



**SECTION B ESTIMATE OF QUANTITIES**

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
009E3230	Grade Staking	15.070	Mile
009E3245	Final Cross Section Survey	2.688	Mile
009E3250	Miscellaneous Staking	2.688	Mile
009E3280	Slope Staking	2.688	Mile
009E3290	Structure Staking	1	Each
009E3300	Three Man Survey Crew	40.0	Hour
100E0100	Clearing	Lump Sum	LS
110E0600	Remove Fence	3,030	Ft
110E1010	Remove Asphalt Concrete Pavement	17,076.0	SqYd
120E0010	Unclassified Excavation	1,109,855	CuYd
120E0420	Contractor Furnished Select Subgrade Topping	104,360	CuYd
120E1000	Muck Excavation	13,749	CuYd
120E2000	Undercutting	49,797	CuYd
120E6100	Water for Embankment	9,650.0	MGal
250E0020	Incidental Work, Grading	Lump Sum	LS
380E2564	4" Barrier Type Colored Median PCC Pavement	3,558.0	SqYd
380E2566	6" Barrier Type Colored Median PCC Pavement	57.0	SqYd
380E4090	10" PCC Fillet Section	39.0	SqYd
421E0100	Pipe Culvert Undercut	3,130	CuYd
450E0122	18" RCP Class 2, Furnish	6,722	Ft
450E0130	18" RCP, Install	6,722	Ft
450E0142	24" RCP Class 2, Furnish	1,838	Ft
450E0145	24" RCP Class 5, Furnish	352	Ft
450E0150	24" RCP, Install	2,190	Ft
450E0162	30" RCP Class 2, Furnish	1,018	Ft
450E0170	30" RCP, Install	1,018	Ft
450E0182	36" RCP Class 2, Furnish	36	Ft
450E0190	36" RCP, Install	36	Ft
450E0192	42" RCP Class 2, Furnish	930	Ft
450E0195	42" RCP Class 5, Furnish	184	Ft
450E0200	42" RCP, Install	1,114	Ft
450E0202	48" RCP Class 2, Furnish	158	Ft
450E0210	48" RCP, Install	158	Ft
450E0225	60" RCP Class 5, Furnish	240	Ft
450E0230	60" RCP, Install	240	Ft
450E0262	84" RCP Class 2, Furnish	14	Ft
450E0267	84" RCP Class 4000D, Furnish	404	Ft
450E0270	84" RCP, Install	418	Ft
450E0304	108" RCP Class 4, Furnish	186	Ft
450E0310	108" RCP, Install	186	Ft
450E2008	18" RCP Flared End, Furnish	9	Each
450E2009	18" RCP Flared End, Install	9	Each
450E2016	24" RCP Flared End, Furnish	11	Each
450E2017	24" RCP Flared End, Install	11	Each
450E2024	30" RCP Flared End, Furnish	1	Each
450E2025	30" RCP Flared End, Install	1	Each
450E2028	36" RCP Flared End, Furnish	1	Each
450E2029	36" RCP Flared End, Install	1	Each
450E2032	42" RCP Flared End, Furnish	3	Each
450E2033	42" RCP Flared End, Install	3	Each
450E2036	48" RCP Flared End, Furnish	1	Each
450E2037	48" RCP Flared End, Install	1	Each
450E2044	60" RCP Flared End, Furnish	1	Each
450E2045	60" RCP Flared End, Install	1	Each

450E2060	84" RCP Flared End, Furnish	2	Each
450E2061	84" RCP Flared End, Install	2	Each
450E2254	108" RCP Sectional End, Furnish	2	Each
450E2255	108" RCP Sectional End, Install	2	Each
450E2304	18" RCP Safety End, Furnish	1	Each
450E2307	18" RCP Safety End, Install	1	Each
450E2308	24" RCP Safety End, Furnish	2	Each
450E2311	24" RCP Safety End, Install	2	Each
450E3042	42" RCP Arch Class 2, Furnish	2,240	Ft
450E3050	42" RCP Arch, Install	2,240	Ft
450E3082	72" RCP Arch Class 2, Furnish	258	Ft
450E3090	72" RCP Arch, Install	258	Ft
450E4532	72" RCP Arch Flared End, Furnish	1	Each
450E4533	72" RCP Arch Flared End, Install	1	Each
450E4608	42" RCP Arch Sloped End, Furnish	16	Each
450E4609	42" RCP Arch Sloped End, Install	16	Each
450E4759	18" CMP 16 Gauge, Furnish	428	Ft
450E4760	18" CMP, Install	428	Ft
450E4769	24" CMP 16 Gauge, Furnish	160	Ft
450E4770	24" CMP, Install	160	Ft
450E4779	30" CMP 16 Gauge, Furnish	290	Ft
450E4780	30" CMP, Install	290	Ft
450E5010	18" CMP Elbow, Furnish	5	Each
450E5011	18" CMP Elbow, Install	5	Each
450E5015	24" CMP Elbow, Furnish	2	Each
450E5016	24" CMP Elbow, Install	2	Each
450E5020	30" CMP Elbow, Furnish	4	Each
450E5021	30" CMP Elbow, Install	4	Each
450E5211	18" CMP Flared End, Furnish	5	Each
450E5212	18" CMP Flared End, Install	5	Each
450E5215	24" CMP Flared End, Furnish	1	Each
450E5216	24" CMP Flared End, Install	1	Each
450E5219	30" CMP Flared End, Furnish	2	Each
450E5220	30" CMP Flared End, Install	2	Each
450E5227	42" CMP Flared End, Furnish	2	Each
450E5228	42" CMP Flared End, Install	2	Each
450E5406	18" CMP Safety End, Furnish	2	Each
450E5407	18" CMP Safety End, Install	2	Each
450E5549	42" CMP Arch 14 Gauge, Furnish	12	Ft
450E5550	42" CMP Arch, Install	12	Ft
450E6027	42" CMP Arch Safety End with Bars, Furnish	2	Each
450E6029	42" CMP Arch Safety End, Install	2	Each
450E7618	18" Steel Pipe, Furnish	56	Ft
450E7642	42" Steel Pipe, Furnish	348	Ft
450E8007	18" Concrete/Steel Pipe Transition, Furnish	2	Each
450E8009	18" RCP to CMP Transition, Furnish	1	Each
450E8010	18" Pipe Transition, Install	3	Each
450E8014	24" RCP to CMP Transition, Furnish	1	Each
450E8015	24" Pipe Transition, Install	1	Each
450E8019	30" RCP to CMP Transition, Furnish	2	Each
450E8020	30" Pipe Transition, Install	2	Each
450E8027	42" Concrete/Steel Pipe Transition, Furnish	2	Each
450E8030	42" Pipe Transition, Install	2	Each
451E1277	1.5" Water Service	1	Each
451E5118	Bore and Jack 18" Pipe	56	Ft
451E5142	Bore and Jack 42" Pipe	348	Ft

**FOR BIDDING PURPOSES ONLY**

Rev 6/21/2016 JHU

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0100(105)419	B2	B108

Plotting Date: 6/22/2016

462E0100	Class M6 Concrete	215.4	CuYd
464E0100	Controlled Density Fill	174.0	CuYd
480E0100	Reinforcing Steel	40,863	Lb
600E0300	Type III Field Laboratory	1	Each
620E0020	Type 2 Right-of-Way Fence	13,269	Ft
620E0040	Type 4 Right-of-Way Fence	9,922	Ft
620E1020	2 Post Panel	171	Each
620E1030	3 Post Panel	13	Each
635E8220	2" Rigid Conduit, Schedule 80	260	Ft
635E8240	4" Rigid Conduit, Schedule 80	260	Ft
650E1060	Type F66 Concrete Curb and Gutter	1,213	Ft
650E1100	Type F610 Concrete Curb and Gutter	33,586	Ft
650E6100	10" Concrete Valley Gutter	24	Ft
651E0060	6" Concrete Sidewalk	704	SqFt
651E7000	Type 1 Detectable Warnings	104	SqFt
670E1200	Type B Frame and Grate Assembly	120	Each
670E5340	4' x 11' Precast Concrete Type S Drop Inlet Lid	5	Each
670E5400	Precast Drop Inlet Collar	120	Each
671E6007	Type A7 Manhole Frame and Lid	3	Each
680E0240	4" Corrugated Polyethylene Drainage Tubing	284	Ft
680E0260	6" Corrugated Polyethylene Drainage Tubing	176	Ft
680E0440	4" Slotted Corrugated Polyethylene Drainage Tubing	2,850	Ft
680E0660	6" Slotted Corrugated Polyethylene Drainage Tubing	2,144	Ft
680E2000	Concrete Headwall for Underdrain	5	Each
680E2500	Porous Backfill	2,007.0	Ton
700E0110	Class A Riprap	4,021.2	Ton
700E0210	Class B Riprap	541.3	Ton
831E0110	Type B Drainage Fabric	4,947	SqYd
998E0100	Railroad Protective Insurance	Lump Sum	LS

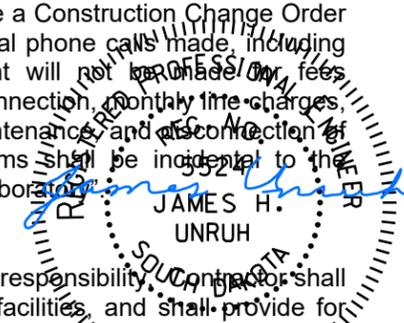
**TYPE III FIELD LABORATORY**

The lab shall be equipped with an internet connection such as DSL, cable modem, or other approved service. The internet connection shall be provided with a multi-port wireless router. The internet connection shall be a minimum speed of 512 Kb unless limited by job location and approved by the DOT. Prior to installing the wireless router the Contractor shall 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.

The Contractor shall submit a copy of each monthly bill for calls charged to this phone at the end of each month. The Project Engineer will then audit the bills to ensure all calls are legitimate and then initiate a Construction Change Order (CCO) to reimburse the Contractor for the actual phone calls made, including local and long distance calls. Reimbursement will not be provided for fees associated with the purchase, installation, disconnection, monthly line charges, and incidentals involved in the installation, maintenance, and disconnection of the phone (including attachments). These items shall be incidental to the contract unit price per each for "Type III Field Laboratory".

**DRAINAGE DURING CONSTRUCTION**

Drainage during construction is the Contractor's responsibility. Contractor shall be aware of existing drainage conditions and facilities, and shall provide for drainage during all phases of construction. Damage caused by improper temporary drainage facilities shall be repaired at the Contractor's expense and to the satisfaction of the Engineer.



**UTILITIES**

The Contractor shall 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 shall 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.

The underground utilities on the cross section sheets are shown at the approximate depths provided by the utility owners.

The Contractor shall be responsible for notifying South Dakota One Call 1-800-781-7474 to have utilities field located. The following utility companies are known to have facilities on the project:

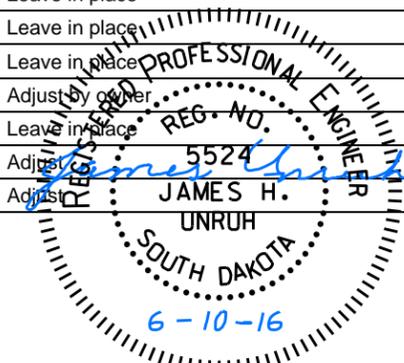
COMMUNICATIONS	MUNICIPAL/PUBLIC	Railroad
Eventis 2730 3 <sup>rd</sup> Ave. P.O. Box 3288 Mankato, MN 56002-3288 Attn: Joni McCabe Office: (507) 387-1770 Cell: (507) 317-1411 Email: <a href="mailto:jeni.mccabe@eventis.com">jeni.mccabe@eventis.com</a>	Minnehaha County 2124 E 60th Street North Sioux Falls, SD 57104 Attn: Shannon Schultz Phone: 605-367-4316 Email: <a href="mailto:sschultz@minnehahacounty.org">sschultz@minnehahacounty.org</a>	City of Brandon Stockwell Engineers 600 N. Main Ave. Suite 100 Sioux Falls, SD 57104 Attn: Paul Sanow Phone: 605-261-9100 Email: <a href="mailto:psanow@stockwellengineers.com">psanow@stockwellengineers.com</a>
		Ellis and Eastern Co. PO Box 84140 Sioux Falls, SD 57118 Attn: Bill Schmidt Office: 605-336-5861 Cell: 605-728-2966

**EXISTING UTILITIES WITHIN CONSTRUCTION LIMITS AND/OR RIGHT-OF-WAY (AT TIME OF DESIGN)**

Note: The final status of power pole relocation will be determined by the owner after review of vertical clearances.

Roadway	Station	Offset	Description	Project Structure #	Owner Structure #	Remarks Leave in place if outside work limits, Adjust if within in work limits outside of ROW Relocate if in proposed ROW or work limit	Owner
Hwy100	834+43	329' R	Power Pole	L-1		Leave in place	L&O
Hwy100	837+60	115' R	Power Pole	L-2		Relocate by owner	
Hwy100	840+55	36' L	Power Pole	L-3		Relocate by owner	
Hwy100	843+38	150' L	Power Pole	L-4		Relocate by owner	
Hwy100	847+38	259' L	Power Pole	L-5		Relocate by owner	
Hwy100	851+68	324' L	Power Pole	L-6		Relocate by owner	
Hwy100	855+30	341' L	Power Pole	L-7		Relocate by owner	
Hwy100	860+05	139' L	Power Pole	L-8		Relocate by owner	
Hwy100	864+51	100' R	Power Pole	L-9		Relocate by owner	
Rice	37+17	70' R	Power Pole	L-10		Relocate by owner	
Hwy100	875+30	676' R	Power Pole	L-11		Relocate by owner	
Rice	-0+65	79' L	Power Pole	XD-1		Leave in place	Xcel Dist.
Rice	1+72	78' L	Power Pole	XD-2		Leave in place	
Rice	4+18	75' L	Power Pole	XD-3		Leave in place	
Rice	6+66	31' L	Power Pole	XD-4		Relocate by owner	
Rice	9+01	31' R	Power Pole	XD-5		Relocate by owner	
Rice	11+12	82' R	Power Pole	XD-6		Leave in place	
Rice	13+65	105' R	Power Pole	XD-7		Leave in place	
Rice	15+90	68' R	Power Pole	XD-8		Leave in place	
Rice	18+16	5' L	Power Pole	XD-9		Relocate by owner	
Rice	20+18	122' L	Power Pole	XD-10		Relocate by owner	
Timberline	69+73	137' L	Power Pole	XD-11		Leave in place	
Timberline	72+38	70' L	Power Pole	XD-12		Leave in place	
Rice	25+48	579' L	Power Pole	XD-13		Leave in place	
Rice	26+33	640' L	Power Pole	XD-14		Leave in place	
Rice	13+65	105' R	Power Pole	XD-31		Leave in place	
Rice	13+54	250' R	Power Pole	XD-32		Leave in place	
Rice	15+76	247' R	Power Pole	XD-33		Leave in place	
Rice	19+87	133' R	Power Pole	XD-35		Leave in place	
Rice	21+64	39' R	Power Pole	XD-36		Adjust by owner	
Rice	22+85	29' L	Power Pole	XD-37		Leave in place	
Rice	22+50	44' L	Power Pole	XD-38		Adjust by owner	
Rice	22+67	120' L	Power Pole	XD-39		Adjust by owner	

POWER		
Xcel Energy Electrical Distribution 500 W. Russell Street Sioux Falls, SD 57104 Attn: Aaron Bickett Office # 605-339-8315 Email: <a href="mailto:aaron.m.bickett@xcelenergy.com">aaron.m.bickett@xcelenergy.com</a>	Xcel Energy Electrical Transmission 210 Lime St Mankato, MN 56001 Dave Hageman Office: (612) 330-5986 Cell: (507) 995-0625 Email: <a href="mailto:david.j.hageman@xcelenergy.com">david.j.hageman@xcelenergy.com</a>	Xcel Energy Gas Transmission PO Box 2747 Fargo, ND 58108 John Ness (gas line contact) (701) 241-8695 Email: <a href="mailto:john.l.ness@xcelenergy.com">john.l.ness@xcelenergy.com</a> Attn: Rick Barber (SF plant) (605) 331-1212 or (605) 331-1218
Western Area Power Administration (WAPA) 200 4 <sup>th</sup> Street SW. Huron, SD 57350 Dave Hinders (605) 353-2555 Email: <a href="mailto:hinders@wapa.gov">hinders@wapa.gov</a>	Sioux Valley Energy 108 N Heritage Rd PO Box 857 Brandon, SD 57005 Attn: Jason Sage Cell: (605) 530-9472 Email: <a href="mailto:jason.sage@siouxvalleyenergy.com">jason.sage@siouxvalleyenergy.com</a>	MidAmerican Energy 1200 S. Blauvelt Sioux Falls, SD 57105 Attn: Tim Galbraith (605) 373-6047 Email: <a href="mailto:tjgalbraith@midamerican.com">tjgalbraith@midamerican.com</a>
ENEL Greenpower 206 W. 1 <sup>st</sup> Street Hardwick, MN Attn: Tony Edwards (507) 935-8048 Email: <a href="mailto:tony.edwards@enel.com">tony.edwards@enel.com</a>	L&O Power Cooperative 1302 South Union Street Rock Rapids, IA 51246 Attn: Troy Metzger Phone: (712) 472-2556 Email: <a href="mailto:troy.metzger@dge.com">troy.metzger@dge.com</a>	East River Electric 211 S. Harth Avenue Madison, SD 57042 Attn: Casey Sichmeller Phone: 605-256-8020 Email: <a href="mailto:csichmeller@eastriver.coop">csichmeller@eastriver.coop</a>
COMMUNICATIONS		MUNICIPAL
MidContinent Communications 3507 S. Duluth Ave. Sioux Falls, SD Attn: Al Mullinix (605) 274-8546 Cell: (605) 231-0388 Email: <a href="mailto:al.mullinix@mci.net">al.mullinix@mci.net</a>	Century Link 125 S. Dakota Ave. Sioux Falls, SD 57104 Attn: Trevor Janssen Office: (605) 977-2848 Cell: (605) 254-5127 Email: <a href="mailto:trevor.janssen@centurylink.com">trevor.janssen@centurylink.com</a>	<b>LIGHT AND POWER</b> City Shop 2000 North Minnesota Box 7402 Sioux Falls, SD 57117-7402 Attn: Jerry Jongeling Office: (605) 373-6978 Cell: (605) 728-9571 Email: <a href="mailto:jjongeling@siouxfalls.org">jjongeling@siouxfalls.org</a>
Alliance Communications Steve Kolbeck 113 N Splitrock Blvd Brandon, SD 57005 Office: 605-594-8229 Cell: 605-359-3078 Email: <a href="mailto:stevek@alliance.coop">stevek@alliance.coop</a>	SDN Communications 2900 W. 10 <sup>th</sup> Street Sioux Falls, SD 57104 Attn: John Mingo Office: 605-978-7119 Cell: 605-770-3797 Email: <a href="mailto:john.mingo@sdncommunications.com">john.mingo@sdncommunications.com</a>	<b>WATER AND SEWER</b> City of Sioux Falls 224 West Ninth Street Sioux Falls, SD 57117-7402 Attn: Shannon Ausen Office: (605) 367-8600 Email: <a href="mailto:sausen@siouxfalls.org">sausen@siouxfalls.org</a>
MCI/Verizon 2400 North Glenville Richardson, TX 75082 Attn: Dean Boyers Office: 972-729-6322 Email: <a href="mailto:dean.boyers@verizon.com">dean.boyers@verizon.com</a>	Sprint 849 Earl St. St. Paul, MN 55106 Attn: Dan Hilliard Office: 651-772-6714 Cell: 612-414-2089 Email: <a href="mailto:dan.j.hilliard@sprint.com">dan.j.hilliard@sprint.com</a>	<b>RURAL WATER</b> Minnehaha Community Water Corporation (MCWC) Ryan Allen 47381 - 248th St. Dell Rapids, SD 57022 605-428-3374 Email: <a href="mailto:mcwcoperations@outlook.com">mcwcoperations@outlook.com</a>



Plotting Date: 6/10/2016

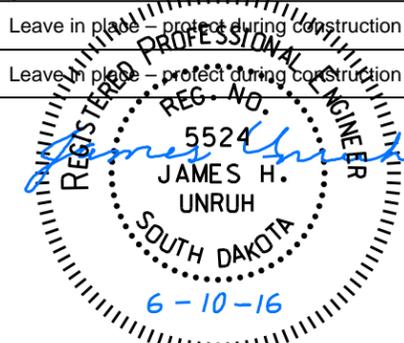
**EXISTING UTILITIES WITHIN CONSTRUCTION LIMITS AND/OR RIGHT-OF-WAY (AT TIME OF DESIGN)**

Note: The final status of power pole relocation will be determined by the owner after review of vertical clearances.

Roadway	Station	Offset	Description	Project Structure #	Owner Structure #	Remarks	Owner
Rice	25+36	404' L	Power Pole	XD-25		Leave in place	Xcel Dist.
Rice	26+69	232' L	Power Pole	XD-26		Leave in place	
Rice	28+27	30' L	Power Pole	XD-27		Relocate by owner	
Rice	30+90	57' R	Power Pole	XD-28		Relocate by owner	
Hwy 100	869+23	120' R	Power Pole	XD-29		Relocate by owner	
Rice	41+55	379' R	Power Pole	XD-30		Leave in place	
Timberline	71+00	50' R	Light Pole	XD-40		Remove, see lighting plans (verify ownership)	
Timberline	70+88	95' R	Light Pole	XD-41		Remove, see lighting plans (verify ownership)	
Existing Timberline/ Rice intersection			Buried Power			Remove, see lighting plans (verify ownership)	
Rice	57+49	57' L	Power Pole	E-1		Leave in place	East River Electric
Rice	54+39	55' L	Power Pole	E-2		Leave in place	
Rice	51+48	90' L	Power Pole	E-3		Leave in place	
Rice	48+53	172' L	Power Pole	E-4		Leave in place	
Rice	45+58	257' L	Power Pole	E-5		Leave in place	
Rice	42+70	342' L	Power Pole	E-6		Leave in place	
Rice	41+95	362' L	Power Pole	E-7		Leave in place	
Rice	40+38	414' L	Power Pole	E-8		Leave in place	
Rice	39+84	291' L	Power Pole	E-9		Relocate anchor pole by owner	
Rice	39+78	426' L	Power Pole	E-10		Leave in place	
Rice	39+75	600' L	Power Pole	E-11		Leave in place	
Rice	39+07	442' L	Power Pole	E-12		Leave in place	
Rice	36+94	509' L	Power Pole	E-13		Leave in place	
Rice	34+80	567' L	Power Pole	E-14		Leave in place	
Rice	33+77	598' L	Power Pole	E-15		Leave in place	
Hwy100	839+00	988' R	Power Pole	XT-1	5508-9	Leave in place	Xcel Transmission
Hwy100	839+75	180' R	Power Pole	XT-2	5508-8	Relocate by owner - Will be relocated by September 23, 2016. Contractor will need to maintain adequate clearances below the existing power line for work completed near the power line prior to that date.	
Hwy100	840+13	597' L	Power Pole	XT-3	5508-7	Leave in place	
Hwy100	865+10	670' L	Power Pole	XT-25		Leave in place	
Hwy100	869+25	380' L	Power Pole	XT-26		Leave in place	
Hwy100	868+70	120' L	Power Pole	XT-27		Leave in place	
Hwy100	868+10	140' R	Power Pole	XT-28		Leave in place	
Hwy100	867+10	530' R	Power Pole	XT-29		Leave in place	
Hwy100	865+10	810' R	Power Pole	XT-30		Leave in place	
Hwy100	868+35	690' L	Power Pole	W-1	GP-SF 0/4	Leave in place	
Rice	31+23	12' R	Power Pole	W-2	GP-SF 0/3	Relocate by owner	WAPA
Rice	36+00	626' L	Power Pole	W-3	GP-SF 0/2	Leave in place	

**EXISTING UTILITIES WITHIN CONSTRUCTION LIMITS AND/OR RIGHT-OF-WAY (AT TIME OF DESIGN)**

Roadway	Station	Offset	Description	Remarks	Owner
Hwy 100	787+39	92' L to 109' R	Water main	Leave in place – protect during construction	MCWC
Hwy 100	787+46	95' L to 111' R	Gas main	Leave in place – protect during construction	Xcel Gas
Hwy 100	800+18	96' L to 152' R	Telephone / Fiber	Lower or relocate	Alliance
Rice	4+90	Pipe extensions L	Telephone / Fiber	Leave in place – protect during construction	SDN MidContinent
Rice	0+00 to 6+00	31' L	Telephone / Fiber	Leave in place	SDN
Rice	0+00 to 6+00	34' L	Telephone / Fiber	Leave in place	MidContinent
Rice	0+00 to 6+00	36' R	Telephone	Leave in place	Century Link
Rice	0+00 to 6+00	60' R	Telephone / Fiber	Leave in place	Sprint
Rice	1+20	50' R	Telephone/Fiber pedestal	Relocate for temporary widening	Century Link
Rice	0+00 to 6+00	70' R	Telephone / Fiber	Leave in place	MCI
Rice	6+00 to 20+00	R	Telephone / Fiber	Leave in place	SDN
Rice	6+00 to 20+00	R	Telephone / Fiber	Leave in place	MidContinent
Rice	6+00 to 20+00	R	Telephone	Leave in place	Century Link
Rice	6+00 to 20+00	R	Telephone / Fiber	Leave in place	Sprint
Rice	6+00 to 20+00	R	Telephone / Fiber	Leave in place	MCI/Verizon
Rice	18-54 and 18+78	36" culvert crossing	Telephone / Fiber	Leave in place – protect during construction	SDN MidContinent Century Link
Rice	20+00 to 30+00	L	Telephone / Fiber	Leave in place	SDN
Rice	20+00 to 30+00	L	Telephone / Fiber	Leave in place	MidContinent
Rice	20+00 to 30+00	L	Telephone	Leave in place	Century Link
Rice	20+00 to 30+00	L	Telephone / Fiber	Leave in place	Sprint
Rice	20+00 to 30+00	L	Telephone / Fiber	Leave in place	MCI/Verizon
Rice	23+30	18" storm pipe	Telephone / Fiber	Leave in place – protect during construction	MCI/Verizon
Rice	23+90	35' L	Telephone/Fiber pedestal	Leave in place – protect during construction	MCI/Verizon
Rice	23+90	35' L	RR signal box	Leave in place – protect during construction	E&E RR
Rice	27+00	18" culvert	Telephone	Leave in place – protect during construction	Century Link
Timberline	Rice to 38+12	76' R to 90' L	Telephone / Fiber	Leave in place – protect during construction	SDN MidContinent
Timberline	69+80	18" culvert	Telephone / Fiber	Leave in place – protect during construction	SDN MidContinent
Rice	0+00 to 9+00	110' L to 0' L	10" Steel Gas / 200 psi 3" Steel Gas / 60 psi	Leave in place – protect during construction	MidAmerican Energy
Rice	9+00 to 17+00	0' R to 56' R	10" Steel Gas / 200 psi 3" Steel Gas / 60 psi	Contractor to adjust subcut and subgrade correction depth to avoid gas lines from 15+00 to 17+00	
Rice	13+50	18" culvert crossing	10" Steel Gas / 200 psi 3" Steel Gas / 60 psi	Leave in place – protect during construction	
Rice	18-54 and 18+78	36" culvert crossing	10" Steel Gas / 200 psi 3" Steel Gas / 60 psi	Leave in place – protect during construction	
Rice	27+00	18" culvert	10" Steel Gas / 200 psi 3" Steel Gas / 60 psi	Leave in place – protect during construction	
Rice	17+00 to Timberline	0' L to 140' L	10" Steel Gas / 200 psi 3" Steel Gas / 60 psi	Adjust subgrade correction depth to avoid gas lines from 17+00 to 19+00	
Timberline	69+08 to 70+99	62' L to 57' R	10" Steel Gas / 200 psi 3" Steel Gas / 60 psi	Leave in place – protect during construction	
Rice	47+00 to 55+00	35' to 65' L	Sanitary sewer force main	Leave in place – protect during construction	City of SF & Brandon



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**TABLE OF EXCAVATION QUANTITIES BY BALANCES**

Station	to Station	Topsoil Excavation (CuYd)	Unstable Excavation (CuYd)	Excavation (CuYd)	* Undercut (CuYd)	* Muck (CuYd)	Total Excavation (CuYd)	* (1) Contractor Furnished Select Subgrade Topping (CuYd)	(2)Topsoil Waste (CuYd)	(3) Out-of-Balance Waste (CuYd)	(4) Out-of-Balance Unstable Waste (CuYd)	(5) (7) Waste (CuYd)	(6) Haul (CuYdSta)	(6) Out-of-Balance Haul (CuYdSta)
<b>Hwy 100</b>														
787+09	873+60	51,653	1,972	819,069	40,851	13,749	927,293	80,290	4,657	86,151		5,651	19,221,300	353,000
<b>Rice Street</b>														
0+00	59+00	13,495	14,098	115,402	8,946	0	151,940	24,070	999		14,098		561,000	862,000
<b>Timberline Avenue</b>														
68+50	72+00	363	1,336	76	0	0	1,774	0	0		1,336		5,323	166,000
<b>East Cactus Hills Access Road</b>														
		100	0	0	0	0	100		52					
<b>West Cactus Hills Access Road</b>														
included in Hwy 100 mainline quantities														
Totals:		65,610	17,405	934,546	49,797	13,749	1,081,108	104,360	5,708	86,151		5,651	19,787,623	1,381,000

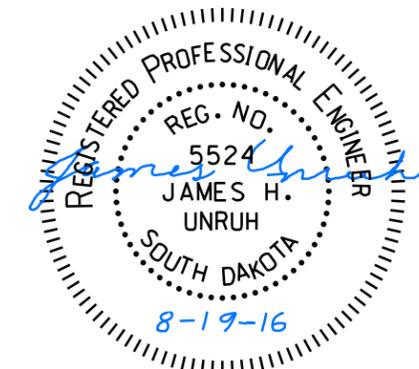
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**TABLE OF UNCLASSIFIED EXCAVATION**

Excavation (includes topsoil excavation quantity)	1,000,157
Undercut	49,797
Topsoil (from Section D)	59,902
<b>Total</b>	<b>1,109,855</b>

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

- (1) Volume is in-place with no shrinkage.
- (1) Select subgrade topping borrow quantity is based on the assumption that Select Subgrade Topping is not available within the project limits. If suitable material is available on-site, the overall earthwork balance would change.
- (2) Excess topsoil shall be utilized within the project limits.
- (3) This waste material shall be utilized for Rice Street, Timberline Road, and Cactus Hill east access grading
- (4) This waste material may be used in the Hwy100 embankment outside of the 2:1 slope from the shoulder PI (see Typical Grading Section station 839+00 to 856+60).
- (5) Overall project earthwork balance shows a slight excess of material. Excess material shall be stockpiled within the project limits at a location determined by the Engineer. Excess material will be used on the Hwy100 Rice Street to I-90 project (PCN 00X8 and PCN 00WN)
- (6) Quantity is not a bid item and is for information only.
- (7) Project PCN00KB (Hwy100 from Madison St. to Maple St.) yielded a small amount of excess grading material that was stockpiled at Maple St. This material will be quantified during PCN01V5 construction and earthwork quantities will be adjusted accordingly. The contractor shall utilize this grading material for Hwy100 fill material immediately north of Maple Street.



**SHRINKAGE FACTORS**

Roadway Section	% Shrinkage
Hwy100	25
Rice St	25
Timberline Ave	30
East Cactus Hills access road	30
Topsoil	40

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

**PROCEDURES FOR DETERMINING UNCLASSIFIED EXCAVATION QUANTITY**

The final Unclassified Excavation quantity shall be based on measured cross sections.

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

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

**GRADING OPERATIONS**

Most of the embankment will be constructed from high silt soils. Soils will be considered to have high silt content if they have more than 60% passing the #200 sieve and a PI less than 20. These soils will be adequate to build the lower portion of the embankment, but will not be allowed in the upper two feet of the subgrade. Past experience with soils of this nature indicates that the moisture content is key to controlling embankment stability. The soil in this part of the embankment shall be at optimum moisture to 4% below optimum moisture at the time of compaction (+0% to -4%). A moisture content approximately 2% below optimum moisture has worked well on past projects. The contractor will be required to perform moisture testing hourly, in accordance with SD108 as set forth in the Materials Manual. DOT field

technicians should run split sample moisture tests twice a day to assure compliance.

There is approximately 6 inches of topsoil available and considered suitable for topping inslopes, ditches and backslopes. This thickness of topsoil is considered to hold true for the right-of-way area outside the backslopes and inslopes of the present grade.

Compaction of earth embankment shall be per the Specified Density Method.

Water for Embankment is estimated at the rate of 10 gal/cuyd.

Rock is not anticipated to be encountered within the project limits.

**HAUL**

Included in the Table of Excavation Quantities by Balances is Haul. This is not a pay item and is for informational purposes only.

Haul: Estimated quantity (CuYdSta) for moving unclassified excavation material to the locations where it is needed throughout the earthwork balance. The quantity for moving Out-of-Balance Excavation material from an earthwork balance to another earthwork balance is also shown.



**UNDERCUTTING**

In all cut sections the earthen subgrade shall be undercut 2 feet below the earthen subgrade surface. The undercut material shall be replaced with Select Subgrade Topping.

Shallow embankment sections, fills less than 2 feet in height measured at the finished subgrade shoulders, shall 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 shall 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 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 shall direct removal of these areas and the additional areas will be measured according to the Engineer.

Undercutting is shown in the Typical Grading Sections and the cross sections.

**TABLE OF UNDERCUTTING**

Station to	Station	Quantity (CuYd)
787+00	837+00	32,945
855+00	871+00	7,905
0+00	12+00	2,527
18+00	28+00	3,002
42+00	55+00	3,418
Total:		49,797

**CONTRACTOR FURNISHED SELECT SUBGRADE TOPPING**

The upper two (2) feet of the subgrade will be constructed from select topping material. Select topping material width will be from 3 foot outside the edge of the outside curb & gutter to 3 foot outside the edge of the median curb & gutter (see typical sections). The moisture content of the select topping at the time of compaction will be as per Section 120.3 B.3.a.

Material for select topping will conform to the following:

- Any material with less than 60 % passing the #200 sieve.
- Any material that has more than 60 % passing the #200 sieve and having a PI less than 40 and greater than or equal to 20.

Soil samples taken from the project indicate it is unlikely that any suitable select topping material will be available from the cut sections. It may appear from the Soils Blocks that material is available, but the majority of suitable material is from depths below the bottom of the cuts on the current alignment. Because of this, the Contractor shall provide Contractor Furnished select subgrade topping material. The Contractor is responsible for obtaining all required permits and clearances for the source.

Regardless of whether the Contractor furnished select subgrade topping material is entirely brought in from the Contractor furnished source or blended with waste material, all costs to furnish and place the material shall be included in the contract unit price per cubic yard for Contractor Furnished Select Subgrade Topping.

Field measurement of Contractor Furnished Select Subgrade Topping material shall not be made and payment for the Contractor Furnished Select Subgrade Topping will be based upon plans quantity unless changes are directed by the Engineer.

**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 17,405 cubic yards of unstable material excavation shall be paid for at the contract unit price per cubic yard for "Unclassified Excavation".

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

Field measurement of unstable material excavation shall not be made. However, if there are additional areas of unstable material excavation other than what is shown in the plans, the Engineer shall 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)
Hwy100				
819+00	821+00	L	2	1,720
826+50	827+50	L	2	251
Rice St				
12+00	20+00	L	2	6,757
29+50	31+00	L	2	2,290
34+00	40+00	L	2	5,051
Timberline				
69+00	71+00	L	2	1,336
Total:				17,405

**MUCK EXCAVATION**

The areas of muck excavation are drawn on the cross sections with a normal depth of 3 feet. The estimated quantity of 13,749 cubic yards of muck excavation shall 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 shall 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 shall be measured and paid for as "Unclassified Excavation".

**TABLE OF MUCK EXCAVATION**

Station to	Station	L/R	Depth (Ft)	Quantity (CuYd)
839+00	856+00	L/R	3	13,749
Total:				13,749

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**TABLE OF SAW EXISTING ASPHALT PAVEMENT (INCIDENTAL)**

Rice Street Station to	Station	L/R	Quantity (Ft)
0+00	0+00	L/R	40
23+22	24+16	L/R	119
47+25	47+35	L	38
56+50	56+50	L/R	40
72+12	72+12	L/R	24
Total:			261

**COORDINATION WITH ELLIS & EASTERN RAILROAD**

Installation of new crossing railroad crossing and signal equipment will be done under a separate contract by others. The crossing is located at Rice Street station 22+80. The contractor shall coordinate with E & E Railroad for the installation of the new crossing and signals. The contact for the railroad is Bill Schmidt at 605-336-5861 (office) or 605-728-2966 (cell).

**REMOVAL OF EXISTING PAVEMENT**

The Contractor shall dispose of the asphalt concrete pavement at a site approved by the Engineer.

The depth of existing Rice Street asphalt concrete pavement is unknown.

**TABLE OF REMOVE ASPHALT CONCRETE PAVEMENT**

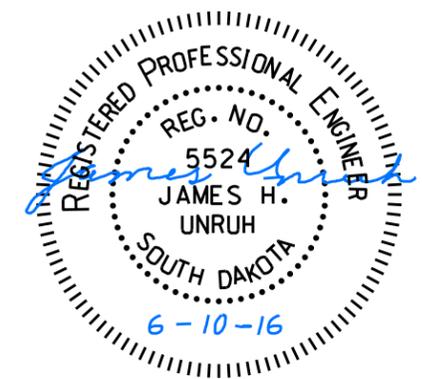
Rice Street Station to	Station	L/R	Quantity (SqYd)
0+00	24+17	L/R	12,690
46+33	56+50	L/R	4,386
Total:			17,076

**UNDERDRAINS**

The SDDOT Geotechnical Engineering Activity shall be contacted prior to underdrain construction to evaluate groundwater conditions and aid in locating the underdrains.

**4" Underdrains**

A series of underdrains shall be installed from Station 804+00± to Station 836+00± to prevent ground water from percolating into the subgrade and lower the effective ground water table to below frost depth. Site conditions may require the underdrain systems to be modified from what is shown in the plans to optimize subsurface drainage.



**UNDERDRAINS (CONT.)**

Station 804+00± to Station 810+00±

The underdrain shall be installed from Station 804+00±, 80' Rt. to Station 810+00±, 80' Rt. to Station 810+00±, 60' Rt. The underdrain shall consist of 4 inch Slotted Corrugated Polyethylene Drainage Tubing placed in a 2 foot wide trench of variable depth backfilled with Porous Backfill and 1 foot of fill material. The underdrain shall outlet into the proposed drop inlet at Station 810+00±, 60' Rt. via 20 feet of 4 inch Corrugated Polyethylene Tubing teed into the longitudinal drain at Station 810+00±, 80' Rt. The solid outlet tubing shall be placed in a 2 foot wide trench of variable depth and then backfilled with fill material.

Station 810+00± to Station 819+40±

The underdrain shall be installed from Station 810+00±, 80' Rt. to Station 819+00±, 80' Rt. to Station 819+40±, 100' Rt. The underdrain shall consist of 4 inch Slotted Corrugated Polyethylene Drainage Tubing placed in a 2 foot wide trench of variable depth backfilled with Porous Backfill and 1 foot of fill material. The underdrain trench shall be graded to drain from Station 812+00± back to Station 810+00± and from Station 812+00± ahead to Station 819+40±. The underdrain shall outlet into the proposed drop inlet at Station 810+00±, 60' Rt. and at an Outlet Headwall at Station 819+40±, 100' Rt. as directed by the Engineer. The underdrain shall daylight at the Outlet Headwall (standard plate 680.01) via 40 feet of 4 inch Corrugated Polyethylene Tubing placed in a 2 foot wide trench of variable depth backfilled with fill material.

Station 822+00± to Station 839+00±

The underdrain shall be installed from Station 822+00±, 80' Rt. to Station 835+50±, 80' Rt. to Station 835+50±, 100' Rt. The underdrain shall consist of 4 inch Slotted Corrugated Polyethylene Drainage Tubing placed in a 2 foot wide trench of variable depth backfilled with Porous Backfill and 1 foot of fill material. The underdrain shall outlet through 220 feet of 4 inch Corrugated Polyethylene Tubing placed in a 2 foot wide trench of variable depth backfilled with fill material. The underdrain outlet tubing shall daylight at an Outlet Headwall (standard plate 680.01) at approximately Station 839+00, 220' Rt. as directed by the Engineer.

6" Underdrains

Larger 6" drainage tubing has been specified to ensure capture and preservation of flows produced from springs that will be covered by the mainline embankment within the Cactus Hills drainage area.

After the Muck Excavation at each site is complete, an underdrain system shall be installed within the drainage area approximately as shown in the plans. Partial backfill of the Muck Excavation may be required to maintain positive drainage toward the outlet location.

Each underdrain trench shall be graded to maintain a minimum of .01ft/ft or 1-% drop from beginning to outlet. Each Outlet Headwall shall be placed to blend in with the surrounding topography with the outlet tubing placed above the bottom of the drainage so as to permit proper flow from the outlet.

Care must be taken to insure that the underdrain and outlet tubing is not damaged during construction. Sufficient cover material is to be placed over the underdrains before heavy equipment is allowed to work over the underdrains.

The underdrain locations and elevations given are based on the best information available to the Geotechnical Engineering Activity. Actual field

conditions may require that adjustments be made by the Project Engineer during construction to provide for sufficient drainage.

Staking for the 6" underdrains will be incidental to the price per foot for the drainage tubing.

Station 1001+00 to Station 1008+86 (south segment on profile)

The underdrain shall be installed from Station 1001+00 to Station 1008+66. The underdrain will consist of 6 inch Slotted Corrugated Polyethylene Tubing placed in a 2 foot wide by 2 foot deep trench backfilled with 2 feet of Porous Backfill. The underdrain shall outlet through 20 feet of 6 inch Corrugated Polyethylene Tubing placed in a 2 foot wide trench of variable depth backfilled with fill material. The underdrain outlet tubing shall daylight at an Outlet Headwall at approximately Station 1008+86 as directed by the Engineer.

Station 1100+00 to Station 1107+54 (middle segment on profile)

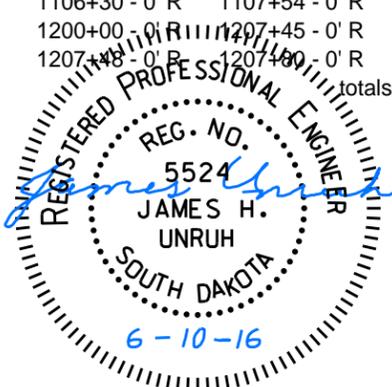
The underdrain shall be installed from Station 1100+00 to Station 1106+30. The underdrain will consist of 6 inch Slotted Corrugated Polyethylene Tubing placed in a 2 foot wide by 2 foot deep trench backfilled with 2 feet of Porous Backfill. The underdrain shall outlet through 124 feet of 6 inch Corrugated Polyethylene Tubing placed in a 2 foot wide trench of variable depth backfilled with fill material. The underdrain outlet tubing shall daylight at an Outlet Headwall at approximately Station 1107+54. as directed by the Engineer.

Station 1200+00 to Station 1207+80 (north segment on profile)

The underdrain shall be installed from Station 1200+00 to Station 1207+48. The underdrain will consist of 6 inch Slotted Corrugated Polyethylene Tubing placed in a 2 foot wide by 2 foot deep trench backfilled with 2 feet of Porous Backfill. The underdrain shall outlet through 32 feet of 6 inch Corrugated Polyethylene Tubing placed in a 2 foot wide trench of variable depth backfilled with fill material. The underdrain outlet tubing shall daylight at an Outlet Headwall at approximately Station 1207+80. as directed by the Engineer.

**TABLE OF UNDERDRAIN**

Station to	Station	4" Tubing		6" Tubing		Porous Backfill (Ton)	Concrete Headwall (Each)
		Slotted (Ft)	Solid (Ft)	Slotted (Ft)	Solid (Ft)		
Hwy100 C-L							
804+00 - 80' R	810+00 - 80' R	600				336	
810+00 - 80' R	810+00 - 60' R		20				
810+00 - 80' R	819+00 - 80' R	900				504	
819+00 - 80' R	819+40 - 100' R		44				1
822+00 - 80' R	835+50 - 80' R	1,350				567	
835+50 - 80' R	839+00 - 220' R		220				1
Underdrain C-L							
1001+00 - 0' R	1008+66 - 0' R			766		214	
1008+66 - 0' R	1008+86 - 0' R				20		1
1100+00 - 0' R	1106+30 - 0' R			630		176	
1106+30 - 0' R	1107+54 - 0' R				124		1
1200+00 - 0' R	1207+45 - 0' R			748		209	
1207+48 - 0' R	1207+80 - 0' R				32		1
totals		2,850	284	2,144	176	2,007	5



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**PIPE CULVERT UNDERCUT**

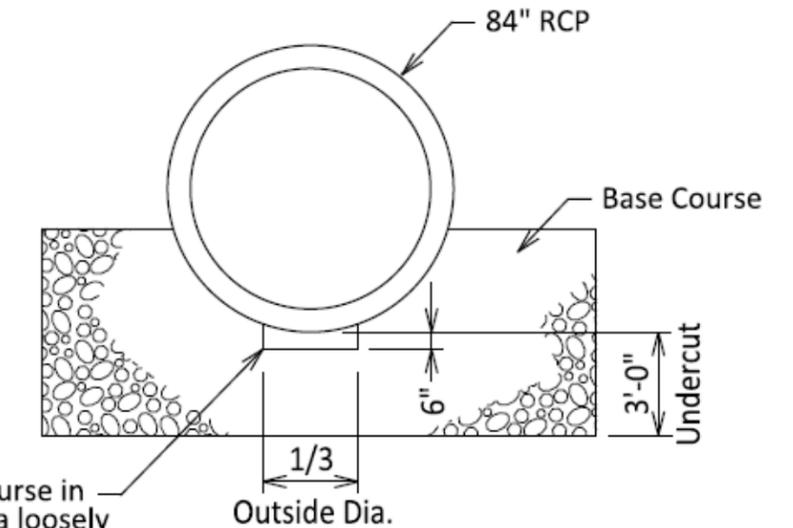
Provide 36 inches of undercut and Base Course backfill at stations 788+05 (Hwy100), 851+00 (Hwy100), and 38+59 (Rice St.) to remove low strength soils from beneath the pipe culverts.

Provide 12 inches of undercut and backfill at station 18+78 (Rice St.).

Provide 24 inches of undercut and Base Course backfill at station 29+69 (Rice St.) to remove low strength soils from beneath the pipe culvert.

At station 851+00 (Hwy100) the middle third of the pipe bedding shall be loosely placed to a depth of 6 inches. Outer bedding material shall be compacted to 95% or greater of the maximum dry density as determined by the specified density method. (See detail below.)

**Pipe Culvert Undercut and Backfill**



Base course in this area loosely placed/uncompacted

Dewatering will be required for construction of pipe culverts at Stations 788+05 (Hwy100), 851+00 (Hwy100), 29+69 (Rice Street), and 38+59 (Rice Street) and will be incidental to Pipe Culvert Undercut

Large diameter RCP at stations 788+05 (Hwy100), 851+00 (Hwy100), 29+69 Rice Street), and 38+59 (Rice Street) shall be undercut to the minimum depth listed and backfilled with Base Course. The depth of undercut is an estimate and the actual depth necessary shall be determined during construction. The Engineer will determine how much undercut shall be done in accordance with Section 421 of the Specifications, but will not reduce the undercut to less than the minimum depth prescribed.



**PIPE CULVERT UNDERCUT (CONT.)**

Pipe Culvert Undercut shall be paid for at the contract unit price per cubic yard for Pipe Culvert Undercut. Undercut backfill shall be Base Course conforming to Section 882 of the Specifications and shall be incidental to Pipe Culvert Undercut.

Compaction of earth embankment and pipe culvert backfill material shall be governed by the Specified Density Method.

At all other locations, the Table of Pipe Culvert Undercut will be followed. This table is intended to be used to establish an estimated quantity of Pipe Culvert Undercut for bidding purposes only. The depth of undercut is an estimate and the actual depth necessary shall be determined during construction. Pipes shown may or may not require undercutting and pipes not shown may require undercutting. The Engineer will determine which pipe shall be undercut in accordance with Section 421 of the Specifications.

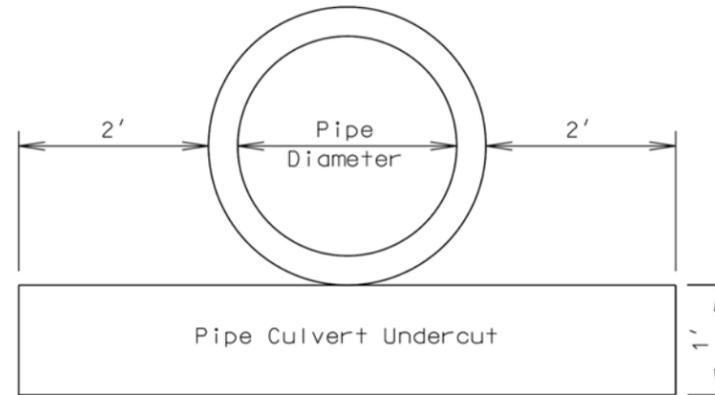
The Table of Reinforced Concrete Pipe lists the quantities of pipe culvert undercut.

The table below contains the rate 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.

**TABLE OF PIPE CULVERT UNDERCUT**

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	---



**CORRUGATED METAL PIPE**

Corrugated metal pipes shall 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 shall 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 elbows shall match the thickest gauge of corrugated metal pipe it is connected to.

**PIPE FOR APPROACHES AND DOWNSPOUTS**

Class II reinforced concrete pipe, high density polyethylene pipe, corrugated polypropylene pipe, 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 shall be as specified in the CORRUGATED METAL PIPE note.

High density polyethylene pipe may be substituted for 36 inch and smaller pipe downspouts at no additional cost to the State. All necessary connections, transitions, and anchoring methods shall be in accordance with the manufacturer's recommendations and be approved by the Engineer. Bedding and backfill material and installation procedures shall conform to the manufacturer's design requirements.

If high density polyethylene pipe, corrugated polypropylene pipe, or steel reinforced polyethylene pipe are provided, then the end sections shall 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 shall be in conformance with Section 464 of the Specifications.

The controlled density fill shall be placed between the pipes from the base of pipe elevation to the haunch of the pipes.

**TABLE OF CONTROLLED DENSITY FILL FOR PIPE**

See Table of Reinforced Concrete Pipe.

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**BORE AND JACK STEEL PIPE**

The Contractor shall install 42" steel pipes at Rice Street Sta. 18+54 and 18+78 and an 18" steel pipe at Rice Street Station 52+50 by boring and jacking the pipe through the existing highway embankment. The pipe shall be installed by boring and jacking methods as specified herein unless an alternate plan is submitted in writing and approved by the Engineer.

As shown on the appropriate pipe cross section, some excavation of the existing roadway embankment is anticipated in order to reduce the length of the bore and jack installation.

Steel pipe for boring and jacking shall meet or exceed the requirements of ASTM A139, Grade B. Pipe shall have a minimum wall thickness of 0.5 inches.

The exterior of the steel pipe shall be coated with a two component coal tar epoxy meeting the requirements of Sherwin-Williams Targuard or an approved equal, applied per the manufacturer's recommendations..

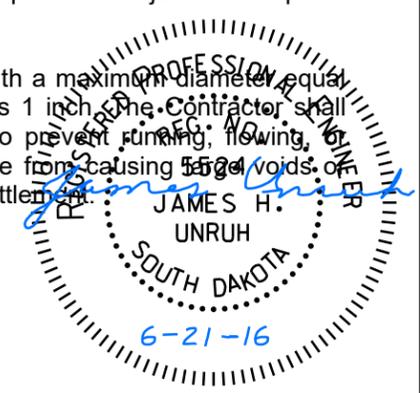
The pipe joints shall be welded by a certified welder in accordance with Section 410.3 D of the Specifications. After the welding has been completed, a two component coal tar epoxy meeting the requirements of Sherwin-Williams Targuard or an approved equal shall be applied in the field to cover the exposed area.

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

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

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

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



**BORE AND JACK STEEL PIPE (CONT.)**

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

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

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

Steel casing shall be installed horizontally through 56' to 94' +/- of embankment. The pipes will be placed through an approximate 5' to 25' +/- vertical depth of glacial till consisting of a mixture of materials ranging from clay to gravel. Large boulders are not anticipated to be encountered within the bore and jack envelope.

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

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

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

**STEEL PIPE TO RCP TRANSITION**

Steel Pipe to RCP Transitions are required for the pipe installation at the ends of the steel pipe sections that connect to concrete pipe. The length of the transitions is assumed to be six feet. The steel pipe used in the transition shall meet the same requirements, including pipe specifications, coal tar epoxy coating, and welding to adjoining steel pipe sections as the steel pipe used in the bore and jack installation.

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

All costs for the furnishing and installation of the two transitions shall be included in the contract unit price for "xx" Concrete/Steel Pipe Transition, Furnish" and "xx" Pipe Transition, Install" per each

**CONCRETE D-LOAD PIPE**

The 84" Class 4000D Reinforced Concrete Pipe located at Sta. 851+00 shall be in conformance with AASHTO Specification M242. Bedding shall be Class B.

**STORM SEWER**

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

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

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

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

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

Watertight joint seals shall conform to the following requirements:

1. Reinforced Concrete Pipe (Circular): Gasketed pipe shall conform to the requirements of ASTM C443 and the gasket shall be in conformance with Section 990 of the Specifications. Non-gasketed concrete pipe shall be sealed with a mastic joint seal conforming to the requirements of ASTM C990 and encased with a minimum 2' wide by 6" thick M6 concrete collar reinforced with 6x6 W2.9 x W2.9 wire mesh.
2. Reinforced Concrete Pipe (Arch): Gasketed pipe shall conform to the requirements of ASTM C443 and the gasket shall be in conformance with Section 990 of the Specifications. Non-gasketed concrete pipe joints shall be sealed with a hydrophilic flexible water stop seal and wrapped with a 1-foot wide strip of fabric above the cradle. The fabric shall conform to the requirements of Section 831 of the Specifications for Type A Drainage Fabric. The hydrophilic flexible water stop shall be from the list below.

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3. Drop Inlets, Manholes, and Junction Boxes: Joints shall be sealed with one of the following methods:
  - a. A flexible strip seal placed in the joints conforming to the requirements of ASTM C990 and the perimeter encased with a minimum 2' wide by 6" thick M6 concrete collar reinforced with 6x6 W2.9 x W2.9 wire mesh.
  - b. A hydrophilic flexible water stop seal placed in the joints and a 1-foot wide strip of fabric wrapped around the perimeter of the pipe. The fabric shall conform to the requirements of Section 831 of the Specifications for Type A Drainage Fabric. The hydrophilic flexible water stop shall be from the list below.
  - c. A self-adhesive external joint seal wrap. The seal wrap shall be from the list below.

Approved List of Self-adhesive Joint Wrap

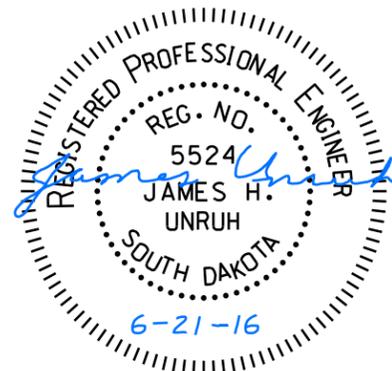
<u>Product</u>	<u>Manufacturer</u>
Mar Mac Seal Wrap	Mar Mac Construction Products McBee, SD 843-335-5814 <a href="http://www.marmac.com/">http://www.marmac.com/</a>
ConWrap CS-217	Concrete Sealants, Inc. Tipp City, OH 800-332-7325 <a href="http://conseal.com/">http://conseal.com/</a>

Approved List of Hydrophilic Flexible Water Stop Seal:

<u>Product</u>	<u>Manufacturer</u>
Waterstop RX	Cetco Hoffman Estates, IL 800-527-9949 <a href="http://www.cetco.com/">http://www.cetco.com/</a>
Conseal CS-231	Concrete Sealants, Inc. Tipp City, OH 800-332-7325 <a href="http://conseal.com/">http://conseal.com/</a>

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

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



**INCIDENTAL WORK, GRADING**

"Incidental Work, Grading" shall consist of the removal and disposal of existing culverts.

TABLE OF INCIDENTAL WORK, GRADING			
Station to	Station	L/R	Remarks
785+88	785+88	R	Take out 84" RCP Flared End
4+83	4+83	L/R	Take out 2.75'x4' - 82' CM Arch Pipe
4+90	4+90	L/R	Take out 2.75'x4' - 82' CM Arch Pipe
29+53	29+53	L/R	Take out 60" - 104' CM Pipe

**DROP INLETS**

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

The plan shown quantities of the drop inlet components such as Class M6 Concrete, Reinforcing Steel, Type B Frame and Grate Assembly, Precast Drop Inlet Collar, and Precast Concrete Type S Drop Inlet Lid will be the basis of payment for these items.

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

**ADJOINING DROP INLETS**

The 18" opening between the drop inlets represents a diameter measurement. For ease of construction, the 18" opening can also be the specified dimension constructed square. If the adjoining walls are poured separately, the joint between the two inlets at the opening shall be grouted. No additional payment shall be made for the work to construct the openings.

**TABLE OF CLASS B RIPRAP AND DRAINAGE FABRIC**

Station	L/R	Culvert Size	Riprap Size (ft)	Class B Riprap (ton)	Type B Drainage Fabric (SqYd)
820+12	100' L	48" round	30x16	74.7	84
826+01	93' L	30" round	30x16	74.7	84
843+00	224' L	30" round	20x12	37.3	48
856+60	218' R	18" & 24"	30x16	74.7	84
866+00	223' R	30" round	30x16	74.7	84
18+66	157' L	2-42" round	36x30	168.0	164
69+80	116' L	18" round	20x12	37.3	48
Total:				541.3	596

**TABLE OF CLASS A FIELDSTONE RIPRAP AND DRAINAGE FABRIC**

Station to Sta.	L/R	Riprap Size (ft)	Class A Riprap (ton)	Type B Drainage Fabric (SqYd)
840+90	841+60 222' R	70x41	491.1	432
843+40	844+10 225' R	70x41	491.1	432
845+90	846+60 230' R	70x41	491.1	432
848+40	849+10 236' R	70x41	491.1	432
850+36	851+13 240' R	77x41	540.2	472
853+90	854+60 240' R	70x41	491.1	432
850+90	854+00 varies L	310x29	1,025.5	1,719
Total:			4,021.2	4,351

**TYPE 1 DETECTABLE WARNINGS**

Detectable warnings shall be in compliance with the Americans with Disability Act regulations. The detectable warnings shall be installed according to the manufacturer's installation instructions.

A concrete thickness equal to the adjacent concrete sidewalk thickness and 2 inches of granular cushion material shall be placed below the Type 1 Detectable Warnings. When concrete is placed below the detectable warnings then the concrete thickness shall be transitioned at the rate of 1" per foot to match the adjacent concrete sidewalk thickness.

The detectable warnings shall be a brick red color for application in concrete curb ramps. Cast iron plates may be a natural patina (weathered steel). When Type 1 Detectable Warnings are specified, the Contractor shall furnish and install only one of the products listed in the Type 1 Detectable Warnings table.

Type 1 Detectable Warnings	
Product	Manufacturer
Detectable Warning Plate Cast Iron Plate	Neenah Foundry Company Neenah, WI 800-558-5075 <a href="http://www.neenahfoundry.com/">http://www.neenahfoundry.com/</a>
Detectable Warning Plate Cast Iron Plate	Deeter Foundry Lincoln, NE 800-234-7466 <a href="http://www.deeter.com/">http://www.deeter.com/</a>
Detectable Warning Plate Cast Iron Plate	East Jordan Iron Works, Inc. 301 Spring Street East Jordan, MI 49727 800-626-4653 <a href="http://www.eiww.com">http://www.eiww.com</a>
CAST-DWD Cast Iron Plate	Key 3 Casting (Northern Foundry) 555 West 25 <sup>th</sup> Street Hibbing, MN 55746 218-263-8871 <a href="http://www.armorcastprod.com/">http://www.armorcastprod.com/</a>

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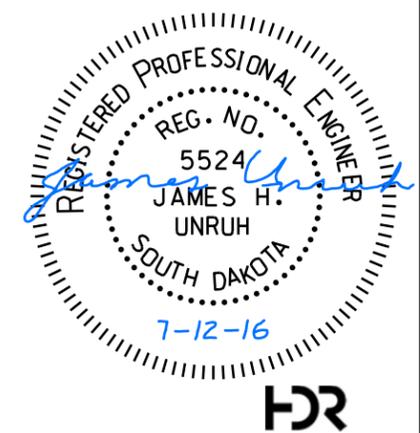
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**PVC PIPE AND WATER SERVICE AT STA. 800+50**

The Contractor shall install PVC pipe across Hwy 100 at Sta. 800+50 as shown on the plans. The PVC pipe shall be Schedule 80 White PVC pipe. All costs for the PVC pipe shall be included in the contract unit price per foot for "2" Rigid Conduit, Schedule 80" and "4" Rigid Conduit, Schedule 80". The PVC pipes shall be capped at the pipe ends and shall have markers installed at the pipe ends per the marker detail in City of Sioux Falls standard plate 950.14. Caps and markers shall be incidental to the contract unit price per foot for the conduit being installed.

- The 2" PVC pipe shall have electrical cable within it. See Section L for the electrical cable specifications and payment.
- The 4" PVC pipe shall have a water service pipe installed within it. See below for the water service pipe specifications and payment.

The Contractor shall install water service pipe within the proposed 4" PVC conduit being installed across Hwy 100 at Sta. 800+50. The water service pipe shall be 1.5" White PVC Pressure Pipe, SDR-21 (200 psi) as manufactured by Northern Pipe Products or approved equal. The pipe shall meet ASTM D-2241 specifications. All costs for the water service pipe shall be included in the contract unit price per each for "1.5" Water Service". The water service pipe shall be capped at the ends of the pipe to allow a connection to be made in the future. The caps shall be incidental to the contract unit price per each for 1.5" Water Service.



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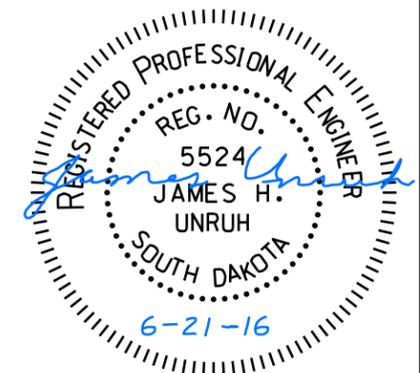
TABLE OF SUPERELEVATION

Station to	Station	Lanes	
787+09.87	829+80	Hwy100 SB	Normal Crown Section
829+80	830+90		Superelevation Transition
830+90	856+65		3,400' Radius Curve Left
			4% Superelevation Rate
			Point of Rotation at inside edge of lane
856+65	857+75	Hwy100 NB	Superelevation Transition
857+75	868+44		Normal Crown Section
868+44	869+94		Cross slope transition
869+94	872+50		1% cross slope through intersection
787+09.87	827+60		Normal Crown Section
827+60	830+90		Superelevation Transition
830+90	856+65		3,400' Radius Curve Left
			4% Superelevation Rate
			Point of Rotation at inside edge of lane
856+65	859+95		Superelevation Transition
859+95	868+44	Rice Street	Normal Crown Section
868+44	869+94		Slope Transition
869+94	872+50		1% cross slope through intersection
0+00	1+75		Normal Crown Section
1+75	3+65		Superelevation Transition
3+65	5+90		1,190' Radius Curve Left
			5.6% Superelevation Rate
			Point of Rotation at centerline
5+90	7+80		Superelevation Transition
7+80	9+70		Normal Crown Section
9+70	11+60		Superelevation Transition
11+60	21+60		1,190' Radius Curve Right
			5.6% Superelevation Rate
			Point of Rotation at centerline
21+60	23+75		Superelevation Transition
23+75	49+10	Normal Crown Section	
49+10	51+00	Superelevation Transition	
51+00	53+60	1,190' Radius Curve Right	
		5.6% Superelevation Rate	
		Point of Rotation at centerline	
53+60	55+50	Superelevation Transition	
55+50	56+50	Normal Crown Section	

See Section F Plans for superelevation details.

TABLE OF PAVEMENT, CURB AND GUTTER, AND SIDEWALK QUANTITIES

Roadway	Station to	Station	L/R	Concrete Curb and Gutter			PCC Fillet Section	Barrier Type Colored Median PCC Pavement			Concrete Sidewalk	Detectable Warning Panel
				Type F 610 Ft	Type F 66 Ft	Valley Gutter Ft	10" SqYd	6" SqYd	4" SqYd	6" SqFt	Type 1 SqFt	
Hwy100	787+43	839+69	L	5,219								
	788+05	870+40	L	8,327								
	788+05	870+40	R	8,257								
	787+53	870+56	R	8,398								
	839+87	840+11	L			24						
	840+33	871+26	L	3,076								
871+66	872+50	R	109									
Rice Street	6+00	12+50	R		648							
	23+00	28+64	R		565							
Hwy100/Rice	Curb Island	NW		100				33				
	Curb Island	SE		100				24				
Hwy100	788+05	792+92	R						164			
	792+92	865+50	L						1,612			
	792+92	865+50	R						1,615			
	865+50	870+40	L						167			
	839+69	839+87	L				17					
	840+16	840+33	L				22					
		SE Corner Maple/Hwy 100								149	20	
		NE Corner Maple/Hwy 100								160	20	
		SE Corner Rice/Hwy 100								171	20	
		SE Island Rice/Hwy 100								80	24	
	NE Corner Rice/Hwy 100								144	20		
<b>Totals:</b>				33,586	1,213	24	39	57	3,558	704	104	



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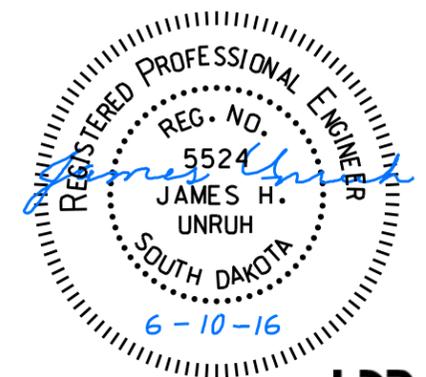
Plotting Date: 6/10/2016

**TABLE OF CONSTRUCTION STAKING**

(See Special Provision for Contractor Staking specifications)

Roadway or Description	Begin Station	End Station	Number of Lanes	Length (Ft)	Grade Staking			Staking <sup>2</sup> Quantity (Mile)	Final Cross Sections (Mile)	Miscellaneous Staking Quantity (Mile)	Slope Staking Quantity (Mile)	Structure Staking Quantity (Each)
					Length (Mile)	Lane Factor	Sets of Stakes <sup>1</sup>					
SB left turn lanes	787+10	792+49	3	539	0.102	1.5	2	0.306				
SB transition 5 to 3 lanes	792+49	793+70	5	121	0.023	2.5	2	0.115				
SB 3 lanes to Rice Street	793+70	872+50	5	7,880	1.492	2.5	2	7.462				
NB 3 lanes to Rice Street turn lanes	787+10	864+72	3	7,762	1.470	1.5	2	4.410				
NB transition 3 to 5 lanes	864+72	865+91	4	119	0.023	2	2	0.090				
NB transition 5 to 6 lanes	865+91	867+79	4	188	0.036	2	2	0.142				
NB left turn lanes to Rice Street	867+79	872+50	3	471	0.089	1.5	2	0.268				
Hwy 100 - entire length	787+10	872+50		8,540	1.617				1.617	1.617	1.617	
Rice Street	0+00	24+23	2	2,423	0.459	1	1	0.459				
Rice Street transition 2 to 6 lanes	24+23	29+72	6	549	0.104	3	1	0.312				
Rice Street	29+72	32+50	6	278	0.053	3	1	0.158				
Rice Street	33+60	36+33	6	273	0.052	3	1	0.155				
Rice Street transition 6 to 2 lanes	36+33	41+82	6	549	0.104	3	1	0.312				
Rice Street	41+82	56+50	2	1,468	0.278	1	1	0.278				
Rice Street - entire length	0+00	56+50		5,650	1.070				1.070	1.070	1.070	
Rice Street Temp Widening - Right Side	-2+60	7+74	2	1,034	0.196	1	1	0.196				
Rice Street Temp Widening - Left Side	14+25	21+74	2	749	0.142	1	1	0.142				
Rice Street Temp Widening - Right Side	45+23	59+25	2	1,402	0.266	1	1	0.266				
12'x10' box culvert	858+00											1
Totals:								15.070	2.688	2.688	2.688	1

1 = Blue Top Stakes Only (Asphalt Concrete Pavement)  
 2 = Blue Top and Paving Hub Stakes (PCC Pavement)



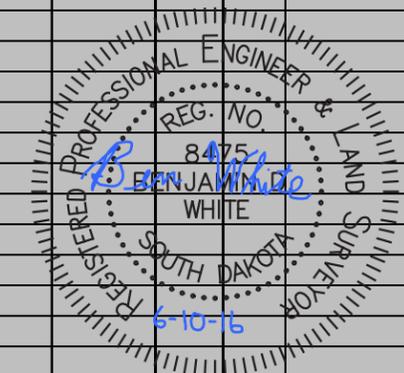
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TABLE OF REINFORCED CONCRETE PIPE

Station Offset (L/R)	Circular														Arch				Pipe Undercut (CuYd)	Controlled Density Fill (CuYd)									
	Circular											Flared End			Safety End		Sec End				Arch								
	18" Cl 2 (Ft)	24" Cl 2 (Ft)	24" Cl 5 (Ft)	30" Cl 2 (Ft)	36" Cl 2 (Ft)	42" Cl 2 (Ft)	42" Cl 5 (Ft)	48" Cl 2 (Ft)	60" Cl 5 (Ft)	84" Cl 2 (Ft)	84" Cl 4000 D (Ft)	108" Cl 4 (Ft)	18" (EA)	24" (EA)	30" (EA)	36" (EA)	42" (EA)	48" (EA)			60" (EA)	84" (EA)	18" (EA)	24" (EA)	108" (EA)	42" Cl 2 (Ft)	72" Cl. 2 (Ft)	Sloped End 42" (EA)	Flared End 72" (EA)
787+50.00-53.67' L TO 788+06.90-8.69' L	72																												
787+65.20-53.84' R TO 787+78.00-53.67' R	14																												
788+89.58-104.00' L TO 787+20.80-102.27' R																								258			1		358
787+82.00-53.67' R TO 789+98.00-53.67' R	216																												
787+12.10-107.10' R TO 786+98.30-108.80' R											14																		6
787+18.80-109.30' R TO 787+21.70-119.40' R						12											1												4
790+00 - 52.67' L TO 8.67' R	62																												
790+00.00 - 10.67' R TO 13.33' R	4																												
790+00.00 - 15.33' R TO 52.17' R	38																												
790+02.00-53.67' R TO 792+43.00-53.67' R	242																												
792+45.00 - 53.67' L TO 8.67' R	62																												
792+45.00 - 10.67' R TO 13.33' R	4																												
792+45.00 - 15.33' R TO 53.67' R	38																												
792+46.50 TO 794+98.50 - 53.67' R	252																												
795+00.00 - 52.67' L TO 15.33' L	38																												
795+00.00 - 13.33' L TO 13.33' R	28																												
795+00.00 - 15.33' R TO 52.67' R	38																												
798+75.00 - 52.67' L TO 15.33' L	38																												
798+75.00 - 13.33' L TO 13.33' R	28																												
798+75.00 - 15.33' R TO 52.67' R	38																												
798+80.60 TO 800+98.00 - 53.67' R	218																												
801+00.00 - 52.67' L TO 15.33' L	38																												
801+00.00 - 13.33' L TO 13.33' R	28																												
801+00.00 - 15.33' R TO 52.17' R	38																												
801+02.00 TO 802+24.20 - 53.67' R		122																											29
802+26.00-55.67' R TO 124.70' R		64											1																15
802+28.20 TO 803+98.00 - 53.67' R																													45
804+00.00 - 52.67' L TO 15.33' L	38																												
804+00.00 - 13.33' L TO 13.33' R	28																												
804+00.00 - 15.33' R TO 51.67' R	38																												
804+07.00 TO 806+98.0 - 53.67' R																													78
807+00.00 - 52.67' L TO 15.33' L	38																												
807+00.00 - 13.33' L TO 13.33' R	28																												
807+00.00 - 15.33' R TO 52.17' R	38																												
807+02.00 TO 809+94.50 - 57.63' R																													77
810+00.00 - 52.67' L TO 15.33' L	38																												
810+00.00 - 13.33' L TO 13.33' R	28																												
810+00.00 - 15.33' R TO 54.13' R	40																												
810+00.00 - 61.13' R TO 185.80' R	120												1																
810+05.50 TO 812+94.50 - 57.63' R																													88
813+00.00 - 52.67' L TO 15.33' L	38																												
813+00.00 - 13.33' L TO 13.33' R	28																												
813+00.00 - 15.33' R TO 54.13' R	40																												
813+05.50 TO 815+94.50 - 57.63' R																													89
816+00.00 - 52.67' L TO 15.33' L	38																												
816+00.00 - 13.33' L TO 13.33' R	28																												
816+00.00 - 15.33' R TO 54.13' R	40																												
816+05.00 TO 818+94.50 - 57.63' R																													89
819+00.00 - 52.67' L TO 15.33' L	38																												

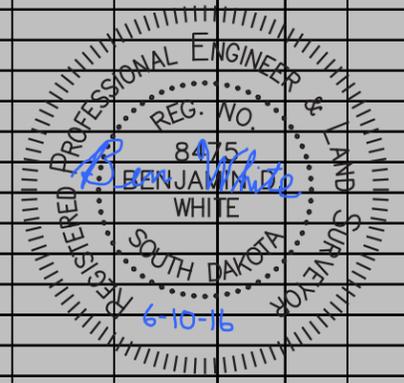


FOR BIDDING PURPOSES ONLY

Plotting Date: 6/10/2016

TABLE OF REINFORCED CONCRETE PIPE (CONTINUED)

Station Offset (L/R)	Circular														Arch				Pipe Undercut (CuYd)	Controlled Density Fill (CuYd)						
	Circular													Arch												
	18"	24"	24"	30"	36"	42"	42"	48"	60"	84"	84"	108"	Flared End				Safety End				Sec End	42"	72"	Sloped End	Flared End	
CI 2	CI 2	CI 5	CI 2	CI 2	CI 2	CI 5	CI 2	CI 5	CI 2	CI 4000 D	CI 4	18"	24"	30"	36"	42"	48"	60"	84"	18"	24"	108"	CI 2	CI. 2	42"	72"
(Ft)	(Ft)	(Ft)	(Ft)	(Ft)	(Ft)	(Ft)	(Ft)	(Ft)	(Ft)	(Ft)	(Ft)	(EA)	(EA)	(EA)	(EA)	(EA)	(EA)	(EA)	(EA)	(EA)	(EA)	(EA)	(Ft)	(Ft)	(EA)	(EA)
819+00.00 - 13.33' L TO 13.33' R	(28)																									
819+00.00 - 15.33' R TO 54.13' R	40																									
819+05.50-53.67' R TO 819+55.80-59.42' R						50																				15
819+44.70-103.54' R TO 819+58.34-63.27' R					36										1											10
819+60.00-99.65' L TO 820+11.78-57.32' R									158								1									52
821+50.00 - 52.67' L TO 15.33' L	38																									
821+50.00 - 13.33' L TO 13.33' R	28																									
821+50.00 - 15.33' R TO 52.67' R	38																									
821+50.00 TO 823+98.50 - 53.67' R	248																									
824+00.00 - 52.67' L TO 15.33' L	38																									
824+00.00 - 13.33' L TO 13.33' R	28																									
824+00.00 - 15.33' R TO 52.67' R	38																									
824+01.50 TO 825+93.00 - 53.67' R	192																									
826+00.00 - 52.67' L to 15.33' L	38																									
826+00.00 - 13.33' L to 13.33' R	28																									
826+00.00 - 15.33' R to 52.17' R	38																									
826+02.00-53.67' R to 826+43.90-59.30' R		44																								11
826+46.90-57.60' R to 827+01.10-92.50' L				154											1											40
826+45.60-62.40' R to 826+17.40-139.50' R		78													1											19
826+48.70-60.70' R to 827+28.50-53.67' R	80																									
830+50.00 - 52.67' L to 15.33' L	38																									
830+50.00 - 13.33' L to 13.33' R	28																									
830+50.00 - 15.33' R to 52.67' R	38																									
830+51.50 to 832+98.50 - 53.67' L	244																									
833+00.00 - 52.67' L to 15.33' L	38																									
833+00.00 - 13.33' L to 13.33' R	28																									
833+00.00 - 15.33' R to 52.67' R	38																									
833+01.50 to 835+98.00 - 53.67' L	292																									
836+00.00 - 52.17' L to 15.33' L	38																									
836+00.00 - 13.33' L to 13.33' R	28																									
836+00.00 - 15.33' R to 52.67' R	38																									
836+02.00 to 838+98.00 - 53.67' L		292																								70
839+00.00 - 52.17' L to 15.33' L	38																									
839+00.00 - 13.33' L to 13.33' R	28																									
839+00.00 - 15.33' R to 52.67' R	38																									
839+02.00 to 841+98.00 - 53.67' L		292																								70
842+00.00 - 51.67' L TO 15.33' L	38																									
842+00.00 - 13.33' L TO 13.33' R	28																									
842+00.00 - 15.33' R TO 52.67' R	38																									
842+02.00-53.67' L to 842+97.00-60.00' L				94																						25
843+00.00 - 63.10' L to 67.10' L				4																						1
845+30.00 - 52.67' L to 15.33' L	38																									
845+30.00 - 13.33' L to 13.33' R	28																									
845+30.00 - 15.33' R to 52.67' R	38																									
845+31.50 to 847+98.50 - 53.67' L	264																									
848+00.00 - 52.67' L to 15.33' L	38																									
848+00.00 - 13.33' L to 13.33' R	28																									
848+00.00 - 15.33' R to 52.67' R	38																									
848+01.50 to 850+78.50 - 53.67' L	274																									
850+80.00 - 52.67' L to 15.33' L		38																								9
850+80.00 - 13.33' L to 13.33' R		28																								7



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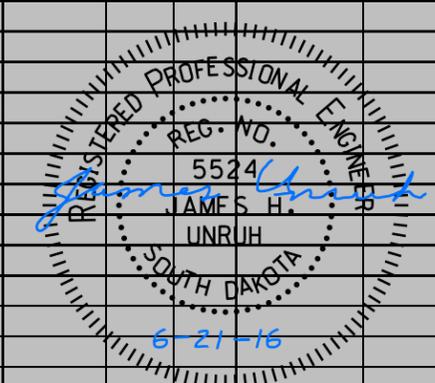
Rev 6/21/2016 JHU

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0100(105)419	B15	B108

Plotting Date: 6/21/2016

TABLE OF REINFORCED CONCRETE PIPE (CONTINUED)

Station Offset (L/R)	Circular																Arch				Pipe Undercut (CuYd)	Controlled Density Fill (CuYd)								
	Circular												Flared End		Safety End		Sec End		Arch											
	18" Cl 2 (Ft)	24" Cl 2 (Ft)	24" Cl 5 (Ft)	30" Cl 2 (Ft)	36" Cl 2 (Ft)	42" Cl 2 (Ft)	42" Cl 5 (Ft)	48" Cl 2 (Ft)	60" Cl 5 (Ft)	84" Cl 2 (Ft)	84" Cl 4000 D (Ft)	108" Cl 4 (Ft)	18" (EA)	24" (EA)	30" (EA)	36" (EA)	42" (EA)	48" (EA)	60" (EA)	84" (EA)			18" (EA)	24" (EA)	108" (EA)	42" Cl 2 (Ft)	72" Cl. 2 (Ft)	Sloped End 42" (EA)	Flared End 72" (EA)	
850+80.00 - 15.33' R to 52.67' R		38																											9	
850+80.00 - 54.67' R to 58.67' R		4																											1	
851+00.00 - 198.10' L to 224.50' R											404										2								554	
856+60.00 - 52.67' L to 15.33' L	38																													
856+60.00 - 13.33' L to 13.33' R	28																													
856+60.00 - 15.33' R to 52.67' R	38																													
856+60.00 - 54.67' R to 58.67' R	4																													
857+63.53-125.35' L to 856+65.40-213.27' R			352										2																85	
858+81.50 to 859+98.50 - 14.33' R	118																													
860+00.00 - 52.67' L to 15.33' L	38																													
860+00.00 - 13.33' L to 13.33' R	28																													
860+00.00 - 15.33' R to 52.67' R	38																													
860+01.50 to 862+98.00 - 53.67' R	298																													
863+00.00 - 52.67' L to 15.33' L	38																													
863+00.00 - 13.33' L to 13.33' R	28																													
863+00.00 - 15.33' R to 52.17' R	38																													
863+02.00 to 865+98.00 - 53.67' R		296																											71	
866+00.00 - 82.00' L to 54.67' L	38											1																		
866+00.00 - 52.67' L to 15.33' L	38																													
866+00.00 - 13.33' L to 10.67' L	4																													
866+00.00 - 8.67' L to 52.17' R	62																													
866+00.00 - 55.17' R to 61.20' R				8																									2	
866+35.80-97.10' L to 866+70.20-123.00' R		212											2																51	
868+30.00 - 52.67' L to 15.33' L	38																													
868+30.00 - 13.33' L to 10.67' L	4																													
868+30.00 - 8.67' L to 64.17' R	74																													
868+35.50 to 869+98.50 - 65.67' R	164																													
870+50.00-52.67' L to 870+30.00-15.33' L	44																													
870+30.00 - 13.33' L to 10.67' L	4																													
870+30.00-8.67' L to 870+00.00-64.67' R	80																													
870+00.00-66.67' R to 870+32.60-138.44' R		80												1															19	
13+50 - 70' L to 13+50 - 54' R	112												2																	
18+54 - 142' L to 40' L								92										1											28	
18+78 - 142' L to 40' L								92										1											28	
21+14 - 153' R to 23+27 - 26' R	232												1																	
27+00 - 222' L to 101' L	110												2																	
28+80 - 75' L to 61' R		122												1															29	
29+58 - 132' L to 29+79 - 122' R											240								1										89	
38+30 - 111' L to 38+85 - 99' R												186																	303	
41+15 - 54' L to 47' R		90												1															22	
46+75.00 -194' L to 48+08.00 - 72' R (8 pipes)																								2,240		16		623	174	
52+50 - 53' L to 67' R	54												1																	
47+58 - 81' L to 47+74 - 88' L	12												1																	
92+53 - 27' L to 24' R		38												2															9	
Totals	6,722	1,838	352	1,018	36	930	184	158	240	14	404	186	9	11	1	1	3	1	1	2	1	2	2	2,240	258	16	1	3,130	174	



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STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0100(105)419	B16	B108

Plotting Date: 6/21/2016

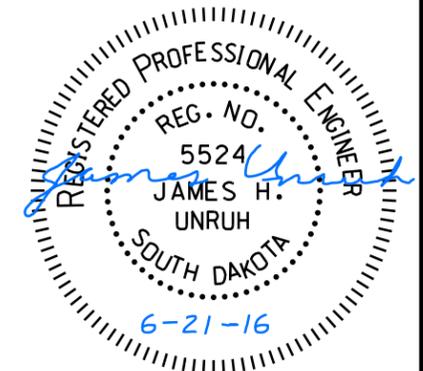
Rev 6/21/2016 JHU

TABLE OF CORRUGATED METAL PIPE

Station Offset (L/R)	Circular												Arch			
	18"	24"	30"	Flared End				Safety End	Elbow			CMP to RCP Transition			42"	Safety End
	16 Ga	16 Ga	16 Ga	18"	24"	30"	42"	18"	18"	24"	30"	18"	24"	30"	14 Ga	42"
	(Ft)	(Ft)	(Ft)	(EA)	(EA)	(EA)	(EA)	(EA)	(EA)	(EA)	(EA)	(EA)	(EA)	(EA)	(Ft)	(EA)
787+17 - 513' R TO 561' R	40							2								
843+00.00 - 69.10' L TO 214.30' L			140			1					2			1		
850+80.00 - 60.67' R TO 224.60' R		160			1					2			1			
856+60.00 - 60.67' R TO 217.80' R	152			1					2			1				
866+00.00 - 63.20' R TO 223.00' R			150			1					2			1		
4+87 - 28' L TO 4+86 - 22' L (Rice)															6	1
4+93 - 35' L to 4+92 - 21' L (Rice)															6	1
29+99 - 130' R to 30+34 - 115' R (Rice)	36			1					1							
30+36 - 114' R to 31+07 - 85' R (Rice)	74			1												
18+54 - 134' R							1									
18+78 - 134' R							1									
69+80 - 106' L to 28' R (Timberline)	126			2					2							
Totals	428	160	290	5	1	2	2	2	5	2	4	1	1	2	12	2

TABLE OF STEEL PIPE

Station Offset (L/R)	Circular		Bore and Jack		Concrete/Steel Pipe Transition	
	18"	42"	18"	42"	18"	42"
	(Ft)	(Ft)	(Ft)	(Ft)	(EA)	(EA)
18+54 - 40' L to 134' R		174		174		1
18+78 - 40' L to 134' R		174		174		1
52+50 - 53' L to 67' R	56		56		2	
Totals	56	348	56	348	2	2

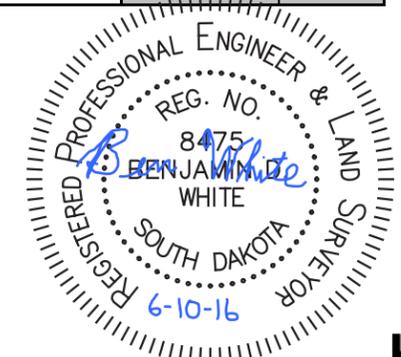


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Plotting Date: 6/10/2016

TABLE OF STORM SEWER DROP INLETS AND JUNCTION BOXES									
Station	Offset	Inlet Type	Class M6 Concrete (CuYd)	Reinforcing Steel (Lb)	Frame and Grate				
					Type B Frame and Grate Assembly (Each)	Precast Drop Inlet Collar (Each)	Type A7 Manhole Frame and Lid (Each)	Type S Inlet Lid (Each)	
787+16.53	104.84	R Custom JB	See Section E						
787+50.00	53.67	L DOT 3x4 Type B	2.34	334.1	1	1			
787+80.00	53.67	R DOT 3x4 Type B	2.99	420.0	1	1			
790+00.00	53.67	R DOT 3x4 Type B	1.97	302.7	1	1			
790+00.00	53.67	L DOT 2x3 Type B	0.90	174.0	1	1			
790+00.00	9.67	R DOT 2x3 Type B	1.32	235.4	1	1			
790+00.00	14.33	R DOT 2x3 Type B	1.33	236.3	1	1			
792+45.00	53.67	L DOT 2x3 Type B	0.90	174.0	1	1			
792+45.00	9.67	R DOT 2x3 Type B	1.29	231.4	1	1			
792+45.00	14.33	R DOT 2x3 Type B	1.30	232.2	1	1			
792+45.00	53.67	R DOT 2x3 Type B	1.14	219.2	1	1			
795+00.00	53.67	L DOT 2x3 Type B	0.90	174.0	1	1			
795+00.00	14.33	L DOT 2x3 Type B	1.09	205.6	1	1			
795+00.00	14.33	R DOT 2x3 Type B	1.17	215.4	1	1			
795+00.00	53.67	R DOT 2x3 Type B	1.09	205.3	1	1			
798+75.00	53.67	L DOT 2x3 Type B	0.91	174.6	1	1			
798+75.00	14.33	L DOT 2x3 Type B	1.10	206.5	1	1			
798+75.00	14.33	R DOT 2x3 Type B	1.16	214.3	1	1			
798+75.00	53.67	R DOT 2x3 Type B	1.10	205.9	1	1			
798+79.00	53.67	R DOT 2x3 Type B	1.10	205.9	1	1			
801+00.00	53.67	L DOT 2x3 Type B	0.91	174.3	1	1			
801+00.00	14.33	L DOT 2x3 Type B	1.10	205.9	1	1			
801+00.00	14.33	R DOT 2x3 Type B	1.15	213.4	1	1			
801+00.00	53.67	R DOT 3x4 Type B	1.79	285.5	1	1			
802+26.20	53.67	R DOT 4x4 Type B	2.39	409.5	1	1			
804+00.00	53.67	L DOT 2x3 Type B	0.91	174.3	1	1			
804+00.00	14.33	L DOT 2x3 Type B	1.09	205.3	1	1			
804+00.00	14.33	R DOT 2x3 Type B	1.15	212.8	1	1			
804+00.00	53.67	R DOT 4x4 Type B	2.38	409.1	1	1			
804+05.00	53.67	R DOT 4x4 Type B	2.43	409.1	1	1			
807+00.00	53.67	L DOT 2x3 Type B	0.91	174.3	1	1			
807+00.00	14.33	L DOT 2x3 Type B	1.08	204.4	1	1			
807+00.00	14.33	R DOT 2x3 Type B	1.14	212.0	1	1			
807+00.00	53.67	R DOT 4x4 Type B	2.38	409.1	1	1			
810+00.00	53.67	L DOT 2x3 Type B	0.85	174.3	1	1			
810+04.00	53.67	L DOT 2x3 Type B	0.91	174.3	1	1			
810+00.00	14.33	L DOT 2x3 Type B	1.08	203.8	1	1			
810+00.00	14.33	R DOT 2x3 Type B	1.14	211.4	1	1			
810+00.00	57.63	R DOT 7x11 Type S	8.30	2196.0				1	
813+00.00	53.67	L DOT 2x3 Type B	0.85	174.3	1	1			
813+04.00	53.67	L DOT 2x3 Type B	0.91	174.3	1	1			
813+00.00	14.33	L DOT 2x3 Type B	1.10	205.9	1	1			
813+00.00	14.33	R DOT 2x3 Type B	1.16	213.7	1	1			
813+00.00	57.63	R DOT 7x11 Type S	7.84	2129.7				1	

TABLE OF STORM SEWER DROP INLETS AND JUNCTION BOXES								
Station	Offset	Inlet Type	Class M6 Concrete (CuYd)	Reinforcing Steel (Lb)	Frame and Grate			
					Type B Frame and Grate Assembly (Each)	Precast Drop Inlet Collar (Each)	Type A7 Manhole Frame and Lid (Each)	Type S Inlet Lid (Each)
816+00.00	53.67	L DOT 2x3 Type B	0.85	174.3	1	1		
816+04.00	53.67	L DOT 2x3 Type B	0.91	174.3	1	1		
816+00.00	14.33	L DOT 2x3 Type B	1.10	205.9	1	1		
816+00.00	14.33	R DOT 2x3 Type B	1.15	206.5	1	1		
816+00.00	57.63	R DOT 7x11 Type S	7.47	2063.4				1
819+00.00	53.67	L DOT 2x3 Type B	0.91	174.3	1	1		
819+00.00	14.33	L DOT 2x3 Type B	1.06	201.8	1	1		
819+00.00	14.33	R DOT 2x3 Type B	1.12	209.6	1	1		
819+00.00	57.63	R DOT 7x11 Type S	7.50	2067.8				1
819+58.19	60.30	R DOT 5x5 JB	4.78	943.8			1	
821+50.00	53.67	L DOT 2x3 Type B	0.90	173.4	1	1		
821+50.00	14.33	L DOT 2x3 Type B	1.09	205.0	1	1		
821+50.00	14.33	R DOT 2x3 Type B	1.15	212.8	1	1		
821+50.00	53.67	R DOT 2x3 Type B	1.09	204.7	1	1		
824+00.00	53.67	L DOT 2x3 Type B	0.90	174.0	1	1		
824+00.00	14.33	L DOT 2x3 Type B	1.09	205.6	1	1		
824+00.00	14.33	R DOT 2x3 Type B	1.15	213.4	1	1		
824+00.00	53.67	R DOT 2x3 Type B	1.04	205.3	1	1		
825+95.00	53.67	R DOT 3x4 Type B	1.77	282.6	1	1		
826+00.00	53.67	L DOT 2x3 Type B	0.90	173.1	1	1		
826+00.00	14.33	L DOT 2x3 Type B	1.09	205.0	1	1		
826+00.00	14.33	R DOT 2x3 Type B	1.15	212.5	1	1		
826+00.00	53.67	R DOT 3x4 Type B	1.73	282.6	1	1		
826+46.25	60.00	R DOT 5x5 JB	4.14	777.4			1	
827+30.00	53.67	R DOT 2x3 Type B	0.90	173.1	1	1		
830+50.00	53.67	L DOT 2x3 Type B	0.85	174.0	1	1		
830+50.00	14.33	L DOT 2x3 Type B	1.00	194.0	1	1		
830+50.00	14.33	R DOT 2x3 Type B	1.00	194.0	1	1		
830+50.00	53.67	R DOT 2x3 Type B	23.11	3071.9	1	1		
833+00.00	53.67	L DOT 2x3 Type B	0.80	174.0	1	1		
833+00.00	14.33	L DOT 2x3 Type B	0.93	184.1	1	1		
833+00.00	14.33	R DOT 2x3 Type B	0.87	176.3	1	1		
833+00.00	53.67	R DOT 2x3 Type B	1.16	207.0	1	1		
836+00.00	53.67	L DOT 3x4 Type B	1.57	258.8	1	1		
836+00.00	14.33	L DOT 2x3 Type B	1.17	215.4	1	1		
836+00.00	14.33	R DOT 3x4 Type B	1.58	248.6	1	1		
836+00.00	53.67	R DOT 2x3 Type B	1.16	207.3	1	1		
839+00.00	53.67	L DOT 3x4 Type B	1.61	267.6	1	1		
839+00.00	14.33	L DOT 2x3 Type B	0.95	187.0	1	1		
839+00.00	14.33	R DOT 2x3 Type B	0.89	179.2	1	1		
839+00.00	53.67	R DOT 2x3 Type B	1.18	210.2	1	1		
842+00.00	53.67	L DOT 4x4 Type B	2.10	365.9	1	1		



Plotting Date: 6/10/2016

TABLE OF STORM SEWER DROP INLETS AND JUNCTION BOXES								
Station	Offset	Inlet Type	Class M6 Concrete (CuYd)	Reinforcing Steel (Lb)	Frame and Grate			
					Type B Frame and Grate Assembly (Each)	Precast Drop Inlet Collar (Each)	Type A7 Manhole Frame and Lid (Each)	Type S Inlet Lid (Each)
842+00.00	14.33	L	DOT 2x3 Type B	0.95	187.0	1	1	
842+00.00	14.33	R	DOT 2x3 Type B	0.89	179.2	1	1	
842+00.00	53.67	R	DOT 2x3 Type B	1.18	210.2	1	1	
843+00.00	60.00	L	DOT 5x5 JB	4.54	824.5			1
845+30.00	53.67	L	DOT 2x3 Type B	0.85	174.0	1	1	
845+30.00	14.33	L	DOT 2x3 Type B	1.01	194.6	1	1	
845+30.00	14.33	R	DOT 2x3 Type B	0.87	176.3	1	1	
845+30.00	53.67	R	DOT 2x3 Type B	1.08	196.3	1	1	
848+00.00	53.67	L	DOT 2x3 Type B	0.80	174.0	1	1	
848+00.00	14.33	L	DOT 2x3 Type B	1.00	194.0	1	1	
848+00.00	14.33	R	DOT 2x3 Type B	0.87	176.3	1	1	
848+00.00	53.67	R	DOT 2x3 Type B	1.09	198.6	1	1	
850+80.00	53.67	L	DOT 2x3 Type B	0.78	169.7	1	1	
850+80.00	14.33	L	DOT 2x3 Type B	1.22	232.5	1	1	
850+80.00	14.33	R	DOT 2x3 Type B	1.22	231.7	1	1	
850+80.00	53.67	R	DOT 2x3 Type B	1.73	298.6	1	1	
856+60.00	53.67	L	DOT 2x3 Type B	0.94	178.1	1	1	
856+60.00	14.33	L	DOT 2x3 Type B	1.28	230.5	1	1	
856+60.00	14.33	R	DOT 2x3 Type B	1.35	239.5	1	1	
856+60.00	53.67	R	DOT 2x3 Type B	1.75	290.8	1	1	
858+80.00	14.33	R	DOT 2x3 Type B	1.35	232.2	1	1	
860+00.00	53.67	L	DOT 2x3 Type B	0.93	176.9	1	1	
860+00.00	14.33	L	DOT 2x3 Type B	1.12	208.5	1	1	
860+00.00	14.33	R	DOT 2x3 Type B	1.12	216.3	1	1	
860+00.00	53.67	R	DOT 2x3 Type B	1.11	208.2	1	1	
863+00.00	53.67	L	DOT 2x3 Type B	0.91	175.0	1	1	
863+00.00	14.33	L	DOT 2x3 Type B	1.09	205.6	1	1	
863+00.00	14.33	R	DOT 2x3 Type B	1.17	215.4	1	1	
863+00.00	53.67	R	DOT 3x4 Type B	1.94	303.4	1	1	
866+00.00	53.67	L	DOT 2x3 Type B	1.16	213.7	1	1	
866+00.00	14.33	L	DOT 2x3 Type B	1.41	247.3	1	1	
866+00.00	9.67	L	DOT 2x3 Type B	1.40	245.3	1	1	
866+00.00	53.67	R	DOT 3x4 Type B	2.27	354.2	1	1	
868+30.00	53.67	L	DOT 2x3 Type B	0.93	177.8	1	1	
868+30.00	14.33	L	DOT 2x3 Type B	1.12	209.3	1	1	
868+30.00	9.67	L	DOT 2x3 Type B	1.13	210.2	1	1	
868+30.00	65.67	R	DOT 2x3 Type B	0.97	189.6	1	1	
868+34.00	65.67	R	DOT 2x3 Type B	0.97	189.6	1	1	
870+00.00	64.67	R	DOT 3x4 Type B	2.26	342.9	1	1	
870+30.00	14.33	L	DOT 2x3 Type B	1.13	210.2	1	1	
870+30.00	9.67	L	DOT 2x3 Type B	1.14	211.1	1	1	
870+50.00	53.67	L	DOT 2x3 Type B	0.93	177.8	1	1	
23+30	24.00	R	DOT 4x11 Type S	3.59	625.6			1
Total :			215.40	40,863.0	120	120	3	5

**FENCING**

Post type and sequence: Right-of-way fence shall be constructed using alternate wood and steel posts.

Gates: Final gate locations will be determined by the Engineer in consultation with landowner and/or tenants. There is no bid item for wire gates; they are incidental to the right-of-way fence bid item.

Fence locations and post panels: Final locations will be determined by the Engineer in consultation with landowner and/or tenants.

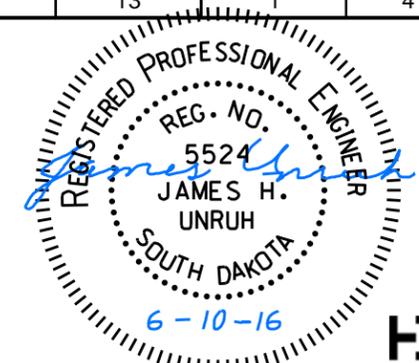
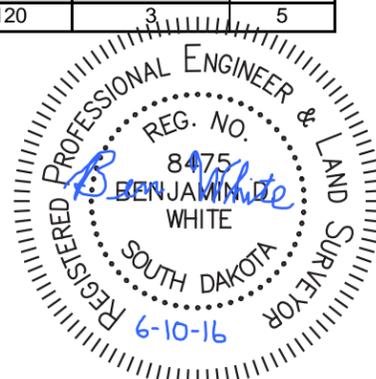
**BRACE PANELS FOR ROW FENCE**

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 shall be attached to each wood post utilizing two 5/16" x 3" lag screws. Holes of appropriate diameter, based on wood post condition, shall be drilled before placement of lag screws. The following are contacts regarding the E-Z Brace:

Roger Papka  
E-Z Brace  
1160 Karen St.  
Watertown, SD 57201  
605-881-6142

Dennis Mack  
E-Z Brace  
108 18<sup>th</sup> St. NE  
Watertown, SD 57201  
605-881-4990

TABLE OF FENCE QUANTITIES									
Station to	Station	L/R	Remove Fence Ft	Right-of-Way Fence		Post Panels		Gates	
				Type 2 Ft	Type 4 Ft	2 post panel Each	3 post panel Each	24' barbed wire gate Each	30' barbed wire gate Each
Hwy100									
787+31 536' R (along Maple St)			40	40		2		1	
787+26	840+47	L		5,638		29	5		
800+10	817+20	L		1,845		20			2
787+25	839+96	R		5,746		36	6		
840+47	870+46	L			3,237	29	2		1
839+96	869+37	R			3,790	34			
Rice Street									
23+33	31+99	R			884	8			
35+25	55+42	R			2,011	13			1
23+33	45+51	L/R	2,593						
28+61	28+16	L/R	189						
27+07	29+12	L	208						
<b>Total:</b>			3,030	13,269	9,922	171	13	1	4



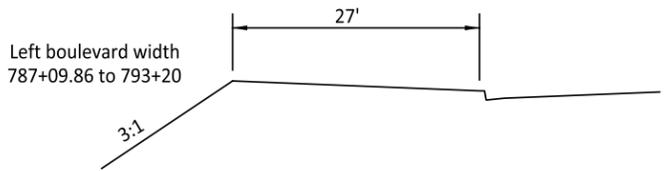
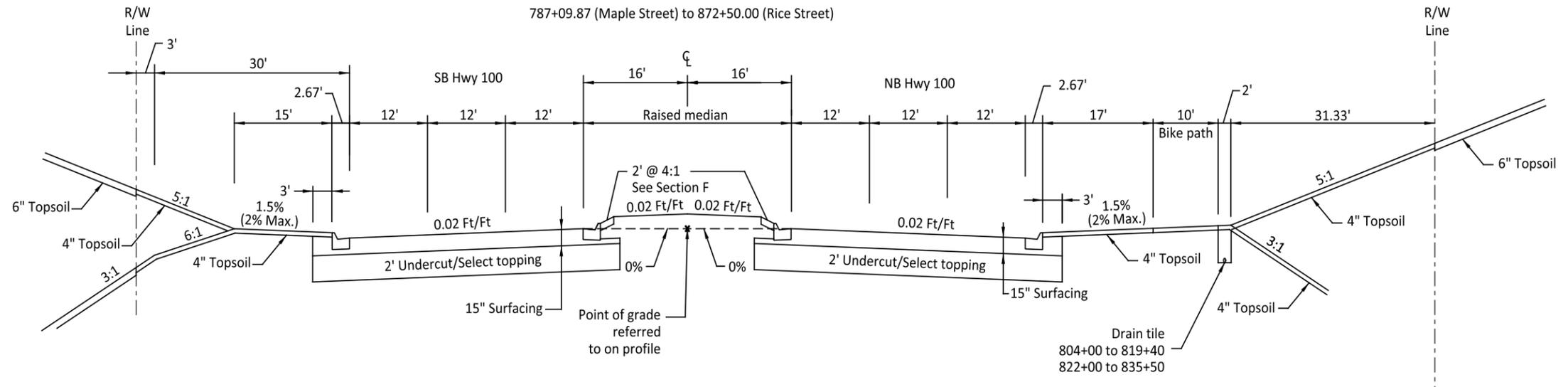
# Typical Grading Sections

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0100(105)419	B19	B108

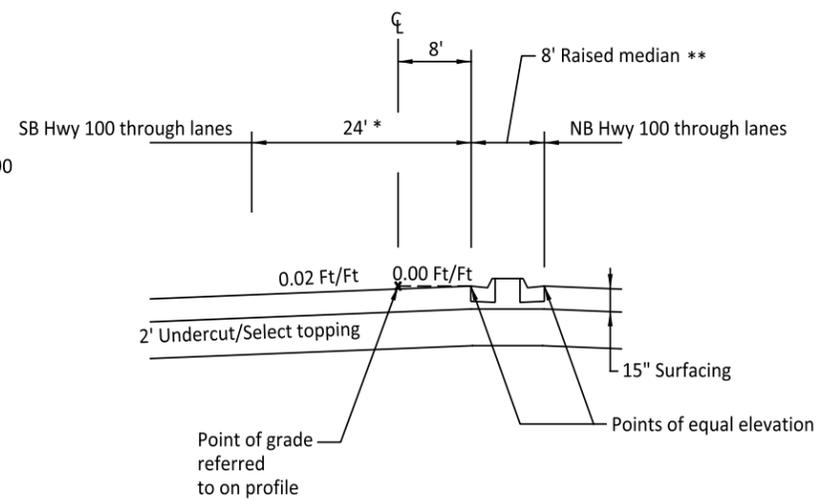
FILE: B19-B22 Typicals.dgn  
PLOTING DATE: 06-10-2016

REV DATE:  
INITIAL:



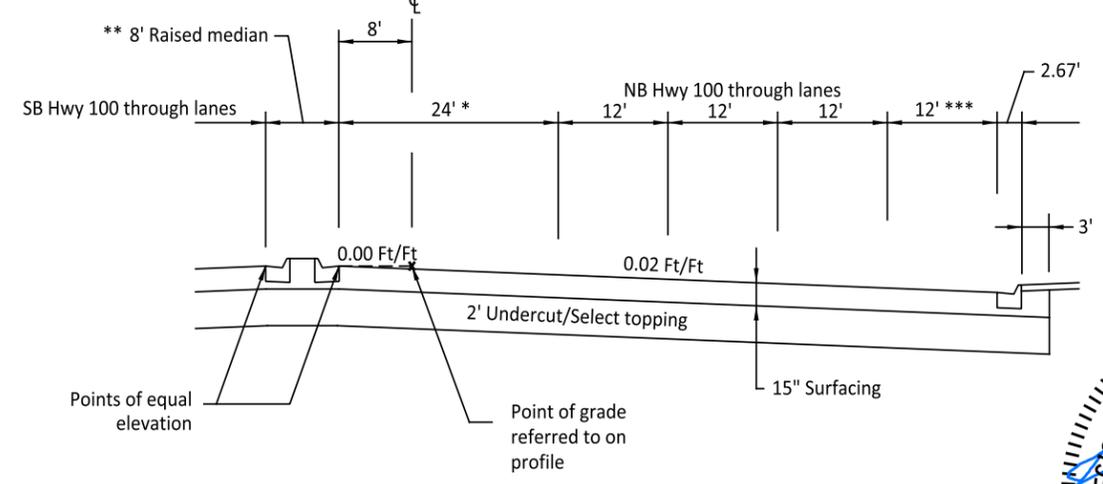
Southbound Left Turn Lane Section  
787+09.87 (Maple Street) to 793+70.10

- \* Left turn lanes taper from 24' at 792+49.90 to 0' at 793+70.10
- \*\* Raised median tapers from 8' at 792+49.90 to 32' at 793+70.10

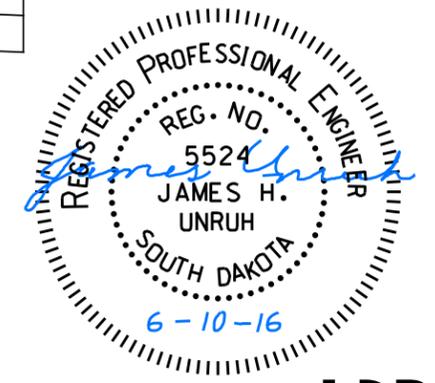
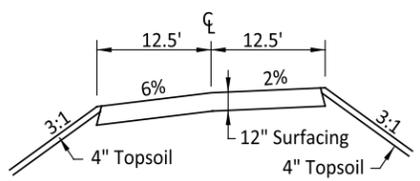


Northbound Right and Dual Left Turn Lanes  
864+72.50 to 871+50.00 (Rice Street)

- \* Left turn lanes taper from 0' at 864+72.50 to 24' at 865+92.50
- \*\* Raised median tapers from 32' at 864+72.50 to 8' at 865+92.50
- \*\*\* Right turn lane tapers from 0' at 866+36.30 to 12' at 867+78.50



Station 839+92.9 L Entrance (West Cactus Hills)



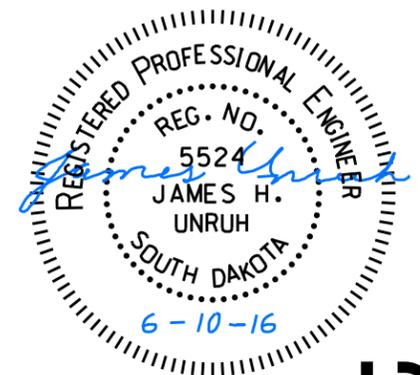
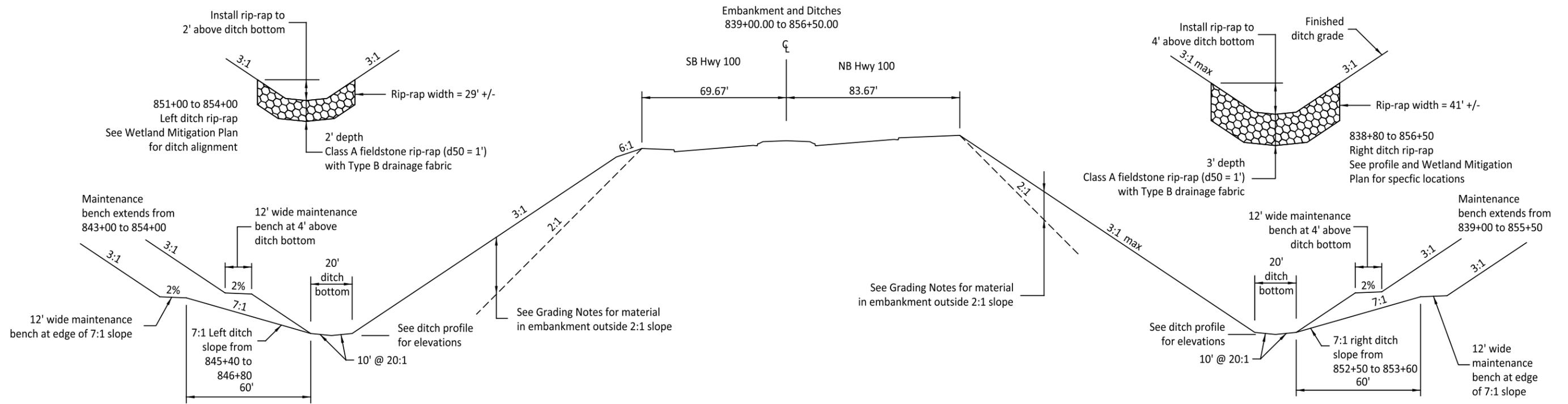
# Typical Grading Sections

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0100(105)419	B20	B108

FILE: B19-B22 Typicals.dgn  
PLOTING DATE: 06-10-2016

REV DATE:  
INITIAL:



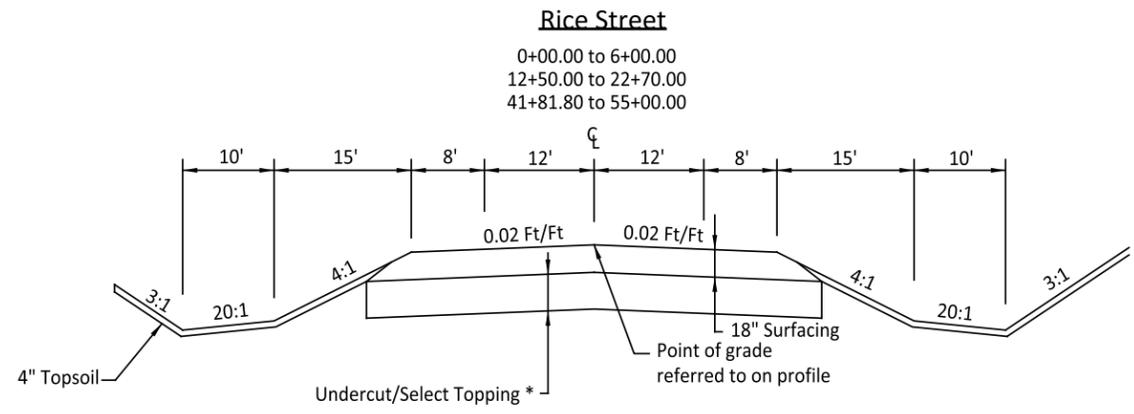
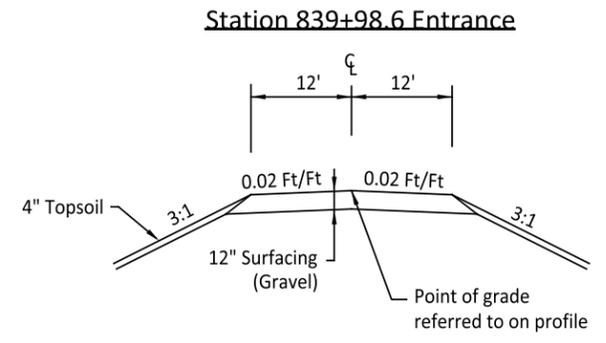
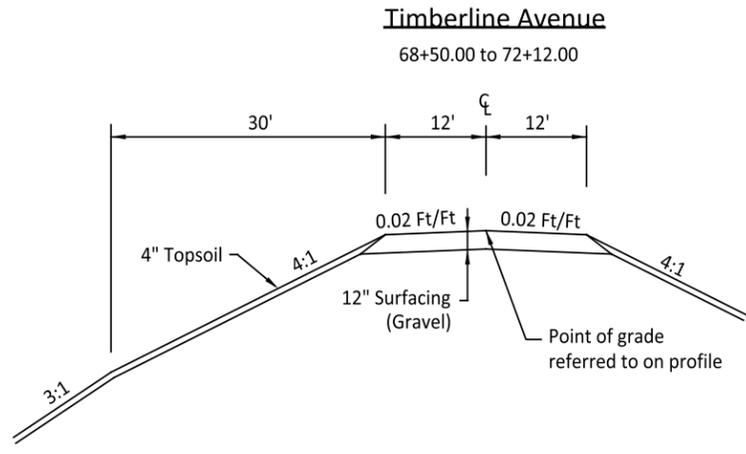
# Typical Grading Sections

FOR BIDDING PURPOSES ONLY

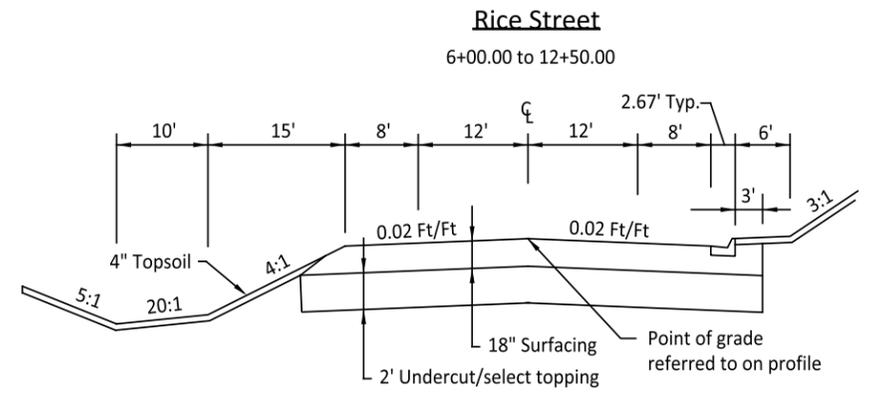
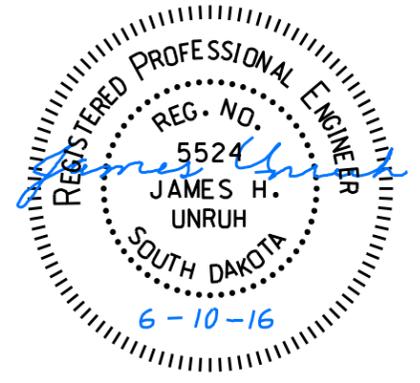
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0100(105)419	B21	B108

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PLOTING DATE: 06-10-2016

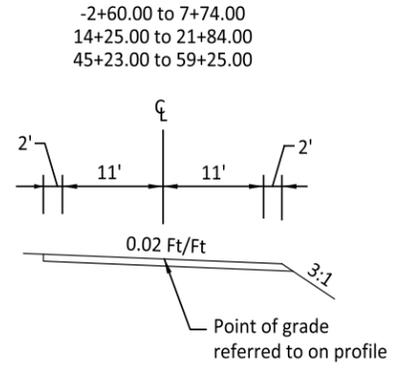
REV DATE:  
INITIAL:



\* 1' from 0+00 to 6+00  
and 49+10 to 55+00  
2' at other locations



**Rice Street Temporary Widening**



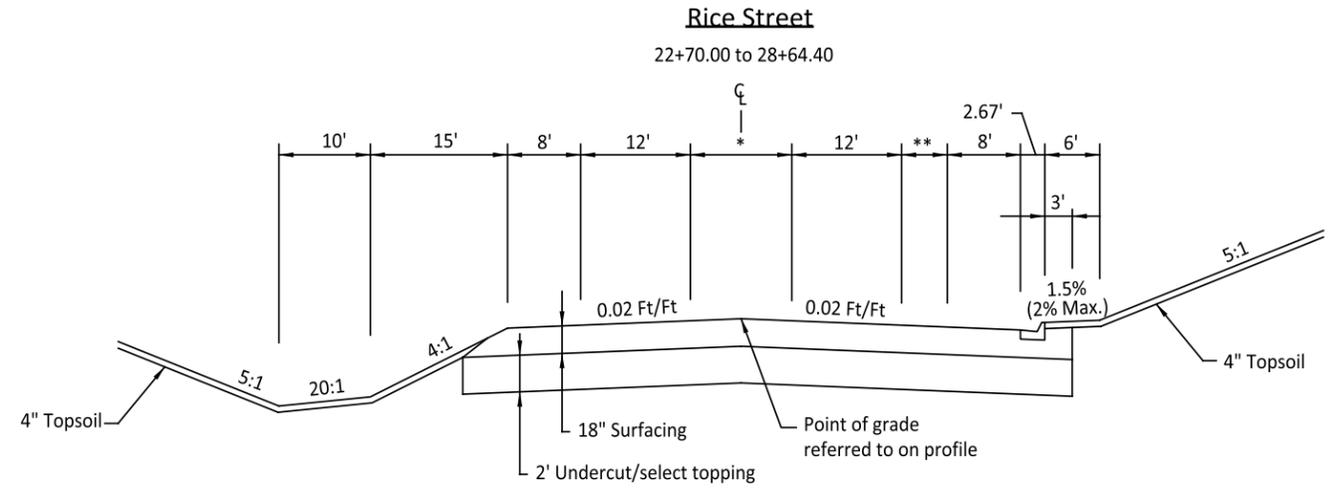
# Typical Grading Sections

FOR BIDDING PURPOSES ONLY

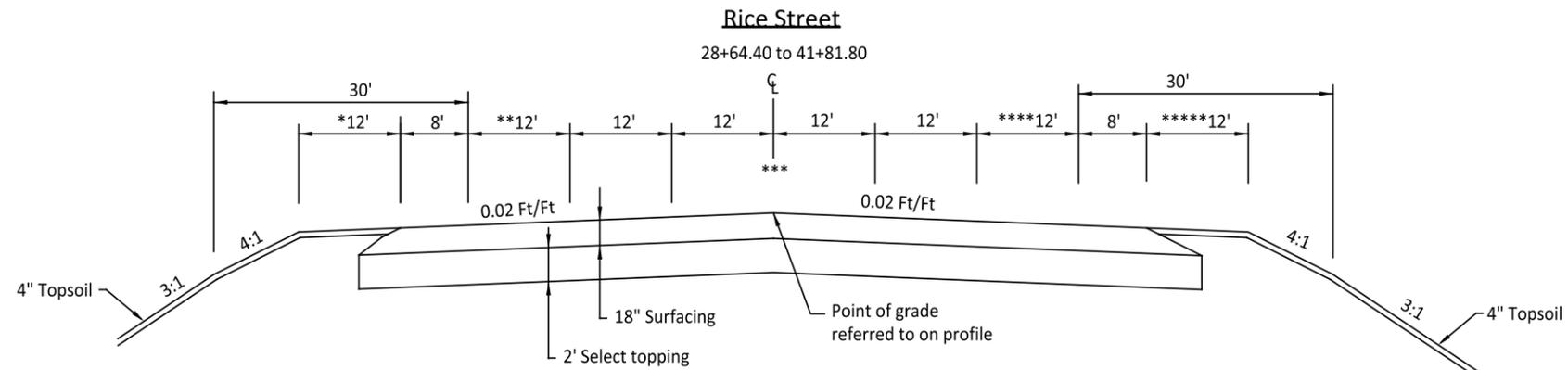
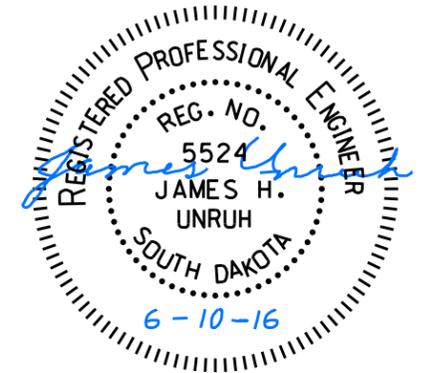
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0100(105)419	B22	B108

FILE: B19-B22 Typicals.dgn  
PLOTING DATE: 06-10-2016

REV DATE:  
INITIAL:



- \* Turn lane tapers from 0' at 24+23 to 24' at 29+72.20
- \*\* Turn lane tapers from 0' at 27+00 to 12' at 28+64.40



- \* 12' from 33+00 to 37+61.10  
Tapers to 0' at 39+00
- \*\* Lane tapers from 0' at 24+23 to 12' at 29+72.20  
Turn lane tapers from 12' at 36+32.50 to 0' at 37+52.80
- \*\*\* Turn lanes taper from 0' at 24+23 to 24' at 29+72.20  
Turn lanes taper from 24' at 36+32.50 to 0' at 41+81.80
- \*\*\*\* 12' from 28+64.40 to 36+32.50  
Tapers from 12' at 36+32.50 to 0' at 41+81.80
- \*\*\*\*\* 12' from 28+64.40 to 33+00  
0' from 33+00 to 41+81.80

# HORIZONTAL ALIGNMENT DATA

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0100(105)419	B23	B108

Plotting Date: 6/10/2016

## SD100 Mainline

Type	Station			Northing	Easting
POB	785+00.00			473296.44	2945201.83
		TL=815.49	N 2° 24' 48" W		
PC	793+15.49			474111.21	2945167.49
PI	802+93.48	R = 11,100.00	Delta = 10° 04' 13" R	475088.32	2945126.31
PT	812+66.42			476057.58	2945256.61
		TL=1,749.16	N 7° 39' 25" E		
PC	830+15.58			477791.15	2945489.67
PI	844+55.21	R = 3,400.00	Delta = 45° 53' 52" L	479217.94	2945681.49
PT	857+39.20			480348.65	2944790.40
		TL=1,753.92	N 38° 14' 27" W		
PC	874+93.12			481726.21	2943704.78

## Timberline Road

Type	Station			Northing	Easting
POB	67+95.97			481071.93	2942852.72
		TL=43.11	N 6° 32' 58" W		
PC	68+39.08			481114.76	2942847.80
PI	69+03.25	R = 200.00	Delta = 35° 34' 45" R	481178.52	2942840.48
PT	69+63.27			481234.63	2942871.62
		TL=88.64	N 29° 01' 46" E		
PC	70+51.92			481312.14	2942914.64
PI	71+08.63	R = 200.00	Delta = 31° 39' 42" L	481361.72	2942942.15
PT	71+62.44			481418.37	2942939.55
		TL=92.76	N 2° 37' 55" W		
POE	72+55.20			481511.04	2942935.29

## Rice Street

Type	Station			Northing	Easting
POB	-0+02.38			479314.58	2941700.03
		TL=327.29	N 32° 34' 38" E		
PC	3+24.91			479590.37	2941876.25
PI	4+76.79	R= 1,190.00	Delta = 14° 32' 49" L	479718.36	2941958.03
PT	6+27.04			479862.78	2942005.04
		TL= 494.97	N 18° 01' 49" E		
PC	11+22.01			480333.44	2942158.25
PI	17+01.82	R= 1,190.00	Delta = 51° 57' 14" R	480884.78	2942337.71
PT	22+01.06			481083.24	2942882.50
		TL= 1,098.94	N 69° 59' 04" E		
PI	33+00.00			481459.38	2943915.06
		TL= 1,759.46	N 69° 58' 45" E		
PC	50+59.46			482061.75	2945568.19
PI	52+31.56	R= 1,190.00	Delta = 16° 27' 31" R	482120.68	2945729.90
PT	54+01.30			482131.37	2945901.67
		TL= 539.67	N 86° 26' 15" E		
POE	59+40.97			482164.90	2946440.30

## Cactus Hills East Access

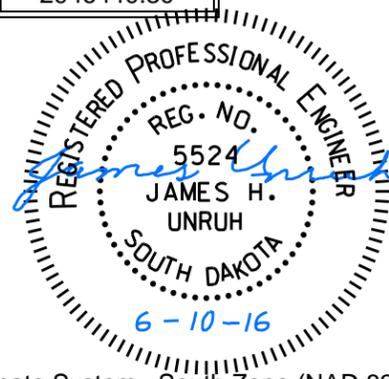
Type	Station			Northing	Easting
POB	90+00.00			482118.06	2945165.10
		TL=400.00	S 20° 01' 15" E		
POE	94+00.00			481742.23	2945302.04

## Rice Street Temporary Widening for Maintenance of Traffic

Type	Station			Northing	Easting
POB	200+00.00			480536.01	2942245.75
		TL=303.73	N 28° 53' 06" E		
PC	203+03.73			480801.96	2942392.47
PI	204+90.25	R= 1,227.00	Delta = 17° 17' 11" R	480938.36	2942519.67
PT	206+73.93			481030.80	2942681.66
		TL= 243.22	N 60° 23' 43" E		
POE	209+17.15			481150.95	2942893.10

## Cactus Hills West Access Road

Type	Station			Northing	Easting
POB	300+00.00			478963.62	2945247.28
		TL=188.41	S 26° 33' 53.31" E		
PC	301+88.41			478795.10	2945331.54
PI	302+28.72	R= 62.00	Delta = 66° 03' 56.10" L	478759.04	2945349.56
PT	302+59.89			478760.89	2945389.84
		TL= 40.319	N 87° 22' 10.59" E		
POE	303+50.00			478765.03	2945479.85



The coordinates shown on this sheet are based on the South Dakota State Plane Coordinate System. South Zone (NAD 83/96) SF = 0.99986486 Vertical Datum: NAVD 88

# HORIZONTAL ALIGNMENT DATA

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT NH 0100(105)419	SHEET B24	TOTAL SHEETS B108
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Plotting Date: 6/10/2016

## Drain Tile (Middle)

Type	Station			Northing	Easting
POB	1100+00.00			479169.38	2945257.36
		TL=39.90	N 8° 26' 43.94" W		
PI	1100+39.90			479208.84	2945251.50
		TL=88.78	N 26° 56' 22.41" W		
PI	1101+28.68			479287.99	2945211.28
		TL=122.39	N 14° 27' 53.72" W		
PI	1102+51.07			479406.50	2945180.71
		TL=127.61	N 0° 30' 06.41" E		
PI	1103.78.68			479534.11	2945181.82
		TL=110.21	N 17° 38' 26.74" W		
PI	1104+88.89			479639.14	2945148.42
		TL=81.05	N 44° 33' 59.55" W		
PI	1105+69.94			479696.88	2945091.55
		TL=58.82	N 16° 13' 52.10" W		
POE	1108+00.00			479687.64	2944916.99
		TL=171.23	S 67° 25' 49.60" W		

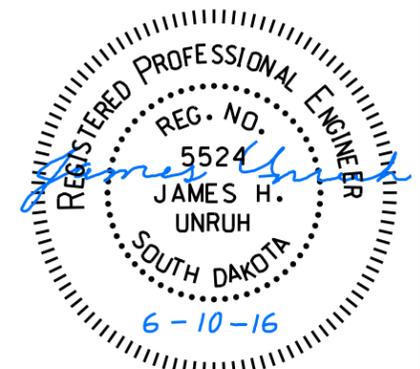
POE	1208+50.00			480483.85	2945022.28
		TL=102.76	N 6° 37' 46.47" E		

## Drain Tile (South)

Type	Station			Northing	Easting
POB	1000+00.00			478668.19	2945800.80
		TL=188.76	N 84° 10' 49.17" W		
PI	1001+88.76			478687.33	2945613.01
		TL=93.66	N 50° 01' 53.48" W		
PI	1002+82.42			478747.49	2945541.23
		TL=77.05	N 16° 15' 31.39" W		
PI	1003+59.47			478821.46	2945519.66
		TL=49.05	N 27° 11' 48.78" W		
PI	1004+08.52			478865.09	2945497.24
		TL=22.63	N 59° 27' 56.63" W		
PI	1004+31.16			478876.59	2945477.75
		TL=68.44	N 42° 32' 34.07" W		
PI	1004+99.59			478927.01	2945431.47
		TL=94.72	N 39° 32' 45.70" W		
PI	1005+94.32			479000.05	2945371.16
		TL=82.06	N 25° 26' 46.41" W		
PI	1006+76.38			479074.16	2945335.90
		TL=115.74	N 46° 54' 29.95" W		
POE	1010+00.00			479212.02	2945051.99
		TL=207.88	N 73° 34' 17.32" W		

## Drain Tile (North)

Type	Station			Northing	Easting
POB	1200+00.00			479852.66	2945051.18
		TL=51.65	N 57° 13' 51.22" E		
PI	1200+51.65			479880.62	2945094.62
		TL=83.92	N 76° 11' 14.98" E		
PI	1201+35.58			479900.65	2945176.11
		TL=37.87	N 54° 06' 09.72" E		
PI	1201+73.45			479922.86	2945206.79
		TL=54.35	N 8° 53' 13.45" E		
PI	1202+27.80			479976.56	2945215.19
		TL=218.68	N 30° 02' 51.78" W		
PI	1204+46.49			480165.85	2945105.69
		TL=105.10	N 57° 09' 51.36" W		
PI	1205+51.59			480222.84	2945017.38
		TL=62.39	N 45° 24' 10.77" W		
PI	1206+13.98			480266.65	2944972.96
		TL=39.66	N 20° 55' 14.22" W		
PI	1206+53.63			480303.69	2944958.79
		TL=93.62	N 33° 27' 50.83" E		



The coordinates shown on this sheet are based on the South Dakota State Plane Coordinate System. South Zone (NAD 83/96) SF = 0.99986486 Vertical Datum: NAVD 88

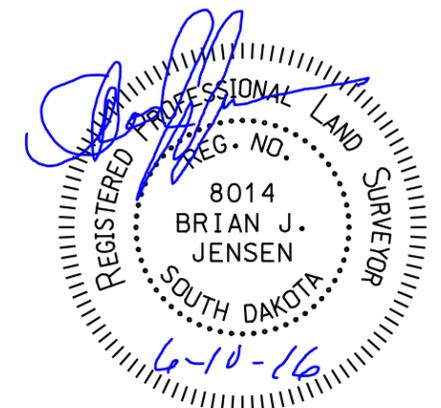
# CONTROL DATA

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT NH 0100(105)419	SHEET B25	TOTAL SHEETS B108
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Plotting Date: 6/10/2016

HORIZONTAL AND VERTICAL CONTROL POINTS						
POINT	STATION	OFFSET	DESCRIPTION	NORTHING	EASTING	ELEVATION
CP4	786+68.13	336.24'L	Rebar w/Alum cap stamped CP4. In field entrance +/- 1050Ft East of Powder House Rd and Maple St. in South ROW fence.	473450.255	2944858.810	1497.79
CP5	796+06.57	29.02'L	Rebar w/Alum cap stamped CP5. In N-S 1/16 line fence +/- 900Ft North of Maple St. Top of hill.	474401.695	2945130.025	1504.08
CP6	805+88.16	110.44'L	Rebar w/Alum cap stamped CP6. In N-S 1/16 line fence +/- 1900Ft North of Maple St. Top of hill.	475391.028	2945076.683	1513.11
CP7	813+21.70	1083.35'R	Rebar w/Alum cap stamped CP7. In N-S 1/4 line fence +/- 2500Ft North of Maple St. Top of hill.	475968.025	2946337.669	1511.20
CP8	827+06.12	830.55'R	Rebar w/Alum cap stamped CP8. In N-S 1/4 line fence +/- 3850Ft North of Maple St. Top of hill. +/-110Ft SW of large power structure.	477373.783	2946271.578	1483.69
CP9	841+02.25	739.93'R	Rebar w/Alum cap stamped CP9. In N-S 1/4 line fence +/- 3100Ft South of Rice St. Top of hill.	479009.646	2946188.531	1450.69
CP10	852+33.37	1204.22'R	Rebar w/Alum cap stamped CP10. In N-S 1/4 line fence +/- 2100Ft South of Rice St. Top of hill.	480526.527	2946118.689	1446.87
CP11	861+30.34	2387.42'R	Rebar w/Alum cap stamped CP11. In ditch South side of Rice St +/-300ft West of Entrance to Cell Tower. +/-1400Ft W of Six Mile Rd.	482133.600	2946423.416	1361.17
I90 402.4			NGS Benchmark NW Quad of I90 and Timberline Rd.	486393.028	2942424.430	1356.13



The coordinates shown on this sheet are based on the South Dakota State Plane Coordinate System. South Zone (NAD 83/96) SF = 0.99986486 Vertical Datum: NAVD 88

# SUBSURFACE UTILITY LOCATIONS

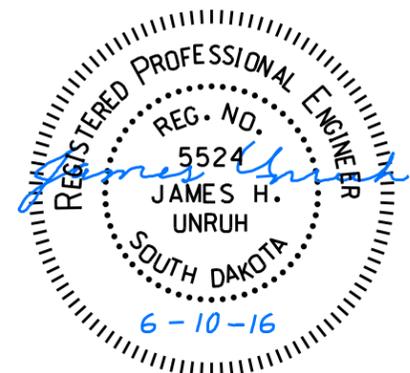
FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT NH 0100(105)419	SHEET B26	TOTAL SHEETS B108
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Plotting Date: 6/10/2016

Subsurface utility explorations were done at the following locations. The information below states what was located in the specified areas. This table is provided to aid the Contractor during construction and does not substitute or replace the requirements of SD One Call. All information is approximate and the Contractor shall verify all utility locations before construction in those areas as mandated in SDCL 49-7A.

Test Hole	Owner	Station	Offset	Finding	Existing Ground Elev.	Utility Depth (Ft.)	Utility Elevation
1	MidContinent Communications	1+99	42' L	2" Fiber Optic (Polyethylene Pipe)	1329.78	3.55	1326.23
2	SDN Communications	1+99	37' L	2" Fiber Optic (Polyethylene Pipe)	1330.09	3.80	1326.29
3	Century Link	2+01	37' R	Buried Telephone (not found)	1330.58		
4	Sprint	2+00	60' R	1" Fiber Optic (Direct Bury Cable)	1330.97	2.20	1328.77
5	MidContinent Communications	4+88	33' L	2" Fiber Optic (Polyethylene Pipe)	1326.08	3.05	1323.03
6	SDN Communications	4+90	25' L	2" Fiber Optic (Polyethylene Pipe)	1327.67	5.70	1321.97
7	MidAmerican Energy	8+05	30' L	10" Natural Gas (Steel)	1323.81	6.98	1316.83
8	MidAmerican Energy	8+05	27' L	4" Natural Gas (Steel)	1323.98	3.10	1320.88
9	MidAmerican Energy	10+01	20' R	10" Natural Gas (Steel)	1324.27	6.60	1317.67
10	MidAmerican Energy	10+01	24' R	4" Natural Gas (Steel)	1324.40	2.85	1321.55
11	MidAmerican Energy	13+48	65' R	10" Natural Gas (Steel)	1322.72	6.55	1316.17
12	MidAmerican Energy	13+49	69' R	4" Natural Gas (Steel)	1322.78	2.82	1319.96
13	MidAmerican Energy	18+62	56' L	10" Natural Gas (Steel)	1317.40	5.22 (QLB)	1312.18
14	MidAmerican Energy	18+62	53' L	4" Natural Gas (Steel)	1318.31	5.98	1312.33
15	MidContinent Communications	18+53	14' L	Fiber Optic	1329.27	4.70 (QLB)	1324.57
16	SDN Communications	18+61	17' R	Fiber Optic	1340.54	4.90 (QLB)	1335.64
17	Century Link	18+67	132' R	1" Buried Telephone (Direct Bury Cable)	1324.27	3.75	1320.52
18	Sprint	18+78	171' R	1" Fiber Optic (Direct Bury Cable)	1325.81	4.00	1321.81
19	MCI - Verizon	21+13	150' R	Fiber Optic (Polyethylene Pipe)	1342.81	4.90 (QLB)	1337.91
20	MidContinent Communications	70+00	14' R	Fiber Optic	1340.86	5.92 (QLB)	1334.94
21	MidAmerican Energy	69+99	1' L	10" Natural Gas (Steel)	1336.43	6.90 (QLB)	1329.53
22	MidAmerican Energy	69+99	2' R	4" Natural Gas (Steel)	1337.25	7.65 (QLB)	1329.60
23	SDN	69+99	28' R	Fiber Optic	1345.10	5.95 (QLB)	1339.15
24	Sprint	23+00	51' L	Fiber Optic (Direct Bury Cable)	1348.29	4.35	1343.94
25	Century Link	23+00	43' L	Buried Telephone (Direct Bury Cable)	1347.91	4.70	1343.21
26	MCI - Verizon	23+09	15' R	Fiber Optic (Polyethylene Pipe)	1347.51	5.49	1342.02
27	MidAmerican Energy	27+00	212' L	2" Polyethylene Pipe	1347.99	3.55	1344.44
28	MidAmerican Energy	27+00	207' L	2" Polyethylene Pipe	1348.86	4.21	1344.65
29	Century Link	27+00	145' L	1" Buried Telephone (Direct Bury Cable)	1350.47	3.27	1347.20



The coordinates shown on this sheet are based on the South Dakota State Plane Coordinate System. South Zone (NAD 83/96) SF = 0.99986486 Vertical Datum: NAVD 88

# LEGEND

Xcel Distribution Pole Structure Number	XD-
Xcel Transmission Pole Structure Number	XT-
L&O Pole Structure Number	L-
WAPA Pole Structure Number	W-
East River Electric Pole Structure Number	E-

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

785+88 - 109' R  
Take out 84" RCP Flared End  
(Incidental Work, Grading)

# Hwy 100

FOR BIDDING PURPOSES ONLY

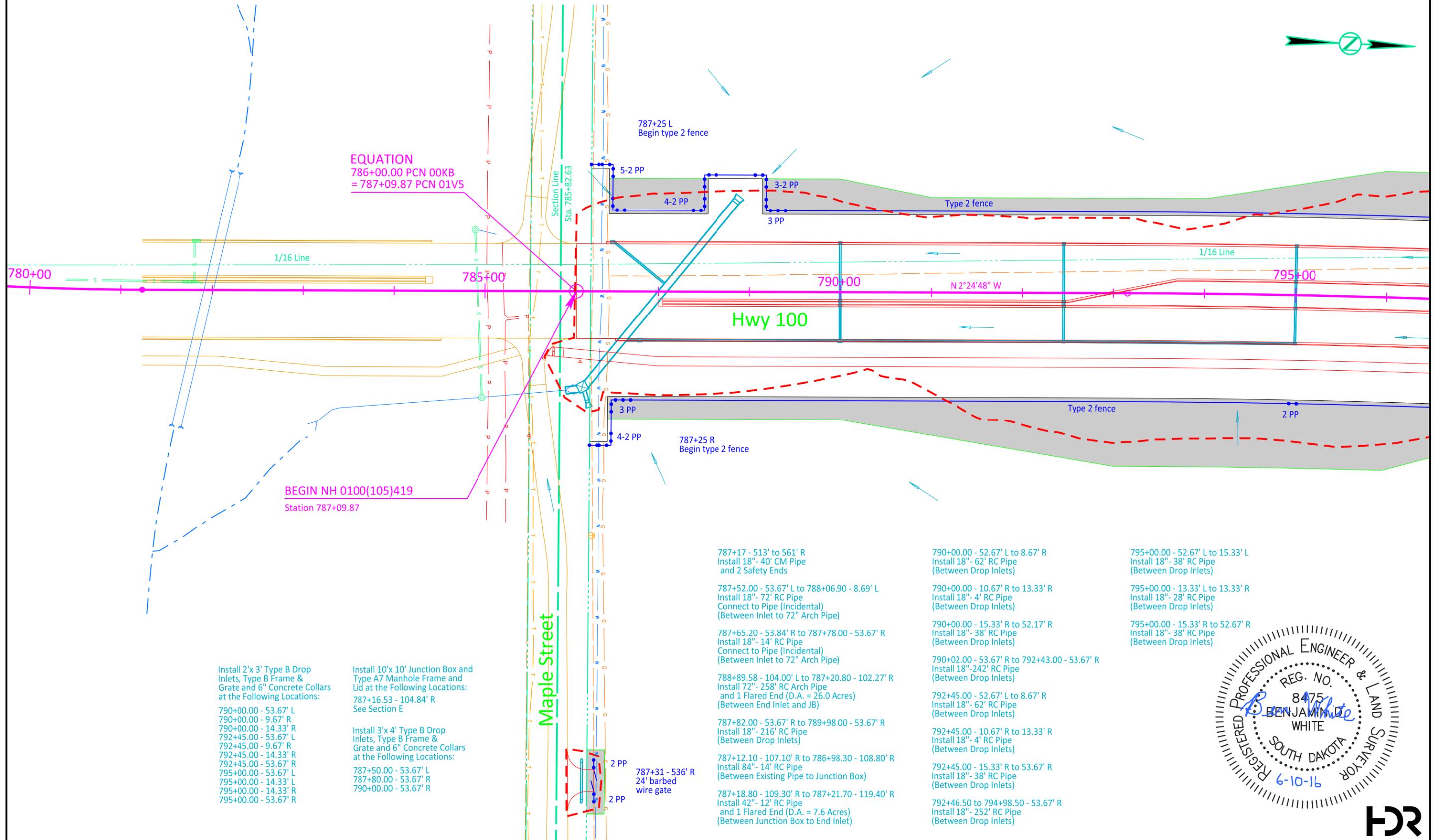
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0100(105)419	B28	B108

FILE: B28  
PLOTTING DATE: 06-10-2016

REV DATE:  
INITIAL:

Sec. 7-T101N-R48W

Sec. 6-T101N-R48W



EQUATION  
786+00.00 PCN 00KB  
= 787+09.87 PCN 01V5

BEGIN NH 0100(105)419  
Station 787+09.87

Install 2'x 3' Type B Drop  
Inlets, Type B Frame &  
Grate and 6" Concrete Collars  
at the Following Locations:  
790+00.00 - 53.67' L  
790+00.00 - 9.67' R  
790+00.00 - 14.33' R  
792+45.00 - 53.67' L  
792+45.00 - 9.67' R  
792+45.00 - 14.33' R  
792+45.00 - 53.67' R  
795+00.00 - 53.67' L  
795+00.00 - 14.33' L  
795+00.00 - 14.33' R  
795+00.00 - 53.67' R

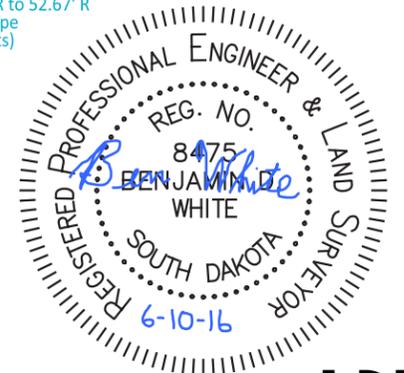
Install 10'x 10' Junction Box and  
Type A7 Manhole Frame and  
Lid at the Following Locations:  
787+16.53 - 104.84' R  
See Section E  
  
Install 3'x 4' Type B Drop  
Inlets, Type B Frame &  
Grate and 6" Concrete Collars  
at the Following Locations:  
787+50.00 - 53.67' L  
787+80.00 - 53.67' R  
790+00.00 - 53.67' R

787+17 - 513' to 561' R  
Install 18"- 40' CM Pipe  
and 2 Safety Ends  
  
787+52.00 - 53.67' L to 788+06.90 - 8.69' L  
Install 18"- 72' RC Pipe  
Connect to Pipe (Incidental)  
(Between Inlet to 72" Arch Pipe)  
  
787+65.20 - 53.84' R to 787+78.00 - 53.67' R  
Install 18"- 14' RC Pipe  
Connect to Pipe (Incidental)  
(Between Inlet to 72" Arch Pipe)  
  
788+89.58 - 104.00' L to 787+20.80 - 102.27' R  
Install 72"- 258' RC Arch Pipe  
and 1 Flared End (D.A. = 26.0 Acres)  
(Between End Inlet and JB)  
  
787+82.00 - 53.67' R to 789+98.00 - 53.67' R  
Install 18"- 216' RC Pipe  
(Between Drop Inlets)  
  
787+12.10 - 107.10' R to 786+98.30 - 108.80' R  
Install 84"- 14' RC Pipe  
(Between Existing Pipe to Junction Box)  
  
787+18.80 - 109.30' R to 787+21.70 - 119.40' R  
Install 42"- 12' RC Pipe  
and 1 Flared End (D.A. = 7.6 Acres)  
(Between Junction Box to End Inlet)

790+00.00 - 52.67' L to 8.67' R  
Install 18"- 62' RC Pipe  
(Between Drop Inlets)  
  
790+00.00 - 10.67' R to 13.33' R  
Install 18"- 4' RC Pipe  
(Between Drop Inlets)  
  
790+00.00 - 15.33' R to 52.17' R  
Install 18"- 38' RC Pipe  
(Between Drop Inlets)  
  
790+02.00 - 53.67' R to 792+43.00 - 53.67' R  
Install 18"- 242' RC Pipe  
(Between Drop Inlets)  
  
792+45.00 - 52.67' L to 8.67' R  
Install 18"- 62' RC Pipe  
(Between Drop Inlets)  
  
792+45.00 - 10.67' R to 13.33' R  
Install 18"- 4' RC Pipe  
(Between Drop Inlets)  
  
792+45.00 - 15.33' R to 53.67' R  
Install 18"- 38' RC Pipe  
(Between Drop Inlets)  
  
792+46.50 to 794+98.50 - 53.67' R  
Install 18"- 252' RC Pipe  
(Between Drop Inlets)

795+00.00 - 52.67' L to 15.33' L  
Install 18"- 38' RC Pipe  
(Between Drop Inlets)  
  
795+00.00 - 13.33' L to 13.33' R  
Install 18"- 28' RC Pipe  
(Between Drop Inlets)  
  
795+00.00 - 15.33' R to 52.67' R  
Install 18"- 38' RC Pipe  
(Between Drop Inlets)

2 PP  
787+31 - 536' R  
24' barbed  
wire gate  
2 PP





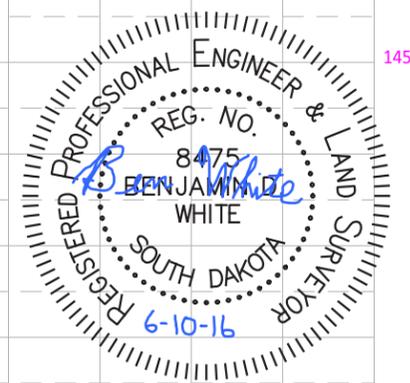
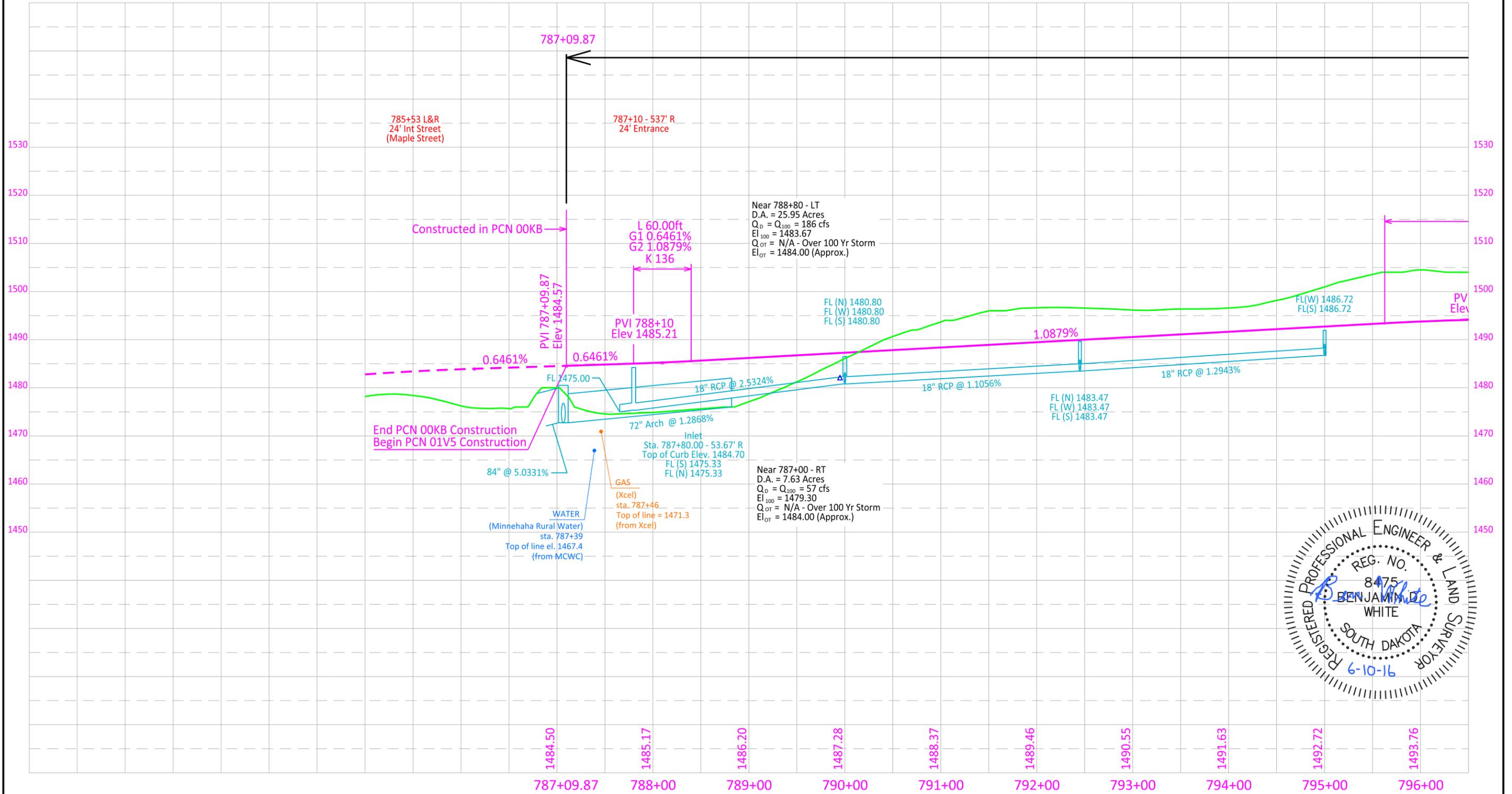
# Hwy 100

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0100(105)419	B30	B108

FILE: B30  
PLOTTING DATE: 06-10-2016

REV DATE:  
INITIAL:



# Hwy 100

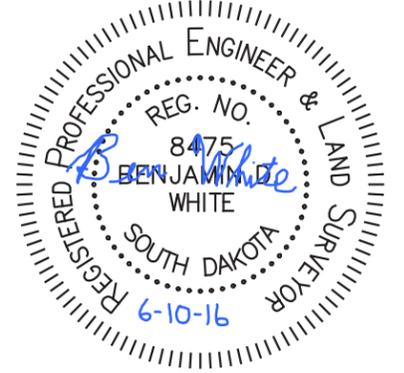
## Sec. 6-T101N-R48W

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0100(105)419	B31	B108

FILE: B31  
PLOTTING DATE: 06-10-2016

REV DATE:  
INITIAL:



798+75.00 - 52.67' L to 15.33' L  
Install 18" - 38' RC Pipe  
(Between Drop Inlets)

798+75.00 - 13.33' L to 13.33' R  
Install 18" - 28' RC Pipe  
(Between Drop Inlets)

798+75.00 - 15.33' R to 52.67' R  
Install 18" - 38' RC Pipe  
(Between Drop Inlets)

798+80.60 to 800+98.00 - 53.67' R  
Install 18" - 218' RC Pipe  
(Between Drop Inlets)

801+00.00 - 52.67' L to 15.33' L  
Install 18" - 38' RC Pipe  
(Between Drop Inlets)

801+00.00 - 13.33' L to 13.33' R  
Install 18" - 28' RC Pipe  
(Between Drop Inlets)

801+00.00 - 15.33' R to 52.17' R  
Install 18" - 38' RC Pipe  
(Between Drop Inlets)

801+02.00 to 802+24.20 - 53.67' R  
Install 24" - 122' RC Pipe  
(Between Drop Inlets)

802+26.00-55.67' R to 124.70' R  
Install 24" - 64' RC Pipe  
and 1 Flared End  
(Between Drop Inlet and End Inlet)

802+28.20 to 803+98.00-53.67' R  
Install 30" - 170' RC Pipe  
(Between Drop Inlets)

804+00.00 - 52.67' L to 15.33' L  
Install 18" - 38' RC Pipe  
(Between Drop Inlets)

804+00.00 - 13.33' L to 13.33' R  
Install 18" - 28' RC Pipe  
(Between Drop Inlets)

804+00.00 - 15.33' R to 51.67' R  
Install 18" - 38' RC Pipe  
(Between Drop Inlets)

804+07.00 to 806+98.00 - 53.67' R  
Install 30" - 296' RC Pipe  
(Between Drop Inlets)

807+00.00 - 52.67' L to 15.33' L  
Install 18" - 38' RC Pipe  
(Between Drop Inlets)

807+00.00 - 13.33' L to 13.33' R  
Install 18" - 28' RC Pipe  
(Between Drop Inlets)

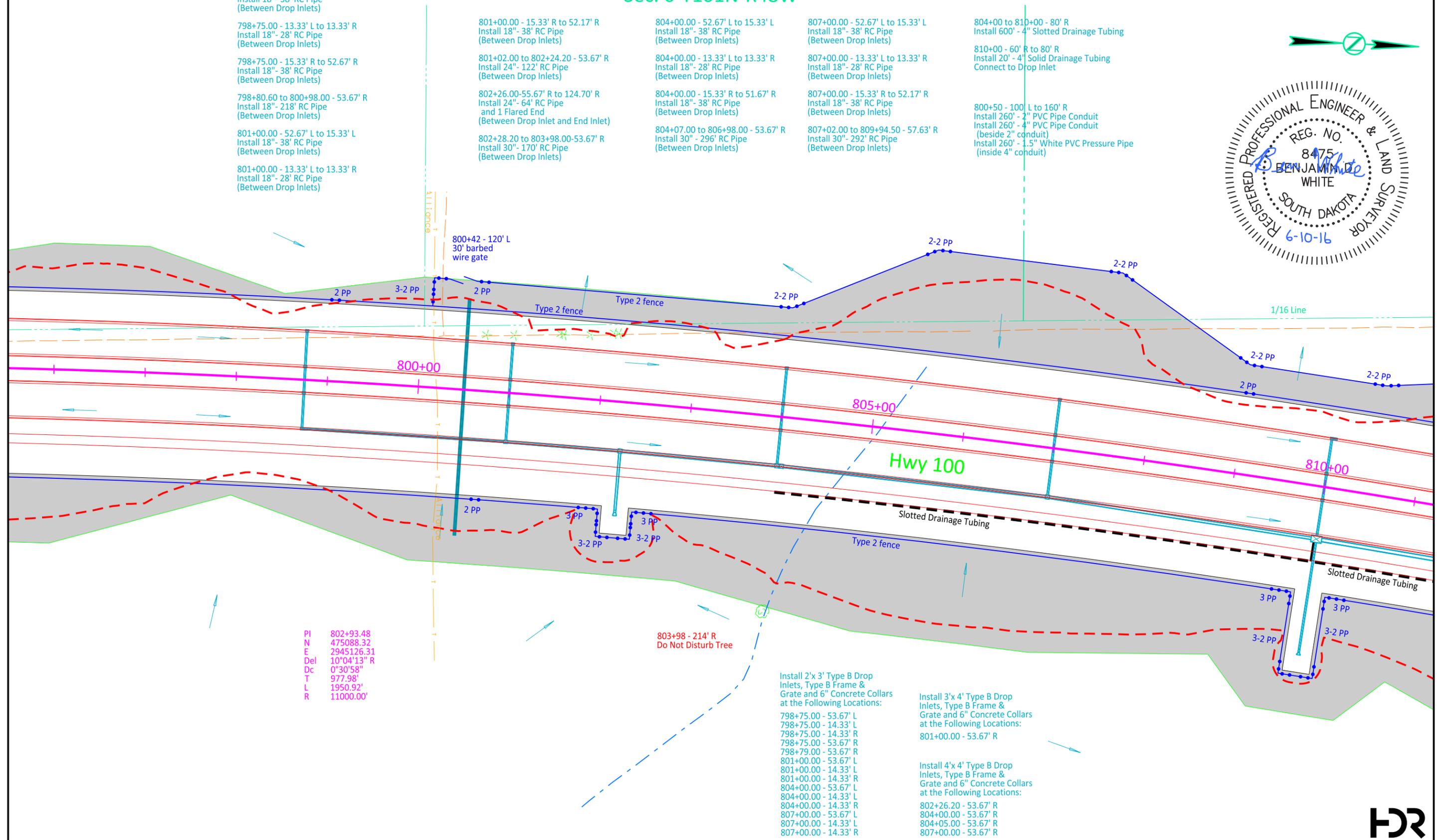
807+00.00 - 15.33' R to 52.17' R  
Install 18" - 38' RC Pipe  
(Between Drop Inlets)

807+02.00 to 809+94.50 - 57.63' R  
Install 30" - 292' RC Pipe  
(Between Drop Inlets)

804+00 to 810+00 - 80' R  
Install 600' - 4" Slotted Drainage Tubing

810+00 - 60' R to 80' R  
Install 20' - 4" Solid Drainage Tubing  
Connect to Drop Inlet

800+50 - 100' L to 160' R  
Install 260' - 2" PVC Pipe Conduit  
Install 260' - 4" PVC Pipe Conduit  
(beside 2" conduit)  
Install 260' - 1.5" White PVC Pressure Pipe  
(inside 4" conduit)



PI 802+93.48  
N 475088.32  
E 2945126.31  
Del 10°04'13" R  
Dc 0°30'58"  
T 977.98'  
L 1950.92'  
R 11000.00'

Install 2'x 3' Type B Drop  
Inlets, Type B Frame &  
Grate and 6" Concrete Collars  
at the Following Locations:

798+75.00 - 53.67' L  
798+75.00 - 14.33' L  
798+75.00 - 14.33' R  
798+75.00 - 53.67' R  
798+79.00 - 53.67' R  
801+00.00 - 53.67' L  
801+00.00 - 14.33' L  
801+00.00 - 14.33' R  
804+00.00 - 53.67' L  
804+00.00 - 14.33' L  
804+00.00 - 14.33' R  
807+00.00 - 53.67' L  
807+00.00 - 14.33' L  
807+00.00 - 14.33' R

Install 3'x 4' Type B Drop  
Inlets, Type B Frame &  
Grate and 6" Concrete Collars  
at the Following Locations:

801+00.00 - 53.67' R

Install 4'x 4' Type B Drop  
Inlets, Type B Frame &  
Grate and 6" Concrete Collars  
at the Following Locations:

802+26.20 - 53.67' R  
804+00.00 - 53.67' R  
804+05.00 - 53.67' R  
807+00.00 - 53.67' R



# Hwy 100 ROW

FOR BIDDING PURPOSES ONLY

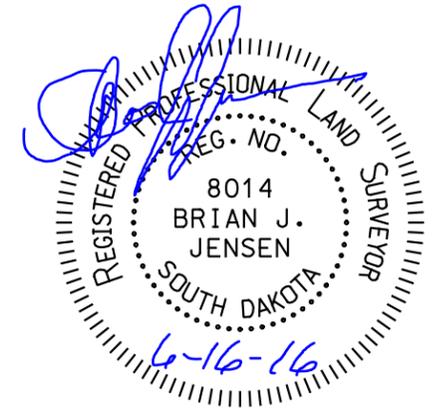
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0100(105)419	B32	B108

FILE: B32 ROW  
PLOTTING DATE: 06-16-2016

REV DATE: 6-16-2016  
INITIAL: BJ

## Sec. 6-T101N-R48W

Gordon L. Ode & Mila Ode  
Parcel 86A

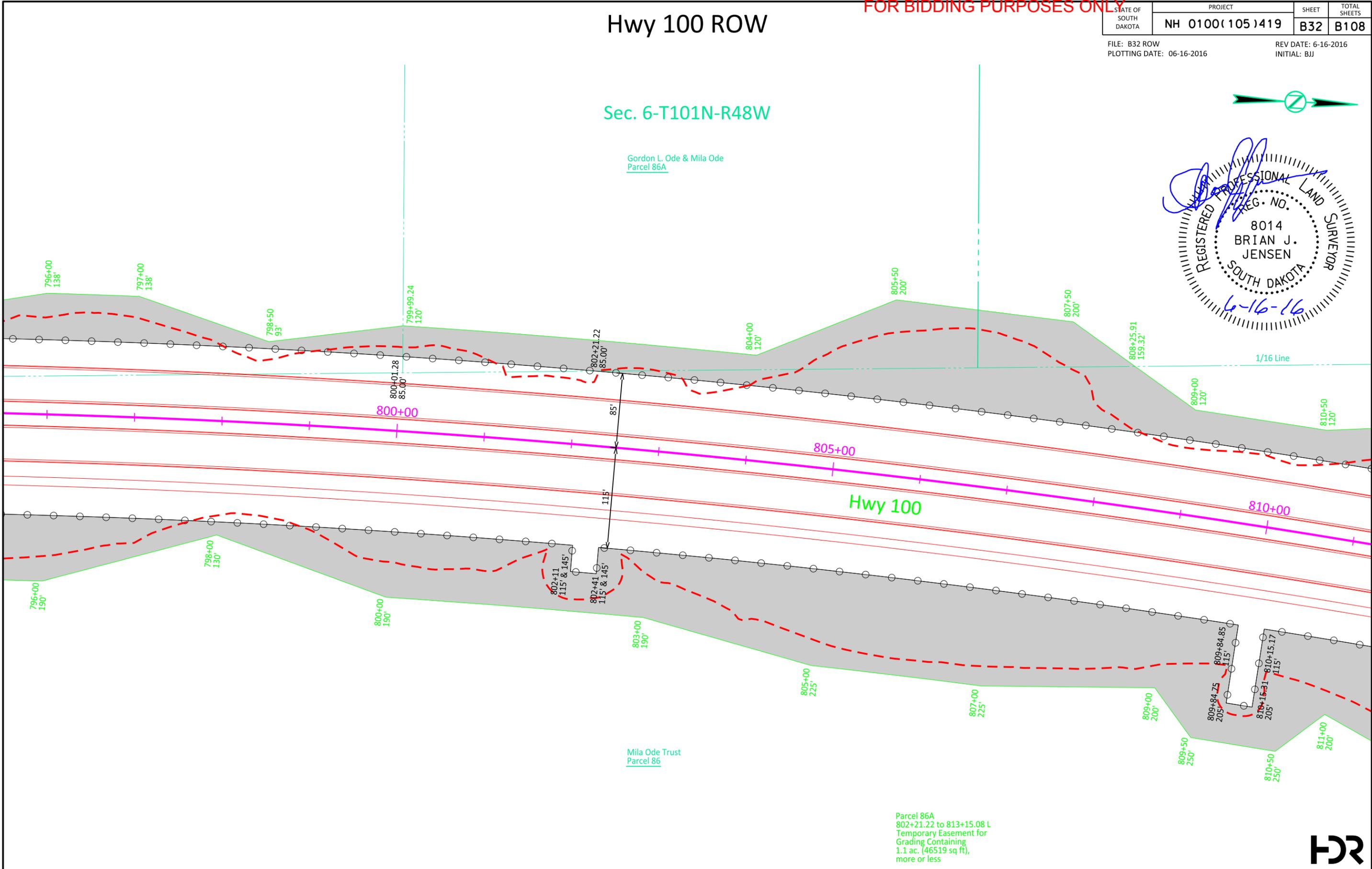


1/16 Line

### Hwy 100

Mila Ode Trust  
Parcel 86

Parcel 86A  
802+21.22 to 813+15.08 L  
Temporary Easement for  
Grading Containing  
1.1 ac. (46519 sq ft),  
more or less



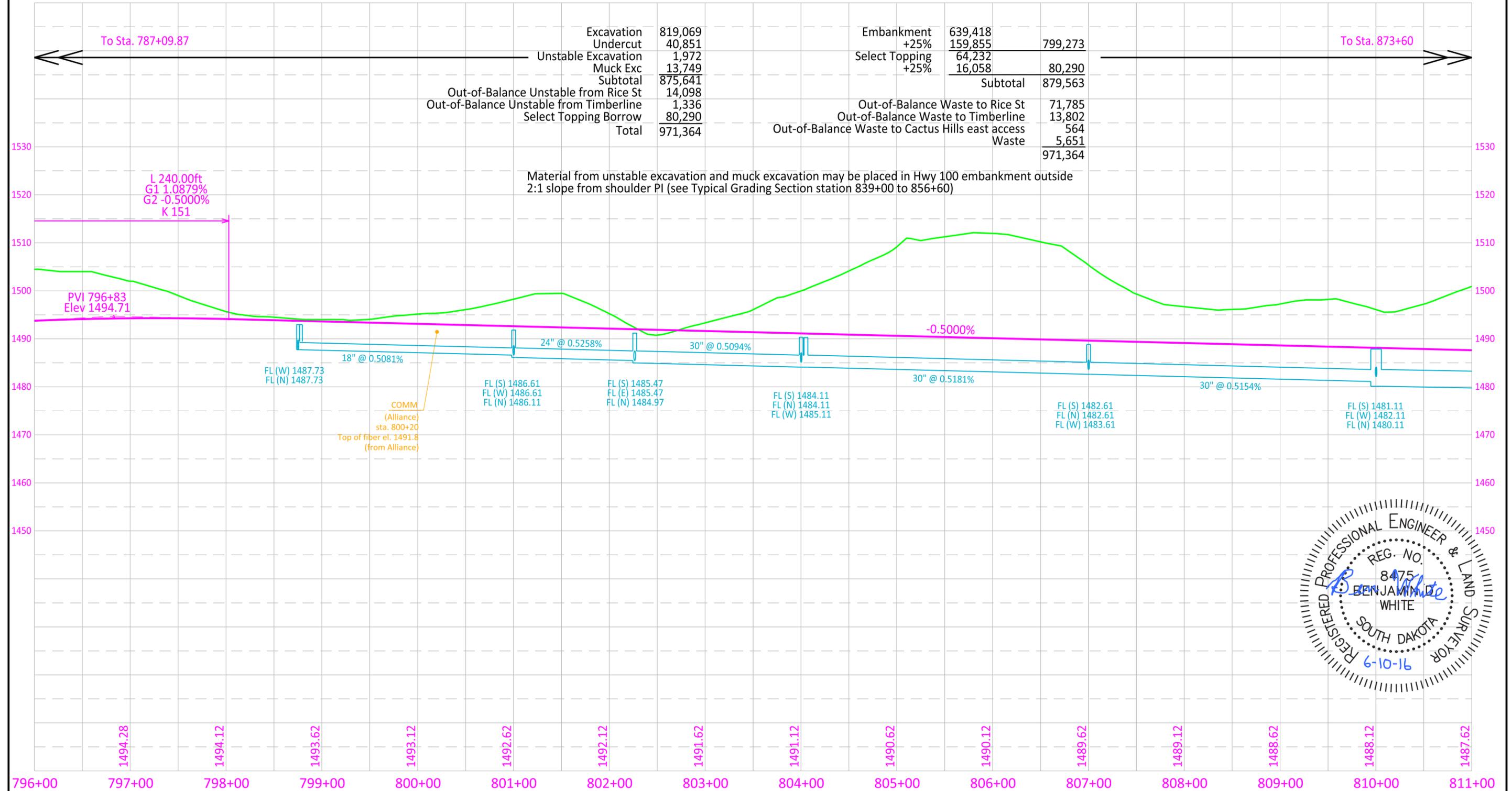
# Hwy 100

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0100(105)419	B33	B108

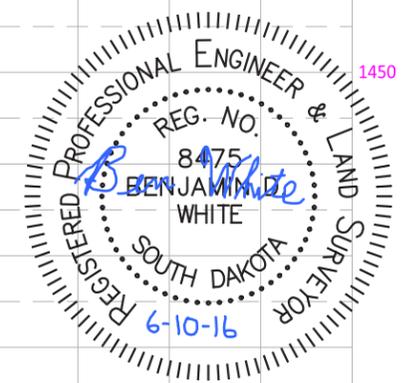
FILE: B33  
PLOTTING DATE: 06-10-2016

REV DATE:  
INITIAL:



Excavation	819,069	Embankment	639,418
Undercut	40,851	+25%	159,855
Unstable Excavation	1,972	Select Topping	64,232
Muck Exc	13,749	+25%	16,058
Subtotal	875,641	Subtotal	80,290
Out-of-Balance Unstable from Rice St	14,098	Out-of-Balance Waste to Rice St	71,785
Out-of-Balance Unstable from Timberline	1,336	Out-of-Balance Waste to Timberline	13,802
Select Topping Borrow	80,290	Out-of-Balance Waste to Cactus Hills east access	564
Total	971,364	Waste	5,651
			971,364

Material from unstable excavation and muck excavation may be placed in Hwy 100 embankment outside 2:1 slope from shoulder PI (see Typical Grading Section station 839+00 to 856+60)



FOR BIDDING PURPOSES ONLY

# Hwy 100

## Sec. 6-T101N-R48W

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0100(105)419	B34	B108

FILE: B34  
PLOTTING DATE: 06-21-2016

REV DATE: 6/21/2016  
INITIAL: JHU



810+00.00 - 52.67' L to 15.33' L  
Install 18"- 38' RC Pipe  
(Between Drop Inlets)

810+00.00 - 13.33' L to 13.33' R  
Install 18"- 28' RC Pipe  
(Between Drop Inlets)

810+00.00 - 15.33' R to 54.13' R  
Install 18"- 40' RC Pipe  
(Between Drop Inlets)

810+00.00 - 61.13' R to 185.80' R  
Install 18"- 120' RC Pipe  
and 1 Flared End  
(Between Drop Inlet and End Inlet)

810+05.50 to 812+94.50 - 57.63' R  
Install 42"- 288' RC Pipe  
(Between Drop Inlets)

813+00.00 - 52.67' L to 15.33' L  
Install 18"- 38' RC Pipe  
(Between Drop Inlets)

813+00.00 - 13.33' L to 13.33' R  
Install 18"- 28' RC Pipe  
(Between Drop Inlets)

813+00.00 - 15.33' R to 54.13' R  
Install 18"- 40' RC Pipe  
(Between Drop Inlets)

813+05.50 to 815+94.50 - 57.63' R  
Install 42"- 290' RC Pipe  
(Between Drop Inlets)

816+00.00 - 52.67' L to 15.33' L  
Install 18"- 38' RC Pipe  
(Between Drop Inlets)

816+00.00 - 13.33' L to 13.33' R  
Install 18"- 28' RC Pipe  
(Between Drop Inlets)

816+00.00 - 15.33' R to 54.13' R  
Install 18"- 40' RC Pipe  
(Between Drop Inlets)

816+05.00 to 818+94.50 - 57.63' R  
Install 42"- 290' RC Pipe  
(Between Drop Inlets)

819+00.00 - 52.67' L to 15.33' L  
Install 18"- 38' RC Pipe  
(Between Drop Inlets)

819+00.00 - 13.33' L to 13.33' R  
Install 18"- 28' RC Pipe  
(Between Drop Inlets)

819+00.00 - 15.33' R to 54.13' R  
Install 18"- 40' RC Pipe  
(Between Drop Inlets)

819+05.50-53.67' R to 819+55.80-59.42' R  
Install 42"- 50' RC Pipe  
(Between Drop Inlet and JB)

819+44.70-103.54' R to 819+58.34-63.27' R  
Install 36"- 36' RC Pipe  
and 1 Flared End  
(Between End Inlet and JB)

819+60.00-99.65' L to 820+11.78-57.32' R  
Install 48"- 158' RC Pipe  
and 1 Flared End (D.A. = 8.8 Acres)  
(Between JB and End Outlet)

810+00 to 819+00 - 80' R  
Install 900" - 4" Slotted Drainage Tubing

819+00 - 80' R to 819+40 - 100' R  
Install 44" - 4" Solid Drainage Tubing

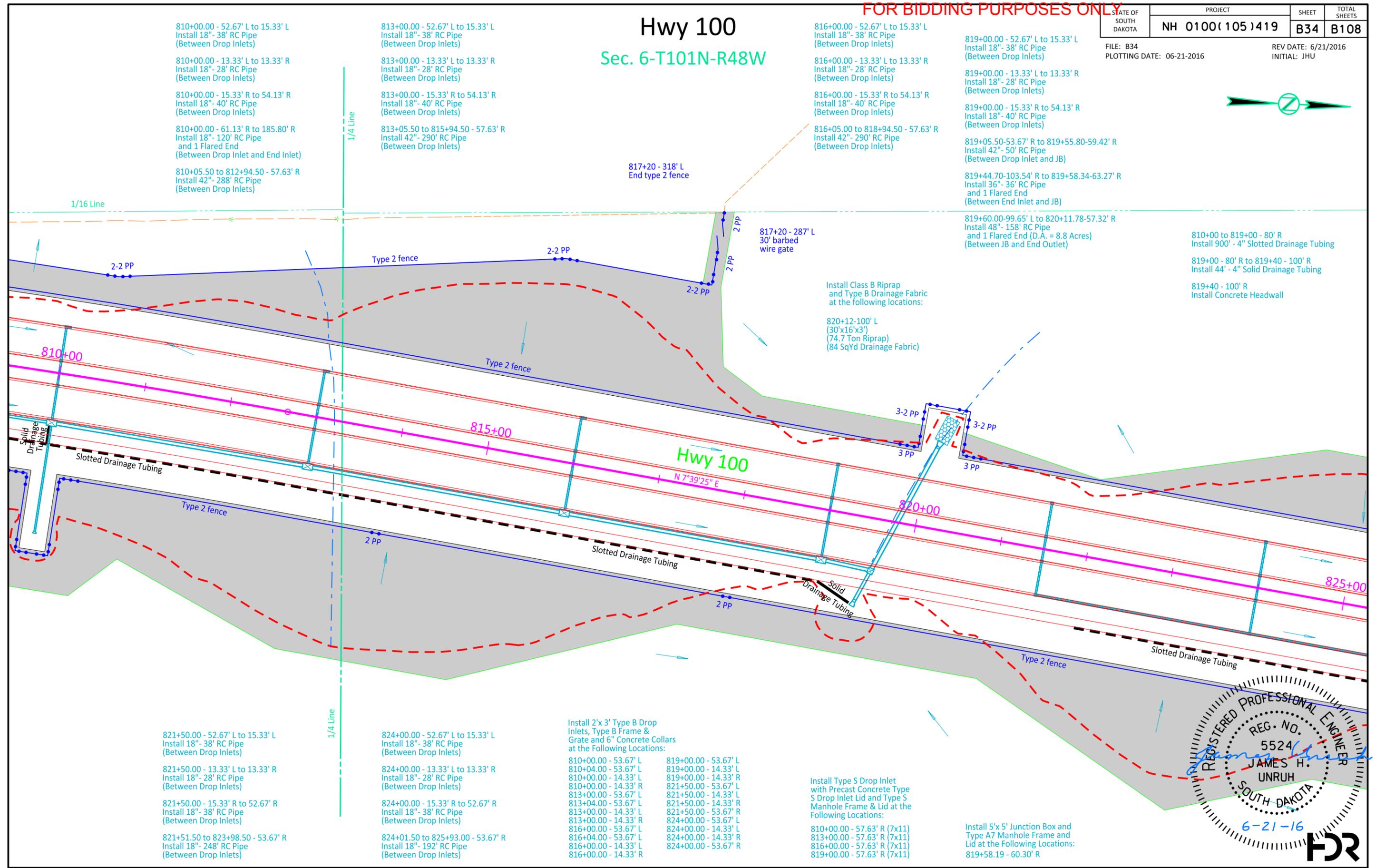
819+40 - 100' R  
Install Concrete Headwall

Install Class B Riprap  
and Type B Drainage Fabric  
at the following locations:

820+12-100' L  
(30'x16'x3')  
(74.7 Ton Riprap)  
(84 SqYd Drainage Fabric)

817+20 - 318' L  
End type 2 fence

817+20 - 287' L  
30' barbed  
wire gate



821+50.00 - 52.67' L to 15.33' L  
Install 18"- 38' RC Pipe  
(Between Drop Inlets)

821+50.00 - 13.33' L to 13.33' R  
Install 18"- 28' RC Pipe  
(Between Drop Inlets)

821+50.00 - 15.33' R to 52.67' R  
Install 18"- 38' RC Pipe  
(Between Drop Inlets)

821+51.50 to 823+98.50 - 53.67' R  
Install 18"- 248' RC Pipe  
(Between Drop Inlets)

824+00.00 - 52.67' L to 15.33' L  
Install 18"- 38' RC Pipe  
(Between Drop Inlets)

824+00.00 - 13.33' L to 13.33' R  
Install 18"- 28' RC Pipe  
(Between Drop Inlets)

824+00.00 - 15.33' R to 52.67' R  
Install 18"- 38' RC Pipe  
(Between Drop Inlets)

824+01.50 to 825+93.00 - 53.67' R  
Install 18"- 192' RC Pipe  
(Between Drop Inlets)

Install 2'x3' Type B Drop  
Inlets, Type B Frame &  
Grate and 6" Concrete Collars  
at the Following Locations:

810+00.00 - 53.67' L	819+00.00 - 53.67' L
810+04.00 - 53.67' L	819+00.00 - 14.33' L
810+00.00 - 14.33' L	819+00.00 - 14.33' R
810+00.00 - 14.33' R	821+50.00 - 53.67' L
813+00.00 - 53.67' L	821+50.00 - 14.33' L
813+04.00 - 53.67' L	821+50.00 - 14.33' R
813+00.00 - 14.33' L	821+50.00 - 53.67' R
813+00.00 - 14.33' R	824+00.00 - 53.67' L
816+00.00 - 53.67' L	824+00.00 - 14.33' L
816+04.00 - 53.67' L	824+00.00 - 14.33' R
816+00.00 - 14.33' L	824+00.00 - 53.67' R
816+00.00 - 14.33' R	

Install Type S Drop Inlet  
with Precast Concrete Type  
S Drop Inlet Lid and Type S  
Manhole Frame & Lid at the  
Following Locations:

810+00.00 - 57.63' R (7x11)
813+00.00 - 57.63' R (7x11)
816+00.00 - 57.63' R (7x11)
819+00.00 - 57.63' R (7x11)

Install 5'x5' Junction Box and  
Type A7 Manhole Frame and  
Lid at the Following Locations:

819+58.19 - 60.30' R
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REGISTERED PROFESSIONAL ENGINEER

REG. NO. 5524

JAMES H. UNRUH

SOUTH DAKOTA

6-21-16



# Hwy 100 ROW

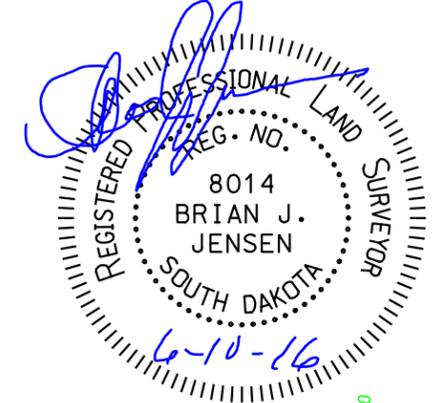
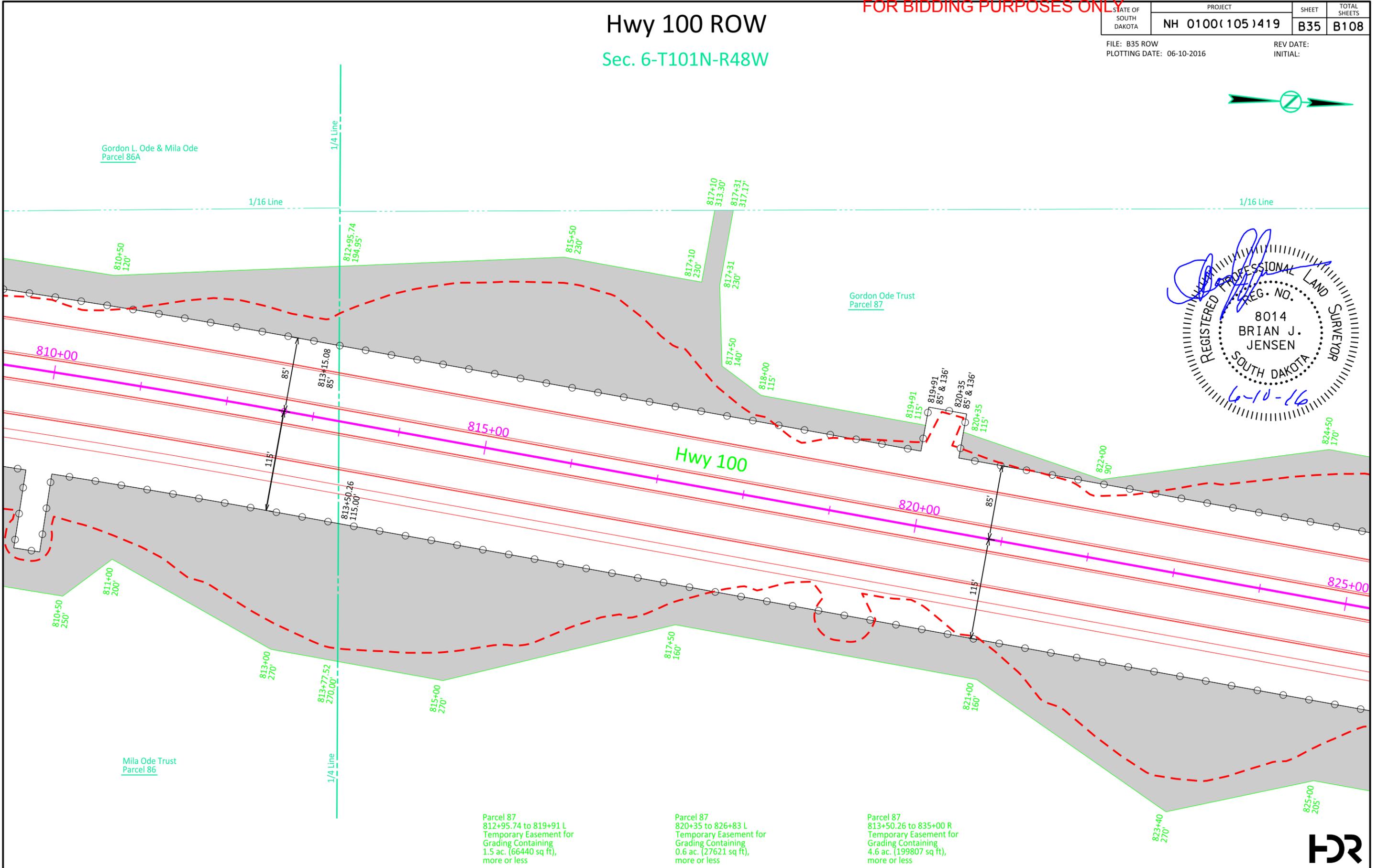
Sec. 6-T101N-R48W

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0100(105)419	B35	B108

FILE: B35 ROW  
PLOTTING DATE: 06-10-2016

REV DATE:  
INITIAL:



Parcel 87  
812+95.74 to 819+91 L  
Temporary Easement for  
Grading Containing  
1.5 ac. (66440 sq ft),  
more or less

Parcel 87  
820+35 to 826+83 L  
Temporary Easement for  
Grading Containing  
0.6 ac. (27621 sq ft),  
more or less

Parcel 87  
813+50.26 to 835+00 R  
Temporary Easement for  
Grading Containing  
4.6 ac. (199807 sq ft),  
more or less



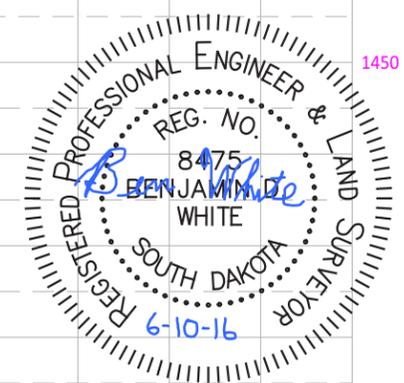
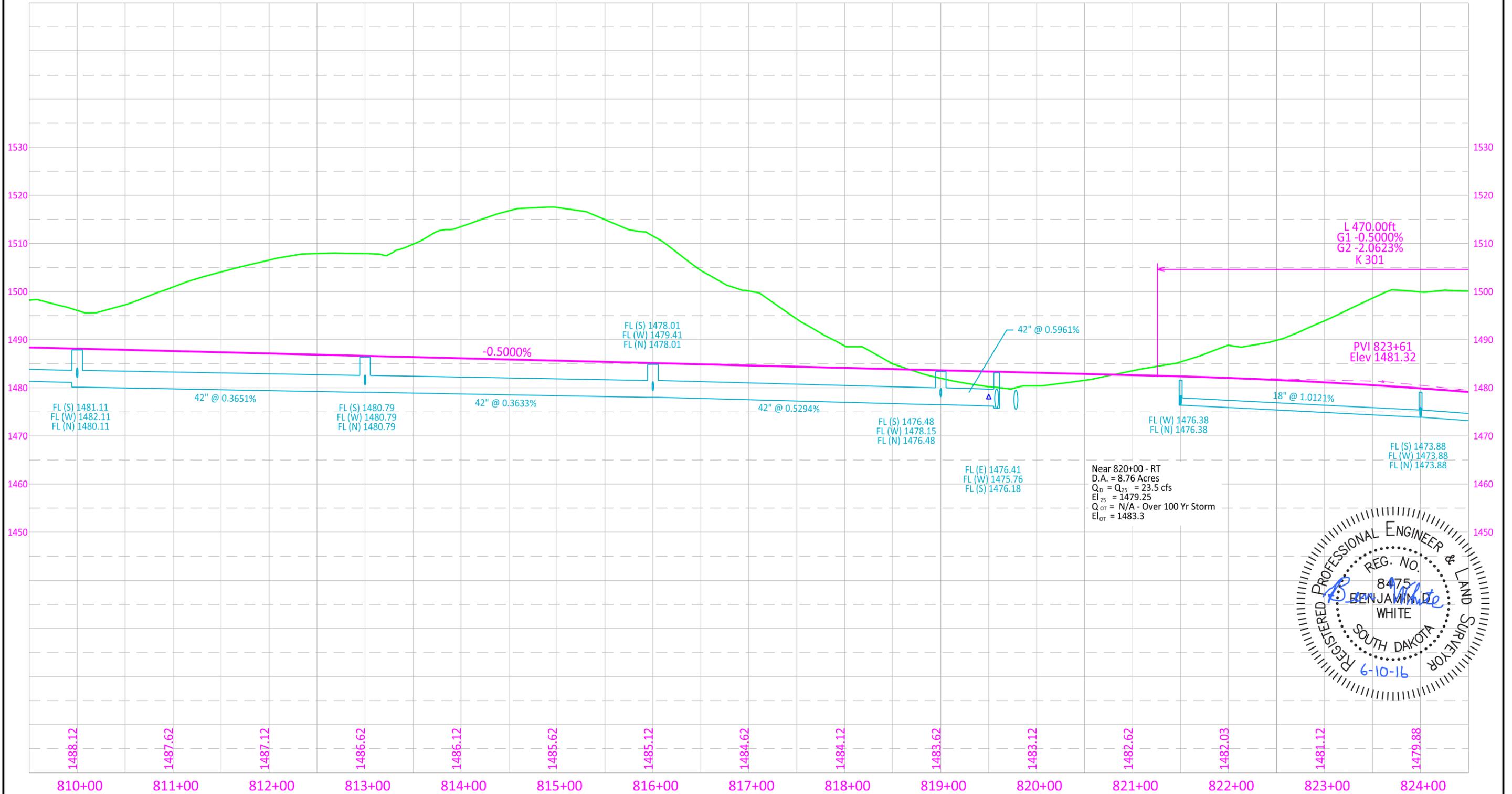
# Hwy 100

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0100(105)419	B36	B108

FILE: B36  
PLOTTING DATE: 06-10-2016

REV DATE:  
INITIAL:



FOR BIDDING PURPOSES ONLY

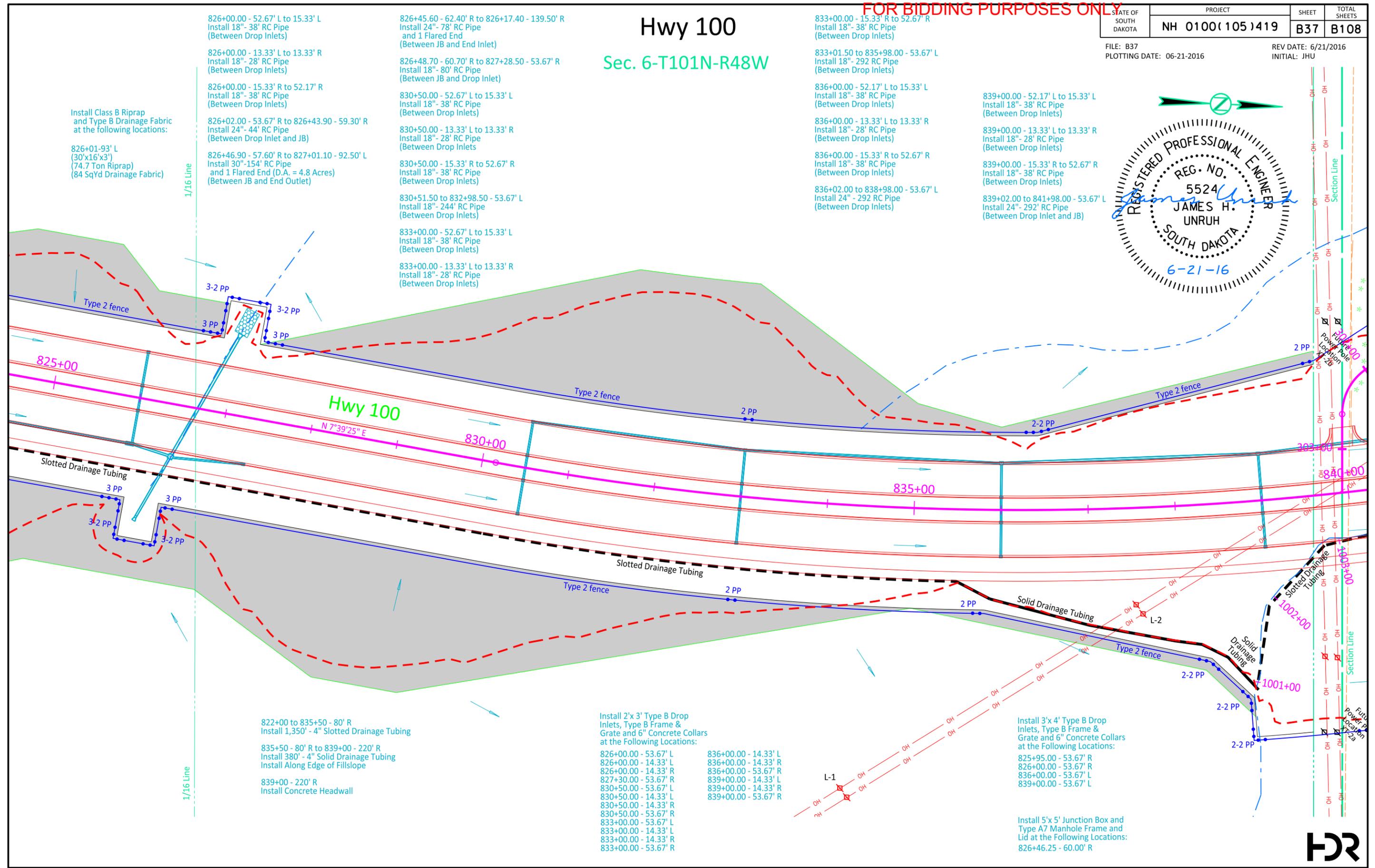
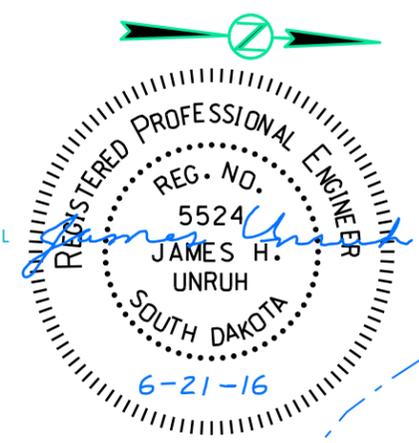
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0100(105)419	B37	B108

FILE: B37  
PLOTTING DATE: 06-21-2016

REV DATE: 6/21/2016  
INITIAL: JHU

# Hwy 100

## Sec. 6-T101N-R48W



826+00.00 - 52.67' L to 15.33' L  
Install 18" - 38' RC Pipe  
(Between Drop Inlets)

826+00.00 - 13.33' L to 13.33' R  
Install 18" - 28' RC Pipe  
(Between Drop Inlets)

826+00.00 - 15.33' R to 52.17' R  
Install 18" - 38' RC Pipe  
(Between Drop Inlets)

826+02.00 - 53.67' R to 826+43.90 - 59.30' R  
Install 24" - 44' RC Pipe  
(Between Drop Inlet and JB)

826+46.90 - 57.60' R to 827+01.10 - 92.50' L  
Install 30" - 154' RC Pipe  
and 1 Flared End (D.A. = 4.8 Acres)  
(Between JB and End Outlet)

826+45.60 - 62.40' R to 826+17.40 - 139.50' R  
Install 24" - 78' RC Pipe  
and 1 Flared End  
(Between JB and End Inlet)

826+48.70 - 60.70' R to 827+28.50 - 53.67' R  
Install 18" - 80' RC Pipe  
(Between JB and Drop Inlet)

830+50.00 - 52.67' L to 15.33' L  
Install 18" - 38' RC Pipe  
(Between Drop Inlets)

830+50.00 - 13.33' L to 13.33' R  
Install 18" - 28' RC Pipe  
(Between Drop Inlets)

830+50.00 - 15.33' R to 52.67' R  
Install 18" - 38' RC Pipe  
(Between Drop Inlets)

830+51.50 to 832+98.50 - 53.67' L  
Install 18" - 244' RC Pipe  
(Between Drop Inlets)

833+00.00 - 52.67' L to 15.33' L  
Install 18" - 38' RC Pipe  
(Between Drop Inlets)

833+00.00 - 13.33' L to 13.33' R  
Install 18" - 28' RC Pipe  
(Between Drop Inlets)

833+00.00 - 15.33' R to 52.67' R  
Install 18" - 38' RC Pipe  
(Between Drop Inlets)

833+01.50 to 835+98.00 - 53.67' L  
Install 18" - 292 RC Pipe  
(Between Drop Inlets)

836+00.00 - 52.17' L to 15.33' L  
Install 18" - 38' RC Pipe  
(Between Drop Inlets)

836+00.00 - 13.33' L to 13.33' R  
Install 18" - 28' RC Pipe  
(Between Drop Inlets)

836+00.00 - 15.33' R to 52.67' R  
Install 18" - 38' RC Pipe  
(Between Drop Inlets)

836+02.00 to 838+98.00 - 53.67' L  
Install 24" - 292 RC Pipe  
(Between Drop Inlets)

839+00.00 - 52.17' L to 15.33' L  
Install 18" - 38' RC Pipe  
(Between Drop Inlets)

839+00.00 - 13.33' L to 13.33' R  
Install 18" - 28' RC Pipe  
(Between Drop Inlets)

839+00.00 - 15.33' R to 52.67' R  
Install 18" - 38' RC Pipe  
(Between Drop Inlets)

839+02.00 to 841+98.00 - 53.67' L  
Install 24" - 292' RC Pipe  
(Between Drop Inlet and JB)

Install Class B Riprap  
and Type B Drainage Fabric  
at the following locations:

826+01-93' L  
(30'x16'x3')  
(74.7 Ton Riprap)  
(84 SqYd Drainage Fabric)

822+00 to 835+50 - 80' R  
Install 1,350' - 4" Slotted Drainage Tubing

835+50 - 80' R to 839+00 - 220' R  
Install 380' - 4" Solid Drainage Tubing  
Install Along Edge of Fillslope

839+00 - 220' R  
Install Concrete Headwall

Install 2'x3' Type B Drop  
Inlets, Type B Frame &  
Grate and 6" Concrete Collars  
at the Following Locations:

826+00.00 - 53.67' L  
826+00.00 - 14.33' L  
826+00.00 - 14.33' R  
827+30.00 - 53.67' R  
830+50.00 - 53.67' L  
830+50.00 - 14.33' L  
830+50.00 - 14.33' R  
830+50.00 - 53.67' R  
833+00.00 - 53.67' L  
833+00.00 - 14.33' L  
833+00.00 - 14.33' R  
833+00.00 - 53.67' R

836+00.00 - 14.33' L  
836+00.00 - 14.33' R  
836+00.00 - 53.67' R  
839+00.00 - 14.33' L  
839+00.00 - 14.33' R  
839+00.00 - 53.67' R

Install 3'x4' Type B Drop  
Inlets, Type B Frame &  
Grate and 6" Concrete Collars  
at the Following Locations:

825+95.00 - 53.67' R  
826+00.00 - 53.67' R  
836+00.00 - 53.67' L  
839+00.00 - 53.67' L

Install 5'x5' Junction Box and  
Type A7 Manhole Frame and  
Lid at the Following Locations:

826+46.25 - 60.00' R



# Hwy 100 ROW

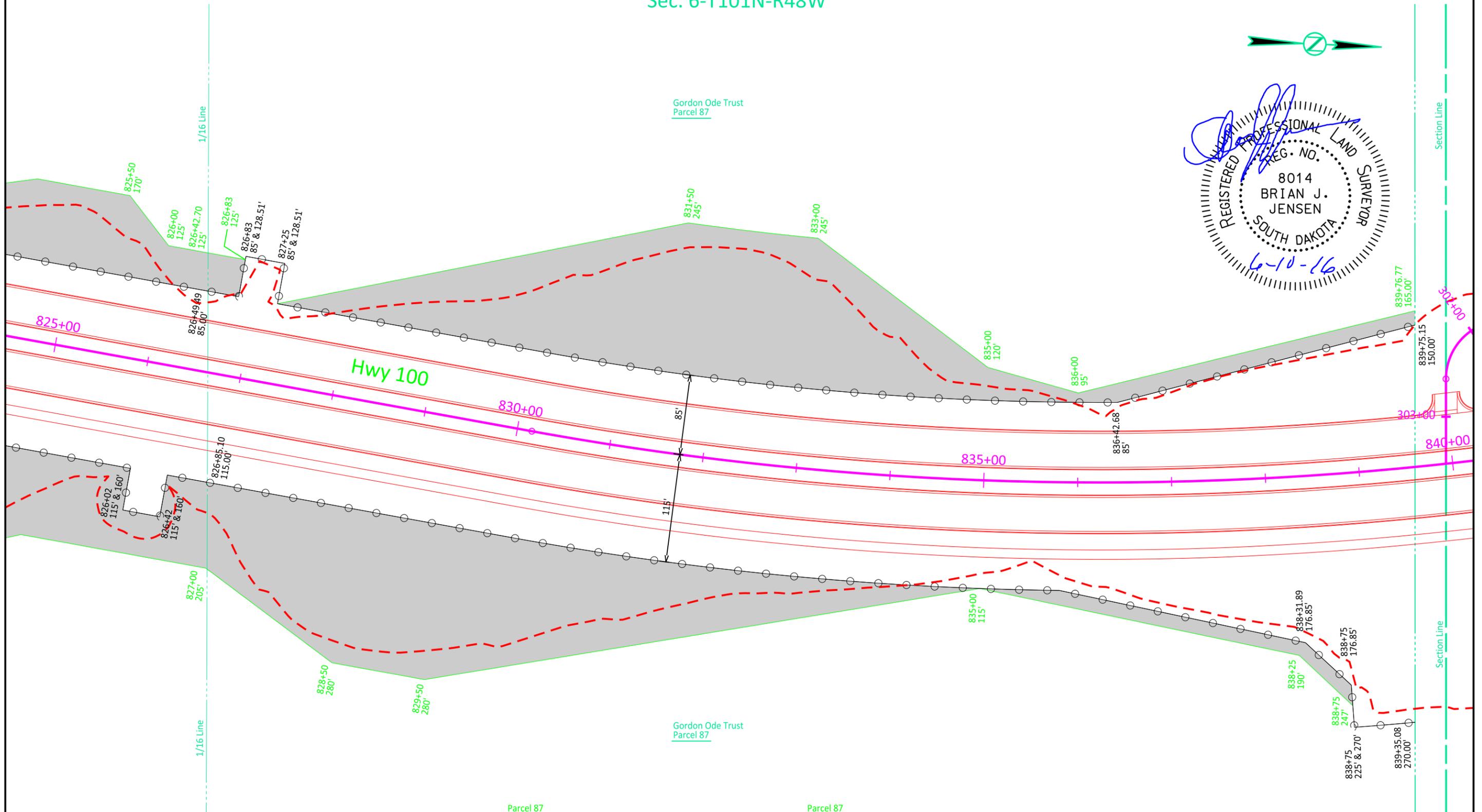
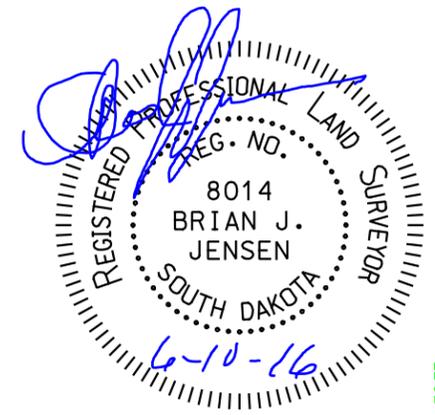
Sec. 6-T101N-R48W

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0100(105)419	B38	B108

FILE: B38 ROW  
PLOT DATE: 06-10-2016

REV DATE:  
INITIAL:



Parcel 87  
827+25 to 839+76.77 L  
Temporary Easement for  
Grading Containing  
1.9 ac. (84426 sq ft),  
more or less

Parcel 87  
835+00 to 838+75 R  
Temporary Easement for  
Grading Containing  
0.1 ac. (5659 sq ft),  
more or less



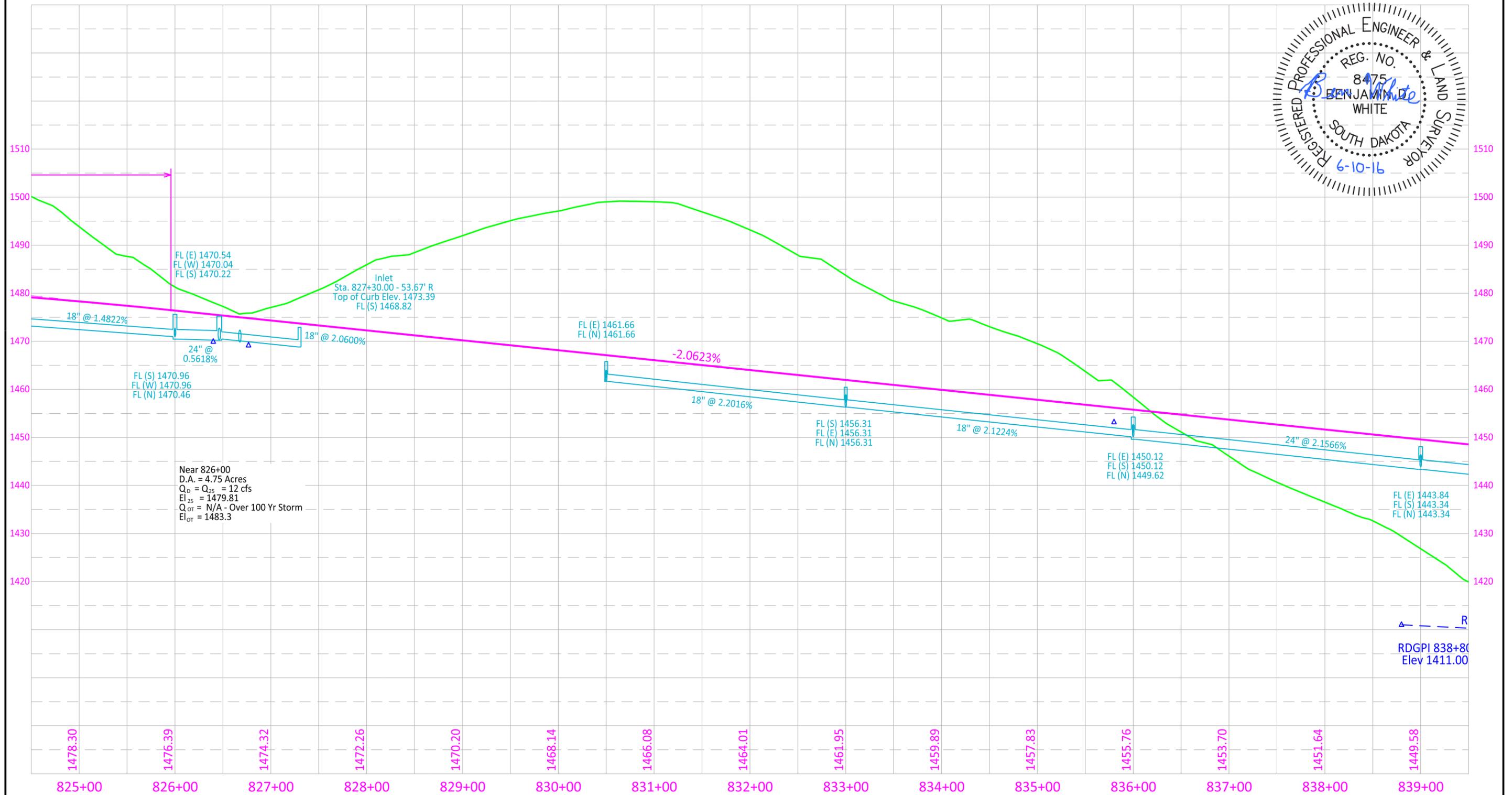
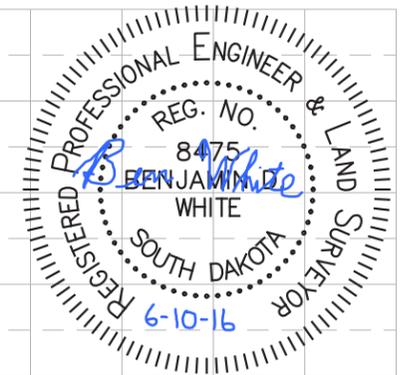
# Hwy 100

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0100(105)419	B39	B108

FILE: B39  
PLOTTING DATE: 06-10-2016

REV DATE:  
INITIAL:

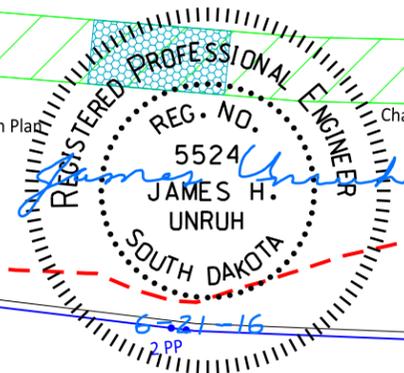
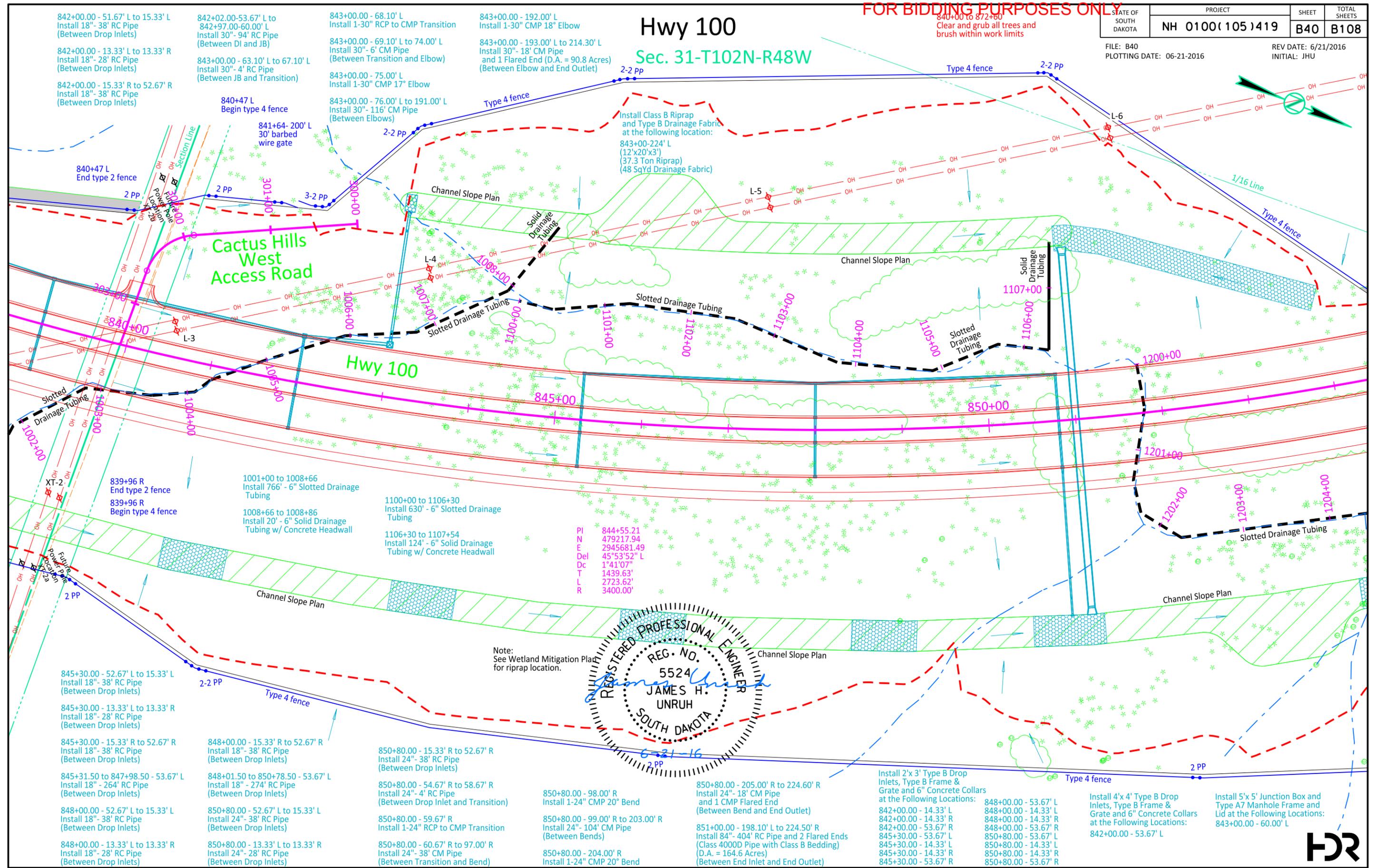


FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0100(105)419	B40	B108
FILE: B40	REV DATE: 6/21/2016		
PLOTTING DATE: 06-21-2016	INITIAL: JHU		

# Hwy 100

## Sec. 31-T102N-R48W



PI 844+55.21  
 NE 479217.94  
 Del 2945681.49  
 Dc 45°53'52" L  
 T 1'41'07"  
 L 1439.63'  
 R 2723.62'  
 L 3400.00'

842+00.00 - 51.67' L to 15.33' L  
 Install 18" - 38' RC Pipe  
 (Between Drop Inlets)

842+00.00 - 13.33' R to 13.33' R  
 Install 18" - 28' RC Pipe  
 (Between Drop Inlets)

842+00.00 - 15.33' R to 52.67' R  
 Install 18" - 38' RC Pipe  
 (Between Drop Inlets)

842+02.00-53.67' L to 842+97.00-60.00' L  
 Install 30" - 94' RC Pipe  
 (Between DI and JB)

843+00.00 - 63.10' L to 67.10' L  
 Install 30" - 4' RC Pipe  
 (Between JB and Transition)

843+00.00 - 68.10' L  
 Install 1-30" RCP to CMP Transition

843+00.00 - 69.10' L to 74.00' L  
 Install 30" - 6' CM Pipe  
 (Between Transition and Elbow)

843+00.00 - 75.00' L  
 Install 1-30" CMP 17" Elbow

843+00.00 - 76.00' L to 191.00' L  
 Install 30" - 116' CM Pipe  
 (Between Elbows)

843+00.00 - 192.00' L  
 Install 1-30" CMP 18" Elbow

843+00.00 - 193.00' L to 214.30' L  
 Install 30" - 18' CM Pipe  
 and 1 Flared End (D.A. = 90.8 Acres)

840+00 to 872+80  
 Clear and grub all trees and  
 brush within work limits

839+96 R  
 End type 2 fence  
 Begin type 4 fence

1001+00 to 1008+66  
 Install 766' - 6" Slotted Drainage  
 Tubing

1008+66 to 1008+86  
 Install 20' - 6" Solid Drainage  
 Tubing w/ Concrete Headwall

1100+00 to 1106+30  
 Install 630' - 6" Slotted Drainage  
 Tubing

1106+30 to 1107+54  
 Install 124' - 6" Solid Drainage  
 Tubing w/ Concrete Headwall

845+30.00 - 52.67' L to 15.33' L  
 Install 18" - 38' RC Pipe  
 (Between Drop Inlets)

845+30.00 - 13.33' R to 13.33' R  
 Install 18" - 28' RC Pipe  
 (Between Drop Inlets)

845+30.00 - 15.33' R to 52.67' R  
 Install 18" - 38' RC Pipe  
 (Between Drop Inlets)

848+00.00 - 15.33' R to 52.67' R  
 Install 18" - 38' RC Pipe  
 (Between Drop Inlets)

848+01.50 to 850+78.50 - 53.67' L  
 Install 18" - 274' RC Pipe  
 (Between Drop Inlets)

850+80.00 - 15.33' R to 52.67' R  
 Install 24" - 38' RC Pipe  
 (Between Drop Inlets)

850+80.00 - 54.67' R to 58.67' R  
 Install 24" - 4' RC Pipe  
 (Between Drop Inlet and Transition)

850+80.00 - 59.67' R  
 Install 1-24" RCP to CMP Transition

850+80.00 - 98.00' R  
 Install 1-24" CMP 20" Bend

850+80.00 - 99.00' R to 203.00' R  
 Install 24" - 104' CM Pipe  
 (Between Bends)

850+80.00 - 204.00' R  
 Install 1-24" CMP 20" Bend

850+80.00 - 205.00' R to 224.60' R  
 Install 24" - 18' CM Pipe  
 and 1 CMP Flared End  
 (Between Bend and End Outlet)

851+00.00 - 198.10' L to 224.50' R  
 Install 84" - 404' RC Pipe and 2 Flared Ends  
 (Class 4000D Pipe with Class B Bedding)  
 (D.A. = 164.6 Acres)

Install 2'x 3' Type B Drop  
 Inlets, Type B Frame &  
 Grate and 6" Concrete Collars  
 at the Following Locations:

842+00.00 - 14.33' L  
 842+00.00 - 14.33' R  
 842+00.00 - 53.67' R  
 845+30.00 - 53.67' L  
 845+30.00 - 14.33' R  
 845+30.00 - 53.67' R

848+00.00 - 53.67' L  
 848+00.00 - 14.33' L  
 848+00.00 - 14.33' R  
 848+00.00 - 53.67' R  
 850+80.00 - 53.67' L  
 850+80.00 - 14.33' L  
 850+80.00 - 14.33' R  
 850+80.00 - 53.67' R

Install 4'x 4' Type B Drop  
 Inlets, Type B Frame &  
 Grate and 6" Concrete Collars  
 at the Following Locations:

842+00.00 - 53.67' L

Install 5'x 5' Junction Box and  
 Type A7 Manhole Frame and  
 Lid at the Following Locations:

843+00.00 - 60.00' L



FOR BIDDING PURPOSES ONLY

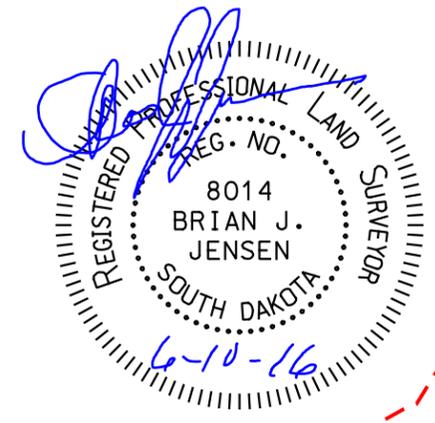
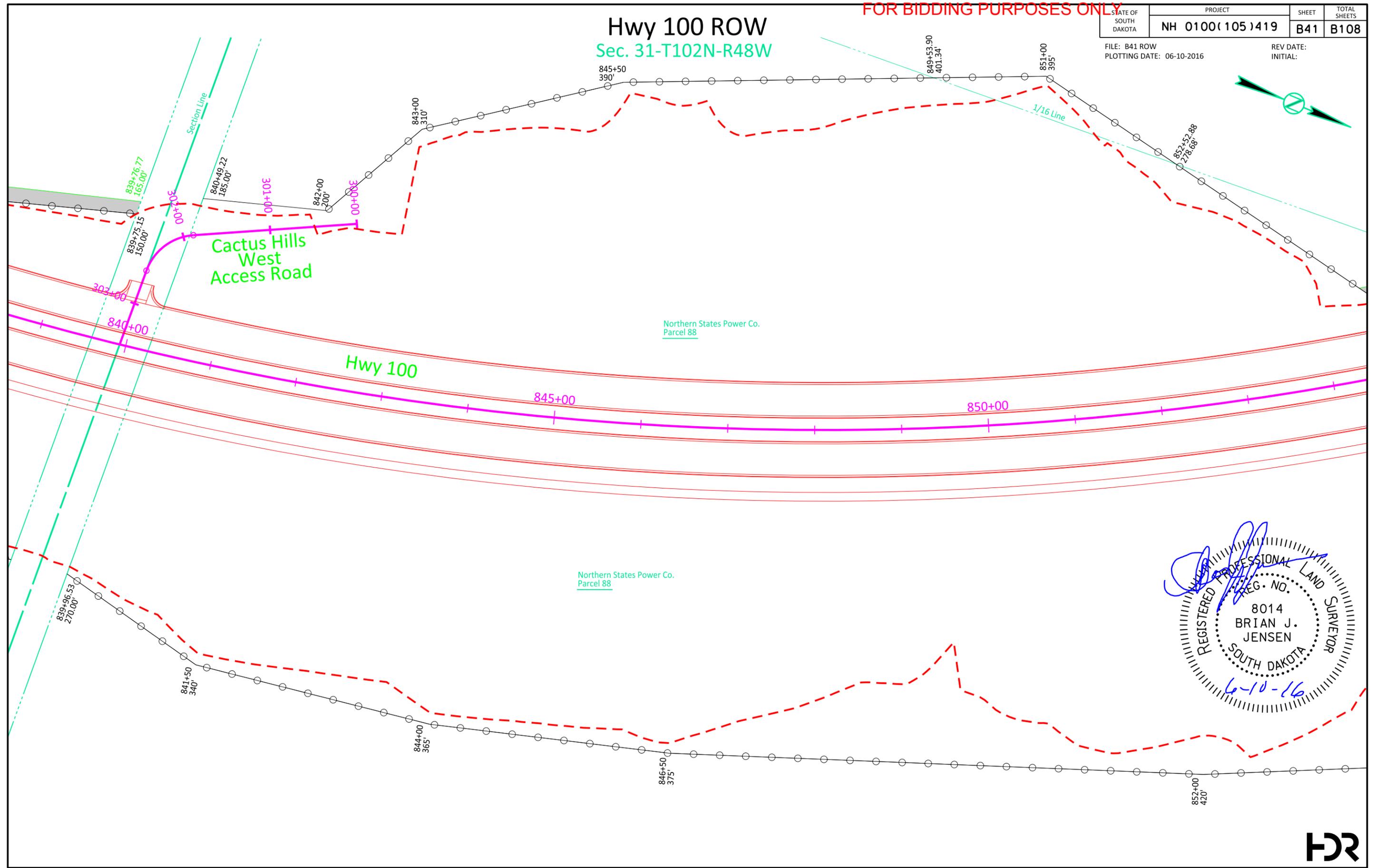
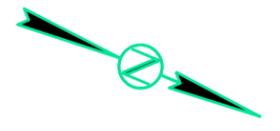
# Hwy 100 ROW

Sec. 31-T102N-R48W

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0100(105)419	B41	B108

FILE: B41 ROW  
PLOTING DATE: 06-10-2016

REV DATE:  
INITIAL:

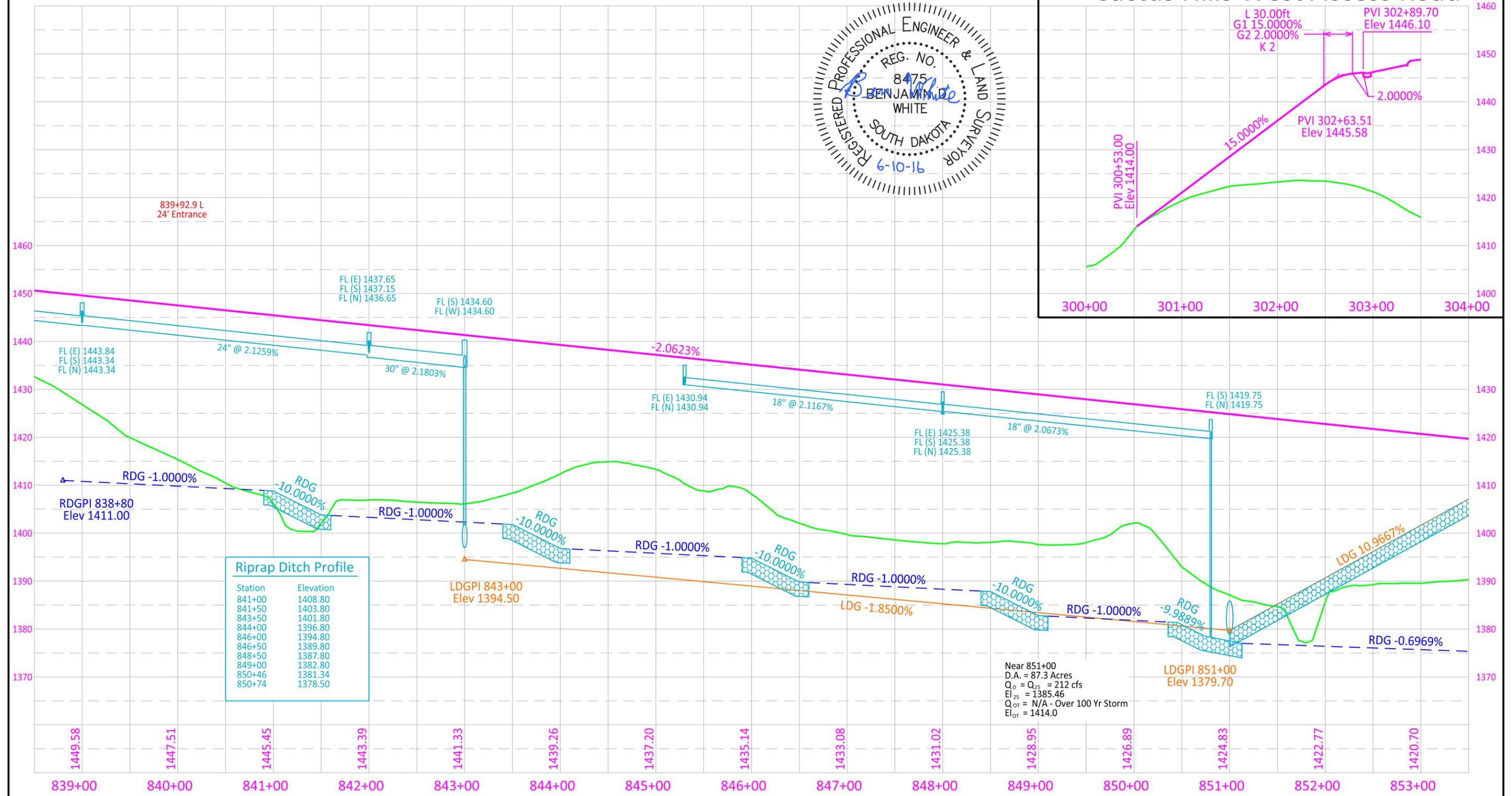
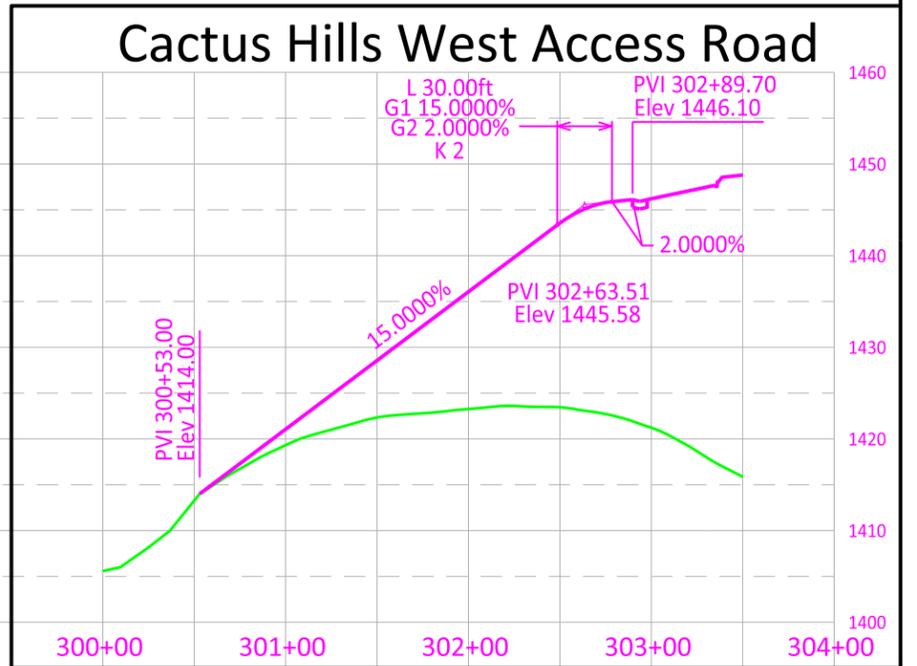
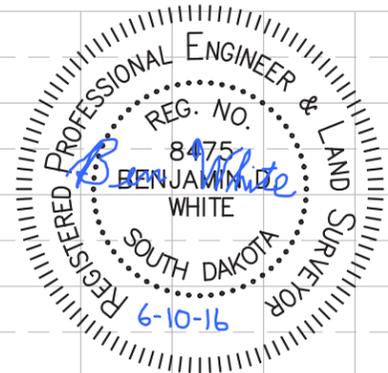


# Hwy 100

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0100(105)419	B42	B108

FILE: B42-B43.dgn  
PLOTTING DATE: 06-10-2016  
REV DATE: INITIAL:



**Riprap Ditch Profile**

Station	Elevation
841+00	1408.80
841+50	1403.80
843+50	1401.80
844+00	1396.80
846+00	1394.80
846+50	1389.80
848+50	1387.80
849+00	1382.80
850+46	1381.34
850+74	1378.50

Near 851+00  
D.A. = 87.3 Acres  
Q<sub>D</sub> = Q<sub>25</sub> = 212 cfs  
E<sub>15</sub> = 1385.46  
Q<sub>OT</sub> = N/A - Over 100 Yr Storm  
E<sub>OT</sub> = 1414.0



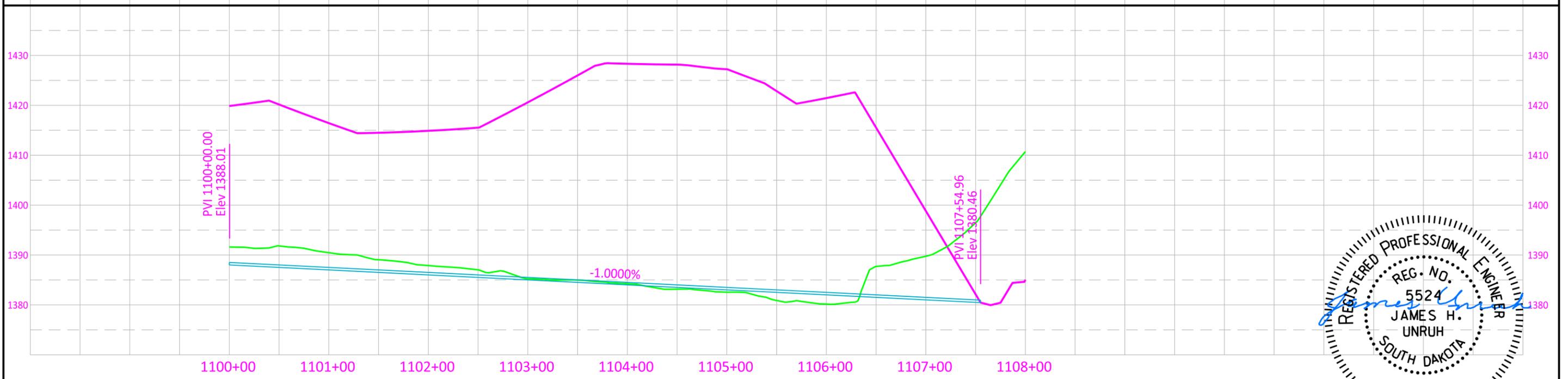
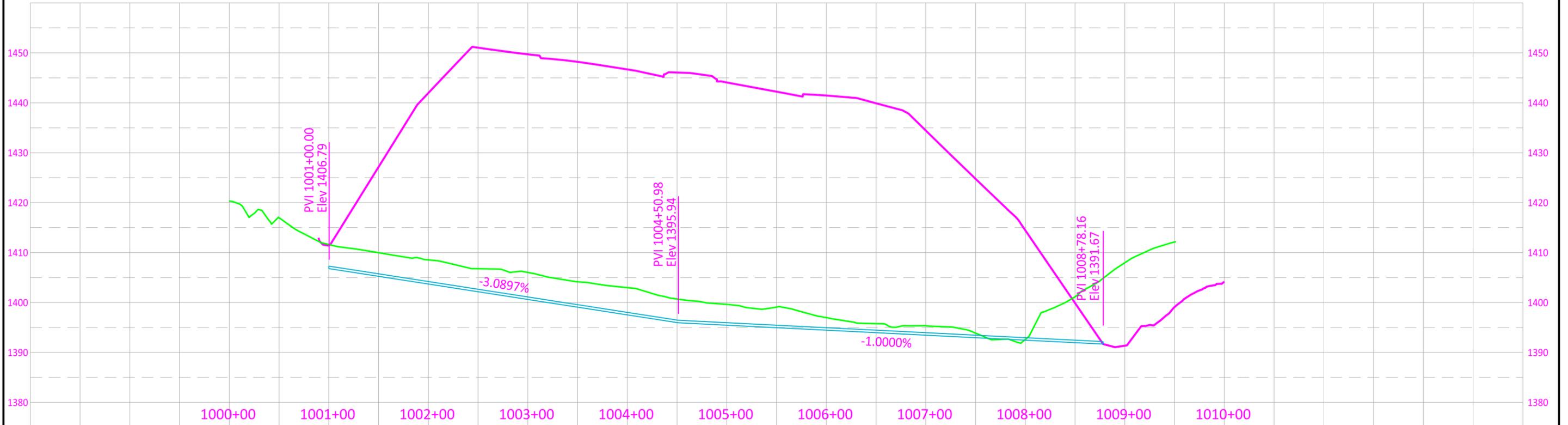
# Underdrain Profile (South)

FOR BIDDING PURPOSES ONLY

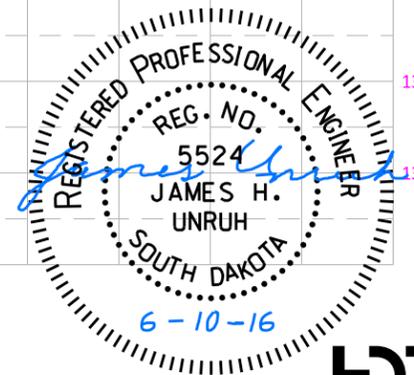
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0100(105)419	B43	B108

FILE: B42-B43.dgn  
PLOT DATE: 06-10-2016

REV DATE:  
INITIAL:



# Underdrain Profile (Middle)

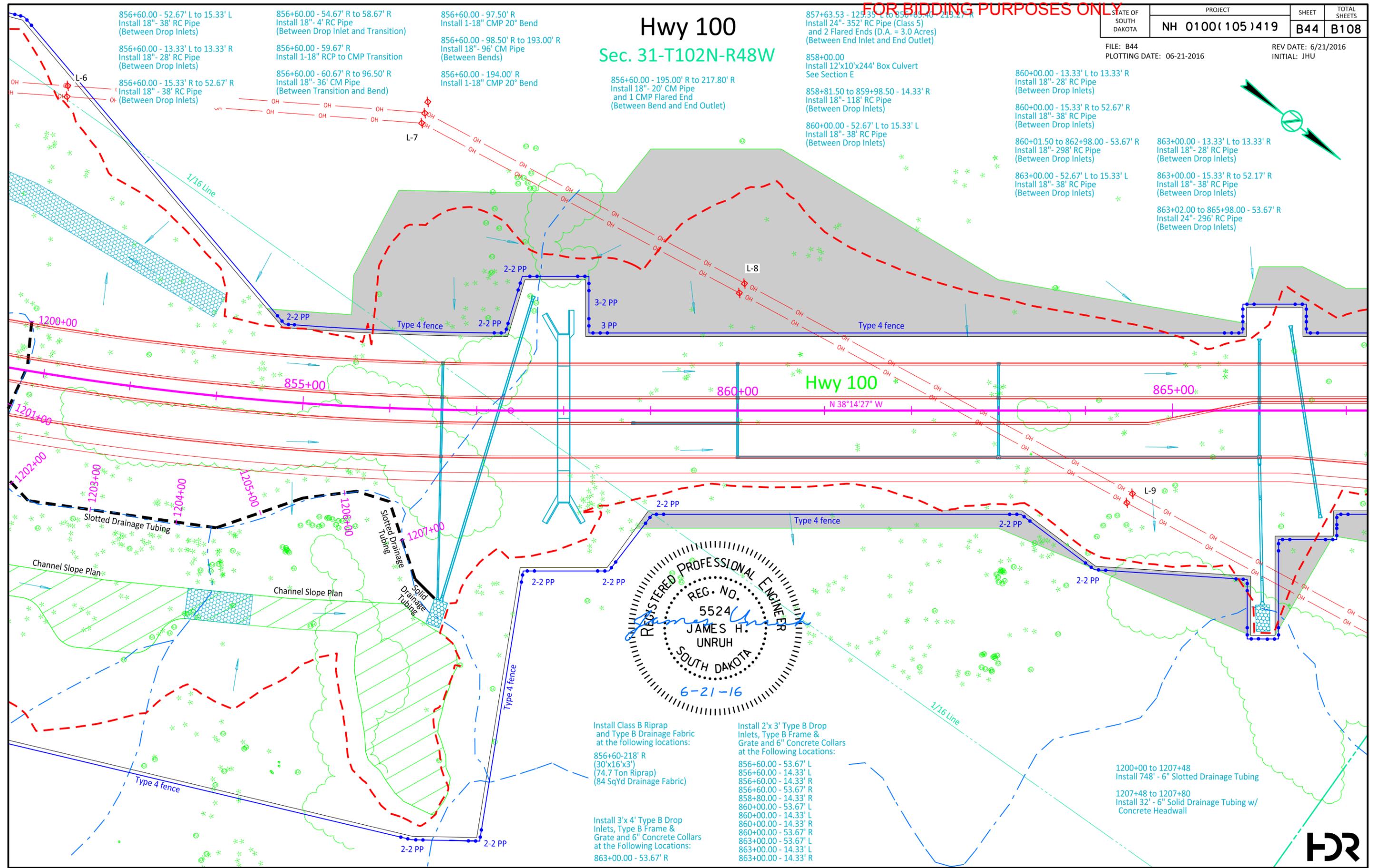


FOR BIDDING PURPOSES ONLY

# Hwy 100

## Sec. 31-T102N-R48W

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0100(105)419	B44	B108
FILE: B44	REV DATE: 6/21/2016		INITIAL: JHU
PLOTTING DATE: 06-21-2016			



856+60.00 - 52.67' L to 15.33' L  
Install 18" - 38' RC Pipe  
(Between Drop Inlets)

856+60.00 - 13.33' L to 13.33' R  
Install 18" - 28' RC Pipe  
(Between Drop Inlets)

856+60.00 - 15.33' R to 52.67' R  
Install 18" - 38' RC Pipe  
(Between Drop Inlets)

856+60.00 - 54.67' R to 58.67' R  
Install 18" - 4' RC Pipe  
(Between Drop Inlet and Transition)

856+60.00 - 59.67' R  
Install 1-18" RCP to CMP Transition

856+60.00 - 60.67' R to 96.50' R  
Install 18" - 36' CM Pipe  
(Between Transition and Bend)

856+60.00 - 97.50' R  
Install 1-18" CMP 20° Bend

856+60.00 - 98.50' R to 193.00' R  
Install 18" - 96' CM Pipe  
(Between Bends)

856+60.00 - 194.00' R  
Install 1-18" CMP 20° Bend

856+60.00 - 195.00' R to 217.80' R  
Install 18" - 20' CM Pipe  
and 1 CMP Flared End  
(Between Bend and End Outlet)

857+63.53 - 125.35' L to 856+60.00 - 215.27' R  
Install 24" - 352' RC Pipe (Class 5)  
and 2 Flared Ends (D.A. = 3.0 Acres)  
(Between End Inlet and End Outlet)

858+00.00  
Install 12'x10'x244" Box Culvert  
See Section E

858+81.50 to 859+98.50 - 14.33' R  
Install 18" - 118' RC Pipe  
(Between Drop Inlets)

860+00.00 - 52.67' L to 15.33' L  
Install 18" - 38' RC Pipe  
(Between Drop Inlets)

860+00.00 - 13.33' L to 13.33' R  
Install 18" - 28' RC Pipe  
(Between Drop Inlets)

860+00.00 - 15.33' R to 52.67' R  
Install 18" - 38' RC Pipe  
(Between Drop Inlets)

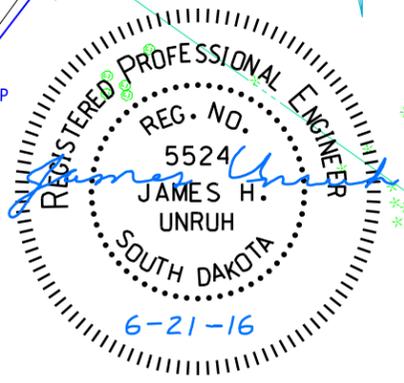
860+01.50 to 862+98.00 - 53.67' R  
Install 18" - 298' RC Pipe  
(Between Drop Inlets)

863+00.00 - 52.67' L to 15.33' L  
Install 18" - 38' RC Pipe  
(Between Drop Inlets)

863+00.00 - 13.33' L to 13.33' R  
Install 18" - 28' RC Pipe  
(Between Drop Inlets)

863+00.00 - 15.33' R to 52.17' R  
Install 18" - 38' RC Pipe  
(Between Drop Inlets)

863+02.00 to 865+98.00 - 53.67' R  
Install 24" - 296' RC Pipe  
(Between Drop Inlets)



Install Class B Riprap and Type B Drainage Fabric at the following locations:  
856+60-218' R  
(30'x16'x3')  
(74.7 Ton Riprap)  
(84 SqYd Drainage Fabric)

Install 3'x4' Type B Drop Inlets, Type B Frame & Grate and 6" Concrete Collars at the Following Locations:  
863+00.00 - 53.67' R

Install 2'x3' Type B Drop Inlets, Type B Frame & Grate and 6" Concrete Collars at the Following Locations:  
856+60.00 - 53.67' L  
856+60.00 - 14.33' L  
856+60.00 - 14.33' R  
856+60.00 - 53.67' R  
858+80.00 - 14.33' R  
860+00.00 - 53.67' L  
860+00.00 - 14.33' L  
860+00.00 - 14.33' R  
860+00.00 - 53.67' R  
863+00.00 - 53.67' L  
863+00.00 - 14.33' L  
863+00.00 - 14.33' R

1200+00 to 1207+48  
Install 748' - 6" Slotted Drainage Tubing

1207+48 to 1207+80  
Install 32' - 6" Solid Drainage Tubing w/  
Concrete Headwall



# Hwy 100 ROW

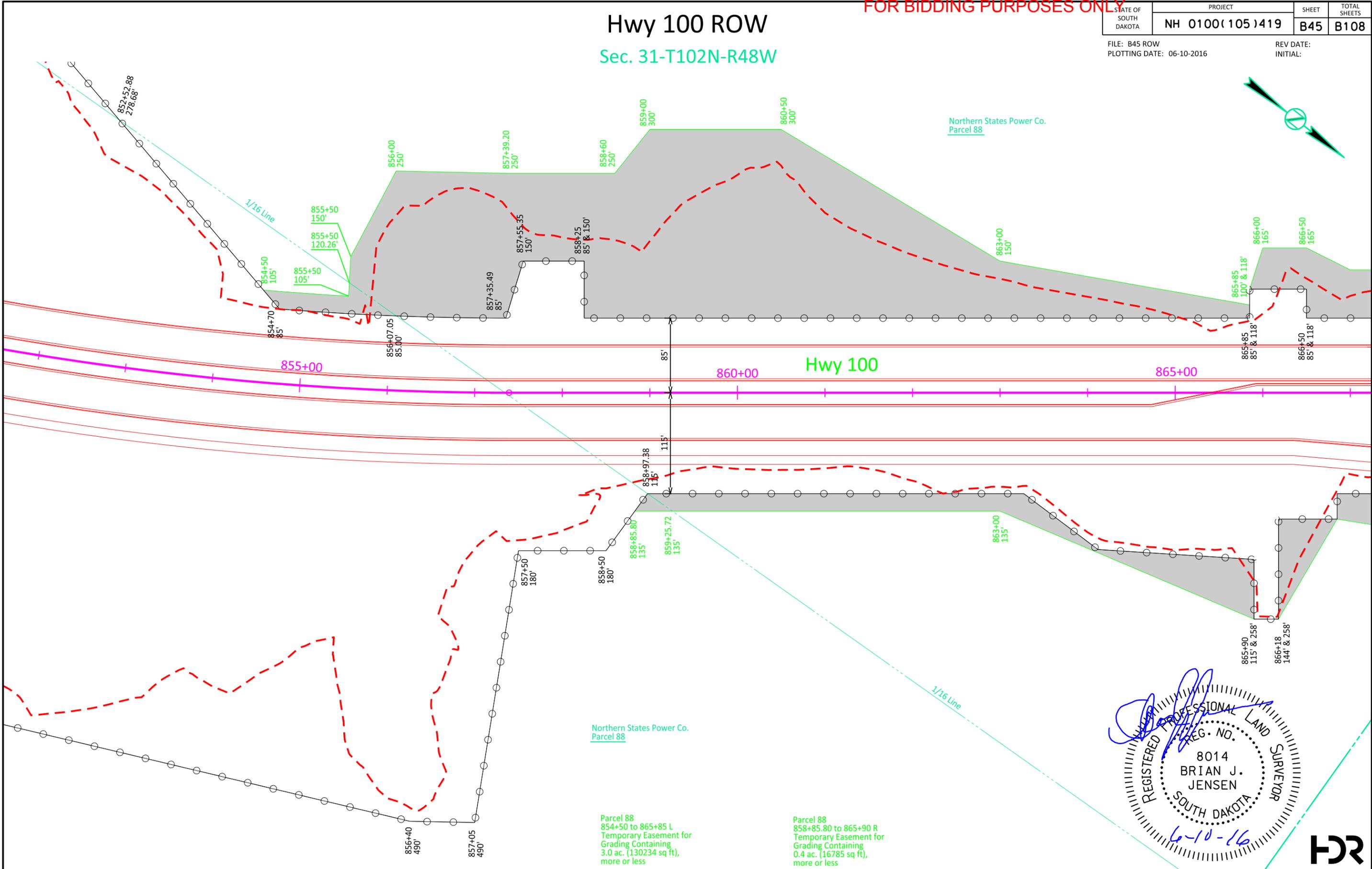
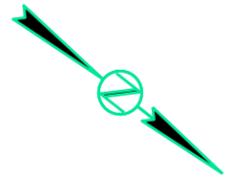
## Sec. 31-T102N-R48W

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0100(105)419	B45	B108

FILE: B45 ROW  
PLOTING DATE: 06-10-2016

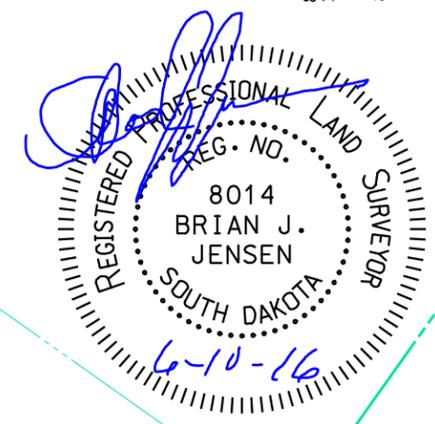
REV DATE:  
INITIAL:



Northern States Power Co.  
Parcel 88

Parcel 88  
854+50 to 865+85 L  
Temporary Easement for  
Grading Containing  
3.0 ac. (130234 sq ft),  
more or less

Parcel 88  
858+85.80 to 865+90 R  
Temporary Easement for  
Grading Containing  
0.4 ac. (16785 sq ft),  
more or less

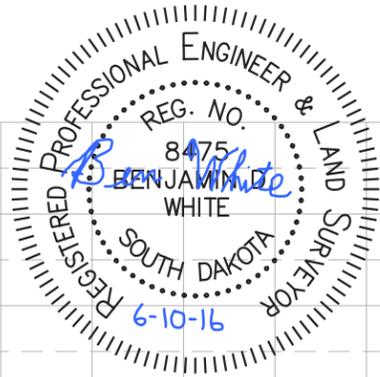


# Hwy 100

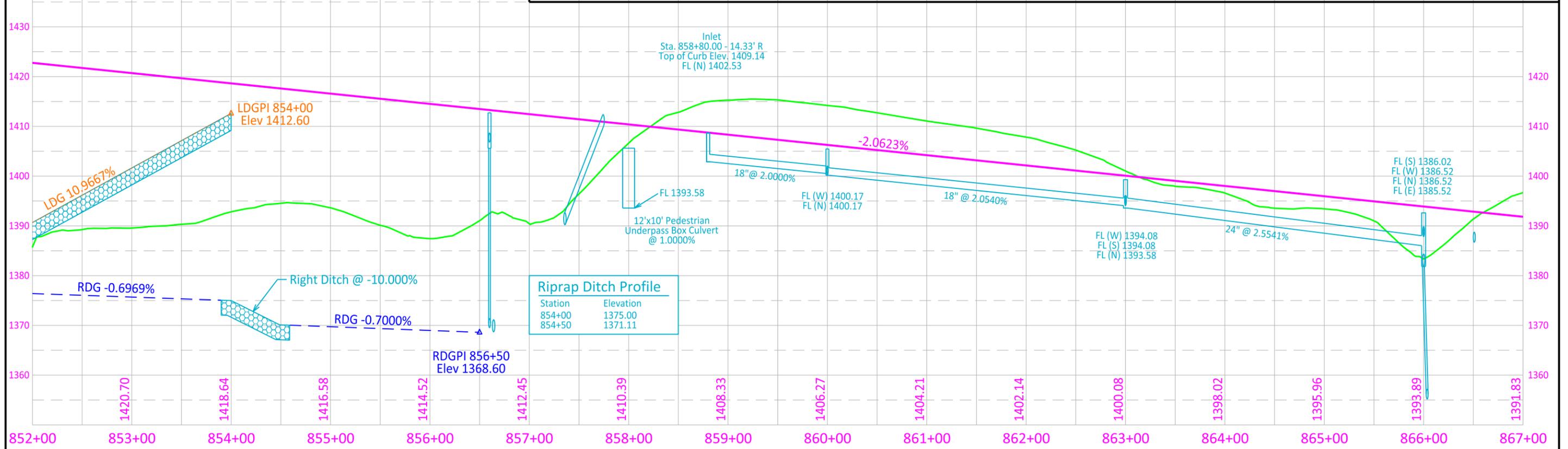
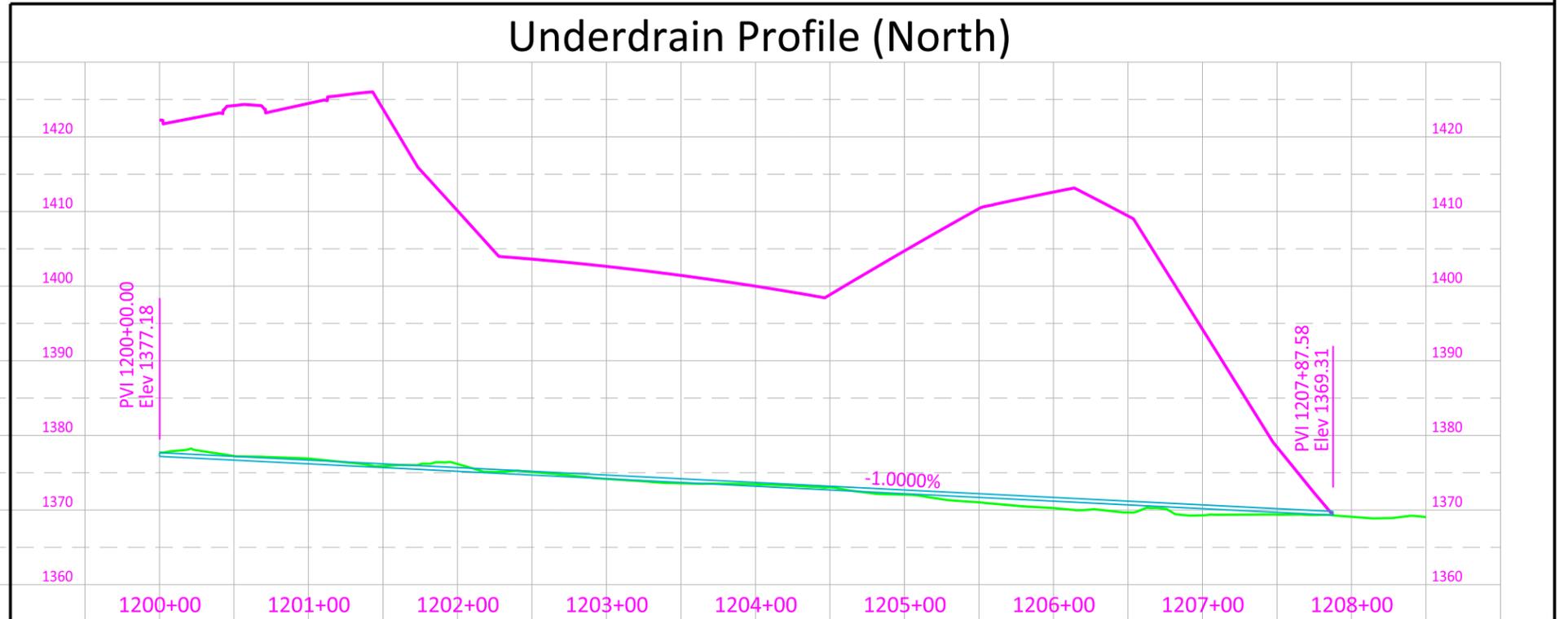
FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0100(105)419	B46	B108

FILE: B46  
PLOTTING DATE: 06-10-2016  
REV DATE:  
INITIAL:



## Underdrain Profile (North)



FOR BIDDING PURPOSES ONLY

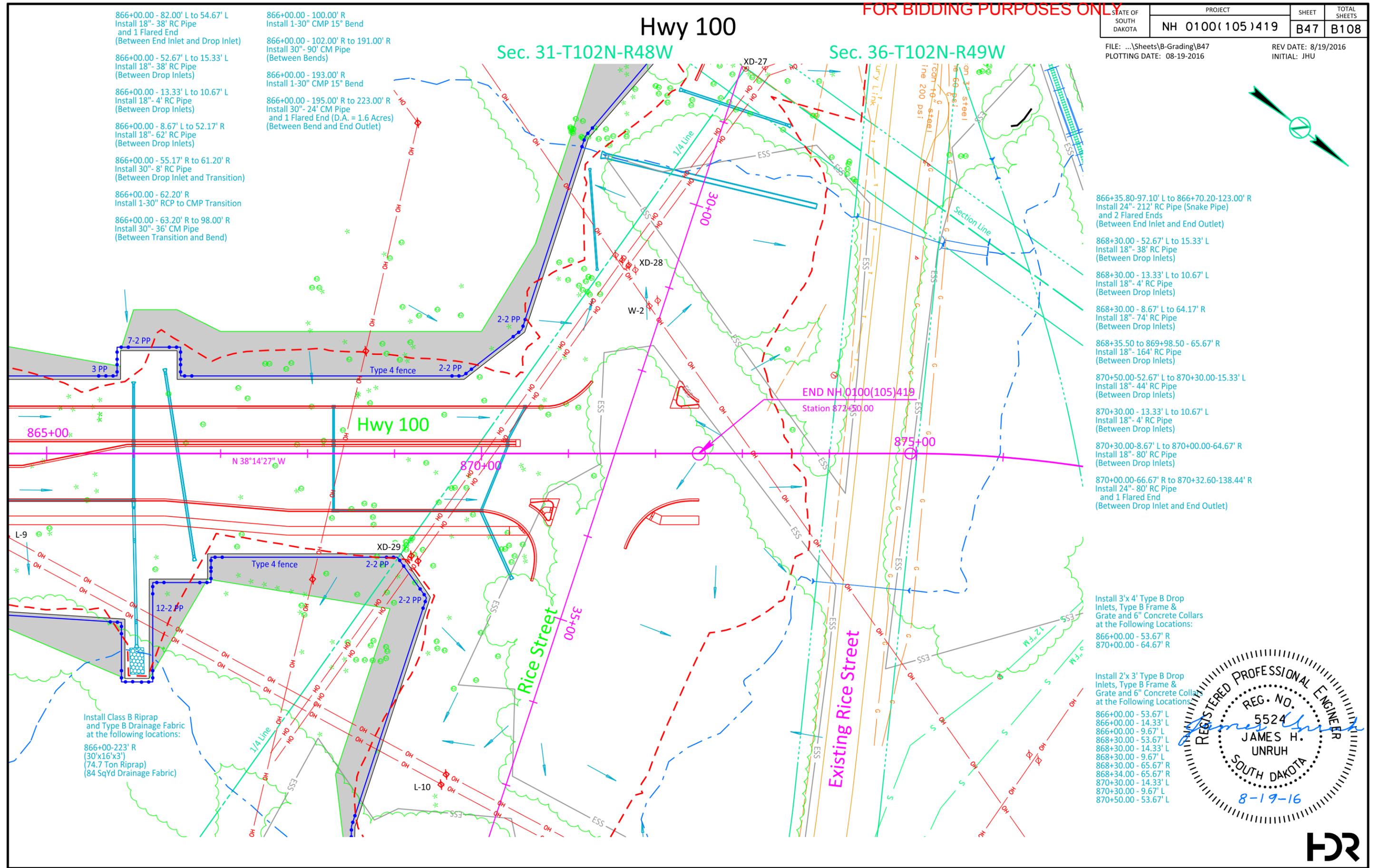
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0100(105)419	B47	B108

FILE: ...\\Sheets\\B-Grading\\B47  
PLOTTING DATE: 08-19-2016  
REV DATE: 8/19/2016  
INITIAL: JHU

# Hwy 100

## Sec. 31-T102N-R48W

## Sec. 36-T102N-R49W



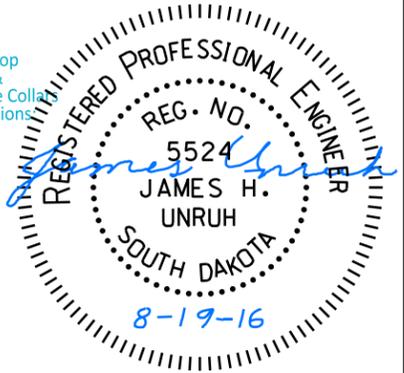
- 866+00.00 - 82.00' L to 54.67' L  
Install 18"- 38' RC Pipe  
and 1 Flared End  
(Between End Inlet and Drop Inlet)
- 866+00.00 - 52.67' L to 15.33' L  
(Between Drop Inlets)
- 866+00.00 - 13.33' L to 10.67' L  
Install 18"- 4' RC Pipe  
(Between Drop Inlets)
- 866+00.00 - 8.67' L to 52.17' R  
Install 18"- 62' RC Pipe  
(Between Drop Inlets)
- 866+00.00 - 55.17' R to 61.20' R  
Install 30"- 8' RC Pipe  
(Between Drop Inlet and Transition)
- 866+00.00 - 62.20' R  
Install 1-30" RCP to CMP Transition
- 866+00.00 - 63.20' R to 98.00' R  
Install 30"- 36' CM Pipe  
(Between Transition and Bend)
- 866+00.00 - 100.00' R  
Install 1-30" CMP 15° Bend
- 866+00.00 - 102.00' R to 191.00' R  
(Between Bends)
- 866+00.00 - 193.00' R  
Install 1-30" CMP 15° Bend
- 866+00.00 - 195.00' R to 223.00' R  
Install 30"- 24' CM Pipe  
and 1 Flared End (D.A. = 1.6 Acres)  
(Between Bend and End Outlet)

- 866+35.80-97.10' L to 866+70.20-123.00' R  
Install 24"- 212' RC Pipe (Snake Pipe)  
and 2 Flared Ends  
(Between End Inlet and End Outlet)
- 868+30.00 - 52.67' L to 15.33' L  
Install 18"- 38' RC Pipe  
(Between Drop Inlets)
- 868+30.00 - 13.33' L to 10.67' L  
Install 18"- 4' RC Pipe  
(Between Drop Inlets)
- 868+30.00 - 8.67' L to 64.17' R  
Install 18"- 74' RC Pipe  
(Between Drop Inlets)
- 868+35.50 to 869+98.50 - 65.67' R  
Install 18"- 164' RC Pipe  
(Between Drop Inlets)
- 870+50.00-52.67' L to 870+30.00-15.33' L  
Install 18"- 44' RC Pipe  
(Between Drop Inlets)
- 870+30.00 - 13.33' L to 10.67' L  
Install 18"- 4' RC Pipe  
(Between Drop Inlets)
- 870+30.00-8.67' L to 870+00.00-64.67' R  
Install 18"- 80' RC Pipe  
(Between Drop Inlets)
- 870+00.00-66.67' R to 870+32.60-138.44' R  
Install 24"- 80' RC Pipe  
and 1 Flared End  
(Between Drop Inlet and End Outlet)

Install 3'x 4' Type B Drop  
Inlets, Type B Frame &  
Grate and 6" Concrete Collars  
at the Following Locations:  
866+00.00 - 53.67' R  
870+00.00 - 64.67' R

Install 2'x 3' Type B Drop  
Inlets, Type B Frame &  
Grate and 6" Concrete Collars  
at the Following Locations:  
866+00.00 - 53.67' L  
866+00.00 - 14.33' L  
866+00.00 - 9.67' L  
868+30.00 - 53.67' L  
868+30.00 - 14.33' L  
868+30.00 - 9.67' L  
868+30.00 - 65.67' R  
868+34.00 - 65.67' R  
870+30.00 - 14.33' L  
870+30.00 - 9.67' L  
870+50.00 - 53.67' L

Install Class B Riprap  
and Type B Drainage Fabric  
at the following locations:  
866+00-223' R  
(30'x16'x3')  
(74.7 Ton Riprap)  
(84 SqYd Drainage Fabric)



FOR BIDDING PURPOSES ONLY

# Hwy 100 ROW

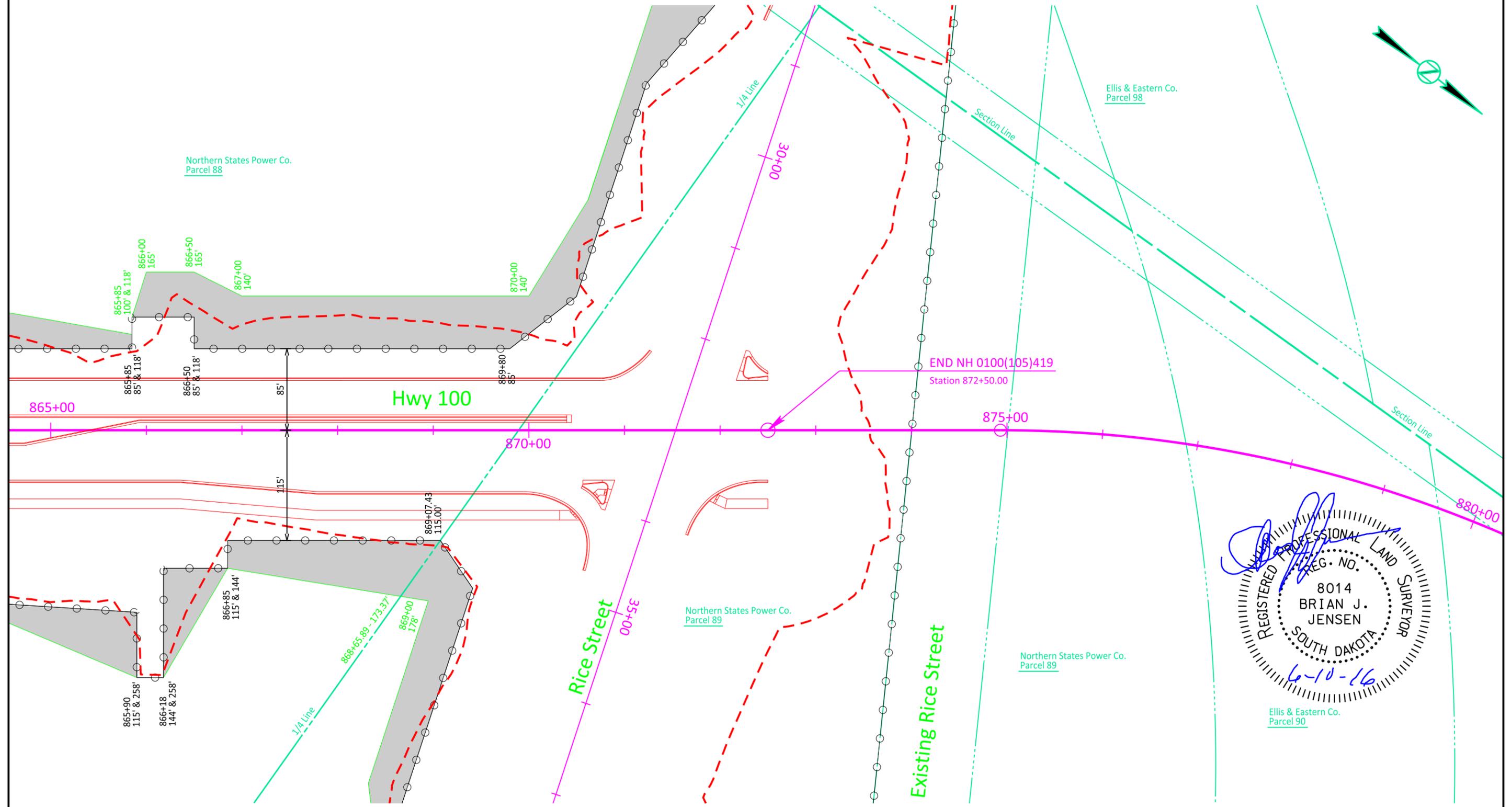
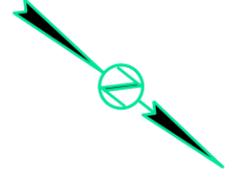
Sec. 31-T102N-R48W

Sec. 36-T102N-R49W

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0100(105)419	B48	B108

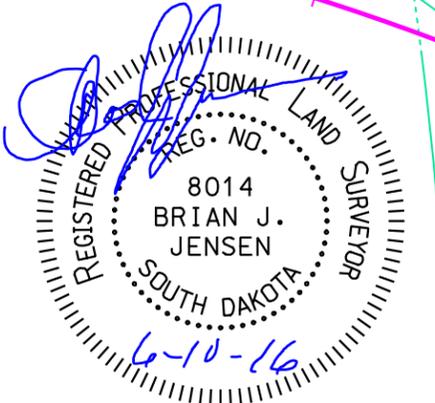
FILE: B48 ROW  
PLOTTING DATE: 06-10-2016

REV DATE:  
INITIAL:



Parcel 88  
866+18 to 866+85 R  
Temporary Easement for  
Grading Containing  
0.1 ac. (3820 sq ft),  
more or less

Parcel 88  
866+85 to 869+07.43 R  
Temporary Easement for  
Grading Containing  
0.2 ac. (9118 sq ft),  
more or less



Ellis & Eastern Co.  
Parcel 90



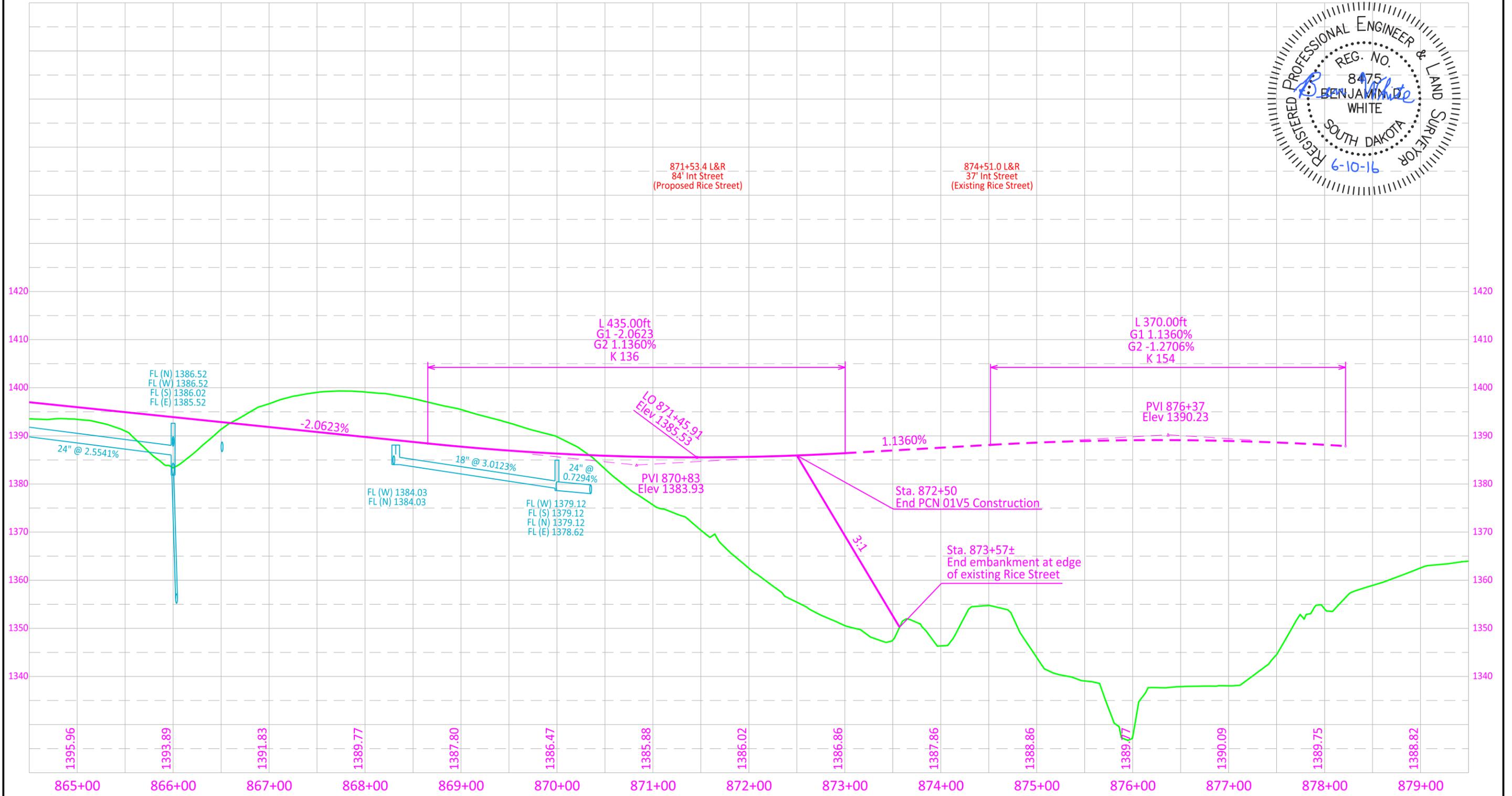
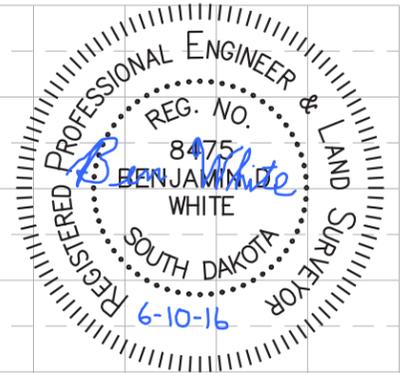
# Hwy 100

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0100(105)419	B49	B108

FILE: B49  
PLOTING DATE: 06-10-2016

REV DATE:  
INITIAL:



FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT NH 0100(105)419	SHEET B50	TOTAL SHEETS B108
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FILE: B50 (Rice)  
PLOTTING DATE: 06-10-2016

REV DATE:  
INITIAL:

# Rice Street

## Sec. 13-T101N-R49W

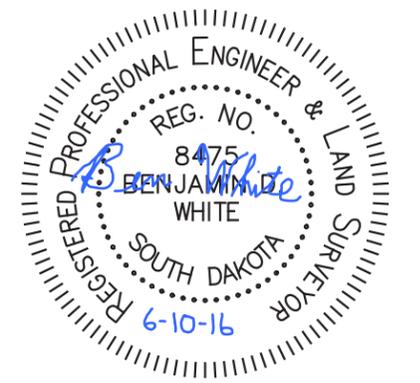
4+83, 28' L to 51' R  
Take out 2.75'x4' - 82' CMP Arch  
(Incidental Work, Grading)

4+90, 28' L to 51' R  
Take out 2.75'x4' - 82' CMP Arch  
(Incidental Work, Grading)

4+87 - 28' L to 4+86 - 22' L  
Install 42" - 6' CMP Arch Pipe  
and 1 Safety End  
(Between Safety End and Existing Pipe)

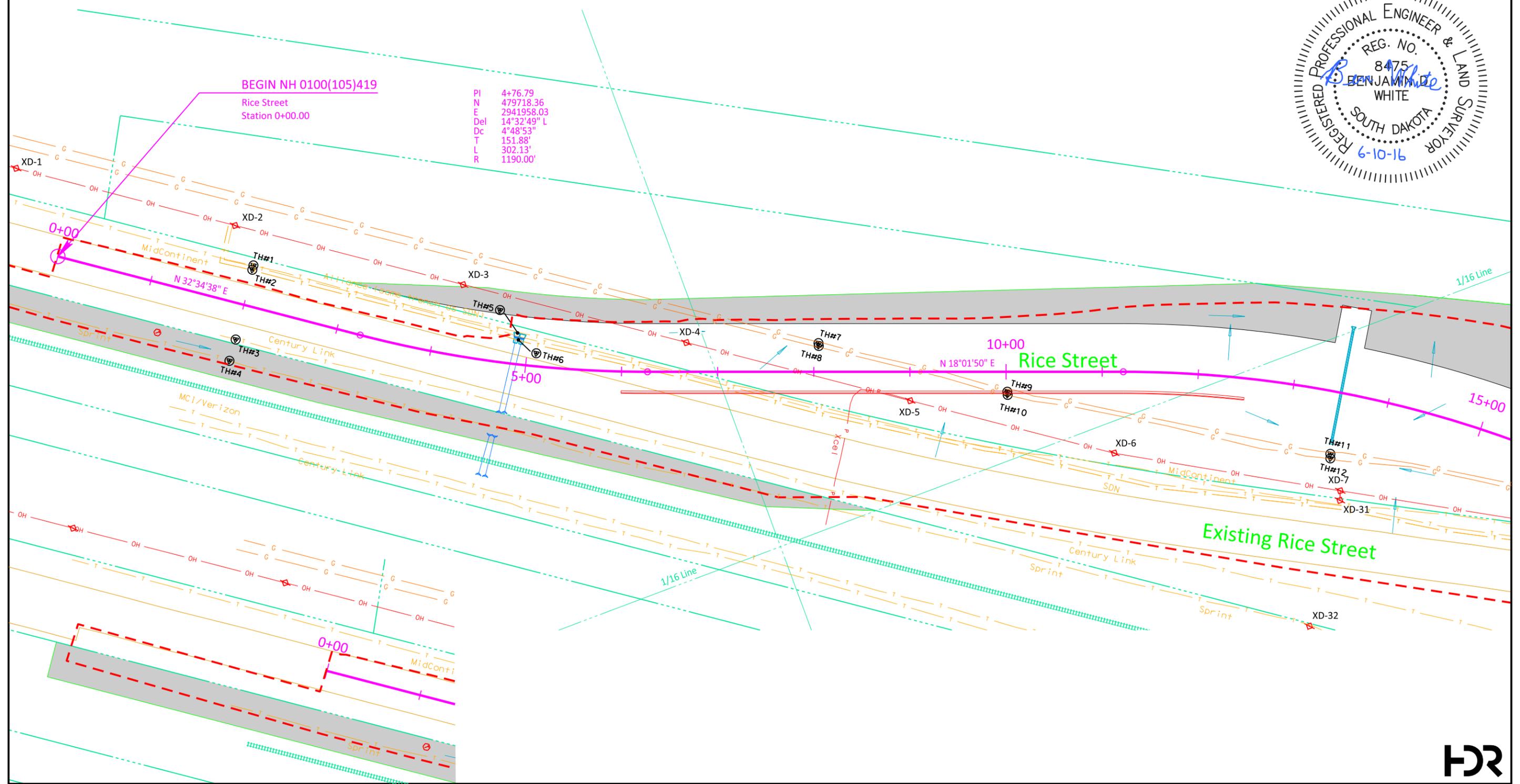
4+93 - 35' L to 4+92 - 21' L  
Install 42" - 6' CMP Arch Pipe  
and 1 Safety End  
(Between Safety End and Existing Pipe)

13+50 - 70' L to 13+50 - 54' R  
Install 18" - 112 RC Pipe  
and 2 Flared Ends (D.A. part of drainage  
system for Sta. 18+54 to Sta. 18+78 culverts)  
(Between End Inlet and End Outlet)



PI 4+76.79  
N 479718.36  
E 2941958.03  
Del 14°32'49" L  
Dc 4°48'53"  
T 151.88'  
L 302.13'  
R 1190.00'

BEGIN NH 0100(105)419  
Rice Street  
Station 0+00.00



# Rice Street ROW

FOR BIDDING PURPOSES ONLY

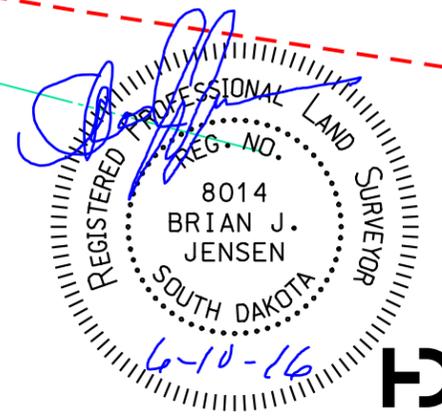
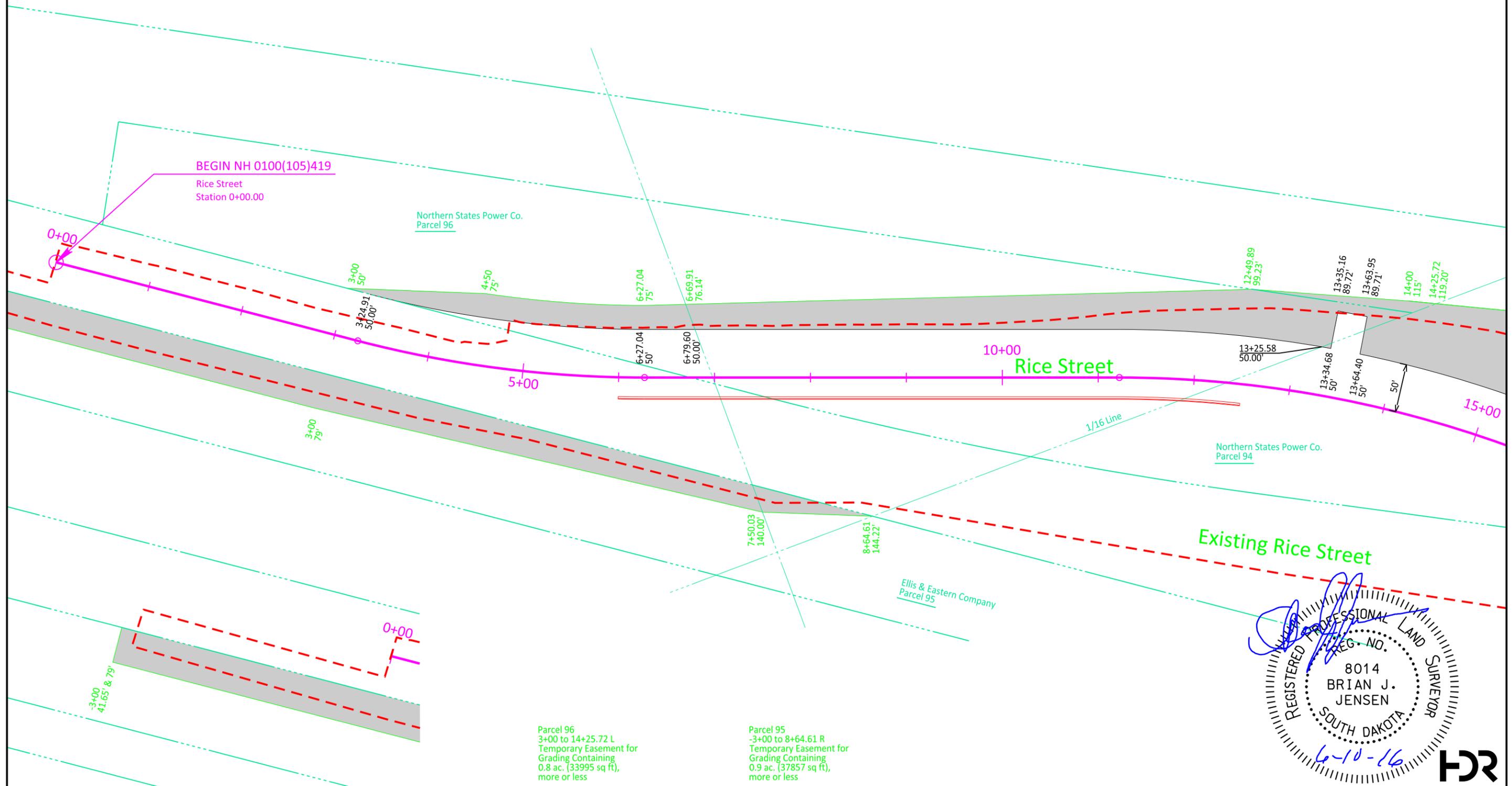
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0100(105)419	B51	B108

FILE: B51 (Rice ROW)  
PLOTING DATE: 06-10-2016

REV DATE:  
INITIAL:



## Sec. 13-T101N-R49W



# Rice Street

FOR BIDDING PURPOSES ONLY

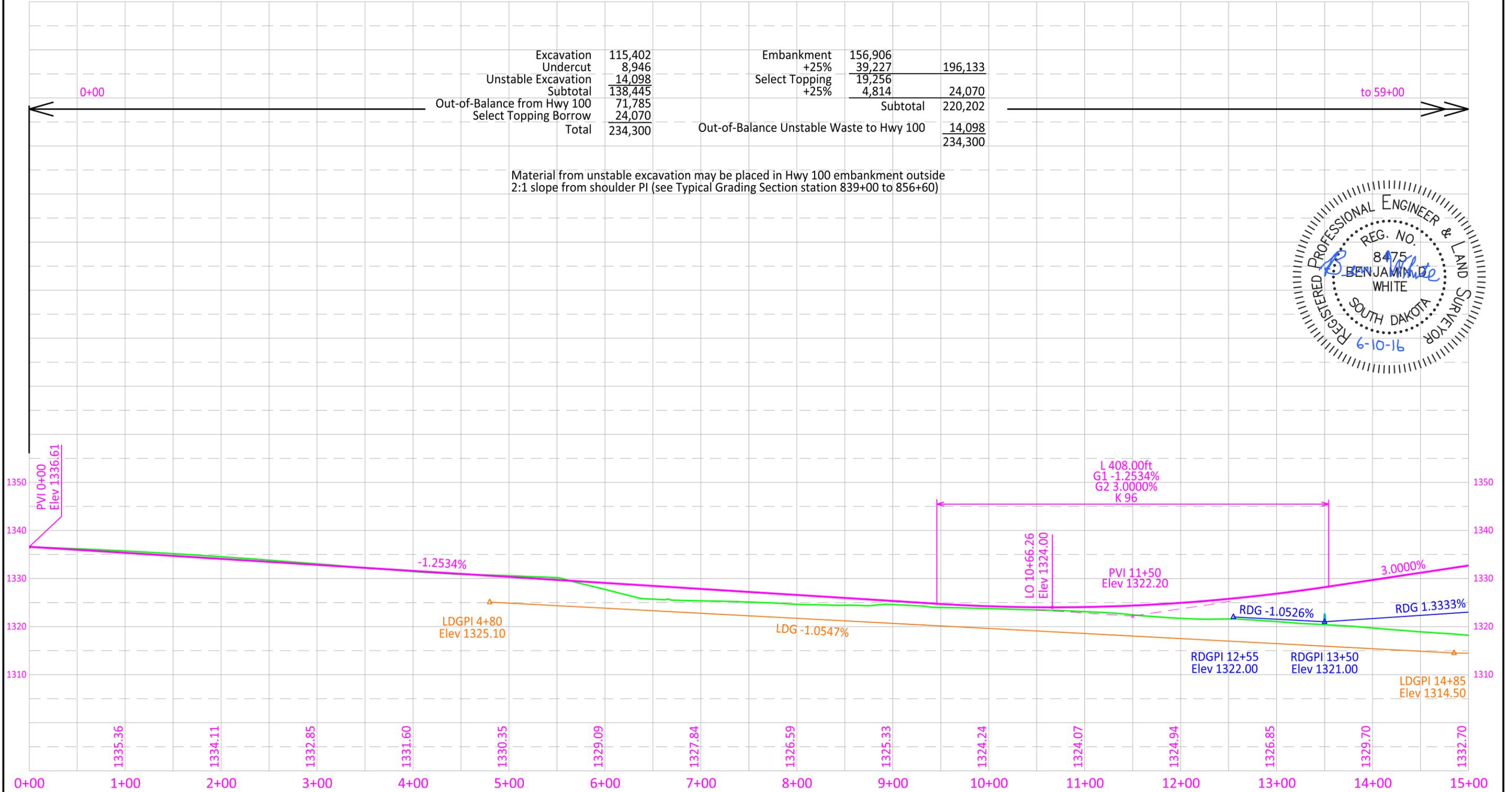
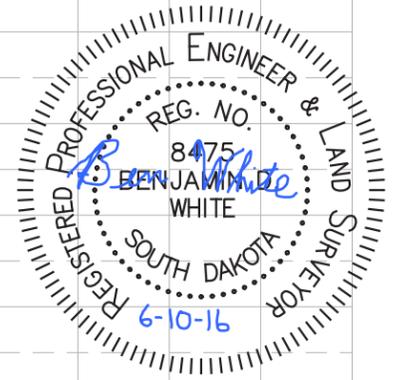
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0100(105)419	B52	B108

FILE: B52 (Rice)  
PLOTTING DATE: 06-10-2016

REV DATE:  
INITIAL:

Excavation	115,402	Embankment	156,906	
Undercut	8,946	+25%	39,227	196,133
Unstable Excavation	14,098	Select Topping	19,256	
Subtotal	138,445	+25%	4,814	24,070
Out-of-Balance from Hwy 100	71,785	Subtotal		220,202
Select Topping Borrow	24,070	Out-of-Balance Unstable Waste to Hwy 100	14,098	
Total	234,300			234,300

Material from unstable excavation may be placed in Hwy 100 embankment outside 2:1 slope from shoulder PI (see Typical Grading Section station 839+00 to 856+60)



FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0100(105)419	B53	B108

FILE: ...\\Sheets\\B-Grading\\B53 (Rice)  
PLOTTING DATE: 08-19-2016  
REV DATE: 8/19/2016  
INITIAL: JHU

# Rice Street

## Sec. 36-T102N-R49W

- 21+00 to 46+00  
Clear and grub all trees and brush within work limits
- 29+53, 181' to 282' L  
Take out 60" - 104' CMP (Incidental Work, Grading)
- 23+33, 75' R to 45+51, 100' R  
Take out 2,593' Fence
- 28+61, 100' L to 28+16, 81' R  
Take out 189' Fence
- 27+07, 77' L to 29+12, 109' L  
Take out 208' Fence
- 18+54 - 142' L to 40' L  
Install 42" - 92' RC Pipe (Class 5)
- 18+54 - 40' L to 134' R  
Install 42" - 174' Steel Pipe Bore and Jack 174' Steel Pipe Under Existing Rice Street
- 18+78 - 142' L to 40' L  
Install 42" - 92' RC Pipe (Class 5)
- 18+78 - 40' L to 134' R  
Install 42" - 174' Steel Pipe Bore and Jack 174' Steel Pipe Under Existing Rice Street

- 21+14 - 153' R to 23+27 - 26' R  
Install 18" - 232' RC Pipe and 1 Flared End (Between Drop Inlet and End Outlet)
- 27+00 - 222' L to 101' L  
Install 18" - 110' RC Pipe and 2 Flared Ends (Between End Outlet and End Inlet)
- 28+80 - 75' L to 61' R  
Install 24" - 122' RC Pipe (Snake Pipe) and 1 Flared End and 1 Safety End (D.A. = 50.7 Acres) (Between End Outlet and End Inlet)
- 29+58 - 132' L to 29+79 - 122' R  
Install 60" - 240' RC Pipe (Class 5) and 1 Flared End (D.A. = 50.7 Acres) (Between End Outlet and End Inlet)
- 69+80 - 106' L to 90' L (Timberline Avenue Alignment)  
Install 18" - 12' CM Pipe and 1 Flared End (Between End Outlet and Bend)
- 69+80 - 90' L (Timberline Avenue Alignment)  
Install 1 - 18" CMP 15° Bend

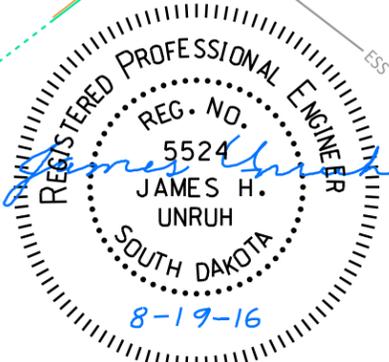
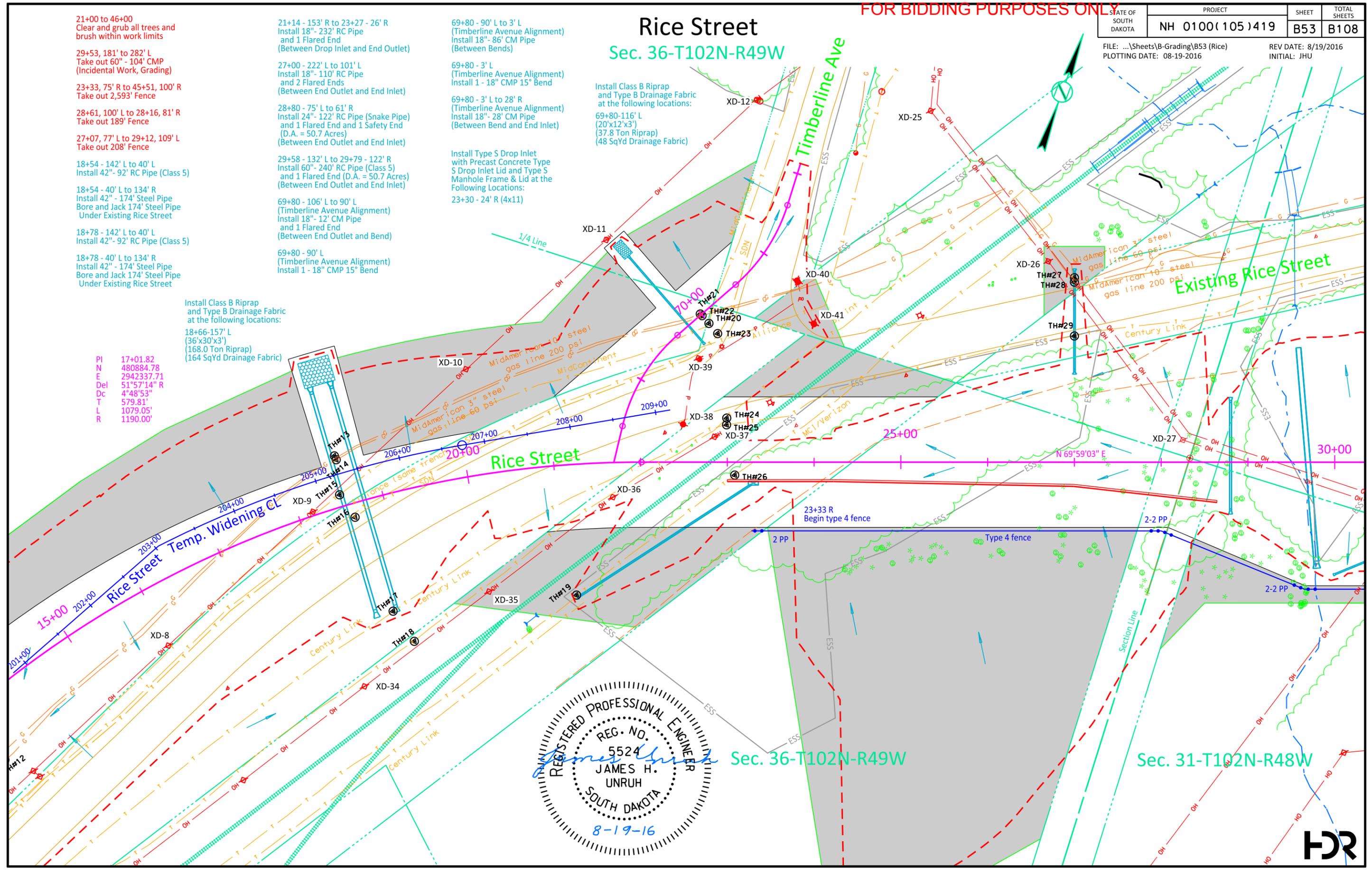
- 69+80 - 90' L to 3' L (Timberline Avenue Alignment)  
Install 18" - 86' CM Pipe (Between Bends)
- 69+80 - 3' L (Timberline Avenue Alignment)  
Install 1 - 18" CMP 15° Bend
- 69+80 - 3' L to 28' R (Timberline Avenue Alignment)  
Install 18" - 28' CM Pipe (Between Bend and End Inlet)

Install Class B Riprap and Type B Drainage Fabric at the following locations:  
69+80-116' L (20'x12'x3') (37.8 Ton Riprap) (48 SqYd Drainage Fabric)

Install Type S Drop Inlet with Precast Concrete Type S Drop Inlet Lid and Type S Manhole Frame & Lid at the Following Locations:  
23+30 - 24' R (4x11)

Install Class B Riprap and Type B Drainage Fabric at the following locations:  
18+66-157' L (36'x30'x3') (168.0 Ton Riprap) (164 SqYd Drainage Fabric)

PI 17+01.82  
N 480884.78  
E 2942337.71  
Del 51°57'14" R  
Dc 4°48'53"  
T 579.81'  
L 1079.05'  
R 1190.00'



Sec. 36-T102N-R49W

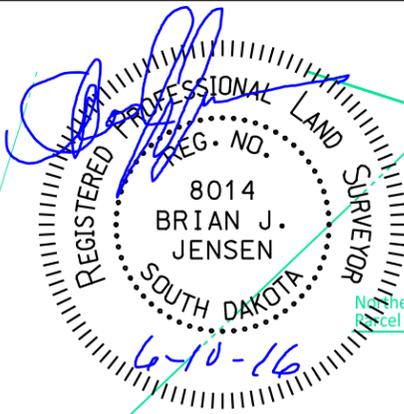
Sec. 31-T102N-R48W



FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0100(105)419	B54	B108

FILE: B54 (Rice ROW)  
 PLOTTING DATE: 06-10-2016  
 REV DATE: INITIAL:



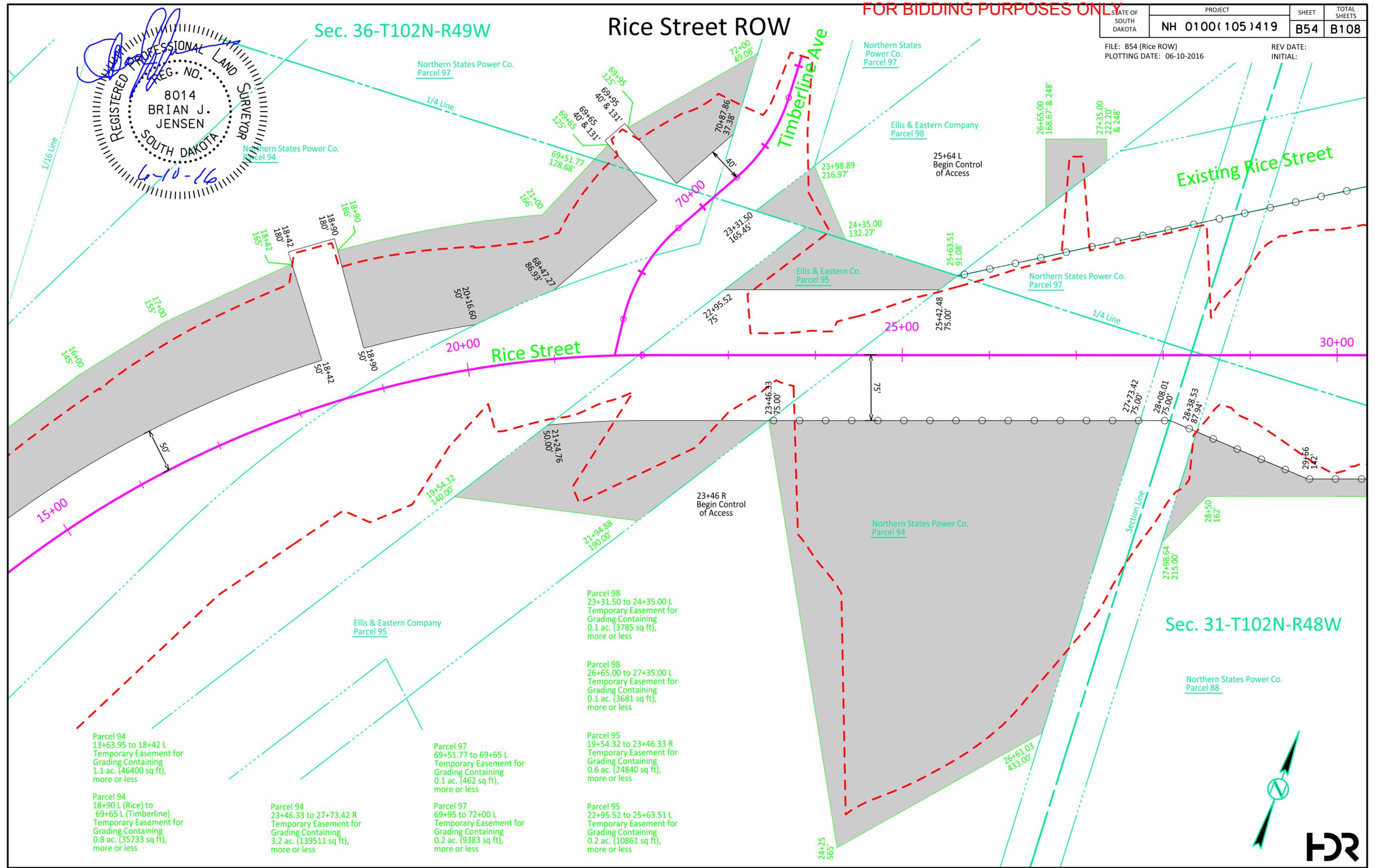
Sec. 36-T102N-R49W

Rice Street ROW

Existing Rice Street

Timberline Ave

Sec. 31-T102N-R48W



Parcel 94  
 13+63.95 to 18+42 L  
 Temporary Easement for  
 Grading Containing  
 1.1 ac. (46400 sq ft),  
 more or less

Parcel 94  
 18+90 L (Rice) to  
 69+65 L (Timberline)  
 Temporary Easement for  
 Grading Containing  
 0.8 ac. (35733 sq ft),  
 more or less

Parcel 94  
 23+46.33 to 27+73.42 R  
 Temporary Easement for  
 Grading Containing  
 3.2 ac. (139511 sq ft),  
 more or less

Parcel 97  
 69+51.77 to 69+65 L  
 Temporary Easement for  
 Grading Containing  
 0.1 ac. (462 sq ft),  
 more or less

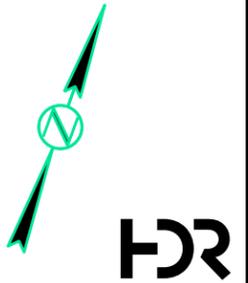
Parcel 97  
 69+95 to 72+00 L  
 Temporary Easement for  
 Grading Containing  
 0.2 ac. (9383 sq ft),  
 more or less

Parcel 98  
 23+31.50 to 24+35.00 L  
 Temporary Easement for  
 Grading Containing  
 0.1 ac. (3785 sq ft),  
 more or less

Parcel 98  
 26+65.00 to 27+35.00 L  
 Temporary Easement for  
 Grading Containing  
 0.1 ac. (3681 sq ft),  
 more or less

Parcel 95  
 19+54.32 to 23+46.33 R  
 Temporary Easement for  
 Grading Containing  
 0.6 ac. (24840 sq ft),  
 more or less

Parcel 95  
 22+95.52 to 25+63.51 L  
 Temporary Easement for  
 Grading Containing  
 0.2 ac. (10861 sq ft),  
 more or less



# Rice Street

FOR BIDDING PURPOSES ONLY

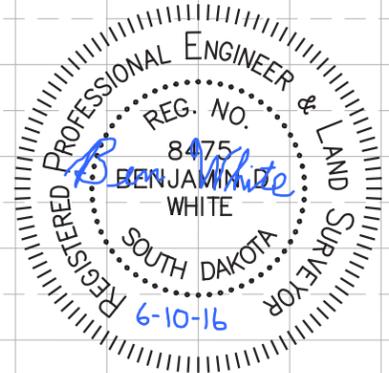
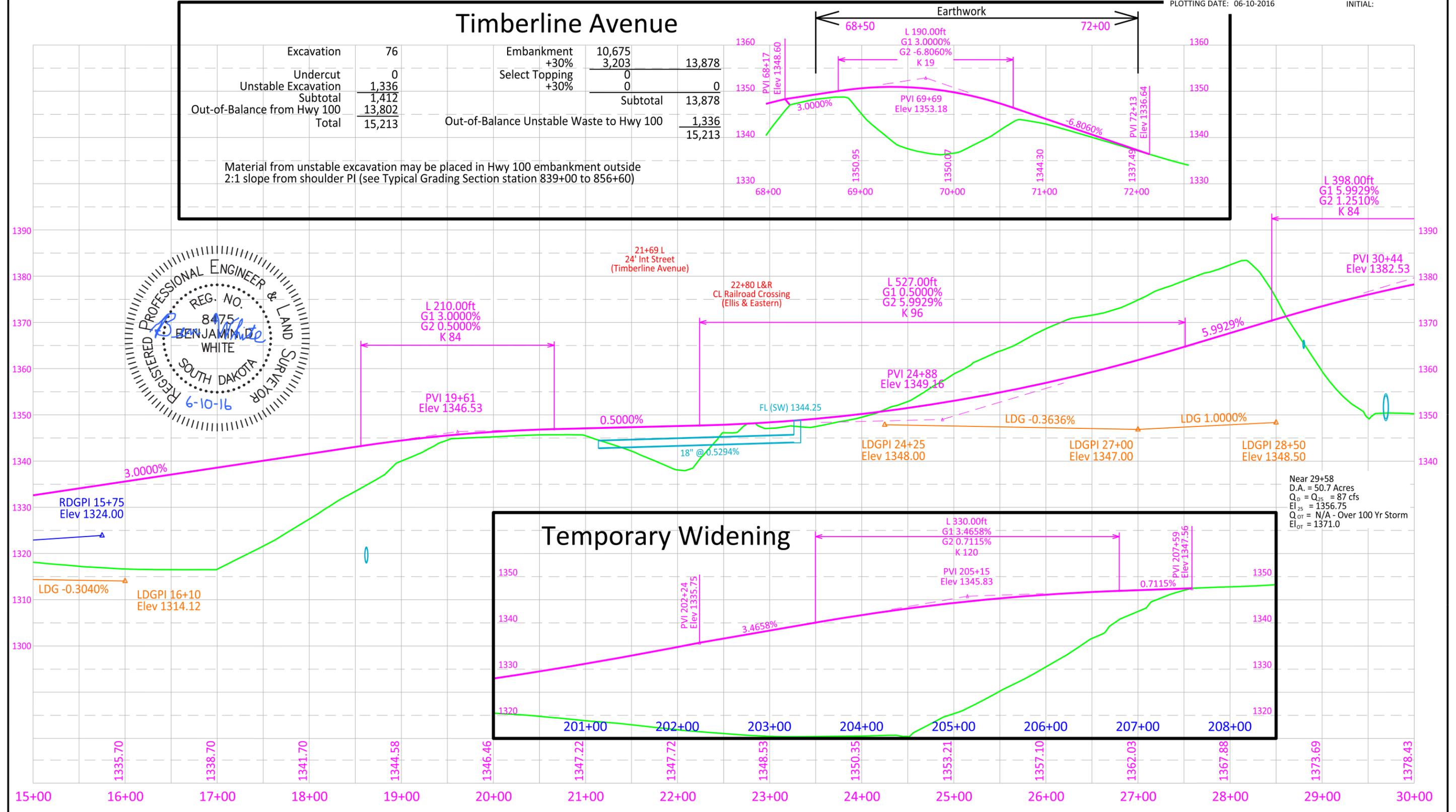
STATE OF SOUTH DAKOTA	PROJECT NH 0100(105)419	SHEET B55	TOTAL SHEETS B108
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FILE: B55 (Rice)  
PLOTTING DATE: 06-10-2016  
REV DATE:  
INITIAL:

## Timberline Avenue

Excavation	76	Embankment +30%	10,675	13,878
Undercut	0	Select Topping +30%	3,203	0
Unstable Excavation	1,336		0	0
Subtotal	1,412		0	0
Out-of-Balance from Hwy 100	13,802		13,878	13,878
Total	15,213	Out-of-Balance Unstable Waste to Hwy 100	1,336	15,213

Material from unstable excavation may be placed in Hwy 100 embankment outside 2:1 slope from shoulder PI (see Typical Grading Section station 839+00 to 856+60)



## Temporary Widening

L 330.00ft  
G1 3.4658%  
G2 0.7115%  
K 120

PVI 205+15  
Elev 1345.83

PVI 207+59  
Elev 1347.56



33+70 - 250' L  
Do Not Disturb Existing Drainageway

# Rice Street

**FOR BIDDING PURPOSES ONLY**

29+99 - 130' R to 30+34 - 115' R  
Install 18" - 36' CM Pipe  
and 1 Flared End  
(Between End Outlet and Elbow)

30+35 - 115' R  
Install 1-18" CMP 15° Elbow

30+36 - 114' R to 31+07 - 85' R  
Install 18" - 74' CM Pipe  
and 1 Flared End  
(Between Elbow and End Inlet)

38+30 - 111' L to 38+85 - 99' R  
Install 108" - 186' RC Pipe (Class 4)  
and 2 Sectional Ends (D.A. = 323.5 Acres)  
(Between End Outlet and End Inlet)

41+15 - 54' L to 47' R  
Install 24" - 90' RC Pipe (Snake Pipe)  
and 1 Flared End and 1 Safety End  
(Between End Outlet and End Inlet)

STATE OF SOUTH DAKOTA	PROJECT NH 0100(105)419	SHEET B56	TOTAL SHEETS B108
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FILE: ...Sheets\B-Grading\B56 (Rice)  
PLOTTING DATE: 08-19-2016

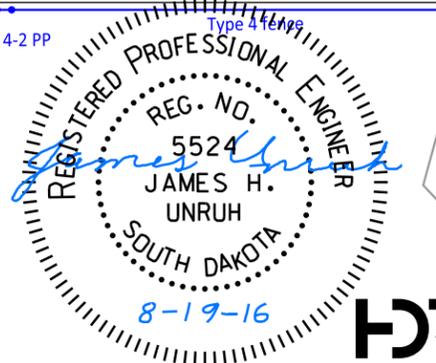
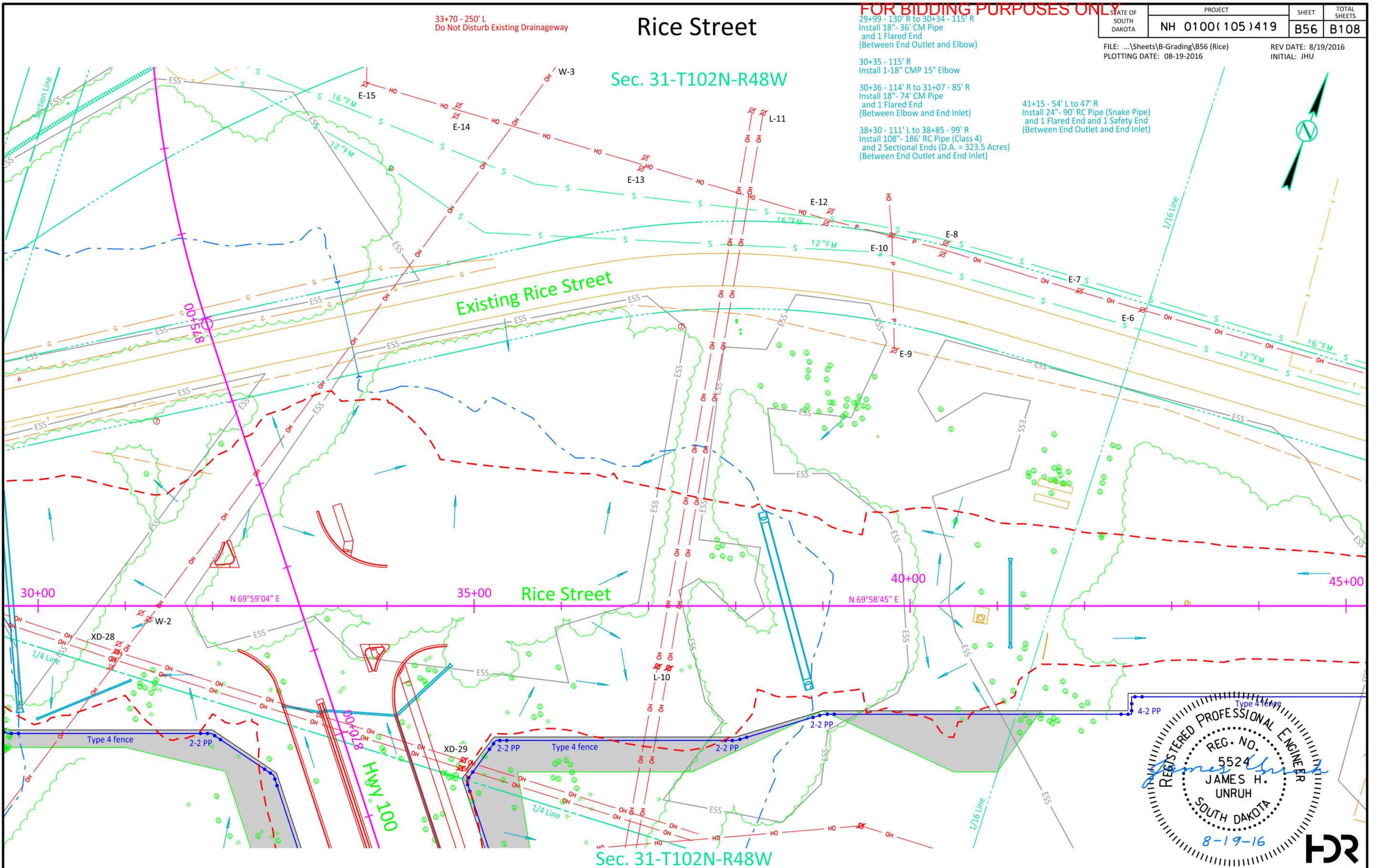
REV DATE: 8/19/2016  
INITIAL: JHU

## Sec. 31-T102N-R48W

Existing Rice Street

Rice Street

## Sec. 31-T102N-R48W



# Rice Street ROW

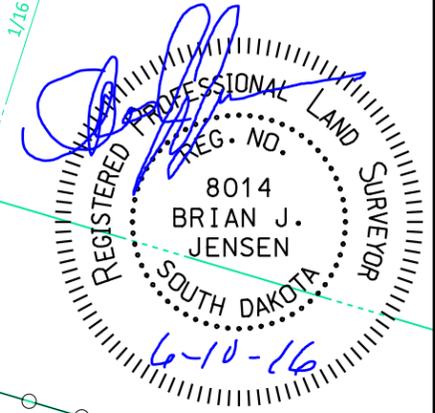
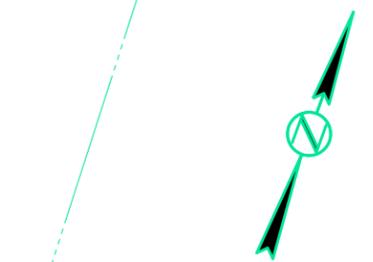
Sec. 31-T102N-R48W

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0100(105)419	B57	B108

FILE: B57 (Rice ROW)  
PLOTING DATE: 06-10-2016

REV DATE:  
INITIAL:

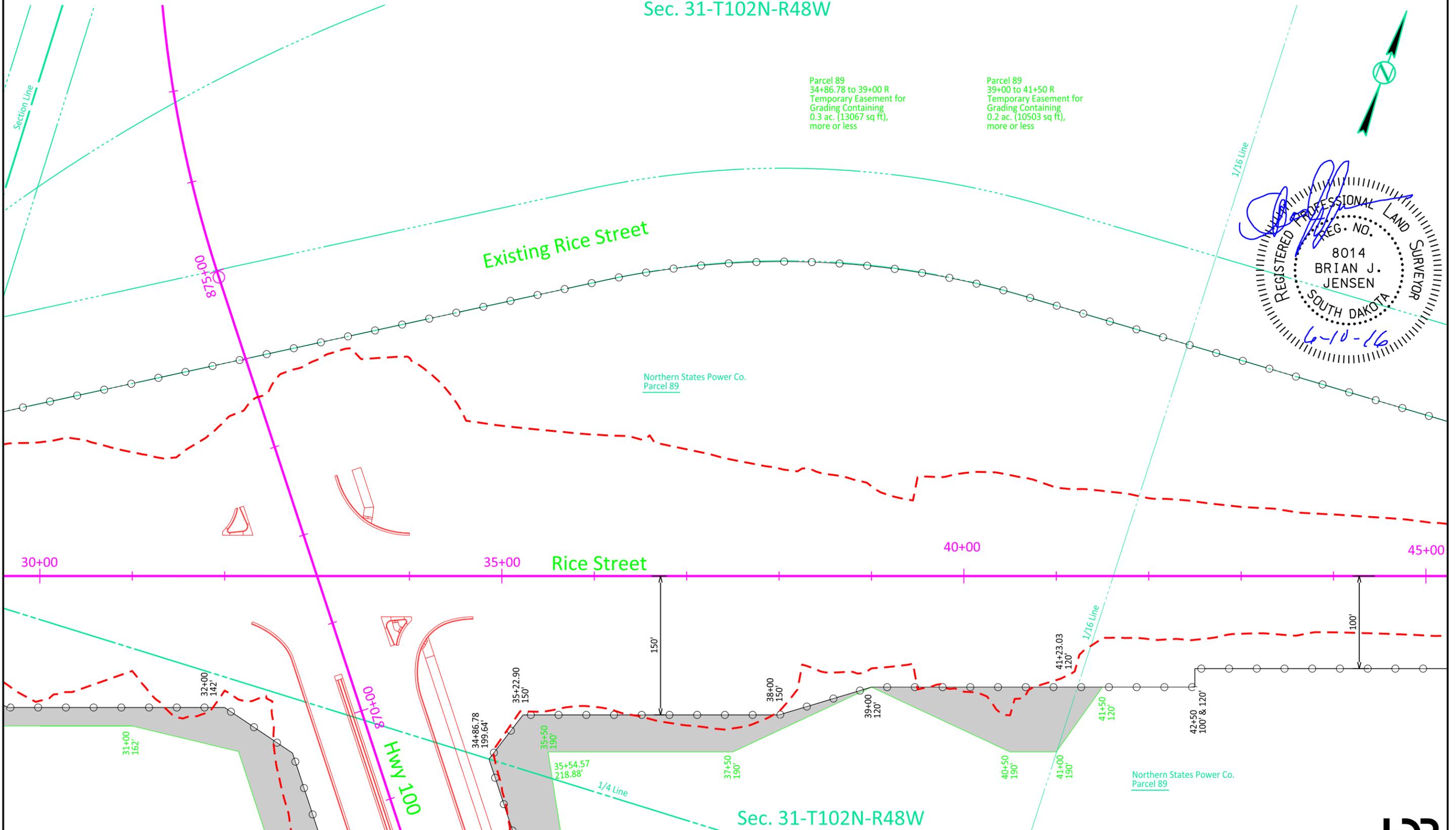


Parcel 89  
34+86.78 to 39+00 R  
Temporary Easement for  
Grading Containing  
0.3 ac. (13067 sq ft),  
more or less

Parcel 89  
39+00 to 41+50 R  
Temporary Easement for  
Grading Containing  
0.2 ac. (10503 sq ft),  
more or less

Northern States Power Co.  
Parcel 89

Northern States Power Co.  
Parcel 89



Sec. 31-T102N-R48W



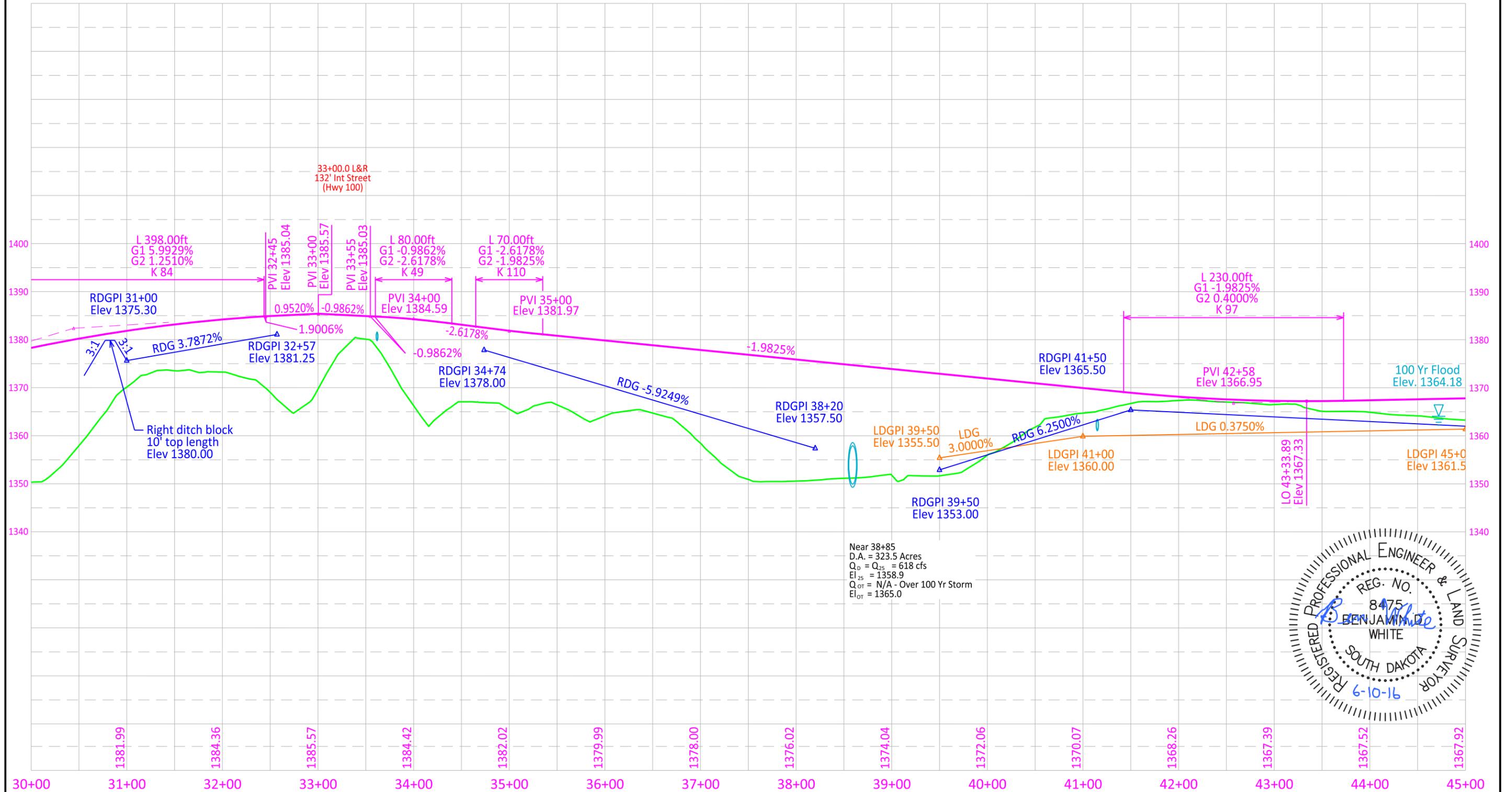
# Rice Street

FOR BIDDING PURPOSES ONLY

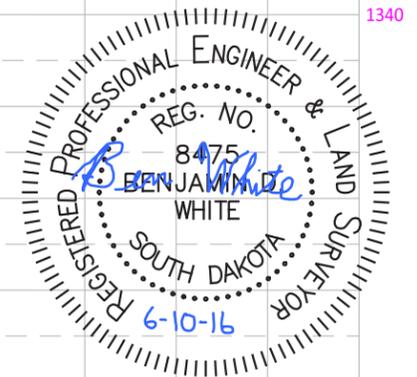
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0100(105)419	B58	B108

FILE: B58 (Rice)  
PLOTTING DATE: 06-10-2016

REV DATE:  
INITIAL:



Near 38+85  
D.A. = 323.5 Acres  
Q<sub>D</sub> = Q<sub>25</sub> = 618 cfs  
El<sub>25</sub> = 1358.9  
Q<sub>07</sub> = N/A - Over 100 Yr Storm  
El<sub>07</sub> = 1365.0



# Rice Street

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0100(105)419	B59	B108

FILE: ...\\Sheets\\B-Grading\\B59 (Rice) REV DATE: 8/19/2016  
 PLOTTING DATE: 08-19-2016 INITIAL: JHU

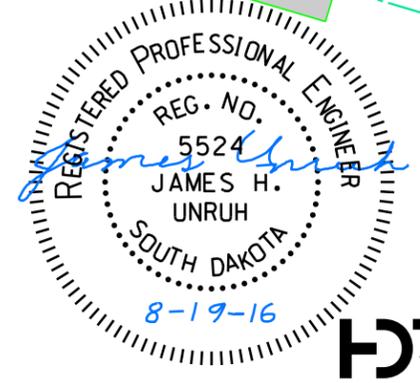
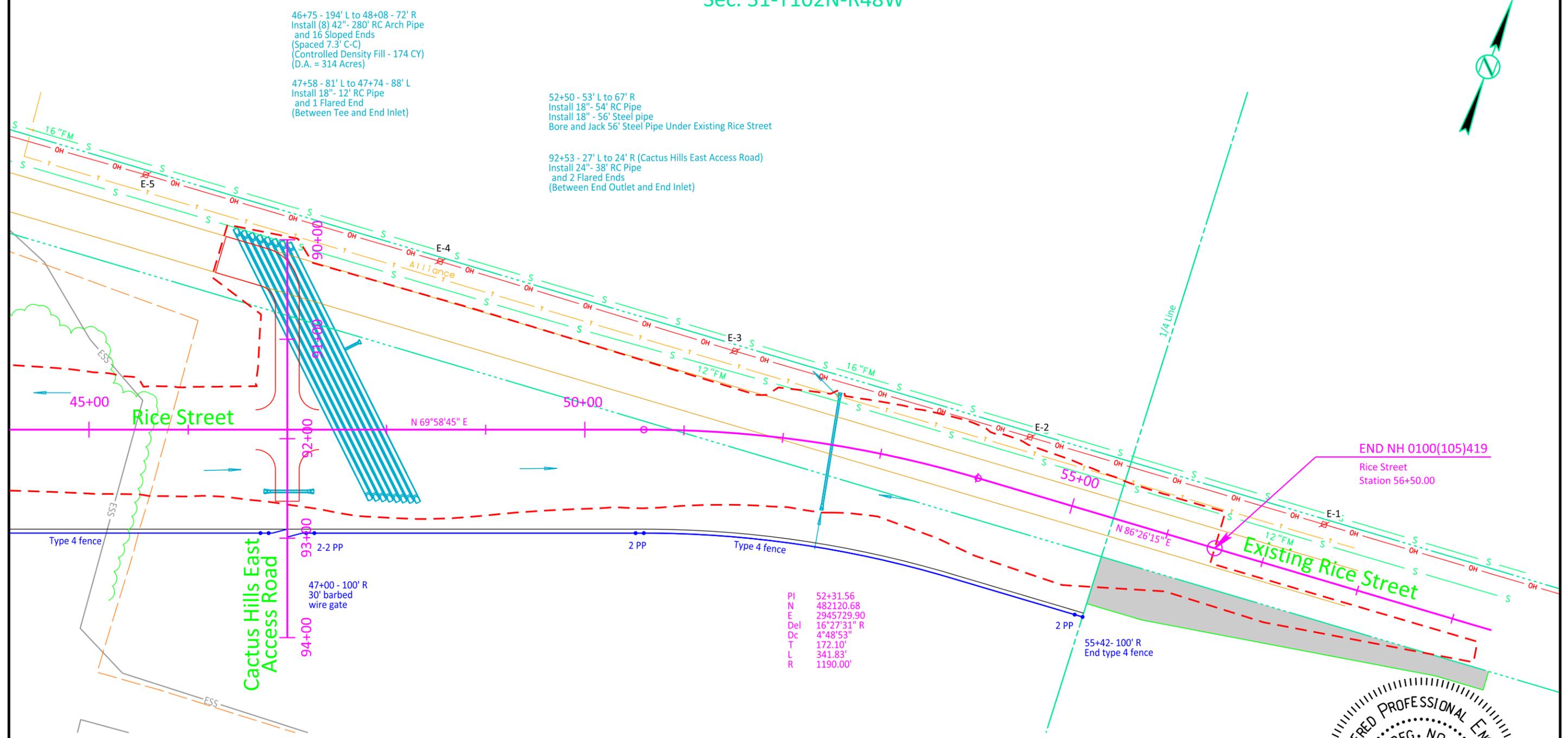
## Sec. 31-T102N-R48W

46+75 - 194' L to 48+08 - 72' R  
 Install (8) 42"- 280' RC Arch Pipe  
 and 16 Sloped Ends  
 (Spaced 7.3' C-C)  
 (Controlled Density Fill - 174 CY)  
 (D.A. = 314 Acres)

47+58 - 81' L to 47+74 - 88' L  
 Install 18"- 12' RC Pipe  
 and 1 Flared End  
 (Between Tee and End Inlet)

52+50 - 53' L to 67' R  
 Install 18"- 54' RC Pipe  
 Install 18"- 56' Steel pipe  
 Bore and Jack 56' Steel Pipe Under Existing Rice Street

92+53 - 27' L to 24' R (Cactus Hills East Access Road)  
 Install 24"- 38' RC Pipe  
 and 2 Flared Ends  
 (Between End Outlet and End Inlet)



# Rice Street ROW

FOR BIDDING PURPOSES ONLY

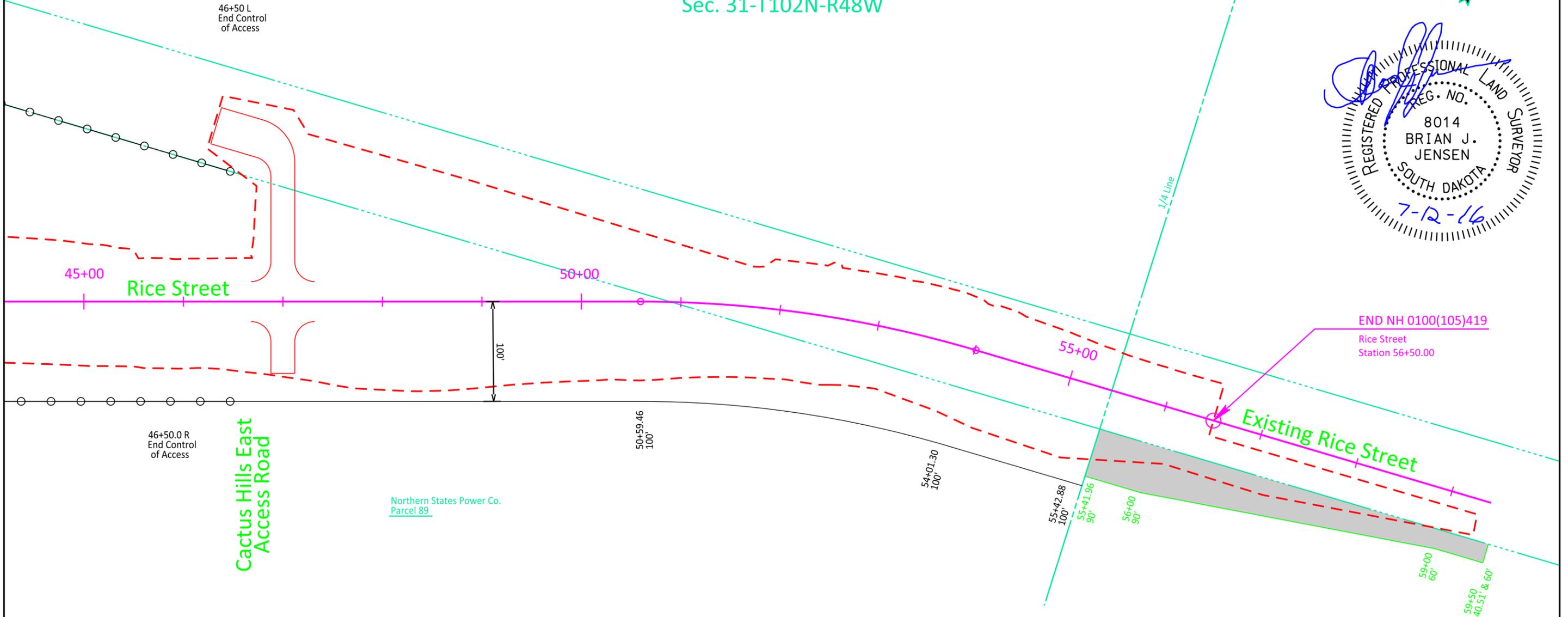
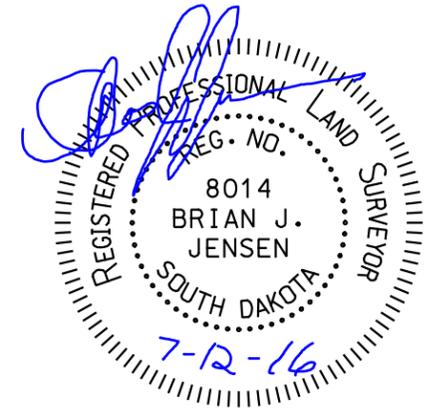
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0100(105)419	B60	B108

FILE: ...\B-Grading\B60 (Rice ROW)  
PLOTING DATE: 07-12-2016

REV DATE: 07-12-16  
INITIAL: BJJ

Northern States Power Co.  
Parcel 89

Sec. 31-T102N-R48W



END NH 0100(105)419  
Rice Street  
Station 56+50.00

Existing Rice Street

Cactus Hills East  
Access Road

Northern States Power Co.  
Parcel A1

Parcel A1  
55+41.96 to 59+50 R  
Temporary Easement for  
Grading Containing  
0.3 ac. (14176 sq ft),  
more or less



# Rice Street

FOR BIDDING PURPOSES ONLY

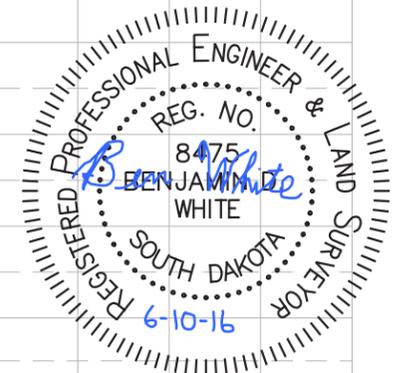
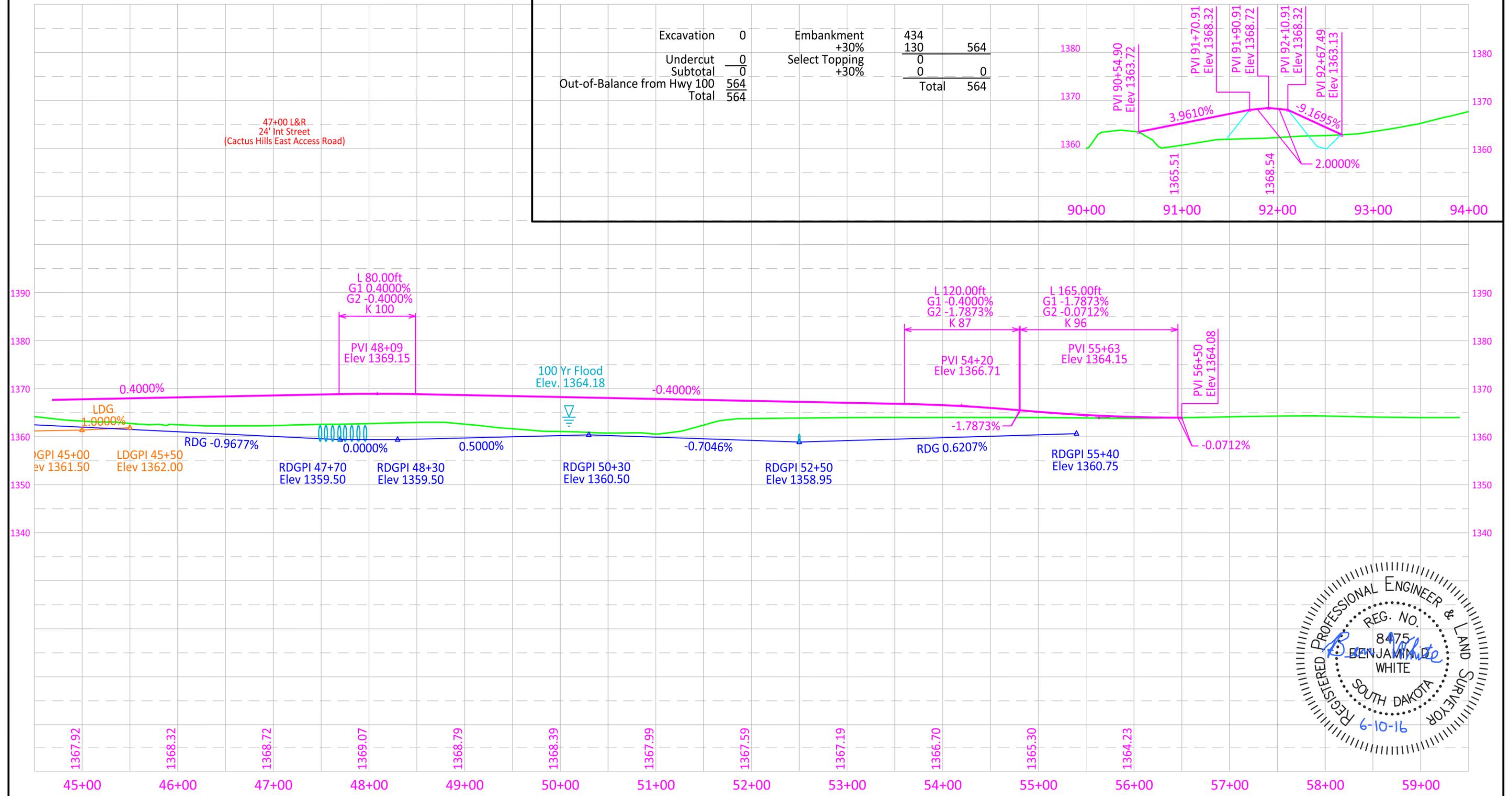
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0100(105)419	B61	B108

FILE: B61 (Rice) PLOTTING DATE: 06-10-2016 REV DATE: INITIAL:

## Cactus Hills East Access Road

Excavation	0	Embankment	434
		+30%	130
			564
Undercut	0	Select Topping	0
Subtotal	0	+30%	0
Out-of-Balance from Hwy 100	564		0
Total	564		564

47+00 L&R  
24' Int Street  
(Cactus Hills East Access Road)



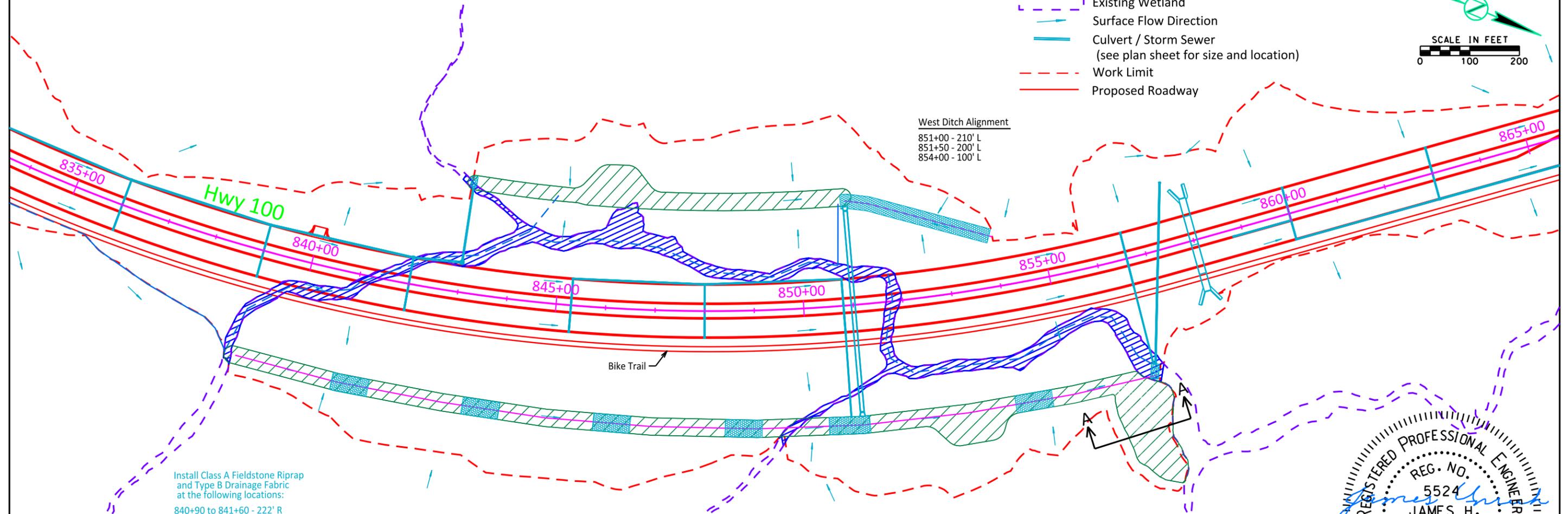
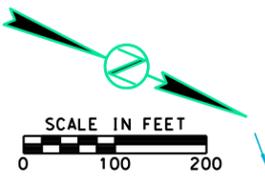
# Wetland Impacts and Minimization

FOR BIDDING PURPOSES ONLY

- Legend**
- Impacted Stream
  - Impacted Wetland
  - Wetland Impact Minimization
  - Ditch Riprap
  - Existing Wetland
  - Surface Flow Direction
  - Culvert / Storm Sewer (see plan sheet for size and location)
  - Work Limit
  - Proposed Roadway

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0100(105)419	B62	B108

FILE: ...\\Sheets\\B-Grading\\B62  
PLOTTING DATE: 08-04-2016  
REV DATE: 8/4/2016  
INITIAL: JHU

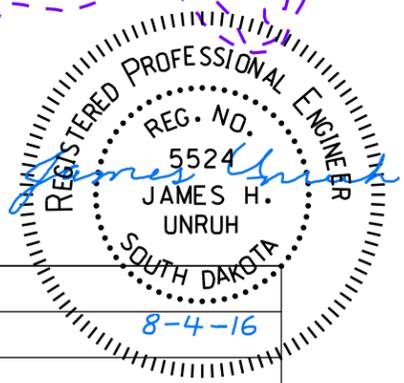


**West Ditch Alignment**  
851+00 - 210' L  
851+50 - 200' L  
854+00 - 100' L

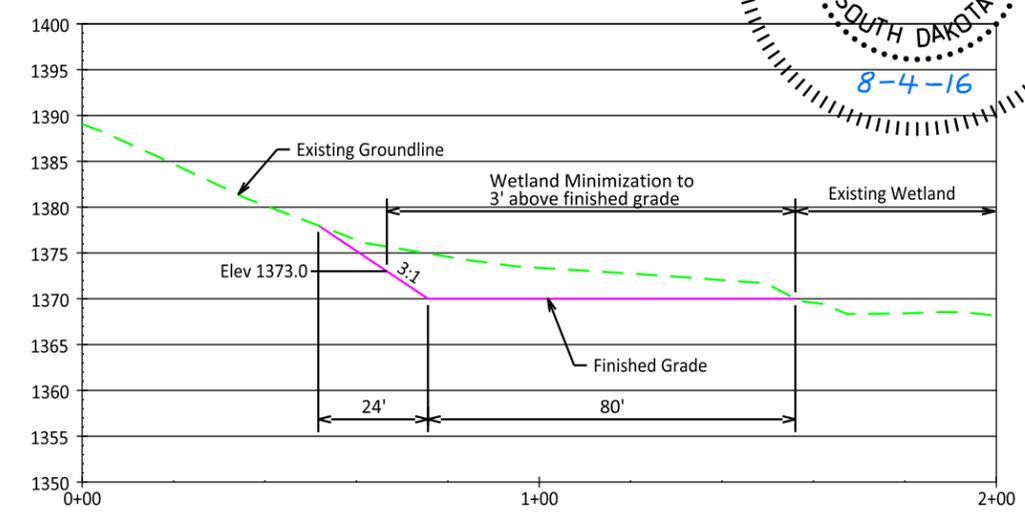
**East Ditch Alignment**  
839+00 - 218' R  
841+00 - 222' R  
843+00 - 224' R  
845+00 - 230' R  
847+00 - 234' R  
849+00 - 238' R  
851+00 - 242' R  
853+00 - 242' R  
855+00 - 242' R  
856+60 - 242' R

Install Class A Fieldstone Riprap and Type B Drainage Fabric at the following locations:

- 840+90 to 841+60 - 222' R (70'x41'x3') (491.1 Ton Riprap) (432 SqYd Drainage Fabric)
- 843+40 to 844+10 - 225' R (70'x41'x3') (491.1 Ton Riprap) (432 SqYd Drainage Fabric)
- 845+90 to 846+60 - 230' R (70'x41'x3') (491.1 Ton Riprap) (432 SqYd Drainage Fabric)
- 848+40 to 849+10 - 236' R (70'x41'x3') (491.1 Ton Riprap) (432 SqYd Drainage Fabric)
- 850+36 to 851+13 - 240' R (77'x41'x3') (540.2 Ton Riprap) (472 SqYd Drainage Fabric)
- 853+90 to 854+60 - 240' R (70'x41'x3') (491.1 Ton Riprap) (432 SqYd Drainage Fabric)
- 850+90 - 208' L to 854+00 - 102' L (310'x29'x2') (1,025.5 Ton Riprap) (1,719 SqYd Drainage Fabric)



Description	Location		Area	Volume	Length
	Hwy100	Rice Street			
Impacted Wetland	838+80 to 856+80 R&L		1.47 acres	10,700 cubic yards (avg. 4.5' depth)	
		29+30 to 29+85 R&L	0.11 acres	620 cubic yards (avg. 3.5' depth)	
		Total	1.58 acres	11,320 cubic yards	
Impacted Stream		38+20 to 39+20 R&L			244 feet



Section A-A (Sta. 856+00)

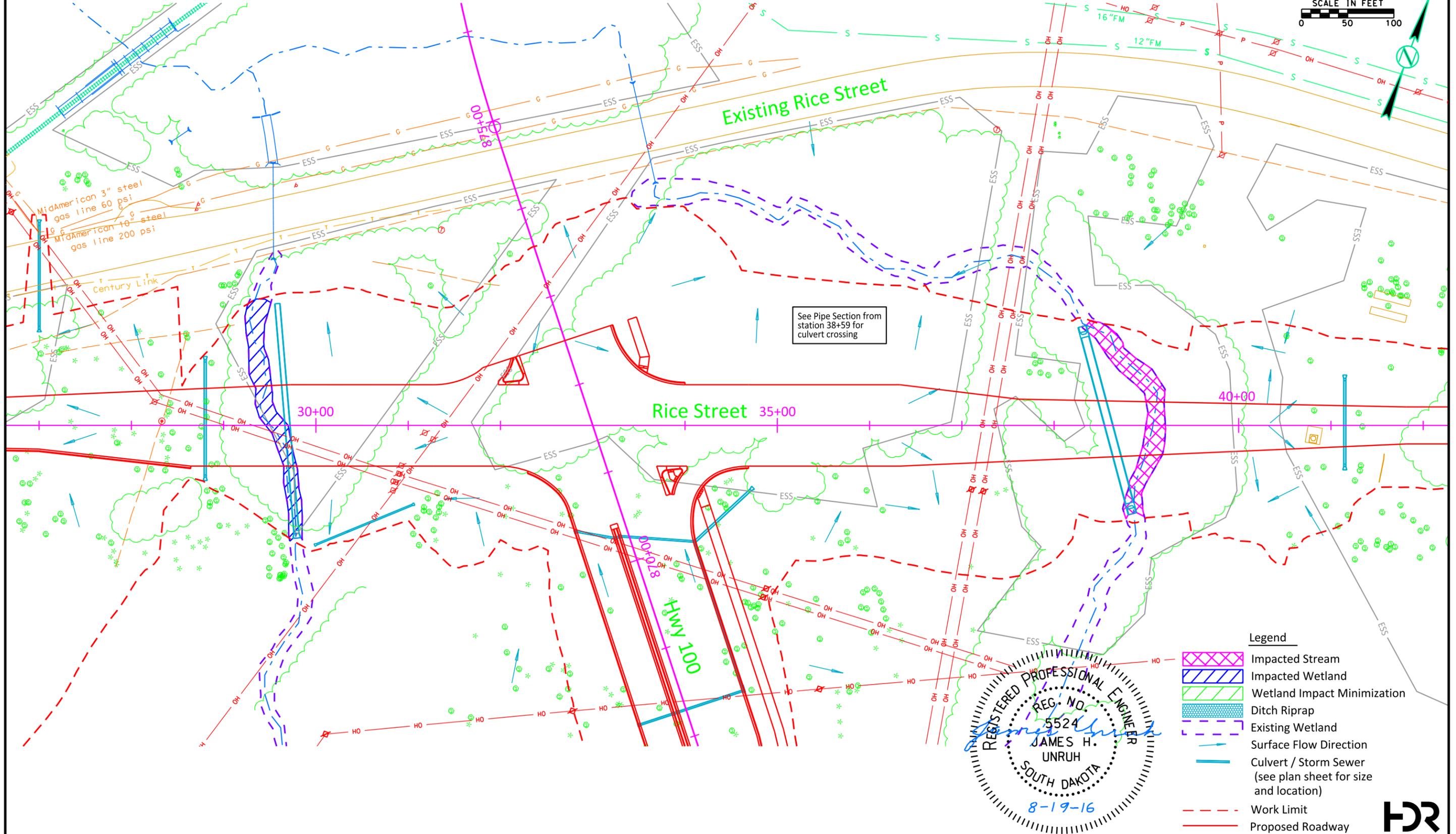


# Wetland Impacts and Minimization

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT NH 0100(105)419	SHEET B63	TOTAL SHEETS B108
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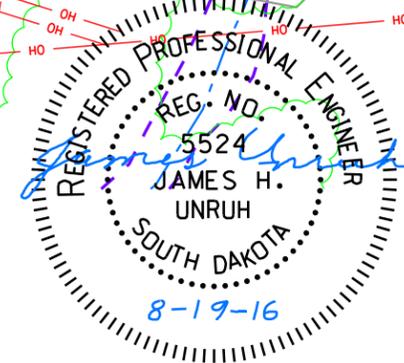
FILE: ...\\Sheets\\B-Grading\\B63  
PLOTTING DATE: 08-19-2016  
REV DATE: 8/19/2016  
INITIAL: JHU



See Pipe Section from station 38+59 for culvert crossing

**Legend**

- Impacted Stream
- Impacted Wetland
- Wetland Impact Minimization
- Ditch Riprap
- Existing Wetland
- Surface Flow Direction
- Culvert / Storm Sewer (see plan sheet for size and location)
- Work Limit
- Proposed Roadway



# Pavement Removal Layout

FOR BIDDING PURPOSES ONLY

Take out Asphalt Concrete Pavement  
at the Following Location:  
0+00 to 24+17 (Existing Rice Street)

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0100(105)419	B64	B108

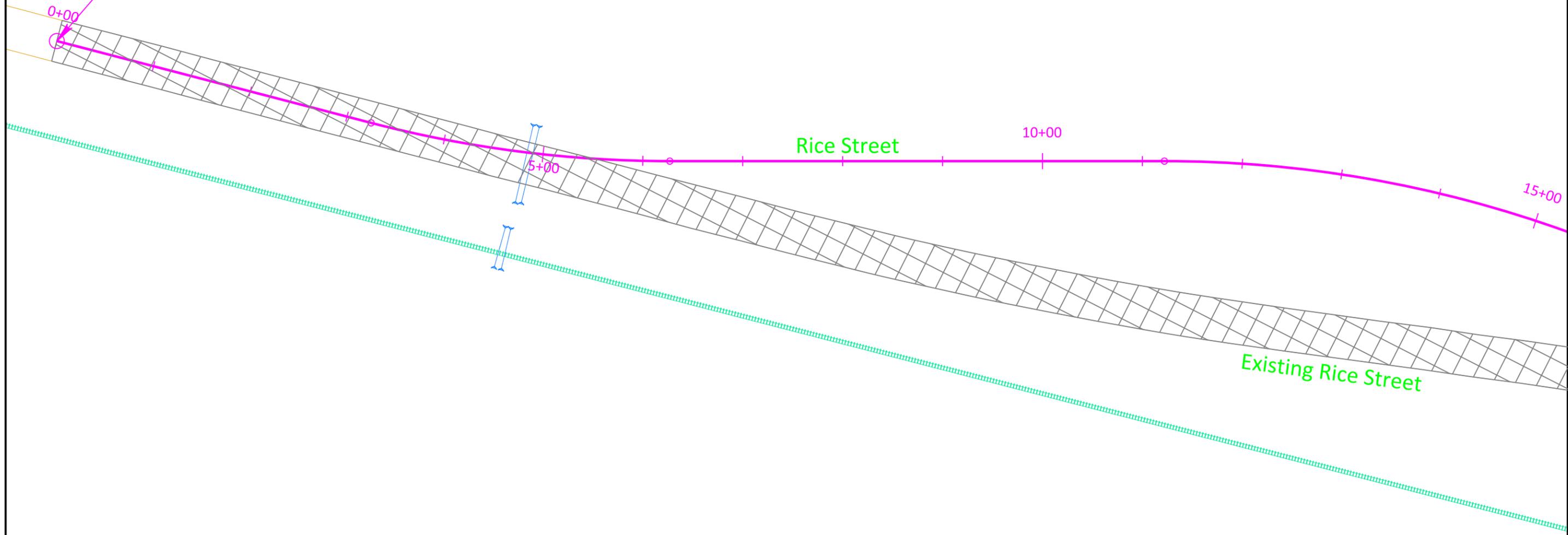
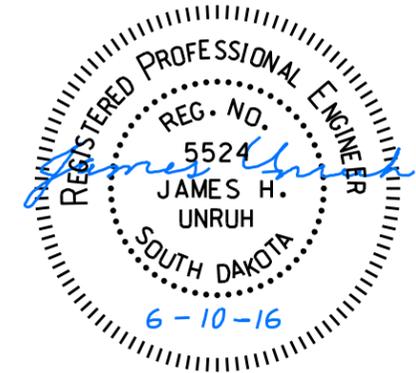
FILE: B64 (Rice Removal)  
PLOTING DATE: 06-10-2016

REV DATE:  
INITIAL:



 Remove Asphalt Concrete Pavement

BEGIN NH 0100(105)419  
Rice Street  
Station 0+00.00



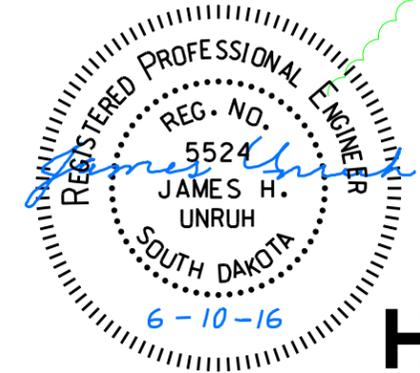
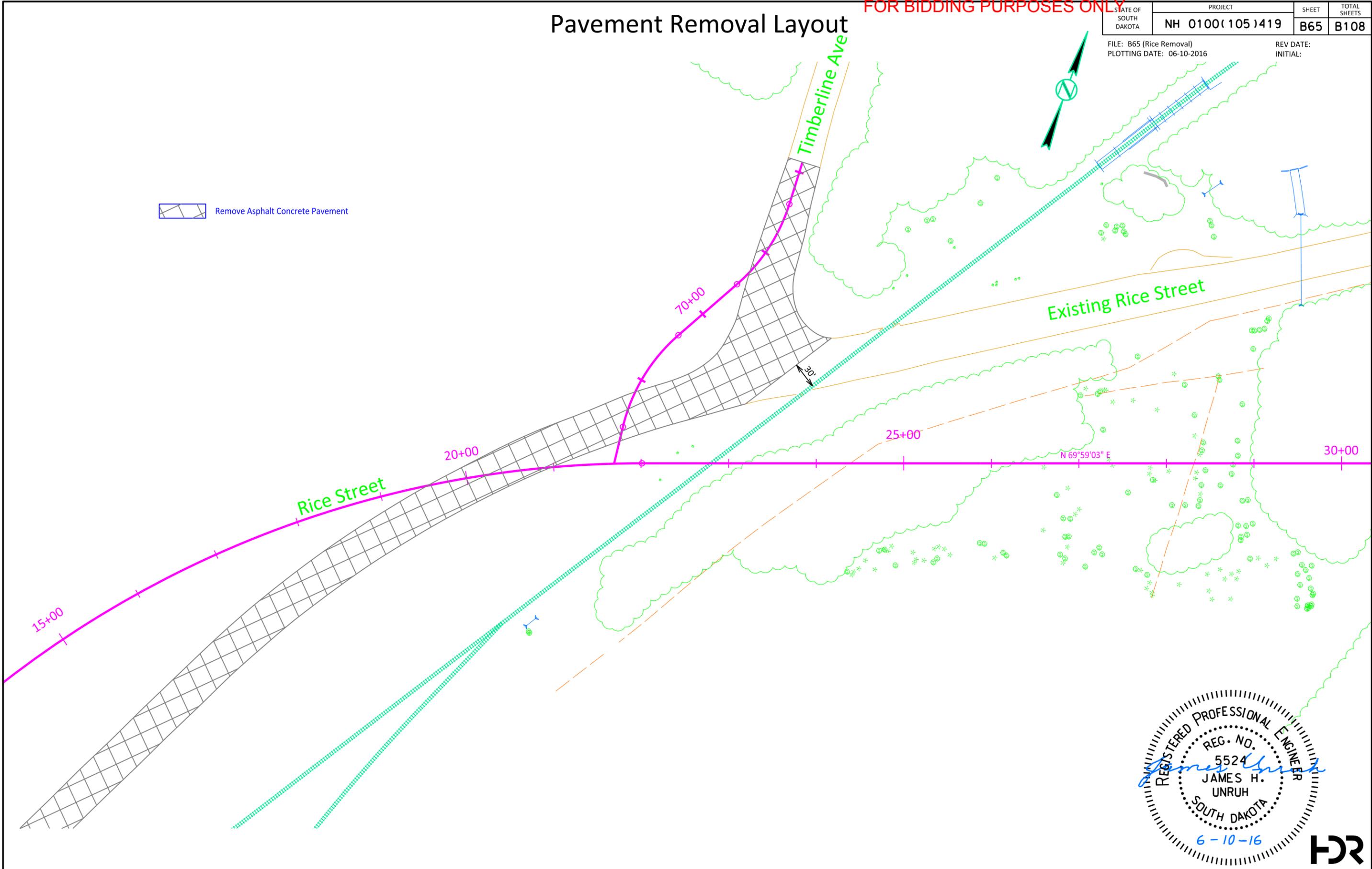
# Pavement Removal Layout

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0100(105)419	B65	B108

FILE: B65 (Rice Removal)  
PLOTTING DATE: 06-10-2016  
REV DATE:  
INITIAL:

 Remove Asphalt Concrete Pavement



FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0100(105)419	B66	B108

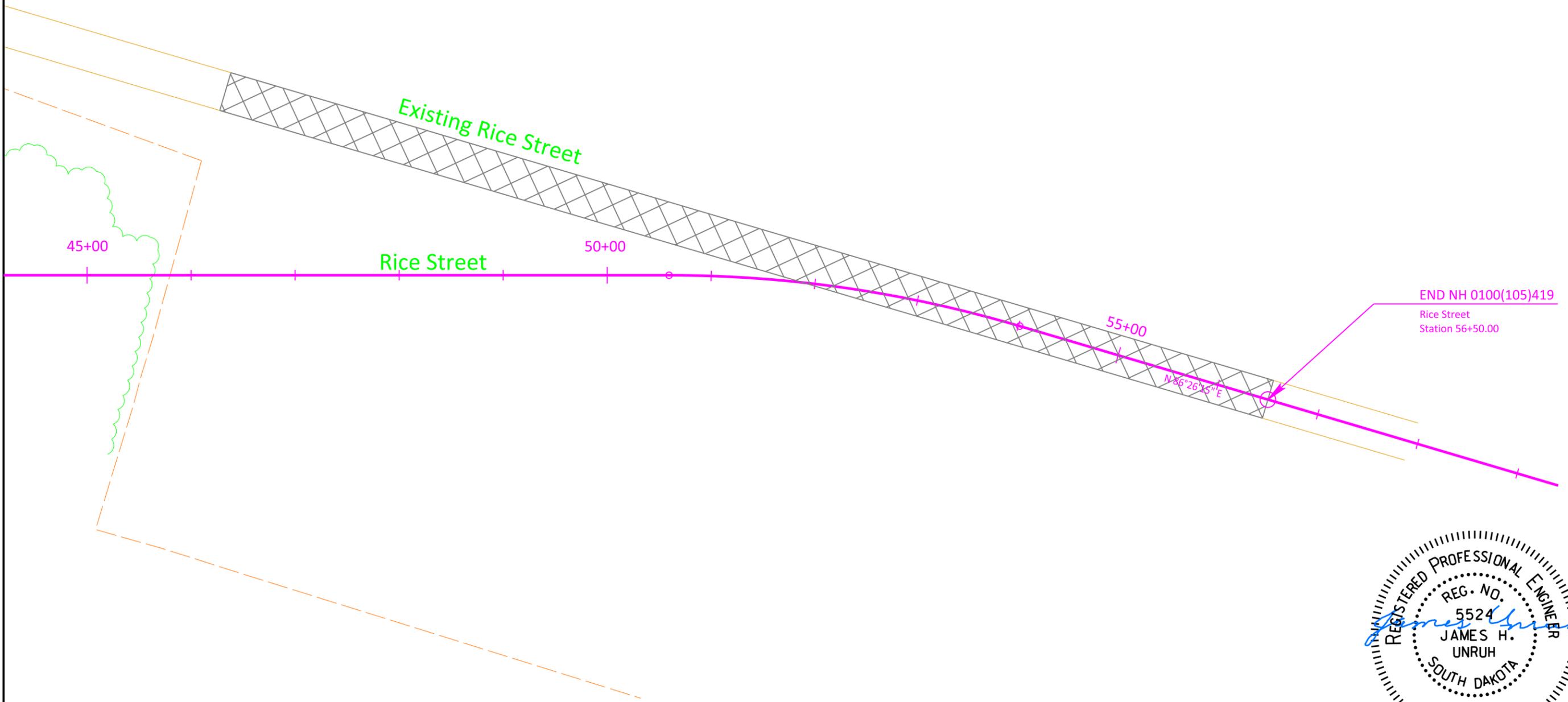
FILE: B66 (Rice Removal)  
PLOTING DATE: 06-10-2016

REV DATE:  
INITIAL:

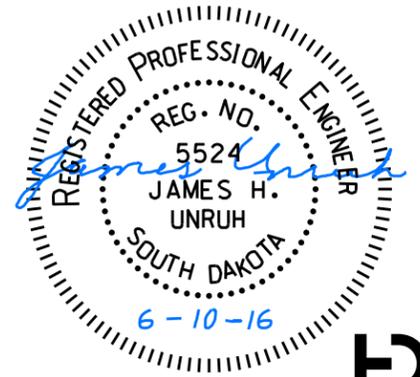
Take out Asphalt Concrete Pavement  
at the Following Location:  
46+33 to 56+50 (Existing Rice Street)

# Pavement Removal Layout

 Remove Asphalt Concrete Pavement



END NH 0100(105)419  
Rice Street  
Station 56+50.00



# Curb & Gutter Layout

FOR BIDDING PURPOSES ONLY

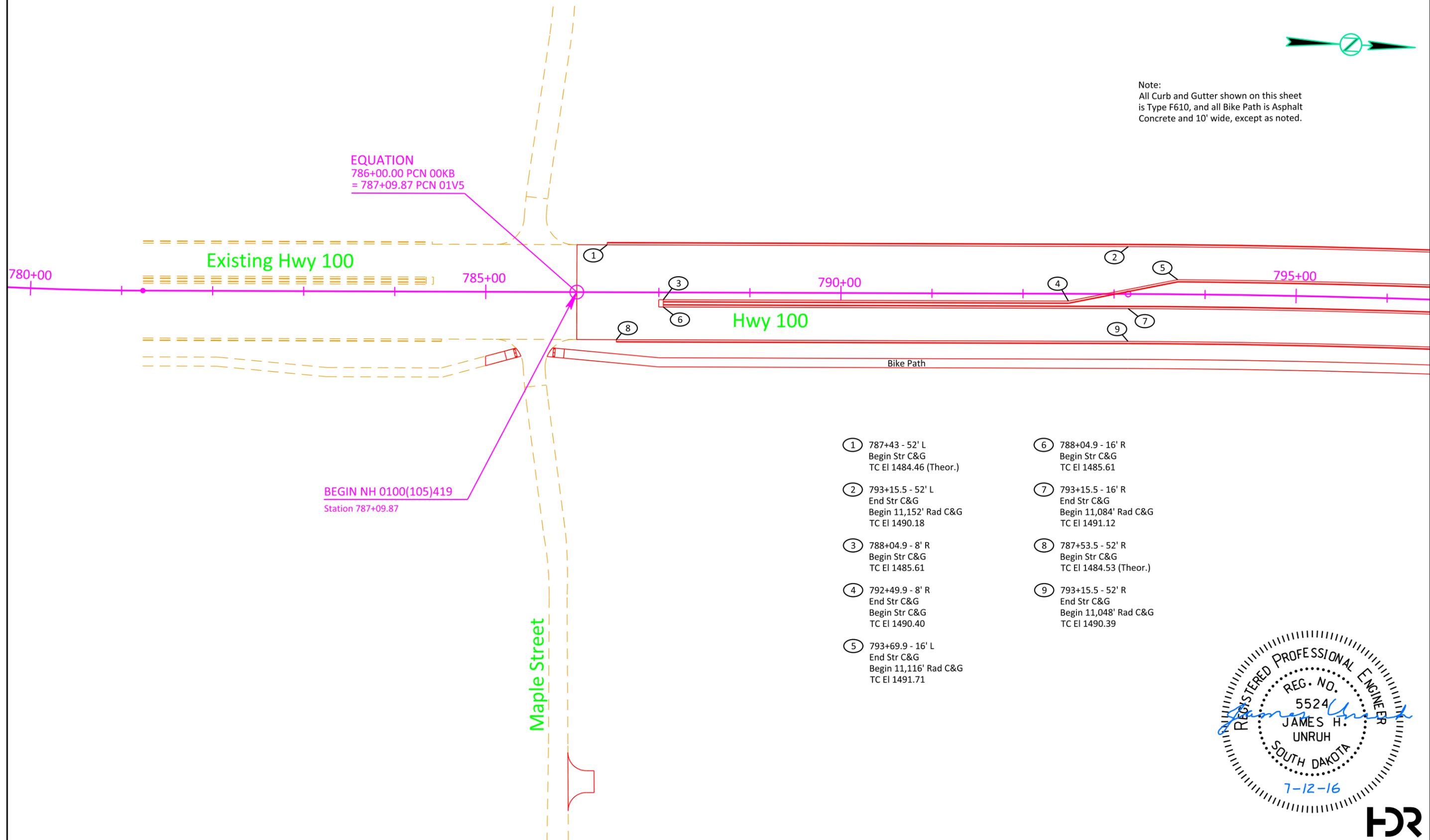
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0100(105)419	B67	B108

FILE: ...\\Sheets\\B-Grading\\B67  
PLOTING DATE: 07-12-2016

REV DATE: 07-12-16  
INITIAL: JHU



Note:  
All Curb and Gutter shown on this sheet  
is Type F610, and all Bike Path is Asphalt  
Concrete and 10' wide, except as noted.



EQUATION  
786+00.00 PCN 00KB  
= 787+09.87 PCN 01V5

Existing Hwy 100

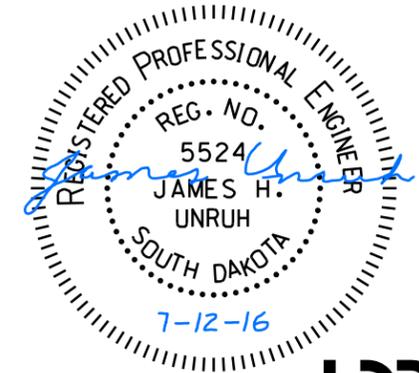
Hwy 100

Bike Path

Maple Street

BEGIN NH 0100(105)419  
Station 787+09.87

- ① 787+43 - 52' L  
Begin Str C&G  
TC El 1484.46 (Theor.)
- ② 793+15.5 - 52' L  
End Str C&G  
Begin 11,152' Rad C&G  
TC El 1490.18
- ③ 788+04.9 - 8' R  
Begin Str C&G  
TC El 1485.61
- ④ 792+49.9 - 8' R  
End Str C&G  
Begin Str C&G  
TC El 1490.40
- ⑤ 793+69.9 - 16' L  
End Str C&G  
Begin 11,116' Rad C&G  
TC El 1491.71
- ⑥ 788+04.9 - 16' R  
Begin Str C&G  
TC El 1485.61
- ⑦ 793+15.5 - 16' R  
End Str C&G  
Begin 11,084' Rad C&G  
TC El 1491.12
- ⑧ 787+53.5 - 52' R  
Begin Str C&G  
TC El 1484.53 (Theor.)
- ⑨ 793+15.5 - 52' R  
End Str C&G  
Begin 11,048' Rad C&G  
TC El 1490.39



# Curb & Gutter Layout

FOR BIDDING PURPOSES ONLY

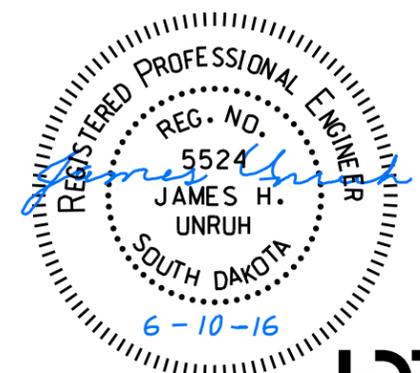
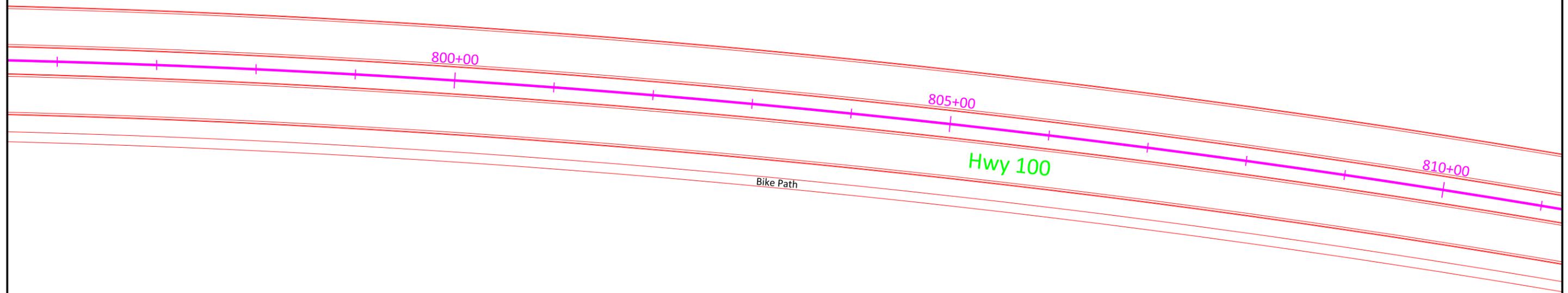
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0100(105)419	B68	B108

FILE: B68  
PLOTING DATE: 06-10-2016

REV DATE:  
INITIAL:



Note:  
All Curb and Gutter shown on this sheet  
is Type F610, and all Bike Path is Asphalt  
Concrete and 10' wide, except as noted.



# Curb & Gutter Layout

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0100(105)419	B69	B108

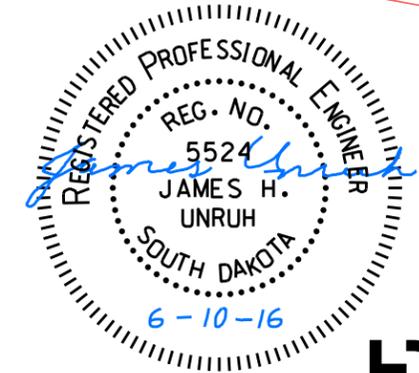
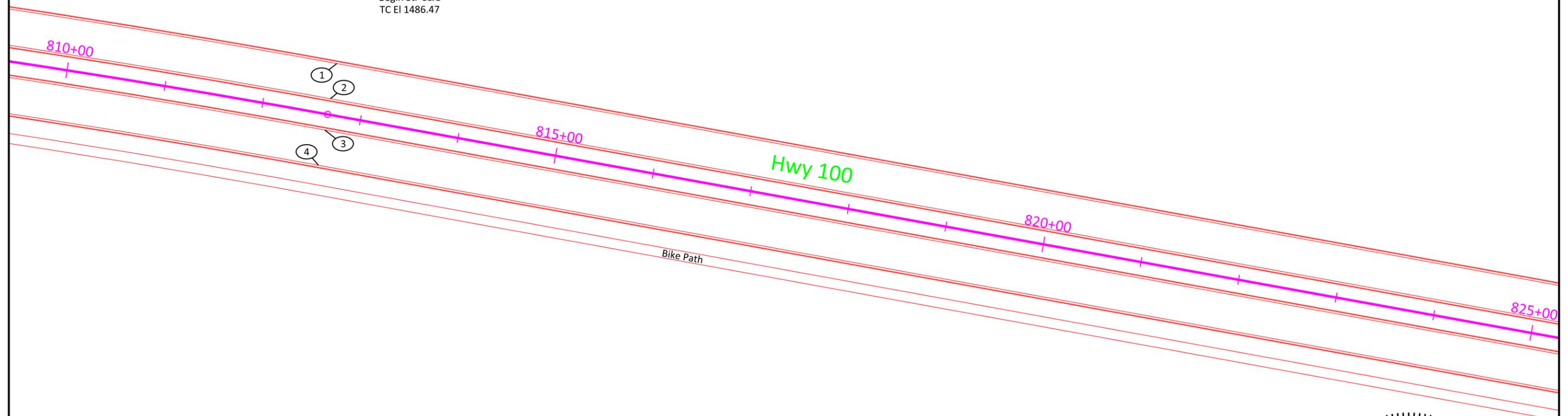
FILE: B69  
PLOTING DATE: 06-10-2016

REV DATE:  
INITIAL:



- ① 812+66.4 - 52' L  
End 11,152' Rad C&G  
Begin Str C&G  
TC El 1486.47
- ② 812+66.4 - 16' L  
End 11,116' Rad C&G  
Begin Str C&G  
TC El 1487.19
- ③ 812+66.4 - 16' R  
End 11,084' Rad C&G  
Begin Str C&G  
TC El 1487.19
- ④ 812+66.4 - 16' R  
End 11,048' Rad C&G  
Begin Str C&G  
TC El 1486.47

Note:  
All Curb and Gutter shown on this sheet  
is Type F610, and all Bike Path is Asphalt  
Concrete and 10' wide, except as noted.



# Curb & Gutter Layout

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0100(105)419	B70	B108

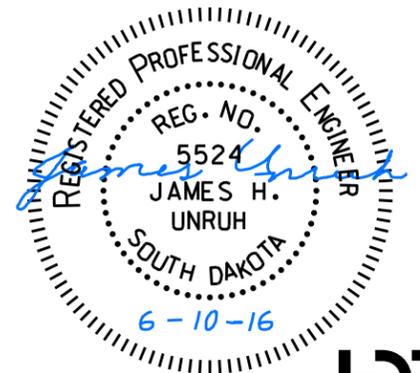
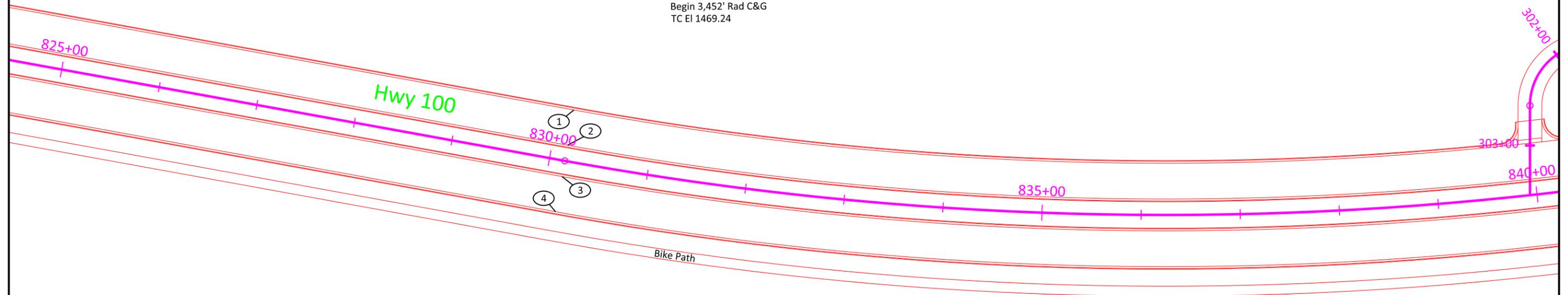
FILE: B70  
PLOT DATE: 06-10-2016

REV DATE:  
INITIAL:



Note:  
All Curb and Gutter shown on this sheet  
is Type F610, and all Bike Path is Asphalt  
Concrete and 10' wide, except as noted.

- ① 830+15.6 - 52' L  
End Str C&G  
Begin 3,348' Rad C&G  
TC El 1467.20
- ② 830+15.6 - 16' L  
End Str C&G  
Begin 3,384' Rad C&G  
TC El 1468.22
- ③ 830+15.6 - 16' R  
End Str C&G  
Begin 3,416' Rad C&G  
TC El 1468.22
- ④ 830+15.6 - 52' R  
End Str C&G  
Begin 3,452' Rad C&G  
TC El 1469.24



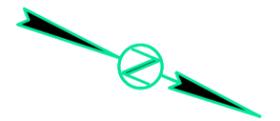
# Curb & Gutter Layout

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0100(105)419	B71	B108

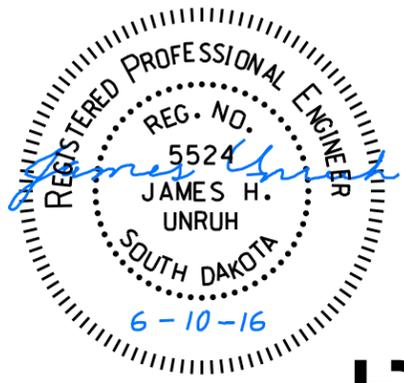
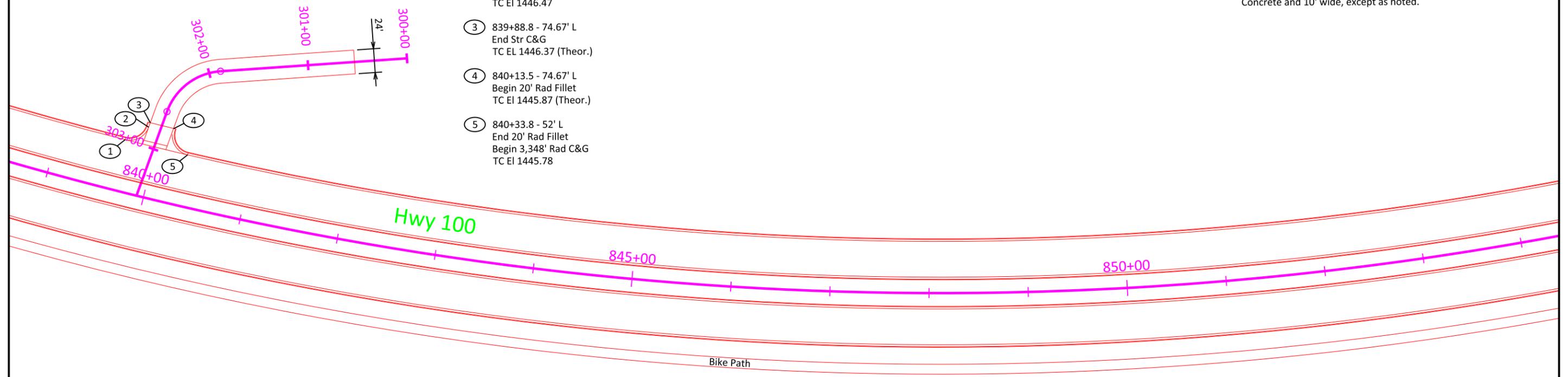
FILE: B71  
PLOTTING DATE: 06-10-2016

REV DATE:  
INITIAL:



Note:  
All Curb and Gutter shown on this sheet  
is Type F610, and all Bike Path is Asphalt  
Concrete and 10' wide, except as noted.

- ① 839+68.0 - 52' L  
End 3,348' Rad C&G  
Begin 20' Rad Fillet  
TC EL 1447.13
- ② 839+88.3 - 69.9' L  
End 20' Rad Fillet  
Begin Str C&G  
TC EL 1446.47
- ③ 839+88.8 - 74.67' L  
End Str C&G  
TC EL 1446.37 (Theor.)
- ④ 840+13.5 - 74.67' L  
Begin 20' Rad Fillet  
TC EL 1445.87 (Theor.)
- ⑤ 840+33.8 - 52' L  
End 20' Rad Fillet  
Begin 3,348' Rad C&G  
TC EL 1445.78



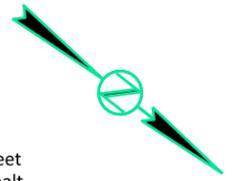
# Curb & Gutter Layout

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0100(105)419	B72	B108

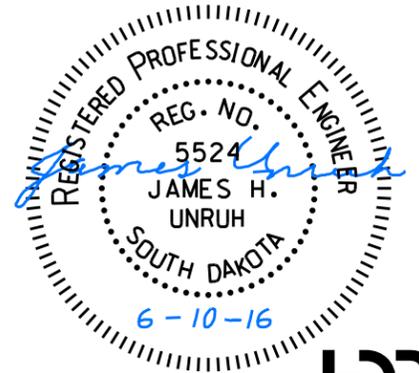
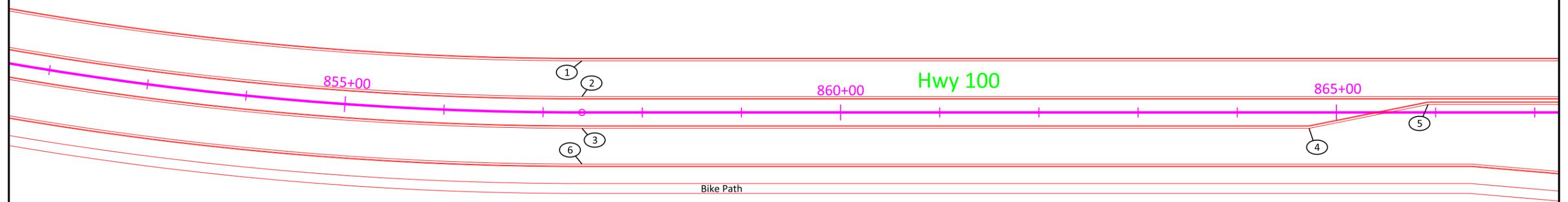
FILE: B72  
PLOTING DATE: 06-10-2016

REV DATE:  
INITIAL:



Note:  
All Curb and Gutter shown on this sheet  
is Type F610, and all Bike Path is Asphalt  
Concrete and 10' wide, except as noted.

- |  |  |
|--|--|
| ① 857+39.2 - 52' L<br>End 3,348' Rad C&G<br>Begin Str C&G<br>TC El 1411.09 | ④ 864+72.5 - 16' R<br>End Str C&G<br>Begin Str C&G<br>TC El 1396.92        |
| ② 857+39.2 - 16' L<br>End 3,384' Rad C&G<br>Begin Str C&G<br>TC El 1412.05 | ⑤ 864+92.5 - 8' L<br>End Str C&G<br>Begin Str C&G<br>TC El 1394.45         |
| ③ 857+39.2 - 16' R<br>End 3,416' Rad C&G<br>Begin Str C&G<br>TC El 1412.05 | ⑥ 857+39.2 - 52' R<br>End 3,452' Rad C&G<br>Begin Str C&G<br>TC El 1413.00 |



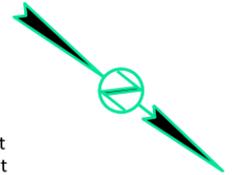
# Curb & Gutter Layout

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0100(105)419	B73	B108

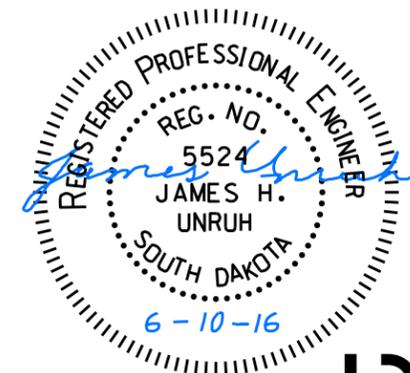
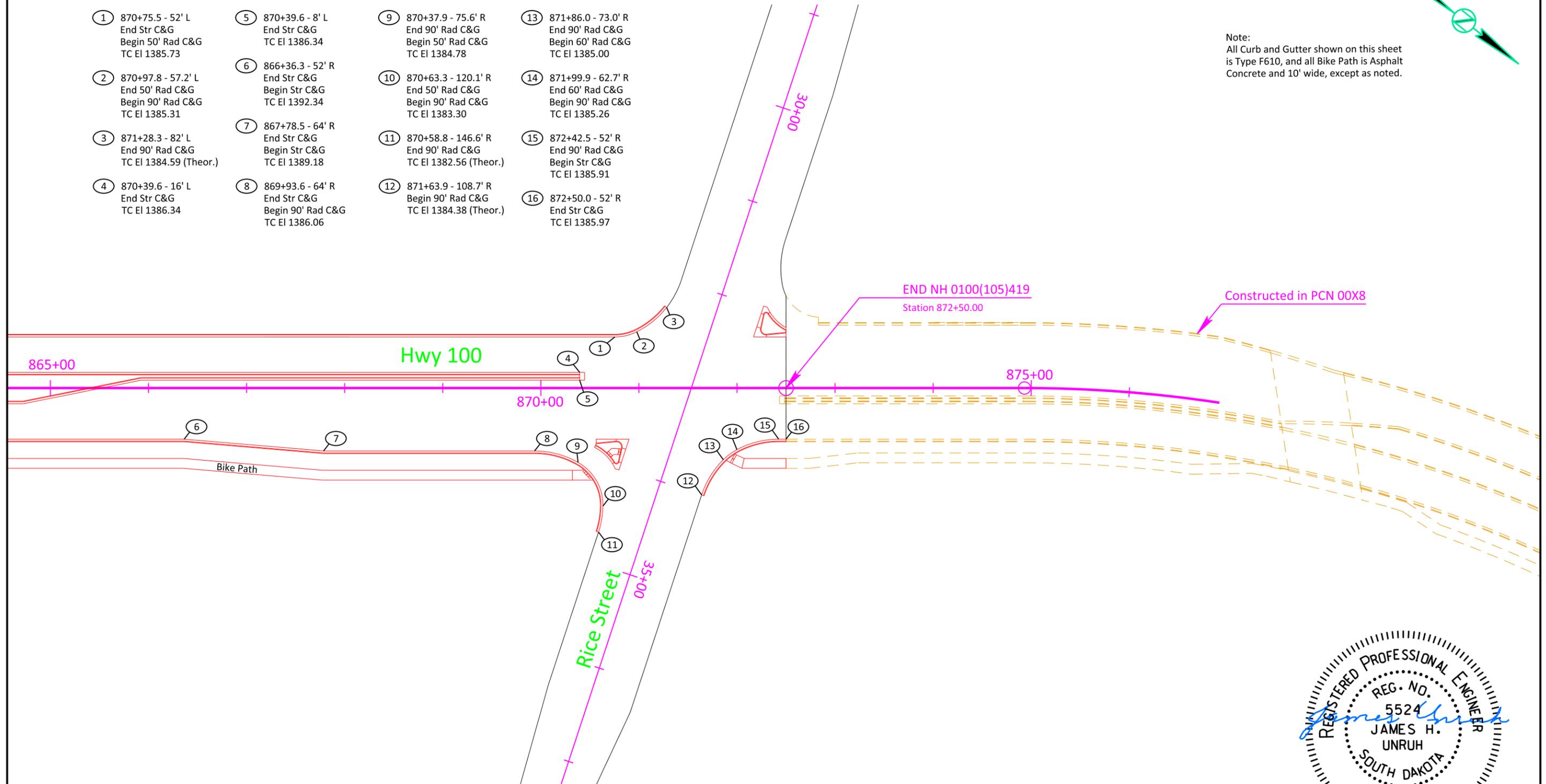
FILE: B73  
PLOTING DATE: 06-10-2016

REV DATE:  
INITIAL:



Note:  
All Curb and Gutter shown on this sheet  
is Type F610, and all Bike Path is Asphalt  
Concrete and 10' wide, except as noted.

- |   |   |  |   |
|---|---|--|---|
| ① 870+75.5 - 52' L<br>End Str C&G<br>Begin 50' Rad C&G<br>TC El 1385.73       | ⑤ 870+39.6 - 8' L<br>End Str C&G<br>TC El 1386.34                       | ⑨ 870+37.9 - 75.6' R<br>End 90' Rad C&G<br>Begin 50' Rad C&G<br>TC El 1384.78  | ⑬ 871+86.0 - 73.0' R<br>End 90' Rad C&G<br>Begin 60' Rad C&G<br>TC El 1385.00 |
| ② 870+97.8 - 57.2' L<br>End 50' Rad C&G<br>Begin 90' Rad C&G<br>TC El 1385.31 | ⑥ 866+36.3 - 52' R<br>End Str C&G<br>Begin Str C&G<br>TC El 1392.34     | ⑩ 870+63.3 - 120.1' R<br>End 50' Rad C&G<br>Begin 90' Rad C&G<br>TC El 1383.30 | ⑭ 871+99.9 - 62.7' R<br>End 60' Rad C&G<br>Begin 90' Rad C&G<br>TC El 1385.26 |
| ③ 871+28.3 - 82' L<br>End 90' Rad C&G<br>TC El 1384.59 (Theor.)               | ⑦ 867+78.5 - 64' R<br>End Str C&G<br>Begin Str C&G<br>TC El 1389.18     | ⑪ 870+58.8 - 146.6' R<br>End 90' Rad C&G<br>TC El 1382.56 (Theor.)             | ⑮ 872+42.5 - 52' R<br>End 90' Rad C&G<br>Begin Str C&G<br>TC El 1385.91       |
| ④ 870+39.6 - 16' L<br>End Str C&G<br>TC El 1386.34                            | ⑧ 869+93.6 - 64' R<br>End Str C&G<br>Begin 90' Rad C&G<br>TC El 1386.06 | ⑫ 871+63.9 - 108.7' R<br>Begin 90' Rad C&G<br>TC El 1384.38 (Theor.)           | ⑯ 872+50.0 - 52' R<br>End Str C&G<br>TC El 1385.97                            |



# Curb & Gutter Layout Rice Street

FOR BIDDING PURPOSES ONLY

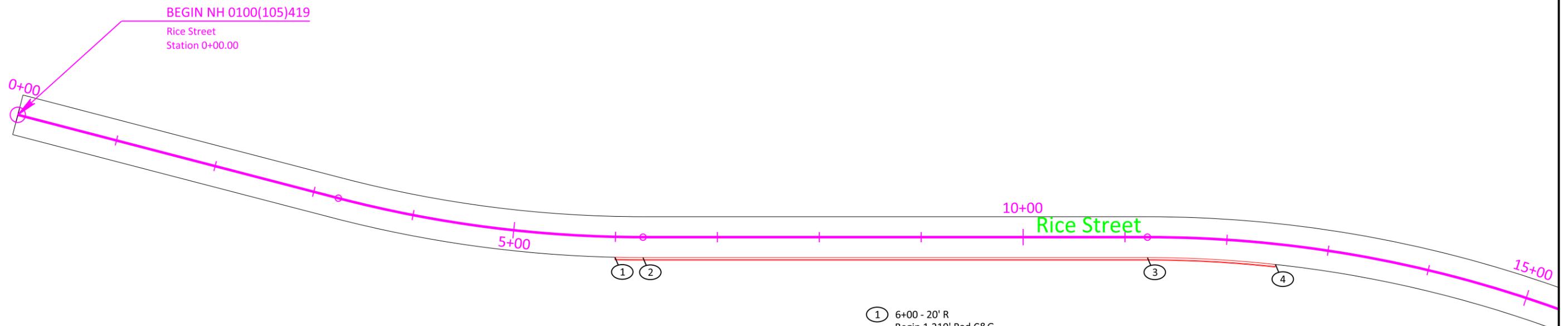
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0100(105)419	B74	B108

FILE: B74 (Rice)  
PLOTING DATE: 06-10-2016

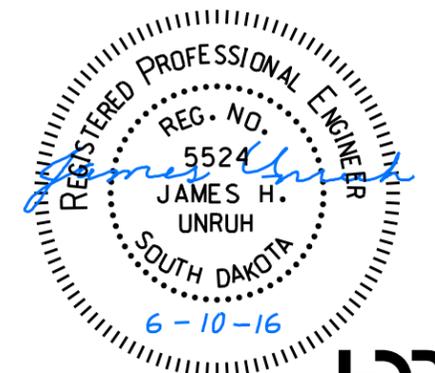
REV DATE:  
INITIAL:



Note:  
All Curb and Gutter shown on this sheet  
is Type F66 except as noted.



- ① 6+00 - 20' R  
Begin 1,210' Rad C&G  
TC El 1330.53 (Theor.)
- ② 6+27.0 - 20' R  
End 1,210' Rad C&G  
Begin Str C&G  
TC El 1329.98
- ③ 11+22.0 - 20' R  
End Str C&G  
Begin 1,170' Rad C&G  
TC El 1323.76
- ④ 12+50.0 - 20' R  
End 1,170' Rad C&G  
TC El 1325.05 (Theor.)



# Curb & Gutter Layout Rice Street

FOR BIDDING PURPOSES ONLY

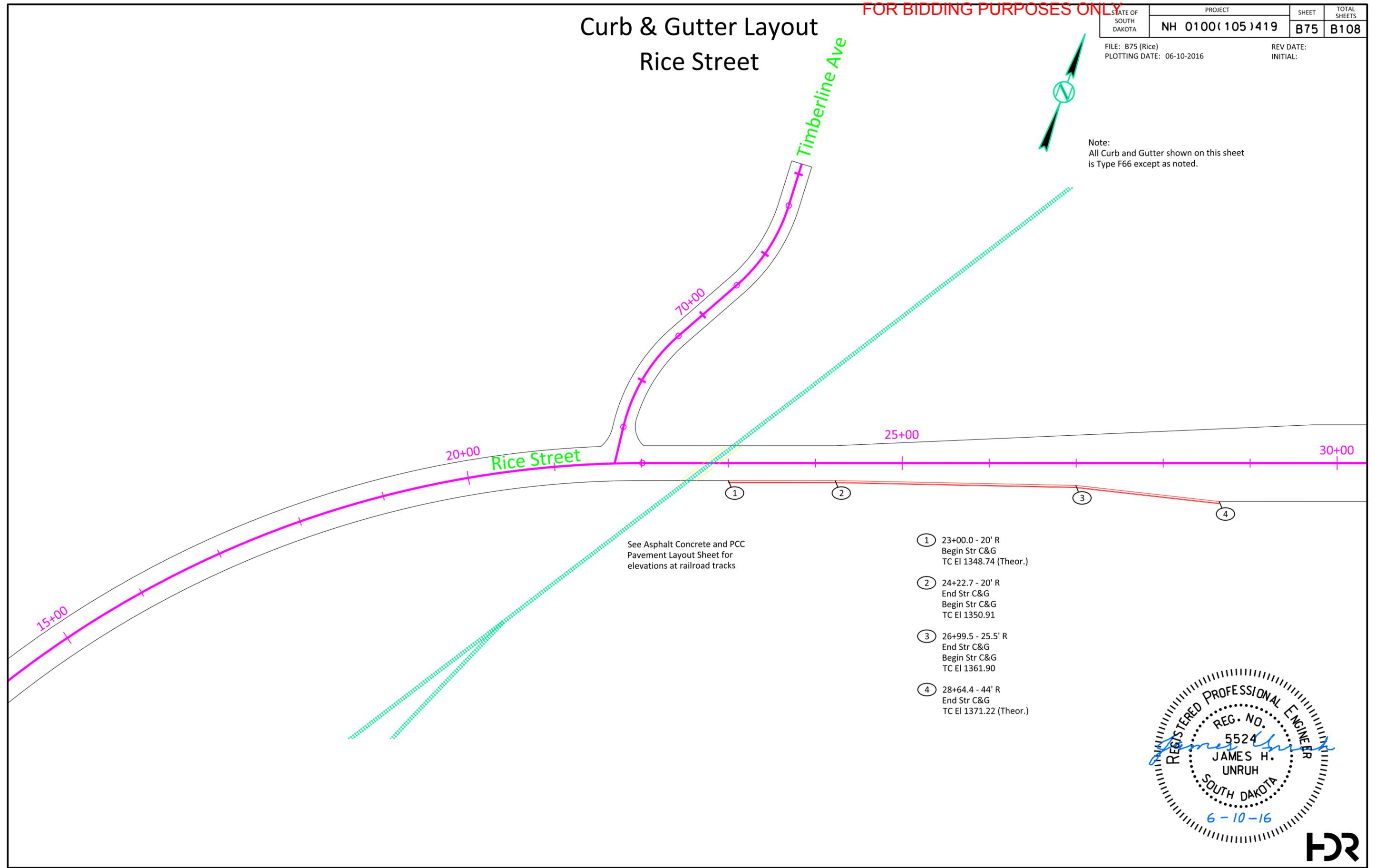
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0100(105)419	B75	B108

FILE: B75 (Rice)  
PLOTING DATE: 06-10-2016

REV DATE:  
INITIAL:

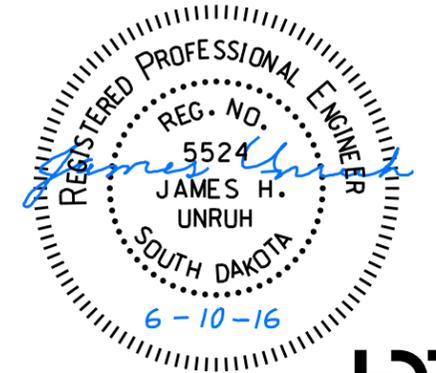


Note:  
All Curb and Gutter shown on this sheet  
is Type F66 except as noted.



See Asphalt Concrete and PCC  
Pavement Layout Sheet for  
elevations at railroad tracks

- ① 23+00.0 - 20' R  
Begin Str C&G  
TC El 1348.74 (Theor.)
- ② 24+22.7 - 20' R  
End Str C&G  
Begin Str C&G  
TC El 1350.91
- ③ 26+99.5 - 25.5' R  
End Str C&G  
Begin Str C&G  
TC El 1361.90
- ④ 28+64.4 - 44' R  
End Str C&G  
TC El 1371.22 (Theor.)



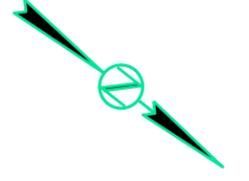
# Curb & Gutter Layout

FOR BIDDING PURPOSES ONLY

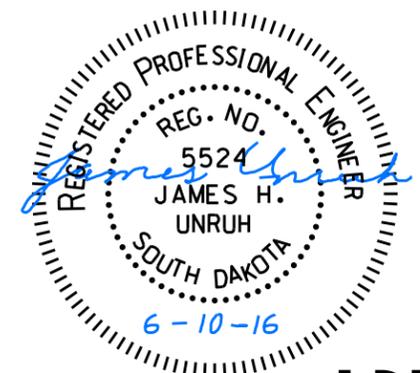
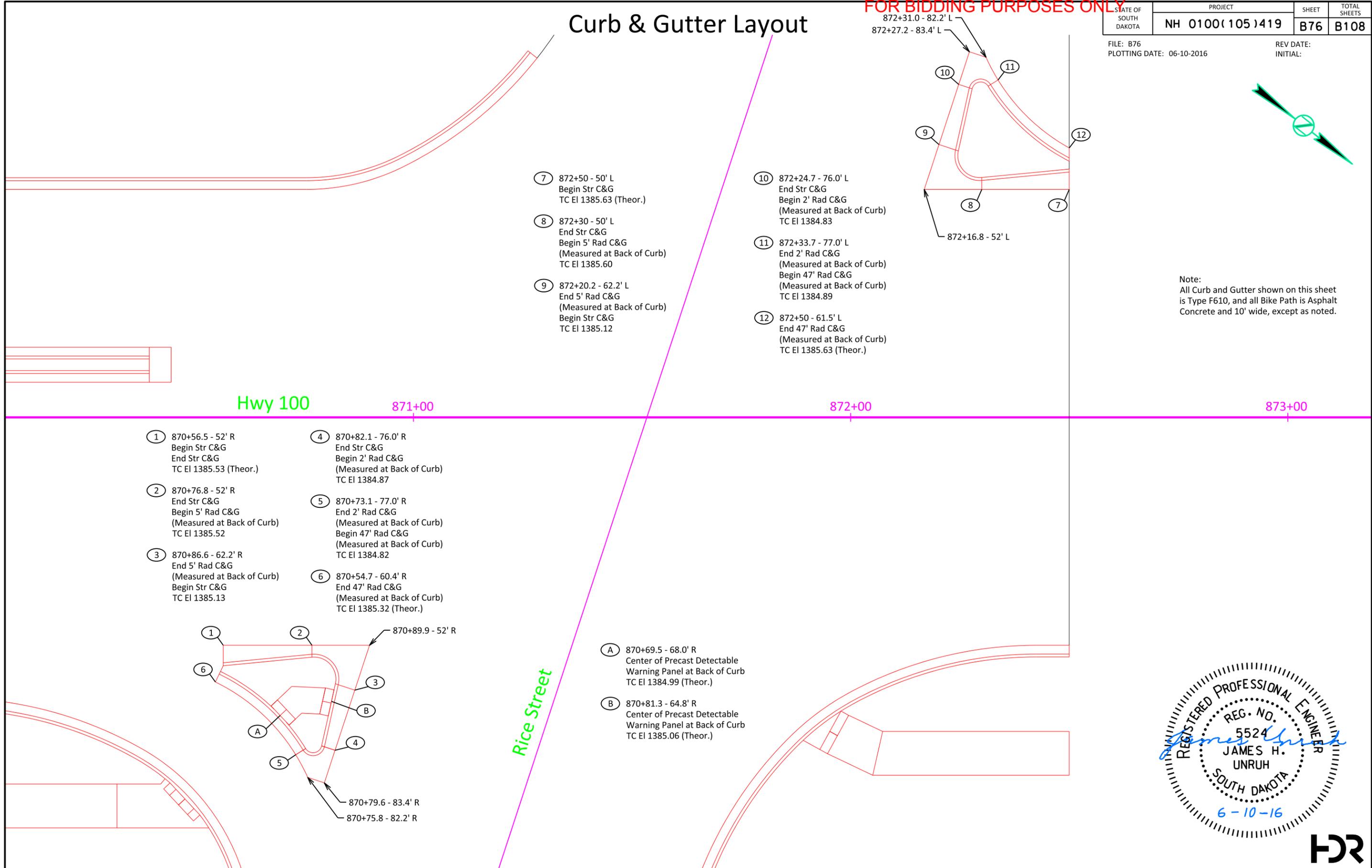
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0100(105)419	B76	B108

FILE: B76  
PLOTTING DATE: 06-10-2016

REV DATE:  
INITIAL:



Note:  
All Curb and Gutter shown on this sheet  
is Type F610, and all Bike Path is Asphalt  
Concrete and 10' wide, except as noted.



FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0100(105)419	B77	B108

FILE: ...\\Sheets\\B-Grading\\B77  
 PLOTTING DATE: 7-12-2016  
 REV DATE: 07-12-16  
 INITIAL: JHU

# Curb Ramp Detail - Hwy 100 / Maple Street

### Legend

Maximum 5% Longitudinal Slope and 2% Cross Slope on Sidewalk and Bike Path

All Concrete Sidewalk is 4" Thick

Detectable Warning Surfaces (2' Wide)

Landing with 2% Max. Slope

Pedestrian Push Button Pole

30"x48" Clear Space for Pedestrian Push Button Poles (2% Max. for Longitudinal and Cross Slopes)

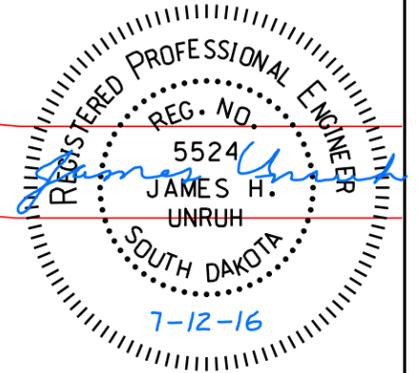
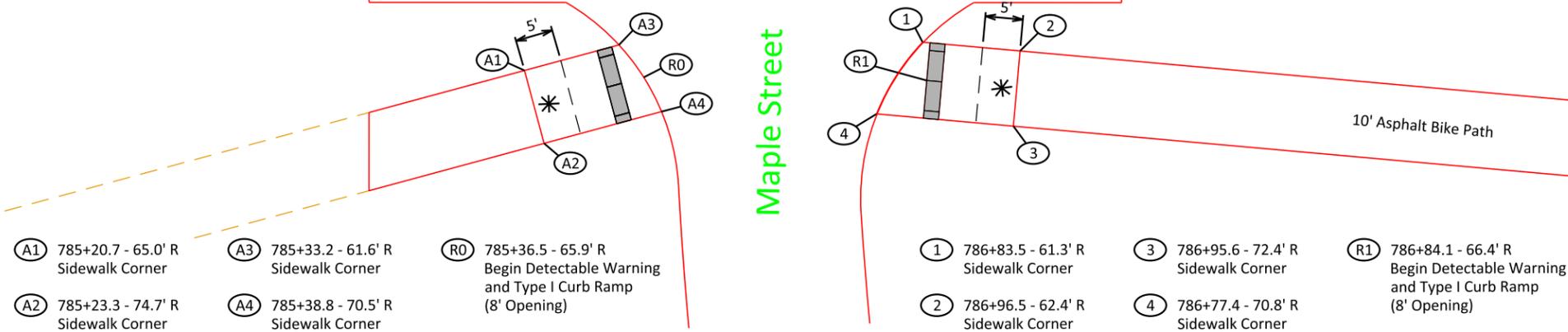
EQUATION  
 786+00.00 PCN 00KB  
 = 787+09.87 PCN 01V5

Hwy 100

Maple Street



SCALE IN FEET  
 0 10 20



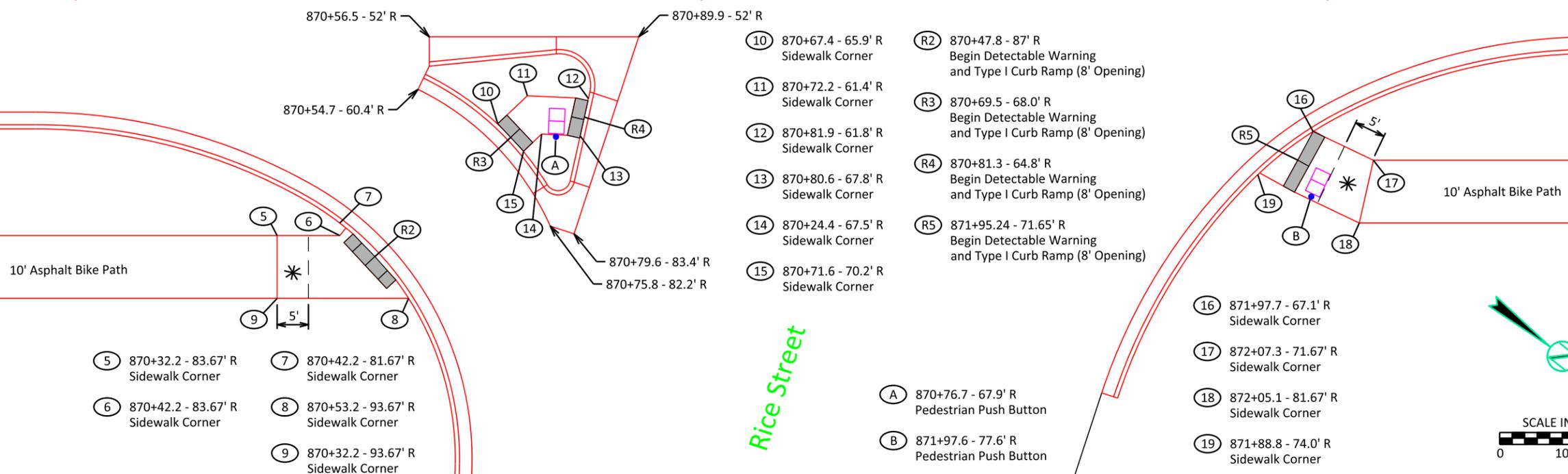
# Curb Ramp Detail - Hwy 100 / Rice Street

870+00

Hwy 100

871+00

872+00



SCALE IN FEET  
 0 10 20



# Underdrain Details

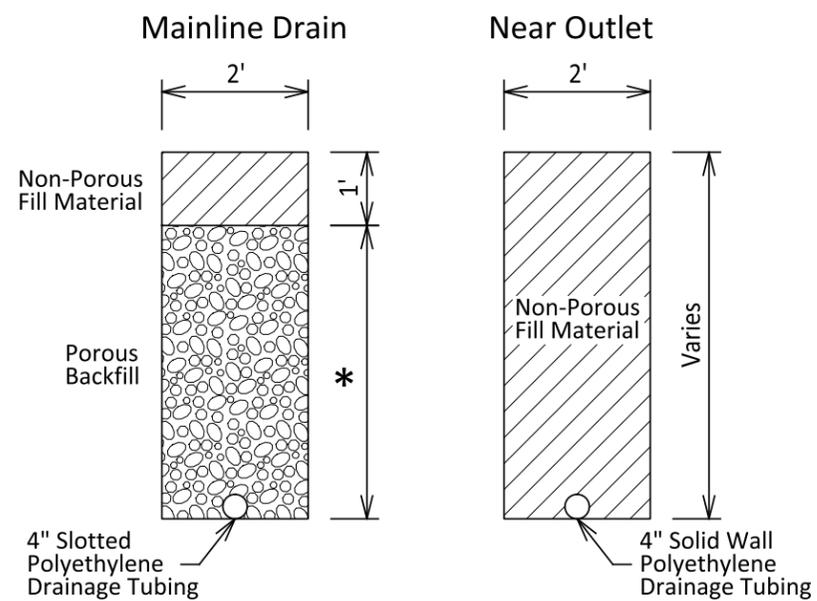
FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0100(105)419	B78	B108

FILE: B78 Underdrain Details.dgn  
PLOT DATE: 06-10-2016

REV DATE:  
INITIAL:

Hwy 100 Sta. 804+00 to Sta. 810+00  
Hwy 100 Sta. 810+00 to Sta. 819+40  
Hwy 100 Sta. 822+00 to Sta. 839+00



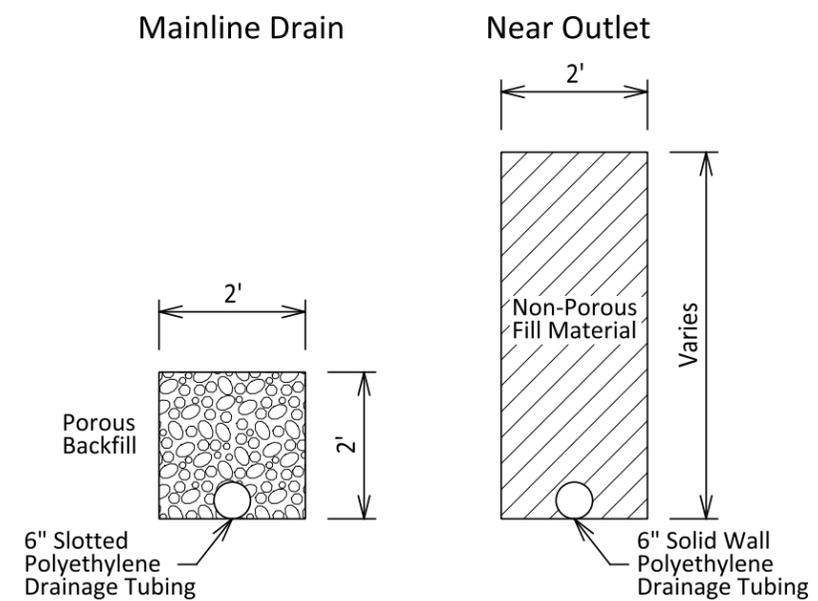
Underdrains shall be constructed in accordance with Section 680 of the Specifications.

\* Adjust depth to maintain 1% grade. Minimum 2' of porous material, where possible.

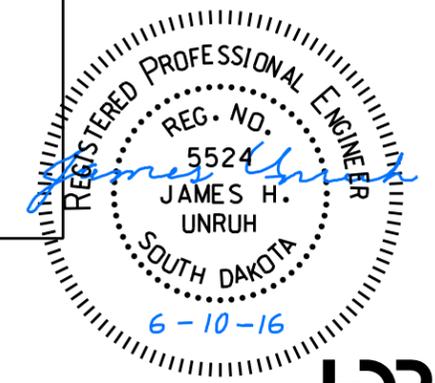
Hwy 100 Sta. 838+85 to Sta. 844+85  
Drainage Tubing Sta. 1001+00 to Sta. 1008+86

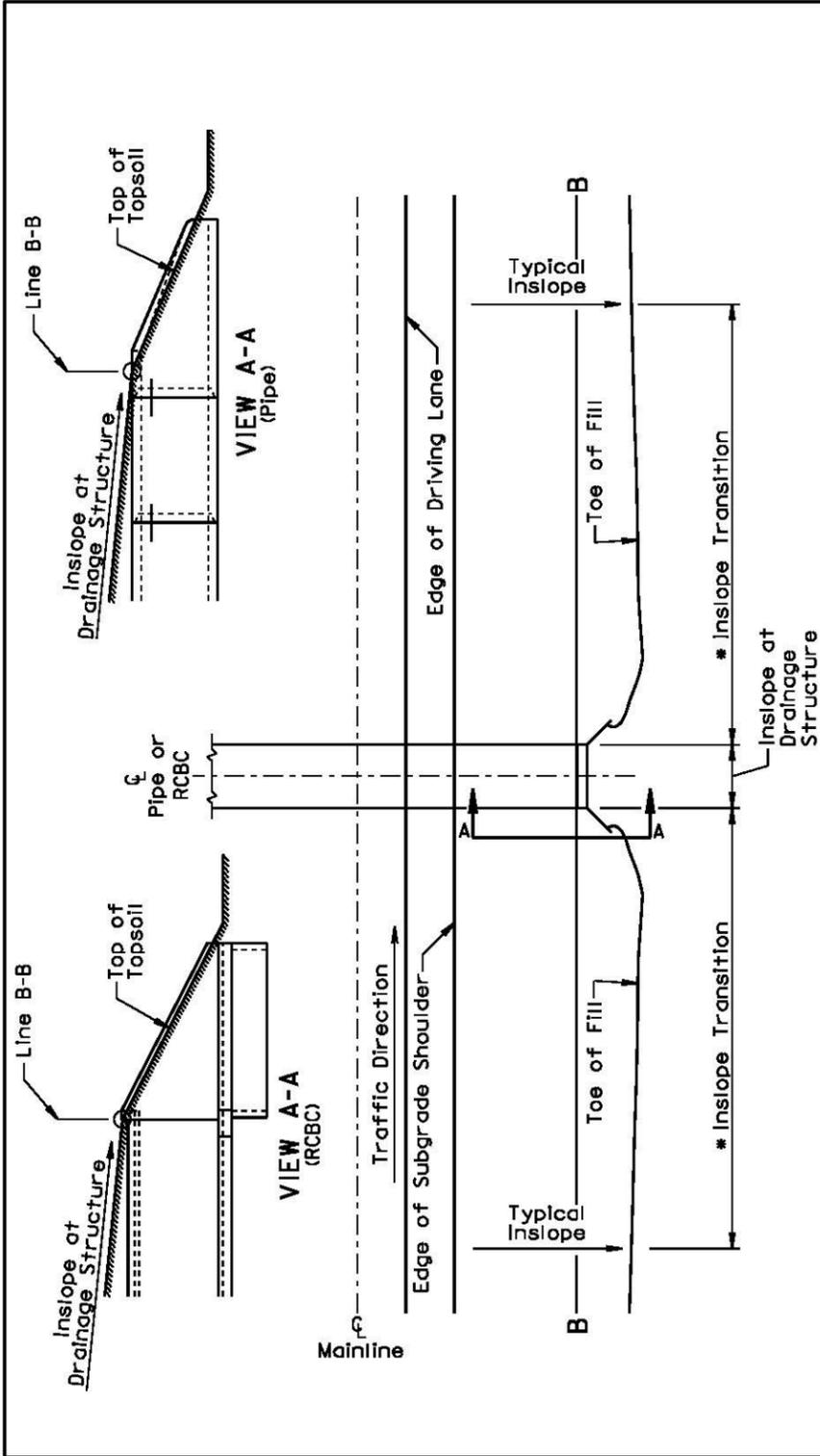
Hwy 100 Sta. 844+40 to Sta. 850+80  
Drainage Tubing Sta. 1100+00 to Sta. 1107+54

Hwy 100 Sta. 851+75 to Sta. 856+60  
Drainage Tubing Sta. 1200+00 to Sta. 1207+80



Underdrains shall be constructed in accordance with Section 680 of the Specifications.





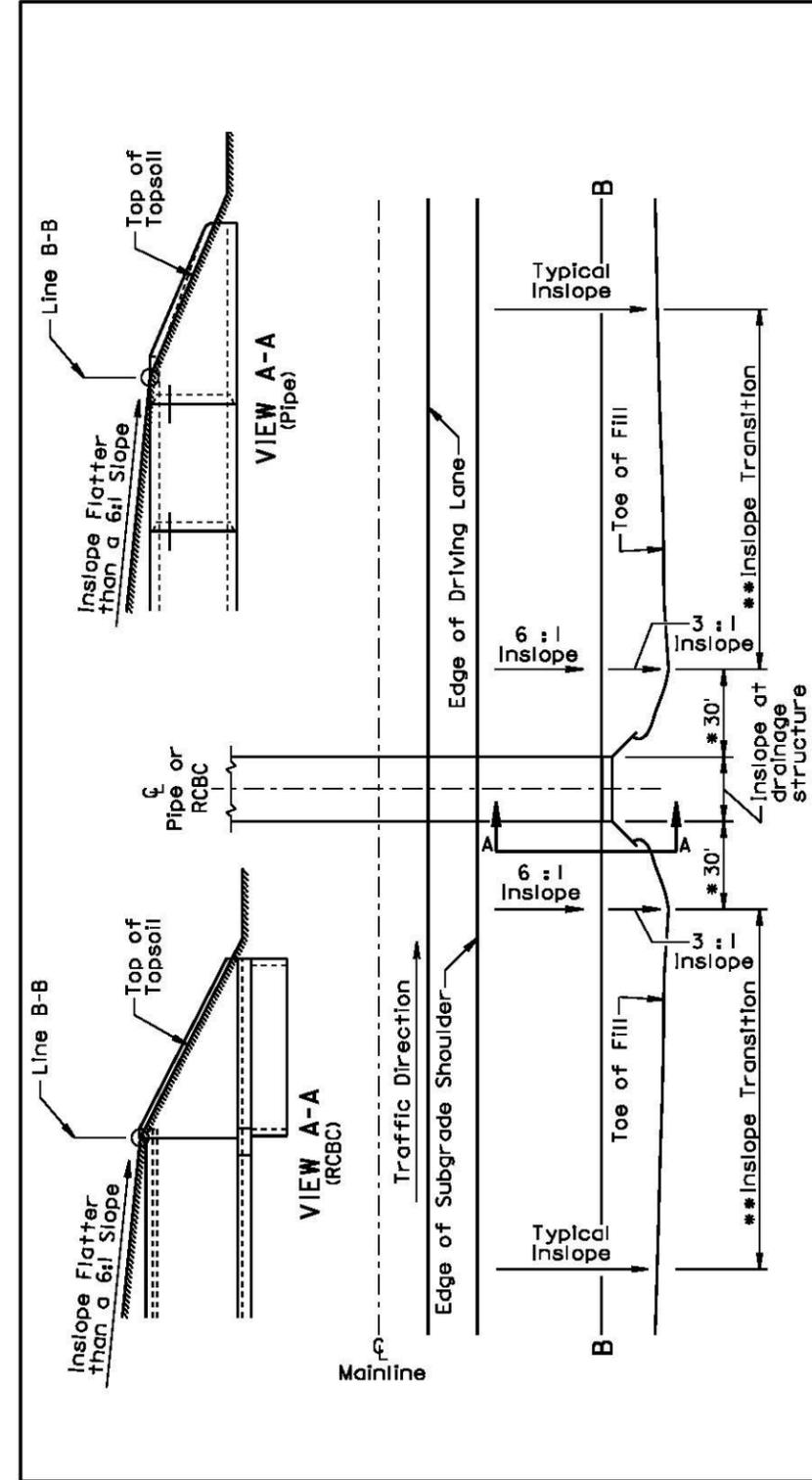
**TYPE 1 INSLOPE TRANSITION**

**GENERAL NOTES:**

This Type 1 Inslope Transition is used when the specified inslope at the drainage structure is flatter than the typical inslope and the inslope at the drainage structure is between a 4:1 slope and 6:1 slope. Line B-B represents the clear zone line, the location where soil intercepts the parapet on an RCBC, the location where the soil intercepts the top of the pipe adjacent to the opening of the pipe end section, or may represent a change in slope.

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

February 14, 2011



**TYPE 2 INSLOPE TRANSITION**

**GENERAL NOTES:**

This Type 2 Inslope Transition is used when the specified inslope at the pipe or RCBC is flatter than a 6:1 slope. Line B-B represents the clear zone line, the location where soil intercepts the parapet on an RCBC, the location where the soil intercepts the top of the pipe adjacent to the opening of the pipe end section, or may represent a change in slope.

\* Transition from inslope at drainage structure to a 6:1 inslope and 3:1 inslope.

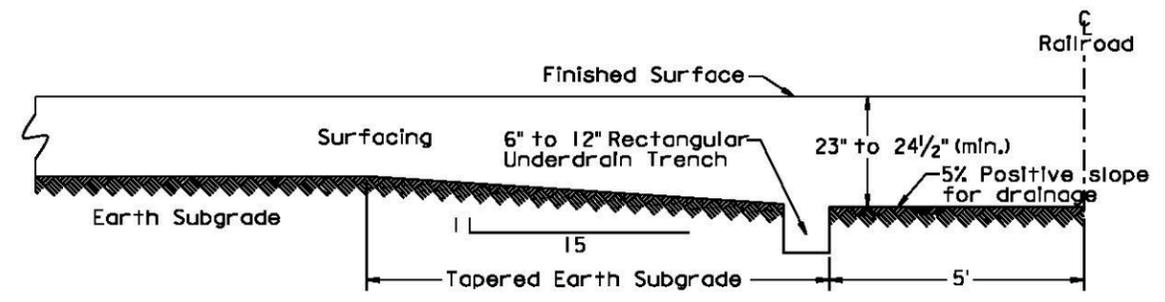
\*\* Transition from typical inslope to the inslopes adjacent to the drainage structure. Within the clear zone (area from edge of subgrade shoulder to line B-B) use 100' length for each 1:1 slope change. Example: transition from a 4:1 to a 6:1 would require a 200' length transition. The typical inslope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

February 14, 2011

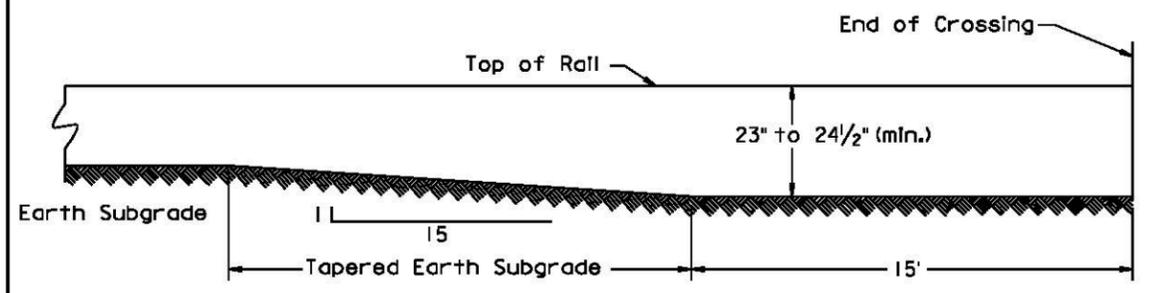
FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0100(105)419	B80	B108

Plotting Date: 6/9/2016



Excavation Profile Along Roadway



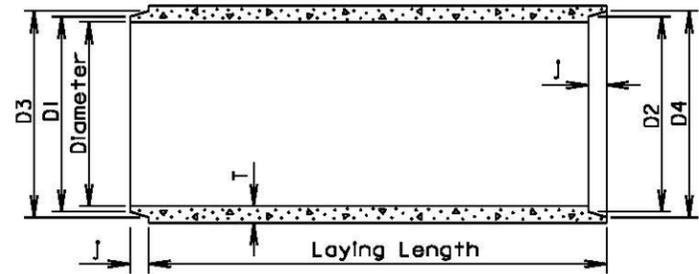
Excavation Profile Along Railroad

March 31, 2000

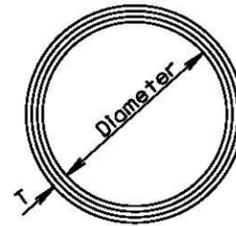
Published Date: 2nd Qtr. 2016	S D D O T	GRADING AT RAILROAD CROSSING	PLATE NUMBER 120.06
			Sheet 1 of 1

**TOLERANCES IN DIMENSIONS**

Diameter:  $\pm 1.5\%$  for 24" Dia. or less and  $\pm 1\%$  or  $\frac{3}{16}$ " 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:**

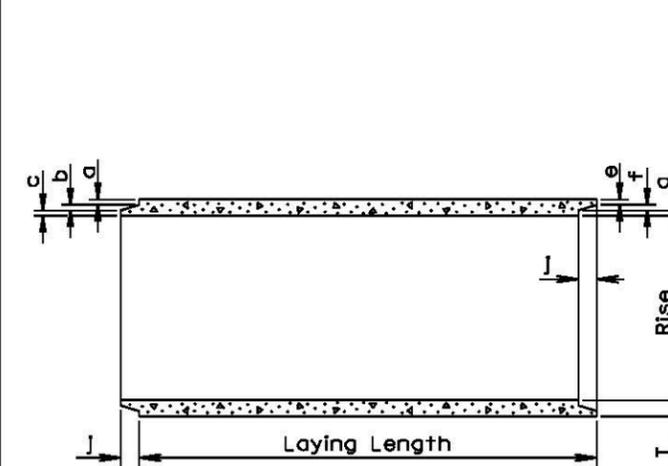
Construction of R. C. P. shall conform to the requirements of Section 990 of the Specifications.

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.

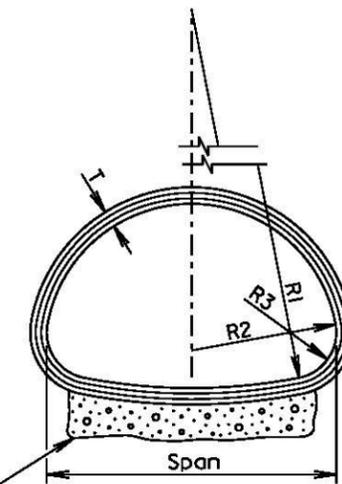
Diam. (In.)	Approx. Wt./Ft. (lb.)	T (In.)	J (In.)	D1 (In.)	D2 (In.)	D3 (In.)	D4 (In.)
12	92	2	1 3/4	13 1/4	13 5/8	13 7/8	14 1/4
15	127	2 1/4	2	16 1/2	16 1/8	17 1/4	17 5/8
18	168	2 1/2	2 1/4	19 5/8	20	20 3/8	20 3/4
21	214	2 3/4	2 1/2	22 7/8	23 1/4	23 3/4	24 1/8
24	265	3	2 3/4	26	26 3/8	27	27 3/8
27	322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

June 26, 2015

<b>S D D O T</b>	<b>REINFORCED CONCRETE PIPE</b>	PLATE NUMBER <b>450.01</b>
	Published Date: 2nd Qtr. 2016	Sheet 1 of 1



LONGITUDINAL SECTION



END VIEW

**TOLERANCES IN DIMENSIONS**

Radial dimensions at joints:  $\pm \frac{1}{8}$ " for 65" span or less and  $\pm \frac{1}{4}$ " for longer spans.  
 Rise and Span:  $\pm 2\%$  of tabular values.  
 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  $\frac{1}{2}$ ".

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 plain 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	13 1/2	22	2 1/2	1 3/8	3/8	3/4	2	1 1/8	3/8	1	27 1/2	13 3/4	5 1/4
24	320	18	28 1/2	3 1/2	1 5/8	1/2	1 3/8	3	1 3/8	1/2	1 5/8	40 1/16	14 3/4	4 5/8
30	450	22 1/2	36 1/4	4	1 11/16	5/8	1 9/16	3 1/2	1 9/16	5/8	1 11/16	51	18 1/4	6 1/8
36	600	26 5/8	43 3/4	4 1/2	2	3/4	1 3/4	4	1 3/4	3/4	2	62	22 1/2	6 1/2
42	740	31 5/16	51 1/8	4 1/2	2	3/4	1 3/4	4	1 3/4	3/4	2	73	26 1/4	7 3/4
48	890	36	58 1/2	5	2 1/4	3/4	2	5	2	3/4	2 1/4	84	30	8 1/8
54	1100	40	65	5 1/2	2 1/2	3/4	2 1/4	5	2 1/4	3/4	2 1/2	92 1/2	33 3/8	10
60	1400	45	73 1/2	6	3 5/16	3/4	1 5/16	5	2 3/4	3/4	2 1/2	105	37 1/2	11
72	1900	54	88	7	3 13/16	1	2 3/16	6	3 1/4	1	2 3/4	126	45	13 5/16
84	2500	62	102	8	4 1/8	1	2 7/8	6	3 1/2	1	3 1/2	162 1/2	52	14 1/2
96	3300	78	122 3/8	9	4 1/2	1	3 1/2	7	4	1	4	218	62	20
108	4200	88	138 1/2	10	5	1	4	7	4 1/2	1	4 1/2	269	70	22
120	5100	96 1/8	154	11	5 1/2	1	4 1/2	7	5	1	5	301 3/8	78	24
132	5100	106 1/2	168 3/4	10		1	4	7	4 1/2	1	4 1/2	329	85 5/8	26 1/8

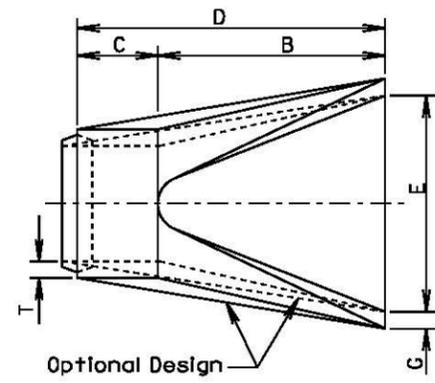
\* Equivalent Diameter of Circular R. C. P.

**GENERAL NOTES:**

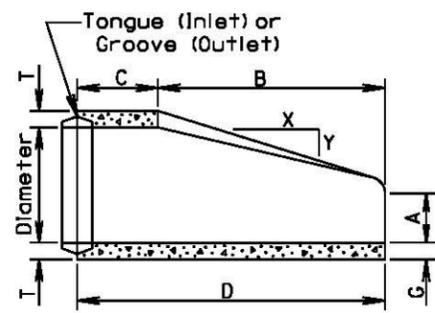
Construction of R.C.P. Arch shall conform to the requirements of Section 990 of the Specifications. Not more than 2 four-foot sections shall be permitted near the ends of any culvert. Four-foot lengths shall be used only to secure the required length of culvert.

June 26, 2015

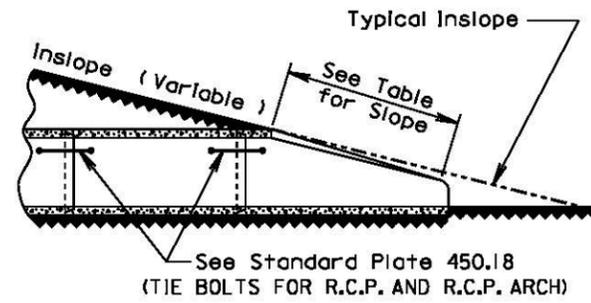
<b>S D D O T</b>	<b>REINFORCED CONCRETE PIPE ARCH</b>	PLATE NUMBER <b>450.02</b>
	Published Date: 2nd Qtr. 2016	Sheet 1 of 1



TOP VIEW



LONGITUDINAL SECTION

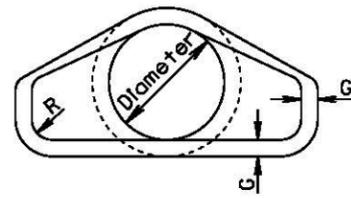


SLOPE DETAIL

GENERAL NOTES:

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

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

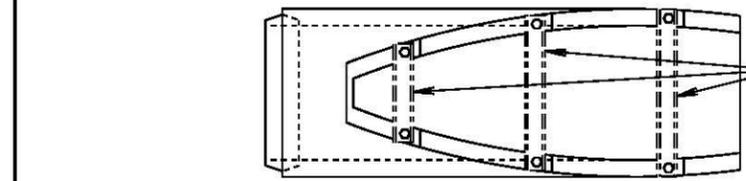


END VIEW

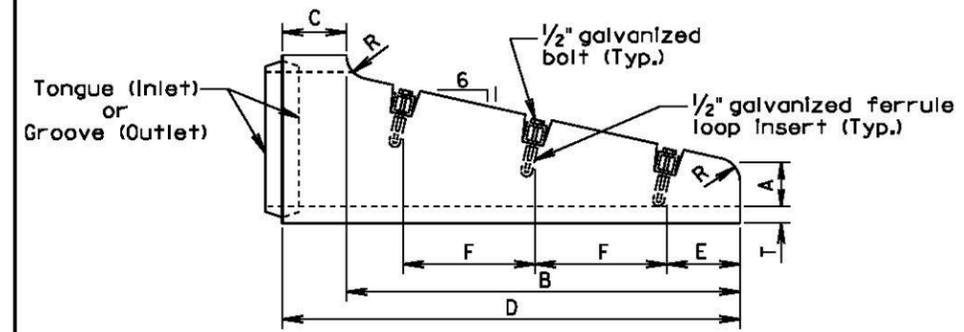
Dia. (In.)	Approx. Wt. of Section (lbs.)	Approx. Slope (X to Y)	T (In.)	A (In.)	B (In.)	C (In.)	D (In.)	E (In.)	G (In.)	R (In.)
12	530	2.4:1	2	4	24	48 7/8	72 7/8	24	2	1 1/2
15	740	2.4:1	2 1/4	6	27	46	73	30	2 1/4	1 1/2
18	990	2.3:1	2 1/2	9	27	46	73	36	2 1/2	1 1/2
21	1280	2.4:1	2 3/4	9	36	37 1/2	73 1/2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

June 26, 2015

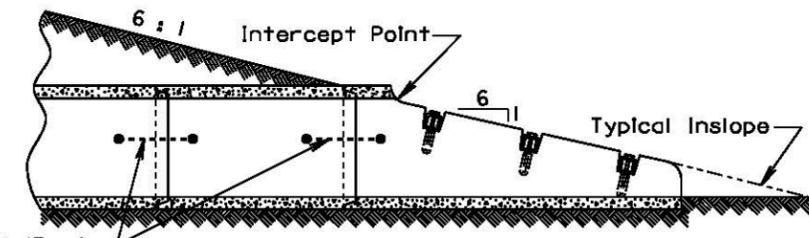
<b>S D D O T</b>	<b>R. C. P. FLARED ENDS</b>	PLATE NUMBER <b>450.10</b>
	Published Date: 2nd Qtr. 2016	Sheet 1 of 1



TOP VIEW



SIDE VIEW



ELEVATION VIEW

If bars are specified in the plans then provide HSS 2.5X2.5X.1875 Structural Steel Tubing in conformance with ASTM A500, Grade B or 3" Diameter Schedule 40 Pipe in conformance with ASTM A53, Grade B.

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

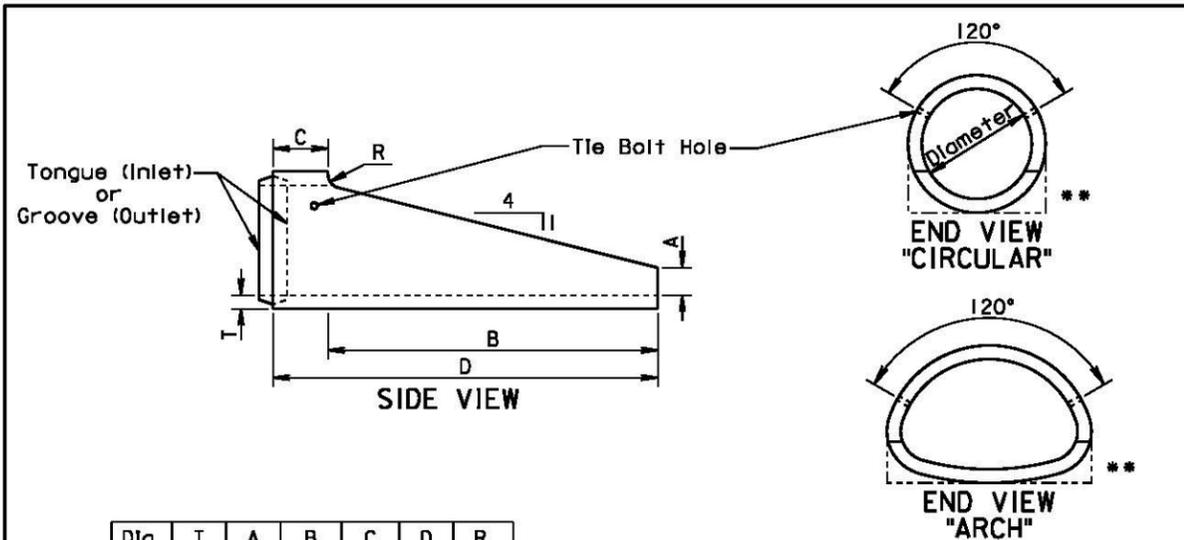
\*The use of 2 sections must be an approved design.  
\*\*Equivalent Diameter of Circular R. C. P.

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 shall be galvanized after fabrication in accordance with ASTM A123.

August 31, 2013

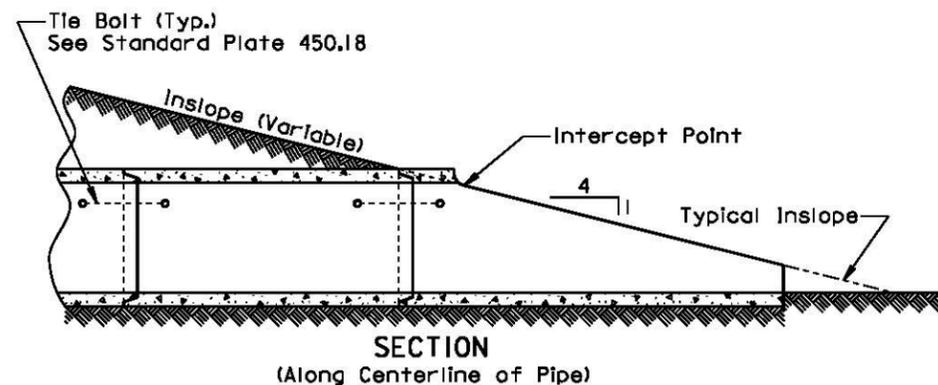
<b>S D D O T</b>	<b>R. C. P. SAFETY ENDS WITH OR WITHOUT BARS</b>	PLATE NUMBER <b>450.12</b>
	Published Date: 2nd Qtr. 2016	Sheet 1 of 1



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	3 1/2	7 1/2	90	12	102	3 1/2
FOR ARCH PIPE						
* 24	3	6	48	12	60	3
* 30	3 1/2	7 1/2	60	12	72	3 1/2
* 36	4 1/2	8 5/8	66	30	96	0
* 42	4 1/2	10	77 1/4	18 3/4	96	0

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

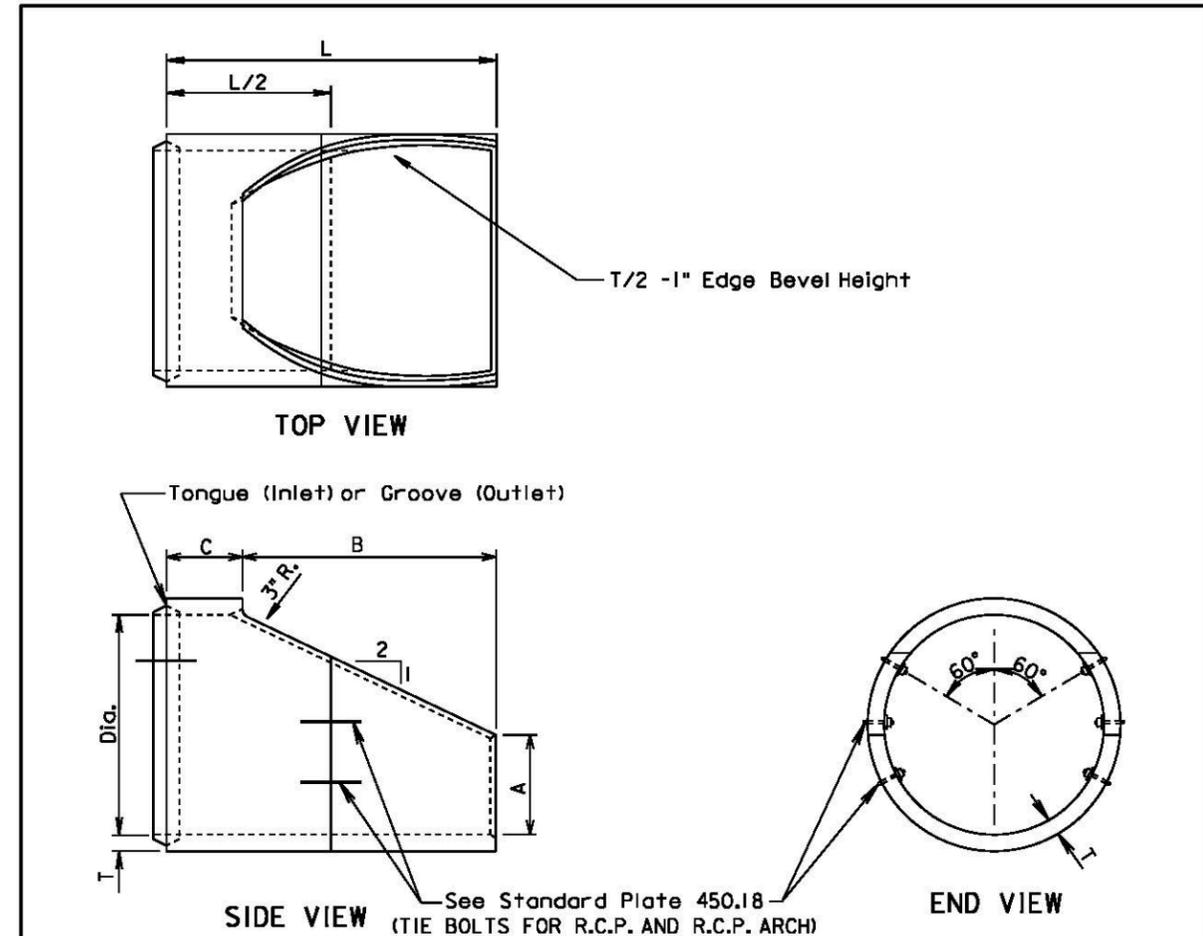
\* Equivalent Diameter of Circular R.C.P.  
 \*\* Acceptable Flat Bottom Alternate.



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

September 22, 2006

Published Date: 2nd Qtr. 2016	S D D O T	R. C. P. SLOPED ENDS	PLATE NUMBER 450.13
			Sheet 1 of 1



Dia. (In.)	T (In.)	L (ft.)	INLET END			OUTLET END		
			A (In.)	B (In.)	C (In.)	A (In.)	B (In.)	C (In.)
96	9	12	42	104	40	44	99	45
108	10	16	42	128	64	44	123	69
120	11	16	42	152	40	44	147	45

GENERAL NOTES:

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

Reinforcement per Class 2 RCP with double reinforcement in the upper 120 degrees of the full barrel portion.

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

June 26, 2015

Published Date: 2nd Qtr. 2016	S D D O T	R. C. P. SECTIONAL ENDS	PLATE NUMBER 450.16
			Sheet 1 of 1

2 Piece			2 Piece			3 Piece				
5° to 45° Elbow			50° to 90° Elbow			90° Elbow				
Diameter	A	L	Diameter	A	L	Diameter	A	B	C	L
Inches	Feet	Feet	Inches	Feet	Feet	Inches	Inches			Feet
12	1	2	12	2	4	12	25 1/2	11	18 1/2	4
15	1	2	15	2	4	15	26 1/2	12	18	4
18	1	2	18	2	4	18	27	14	17	4
21	2	4	21	2	4	21	27	15	16 1/2	4
24	2	4	24	2	4	24	27 1/2	16	16	4
27	2	4	27	2	4	27	27 1/2	17	15 1/2	4
30	2	4	30	3	6	30	40	19	26 1/2	6
33	2	4	33	3	6	33	40	20	26	6
36	2	4	36	3	6	36	40 1/2	21	25 1/2	6
42	2	4	42	3	6	42	41	23	24 1/2	6
48	2	4	48	4	8	48	53 1/2	26	35	8
54	3	6	54	4	8	54	54	28	34	8
60	3	6	60	4	8	60	54 1/2	31	32 1/2	8
66	3	6	66	4	8	66	54	33	31 1/2	8
72	3	6	72	5	10	72	67 1/2	36	42	10
78	3	6	78	5	10	78	68	39	40 1/2	10
84	3	6	84	5	10	84	68 1/2	41	39 1/2	10
90	3	6	90	6	12	90	70	46	37	10
96	3	6	96	6	12	96	82	46	49	12

FABRICATED ELBOW LENGTHS FOR ALL CORRUGATIONS

GENERAL NOTES:

All dimensions shown are nominal.

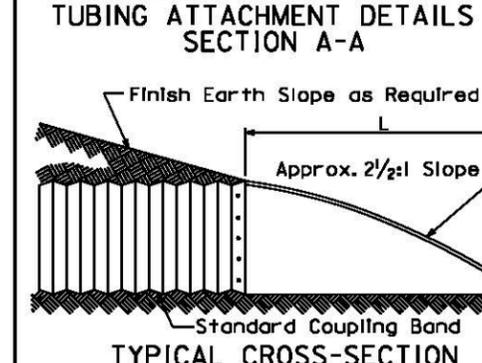
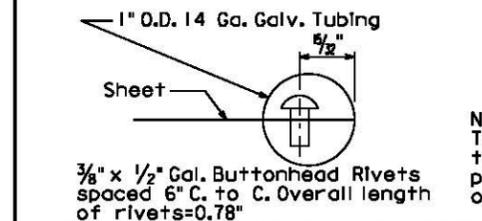
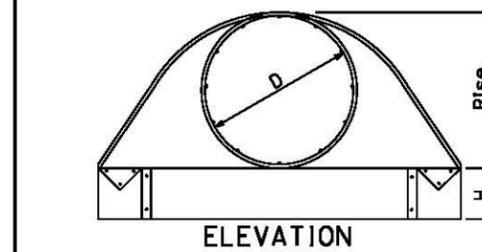
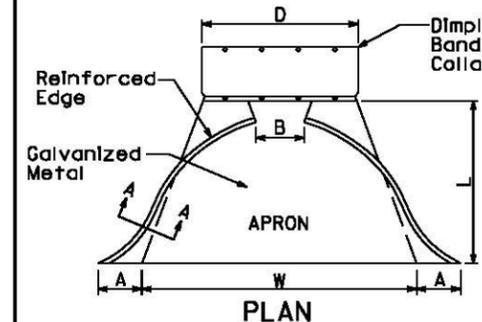
L = Linear Feet of C.M.P. required to fabricate fitting.

June 26, 2001

<b>S D D O T</b>	<b>C.M.P. FABRICATED LENGTHS FOR ELBOWS</b>	PLATE NUMBER <b>450.32</b>
		Sheet 1 of 1

Published Date: 2nd Qtr. 2016

Alternate Type Connector Sections may be used with approval of the Engineer.



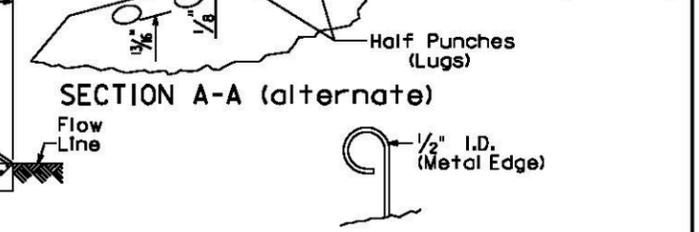
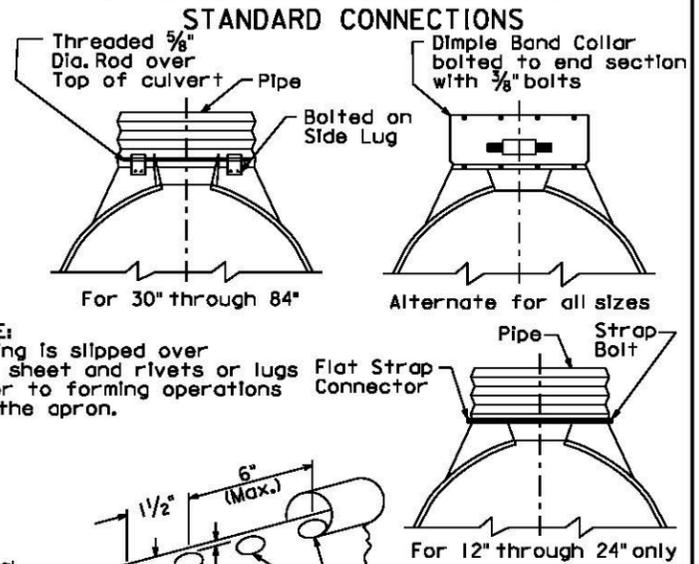
GENERAL NOTES:  
 All 3 pc. bodies shall have 12 Ga. sides and 10 Ga. center panels. Width of center panels shall be greater than 20% of the pipe periphery. Multiple panel bodies to have lap seams tightly joined by 3/8" Dia. galvanized rivets or bolts.  
 For 60" through 84" sizes, reinforced edges shall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

March 31, 2000

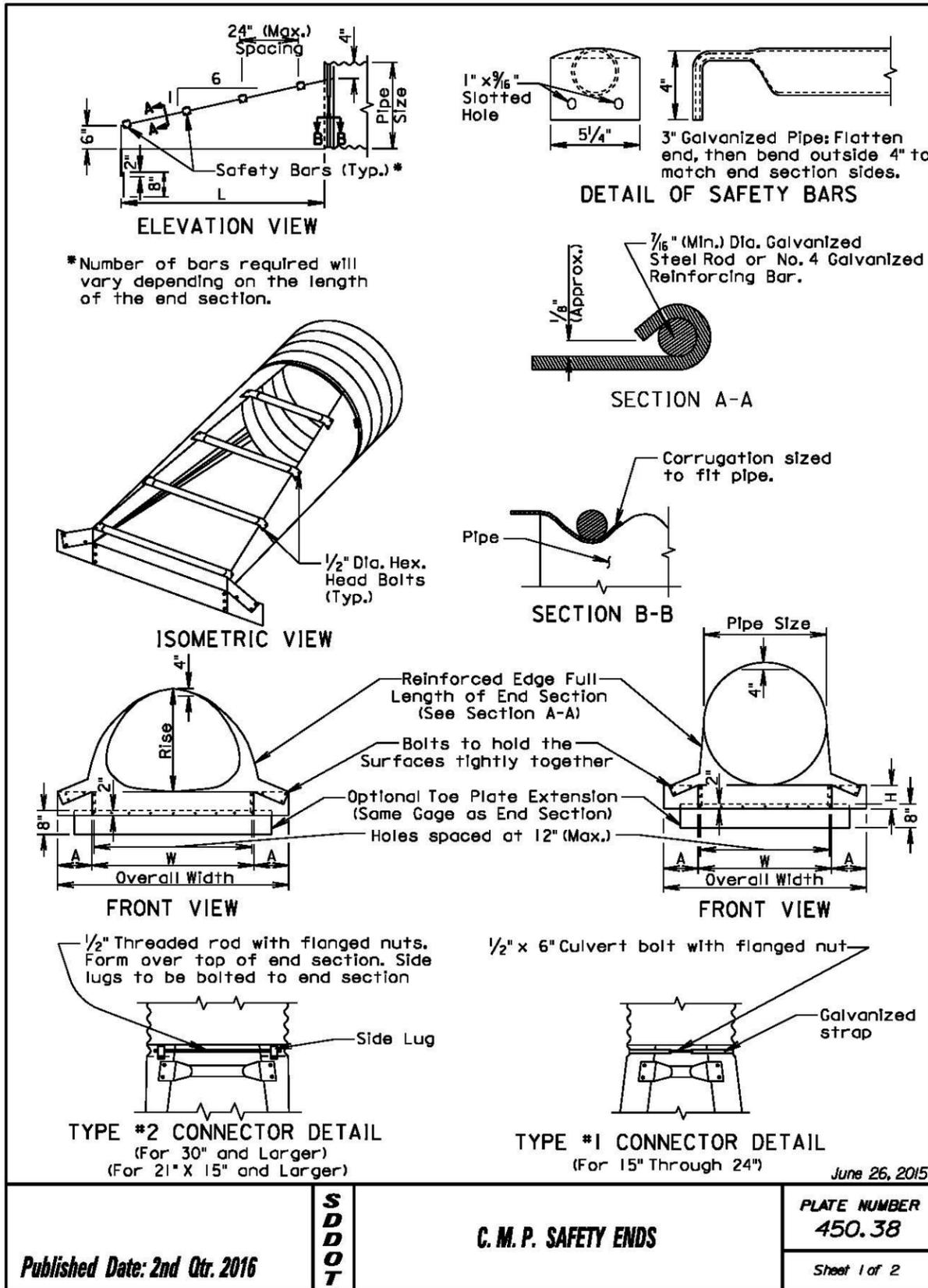
<b>S D D O T</b>	<b>C.M.P. FLARED ENDS</b>	PLATE NUMBER <b>450.35</b>
		Sheet 1 of 1

Published Date: 2nd Qtr. 2016

Dia. D (In.)	Ga.	DIMENSIONS (In.)					Approx. Slope	Body
		A	B	H	L	W		
12	16	6	6	6	21	24	2 1/2:1	1 Pc.
15	16	7	8	6	26	30	2 1/2:1	1 Pc.
18	16	8	10	6	31	36	2 1/2:1	1 Pc.
21	16	9	12	6	36	42	2 1/2:1	1 Pc.
24	16	10	13	6	41	48	2 1/2:1	1 Pc.
30	14	12	16	8	46	60	2 1/2:1	1 Pc.
36	14	14	19	9	51	72	2 1/2:1	2 Pc.
42	12	16	22	11	60	84	2 1/2:1	2 Pc.
48	12	18	27	12	69	90	2 1/4:1	2 Pc.
54	12	18	30	12	78	102	2:1	3 Pc.
60	12	18	33	12	84	114	1 3/4:1	3 Pc.
66	12	18	36	12	87	120	1 1/2:1	3 Pc.
72	12	18	39	12	87	126	1 1/3:1	3 Pc.
78	12	18	42	12	87	132	1 1/4:1	3 Pc.
84	12	18	45	12	87	138	1 1/5:1	3 Pc.



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



ARCH C.M.P. SAFETY ENDS										
Equv. Dia. (Inch)	(Inches)		Min. Thick. Inch	Gage	Dimensions (Inches)			L Dimensions		
	Span	Rise			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. Inch	Gage	Dimensions (Inches)			L Dimensions			
			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 ends shall be fabricated from galvanized steel conforming to the requirements of the Specifications.

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

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

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

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

Installation shall be performed in accordance with the Specifications.

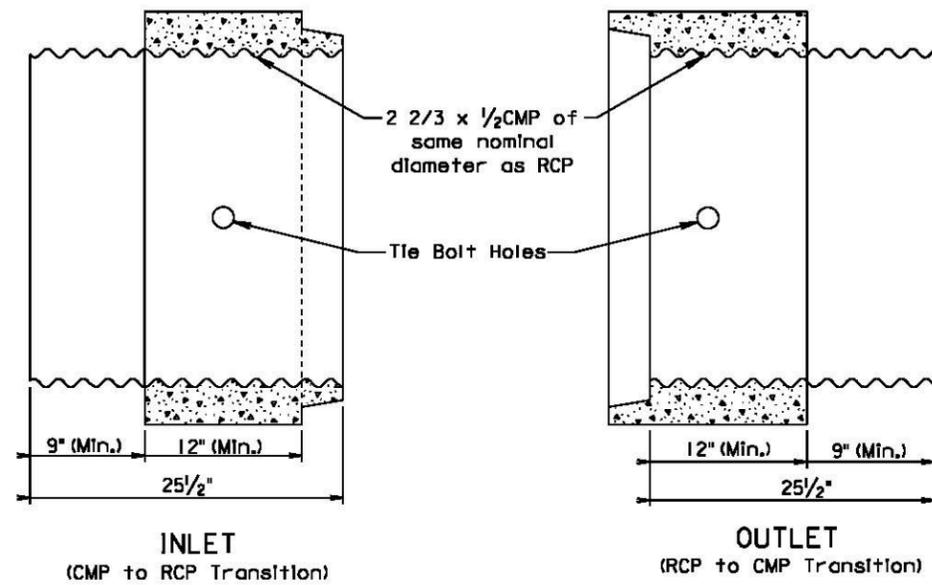
Cost of all work and materials required for fabrication and installation of safety ends shall be incidental to the bid items for the various sizes of safety ends.

June 26, 2015

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0100(105)419	B86	B108

Plotting Date: 6/9/2016

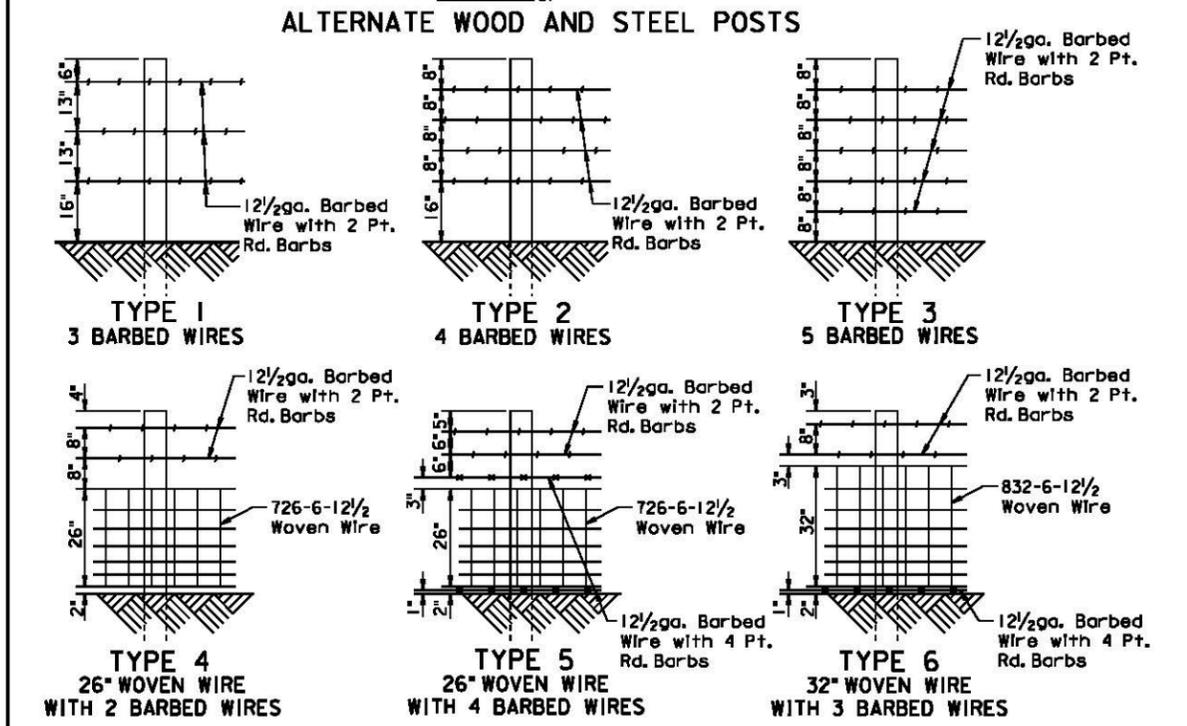
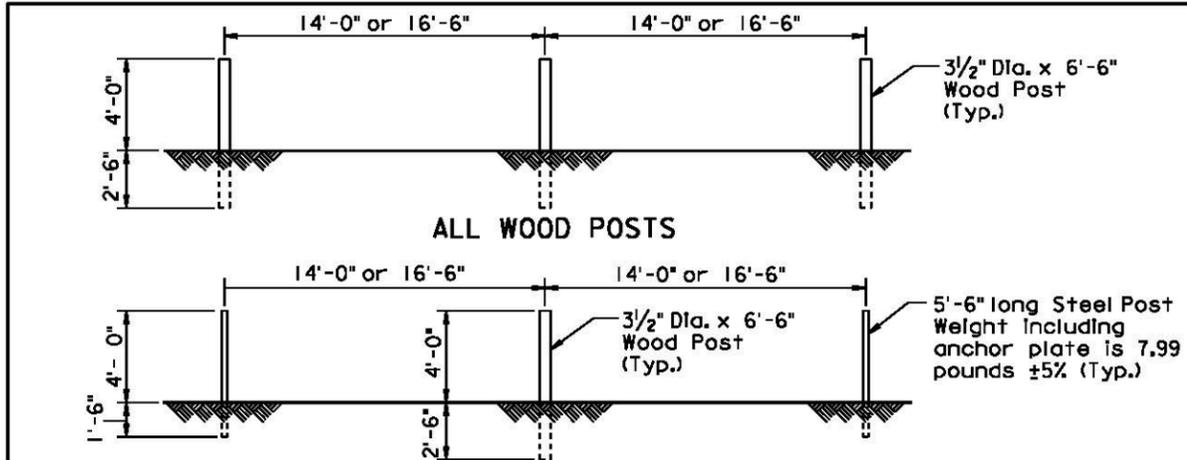


**GENERAL NOTE:**

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

March 31, 2000

Published Date: 2nd Qtr. 2016	S D D O T	C.M.P. TO R.C.P. TRANSITION AND R.C.P. TO C.M.P. TRANSITION	PLATE NUMBER 450.50
			Sheet 1 of 1



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

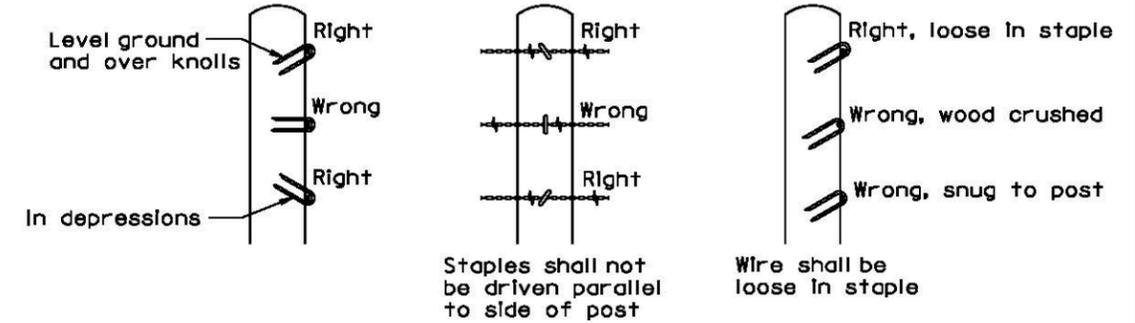
**GENERAL NOTES:**  
 Fence types designated on the plans that are followed by the letter S shall have smooth (barbless) wires.  
 When type 5S or 6S is designated the bottom wire may be barbed, smooth, or left off.  
 All degrees of curvature stated for fence are at centerline of roadway.  
 September 14, 2009

Published Date: 2nd Qtr. 2016

**S  
D  
D  
O  
T**

**RIGHT-OF-WAY FENCE**

PLATE NUMBER  
**620.01**  
Sheet 1 of 1



**STAPLE INSTALLATION**

**GENERAL NOTES:**

The Right-of-Way fence shall consist of barbed wire or a combination of woven wire and barbed wire. The barbed wire and/or woven wire shall be fastened to all wood posts or fastened to alternating wood and steel posts. Only wood posts shall be used for brace panels. Gates shall be of the type designated in the plans or as otherwise directed by the Engineer. Fence shall 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 shall 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 shall 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 shall be fabricated from zinc coated 14 ga. wire. Two point barbs shall be wrapped twice around one main strand at 4" spacings and the four point barbs shall be interlocked and wrapped around both main strands at 5" spacings.

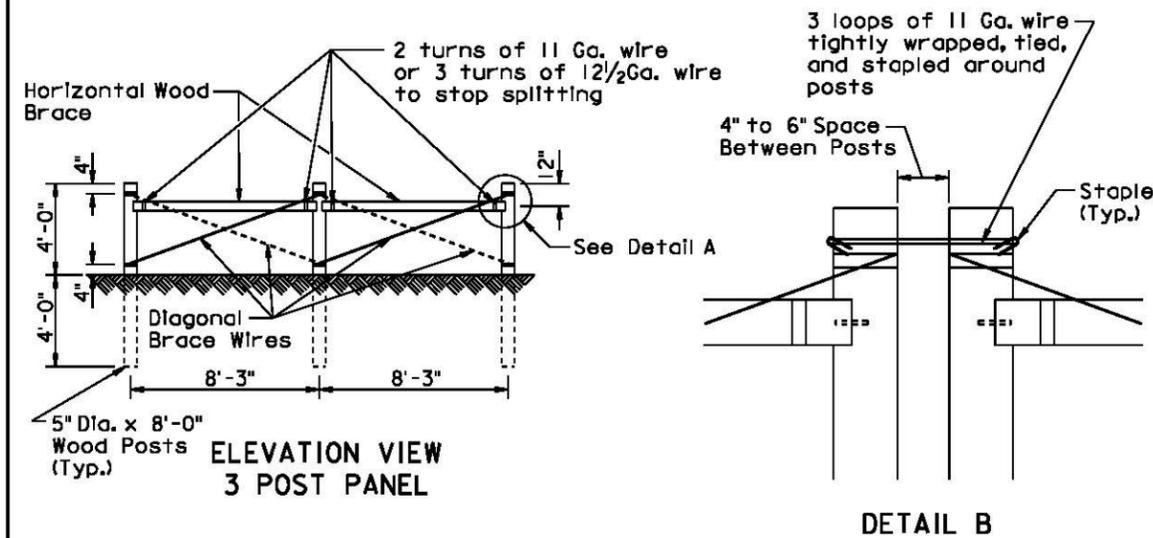
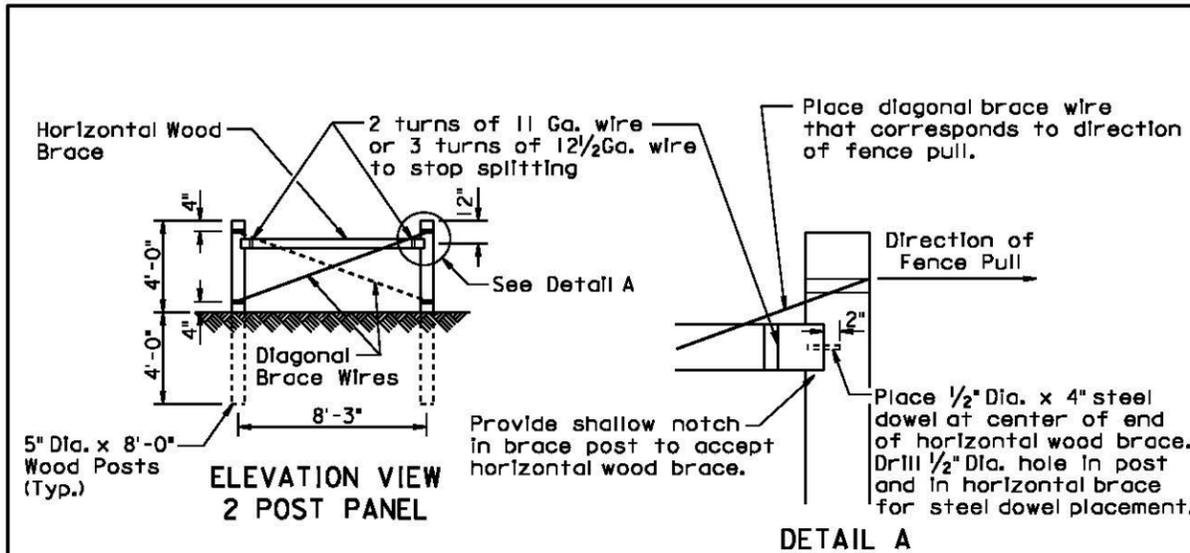
The gages of wire and wood post lengths and sizes are the minimum acceptable unless otherwise specified in the plans. The tolerances for steel posts shall be as stated in AASHTO M281. Woven wire shall conform to design and specifications of ASTM A116 and barbed wire shall conform to ASTM A121.

Published Date: 2nd Qtr. 2016

**S  
D  
D  
O  
T**

**STAPLE INSTALLATION AND GENERAL RIGHT-OF-WAY FENCE NOTES**

December 23, 2004  
PLATE NUMBER  
**620.02**  
Sheet 1 of 1



**GENERAL NOTES:**

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

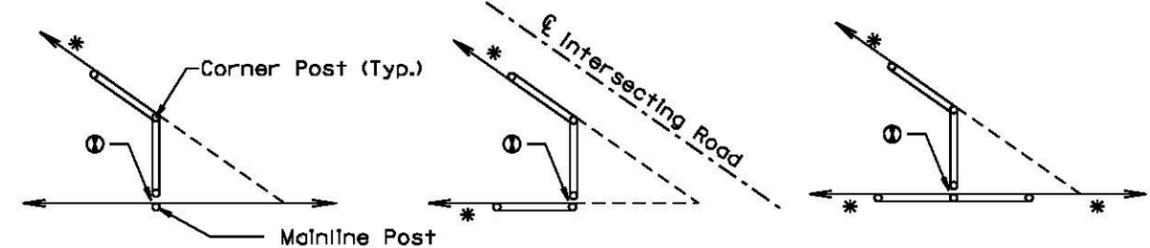
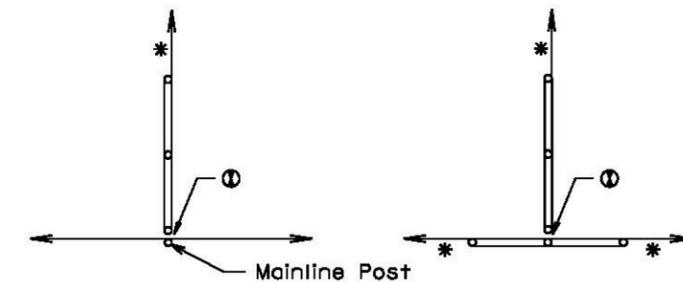
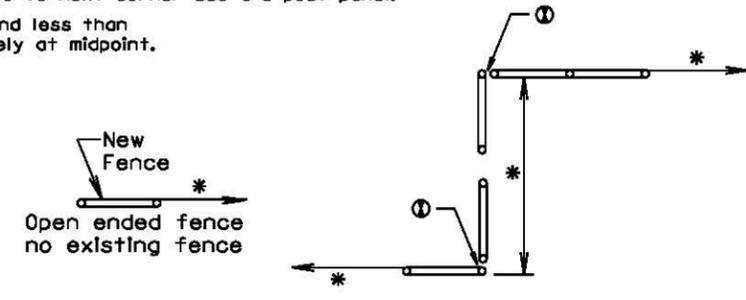
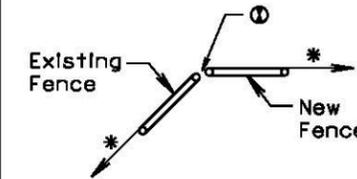
December 23, 2004

SPACING OF 2 POST PANELS WITHIN CURVES	
DEGREE OF CURVE	SPACING OF 2 POST PANEL
less than 3°15'	•• 1320'
3°15' and greater	•• At P.C., P.T., and at every 1320' between P.C. and P.T.

**GENERAL NOTE:**

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

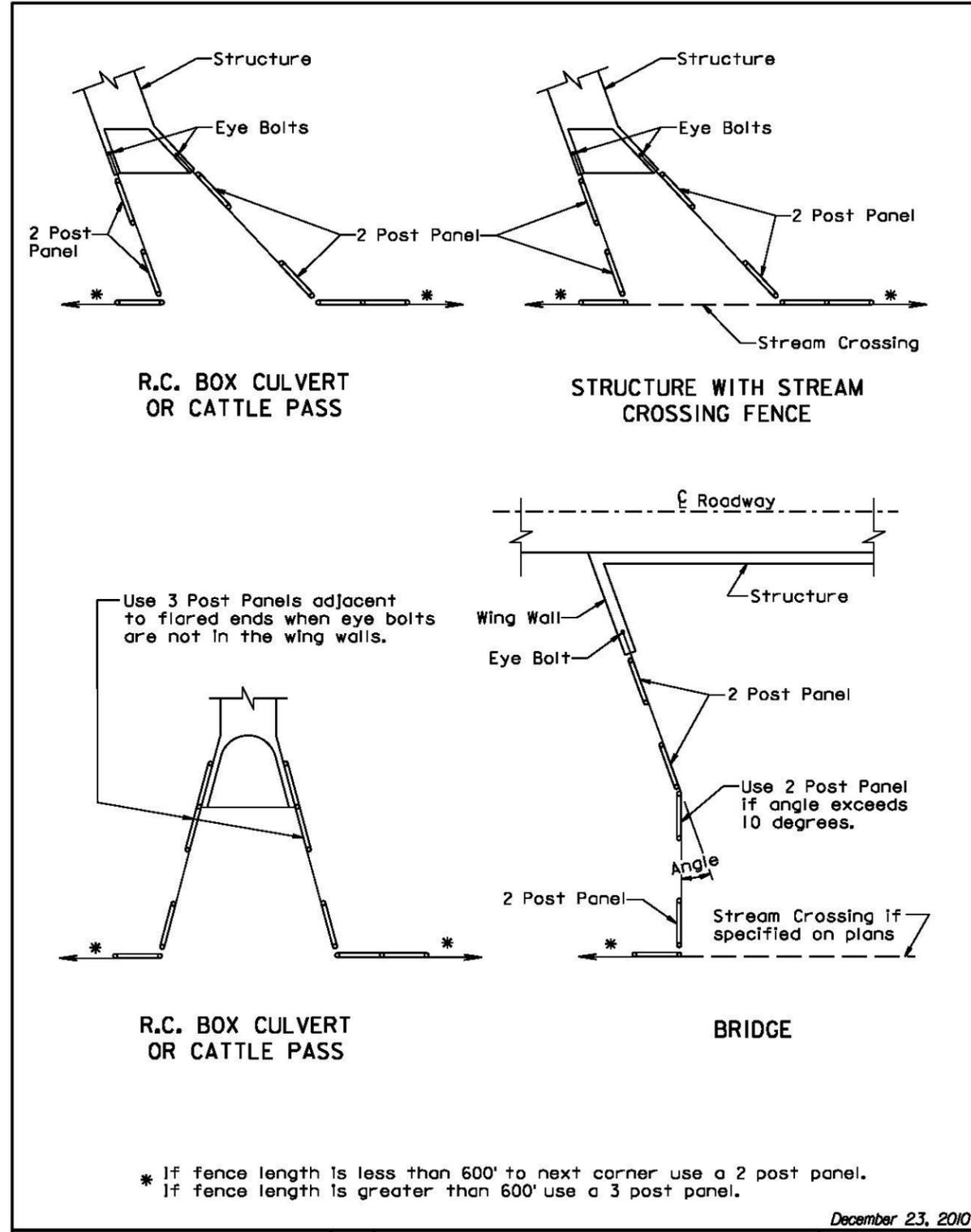
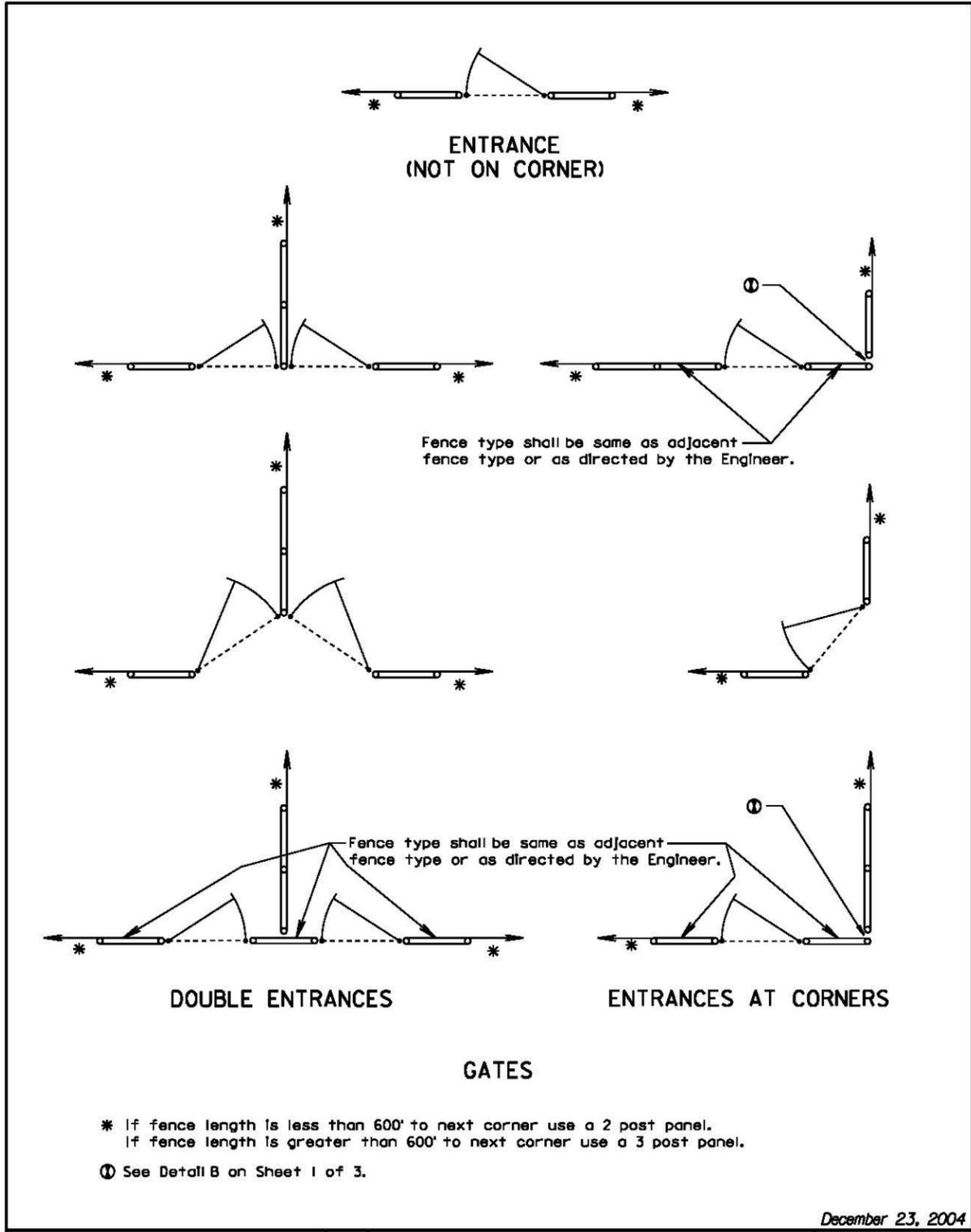
- \* If fence length is less than 600' to next corner use a 2 post panel.
- \* If fence length is greater than 600' to next corner use a 3 post panel.
- \*\* Fence lengths greater than 1320' and less than 2640' place 2 Post Panel approximately at midpoint.
- ① See Detail B on Sheet 1 of 3.

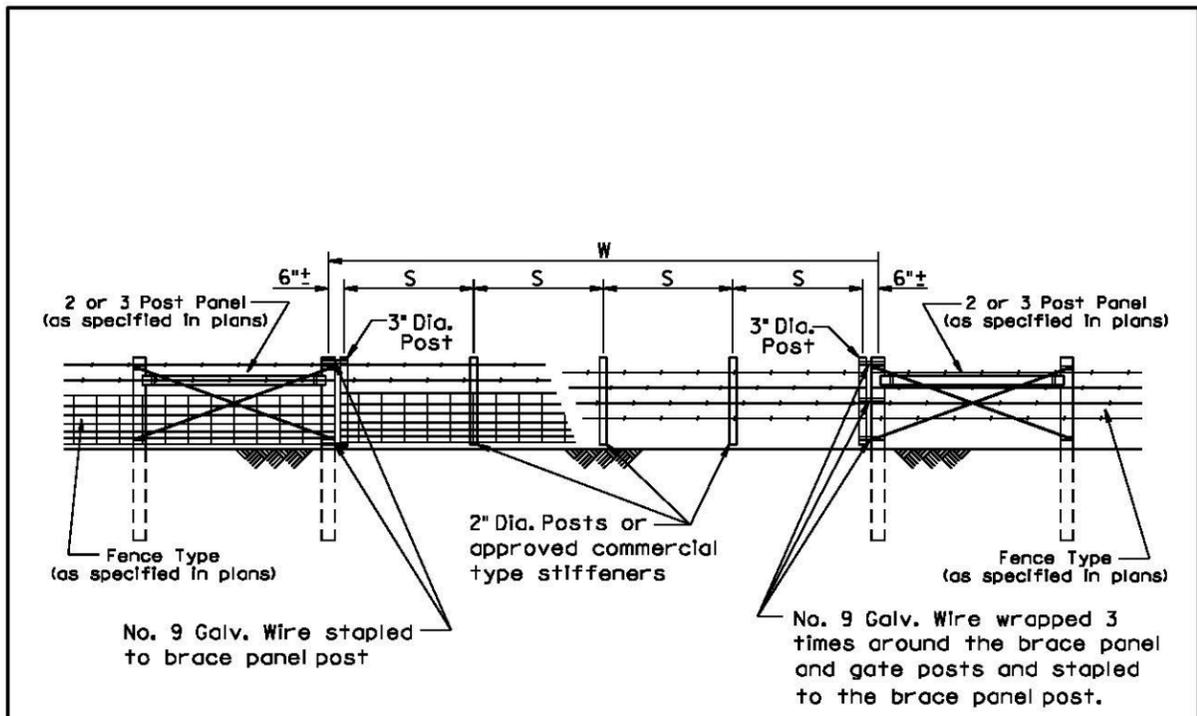


Additional fence panel is NOT required when an angle in the mainline fence is 10° and less.

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

December 23, 2004





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:**

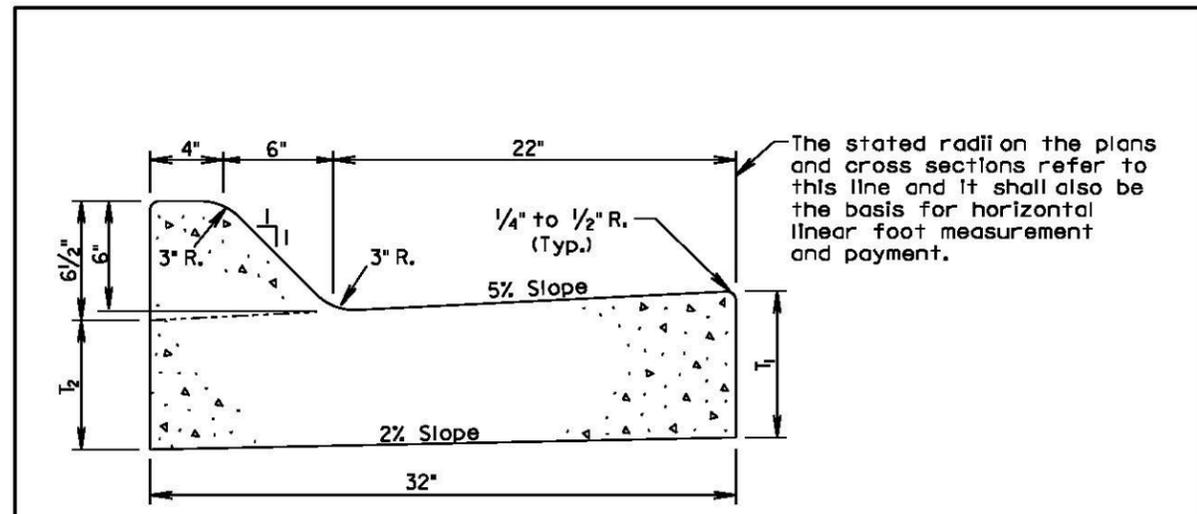
Creosote treatment of the gate posts will not be accepted.

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

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

March 31, 2000

Published Date: 2nd Qtr. 2016	S D D O T	WIRE GATES	PLATE NUMBER
			620.20
			Sheet 1 of 1



Type	T <sub>1</sub> (Inches)	T <sub>2</sub> (Inches)	Cu. Yd. Per Lin. Ft.	Lin. Ft. Per Cu. Yd.
F66	6	5/16	0.057	17.6
F67	7	6/16	0.065	15.4
F68	8	7/16	0.073	13.6
F68.5	8.5	7 9/16	0.077	12.9
F69	9	8/16	0.082	12.3
F69.5	9.5	8 9/16	0.086	11.7
F610	10	9/16	0.090	11.1
F610.5	10.5	9 9/16	0.094	10.7
F611	11	10/16	0.098	10.2
F611.5	11.5	10 9/16	0.102	9.8
F612	12	11/16	0.106	9.4

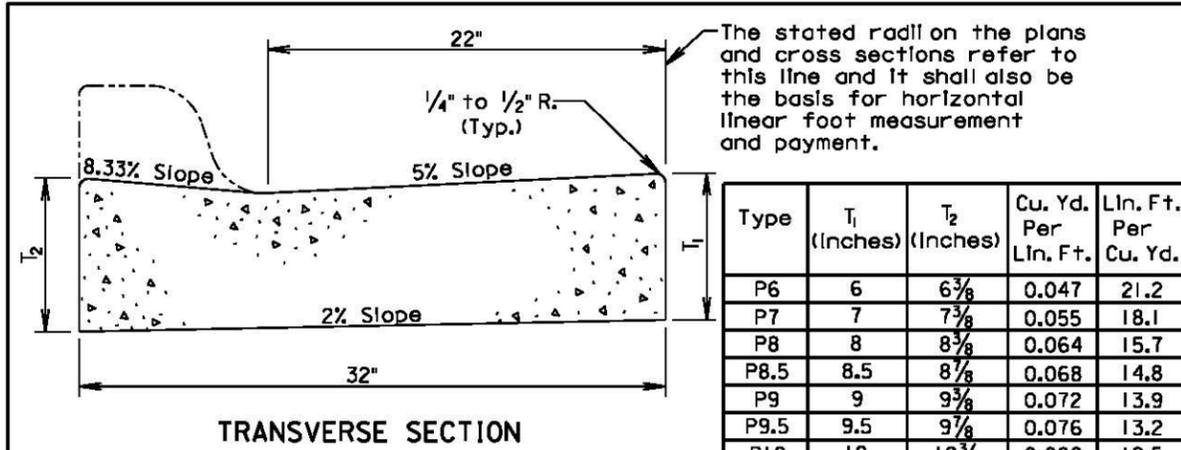
**GENERAL NOTES:**

When concrete curb and gutter longitudinally adjoins new concrete pavement, the method of attachment shall be by one of the methods shown on Standard Plate 380.11.

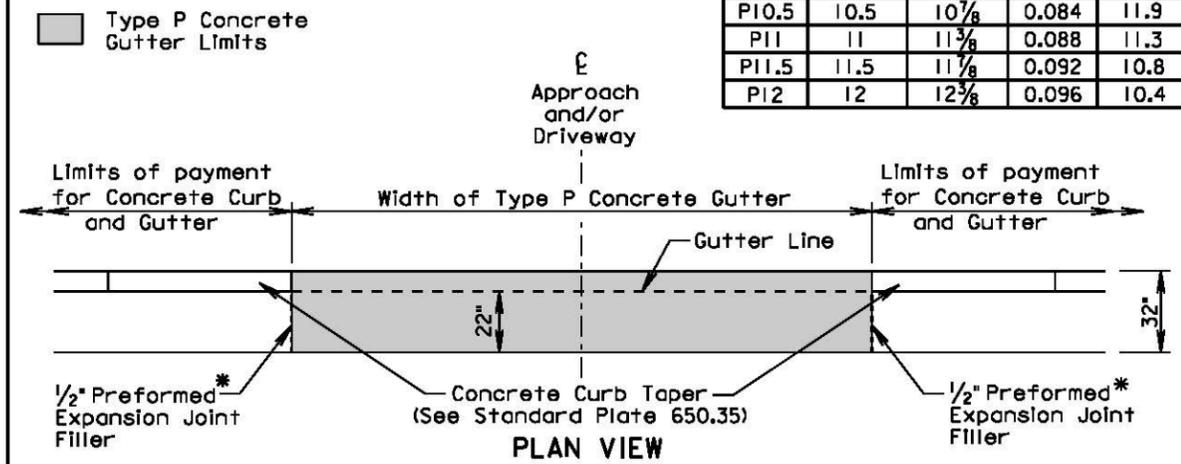
See Standard Plate 650.90 for expansion and contraction joints in the curb and gutter.

September 6, 2008

Published Date: 2nd Qtr. 2016	S D D O T	TYPE F CONCRETE CURB AND GUTTER	PLATE NUMBER
			650.20
			Sheet 1 of 1



Type	T <sub>1</sub> (Inches)	T <sub>2</sub> (Inches)	Cu. Yd. Per Ln. Ft.	Ln. Ft. Per Cu. Yd.
P6	6	6 <sup>3</sup> / <sub>8</sub>	0.047	21.2
P7	7	7 <sup>3</sup> / <sub>8</sub>	0.055	18.1
P8	8	8 <sup>3</sup> / <sub>8</sub>	0.064	15.7
P8.5	8.5	8 <sup>7</sup> / <sub>8</sub>	0.068	14.8
P9	9	9 <sup>3</sup> / <sub>8</sub>	0.072	13.9
P9.5	9.5	9 <sup>7</sup> / <sub>8</sub>	0.076	13.2
P10	10	10 <sup>3</sup> / <sub>8</sub>	0.080	12.5
P10.5	10.5	10 <sup>7</sup> / <sub>8</sub>	0.084	11.9
P11	11	11 <sup>3</sup> / <sub>8</sub>	0.088	11.3
P11.5	11.5	11 <sup>7</sup> / <sub>8</sub>	0.092	10.8
P12	12	12 <sup>3</sup> / <sub>8</sub>	0.096	10.4



\* Joint will not be needed if concrete curb and gutter and type P concrete gutter is placed at the same time. If the 1/2" Preformed Expansion Joint Filler is provided, then the joint shall be sealed in accordance with Standard Plate 650.90.

**GENERAL NOTES:**

The concrete for the Type P Concrete Gutter shall comply with the requirements of the Specifications for Class M6 Concrete.

When concrete gutter longitudinally adjoins new concrete pavement, the method of attachment shall be by one of the methods shown on Standard Plate 380.11.

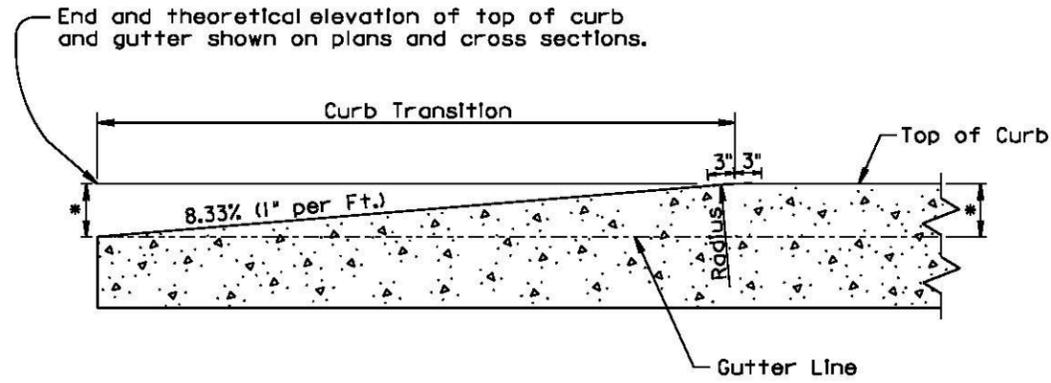
Transverse contraction joints shall be constructed at 10' intervals in the concrete gutter except when concrete gutter is constructed adjacent to mainline PCC pavement. When concrete gutter is constructed adjacent to mainline PCC pavement, a transverse contraction joint shall be constructed in the concrete gutter at each mainline PCC pavement transverse contraction joint location.

When concrete gutter is placed monolithically with mainline PCC pavement, the transverse contraction joints in the concrete gutter shall be sawed and sealed the same as the transverse contraction joints in the mainline PCC pavement.

When concrete gutter is not placed monolithically with the mainline PCC pavement and when the adjacent mainline surfacing is not PCC concrete, the transverse contraction joints in the concrete gutter shall be 1/2 inches deep if formed in the fresh concrete using a suitable grooving tool. If a saw is used to cut the contraction joints, then the depth of the joint shall be at least 1/4 the thickness of the concrete.

June 26, 2015

<b>S D D O T</b>	<b>TYPE P CONCRETE GUTTER</b>	PLATE NUMBER <b>650.30</b>
	Published Date: 2nd Qtr. 2016	Sheet 1 of 1



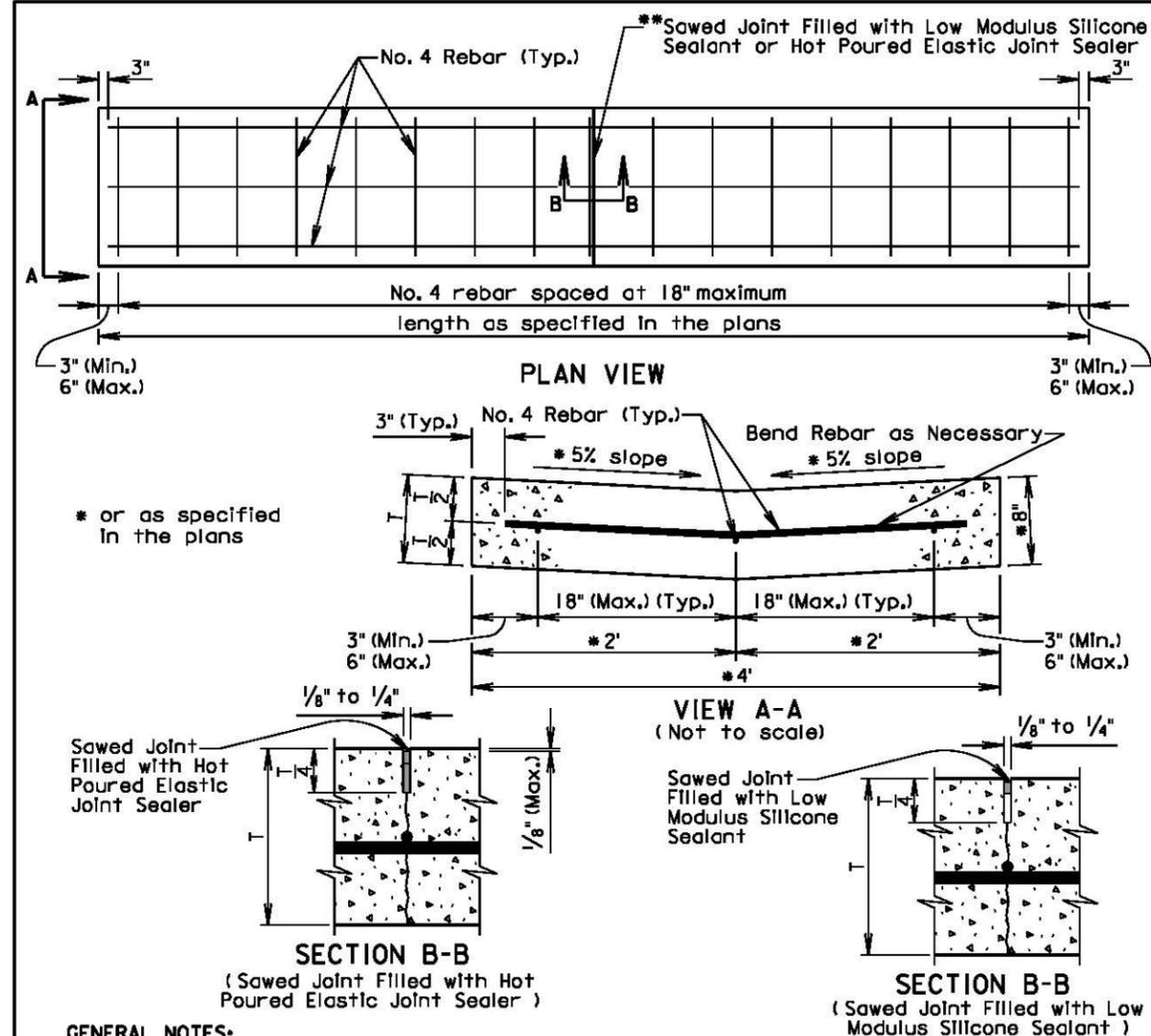
\* Height of Curb

LONGITUDINAL SECTION OF CONCRETE CURB TAPER

September 14, 2005

<b>S D D O T</b>	<b>CONCRETE CURB TAPER</b>	PLATE NUMBER <b>650.35</b>
		Sheet 1 of 1

Published Date: 2nd Qtr. 2016



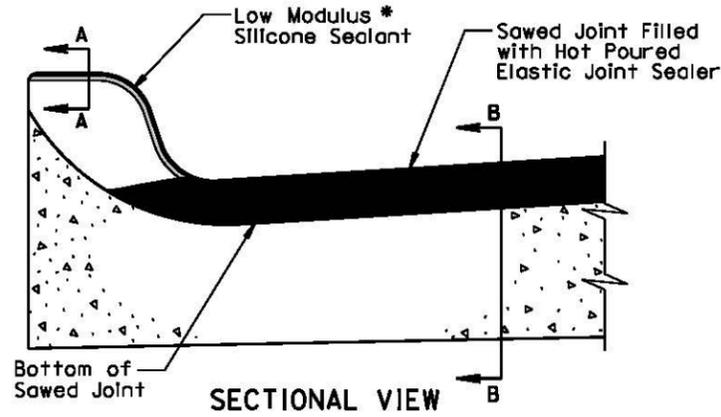
**GENERAL NOTES:**

- The concrete shall comply with the Specifications for Class M6 concrete.
- The reinforcing steel shall comply with the requirements of the Specification Sections 480 and 1010.
- If a lap splice is provided the No. 4 rebar shall be lapped a minimum of 12".
- \*\* The sawed joints shall be spaced at 12'; however, when the length of the valley gutter is 12' to 24' there shall be a joint at the midpoint of the length. The saw cut to control cracking shall be a minimum of 1/4 the thickness of the pavement.
- All hot poured elastic joint sealer material spilled on the surface of the concrete pavement shall be removed as soon as the material has cooled. The extent of removal of material shall be to the satisfaction of the Engineer. All costs for removal of the spilled joint sealer material shall be borne by the Contractor.
- The silicone sealant shall be bonded to the sides of a clean joint to completely seal the joint as approved by the Engineer.
- All costs for furnishing and installing the valley gutter including materials, equipment, labor, and incidentals shall be included in the contract unit price per square yard for the corresponding Valley Gutter bid item.

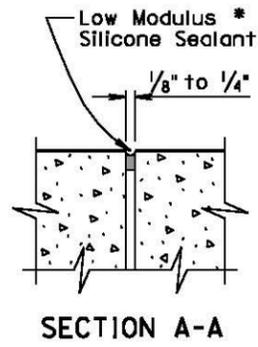
February 10, 2014

<b>S D D O T</b>	<b>VALLEY GUTTER</b>	PLATE NUMBER <b>650.40</b>
		Sheet 1 of 1

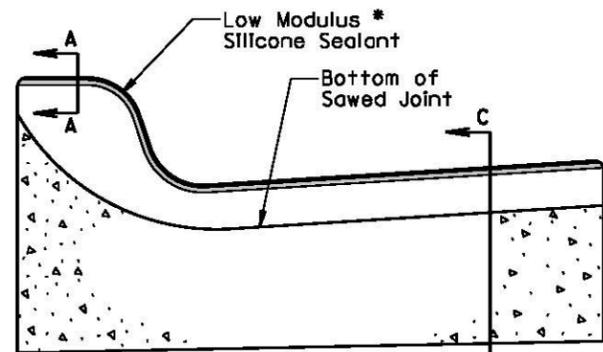
Published Date: 2nd Qtr. 2016



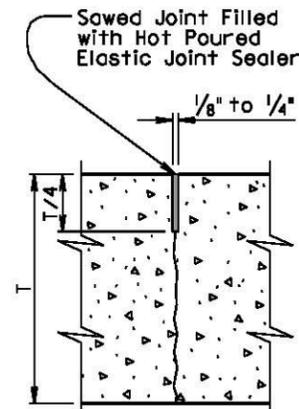
**SECTIONAL VIEW**  
(Curb and Gutter Placed Monolithic with Adjacent Mainline PCC Pavement)



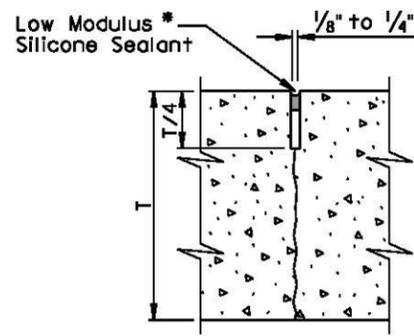
**SECTION A-A**



**SECTIONAL VIEW**  
(Curb and Gutter not Placed Monolithic with Adjacent Mainline PCC Pavement or Mainline Surfacing Is not PCC Pavement)



**SECTION B-B**

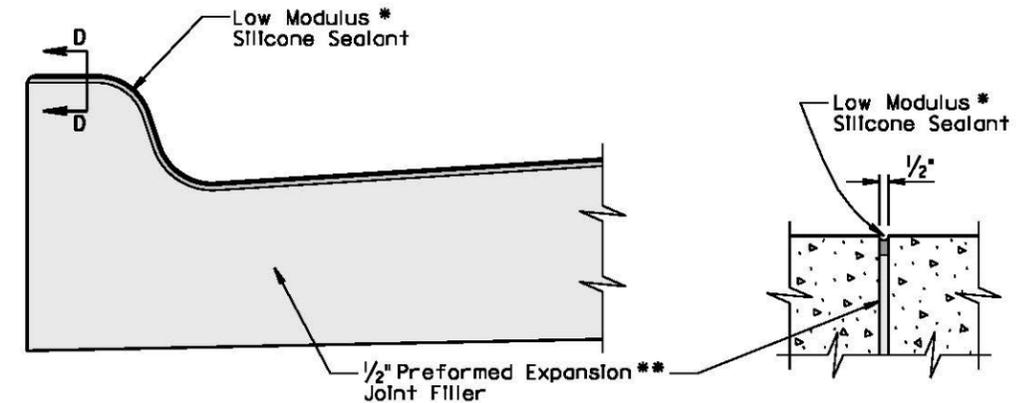


**SECTION C-C**

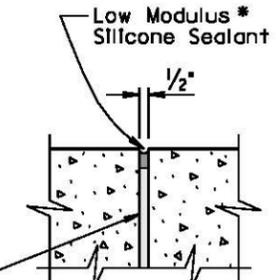
\* The silicone sealant shall be placed such that it completely seals the joint and is bonded to the sides of the clean joint as approved by the Engineer.

September 6, 2013

Published Date: 2nd Qtr. 2016	S D D O T	JOINTS IN CONCRETE CURB AND GUTTER	PLATE NUMBER 650.90
			Sheet 1 of 2



**SECTIONAL VIEW**  
(Curb and Gutter at 1/2" Preformed Expansion Joint Filler Location)



**SECTION D-D**

\* The silicone sealant shall be placed such that it completely seals the joint and is bonded to the sides of the clean joint as approved by the Engineer.

**GENERAL NOTES:**

For illustrative reason, only the type B curb and gutter is shown.

\*\* A 1/2" preformed expansion joint filler shall be placed transversely in the curb and gutter at the following locations:

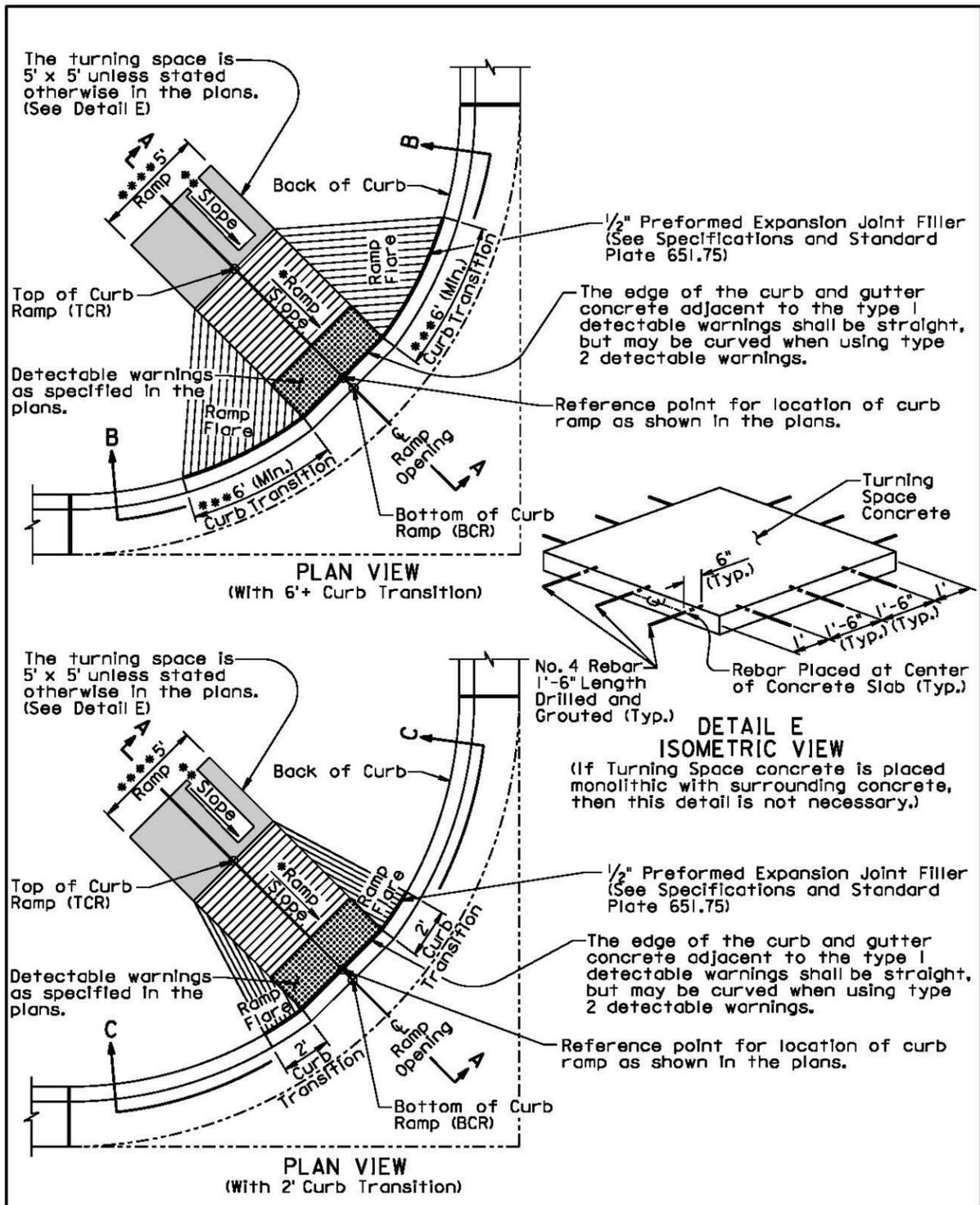
1. At each junction between the radius return of curb and gutter and curb and gutter which is parallel to the project centerline.
2. At each junction between new curb and gutter and existing curb and gutter.

Transverse contraction joints shall be constructed at 10' intervals in the concrete curb and gutter except when the concrete curb and gutter is constructed adjacent to mainline PCC pavement. When concrete curb and gutter is constructed adjacent to mainline PCC pavement, a transverse contraction joint shall be constructed in the concrete curb and gutter at each mainline PCC pavement transverse contraction joint location.

When concrete curb and gutter is not placed monolithically with the mainline PCC pavement or when the adjacent mainline surfacing is not PCC concrete, the transverse contraction joints in the concrete curb and gutter shall be 1/2 inches deep if formed in the fresh concrete using a suitable grooving tool. If a saw is used to cut the contraction joints, then the depth of the joint shall be at least 1/4 the thickness of the concrete and the joint shall be sealed in accordance with the details shown above.

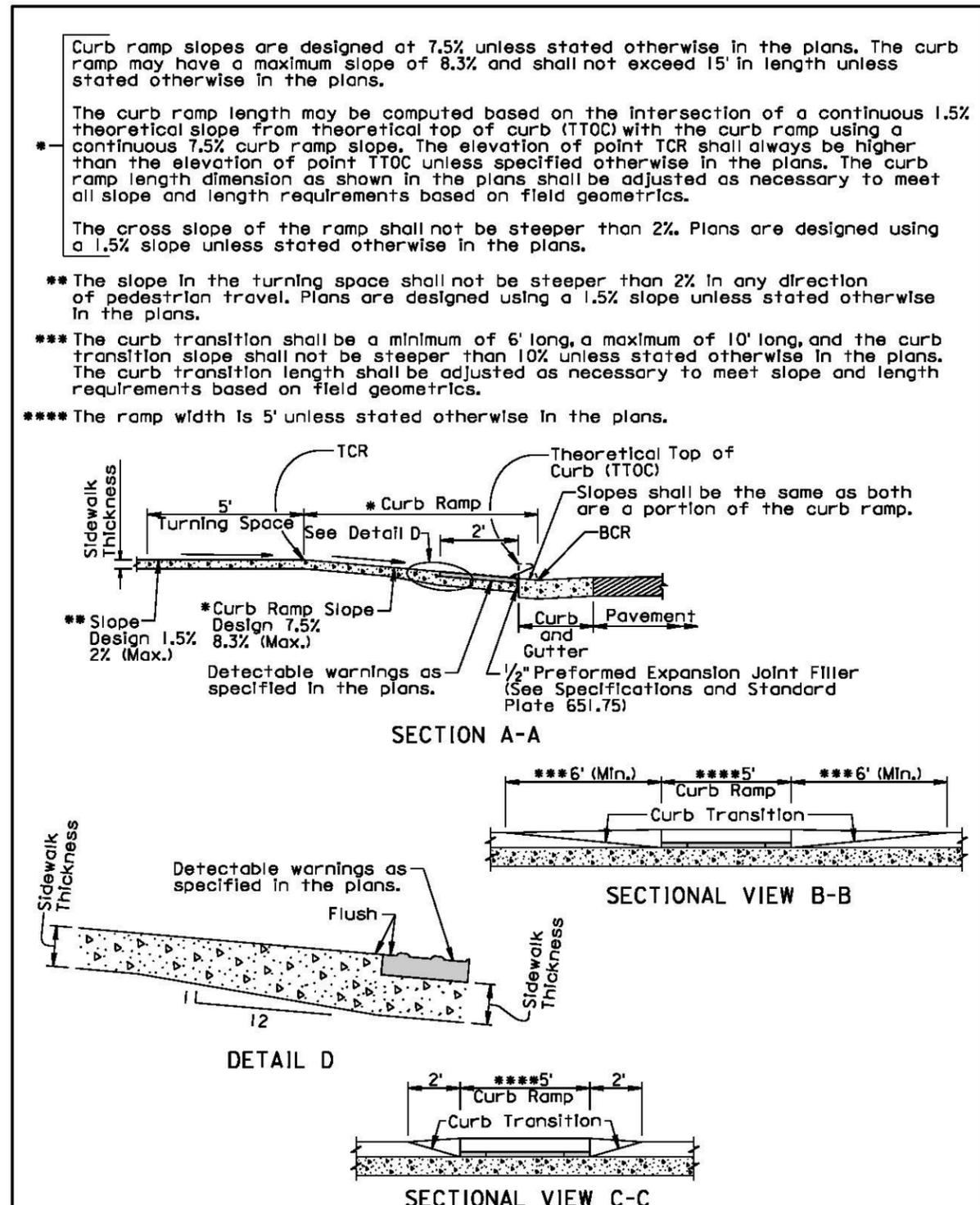
September 6, 2013

Published Date: 2nd Qtr. 2016	S D D O T	JOINTS IN CONCRETE CURB AND GUTTER	PLATE NUMBER 650.90
			Sheet 2 of 2



September 6, 2015

S D D O T	TYPE 1 CURB RAMP (PERPENDICULAR CURB RAMP)	PLATE NUMBER 651.01
		Sheet 1 of 3
		Published Date: 2nd Qtr. 2016



September 6, 2015

S D D O T	TYPE 1 CURB RAMP (PERPENDICULAR CURB RAMP)	PLATE NUMBER 651.01
		Sheet 2 of 3
		Published Date: 2nd Qtr. 2016

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0100(105)419	B95	B108

Plotting Date: 6/9/2016

**GENERAL NOTES:**

For illustrative purpose only, type 1 detectable warnings are shown in the drawings.

For illustrative purpose only, PCC fillet sections are shown in the drawings. The curb ramp depicted on this standard plate may be used with a PCC fillet section or curb and gutter.

For illustrative purpose only, the curb ramp location is shown at the center of a PCC fillet section. The curb ramp shall be placed at the location stated in the plans.

Sidewalk shall not be placed adjacent to the curb ramp flares when a 2' curb transition is used unless shown otherwise in the plans.

\* Care shall be taken to ensure a uniform grade on the curb ramp, free of sags and short grade changes.

Surface texture of the curb ramp shall be obtained by coarse brooming transverse to the slope of the curb ramp.

The normal gutter line profile shall be maintained through the area of the ramp opening.

Joints shall be sawed or tooled into the concrete adjacent to the detectable warnings to alleviate possible corner cracking.

Care shall be taken to ensure that the surface of the detectable warnings are clean and maintains a uniform color.

The detectable warnings shall be cut as necessary to fit the plan specified limits of the detectable warnings. Cost for cutting the detectable warnings shall be incidental to the corresponding detectable warning bid item.

There will be no separate payment for curb ramps. The curb ramp shall be measured and paid for at the contract unit price per square foot for the corresponding concrete sidewalk bid item. The square foot area of the detectable warnings shall be included in the measured and paid for quantity of sidewalk.

If rebar is placed in the Turning Space as depicted in DETAIL E, the cost of the materials, labor, and equipment to furnish and install the rebar shall be incidental to the contract unit price per square foot for the corresponding concrete sidewalk bid item.

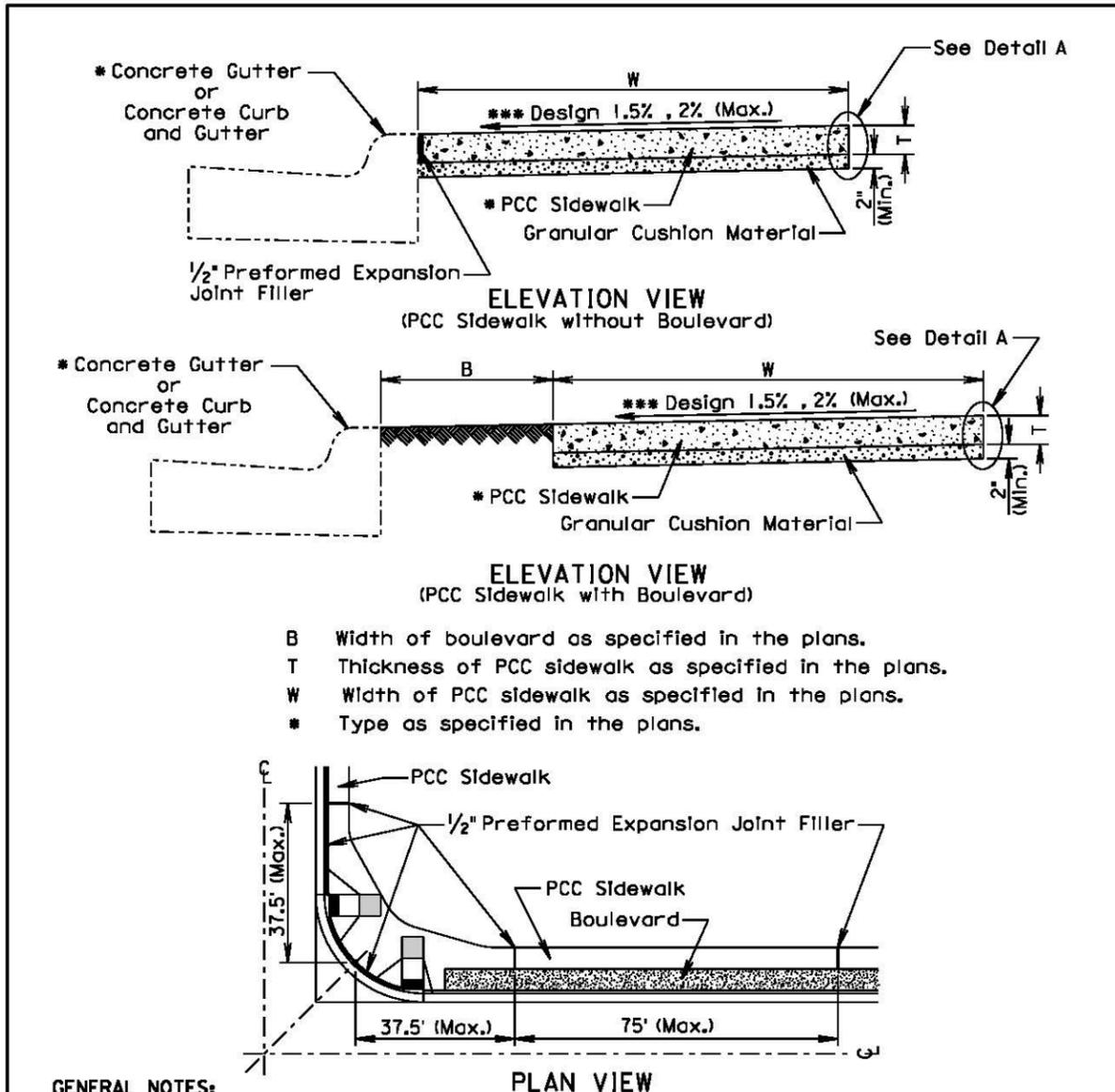
The curb transitions and ramp opening shall be measured and paid for at the contract unit price per foot for the corresponding curb and gutter bid item when curb and gutter is used. The curb transitions and ramp opening shall be measured and paid for at the contract unit price per square yard for the corresponding PCC fillet section bid item when a PCC fillet section is used.

The type 1 detectable warnings shall be measured to the nearest square foot. All costs for furnishing and installing the type 1 detectable warnings including labor, equipment, materials, and incidentals shall be paid for at the contract unit price per square foot for "Type 1 Detectable Warnings".

The type 2 detectable warnings shall be measured to the nearest square foot. All costs for furnishing and installing the type 2 detectable warnings including labor, equipment, and materials, including adhesive, necessary sealant or grout, and necessary grinding shall be paid for at the contract unit price per square foot for "Type 2 Detectable Warnings".

September 6, 2015

<b>Published Date: 2nd Qtr. 2016</b>	<b>S D D O T</b>	<b>TYPE 1 CURB RAMP (PERPENDICULAR CURB RAMP)</b>	<b>PLATE NUMBER</b> 651.01
			Sheet 3 of 3



- B Width of boulevard as specified in the plans.
- T Thickness of PCC sidewalk as specified in the plans.
- W Width of PCC sidewalk as specified in the plans.
- \* Type as specified in the plans.

**GENERAL NOTES:**

The PCC sidewalk shall be constructed in accordance with Section 651 of the Specifications.

\*\*\*The cross slope of the sidewalk is designed at 1.5% and the maximum slope allowed is 2% unless specified otherwise in the plans.

The maximum length between expansion joints in PCC sidewalk is 75 feet.

PCC sidewalk placed adjacent to intersection of roadways shall have an expansion joint placed transversely a maximum of 37.5 feet from the intersection. See PLAN VIEW.

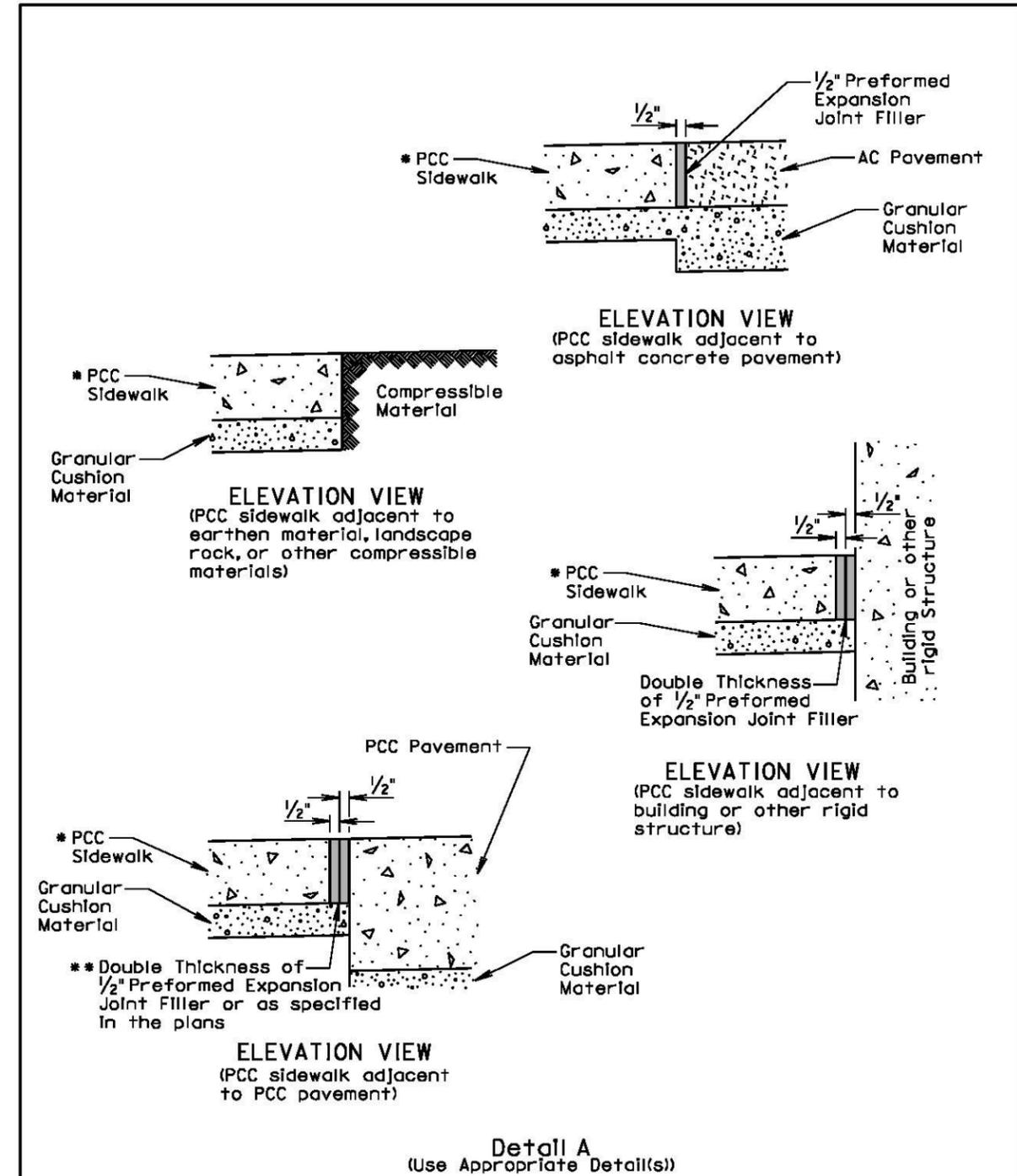
An expansion joint in PCC sidewalk shall consist of a 1/2 inch thick preformed expansion joint filler material placed full depth and width of the PCC sidewalk.

\*\* Large areas of PCC pavement adjacent to PCC sidewalk may require a different joint treatment than shown in the detail. If a different joint detail is necessary, plans will contain the joint detail and the Contractor shall construct the joint treatment in accordance with the plans.

September 6, 2015

<b>S D D O T</b>	<b>PCC SIDEWALK</b>	PLATE NUMBER <b>651.75</b>
		Sheet 1 of 2

Published Date: 2nd Qtr. 2016

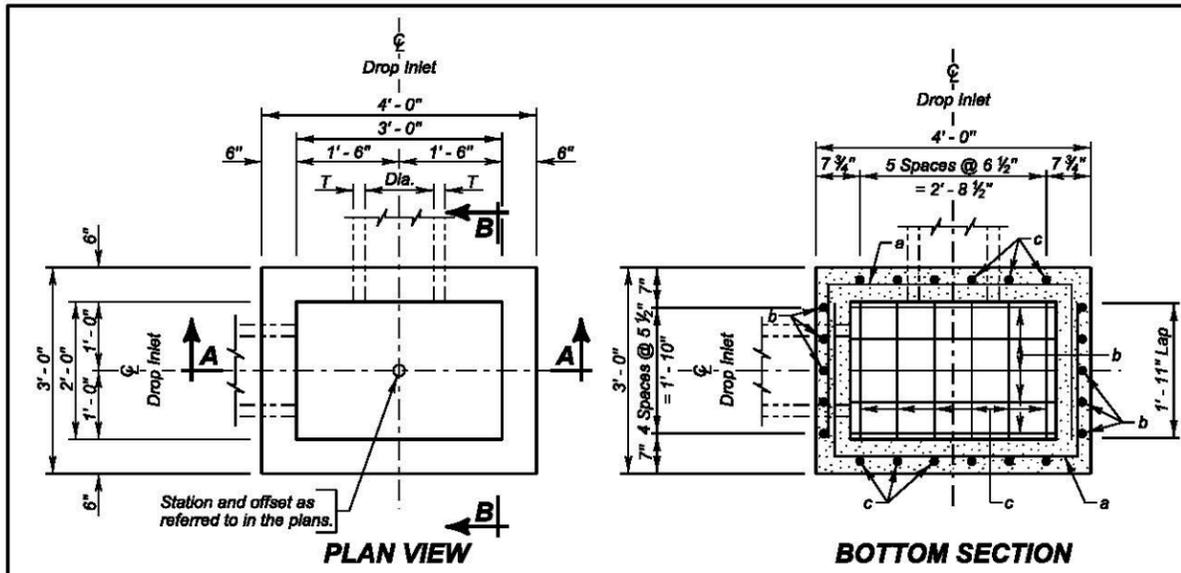


**Detail A**  
(Use Appropriate Detail(s))

September 6, 2015

<b>S D D O T</b>	<b>PCC SIDEWALK</b>	PLATE NUMBER <b>651.75</b>
		Sheet 2 of 2

Published Date: 2nd Qtr. 2016



ESTIMATED QUANTITIES			
ITEM	UNIT	CONSTANT QUANTITY	VARIABLE QUANTITY
* Class M6 Concrete	Cu. Yd.	0.26	0.22H
Reinforcing Steel	Lb.	83.03	28.97H
Frame and Grate Assembly	Each	1	

**DROP INLETS FOR 12" TO 24" DIAMETER PIPE**

**SPECIFICATIONS**

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

**GENERAL NOTES:**

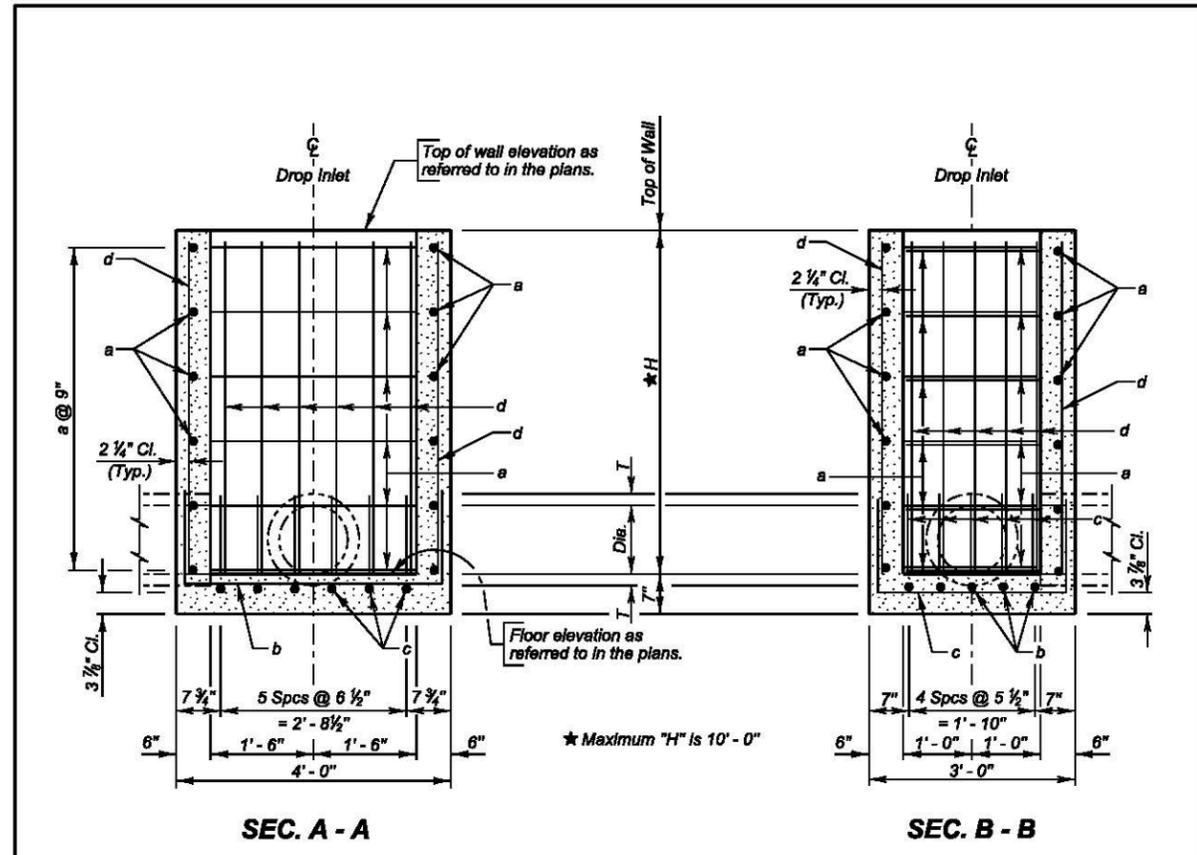
- Design Live Load: HL-93. No construction loading in excess of legal load was considered.
- Reinforcing steel shall conform to ASTM A615 grade 60. The d bars shall be lapped 12 inches with the b and c bars. Cut and bend reinforcing steel as required to place pipe(s) through the drop inlet wall.
- Drop inlet may be precast. If precast drop inlet details differ from this standard plate, submit a checked design done by a SD registered P.E. and shop plans to the Office of Bridge Design for approval.
- \* Reduce total quantities of concrete by the amount of concrete displaced by the pipe(s). The total quantity of concrete shall be computed to the nearest hundredth of a cubic yard. The total quantity of reinforcing steel shall be computed to the nearest pound.
- Drop inlet shown may be modified by the addition or omission of connecting pipes as noted elsewhere in the plans. All pipes entering drop inlet must fit between the inside face of walls and shall not enter through the corners.
- Maximum R.C.P. diameter shall not exceed 18 inches on the 2-foot wide side and shall not exceed 24 inches (24 inches for R.C. arch) on the 3-foot wide side of the drop inlet.

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

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

December 16, 2015

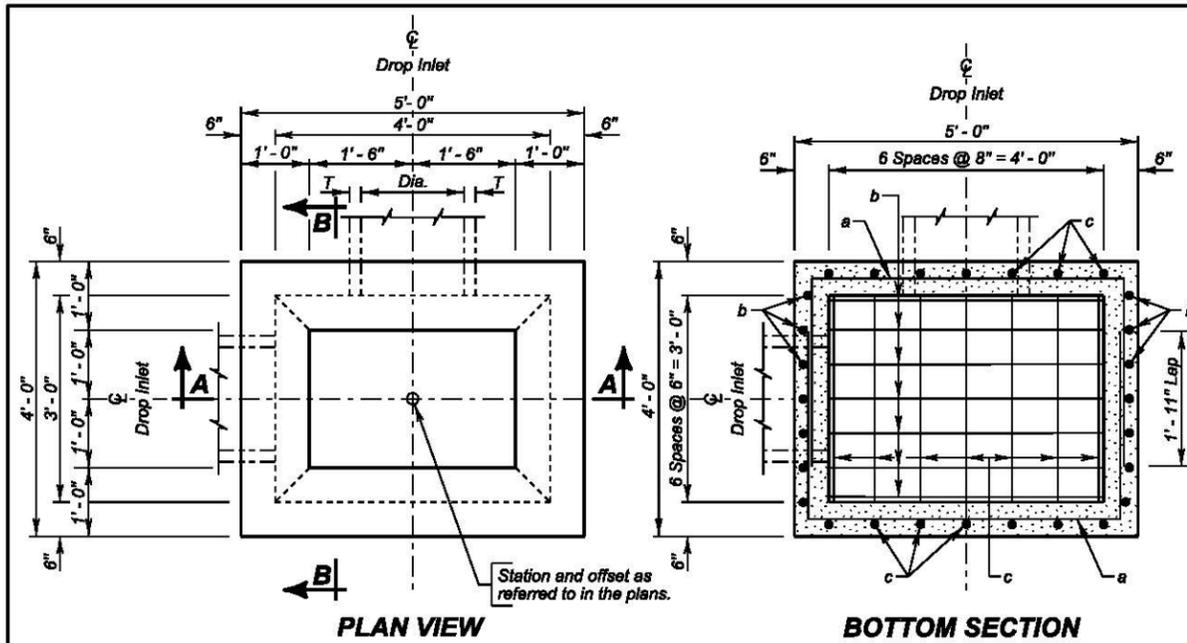
<b>SD DOT</b>	<b>2' X 3' TYPE B REINFORCED CONCRETE DROP INLET</b>	PLATE NUMBER <b>670.01</b>
	Published Date: 2nd Qtr. 2016	Sheet 1 of 2



REINFORCING SCHEDULE				
Mk.	No.	Size	Length	Type
a	2.67H	4	8'-0"	17
b	5	5	6'-3"	17
c	6	4	5'-3"	17
d	22	4	H-2"	Str.

NOTE: All dimensions are out to out of bars.

<b>SD DOT</b>	<b>2' X 3' TYPE B REINFORCED CONCRETE DROP INLET</b>	PLATE NUMBER <b>670.01</b>
	Published Date: 2nd Qtr. 2016	Sheet 2 of 2



ESTIMATED QUANTITIES			
ITEM	UNIT	CONSTANT QUANTITY	VARIABLE QUANTITY
* Class M6 Concrete	Cu. Yd.	0.72	0.30H
Reinforcing Steel	Lb.	130.93	36.54H
Frame and Grate Assembly	Each	1	

**DROP INLETS FOR 12" TO 36" DIAMETER PIPE**

**SPECIFICATIONS**

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

**GENERAL NOTES:**

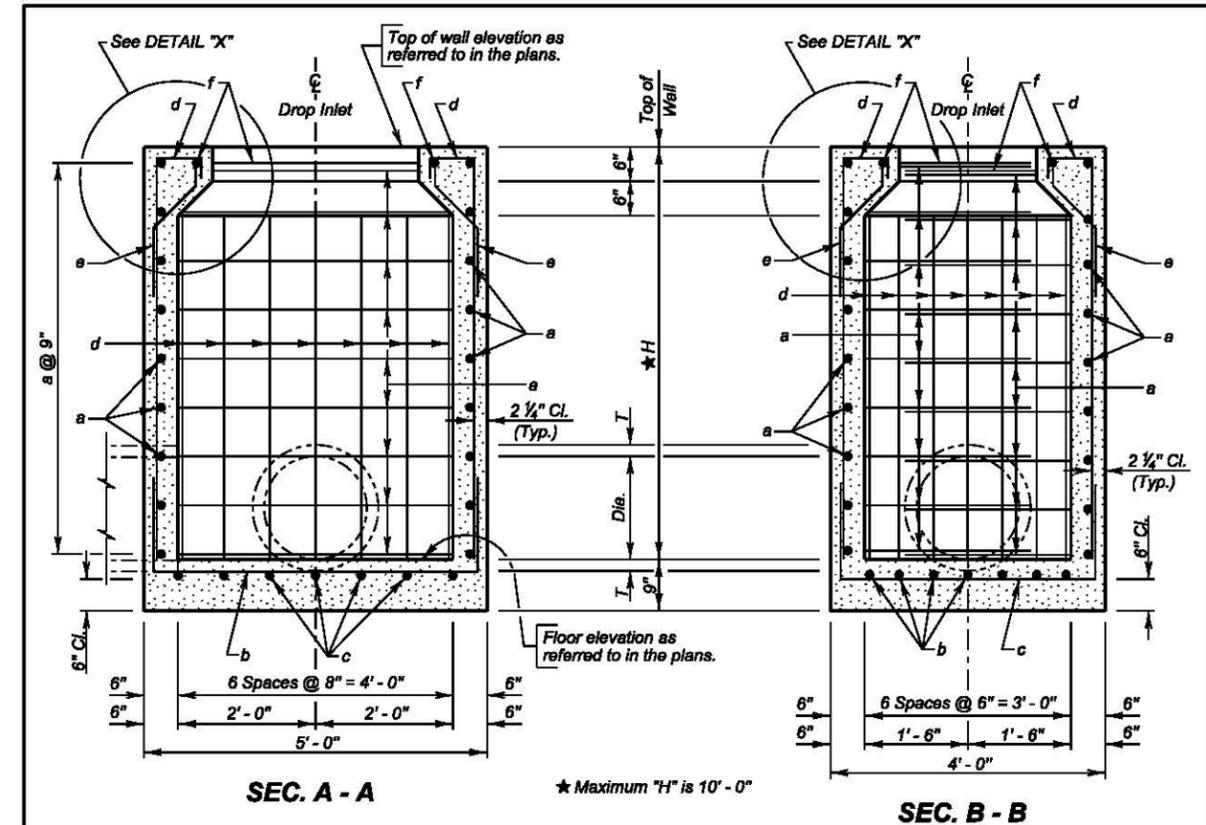
- Design Live Load: HL-93. No construction loading in excess of legal load was considered.
- Reinforcing steel shall conform to ASTM A615 grade 60. The d bars shall be lapped 12 inches with the b and c bars. Cut and bend reinforcing steel as required to place pipe(s) through the drop inlet wall.
- Drop inlet may be precast. If precast drop inlet details differ from this standard plate, submit a checked design done by a SD registered P.E. and shop plans to the Office of Bridge Design for approval.
- \* Reduce total quantities of concrete by the amount of concrete displaced by the pipe(s). The total quantity of concrete shall be computed to the nearest hundredth of a cubic yard. The total quantity of reinforcing steel shall be computed to the nearest pound.
- Drop inlet shown may be modified by the addition or omission of connecting pipes as noted elsewhere in the plans. All pipes entering drop inlet must fit between the inside face of walls and shall not enter through the corners.
- Maximum R.C.P. diameter shall not exceed 24 inches (24 inches for R. C. arch) on the 3-foot wide side and shall not exceed 36 inches (30 inches for R.C. arch) on the 4-foot wide side of the drop inlet.

PIPE DISPLACEMENT REDUCTIONS		
Diameter (Inches)	Wall T (Inches)	Class M6 Concrete (Cu. Yd.)
12	2	0.03
15	2 1/4	0.04
18	2 1/2	0.05
24	3	0.09
30	3 1/2	0.14
36	4	0.20
R.C.P.		
18	2 1/2	0.05
24	3 1/2	0.09
30	4	0.14
R.C. ARCH		
18	2 1/2	0.05
24	3 1/2	0.09
30	4	0.14

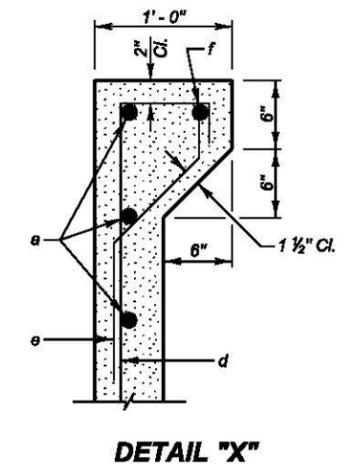
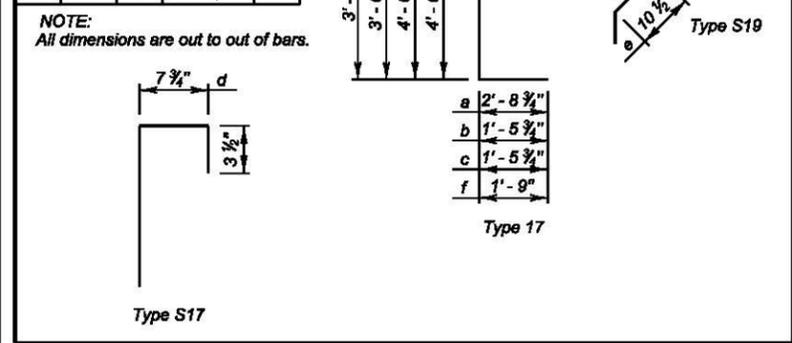
The dimension of H is in feet. Maximum H is 10 feet.

December 16, 2015

<b>S D D O T</b>	<b>3' X 4' TYPE B REINFORCED CONCRETE DROP INLET</b>	PLATE NUMBER <b>670.02</b>
	Published Date: 2nd Qtr. 2016	Sheet 1 of 2

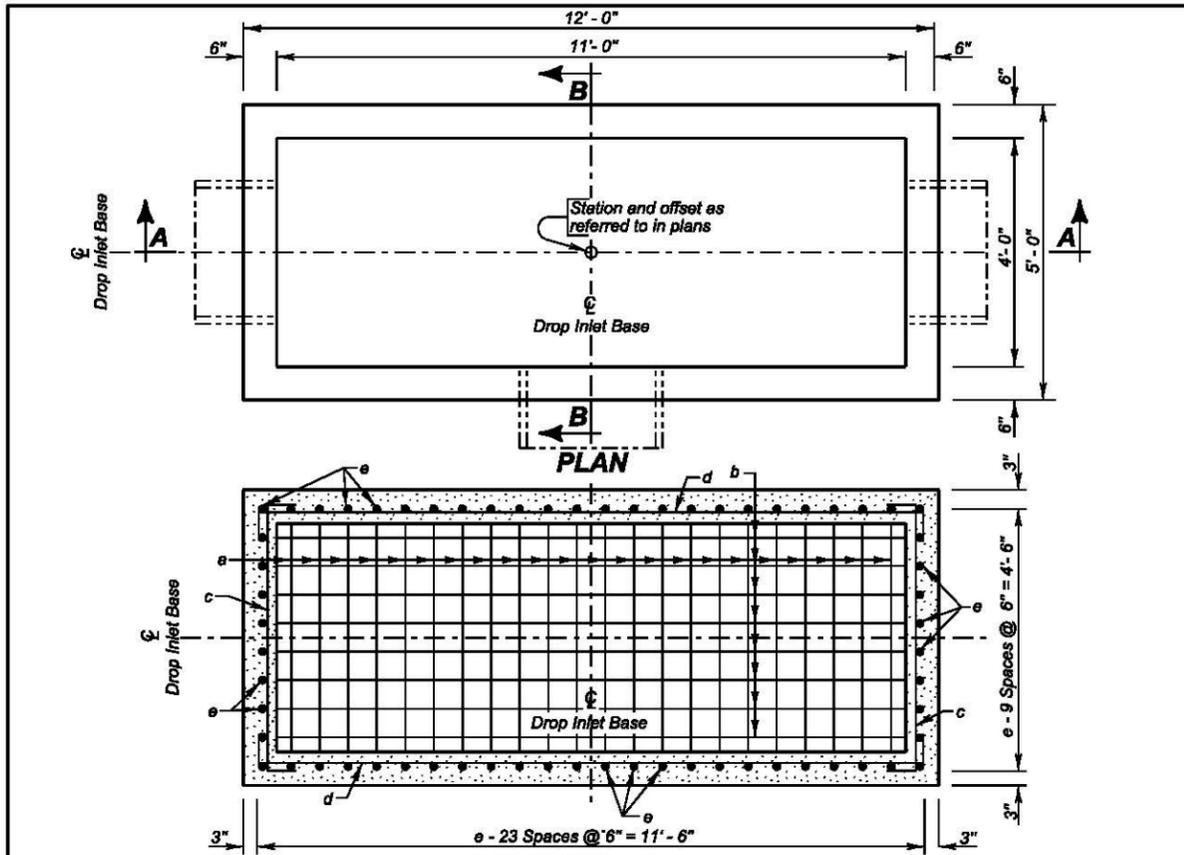


REINFORCING SCHEDULE				
Mk.	No.	Size	Length	Type
a	2.67H	4	10' - 0"	17
b	7	4	7' - 6"	17
c	7	4	6' - 6"	17
d	28	4	H + 9"	S17
e	28	4	2' - 3"	S19
f	2	4	7' - 0"	17



December 16, 2015

<b>S D D O T</b>	<b>3' X 4' TYPE B REINFORCED CONCRETE DROP INLET</b>	PLATE NUMBER <b>670.02</b>
	Published Date: 2nd Qtr. 2016	Sheet 2 of 2



**PLAN**  
(Bottom Steel)  
(Pipe Not Shown)

**SPECIFICATIONS:**

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

**GENERAL NOTES:**

1. Design Live Load: HL-93 loading. No construction loading in excess of legal load was considered.
2. Base is intended for use with a Precast Concrete Type S Drop Inlet Lid, Standard Plate 670.40. Base may be precast. If precast base used, and details differ from that shown, the precast base must be on the current approved list. The current approved list is available through proper channels from the SDDOT Office of Bridge Design.
3. To qualify for addition to the approved list, submit a checked design, by South Dakota Registered Professional Engineers and shop plans to the Office of Bridge Design for approval. Design shall be in accordance with the current edition of the AASHTO LRFD Bridge Design Specifications.
- \* 4. Reduce total quantities of concrete by the amount of concrete displaced by the pipe. The total quantity of concrete shall be computed to the nearest hundredth of a cubic yard. The total quantity of reinforcing steel shall be computed to the nearest pound.
5. Inlets shown may be modified by the addition or omission of connecting pipes as shown on the layouts. Connecting pipes shall not enter the inlet through the corners.
6. Maximum R.C.P. diameter shall not exceed 36 inches (30 inches for R.C. Arch) on the 4-foot wide side of the Drop Inlet.
7. Reinforcing steel shall conform to ASTM A615 Grade 60. Cut and bend reinforcing steel as required to place pipe(s) through the inlet wall.
8. Use 1 inch clear cover on all reinforcing steel unless otherwise noted.
9. The dimension of H is in feet. Maximum H is 8 feet.

June 26, 2015

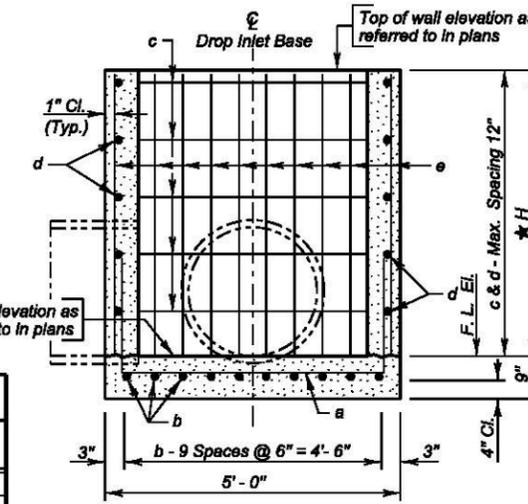
<b>S D D O T</b>	<b>4' X 11' TYPE S DROP INLET BASE</b>	PLATE NUMBER <b>670.32</b>
	Published Date: 2nd Qtr. 2016	Sheet 1 of 2

PIPE DISPLACEMENT REDUCTIONS		
Diameter (Inches)	Wall T (Inches)	Class M6 Concrete (Cu. Yd.)
12	2	0.03
15	2 1/2	0.04
18	2 1/2	0.05
24	3	0.09
30	3 1/2	0.14
36	4	0.20
42	4 1/2	0.26
48	5	0.34
54	5 1/2	0.43
60	6	0.52
18	2 1/2	0.05
24	3 1/2	0.09
30	4	0.14
36	4 1/2	0.19
42	4 1/2	0.24
48	5	0.32
54	5 1/2	0.39
60	6	0.49
72	7	0.70
84	8	0.93

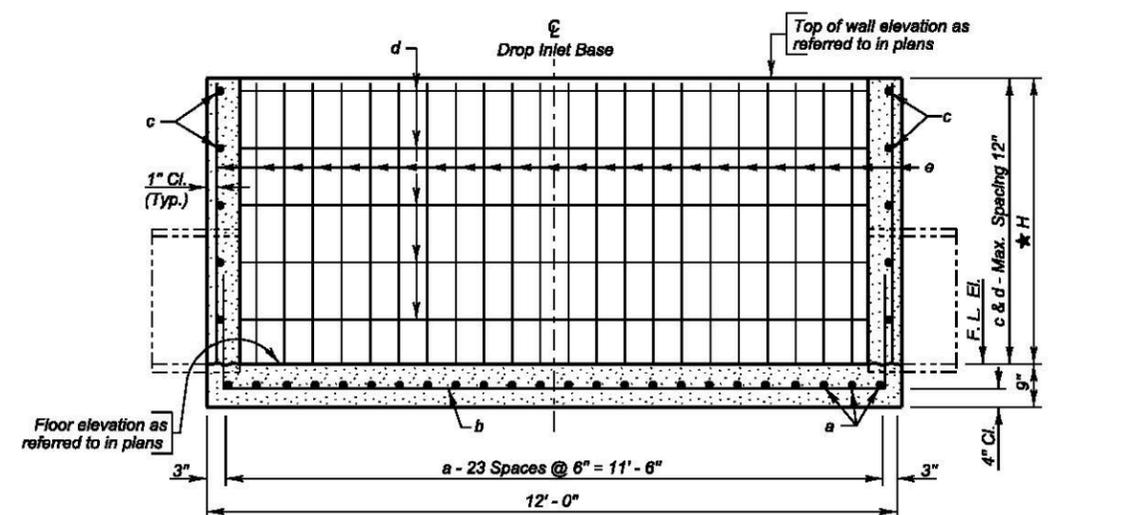
REINFORCING SCHEDULE					
Mk. No.	Size	Length	Type	Bending Details	
a	24	5	9'-6"	17	
b	10	5	16'-6"	17	
c	2H	4	5'-6"	17	
d	2H	4	12'-6"	17	
e	64	4	H - 2"	Str.	

NOTE:  
All dimensions are out to out of bars.

ESTIMATED QUANTITIES			
ITEM	UNIT	CONSTANT QUANTITY	VARIABLE QUANTITY
* Class M6 Concrete	Cu. Yd.	1.67	0.59H
Reinforcing Steel	Lb.	402.77	66.80H



**SEC. B - B**

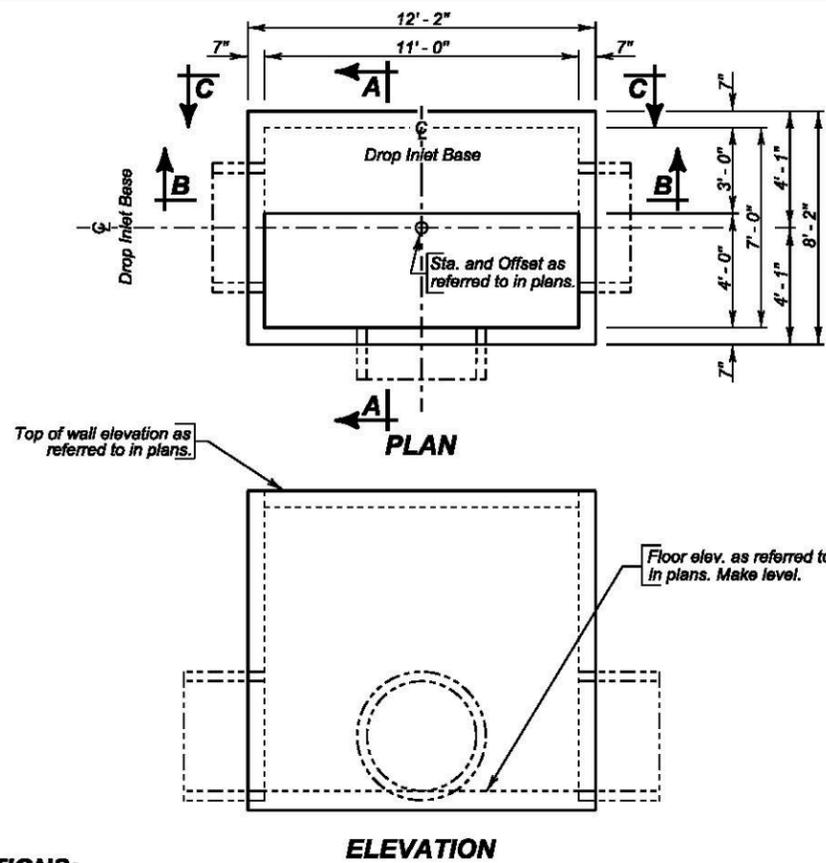


**SEC. A - A**

\* Maximum H is 8' - 0"

June 26, 2015

<b>S D D O T</b>	<b>4' X 11' TYPE S DROP INLET BASE</b>	PLATE NUMBER <b>670.32</b>
	Published Date: 2nd Qtr. 2016	Sheet 2 of 2



**SPECIFICATIONS:**

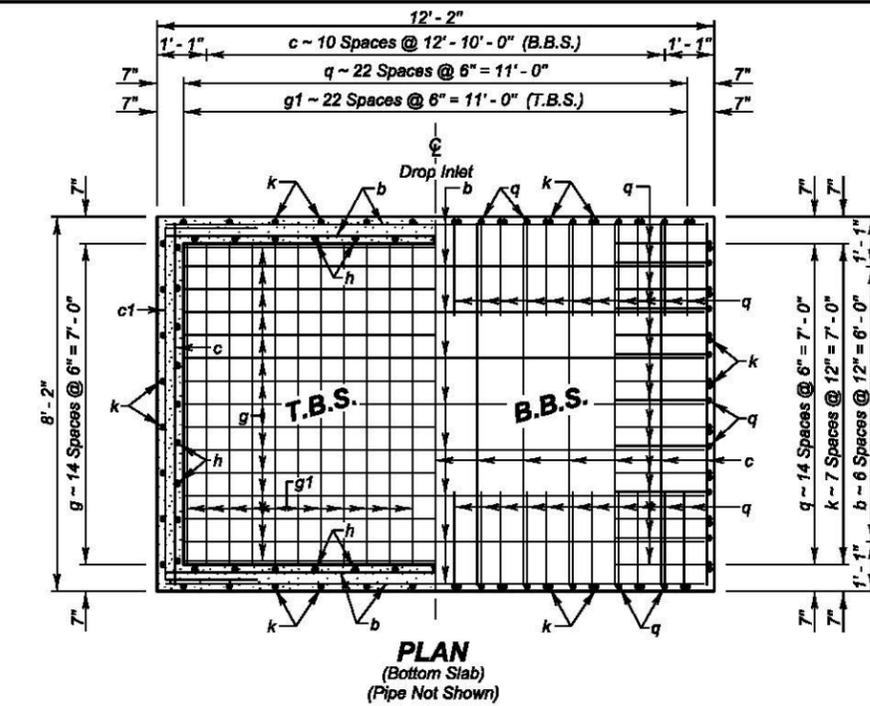
1. Design Specifications: AASHTO LRFD Bridge Design Specifications, 2012 Edition.
2. Construction Specifications: South Dakota Standard Specifications for Roads and Bridges, Current Edition and required Provisions, Supplemental Specifications, and Special Provisions as included in the Proposal.

**GENERAL NOTES:**

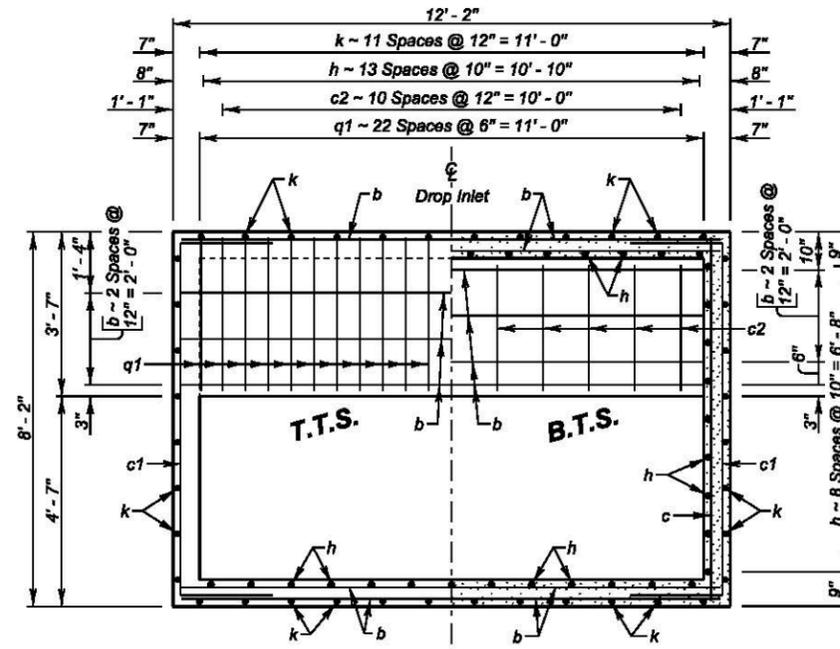
1. Design Live Load: HL-93 loading. No construction loading in excess of legal load was considered.
2. Base is intended for use with a Precast Concrete Type S Drop Inlet Lid, Standard Plate 670.40. Base may be precast. If precast base used, and details differ from that shown, the precast base must be on the current approved list. The current approved list is available through proper channels from the SDDOT Office of Bridge Design.
3. To qualify for addition to the approved list, submit a checked design, by South Dakota Registered Professional Engineers and shop plans to the Office of Bridge Design for approval. Design shall be in accordance with the current edition of the AASHTO LRFD Bridge Design Specifications.
- \* 4. Reduce total quantities of concrete by the amount of concrete displaced by the pipe. The total quantity of concrete shall be computed to the nearest hundredth of a cubic yard. The total quantity of reinforcing steel shall be computed to the nearest pound.
5. Inlets shown may be modified by the addition or omission of connecting pipes as shown on the layouts. Connecting pipes shall not enter the inlet through the corners.
6. Maximum R.C.P. diameter shall not exceed 66 inches (54 inches for R.C. Arch) on the 7-foot wide side of the Drop Inlet.
7. Reinforcing steel shall conform to ASTM A615 Grade 60. Cut and bend reinforcing steel as required to place pipe(s) through the inlet wall.
8. Use 1 inch clear cover on all reinforcing steel unless otherwise noted.
9. The dimension of H is in feet. Maximum H is 10 feet.

June 26, 2015

<b>S D D O T</b>	<b>7' X 11' TYPE S DROP INLET BASE</b>	PLATE NUMBER <b>670.34</b>
	Published Date: 2nd Qtr. 2016	Sheet 1 of 4



**PLAN**  
(Bottom Slab)  
(Pipe Not Shown)



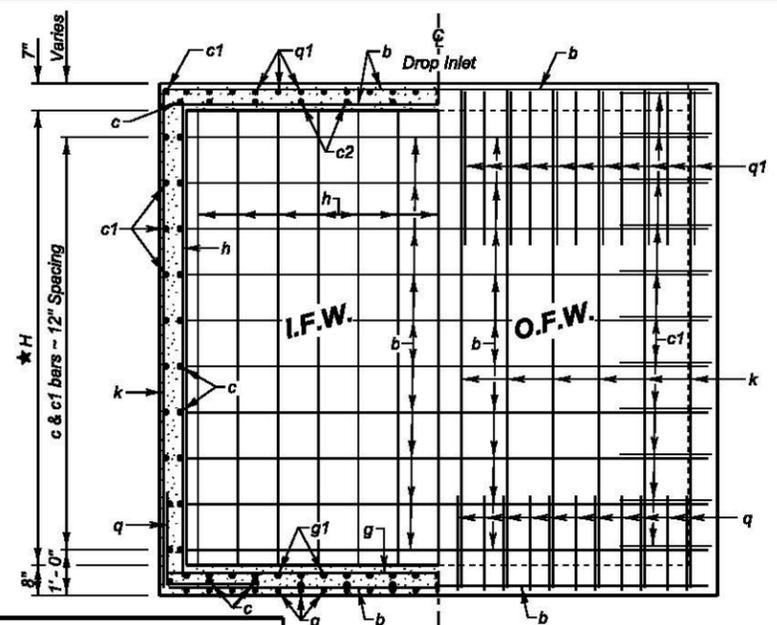
**PLAN**  
(Top Slab)  
(Pipe Not Shown)

**LEGEND FOR PLACING RE-STEEL**

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

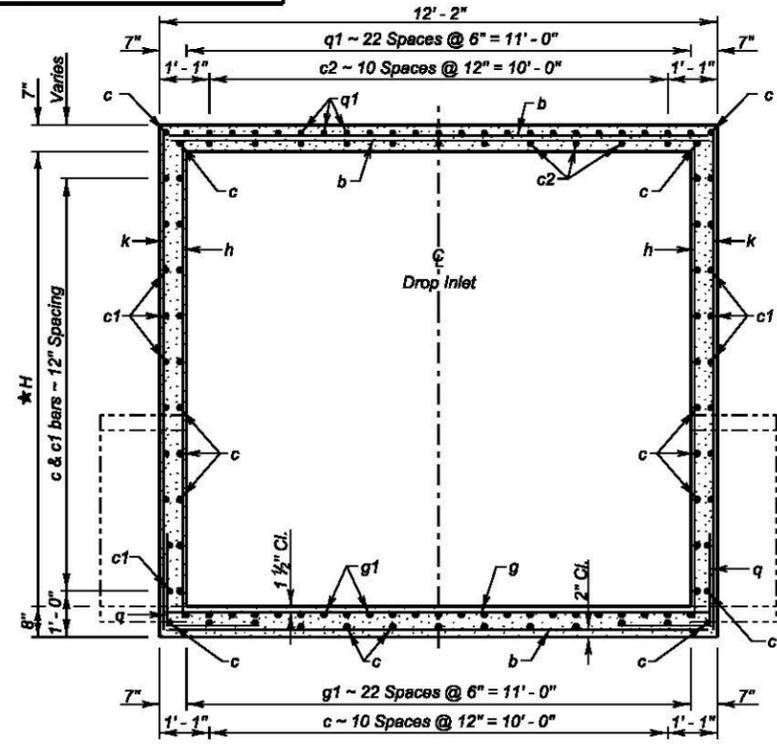
June 26, 2015

<b>S D D O T</b>	<b>7' X 11' TYPE S DROP INLET BASE</b>	PLATE NUMBER <b>670.34</b>
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**LEGEND FOR PLACING RE-STEEL**  
 O.F.W. - Outside Face of Wall  
 I.F.W. - Inside Face of Wall

**VIEW C - C**  
(Pipe Not Shown)



**SEC. B - B**

★ Maximum H is 10' - 0"

June 26, 2015

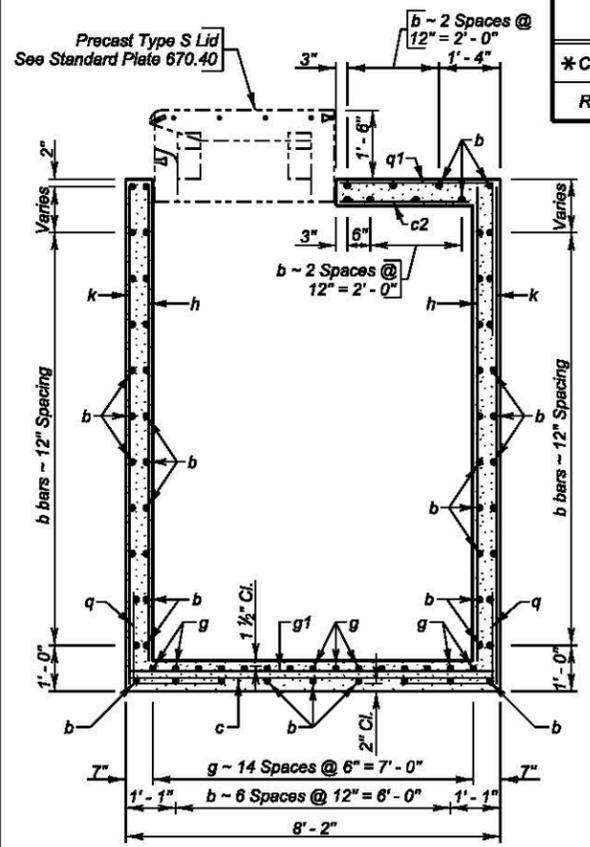
<b>S D D O T</b>	<b>7' X 11' TYPE S DROP INLET BASE</b>	PLATE NUMBER <b>670.34</b>
	Published Date: 2nd Qtr. 2016	Sheet 3 of 4

REINFORCING SCHEDULE				
Mk.	No.	Size	Length	Type
b	19 + 4H	4	11' - 9"	Str.
c	15 + 2H	4	7' - 9"	Str.
c1	2 + 2H	4	11' - 10"	17
c2	11	4	2' - 10"	Str.
g	15	5	11' - 9"	Str.
g1	23	5	7' - 9"	Str.
h	46	5	H + 5"	Str.
k	40	5	H + 5"	Str.
q	76	5	5' - 6"	17A
q1	23	5	6' - 8"	17A

**Bending Details**

**NOTE:**  
All dimensions are out to out of bars

ESTIMATED QUANTITIES			
ITEM	UNIT	CONSTANT QUANTITY	VARIABLE QUANTITY
* Class M6 Concrete	Cu. Yd.	3.65	0.83H
Reinforcing Steel	Lb.	1266	147.26H

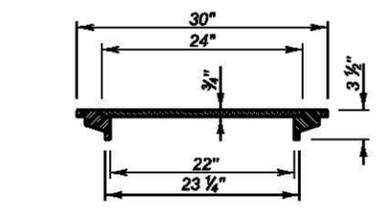
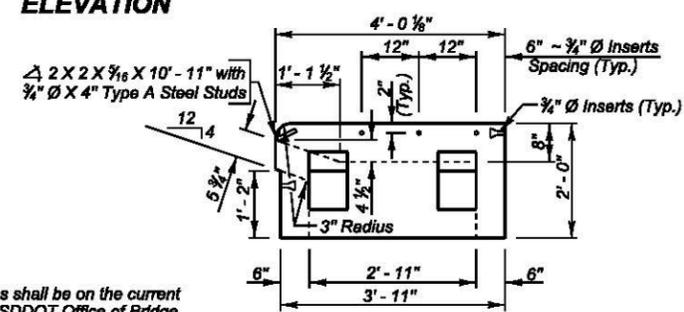
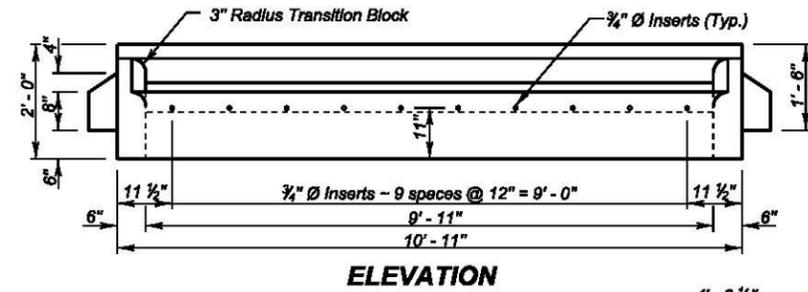
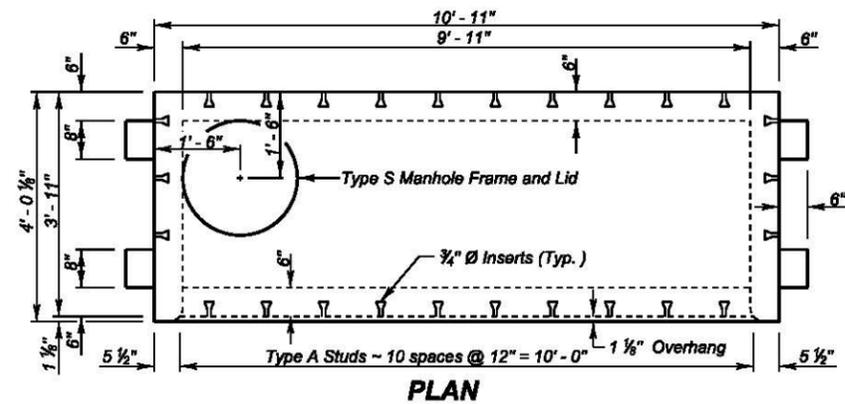


**SEC. A - A**  
(Pipe Not Shown)

PIPE DISPLACEMENT REDUCTIONS		
Diameter (Inches)	Wall T (Inches)	Class M6 Concrete (Cu. Yd.)
12	2	0.03
15	2 1/4	0.04
18	2 1/2	0.06
24	3	0.11
30	3 1/2	0.16
36	4	0.23
42	4 1/2	0.31
48	5	0.40
54	5 1/2	0.50
60	6	0.61
<b>R.C.P.</b>		
18	2 1/2	0.06
24	3 1/2	0.11
30	4	0.16
36	4 1/2	0.22
42	4 1/2	0.29
48	5	0.37
54	5 1/2	0.46
60	6	0.57
72	7	0.82
84	8	1.09
<b>R.C. ARCH</b>		

June 26, 2015

<b>S D D O T</b>	<b>7' X 11' TYPE S DROP INLET BASE</b>	PLATE NUMBER <b>670.34</b>
	Published Date: 2nd Qtr. 2016	Sheet 4 of 4

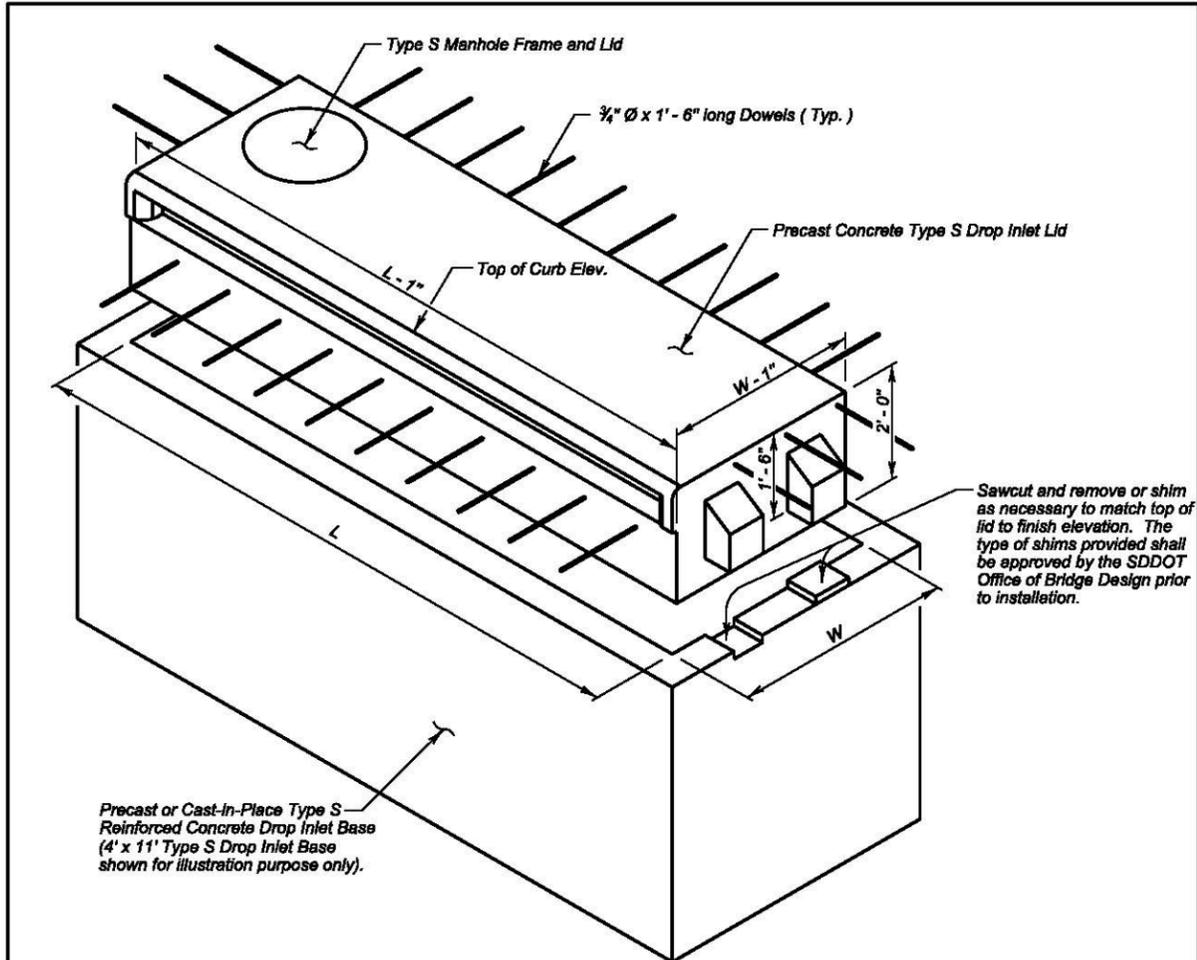


**GENERAL NOTES:**

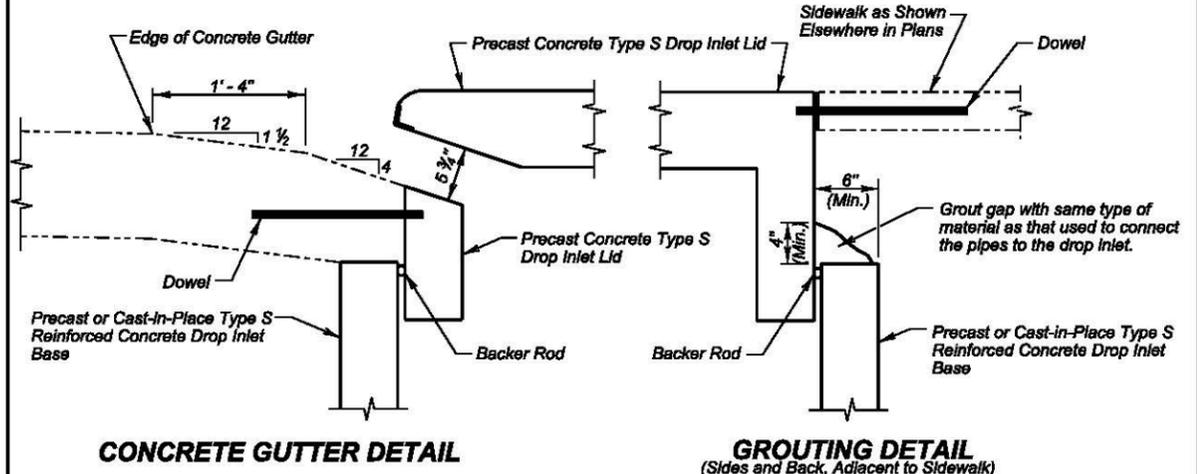
1. The Precast Concrete Type S Drop Inlet Lid and the shims shall be on the current approved list available through proper channels from the SDDOT Office of Bridge Design. To qualify for addition to the approved list, submit a checked design, done by South Dakota Registered Professional Engineers, and shop plans to the Office of Bridge Design for approval. Design shall be in accordance with the current edition of the AASHTO LRFD Bridge Design Specifications.
2. Design Live Load shall be HL - 93.
3. Concrete mix shall be as per fabricators design, however, minimum compressive strength shall not be less than 4500 psi. Type II Cement is required.
4. The Type S Manhole Frame and Lid shall conform to AASHTO M105, Class 30.
5. Structural Steel shall conform to ASTM A36. The 3/4 inch diameter Headed Type A Steel Studs shall conform to Section 7 of the current edition of AWS D1. 1 Structural Steel Welding Code.
6. The 3/4 inch diameter Concrete Inserts shall be galvanized or made of a corrosion resistant material. Provide 3/4 inch diameter x 1' - 6\"/>
- 7. All costs associated with furnishing and installing the Precast Concrete Type S Drop Inlet Lid including the type S manhole frame and lid, shims, inserts, and dowels shall be included in the contract unit price per each for "4' x 11' Precast Concrete Type S Drop Inlet Lid".

December 23, 2012

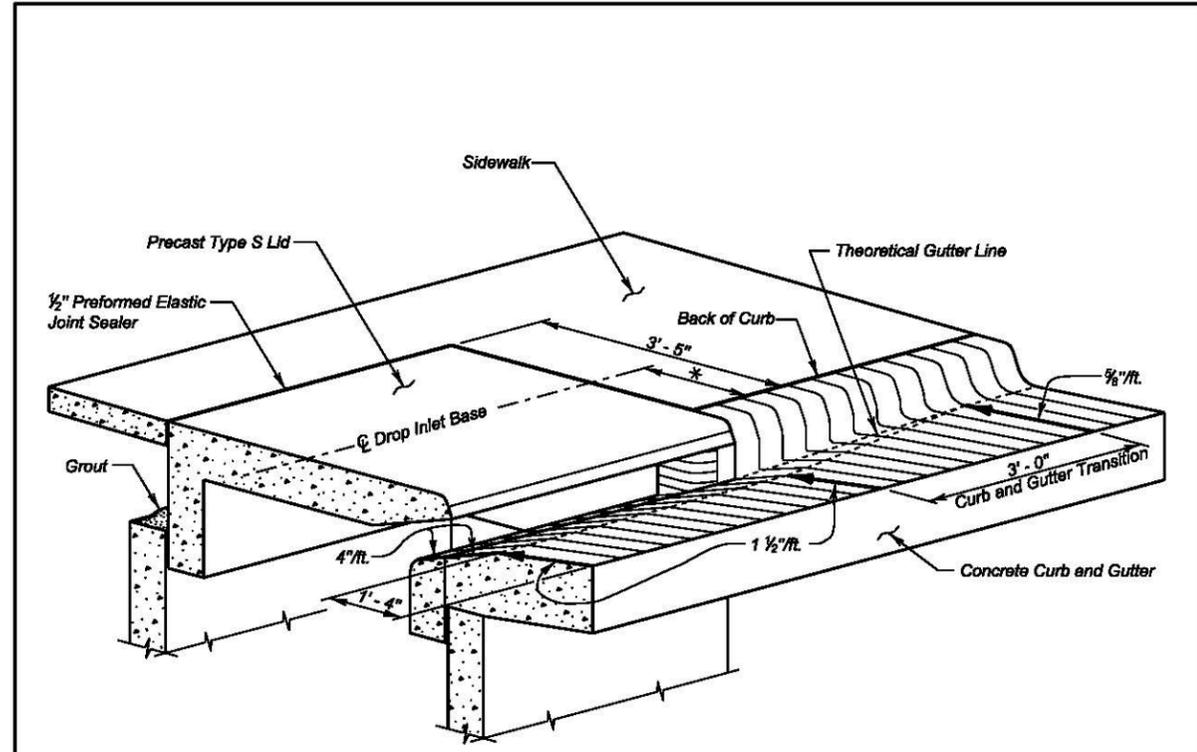
<b>S D D O T</b>	<b>4' X 11' PRECAST CONCRETE TYPE S DROP INLET LID</b>	PLATE NUMBER <b>670.40</b>
	Published Date: 2nd Qtr. 2016	Sheet 1 of 1



**TYPE S DROP INLET**



December 23, 2012



**CURB AND GUTTER TRANSITION DETAILS**

Drop Inlet Base Unit Size	* Distance
4' x 6'	1' - 5 1/2"
4' x 11'	1' - 5 1/2"
7' x 11'	2' - 11 1/2"

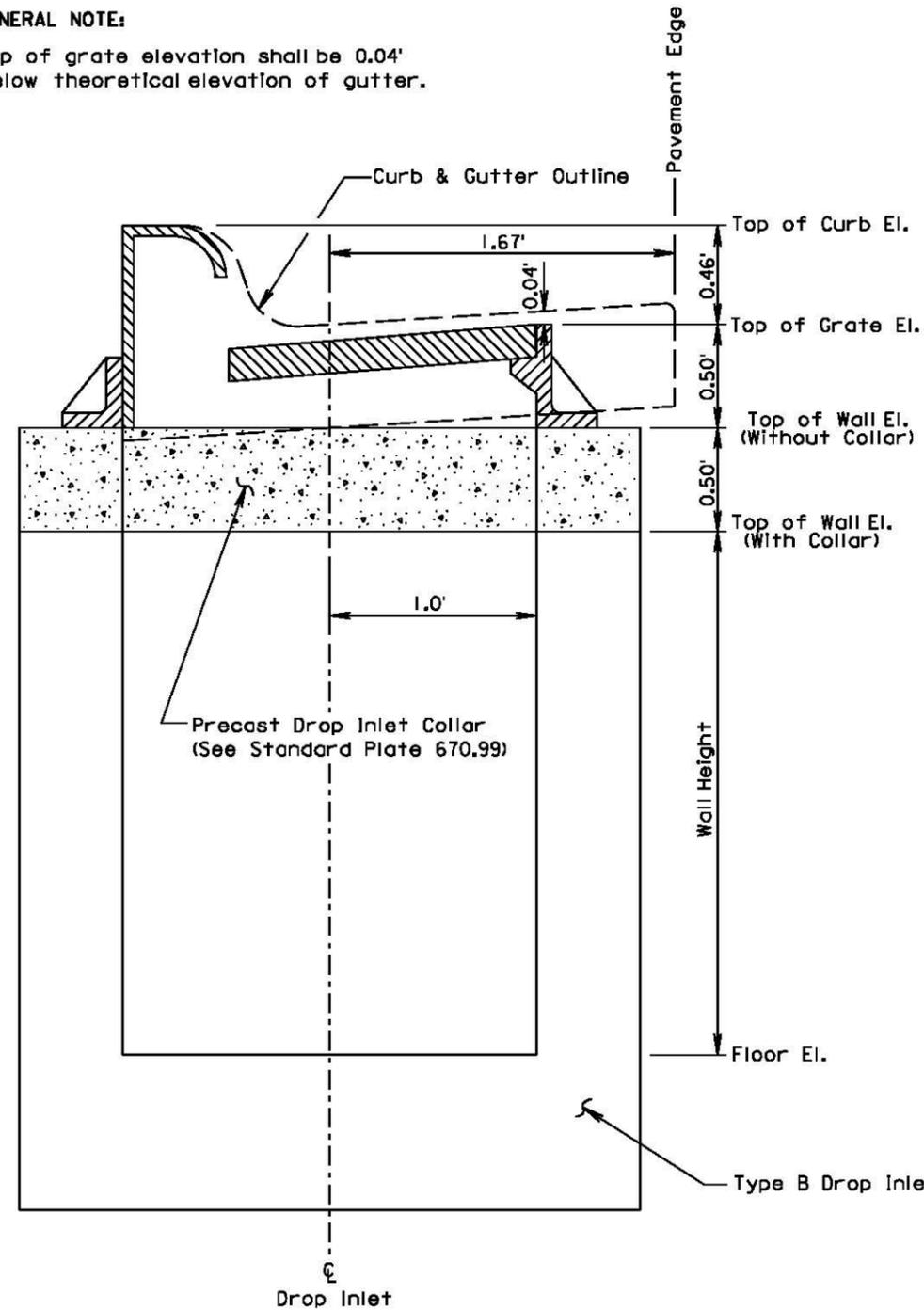
**GENERAL NOTES:**

1. Dowels shall be used to anchor the precast concrete Type S drop inlet lid to the concrete gutter. See Standard Plate 670.38 or 670.40 as applicable. If there is sidewalk adjacent to the drop inlet, the precast lid shall match the finish elevations and cross slopes of the sidewalk.
2. The sidewalk shall be steel reinforced when the sidewalk adjoins the precast lid. Refer to Standard Plate 651.70 for reinforced concrete sidewalk details.

December 23, 2012

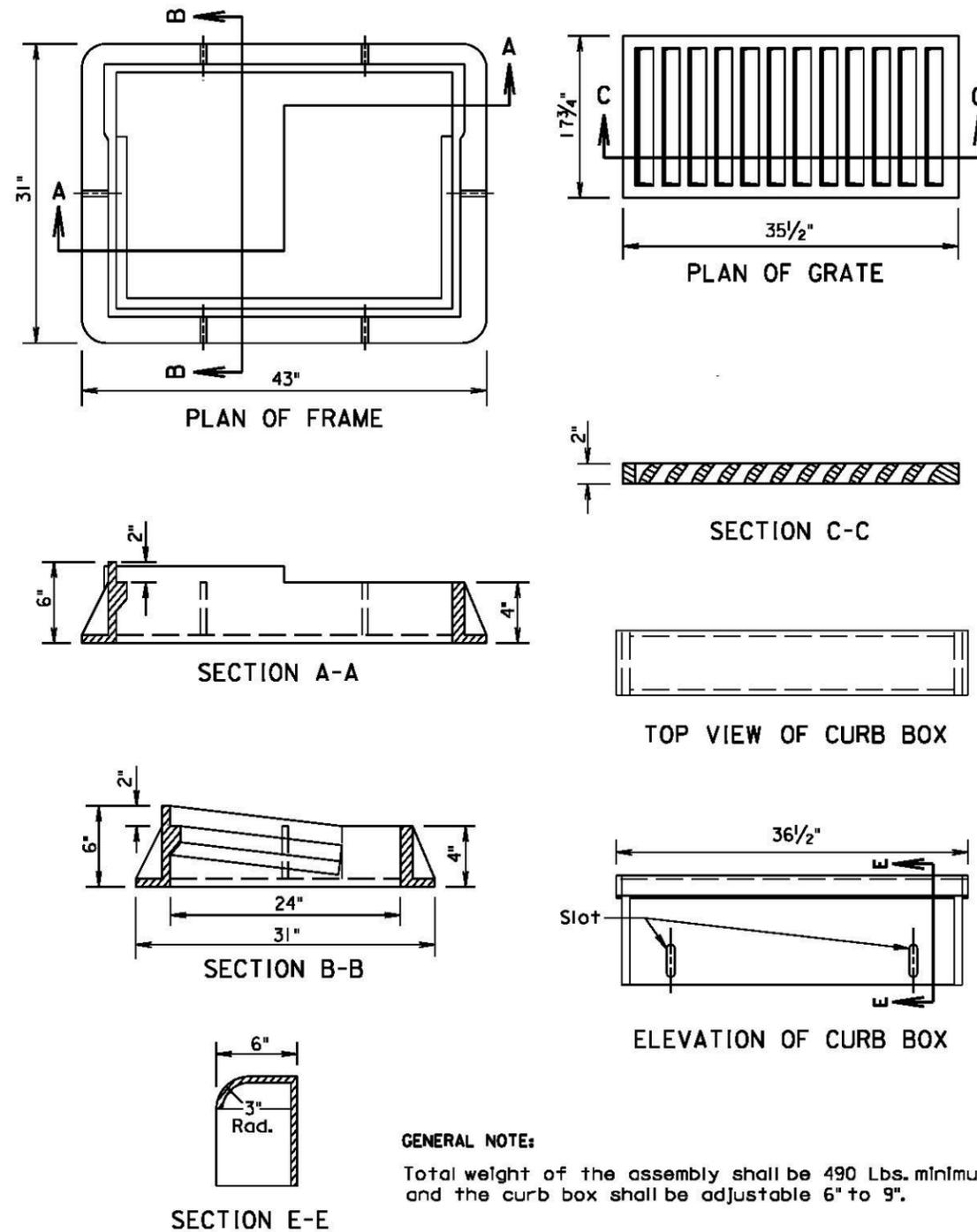
**GENERAL NOTE:**

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



June 26, 2011

Published Date: 2nd Qtr. 2016	S D D O T	INSTALLATION OF TYPE B DROP INLET	PLATE NUMBER 670.75
			Sheet 1 of 1



**GENERAL NOTE:**

Total weight of the assembly shall be 490 Lbs. minimum and the curb box shall be adjustable 6" to 9".

March 31, 2000

Published Date: 2nd Qtr. 2016	S D D O T	TYPE B FRAME AND GRATE ASSEMBLY	PLATE NUMBER 670.80
			Sheet 1 of 1

INFORMATIONAL QUANTITIES			
ITEM	Class M6 Concrete	Reinforcing * Steel	Install Dowel in Concrete
DROP INLET COVER SIZE	Cu. Yd.	Lb.	Each
4' - 0" x 11' - 0"	1.1	116	12
5' - 6" x 11' - 0"	1.5	153	12
7' - 0" x 11' - 0"	1.9	218	12

\* Quantity of z1 Dowel Bars is not included in Reinforcing Steel.

**SPECIFICATIONS**

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

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

**GENERAL NOTES**

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

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

Use 1/2 inch clear cover on all reinforcing steel except as shown.

All exposed edges shall be chamfered 1/4 inch.

Maximum fill over drop inlet cover shall be 3 feet, including surfacing.

Contractor shall break out drop inlet walls as necessary for the drop inlet cover to fit below roadway surfacing.

Apply a thin layer of grout between drop inlet and cover to ensure uniform bearing. Grout shall conform to Section 460.2 K.

All costs involved in furnishing and installing the drop inlet cover including the epoxy resin and dowels shall be incidental to the contract unit price per Each for "4' x 11' Drop Inlet Cover", "5.5' x 11' Drop Inlet Cover, or "7' x 11' Drop Inlet Cover".

**INSTALLING DOWELS IN CONCRETE**

Holes drilled in the existing concrete shall be true and normal or as shown in the plans. Care shall be taken not to damage the existing reinforcing steel. It is very likely that some of the existing reinforcing steel shown in the original construction plans may have been placed out of position during original construction. Therefore, prior to drilling holes in the concrete, an effort will be made by the Department forces to mark locations of the in place reinforcing steel on the concrete surface. In spite of this precaution, the Contractor can still expect to encounter and have to drill through reinforcing steel or shift the dowel spacing as approved by the Engineer to miss the existing reinforcing steel.

The epoxy resin mixture shall be of a type for bonding steel to hardened concrete and shall conform to AASHTO M235 Type IV, Grade 3 (Equivalent to ASTM C881, Type IV, Grade 3).

The diameter of the drilled holes shall not be less than 1/8 inch greater, nor more than 3/8 inch greater than the diameter of the dowels or as per the Manufacturer's recommendations. Use compressed air or other techniques to ensure that the hole is free of any loose material before epoxy resin is applied.

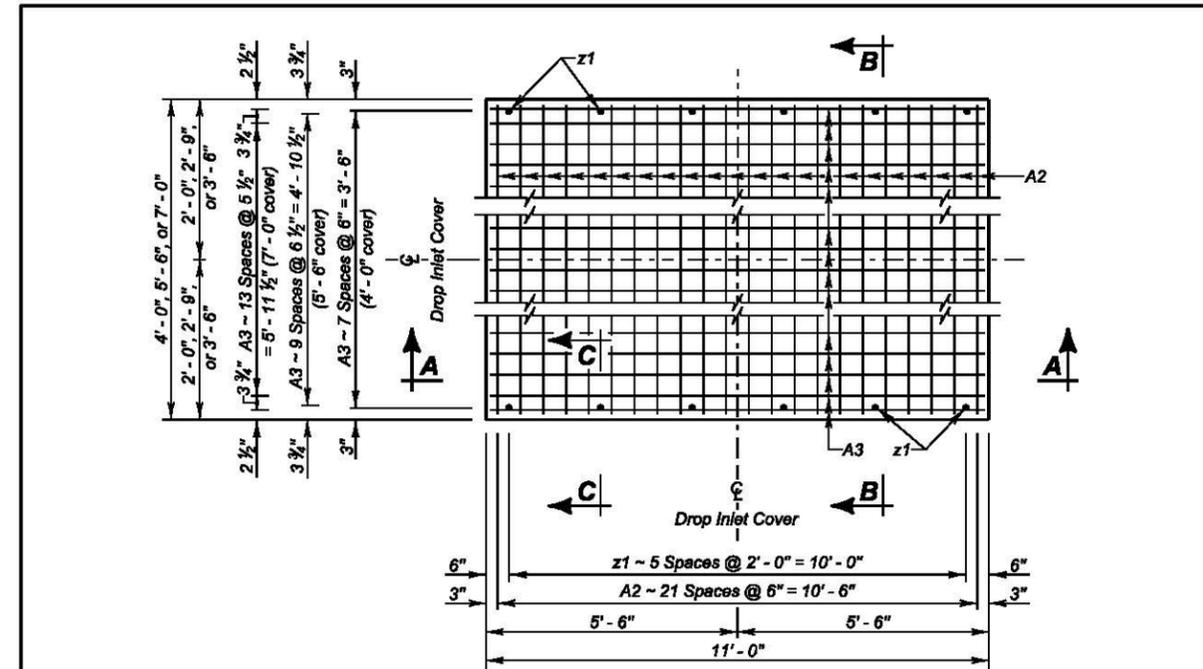
Mix epoxy resin as recommended by the Manufacturer and apply by an injection method as approved by the Engineer. Beginning at the bottom of the drilled holes, fill the holes 1/2 to 1/2 full of epoxy resin. Rotate the steel bar during installation to eliminate voids and ensure complete bonding of the bar. Insertion of the bars by the dipping method will not be allowed.

No loads shall be applied to the epoxy grouted dowel bars until the epoxy resin has had sufficient time to cure as specified by the epoxy resin manufacturer.

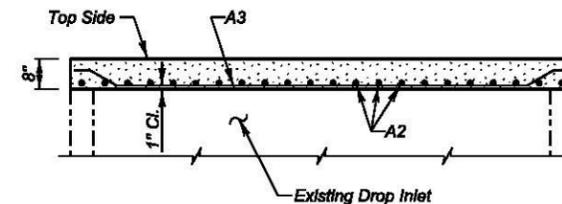
Embed dowels 9 inches into existing concrete.

December 16, 2015

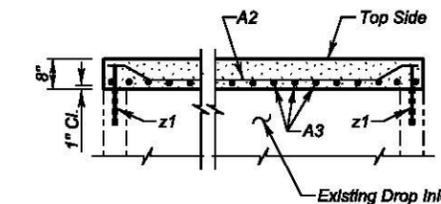
<b>SD DOT</b>	<b>PERMANENT 4' X 11', 5.5' X 11', AND 7' X 11' DROP INLET COVERS</b>	PLATE NUMBER <b>670.92</b>
	Published Date: 2nd Qtr. 2016	Sheet 1 of 2



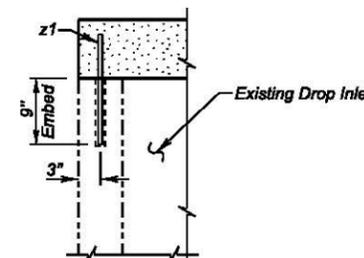
PLAN VIEW



SEC. A - A



SEC. B - B



SEC. C - C

REINFORCING SCHEDULE (for one cover)					
WIDTH	Mk.	No.	Size	Length	Type
4'-0"	A2	22	4	3'-11"	14A
	A3	8	4	10'-11"	14A
	* z1	12	4	1'-3"	Str.
5'-6"	A2	22	4	5'-5"	14A
	A3	10	4	10'-11"	14A
	* z1	12	4	1'-3"	Str.
7'-0"	A2	22	4	6'-11"	14A
	A3	16	4	10'-11"	14A
	* z1	12	4	1'-3"	Str.

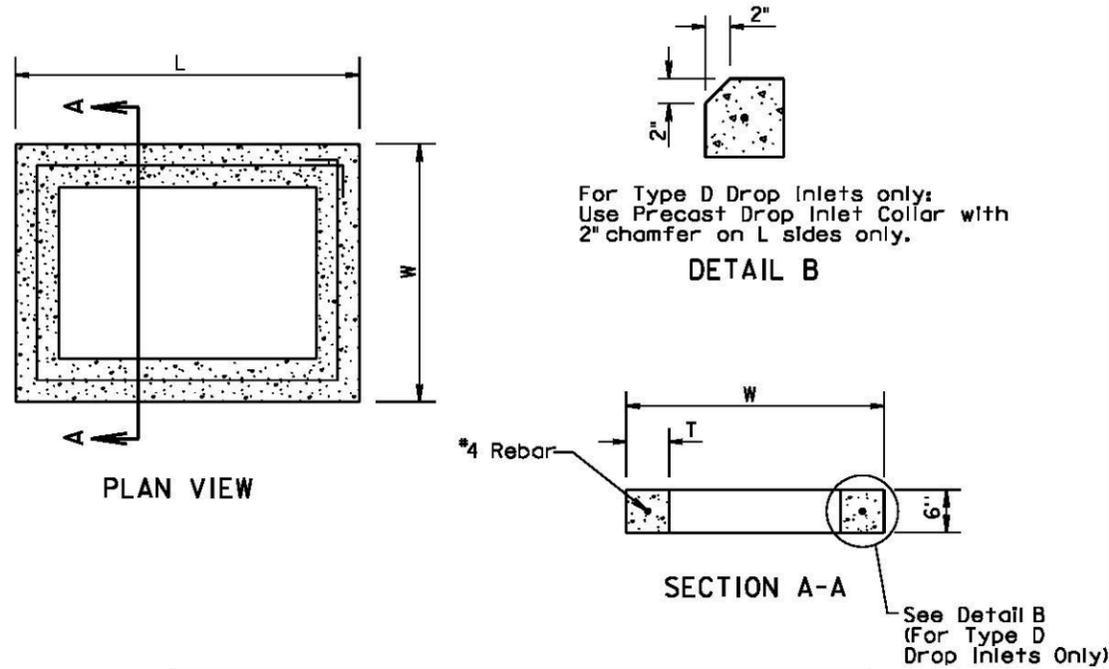
\* Dowel Bar

Bending Details	
12 6 1/8	4" 6 1/2" 4"
A2	2'-0" 4'-0"
A3	9'-0" 4'-0"
A2	3'-6" 5'-6"
A3	9'-0" 5'-6"
A2	5'-0" 7'-0"
A3	9'-0" 7'-0"

Type 14A

December 16, 2015

<b>SD DOT</b>	<b>PERMANENT 4' X 11', 5.5' X 11', AND 7' X 11' DROP INLET COVERS</b>	PLATE NUMBER <b>670.92</b>
	Published Date: 2nd Qtr. 2016	Sheet 2 of 2



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

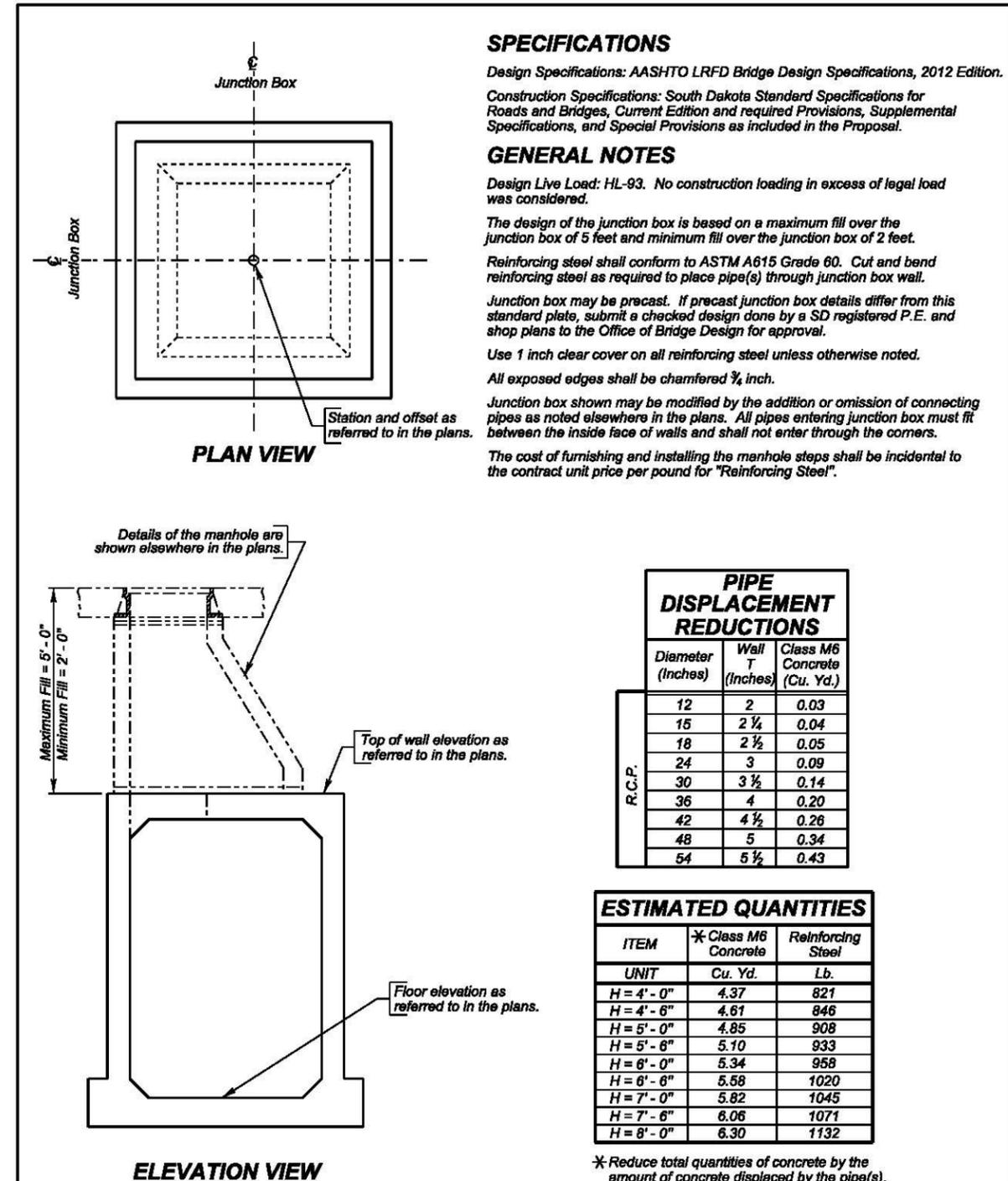
**GENERAL NOTES:**

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

March 31, 2000

<b>SD DOT</b>	<b>PRECAST DROP INLET COLLAR</b>	PLATE NUMBER <b>670.99</b>
		Sheet 1 of 1

Published Date: 2nd Qtr. 2016



**SPECIFICATIONS**

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

**GENERAL NOTES**

Design Live Load: HL-93. No construction loading in excess of legal load was considered.  
 The design of the junction box is based on a maximum fill over the junction box of 5 feet and minimum fill over the junction box of 2 feet.  
 Reinforcing steel shall conform to ASTM A615 Grade 60. Cut and bend reinforcing steel as required to place pipe(s) through junction box wall.  
 Junction box may be precast. If precast junction box details differ from this standard plate, submit a checked design done by a SD registered P.E. and shop plans to the Office of Bridge Design for approval.  
 Use 1 inch clear cover on all reinforcing steel unless otherwise noted.  
 All exposed edges shall be chamfered 1/4 inch.  
 Junction box shown may be modified by the addition or omission of connecting pipes as noted elsewhere in the plans. All pipes entering junction box must fit between the inside face of walls and shall not enter through the corners.  
 The cost of furnishing and installing the manhole steps shall be incidental to the contract unit price per pound for "Reinforcing Steel".

PIPE DISPLACEMENT REDUCTIONS		
Diameter (Inches)	Wall T (Inches)	Class M6 Concrete (Cu. Yd.)
12	2	0.03
15	2 1/4	0.04
18	2 1/2	0.05
24	3	0.09
30	3 1/2	0.14
36	4	0.20
42	4 1/2	0.26
48	5	0.34
54	5 1/2	0.43

ESTIMATED QUANTITIES		
ITEM	* Class M6 Concrete	Reinforcing Steel
UNIT	Cu. Yd.	Lb.
H = 4' - 0"	4.37	821
H = 4' - 6"	4.61	846
H = 5' - 0"	4.85	908
H = 5' - 6"	5.10	933
H = 6' - 0"	5.34	958
H = 6' - 6"	5.58	1020
H = 7' - 0"	5.82	1045
H = 7' - 6"	6.06	1071
H = 8' - 0"	6.30	1132

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

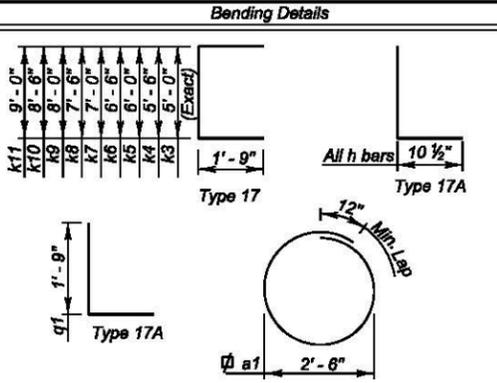
December 16, 2015

<b>SD DOT</b>	<b>5'X 5' JUNCTION BOX</b>	PLATE NUMBER <b>671.01</b>
		Sheet 1 of 3

Published Date: 2nd Qtr. 2016

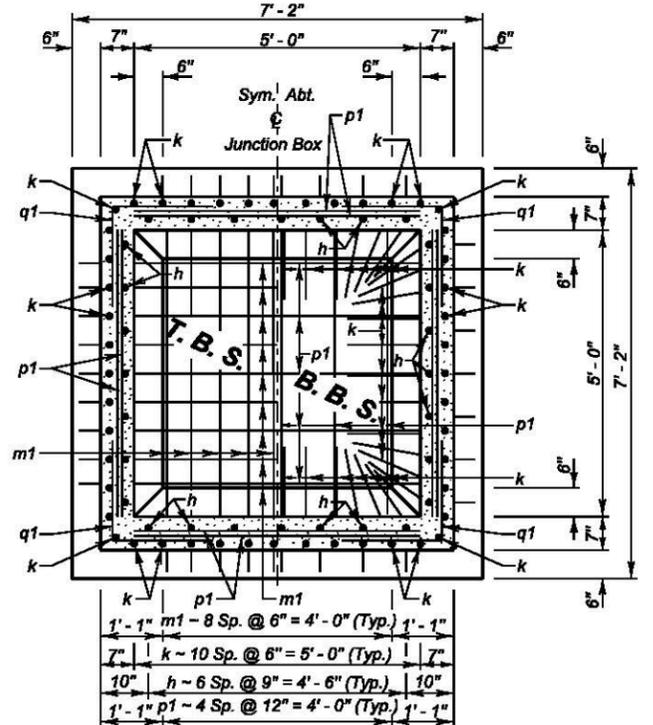
**REINFORCING SCHEDULE**

Mk.	No.	Size	Length	Type
∅ a1	1	6	9'-0"	T3
∇ a2	4	-	-	-
h3	28	4	5'-9"	17A
k3	48	4	8'-6"	17
m1	18	5	6'-9"	Str.
n1	18	5	5'-9"	Str.
p1	52	4	5'-0"	Str.
q1	8	4	3'-6"	17A
∅ a1	1	6	9'-0"	T3
∇ a2	4	-	-	-
h4	28	4	6'-3"	17A
k4	48	4	9'-0"	17
m1	18	5	6'-9"	Str.
n1	18	5	5'-9"	Str.
p1	52	4	5'-0"	Str.
q1	8	4	3'-6"	17A
∅ a1	1	6	9'-0"	T3
∇ a2	5	-	-	-
h5	28	4	6'-9"	17A
k5	48	4	9'-6"	17
m1	18	5	6'-9"	Str.
n1	18	5	5'-9"	Str.
p1	52	4	5'-0"	Str.
q1	8	4	3'-6"	17A
∅ a1	1	6	9'-0"	T3
∇ a2	5	-	-	-
h6	28	4	7'-3"	17A
k6	48	4	10'-0"	17
m1	18	5	6'-9"	Str.
n1	18	5	5'-9"	Str.
p1	60	4	5'-0"	Str.
q1	12	4	3'-6"	17A
∅ a1	1	6	9'-0"	T3
∇ a2	6	-	-	-
h7	28	4	7'-9"	17A
k7	48	4	10'-6"	17
m1	18	5	6'-9"	Str.
n1	18	5	5'-9"	Str.
p1	60	4	5'-0"	Str.
q1	12	4	3'-6"	17A
∅ a1	1	6	9'-0"	T3
∇ a2	6	-	-	-
h8	28	4	8'-3"	17A
k8	48	4	11'-0"	17
m1	18	5	6'-9"	Str.
n1	18	5	5'-9"	Str.
p1	68	4	5'-0"	Str.
q1	16	4	3'-6"	17A
∅ a1	1	6	9'-0"	T3
∇ a2	7	-	-	-
h9	28	4	8'-9"	17A
k9	48	4	11'-6"	17
m1	18	5	6'-9"	Str.
n1	18	5	5'-9"	Str.
p1	68	4	5'-0"	Str.
q1	16	4	3'-6"	17A



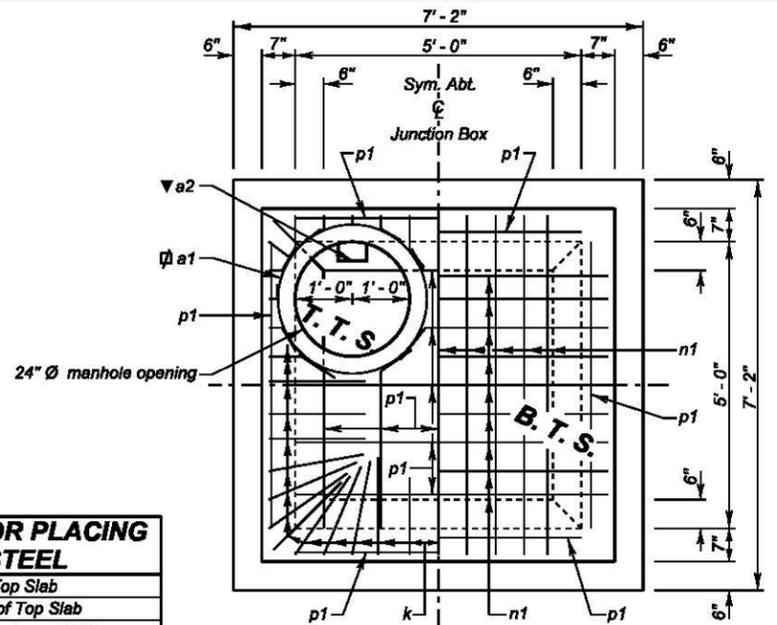
**LEGEND FOR PLACING RE-STEEL**  
 T. B. S. - Top of Bottom Slab  
 B. B. S. - Bottom of Bottom Slab

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



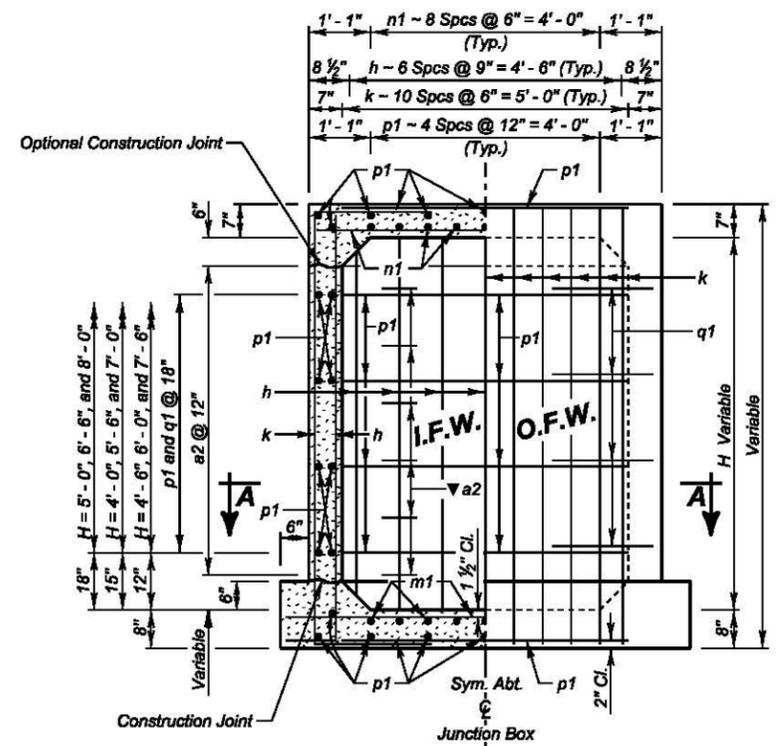
**SEC. A - A**

December 16, 2015



**LEGEND FOR PLACING RE-STEEL**  
 T. T. S. - Top of Top Slab  
 B. T. S. - Bottom of Top Slab  
 O. F. W. - Outside Face of Wall  
 I. F. W. - Inside Face of Wall

**PLAN VIEW**



**ELEVATION VIEW**

December 16, 2015

