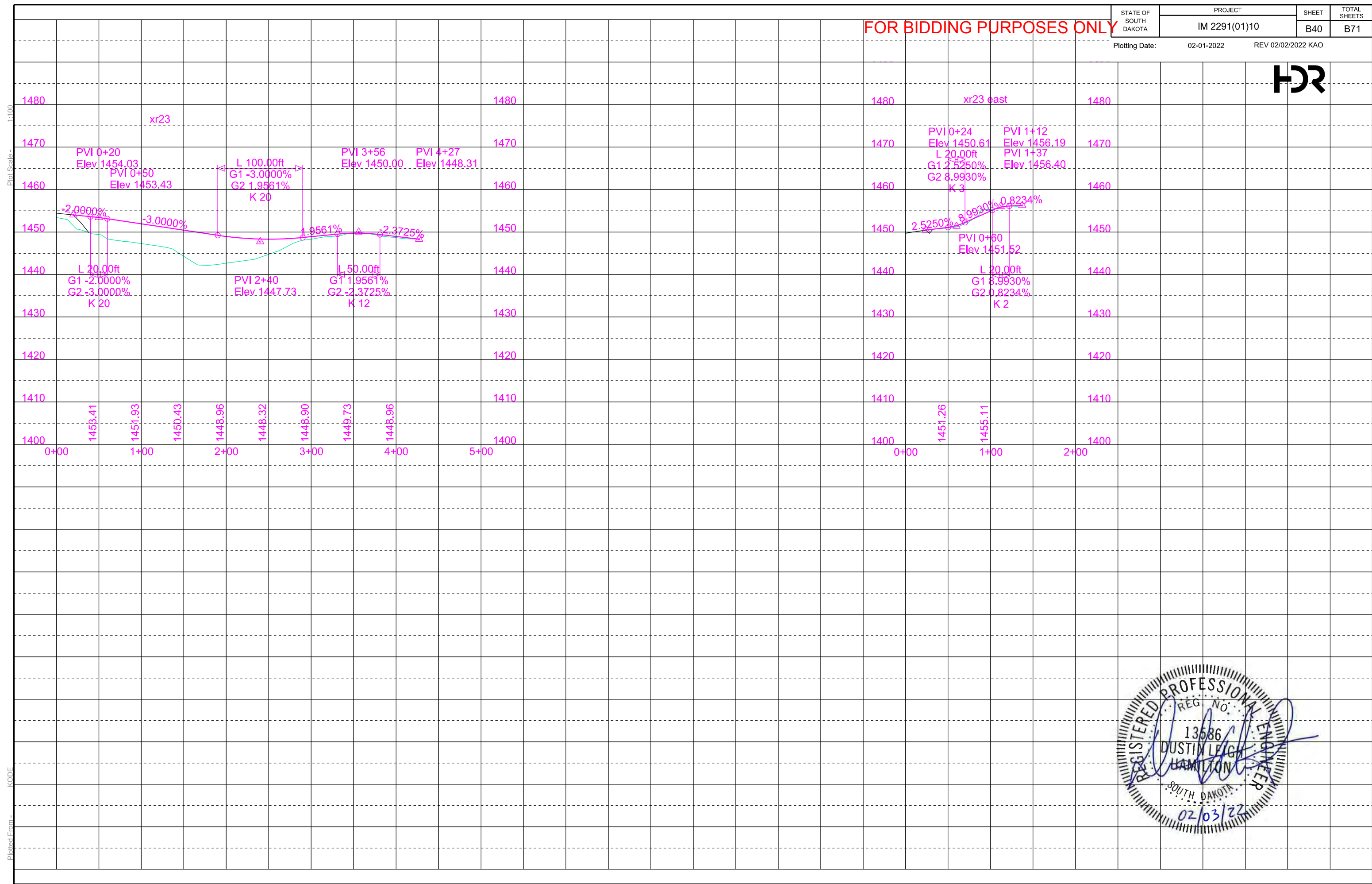
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FOR BIDDING PURPOSES ONLY

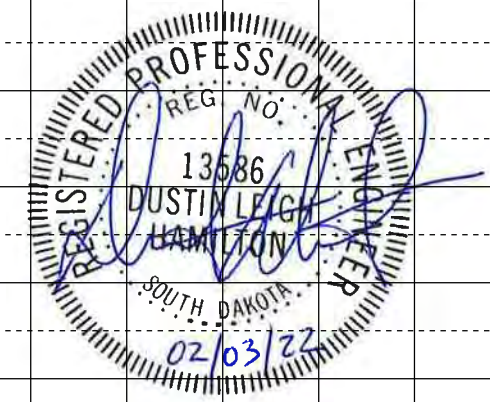


Plot Scale - 1:100

Plotted From - KCODE



File - ...Section B120v_dirive.dgn



37+27-36' R to 37+85-37' R
Take Out 12"-59' CMP
(Incidental Work, Grading)

42+32-50' L to 42+50-50' L
Remove Gate

41+12 R
Take Out Sign
(Incidental Work, Grading)

39+77.49' L to 39+78.25' R
Take Out 24"-21' RCP
(Incidental Work, Grading)

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 2291(01)10	B41	B71

Plotting Date: 02-01-2022
 REV 04/05/2021 JAL
 REV 04/13/2021 JAL
 REV 05/11/2021 KAO
 REV 07/13/2021 KAO
 REV 09/27/2021 KAO
 REV 11/29/2021 KAO
 REV 02/02/2022 KAO

39+76.18-54.11' R to 39+73.99' - 73.61' L (4.12 ac)
Install 112'-24" RCP
and 2 RCP Flared End Sections
(Between Inlet and Outlet)

39+74.02 - 93.40' L
Install Class A Riprap
and Class B Drainage Fabric
(Riprap dimensions: 22' x 9' x 2.25')

42+32-50' L to 42+50-50' L
Reset Gate

Do Not Disturb Fence
at the following locations:
40+64-64' L to 40+64-90' L
42+18-50' L to 42+18-96' L

40+52-37' R to 41+18-37' R
Take Out 18"-66' CMP
(Incidental Work, Grading)

41+35 L
Refurbish
Mailbox

41+46.28-40.38' R to 41+95.82-38.87' R (1.51 ac)
Install 38'-18" RCP
and 2 RCP Flared End Sections
(Between Inlet and Outlet)

Install Type 4 Fence
at the following locations:
29+90-160' L to 40+63-66' L - 1170'
42+18-50' L to 42+32-50' L - 14'
42+50-50' L to 42+82-50' L - 32'
42+82-50' L to 42+82-33' L - 17'
42+82-33' L to 43+02-33' L - 20'
43+02-33' L to 43+02-46' L - 13'

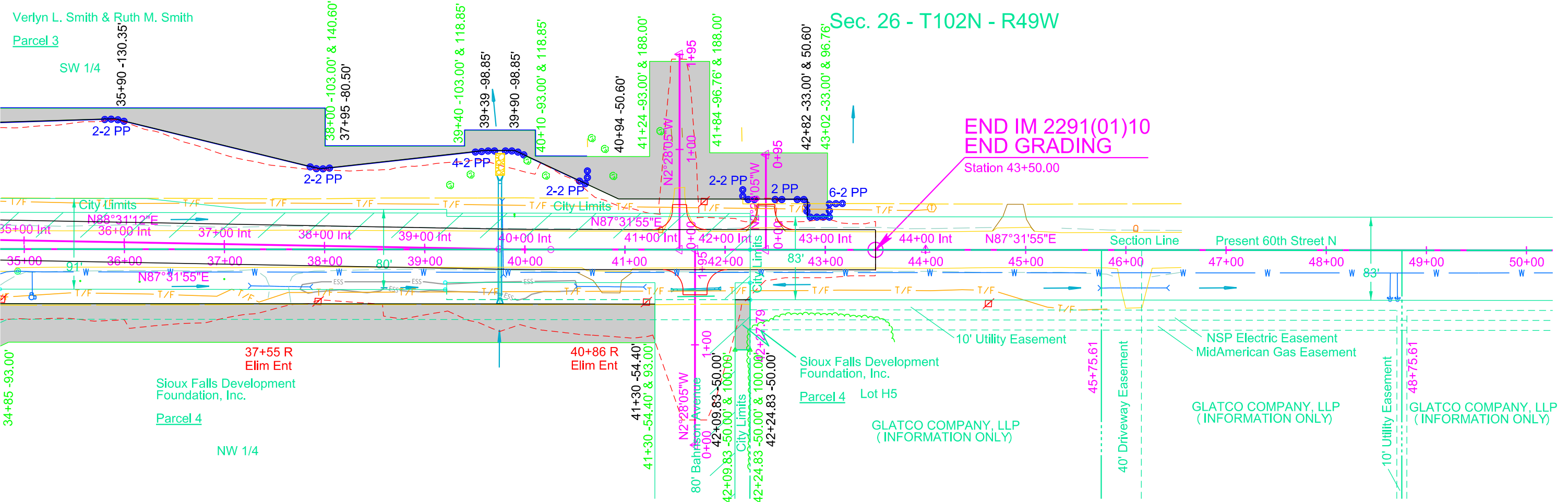
60th Street Int
PI 40+00.26
N 483565.96
E 2934185.95
Del 0°59'17" L
Dc 1°54'35"
T 25.87'
L 51.73'
R 3000.00'

0+00.00 (xr41) =
41+54.28 (mainline)
0+00.00 (xr43) =
42+40.52 (mainline)

60th Street Int
PI 44+00.26
N 483583.19
E 2934585.58
Del 0°00'00" L

Clear and Grub Tree
at the following locations:
39+25-65' L
39+46-75' L
40+02-90' L
40+21-75' L

Remove Fence
at the following locations:
29+35-23' R to 42+24-55' R - 1367'
29+35-23' L to 40+63-66' L - 1328'
42+18-52' L to 43+02-46' L - 100'



Sec. 26 - T102N - R49W

Sec. 35 - T102N - R49W

LACEY'S TRACT 2

29+92-185.5' L to 40+62-93' L
Install 1251' Type 1 Temporary Fence
at temporary easement

37+55 R
Elim Ent

40+86 R
Elim Ent

1+95.00 (xr42) =
41+69.83 (mainline)

Parcel 4
42+10 to 42+25 R
Temporary Easement containing
750 sf, more or less



Plot Scale - 1"=100'

Plotted From - KODE

File - ...Sheet Files\Section B105.dgn

FOR BIDDING PURPOSES ONLY

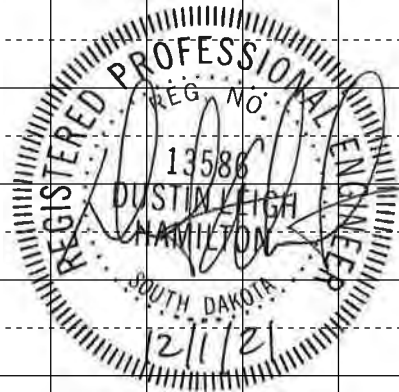
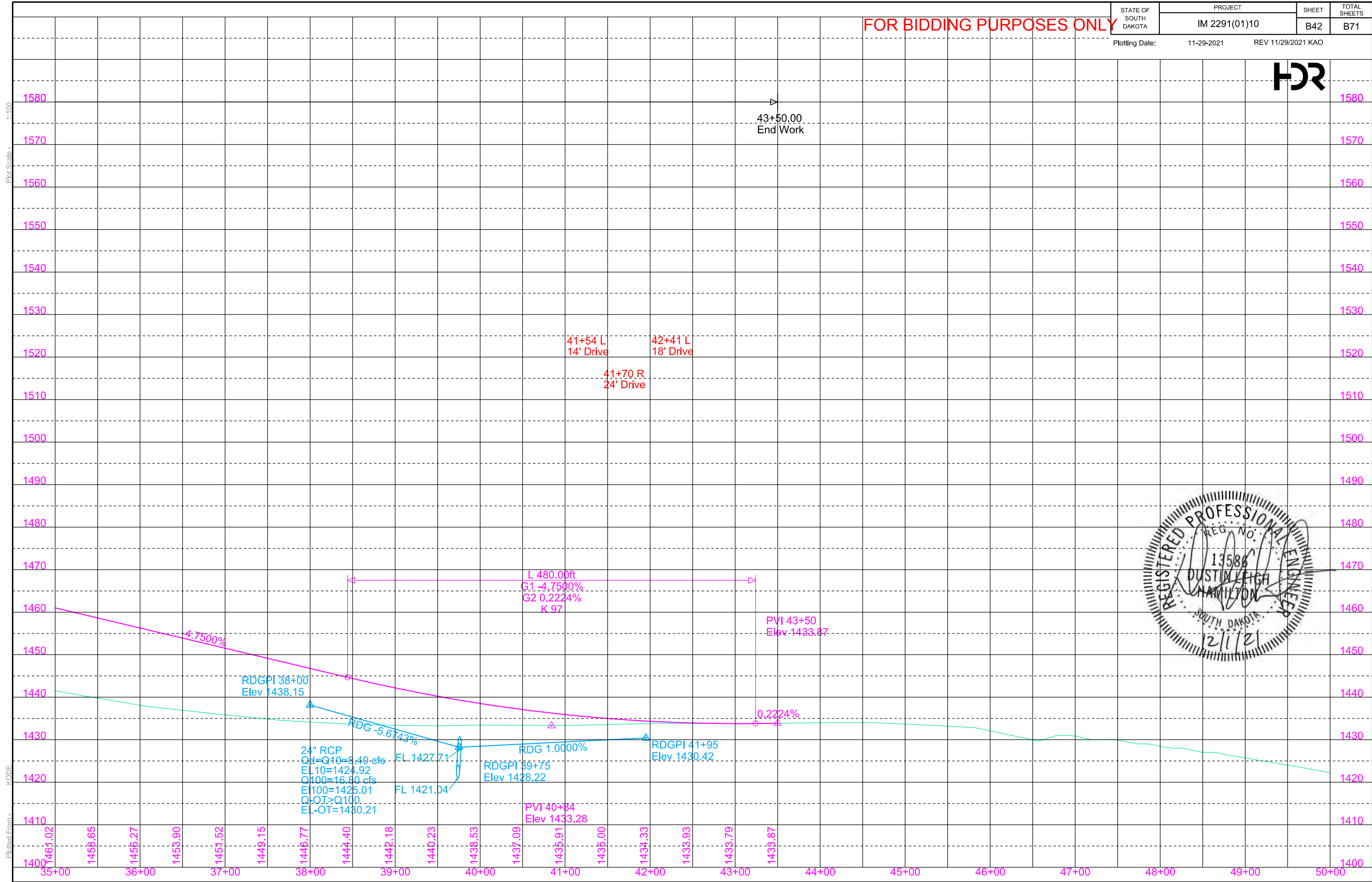
STATE OF SOUTH DAKOTA	PROJECT IM 2291(01)10	SHEET B42	TOTAL SHEETS B71
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Plotting Date: 11-29-2021 REV 11/29/2021 KAO



Plot Scale - 1:100

Plotted From - KODE



File - ...Sheet Files\Section B105v.dgn

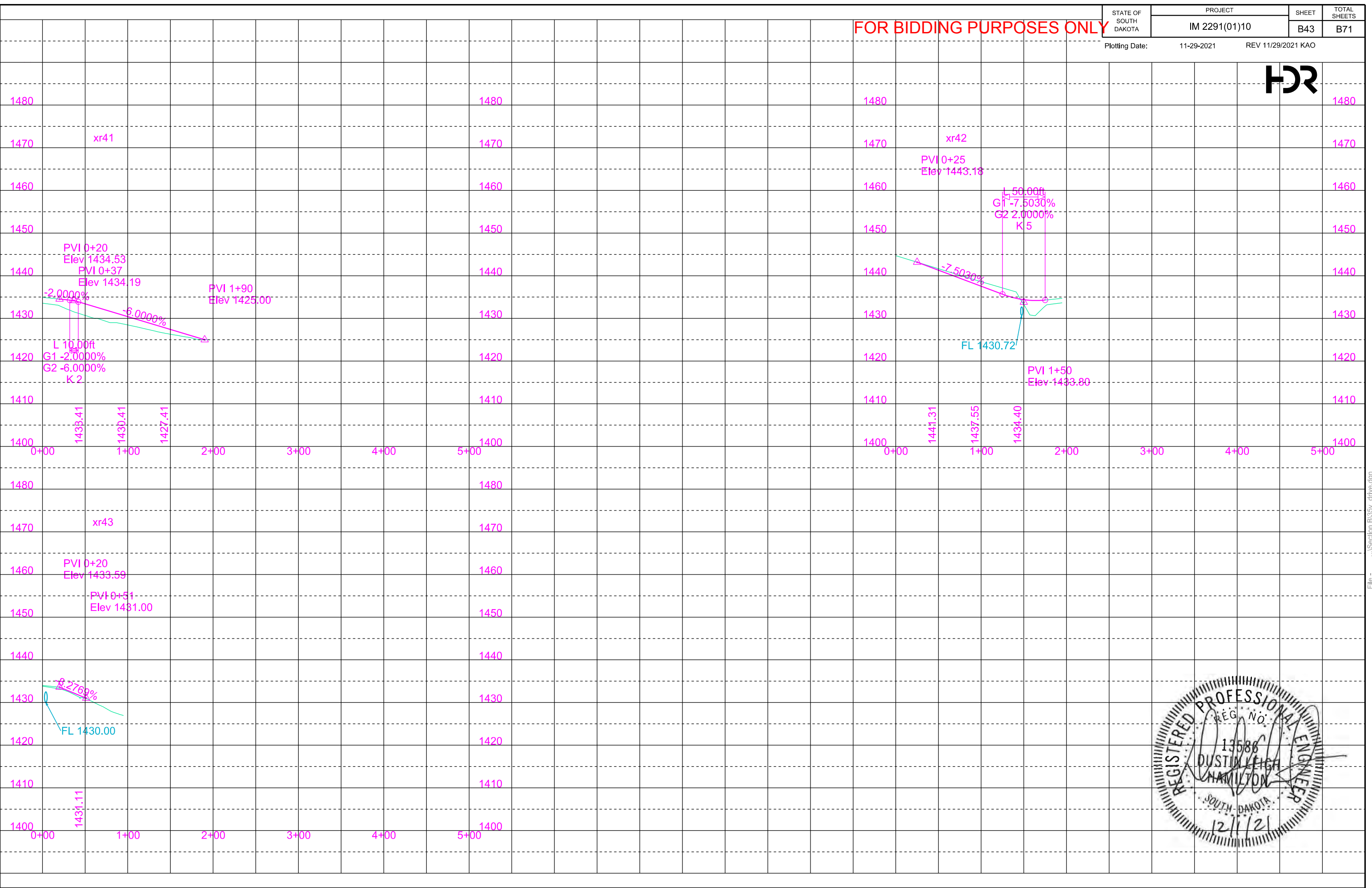
FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT IM 2291(01)10	SHEET B43	TOTAL SHEETS B71
Plotting Date: 11-29-2021		REV 11/29/2021 KAO	

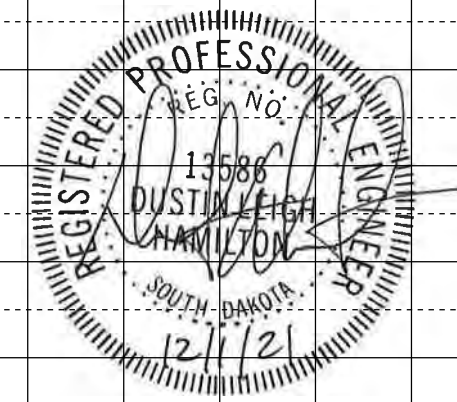


Plot Scale - 1:100

Plotted From - KCODE



File - ...Section B105v_drive.dgn



STATE OF SOUTH DAKOTA	PROJECT IM 2291(01)10	SHEET B44	TOTAL SHEETS B71
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Plotting Date: 11-29-2021 REV 08/14/2020 JAL
REV 05/11/2021 KAO

FOR BIDDING PURPOSES ONLY

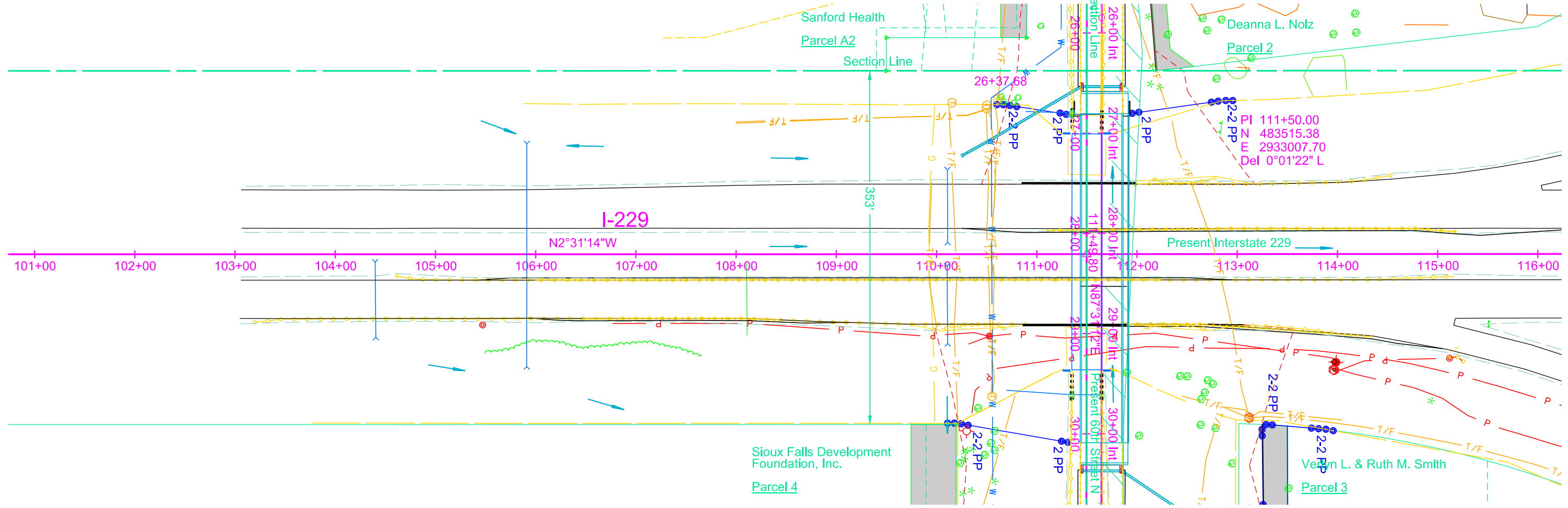
Take Out Guardrail
at the following locations:
103+18-68' R to 110+69-75' R - 752 Ft
104+60-22' R to 115+17-22' R - 1058 Ft
110+05-75' R to 110+90-70' R - 85 Ft
111+86-70' R to 112+70-75' R - 85 Ft
112+06-75' R to 113+95-79' R - 190 Ft
111+15-24' L to 115+18-22' L - 404 Ft
111+95-70' L to 112+79-76' L - 85 Ft
112+15-75' L to 114+55-79' L - 241 Ft

Install Guardrail
at the following locations:
105+85-26' R to 112+39-26' R - 655 Ft
106+33-65' R to 108+58-696' R - 226 Ft
111+77-70' R to 114+48-94' R - 260 Ft
110+96-24' L to 115+33-22' L - 437 Ft



Sec. 34 - T102N - R49W

Sec. 27 - T102N - R49W



Sec. 35 - T102N - R49W

Sec. 26 - T102N - R49W



Plot Scale - 1:100

Plotted From - KODE

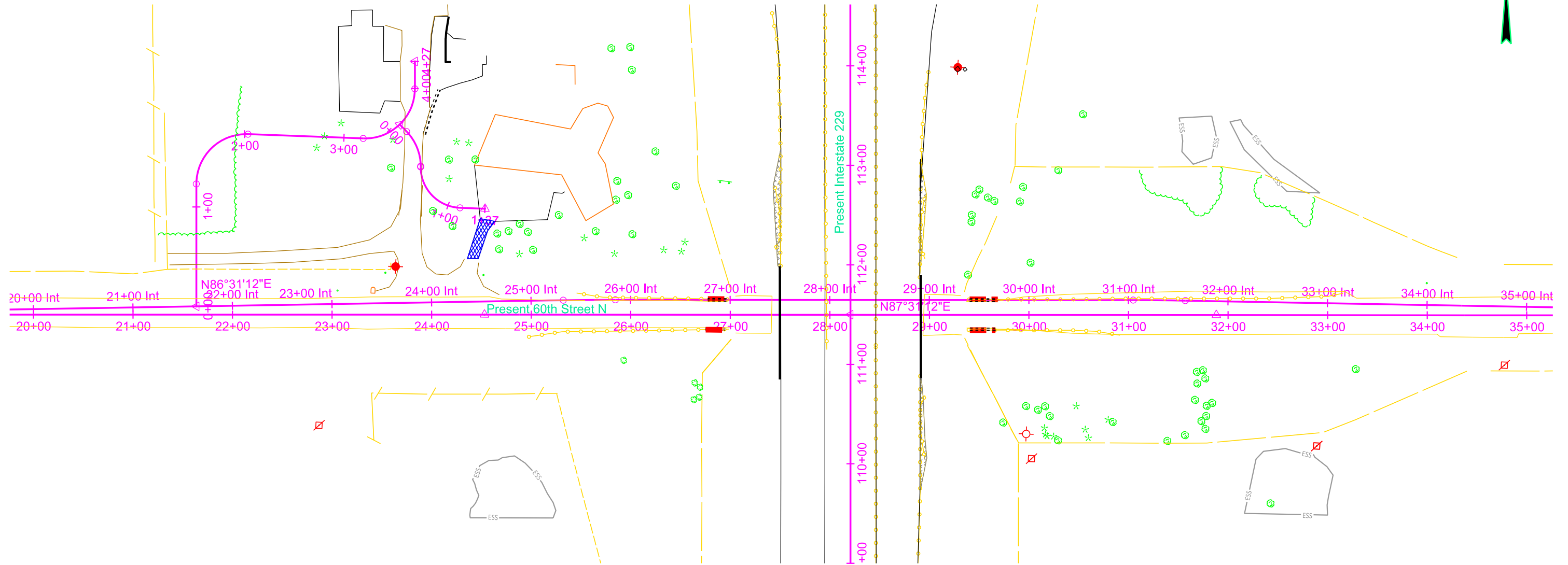
File - ...Sheet Files\Section B101.dgn

PAVEMENT REMOVAL LAYOUT

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT IM 2291(01)10	SHEET B45	TOTAL SHEETS B71
Plotting Date: 02-01-2022		REV 07/19/2021 KAO REV 02/02/2022 KAO	

Plot Scale - 1:100



Plotted From - KODE

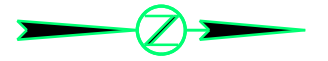
File - ...Sheet Files\Section B120pr.dgn



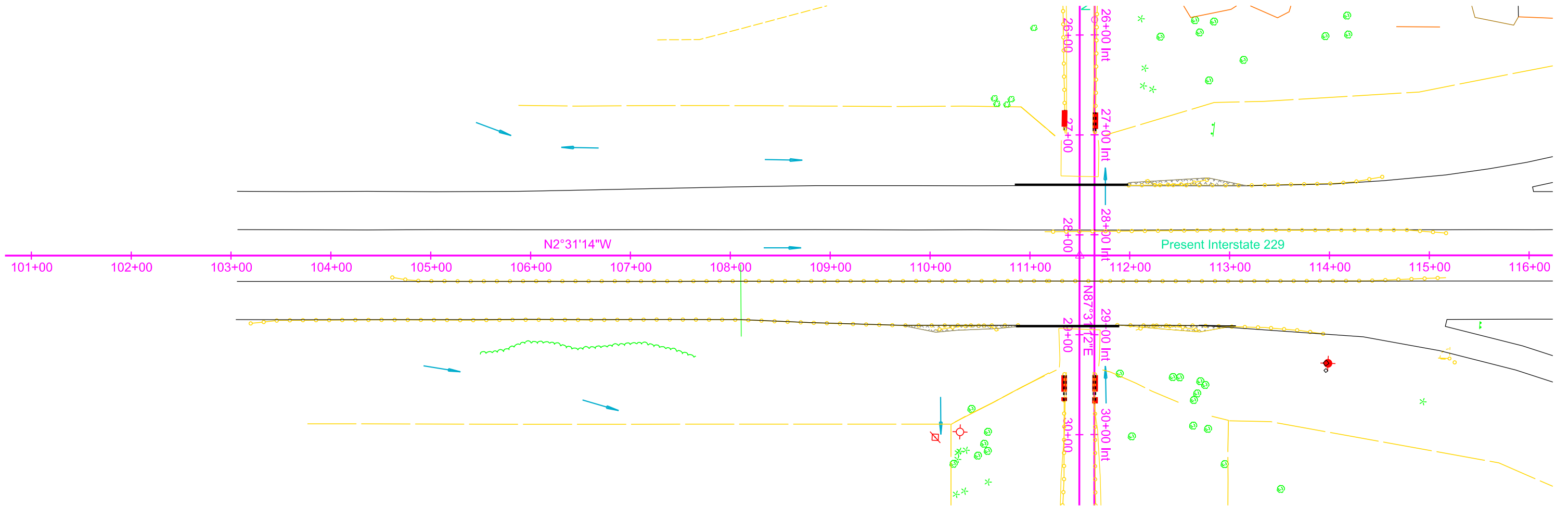
PAVEMENT REMOVAL LAYOUT

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT IM 2291(01)10	SHEET B46	TOTAL SHEETS B71
Plotting Date: 11-29-2021		REV 07/19/2021 KAO	



Plot Scale - 1:100



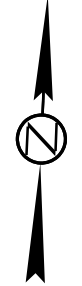
Plotted From - KODE



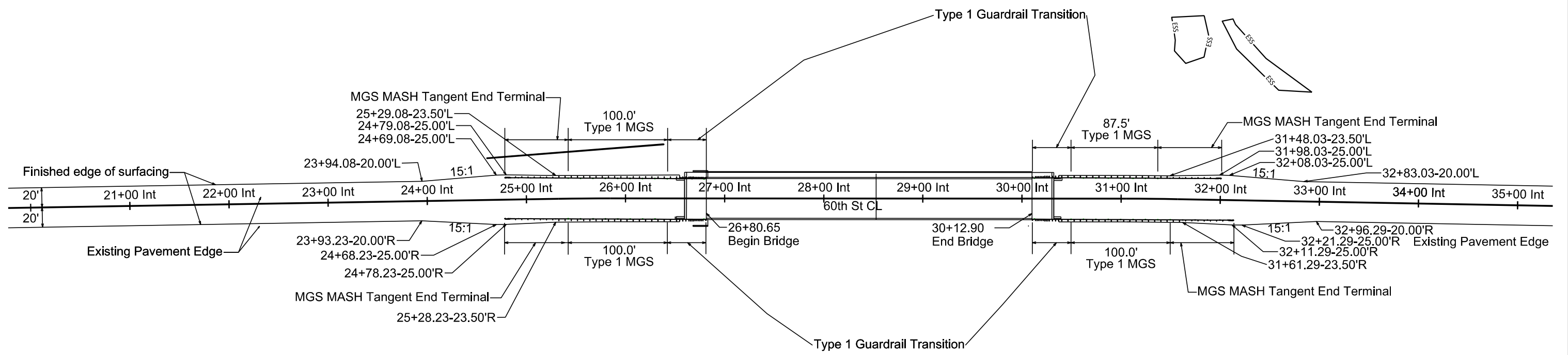
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GUARDRAIL LAYOUT FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT IM 2291(01)10	SHEET B47	TOTAL SHEETS B71
Plotting Date: 11-29-2021		REV 06/02/2021 KAO REV 07/19/2021 KAO	



Plot Scale - 1:100



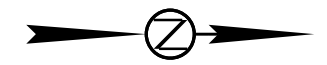
Plotted From - KODE



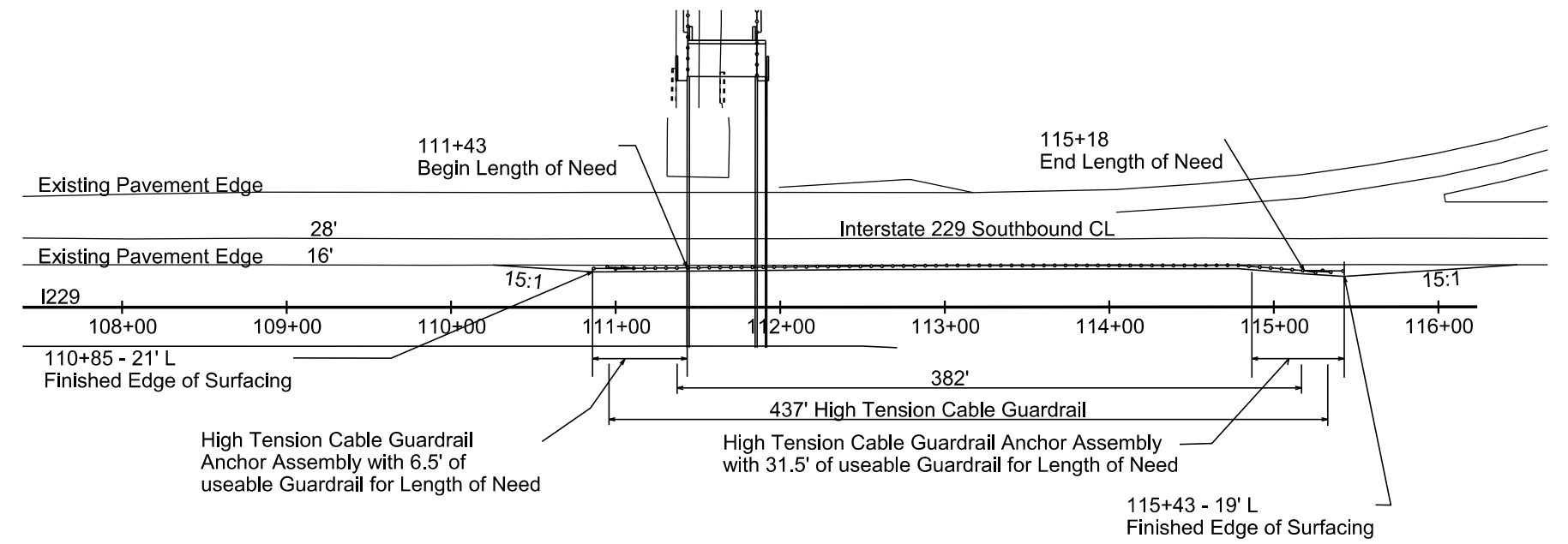
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GUARDRAIL LAYOUT FOR BIDDING PURPOSES ONLY

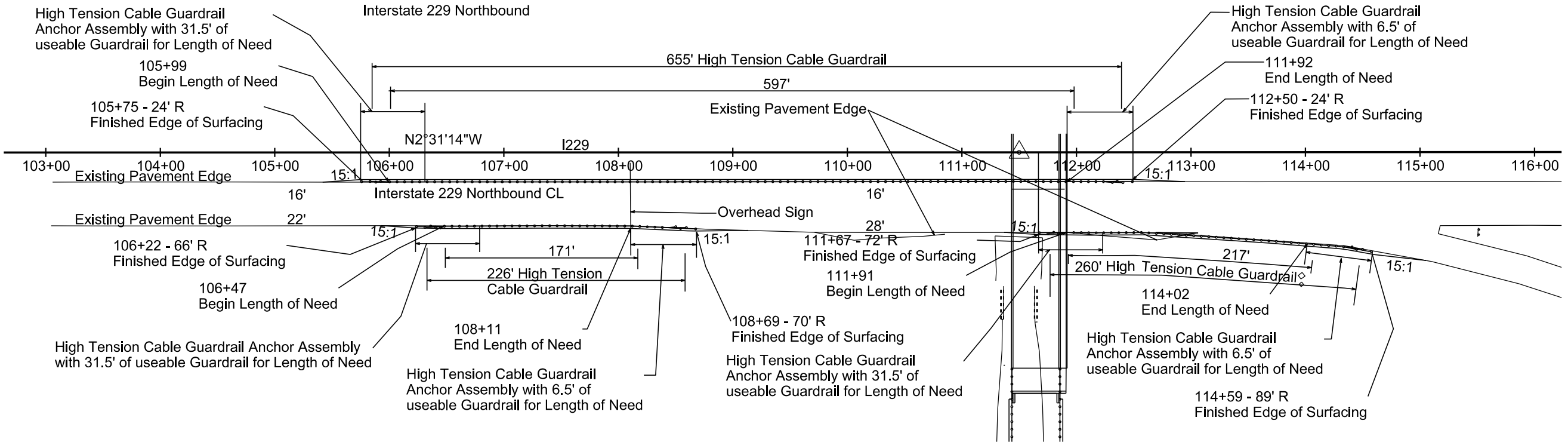
STATE OF SOUTH DAKOTA	PROJECT IM 2291(01)10	SHEET B48	TOTAL SHEETS B71
Plotting Date: 11-29-2021		REV 08/14/2020 JAL REV 05/11/2021 KAO REV 06/02/2021 KAO REV 07/19/2021 KAO	



Interstate 229 Southbound



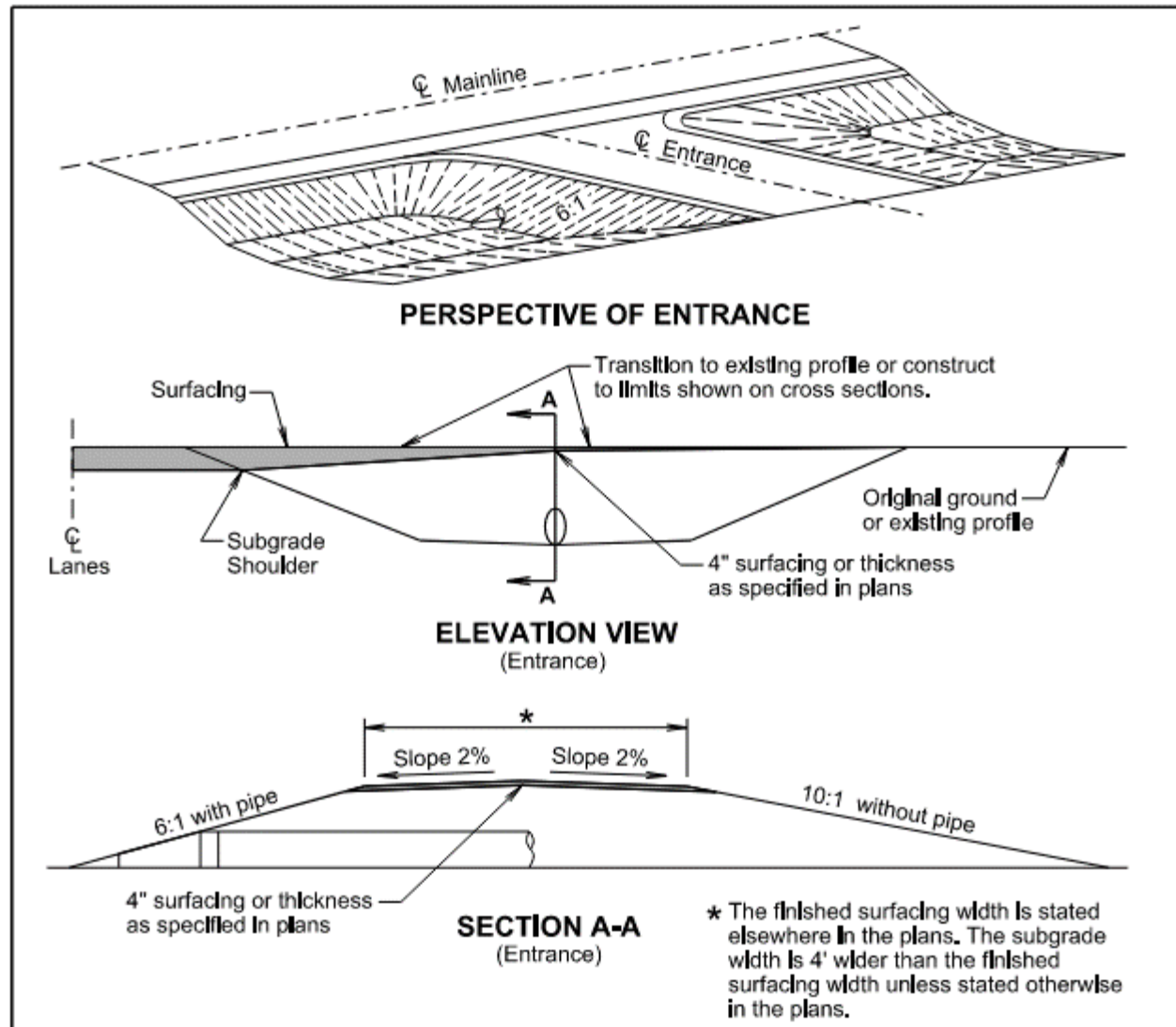
Interstate 229 Northbound



Plot Scale - 1:100
KODE
Plotted From -

File - ... \Section B10101gr.dgn





GENERAL NOTES:

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

A 6:1 inslope will be constructed for an entrance when a pipe is required. A 10:1 inslope will be constructed when a pipe is not required.

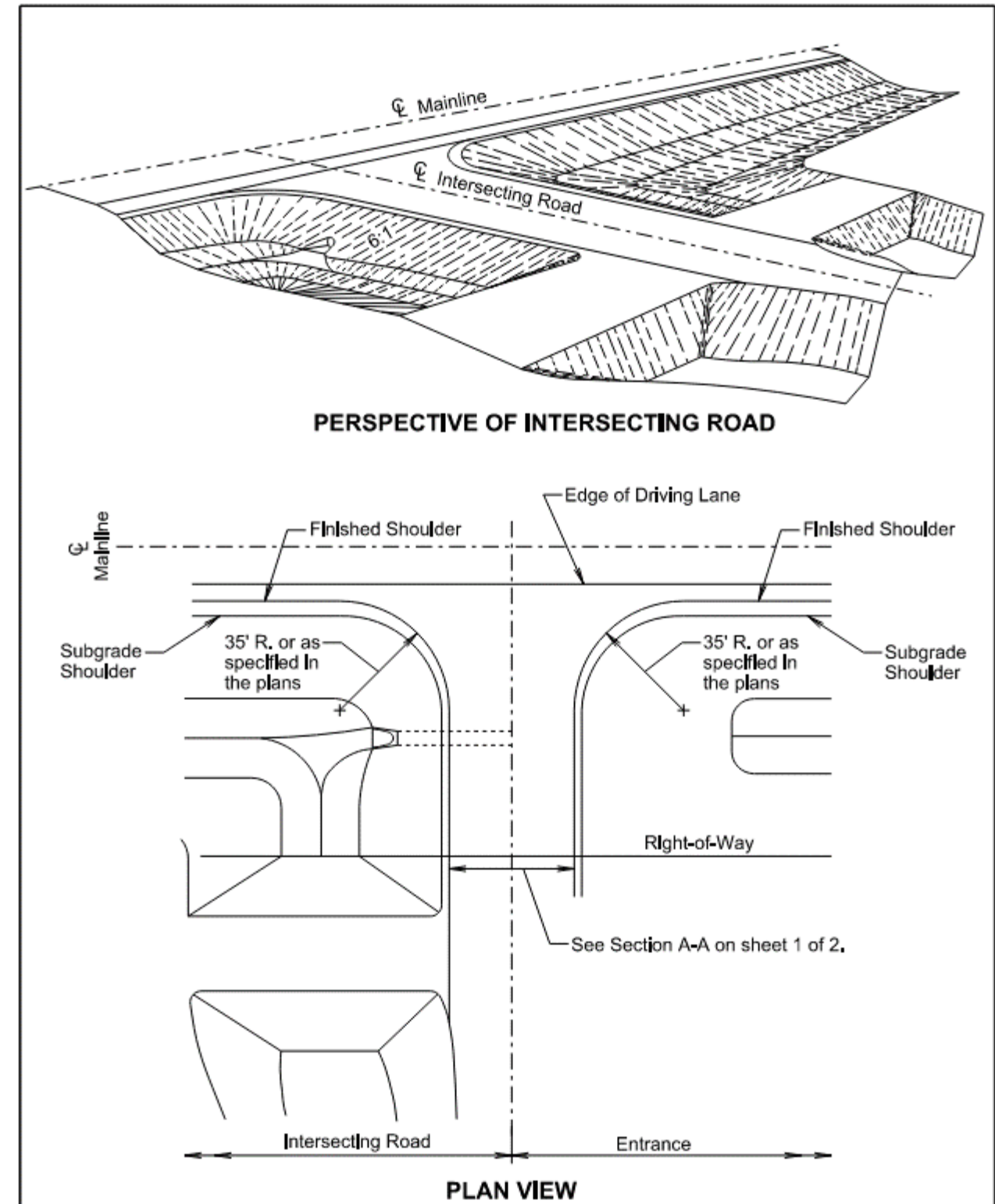
Pipe length will be adjusted if necessary during construction to obtain the 6:1 slope. For grading projects, the pipe length is estimated typically using a 4" thickness of surfacing directly over the subgrade above the pipe.

The transition area between the mainline inslope and the approach inslope for entrances will be rounded to eliminate an abrupt transition.

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

September 14, 2018

Published Date: 3rd Qtr. 2021	S D D O T	INTERSECTING ROADS AND ENTRANCES	PLATE NUMBER
			120.01
			Sheet 1 of 2



September 14, 2018

Published Date: 3rd Qtr. 2021	S D D O T	INTERSECTING ROADS AND ENTRANCES	PLATE NUMBER
			120.01
			Sheet 2 of 2

Published Date: 3rd Qtr. 2021

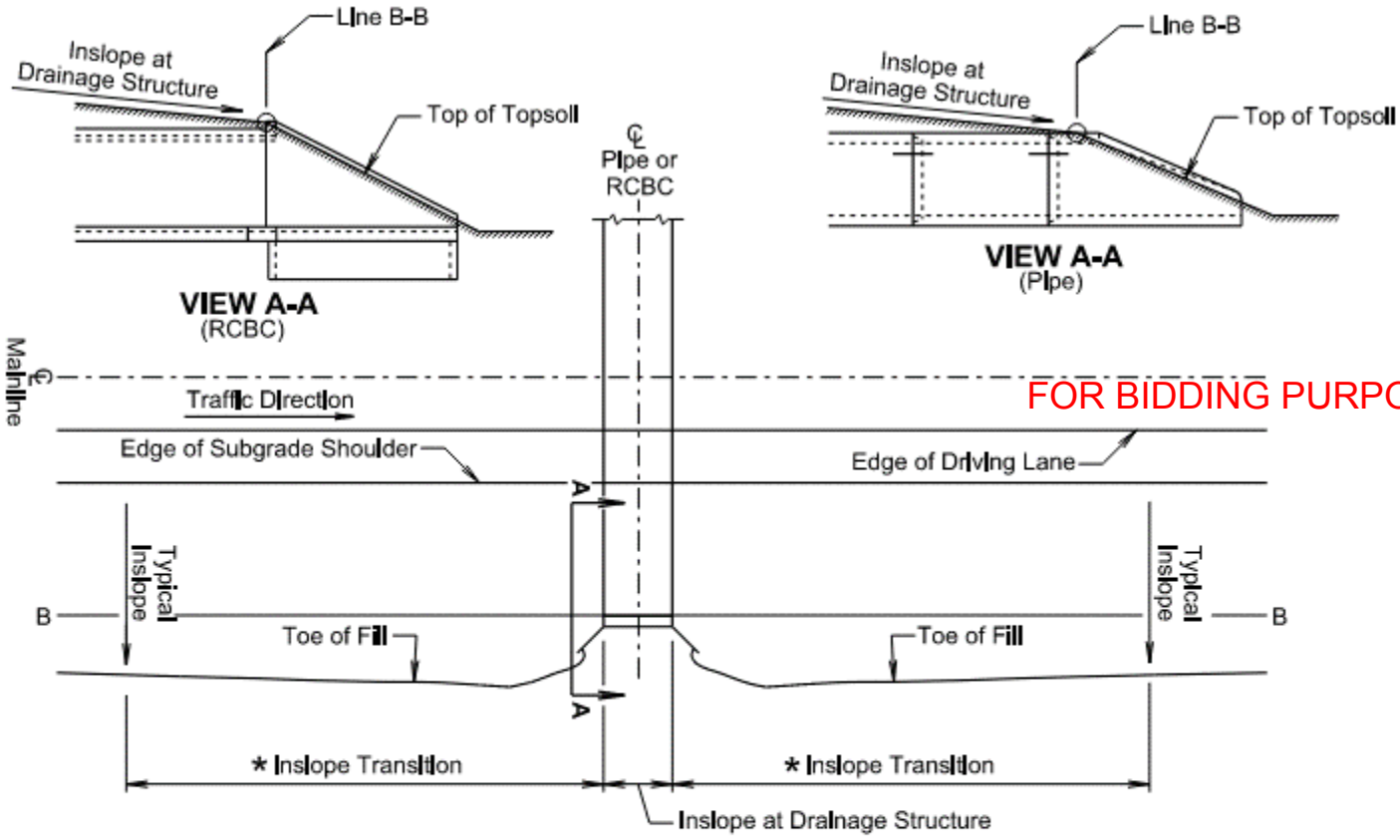
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INSLOPE TRANSITIONS AT PIPE CULVERTS
OR REINFORCED CONCRETE BOX CULVERTS

PLATE NUMBER
120.05

September 14, 2018

Sheet 1 of 2



FOR BIDDING PURPOSES ONLY

TYPE 1 INSLOPE TRANSITION

GENERAL NOTES:

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

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

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

Published Date: 3rd Qtr. 2021

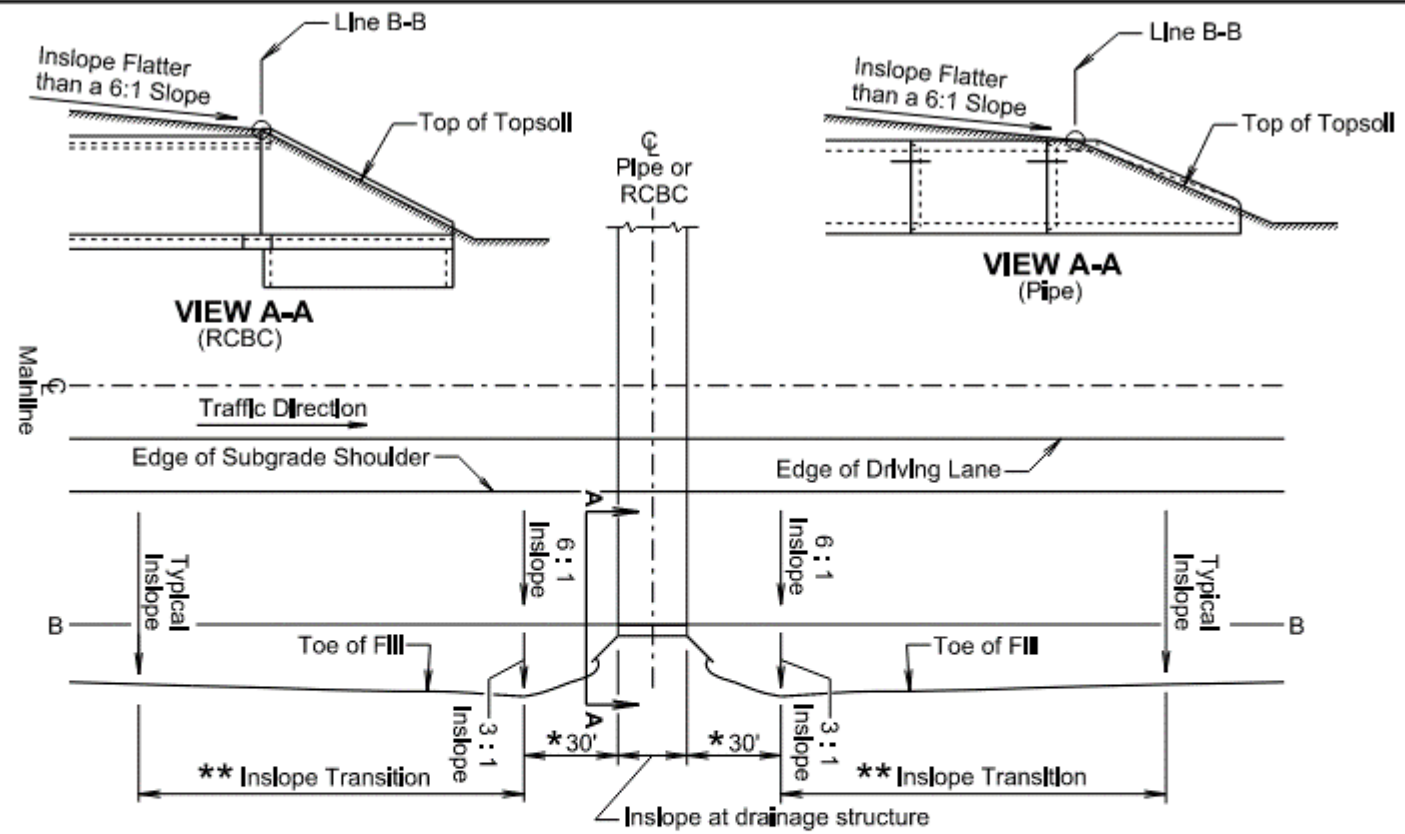
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INSLOPE TRANSITIONS AT PIPE CULVERTS
OR REINFORCED CONCRETE BOX CULVERTS

PLATE NUMBER
120.05

September 14, 2018

Sheet 2 of 2



TYPE 2 INSLOPE TRANSITION

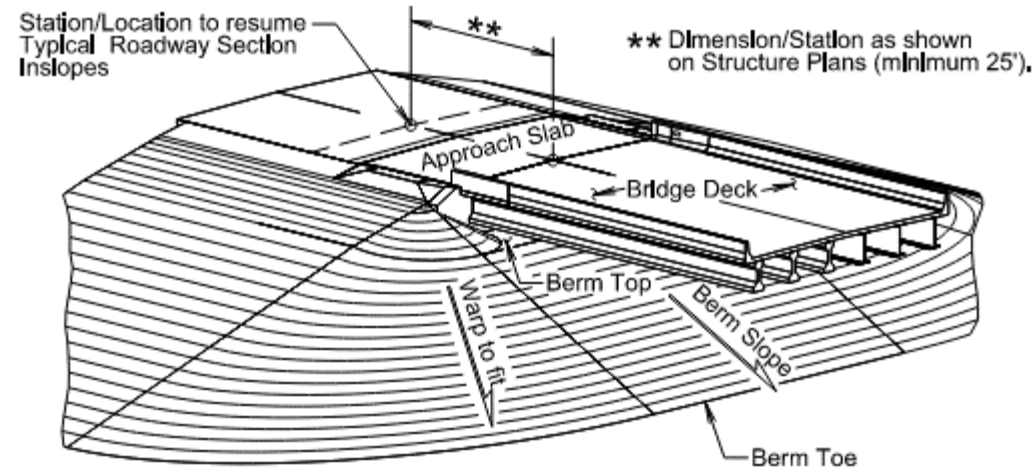
GENERAL NOTES:

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

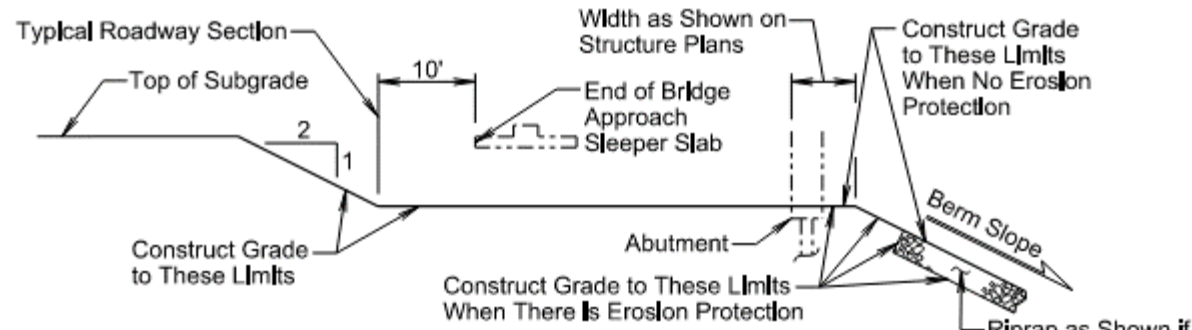
Line B-B represents the clear zone line, the location where soil intercepts the parapet on an RCBC, the location where the soil intercepts the top of the pipe adjacent to the opening of the pipe end section, or may represent a change in slope.

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

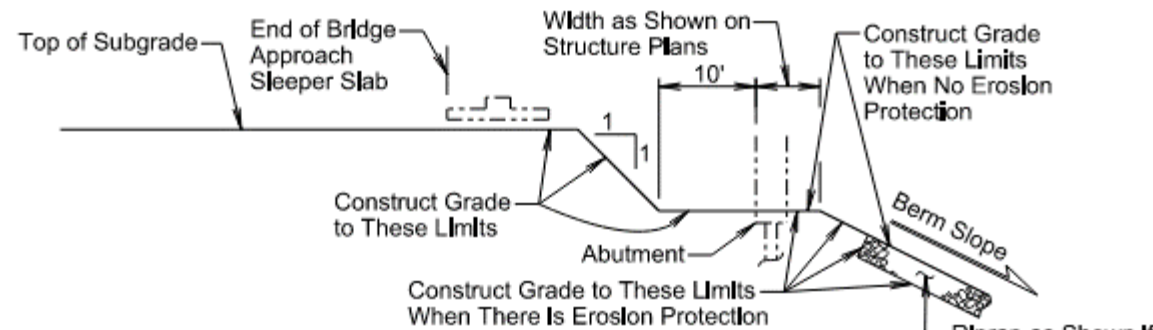
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 2291(01)10	B50	B71
Plotting Date: 12/3/2021			
			REV 9/20/2021 KAO
			REV 11/18/2021 KAO



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



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



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

GENERAL NOTES:

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

January 22, 2021

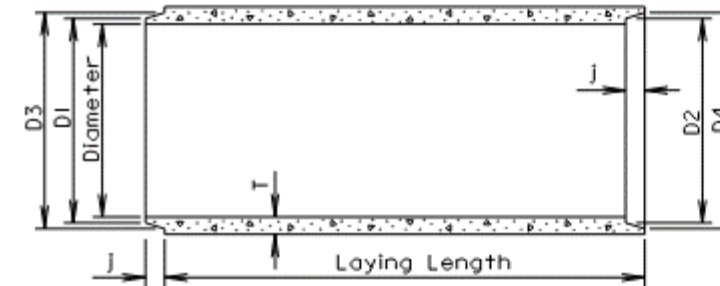
June 26, 2015

S D D O T	BRIDGE BERM (PROJECTING EMBANKMENT)	PLATE NUMBER 120.11
		Sheet 1 of 1

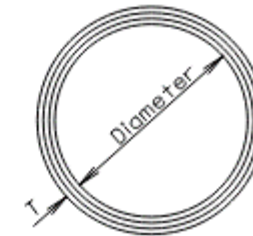
Published Date: 3rd Qtr. 2021

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:

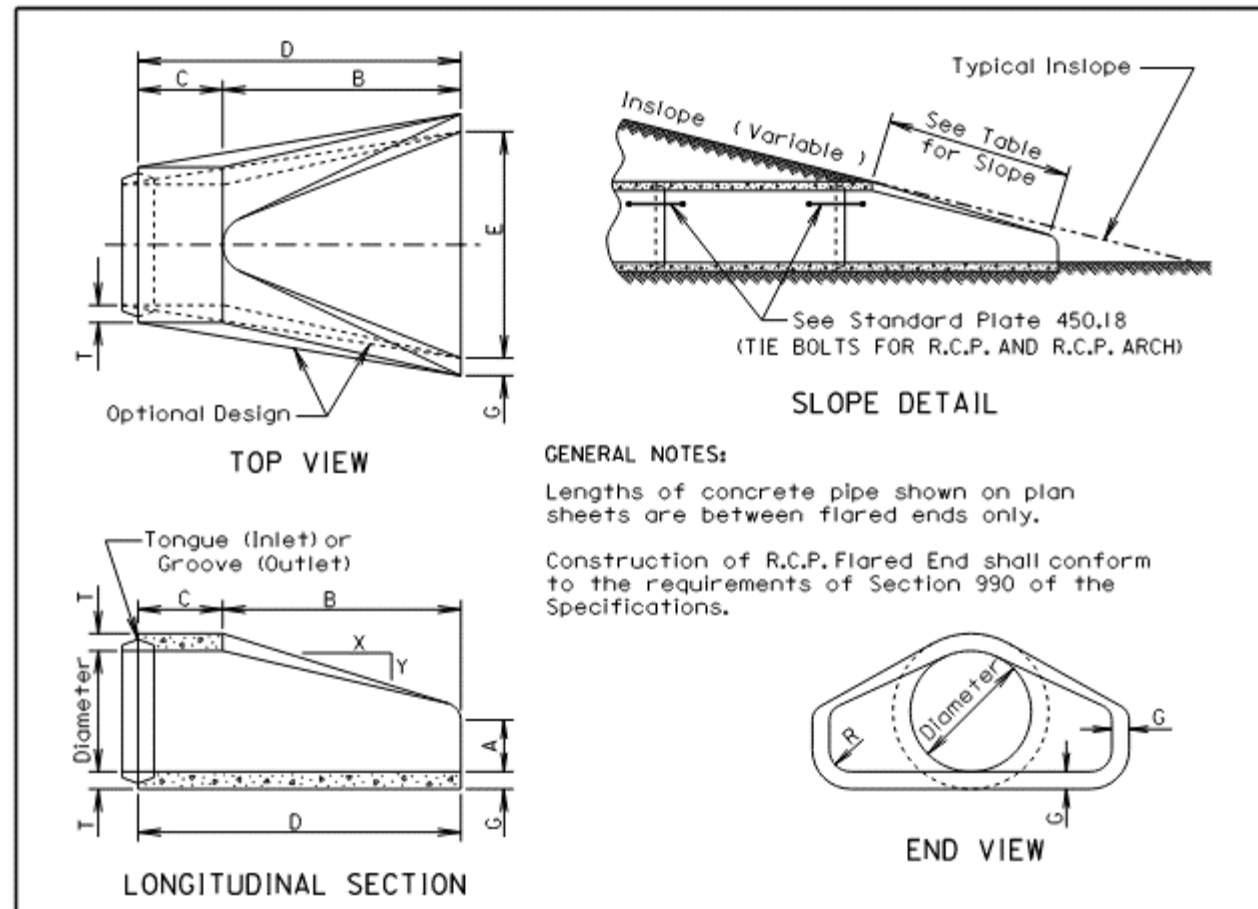
Construction of R. C. P. shall conform to the requirements of Section 990 of the Specifications.

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 3/4	13 5/8	13 7/8	14 1/4
15	127	2 1/4	2	16 1/2	16 7/8	17 1/4	17 5/8
18	168	2 1/2	2 1/4	19 5/8	20	20 3/8	20 3/4
21	214	2 3/4	2 1/2	22 7/8	23 1/4	23 3/4	24 1/8
24	265	3	2 3/4	26	26 3/8	27	27 3/8
27	322	3 1/4	3	29 1/4	29 5/8	30 1/4	30 5/8
30	384	3 1/2	3 1/4	32 3/8	32 3/4	33 1/2	33 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 5/8	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 3/8	58 3/8	59 3/8	59 3/8
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

S D D O T	REINFORCED CONCRETE PIPE	PLATE NUMBER 450.01
		Sheet 1 of 1

Published Date: 3rd Qtr. 2021

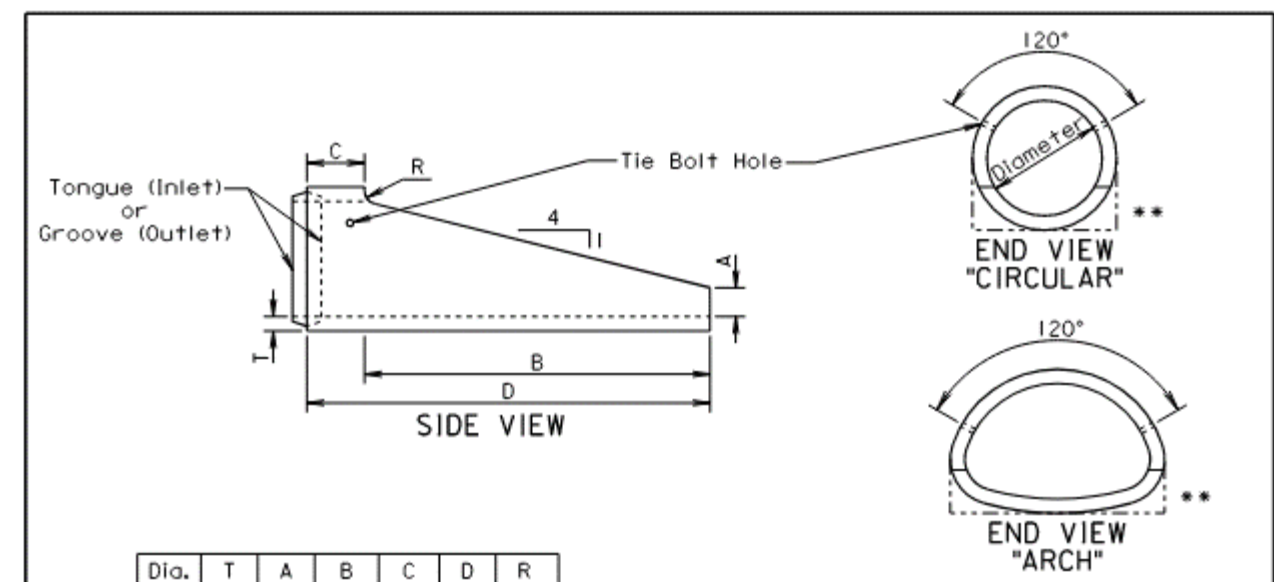


GENERAL NOTES:
Lengths of concrete pipe shown on plan sheets are between flared ends only.
Construction of R.C.P. Flared End shall conform to the requirements of Section 990 of the Specifications.

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

June 26, 2015

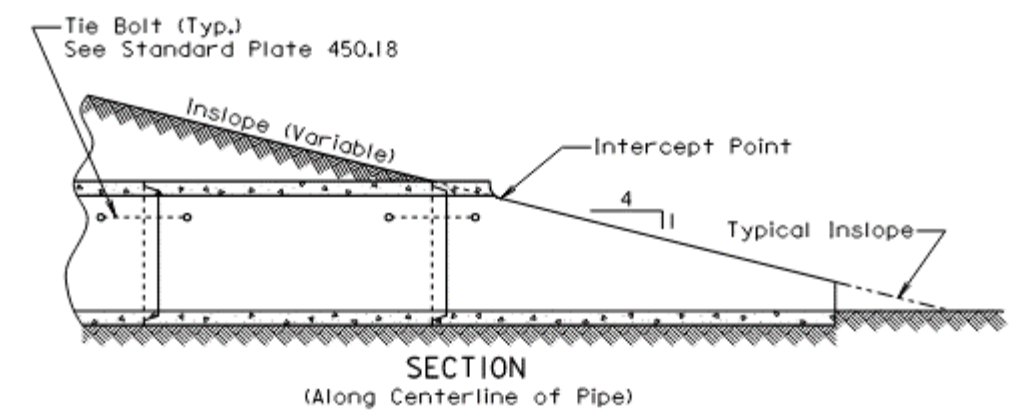
SDDOT	R. C. P. FLARED ENDS	PLATE NUMBER 450.10
		Sheet 1 of 1
		Published Date: 3rd Qtr. 2021



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

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

SDDOT	R. C. P. SLOPED ENDS	PLATE NUMBER 450.13
		Sheet 1 of 1
		Published Date: 3rd Qtr. 2021



Wall "t" (in.)	Rod Dia. (in.)	Pipe Sleeve Dia. (nominal)
< 3/4	5/8	3/4
3/2-6/2	3/4	1
> 7	1	1 1/4

GENERAL NOTES:

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

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

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

ASTM F1554 Grade 36 or ASTM A36 Rod with Heavy Hex Nut and Washer

ASTM F1554 Grade 36 or ASTM A36 Tie Bolt with 2 Heavy Hex Nuts and 2 Washers

ADJUSTABLE EYE BOLT TIE

Pipe Dia. (in.)	"L" (in.)	Bolt Dia. (in.)
< 48	4	3/4
> 48	6	1

GENERAL NOTES:

Angles shall conform to ASTM A36.

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

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

ASTM A307 Bolt with Heavy Hex Nut and 2 Washers

Boles may be reversed

ANGLE AND BOLT TIE

GENERAL NOTES:

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

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

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

END VIEW "CIRCULAR"

END VIEW "ARCH"

February 28, 2013

Published Date: 3rd Qtr. 2021	S D D O T	TIE BOLTS FOR R.C.P. AND R.C.P. ARCH	PLATE NUMBER 450.18
			Sheet 1 of 1

SPECIFICATIONS:

Design Specifications: AASHTO Specifications for Highway Bridges, 1996 Edition (Service Load).

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

GENERAL NOTES:

Design Loading: HS20-44 AASHTO.

Cattle guards will be constructed in accordance with Section 610.

All structural steel will conform to ASTM A709, Grade 36. Structural tubing will conform to ASTM A500, Grade B. All bolts and nuts will be galvanized and will conform to ASTM A307. All lock washers will be galvanized and will conform to AISI B18.21.1.

Welding and weld inspection will be in accordance with AWS D1.1-(Current Year).

Cattle guard grate, wings, and connecting plates will be painted with a paint system which conforms to Section 412.2 and will be applied in accordance with the manufacturer's recommendations. The top coat will be green in color, conforming to Federal Standard 24108.

Grate sections may be combined to obtain larger grate widths. Refer to the detail of multiple installation joint on sheet 3 of 3 when larger grate widths are required.

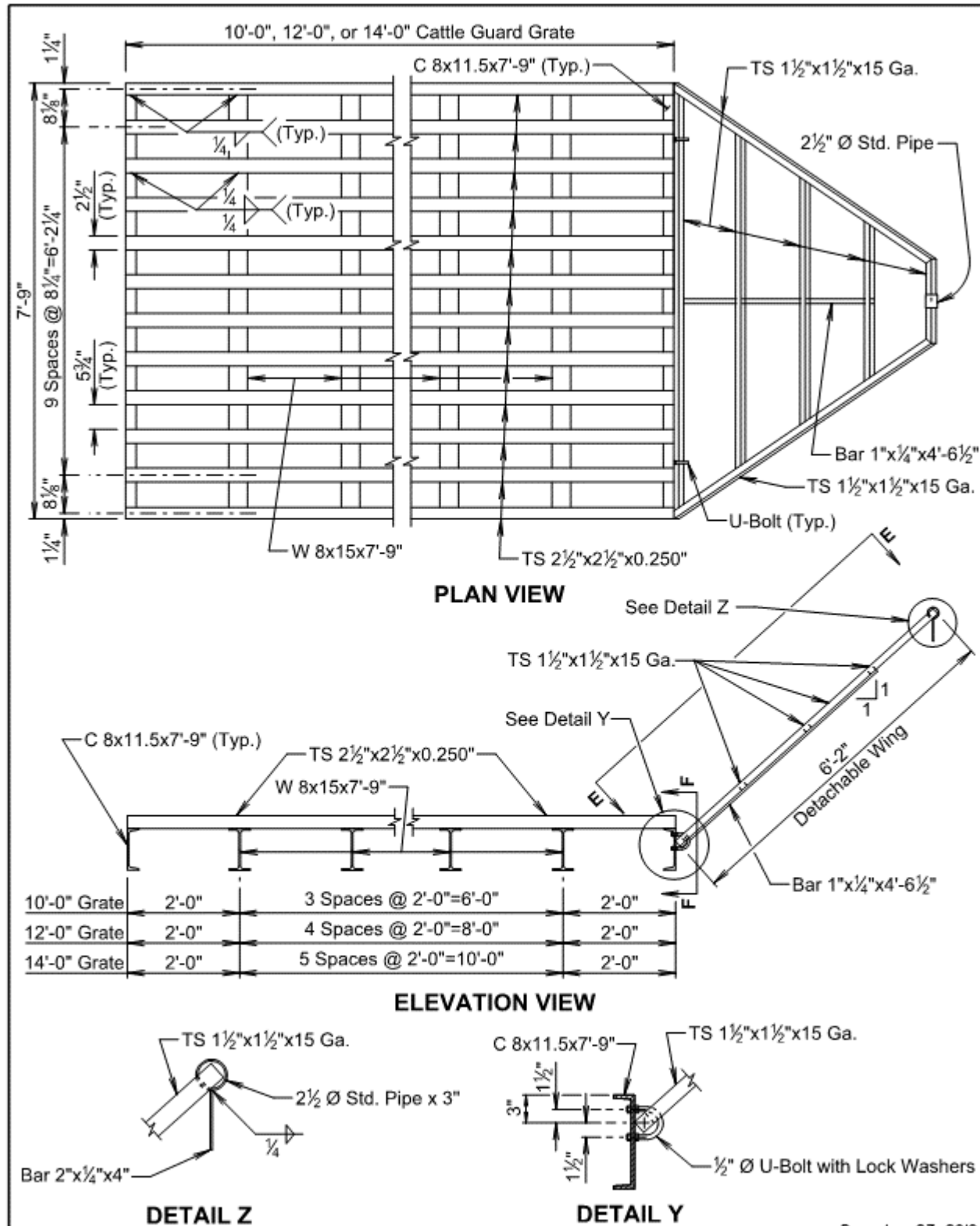
Cattle guard grate and wing details will be used in conjunction with cast-in-place or precast cattle guard foundation details on standard plate 610.01 or 610.02 when cattle guard foundations are required.

Alternate designs will be considered; submit detailed drawings and specifications of the proposed similar cattle guard grate or wing through proper channels to the Office of Bridge Design for approval.

INFORMATIONAL QUANTITIES					
ITEM	UNIT	QUANTITY			
		10' GRATE	12' GRATE	14' GRATE	2-WINGS
Structural Steel	Lb.	1496	1783	2070	114

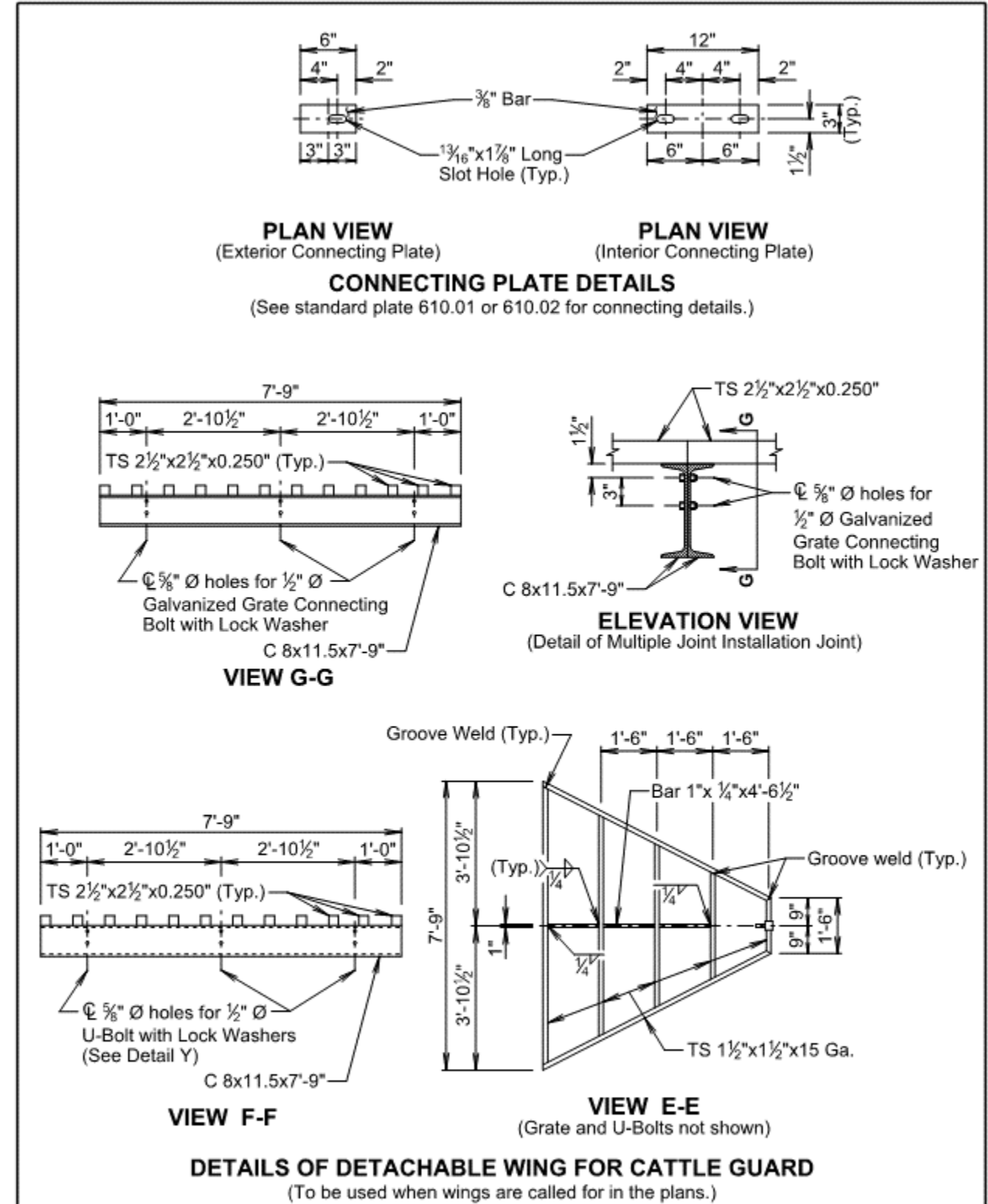
BILL OF MATERIALS FOR CATTLE GUARD GRATES						
WIDTH OF CATTLE GUARD	CATTLE GUARD GRATE			CONNECTING PLATES		GRATE CONN. BOLTS
	10'-0"	12'-0"	14'-0"	6"	12"	
10'	1			4	8	—
12'		1		4	10	—
14'			1	4	12	—
20'	2			4	18	6
24'		2		4	22	6
30'	3			4	28	12

Published Date: 3rd Qtr. 2021	S D D O T	CATTLE GUARD GRATE AND WING	PLATE NUMBER 610.03
			Sheet 1 of 3



December 23, 2019

SDDOT	CATTLE GUARD GRATE AND WING	PLATE NUMBER 610.03
		Sheet 2 of 3
		Published Date: 3rd Qtr. 2021



December 23, 2019

SDDOT	CATTLE GUARD GRATE AND WING	PLATE NUMBER 610.03
		Sheet 3 of 3
		Published Date: 3rd Qtr. 2021



ALL WOOD POSTS

14'-0" or 16'-6" 14'-0" or 16'-6"

3 1/2" Dia. x 6'-6" Wood Post (Typ.)

4'-0" 2'-6"

ALTERNATE WOOD AND STEEL POSTS

14'-0" or 16'-6" 14'-0" or 16'-6"

3 1/2" Dia. x 6'-6" Wood Post (Typ.)

5'-6" long Steel Post Weight including anchor plate is 7.99 pounds ±5% (Typ.)

4'-0" 4'-0" 2'-6"

TYPE 1 (3 Barbed Wires)

12 1/2 ga. Barbed Wire with 2 Pt. Rd. Barbs

16" 13" 13" 8"

TYPE 2 (4 Barbed Wires)

12 1/2 ga. Barbed Wire with 2 Pt. Rd. Barbs

16" 8" 8" 8"

TYPE 3 (5 Barbed Wires)

12 1/2 ga. Barbed Wire with 2 Pt. Rd. Barbs

16" 8" 8" 8"

TYPE 4 (26" Woven Wire with 2 Barbed Wires)

12 1/2 ga. Barbed Wire with 2 Pt. Rd. Barbs

726-6-12 1/2 Woven Wire

4" 8" 26"

TYPE 5 (26" Woven Wire with 4 Barbed Wires)

12 1/2 ga. Barbed Wire with 2 Pt. Rd. Barbs

726-6-12 1/2 Woven Wire

12 1/2 ga. Barbed Wire with 4 Pt. Rd. Barbs

3" 26" 1"

TYPE 6 (32" Woven Wire with 3 Barbed Wires)

12 1/2 ga. Barbed Wire with 2 Pt. Rd. Barbs

832-6-12 1/2 Woven Wire

12 1/2 ga. Barbed Wire with 4 Pt. Rd. Barbs

3" 32" 1"

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

SD DOT

RIGHT-OF-WAY FENCE

PLATE NUMBER
620.01

Sheet 1 of 1

Published Date: 4th Qtr. 2021

STAPLE INSTALLATION

Level ground and over knolls: Correct, Wrong, Correct

In depressions: Correct

Staples will not be driven parallel to side of post

Correct, loose in staple

Wrong, wood crushed

Wrong, snug to post

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

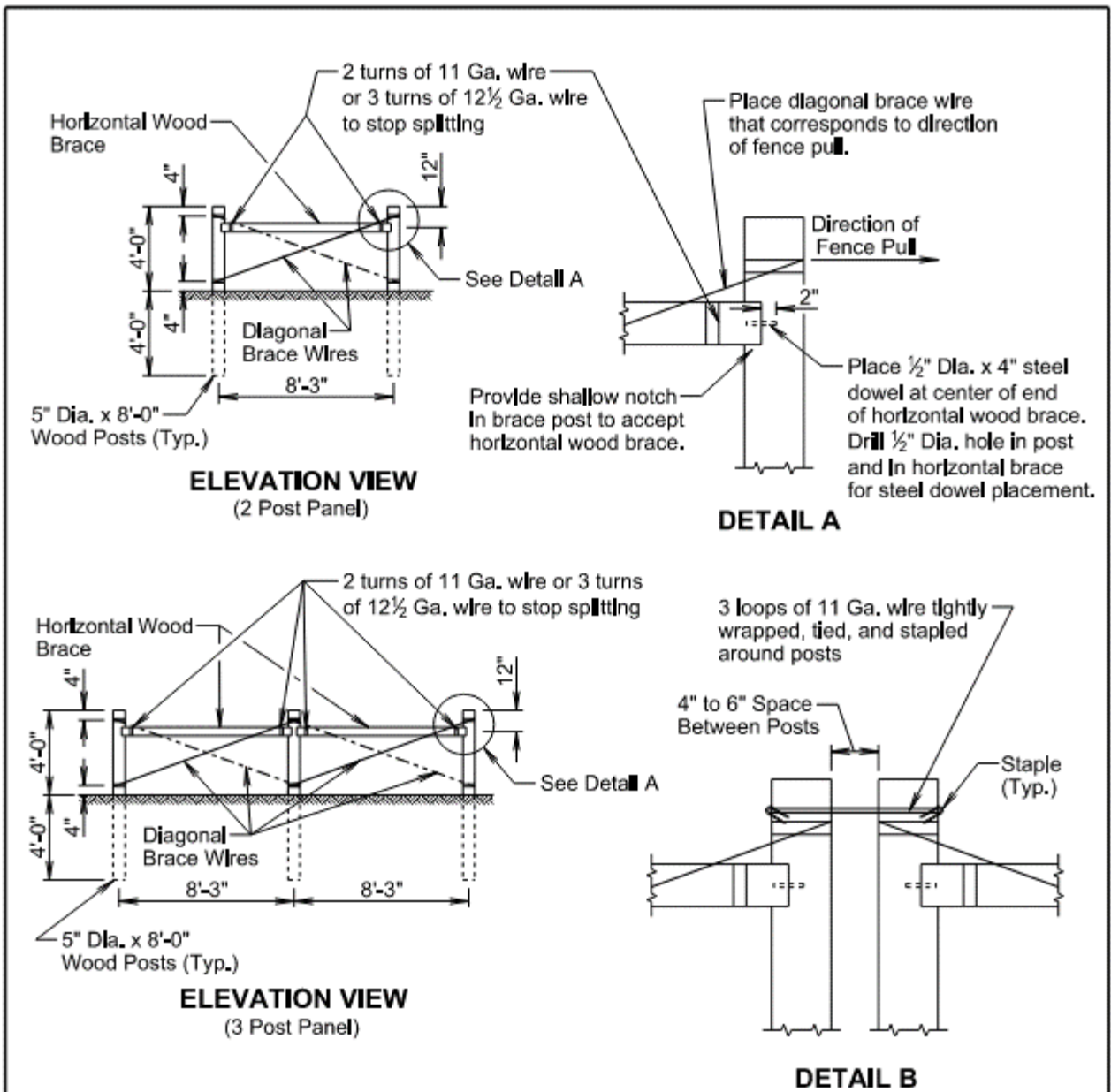
SD DOT

STAPLE INSTALLATION AND GENERAL RIGHT-OF-WAY FENCE NOTES

PLATE NUMBER
620.02

Sheet 1 of 1

Published Date: 4th Qtr. 2021

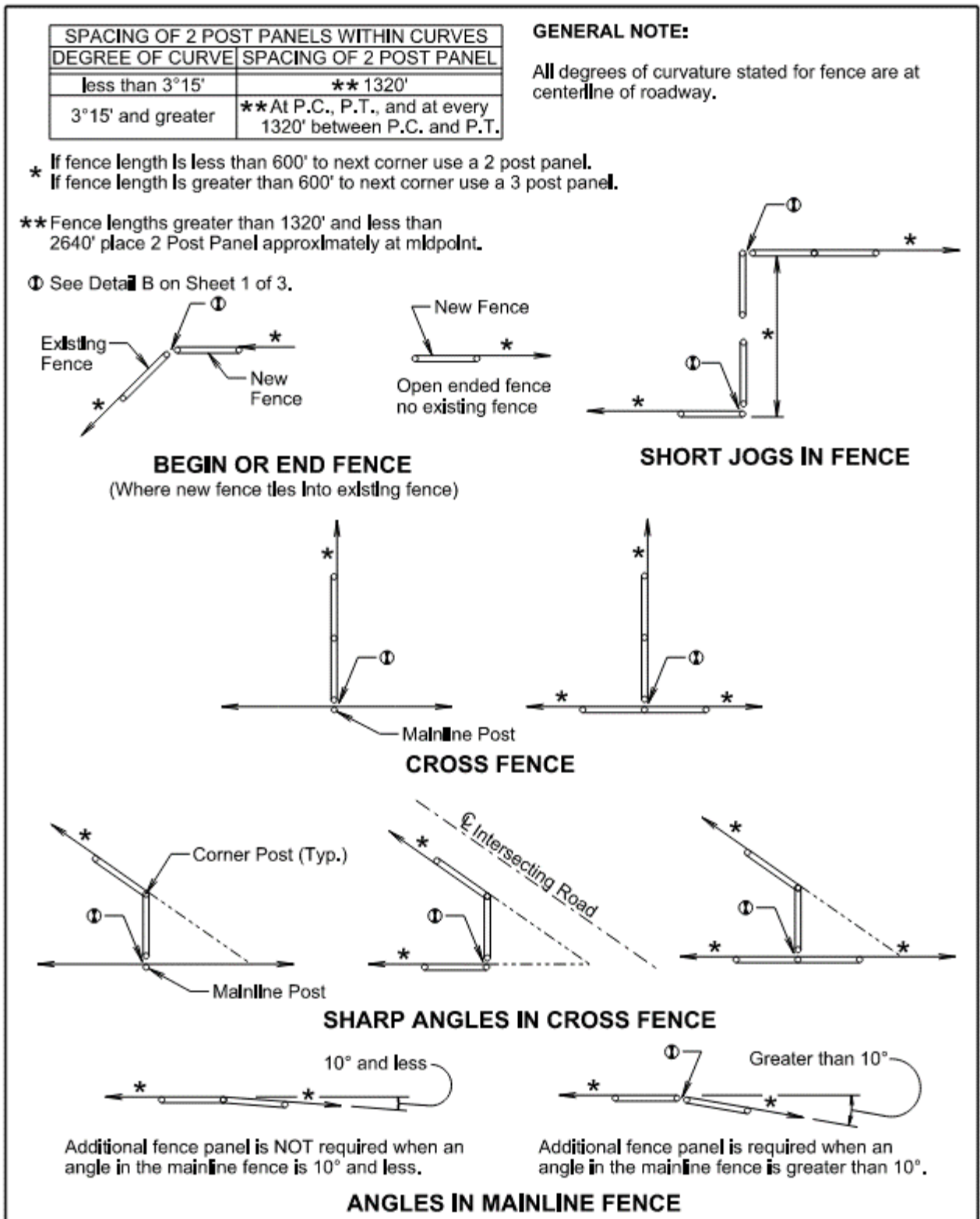


GENERAL NOTES:

- 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.

June 26, 2019

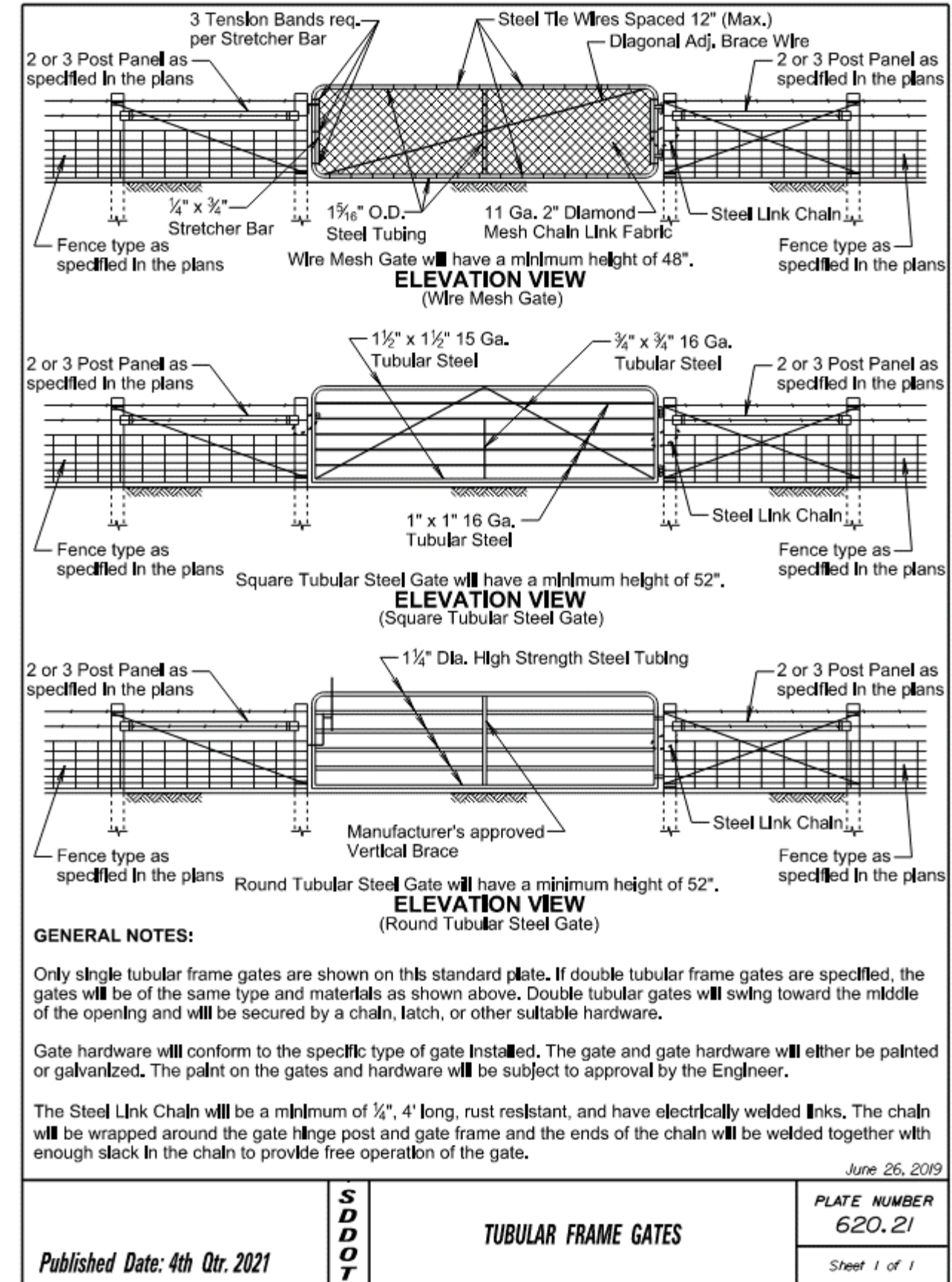
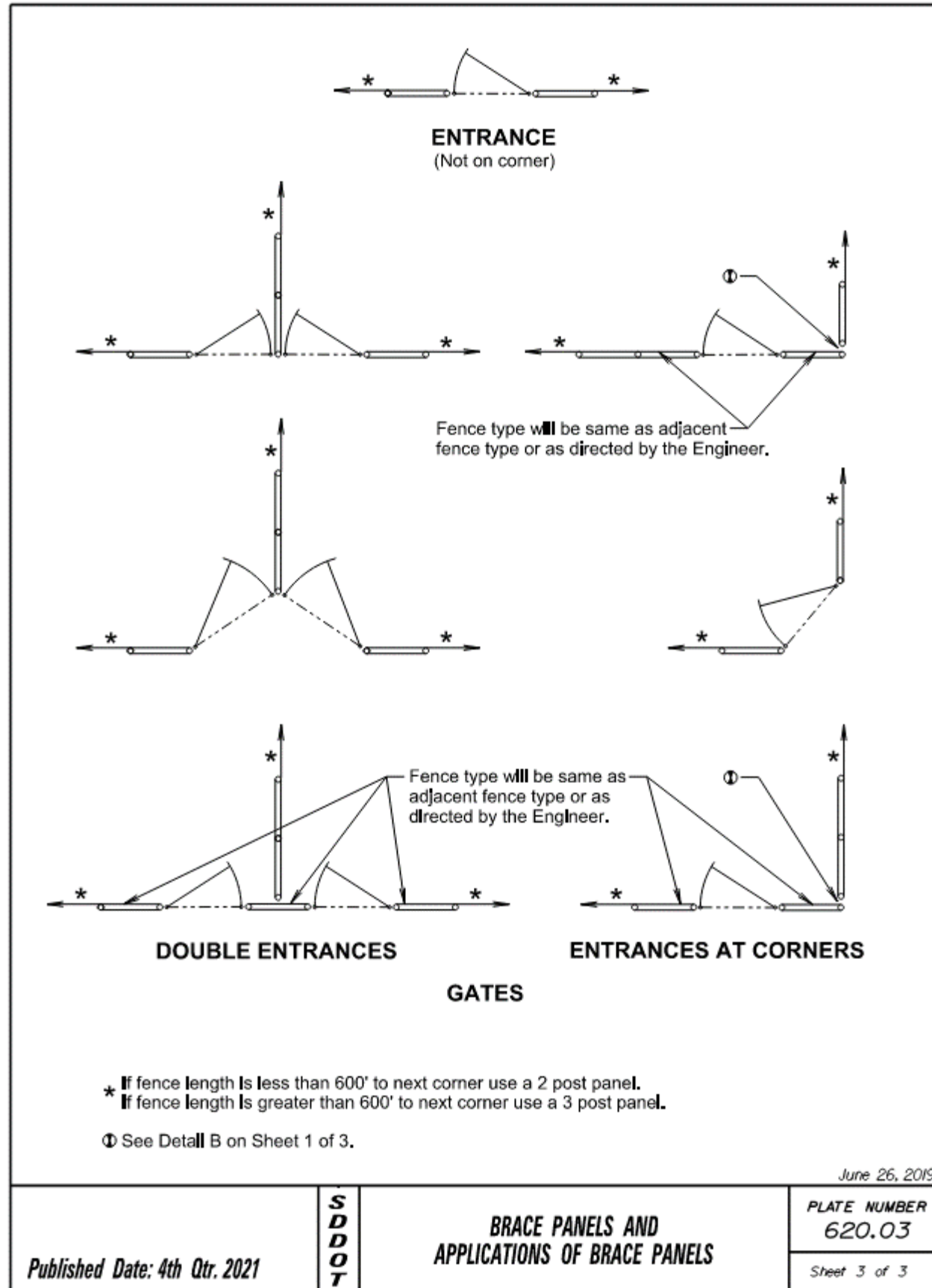
Published Date: 4th Qtr. 2021	S D D O T	BRACE PANELS AND APPLICATIONS OF BRACE PANELS	PLATE NUMBER 620.03
			Sheet 1 of 3

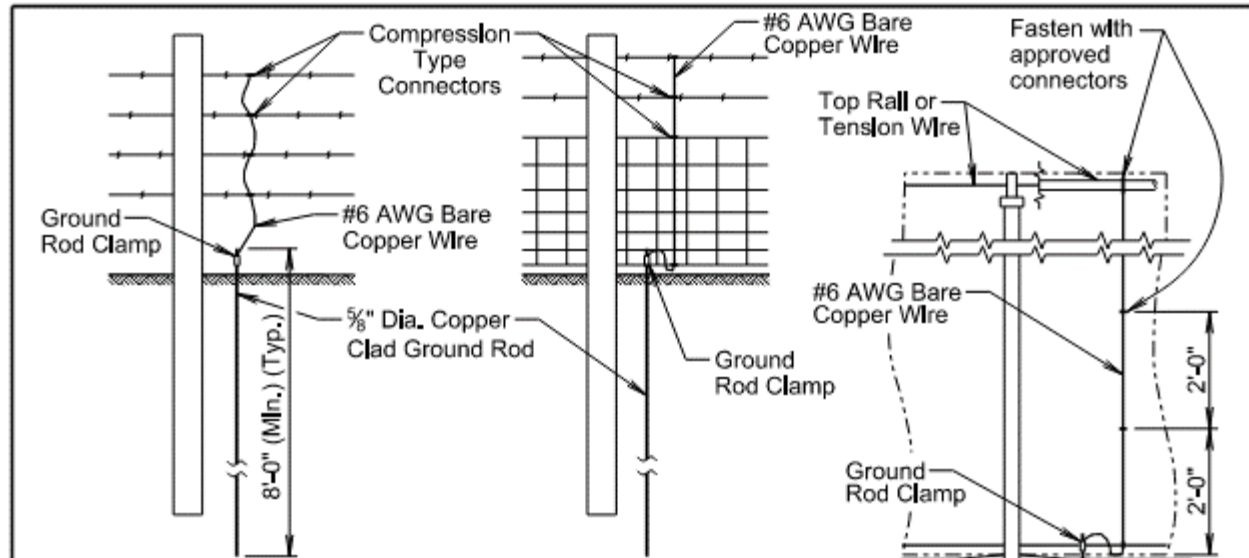


June 26, 2019

Published Date: 4th Qtr. 2021	S D D O T	BRACE PANELS AND APPLICATIONS OF BRACE PANELS	PLATE NUMBER 620.03
			Sheet 2 of 3







BARBED WIRE FENCE **WOVEN WIRE FENCE**

GENERAL NOTES:

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

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

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

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

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

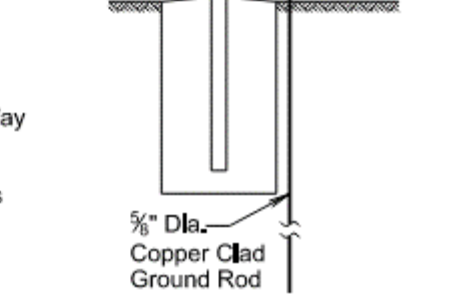
The cost of furnishing and placing all materials for grounding will be incidental to the contract unit price per foot for the respective Right-of-Way fence or chain link fence contract item.

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

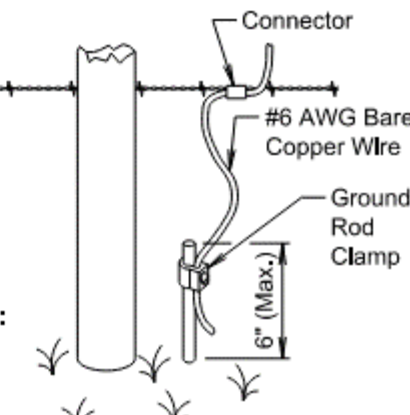
- 1 ground rod clamp,
- 1 5/8" diameter x 8' long copper clad ground rod
- 1 #6 AWG bare copper wire; 7' long for Right-of-Way fence or 10' long for chain link fence.

Compression type or other type of connectors:

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



CHAIN LINK FENCE



GROUND ROD DETAIL

June 26, 2019

S D D O T	FENCE GROUNDING	PLATE NUMBER 620.11
		Sheet 1 of 1

Published Date: 4th Qtr. 2021

Type of MGS	W Beam Rail Single or Double (Nested)	Blockout Size	Blockout Material	Post Size	Post Material	Post Spacing
1	Single	6"x12"x14"	Wood	6"x8"x6'-0"	Wood	6'-3"
1C	Single	6"x12"x14"	Wood	6"x8"x7'-6"	Wood	6'-3"
2	Single	6"x12"x14"	Wood	6"x8"x6'-0"	Wood	3'-1 1/2"
3	Single	6"x12"x14"	Wood	6"x8"x6'-0"	Wood	1'-6 3/4"
4	Double	6"x12"x14"	Wood	6"x8"x6'-0"	Wood	6'-3"

Type of MGS	See Standard Plate(s)
1	630.20, 630.22
1C	630.20, 630.25
2	630.20
3	630.20
4	630.20

GENERAL NOTES:

Asphalt concrete will be the same type used elsewhere on the project or will be as specified in the plans. If asphalt concrete is not specified in the plans, the asphalt concrete will conform to the Specifications for "Asphalt Concrete Composite".

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

Topsoll is not shown in the transverse section drawing on sheet 2 of 6.

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

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

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

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

September 14, 2019

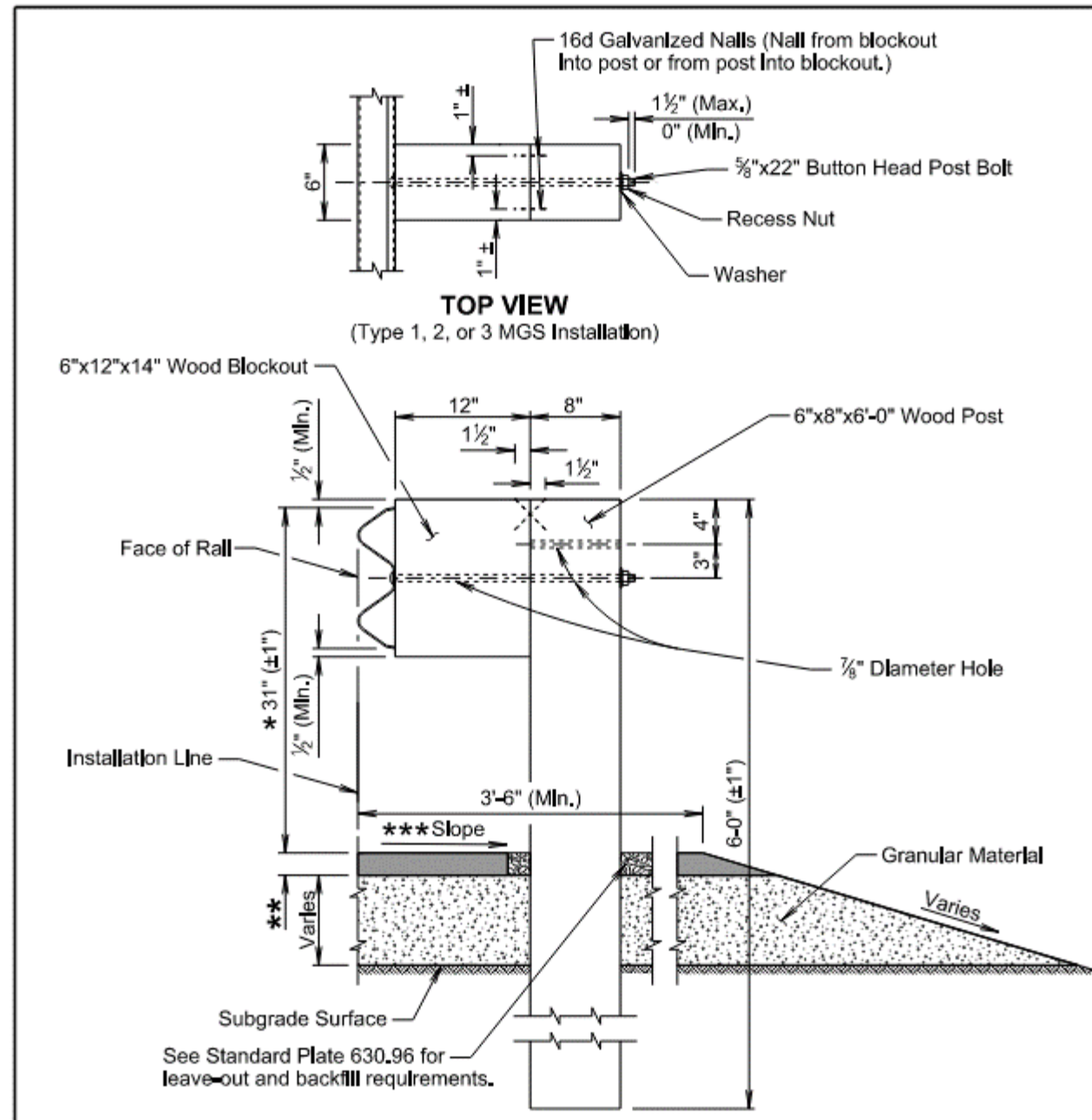
S D D O T	MIDWEST GUARDRAIL SYSTEM (MGS)	PLATE NUMBER 630.20
		Sheet 1 of 6

Published Date: 3rd Qtr. 2021

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 2291(01)10	B59	B71

Plotting Date: 12/3/2021

REV 9/20/2021 KAO
REV 11/18/2021 KAO



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

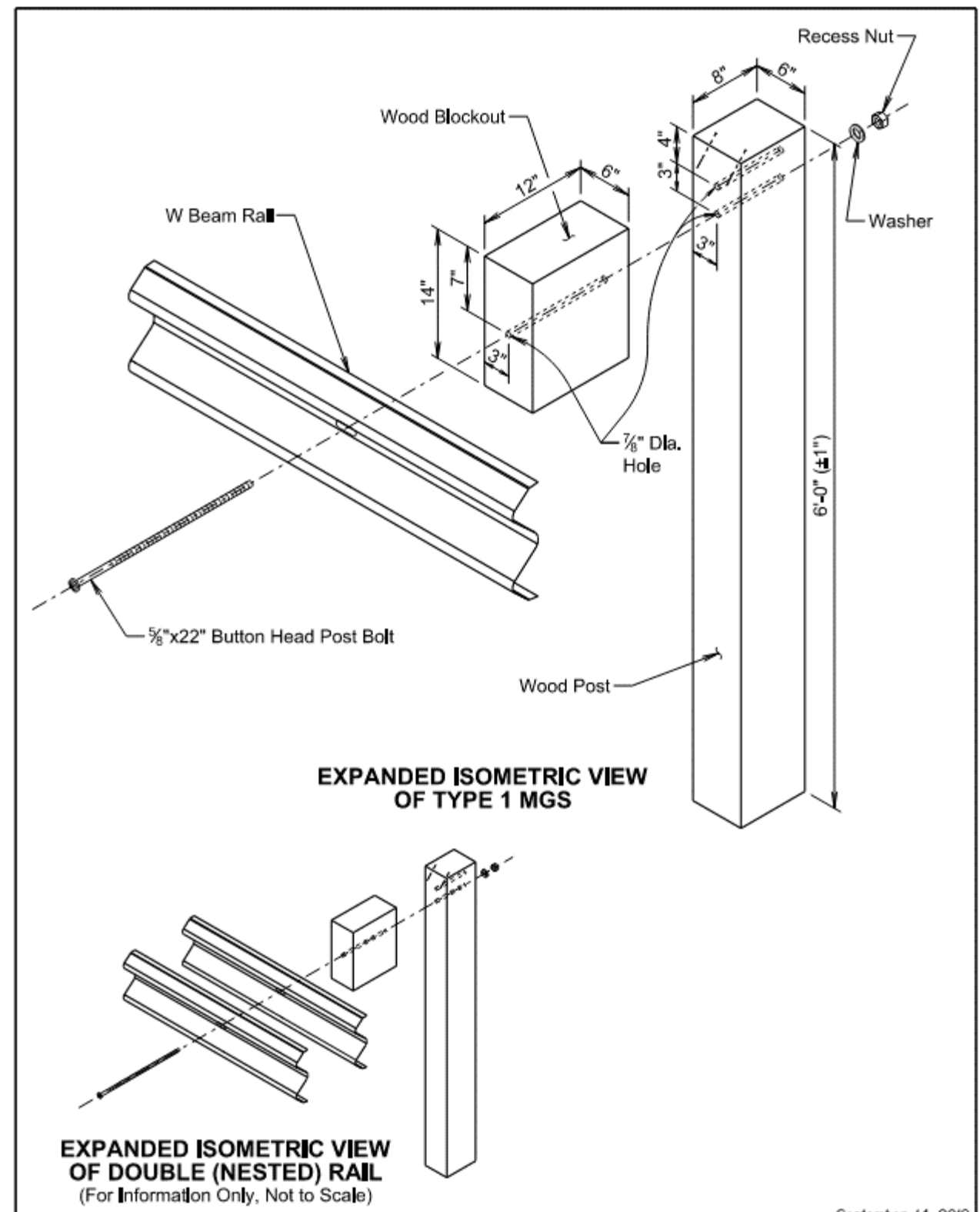
TRANSVERSE SECTION
(Type 1, 2, or 3 MGS Installation)

- * See Standard Plate 630.99
- ** 2" asphalt concrete or as specified in the plans.
- *** The cross slope will be as specified in the plans; however, the cross slope will not be steeper than a 10:1 slope.

September 14, 2019

SDDOT	MIDWEST GUARDRAIL SYSTEM (MGS)	PLATE NUMBER 630.20
		Sheet 2 of 6

Published Date: 3rd Qtr. 2021



EXPANDED ISOMETRIC VIEW OF TYPE 1 MGS

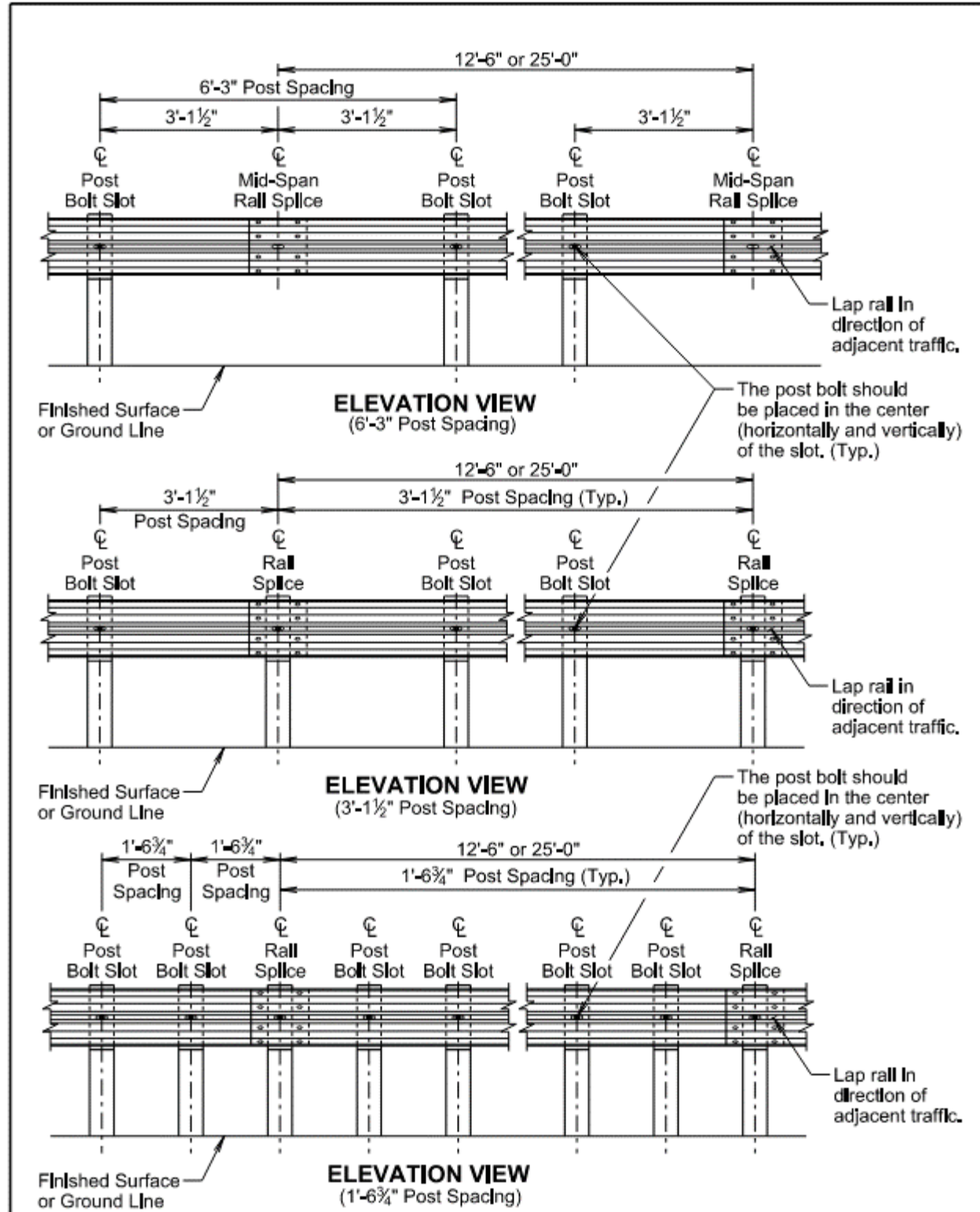
EXPANDED ISOMETRIC VIEW OF DOUBLE (NESTED) RAIL
(For Information Only, Not to Scale)

September 14, 2019

SDDOT	MIDWEST GUARDRAIL SYSTEM (MGS)	PLATE NUMBER 630.20
		Sheet 3 of 6

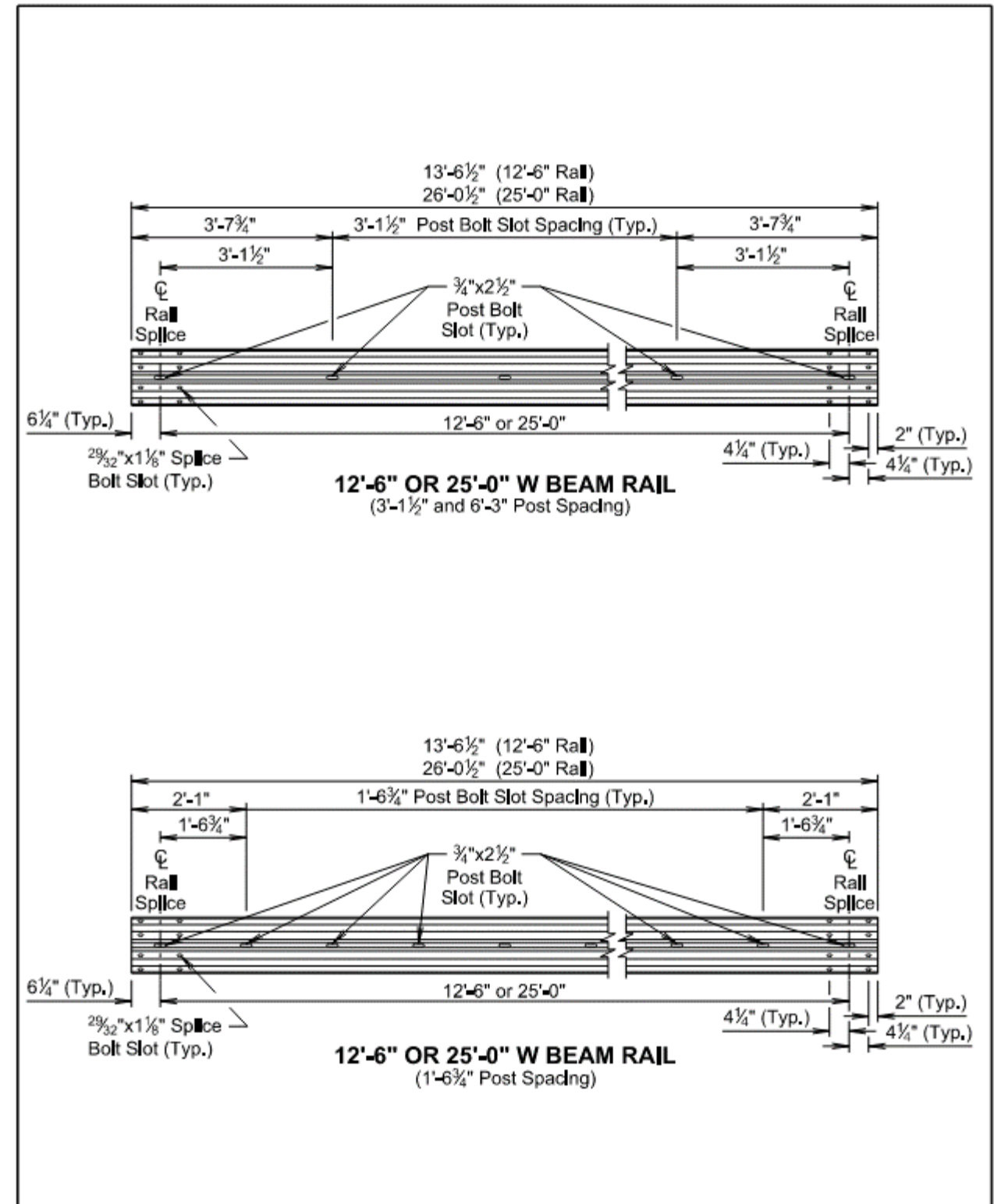
Published Date: 3rd Qtr. 2021





September 14, 2019

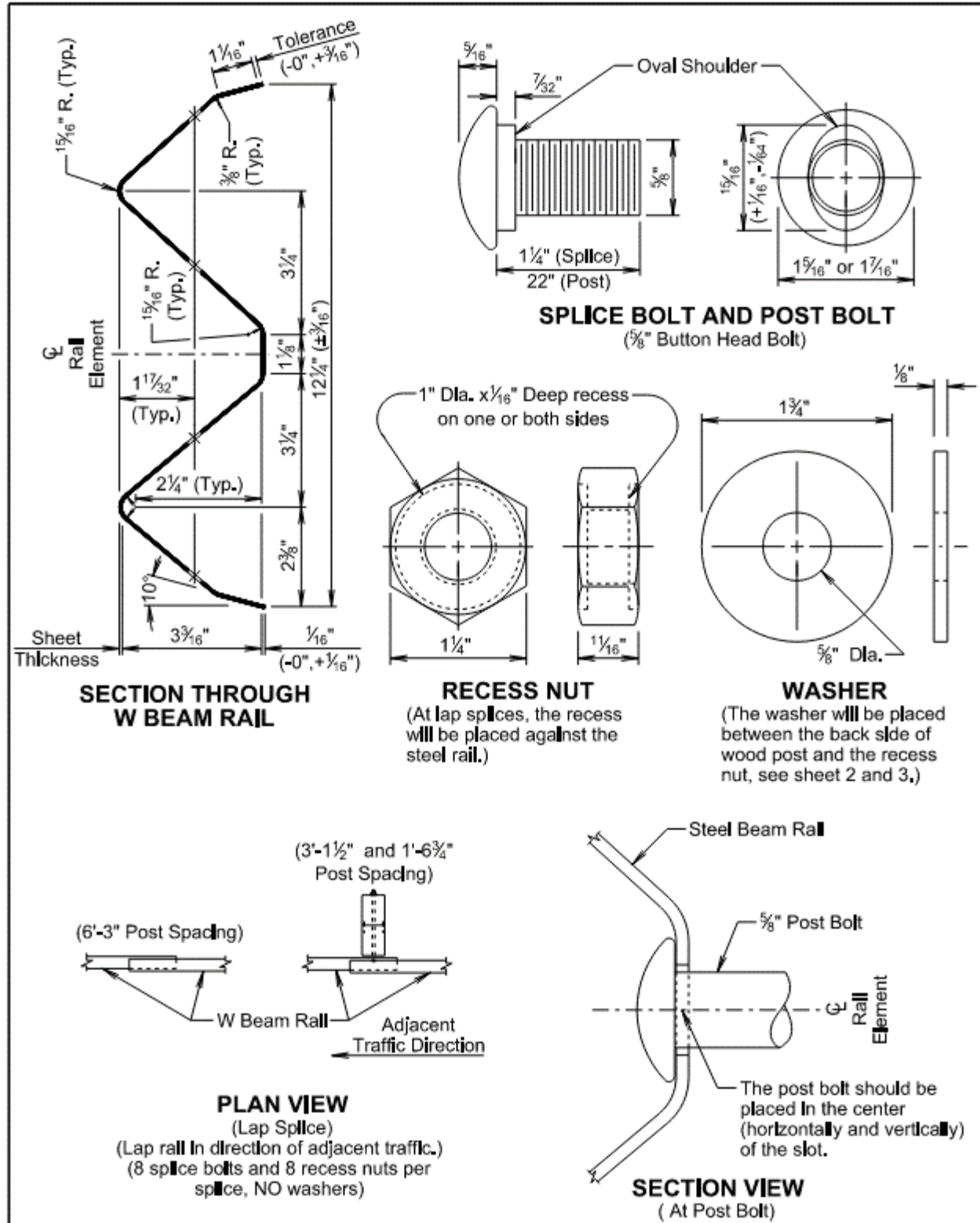
Published Date: 3rd Qtr. 2021	S D D O T	MIDWEST GUARDRAIL SYSTEM (MGS)	PLATE NUMBER
			630.20
			Sheet 4 of 6



September 14, 2019

Published Date: 3rd Qtr. 2021	S D D O T	MIDWEST GUARDRAIL SYSTEM (MGS)	PLATE NUMBER
			630.20
			Sheet 5 of 6

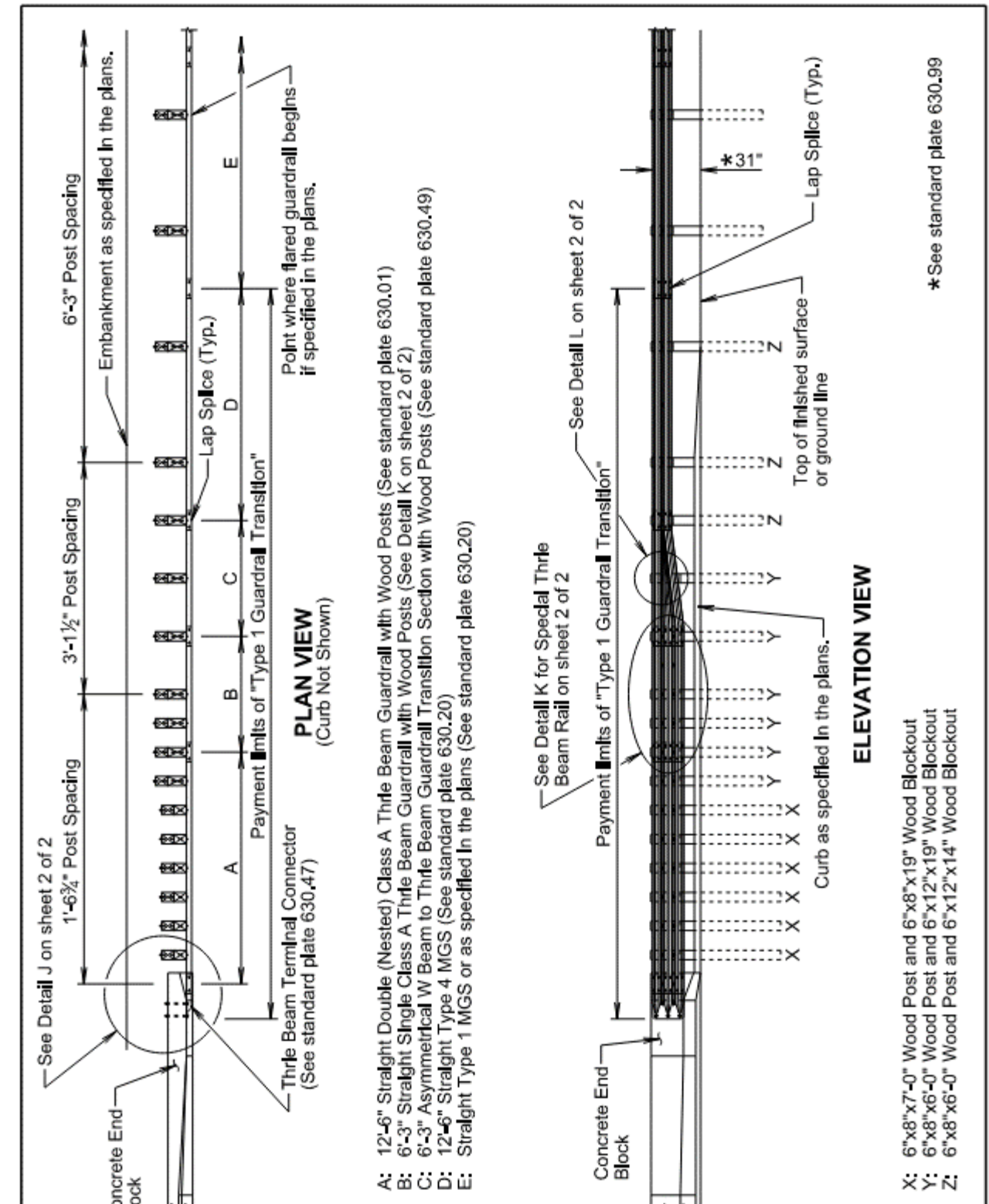




September 14, 2019

S D D O T	MIDWEST GUARDRAIL SYSTEM (MGS)	PLATE NUMBER 630.20
		Sheet 6 of 6

Published Date: 3rd Qtr. 2021

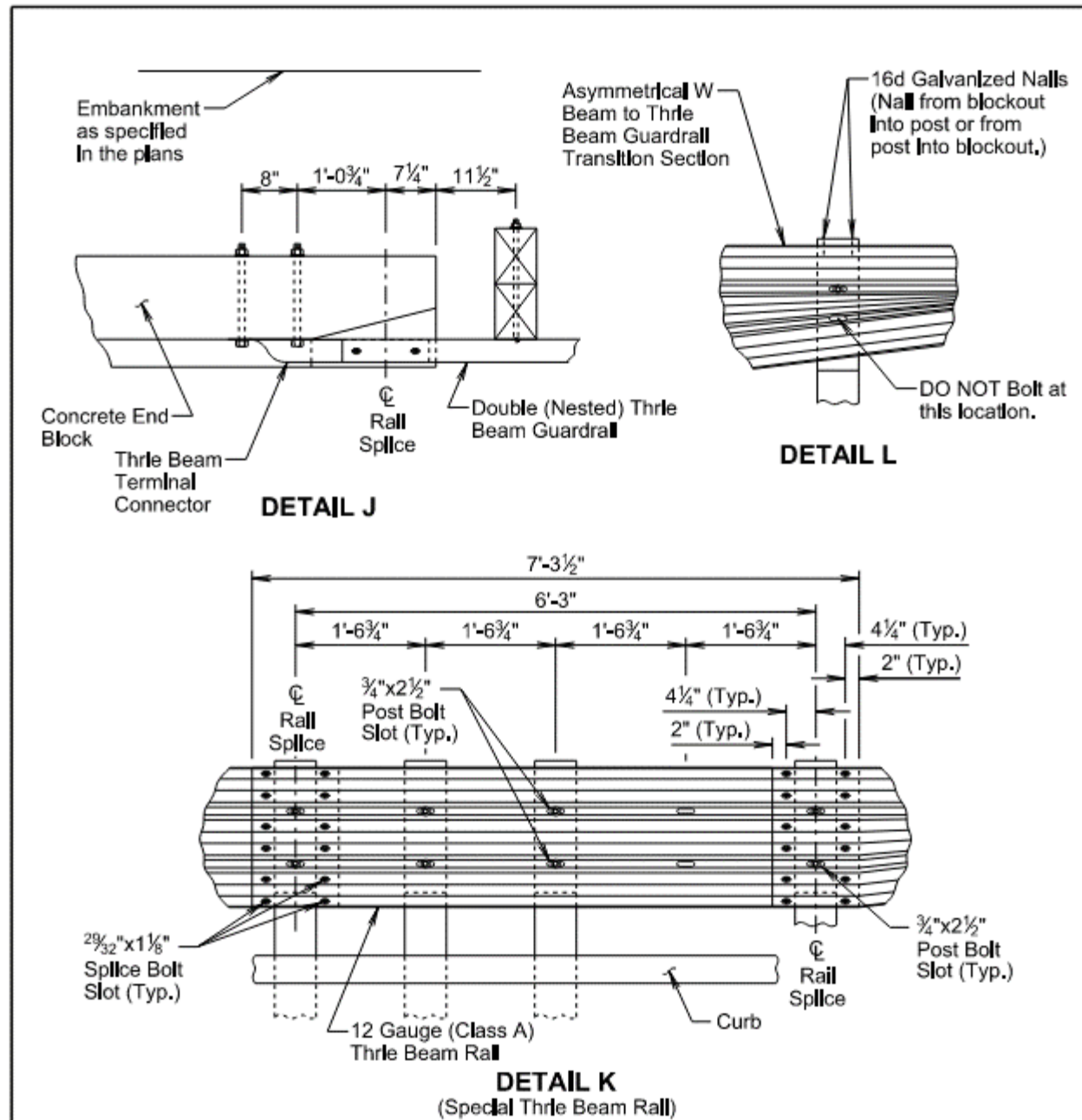


September 14, 2019

S D D O T	TYPE 1 GUARDRAIL TRANSITION (CONCRETE END BLOCK TO MIDWEST GUARDRAIL SYSTEM (MGS))	PLATE NUMBER 630.50
		Sheet 1 of 2

Published Date: 3rd Qtr. 2021





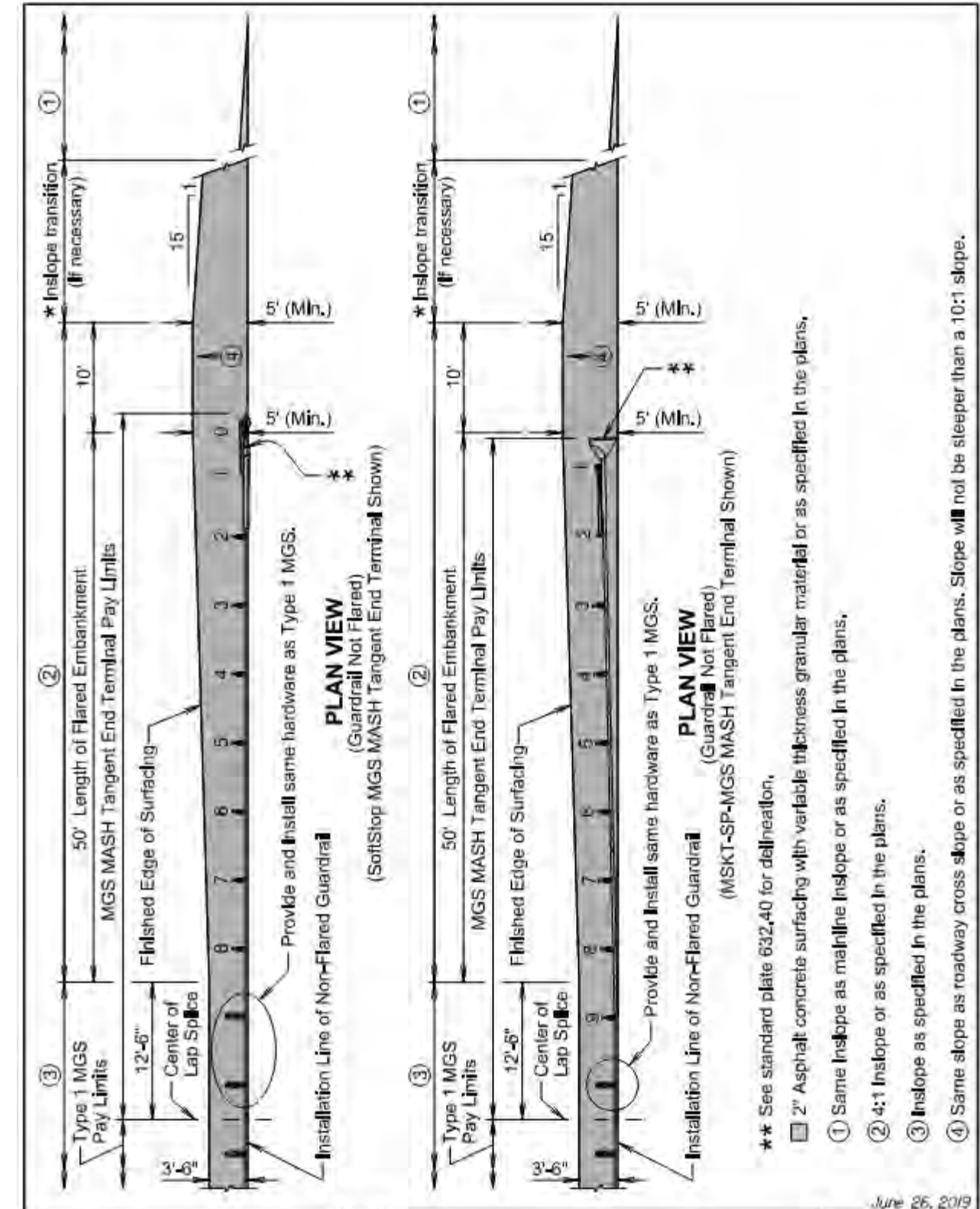
GENERAL NOTES:

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

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

September 14, 2019

S D D O T	TYPE 1 GUARDRAIL TRANSITION (CONCRETE END BLOCK TO MIDWEST GUARDRAIL SYSTEM (MGS))	PLATE NUMBER 630.50
	Published Date: 3rd Qtr. 2021	Sheet 2 of 2



- ** See standard plate 632.40 for delineation.
- 2" Asphalt concrete surfacing with variable thickness granular material or as specified in the plans.
- ① Same slope as mainline inslope or as specified in the plans.
- ② 4:1 inslope or as specified in the plans.
- ③ Inslope as specified in the plans.
- ④ Same slope as roadway cross slope or as specified in the plans. Slope will not be steeper than a 10:1 slope.

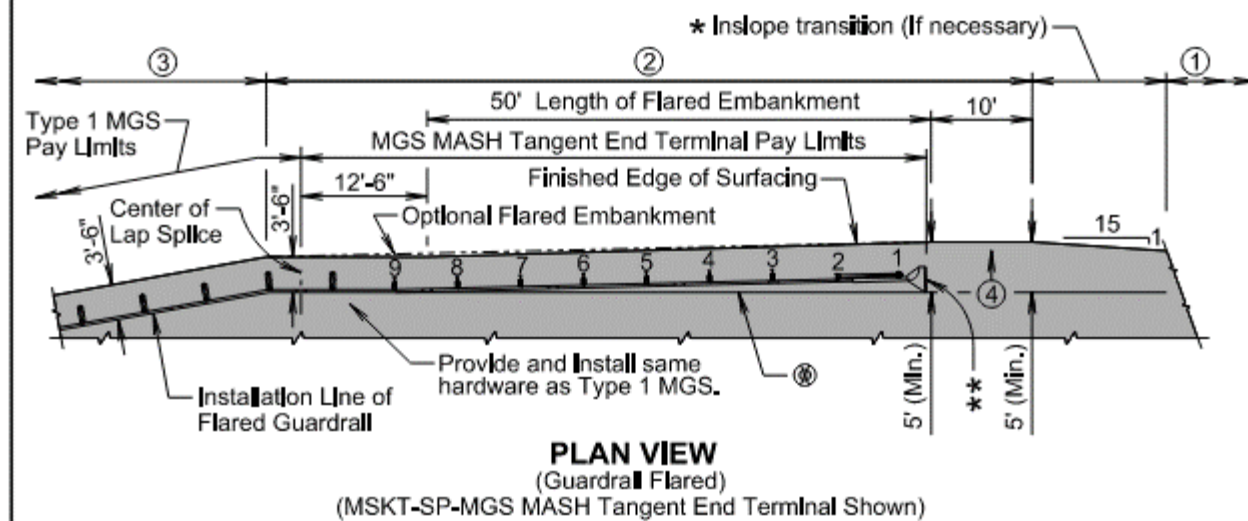
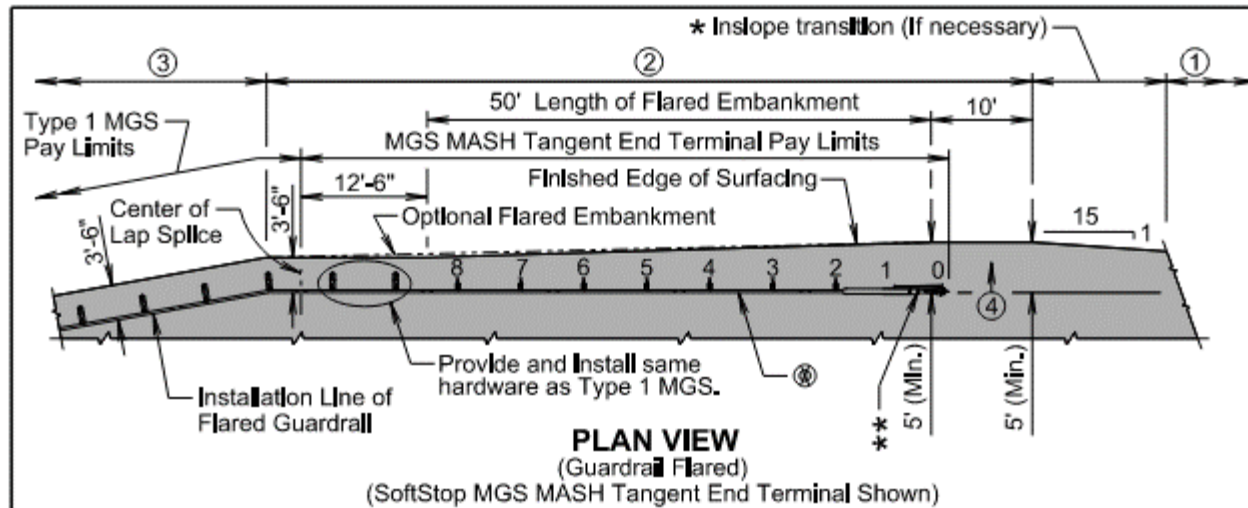
June 26, 2019

S D D O T	EMBANKMENT, SURFACING, AND PAYMENT LIMITS FOR MGS MASH TANGENT END TERMINAL	PLATE NUMBER 630.89
	Published Date: 3rd Qtr. 2021	Sheet 1 of 2

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 2291(01)10	B63	B71

Plotting Date: 12/3/2021

REV 9/20/2021 KAO
REV 11/18/2021 KAO



GENERAL NOTES:

The MGS MASH tangent end terminals above are for illustrative purpose only.

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

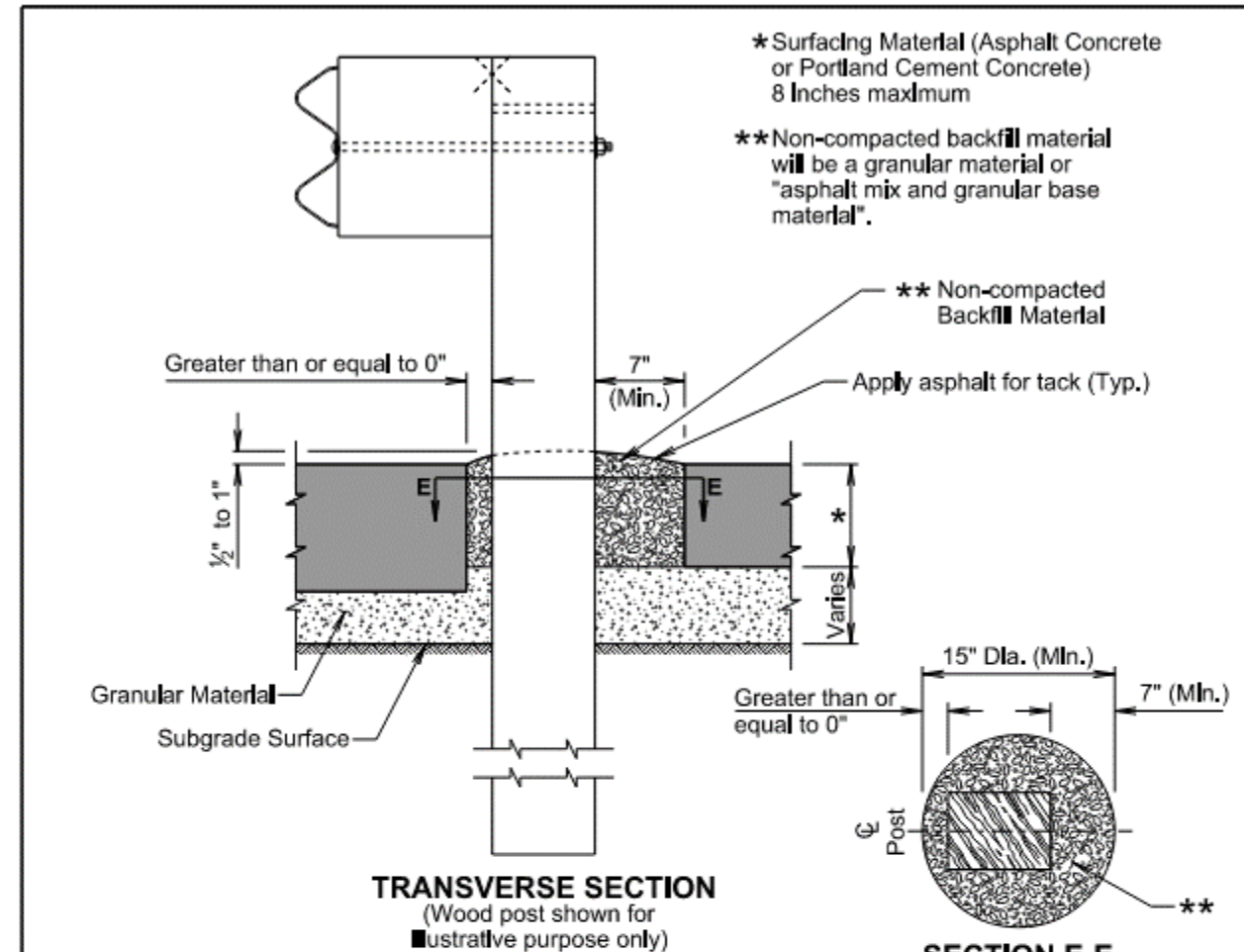
⊙ The installation reference line for MGS MASH tangent end terminals will always be parallel to the roadway.

Asphalt concrete will be the same type used elsewhere on the project or will be as specified in the plans. If asphalt concrete is not specified in the plans, the asphalt concrete will conform to the Specifications for "Asphalt Concrete Composite."

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

June 26, 2019

Published Date: 3rd Qtr. 2021	S D D O T	EMBANKMENT, SURFACING, AND PAYMENT	PLATE NUMBER
		LIMITS FOR MGS MASH TANGENT END TERMINAL	630.89
			Sheet 2 of 2



GENERAL NOTES:

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

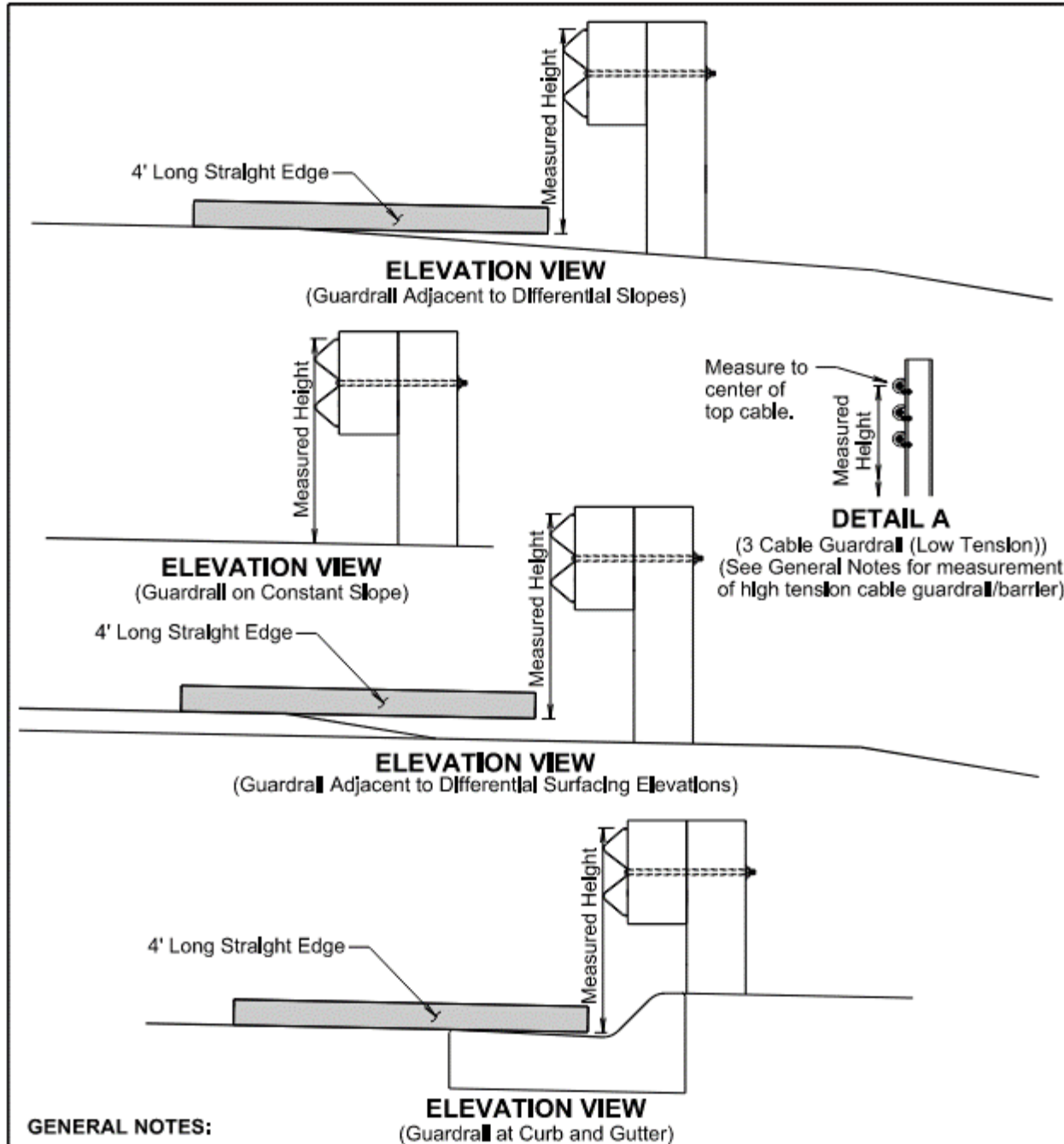
The backfill material will be mounded 1/2 inch to 1 inch above the top of the adjacent surfacing as illustrated above.

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

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

September 14, 2019

Published Date: 3rd Qtr. 2021	S D D O T	GUARDRAIL POST INSTALLED IN	PLATE NUMBER
		ASPHALT CONCRETE OR	630.96
		PORTLAND CEMENT CONCRETE	Sheet 1 of 1



GENERAL NOTES:

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

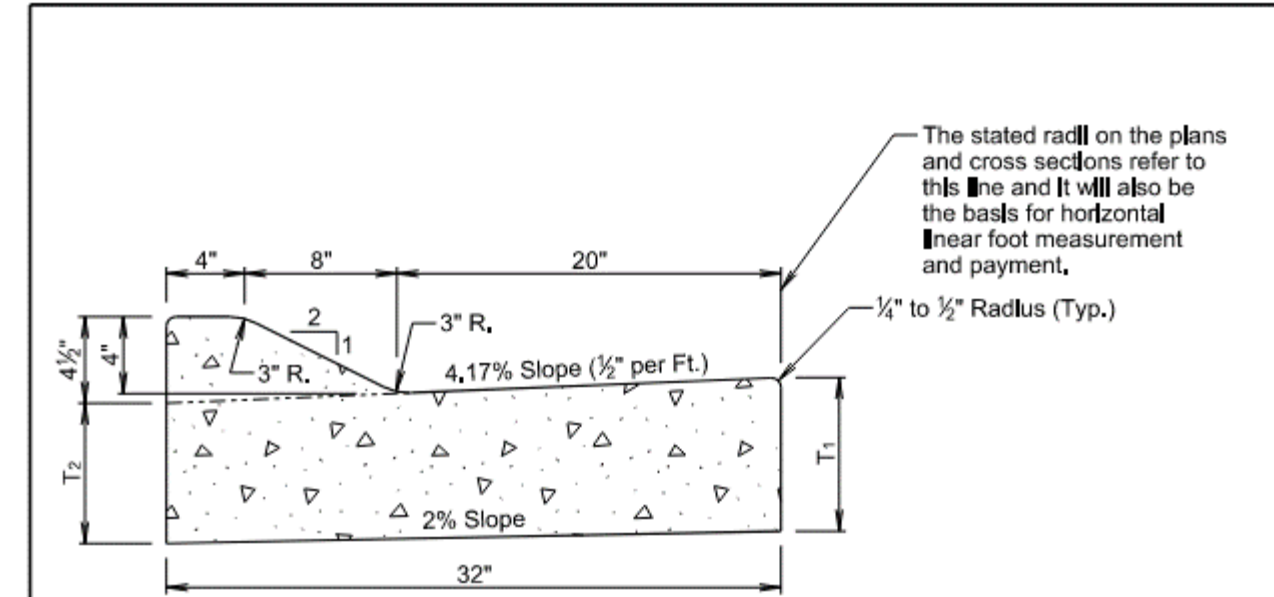
When measuring height of 3 cable guardrail (low tension) the height will be measured to the center of the top cable. See Detail A.

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

September 14, 2019

S D D O T	MEASURING GUARDRAIL HEIGHT	PLATE NUMBER 630.99
		Sheet 1 of 1

Published Date: 3rd Qtr. 2021



TYPE D CONCRETE CURB AND GUTTER

Type	T ₁ (Inches)	T ₂ (Inches)	Cu. Yd. Per Lin. Ft.	Lin. Ft. Per Cu. Yd.
D46	6	5 ⁵ / ₁₆	0.056	18.0
D47	7	6 ⁵ / ₁₆	0.064	15.7
D48	8	7 ⁵ / ₁₆	0.072	13.9
D48.5	8.5	7 ¹³ / ₁₆	0.076	13.1
D49	9	8 ⁵ / ₁₆	0.080	12.5
D49.5	9.5	8 ¹³ / ₁₆	0.084	11.9
D410	10	9 ⁵ / ₁₆	0.088	11.3
D410.5	10.5	9 ¹³ / ₁₆	0.093	10.8
D411	11	10 ⁵ / ₁₆	0.097	10.3
D411.5	11.5	10 ¹³ / ₁₆	0.101	9.9
D412	12	11 ⁵ / ₁₆	0.105	9.5

GENERAL NOTES:

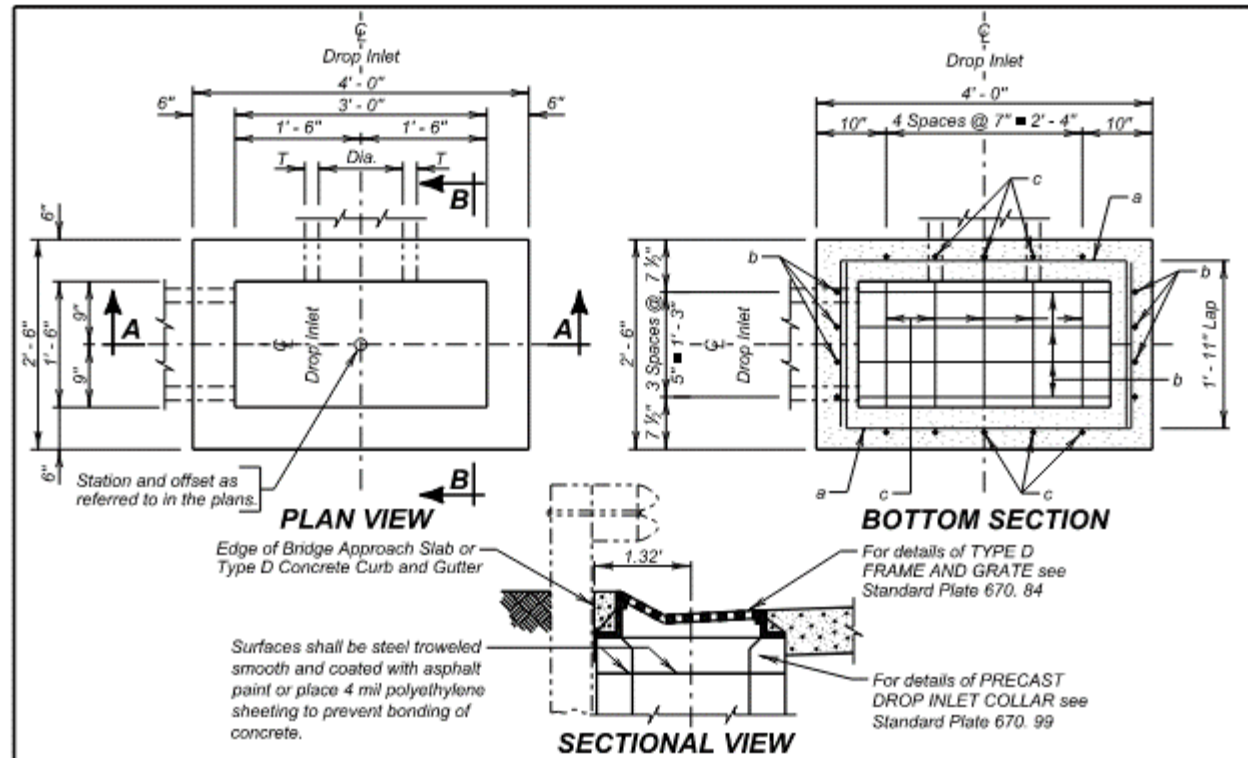
When concrete curb and gutter longitudinally adjoins new concrete pavement, the method of attachment will be by one of the methods shown on standard plate 380.11.

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

December 23, 2019

S D D O T	TYPE D CONCRETE CURB AND GUTTER	PLATE NUMBER 650.15
		Sheet 1 of 1

Published Date: 3rd Qtr. 2021



DROP INLETS FOR 12" TO 24" DIAMETER PIPE

ESTIMATED QUANTITIES			
ITEM	UNIT	CONSTANT QUANTITY	VARIABLE QUANTITY
* Class M6 Concrete	Cu. Yd.	0.22	0.20H
Reinforcing Steel	Lb.	39.95	25.40H
Frame and Grate Assembly	Each	1	—

SPECIFICATIONS

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

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

GENERAL NOTES:

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

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

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

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

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

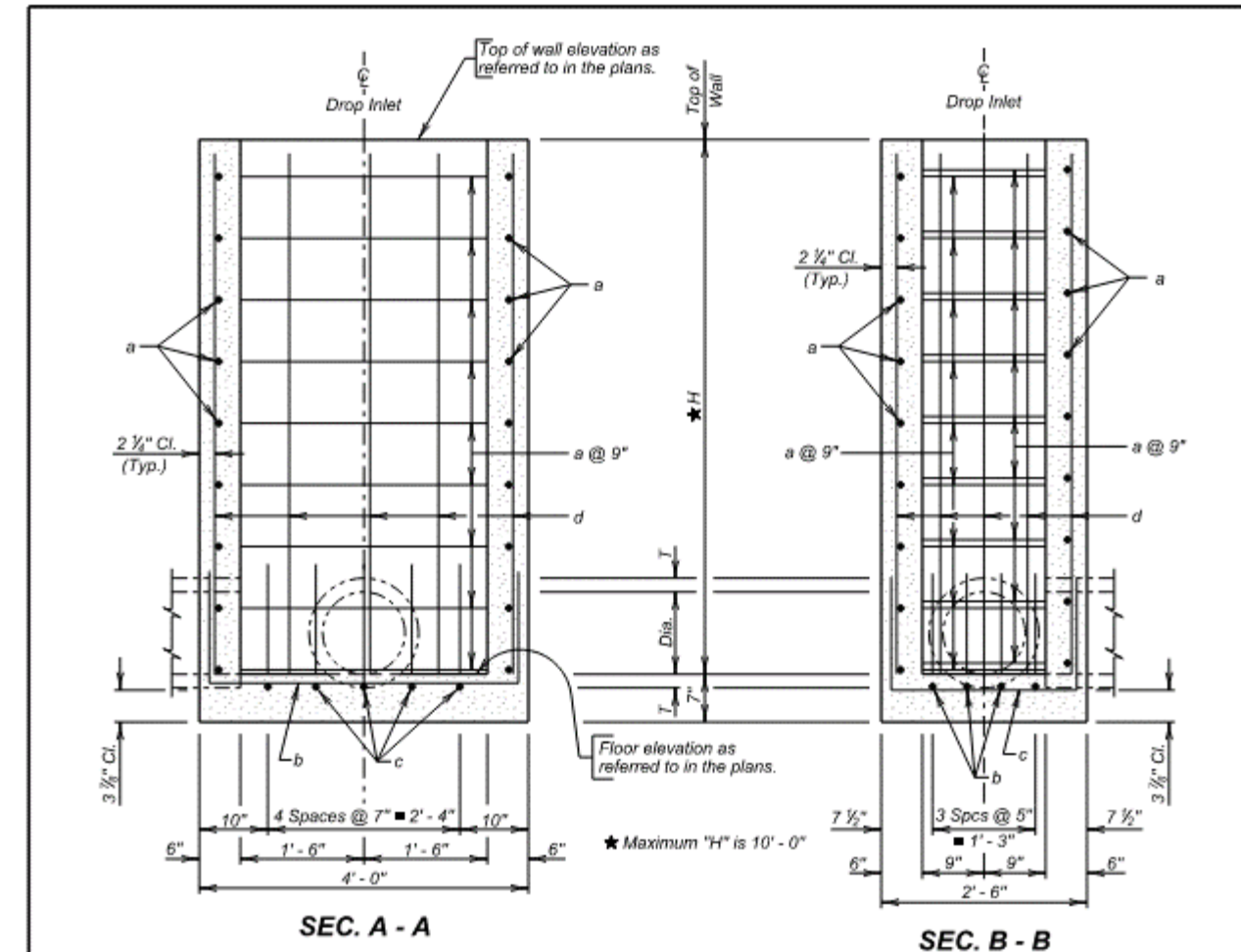
Maximum R.C.P. diameter shall not exceed 12 inches (No R. C. arch) on the 1-foot 6-inch wide side and shall not exceed 24 inches (24 inches for R. C. arch) on the 3-foot wide side of the drop inlet.

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

PIPE DISPLACEMENT REDUCTIONS			
Diameter (Inches)	Wall T (Inches)	Class M6 Concrete (Cu. Yd.)	
12	2	0.03	
15	2 1/4	0.04	
18	2 1/2	0.05	
24	3	0.09	
R.C. ARCH	18	2 1/2	0.05
	24	3 1/2	0.09

December 16, 2015

SD DOT	1.5' X 3' TYPE D REINFORCED CONCRETE DROP INLET	PLATE NUMBER 670.20
	Published Date: 3rd Qtr. 2021	Sheet 1 of 2



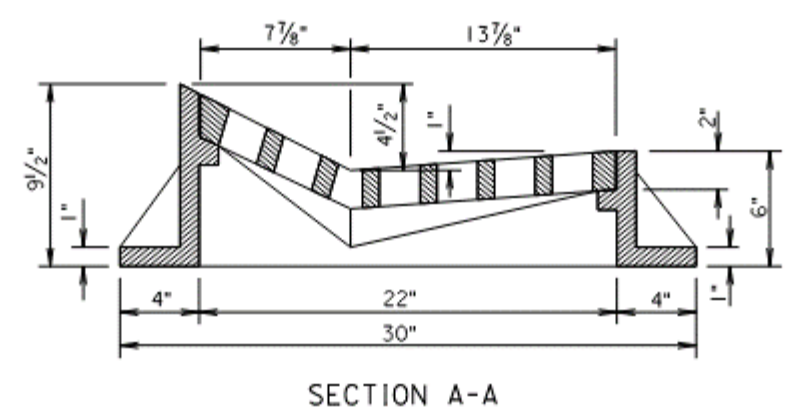
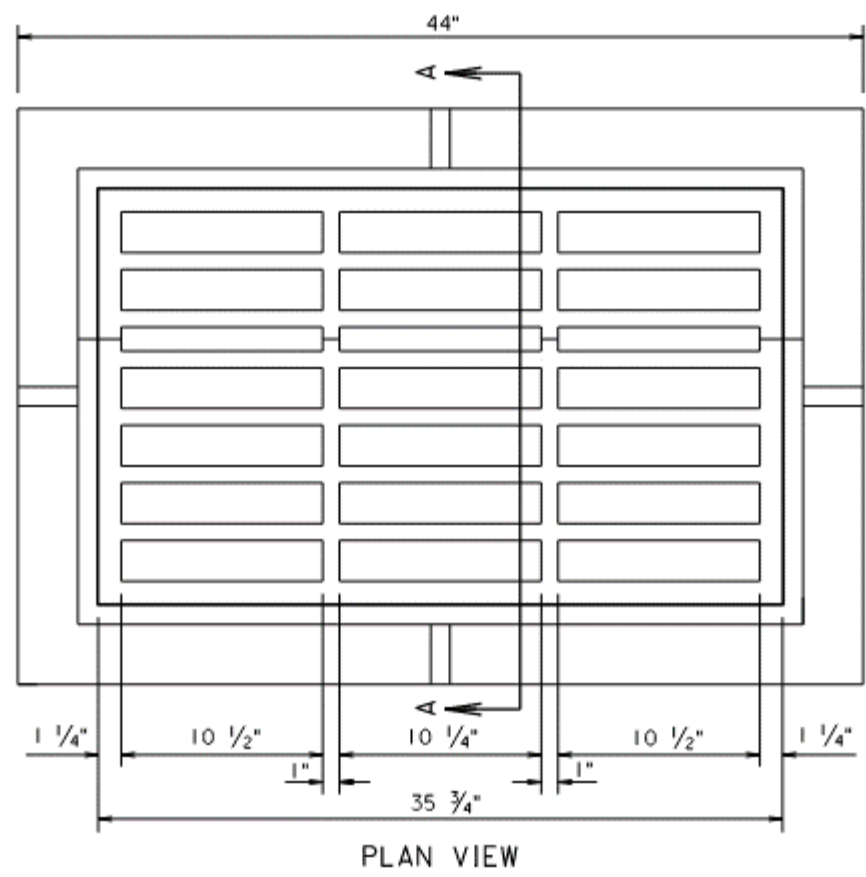
REINFORCING SCHEDULE				
Mk.	No.	Size	Length	Type
a	2.67H	4	7'-6"	17
b	4	5	6'-3"	17
c	5	4	4'-9"	17
d	18	4	H - 2"	Str.

NOTE: All dimensions are out to out of bars.

December 16, 2015

SD DOT	1.5' X 3' TYPE D REINFORCED CONCRETE DROP INLET	PLATE NUMBER 670.20
	Published Date: 3rd Qtr. 2021	Sheet 2 of 2



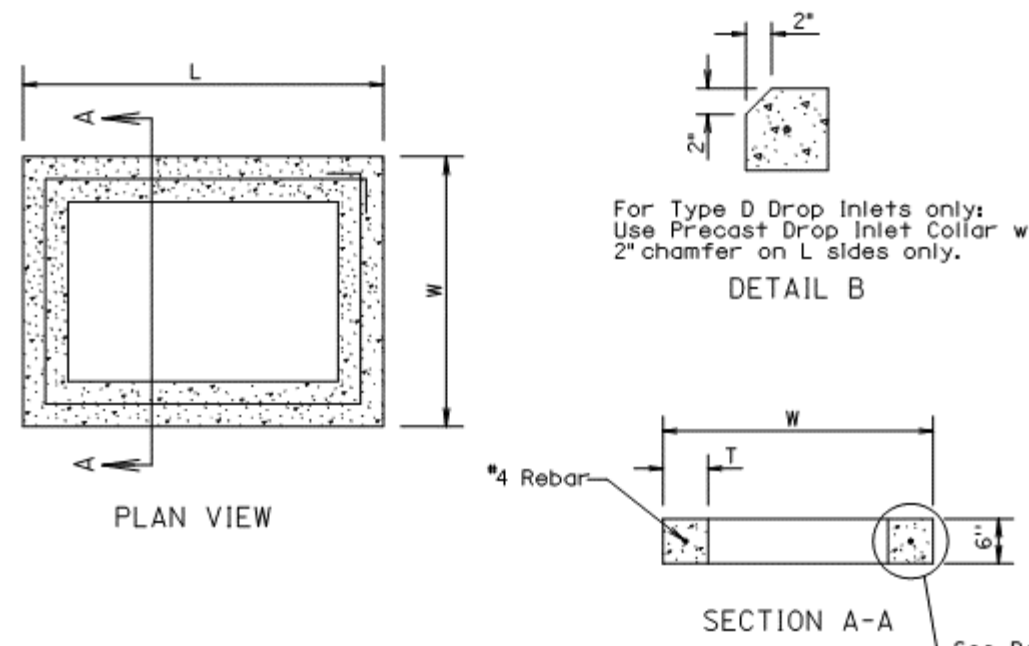


GENERAL NOTE:
The total weight of the frame and grate shall be 620 pounds minimum.

March 31, 2000

S D D O T	TYPE D FRAME AND GRATE	PLATE NUMBER 670.84
		Sheet 1 of 1

Published Date: 3rd Qtr. 2021



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

DETAIL B

SECTION A-A

See Detail B
(For Type D
Drop Inlets Only)

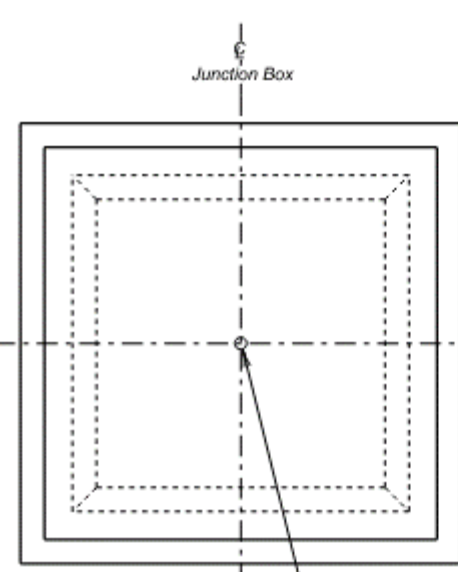
INFORMATIONAL QUANTITIES					
FRAME AND GRATE TYPE	L Ft-In	W Ft-In	T In	CLASS M6 CONCRETE CuYd	REINFORCING STEEL Lb
TYPE B	4'-0"	3'-0"	6	0.11	9
TYPE C	5'-0"	4'-0"	6	0.15	11
TYPE D	4'-0"	2'-6"	6	0.10	8

GENERAL NOTES:
All reinforcing steel shall conform to ASTM A615, Grade 60.
The 1/2" diameter bar shall lap 6"± and shall be centered in the concrete.
The cost of furnishing and installing Precast Drop Inlet Collars, including labor, materials, and incidentals shall be incidental to the contract unit price per Each for "Precast Drop Inlet Collar".

March 31, 2000

S D D O T	PRECAST DROP INLET COLLAR	PLATE NUMBER 670.99
		Sheet 1 of 1

Published Date: 3rd Qtr. 2021



PLAN VIEW

SPECIFICATIONS

Design Specifications: AASHTO LRFD Bridge Design Specifications, 2012 Edition.
Construction Specifications: South Dakota Standard Specifications for Roads and Bridges, Current Edition and required Provisions, Supplemental Specifications, and Special Provisions as included in the Proposal.

GENERAL NOTES

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

The design of the junction box is based on a maximum fill over the junction box of 5 feet and minimum fill over the junction box of 2 feet.

Reinforcing steel shall conform to ASTM A615 Grade 60. Cut and bend reinforcing steel as required to place pipe(s) through junction box wall.

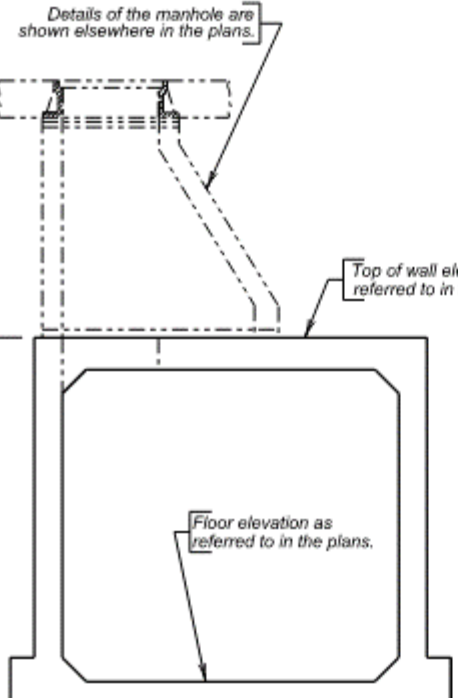
Junction box may be precast. If precast junction box details differ from this standard plate, submit a checked design done by a SD registered P.E. and shop plans to the Office of Bridge Design for approval.

Use 1 inch clear cover on all reinforcing steel unless otherwise noted.

All exposed edges shall be chamfered 1/4 inch.

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

The cost of furnishing and installing the manhole steps shall be incidental to the contract unit price per pound for "Reinforcing Steel".



ELEVATION VIEW

PIPE DISPLACEMENT REDUCTIONS		
Diameter (Inches)	Wall T (Inches)	Class M6 Concrete (Cu. Yd.)
12	2	0.03
15	2 1/4	0.04
18	2 1/2	0.06
24	3	0.11
30	3 1/2	0.16
36	4	0.23
42	4 1/2	0.31
48	5	0.40
54	5 1/2	0.50

ESTIMATED QUANTITIES		
ITEM	* Class M6 Concrete	Reinforcing Steel
UNIT	Cu. Yd.	Lb.
H 4'-0"	7.09	1506
H 4'-6"	7.42	1541
H 5'-0"	7.75	1622
H 5'-6"	8.08	1657
H 6'-0"	8.40	1692
H 6'-6"	8.73	1773
H 7'-0"	9.06	1808
H 7'-6"	9.39	1843
H 8'-0"	9.71	1924

*Reduce total quantities of concrete by the amount of concrete displaced by the pipe(s). Quantity shown includes reduction for a 24-inch diameter manhole opening. The total quantity of concrete shall be computed to the nearest hundredth of a cubic yard.

SD DOT

7' X 7' JUNCTION BOX

Published Date: 3rd Qtr. 2021

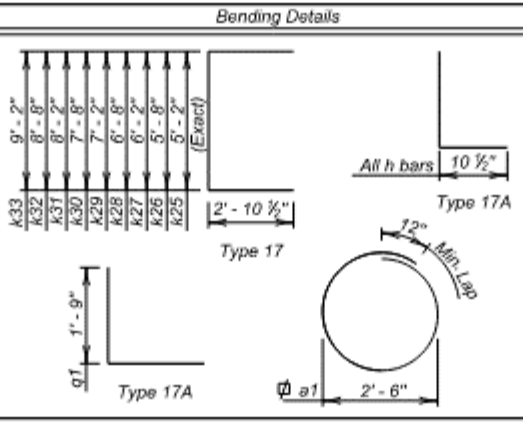
May 9, 2020

PLATE NUMBER
671.03

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REINFORCING SCHEDULE

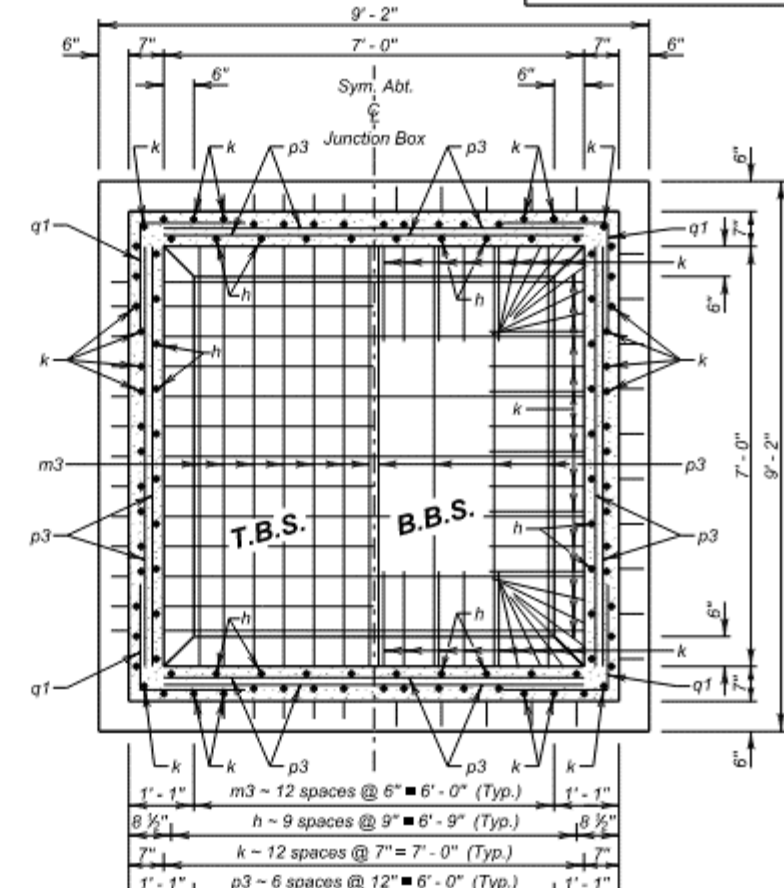
Mk.	No.	Size	Length	Type
a1	1	6	9'-0"	T3
a2	4	-	-	-
h25	40	4	5'-9"	17A
k25	64	4	9'-3"	17
m3	26	6	8'-9"	Str.
n3	26	6	7'-9"	Str.
p3	60	4	7'-0"	Str.
q3	8	4	3'-6"	17A
a1	1	6	9'-0"	T3
a2	4	-	-	-
h26	40	4	6'-3"	17A
k26	64	4	9'-9"	17
m3	26	6	8'-9"	Str.
n3	26	6	7'-9"	Str.
p3	60	4	7'-0"	Str.
q1	8	4	3'-6"	17A
a1	1	6	9'-0"	T3
a2	5	-	-	-
h27	40	4	6'-9"	17A
k27	64	4	10'-3"	17
m3	26	6	8'-9"	Str.
n3	26	6	7'-9"	Str.
p3	68	4	7'-0"	Str.
q1	12	4	3'-6"	17A
a1	1	6	9'-0"	T3
a2	5	-	-	-
h28	40	4	7'-3"	17A
k28	64	4	10'-9"	17
m3	26	6	8'-9"	Str.
n3	26	6	7'-9"	Str.
p3	68	4	7'-0"	Str.
q1	12	4	3'-6"	17A
a1	1	6	9'-0"	T3
a2	6	-	-	-
h29	40	4	7'-9"	17A
k29	64	4	11'-3"	17
m3	26	6	8'-9"	Str.
n3	26	6	7'-9"	Str.
p3	68	4	7'-0"	Str.
q1	12	4	3'-6"	17A
a1	1	6	9'-0"	T3
a2	6	-	-	-
h30	40	4	8'-3"	17A
k30	64	4	11'-9"	17
m3	26	6	8'-9"	Str.
n3	26	6	7'-9"	Str.
p3	76	4	7'-0"	Str.
q1	16	4	3'-6"	17A
a1	1	6	9'-0"	T3
a2	7	-	-	-
h31	40	4	8'-9"	17A
k31	64	4	12'-3"	17
m3	26	6	8'-9"	Str.
n3	26	6	7'-9"	Str.
p3	76	4	7'-0"	Str.
q1	16	4	3'-6"	17A



LEGEND FOR PLACING RE-STEEL

T.B.S. - Top of Bottom Slab
B.B.S. - Bottom of Bottom Slab

Cast iron Manhole Steps (R - 1980 - C) from Neenah Foundry or equivalent.
Locate in center of top slab with 3" clearance at manhole opening.
All dimensions are out to out of bars.



SEC. A - A

SD DOT

7' X 7' JUNCTION BOX

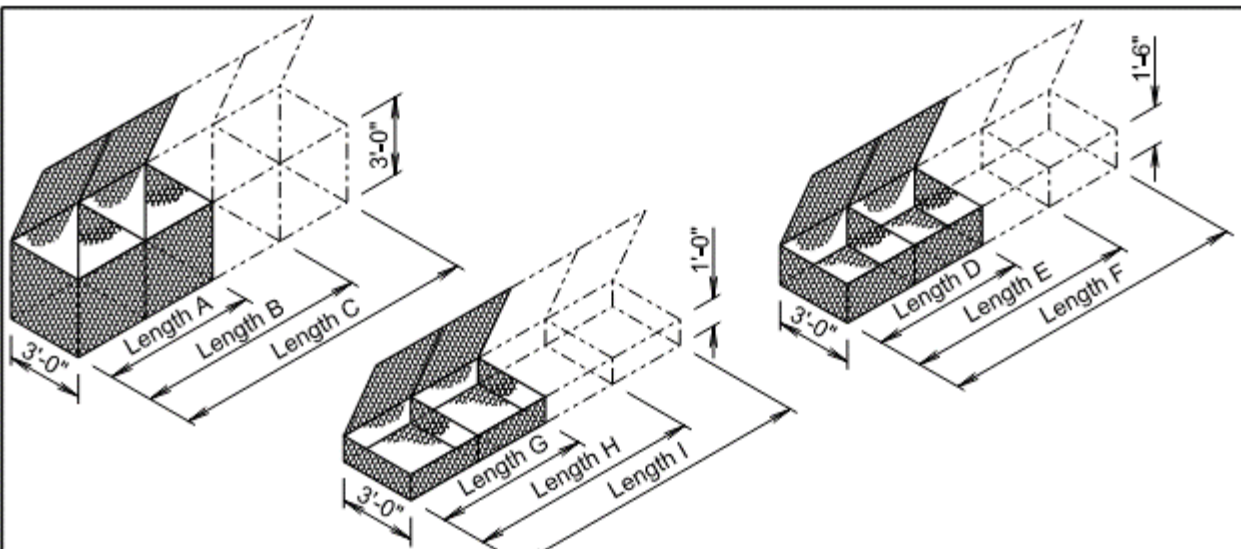
Published Date: 3rd Qtr. 2021

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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 gablons 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 1 1/2 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 gablon assembly and final construction of gablon structures. Interlocking fasteners for galvanized gablons 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.

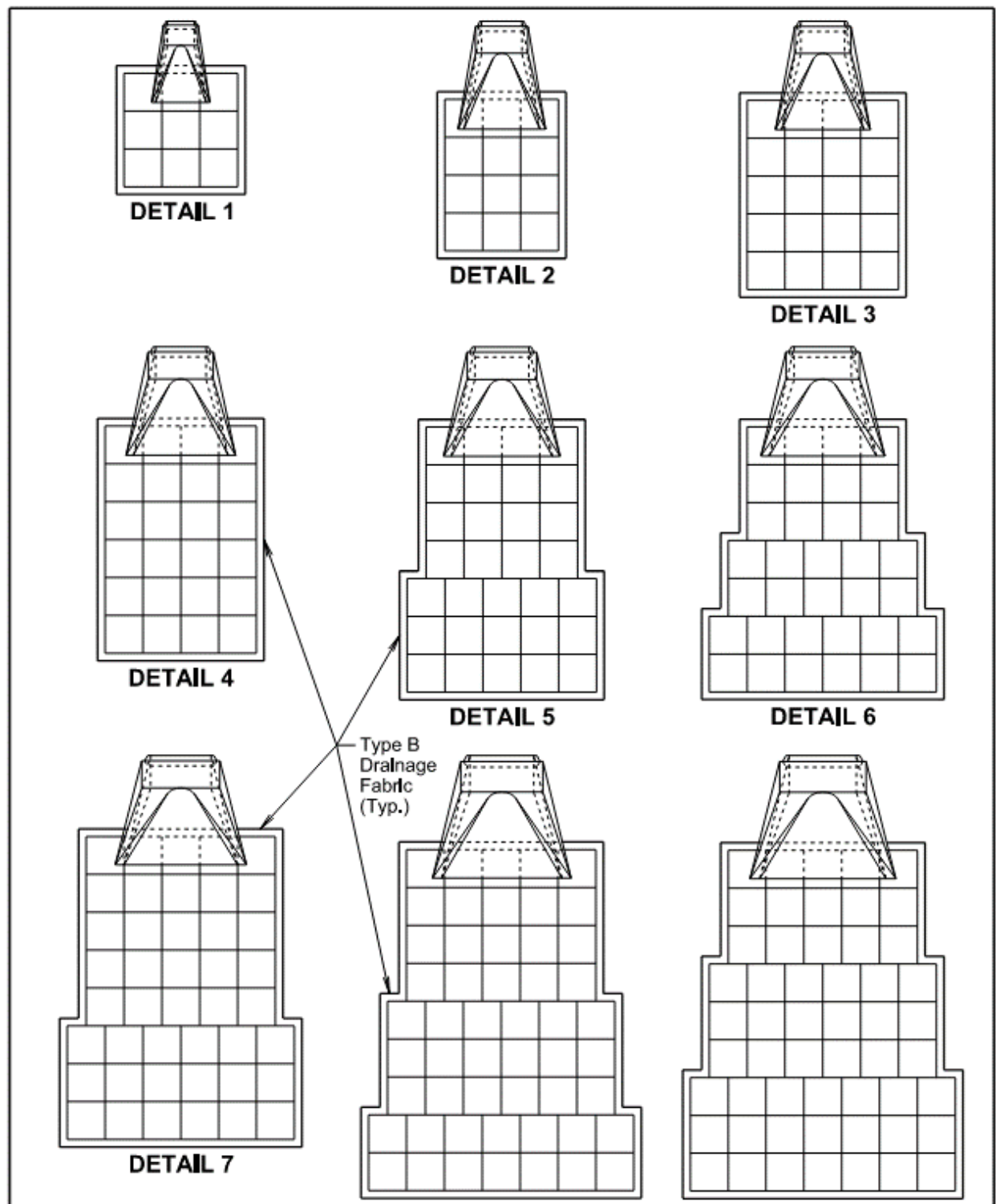
Interlocking fasteners for PVC coated gablons will be high tensile 0.120 inch diameter stainless steel wire conforming to ASTM A313, Type 302, Class 1. The spacing of the interlocking fasteners during all phases of assembly and construction will not exceed 6 inches.

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 GABLONS	PLATE NUMBER 720.01
		Sheet 1 of 1

Published Date: 1st Qtr. 2022



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: 1st Qtr. 2022

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

GENERAL NOTES:

Gablons 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 gablons will be modified to accommodate the metal end section as approved by the Engineer.

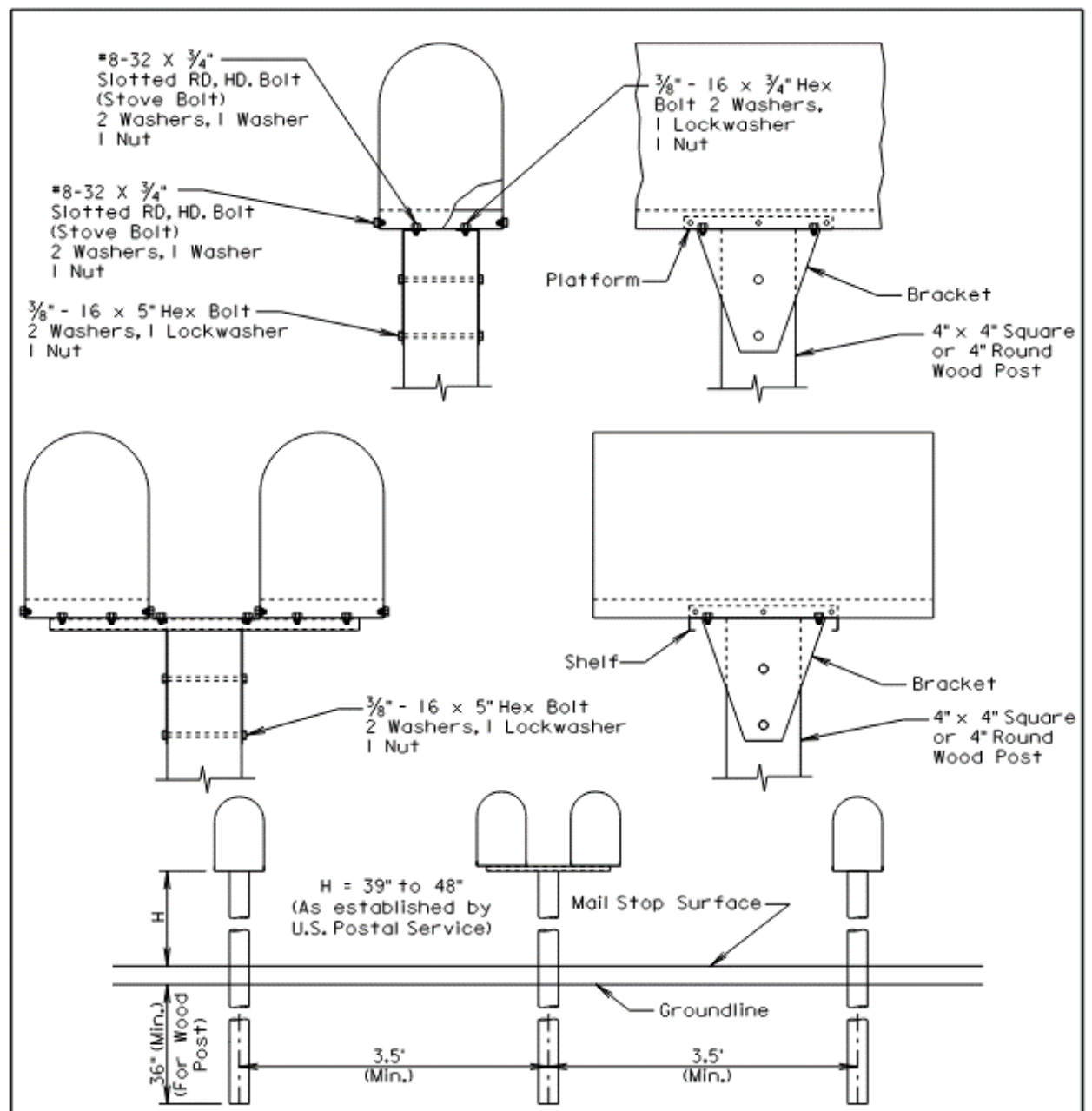
* Gablon and type B drainage fabric quantities on this standard plate are based on standard gablon sizes D, E, and F as depicted on standard plate 720.01.

Type B drainage fabric will be placed under the gablons and around the exterior sides (perimeter) of the gablons 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 2 of 2

Published Date: 1st Qtr. 2022



GENERAL NOTES: SPACING FOR MULTIPLE POST INSTALLATION

The post support assemblies provided should be consistent throughout the project. Single and double mailboxes may be in any sequence.

Post support assemblies shall be one from the approved products list, a 4"x4" or 4" round wood post, or an alternate post support assembly that meets the test level 3 crash testing requirements of NCHRP 350 or MASH.

Alternate mailbox support assemblies shall be approved by the Engineer prior to installation. The Contractor shall provide the Engineer written certification that the mailbox support assembly has met the crash testing requirements and will be installed in accordance with the manufacturer's installation instructions.

September 6, 2013

S D D O T	SINGLE AND DOUBLE MAILBOX ASSEMBLIES	PLATE NUMBER 900.02
		Sheet 1 of 1

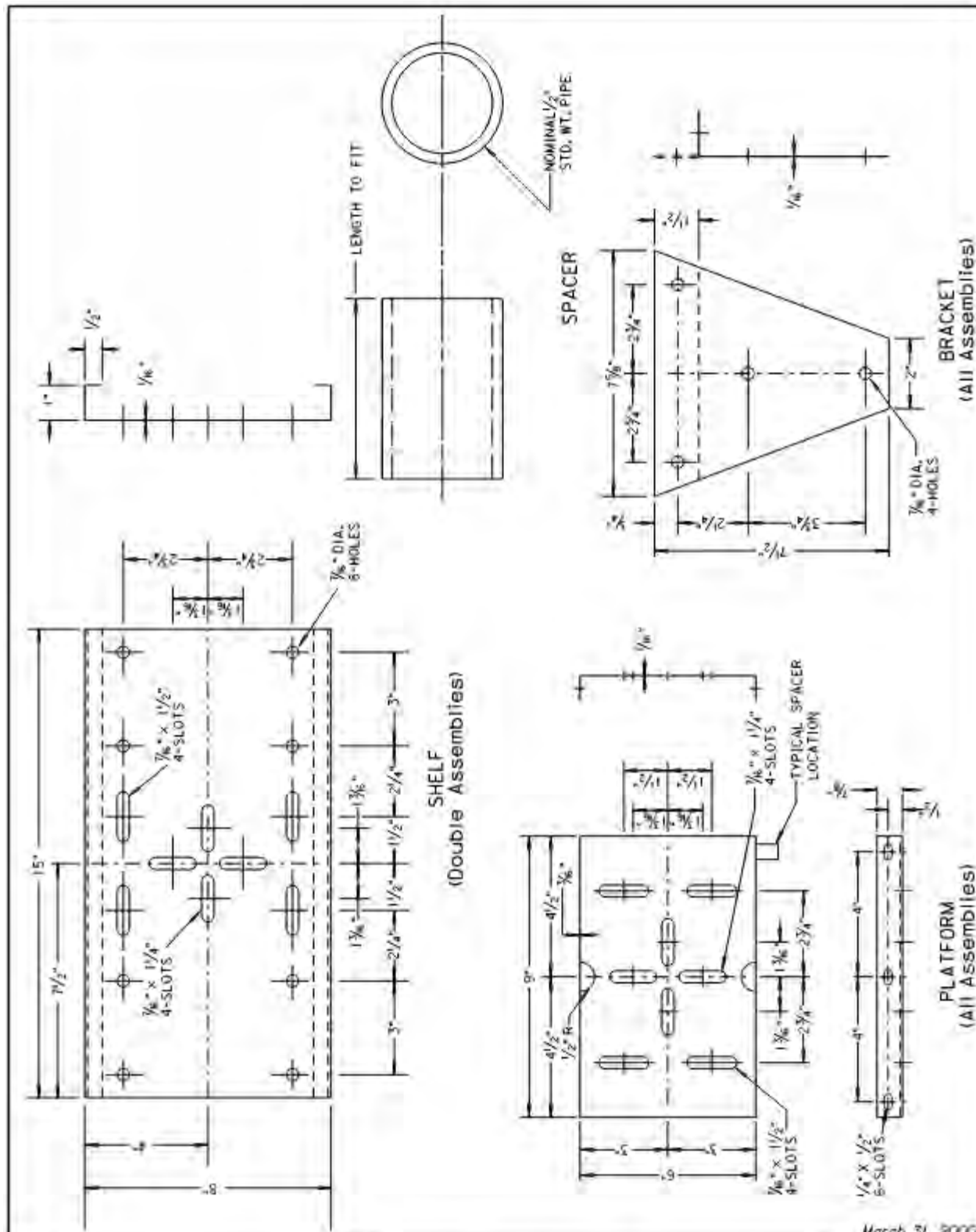
Published Date: 3rd Qtr. 2021



STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 2291(01)10	B71	B71

Plotting Date: 2/1/2022

REV 02/02/2022 KAO



March 31, 2000

Published Date: 3rd Qtr. 2021	MAILBOX SUPPORT HARDWARE	PLATE NUMBER 900.03
		Sheet 1 of 1