STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0081(112)95	1	167

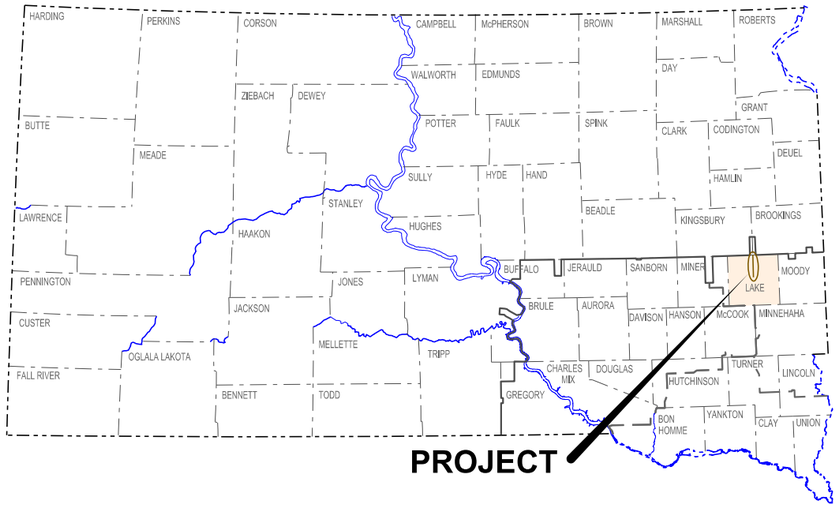
Plotting Date: 05/08/2024

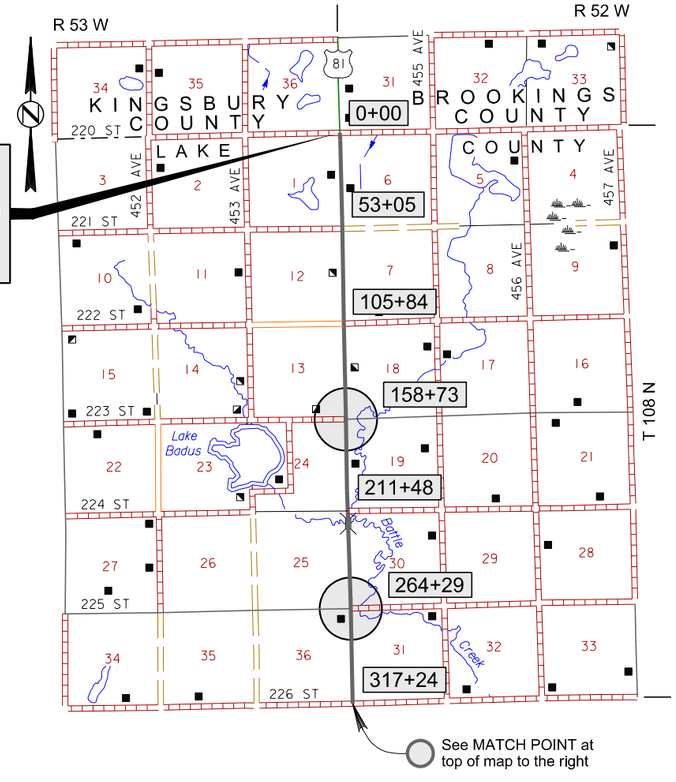
STATE OF SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION
PLANS FOR PROPOSED

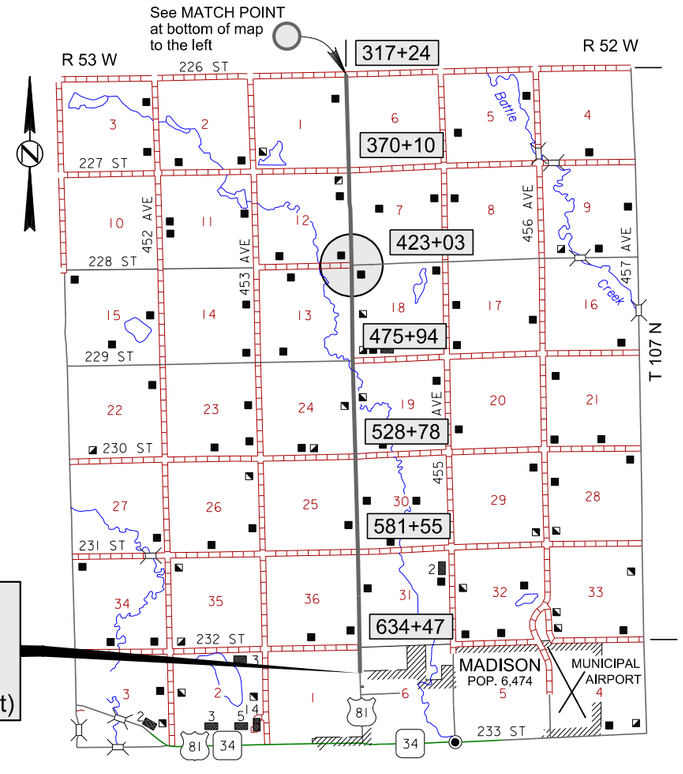
PROJECT NH 0081(112)95
US HIGHWAY 81
LAKE COUNTY

COLD MILLING ASPHALT CONCRETE,
FULL DEPTH RECLAMATION,
INTERSECTION IMPROVEMENT - LEFT TURN LANES
ASPHALT CONCRETE RESURFACING,
RC BOX CULVERT EXTENSION, CULVERT WORK,
PAVEMENT MARKING, PERMANENT SIGNING &
REMOVE CABLE GUARDRAIL
PCN 06P9

INDEX OF SHEETS - See Sheet 2







BEGIN PROJECT
STA. 0+00
MRM 107.73 +0.000
MILEAGE 102.902
(At End Concrete)

Left Turn Lanes to be installed on US81 at the intersections with 223rd St, 225th St & 228th St

END PROJECT
STA. 649+95
MRM 95.21 +0.221
MILEAGE 90.581
(1100' N of Jct ℄ NW 9th St)

See MATCH POINT at top of map to the right

DESIGN DESIGNATION	
ADT(2023)	1757
ADT(2043)	2,403
DHV	498
D	50%
T DHV	5.5%
T ADT	12.1%
V	50/65 MPH

STORM WATER PERMIT
Receiving Waters:
Battle Creek, Unnamed Creek from Ramona to Madison
Area Disturbed: 36.6Acres
Total Project Area: 224 Acres
Latitude: 44.1959 (Google Maps)
Longitude: -97.1297 (Google Maps)

PROJECT LENGTH
64,994' 12.310 Miles

PROJECT NH 0081(112)95
US HIGHWAY 81
LAKE COUNTY

PCN 06P9

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ESTIMATE OF QUANTITIES

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STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
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BID ITEM NUMBER	ITEM	QUANTITY	UNIT
004E0030	Maintenance of Traffic Diversion(s)	Lump Sum	LS
004E0050	Remove Traffic Diversion(s)	Lump Sum	LS
009E0010	Mobilization	Lump Sum	LS
009E3210	Construction Staking	12.310	Mile
009E3230	Grade Staking	12.958	Mile
009E3240	Graded Centerline Staking	12.310	Mile
009E3250	Miscellaneous Staking	12.310	Mile
009E3280	Slope Staking	1.430	Mile
009E3301	Engineer Directed Surveying/Staking	20.0	Hour
009E4200	Construction Schedule, Category II	Lump Sum	LS
110E0130	Remove Traffic Sign	47	Each
110E0500	Remove Pipe Culvert	320	Ft
110E0510	Remove Pipe End Section	8	Each
110E0700	Remove 3 Cable Guardrail	780	Ft
110E1010	Remove Asphalt Concrete Pavement	923.0	SqYd
110E1700	Remove Silt Fence	626	Ft
110E5010	Salvage Delineator	82	Each
110E7150	Remove Sign for Reset	15	Each
110E7500	Remove Pipe for Reset	36	Ft
110E7510	Remove Pipe End Section for Reset	20	Each
120E0010	Unclassified Excavation	39,702	CuYd
120E0100	Unclassified Excavation, Digouts	616	CuYd
120E0600	Contractor Furnished Borrow	30,130	CuYd
120E1000	Muck Excavation	265	CuYd
120E2000	Undercutting	15,733	CuYd
120E6100	Water for Embankment	301.0	MGal
120E6200	Water for Granular Material	1,674.0	MGal
210E3500	Heavy Roadway Shaping	0.200	Mile
230E0010	Placing Topsoil	15,384	CuYd
260E1010	Base Course	2,299.0	Ton
260E1030	Base Course, Salvaged	22,958.0	Ton
260E1050	Base Course, Salvaged Asphalt Mix	11,453.0	Ton
* 260E6000	Granular Material, Furnish	30,327.0	Ton
260E6000	Granular Material, Furnish	11,479.0	Ton
* 270E0200	Blend, Haul, and Stockpile Granular Material	60,654.0	Ton
270E0220	Blend and Stockpile Granular Material	22,958.0	Ton
280E0010	Full Depth Reclamation	317,907	SqYd
320E0005	PG 58-34 Asphalt Binder	3,465.4	Ton
320E1200	Asphalt Concrete Composite	238.0	Ton
320E1203	Class Q3R Hot Mixed Asphalt Concrete	74,469.0	Ton
320E4000	Hydrated Lime	737.3	Ton
320E7012	Grind 12" Rumble Strip or Stripe in Asphalt Concrete	24.6	Mile
330E0010	MC-70 Asphalt for Prime	183.3	Ton
330E0100	SS-1h or CSS-1h Asphalt for Tack	202.9	Ton
330E0210	SS-1h or CSS-1h Asphalt for Flush Seal	12.3	Ton
330E1000	Blotting Sand for Prime	902.4	Ton
330E2000	Sand for Flush Seal	46.5	Ton
332E0010	Cold Milling Asphalt Concrete	277,352	SqYd
421E0100	Pipe Culvert Undercut	102	CuYd
450E0122	18" RCP Class 2, Furnish	10	Ft
450E0130	18" RCP, Install	10	Ft
450E0142	24" RCP Class 2, Furnish	172	Ft
450E0150	24" RCP, Install	172	Ft
450E0162	30" RCP Class 2, Furnish	110	Ft
450E0170	30" RCP, Install	110	Ft
450E0182	36" RCP Class 2, Furnish	72	Ft
450E0190	36" RCP, Install	72	Ft
450E0192	42" RCP Class 2, Furnish	70	Ft
450E0200	42" RCP, Install	70	Ft
450E0222	60" RCP Class 2, Furnish	64	Ft
450E0230	60" RCP, Install	64	Ft
450E2016	24" RCP Flared End, Furnish	2	Each
450E2017	24" RCP Flared End, Install	2	Each
450E2024	30" RCP Flared End, Furnish	2	Each
450E2025	30" RCP Flared End, Install	2	Each
450E2028	36" RCP Flared End, Furnish	2	Each
450E2029	36" RCP Flared End, Install	2	Each
450E2032	42" RCP Flared End, Furnish	2	Each
450E2033	42" RCP Flared End, Install	2	Each
450E9000	Reset Pipe	36	Ft
450E9001	Reset Pipe End Section	20	Each
600E0300	Type III Field Laboratory	1	Each
632E1320	2.0"x2.0" Perforated Tube Post	609.0	Ft
632E1340	2.5"x2.5" Perforated Tube Post	24.0	Ft
632E2510	Type 2 Object Marker Back to Back	122	Each
632E3203	Flat Aluminum Sign, Nonremovable Copy High Intensity	194.0	SqFt
632E3205	Flat Aluminum Sign, Nonremovable Copy Super/Very High Intensity	177.2	SqFt
632E3500	Reset Sign	15	Each
633E1200	High Build Waterborne Pavement Marking Paint, White	573	Gal
633E1205	High Build Waterborne Pavement Marking Paint, Yellow	278	Gal
634E0010	Flagging	1,680.0	Hour
634E0020	Pilot Car	720.0	Hour
634E0110	Traffic Control Signs	746.5	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0630	Temporary Pavement Marking	61.6	Mile
730E0212	Type G Permanent Seed Mixture	952	Lb
732E0100	Mulching	73.2	Ton
734E0602	Low Flow Silt Fence	2,160	Ft
734E0604	High Flow Silt Fence	342	Ft
734E0610	Mucking Silt Fence	174	CuYd
734E0620	Repair Silt Fence	626	Ft
900E0010	Refurbish Single Mailbox	16	Each
900E1980	Storage Unit	1	Each

*** - Denotes Non-Participating**

STRUCTURE NO. 40-120-042

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E3290	Structure Staking	1	Each
420E0200	Structure Excavation, Box Culvert	77	CuYd
421E0200	Box Culvert Undercut	219	CuYd
450E4699	Tie Bolts for RCP	6	Each
450E8300	Culvert Joint Cleaning	108.0	Ft
450E8305	Repair Culvert Joint	108.0	Ft
450E8310	Chemical Grout Void Fill	27.0	Gal
460E0120	Class A45 Concrete, Box Culvert	142.6	CuYd
460E0300	Breakout Structural Concrete	32.0	CuYd
460E0380	Install Dowel in Concrete	128	Each
480E0100	Reinforcing Steel	17,020	Lb
700E0210	Class B Riprap	65.6	Ton
831E0110	Type B Drainage Fabric	82	SqYd

SPECIFICATIONS

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

ENVIRONMENTAL COMMITMENTS

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ENVIRONMENTAL COMMITMENTS

The SDDOT is committed to protecting the environment and uses Environmental Commitments as a communication tool for the Engineer and Contractor to ensure that attention is given to avoid, minimize, and/or mitigate an environmental impact. Environmental commitments to various agencies and the public have been made to secure approval of this project. An agency with permitting authority can delay a project if identified 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. During construction, the Project Engineer will verify that the Contractor has met Environmental Commitment requirements. These environmental commitments are not subject to change without prior written approval from the SDDOT Environmental Office.

Additional guidance on SDDOT's Environmental Commitments can be accessed through the Environmental Procedures Manual found at: <https://dot.sd.gov/media/documents/EnvironmentalProceduresManual.pdf >

For questions regarding change orders in the field that may have an effect on an Environmental Commitment, the Project Engineer will contact the Environmental Engineer at 605-773-3180 or 605-773-4336 to determine whether an environmental analysis and/or resource agency coordination is necessary.

Once construction is complete, the Project Engineer will review all environmental commitments for the project and document their completion.

COMMITMENT A: AQUATIC RESOURCES

COMMITMENT A1: WETLANDS

All efforts to avoid and minimize wetland impacts from the project have resulted in approximately 0.29 acres of wetlands (includes temporary and permanent) becoming impacted. Refer to plans for location and boundaries of the impacted wetlands.

Table of Impacted Wetlands

Wetland No.	Station	Perm. Impact Left (Acres)	Perm. Impact Right (Acres)	Temp. Impact Left (Acres)	Temp. Impact Right (Acres)	Total Impact (Acres)
1	14+82	0.00	0.00	0.007	0.013	0.02
2	40+49	0.00	0.00	0.005	0.006	0.011
3	103+19	0.00	0.00	0.001	0.005	0.006
4	216+13	0.007	0.013	0.00	0.00	0.02
5	227+44	0.00	0.00	0.005	0.005	0.01
6	283+72	0.00	0.00	0.00	0.005	0.005
7	410+00 to 418+00	0.00	0.202	0.00	0.00	0.202
8	459+26	0.00	0.00	0.005	0.005	0.01
9	496+01	0.00	0.00	0.00	0.005	0.005
10	529+69	0.00	0.00	0.00	0.004	0.004

Action Taken/Required:

Mitigation is required in accordance with the "*Statewide Finding Regarding Wetlands for South Dakota Federal-Aid Highway Projects (February 2018)*". Replacement of 0.02 acres of permanent wetland impacts will be completed through another wetland mitigation opportunity in a manner which considers FHWA's program-wide goal of 'net gain' of wetlands through enhancement, creation, and preservation.

Pending the USACE 404 permit, SDDOT intends to satisfy compensatory wetland mitigation requirements under Section 404 of the CWA in the Lower Big Sioux GSA by purchasing 1.11 FCU credits from an approved wetland mitigation bank site provider in the Lower Big Sioux GSA if credits are available. If no bank site credits are available, the SDDOT intends to purchase 1.67 FCU credits from the Ducks Unlimited In-Lieu Fee program in the Lower Big Sioux GSA.

Temporary impacts identified in the Table of Impacted Wetlands will not be mitigated as original contours and elevations will be re-established as designated in Section B – Grading Plans. Prior to initiating temporary work in wetlands, the Contractor will submit a plan to the Project Engineer in accordance with Section 7.21 D of the Specifications.

COMMITMENT A2: STREAMS

All efforts to avoid and minimize stream impacts from the project have resulted in approximately 0.02 acres of stream (includes temporary and permanent) becoming impacted. Refer to plans for location and boundaries of the impacted streams.

Table of Impacted Streams

Stream Name	Station	Perm. Impact Left (Acres)	Perm. Impact Right (Acres)	Temp. Impact Left (Acres)	Temp. Impact Right (Acres)	Total Impact (Acres)
Battle Creek	216+13	0.003	0.005	0.00	0.00	0.008
Unnamed Tributary to Battle Creek	268+40	0.007	0.007	0.00	0.00	0.014

Action Taken/Required:

It has been determined that project impacts do not require mitigation. Permanent stream impacts identified in the Table of Impacted Streams will not be mitigated as there are less than 0.03 acres of impact per aquatic resource.

COMMITMENT C: WATER SOURCE

The Contractor will not withdraw water with equipment previously used outside the State of South Dakota or previously used in aquatic invasive species (AIS) positive waters within South Dakota without prior approval from the SDDOT Environmental Office. To prevent and control the introduction and spread of invasive species into the project vicinity, all equipment will be power washed with hot water (≥140 °F) and completely dried for a minimum of 7 days prior to subsequent use. South Dakota administrative rule 41:10:04:02 forbids the possession and transport of AIS; therefore, all attached dirt, mud, debris and vegetation must be removed and all compartments and tanks capable of holding standing water must be drained. This includes, but is not limited to, all equipment, pumps, lines, hoses and holding tanks.

Action Taken/Required:

The Contractor will obtain the necessary permits from the regulatory agencies such as the South Dakota Department of Agriculture and Natural Resources (DANR) and the United States Army Corps of Engineers (USACE) prior to water extraction activities.

Additional information and mapping of water sources impacted by Aquatic Invasive Species in South Dakota can be accessed at:
< https://sdleastwanted.sd.gov/maps/default.aspx >

< South Dakota Administrative Rule 41:10:04 Aquatic Invasive Species: https://sdlegislature.gov/rules/DisplayRule.aspx?Rule=41:10:04 >

COMMITMENT D: WATER QUALITY STANDARDS

COMMITMENT D1: SURFACE WATER QUALITY

This project may be in the vicinity of multiple streams and wetlands. These waters are considered waters of the state and are protected under Administrative Rules of South Dakota (ARSD) Chapter 74:51. Special construction measures may have to be taken to ensure that this water body is not impacted.

Action Taken/Required:

The Contractor is advised that the South Dakota Surface Water Quality Standards, administered by the South Dakota Department of Agriculture and Natural Resources (DANR), apply to this project. Special construction measures will be taken to ensure the above standard(s) of the surface waters are maintained and protected.

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COMMITMENT D2: SURFACE WATER DISCHARGE

The DANR General Permit for Temporary Discharge is required for temporary dewatering and discharges to waters of the state. The effluent limit for total suspended solids will be 90 mg/L 30-day average. The effluent limit applies to discharges to all waters of the state except discharges to waters classified as cold water permanent fish life propagation waters according to the ARSD 74:51:01:45. For discharges to waters of the state classified as cold water permanent fish life propagation waters, the effluent limit for total suspended solids will be 53 mg/L daily maximum.

The permittee has the option of completing effluent testing or implementing a pollution prevention plan for compliance with this permit. If the permittee develops a pollution prevention plan instead of total suspended solids sampling, the plan must be developed and implemented prior to discontinuing total suspended solids sampling. Refer to Section 4.0 of the permit. If any pollutants are suspected of being discharged, a sample must be taken for those parameters listed in Section 3.4 of the permit.

Refer to Commitment D1: Surface Water Quality for stream classification.

Action Taken/Required:

If construction dewatering is required and this project is currently covered under a General Permit for Stormwater Discharges Associated with Construction Activities, the contractor will need to submit the dewatering information to the SDDANR using the following form:

< https://danr.sd.gov/OfficeOfWater/SurfaceWaterQuality/docs/DANR_AddTempInfoFillable.pdf >

The Contractor will provide a copy of the approved permit or the submitted dewatering information to the Project Engineer prior to proceeding with any dewatering activities. The approved permit or submitted dewatering information must be kept on-site and as part of the project records.

Effluent monitoring, as a result of dewatering activities, will be summarized for each month and recorded on a separate Discharge Monitoring Report (DMR) and submitted to DANR monthly. Additional information can be found at:
< https://danr.sd.gov/OfficeOfWater/SurfaceWaterQuality/swdpermitting/Ereporting.aspx >

COMMITMENT E: STORM WATER

Construction activities constitute 1 acre or more of earth disturbance and/or work in a waterway.

Action Taken/Required:

The DANR General Permit for Stormwater Discharges Associated with Construction Activities is required for construction activity disturbing one or more acres of earth and work in a waterway. The SDDOT is the owner of this permit and will submit the NOI to DANR 15 days prior to project start in order to obtain coverage under the General Permit. Work can begin once the DANR letter of approval is received.

The Contractor must adhere to the "Special Provision Regarding Storm Water Discharges to Waters of the State."

The Contractor will complete the DANR Contractor Certification Form prior to the pre-construction meeting. The form certifies under penalty of law that the Contractor understands and will comply with the terms and conditions of the permit for this project. Work may not begin on this project until this form is signed and submitted to DANR.

The form can be found at:
< https://danr.sd.gov/OfficeOfWater/SurfaceWaterQuality/docs/DANR_CGPAppendixCCA2018Fillable.pdf >

The Contractor is advised that permit coverage may also be required for off-site activities, such as borrow and staging areas, which are the responsibility of the Contractor.

Storm Water Pollution Prevention Plan

The Storm Water Pollution Prevention Plan (SWPPP) will be developed prior to the submittal of the NOI and will be implemented for all construction activities for compliance with the permit. The SWPPP must be kept on-site and updated as site conditions change. Erosion control measures and best management practices will be implemented in accordance with the SWPPP.

The DOT 298 Form will be used for site inspections and to document changes to the SWPPP. A copy of the completed inspection form will be filed with the SWPPP documents and retained for a minimum of three years.

The inspection will include disturbed areas of the construction site that have not been finally stabilized, areas used for storage materials, structural control measures, and locations where vehicles enter or exit the site. These areas will be inspected for evidence of, or the potential for, pollutants entering the drainage system. Erosion and sediment control measures identified in the SWPPP will be observed to ensure that they are operating correctly, and sediment is not tracked off the site.

Information on storm water permits and SWPPPs are available on the following websites:

SDDOT: < https://dot.sd.gov/doing-business/environmental/stormwater >

DANR:< https://danr.sd.gov/OfficeOfWater/SurfaceWaterQuality/stormwater/default.aspx >

EPA: < https://www.epa.gov/npdes >

COMMITMENT H: WASTE DISPOSAL SITE

The Contractor will 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) will 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 Agriculture and Natural Resources.

The waste disposal site(s) will 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 Environmental Office and the Project Engineer.

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

1. Construction and/or demolition debris consisting of concrete, asphalt concrete, or other similar materials will be buried in a trench separate from wood debris. The final cover over the construction and/or demolition debris will consist of a minimum of 1 foot of soil capable of supporting vegetation. Waste disposal sites provided outside of the Public ROW will be seeded in accordance with Natural Resources Conservation Service recommendations. The seeding recommendations may be obtained through the appropriate County NRCS Office. The Contractor will control the access to waste disposal sites not within the Public ROW with 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 not to exceed the duration of the project. Prior to project completion, the waste will 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) will be incidental to the various contract items.

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COMMITMENT I: HISTORIC PRESERVATION OFFICE CLEARANCES

The SDDOT has obtained concurrence with the State Historic Preservation Office (SHPO) 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 a cultural resource review prior to scheduling the pre-construction meeting. 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 will arrange and pay for a record search and when necessary, a cultural resource survey. 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 if the site was previously surveyed; however, a cultural resources survey may need to be conducted by a qualified archaeologist.

The Contractor will provide ARC with the following: a topographical map or aerial view in 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 will submit the cultural resources survey report to SDDOT Environmental Office, 700 East Broadway Avenue, Pierre, SD 57501-2586. 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.

In the event of an inadvertent discovery of human remains, funerary objects, or if evidence of cultural resources is identified during project construction activities, then such activities within 150 feet of the inadvertent discovery will immediately cease and the Project Engineer will be immediately notified. The Project Engineer will contact the SDDOT Environmental Office, who will contact the appropriate SHPO/THPO within 48 hours of the discovery to determine an appropriate course of action.

SHPO 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 will not utilize a site known or suspected of having contaminated soil or water. The Contractor will provide the required permits and clearances to the Project Engineer at the preconstruction meeting.

COMMITMENT M: SECTION 4(f)/6(f) RESOURCES

COMMITMENT M1: SECTION 4(f) PROPERTY

A Section 4(f) Evaluation concluded there are Section 4(f) properties located adjacent to the project.

Station	Section 4(f) Property
51+00 – 262+00 R 105+50 – 156+00 L	Lake Badus Rural Agricultural Historic District
422+50 – 449+00L	Abraham Hegdahl Farm (Historic District)

Action Taken/Required:

The Contractor is not permitted to stage equipment or materials within the Lake Badus Rural Agricultural Historic District and within the Abraham Hegdahl Farm (Historic District). The Contractor will notify the Project Engineer if additional easement is needed to complete the work adjacent to any Section 4(f) property. The Project Engineer will obtain an appropriate course of action from the Environmental Office before proceeding with construction activities that affect any Section 4(f) property.

COMMITMENT N: SECTION 404 PERMIT

The SDDOT has obtained a Section 404 Permit from the USACE for the permanent actions associated with this project.

Action Taken/Required:

The Contractor will comply with all requirements contained in the Section 404 Permit.

The Contractor will also be responsible for obtaining a Section 404 Permit for any dredge, excavation, or fill activities associated with material sources, storage areas, waste sites, and Contractor work sites outside the plan work limits that affect wetlands, floodplains, or waters of the United States.

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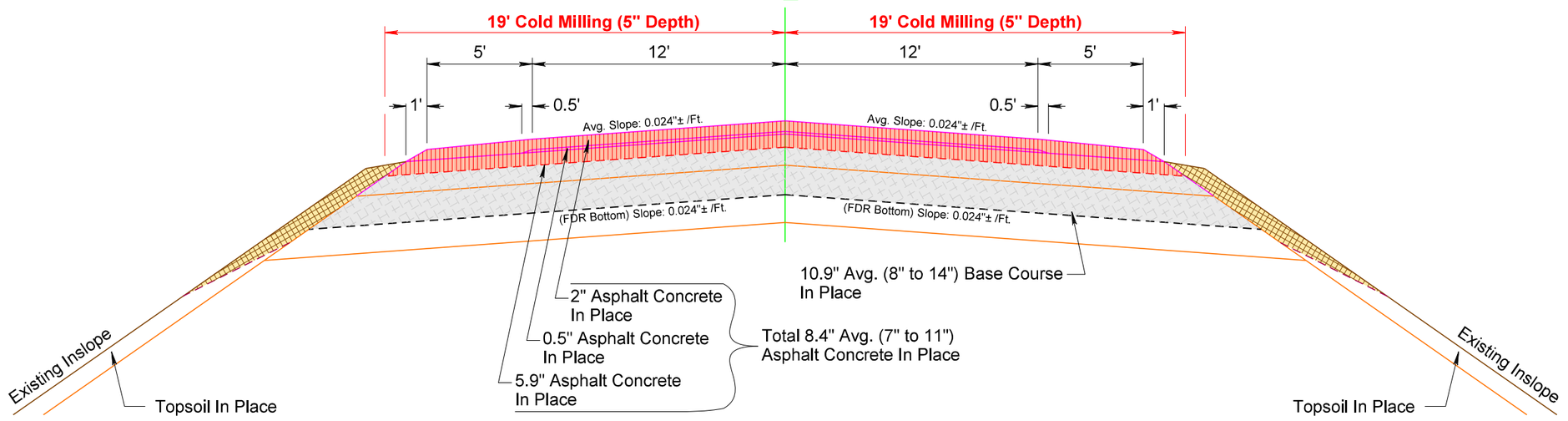
TYPICAL COLD MILLING & FULL DEPTH RECLAMATION SECTION

Cold Milling Asphalt Concrete

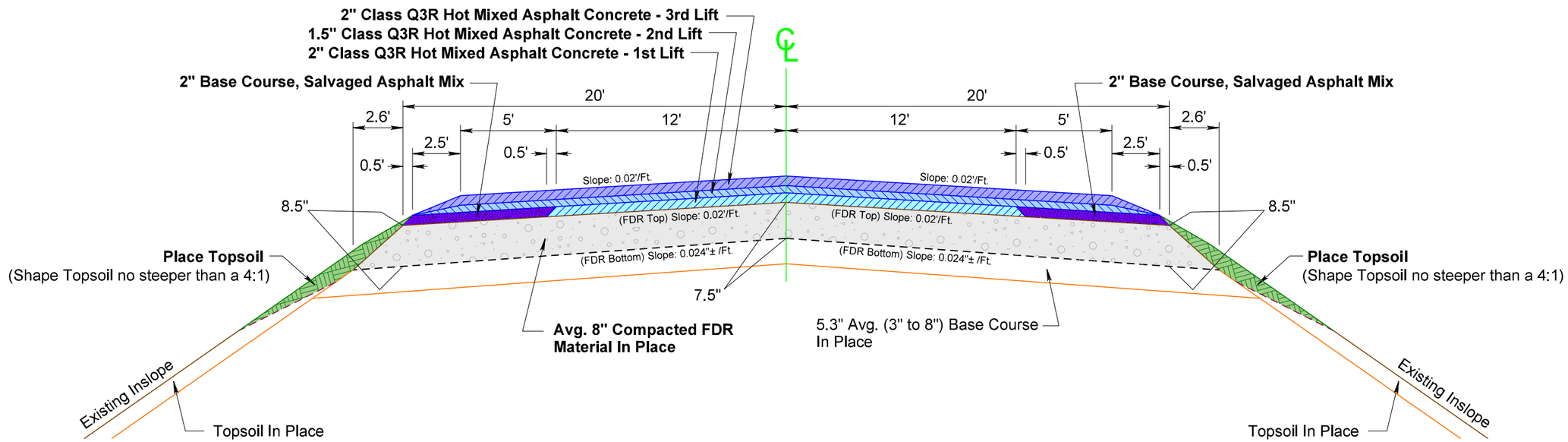
9" Full Depth Reclamation

Unclassified Excavation - Remove Topsoil

SECTION 1
Rural 2 Lane
0+00 to 145+03
167+83 to 255+19
277+99 to 409+33
432+13 to 649+95



TYPICAL RESURFACING SECTION



STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
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Plotting Date: 05/08/2024

TYPICAL COLD MILLING, FULL DEPTH RECLAMATION & REMOVAL SECTION

Cold Milling Asphalt Concrete

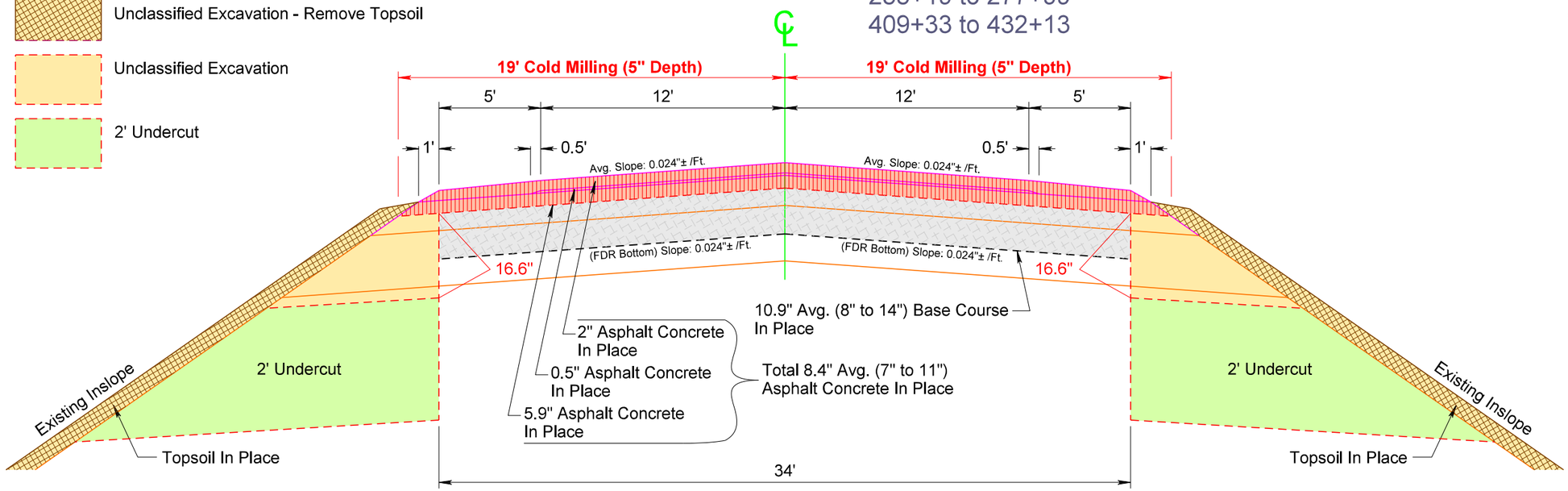
9" Full Depth Reclamation

Unclassified Excavation - Remove Topsoil

Unclassified Excavation

2' Undercut

SECTION 2
New Left Turn Lanes
145+03 to 167+83
255+19 to 277+99
409+33 to 432+13

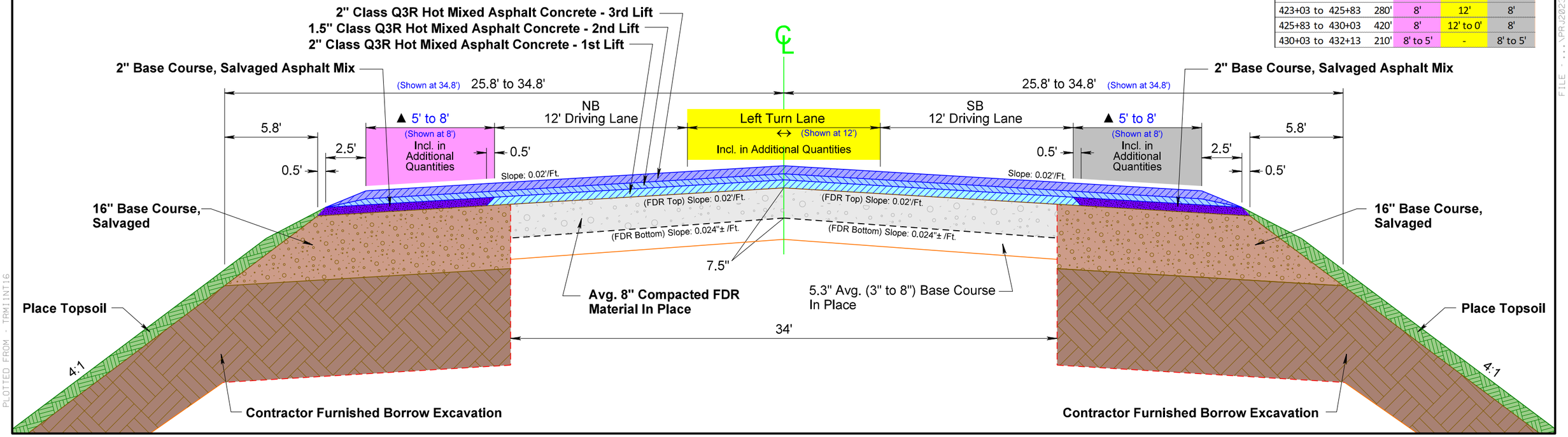


Quantities for Transitions and Widened Sections are included in the Table of Additional Quantities

Transitions

Location	Distance	Left Shoulder Width ▲	Left Turn Lane Width -	Right Shoulder Width ▲
At 223rd St (158+73)				
145+03 to 147+13	210'	5' to 8'	-	5' to 8'
147+13 to 151+33	420'	8'	0' to 12'	8'
151+33 to 158+73	740'	8'	12'	8'
158+73 to 161+53	280'	8'	12'	8'
161+53 to 165+73	420'	8'	12' to 0'	8'
165+73 to 167+83	210'	8' to 5'	-	8' to 5'
At 225th St (264+29)				
255+19 to 257+29	210'	5' to 8'	-	5' to 8'
257+29 to 261+49	420'	8'	0' to 12'	8'
261+49 to 264+29	280'	8'	12'	8'
264+29 to 271+69	740'	8'	12'	8'
271+69 to 275+89	420'	8'	12' to 0'	8'
275+89 to 277+99	210'	8' to 5'	-	8' to 5'
At 228th St (423+03)				
409+33 to 411+43	210'	5' to 8'	-	5' to 8'
411+43 to 415+63	420'	8'	0' to 12'	8'
415+63 to 423+03	740'	8'	12'	8'
423+03 to 425+83	280'	8'	12'	8'
425+83 to 430+03	420'	8'	12' to 0'	8'
430+03 to 432+13	210'	8' to 5'	-	8' to 5'

TYPICAL RESURFACING SECTION



RATES OF MATERIALS

Section 1
Rural Two Lane
0+00.00 to 145+03.00
167+83.00 to 255+19.00
277+99.00 to 409+33.00
432+13.00 to 649+95.00

The Estimate of quantities is based on the following quantities of materials per mile.

BASE COURSE, SALVAGED ASPHALT MIX

Crushed Aggregate	462 Tons
Water for Granular Material	8.9 MGals

FULL DEPTH RECLAMATION

Water for Granular Material	107 MGals

2" CLASS Q3R HOT MIXED ASPHALT CONCRETE 1ST LIFT

Salvaged Asphalt Concrete	304 Tons
Crushed Aggregate	1216 Tons
PG 58-34 Asphalt Binder	75 Tons
	TOTAL: 1595 Tons
Hydrated Lime	16 Tons
	TOTAL: 1611 Tons

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

MC-70 Asphalt for Prime at the rate of 14.6 tons applied 42 feet wide (Rate = 0.15 gallon per square yard).

Blotting Sand for Prime at the rate of 70 tons applied 24 feet wide (Rate = 10 pounds per square yard).

SS-1h or CSS-1h Asphalt for Tack at the rate of 3.9 tons applied 26 feet wide (Rate = 0.06 gallon per square yard).

1.5" CLASS Q3R HOT MIXED ASPHALT CONCRETE 2ND LIFT

Salvaged Asphalt Concrete	340 Tons
Crushed Aggregate	1359 Tons
PG 58-34 Asphalt Binder	84 Tons
	TOTAL: 1783 Tons
Hydrated Lime	18 Tons
	TOTAL: 1801 Tons

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

SS-1h or CSS-1h Asphalt for Tack at the rate of 6 tons applied 40 feet wide (Rate = 0.06 gallon per square yard).

2" CLASS Q3R HOT MIXED ASPHALT CONCRETE 3RD LIFT

Salvaged Asphalt Concrete	453 Tons
Crushed Aggregate	1812 Tons
PG 58-34 Asphalt Binder	112 Tons
	TOTAL: 2377 Tons
Hydrated Lime	24 Tons
	TOTAL: 2401 Tons

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

SS-1h or CSS-1h Asphalt for Tack at the rate of 6 tons applied 40 feet wide (Rate = 0.06 gallon per square yard).

FLUSH SEAL (Centered over Outside Shoulder Rumble Strips)

SS-1h or CSS-1h Asphalt for Flush Seal at the rate of 0.8 ton applied 3 feet wide (1.5 feet wide each shoulder) (Rate = 0.1 gallon per square yard).

Section 2
Left Turn Lanes
145+03.00 to 167+83.00
255+19.00 to 277+99.00
409+33.00 to 432+13.00

The Estimate of quantities is based on the following quantities of materials per mile.

BASE COURSE, SALVAGED ASPHALT MIX

Crushed Aggregate	92 Tons
Water for Granular Material	1.8 MGals

BASE COURSE, SALVAGED

Crushed Aggregate	9230 Tons
Water for Granular Material	88.6 MGals

FULL DEPTH RECLAMATION

Water for Granular Material	91 MGals

2" CLASS Q3R HOT MIXED ASPHALT CONCRETE 1ST LIFT

Salvaged Asphalt Concrete	453 Tons
Crushed Aggregate	1812 Tons
PG 58-34 Asphalt Binder	112 Tons
	TOTAL: 2377 Tons
Hydrated Lime	24 Tons
	TOTAL: 2401 Tons

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

MC-70 Asphalt for Prime at the rate of 14.6 tons applied 42 feet wide (Rate = 0.15 gallon per square yard).

Blotting Sand for Prime at the rate of 70 tons applied 24 feet wide (Rate = 10 pounds per square yard).

SS-1h or CSS-1h Asphalt for Tack at the rate of 5.7 tons applied 38 feet wide (Rate = 0.06 gallon per square yard).

1.5" CLASS Q3R HOT MIXED ASPHALT CONCRETE 2ND LIFT

Salvaged Asphalt Concrete	340 Tons
Crushed Aggregate	1359 Tons
PG 58-34 Asphalt Binder	84 Tons
	TOTAL: 1783 Tons
Hydrated Lime	18 Tons
	TOTAL: 1801 Tons

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

SS-1h or CSS-1h Asphalt for Tack at the rate of 6 tons applied 40 feet wide (Rate = 0.06 gallon per square yard).

2" CLASS Q3R HOT MIXED ASPHALT CONCRETE 3RD LIFT

Salvaged Asphalt Concrete	453 Tons
Crushed Aggregate	1812 Tons
PG 58-34 Asphalt Binder	112 Tons
	TOTAL: 2377 Tons
Hydrated Lime	24 Tons
	TOTAL: 2401 Tons

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

SS-1h or CSS-1h Asphalt for Tack at the rate of 6 tons applied 40 feet wide (Rate = 0.06 gallon per square yard).

FLUSH SEAL (Centered over Outside Shoulder Rumble Strips)

SS-1h or CSS-1h Asphalt for Flush Seal at the rate of 0.8 ton applied 3 feet wide (1.5 feet wide each shoulder) (Rate = 0.1 gallon per square yard).

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0081(112)95	11	167

TABLE OF PROJECT STATIONING

SECTION	PROJECT NUMBER	STATION	TO	STATION	DESCRIPTION	LENGTH	GROSS SECTION LENGTHS		NET SECTION LENGTHS	
1	Project No. 1	0+00.00	to	145+03.00	Rural Two Lane	14503.00'	**58155.00'**		**58155.00'**	**11.014 mi.**
		167+83.00	to	255+19.00		8736.00'				
		277+99.00	to	409+33.00		13134.00'				
		432+13.00	to	649+95.00		21782.00'				
2	Project No. 1	145+03.00	to	167+83.00	Left Turn Lanes	2280.00'	**6840.00'**		**6840.00'**	**1.295 mi.**
		255+19.00	to	277+99.00		2280.00'				
		409+33.00	to	432+13.00		2280.00'				
					Grand Totals		**64995.00'**	**12.310 mi.**	**64995.00'**	**12.310 mi.**

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0081(112)95	12	167

TABLE OF MATERIALS QUANTITIES

N.A.B.I. = Not A Bid Item

SECTION PROJECT	UNCL. EXC. CuYd	UNCL. EXC. DIG-OUTS CuYd	REMOVE ASPHALT CONCRETE PAVEMENT SqYd	CONTRACTOR FURNISHED BORROW EXCAVATION CuYd	WATER FOR EMB. MGal	BASE COURSE Ton	BASE COURSE SALVAGED Ton	WATER FOR GRAN. MATER. MGal	COLD MILLING ASPHALT CONCRETE SqYd	BASE COURSE SALVAGED ASPHALT MIX Ton	MILLED MATERIAL TO BE REUSED IN BLENDING	GRANULAR MATERIAL, FURNISH	BLEND AND STOCKPILE GRANULAR MATERIAL	* GRANULAR MATERIAL, FURNISH	* BLEND, HAUL AND STOCKPILE GRANULAR MATERIAL	FULL DEPTH RECLA-MATION SqYd
1	13020	551	826	10312	103	-	1101	1287	245543	10177	37865	551	1101			292067
2	26682	65	97	19818	198	-	12083	236	28880	238	3957	6042	12083			25840
Subtotals:	**39702**	**616**	**923**	**30130**	**301**	**-**	**13184**	**1523**	**274423**	**10415**	**41822**	**6593**	**13184**			**317907**
Add Quans for in Section 1																
Additional Quantities from notes:	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**			**-**
Table of Additional Quantities:	**-**	**-**	**-**	**-**	**-**	**2299**	**9774**	**151**	**2929**	**1038**	**-**	**4886**	9774			**-**
Totals:	**39702**	**616**	**923**	**30130**	**301**	**2299**	**22958**	**1674**	**277352**	**11453**	**41822**	**11479**	**22958**	**30343**	**60686**	**317907**

N.A.B.I. = Not A Bid Item

SECTION PROJECT	CLASS Q3R HOT MIXED ASPHALT CONCRETE Ton	PG 58-34 ASPHALT BINDER Ton	HYDRATED LIME Ton	VIRG. AGGR. N.A.B.I. Ton	SALV. MAT'L. N.A.B.I. Ton	ASPHALT CONCRETE COMPOSITE Ton	MC-70 ASPH. FOR PRIME Ton	BLOTTING SAND FOR PRIME Ton	SS-1h/ CSS-1h ASPH. FOR TACK Ton	SS-1h/ CSS-1h ASPH. FOR FLUSH SEAL Ton	SAND FOR FLUSH SEAL Ton
1	64025	2979.4	633.9	48330	12083	-	160.8	771	175.2	8.8	-
2	8550	397.9	84.7	6454	1614	-	18.9	91	23.0	1.0	-
Subtotals:	**72575**	**3377.3**	**718.6**	**54784**	**13697**	**-**	**179.7**	**862**	**198.2**	**9.8**	**-**
Add Quans for in Section 1	-	-	-	-	-	-	-	10	-	-	-
Additional Quantities from notes:	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**10**	**-**	**-**	**-**
Table of Additional Quantities:	**1894**	**88.1**	**18.7**	**1429**	**358**	**238**	**3.6**	**30.4**	**4.7**	**2.5**	**47**
Totals:	**74469**	**3465.4**	**737.3**	**56213**	**14055**	**238**	**183.3**	**902.4**	**202.9**	**12.3**	**47**

* Denotes Nonparticipating

TABLE OF ADDITIONAL QUANTITIES

Rev 6/11/24 pm

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0081(112)95	13	167

N.A.B.I. = Not A Bid Item

	LOCATION			BASE COURSE Ton	BASE COURSE SALVAGED Ton	WATER FOR GRAN. MATER. MGal	COLD MILLING ASPHALT CONCRETE SqYd	BASE COURSE SALVAGED ASPHALT MIX Ton	CLASS Q3R HOT MIXED ASPHALT CONCRETE 2ND LIFT Ton	PG 58-34 ASPHALT BINDER <---- 2ND LIFT ----> Ton	HYDRATED LIME Ton	VIRG. AGGR. N.A.B.I. Ton	SALV. MAT'L. N.A.B.I. Ton	CLASS Q3R HOT MIXED ASPHALT CONCRETE 3RD LIFT Ton	PG 58-34 ASPHALT BINDER <---- 3RD LIFT ----> Ton	HYDRATED LIME Ton	VIRG. AGGR. N.A.B.I. Ton	SALV. MAT'L. N.A.B.I. Ton	ASPHALT CONCRETE COMPOSITE Ton	MC-70 ASPH. FOR PRIME Ton	BLOTTING SAND FOR PRIME Ton	SS-1h/ CSS-1h ASPH. FOR FLUSH SEAL Ton	SAND FOR FLUSH SEAL Ton
Mainline Transitions			Width																				
Sec. 2	147+13	to 151+33	0' to 12'	-	498	5	-	59	24	1.1	0.2	18	4	31	1.4	0.3	23	6	-	0.17	1.4	0.06	1.1
Sec. 2	151+33	to 161+53	12'	-	1813	19	-	214	114	5.3	1.1	87	21	152	7.1	1.6	115	27	-	0.81	6.8	0.30	5.5
Sec. 2	161+53	to 165+73	12' to 0'	-	498	5	-	59	24	1.1	0.2	18	4	31	1.4	0.3	23	6	-	0.17	1.4	0.06	1.1
Sec. 2	257+29	to 261+49	0' to 12'	-	498	5	-	59	24	1.1	0.2	18	4	31	1.4	0.3	23	6	-	0.17	1.4	0.06	1.1
Sec. 2	261+49	to 271+69	12'	-	1813	19	-	214	114	5.3	1.1	87	21	152	7.1	1.6	115	27	-	0.81	6.8	0.30	5.5
Sec. 2	271+69	to 275+89	12' to 0'	-	498	5	-	59	24	1.1	0.2	18	4	31	1.4	0.3	23	6	-	0.17	1.4	0.06	1.1
Sec. 2	411+43	to 415+63	0' to 12'	-	498	5	-	59	24	1.1	0.2	18	4	31	1.4	0.3	23	6	-	0.17	1.4	0.06	1.1
Sec. 2	415+63	to 425+83	12'	-	1813	19	-	214	114	5.3	1.1	87	21	152	7.1	1.6	115	27	-	0.81	6.8	0.30	5.5
Sec. 2	425+83	to 430+03	12' to 0'	-	498	5	-	59	24	1.1	0.2	18	4	31	1.4	0.3	23	6	-	0.17	1.4	0.06	1.1
Shoulder Transitions			Width																				
Sec. 2	145+03	to 147+13	0' to 3'	-	62	1	-	7	8	0.4	0.1	6	2	8	0.4	0.1	6	2	-	0.04	0.4	0.01	0.3
Sec. 2	165+73	to 167+83	3' to 0'	-	62	1	-	7	8	0.4	0.1	6	2	8	0.4	0.1	6	2	-	0.04	0.4	0.01	0.3
Sec. 2	255+19	to 257+29	0' to 3'	-	62	1	-	7	8	0.4	0.1	6	2	8	0.4	0.1	6	2	-	0.04	0.4	0.01	0.3
Sec. 2	275+89	to 277+99	3' to 0'	-	62	1	-	7	8	0.4	0.1	6	2	8	0.4	0.1	6	2	-	0.04	0.4	0.01	0.3
Sec. 2	409+33	to 411+43	0' to 3'	-	62	1	-	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sec. 2	430+03	to 432+13	3' to 0'	-	62	1	-	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Heavy Roadway Shaping (from notes)				-	-	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mainline Cross Pipe Replacements				999	-	12	-	-	-	-	-	-	-	-	-	-	-	-	238	-	-	-	-
Temorary Shoulder Widening				1300	-	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Turnouts																							
14	Mailbox Turnouts			-	102	1	313	-	32	1.6	0.3	24	6	32	1.5	0.3	24	6	-	-	-	-	-
1	Historical Marker			-	8	-	23	-	3	0.1	-	2	1	3	0.1	-	2	1	-	-	-	-	-
Resurface to ROW																							
4	Intersecting Roads			-	-	-	392	-	-	-	-	-	-	108	5.0	1.1	82	20	-	-	-	0.20	3.9
1	Farm Entrance			-	-	-	58	V	-	-	-	-	-	14	0.7	0.1	10	3	-	-	-	0.03	0.5
Resurface to End of Radius																							
21	Intersecting Roads			-	315	3	1407	-	-	-	-	-	-	357	16.6	3.5	270	67	-	-	-	0.68	12.8
16	Farm Entrances			-	160	2	736	V	-	-	-	-	-	153	7.1	1.5	115	28	-	-	-	0.29	5.5
Pads																							
39	Field Entrances			-	390	4	-	|	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TOTALS:			**2299**	**9774**	**151**	**2929**	**1038**	**553**	**25.8**	**5.2**	**419**	**102**	**1341**	**62.3**	**13.5**	**1010**	**250**	**238**	**3.61**	**30.4**	**2.50**	**47.0**

NOTES: 4.7 tons of SS-1h or CSS-1h Asphalt for Tack are included in the Estimate of Quantities and will be applied at the rate shown on the plans as directed by the Engineer.

The tonnage shown above for Base Course, Salvaged is based on a compacted depth of 16 inches for Mainline Transitions in the Turn Lane Sections, 4 inches for Mailbox & Historical Maker Turnouts and 2 inches for Intersections & Entrances.

The tonnage shown above for Base Course, Salvaged Asphalt Mix is based on a compacted depth of 2 inches.

The tonnage shown above for Base Course is based on a compacted depth of 12 inches.

The tonnage shown above for Class Q3 Hot Mixed Asphalt Concrete - 2nd Lift is based on a compacted depth of 1.5 inches.
The tonnage shown above for Class Q3 Hot Mixed Asphalt Concrete - 3rd Lift is based on a compacted depth of 2 inches.
The tonnage shown above for Asphalt Concrete Composite is based on a compacted depth of 2 - 2.5 inch lifts

The above quantities are included in the Estimate of Quantities.

SUMMARY OF ASPHALT CONCRETE

	CLASS Q3R HOT MIXED ASPHALT CONCRETE 1ST LIFT COMPACTION WITH SPECIFIED DENSITY TONS	CLASS Q3R HOT MIXED ASPHALT CONCRETE 1ST LIFT COMPACTION WITHOUT SPECIFIED DENSITY TONS	CLASS Q3R HOT MIXED ASPHALT CONCRETE 2ND LIFT COMPACTION WITH SPECIFIED DENSITY TONS	CLASS Q3R HOT MIXED ASPHALT CONCRETE 2ND LIFT COMPACTION WITHOUT SPECIFIED DENSITY TONS	CLASS Q3R HOT MIXED ASPHALT CONCRETE 3RD LIFT COMPACTION WITH SPECIFIED DENSITY TONS	CLASS Q3R HOT MIXED ASPHALT CONCRETE 3RD LIFT COMPACTION WITHOUT SPECIFIED DENSITY TONS	ASPHALT CONCRETE COMPOSITE COMPACTION WITHOUT SPECIFIED DENSITY TONS
Finished Roadway Surface	19425	-	14577	-	19432	-	-
Shoulders	-	1428	-	7592	-	10121	-
Table of Additional Quantities							
Mainline Transitions	-	-	486	-	642	-	-
Shoulder Transitions	-	-	-	32	-	32	-
Miscellaneous Nondensity Locations	-	-	-	-	-	-	238
Turnouts, Int Roads, Ents & Pads	-	-	-	35	-	667	-
Additional Totals:	**-**	**-**	**486**	**67**	**642**	**699**	**238**
Totals:	**19425**	**1428**	**15063**	**7659**	**20074**	**10820**	**238**

54562	TONS ASPHALT CONCRETE COMPACTION WITH SPECIFIED DENSITY
20145	TONS ASPHALT CONCRETE COMPACTION WITHOUT SPECIFIED DENSITY
74707	TONS TOTAL

TABLE FOR MAINLINE CULVERT WORK

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STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0081(112)95	15	167

NH 0081(112)95 PCN 06P9 US HWY 81 Sioux Falls Area

LOCATION				PIPE DATA							CULVERT												CULVERT ENDS								EARTHWORK			OBJ MARKER		
											REMOVE / RESET			NEW									TYPE	REMOVE / RESET			NEW								OM-2 & POST		
																		RCP									RCP Flared Ends									
															CIRCULAR																						
SITE NO	CUL-VERT ID	MRM	STATION	NO of PIPE - SIZE (DIA or W x H) DIA = IN W x H = FT	LENGTH	TYPE	DRAINAGE AREA ACRES	DRAINAGE DIRECTION	CLEAR ZONE 20 FT** SIDE OF ROAD	WORK DESCRIPTION	REM PIPE	REM PIPE FOR RESET	RESET PIPE	18"	24"	30"	36"	42"	60"	EXISTING	REM PIPE END	REM END FOR RESET	RESET PIPE END	24"	30"	36"	42"	UNCLASSIFIED EXCAVATION	PIPE CULVERT UNDERCUT	CONTR FURN BORROW EXCAVATION	EXISTING***	SALVAGE	Bk-Bk
					FT						FT	FT	FT	FT	FT	FT	FT	FT	FT	Δ	EA	EA	EA	EA	EA	EA	EA	YD³	YD³	YD³	EA	EA	EA
	25880	107.66	**5+79**	1 - 72 DIA	84	RCP ARCH	595	E	**E**	No Work										**FE**												**1**	**2**
									W	No Work										FE												1	2
	25879	107.44	**14+82**	1 - 24 DIA	86	RCP	24	E	**E**	Replace Pipe	**86**				**98**					**FE**	**1**			**1**				**875**	**26**	**1115**		**1**	**1**
									W											FE	1			1								1	1
	25751	106.96	**40+49**	1 - 30 DIA	86	CMP	57	E	**E**	Replace Pipe	**86**					**84**				**FE**	**1**				**1**			**585**	**25**	**695**		**1**	**2**
									W											FE	1				1							1	2
	25750	106.71	**53+65**	1 - 18 DIA	60	RCP	3	E	**E**	Reset End										**FE**												**1**	**1**
									W	Reset End										FE												1	1
	25749	106.53	**62+54**	1 - 24 DIA	96	RCP	17	E	**E**	No Work										**FE**												**1**	**1**
									W	No Work										FE												1	1
	25748	106.19	**81+03**	1 - 18 DIA	86	RCP	15	E	**E**	No Work										**FE**												**1**	**1**
									W	No Work										FE												1	1
	25747	105.95	**93+05**	1 - 18 DIA	74	RCP	10	E	**E**	No Work										**FE**												**1**	**1**
									W	No Work										FE												1	1
	25746	105.76	**103+19**	1 - 42 DIA	76	CMP	196	W	**E**	Replace Pipe	**76**							**70**		**FE**	**1**						**1**	**600**	**26**	**700**		**1**	**2**
									W											FE	1						1					1	2
	25644	105.52	**116+25**	1 - 24 DIA	74	CMP	28	W	**E**	No Work										**FE**												**1**	**1**
									W	No Work										FE												1	1
	25643	105.29	**127+63**	1 - 18 DIA	66	RCP	18	W	**E**	No Work										**FE**												**1**	**1**
									W	No Work										FE												1	1
	25642	105.13	**136+06**	1 - 24 DIA	74	RCP	24	W	**E**	No Work										**FE**												**1**	**1**
									W	No Work										FE												1	1
	25641	104.83	**151+62**	1 - 24 DIA	86	RCP	21	E	**E**	Extend For Turn Lane					**12**					**FE**		**1**	**1**									**1**	**1**
									W	Extend For Turn Lane					12					FE		1	1									1	1
	25640	104.68	**158+13**	1 - 18 DIA	58	RCP	4	E	**E**	Extend For Turn Lane					**12**					**FE**		**1**	**1**									**1**	**1**
									W	Extend For Turn Lane					12					FE		1	1									1	1
	25639	104.34	**177+93**	1 - 18 DIA	70	CMP	25	W	**E**	No Work										**FE**												**1**	**1**
									W	No Work										FE												1	1
	25638	103.64	**216+13**	3 - 10 x 8	52	RCBC	9,500	E	**E**	Extend RCBC - See Details										**WW**												**2**	**2**
									W	Extend RCBC - See Details										WW												2	2
	25637	103.41	**227+44**	1 - 18 DIA	70	RCP	14	E	**E**	Reset End										**FE**		**1**	**1**								**5**	**1**	**1**
									W	Reset End										FE		1	1								5	1	1
	25636	103.18	**239+25**	1 - 18 DIA	84	RCP	14	E	**E**	No Work										**FE**												**1**	**1**
									W	No Work										FE												1	1
										TOTALS THIS SHEET	248	-	-	-	146	84	-	70	-		6	6	6	2	2	-	2	2060	77	2520		36	42

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TABLE FOR MAINLINE CULVERT WORK

Rev 6/11/24 pm

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0081(112)95	16	167

NH 0081(112)95 PCN 06P9 US HWY 81 Sioux Falls Area

LOCATION				PIPE DATA							CULVERT												CULVERT ENDS								EARTHWORK			OBJ MARKER		
											REMOVE / RESET			NEW									TYPE	REMOVE / RESET			NEW								OM-2 & POST		
														RCP													RCP Flared Ends									
														CIRCULAR																							
SITE NO	CUL-VERT ID	MRM	STATION	NO of PIPE - SIZE (DIA or W x H) DIA = IN W x H = FT	LENGTH	TYPE	DRAINAGE AREA ACRES	DRAINAGE DIRECTION	CLEAR ZONE 20 FT** SIDE OF ROAD	WORK DESCRIPTION	REM PIPE	REM PIPE FOR RESET	RESET PIPE	18"	24"	30"	36"	42"	60"	EXISTING	REM PIPE END	REM END FOR RESET	RESET PIPE END	24"	30"	36"	42"	UNCLASSIFIED EXCAVATION	PIPE CULVERT UNDERCUT	CONTR FURN BORROW EXCAVATION	EXISTING***	SALVAGE	Bk-Bk
					FT						FT	FT	FT	FT	FT	FT	FT	FT	FT	Δ	EA	EA	EA	EA	EA	EA	EA	YD³	YD³	YD³	EA	EA	EA
	25634	102.72	**264+98**	1 - 30 DIA	86	RCP		E	**E**	Extend For Turn Lane						**12**				**FE**		**1**	**1**										**1**	**2**
									W	Extend For Turn Lane						14				FE		1	1										1	2
	25632	102.68	**268+40**	2 - 60 DIA	92	RCP	820	E	**E**	Extend For Turn Lane & Reset 6' pipe		**12**	**12**						**32**	**FE**		**2**	**2**										**1**	**2**
									W	Extend For Turn Lane & Reset 6' pipe		12	12						32	FE		2	2										1	2
	25631	102.51	**275+89**	1 - 18 DIA	88	RCP	18	E	**E**	Extend For Turn Lane				**4**						**FE**		**1**	**1**										**1**	**1**
									W	Extend For Turn Lane				6						FE		1	1										1	1
	25629 25630	102.36	**283+72**	2 - 42 DIA	96	RCP ARCH	271	E	**E**	Reset Southeast End Section										**FE**		**1**	**1**								**5**		**1**	**2**
									W	No Work										FE												1	2
	25628	101.70	**317+85**	1 - 18 DIA	104	RCP	5	E	**E**	No Work										**FE**												**1**	**1**
									W	No Work										FE												1	1
	25627	101.26	**341+10**	1 - 30 DIA	84	RCP	80	E	**E**	No Work										**FE**												**1**	**2**
									W	No Work										FE												1	2
	25626	101.00	**354+66**	1 - 36 DIA	82	RCP	84	E	**E**	No Work										**FE**												**1**	**2**
									W	No Work										FE												1	2
	25624	100.63	**376+53**	1 - 30 DIA	96	RCP	96	E	**E**	No Work										**FE**												**1**	**2**
									W	No Work										FE												1	2
	25623	100.28	**394+32**	1 - 18 DIA	78	RCP	10	W	**E**	No Work										**FE**												**1**	**1**
									W	No Work										FE												1	1
	25622	99.94	**411+79**	1 - 48 DIA	78	RCP ARCH	154	E / W	**E**	No Work										**FE**												**1**	**2**
									W	No Work										FE												1	2
	25620	99.70	**424+33**	1 - 24 DIA	88	RCP	7	W	**E**	Extend For Turn Lane					**12**					**FE**		**1**	**1**										**1**	**1**
									W	Extend For Turn Lane					14					FE		1	1										1	1
	25619	99.45	**438+00**	1 - 30 DIA	90	RCP	74	W	**E**	No Work										**FE**												**1**	**2**
									W	No Work										FE												1	2
	25618	99.04	**459+26**	1 - 30 DIA	80	RCP	80	W	**E**	Reset End and 6' Pipe Section		**6**	**6**							**FE**		**1**	**1**								**13**		**1**	**2**
									W	Reset End and 6' Pipe Section		6	6							FE		1	1								13		1	2
	25617	98.73	**473+55**	2 - 60 x DIA	84	RCP	488	W	**E**	No Work										**FE**												**1**	**2**
									W	No Work										FE												1	2
	24549	98.62	**481+10**	1 - 8 x 6	60	RCBC	2,183	E	**E**	No Work										**WW**												**1**	**1**
									W	No Work										WW												1	1
	24548	98.34	**496+01**	1 - 36 DIA	60	RCP	125	E	**E**	Reset End										**FE**		**1**	**1**								**5**		**1**	**2**
									W	No Work										FE												1	2
	24547	98.21	**503+23**	2 - 42 DIA	66	RCP	619	E	**E**	No Work										**FE**												**1**	**2**
									W	No Work										FE												1	2
										TOTALS THIS SHEET	-	36	36	10	26	26	-	-	64		-	14	14	-	-	-	-	-	-	36		34	58

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TABLE FOR MAINLINE CULVERT WORK

Rev 6/11/24 pm

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0081(112)95	17	167

NH 0081(112)95 PCN 06P9 US HWY 81 Sioux Falls Area

LOCATION				PIPE DATA							CULVERT										CULVERT ENDS								EARTHWORK			OBJ MARKER		
											REMOVE / RESET			NEW							TYPE	REMOVE / RESET			NEW								OM-2 & POST		
														RCP										RCP Flared Ends										
														CIRCULAR																					
SITE NO	CUL-VERT ID	MRM	STATION	NO of PIPE - SIZE (DIA or W x H) DIA = IN W x H = FT	LENGTH FT	TYPE	DRAINAGE AREA ACRES	DRAINAGE DIRECTION	CLEAR ZONE 20 FT** SIDE OF ROAD	WORK DESCRIPTION	REM PIPE FT	REM PIPE FOR RESET FT	RESET PIPE FT	18" FT	24" FT	30" FT	36" FT	42" FT	60" FT	EXISTING Δ	REM PIPE END EA	REM END FOR RESET EA	RESET PIPE END EA	24" EA	30" EA	36" EA	42" EA	UNCLASSIFIED EXCAVATION YD³	PIPE CULVERT UNDERCUT YD³	CONTR FURN BORROW EXCAVATION YD³	EXISTING*** EA	SALVAGE EA	Bk-Bk EA
	24535	97.70	**529+69**	1 - 36 DIA	72	CMP	119	E	**E**	Replace Pipe	**72**						**72**			**FE**	**1**					**1**		**470**	**25**	**520**		**1**	**2**
									W	Replace Pipe										FE	1					1							1	2
	24534	97.26	**553+00**	1 - 36 DIA	64	RCP			**E**	No Work										**FE**												**1**	**2**
									W	No Work										FE												1	2
	24533	97.14	**559+00**	1 - 84 DIA	84	RCP	880	E	**E**	No Work										**FE**												**1**	**2**
									W	No Work										FE												1	2
	24530	96.64	**585+14**	1 - 54 DIA	80	RCP	114	E	**E**	No Work										**FE**												**1**	**2**
									W	No Work										FE												1	2
	24529	96.32	**602+64**	1 - 36 DIA	62	RCP	101	E	**E**	No Work										**FE**												**1**	**2**
									W	No Work										FE												1	2
	25106	95.96	**621+75**	1 - 18 DIA	74	RCP	15	E	**E**	No Work										**FE**												**1**	**1**
									W	No Work										FE												1	1
										TOTALS THIS SHEET	72	-	-	-	-	-	72	-	-		2	-	-	-	-	2	-	470	25	520		12	22
										TOTALS ALL SHEETS	**320**	**36**	**36**	**10**	**172**	**110**	**72**	**70**	**64**		**8**	**20**	**20**	**2**	**2**	**2**	**2**	2530	102	**3076**		**82**	**122**

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TABLE FOR CONSTRUCTION STAKING

(See Special Provision for Contractor Staking)

Roadway and Description	Begin Station	End Station	Number of Lanes	Length (Ft)	Grade Staking: Length (Mile)	Grade Staking: Lane Factor	Grade Staking: *Sets of Stakes	Grade Staking: **Grade Staking Quantity (Mile)	Miscellaneous Staking Quantity (Mile)	Slope Staking Quantity (Mile)	Construction Staking Quantity (Mile)	Graded Centerline Staking Quantity (Mile)	Structure Staking Quantity (Each)
(2 Lanes)	0+00	145+03	2	14,503	2.747	1	1	2.747	2.747	0	2.747	2.747	-
Turn Lanes at 223rd St	145+03	167+83	3	2,280	0.432	1.5	1	0.648	0.432	0.432	0.432	0.432	-
(2 Lanes)	167+83	212+53	2	4,470	0.847	1	1	0.847	0.847	0	0.847	0.847	-
RCBC Extension & Inslope Transition	212+53	219+60	2	707	0.134	1	1	0.134	0.134	0.134	0.134	0.134	1
(2 Lanes)	219+63	255+19	2	3,556	0.673	1	1	0.673	0.673	0	0.673	0.673	-
Turn Lanes at 225th St	255+19	277+99	3	2,280	0.432	1.5	1	0.648	0.432	0.432	0.432	0.432	-
(2 Lanes)	277+99	409+33	2	13,134	2.488	1	1	2.488	2.488	0	2.488	2.488	-
Turn Lanes at 228th St	409+33	432+13	3	2,280	0.432	1.5	1	0.648	0.432	0.432	0.432	0.432	-
(2 Lanes)	432+13	649+95	2	21,782	4.125	1	1	4.125	4.125	0	4.125	4.125	-
							Totals:	12.958	12.310	1.430	12.310	12.310	1

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

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

UTILITIES

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

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 will contact the Engineer to determine modifications that will be necessary to avoid utility impacts.

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

SURFACING/SUBGRADE INVESTIGATION

A copy of the surfacing/subgrade investigation for this project is available from the Sioux Falls Area and the Mitchell Region Offices.

SURFACING THICKNESS DIMENSIONS

The plans shown spread rates 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, the depth/quantity may be varied to achieve the required elevation.

TYPE III FIELD LABORATORY

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

Reimbursement will not be made for fees associated with the purchase, installation, maintenance, monthly line charges, and incidentals involved with the internet connection (including attachments). These items will be incidental to the contract unit price per each for Type III Field Laboratory.

STORAGE UNIT

The Contractor will provide a storage unit such as a portable storage container or a semi-trailer meeting the minimum size requirements from the table below:

Project Total Asphalt Concrete Tonnage	Minimum Internal Size (Cu Ft)	Minimum External Size (L x W x H)
Less than 50,000 ton	1,166	20' x 8' x 8.6' std
More than 50,000 ton	2,360	40' x 8' x 8.6' std
All Gyratory Controlled QC/QA Projects	2,360	40' x 8' x 8.6' std

The storage unit is intended for use only by the Engineer for the duration of the project. The QC lab personnel or the Contractor will not be allowed to use the storage container while it is on the project, without permission of the Engineer.

The storage unit will be on site and operational prior to asphalt concrete production. Upon completion of asphalt concrete production, the Engineer will notify the Contractor when the storage unit can be removed from the project. The storage unit use will not exceed 30 calendar days from the completion of asphalt concrete production. The storage unit will remain the property of the Contractor.

The storage unit will be weather proof and will be set in a level position. The storage unit will be able to be locked with a padlock.

The storage unit will be placed adjacent to the QA lab, as approved by the Engineer.

The following will apply when the storage unit provided on the project is a portable storage container:

1. The portable storage container will be constructed of steel.
2. The portable storage container will be set such that it is raised above the surrounding ground level to keep water from ponding under or around the storage container.

The following will apply when the storage unit provided on the project is a semi-trailer:

1. A set of steps and hand railings will be provided at the exterior door.
2. If the floor of the semi-trailer is 18 inches or more above the ground, a landing will be constructed at the exterior door. The minimum dimensions for the landing will be 4 feet by 5 feet. The top of the landing will be level with the threshold or opening of the doorway.
3. The semi-trailer may be connected to the QA lab by a stable elevated walkway. The walkway will be a minimum of 48 inches wide and contain handrails installed at 32 inches above the deck of the walkway. The walkway will be constructed such that it is stable and the deck does not deform during use and allows for proper door operation. Walkway construction will be approved by the Engineer.

All cost for furnishing, maintaining, and removing the storage unit including labor, equipment, and materials including any necessary walkways, landings, stairways, and handrails will be included in the contract unit price per each for "Storage Unit".

INTERSECTING ROADS AND ENTRANCES

Intersecting roads and entrances will 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.

GENERAL GEOLOGY

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

CLASSIFICATION OF EXCAVATION

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

GRADING OPERATIONS

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

SHRINKAGE FACTOR: Embankment +50%

TABLE OF EXCAVATION QUANTITIES BY LOCATION

Location	Section	Station	to Station	Remove Topsoil	Excavation CuYd	* Undercut CuYd	* Muck Exc. CuYd	Unstable Exc.	* Contractor Furnished Borrow CuYd	Total Excavation CuYd	** Waste CuYd
223rd St Turn Lane	2	145+03	167+83	1597	2002	5304			5292	14195	978
RCBC Extension (Inslope Transition)	1	212+53	219+60	700					3021	3721	
225th St Turn Lane	2	255+19	277+99	1672	1946	5333	265		7461	16677	1243
228th St Turn Lane	2	409+33	432+13	1625	1932	5096		175	7065	15893	978
Mainline Pipe Culvert Work	2	See Pipe Table		na	2530				3076	5606	
Temporary Shoulder Widening	1	See Table for Temporary Shoulder Widening(in notes) and Layout							4215	4215	
Mainline Section 1	1	See Typical Sec 1		9790						9790	
				15384	8410	15733	265	175	30130	70097	3199

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

** The quantities for these items are for information only.

TABLE OF UNCLASSIFIED EXCAVATION

Excavation	8410
Undercut	15733
Topsoil	15384
Unstable Excavation	175
Total:	**39702**

PROCEDURES FOR DETERMINING UNCLASSIFIED EXCAVATION QUANTITY

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

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

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

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

PLACING TOPSOIL

Prior to beginning surfacing operations, a 4” depth of topsoil will be bladed down the respective inslopes and left in a windrow off the shoulder. Following completion of surfacing operations, topsoil will be bladed back up the inslope to the point indicated on the typical section.

Topsoil will also be salvaged and stockpiled prior to constructing the turn lanes and prior to constructing the transition for the RCBC extension at 216+13. Limits of this work, depth of salvage, and stockpile location will be directed by the Engineer. Following completion of construction, topsoil will be spread evenly over the disturbed areas.

The thickness will be approximately 4 inches.

The estimated amount of topsoil to be placed is shown in the Table for Placing Topsoil.

TABLE FOR PLACING TOPSOIL

	Section	Station	to Station	Topsoil (CuYd)
Mainline	1	0+00	145+03	2540
223rd St Turn Lane	2	145+03	167+83	1597
Mainline	1	167+83	212+53	783
RCBC Extension (Inslope Transition)	1	212+53	219+60	700
Mainline	1	219+60	255+19	623
225th St Turn Lane	2	255+19	277+99	1672
Mainline	1	277+99	409+33	2300
228th St Turn Lane	2	409+33	432+13	1625
Mainline	1	432+13	634+47	3544
			Total:	**15384**

UNDERCUTTING

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

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

CONTRACTOR FURNISHED BORROW EXCAVATION

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

For the culvert work locations except the locations where new turn lanes are being constructed and where the RCBC is being extended at 216+13, removing and replacing topsoil will not be measured for payment but will be incidental to the contract unit price per cubic yard for Contractor Furnished Borrow Excavation.

The Contractor will be allowed to place topsoil in lieu of fill material if the fill depth is one foot or less. By doing this the Contractor will not be required to remove and replace the four inches of in place topsoil.

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

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

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

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

The Department will be responsible for the following minimum testing:

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

UNSTABLE MATERIAL EXCAVATION

The areas of unstable material excavation are drawn on the cross sections with a normal depth of 2 feet. The estimated quantity of 175 cubic yards of unstable material excavation will be paid for at the contract unit price per cubic yard for "Unclassified Excavation".

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

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

TABLE OF UNSTABLE MATERIAL EXCAVATION

Station	to	Station	L/R	Depth (Ft)	Quantity (CuYd)
412+00±		416+50±	R	2	175
				Total:	175

MUCK EXCAVATION

The areas of muck excavation are drawn on the cross sections with a normal depth of 3 feet. The estimated quantity of 265 cubic yards of muck excavation will be paid for at the contract unit price per cubic yard for "Muck Excavation".

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

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

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

TABLE OF MUCK EXCAVATION

Station	to	Station	L/R	Depth (Ft)	Quantity (CuYd)
264+75±		265+75±	R	3	105
265+00±		268+00±	L	3	160
				Total:	265

COLD MILLING ASPHALT CONCRETE

The Los Angeles Abrasion Loss value on the aggregate used for the in-place asphalt concrete was 25. This value was obtained from testing during construction of the in-place asphalt concrete.

Asphalt Repair Mastic was placed on the roadway surface with a Crack Leveling project in 2018. The cold milled material, including the Asphalt Repair Mastic can be used in the RAP.

Cold milling asphalt concrete will be done according to the typical section(s). In areas where maintenance patches have raised and/or widened the road, additional asphalt concrete will 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 will be daylighted to the outside edge of the roadway. Any additional costs associated with this additional cold milling will be incidental to the contract unit price per square yard for "Cold Milling Asphalt Concrete".

Cold milling asphalt is estimated to produce 67324 tons of cold milled asphalt concrete material. An estimated 11453 tons of cold milled asphalt concrete material will be used on this project as Base Course, Salvaged Asphalt Mix below the proposed asphalt concrete shoulders. An estimated 11479 tons of cold milled asphalt concrete material will be blended with Granular Material, Furnish and will be used on this project as Base Course, Salvaged at the locations identified in the plans. An estimated 14055 tons of cold milled asphalt concrete material will be used on this project as RAP in the Class Q3R Hot Mixed Asphalt Concrete mixture.

The remainder of the salvaged asphalt concrete material will be stockpiled according to the Blend, Haul, and Stockpile Granular Material plan note.

RAP achieved for project use and/or other uses is based on the dimensions given in the typical section(s). Field conditions will vary from that given in the typical section(s). Therefore, the Contractor may be required to adjust the mill depth, as necessary, to provide the quantity of RAP specified by the plans, if approved by the Engineer.

BLEND AND STOCKPILE GRANULAR MATERIAL

An Estimated 11479 tons (for informational purposes only) of Salvaged Asphalt Mix Material will be blended with 11479 tons of Granular Material, Furnish and stockpiled at the Contractor's furnished stockpile site.

The Contractor will use a portable platform scale, stationary commercial scale, stationary commercial plant, portable plant scale, or a belt scale to control the blending and weighing of the salvage material with Contractor furnished granular material.

The salvaged asphalt mix material will be crushed to meet the requirements of Section 884.2 D.2 prior to blending into the stockpile.

Salvaged asphalt mix material and salvaged granular material will be blended with Granular Material, Furnish at a rate of 50% salvaged asphalt mix material and 50% Granular Material, Furnish to obtain stockpile material. Material will be uniformly blended to the satisfaction of the Engineer.

No further gradation testing of the blended material will be required.

All costs for crushing the salvaged asphalt mix material, stockpiling, and blending the materials will be incidental to the contract unit price per ton for "Blend and Stockpile Granular Material".

BLEND, HAUL, AND STOCKPILE GRANULAR MATERIAL

Excess salvaged asphalt concrete material estimated at 30327 tons (for informational purposes only) will be blended with 30327 tons of Granular Material, Furnish and will be hauled, blended and stockpiled in the Southeast ¼ of Section 16, Township 106 North, Range 52 West of the 5th P.M., Lake County, South Dakota at the Madison SDDOT Maintenance yard. The Contractor will have approval from the Engineer of the stockpile location prior to stockpiling the material within the aforementioned site.

A computerized scale, portable platform scale, stationary commercial scale, stationary commercial plant, portable plant scale, or a belt scale along with a scale operator will be provided by the Contractor at the stockpile site to weigh the salvaged material prior to blending.

The salvaged asphalt concrete material will be crushed to meet the requirements of Section 884.2 D.3 prior to blending into the stockpile.

Salvaged asphalt concrete material will be blended with Granular Material, Furnish at a rate of 50% salvaged asphalt mix material and 50% Granular Material, Furnish to obtain stockpile material. Material will be uniformly blended to the satisfaction of the Engineer.

No further gradation testing of the blended material will be required.

All other costs for crushing, hauling, stockpiling, and blending salvaged asphalt concrete material and Granular Material, Furnish will be incidental to the contract unit price per ton for "Blend, Haul and Stockpile Granular Material".

GRANULAR MATERIAL, FURNISH

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

The granular material will be Base Course meeting the requirements of Section 882.

BASE COURSE

Base Course will be used at Pipe Replacement Locations. It will be necessary to use Base Course at these sites because the pipe may be replaced before cold milling or salvaging take place.

BASE COURSE, SALVAGED

Base Course, Salvaged will be obtained from the stockpile site(s) provided by the Contractor and may be used without further gradation testing.

The Contractor will ensure the Base Course, Salvaged material contains no more than 50% salvaged asphalt mix material and at least 50% granular material (salvaged or virgin). Blended material will be to the satisfaction of the Engineer.

All other requirements for Base Course, Salvaged will apply.

BASE COURSE, SALVAGED ASPHALT MIX

Base Course, Salvaged Asphalt Mix estimated at 11453 tons will be obtained from the cold milled material produced on this project.

The Base Course, Salvaged Asphalt Mix will be crushed to meet the requirements of Section 884.2 D.3 prior to placement.

Base Course, Salvaged Asphalt Mix placed on the shoulders will be compacted according to Section 260.3.D of the Specifications except that a pneumatic tired roller with an effective roller weight of at least 250 pounds per square inch of roller width will be required.

At the time of compaction, the material will have approximately 4% moisture uniformly blended throughout the depth of material. The Engineer may adjust the percent moisture. Included in the Estimate of Quantities is 8.9 MGal/per mile for Water for Granular Material.

WATER FOR COMPACTION

The moisture content for compaction of the Base Course will be approximately optimum moisture of the material. The quantity for Water for Granular Material is based on 5% of the quantity of Base Course.

The moisture content for compaction of the Base Course, Salvaged and Base Course, Salvaged Asphalt Mix will be approximately optimum moisture of the material. The quantity for Water for Granular Material is based on 4% of the quantity of Base Course, Salvaged and Base Course, Salvaged Asphalt Mix.

FULL DEPTH RECLAMATION (FDR)

The Contractor may perform initial rolling with a sheepsfoot roller until the roller pads walk out of the reclaimed mix. The sheepsfoot roller will weigh at least 25,000 pounds. The maximum lift thickness may be increased to 8.5" if a sheepsfoot roller is utilized and good compaction results are obtained. Moisture and density requirements throughout the full depth of processing as required in Section 280.3 C will be adhered to; moisture testing will be completed behind the processing unit and prior to compaction.

The shaping of the finished granular surface to repair ruts, potholes, wash-boarding, sheepsfoot roller marks, and other distortions will be accomplished by scarifying to a depth of 2 inches below the deepest distortion and shaped and compacted to the typical section.

Repeated reclaiming and rolling may be required within two calendar days after the initial processing and rolling to achieve the target density on the completed in-place recycled surface. The Contractor will discontinue any type of rolling that results in cracking, movement, or other types of distress until such time that the problem can be resolved. If there is a significant change in mix proportions, weather conditions, or other controlling factors, the Engineer may require construction of test strips to check target density.

All other requirements for Full Depth Reclamation will apply.

UNCLASSIFIED EXCAVATION, DIGOUTS

The locations and extent of digout areas will be determined in the field by the Engineer. The backfilling material for the digouts will be Base Course, Salvaged.

Included in the Estimate of Quantities are 50 cubic yards of Unclassified Excavation, Digouts per mile for the removal of unstable material throughout the project.

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

The digouts will be extended through the shoulder and backfilled with granular material that will daylight to the inslope to allow water to escape the subsurface.

BLOTTING SAND FOR PRIME

Included in the Estimate of Quantities are 10 tons of Blotting Sand for Prime to be used where necessary for maintenance of traffic as directed by the Engineer. (Rate = 10 pounds per square yard)

HEAVY ROADWAY SHAPING

Included in the Estimate of Quantities are 0.2 Miles of Heavy Roadway Shaping to be used in areas designated by the Engineer.

Included in the Estimate of Quantities are 20 MGals of Water for Granular Material for shaping and recompaction.

CLASS Q3R HOT MIXED ASPHALT CONCRETE

Mineral Aggregate:

Asphalt concrete aggregates will consist of reclaimed asphalt pavement (RAP) and virgin aggregate.

Virgin mineral aggregate for Class Q3R Hot Mixed Asphalt Concrete will conform to the requirements of Class Q3.

The Class Q3R Hot Mixed Asphalt Concrete will include 20 percent RAP in the mixture. RAP will be obtained from the material produced by cold milling on this project.

Mix Design Criteria:

Gyratory Controlled QC/QA Mix Design requirements for the Class Q3R Hot Mixed Asphalt Concrete will conform to the requirements of Class Q3 except as modified by the following:

Gyratory Compactive Effort:

	$N_{initial}$	N_{design}	$N_{maximum}$
Class Q3R	6	50	75

All remaining requirements for Class Q3 will apply.

ASPHALT CONCRETE COMPOSITE

Section 324 will apply except that Class Q3R Hot Mixed Asphalt Concrete as specified elsewhere in the plans may be used as Asphalt Concrete Composite.

Plans specified locations for Asphalt Concrete Composite will be paid for at the contract unit price per ton for "Asphalt Concrete Composite" regardless of the class of asphalt concrete used at such locations.

RUMBLE STRIPES/STRIPS – FLUSH SEAL

Asphalt for Flush Seal will be applied after the rumble stripes/strips have been installed. The application width will extend 3 in beyond each edge of the rumble stripe/strip to create a total application rate of 0.10 gal./sq.yd on the rumble stripes/strips.

EDGELINE RUMBLE STRIPS

INSTALLATION:

Edgeline rumble strips will be constructed according to Standard Plate 320.24.

Rumble strips will be completed prior to application of the flush seal and permanent pavement marking.

Rumble strips will be installed in rural areas with posted speeds greater than 50 mph and are not required in urban areas. The rumble strips will begin at the location of the Speed Limit 65 sign as traffic is departing the built up area of a community, unless otherwise specified in the plans. The Engineer will provide the exact start and stop locations.

ROADWAY CLEANING:

The Contractor will 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. It will be the Contractor's responsibility to ensure the loose material does not enter any vegetated areas or waterways.

Cost for this work will be incidental to the contract unit price per mile for Grind 12" Rumble Strip or Stripe in Asphalt Concrete.

MAINLINE CROSS PIPE REPLACEMENT

Pipe culverts at 14+82, 40+49, 103+19, and 529+69 will be installed in accordance with the following notes and as shown on the Pipe Installation Detail.

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

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

Select fill material for backfilling the undercut area will conform to the gradation requirements of Base Course in Section 882. If groundwater is encountered during construction, the select fill material for backfilling the undercut area and Class B Bedding will conform to the gradation requirements of Section 421.2 A. until backfill placement is above the groundwater level. The Engineer will process a CCO to provide for compensation to the Contractor for the added cost of the changed material. All other requirements of Section 421 will apply.

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

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

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

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

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

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

TABLE FOR MAINLINE CROSS PIPE REPLACEMENT

LOCATION	PIPE CULVERT UNDERCUT (CuYds)	REMOVE ASPHALT CONCRETE (Sq.Yds)	SELECT FILL MATERIAL (Tons)	BASE COURSE (Tons)	1ST LIFT ASPHALT CONCRETE COMPOSITE (Tons)	2ND LIFT ASPHALT CONCRETE COMPOSITE (Tons)
14+82	26	247	96	165	34	34
40+49	25	201	103	134	28	28
103+19	26	218	113	145	30	30
529+69	25	192	115	128	27	27
Totals:	**102**	**858**	**427**	**572**	**119**	**119**

Quantities are included in the Table of Additional Quantities for Mainline Cross Pipe Replacement. The quantity for Select Fill Material will be added/included in the quantity for Base Course.

TEMPORARY SHOULDER WIDENING

During ½ roadway width replacements, the Contractor will be required to widen the shoulders with borrow material and base course surfacing as shown in the plan detail “Temporary Shoulder Widening” to maintain traffic through the project site. Changes to the location or geometry of the shoulder widening as shown in the plans is subject to approval by the Engineer. At a minimum, the widening will be constructed so that no part of the inslope is steeper than 3:1 and that a minimum of 12” of base course surfacing is placed to accommodate traffic.

The construction of temporary shoulder widening may require the installation of temporary drainage structures. The Contractor will be responsible for adequately sizing the temporary drainage structure to reduce the potential for upstream flooding at these crossings.

Upon completion of the culvert reset or new culvert installation, any excess materials used for temporary widening no longer required will be removed from the project or reused at other locations as approved by the Engineer.
The temporary widened shoulders will be constructed according to Section 4.5 A of the Specifications, Installation and removal of the temporary widened shoulders will meet all requirements as set forth in the South Dakota Surface Water Quality Standards.

The cost of labor, equipment, and incidentals required to satisfactorily maintain traffic diversions and provide temporary drainage structures will be incidental to the contract lump sum price for Maintenance of Traffic Diversion(s).

The cost of labor, equipment, and incidentals necessary to satisfactorily remove traffic diversions and dispose of materials will be incidental to the contract lump sum price for Remove Traffic Diversion(s).

TABLE FOR TEMPORARY SHOULDER WIDENING

LOCATION	CONTR. FURNISHED BORROW EXC. (For one side) (CuYds)	BASE COURSE (For one side) (Tons)
14+82	1975	325
40+49	715	325
103+19	1075	325
529+69	450	325
Totals:	**4215**	**1300**

PIPE EXTENSIONS

For pipe extensions that are outside the new surfaced shoulder as shown in the typical sections, acceptance tests in the lower one-half and upper one-half of pipe 48” or less in diameter may be performed by visual inspection to the satisfaction of the Engineer. All other MSTR pipe density testing requirements will apply.

REMOVING CORRUGATED METAL PIPE

When it is necessary to remove a damaged culvert end, the culvert may be cut with a torch. If the culvert is cut with a torch, it will be painted with a galvanizing paint approved by the Engineer.

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.

Cost for removing damaged portions of culverts will be included in the contract unit price per foot for Remove Pipe Culvert.

TIE BOLTS FOR RCP/RCP ARCH CULVERTS

Tie bolts will conform to Standard Plate 450.18.

Tie Bolts will be installed at the inlet and outlet on the first three sections of new/reset culvert and on new/reset culvert ends (requires connection from existing culvert to new culvert / new end section).

For informational purposes:

Field drilling will be required to install the tie bolts on reset culvert, on reset culvert ends and on existing culvert when installing a new/reset end section.

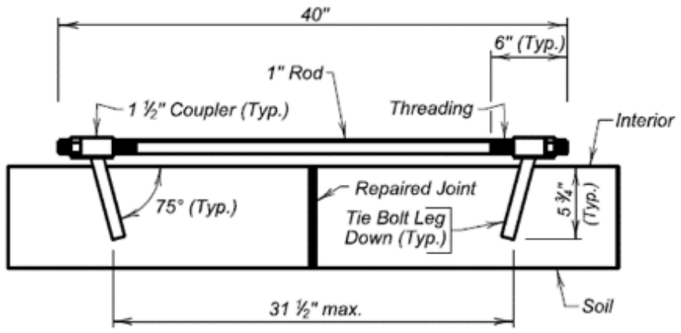
Cost for removing tie bolts, drilling tie bolt holes and furnishing and installing tie bolts will be incidental to the contract unit prices for installing or resetting RCP/RCP Arch Culverts and End Sections. Existing tie bolts may be salvaged and reused if condition is acceptable to the Engineer.

The Contractor will place culvert and end sections such that the installation does not cause existing culvert sections to separate at any of the existing joints. Any joint separation caused by the Contractor’s operations will result in removal, resetting and re-tie bolting of said culvert sections at the Contractor’s expense.

TIE BOLTS FOR REINFORCED CONCRETE BOX CULVERT

All joints for culverts listed in the "Table of Reinforced Concrete Box Culvert Joint Repair and Void Grouting" in the plan notes will have tie bolts installed on the inside of the culvert. The Contractor will drill holes at an angle as to cause the legs of the tie bolt to bind against the outside face of the hole upon tie bolt tightening. Bending of the tie bolt legs may need to be done in order to achieve this. Prior to inserting the tie bolt the Contractor will fill the hole with epoxy resin. The epoxy resin mixture will be of a type for bonding steel to hardened concrete and will conform to AASHTO M235 Type IV, (Equivalent to ASTM C881, Type IV). The Contractor will allow the resin to properly setup prior to the final tightening of the tie bolts. Cost for drilling tie bolt holes, epoxy resin, connections, and furnishing and installing the tie bolts for reinforced concrete pipe and reinforced concrete box culvert will be incidental to the contract unit price per each for "Tie Bolts for RCP".

For informational purposes: Field drilling will be required to install the tie bolts on reset culvert, on reset culvert ends, existing culvert when installing a new/reset end section, and on existing concrete box culvert sections.



RCBC Tie Bolt Detail

REINFORCED CONCRETE BOX CULVERT JOINT REPAIR AND VOID GROUTING

A. CULVERT JOINT CLEANING

1. This work will consist of cleaning of the culvert joints, washing the entire culvert and joints with a high pressure washer, and if needed, wire brush cleaning of each joint to be repaired as directed by the Engineer. The entire culvert will be clean and dry and most notably the specified joints will be thoroughly cleaned to the satisfaction of the Engineer using a power washer with water pressure of at least 2500 psi. The culvert must be in a clean condition so that no deleterious material is trapped in the joints that are being repaired. The Contractor will dispose of all debris removed from the culverts during the cleaning operation as approved by the Engineer.
2. All costs for equipment, material and labor for the culvert joint cleaning work will be incidental to the contract unit price per foot for Culvert Joint Cleaning which will be compensation in full for all equipment.
3. Contractor will visit the project to determine the extent of cleaning needed for Culvert Joint Cleaning prior to bidding work.

B. REPAIR CULVERT JOINT

This work will consist of repairing culvert joints in accordance with the Chemical Grout Manufacturer's directions for the sealing of each joint to prevent future infiltration/exfiltration of soils and water. Joint Sealing also prevents the soil stabilization and void filling grout from expanding back into the structure during injection. The following will apply:

1. The work will consist of repairing the concrete culvert joint with sealant comprised of water reactive hydrophilic polyurethane resin and dry oil free oakum. The work will include the furnishing by the Contractor, of all supervision, training, labor, materials, tools, lighting and equipment for the performance of all operations necessary to repair or seal joints between concrete pipe sections throughout the culvert. All grout will be injected under such pressure so as not to damage the existing drainage structure or roadway structure.
2. The Contractor will provide a notarized statement, from the Manufacturer, that the polyurethane foam resin meets the specified requirements, along with submitting the Manufacturer's current product specification and installation instructions. The grout materials will be non-flammable and non-toxic when cured.
3. The Contractor will be an Approved Contractor of the Manufacturer of the specified product and will provide written certification from the Manufacturer attesting to their Approved Contractor status.
4. All product documentation and Contractor submittals must be submitted to the Engineer prior to or at the preconstruction meeting. The Contractor must have the Engineer's approval prior to commencing any of this work.
5. The Contractor will follow the Manufacturer's installation instructions throughout the repair process and install components in accordance with Manufacturer's specifications.
6. The Contractor will provide safe storage and handling of materials prior to delivery and at the project site. All material installation, handling and storage will be in accordance with Manufacturer's recommendations.

B. REPAIR CULVERT JOINT (CONTINUED)

7. Temperature of the resin is critical from the point of pumping to the point of injection. All polyurethanes react faster at higher temperatures. Drum heaters and heated hoses are required when ambient or ground temperatures are below 70 degrees Fahrenheit. The optimum hose temperature will vary with the weather conditions and the particular job site conditions with the minimum hose temperature being 75 degrees Fahrenheit and the maximum hose temperature being 95 degrees Fahrenheit and the drum temperature not to exceed 90 degrees Fahrenheit.
8. The Contractor will provide worker and inspector safety and worker protective gear in accordance with the manufacturer, including but not limited to chemical goggles, face shields, eye wash system and NBR gloves.
9. The Contractor will submit to the Engineer for approval a detailed procedure for the installation of the polyurethane grout.
10. The work will include, but is not limited to sealing each pipe joint with a hydrophilic polyurethane grout meeting the following specifications:
    - GEL FOAM II (Saturated Oakum Rope Joint Packing) as manufactured by Green Mountain International, LLC or equal.
    - ULTRA (Single Component Grout For Joint Injection) as manufactured by Green Mountain International, LLC or equal.
11. UV Protection (Gel Coat) - The work will consist of trimming excess grout and oakum from the interior face of the joint prior to applying the Gel Coat. The epoxy gel compound will be recommended by the Manufacturer for both surface sealing and protecting the hydrophilic grout from UV exposure. The epoxy gel compound will be mixed and handled in accordance with the Manufacturer's recommendations and will meet the following requirements:
    - Epoxy gel sealant compounds manufactured by Green Mountain Grouts, LLC or equal.
12. All costs for all equipment, material and labor required to complete the work will be incidental to the contract unit price per foot for Repair Culvert Joint. Completion of the work includes initial saturated oakum rope packing of each joint, follow up injection of resin into the back side of each joint, trimming the excess grout and oakum from the interior face of the joint, application of the epoxy gel coat and site clean-up.
13. Contractor will visit the project to determine the extent of work needed for Repairing the Culvert Joints prior to bidding the work.

REINFORCED CONCRETE BOX CULVERT JOINT REPAIR AND VOID GROUTING (CONTINUED)

C. DUAL COMPONENT CHEMICAL GROUT FOR VOID FILLING

1. This work will consist of filling external voids surrounding the culvert, with an injected high expansion chemical grout compound. The work will include furnishing the chemical grout by the Contractor, all supervision, training, labor, materials, tools, lighting and equipment for the performance of all operations necessary to fill external voids around the drainage structure. Holes will be strategically drilled as required and grout injected throughout the structure to effectively fill all voids that have developed outside of the structure due to the infiltration of external soils and materials into the culvert and "piping" (water running outside and under the structure due to separated joints). All grout will be injected under such pressure so as not to damage the existing drainage structure or roadway structure. All joints will be appropriately cleaned and sealed, with appropriate recommended cure time, prior to the injection of the void grouting. After completion of the void filling, all holes will be properly sealed.
2. The Contractor must supply the Engineer with three (3) prior job references of projects where they have successfully injected urethane resin for subgrade void filling applications, or soil stabilization.
3. The Contractor will provide a notarized statement, from the Manufacturer, that the polyurethane foam resin meets the specified requirements for filling voids, along with submitting the Manufacturer's current product specification and installation instructions.
4. The Contractor will follow the Manufacturer's installation instructions throughout the repair process and install components in accordance with Manufacturer's specifications.
5. The Contractor will be an Approved Contractor of the Manufacturer of the specified product and will provide certification from the Manufacturer attesting to their Approved Contractor status.
6. The Contractor will provide safe storage and handling of materials prior to delivery and at the project site. All material installation, handling and storage will be in accordance with the Manufacturer's recommendations.
7. The Contractor will provide worker and inspector safety and worker protective gear in accordance with the Manufacturer, including but not limited to chemical goggles, face shields, eye wash system, Tyvek or equivalent clothing protection and NBR gloves.
8. All product documentation and Contractor submittals must be submitted to the Engineer prior to or at the preconstruction meeting. The Contractor must have the Engineer's approval prior to commencing on any of this work.
9. The chemical grout or void filling materials will be a dual component hydrophobic polyurethane grout compound.
10. The grout materials will be non-flammable and non-toxic when cured.

C. DUAL COMPONENT CHEMICAL GROUT FOR VOID FILLING (CONTINUED)

11. The grout mixture will have expansion properties listed in the data sheets of greater than twenty (20) times its original volume and cure to rigid closed cell polyurethane foam. The grout will expand to fill any voids and bond to the exterior surface of the structure. The grout will be in accordance with the Manufacture's recommendations and will meet the following requirements:
    - VF dual component polyurethane grouts as manufactured by Green Mountain International, LLC or equal.
12. It is the Contractor's responsibility to locate reinforcing bars and conduit prior to drilling any grout holes.
13. The typical method consists of placing a layer of chemical grout behind or around the structure. The Contractor will submit for approval by the Engineer a detailed grouting plan showing the spacing, orientation and depth of the grout holes, as well as type of polyurethane grout to be used, range of gel times, equipment, mixing procedures, recommended injection pressure, technique for monitoring grout travel and any other pertinent information. The grouting plan should address the prevention of overfilling and prevention of damage to structures or roadway. The Contractor will submit this detailed procedure for the installation of the expansion grout to the Engineer for approval. The holes are drilled with a rotary percussion hammer drill using a sharp masonry bit with a minimum diameter of 3/8 inch to a maximum diameter of 5/8 inch. Care must be taken to prevent holes from causing damage to reinforcing bars or utility conduits. Drilled holes should be vacuumed and flushed. Use injection grout and methods as recommended by Manufacturer.

    TEMPERATURE of the resin is critical from the point of pumping to the point of injection.

    All polyurethanes react faster at higher temperatures. Drum heaters and heated hoses are required when ambient and ground temperatures are below 70 degrees Fahrenheit. The optimum hose temperature will vary with the weather conditions and the particular job site conditions with the minimum hose temperature being 75 degrees Fahrenheit and the maximum hose temperature being 95 degrees Fahrenheit and the drum temperature not to exceed 90 degrees Fahrenheit.

    Injection can be monitored by either applicator's visual inspection or by pumping a specific amount of injection grout into each hole. The work will start at the inlet end of the pipe and proceed downstream to the outlet. Inject bottom row every other hole. When material appears at the adjacent port, discontinue injection at entry port and begin injection at the adjacent port.

    Continue injection process section by section from bottom of pipe to top of pipe in a continuous manner to next pipe section. Injection pressure will vary from 200 psi to 3000 psi depending on the width of the joint, thickness of the structure, and condition of the concrete. After the grout cures, excess material will be trimmed to be flush with the pipe interior wall and the pipe left clean.
14. All costs for filling external voids surrounding the culvert will be incidental to the contract unit price per gallon for Chemical Grout Void Fill for all equipment, intermediate and post cleanup, material and labor required to complete the work. Any overfilling of voids that results in damage to overlying pavement, highway user ride quality, or drainage structure integrity will be corrected by the Contractor at no expense to the Owner. All corrections will be approved by the Engineer.

C. DUAL COMPONENT CHEMICAL GROUT FOR VOID FILLING (CONTINUED)

15. Contractor will visit the project to determine the extent of work needed for the Grout Void Fill prior to bidding the work.

TABLE OF REINFORCED CONCRETE BOX JOINT REPAIR AND VOID GROUTING

Station	Type	No. Joints to Repair	Tie Bolts (Each)	Culvert Joint Cleaning (Feet)	Repair Culvert Joint (Feet)	Chemical Grout Void Fill (Gallon)
216+13	3-10'x8' RCBC	1	6	108.0	108.0	27
	Totals:		**6**	**108.0**	**108.0**	**27**

INSLOPE TRANSITIONS

Inslope transitions will be required at the RCBC Extension at 216+13. Refer to Standard Plate 120.05 and to the sheet titled Inslope Transition for details.

TABLE OF INSLOPE TRANSITIONS

Station	Side
216+13	L
216+13	R

EMBANKMENT ADJACENT TO CULVERTS

Earth embankment adjacent to the existing culverts/end sections shown in the Table of Mainline Culvert Work will be removed prior to removing the culverts/end sections. Upon installation/reset of the culvert/end sections, the earth embankment will be replaced and compacted adjacent to the culvert/end sections.

Cost for removing, replacing and compacting the earth embankment is included in the contract unit price per cubic yard for Contractor Furnished Borrow Excavation.

TYPE 2 OBJECT MARKERS

The Contractor is required to remove Type 2 Object Markers prior to the work and install new Type 2 Object Markers after the work for all the pipe ends, as detailed in the plans. Cost for Type 2 object marker and post removal will be incidental to the contract unit price per each for Remove Delineator.

Type 2 Object Markers and posts will be furnished and installed by the Contractor at the locations shown in the Table for Mainline Culvert Work.

REFURBISH SINGLE MAILBOXES

Existing mailboxes will be removed, turnouts constructed, and mailboxes reset on new posts with the necessary support hardware for single mailbox assemblies. The local Postmaster will determine the recommended mounting height. The Contractor will coordinate with the Engineer on the proper postal representative to contact.

STATION	Side	BASE COURSE, SALVAGED TONS	CLASS Q3R HOT MIXED ASPHALT CONCRETE TONS	REFURBISH SINGLE MAILBOX EACH
33+05	L	-	-	1
76+15	L	8	6	1
185+15	L	-	-	1
281+80	L	8	6	1
327+50	R	7	4	1
370+40	R	7	4	1
384+90	R	7	4	1
419+10	R	7	4	1
426+85	R	7	4	1
450+75	R	8	6	1
492+85	R	8	6	1
499+25	R	7	4	1
550+25	R	7	4	1
568+50	R	7	4	1
606+85	R	7	4	1
627+85	R	7	4	1
TOTALS:		**102**	**64**	**16**

MYCORRHIZAL INOCULUM

Mycorrhizal inoculum will 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 will provide certification of the fungal species claimed and the live propagule count. The inoculum will include a minimum 25% the fungal species *Rhizophagus intraradices*. The remaining 75% may include other endomycorrhizal fungal species.

All seed will 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 will be incidental to the contract unit price per pound for the corresponding permanent seed mixture.

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 will consist of the following:

Grass Species	Variety	Pure Live Seed (PLS) (Pounds/Acre)
Western Wheatgrass	Arriba, Flintlock, Rodan, Rosana, Walsh	7
Switchgrass	Dacotah, Forestburg, Nebraska 28, Pathfinder, Summer, Sunburst, Trailblazer	3
Indiangrass	Holt, Tomahawk, Chief, Nebraska 54	3
Big Bluestem	Bison, Bonilla, Champ, Sunnyview, Rountree, Bonanza	3
Oats or Spring Wheat: April through May; Winter Wheat: August through November		10
	Total:	26

MULCHING (GRASS HAY OR STRAW)

If the Contractor uses a no-till drill, mulch may be applied prior to seeding and the mulch can then be punched into the soil by the no-till drill. If the Contractor uses this process, the no-till drill seeding will be completed immediately following the mulch application and the mulch will be punched into the soil at a 3-inch depth.

LOW FLOW SILT FENCE

The low flow silt fence fabric provided will be from the approved product list. The approved product list for low flow silt fence may be viewed at the following internet site:

http://apps.sd.gov/HC60ApprovedProducts/main.aspx

Low flow silt fence will be placed at the locations noted in the table and at locations that will minimize siltation of adjacent streams, lakes, dams, or drainage areas as determined by the Engineer during construction. Refer to Standard Plate 734.04 for details.

An additional quantity of Low Flow Silt Fence has been added to the Estimate of Quantities for temporary sediment control.

TABLE OF LOW FLOW SILT FENCE

Station	Location	Quantity (Ft)
212+25 to 215+80 L	RCBC Transition Toe	415
212+25 to 215+80 R	RCBC Transition Toe	415
216+40 to 219+95 L	RCBC Transition Toe	415
216+40 to 219+95 R	RCBC Transition Toe	415
	Additional Quantity:	500
	Total:	2160

HIGH FLOW SILT FENCE

The high flow silt fence fabric provided will be from the approved product list. The approved product list for high flow silt fence may be viewed at the following internet site:

http://apps.sd.gov/HC60ApprovedProducts/main.aspx

High flow silt fence will be placed at the locations noted in the table and at locations that will minimize siltation of adjacent streams, lakes, dams, or drainage areas as determined by the Engineer during construction. Refer to Standard Plate 734.05 for details.

An additional quantity of high flow silt fence has been added to the Estimate of Quantities for temporary sediment control.

TABLE OF HIGH FLOW SILT FENCE

Station	Location	Quantity (Ft)
151+62 R	Inlet of Pipe	18
158+13 R	Inlet of Pipe	18
264+00 R	Inlet of Pipe	18
264+98 R	Inlet of Pipe	18
268+40 R	Inlet of Pipe	30
275+69 R	Inlet of Pipe	18
411+79 R	Inlet of Pipe	18
411+79 L	Outlet of Pipe	18
422+73 L	Inlet of Pipe	18
424+33 L	Inlet of Pipe	18
	Additional Quantity:	150
	Total:	342

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0081(112)95	27	167

STORMWATER POLLUTION PREVENTION PLAN CHECKLIST

*(The numbers left of the title headings are **reference numbers** to the GENERAL PERMIT FOR STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITIES (Stormwater Permit))*

5.3 (2): STAFF TRAINING/SWPPP IMPLEMENTATION

To promote stormwater management awareness specific for this project, the Contractor's Erosion Control Supervisor should provide correspondence of how the SWPPP will be implemented. The Contractor's Erosion Control Supervisor is responsible for providing this information at the preconstruction meeting, and subsequently completing an attendance log, which should identify site-specific implementation of the SWPPP and the names of the personnel who attended the preconstruction meeting. Documentation of the preconstruction meeting will be filed with the SWPPP documents.

5.3 (3): DESCRIPTION OF CONSTRUCTION ACTIVITIES

- **5.3 (3a): Project Limits** (See Title Sheet)
- **5.3 (3a): Project Description** (See Title Sheet)
- **5.3 (4): Site Map(s)** (See Title Sheet and Plans)
- **Major Soil Disturbing Activities** (check all that apply)
  - ☐ Clearing and grubbing
  - ☒ Excavation/borrow
  - ☒ Grading and shaping
  - ☒ Filling
  - ☐ Other (describe):
- **5.3 (3b): Total Project Area** 224 acres
- **5.3 (3b): Total Area to be Disturbed** 36.6 acres
- **5.3 (3c): Maximum Area Disturbed at One Time**36.6
- **5.3 (3d): Existing Vegetative Cover (%)** 60%
- **5.3 (3d): Description of Vegetative Cover**Typical Eastern SD native and introduced grasses and forbs.

- **5.3 (3e): Soil Properties:** AASHTO Soil Classification A6 and A7
- **5.3 (3f): Name of Receiving Water Body/Bodies** Battle Creek, Unnamed Creek from Ramona to Madison
- **5.3 (3g): Location of Construction Support Activity Areas**

5.3 (3h): ORDER OF CONSTRUCTION ACTIVITIES

- **Special sequencing requirements** (see sheet).

The Contractor will enter the Estimated Start Date.

Description	Estimated Start Date
Install stabilized construction entrance(s).	
Install perimeter protection where runoff may exit site.	
Install perimeter protection around stockpiles.	
Install channel and ditch bottom protection.	
Clearing and grubbing.	
Remove and stockpile topsoil.	
Stabilize disturbed areas.	
Install utilities, storm sewers, curb and gutter.	
Install inlet and culvert protection after completing storm drainage and other utility installations.	
Final grading.	
Final paving.	
Removal of protection devices.	
Reseed areas disturbed by removal activities.	

5.3 (5): DESCRIPTION AND MAINTENANCE OF CONTROL MEASURES

All controls will be maintained in good working order. Necessary repairs will be initiated within 24 hours of the site inspection report. Include the technical reasoning for selecting each control. (check all that apply)

Perimeter Controls (See Detail Plan Sheets)

Description	Estimated Start Date
☐ Natural Buffers (within 50 ft of Waters of State)	
☒ Silt Fence	
☐ Erosion Control Wattles	
☐ Temporary Berm / Windrow	
☐ Floating Silt Curtain	
☐ Stabilized Construction Entrances	
☐ Entrance/Exit Equipment Tire Wash	
☐ Other:	

Structural Erosion and Sediment Controls

Description	Estimated Start Date
☒ Silt Fence	
☐ Temporary Berm/Windrow	
☐ Erosion Control Wattles	
☐ Temporary Sediment Barriers	
☐ Erosion Bales	
☐ Temporary Slope Drain	
☐ Turf Reinforcement Mat	
☐ Riprap	
☐ Gabions	
☐ Rock Check Dams	
☐ Sediment Traps/Basins	
☐ Culvert Inlet Protection	
☐ Transition Mats	
☐ Median/Area Drain Inlet Protection	
☐ Curb Inlet Protection	
☐ Interceptor Ditch	
☐ Concrete Washout Facility	
☐ Work Platform	
☐ Temporary Water Barrier	
☐ Temporary Water Crossing	
☐ Permanent Stormwater Ponds	
☐ Permanent Open Vegetated Swales	
☐ Natural Depressions to allow for Infiltration	
☐ Sequential Systems that combine several practices	
☐ Other:	

Dust Controls

Description	Estimated Start Date
☐ Tarps & Wind impervious fabrics	
☐ Watering	
☐ Stockpile location/orientation	
☐ Dust Control Chlorides	
☐ Other	

Dewatering BMPs

Description	Estimated Start Date
☐ Sediment Basins	
☐ Dewatering bags	
☐ Weir tanks	
☐ Temporary Diversion Channel	
☐ Other:	

Stabilization Practices (See Detail Plan Sheets)

(Stabilization measures will begin the following work day whenever earth disturbing activity on any portion of the site has temporarily or permanently ceased. Temporary stabilization will be completed as soon as practicable but no later than 14 days after initiating soil stabilization activities (**3.18**))

Description	Estimated Start Date
☐ Vegetation Buffer Strips	
☐ Temporary Seeding (Cover Crop Seeding)	
☒ Permanent Seeding	
☐ Sodding	
☐ Planting (Woody Vegetation for Soil Stabilization)	
☒ Mulching (Grass Hay or Straw)	
☐ Fiber Mulching (Wood Fiber Mulch)	
☐ Soil Stabilizer	
☐ Bonded Fiber Matrix	
☐ Fiber Reinforced Matrix	
☐ Erosion Control Blankets	
☐ Surface Roughening (e.g. tracking)	
☐ Other:	

Wetland Avoidance

Will construction and/or erosion and sediment controls impinge on regulated wetlands? Yes ☐ No ☒ If yes, the structural and erosion and sediment controls have been included in the total project wetland impacts and have been included in the 404 permit process with the USACE.

5.3 (6): PROCEDURES FOR INSPECTIONS

- Inspections will be conducted at least once every 7 days.
- All controls will be maintained in good working order. Necessary repairs will be initiated within 24 hours of the site inspection report.
- Silt fence will be inspected for depth of sediment and for tears to ensure the fabric is securely attached to the posts and that the posts are well anchored. Sediment buildup will be removed from the silt fence when it reaches 1/3 of the height of the silt fence.
- Sediment basins and traps will be checked. Sediment will be removed when depth reaches approximately 50 percent of the structure's capacity, and at the conclusion of the construction.
- Check dams will be inspected for stability. Sediment will be removed when depth reaches ½ the height of the dam.
- All seeded areas will be checked for bare spots, washouts, and vigorous growth free of significant weed infestations.
- Inspection and maintenance reports will be prepared on form DOT 298 for each site inspection, this form will also be used to document changes to the SWPPP. A copy of the completed inspection form will be filed with the SWPPP documents.
- The SDDOT Project Engineer and Contractor's Erosion Control Supervisor are responsible for inspections. Maintenance and repair activities are the responsibility of the Contractor. The SDDOT Project Engineer will complete the inspection and maintenance reports and distribute copies per the distribution instructions on DOT 298.

5.3 (7): POST CONSTRUCTION STORMWATER MANAGEMENT

Stormwater management will be handled by temporary controls outlined in "DESCRIPTION AND MAINTENANCE OF CONTROL MEASURES" above, and any permanent controls needed to meet permanent stormwater management needs in the post construction period will be shown in the plans and noted as permanent.

5.3 (8): POLLUTION PREVENTION PROCEDURES

5.3 (8a): Spill Prevention and Response Procedures

➢ **Material Management**

- Housekeeping
  - Only needed products will be stored on-site by the Contractor.
  - Except for bulk materials the contractor will store all materials under cover and/or in appropriate containers.
  - Products must be stored in original containers and labeled.
  - Material mixing will be conducted in accordance with the manufacturer's recommendations.
  - When possible, all products will be completely used before properly disposing of the container off-site.
  - The manufacturer's directions for disposal of materials and containers will be followed.
  - The Contractor's site superintendent will inspect materials storage areas regularly to ensure proper use and disposal.
  - Dust generated will be controlled in an environmentally safe manner.

- Hazardous Materials
  - Products will be kept in original containers unless the container is not resealable and provide secondary containment as applicable.
  - Original labels and material safety data sheets will be retained in a safe place to relay important product information.
  - If surplus product must be disposed of, manufacturer's label directions for disposal will be followed.
  - Maintenance and repair of all equipment and vehicles involving oil changes, hydraulic system drain down, de-greasing operations, fuel tank drain down and removal, and other activities which may result in the accidental release of contaminants will be conducted on an impervious surface and under cover during wet weather to prevent the release of contaminants onto the ground.
  - Wheel wash water will be collected and allowed to settle out suspended solids prior to discharge. Wheel wash water will not be discharged directly into any stormwater system or stormwater treatment system.
  - Potential pH-modifying materials such as: bulk cement, cement kiln dust, fly ash, new concrete washings, concrete pumping, residuals from concrete saw cutting (either wet or dry), and mixer washout waters will be collected on site and managed to prevent contamination of stormwater runoff.

➢ **Spill Control Practices**

In addition to the previous housekeeping and management practices, the following practices will be followed for spill prevention and cleanup if needed.

- For all hazardous materials stored on site, the manufacturer's recommended methods for spill cleanup will be clearly posted. Site personnel will be made aware of the procedures and the locations of the information and cleanup supplies.
- Appropriate cleanup materials and equipment will be maintained by the Contractor in the materials storage area on-site. As appropriate, equipment and materials may include items such as brooms, dust pans, mops, rags, gloves, goggles, kitty litter, sand, sawdust, and plastic and metal trash containers specifically for cleanup purposes.
- All spills will be cleaned immediately after discovery and the materials disposed of properly.
- The spill area will be kept well ventilated and personnel will wear appropriate protective clothing to prevent injury from contact with a hazardous substance.
- After a spill a report will be prepared describing the spill, what caused it, and the cleanup measures taken. The spill prevention plan will be adjusted to include measures to prevent this type of spill from reoccurring, as well as clean up instructions in the event of reoccurrences.
- The Contractor's site superintendent, responsible for day-to-day operations, will be the spill prevention and cleanup coordinator.

➢ **Spill Response**

The primary objective in responding to a spill is to quickly contain the material(s) and prevent or minimize migration into stormwater runoff and conveyance systems. If the release has impacted on-site stormwater, it is critical to contain the released materials on-site and prevent their release into receiving waters. If a spill of pollutants threatens stormwater or surface water at the site, the spill response procedures outlined below must be implemented in a timely manner to prevent the release of pollutants.

- The Contractor's site superintendent will be notified immediately when a spill or the threat of a spill is observed. The superintendent will assess the situation and determine the appropriate response.
- If spills represent an imminent threat of escaping erosion and sediment controls and entering receiving waters, personnel will be directed to respond immediately to contain the release and notify the superintendent after the situation has been stabilized.
- Spill kits containing appropriate materials and equipment for spill response and cleanup will be maintained by the Contractor at the site.
- If oil sheen is observed on surface water (e.g. settling ponds, detention ponds, swales), action will be taken immediately to remove the material causing the sheen. The Contractor will use appropriate materials to contain and absorb the spill. The source of the oil sheen will also be identified and removed or repaired as necessary to prevent further releases.
- If a spill occurs the superintendent or the superintendent's designee will be responsible for completing the spill reporting form and for reporting the spill to SDDANR.
- Personnel with primary responsibility for spill response and cleanup will receive training by the Contractor's site superintendent or designee. The training must include identifying the location of the spill kits and other spill response equipment and the use of spill response materials.
- Spill response equipment will be inspected and maintained as necessary to replace any materials used in spill response activities.

5.3 (8b): WASTE MANAGEMENT PROCEDURES

➢ **Waste Disposal**

- All liquid waste materials will be collected and stored in approved sealed containers. All trash and construction debris from the site will be deposited in the approved containers. Containers will be serviced as necessary, and the trash will be hauled to an approved disposal site or licensed landfill. All onsite personnel will be instructed in the proper procedures for waste disposal and notices stating proper practices will be posted. The Contractor is responsible for ensuring waste disposal procedures are followed.

➢ **Hazardous Waste**

- All hazardous waste materials will be disposed of in a manner specified by local or state regulations or by the manufacturer. Site personnel will be instructed in these practices, and the Contractor will be responsible for seeing that these practices are followed.

➢ **Sanitary Waste**

- Portable sanitary facilities will be provided on all construction sites. Sanitary waste will be collected from the portable units which must be secured to prevent tipping and serviced in a timely manner by a licensed waste management Contractor or as required by any local regulations.

5.3 (9): CONSTRUCTION SITE POLLUTANTS

The following materials or substances are expected to be present on the site during the construction period. These materials will be handled as noted under the heading "POLLUTION PREVENTION PROCEDURES" (check all that apply).

- ☒ Concrete and Portland Cement
- ☒ Detergents
- ☒ Paints
- ☒ Metals
- ☒ Bituminous Materials
- ☒ Petroleum Based Products
- ☒ Diesel Exhaust Fluid
- ☒ Cleaning Solvents
- ☒ Wood
- ☒ Cure
- ☐ Texture
- ☐ Chemical Fertilizers
- ☐ Other:

Product Specific Practices

- **Petroleum Products**
  All on-site vehicles will be monitored for leaks and receive regular preventive maintenance to reduce the chance of leakage. Petroleum products will be stored in tightly sealed containers which are clearly labeled.

- **Fertilizers**
  Fertilizers will be applied only in the amounts specified by the SDDOT. Once applied, fertilizers will be worked into the soil to limit the exposure to stormwater. Fertilizers will be stored in an enclosed area. The contents of partially used fertilizer bags will be transferred to sealable containers to avoid spills.

- **Paints**
  All containers will be tightly sealed and stored when not required for use. The excess will be disposed of according to the manufacturer's instructions and any applicable state and local regulations.

- **Concrete Trucks**
  Contractors will provide designated truck washout facilities on the site. These areas must be self-contained and not connected to any stormwater outlet of the site. Upon completion of construction, the area at the washout facility will be properly stabilized.

5.3 (10): NON-STORMWATER DISCHARGES

The following non-stormwater discharges are anticipated during the course of this project (check all that apply).

- ☐ Discharges from water line flushing.
- ☒ Pavement wash-water, where no spills or leaks of toxic or hazardous materials have occurred.
- ☐ Uncontaminated ground water associated with dewatering activities.

5.3 (11): INFEASIBILITY DOCUMENTATION

If it is determined to be infeasible to comply with any of the requirements of the Stormwater Permit, the infeasibility determination must be thoroughly documented in the SWPPP.

7.0: SPILL NOTIFICATION

In the event of a spill, the Contractor's site superintendent will make the appropriate notification(s), consistent with the following procedures:

- A release or spill of a regulated substance (includes petroleum and petroleum products) must be reported to SDDANR immediately **if any one of the following** conditions exists:
  - The release or spill threatens or is able to threaten waters of the state (surface water or ground water)
  - The release or spill causes an immediate danger to human health or safety
  - The release or spill exceeds 25 gallons
  - The release or spill causes a sheen on surface water
  - The release or spill of any substance that exceeds the ground water quality standards of ARSD Chapter 74:54:01
  - The release or spill of any substance that exceeds the surface water quality standards of ARSD Chapter 74:51:01
  - The release or spill of any substance that harms or threatens to harm wildlife or aquatic life
  - The release or spill is required to be reported according to Superfund Amendments and Reauthorization Act (SARA) Title III List of Lists, Consolidated List of Chemicals Subject to Reporting Under the Emergency Planning and Community Right to Know Act, US Environmental Protection Agency.

- To report a release or spill, call SDDANR at 605-773-3296 during regular office hours (8 a.m. to 5 p.m. Central Standard Time). To report the release after hours, on weekends or holidays, call South Dakota Emergency Management at 605-773-3231. Reporting the release to SDDANR does not meet any obligation for reporting to other state, local, or federal agencies. Therefore, you must also contact local authorities to determine the local reporting requirements for releases. A written report of the unauthorized release of any regulated substance, including quantity discharged, and the location of the discharge will be sent to SDDANR within 14 days of the discharge.

5.4: SWPPP CERTIFICATIONS

➢ **Certification of Compliance with Federal, State, and Local Regulations**

The Storm Water Pollution Prevention Plan (SWPPP) for this project reflects the requirements of all local municipal jurisdictions for storm water management and sediment and erosion control as established by ordinance, as well as other state and federal requirements for sediment and erosion control plans, permits, notices or documentation as appropriate.

➢ **South Dakota Department of Transportation**

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

_____

Authorized Signature (See the General Permit, Section 7.4 (1))

➢ **Prime Contractor**

This section is to be executed by the General Contractor after the award of the contract. This section may be executed any time there is a change in the Prime Contractor of the project.

I certify under penalty of law that this document and all attachments will be revised or maintained under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

_____

Authorized Signature

CONTACT INFORMATION

The following personnel are duly authorized representatives and have signatory authority for modifications made to the SWPPP:

➢ **Contractor Information**:

- Prime Contractor Name: _____
- Contractor Contact Name: _____
- Address: _____
- _____
- City: _____State: _____Zip: _____
- Office Phone: _____Field: _____
- Cell Phone: _____Fax: _____

➢ **Erosion Control Supervisor**

- Name: _____
- Address: _____
- _____
- City: _____State: _____Zip: _____
- Office Phone: _____Field: _____
- Cell Phone: _____Fax: _____

➢ **SDDOT Project Engineer**

- Name: _____
- Business Address: _____
- Job Office Location: _____
- City: _____State: _____Zip: _____
- Office Phone: _____Field: _____
- Cell Phone: _____Fax: _____

➢ **SDDANR Contact Spill Reporting**
- Business Hours Monday-Friday (605) 773-3296
- Nights and Weekends (605) 773-3231

➢ **SDDANR Contact for Hazardous Materials.**
- (605) 773-3153

➢ **National Response Center Hotline**
- (800) 424-8802.

➢ **SDDANR Stormwater Contact Information**
- SDDANR Stormwater (800) 737-8676
- Surface Water Quality Program (605) 773-3351

5.5: REQUIRED SWPPP MODIFICATIONS

➢ **5.5 (1): Conditions Requiring SWPPP Modification**

The SWPPP must be modified, including the site map(s), in response to any of the following conditions:

- When a new operator responsible for implementation of any part the SWPPP begins work on the site.
- When changes to the construction plans, sediment and erosion control measures, or any best management practices on site that are no longer accurately reflected in the SWPPP. This includes changes made in response to corrective actions triggered by inspections.
- To reflect areas on the site map where operational control has been transferred (including the date of the transfer) or has been covered under a new permit since initiating coverage under this general permit.
- If inspections by site staff, local officials, SDDANR, or U.S. EPA determine that SWPPP modifications are necessary for compliance with the Stormwater Permit.
- To reflect any revisions to applicable federal, state, or local requirements that affect the control measures implemented at the site.
- If approved by the Secretary, to reflect any changes in chemical water treatment systems or controls, including the use of a different water treatment chemical, age rates, different areas, or methods of application.

➢ **5.5 (2): Deadlines for SWPPP Modification**

Any required revisions to the SWPPP must be completed within 7 calendar days following any of the items listed above.

➢ **5.5 (3): Documentation of Modifications to the Plan**

All SWPPP modification records are required to be maintained showing the dates of when the modification occurred. The records must include the name of the person authorizing each change and a brief summary of all changes.

➢ **5.5 (4): Certification Requirements**

All modifications made to the SWPPP must be signed and certified as required in Section 7.4.

➢ **5.5 (5): Required Notice to Other Operators**

If there are multiple operators at the site, the Contractor's Erosion Control Supervisor must notify each operator that may be impacted by the change to the SWPPP within 24 hours.

When modifications as described above occur, the SWPPP will be modified to provide appropriate protection to disturbed areas, all storm water structures, and adjacent waters. The SDDOT Project Engineer will modify the SWPPP using the DOT 298 form and drawings on the plan will be modified to reflect the needed changes. Copies of the DOT 298 forms and the SWPPP will be retained on site in a designated place for review throughout the course of the project. A copy of the DOT 298 form will be given to the Contractor Erosion Control Supervisor and a copy will be emailed to the SDDOT Environmental Section in accordance with the DOT 298 Form.

GENERAL PERMANENT SIGNING

New sign installations will be staked in the field by the Contractor and checked by the Engineer. The Contractor will give the Engineer a minimum of one week to check staked locations prior to signpost installation. Lateral offset of signs will be as shown in the plans or as directed by the Engineer.

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

When signs are mounted in an assembly, they will be 1-2 inches apart vertically and horizontally.

The height of the post must not exceed the minimum height needed by more than 0.5 feet. Any portion that extends above the sign will be cut off. No separate payment will be made for cutting the post or for that length cut off.

Aluminum U-Channel stiffeners will be used on all signs 36 inches or greater in width and will conform to ASTM B221 Alloy 6063-T6 or 6061-T6. The U-Channel will be 2 inches in width and free of holes. The U-Channel stiffeners will 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 1/4-inch diameter drive rivets.

The Contractor will 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 will extend through each post.

Prior to ordering signs, the Contractor will verify dimensions, background, border, and legend of the signs.

Prior to use, the Contractor will provide documentation for the sign support devices showing they meet the applicable NCHRP 350 or MASH requirements.

REMOVE TRAFFIC SIGN

Existing signs that are shown as being removed in the Permanent Signing Table will become the property of the Contractor. Existing signposts and bases will be removed in their entirety. All existing signs, posts, and/or hardware removed will not be reused. Holes remaining from the removal of wood posts will be backfilled and compacted with material placed in layers not to exceed 6 inches in depth.

All costs associated with the removal of existing signs, posts, hardware, and backfilled holes will be incidental to the contract unit price per each for “Remove Traffic Sign”. Quantities will be per assembly at the contract unit price per each.

REMOVE SIGN FOR RESET AND RESET SIGN

Signs that are scheduled for reset will be dismantled and reassembled to the extent needed by the Contractor to properly reset the sign. Signs will be handled with care so that the existing signs, posts, and bases are not damaged during the relocation process. The Contractor will replace and pay for any reset signs damaged in their care. The Contractor will remove and dispose of any existing posts for all reset signs that require use of new posts as shown in the Table of Permanent Signing.

All costs for removing, dismantling, and disposing of any existing posts will be incidental to the contract unit price per each for “Remove Sign for Reset”. All costs for resetting the existing signs will be incidental to the contract unit price per each for “Reset Sign”. All quantities for Remove Sign for Reset and Reset Sign will be per assembly at the contract unit price per each.

NEW PERMANENT SIGNING

All signs will be manufactured in accordance with the sheeting manufacturer’s recommendations utilizing a matched component system, including inks, electronic cuttable films, and protective overlay films.

All Flat Aluminum Signs, Nonremovable Copy High Intensity will have sheeting in conformance with the requirements of ASTM D4956 Type IV. All Flat Aluminum Signs, Nonremovable Copy Super/Very High Intensity will have sheeting in conformance with the requirements of ASTM D4956 Type XI.

All costs associated with furnishing and installing the new permanent signs, and with furnishing and installing stiffeners and hardware will be incidental to the contract unit price per square foot for “Flat Aluminum Sign, Nonremovable Copy High Intensity” or “Flat Aluminum Sign, Nonremovable Copy Super/Very High Intensity”.

DIGITALLY PRINTED SIGNS

Digitally printed signs will be allowed on this project. If the Contractor elects to provide digitally printed signs, such signs will adhere to the following specifications.

PROTECTIVE OVERLAY FILM

Permanent traffic signs printed with digital ink systems will be fabricated with a full sign protective overlay film designed to provide a smooth surface needed for retroreflectivity, and to protect the sign from fading and UV degradation. The overlaminate will comply with the retroreflective sheeting manufacturer’s recommendations to ensure proper adhesion and

transparency and will also meet the reflective film durability as identified in Table 1.

Table 1: Retroreflective Film Minimum Durability Requirements

ASTM D4956 Type	Full Sign Replacement Term (years)	Sheeting Replacement Term (years)
I	0	7
III	7	10
IV	7	10
VIII	7	10
IX	7	12
XI	7	12

FABRICATION

Retroreflective sheeting will be applied to a properly cleaned and prepared aluminum sign blank in accordance with the retroreflective sheeting manufacturer’s recommendations. Sign legend will be applied using digital print technologies and systems in accordance with the retroreflective sheeting manufacturer’s recommendations and the requirements of these plans.

Finished signs will be free of ragged edges and must be supplied clean and free of scratches, grease, oil, lubricants or other contaminants. Minor blemishes (dirt speck, dust, etc.) may settle on the fresh ink surface or become entrapped between the sheeting surface and transparent overlay film due to static charge within the sign shop environment. Any blemish must be minor and not interfere with the communication of the sign message to the

motorist. The blemish must not be visible to the naked eye when viewed from 30 feet or greater.

After application of the retroreflective sheeting, sign blanks will be stacked and packaged face to face, back to back, and protected in accordance with the sheeting manufacturer’s recommendations. Finished signs will be securely packaged to prevent damage during transit or storage according to the sheeting manufacturer’s recommendations.

TRAFFIC SIGN PERFORMANCE WARRANTY PROVISIONS

Based on the ASTM Type of sheeting specified, traffic control signs will be warranted for the duration shown in Table 1. Full product terms and conditions are as established by each sheeting manufacturer and may contain certain limitations based on sheeting and ink colors, and geographic exposure of the sign. A copy of the warranty document with complete details of terms and conditions will be supplied if requested by the Engineer.

CERTIFIED DIGITAL SIGN FABRICATOR

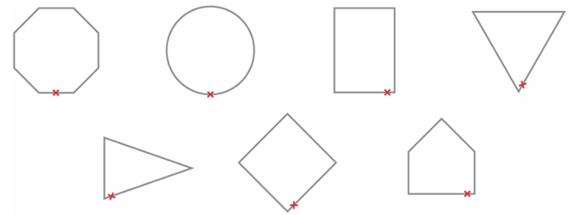
Sign fabricators using digital imaging methods to produce regulated traffic signs must be certified by the reflective sheeting manufacturer whose materials are used to produce the delivered signs.

DATE TAGGING SIGNS WITH PERTINENT INFORMATION

All digitally printed signs are required to be date-tagged with the following 2 components:

1. Date tags on the back of signs
   Tags will have the following information and be fabricated with material and printing system that are as durable as the warranted sign.
   - Name of Sign Fabricator
   - Date the sign was fabricated (month and year)
   - Process that was used for sign fabrication (digitally printed)
   - Supplier of sheeting that was used for fabricating the sign.
2. Border date

The month and year (mm/yyyy) of sign fabrication will be printed in the border of the sign in 3/8” sans serif font. Border date will be printed with the same warranted printed system as the sign face. The date should be printed in the locations indicated below.



SQUARE TUBE ANCHOR SLEEVE

The Contractor will furnish and install new 2.5” x 2.5” x 18”, 12 Gauge square tube anchor sleeve or equivalent components as approved by the Engineer for 2.0” x 2.0” perforated tube posts. A 2.25” x 2.25” x 4’, 12 Gauge perforated tube post will be used as the anchor post for installation with the square tube anchor sleeve.

SQUARE TUBE POST SLEEVE

All 2.5” x 2.5”, 10 Gauge perforated tube post will be sleeved with a 2-3/16” x 2-3/16” x 4’, 10 Gauge perforated tube post.

WINGED SLIP BASE ANCHOR

The Contractor will furnish and install new winged slip base anchors for 2.5” x 2.5” perforated tube posts as required in the Permanent Signing Table. Winged slip base anchors will be installed using the direct drive method. Winged slip base anchors will consist of a slip base (upper), a 48-inch long winged anchor (lower), and a hardware kit.

MILEAGE REFERENCE MARKERS

Mileage Reference Markers (MRMs) are not to be disturbed. If an MRM is attached to a sign listed for replacement it will be removed and reattached to the new sign in the same location. Payment for this work will be incidental to the various signing contract items.

SEQUENCE OF OPERATIONS

The Contractor will submit a sequence of operations for approval two weeks prior to the preconstruction meeting. If changes to the sequence of operations are proposed during the project, these must be submitted for review a minimum of one week prior to potential implementation. Approval for changes to the sequence of operations will only be allowed when the proposed changes meet with the Department's intent for traffic control and sequencing of the work.

COORDINATION BETWEEN CONTRACTORS

A separate contract for Project PH 0020(242) – PCN 09FL will be awarded to another Contractor for Centerline Rumble Strips on US81 adjacent to this project (PCN 06P9). The work description for PCN 09FL will begin at MRM 107.73 + 0.000 and end at MRM 116.64 + 0.000.

GENERAL TRAFFIC CONTROL

Existing guide, route, informational logo, regulatory, and warning signs will be temporarily reset and maintained during construction. Removing, relocating, covering, salvaging, and resetting of existing traffic control devices, including delineation, will be the responsibility of the Contractor. Cost for this work will be incidental to the contract unit prices for the various items unless otherwise specified in the plans. Any delineators and signs damaged or lost will be replaced by the Contractor at no cost to the State.

All temporary traffic control sign locations will be set in the field by the Contractor and verified by the Engineer prior to installation.

All construction operations will be conducted in the general direction of traffic movement.

If there is a discrepancy between the traffic control plans, standard plates, and the MUTCD, whichever is more stringent will be used, as determined by the Engineer.

Unless otherwise stated in these plans, work will not be allowed during hours of darkness.

Fixed location signing placed more than 4 calendar days prior to the start of construction will be covered or laid down until the time of construction. The covers must be approved by the Engineer prior to installation. The cost of materials, labor, and equipment necessary to complete this work will be incidental to other contract items. No separate payment will be made.

All fixed location signs, sign posts, and breakaway bases will be removed within 7 calendar days following pavement marking.

All haul trucks will be equipped with an additional flashing amber light that is visible from the backside of the haul truck. The costs for the flashing amber lights will be incidental to the various related contract items.

At no time will a vertical drop-off of greater than 3 inches be left overnight adjacent to the traveled way. The Contractor will utilize embankment material to ensure a 3-inch vertical drop-off is not exceeded. The slope of the embankment material will not be steeper than a 4:1 within 30 feet of the traveled way.

Traffic will be maintained on the driving lanes. Use of the shoulder as a driving lane will not be permitted. Any damage to the shoulder due to rerouted traffic or Contractor's equipment will be repaired at no expense to the Department.

The Contractor will furnish, install, maintain, and remove TRUCK CROSSING (W8-6) signs daily. The TRUCK CROSSING signs will be displayed always when haul vehicles are hauling material. When hauling conditions no longer exist, the signs will be covered or removed from view. The exact number and location will be determined during construction. Payment for additional signs will be based on the contract unit price per square foot for "Traffic Control Signs".

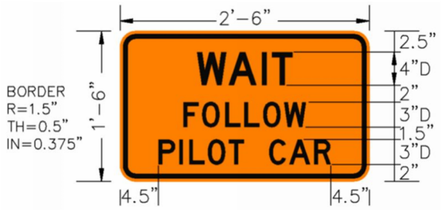
GROOVED PAVEMENT (W8-15) signs with MOTORCYCLE (W8-15P) plaques are required in advance of areas that have been cold milled and are not resurfaced the same day. The GROOVED PAVEMENT sign assemblies will be installed a minimum of 1000 feet in advance of cold milled sections and remain in place until the sections have been resurfaced.

A mobile work operation will be allowed provided the rumble strip or rumble stripe grooving, flush sealing, and pavement marking can be completed satisfactorily by a continuously moving work operation. A mobile work operation will require approval by the Engineer.

FLAGGING

Operations will be conducted so that the traveling public will not have to wait longer than 15 minutes at the flagger station.

Additional flagger warning signs and flagger hours have been included in the Estimate of Quantities for use on intersecting roads. These flaggers will be used as directed by the Engineer and will be used primarily during daytime hours. Also included in the Estimate of Quantities are WAIT FOLLOW PILOT CAR signs for use on low volume intersecting roads as determined by the Engineer. WAIT FOLLOW PILOT CAR signs will not block the view of the stop sign.



It is required that the flaggers and pilot car operators be able to communicate with one another. If an emergency vehicle needs to pass through the project, the Contractor will be required to expedite traffic movement. All costs associated with this will be incidental to the contract unit price per hour for "Flagging".

WORK ZONE SPEED REDUCTION

The Department is required to obtain a speed reduction resolution prior to the installation of any SPEED LIMIT (R2-1) signs. To provide adequate time for the resolution to be enacted, the Contractor will inform the Engineer a minimum of 3 weeks prior to the scheduled installation of any work zone speed reduction signs on the project. The information provided by the Contractor will include the anticipated date of sign installation, the newly reduced speed limit, the location of the work zone, and the anticipated completion date of work requiring the speed reduction.

A work zone speed reduction will only be allowed for traffic on the intermediate reclaimed gravel surface. SPEED LIMIT (R2-1) signs will be placed prior to the reclaimed gravel surface and after all paved crossroads within the reclaimed gravel surface section. 8 SPEED LIMIT (R2-1) signs have been provided in the quantities to accomplish this.

TEMPORARY PAVEMENT MARKING

The total length of no passing zone on this project is estimated to be 6.3 miles.

It is estimated that 23 DO NOT PASS (R4-1) and 22 PASS WITH CARE (R4-2) signs will be required to mark the no passing zones, should the Contractor elect to use these signs.

Quantities of Temporary Pavement Markings consist of:

One pass on top of the milled surface
One pass for Full Depth Reclamation
One pass on the first lift of asphalt concrete
One pass on the second lift of asphalt concrete
One pass on top of the final lift of asphalt concrete

If the Engineer determines that an additional pass prior to the flush seal is not required, this application of the temporary pavement marking will be eliminated. If the flush seal is eliminated for the project, the application of the temporary pavement marking on top of the flush seal as well as the additional pass prior to 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.

In the absence of a signed lane closure or pilot car operation, FLAGGER (W20-7) symbol signs and flaggers, or a shadow vehicle with rotating yellow lights or strobe lights will be positioned on the shoulder in advance of workers for both directions of traffic during the installation and removal of the temporary flexible vertical markers (tabs). The traffic control device used will be moved intermittently to provide proper warning of the work operation. A ROAD WORK AHEAD (W20-1) sign, a WORKER (W21-1) symbol sign or a BE PREPARED TO STOP (W3-4) sign will be mounted on the rear of the shadow vehicle. The method of traffic control used by the Contractor for this work must be approved by the Engineer.

Prior to nightfall, tabs will be required to mark centerline on segments of roadway where existing centerline markings have been removed and new markings have not been installed.

INCIDENTS

An incident is an emergency road user occurrence, a natural disaster, or other unplanned event that affects or impedes the normal flow of traffic such as a crash, hazardous materials spill, or other event.

The Contractor will set up a meeting prior to start of work to plan and coordinate responses to an incident. The Contractor will invite the Department of Transportation, the South Dakota Highway Patrol, the Lake County Sheriff and local emergency response entities to the meeting.

The Contractor will assist to maintain traffic as required by these plan notes and as agreed to at that meeting.

Emergency vehicle access through the project will be considered and discussed at the meeting.

The Contractor may be required to modify messages on portable changeable message signs or relocate portable changeable message signs, and to provide flaggers to direct or detour traffic. The Contractor should be prepared to relocate advance warning signs if determined to be necessary for a major traffic incident lasting more than two hours. Fixed location ground mounted signs may be covered and additional portable signs provided.

No additional payment will be made for the modification of portable changeable message sign messages or the relocation of portable changeable message signs. Cost for the relocation of an advance warning sign due to an incident will be 50% of the designated sign rate. Flaggers will be paid for at the contract unit price per hour for "Flagging".

The Contractor will have replacement hardware available so that in the event the crash attenuator is hit and made unusable, the crash attenuator can be made functional within 24 hours. The cost of replacement will be incidental to the contract unit price per each for Temporary Concrete Barrier Module Set or Repair Kit. No payment will be made for the Temporary Concrete Barrier Module Set or Repair Kit if no repairs are necessary. Upon completion of the project, crash attenuators will remain the property of the Contractor.

PAVEMENT MARKING PAINT

The Contractor will advise the Engineer a minimum of 3 weeks prior to the application of the permanent pavement marking to allow the State to check and mark the location of no passing zones.

The application of permanent pavement marking will begin no sooner than 7 calendar days following completion of the fog or flush seal. Application of permanent pavement marking will be completed within 14 calendar days following completion of the final surfacing.

HIGH BUILD WATERBORNE PAVEMENT MARKING PAINT

All materials will be applied as per manufacturer's recommendations. High build waterborne pavement marking paint will conform to the supplemental specifications for Section 980.1 B.

Reflective media will consist of glass beads. Reflective media will require a Certificate of Compliance for Certification for each source and lot. Acceptance sampling will not be required.

RATES OF MATERIALS FOR HIGH BUILD WATERBORNE PAVEMENT MARKING PAINT

Solid 4" line = 22.5 Gals/Mile
Dashed 4" line = 6.2 Gal/Mile
Glass Beads = 8 Lbs/Gal.

All cost for materials, labor and equipment necessary to furnish and install the pavement markings will be incidental to the contract unit price for the respective High Build Waterborne Pavement Marking Paint items.

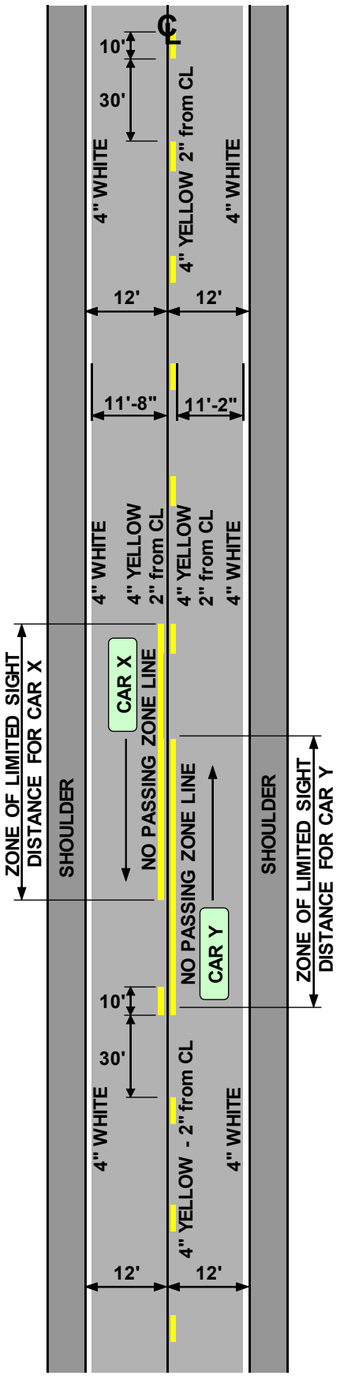
RETROREFLECTIVITY FOR PAVEMENT MARKING PAINT

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 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 will be 275 $mc/m^2/lux$ for white and 170 $mc/m^2/lux$ for yellow.

TWO LANE ROADWAY



PAVEMENT MARKING

Typical pavement marking as shown on this sheet will be applied throughout the entire length of two lane roadway.

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

Application rates will be as follows:

Two Lane Roadway (Rates for one line)
Dashed Yellow Centerline Rate = 6.2 Gals./Pass-Mile
Solid Yellow Centerline Rate = 22.5 Gals./Pass-Mile
Solid White Edgeline Rate = 22.5 Gals./Pass-Mile

4" Yellow Skip Centerline (when not adjacent to a 4" Yellow No Passing Zone) will be placed consistently to the south or east side of centerline.

ESTIMATED QUANTITIES (BASED ON ONE APPLICATION)	
HIGH BUILD	**QUANTITY**
WHITE	**573 GALLONS**
YELLOW	**278 GALLONS**

Included in the above quantities are:						
Additional White (1 Application)				Additional Yellow (1 Application)		
Description			Gallons	Description		Gallons
4" Lines	1812'		10	Transitions	6 Ea 6480'	36
8" Lines	-		-	4" Skip Lines	-	-
12" Gore Lines	-		-	8" Lines	-	-
Crosswalks	-	-	-	12" Lines	-	-
24" Stop Lines	-		-	24" Hatches	650'	33
24" Hatches	-		-	Solid Areas	-	-
Solid Areas	-		-	Additional Yellow:		69
Arrows						
Left Arrows	8 Ea		5			
Right Arrows	7 Ea		4			
Straight Arrows	-		-			
Combo Arrows	-		-			
Lane Drop Arrows	-		-			
Messages						
STOP	-		-			
STOP AHEAD	-		-			
R X R w/ Stop Lines	-		-			
SCHOOL X-ING	-		-			
Additional White:			19			

Additional Quantities

Rates of Coverage:	SqFt/Gal
4", 8" & 12" Lines -	60
24" Lines & Hatches -	40
Arrows, Messages and Solid Areas -	25

All pavement marking dimensions are based on 12' driving lanes.

ITEMIZED LIST FOR TRAFFIC CONTROL SIGNS

		CONVENTIONAL ROAD			
SIGN CODE	**SIGN DESCRIPTION**	**NUMBER**	**SIGN SIZE**	**SQFT PER SIGN**	**SQFT**
R1-1	STOP	4	30"	5.2	20.8
R2-1	SPEED LIMIT 45	8	24" x 30"	5.0	40.0
W1-4	REVERSE CURVE (L or R)	1	48" x 48"	16.0	16.0
W3-1	STOP AHEAD (symbol)	2	48" x 48"	16.0	32.0
W8-1	BUMP	3	48" x 48"	16.0	48.0
W8-6	TRUCK CROSSING	2	48" x 48"	16.0	32.0
W8-7	LOOSE GRAVEL	2	48" x 48"	16.0	32.0
W8-11	UNEVEN LANES	6	48" x 48"	16.0	96.0
W8-15	GROOVED PAVEMENT	2	48" x 48"	16.0	32.0
W8-15P	MOTORCYCLE (plaque)	2	24" x 18"	3.0	6.0
W13-1P	ADVISORY SPEED (plaque)	2	30" x 30"	6.3	12.6
W20-1	ROAD WORK AHEAD	5	48" x 48"	16.0	80.0
W20-4	ONE LANE ROAD AHEAD	6	48" x 48"	16.0	96.0
W20-7	FLAGGER (symbol)	6	48" x 48"	16.0	96.0
W21-2	FRESH OIL	2	48" x 48"	16.0	32.0
SPECIAL	WAIT FOLLOW PILOT CAR	2	30" x 18"	3.8	7.6
G20-1	ROAD WORK NEXT 9 MILES	1	36" x 18"	4.5	4.5
G20-1	ROAD WORK NEXT 8 MILES	1	36" x 18"	4.5	4.5
G20-1	ROAD WORK NEXT 7 MILES	1	36" x 18"	4.5	4.5
G20-1	ROAD WORK NEXT 12 MILES	2	36" x 18"	4.5	9.0
G20-1	ROAD WORK NEXT 5 MILES	1	36" x 18"	4.5	4.5
G20-1	ROAD WORK NEXT 4 MILES	1	36" x 18"	4.5	4.5
G20-1	ROAD WORK NEXT 3 MILES	1	36" x 18"	4.5	4.5
G20-2	END ROAD WORK	7	36" x 18"	4.5	31.5
		CONVENTIONAL ROAD TRAFFIC CONTROL SIGNS SQFT			**746.5**

NH 0081(112)95, PCN 06P9, Sign Installation US81

Station	Side of Road	Description	Sign Code	Width (Inches)	Height (Inches)	Flat Aluminum sign, Nonremovable Copy High Intensity (SQFT)	Flat Aluminum Sign, Nonremovable Copy Super/Very High Intensity (SQFT)	2.0"x2.0" Perforated Tube Post 12 ga. (FT)	2.5"x2.5" Perforated Tube Post 10 Ga. (FT)	(N.A.B.I.) Square Tube Anchor Sleeve (Each)	Remove Traffic Sign (Each)	Remove Sign for Reset	Reset Sign	Direction Sign Faces	Current Type of Post	Remarks
0+24	R	Stop	R1-1	30	30							1	1	West	Perforated Tube	Remove and Reset Existing Sign on Existing Post
0+35	R	Lake County	Special	36	24	6.0		10		1	1			North	Perforated Tube	Remove and Replace Existing Sign with New Sign on New Post
0+79	R	Historic Marker	Special									1	1	North	Steel Round Post	Remove and Reset Existing Sign on Existing Post
1+78	R	South	M3-3	24	12	2.0		11		1	1			North	Perforated Tube	Remove and Replace Existing Signs with New Signs on New Post
		US81	M1-4	24	24	4.0										
4+42	L	No Passing Zone	W14-3	48	36							1	1	South	Perforated Tube	Remove and Reset Existing Sign on Existing Post
10+73	L	Historic Marker, Advance (1000 Feet)	Special									1	1	South	Perforated Tube	Remove and Reset Existing Sign on Existing Post
12+77	R	No Passing Zone	W14-3	48	36							1	1	North	Perforated Tube	Remove and Reset Existing Sign on Existing Post
36+23	L	No Passing Zone	W14-3	48	36		5.6	10		1	1			South	Perforated Tube	Remove and Replace Existing Sign with New Sign on New Post
45+54	R	No Passing Zone	W14-3	48	36							1	1	North	Perforated Tube	Reset Existing Sign on Existing Post
46+95	R	Madison 12	Special	90	24	15.0		21		2	1			North	Perforated Tube	Remove and Replace Existing Sign with New Sign on New Post
46+70	L	Jct 14/ Arlington/ Watertown	Special	102	48	34.0			24	2	1			South	Perforated Tube	Remove and Replace Existing Signs with New Signs on New Posts
52+86	L	Stop	R1-1	30	30		5.2	10		1	1			East	Perforated Tube	Remove and Replace Existing Sign with New Sign on New Post
53+22	R	Stop	R1-1	30	30		5.2	10		1	1			West	Perforated Tube	Remove and Replace Existing Sign with New Sign on New Post
67+58	L	No Passing Zone	W14-3	48	36		5.6	10		1	1			South	Perforated Tube	Remove and Replace Existing Sign with New Sign on New Post
105+61	L	Stop	R1-1	30	30		5.2	10		1	1			East	Perforated Tube	Remove and Replace Existing Sign with New Sign on New Post
106+01	R	Stop	R1-1	30	30		5.2	10		1	1			West	Perforated Tube	Remove and Replace Existing Sign with New Sign on New Post
137+74	R	No Passing Zone	W14-3	48	36							1	1	North	Perforated Tube	Remove and Reset Existing Sign on Existing Post
152+94	R	(Left Arrow) Nunda 6	Special	90	24	15.0		21		2	1			North	Perforated Tube	Remove and Replace Existing Signs with New Signs on New Posts
157+53	L	North	M3-1	24	12	2.0		11		1	1			South	Perforated Tube	Remove and Replace Existing Signs with New Signs on New Posts
		US81	M1-4	24	24	4.0										
158+51	L	Stop	R1-1	30	30		5.2	11		1	1			East	Perforated Tube	Remove and Replace Existing Sign with New Sign on New Post
159+01	R	Stop	R1-1	30	30		5.2	11		1	1			West	Perforated Tube	Remove and Replace Existing Sign with New Sign on New Post
159+58	L	Historical Marker	Special											South	Steel Round Post	Remove and Reset Existing Sign on Existing Post
164+03	L	Nunda 6 (Right Arrow)	Special	96	24	16.0		21		2	1			South	Perforated Tube	Remove and Replace Existing Sign with New Sign on New Posts
173+81	L	No Passing Zone	W14-3	48	36		5.6	10		1	1			South	Perforated Tube	Remove and Replace Existing Sign with New Sign on New Post
211+35	L	Stop	R1-1	30	30			11		1		1	1	East	Perforated Tube	Remove and Reset Existing Sign on New Post
224+91	R	No Passing Zone	W14-3	48	36		5.6	10		1	1			North	Perforated Tube	Remove and Replace Existing Sign with New Sign on New Post
238+15	R	No Passing Zone	W14-3	48	36			10		1		1	1	North	Perforated Tube	Remove and Reset Existing Sign on New Post
241+73	L	No Passing Zone	W14-3	48	36		5.6	10		1	1			South	Perforated Tube	Remove and Replace Existing Sign with New Sign on New Post
254+93	L	No Passing Zone	W14-3	48	36		5.6	10		1	1			South	Perforated Tube	Remove and Replace Existing Sign with New Sign on New Post
257+63	R	Ramona 4 (Right Arrow)	Special	102	24	16.0		21		2	1			North	Perforated Tube	Remove and Replace Existing Sign with New Sign on New Posts
264+00	L	Stop	R1-1	30	30							1	1	East	Perforated Tube	Remove and Reset Existing Sign on Existing Post
264+57	R	Stop	R1-1	30	30		5.2	11		1	1			West	Perforated Tube	Remove and Replace Existing Sign with New Sign on New Post
265+58	R	South	M3-3	24	12	2.0		11		1	1			North	Perforated Tube	Remove and Replace Existing Signs with New Signs on New Post
		US81	M1-4	24	24	4.0										

NH 0081(112)95, PCN 06P9, Sign Installation US81

Station	Side of Road	Description	Sign Code	Width (Inches)	Height (Inches)	Flat Aluminum sign, Nonremovable Copy High Intensity (SQFT)	Flat Aluminum Sign, Nonremovable Copy Super/Very High Intensity (SQFT)	2.0"x2.0" Perforated Tube Post 12 ga. (FT)	2.5"x2.5" Perforated Tube Post 10 Ga. (FT)	(N.A.B.I.) Square Tube Anchor Sleeve (Each)	Remove Traffic Sign (Each)	Remove Sign for Reset	Reset Sign	Direction Sign Faces	Current Type of Post	Remarks
269+86	L	(Left Arrow) Ramona 4	Special	102	24	16.0		21		2	1			South	Perforated Tube	Remove and Replace Existing Sign with New Sign on New Posts
283+39	L	No Passing Zone	W14-3	48	36		5.6	10		1				South	Perforated Tube	Remove and Replace New Sign on New Post
317+00	L	Stop	R1-1	30	30		5.2	11		1	1			East	Perforated Tube	Remove and Replace Existing Sign with New Sign on New Post
317+48	R	Stop	R1-1	30	30		5.2	11		1	1			West	Perforated Tube	Remove and Replace Existing Sign with New Sign on New Post
335+28	L	No Passing Zone	W14-3	48	36							1	1	South	Perforated Tube	Remove and Reset Existing Sign on Existing Post
357+10	R	No Passing Zone	W14-3	48	36							1	1	North	Perforated Tube	Remove and Reset Existing Sign on Existing Post
369+90	L	Stop	R1-1	30	30							1	1	East	Perforated Tube	Remove and Reset Existing Sign on Existing Post
370+35	R	Stop	R1-1	30	30		5.2	11		1		1	1	West	Perforated Tube	Remove and Replace Existing Sign with New Sign on New Post
375+67	R	No Passing Zone	W14-3	48	36		5.6	10		1	1			North	Perforated Tube	Remove and Replace Existing Sign with New Sign on New Post
376+82	L	No Passing Zone	W14-3	48	36		5.6	10		1	1			South	Perforated Tube	Remove and Replace Existing Sign with New Sign on New Post
396+12	L	No Passing Zone	W14-3	48	36		5.6	10		1	1			South	Perforated Tube	Remove and Replace Existing Sign with New Sign on New Post
417+21	R	(Left Arrow) Rutland 8	Special	102	24	17.0		21		2	1			North	Perforated Tube	Remove and Replace Existing Sign with New Sign on New Posts
421+37	L	North	M3-1	24	12	2.0		11		1	1			South	Perforated Tube	Remove and Replace Existing Signs with New Signs on New Post
		US81	M1-4	24	24	4.0										
422+60	L	Stop	R1-1	30	30		5.2	11		1	1			East	Perforated Tube	Remove and Replace Existing Sign with New Sign on New Post
423+8	R	Stop	R1-1	30	30		5.2	11		1	1			West	Perforated Tube	Remove and Replace Existing Sign with New Sign on New Post
429+00	R	Rutland 8 (Right Arrow)	Special	102	24	17.0		21		2	1			South	Perforated Tube	Remove and Replace Existing Sign with New Sign on New Posts
437+52	L	No Passing Zone	W14-3	48	36		5.6	10		1	1			South	Perforated Tube	Remove and Replace Existing Sign with New Sign on New Post
475+67	L	Stop	R1-1	30	30									East	Perforated Tube	Remove and Reset Existing Sign on New Post
476+15	R	Stop	R1-1	30	30		5.2	11		1	1			West	Perforated Tube	Remove and Replace Existing Sign with New Sign on New Post
476+84	R	South	M3-3	24	12	2.0		11		1	1			North	Perforated Tube	Remove and Replace Existing Signs with New Signs on New Post
		US81	M1-4	24	24	4.0										
528+54	L	Stop	R1-1	30	30		5.2	11		1	1			East	Perforated Tube	Remove and Replace Existing Sign with New Sign on New Post
528+95	R	Stop	R1-1	30	30		5.2	11		1	1			West	Perforated Tube	Remove and Replace Existing Sign with New Sign on New Post
557+57	R	No Passing Zone	W14-3	48	36		5.6	10		1	1			North	Perforated Tube	Remove and Replace Existing Sign with New Sign on New Post
578+95	L	No Passing Zone	W14-3	48	36			10		1		1	1	South	Perforated Tube	Remove and Reset Existing Sign on New Post
581+35	L	Stop	R1-1	30	30		5.2	11		1	1			East	Perforated Tube	Remove and Replace Existing Sign with New Sign on New Post
581+86	R	Stop	R1-1	30	30		5.2	11		1	1			West	Perforated Tube	Remove and Replace Existing Sign with New Sign on New Post
618+64	R	No Passing Zone	W14-3	48	36		5.6	10		1	1			North	Perforated Tube	Remove and Replace Existing Sign with New Sign on New Post
634+12	L	Stop	R1-1	30	30		5.2	11		1	1			East	Perforated Tube	Remove and Replace Existing Sign with New Sign on New Post
634+60	R	Stop	R1-1	30	30		5.2	11		1	1			West	Perforated Tube	Remove and Replace Existing Sign with New Sign on New Post
640+96	L	No Passing Zone	W14-3	48	36		5.6	10		1	1			South	Perforated Tube	Remove and Replace Existing Sign with New Sign on New Post
644+47	L	511 Sign	Special	36	36						1			South	Perforated Tube	Remove Do Not Replace
646+79	R	Madison Population	Special	72	24	12.0		21		2	1			North	Perforated Tube	Remove and Replace Existing Sign with New Sign on New Post
					TOTAL	194.0	177.2	609	24	60	47	15	15			

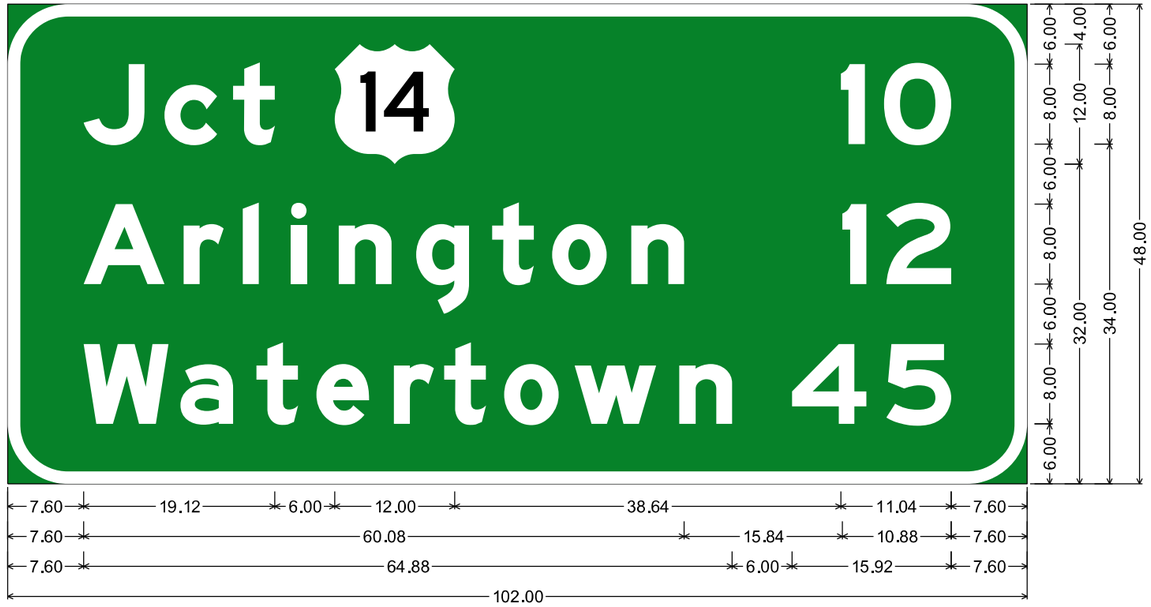
NH 0081(112)95, PCN 06P9, Sign Summary US81

Sign Code	Description	Width (Inches)	Height (Inches)	Sq. Ft.	No.	Flat Aluminum Sign, Nonremovable Copy High Intensity (SQFT)	Flat Aluminum Sign, Nonremovable Copy Super or Very High Intensity (SQFT)	Text / Background
M1-4	US81	24	24	4.0	5	20.0		Black on White
M3-1	North	24	12	2.0	2	4.0		Black on White
M3-3	South	24	12	2.0	3	6.0		Black on White
R1-1	Stop	30	30	5.2	19		98.8	White on Red
W14-3	No Passing Zone	48	36	5.6	14		78.4	Black on Yellow
Special	Lake County	36	24	6.0	1	6.0		White on Green
Special	Madison 12	90	24	15.0	1	15.0		White on Green
Special	Jct 14/ Arlington/ Watertown	102	48	34.0	1	34.0		White on Green
Special	Nunda 6 NB	90	24	15.0	1	15.0		White on Green
Special	Nunda 6 SB	96	24	16.0	1	16.0		White on Green
Special	Ramona 4 NB	96	24	16.0	1	16.0		White on Green
Special	Ramona 4 SB	96	24	16.0	1	16.0		White on Green
Special	Rutland 8 SB	102	24	17.0	1	17.0		White on Green
Special	Rutland 8 NB	102	24	17.0	1	17.0		White on Green
Special	Madison Population	72	24	12.0	1	12.0		White on Green
						194.0	**177.2**	

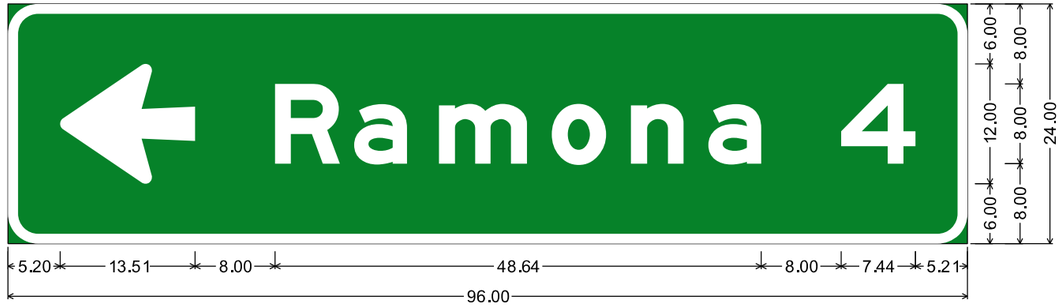
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0081(112)95	38	167

Plotting Date: 05/10/2024

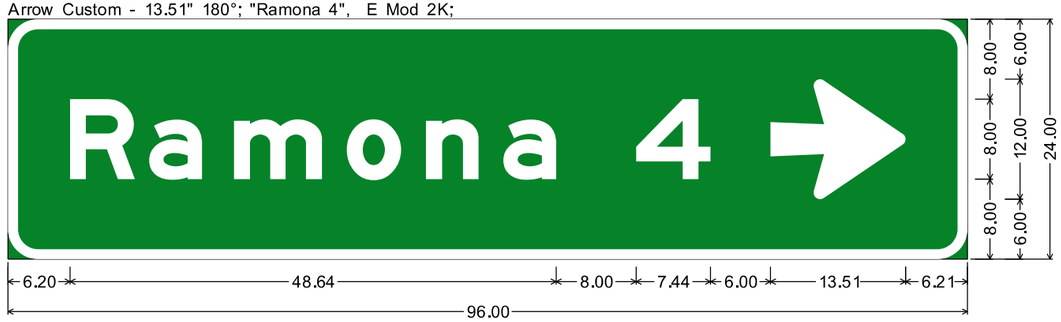
SPECIAL SIGN DETAIL



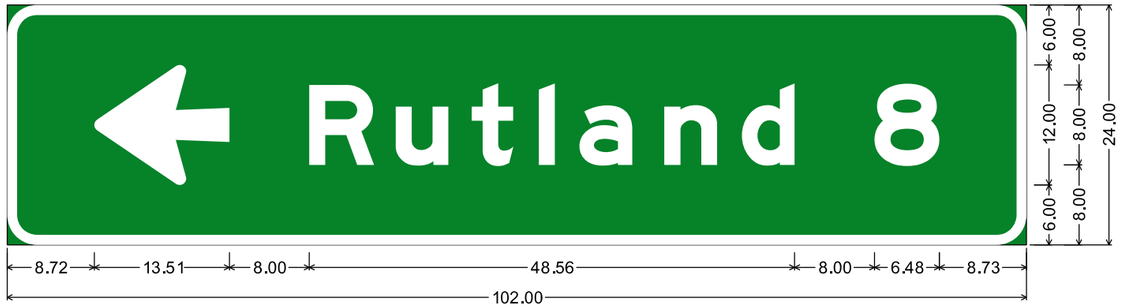
6.00" Radius, 1.25" Border, White on Green;
"Jct", E Mod 2K; "10", E Mod 2K; "Arlington", E Mod 2K; "12", E Mod 2K; "Watertown", E Mod 2K; "45", E Mod 2K;



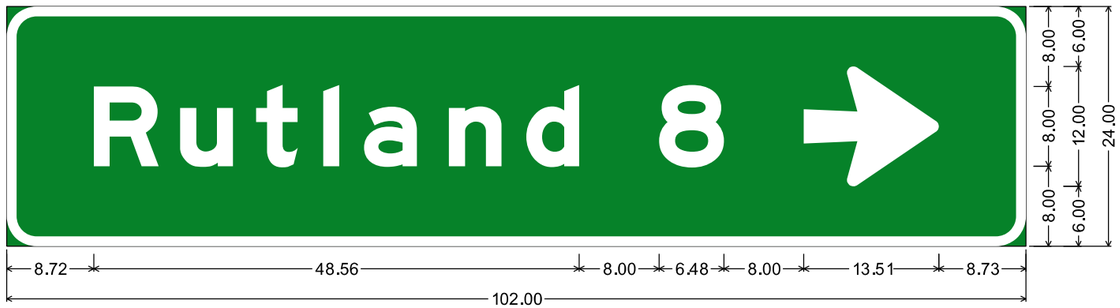
3.00" Radius, 1.00" Border, White on Green;
Arrow Custom - 13.51" 180°; "Ramona 4", E Mod 2K;



3.00" Radius, 1.00" Border, White on Green;
"Ramona 4", E Mod 2K; Arrow Custom - 13.51" 0°;



3.00" Radius, 1.00" Border, White on Green;
Arrow Custom - 13.51" 180°; "Rutland 8", E Mod 2K;

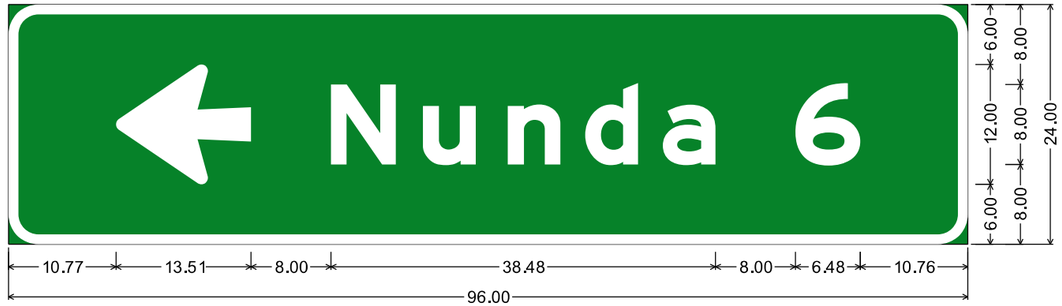


3.00" Radius, 1.00" Border, White on Green;
"Rutland 8", E Mod 2K; Arrow Custom - 13.51" 0°;

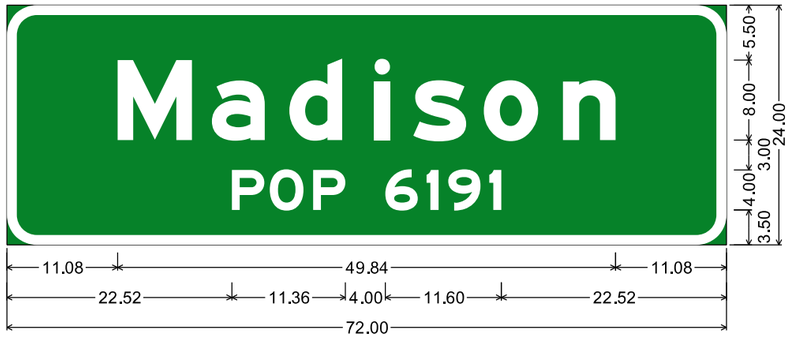
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0081(112)95	39	167

Plotting Date: 05/10/2024

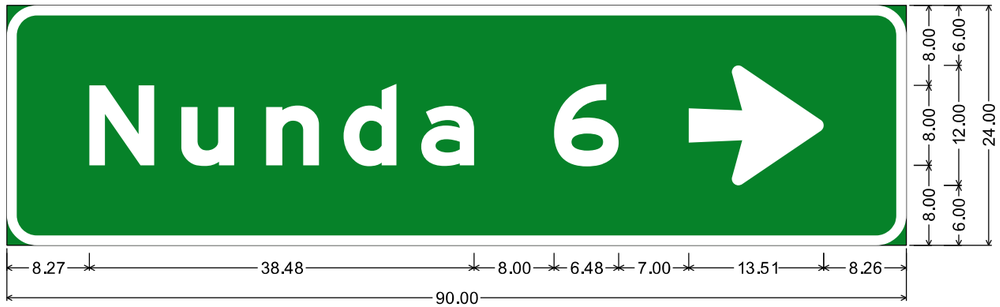
SPECIAL SIGN DETAIL



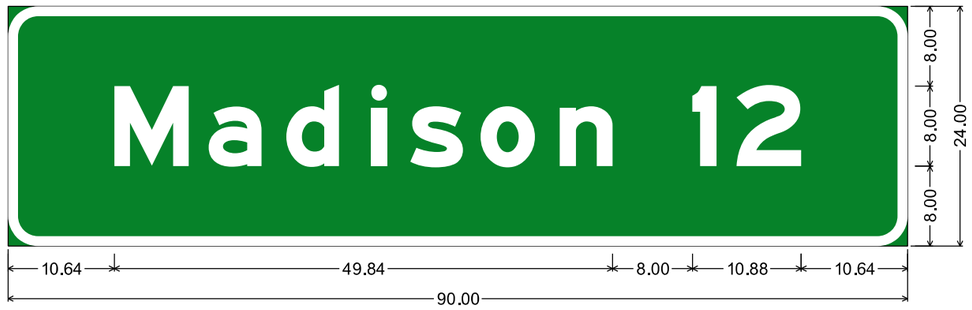
3.00" Radius, 1.00" Border, White on Green;
Arrow Custom - 13.51" 180°; "Nunda 6", E Mod 2K;



3.00" Radius, 1.00" Border, White on Green;
"Madison", E Mod 2K; "POP 6191", E Mod 2K;



3.00" Radius, 1.00" Border, White on Green;
"Nunda 6", E Mod 2K; Arrow Custom - 13.51" 0°;

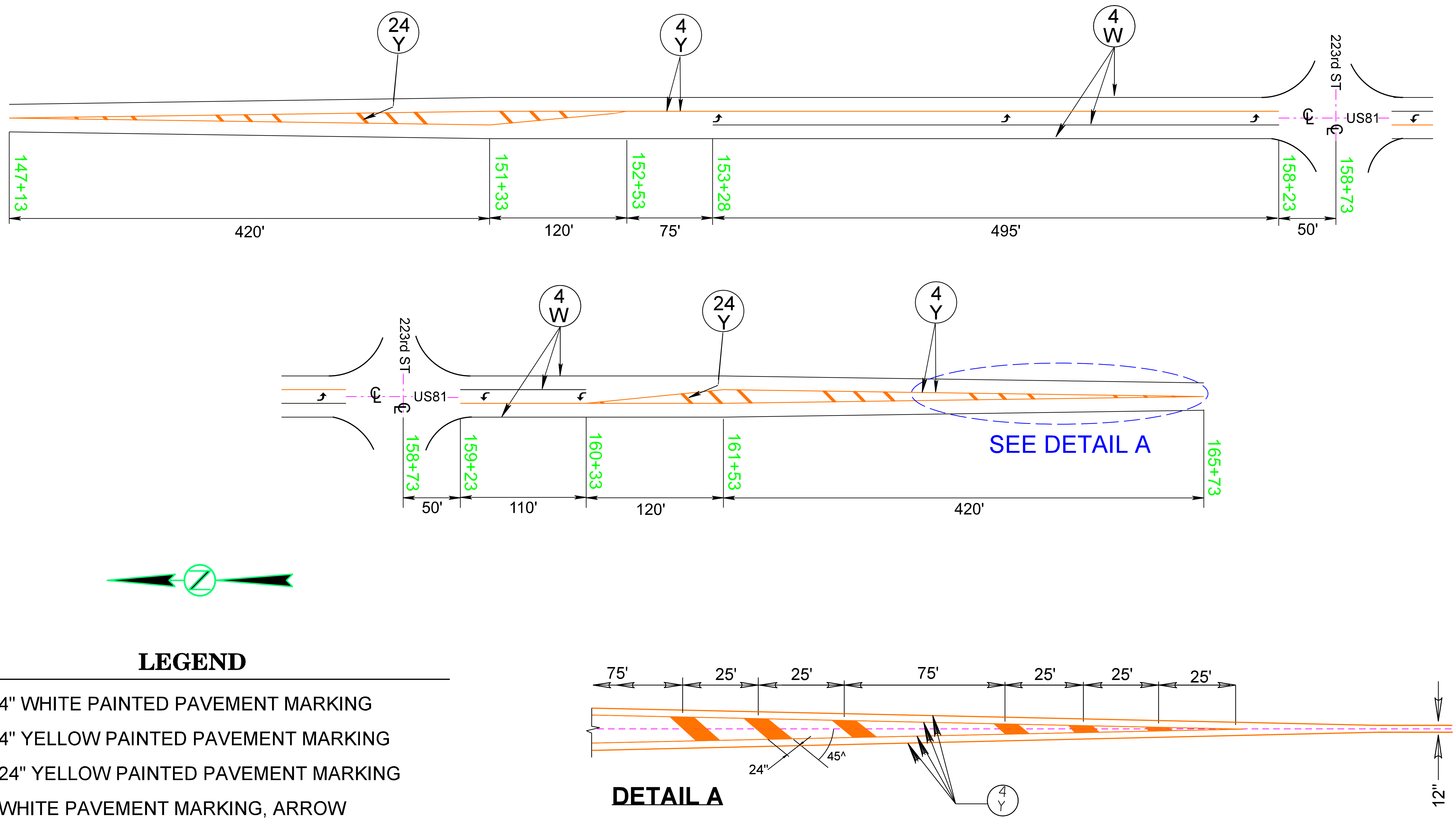


3.00" Radius, 1.00" Border, White on Green;
"Madison 12", E Mod 2K;

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0081(112)95	40	167

Plotting Date: 05/10/2024

PERMANENT PAVEMENT MARKINGS
JCT OF US81 & 223rd ST

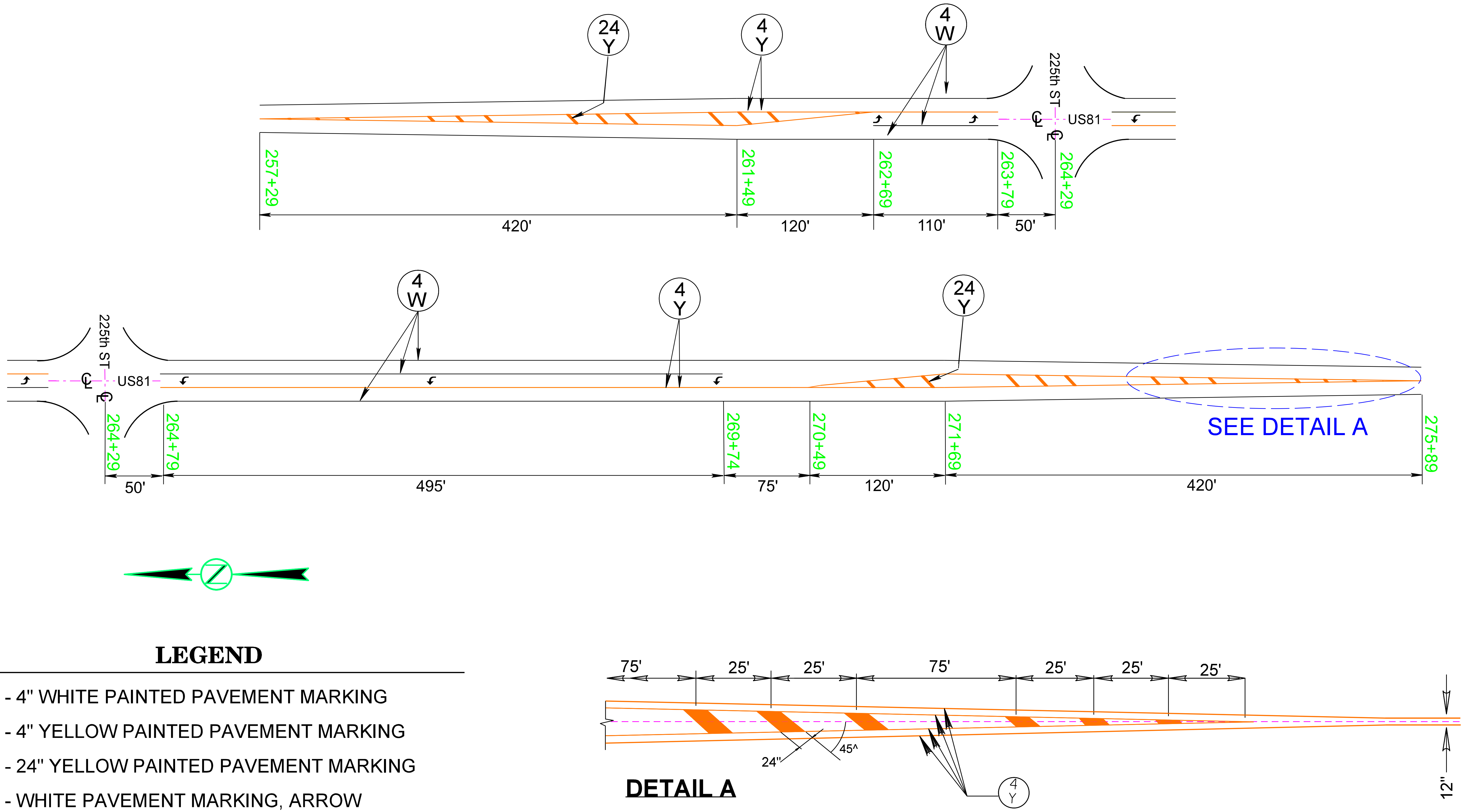


LEGEND

- 4 W - 4" WHITE PAINTED PAVEMENT MARKING
- 4 Y - 4" YELLOW PAINTED PAVEMENT MARKING
- 24 Y - 24" YELLOW PAINTED PAVEMENT MARKING
- ↰ - WHITE PAVEMENT MARKING, ARROW

Plotting Date: 05/10/2024

PERMANENT PAVEMENT MARKINGS
JCT OF US81 & 225th ST



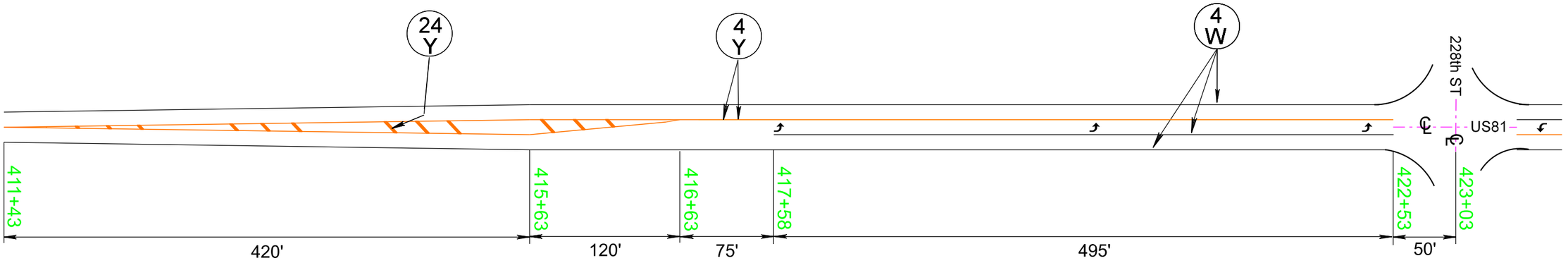
LEGEND

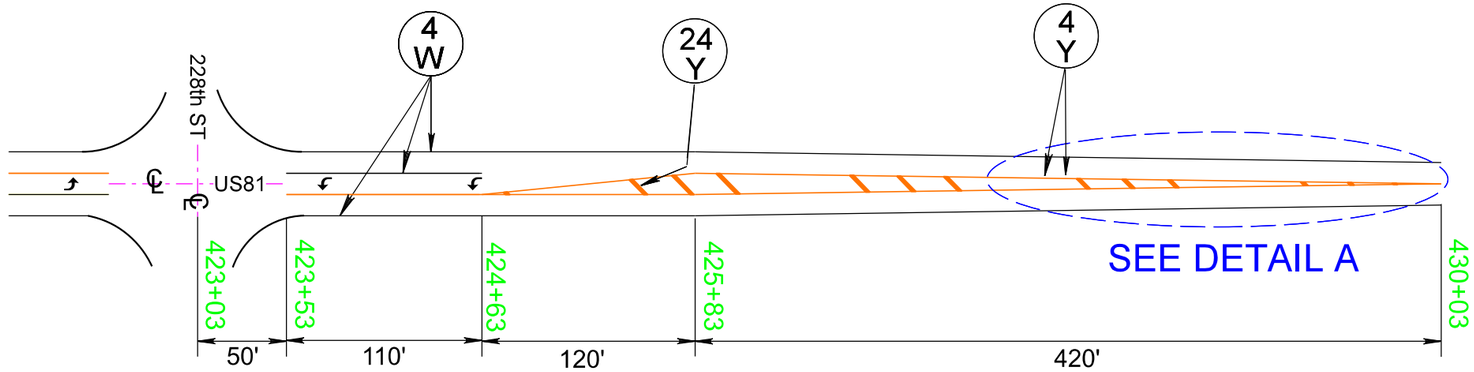
- 4" WHITE PAINTED PAVEMENT MARKING (4 W)
- 4" YELLOW PAINTED PAVEMENT MARKING (4 Y)
- 24" YELLOW PAINTED PAVEMENT MARKING (24 Y)
- WHITE PAVEMENT MARKING, ARROW

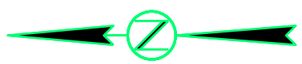
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0081(112)95	42	167

Plotting Date: 05/10/2024

PERMANENT PAVEMENT MARKINGS
JCT OF US81 & 228th ST

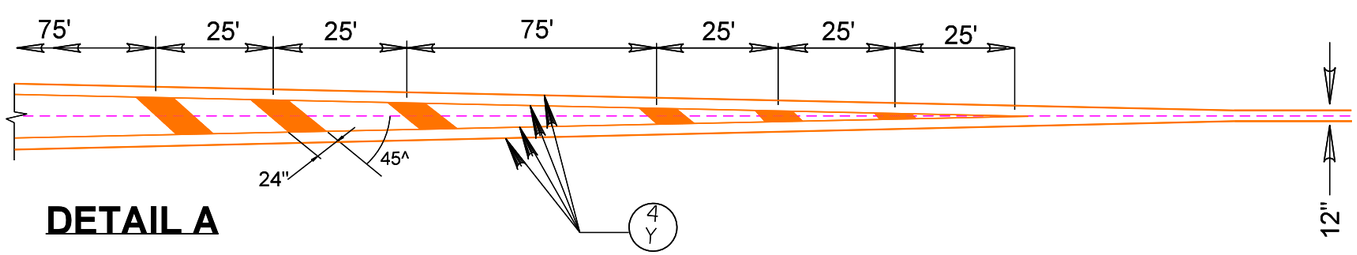






LEGEND

- (4 W) - 4" WHITE PAINTED PAVEMENT MARKING
- (4 Y) - 4" YELLOW PAINTED PAVEMENT MARKING
- (24 Y) - 24" YELLOW PAINTED PAVEMENT MARKING
- ↰ - WHITE PAVEMENT MARKING, ARROW



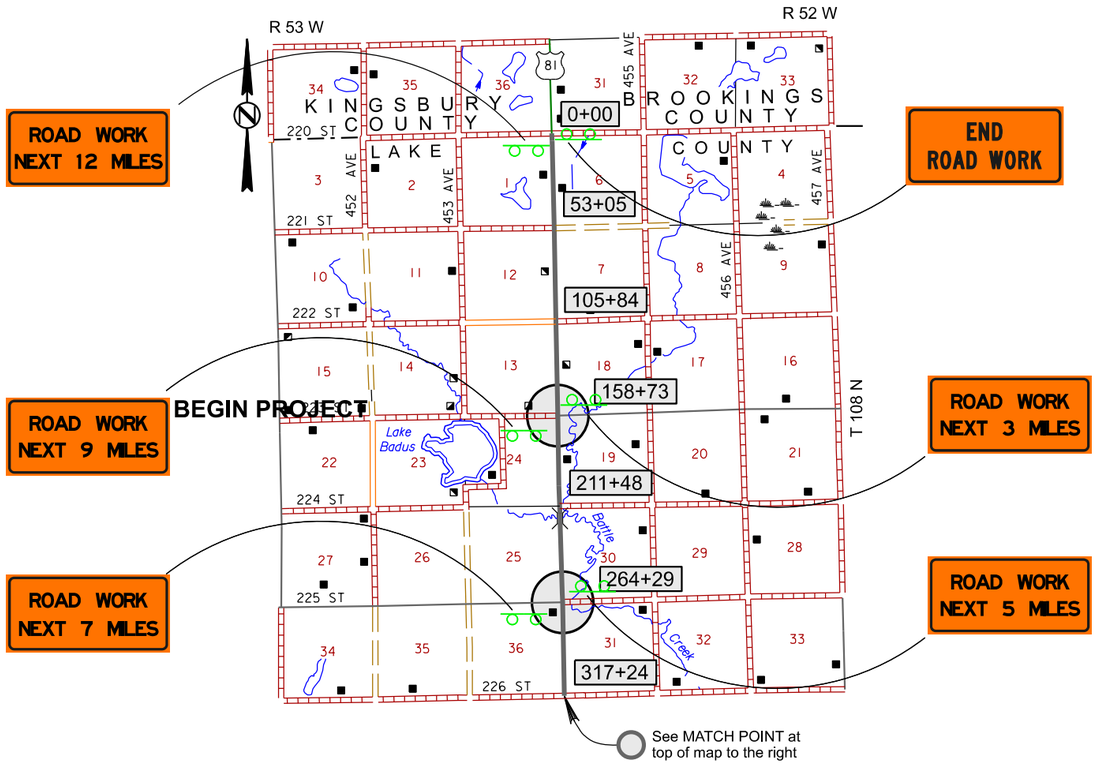
DETAIL A

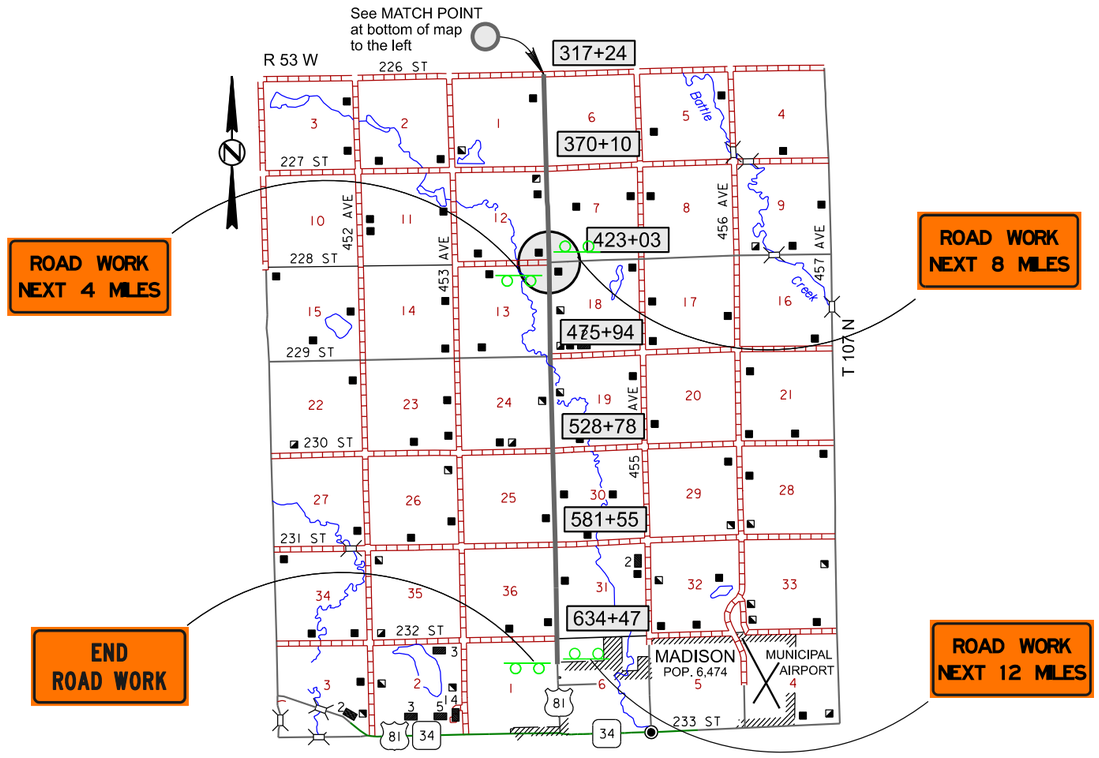
Plot Scale - 1:85.2591
Plotted From - TRM13315
Plot Name - $$dolnameSS
File - ...\prj2023\axe06P9\TurnLanes.dgn

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0081(112)95	43	167

Plotting Date: 05/10/2024

TRAFFIC CONTROL
Fixed Location Signs





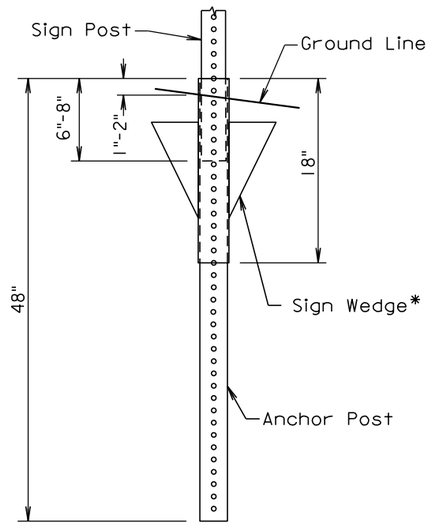
All fixed location signs will remain in place until permanent pavement marking is completed.

Signs will be placed 200' to 300' from intersections. Exact location to be determined by engineer.

Construction signs cannot obscure existing signs and must be installed a minimum of 200' from existing signs.

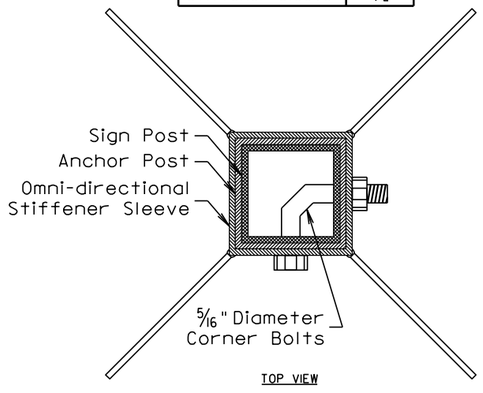
Construction signs will not be installed on the same post as an existing highway sign or light pole.

2" SQUARE STEEL PERFORATED TUBE POST WINGED SLEEVE ANCHOR BASE DETAILS (Typical)



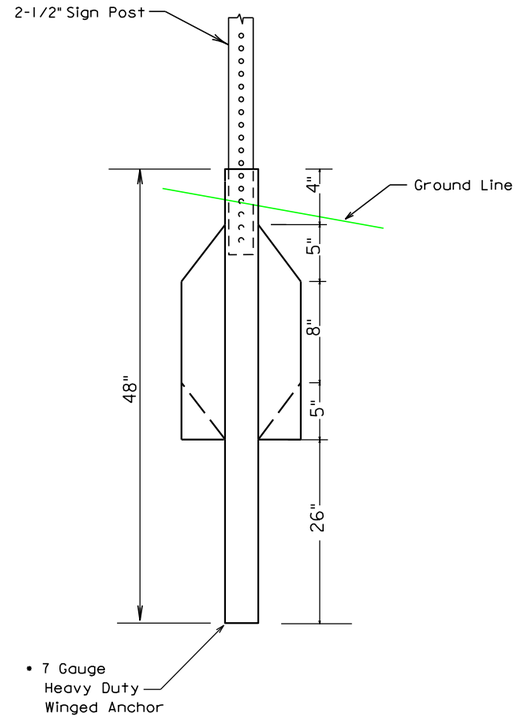
✳ - 18" Multi-directional Sleeve w/4 Blades, or Equivalent.
Manufacturer Recommended Dimensions and Installation.

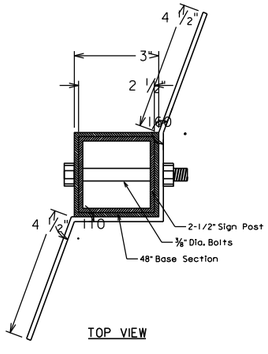
POST SIZE	
Sign Post	2"
Anchor Post	2 1/4"
Stiffener Sleeve	2 1/2"



TOP VIEW

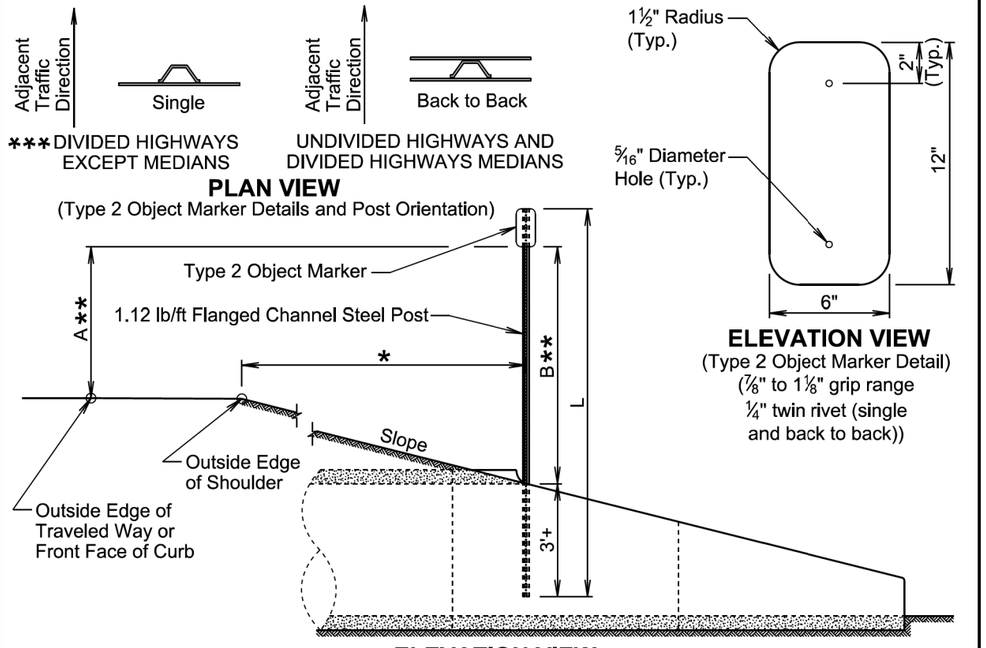
2 1/2" SQUARE STEEL PERFORATED TUBE POST WINGED BREAKAWAY NON-SLIP BASE ANCHOR DETAILS FOR SOIL INSTALLATIONS (Typical)





TOP VIEW

Dimensions shown may vary by Manufacturer. The Contractor shall use Manufacturer recommended assembly parts and procedures. Sign installations must meet MASH NCHRP 350 breakaway requirements.



TYPE 2 OBJECT MARKER POST LENGTHS										
OFFSET (*)		1'	2'	3'	4'	5'	6'	7'	8'	Greater Than 8'
		POST LENGTH (L)								
SLOPE	3:1	8'-6"	8'-9"	9'-3"	9'-6"	9'-9"	10'-3"	10'-6"	10'-9"	8'-0"
	4:1	8'-6"	8'-9"	9'-0"	9'-3"	9'-9"	9'-9"	10'-0"	10'-3"	8'-0"
	5:1	8'-3"	8'-6"	8'-9"	9'-0"	9'-3"	9'-3"	9'-6"	9'-9"	8'-0"
	6:1	8'-3"	8'-6"	8'-9"	8'-9"	9'-0"	9'-3"	9'-3"	9'-6"	8'-0"

GENERAL NOTES:

*** The type 2 object marker may be installed back to back when specified in the plans.

Post Length L was calculated based on a shoulder width of 6 feet at a crosslope of 4 percent and L was rounded up to the nearest 3 inches.

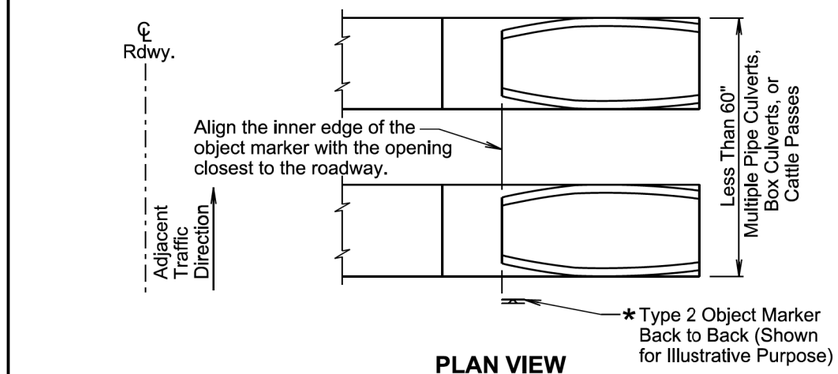
** Dimension A is 4 feet when the Offset * is 8 feet and less. Dimension B is 4 feet when Offset * is greater than 8 feet.

The type 2 object marker and the 1.12 lb/ft flanged channel steel post will be in conformance with Specifications Section 982.2 J.

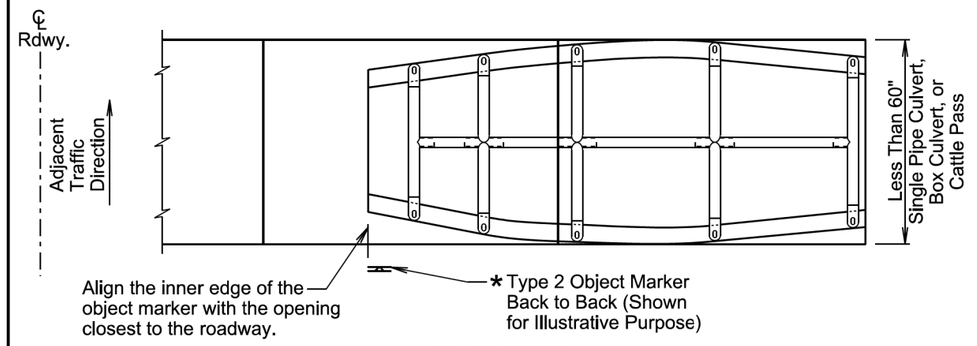
Payment for the type 2 object marker will be in conformance with Specification Section 632.5 B.

December 23, 2019

Published Date: 2025	SDDOT	TYPE 2 OBJECT MARKER (DIRECT DRIVE)	PLATE NUMBER 632.01
			Sheet 1 of 1



PLAN VIEW
(For Multiple Pipe Culverts, Box Culverts, and Cattle Passes)
(Pipe culverts shown for illustrative purpose.)
(Embankment is not shown.)



PLAN VIEW
(For Single Pipe Culvert, Box Culvert, and Cattle Pass)
(Pipe culvert shown for illustrative purpose.)
(Embankment is not shown.)

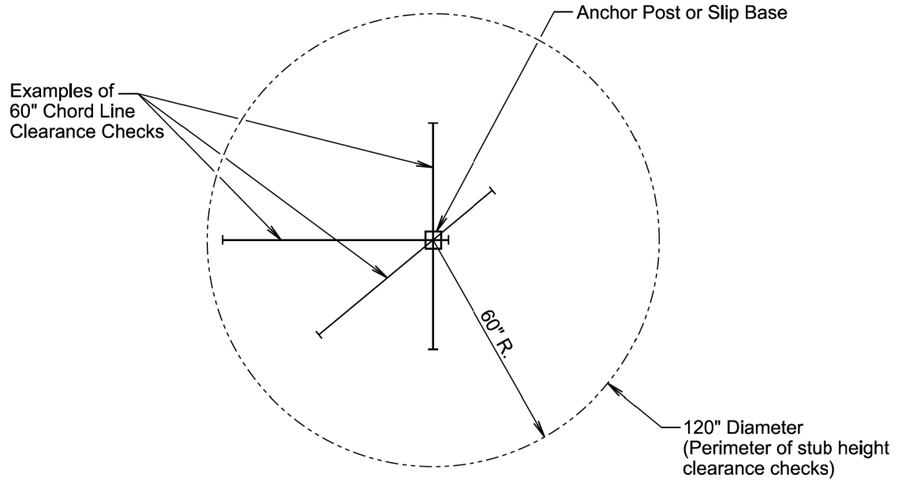
GENERAL NOTES:

This standard plate will be used in conjunction with standard plate 632.01.

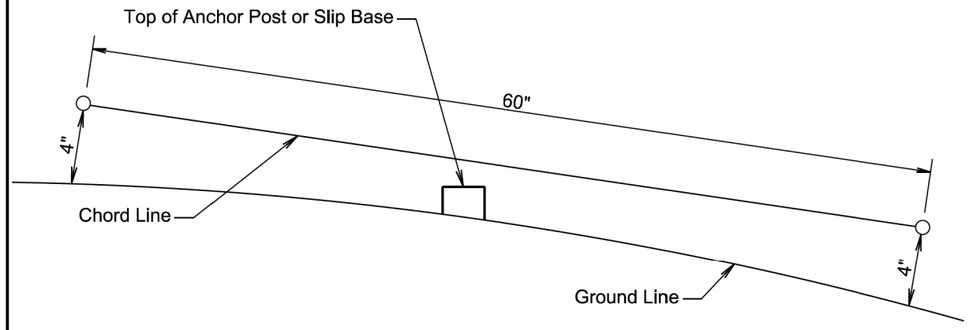
* The type 2 object markers will be installed at the locations shown above. The type 2 object markers, single faced or back to back, will be as specified in the plans.

December 23, 2019

Published Date: 2025	SDDOT	TYPE 2 OBJECT MARKER AT PIPE CULVERTS, BOX CULVERTS, AND CATTLE PASSES (Less than 60" Overall Width)	PLATE NUMBER 632.03
			Sheet 1 of 1



PLAN VIEW
(Examples of stub height clearance checks)



ELEVATION VIEW

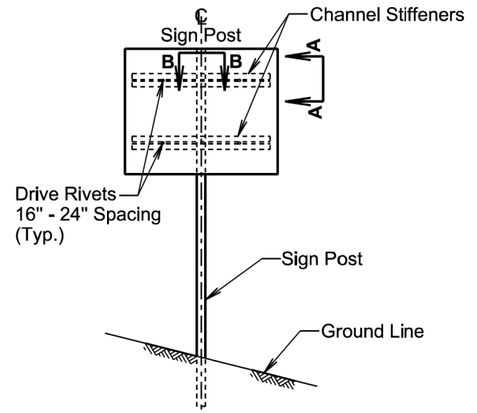
GENERAL NOTES:

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

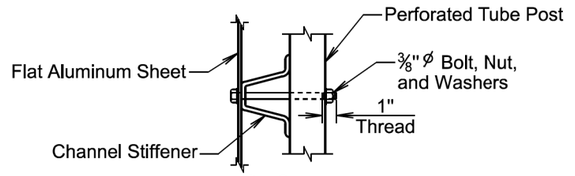
At locations where there is curb and gutter adjacent to the breakaway sign support, the stub height will be a maximum of 4" above the ground line at the localized area adjacent to the breakaway support stub.

January 22, 2021

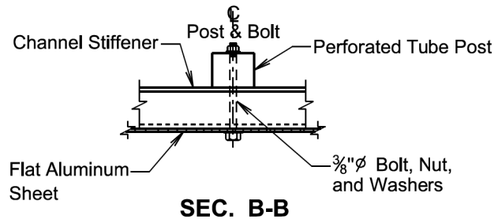
Published Date: 2025	SDDOT	BREAKAWAY SUPPORT STUB CLEARANCE	PLATE NUMBER 632.18
			Sheet 1 of 1



ELEVATION VIEW
(One post breakaway sign supports.)



SEC. A-A

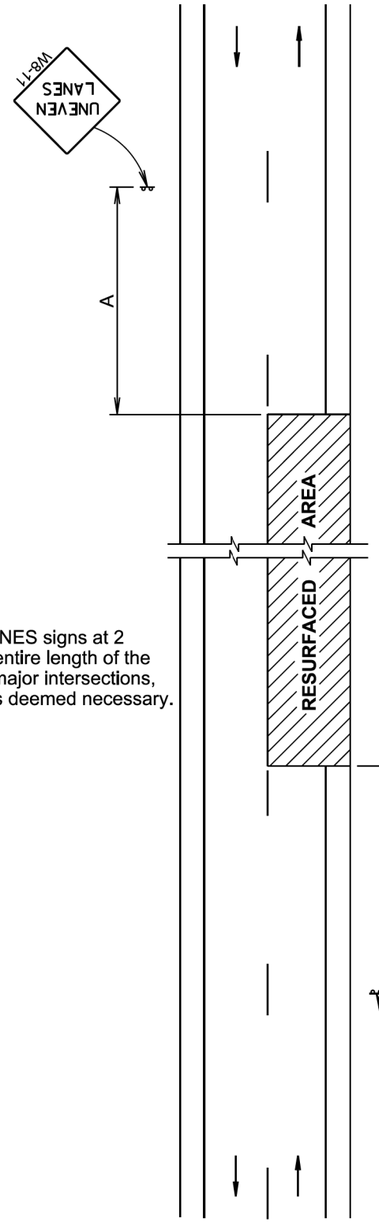


SEC. B-B
(Typical sign and stiffener details.)

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

November 19, 2020

Published Date: 2025	SDDOT	SIGN STIFFENER DETAILS	PLATE NUMBER 632.60
			Sheet 1 of 2



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.

January 22, 2021

Published Date: 2025

SDDOT

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	500	25
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.

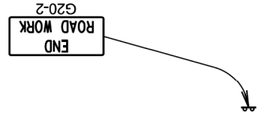
The ROAD WORK AHEAD and the END ROAD WORK signs may be omitted for short duration operations (1 hour or less).

For tack and/or flush seal operations, when flaggers are not being used, the FRESH OIL sign (W21-2) will 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 will be drums or 42" cones.

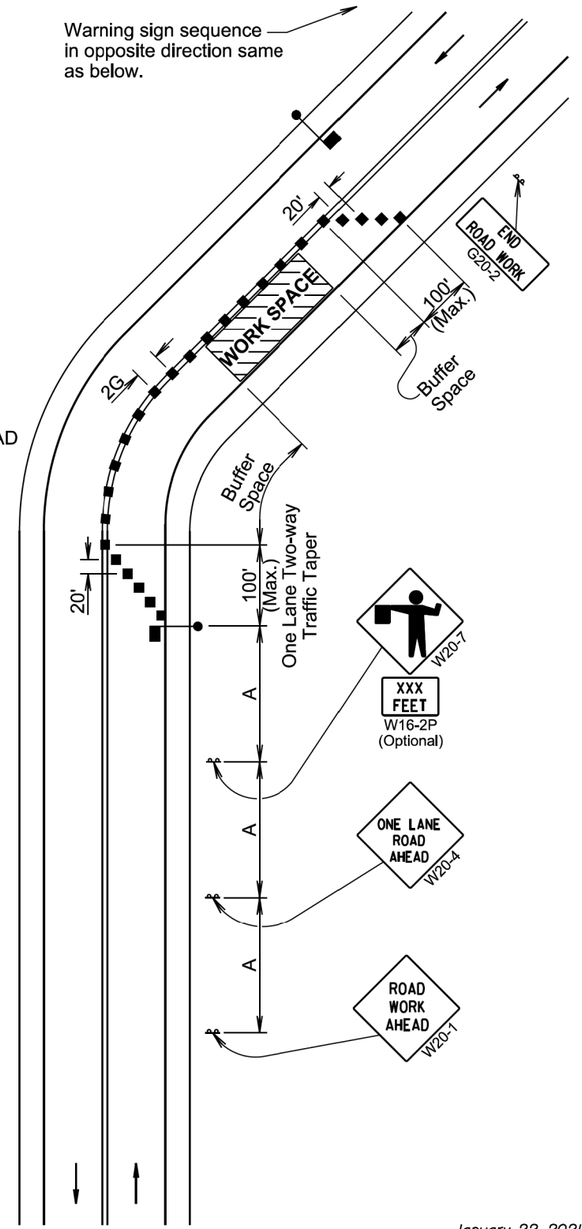
Channelizing devices are not required along the centerline adjacent to work area when pilot cars are utilized for escorting traffic through the work area.



Channelizing devices and flaggers will 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.



January 22, 2021

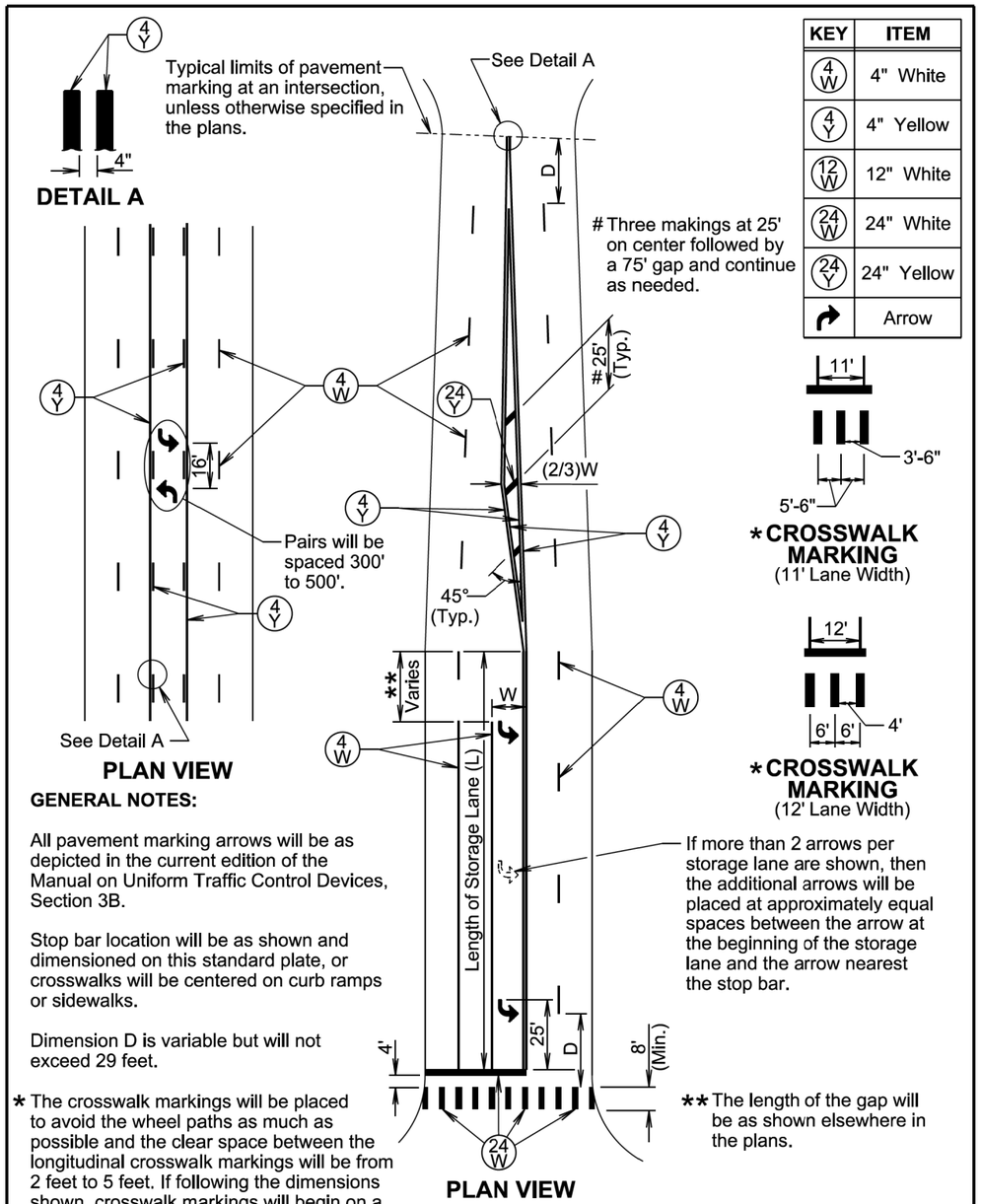
Published Date: 2025

SDDOT

LANE CLOSURE WITH FLAGGER PROVIDED

PLATE NUMBER 634.23

Sheet 1 of 1



GENERAL NOTES:

All pavement marking arrows will be as depicted in the current edition of the Manual on Uniform Traffic Control Devices, Section 3B.

Stop bar location will be as shown and dimensioned on this standard plate, or crosswalks will be centered on curb ramps or sidewalks.

Dimension D is variable but will not exceed 29 feet.

* The crosswalk markings will be placed to avoid the wheel paths as much as possible and the clear space between the longitudinal crosswalk markings will be from 2 feet to 5 feet. If following the dimensions shown, crosswalk markings will begin on a lane line or centerline.

If more than 2 arrows per storage lane are shown, then the additional arrows will be placed at approximately equal spaces between the arrow at the beginning of the storage lane and the arrow nearest the stop bar.

** The length of the gap will be as shown elsewhere in the plans.

March 31, 2024

Published Date: 2025	SDDOT	PAVEMENT MARKINGS FOR ADJACENT INTERSECTIONS AND CENTER TURN LANE	PLATE NUMBER 633.01
			Sheet 1 of 1

* Messages on signs will vary depending on the operation being conducted.

Vehicle-mounted signs will be mounted in a manner such that they are not obscured by equipment or supplies. Sign legends on vehicle-mounted signs will be covered or turned from view when work is not in progress.

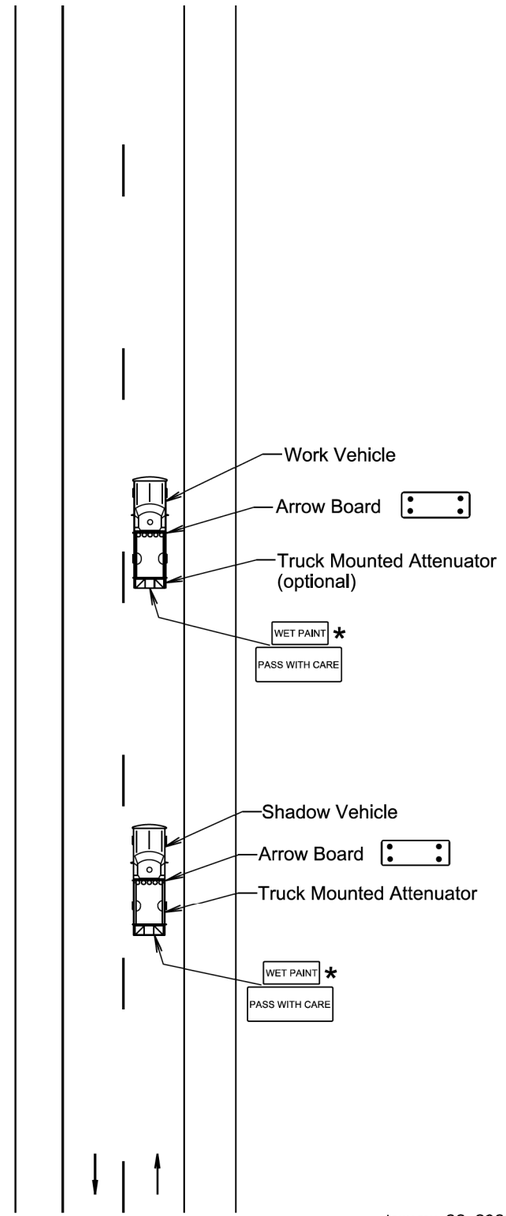
Shadow and Work vehicles will display high-intensity rotating, flashing, oscillating, or strobe lights, flags, signs, or arrow boards.

Vehicle hazard warning signals will not be used instead of the vehicle's high-intensity rotating, flashing, oscillating, or strobe lights.

When an arrow board is used, it will be used in the caution mode. Marching Diamonds are acceptable.

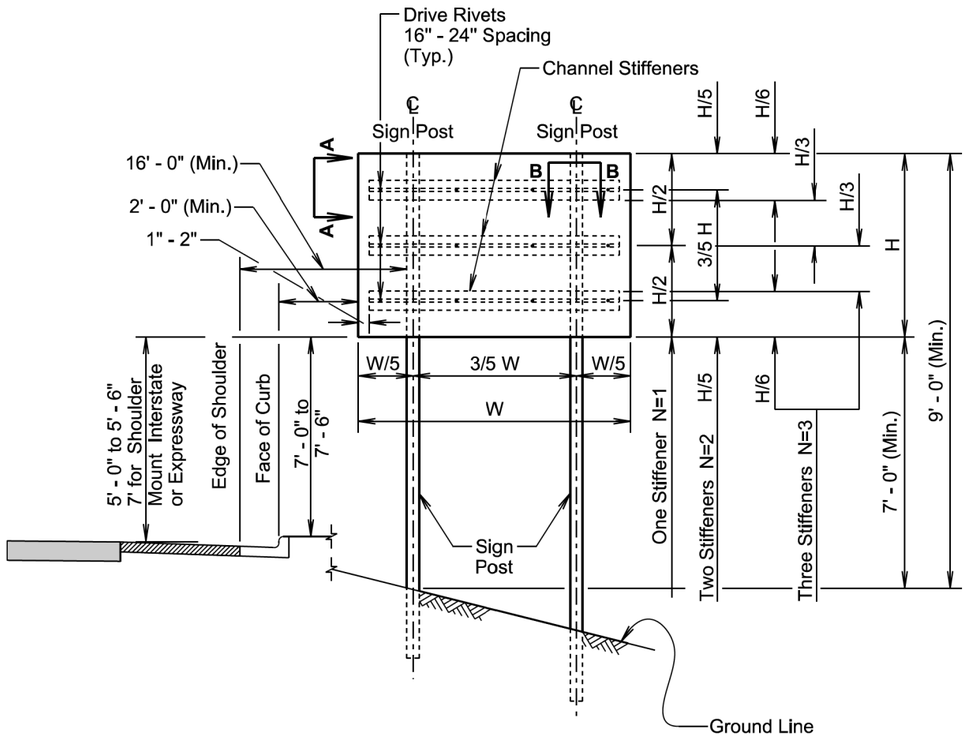
Arrow boards will, as a minimum, be Type B, with a size of 60" x 30".

All costs associated with the traffic control for mobile operation including signs, arrow boards and equipment will be incidental to the contract lump sum price for "Traffic Control, Miscellaneous".



January 22, 2021

Published Date: 2025	SDDOT	MOBILE OPERATIONS ON 2-LANE ROAD	PLATE NUMBER 634.06
			Sheet 1 of 1



TWO POST BREAKAWAY SIGN SUPPORTS

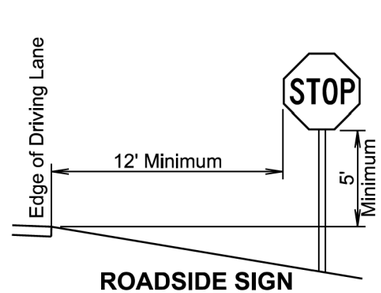
GENERAL NOTES:

The number of stiffeners used (N) will 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.

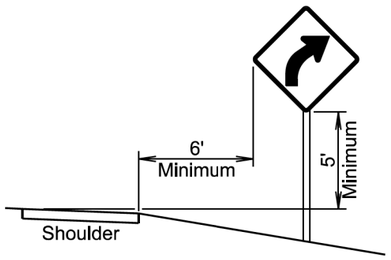
A minimum of two bolts will be required to fasten the sign to each post.

November 19, 2020

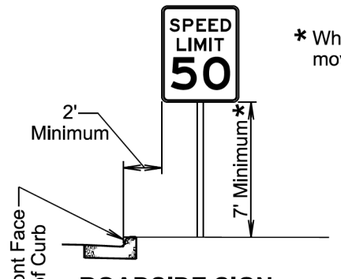
Published Date: 2025	SDDOT	SIGN STIFFENER DETAILS	PLATE NUMBER 632.60
			Sheet 2 of 2



ROADSIDE SIGN IN RURAL AREA

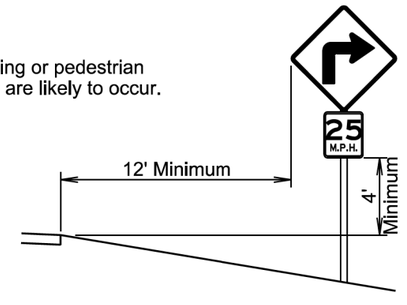


ROADSIDE SIGN IN RURAL AREA
(If shoulder width is greater than 6 foot)

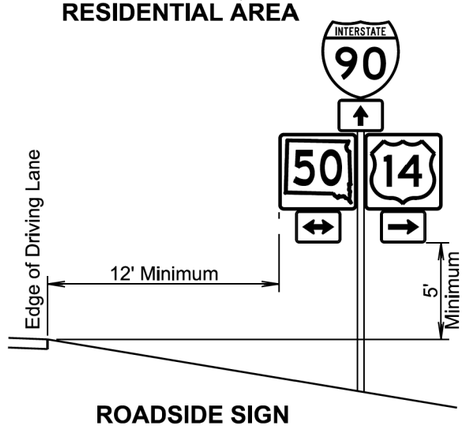


ROADSIDE SIGN IN BUSINESS, COMMERCIAL, OR RESIDENTIAL AREA

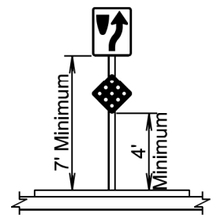
* Where parking or pedestrian movements are likely to occur.



WARNING SIGN ADVISORY SPEED PLAQUE IN RURAL AREA



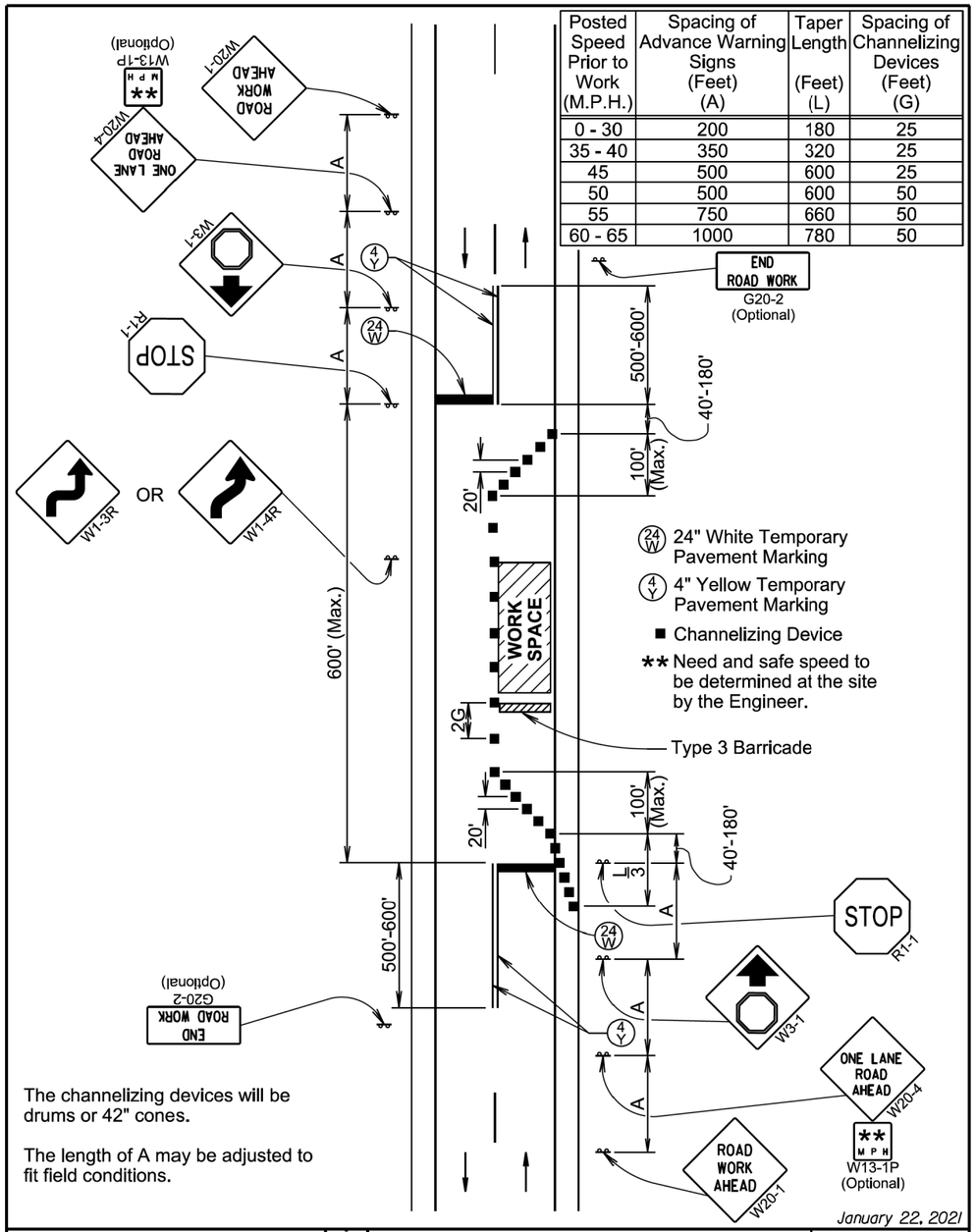
ROADSIDE SIGN IN RURAL AREA



SIGN ON NOSE OF MEDIAN

November 19, 2020

Published Date: 2025	SDDOT	OFFSETS FOR SIGN INSTALLATION	PLATE NUMBER 632.90
			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	500	600	25
50	500	600	50
55	750	660	50
60 - 65	1000	780	50

24 W 24" White Temporary Pavement Marking

4 Y 4" Yellow Temporary Pavement Marking

■ Channelizing Device

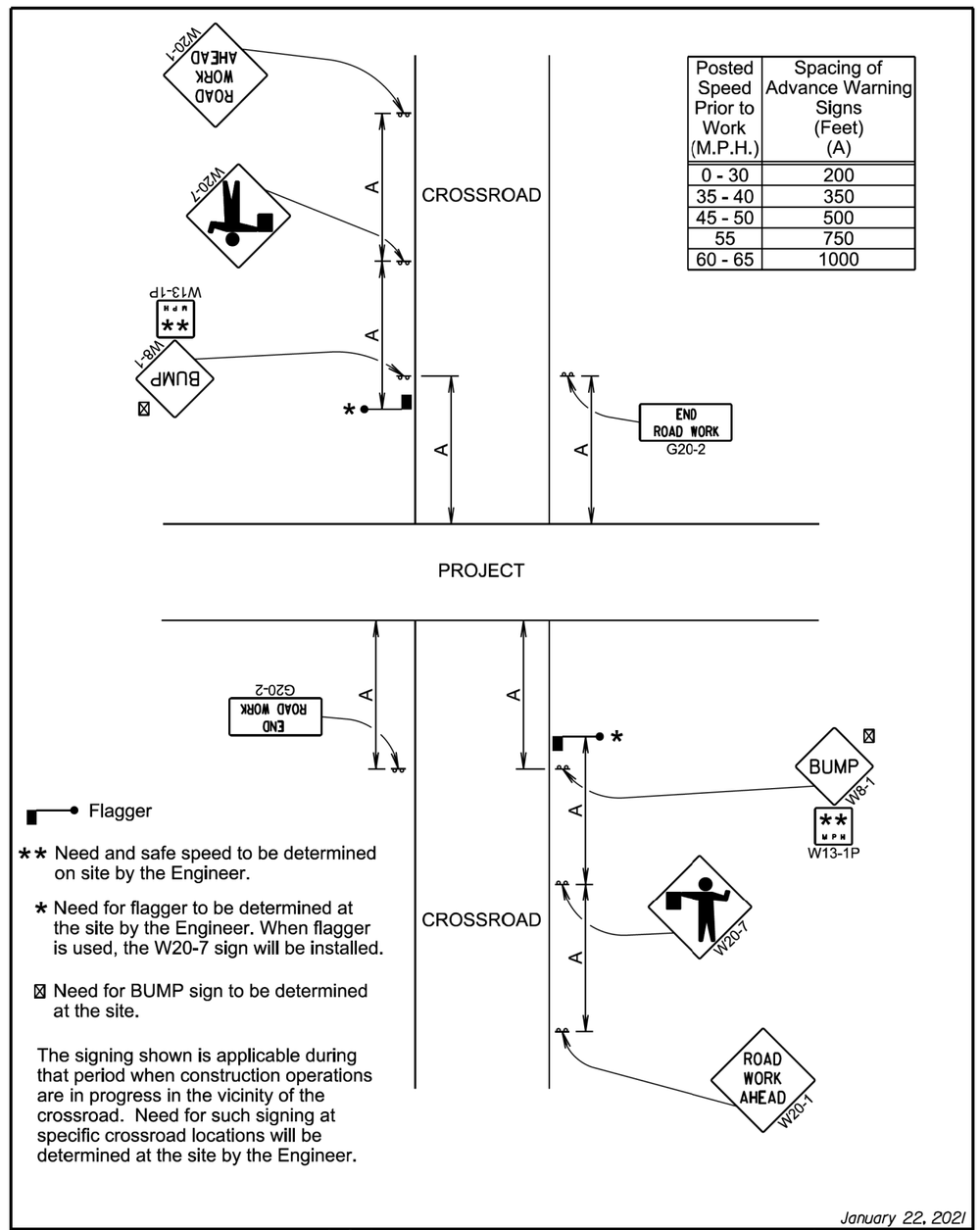
** Need and safe speed to be determined at the site by the Engineer.

The channelizing devices will be drums or 42" cones.

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

January 22, 2021

Published Date: 2025	SDDOT	LANE CLOSURE USING STOP SIGNS	PLATE NUMBER 634.25
			Sheet 1 of 1



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 - 65	1000

Flagger

** Need and safe speed to be determined on site by the Engineer.

* Need for flagger to be determined at the site by the Engineer. When flagger is used, the W20-7 sign will be installed.

⊠ Need for BUMP sign to be determined at the site.

The signing shown is applicable during that period when construction operations are in progress in the vicinity of the crossroad. Need for such signing at specific crossroad locations will be determined at the site by the Engineer.

January 22, 2021

Published Date: 2025	SDDOT	PROJECT OPEN TO TRAFFIC FROM CROSSROAD	PLATE NUMBER 634.38
			Sheet 1 of 1

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0081(112)95	51	167

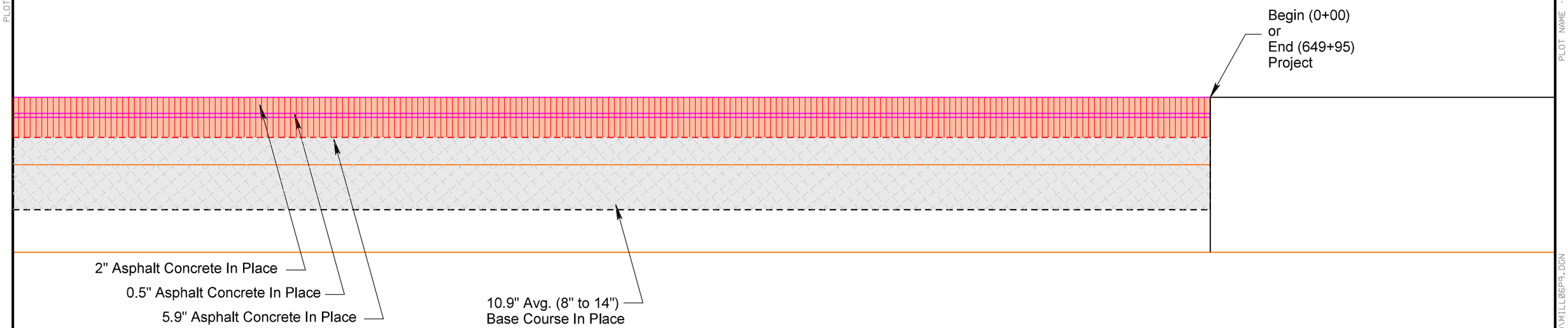
Plotting Date: 05/08/2024

LAYOUT FOR RECLAMATION TAPERS

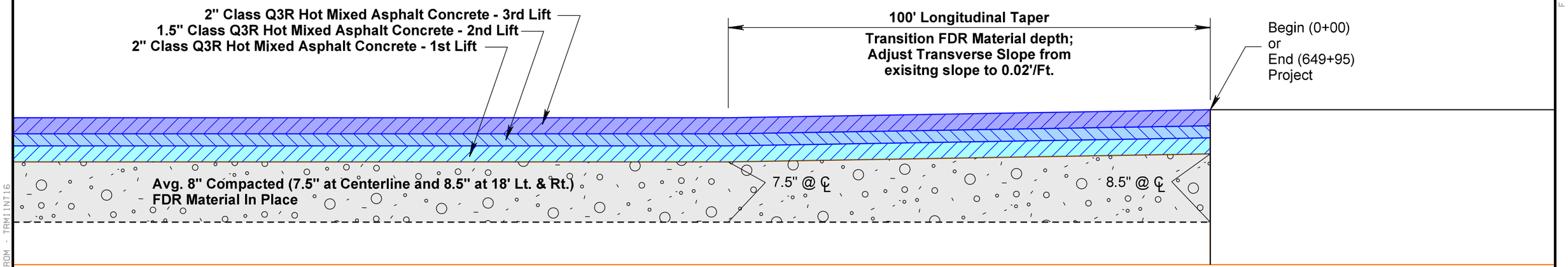
At Begin & End Project

Cold Milling
Asphalt Concrete 5" Depth

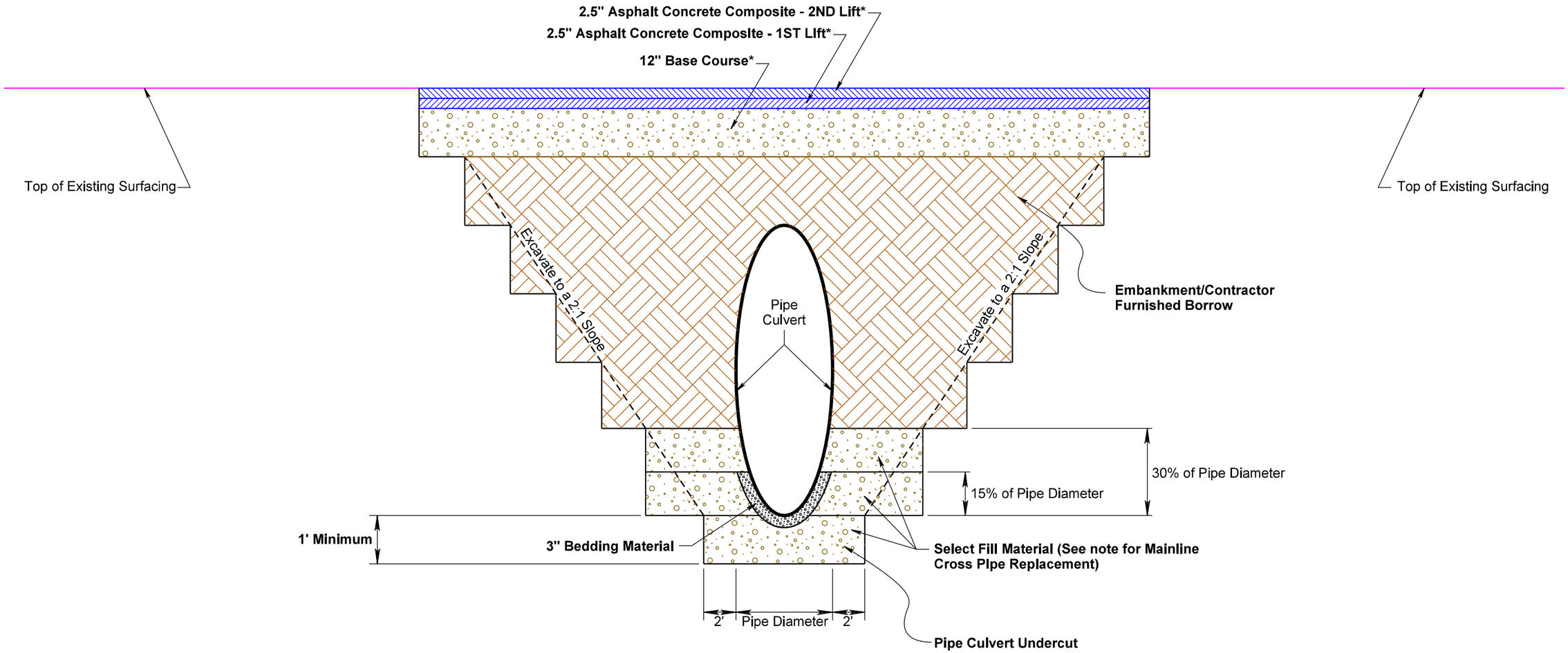
9" Full Depth Reclamation



LAYOUT FOR RESURFACING TAPERS



LAYOUT OF EMBANKMENT AND SURFACING FOR CULVERT REPLACEMENT

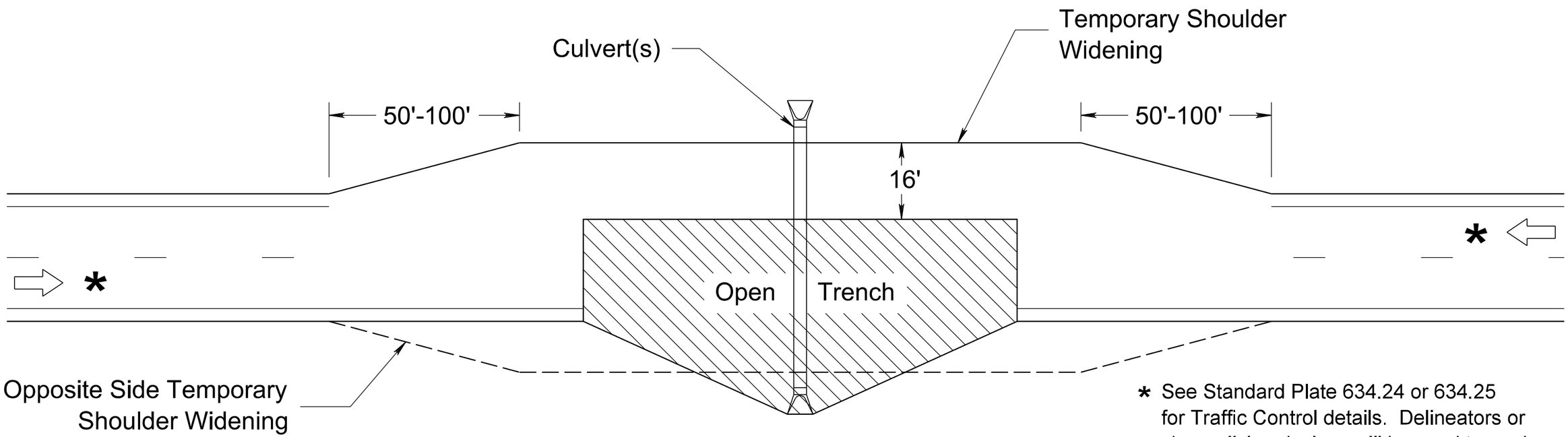


* Quantity is included in the Table of Additional Quantities.

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0081(112)95	53	167

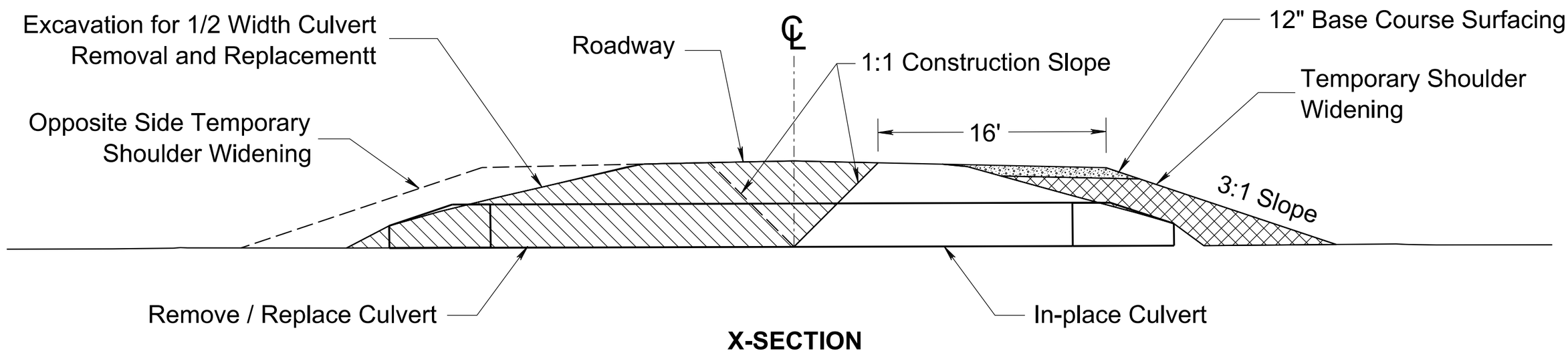
Plotting Date: 05/08/2024

TEMPORARY SHOULDER WIDENING
(TYPICAL)



PLAN

* See Standard Plate 634.24 or 634.25 for Traffic Control details. Delineators or channelizing devices will be used to mark edge of roadway along the widened shoulder.



X-SECTION

CONTROL DATA

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0081(112)95	54	167

HORIZONTAL AND VERTICAL CONTROL POINTS						
POINT	**STATION**	**OFFSET**	**DESCRIPTION**	**NORTHING**	**EASTING**	**ELEVATION**
CP1	419+61.03	78.02 L	“Mainline” stationing	653164.480	2810279.240	1763.42
CP2	264+70.05	206.45 L	“Mainline” stationing	668645.020	2809734.263	1715.98
CP3	159+15.82	366.45 L	“Mainline” stationing	679196.220	2809505.140	1745.13
CP4	0+36.74	125.33 L	“Mainline” stationing	695053.770	2808616.930	1786.68

The coordinates shown on this sheet are based on the South Dakota State Plane Coordinate System. South Zone (NAD 83/11; Epoch 2010 00 Geoid 12A (Conus); SF = 0.9998430820
The elevations shown on this sheet are based on NAVD 88.

HORIZONTAL DATA

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0081(112)95	55	167

Mainline @ 223rd– for constructing Turn Lanes at US81 & 223rd St.

Type	Station			Northing	Easting
POB	143+73.00			680726.603	2809079.348
		TL= 1500.00	S 2°13'46" E		
PI	158+73.00			679227.738	2809137.700
		TL= 1500.00	S 1°58'31" E		
POE	173+73.00			677728.629	2809189.402

Mainline @ 225th– for constructing Turn Lanes at US81 & 225th St.

Type	Station			Northing	Easting
POB	249+04.40			670201.405	2809467.530
		TL= 1525.00	S 2°11'51" E		
PI	264+29.40			668677.526	2809526.005
		TL= 1525.00	S 2°24'51" E		
POE	279+54.40			667153.879	2809590.241

Mainline @ 228th– for constructing Turn Lanes at US81 & 228th St.

Type	Station			Northing	Easting
POB	409+23.27			654203.821	2810143.618
		TL= 999.97	S 3°11'36" E		
PC	419+23.24			653205.404	2810199.320
PI	423+03.27	R = 24795.06	Delta = 1°45'22" R	652825.964	2810220.489
PT	426+83.24			652446.054	2810230.019
		TL= 953.20	S 1°26'13" E		
POE	436+36.44			651493.153	2810253.924

HORIZONTAL DATA

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0081(112)95	56	167

Mainline – (best fit from old plans and Quarter Mile Survey)

POB	-0+00.00			695085.376	2808490.210
		TL= 1235.47	S 2°20'03" E		
PI	12+35.47			693850.932	2808540.527
		TL= 246.23	S 2°22'20" E		
PI	14+81.70			693604.911	2808550.718
		TL= 193.80	S 2°16'02" E		
PI	16+75.50			693411.267	2808558.385
		TL= 972.10	S 2°22'52" E		
PI	26+47.60			692440.002	2808598.770
		TL= 1401.85	S 2°20'28" E		
PI	40+49.45			691039.320	2808656.031
		TL= 1255.66	S 2°23'24" E		
PI	53+05.11			689784.750	2808708.396
		TL= 2266.94	S 3°18'18" E		
PC	75+72.05			687521.580	2808839.085
PI	79+41.76	R = 23686.45	Delta = 1°47'18" R	687152.493	2808860.398
PT	83+11.40			686782.921	2808870.183
		TL= 1863.19	S 1°30'59" E		
PI	101+74.59			684920.385	2808919.492
		TL= 144.64	S 1°37'33" E		
PI	103+19.23			684775.805	2808923.595
		TL= 264.97	S 1°35'35" E		
PI	105+84.20			684510.934	2808930.962
		TL= 2644.74	S 2°15'00" E		
PI	132+28.94			681868.235	2809034.788
		TL= 2644.02	S 2°13'28" E		
PI	158+72.96			679226.208	2809137.416
		TL= 2644.70	S 2°00'34" E		
PI	185+17.65			676583.136	2809230.149
		TL= 2630.40	S 2°00'28" E		
PI	211+48.06			673954.348	2809322.302
		TL= 463.86	S 2°06'38" E		
PI	216+11.92			673490.800	2809339.385
		TL= 4817.42	S 2°13'24" E		
PI	264+29.34			668677.005	2809526.277
		TL= 2653.19	S 2°24'47" E		
PI	290+82.54			666026.163	2809637.990
		TL= 2641.30	S 2°25'02" E		
PI	317+23.84			663387.212	2809749.391
		TL= 2644.80	S 2°27'11" E		
PI	343+68.64			660744.837	2809862.597
		TL= 2641.02	S 2°16'14" E		
PI	370+09.66			658105.889	2809967.226

HORIZONTAL DATA

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0081(112)95	57	167

		TL= 2672.37	S 2°19'49" E		
PI	396+82.03			655435.726	2810075.884
		TL= 2317.50	S 3°09'20" E		
PC	419+99.53			653121.744	2810203.457
PI	423+03.09	R = 20500.00	Delta = 1°41'48" R	652818.637	2810220.168
PT	426+06.62			652515.169	2810227.896
		TL= 1022.35	S 1°27'32" E		
PI	436+28.96			651493.153	2810253.924
		TL= 1316.44	S 1°30'17" E		
PI	449+45.40			650177.169	2810288.493
		TL= 2648.70	S 2°17'26" E		
PI	475+94.10			647530.585	2810394.355
		TL= 2645.50	S 2°25'40" E		
PI	502+39.60			644887.460	2810506.413
		TL= 2638.50	S 2°18'41" E		
PI	528+78.10			642251.108	2810612.831
		TL= 2205.80	S 2°01'07" E		
PC	550+83.90			640046.677	2810690.524
PI	555+10.70	R = 23119.10	Delta = 2°06'55" L	639620.144	2810705.557
PT	559+37.40			639194.455	2810736.322
		TL= 289.16	S 4°08'01" E		
PC	562+26.55			638906.052	2810757.166
PI	568+22.13	R = 22920.00	Delta = 2°58'37" R	638312.026	2810800.097
PT	574+17.44			637716.572	2810812.121
		TL= 737.25	S 1°09'24" E		
PI	581+54.69			636979.468	2810827.004
		TL= 2221.06	S 1°10'17" E		
PC	603+75.75			634758.876	2810872.407
PI	608+01.91	R = 23030.76	Delta = 2°07'13" L	634332.799	2810881.119
PT	612+27.98			633907.337	2810905.587
		TL= 1879.39	S 3°17'29" E		
PC	631+07.37			632031.051	2811013.494
PI	633+89.58	R = 22920.00	Delta = 1°24'39" R	631749.306	2811029.698
PT	636+71.76			631467.247	2811038.959
		TL= 2419.04	S 1°52'50" E		
PI	660+90.80			629049.513	2811118.346
		TL= 2691.60	S 2°37'10" E		
POE	687+82.40			626360.725	2811241.360

LEGEND

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0081(112)95	58	167

Plotting Date: 05/10/2024

- 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
- 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
- Electric Transformer/Power Junction Box
- Fence Barbwire
- Fence Chainlink
- Fence Electric
- Fence Miscellaneous
- 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 ROW Marker
- Interstate Close Gate
- Iron Pin
- Irrigation Ditch
- Lake Edge
- Lawn Sprinkler
- Mailbox
- Manhole Electric
- Manhole Gas
- Manhole Miscellaneous
- Manhole Sanitary Sewer
- Manhole Storm Sewer
- Manhole Telephone
- Manhole Water
- Merry-Go-Round
- Microwave Radio Tower
- Miscellaneous Line
- Miscellaneous Property Corner
- Miscellaneous Post
- Overhang Or Encroachment
- Overhead Utility Line — OH —
- Parking Meter
- Pedestrian Push Button Pole
- 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 ROW 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
- ROW Line
- New ROW 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 Median Pavement
- Remove Concrete Curb and/or Gutter

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

PLOT SCALE - 1:200

PLOT NAME - 8

PLOTTED FROM - TRMIINT16

FILE - ...\PRJ2023\LAKE0GP9\LEGEND.DGN

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0081(112)95	59	167

Plotting Date: 05/10/2024

Sec 6 - T108N - R52W

14+82 (13 ac)
Place New
24" x 98' RCP & 2 Flared Ends

14+82
Take Out 24" - 86' RCP
& 2 Flared Ends

State of South Dakota
(Department of Game, Fish & Parks)

Government Lots 4 and 5 of Section 6 - Township 108 North - Range 52 West of the 5th P.M., except Lot H1 in the NW1/4

Government Lot 4

Government Lot 5

1/4 Line

150'

Section Line

5+00

10+00

15+00

20+00

25+00

150'

Government Lot 1

S1/2 NE1/4

Paul & Barbara Hoff Living Trust

Tract A of Haberger's First Addition in the NE1/4 and in the N1/2 SE1/4 of Section 1 - Township 108 North - Range 53 West of the 5th P.M.

HABERGER'S FIRST ADDITION

TRACT A

Paul & Barbara Hoff Living Trust

Government Lots 1 and 2 and the S1/2 NE1/4 of Section 1 - Township 108 North - Range 53 West of the 5th P.M., except Tract A of Haberger's First Addition in the NE1/4 and N1/2 SE1/4 and except Lot H1 in the NE1/4

Sec 1 - T108N - R53W

1/16 Line

1/4 Line

PLOT SCALE - 1:150

PLOT NAME - 9

FILE - ...\PRJ2023\LAKE06P9\D06P9.DGN

PLOTTED FROM - TRM1INT16

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0081(112)95	60	167

Plotting Date: 05/10/2024

PLOT SCALE - 1:150

PLOT NAME - 10

FILE - ...\PRJ2023\LAKE06P9\D06P9.DGN

PLOTTED FROM - TRM1INT16

40+49 (66 ac)
Place New
30" x 84' RCP & 2 Flared Ends

40+49
Take Out 30" - 86' CMP
& 2 Flared Ends

Sec 6 - T108N - R52W

Russell D. Simmons & Susan D. Simmons

Government Lot 6 of Section 6 - Township 108 North - Range 52 West of the 5th P.M., except Lot H1 in the W1/2 SW1/4

Swenson Properties Limited Partnership

Government Lot 7 of Section 6 - Township 108 North - Range 52 West of the 5th P.M., except Lot H1 in the W1/2 SW1/4

Government Lot 6

Government Lot 7

150'

30+00

35+00

Section Line

40+00

45+00

50+00

N1/2 SE1/4

S1/2 SE1/4

1/16 Line

Paul & Barbara Hoff Living Trust

The N1/2 SE1/4 of Section 1 - Township 108 North - Range 53 West of the 5th P.M., except Tract A of Haberger's First Addition in the NE1/4 and N1/2 SE1/4 and except Lot H1 therein

Swenson Properties Limited Partnership

The S1/2 SE1/4 of Section 1 - Township 108 North - Range 53 West of the 5th P.M., except Lot H1 therein

Sec 1 - T108N - R53W

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0081(112)95	61	167

Plotting Date: 05/10/2024

PLOT SCALE - 1:150

PLOT NAME - 11

FILE - ...\PRJ2023\LAKE06P\D0[illegible].DGN

PLOTTED FROM - TRM11NT16

Sec 7 - T108N - R52W

Property Line 1550 feet

103+19 (225 ac)
Place New
42" x 70' RCP & 2 Flared Ends

103+19
Take Out 42" - 76' CMP
& 2 Flared Ends

Sec 18 - T108N - R52W

Propety Line 697 feet

Steven W. Jaton & Virginia A. Jaton

Government Lots 3 and 4 of Section 7 - Township 108 North - Range 52 West of the 5th P.M., except the East 1550 feet of the West 1937.6 feet of the South 697 feet thereof and except Lot H1 in the SW1/4

Government Lot 4

Government Lot 1

Government Lot 3

33'

33'

150'

150'

95+00

Section Line

100+00

105+00

110+00

115+00

SE1/4

33'

33'

Section Line

NE1/4

Linda J. Schroeder

The SE1/4 of Section 12 - Township 108 North - Range 53 West of the 5th P.M., except Lot H1 therein

Sec 12 - T108N - R53W

Sec 13 - T108N - R53W

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0081(112)95	62	167

Plotting Date: 05/10/2024

US81 & 223rd St Intersection

New Left Turn Lane

PLOT SCALE - 1:150

PLOT NAME - 12

FILE - ...\PRJ2023\LAKE06P9\D06P9.DGN

PLOTTED FROM - TRMIINT16

Sec 18 - T108N - R52W

Sec 19 - T108N - R52W

151+62
In Place
24" x 86' RCP & 2 Flared Ends
Left - Remove & Reset Flared End, Extend 12' RCP
Right- Remove & Reset Flared End, Extend 12' RCP

158+13
In Place
18" x 58' RCP & 2 Flared Ends
Left - Remove & Reset Flared End, Extend 12' RCP
Right- Remove & Reset Flared End, Extend 12' RCP

Dale L. Schwader

Government Lots 3 and 4 and the E1/2 SW1/4 of Section 18 - Township 108 North - Range 52 West of the 5th P.M., except the North 180 feet of the West 600 feet of Governent Lot 3, except the South 135 feet of the North 315 feet of the West 600 feet of Government Lot 3 and except the Lot H1 in the SW1/4

Government Lot 3

Government Lot 4

Government Lot 1

33'
33'

150'
Section Line
145+00
150+00
155+00
160+00
165+00
Section Line
150'

145+03
Begin
Shoulder
Widening

147+13
Begin
Taper for
Left Turn Lane

SE1/4

151+33
End
Taper for
Left Turn Lane
Begin
Left Turn Lane

165+73
End
Left Turn Lane
Begin
Taper for
Left Turn Lane

165+73
End
Taper for
Left Turn Lane

167+83
End
Shoulder
Widening

N1/2 NE1/4

33'
33'

Section Line

Remove Topsoil	1597	Cu.Yds.
Excavation	2002	Cu.Yds.
Undercut	5304	Cu.Yds.
Contractor Furnished Borrow Excavation	5292	Cu.Yds.
Total	14,195	Cu.Yds.

Embankment	2416		Cu.Yds.
+50%	1208	3624	Cu.Yds.
Undercut	5304		Cu.Yds.
+50%	2652	7956	Cu.Yds.
*Approaches		40	Cu.Yds.
Place Topsoil		1597	Cu.Yds.
Waste		978	Cu.Yds.
Total		14,195	Cu.Yds.

*Break Down for Approaches:		
145+45 Lt	40	Cu.Yds.
Total	40	Cu.Yds.

Dennis & Donna Rensch Living Trust

The SE1/4 of Section 13 - Township 108 North - Range 53 West of the 5th P.M., except Lot 1 of Minnaert's Addition therein and except Lot H1 therein

Hyland Family Farm, LLC

The N1/2 NE1/4 of Section 24 - Township 108 North - Range 53 West of the 5th P.M., except Lot H1 therein

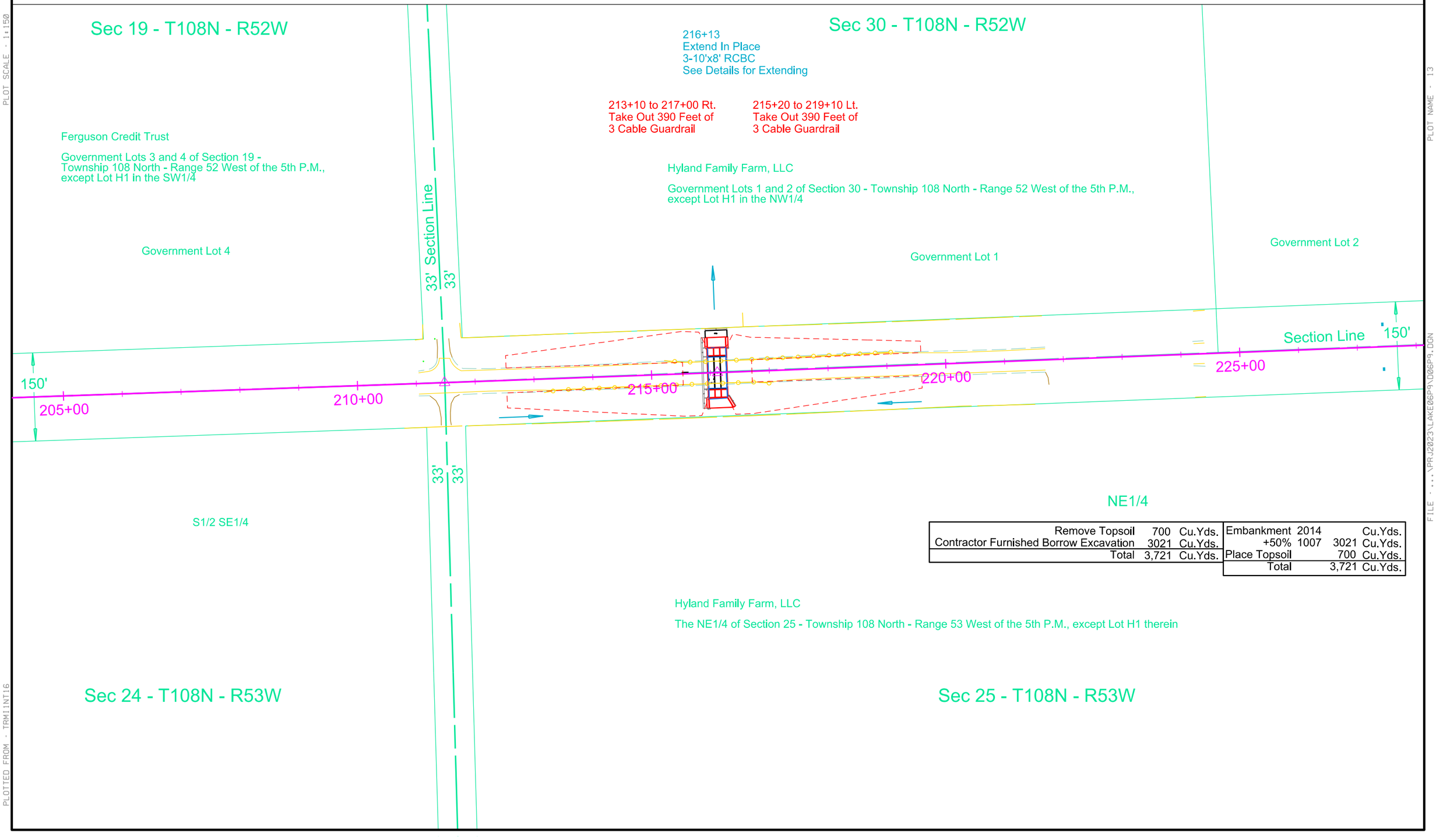
Sec 13 - T108N - R53W

Sec 24 - T108N - R53W

3-10'x8' RCBC Extension @ 216+13

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0081(112)95	63	167

Plotting Date: 05/10/2024



Remove Topsoil	700	Cu.Yds.
Contractor Furnished Borrow Excavation	3021	Cu.Yds.
Total	3,721	Cu.Yds.

Embankment	2014		Cu.Yds.
+50%	1007	3021	Cu.Yds.
Place Topsoil		700	Cu.Yds.
Total		3,721	Cu.Yds.

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0081(112)95	64	167

Plotting Date: 05/10/2024

US81 & 225th St Intersection

New Left Turn Lane

Sec 30 - T108N - R52W

264+98
In Place
30" x 86' RCP & 2 Flared Ends
Left - Remove & Reset Flared End, Extend 12' RCP
Right- Remove & Reset Flared End, Extend 14' RCP

268+40
In Place
TWIN 60" x 92' RCP & 4 Flared Ends
Left - For Each Pipe - Remove & Reset Flared Ends and 6' Pipe section, Extend 16' (32' total) RCP
Right - For Each Pipe - Remove & Reset Flared End and 6' Pipe section, Extend 16' (32' total) RCP

Sec 31 - T108N - R52W

275+89
In Place
18" x 88' RCP & 2 Flared Ends
Left - Remove & Reset Flared End, Extend 4' RCP
Right- Remove & Reset Flared End, Extend 6' RCP

Dallas D. Schwiesow & Chonette F. Schwiesow

Government Lots 3 and 4 of Section 30 - Township 108 North - Range 52 West of the 5th P.M., except Lot H1 in the W1/2 SW1/4

Audrey E. Keierleber

Government Lots 1 and 2 and the E1/2 NW1/4 of Section 31 - Township 108 North - Range 52 West of the 5th P.M., except Lot H1 in the NW1/4

Government Lot 4

Government Lot 1

Government Lot 2

33'
33'

150'
150'

255+00
260+00
265+00
270+00
275+00

Section Line

255+19
Begin
Shoulder
Widening

257+29
Begin
Taper for
Left Turn Lane

SE1/4

261+49
End
Taper for
Left Turn Lane
Begin
Left Turn Lane

271+69
End
Left Turn Lane
Begin
Taper for
Left Turn Lane

275+89
End
Taper for
Left Turn Lane

277+99
End
Shoulder
Widening

E1/2 NE1/4

Remove Topsoil	1672	Cu.Yds.
Excavation	1946	Cu.Yds.
Undercut	5333	Cu.Yds.
Muck Excavation	265	Cu.Yds.
Contractor Furnished Borrow Excavation	7461	Cu.Yds.
Total	16,677	Cu.Yds.

Embankment	3788	Cu.Yds.
+50%	1894	5682 Cu.Yds.
Undercut	5333	Cu.Yds.
+50%	2667	8000 Cu.Yds.
*Approaches		80 Cu.Yds.
Place Topsoil		1672 Cu.Yds.
Waste		1308 Cu.Yds.
Total		16,677 Cu.Yds.

*Break Down for Approaches:		
274+00 Lt	40	Cu.Yds.
274+80 Rt	40	Cu.Yds.
Total	80	Cu.Yds.

Hyland Family Farm, LLC

The SE1/4 of Section 25 - Township 108 North - Range 53 West of the 5th P.M., except Lot H1 therein

Leland J. Spilde & Diane M. Spilde

The North 680.26 feet of the E1/2 NE1/4 of Section 36 - Township 108 North - Range 53 West of the 5th P.M., except Lot H1 therein

Property Line

Duane S. Hyland & Barbara J. Hyland

The E1/2 NE1/4 of Section 36 - Township 108 North - Range 53 West of the 5th P.M., except the North 680.26 feet thereof and except Lot H1 therein

Sec 25 - T108N - R53W

Sec 36 - T108N - R53W

PLOT SCALE - 1:150
PLOT NAME - 14
PLOTTED FROM - TRMINT16
FILE - ...\PRJ2023\LAKE06P9\D06P9.DGN

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0081(112)95	65	167

Plotting Date: 05/10/2024

US81 & 228th St Intersection

New Left Turn Lane

PLOT SCALE - 1:150

PLOT NAME - 15

411+79
In Place
48" x 88' RC Arch & 2 Flared Ends
No Work - Do not Disturb

Sec 7 - T107N - R52W

Sec 18 - T107N - R52W

424+33
In Place
24" x 88' RCP & 2 Flared Ends
Left - Remove & Reset Flared End, Extend 12' RCP
Right- Remove & Reset Flared End, Extend 14' RCP

Sunde Weiland Living Trust

Government Lot 4 and the SE1/4 SW1/4 of Section 7 - Township 107 North - Range 52 West of the 5th P.M., except Lot H1 in the S1/2 SW1/4

PI 423+03.27
N 652825.96
E 2810220.49
Del 1°45'22"R
Dc 0°13'52"
T 380.03
L 760.00
R 24795.06

Jody M. Bergheim

Tract A of Bergheim First Addition in the NW1/4 of Section 18 - Township 107 North - Range 52 West of the 5th P.M.

TRACT A

BERGHEIM FIRST ADDITION

Government Lot 4

Government Lot 1

TRACT 3

Section Line

410+00 415+00 420+00 425+00 430+00

150' 150'

33' 33'

409+33
Begin
Shoulder
Widening

411+43
Begin
Taper for
Left Turn Lane

SE1/4

415+63
End
Taper for
Left Turn Lane
Begin
Left Turn Lane

425+83
End
Left Turn Lane
Begin
Taper for
Left Turn Lane

NE1/4

430+03
End
Taper for
Left Turn Lane

432+13
End
Shoulder
Widening

Karl Stampe Henning

The South 741 feet of the East 416 feet of the SE1/4 of Section 12 - Township 107 North - Range 53 West of the 5th P.M., except Lot H1 in the SE1/4

Property Line 416 feet

Property Line 741 feet

448th Avenue Limited Partnership

The SE1/4 of Section 12 - Township 107 North - Range 53 West of the 5th P.M., except the South 741 feet of the East 416 feet thereof and except Lot H1 therein

Janet A. Sunde Living Trust

The NE1/4 of Section 13 - Township 107 North - Range 53 West of the 5th P.M., except Lot H1 therein

Remove Topsoil	1625	Cu.Yds.
Excavation	1932	Cu.Yds.
Undercut	5096	Cu.Yds.
UnstableExcavation	175	Cu.Yds.
Contractor Furnished Borrow Excavation	7065	Cu.Yds.
Total	15,893	Cu.Yds.

Embankment	3657		Cu.Yds.
+50%	1826	5486	Cu.Yds.
Undercut	5096		Cu.Yds.
+50%	2548	7644	Cu.Yds.
*Approaches		160	Cu.Yds.
Place Topsoil		1625	Cu.Yds.
Waste		978	Cu.Yds.
Total		15,893	Cu.Yds.

*Break Down for Approaches:		
419+45 Lt	40	Cu.Yds.
419+45 Rt	40	Cu.Yds.
427+20 Lt	40	Cu.Yds.
427+20 Rt	40	Cu.Yds.
Total	160	Cu.Yds.

Sec 12 - T107N - R53W

Sec 13 - T107N - R53W

PLOTTED FROM - TRMIINT16

FILE - ...\PRJ2023\LAKE06P9\D06P9.DGN

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0081(112)95	66	167

Plotting Date: 05/10/2024

PLOT SCALE - 1:150

PLOT NAME - 16

FILE - ...\PROJ2023\LAKE06P9\D06P9.DGN

PLOTTED FROM - TRM1INT16

Sec 19 - T107N - R52W

Government Lot 4

Sec 30 - T107N - R52W

529+69 (119 ac)
Place New
36" x 72' RCP & 2 Flared Ends

529+69
Take Out 36" - 72' CMP
& 2 Flared Ends

Dennis J. Jung & Janice I. Jung

Government Lots 1 and 2 and the E1/2 NW1/4 of Section 30 - Township 107 North - Range 52 West of the 5th P.M., except Lot H1 in the NW1/4

Government Lot 1

33'
33'

150'

520+00

525+00

530+00

535+00

540+00

150'

33'
33'

SE1/4

Property Line 550 feet

Dennis J. Jung & Janice I. Jung

The NE1/4 of Section 25 - Township 107 North - Range 53 West of the 5th P.M., except the North 250 feet of the East 550 feet thereof and except Lot H1 therein

Prop. Line 250 feet

East River Electric Power Cooperative, Inc.

The North 250 feet of the East 550 feet of the NE1/4 NE1/4 of Section 25 - Township 107 North - Range 53 West of the 5th P.M., except Lot H1 in the NE1/4

Sec 24 - T107N - R53W

Sec 25 - T107N - R53W

EROSION AND SEDIMENT CONTROL LEGEND

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0081(112)95	67	167

Plotting Date: 05/10/2024

- Low Flow Silt Fence
- High Flow Silt Fence
- High Flow Silt Fence at Pipe
- Sediment Control at Inlet After Placement of Surfacing
- Sediment Control at Inlet Before Placement of Surfacing
- Temporary Sediment Barriers
- Temporary Water Barriers
- Floating Silt Curtain
- Sediment Filter Bags
- Triangular Silt Barriers
- Erosion Control Wattles on Slopes
- Erosion Control Wattles at Inlets
- Erosion Control Wattles in Ditches
- Erosion Bales
- Surfacing Roughening
- Temporary Grass Hay or Straw Mulch/ Soil Stabilizer
- Cut Interceptor Ditch
- Temporary Slope Drain
- Bonded Fiber Matrix/ Fiber Reinforced Matrix
- Rock Check Dam
- Type 1 Erosion Control Blanket
- Type 2 Erosion Control Blanket
- Type 3 Erosion Control Blanket
- Type 4 Erosion Control Blanket
- Type 1 Turf Reinforcement Mat
- Type 2 Turf Reinforcement Mat
- Type 3 Turf Reinforcement Mat
- Transition Mat
- Silt Trap (See Standard Plate 734.04)

BEST MANAGEMENT PRACTICES

Best Management Practices (BMPs) are split into three categories and are to be used throughout construction.

INITIAL PHASE

BMPs from the Legend shown as Orange Symbols on the Erosion and Sediment Control Plan Sheets are to be installed in the Initial Phase prior to earth disturbing activitles and remain in place for the Intermediate Phase for temporary stabilization and in the Final Phase to achieve final stabilization.

INTERMEDIATE PHASE

BMPs from the Legend shown as Blue Symbols on the Erosion and Sediment Control Plan Sheets are to be installed in the Intermediate Phase for temporary stabilization and remain in place in the Final Phase to achieve final stabilization.

FINAL PHASE

BMPs from the Legend shown as Green Symbols on the Erosion and Sediment Control Plan Sheets are to be installed in the Final Phase to achieve final stabilization.

If these items are applicable they are to be shown in the updated SWPPP using the Symbols given.

- TS — Topsoil Stockpile
- M — On-Site Construction Material Storage Area
- B — Borrow Area
- SK — Spill Kit
- CE — Stabilized Construction Entrance
- WP — Work Platform
- VB — Vegetated Buffer Strip
- CC — Cover Crop Seeding
- CW — Concrete Washout
- PT — Portable Toilet
- AP — Asphalt Plant Site
- CP — Concrete Plant Site
- V — Vehicle and Equipment Parking Area, Fueling Area, or Maintenance Area
- D — Dumpster or other Trash and Debris Containers

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0081(112)95	68	167

Plotting Date: 05/10/2024

US81 & 223rd St Intersection

New Left Turn Lane

Sec 18 - T108N - R52W

Sec 19 - T108N - R52W

Install High Flow Silt Fence
at the following locations:

151+62 Rt	Inlet End of Pipe	18 Ft
158+13 Rt	Inlet End of Pipe	18 Ft
	Total	36 Ft

Dale L. Schwader

Government Lots 3 and 4 and the E1/2 SW1/4 of Section 18 - Township 108 North - Range 52 West of the 5th P.M., except the North 180 feet of the West 600 feet of Governent Lot 3, except the South 135 feet of the North 315 feet of the West 600 feet of Government Lot 3 and except the Lot H1 in the SW1/4

Government Lot 3

Government Lot 4

Government Lot 1

33'
33'

150'
Section Line
145+00
150+00
155+00
160+00
165+00
Section Line
150'

SE1/4

N1/2 NE1/4

33'
33'
Section Line

Dennis & Donna Rensch Living Trust

The SE1/4 of Section 13 - Township 108 North - Range 53 West of the 5th P.M., except Lot 1 of Minnaert's Addition therein and except Lot H1 therein

Hyland Family Farm, LLC

The N1/2 NE1/4 of Section 24 - Township 108 North - Range 53 West of the 5th P.M., except Lot H1 therein

Sec 13 - T108N - R53W

Sec 24 - T108N - R53W

PLOT SCALE - 1:150

PLOT NAME - 18

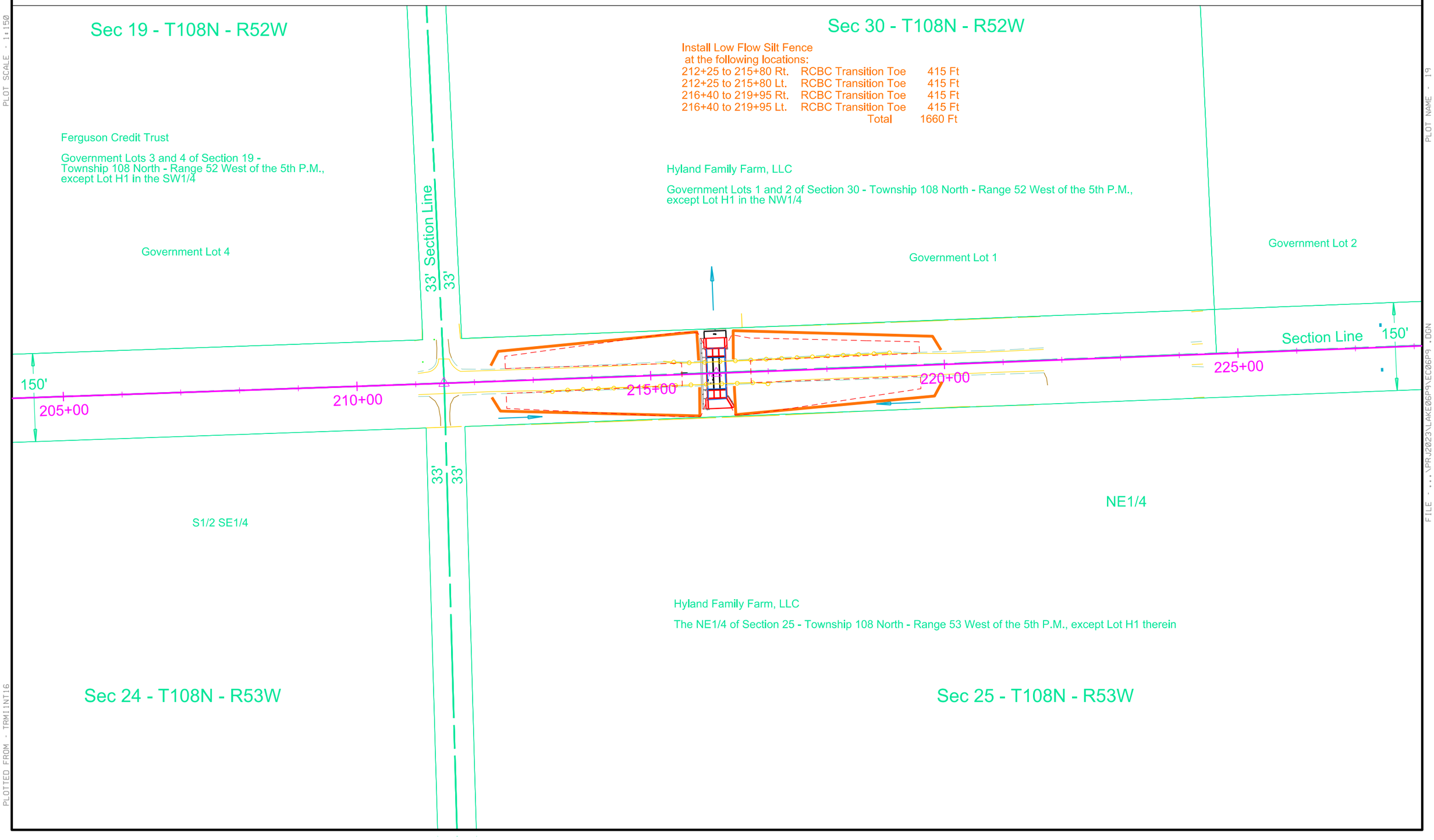
FILE - ...\PRJ2023\LAKE06P9\EC06P9_D0N

PLOTTED FROM - TRMIINT16

3-10'x8' RCBC Extension @ 216+13

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0081(112)95	69	167

Plotting Date: 05/10/2024



PLOT SCALE - 1:150

PLOTTED FROM - TRMIINT16

PLOT NAME - 19

FILE - ...\PRJ2023\LAKE06P9\EC06P9.DGN

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0081(112)95	70	167

Plotting Date: 05/10/2024

US81 & 225th St Intersection

New Left Turn Lane

Sec 30 - T108N - R52W

Sec 31 - T108N - R52W

Install High Flow Silt Fence
at the following locations:

264+00 Rt	Inlet End of Pipe	18 Ft
264+98 Rt	Inlet End of Pipe	18 Ft
268+40 Rt	Inlet End of Pipe	30 Ft
275+69 Rt	Inlet End of Pipe	18 Ft
	Total	84 Ft

Dallas D. Schwiesow & Chonette F. Schwiesow

Government Lots 3 and 4 of Section 30 - Township 108 North - Range 52 West of the 5th P.M.,
except Lot H1 in the W1/2 SW1/4

Audrey E. Keierleber

Government Lots 1 and 2 and the E1/2 NW1/4 of Section 31 - Township 108 North - Range 52 West of the 5th P.M.,
except Lot H1 in the NW1/4

Government Lot 4

Government Lot 1

Government Lot 2

33'
33'

150'
150'

255+00
260+00
265+00
270+00
275+00

Section Line

SE1/4

E1/2 NE1/4

Hyland Family Farm, LLC

The SE1/4 of Section 25 - Township 108 North - Range 53 West of the 5th P.M., except Lot H1 therein

Leland J. Spilde & Diane M. Spilde

The North 680.26 feet of the E1/2 NE1/4 of Section 36 - Township 108 North - Range 53 West of the 5th P.M.,
except Lot H1 therein

Property Line

Duane S. Hyland & Barbara J. Hyland

The E1/2 NE1/4 of Section 36 - Township 108 North - Range 53 West of the 5th P.M.,
except the North 680.26 feet thereof
and except Lot H1 therein

Sec 25 - T108N - R53W

Sec 36 - T108N - R53W

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0081(112)95	71	167

Plotting Date: 05/10/2024

US81 & 228th St Intersection

New Left Turn Lane

Sec 7 - T107N - R52W

Sec 18 - T107N - R52W

Install High Flow Silt Fence
at the following locations:

411+79 Rt	Inlet End of Pipe	18 Ft
411+79 Lt	Outlet End of Pipe	18 Ft
422+73 Lt	Inlet of Pipe	18 Ft
424+33 Lt	Inlet End of Pipe	18 Ft
	Total	72 Ft

Sunde Weiland Living Trust

Government Lot 4 and the SE1/4 SW1/4 of Section 7 - Township 107 North - Range 52 West of the 5th P.M., except Lot H1 in the S1/2 SW1/4

PI 423+03.27
N 652825.96
E 2810220.49
Del 1°45'22"R
Dc 0°13'52"
T 380.03
L 760.00
R 24795.06

Government Lot 4

TRACT A

BERGHEIM FIRST ADDITION

Jody M. Bergheim

Tract A of Bergheim First Addition in the NW1/4 of Section 18 - Township 107 North - Range 52 West of the 5th P.M.

Government Lot 1

TRACT 3

Section Line

410+00 415+00 420+00 425+00 430+00

150' 150'

33' 33' 33' 33'

Property Line 416 feet

Property Line 741 feet

SE1/4

448th Avenue Limited Partnership

The SE1/4 of Section 12 - Township 107 North - Range 53 West of the 5th P.M., except the South 741 feet of the East 416 feet thereof and except Lot H1 therein

Karl Stampe Henning

The South 741 feet of the East 416 feet of the SE1/4 of Section 12 - Township 107 North - Range 53 West of the 5th P.M., except Lot H1 in the SE1/4

NE1/4

Janet A. Sunde Living Trust

The NE1/4 of Section 13 - Township 107 North - Range 53 West of the 5th P.M., except Lot H1 therein

Sec 12 - T107N - R53W

Sec 13 - T107N - R53W

PLOT SCALE - 1:150

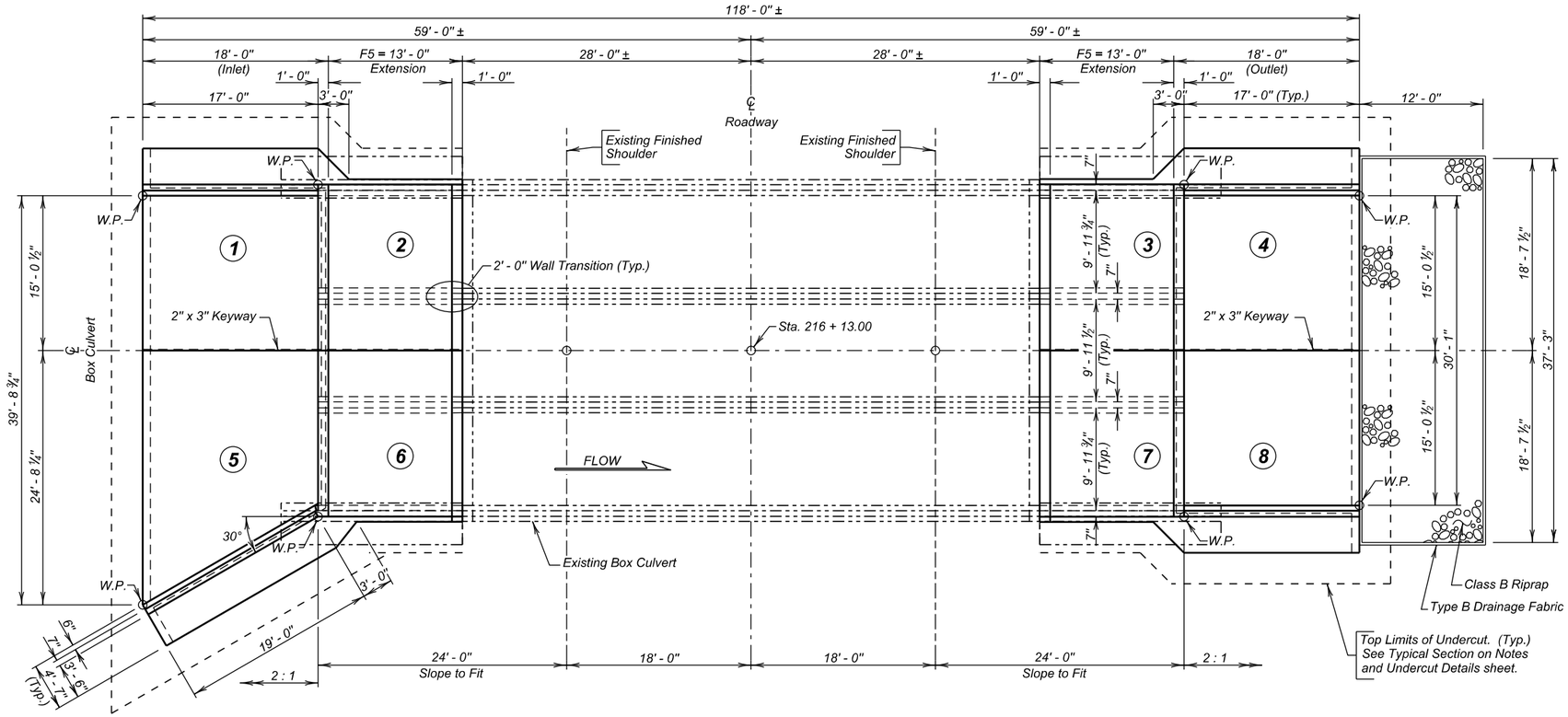
PLOT NAME - 21

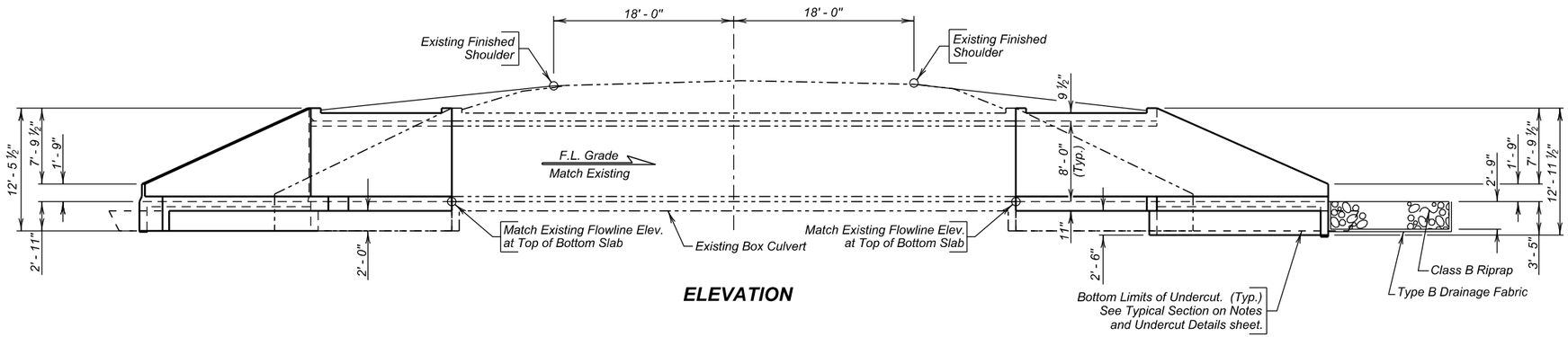
FILE - ...\PRJ2023\LAKE06P9\EC06P9.DGN

PLOTTED FROM - TRMIINT16

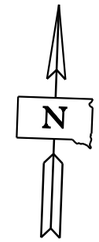
Revised June 11, 2024 ER/BM

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	NH 0081(112)95	72	167





ELEVATION



NOTE: All stations and elevations are based on survey of the existing box culvert. The intent is to match the existing box location, flowline, and slope.

-X028-

INDEX OF CULVERT SHEETS-

ESTIMATED QUANTITIES

	ITEM	UNIT	QUANTITY
	Class A45 Concrete, Box Culvert	Cu. Yd.	142.6
	Reinforcing Steel	Lb.	17020
	Structure Excavation, Box Culvert	Cu. Yd.	77
	Box Culvert Undercut	Cu. Yd.	219
≠	Class B Riprap	Ton	65.6
	Type B Drainage Fabric	Sq. Yd.	82
	Breakout Structural Concrete	Cu. Yd.	32.0
	Install Dowel in Concrete	Each	128

≠ For estimating purposes only, a factor of 1.4 tons/cu. yd. was used to convert Cu. Yd. to Tons.

PLANS BY :
OFFICE OF BRIDGE DESIGN, SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION

GENERAL DRAWING AND QUANTITES

FOR

3 - 10' X 8' BOX CULVERT EXTENSION

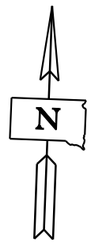
OVER BATTLE CREEK — 0° SKEW
STA. 216 + 13.00 — SEC. 25/30-T108N-R53/52W
STR. NO. 40-120-042 — NH 0081(112)95
PCN 06P9 — HL-93

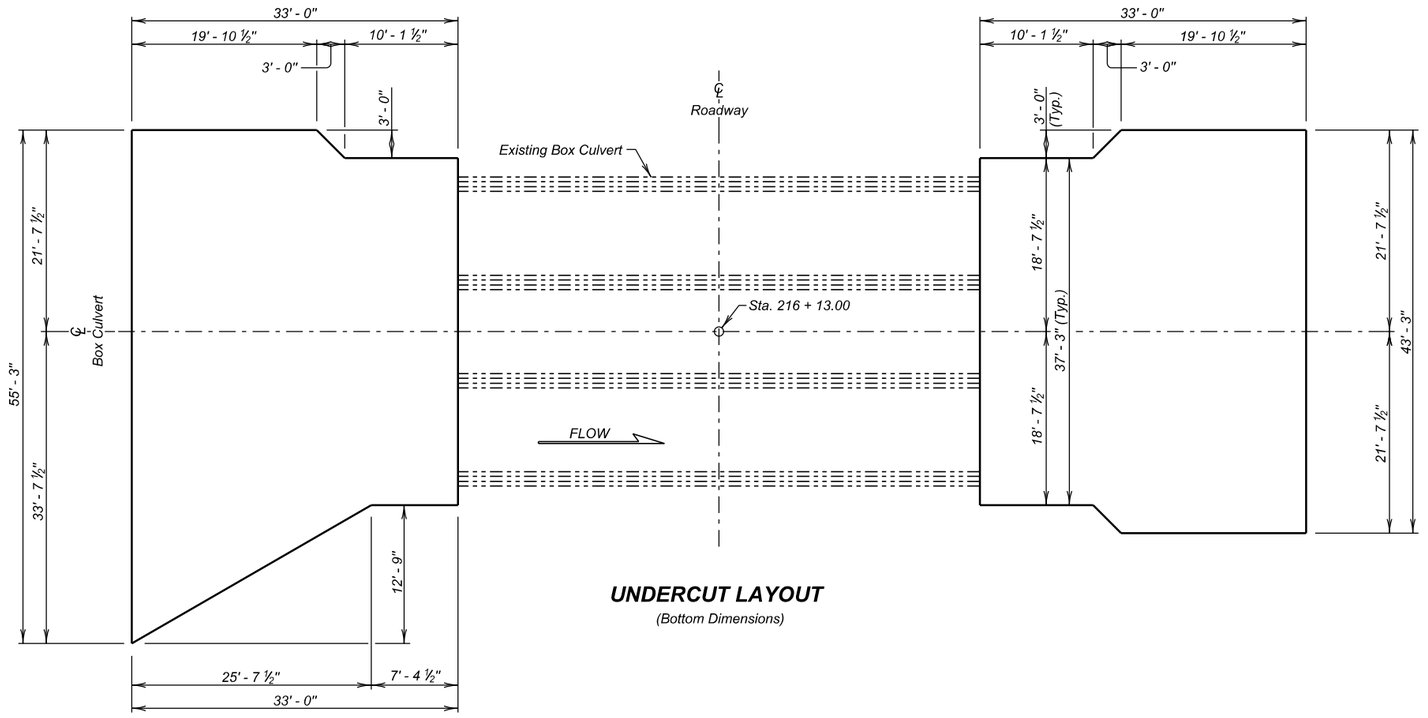
LAKE COUNTY
S. D. DEPT. OF TRANSPORTATION
NOVEMBER 2023

-X028- 1 OF 10

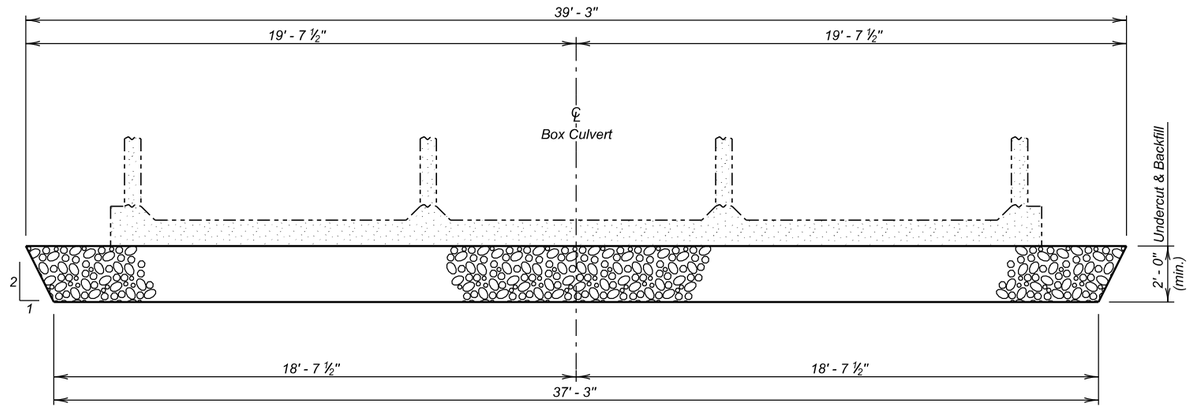
DESIGNED BY	DRAWN BY	CHECKED BY	
BS/BM	BT	ER	Steve A Johnson BRIDGE ENGINEER
LAKE06P9	06P9TA01		

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	NH 0081(112)95	73	167





UNDERCUT LAYOUT
(Bottom Dimensions)



TYPICAL SECTION
(For Limits of Undercut)

SPECIFICATIONS

1. *Design Specifications: AASHTO LRFD Bridge Design Specifications, 9th Edition.*
2. *Construction Specifications: South Dakota Standard Specifications for Roads and Bridges, 2015 Edition and required Provisions, Supplemental Specifications, and Special Provisions as included in the Proposal.*

GENERAL NOTES

1. *Design Live Load: HL-93. No construction loading in excess of legal load was considered.*
2. *The design of the barrel section is based on a minimum fill height of 2 feet and includes all subsequent fill heights up to and including the maximum fill height of 5 ft. (F5).*
3. *Design Material Strengths: Concrete $f'c$ = 4500 p.s.i.*
   Reinforcing Steel fy = 60000 p.s.i.
4. *All concrete will be Class A45, Box Culvert conforming to Section 460 of the Construction Specifications.*
5. *All reinforcing steel will conform to ASTM A615 Grade 60.*
6. *All lap splices shown are contact lap splices unless noted otherwise.*
7. *All exposed edges will be chamfered ¾ inch unless noted otherwise in the plans.*
8. *Use 1 inch clear cover on all reinforcing steel EXCEPT as shown.*
9. *The Contractor will imprint on the structure the date of the existing box culvert construction as well as the date of new construction as specified and detailed on Standard Plate 460.03.*
10. *Care will be taken to establish Working Points (W.P.) as shown on the wings.*
11. *Circled numbers in PLAN and ELEVATION views on the General Drawing are section I.D. Numbers (see SDDOT Materials Manual).*
12. *Cost of Preformed Expansion Joint Filler used in apron construction will be incidental to the other contract items.*
13. *For joint repair refer to "REINFORCING CONCRETE/REINFORCED CONCRETE BOX CULVERT REPAIR AND VOID GROUTING" elsewhere in the plans.*
14. *For tie bolts refer to "TIE BOLTS FOR RCP/RCBC" elsewhere in the plans.*

DIMENSIONS OF EXISTING BOX CULVERT

All details and dimensions of the Existing Box Culvert, contained in these plans, are provided as information only. It is the Contractor's responsibility to inspect and verify the actual field conditions and any necessary dimensions affecting the satisfactory completion of the work required for this project. Original construction plans can be obtained from the Office of Bridge Design.

ESTIMATED QUANTITIES

	ITEM	UNIT	QUANTITY
℄	Box Culvert Undercut	Cu. Yd.	219

℄ *For payment, quantity is based on plan shown undercut dimensions and will not be measured unless the Engineer orders a change.*

NOTES AND UNDERCUT DETAILS

FOR

3 - 10' X 8' BOX CULVERT EXTENSION

OVER BATTLE CREEK — 0° SKEW
STA. 216 + 13.00 — SEC. 25/30-T108N-R53/52W
STR. NO. 40-120-042 — NH 0081(112)95
HL-93

LAKE COUNTY
S. D. DEPT. OF TRANSPORTATION
NOVEMBER 2023

DESIGNED BY	DRAWN BY	CHECKED BY	
BS/BM	BT	ER	Steve A Johnson BRIDGE ENGINEER
LAKE06P9	06P9TA02		

Revised June 11, 2024 ER/BM

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	NH 0081(112)95	74	167

BREAKOUT STRUCTURAL CONCRETE

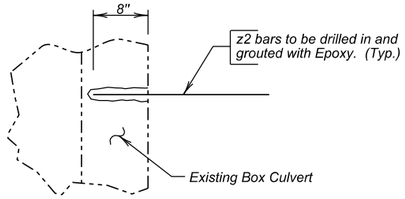
1. This work will consist of breaking out and disposing of structural concrete. All broken out concrete and other discarded material will be disposed of in accordance with the WASTE DISPOSAL SITE notes found elsewhere in the plans.
2. Define the breakout limits with 3/4 inch deep saw cuts.
3. Any additional breakout required due to spalling or cracking of the existing structure will be determined by the Engineer. Where additional breakout in the barrel section of the existing structure is required, care will be taken not to damage any of the existing reinforcing steel. All steel will be left in place and thoroughly cleaned by sandblasting.
4. Additional breakout in existing walls or top slab will require shoring up of the parapet and top slab, as directed by the Engineer.
5. Plans quantity payment will be full compensation for this item regardless of the quantity actually broken out, unless measurement is ordered by the Engineer. If the Engineer orders breakout beyond the limits shown, this additional breakout will be paid for at the contract unit price per cubic yard for Breakout Structural Concrete. If additional breakout is caused by the Contractor's operations, no additional payment will be made.
6. Breakout Structural Concrete will be paid for at the contract unit price per cubic yard. This payment will be full compensation for furnishing all materials, labor, tools and equipment necessary or incidental to breaking out the structural concrete. Payment includes, but is not limited to, excavation required to perform the required breakout, sawcutting, breaking out concrete, cleaning and sandblasting reinforcing steel and concrete surfaces, and removing and disposing of all waste materials to satisfactorily complete the work.

INSTALLING DOWELS IN CONCRETE

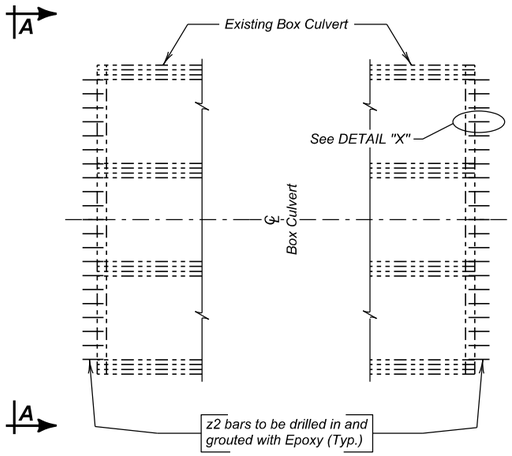
1. The epoxy resin mixture will be of a type for bonding steel to hardened concrete and shall conform to AASHTO M235 Type IV, Grade 3 (Equivalent to ASTM C881, Type IV, Grade 3).
2. The diameter of the drilled holes will not be less than 1/8 inch greater, nor more than 3/8 inch greater than the diameter of the dowels or as per the Manufacturer's recommendations. Holes will not be drilled using core bits. The drilled holes will be blown out with compressed air using a device that will reach the back of the hole to ensure that all debris or loose material has been removed prior to epoxy injection.
3. Mix epoxy resin as recommended by the Manufacturer and apply by an injection method as approved by the Engineer. Beginning at the back of the drilled holes, fill the holes 1/3 to 1/2 full of epoxy, or as recommended by the Manufacturer, prior to insertion of the steel bar. Care will be taken to prevent epoxy from running out of the horizontal holes prior to steel bar insertion. Rotate the steel bar during installation to eliminate voids and ensure complete bonding of the bar. Insertion of the bars by the dipping or painting methods will not be allowed.
4. No loads shall be applied to the epoxy grouted dowel bars until the epoxy resin has had sufficient time to cure as specified by the epoxy resin manufacturer.
5. Embed z2 dowels 8" into existing concrete.
6. z2 dowel bars will be #6 deformed bars conforming to ASTM A615 Grade 60.
7. The cost of drilling holes, epoxy resin, dowels, installation and other incidental items will be included in the contract unit price per each for Install Dowel in Concrete.

ESTIMATED QUANTITIES
(Inlet and Outlet)

ITEM	UNIT	QUANTITY
Breakout Structural Concrete	Cu. Yd.	32.0
Install Dowel in Concrete	Each	128

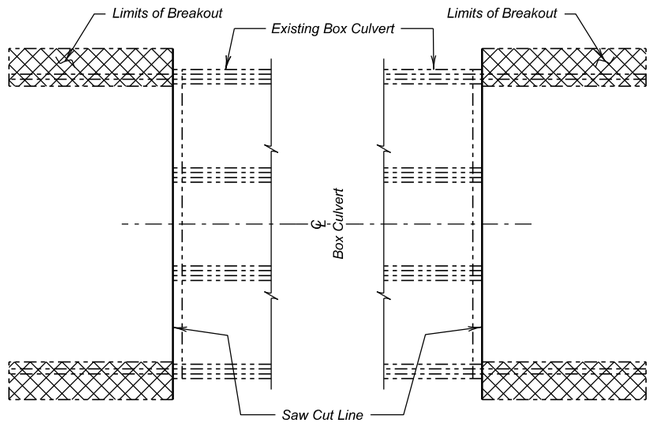


DETAIL "X"

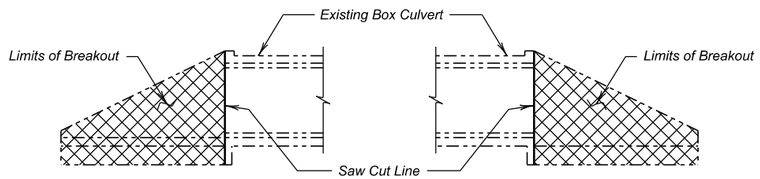


PLAN - DOWEL DETAILS

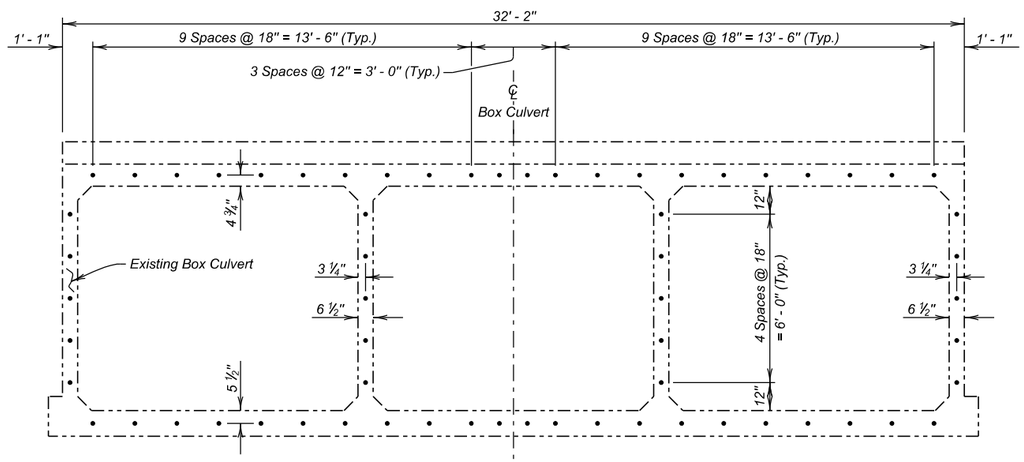
(Inlet and Outlet)



PLAN - BREAKOUT DETAILS



ELEVATION - BREAKOUT DETAILS



VIEW A - A
(Dowel Locations)

BREAKOUT AND DOWEL PLACEMENT DETAILS
FOR
3 - 10' X 8' BOX CULVERT EXTENSION

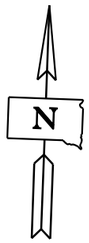
OVER BATTLE CREEK — 0° SKEW
STA. 216 + 13.00 — SEC. 25/30-T108N-R53/52W
STR. NO. 40-120-042 — NH 0081(112)95
HL-93

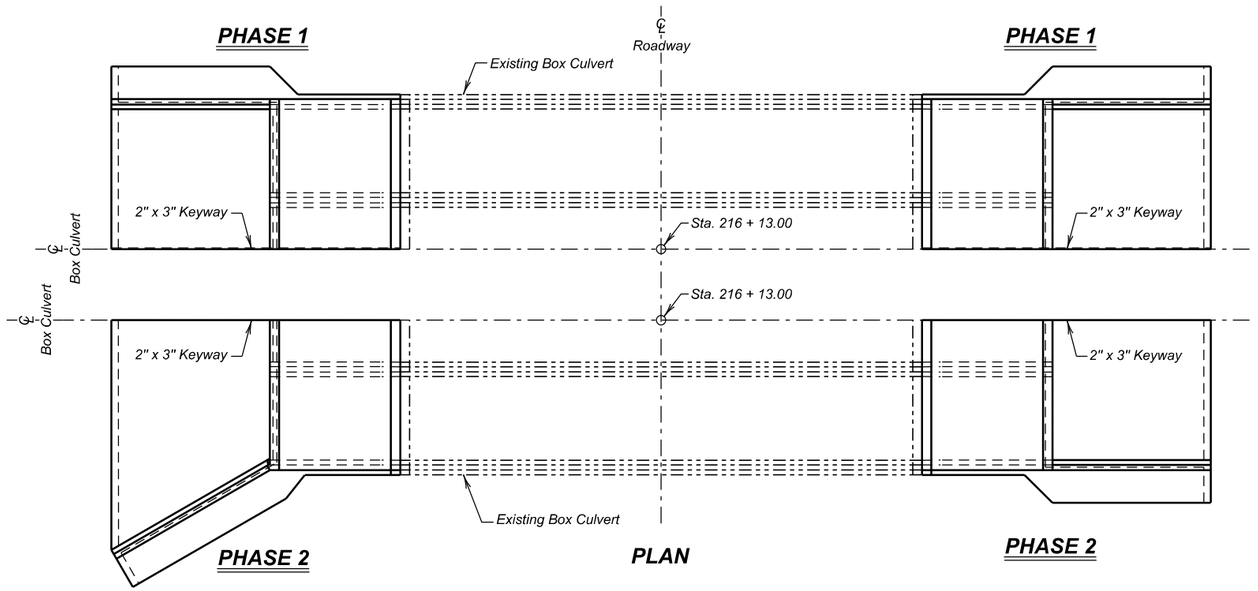
LAKE COUNTY
S. D. DEPT. OF TRANSPORTATION
NOVEMBER 2023

3 OF 10

DESIGNED BY	DRAWN BY	CHECKED BY	
BS/BM	BT	ER	Steve A Johnson BRIDGE ENGINEER
LAKE06P9	06P9TA03		

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	NH 0081(112)95	75	167

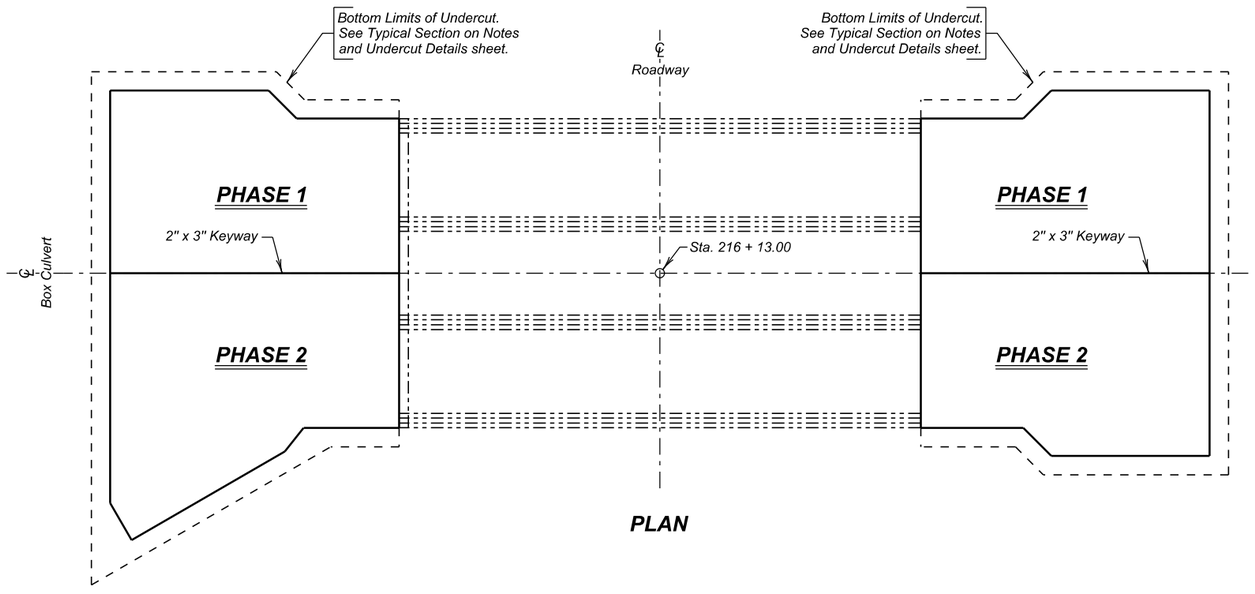




PLAN

PHASED CONSTRUCTION NOTE

Phased construction is required to allow for the diversion of stream.



PLAN

PHASE CONSTRUCTION LAYOUT

FOR

3 - 10' X 8' BOX CULVERT EXTENSION

OVER BATTLE CREEK — 0° SKEW

STA. 216 + 13.00 — SEC. 25/30-T108N-R53/52W

STR. NO. 40-120-042 — NH 0081(112)95

HL-93

LAKE COUNTY

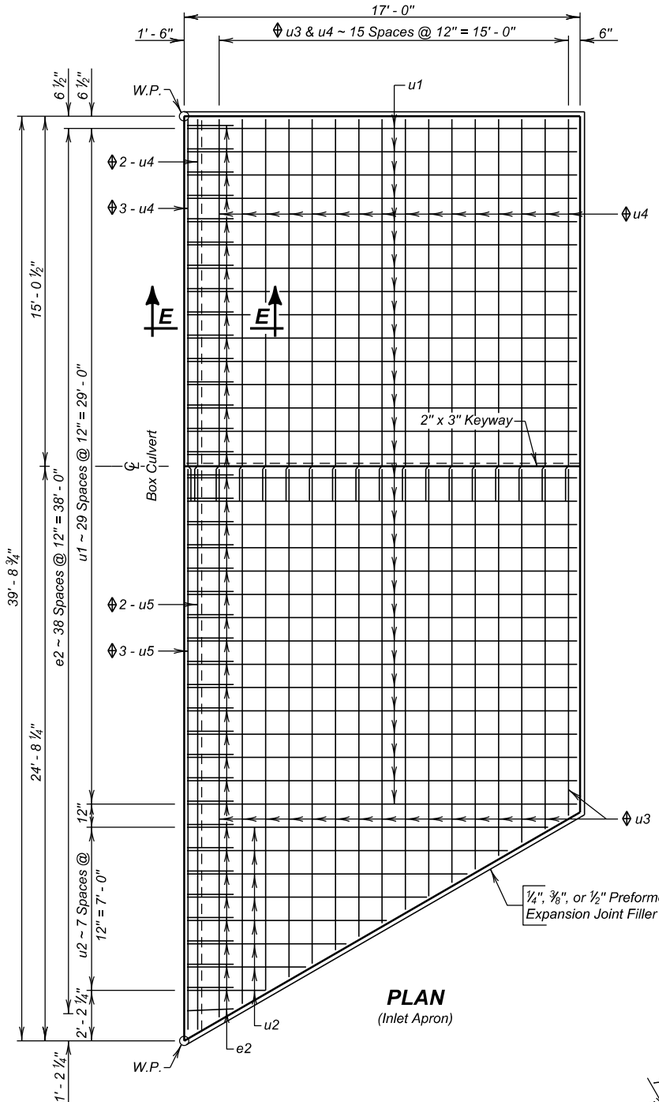
S. D. DEPT. OF TRANSPORTATION

NOVEMBER 2023

DESIGNED BY	DRAWN BY	CHECKED BY	
BS/BM	BT	ER	Steve A Johnson BRIDGE ENGINEER
LAKE06P9	06P9TA04		

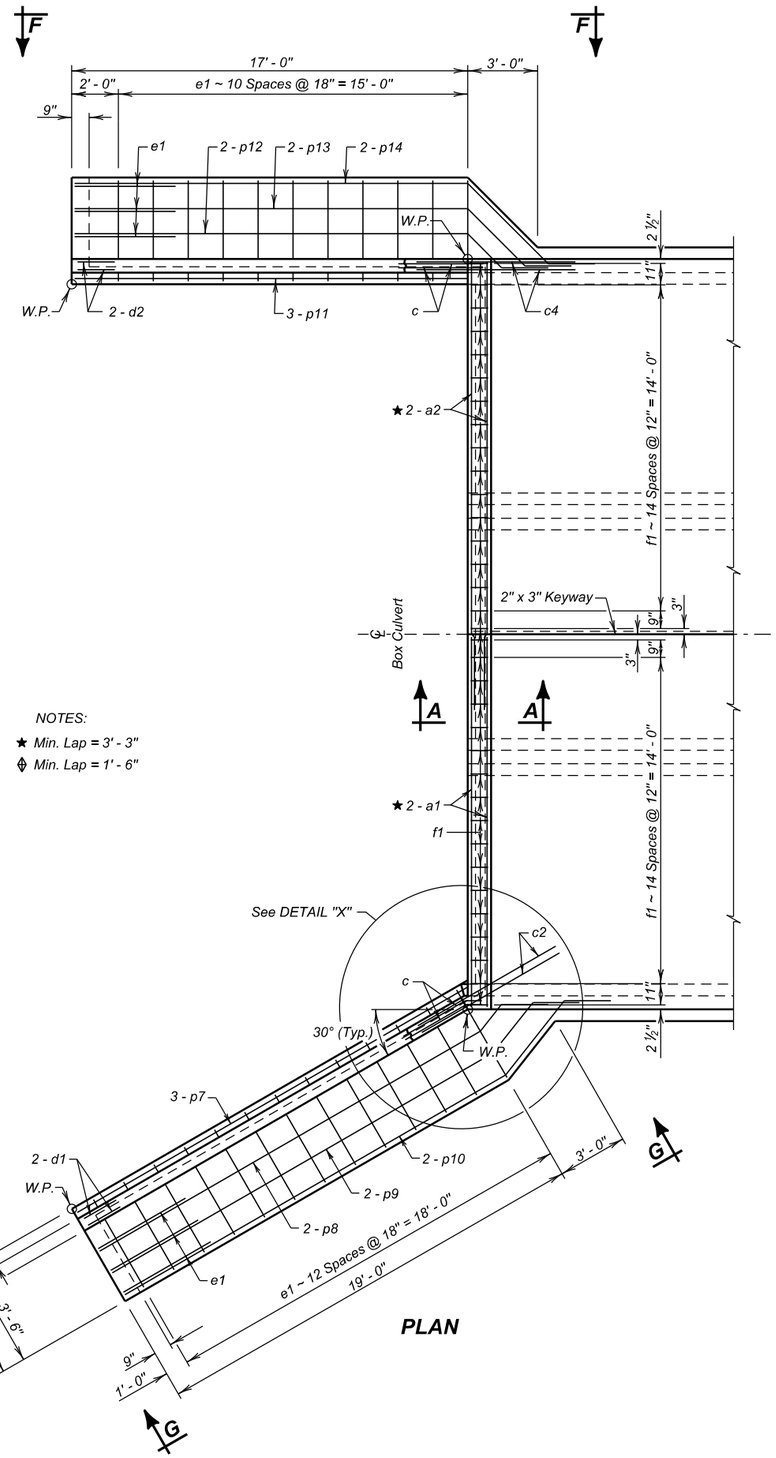
STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	NH 0081(112)95	76	167

NOTE:
Apron will NOT be built monolithic with the Box Culvert.

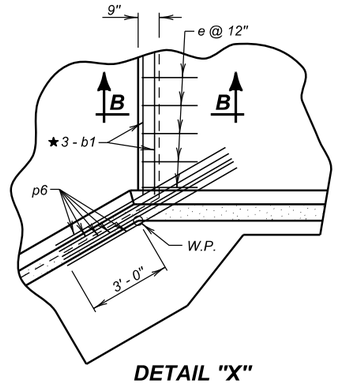


PLAN
(Inlet Apron)

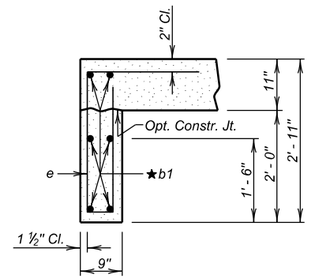
NOTES:
★ Min. Lap = 3' - 3"
⧳ Min. Lap = 1' - 6"



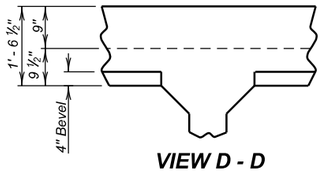
PLAN



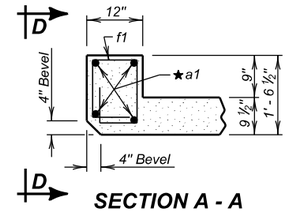
DETAIL "X"
(At Bottom Slab)



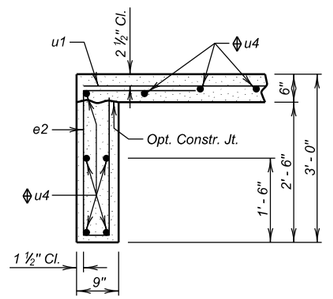
SECTION B - B



VIEW D - D
(At Interior Wall)



SECTION A - A
(At Top Slab)



SECTION E - E

INLET DETAILS (A)

FOR

3 - 10' X 8' BOX CULVERT EXTENSION

OVER BATTLE CREEK — 0° SKEW
STA. 216 + 13.00 — SEC. 25/30-T108N-R53/52W
STR. NO. 40-120-042 — NH 0081(112)95
HL-93

LAKE COUNTY
S. D. DEPT. OF TRANSPORTATION
NOVEMBER 2023

5 OF 10

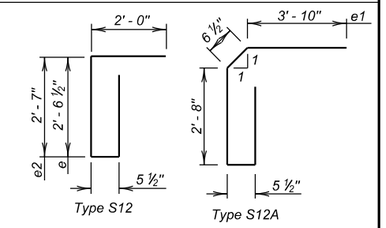
DESIGNED BY	DRAWN BY	CHECKED BY	
BS/BM	BT	ER	Steve A Johnson BRIDGE ENGINEER
LAKE06P9	06P9TA05		

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	NH 0081(112)95	77	167

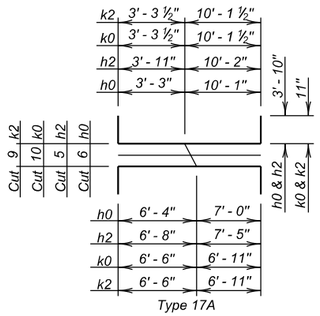
REINFORCING SCHEDULE

	Mk.	No.	Size	Length	Type
	a1	4	6	16' - 0"	Str.
	a2	4	6	19' - 6"	Str.
	b1	6	6	15' - 3"	Str.
	b2	6	6	19' - 0"	Str.
✳	c	4	5	4' - 6"	1A
	c1	4	5	20' - 6"	Str.
	c2	2	5	7' - 0"	19B
	c3	4	5	18' - 6"	Str.
	c4	2	5	7' - 0"	19B
	d1	4	5	5' - 9"	19B
	d2	4	5	5' - 9"	19B
	e	31	4	7' - 3"	S12
	e1	30	4	10' - 0"	S12A
	f1	34	4	5' - 3"	S6A
	g0	6	5	5' - 0"	19B
⌀	g1	7	4	24' - 0"	19B
	g2	2	4	20' - 9"	19B
	g3	6	5	5' - 0"	Str.
⌀	g4	7	4	21' - 9"	Str.
	g5	2	4	18' - 9"	Str.
⌀	h0	6	4	21' - 0"	17A
	h1	1	4	6' - 6"	17A
⌀	h2	5	4	21' - 9"	17A
	h3	1	4	7' - 0"	17A
⌀	k0	10	4	15' - 3"	17A
	k1	2	4	3' - 9"	17A
⌀	k2	9	4	15' - 3"	17A
✳	p6	10	6	7' - 0"	Str.
✳	p7	7	4	21' - 6"	Str.
✳	p8	2	4	21' - 3"	Str.
✳	p9	2	4	23' - 0"	Str.
✳	p10	2	4	25' - 0"	Str.
✳	p11	7	4	19' - 6"	Str.
✳	p12	2	4	19' - 3"	Str.
✳	p13	2	4	21' - 6"	Str.
✳	p14	2	4	23' - 6"	Str.
	INLET APRON				
	e2	39	4	7' - 6"	S12
	u1	30	4	16' - 9"	Str.
⌀	u2	4	4	18' - 9"	Str.
⌀	u3	8	4	38' - 9"	Str.
	u4	21	4	16' - 6"	Str.
	u5	5	4	24' - 3"	Str.

Bending Details



Type S12 Type S12A



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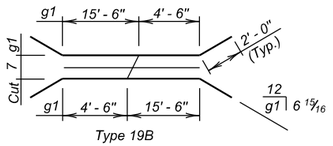

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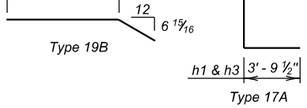

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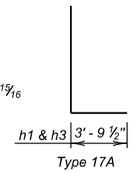

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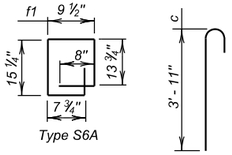

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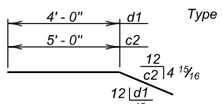
Type 1A



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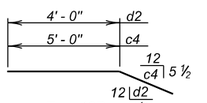
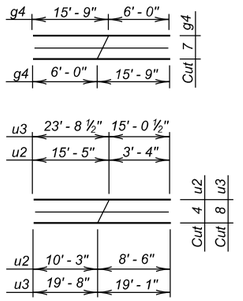


Type 19B

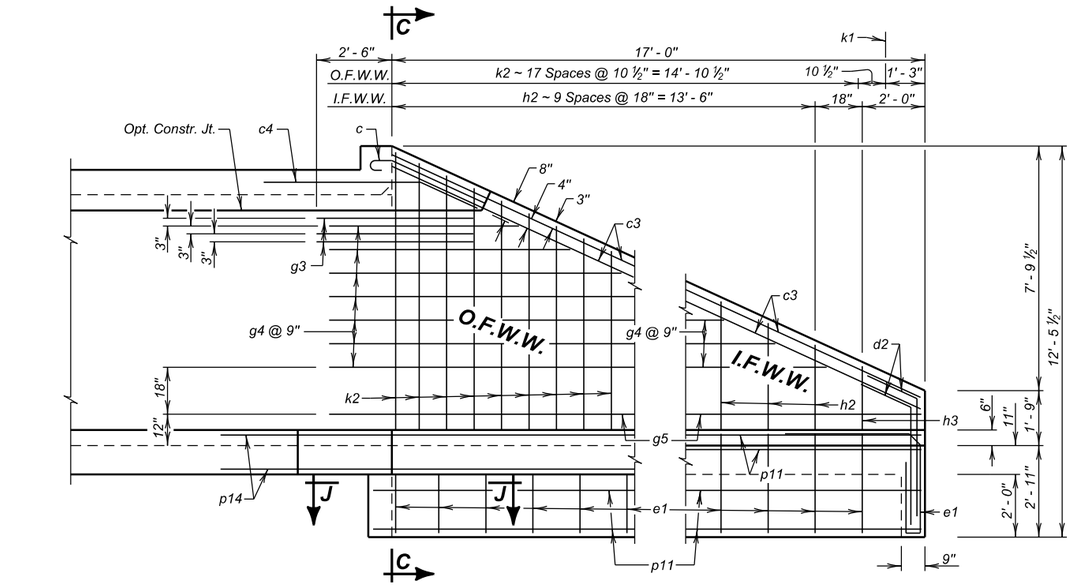
Type 17A



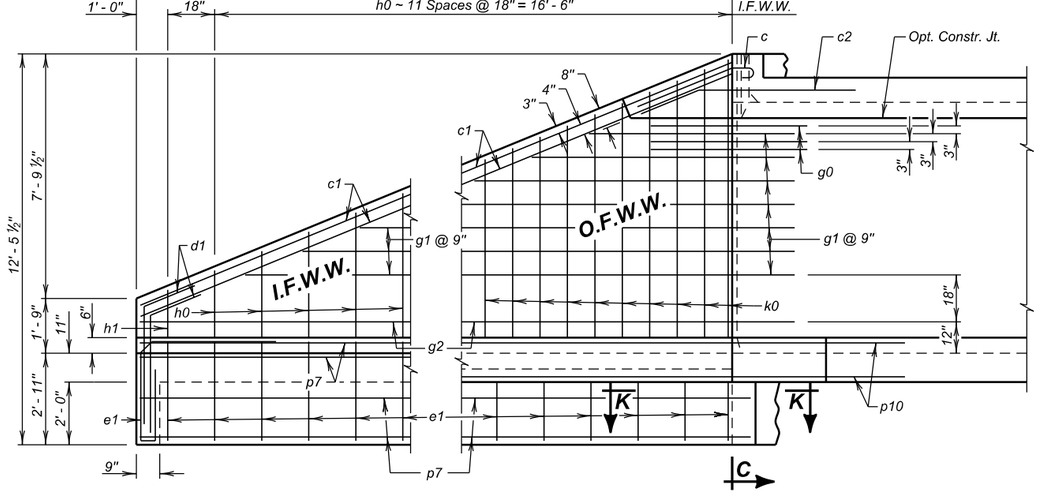
NOTES:
All dimensions are out to out of bars.
⌀ See cutting diagram.
✳ Bend in field as necessary to fit.

ESTIMATED QUANTITIES

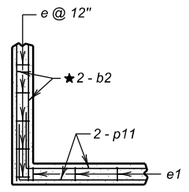
ITEM	Class A45 Concrete, Box Culvert	Reinforcing Steel	Structure Excavation, Box Culvert
UNIT	Cu. Yd.	Lb.	Cu. Yd.
Inlet	21.0	2419	11.3
Inlet Apron	13.7	1101	13.7



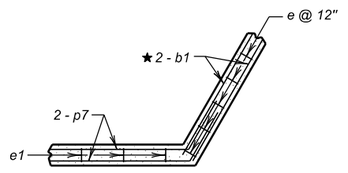
VIEW F - F



VIEW G - G



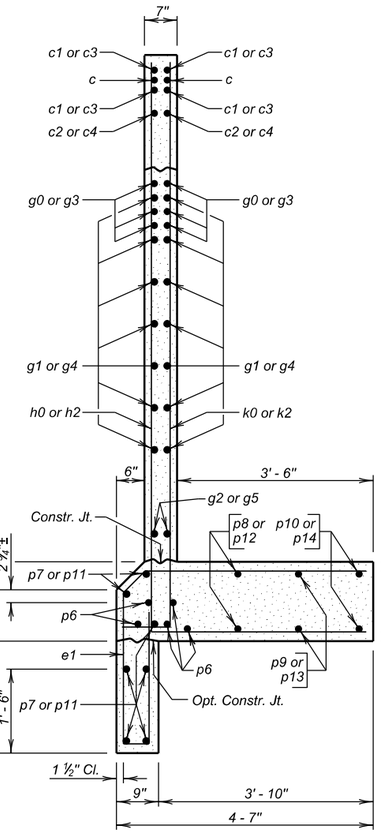
SECTION J - J



SECTION K - K

LEGEND FOR PLACING RE-STEEL

O. F. W. W. - Outside Face of Wing Wall
I. F. W. W. - Inside Face of Wing Wall



SECTION C - C

INLET DETAILS (B)
FOR
3 - 10' X 8' BOX CULVERT EXTENSION

OVER BATTLE CREEK
STA. 216 + 13.00
STR. NO. 40-120-042

0° SKEW
SEC. 25/30-T108N-R53/52W
NH 0081(112)95
HL-93

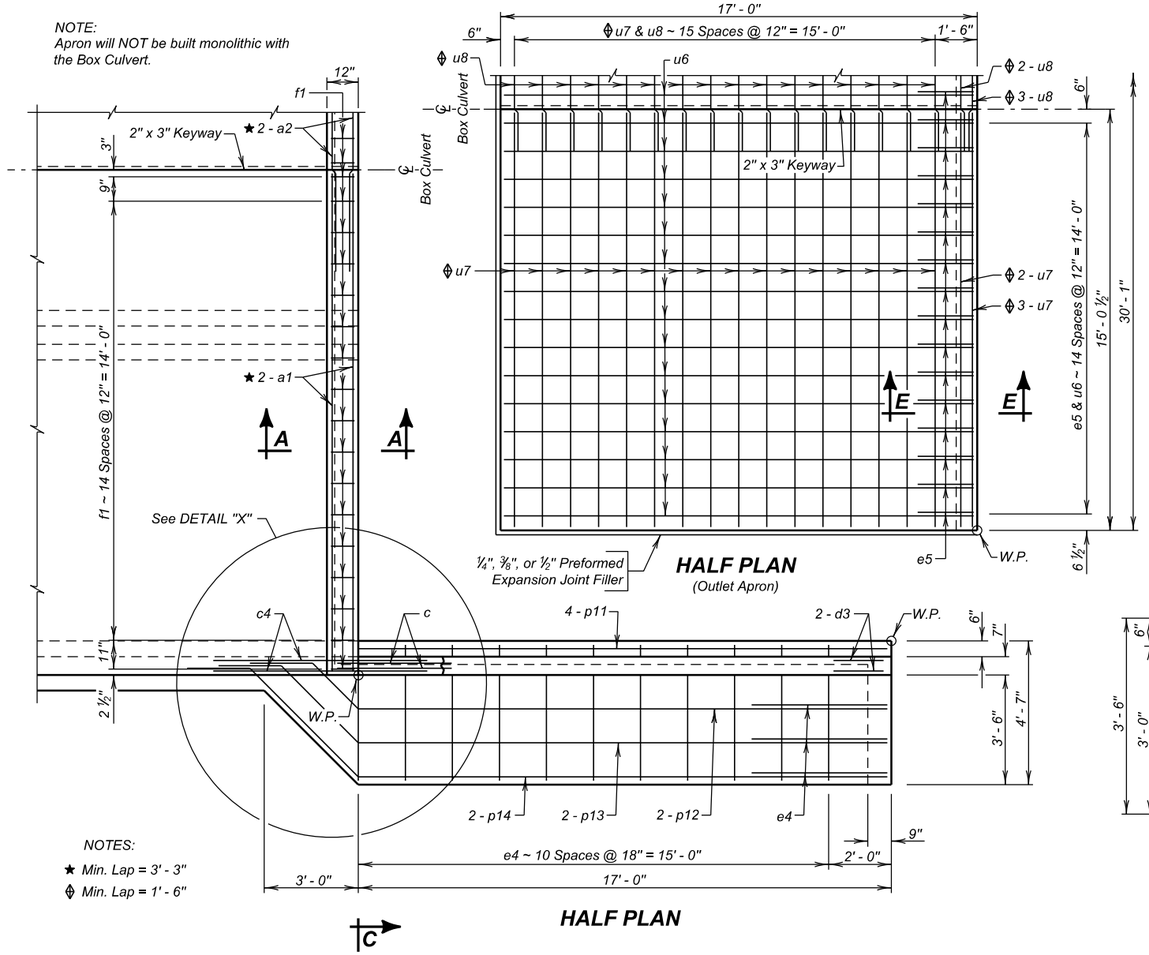
LAKE COUNTY
S. D. DEPT. OF TRANSPORTATION
NOVEMBER 2023

6 OF 10

DESIGNED BY	DRAWN BY	CHECKED BY	
BS/BM	BT	ER	Steve A Johnson BRIDGE ENGINEER
LAKE06P9	06P9TA06		

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	NH 0081(112)95	78	167

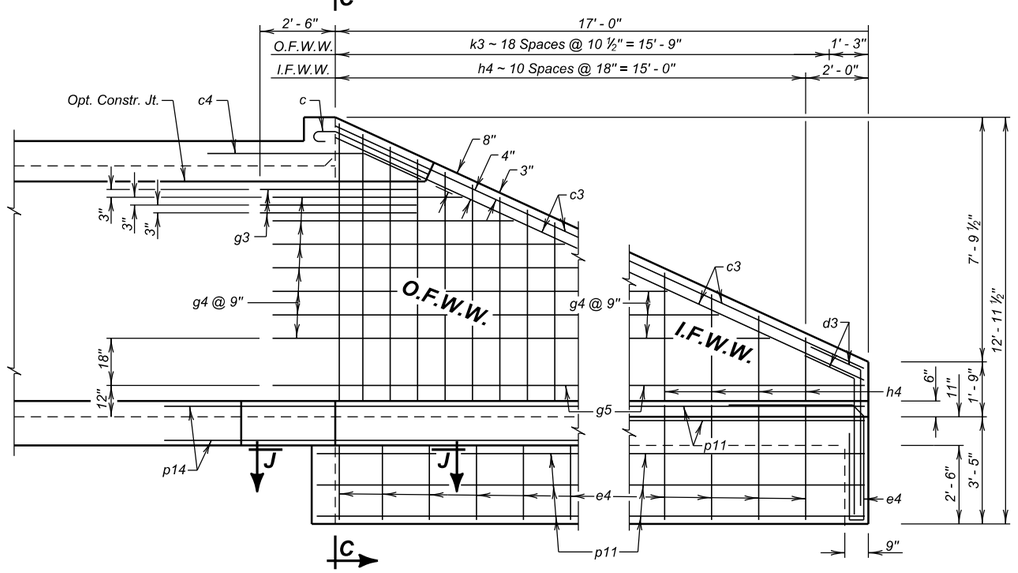
NOTE:
Apron will NOT be built monolithic with the Box Culvert.



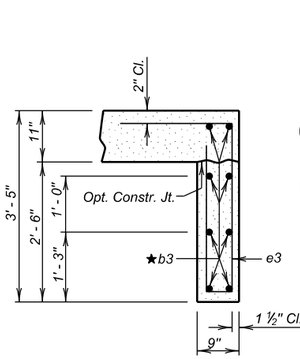
NOTES:
★ Min. Lap = 3' - 3"
⧫ Min. Lap = 1' - 6"

HALF PLAN

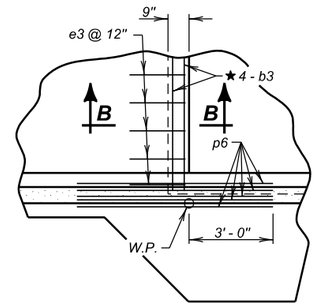
HALF PLAN (Outlet Apron)



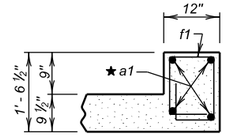
ELEVATION



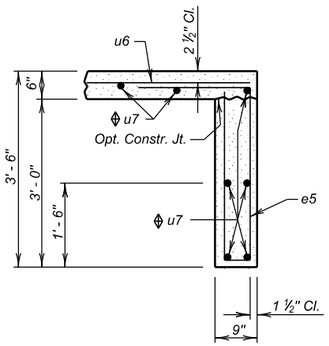
SECTION B - B



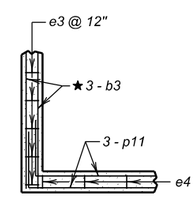
DETAIL "X"
(At Bottom Slab)



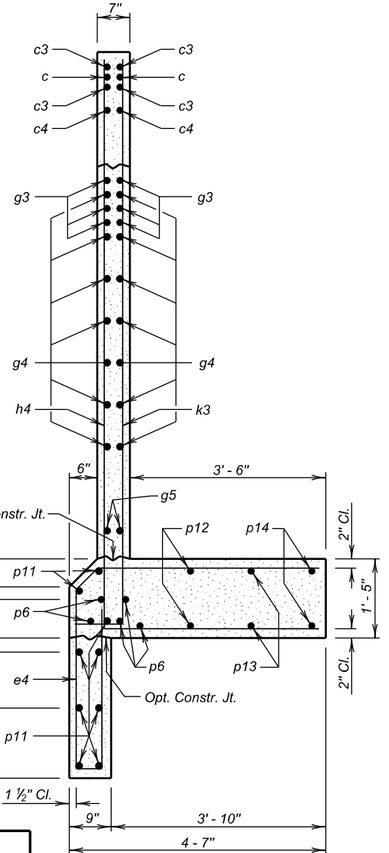
SECTION A - A
(At Top Slab)



SECTION E - E



SECTION J - J



SECTION C - C

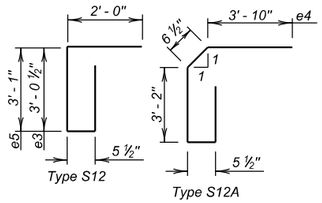
LEGEND FOR PLACING RE-STEEL

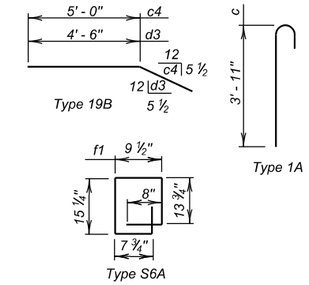
O. F. W. W. - Outside Face of Wing Wall
I. F. W. W. - Inside Face of Wing Wall

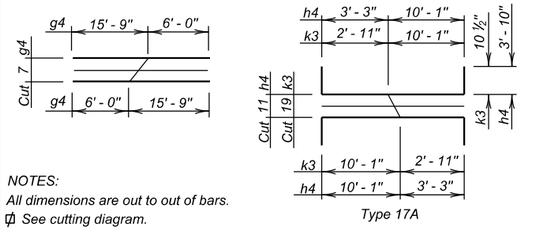
REINFORCING SCHEDULE

	Mk.	No.	Size	Length	Type
✳	a1	4	6	16' - 0"	Str.
	a2	4	6	19' - 6"	Str.
	b2	8	6	19' - 0"	Str.
	b3	8	6	15' - 6"	Str.
✳	c	4	5	4' - 6"	1A
	c3	8	5	18' - 6"	Str.
	c4	4	5	7' - 0"	19B
	d3	8	5	6' - 3"	19B
	e3	32	4	8' - 3"	S12
	e4	28	4	11' - 0"	S12A
	f1	34	4	5' - 3"	S6A
	g3	12	5	5' - 0"	Str.
⧫	g4	14	4	21' - 9"	Str.
	g5	4	4	18' - 9"	Str.
⧫	h4	11	4	21' - 0"	17A
⧫	k3	19	4	14' - 9"	17A
	p6	10	6	7' - 0"	Str.
✳	p11	18	4	19' - 6"	Str.
✳	p12	4	4	19' - 3"	Str.
✳	p13	4	4	21' - 6"	Str.
✳	p14	4	4	23' - 6"	Str.
	OUTLET APRON				
	e5	30	4	8' - 6"	S12
	u6	30	4	16' - 9"	Str.
	u7	21	4	14' - 9"	Str.
	u8	21	4	16' - 6"	Str.

Bending Details







NOTES:
All dimensions are out to out of bars.
⧫ See cutting diagram.
✳ Bend in field as necessary to fit.

ESTIMATED QUANTITIES

ITEM	Class A45 Concrete, Box Culvert	Reinforcing Steel	Structure Excavation, Box Culvert
UNIT	Cu. Yd.	Lb.	Cu. Yd.
Outlet	20.1	2553	10.8
Outlet Apron	12.0	944	12.0

OUTLET DETAILS
FOR
3 - 10' X 8' BOX CULVERT EXTENSION

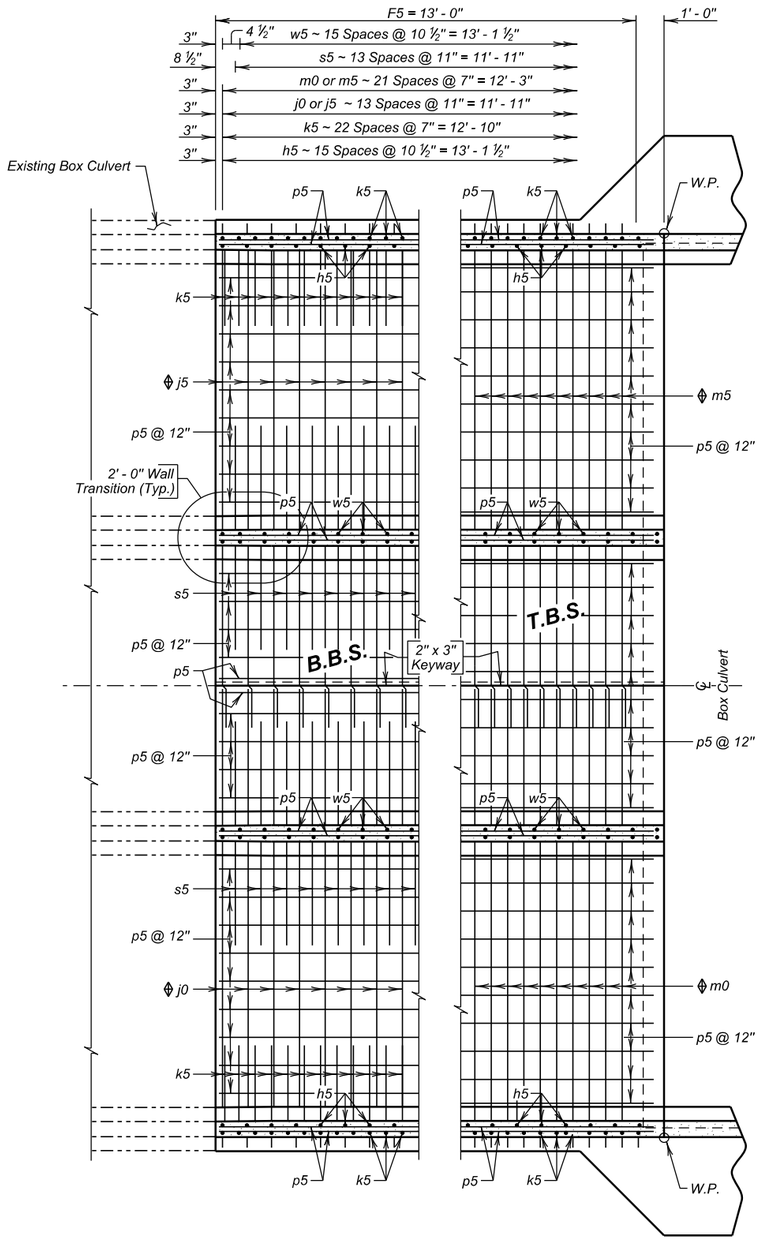
OVER BATTLE CREEK — 0° SKEW
STA. 216 + 13.00 — SEC. 25/30-T108N-R53/52W
STR. NO. 40-120-042 — NH 0081(112)95
HL-93

LAKE COUNTY
S. D. DEPT. OF TRANSPORTATION
NOVEMBER 2023

7 OF 10

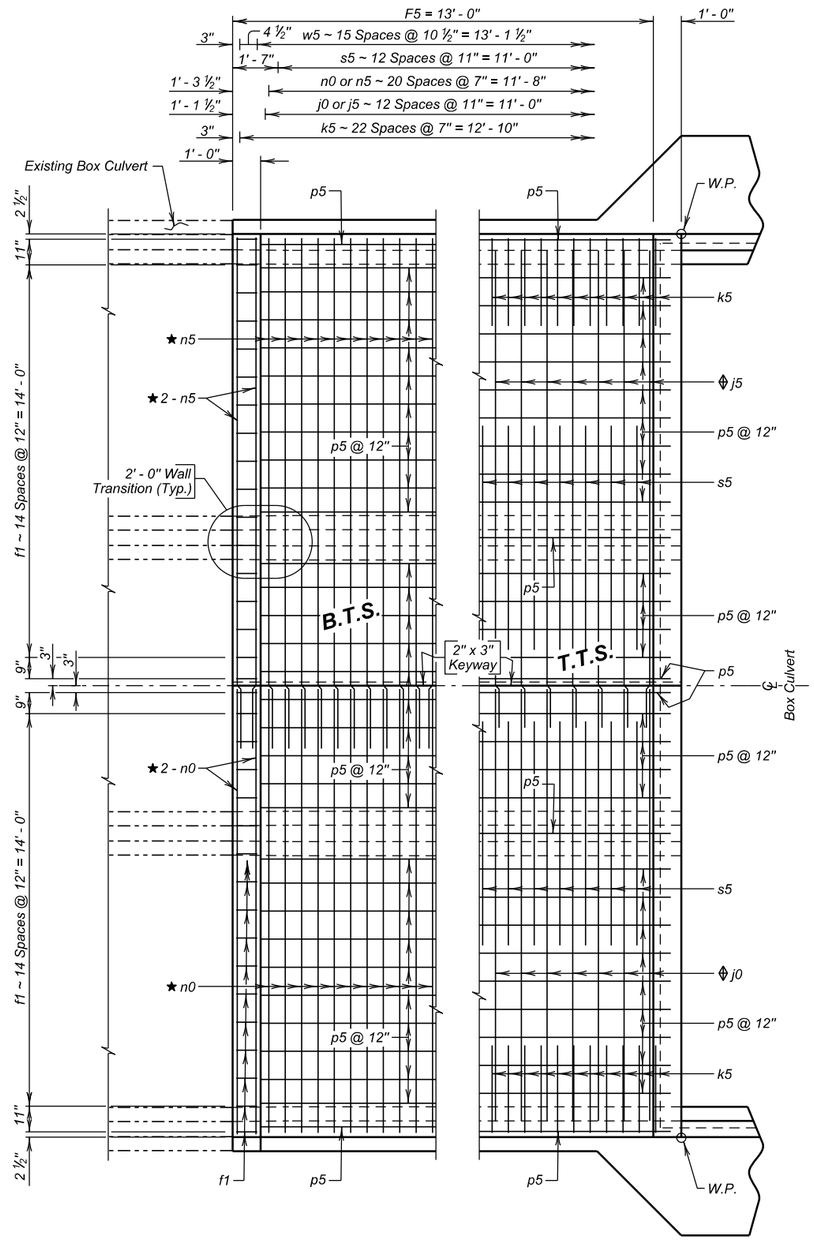
DESIGNED BY	DRAWN BY	CHECKED BY	
BS/BM	BT	ER	Steve A Johnson BRIDGE ENGINEER
LAKE06P9	06P9TA07		

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	NH 0081(112)95	79	167



PLAN

(Outlet End - Bottom Slab, Inlet similar by opposite hand.)



PLAN

(Outlet End - Top Slab, Inlet similar by opposite hand.)

LEGEND FOR PLACING RE- STEEL

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

NOTES:

★ *Min. Lap = 2' - 3"*

◈ *Min. Lap = 1' - 6"*

F5 BARREL END SECTION DETAILS (15' - 0") (A)

FOR

3 - 10' X 8' BOX CULVERT EXTENSION

OVER BATTLE CREEK — 0° SKEW

STA. 216 + 13.00 — SEC. 25/30-T108N-R53/52W

STR. NO. 40-120-042 — NH 0081(112)95

HL-93

LAKE COUNTY

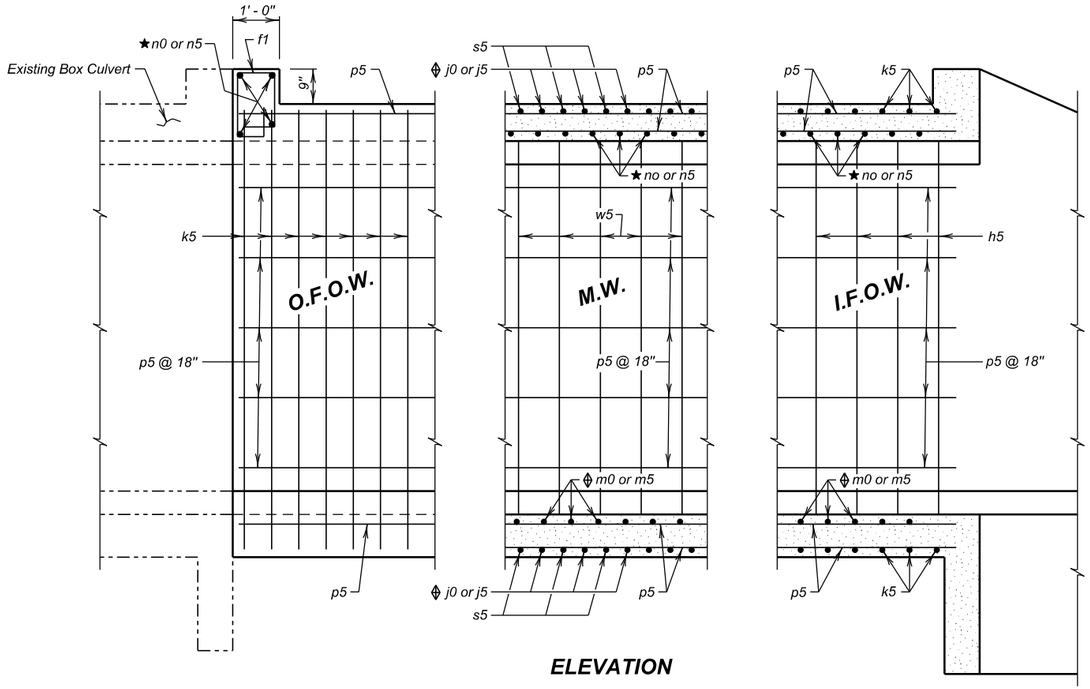
S. D. DEPT. OF TRANSPORTATION

NOVEMBER 2023

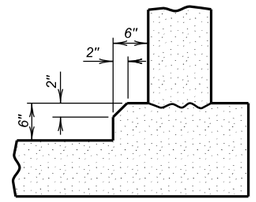
8 OF 10

DESIGNED BY	DRAWN BY	CHECKED BY	
BS/BM LAKE06P9	BT 06P9TA08	ER	Steven A Johnson BRIDGE ENGINEER

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	NH 0081(112)95	80	167



ELEVATION



OPTIONAL FILLET DETAIL

(At Bottom Slab)

Note: Contractor may form the optional full fillet, with 2" Chamfer, as detailed. The cost of the additional concrete shall be borne by the Contractor.

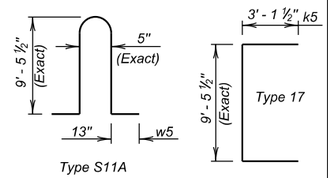
LEGEND FOR PLACING RE- STEEL

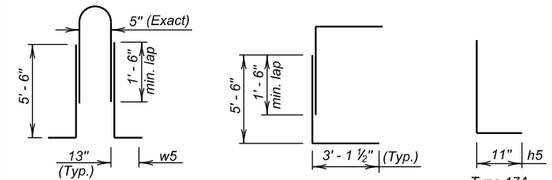
O. F. O. W.	- Outside Face of Outside Wall
I. F. O. W.	- Inside Face of Outside Wall
M. W.	- Middle Wall

REINFORCING SCHEDULE

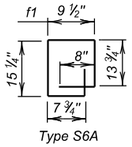
(For 2 - F5 Barrel End Sections @ 15' - 0")

Mk.	No.	Size	Length	Type	Bending Details
f1	68	4	5' - 3"	S6A	
h5	64	4	10' - 0"	17A	
j0	54	4	15' - 6"	Str.	
j5	54	4	17' - 3"	Str.	
k5	92	4	15' - 9"	17	
m0	44	4	16' - 6"	Str.	
m5	44	4	18' - 3"	Str.	
n0	50	5	16' - 0"	Str.	
n5	50	5	18' - 6"	Str.	
p5	340	4	13' - 6"	Str.	
s5	108	4	4' - 9"	Str.	
w5	68	4	21' - 3"	S11A	
✳z2	126	6	2' - 3"	Str.	





Contractor may use optional reinforcing steel splice, as shown. The cost of the additional reinforcing steel shall be borne by the Contractor.

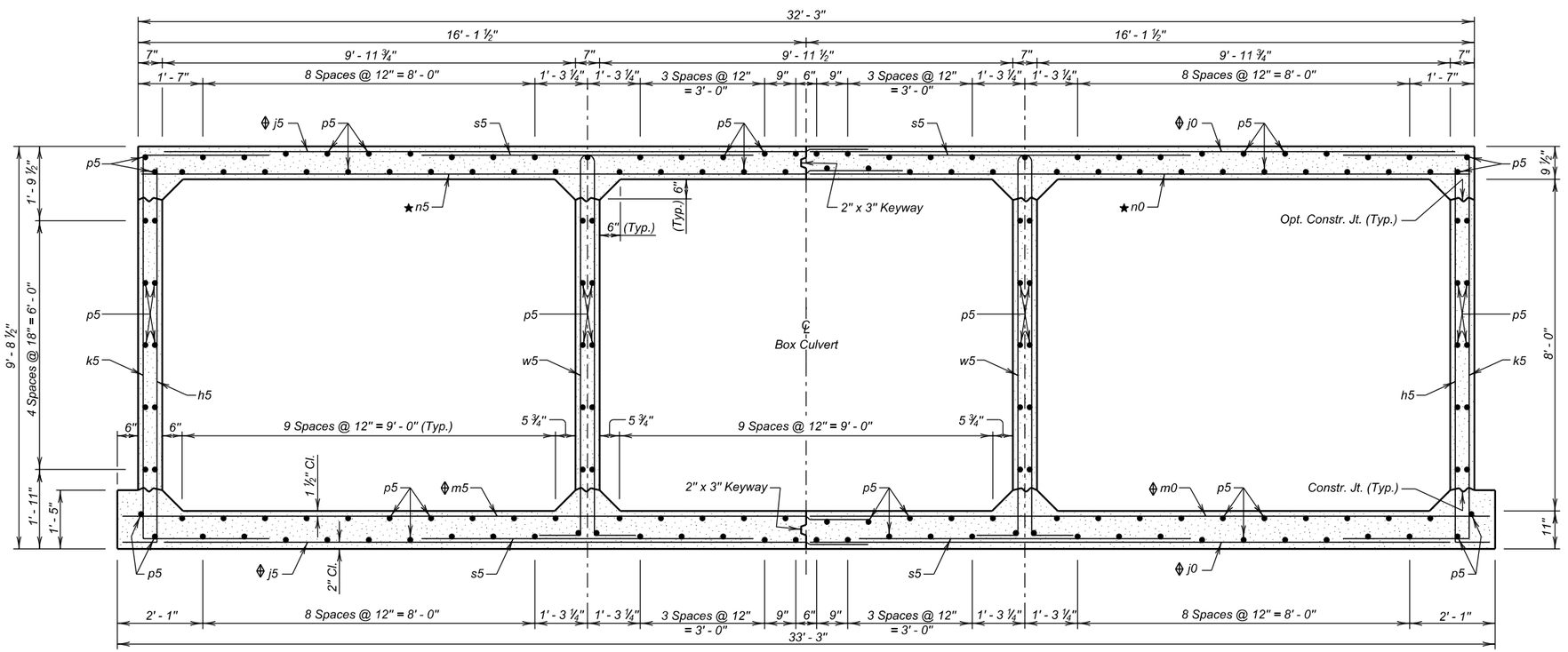


NOTES:

All dimensions are out to out of bars.

Request for additional reinforcing steel splices at points other than those shown, must be submitted to the Engineer for prior approval. If additional splices are approved, no payment will be allowed for the added quantity of reinforcing steel.

✳*Quantity of z2 bars is not included in reinforcing steel. See BREAKOUT AND DOWEL PLACEMENT DETAILS Sheet.*



F5 BARREL SECTION

(5' - 0" Maximum Fill)

ESTIMATED QUANTITIES

ITEM	Class A45 Concrete, Box Culvert	Reinforcing Steel	Structure Excavation, Box Culvert
UNIT	Cu.Yd.	Lb.	Cu.Yd.
2 - F5 Barrel End Sections @ 15' - 0"	75.8	10003	29.4

F5 BARREL END SECTION DETAILS (15' - 0") (B)

FOR

3 - 10' X 8' BOX CULVERT EXTENSION

OVER BATTLE CREEK — 0° SKEW

STA. 216 + 13.00 — SEC. 25/30-T108N-R53/52W

STR. NO. 40-120-042 — NH 0081(112)95

HL-93

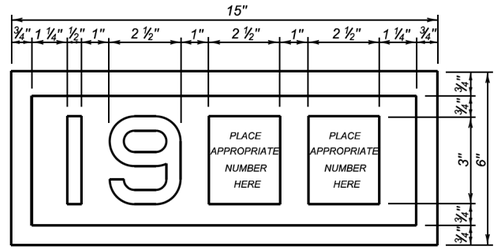
LAKE COUNTY

S. D. DEPT. OF TRANSPORTATION

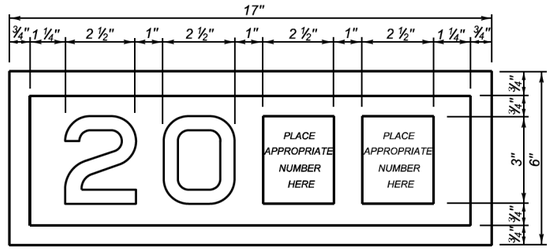
NOVEMBER 2023

DESIGNED BY	DRAWN BY	CHECKED BY	
BS/BM	BT	ER	Steve A Johnson BRIDGE ENGINEER
LAKE06P9	06P9TA09		

YEAR PLATE DETAILS FOR ORIGINAL CONSTRUCTION

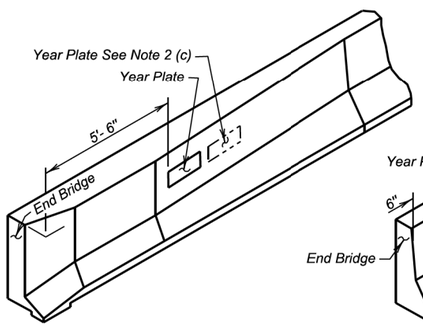


YEAR PLATE DETAILS FOR NEW CONSTRUCTION

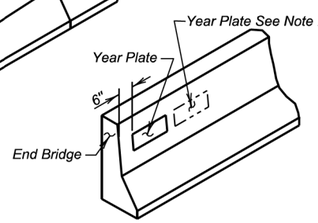


GENERAL NOTES:

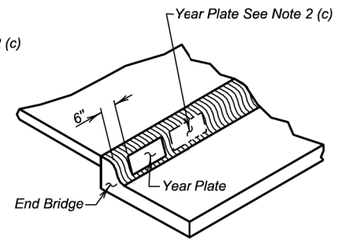
1. Year plates of the general dimensions shown shall be constructed on all box culverts and bridges. The year plates shall be constructed in reverse and attached to the forms in such a manner that the finished imprint in the concrete does not exceed one-half (½) inch in depth.
2. Year plates shall be located on structure(s) as follows:
   a. On cast-in-place box culverts the year plates shall be four and one - half (4 ½) inches below the top of the upstream parapet wall and centered laterally on the upstream face. On precast box culverts the year plate shall be centered laterally on the upstream face of the top slab. Where an extended interior wall interferes with this location, the year plate shall be centered in an adjacent barrel.
   b. On bridges with six (6) inch curbs or "Jersey" shaped barriers with no endblocks, the year plate shall be centered vertically on the curb face approximately six (6) inches from the end of the bridge, or as designated by the Engineer. On bridges with "Jersey" shaped barrier endblocks, the year plate shall be centered on the upper sloped portion of the barrier approximately 5'- 6" from the end of the bridge, or as designated by the Engineer. There shall be one year plate at each end of the bridge on opposite sides.
   c. When the plans specify that both the original date of construction and the date of reconstruction are to be shown, one date shall be placed as listed above and the other located adjacent to it. Both year plates shall be shown at each end of the bridge on opposite sides.
3. There will be no separate measurement or payment made for year plates on box culverts and bridges. All costs for this work shall be incidental to other contract items.



JERSEY BARRIER
(With Endblock)



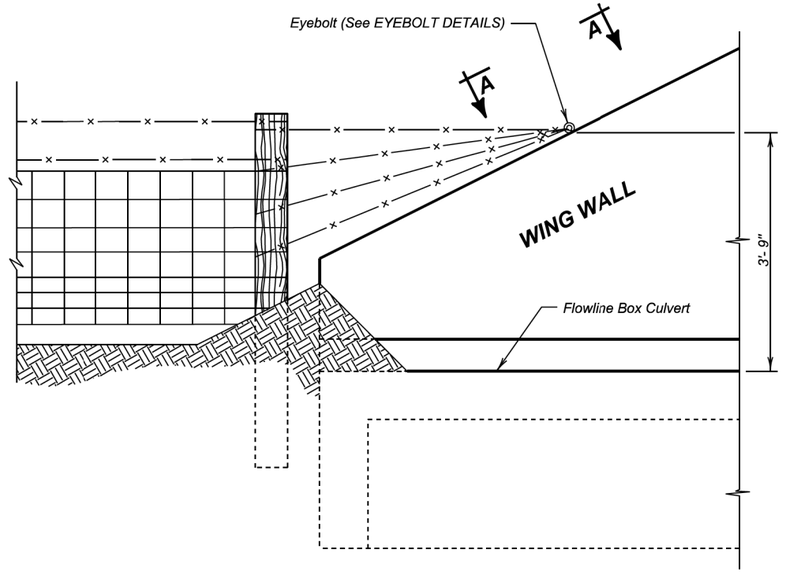
JERSEY BARRIER



TYPE B CURB

June 26, 2012

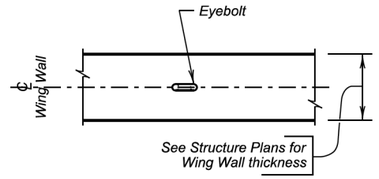
Published Date: 2025	SDDOT	DUAL DATE YEAR PLATE DETAILS	PLATE NUMBER 460.03
			Sheet 1 of 1



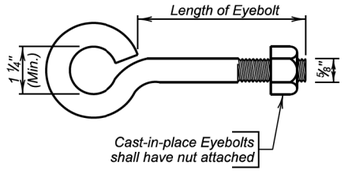
DETAIL FOR FENCE ANCHORS

GENERAL NOTES:

1. The fence and post details shown are for illustrative purpose only. The fence shall be as specified elsewhere in the plans.
2. Eyebolts shall be placed on all of the box culvert wing walls.
3. Eyebolts shall be ⅝ inch diameter and shall conform to ASTM A307.
4. Eyebolts, nuts, and concrete inserts shall be galvanized in accordance with AASHTO M232 (ASTM A153). Concrete inserts of corrosion resistant material need not be galvanized.
5. Cast-in-place eyebolts shall have a nut attached, be 4 ½ inches (Min.) in length and shall be embedded such that the eye of the bolt is flush with the concrete surface. (See Eyebolt Details) As an alternate, cast-in-place concrete inserts, capable of developing the full strength of the ⅝ inch diameter threaded eyebolt, may be used and shall be set in the concrete in accordance with the manufacturer's recommendations. The eyebolt shall be of sufficient length to develop its full strength. The eye of the eyebolt shall be flush with the concrete surface.
6. The cost for furnishing and installing eyebolts and/or concrete inserts shall be incidental to various contract items.



VIEW A - A

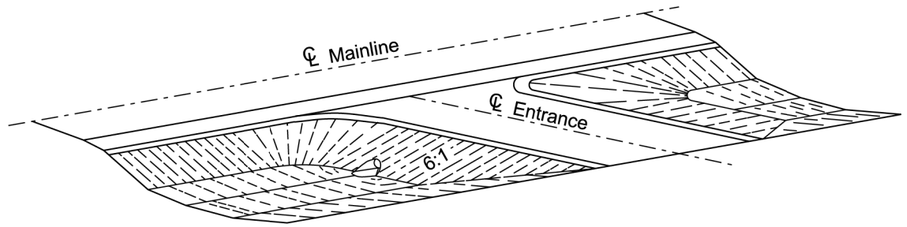


EYEBOLT DETAILS

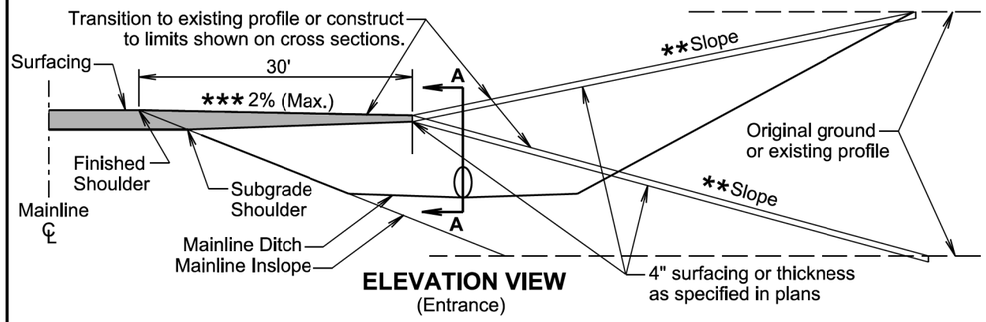
December 23, 2012

Published Date: 2025	SDDOT	FENCE ANCHORS FOR BOX CULVERT WING WALLS	PLATE NUMBER 620.16
			Sheet 1 of 1

3 - 10' X 8' BOX CULVERT EXTENSION
STR. NO. 40-120-042
NOVEMBER 2023



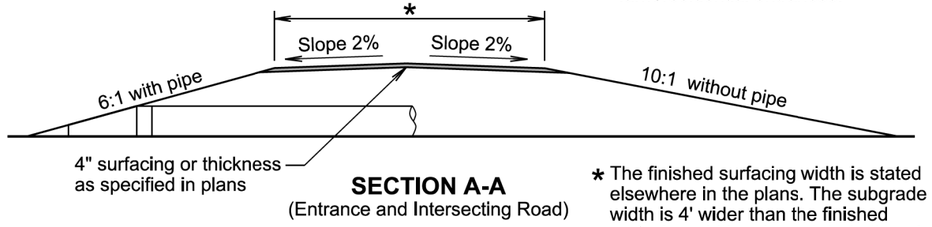
PERSPECTIVE OF ENTRANCE



ELEVATION VIEW
(Entrance)

*** 2% When on the inside of superelevation and 0% or flat when on outside of superelevation.

** Entrance maximum slope is typically 10:1 for field entrances and 15:1 for farm/residential entrances.



SECTION A-A
(Entrance and Intersecting Road)

* The finished surfacing width is stated elsewhere in the plans. The subgrade width is 4' wider than the finished surfacing width unless stated otherwise in the plans.

GENERAL NOTES:

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

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

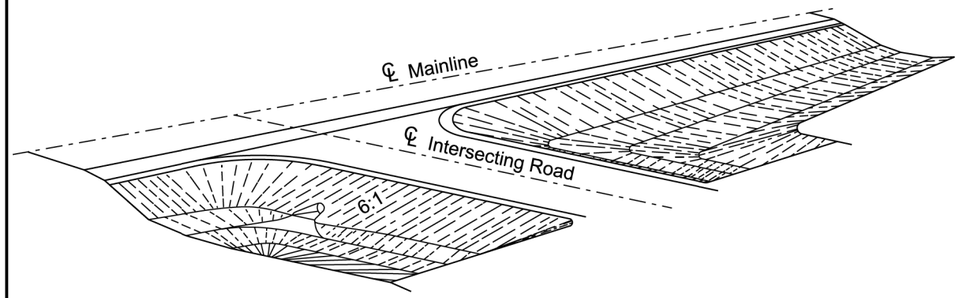
Pipe length will be adjusted if necessary during construction to obtain the 6:1 slope. For grading projects, the pipe length is estimated typically using a 4" thickness of surfacing directly over the subgrade above the pipe.

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

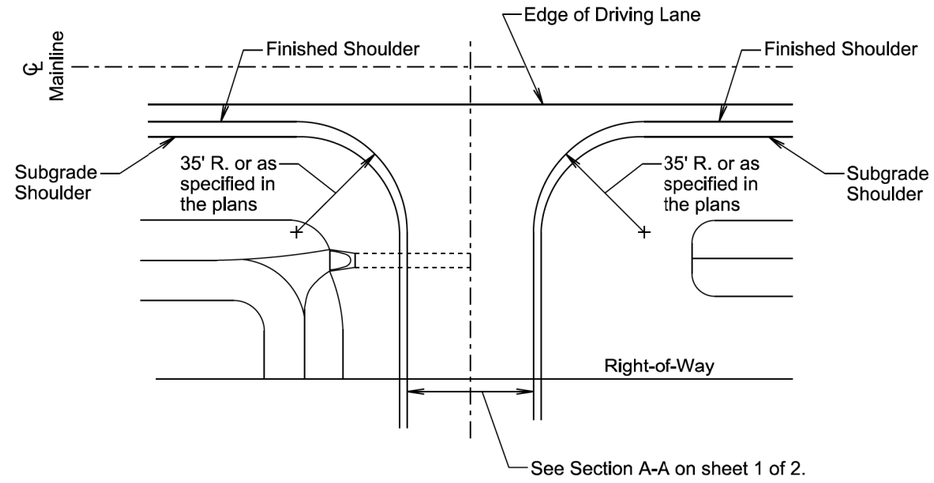
The turning radii will be 35' for intersecting roads and entrances unless stated otherwise in the plans.

November 19, 2021

Published Date: 2025	SDDOT	INTERSECTING ROADS AND ENTRANCES	PLATE NUMBER 120.01
			Sheet 1 of 2



PERSPECTIVE OF INTERSECTING ROAD



PLAN VIEW

GENERAL NOTES:

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

November 19, 2021

Published Date: 2025	SDDOT	INTERSECTING ROADS AND ENTRANCES	PLATE NUMBER 120.01
			Sheet 2 of 2

Published Date: 2025

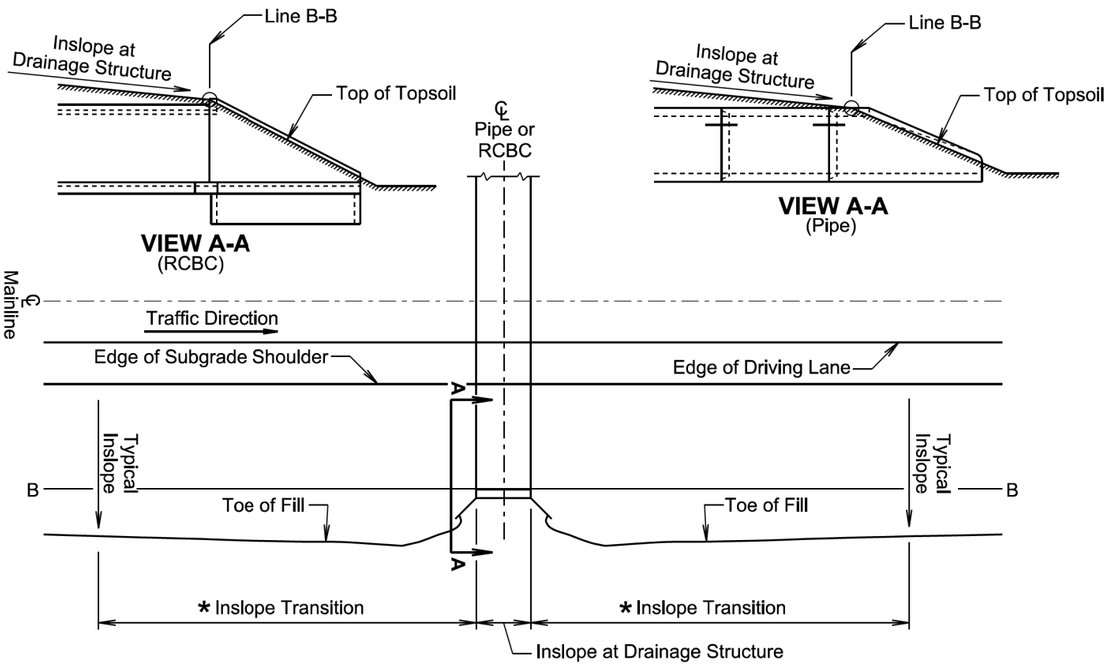
SDDOT

INSLOPE TRANSITIONS AT PIPE CULVERTS OR REINFORCED CONCRETE BOX CULVERTS

PLATE NUMBER 120.05

Sheet 1 of 2

September 14, 2018



TYPE 1 INSLOPE TRANSITION

GENERAL NOTES:

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

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

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

Published Date: 2025

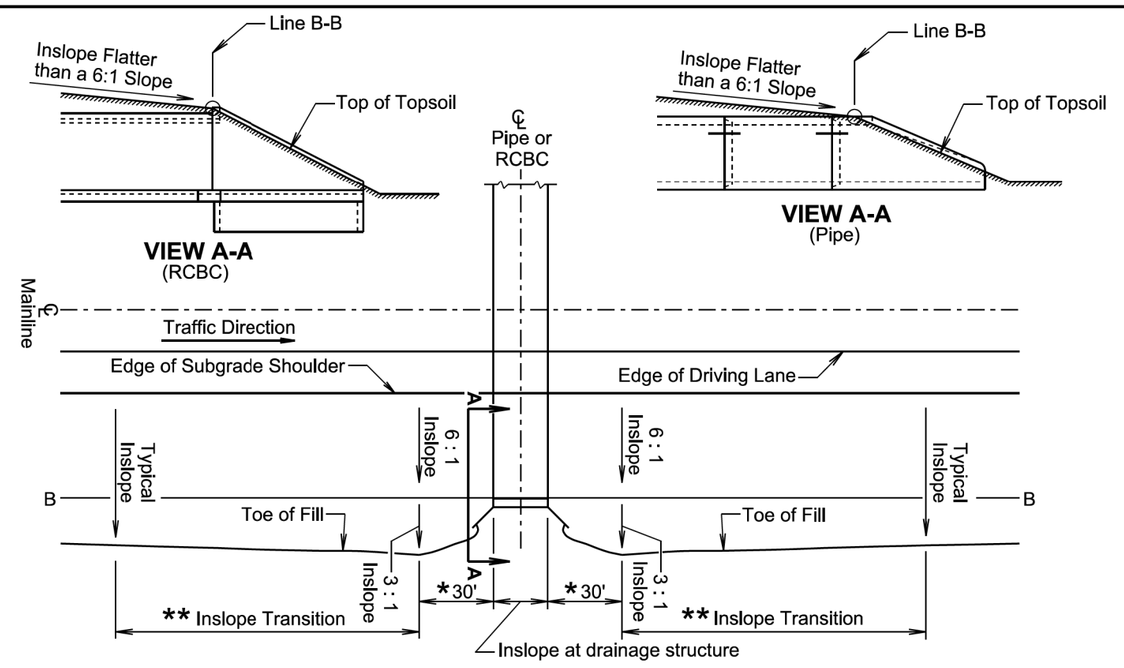
SDDOT

INSLOPE TRANSITIONS AT PIPE CULVERTS OR REINFORCED CONCRETE BOX CULVERTS

PLATE NUMBER 120.05

Sheet 2 of 2

September 14, 2018



TYPE 2 INSLOPE TRANSITION

GENERAL NOTES:

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

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

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

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

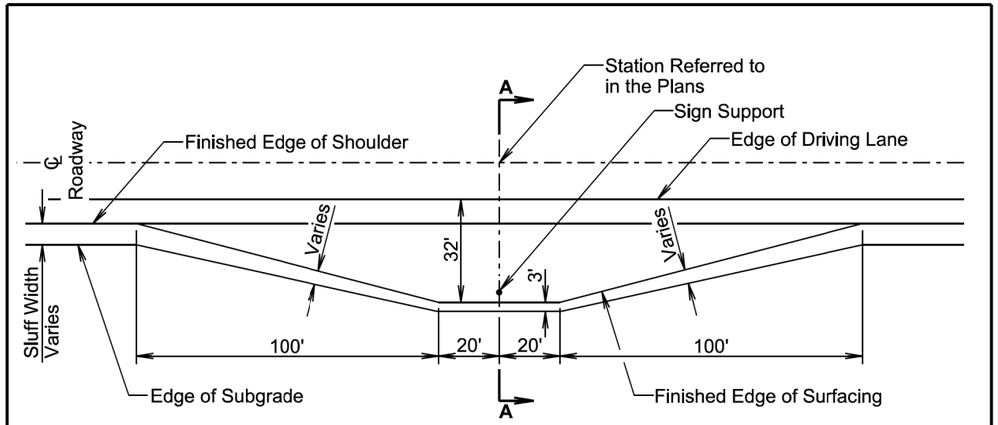
Plotting Date: 06/11/2024

STATE OF SOUTH DAKOTA

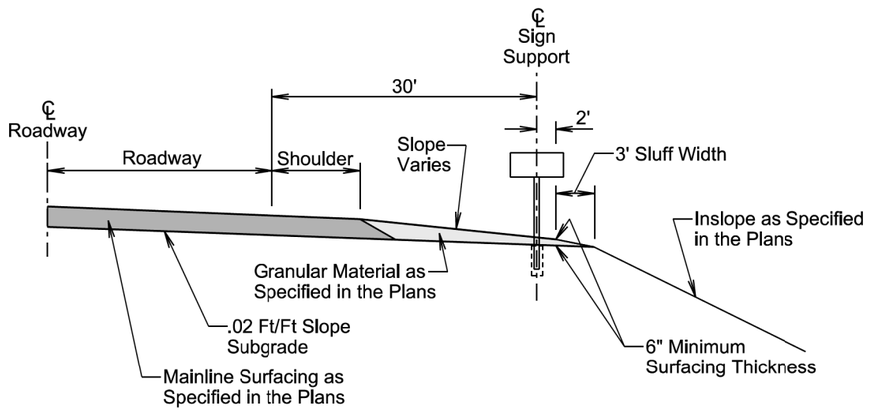
PROJECT NH 0081(112)95

SHEET 83

TOTAL SHEETS 167



PLAN VIEW



SECTION A-A

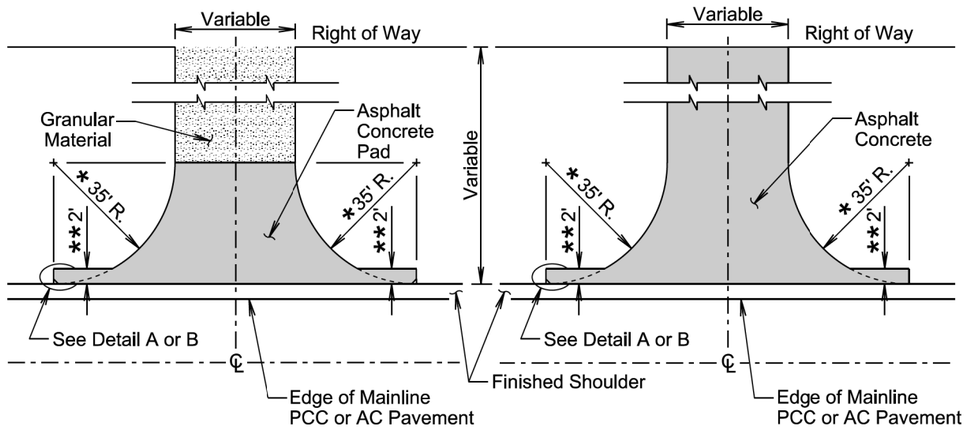
GENERAL NOTES:

The finished cross slope of the turnout from the edge of the shoulder to the outside edge of the finished surface will vary depending upon the mainline surfacing thickness.

The minimum surfacing thickness within the turnout will be 6" as depicted in Section A-A.

September 14, 2018

Published Date: 2025	SDDOT	***HISTORICAL MARKER TURNOUT***	***PLATE NUMBER 120.20***
			Sheet 1 of 1



PLAN VIEW
(Intersecting Road)
(No Asphalt Concrete Surfacing Beyond Right of Way)

PLAN VIEW
(Intersecting Road)
(Asphalt Concrete Surfacing Beyond Right of Way)

GENERAL NOTES:

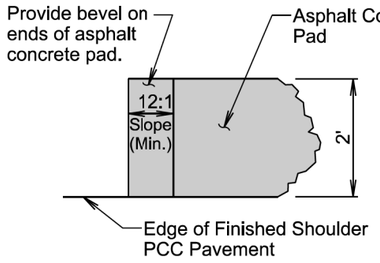
The precise construction limits for situations other than shown above will be determined by the Engineer during construction.

* For new construction, 35' radius typical or as specified in the plans. For resurfacing projects, radius is variable depending on existing conditions.

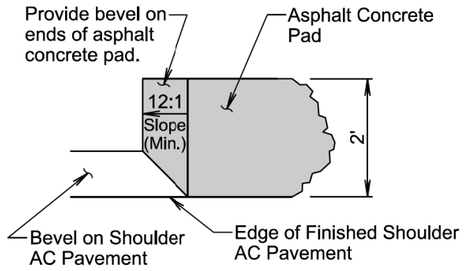
** The Contractor may adjust the screed of the paver during mainline paving operations to provide the 2-foot asphalt concrete pad or the Contractor may provide the 2-foot asphalt concrete pad during paving of the intersecting roads as shown above. The Engineer may eliminate the 2-foot asphalt concrete pads if the Engineer, in the Engineer's sole discretion, determines the pads are infeasible to construct due to site specific reasons including, but not limited to; existing inslope configuration, borrow and material availability, and right-of-way constraints.

August 27, 2020

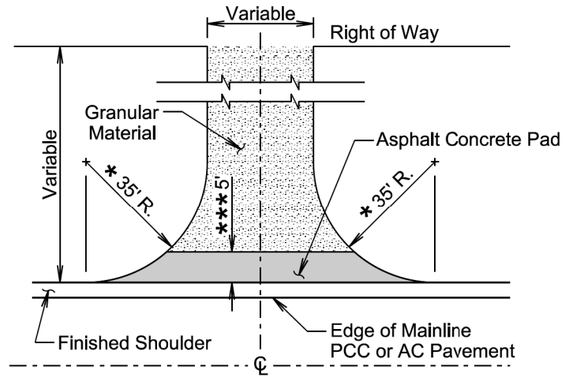
Published Date: 2025	SDDOT	SURFACING OR RESURFACING OF INTERSECTING ROADS AND ENTRANCES (MAINLINE AND SHOULDERS: PCC OR AC PAVEMENT)	PLATE NUMBER 320.04 Sheet 1 of 2



DETAIL A
(Typ. for Projects with PCC Pavement on Shoulder)



DETAIL B
(Typ. for Projects with AC Pavement on Shoulder)

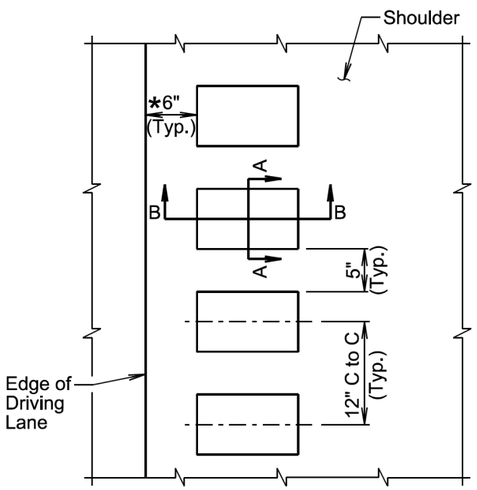


PLAN VIEW
(Entrance)

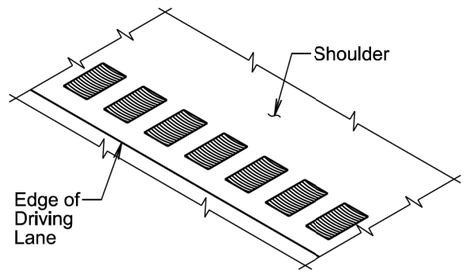
*** Not required if finished shoulder width is 4' or greater.

August 27, 2020

Published Date: 2025	SDDOT	SURFACING OR RESURFACING OF INTERSECTING ROADS AND ENTRANCES (MAINLINE AND SHOULDERS: PCC OR AC PAVEMENT)	PLATE NUMBER 320.04 Sheet 2 of 2

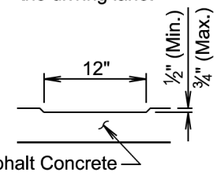


PLAN VIEW
(Typical Rumble Strip in Asphalt Concrete)

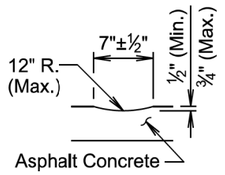


PERSPECTIVE VIEW
(Typical Rumble Strip in Asphalt Concrete)

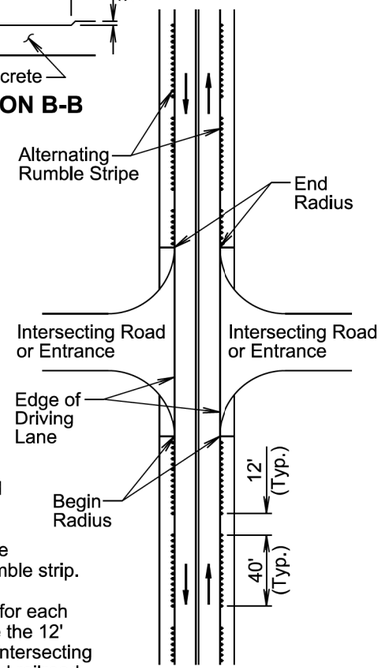
*When PCC pavement width from centerline to edge of pavement is 12', the rumble strip may be placed a maximum of 2' from the edge of the driving lane.



SECTION B-B



SECTION A-A



PLAN VIEW

GENERAL NOTES:

A rumble strip will be constructed on all of the asphalt concrete shoulders by grinding alternating patterns of 40' continuous indentations in the asphalt concrete. The rumble strip will receive a flush seal or asphalt surface treatment as specified in the plans.

A rumble strip will not be constructed through intersecting roads, entrances, turnouts, bridge decks, bridge approach slabs, and railroad crossings. The lengths of the 40' segments with continuous indentations and the 12' segments without a rumble strip adjacent to the intersecting roads, entrances, turnouts, bridge decks, bridge approach slabs, and railroad crossings will be adjusted as approved by the Engineer.

Prior to constructing the rumble strip the Contractor will submit to the Engineer, for approval, the proposed method of constructing the rumble strip.

Measurement of the rumble strip will be to the nearest 0.1 of a mile for each shoulder. Measurement and payment of the rumble strip will include the 12' long segments without rumble strips and the segments adjacent to intersecting roads, entrances, turnouts, bridge decks, bridge approach slabs, and railroad crossings without rumble strips. Payment for constructing the rumble strip will be at the contract unit price per mile for "Grind 12" Rumble Strip or Stripe in Asphalt Concrete".

September 14, 2019

Published Date: 2025	SDDOT	12" RUMBLE STRIP IN ASPHALT CONCRETE ON NONDIVIDED HIGHWAY SHOULDERS	PLATE NUMBER 320.24 Sheet 1 of 1

PLOT SCALE - 1:200

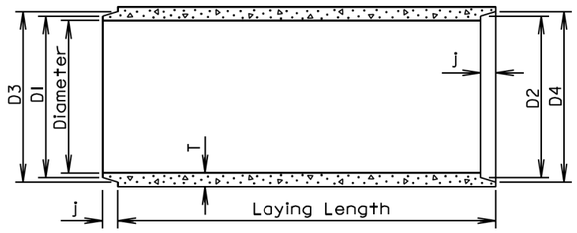
PLOT NAME - 6

FILE - ...\STANDARDPLATES_06P9.DGN

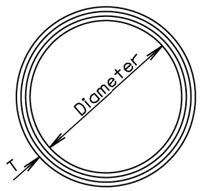
.PLOTTED FROM - TRM1INT16

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

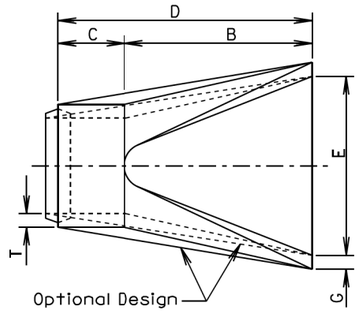
Published Date: 2025

SDDOT

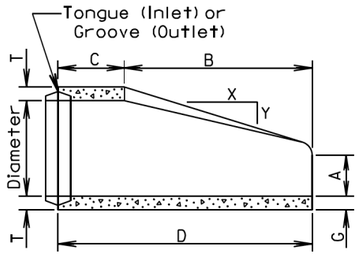
REINFORCED CONCRETE PIPE

PLATE NUMBER 450.01

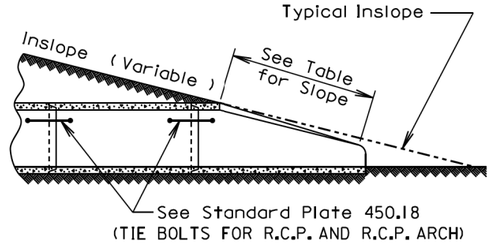
Sheet 1 of 1



TOP VIEW



LONGITUDINAL SECTION

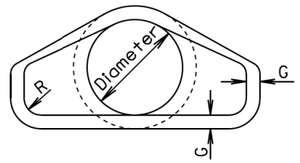


SLOPE DETAIL

GENERAL NOTES:

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

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



END VIEW

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

June 26, 2015

Published Date: 2025

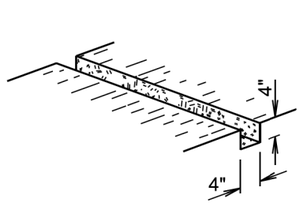
SDDOT

R. C. P. FLARED ENDS

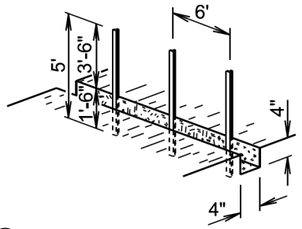
PLATE NUMBER 450.10

Sheet 1 of 1

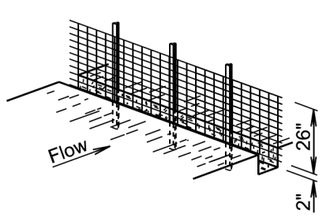
MANUAL LOW FLOW SILT FENCE INSTALLATION



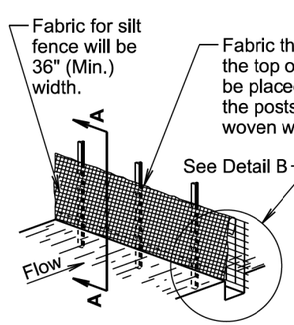
① EXCAVATE TRENCH



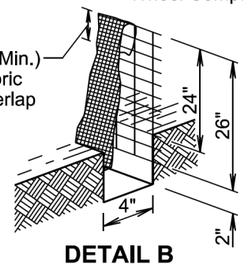
② DRIVE STEEL T FENCE POSTS



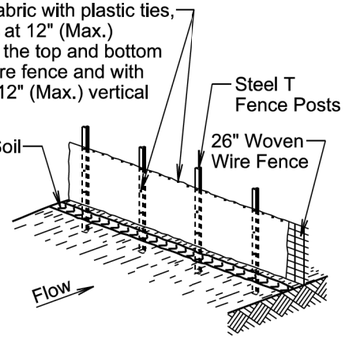
③ ATTACH 26" WOVEN WIRE FENCE TO POSTS



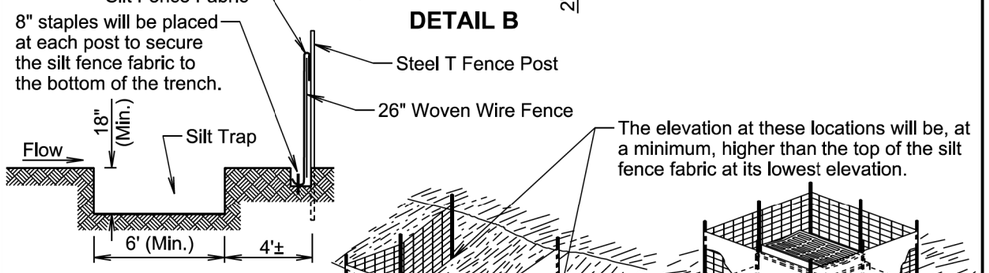
④ ATTACH SILT FENCE FABRIC



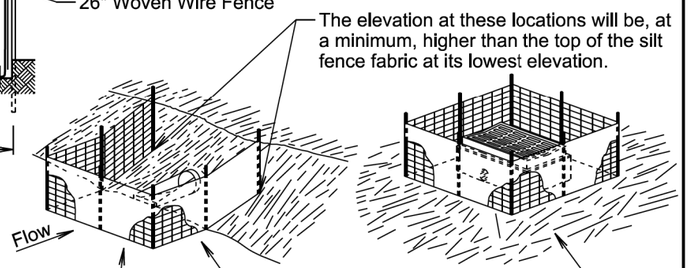
DETAIL B



⑤ BACKFILL TRENCH AND WHEEL COMPACT SOIL



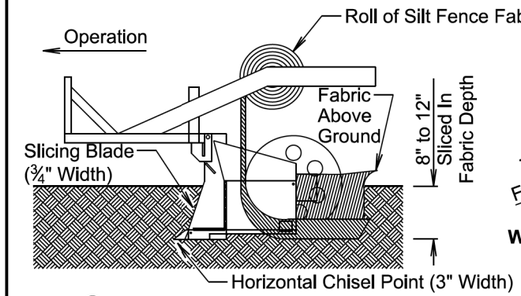
SECTION A-A



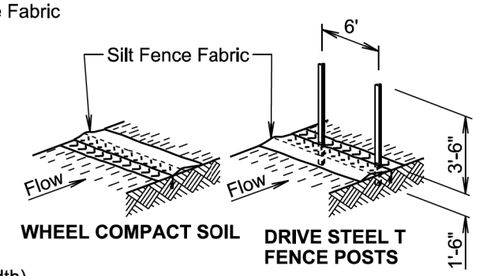
February 14, 2020

Published Date: 2025	SDDOT	LOW FLOW SILT FENCE AND SILT TRAP	PLATE NUMBER 734.04
			Sheet 1 of 2

MACHINE SLICED LOW FLOW SILT FENCE INSTALLATION



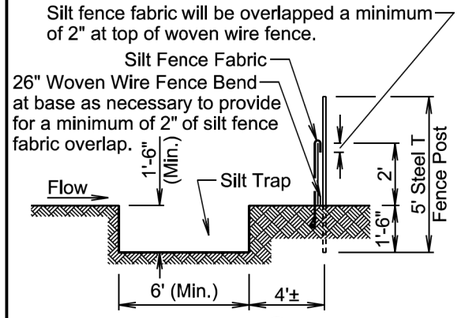
① INSTALL SILT FENCE FABRIC BY MACHINE SLICING METHOD.

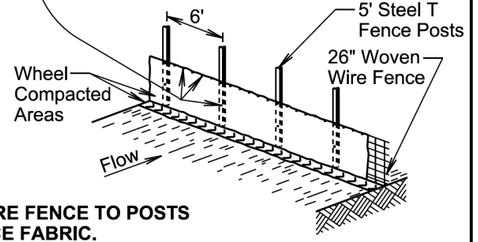


WHEEL COMPACT SOIL

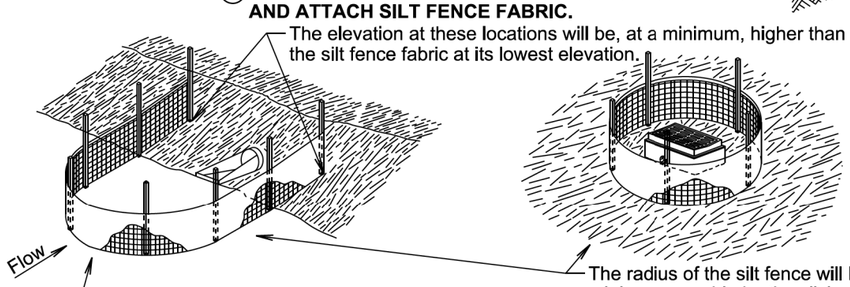
DRIVE STEEL T FENCE POSTS

② WHEEL COMPACT SOIL ABOVE SLICED IN PORTION OF FABRIC AND THEN DRIVE STEEL T FENCE POSTS.





③ ATTACH 26" WOVEN WIRE FENCE TO POSTS AND ATTACH SILT FENCE FABRIC.



GENERAL NOTES:

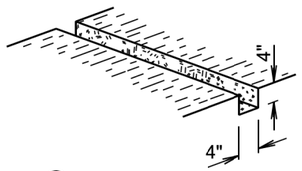
A silt trap will be provided when specified by a plan note. All costs for constructing the silt trap will be incidental to the contract unit price per cubic yard for "Silt Trap".

If a trench can not be dug or the silt fence fabric can not be sliced in due to the type of earthen material (such as rock), then a row of 30 to 40 pound sandbags butted end to end will be provided on top of the extra length of silt fence fabric to prevent underflow.

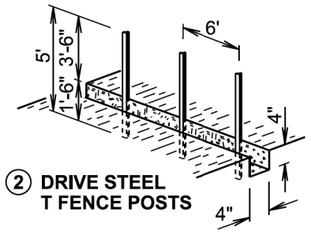
February 14, 2020

Published Date: 2025	SDDOT	LOW FLOW SILT FENCE AND SILT TRAP	PLATE NUMBER 734.04
			Sheet 2 of 2

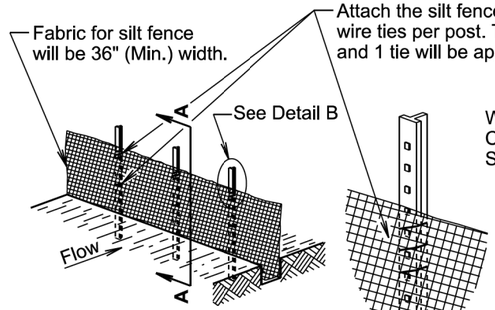
MANUAL HIGH FLOW SILT FENCE INSTALLATION



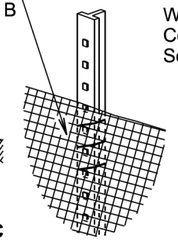
① EXCAVATE TRENCH



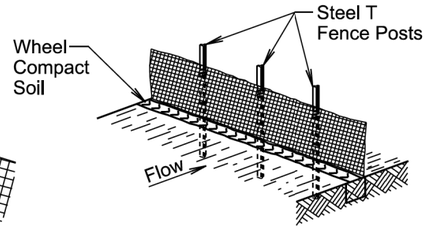
② DRIVE STEEL T FENCE POSTS



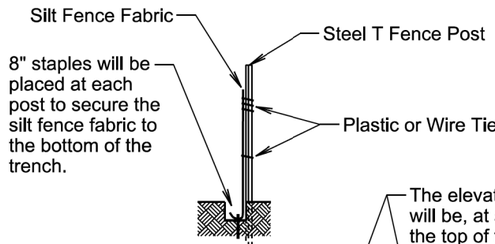
③ ATTACH SILT FENCE FABRIC



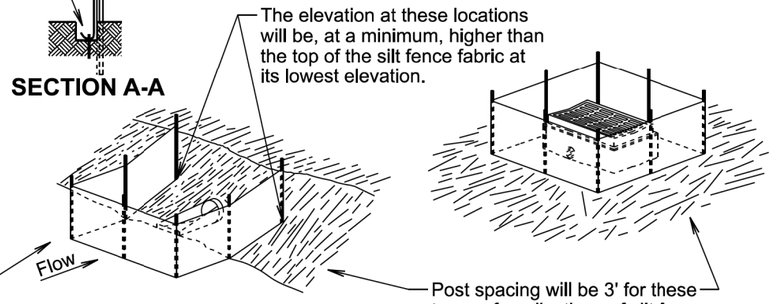
DETAIL B



④ BACKFILL TRENCH AND WHEEL COMPACT SOIL



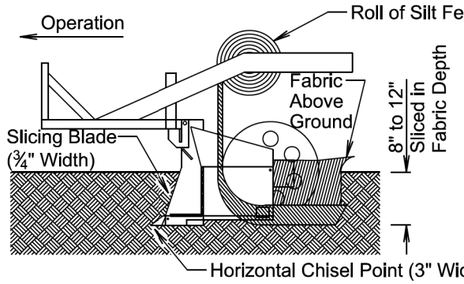
SECTION A-A



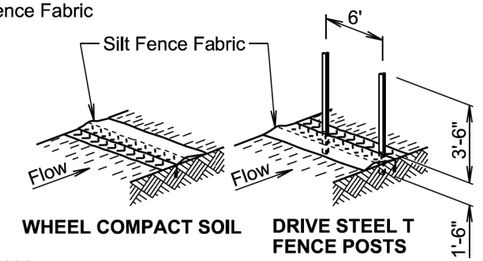
February 14, 2020

Published Date: 2025	SDDOT	HIGH FLOW SILT FENCE	PLATE NUMBER 734.05
			Sheet 1 of 2

MACHINE SLICED HIGH FLOW SILT FENCE INSTALLATION

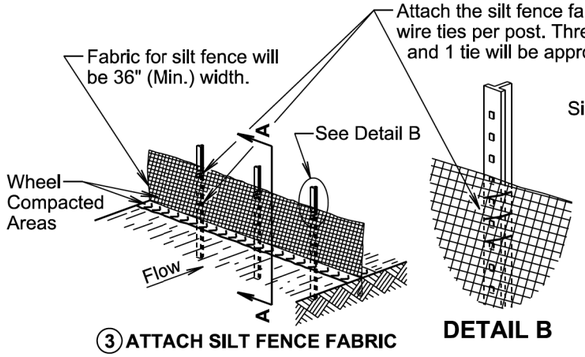


① INSTALL SILT FENCE FABRIC BY MACHINE SLICING METHOD.



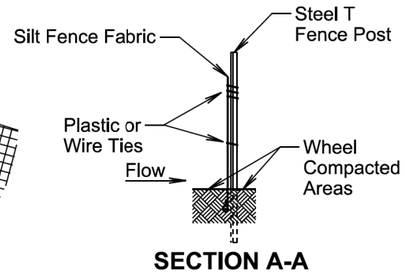
WHEEL COMPACT SOIL — DRIVE STEEL T FENCE POSTS

② WHEEL COMPACT SOIL ABOVE SLICED IN PORTION OF FABRIC AND THEN DRIVE STEEL T FENCE POSTS.

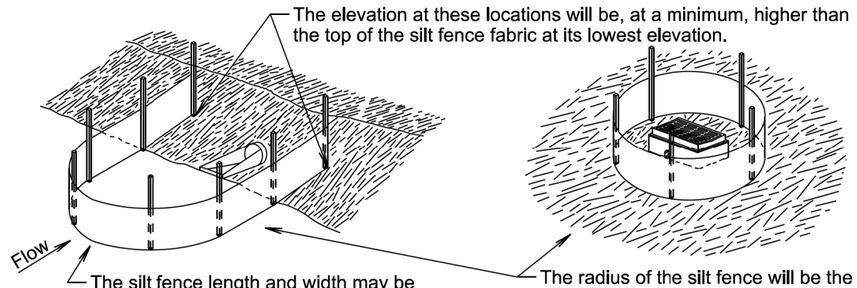


③ ATTACH SILT FENCE FABRIC

DETAIL B



SECTION A-A

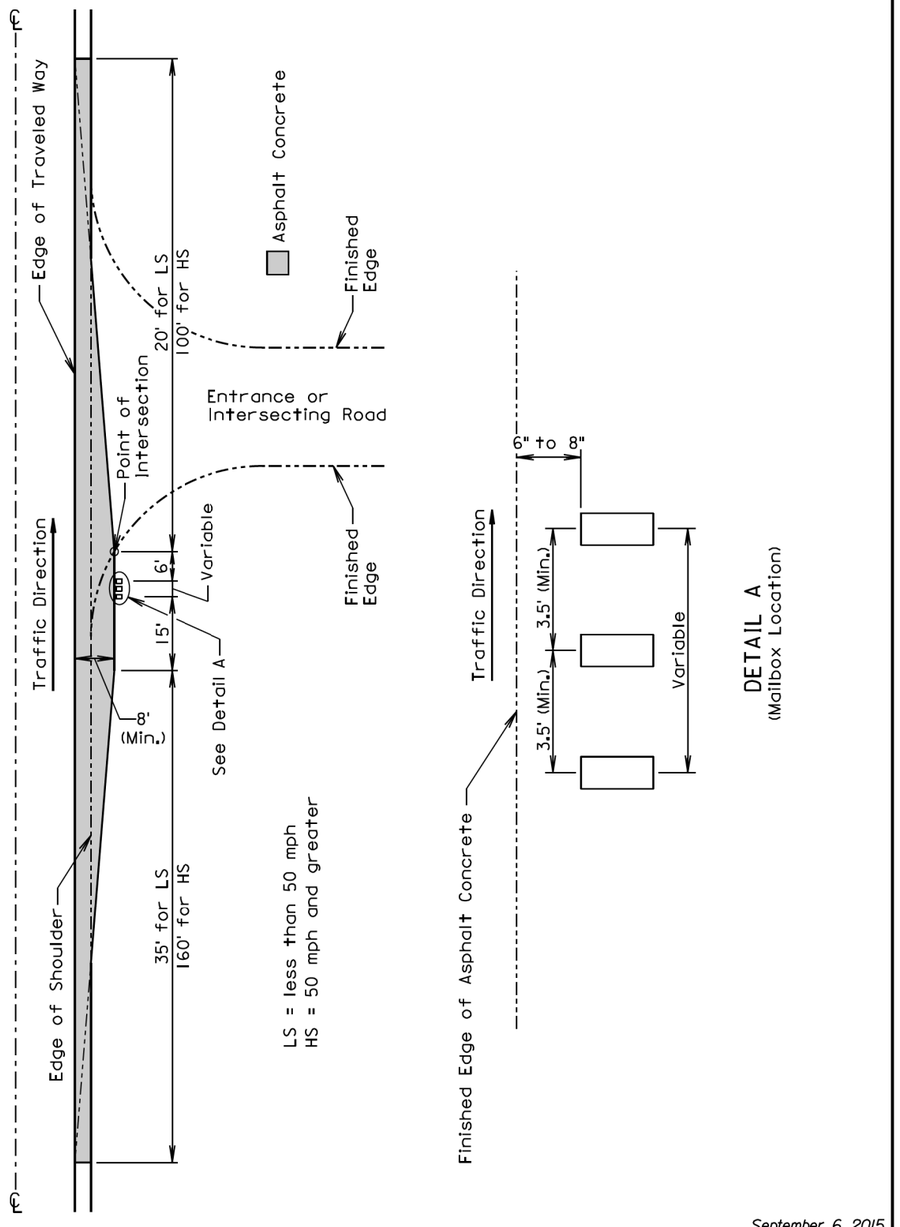


GENERAL NOTE:

If a trench can not be dug or the silt fence fabric can not be sliced in due to the type of earthen material (such as rock), then a row of 30 to 40 pound sandbags butted end to end will be provided on top of the extra length of silt fence fabric to prevent underflow.

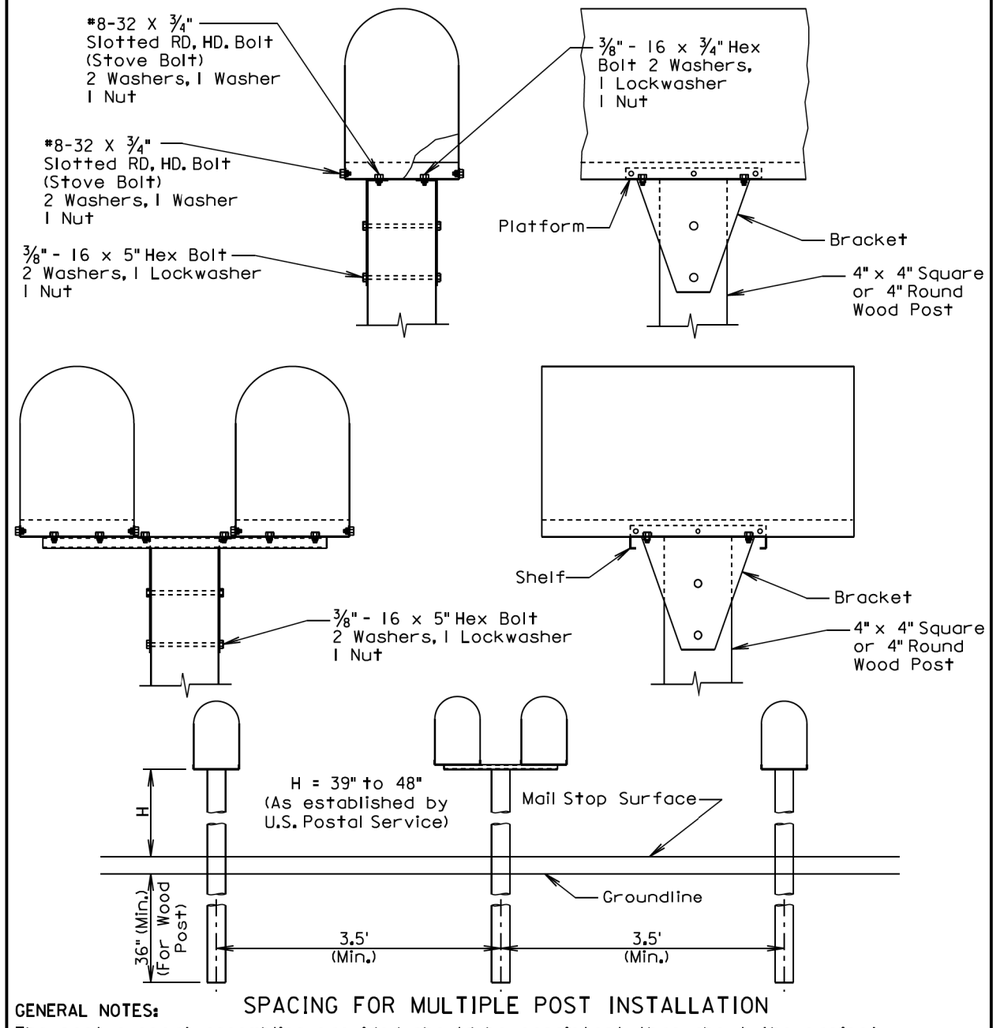
February 14, 2020

Published Date: 2025	SDDOT	HIGH FLOW SILT FENCE	PLATE NUMBER 734.05
			Sheet 2 of 2



September 6, 2015

Published Date: 2025	SDDOT	MAILBOX TURNOUT	PLATE NUMBER 900.01
			Sheet 1 of 1



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: 2025	SDDOT	SINGLE AND DOUBLE MAILBOX ASSEMBLIES	PLATE NUMBER 900.02
			Sheet 1 of 1

PLOT SCALE - 1:200

PLOT NAME - 9

FILE - ...\STANDARDPLATES_06P9.DGN

PLOTTED FROM - TRM11NT16

Published Date: 2025

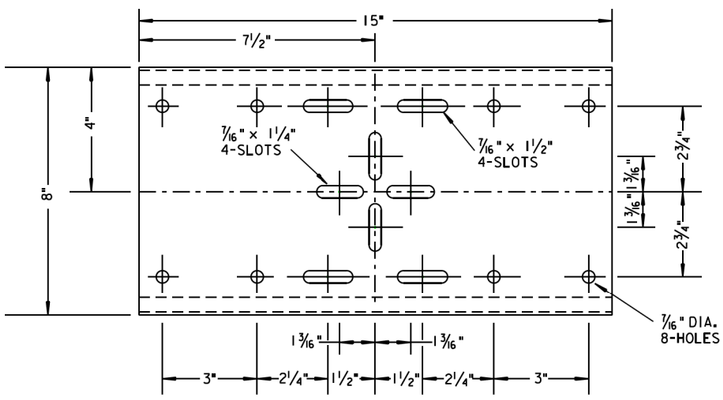
SDDOT

MAILBOX SUPPORT HARDWARE

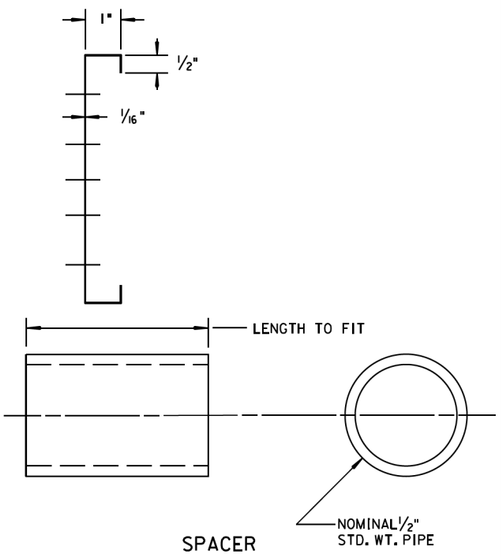
PLATE NUMBER 900.03

March 31, 2000

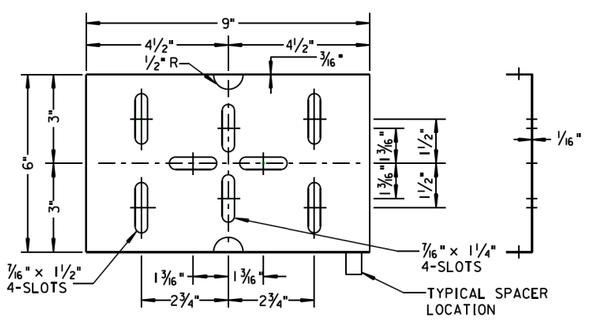
Sheet 1 of 1

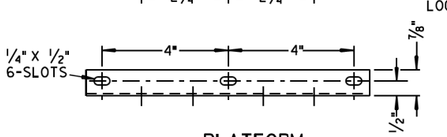


SHELF
(Double Assemblies)

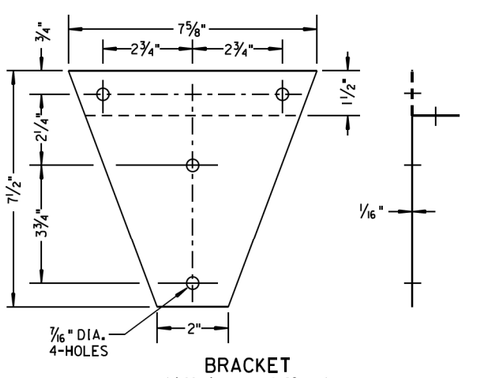


SPACER





PLATFORM
(All Assemblies)

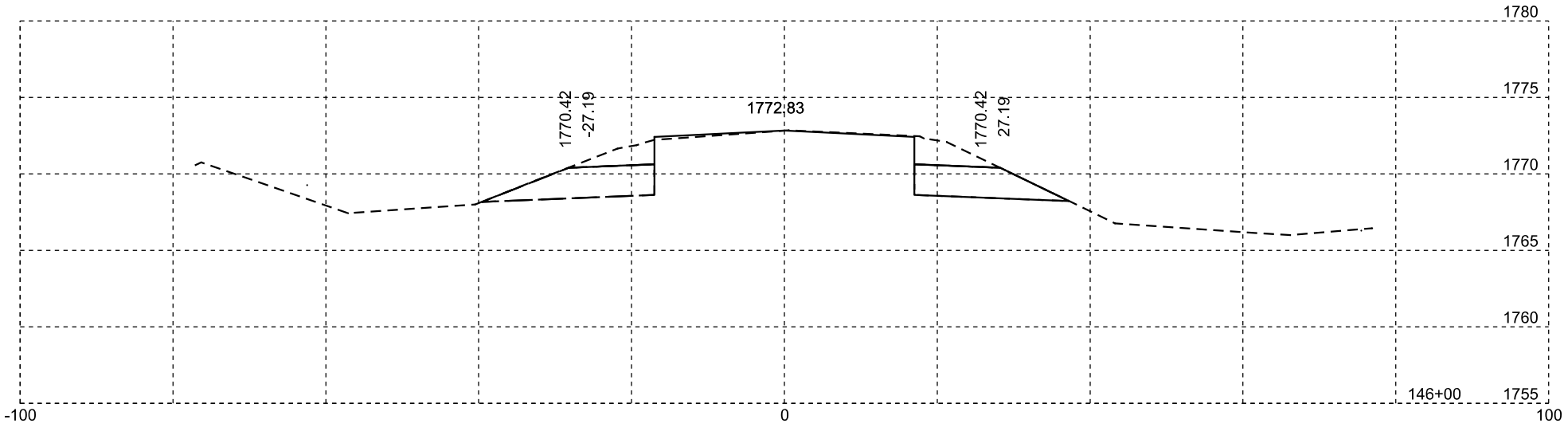


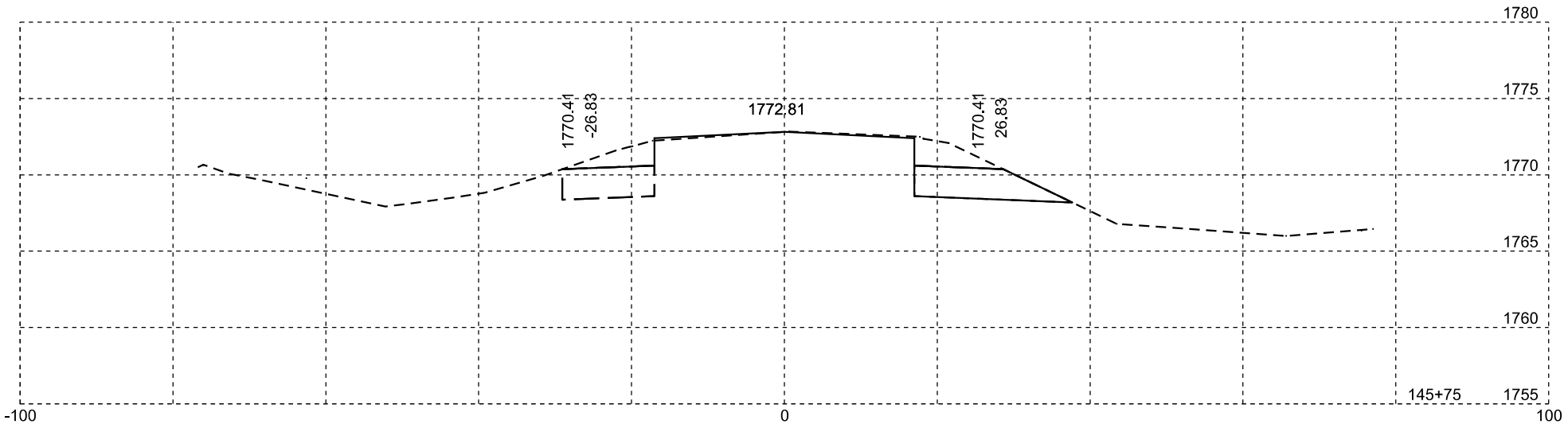
BRACKET
(All Assemblies)

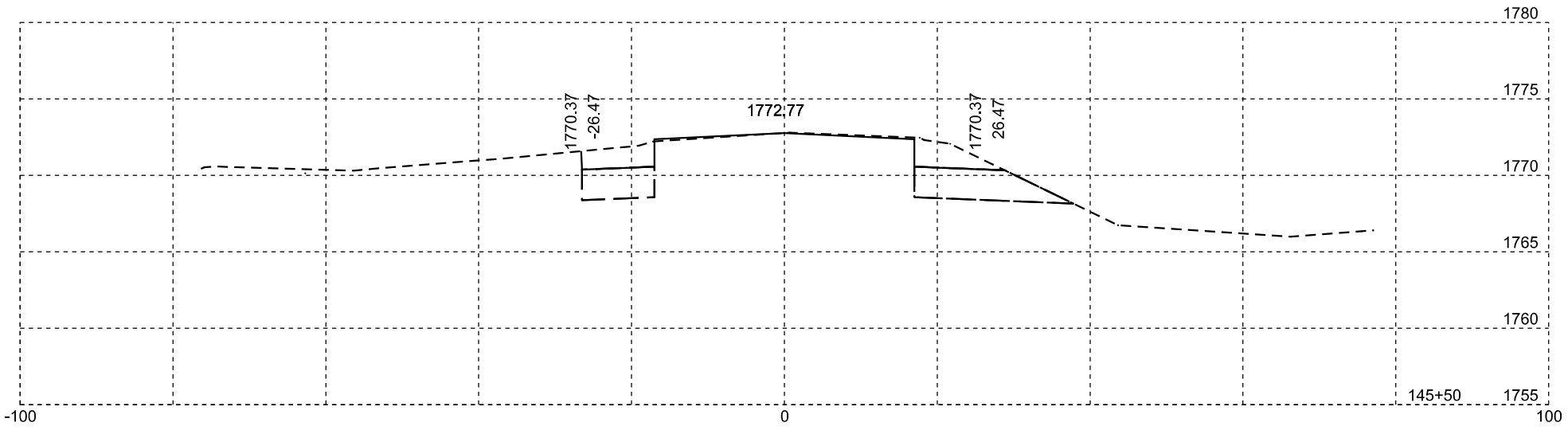
Plotting Date: 06/11/2024

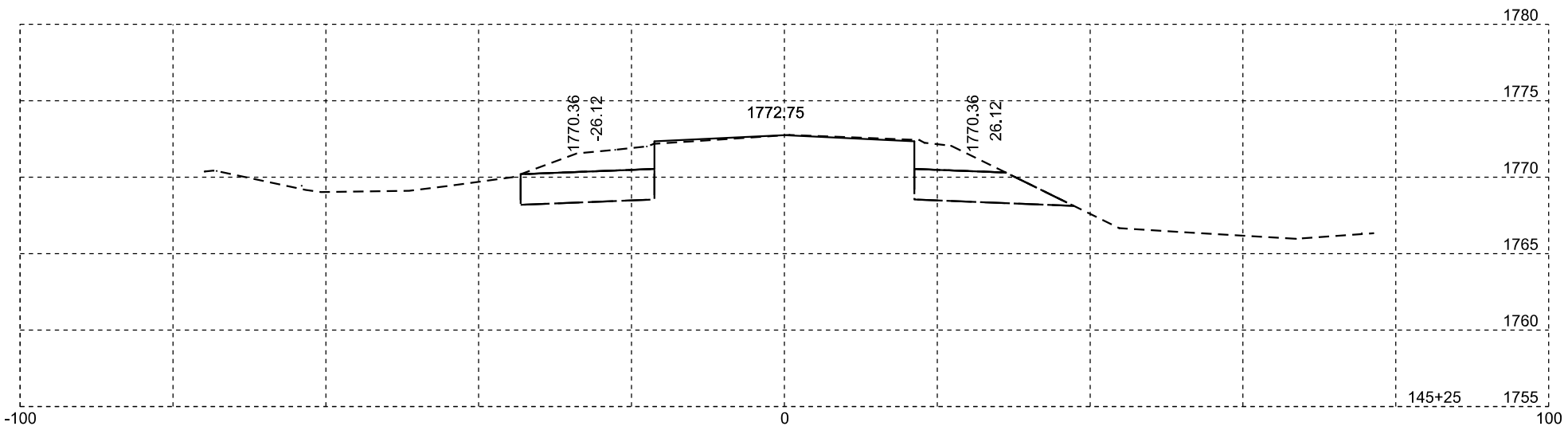
STATE OF SOUTH DAKOTA	PROJECT
	NH 0081(112)95
SHEET	91
TOTAL SHEETS	167

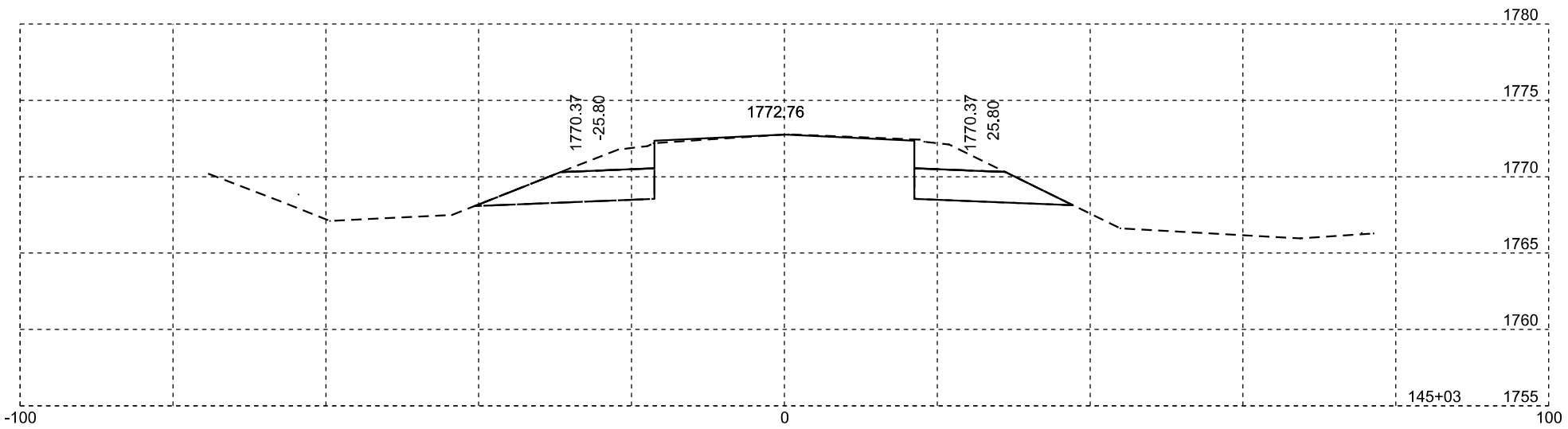
223rd









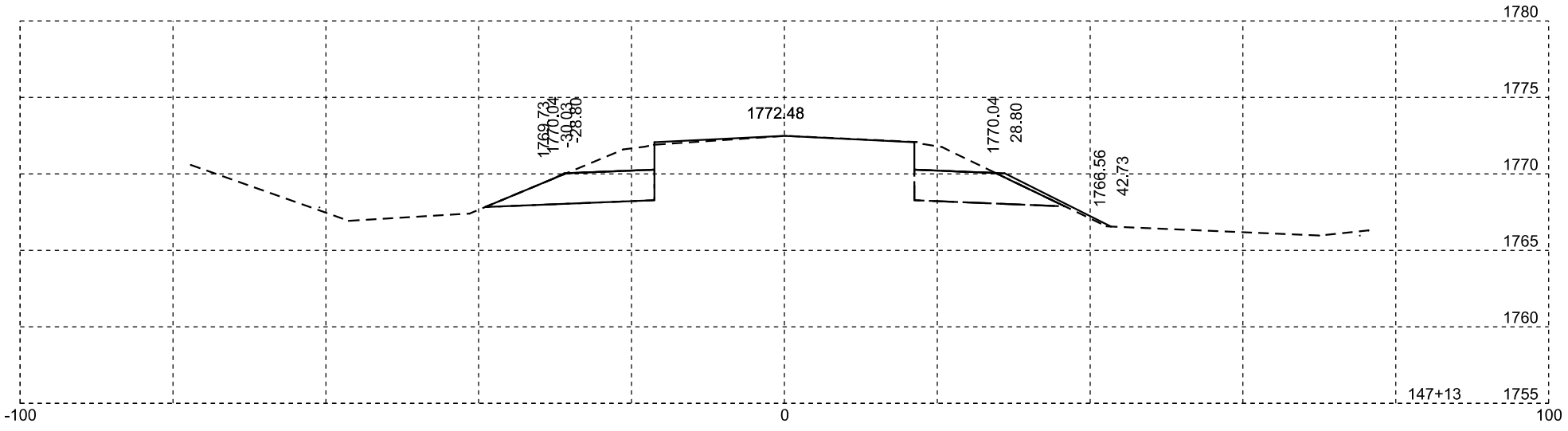


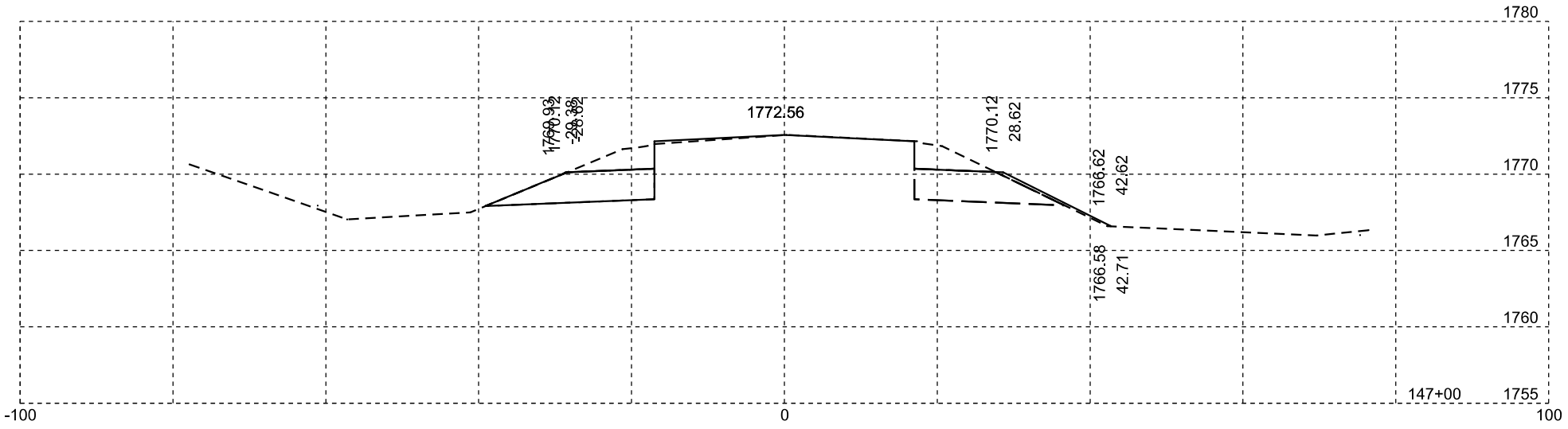
1

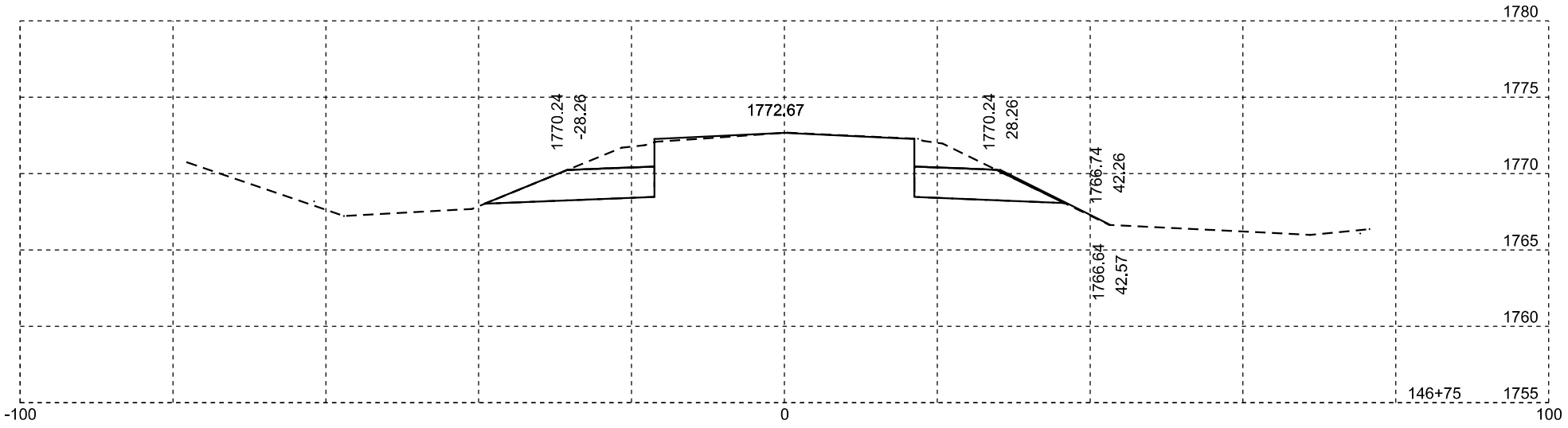
Plotting Date: 05/09/2024

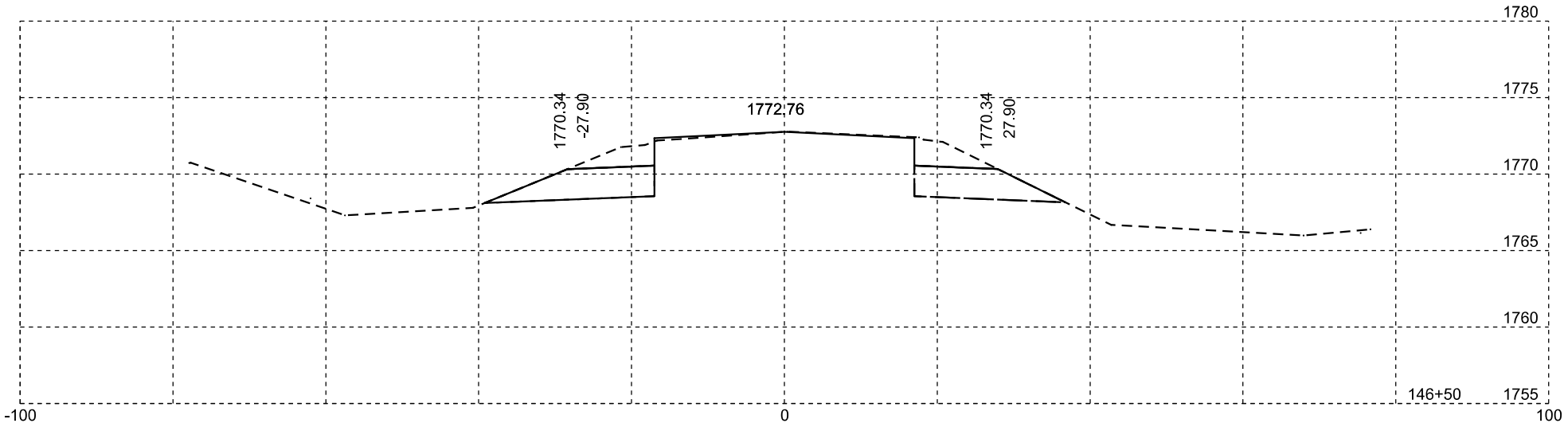
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(112)95	92	167

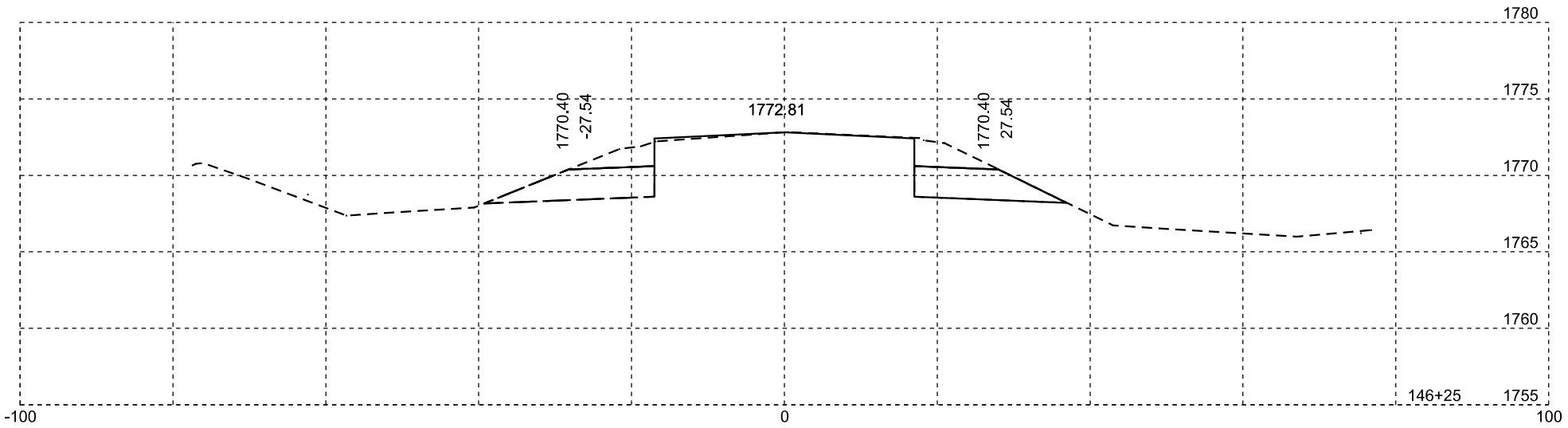
223rd











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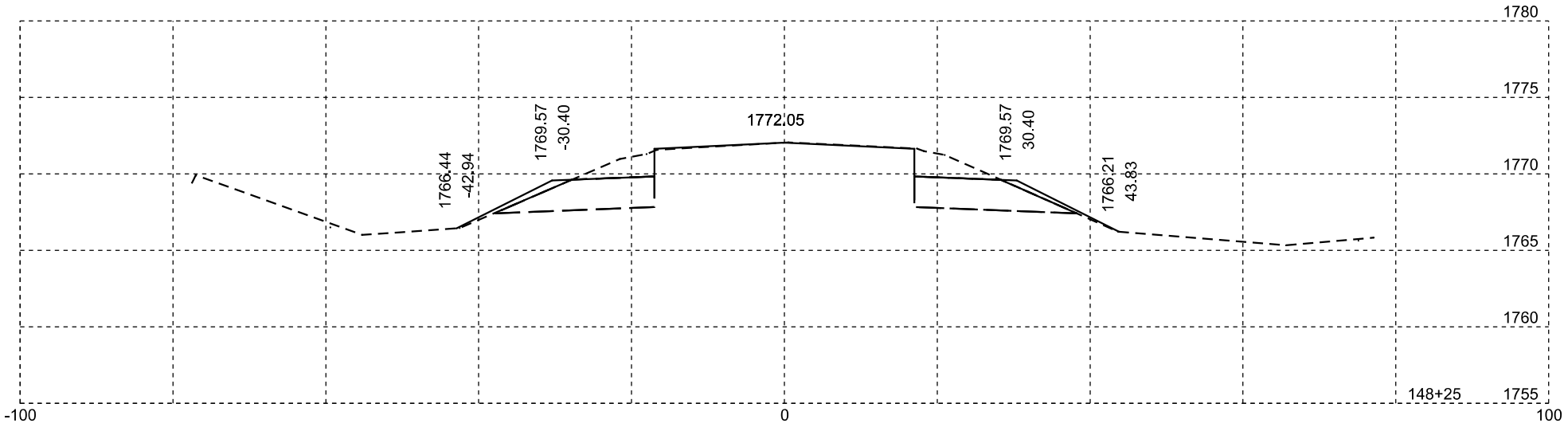
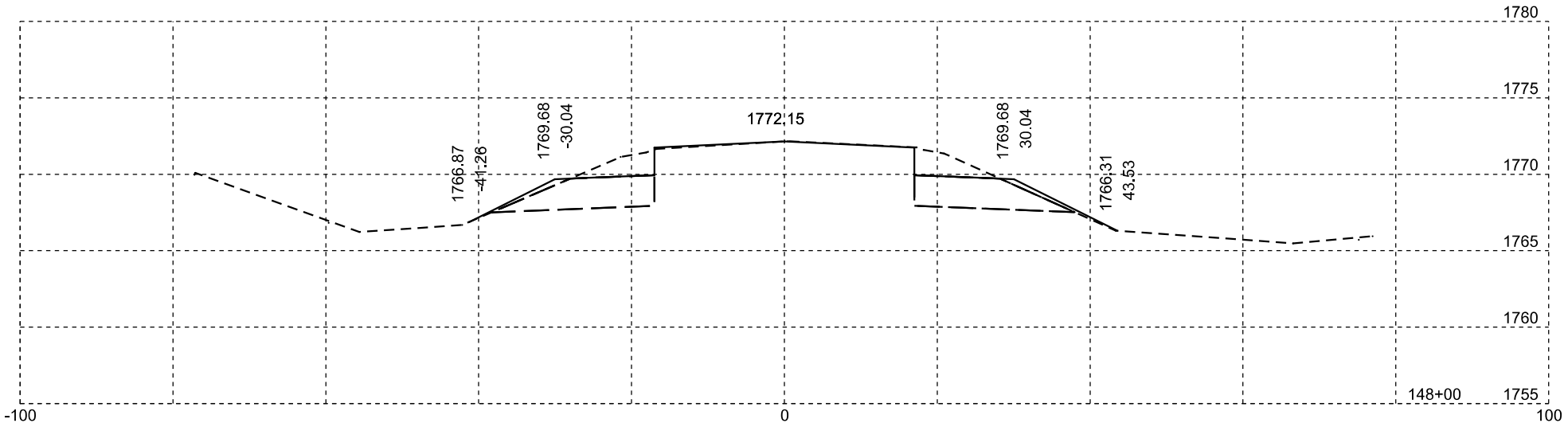
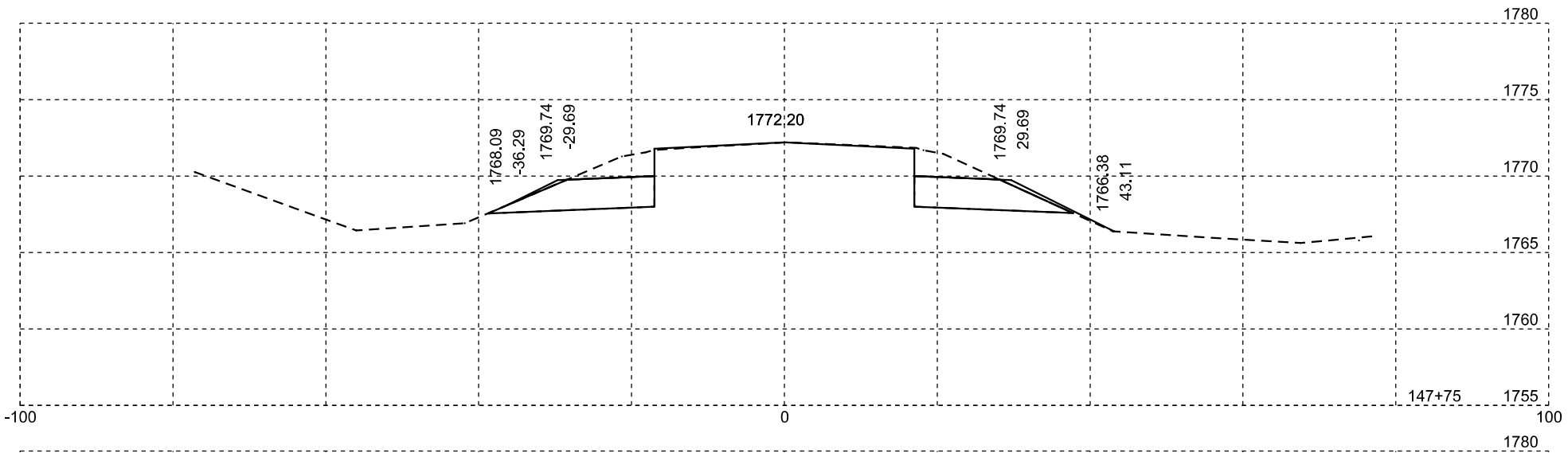
Plotting Date: 05/09/2024

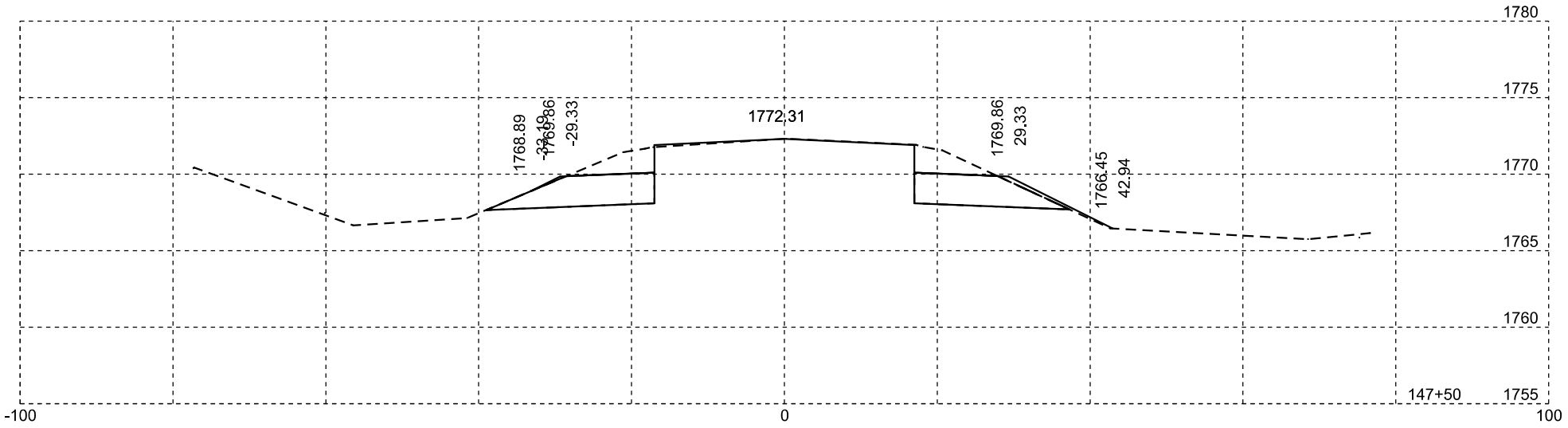
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(112)95	93	167

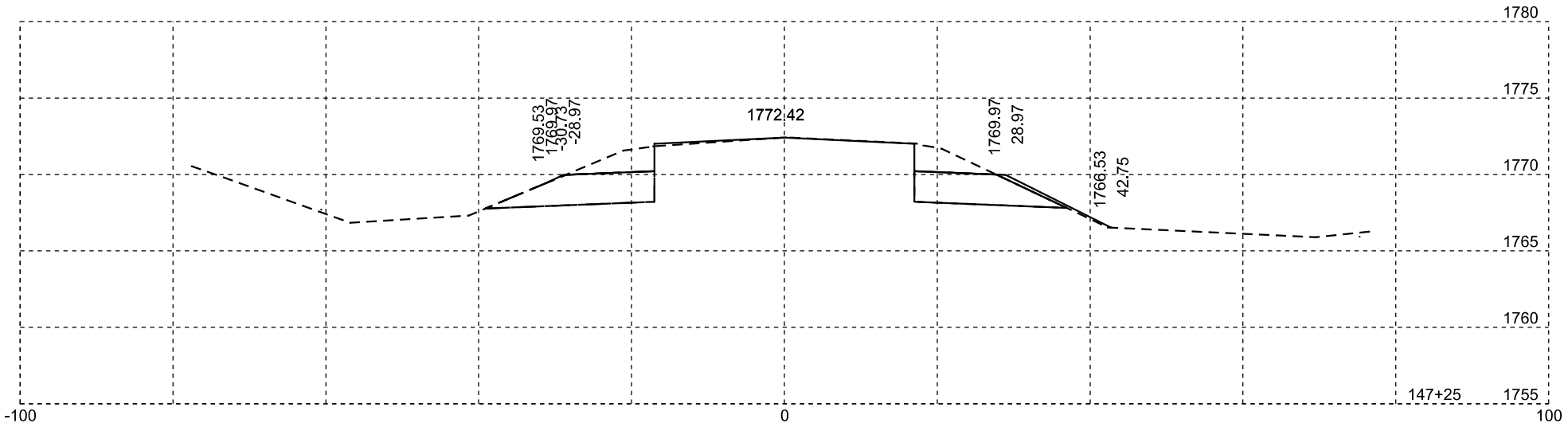
223rd









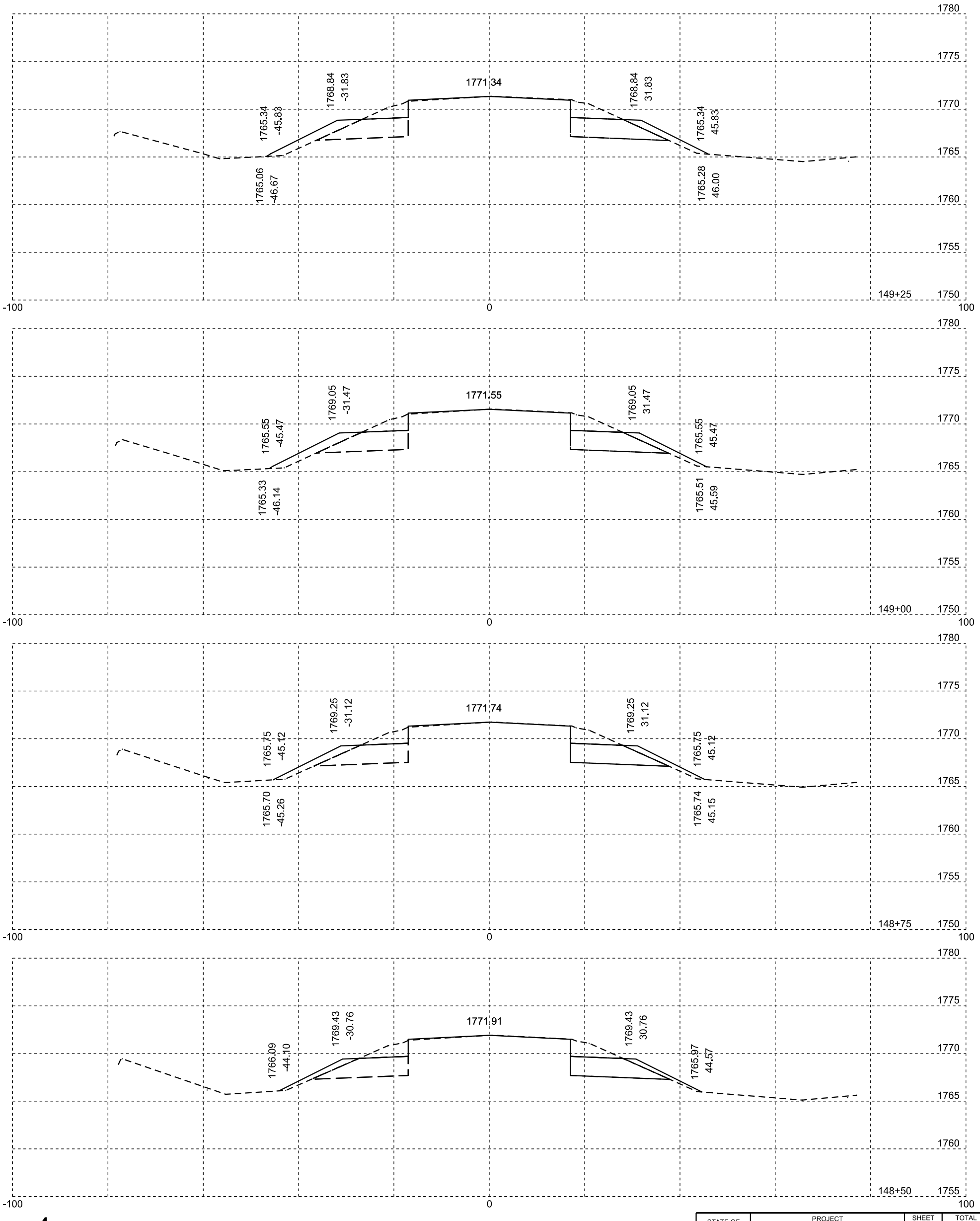


3

Plotting Date: 05/09/2024

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(112)95	94	167

223rd



Plotting Date: 05/09/2024

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(112)95	95	167

223rd

5

Plotting Date: 05/09/2024

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(112)95	96	167

223rd

6

Plotting Date: 05/09/2024

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(112)95	97	167

223rd

Plotting Date: 05/09/2024

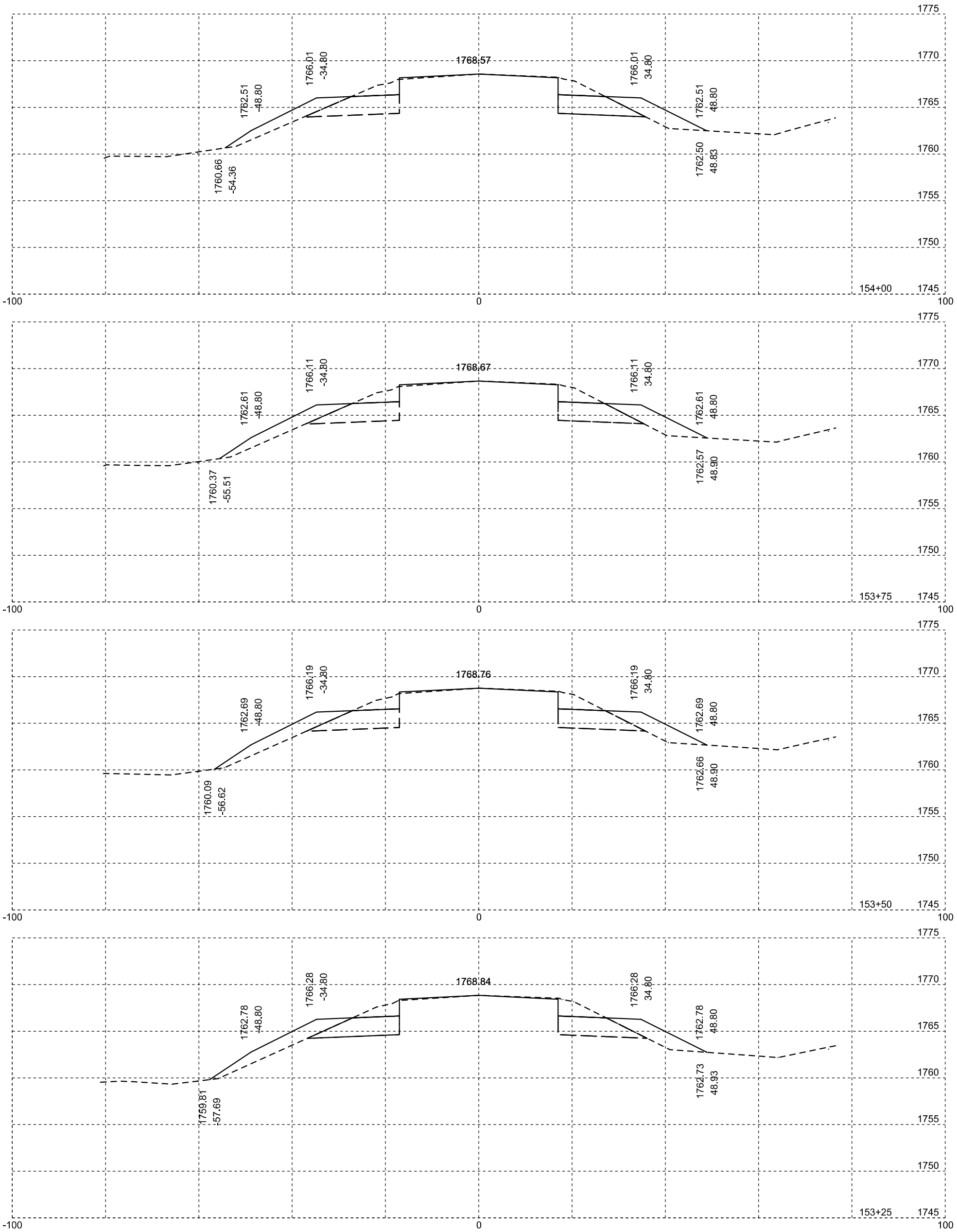
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(112)95	98	167

223rd

Plotting Date: 05/09/2024

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(112)95	99	167

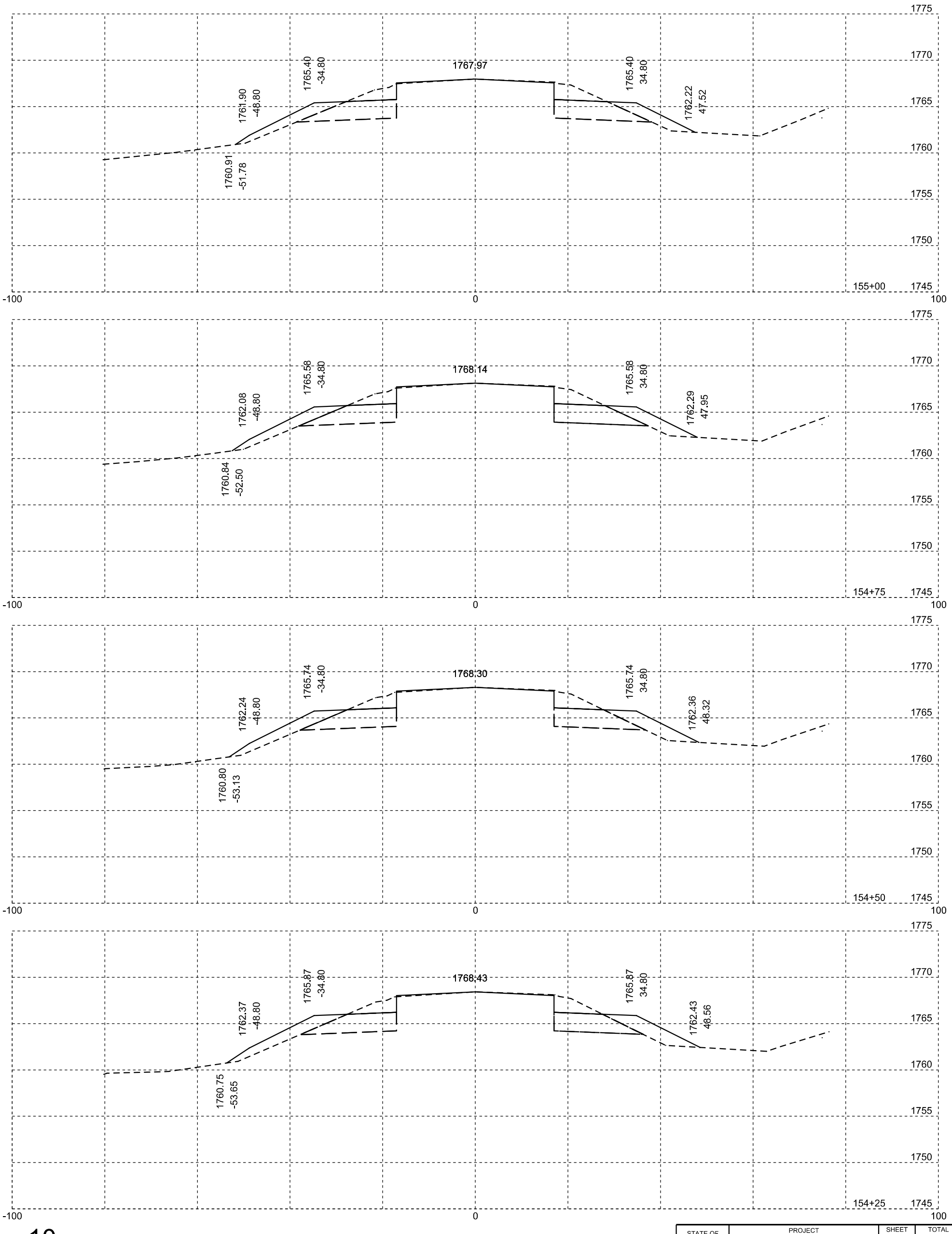
223rd



Plotting Date: 05/09/2024

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(112)95	100	167

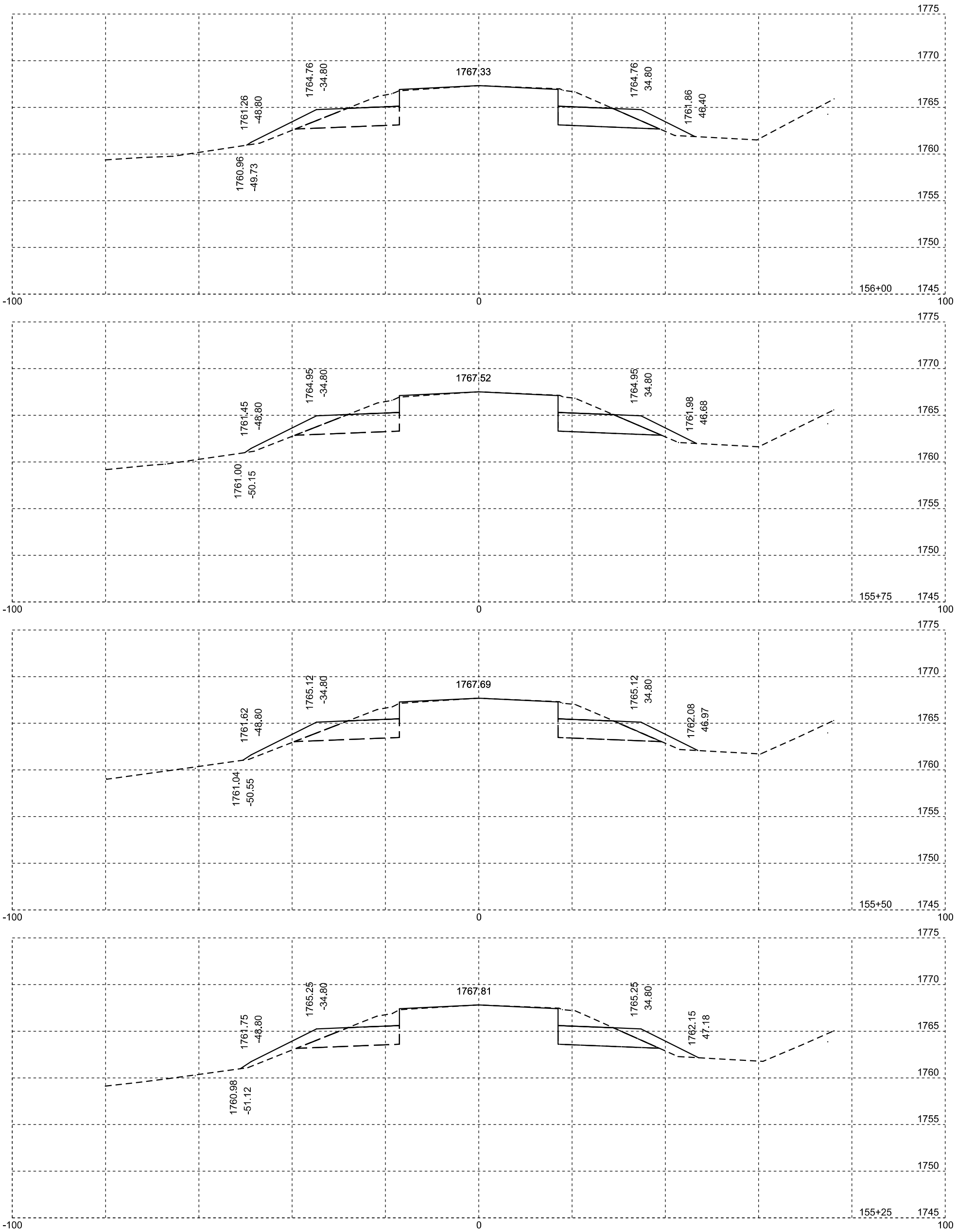
223rd



Plotting Date: 05/09/2024

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(112)95	101	167

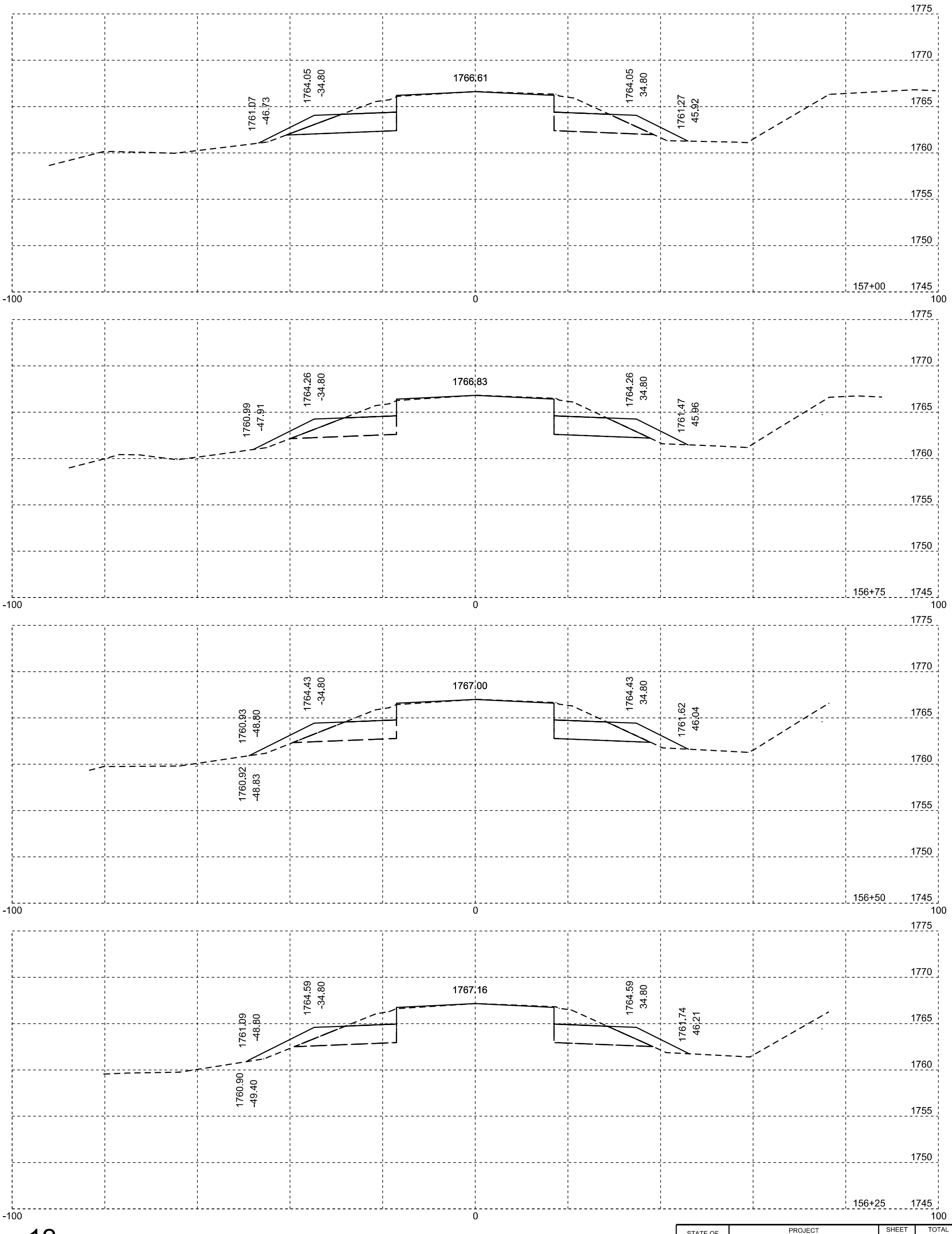
223rd



Plotting Date: 05/09/2024

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(112)95	102	167

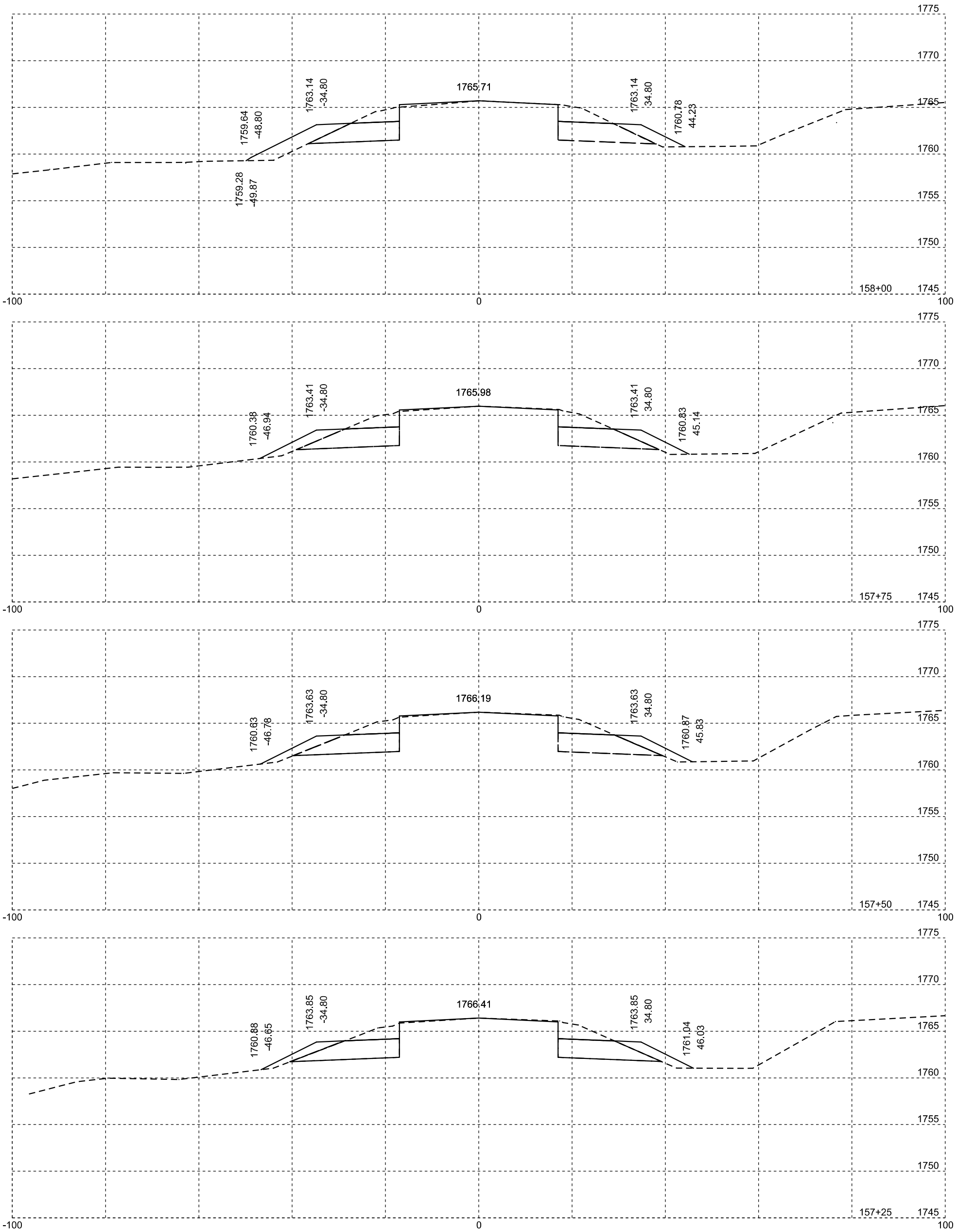
223rd



Plotting Date: 05/09/2024

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(112)95	103	167

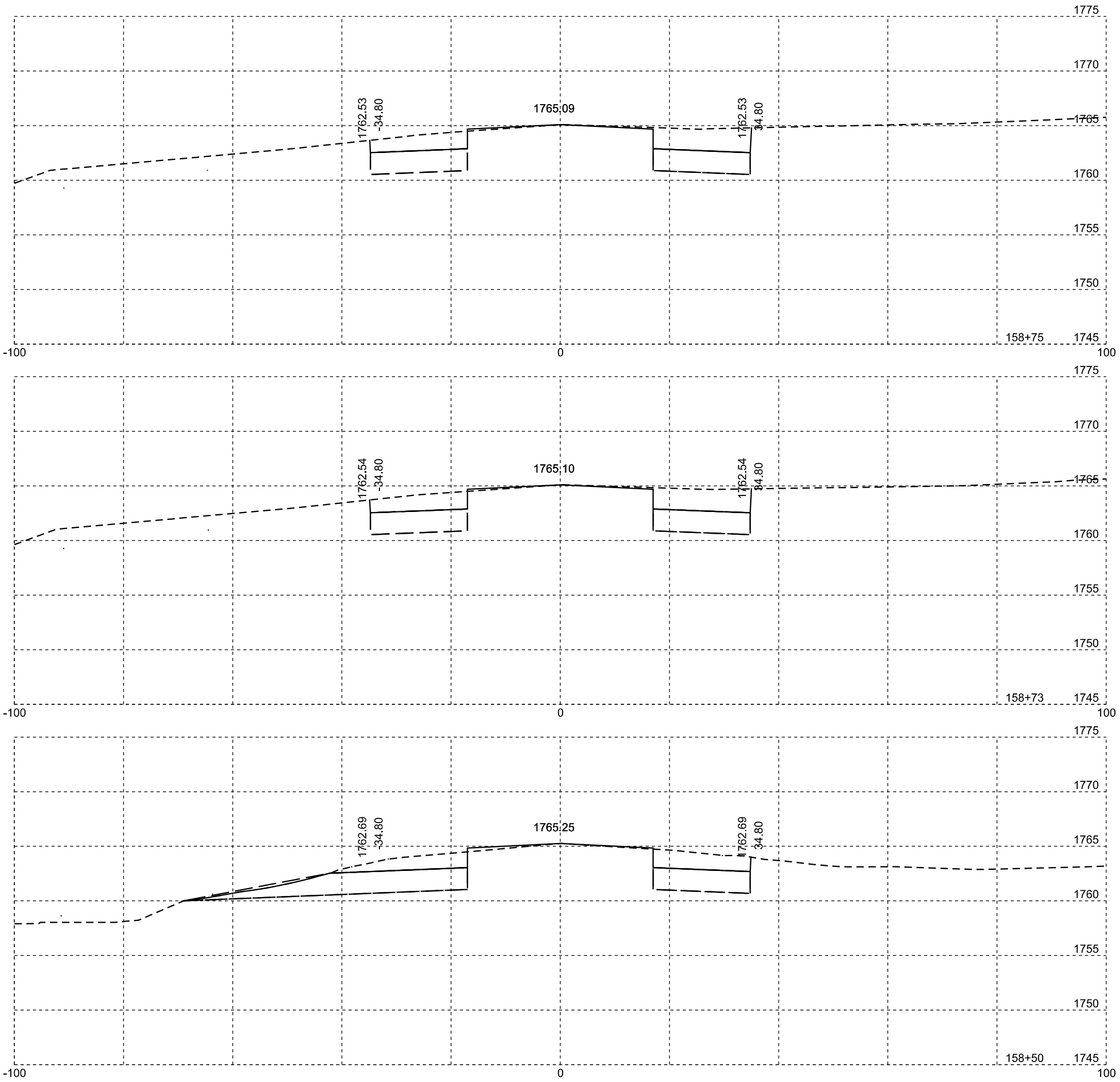
223rd



Plotting Date: 05/09/2024

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(112)95	104	167

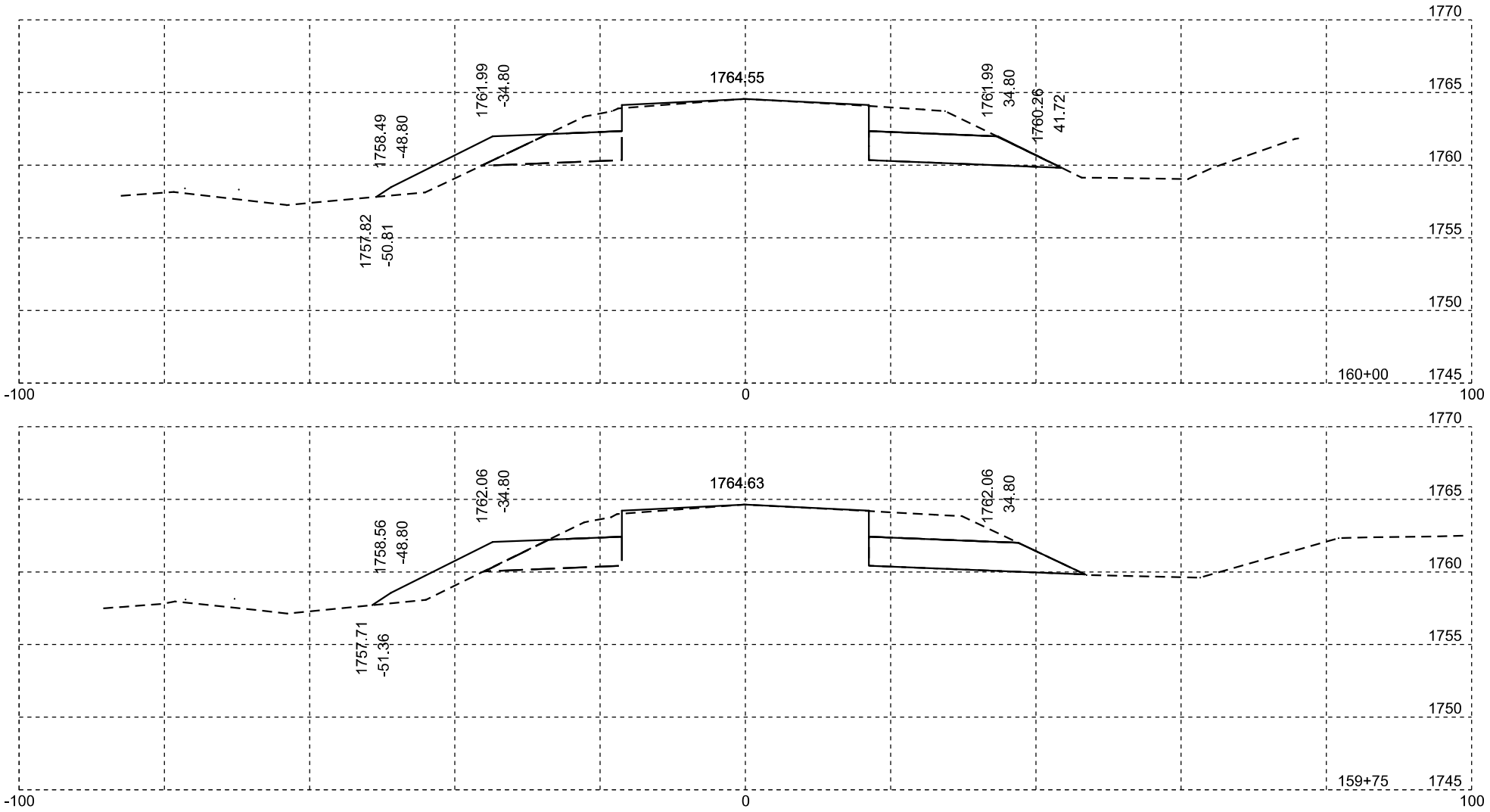
223rd

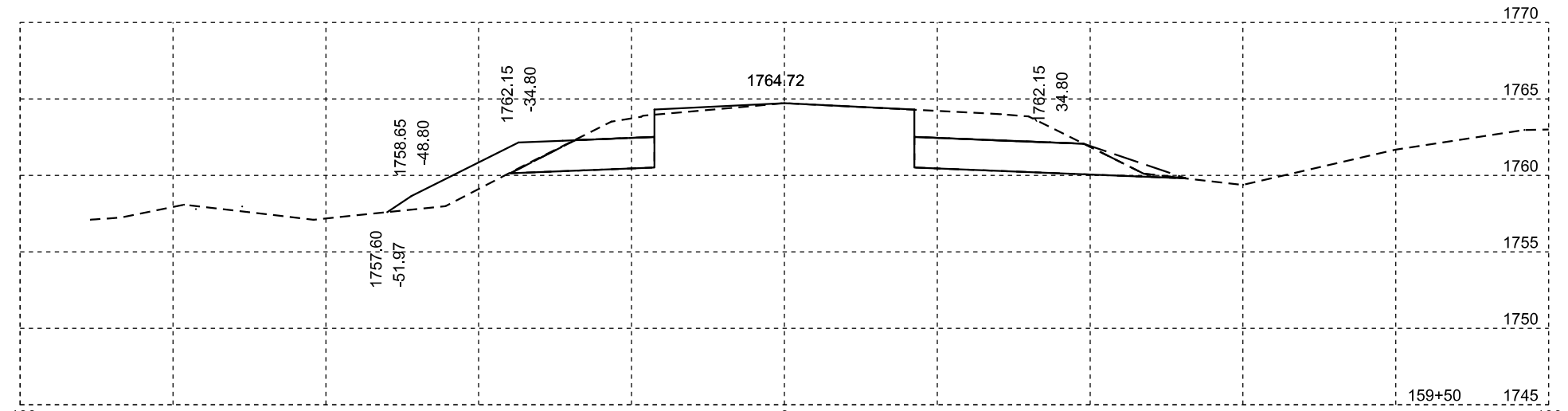


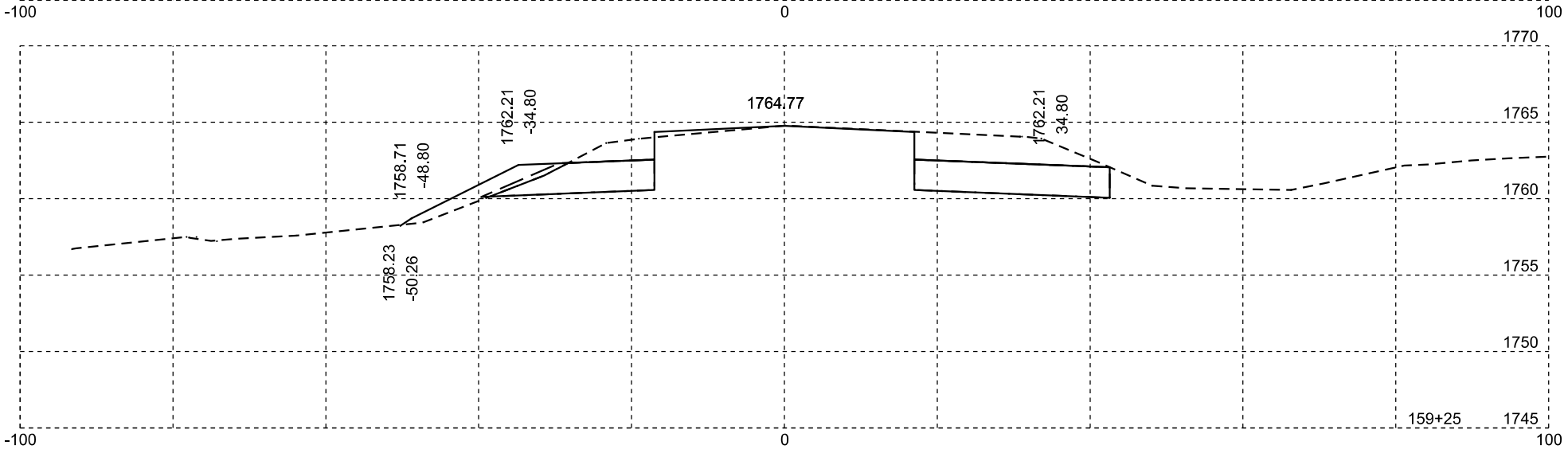
Plotting Date: 05/09/2024

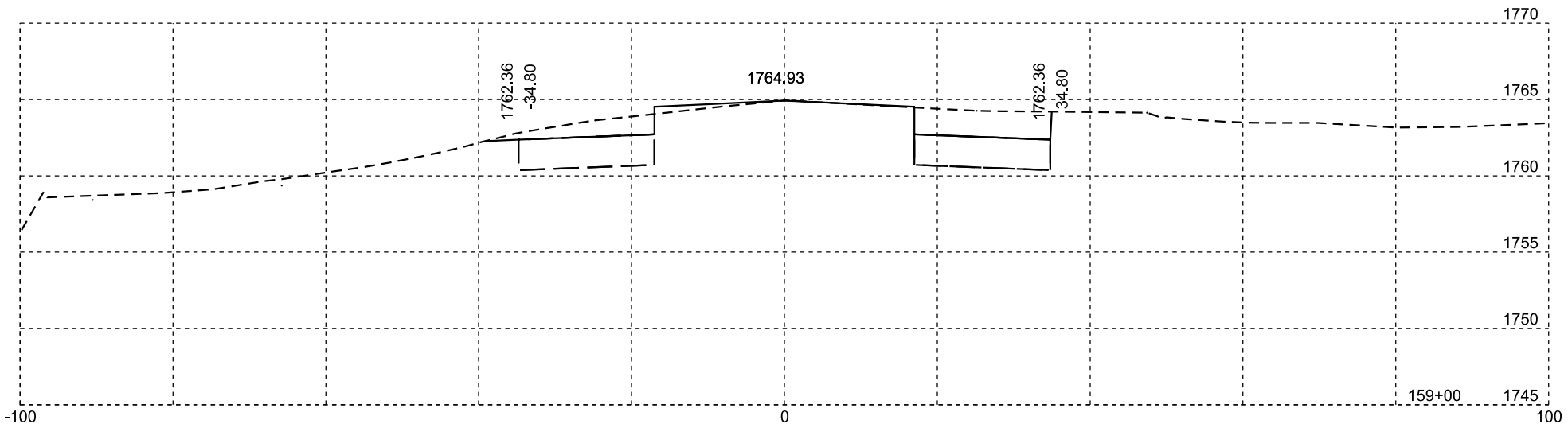
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(112)95	105	167

223rd







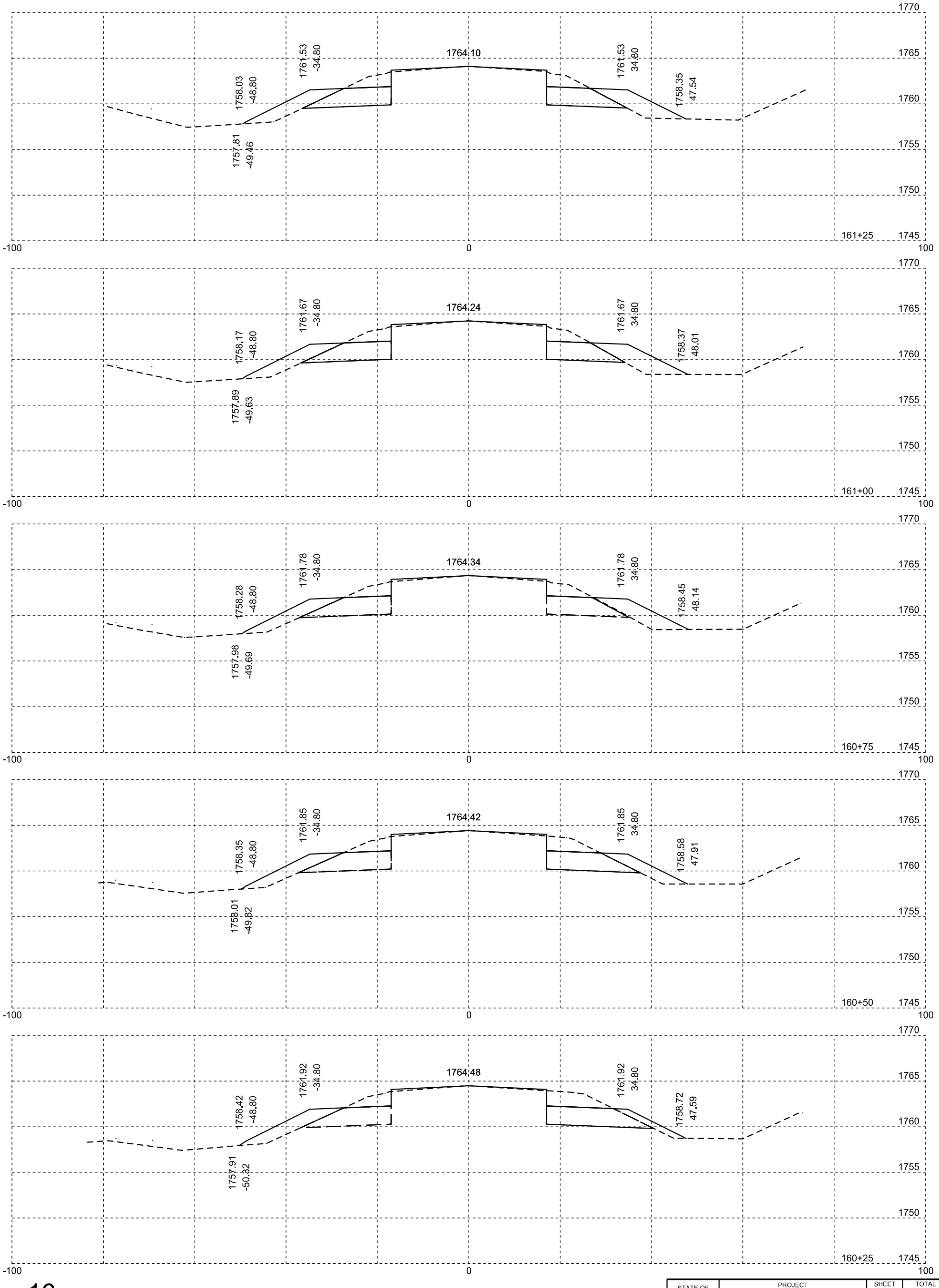


15

Plotting Date: 05/09/2024

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(112)95	106	167

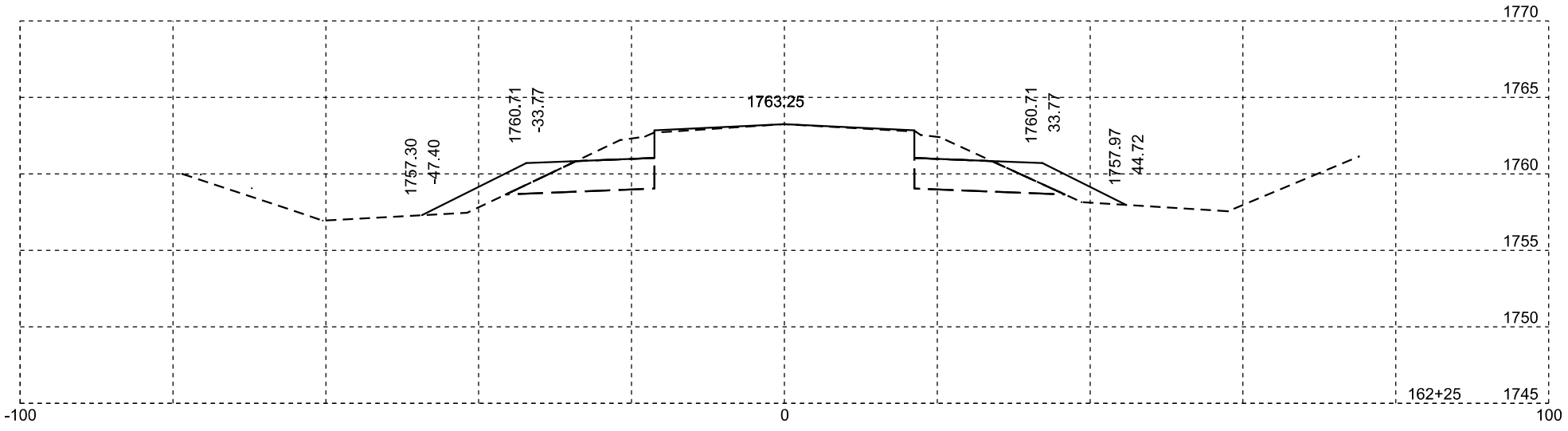
223rd

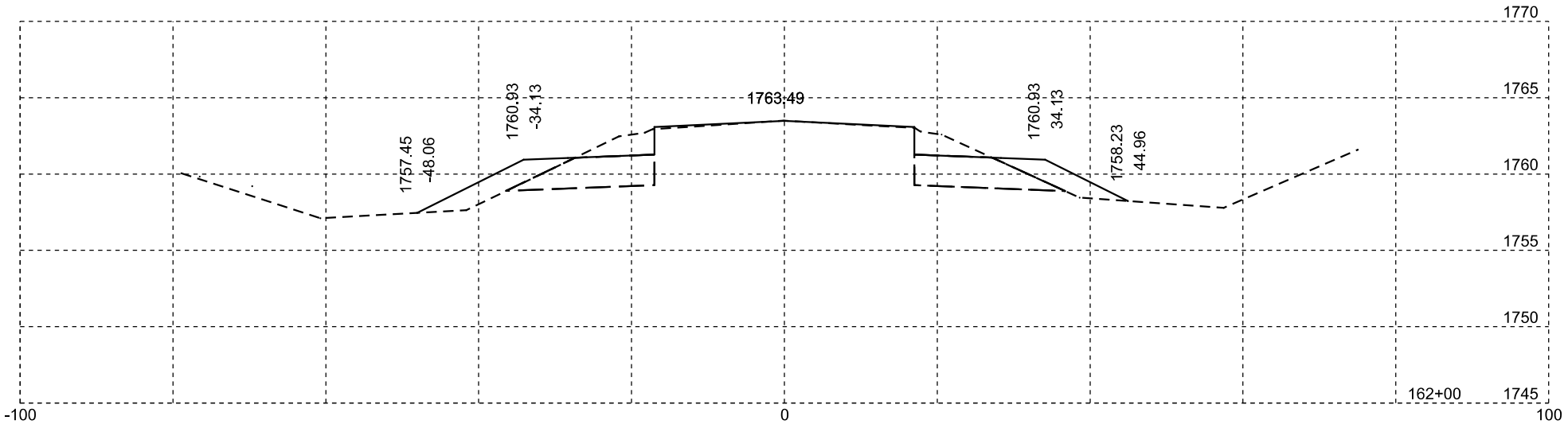


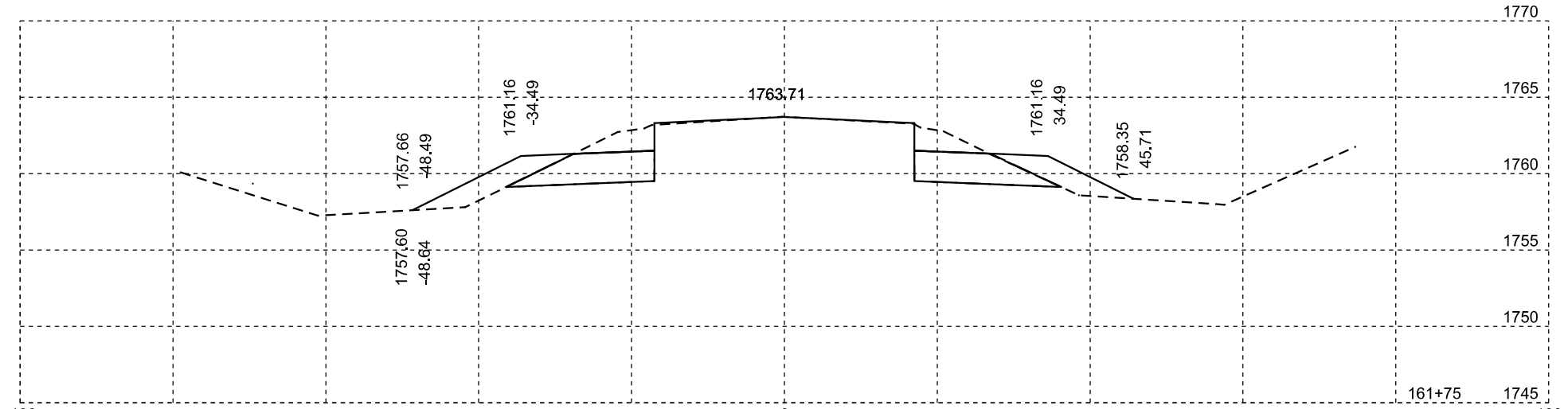
Plotting Date: 05/09/2024

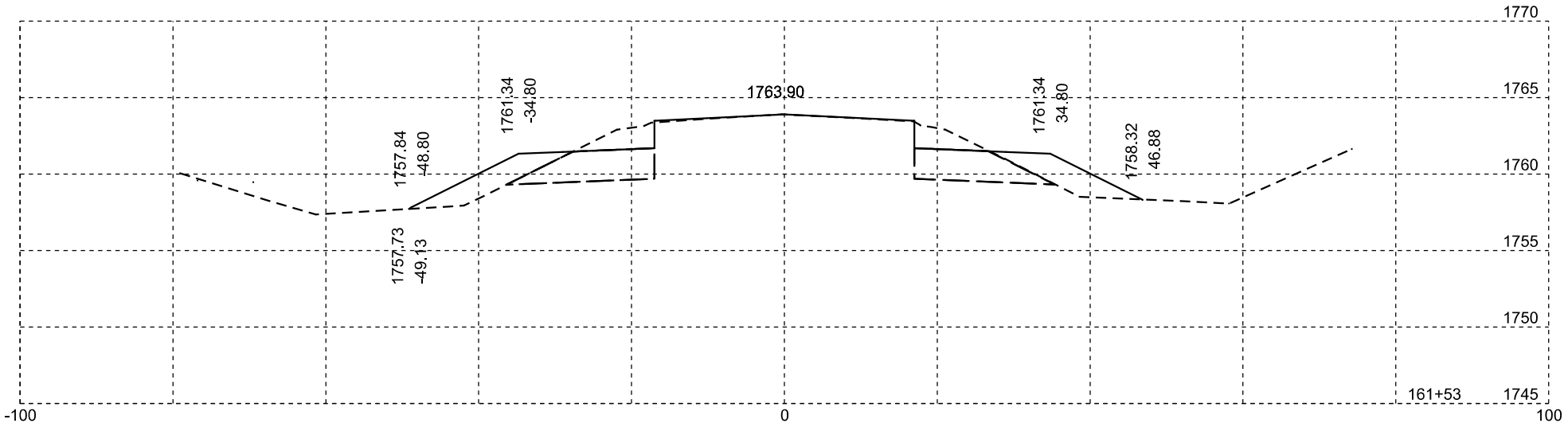
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(112)95	107	167

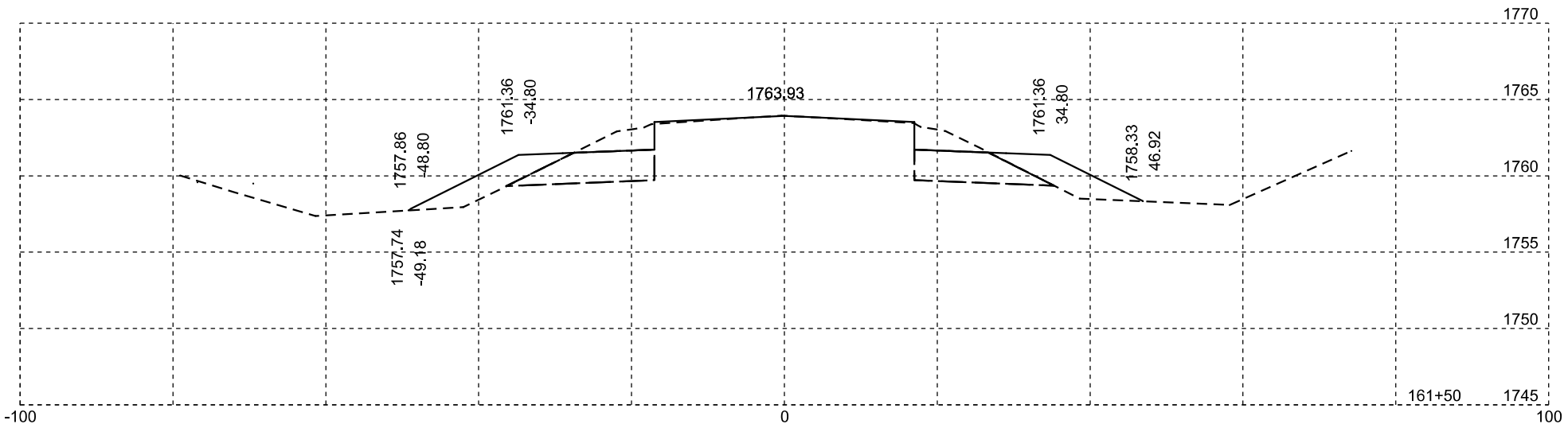
223rd









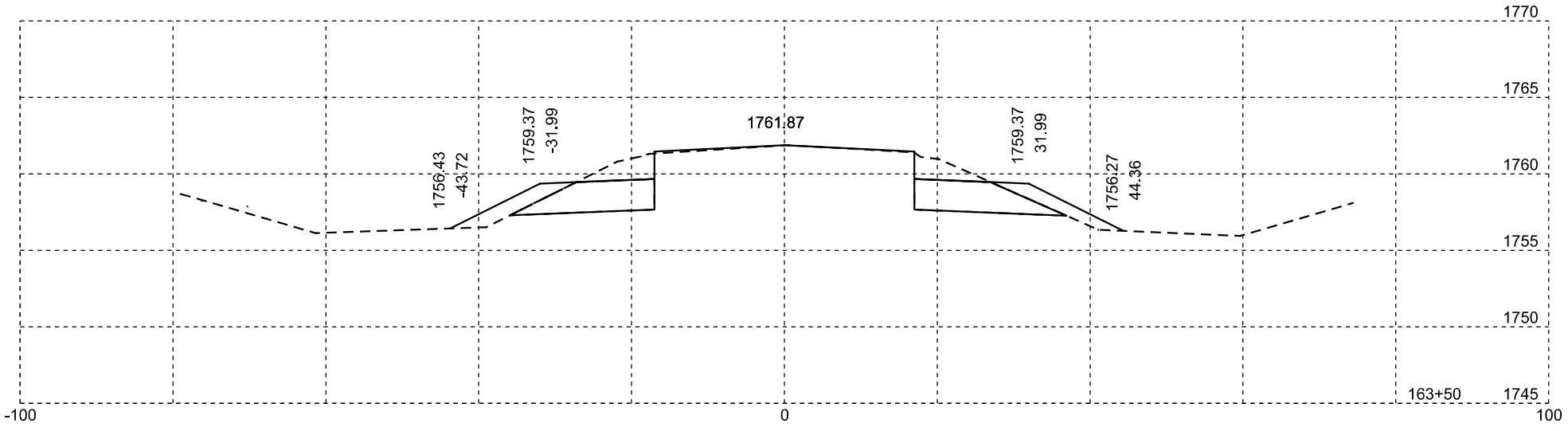


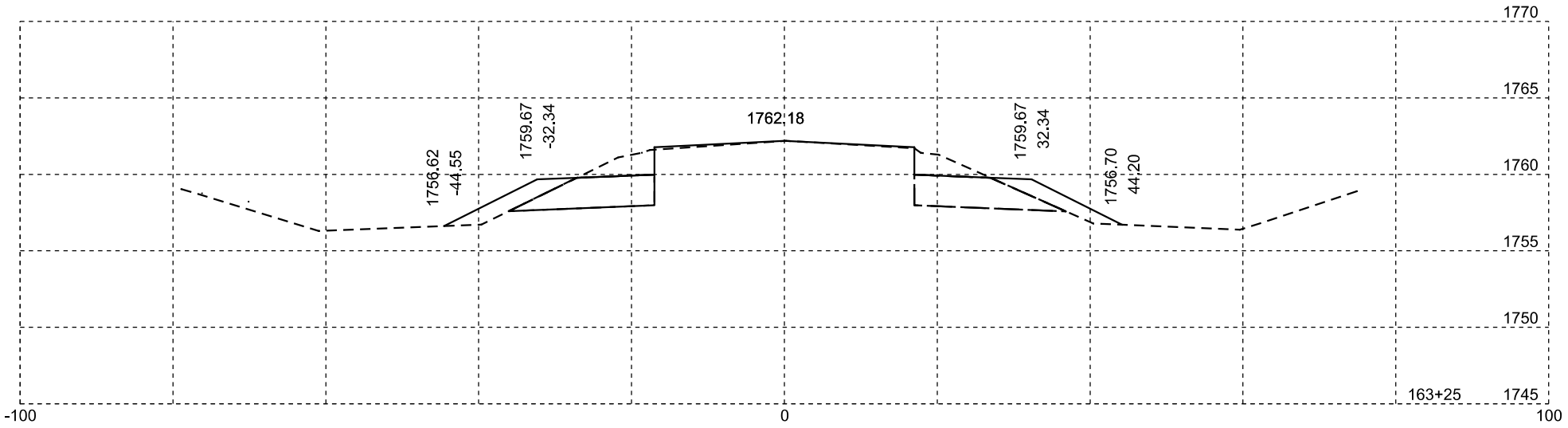
17

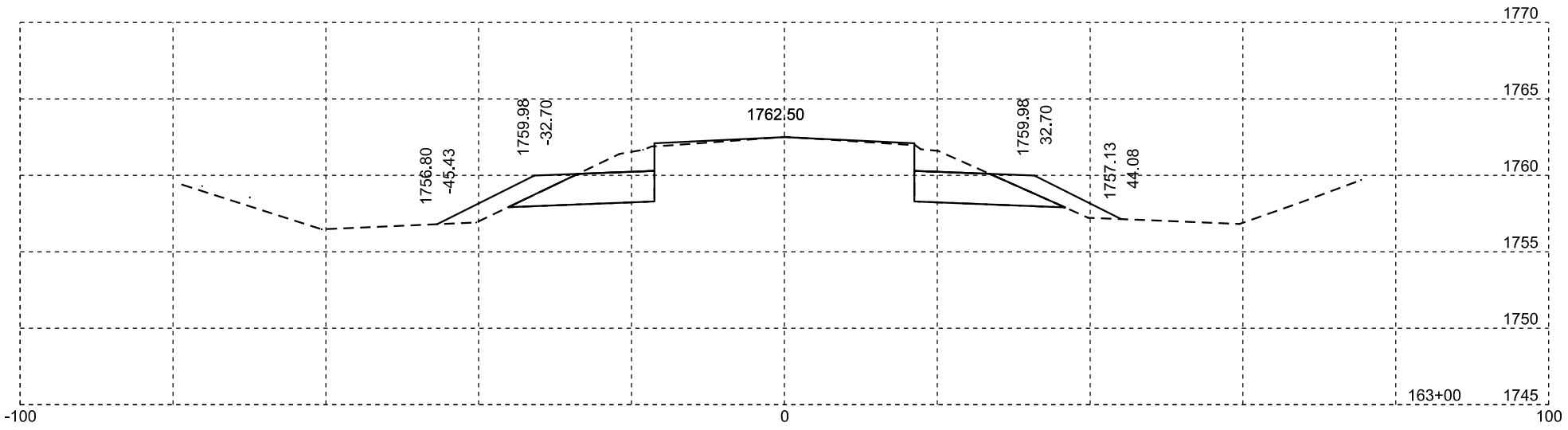
Plotting Date: 05/09/2024

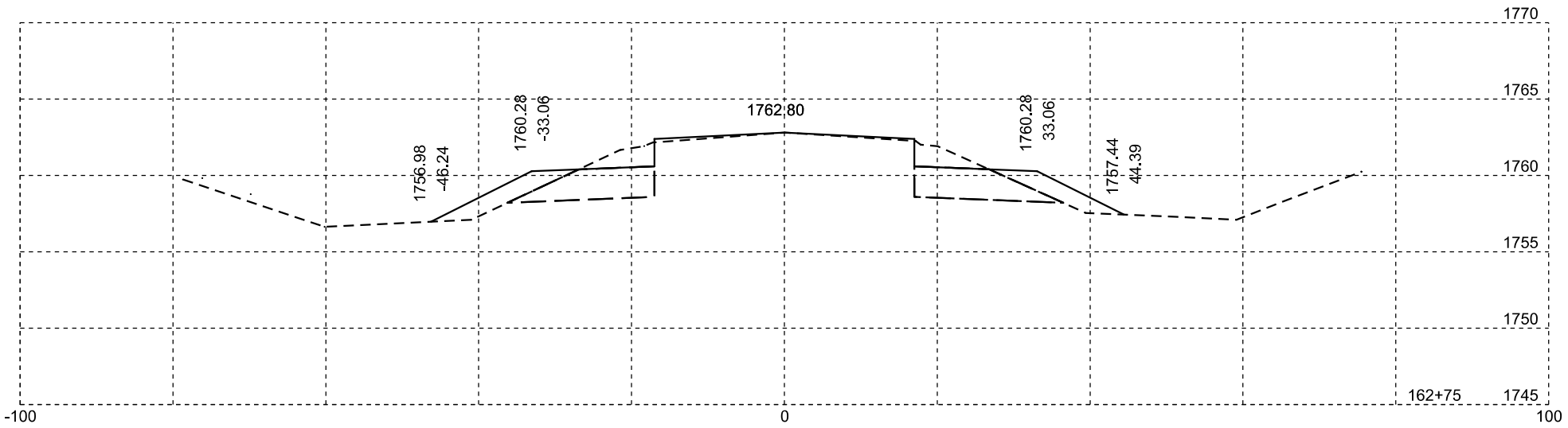
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(112)95	108	167

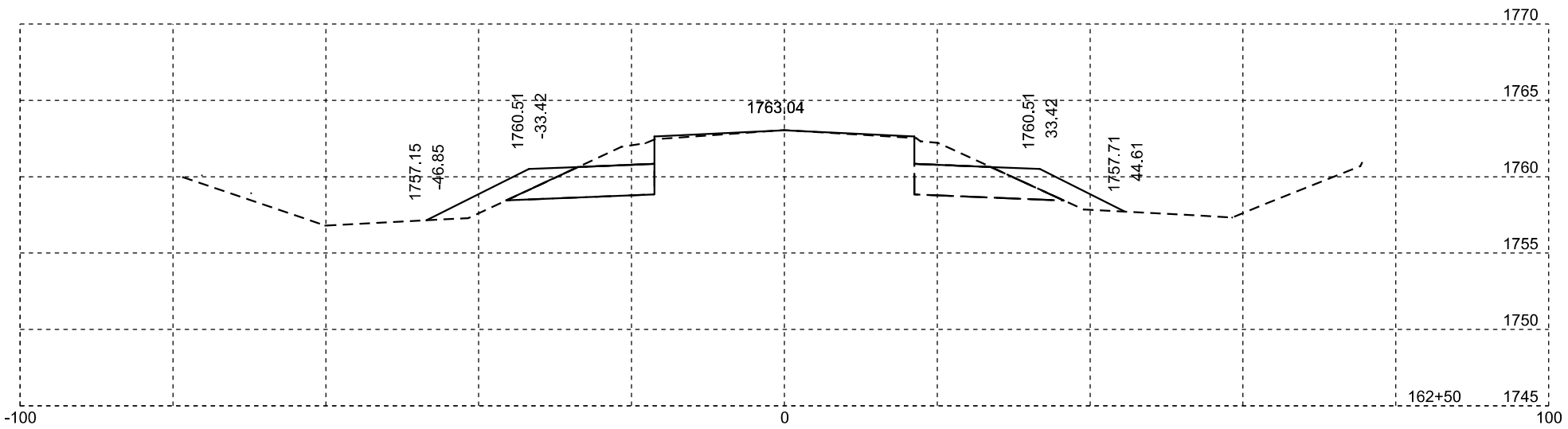
223rd









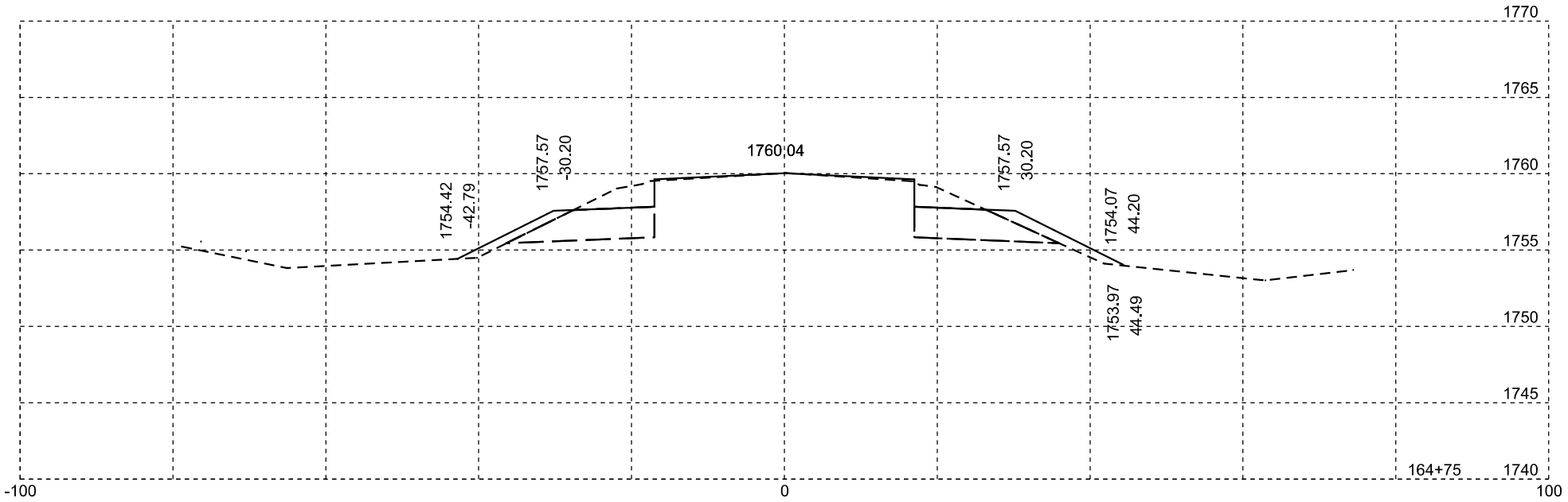


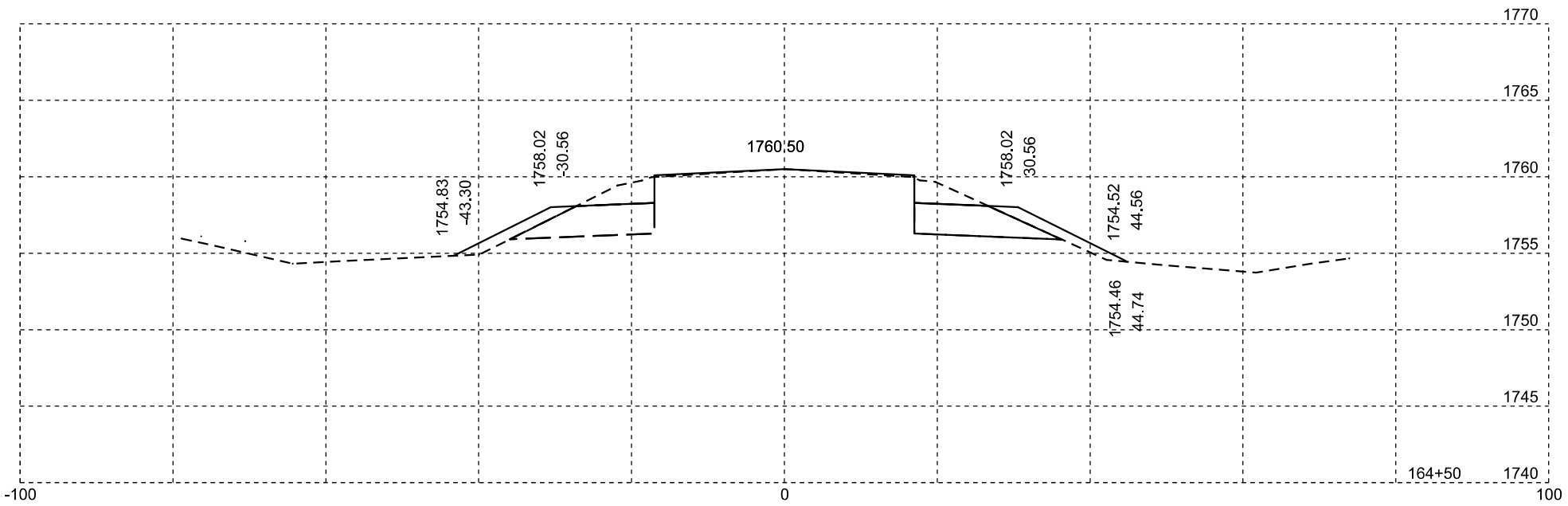
18

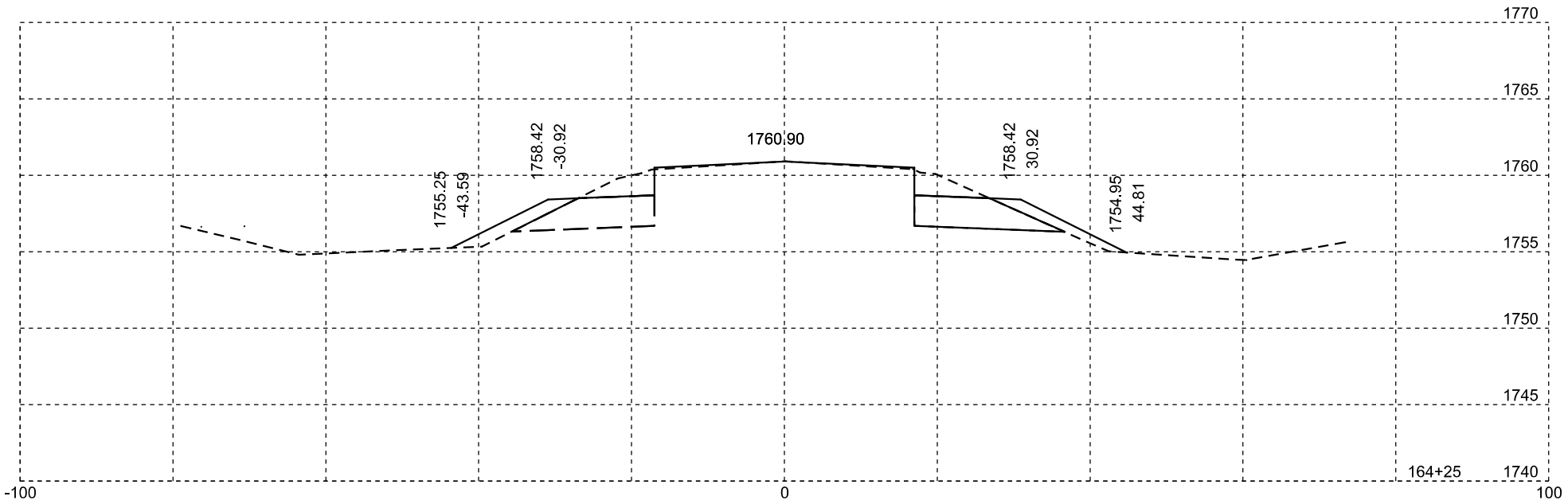
Plotting Date: 05/09/2024

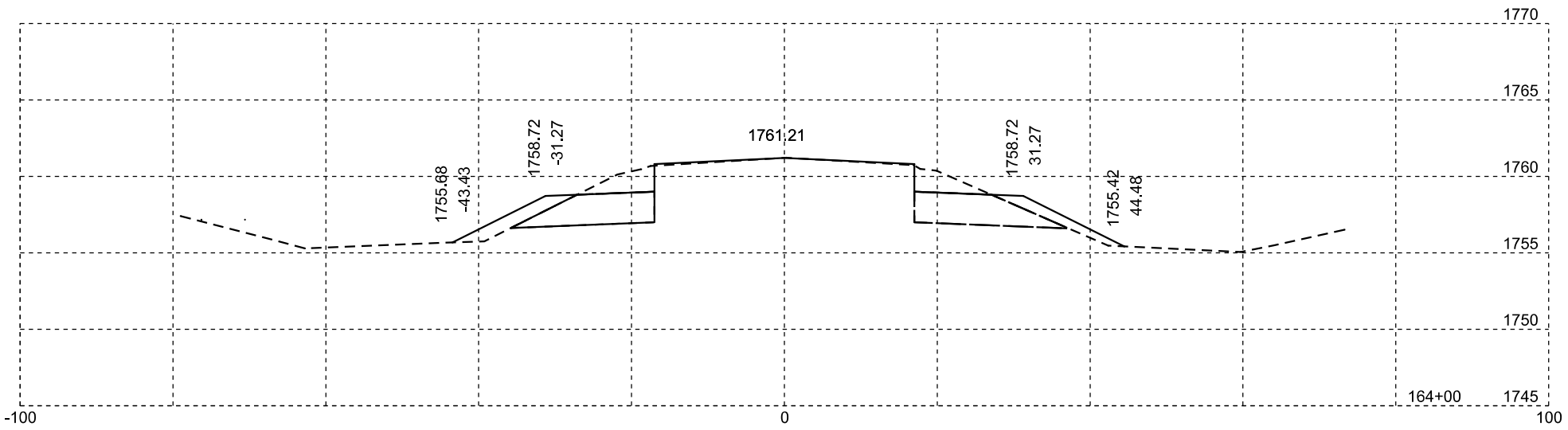
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(112)95	109	167

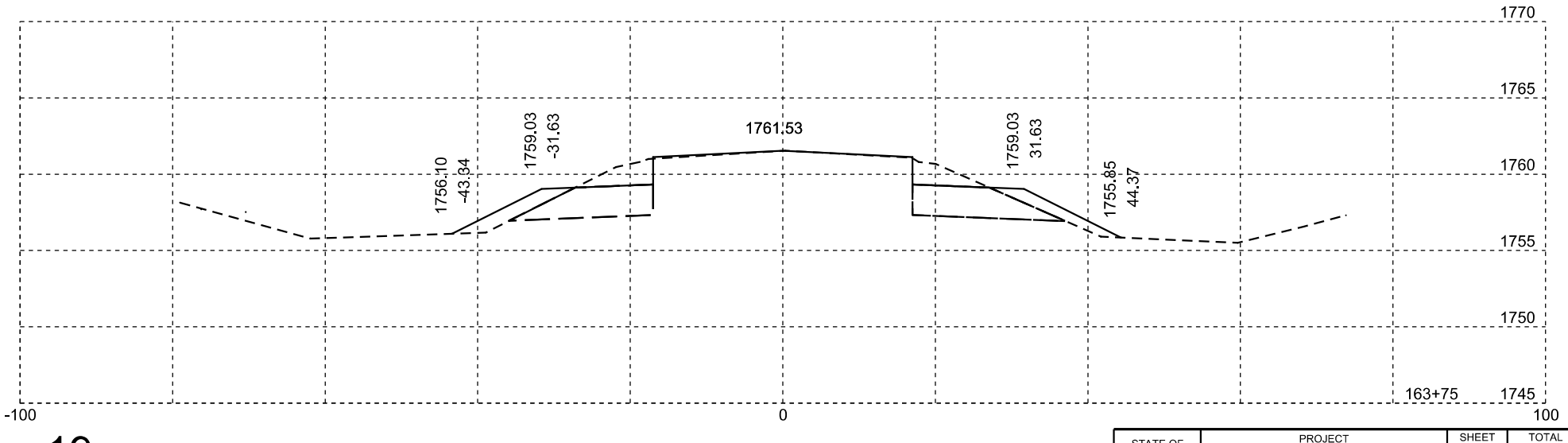
223rd







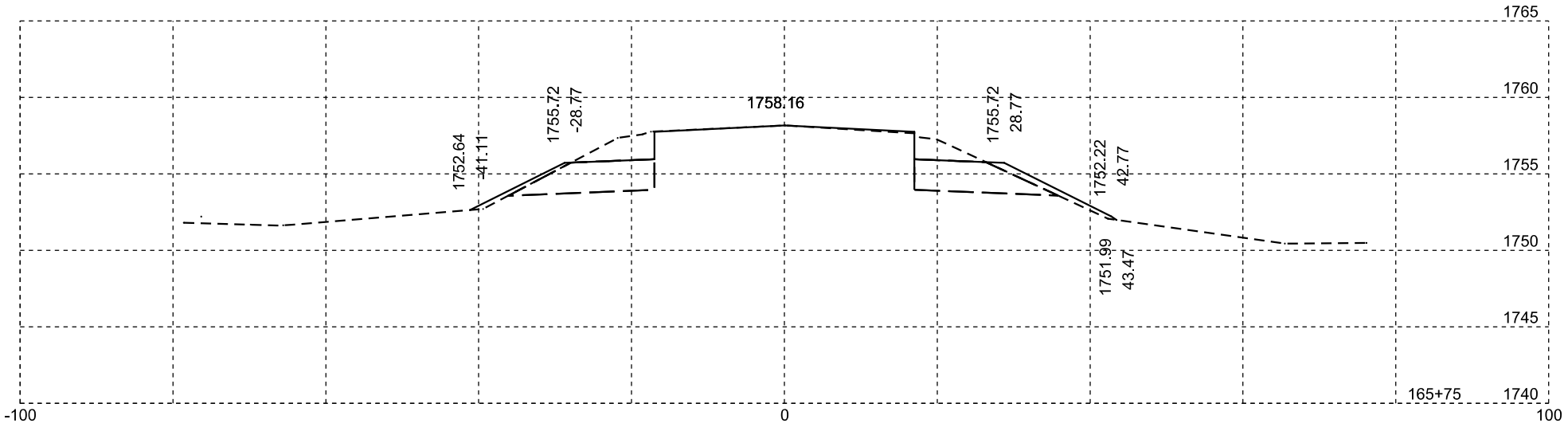


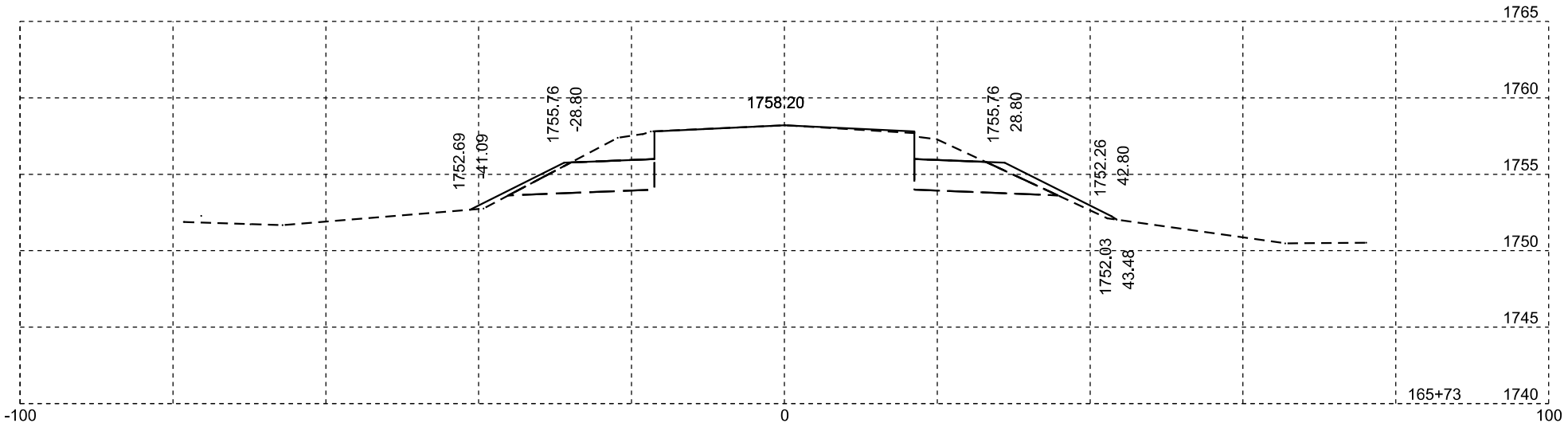


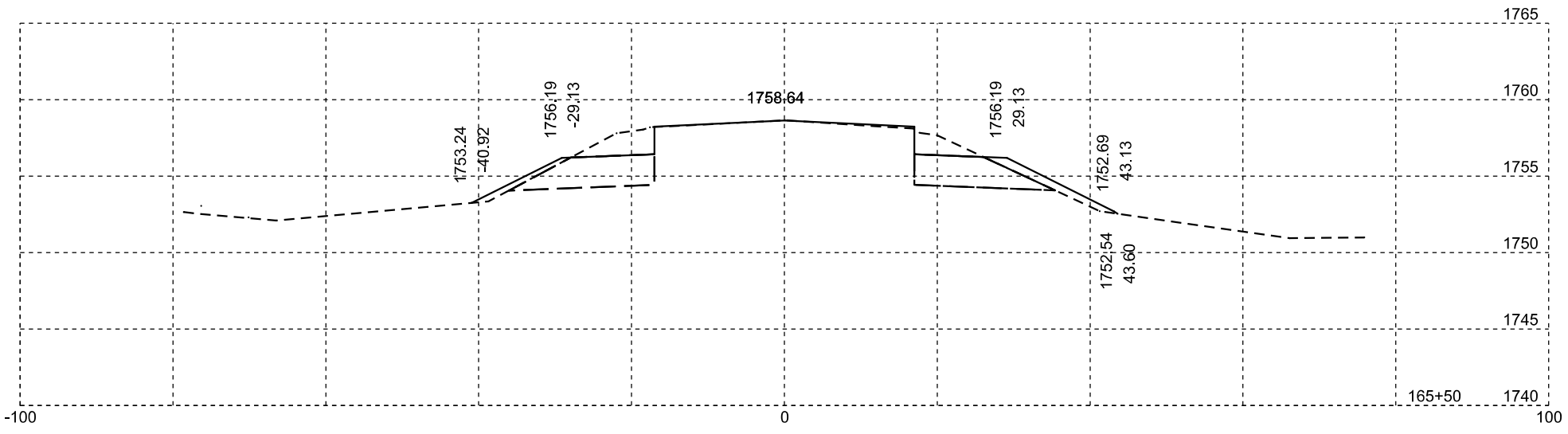
Plotting Date: 05/09/2024

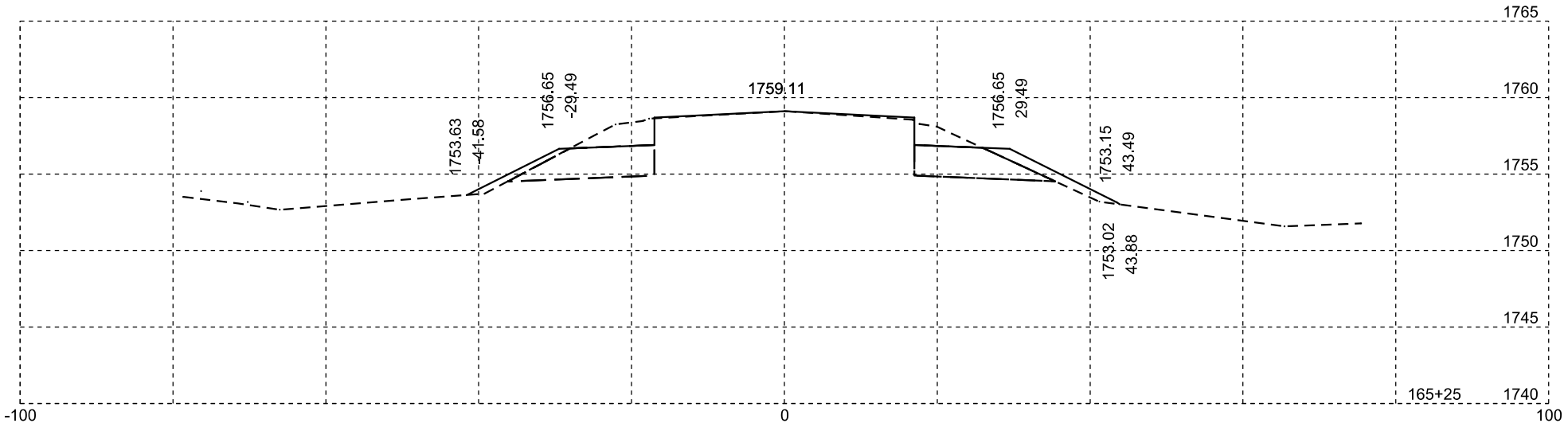
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(112)95	110	167

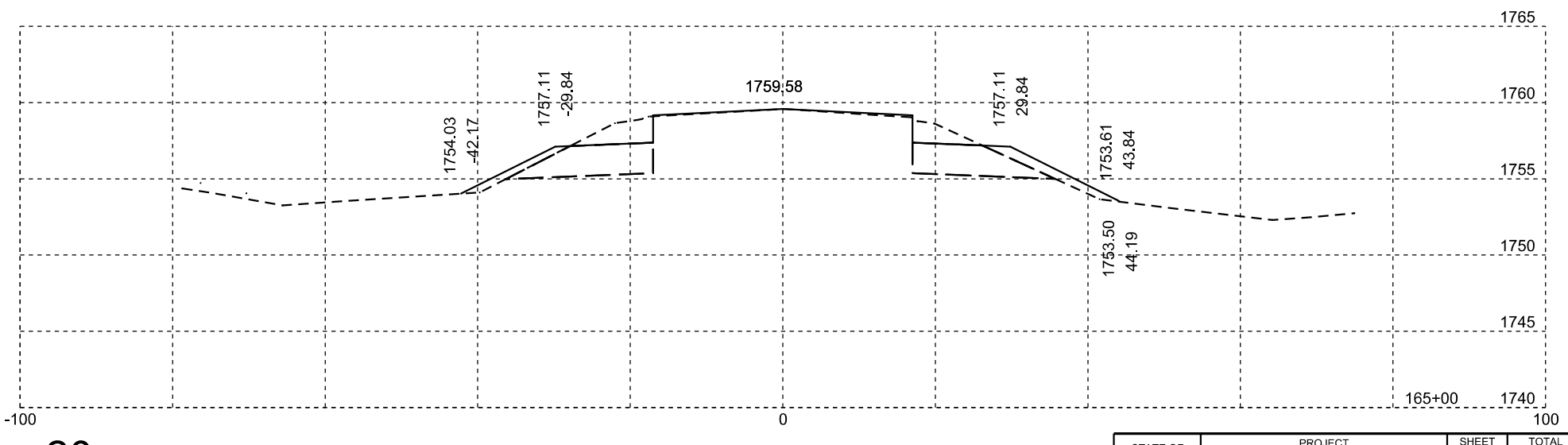
223rd









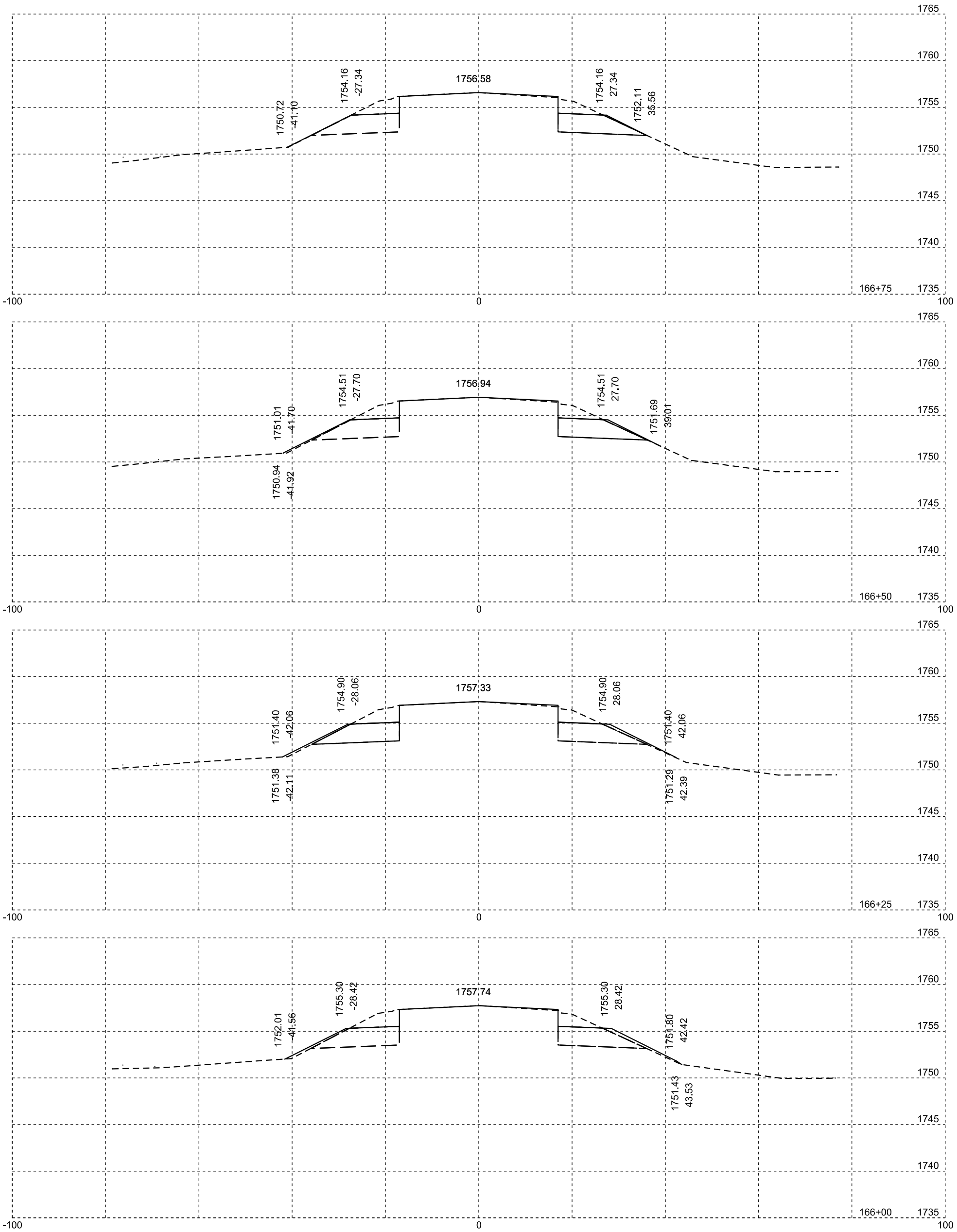


20

Plotting Date: 05/09/2024

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(112)95	111	167

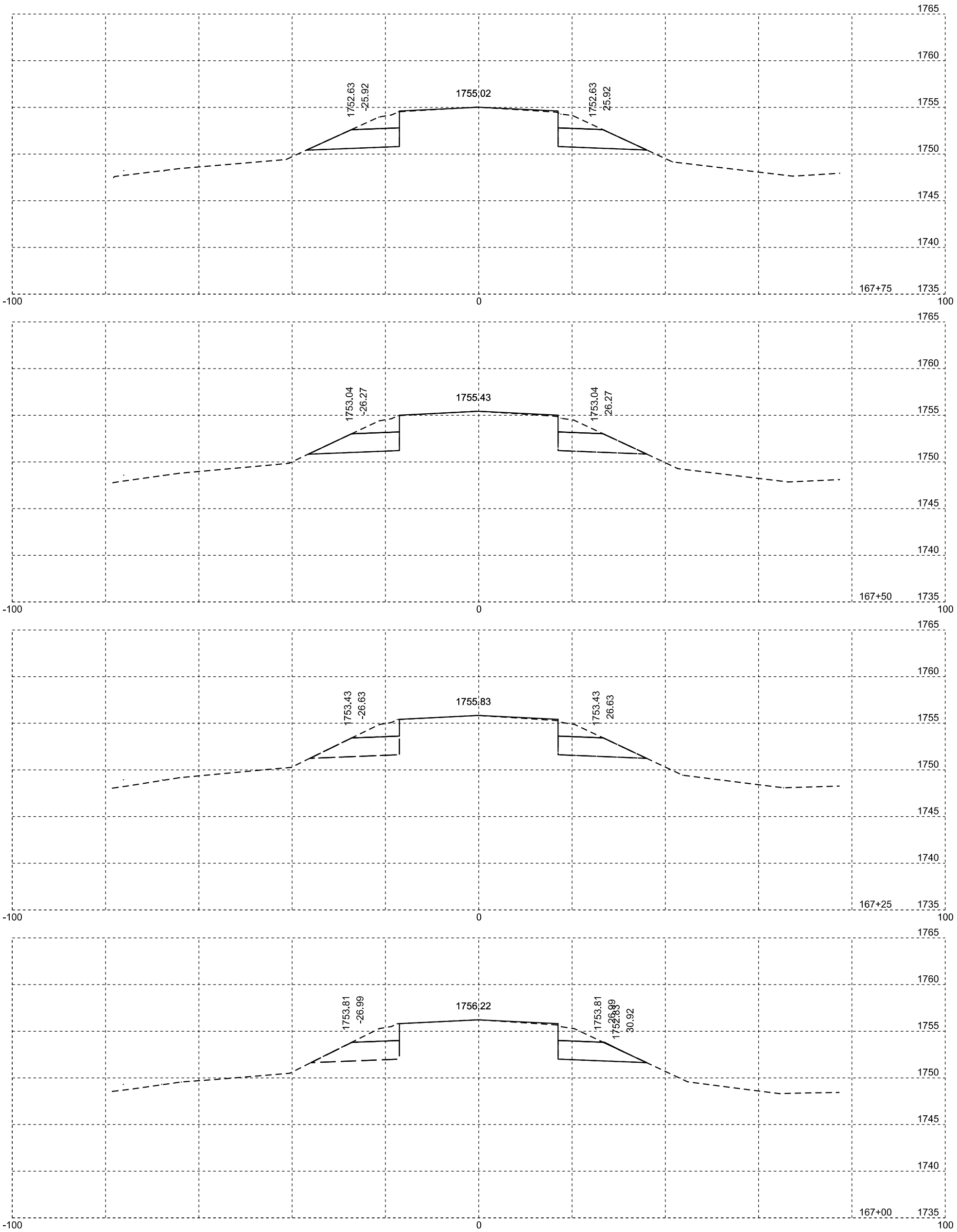
223rd



Plotting Date: 05/09/2024

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(112)95	112	167

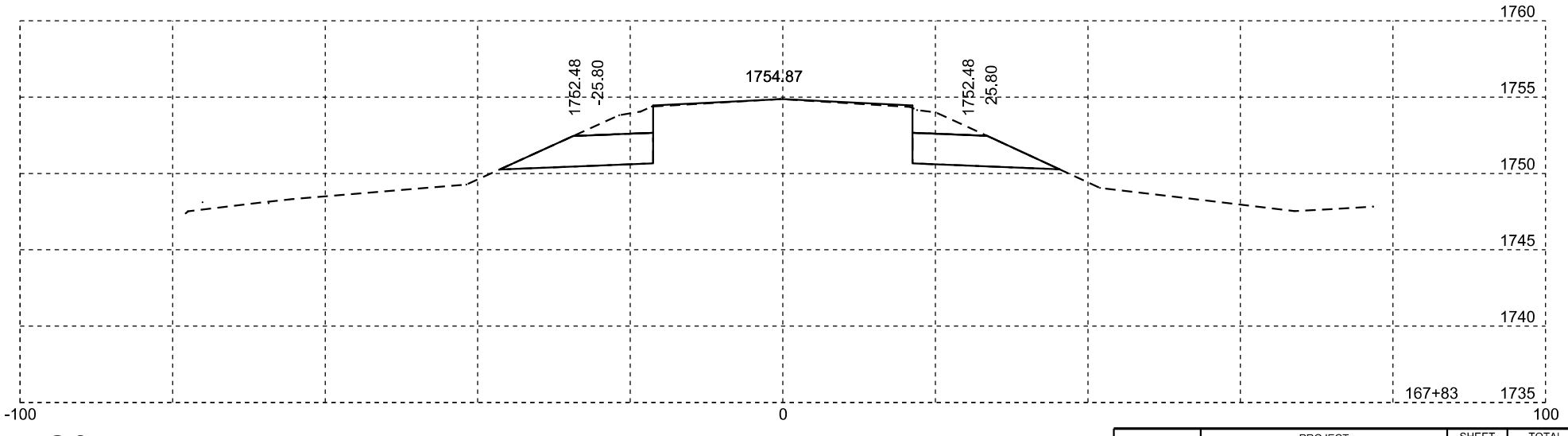
223rd



Plotting Date: 05/09/2024

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(112)95	113	167

223rd

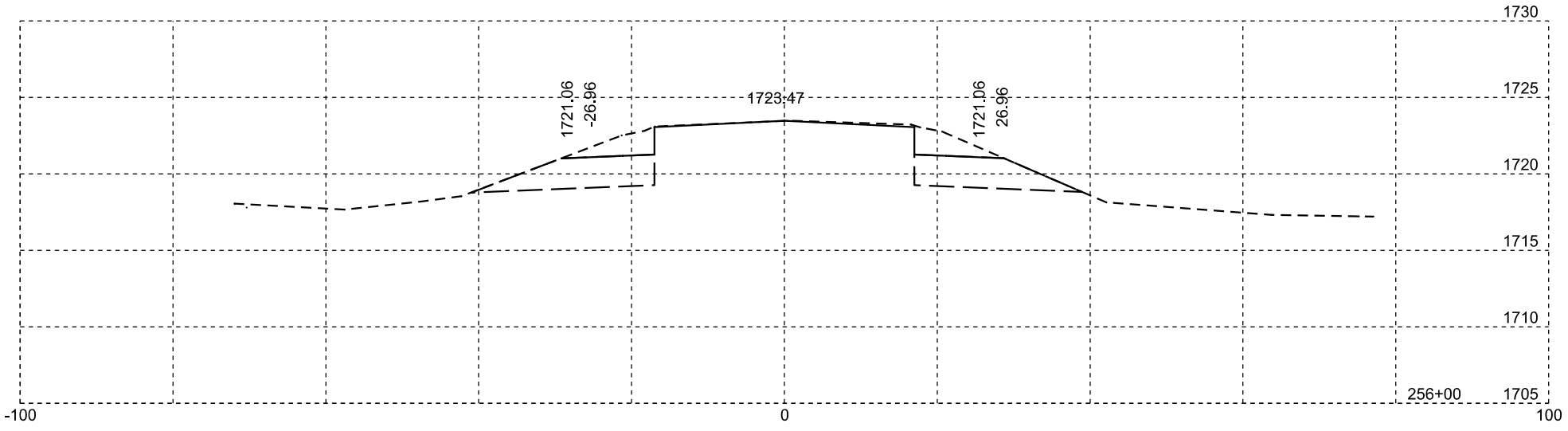


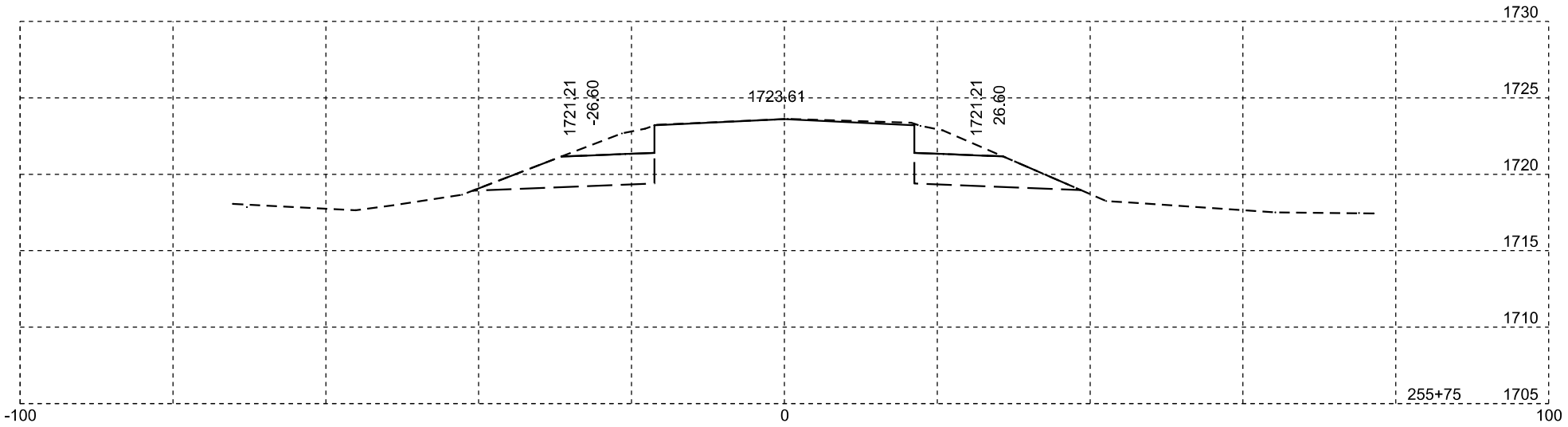
23

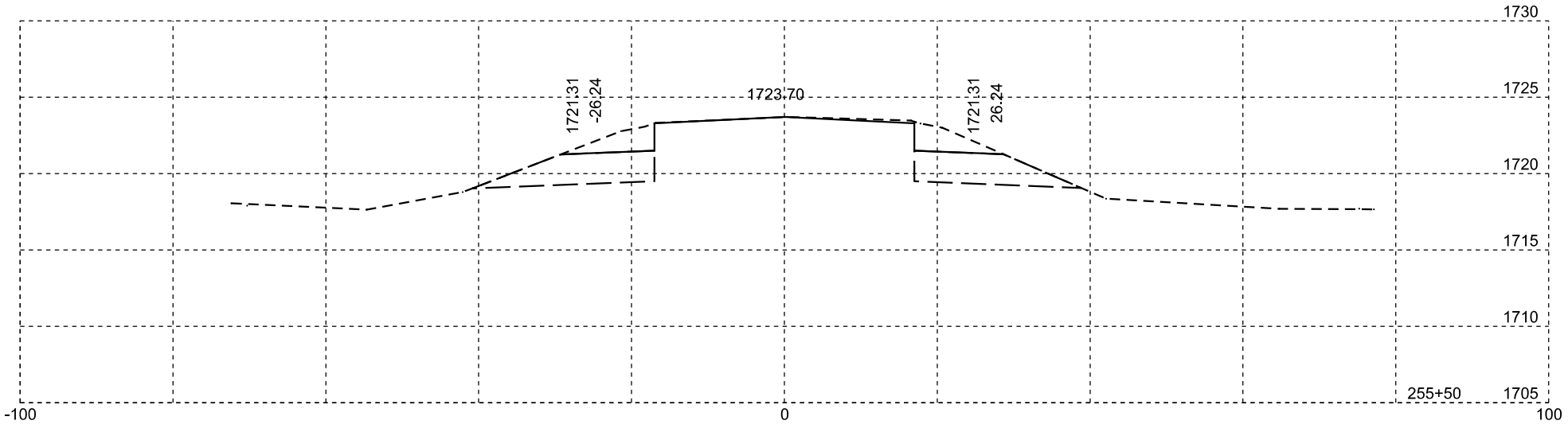
Plotting Date: 05/09/2024

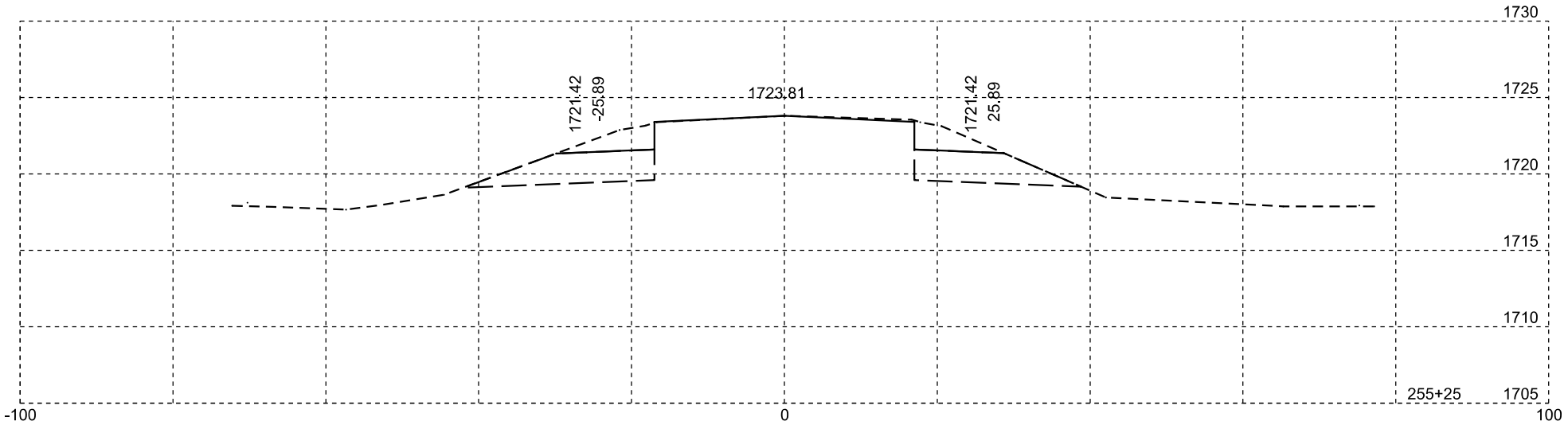
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(112)95	114	167

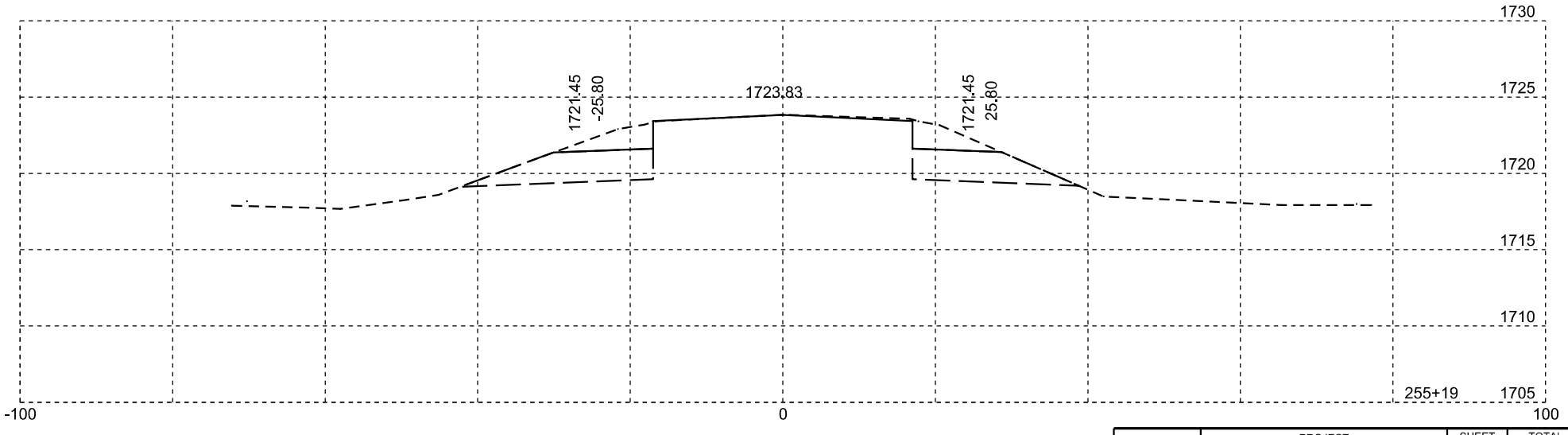
225th









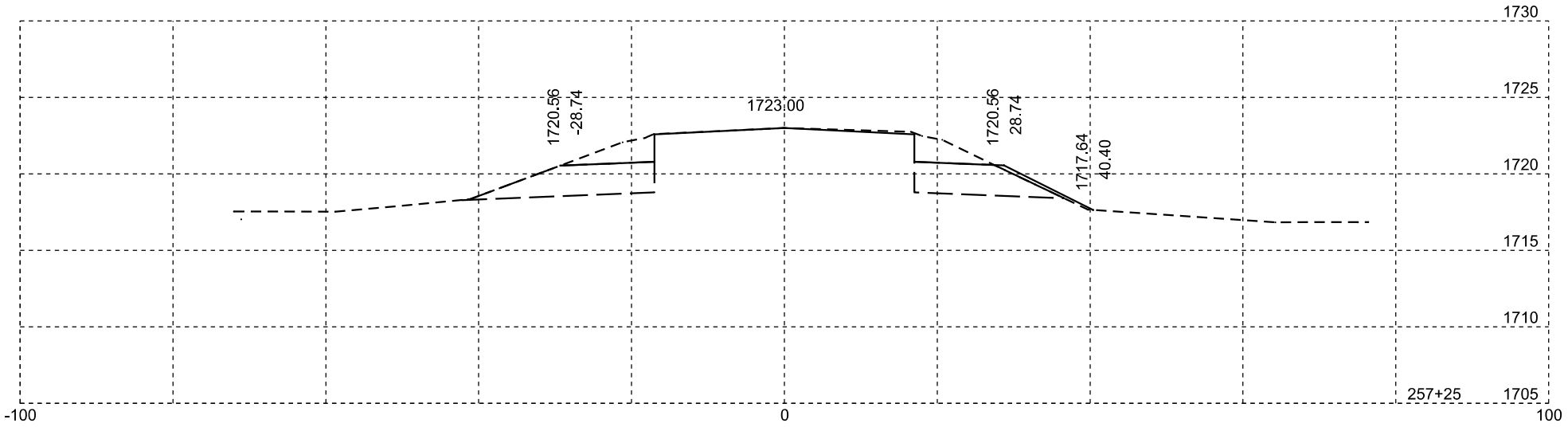


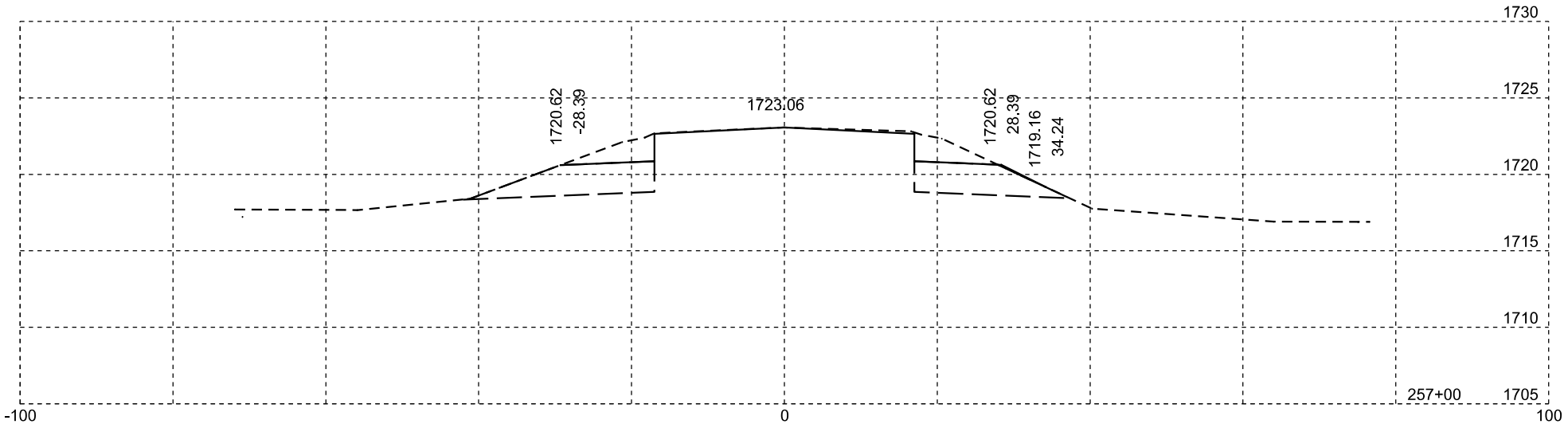
1

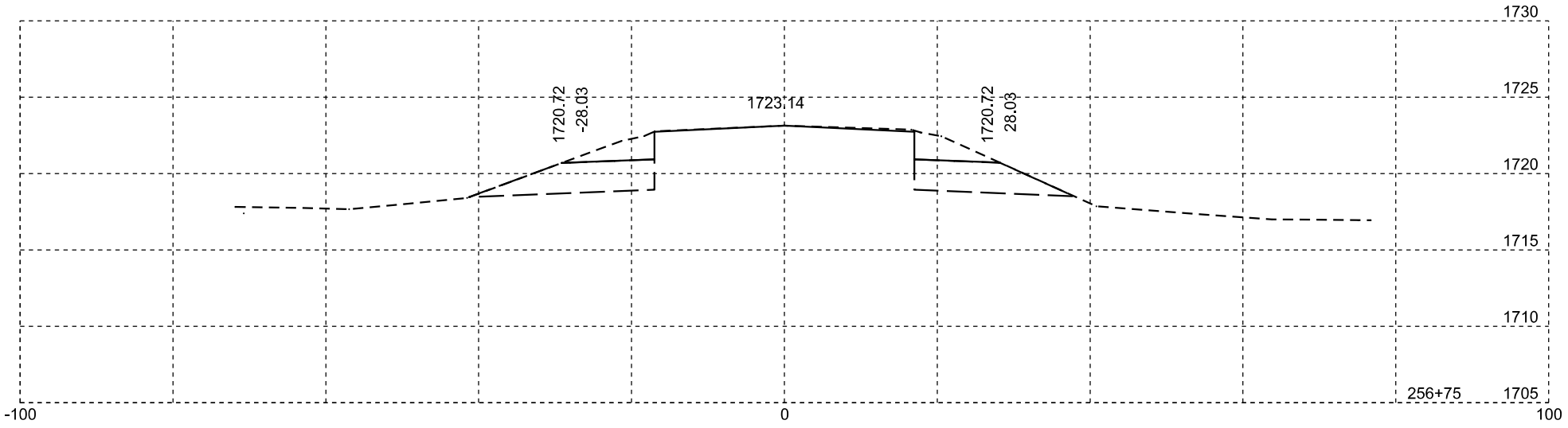
Plotting Date: 05/09/2024

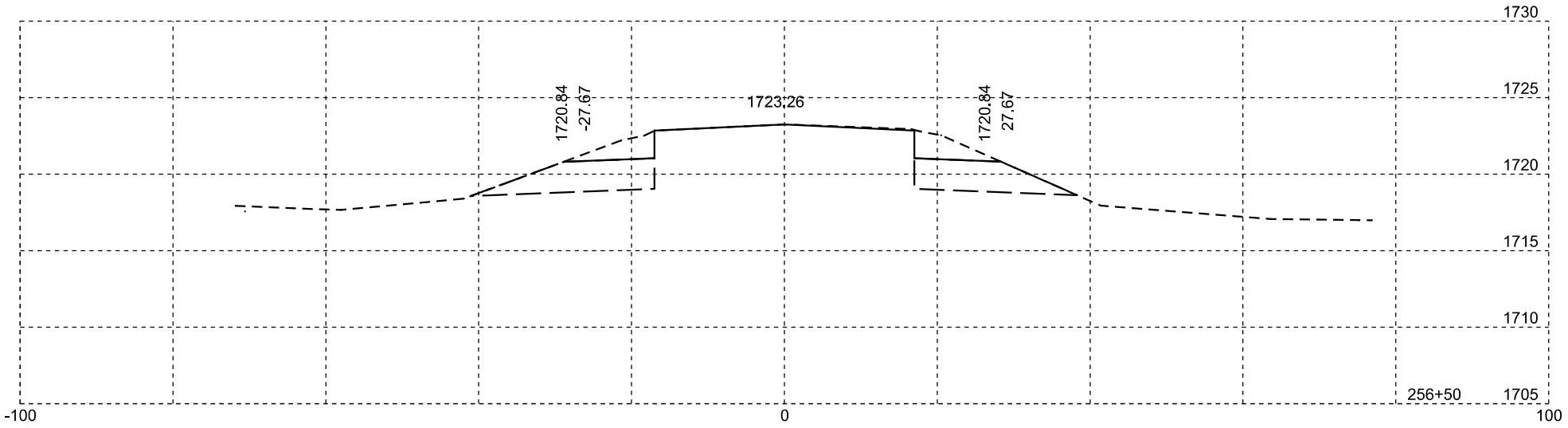
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(112)95	115	167

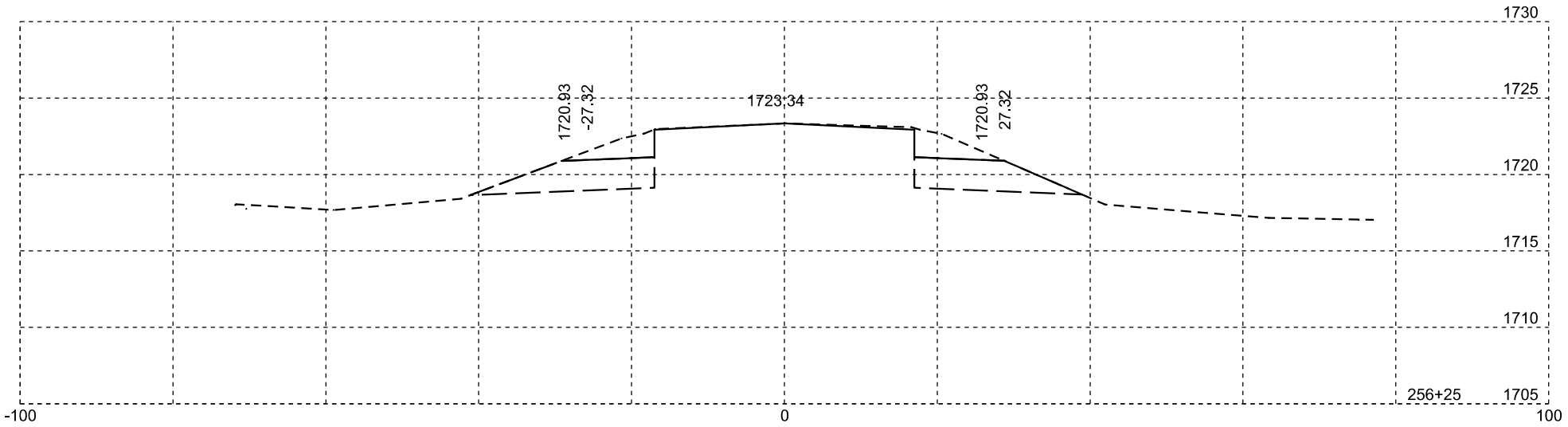
225th









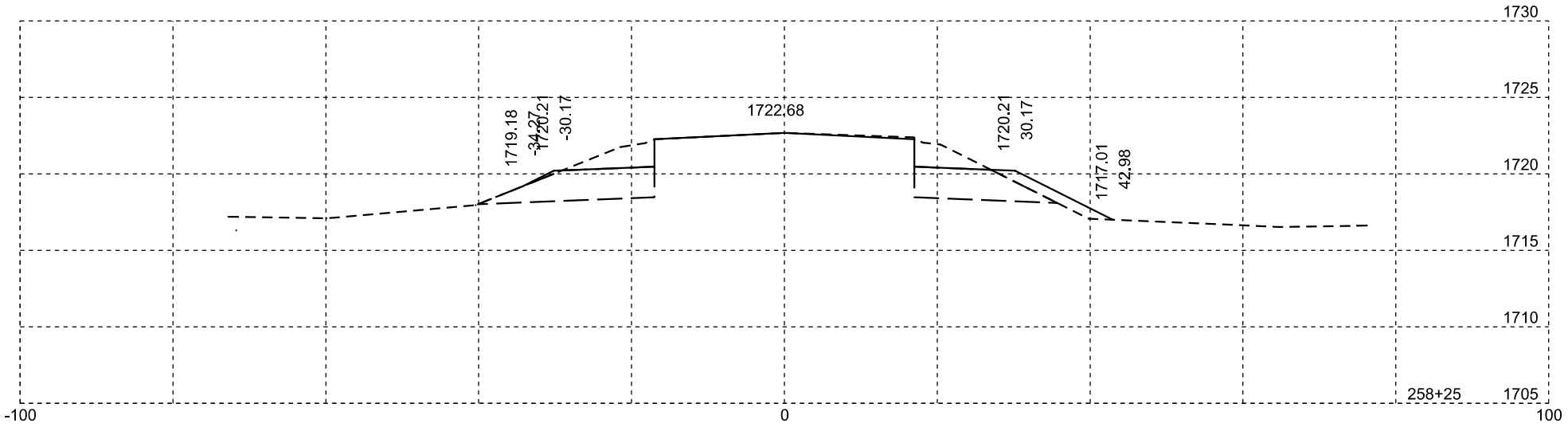


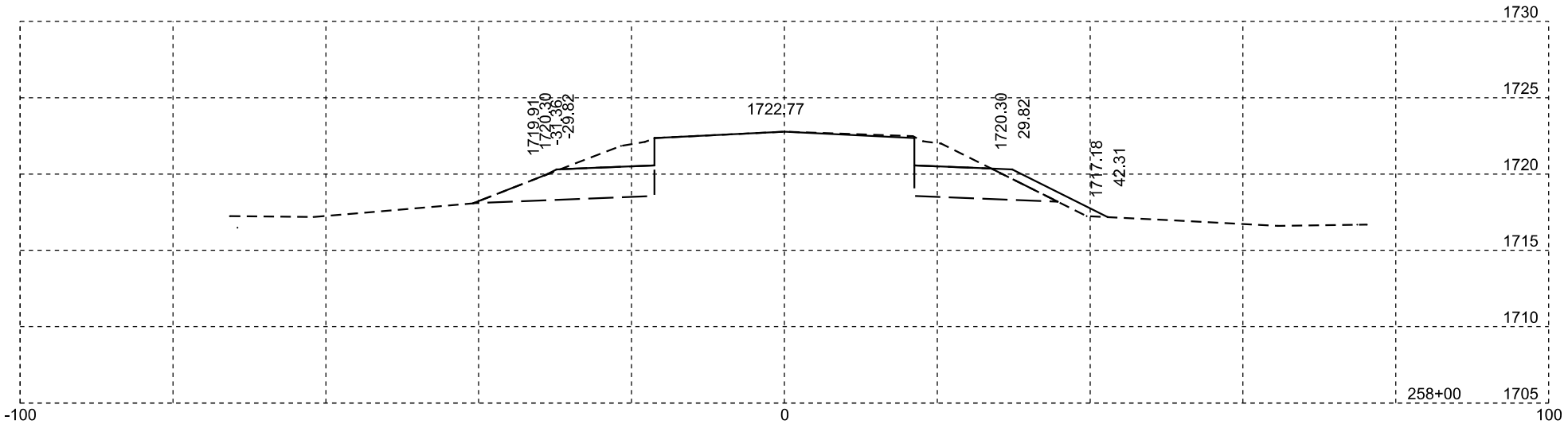
2

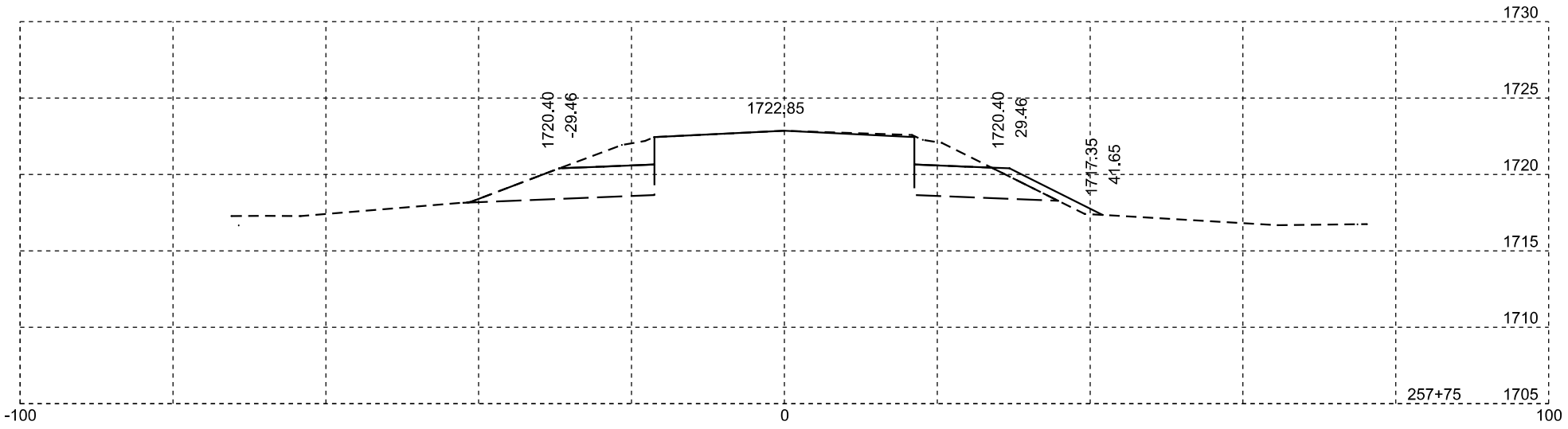
Plotting Date: 05/09/2024

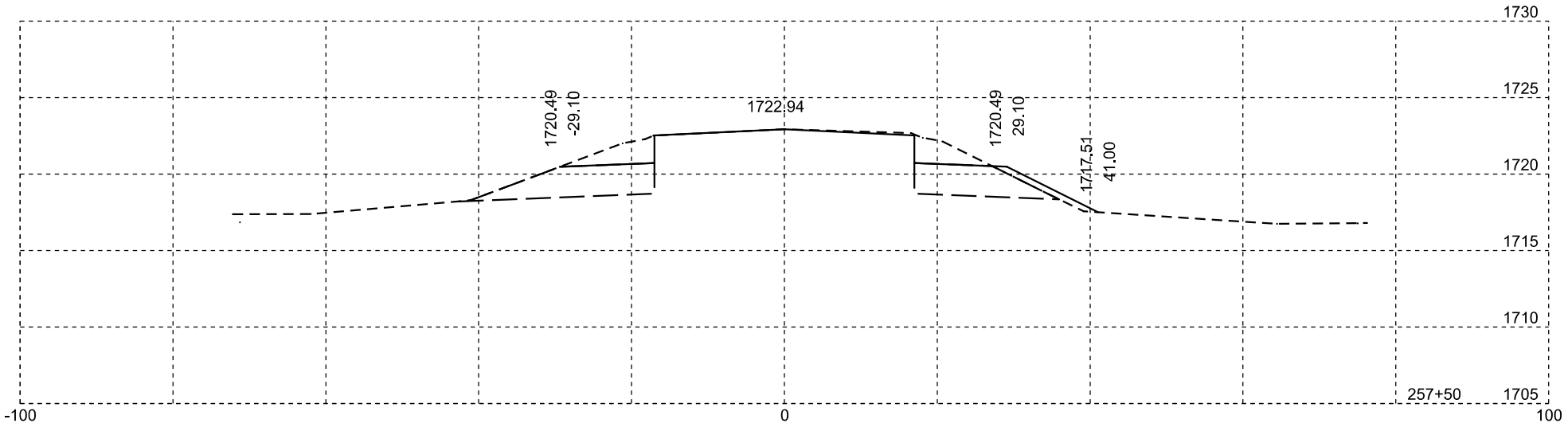
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(112)95	116	167

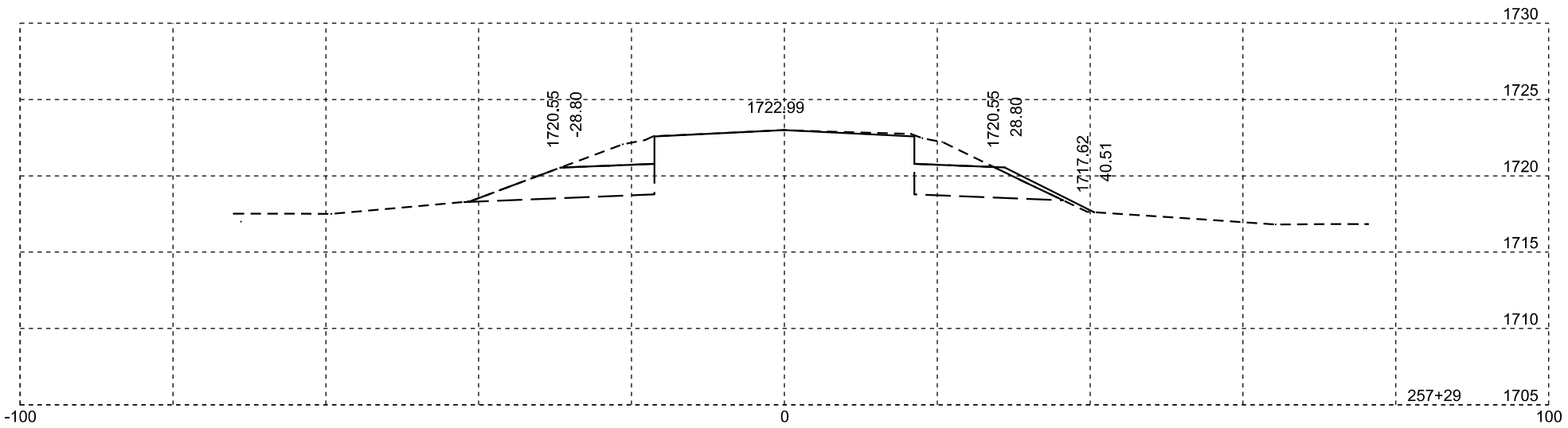
225th









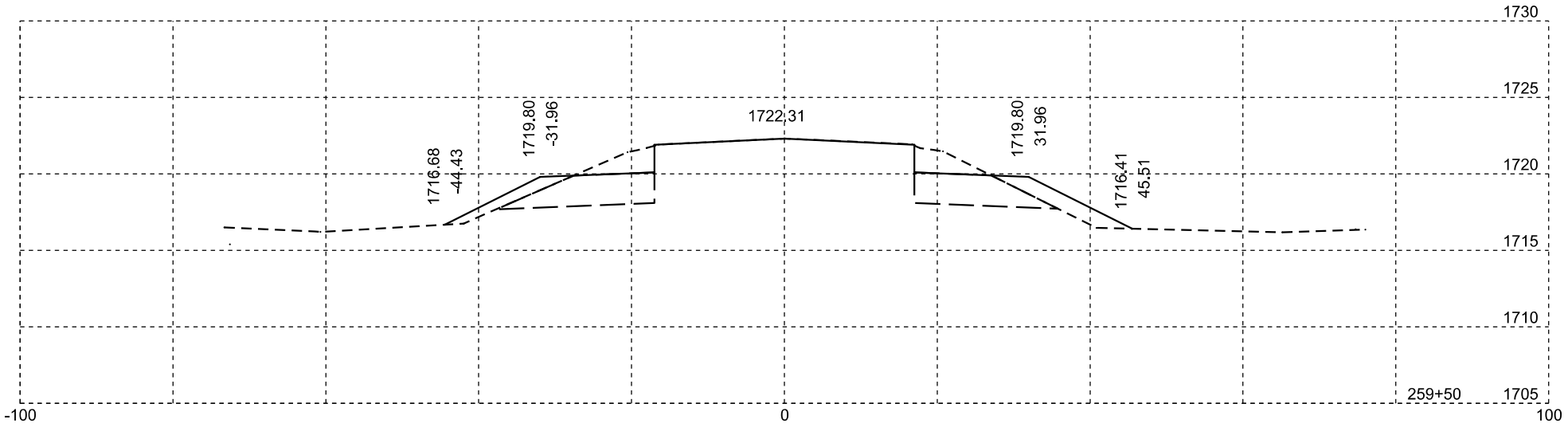


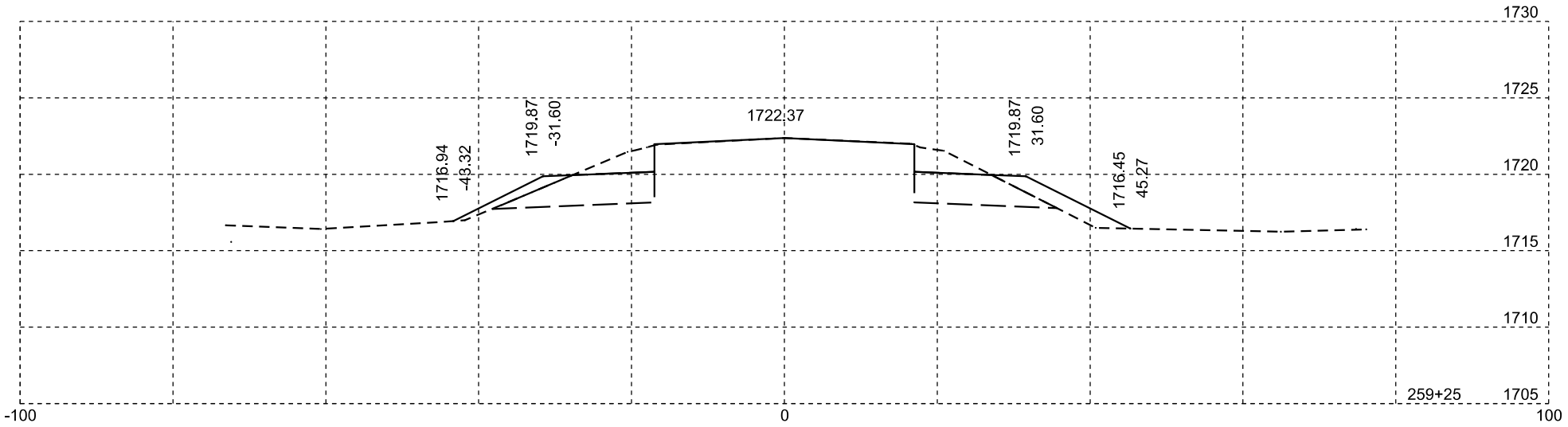
3

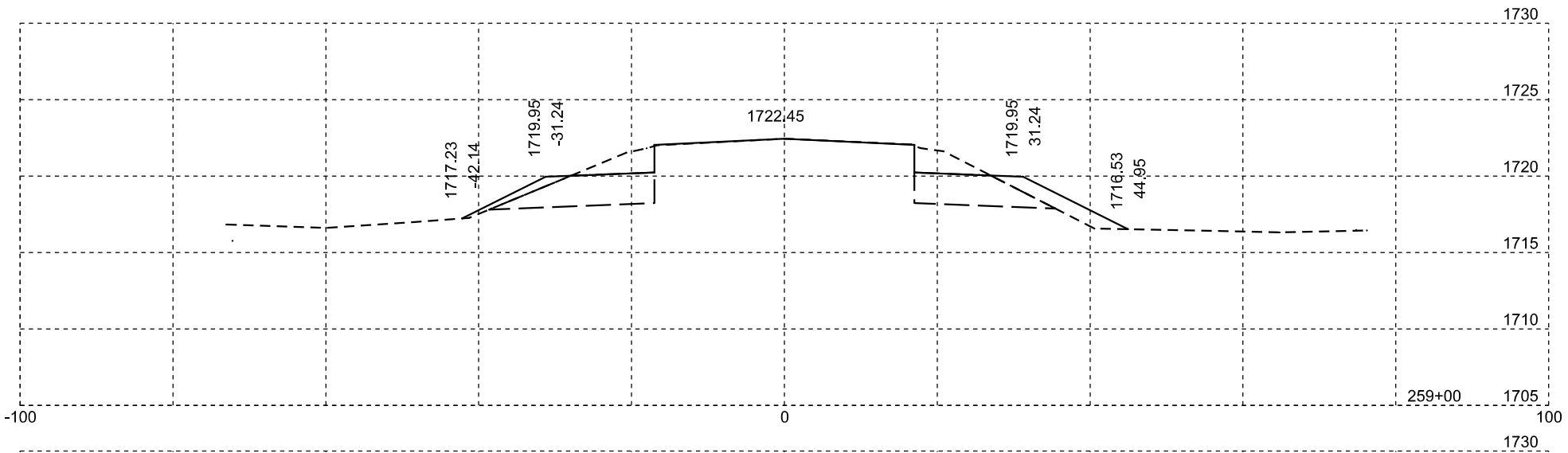
Plotting Date: 05/09/2024

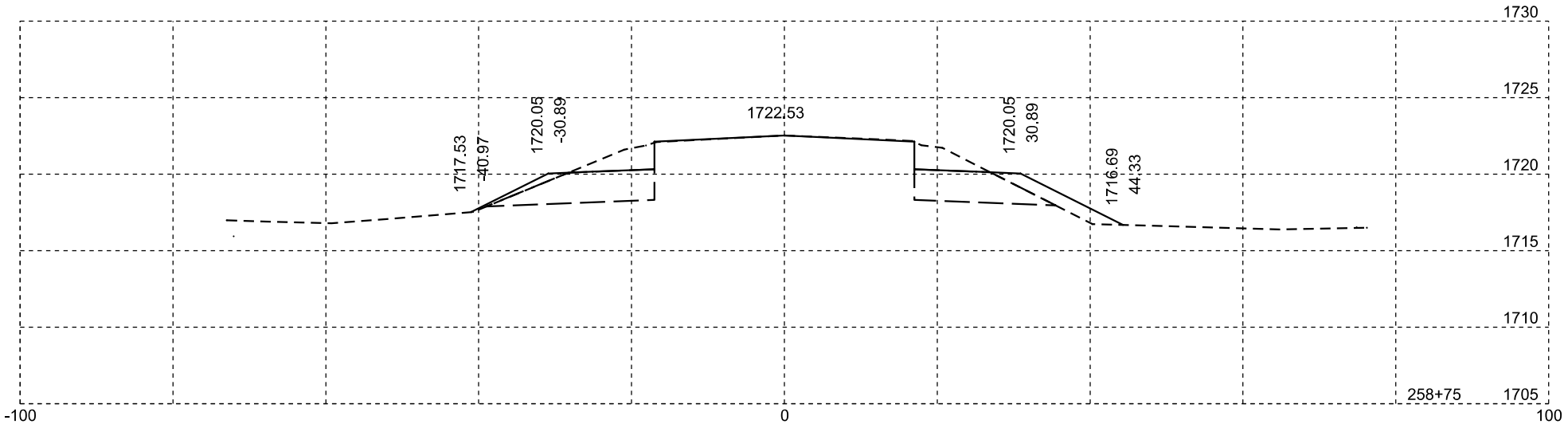
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(112)95	117	167

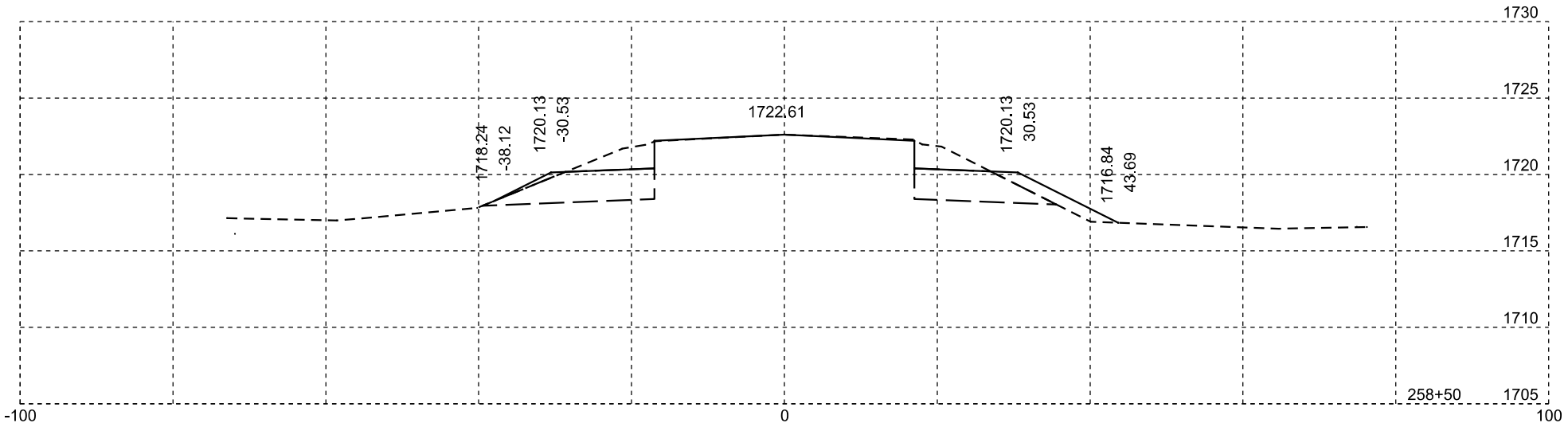
225th









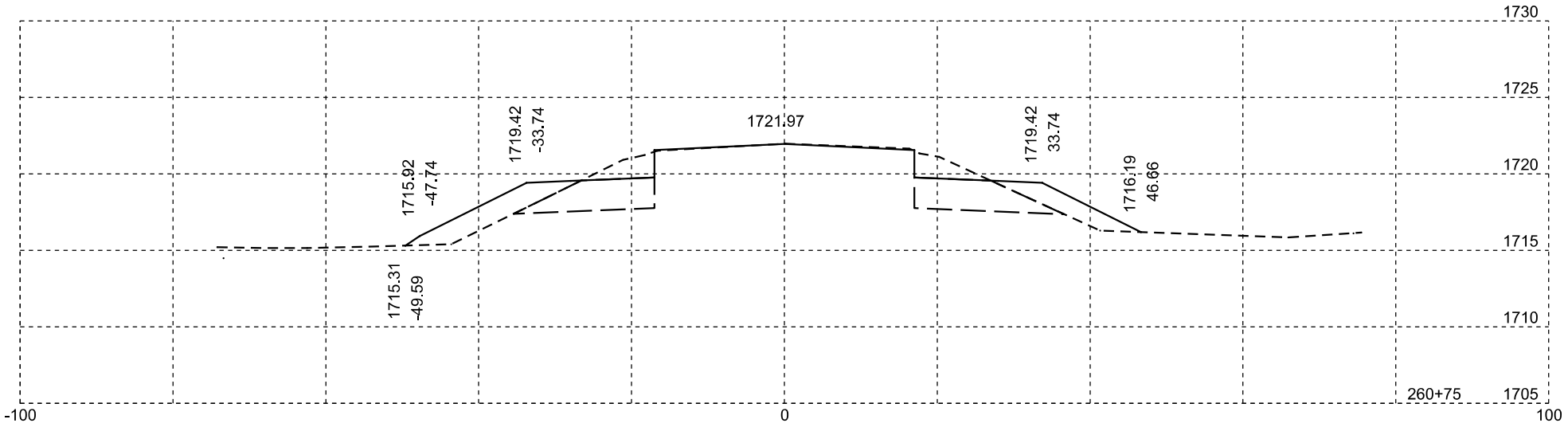


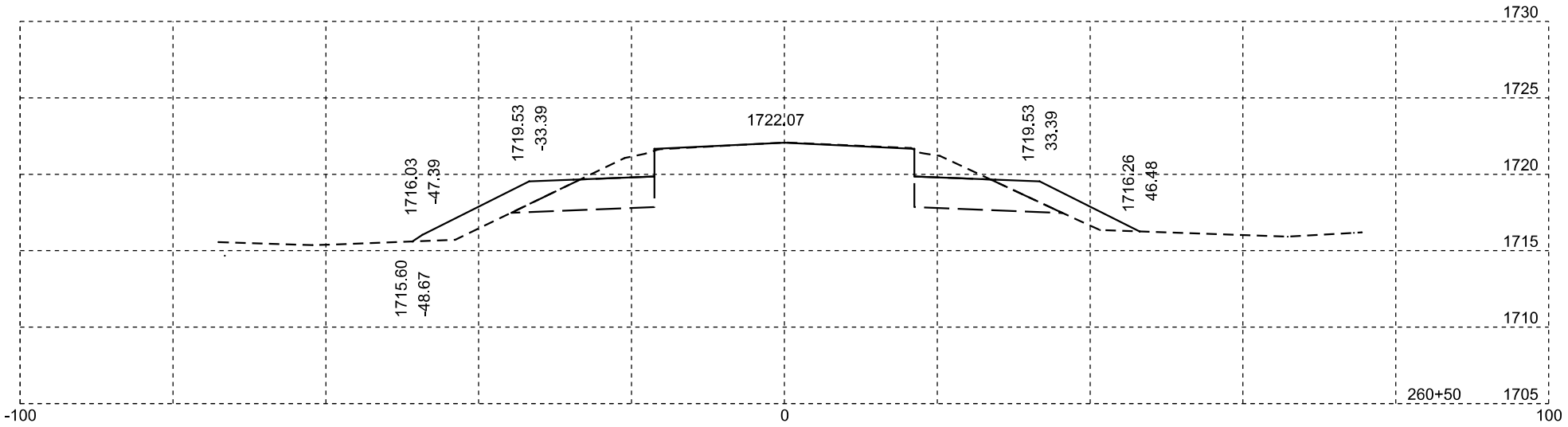
4

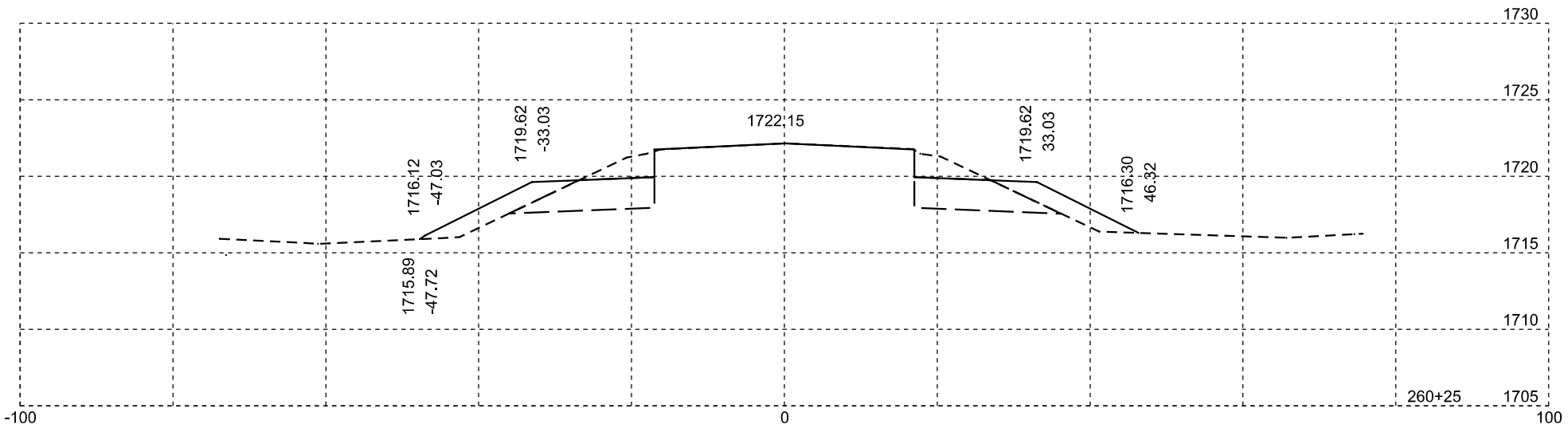
Plotting Date: 05/09/2024

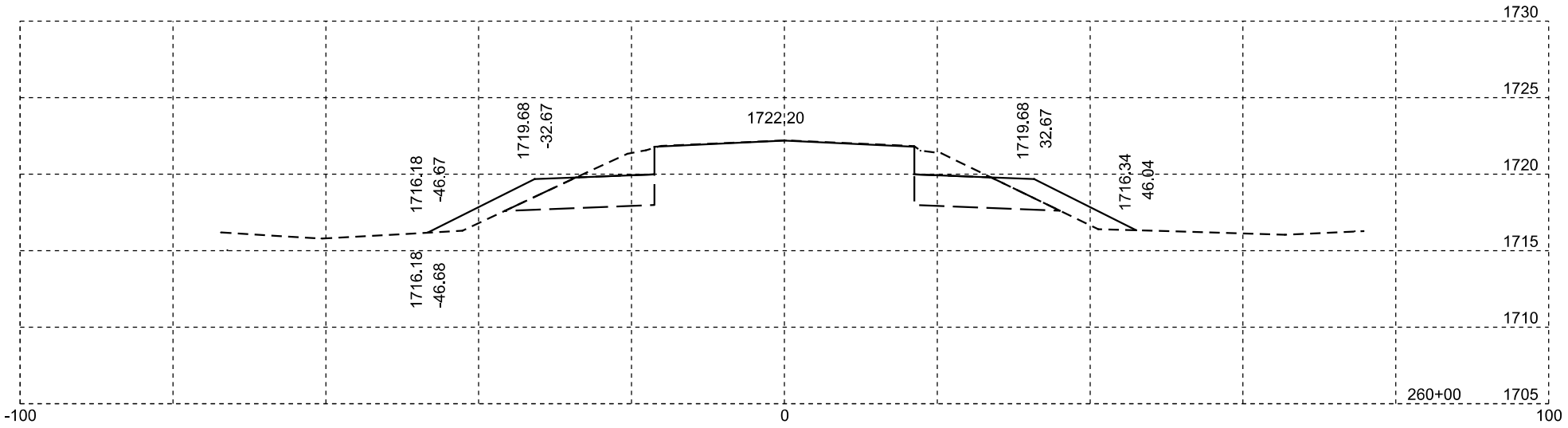
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(112)95	118	167

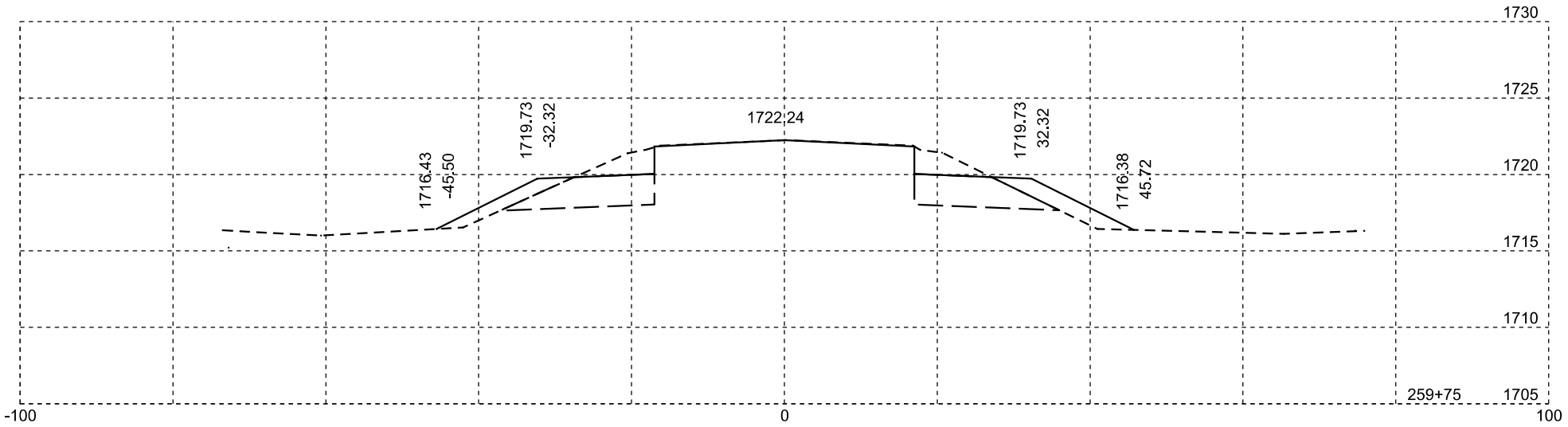
225th











5

Plotting Date: 05/09/2024

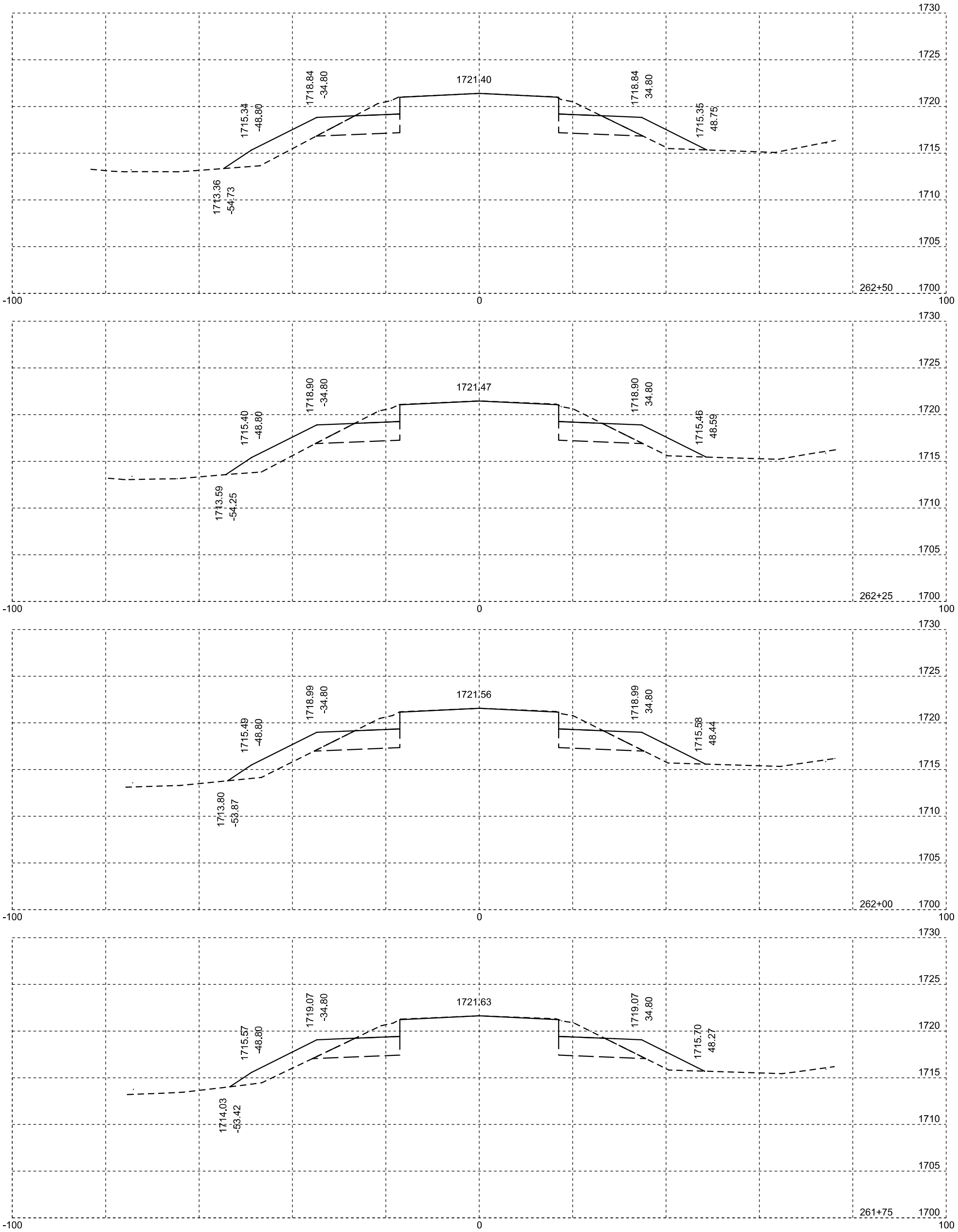
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(112)95	119	167

225th

Plotting Date: 05/09/2024

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(112)95	120	167

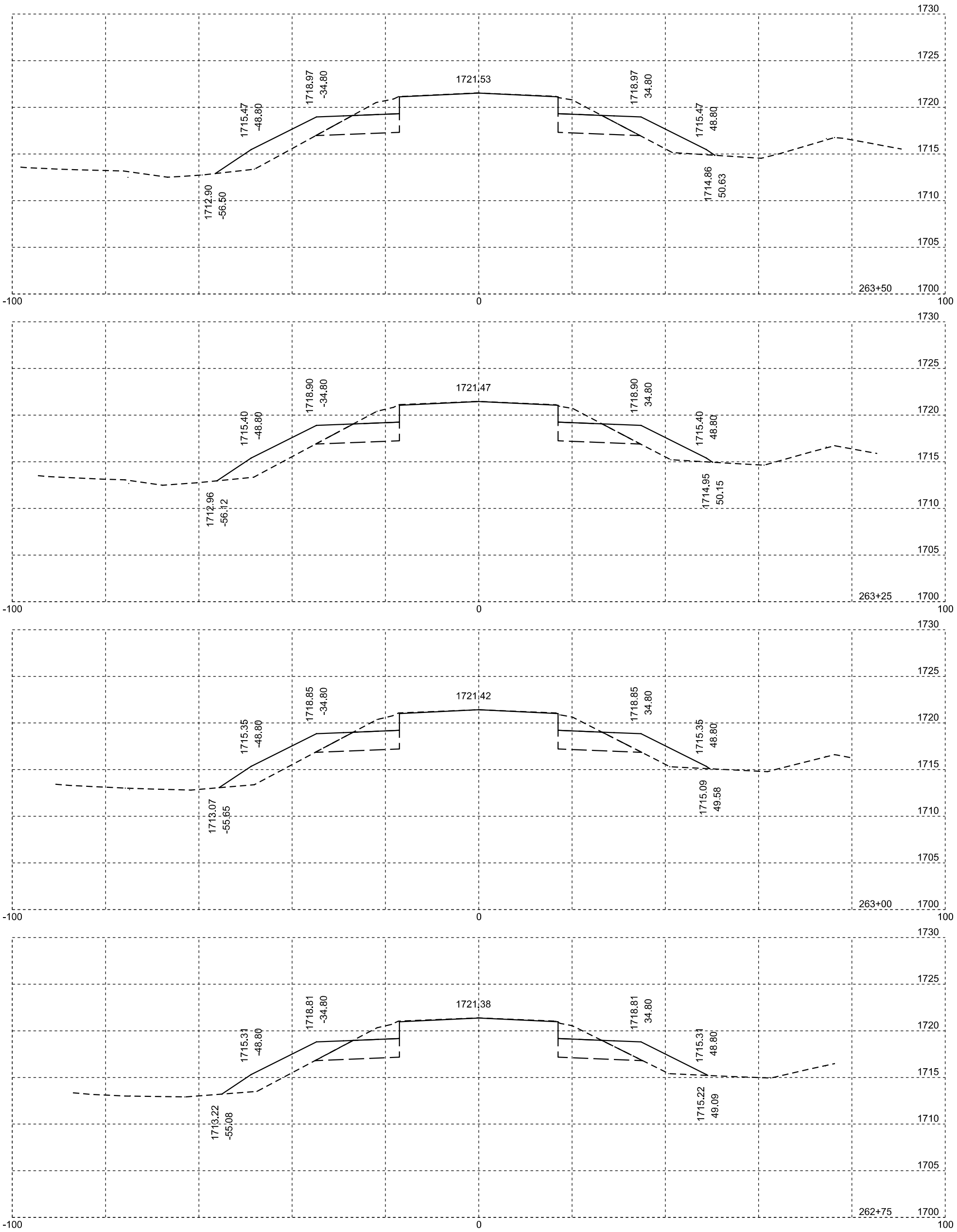
225th



Plotting Date: 05/09/2024

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(112)95	121	167

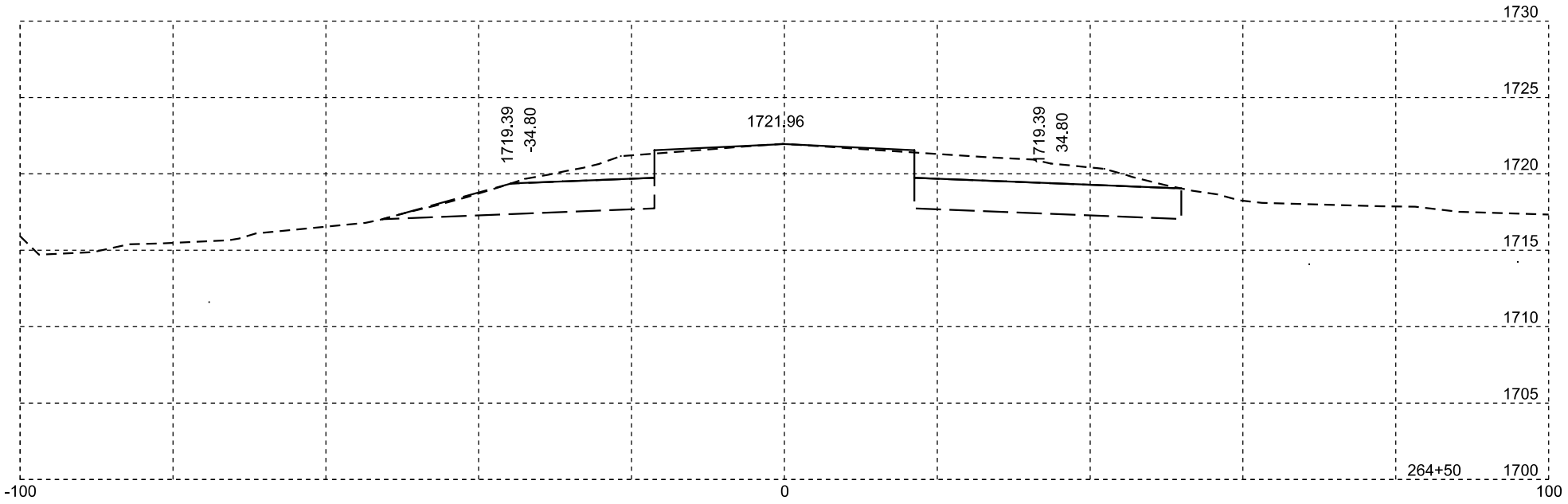
225th

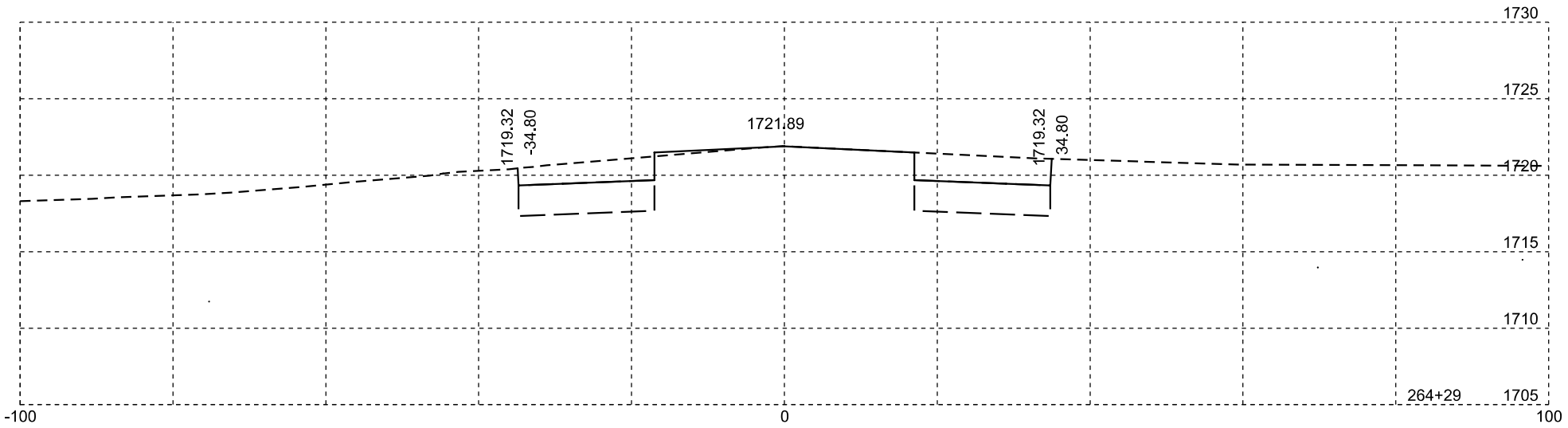


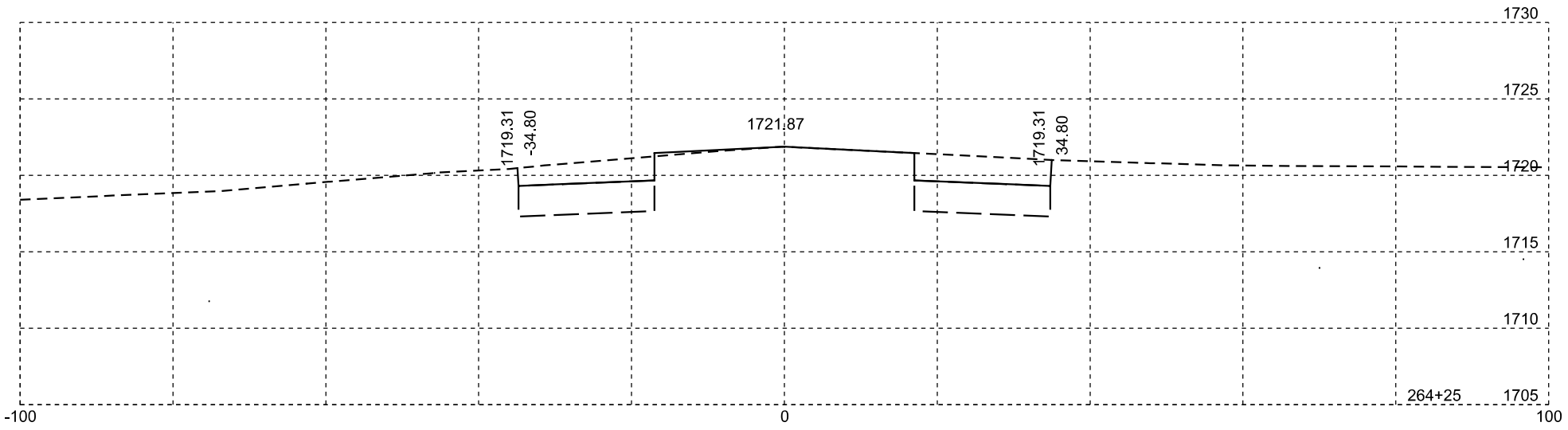
Plotting Date: 05/09/2024

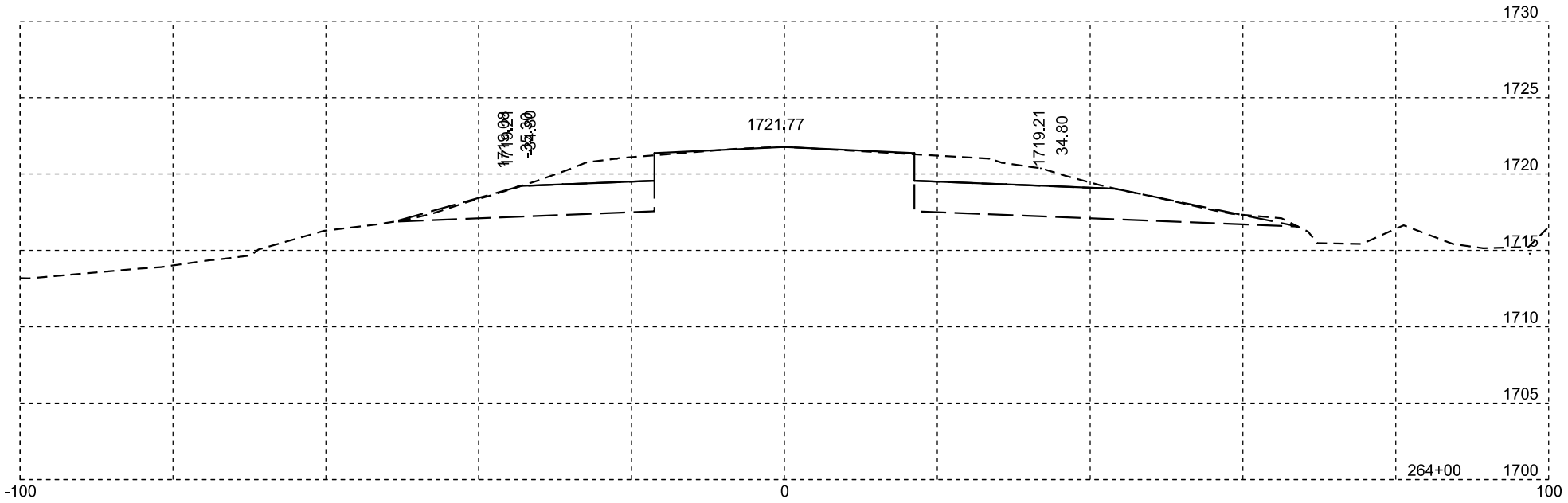
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(112)95	122	167

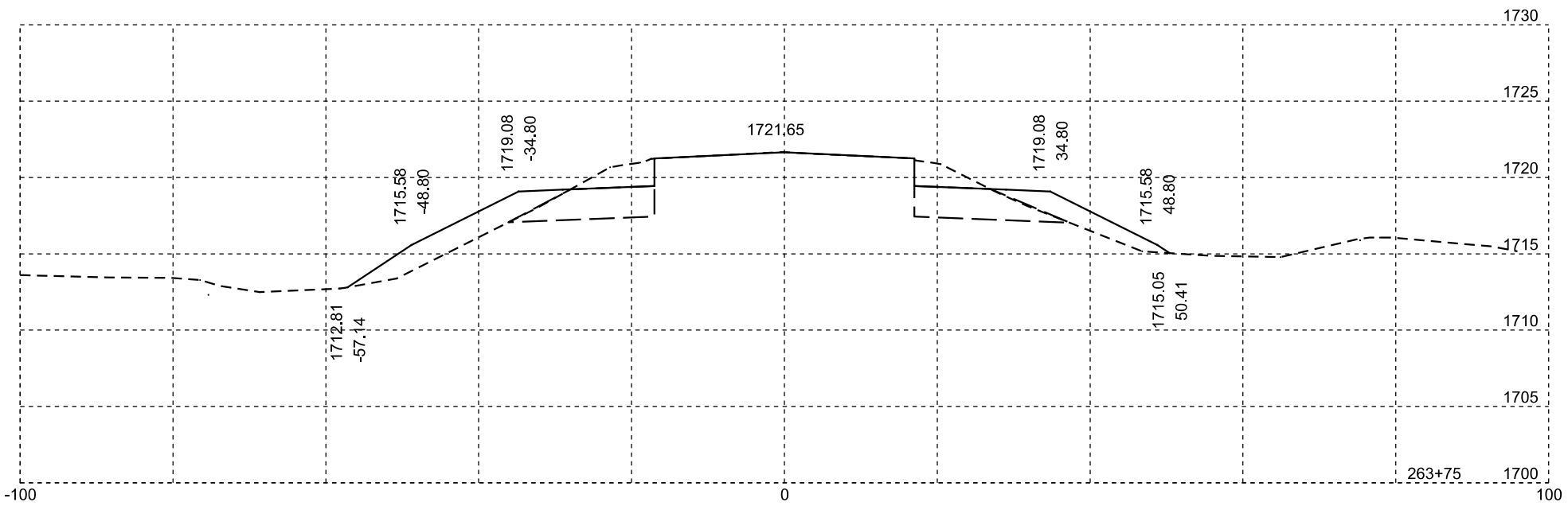
225th











9

Plotting Date: 05/09/2024

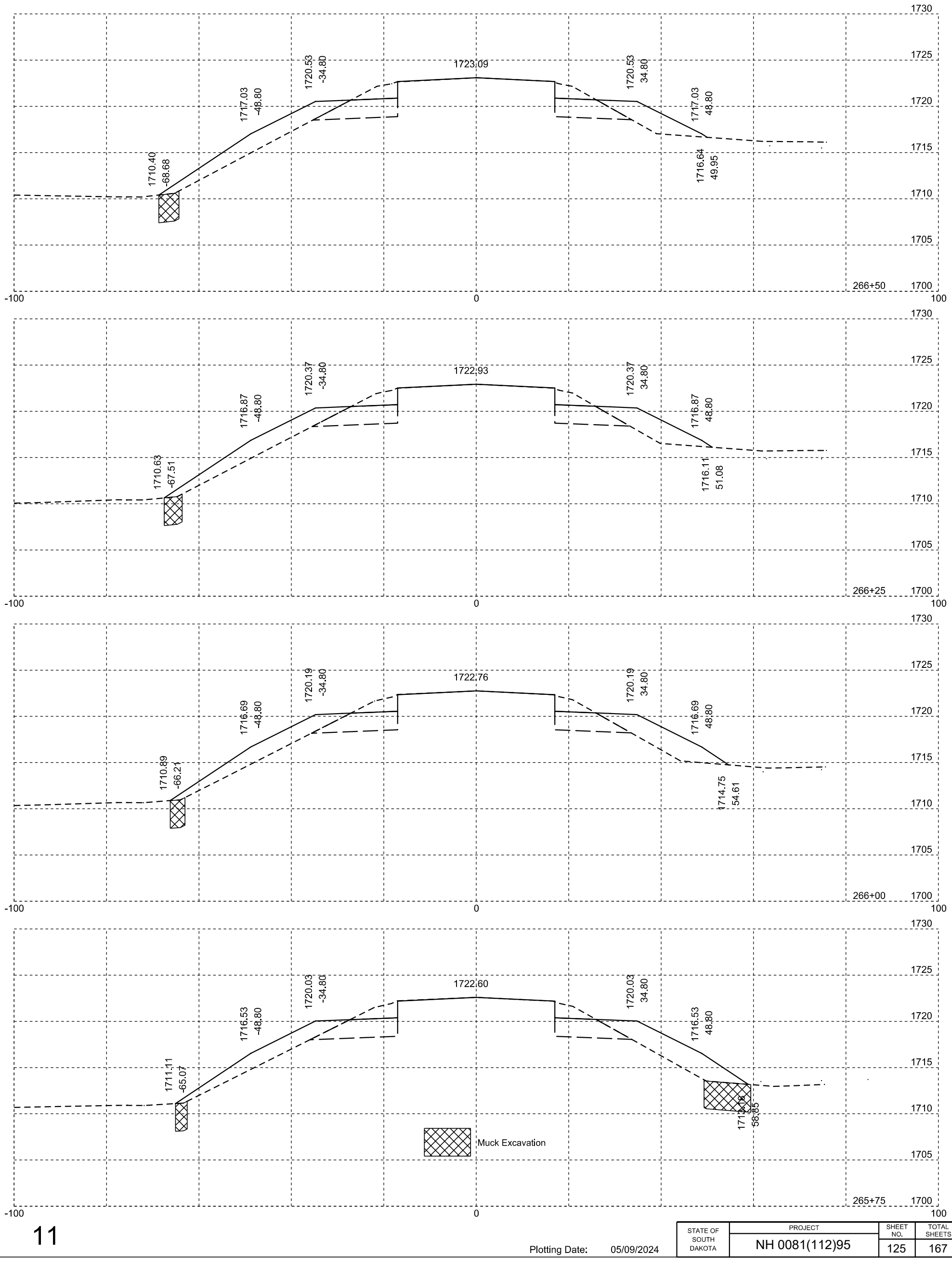
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(112)95	123	167

225th

Plotting Date: 05/09/2024

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(112)95	124	167

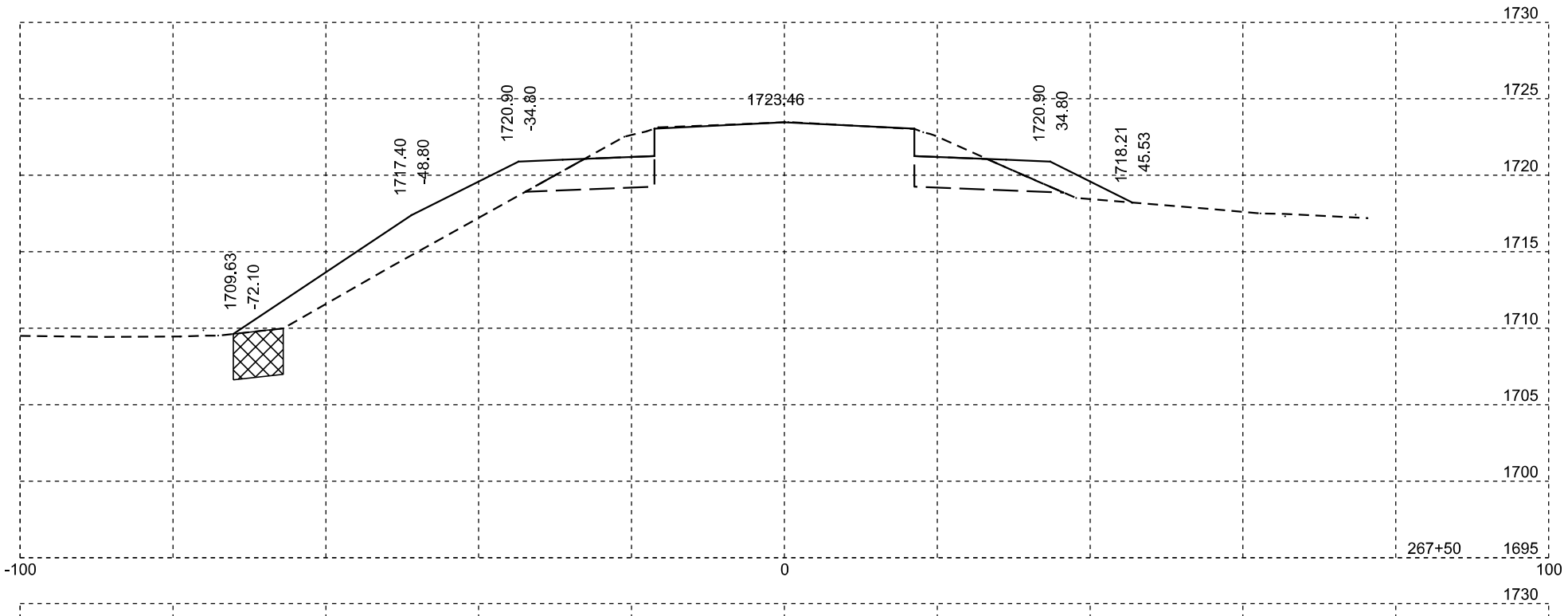
225th

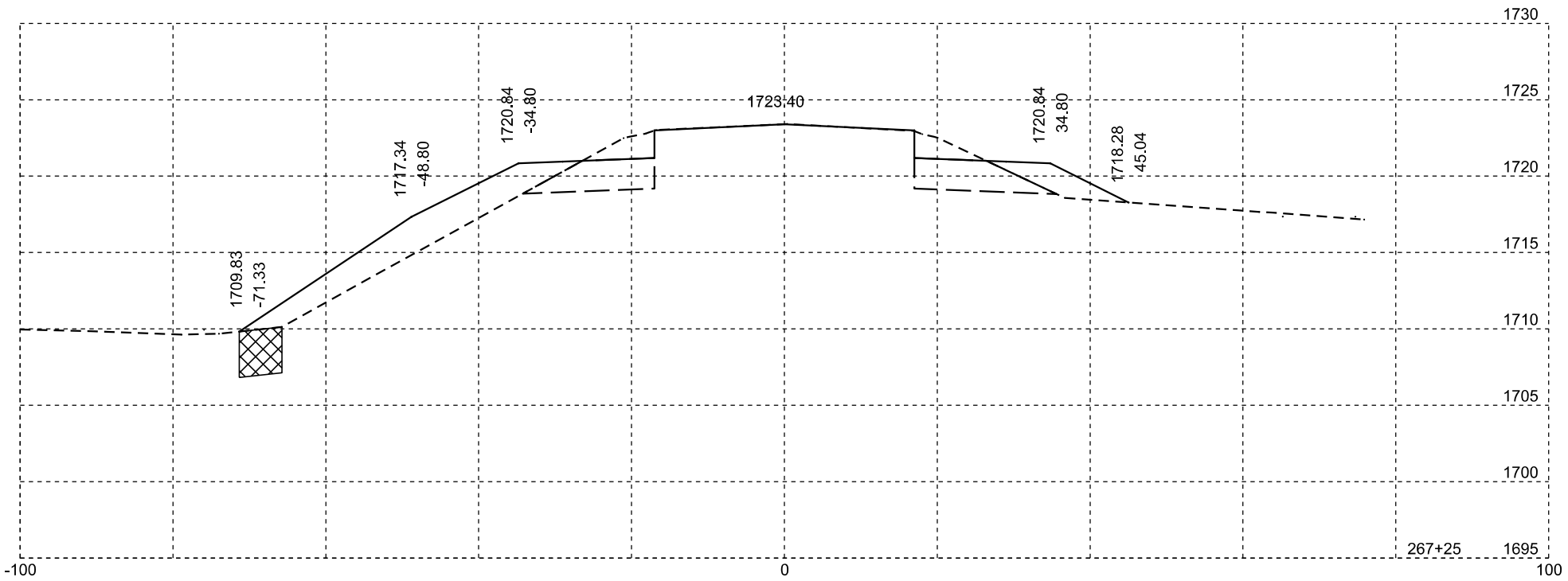


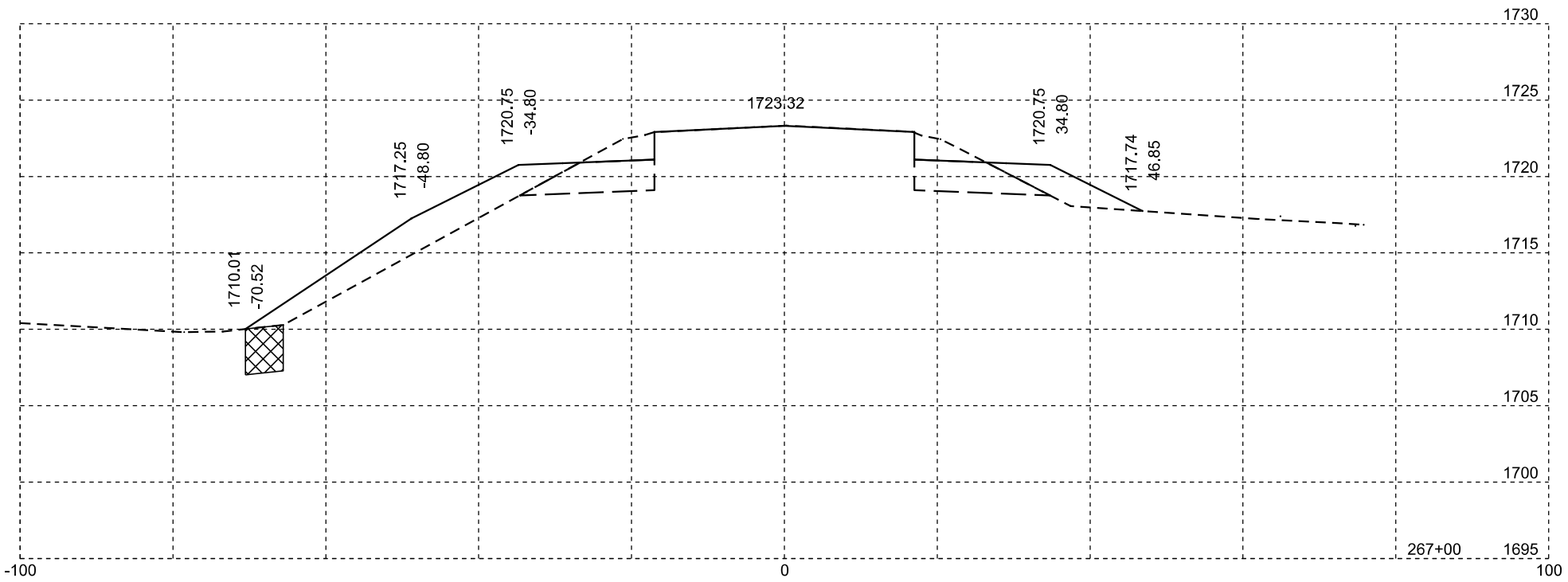
Plotting Date: 05/09/2024

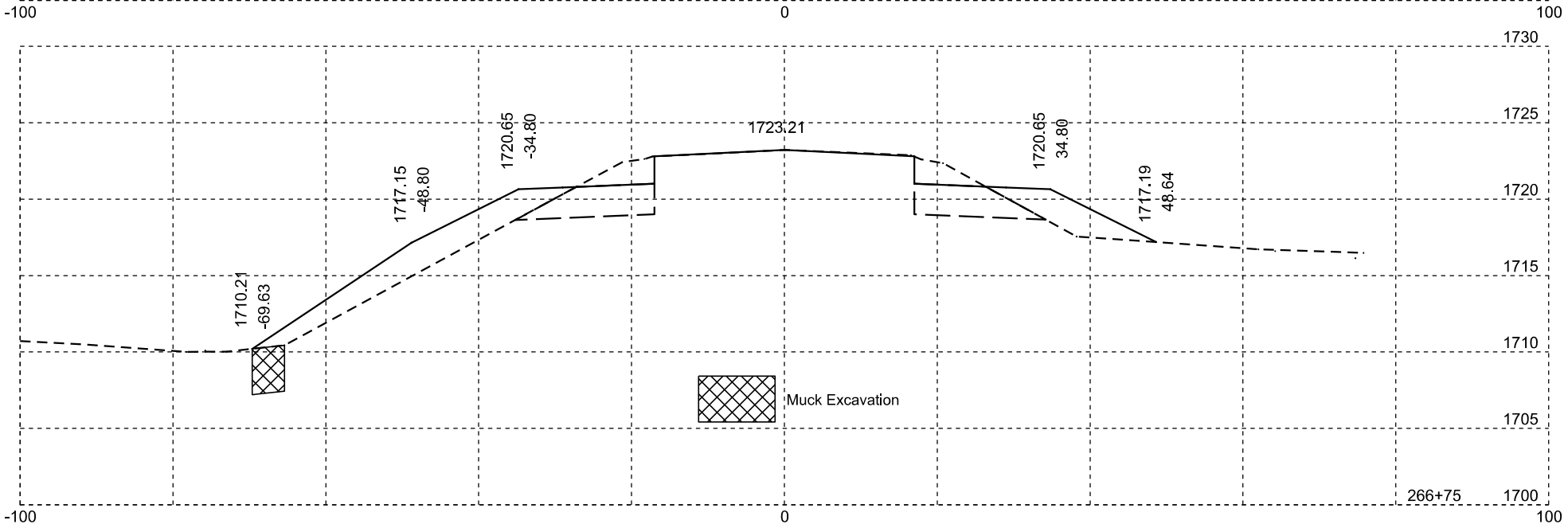
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(112)95	125	167

225th







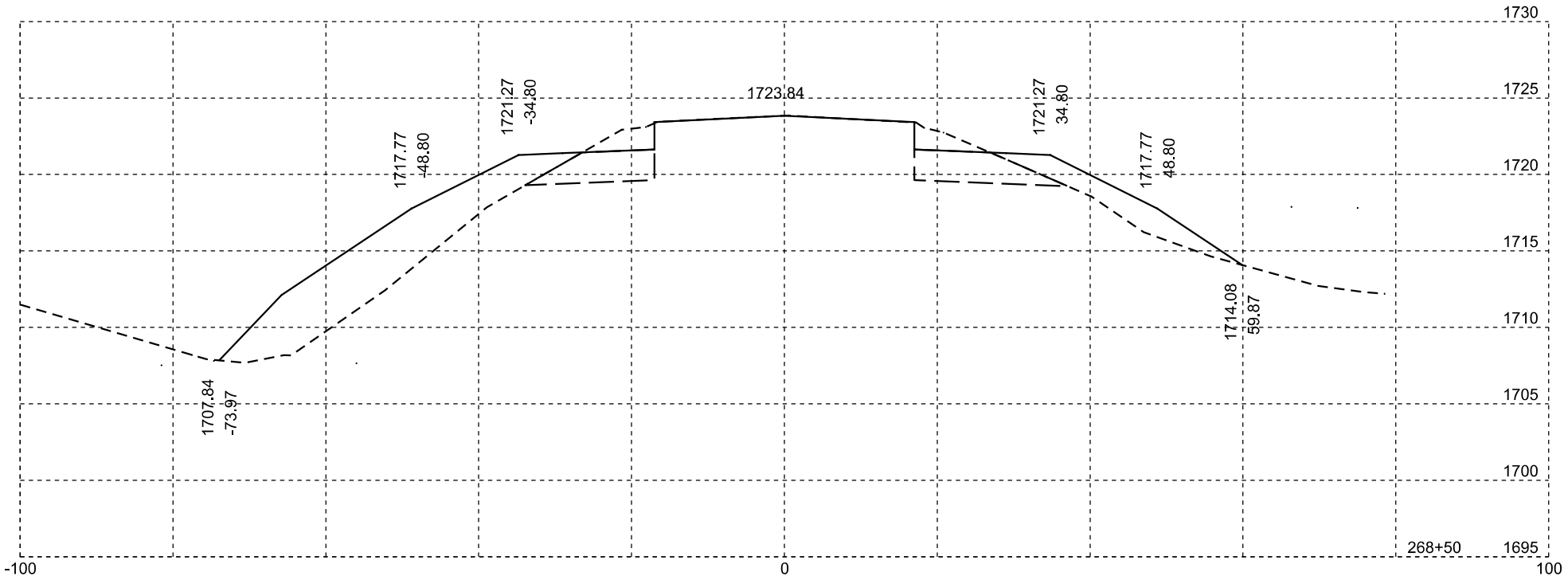


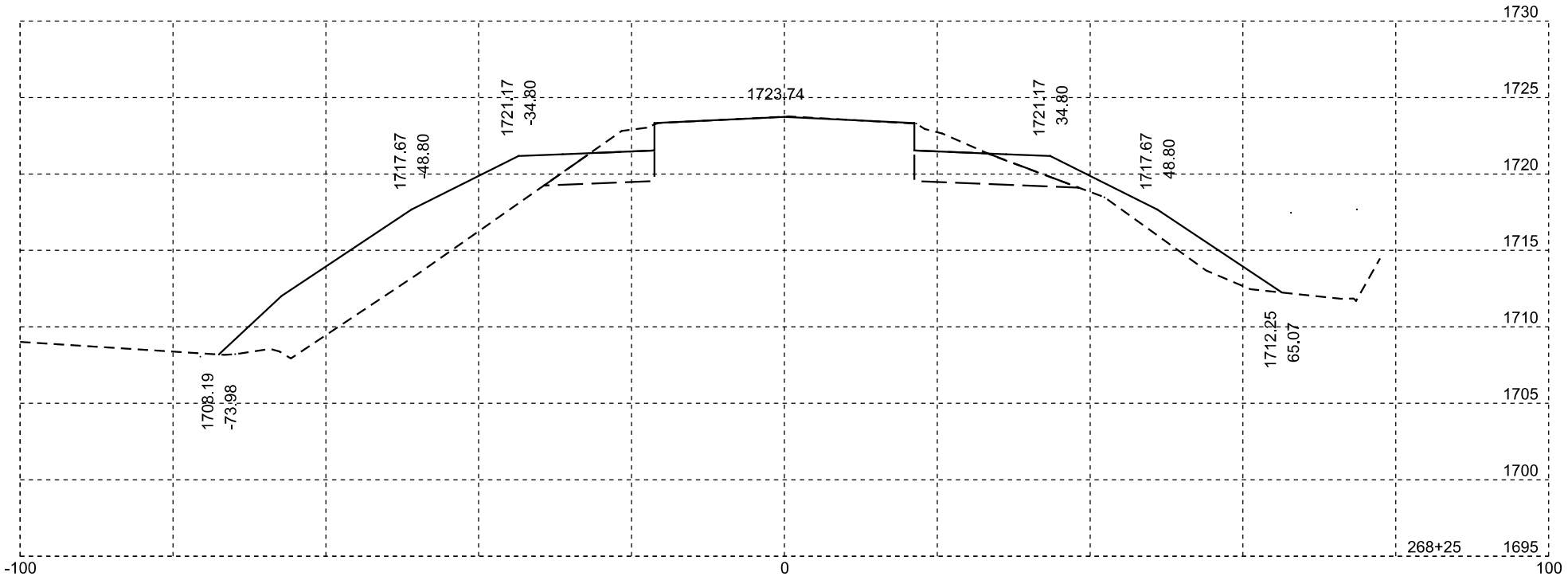
12

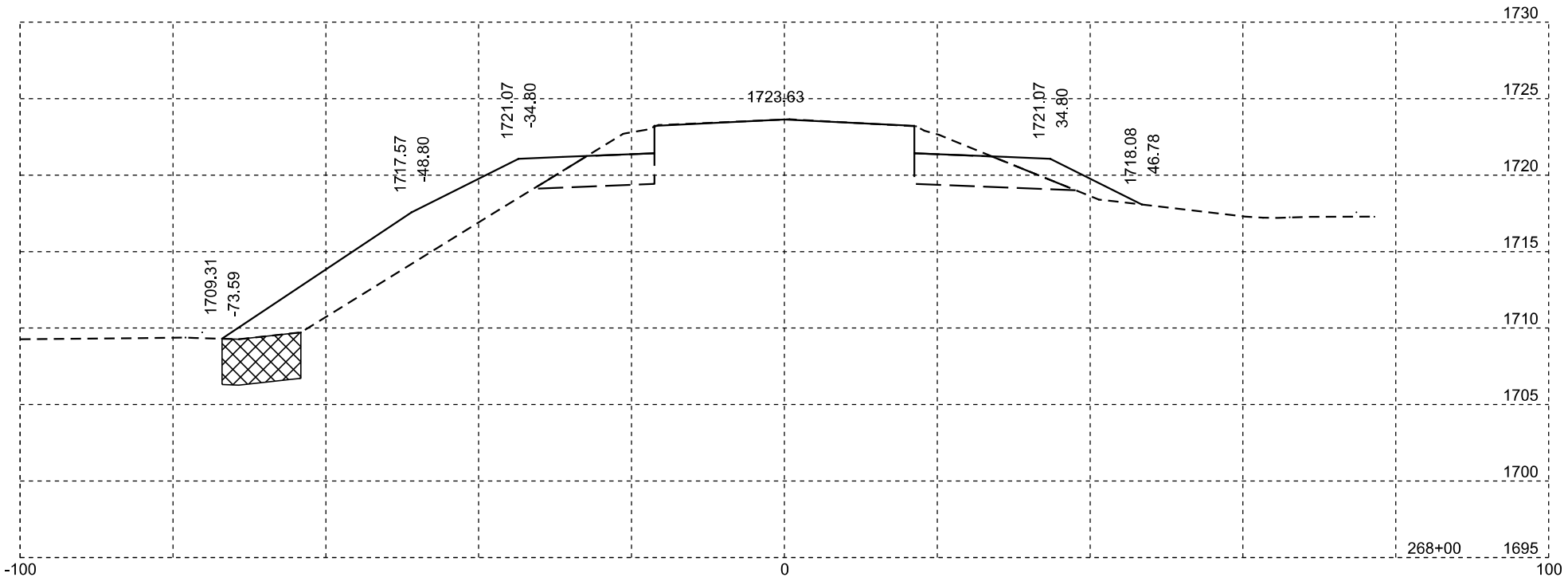
Plotting Date: 05/09/2024

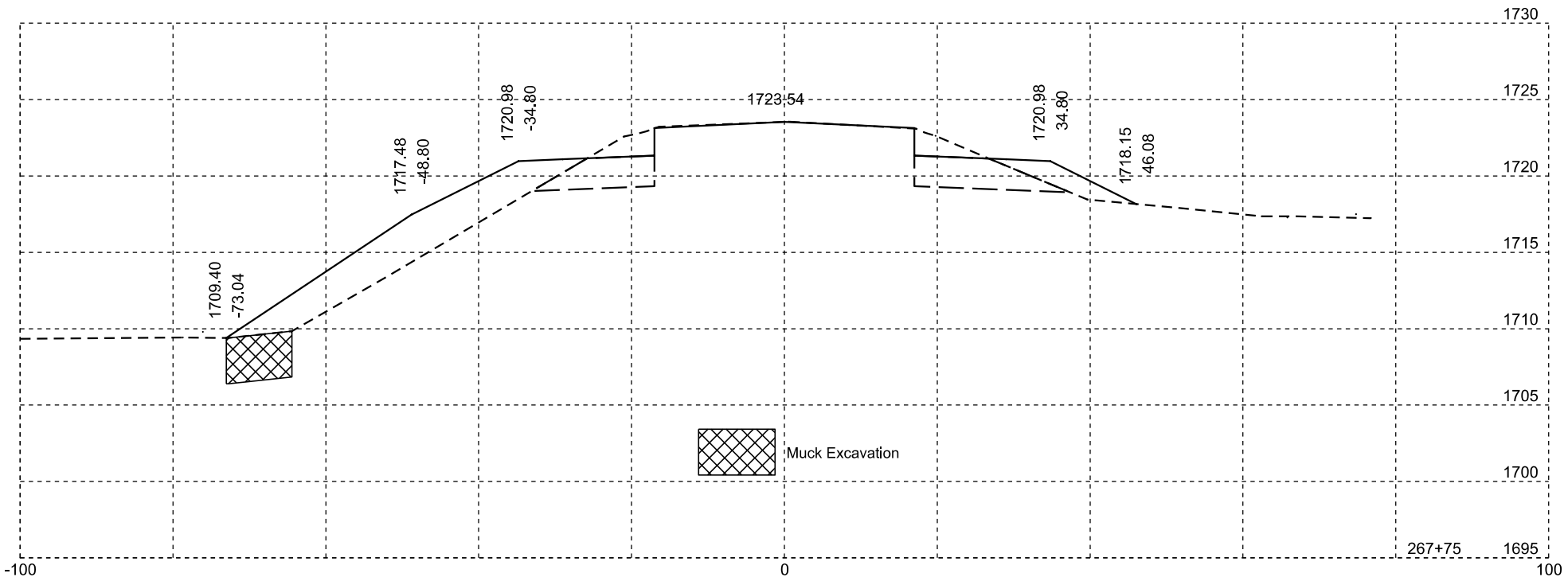
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(112)95	126	167

225th









13

Plotting Date: 05/09/2024

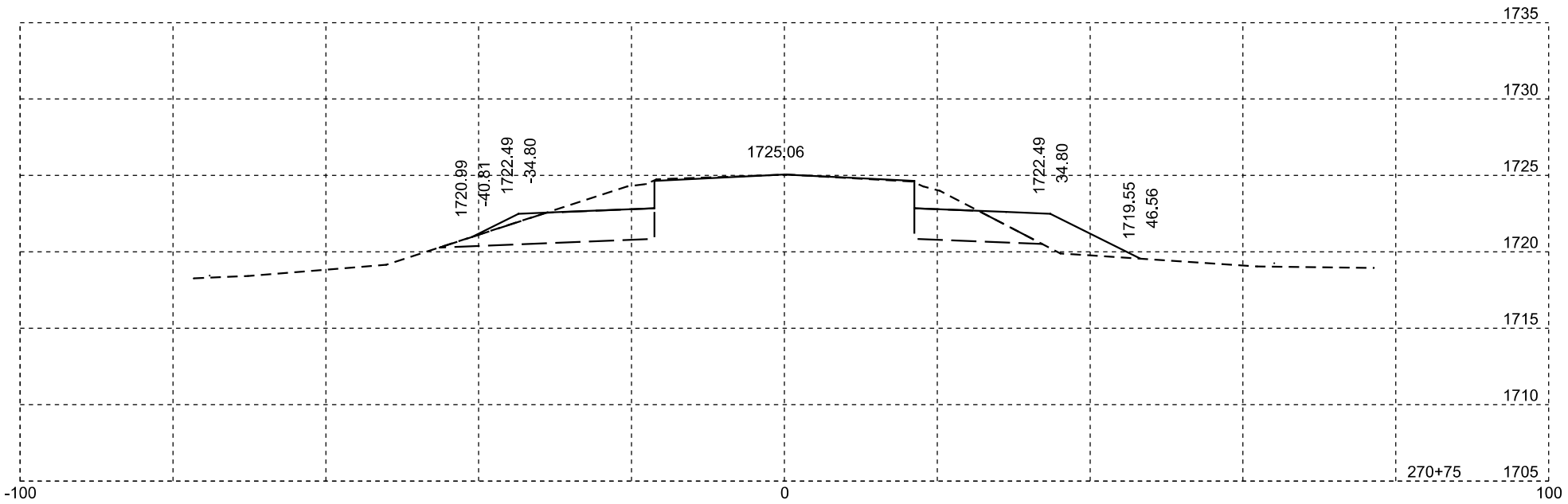
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(112)95	127	167

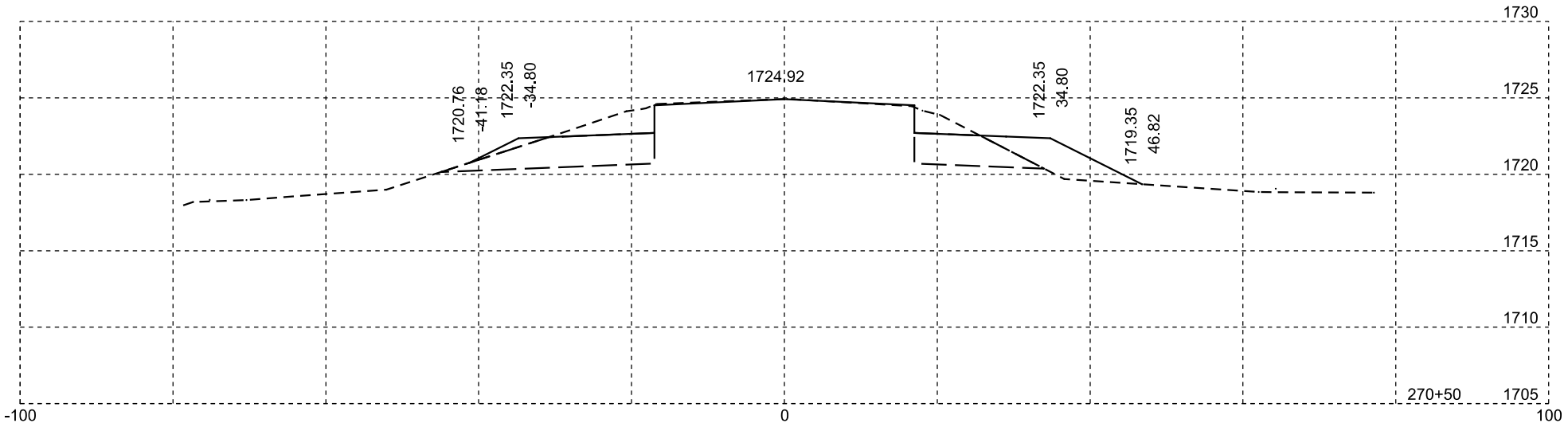
225th

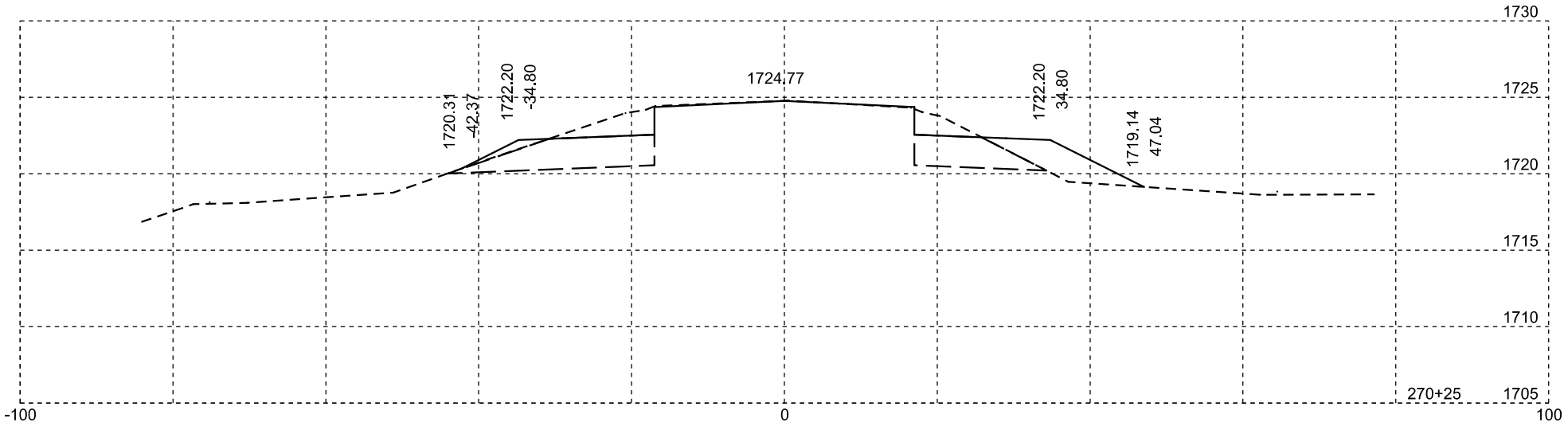
Plotting Date: 05/09/2024

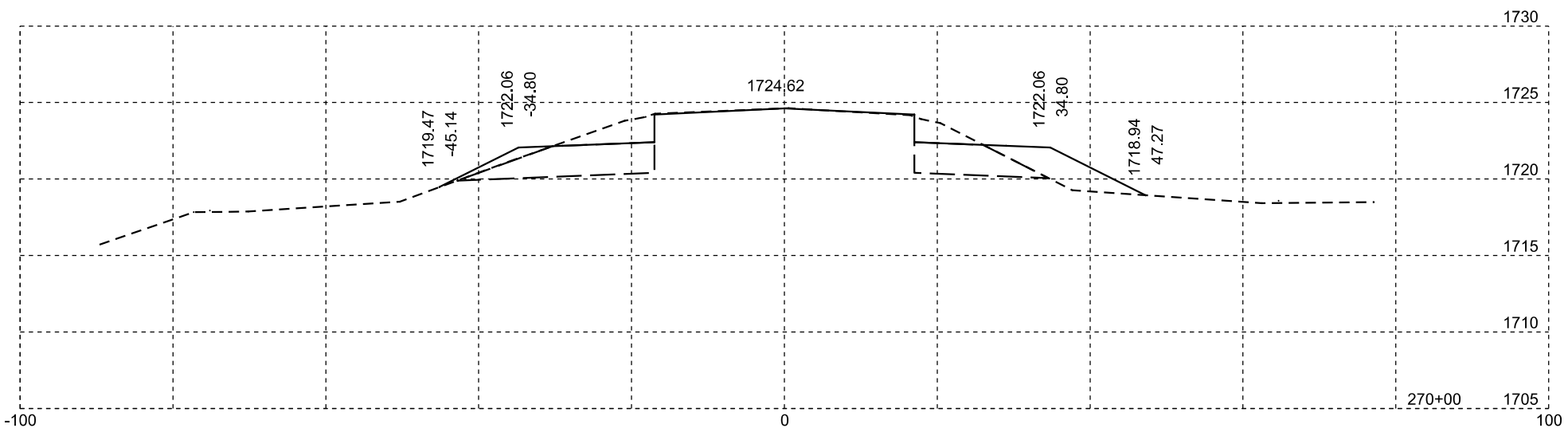
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(112)95	128	167

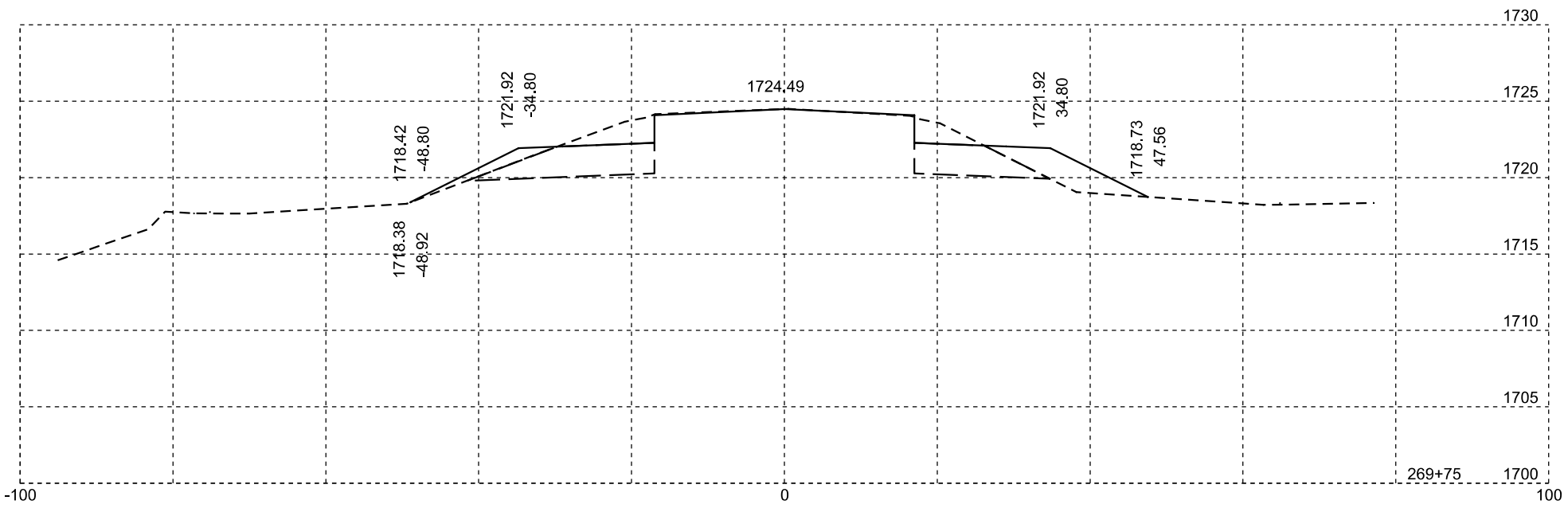
225th









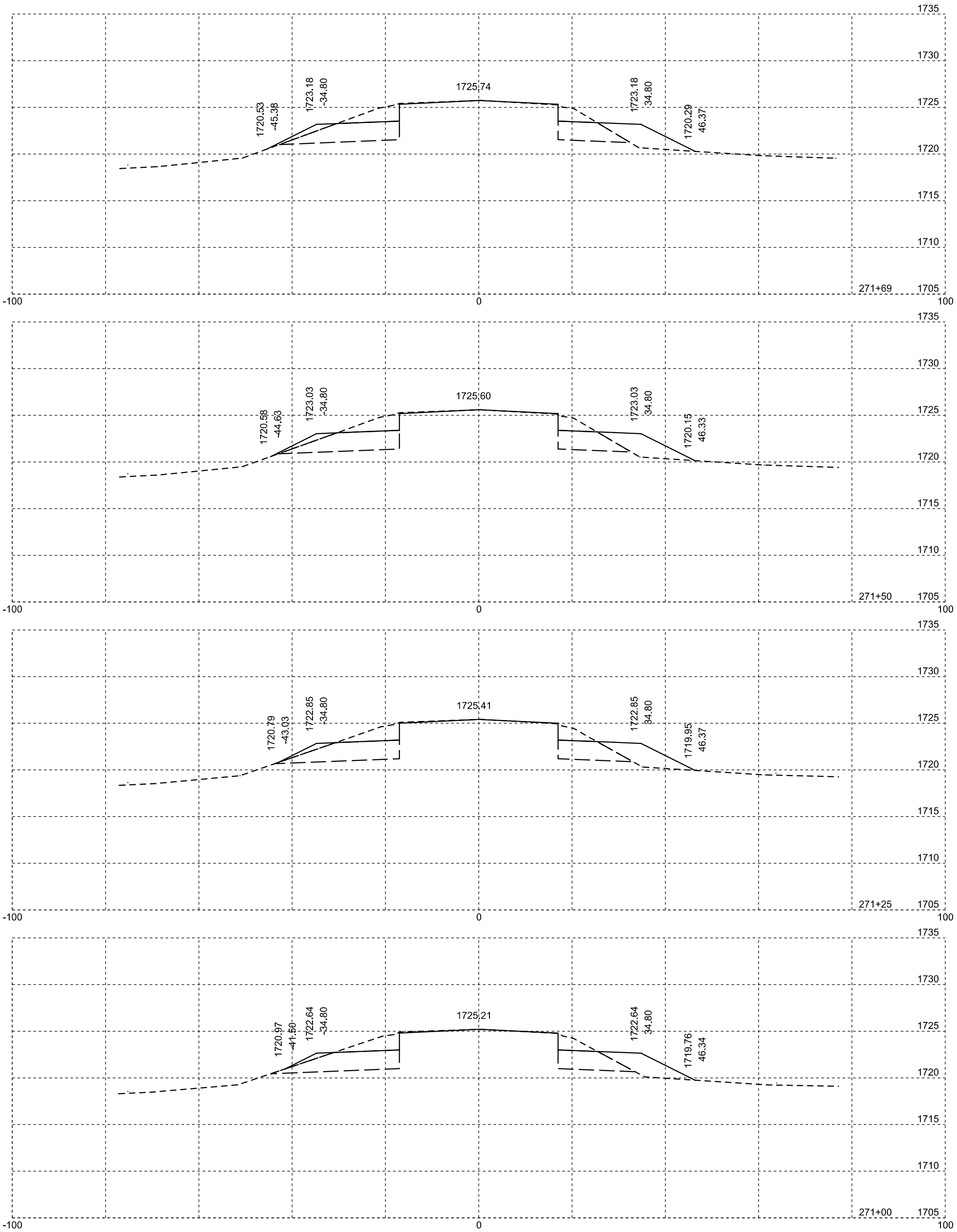


15

Plotting Date: 05/09/2024

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(112)95	129	167

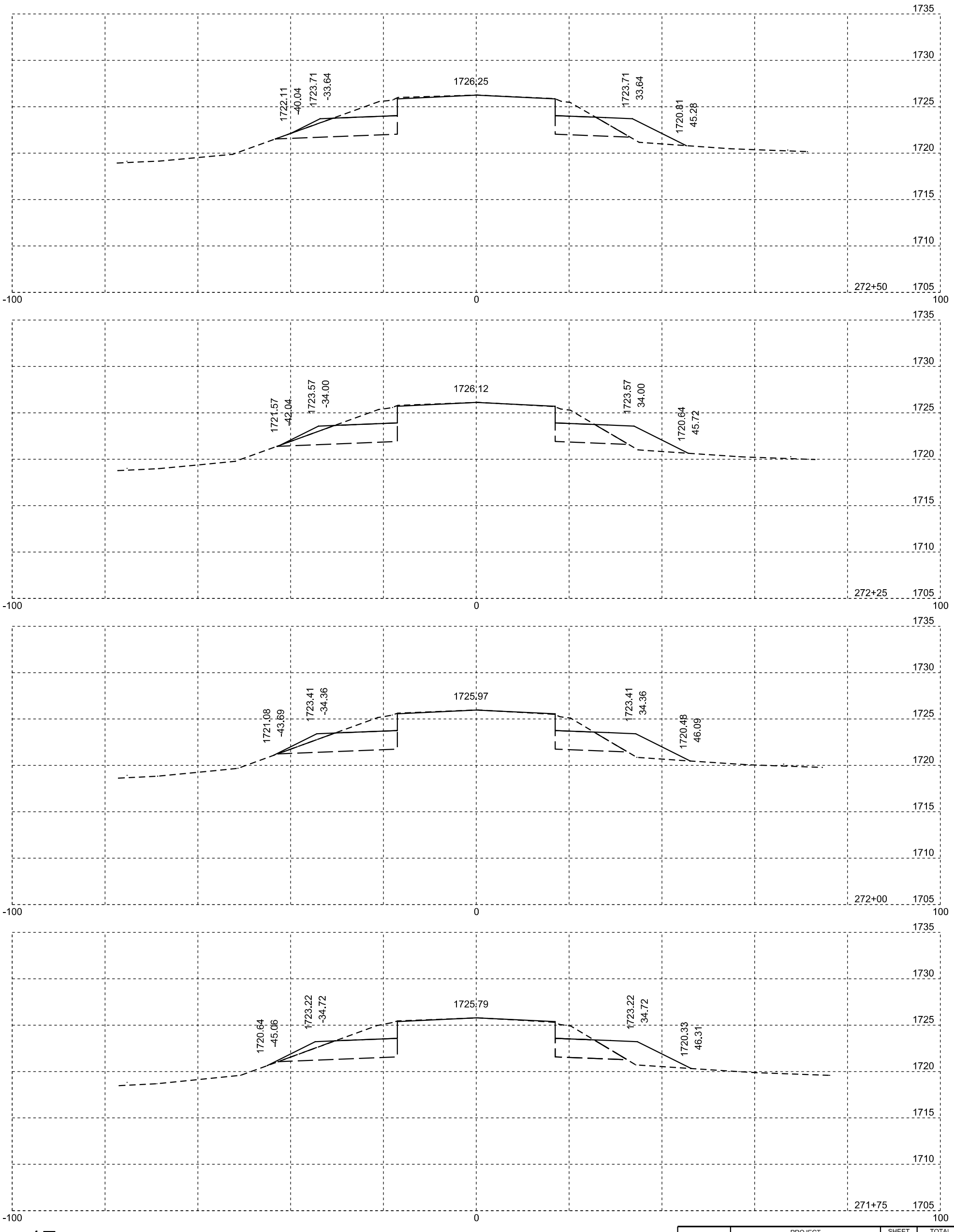
225th



Plotting Date: 05/09/2024

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(112)95	130	167

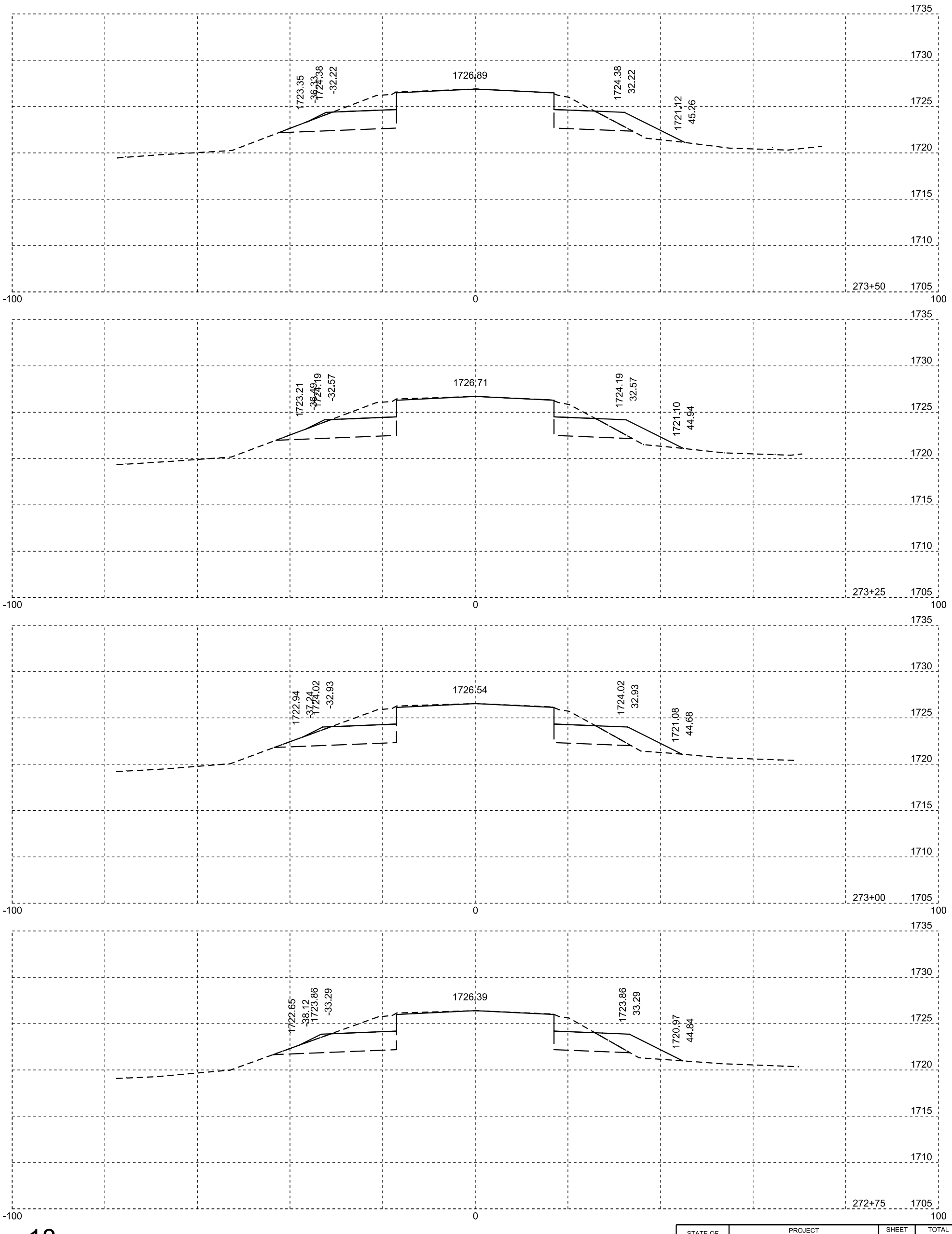
225th



Plotting Date: 05/09/2024

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(112)95	131	167

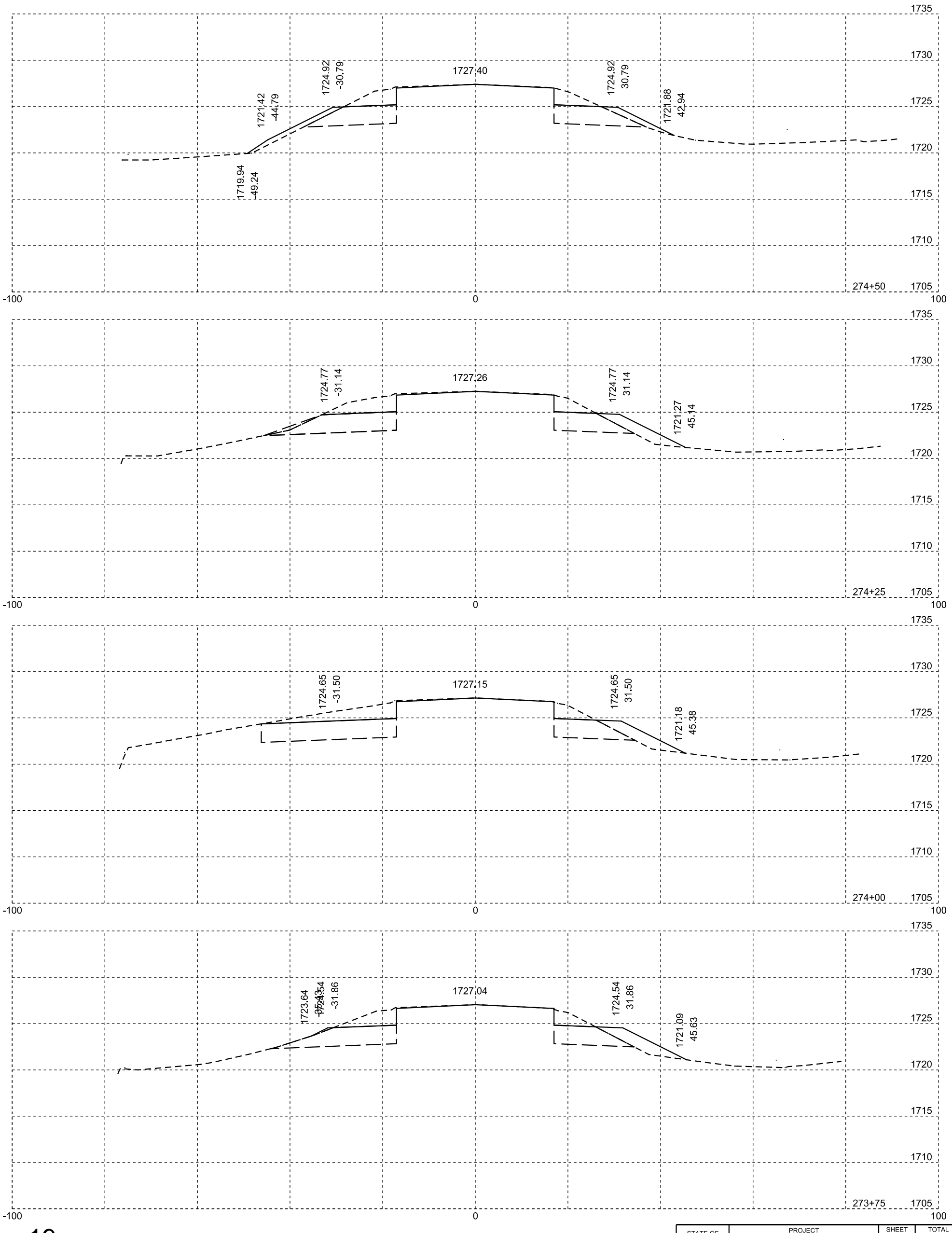
225th



Plotting Date: 05/09/2024

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(112)95	132	167

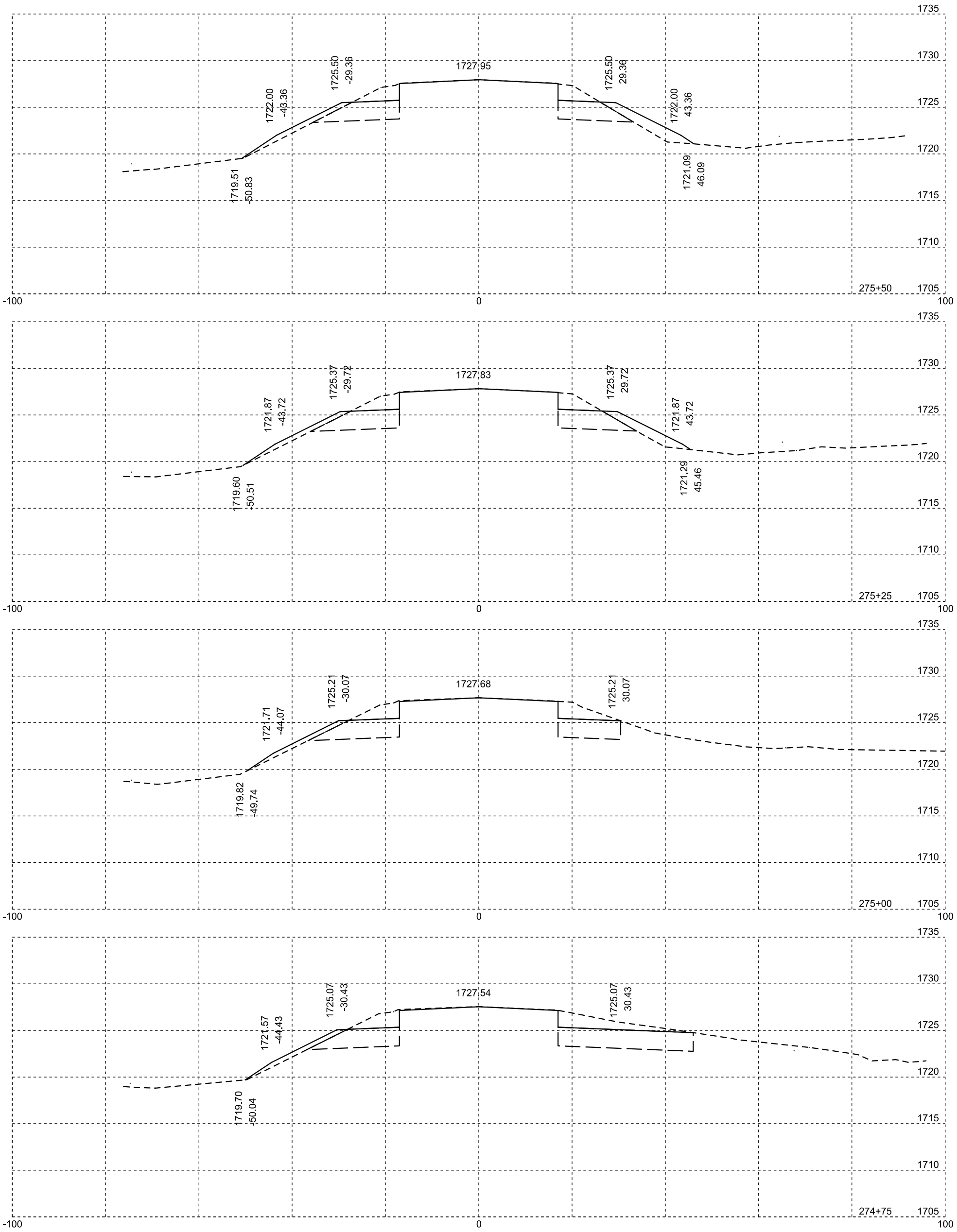
225th



Plotting Date: 05/09/2024

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(112)95	133	167

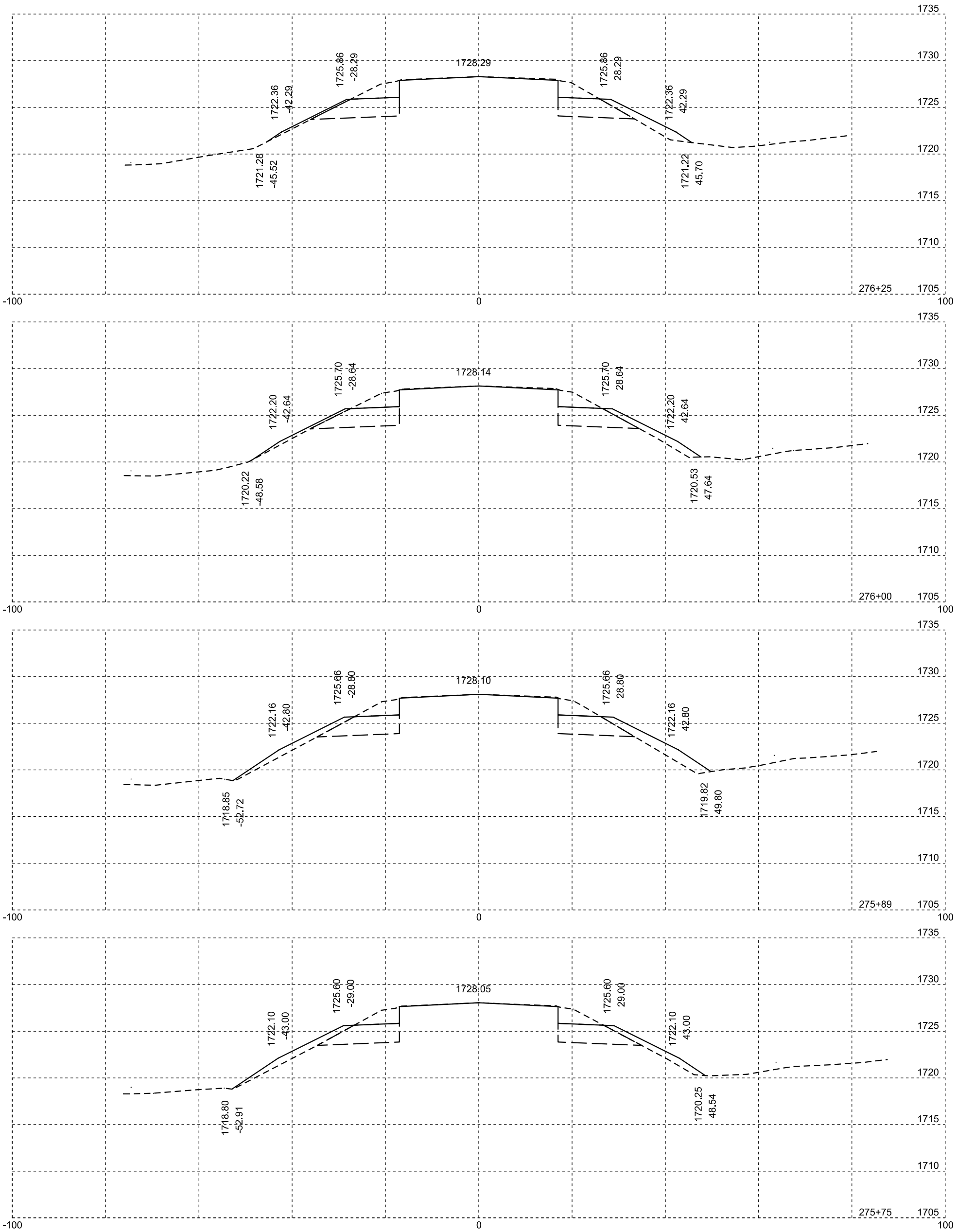
225th



Plotting Date: 05/09/2024

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(112)95	134	167

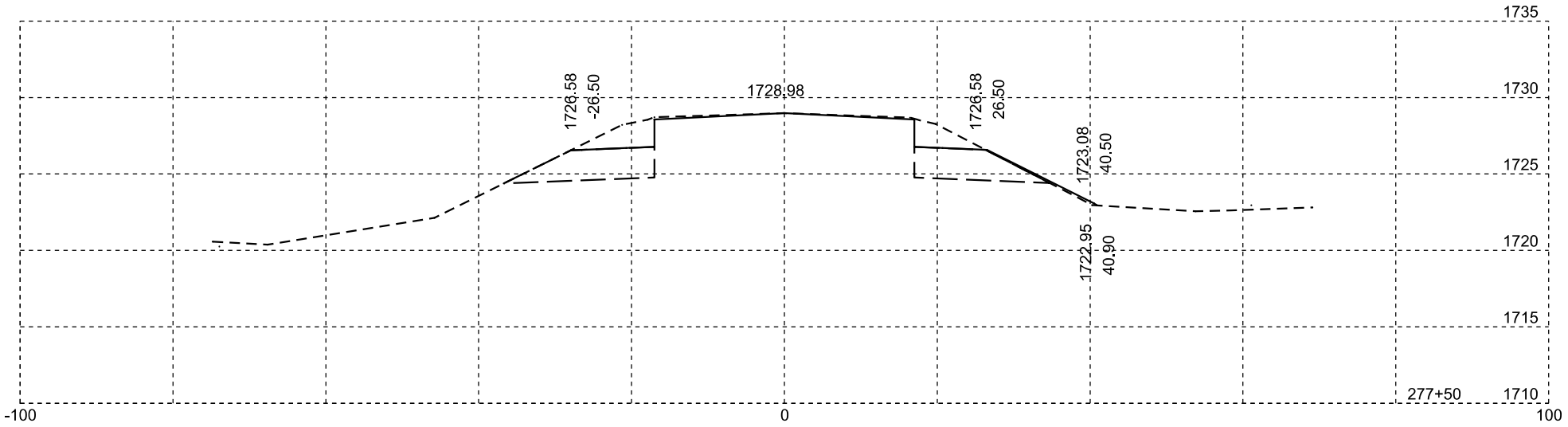
225th

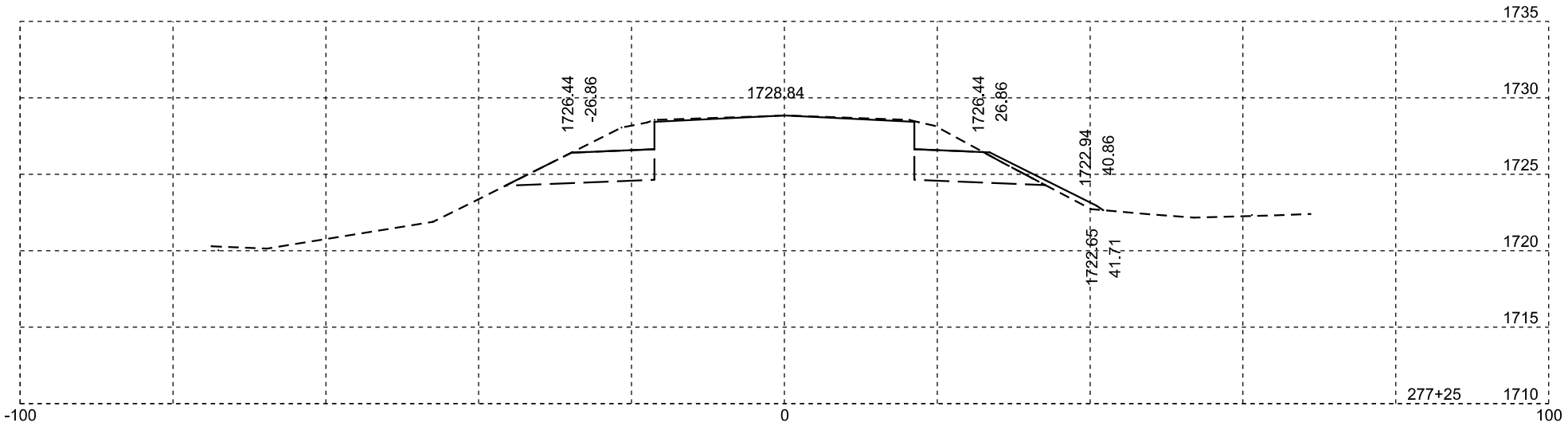


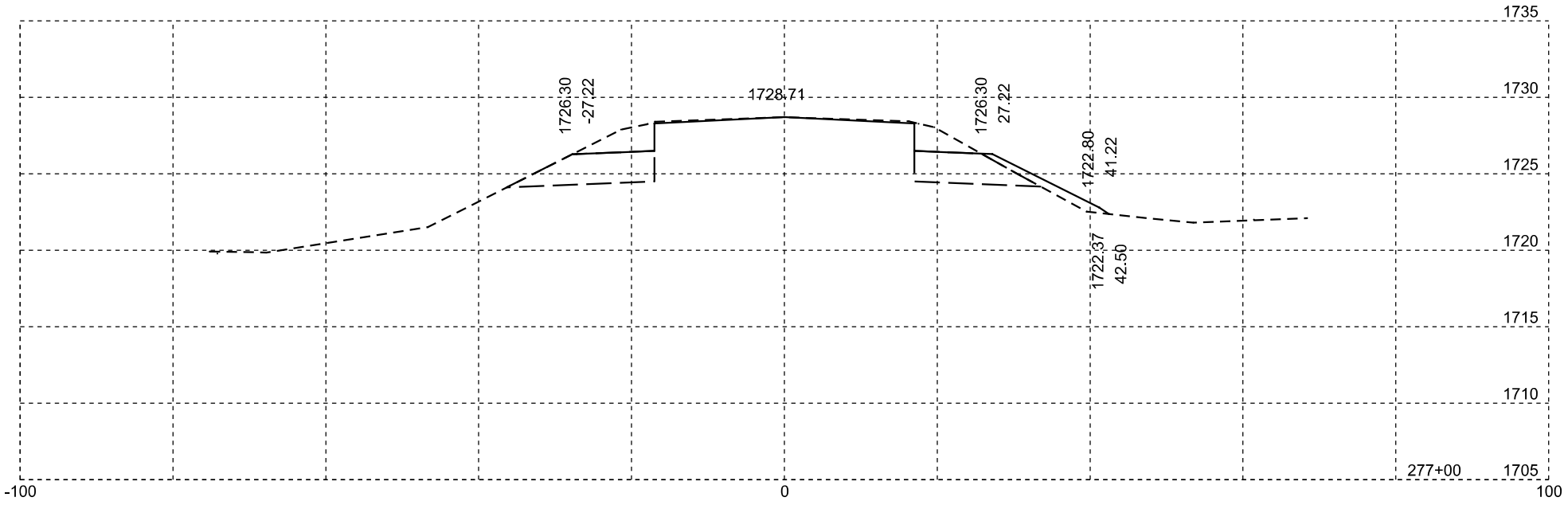
Plotting Date: 05/09/2024

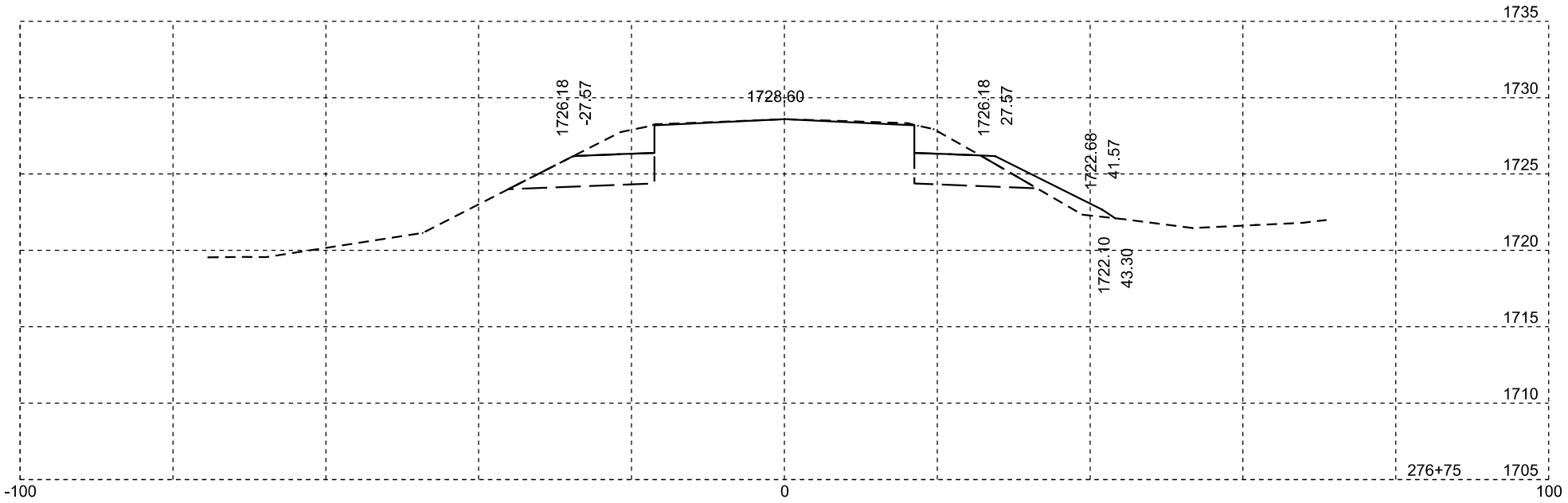
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(112)95	135	167

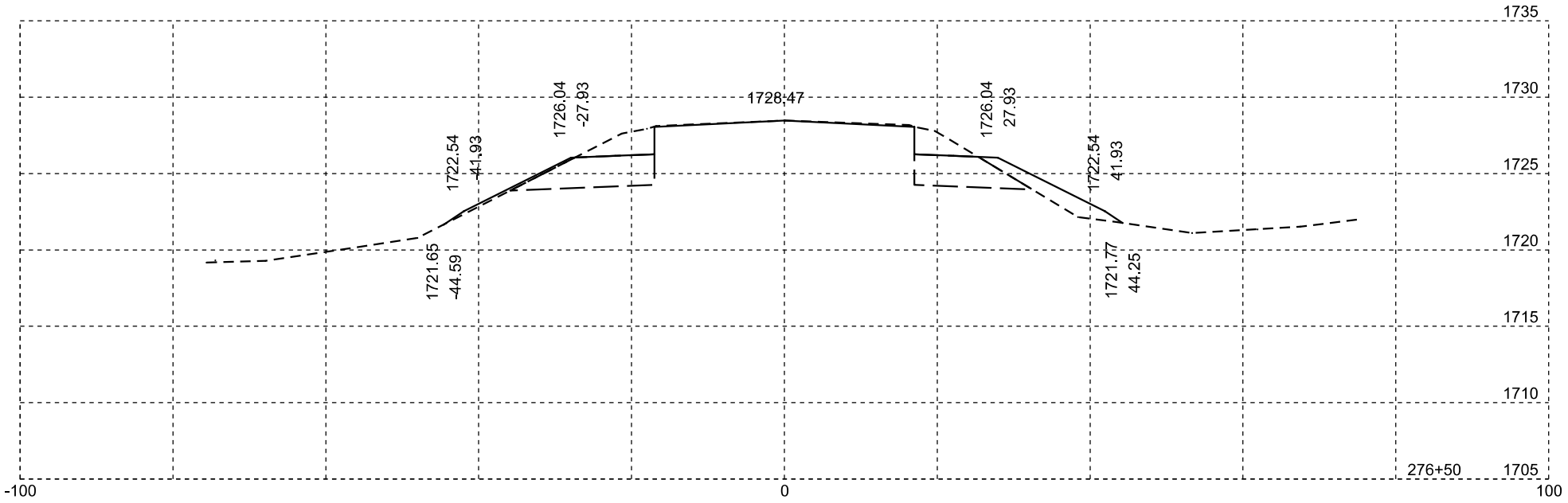
225th











Plotting Date: 05/09/2024

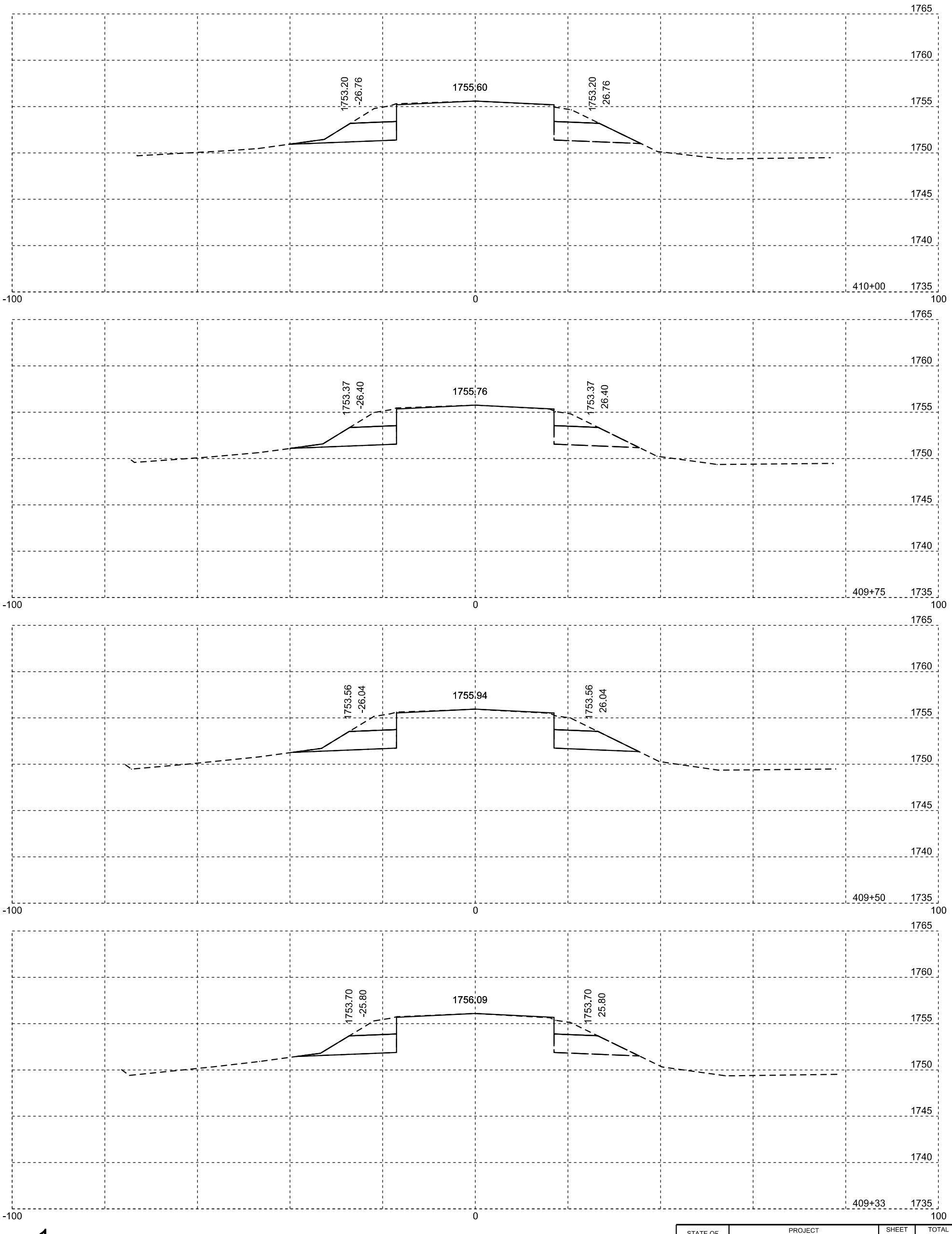
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(112)95	136	167

225th

Plotting Date: 05/09/2024

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(112)95	137	167

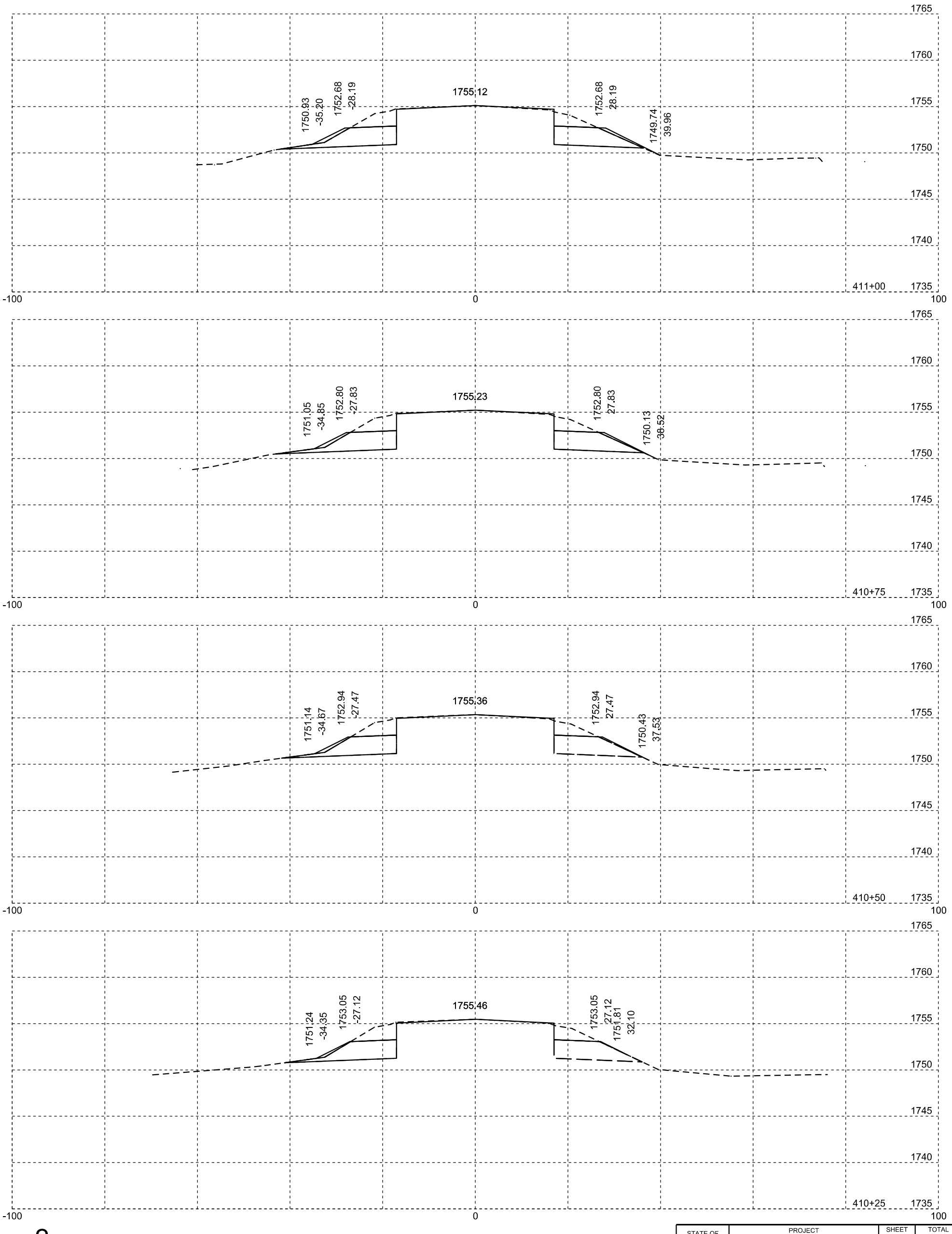
228th



Plotting Date: 05/09/2024

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(112)95	138	167

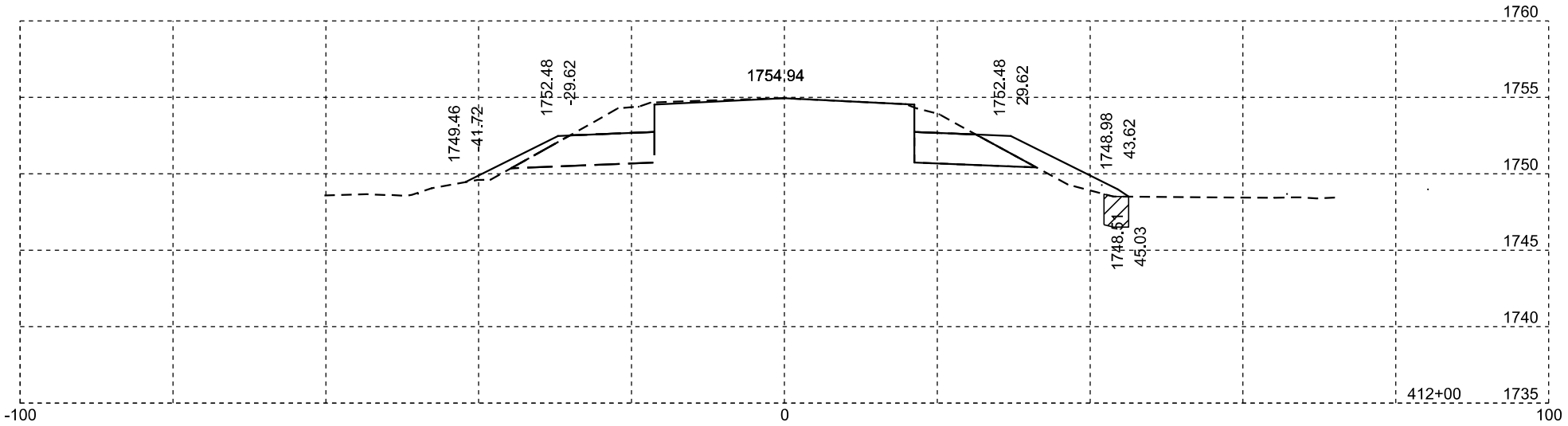
228th

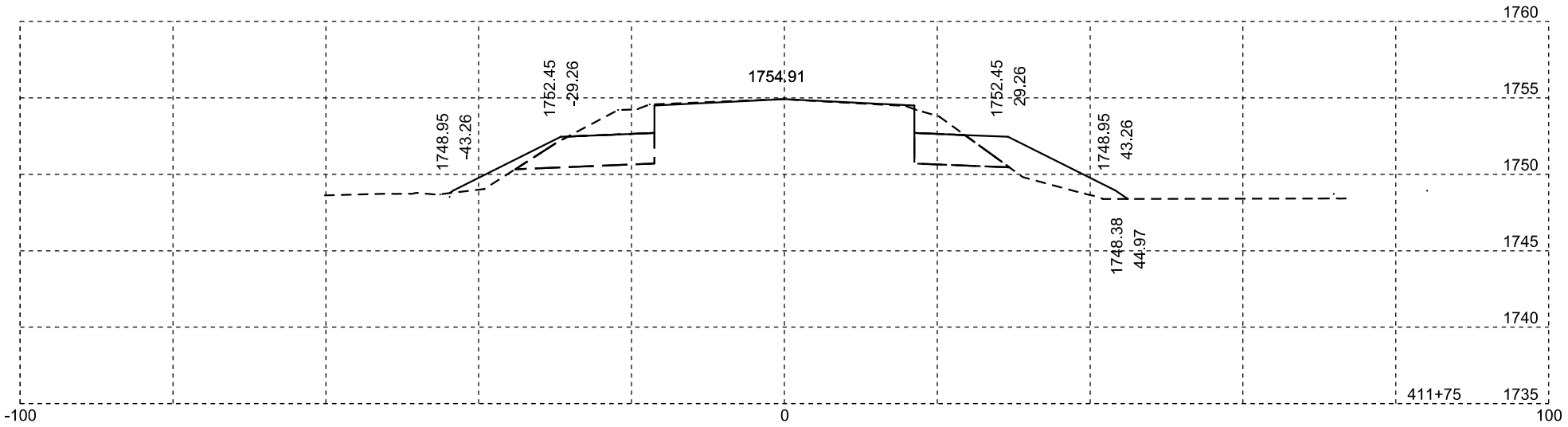


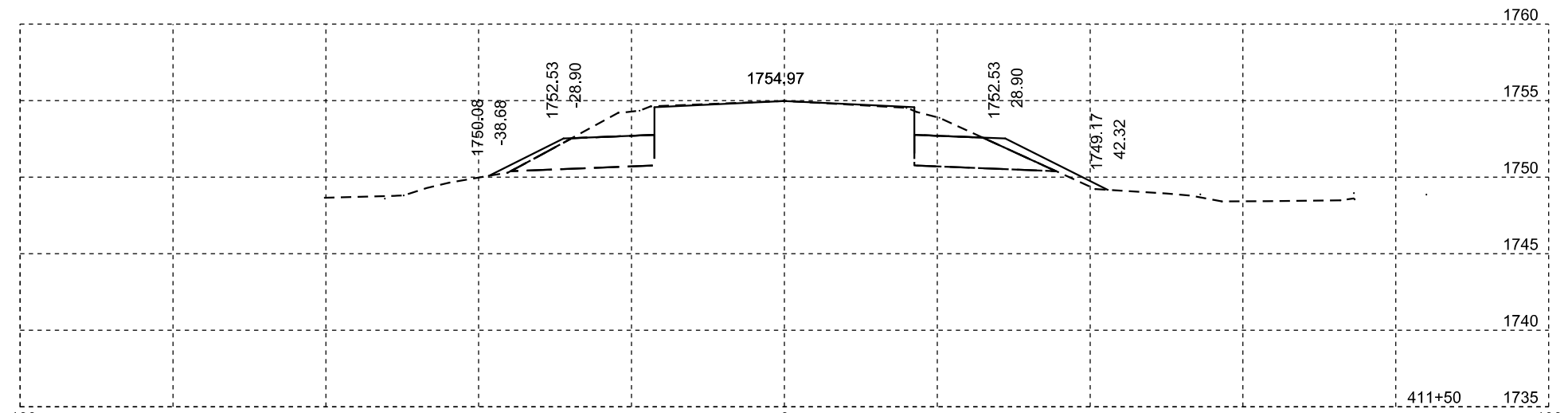
Plotting Date: 05/09/2024

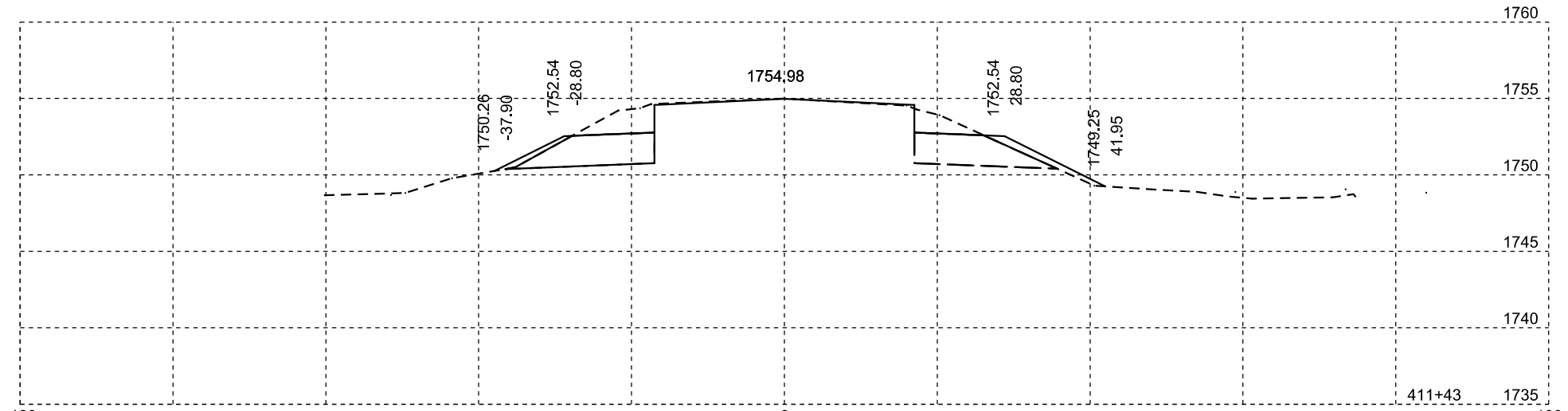
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(112)95	139	167

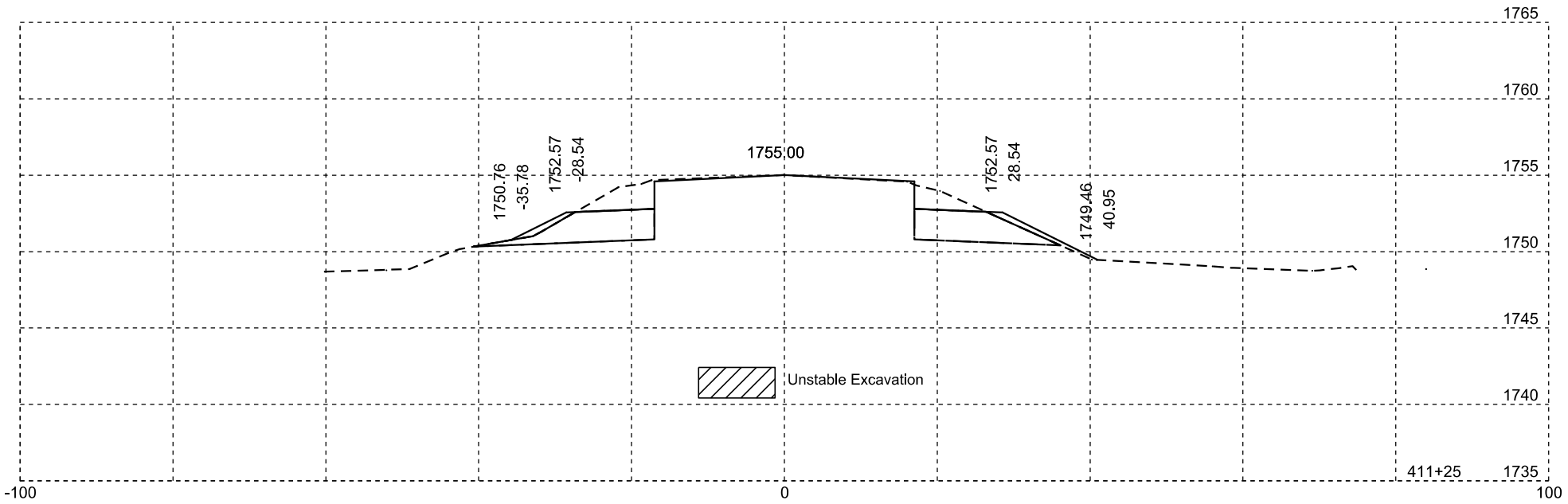
228th









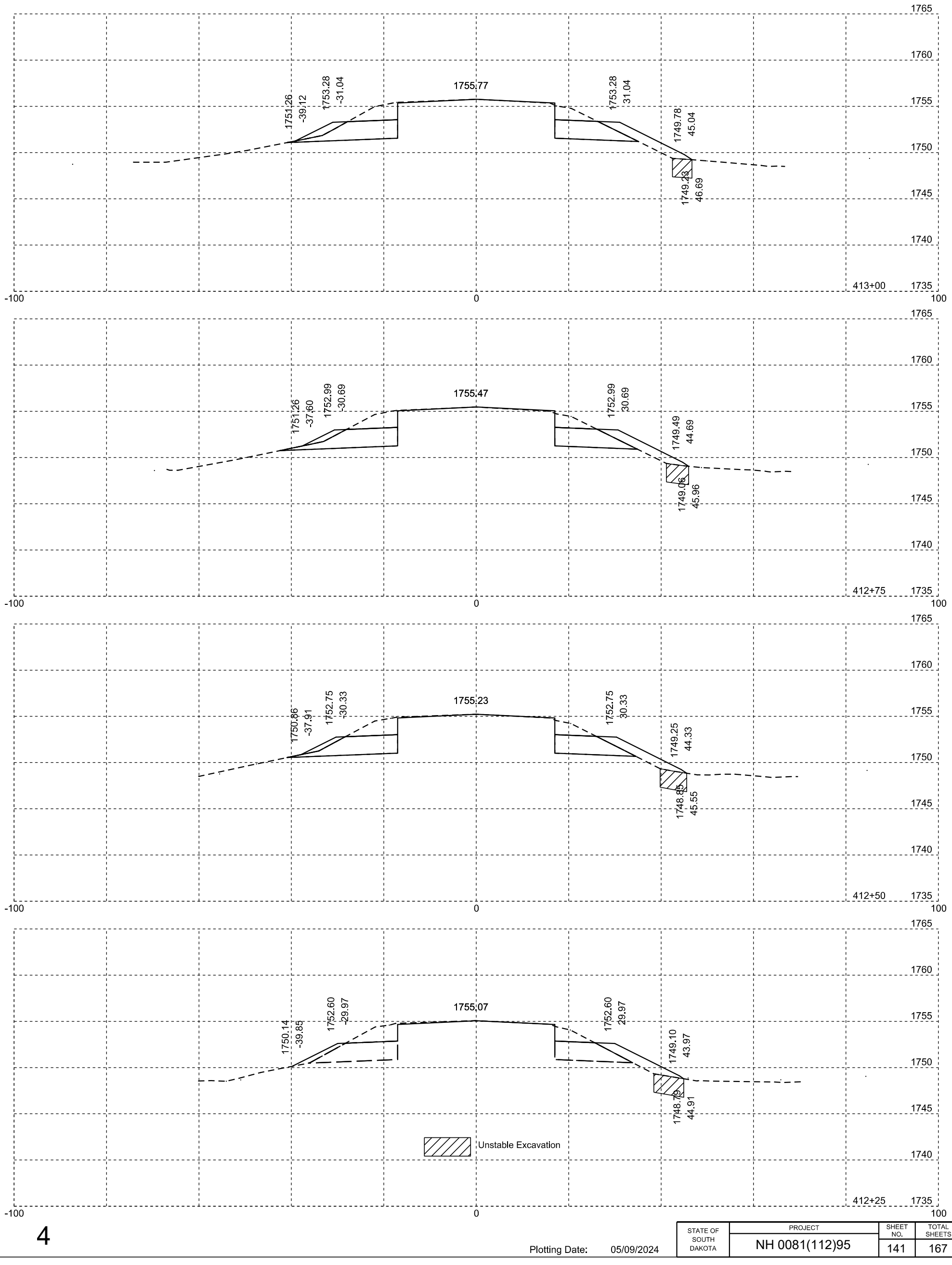


3

Plotting Date: 05/09/2024

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(112)95	140	167

228th



Plotting Date: 05/09/2024

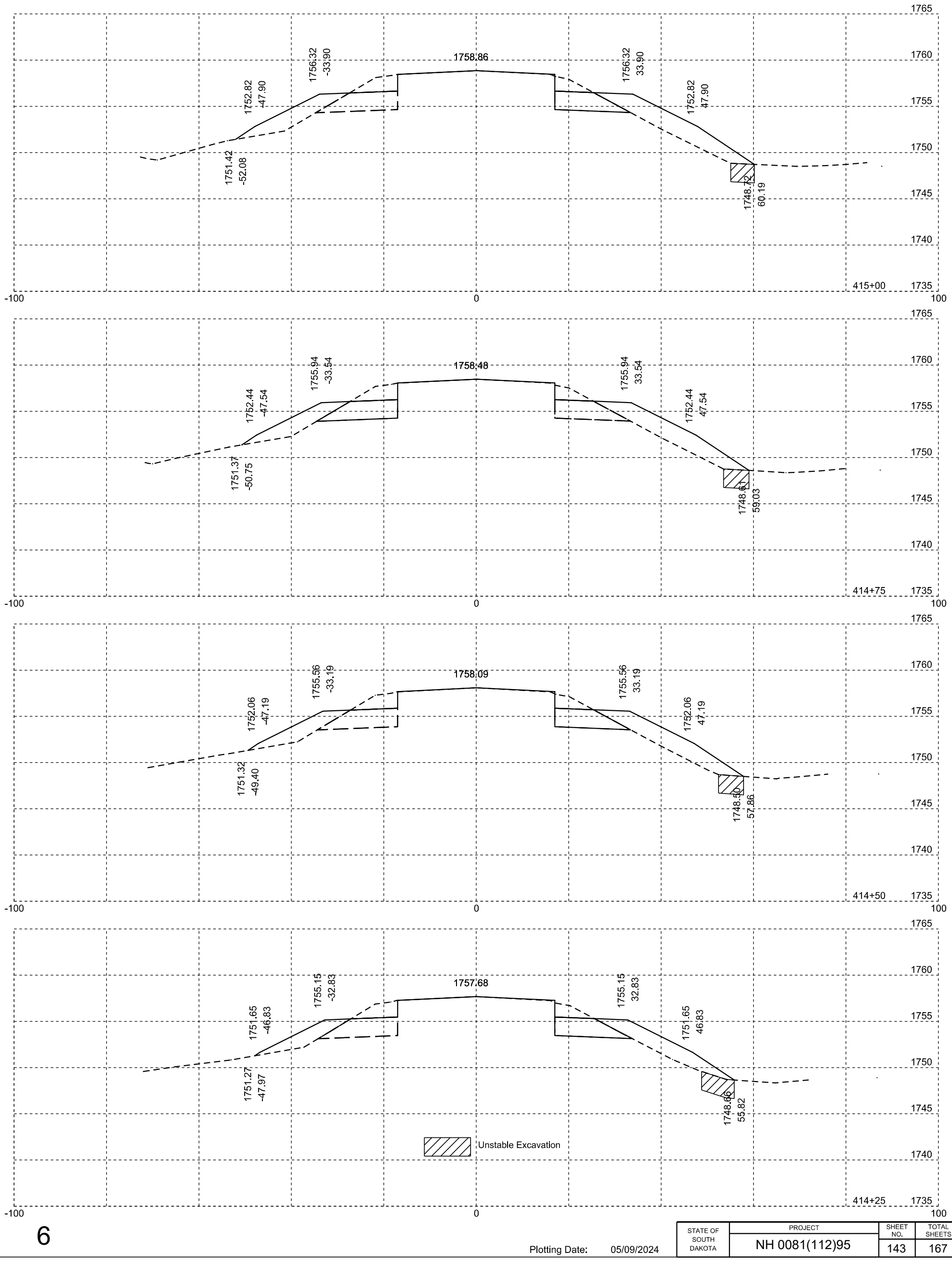
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(112)95	141	167

228th

Plotting Date: 05/09/2024

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(112)95	142	167

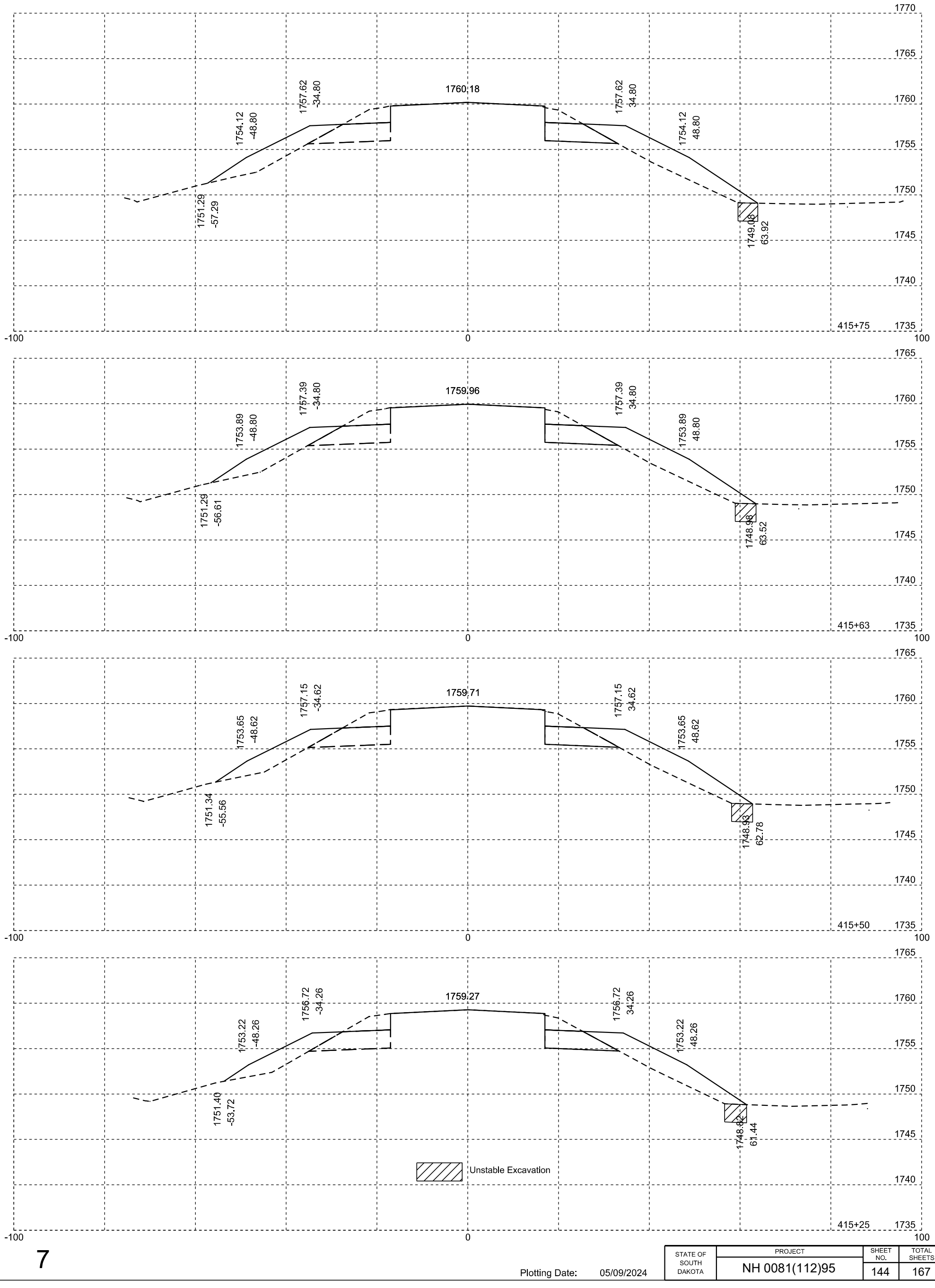
228th



Plotting Date: 05/09/2024

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(112)95	143	167

228th

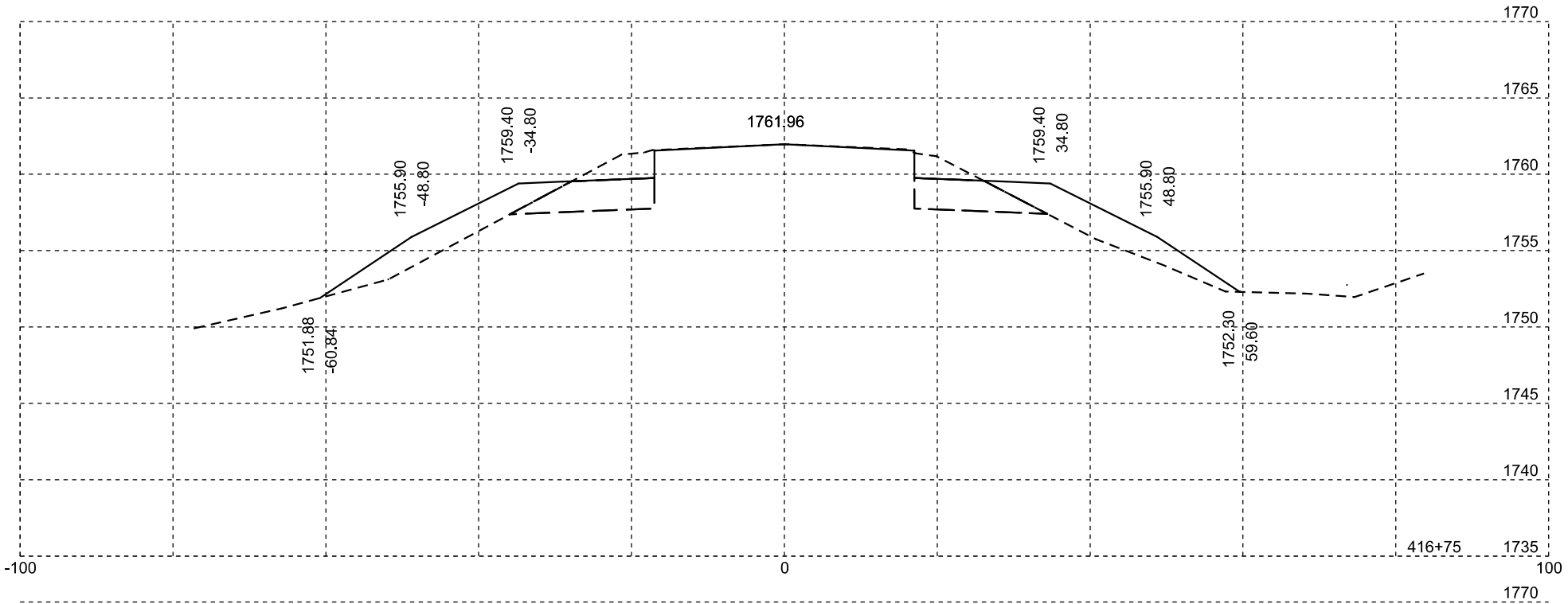


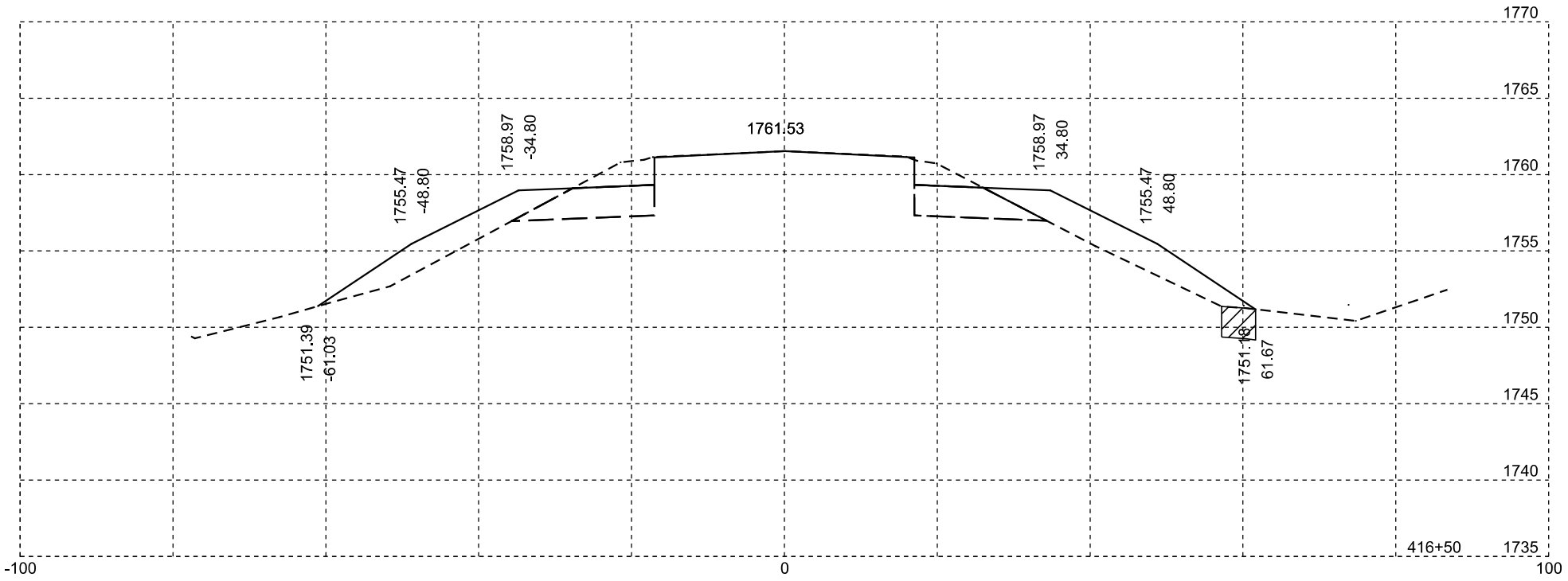
7

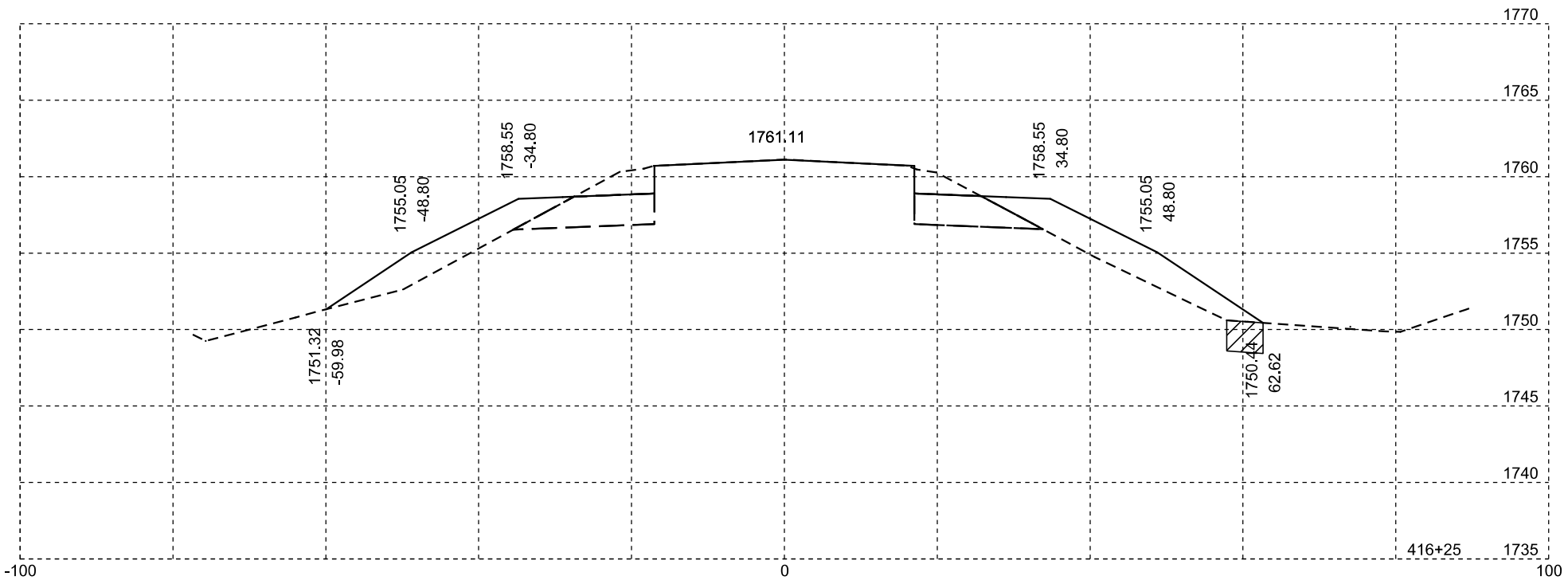
Plotting Date: 05/09/2024

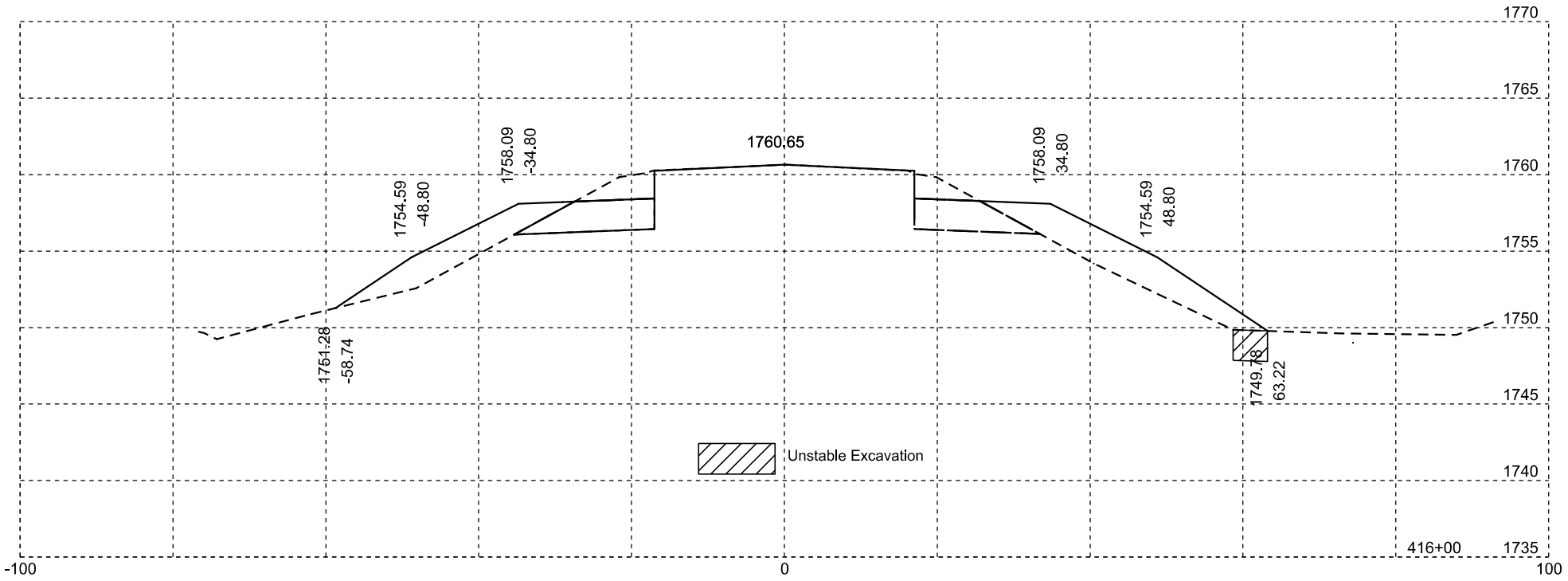
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(112)95	144	167

228th





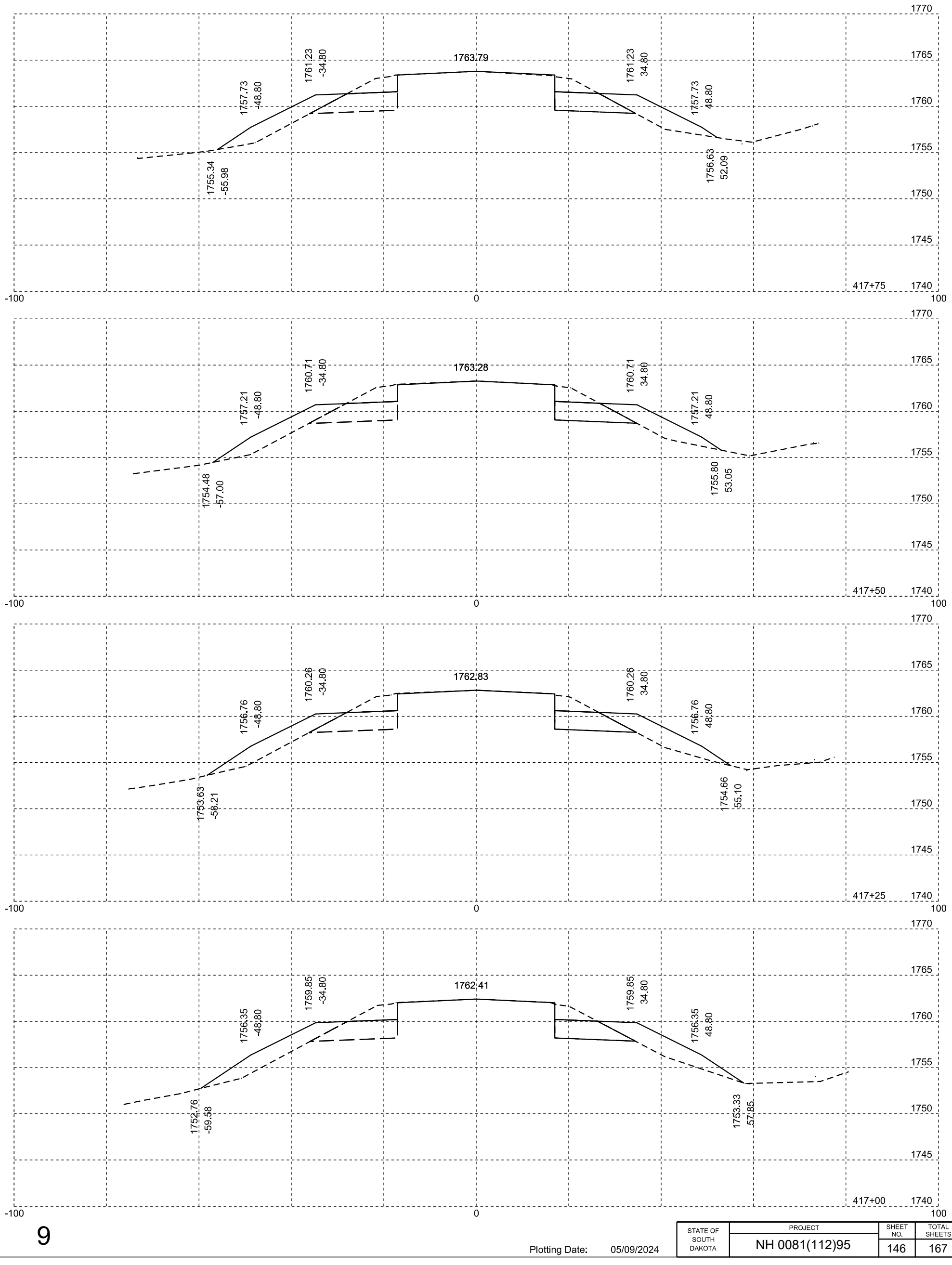




Plotting Date: 05/09/2024

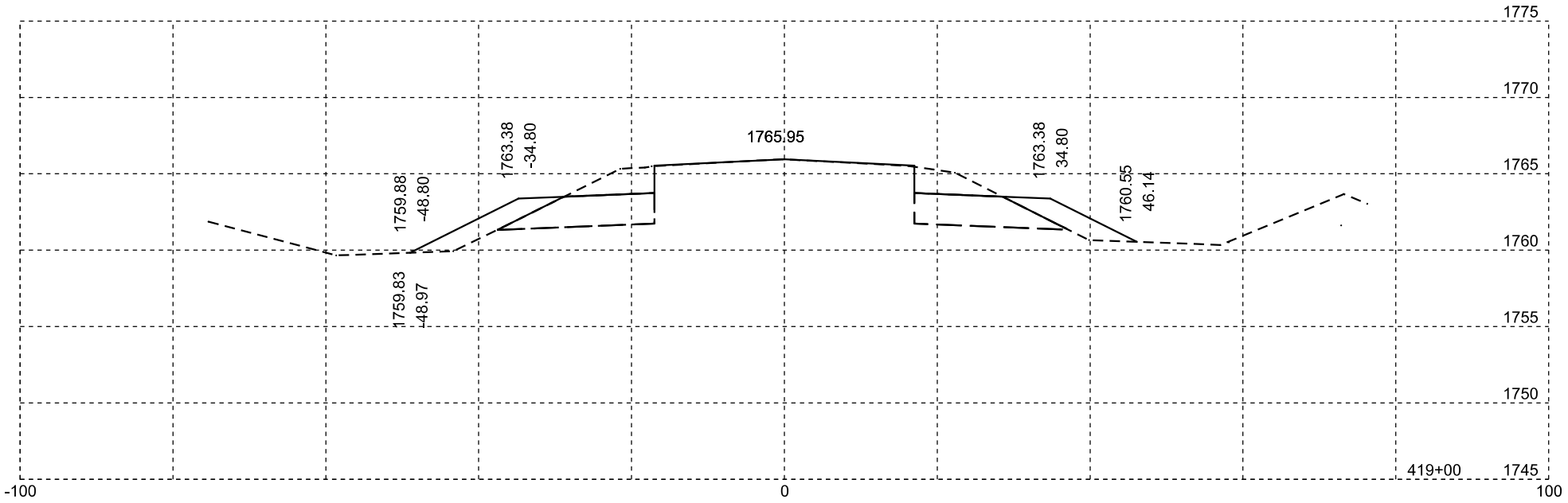
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(112)95	145	167

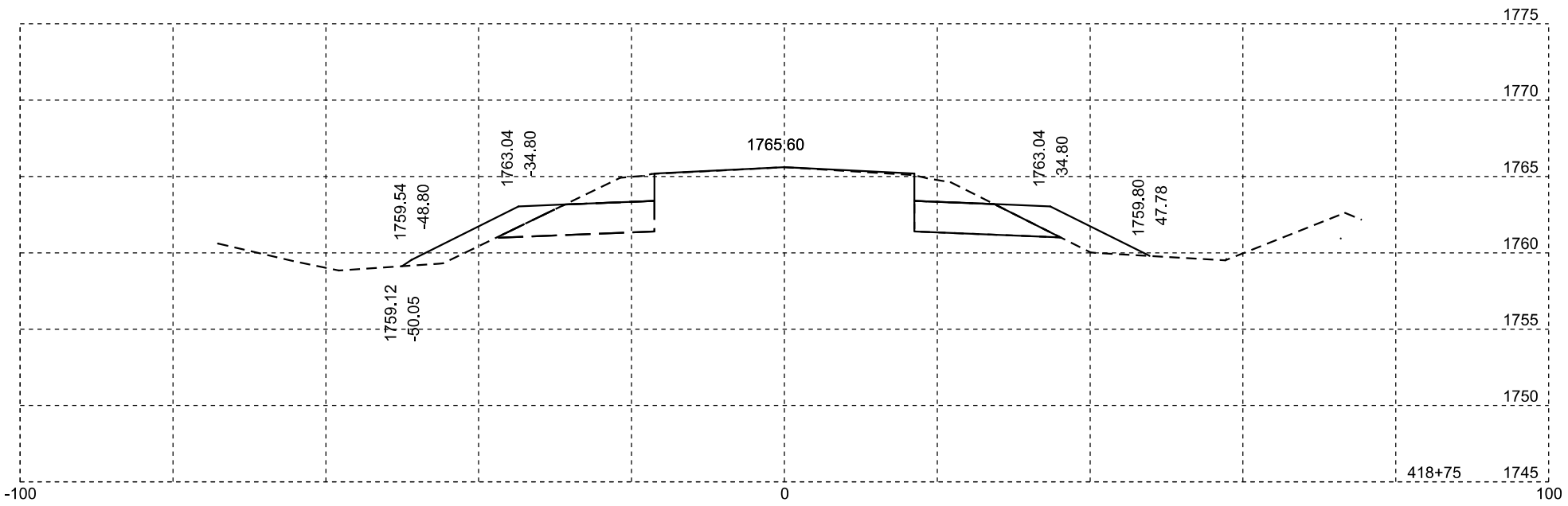
228th

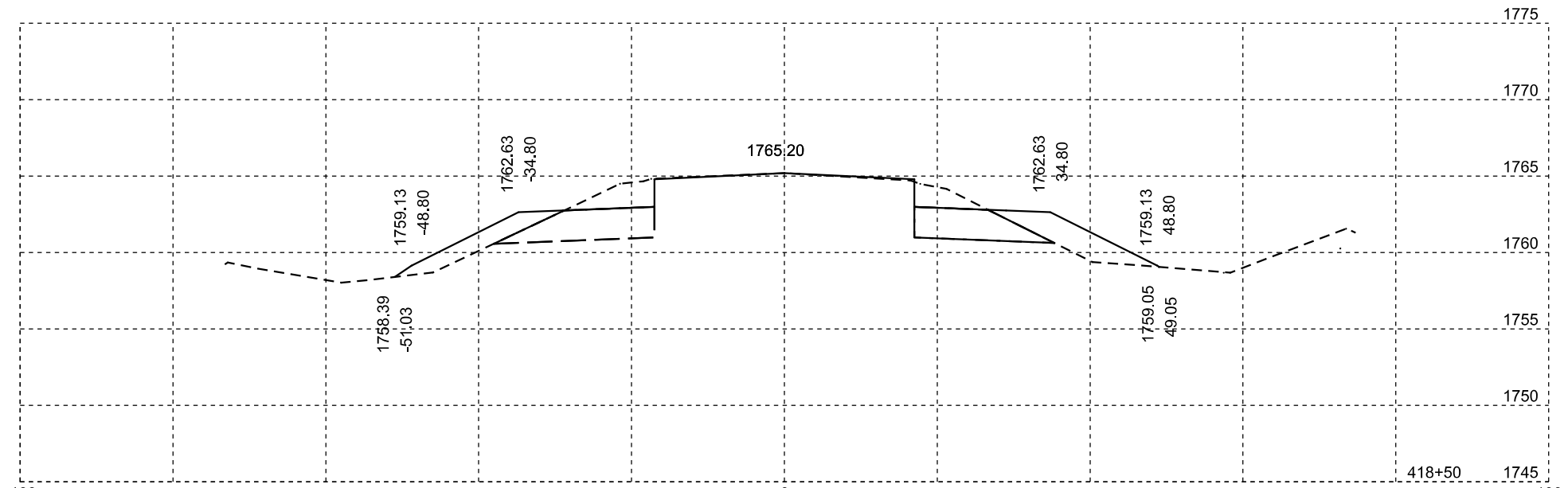


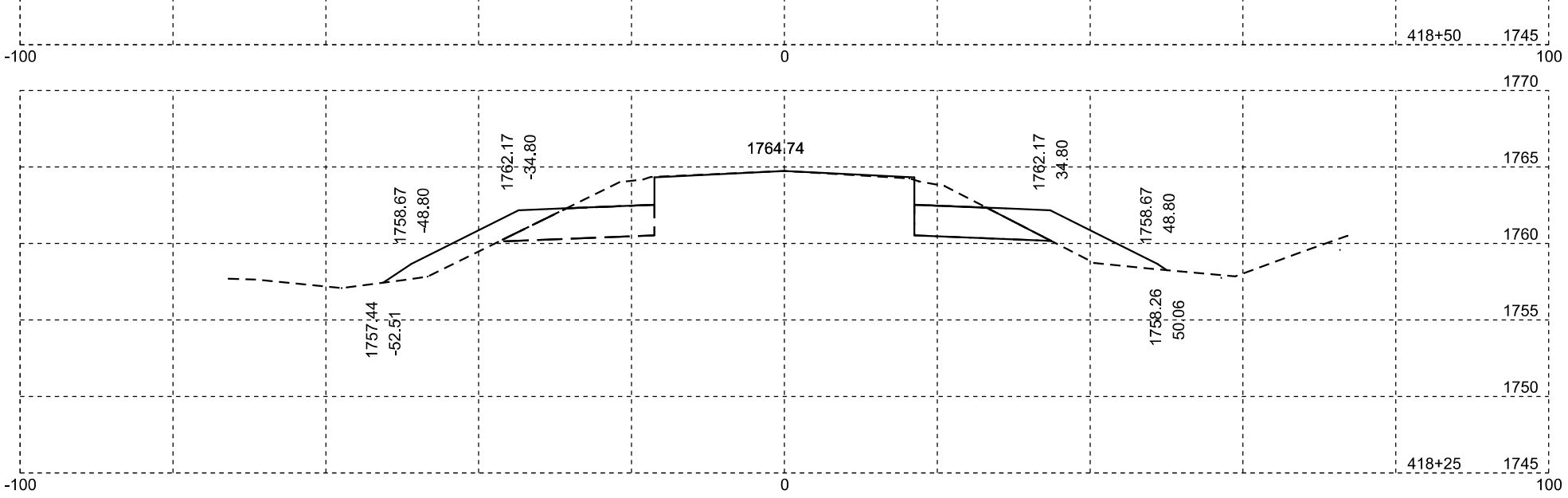
Plotting Date: 05/09/2024

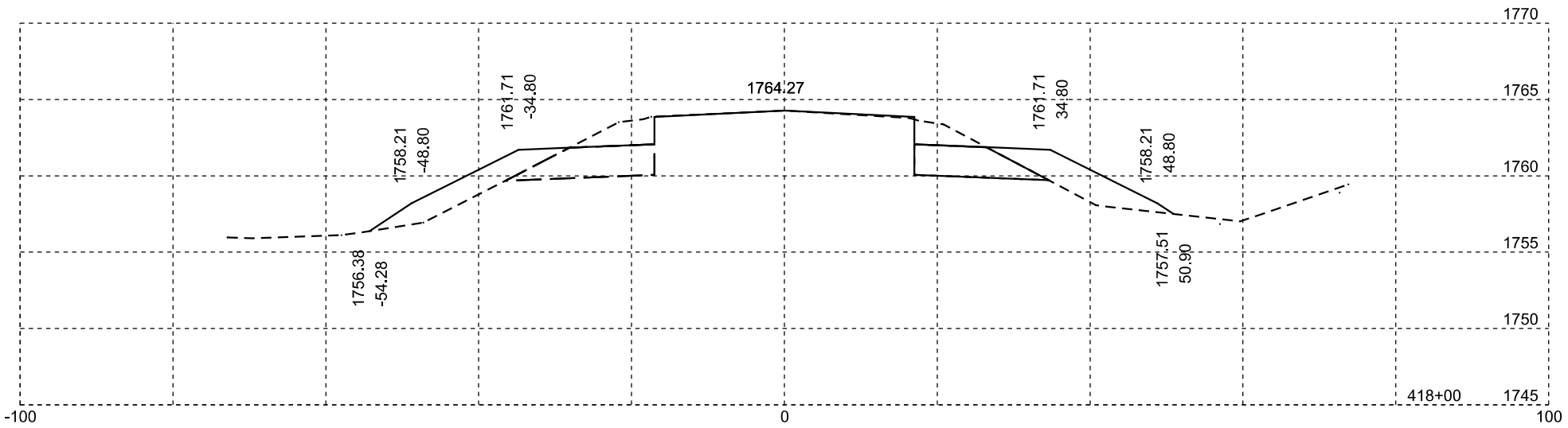
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(112)95	146	167







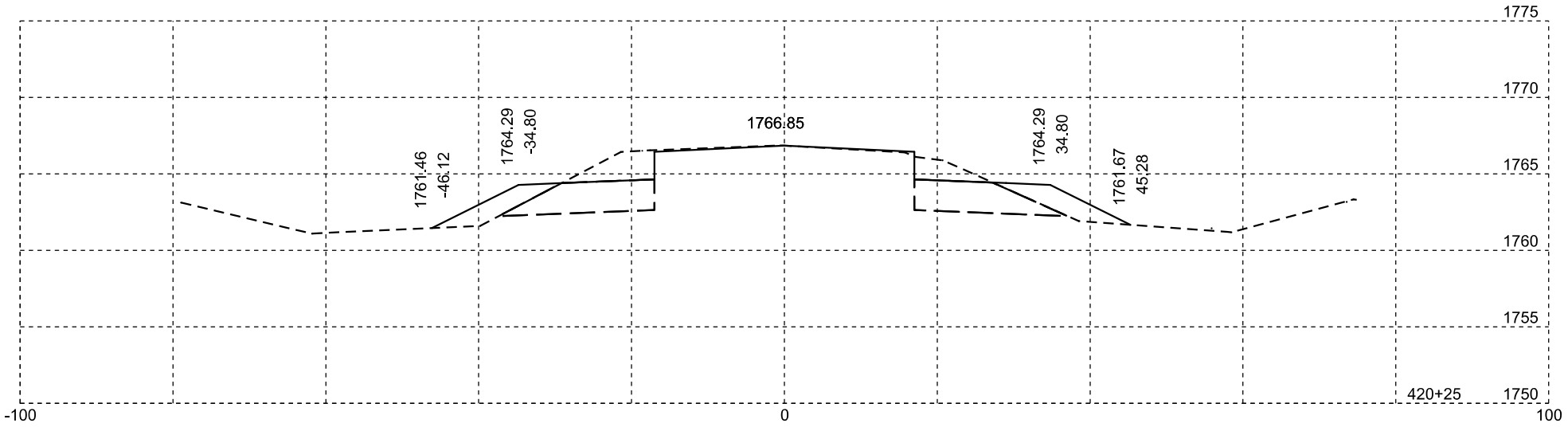


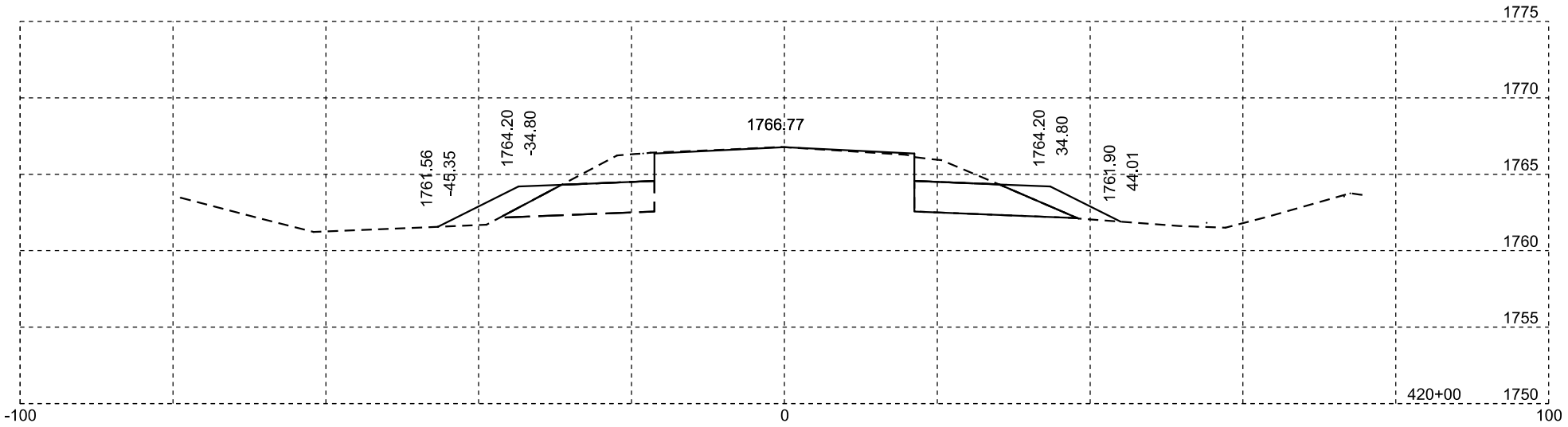


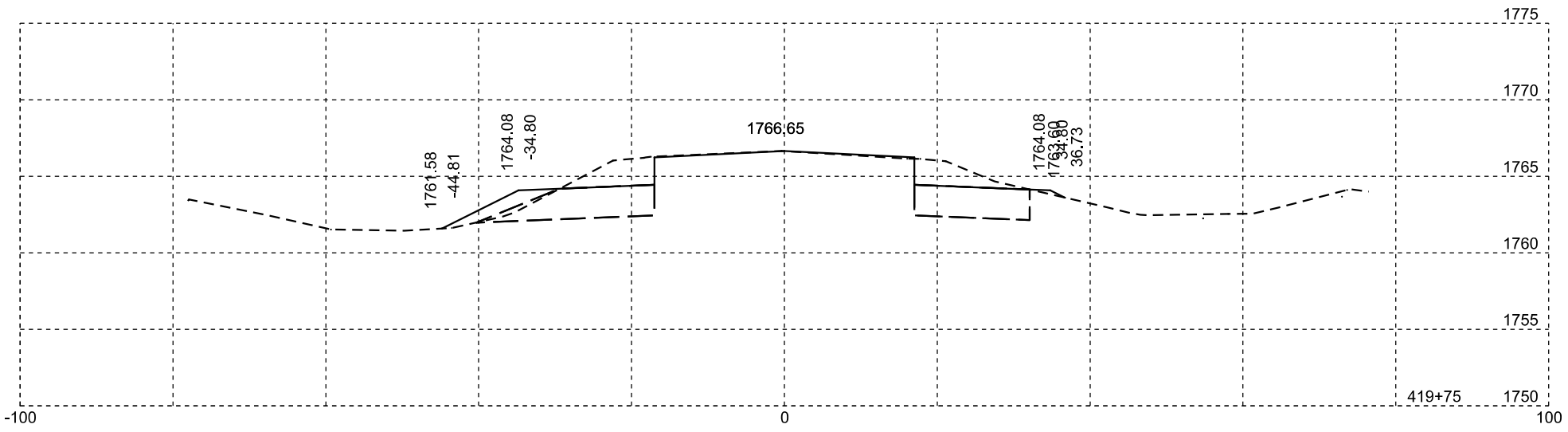
Plotting Date: 05/09/2024

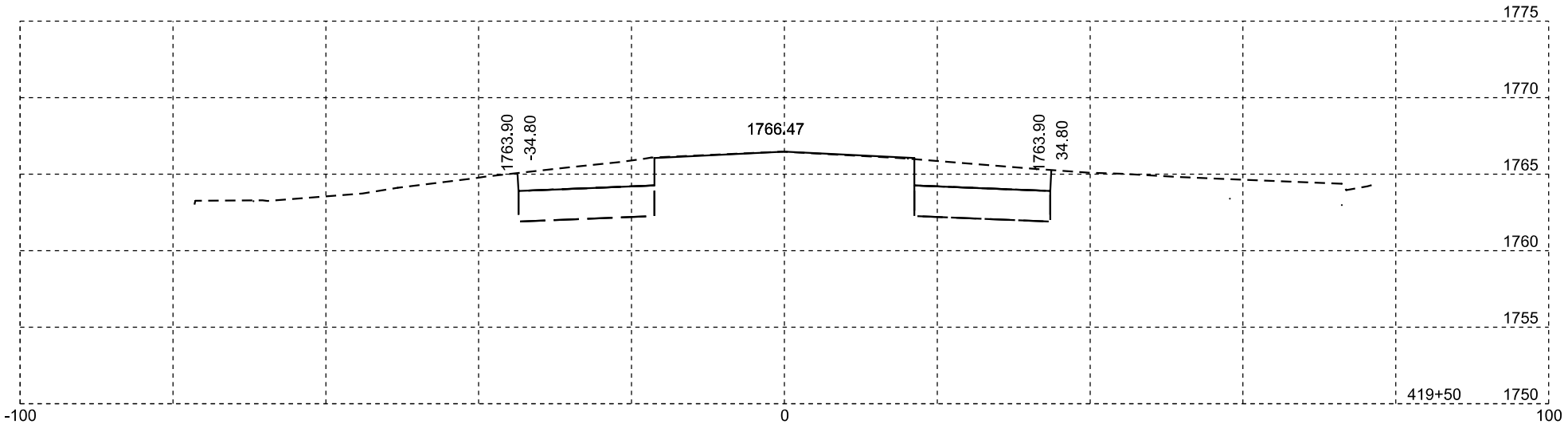
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(112)95	147	167

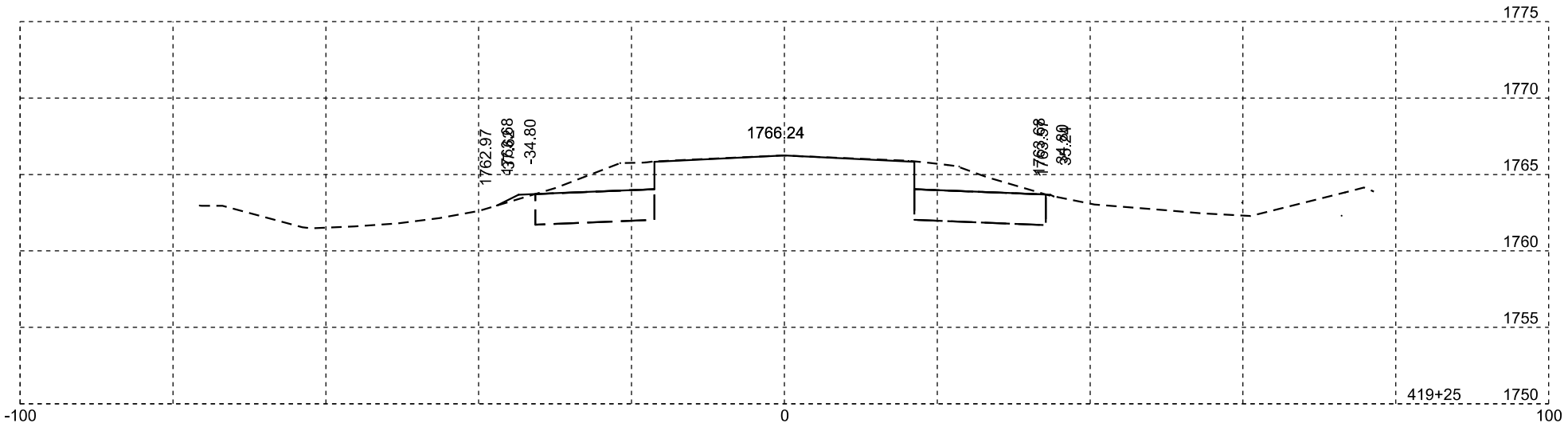
228th







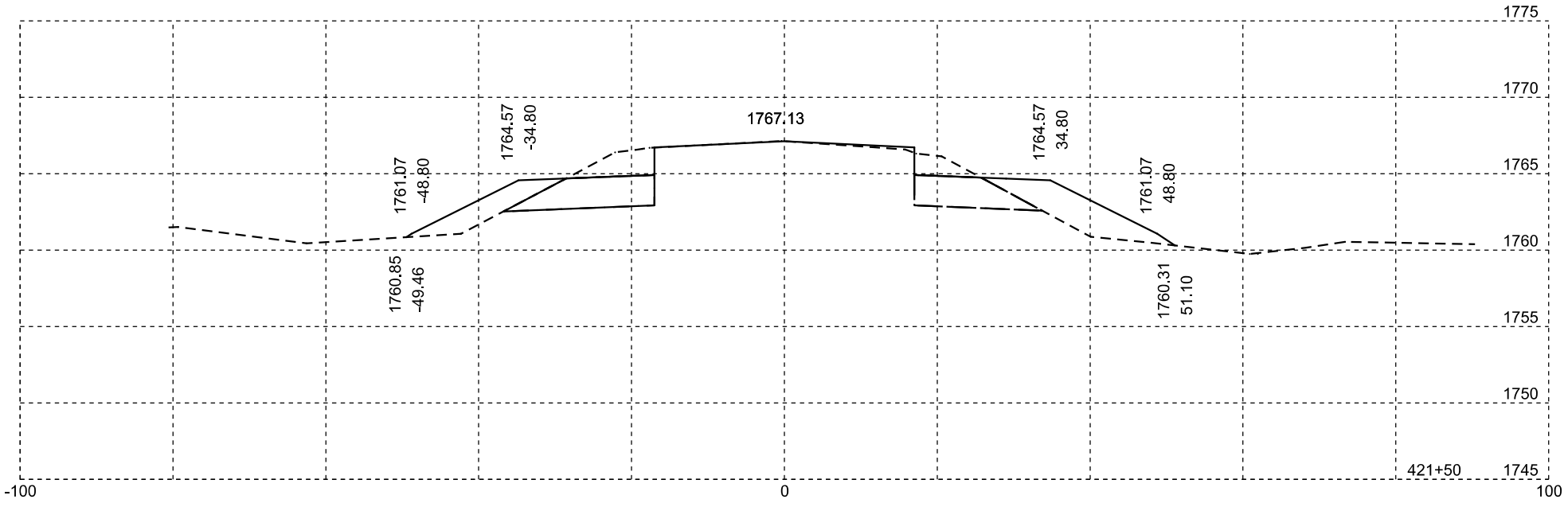


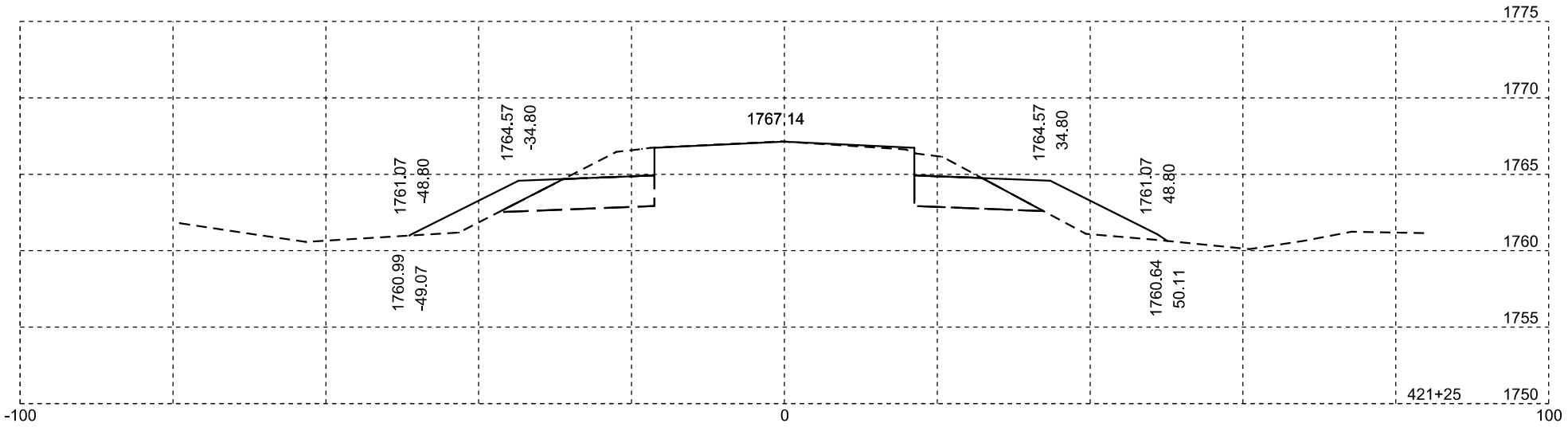


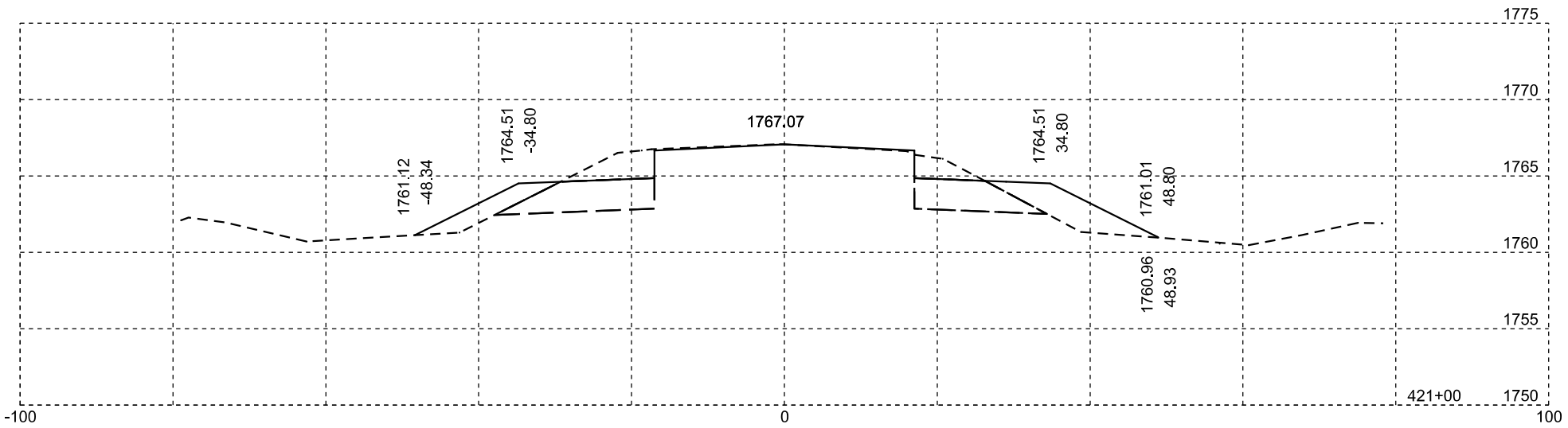
Plotting Date: 05/09/2024

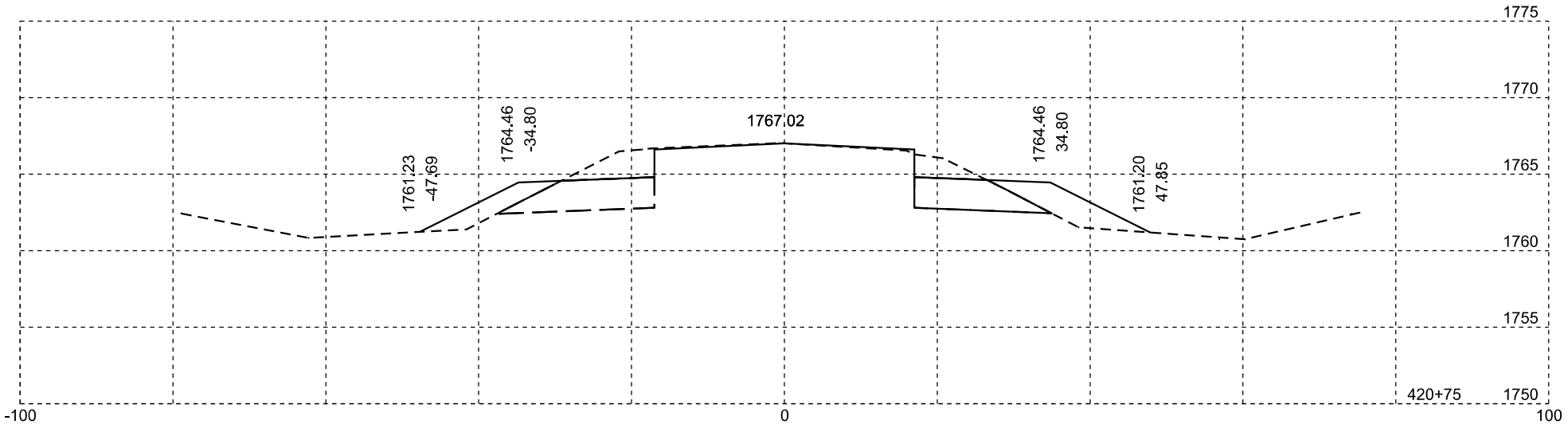
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(112)95	148	167

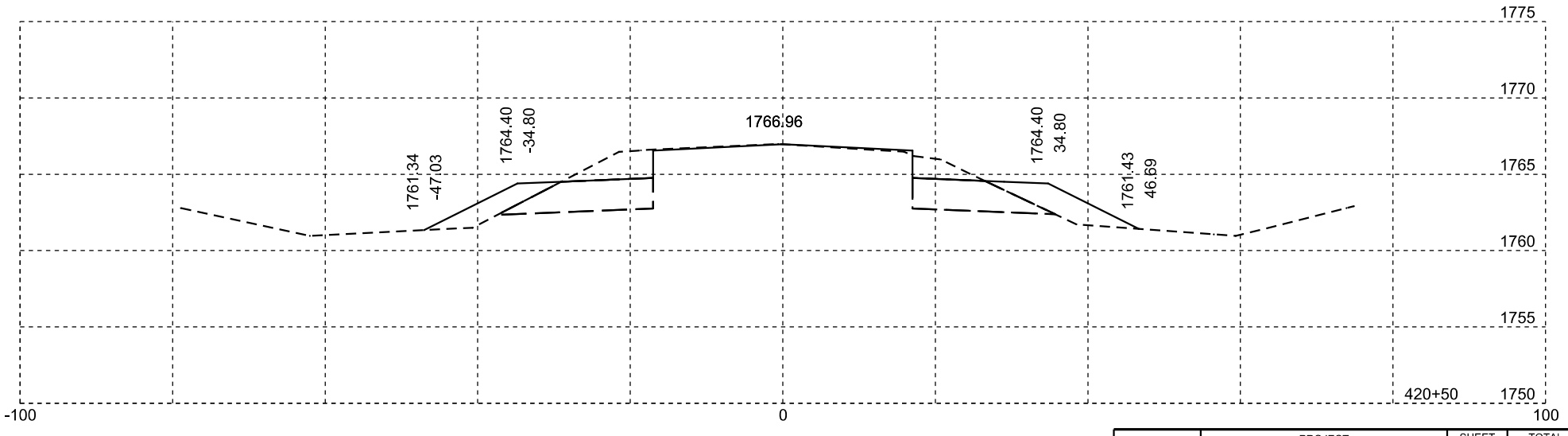
228th











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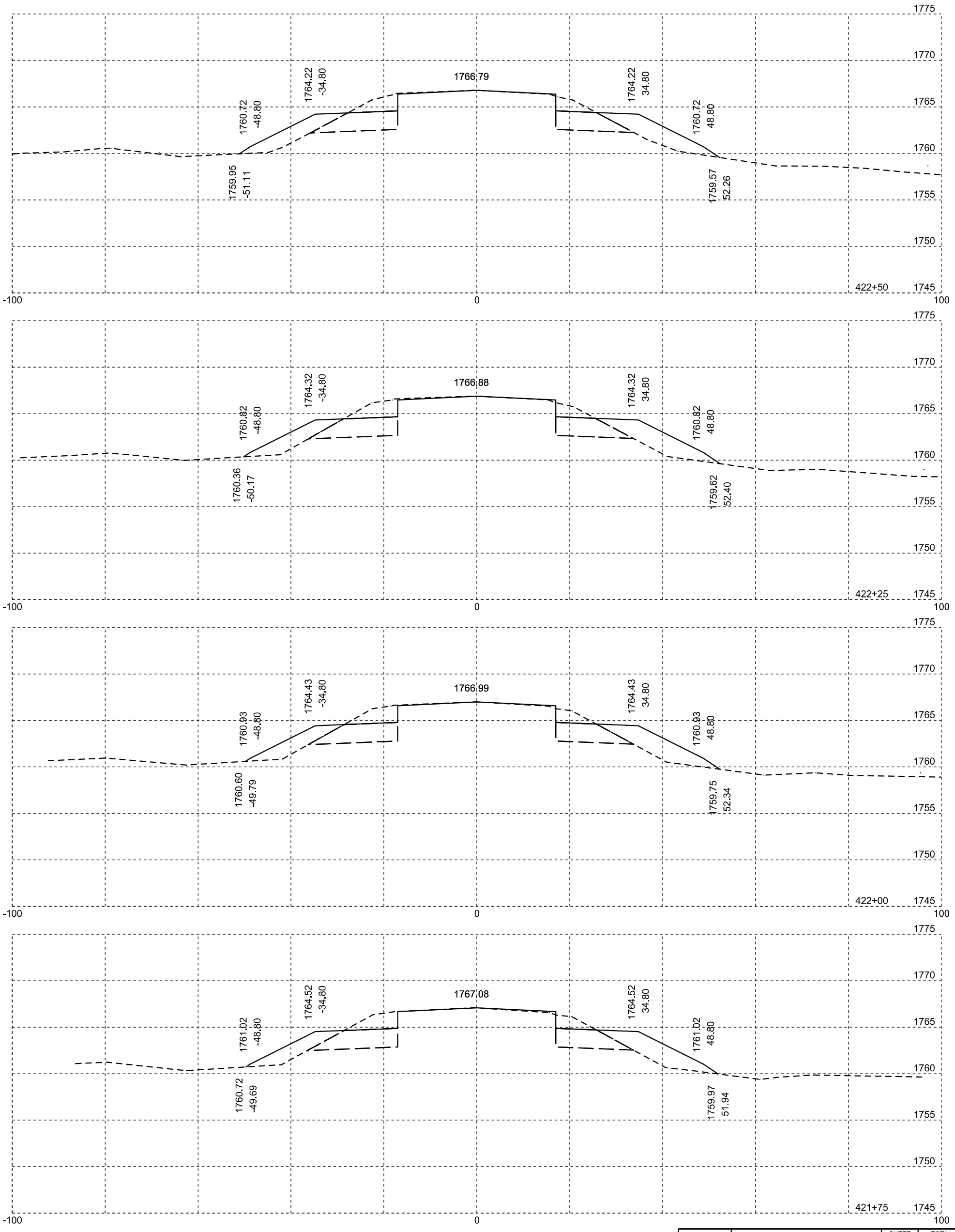
Plotting Date: 05/09/2024

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(112)95	149	167

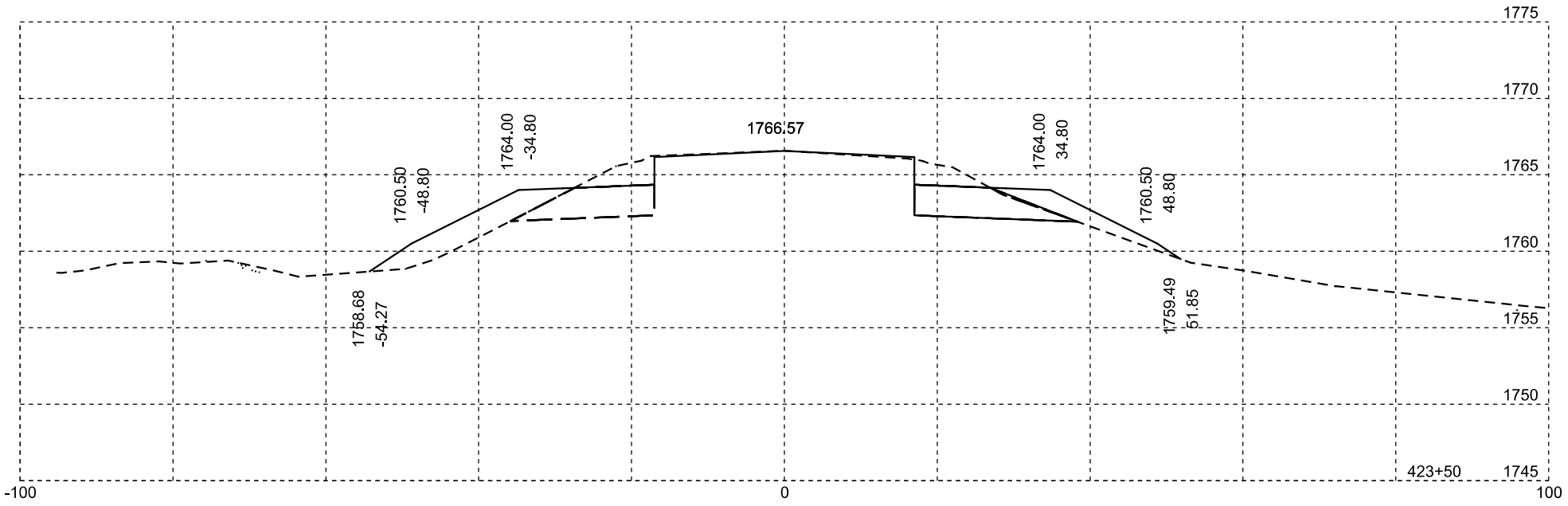
228th

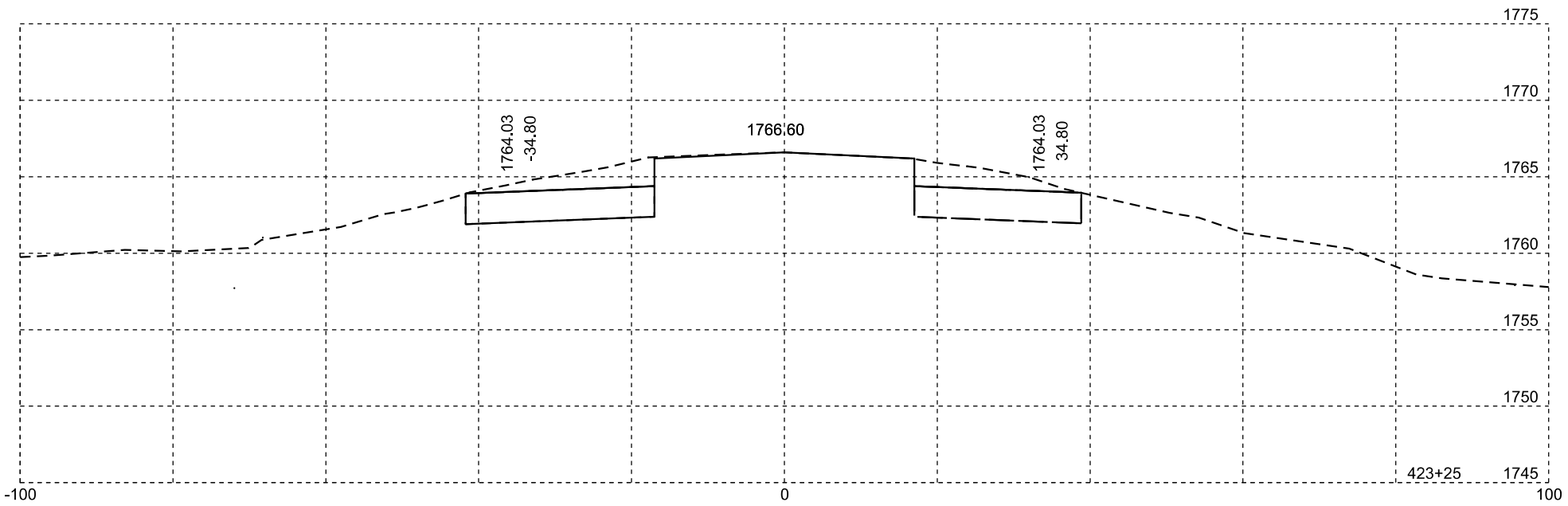


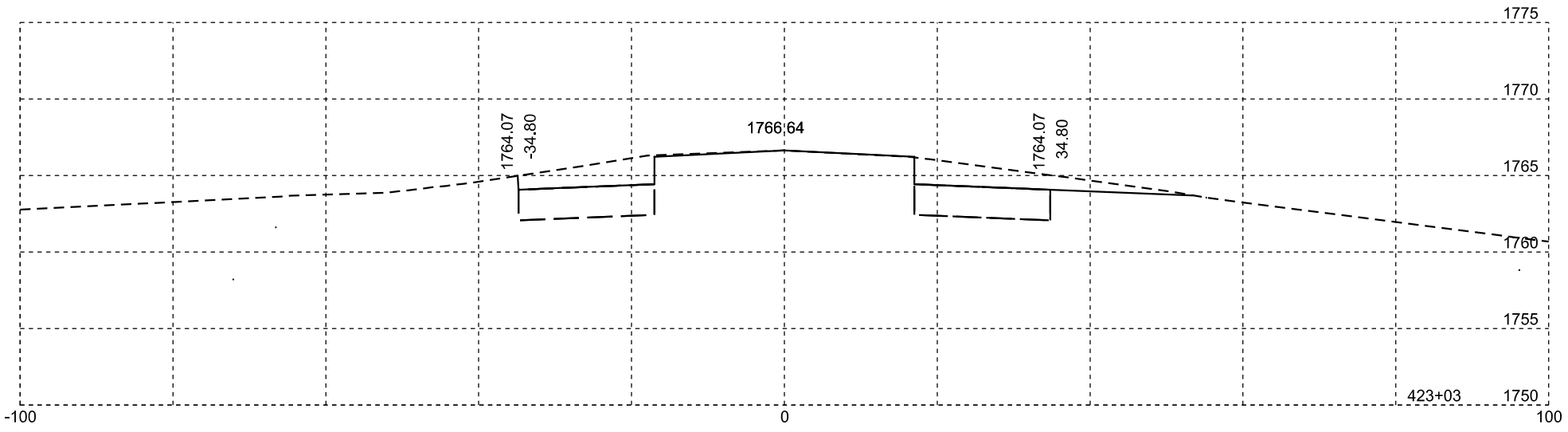
Plotting Date: 05/09/2024

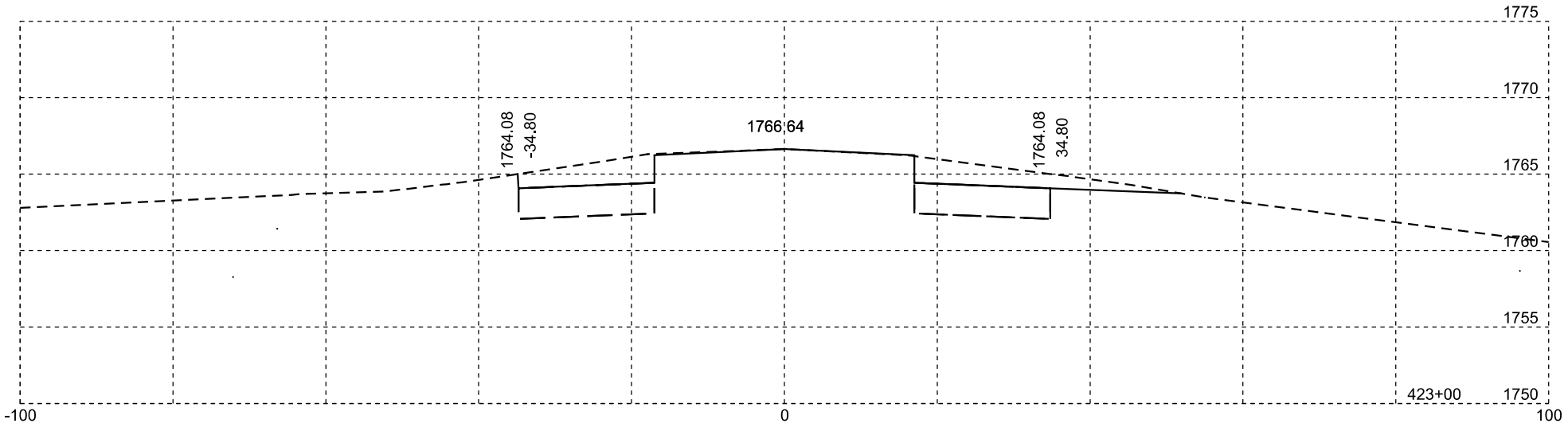
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(112)95	150	167

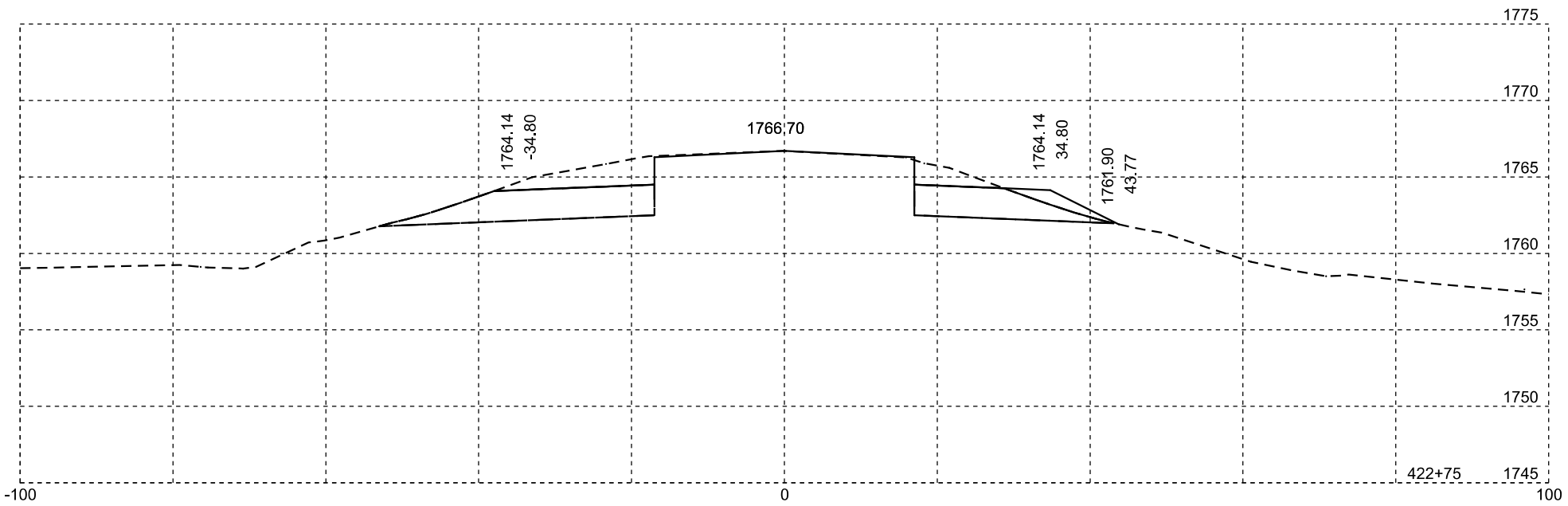
228th











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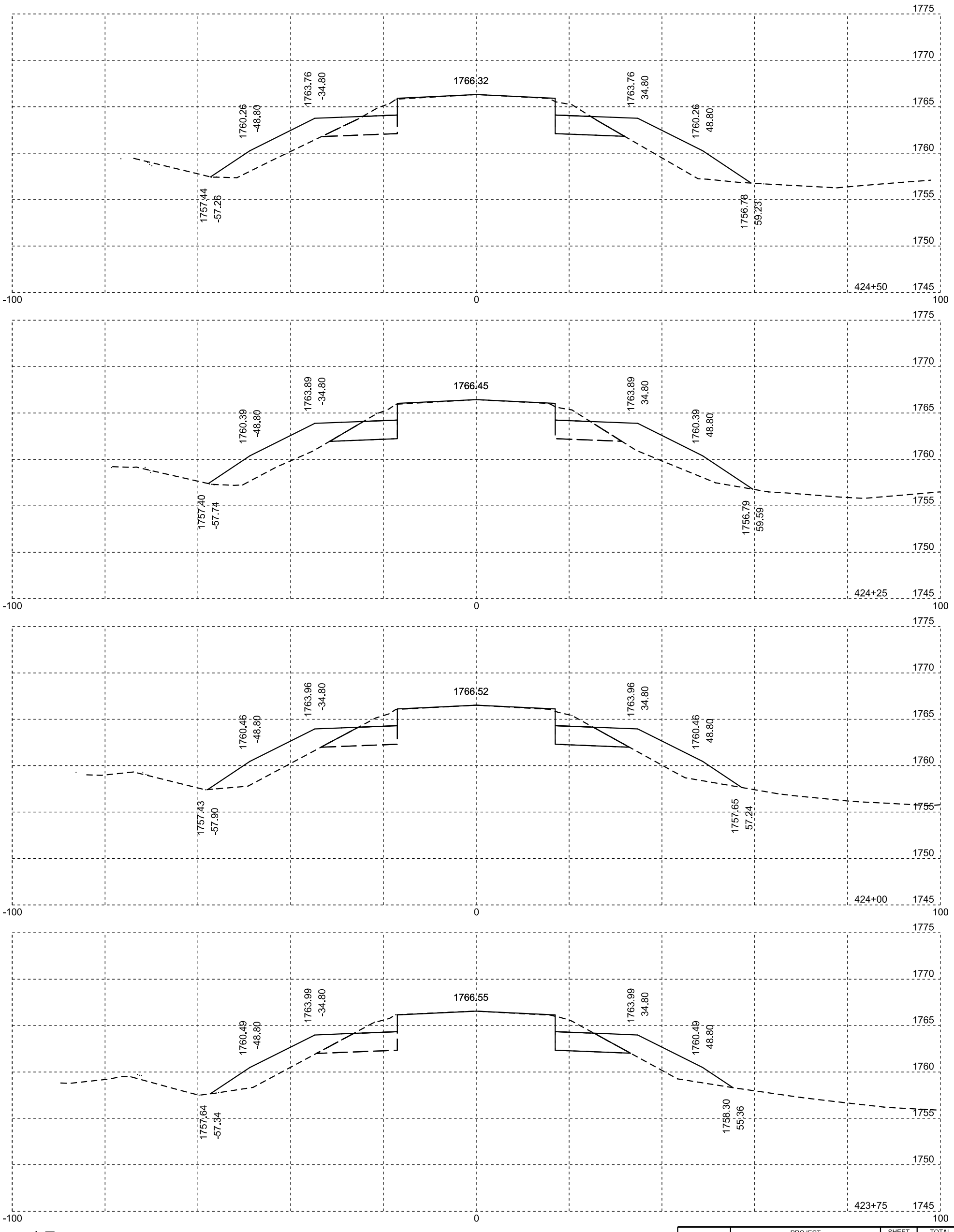
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(112)95	151	167

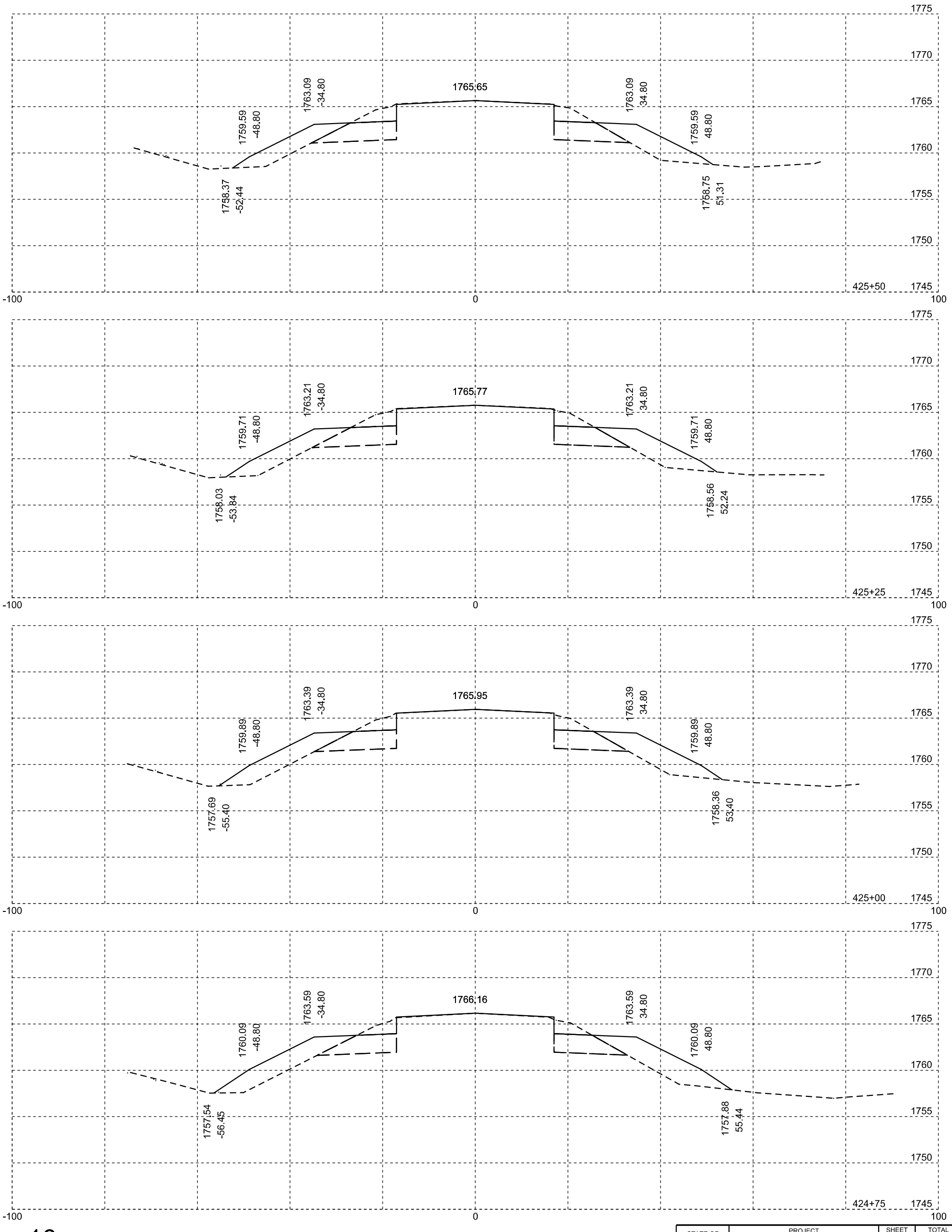
228th



Plotting Date: 05/09/2024

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(112)95	152	167

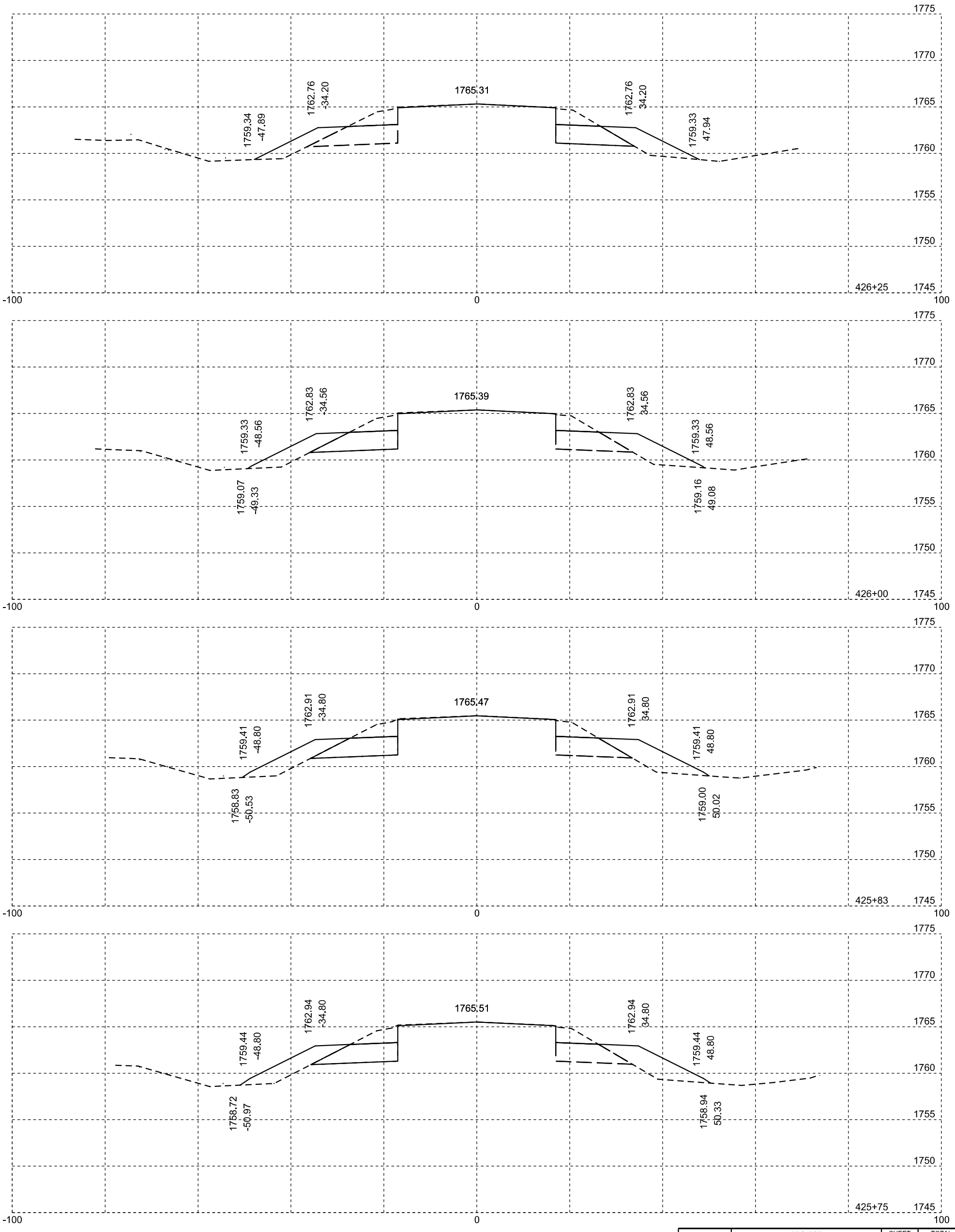
228th



Plotting Date: 05/09/2024

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(112)95	153	167

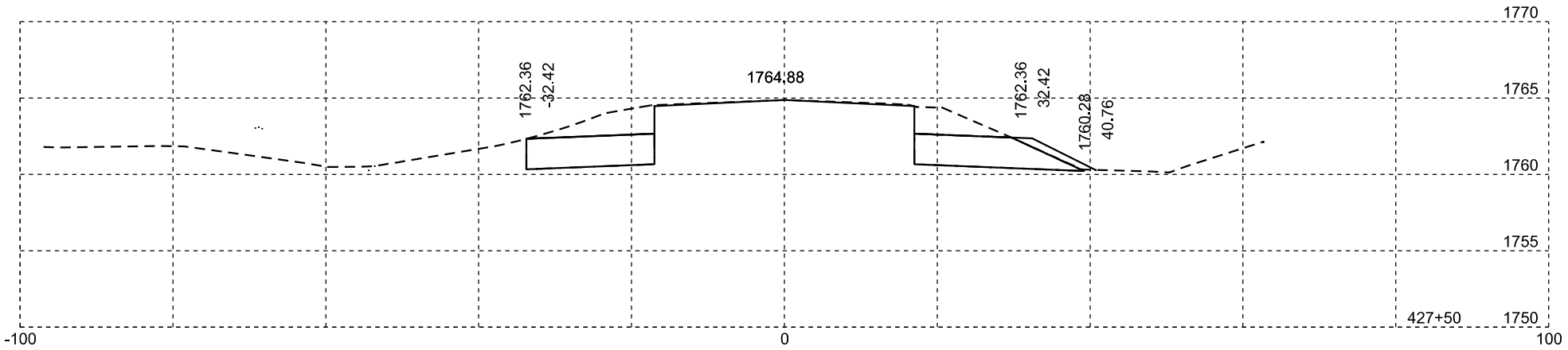
228th

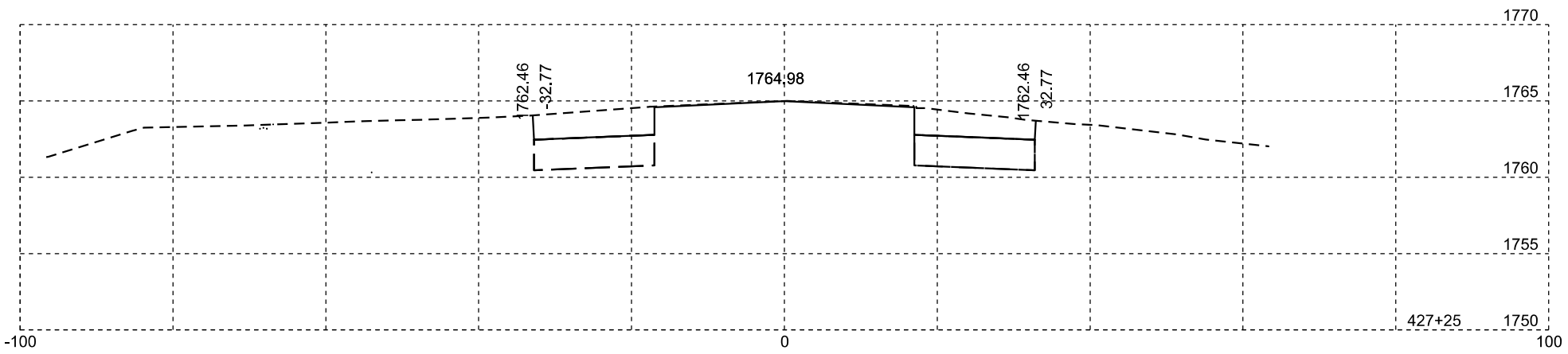


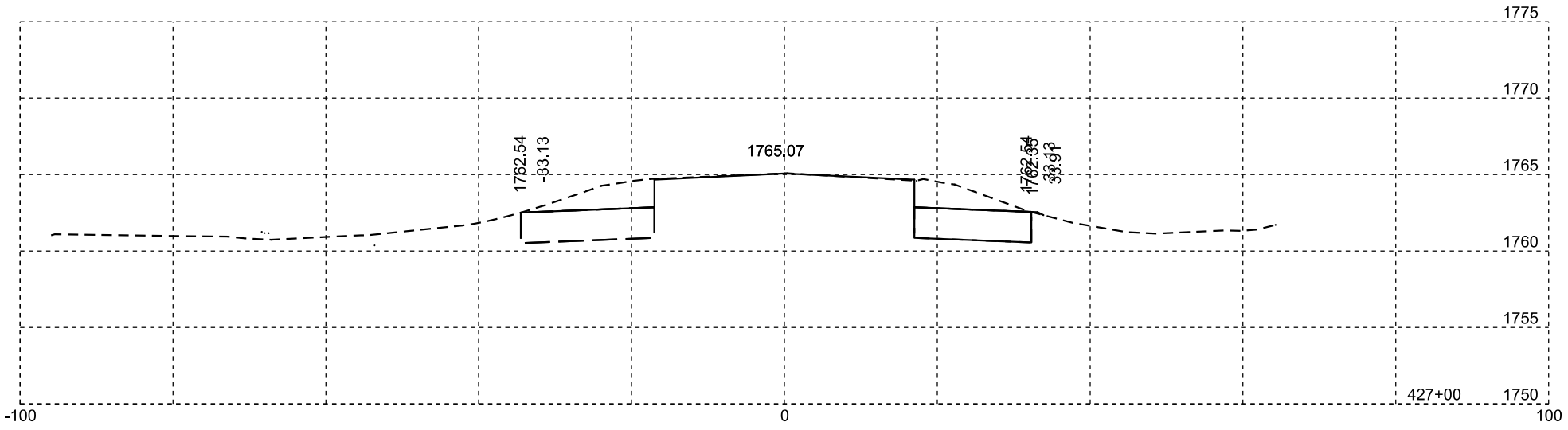
Plotting Date: 05/09/2024

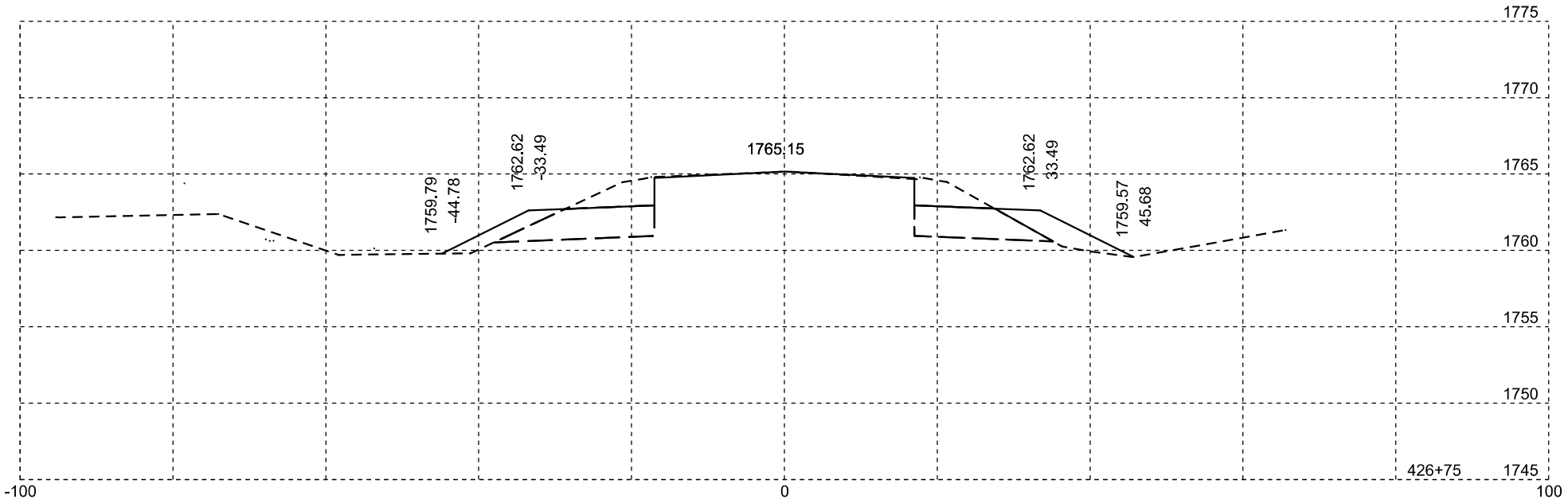
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(112)95	154	167

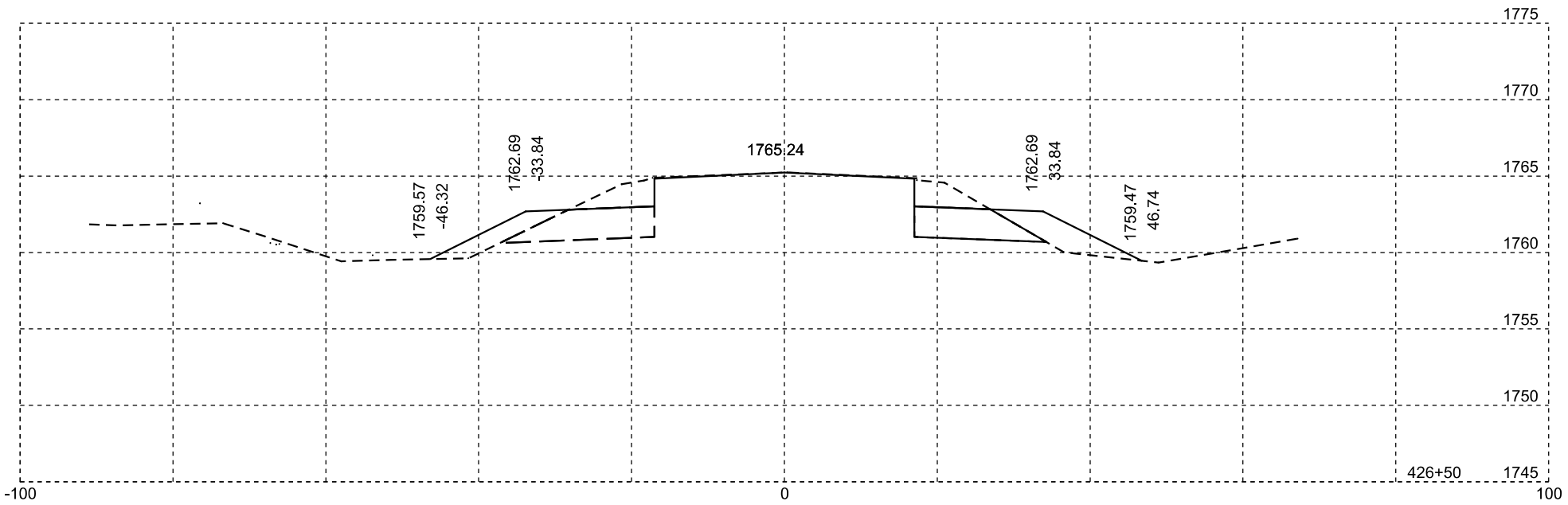
228th









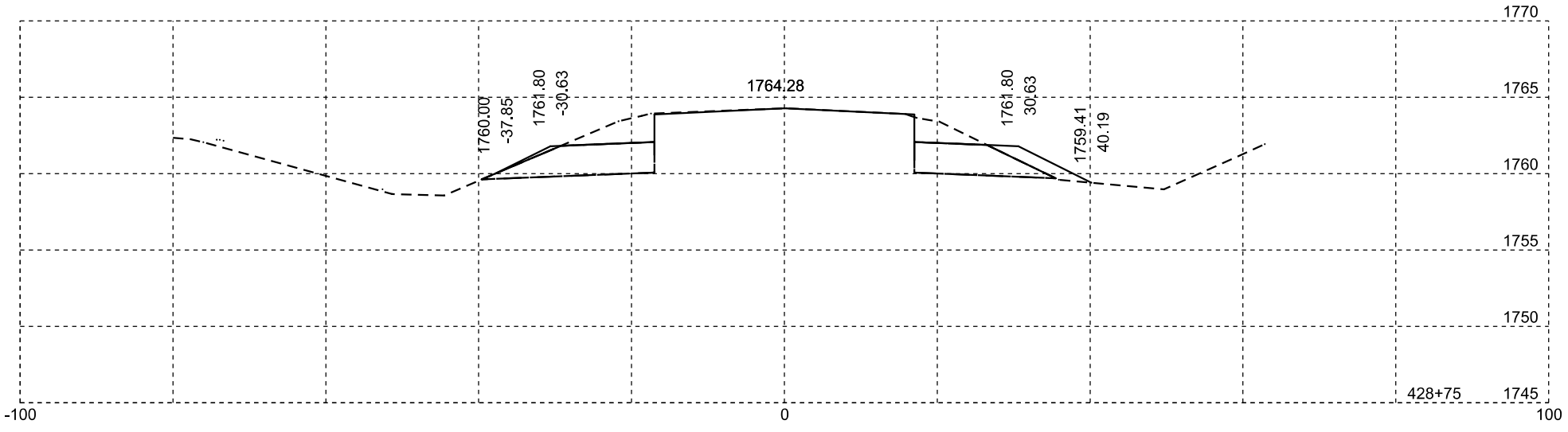


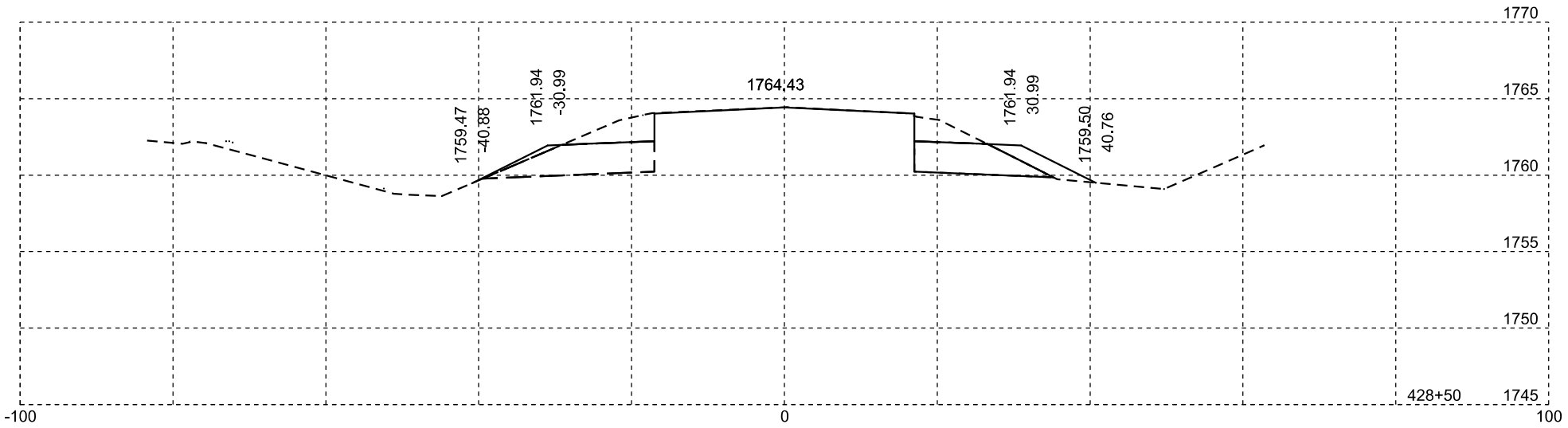
18

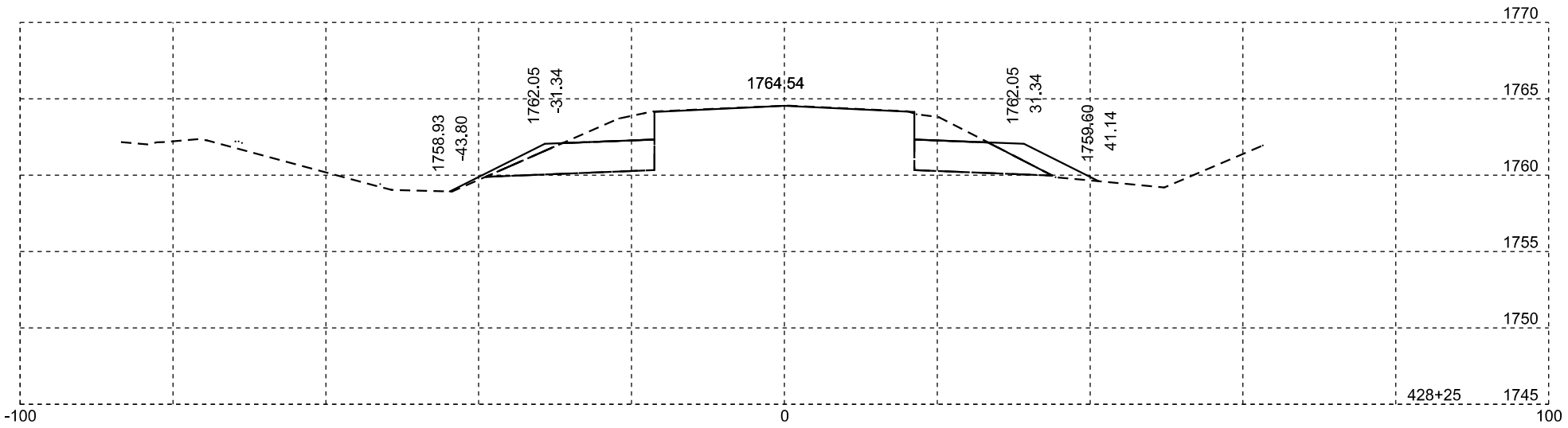
Plotting Date: 05/09/2024

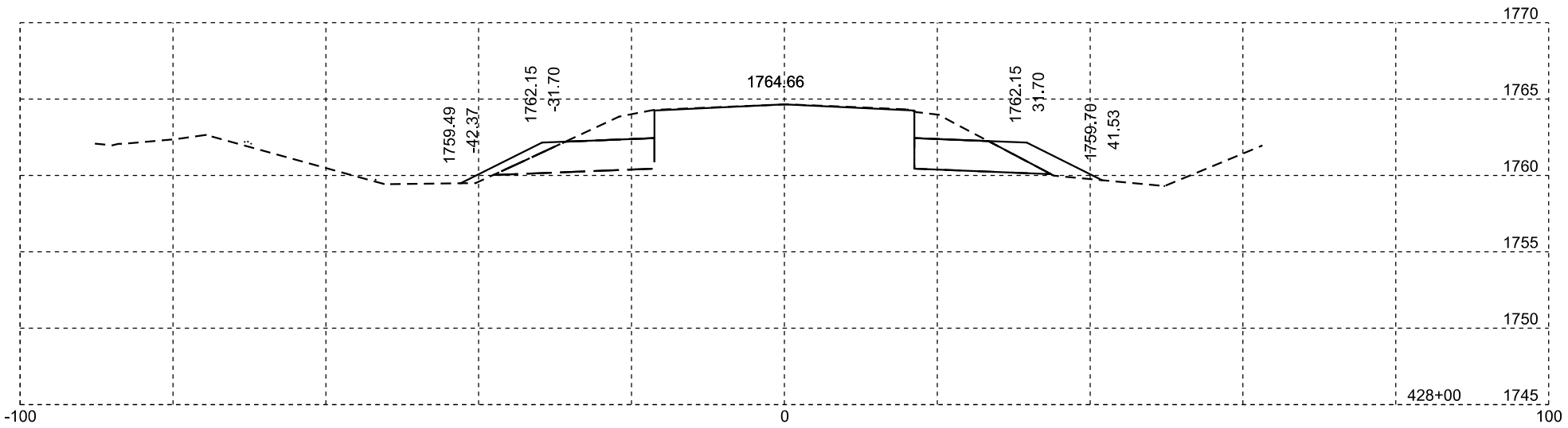
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(112)95	155	167

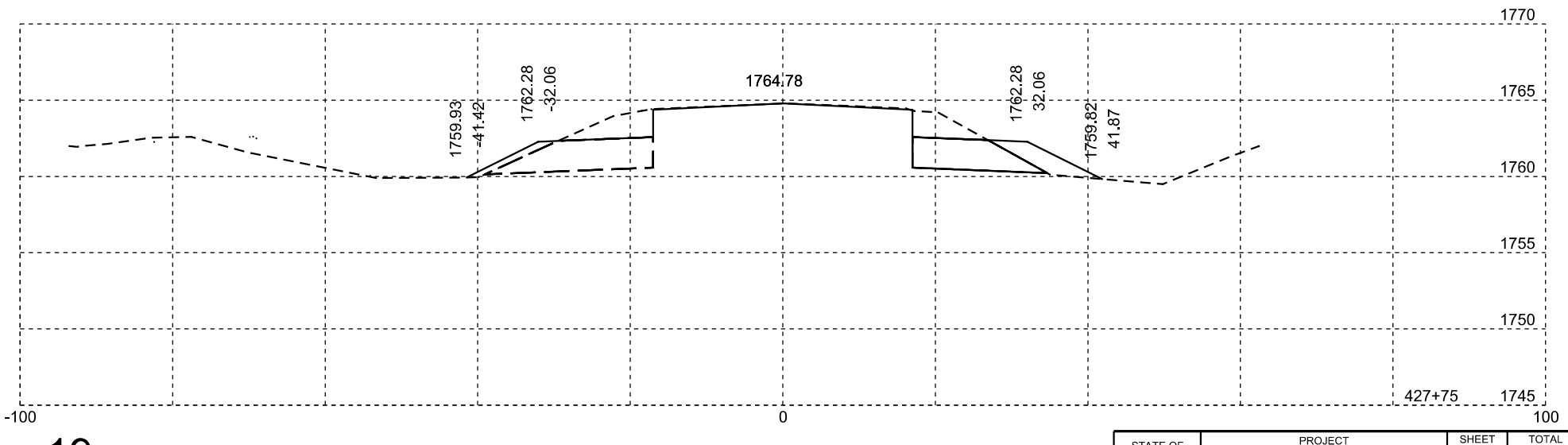
228th







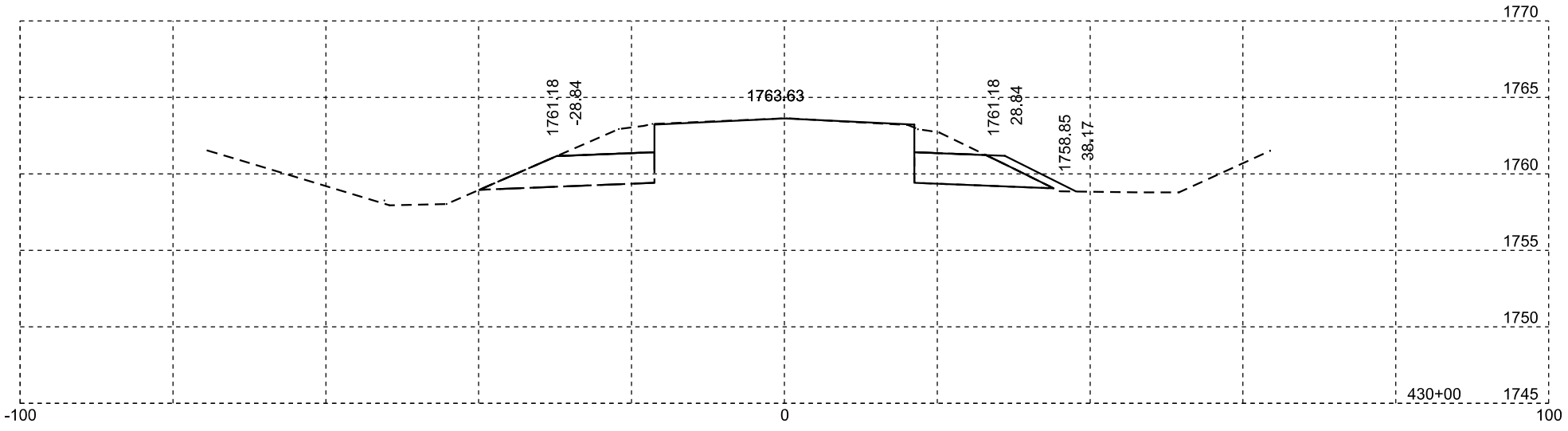


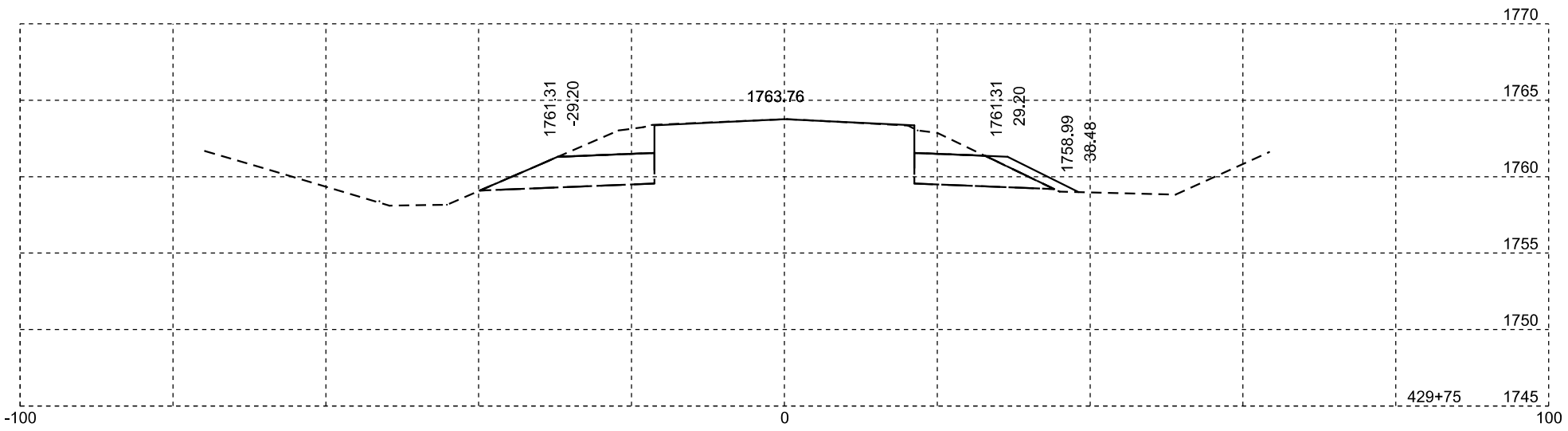


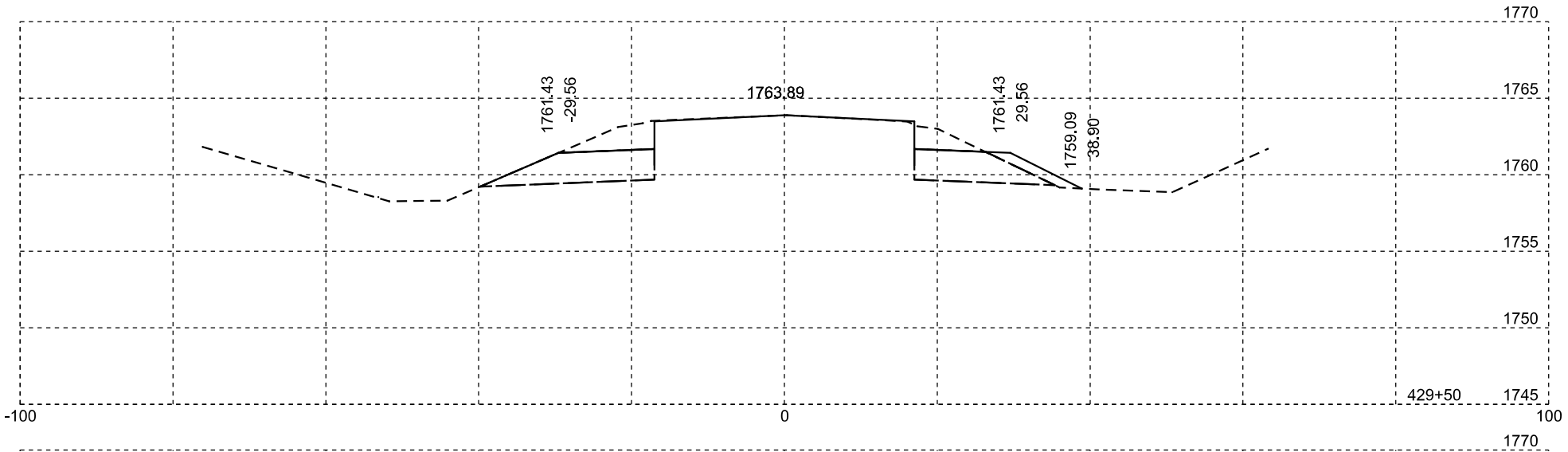
Plotting Date: 05/09/2024

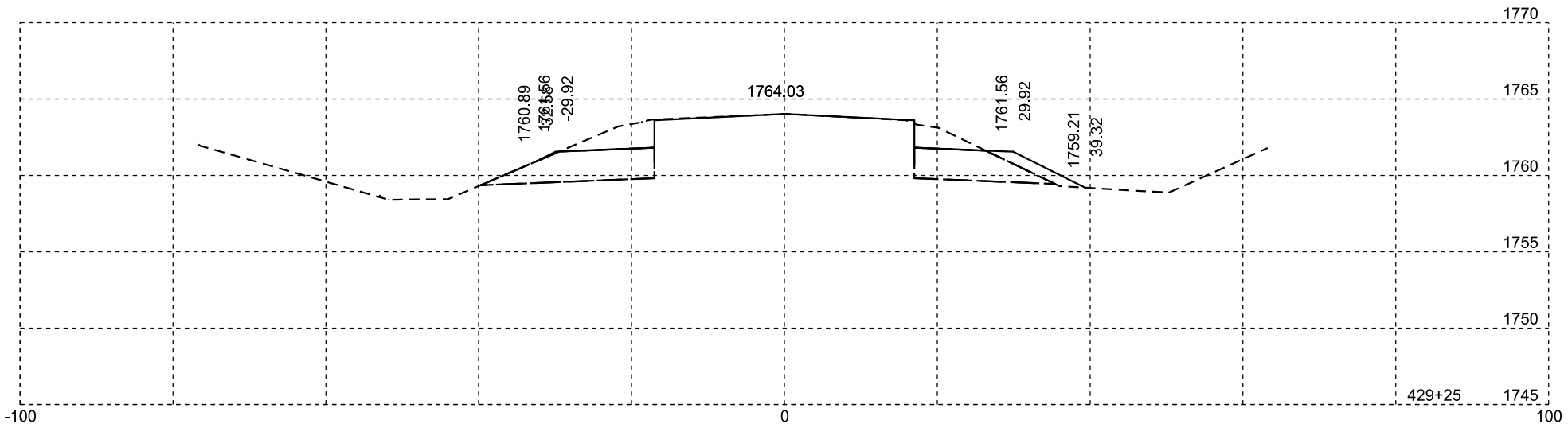
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(112)95	156	167

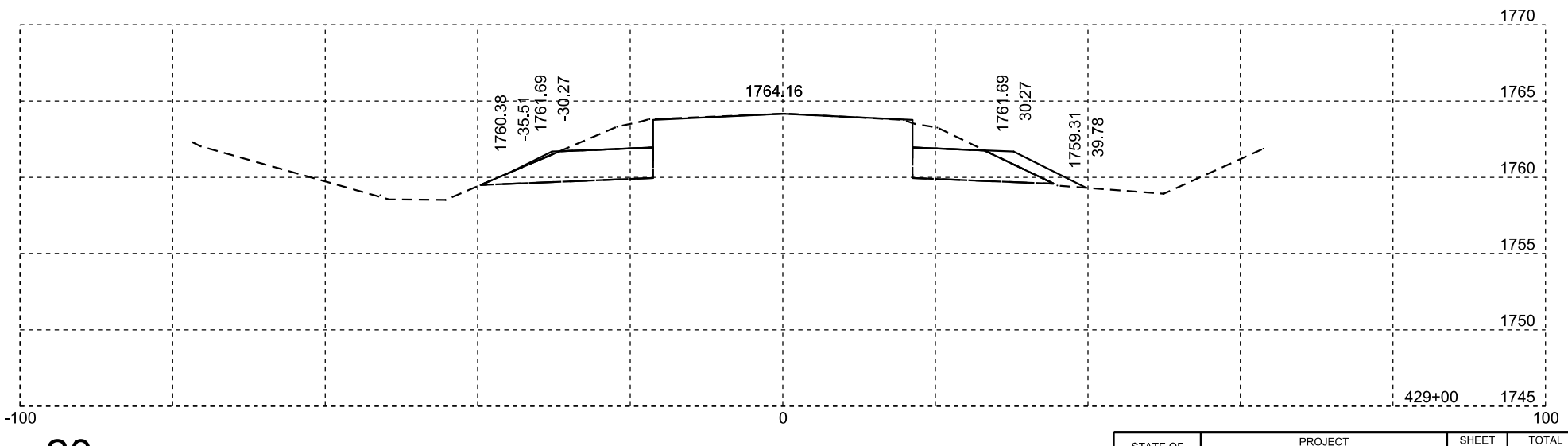
228th







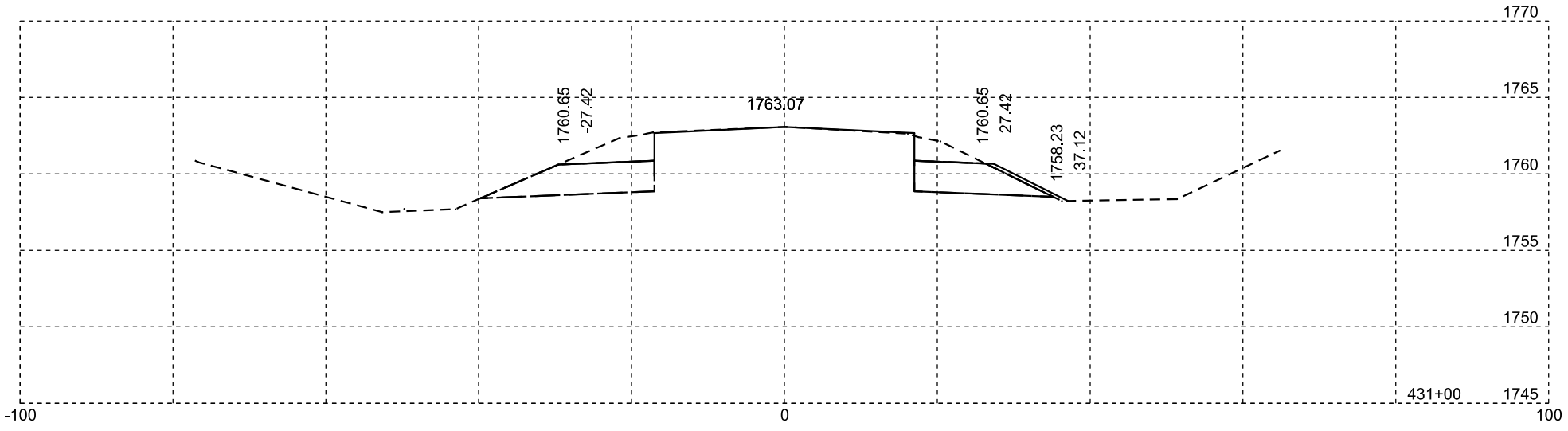


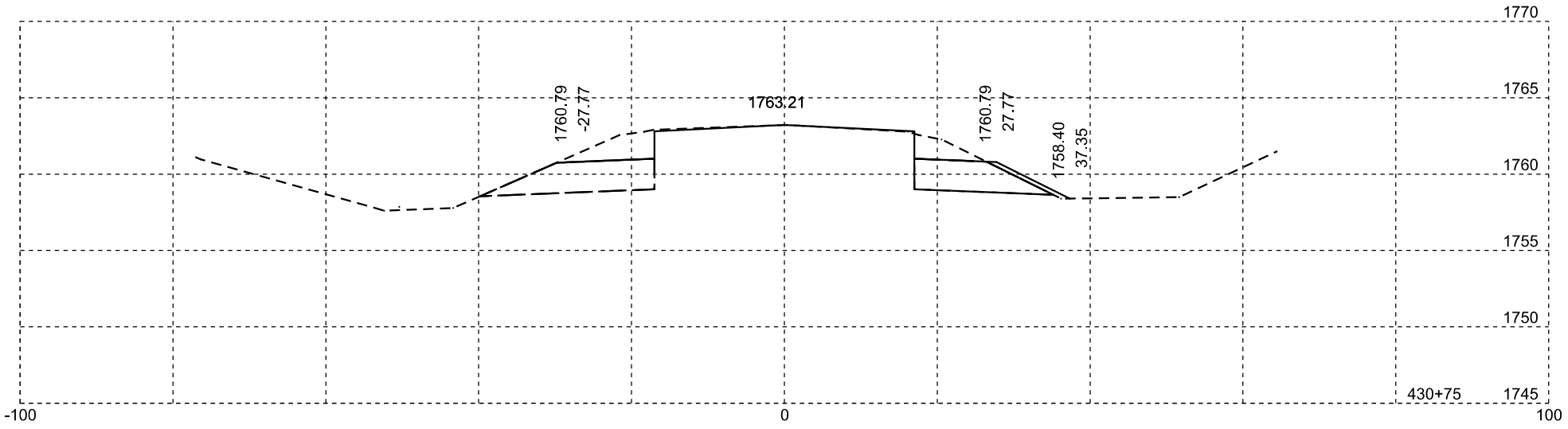


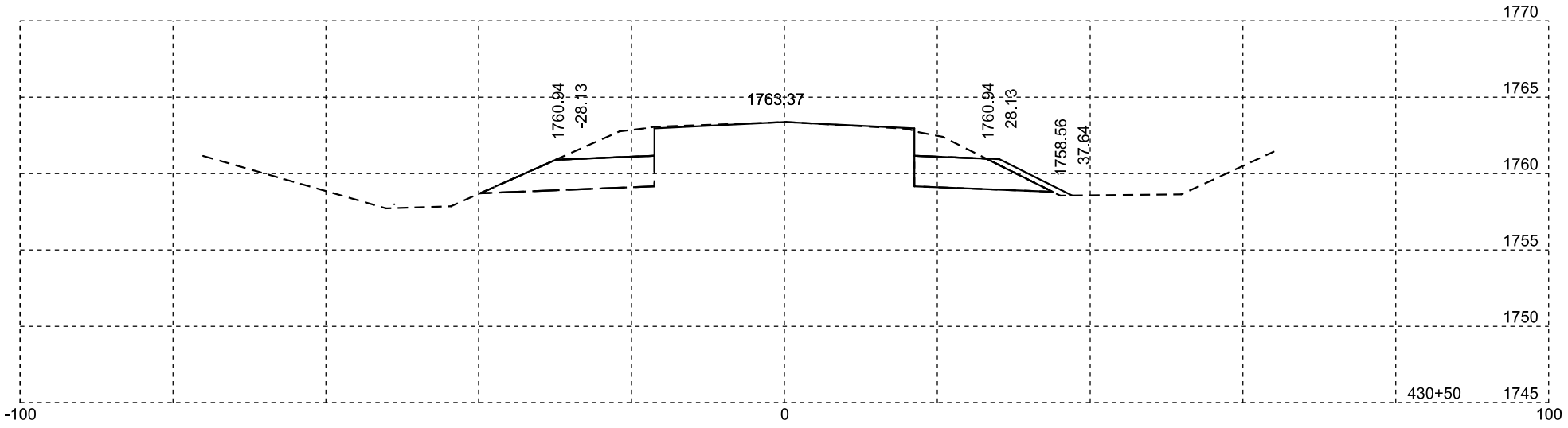
Plotting Date: 05/09/2024

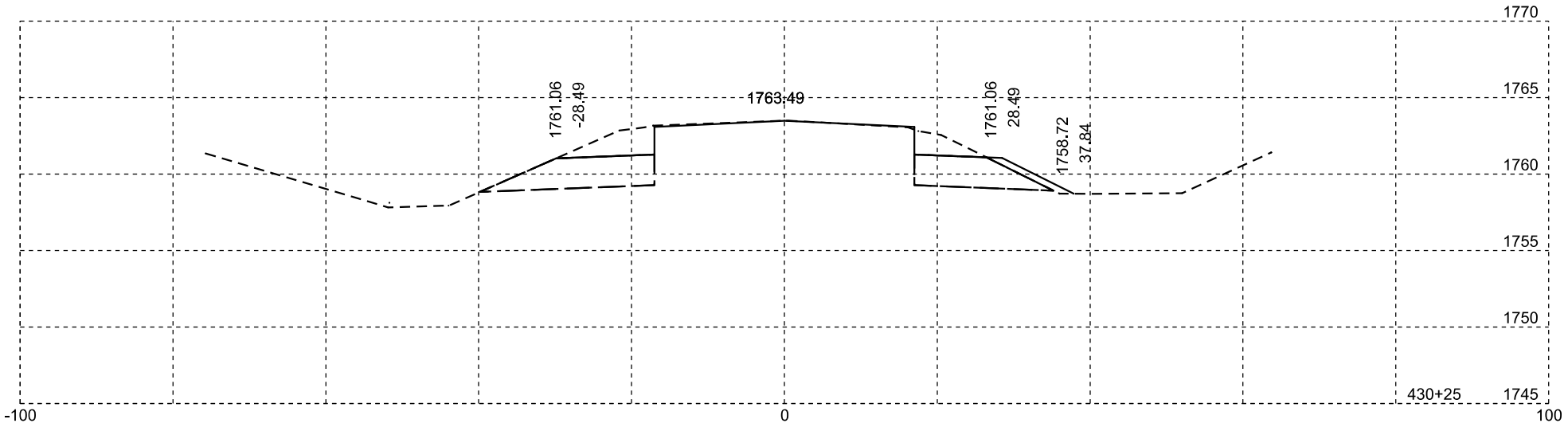
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(112)95	157	167

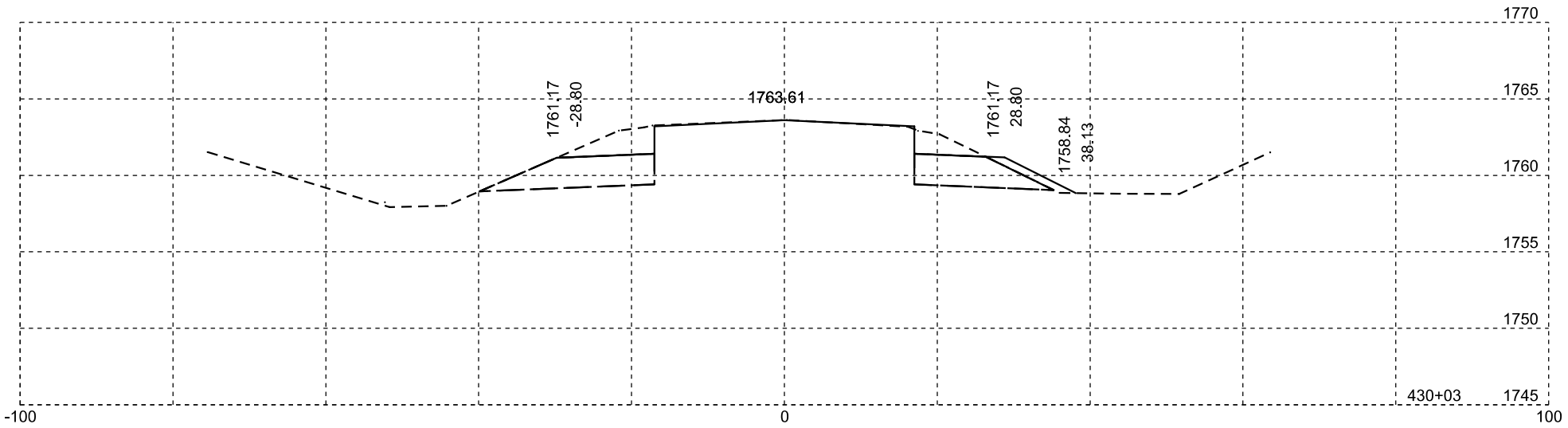
228th











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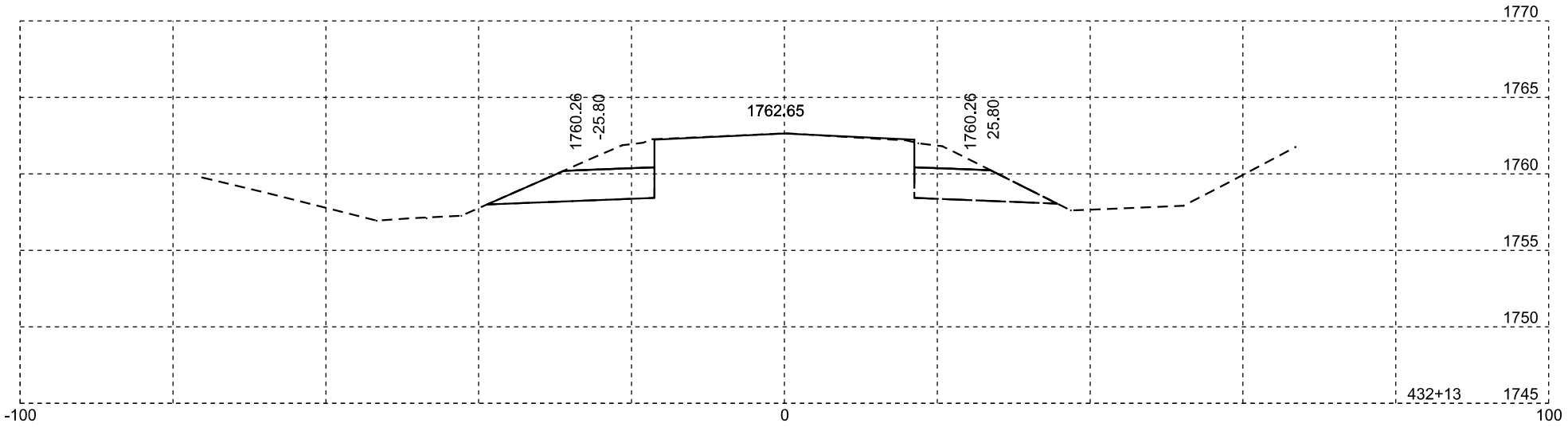
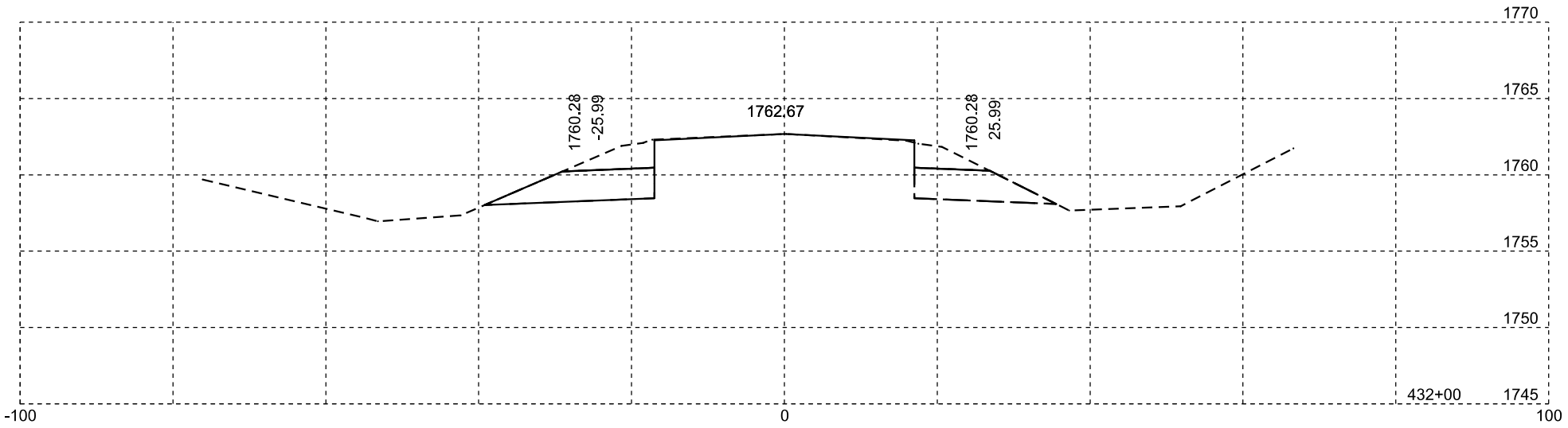
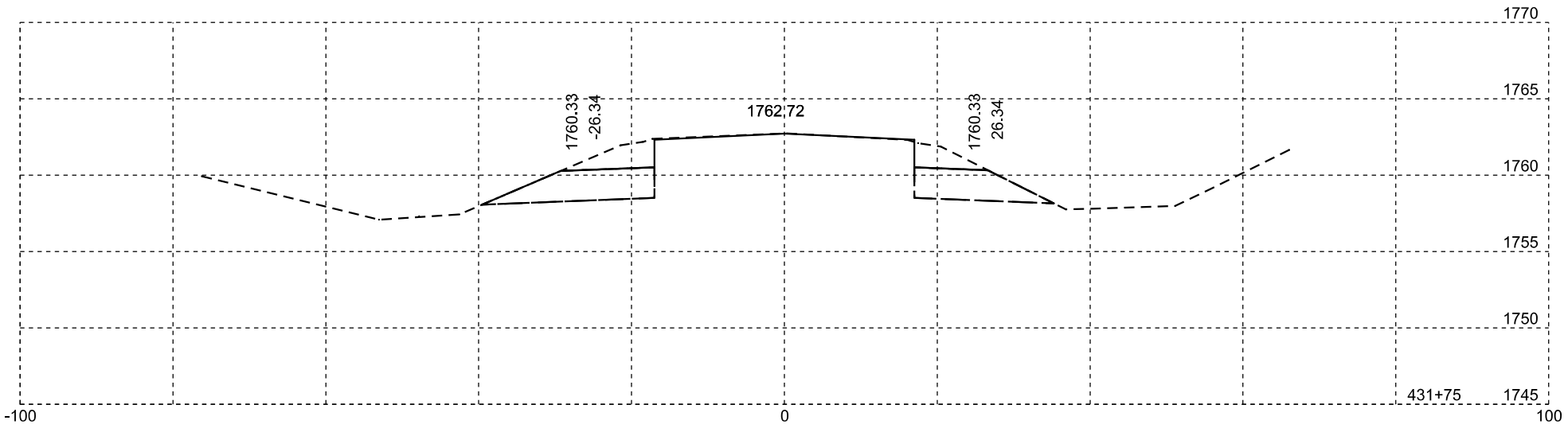
Plotting Date: 05/09/2024

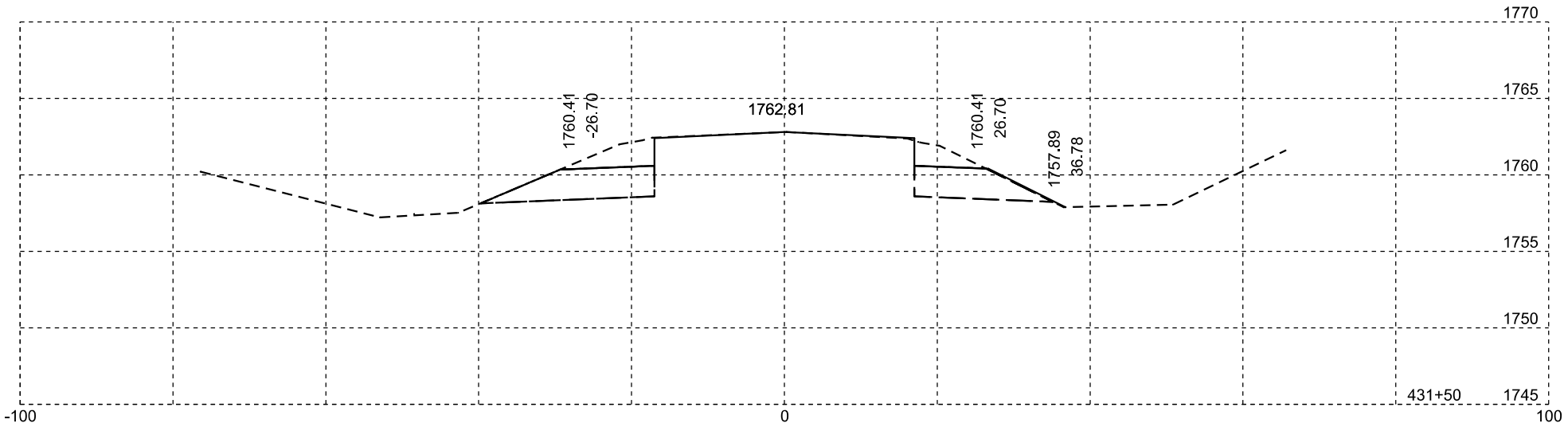
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(112)95	158	167

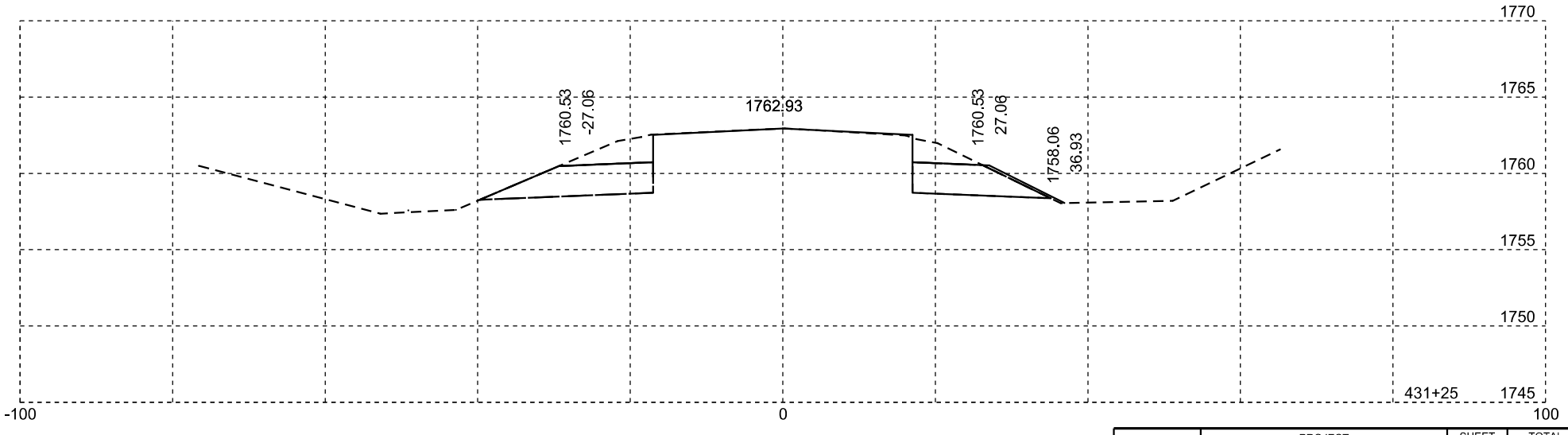
228th









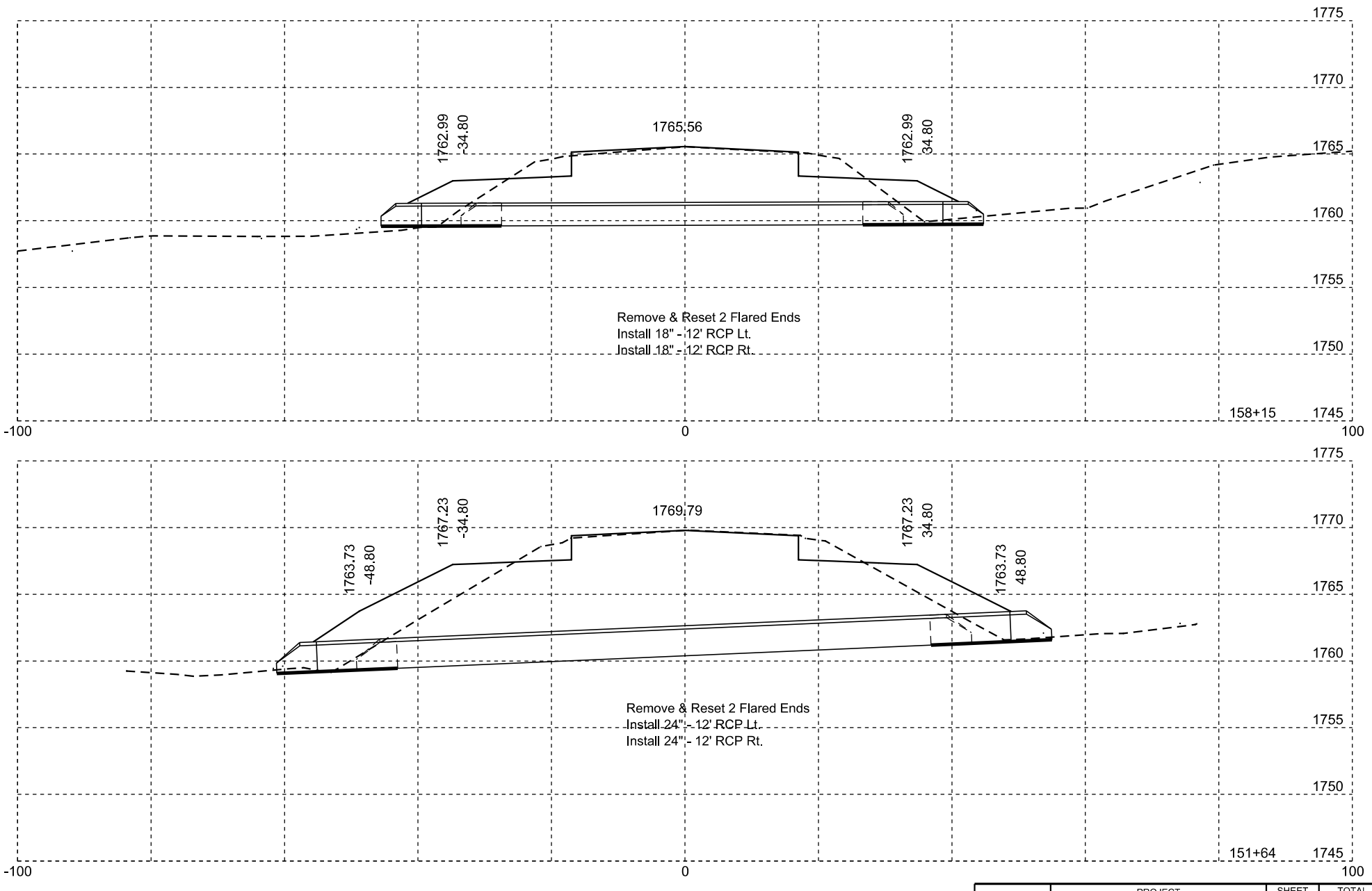


22

Plotting Date: 05/09/2024

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(112)95	159	167

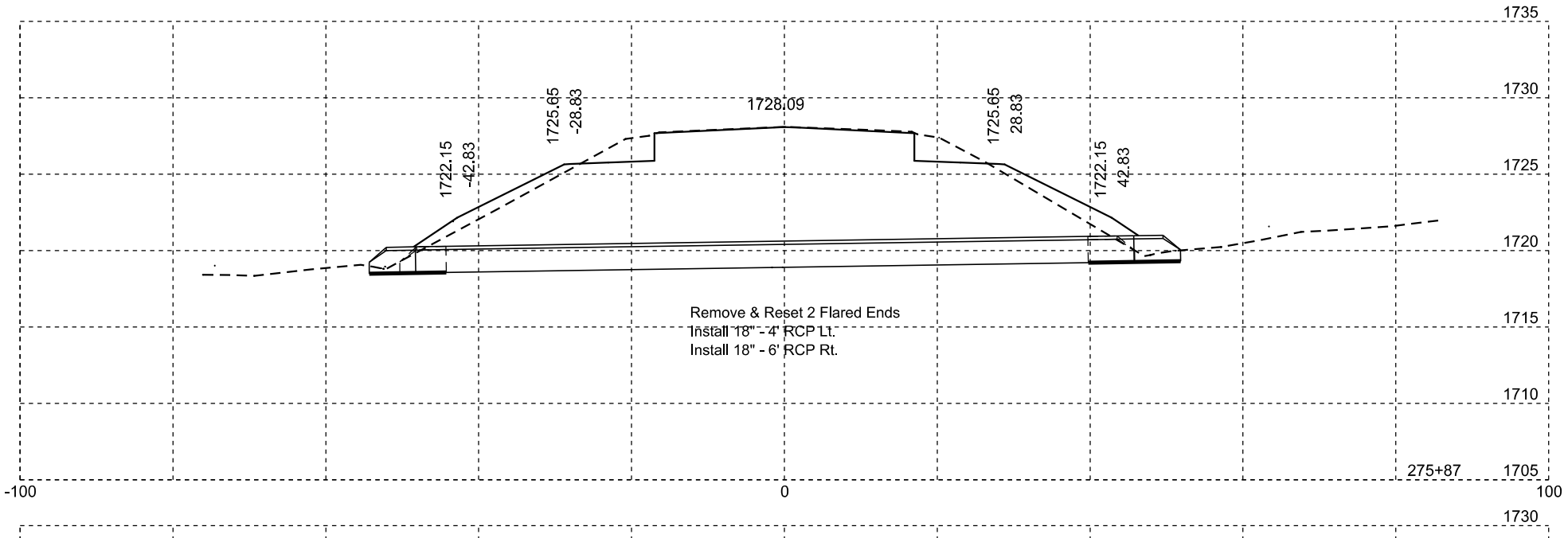
223rd - Pipe Work

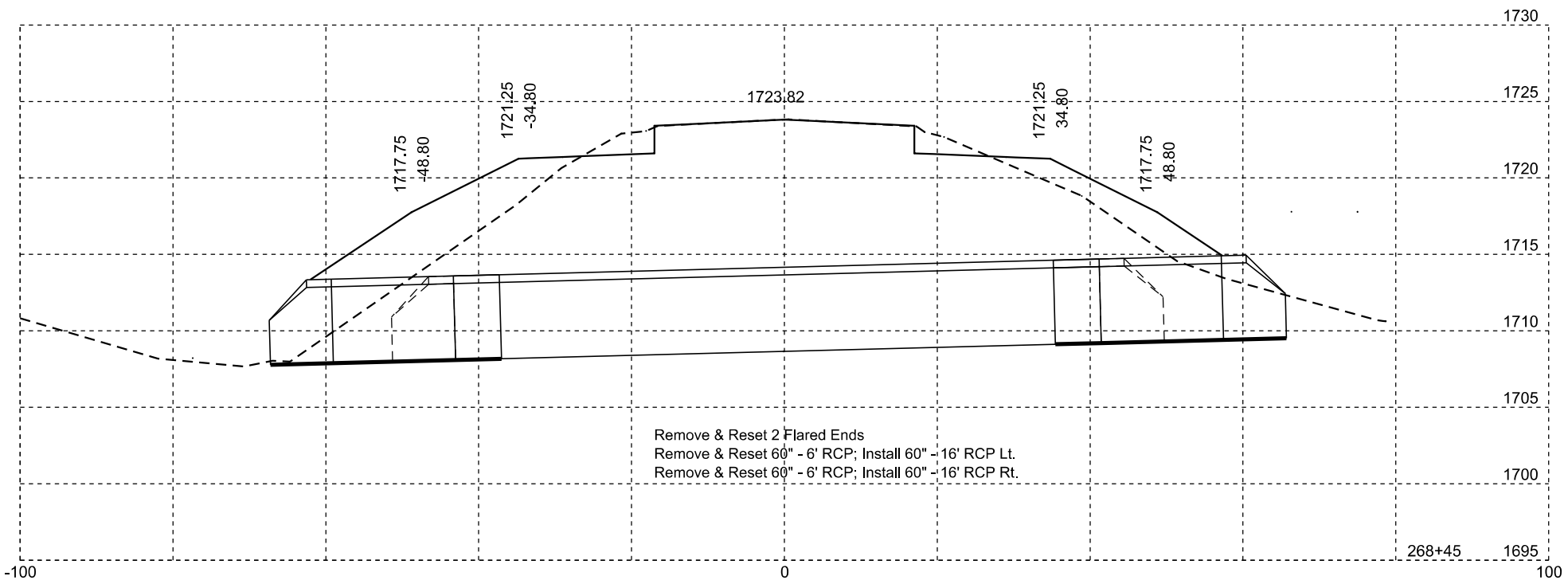


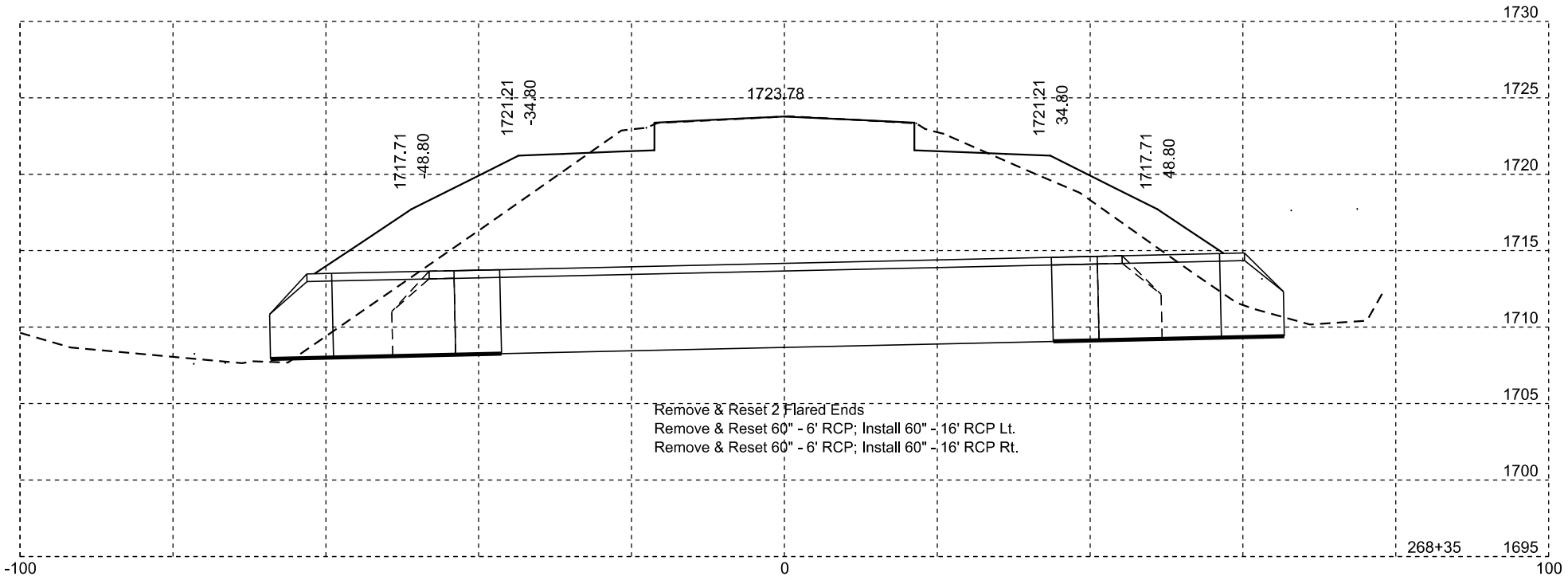
Plotting Date: 05/10/2024

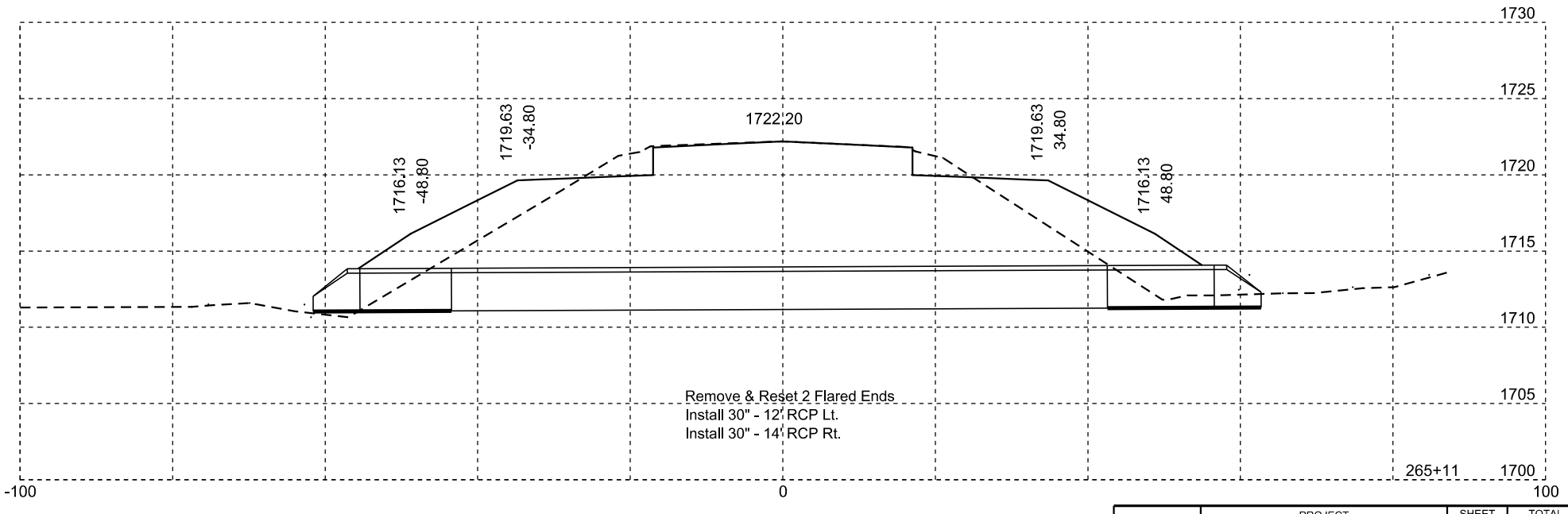
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(112)95	160	167

225th - Pipe Work





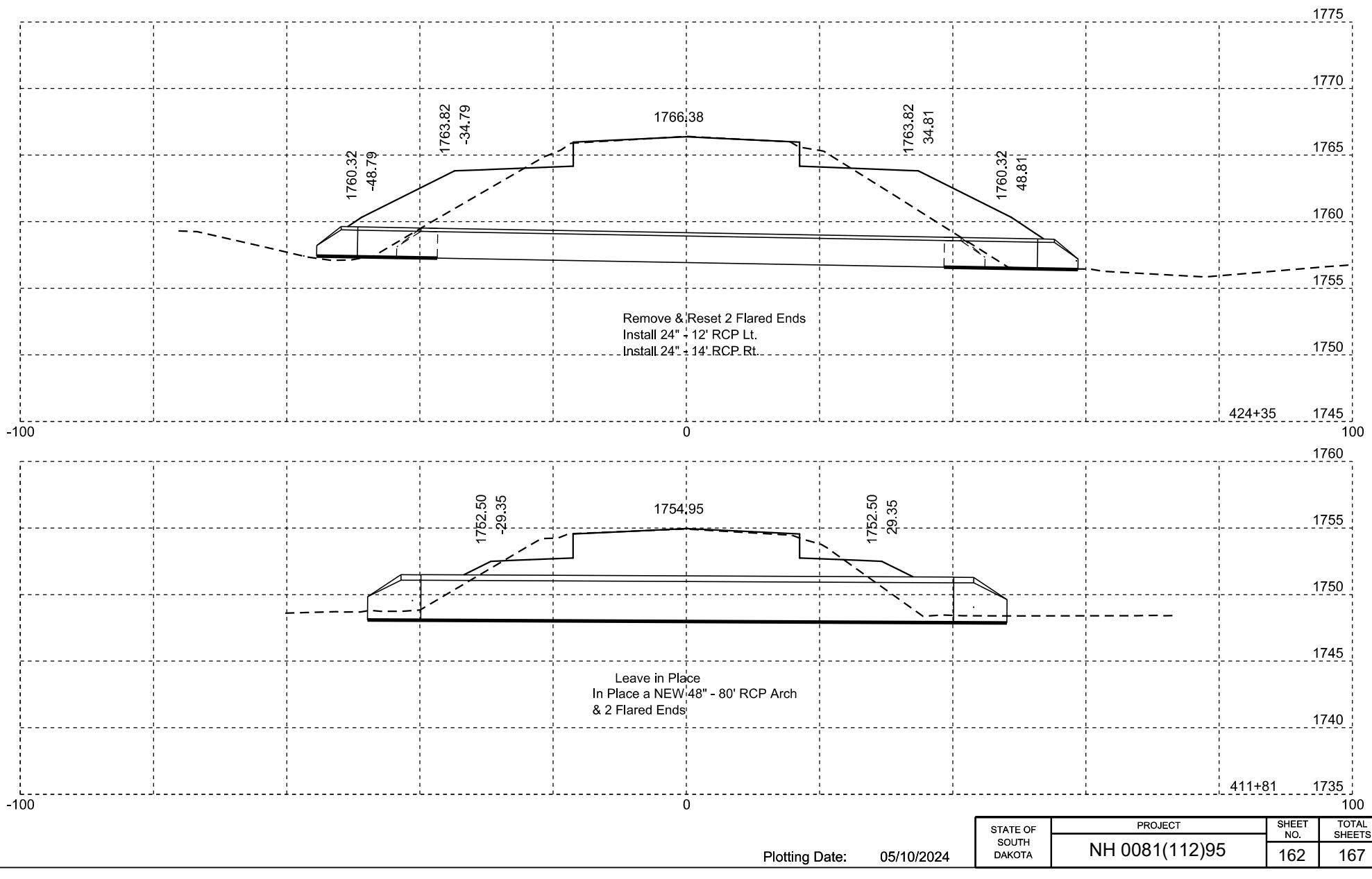




Plotting Date: 05/10/2024

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(112)95	161	167

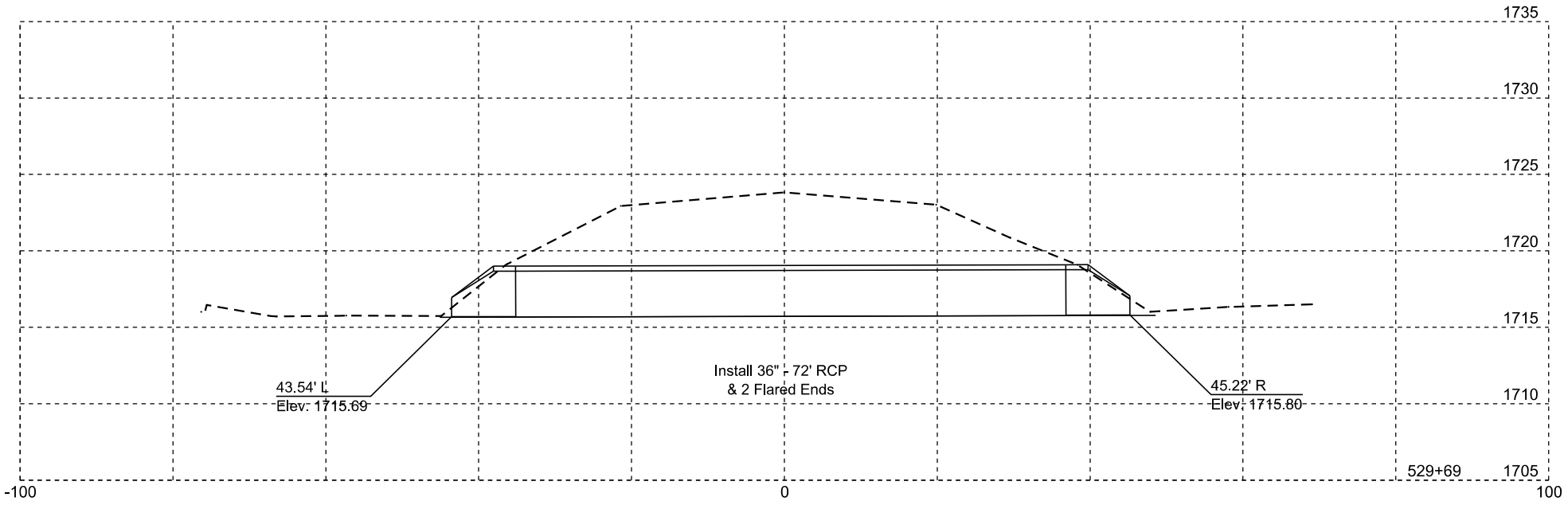
228th - Pipe Work

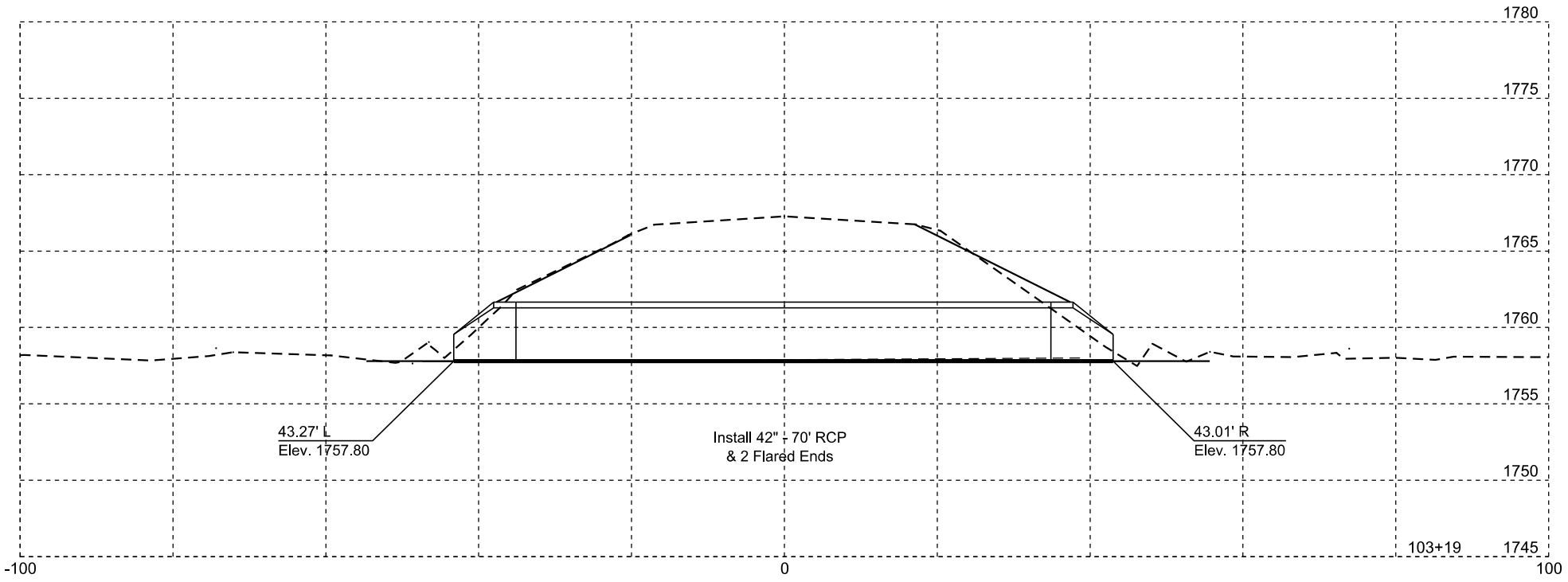


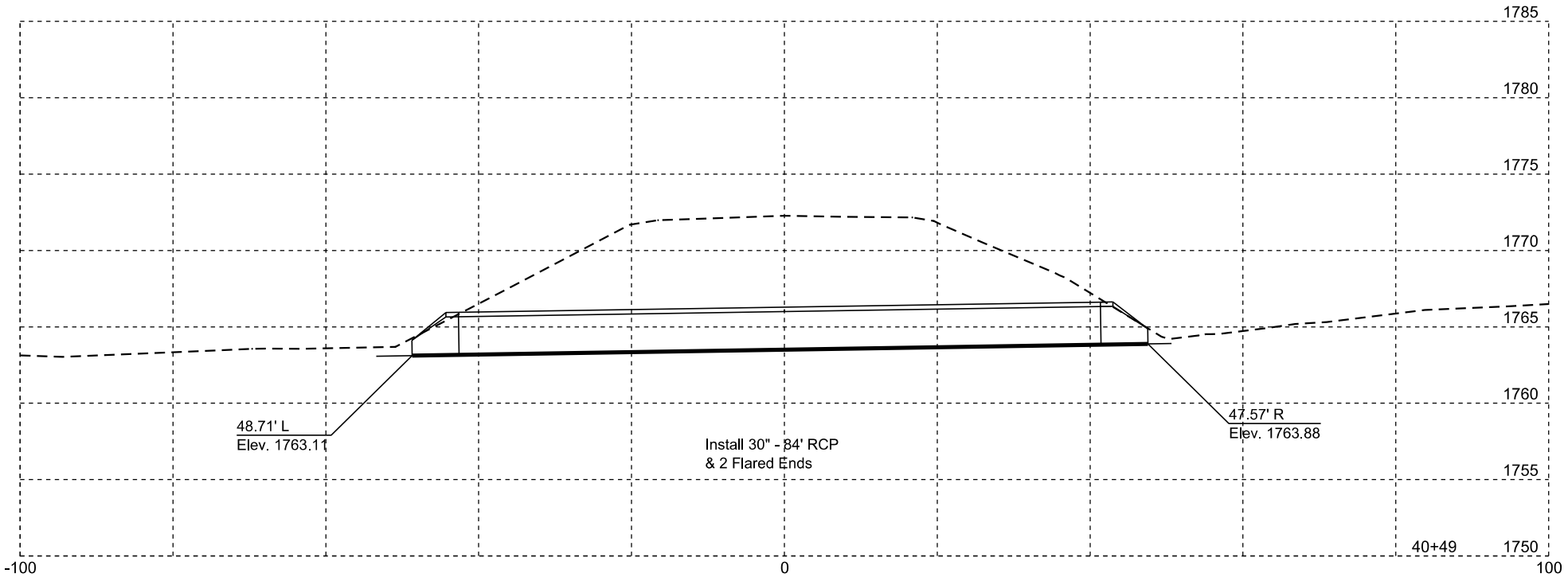
Plotting Date: 05/10/2024

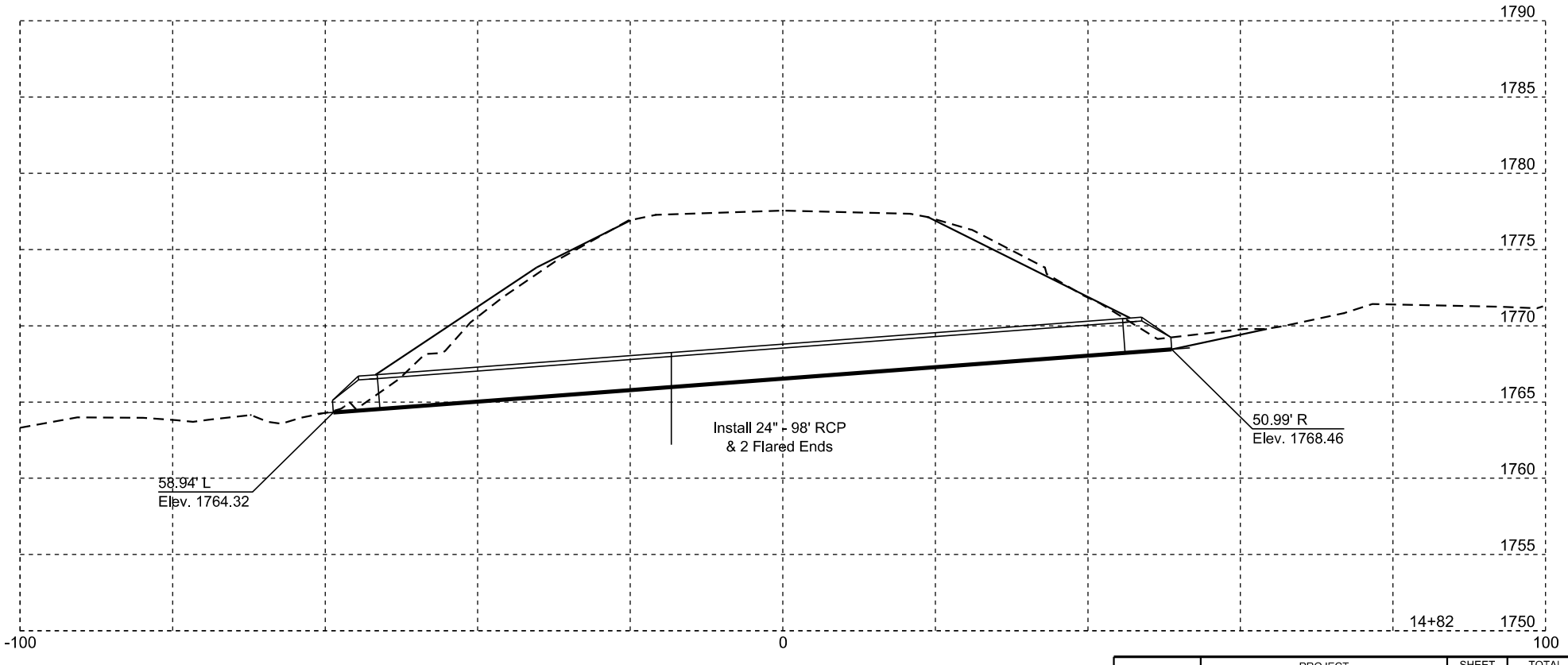
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(112)95	162	167

Pipe Replacement









Plotting Date: 05/09/2024

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(112)95	163	167

RCBC Extension - Transition

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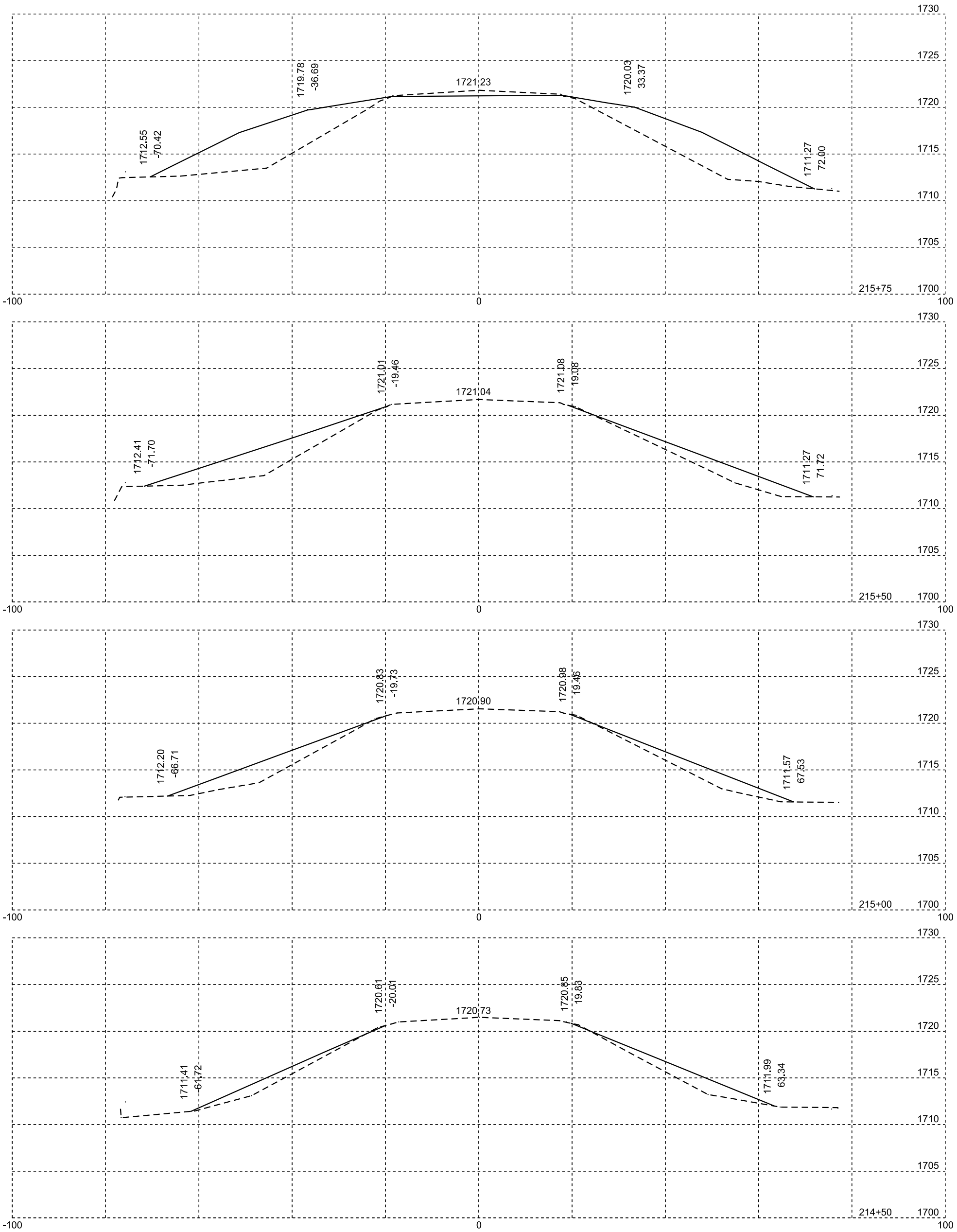
Plotting Date: 05/09/2024

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(112)95	164	167

RCBC Extension - Transition

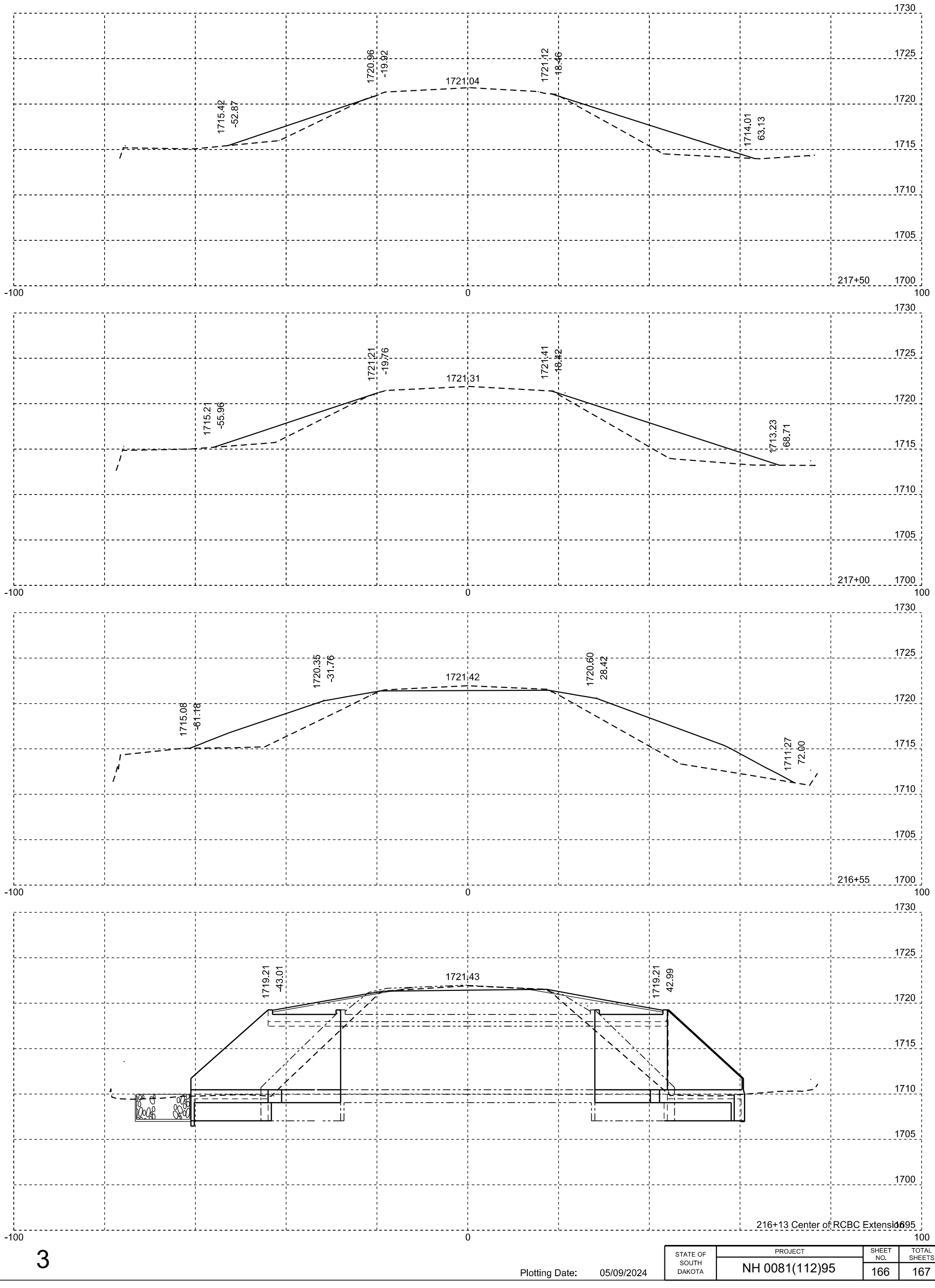


2

Plotting Date: 05/09/2024

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(112)95	165	167

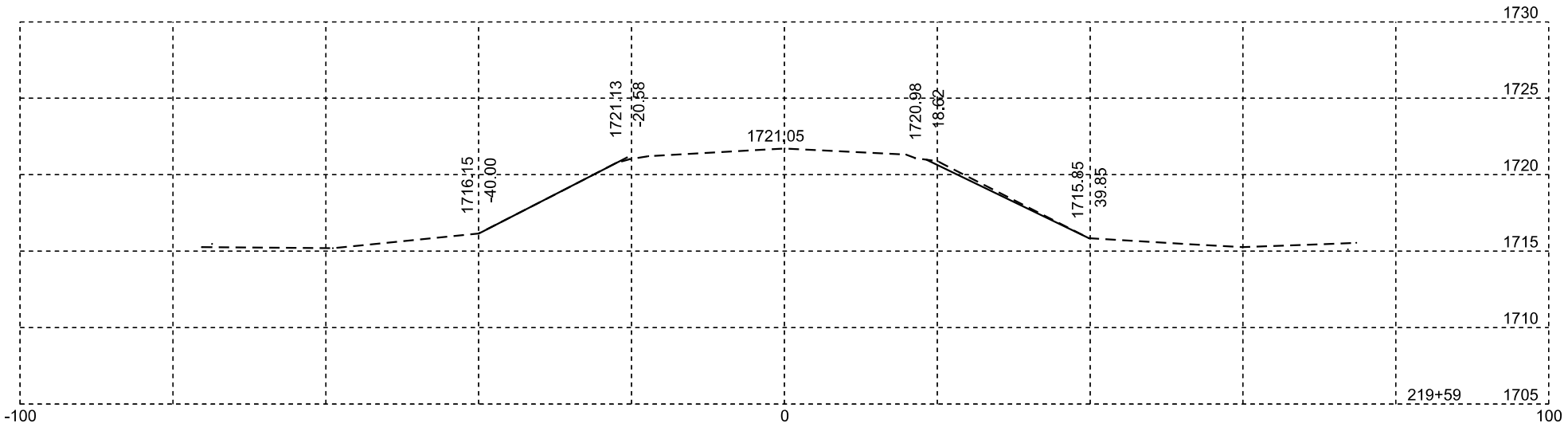
RCBC Extension - Transition

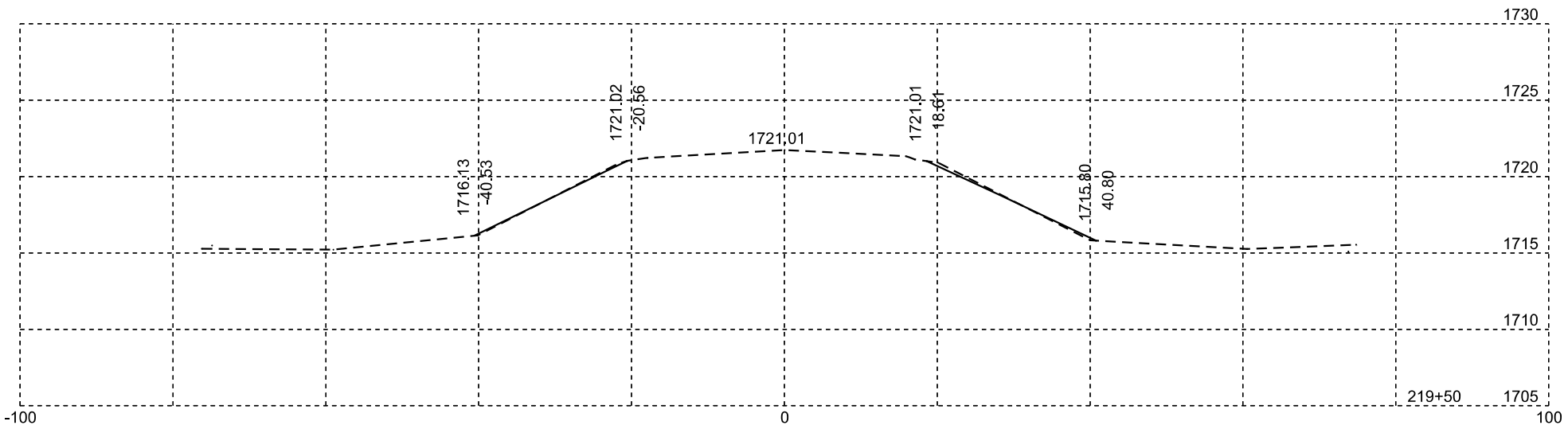


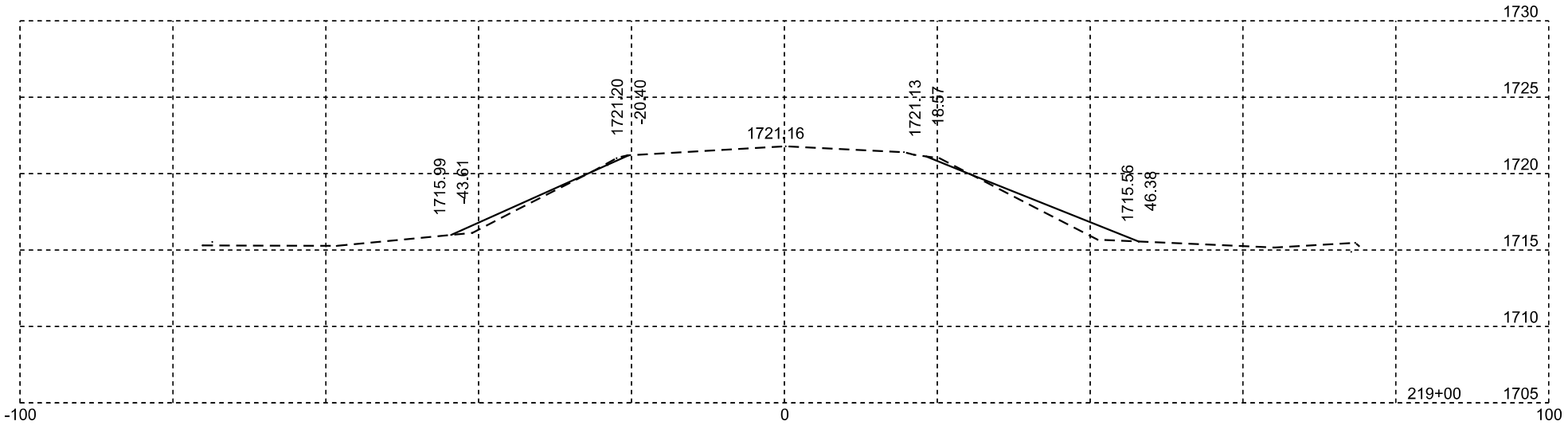
Plotting Date: 05/09/2024

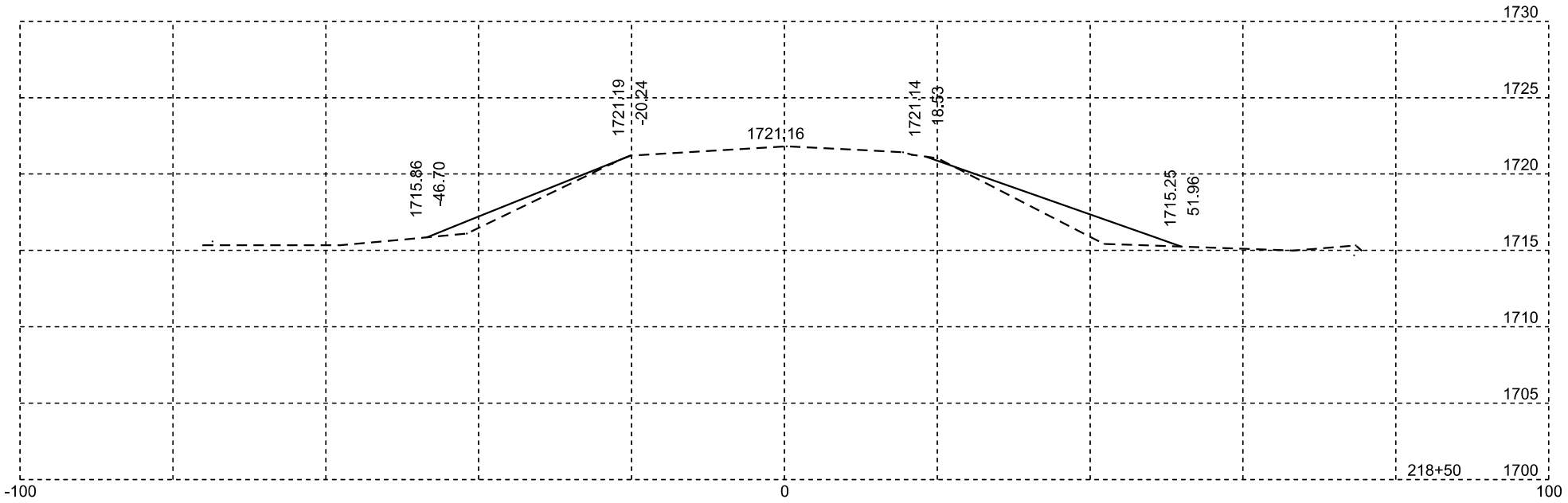
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(112)95	166	167

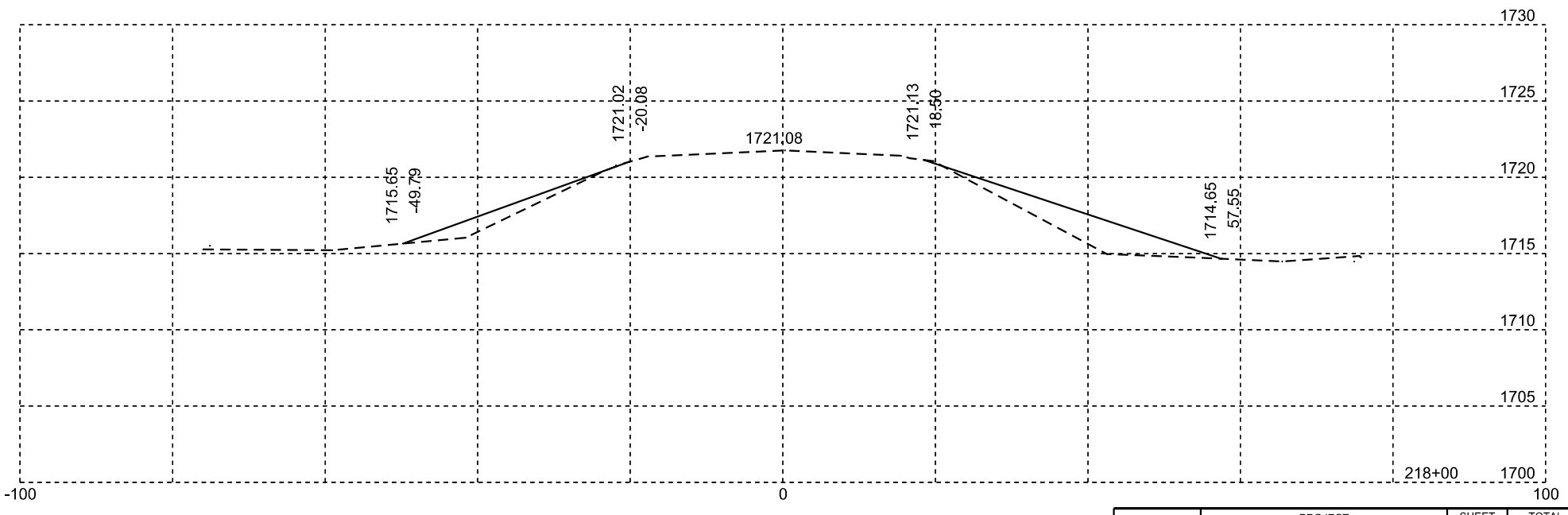
RCBC Extension - Transition











4

Plotting Date: 05/09/2024

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(112)95	167	167