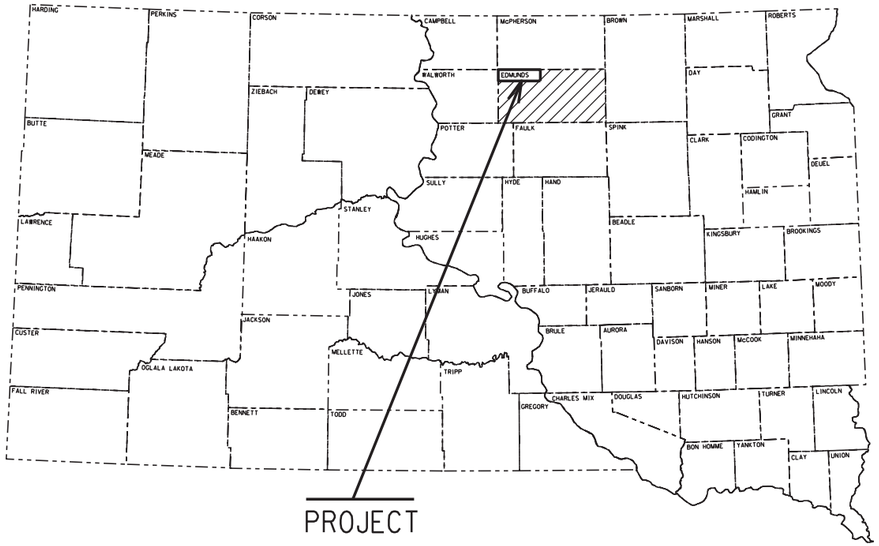
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	P 0253(04)182	1	71

Plotting Date: 08/01/2016

STATE OF SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION
PLANS FOR PROPOSED

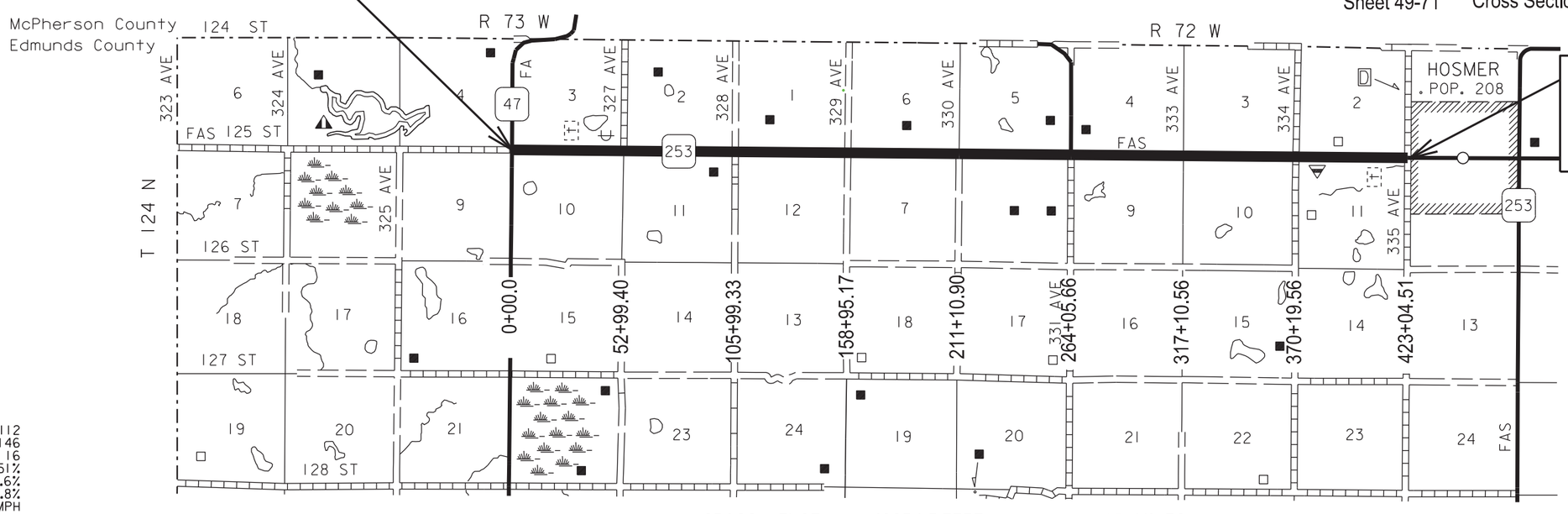
PROJECT P 0253(04)182
S.D. HIGHWAY 253
EDMUNDS COUNTY

COLD MILLING ASPHALT CONCRETE, ASPHALT CONCRETE RESURFACING AND CULVERT REPLACEMENT
PCN 03T8



Begin Project
Sta 1+00.00
MRM 190+00 +0.911

End Project
Sta 423+54.51
MRM 182.00 +0.932



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DESIGN DESIGNATION

ADT (2015)	112
ADT (2035)	146
DHV	16
D	51%
T DHV	2.6%
T ADT	5.8%
V	65 MPH

STORM WATER PERMIT
None Required

GROSS LENGTH	42254.5 FEET	8.003 MILES
LENGTH OF EXCEPTIONS	0 FEET	0.000 MILES
NET LENGTH	42254.5 FEET	8.003 MILES

PLOT SCALE - 1:6000
PLOTTED FROM - TRAB17886
PLOT NAME - 2
FILE - ...\03T8_TITLE SHEET.DGN

ESTIMATE OF QUANTITIES

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
110E0500	Remove Pipe Culvert	34	Ft
110E0510	Remove Pipe End Section	5	Each
110E7150	Remove Sign for Reset	29	Each
110E7500	Remove Pipe for Reset	122	Ft
110E7510	Remove Pipe End Section for Reset	15	Each
120E0010	Unclassified Excavation	4,833	CuYd
120E0100	Unclassified Excavation, Digouts	400	CuYd
120E0600	Contractor Furnished Borrow Excavation	4,270	CuYd
230E0100	Remove and Replace Topsoil	Lump Sum	LS
250E0020	Incidental Work, Grading	Lump Sum	LS
260E1010	Base Course	2,607.2	Ton
* 260E6000	Granular Material, Furnish	2,445.3	Ton
* 270E0200	Blend, Haul, and Stockpile Granular Material	6,113.2	Ton
320E0005	PG 58-34 Asphalt Binder	766.7	Ton
320E1200	Asphalt Concrete Composite	414.3	Ton
320E1202	Class Q2R Hot Mixed Asphalt Concrete	14,538.9	Ton
320E1800	Asphalt Concrete Blade Laid	1,200.4	Ton
320E4000	Hydrated Lime	159.2	Ton
320E7008	Grind 8" Rumble Strip or Stripe in Asphalt Concrete	16.0	Mile
330E0100	SS-1h or CSS-1h Asphalt for Tack	82.3	Ton
330E0210	SS-1h or CSS-1h Asphalt for Flush Seal	27.9	Ton
330E2000	Sand for Flush Seal	416.1	Ton
332E0010	Cold Milling Asphalt Concrete	122,176	SqYd
421E0100	Pipe Culvert Undercut	201	CuYd
450E0162	30" RCP Class 2, Furnish	68	Ft
450E0170	30" RCP, Install	68	Ft
450E0182	36" RCP Class 2, Furnish	238	Ft
450E0190	36" RCP, Install	238	Ft
450E0192	42" RCP Class 2, Furnish	78	Ft
450E0200	42" RCP, Install	78	Ft
450E0212	54" RCP Class 2, Furnish	80	Ft
450E0220	54" RCP, Install	80	Ft
450E0222	60" RCP Class 2, Furnish	78	Ft
450E0230	60" RCP, Install	78	Ft
450E2008	18" RCP Flared End, Furnish	5	Each
450E2009	18" RCP Flared End, Install	5	Each
450E2028	36" RCP Flared End, Furnish	6	Each
450E2029	36" RCP Flared End, Install	6	Each
450E2032	42" RCP Flared End, Furnish	2	Each
450E2033	42" RCP Flared End, Install	2	Each
450E2040	54" RCP Flared End, Furnish	2	Each
450E2041	54" RCP Flared End, Install	2	Each
450E2044	60" RCP Flared End, Furnish	2	Each
450E2045	60" RCP Flared End, Install	2	Each
450E2204	30" RCP Sloped End, Furnish	2	Each
450E2205	30" RCP Sloped End, Install	2	Each
450E5310	24" CMP Sloped End, Furnish	12	Each
450E5311	24" CMP Sloped End, Install	12	Each
450E9000	Reset Pipe	122	Ft
450E9001	Reset Pipe End Section	15	Each
600E0300	Type III Field Laboratory	1	Each
632E1320	2.0"x2.0" Perforated Tube Post	342.0	Ft
632E3500	Reset Sign	29	Each
633E1300	Pavement Marking Paint, White	271	Gal
633E1305	Pavement Marking Paint, Yellow	96	Gal
634E0010	Flagging	130.0	Hour
634E0020	Pilot Car	65.0	Hour
634E0110	Traffic Control Signs	683.0	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0265	Type 3 Barricade, 6' Double Sided	4	Each
634E0285	Type 3 Barricade, 8' Double Sided	6	Each
634E0630	Temporary Pavement Marking	32.1	Mile
634E0810	Groove 6" Wide Rumble Strip	374	Ft
634E1002	Detour Signing	191.3	SqFt
730E0100	Cover Crop Seeding	3.0	Bu
734E0010	Erosion Control	Lump Sum	LS
734E0154	12" Diameter Erosion Control Wattle	100	Ft
831E0300	Reinforcement Fabric (MSE)	1,582	SqYd
900E0010	Refurbish Single Mailbox	3	Each

*** - Denotes Non-Participating**

SPECIFICATIONS

Standard Specifications for Roads and Bridges, 2015 Edition and Required Provisions, Supplemental Specifications and Special Provisions as included in the Proposal.

ENVIRONMENTAL COMMITMENTS

An Environmental Commitment is a measure that SDDOT commits to implement in order to avoid, minimize, and/or mitigate a real or potential environmental impact. Environmental commitments to various agencies and the public have been made to secure approval of this project. An agency mentioned below with permitting authority can influence a project if perceived environmental impacts have not been adequately addressed. Unless otherwise designated, the Contractor's primary contact regarding matters associated with these commitments will be the Project Engineer. These environmental commitments are not subject to change without prior written approval from the SDDOT Environmental Office. The environmental commitments associated with this project are as follows:

COMMITMENT B: FEDERALLY THREATENED, ENDANGERED, AND PROTECTED SPECIES

COMMITMENT B2: WHOOPING CRANE

The Whooping Crane is a spring and fall migratory bird in South Dakota that is about 5 feet tall and typically stops on wetlands, rivers, and agricultural lands along their migration route. An adult Whooping Crane is white with a red crown and a long, dark, pointed bill. Immature Whooping Cranes are cinnamon brown. While in flight, their long necks are kept straight and their long dark legs trail behind. Adult Whooping Cranes' black wing tips are visible during flight.

Action Taken/Required:

Harassment or other measures to cause the Whooping Crane to leave the site is a violation of the Endangered Species Act. If a Whooping Crane is sighted roosting in the vicinity of the project, borrow pit, or staging site associated with the project, cease construction activities in the affected area until the Whooping Crane departs and contact the Project Engineer. The Project Engineer will contact the Environmental Office so that the sighting can be reported to USFWS.

COMMITMENT C: WATER SOURCE

The Contractor shall not withdraw water with equipment previously used outside the State of South Dakota without prior approval from the SDDOT Environmental Office. Thoroughly wash all construction equipment before entering South Dakota to reduce the risk of invasive species introduction into the project vicinity.

Action Taken/Required:

The Contractor shall obtain the necessary permits from the regulatory agencies such as the Department of Environment and Natural Resources (DENR) and the United States Army Corps of Engineers (COE) prior to executing water extraction activities.

COMMITMENT E: STORM WATER

Construction activities constitute less than 1 acre of disturbance.

Action Taken/Required:

At a minimum and regardless of project size, appropriate erosion and sediment control measures must be installed to control the discharge of pollutants from the construction site.

PLOTTED FROM - TRAB17892

COMMITMENT H: WASTE DISPOSAL SITE

The Contractor shall furnish a site(s) for the disposal of construction and/or demolition debris generated by this project.

Action Taken/Required:

Construction and/or demolition debris may not be disposed of within the Public ROW.

The waste disposal site(s) shall be managed and reclaimed in accordance with the following from the General Permit for Construction/Demolition Debris Disposal Under the South Dakota Waste Management Program issued by the Department of Environment and Natural Resources.

The waste disposal site(s) shall not be located in a wetland, within 200 feet of surface water, or in an area that adversely affects wildlife, recreation, aesthetic value of an area, or any threatened or endangered species, as approved by the Project Engineer.

If the waste disposal site(s) is located such that it is within view of any ROW, the following additional requirements shall apply:

1. Construction and/or demolition debris consisting of concrete, asphalt concrete, or other similar materials shall be buried in a trench completely separate from wood debris. The final cover over the construction and/or demolition debris shall consist of a minimum of 1 foot of soil capable of supporting vegetation. Waste disposal sites provided outside of the Public ROW shall be seeded in accordance with Natural Resources Conservation Service recommendations. The seeding recommendations may be obtained through the appropriate County NRCS Office. The Contractor shall control the access to waste disposal sites not within the Public ROW through the use of fences, gates, and placement of a sign or signs at the entrance to the site stating “No Dumping Allowed”.

2. Concrete and asphalt concrete debris may be stockpiled within view of the ROW for a period of time not to exceed the duration of the project. Prior to project completion, the waste shall be removed from view of the ROW or buried and the waste disposal site reclaimed as noted above.

The above requirements will not apply to waste disposal sites that are covered by an individual solid waste permit as specified in SDCL 34A-6-58, SDCL 34A-6-1.13, and ARSD 74:27:10:06.

Failure to comply with the requirements stated above may result in civil penalties in accordance with South Dakota Solid Waste Law, SDCL 34A-6-1.31.

All costs associated with furnishing waste disposal site(s), disposing of waste, maintaining control of access (fence, gates, and signs), and reclamation of the waste disposal site(s) shall be incidental to the various contract items.

COMMITMENT I: HISTORICAL PRESERVATION OFFICE CLEARANCES

The SDDOT has obtained concurrence with the State Historical Preservation Office (SHPO or THPO) for all work included within the project limits and all department designated sources and designated option material sources, stockpile sites, storage areas, and waste sites provided within the plans.

Action Taken/Required:

All earth disturbing activities not designated within the plans require review of cultural resources impacts. This work includes, but is not limited to: Contractor furnished material sources, material processing sites, stockpile sites, storage areas, plant sites, and waste areas.

The Contractor shall arrange and pay for a cultural resource survey and/or records search. The Contractor has the option to contact the state Archaeological Research Center (ARC) at 605-394-1936 or another qualified archaeologist, to obtain either a records search or a cultural resources survey. A record search might be sufficient for review; however, a cultural resources survey may need to be conducted by a qualified archaeologist.

The Contractor shall provide ARC with the following: a topographical map or aerial view on which the site is clearly outlined, site dimensions, project number, and PCN. If applicable, provide evidence that the site has been previously disturbed by farming, mining, or construction activities with a landowner statement that artifacts have not been found on the site.

The Contractor shall submit the records search or cultural resources survey report and if the location of the site is within the current geographical or historic boundaries of any South Dakota reservation to SDDOT Environmental Engineer, 700 East Broadway Avenue, Pierre, SD 57501-2586 (605-773-3180). SDDOT will submit the information to the appropriate SHPO/THPO. Allow **30 Days** from the date this information is submitted to the Environmental Engineer for SHPO/THPO review.

If evidence for cultural resources is uncovered during project construction activities, then such activities shall cease and the Project Engineer shall be immediately notified. The Project Engineer will contact the SDDOT Environmental Engineer in order to determine an appropriate course of action.

SHPO/THPO review does not relieve the Contractor of the responsibility for obtaining any additional permits and clearances for Contractor furnished material sources, material processing sites, stockpile sites, storage areas, plant sites, and waste areas that affect wetlands, threatened and endangered species, or waterways. The Contractor shall provide the required permits and clearances to the Project Engineer at the preconstruction meeting.

COMMITMENT N: SECTION 404 PERMIT

The SDDOT has obtained a Section 404 Permit from the US Army Corps of Engineers for the permanent actions associated with this project.

Action Taken/Required:

The Contractor shall comply with all requirements contained in the Section 404 permit.

The Contractor shall also be responsible for obtaining a Section 404 permit for any dredge, excavation, or fill activities associated with staging areas, borrow sites, waste disposal sites, or material processing sites that affect wetlands or waters of the United States.

PLOTTED FROM - TRAB17982

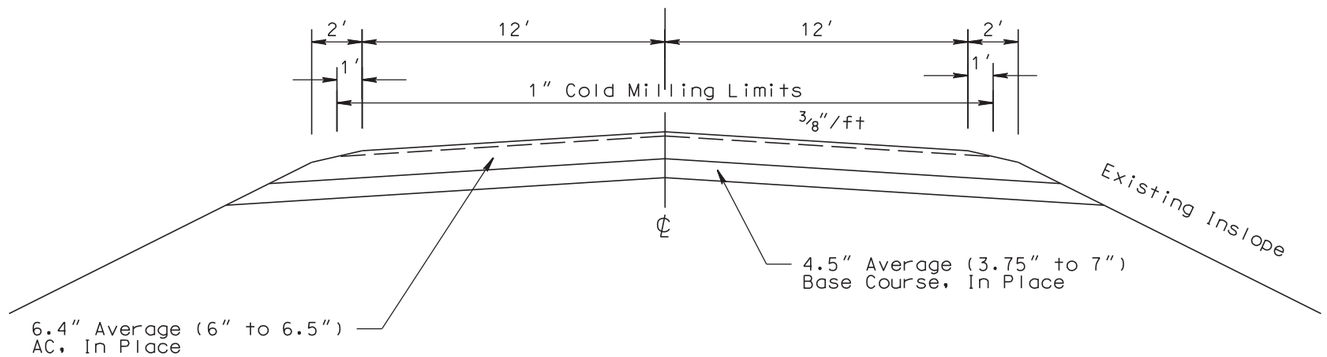
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	P 0253(04)182	4	71

TYPICAL RESURFACING SECTION

SECTION 1

Sta. 1+00 to Sta. 423+54.51

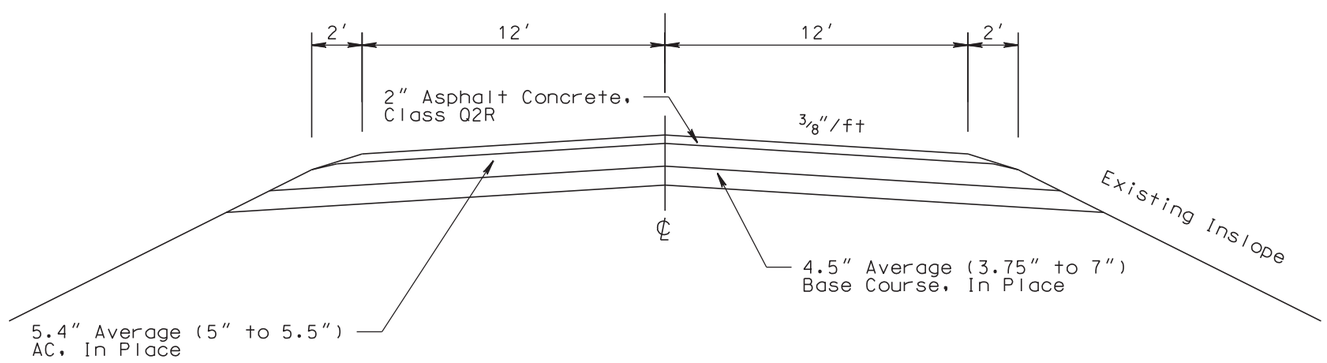
EXISTING TYPICAL SECTION AND DETAIL
FOR COLD MILLING ASHPALT CONCRETE



SECTION 1

Sta. 1+00 to Sta. 423+54.51

TYPICAL RESURFACING SECTION



PLOTTED FROM - TRAB17886

RATES OF MATERIALS

The Estimate of Quantities is based on the following quantities of material per **mile**.

STA. 1+00 to 423+54.51

CLASS Q2R HOT MIXED ASPHALT CONCRETE – 2" LIFT

Crushed Aggregate.....	1266 Tons
Salvaged Asphalt Concrete	317 Tons
PG 58-34 Asphalt Binder.....	78 Tons
Total without Lime	**1661 Tons**
Hydrated Lime.....	17 Tons
Total with Lime	**1678 Tons**

The exact proportion of these materials will be determined on construction.

SS-1h or CSS-1h Emulsified Asphalt for Tack at the rate of **4.3** tons applied **29** feet wide.
(Rate = 0.06 Gal./Sq.Yd.)

FLUSH SEAL

SS-1h or CSS-1h Emulsified Asphalt for Flush Seal at the rate of **3.5** tons applied **28** feet wide.
(Rate = 0.05 Gal./Sq.Yd.).

Sand for Flush Seal at the rate of **52** tons applied **22** feet wide. (Rate = 8 Lb./Sq.Yd.).

PLOTTED FROM - TRAB17882

TABLE OF ADDITIONAL QUANTITIES

LOCATIONS:	BASE COURSE TON	CLASS Q2R HOT MIXED ASPHALT CONCRETE TON	HYDRATED LIME TON	PG 58-34 ASPHALT BINDER TON	SALVAGED ASPHALT CONCRETE (RAP) (NABI) TON	VIRGIN AGGREGATE (NABI) TON	COLD MILLING ASPHALT CONCRETE SqYd
Edmunds County 3 North (331 Ave) Asphalt to the ROW Line	-	25.0	0.25	1.16	4.72	18.87	107
8 Intersecting Gravel Section Line Roads to be Paved to Radius Point (327th Ave N, 328th Ave S, 330th Ave S, 331st Ave S, 334th Ave N&S, 335th N&S,)	120	125.0	1.25	5.82	23.59	94.35	-
7 Intersecting Gravel Section Line Roads (5' Asphalt Pad) (327th Ave = S, 328th Ave = N, 329th Ave = N&S, 330th Ave N, 333th Ave N&S)	105	21.0	0.21	0.98	3.96	15.85	-
2 Farm Entrances (5' Asphalt Pad), (MRM 183.122 Lt & MRM 187.405 Rt)	30	7.0	0.07	0.33	1.32	5.28	-
36 Farm and Field Entrances (5' Asphalt Pad)	540	110.0	1.10	5.12	20.76	83.03	-
Pull off for cemetary parking (MRM 183.230 to MRM 183.394 Lt)	-	22.0	0.22	1.02	4.15	16.61	-
TOTALS	**795**	**310.0**	**3.1**	**14.4**	**58.5**	**234.0**	**107**

The tonnage shown in the Table of Additional Quantities for Class Q2R Hot Mixed Asphalt Concrete for Intersecting Roads and Pullouts is based on an average compacted depth of 2 inches.

Included in the Estimate of Quantities are 2.0 tons of Asphalt for Tack SS-1H or CSS-1H for entrances throughout the project, and shall be applied at the rate shown on the plans or as directed by the Engineer.

The above quantities are included in the Estimate of Quantities.

SUMMARY OF ASPHALT CONCRETE

LOCATIONS:	Class Q2R Hot Mixed Asphalt Concrete with Specified Density Compaction TON	Class Q2R Hot Mixed Asphalt Concrete without Specified Density Compaction TON
Section 1: 24' Wide Mainline plus two 2' sluffs	13428.6	-
Spot leveling, strengthening, and repair of existing surface		800.3
Table of Additional Quantities	-	310.0
TOTAL	**13428.6**	**1110.3**

Total Class Q2R Hot Mixed Asphalt Concrete: 14538.9 *Tons*

PLOTTED FROM - TRAB17882

TABLE OF PROJECT STATIONING

SECTION	STATION	TO	STATION	LENGTH (Ft)	GROSS SECTION LENGTH (Ft)	GROSS SECTION LENGTH (Miles)	NET SECTION LENGTH (Miles)
1	1+00	TO	423+54.51	42254.5	42254.51	8.003	8.003
				TOTAL:	42254.51	8.003	8.003

TABLE OF MATERIAL QUANTITIES

	UNCLASSIFIED EXCAVATION, DIG OUTS	BASE COURSE	COLD MILLING ASPHALT CONCRETE	ASPHALT CONCRETE BLADE LAID	HYDRATED LIME	PG 58-34 ASPHALT BINDER	VIRG. AGGR. (NABI.)	CLASS Q2R HOT MIXED ASPHALT CONCRETE	HYDRATED LIME	PG 58-34 ASPHALT BINDER	SALVAGED ASPHALT CONCRETE RAP (NABI)	VIRG. AGGR. (NABI.)	CLASS Q2R HOT MIXED ASPHALT CONCRETE	PG 58-34 ASPHALT BINDER	HYDRATED LIME	SALVAGED ASPHALT CONCRETE RAP (NABI)	VIRG. AGGR. (NABI.)	SS-1h/ CSS-1h ASPH. FOR TACK	SS-1h/ CSS-1h ASPH. FOR FLUSH SEAL	SAND FOR FLUSH SEAL
				<----------Blade Laid---------->				<----------Spot Leveling---------->					<----------Main Line---------->							
SECTION	CuYd	Ton	SqYd	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton
1	400	800	122069	1200.4	12.0	90.4	1098.0	800.3	8.00	37.6	150.9	603.7	13428.6	624.21	136.05	2536.87	10131.5	77.93	27.93	416.1
Sub totals	400	800	122069	1200	12	90	1098	800.3	8	38	150.9	604	13428.6	624	136	2537	10131	77.9	27.9	416.1
Additional Quantities	-	795.0	107	-	-	-	-	-	-	-	-	-	310.0	14.42	3.10	58.50	234.0	4.0	-	-
Culvert Replacement	-	1011.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.4	-	-
Totals	400	2607.2	122176	1200.4	12.0	90.4	1098.0	800.3	8.0	37.6	150.9	603.7	13738.6	638.6	139.1	2595.4	10365.5	82.3	27.9	416.1

PLOTTED FROM - TRAB17882

TABLE OF MAINLINE CULVERT WORK

Culvert #	Approx. MRM	Station	Side	In Place Culvert Size and Type		Incidental Work, Grading (LS)	Contractor Furnished Borrow Excavation (Cu Yd)	Remove Pipe Culvert (Ft)	Remove Pipe for Reset (Ft)	Remove Pipe End Section (Each)	Remove Pipe End Section for Reset (Each)	30" RCP (Ft)	36" RCP (Ft)	42" RCP (Ft)	54" RCP (Ft)	60" RCP (Ft)	18" RCP Flared End (Each)	36" RCP Flared End (Each)	42" RCP Flared End (Each)	54" RCP Flared End (Each)	60" RCP Flared End (Each)	30" RCP Sloped End (Each)	24" CMP Sloped End (Each)	Reset Pipe (Ft)	Reset Pipe End Section (Each)	Comments
	190.93	0+00																								SD 47 Intersection
1	190.88	0+95	Lt	24"	RCP				6		1													6	1	
			Rt						6		1													6	1	
2	190.14	22+30	Lt	24"	CMP	Lump Sum	70						78					1								Replace 24" CMP with 36" RCP. See Plan/Profile Sheet
			Rt				355											1								
3	190.48	40+33	Lt	24"	CMP	Lump Sum	20						82					1								Replace 24" CMP with 36" RCP. See Plan/Profile Sheet
			Rt				20											1								
4	189.89	53+60	Lt	18"	RCP				6		1													6	1	
			Rt						6		1													6	1	
5	189.64	67+00	Lt	18"	RCP				6		1													6	1	
			Rt						6		1													6	1	
6	189.21	89+16	Lt	24"	CMP	Lump Sum	105									78					1					Replace 24" CMP with 60" RCP. See Plan/Profile Sheet
			Rt				400														1					
7	188.89	106+60	Lt	18"	RCP				10		1													10	1	
			Rt						10		1													10	1	
8	188.71	116+00	Lt	24"	CMP	Lump Sum	350						78					1								Replace 24" CMP with 36" RCP. See Plan/Profile Sheet
			Rt				500											1								
9	188.55	125+00	Lt	24"	CMP		10	2															1			Cut off damaged ends of culvert barrel section and install new Sloped Ends
			Rt				10	1															1			
10	188.07	150+00	Lt	24"	CMP	Lump Sum	20					68										1				Replace 24" CMP with 30" RCP. See Plan/Profile Sheet
			Rt				20															1				
11	187.79	165+00	Lt	24"	RCP				16		1													16	1	
			Rt						6		1													6	1	
12	187.15	198+63	Lt	24"	CMP	Lump Sum	90							78					1							Replace 24" CMP with 42" RCP. See Plan/Profile Sheet
			Rt				105												1							
13	186.71	222+00	Lt	18"	RCP				6		1													6	1	
			Rt						6	1							1							6		
14	186.25	246+00	Lt	18"	RCP				6		1													6	1	
			Rt						6	1							1							6		
15	186.08	255+13	Lt	24"	CMP		10	3															1			Cut off damaged ends of culvert barrel section and install new Sloped Ends
			Rt				10	3															1			
16	185.86	266+80	Lt	24"	CMP		10	4															1			Cut off damaged ends of culvert barrel section and install new Sloped Ends
			Rt				10	4															1			
17	185.84	267+06	Lt	4' x 6' Cattle Pass																						No Work Required
			Rt																							
18	185.34	294+32	Lt	24"	CMP	Lump Sum	465								80					1						Replace 24" CMP with 54" RCP. See Plan/Profile Sheet
			Rt				490													1						

PLOTTED FROM - TRAB17882

TABLE OF MAINLINE CULVERT WORK

Culvert #	Approx. MRM	Station	Side	In Place Culvert Size and Type		Incidental Work, Grading (LS)	Contractor Furnished Borrow Excavation (Cu Yd)	Remove Pipe Culvert (Ft)	Remove Pipe for Reset (Ft)	Remove Pipe End Section (Each)	Remove Pipe End Section for Reset (Each)	30" RCP (Ft)	36" RCP (Ft)	42" RCP (Ft)	54" RCP (Ft)	60" RCP (Ft)	18" RCP Flared End (Each)	36" RCP Flared End (Each)	42" RCP Flared End (Each)	54" RCP Flared End (Each)	60" RCP Flared End (Each)	30" RCP Sloped End (Each)	24" CMP Sloped End (Each)	Reset Pipe (Ft)	Reset Pipe End Section (Each)	Comments
19	185.07	308+95	Lt	24"	CMP		15	4															1			Cut off damaged ends of culvert barrel section and install new Sloped Ends
			Rt				15	4															1			
20	184.70	328+00	Lt	18"	RCP				6	1							1							6		
			Rt						6	1							1							6		
21	184.20	354+28	Lt	24"	RCP				6		1													6	1	
			Rt						4		1													4	1	
22	183.90	371+39	Lt	18"	RCP				4		1													4	1	
			Rt						6		1													6	1	
23	183.44	396+00	Lt	18"	RCP						1														1	
			Rt							1							1									
24	183.32	402+00	Lt	24"	CMP		20	2															1			Cut off damaged ends of culvert barrel section and install new Sloped Ends
			Rt				10	2															1			
25	182.93	422+00	Lt	24"	CMP		10	3.5															1			Cut off damaged ends of culvert barrel section and install new Sloped Ends
			Rt				10	1															1			
						Lump Sum	3150	33.5	122	5	15	68	238	78	80	78	5	6	2	2	2	2	12	122.0	15	

Culvert type and size obtained from a combination of visual inspection and original construction plans. Additional repair may be required at time of construction.

In place Culvert Markers shall be removed and reset when performing Culvert Work. Cost to remove and reset Culvert Markers shall be incidental to the various culvert contract items.

The Contractor Furnished Borrow Excavation in the above table is for use on the inslopes as shown on the cross sections.

Pipe Culvert Total Replacement Quantities

MRM	STATION	New Pipe Size (Inches)	Unclassified Excavation (CuYd)	Asphalt Removal Dimensions	Base Course (for surfacing) (Ton)	Base Course (for Pipe Culvert Undercut & Bedding) (Ton)	Asphalt Concrete Composite (Ton)	Reinforcement Fabric (MSE) (SqYd)*	Contractor Furnished Borrow Excavation (CuYd)	Pipe Culvert Undercut (CuYd)
190.14	22+30	36	744	26' x 76'	149.3	86.9	61.1	233	184	27
190.48	40+33	36	1035	26' x 85'	166.9	90.6	68.3	261	270	28
189.21	89+16	60	577	26' x 69.5'	136.2	125.7	55.8	213	100	35
188.71	116+00	36	598	26' x 70'	137.5	86.9	56.3	215	141	27
188.07	150+00	30	466	26' x 66.5'	130.5	69.7	53.4	204	113	22
187.15	198+63	42	837	26' x 80'	156.3	96.6	64.0	245	203	29
185.34	294+32	54	576	26' x 69'	135.1	118.3	55.3	212	109	34
	Total		**4833**		**1011.9**	**674.7**	**414.3**	**1582**	**1120**	**201**
						Information Only				

* Note: The indicated items are installed at 24' wide and the length in the Asphalt Removal Dimensions column and the 15% for overlap is included in the quantity.

- The above quantities are included in the Estimate of Quantities.

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SD253 Permanent Sign Installation Table

MRM + Displacement	Side of Road	Description	2.0"x2.0" Perforated Tube Post 12 ga. (FT)	(N.A.B.I.) Square Tube Anchor Sleeve (Each)	Remove Sign For Reset (Each)	Reset Sign (Each)	Direction Sign Faces	Current Type of Post	Remarks
Note: Side of Road is Based on the Direction MRM's Increase (I.E. Right is the North Side of the Road and Left is the South Side of the Road)									
182.00 + 0.905	Rt.	Stop					N	Telespar	Do Not Disturb
182.00 + 0.916	Lt.	Stop	10	1	1	1	S	U-Channel	Reset Existing Sign on New Post
182.00 + 0.919	Rt.	No Passing Zone	12	1	1	1	W	U-Channel	Reset Existing Sign on New Post
182.00 + 0.925	Rt.	North	12	1	1	1	E	U-Channel	Reset Existing Signs on New Post
		SD 253					E		
183.00 + 0.028	Lt.	Speed Limit 45 MPH					W	Telespar	Do Not Disturb
183.00 + 0.029	Rt.	Speed Limit 65 MPH					E	Telespar	Do Not Disturb
183.00 + 0.174	Lt.	Speed Limit Reduction 45					W	Telespar	Do Not Disturb
183.00 + 0.327	Rt.	No Passing Zone	12	1	1	1	W	U-Channel	Reset Existing Sign on New Post
183.00 + 0.352	Lt.	No Passing Zone	12	1	1	1	E	4" X 6" Wood	Reset Existing Sign on New Post
183.00 + 0.454	Rt.	Speed Limit 65 MPH					E	Telespar	Do Not Disturb
183.00 + 0.746	Rt.	No Passing Zone	12	1	1	1	W	U-Channel	Reset Existing Sign on New Post
183.00 + 0.923	Lt.	Stop	10	1	1	1	S	U-Channel	Reset Existing Sign on New Post
183.00 + 0.930	Rt.	Stop	10	1	1	1	N	U-Channel	Reset Existing Sign on New Post
184.00 + 0.905	Lt.	Stop					S	Telespar	Do Not Disturb
184.00 + 0.906	Rt.	Stop					N	Telespar	Do Not Disturb
185.00 + 0.803	Lt.	South	11	1	1	1	W	4" X 6" Wood	Reset Existing Signs on New Post
		SD 253					W		
185.00 + 0.907	Lt.	Stop	10	1	1	1	S	U-Channel	Reset Existing Sign on New Post
185.00 + 0.915	Rt.	Stop					N	Telespar	Do Not Disturb
186.00 + 0.017	Rt.	North	11	1	1	1	E	U-Channel	Reset Existing Signs on New Post
		SD 253					E		
186.00 + 0.907	Lt.	Stop	10	1	1	1	S	U-Channel	Reset Existing Sign on New Post
186.00 + 0.914	Rt.	Stop					N	Telespar	Do Not Disturb

PLOTTED FROM - TRAB10100

SD253 Permanent Sign Installation Table

MRM + Displacement	Side of Road	Description	2.0"x2.0" Perforated Tube Post 12 ga. (FT)	(N.A.B.I.) Square Tube Anchor Sleeve (Each)	Remove Sign For Reset (Each)	Reset Sign (Each)	Direction Sign Faces	Current Type of Post	Remarks
187.00 + 0.435	Lt.	No Passing Zone	12	1	1	1	E	U-Channel	Reset Existing Sign on New Post
187.00 + 0.783	Rt.	No Passing Zone	12	1	1	1	W	U-Channel	Reset Existing Sign on New Post
187.00 + 0.894	Lt.	Stop					S	Telespar	Do Not Disturb
187.00 + 0.898	Rt.	Stop					N	Telespar	Do Not Disturb
188.00 + 0.412	Lt.	No Passing Zone	12	1	1	1	E	U-Channel	Reset Existing Sign on New Post
188.00 + 0.899	Lt.	Stop	10	1	1	1	S	U-Channel	Reset Existing Sign on New Post
188.00 + 0.900	Rt.	Stop					N	Telespar	Do Not Disturb
189.00 + 0.085	Rt.	No Passing Zone	12	1	1	1	W	U-Channel	Reset Existing Sign on New Post
189.00 + 0.238	Lt.	No Passing Zone	12	1	1	1	E	4" X 6" Wood	Reset Existing Sign on New Post
189.00 + 0.579	Lt.	No Passing Zone	12	1	1	1	E	4" X 6" Wood	Reset Existing Sign on New Post
189.00 + 0.643	Rt.	No Passing Zone	12	1	1	1	W	U-Channel	Reset Existing Sign on New Post
189.00 + 0.886	Lt.	South	11	1	1	1	W	4" X 6" Wood	Reset Existing Signs on New Post
		SD 253					W		
189.00 + 0.897	Lt.	Stop							Do Not Disturb
189.00 + 0.904	Rt.	Stop	10	1	1	1	N	Telespar	Reset Existing Sign on New Post
190.00 + 0.150	Lt.	No Passing Zone	12	1	1	1	E	U-Channel	Reset Existing Sign on New Post
190.00 + 0.195	Rt.	No Passing Zone					W	Telespar	Do Not Disturb
190.00 + 0.546	Rt.	No Passing Zone	12	1	1	1	W	U-Channel	Reset Existing Sign on New Post
190.00 + 0.603	Rt.	Stop Ahead Symbol					E	Telespar	Do Not Disturb
190.00 + 0.666	Rt.	JCT	11	1	1	1	E	U-Channel	Reset Existing Signs on New Post
		SD 47					E		
190.00 + 0.737	Rt.	End	11	1	1	1	E	U-Channel	Reset Existing Signs on New Post
		SD 253					E		
190.00 + 0.739	Lt.	No Passing Zone	12	1	1	1	E	4" X 6" Wood	Reset Existing Sign on New Post
190.00 + 0.814	Rt.	Bowdle 9 / Eureka 14	26	2	1	1	E	U-Channel	Reset Existing Sign on New Post
190.00 + 0.872	Lt.	South	11	1	1	1	W	U-Channel	Reset Existing Signs on New Post
		SD 253					W		
		TOTAL	342.0	30	29	29			

PLOTTED FROM - TRAB10100

SURFACING THICKNESS DIMENSIONS

Plans tonnage will be applied even though the thickness may vary from that shown on the plans.

At those locations where material must be placed to achieve a required elevation, plans quantities may be varied to achieve the required elevation.

SEQUENCE OF OPERATIONS

1) Install Traffic Control Signing
2) Complete Culvert Work
3) Install Erosion Control
4) Cold Milling Asphalt Concrete
5) Placement of Class Q2R Hot Mixed Asphalt Concrete
6) Placement of Flush Seal
7) Install Permanent Pavement Markings
8) Upgrade Permanent Signing
9) Remove Traffic Control Signing

GENERAL NOTES

The Contractor shall be required to mow the inslopes with a rotary mower to a height of 6 inches for a distance of 14 feet from the edge of the roadway (or shoulder) for the length of the project. This work will be completed to the satisfaction of the Engineer after all construction activities are completed. All costs associated with this work shall be incidental to the various contract items.

UTILITIES

Utilities are not planned to be affected on this project. If utilities are identified near the improvement area through the SD One Call Process as required by South Dakota Codified Law 49-7A and Administrative Rule Article 20:25, the contractor shall contact the project engineer to determine modifications that will be necessary to avoid utility impacts.

TRAFFIC CONTROL

Removing, relocating, covering, salvaging and resetting of existing traffic control devices, including delineation, shall be the responsibility of the Contractor. Cost of this work shall be incidental to the various contract items unless otherwise specified in the plans. Delineators and signs damaged or lost shall be replaced by the Contractor at no cost to the State.

Indiscriminate driving and parking of vehicles within the right-of-way will not be permitted. Any damage to the vegetation, surfacing, embankment, delineators and existing signs resulting from such indiscriminate use shall be repaired and/or restored by the Contractor, at no expense to the State, and to the satisfaction of the Engineer.

Work activities during non-daylight hours are subject to prior approval.

Work zones for the various construction operations that utilize a pilot car shall not exceed 3 miles in length. The maximum delay for a vehicle at a flagging station shall not exceed 15 minutes.

“Grooved Pavement” signs shall be placed at each end of the project until all cold milled areas are covered with asphalt concrete. Additional “Grooved Pavement” signs shall be placed as indicated on the FIXED LOCATION SIGN detail until all cold milled areas are covered with asphalt concrete. Attached to each sign shall be a “Next xx Miles” sign and motorcycle plaque. These signs are included in the Itemized List for Traffic Control Signs.

Traffic Control signs, as shown in the Itemized List for Traffic Control Signs, are estimates. Contractor’s operation may require adjustments in quantities, either more or less. Payment will be for those signs actually ordered by the Engineer and used.

The Contractor is limited to 1 culvert replacement location at a time to be constructed full width at a time. The road will be closed in 1 mile sections and the traffic control will be moved for each location. See Road Closure Signing detail for typical traffic control setup. The Contractor may elect to wait until all 7 culvert replacement locations are completed before placing asphalt composite at each location. Estimate of Quantities include Traffic Control signs for working on one culvert location. Traffic Control Signs shall be relocated to other mainline culvert locations as needed. No further payment for additional signing shall be made.

SHRINKAGE FACTOR: +30%

CONTRACTOR FURNISHED BORROW EXCAVATION

The Contractor shall provide a suitable site for Contractor furnished borrow excavation material. The Contractor is responsible for obtaining all required permits and clearances for the borrow site. The borrow material shall be approved by the Engineer. The plans quantity for “Contractor Furnished Borrow Excavation” for the inslope embankment as shown in the Table for Mainline Culvert Repair will be the basis of payment for this item. The remaining “Contractor Furnished Borrow Excavation” shall be measured for payment.

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

RCP AND CMP CULVERT REPAIRS FOR MAINLINE CULVERTS

The Contractor is encouraged to thoroughly investigate the culvert repair sites prior to bidding. Prior to working on the sites that are inundated with water, a complete dewatering plan shall be submitted for approval to the Engineer. No separate payment for dewatering will be made.

All pipe and end treatments designated for removal shall become the property of the Contractor for his disposal.

Tie bolts shall be installed at all joint locations where existing pipe sections and end treatments are being reset or installed new. This may require drilling holes into the existing pipe sections and end treatments. Tie bolts shall be installed in accordance with Standard Plate No. 450.18. New RCP culvert installations shall have all the joint locations tied together with tie bolts.

When necessary to remove end sections of CMP culverts, they may be cut with a torch. If the culvert is cut the damaged area shall be painted with a galvanizing paint approved by the Engineer. All costs associated with cutting and painting shall be incidental to the various contract items.

The Contractor is advised of the risk of lead exposure when cutting galvanized paint. The Contractor should plan his/her operations accordingly, and inform employees of hazards of lead exposure.

Prior to culvert repair work the Contractor shall remove and stockpile all of the in place topsoil from the construction areas. On completion of construction operations this salvaged topsoil shall be spread evenly over the newly constructed embankment inslopes. The Contractor is responsible for arranging an agreement with the landowner for topsoil replacement in borrow areas. Removal and replacement of topsoil shall be incidental to the contract lump price for REMOVE AND REPLACE TOPSOIL.

MAINLINE CROSS PIPE REPLACEMENT

This work shall be completed a minimum of 21 calendar days prior to the commencement of cold milling operations on the project.

If water is present, the area around the pipe inlet and outlets shall be blocked with sandbags wrapped in 6 mil polyethylene sheeting and dewatered before construction activities can begin. All costs associated with sandbagging shall be incidental to the contract unit prices for the various pipe contract items. The pipe shall be installed in dry bedding.

After the existing pipe has been removed, the new pipe culvert shall be undercut to a minimum depth of 1 foot. 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 Standard Specifications, but will not reduce the undercut to less than 1 foot in depth.

Material for backfilling the undercut area shall conform to the gradation requirements of Base Course in Section 882. All other requirements of Section 421 shall apply.

Pipe culverts will be bedded in accordance with Section 450.3.F.2, Class B Bedding with the following exceptions. The undercut area shall extend 2 feet from the outermost diameter on both sides of the pipe with the back of the excavated area being sloped 3:1 upward to the top of the roadway surface. The select fill material for the Class B Bedding Material shall conform to the gradation requirements of Base Course in Section 882. The sand used under the culvert will be to the satisfaction of the Engineer. See Culvert Replacement Detail.

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

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MAINLINE CROSS PIPE REPLACEMENT (CONTINUED)

The remainder of the pipe culvert excavation shall be backfilled with soils taken from the pipe removal excavation or other suitable material as approved by the Engineer. The backfill will be benched into 3:1 excavation slope. Compaction of the backfill material shall be governed by the Specified Density Method.

After the new pipe has been backfilled to the top of the subgrade, a 12” depth of base course and 5” depth (2- 2.5” lifts) of asphalt concrete composite shall be placed as a patch matching the existing asphalt concrete. See Culvert Replacement Detail.

All costs to saw cut asphalt, remove and dispose of asphalt, excavate and backfill the material to the bottom of the pipe and slope the excavating limits at a 3:1 backslope shall be paid for at the contract unit price per cubic yard for Unclassified Excavation. No additional payment will be made for asphalt removal, excavation, or disposal of material to accommodate temporary channel diversions or pipes. The cost for asphalt concrete composite installed over the pipe replacement shall be paid for at the contract unit price per ton for Asphalt Concrete Composite.

Pipe flowline shall match that of existing pipe. Ditches may need to be excavated in each direction from the pipe ends to maintain proper water flow through the pipe. The excavated material shall become the property of the Contractor for his disposal. All costs associated with this work shall be incidental to the contract lump sum price for Incidental Work, Grading.

It is anticipated that 2/3 of the subgrade material will be stockpiled and used to backfill the trench. All remaining material generated from the removal of the base course and subgrade shall become property of the Contractor. All costs associated with these activities shall be incidental to the contract unit price per cubic yard for UNCLASSIFIED EXCAVATION.

Salvage or granular material will not be allowed for backfill in the subgrade.

The cost for asphalt concrete composite installed over the pipe replacement shall be paid for at the contract unit price per ton for ASPHALT CONCRETE COMPOSITE.

REINFORCEMENT FABRIC (MSE)

1,582 square yards of Reinforcement Fabric (MSE) should be included in the materials quantities for bidding purposes. This quantity is assumed to cover 1376 sq. yds. The bid quantity has been increased by 15% to account for overlaps.

The top of the subgrade shall be prepared by smoothing the surface of the subgrade to minimize any ruts, ridges, and depressions. Any rocks or other protrusions that might damage the fabric will be removed. The fabric will unrolled perpendicular to the centerline and overlapped a minimum of 2 feet.

The fabric will be placed as taut as possible with minimal wrinkles. Placement will be done so that subsequent granular cover material does not shove, wrinkle or distort the in place fabric. The overlaps will be shingled in a manner that assures granular material will not be forced under the fabric during backfilling operations. The fabric may be held in place with small piles of granular material or staples. No traffic will be allowed on the uncovered fabric.

Granular material will be dumped at least 20 feet behind the leading edge of the backfill and pushed into place with a loader or dozer from the covered areas to the uncovered areas. The granular material will be placed as two 6 inch lift or as directed by the Engineer. The granular material will be compacted to 97% maximum dry density as determined by the Specified Density Method.

Reinforcement Fabric (MSE) Specification:

The fabric will conform to the specification for Geotextiles and Impermeable Plastic Membrane, Reinforcement Fabric (MSE) (Section 831 of the Specifications). The fabric will be on the Approved Products List for this material or will be certified by the supplier to meet this specification prior to installation.

Fabric will be paid for at the contract unit price per square yard for Reinforcement Fabric (MSE). Payment quantities will be based on area covered plus 15%. Overlaps are accounted for by the additional 15%. Payment will be full compensation for furnishing and installing the fabric only. Granular backfill materials will be paid for under a separate bid item.

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. These items shall be incidental to the contract unit price per each for TYPE III FIELD LABORATORY.

A Type II Field Lab may be used for the culvert work.

SHOULDER PREPARATION

Vegetation and accumulated material adjacent to the existing surface edge shall be removed to the satisfaction of the Engineer prior to placement of mainline surfacing. Any remaining windrow of accumulated material shall be re-spread evenly on the inslope adjacent to the asphalt shoulder to the satisfaction of the Engineer prior to the application of the flush seal.

Any vegetation damaged outside of the asphalt concrete limits shall be repaired and/or restored by the Contractor, at no expense to the State, and to the satisfaction of the Engineer.

This shoulder work shall be incidental to other contract items. Separate measurement and payment will not be made.

INTERSECTING ROADS AND ENTRANCES

Intersecting roads and entrances shall be satisfactorily cleared of vegetation, shaped, and compacted prior to placement of mainline surfacing. This work will be considered incidental to other contract items. Separate measurement and payment will not be made.

EXCAVATION OF UNSTABLE MATERIAL

Included in the Estimate of Quantities are **50** Cubic Yards of Unclassified Excavation, Digouts per mile for the shoulders for the necessary removal of unstable material.

Backfill shall be Base Course paid for at the contract unit price per ton.

The digout shall be extended to the shoulder and the granular material backfill shall daylight to the inslope to allow water to escape the subgrade.

A copy of the surfacing/subgrade investigation for this project is available from the Aberdeen Area and the Aberdeen Region offices.

BASE COURSE

Included in the Estimate of Quantities are **100** tons of Base Course per mile for backfill of Unclassified Excavation, Digouts.

COLD MILLING ASPHALT CONCRETE

The placement of asphalt concrete shall begin within **5** working days after completion of cold milling of mainline asphalt concrete.

The Los Angeles Abrasion Loss value on the aggregate used for the in place asphalt concrete varies from 32 to 34 percent. These value was obtained from testing during construction of the in place asphalt concrete.

Cold milling asphalt is estimated to produce _6414.2 tons of salvaged asphalt concrete (RAP) material. An estimated __2746.3 tons of salvaged asphalt concrete will be used on this project in the Class Q2R Hot Mixed Asphalt Concrete mixtures. The Contractor is responsible to assure enough salvaged asphalt concrete (RAP) is available for the Class Q2R Hot Mixed Asphalt Concrete. The remainder of the cold milled material shall be stockpiled and blended with granular material.

Cold Milling Asphalt shall be done according to the typical section. In areas where maintenance patches have raised and/or widened the road, additional asphalt concrete shall be milled to provide a uniform typical section from centerline to the edge of the finished shoulder. These areas also include farm, residential, field entrances and intersecting roads. Milling shall be daylighted to the outside edge of the roadway. Any additional costs associated with this additional cold milling shall be incidental to the contract unit price per cubic yard for COLD MILLING ASPHALT CONCRETE.

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COLD MILLING ASPHALT CONCRETE(CONTINUED)

Cold Milling of Asphalt shall consist of removing the in place asphalt to an average depth of **1"**. This material is to be removed at a constant slope of **3/8" /FT in Section 1** from the in place shoulder elevation to centerline of the roadway. The width to be milled is approximately 26' in Section 1 from centerline of roadway to the shoulder.

GRANULAR MATERIAL, FURNISH

Granular Material shall be furnished by the Contractor for use in blending with the salvaged asphalt mix material from this project.

The Granular Material shall be Base Course meeting the requirements of Section 882.

BLEND, HAUL & STOCKPILE GRANULAR MATERIAL

Excess asphalt mix material estimated at 3667.9 tons (for informational purposes only) shall be blended with 2445.3 tons of Granular Material, Furnish and shall be hauled, blended and stockpiled at the Ipswich Department of Transportation Maintenance Yard SW 1/4 Sec. 22 T123N R68W (East side of Ipswich on US Hwy. 12). Phil Dwight (605-626-7885), the Area Engineer, shall be contacted for exact placement within the maintenance yard. A computerized scale along with a scale operator shall be provided by the Contractor at the stockpile site to weigh the salvaged material prior to blending.

Asphalt mix material shall be blended with Granular Material, Furnished at a rate of 60% salvaged asphalt mix material and 40% Granular Material, Furnished to obtain stockpile material. Prior to incorporation into the stockpile, cold milled asphalt material shall be run over a 1 ½" screen to remove large chunks. No further testing of the material will be required. The use of a pugmill to blend the materials will be accepted.

Calibrated conveyor(s) shall be used to provide a uniform blending of the materials. Material shall be blended prior to incorporation into the pile.

All other costs for hauling, stockpiling, and blending asphalt mix material and Granular Material, Furnished shall be incidental to the contract unit price per ton for BLEND, HAUL & STOCKPILE GRANULAR MATERIAL.

ASPHALT FOR TACK

Included in the Estimate of Quantities are **2** tons of SS-1h or CSS-1h Asphalt for Tack for surface repair, strengthening, and spot leveling areas throughout the project.

ASPHALT CONCRETE BLADE LAID

Included in the Estimate of Surfacing Quantities are 150 tons of Asphalt Concrete Blade Laid, 1.5 tons of Hydrated Lime, and 11.3 tons of PG 58-34 Asphalt Binder per mile and shall be tight bladed on the existing surface 24 feet wide prior to the overlay. Included in the Estimate of Surfacing Quantities are **43.2** tons of SS-1h or CSS-1h Emulsified Asphalt for Tack for tight blading per mile, applied at a rate of 0.09 gal./sq. yd. A sufficient amount of material shall be kept in front of the blade to fill and level all joints, cracks and other surface irregularities.

The blade used to tight blade the material shall be equipped with gates, wings or other devices approved by the Engineer to prevent the material from windrowing at the edges of the blade.

Mineral Aggregate for tight bladed material shall use only the fine aggregate components combined in the same proportions as the Class Q2R Hot Mixed Asphalt Concrete mix. The asphalt binder content shall be determined so that the air voids of Asphalt Concrete Blade Laid Lift are between 3.0% and 5.0%. No quality testing will be done on any of the coarse aggregate (+No. 4 sieve) in this mix.

The tight bladed material shall be compacted by at least 2 complete coverage's with pneumatic tired rollers.

All loose existing joint material shall be removed and the surface shall be thoroughly swept with a rotary broom to remove all loose asphalt concrete and joint material from cracks and spall areas prior to placing the Blade Laid Mix. Cost for removing the material and brooming shall be included in the contract unit price per ton for Asphalt Concrete Blade Laid.

CLASS Q2R HOT MIXED ASPHALT CONCRETE

Mineral Aggregate:
Asphalt concrete aggregates shall consist of reclaimed asphalt pavement (RAP) and virgin aggregate.

Virgin mineral aggregate for Class Q2R Hot Mixed Asphalt Concrete shall conform to the requirements of Class Q2.

The Class Q2R Hot Mixed Asphalt Concrete shall include 20 percent RAP in the mixture. RAP shall be obtained from the material produced by cold milling on this project and may be used without further quality testing.

Mix Design Criteria:
Gyratory Controlled QC/QA Mix Design requirements for the Class Q2R Hot Mixed Asphalt Concrete shall conform to the requirements of Class Q2 except as modified by the following:

Gyratory Compactive Effort:

	$N_{initial}$	N_{design}	$N_{maximum}$
Class Q2R	6	50	75

All remaining requirements for Class Q2 shall apply.

ADDITIONAL QUANTITIES:

Included in the Estimate of Quantities are **100** tons of Class **Q2R** Asphalt Concrete and, **1.0** tons of Hydrated Lime of Asphalt concrete and **4.7** tons of PG **58-34** Asphalt Binder, per mile for spot leveling, strengthening, and repair of the existing surface. This material shall be placed where and as directed by the Engineer.

FLUSH SEAL

Application of Flush Seal shall be completed within 10 working days following completion of the asphalt concrete surfacing.

For each working day that the Flush Seal remains uncompleted after the 10 working day limitation, the Contractor will be assessed liquidated damages at the rate of $250.00 per day.

The liquidated damages shall apply up to the expiration of the contract time requirement in which the flush seal is required to be completed, including any formally approved time extensions. Following the expiration of the contract time requirement in which the flush seal is required to be completed, including any formally approved time extensions, liquidated damages will be assessed in accordance with Section 8.8 of the specifications.

Application of Flush Seal may be eliminated by the Engineer. If the paved surface remains tight, the Engineer shall notify the Contractor as soon as possible that the Flush Seal is unnecessary.

SAND FOR FLUSH SEAL

The sand application shall be placed 11' wide in each lane, leaving 12" on center line and 6" on each edge line free of sand.

Aggregate for Flush Seal shall conform to the requirements of Section 879 of the Specifications.

REFURBISH MAILBOXES

Existing mailboxes shall be removed and mailboxes reset on new posts with the necessary support hardware for single or double mailbox assemblies (See Standard Plate No's. 900.02 and 900.03. The local Postmaster will determine the recommended mounting height of the mailboxes throughout the project. The Contractor shall coordinate with the Engineer on the proper postal representative to contact.

TABLE OF REFURBISH MAILBOXES

Location	Side	SINGLE MAILBOX
MRM	-	**EACH**
186.42	Rt	1
187.43	Rt	1
189.91	Lt	1
TOTALS		**3**

All costs for removing existing mailboxes, providing temporary mailboxes, and resetting mailboxes with new posts and necessary support hardware shall be incidental to the contract unit price per each for REFURBISH SINGLE MAILBOX.

PLOTTED FROM - TRAB17882

TEMPORARY AND PERMANENT PAVEMENT MARKINGS

Maintaining size, shape, and dimension of existing pavement markings shall be the responsibility of the Contractor for both temporary and permanent pavement marking applications.

Temporary Flexible Vertical Markers (Tabs) shall be used to mark dashed centerline, No Passing Zones and applicable lane lines on the wear course or after application of the Flush Seal. Paint will not be allowed for Temporary Pavement Marking on the Asphalt Concrete Class Q2R Hot Mixed Asphalt Concrete wear course or after application of the Flush Seal.

TEMPORARY PAVEMENT MARKINGS

The total length of no passing zone on this project is estimated to be **1.99** miles.

Quantities of Temporary Pavement Markings consist of:

- One pass on top of the Asphalt Composite for Culvert Replacements.
- One pass on top of the Cold Milled Surface.
- One pass on top of the Blade Laid.
- One pass on top of the Asphalt Concrete.
- One pass on top of the Flush Seal.

If the Flush Seal is eliminated, the application of the Temporary Pavement Marking on top of the Flush Seal will be eliminated. No adjustment in the contract unit price for Temporary Pavement Marking will be made because of a variation in quantities.

Temporary Flexible Vertical Markers (Tabs) may be used as detailed in the Specifications. Covers on the tabs shall be sufficiently secured to prevent traffic from dislodging the cover and when removed the covers shall be properly disposed. The Contractor shall remove and properly dispose of the tabs after Permanent Pavement Marking is applied. Method of removal shall be nondestructive to the road surface and shall be accomplished within one week of completion of the Permanent Pavement Marking.

Any tabs with covers removed before the Flush Seal shall be replaced prior to Flush Seal application.

Cost for furnishing, applying, removing and disposing of the Temporary Flexible Vertical Markers (Tabs) shall be included in the contract unit price per mile for TEMPORARY PAVEMENT MARKING.

Flagger symbol signs (W20-7) and flaggers, or a shadow vehicle with rotating yellow lights or strobe lights shall be positioned on the roadway shoulder in advance of workers for both directions of traffic during the installation of temporary road markers. The traffic control device used shall be moved to provide proper warning of the work operation. A ROAD WORK AHEAD (W20-1), a Workers symbol sign (W21-1) or a BE PREPARED TO STOP (W3-4) warning sign shall be mounted on the rear of the shadow vehicle. The method of traffic control used by the Contractor for this work shall be approved by the Engineer.

PERMANENT PAVEMENT MARKING

Traffic Control shall be incidental to the cost of application. The striper and advance or trailing warning vehicle shall be equipped with flashing amber lights or advance warning arrow panel.

All materials shall be applied as per manufacturer's recommendations.

The Contractor shall advise the Engineer a minimum of 2 weeks prior to the application of the permanent pavement marking to allow the State to check and mark the location of no passing zones. All materials shall be applied as per manufacturer's recommendations.

The application of Permanent Pavement Marking paint may not begin until 7 calendar days following completion of final surfacing (including Flush Seal if applied) and shall be completed within 14 calendar days following completion of the final surfacing.

For each working day the application of permanent pavement marking paint remains uncompleted beyond the time limits described in the preceding paragraph, the Contractor will be assessed liquidated damages at the rate of $250.00 per day.

The liquidated damages shall apply up to the expiration of the contract time requirement in which the permanent pavement markings are required to be completed, including any formally approved time extensions. Following the expiration of the contract time requirement in which the permanent pavement markings are required to be completed, including any formally approved time extensions, liquidated damages will be assessed in accordance with Section 8.8 of the specifications.

RETROREFLECTIVITY FOR PAVEMENT MARKING PAINT

The Department may take retroreflectivity readings on the pavement marking lines after 2 days and within 30 days of the line application using either a portable or mobile retroreflectometer that conforms to a 30-meter geometry. If the Department chooses to take retroreflectivity readings, three retroreflectivity readings will be taken on each line at each test location. The three readings will be averaged and become the reading for that test location.

If the Department chooses to take retroreflectivity readings, three readings will be taken on the edge lines and lane lines in the direction of application. For combination solid yellow and skip yellow lines for turn lanes and for centerline markings on two-way roadways, three readings will be taken in one direction, the reflectometer will be turned 180 degrees and three more readings will be taken. The six readings for the centerline markings will be averaged and become the test reading for that test location.

If the Department chooses to take readings, the minimum retroreflectivity values shall be 275 $mc/m^2/lux$ for white and 170 $mc/m^2/lux$ for yellow.

COLD WEATHER, WATERBORNE PAINT

Waterborne paint applied after October 15 shall be formulated as cold weather, waterborne paint and shall be applied in accordance with manufacturer's recommendations, including minimum temperature requirements.

Cold weather, waterborne paint shall conform to Section 980 of the Specifications except for the following:

980.1: Resin Binder shall be Fastrack™ XSR manufactured by Dow, or approved equal.

980.1 A. Quantitative Requirements:

Pigment, percent by weight: 60.0 – 63.0 for white and 58.5 – 61.5 for yellow.

Pigment, percent by weight; tested in accordance with ASTM D3723: 60.0 – 63.0 for white and 56.1 – 59.2 for yellow.

Non-volatile Vehicle, percent by weight; tested in accordance with NIST 141C (Method 4051.1): 41.5 minimum for white and 51.5 minimum for yellow.

GENERAL PERMANENT SIGNING NOTES

Signs that are to be installed shall be staked in the field by the Contractor and checked by the Engineer. The Contractor shall give the Engineer a minimum of one week to check staked locations prior to sign/post installation.

The Contractor shall be responsible for contacting South Dakota One Call to locate the utilities at the staked sign installation locations.

Prior to ordering sign posts, the Contractor shall verify post lengths. The height of the post shall not exceed the minimum height needed by more than 0.5 feet. Any portion that extends above the sign shall be cut off. No separate payment will be made for cutting the post or for that length cut off.

PLOTTED FROM - TRAB17982

RESET EXISTING SIGNS

Signs for reset are summarized in the Sign Table.

Sign Installation Hardware

Aluminum U-Channel stiffeners shall be used on all standard highway signs greater than 36 inches in width and shall conform to Alloy 6063-T6 or 6061-T6. The U-Channel shall be 2 inches in width and free of holes. The U-Channel stiffeners shall also be used to connect various signs together so that an entire sign assembly can be erected on a single installation.

Stiffeners may be fastened to signs by use of ¼ inch diameter drive rivets.

Refer to the Breakaway Sign Supports diagram for typical sign and stiffener details.

The Contractor shall use 3/8 inch diameter rust proof machine sign bolts, flat metal washers, neoprene washers (against the sign sheeting), lock washers, and nuts to fasten the sign to the channel aluminum and posts. A minimum of two bolts shall extend through each post.

All costs associated with resetting the existing permanent signs, and with furnishing and installing stiffeners and hardware shall be incidental to the contract unit price per each for Reset Sign.

SQUARE TUBE ANCHOR SLEEVE

The Contractor shall furnish and install new square tube anchor sleeve as follows:

2.5” x 18”, 12 Gauge square tube anchor sleeve, (or equivalent components as approved by the Engineer).

A 2.25” x 2.25” x 4’ perforated tube post (12 Gauge) shall be used as the anchor post for installation with the square tube anchor sleeve.

MILEAGE REFERENCE MARKERS

MRMs (Mileage Reference Markers) are not to be disturbed.

REMOVE AND REPLACE TOPSOIL

Topsoil shall also be salvaged and stockpiled prior to constructing the embankment area(s). Limits of this work and location will be directed by the Engineer. Following completion of construction, topsoil shall be spread evenly over the disturbed areas.

The estimated amount of topsoil to be removed and replaced is 1280 CuYd.

All cost associated with removing and replacing the topsoil along areas to be resurfaced shall be incidental to the lump sum price for “REMOVE and REPLACE TOPSOIL”.

EROSION CONTROL

The estimated area requiring erosion control is 3.5 Acres. All costs for the erosion control work for furnishing, placing, and maintaining erosion control including equipment, labor, seeding and mulching shall be incidental to the contract lump sum price for “Erosion Control”.

The limits of erosion control work will be determined by the Engineer during construction.

Mycorrihizal Inoculum

Mycorrhizal inoculum shall consist of mycorrhizal fungi spores and mycorrhizal fungi-infected root fragments in a solid carrier. The carrier may include organic materials, calcinated clay, or other materials consistent with application and good plant growth. The supplier shall provide certification of the fungal species claimed and the live propagule count. The inoculum shall include the following fungal species:

Glomus intraradices	25%
Glomus aggregatu	25%
Glomus mosseae	25%
Glomus etunicatum	25%

All seed shall be inoculated by the seed supplier with a minimum of 100,000 live propagules of mycorrhizal fungi per acre. All costs of inoculating the seed shall be incidental to the contract Lump Sum price for “EROSION CONTROL”.

The mycorrhizal inoculum shall be from the list below or an approved equal:

Product	Manufacturer
MycoApply	Mycorrhizal Applications, Inc. Grants Pass, OR Phone: 1-866-476-7800 http://www.mycorrhizae.com/

Fertilizing

Application of fertilizer will not be required on this project.

Permanent Seeding

The areas to be seeded consist of all newly graded areas within the project limits except for the top of roadways.

Type G Permanent Seed Mixture shall consist of the following:

Grass Species	Variety	Pure Live Seed (PLS) (Pounds/Acre)
Western Wheatgrass	Arriba, Flintlock, Rodan, Rosana	7
Switchgrass	Dacotah, Forestburg, Nebraska 28, Pathfinder, Summer, Sunburst, Trailblazer	3
Indiangrass	Holt, Tomahawk	3
Big Bluestem	Bison, Bonilla, Champ, Pawnee, Sunnyview	3
Oats or Spring Wheat: April through May; Winter Wheat: August through November		10
	Total:	26

Mulching (Grass Hay or Straw)

The mulching shall be installed at the 7 culvert replacements which are located at the following stations: 22+30, 40+33, 89+16, 116+00, 150+00, 198+63 and 294+32.

COVER CROP SEEDING

Additional cover crop seeding may be used on this project as a temporary erosion control measure for disturbed earthen areas other than what is described in Section 730.3 D. of the specifications. The actual limits and use of additional cover crop seeding shall be determined by the Engineer during construction. The additional quantity of cover crop seeding was estimated at 25% of the disturbed areas outside the areas described in Section 730.3 D. of the specifications.

The cover crop shall be installed at the 7 culvert replacements which are located at the following stations: 22+30, 40+33, 89+16, 116+00, 150+00, 198+63 and 294+32.

PLOTTED FROM - TRAB17982

EROSION CONTROL WATTLE

Erosion control wattles for restraining the flow of runoff and sediment shall be installed at locations determined by the Engineer during construction. Refer to Standard Plate 734.06 for details.

The Contractor shall provide certification that the erosion control wattles do not contain noxious weed seeds.

Erosion control wattles shall remain on the project until vegetation has been established and then they shall be removed in accordance with the Engineer.

An estimated quantity of erosion control wattles shall remain on the project until vegetation has been established. It is estimated that some of the erosion control wattles will remain on the project to decompose.

The erosion control wattle provided shall be from the approved product list. The approved product list for erosion control wattle may be viewed at the following internet site:

http://sddot.com/business/certification/products/Default.aspx

RUMBLE STRIPES

Rumble Stripes installation shall be completed prior to application of the Flush Seal and Permanent Pavement Markings. Rumble Stripes shall not be installed on the bridge decks. In the event the Flush Seal is eliminated from the contract, the Contractor will still be required to apply a Flush Seal to the newly installed 8” Rumble Stripes at a width of 1’ and at the same rate as specified in this plan set. No adjustment in the contract unit price will be made and SS-1h or CSS-1h Asphalt for Flush Seal will be paid at the contract unit price per ton.

The Contractor shall be required to remove loose material from the driving surface and/or asphalt shoulders of the roadway. Loose material may be broomed to the edge of shoulders and it shall be the Contractor’s responsibility to ensure the loose material does not enter any vegetated areas and/or waterways.

All costs associated with the work shall be incidental to the contract unit price per mile for GRIND 8" RUMBLE STRIP OR STRIPE IN ASPHALT CONCRETE.

TABLE OF 8” RUMBLE STRIPES

Sta 1+00 to Sta 423+54.51 (Rt shoulder) = 42251.5 Ft, 8.002 Miles

Sta 1+00 to Sta 423+54.51 (Lt shoulder) = 42251.5 Ft, 8.002 Miles

Total = 84503.0 Ft 16.004 Mile

RUMBLE STRIPS AT SD 47 JUNCTION

Rumble Strip installation shall be completed prior to application of the Flush Seal and Permanent Pavement Markings.

The Contractor shall grind rumble strips in the asphalt concrete on SD 253 at the SD 47 Junction according to the detail Recessed Rumble Strip Layout.

All costs for installing rumble strips shall be incidental to the contract unit price per foot for GROOVE 6” WIDE RUMBLE STRIP. Basis of Payment shall be plans quantity.

In the event the Flush Seal is eliminated from the contract, the Contractor will still be required to apply a Flush Seal to the newly installed rumble strips at the same rate as specified in this plan set. No adjustment in the contract unit price will be made and SS-1h or CSS-1h Asphalt for Flush Seal will be paid at the contract unit price per ton.

PLOTTED FROM - TRAB17982

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	P 0253(04)182	18	71

FIXED LOCATION SIGN
(GROUND MOUNT BREAKAWAY SUPPORTS)

1

ROAD WORK
NEXT 8 MILES

G20-1

2

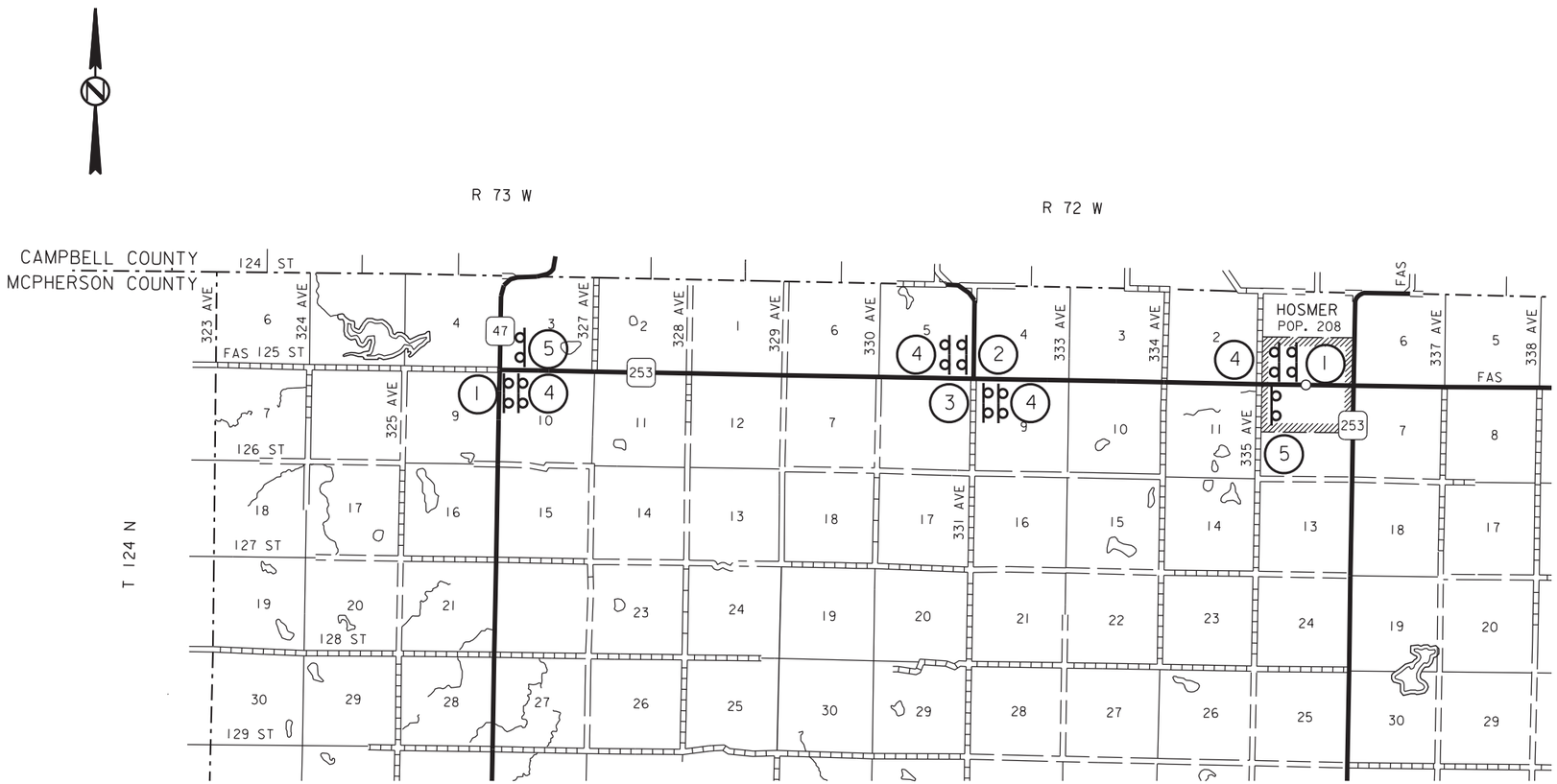
ROAD WORK
NEXT 5 MILES

G20-1

3

ROAD WORK
NEXT 3 MILES

G20-1



4

Grooved
Pavement

W8-15

W8-15P

Next
xx
Miles

W7-3aP

5

END
ROAD WORK

G20-2
(48"x 24")

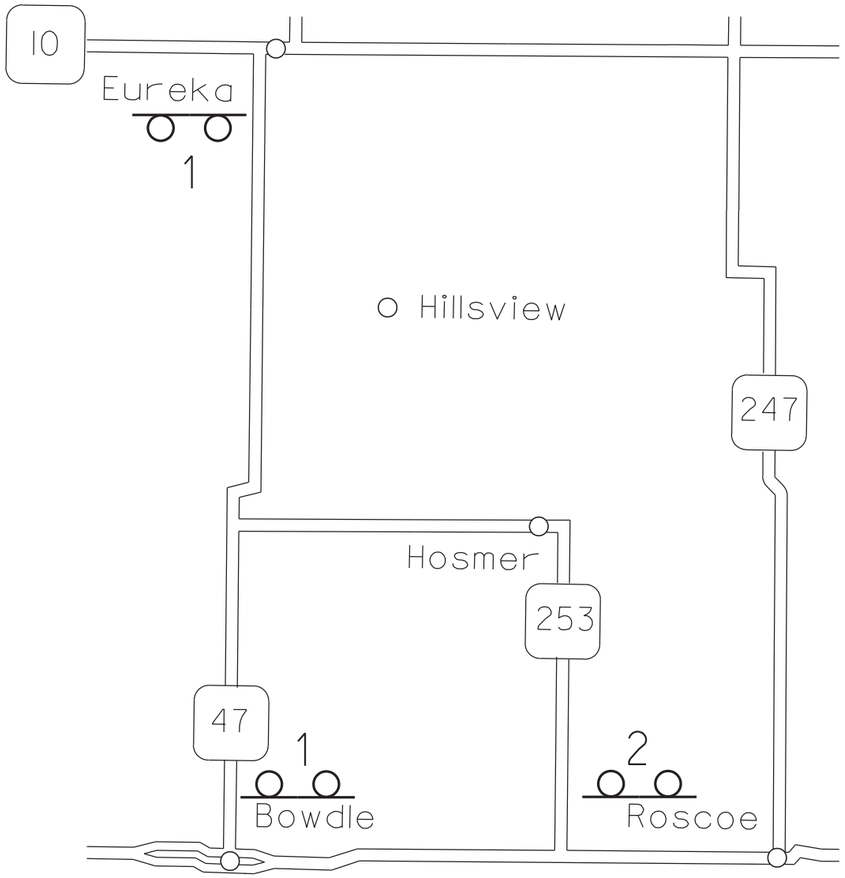
ROAD
WORK
AHEAD

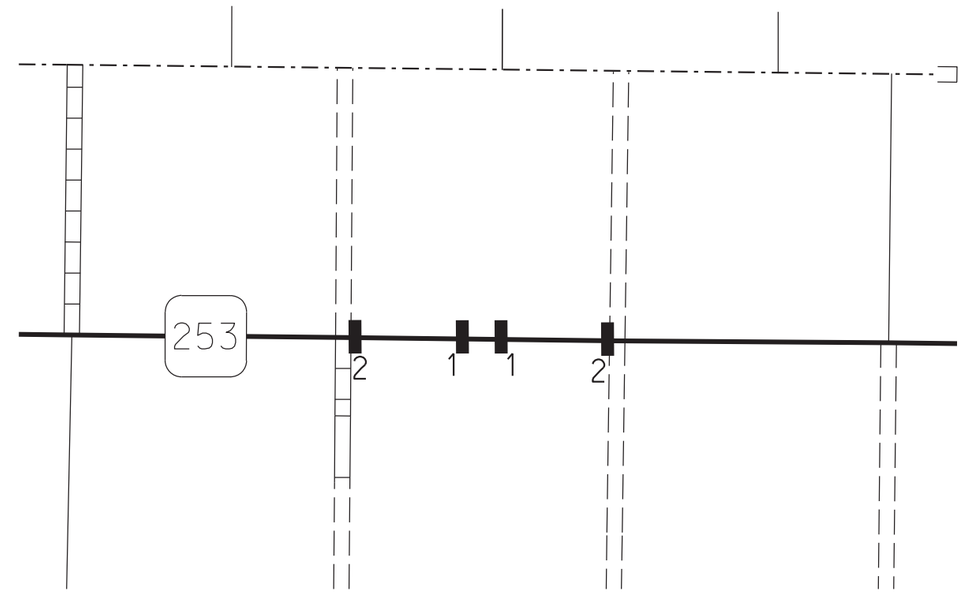
W20-1

W20-1 ROAD WORK AHEAD signs shall be mounted on portable supports and shall be placed on intersecting roadways as directed by the Engineer. ROAD WORK AHEAD signs shall be moved as necessary to keep current with work activities.

PLOTTED FROM - TRAB17886

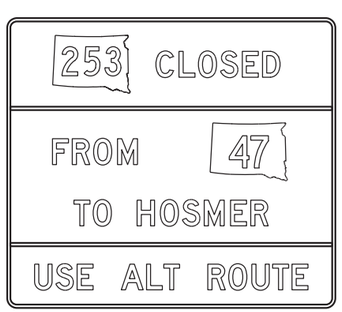
ROAD CLOSURE SIGNING





This is a typical setup for the culvert replacements.

1



2

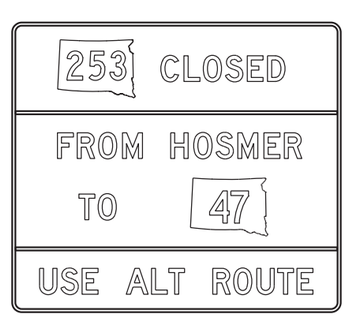
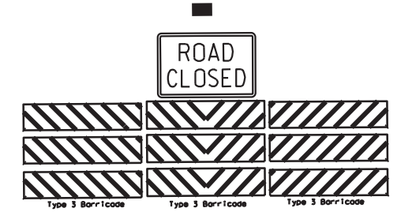


Table for distances on Road Closed Signs

	Sign # 3	
Station	Distance on sign at begin project (Mile)	Distance on sign at end project (Mile)
22+30	0	7
40+33	0	7
89+46	1	6
116+00	2	5
150+00	2	5
198+63	3	4
294+32	5	2

1



8' Double Sided Barricades

2

6' Double Sided Barricade

3

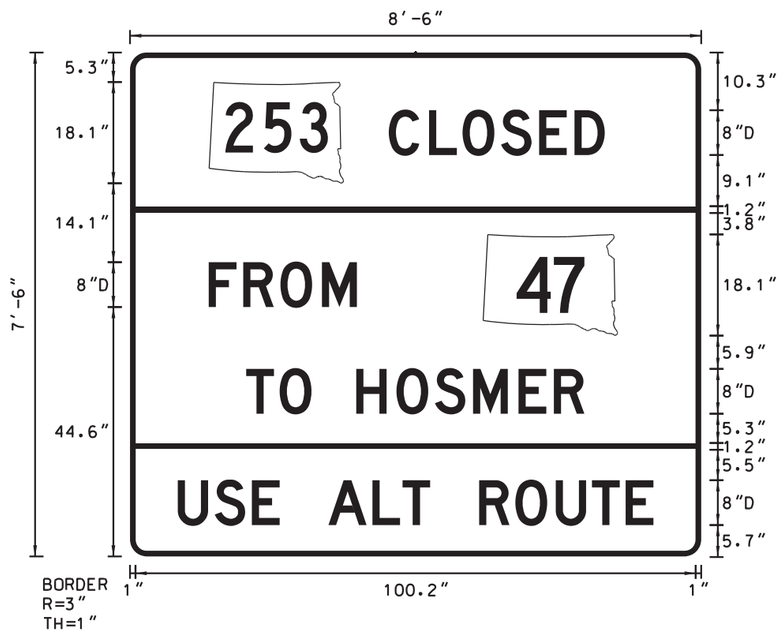
6' Double Sided Barricade

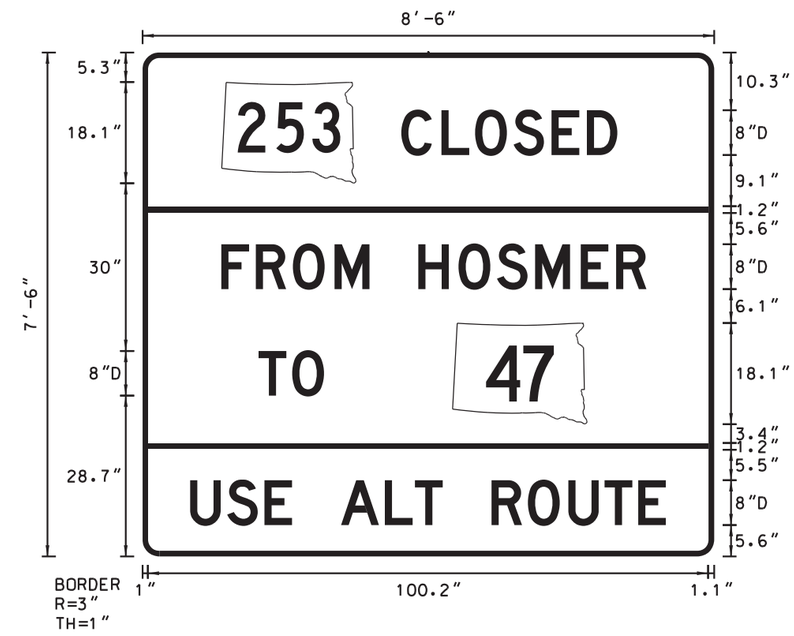
PLOT SCALE - 1:2934.13
PLOT NAME - 1
FILE - ...\AREA DESIGN\03T8 TC.DGN
PLOTTED FROM - TRAB17886

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	P 0253(04)182	20	71

Plotting Date: 07/05/2016

SPECIAL SIGN DESIGN





PLOT SCALE - 1:2.2575

PLOT NAME - 1

FILE - ...\SPECIAL SIGN DESIGN.DGN

PLOTTED FROM - TRAB10100

The signs illustrated are not required if the work space is behind a barrier, more than 2 feet behind the curb, or 15 feet or more from the edge of any roadway.

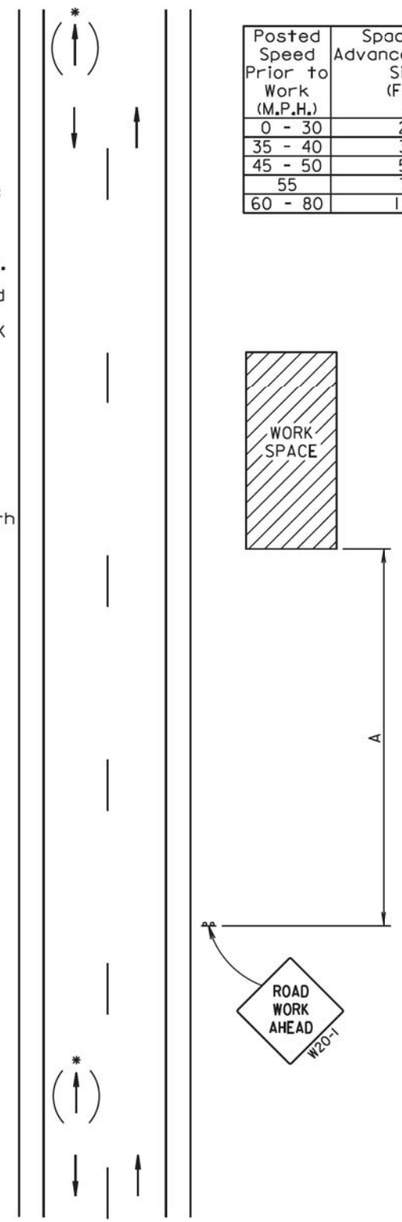
The signs illustrated shall be used where there are distracting situations; such as: vehicles parked on shoulder, vehicles accessing the work site via the highway, and equipment traveling on or crossing the roadway to perform work operations.

The ROAD WORK AHEAD sign may be replaced with other appropriate signs, such as the SHOULDER WORK sign. The SHOULDER WORK sign may be used for work adjacent to the shoulder.

* If the work space is on a divided highway, an advance warning sign should also be placed on the left side of the directional roadway.

For short term, short duration, or mobile operations, all signs and channelizing devices may be eliminated if a vehicle with an activated flashing or revolving yellow light is used.

Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet) (A)
0 - 30	200
35 - 40	350
45 - 50	500
55	750
60 - 80	1000



April 15, 2015

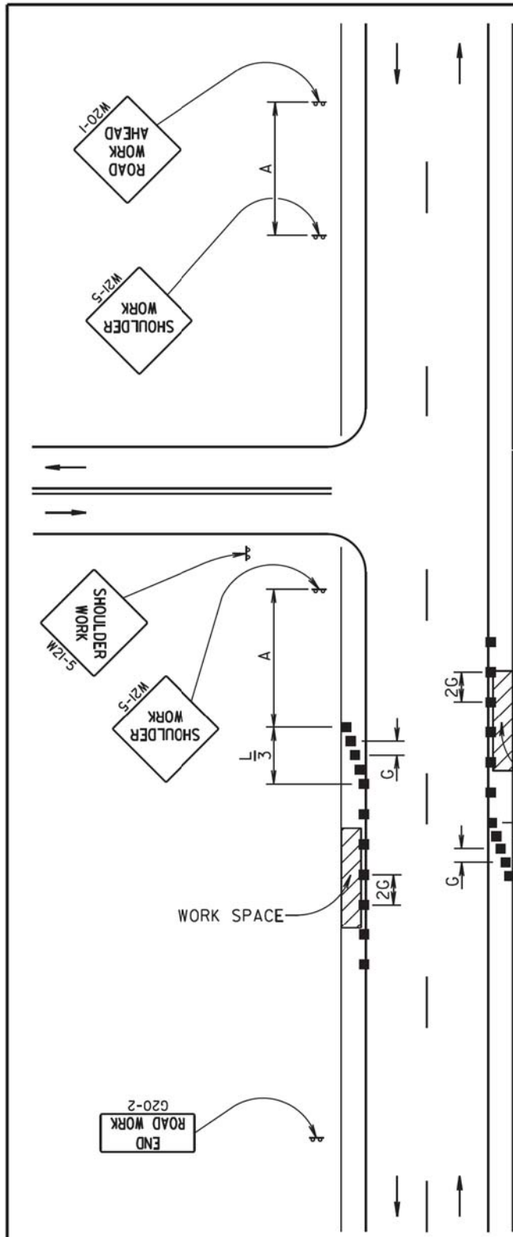
Published Date: 2nd Qtr. 2016

SDDOT

GUIDES FOR TRAFFIC CONTROL DEVICES
WORK BEYOND THE SHOULDER

PLATE NUMBER 634.01

Sheet 1 Of 1



Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet) (A)	Taper Length (Feet) (L)	Spacing of Channelizing Devices (Feet) (G)
0 - 30	200	180	25
35 - 40	350	320	25
45 - 50	500	600	50
55	750	660	50
60 - 65	1000	780	50

■ Channelizing Device

END ROAD WORK
G20-2

The channelizing devices shall be drums or 42" cones if traffic control must remain overnight.

For short duration operations (1 hour or less) all channelizing devices may be eliminated if a vehicle with an activated flashing or revolving yellow light is used.

Worker signs (W21-1 or W21-1a) may be used instead of SHOULDER WORK signs.

A SHOULDER WORK sign should be placed on the left side of a divided or one-way roadway only if the left shoulder is affected.

The SHOULDER WORK sign on an intersecting roadway is not required if drivers emerging from that roadway will encounter another advance warning sign before they reach a work activity area.

September 22, 2014

Published Date: 2nd Qtr. 2016

SDDOT

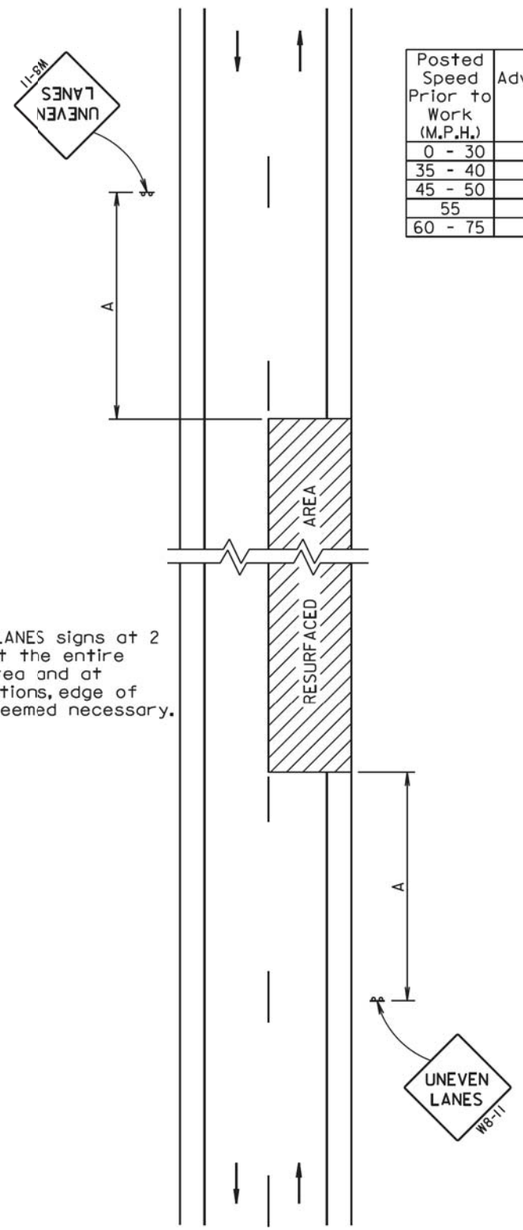
GUIDES FOR TRAFFIC CONTROL DEVICES
WORK ON SHOULDERS

PLATE NUMBER 634.03

Sheet 1 of 1

PLOT SCALE - 1:200
PLOT NAME - 6
FILE - ...\63401&63403.DGN
-PLOTTED FROM - TRAB17986

Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet) (A)
0 - 30	200
35 - 40	350
45 - 50	500
55	750
60 - 75	1000



Install additional UNEVEN LANES signs at 2 mile intervals throughout the entire length of the uneven area and at affected major intersections, edge of towns, and other sites deemed necessary.

April 15, 2015

Published Date: 2nd Qtr. 2016

SDDOT

GUIDES FOR TRAFFIC CONTROL DEVICES
UNEVEN ROAD SURFACE

PLATE NUMBER 634.22

Sheet 1 of 1

Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet) (A)	Spacing of Channelizing Devices (Feet) (G)
0 - 30	200	25
35 - 40	350	25
45 - 50	500	50
55	750	50
60 - 65	1000	50

Flagger

Channelizing Device

For low-volume traffic situations with short work zones on straight roadways where the flagger is visible to road users approaching from both directions, a single flagger may be used.

The ROAD WORK AHEAD and the END ROAD WORK signs may be omitted for short duration operations (1 hour or less).

For tack and/or flush seal operations, when flaggers are not being used, the FRESH OIL sign (W21-2) shall be displayed in advance of the liquid asphalt areas.

Flashing warning lights and/or flags may be used to call attention to the advance warning signs.

The channelizing devices shall be drums or 42" cones.

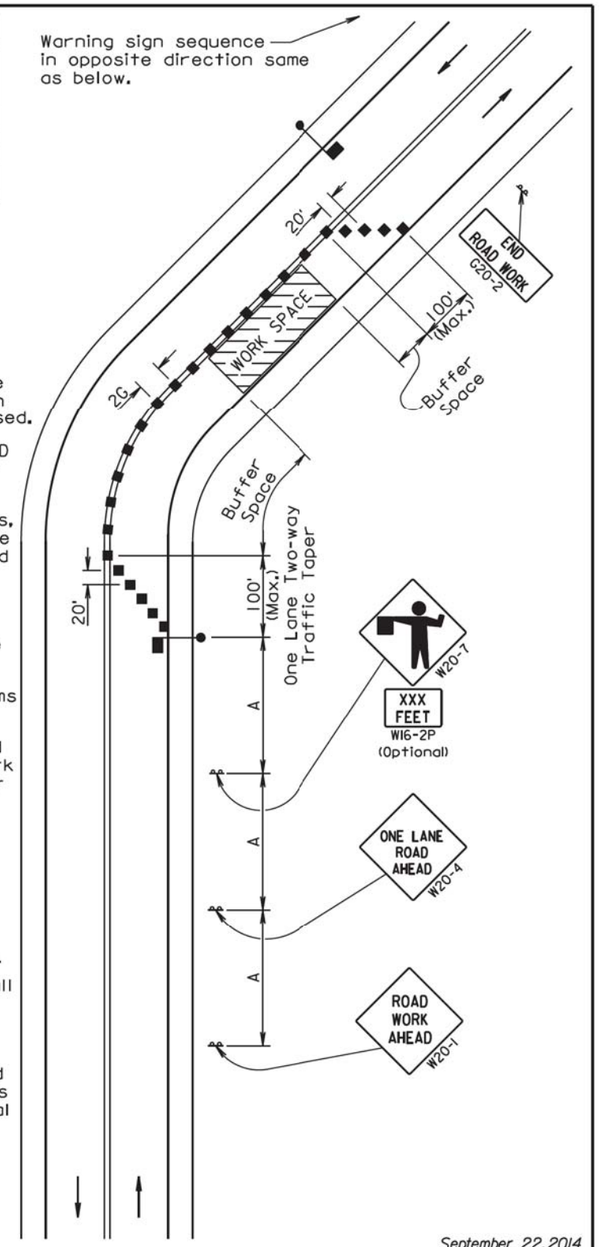
Channelizing devices are not required along the centerline adjacent to work area when pilot cars are utilized for escorting traffic through the work area.

END ROAD WORK G20-2

Channelizing devices and flaggers shall be used at intersecting roads to control intersecting road traffic as required.

The buffer space should be extended so that the two-way traffic taper is placed before a horizontal or vertical curve to provide adequate sight distance for the flagger and queue of stopped vehicles.

The length of A may be adjusted to fit field conditions.



September 22, 2014

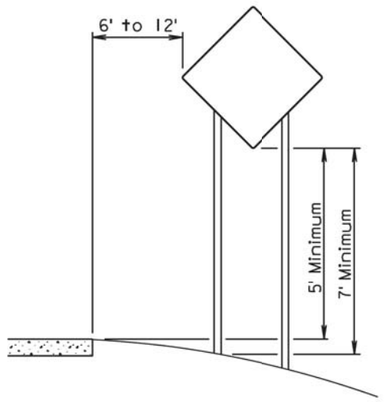
Published Date: 2nd Qtr. 2016

SDDOT

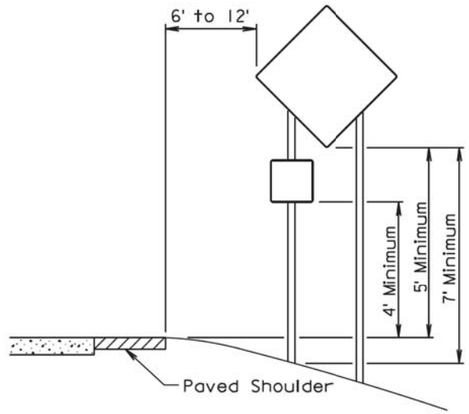
GUIDES FOR TRAFFIC CONTROL DEVICES
LANE CLOSURE WITH FLAGGER PROVIDED

PLATE NUMBER 634.23

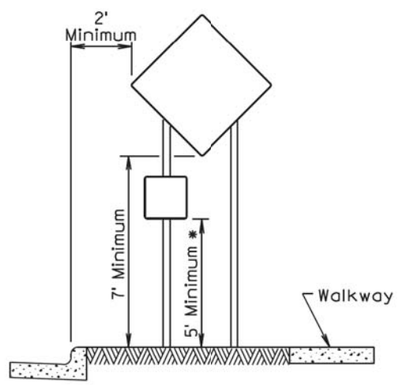
Sheet 1 of 1



RURAL DISTRICT

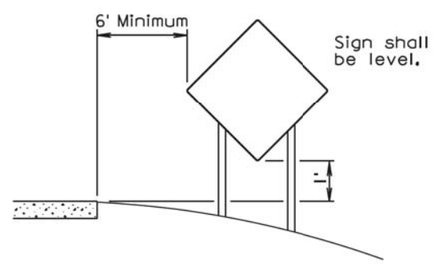


RURAL DISTRICT WITH SUPPLEMENTAL PLATE



URBAN DISTRICT

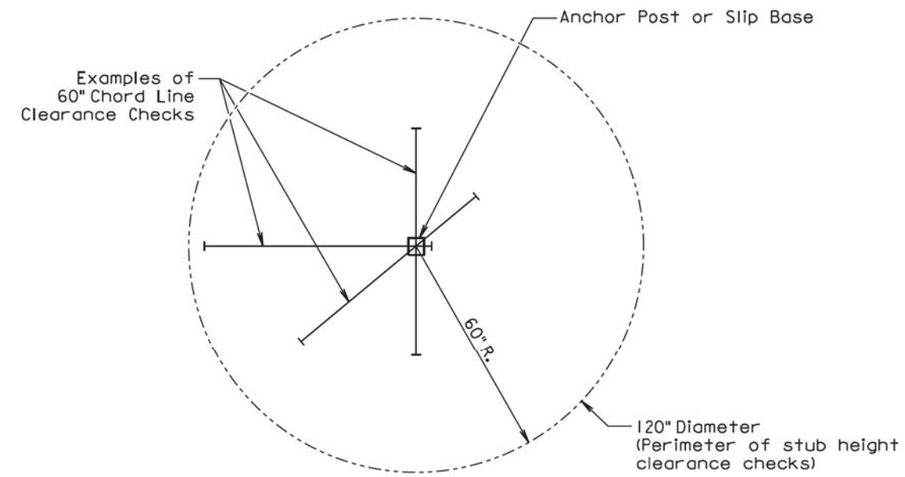
* If the bottom of supplemental plate is mounted lower than 7 feet above a pedestrian walkway, the supplemental plate should not project more than 4" into the pedestrian facility.



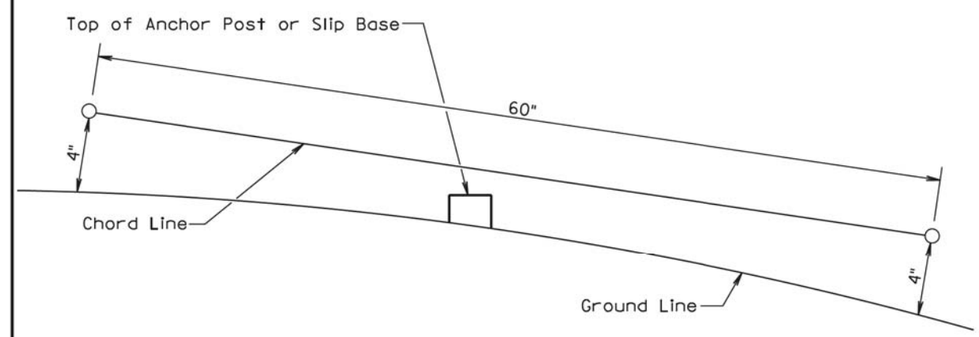
RURAL DISTRICT
3 DAY MAXIMUM
(Not applicable to regulatory signs)

September 22, 2014

Published Date: 2nd Qtr. 2016	SDDOT	CRASHWORTHY SIGN SUPPORTS (Typical Construction Signing)	PLATE NUMBER 634.85 Sheet 1 of 1



PLAN VIEW
(Examples of stub height clearance checks)



ELEVATION VIEW

GENERAL NOTES:

The top of anchor posts and slip bases SHALL NOT extend above a 60" chord line within a 120" diameter circle around the post with ends 4" above the ground.

At locations where there is curb and gutter adjacent to the breakaway sign support, the stub height shall be a maximum of 4" above the ground line at the localized area adjacent to the breakaway support stub.

The 4" stub height clearance is not necessary for U-channel lap splices where the support is designed to yield (bend) at the base.

July 1, 2005

Published Date: 2nd Qtr. 2016	SDDOT	BREAKAWAY SUPPORT STUB CLEARANCE	PLATE NUMBER 634.99 Sheet 1 of 1

PLOT SCALE - 1:200
PLOT NAME - 8
FILE - ...\63485&63499.DGN
-PLOTTED FROM - TRAB17886

ITEMIZED LIST FOR TRAFFIC CONTROL SIGNS

SIGN CODE	SIGN DESCRIPTION	CONVENTIONAL ROAD NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
R11-2	ROAD CLOSED	2	48" x 30"	10.0	20.0
R11-3a	ROAD CLOSED __ MILES AHEAD LOCAL TRAFFIC ONLY	4	60" x 30"	12.5	50.0
W7-3aP	NEXT __ MILES (plaque)	4	36" x 30"	7.5	30.0
W8-1	BUMP	14	48" x 48"	16.0	224.0
W8-6	TRUCK CROSSING	2	48" x 48"	16.0	32.0
W8-11	UNEVEN LANES	2	48" x 48"	16.0	32.0
W8-15	GROOVED PAVEMENT	4	48" x 48"	16.0	64.0
W8-15P	MOTORCYCLE (plaque)	4	24" x 18"	3.0	12.0
W20-1	ROAD WORK AHEAD	4	48" x 48"	16.0	64.0
W20-4	ONE LANE ROAD AHEAD	2	48" x 48"	16.0	32.0
W20-7	FLAGGER (symbol)	4	48" x 48"	16.0	64.0
W21-5	SHOULDER WORK	2	48" x 48"	16.0	32.0
G20-1	ROAD WORK NEXT X MILES	4	36" x 18"	4.5	18.0
G20-2	END ROAD WORK	2	36" x 18"	4.5	9.0
		CONVENTIONAL ROAD TRAFFIC CONTROL SIGNS SQFT			683.0

TYPE 3 BARRICADES

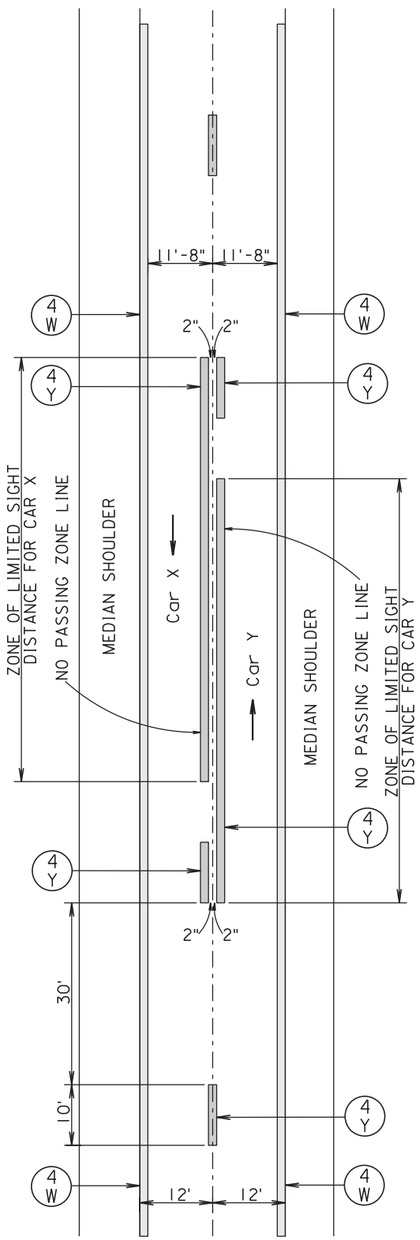
ITEM DESCRIPTION	QUANTITY
Type 3 Barricade, 6' Double Sided	4 Each
Type 3 Barricade, 8' Double Sided	6 Each

DETOUR SIGNING TABLE

Quantity	Sign Description	Color	Width Inches	Height Inches	Sq. Ft.	Total Sq. Ft.
2	SD 253 Closed From SD 47 to Hosmer Use Alt Route	Black/Orange	102	90	63.75	127.50
1	SD 253 Closed From SD 47 to Hosmer Use Alt Route	Black/Orange	102	90	63.75	63.75
					TOTAL :	191.25

PLOTTED FROM - TRAB17882

TWO LANE UNDIVIDED ROADWAY



KEY	ITEM
4 W	4" White
4 Y	4" Yellow

FURNISHING AND APPLYING PAVEMENT MARKING PAINT

1. The approximate paint application rates shall be as follows:

Undivided Roadway	Divided Roadway
Yellow Centerline 12± Gallons/Pass-Mile (Includes No-passing lines)	White Centerline 4.60 Gallons/Pass-Mile
White Edgeline 16.90 Gallons/Pass-Mile (Solid Line)	Yellow or White Edgeline 16.90 Gallons/Pass-Mile (Solid Line)

2. The typical pavement markings as shown on this sheet shall be applied throughout the entire length of the project.

3. Exact location of the NO PASSING ZONE lines will be determined in the field by the Engineer. A dash of white paint will mark the beginning and end of all no passing zones. NO PASSING ZONE signs and the ending post in fence lines, if present, shall not be used as the beginning and ending NO PASSING ZONE lines.

4. Traffic Control shall be incidental to the cost of application. The striper and advance or trailing warning vehicle shall be equipped with flashing amber lights or advance warning arrow board.

PLOT SCALE - 1:200
PLOTTED FROM - TRAB17886
PLOT NAME - 4
FILE - ...\PAVEMENT MARKING DETAILS.DGN

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	P 0253(04)182	26	71

EXISTING TOPOGRAPHY SYMBOLOGY AND LEGEND

Anchor
Antenna
Approach
Assumed Corner
Azimuth Marker
BBQ Grill/ Fireplace
Bearing Tree
Bench Mark
Box Culvert
Bridge
Brush
Buildings
Bulk Tank
Cattle Guard
Cemetery
Centerline
Cistern
Clothes Line
Commercial Sign Double Face
Commercial Sign One Post
Commercial Sign Overhead
Commercial Sign Two Post
Concrete Symbol
Creek Edge
Curb/Gutter
Curb
Dam Grade/Dike/Levee
Deck Edge
Ditch Block
Doorway Threshold
Drainage Profile
Drop Inlet
Edge Of Asphalt
Edge Of Concrete
Edge Of Gravel
Edge Of Other
Edge Of Shoulder
Elec. Trans./Power Jct. Box
Environmental Sensitive Site — ESS —
Fence Barbwire
Fence Chainlink
Fence Electric
Fence Misc.
Fence Rock
Fence Snow
Fence Wood
Fence Woven
Fire Hydrant
Flag Pole
Flower Bed
Gas Valve Or Meter
Gas Pump Island
Grain Bin
Guardrail
Guide Sign One Post
Guide Sign Two Post
Gutter
Guy Pole
Haystack

Hedge
Highway R.O.W. Marker
Interstate Close Gate
Iron Pin
Irrigation Ditch
Lake Edge
Lawn Sprinkler
Mailbox
Manhole Electric
Manhole Gas
Manhole Misc
Manhole Sanitary Sewer
Manhole Storm Sewer
Manhole Telephone
Manhole Water
Merry-Go-Round
Microwave Radio Tower
Misc. Line
Misc. Property Corner
Misc. Post
Overhang Or Encroachment
Overhead Utility Line — OH —
Parking Meter
Pipe With End Section
Pipe With Headwall
Pipe Without End Section
Playground Slide
Playground Swing
Power And Light Pole
Power And Telephone Pole
Power Meter
Power Pole
Power Pole And Transformer
Power Tower Structure
Propane Tank
Property Pipe
Property Pipe With Cap
Property Stone
Public Telephone
Railroad Crossing Signal
Railroad Milepost Marker
Railroad Profile
Railroad R.O.W. Marker
Railroad Signs
Railroad Switch
Railroad Track
Railroad Trestle
Rebar
Rebar With Cap
Reference Mark
Regulatory Sign One Post
Regulatory Sign Two Post
Retaining Wall
Riprap
River Edge
Rock And Wire Baskets
Rockpiles
Satellite Dish
Septic Tank

Shrub Tree
Sidewalk
Sign Face
Sign Post
Slough Or Marsh
Spring
Stream Gauge
Street Marker
Subsurface Utility Exploration Test Hole
Telephone Fiber Optics — T/F —
Telephone Junction Box
Telephone Pole
Television Cable Jct Box
Television Tower
Test Wells/Bore Holes
Traffic Signal
Trash Barrel
Tree Belt
Tree Coniferous
Tree Deciduous
Tree Stumps
Triangulation Station
Underground Electric Line — P —
Underground Gas Line — G —
Underground High Pressure Gas Line — HG —
Underground Sanitary Sewer — S —
Underground Storm Sewer — S —
Underground Tank
Underground Telephone Line — T —
Underground Television Cable — TV —
Underground Water Line — W —
Warning Sign One Post
Warning Sign Two Post
Water Fountain
Water Hydrant
Water Meter
Water Tower
Water Valve
Water Well
Weir Rock
Windmill
Wingwall
Witness Corner

State and National Line
County Line
Section Line
Quarter Line
Sixteenth Line
Property Line
Construction Line
R. O. W. Line
New R. O. W. Line
Cut and Fill Limits
Control of Access
New Control of Access
Proposed ROW (After Property Disposal)

Drainage Arrow

Remove Concrete Pavement
Remove Concrete Driveway Pavement
Remove Asphalt Concrete Pavement
Remove Concrete Sidewalk
Remove Concrete Approach Pavement
Remove Concrete Median Pavement

Remove Concrete Curb
Remove Concrete Curb and Gutter
Remove Concrete Gutter

Detectable Warning
Pedestrian Push Button Pole and 30" x 48" Clear Space with 1.5% slope

PLOTTED FROM - TRAB17886

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	P 0253(04)182	27	71

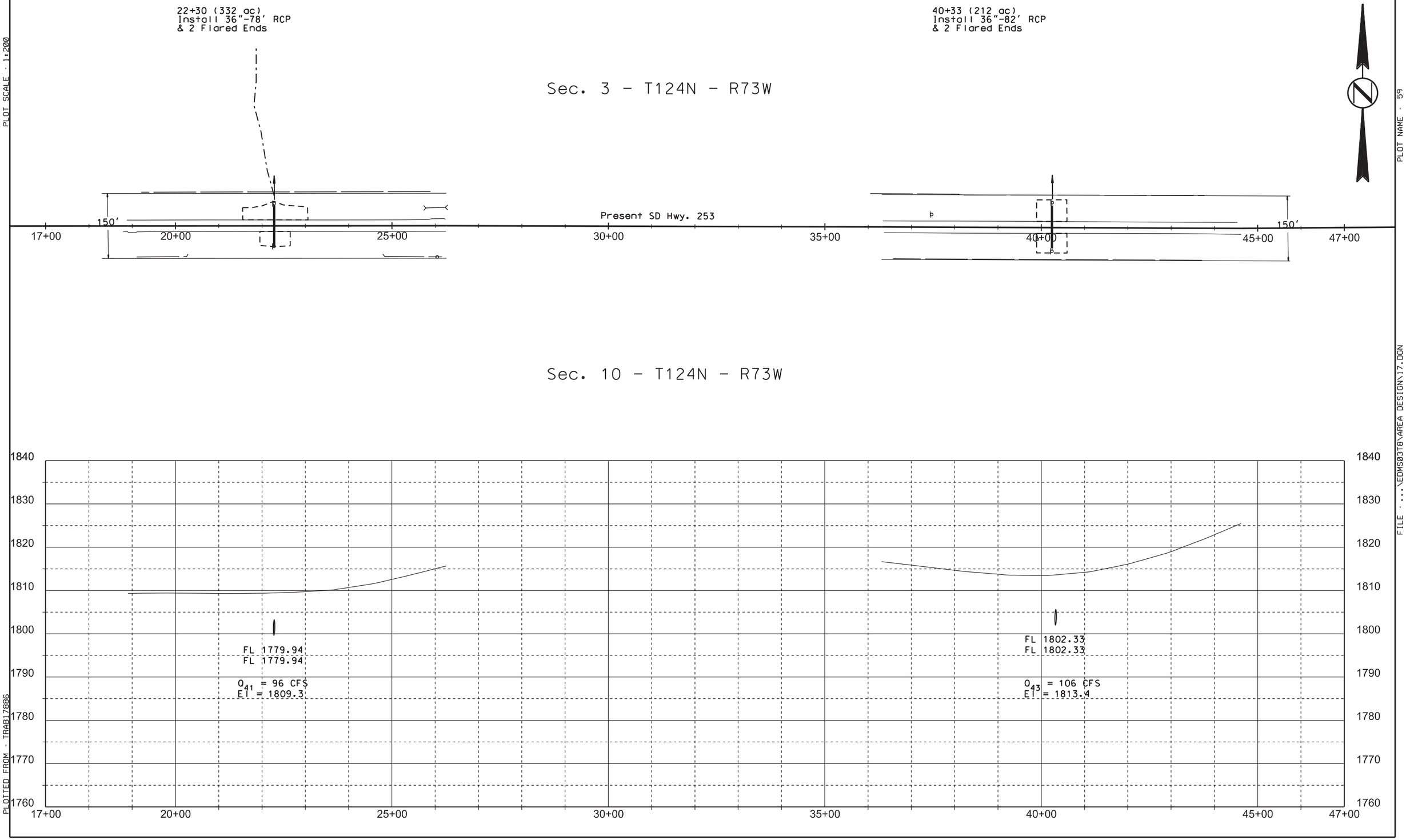
Plotting Date: 05/26/2016

22+30
Take Out 24"-100' CMP
(Incidental Work, Grading)

22+30 (332 ac)
Install 36"-78' RCP
& 2 Flared Ends

40+33
Take Out 24"-112' CMP
(Incidental Work, Grading)

40+33 (212 ac)
Install 36"-82' RCP
& 2 Flared Ends



PLOT SCALE - 1:200

PLOT NAME - 59

FILE - ...\EDMS0318\AREA DESIGN\17.DGN

PLOTTED FROM - TRAB17986

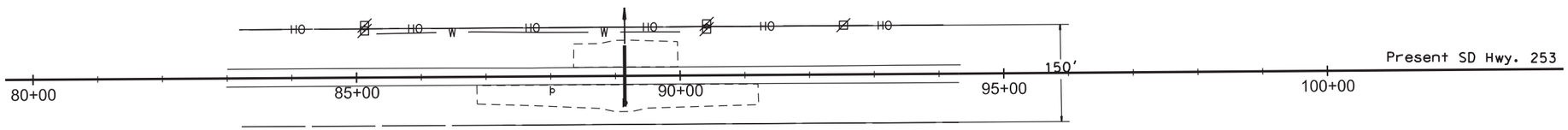
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	P 0253(04)182	28	71

Plotting Date: 05/08/2015

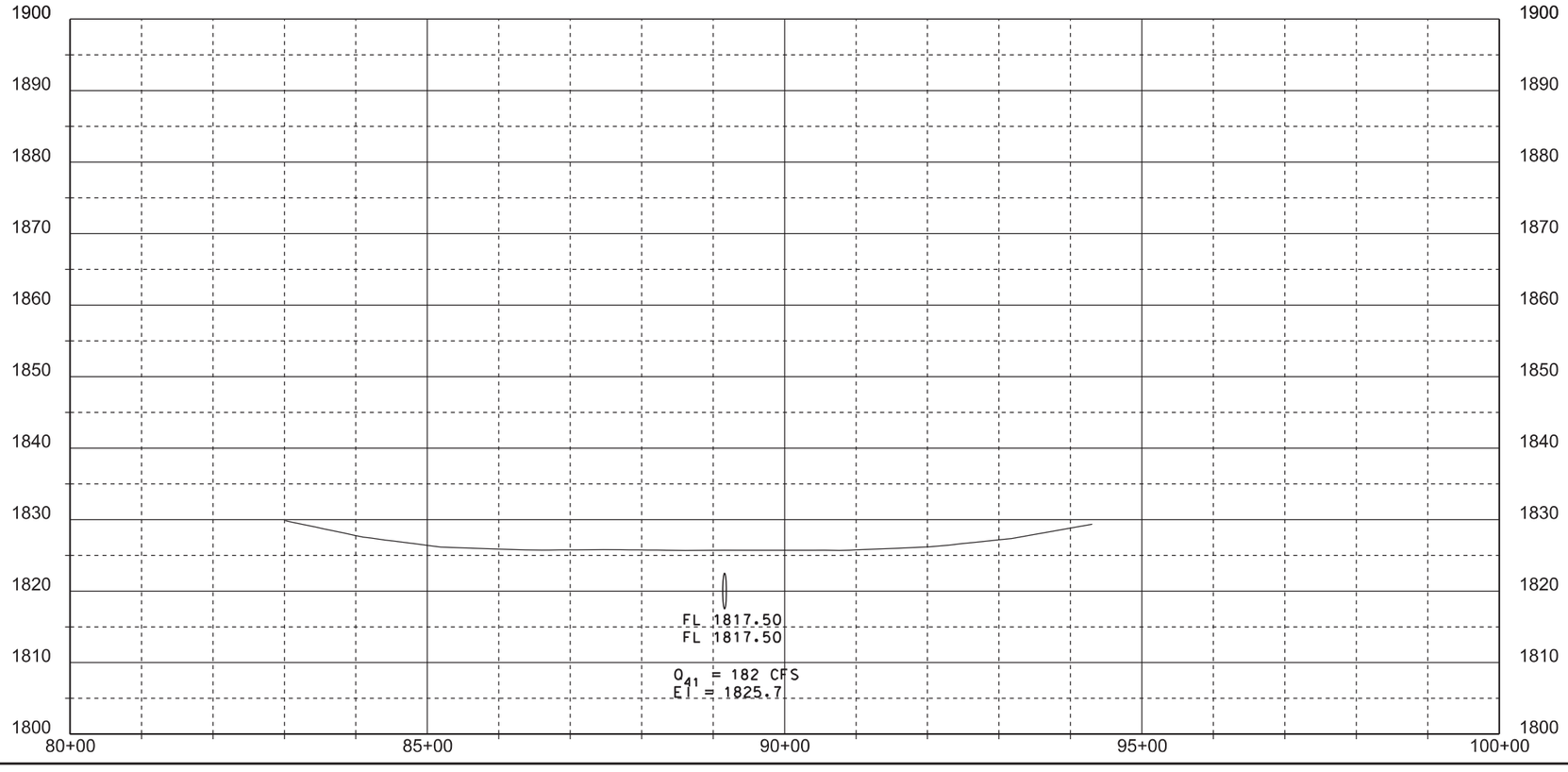
89+16
Take Out 24"-84' CMP
(Incidental Work, Grading)

89+16 (969 ac)
Install 60"-78' RCP
& 2 Flared Ends

Sec. 2 - T124N - R73W



Sec. 11 - T124N - R73W



PLOT SCALE - 1:200

PLOT NAME - 3

FILE - U:\REGIONA\PRJ\EDMS03T8\80.DGN

PLOTTED FROM - TRAB17982

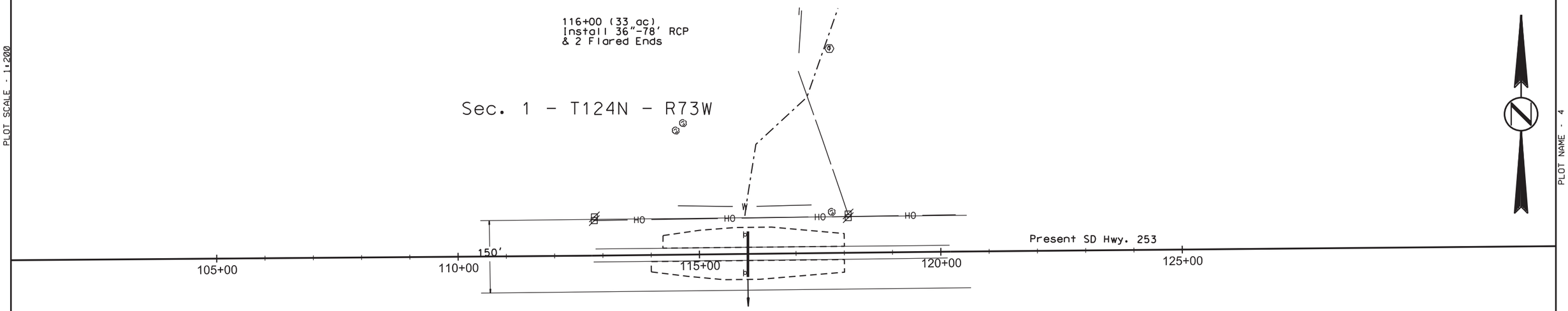
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	P 0253(04)182	29	71

Plotting Date: 05/08/2015

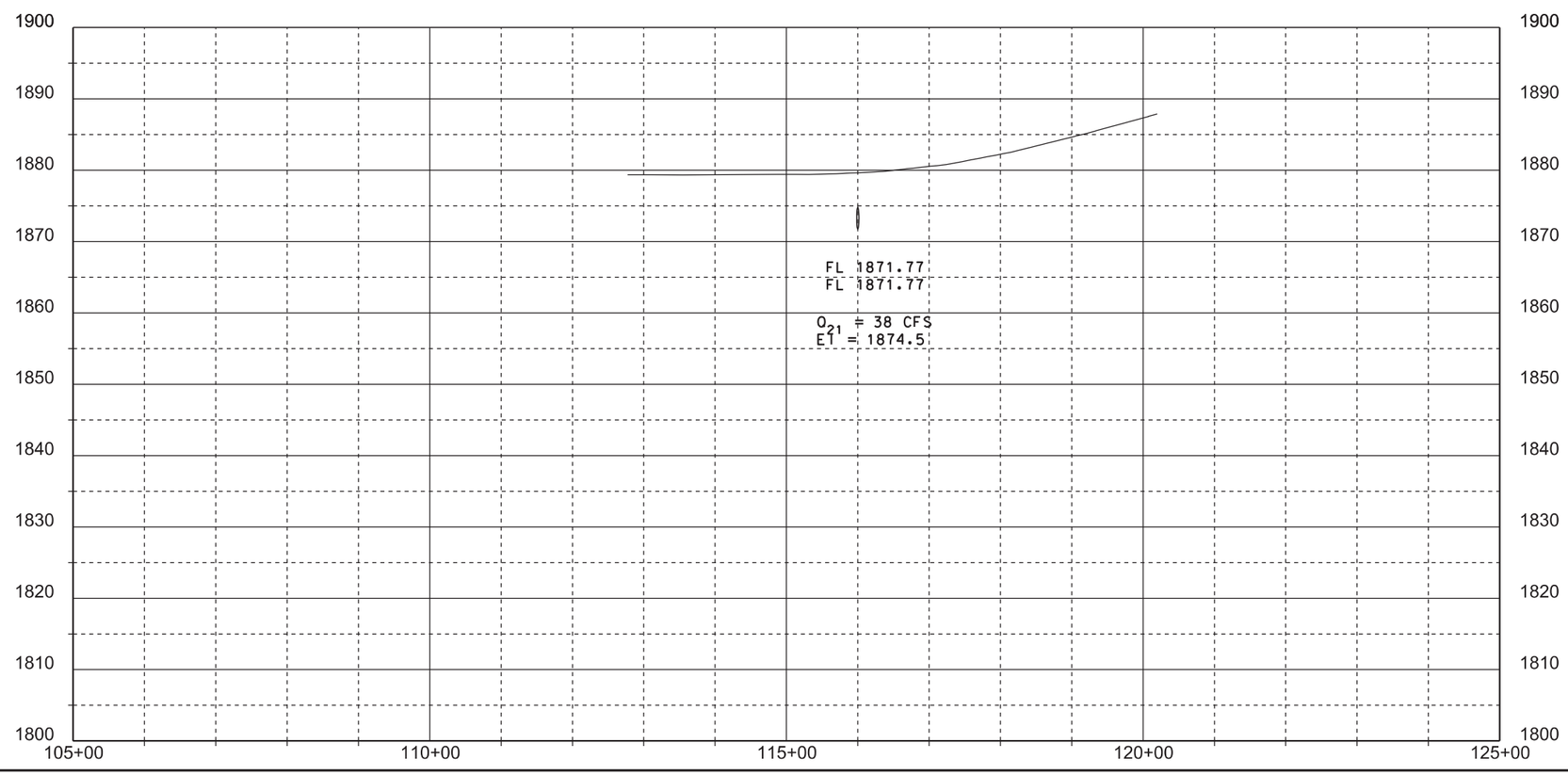
PLOT SCALE - 1:200

PLOT NAME - 4

FILE - U:\REGIONA\PRJ\EDMS03T8\105.DGN



Sec. 12 - T124N - R73W



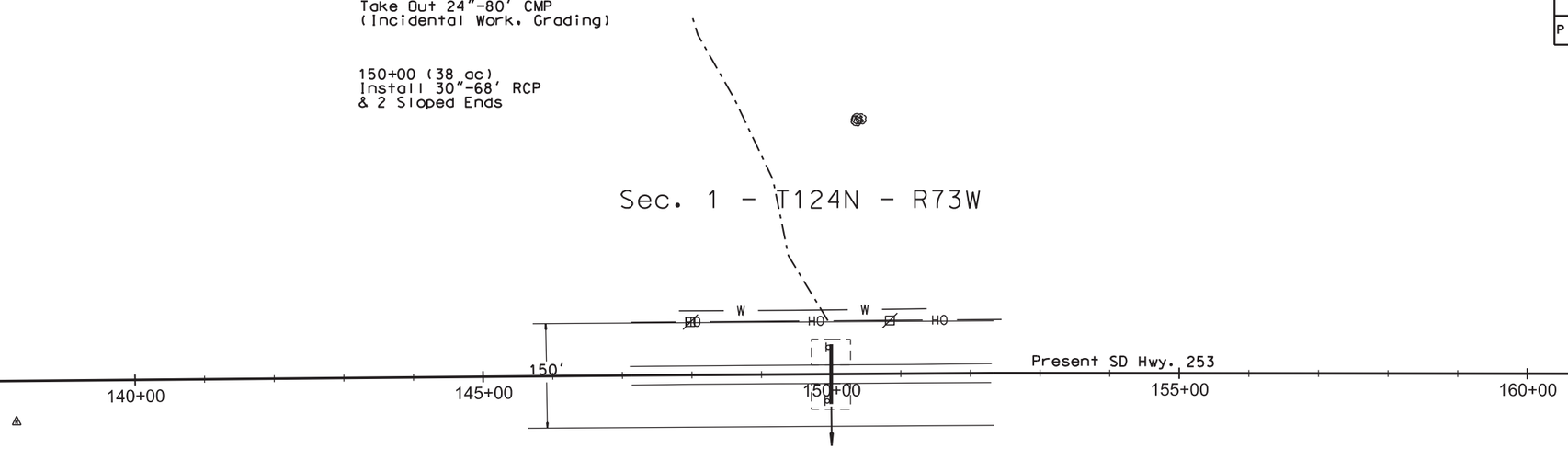
PLOTTED FROM - TRAB17882

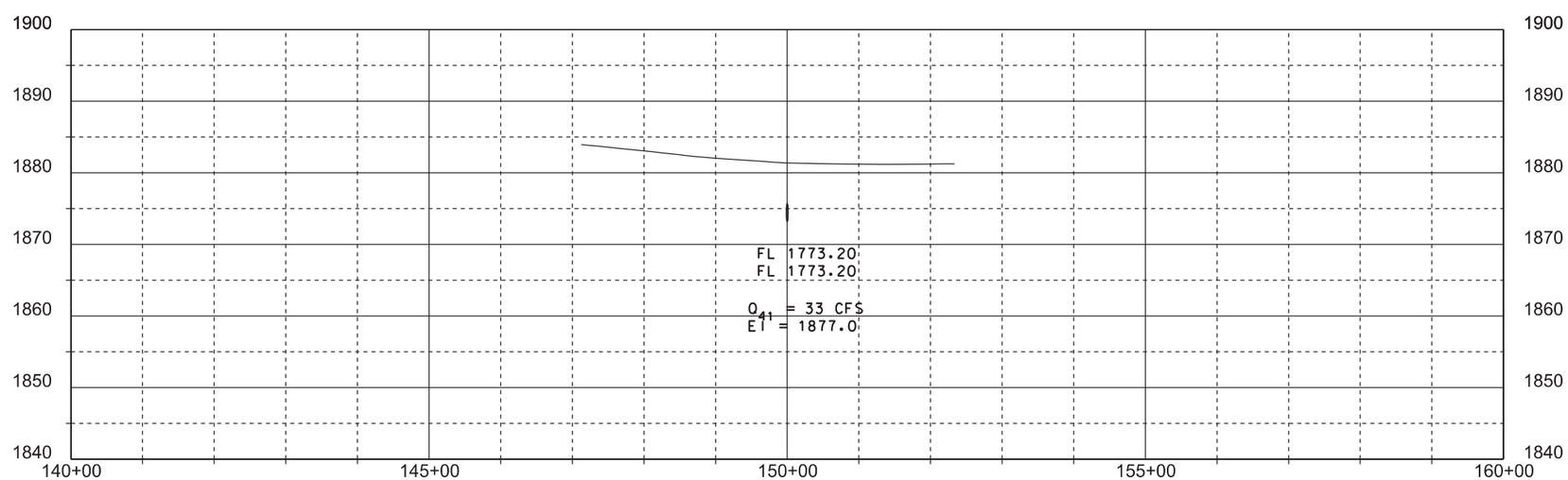
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	P 0253(04)182	30	71

Plotting Date: 05/08/2015

150+00
Take Out 24"-80' CMP
(Incidental Work, Grading)

150+00 (38 ac)
Install 30"-68' RCP
& 2 Sloped Ends





PLOT SCALE - 1:200

PLOTTED FROM - TRAB17982

PLOT NAME - 5

FILE - U:\REGIONA\PRJ\EDMS0378\140.DGN

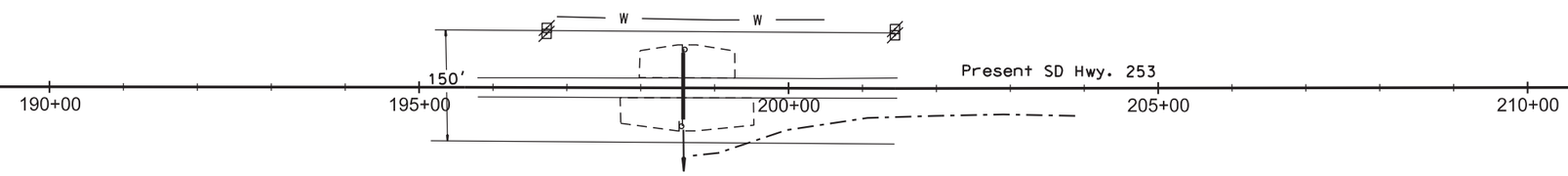
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	P 0253(04)182	31	71

Plotting Date: 05/08/2015

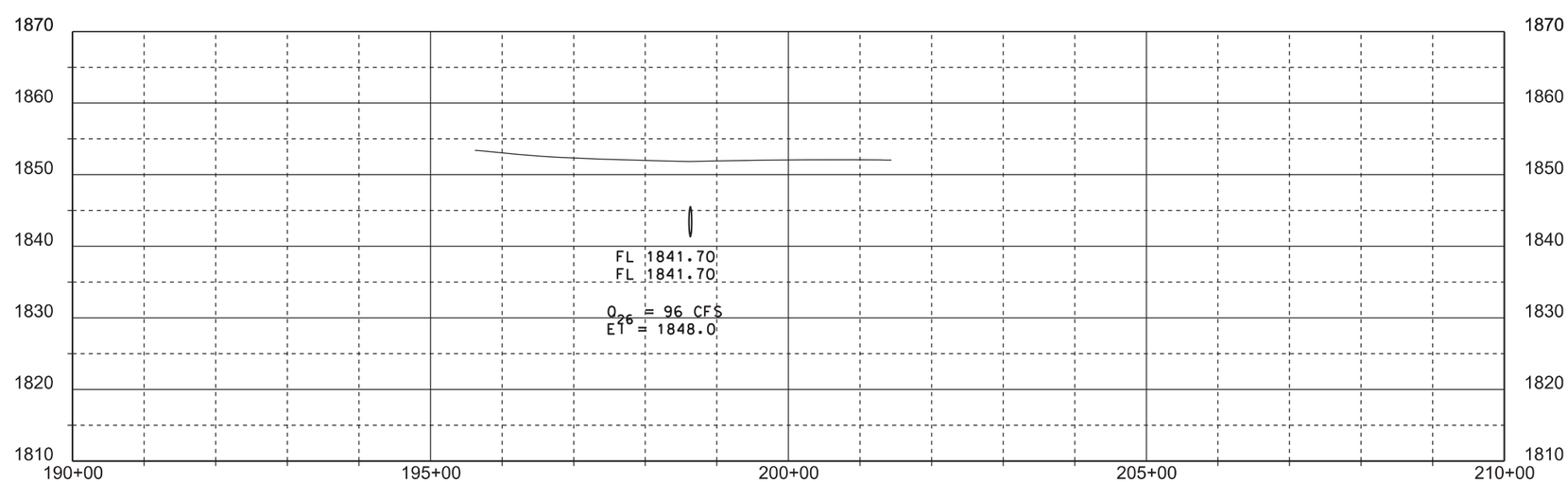
198+63
Take Out 24"-104' CMP
(Incidental Work, Grading)

198+63 (483 ac)
Install 42"-78' RCP
& 2 Flared Ends

Sec. 6 - T124N - R72W



Sec. 7 - T124N - R72W



PLOT SCALE - 1:200

PLOT NAME - 6

FILE - U:\REGIONA\PRJ\EDMS0378\190.DGN

PLOTTED FROM - TRAB17982

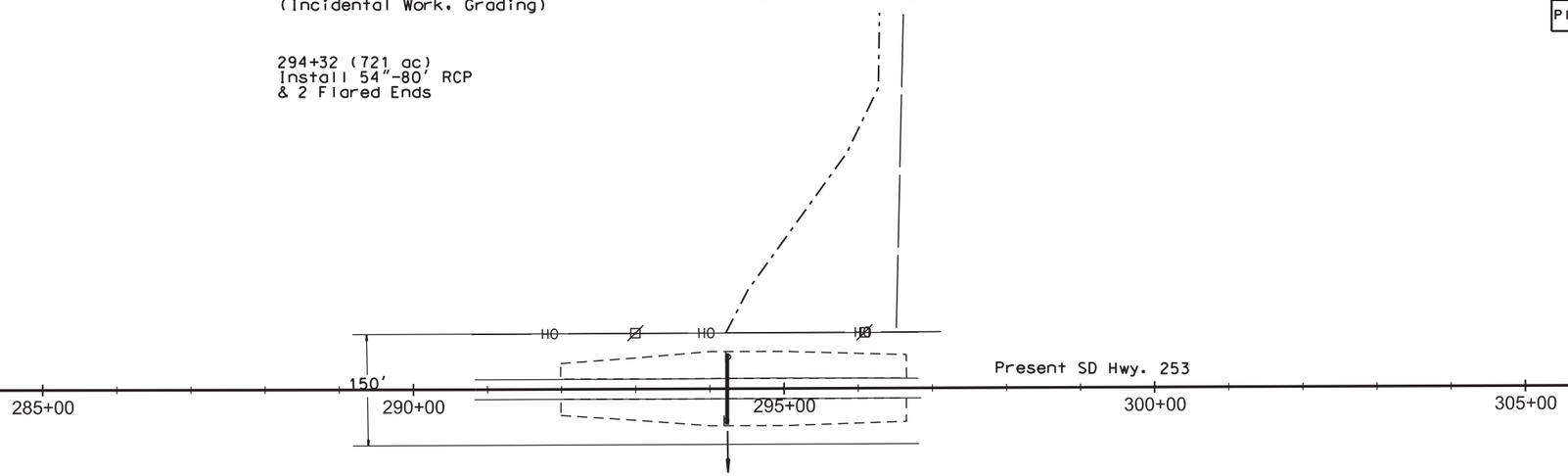
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	P 0253(04)182	32	71

Plotting Date: 05/08/2015

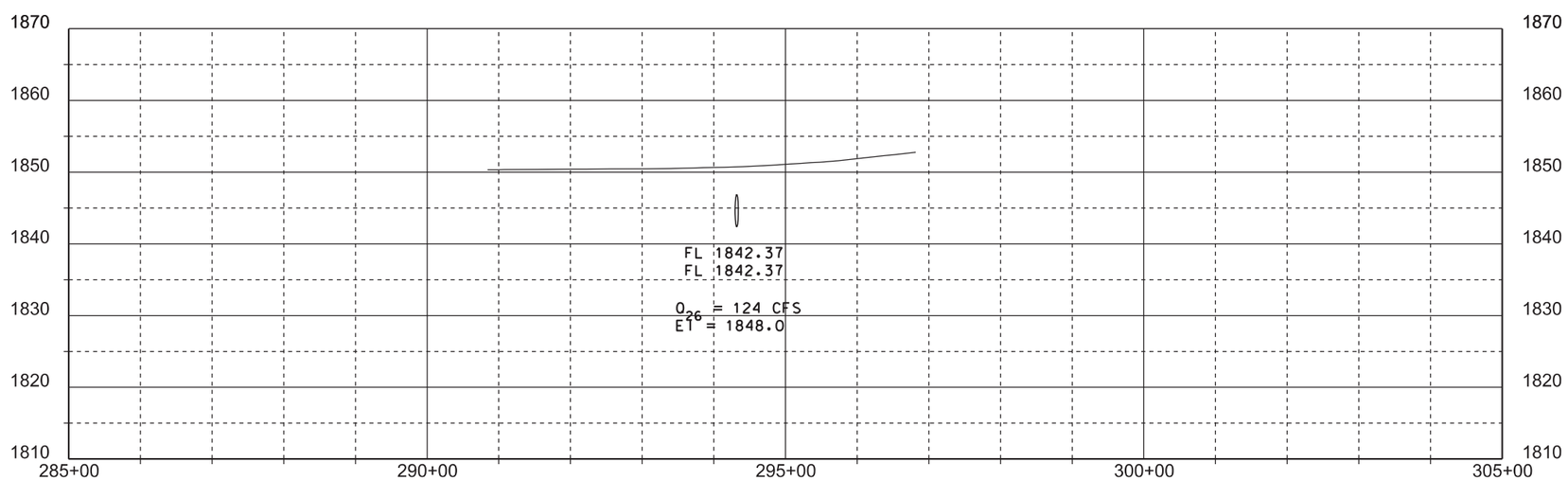
294+32
Take Out 24"-86' CMP
(Incidental Work, Grading)

294+32 (721 ac)
Install 54"-80' RCP
& 2 Flared Ends

Sec. 4 - T124N - R72W



Sec. 9 - T124N - R72W



PLOT SCALE - 1:200

PLOT NAME - 7

FILE - U:\REGIONA\PRJ\EDMS0378\280.DGN

PLOTTED FROM - TRAB17982

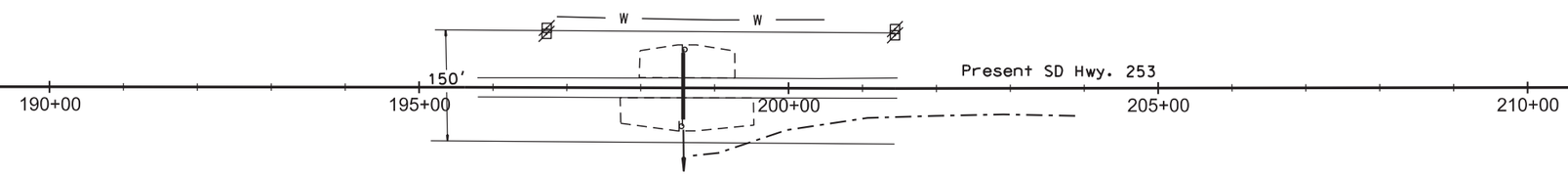
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	P 0253(04)182	33	71

Plotting Date: 05/06/2015

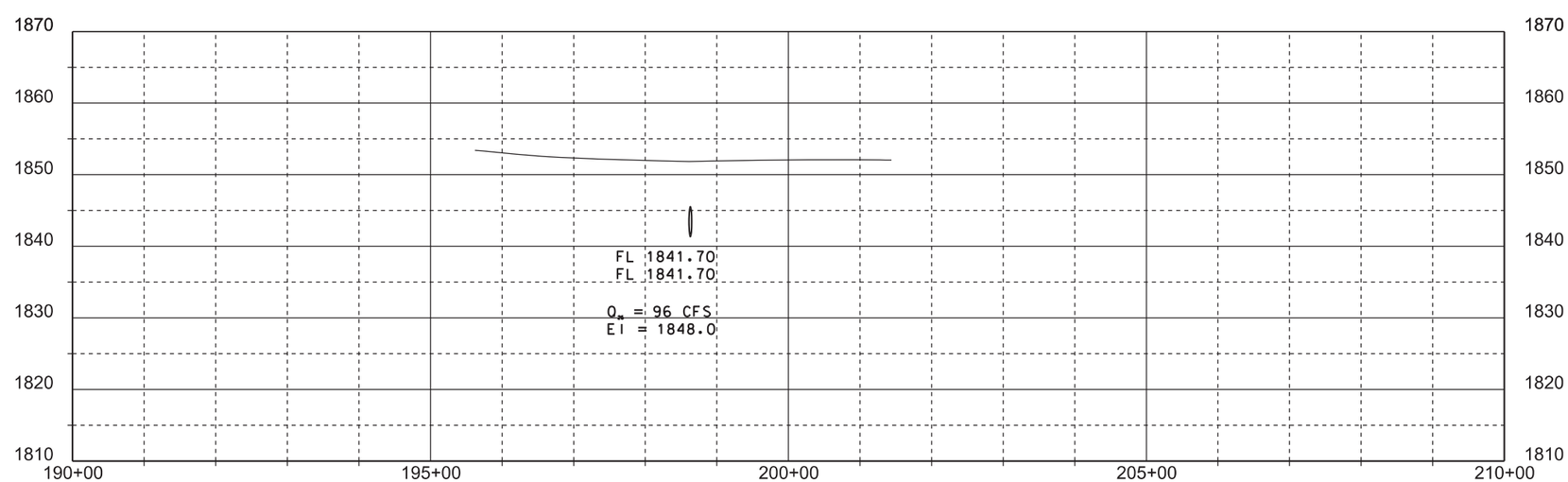
198+63
Take Out 24"-104' CMP
(Incidental Work, Grading)

198+63 (483 ac)
Install 42"-78' RCP
& 2 Flared Ends

Sec. 6 - T124N - R72W



Sec. 7 - T124N - R72W



PLOT SCALE - 1:200

PLOTTED FROM - TRAB17982

PLOT NAME - 6

FILE - U:\REGIONA\PRJ\EDMS0378\190.DGN

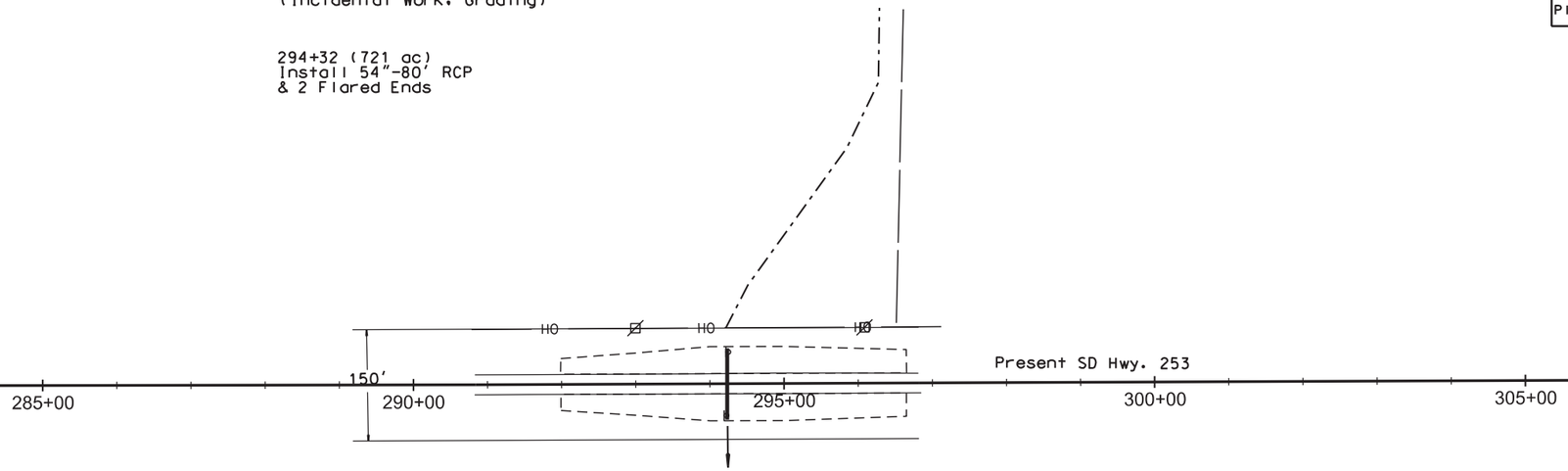
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	P 0253(04)182	34	71

Plotting Date: 05/06/2015

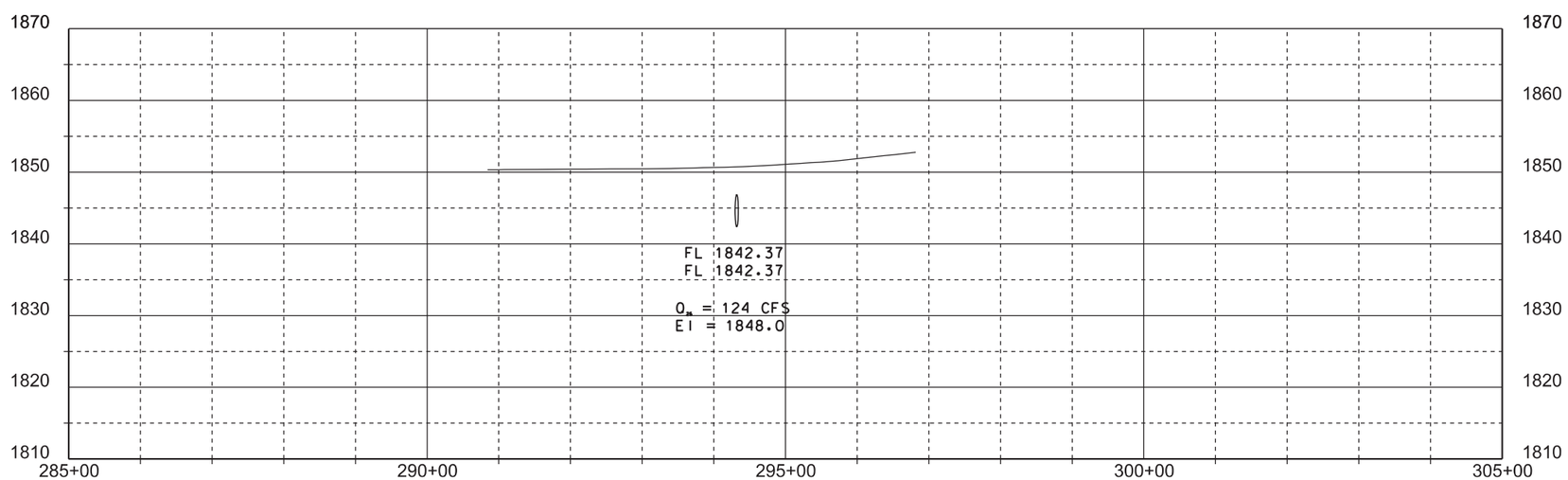
294+32
Take Out 24"-86' CMP
(Incidental Work, Grading)

294+32 (721 ac)
Install 54"-80' RCP
& 2 Flared Ends

Sec. 4 - T124N - R72W



Sec. 9 - T124N - R72W



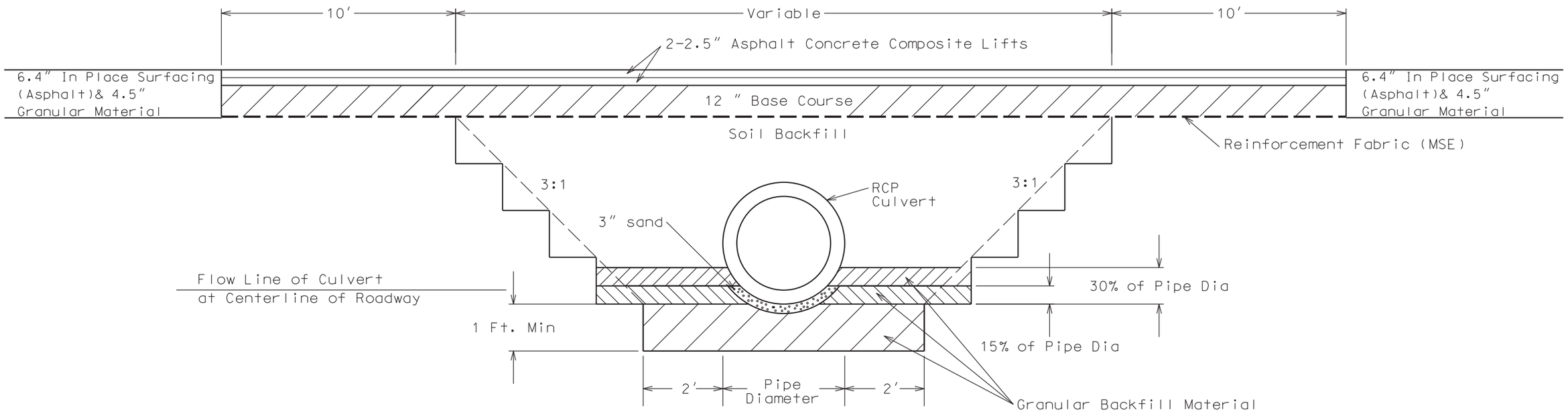
PLOT SCALE - 1:200

PLOT NAME - 7

FILE - U:\REGIONA\PRJ\EDMS0378\280.DGN

PLOTTED FROM - TRAB17982

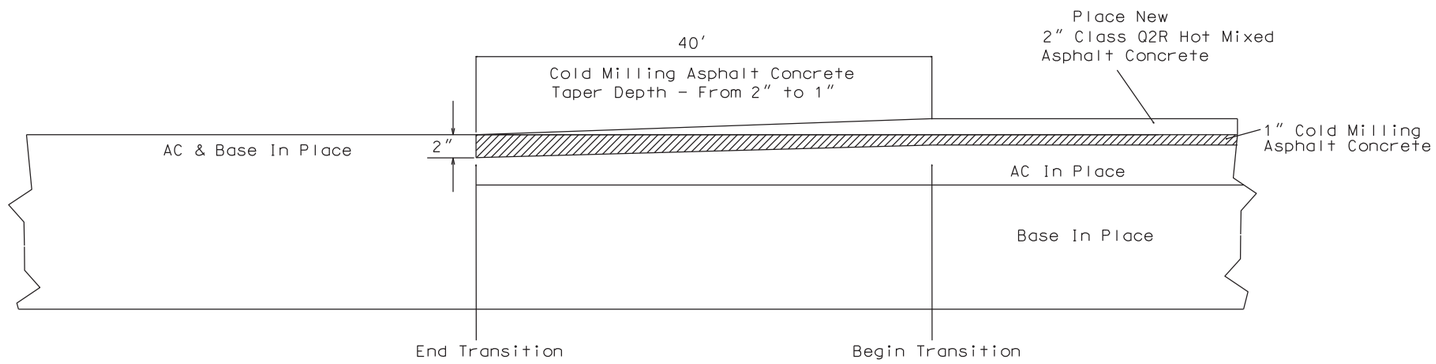
CULVERT REPLACEMENT DETAIL



PLOT SCALE - 1:3.55314
PLOT NAME - 8
FILE -...\0378 CULVERT DETAIL.DGN
PLOTTED FROM - TRAB17886

COLD MILLING DETAILS AT BEGIN & END PROJECT

(Drawing not to scale)

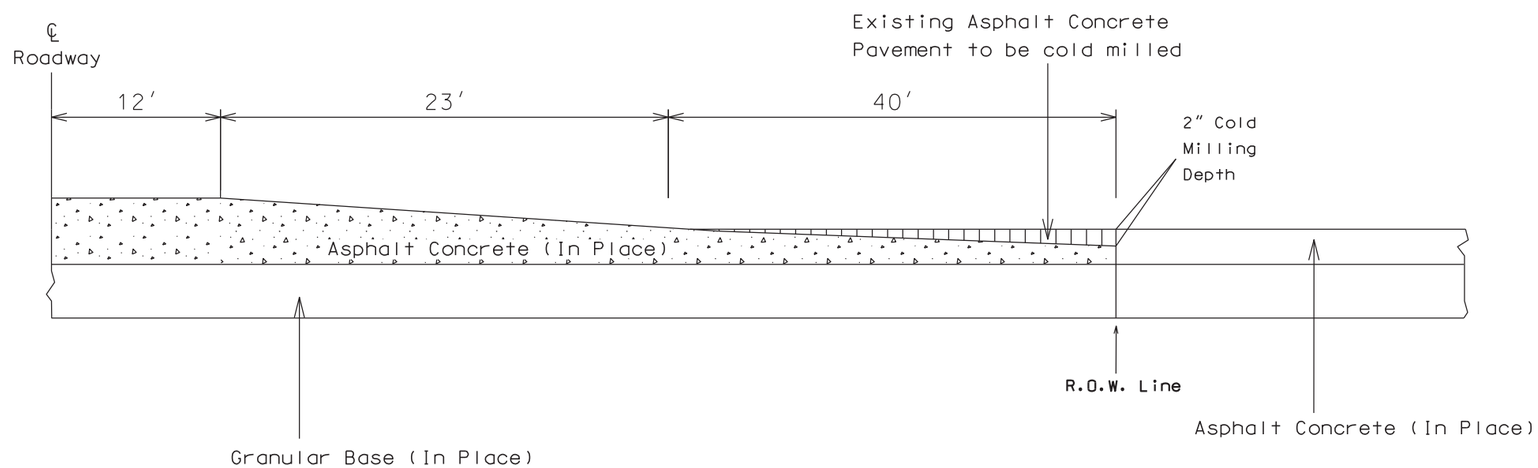


All costs associated with tapering the depth of cold milling asphalt concrete shall be incidental to the contract unit price per square yard for Cold Milling Asphalt Concrete.

COLD MILLING DETAIL AT INTERSECTING ROADS & ENTRANCES

Edmunds County 3 (331th Ave N)

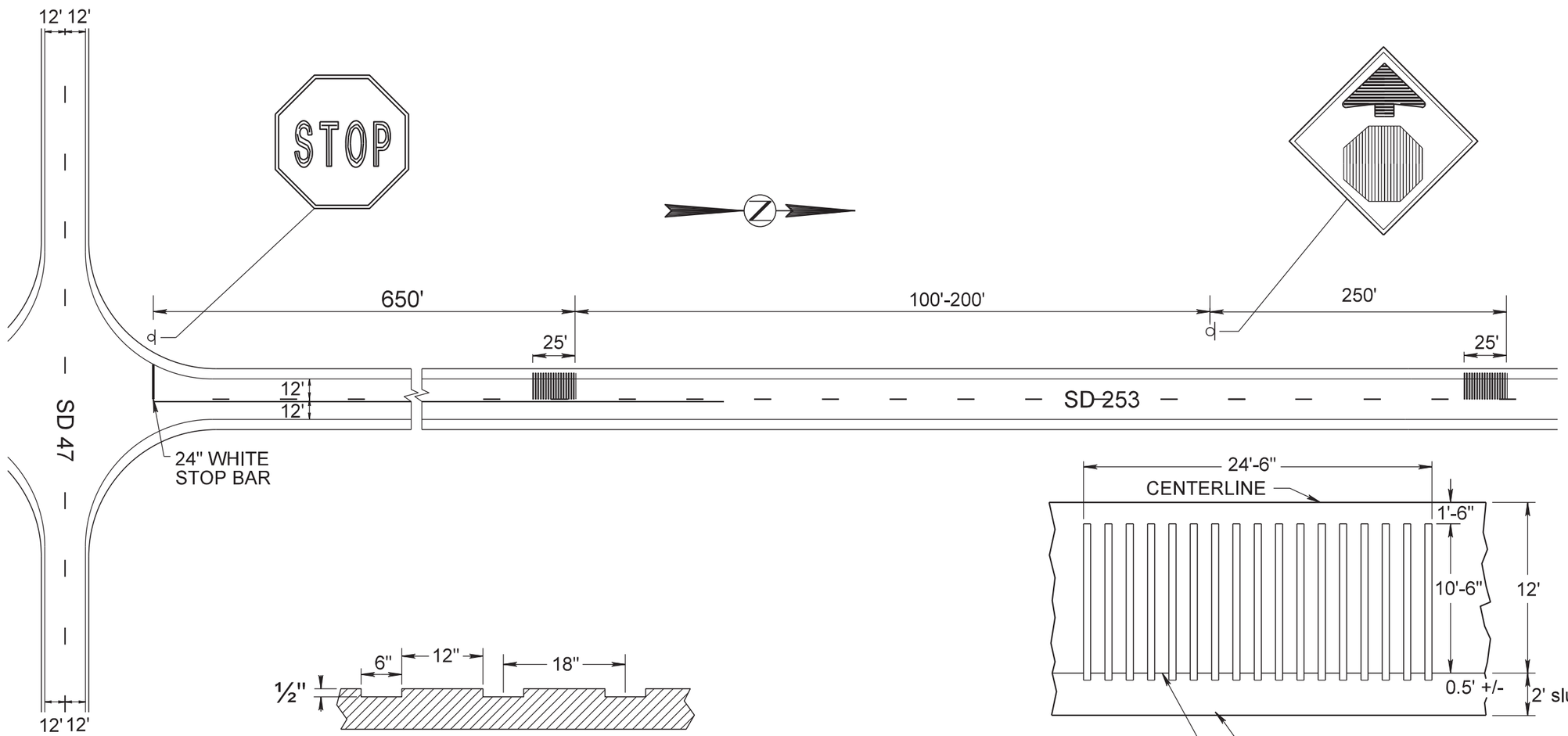
(Drawing is not to Scale)



Cold Mill 40 feet of Asphalt Concrete Pavement (approx. 24 feet wide) to R.O.W.
Included in the Estimate of Quantities is 107 square yards of Cold Milling Asphalt Concrete.

PLOTTED FROM - TRAB17886

RECESSED RUMBLE STRIPS



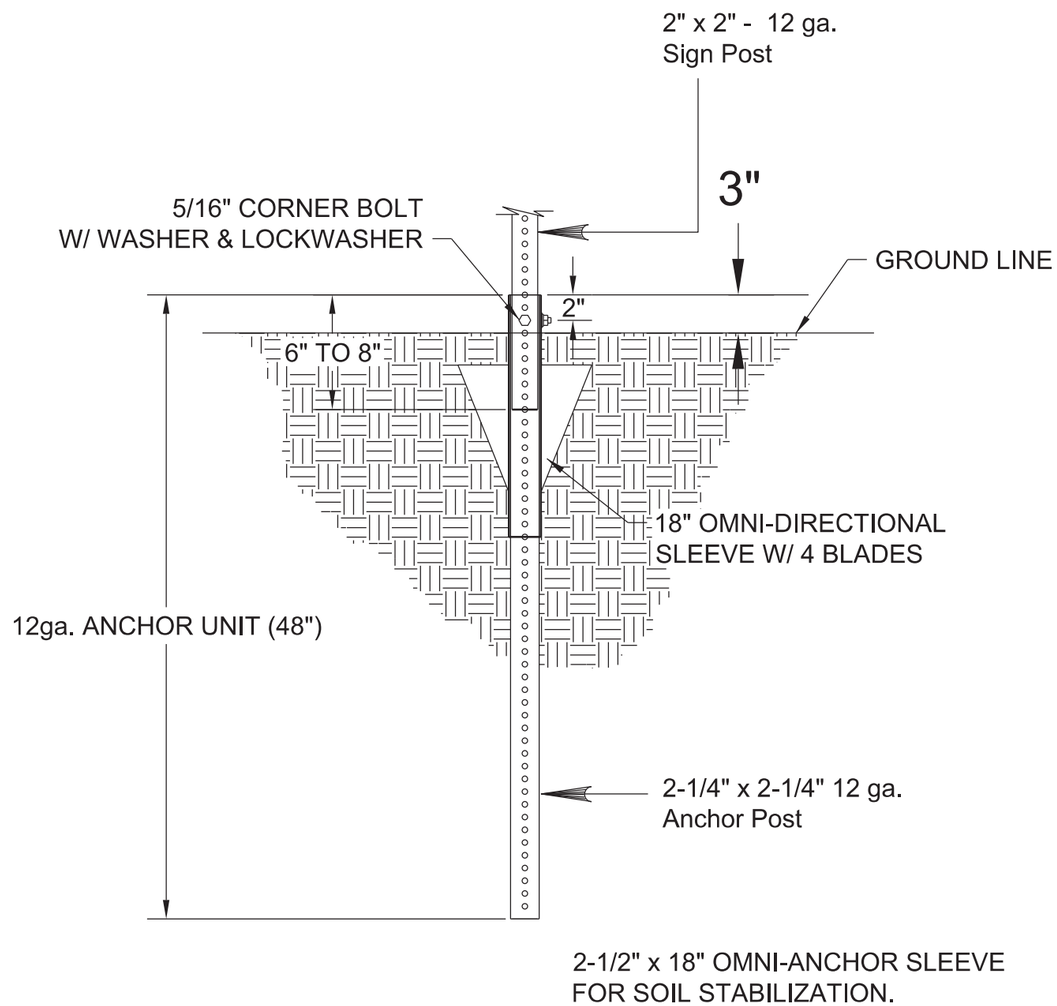
RUMBLE STRIP PROFILE (TYPICAL)

RUMBLE STRIP PLAN VIEW

THE RUMBLE STRIPS SHALL BE ROUTED OR CUT INTO THE ASPHALT CONCRETE SURFACE. THE RUMBLE STRIP CUTS SHOULD EXTEND PAST THE EDGE OF THE DRIVING LANE TO ALLOW FOR DRAINAGE.

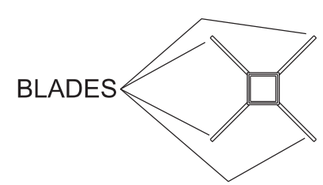
PLOT SCALE - 1:70
PLOT NAME - 1
FILE ...\RECESSED RUMBLE STRIPS.DGN
PLOTTED FROM - TRAB17986

SQUARE TUBE
4 BLADE ANCHOR DETAIL



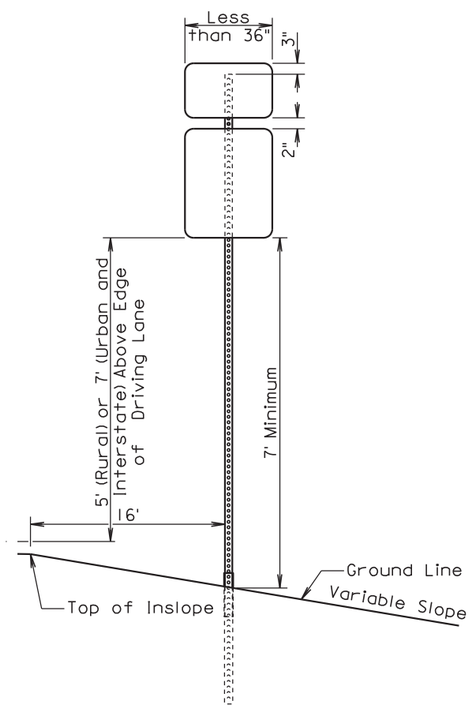
2-1/2" x 18" 12 ga. Omni-Sleeve

ANCHOR SLEEVE
TOP VIEW

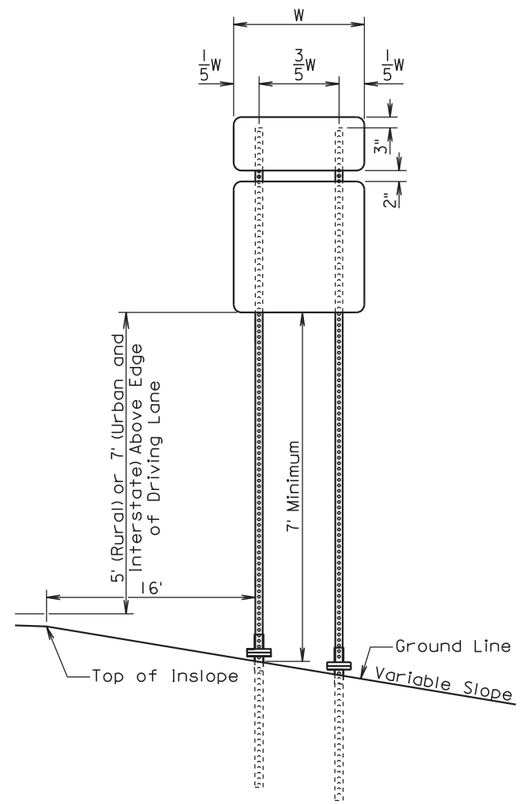


PLOT SCALE - 1:200
PLOTTED FROM - TRAB10100
PLOT NAME - 1
FILE - ...\SIGN POST INSTALL DETAILS.DGN

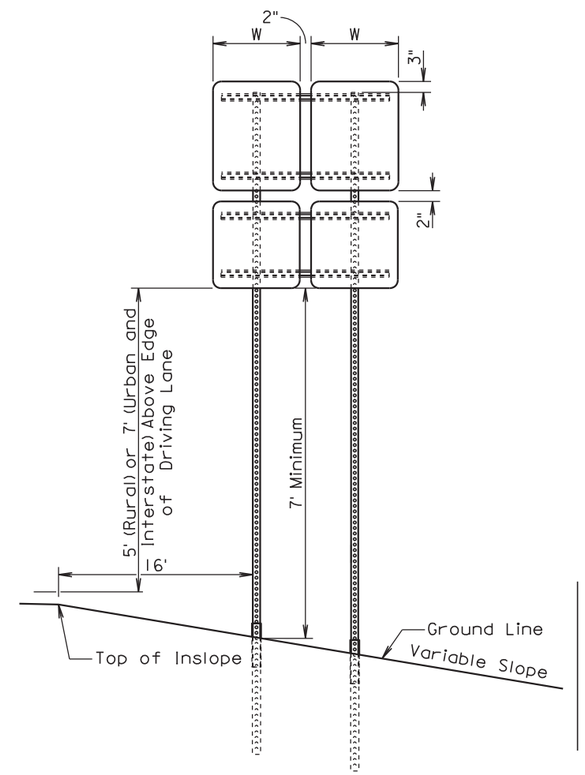
INSTALLATION DETAILS FOR MULTIPLE SIGN ASSEMBLIES



ELEVATION VIEW
(Single post assembly)



ELEVATION VIEW
(Double post assembly)



ELEVATION VIEW
(Double post assembly)

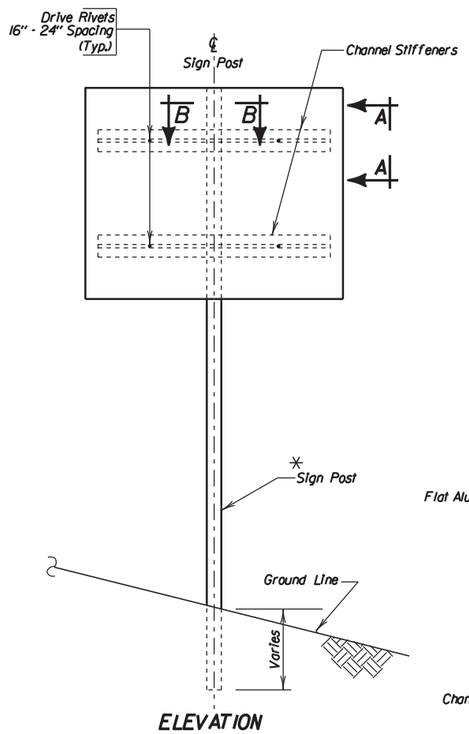
GENERAL NOTES:

The sign posts and bases shown are for illustrative purpose. The post type required shall be the type specified in the plans.

All breakaway sign supports shall comply with NCHRP 350 or MASH crash testing requirements and FHWA requirements. The Contractor shall provide post installation details at the preconstruction meeting for all breakaway sign support assemblies.

PLOT SCALE - 1:200
PLOTTED FROM - TRAB10100
PLOT NAME - 2
FILE - ...\SIGN POST INSTALL DETAILS.DGN

ONE POST BREAKAWAY SIGN SUPPORTS



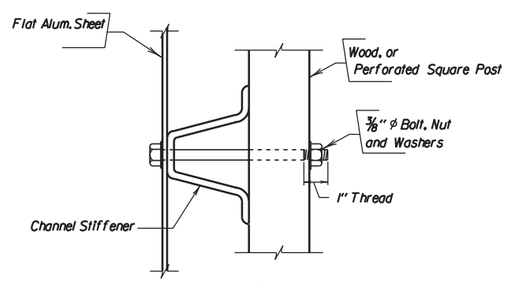
ELEVATION

Ø A plastic washer, as recommended by the sheeting manufacturer, shall be installed between the sign face and the metal washer shown.

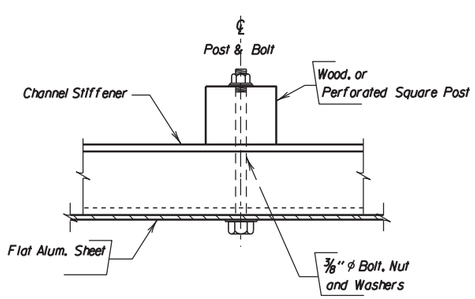
Height and lateral distance as recommended by latest edition of MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.

✳ Single post installation shown. (See applicable Details or Standard Plates shown in these plans for multiple post spacing requirements.)

(Typical Sign and Stiffener Details)

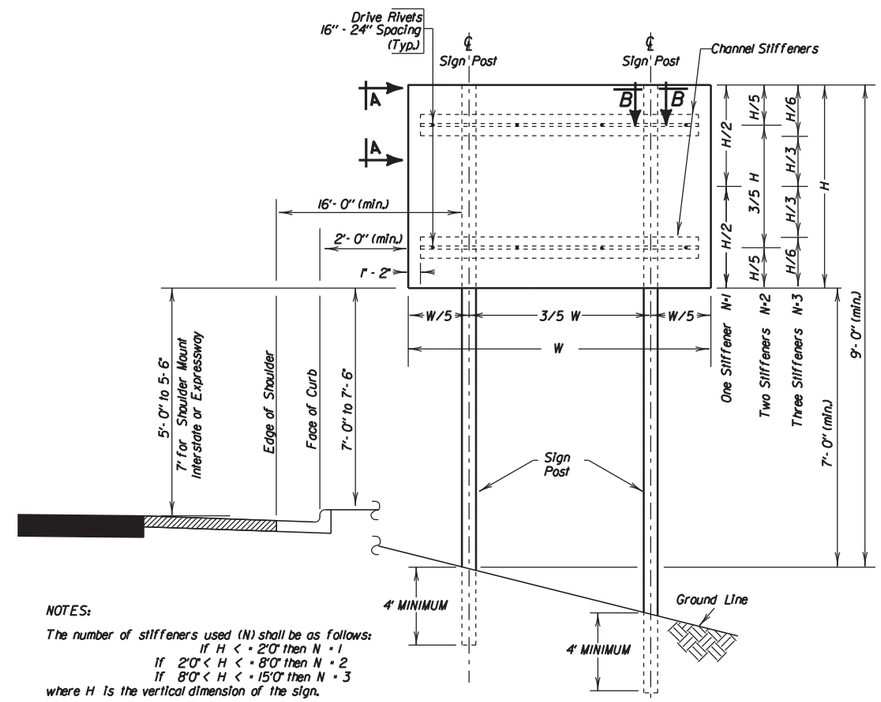


SEC. A-A



SEC. B-B

TWO POST BREAKAWAY SIGN SUPPORTS



NOTES:

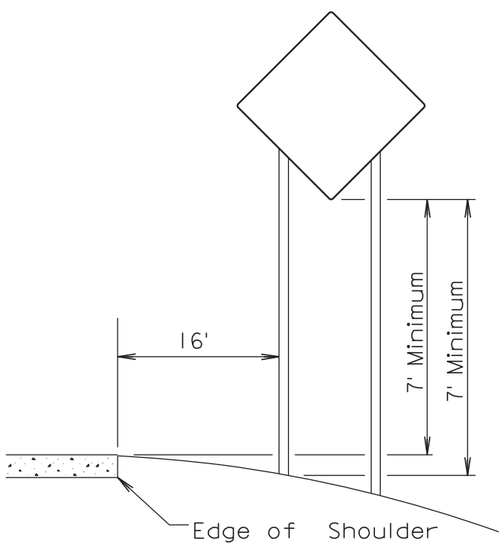
The number of stiffeners used (N) shall be as follows:

If H < = 2'0" then N = 1
If 2'0" < H < = 8'0" then N = 2
If 8'0" < H < = 15'0" then N = 3

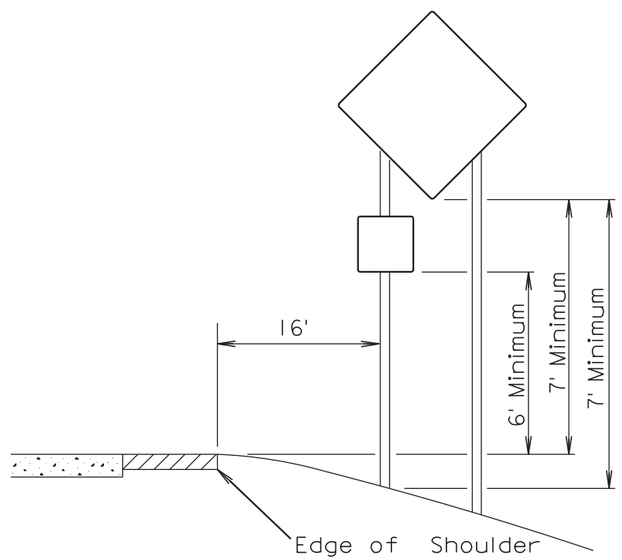
where H is the vertical dimension of the sign.

A minimum of two bolts shall be required to fasten the sign to each post.

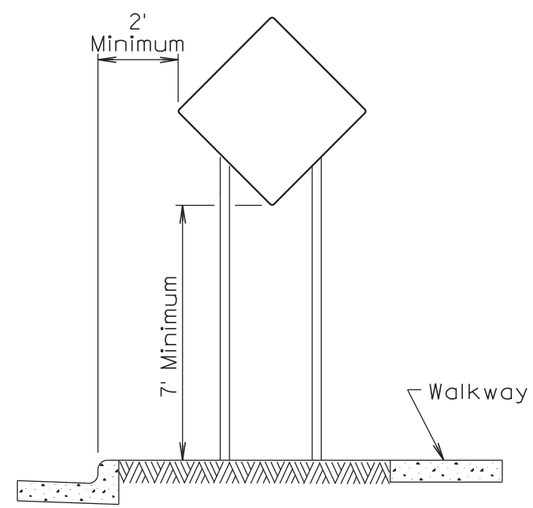
SIGN SUPPORTS
(Lateral Off–Sets)



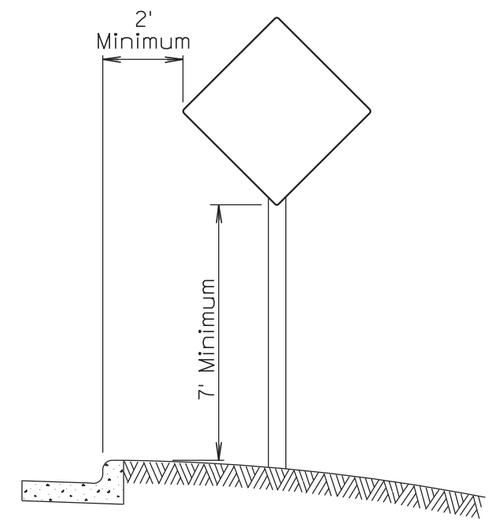
RURAL DISTRICT



RURAL DISTRICT WITH SUPPLEMENTAL PLATE

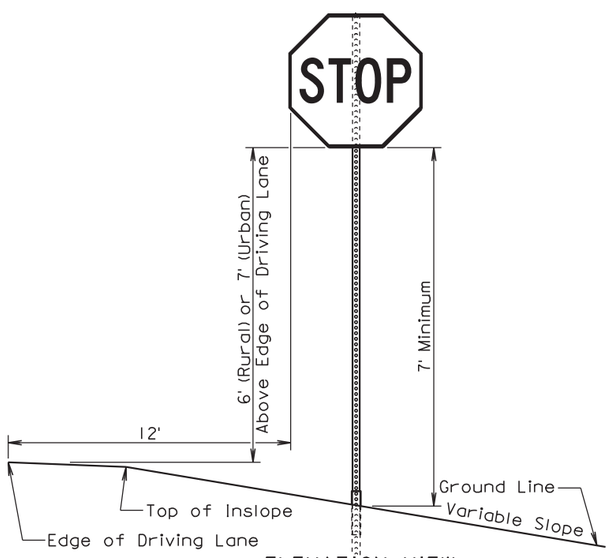


URBAN DISTRICT



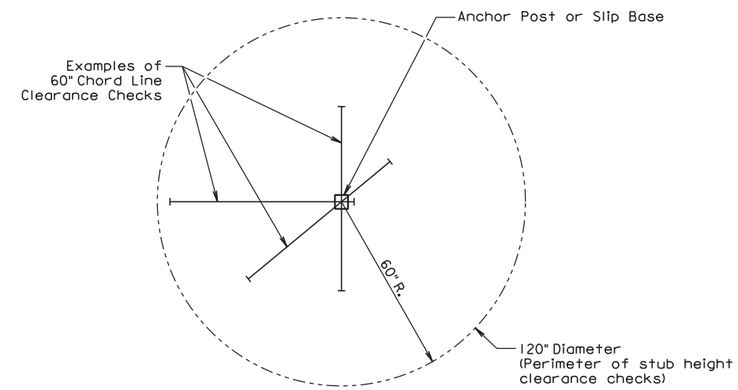
URBAN DISTRICT

INSTALLATION DETAILS FOR STOP SIGNS

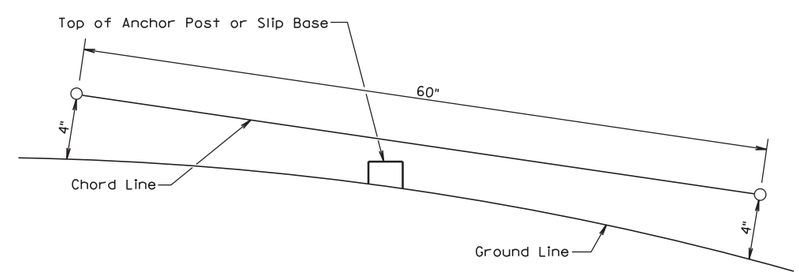


ELEVATION VIEW
(Single post assembly)

BREAKAWAY SUPPORT STUB CLEARANCE



PLAN VIEW
(Examples of stub height clearance checks)

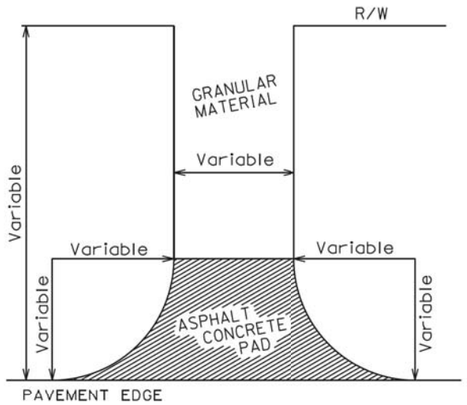


ELEVATION VIEW

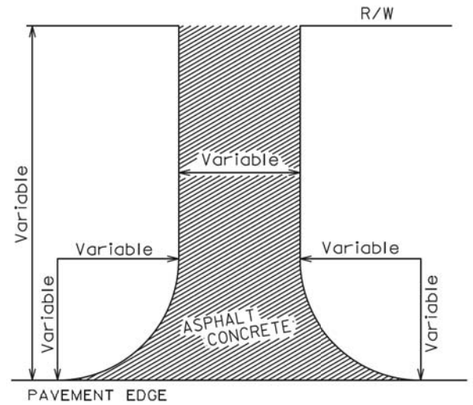
GENERAL NOTES:

The top of anchor posts and slip bases SHALL NOT extend above a 60" chord line within a 120" diameter circle around the post with ends 4" above the ground.

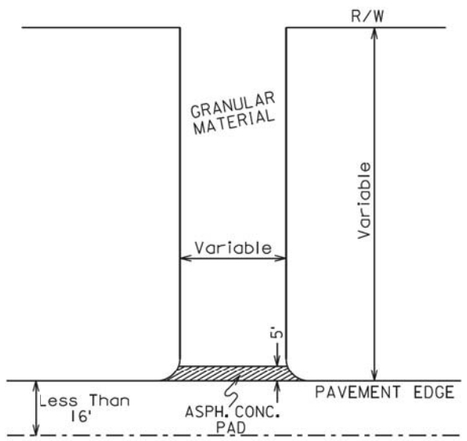
At locations where there is curb and gutter adjacent to the breakaway sign support, the stub height shall be a maximum of 4" above the ground line at the localized area adjacent to the breakaway support stub.



INTERSECTING ROAD
NO ASPHALT CONCRETE SURFACING
BEYOND R/W



INTERSECTING ROAD
ASPHALT CONCRETE SURFACING
BEYOND R/W



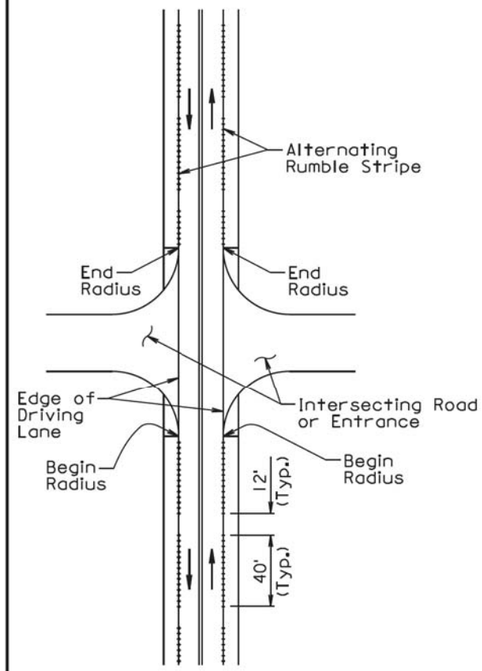
ENTRANCE

The surfacing details shown on this sheet are provided as a guide for surfacing these facilities. The precise construction limits for situations other than the standards shown will be determined by the Engineer, at the time of construction.

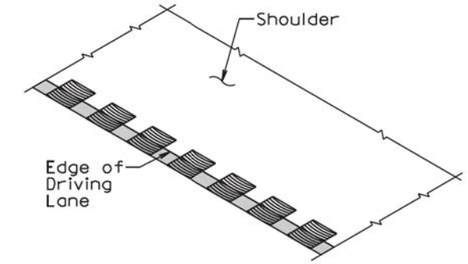
ROADWAY WITH OR WITHOUT SHOULDER

March 31, 2000

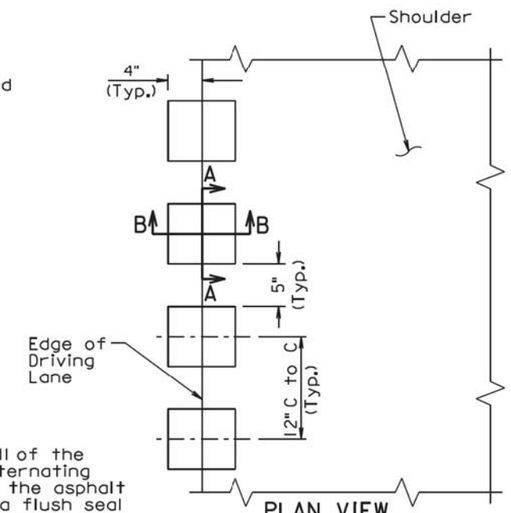
Published Date: 2nd Qtr. 2016	SDDOT	RESURFACING OF INTERSECTING ROADS AND ENTRANCES	PLATE NUMBER 320.10
			Sheet 1 of 1



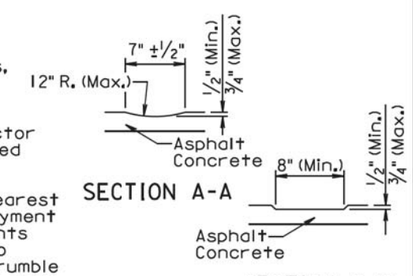
PLAN VIEW



PERSPECTIVE OF TYPICAL
RUMBLE STRIPE IN ASPHALT CONCRETE



PLAN VIEW
TYPICAL RUMBLE STRIPE
IN ASPHALT CONCRETE



SECTION A-A

SECTION B-B

GENERAL NOTES:

A rumble stripe shall be constructed on all of the asphalt concrete shoulders by grinding alternating patterns of 40' continuous indentations in the asphalt concrete. The rumble stripe shall receive a flush seal with the shoulder flush sealing or asphalt surface treatment.

A rumble stripe shall not be constructed through intersecting roads, entrances, and turnouts. The lengths of the 40' segments with continuous indentations and the 12' segments without a rumble stripe adjacent to the intersecting roads, entrances, and turnouts shall be adjusted as approved by the Engineer.

Prior to constructing the rumble stripe the Contractor shall submit to the Engineer, for approval, the proposed method of constructing the rumble stripe.

Measurement of the rumble stripe shall be to the nearest 0.1 of a mile for each shoulder. Measurement and payment of the rumble stripe shall include the 12' long segments without rumble stripes and the segments adjacent to intersecting roads, entrances, and turnouts without rumble stripes. Payment for constructing the rumble stripe shall be at the contract unit price per mile for "Grind 8" Rumble Strip or Stripe in Asphalt Concrete".

June 26, 2011

Published Date: 2nd Qtr. 2016	SDDOT	8" RUMBLE STRIPE IN ASPHALT CONCRETE ON NONDIVIDED HIGHWAY SHOULDERS	PLATE NUMBER 320.20
			Sheet 1 of 1

PLOT SCALE - 1:200
PLOT NAME - 1
FILE - ...\320100320020.DGN
-PLOTTED FROM - TRAB17886

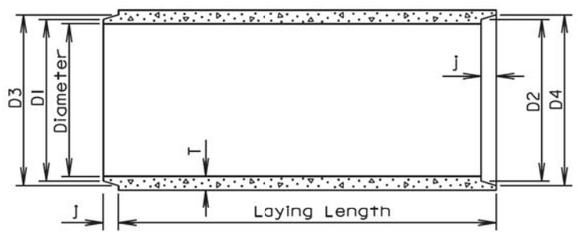
PLOT SCALE - 1:200

PLOT NAME - 3

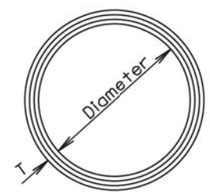
FILE - ...\450010&450110.DGN

TOLERANCES IN DIMENSIONS

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



LONGITUDINAL SECTION



END VIEW

GENERAL NOTES:

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

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

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

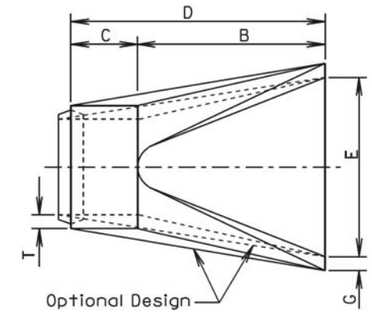
Published Date: 2nd Qtr. 2016

SDDOT

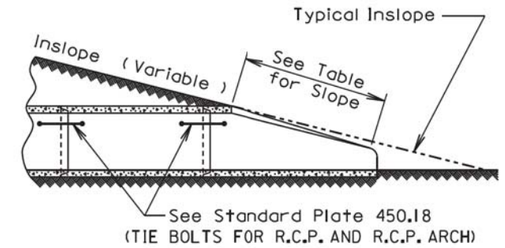
REINFORCED CONCRETE PIPE

PLATE NUMBER 450.01

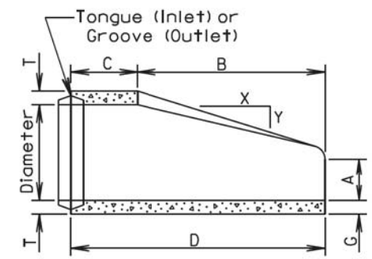
Sheet 1 of 1



TOP VIEW



SLOPE DETAIL

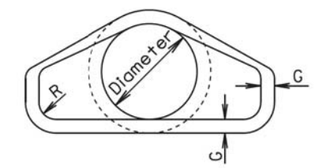


LONGITUDINAL SECTION

GENERAL NOTES:

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

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



END VIEW

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

June 26, 2015

Published Date: 2nd Qtr. 2016

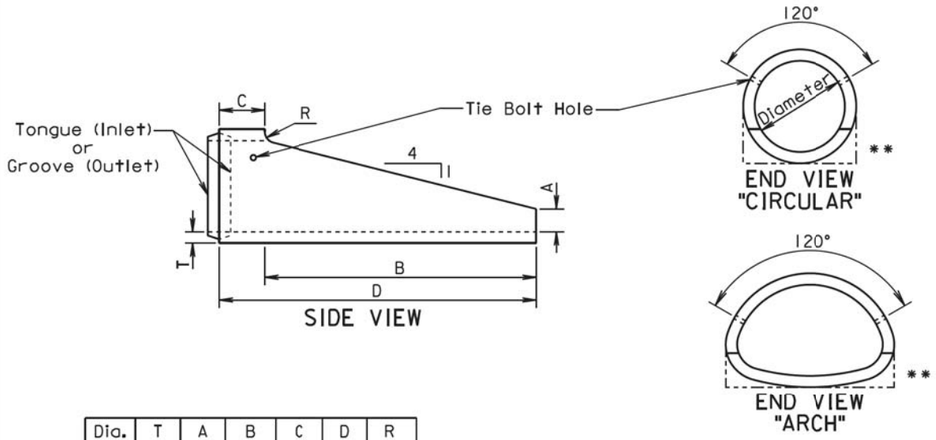
SDDOT

R. C. P. FLARED ENDS

PLATE NUMBER 450.10

Sheet 1 of 1

-PLOTTED FROM - TRAB17886



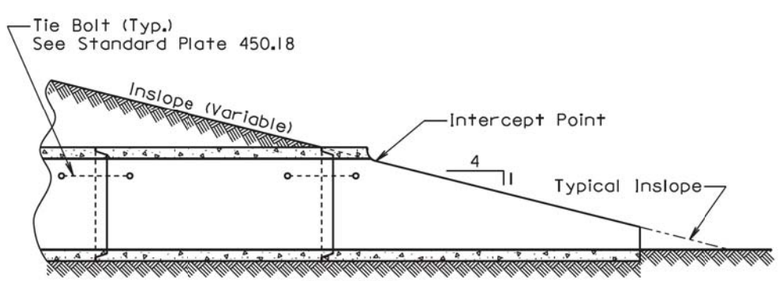
Dia. (in.)	T (in.)	A (in.)	B (in.)	C (in.)	D (in.)	R (in.)
FOR CIRCULAR PIPE						
24	3	6	72	12	84	3
30	3½	7½	90	12	102	3½
FOR ARCH PIPE						
* 24	3	6	48	12	60	3
* 30	3½	7½	60	12	72	3½
* 36	4½	8⅝	66	30	96	0
* 42	4½	10	77¼	18¾	96	0

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

* Equivalent Diameter of Circular R.C.P.

** Acceptable Flat Bottom Alternate.



SECTION
(Along Centerline of Pipe)

GENERAL NOTE:

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

September 22, 2006

Published Date: 2nd Qtr. 2016 | SDDOT | R. C. P. SLOPED ENDS | PLATE NUMBER 450.13 | Sheet 1 of 1

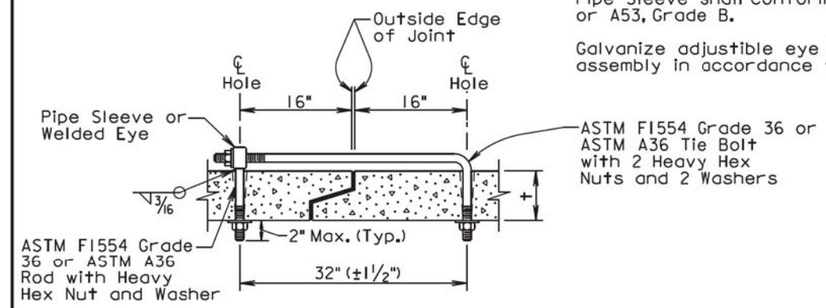
Wall "t" (in.)	Rod Dia. (in.)	Pipe Sleeve Dia. (nominal)
≤ 3¼	⅝	¾
3½-6½	¾	1
≥ 7	1	1¼

GENERAL NOTES:

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

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

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



ADJUSTABLE EYE BOLT TIE

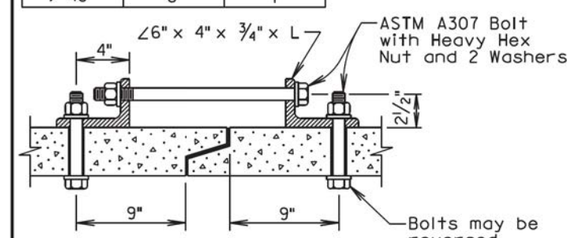
Pipe Dia. (in.)	"L" (in.)	Bolt Dia. (in.)
≤ 48	4	¾
> 48	6	1

GENERAL NOTES:

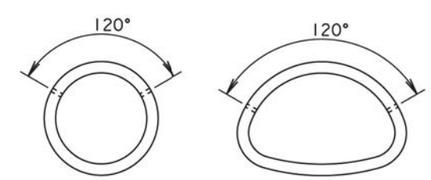
Angles shall conform to ASTM A36.

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

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



ANGLE AND BOLT TIE



END VIEW
"CIRCULAR"

END VIEW
"ARCH"

GENERAL NOTES:

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

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

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

February 28, 2013

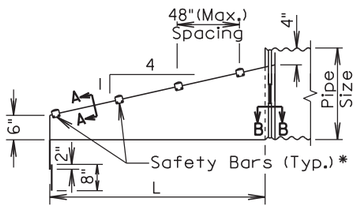
Published Date: 2nd Qtr. 2016 | SDDOT | TIE BOLTS FOR R.C.P. AND R.C.P. ARCH | PLATE NUMBER 450.18 | Sheet 1 of 1

PLOT SCALE - 1:200

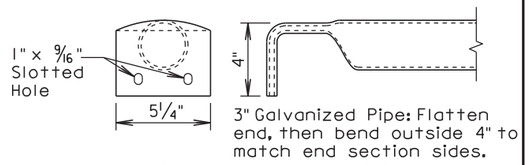
PLOTTED FROM - TRAB17886

PLOT NAME - 5

FILE - ...\45013&45018.DGN

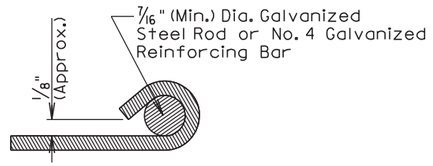


ELEVATION VIEW

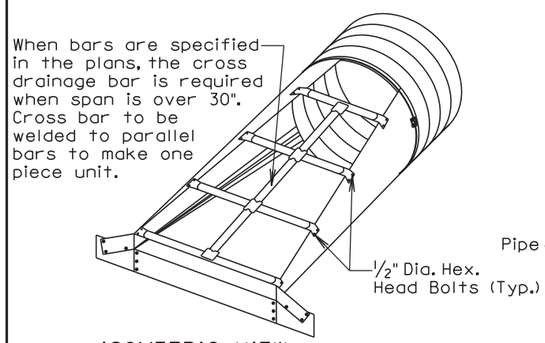


DETAIL OF SAFETY BARS

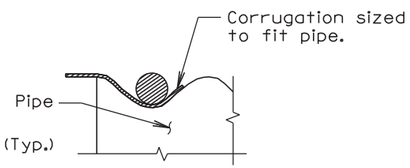
*Number of bars required will vary depending on the length of the end section.



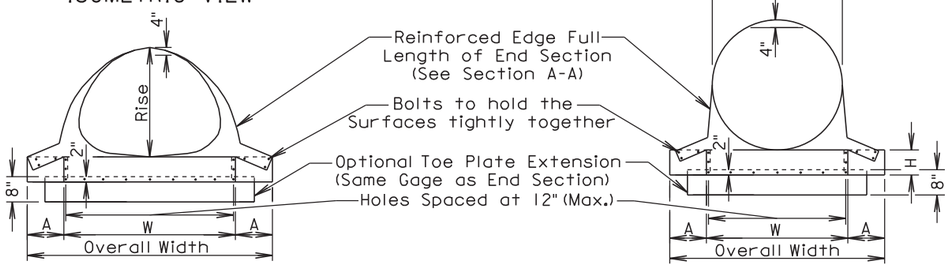
SECTION A-A



ISOMETRIC VIEW

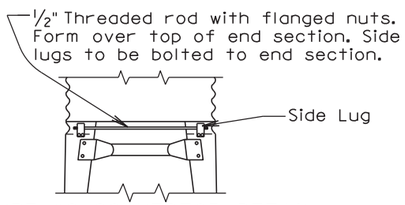


SECTION B-B

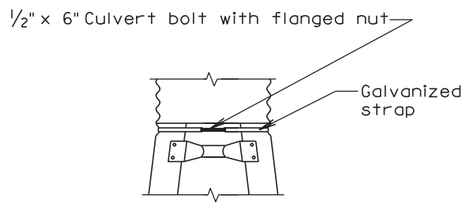


FRONT VIEW

FRONT VIEW



TYPE #2 CONNECTOR DETAIL
(For 30" and Larger)
(For 21" X 15" and Larger)



TYPE #1 CONNECTOR DETAIL
(For 15" Through 24")

February 10, 2014

Published Date: 2nd Qtr. 2016	SDDOT	C. M. P. SLOPED ENDS	PLATE NUMBER 450.37
			Sheet 1 of 2

ARCH C.M.P. SLOPED ENDS										
Equv. Dia. (Inch)	(Inches)		Min. Thick.		Dimensions (Inches)				L Dimensions	
	Span	Rise	Inch	Gage	A	H	W	Overall Width	Slope	Length (Inch)
18	21	15	.064	16	8	6	27	43	4:1	20
21	24	18	.064	16	8	6	30	46	4:1	32
24	28	20	.064	16	8	6	34	50	4:1	40
30	35	24	.079	14	12	9	41	65	4:1	56
36	42	29	.109	12	12	9	48	72	4:1	76
42	49	33	.109	12	16	12	55	87	4:1	92
48	57	38	.109	12	16	12	63	95	4:1	112
54	64	43	.109	12	16	12	70	102	4:1	132
60	71	47	.109	12	16	12	77	109	4:1	148
72	83	57	.109	12	16	12	89	121	4:1	188

CIRCULAR C.M.P. SLOPED ENDS								
Pipe Dia. (Inch)	Min. Thick.		Dimensions (Inches)				L Dimensions	
	Inch	Gage	A	H	W	Overall Width	Slope	Length (Inch)
15	.064	16	8	6	21	37	4:1	20
18	.064	16	8	6	24	40	4:1	32
21	.064	16	8	6	27	43	4:1	44
24	.064	16	8	6	30	46	4:1	56
30	.109	12	12	9	36	60	4:1	80
36	.109	12	12	9	42	66	4:1	104
42	.109	12	16	12	48	80	4:1	128
48	.109	12	16	12	54	86	4:1	152
54	.109	12	16	12	60	92	4:1	176
60	.109	12	16	12	66	98	4:1	200

GENERAL NOTES:

Safety bars shall be attached to sloped ends over 30" in diameter only when specified in the plans.

Sloped ends shall be fabricated from galvanized steel and shall conform 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.

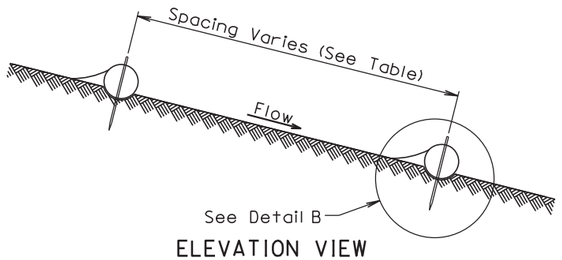
Installation shall be performed in accordance with the Specifications.

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

February 10, 2014

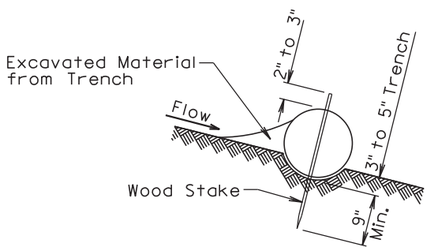
Published Date: 2nd Qtr. 2016	SDDOT	C. M. P. SLOPED ENDS	PLATE NUMBER 450.37
			Sheet 2 of 2

PLOTTED FROM - TRAB17882

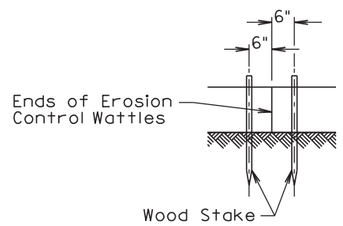


ELEVATION VIEW
CUT OR FILL SLOPE INSTALLATION

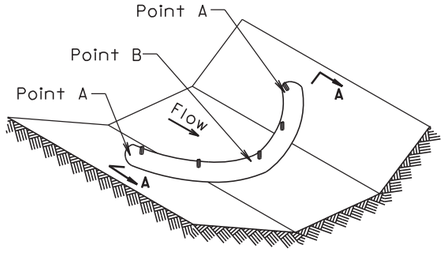
CUT OR FILL SLOPE INSTALLATION	
Slope	Spacing (Ft)
1:1	10
2:1	20
3:1	30
4:1	40



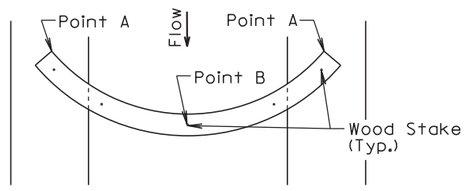
DETAIL B
(TYPICAL OF ALL INSTALLATIONS)



DETAIL C

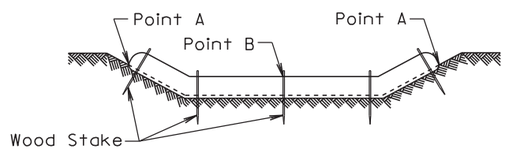


ISOMETRIC VIEW
DITCH INSTALLATION



PLAN VIEW
DITCH INSTALLATION

DITCH INSTALLATION	
Grade	Spacing (Ft)
2%	150
3%	100
4%	75
5%	50



SECTION A-A

December 23, 2004

Published Date: 2nd Qtr. 2016

SDDOT

EROSION CONTROL WATTLE

PLATE NUMBER 734.06

Sheet 1 of 2

GENERAL NOTES:

At cut or fill slope installations, wattles shall be installed along the contour and perpendicular to the water flow.

At ditch installations, point A must be higher than point B to ensure that water flows over the wattle and not around the ends.

The Contractor shall dig a 3" to 5" trench, install the wattle tightly in the trench so that daylight can not be seen under the wattle, and then compact the soil excavated from the trench against the wattle on the uphill side. See Detail B.

The stakes shall be 1"x2" or 2"x2" wood stakes, however, other types of stakes such as rebar may be used only if approved by the Engineer. The stakes shall be placed 6" from the ends of the wattles and the spacing of the stakes along the wattles shall be 3' to 4'.

Where installing running lengths of wattles, the Contractor shall butt the second wattle tightly against the first and shall not overlap the ends. See Detail C.

The Contractor and Engineer shall inspect the erosion control wattles once every week and within 24 hours after every rainfall event greater than ½". The Contractor shall remove, dispose, or reshape the accumulated sediment when necessary as determined by the Engineer.

Sediment removal, disposal, or necessary shaping shall be as directed by the Engineer. All costs for removing accumulated sediment, disposal of sediment, and necessary shaping shall be incidental to the contract unit price per cubic yard for "Remove Sediment".

All costs for furnishing and installing the erosion control wattles including labor, equipment, and materials shall be incidental to the contract unit price per foot for the corresponding erosion control wattle bid item.

All costs for removing the erosion control wattle from the project including labor, equipment, and materials shall be incidental to the contract unit price per foot for "Remove Erosion Control Wattle".

December 23, 2004

Published Date: 2nd Qtr. 2016

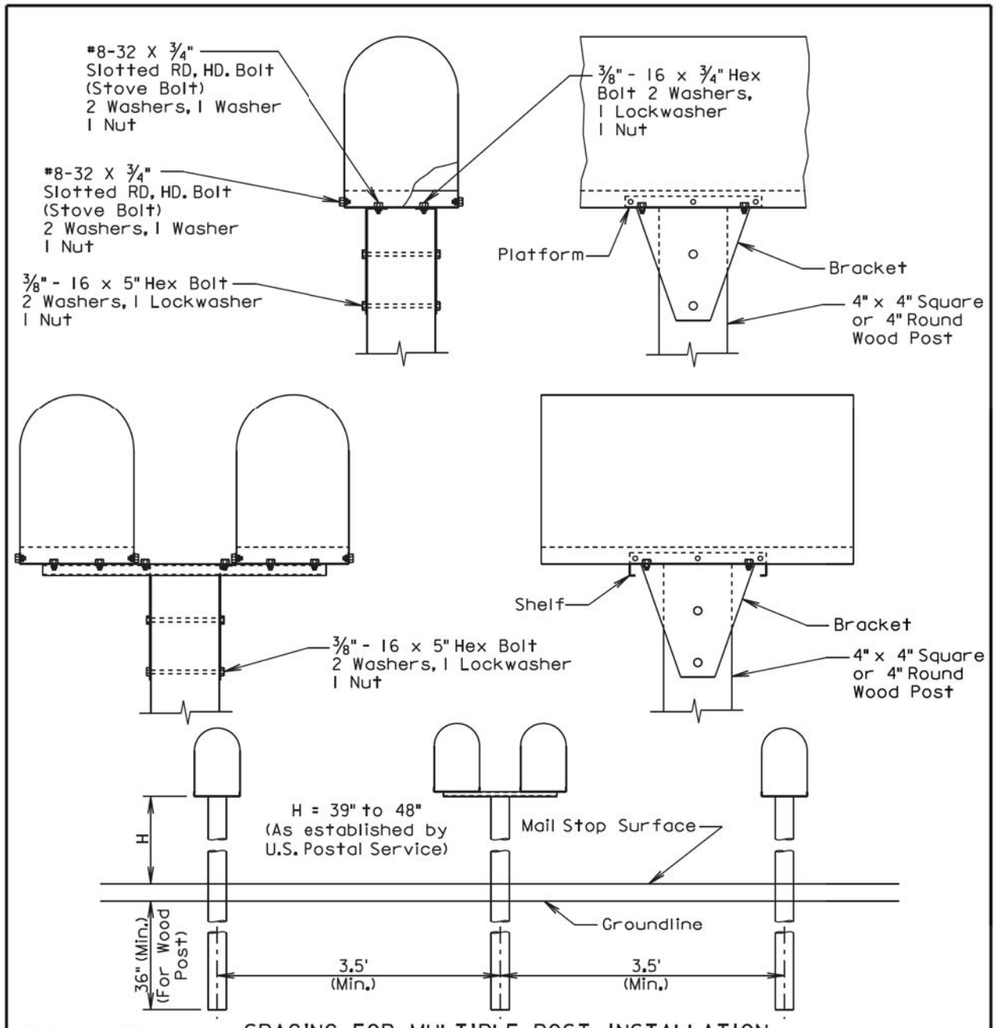
SDDOT

EROSION CONTROL WATTLE

PLATE NUMBER 734.06

Sheet 2 of 2

PLOTTED FROM - TRAB17982



SPACING FOR MULTIPLE POST INSTALLATION

GENERAL NOTES:

The post support assemblies provided should be consistant throughout the project.

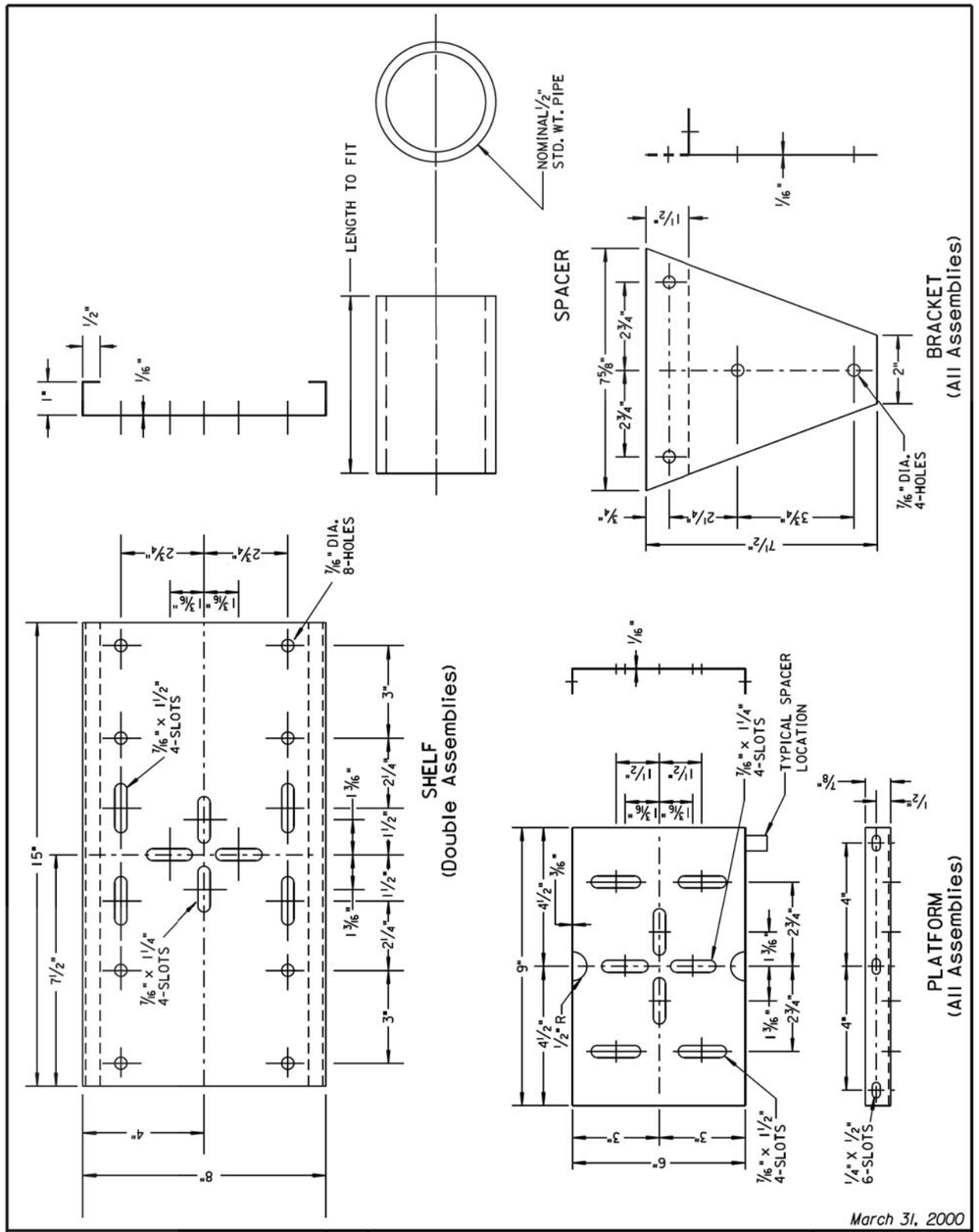
Single and double mailboxes may be in any sequence.

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

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

September 6, 2013

Published Date: 2nd Qtr. 2016	SDDOT	SINGLE AND DOUBLE MAILBOX ASSEMBLIES	PLATE NUMBER 900.02
			Sheet 1 of 1



March 31, 2000

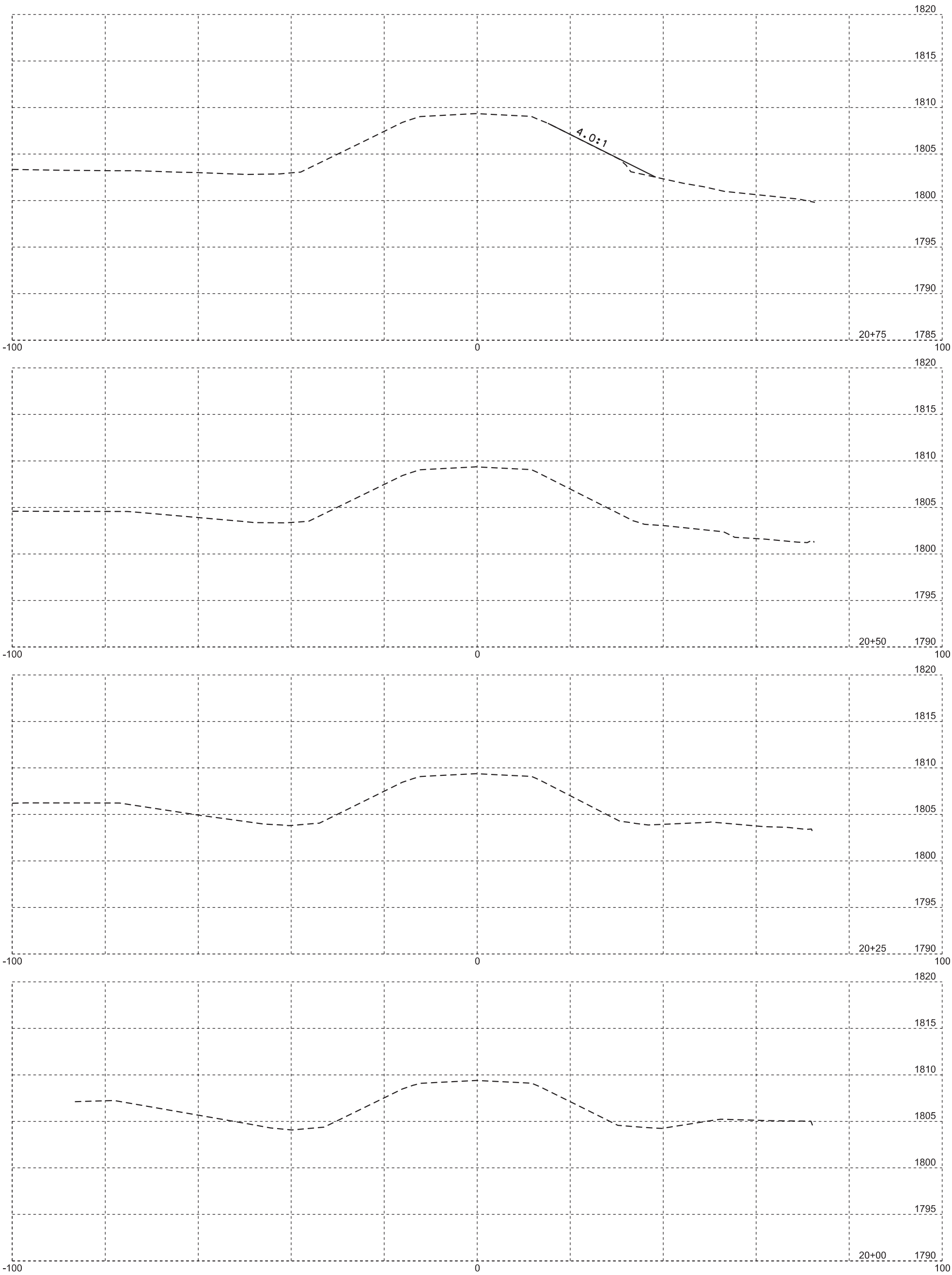
Published Date: 2nd Qtr. 2016	SDDOT	MAILBOX SUPPORT HARDWARE	PLATE NUMBER 900.03
			Sheet 1 of 1

PLOT SCALE - 1:200

PLOT NAME - 9

FILE - ...\900002&900003.DGN

-PLOTTED FROM - TRAB17886



Plotting Date: 07/14/2016

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
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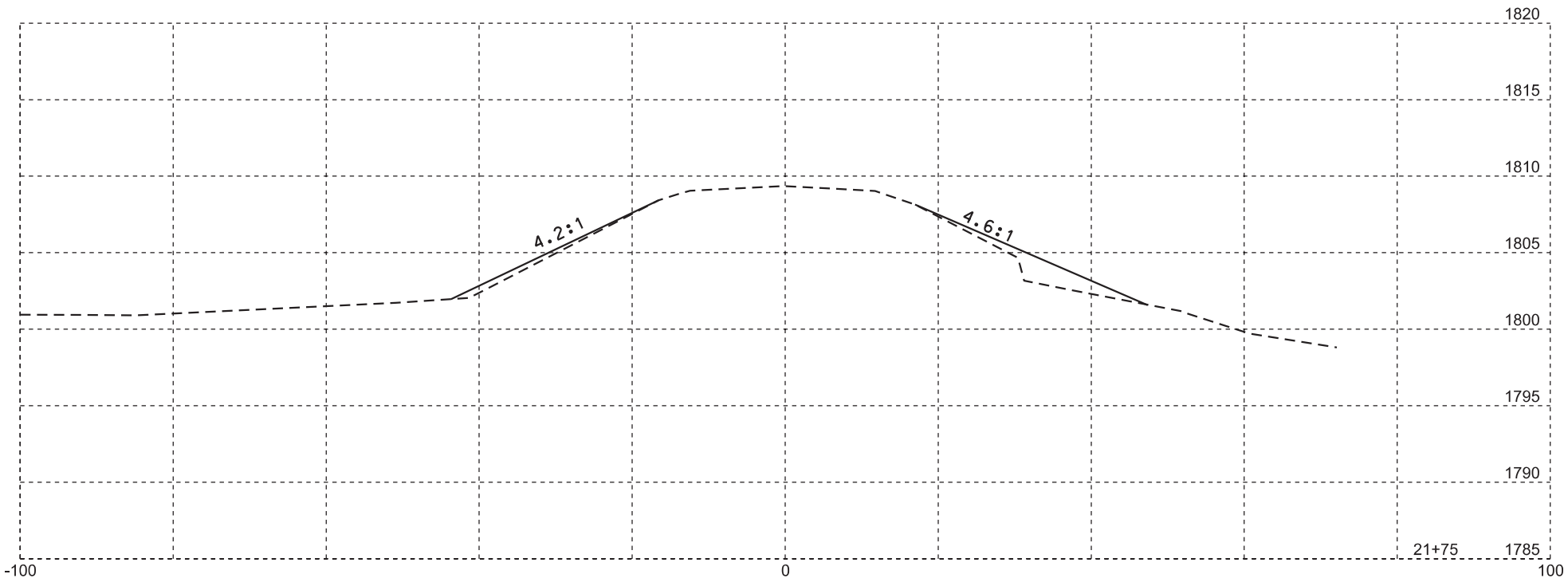

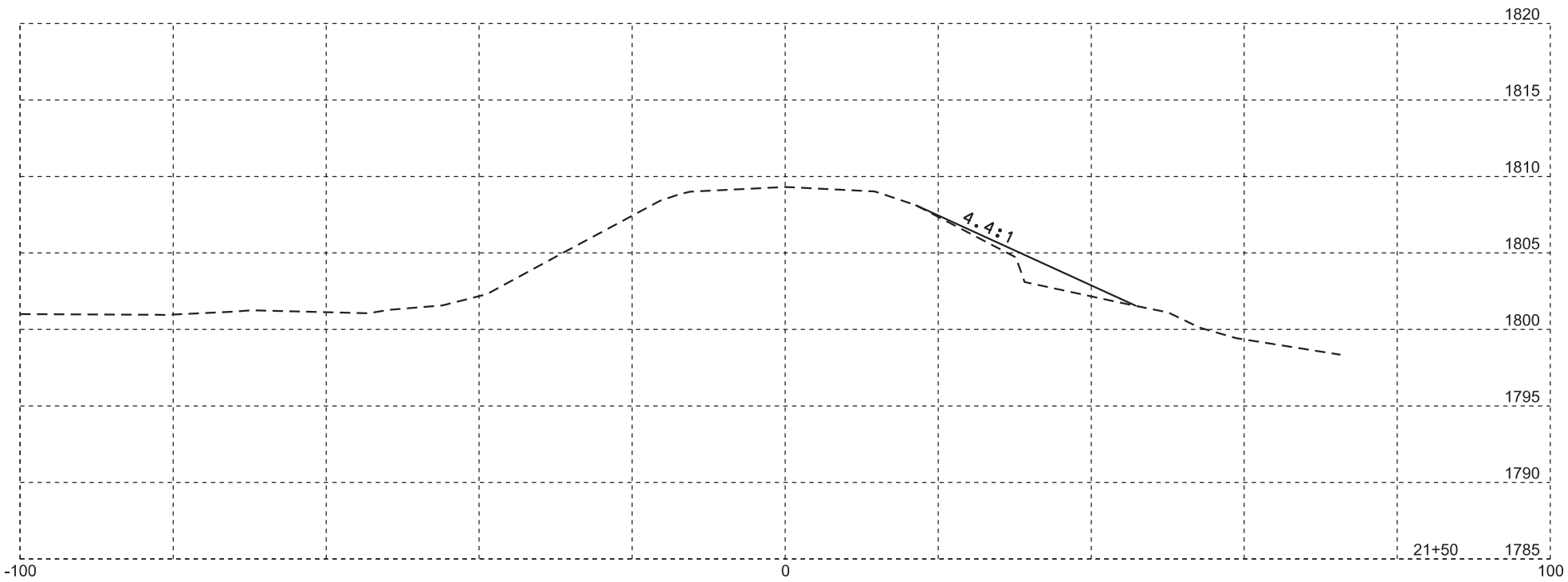

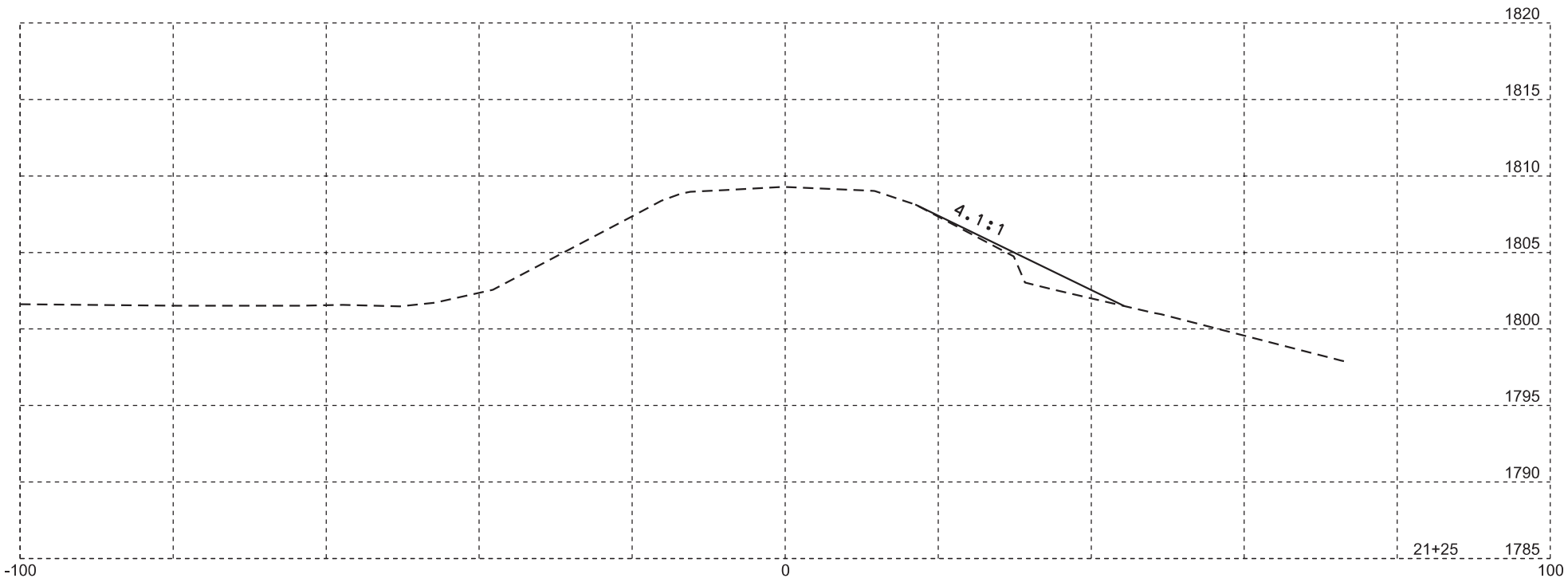

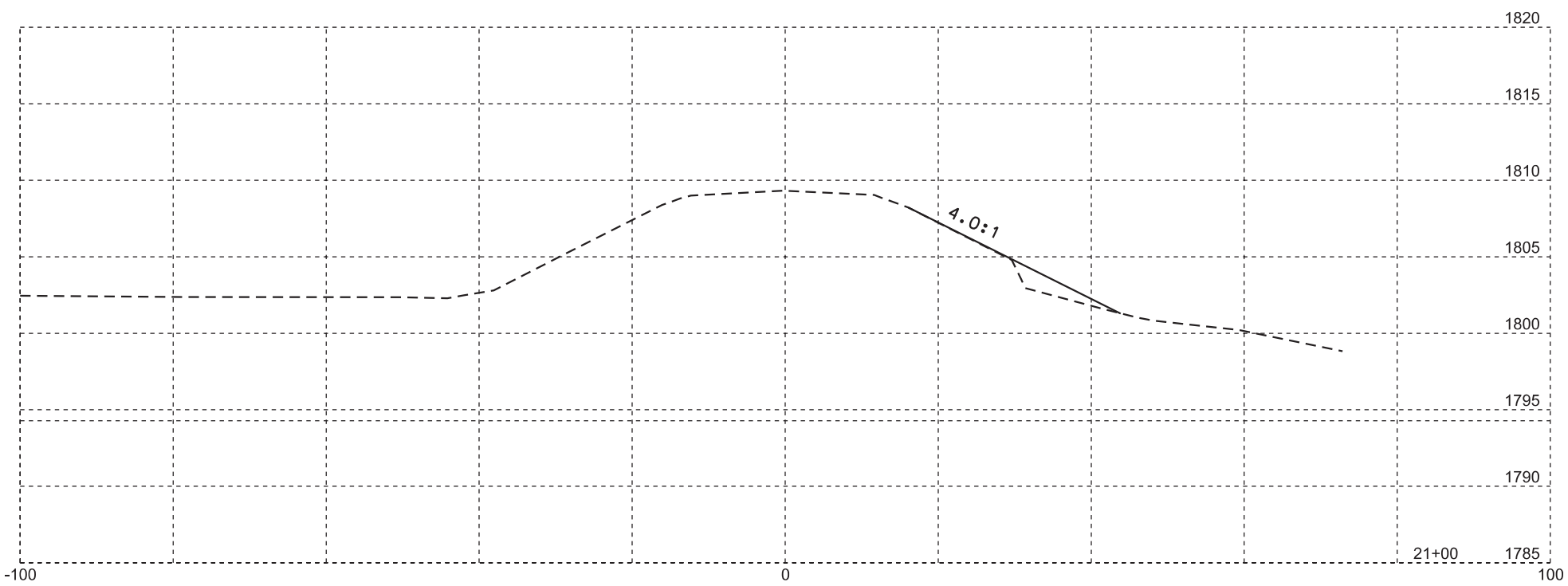

Plotting Date: 07/14/2016

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
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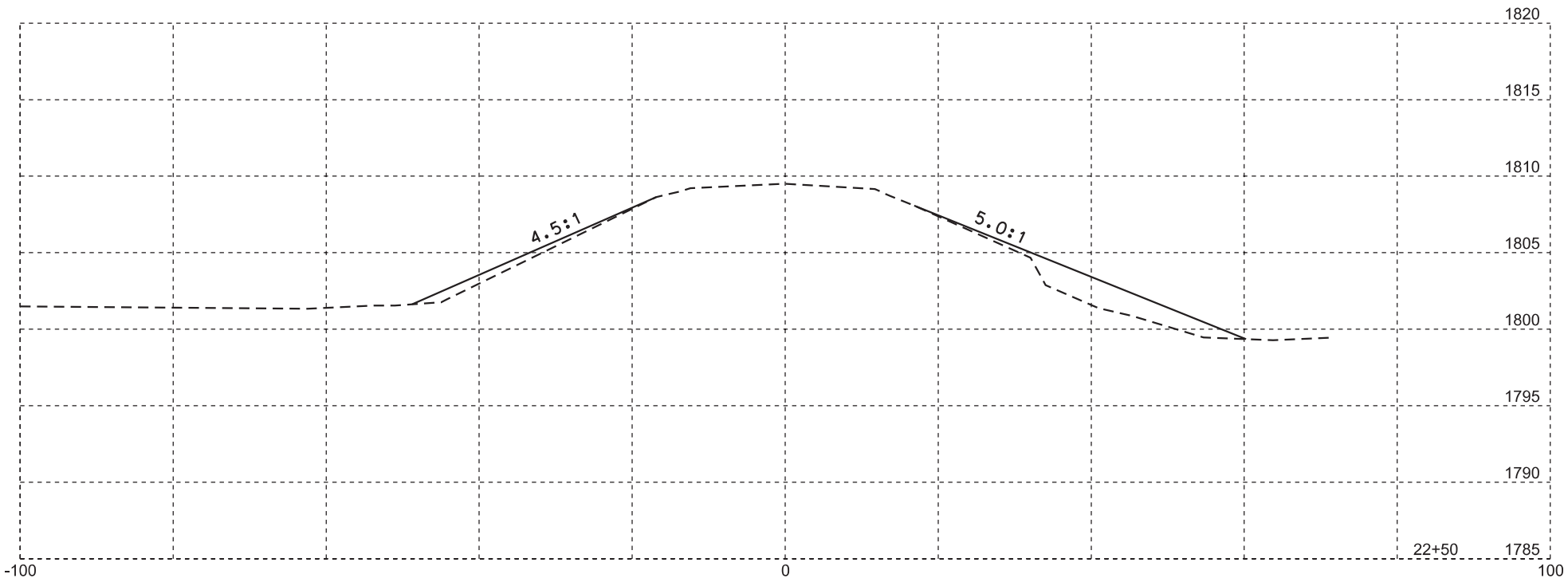

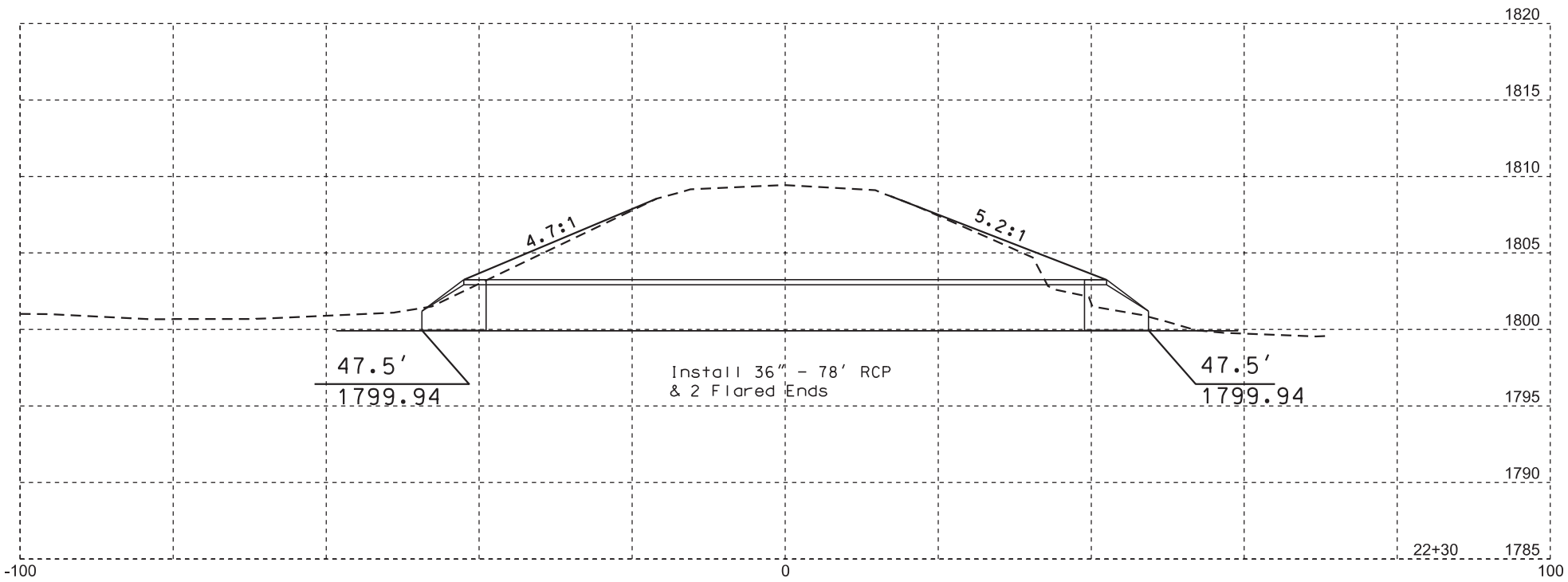

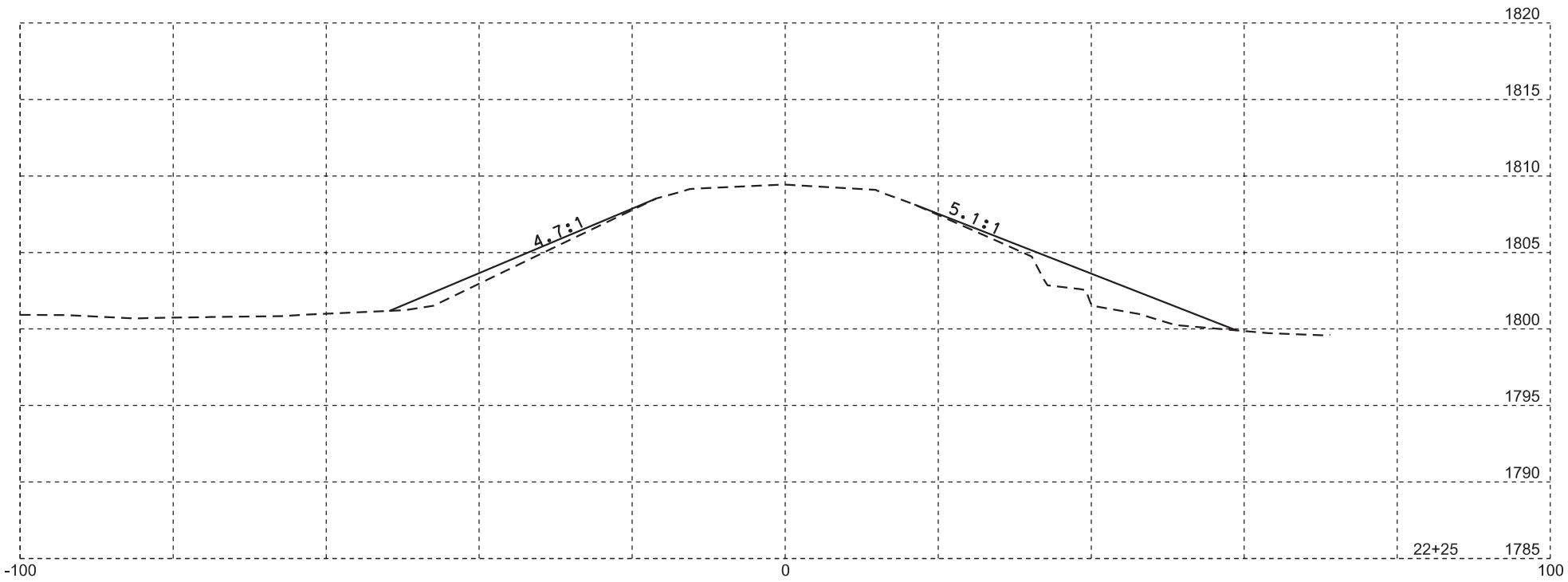

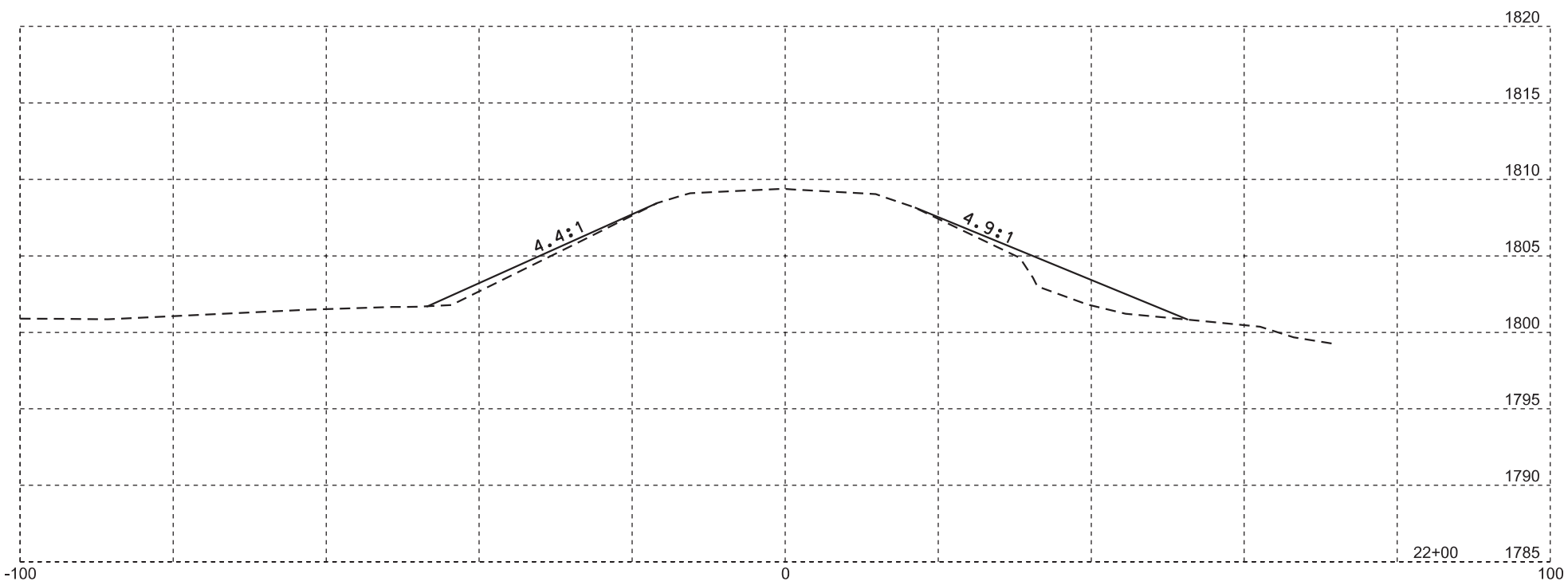

Plotting Date: 07/14/2016

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
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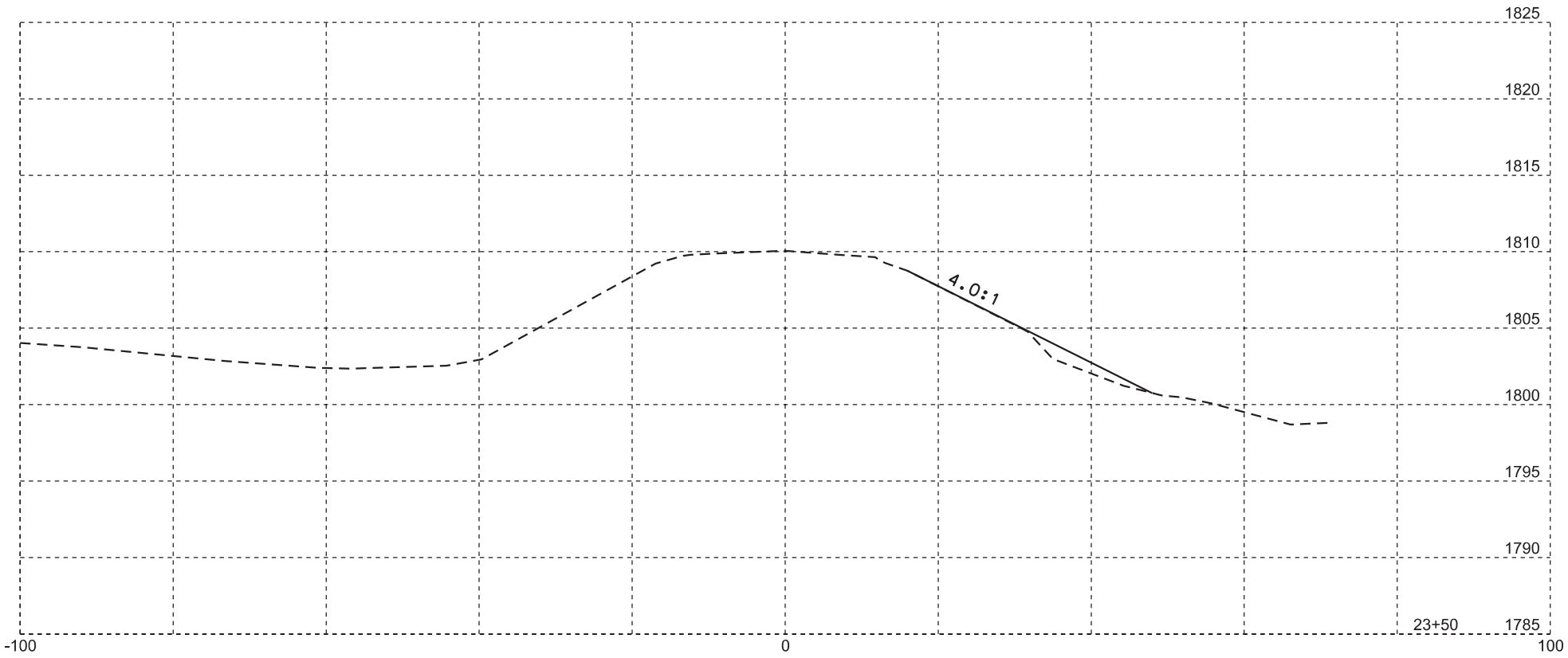

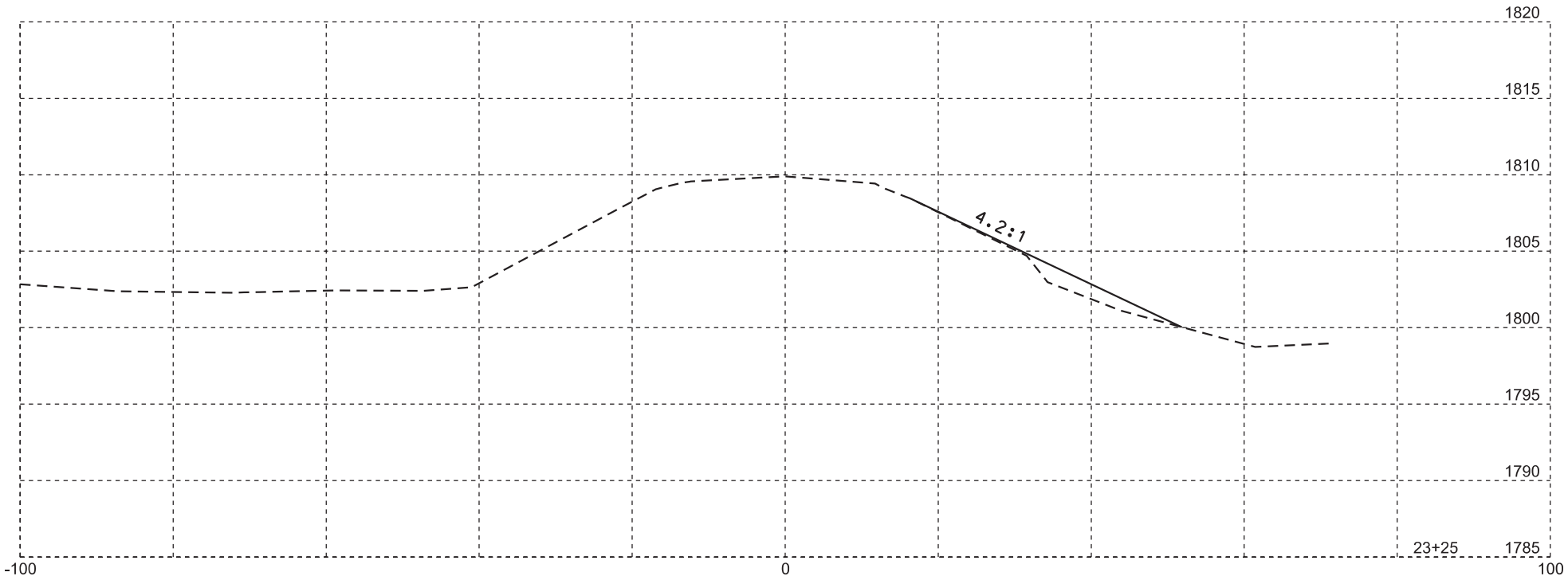

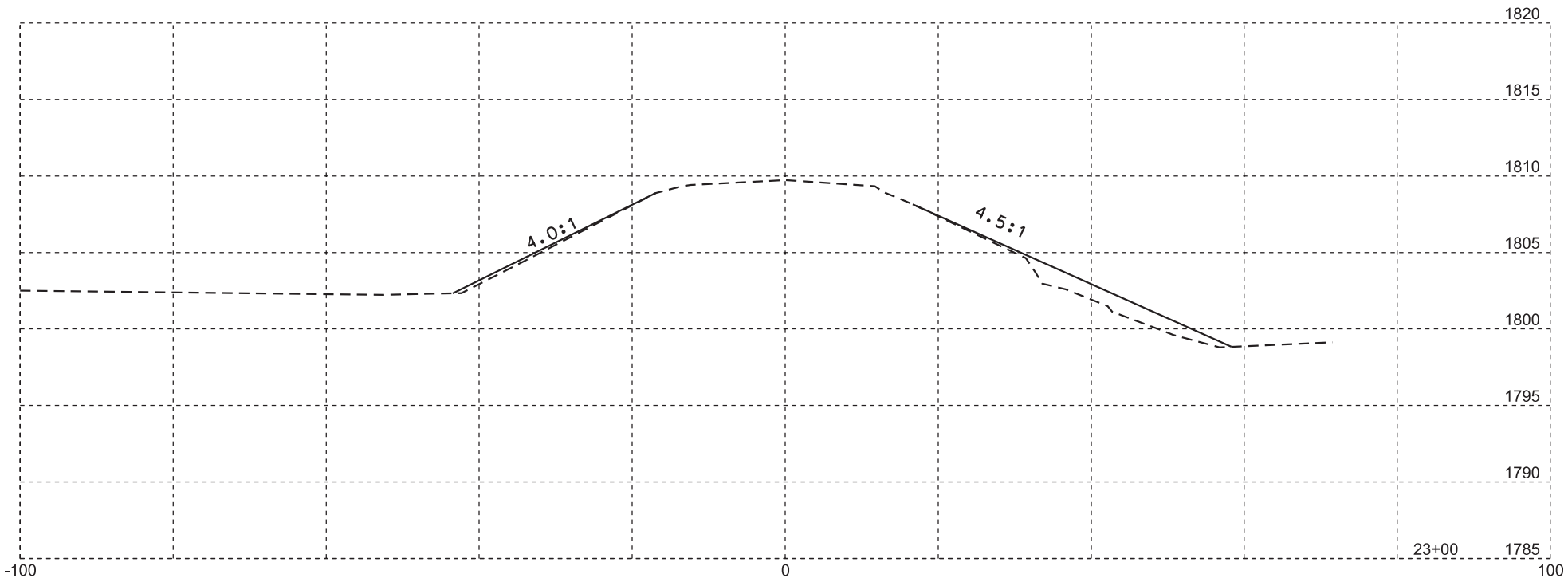

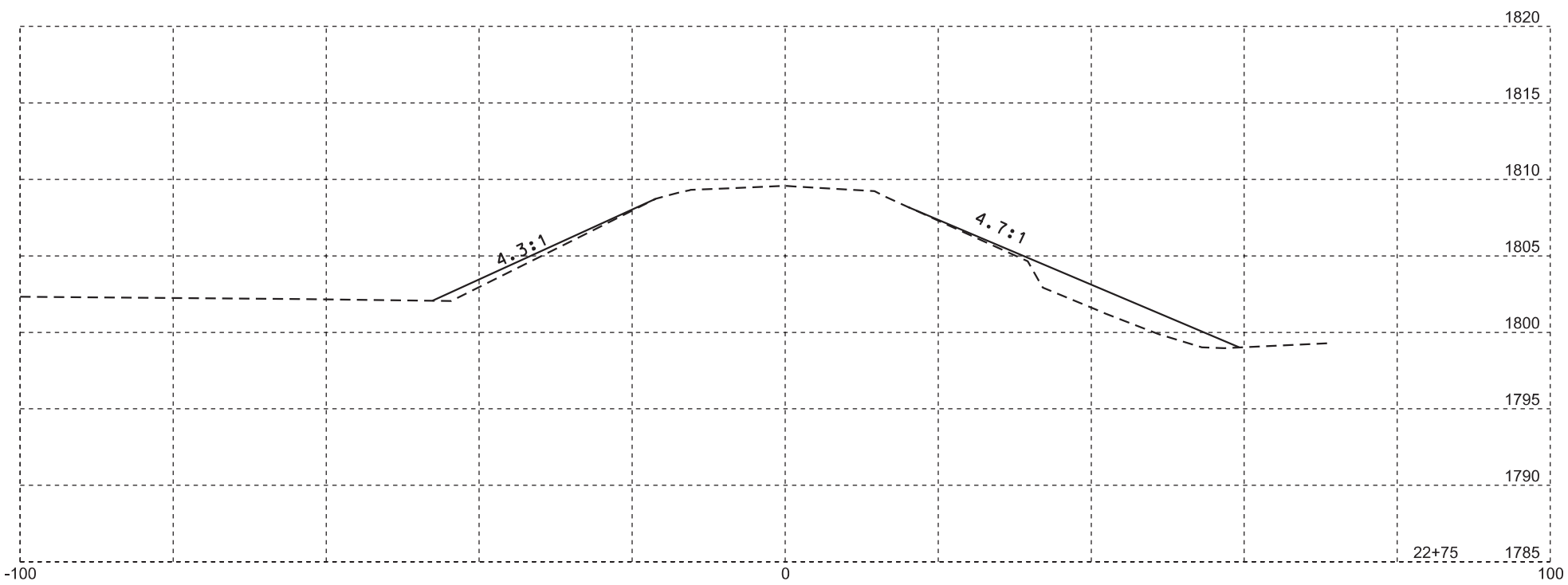

Plotting Date: 07/14/2016

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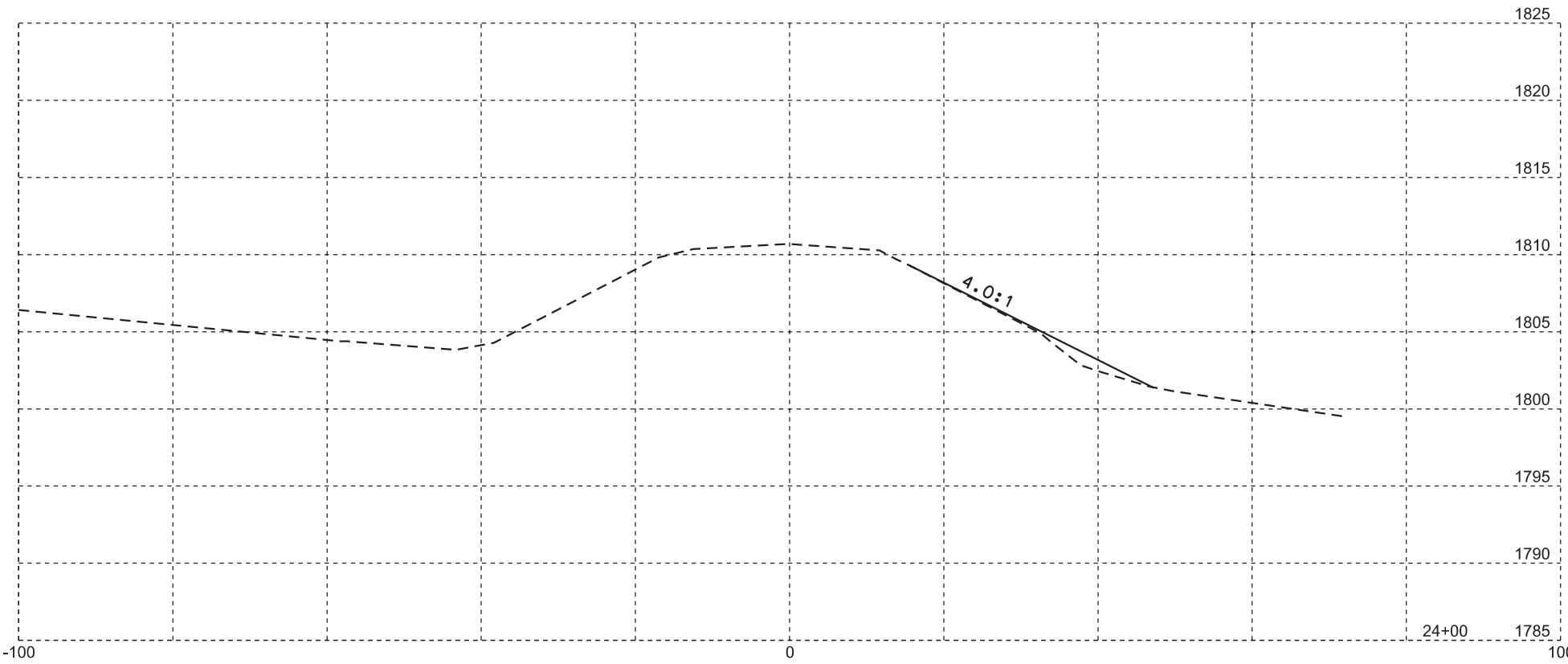

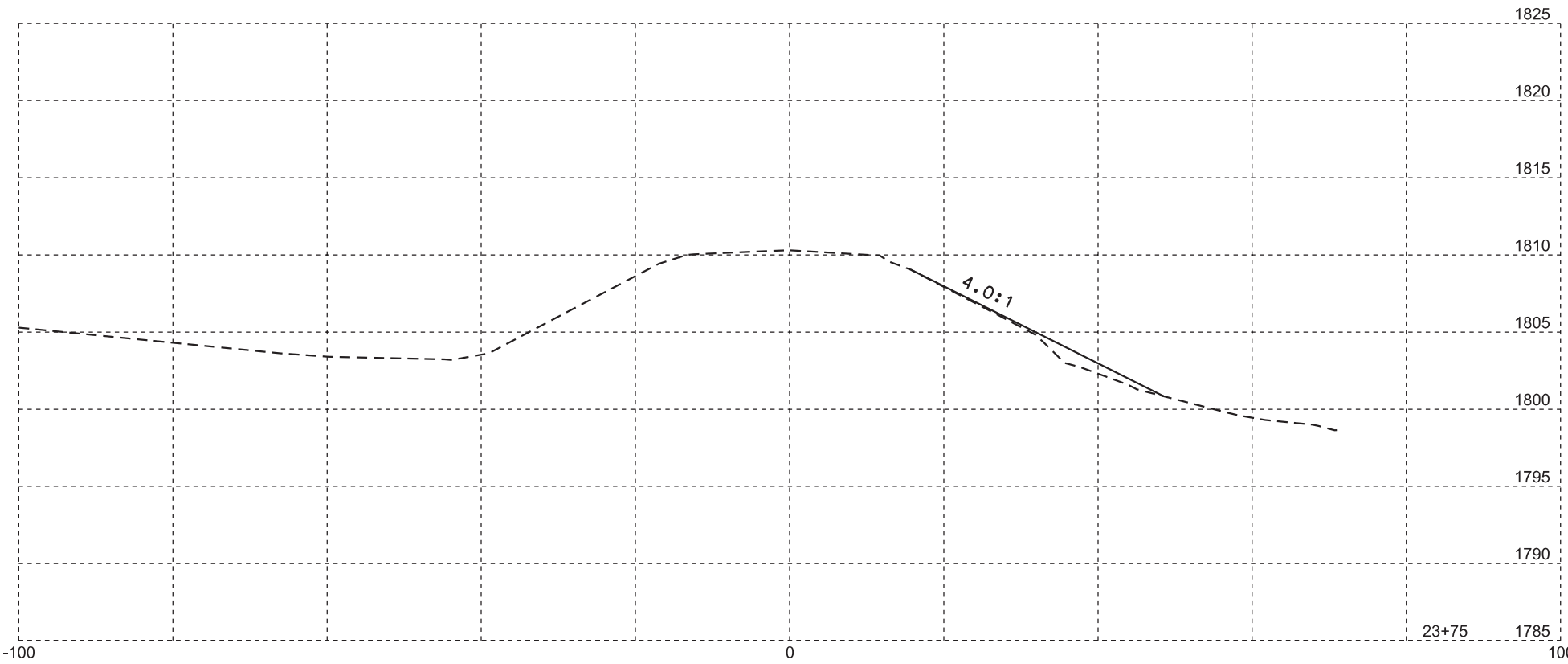

Plotting Date: 07/14/2016

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
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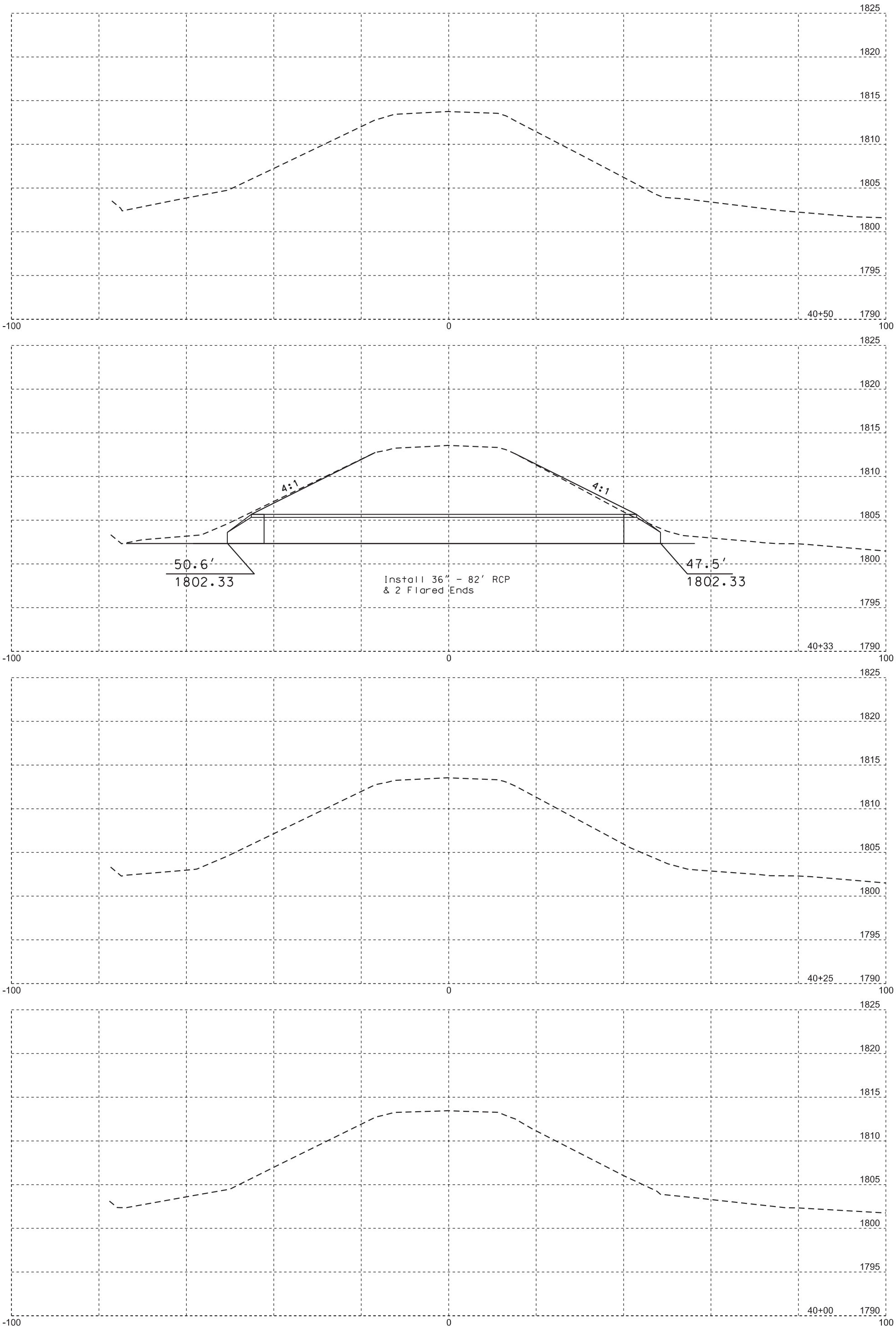

Plotting Date: 07/14/2016

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
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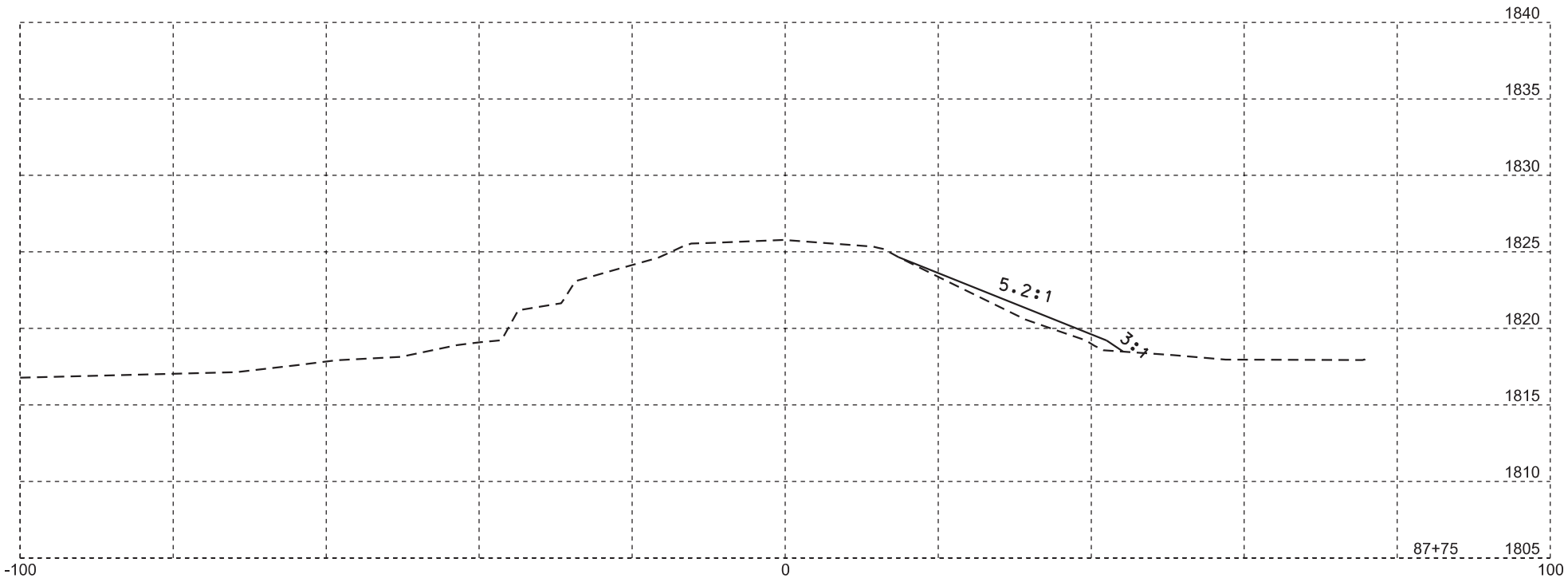

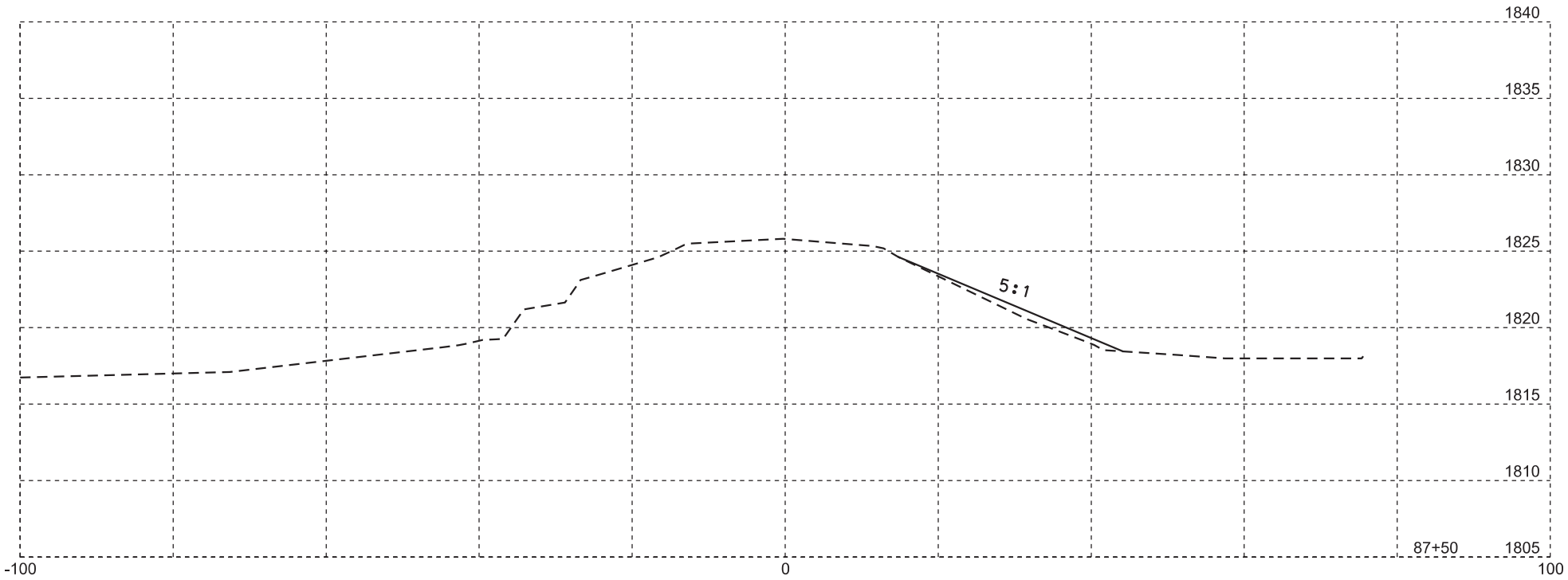

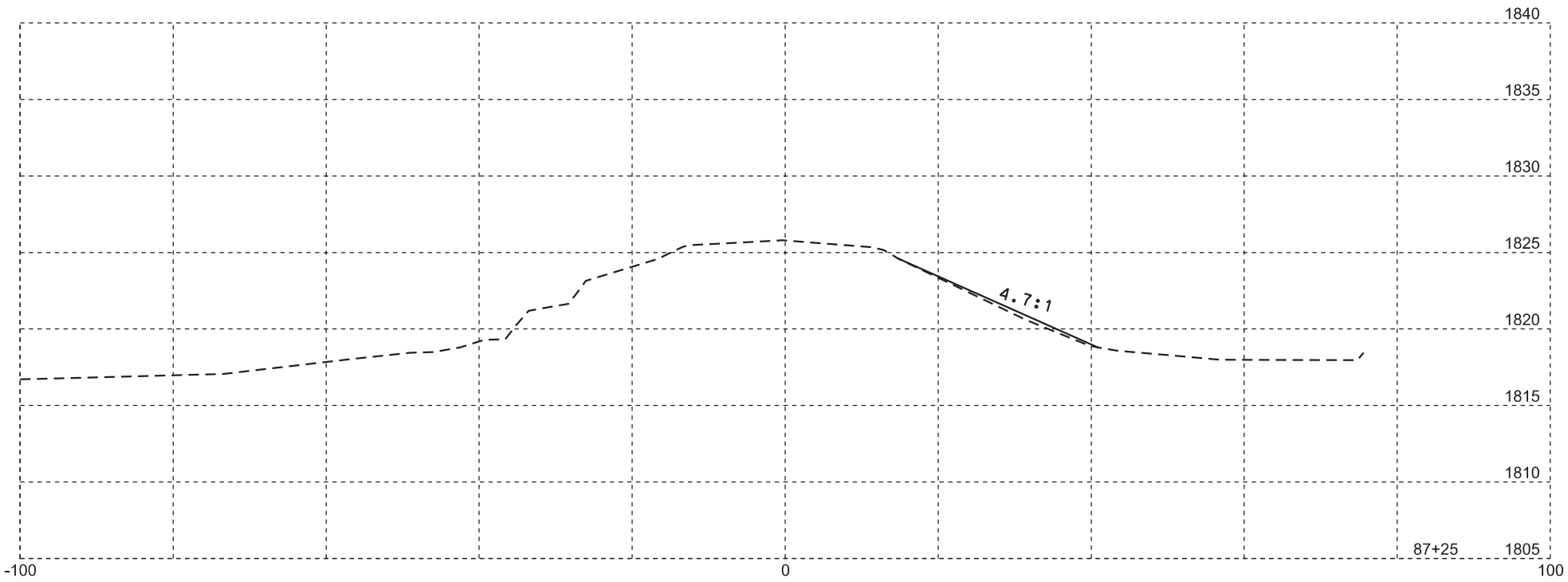

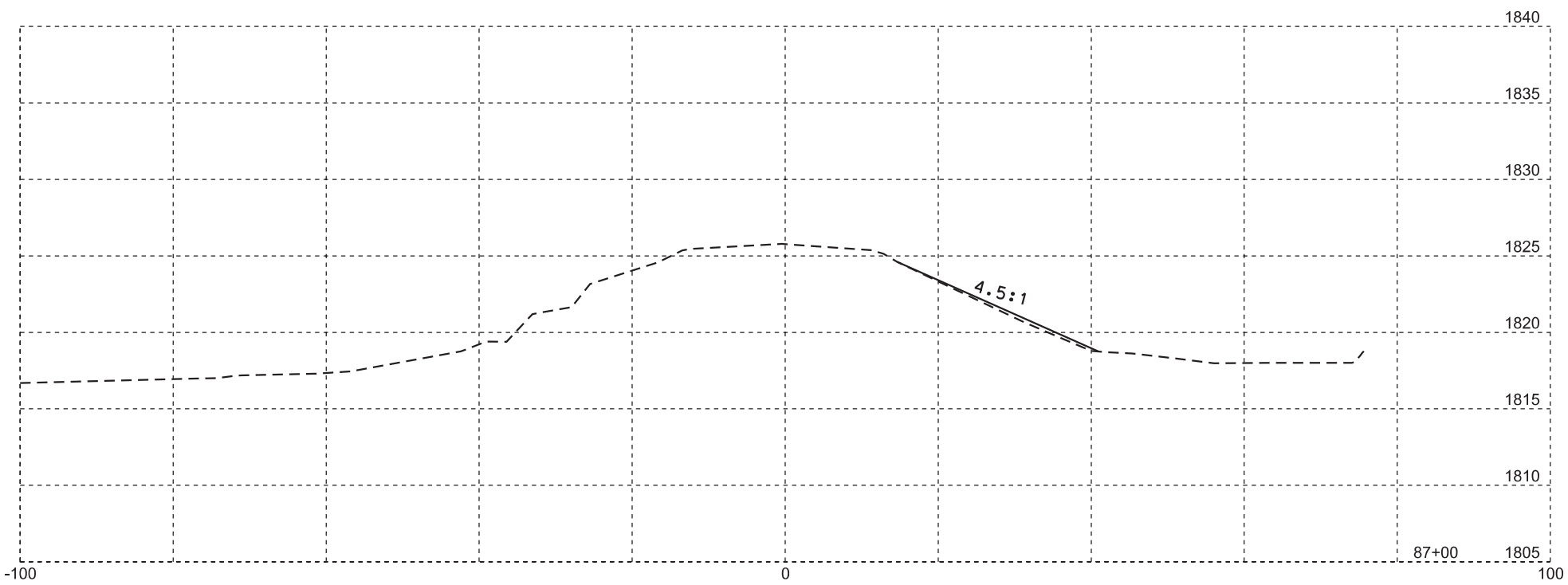

Plotting Date: 07/14/2016

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
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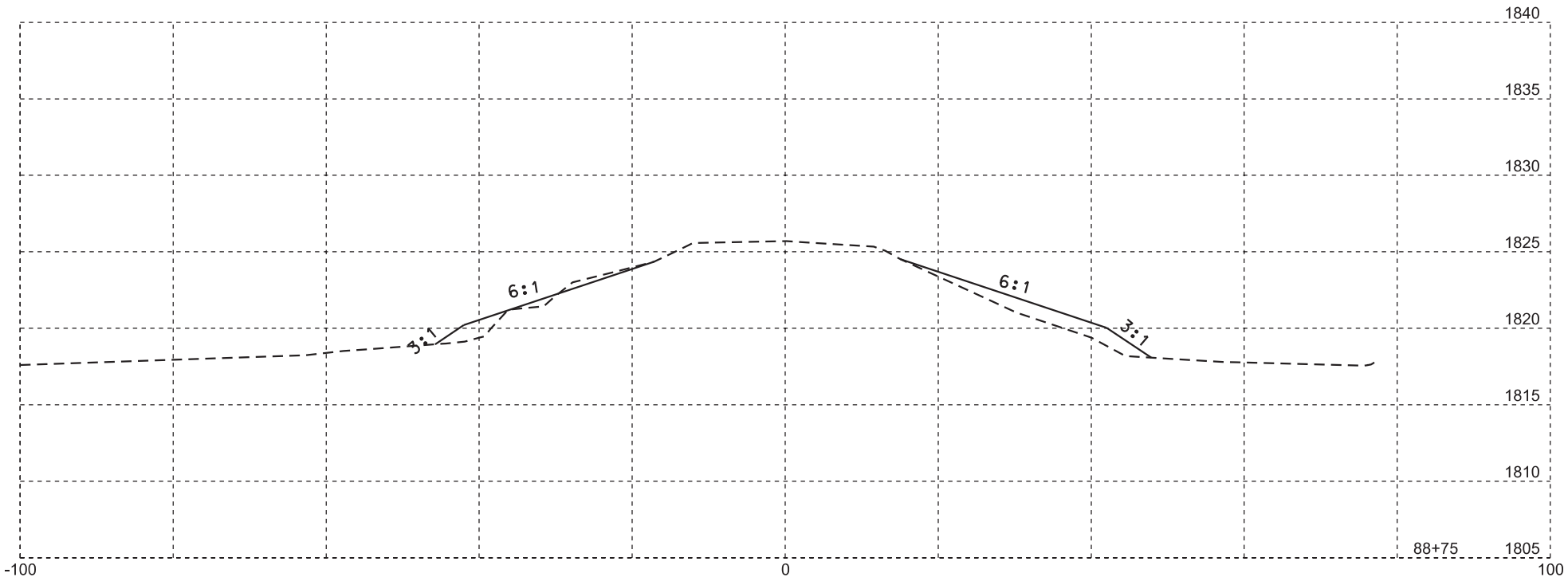

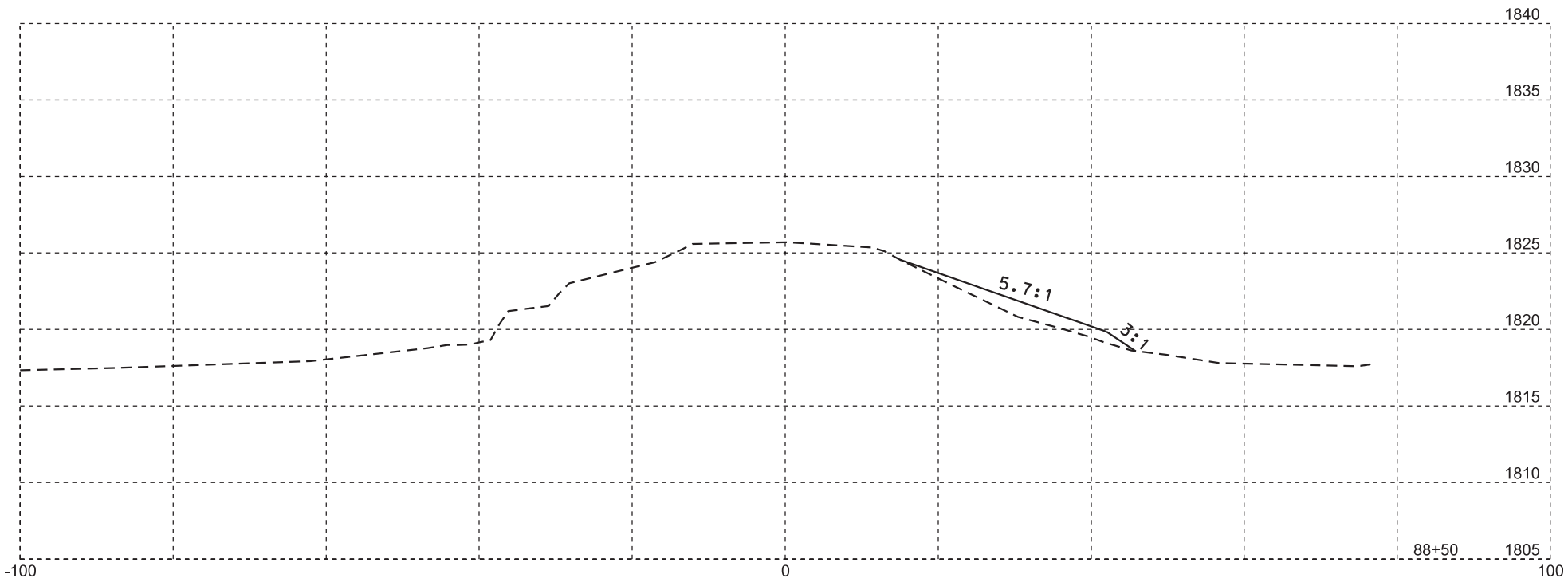

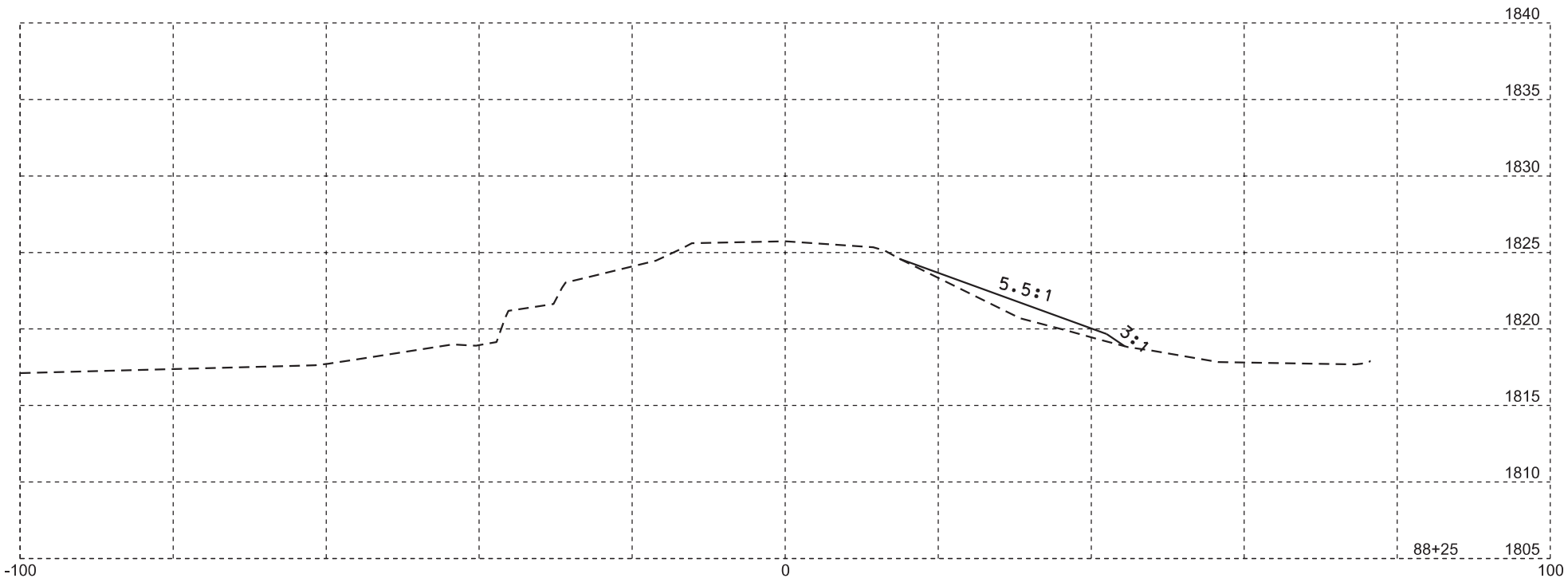

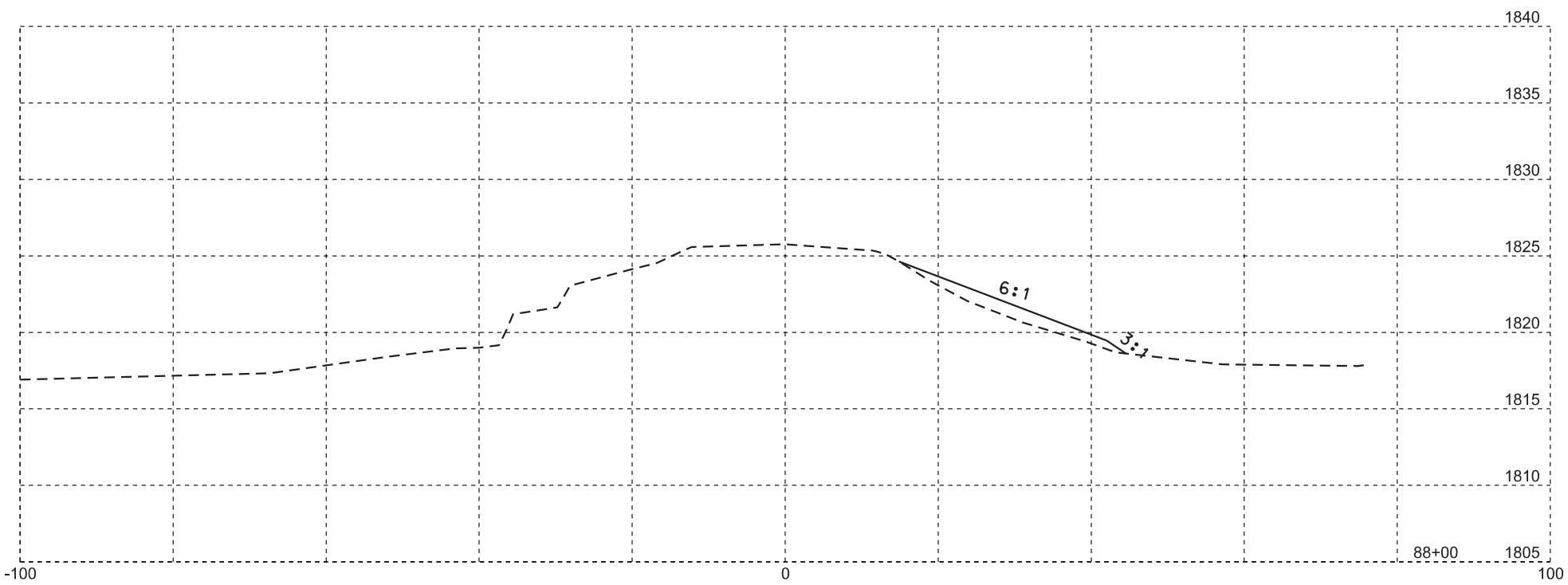

Plotting Date: 07/14/2016

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
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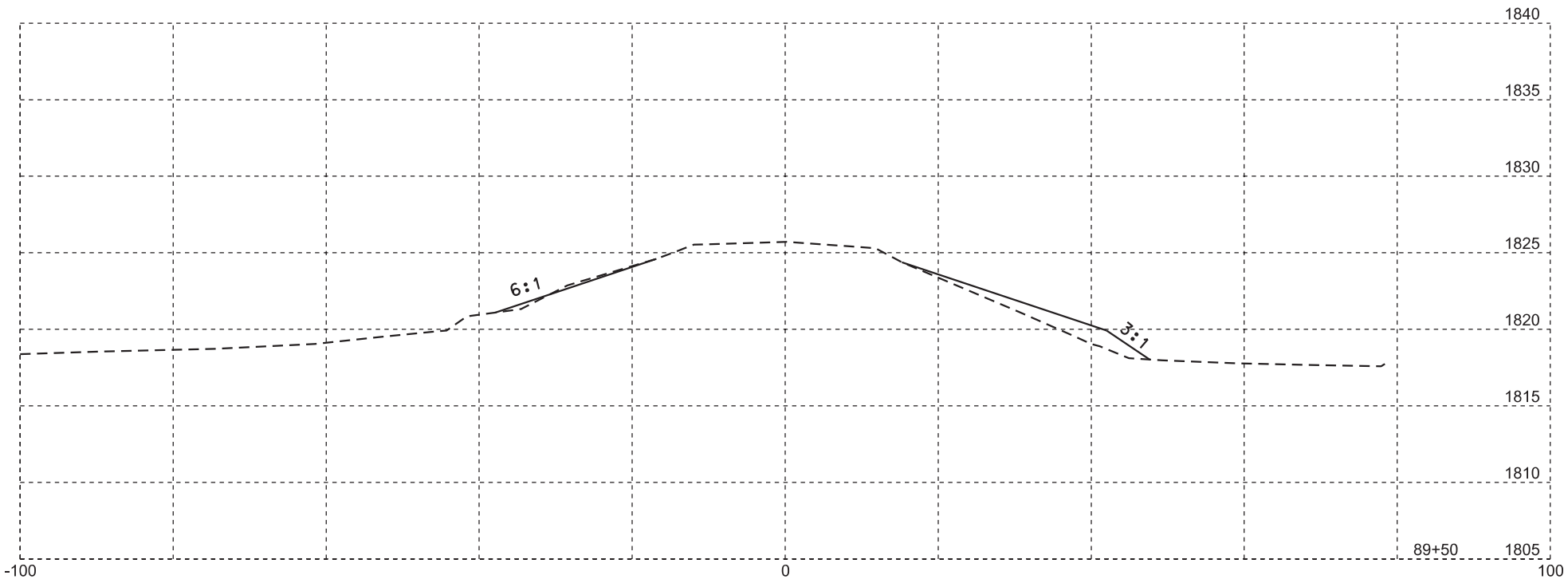

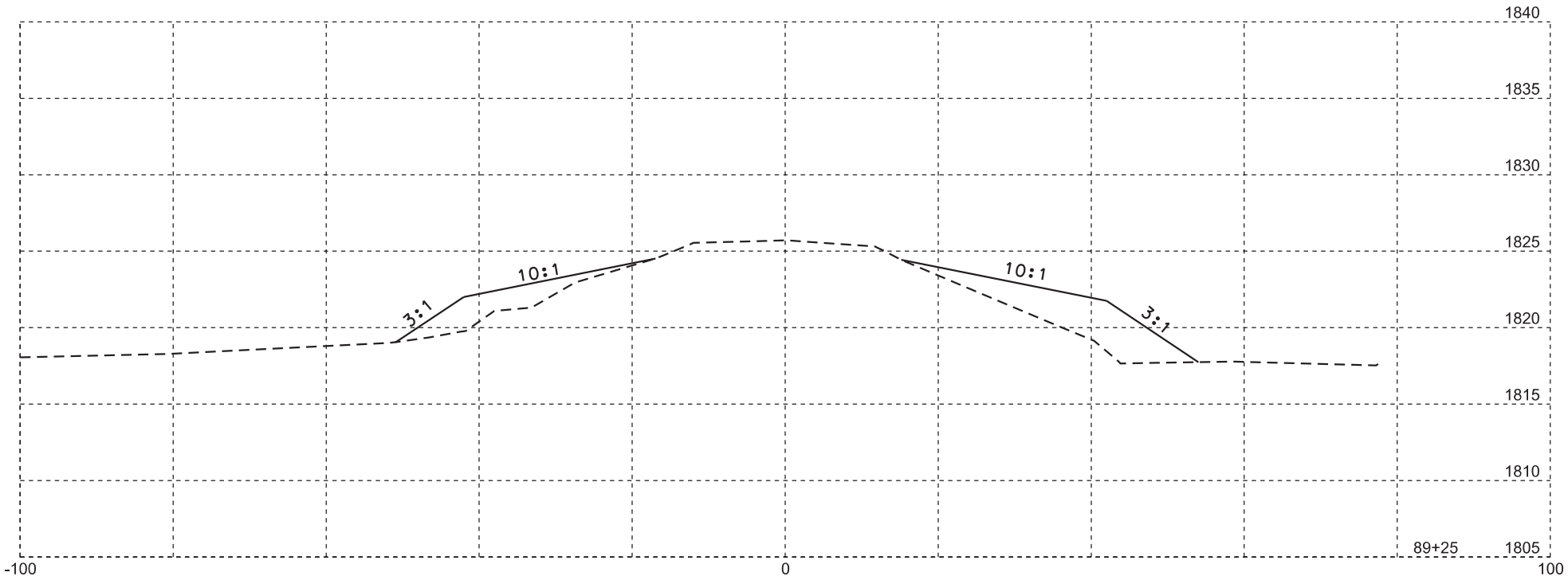

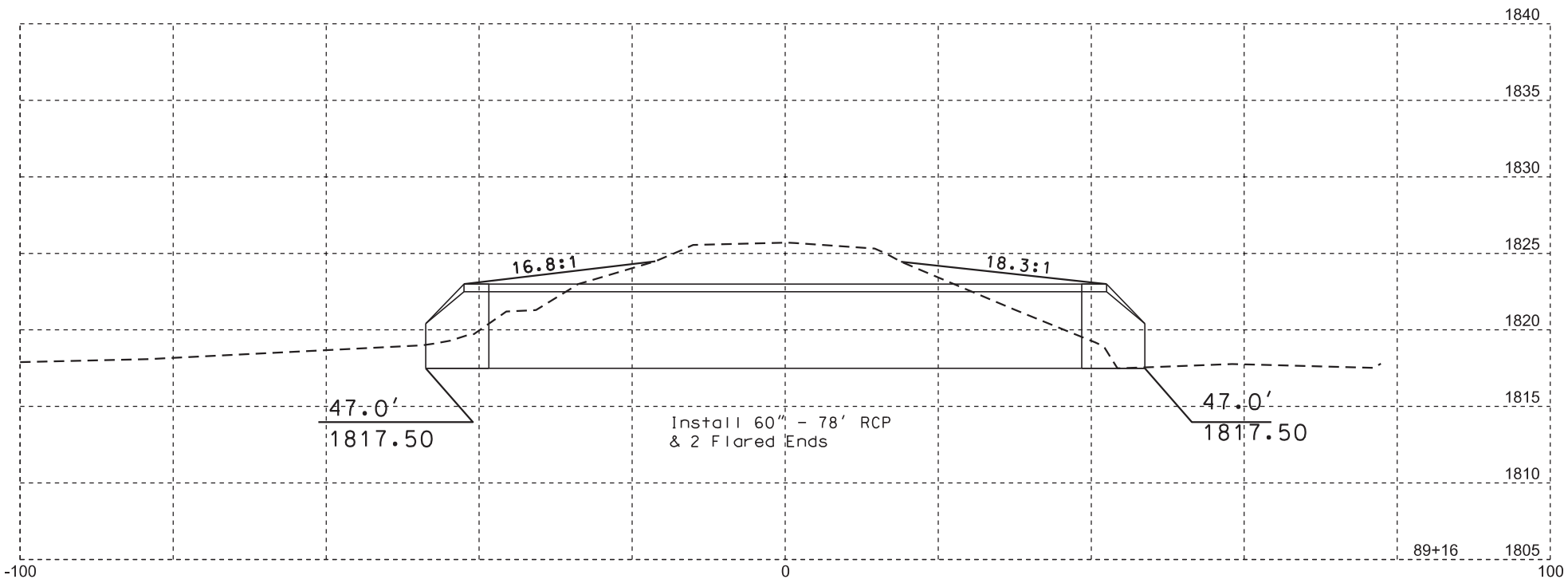

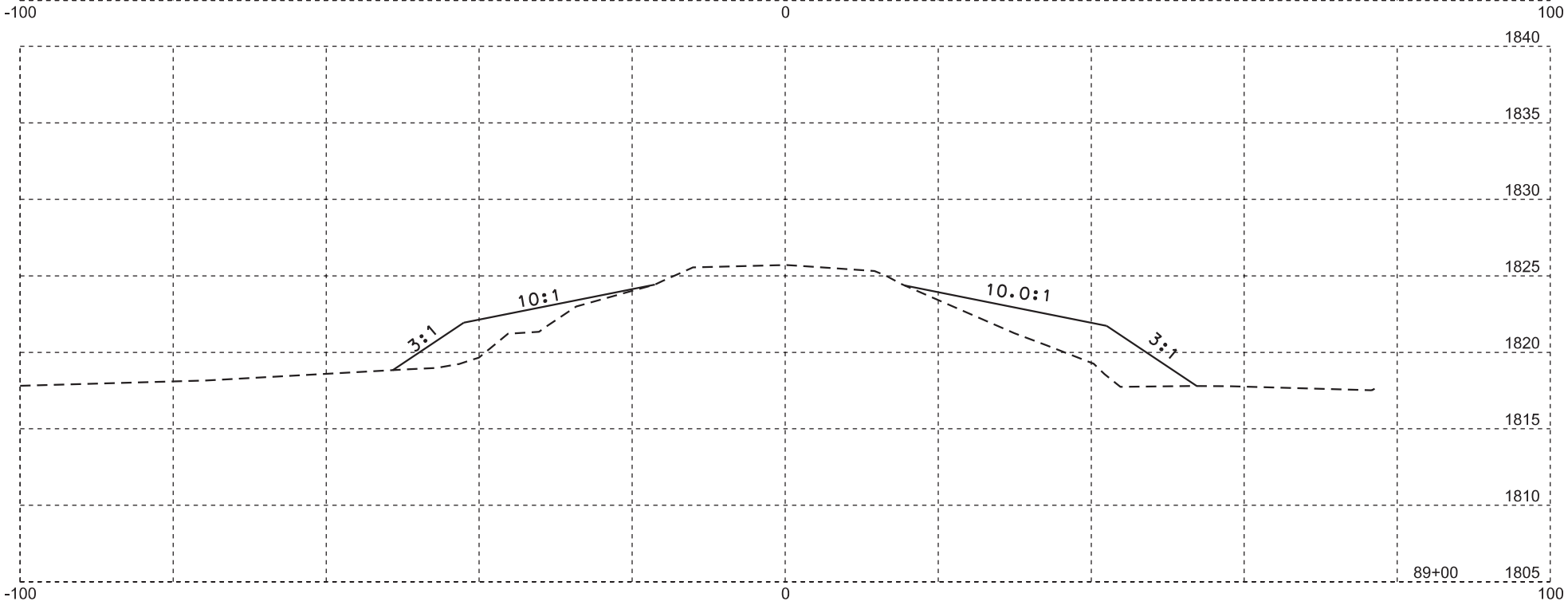

Plotting Date: 07/14/2016

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
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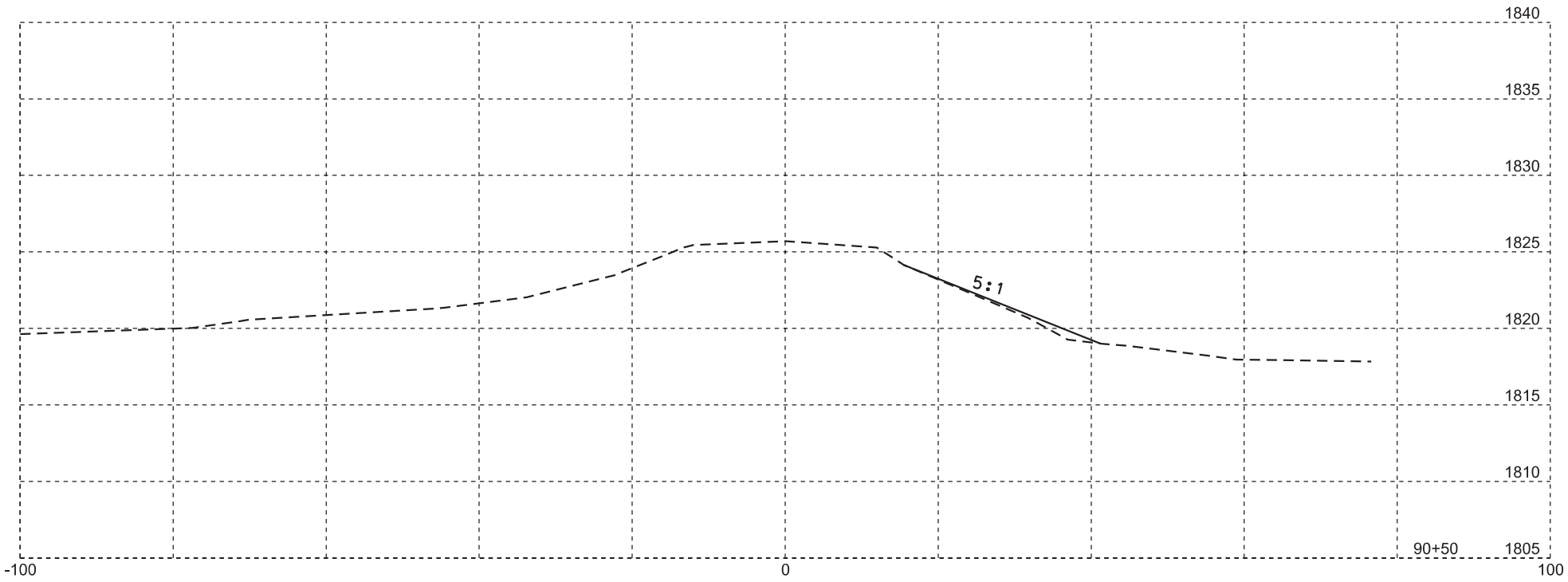

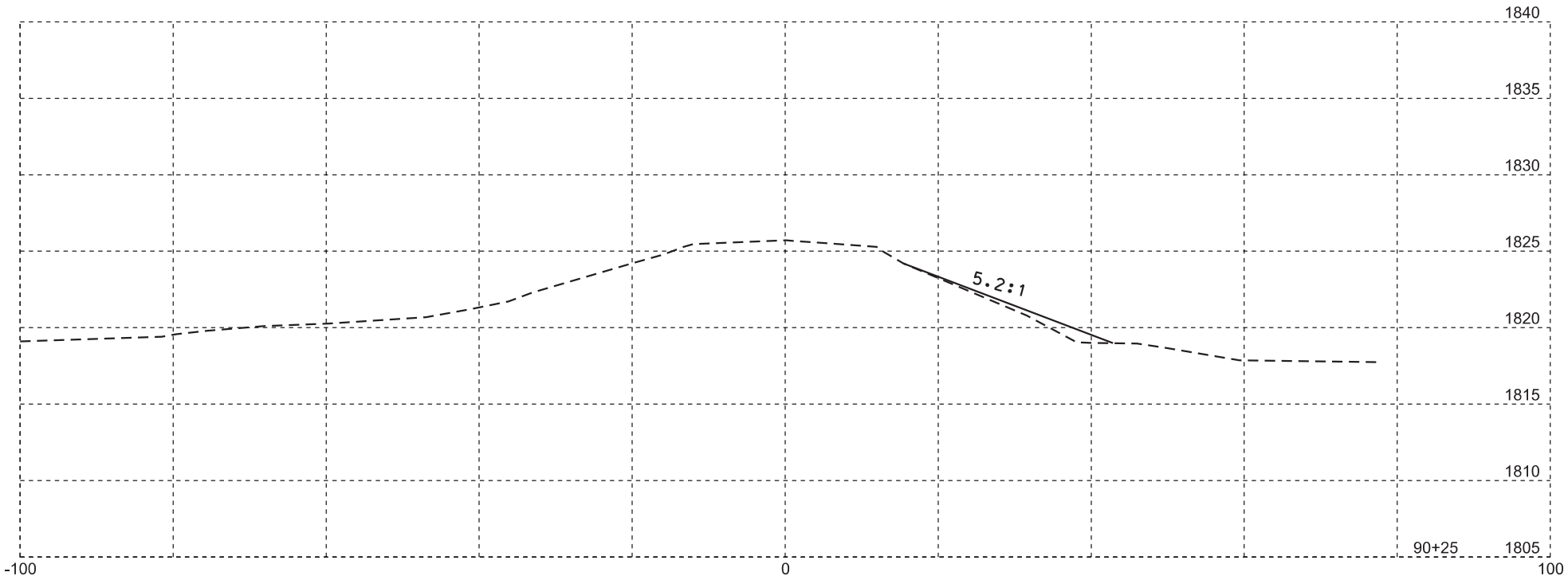

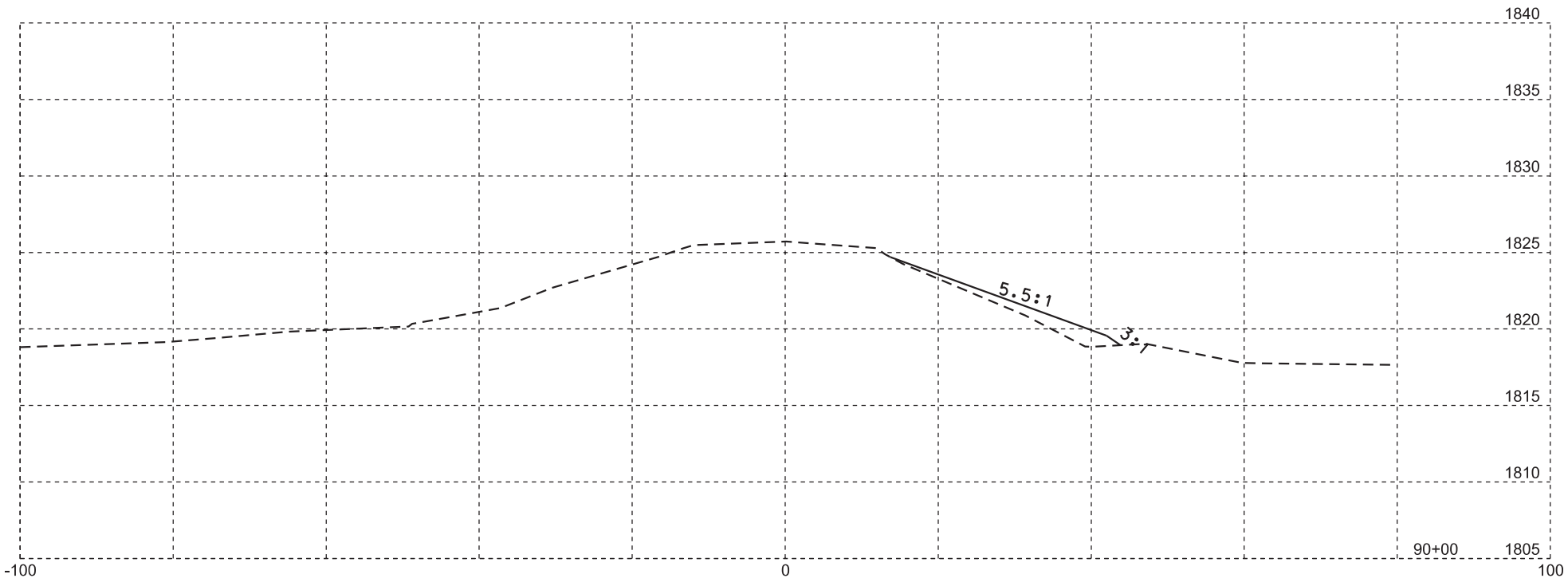

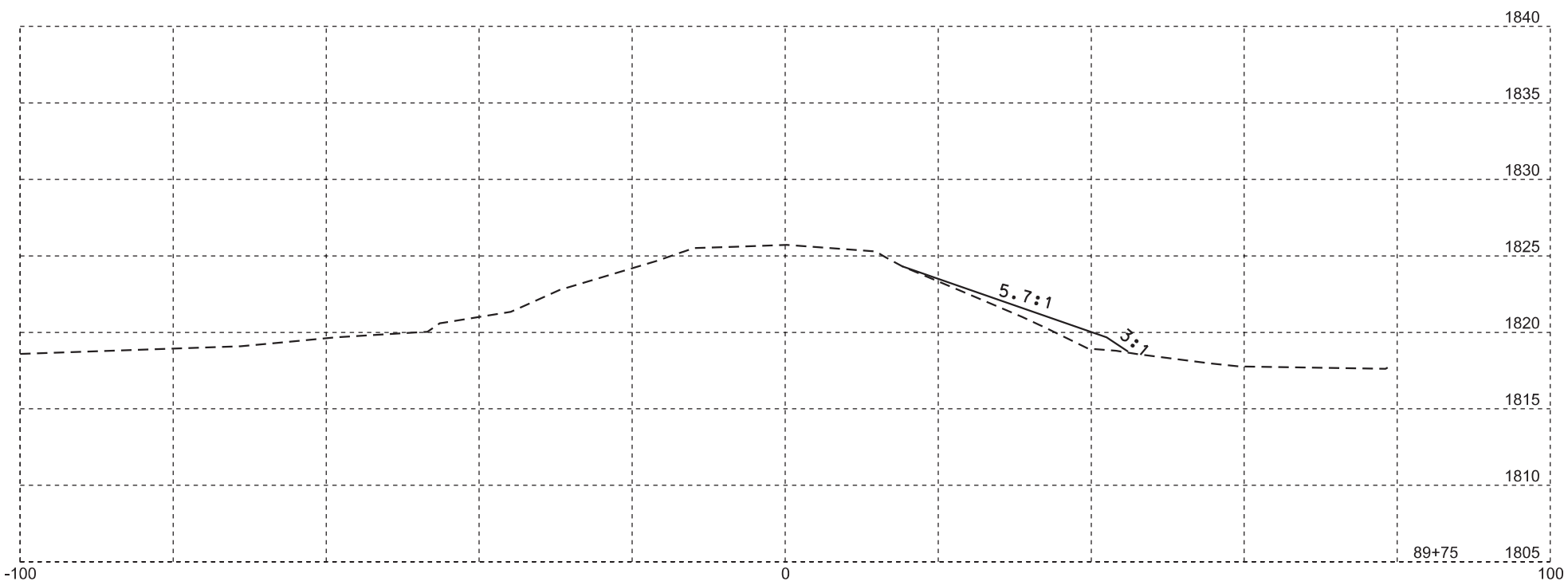

Plotting Date: 07/14/2016

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
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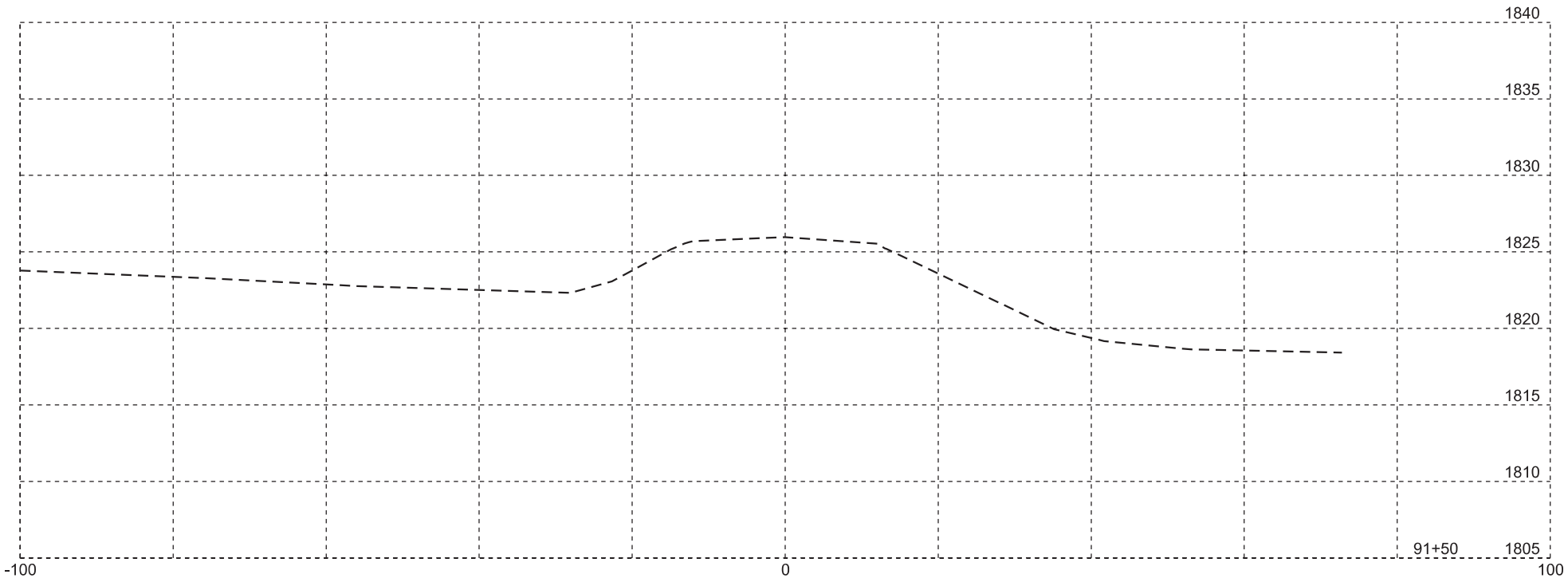
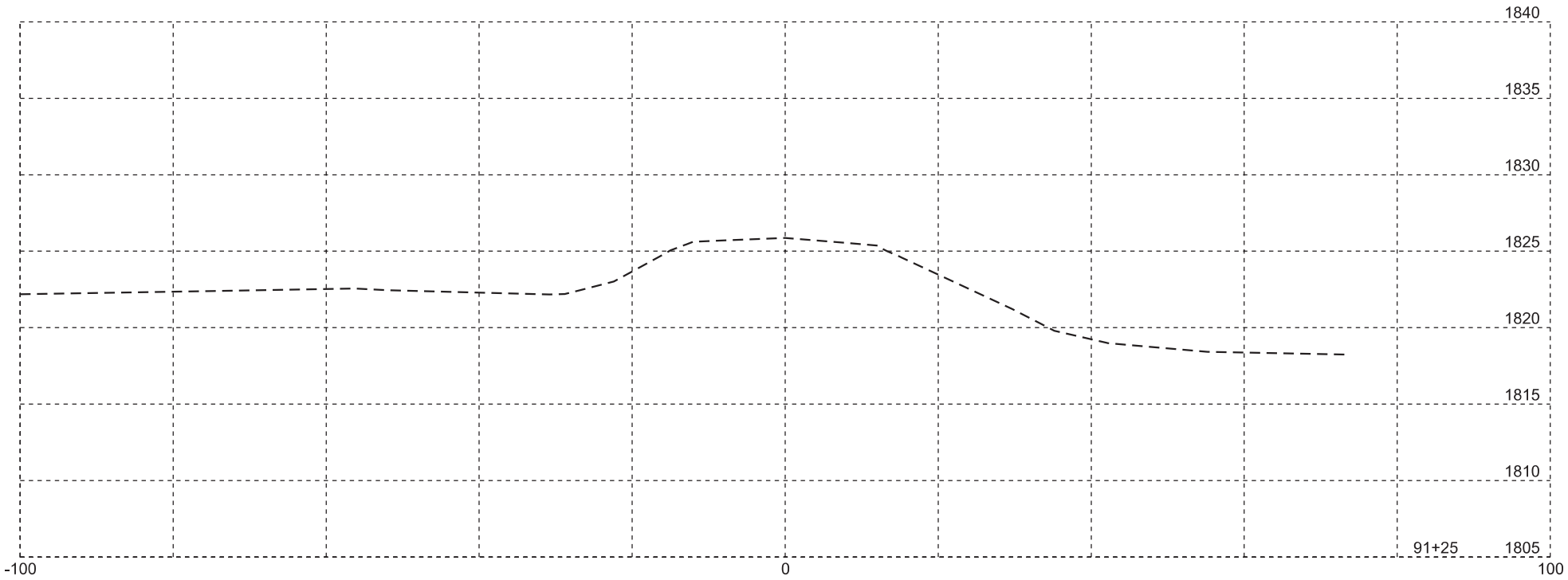
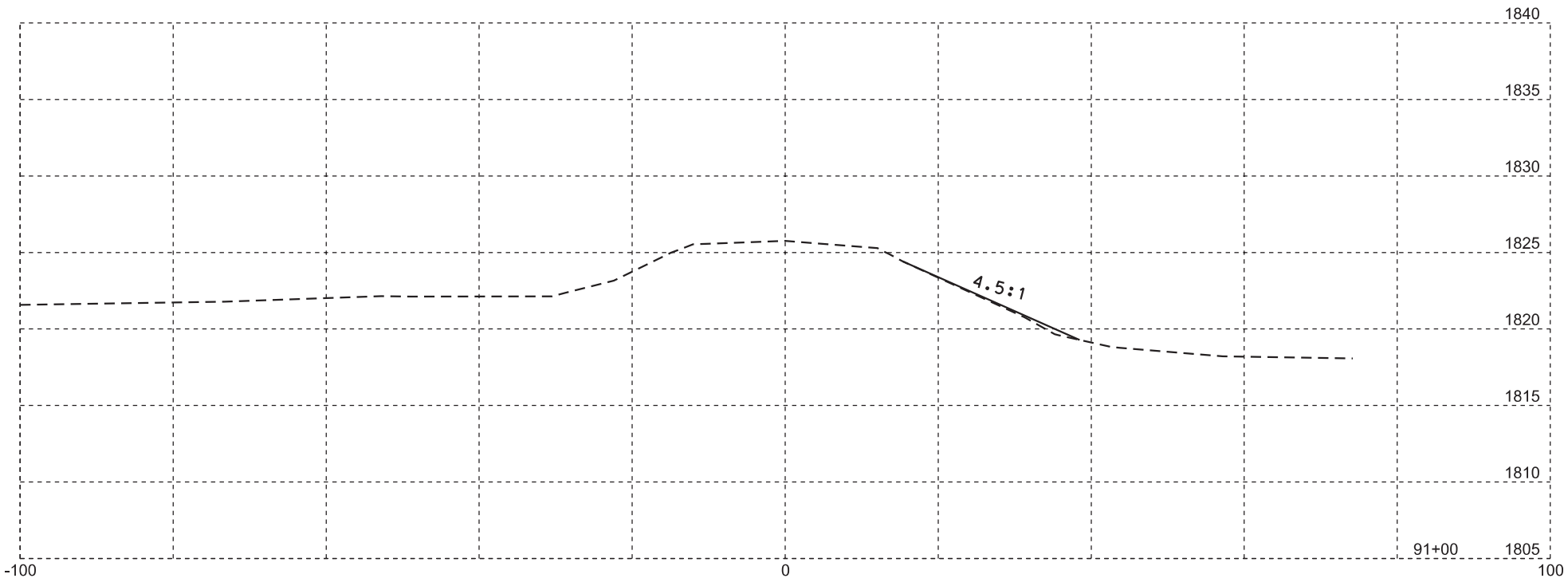
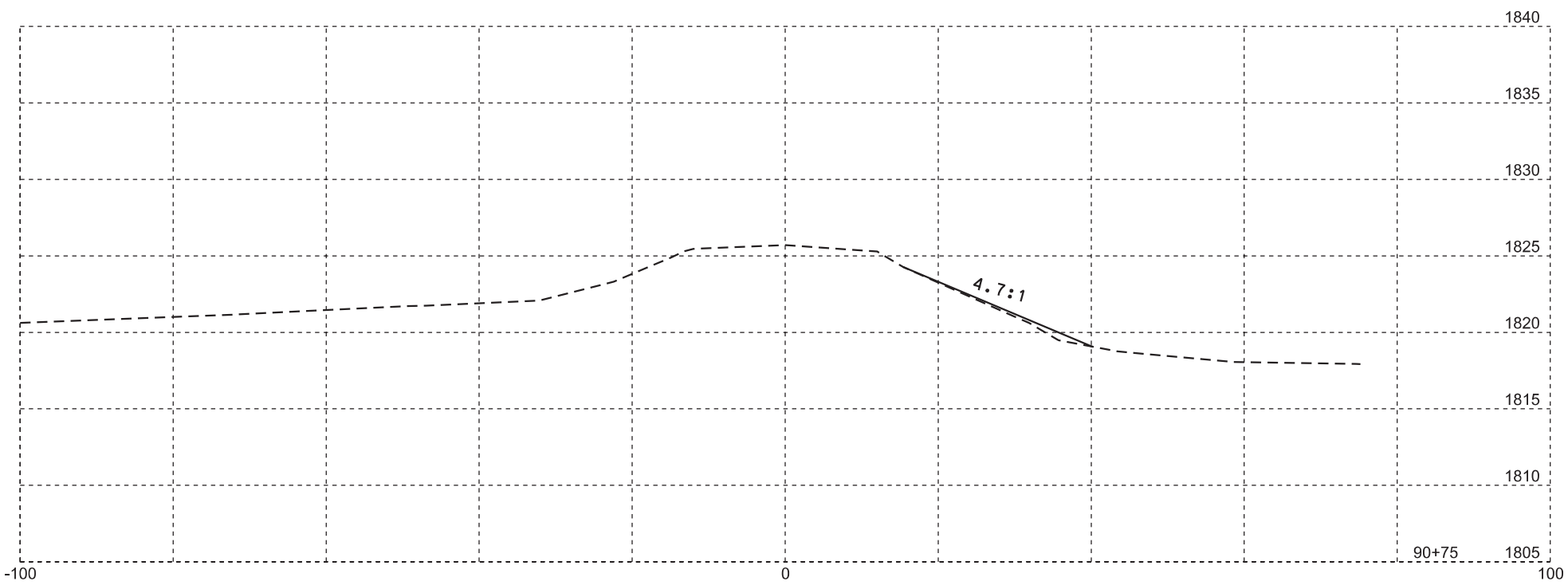


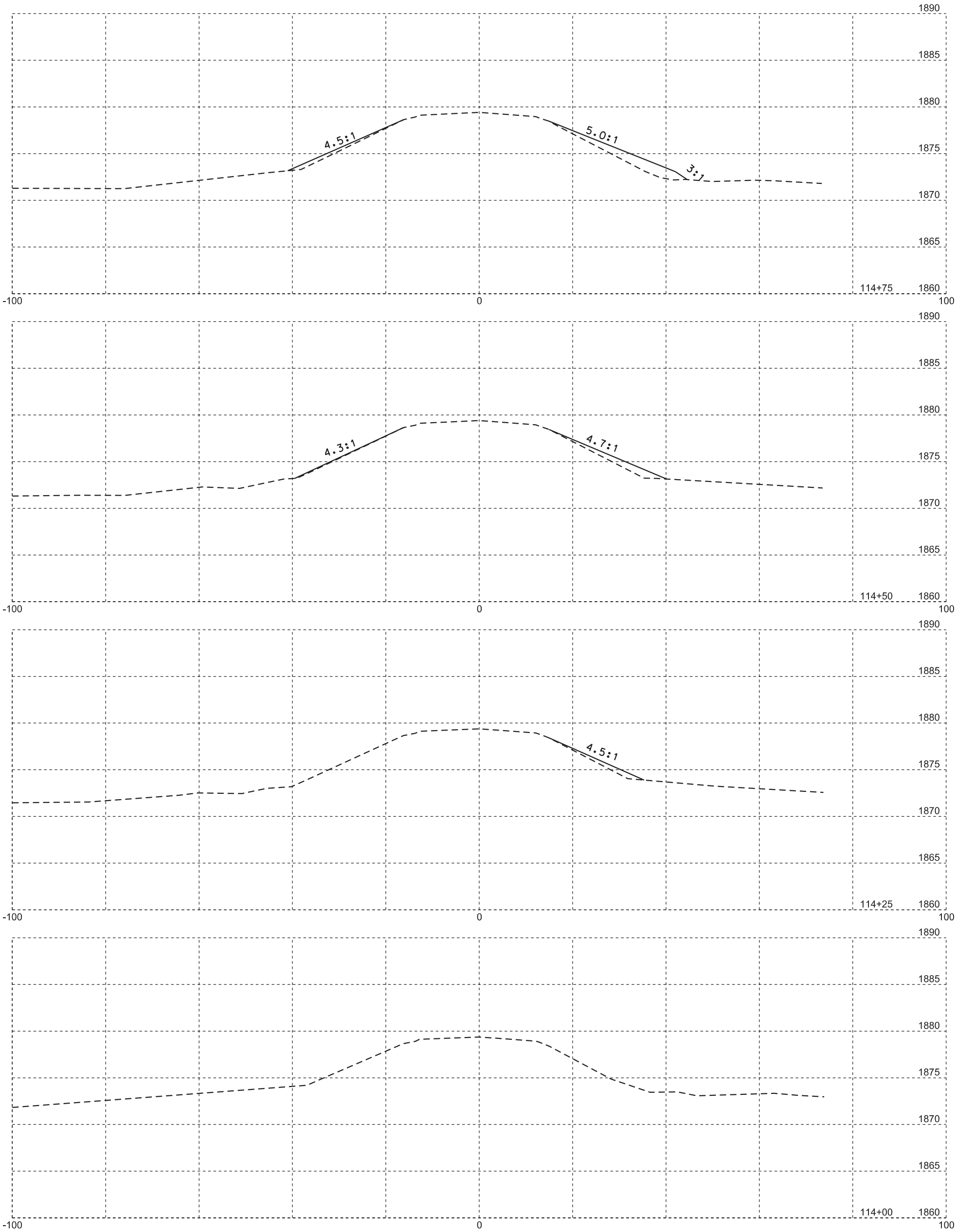






Plotting Date: 07/14/2016

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	P 0253(04)182	59	71



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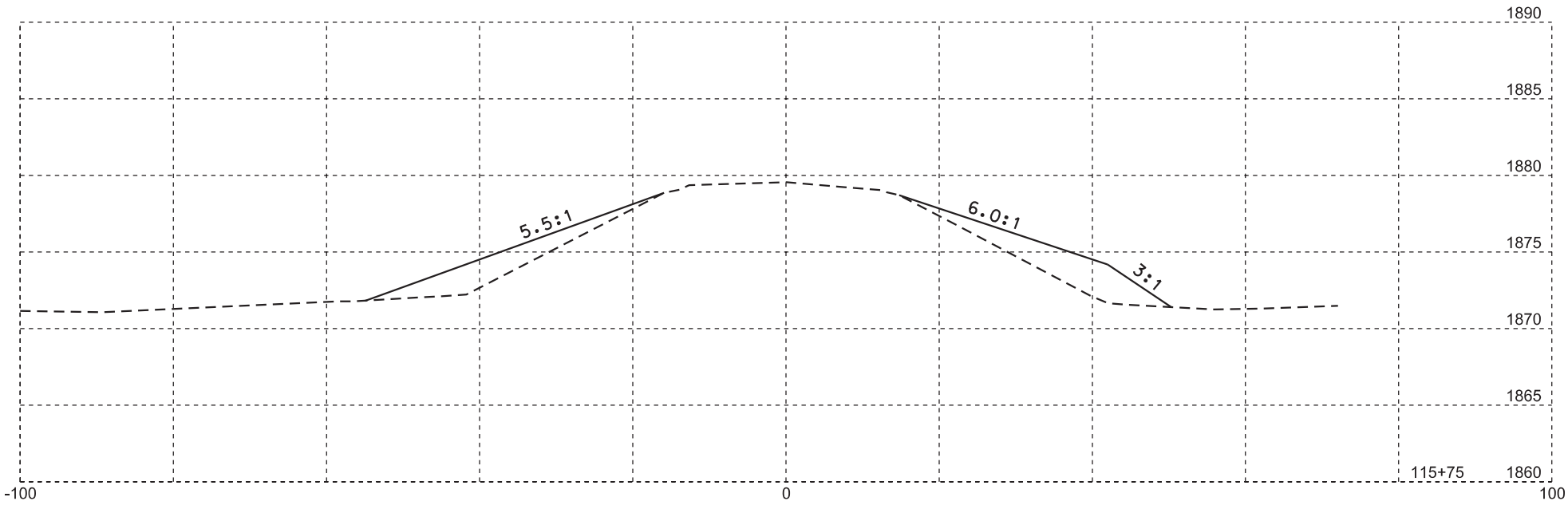
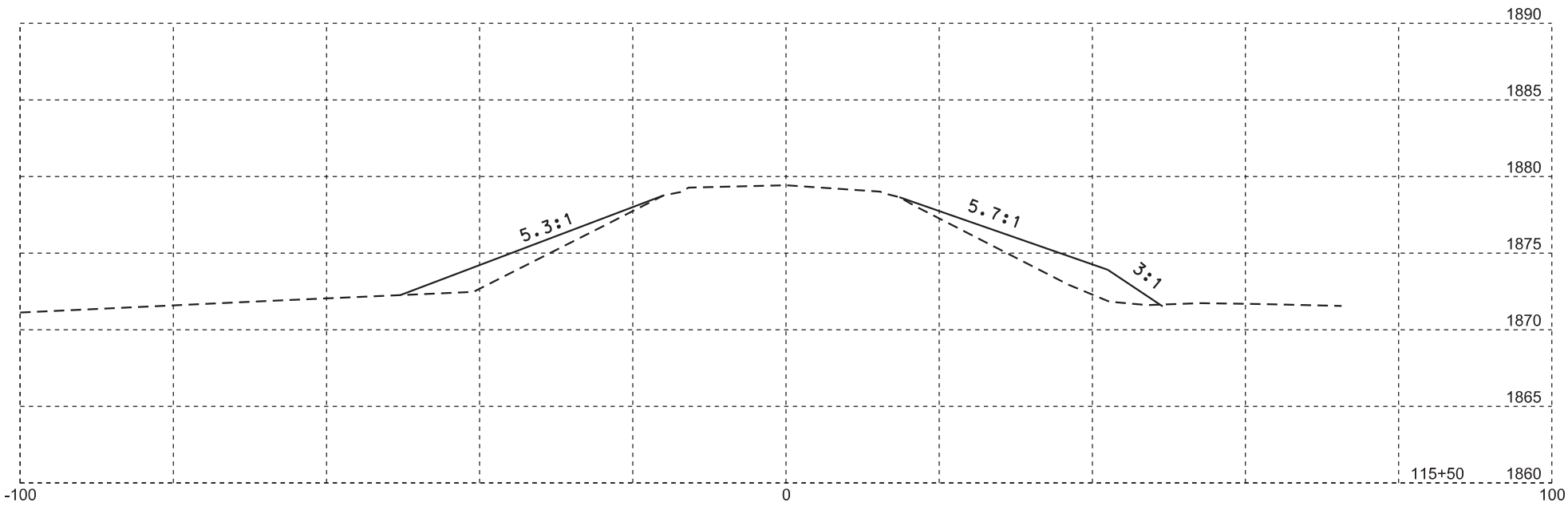
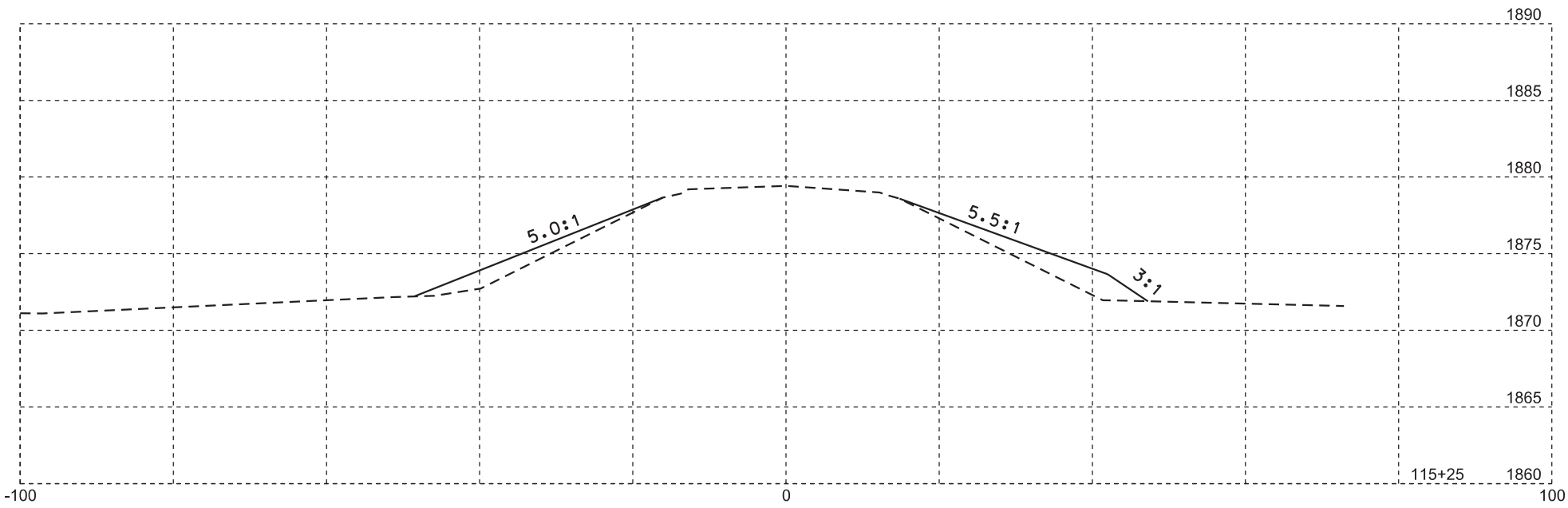
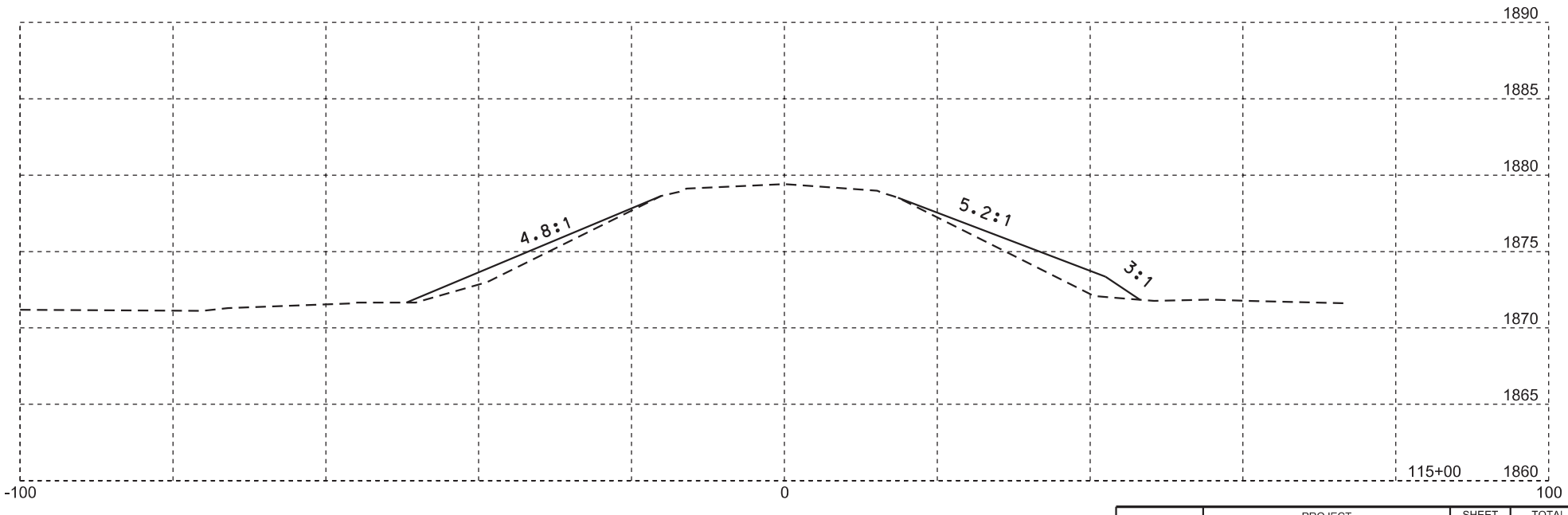
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	P 0253(04)182	60	71









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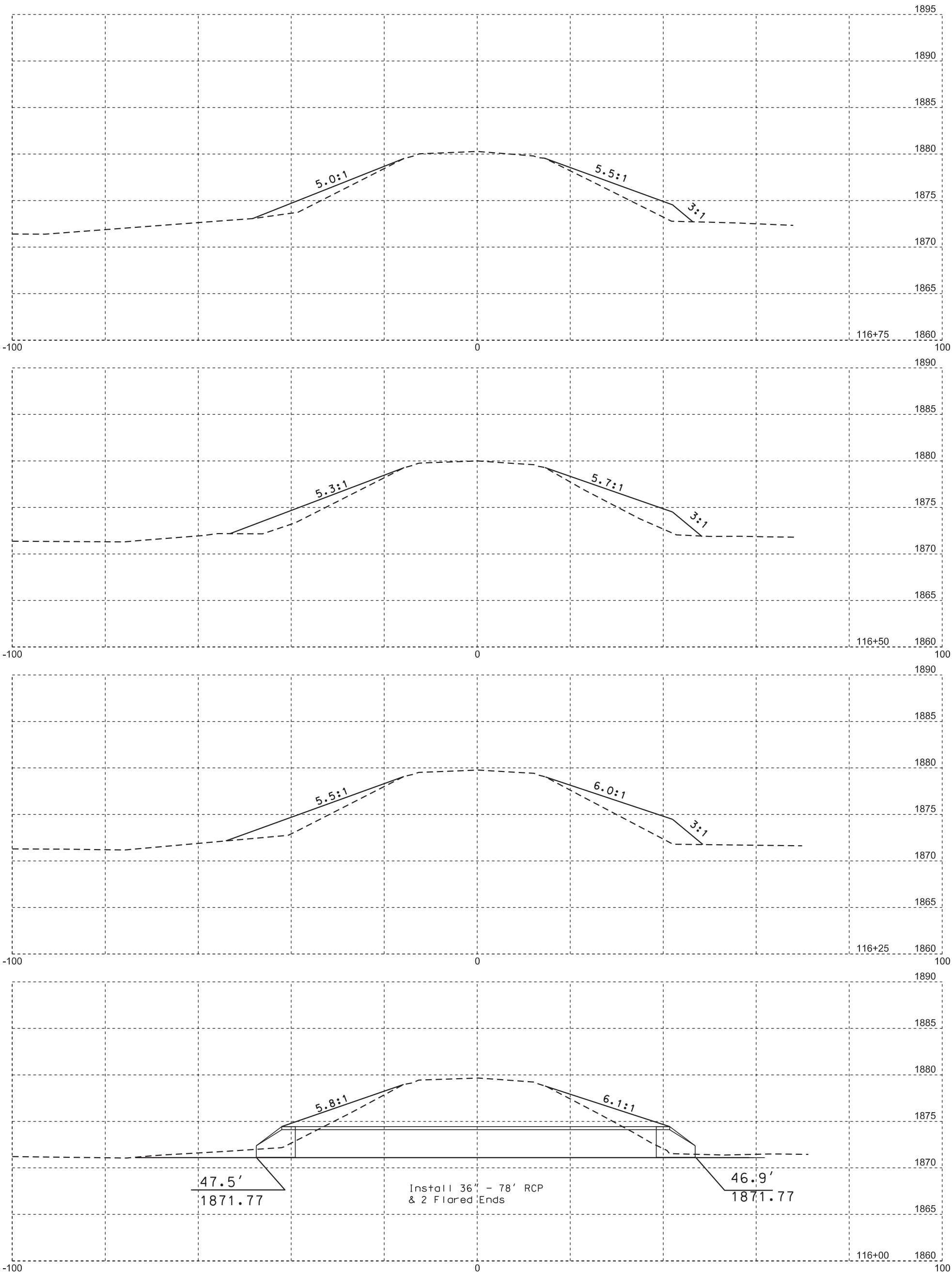
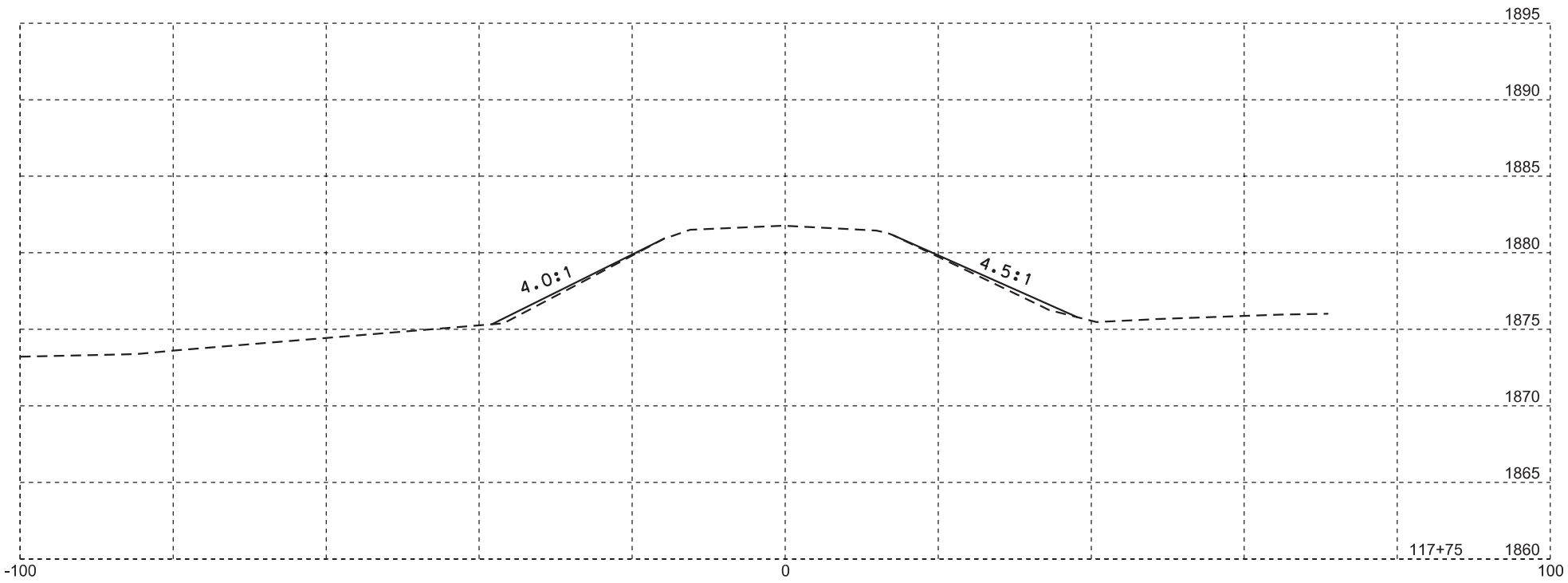
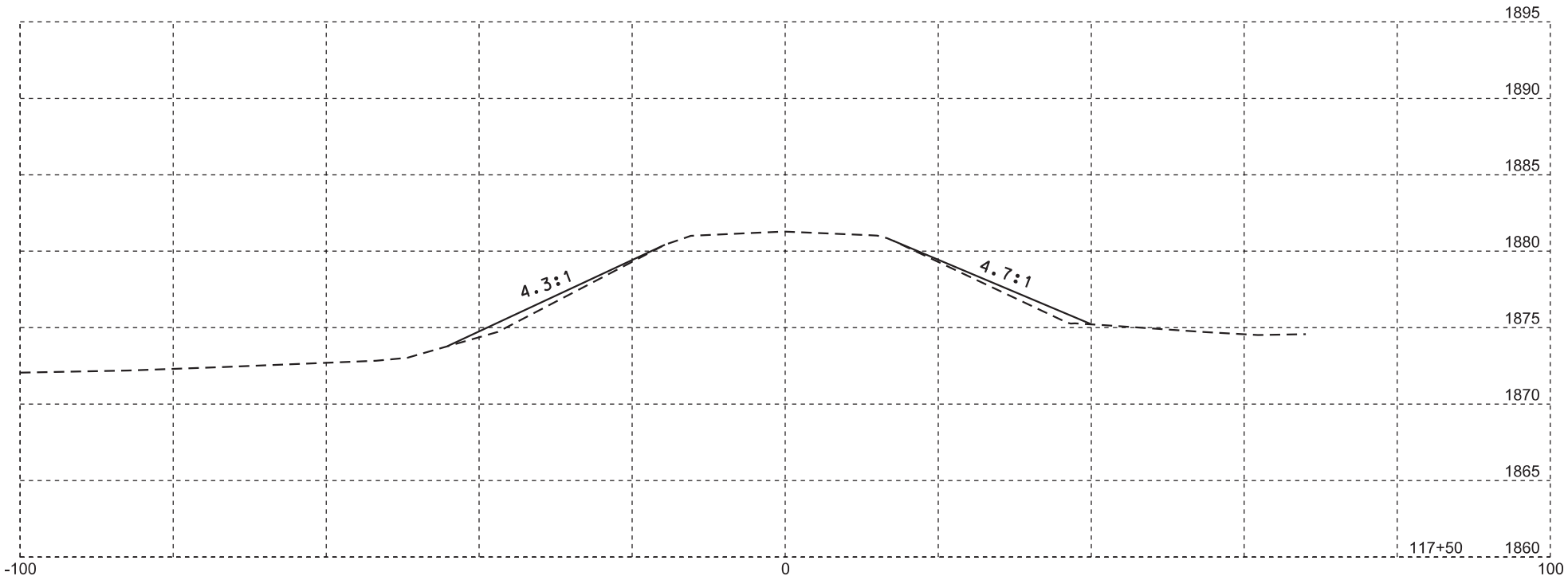
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	P 0253(04)182	61	71

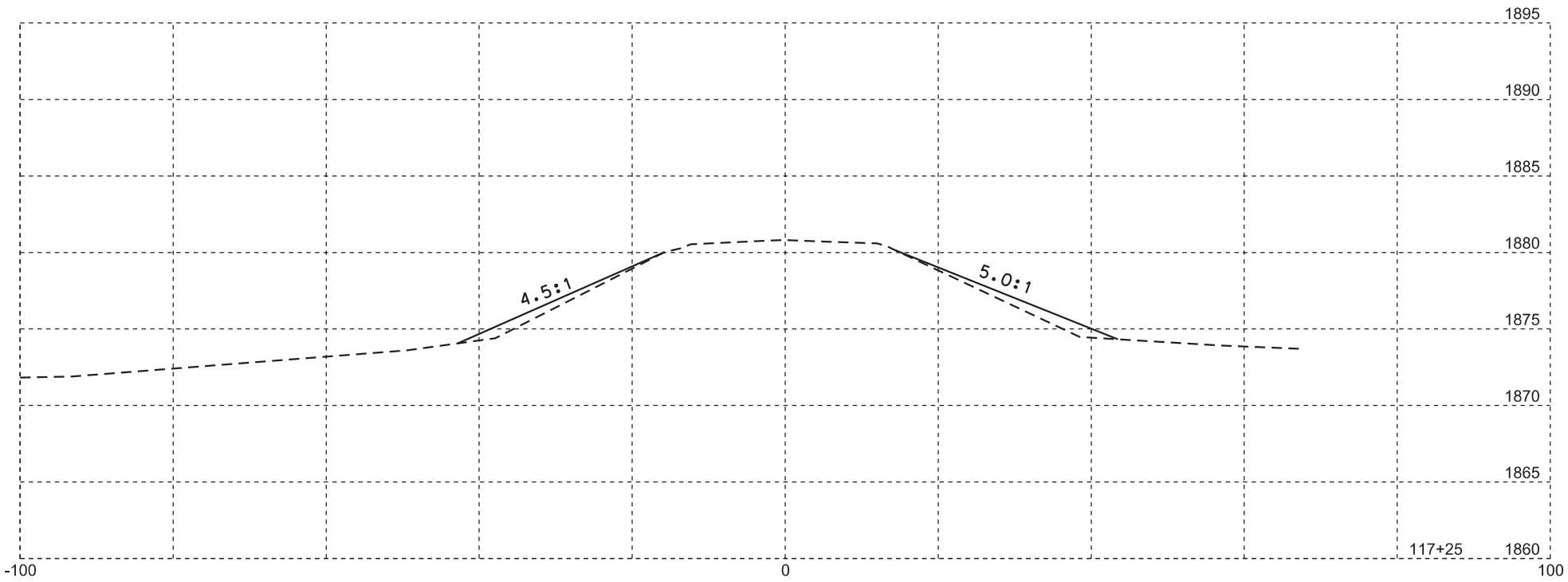


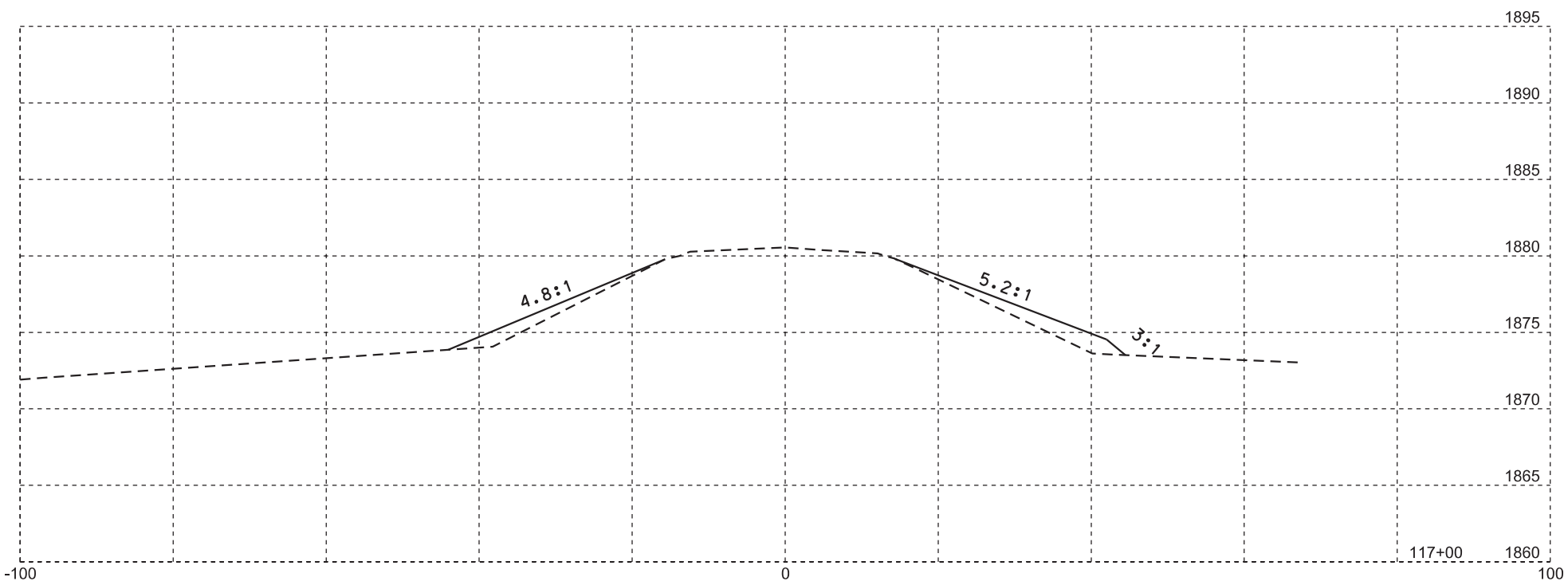
Plotting Date: 07/14/2016

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	P 0253(04)182	62	71









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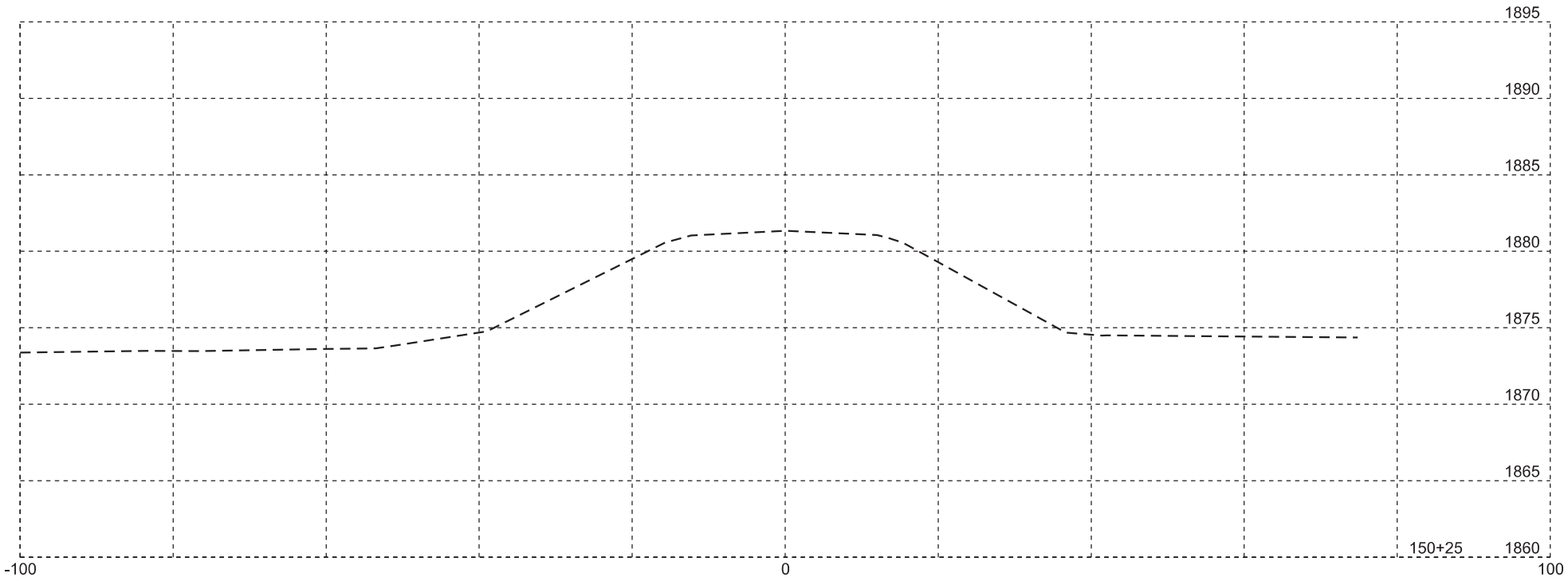
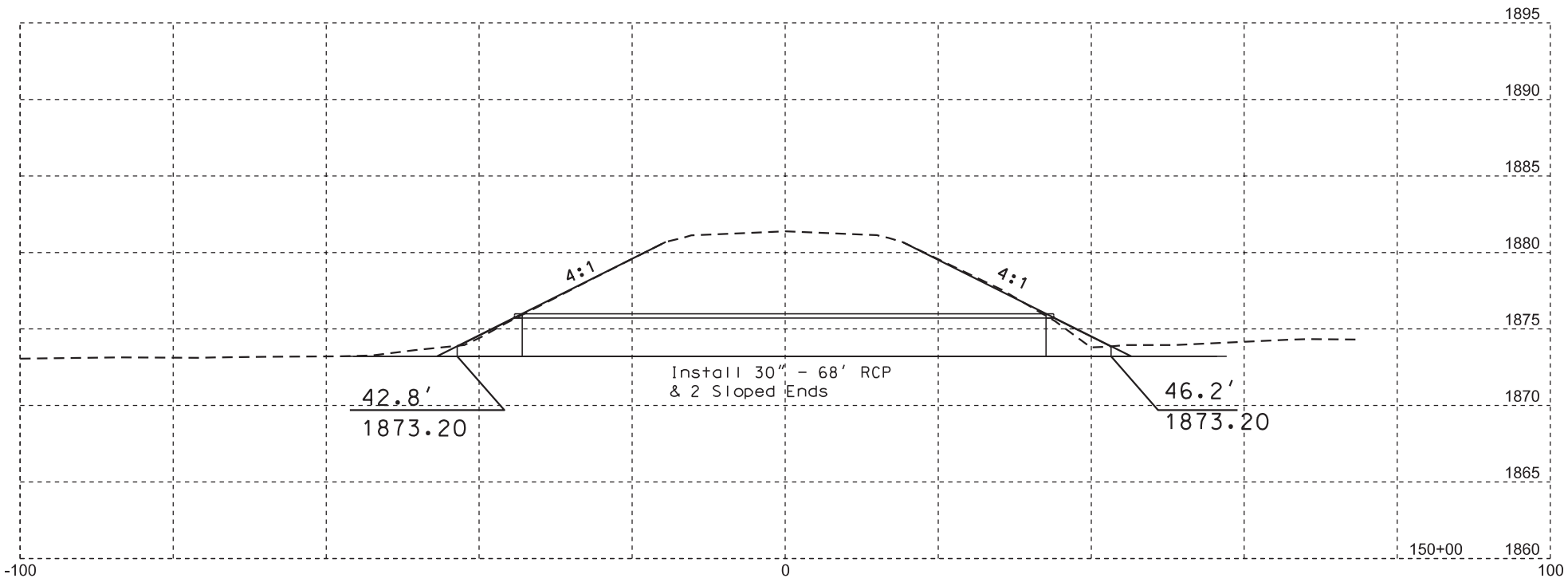
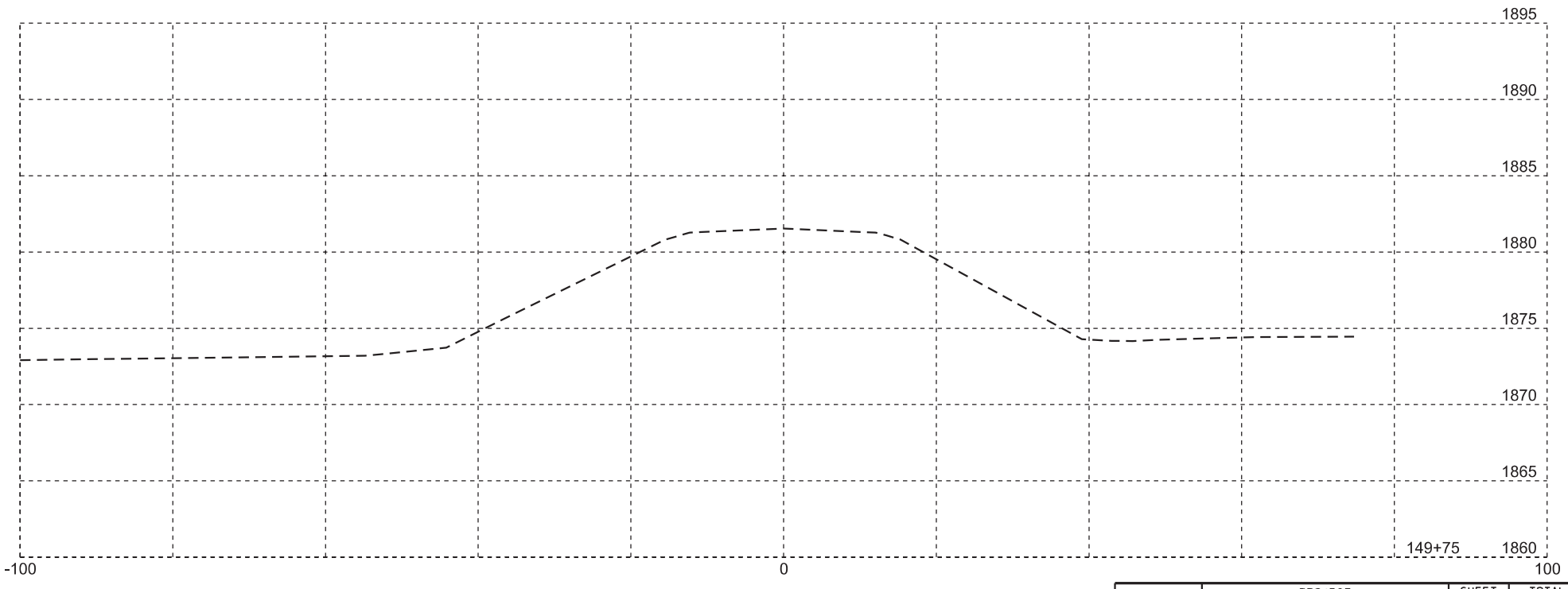
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	P 0253(04)182	63	71







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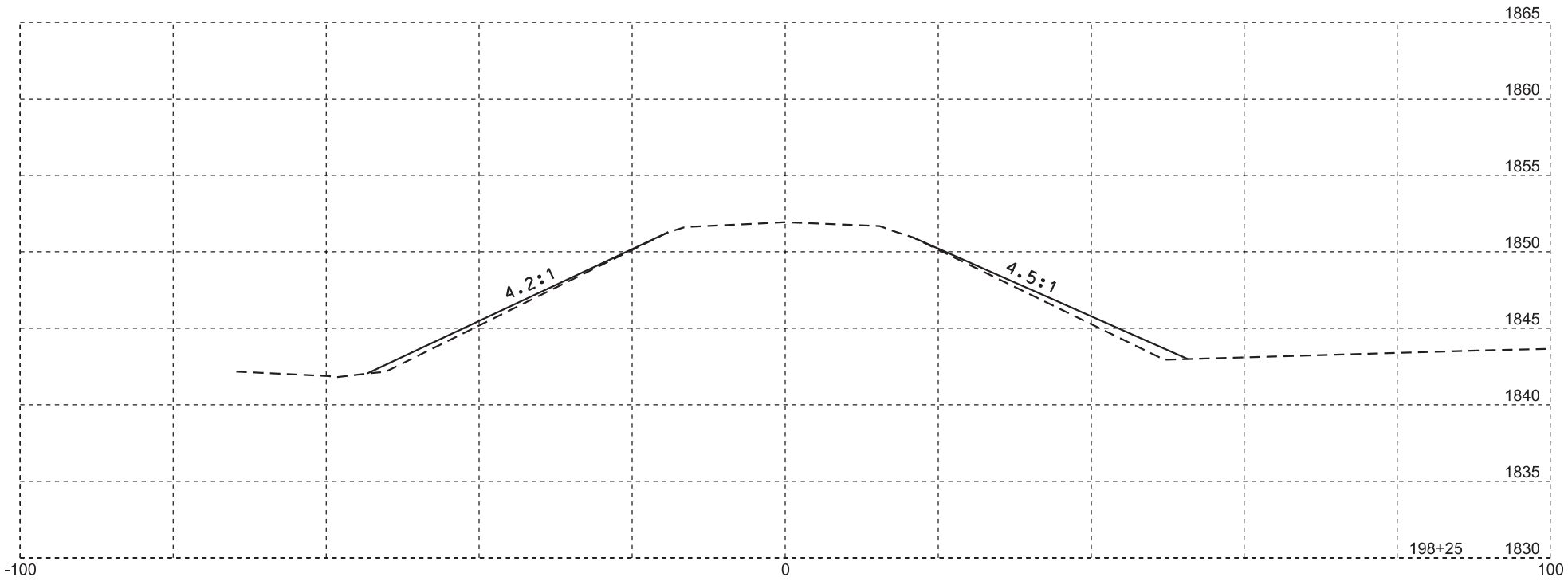
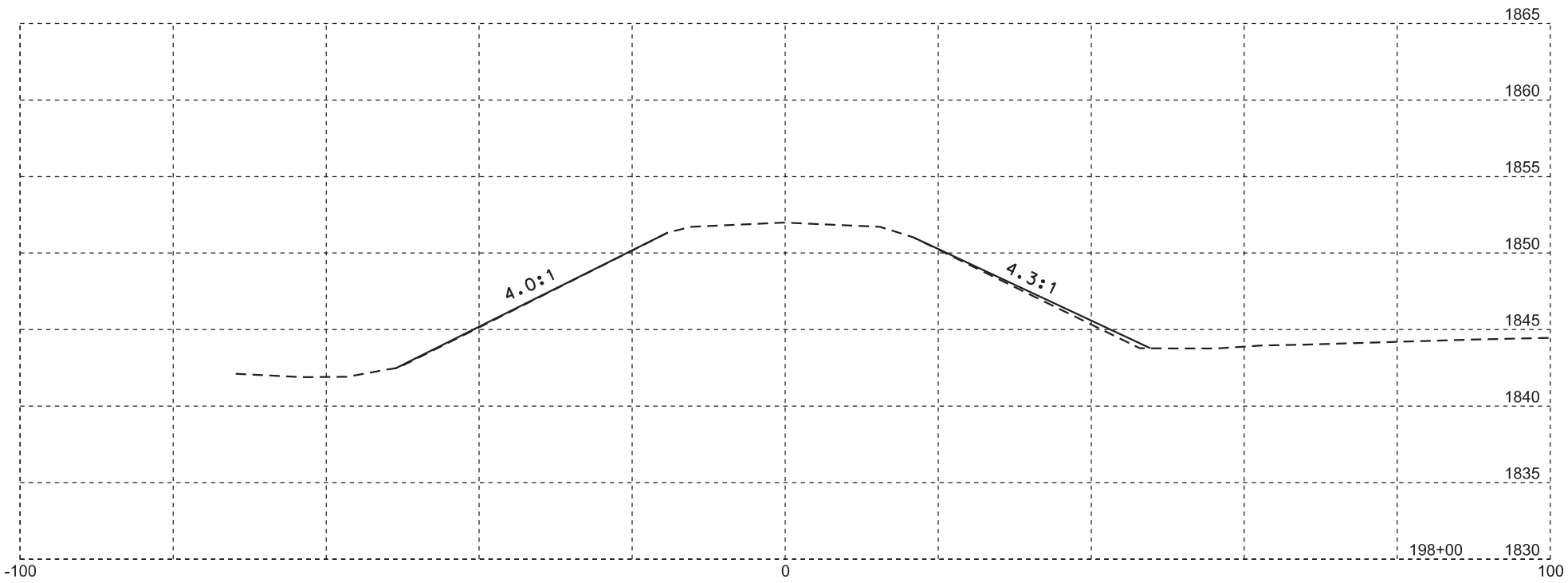
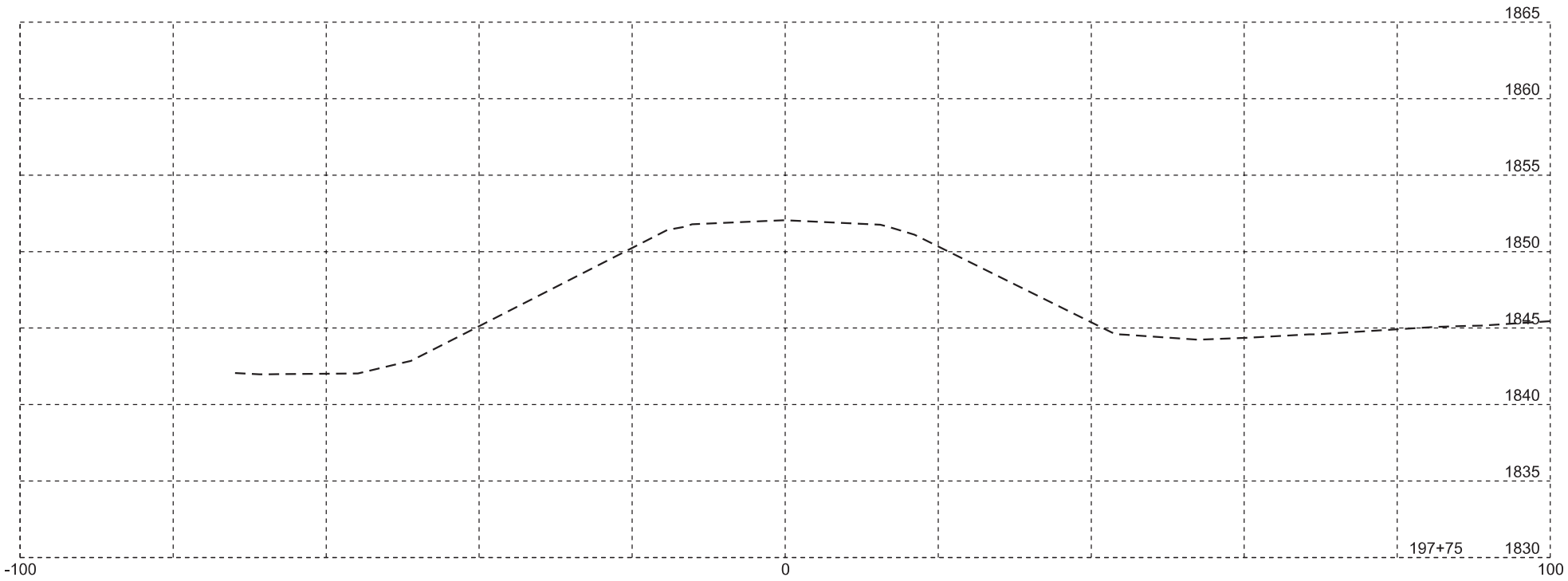
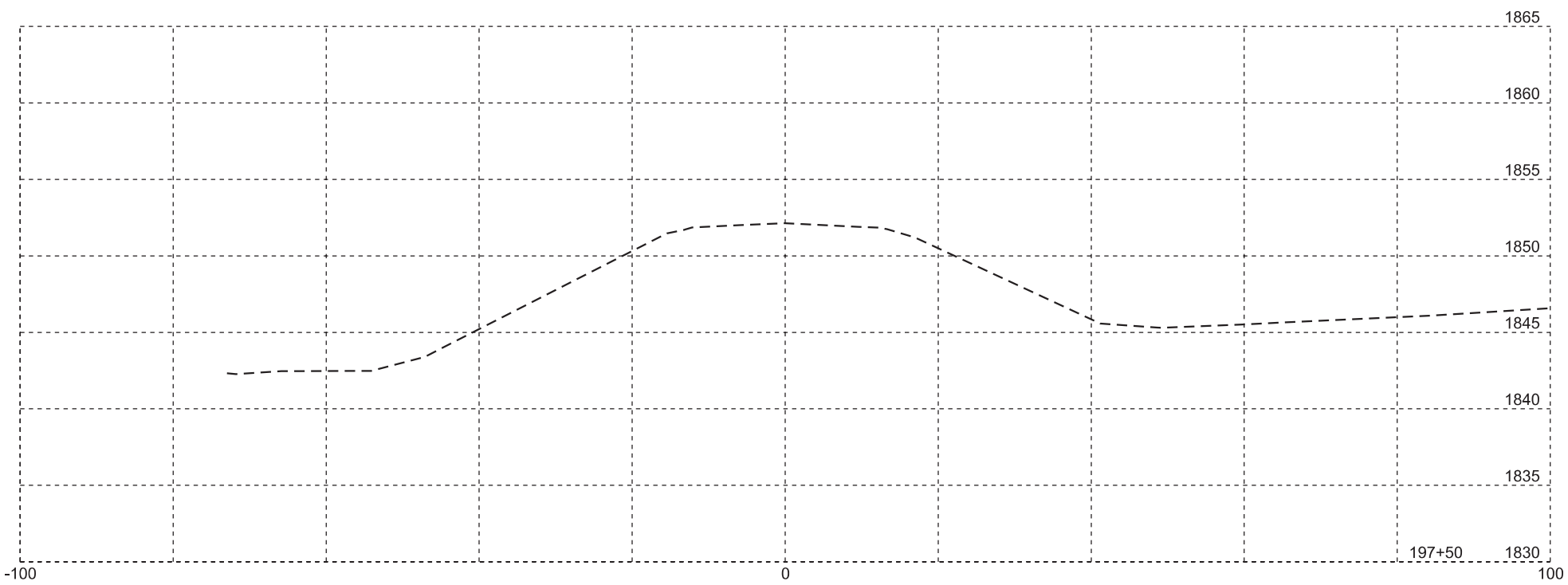
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	P 0253(04)182	64	71









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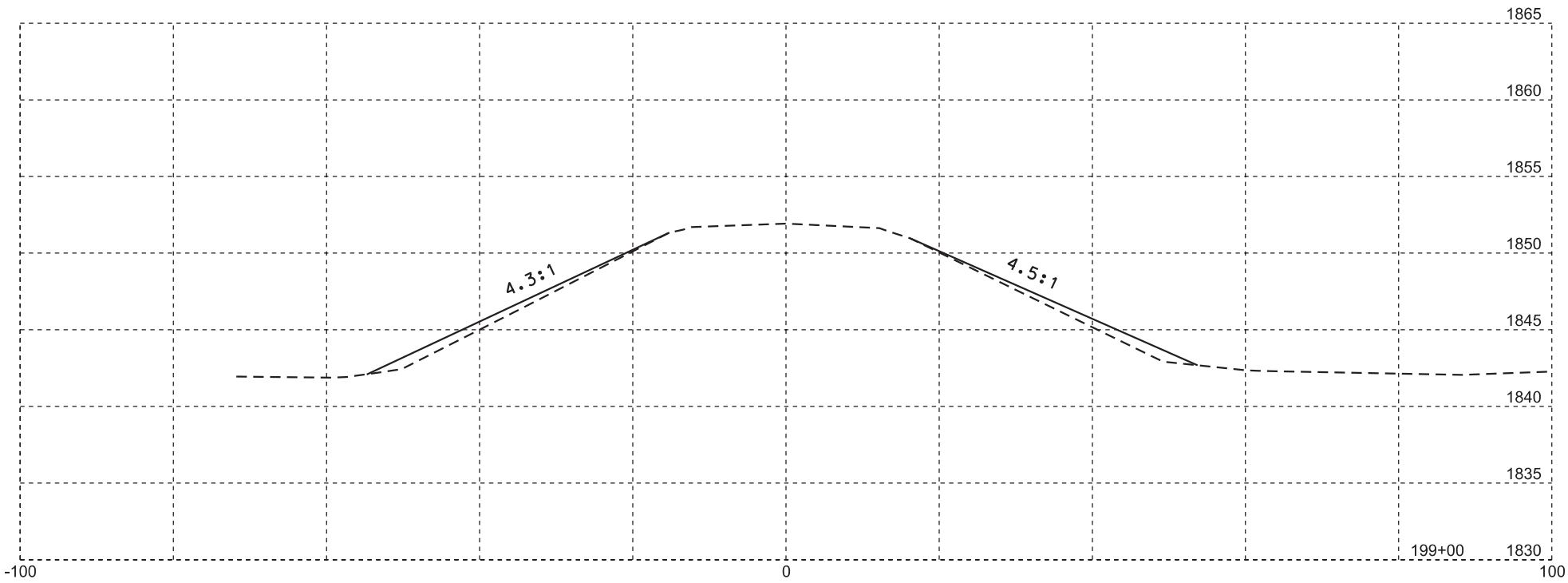
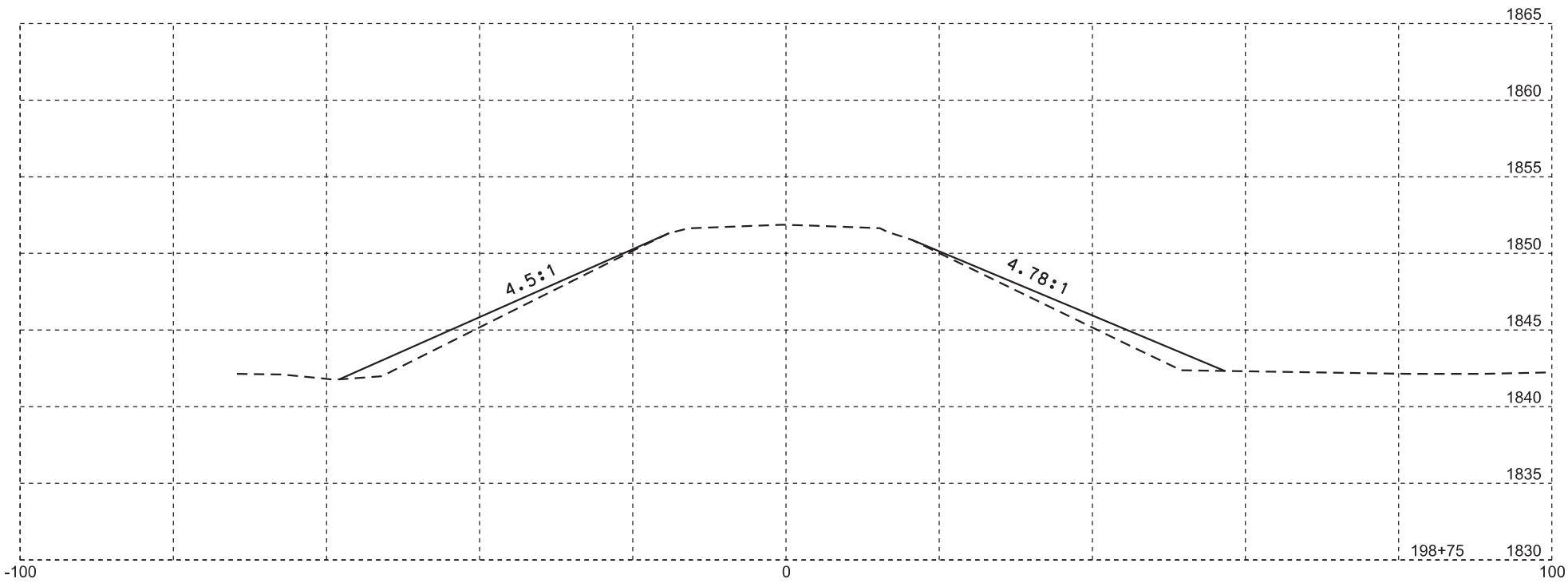
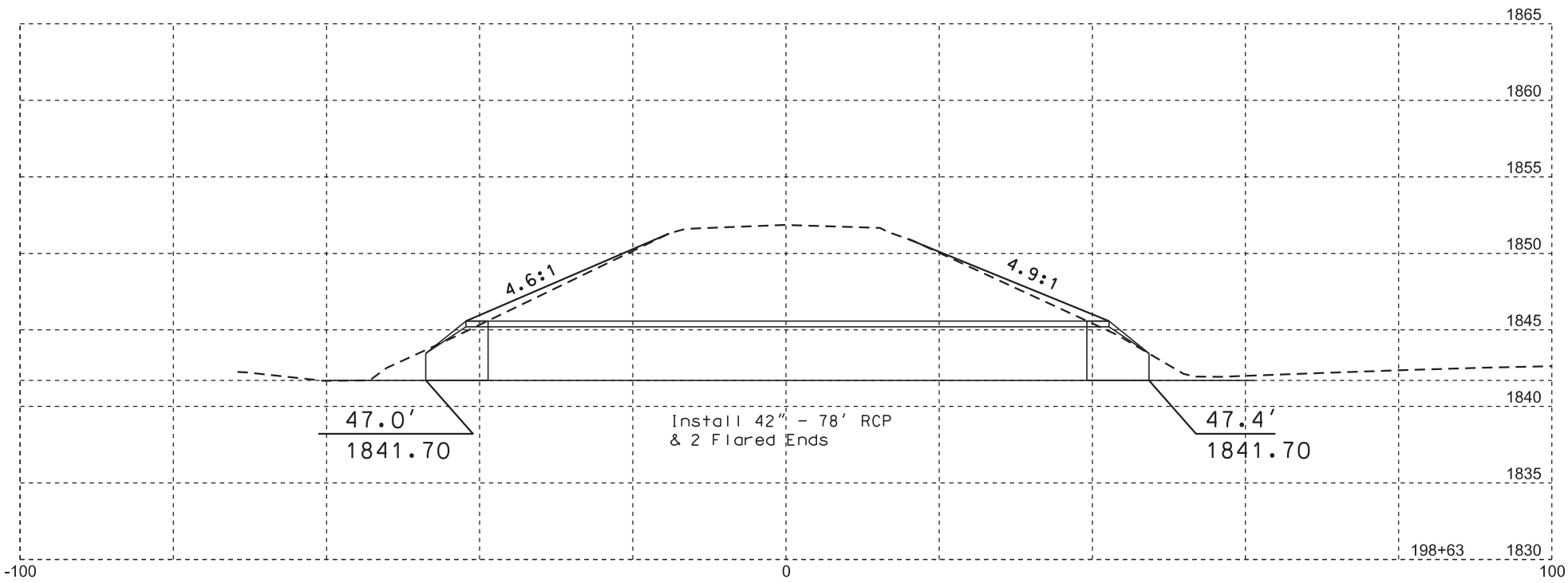
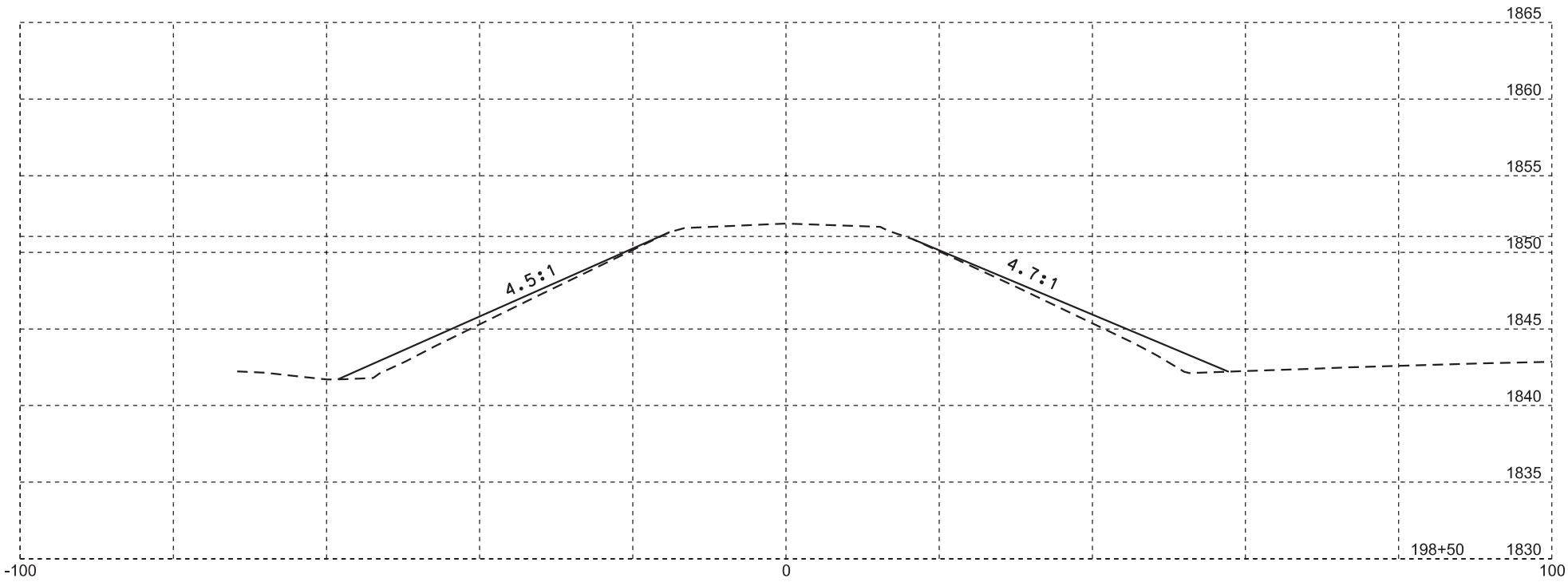
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	P 0253(04)182	65	71









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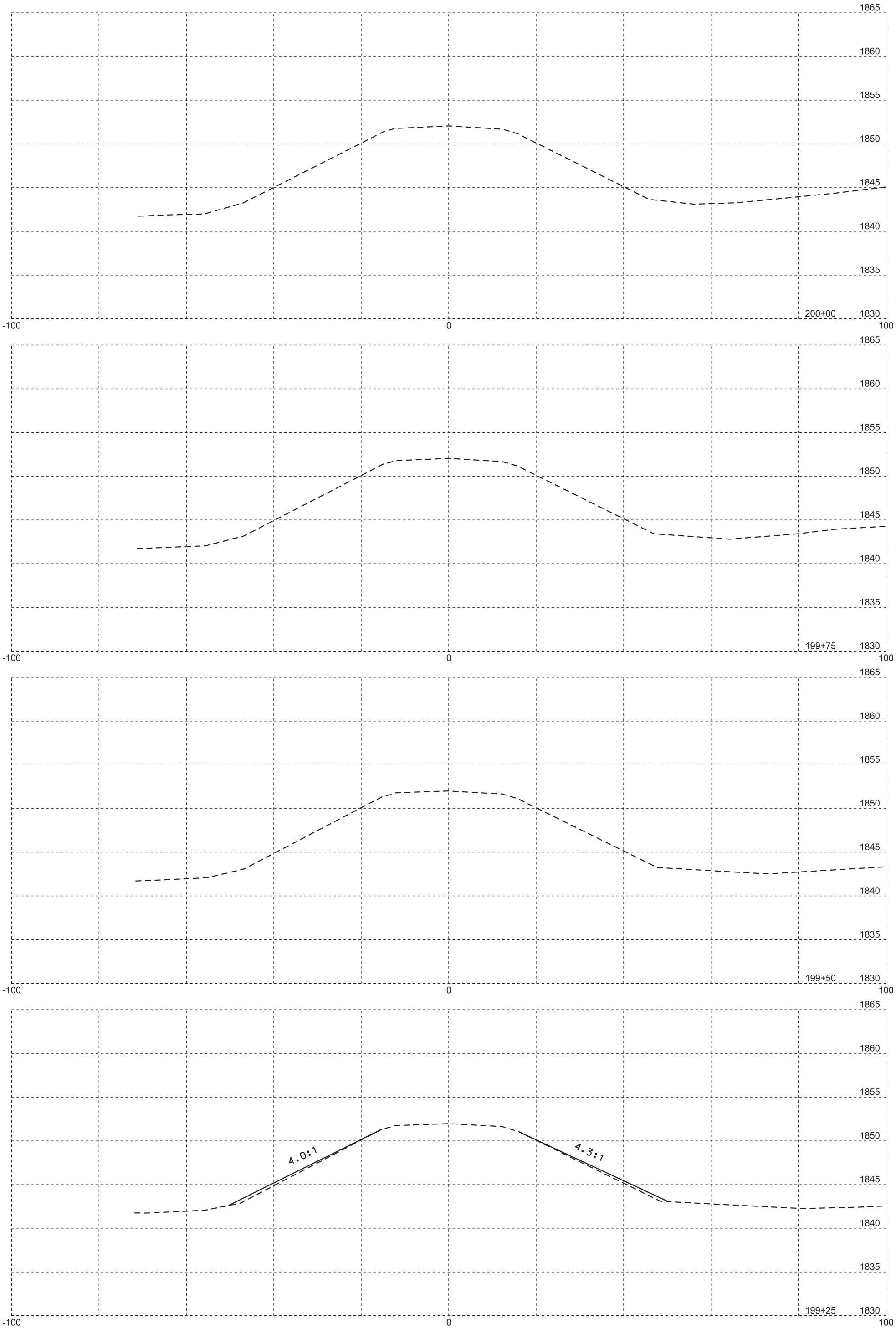
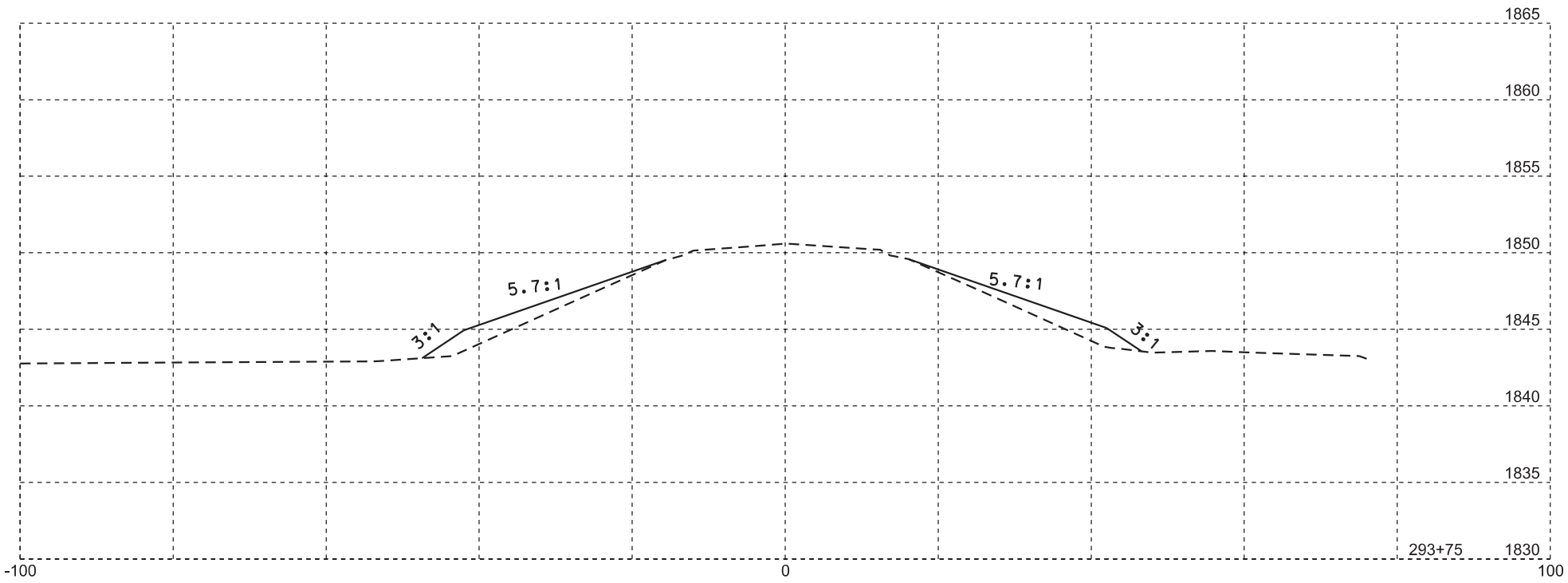
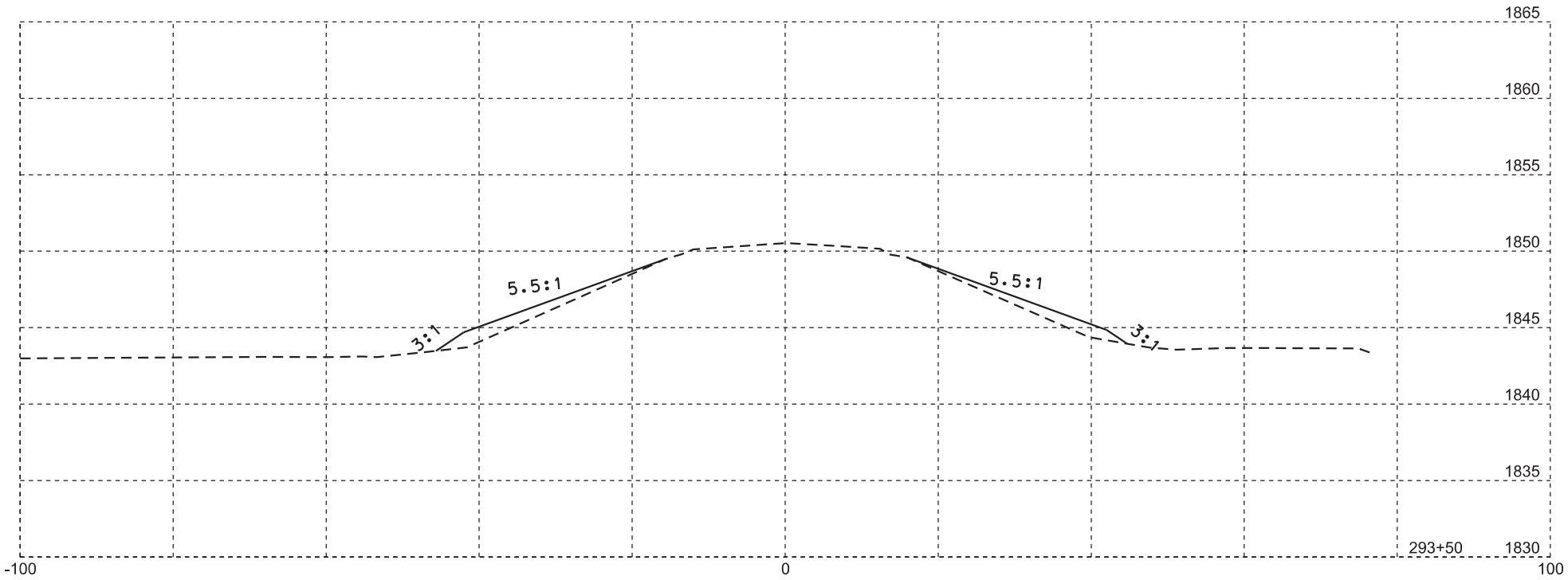
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	P 0253(04)182	66	71

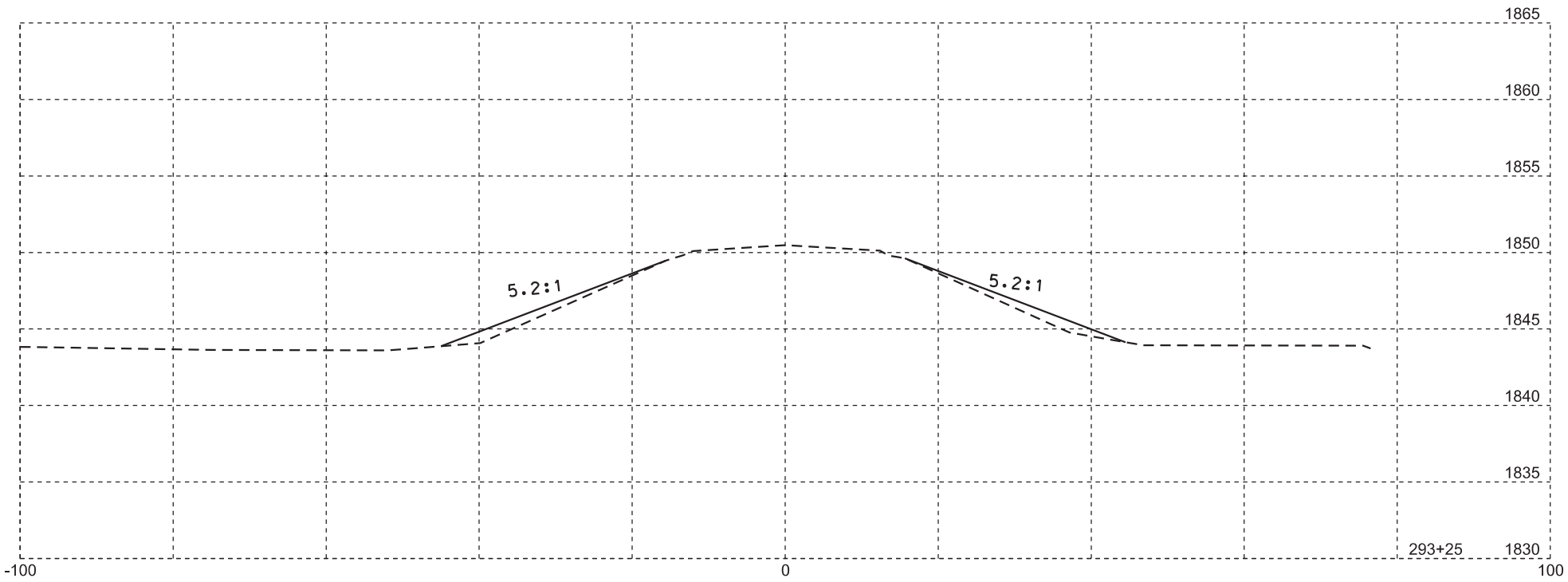


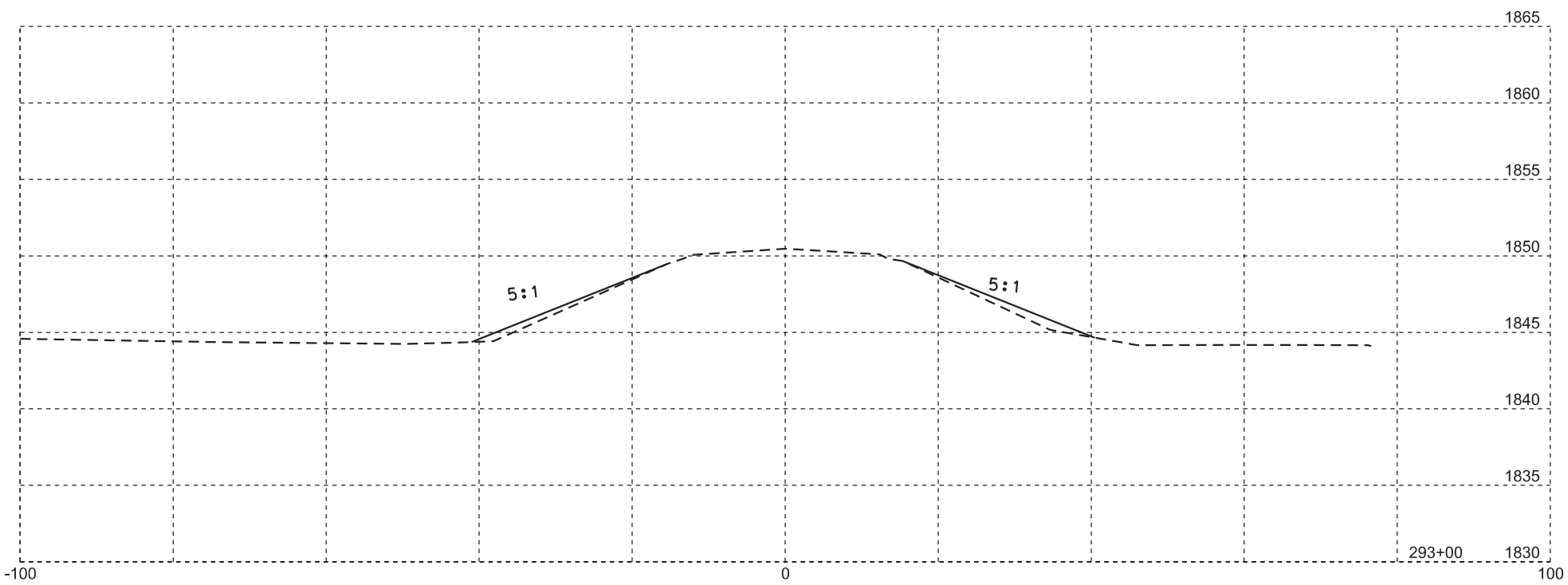
Plotting Date: 07/14/2016

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	P 0253(04)182	67	71









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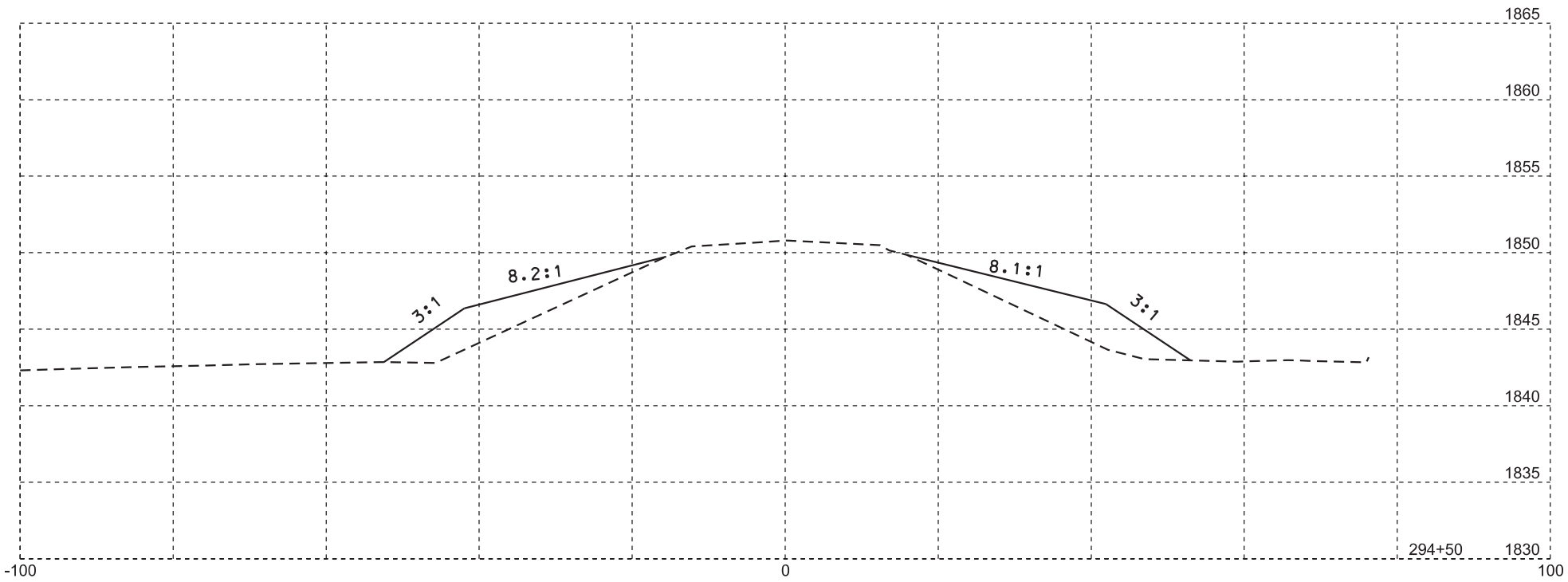
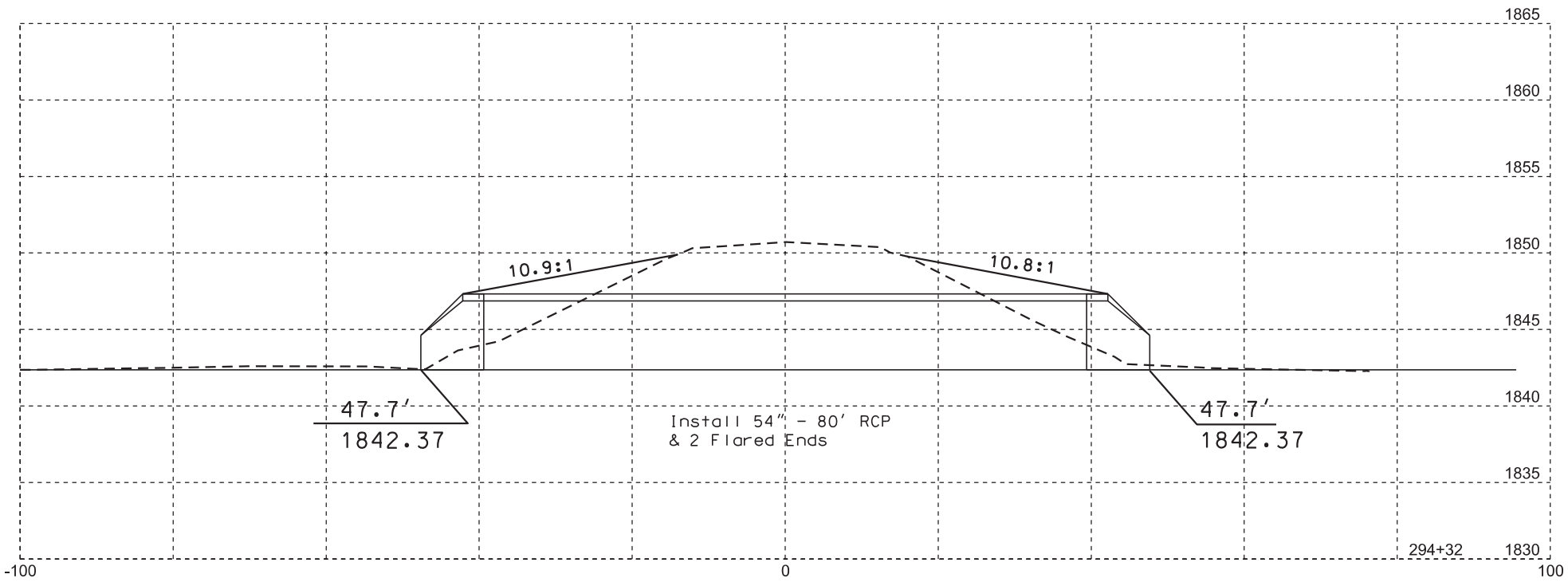
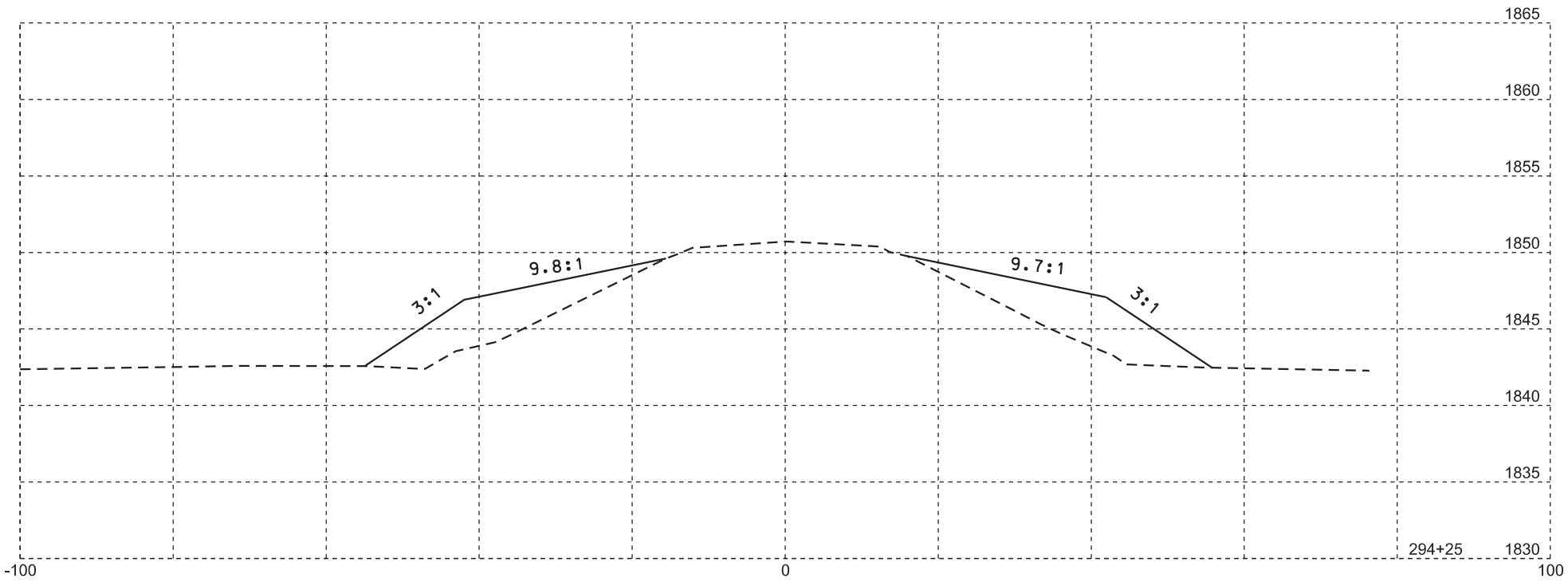
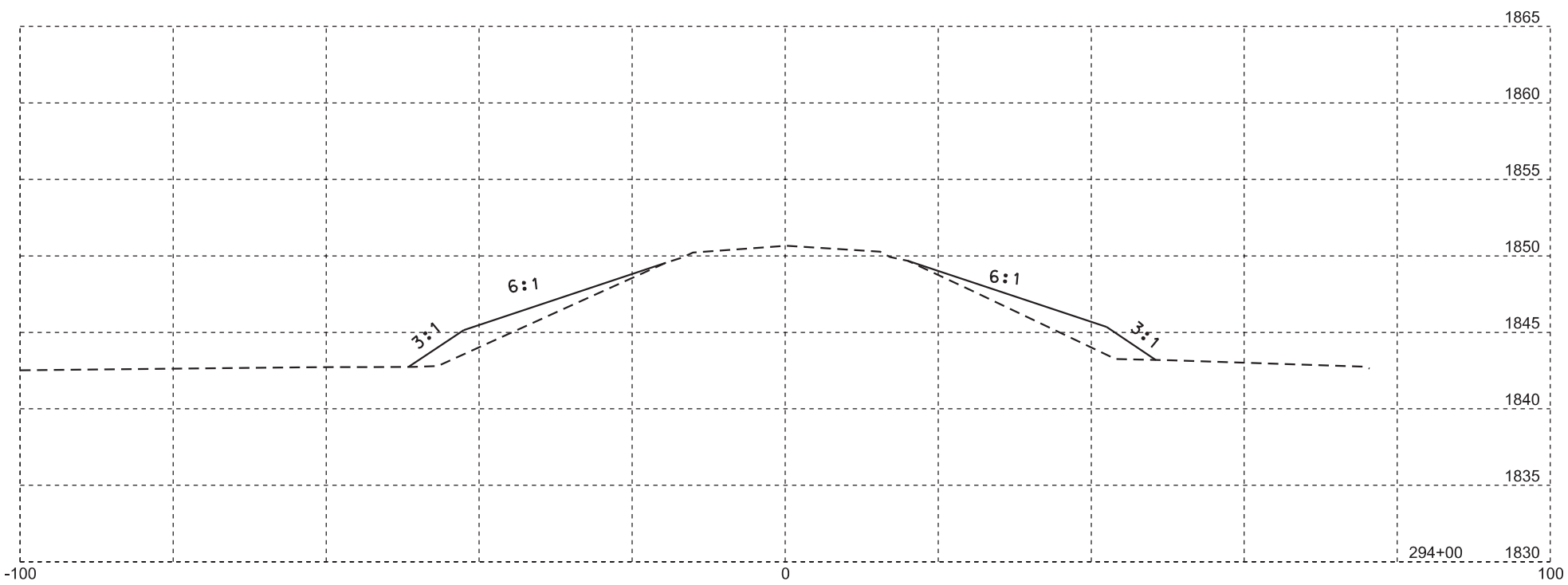
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	P 0253(04)182	68	71









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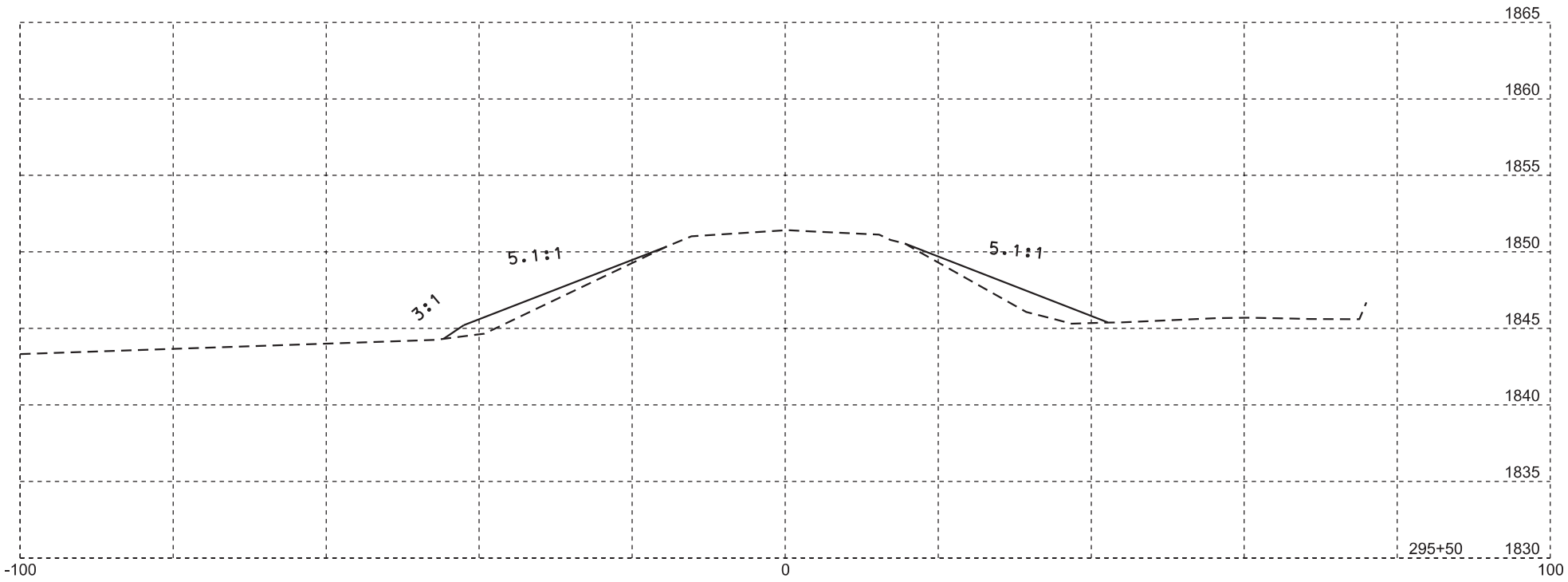
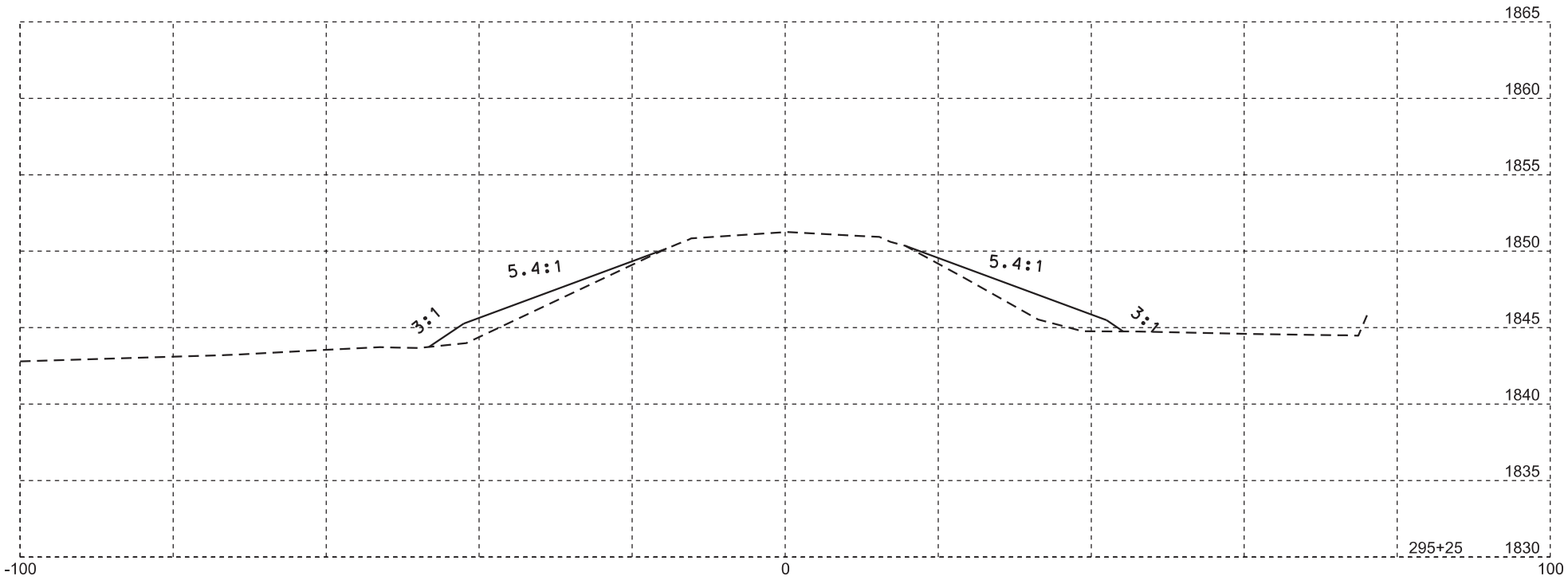
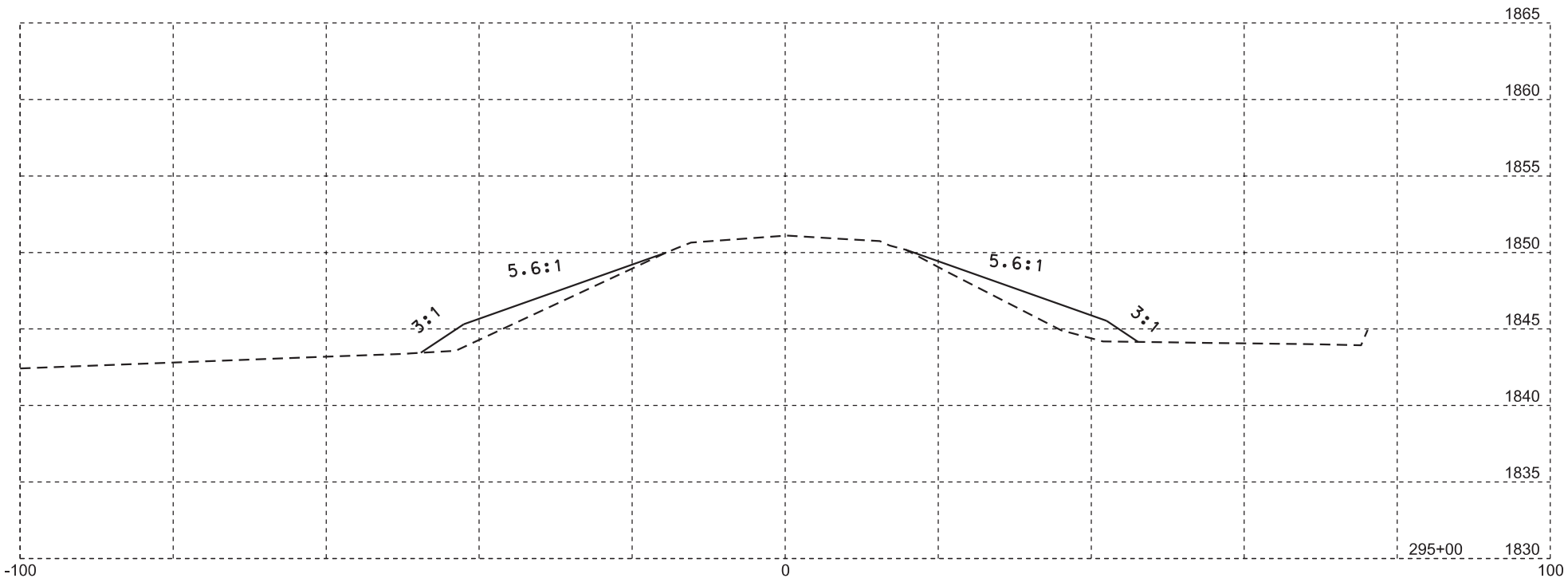
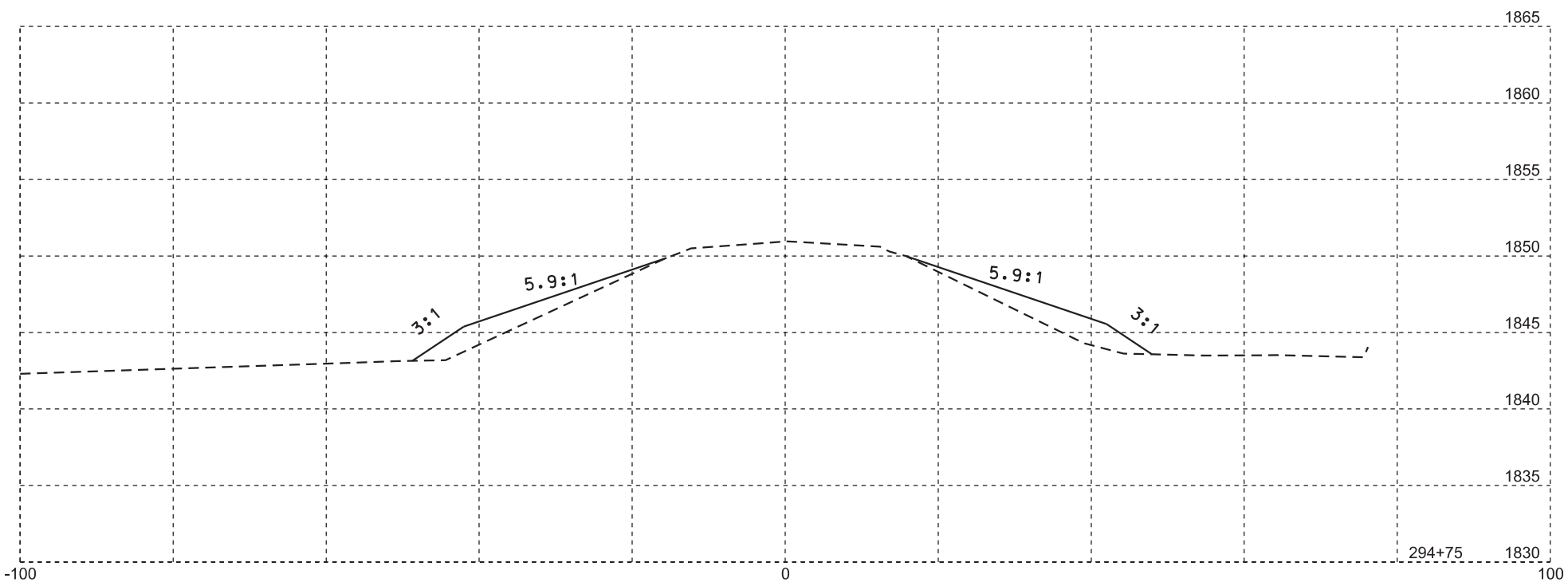
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	P 0253(04)182	69	71









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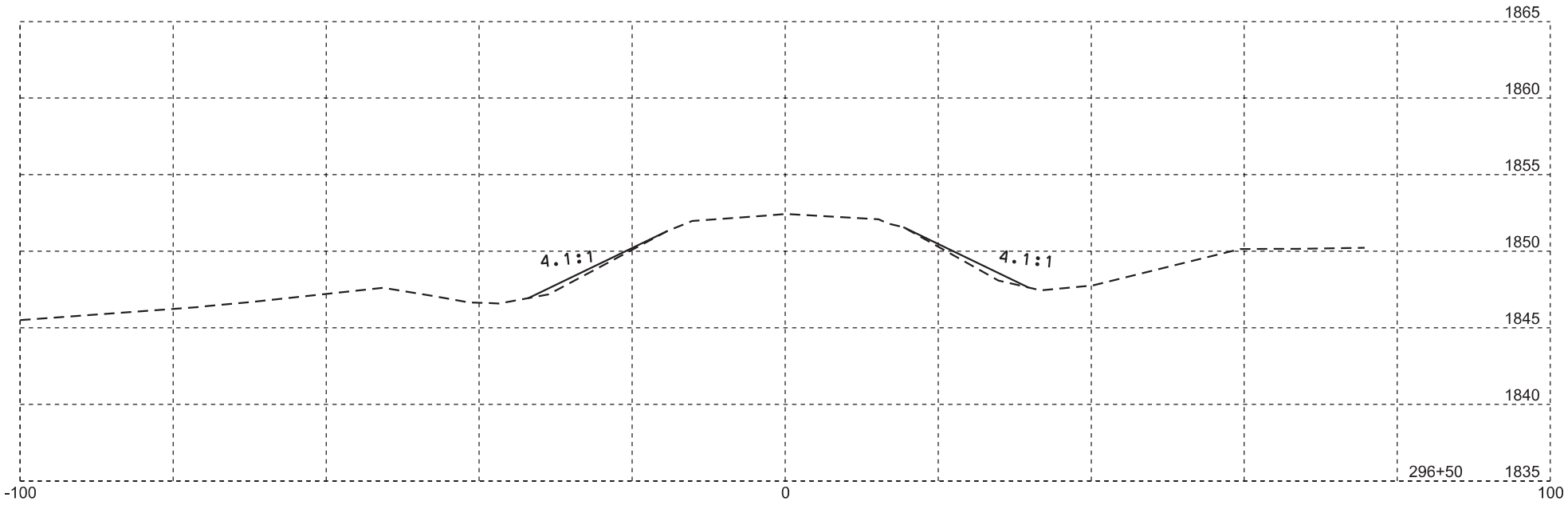
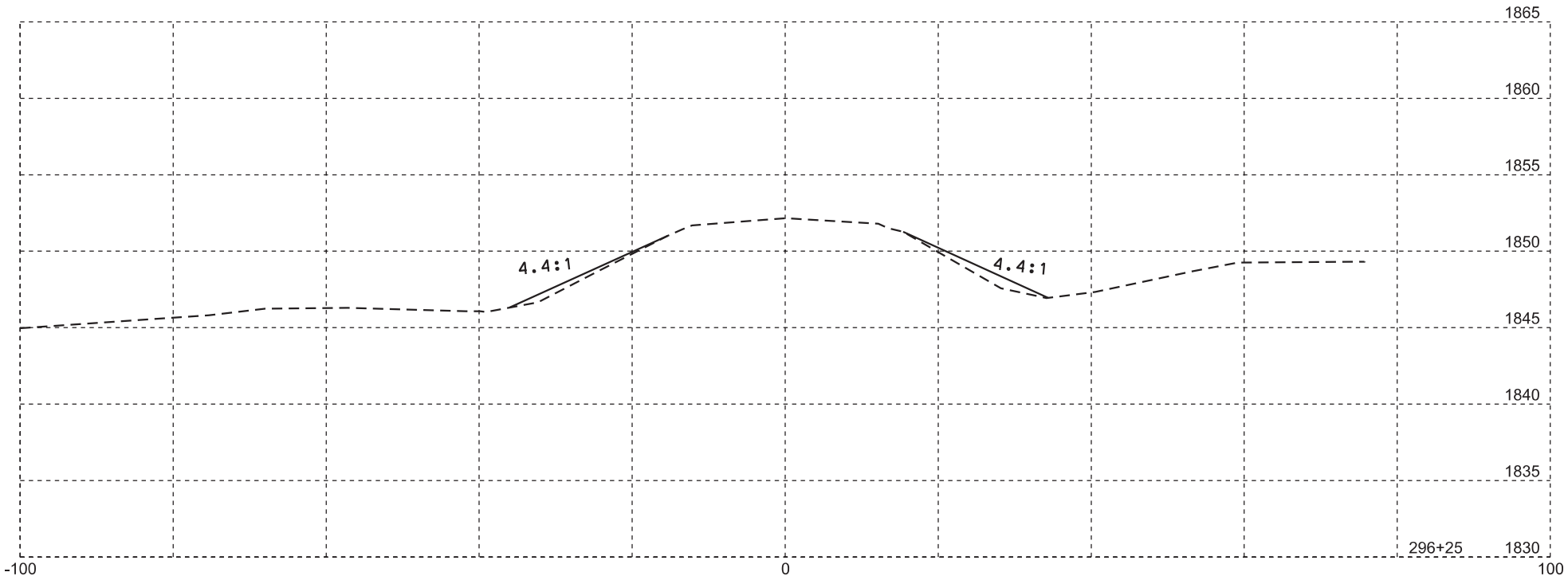
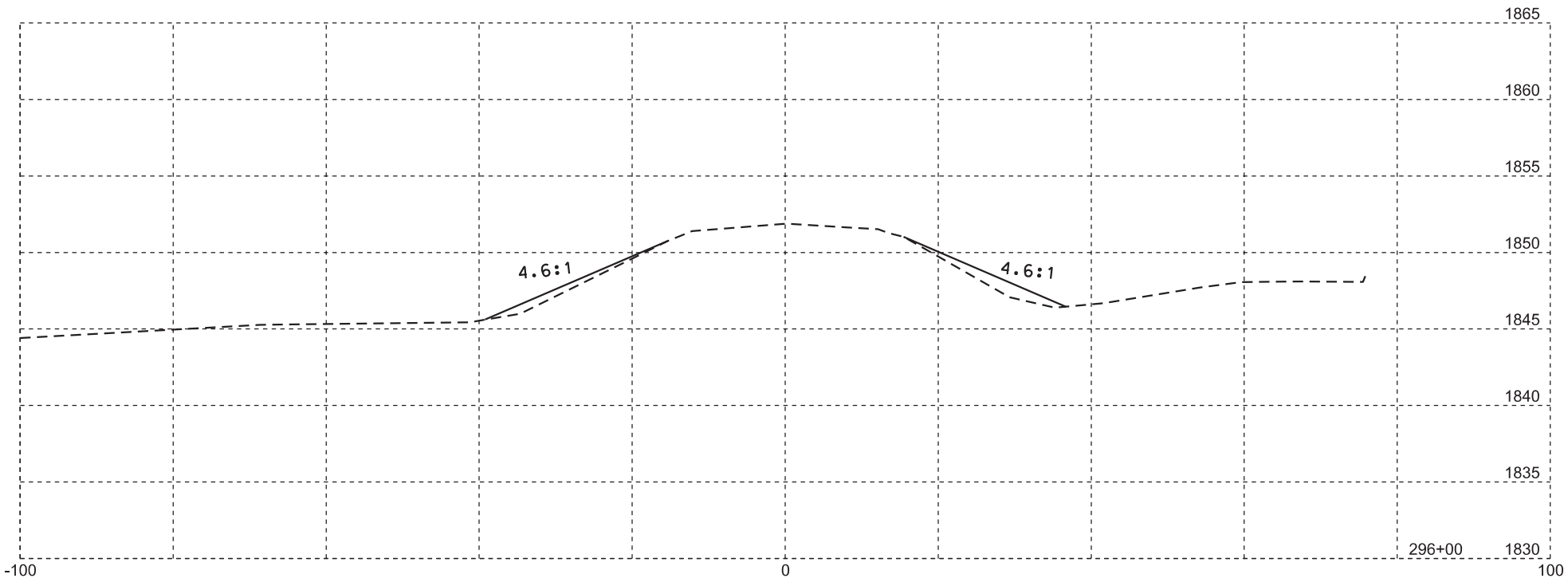
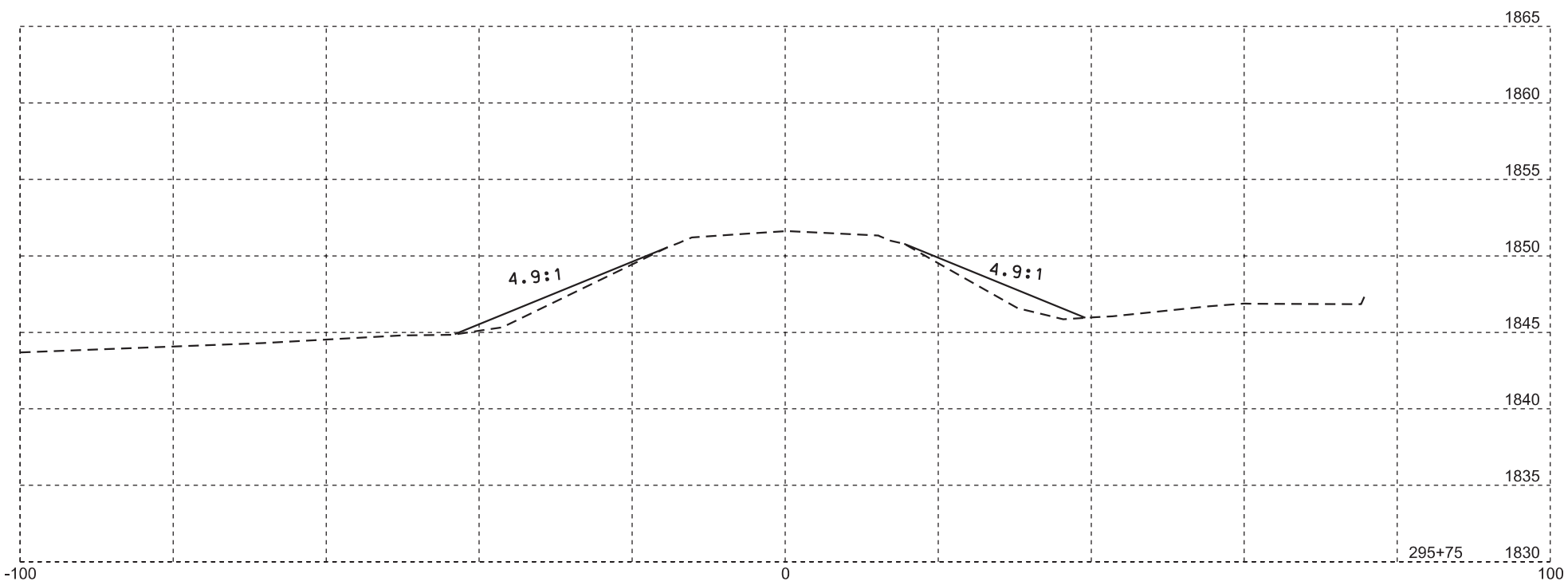
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	P 0253(04)182	70	71









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STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	P 0253(04)182	71	71