

SECTION B: GRADING PLANS

FOR BIDDING PURPOSES ONLY

BAI JOB # 23190-12

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0025(89)149	B1	B71

Plotting Date: 05-22-2025

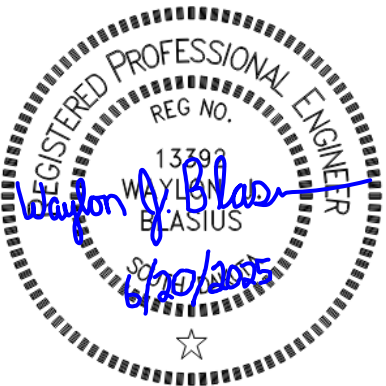
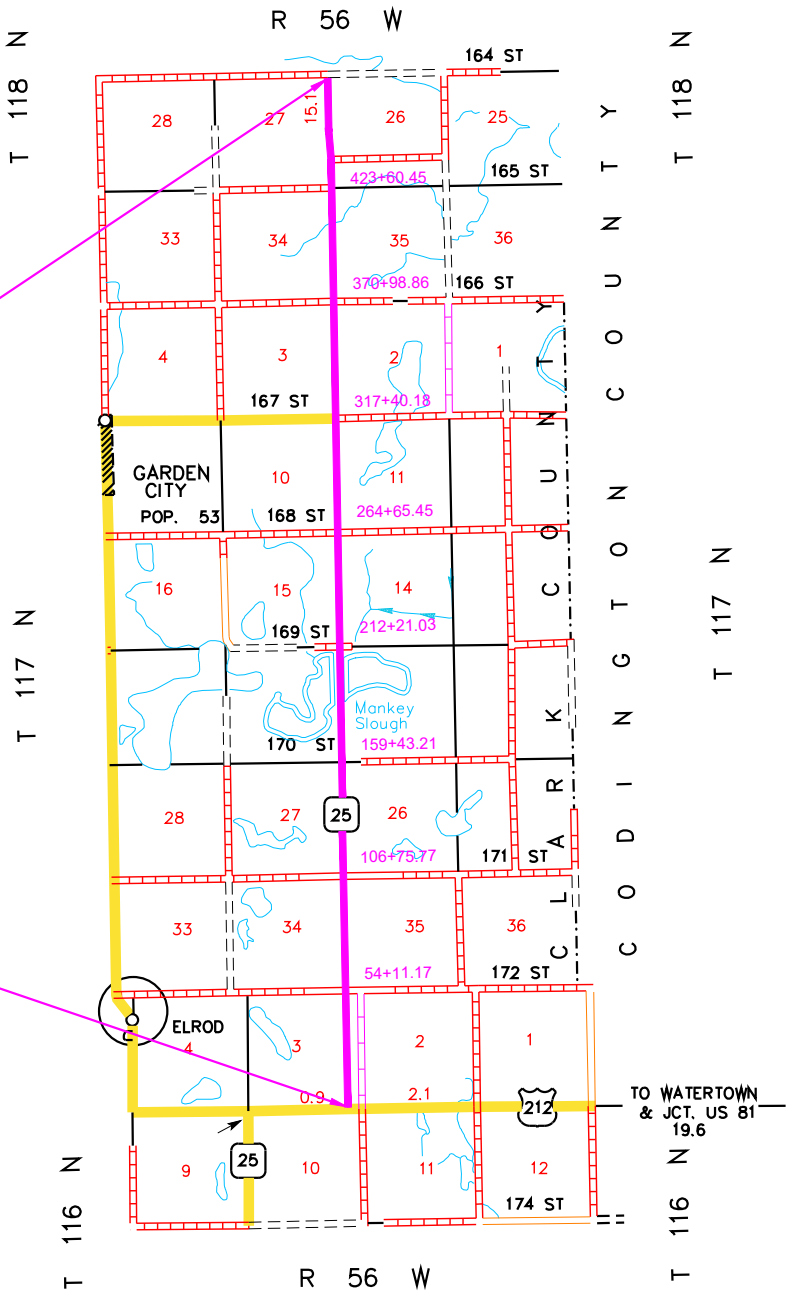
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END P 0025(89)149
Station 476+13 = Station 210+92.60 on F 465(1)

BEGIN P 0025(89)149
Station 0+86 = Station 687+52.30 on F 465(1)



SECTION B ESTIMATE OF QUANTITIES

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
009E3220	Reestablish Right-of-Way and Property Corner	88	Each
009E3225	Reestablish Public Land Survey System Corner	18	Each
009E3230	Grade Staking	9,001	Mile
009E3245	Final Cross Section Survey	9,001	Mile
009E3250	Miscellaneous Staking	9,001	Mile
009E3280	Slope Staking	9,001	Mile
009E3301	Engineer Directed Surveying/Staking	40.0	Hour
009E4300	Construction Schedule, Category III	Lump Sum	LS
009E4330	Project Management, Category III	Lump Sum	LS
100E0100	Clearing	Lump Sum	LS
110E0600	Remove Fence	5,739	Ft
110E1050	Remove Asphalt Concrete Approach Pavement	1,433.0	SqYd
110E5451	Salvage Riprap	7,440.0	Ton
120E0010	Unclassified Excavation	535,133	CuYd
120E0600	Contractor Furnished Borrow Excavation	148,229	CuYd
120E0900	Contaminated Material Excavation	100	CuYd
120E1000	Muck Excavation	25,635	CuYd
120E2000	Undercutting	132,722	CuYd
120E6100	Water for Embankment	5,240.0	MGal
250E0020	Incidental Work, Grading	Lump Sum	LS
260E6010	Granular Material	200.0	Ton
* 270E0022	Salvage Asphalt Mix Material	9,300.0	Ton
270E0040	Salvage and Stockpile Asphalt Mix and Granular Base Material	145,583.1	Ton
* 270E0040	Salvage and Stockpile Asphalt Mix and Granular Base Material	250.0	Ton
* 270E0210	Haul and Stockpile Granular Material	250.0	Ton
* 270E0230	Haul and Stockpile Asphalt Mix Material	9,300.0	Ton
421E0100	Pipe Culvert Undercut	788	CuYd
450E0143	24" RCP Class 3, Furnish	1,310	Ft
450E0144	24" RCP Class 4, Furnish	72	Ft
450E0150	24" RCP, Install	1,382	Ft
450E0163	30" RCP Class 3, Furnish	736	Ft
450E0164	30" RCP Class 4, Furnish	64	Ft
450E0170	30" RCP, Install	800	Ft
450E0182	36" RCP Class 2, Furnish	264	Ft
450E0190	36" RCP, Install	264	Ft
450E0192	42" RCP Class 2, Furnish	78	Ft
450E0200	42" RCP, Install	78	Ft
450E0202	48" RCP Class 2, Furnish	160	Ft
450E0210	48" RCP, Install	160	Ft
450E0212	54" RCP Class 2, Furnish	122	Ft
450E0214	54" RCP Class 4, Furnish	120	Ft

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
450E0220	54" RCP, Install	242	Ft
450E2028	36" RCP Flared End, Furnish	6	Each
450E2029	36" RCP Flared End, Install	6	Each
450E2032	42" RCP Flared End, Furnish	2	Each
450E2033	42" RCP Flared End, Install	2	Each
450E2036	48" RCP Flared End, Furnish	4	Each
450E2037	48" RCP Flared End, Install	4	Each
450E2040	54" RCP Flared End, Furnish	4	Each
450E2041	54" RCP Flared End, Install	4	Each
450E2200	24" RCP Sloped End, Furnish	28	Each
450E2201	24" RCP Sloped End, Install	28	Each
450E2204	30" RCP Sloped End, Furnish	18	Each
450E2205	30" RCP Sloped End, Install	18	Each
450E2308	24" RCP Safety End, Furnish	6	Each
450E2311	24" RCP Safety End, Install	6	Each
450E3023	30" RCP Arch Class 3, Furnish	62	Ft
450E3030	30" RCP Arch, Install	62	Ft
450E3032	36" RCP Arch Class 2, Furnish	340	Ft
450E3034	36" RCP Arch Class 4, Furnish	88	Ft
450E3040	36" RCP Arch, Install	428	Ft
450E3042	42" RCP Arch Class 2, Furnish	100	Ft
450E3050	42" RCP Arch, Install	100	Ft
450E3052	48" RCP Arch Class 2, Furnish	156	Ft
450E3060	48" RCP Arch, Install	156	Ft
450E3072	60" RCP Arch Class 2, Furnish	78	Ft
450E3080	60" RCP Arch, Install	78	Ft
450E4512	36" RCP Arch Flared End, Furnish	8	Each
450E4513	36" RCP Arch Flared End, Install	8	Each
450E4516	42" RCP Arch Flared End, Furnish	2	Each
450E4517	42" RCP Arch Flared End, Install	2	Each
450E4520	48" RCP Arch Flared End, Furnish	4	Each
450E4521	48" RCP Arch Flared End, Install	4	Each
450E4528	60" RCP Arch Flared End, Furnish	2	Each
450E4529	60" RCP Arch Flared End, Install	2	Each
450E4604	30" RCP Arch Sloped End, Furnish	2	Each
450E4605	30" RCP Arch Sloped End, Install	2	Each
450E4606	36" RCP Arch Sloped End, Furnish	2	Each
450E4607	36" RCP Arch Sloped End, Install	2	Each
450E4759	18" CMP 16 Gauge, Furnish	1,346	Ft
450E4760	18" CMP, Install	1,346	Ft
450E4769	24" CMP 16 Gauge, Furnish	410	Ft
450E4770	24" CMP, Install	410	Ft
450E4779	30" CMP 16 Gauge, Furnish	54	Ft

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
450E4780	30" CMP, Install	54	Ft
450E5406	18" CMP Safety End, Furnish	34	Each
450E5407	18" CMP Safety End, Install	34	Each
450E5410	24" CMP Safety End, Furnish	12	Each
450E5411	24" CMP Safety End, Install	12	Each
450E5414	30" CMP Safety End, Furnish	2	Each
450E5417	30" CMP Safety End, Install	2	Each
451E7300	Repair Drain Tile	500	Ft
464E0100	Controlled Density Fill	26.8	CuYd
600E0300	Type III Field Laboratory	1	Each
620E0020	Type 2 Right-of-Way Fence	5,750	Ft
620E0515	Type 1A Temporary Fence	3,091	Ft
620E1020	2 Post Panel	18	Each
620E1030	3 Post Panel	11	Each
700E0110	Class A Riprap	3,690.0	Ton
700E2010	Place Riprap	7,440.0	Ton
720E1010	PVC Coated Bank and Channel Protection Gabion	66.0	CuYd
831E0110	Type B Drainage Fabric	11,194	SqYd
900E0010	Refurbish Single Mailbox	2	Each
900E1150	Right of Way Marker	82	Each

* - Denotes Non-Participating



GRADING OPERATIONS

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

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

Special ditch grades and other sections of the roadway different than the typical section 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.

Once surfacing removal and undercutting operations are complete, mainline pipe and box culverts will be installed prior to the Contractor backfilling the undercut and/or placing embankment on the roadway within 500 feet in either direction of the crossing locations.

The Contractor is advised that at the time of the investigation (March-May 2021), groundwater was encountered at a level that will be near or above the bottom of the proposed ditch cuts/undercut at Stations 220+00, 241+00, 259+00, 272+00, and 305+00. Seasonal changes may affect the groundwater elevations. The Contractor is encouraged to review the soil borings shown in the cross sections for additional water table information.

The Contractor will contact the landowner for Parcel 6 and notify them in advance of performing any grading work outside of the right-of-way and on the property.

Inundated Construction Areas

The following areas were inundated with water at the time of field inspection. Extra effort may be required to excavate saturated organic material from the embankment footprint prior to fill placement. The contractor will excavate muck materials ahead of the advancing fill. Special excavation techniques (long-reach equipment etc.) may be required at the following locations:

Clark County Route 29
Station 16+75± to Station 19+00±, Lt.
Station 18+00± to Station 19+00±, Rt.

SD25
Station 147+00± to Station 159+00±, Lt. & Rt
Station 207+00± to Station 212+00±, Rt.
Station 208+75± to Station 212+00±, Lt
Station 317+75± to Station 322+00±, Rt
Station 325+00± to Station 327+00±, Rt.

If in the opinion of the Engineer, Muck Excavation cannot be completed through conventional methods, the embankment may be constructed by end dumping and pushing fill material into the inundated area. Prior to placement of fill the foundation will be prepared to the satisfaction of the Engineer by use of long-reach or other equipment to displace soft, organic, and unstable

material. Push fill material into the water at an angle that will cause the mud wave to be pushed outside the limits of the embankment.

TYPE III FIELD LABORATORY

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

UTILITIES

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

CLEARING

Before clearing activities begin, the Contractor will contact the Engineer to determine the limits of clearing for the project. If the trees or shrubs that are supposed to remain within the limits of work are damaged or destroyed by the Contractor, the Contractor will replace them with the same size and type at the Contractor's expense.

All trees removed will become the property of the Contractor.

GENERAL GEOLOGY

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

CLASSIFICATION OF EXCAVATION

Most of the material encountered should be able to be excavated using conventional methods associated with normal Unclassified Excavation. Muck Excavation will be required at the areas shown in the plans or as directed by the Engineer.

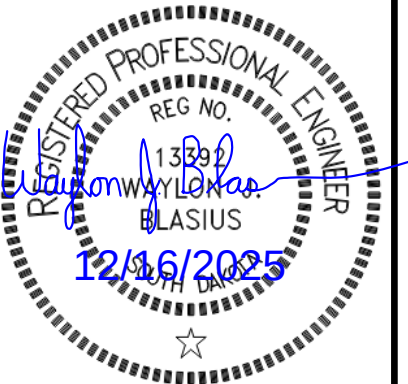
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INSLOPE TRANSITIONS

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

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

Station	L/R	Type
19+26	L/R	1
42+45	L/R	1
158+20	L/R	1
221+40	L/R	2
285+32	L/R	2
342+21	L/R	2
384+76	L/R	2
424+84	L/R	2
448+23	L/R	2
456+27	L/R	2



Compensation for "Extra Haul" will not be made for haul distances less than 5 stations. When payment for "Extra Haul" is authorized, the distance used for "Extra Haul" calculations will be that in excess of 5 stations.



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 4 inches) will then be replaced and compacted to the density specified to the section being constructed.

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

TABLE OF UNDERCUTTING LOCATIONS

Station	to	Station
0+86		25+00
30+00		81+00
89+00		209+00
216+00		247+00
254+00		288+00
298+00		313+00
322+00		342+00
346+00		404+00
410+00		476+13

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 7486 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)
54+25		56+50	L	2	109
246+00		253+00	R	2	1197
247+00		253+00	L	2	847
282+00		296+00	L	2	1919
290+75		296+50	R	2	1114
312+00		315+00	R	2	553
313+00		317+00	L	2	832
305+50		309+00	L	2	546
XR317					
13+50		15+25	R	2	369
				Total:	7486

MUCK EXCAVATION

The areas of muck excavation are drawn on the cross sections with a normal depth of 3 feet. The estimated quantity of 25635 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)
2+00		5+50	R	3	393
3+00		5+50	L	3	180
19+00		22+00	R	3	886
19+00		27+00	L	3	1549
40+50		49+00	R	3	1137
40+50		49+00	L	3	1462
50+75		54+20	R	3	292
50+75		54+20	L	3	356
80+00		81+50	R	3	540
80+50		85+00	L	3	899
107+10		112+50	R	3	511
107+10		112+50	L	3	511
147+00		159+00	R	3	2456
147+00		159+00	L	3	1028
183+50		186+00	L	3	246
207+00		212+00	R	3	839
208+75		212+00	L	3	1679
283+00		290+75	R	3	1206

315+00	317+00	R	3	685
317+75	322+00	R	3	706
317+75	327+00	L	3	1411
325+00	327+00	R	3	415
405+50	408+50	R	3	503
443+50	449+00	R	3	603
443+50	462+90	L	3	2298
450+50	462+90	R	3	1643
XR317				
14+00	15+25	L	3	384
16+75	19+00	L	3	375
16+75	19+00	R	3	442
				Total: 25635

SALVAGE AND STOCKPILE ASPHALT MIX AND GRANULAR BASE MATERIAL

The Los Angeles Abrasion Loss value on the aggregate used for the in-place asphalt concrete was 22. This value was obtained from testing during construction of the in-place asphalt concrete.

An estimated 144,683 tons (72,414 Cubic Yards) of asphalt mix and granular base material will be used as Base Course, Salvaged on this project.

An estimated 900 tons (476 Cubic Yards) of asphalt mix and granular base material may be used as Temporary Gravel Surfacing on this project as directed by the Engineer. See Section C, Traffic Control Plans, for details on where and when to place Temporary Gravel Surfacing.

Salvaged material will be processed to meet the requirements of Section 884.2 D.7 prior to stockpiling. The Contractor will ensure that no vegetation, topsoil, subgrade, or other foreign material is incorporated into the salvaged asphalt mix and granular base material.

The quantity of salvaged asphalt mix and granular base material may vary from the plans. Excess salvaged asphalt mix and granular base material not used on the project will be stockpiled according to the Stockpile Site for Salvaged Material plan note.

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



SALVAGE AND STOCKPILE ASPHALT MIX MATERIAL

The Los Angeles Abrasion Loss value on the aggregate used for the in-place asphalt concrete was 22. This value was obtained from testing during construction of the in-place asphalt concrete.

An estimated 9,300 tons (4,655 Cubic Yards) of asphalt mix material will be salvaged from the existing highway and stockpiled at a Contractor furnished location according to the Stockpile Site for Salvaged Asphalt Mix Material plan note to be used as RAP in the asphalt concrete for PCN 06DX.

All costs for salvaging the remaining asphalt concrete material will be incidental to the contract unit price per ton for Salvage and Stockpile Asphalt Mix and Granular Base Material.

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

SALVAGE AND STOCKPILE ASPHALT MIX MATERIAL (Cont.)

The following table is furnished for information only.

MRM	Distance from Centerline (Feet)		Thickness of Asphalt Mix Material (Inches)	Thickness of Granular Material (Inches)
	Lt.	Rt.		
149.98		10.2	6.0	12.0
150.50	7.0		8.0	11.0
151.00		6.4	6.0	14.0
151.50	6.2		7.0	12.0
152.00		7.4	7.0	13.0
152.50	6.8		7.0	11.0
153.00		6.8	6.0	13.0
153.20		9.4	5.0	13.0
154.00		6.6	8.0	12.0
154.50	6.8		8.0	11.0
155.00		7.0	7.0	11.0
155.50	7.6		8.0	8.0
156.00		7.2	8.0	9.0
156.17		9.0	9.0	8.0
156.47		9.6	9.0	8.0
157.00	7.6		7.0	11.0
157.40		10.2	7.0	10.0
157.72		9.8	7.0	11.0
157.99		9.6	7.0	11.0
158.50	7.6		7.0	10.0
158.75		8.6	7.0	9.0
Average Thickness:			7.2	10.9

STOCKPILE SITE FOR SALVAGED MATERIAL

The Contractor will acquire a stockpile site within 1 mile of the project for placing in a separate pile 9,300 tons of processed asphalt mix material to be used on a future asphalt concrete surfacing project, and for the temporary storage and handling of salvaged asphalt mix material from this project. Equipment will not be allowed on the stockpile.

An estimated 250 tons of excess salvaged asphalt mix and granular base material not used on the project will be stockpiled at this Contractor furnished stockpile site to be used on a future asphalt concrete surfacing project. The salvaged asphalt mix and granular base material will be placed in a separate pile.

The Contractor will secure transferable rights from the landowner for access, storage, handling, and retrieval of the salvaged material. The Contractor will provide and transfer these rights to the Department by completion of the salvaging and stockpiling operation.

Upon completion of the stockpile, the stockpile site and haul road to the site will be left in a neat and accessible condition as determined by the Engineer. At this time the Contractor will be released from any further work obligation regarding the stockpile site and haul road.

All costs associated with acquiring the site, including land rental and loss of production to the landowner through December 31, 2027, haul road restoration after completion of stockpiling, stripping of topsoil, and site preparation prior to stockpiling will be incidental to the contract unit price per ton for "Salvage and Stockpile Asphalt Mix Material". Stockpile cleanup, replacement of topsoil, reseeding, and final haul road restoration will be the responsibility of the Department.

STOCKPILE SITE

Prior to stockpiling of materials, topsoil will be salvaged from and stockpiled within the leased area. Topsoil will be considered to consist of the upper 6 inches of natural soil which normally supports vegetation.

A Type 1A Temporary Fence with six 2 post panels will be erected around the stockpile site.

Type 1A Temporary Fence will be paid for at the contract unit price.

Payment for stockpile site preparation will be incidental to the various contract items.

TABLE OF ASPHALT CONCRETE APPROACH PAVEMENT REMOVAL

Station	to	Station	L/R	Quantity (SqYd)
53+50		54+64	L	157
53+57		54+53	R	123
106+30		107+15	R	142
106+45		107+11	L	118
264+19		264+38	L	110
265+07		265+00	R	38
316+88		317+82	R	165
353+06		353+95	L	47
370+73		371+24	R	69
370+74		371+19	L	70
423+34		424+02	L	100
435+84		436+84	R	171
475+94		476+68	L	123
Total:				1433

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.

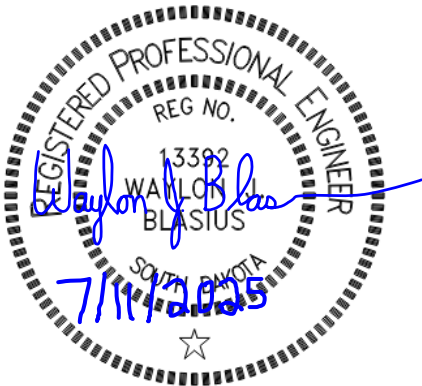
The Contractor furnished borrow excavation material will be uniform in texture and free from organic material. The liquid limit will not exceed 45 and the plastic index will not exceed 25.

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.



EXCAVATION FOR DEEP PIPE REMOVAL

Included in the quantity of "Unclassified Excavation" are 6,530 cubic yards of excavation for removal of deep pipes. Deep pipes are existing mainline pipes at depths of 10 feet or greater (measured from the flow line to the lowest elevation of either the existing ground line, undercut line, or bottom of removed or salvaged surfacing).

All work necessary to excavate and backfill the deep pipes including labor, equipment, and incidentals will be incidental to the contract unit price per cubic yard for "Unclassified Excavation". Payment for deep pipe excavation will be based only on plans quantity and measurement of these excavation quantities during construction will not be performed.

The excavation quantities for deep pipes are not included with the earthwork balance quantities on the plans profile sheets. The quantities computed for excavation of the deep pipes are based on the limits shown in the drawing below. The drawing shows a box culvert for illustration purposes only; the limits are similar for a pipe.

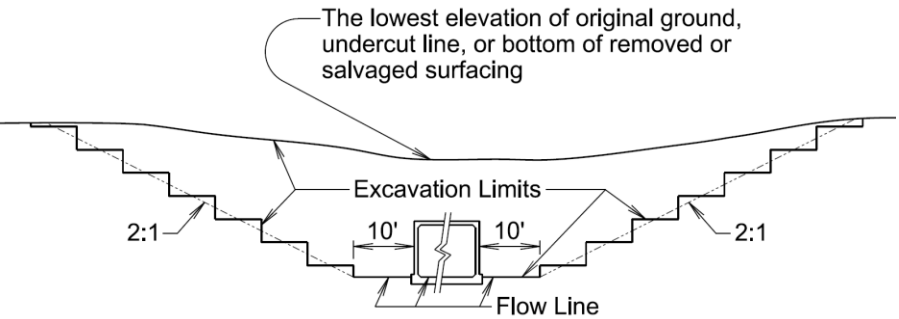


TABLE OF EXCAVATION FOR DEEP PIPE REMOVAL

Station	Type	Quantity (CuYd)
247+81	Pipe	499
296+33	Pipe	1527
316+25	Pipe	705
407+06	Pipe	3799
Total:		6530

PIPE CULVERT UNDERCUT

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

Station	Undercut Depth (Ft)	Pipe Culvert Undercut (CuYd)
19+26	2	63
42+45	1	27
81+68	1	39
158+20	2	77
202+01	1	35
221+40	1	53
285+32	1	29
296+33	1	44
342+21	2	122
384+76	2	63
407+06	2	114
424+84	1	27
448+23	1	29
456+27	2	66
Total:		788

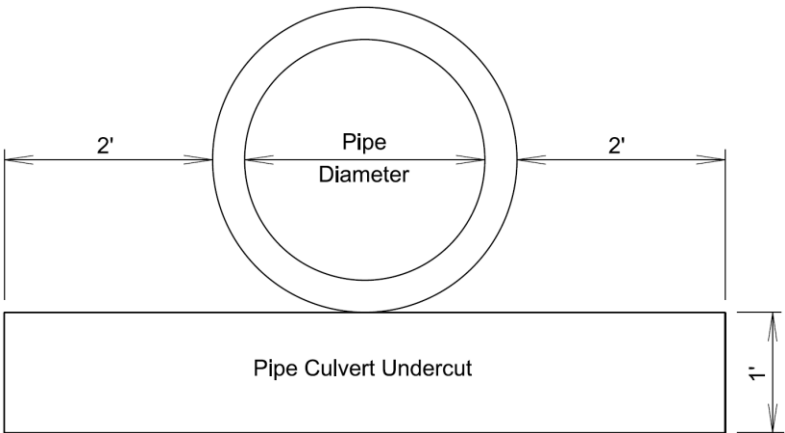
At the time of the subsurface investigation (March-May 2021), soil borings indicate that groundwater may be encountered within the pipe culvert undercut excavations at Stations 42+45, 70+50, 110+50, 221+40 (cattle pass), 243+62, 257+36, and 265+36. Seasonal changes in groundwater may affect other pipe culverts not listed.

Granular material may be required for backfilling the pipe culvert undercut areas where site conditions warrant. Granular material will conform to the gradation requirements in Section 421.2.A of the Specifications and will be paid for at the contract unit price per ton for "Granular Material". A quantity of 200 tons of granular material is included in the estimate of quantities for use where it is determined to be needed. The quantity will be adjusted or eliminated by construction change order, depending on field conditions.

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	---



INCIDENTAL WORK, GRADING

Station	L/R	Remarks
1+05		Take Out 18" - 102' RCP & 2 End Sections
8+89	45' R	Take Out 18" - 53' RCP & 2 End Sections
18+00	44' R	Take Out 18" - 46' RCP & 2 End Sections
19+26		Take Out 30" - 70' RCP & 2 End Sections
42+45		Take Out 24" - 67' RCP & 2 End Sections
51+42		Take Out 18" - 71' RCP & 2 End Sections
54+11	53' L	Take Out 18" - 71' RCP & 2 End Sections
54+11	60' R	Take Out 18" - 69' RCP & 2 End Sections
56+53	60' R	Take Out 24" - 42' CMP & 2 End Sections
58+52		Take Out 24" - 60' RCP & 2 End Sections
70+50		Take Out 18" - 65' RCP & 2 End Sections
81+67		Take Out 24" - 81' RCP & 2 End Sections
103+50		Take Out 24" - 89' RCP & 2 End Sections
110+50		Take Out 24" - 74' RCP & 2 End Sections
119+88		Take Out 24" - 85' RCP & 2 End Sections
133+47	45' L	Take Out 15" - 66' RCP & 2 End Sections
170+45		Take Out 18" - 64' RCP & 2 End Sections
177+45		Take Out 18" - 73' RCP & 2 End Sections
200+41		Take Out 30" - 40' RCP & 2 End Sections
221+40		Take Out 4X6' - 63' RCP Cattle Pass
229+41		Take Out 18" - 62' RCP & 2 End Sections
230+44	45' R	Take Out 18" - 60' RCP & 2 End Sections
243+62		Take Out 18" - 71' RCP & 2 End Sections
247+81		Take Out 18" - 120' RCP & 2 End Sections
251+36		Take Out 18" - 69' RCP & 2 End Sections
253+00	47' R	Take Out 18" - 56' RCP & 2 End Sections
257+36		Take Out 18" - 71' RCP & 2 End Sections
265+36		Take Out 18" - 63' RCP & 2 End Sections
266+26	46' L	Take Out 18" - 51' RCP & 2 End Sections
278+32		Take Out 18" - 70' RCP & 2 End Sections
285+32		Take Out 18" - 55' RCP & 2 End Sections
291+05	42' L	Take Out 18" - 61' RCP & 2 End Sections
291+05	48' R	Take Out 18" - 49' RCP & 2 End Sections
296+33		Take Out 18" - 117' RCP & 2 End Sections
299+77	42' L	Take Out 18" - 60' RCP & 2 End Sections
311+31		Take Out 18" - 70' RCP & 2 End Sections
316+87		Take Out 18" - 101' CMP & 2 End Sections
318+67		Take Out 24" - 89' CMP & 2 End Sections
335+00	46' R	Take Out 18" - 69' RCP & 2 End Sections
342+21		Take Out 24" - 63' RCP & 2 End Sections
349+42	43' R	Take Out 18" - 54' RCP & 2 End Sections
352+54	36' L	Take Out 18" - 55' CMP & 2 End Sections
353+63	36' L	Take Out 18" - 78' RCP & 2 End Sections
358+73		Take Out 18" - 55' RCP & 2 End Sections
360+56	39' L	Take Out 18" - 49' RCP & 2 End Sections
378+31		Take Out 24" - 75' RCP & 2 End Sections
384+75		Take Out 18" - 67' RCP & 2 End Sections
395+26		Take Out 18" - 71' RCP & 2 End Sections
407+06		Take Out 18" - 133' RCP & 2 End Sections
423+60	79' L	Take Out 18" - 40' RCP & 2 End Sections
423+78	48' R	Take Out 18" - 47' RCP & 2 End Sections
424+84		Take Out 24" - 60' RCP & 2 End Sections
433+72	73' R	Take Out 18" - 49' RCP & 2 End Sections
433+83	19' L	Take Out 18" - 72' RCP & 2 End Sections
436+43	49' R	Take Out 18" - 79' CMP & 2 End Sections
448+23		Take Out 24" - 76' RCP & 2 End Sections
456+27		Take Out 54" - 80' CMP & 2 End Sections
463+25	55' R	Take Out 18" - 50' RCP & 2 End Sections
475+70		Take Out 18" - 67' RCP & 2 End Sections

SALVAGED RIPRAP

All salvaged Riprap noted in the plans will be reused on the project. The Riprap to be salvaged is a mixture of Class A and B sizes. Care will be taken not to damage the structural properties of the riprap during salvaging and transporting. All costs for salvaging and transporting the riprap will be incidental to the contract unit price for "Salvage Riprap". Plans quantity will be the basis of payment for the "Salvage Riprap" bid item. It is estimated that **4960** CuYd (7,440 Ton) of Riprap will be salvaged on the project. Before preparing a bid, the Contractor will make a visual inspection of the project to verify the extent of the work and material involved.

PLACING RIPRAP

Contractor operations for placing riprap as noted in the plans will follow Section 700 of the Specifications. The Contractor will reuse salvaged riprap from the project for placing at locations noted in the plans. The Contractor will furnish the quantity of riprap necessary to complete placement that is beyond what is salvaged. All costs for placing the salvaged riprap will be incidental to the contract unit price for "Place Riprap". All contractor furnished riprap will be weighed and measured for payment based on the actual quantity that is installed on the project, and all costs for placing will be incidental to the contract unit price for "Class A Riprap". It is estimated that 7,440 Tons of salvaged riprap will be used on the project. It is estimated that 3,690 Tons of Class A Riprap will be furnished and placed by the Contractor. It is estimated that 10,990 SqYd of Type B Drainage Fabric will be placed under the salvaged and furnished riprap. Before preparing a bid, the Contractor will make a visual inspection of the project to verify the extent of the work and material involved.

TABLE OF SALVAGE RIPRAP, RIPRAP, AND DRAINAGE FABRIC

Station	to	Station	L/R	Salvage & Place Riprap (Ton)	Class A Riprap (Ton)	Type B Drainage Fabric (SqYd)
147+75		159+15	R	2090	700	2790
150+00		158+60	L	1580	530	2100
186+50		187+00	R	90	30	120
184+25		187+00	L	500	170	670
206+00		211+00	R	920	310	1220
206+00		210+80	L	880	290	1180
210+80		211+80	L		360	330
211+00		211+62	R		270	240
317+85		320+00	R		570	510
XR317 – County Road 29						
16+70		21+00	L	790	260	1050
17+80		21+00	R	590	200	780
Totals:				7440	3690	10990



FOR BIDDING PURPOSES ONLY
SALVAGED ITEMS

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
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All salvaged items noted on the plans will be salvaged for future highway use and hauled to the Department of Transportation's Clark Maintenance Shop as directed by the Engineer. Care will be taken not to damage the structural properties of the items during dismantling and transporting. All broken concrete and materials not salvaged will be disposed of in accordance with the Specifications. All costs for salvaging and transporting the items will be incidental to the contract lump sum price for "Incidental Work, Grading". Before preparing a bid, the Contractor will make a visual inspection of the project to verify the extent of the work and material involved.

DRAIN TILE

There are several locations along the project where drain tile may be encountered during construction. Drain tile is not clearly identified on the plan sheets and the Contractor is encouraged to visit the site to assess the potential conflicts with grading.

The Contractor will repair any damaged drain tile to the extent that the functionality of the drainage system is retained after the project. Where replacement is necessary, the existing drain tile will be replaced with the appropriate diameter of corrugated polyethylene drainage tubing. The corrugated polyethylene drainage tubing will be in conformance with Section 990 of the Specifications.

All costs associated with the repair and or replacement of the drainage tile will be incidental to the contract unit price per foot for "Repair Drain Tile". An arbitrary quantity of 500 LF has been added to the estimate of quantities to establish a unit price. The quantity will be adjusted or eliminated by construction change order, depending on field conditions.

CORRUGATED METAL PIPE

Corrugated metal pipes will have 2 3/8-inch x 1/2-inch corrugations for 42-inch and smaller round pipe and 48-inch and smaller arch pipe unless otherwise stated in the plans. Corrugated metal pipes will have 3-inch x 1-inch or 5-inch x 1-inch corrugations for 48-inch and larger round pipe and 54-inch and larger arch pipe unless otherwise stated in the plans.

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

PIPE FOR APPROACHES

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

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

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

CONTROLLED DENSITY FILL FOR PIPE

Controlled density fill will be in conformance with Section 464 of the Specifications.

The controlled density fill will be placed between the pipes from the base of pipe elevation to the haunch of the pipes and extend to the end of the end section.

Controlled density fill between metal pipes will require the pipes to be anchored to resist floating. Anchoring methods will be determined by the Contractor and approved by the Engineer. Payment for anchoring the pipes will be incidental to the pipe installation contract item.

TABLE OF CONTROLLED DENSITY FILL FOR PIPE

Station	Quantity (CuYd)
221+40	12.0
342+21	14.8
Total:	26.8

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.

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

Station	L/R	PVC Coated Bank and Channel Protection Gabion (CuYd)	Type B Drainage Fabric (SqYd)
247+81	R	4.5	15
251+36	R	4.5	15
278+32	L	4.5	15
296+33	R	6.0	19
311+31	R	4.5	15
316+25	R	6.0	19
319+00	R	6.0	19
384+76	R	12.0	34
407+06	R	12.0	34
424+84	R	6.0	19
Totals:		66.0	204

MAILBOXES

The Contractor will reset the existing mailboxes on new posts with the necessary support hardware for single 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".

Single mailboxes will be refurbished at Sta. 335+30 R and Sta. 353+30 L.

TEMPORARY FENCE

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

BRACE PANELS FOR ROW FENCE

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

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

TABLE OF SUPERELEVATION

Station	to	Station	
0+86		476+13	- Normal Crown Section

FOR BIDDING PURPOSES ONLY

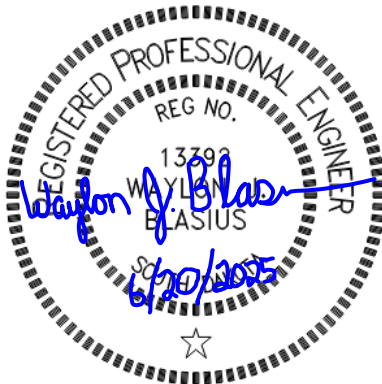
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P-PT 0025(89)149	B9	B71

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

The Contractor will have a Land Surveyor, licensed in the State of South Dakota, to set, reestablish or verify public land survey system (PLSS) corners, right of way (ROW) corners, and property corners as directed by the appropriate SDDOT Region Land Surveyor. It is estimated that 18 PLSS corners and 88 ROW and property corners will be set, reestablished, or verified for this project. The Contractor's Land Surveyor, under the direction of the Region Land Surveyor, will set, reestablish, or verify all corner monuments after surfacing and fencing operations are completed in accordance with the PUBLIC LANDS SURVEY SYSTEM CORNERS section and the RIGHT OF WAY AND PROPERTY CORNERS section in Chapter 8 of the SDDOT Survey Manual.

< <https://dot.sd.gov/doing-business/engineering/design-services/surveyors> >

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



RIGHT OF WAY MARKER

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P-PT 0025(89)149	B10	B71

The Right of Way Marker and installation locations will conform to the details on standard plate 900.15. Install Right of Way Markers 10 feet from both sides of entrances that are centered on property lines without fence, so that a marker is not placed in the entrance.

TABLE OF RIGHT OF WAY MARKER

Station	L/R	Quantity (Each)
0+74	R	1
2+06	L	1
13+94	L/R	2
26+41	L/R	2
39+62	L/R	2
53+78	L/R	2
54+44	R	1
67+64	R	1
80+36	L/R	2
93+56	L/R	2
106+44	L/R	2
107+08	L/R	2
120+28	L/R	2
133+10	L/R	2
146+27	L	1
159+10	L	1
172+66	R	1
211+88	L/R	2
212+54	L/R	2
225+74	L/R	2
238+42	LL/RR	4
251+62	L/R	2
264+33	L/R	2
265+00	L/R	2
278+19	L/R	2
291+06	LL/RR	4
304+26	L/R	2
317+07	L/R	2
330+92	L/R	2
343+74	L/R	2
356+97	L/R	2
370+66	L/R	2
371+32	L/R	2
384+51	L/R	2
397+29	LL/RR	4
410+48	L/R	2
423+27	L/R	2
423+93	L/R	2
437+12	L/R	2
463+06	LL/R	3
475+88	L/R	2
Total:		82



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

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P-PT 0025(89)149	B11	B71

Roadway and Description	Begin Station	End Station	Number of Lanes	Length (Ft)	Grade Staking				Miscellaneous Staking Quantity (Mile)	Slope Staking Quantity (Mile)	Final Cross Section Survey Quantity (Mile)
					Length (Mile)	Lane Factor	*Sets of Stakes	**Grade Staking Quantity (Mile)			
SD25 (2 Lanes AC Pavement)	0+86	476+13	2	47527	9.001	1	1	9.001	9.001	9.001	9.001
							Totals:	9.001	9.001	9.001	9.001

* 1 = Blue Top Stakes Only (Asphalt Concrete Pavement)
** Grade Staking Quantity = (Length) x (Lane Factor) x (Sets of Stakes)



PIPE QUANTITIES

FOR BIDDING PURPOSES ONLY

PROJECT	P-PT 0025(89)149	SHEET	TOTAL SHEETS
		B12	B71

Station		Offset (L/R)		Reinforced Concrete Pipe																											
											Circular Safety Ends		Circular Sloped Ends		Circular Flared Ends				Arch						Arch Flared Ends				Arch Sloped Ends		
				24" CI 3	24" CI 4	30" CI 3	30" CI 4	36" CI 2	42" CI 2	48" CI 2	54" CI 2	54" CI 4	18"	24"	24"	30"	36"	42"	48"	54"	30" CI 3	36" CI 2	36" CI 4	42" CI 2	48" CI 2	60" CI 2	36"	42"	48"	60"	30"
Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Each	Each	Each	Each	Each	Each	Each	Each	Ft	Ft	Ft	Ft	Ft	Ft	Each	Each	Each	Each	Each	Each		
1+05				96									2																		
19+26								80									2														
42+45						78								2																	
51+42		78											2																		
54+11	49' L	62									2																				
54+11	54' R																		66										2		
58+53		66											2																		
70+50		60											2																		
81+68																						100				2					
103+49				94										2																	
110+49		82											2																		
119+88		84											2																		
158+20																							78					2			
170+45		70											2																		
177+45																			62										2		
186+16	49' R	54									2																				
202+01						108									2																
212+21	67' R	82									2																				
212+21	62' L			68										2																	
221+40 (TWIN)																				156					4						
229+41		60											2																		
243+62 (Skewed)		74											2																		
247+81		88	72										2																		
251+36		112											2																		
257+36 (Skewed)				70										2																	
265+36				64										2																	
278+32 (Skewed)		80											2																		
285+32																				78					2						
296+33																				40	88				2						
311+31 (Skewed)		86											2																		
316+25				74	64									2																	
319+00				122										2																	
342+21 (TWIN)																							156				4				
358+68		94											2																		
378+31				84										2																	
384+76								80									2														
395+27		78											2																		
407+06									44	120								2													
424+84						78										2															
448+23							78									2															
456+27									78									2													
475+70				64										2																	
Subtotal:		1310	72	736	64	264	78	160	122	120	0	6	28	18	6	2	4	4	62	340	88	100	156	78	8	2	4	2	2	2	

REGISTERED PROFESSIONAL ENGINEER

REG NO. 13793

W. J. BLAS

BLAS

6/20/2025

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FOR BIDDING PURPOSES ONLY

PROJECT
P-PT 0025(89)149

SHEET	TOTAL SHEETS
B13	B71

REGISTERED PROFESSIONAL ENGINEER
 REG NO. 13392
 WAYNE J. BLASIOUS
 State of New York
 expires 6/30/2025

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FENCE QUANTITIES

REVISÉD 12-16-2025 EJK

STATE OF
SOUTH DAKOTA

PROJECT

P-PT 0025(89)149

SHEET

B14

TOTAL

B71

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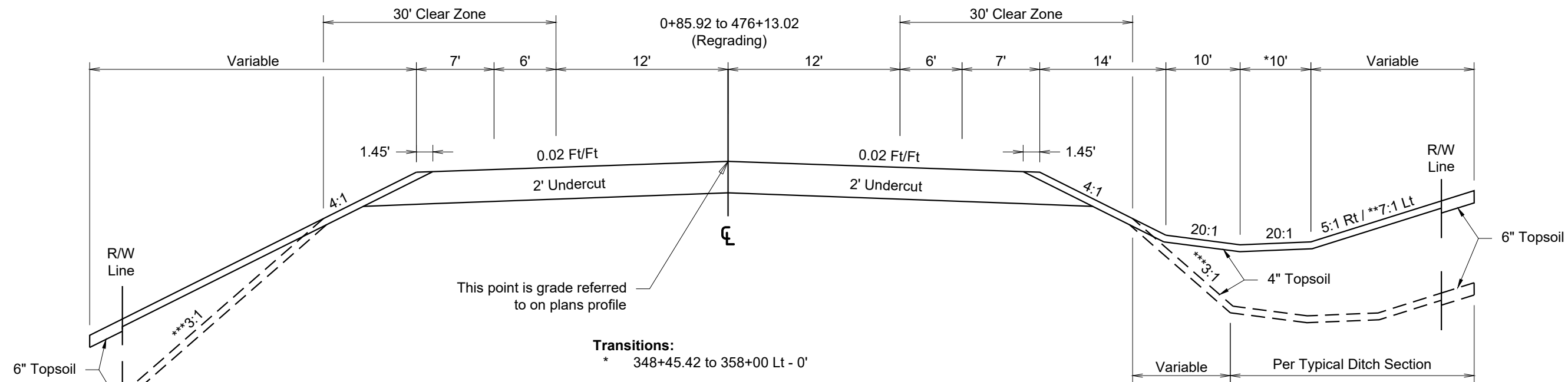
TYPICAL GRADING SECTION

FOR BIDDING PURPOSES ONLY

BAI JOB # 23190-12

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P-PT 0025(89)149		
		B15	B71

Plotting Date: 05-22-2025

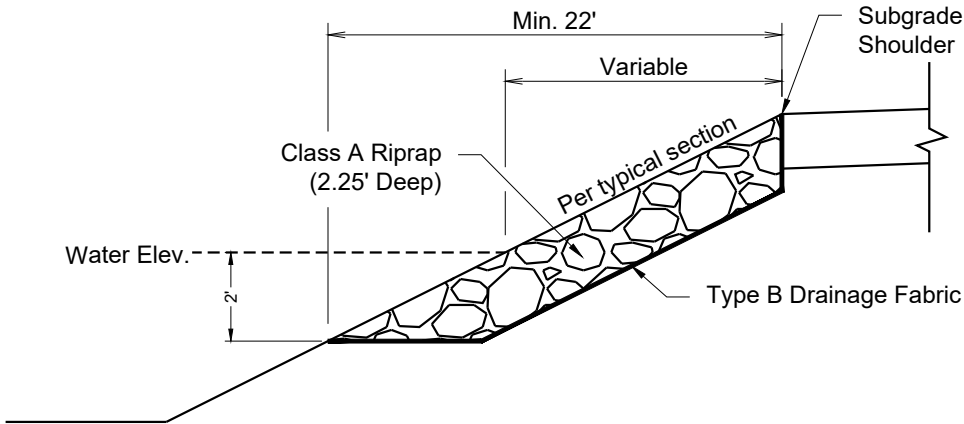


- Transitions:**
- * 348+45.42 to 358+00 Lt - 0'
 - ** 348+45.42 to 358+00 - 4:1 Lt
 - *** 3:1 Inslope breaks past C.Z. at the following locations:
 - 211+00 to 216+50 Lt & Rt
 - 244+25 to 253+75 Lt & Rt
 - 290+25 to 299+00 Lt & Rt
 - 312+00 to 316+84.47 Lt & Rt
 - 317+97.49 to 320+00 Lt & Rt
 - 404+50 to 410+25 Lt & Rt



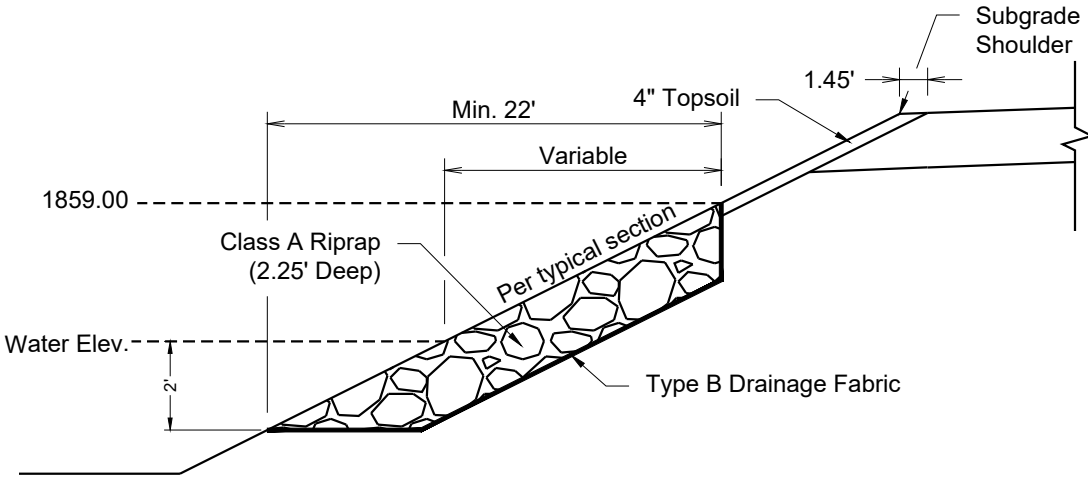
Riprap Installation Detail

- 147+75 to 159+15 R
- 150+00 to 158+60 L
- 186+50 to 187+00 R
- 184+25 to 187+00 L
- 206+00 to 211+80 L
- 206+00 to 211+62 R



Riprap Installation Detail 2

- 16+70 to 21+00 L (xr317)
- 17+80 to 21+00 R (xr317)
- 317+85 to 320+00 (Mainline)



HORIZONTAL ALIGNMENT DATA

FOR BIDDING PURPOSES ONLY

BAI Job #23190-12

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0025(89)149	B17	B71

Plotting Date: 1-05-2025

MAINLINE

Type	Station			Northing	Easting						
POB	0+85.92			390139.511	2607,488.610	PC	411+50.07			431182.434	2606194.582
		TL= 2555.01	N 1°49'32" W			PI	414+00.08	R= 20560.29	Delta= 1°23'36" R	431432.324	2606186.765
PI	26+40.93			392693.225	2607407.220	PT	416+50.07			431682.330	2606185.026
		TL= 2770.24	N 1°48'09" W					TL= 1326.47	N 0°23'54" W		
PI	54+11.17			395462.093	2607320.078	PC	429+76.54			433008.771	2606175.803
		TL= 2624.73	N 1°52'16" W			PI	433+26.61	R= 15005.09	Delta= 2°40'22" L	433358.826	2606173.369
PI	80+35.90			398085.424	2607234.381	PT	436+76.54			433708.387	2606154.613
		TL= 2639.87	N 1°46'41" W					TL= 823.33	N 3°04'17" W		
PI	106+75.77			400724.023	2607152.465	PC	444+99.87			434530.535	2606110.500
		TL= 2634.61	N 1°58'45" W			PI	447+99.88	R= 28380.90	Delta= 1°12'41" R	434830.116	2606094.426
PI	133+10.38			403357.063	2607061.480	PT	450+99.87			435129.969	2606084.688
		TL= 2382.83	N 1°56'17" W					TL= 1400.02	N 1°51'36" W		
PC	156+93.21			405738.527	2606980.895	PC	464+99.89			436529.250	2606039.247
PI	159+43.21	R= 90647.41	Delta= 0°18'58" R	405988.385	2606972.440	PI	468+99.90	R= 79323.87	Delta= 0°34'40" R	436929.043	2606026.264
PT	161+93.21			406238.285	2606965.363	PT	472+99.89			437328.946	2606017.314
		TL= 2395.226	N 1°37'19" W					TL= 313.75	N 1°16'56" W		
PI	185+88.44			408632.552	2606897.564	PI	476+13.64			437642.618	2606010.293
		TL= 2632.59	N 1°45'44" W					TL= 187.00	N1°01'56" W		
PI	212+21.03			411263.902	2606816.611	POE	478+00.65			437829.591	2606006.925
		TL= 2620.37	N 1°50'33" W								
PI	238+41.40			413882.917	2606732.365						
		TL= 2624.05	N 1°44'06" W								
PI	264+65.45			416505.765	2606652.913						
		TL= 2639.80	N 1°35'14" W								
PI	291+05.25			419144.550	2606579.794						
		TL=2284.90	N 1°49'09" W								
PC	313+90.15			421428.302	2606507.265						
PI	317+40.17	R= 29561.74	Delta= 1°21'24" L	421778.142	2606496.154						
PT	320+90.15			422127.621	2606476.763						
		TL= 1214.35	N 3°10'33" W								
PC	333+04.50			423340.101	2606409.490						
PI	336+54.55	R= 4000.00	Delta= 2°29'13" R	423689.618	2606390.097						
PT	340+04.50			424039.648	2606385.888						
		TL= 1287.34	N 0°41'20" W								
PC	352+91.83			425326.889	2606370.411						
PI	357+91.85	R=47630.95	Delta= 1°12'10" L	425826.872	2606364.399						
PT	362+91.83			426326.617	2606347.892						
		TL= 807.03	N 1°53'30" W								
PI	370+98.86			427133.206	2606321.251						
		TL= 4051.21	N 1°47'30" W								

xr317

Type	Station			Northing	Easting
POB	0+00.00			421730.226	2604896.857
		TL= 1599.76	N 88°17'02" E		
PI	15+99.76			421778.134	2606495.901
		TL= 522.86	N 87°55'21" W		
POE	21+22.62			421797.088	2607018.417



The coordinates shown on this sheet are based on the South Dakota State Plane Coordinate System. North Zone (NAD 83/11); epoch 2010.00; Geoid 18; SF = 0.99985776

HORIZONTAL AND VERTICAL CONTROL POINTS						
POINT	STATION	OFFSET	DESCRIPTION	NORTHING	EASTING	ELEVATION
REFMRK	8+66.68	60.46' L	ROD & CAP	390918.146	2607403.303	1797.144
REFMRK	72+76.33	71.84' L	ROD & CAP	397323.913	2607187.384	1817.154
REFMRK	133+65.37	71.46' L	ROD & CAP	403409.599	2606988.205	1823.959
REFMRK	186+01.76	75.06 R	ROD & CAP	408648.176	2606972.178	1810.079
REFMRK	233+28.77	73.53' L	ROD & CAP	413368.185	2606675.357	1893.975
REFMRK	299+74.81	68.18' L	ROD & CAP	420011.503	2606484.043	1898.454
REFMRK	360+46.05	70.64' L	ROD & CAP	426078.705	2606283.2	1875.804
REFMRK	413+69.85	54.79' L	ROD & CAP	431400.624	2606134.447	1875.086
REFMRK	476+14.19	63.64 R	ROD & CAP	437644.245	2606073.916	1843.01

The coordinates shown on this sheet are based on the South Dakota State Plan Coordinate System. North Zone (NAD 83/11); epoch 2010.00
Geoid 18; SF = 0.99985776
The elevations shown on this sheet are based on NAVD 88.



LEGEND

FOR BIDDING PURPOSES ONLY

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

1+05
Take Out 18" - 102' RCP
& 2 End Sections
(Incidental Work, Grading)

1+05 (16 Ac)
Install 30" - 96' RCP
& 2 Sloped Ends

8+89 - 45' R
Take Out 18" - 53' RCP
& 2 End Sections
(Incidental Work, Grading)

8+77 - 49' R
Install 24" - 60' CMP
& 2 Safety Ends

8+77 - 49' L
Install 24" - 60' CMP
& 2 Safety Ends

18+00 - 44' R
Take Out 18" - 46' RCP
(Incidental Work, Grading)

19+26
Take Out 30" - 70' RCP
& 2 End Sections
(Incidental Work, Grading)

19+26 (1549 Ac)
Install 48" - 80' RCP
& 2 Flared Ends

Sec. 3 - T116N - R56W

Andrew Lee Wookey and Holly Renae Wookey
Parcel A1

SE1/4

Present SD Hwy 25

N 49°32'W

16+61 R
Eliminate Entrance

PI 26+40.93
N 392693.23
E 2607407.22
Del 0°01'22" R

Section Line

Sec. 2 - T116N - R56W

SW1/4

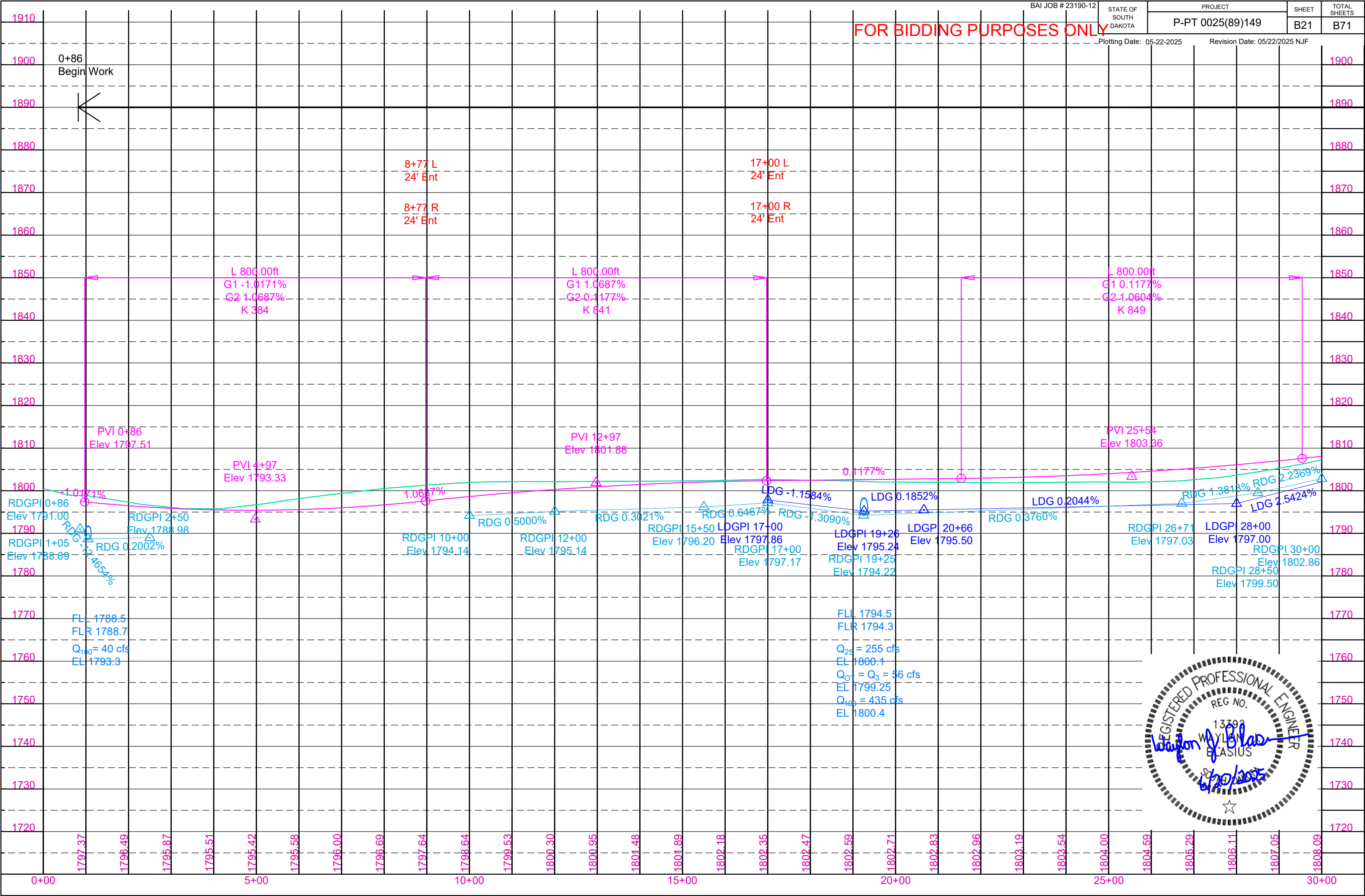
Parcel A1
6+19.09 to 12+06.31 L
Temporary Easement containing
0.3 ac, more or less

Parcel A1
16+27.82 to 26+41.24 L
Temporary Easement containing
0.6 ac, more or less

Parcel A1
0+74.40 to 11+41.11 R
Temporary Easement containing
0.5 ac, more or less

Parcel A1
16+31.16 to 26+41.06 R
Temporary Easement containing
0.5 ac, more or less

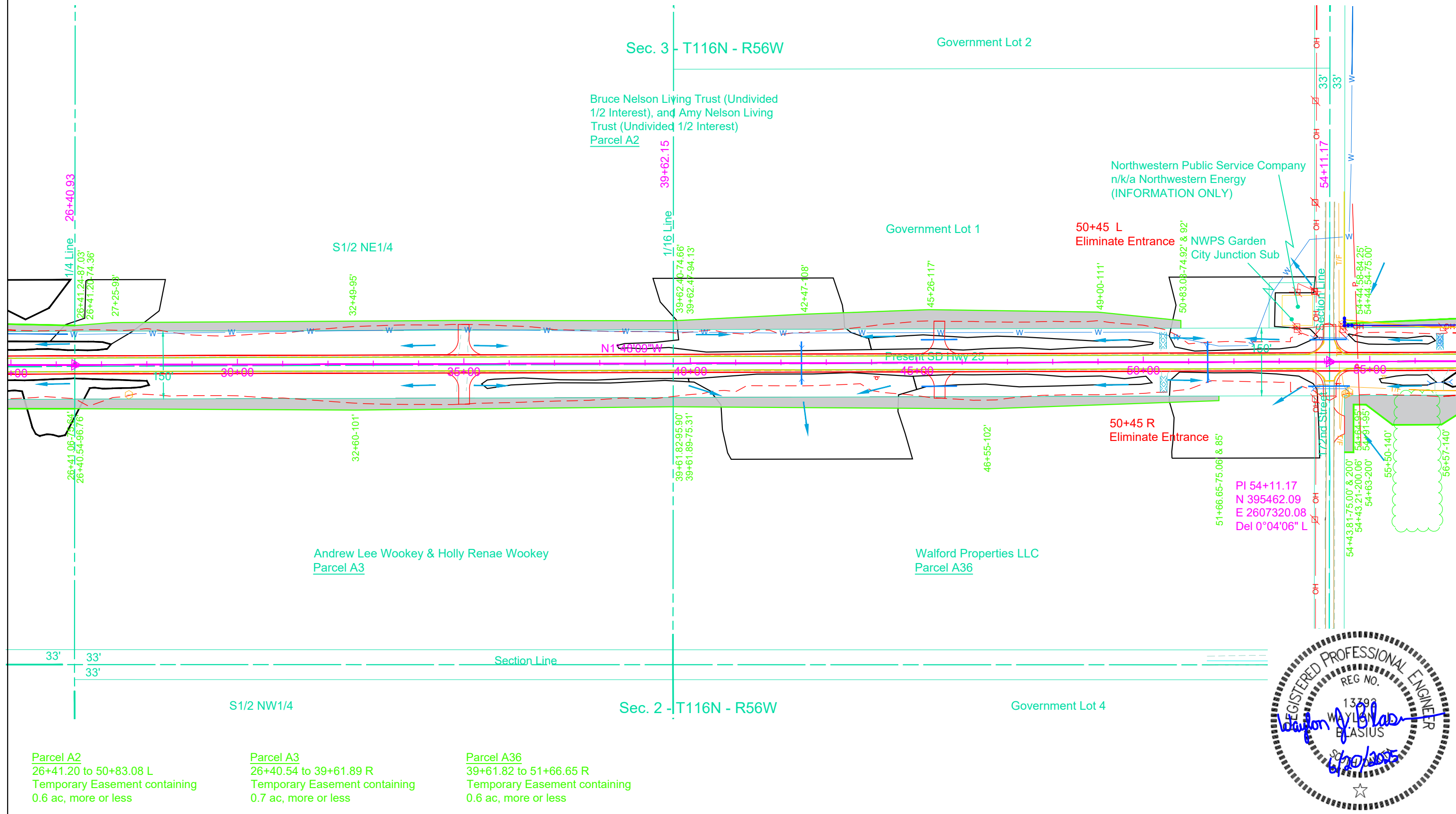




Revision Date: 05/22/2025 NJF

54+11 - 60' R
TAKEDOWN OF 69' R
& 2 End Sections
(Incidental Work, Grading)

54+11 - 54' R
Install 36" - 66' Arch RCP
& 2 Sloped Ends



FOR BIDDING PURPOSES ONLY



70+50
Take Out 18" - 65' RCP
& 2 End Sections
(Incidental Work, Grading)

70+50 (2 Ac)
Install 24" - 60' RCP
& 2 Sloped Ends

80+36-66' L
Install 24" - 92' CMP
& 2 Safety Ends

56+53 - 60' R
Take Out 24" - 42' CMP
& 2 End Sections
(Incidental Work, Grading)

58+52
Take Out 24" - 60' RCP
& 2 End Sections
(Incidental Work, Grading)

58+53 (44 Ac)
Install 24" - 66' RCP
& 2 Sloped Ends

Sec. 34 - T117N - R56W

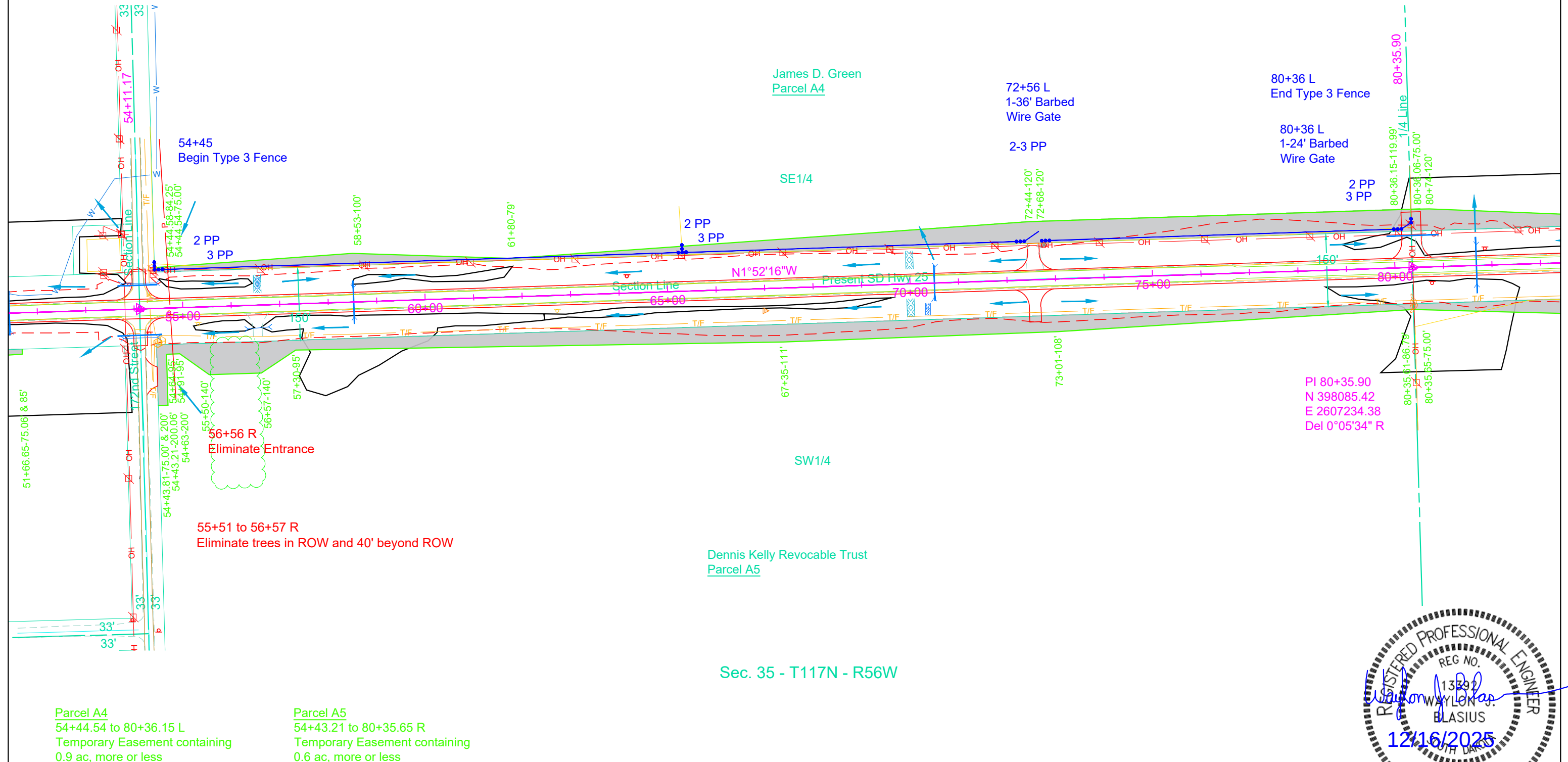
James D. Green
Parcel A4

SE1/4

SW1/4

Dennis Kelly Revocable Trust
Parcel A5

Sec. 35 - T117N - R56W



81+67
Take Out 24" - 81' RCP
& 2 End Sections
(Incidental Work, Grading)
81+68 (88 Ac, Equalizer)
Install 42" - 100' RCP Arch
& 2 Flared Ends

FOR BIDDING PURPOSES ONLY
103+50
Take Out 24" - 80' RCP
& 2 End Sections
(Incidental Work, Grading)
103+49 (35 Ac)
Install 30" - 94' RCP
& 2 Sloped Ends

BAI JOB # 23190-12

STATE OF
SOUTH
DAKOTA

PROJECT

P-PT 0025(89)149

SHEET

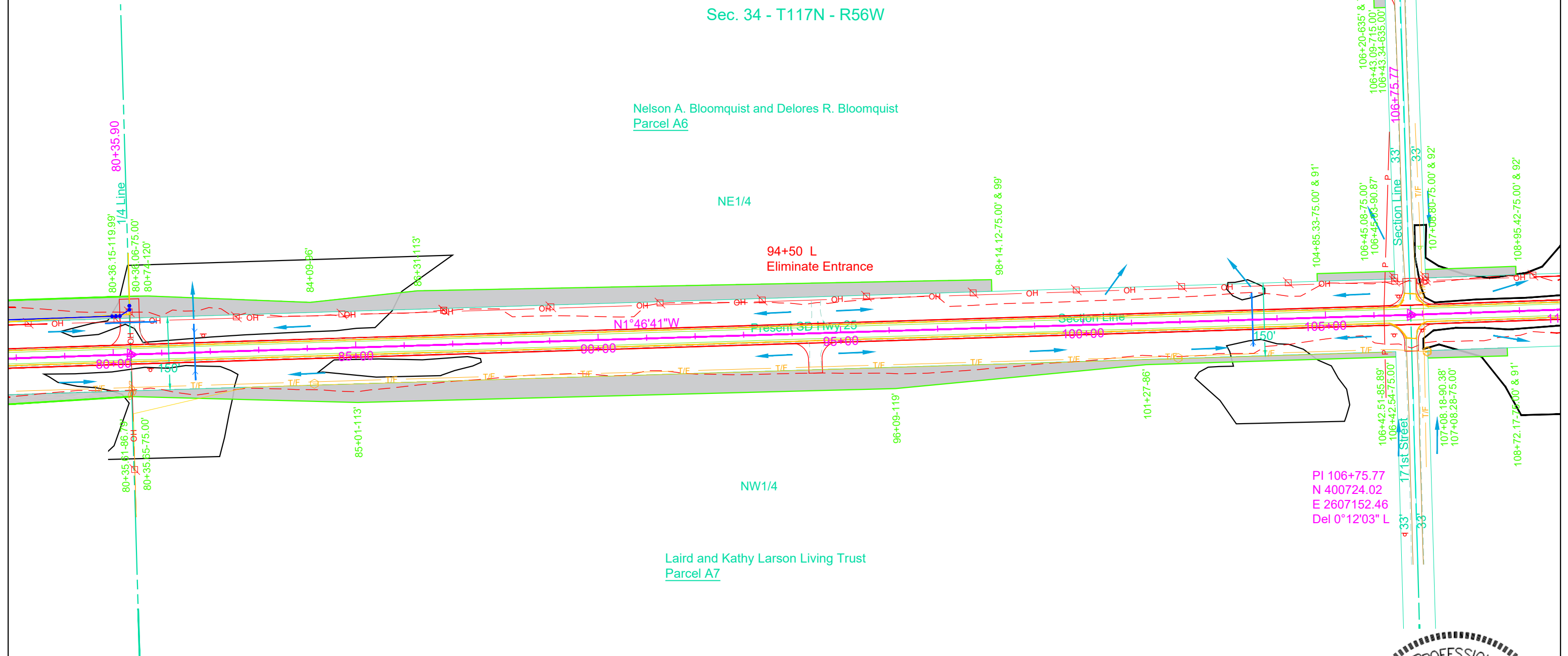
B26

TOTAL
SHEETS

B71

Plotting Date: 05-22-2025

Revision Date: 05/22/2025 NJF



PI 106+75.77
N 400724.02
E 2607152.46
Del 0°12'03" L

Parcel A6
80+36.06 to 98+14.12 L
Temporary Easement containing
1.3 ac, more or less

Parcel A6
104+85.33 to 106+45.08 L
Temporary Easement containing
0.1 ac, more or less

Parcel A6
106+20 to 106+43.34
Temporary Easement containing
0.1 ac, more or less

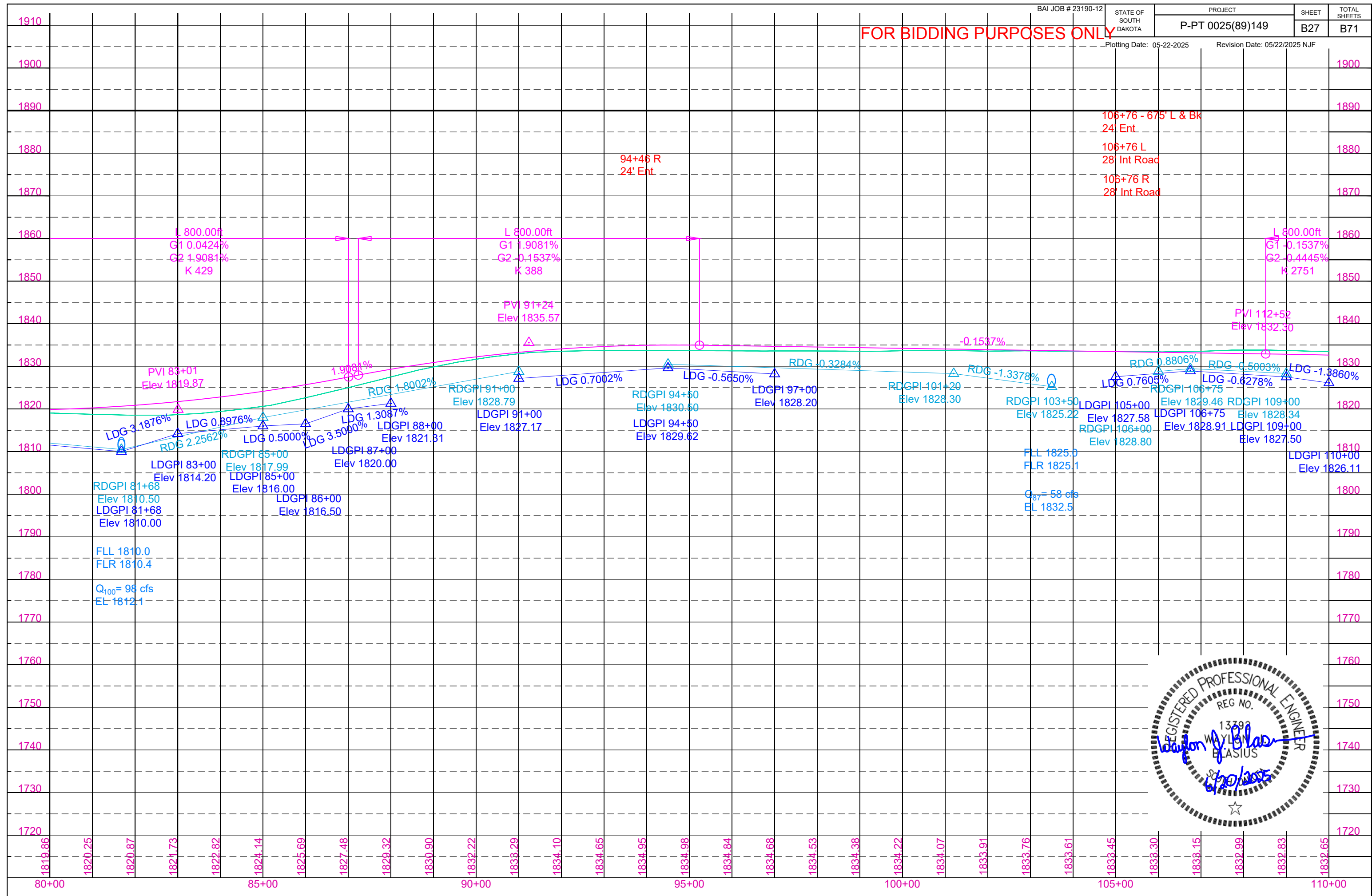
Parcel A7
80+35.61 to 106+42.54 R
Temporary Easement containing
1.8 ac, more or less



FOR BIDDING PURPOSES ONLY

Plotting Date: 05-22-2025

Revision Date: 05/22/2025 NJF



FOR BIDDING PURPOSES ONLY



110+50
Take Out 24" - 74' RCP
& 2 End Sections
(Incidental Work, Grading)

110+49 (10 Ac, Equalizer)
Install 24" - 82' RCP
& 2 Sloped Ends

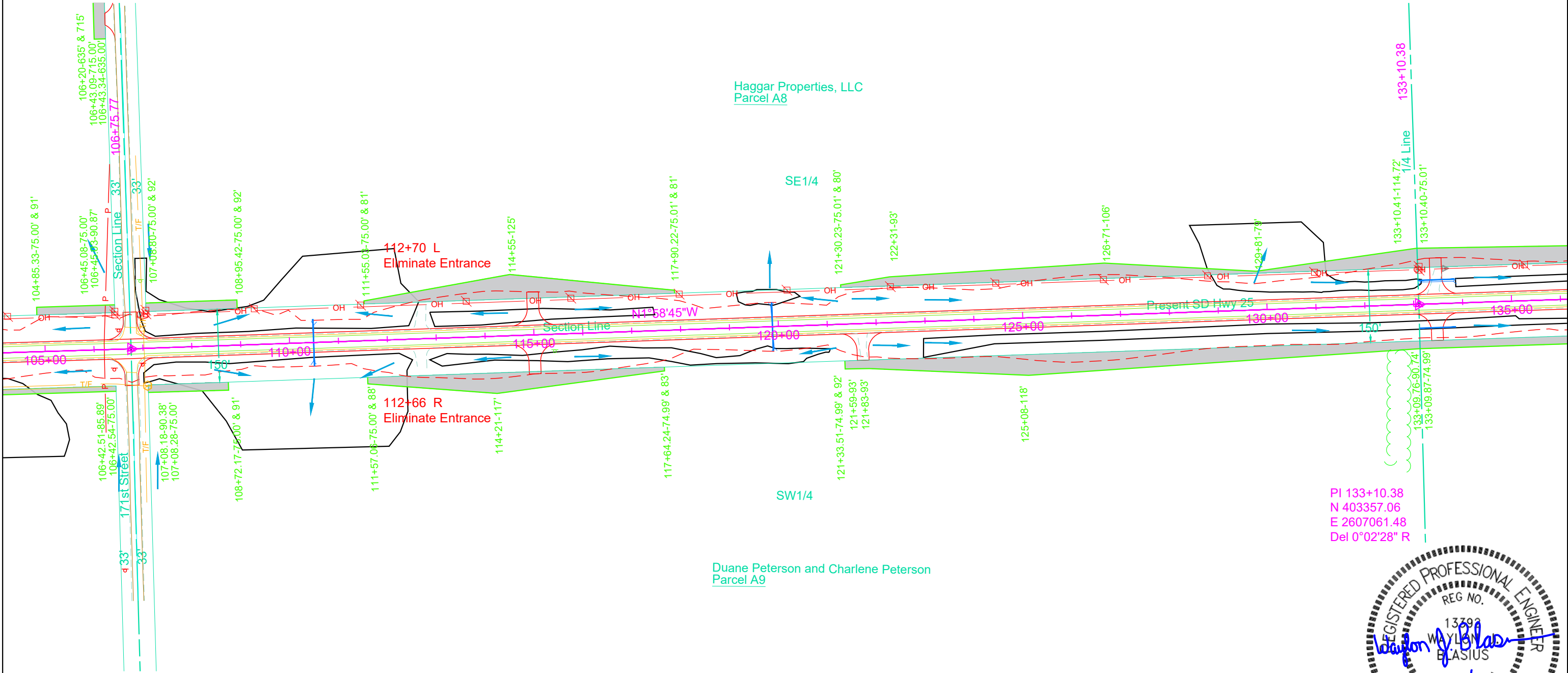
119+88
Take Out 24" - 85' RCP
& 2 End Sections
(Incidental Work, Grading)

119+88 (11 Ac)
Install 24" - 84' RCP
& 2 Sloped Ends

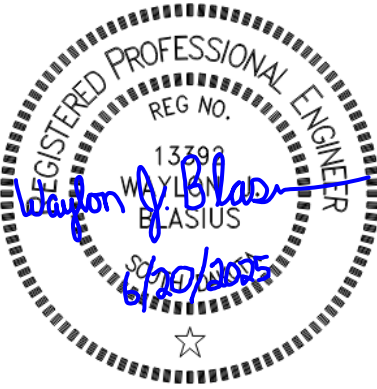
133+47 - 49' L
Install 18" - 66' CMP
& 2 Safety Ends

133+47 - 49' R
Install 24" - 60' CMP
& 2 Safety Ends

Sec. 27 - T117N - R56W



PI 133+10.38
N 403357.06
E 2607061.48
Del 0°02'28" R



Parcel A8
107+08.80 to 108+95.42 L
Temporary Easement containing
0.1 ac, more or less

Parcel A8
111+55.03 to 117+90.22 L
Temporary Easement containing
0.4 ac, more or less

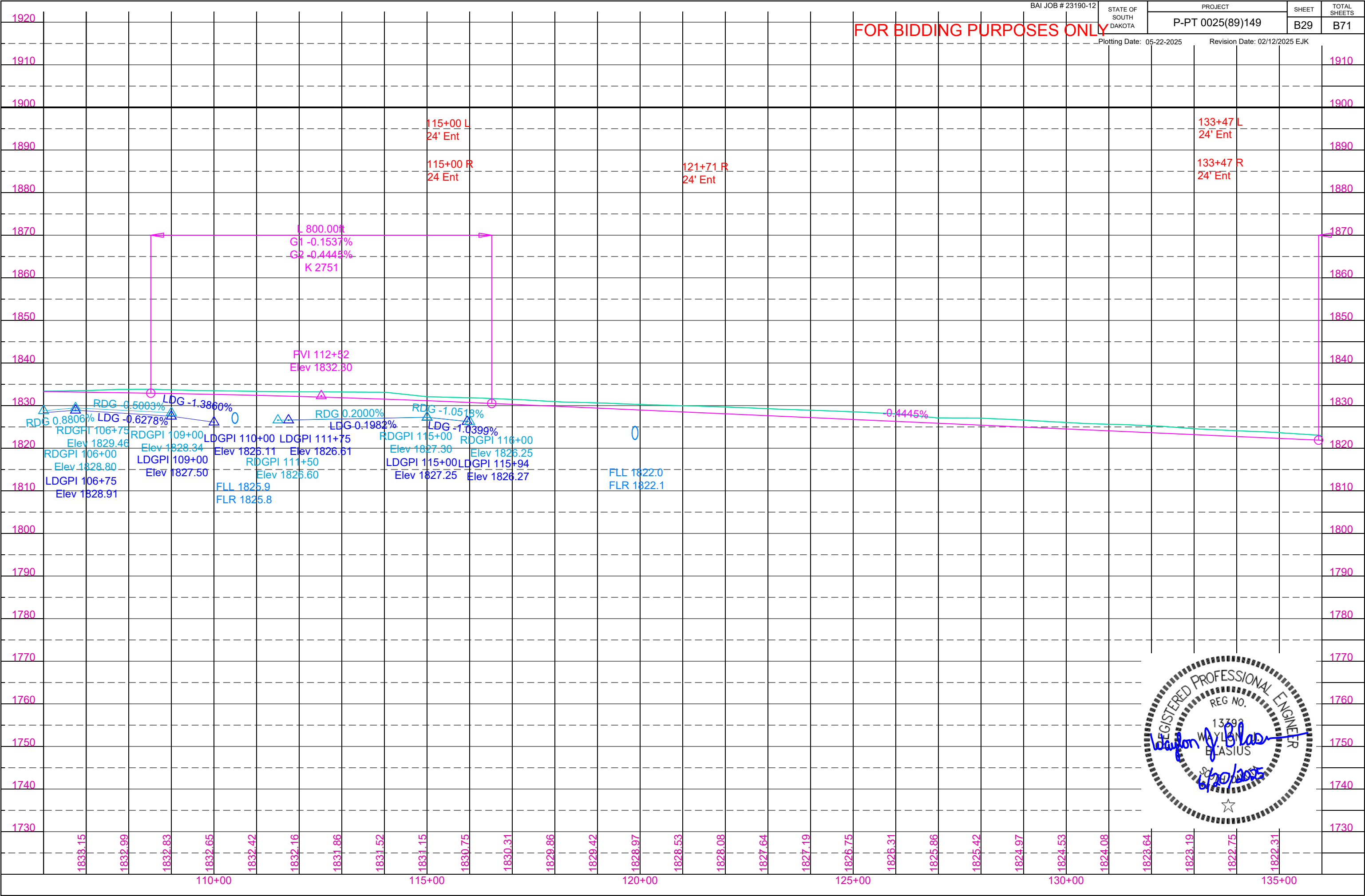
Parcel A8
121+30.23 to 133+10.41 L
Temporary Easement containing
0.6 ac, more or less

Parcel A9
107+08.18 to 108+72.17 R
Temporary Easement containing
0.1 ac, more or less

Parcel A9
111+57.06 to 117+64.24 R
Temporary Easement containing
0.4 ac, more or less

Parcel A9
121+33.51 to 133+09.87 R
Temporary Easement containing
0.8 ac, more or less

Sec. 26 - T117N - R56W



133+47 - 45' L
Take Out 15" - 66' RCP
& 2 End Sections
(Incidental Work, Grading)

133+47 - 49'L
Install 18" - 66' CMP
& 2 Safety Ends

133+47 - 49'R
Install 24" - 60' CMP
& 2 Safety Ends

FOR BIDDING PURPOSES ONLY

BAI JOB # 23190-12

STATE OF
SOUTH
DAKOTA

PROJECT

P-PT 0025(89)149

SHEET

B30

TOTAL
SHEETS

B71

Plotting Date: 05-22-2025

Revision Date: 02/12/2025 EJK



158+20 (174 Ac, Equalizer)
Install 60" - 78' RCP Arch
& 2 Flared Ends

159+43 - 49'L
Install 18" - 82' CMP
& 2 Safety Ends

Sec. 27 - T117N - R56W

Haggar Properties, LLC
Parcel A10

NE1/4

150+00 to 158+60 L
Salvage existing Riprap for reuse

147+75 to 159+15 R
Salvage existing Riprap for reuse

136+40 R
Eliminate Entrance

S1/2 NW 1/4

Duane Peterson and Charlene
Peterson
Parcel A11

2-2 PP
146+25 R
Begin Type 2 Fence
147+00 R
End Type 2 Fence

N1/2 NW1/4

Gary Biberdorf et.al.
Parcel A12

PI 159+43.21
N 405988.39
E 2606972.44
Del 0°18'58" R
Dc 0°03'48"
T 250.00'
L 500.00'
R 90647.41'

Sec. 26 - T117N - R56W

Parcel A10
133+10.40 to 146+08.84 L
Temporary Easement containing
0.9 ac, more or less

Parcel A10
150+72.02 to 153+99.05 L
Temporary Easement containing
0.1 ac, more or less

Parcel A11
133+09.76 to 146+26.27 R
Temporary Easement containing
0.5 ac, more or less

Parcel A12
146+26.00 to 147+56.39 R
Temporary Easement containing
0.1 ac, more or less

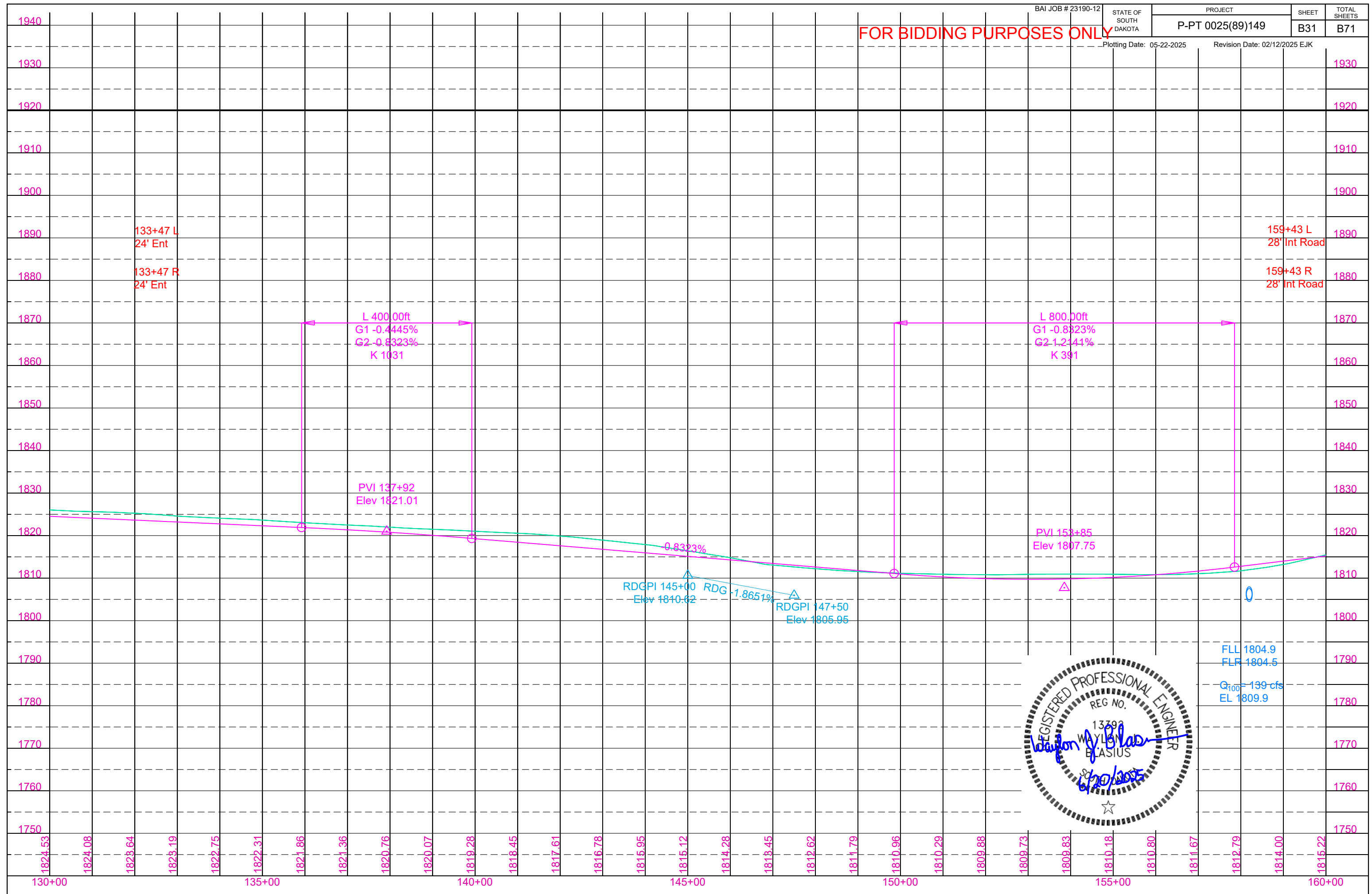
Parcel A12
156+33.30 to 159+09.61 R
Temporary Easement containing
0.1 ac, more or less



FOR BIDDING PURPOSES ONLY

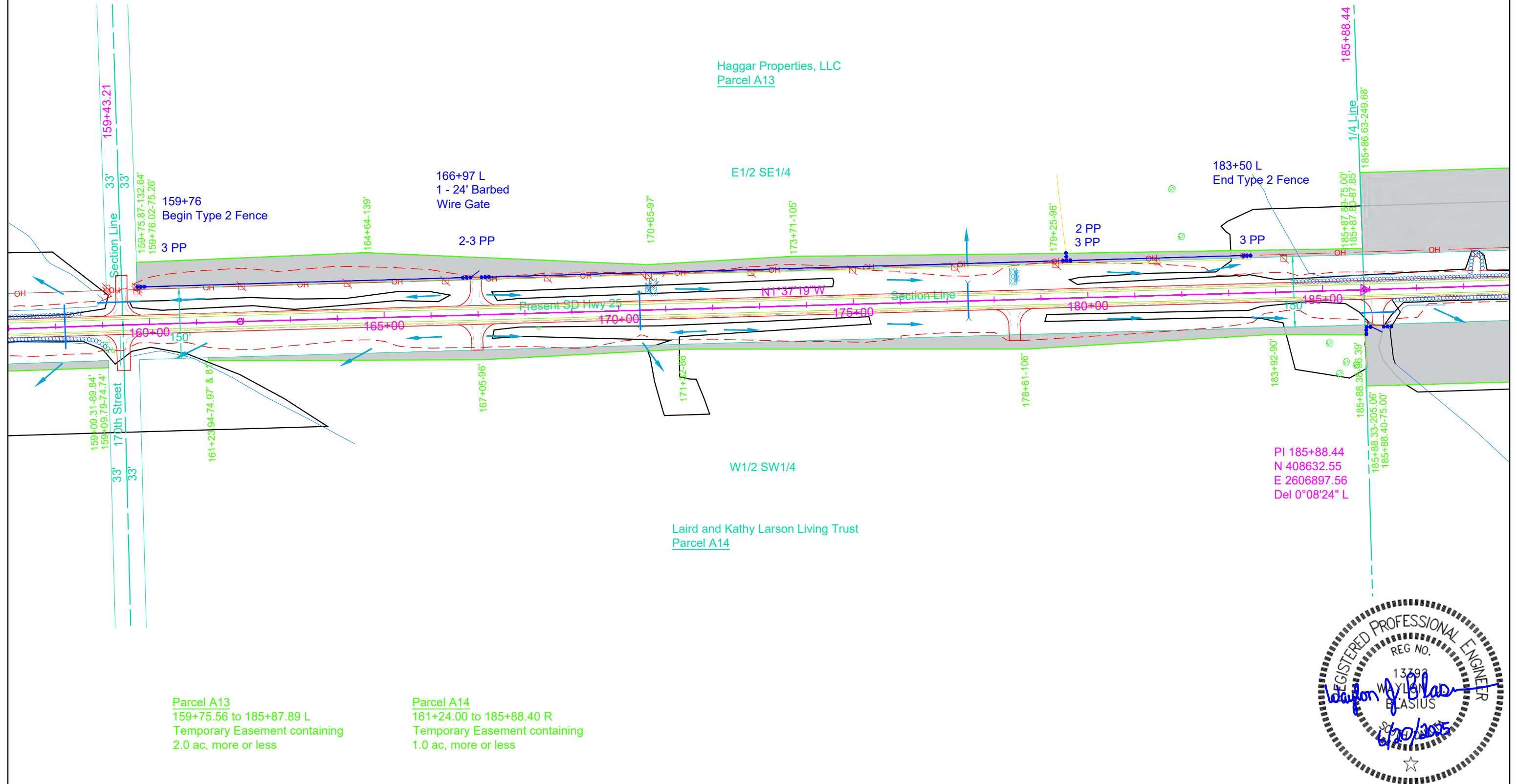
Plotting Date: 05-22-2025

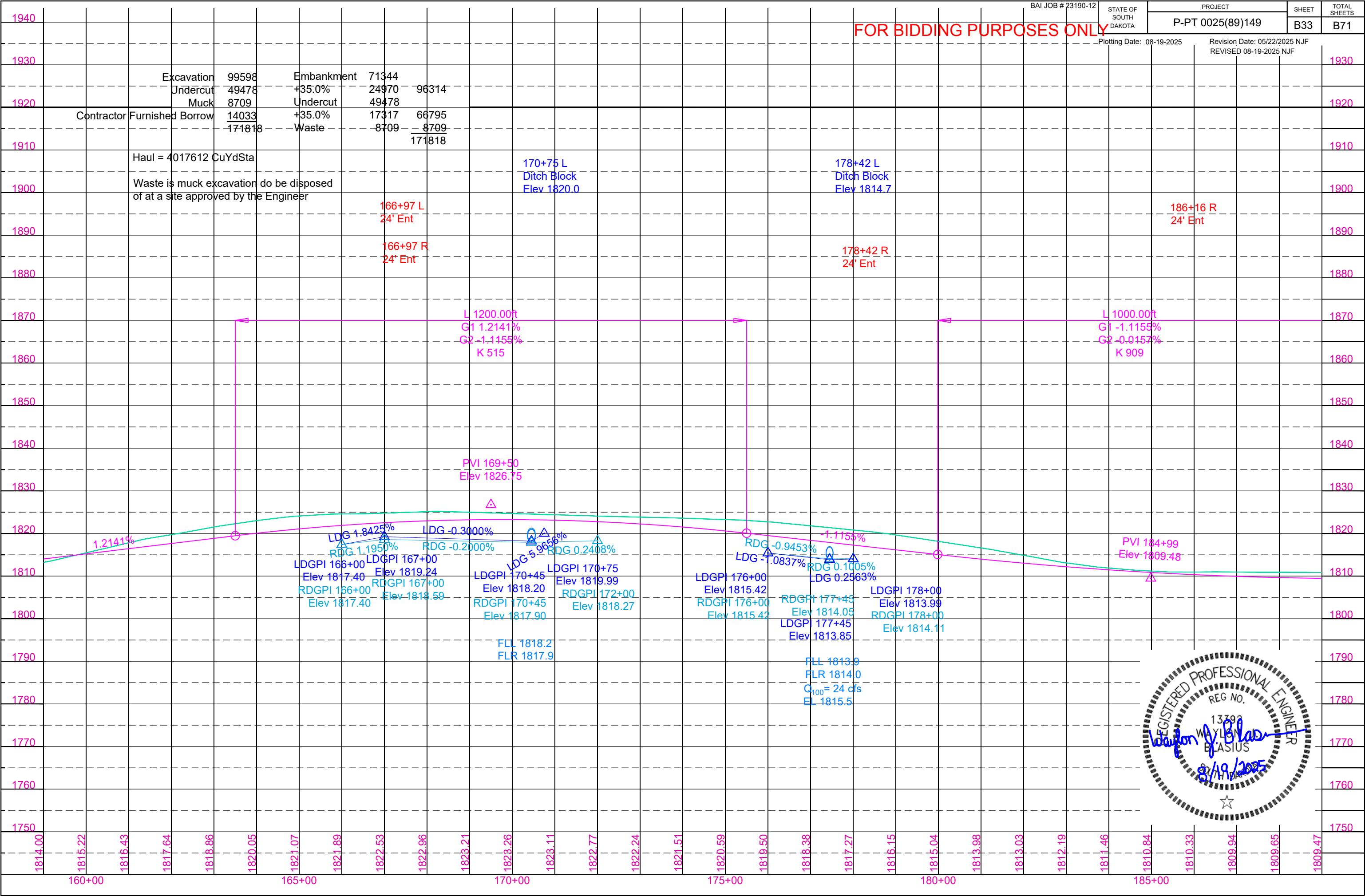
Revision Date: 02/12/2025 EJK



Plotting Date: 05-22-2025 Revision Date: 05/22/2025 NJF

177+45 (6 Ac)
Install 30" - 62' RCP Arch
& 2 Sloped Ends





FOR BIDDING PURPOSES ONLY

200+41
Take Out 30" - 40' RCP
& 2 End Sections
(Incidental Work, Grading)

202+01 (8134 Ac, Equalizer)
Install 36" - 108' RCP
& 2 Flared Ends



Sec. 22 - T117N - R56W

Haggar Properties, LLC
Parcel A15

NE1/4

NW1/4

James H. Myers and Mary M. Myers (3/4th Interest),
and Tom and Helga Myers Trust (1/4 Interest)
Parcel A16

Sec. 23 - T117N - R56W

186+16 - 49' R
Install 24" - 54' RCP
& 2 Safety Ends

184+25 to 210+80 L
Salvage existing Riprap for reuse

188+00 to 208+00 L
Do Not Disturb existing Utility Berms

186+50 to 211+00 R
Salvage existing Riprap for reuse

185+88 R
Begin Type 2 Fence

186+16 R
1 - 24' Barbed
Wire Gate

186+47 R
End Type 2 Fence

Parcel A15
185+86.63 to 211+88.00 L
Temporary Easement containing
10.5 ac, more or less

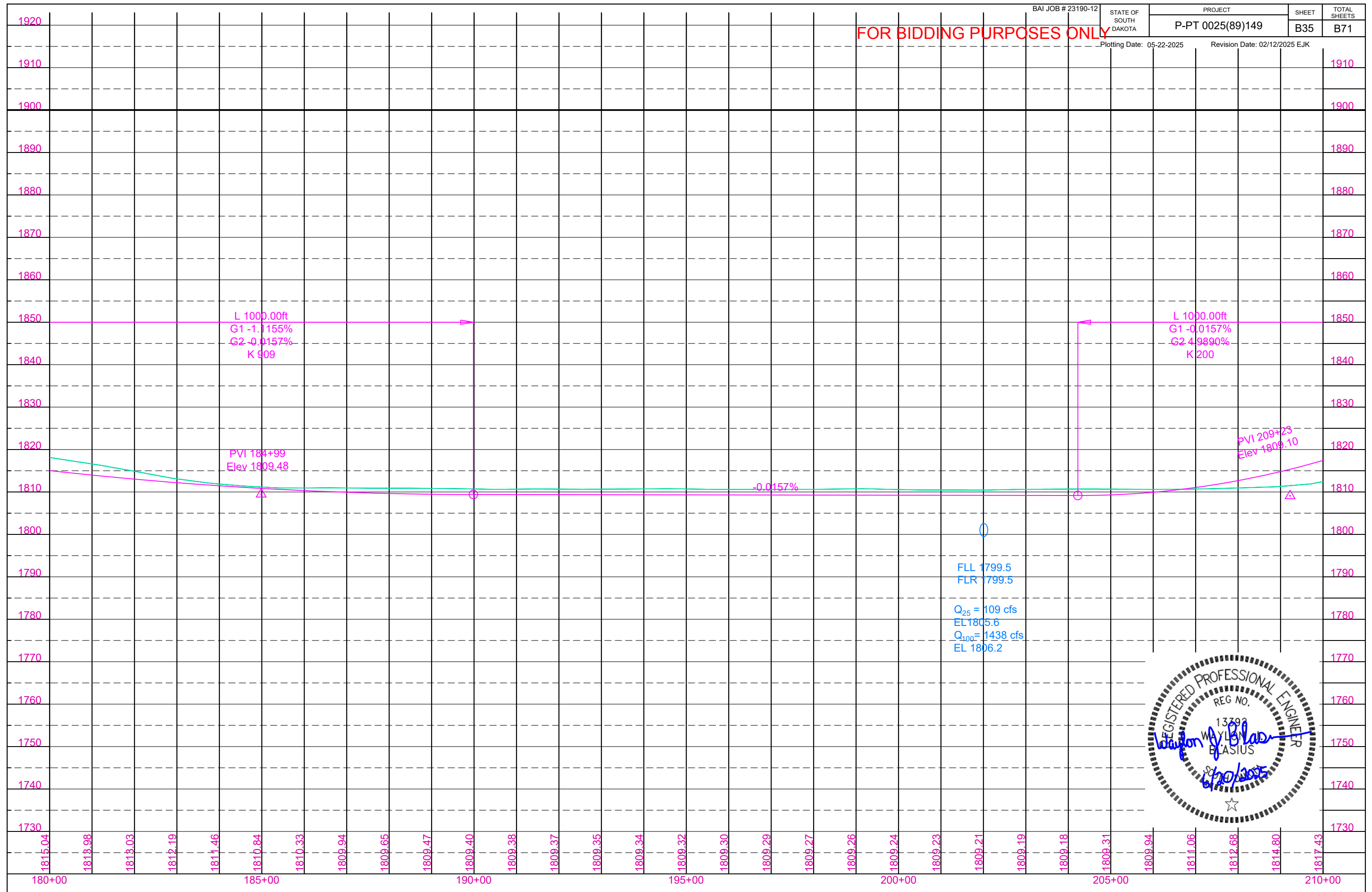
Parcel A16
185+88.33 to 211+87.93 R
Temporary Easement containing
8.0 ac, more or less



FOR BIDDING PURPOSES ONLY

Plotting Date: 05-22-2025

Revision Date: 02/12/2025 EJK



FOR BIDDING PURPOSES ONLY

212+21 - 62'L
Install 30" - 68' RCP
& 2 Sloped Ends

212+21 - 67'R
Install 24" - 82' RCP
& 2 Safety Ends

221+40
Take Out 4X6' - 63' RCP Cattle Pass
(Incidental Work, Grading)

229+41
Take Out 18" - 62' RCP
& 2 End Sections
(Incidental Work, Grading)

230-44-15'R
Take Out 18" - 60' RCP
& 2 End Sections
(Incidental Work, Grading)

221+40 (11 Ac)
Install Twin 36" - 78' RCP Arch
& 4 Flared Ends
(Spaced 6.8 ft C to C
Controlled Density Fill)

229+41 (1 Ac)
Install 24" - 60' RCP
& 2 Sloped Ends

230+43-49'R
Install 18" - 72' CMP
& 2 Safety Ends

238+41-49'L
Install 18" - 80' CMP
& 2 Safety Ends

238+41-49'R
P Install 18" - 82' CMP
& 2 Safety Ends

Sec. 15 - T117N - R56W

Haggar Properties, LLC
Parcel A17

SE1/4

233+40 L
Eliminate Entrance

PI 238+41.40
N 413882.92
E 2606732.36
Del 0°06'26" R

233+40 R
Eliminate Entrance

Northern Border Pipeline Company, ONEOK
Partners Intermediate Limited Partnership and
TC Pipeline Intermediate Limited Partnership
Parcel A19

226+76 R
Begin Type 2 Fence

233+27 R
End Type 2 Fence

227+00 to 230+00
Do Not Disturb
Chainlink Fence in
Temporary Easement

1/64 Line

Sec. 14 - T117N - R56W

Parcel A17
212+54.10 to 238+41.57 L
Temporary Easement containing
4.1 ac, more or less

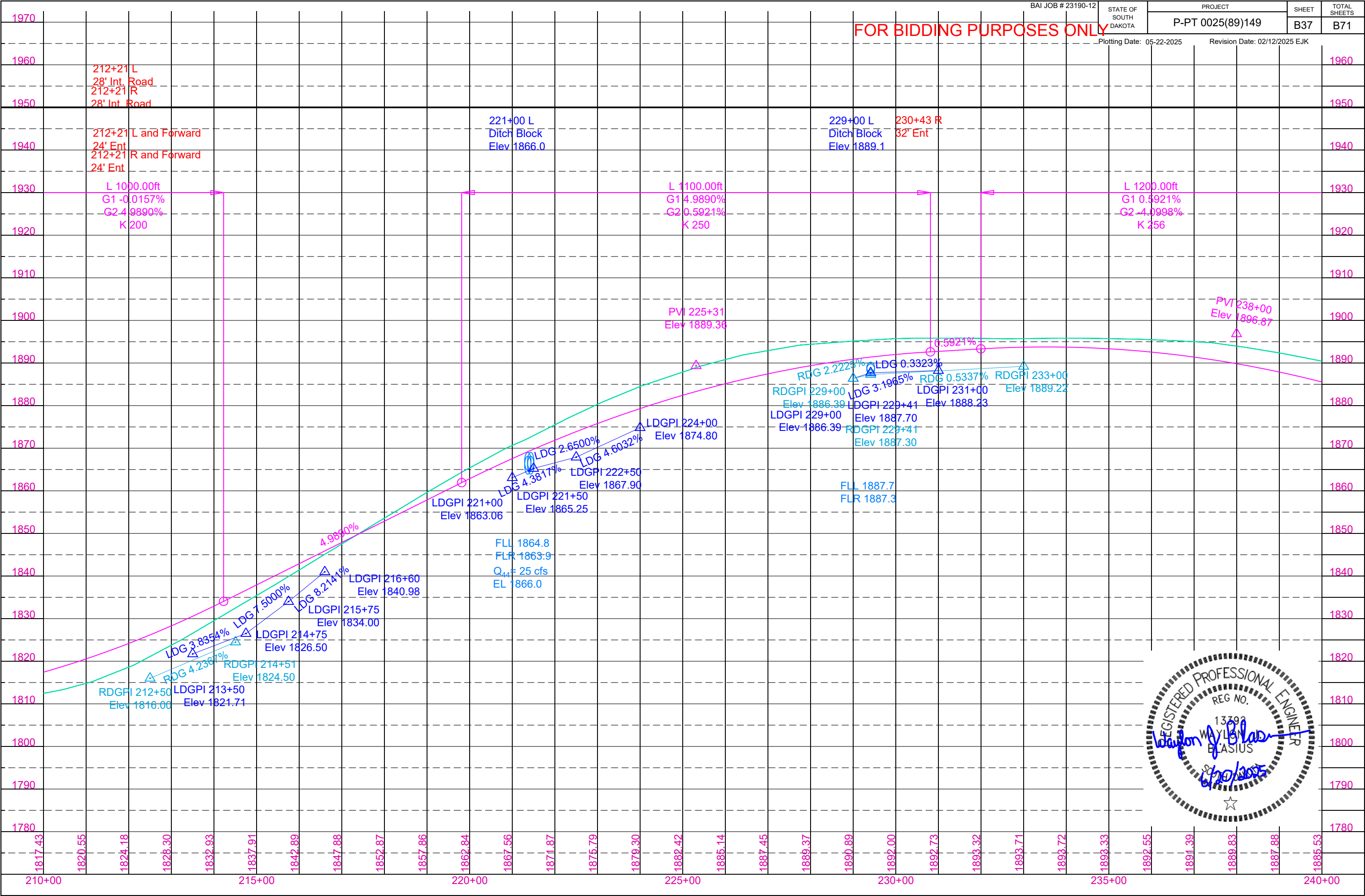
Parcel A18
212+53.37 to 217+15.04 R
Temporary Easement containing
0.3 ac, more or less

Parcel A18
220+51.59 to 226+76.14 R
Temporary Easement containing
0.8 ac, more or less

Parcel A18
233+26.57 to 238+41.85 R
Temporary Easement containing
0.6 ac, more or less

Parcel A19
226+76.11 to 233+26.60 R
Temporary Easement containing
0.3 ac, more or less





REGISTERED PROFESSIONAL ENGINEER

REG NO. 13792

WAYNE BLASIUS

6/20/2025

243+62
Take Out 18" - 71' RCP
& 2 End Sections
(Incidental Work, Grading)
243+62 (3 Ac)
Install 24" - 74' RCP
Skewed 30° RHF
& 2 Sloped Ends

247+81
Take Out 18" - 120' RCP
& 2 End Sections
(Incidental Work, Grading)
247+81 (9 Ac)
Install 24" - 160' RCP
& 2 Sloped Ends

247+81
Install Bank and Channel Protection
Gabions (4.5 Cu. Yd.) and Type B
Drainage Fabric (15 Sq. Yd.)

251+36
Take Out 18" - 69' RCP
& 2 End Sections
(Incidental Work, Grading)
251+36 (15 Ac)
Install 24" - 112' RCP
& 2 Sloped Ends

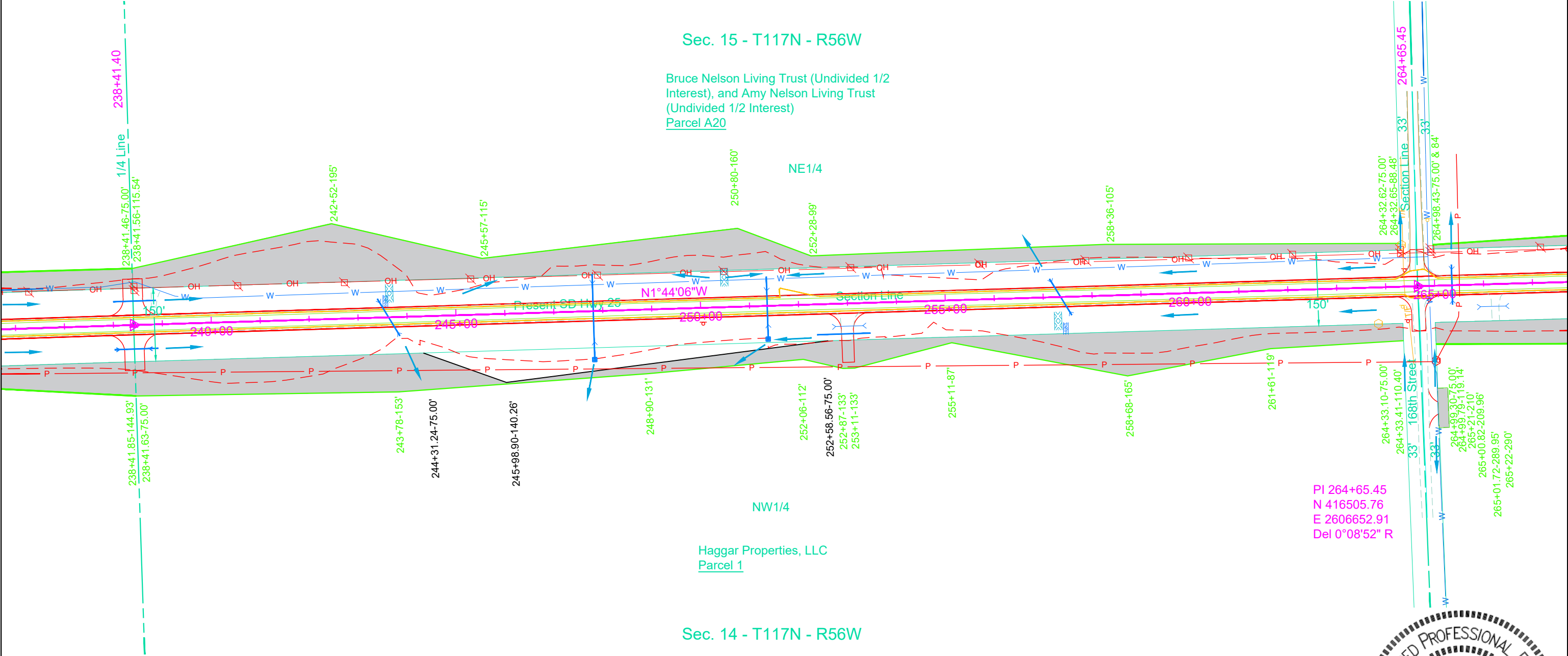
251+36
Install Bank and Channel Protection
Gabions (4.5 Cu. Yd.) and Type B
Drainage Fabric (15 Sq. Yd.)

253+00 - 47' R
Take Out 18" - 56' RCP
& 2 End Sections
(Incidental Work, Grading)

253+00 - 62' R
Install 18" - 102' CMP
& 2 Safety Ends

257+36
Take Out 18" - 112' RCP
& 2 End Sections
(Incidental Work, Grading)
257+36 (8 Ac)
Install 30" - 70' RCP
Skewed 30° RHF
& 2 Sloped Ends

FOR BIDDING PURPOSES ONLY

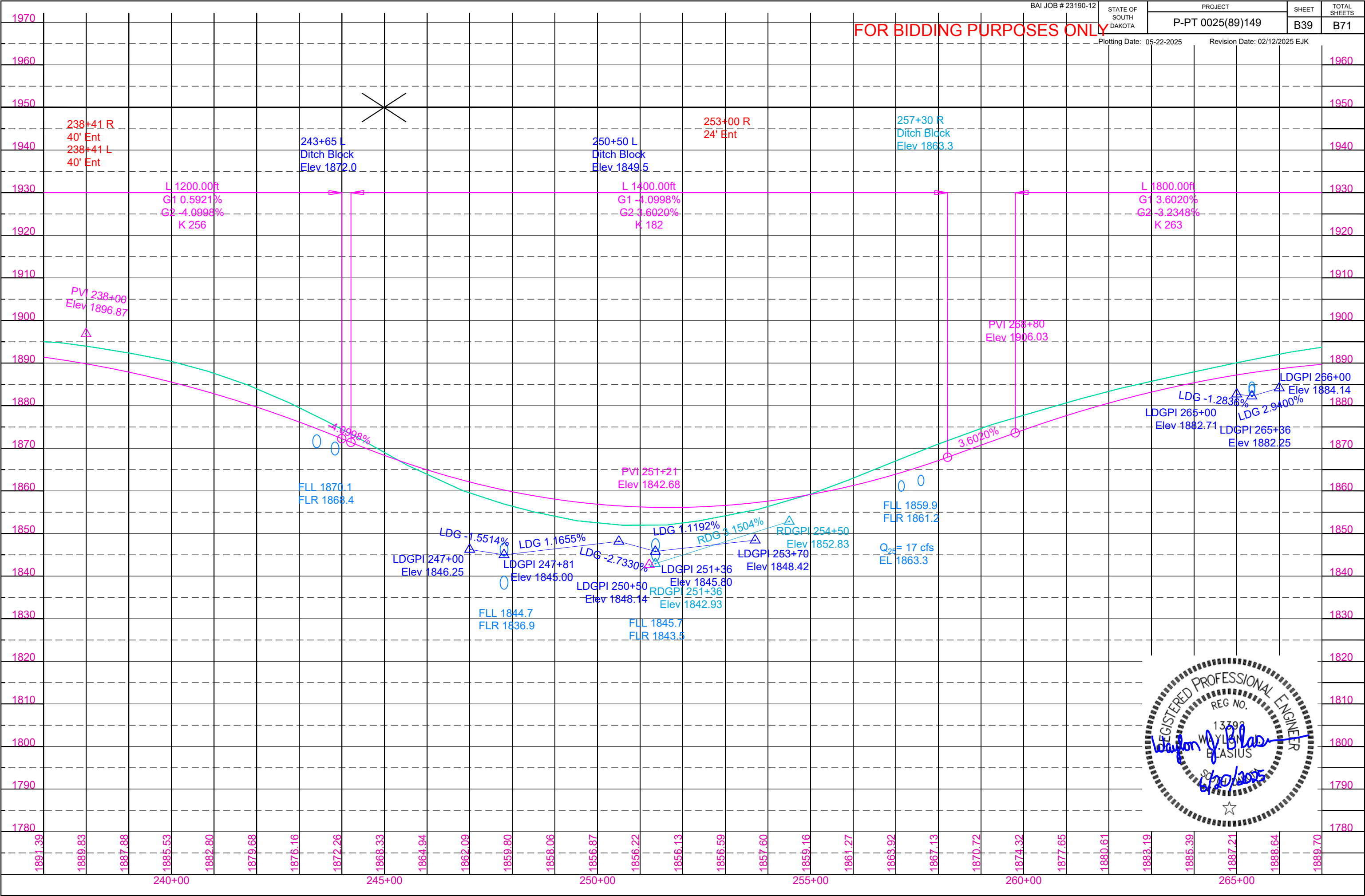


Parcel A20
238+41.46 to 264+32.65 L
Temporary Easement containing
2.9 ac, more or less

Parcel 1
238+41.63 to 264+33.41 R
Temporary Easement containing
2.8 ac, more or less

PI 264+65.45
N 416505.76
E 2606652.91
Del 0°08'52" R





265+36
Take Out 18" - 63' RCP
& 2 End Sections
(Incidental Work, Grading)

266+26 - 46 L
Take Out 18" - 51 RCP
& 2 End Sections
(Incidental Work, Grading)

265+36 (4 Ac)
Install 30" - 64' RCP
& 2 Sloped Ends

278+32
Take Out 18" - 70' RCP
& 2 End Sections
(Incidental Work, Grading)

278+32 (4 Ac)
Install 24" - 80' RCP
Skewed 30° LHF
& 2 Sloped Ends

278+32
Install Bank and Channel Protection
Gabions (4.5 Cu. Yd.) and Type B
Drainage Fabric (15 Sq. Yd.)

285+32
Take Out 18" - 55' RCP
& 2 End Sections
(Incidental Work, Grading)

285+32 (59 Ac)
Install 36" - 78' RCP Arch
& 2 Flared Ends

291+05 - 42 L
Take Out 18" - 61' RCP
& 2 End Sections
(Incidental Work, Grading)

291+05 - 59' L
Install 18" - 106' CMP
& 2 Safety Ends

291+05 - 48 R
Take Out 18" - 49' RCP
& 2 End Sections
(Incidental Work, Grading)

291+05 - 65' R
Install 18" - 124' CMP
& 2 Safety Ends

BAI JOB # 23190-12

STATE OF
SOUTH
DAKOTA

PROJECT

P-PT 0025(89)149

SHEET

B40

TOTAL
SHEETS

B71

Plotting Date: 05-22-2025

Revision Date: 02/12/2025 EJK

FOR BIDDING PURPOSES ONLY



Sec. 10 - T117N - R56W

Haggar Properties, LLC
Parcel A21

SE 1/4

SW 1/4

Lynda J. Stern
Parcel A22

Sec. 11 - T117N - R56W

Parcel A21
264+98.43 to 279+39.81 L
Temporary Easement containing
0.7 ac, more or less

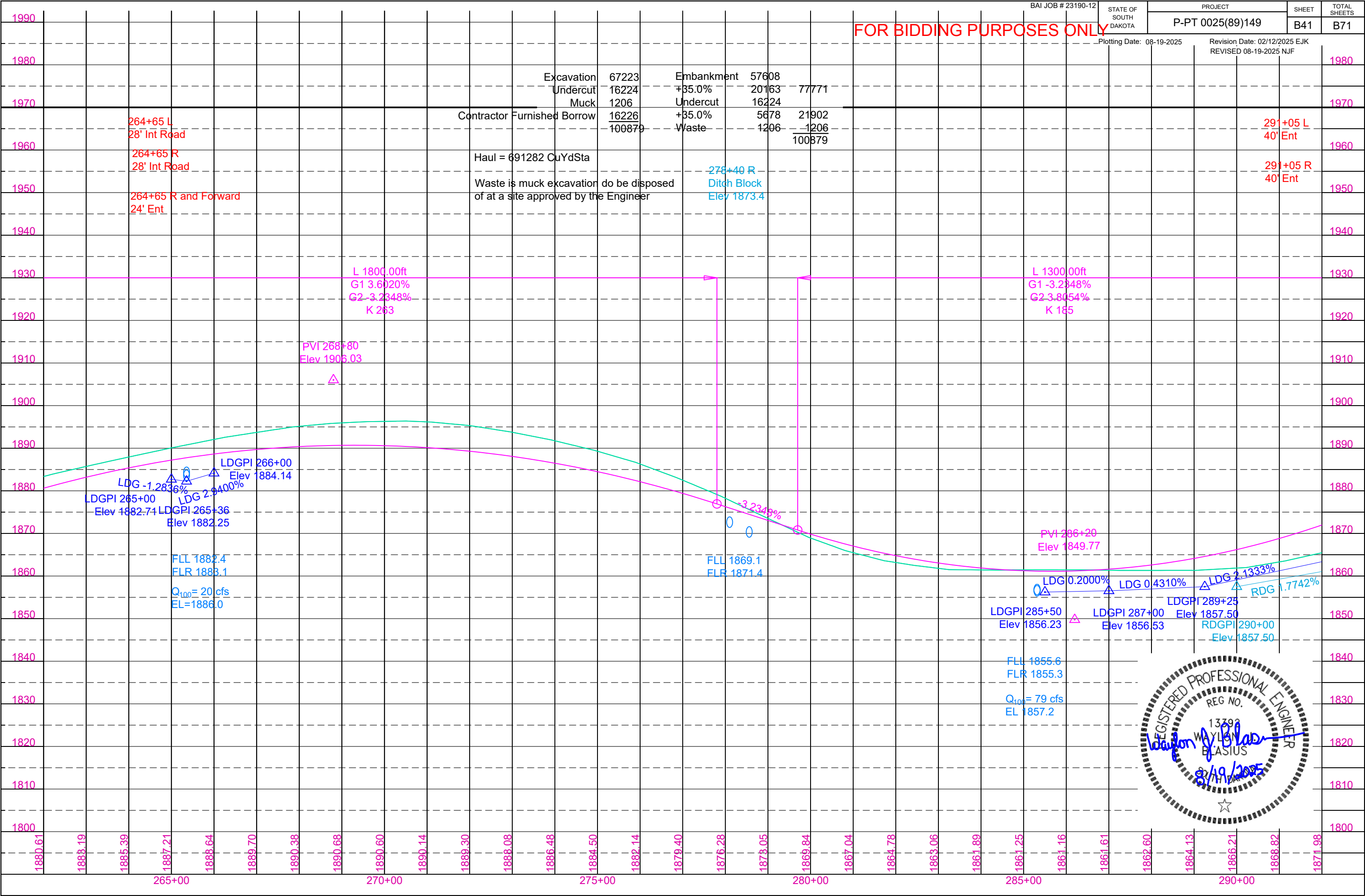
Parcel A21
289+25.69 to 291+05.58 L
Temporary Easement containing
0.2 ac, more or less

Parcel A22
264+99.30 to 280+67.12 R
Temporary Easement containing
2.1 ac, more or less

Parcel A22
265+00.82 to 265+21 R
Temporary Easement containing
0.1 ac, more or less

Parcel A22
288+66.83 to 291+06.04 L
Temporary Easement containing
0.4 ac, more or less





FOR BIDDING PURPOSES ONLY



296+33
Take Out 18" - 117' RCP
& 2 End Sections
(Incidental Work, Grading)
299+77 - 42 L
Take Out 18" - 60' RCP
& 2 End Sections
(Incidental Work, Grading)

296+33 (3 Ac)
Install 36" - 128' Arch RCP
& 2 Flared Ends
296+33
Install Bank and Channel Protection
Gabions (6.0 Cu. Yd.) and Type B
Drainage Fabric (19 Sq. Yd.)

311+31
Take Out 18" - 70' RCP
& 2 End Setions
(Incidental Work, Grading)

311+31 (3 Ac)
Install 24" - 86' RCP
Skewed 30° RHF
& 2 Sloped Ends
311+31
Install Bank and Channel Protection
Gabions (4.5 Cu. Yd.) and Type B
Drainage Fabric (15 Sq. Yd.)

316+87
Take Out 18" - 101' CMP
(Incidental Work, Grading)
316+25 (31 Ac)
Install 30" - 138' RCP
& 2 Sloped Ends
316+25
Install Bank and Channel Protection
Gabions (6.0 Cu. Yd.) and Type B
Drainage Fabric (19 Sq. Yd.)

Sec. 10 - T117N - R56W

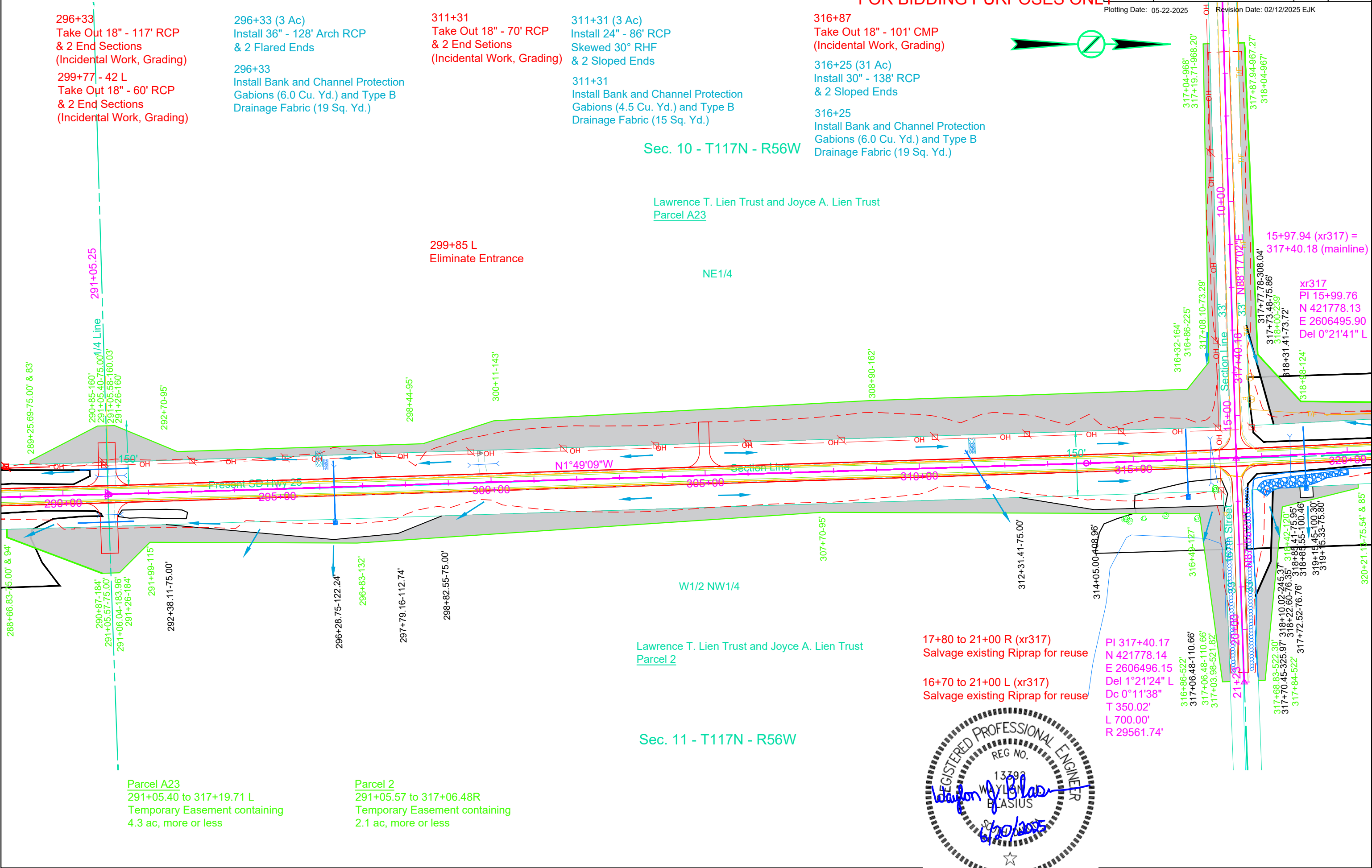
Lawrence T. Lien Trust and Joyce A. Lien Trust
Parcel A23

299+85 L
Eliminate Entrance

NE1/4

15+97.94 (xr317) =
317+40.18 (mainline)

xr317
PI 15+99.76
N 421778.13
E 2606495.90
Del 0°21'41" L



Parcel A23
291+05.40 to 317+19.71 L
Temporary Easement containing
4.3 ac, more or less

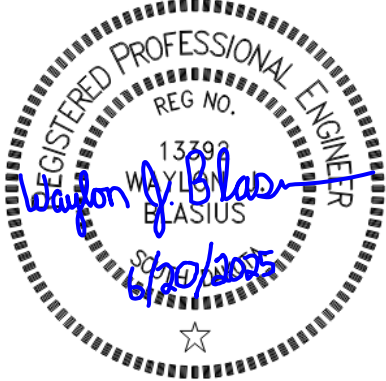
Parcel 2
291+05.57 to 317+06.48R
Temporary Easement containing
2.1 ac, more or less

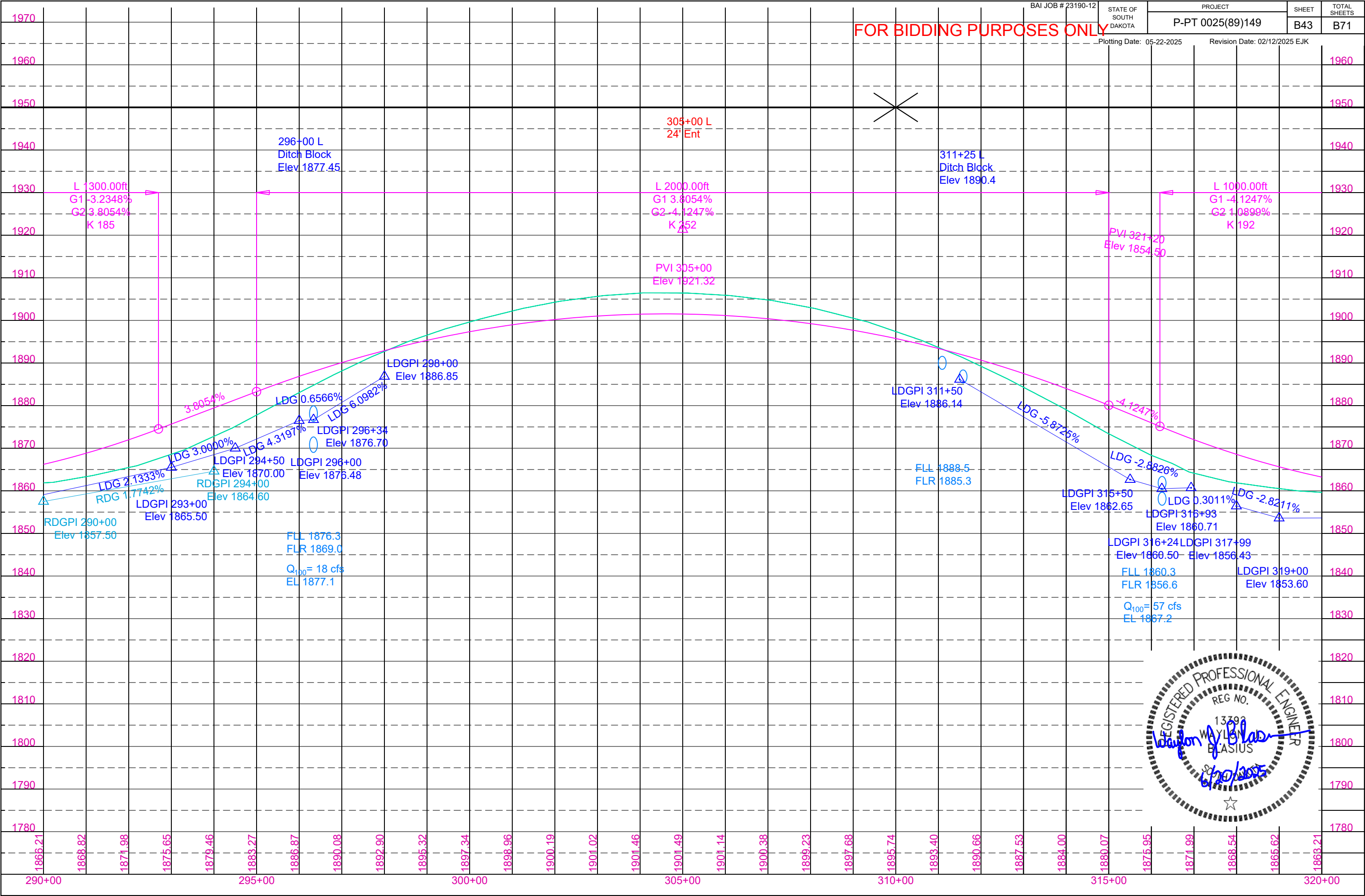
Lawrence T. Lien Trust and Joyce A. Lien Trust
Parcel 2

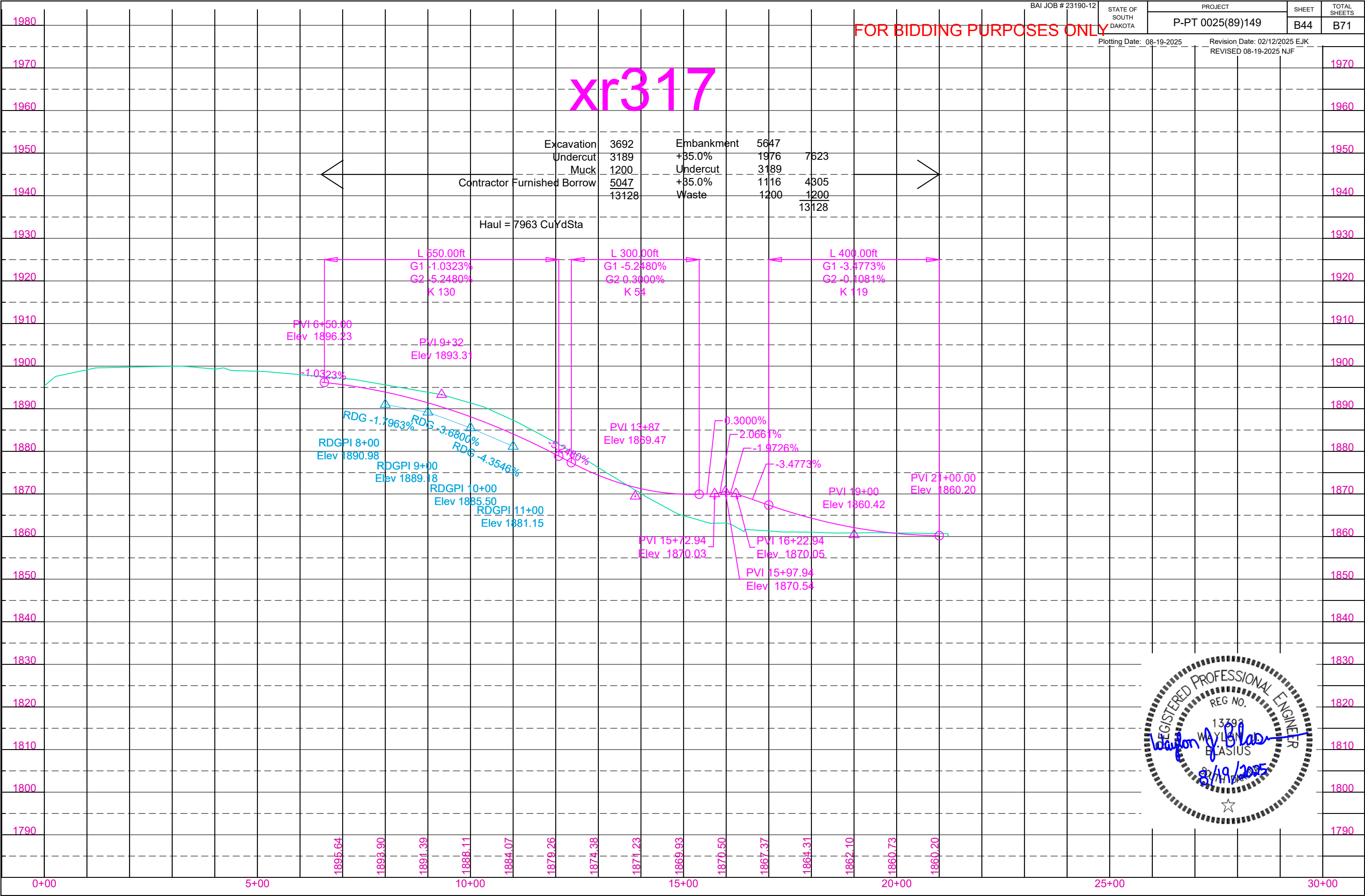
Sec. 11 - T117N - R56W

17+80 to 21+00 R (xr317)
Salvage existing Riprap for reuse
16+70 to 21+00 L (xr317)
Salvage existing Riprap for reuse

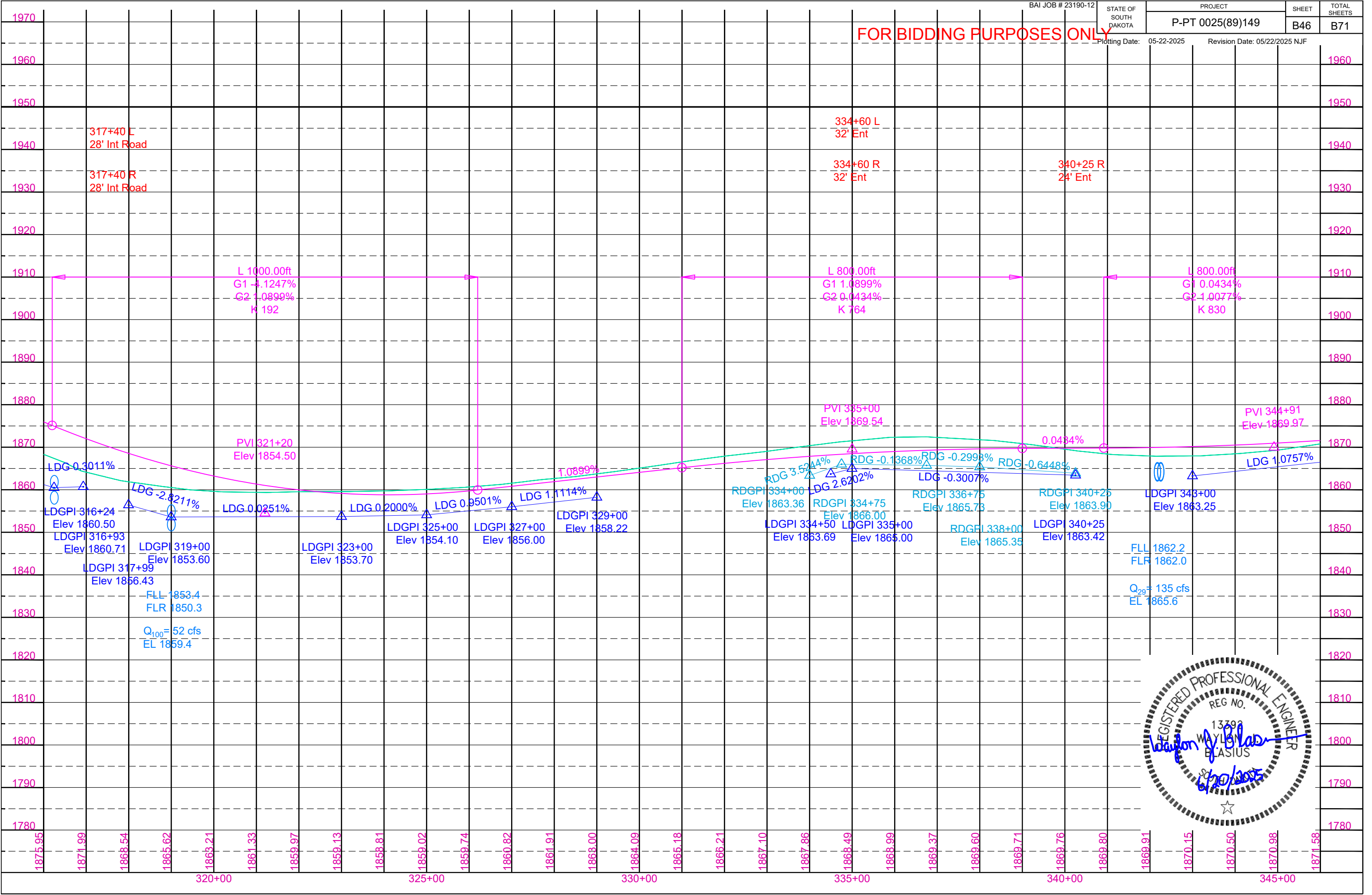
PI 317+40.17
N 421778.14
E 2606496.15
Del 1°21'24" L
Dc 0°11'38"
T 350.02'
L 700.00'
R 29561.74'







xr317



349+42 - 43' R
Take Out 18" - 54' RCP
& 2 End Sections
(Incidental Work, Grading)

352+54- 36' L
Take Out 18" - 55' CMP
& 2 End Sections
(Incidental Work, Grading)

353+63 - 36' L
Take Out 18" - 78' RCP
& 2 End Sections
(Incidental Work, Grading)

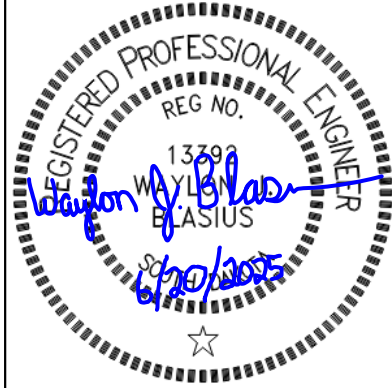
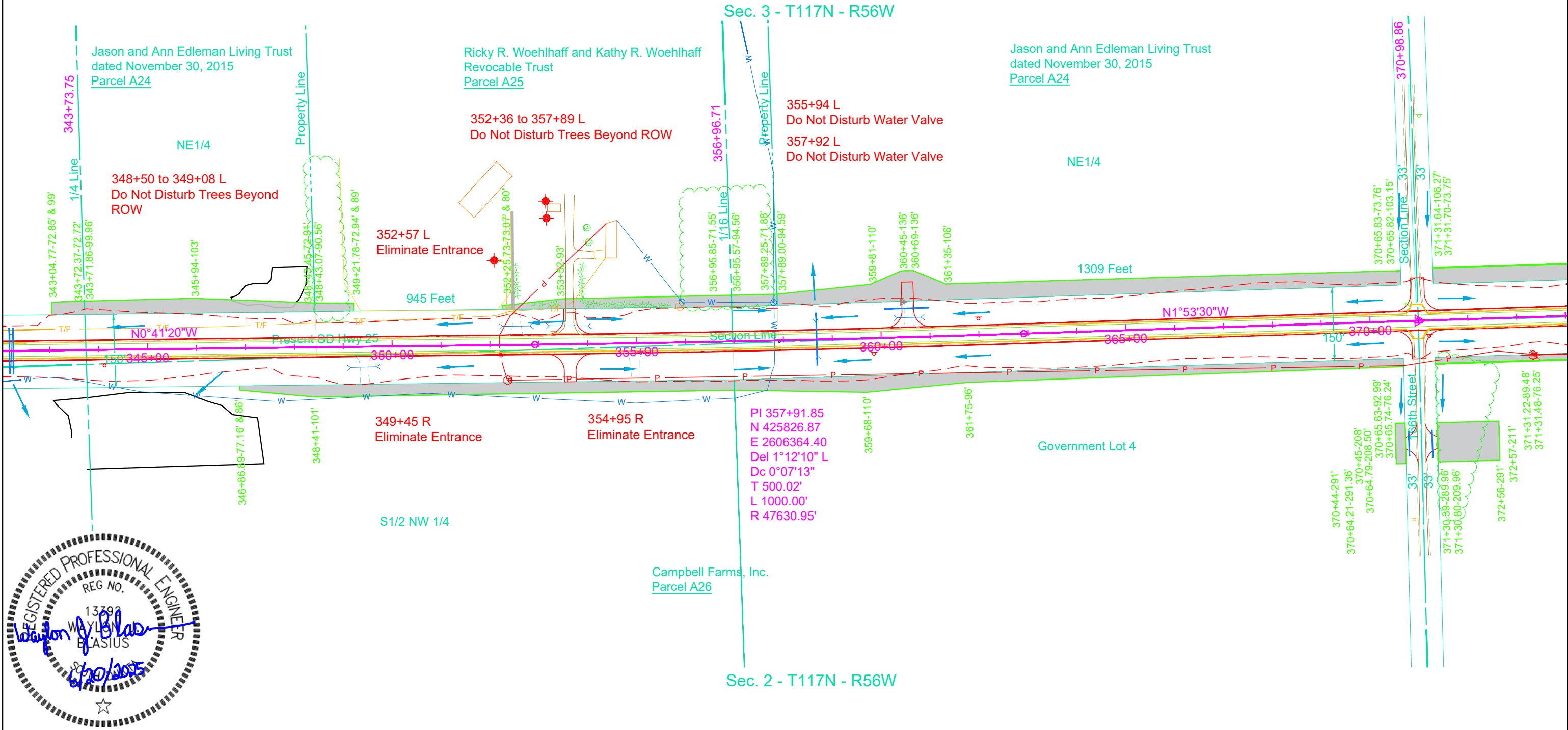
358+73
Take Out 18" - 55' RCP
& 2 End Sections
(Incidental Work, Grading)

358+68 (3 Ac)
Install 24" - 94' RCP
& 2 Sloped Ends

360+56 - 39' L
Take Out 18" - 49' RCP
& 2 End Sections
(Incidental Work, Grading)

360+56 - 59' L
Install 18" - 84' CMP
& 2 Safety Ends

FOR BIDDING PURPOSES ONLY



Parcel A24
343+71.86 to 348+43.45 L
Temporary Easement containing
0.3 ac, more or less

Parcel A24
357+89.00 to 370+65.83 L
Temporary Easement containing
1.0 ac, more or less

Parcel A25
348+43.07 to 349+21.78 L
Temporary Easement containing
0.1 ac, more or less

Parcel A25
352+25.73 to 357+89.25 L
Temporary Easement containing
0.3 ac, more or less

Parcel A26
346+86.89 to 370+65.74 R
Temporary Easement containing
1.2 ac, more or less

Parcel A26
370+44 to 370+64.79 R
Temporary Easement containing
0.1 ac, more or less

FOR BIDDING PURPOSES ONLY

370+72 - 250' R
Install 18" - 42' CMP
& 2 Safety Ends

371+20 -250' R
Install 18" - 50' CMP
& 2 Safety Ends

378+31
Take Out 24" - 75' RCP
& 2 End Sections
(Incidental Work, Grading)

378+31 (19 Ac)
Install 30" - 84' RCP
& 2 Sloped Ends

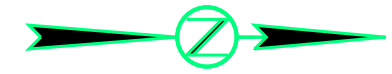
384+75
Take Out 18" - 67' RCP
& 2 End Sections
(Incidental Work, Grading)

384+76 (111 Ac)
Install 48" - 80' RCP
& 2 Flared Ends

384+76
Install Bank and Channel Protection
Gabions (12.0 Cu. Yd.) and Type B
Drainage Fabric (34 Sq. Yd.)

395+26
Take Out 18" - 74' RCP
& 2 End Sections
(Incidental Work, Grading)

395+27 (5 Ac)
Install 24" - 78' RCP
& 2 Sloped Ends



Sec. 34 - T118N - R56W

Campbell Farms, Inc.
Parcel A27

SE1/4

SW1/4

Haggar Properties, LLC and
Mary Christina Haggar
Parcel A28

Sec. 35 - T118N - R56W

Parcel A27
371+31.64 to 377+14.68 L
Temporary Easement containing
0.4 ac, more or less

Parcel A27
379+53.19 to 397+28.48 L
Temporary Easement containing
1.2 ac, more or less

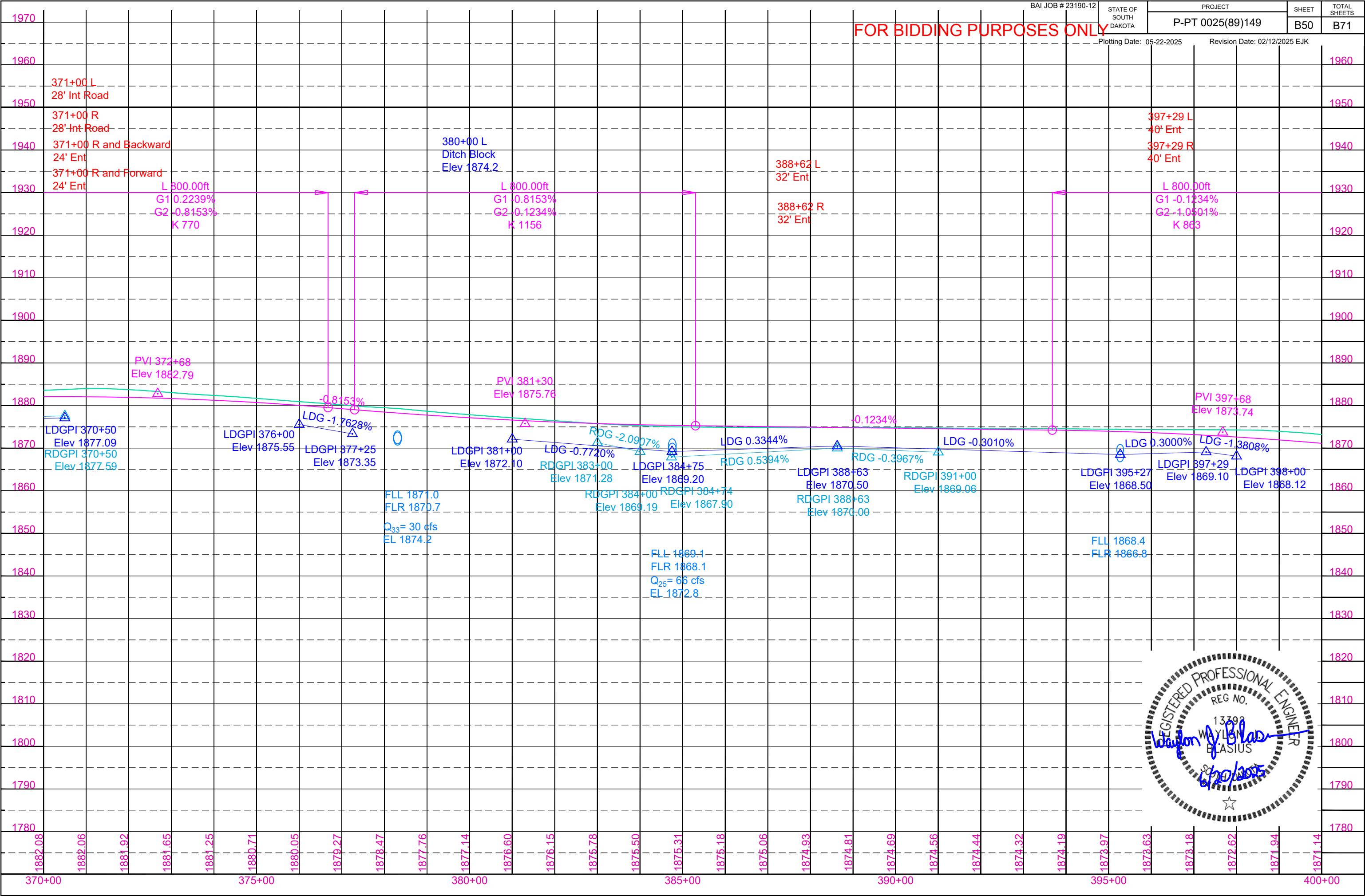
Parcel A28
371+30.39 to 372+56 R
Temporary Easement containing
0.2 ac, more or less

Parcel A28
371+31.22 to 375+98.48 R
Temporary Easement containing
0.1 ac, more or less

Parcel A28
379+58.05 to 391+23.18 R
Temporary Easement containing
0.5 ac, more or less

Parcel A28
396+74.63 to 397+28.22 R
Temporary Easement containing
0.1 ac, more or less





407+06
Take Out 18" - 133' RCP
& 2 End Sections
(Incidental Work, Grading)

407+06 (488 Ac)
Install 54" - 164' RCP
& 2 Flared Ends

407+06
Install Bank and Channel Protection
Gabions (12.0 Cu. Yd.) and Type B
Drainage Fabric (34 Sq. Yd.)

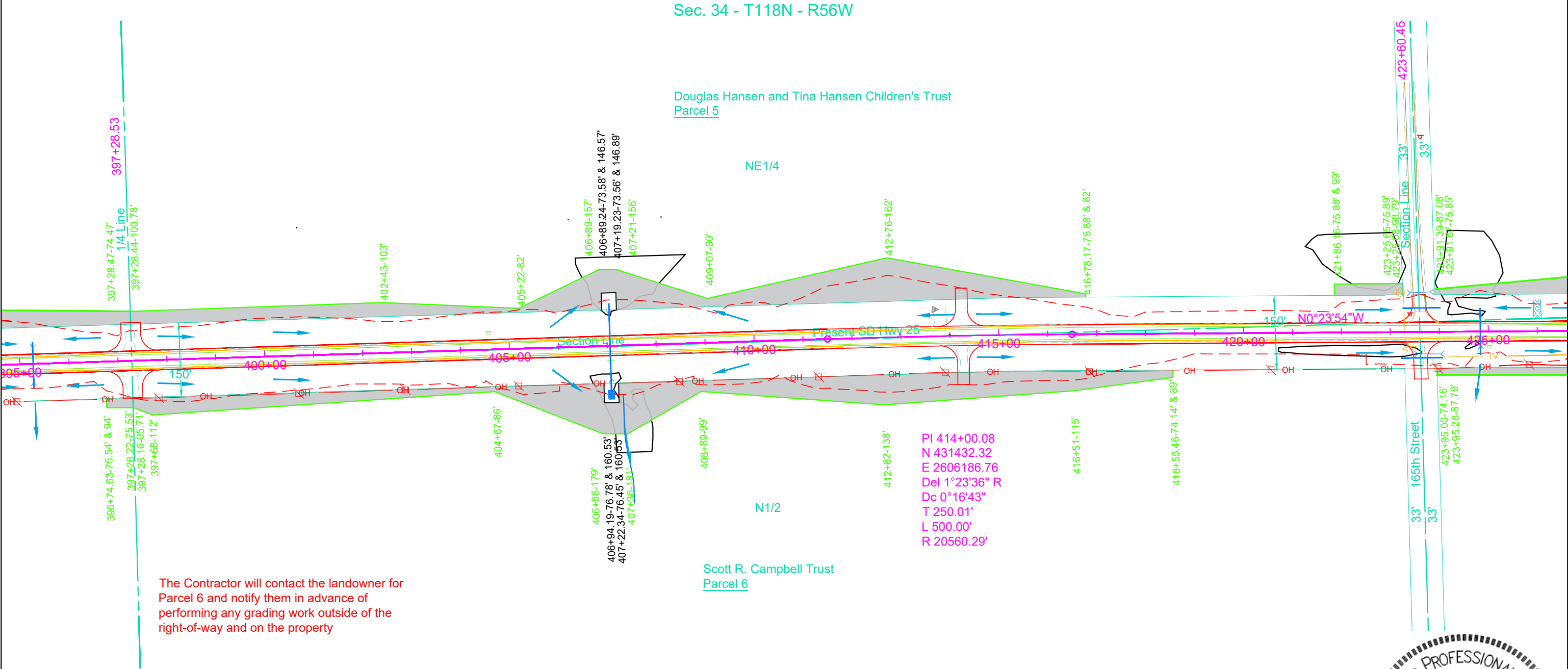
423+60 - 79' L
Take Out 18" - 40' RCP
& 2 End Sections
(Incidental Work, Grading)

423+62 - 49' L (37 Ac)
Install 18" - 70' CMP
& 2 Safety Ends

423+78 - 48' R
Take Out 18" - 40' RCP
& 2 End Sections
(Incidental Work, Grading)

423+62 - 53' R
Install 18" - 78' CMP
& 2 Safety Ends

FOR BIDDING PURPOSES ONLY



Sec. 34 - T118N - R56W

Douglas Hansen and Tina Hansen Children's Trust
Parcel 5

NE1/4

N1/2

Scott R. Campbell Trust
Parcel 6

Sec. 35 - T118N - R56W

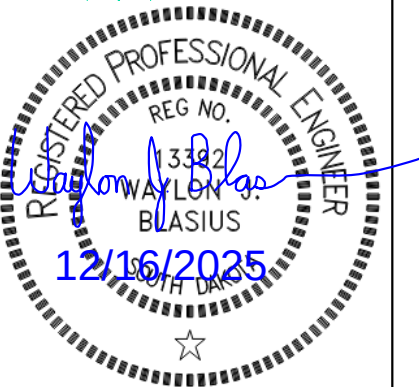
PI 414+00.08
N 431432.32
E 2606186.76
Del 1°23'36" R
Dc 0°16'43"
T 250.01'
L 500.00'
R 20560.29'

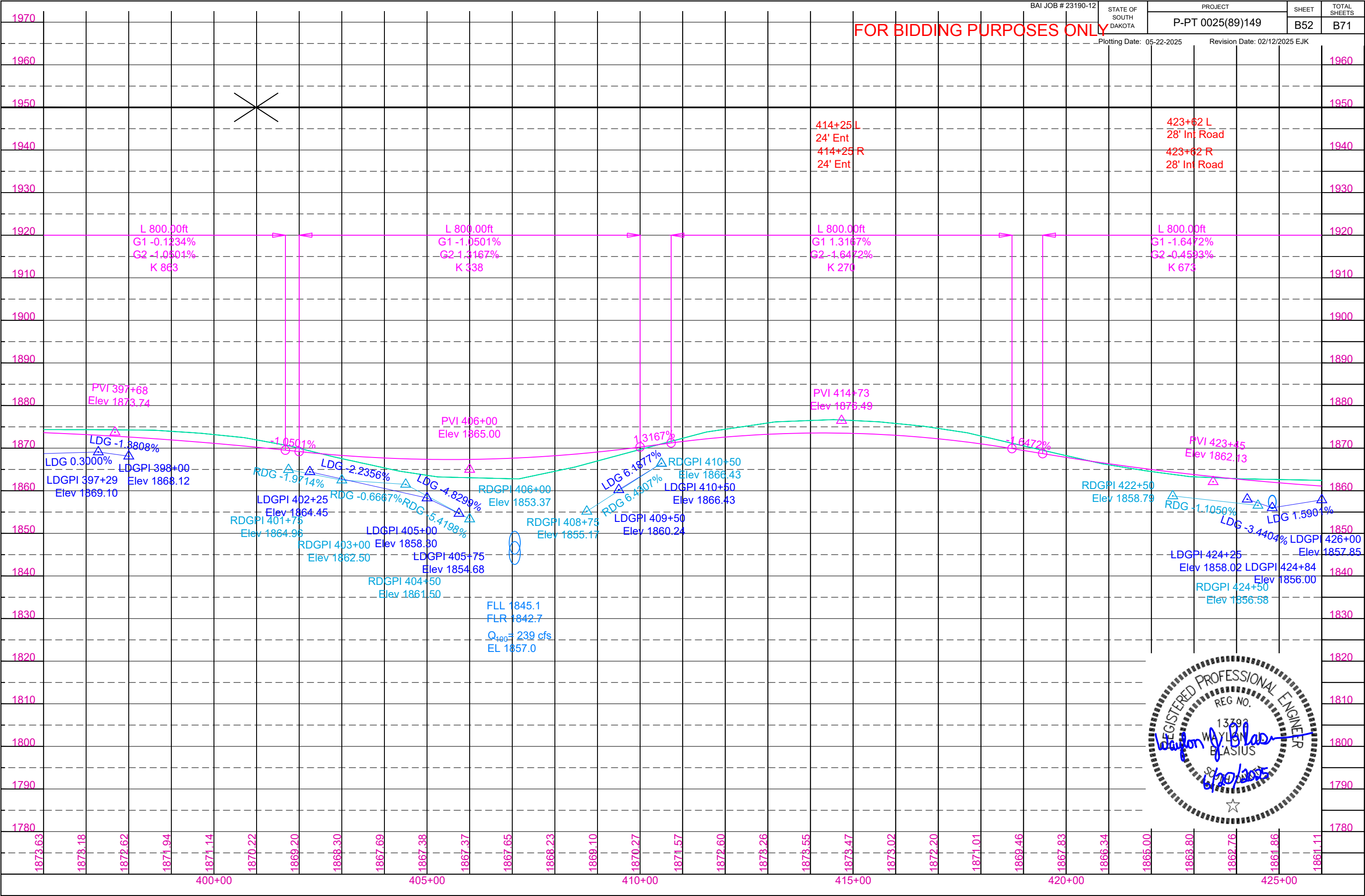
The Contractor will contact the landowner for
Parcel 6 and notify them in advance of
performing any grading work outside of the
right-of-way and on the property

Parcel 5
397+28.44 to 416+78.17 L
Temporary Easement containing
1.7 ac, more or less

Parcel 5
421+86.16 to 423+25.65 L
Temporary Easement containing
0.1 ac, more or less

Parcel 6
397+28.16 to 418+55.46 R
Temporary Easement containing
2.0 ac, more or less





FOR BIDDING PURPOSES ONLY

- 424+84
Take Out 24" - 60' RCP
& 2 End Sections
(Incidental Work, Grading)

424+84 (48 Ac)
Install 36" - 78' RCP
& 2 Flared Ends

424+84
Install Bank and Channel Protection
Gabions (6.0 Cu. Yd.) and Type B
Drainage Fabric (19 Sq. Yd.)
- 433+72 - 73' R
Take Out 18" - 49' RCP
& 2 End Sections
(Incidental Work, Grading)

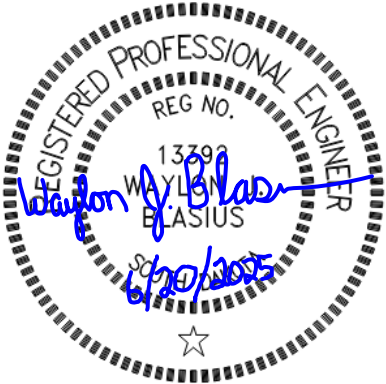
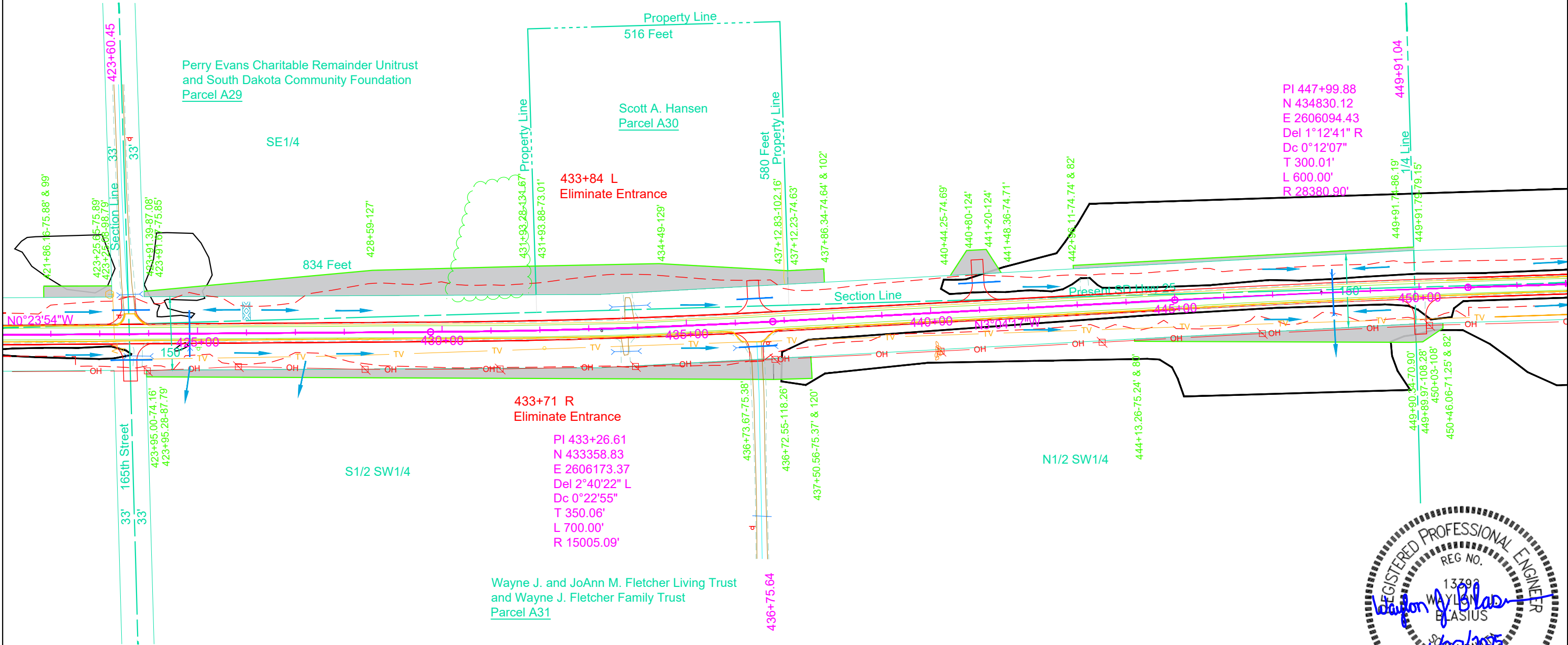
433+83 - 19' L
Take Out 18" - 72' RCP
& 2 End Sections
(Incidental Work, Grading)

436+40 - 49' L
Install 30" - 54' CMP
& 2 Safety Ends
- 436+43 - 49' R
Take Out 18" - 79' CMP
& 2 End Sections
(Incidental Work, Grading)

436+40 - 49' R
Install 18" - 70' CMP
& 2 Safety Ends

441+00 - 57' L (15 Ac)
Install 24" - 72' CMP
& 2 Safety Ends
- 448+23
Take Out 24" - 76' RCP
& 2 End Sections
(Incidental Work, Grading)

448+23 (54 Ac, Equalizer)
Install 42" - 78' RCP
& 2 Flared Ends



- Parcel A29
423+91.39 to 431+93.88 L
Temporary Easement containing
0.8 ac, more or less

Parcel A29
437+12.23 to 437+86.34 L
Temporary Easement containing
0.1 ac, more or less

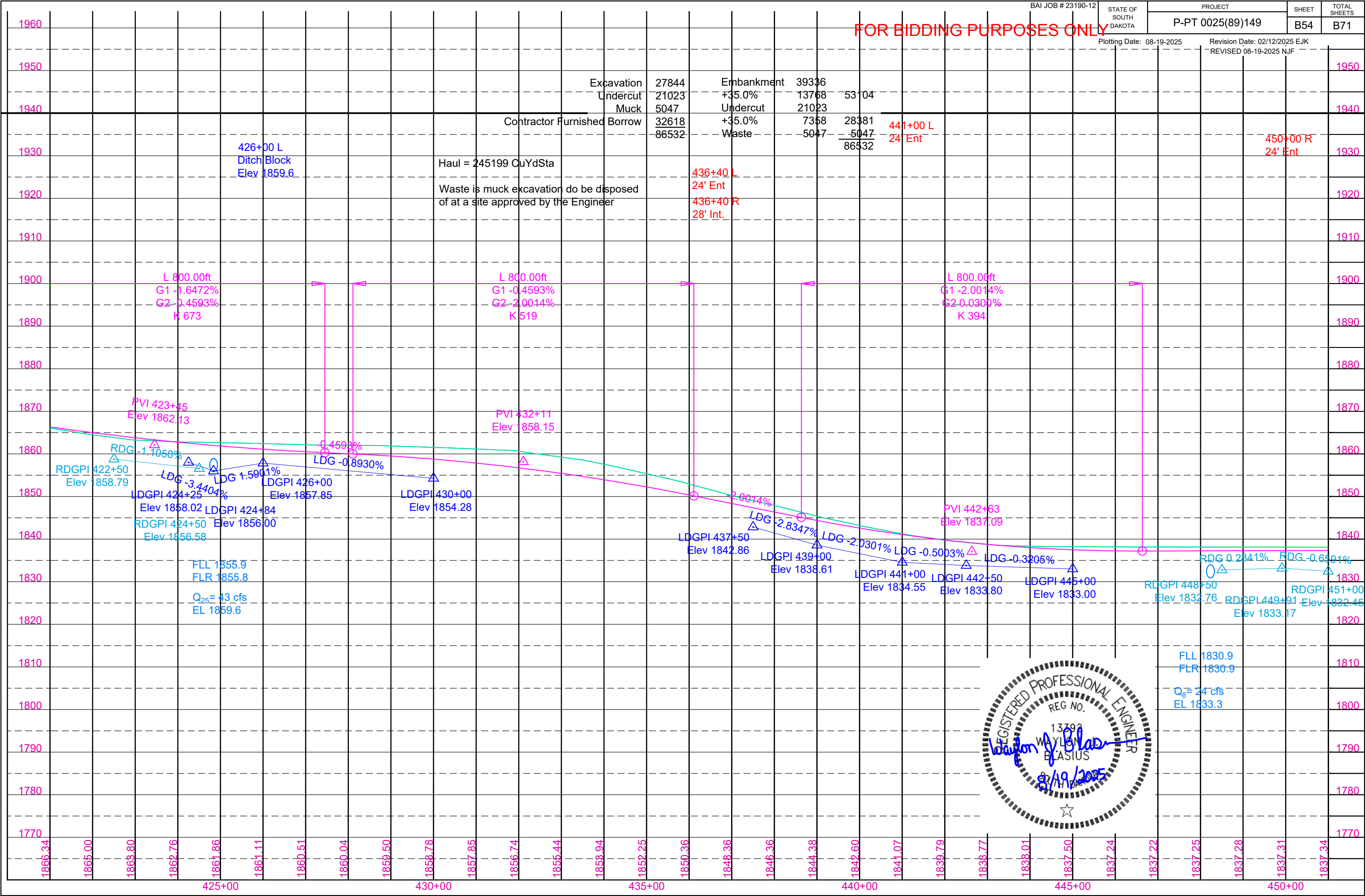
Parcel A29
440+44.25 to 441+48.36 L
Temporary Easement containing
0.1 ac, more or less

Parcel A29
442+96.11 to 449+91.79 L
Temporary Easement containing
0.1 ac, more or less

Parcel A30
431+91.71 to 437+12.83 L
Temporary Easement containing
0.6 ac, more or less

Parcel A31
423+95.00 to 437+50.56 R
Temporary Easement containing
0.7 ac, more or less

Parcel A31
444+13.26 to 449+90.34 R
Temporary Easement containing
0.3 ac, more or less



456+27
Take Out 54" - 80' CMP
& 2 End Sections
(Incidental Work, Grading)

456+27 (1357 Ac, Equalizer)
Install 54" - 78' RCP
& 2 Flared Ends

463+25 - 55' R
Take Out 18" - 50' RCP
& 2 End Sections
(Incidental Work, Grading)

463+06 - 52' L (14 Ac)
Install 18" - 86' CMP
& 2 Safety Ends

FOR BIDDING PURPOSES ONLY
(Incidental Work, Grading)

475+70
Take Out 18" - 67' RCP
& 2 End Sections
(Incidental Work, Grading)

475+70 (10 Ac)
Install 30" - 64' RCP
& 2 Sloped Ends

BAI JOB # 23190-12

STATE OF
SOUTH
DAKOTA

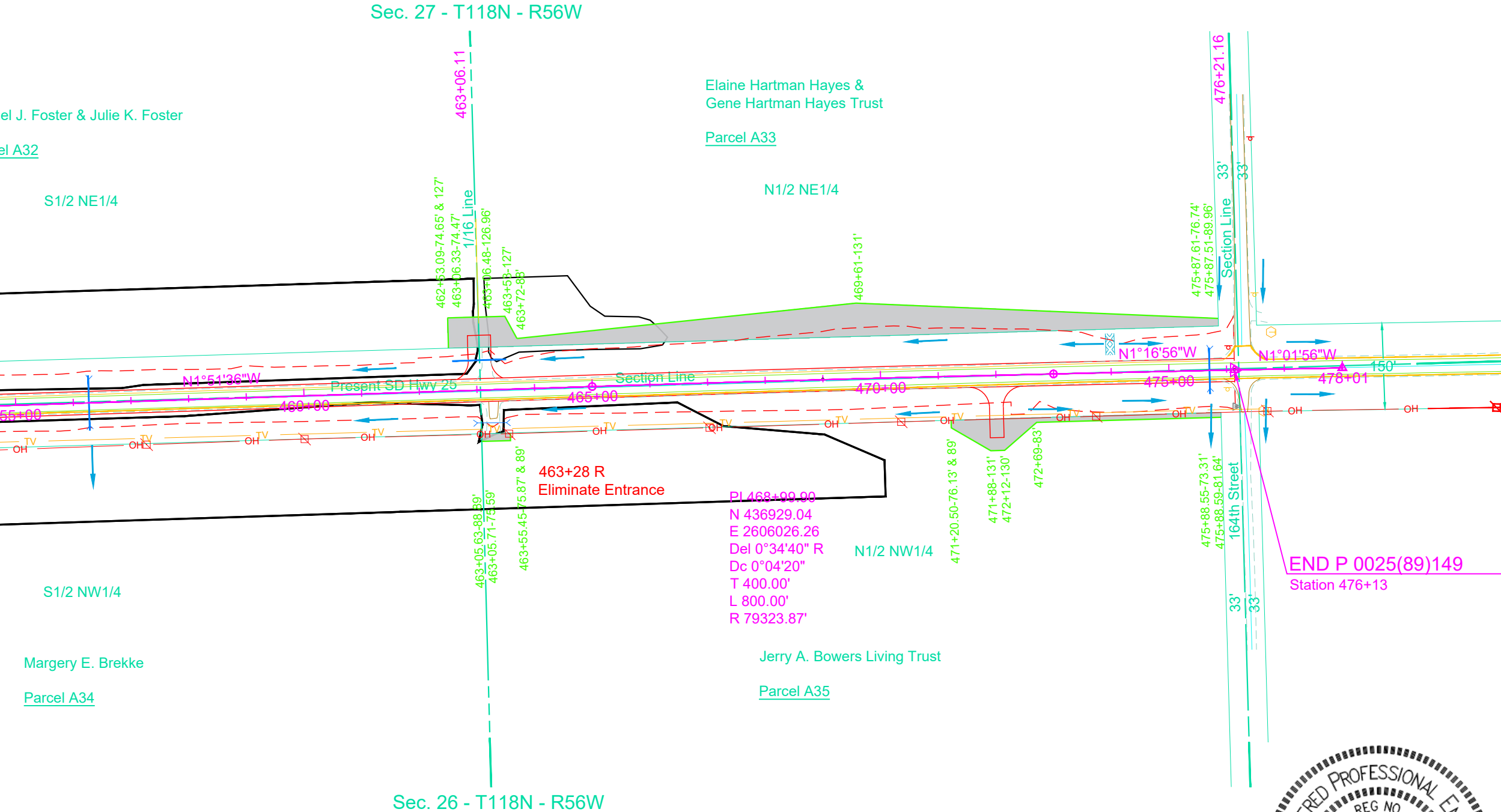
PROJECT
P-PT 0025(89)149

SHEET
B55

TOTAL
SHEETS
B71

Plotting Date: 05-22-2025

Revision Date: 02/12/2025 EJK



Parcel A32
462+53.09 to 463+06.33 L
Temporary Easement containing
0.1 ac, more or less

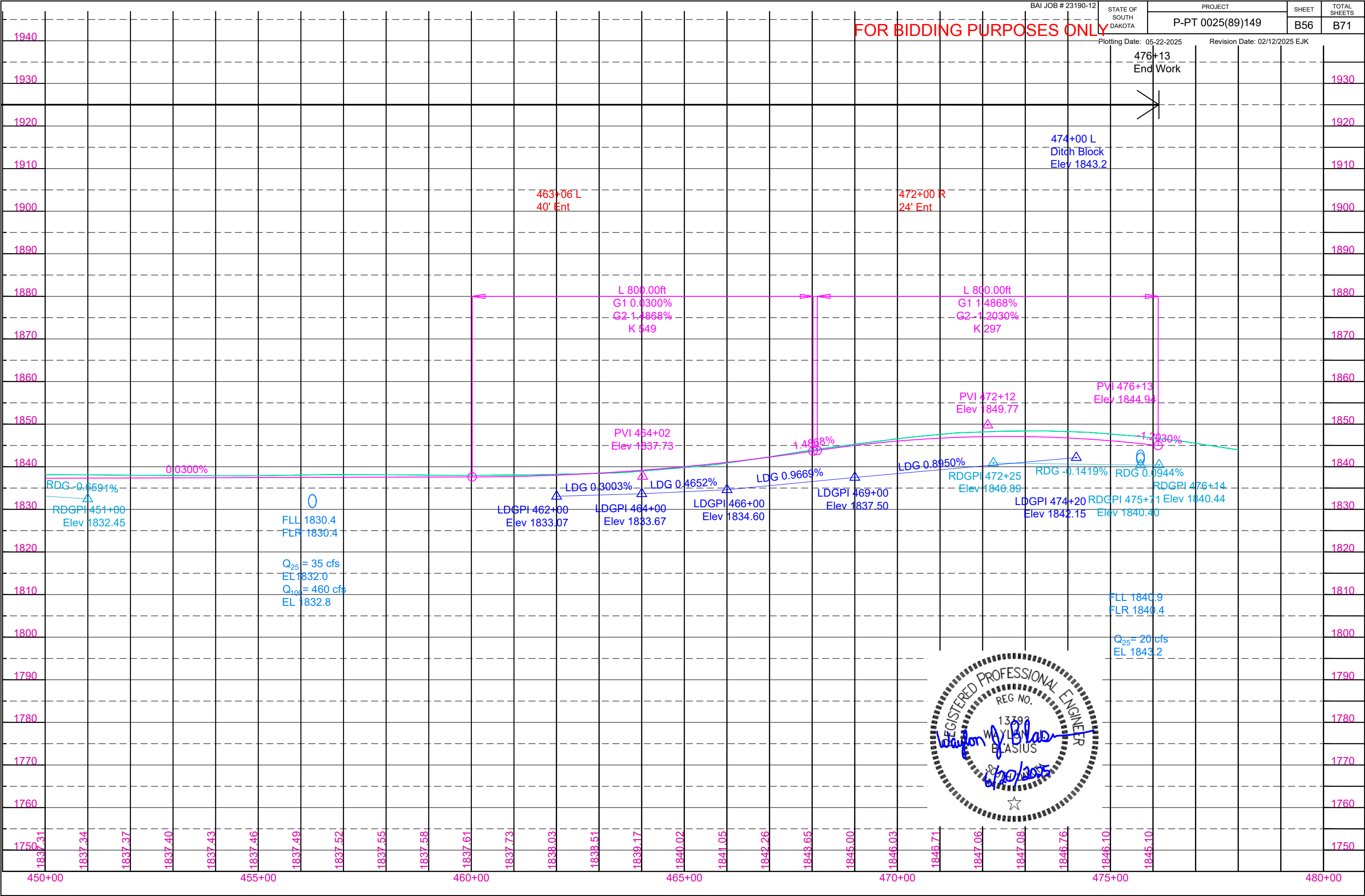
Parcel A33
463+06.48 to 475+87.61 L
Temporary Easement containing
1.1 ac, more or less

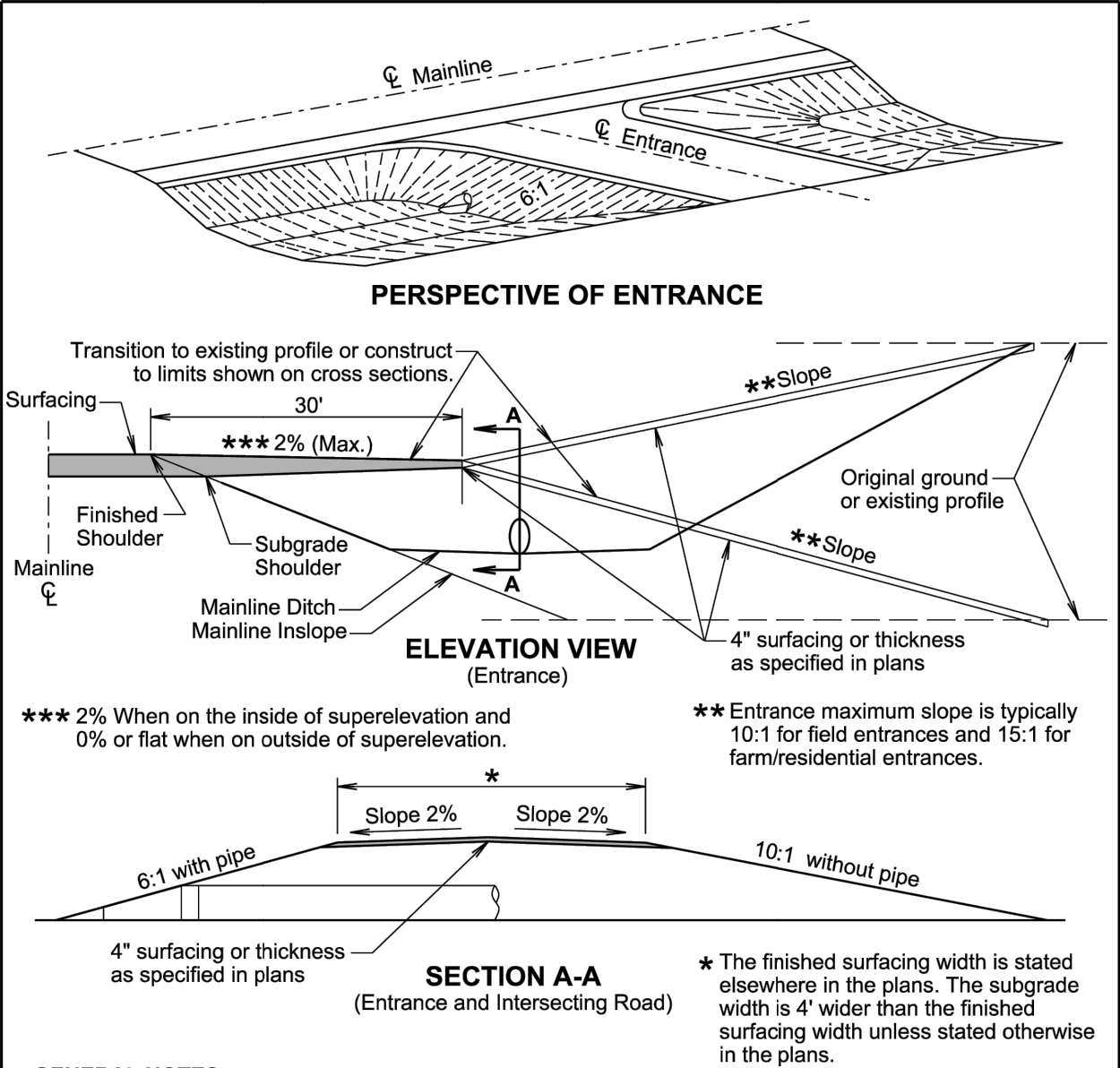
Parcel A34
449+89.97 to 450+46.06 R
Temporary Easement containing
0.1 ac, more or less

Parcel A35
463+05.63 to 463+55.45 R
Temporary Easement containing
0.1 ac, more or less

Parcel A35
471+20.50 to 475+88.59 R
Temporary Easement containing
0.2 ac, more or less







GENERAL NOTES:

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

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

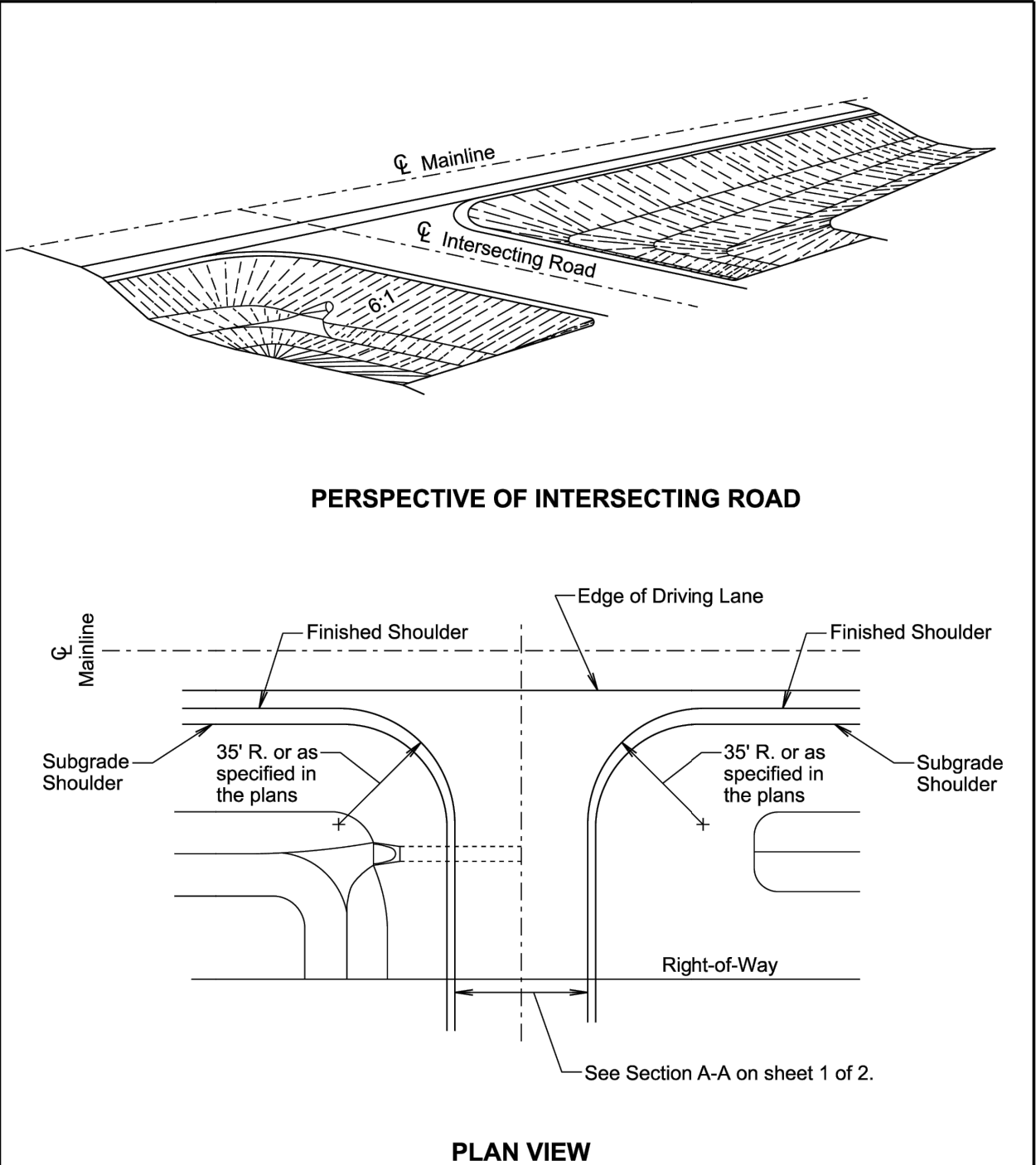
Pipe length will be adjusted if necessary during construction to obtain the 6:1 slope. For grading projects, the pipe length is estimated typically using a 4" thickness of surfacing directly over the subgrade above the pipe.

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

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

November 19, 2021

Published Date: 2026	S D D O T	INTERSECTING ROADS AND ENTRANCES	PLATE NUMBER
			120.01
			Sheet 1 of 2

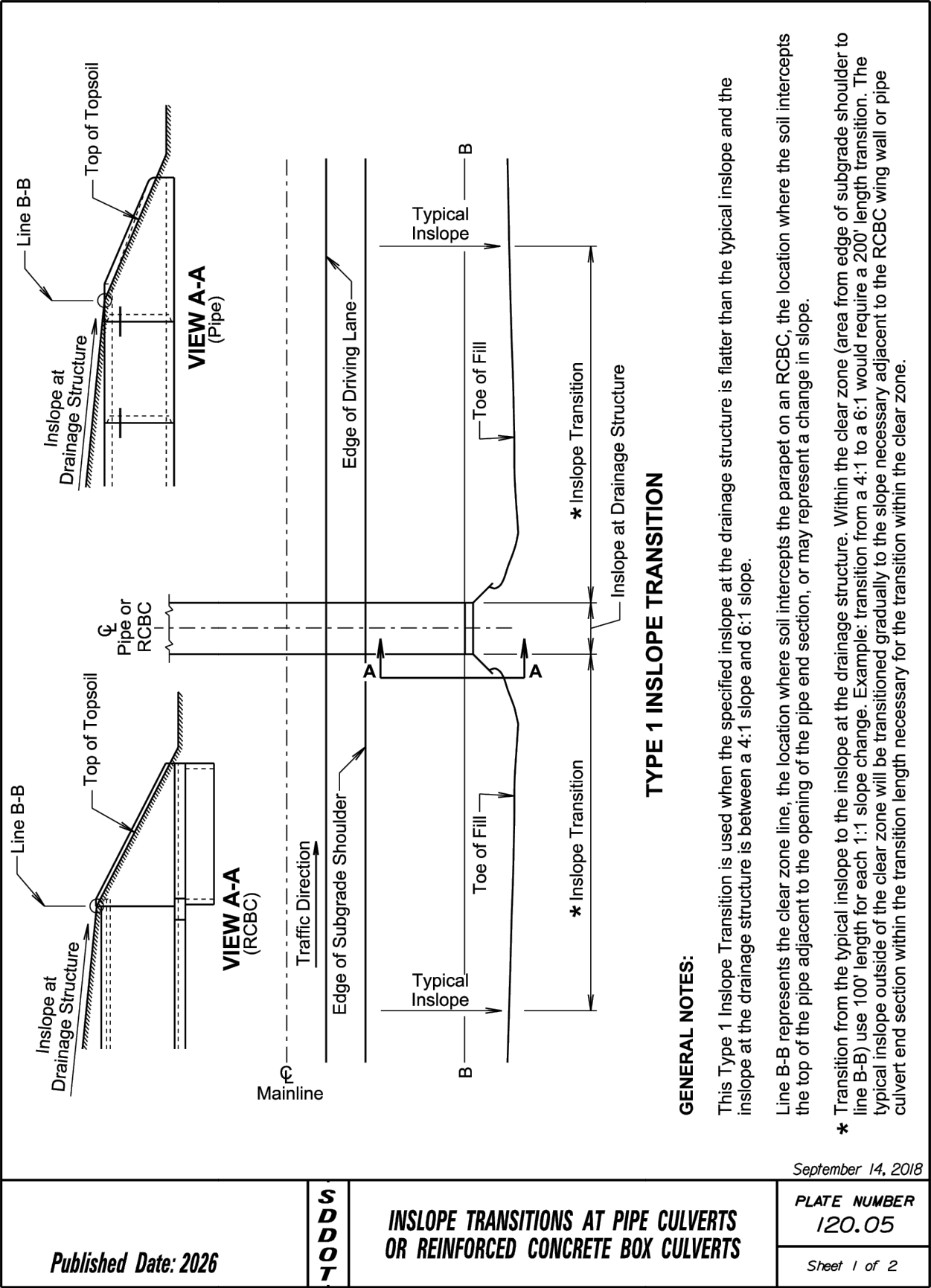
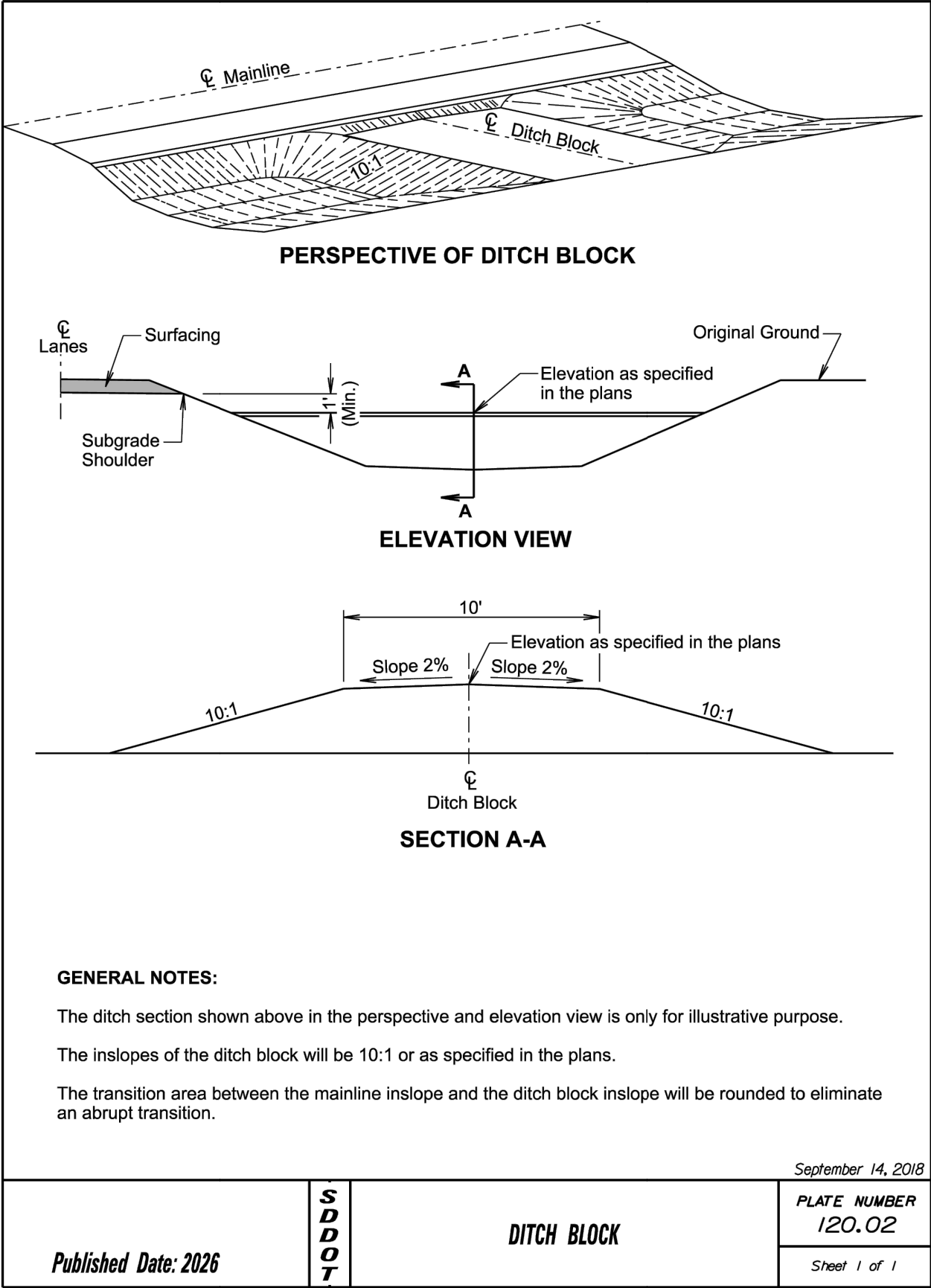


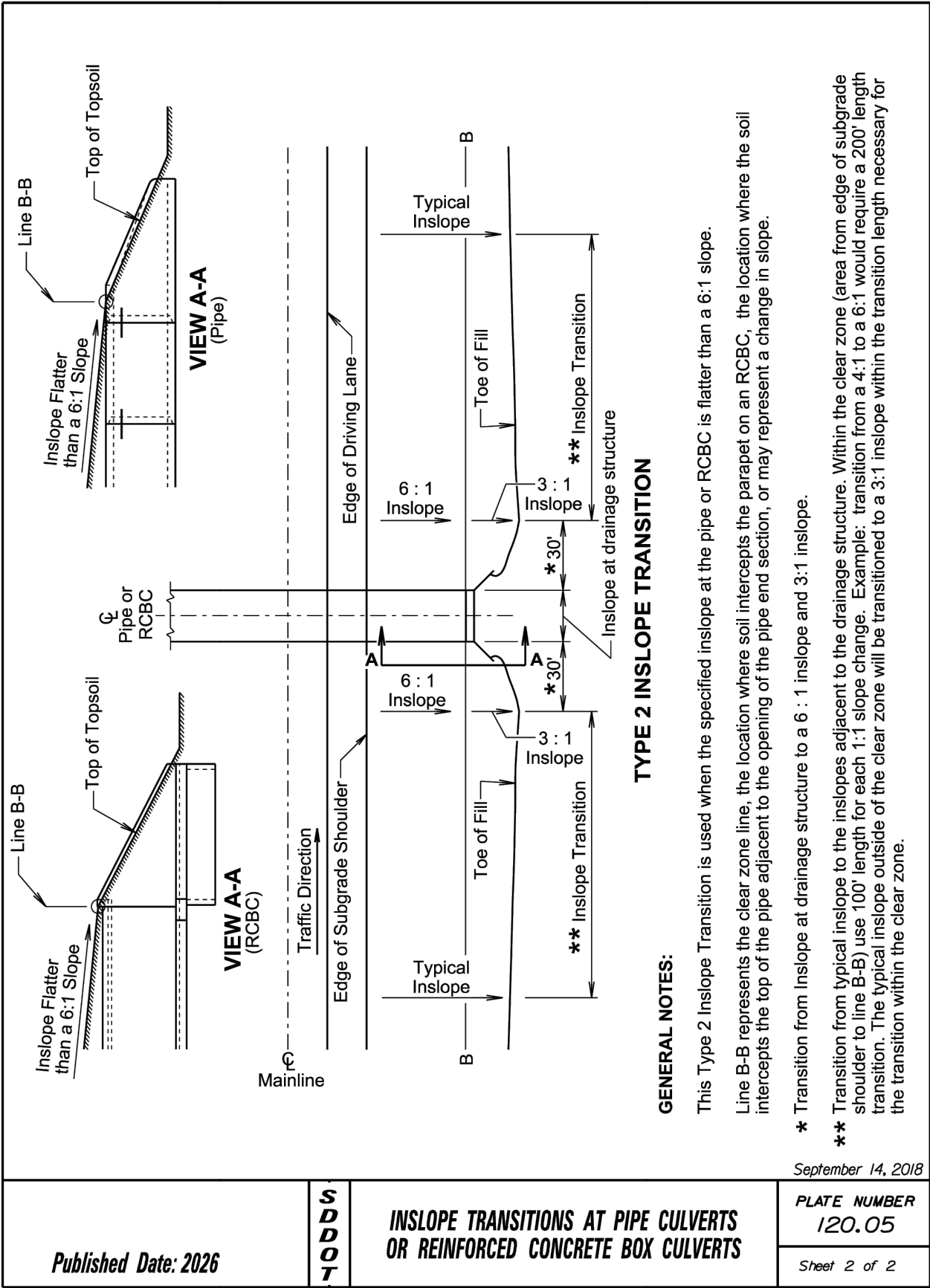
GENERAL NOTES:

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

November 19, 2021

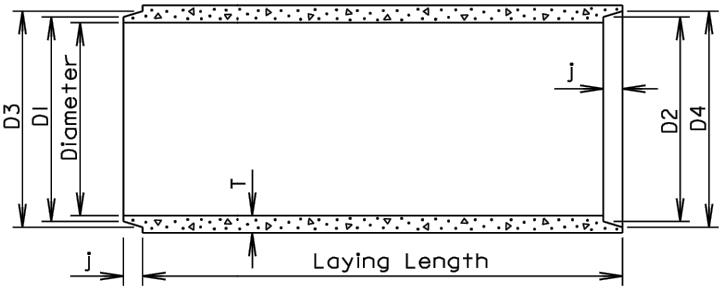
Published Date: 2026	S D D O T	INTERSECTING ROADS AND ENTRANCES	PLATE NUMBER
			120.01
			Sheet 2 of 2



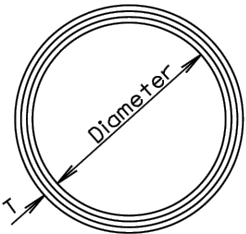


TOLERANCES IN DIMENSIONS

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



LONGITUDINAL SECTION



END VIEW

GENERAL NOTES:

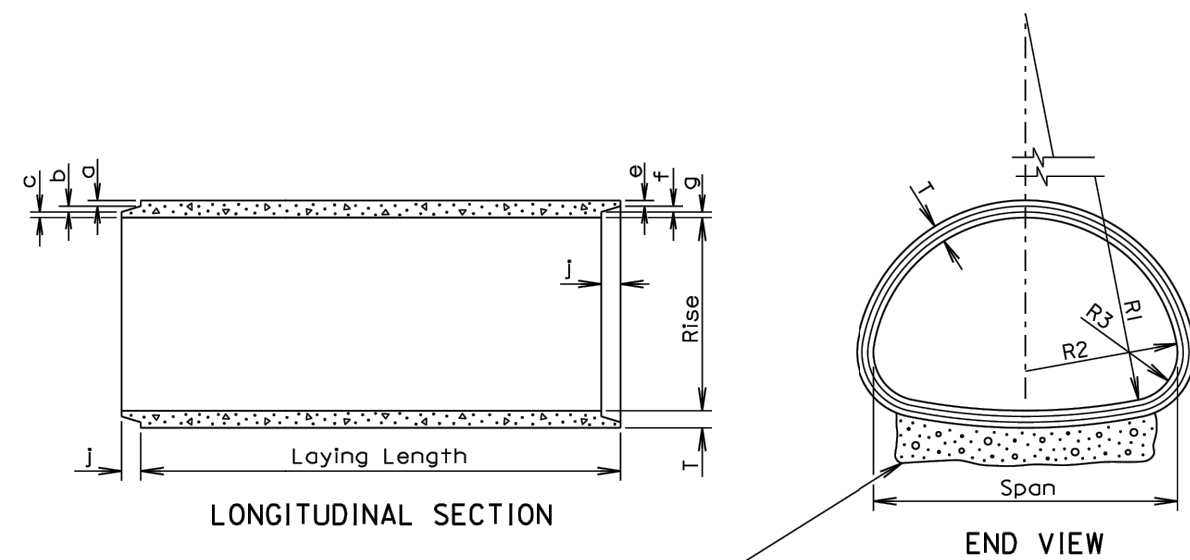
Construction of R.C.P. shall conform to the requirements of Section 990 of the Specifications.

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

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

June 26, 2015

Plotting Date: 05-22-2025



TOLERANCES IN DIMENSIONS

Radial dimensions at joints: $\pm 1/8"$ for 65" span or less and $\pm 1/4"$ for longer spans.

Rise and Span: $\pm 2\%$ of tabular values.

Length of Joint (J): $\pm 1/4"$.

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 1/2".

Gravel Bedding Material shall be supplied for 102" to 169" spans. It shall be placed to a thickness of 6" (Min.) x 85% of the Span x Length of culvert and shall conform to the gradation requirements for gravel surfacing except material may be screened or may be plan provided material.

* Size (in.)	Approx. Wt./Ft. (lb.)	Rise (in.)	Span (in.)	T (in.)	a (in.)	b (in.)	c (in.)	J (in.)	e (in.)	f (in.)	g (in.)	R1 (in.)	R2 (in.)	R3 (in.)
18	170	13½	22	2½	1⅜	¾	¾	2	1⅛	⅜	1	27½	13¾	5¼
24	320	18	28½	3½	1⅝	½	1⅜	3	1⅜	½	1⅝	40⅞	14¾	4⅝
30	450	22½	36¼	4	1⅞	⅝	1⅞	3½	1⅞	⅝	1⅞	51	18¾	6⅞
36	600	26⅝	43¾	4½	2	¾	1¾	4	1¾	¾	2	62	22½	6½
42	740	31⅞	51⅞	4½	2	¾	1¾	4	1¾	¾	2	73	26¼	7¾
48	890	36	58½	5	2¼	¾	2	5	2	¾	2¼	84	30	8⅞
54	1100	40	65	5½	2½	¾	2¼	5	2¼	¾	2½	92½	33⅞	10
60	1400	45	73½	6	3⅞	¾	1⅝	5	2¾	¾	2½	105	37½	11
72	1900	54	88	7	3⅞	1	2⅞	6	3¼	1	2¾	126	45	13⅝
84	2500	62	102	8	4⅞	1	2⅞	6	3½	1	3½	162½	52	14½
96	3300	78	122⅞	9	4½	1	3½	7	4	1	4	218	62	20
108	4200	88	138½	10	5	1	4	7	4½	1	4½	269	70	22
120	5100	96⅞	154	11	5½	1	4½	7	5	1	5	301⅞	78	24
132	5100	106½	168¾	10		1	4	7	4½	1	4½	329	85⅞	26⅞

* Equivalent Diameter of Circular R. C. P.

GENERAL NOTES:

Construction of R.C.P. Arch 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.

June 26, 2015

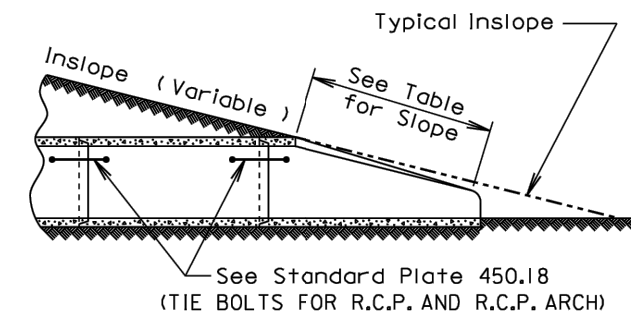
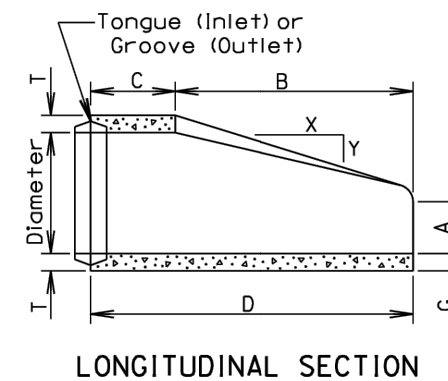
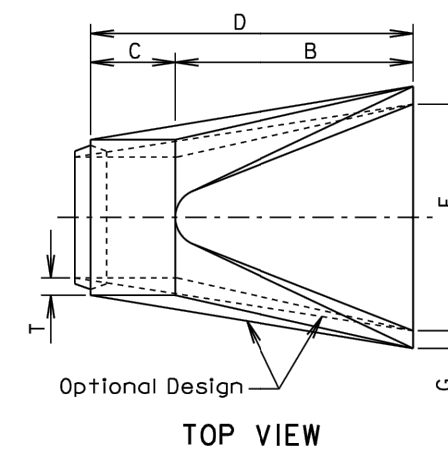
Published Date: 2026

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REINFORCED CONCRETE PIPE ARCH

PLATE NUMBER
450.02

Sheet 1 of 1

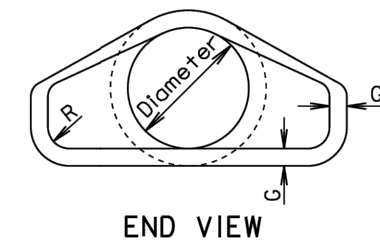


SLOPE DETAIL

GENERAL NOTES:

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

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



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 $\frac{7}{8}$	72 $\frac{7}{8}$	24	2	1 $\frac{1}{2}$
15	740	2.4: 1	2 $\frac{1}{4}$	6	27	46	73	30	2 $\frac{1}{4}$	1 $\frac{1}{2}$
18	990	2.3: 1	2 $\frac{1}{2}$	9	27	46	73	36	2 $\frac{1}{2}$	1 $\frac{1}{2}$
21	1280	2.4: 1	2 $\frac{3}{4}$	9	36	37 $\frac{1}{2}$	73 $\frac{1}{2}$	42	2 $\frac{3}{4}$	1 $\frac{1}{2}$
24	1520	2.5: 1	3	9 $\frac{1}{2}$	43 $\frac{1}{2}$	30	73 $\frac{1}{2}$	48	3	1 $\frac{1}{2}$
27	1930	2.5: 1	3 $\frac{1}{4}$	10 $\frac{1}{2}$	49 $\frac{1}{2}$	24	73 $\frac{1}{2}$	54	3 $\frac{1}{4}$	1 $\frac{1}{2}$
30	2190	2.5: 1	3 $\frac{1}{2}$	12	54	19 $\frac{3}{4}$	73 $\frac{3}{4}$	60	3 $\frac{1}{2}$	1 $\frac{1}{2}$
36	4100	2.5: 1	4	15	63	34 $\frac{3}{4}$	97 $\frac{3}{4}$	72	4	1 $\frac{1}{2}$
42	5380	2.5: 1	4 $\frac{1}{2}$	21	63	35	98	78	4 $\frac{1}{2}$	1 $\frac{1}{2}$
48	6550	2.5: 1	5	24	72	26	98	84	5	1 $\frac{1}{2}$
54	8240	2: 1	5 $\frac{1}{2}$	27	65	33 $\frac{1}{4}$	98 $\frac{1}{4}$	90	5 $\frac{1}{2}$	1 $\frac{1}{2}$
60	8730	1.9: 1	6	35	60	39	99	96	5	1 $\frac{1}{2}$
66	10710	1.7: 1	6 $\frac{1}{2}$	30	72	27	99	102	5 $\frac{1}{2}$	1 $\frac{1}{2}$
72	12520	1.8: 1	7	36	78	21	99	108	6	1 $\frac{1}{2}$
78	14770	1.8: 1	7 $\frac{1}{2}$	36	90	21	111	114	6 $\frac{1}{2}$	1 $\frac{1}{2}$
84	18160	1.6: 1	8	36	90 $\frac{1}{2}$	21	111 $\frac{1}{2}$	120	6 $\frac{1}{2}$	1 $\frac{1}{2}$
90	20900	1.5: 1	8 $\frac{1}{2}$	41	87 $\frac{1}{2}$	24	111 $\frac{1}{2}$	132	6 $\frac{1}{2}$	6

June 26, 2015

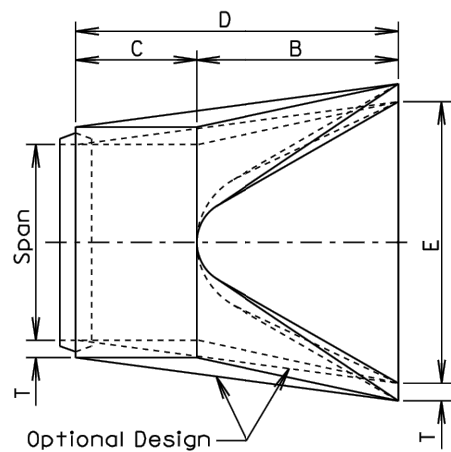
Published Date: 2026

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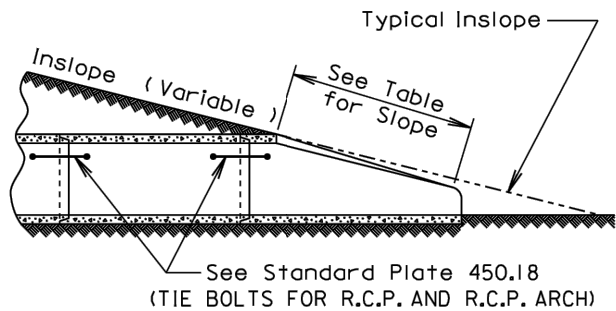
R. C. P. FLARED ENDS

PLATE NUMBER
450.10

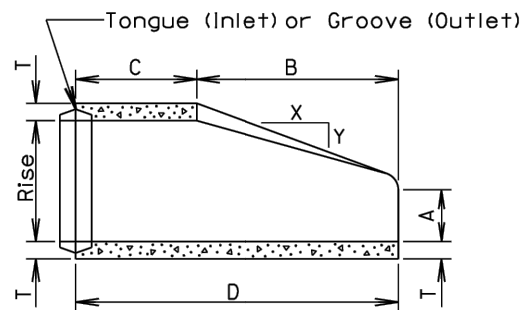
Sheet 1 of 1



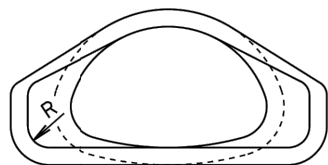
TOP VIEW



SLOPE DETAIL



LONGITUDINAL SECTION



END VIEW

GENERAL NOTES:

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

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

* Size (in.)	Approximate Weight of Section (lbs.)	Rise (in.)	Span (in.)	Slope (X:Y)	T (in.)	A (in.)	B (in.)	C (in.)	D (in.)	E (in.)	R (in.)
18	1100	13 1/2	22	3: 1	2 1/2	7	27	45	72	36	2
24	1750	18	28 1/2	3: 1	3 1/2	8 1/2	39	33	72	48	3
30	3300	22 1/2	36 1/4	3: 1	4	9 1/2	50	46	96	60	3
36	4350	26 5/8	43 3/4	3: 1	4 1/2	11 1/8	60	36	96	72	6
42	5250	31 5/16	51 1/8	3: 1	4 1/2	15 13/16	60	36	96	78	6
48	6400	36	58 1/2	3: 1	5	21	60	36	96	84	6
54	7850	40	65	3: 1	5 1/2	25 1/2	60	36	96	90	6
60	9500	45	73 1/2	3: 1	6	31	60	36	96	96	6
72	13550	54	88	2: 1	7	31	60	39	99	120	6
84	17950	62	102	2: 1	8	28 1/2	83	19	102	144	6

*Equivalent Diameter of Circular R. C. P.

June 26, 2015

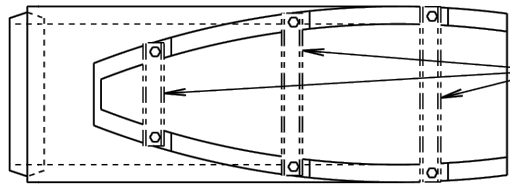
Published Date: 2026

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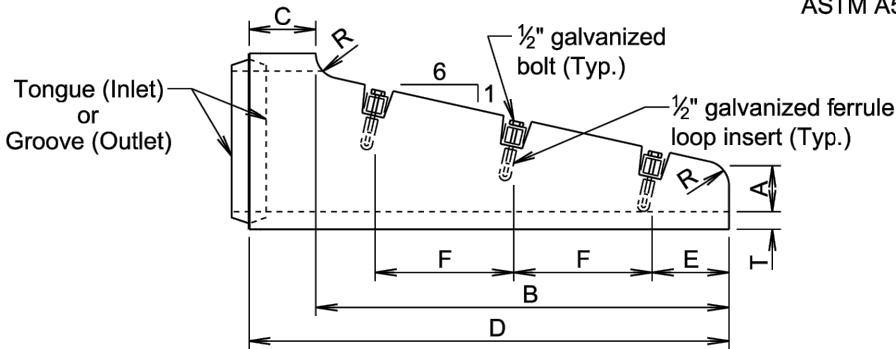
R. C. P. ARCH FLARED ENDS

PLATE NUMBER
450.11

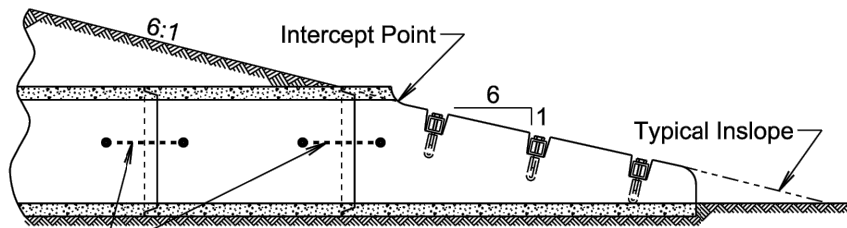
Sheet 1 of 1



TOP VIEW



SIDE VIEW



Tie Bolt (Typ.)
See Standard Plate 450.18

ELEVATION VIEW

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

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

GENERAL NOTES:

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

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

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

Apr11 8, 2025

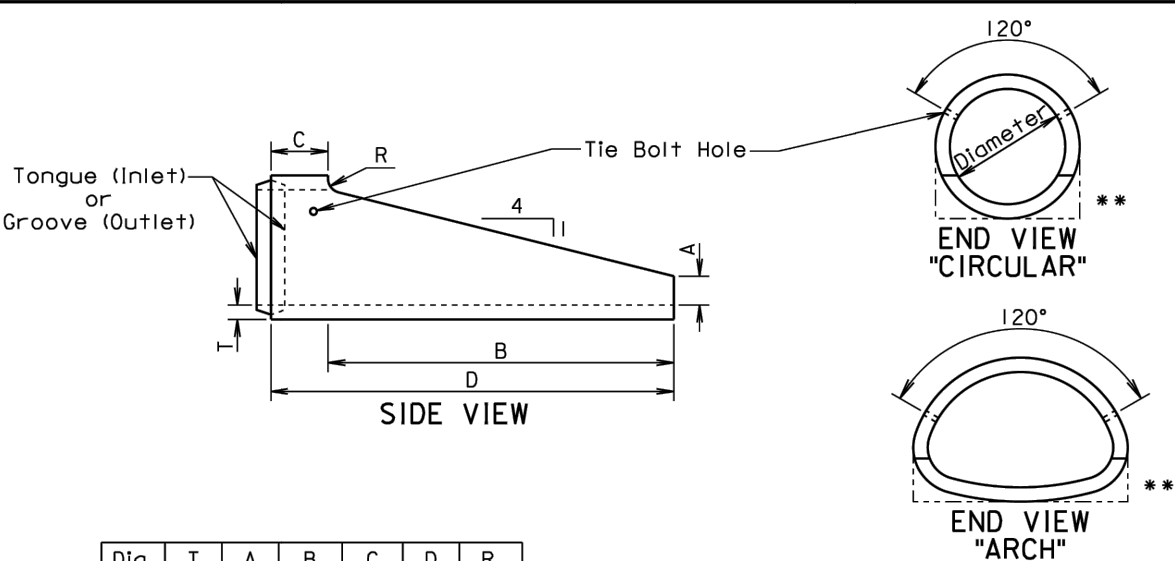
Published Date: 2026

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R.C.P. SAFETY ENDS
WITH OR WITHOUT BARS

PLATE NUMBER
450.12

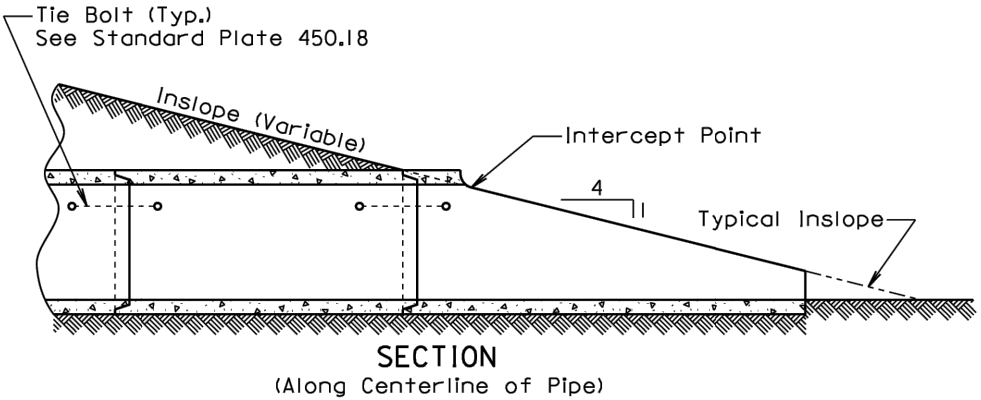
Sheet 1 of 1



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	3½	7½	90	12	102	3½
FOR ARCH PIPE						
* 24	3	6	48	12	60	3
* 30	3½	7½	60	12	72	3½
* 36	4½	8⅝	66	30	96	0
* 42	4½	10	77¼	18¾	96	0

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

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	3½	11	90	12	102	0
FOR ARCH PIPE						
* 24	3	9	48	12	60	0
* 30	3½	11	60	12	72	0



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

September 22, 2006

Published Date: 2026

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R. C. P. SLOPED ENDS

PLATE NUMBER
450.13

Sheet 1 of 1

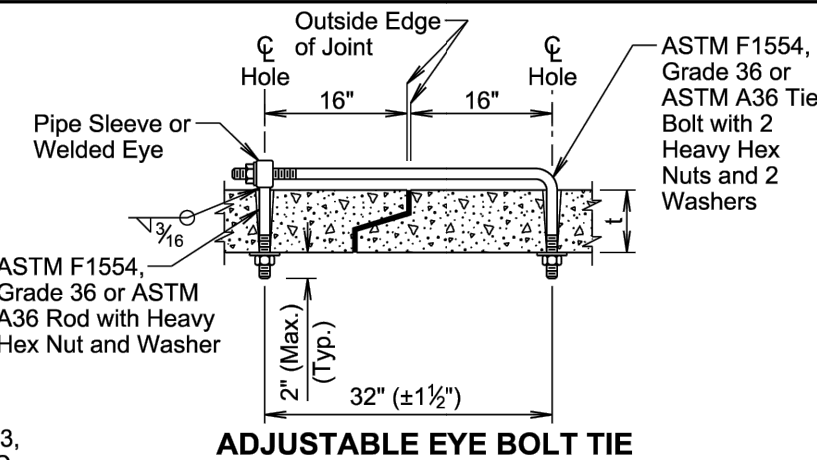
Wall "t" (in.)	Rod Dia. (in.)	Pipe Sleeve Dia. (nominal)
≤ 3¼	⅝	¾
3½-6½	¾	1
≥ 7	1	1¼

GENERAL NOTES:

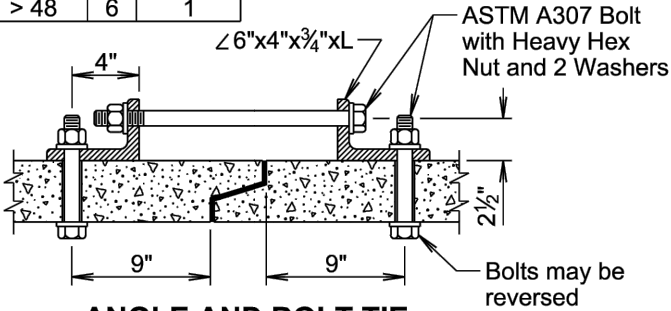
Tie bolts will conform to ASTM F1554, Grade 36 or ASTM A36. Nuts will be heavy hex conforming to ASTM A563. Washers will conform to ASTM F436.

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

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



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

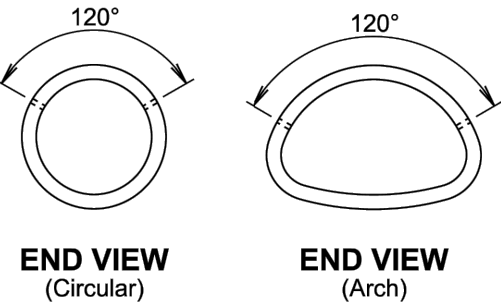


GENERAL NOTES:

Angles will conform to ASTM A36.

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

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



GENERAL NOTES:

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

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

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

April 18, 2025

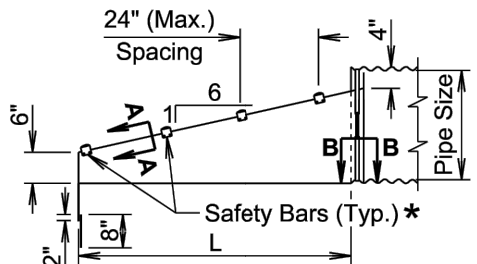
Published Date: 2026

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TIE BOLTS FOR R.C.P. AND R.C.P. ARCH

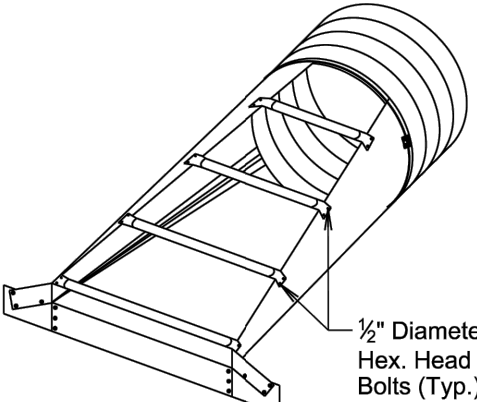
PLATE NUMBER
450.18

Sheet 1 of 1

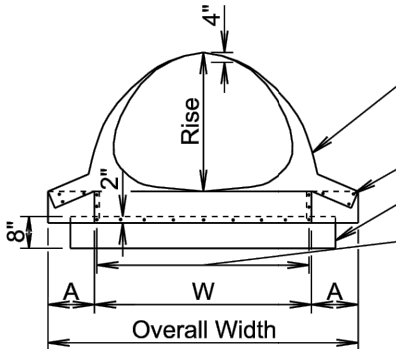


* Number of bars required will vary depending on the length of the end section.

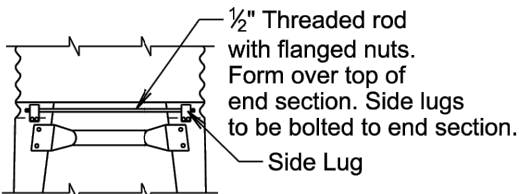
ELEVATION VIEW



ISOMETRIC VIEW

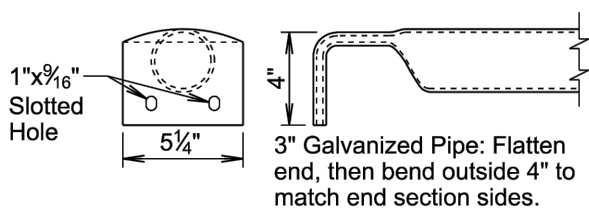


FRONT VIEW

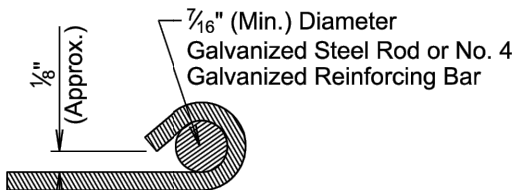


TYPE #2 CONNECTOR DETAIL

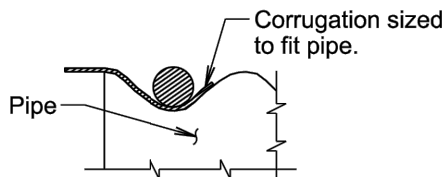
(For 30" and Larger)
(For 21"x15" and Larger)



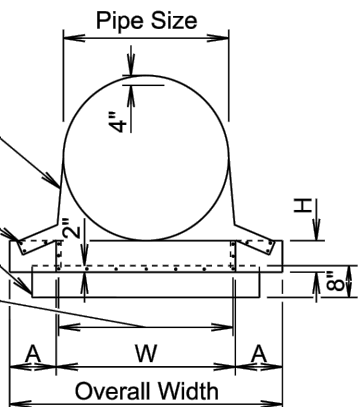
DETAIL OF SAFETY BARS



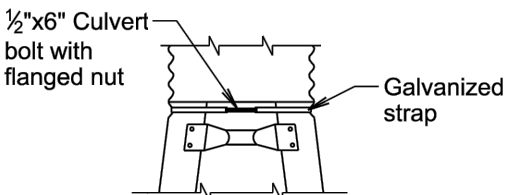
SECTION A-A



SECTION B-B



FRONT VIEW



TYPE #1 CONNECTOR DETAIL

(For 15" Through 24")

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

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

GENERAL NOTES:

Safety bars will be provided when specified in the plans.

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

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

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

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

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

Installation will be performed in accordance with the Specifications.

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

April 8, 2025

April 8, 2025

Published Date: 2026

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C.M.P. SAFETY ENDS

PLATE NUMBER
450.38

Sheet 1 of 2

Published Date: 2026

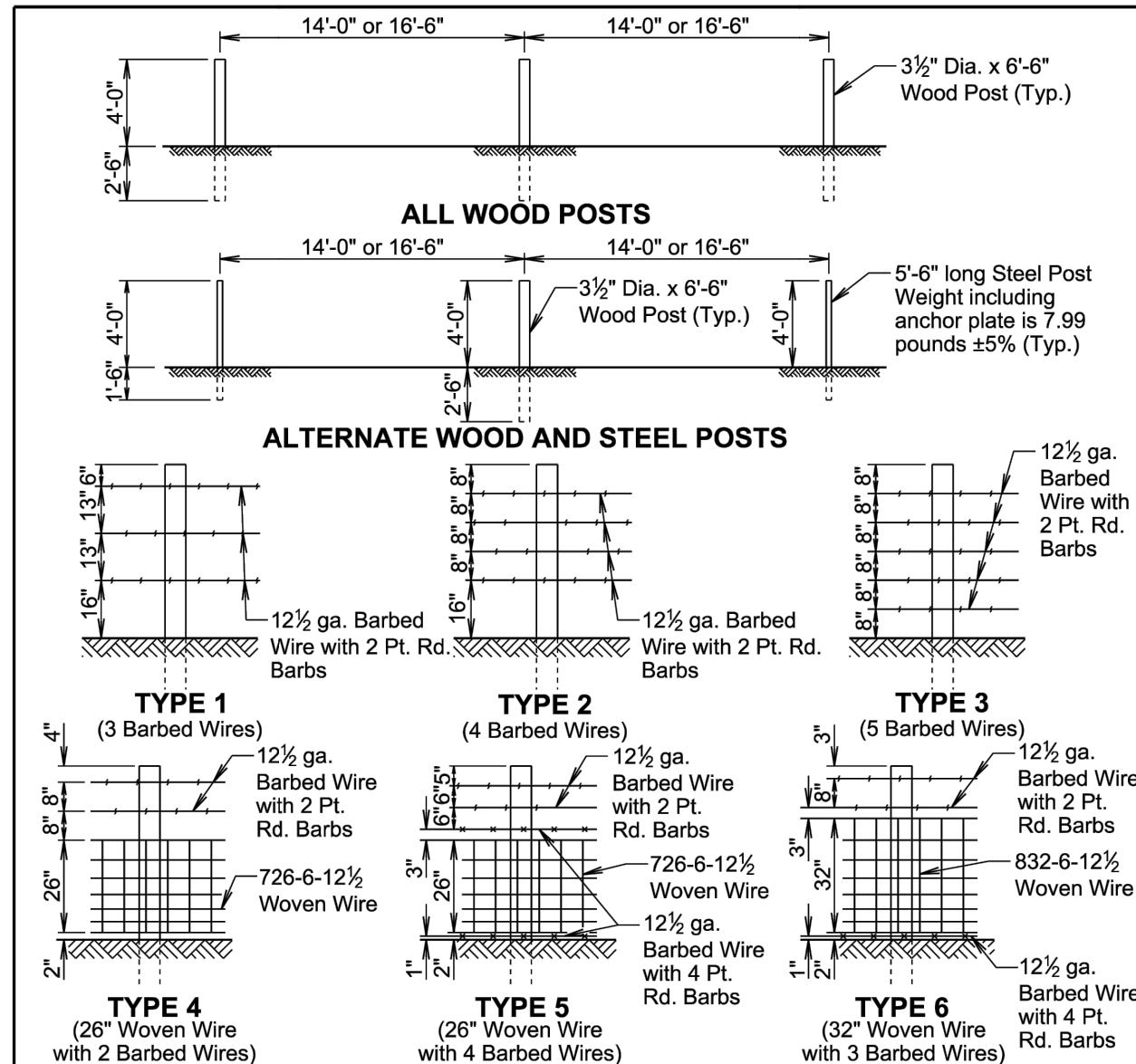
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C.M.P. SAFETY ENDS

PLATE NUMBER
450.38

Sheet 2 of 2

Plotting Date: 05-22-2025



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

GENERAL NOTES:

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

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

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

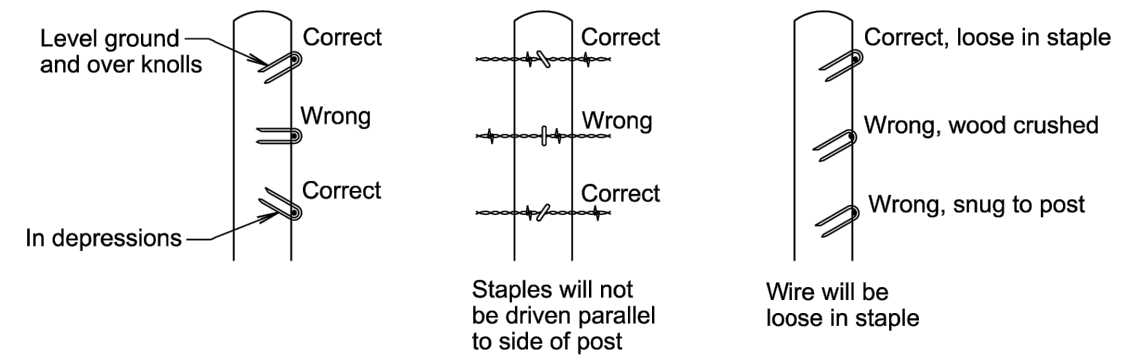
April 8, 2025

PLATE NUMBER
620.01

Sheet 1 of 1

Published Date: 2026

SDOT

RIGHT-OF-WAY FENCE

STAPLE INSTALLATION

GENERAL NOTES:

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

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

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

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

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

June 26, 2019

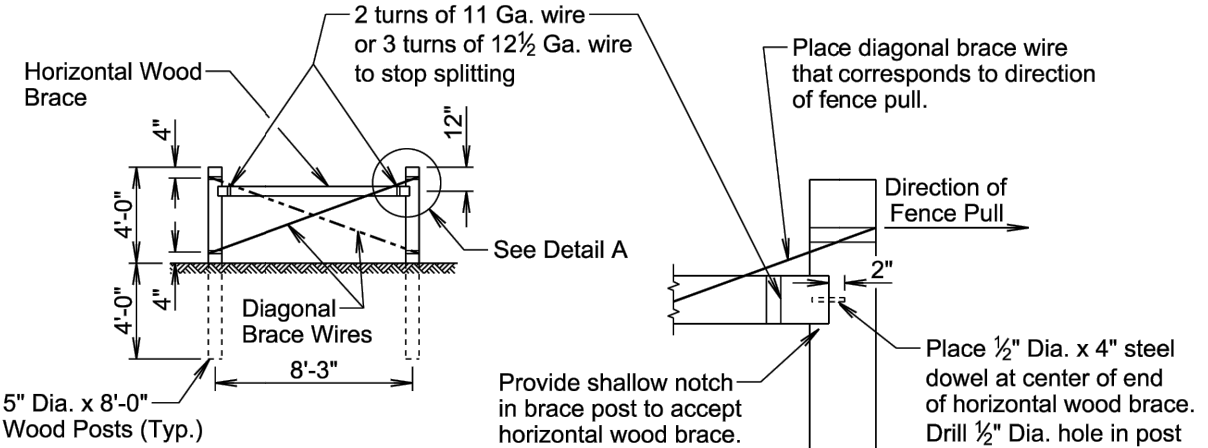
Published Date: 2026

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STAPLE INSTALLATION AND GENERAL RIGHT-OF-WAY FENCE NOTES

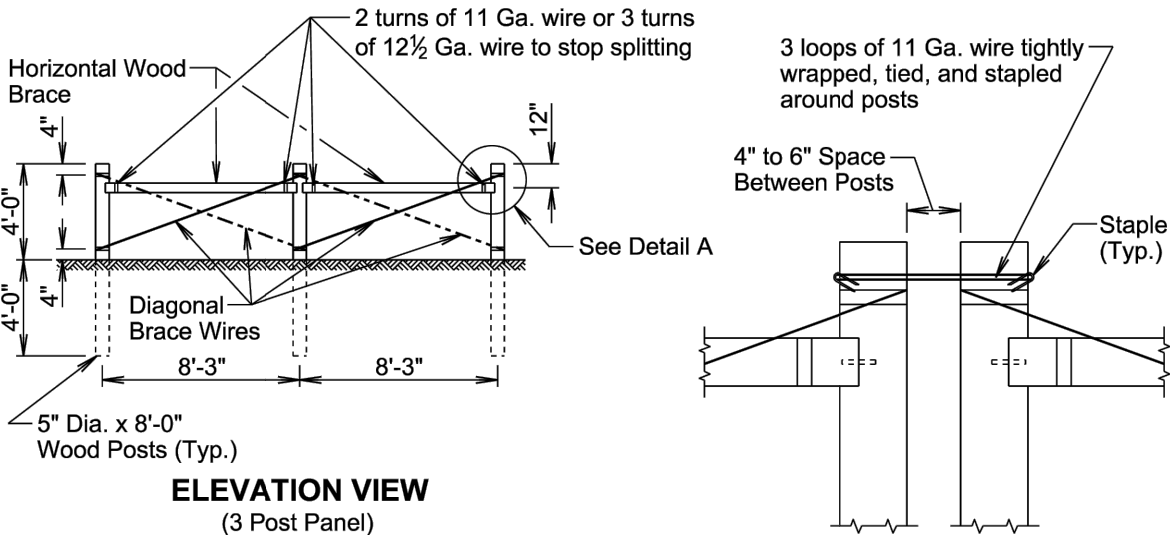
PLATE NUMBER
620.02

Sheet 1 of 1



ELEVATION VIEW
(2 Post Panel)

DETAIL A



ELEVATION VIEW
(3 Post Panel)

DETAIL B

GENERAL NOTES:

- Two Post Panels will be installed at least every 1320' between corners.
- Two Post Panels will be installed at any sharp vertical angle crest points and as directed by the Engineer.
- Horizontal wood braces will consist of 4" dia. x 8' wood posts or rough 4" x 4" x 8' timbers.
- Diagonal brace wires will be fabricated with 4 strands of 9 Ga. galvanized wire twisted tight. The diagonal brace wires will be installed in accordance with the direction of the fence pull. Two diagonal brace wires are required if fence pull is in both directions.

March 31, 2024

Published Date: 2026

SDOT

BRACE PANELS AND
APPLICATIONS OF BRACE PANELS

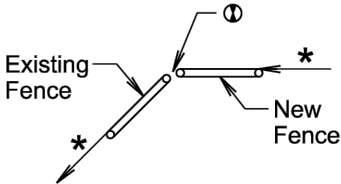
PLATE NUMBER
620.03

Sheet 1 of 3

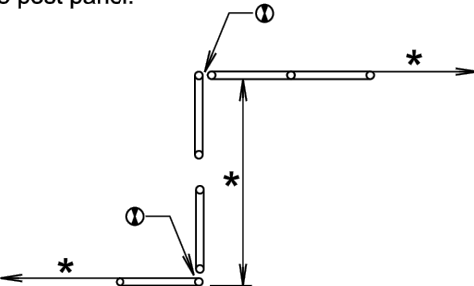
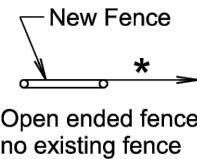
RADIUS OF CURVE	SPACING OF 2 POST PANEL
Greater than 1800 Ft.	** 1320'
Less than 1800 Ft.	** At P.C., P.T., and at every 1320' between P.C. and P.T.

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

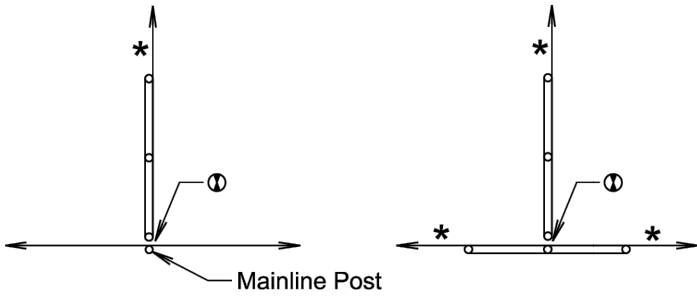
① See Detail B on Sheet 1 of 3.



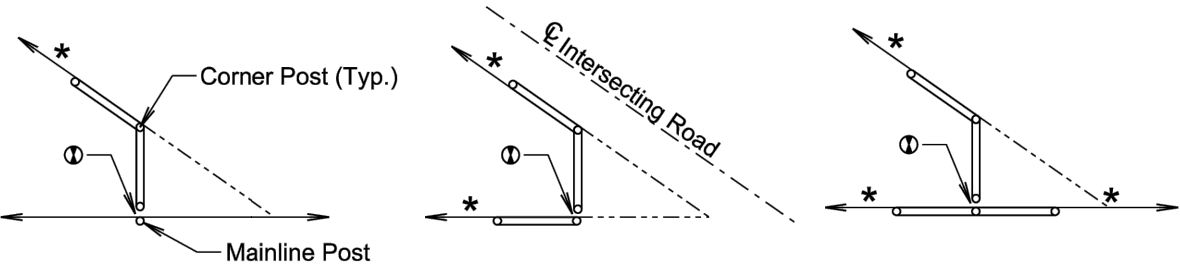
BEGIN OR END FENCE
(Where new fence ties into existing fence)



SHORT JOGS IN FENCE



CROSS FENCE



SHARP ANGLES IN CROSS FENCE



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

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

ANGLES IN MAINLINE FENCE

March 31, 2024

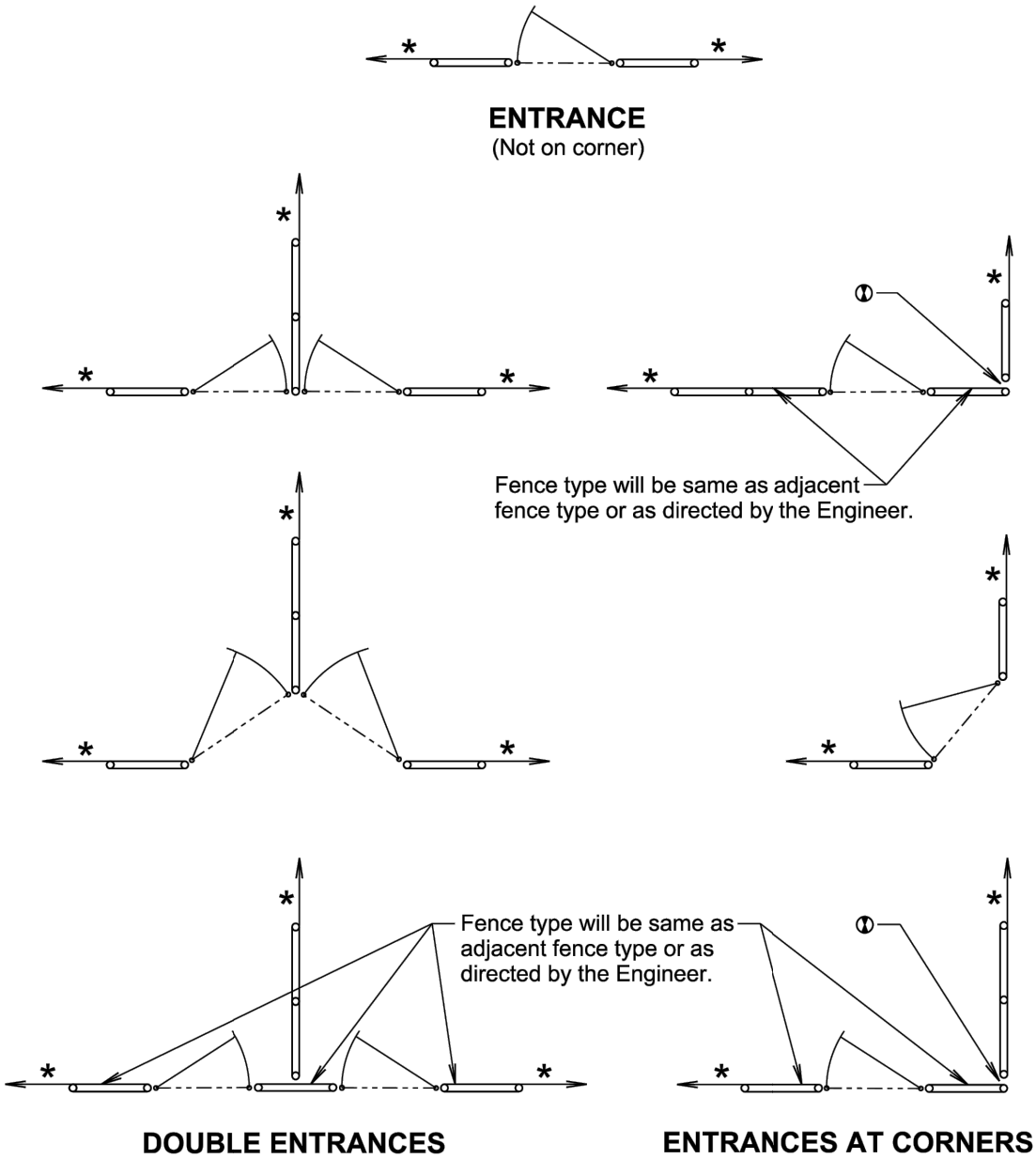
Published Date: 2026

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BRACE PANELS AND
APPLICATIONS OF BRACE PANELS

PLATE NUMBER
620.03

Sheet 2 of 3



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

① See Detail B on Sheet 1 of 3.

March 31, 2024

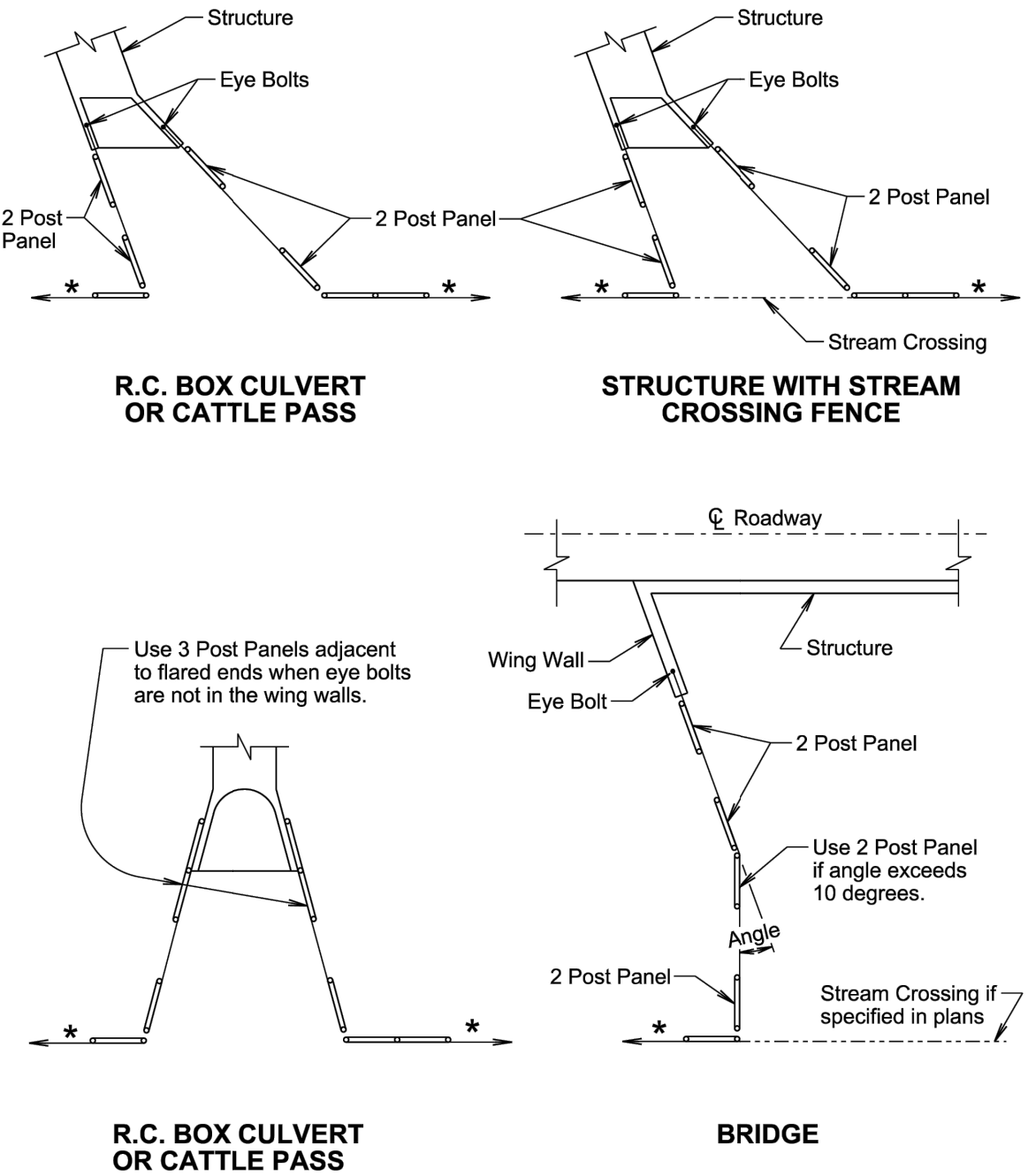
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BRACE PANELS AND
APPLICATIONS OF BRACE PANELS

PLATE NUMBER
620.03

Sheet 3 of 3



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

June 26, 2019

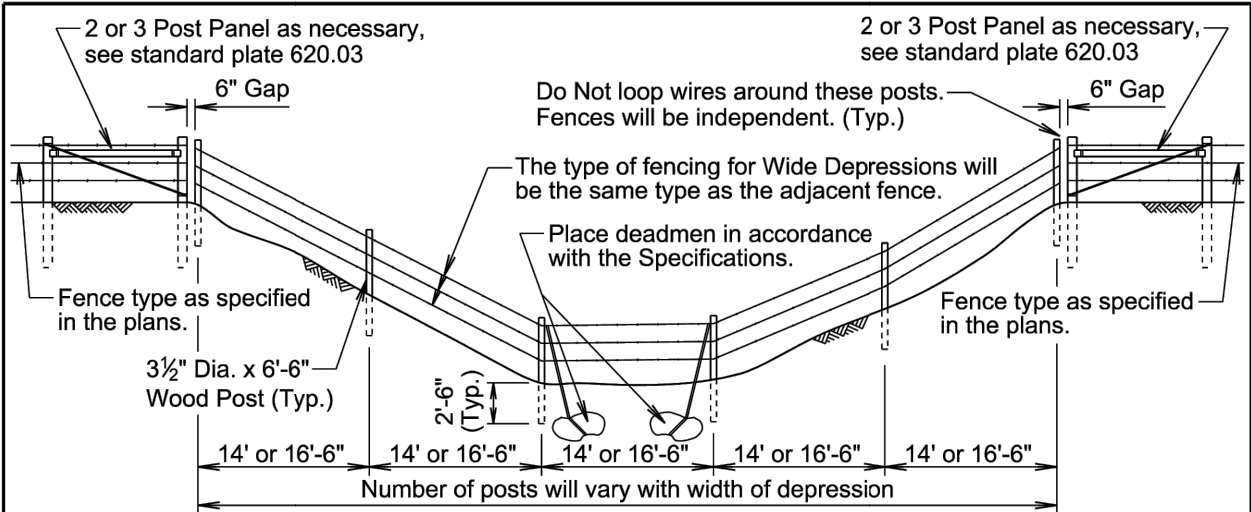
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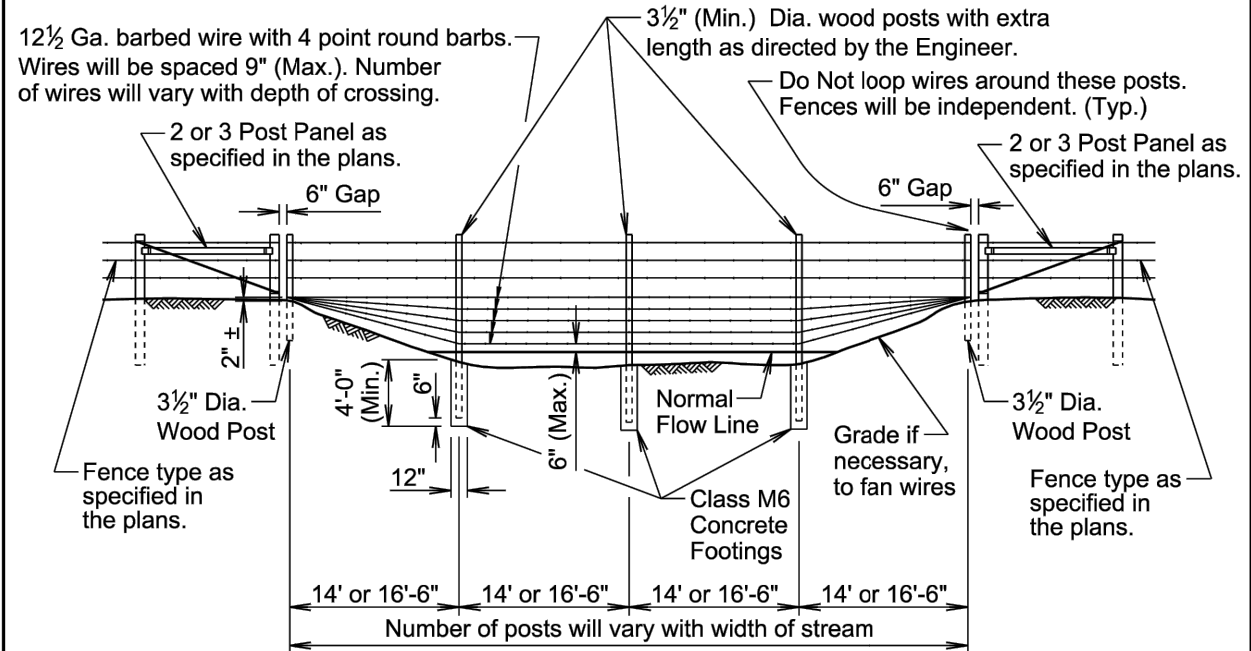
BRACE PANEL APPLICATIONS AT STRUCTURES

PLATE NUMBER
620.04

Sheet 1 of 1



This installation will be made when requested by the Engineer.
FENCING AT WIDE DEPRESSION
(Subject to Flooding)



This installation will be made only when stated in the plans.
FENCING AT STREAM CROSSING

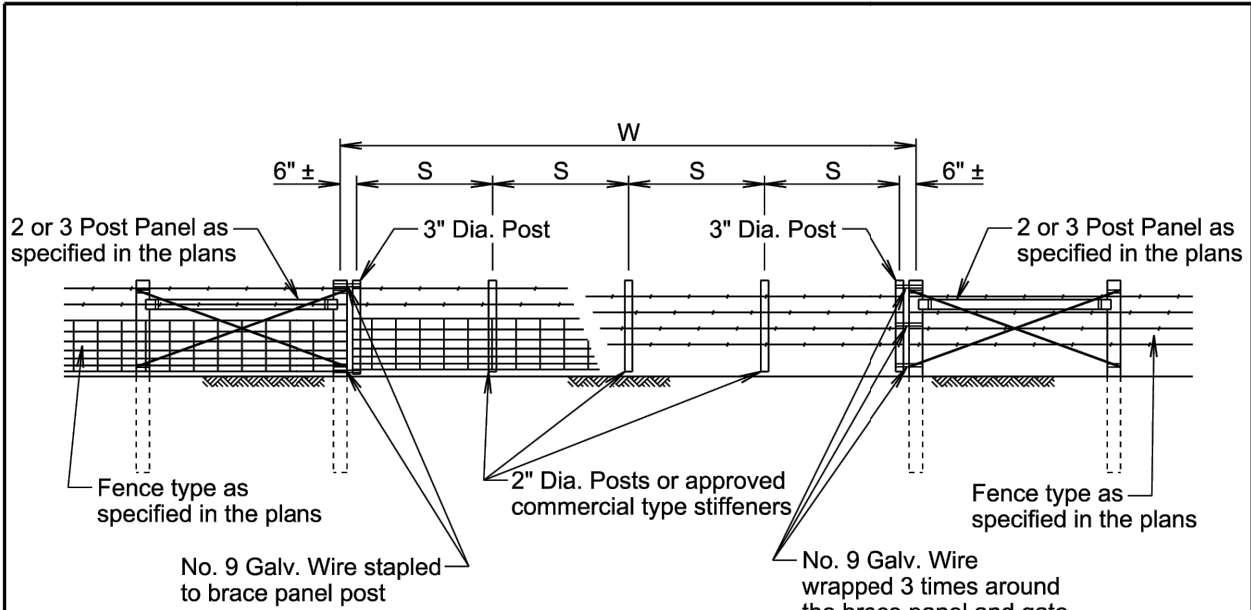
GENERAL NOTES:

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

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

June 26, 2019

Published Date: 2026	S D D O T	FENCING AT WIDE DEPRESSION(S) AND STREAM CROSSING(S)	PLATE NUMBER
			620.10
			Sheet 1 of 1



ELEVATION VIEW

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

GENERAL NOTES:

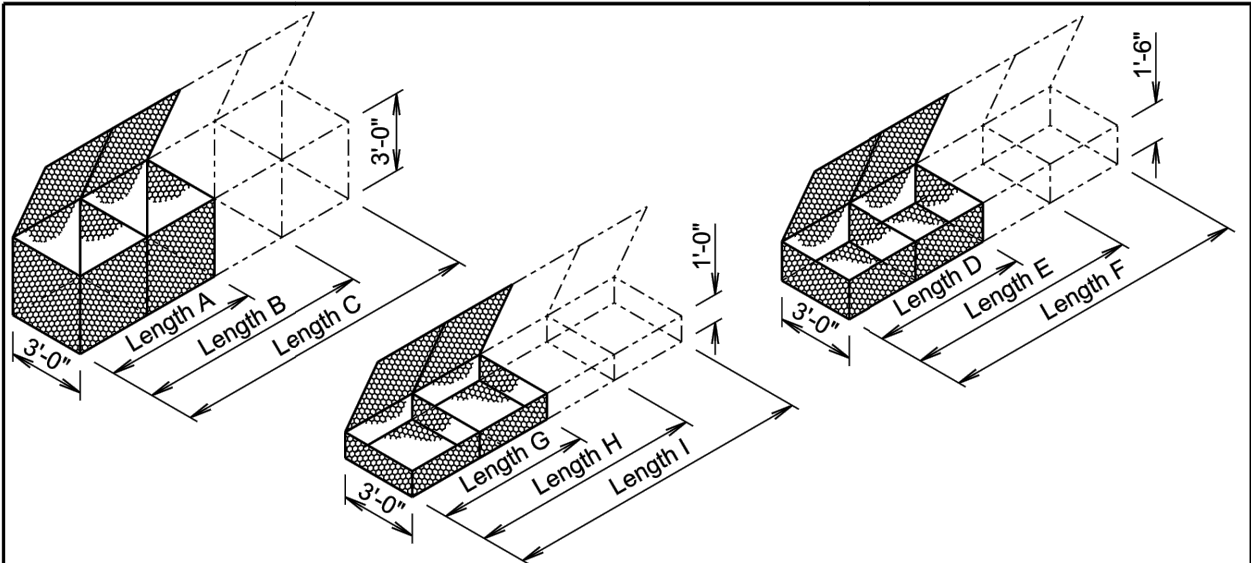
Creosote treatment of the gate posts will not be accepted.

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

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

June 26, 2019

Published Date: 2026	S D D O T	WIRE GATES	PLATE NUMBER
			620.20
			Sheet 1 of 1



GABION DETAILS

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

GENERAL NOTES: Above dimensions subject to mill tolerances.

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

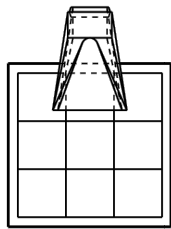
- The lacing procedure is as follows:
1. Cut a length of lacing wire approximately 1½ times the distance to be laced but not exceeding 5 feet.
 2. Secure the wire terminal at the corner by looping and twisting.
 3. Proceed lacing with alternating single and double loops at a spacing not to exceed 6 inches.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

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

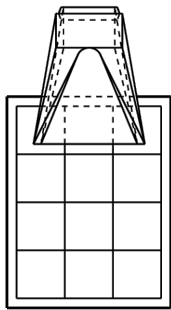
Interlocking fasteners for PVC coated gabions will be high tensile 0.120 inch diameter stainless steel wire conforming to ASTM A313, Type 302, Class 1. The spacing of the interlocking fasteners during all phases of assembly and construction will not exceed 6 inches.

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

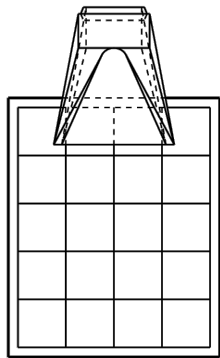
February 14, 2020



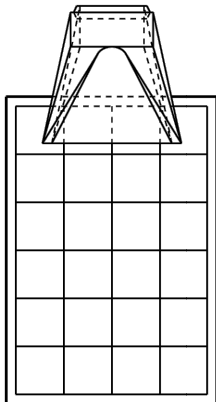
DETAIL 1



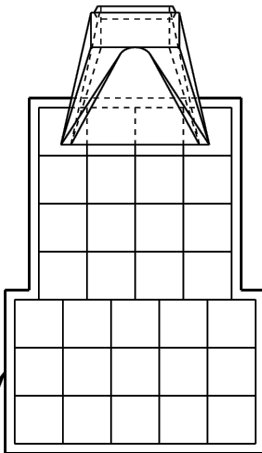
DETAIL 2



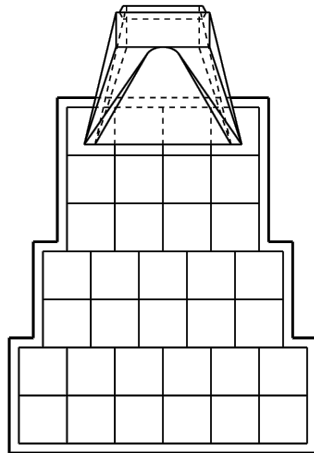
DETAIL 3



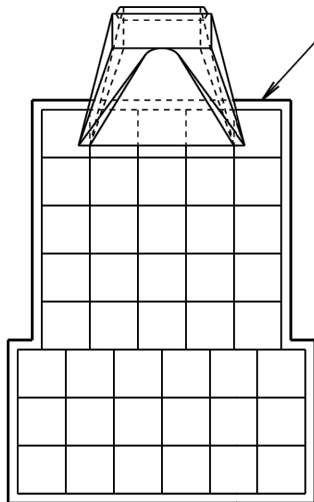
DETAIL 4



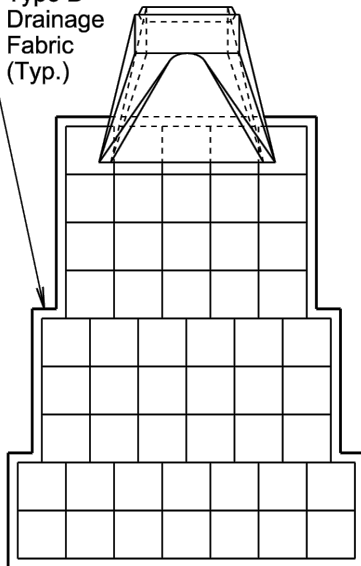
DETAIL 5



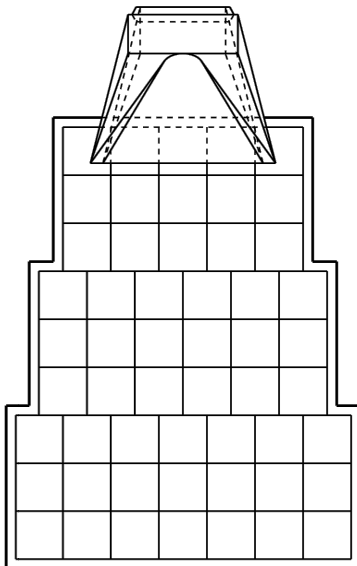
DETAIL 6



DETAIL 7



DETAIL 8



DETAIL 9

Type B
Drainage
Fabric
(Typ.)

February 14, 2020

Published Date: 2026

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BANK AND CHANNEL PROTECTION GABION
PLACEMENT UNDER PIPE END SECTIONS

PLATE NUMBER
720.03

Sheet 1 of 2

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

RCP, RCP Arch,
CMP, and CMP Arch

GENERAL NOTES:

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

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

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

February 14, 2020

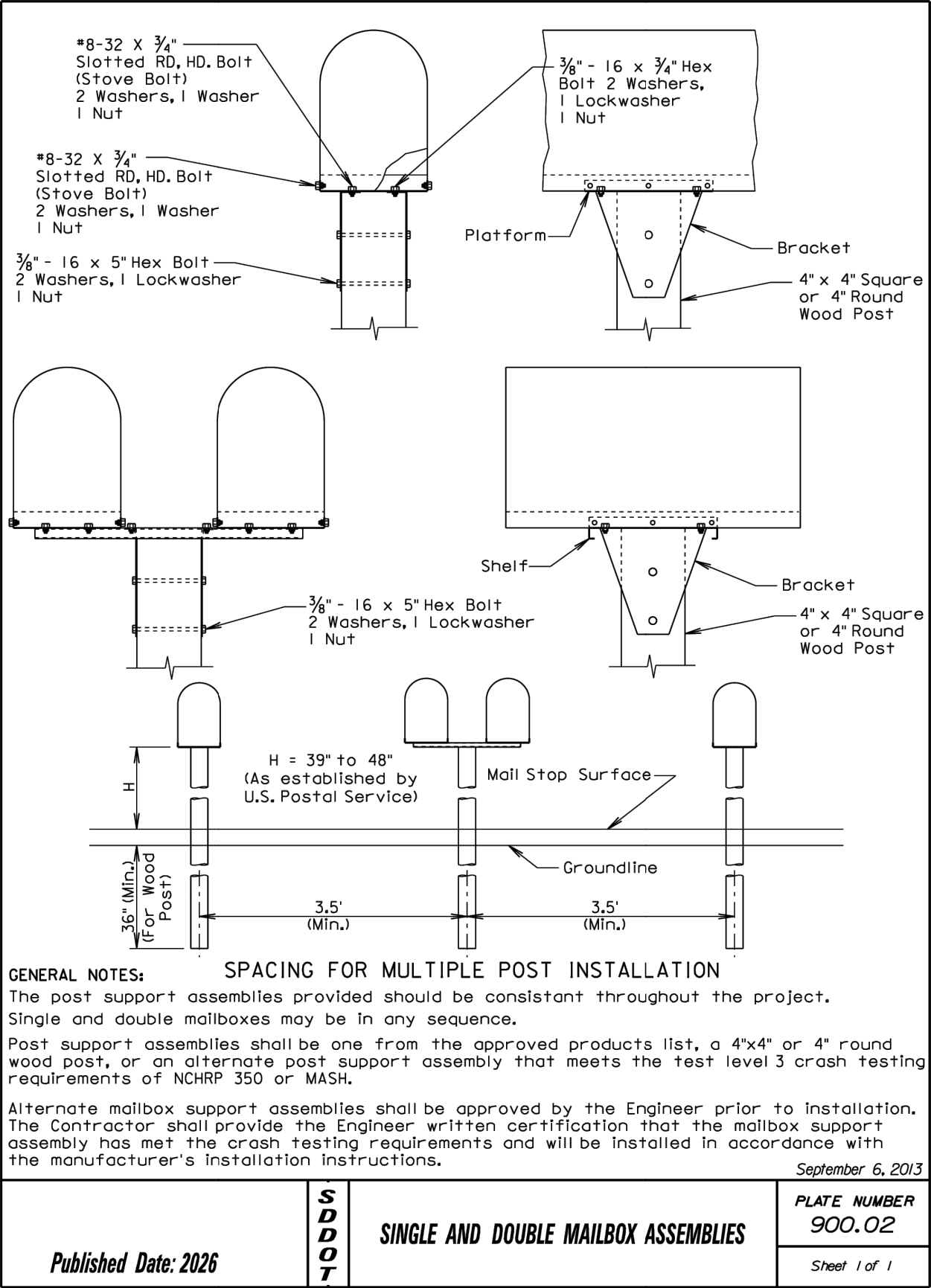
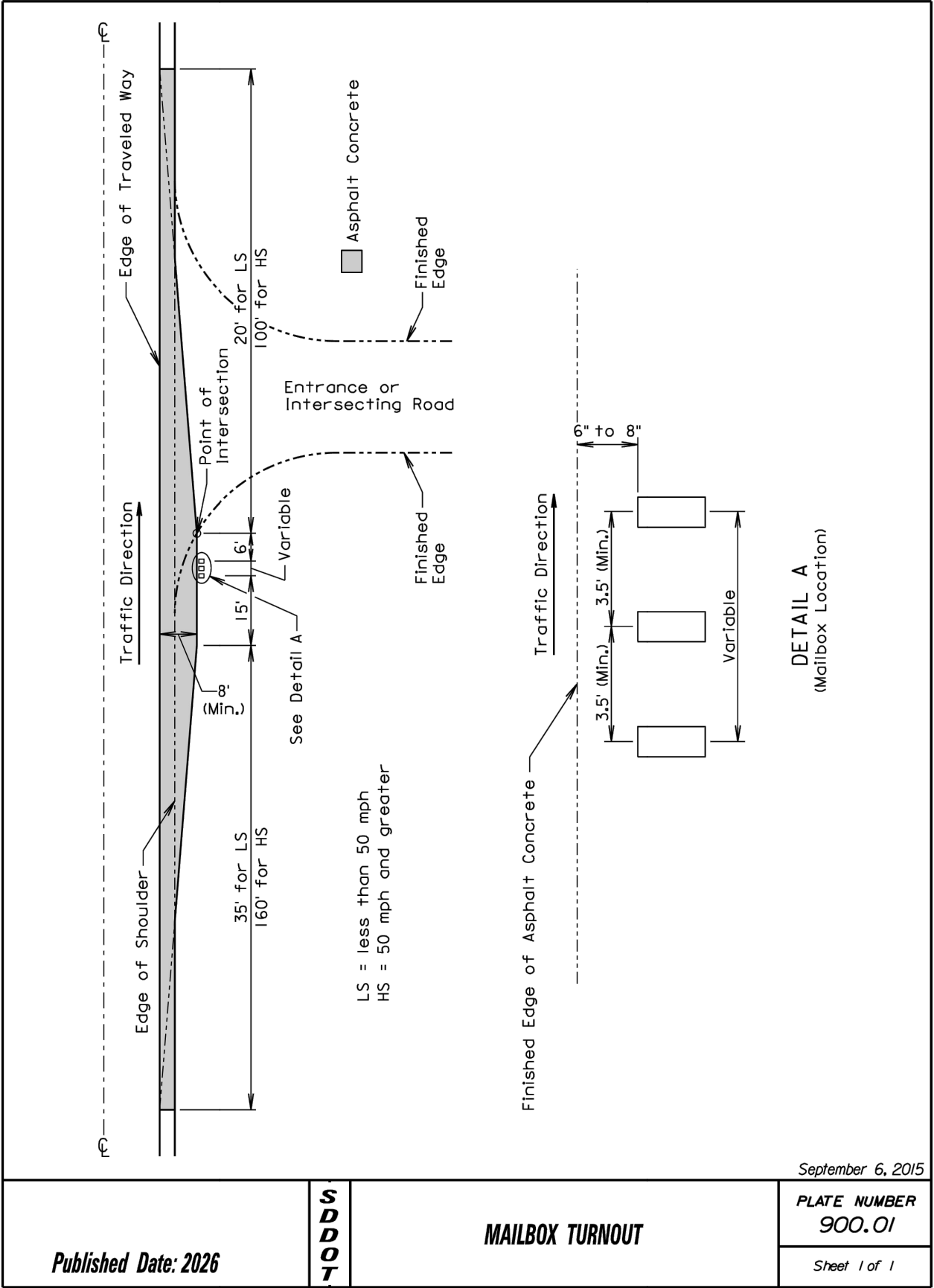
Published Date: 2026

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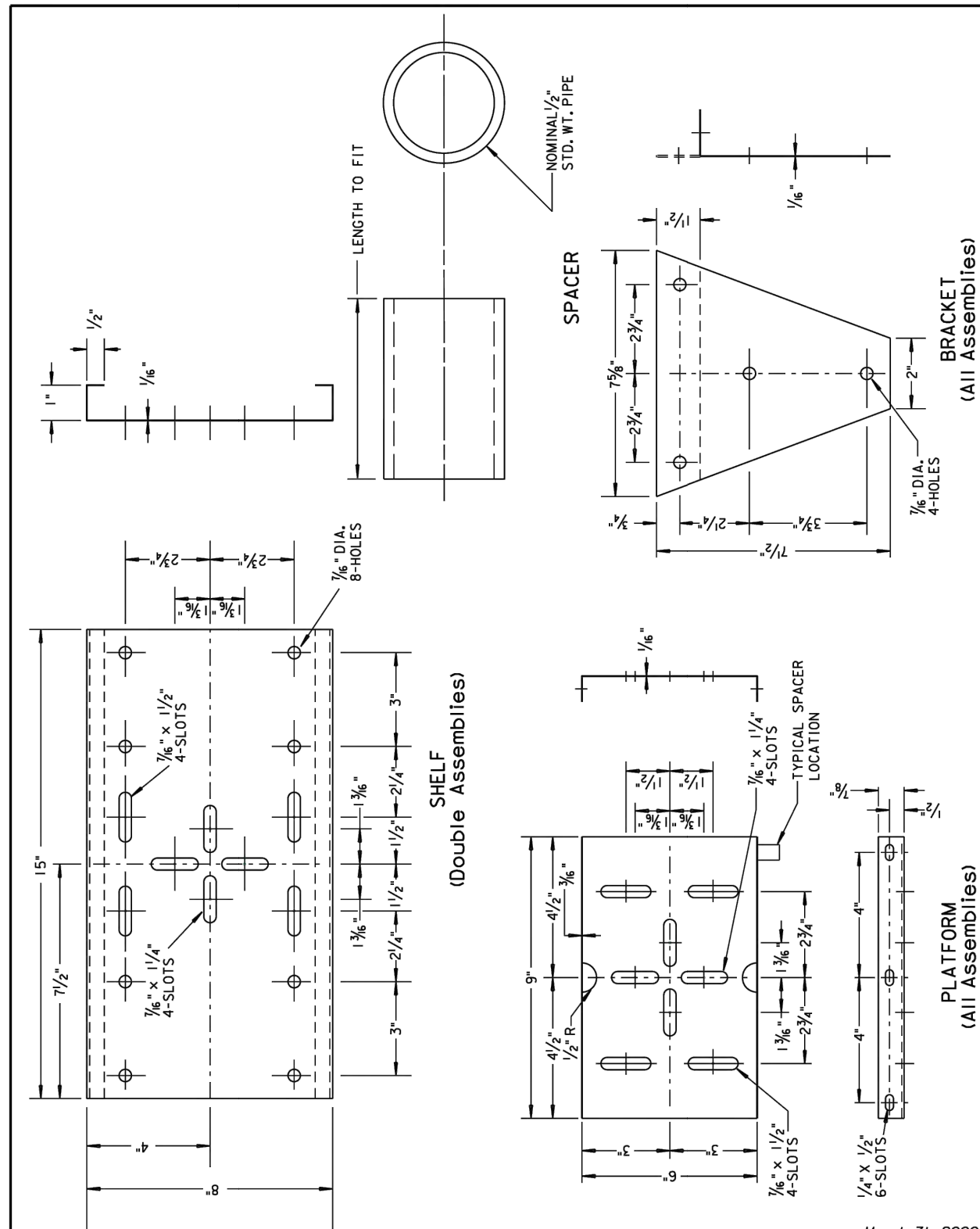
BANK AND CHANNEL PROTECTION GABION
PLACEMENT UNDER PIPE END SECTIONS

PLATE NUMBER
720.03

Sheet 2 of 2



Plotting Date: 05-22-2025



March 31, 2000

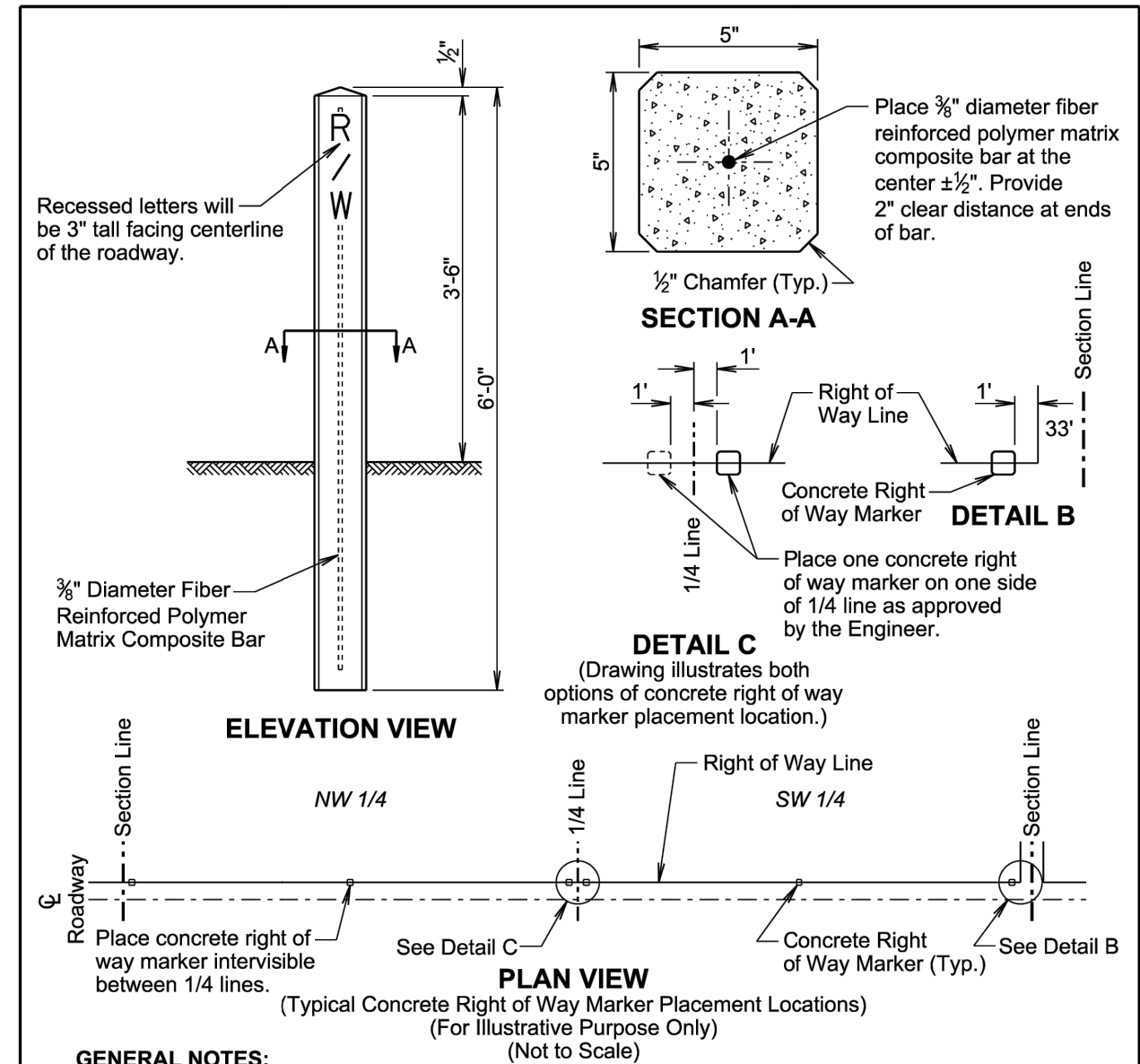
Published Date: 2026

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MAILBOX SUPPORT HARDWARE

PLATE NUMBER
900.03

Sheet 1 of 1



GENERAL NOTES:

The concrete right of way markers will be set plumb and backfilled as approved by the Engineer.

Additional concrete right of way markers may need to be installed due to the terrain. Placement of additional concrete right of way markers must be approved by the Engineer prior to installation.

The concrete will be Class M6 in accordance with specifications Section 462.

The fiber reinforced polymer matrix composite bar will have a minimum of 130 ksi tensile strength, a minimum ultimate tensile load of 19,675 lbs, and a minimum tensile modulus of elasticity of 6.7×10^6 psi in accordance with ASTM D7205. Bond strength will be a minimum of 2,047 psi in accordance with ACI 440.3R Part 2 B3. Minimum shear capacity will be 25.1 ksi in accordance with ASTM D7617.

All costs for furnishing and installing the concrete right of way marker including materials, labor, and equipment will be incidental to the contract unit price per each for "Concrete Right of Way Marker".

April 8, 2025

Published Date: 2026

SDDOT

CONCRETE RIGHT OF WAY MARKER

PLATE NUMBER
900.15

Sheet 1 of 1