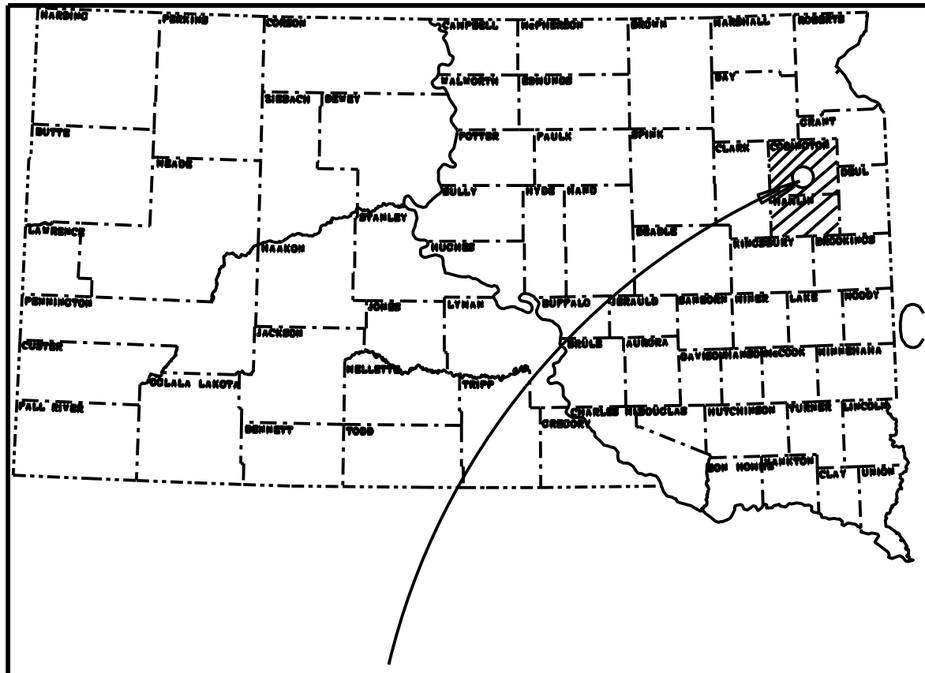
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(120)145	1	93

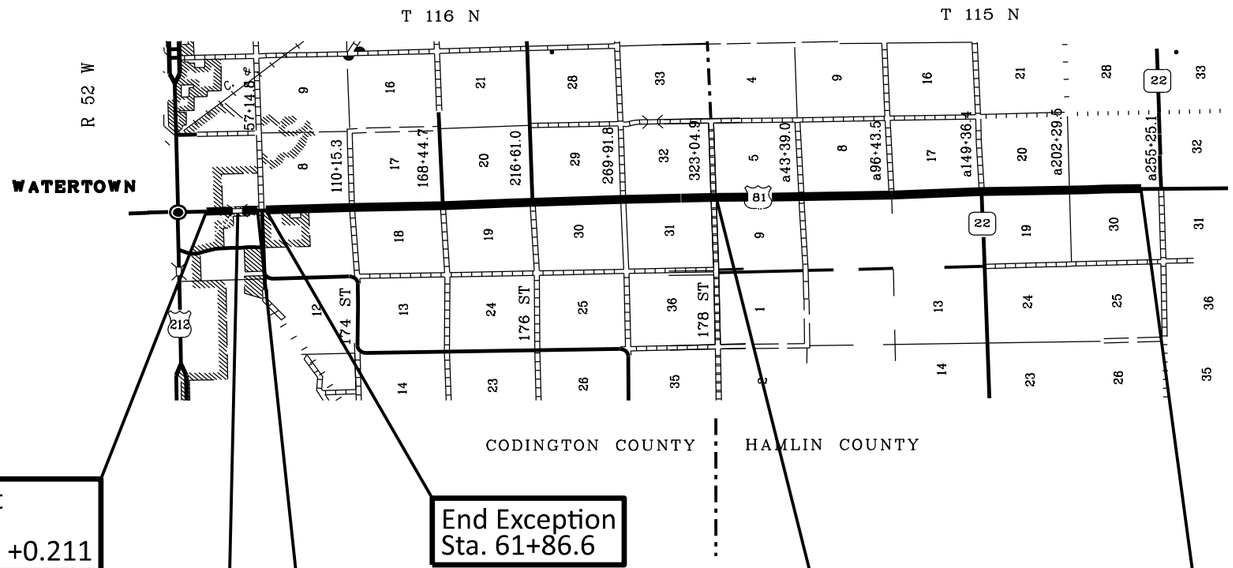
STATE OF SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION
PLANS FOR PROPOSED

NH 0081(120)145
U.S. HIGHWAY 81
CODINGTON & HAMLIN COUNTIES

COLD MILLING ASPHALT CONCRETE,
ASPHALT CONCRETE RESURFACING,
& CULVERT REPAIRS

PCN 07YW





INDEX OF SHEETS

DESIGN DESIGNATION

ADT (2022)	3475
ADT (2040)	5093
DHV	572
D	50%
T DHV	4.3%
T ADT	9.5%
V	65 MPH RURAL
	45 MPH URBAN

STORM WATER PERMIT

Major Recieving
Body of Water: Big Sioux River
Area Disturbed: 1.25 Acres
Total Project Area: 193 Acres
Approx. Begin Lat/Long: 44.88318/-97.10895

GROSS LENGTH	55,379.6 FEET	10.489 MILES
LENGTH OF EXCEPTIONS	861.3 FEET	0.163 MILES
NET LENGTH	54,518.3 FEET	10.325 MILES

PLOTTED FROM - $$USERNAME$$

10

January 22, 2025

ESTIMATE OF QUANTITIES AND ENVIRONMENTAL COMMITMENTS

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(120)145	2	93

ESTIMATE OF QUANTITIES

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
009E3230	Grade Staking	0.257	Mile
009E3250	Miscellaneous Staking	0.513	Mile
009E3280	Slope Staking	0.513	Mile
009E3301	Engineer Directed Surveying/Staking	10.0	Hour
110E0510	Remove Pipe End Section	7	Each
110E0730	Remove Beam Guardrail	465.8	Ft
110E1010	Remove Asphalt Concrete Pavement	777.2	SqYd
110E1690	Remove Sediment	0.5	CuYd
110E1700	Remove Silt Fence	30	Ft
110E7500	Remove Pipe for Reset	250	Ft
110E7510	Remove Pipe End Section for Reset	35	Each
120E0010	Unclassified Excavation	7,075	CuYd
120E0100	Unclassified Excavation, Digouts	518	CuYd
120E0600	Contractor Furnished Borrow Excavation	10,704	CuYd
120E1000	Muck Excavation	441	CuYd
120E2000	Undercutting	4,059	CuYd
120E6100	Water for Embankment	144.7	MGal
210E0100	Shoulder Clearing	20.7	Mile
230E0010	Placing Topsoil	1,171	CuYd
230E0100	Remove and Replace Topsoil	Lump Sum	LS
260E1010	Base Course	2,616.5	Ton
* 260E6000	Granular Material, Furnish	6,000.0	Ton
270E0040	Salvage and Stockpile Asphalt Mix and Granular Base Material	3,303.7	Ton
* 270E0200	Blend, Haul, and Stockpile Granular Material	12,000.0	Ton
320E0005	PG 58-34 Asphalt Binder	1,384.1	Ton
320E0008	PG 64-34 Asphalt Binder	963.3	Ton
320E1090	Modified Class S Asphalt Concrete	15,441.7	Ton
320E1200	Asphalt Concrete Composite	315.2	Ton
320E1203	Class Q3R Hot Mixed Asphalt Concrete	26,846.9	Ton
320E1800	Asphalt Concrete Blade Laid	1,787.7	Ton
320E3000	Compaction Sample	3	Each
320E3100	Stabilizing Additive for Asphalt Concrete	49.9	Ton
320E4000	Hydrated Lime	273.1	Ton
320E5020	Saw Joint in Asphalt Concrete	2,734	Ft
320E7012	Grind 12" Rumble Strip or Stripe in Asphalt Concrete	18.4	Mile
320E7030	Grind Sinusoidal Centerline Rumble Stripe in Asphalt Concrete	9.2	Mile
330E0100	SS-1h or CSS-1h Asphalt for Tack	223.0	Ton
330E0210	SS-1h or CSS-1h Asphalt for Flush Seal	3.5	Ton
332E0010	Cold Milling Asphalt Concrete	214,391	SqYd
421E0100	Pipe Culvert Undercut	10	CuYd
450E0142	24" RCP Class 2, Furnish	8	Ft

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
450E0150	24" RCP, Install	8	Ft
450E0192	42" RCP Class 2, Furnish	18	Ft
450E0200	42" RCP, Install	18	Ft
450E2016	24" RCP Flared End, Furnish	2	Each
450E2017	24" RCP Flared End, Install	2	Each
450E2028	36" RCP Flared End, Furnish	1	Each
450E2029	36" RCP Flared End, Install	1	Each
450E2200	24" RCP Sloped End, Furnish	1	Each
450E2201	24" RCP Sloped End, Install	1	Each
450E2207	36" RCP Sloped End with Bars, Furnish	1	Each
450E2209	36" RCP Sloped End, Install	1	Each
450E4512	36" RCP Arch Flared End, Furnish	2	Each
450E4513	36" RCP Arch Flared End, Install	2	Each
450E4699	Tie Bolts for RCP	22	Each
450E9000	Reset Pipe	250	Ft
450E9001	Reset Pipe End Section	35	Each
600E0300	Type III Field Laboratory	1	Each
630E0500	Type 1 MGS	125.0	Ft
630E1501	Type 1 Retrofit Guardrail Transition	4	Each
630E2018	MGS MASH Tangent End Terminal	4	Each
632E2220	Guardrail Delineator	16	Each
632E2510	Type 2 Object Marker Back to Back	84	Each
633E0030	Cold Applied Plastic Pavement Marking, 24"	836	Ft
633E0040	Cold Applied Plastic Pavement Marking, Arrow	30	Each
633E0046	Cold Applied Plastic Pavement Marking, Lane Reduction Arrow	9	Each
633E1206	High Build Waterborne Pavement Marking Paint with Reflective Elements, Yellow	322	Gal
633E3000	Durable Pavement Marking, 4" White	113,939	Ft
633E5015	Grooving for Cold Applied Plastic Pavement Marking, 24"	836	Ft
633E5025	Grooving for Cold Applied Plastic Pavement Marking, Arrow	30	Each
633E5031	Grooving for Cold Applied Plastic Pavement Marking, Lane Reduction Arrow	9	Each
633E5100	Grooving for Durable Pavement Marking, 4"	188,873	Ft
634E0010	Flagging	450.0	Hour
634E0020	Pilot Car	200.0	Hour
634E0110	Traffic Control Signs	869.8	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0275	Type 3 Barricade	4	Each
634E0420	Type C Advance Warning Arrow Board	2	Each
634E0630	Temporary Pavement Marking	41.6	Mile
634E0640	Temporary Pavement Marking	1,200	Ft
730E0100	Cover Crop Seeding	2.2	Bu
730E0204	Type C Permanent Seed Mixture	51	Lb
732E0100	Mulching	8.4	Ton

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
734E0154	12" Diameter Erosion Control Wattle	200	Ft
734E0165	Remove and Reset Erosion Control Wattle	50	Ft
734E0602	Low Flow Silt Fence	120	Ft
734E0610	Mucking Silt Fence	8	CuYd
734E0620	Repair Silt Fence	30	Ft
900E0010	Refurbish Single Mailbox	33	Each
900E0012	Refurbish Double Mailbox	6	Each
900E1980	Storage Unit	1	Each

*** - Denotes Non-Participating**

SPECIFICATIONS

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

ENVIRONMENTAL COMMITMENTS

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.

PLOTTED FROM - $$USERNAME$$

ESTIMATE OF QUANTITIES AND ENVIRONMENTAL COMMITMENTS

COMMITMENT A: AQUATIC RESOURCES

COMMITMENT A1: WETLANDS

All efforts to avoid and minimize wetland impacts from the project have resulted in approximately 0.244 acre(s) of wetlands (includes temporary and permanent) becoming impacted.

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	153+80 - 155+20	0.06	N/A	0.170	N/A	0.23
2	86+50	N/A	N/A	0.002	0.002	0.004
3	117+14	N/A	N/A	0.001	0.001	0.002
4	128+86	N/A	N/A	0.002	0.002	0.004
5	137+97	N/A	N/A	0	0.002	0.002
6	189+24	N/A	N/A	0	0.002	0.002
7	189+24	N/A	N/A	0	0.002	0.002
8	189+24	N/A	N/A	0.001	0.001	0.002
9	230+63	N/A	N/A	0.002	0.002	0.004
10	250+26	N/A	N/A	0.002	0.002	0.004
11	276+00	N/A	N/A	0.002	0.002	0.004
12	276+00	N/A	N/A	0.002	0.002	0.004
13	299+67	N/A	N/A	0.002	0.002	0.004
14	3+62	N/A	N/A	0.006	0.006	0.012
15	60+52	N/A	N/A	0.002	0.002	0.004
16	75+50	N/A	N/A	0.002	0.002	0.004
17	95+00	N/A	N/A	0.002	0	0.002
18	132+15	N/A	N/A	0.003	0.003	0.006
19	154+37	N/A	N/A	0.001	0.001	0.002

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 0.06 acre(s) 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.

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 the 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.

The Contractor will notify the Project Engineer if additional easement is needed to complete work adjacent to any wetland. The Project Engineer will obtain an appropriate course of action from the Environmental Office before proceeding with construction activities that affect any wetlands beyond the work limits and easements shown in the plans.

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.

The Contractor will not withdraw water directly from streams of the James, Big Sioux, and Vermillion watersheds without prior approval from the SDDOT Environmental Office.

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

The Big Sioux River is classified as a warm water semi-permanent fishery with a total suspended solids standard of less than 90 mg/L 30-day average, less than 158 mg/L daily maximum.

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.

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 not required to be covered under a General Permit for Stormwater Discharges Associated with Construction Activities, the Contractor will obtain the General Permit for Temporary Discharge Activities from the DANR Surface Water Program, 605-773-3351.
<
https://danr.sd.gov/OfficeOfWater/SurfaceWaterQuality/docs/DANR_TemporaryDischargeNOI2018Fillable.pdf >

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:

COMMITMENT D2: SURFACE WATER DISCHARGE (Continued)

<
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 >

ESTIMATE OF QUANTITIES AND ENVIRONMENTAL COMMITMENTS

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.

COMMITMENT I: HISTORIC PRESERVATION OFFICE CLEARANCES

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

Action Taken/Required:

All earth disturbing activities not designated within the plans require 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 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:

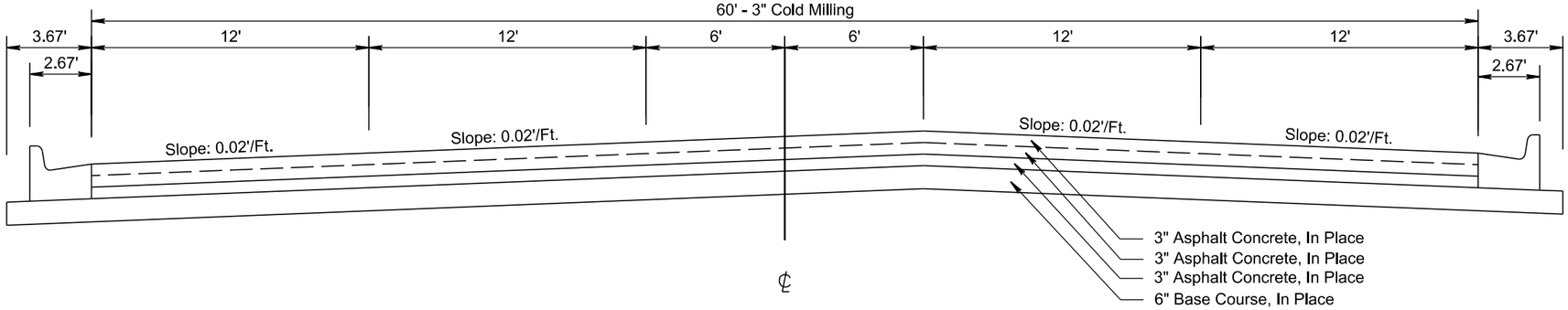
The Contractor will comply with all requirements contained in the Section 404 Permit.
The Contractor will also be responsible for obtaining a Section 404 Permit for any dredge, excavation, or fill activities associated with material sources, storage areas, waste sites, and Contractor work sites outside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

TYPICAL SURFACING SECTIONS

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(120)145	5	93

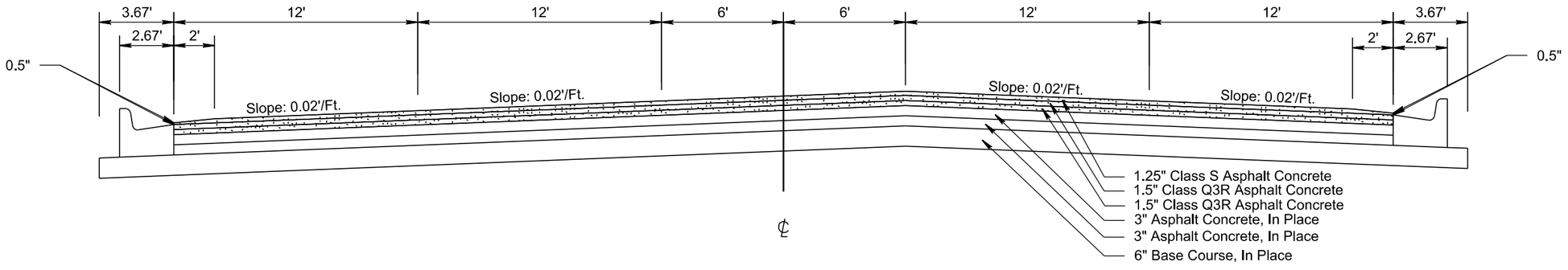
Section 1

Sta. 23+37 to Sta. 25+00
In Place & Cold Milling Section



Section 1

Sta. 23+37 to Sta. 25+00
Resurfacing Section



PLOTTED FROM - $$USERNAME$$

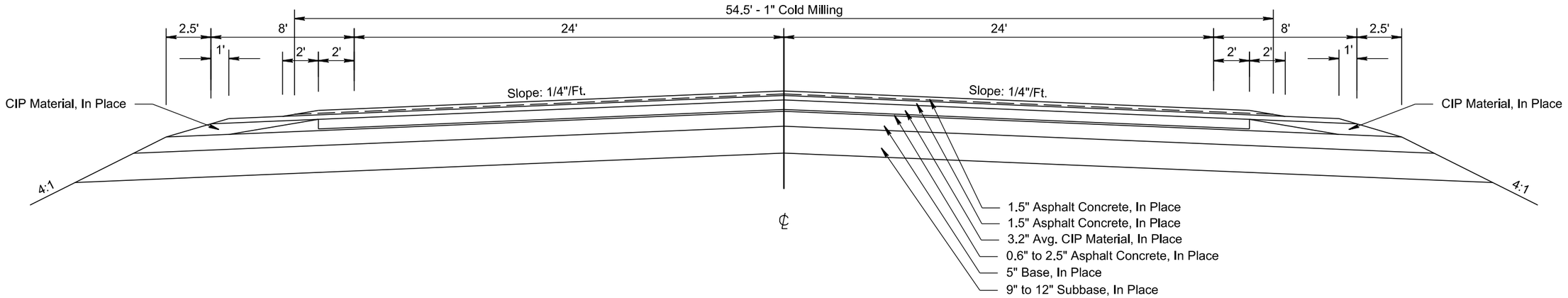
TYPICAL SURFACING SECTIONS

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(120)145	6	93

Section 2

Milling Exception: 55+17.8 to 61+86.6

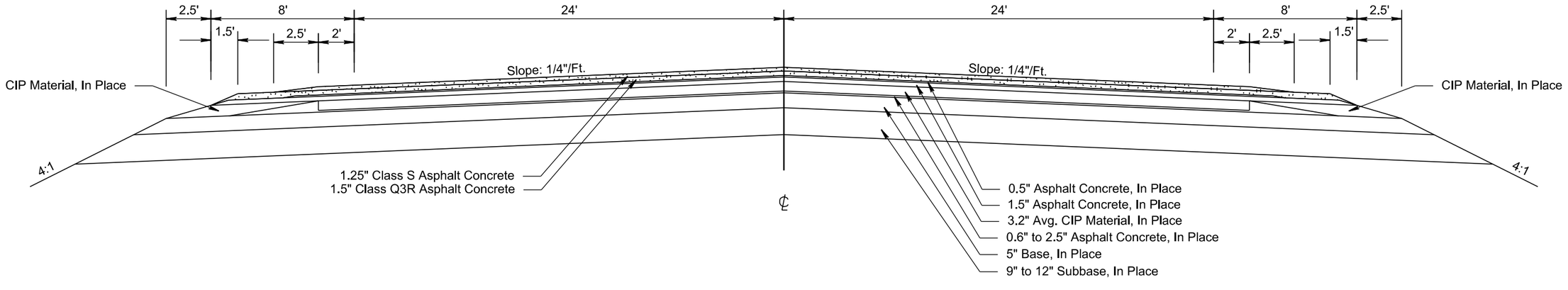
Sta. 25+00 to Sta. 55+17.8
Sta. 61+86.6 to Sta. 102+20
In Place & Cold Milling Section



Section 2

Surfacing Exception: 55+17.8 to 61+86.6

Sta. 25+00 to Sta. 55+17.8
Sta. 61+86.6 to Sta. 102+20
Resurfacing Section



PLOTTED FROM - $$USERNAME$$

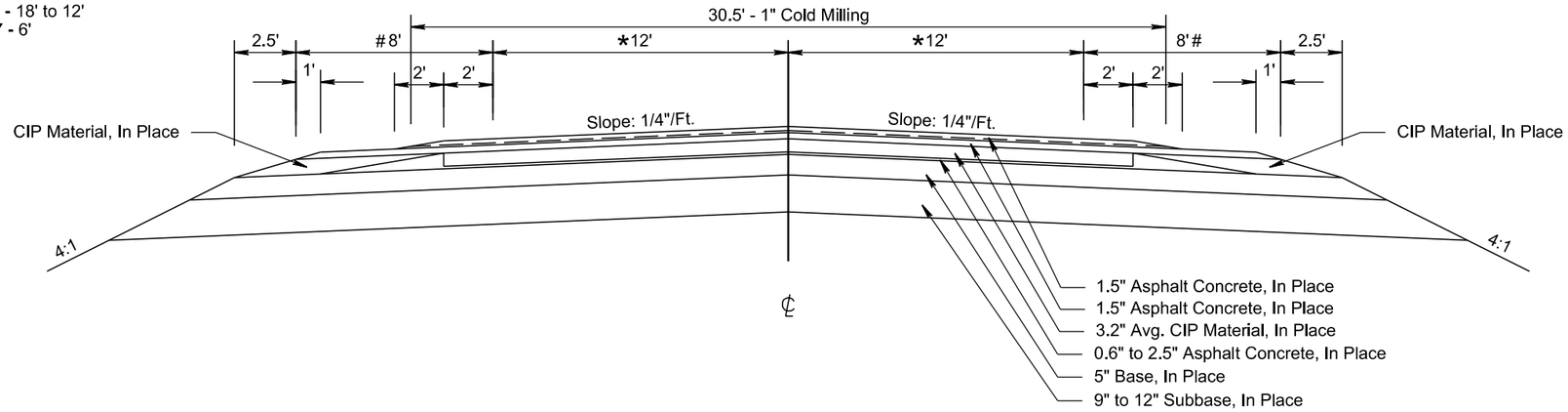
TYPICAL SURFACING SECTIONS

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(120)145	7	93

Section 3

Sta. 102+20 to Sta. 205+00.61
Sta. 223+41.36 to Sta. 331+79.8
Equation - Sta. 331+79.8 = a 0+00
Sta. a 0+00 to Sta. a 138+54.61
Sta. a 163+95.72 to Sta. a 245+36.8
In Place & Cold Milling Section

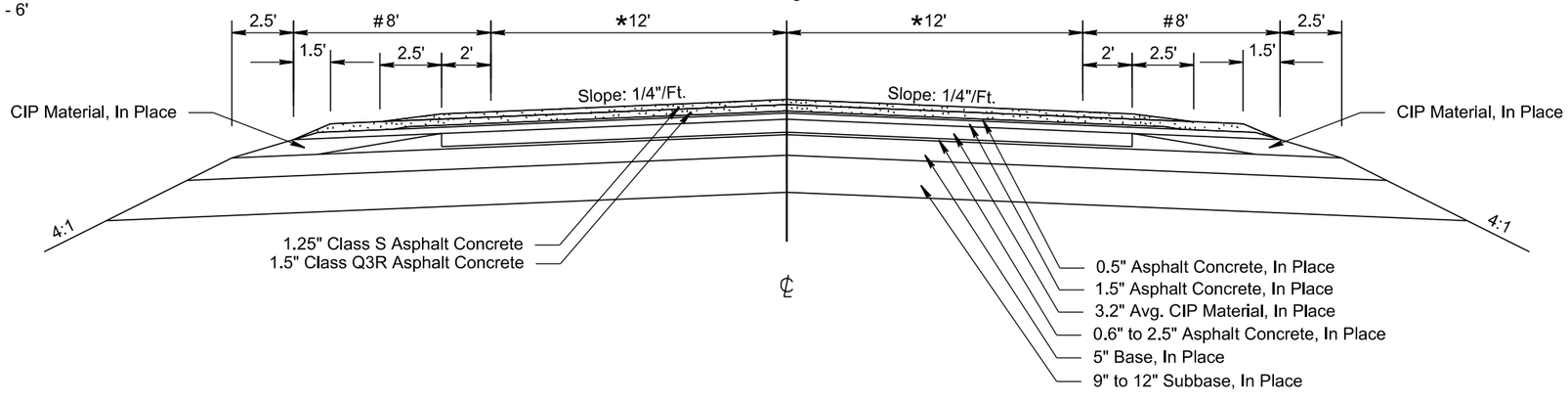
Transitions:
* Sta. 102+20 to Sta. 117+00 - 24' to 12'
* Sta. 153+04.7 to Sta. 163+32.2 - 12' to 18'
* Sta. 163+32.2 to 168+57.2 - 18'
* Sta. 168+57.2 to 176+24.7 - 18' to 12'
# Sta. 153+04.7 to 176+24.7 - 6'



Section 3

Sta. 102+20 to Sta. 205+00.61
Sta. 223+41.36 to Sta. 331+79.8
Equation - Sta. 331+79.8 = a 0+00
Sta. a 0+00 to Sta. a 138+54.61
Sta. a 163+95.72 to Sta. a 245+36.8
Resurfacing Section

Transitions:
* Sta. 102+20 to Sta. 117+00 - 24' to 12'
* Sta. 153+04.7 to Sta. 163+32.2 - 12' to 18'
* Sta. 163+32.2 to 168+57.2 - 18'
* Sta. 168+57.2 to 176+24.7 - 18' to 12'
# Sta. 153+04.7 to 176+24.7 - 6'



TYPICAL SURFACING SECTIONS

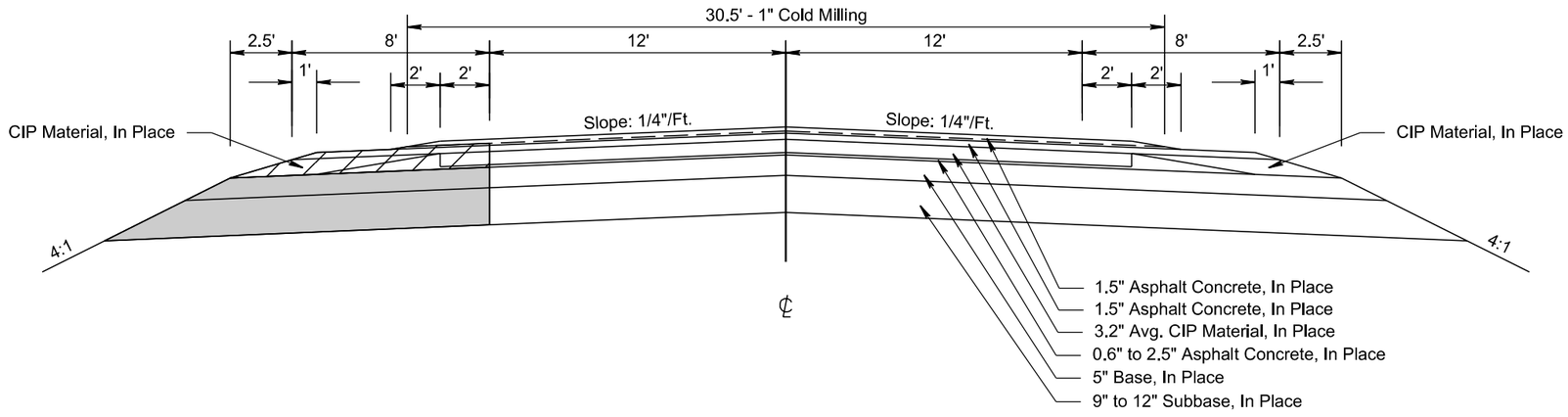
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(120)145	8	93

Remove Asphalt Concrete Pavement

Unclassified Excavation

Section 3a

Sta. a 138+54.61 to Sta. a 163+95.72
In Place & Cold Milling Section



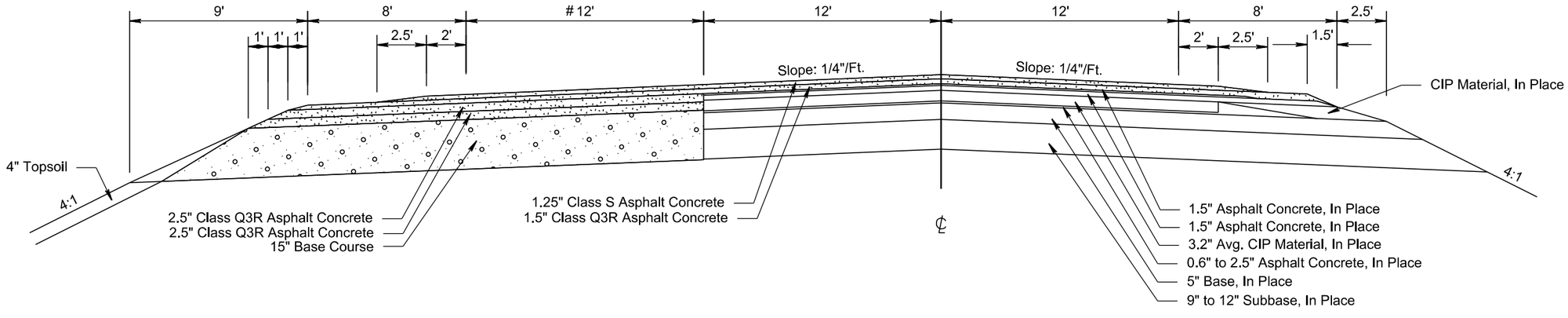
Transitions:

Sta. a 138+54.61 to Sta. a 146+94.61
0' to 12'

Sta. a 155+55.72 to Sta. a 163+95.72
12' to 0'

Section 3a

Sta. a 138+54.61 to Sta. 163+95.72
Resurfacing Section



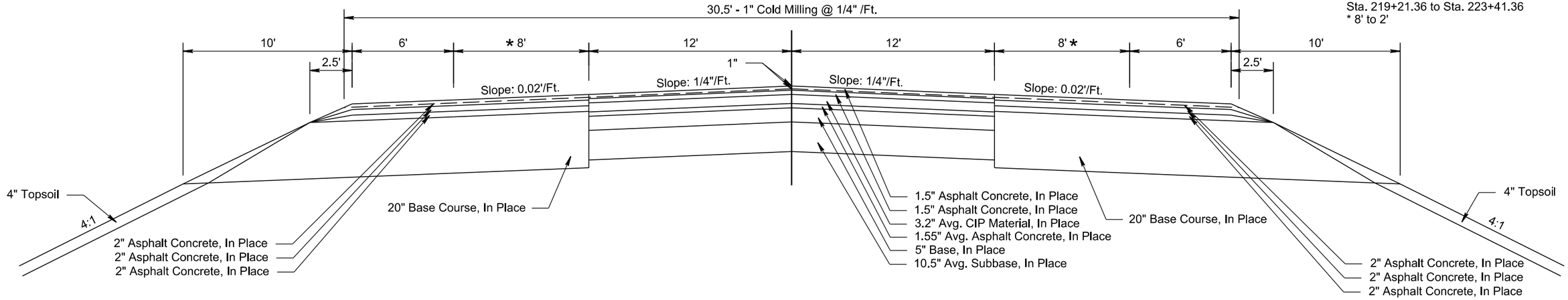
PLOTTED FROM - $$USERNAME$$

TYPICAL SURFACING SECTIONS

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(120)145	9	93

Section 4

US81 & 176th Ave.
Sta. 205+00.61 to Sta. 223+41.36
In Place & Cold Milling Section



Transitions:

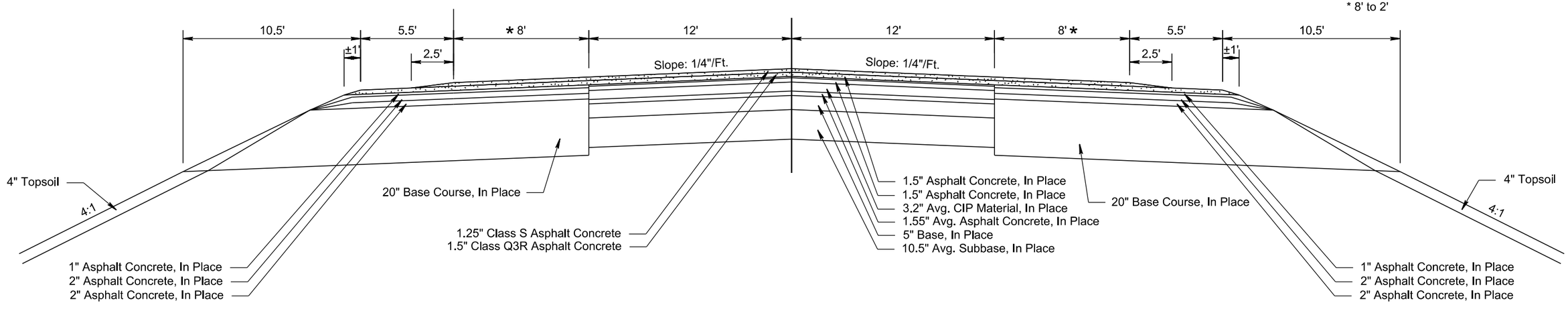
Sta. 205+00.61 to Sta. 209+20.61
* 2' to 8'

Sta. 209+20.61 to Sta. 219+21.36
* 8'

Sta. 219+21.36 to Sta. 223+41.36
* 8' to 2'

Section 4

US81 & 176th Ave.
Sta. 205+00.61 to Sta. 223+41.36
Resurfacing Section



PLOTTED FROM - $$USERNAME$$

RATES OF MATERIALS

Section 1 (Sta. 23+37 to 25+00) Quantities will be as listed in the Table of Additional Quantities.

The Estimate of Quantities is based on the following quantities of material per mile for Section 2 & Section 3.

Section 2
Resurfacing Section

STA. 25+00 to 41+63.72
STA. 43+56.22 to 55+17.8
STA. 61+86.6 to 102+20

CLASS Q3R HOT MIXED ASPHALT CONCRETE –1.5" LIFT

Crushed Aggregate.....	2400 Tons
Salvaged Asphalt Concrete……..	600 Tons
PG 58-34 Asphalt Binder @ 4.7%.....	148 Tons
Total without Lime	**3148 Tons**
Hydrated Lime @ 1.0%.....	31 Tons
Total with Lime	**3179 Tons**

Laid 1.5 inches compacted depth; 61' top, 64' bottom

CLASS S HOT MIXED ASPHALT CONCRETE –1.25" LIFT (WEARING COURSE)

Crushed Aggregate.....	2076 Tons
PG 64-34 Asphalt Binder@ 6.5%.....	144 Tons
Total without Additive	**2220 Tons**
Stabilizing Additive @ 0.3%.....	6.66 Tons
Total with Additive	**2226.66 Tons**

Laid 1.25 inches compacted depth; 52' top, 57' bottom

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

SS-1h or CSS-1h Emulsified Asphalt for Tack
Bladelaid – at the rate of **10.6** tons applied **49** feet wide.
(Rate = 0.09 Gal./Sq Yd)
Mainline - at the rate of **9.6** tons applied **65** feet wide.
Wear Course - at the rate of **8.6** tons applied **58** feet wide.
(Rate = 0.06 Gal./Sq.Yd.)

FLUSH SEAL

SS-1h or CSS-1h Emulsified Asphalt for Flush Seal at the rate of **0.19** tons applied **1.5** feet wide to cover centerline rumble stripes.
SS-1h or CSS-1h Emulsified Asphalt for Flush Seal at the rate of **0.19** tons applied **1.5** feet wide to cover edge line rumble strips.
(Rate = 0.05 Gal./Sq.Yd.).

Note: Rumble Strips will only be placed Sta. 78+66 – a141+86 (Thru Equation) and Sta. a156+86 – a245+36.

Section 3
Resurfacing Section

STA. 102+20 to 205+00.61
STA. 223+41.36 to 331+79.8
STA. a0+00 to a138+54.61
STA. a163+95.72 to a245+36.8

CLASS Q3R HOT MIXED ASPHALT CONCRETE –1.5" LIFT

Crushed Aggregate.....	1505 Tons
Salvaged Asphalt Concrete……..	376 Tons
PG 58-34 Asphalt Binder @ 4.7%.....	93 Tons
Total without Lime	**1974 Tons**
Hydrated Lime @ 1.0%.....	20 Tons
Total with Lime	**1994 Tons**

Laid 1.5 inches compacted depth; 37' top, 40' bottom

CLASS S HOT MIXED ASPHALT CONCRETE –1.25" LIFT (WEARING COURSE)

Crushed Aggregate.....	1162 Tons
PG 64-34 Asphalt Binder@ 6.5%.....	81 Tons
Total without Additive	**1243 Tons**
Stabilizing Additive @ 0.3%.....	3.72 Tons
Total with Additive	**1246.72 Tons**

Laid 1.25 inches compacted depth; 28' top, 33' bottom

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

SS-1h or CSS-1h Emulsified Asphalt for Tack
Bladelaid – at the rate of **5.4** tons applied **25** feet wide.
(Rate = 0.09 Gal./Sq Yd)
Mainline - at the rate of **6.1** tons applied **41** feet wide.
Wear Course - at the rate of **5.0** tons applied **34** feet wide.
(Rate = 0.06 Gal./Sq.Yd.)

FLUSH SEAL

SS-1h or CSS-1h Emulsified Asphalt for Flush Seal at the rate of **0.19** tons applied **1.5** feet wide to cover centerline rumble stripes.
SS-1h or CSS-1h Emulsified Asphalt for Flush Seal at the rate of **0.19** tons applied **1.5** feet wide to cover edge line rumble strips.
(Rate = 0.05 Gal./Sq.Yd.).

Note: Rumble Strips will only be placed Sta. 78+66 – a141+86 (Thru Equation) and Sta. a156+86 – a245+36.

RATES OF MATERIALS (Continued)

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

Section 3a & 4

Resurfacing Section

STA. a138+54.61 to a163+95.72 **
STA. 205+00.61 to 223+41.36

CLASS Q3R HOT MIXED ASPHALT CONCRETE –2.5" BOTTOM LIFT **

Crushed Aggregate.....	26.47 Tons/Sta
Salvaged Asphalt Concrete……..	6.62 Tons/Sta
PG 58-34 Asphalt Binder @ 4.7%.....	1.63 Tons/Sta
Total without Lime	**34.72 Tons/Sta**
Hydrated Lime @ 1.0%.....	0.35 Tons/Sta
Total with Lime	**35.07 Tons/Sta**

Laid 2.5 inches compacted depth; 22' top, 23' bottom

CLASS Q3R HOT MIXED ASPHALT CONCRETE – 2.5" TOP LIFT **

Crushed Aggregate.....	25.29 Tons/Sta
Salvaged Asphalt Concrete……..	6.32 Tons/Sta
PG 58-34 Asphalt Binder @ 4.7%.....	1.56 Tons/Sta
Total without Lime	**33.17 Tons/Sta**
Hydrated Lime @ 1.0%.....	0.33 Tons/Sta
Total with Lime	**33.50 Tons/Sta**

Laid 2.5 inches compacted depth; 21' top, 22' bottom

CLASS Q3R HOT MIXED ASPHALT CONCRETE – 1.5" LIFT

Crushed Aggregate.....	36.22 Tons/Sta
Salvaged Asphalt Concrete……..	9.05 Tons/Sta
PG 58-34 Asphalt Binder @ 4.7%.....	2.23 Tons/Sta
Total without Lime	**47.50 Tons/Sta**
Hydrated Lime @ 1.0%.....	0.48 Tons/Sta
Total with Lime	**47.98 Tons/Sta**

Laid 1.5 inches compacted depth; 50.5' top, 53' bottom

CLASS S HOT MIXED ASPHALT CONCRETE –1.25" LIFT (WEARING COURSE)

Crushed Aggregate.....	30.66 Tons/Sta
PG 64-34 Asphalt Binder@ 6.5%.....	2.13 Tons/Sta
Total without Additive	**32.79 Tons/Sta**
Stabilizing Additive @ 0.3%.....	0.10 Tons/Sta
Total with Additive	**32.89 Tons/Sta**

Laid 1.25 inches compacted depth; 40' top, 45' bottom

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

SS-1h or CSS-1h Emulsified Asphalt for Tack
Bladelaid – at the rate of **0.15** tons applied **37** feet wide.
(Rate = 0.09 Gal./Sq Yd)
Mainline - at the rate of **0.15** tons applied **54** feet wide.
Wear Course - at the rate of **0.13** tons applied **46** feet wide.
(Rate = 0.06 Gal./Sq.Yd.)

FLUSH SEAL

SS-1h or CSS-1h Emulsified Asphalt for Flush Seal at the rate of **0.0036** tons applied **1.5** feet wide to cover centerline rumble stripes.
SS-1h or CSS-1h Emulsified Asphalt for Flush Seal at the rate of **0.0036** tons applied **1.5** feet wide to cover edge line rumble strips.
(Rate = 0.05 Gal./Sq.Yd.).

Note: Rumble Strips will only be placed Sta. 78+66 – a141+86 (Thru Equation) and Sta. a156+86 – a245+36.

TABLE OF ADDITIONAL QUANTITIES - NH 0081(120)145, PCN 07YW

LOCATIONS:	BASE COURSE TON	Contractor Furnished Borrow CU YD	Asphalt Concrete Composite TON	CLASS Q3R HOT MIXED ASPHALT CONCRETE TON	PG 58-34 ASPHALT BINDER TON	HYDRATED LIME TON	SALVAGE ASPHALT CONCRETE (RAP) N.A.B.I. TON	Virgin Aggregate N.A.B.I. TON	MODIFIED CLASS S ASPHALT CONCRETE TON	PG 64-34 ASPHALT BINDER TON	STABILIZING ADDITIVE FOR ASPHALT CONCRETE TON	Virgin Aggregate N.A.B.I. TON	SS-1h/ CSS-1h ASPH. FOR TACK TON	COLD MILLING ASPHALT CONCRETE SQ YD
Section 1 Sta. 23+37 to 25+00 (2 - 3" Lifts)	-	-	-	363.0	17.06	0.36	69.0	276.6	75.5	4.91	2.27	68.3	1.20	1087.0
Str # 15-190-186 NW Guardrail Surfacing	-	130.0	15.0	-	-	-	-	-	-	-	-	-	-	-
NE Guardrail Surfacing	-	-	13.0	-	-	-	-	-	-	-	-	-	-	-
SW Guardrail Surfacing	30	250.0	13.0	-	-	-	-	-	-	-	-	-	-	-
SE Guardrail Surfacing	10	-	15.0	-	-	-	-	-	-	-	-	-	-	-
SD 22 Right Turn Lane / Acceleration Lane Sta. a149+36	-	-	-	152.2	7.15	0.15	28.9	116.0	126.6	8.23	3.80	114.6	0.10	1827.0
Intersecting Roads (6 Asphalt & 12 Gravel)	300	-	-	506.0	23.78	0.51	96.1	385.6	-	-	-	-	0.88	129.0
Driveways (15 Asphalt & 29 Gravel)	670	-	-	345.1	16.22	0.35	65.6	262.9	-	-	-	-	0.60	186.0
Field Entrances (38 Gravel)	570	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTALS	**1580**	**380.0**	**56.0**	**1366.3**	**64.2**	**1.4**	**259.6**	**1041.1**	**202.1**	**13.1**	**6.1**	**182.9**	**2.8**	**3229.0**

The tonnage shown in the Table of Additional Quantities for Class Q3R Hot Mix Asphalt Concrete is based on an average compacted thickness of 1.5 inches.

The tonnage shown in the Table of Additional Quantities for Class Q3R Hot Mix Asphalt Concrete is based on an average compacted thickness of 1.25 inches.

Application shall be at the rate shown on the plans or as directed by the Engineer.

The above quantities are included in the Estimate of Quantities.

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(120)145	13	93

Revised 11-5-24 BRO

TABLE OF PROJECT STATIONING

SECTION	STATION	TO	STATION	LENGTH (Ft)	GROSS SECTION LENGTH (Ft)	GROSS SECTION LENGTH (Miles)
1	23+37.00	to	25+00.00	163.00	163.00	0.031
2	25+00.00	to	41+63.72	1663.72	1663.72	0.315
2	43+56.22	to	55+17.80	1161.58	1161.58	0.220
2	61+86.60	to	102+20.00	4033.40	4033.40	0.764
3	102+20.00	to	205+00.61	10280.61	10280.61	1.947
4	205+00.61	to	223+41.36	1840.75	1840.75	0.349
3	223+41.36	to	331+79.80	10838.44	10838.44	2.053
3	a0+00	to	a138+54.61	13854.61	13854.61	2.624
3a	a138+54.61	to	a163+95.72	2541.00	2541.00	0.481
3	a163+95.72	to	a245+36.8	8141.08	8141.08	1.542
TOTAL:					54518.19	10.325

SUMMARY OF ASPHALT CONCRETE

LOCATIONS:	Class Q3R Hot Mixed Asphalt Concrete Compaction with Specified Density TONS	Class Q3R Hot Mixed Asphalt Concrete Compaction without Specified Density TONS	Modified Class S Asphalt Concrete Compaction without Specified Density TONS	Asphalt Concrete Composite Compaction without Specified Density TONS	Asphalt Concrete Blade Laid Compaction without Specified Density TONS
Section 1 - 23+37 to 25+00	363.0	--	75.5	0.8	11.6
Section 2 - 25+00 to 55+17 & 61+86 to 102+20 - 48' Wide	3130.2	--	2923.3	33.4	400.5
Section 2 - 25+00 to 55+17 & 61+86 to 102+20 - 6.5' Shoulder + 1.5' Sluff	--	1043.4	--	--	--
Section 3 - 102+20 to a245+36.8 (Thru Equation) - 24' to 36' Wide	12311.2	--	10288.1	204.2	1224.9
Section 3 - 102+20 to a245+36.8 (Thru Equation) - 6.5' Shoulder + 1.5' Sluff	--	4103.7	--	--	--
Section 3a - a138+54 to a163+95 - 28' to 40' Wide	914.4	1742.3	835.7	12.0	72.2
Section 3a - a138+54 to a163+95 - 5.5' Shoulder + 1.0' Sluff	--	304.8	--	--	--
Section 4 - 163+32 to 168+57 & 205+00.61 to 223+41.36 - 28' to 40' Wide	599.2	--	596.3	8.8	78.5
Section 4 - 163+32 to 168+57 & 205+00.61 to 223+41.36 - 5.5' Shoulder + 1.0' Sluff	--	295.1	--	--	--
Spot leveling, strengthening, and repair of existing surface	-	1036.2	-	-	-
Table of Additional Quantities	-	1003.3	126.6	56.0	-
TOTAL	**17318.0**	**9528.8**	**14845.5**	**315.2**	**1787.7**

TABLE OF MATERIAL QUANTITIES

	UNCLASSIFIED EXCAVATION, DIG OUTS	REMOVE ASPHALT CONCRETE PAVEMENT	BASE COURSE	ASPHALT CONCRETE COMPOSITE	COLD MILLING ASPHALT CONCRETE	MODIFIED CLASS S ASPHALT CONCRETE	STABILIZING ADDITIVE FOR ASPHALT CONCRETE	PG 64-34 ASPHALT BINDER	VIRG.. AGGR. (NABI.)	ASPHALT CONCRETE BLADE LAID	HYDRATED LIME	PG 58-34 ASPHALT BINDER	VIRG.. AGGR. (NABI.)	CLASS Q3R HOT MIXED ASPHALT CONCRETE	HYDRATED LIME	PG 58-34 ASPHALT BINDER	SALVAGED ASPHALT CONCRETE (RAP) (NABI.)	VIRG.. AGGR. (NABI.)	SS-1h/ CSS-1h ASPH. FOR TACK	SS-1h/ CSS-1h ASPH. FOR FLUSH SEAL
						<----------1.25" Lift---------->				<---Asphalt Concrete Blade Laid--->				<----------1.5" Lift---------->						
SECTION	CuYd	SqYd	Ton	Ton	SqYd	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton
1	1.6	2.3	3.2	0.8	1087.0	75.5	2.27	4.91	68.3	11.6	0.11	0.9	10.6	363.0	0.36	17.06	69.0	276.6	1.2	0.0
2	66.8	100.1	133.6	33.4	42697.7	2923.3	8.80	189.00	2725.5	400.5	4.01	29.6	366.9	4173.6	40.70	194.30	787.7	3150.9	38.1	0.2
3	408.3	612.5	816.6	204.2	150219.0	10884.3	30.70	668.40	10185.2	1224.9	12.25	90.6	1122.1	16415.0	164.50	765.40	3095.4	12389.7	162.7	3.1
3a	24.0	36.1	48.1	12.0	8611.2	835.7	2.50	54.10	779.1	72.2	0.72	5.3	66.2	2961.5	29.50	137.70	558.8	2235.5	7.9	0.1
4	17.5	26.2	35.0	8.8	9633.6	596.3	1.80	38.70	555.8	78.5	0.80	5.8	71.9	894.3	8.70	41.50	168.8	675.3	8.1	0.1
Sub totals	518.1	777.2	1036.5	259.2	212248.5	15315.1	46.07	955.11	14313.9	1787.7	17.89	132.3	1637.6	24807.4	243.76	1155.96	4679.7	18728.0	218.0	3.5
Spot Leveling	-	-	-	-	-	-	-	-	-	-	-	-	-	1036.2	10.36	48.70	196.7	780.4	3.4	-
Additional Quantities	-	-	1580.0	56.0	2142.0	126.6	3.80	8.23	114.6	-	-	-	-	1003.3	1.04	47.14	190.6	764.5	1.6	-
Totals	518.1	777.2	2616.5	315.2	214390.5	15441.7	49.87	963.34	14428.5	1787.7	17.89	132.3	1637.6	26846.9	255.16	1251.80	5067.0	20272.9	223.0	3.5

PLOTTED FROM - $USERNAME$$

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(120)145	14	93

US 81 TABLE OF MAINLINE CULVERT WORK

Culvert #	Culvert Inventory #	MRM	+ Disp		Station	Side	Per Original Plans: In Place Culvert Size and Type		Per Original Plans: Culvert Length (Ft)	Per Original Plans: Culvert End Type	Per Original Plans: Direction of Flow	Per Original Plans: Drain-age Area (Acre)	Contractor Furnished Borrow Excavation (CuYd)	Remove Pipe: for Reset (Ft)	Remove Pipe: End Section (Each)	Remove Pipe: End Section for Reset (Each)	Furnish and Install: 24" RCP (Ft)	Furnish and Install: 24" RCP Flared End (Each)	Furnish and Install: 36" RCP Flared End (Each)	Furnish and Install: 36" RCPA Flared End (Each)	Furnish and Install: 24" RCP Sloped End (Each)	Furnish and Install: 36" RCP Sloped End W/Bars (Each)	Reset Pipe (Ft)	Reset Pipe End Section (Each)	Tie Bolts for RCP (Each)	Repair Comments
32	26482	145.07	0.28	a	241+66	L	24"	RCP		Flared	West	?	10	6		1	4						6	1		Reset FE & 6' on both ends. Add 4' & 10 CY Fill on Left.
						R				Flared				6		1							6	1		
31	26483	145.07	0.75	a	217+25	L	54"	RCP	166'	Flared Headway	East	316														No Work Required.
						R				Flared Headway																
30	26484	145.07	0.95	a	206+77	L	48"	RCP		Flared Headway	East	36														No Work Required.
						R				Flared Headway																
29	26486	146.00	0.29	a	188+00	L	48"	RCP	86'	Flared	West	?														No Work Required. (Liner installed on PCN 06EC.)
						R				Flared																
28	26487	146.00	0.63	a	170+14	L	30"	RCP	64	Sloped	West	35														Reset Sloped End & 6' on Rt.
						R				Sloped				6		1							6	1		
27	27345	146.00	0.91	a	154+37	L	42"	RCP	136'	Flared	West	23		6		1							6	1		Reset FE & 6'.
						R				Flared				10		1							10	1		Reset FE & 10'.
26s	27346	147.09	0.34	a	132+15	L	36"	RCP	70'	Sloped	West															No Work Required.
						R				Sloped																
26m	27346	147.09	0.34	a	132+15	L	36"	RCP	70'	Sloped	West	514			1							1				Replace SE w/Bars
						R				Sloped																No Work Required.
26n	27346	147.09	0.34	a	132+15	L	36"	RCP	70'	Sloped	West															No Work Required.
						R				Sloped																
25	27347	147.09	0.62	a	117+00	L	24"	RCP	122'	Sloped	West	14		6		1							6	1		Reset FE & 6' on both ends.
						R				Sloped				6		1							6	1		

PLOTTED FROM - $$USERNAME$$

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(120)145	15	93

US 81 TABLE OF MAINLINE CULVERT WORK

Culvert #	Culvert Inventory #	MRM	+ Disp		Station	Side	Per Original Plans: In Place Culvert Size and Type		Per Original Plans: Culvert Length (Ft)	Per Original Plans: Culvert End Type	Per Original Plans: Direction of Flow	Per Original Plans: Drain-age Area (Acre)	Contractor Furnished Borrow Excavation (CuYd)	Remove Pipe: for Reset (Ft)	Remove Pipe: End Section (Each)	Remove Pipe: End Section for Reset (Each)	Furnish and Install: 24" RCP (Ft)	Furnish and Install: 24" RCP Flared End (Each)	Furnish and Install: 36" RCP Flared End (Each)	Furnish and Install: 36" RCPA Flared End (Each)	Furnish and Install: 24" RCP Sloped End (Each)	Furnish and Install: 36" RCP Sloped End **W/Bars** (Each)	Reset Pipe (Ft)	Reset Pipe End Section (Each)	Tie Bolts for RCP (Each)	Repair Comments
24	317649	148.00	0.00	a	104+03	L	24"	RCP		Sloped	West	25														No Work Required.
						R				Sloped																
23	317648	148.00	0.17	a	95+00	L	36"	RCP	98'	Flared	West	32		8		1							8	1		Reset FE & 8'.
						R				Flared				6		1							6	1		Reset FE & 6'.
22	27349	148.00	0.54	a	75+50	L	36"	RCP		Flared	West	108		6		1							6	1		Reset FE & 6' on both ends.
						R				Flared				6		1							6	1		
21	27350	148.00	0.83	a	60+52	L	72"	RCP	102'	Flared	West	583		12		1							12	1	22	Reset FE & 12'. Tie all Joints
						R				Flared				18		1							18	1		Reset FE & 18'.
20	27351	149.00	0.23	a	38+00+/-	L	84"	RCP		Flared		?														No Work Required. (Joints sealed w/PCN 06EH.)
						R				Flared																
19	27352	149.00	0.87	a	3+62	L	30"	RCP	72	Sloped	West	38		6		1							6	1		Reset SE & 6' on both ends.
						R				Sloped				6		1							6	1		
18	27353	150.00	0.55		299+67	L	30"	RCP	100'	Flared	East	64		6		1							6	1		Reset FE & 6' on both ends.
						R				Flared				6		1							6	1		
17	27354	150.00	0.79		286+80	L	2-8'x8'	RCBC	80'	Flared		1974														
						R				Flared																
16s	27355	150.00	0.99		276+00	L	30"	RCP Arch	76'	Flared	West	?		4		1							4	1		Reset FE & 4".
						R				Flared				6		1							6	1		Reset FE & 6'.
16n	27355	150.00	0.99		276+00	L	30"	RCP Arch	76'	Flared	West			4		1							4	1		Reset FE & 4".
						R				Flared				6		1							6	1		Reset FE & 6'.

PLOTTED FROM - $$USERNAME$$

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(120)145	16	93

US 81 TABLE OF MAINLINE CULVERT WORK

						Per Original Plans							Remove Pipe			Furnish and Install										
Culvert #	Culvert Inventory #	MRM	+ Disp	Station	Side	In Place Culvert Size and Type		Culvert Length (Ft)	Culvert End Type	Direction of Flow	Drain-age Area Acre	Contractor Furnished Borrow Excavation (CuYd)	for Reset (Ft)	End Section (Each)	End Section for Reset (Each)	24" RCP (Ft)	24" RCP Flared End (Each)	36" RCP Flared End (Each)	36" RCPA Flared End (Each)	24" RCP Sloped End (Each)	36" RCP Sloped End **W/Bars** (Each)	Reset Pipe (Ft)	Reset Pipe End Section (Each)	Tie Bolts for RCP (Each)	Repair Comments
15	27356	151.00	0.48	250+26	L	36"	RCP	100'	Flared	West	79		6		1							6	1		Reset FE & 6' on both ends
					R				Flared				6		1							6	1		
14	27357	151.00	0.85	230+63	L	18"	RCP	80'	Flared	West	17		4		1							4	1		Reset FE & 4".
					R				Flared				6		1							6	1		Reset FE & 6'.
13	27358	151.00	0.97	224+10	L	24"	RCP	120'	Flared	West	?														No Work Required.
					R				Flared																
12	27359	152.00	0.12	216+07	L	18"	RCP	62'	Flared	West	20														No Work Required.
					R				Flared																
11	27360	152.00	0.45	199+10	L	10'X8'	RCBC	118'	Flared	West	?														No Work Required.
					R				Flared																
10s	27361	152.00	0.64	189+24	L	36"	RCP	72'	Sloped	West	347														No Work Required.
					R				Flared				6		1							6	1		Reset FE & 6' on Rt.
10m	27361	152.00	0.64	189+24	L	36"	RCP	72'	Sloped	West															No Work Required.
					R				Flared				6		1							6	1		Reset FE & 6' on Rt.
10n	27361	152.00	0.64	189+24	L	36"	RCP	72'	Sloped	West															No Work Required.
					R				Flared				6		1							6	1		Reset FE & 6' on Rt.
9	27362	153.00	0.21	158+65	L	24"	RCP	96'	Sloped	West	12														No Work Required.
					R				Sloped				4		1							4	1		Reset FE & 4' on Rt.
8	27363	153.00	0.60	137+97	L	36"	RCP	90'	Flared	West	103		6		1							6	1		Reset FE & 6' on both ends.
					R				Flared				6		1							6	1		

PLOTTED FROM - $$USERNAME$$

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(120)145	17	93

US 81 TABLE OF MAINLINE CULVERT WORK

Culvert #	Culvert Inventory #	MRM	+ Disp	Station	Side	Per Original Plans: In Place Culvert Size and Type		Per Original Plans: Culvert Length (Ft)	Per Original Plans: Culvert End Type	Per Original Plans: Direction of Flow	Per Original Plans: Drain-age Area (Acre)	Contractor Furnished Borrow Excavation (CuYd)	Remove Pipe: for Reset (Ft)	Remove Pipe: End Section (Each)	Remove Pipe: End Section for Reset (Each)	Furnish and Install: 24" RCP (Ft)	Furnish and Install: 24" RCP Flared End (Each)	Furnish and Install: 36" RCP Flared End (Each)	Furnish and Install: 36" RCPA Flared End (Each)	Furnish and Install: 24" RCP Sloped End (Each)	Furnish and Install: 36" RCP Sloped End **W/Bars** (Each)	Reset Pipe (Ft)	Reset Pipe End Section (Each)	Tie Bolts for RCP (Each)	Repair Comments
7	26488	153.00	0.79	128+86	L	24"	RCP	96'	Flared	West	17		6	1			1					6			Replace FE & Reset 6'.
					R				Flared				6		1							6	1		Reset FE & 6'
6	26489	153.00	0.97	117+14	L	30"	RCP	110'	Flared	West	12		6		1							6	1		Reset FE & 6' on both ends
					R				Flared				6		1							6	1		
5	26490	154.00	0.29	102+30	L	36"	RCP		Flared	West	96		6		1							6	1		Reset FE & 6'
					R				Flared				6	1				1				6			Replace FE & Reset 6'.
4	26491	154.00	0.59	86+50	L	24"	RCP	96'	Flared	West	?			1		4				1					Remove FE, add 4' & SE.
					R				Flared					1			1								Replace FE with SE.
3	26492	154.00	0.81	75+06	L	30"	RCP Arch	92'	Flared	East	10		4	1					1			4			Replace FE. Reset 4'.
					R				Flared				8	1					1			8			Replace FE. Reset 8'.
Exception for roundabout																									
2	317656	155.17	0.01	54+42 +/-	L	18"	RCP		Flared		7														No Work Required
					R				Flared																
1s	26493	155.40	0.34	24+15	L	30"	RCP Arch		Sloped		?														No Work Required
					R				Sloped																
1n	26493	155.40	0.34	24+15	L	30"	RCP Arch		Sloped																No Work Required
					R				Sloped																
										TOTAL		**10**	**250**	**7**	**35**	**8**	**2**	**1**	**2**	**1**	**1**	**250**	**35**	**22**	

Left and Right based upon project station, thus Left is East side and Right is West side.

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

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

Initial Inspection held on 9-16-20. Above table produced from that inspection.

PLOTTED FROM - $$USERNAME$$

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(120)145	18	93

TABLE OF ADDITIONAL QUANTITIES FOR DRIVEWAYS, APPROACHES AND INTERSECTING ROADS

Station	Left/Right	Description	Work Required	Class Q3R Hot Mixed Asphalt Concrete (Ton)	PG 58-34 Binder (Ton)	Hydrated Lime (Ton)	Virgin Aggregate (NABI) (Ton)	Salvaged Asphalt Concrete (NABI) (Ton)	Cold Milling Asphalt Concrete (SqYd)	Base Course (Ton)	Comments
27+55	RIGHT	DRIVEWAY	NO WORK REQUIRED								MATCH EXISTING CONCRETE DRIVE
28+72	LEFT	14TH AVE SE	RESURFACE EXISTING UP TO ROW WITH ASPHALT CONCRETE	38.0	1.77	0.380	28.68	7.17	20.0		2.0" COMPACTED DEPTH OF ASPHALT CONCRETE
31+48	RIGHT	DRIVEWAY	NO WORK REQUIRED								MATCH EXISTING CONCRETE DRIVE
32+05	LEFT	DRIVEWAY	5 FOOT ASPHALT PAD & TRANSITION TO BASE COURSE	4.0	0.19	0.040	3.02	0.75		25.0	2.0" COMPACTED DEPTH OF ASPHALT CONCRETE; BASE COURSE TO TRANSITION
33+27	RIGHT	DRIVEWAY	RESURFACE EXISTING UP TO ROW WITH ASPHALT CONCRETE	30.0	1.40	0.300	22.64	5.66	17.0		2.0" COMPACTED DEPTH OF ASPHALT CONCRETE
33+79	LEFT	DRIVEWAY	RESURFACE EXISTING UP TO ROW WITH ASPHALT CONCRETE	20.0	0.93	0.200	15.10	3.77	10.0		2.0" COMPACTED DEPTH OF ASPHALT CONCRETE
34+03	RIGHT	DRIVEWAY	RESURFACE EXISTING UP TO ROW WITH ASPHALT CONCRETE	16.0	0.74	0.160	12.08	3.02			2.0" COMPACTED DEPTH OF ASPHALT CONCRETE
46+05	RIGHT	DRIVEWAY	TRANSITION TO BASE COURSE							25.0	BASE COURSE TO TRANSITION
47+10	RIGHT	DRIVEWAY	5 FOOT ASPHALT PAD	4.0	0.19	0.040	3.02	0.75	18.0		MATCH EXISTING CONCRETE DRIVE
47+50	LEFT	DRIVEWAY	5 FOOT ASPHALT PAD & TRANSITION TO BASE COURSE	4.0	0.19	0.040	3.02	0.75		25.0	2.0" COMPACTED DEPTH OF ASPHALT CONCRETE; BASE COURSE TO TRANSITION
47+70	RIGHT	DRIVEWAY	RESURFACE EXISTING UP TO ROW WITH ASPHALT CONCRETE	40.0	1.86	0.400	30.19	7.55		25.0	2.0" COMPACTED DEPTH OF ASPHALT CONCRETE; BASE COURSE TO TRANSITION
48+70	LEFT	DRIVEWAY	RESURFACE EXISTING UP TO ROW WITH ASPHALT CONCRETE	20.0	0.93	0.200	15.10	3.77	13.0		2.0" COMPACTED DEPTH OF ASPHALT CONCRETE
49+70	RIGHT	DRIVEWAY	5 FOOT ASPHALT PAD & TRANSITION TO BASE COURSE	3.5	0.16	0.035	2.64	0.66		20.0	2.0" COMPACTED DEPTH OF ASPHALT CONCRETE; BASE COURSE TO TRANSITION
50+52	LEFT	DRIVEWAY	RESURFACE EXISTING UP TO ROW WITH ASPHALT CONCRETE	40.0	1.86	0.400	30.19	7.55	22.0		2.0" COMPACTED DEPTH OF ASPHALT CONCRETE
51+88	RIGHT	DRIVEWAY	5 FOOT ASPHALT PAD & TRANSITION TO BASE COURSE	3.1	0.14	0.031	2.34	0.58		20.0	2.0" COMPACTED DEPTH OF ASPHALT CONCRETE; BASE COURSE TO TRANSITION
52+40	LEFT	DRIVEWAY	5 FOOT ASPHALT PAD & TRANSITION TO BASE COURSE	2.5	0.12	0.025	1.89	0.47		15.0	2.0" COMPACTED DEPTH OF ASPHALT CONCRETE; BASE COURSE TO TRANSITION
53+54	LEFT	DRIVEWAY	RESURFACE EXISTING UP TO ROW WITH ASPHALT CONCRETE	22.0	1.02	0.220	16.61	4.15	15.0		2.0" COMPACTED DEPTH OF ASPHALT CONCRETE
53+84	RIGHT	DRIVEWAY	RESURFACE EXISTING UP TO ROW WITH ASPHALT CONCRETE	28.0	1.30	0.280	21.13	5.28	20.0		2.0" COMPACTED DEPTH OF ASPHALT CONCRETE
54+59	LEFT	DRIVEWAY	RESURFACE EXISTING UP TO ROW WITH ASPHALT CONCRETE	20.0	0.93	0.200	15.10	3.77	10.0		2.0" COMPACTED DEPTH OF ASPHALT CONCRETE
71+49	RIGHT	24TH AVENUE SE	RESURFACE EXISTING UP TO ROW WITH ASPHALT CONCRETE	40.0	1.86	0.400	30.19	7.55	22.0		2.0" COMPACTED DEPTH OF ASPHALT CONCRETE
74+99	RIGHT	DRIVEWAY	RESURFACE EXISTING UP TO ROW WITH ASPHALT CONCRETE	14.0	0.65	0.140	10.57	2.64	13.0		2.0" COMPACTED DEPTH OF ASPHALT CONCRETE
77+36	LEFT	DRIVEWAY	TRANSITION TO BASE COURSE							15.0	BASE COURSE TO TRANSITION
78+07	RIGHT	DRIVEWAY	RESURFACE EXISTING UP TO ROW WITH ASPHALT CONCRETE	14.0	0.65	0.140	10.57	2.64	13.0		2.0" COMPACTED DEPTH OF ASPHALT CONCRETE
92+96	RIGHT	28TH AVENUE SE	RESURFACE EXISTING UP TO ROW WITH ASPHALT CONCRETE	32.0	1.49	0.320	24.15	6.04	25.0		2.0" COMPACTED DEPTH OF ASPHALT CONCRETE
97+63	RIGHT	DRIVEWAY	TRANSITION TO BASE COURSE							15.0	BASE COURSE TO TRANSITION
97+63	LEFT	DRIVEWAY	TRANSITION TO BASE COURSE							15.0	BASE COURSE TO TRANSITION
106+01	RIGHT	DRIVEWAY	TRANSITION TO BASE COURSE							15.0	BASE COURSE TO TRANSITION
108+05	RIGHT	DRIVEWAY	RESURFACE EXISTING UP TO ROW WITH ASPHALT CONCRETE	20.0	0.93	0.200	15.10	3.77	10.0		2.0" COMPACTED DEPTH OF ASPHALT CONCRETE
110+15	RIGHT	32ND AVE SE	RESURFACE EXISTING AROUND RADIUS WITH AC AND TRANSITION TO BC	25.0	1.16	0.250	18.87	4.72		25.0	2.0" COMPACTED DEPTH OF ASPHALT CONCRETE; BASE COURSE TO TRANSITION
110+15	LEFT	32ND AVE SE	RESURFACE EXISTING AROUND RADIUS WITH AC AND TRANSITION TO BC	25.0	1.16	0.250	18.87	4.72		25.0	2.0" COMPACTED DEPTH OF ASPHALT CONCRETE; BASE COURSE TO TRANSITION

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(120)145	19	93

TABLE OF ADDITIONAL QUANTITIES FOR DRIVEWAYS, APPROACHES AND INTERSECTING ROADS

Station	Left/Right	Description	Work Required	Class Q3R Hot Mixed Asphalt Concrete (Ton)	PG 58-34 Binder (Ton)	Hydrated Lime (Ton)	Virgin Aggregate (NABI) (Ton)	Salvaged Asphalt Concrete (NABI) (Ton)	Cold Milling Asphalt Concrete (SqYd)	Base Course (Ton)	Comments
111+58	RIGHT	DRIVEWAY	TRANSITION TO BASE COURSE							15.0	BASE COURSE TO TRANSITION
113+58	RIGHT	DRIVEWAY	TRANSITION TO BASE COURSE							15.0	BASE COURSE TO TRANSITION
124+98	LEFT	DRIVEWAY	RESURFACE EXISTING UP TO ROW WITH ASPHALT CONCRETE	20.0	0.93	0.200	15.10	3.77	10.0		2.0" COMPACTED DEPTH OF ASPHALT CONCRETE
125+02	RIGHT	FIELD ENT	TRANSITION TO BASE COURSE							15.0	BASE COURSE TO TRANSITION
136+77	LEFT	FIELD ENT	TRANSITION TO BASE COURSE							15.0	BASE COURSE TO TRANSITION
138+53	RIGHT	FIELD ENT	TRANSITION TO BASE COURSE							15.0	BASE COURSE TO TRANSITION
146+01	RIGHT	FIELD ENT	TRANSITION TO BASE COURSE							15.0	BASE COURSE TO TRANSITION
146+01	LEFT	DRIVEWAY	TRANSITION TO BASE COURSE							25.0	BASE COURSE TO TRANSITION
168+44	RIGHT	175TH ST	RESURFACE EXISTING AROUND RADIUS WITH AC AND TRANSITION TO BC	25.0	1.16	0.250	18.87	4.72		25.0	2.0" COMPACTED DEPTH OF ASPHALT CONCRETE; BASE COURSE TO TRANSITION
168+44	LEFT	175TH ST	RESURFACE EXISTING UP TO ROW WITH ASPHALT CONCRETE	28.0	1.30	0.280	21.13	5.28	20.0		2.0" COMPACTED DEPTH OF ASPHALT CONCRETE
175+09	RIGHT	DRIVEWAY	TRANSITION TO BASE COURSE							25.0	BASE COURSE TO TRANSITION
184+95	LEFT	FIELD ENT	TRANSITION TO BASE COURSE							15.0	BASE COURSE TO TRANSITION
194+81	RIGHT	FIELD ENT	TRANSITION TO BASE COURSE							15.0	BASE COURSE TO TRANSITION
194+81	LEFT	FIELD ENT	TRANSITION TO BASE COURSE							15.0	BASE COURSE TO TRANSITION
200+61	RIGHT	FIELD ENT	TRANSITION TO BASE COURSE							15.0	BASE COURSE TO TRANSITION
202+31	LEFT	DRIVEWAY	TRANSITION TO BASE COURSE							25.0	BASE COURSE TO TRANSITION
203+67	LEFT	DRIVEWAY	TRANSITION TO BASE COURSE							25.0	BASE COURSE TO TRANSITION
204+51	RIGHT	FIELD ENT	TRANSITION TO BASE COURSE							15.0	BASE COURSE TO TRANSITION
210+81	RIGHT	FIELD ENT	TRANSITION TO BASE COURSE							15.0	BASE COURSE TO TRANSITION
210+81	LEFT	FIELD ENT	TRANSITION TO BASE COURSE							15.0	BASE COURSE TO TRANSITION
216+61	RIGHT	176TH ST	RESURFACE EXISTING AROUND RADIUS WITH AC AND TRANSITION TO BC	25.0	1.16	0.250	18.87	4.72		25.0	2.0" COMPACTED DEPTH OF ASPHALT CONCRETE; BASE COURSE TO TRANSITION
216+61	LEFT	176TH ST	RESURFACE EXISTING UP TO ROW WITH ASPHALT CONCRETE	28.0	1.30	0.280	21.13	5.28	20.0		2.0" COMPACTED DEPTH OF ASPHALT CONCRETE
218+83	RIGHT	DRIVEWAY	TRANSITION TO BASE COURSE							25.0	BASE COURSE TO TRANSITION
233+96	RIGHT	FIELD ENT	TRANSITION TO BASE COURSE							15.0	BASE COURSE TO TRANSITION
233+96	LEFT	FIELD ENT	TRANSITION TO BASE COURSE							15.0	BASE COURSE TO TRANSITION
243+84	RIGHT	DRIVEWAY	TRANSITION TO BASE COURSE							25.0	BASE COURSE TO TRANSITION
253+64	RIGHT	DRIVEWAY	TRANSITION TO BASE COURSE							25.0	BASE COURSE TO TRANSITION
258+09	RIGHT	DRIVEWAY	TRANSITION TO BASE COURSE							25.0	BASE COURSE TO TRANSITION
261+71	RIGHT	DRIVEWAY	TRANSITION TO BASE COURSE							25.0	BASE COURSE TO TRANSITION
261+71	LEFT	FIELD ENT	TRANSITION TO BASE COURSE							15.0	BASE COURSE TO TRANSITION
269+91	RIGHT	177TH ST	RESURFACE EXISTING AROUND RADIUS WITH AC AND TRANSITION TO BC	25.0	1.16	0.250	18.87	4.72		25.0	2.0" COMPACTED DEPTH OF ASPHALT CONCRETE; BASE COURSE TO TRANSITION

TABLE OF ADDITIONAL QUANTITIES FOR DRIVEWAYS, APPROACHES AND INTERSECTING ROADS

Station	Left/Right	Description	Work Required	Class Q3R Hot Mixed Asphalt Concrete (Ton)	PG 58-34 Binder (Ton)	Hydrated Lime (Ton)	Virgin Aggregate (NABI) (Ton)	Salvaged Asphalt Concrete (NABI) (Ton)	Cold Milling Asphalt Concrete (SqYd)	Base Course (Ton)	Comments
269+91	LEFT	177TH ST	RESURFACE EXISTING AROUND RADIUS WITH AC AND TRANSITION TO BC	25.0	1.16	0.250	18.87	4.72		25.0	2.0" COMPACTED DEPTH OF ASPHALT CONCRETE; BASE COURSE TO TRANSITION
276+75	RIGHT	FIELD ENT	TRANSITION TO BASE COURSE							15.0	BASE COURSE TO TRANSITION
276+75	LEFT	DRIVEWAY	TRANSITION TO BASE COURSE							25.0	BASE COURSE TO TRANSITION
288+64	RIGHT	DRIVEWAY	TRANSITION TO BASE COURSE							25.0	BASE COURSE TO TRANSITION
288+64	LEFT	FIELD ENT	TRANSITION TO BASE COURSE							15.0	BASE COURSE TO TRANSITION
308+60	RIGHT	DRIVEWAY	TRANSITION TO BASE COURSE							25.0	BASE COURSE TO TRANSITION
308+60	LEFT	FIELD ENT	TRANSITION TO BASE COURSE							15.0	BASE COURSE TO TRANSITION
323+04	RIGHT	178TH ST	RESURFACE EXISTING AROUND RADIUS WITH AC AND TRANSITION TO BC	25.0	1.16	0.250	18.87	4.72		25.0	2.0" COMPACTED DEPTH OF ASPHALT CONCRETE; BASE COURSE TO TRANSITION
323+04	LEFT	178TH ST	RESURFACE EXISTING AROUND RADIUS WITH AC AND TRANSITION TO BC	25.0	1.16	0.250	18.87	4.72		25.0	2.0" COMPACTED DEPTH OF ASPHALT CONCRETE; BASE COURSE TO TRANSITION
325+33	RIGHT	FIELD ENT	TRANSITION TO BASE COURSE							15.0	BASE COURSE TO TRANSITION
325+33	LEFT	FIELD ENT	TRANSITION TO BASE COURSE							15.0	BASE COURSE TO TRANSITION
328+89	RIGHT	DRIVEWAY	TRANSITION TO BASE COURSE							25.0	BASE COURSE TO TRANSITION
343+80	RIGHT	FIELD ENT	TRANSITION TO BASE COURSE							15.0	BASE COURSE TO TRANSITION
343+80	LEFT	FIELD ENT	TRANSITION TO BASE COURSE							15.0	BASE COURSE TO TRANSITION
355+78	RIGHT	FIELD ENT	TRANSITION TO BASE COURSE							15.0	BASE COURSE TO TRANSITION
355+78	LEFT	DRIVEWAY	TRANSITION TO BASE COURSE							25.0	BASE COURSE TO TRANSITION
a43+39	RIGHT	179TH ST	RESURFACE EXISTING AROUND RADIUS WITH AC AND TRANSITION TO BC	25.0	1.16	0.250	18.87	4.72		25.0	2.0" COMPACTED DEPTH OF ASPHALT CONCRETE; BASE COURSE TO TRANSITION
a43+39	LEFT	179TH ST	RESURFACE EXISTING AROUND RADIUS WITH AC AND TRANSITION TO BC	25.0	1.16	0.250	18.87	4.72		25.0	2.0" COMPACTED DEPTH OF ASPHALT CONCRETE; BASE COURSE TO TRANSITION
a48+97	RIGHT	DRIVEWAY	TRANSITION TO BASE COURSE							25.0	BASE COURSE TO TRANSITION
a48+97	LEFT	FIELD ENT	TRANSITION TO BASE COURSE							15.0	BASE COURSE TO TRANSITION
a64+95	LEFT	FIELD ENT	TRANSITION TO BASE COURSE							15.0	BASE COURSE TO TRANSITION
a70+20	RIGHT	FIELD ENT	TRANSITION TO BASE COURSE							15.0	BASE COURSE TO TRANSITION
a70+28	LEFT	DRIVEWAY	TRANSITION TO BASE COURSE							25.0	BASE COURSE TO TRANSITION
a81+97	RIGHT	FIELD ENT	TRANSITION TO BASE COURSE							15.0	BASE COURSE TO TRANSITION
a96+43	RIGHT	FIELD ENT	TRANSITION TO BASE COURSE							15.0	BASE COURSE TO TRANSITION
a96+43	LEFT	180TH ST	RESURFACE EXISTING AROUND RADIUS WITH AC AND TRANSITION TO BC	25.0	1.16	0.250	18.87	4.72		25.0	2.0" COMPACTED DEPTH OF ASPHALT CONCRETE; BASE COURSE TO TRANSITION
a102+96	LEFT	FIELD ENT	TRANSITION TO BASE COURSE							15.0	BASE COURSE TO TRANSITION
a122+96	RIGHT	FIELD ENT	TRANSITION TO BASE COURSE							15.0	BASE COURSE TO TRANSITION
a122+96	LEFT	FIELD ENT	TRANSITION TO BASE COURSE							15.0	BASE COURSE TO TRANSITION
a149+36	RIGHT	SD 22	RESURFACE EXISTING UP TO ROW WITH ASPHALT CONCRETE	40.0	1.86	0.400	30.19	7.55	22.0		2.0" COMPACTED DEPTH OF ASPHALT CONCRETE
a149+36	LEFT	181ST ST	RESURFACE EXISTING AROUND RADIUS WITH AC AND TRANSITION TO BC	25.0	1.16	0.250	18.87	4.72		25.0	2.0" COMPACTED DEPTH OF ASPHALT CONCRETE; BASE COURSE TO TRANSITION
a163+34	RIGHT	DRIVEWAY	TRANSITION TO BASE COURSE							25.0	BASE COURSE TO TRANSITION

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(120)145	21	93

TABLE OF ADDITIONAL QUANTITIES FOR DRIVEWAYS, APPROACHES AND INTERSECTING ROADS

Station	Left/Right	Description	Work Required	Class Q3R Hot Mixed Asphalt Concrete (Ton)	PG 58-34 Binder (Ton)	Hydrated Lime (Ton)	Virgin Aggregate (NABI) (Ton)	Salvaged Asphalt Concrete (NABI) (Ton)	Cold Milling Asphalt Concrete (SqYd)	Base Course (Ton)	Comments
a164+98	LEFT	FIELD ENT	TRANSITION TO BASE COURSE							15.0	BASE COURSE TO TRANSITION
a182+74	LEFT	FIELD ENT	TRANSITION TO BASE COURSE							15.0	BASE COURSE TO TRANSITION
a196+91	RIGHT	FIELD ENT	TRANSITION TO BASE COURSE							15.0	BASE COURSE TO TRANSITION
a196+91	LEFT	FIELD ENT	TRANSITION TO BASE COURSE							15.0	BASE COURSE TO TRANSITION
a202+27	LEFT	DRIVEWAY	RESURFACE EXISTING UP TO ROW WITH ASPHALT CONCRETE	20.0	0.93	0.200	15.10	3.77	15.0		2.0" COMPACTED DEPTH OF ASPHALT CONCRETE
a202+29	RIGHT	FIELD ENT	TRANSITION TO BASE COURSE							15.0	BASE COURSE TO TRANSITION
a213+96	RIGHT	FIELD ENT	TRANSITION TO BASE COURSE							15.0	BASE COURSE TO TRANSITION
a226+45	LEFT	FIELD ENT	TRANSITION TO BASE COURSE							15.0	BASE COURSE TO TRANSITION
a226+60	RIGHT	FIELD ENT	TRANSITION TO BASE COURSE							15.0	BASE COURSE TO TRANSITION
			DRIVEWAYS	345.1	16.06	3.451	260.47	65.12	186.0	670.0	
			FIELD APPROACHES	0.0	0.00	0.000	0.00	0.00	0.0	570.0	
			INTERSECTING ROADS & CITY STREETS	506.0	23.54	5.060	381.92	95.48	129.0	300.0	
			Totals	851.1	39.60	8.511	642.39	160.60	315.0	1540.0	

The above quantities are included in the US 81 TABLE OF ADDITIONAL QUANTITIES.

TABLE OF GUARDRAIL REMOVAL AND INSTALLATION

		Remove Beam Guardrail (FT)	Type 1 MGS (FT)	Type 1 Retrofit Guardrail Transition (Each)	MGS MASH Tangent End Terminal (Each)	Guardrail Delineator (Each)
STR. NO. 15-190-186 MRM 155.40	Begin Bridge Rt (NW)	134.7	37.5	1	1	4
	Begin Bridge Lt (NE)	97.8	25.0	1	1	4
	End Bridge Rt (SW)	97.6	25.0	1	1	4
	End Bridge Lt (SE)	135.7	37.5	1	1	4
	TOTAL	**465.8**	**125.0**	**4**	**4**	**16**

The above quantities are included in the Estimate of Quantities.

SURFACING THICKNESS DIMENSIONS

The plans shown spread rates will be applied even though the thickness may vary from that shown in 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.

SCOPE OF WORK

Work on this project involves cold milling asphalt concrete, placement of asphalt concrete pavement, culvert repairs, rumble strips and pavement markings.

SEQUENCE OF OPERATIONS

The following Sequence of Operations will be adhered to. Any changes must be approved in writing by the Area Engineer prior to changes being made.

1. Install Traffic Control Signing.
2. Complete Grade Widening Sta. a 138+54.61 to a 163+95.72
3. Complete Culvert Repairs.
4. Complete Cold Milling Operations.
5. Complete Unclassified Excavation for Digouts and Backfill Operations.
6. Complete Asphalt Concrete Paving Operations.
7. Grind Rumble Stripes.
8. Complete Flush Seal.
9. Install Permanent Pavement Markings.
10. Refurbish Mailboxes.
11. Remove Traffic Control Signing.
12. Mow Project Inslopes and Complete any Remaining Project Cleanup.

Contractor requests to deviate from the sequence of operations will be submitted in writing to the Engineer for review. Approval of an alternate 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. An alternate sequence will be submitted for review a minimum of one week prior to potential implementation.

GENERAL NOTES

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

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.

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.

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.

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.

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.

Lane closures will be limited to 5 miles in length. The distance between the closest points of any two-lane closures will be at least 3 miles, excluding tapers.

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.

During Grade work Sta. a 138+54.61 to a 163+95.72, the Contractor will maintain traffic using flagger and pilot car during daylight hours. All drop offs greater than 2" will be protected by nightfall by the Contractor by blading and compacting existing material adjacent to the Asphalt Concrete carrying traffic. Traffic Control Drums will be utilized along the length of the grading area placed on the existing material during all non—working hours day or night.

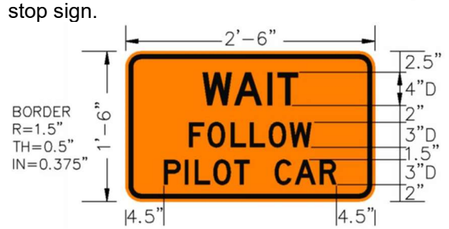
Grading work Sta. a 138+54.61 to a 163+95.72 will be completed prior to Asphalt Concrete Milling the remainder of the roadway.

Traffic between Sta.23+37 and 102+20 will be maintained one lane in each direction and will require the use of Drums and Candlesticks to replicate existing Gore Areas near the roundabout. Daily maintenance of Drums and Candlesticks will be required to allow for proper traffic movement by nightfall each day. A traffic control plan will be provided to the Engineer at the preconstruction meeting for approval. No work in this section of roadway will be allowed until the traffic control plan is approved.

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.

TYPE III FIELD LABORATORY

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

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.

GRADING OPERATIONS

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

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

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

UTILITIES

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

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.

SAW JOINT IN ASPHALT CONCRETE

Prior to the removal of in place asphalt concrete in widening sections, the existing pavement will be sawed full depth to a true line with a vertical face. See typical sections. If approved by the Engineer, the Contractor may elect to use a different method to create this vertical face. All costs to saw joint will be incidental to the contract unit price per foot for “Saw Joint in Asphalt Concrete”.

SALVAGE AND STOCKPILE ASPHALT MIX AND GRANULAR BASE MATERIAL

An estimated 3303.7 tons (1748 Cubic Yards) of asphalt mix and granular base material will be salvaged from the entire length of the existing highway (including ramps) and stockpiled at a site furnished by the Contractor and satisfactory to the Engineer.

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

Refer to the inplace typical sections for It is estimate of the inplace surfacing.

CONTRACTOR FURNISHED BORROW EXCAVATION

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

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

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

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

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

The Department will be responsible for the following minimum testing:

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

HORIZONTAL ALIGNMENT DATA

US Hwy 81

Type	Station			Northing	Easting
POB	a 136+00.00			352667.972	2719465.567
		TL = 2800.00	S 2°42'30" E		
POE	a 164+00.00			349871.099	2719597.868

US Hwy 81/SD Hwy 22 Intersection NW Quadrant

POB	0+00.00			351337.702	2719376.430
		TL = 73.26	N 87°15'56" E		
PC	0+73.26			351341.197	2719449.603
PI	1+28.25	R = 55.00	Delta= 89°59'49" L	351343.820	2719504.537
PT	1+59.65			351398.755	2719501.916
		TL = 6.87	N 2°43'53" W		
POE	1+66.52			351405.622	2719501.589

CONTROL DATA

HORIZONTAL AND VERTICAL CONTROL POINTS

POINT	STATION	OFFSET	DESCRIPTION	NORTHING	EASTING	ELEVATION
CP 1	North of Project		Rebar, MRM 147.43, 100' west of Hwy 81 Centerline, in fence between 2 post panel	353298.094	2719336.720	1716.027
CP 2	a 159+75.54	100.56' R	Property Pin, MRM 146.86, 100' west of Hwy 81 Centerline	350292.540	2719477.198	1735.753
CP	South of Project		Harn Point 81-140.70	318963.632	2715467.563	1745.400

SHRINKAGE FACTOR: Embankment +50%

TABLE OF EXCAVATION QUANTITIES BY BALANCES

Station	to	Station	Excavation (CuYd)	*Undercut (CuYd)	* Muck Exc. (CuYd)	* Contractor Furnished Borrow Exc. (CuYd)	Total Excavation (CuYd)	** Waste (CuYd)
US 81								
138+54.61		163+95.72	51	3822	441	10096	14410	441
US 81/SD 22 Intersection NW Quadrant								
0+00		1+66.52	46	237		218	501	
		Totals:	97	4059	441	10314	14911	441

* 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

	(CuYd)
Excavation	97
Undercut	4059
Topsoil	1171
Salvaged Asphalt Mix and Granular Base Material (from cut sections)	1748
Total	7075

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

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

Salvaged Asphalt Mix and Granular Base Material will be paid for at the contract unit price per ton and is also included in and paid for once as Unclassified Excavation. When finaling a project, the quantity of Salvaged Asphalt Mix and Granular Base Material from cut sections will not be added to the Excavation quantity as it is already in the cuts on the final cross sections.

UNDERCUTTING

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

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

The 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.

MUCK EXCAVATION

The areas of muck excavation are drawn on the cross sections with a normal depth of 3 feet. The estimated quantity of 411 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)
153+50		155+00	L	3	441

PIPE EXTENSIONS BACKFILL COMPACTION

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.

PIPE CULVERT UNDERCUT

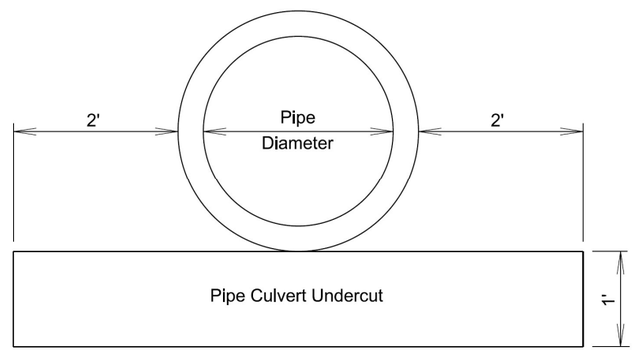
The table includes undercut for 36 inch and larger pipe culverts. The depth of undercut is an estimate and the actual depth necessary will be determined during construction. Pipes listed may or may not require undercutting and pipes not listed may require undercutting. The Engineer will determine which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

Station	Undercut Depth (Ft)	Pipe Culvert Undercut (CuYd)
a 154+98 L	1	9.9

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

Storm sewer and approach pipes do not require undercutting unless specified otherwise in these plans.

Pipe Diameter (In)	Round Pipe Undercut Rate for 1’ Depth (CuYd/Ft)	Arch Pipe Undercut Rate for 1’ Depth (CuYd/Ft)
24	0.2407	0.2577
30	0.2623	0.2847
36	0.2840	0.3110
42	0.3056	0.3337
48	0.3272	0.3596
54	0.3488	0.3827
60	0.3704	0.4105
66	0.3920	---
72	0.4136	0.4630
78	0.4352	---
84	0.4568	0.5123
90	0.4784	---



REMOVE AND REPLACE TOPSOIL

Topsoil will also be salvaged and stockpiled prior to constructing the following: culvert extension/resets and guardrail embankment area(s). 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.

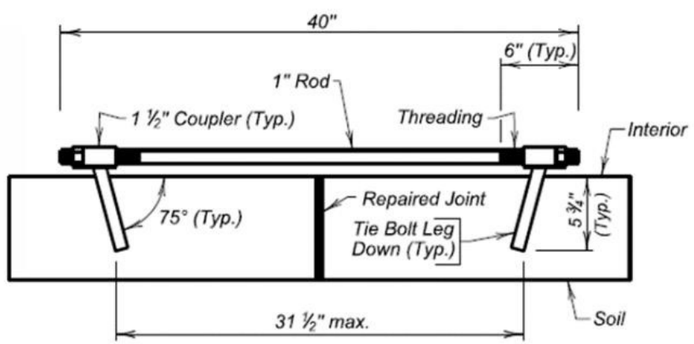
The estimated amount of topsoil to be removed and replaced is 350 CuYd. This quantity includes removal and replacement of 4" existing topsoil at pipe and guardrail areas.

All costs associated with removing and replacing the topsoil along areas to be resurfaced will be incidental to the contract lump sum price for REMOVE AND REPLACE TOPSOIL.

TIE BOLTS FOR REINFORCED CONCRETE 72" PIPE

All joints within the length specified for the 72" RCP culvert listed in the US 81 Table of Mainline Culvert Work 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 set-up 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 will be incidental to the contract unit price per each for TIE BOLTS FOR RCP.



RCP CULVERT REPAIRS FOR MAINLINE PIPE CULVERTS

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

Resetting and replacement of RCP will be completed prior to Class Q3R Asphalt Concrete paving.

All pipe installed new or reset on the project will be tied. Cost for drilling tie bolt holes and furnishing and installing tie bolts for reinforced concrete pipe will be incidental to the various pipe items.

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

Prior to culvert repair work the Contractor will remove and stockpile all of the in place topsoil from the construction areas. On completion of construction operations this salvaged topsoil will be spread evenly over the newly constructed embankment inslopes.

Pipe installation Sta. a154+98 Lt within the grading limits will require 18' extension of 42" RCP. This will be completed prior to widening the roadway for the addition of a turn lane. Pipe tie bars will be required on new and reset sections.

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.

In areas where granular material has been placed adjacent to the existing asphalt concrete, the Contractor will be required to remove the granular material to a depth below the existing asphalt concrete to allow for the placement of the new asphalt concrete. New asphalt concrete will be placed flush with the existing asphalt concrete. The existing granular material removed will be placed on the entrances, intersecting roads or other locations as directed by the Engineer.

All costs to remove and place the granular material including labor, equipment and incidentals will be incidental to the various related contract items.

SHOULDER CLEARING

Prior to cold milling, SDDOT personnel will spray the shoulders to kill existing vegetation.

Vegetation and accumulated material on or adjacent to the existing roadway edge will be removed by the Contractor, to the satisfaction of the Engineer, prior to cold milling. Any remaining windrow of accumulated material will be spread evenly on the inslope adjacent to the asphalt shoulder, to the satisfaction of the Engineer, following application of the flush seal.

The Contractor will notify the Watertown Area Office at (605) 882-5166 at least two weeks prior to beginning work on this project so SDDOT personnel can spray along the shoulder and inslopes. The Department will not be responsible for the effectiveness of the spraying.

Each shoulder will be measured for payment. Costs associated with this work will be included in the contract unit price per mile for SHOULDER CLEARING.

COLD MILLING ASPHALT CONCRETE

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

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

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 **12,000** tons of cold milled asphalt concrete material. An estimated **4,255** 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 Contractor is responsible to assure enough asphalt concrete salvage is available for the Class Q3R Hot Mixed Asphalt Concrete

An estimated quantity of the salvaged asphalt concrete material will be blended and stockpiled according to the Blend, Haul, and Stockpile Granular Material plan note. Any remaining salvaged asphalt concrete material will become the property of the Contractor for disposal.

BLEND, HAUL, AND STOCKPILE GRANULAR MATERIAL

Excess salvaged asphalt concrete material estimated at **6,000** tons (for informational purposes only) will be blended with **6,000** tons of Granular Material, Furnish and will be hauled, blended and stockpiled at the Watertown Area Maintenance Yard at 5000 9th Ave SE Watertown, SD.

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.2 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.

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 Asphalt Concrete Composite and Base Course. The depth of asphalt will match the in-place thickness.

Included in the Estimate of Quantities are 50 cubic yards of Unclassified Excavation, Digouts and 75 square yards of Remove Asphalt Concrete Pavement per mile for the removal of asphalt and unstable material throughout the project.

Included in the Estimate of Quantities are 100 tons of Base Course and 25 tons of Asphalt Concrete Composite 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.

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

WATER FOR COMPACTION OF GRANULAR MATERIALS

Cost of water for compaction of the granular material will be incidental to the contract unit price for the various contract items. Six percent, plus or minus, moisture will be required at the time of compaction unless otherwise directed by the Engineer.

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.

ASPHALT FOR TACK

Included in the Estimate of Quantities are **2.7** tons of SS-1h or CSS-1h Asphalt for Tack for surface repair, strengthening, and spot leveling areas throughout the project. (Rate = 0.09 Gal./ Sq.Yd.).

ASPHALT CONCRETE BLADE LAID

Included in the Estimate of Surfacing Quantities are 375 tons of Asphalt Concrete Blade Laid, 3.8 tons of Hydrated Lime, and 27.75 tons of PG 58-34 Asphalt Binder per mile and will be tight bladed on the existing surface 60 feet wide prior to the overlay of Section 1.

Included in the Estimate of Surfacing Quantities are 300 tons of Asphalt Concrete Blade Laid, 3 tons of Hydrated Lime, and 22.2 tons of PG 58-34 Asphalt Binder per mile and will be tight bladed on the existing surface 48 feet wide prior to the overlay of Section 2.

Included in the Estimate of Surfacing Quantities are 150 tons of Asphalt Concrete Blade Laid, 1.5 tons of Hydrated Lime, and 11.1 tons of PG 58-34 Asphalt Binder per mile and will be tight bladed on the existing surface 24 feet wide prior to the overlay of Section 3.

Included in the Estimate of Surfacing Quantities are 225 tons of Asphalt Concrete Blade Laid, 2.3 tons of Hydrated Lime, and 16.7 tons of PG 58-34 Asphalt Binder per mile and will be tight bladed on the existing surface 36 feet wide prior to the overlay of Section 4.

Mineral Aggregate for tight bladed material will use only the fine aggregate components combined in the same proportions as the Class Q3R Hot Mixed Asphalt Concrete mix. Quality testing is not required on the coarse aggregate (+No. 4 sieve) in this mixture.

The Asphalt Concrete Blade Laid Lift will be designed using an N_{design} Gyratory Compactive Effort of 65. The asphalt binder content will be determined so that the air voids of Asphalt Concrete Blade Laid Lift are between 3.0% and 5.0%.

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.

MODIFIED CLASS S ASPHALT CONCRETE

Mineral aggregate for the Modified Class S Asphalt Concrete will conform to the requirements for Class S, Type 1 except for the following change to the gradation:

Passing 3/4” sieve	100%
Passing 5/8” sieve	97-100%
Passing 1/2" sieve	86-100%
Passing 3/8” sieve	66-80%
Passing No. 4 sieve	25-35%
Passing No. 8 sieve	12-22%
Passing No. 200 sieve	8.0-12.0%

When directed by the Engineer, the Contractor will saw and remove a total of three undamaged compaction cores (4” dia. min.) from designated area(s) and repair the hole(s) to the satisfaction of the Engineer. All costs associated with the compaction cores will be incidental to the contract unit price per each for Compaction Sample.

All other requirements in the Specifications for Class S Asphalt Concrete will apply.

GRIND RUMBLE STRIP IN ASPHALT CONCRETE

Asphalt concrete rumble strips will be constructed on the shoulders. Rumble strips will be paid for at the contract unit price per mile for Grind 12” Rumble Strip or Stripe in Asphalt Concrete. Rumble Strips will only be placed where the speed limit is 50 mph or greater. It is estimated that **18.4** miles of asphalt concrete rumble strips will be required from Sta. 78+66 to Sta. a141+86 thru equation and Sta. a156+86 to Sta. a245+36.

Rumble strip installation will be completed prior to application of the flush seal and permanent pavement markings. In the event the flush seal is eliminated from the contract, the Contractor will still be required to apply a flush seal to the newly installed 12” rumble strips at a width of 18” and at the same rate as specified in this plan set. No adjustment in payment will be made and SS-1h or CSS-1h Asphalt for Flush Seal will be paid at the contract unit price per ton.

GRIND SINUSOIDAL CENTERLINE RUMBLE STRIPE IN ASPHALT CONCRETE

Sinusoidal rumble stripes will be constructed on the centerline, as detailed in the plan set. Sinusoidal rumble stripes will be paid for at the contract unit price per mile for Grind Sinusoidal Centerline Rumble Stripe in Asphalt Concrete. Rumble Strips will only be placed where the speed limit is 50 mph or greater. It is estimated that **9.2** miles of sinusoidal rumble stripes will be required from Sta. 78+66 to Sta. a141+86 thru equation and Sta. a156+86 to Sta. a245+36.

Sinusoidal rumble stripe installation will be completed prior to application of the flush seal and permanent pavement markings. In the event the flush seal is eliminated from the contract, the Contractor will still be required to apply a flush seal to the newly installed sinusoidal rumble stripes. No adjustment in payment will be made and SS-1h or CSS-1h Asphalt for Flush Seal will be paid at the contract unit price per ton.

CENTERLINE RUMBLE STRIPES – FLUSH SEAL

Asphalt for Flush Seal will be applied to the Class S Asphalt Concrete after the centerline rumble stripes have been installed. The application width will be 1.5 feet with an application rate of 0.05 gal./sq.yd on the centerline rumble stripes.

TEMPORARY PAVEMENT MARKINGS

The total length of no passing zone on this project is estimated to be **7.0** miles.

It is estimated that 32 DO NOT PASS (R4-1) and 32 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 Cold Milled Surface.
One pass on top of the Blade Laid Surface.
One pass on top of the Lift of Class Q3R Asphalt Concrete.
One pass on top of the Lift of Class S Asphalt Concrete.

Temporary flexible vertical markers (tabs) will be used to mark dashed centerline, No Passing Zones, and applicable lane lines. Paint will not be allowed for temporary pavement marking on the asphalt concrete wear course or after application of the flush seal.

Covers on the tabs will be sufficiently secured to prevent traffic from dislodging the cover and when removed, the covers will be properly disposed of. The Contractor will remove and properly dispose of the tabs

after permanent pavement marking is applied. Method of removal will be nondestructive to the road surface and will be accomplished within one week of completion of the permanent pavement marking.

Any temporary flexible vertical markers (tabs) with covers removed before the flush seal will be replaced prior to application of the flush seal. Full reflectivity of all temporary flexible vertical markers (tabs) is required at all times. The Contractor will be required to replace any missing or non-reflective tabs at no additional cost to the State.

If the flush seal is eliminated, the application of the temporary pavement marking on top of the flush seal will be eliminated. No adjustment in the contract unit price for TEMPORARY PAVEMENT MARKING will be made because of a variation in quantities

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.

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.

4” White Pavement Markings will be Durable Pavement Marking and 4” Yellow Pavement Markings will be High Build Waterborne Pavement Marking with Reflective Elements.

COLD APPLIED PLASTIC PAVEMENT MARKING

All materials will be applied as per the manufacturer’s recommendations.

Cold Applied Plastic Pavement Markings will be 3M Series 380 AW or an approved equal.

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 consisting of glass beads as well as bonded core reflective elements will be adhered to the paint.

The bonded core reflective elements will contain either clear or yellow tinted microcrystalline ceramic beads bonded to the outer surface. The bonded core reflective elements will provide a 50/50 blend of dry to wet ratio of reflective element. All microcrystalline ceramic beads bonded to reflective elements will have a minimum index of refraction of 1.8 for dry retroreflectivity and 2.4 for wet retroreflectivity when tested using the liquid oil immersion method.

The Department will take retroreflectivity readings on the pavement marking lines no sooner than 3 days and no later than 30 days after the completion of all line applications required for an individual highway route using a portable retroreflectometer conforming to 30-meter geometry. Retroreflectivity readings will be taken on a test location with cleaning being limited to light hand brooming.

Pavement markings not conforming to the retroreflectivity requirements will be removed and replaced. If replacement of markings cannot be applied within the same year, the Contractor will schedule subject work to be completed no later than June 15th in the following year. Upon replacement, the retroreflectivity testing process will be done again requiring new readings.

The Department will randomly select one test location per mile of each edge line including ramps and one test location per mile of centerline (solid and/or skip line will be considered as one centerline). Three retroreflectivity readings will be taken at each test location. The three readings will be averaged and become the reading for that test location.

Initial readings:

Pavement Marking Color	Minimum Value
White	350 mc/m^2/lux
Yellow	275 mc/m^2/lux

All pavement markings not conforming to the requirements provided in these plans will be considered deficient and will be removed and replaced. Additional retroreflectivity readings will be taken by the Department to determine the limits of removal. The removal will be accomplished using suitable sand blasting or grinding equipment unless the Engineer authorizes other means. The removal process will remove at least 90% of the deficient line, with no excessive scarring of the existing pavement. The removal width will be one inch wider all around the nominal width of the pavement marking to be removed. Removal and replacement of the pavement markings will be at the Contractor’s expense, with no cost incurred by the State.

RATES OF MATERIALS FOR HIGH BUILD WATERBORNE PAVEMENT MARKING PAINT

Solid 4” line = 27.8 Gals/Mile
Dashed 4” line = 7.6 Gal/Mile
Glass Beads = 5.3 Lbs/Gal.
Composite Reflective Elements = 2.1 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.

MARKINGS WITHIN SINUSOIDAL CENTERLINE RUMBLE STRIPES

Sinusoidal rumble stripes exist on US81.

The sinusoidal centerline rumble stripes are recessed below the pavement surface, so pavement marking grooving will not be required at these locations.

Sinusoidal rumble stripes will receive an asphalt surface treatment to seal the centerline joint and minimize the depth of water held on centerline.

Retroreflectivity readings will not be taken for pavement markings within the sinusoidal rumble stripe. Restriping of pavement markings to meet the specified application rate requirements and to provide a quality retroreflective line will be at the expense of the Contractor with no additional cost to the Department. Sections to be restriped will be determined by the Engineer.

GROOVING FOR COLD APPLIED PLASTIC PAVEMENT MARKING

The Contractor will establish a positive means for the removal of the grinding and/or grooving residue. Residue from dry grooving will be vacuumed. Solid residue will be removed from the pavement surfaces before being blown by traffic action or wind. The Contractor will conduct this work to control and minimize airborne dust and similar debris that may become a hazard to motor vehicle operation or nuisance to property owners. Residue from wet grooving will not be permitted to flow across lanes being used by public traffic or into gutter or drainage facilities. Residue, whether in solid or slurry form, will be disposed of in a manner that will prevent it from reaching any waterway in a concentrated state. The cleaning of the residue for grooving will be to the satisfaction of the Engineer and may require more than one pass to adequately remove material. All costs for removal of grinding and/or grooving residue will be included in the contract unit price per foot, square foot, or each for "Grooving for Cold Applied Plastic Pavement Marking" contract items.

4" Pavement Marking Table

Station	Durable Pavement Marking, 4" White (Feet)	High Build Waterborne Pavement Marking Paint with Reflective Elements, Yellow (Gal)	Grooving for Pavement Markings (Feet)
23+37 – 55+17	7,120	33.4	13,480
61+86 – 102+20	9,681	42.2	17,749
102+20 – 152+50	10,060	16.8	15,090
152+50 – 177+45	5,490	52.5	15,470
177+45 – 205+00	5,510	9.2	8,265
205+00 – 223+41	4,279	38.6	11,643
223+41 – 331+80	21,679	37.2	32,518
a0+00 – a245+36	49,070	92.0	73,608
a144+46-a154+46	1050	0	1050
Totals	113,939	321.9	188,873

TYPE 2 OBJECT MARKERS

New back to back object markers with new posts will be install on each side of the roadway as per Standard Plate 632.04.

All costs associated with removal of in place pipe markers and installation of new back to back object markers will be incidental to the contract unit price per each for TYPE 2 OBJECT MARKER BACK TO BACK.

PLACING TOPSOIL

The thickness will be approximately 4 inches within the right-of-way and 6 inches on temporary easements.

The estimated amount of topsoil to be placed is as follows:

Station	to	Station	Topsoil (CuYd)
a 138+55		a 163+76	1,171
		Total:	**1,171**

PERMANENT SEEDING

The areas to be seeded consist of all newly graded areas within the project limits except for the top of roadways and temporary easements under cultivation.

Type C Permanent Seed Mixture will consist of the following:

Grass Species	Variety	Pure Live Seed (PLS) (Pounds/Acre)
Western Wheatgrass	Arriba, Flintlock, Rodan, Rosana, Walsh	16
Canada Wildrye	Mandan	2
	Total:	**18**

FERTILIZING

Application of fertilizer will not be required on this project.

COVER CROP SEEDING

Cover crop seeding may be used on this project as a temporary erosion control measure. The actual limits and use of cover crop seeding will be determined by the Engineer during construction.

MULCHING (GRASS HAY OR STRAW)

An additional 2 tons of Grass Hay or Straw Mulch has been added to the Estimate of Quantities for temporary erosion control on areas determined by the Engineer during construction.

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.

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.

The mycorrhizal inoculum will be as shown below or an approved equal:

Product	Manufacturer
MycoApply	Mycorrhizal Applications, Inc. Grants Pass, OR Phone: 1-866-476-7800 www.mycorrhizae.com
AM 120 Multi Species Blend	Reforestation Technologies Int. Gilroy, CA Phone: 1-800-784-4769 www.reforest.com
LALRISE Prime and Max WP	Lallemand Specialties Inc. Milwaukee, WI Phone: 1-844-590-7781 www.lallemandplantcare.com

EROSION CONTROL WATTLE

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

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

Erosion control wattles will remain on the project to decompose.

A quantity of 200' of 12" Diameter Erosion Control Wattles has been added to the Estimate of Quantities for temporary erosion and sediment control in highway ditch channels and as an alternative to low flow or high flow silt fence at wetland areas adjacent to the highway.

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

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

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)
60+32 to 60+72 L	Along ROW	40
60+32 to 60+72 R	Along ROW	40
	Additional Quantity:	40
	Total:	120

MAILBOXES

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

If large mailboxes are located at double mailbox installations, a single post may need to be used for the large mailbox.

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

TABLE OF REFURBISH MAILBOXES

Location STA	SIDE	SINGLE MAILBOX EACH	DOUBLE MAILBOX EACH
34+44	RT		1
34+47	RT		1
34+50	RT		1
34+53	RT		1
35+30	RT	1	
35+50	LT	1	
48+77	RT	1	
48+80	RT	1	
49+20	LT	1	
50+34	LT	1	
51+57	LT	1	
52+14	LT	1	
54+52	LT	1	
55+55	LT	1	
98+85	RT	1	
106+45	RT	1	
106+47	RT	1	
108+35	RT	1	
108+48	RT	1	
111+31	RT	1	
124+68	RT	1	
145+65	RT	1	
169+88	RT	1	
197+29	RT	1	
219+08	RT	1	
243+57	RT	1	
253+72	RT	1	
258+06	RT	1	
258+06	RT	1	
258+06	RT	1	
261+70	RT	1	
276+53	RT	1	
288+42	RT	1	
308+31	RT	1	
328+65	RT	1	
a24+04	RT	1	
a43+87	RT	1	
a48+44	RT		1
a70+70	RT	1	
a163+15	RT		1
TOTALS		33	6

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(120)145	32	93

TABLE OF CONSTRUCTION STAKING

(See Special Provision for Contractor Staking)

					Grade Staking					
Roadway and Description	Begin Station	End Station	Number of Lanes	Length (Ft)	Length (Mile)	Lane Factor	*Sets of Stakes	**Grade Staking Quantity (Mile)	Miscellaneous Staking Quantity (Mile)	Slope Staking Quantity (Mile)
US 81 (Turn Lane Widening)	138+54.61	163+95.72	1	2541.11	0.481	0.5	1	0.241	0.481	0.481
US 81/SD 22 Intersection Northwest Quadrant	0+00	1+66.52	1	166.52	0.032	0.5	1	0.016	0.032	0.032
							Totals:	0.257	0.513	0.513

* 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)

PLOTTED FROM - $$USERNAME$$

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** 193 Acres
- **5.3 (3b): Total Area to be Disturbed** 1.25 Acres
- **5.3 (3c): Maximum Area Disturbed at One Time** 1.25 Acres
- **5.3 (3d): Existing Vegetative Cover (%)** 65 %
- **5.3 (3d): Description of Vegetative Cover** Native and Introduced East River Grasses
- **5.3 (3e): Soil Properties:** USDA-NRCS Soil Series Classification Loam, Silt Loam, Silt Clay Loam
- **5.3 (3f): Name of Receiving Water Body/Bodies** Big Sioux River
- **5.3 (3g): Location of Construction Support Activity Areas**

5.3 (3h): ORDER OF CONSTRUCTION ACTIVITIES

- **Special sequencing requirements (**see Sequence of Operations notes).

The Contractor will enter the Estimated Start Date.

Description	Estimated Start Date
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 Culvert.	
Install inlet and culvert protection after completing storm drainage installation.	
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**

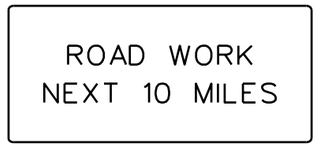
If there are multiple operators at the site, the Contractor's Erosion Control Supervisor must notify each operator that may be impacted by the change to the SWPPP within 24 hours.

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.

FIXED LOCATION GROUND MOUNTED BREAKAWAY SUPPORT SIGNS

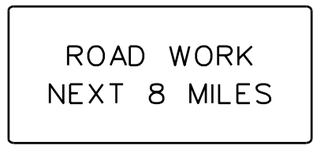
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(120)145	37	93

A



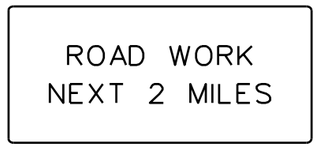
G20-1

B



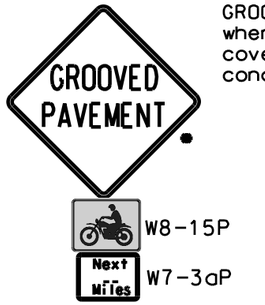
G20-1

C



G20-1

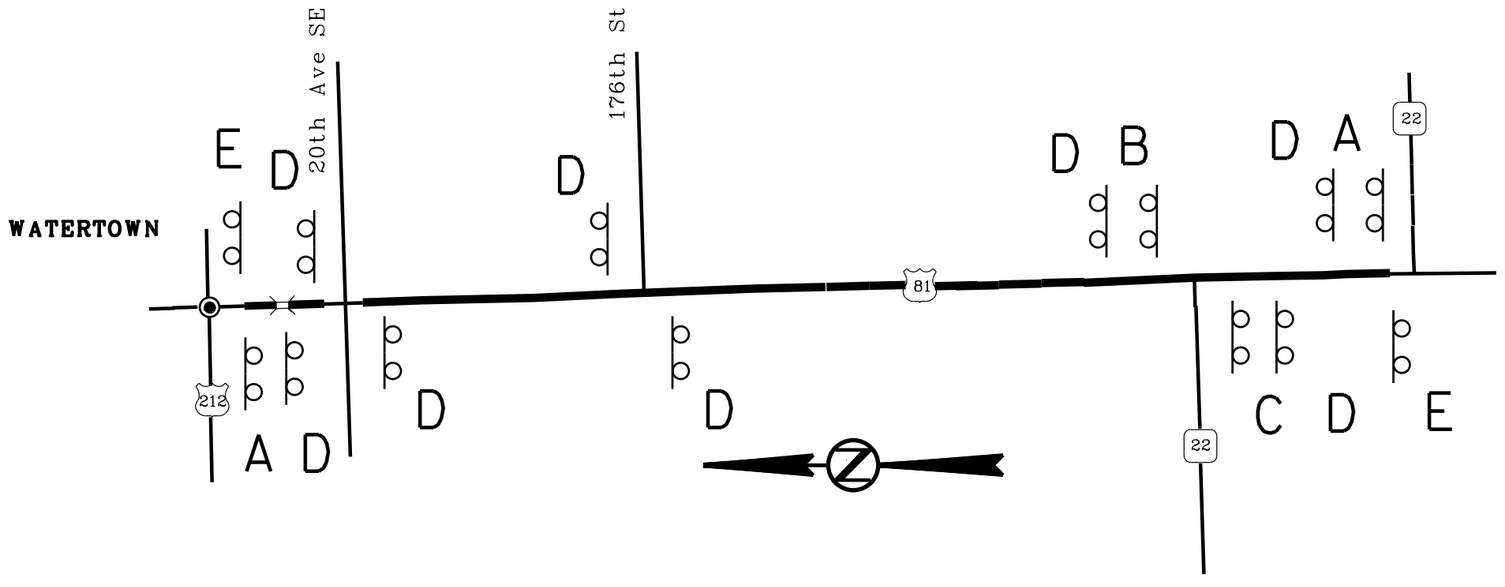
D



GROOVED PAVEMENT signs must only be visible when the condition exists. Signs will be covered or removed when the grooved road condition is not present.

E

G20-2



EXACT LOCATION OF SIGNS TO BE DETERMINED IN THE FIELD BY THE ENGINEER.

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

PLOTTED FROM - $$USERNAME$$

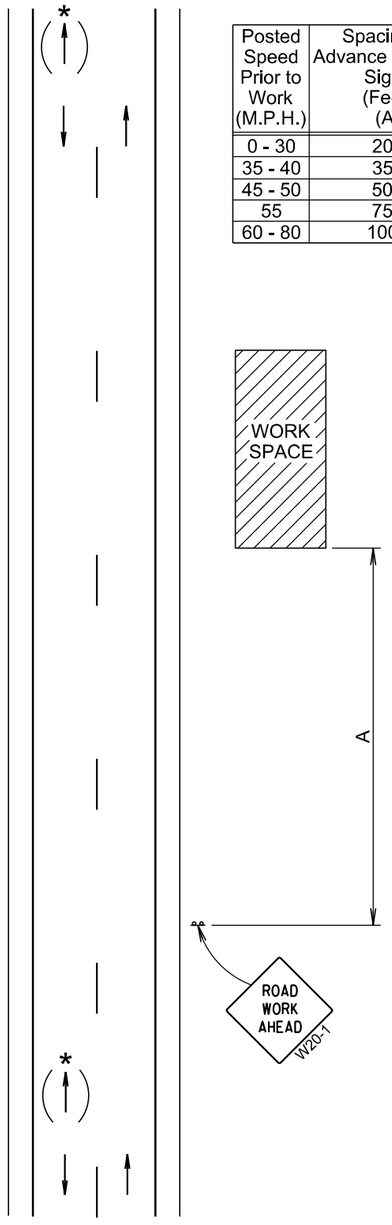
The signs illustrated are not required if the work space is behind a barrier, more than 2 feet behind the curb, or 15 feet or more from the edge of any roadway.

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

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

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

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



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

January 22, 2021

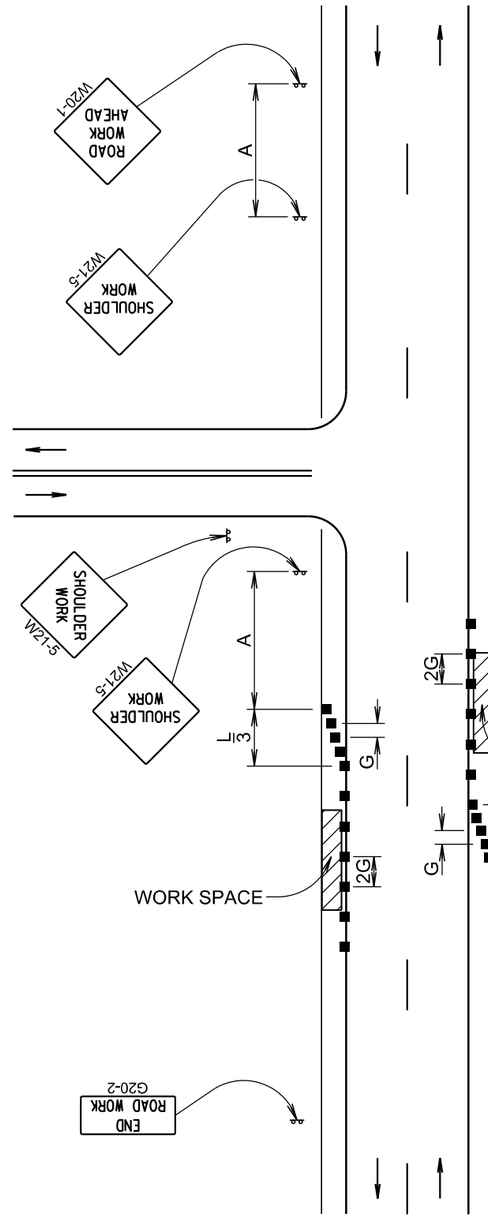
Published Date: 2025

SDDOT

WORK BEYOND THE SHOULDER

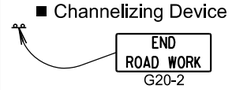
PLATE NUMBER 634.01

Sheet 1 of 1



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

■ Channelizing Device



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

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

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

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

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

January 22, 2021

Published Date: 2025

SDDOT

WORK ON SHOULDERS

PLATE NUMBER 634.03

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.

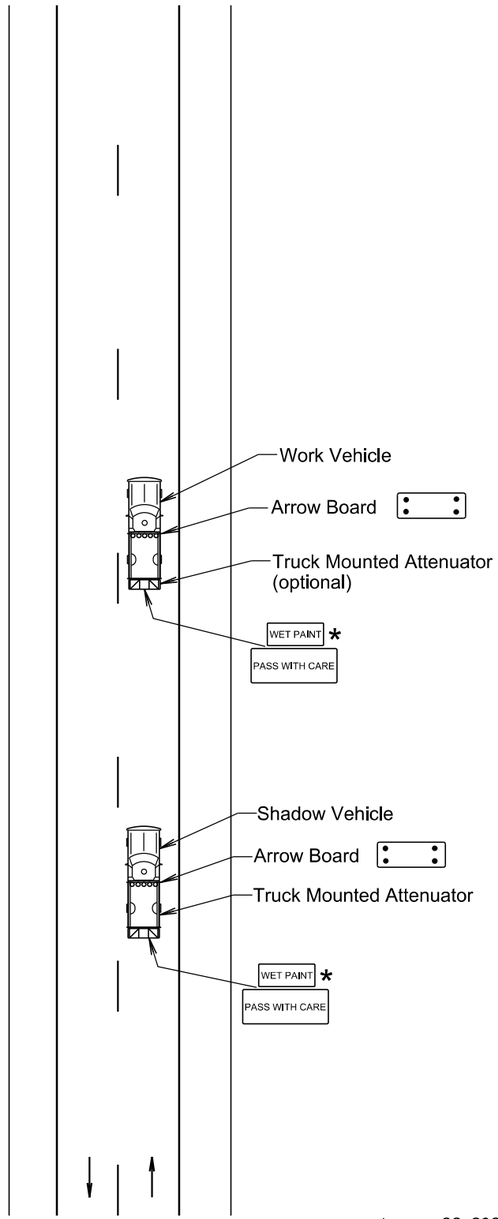
Shadow and Work vehicles will display high-intensity rotating, flashing, oscillating, or strobe lights, flags, signs, or arrow boards.

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".

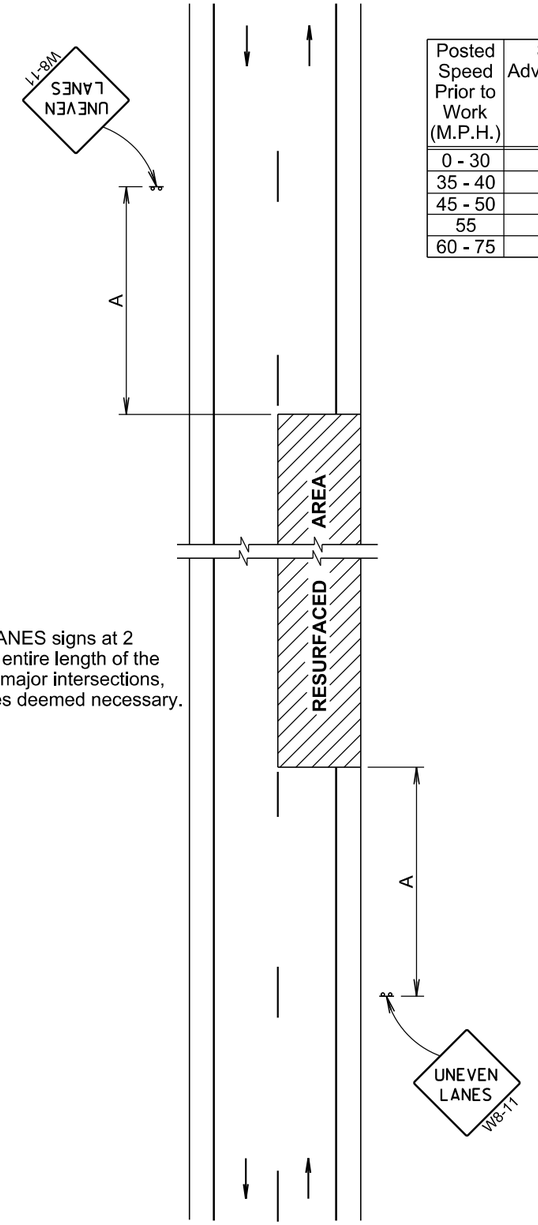


January 22, 2021

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

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

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(120)145	40	93

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.

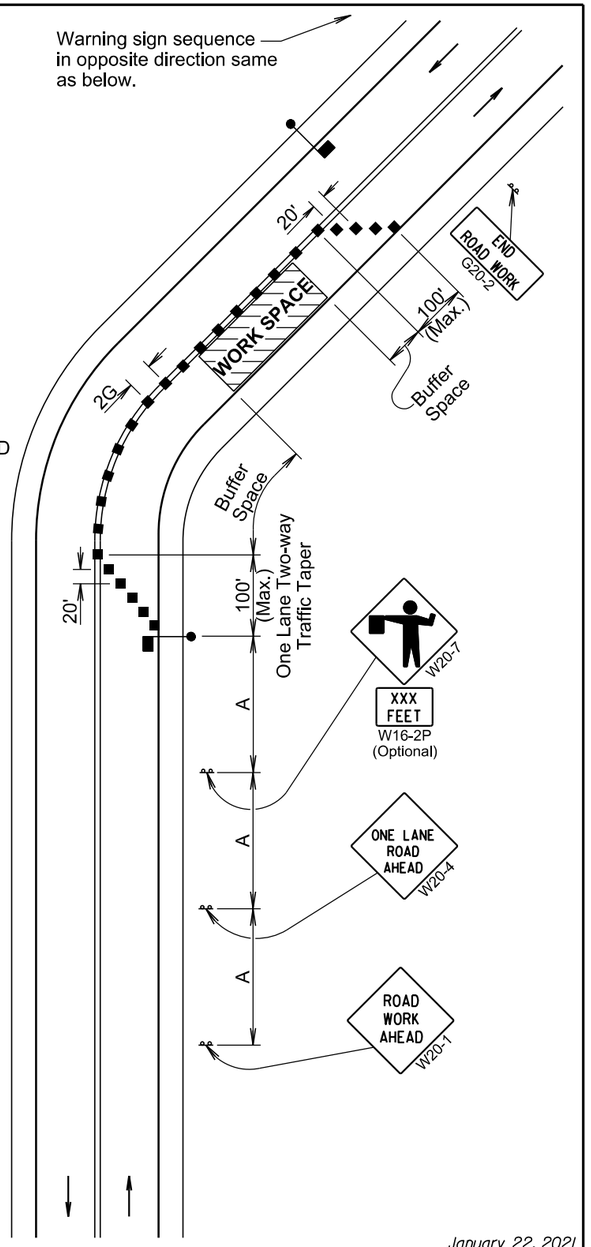
Channelizing devices are not required along the centerline adjacent to work area when pilot cars are utilized for escorting traffic through the work area.

END ROAD WORK G20-2

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

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

Posted Speed Prior to Work (M.P.H.)	Spacing of Channelizing Devices (Feet) (G)
0 - 30	25
35 - 45	25
50	50 *
55	50 *
60 - 65	50 *

* Spacing is 40' for 42" cones.

Reflectorized Drum

Channelizing Device

4Y 4" Yellow Temporary Pavement Marking

Urban areas and intersecting streets may limit sign spacing.

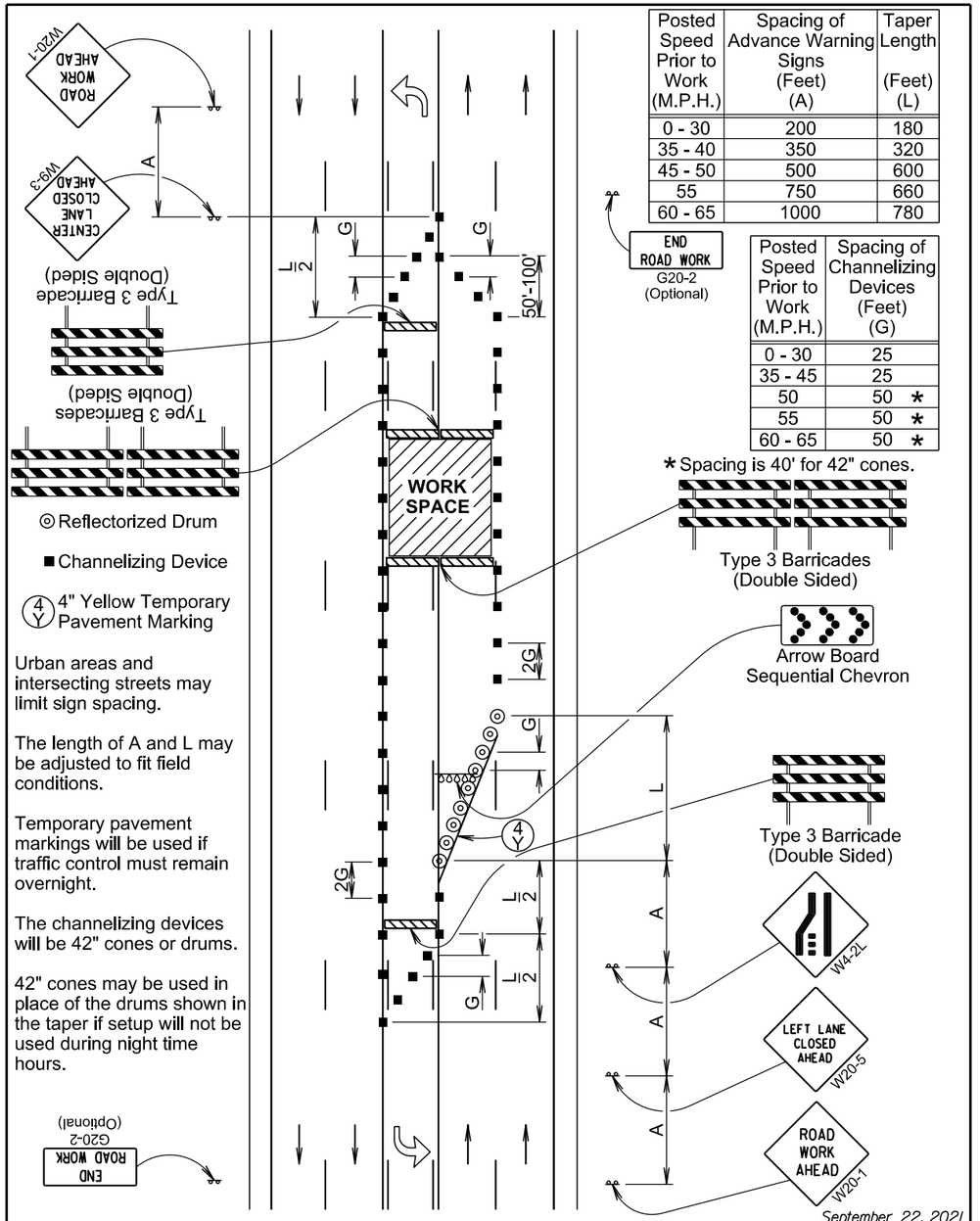
The length of A and L may be adjusted to fit field conditions.

Temporary pavement markings will be used if traffic control must remain overnight.

The channelizing devices will be 42" cones or drums.

42" cones may be used in place of the drums shown in the taper if setup will not be used during night time hours.

END ROAD WORK G20-2 (Optional)



September 22, 2021

Published Date: 2025

SDDOT

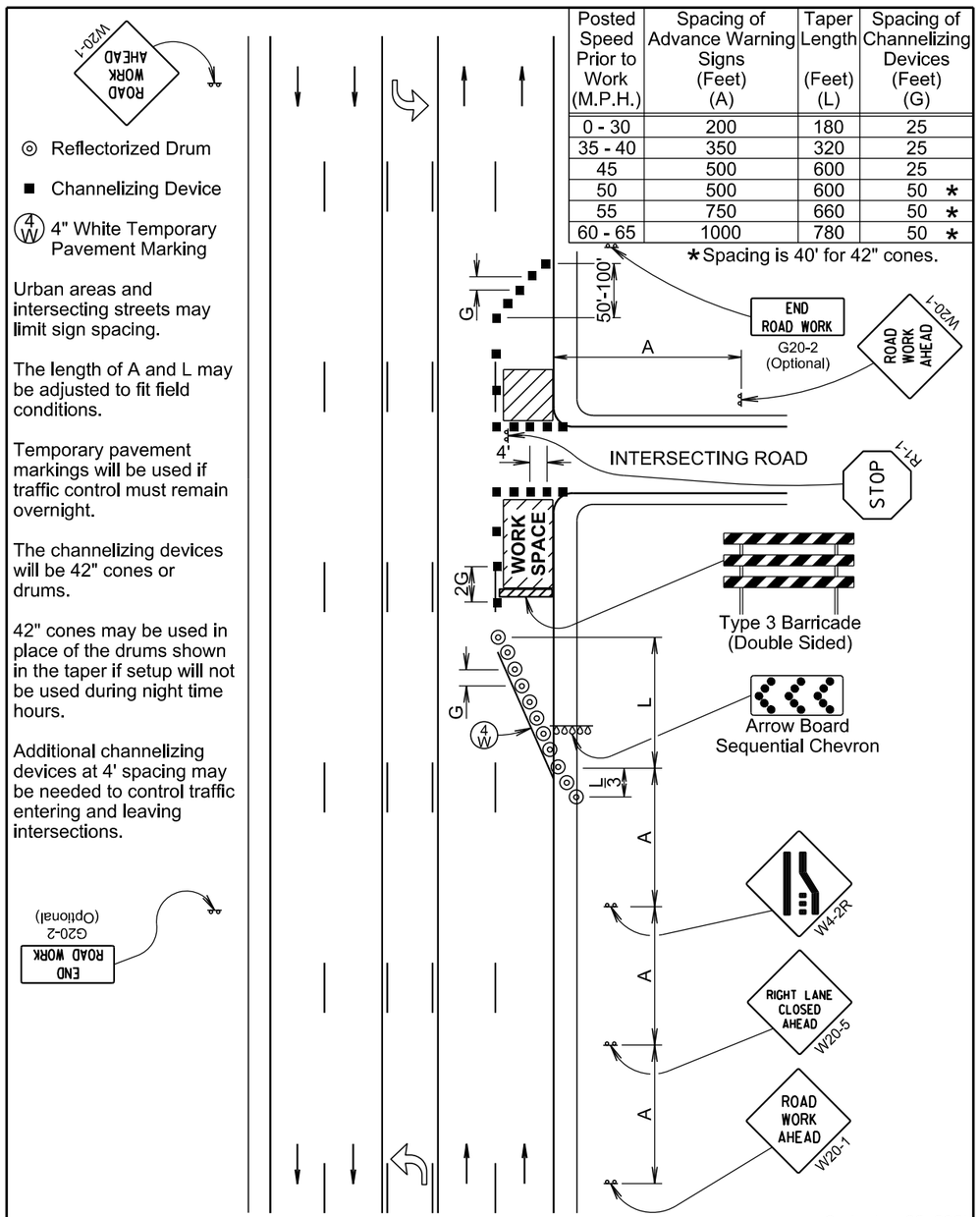
5-LANE, INSIDE 2 LANES CLOSED

PLATE NUMBER 634.56

Sheet 1 of 1

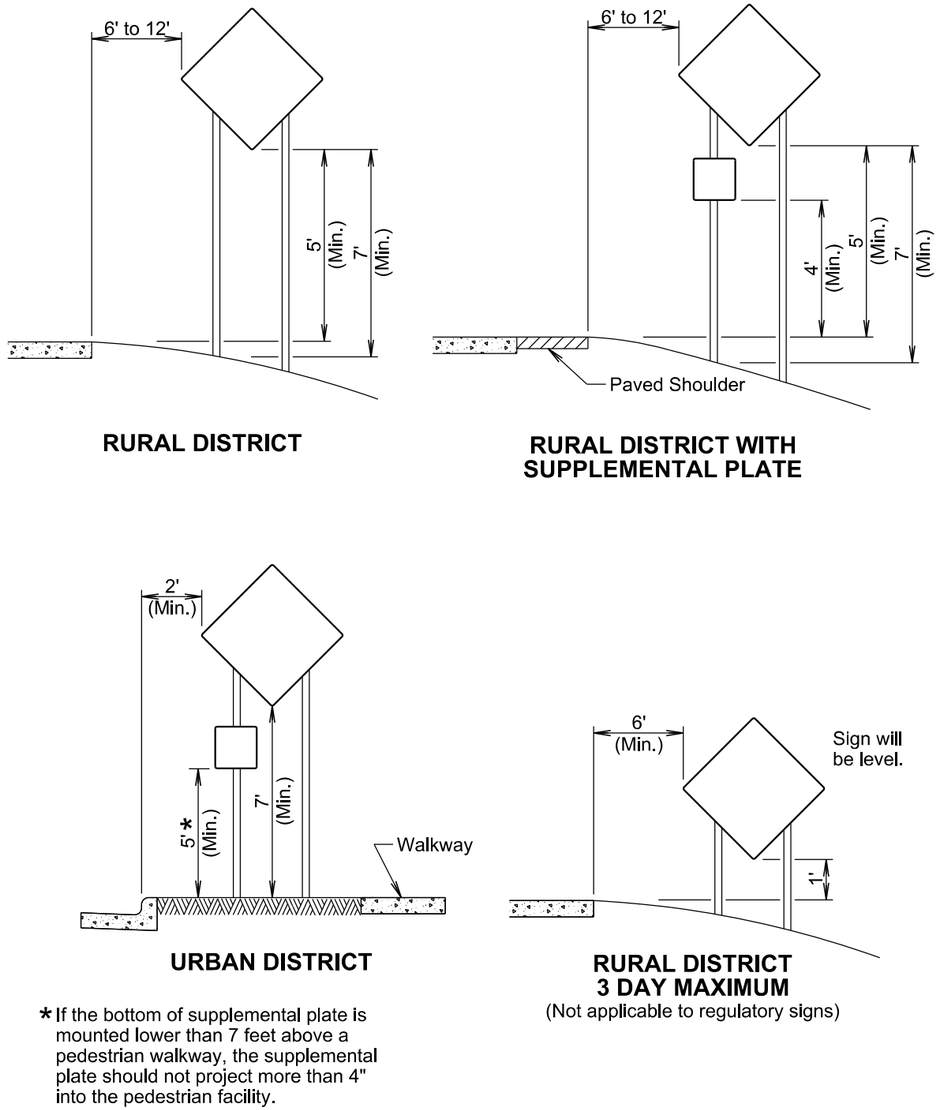
PLOTTED FROM - $$USERNAME$$

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(120)145	41	93



September 22, 2021

Published Date: 2025	SDDOT	5-LANE, OUTSIDE LANE CLOSED	PLATE NUMBER 634.60
			Sheet 1 of 1



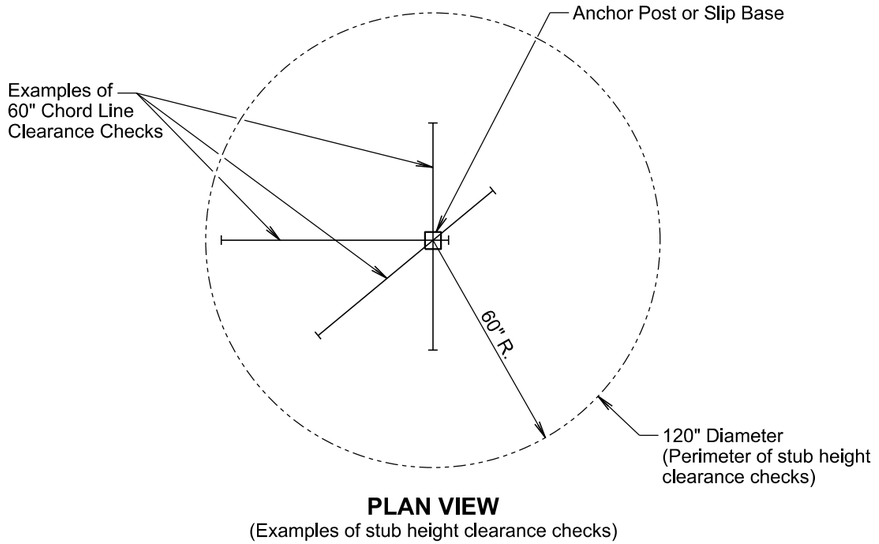
*If the bottom of supplemental plate is mounted lower than 7 feet above a pedestrian walkway, the supplemental plate should not project more than 4" into the pedestrian facility.

January 22, 2021

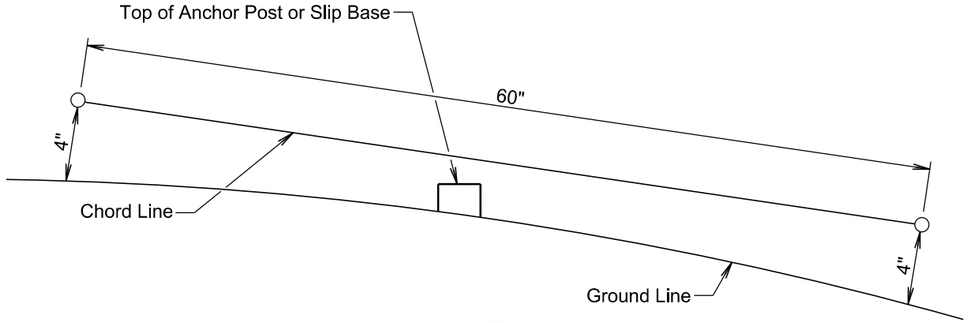
Published Date: 2025	SDDOT	CRASHWORTHY SIGN SUPPORTS (Typical Construction Signing)	PLATE NUMBER 634.85
			Sheet 1 of 1

PLOTTED FROM - $$USERNAME$$

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(120)145	42	93



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.

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

January 22, 2021

Published Date: 2025	SDDOT	*BREAKAWAY SUPPORT STUB CLEARANCE*	*PLATE NUMBER* 634.99
			Sheet 1 of 1

ITEMIZED LIST FOR TRAFFIC CONTROL SIGNS

SIGN CODE	SIGN DESCRIPTION	CONVENTIONAL ROAD NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
W4-2	LEFT or RIGHT LANE ENDS (symbol)	1	48" x 48"	16.0	16.0
W7-3aP	NEXT __ MILES (plaque)	8	36" x 30"	7.5	60.0
W8-1	BUMP	8	48" x 48"	16.0	128.0
W8-6	TRUCK CROSSING	4	48" x 48"	16.0	64.0
W8-7	LOOSE GRAVEL	4	48" x 48"	16.0	64.0
W8-11	UNEVEN LANES	2	48" x 48"	16.0	32.0
W8-15	GROOVED PAVEMENT	8	48" x 48"	16.0	128.0
W8-15P	MOTORCYCLE (plaque)	8	24" x 18"	3.0	24.0
W9-3	CENTER LANE CLOSED AHEAD	2	48" x 48"	16.0	32.0
W20-1	ROAD WORK AHEAD	8	48" x 48"	16.0	128.0
W20-4	ONE LANE ROAD AHEAD	2	48" x 48"	16.0	32.0
W20-5	LEFT or RIGHT LANE CLOSED AHEAD	1	48" x 48"	16.0	16.0
W20-7	FLAGGER (symbol)	2	48" x 48"	16.0	32.0
W21-2	FRESH OIL	2	48" x 48"	16.0	32.0
W21-5	SHOULDER WORK	2	48" x 48"	16.0	32.0
G20-1	ROAD WORK NEXT _10_ MILES	2	36" x 18"	4.5	9.0
G20-1	ROAD WORK NEXT _8_ MILES	1	36" x 18"	4.5	4.5
G20-1	ROAD WORK NEXT _2_ MILES	1	36" x 18"	4.5	4.5
G20-2	END ROAD WORK	2	36" x 18"	4.5	9.0
SPECIAL	WAIT FOLLOW PILOT CAR	6	30" x 18"	3.8	22.8
		CONVENTIONAL ROAD TRAFFIC CONTROL SIGNS SQFT			869.8

HORIZONTAL AND VERTICAL CONTROL POINTS

POINT	STATION	OFFSET	DESCRIPTION	NORTHING	EASTING	ELEVATION
CP 1	North of Project		Rebar, MRM 147.43, 100’ west of Hwy 81 Centerline, in fence between 2 post panel	353298.094	2719336.720	1716.027
CP 2	A 159+75.54	100.56’ R	Property Pin, MRM 146.86, 100’ west of Hwy 81 Centerline, west side of road	350292.540	2719477.198	1735.753
CP	South of Project		Harn Point 81-140.70	318963.362	2715467.563	1745.400

The coordinates shown on this sheet are based on the South Dakota State Plane Coordinate System. South Zone (NAD 83/11); epoch 2010.00
Geoid18; SF = 0.9998421017
The elevations shown on this sheet are based on NAVD 88.

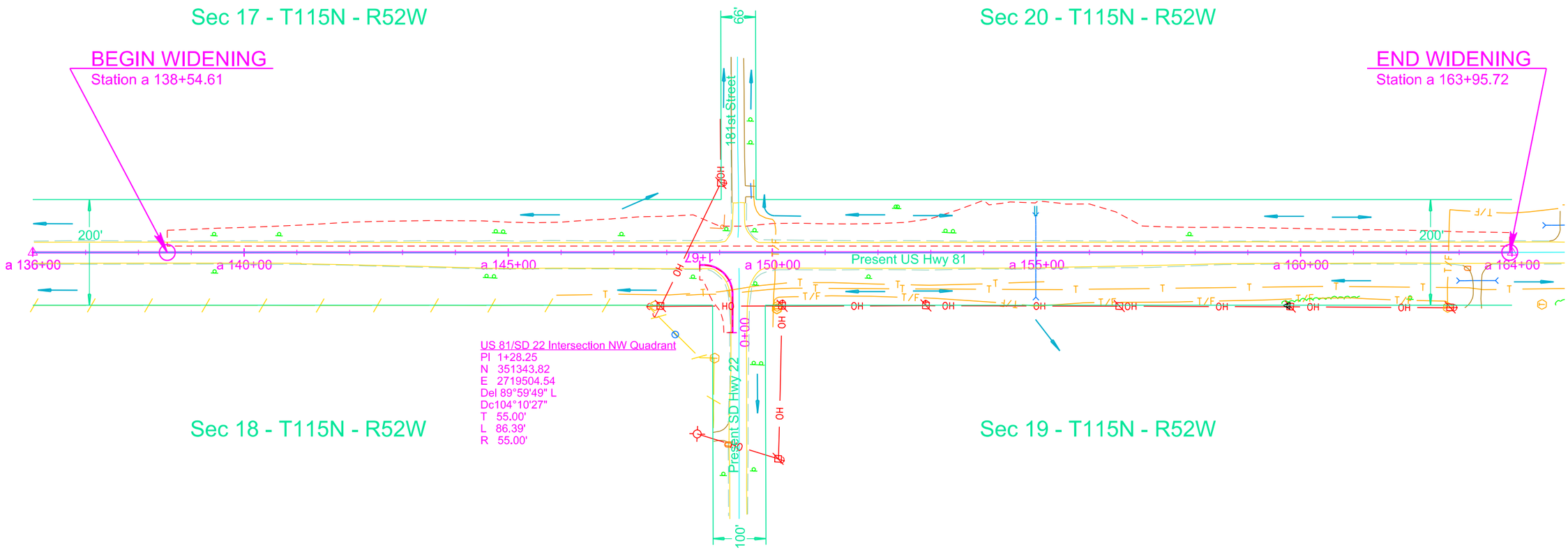
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(120)145	44	93

a 138+54.61 to 163+95.72 L
Widen Roadway for Turn Lane

0+00 to 1+66.52 L (US 81/SD 22 Intersection NW Quadrant Alignment)
Widen Intersection Radius
(See intersection layout sheet for details)

a 154+98 L
Remove for Reset 42" RCP Flared End
Remove and Reset 42" - 6' RCP
Install 42" - 18' RCP
Reset 42" RCP Flared End

a 154+98 R
Remove for Reset 42" RCP Flared End
Remove and Reset 42" - 10' RCP
Reset 42" RCP Flared End



PLOTTED FROM - $$USERNAME$$

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(120)145	45	93

a 138+54.61

a 163+95.72

Excavation	51	Embankment	5491	
Undercut	3822	+50%	2745	8236
Muck	411	Undercut	3822	
Contractor Furnished Borrow	10096	+50%	1911	5733
	14410	Waste		411
				14410

Waste is muck excavation to be disposed of at a site approved by Engineer

US 81/SD 22 NW Quadrant Earthwork

Excavation	46	Embankment	97	
Undercut	237	+50%	48	145
Contractor Furnished Borrow	218	Undercut	237	
	501	+50%	119	356
				501

LDGPI a 154+95
Elev 1722.00

LDG 0.0000%

LDG 8.8966%

LDGPI a 155+05
Elev 1722.00

LDGPI a 156+50
Elev 1734.90

1850 1840 1830 1820 1810 1800 1790 1780 1770 1760 1750 1740 1730 1720 1710 1700 1690 1680 1670

a 136+00 a 141+00 a 146+00 a 151+00 a 156+00 a 161+00 a 164+00

PLOTTED FROM - $$USERNAME$$

US 81/SD 22 INTERSECTION LAYOUT

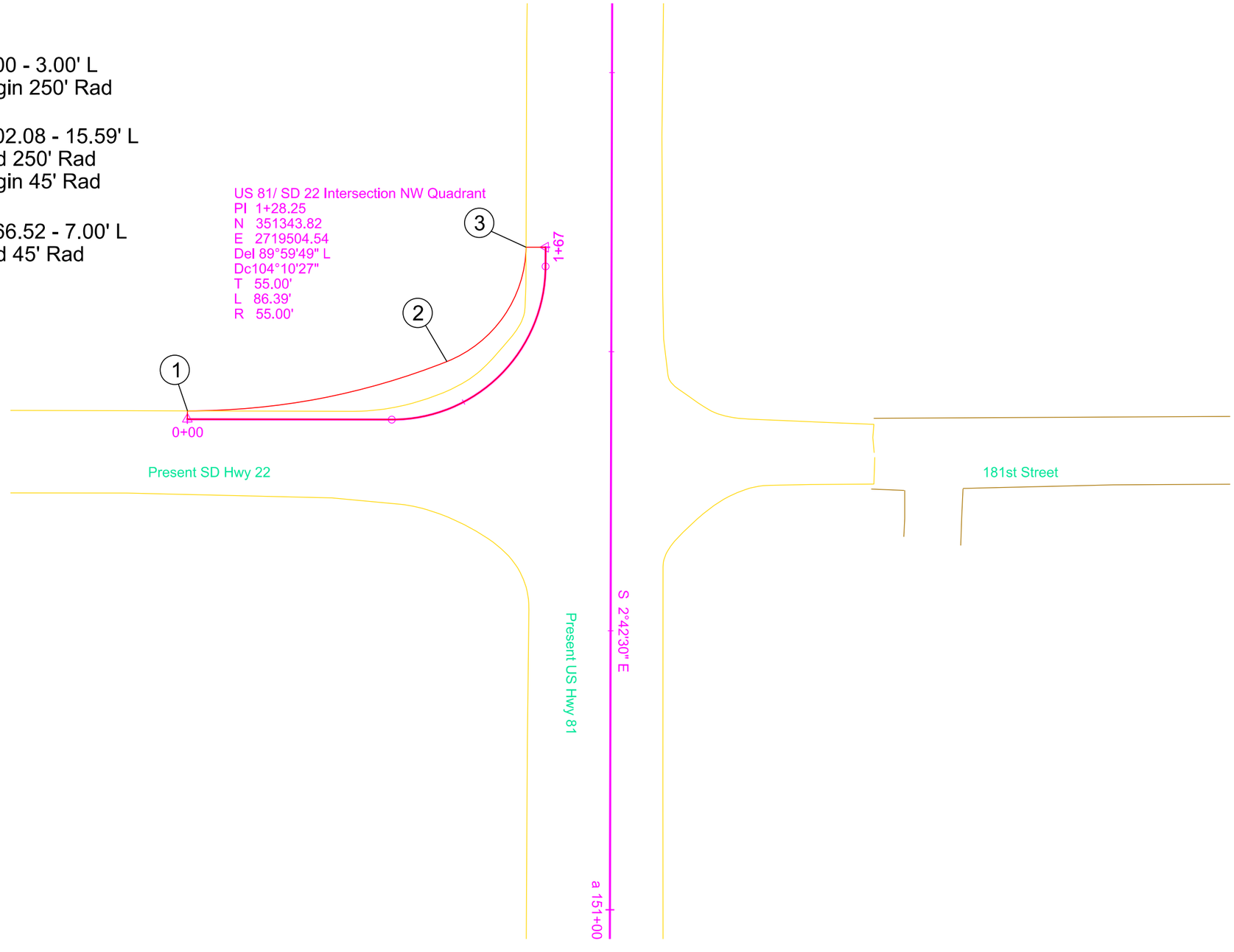
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(120)145	46	93

Note: Points are outside edge of asphalt surfacing

1 0+00 - 3.00' L
Begin 250' Rad

2 1+02.08 - 15.59' L
End 250' Rad
Begin 45' Rad

3 1+66.52 - 7.00' L
End 45' Rad



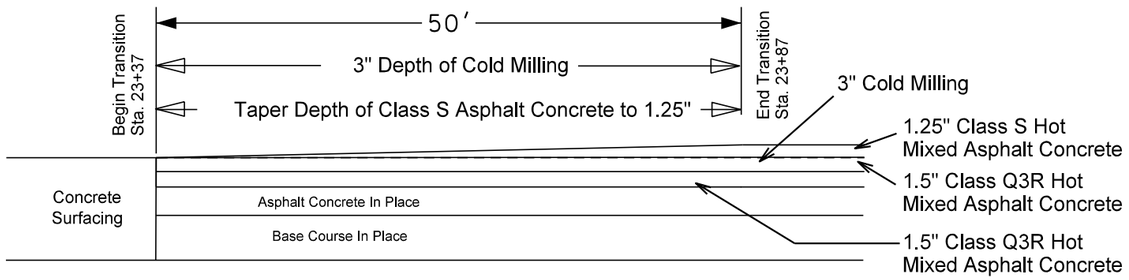
PLOTTED FROM - $$USERNAME$$

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(120)145	47	93

TRANSITION DETAILS FOR PROJECT LIMITS, EXCEPTIONS, BRIDGE ENDS, INTERSECTING ROADS, & ENTRANCES

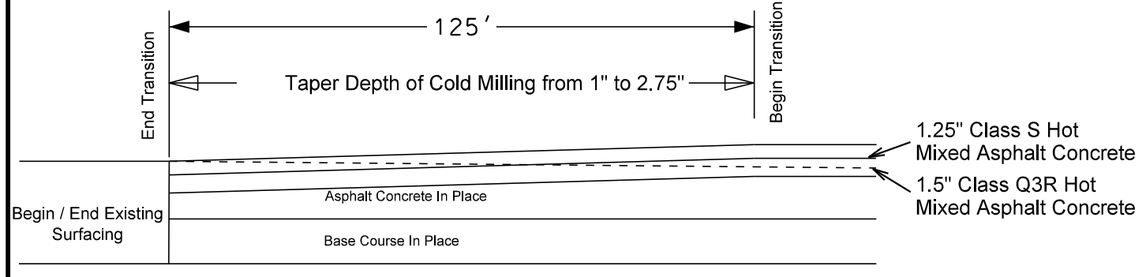
TRANSITION SECTION

Section 1 23+37 to 25+00



TRANSITION SECTIONS

41+63.72 Begin Str. No. 15-190-186
43+56.22 End Str. No. 15-190-186
55+17.8 Begin Exception
61+86.6 End Exception
a 245+36.8 End Project



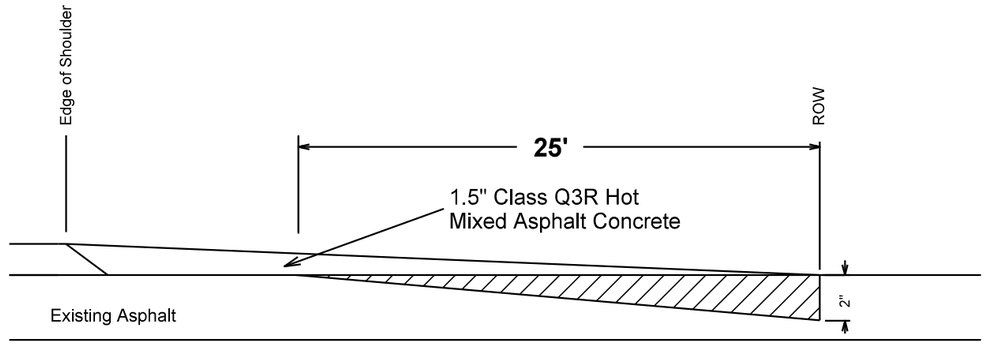
Note: Width of Cold Milling Asphalt Concrete at beginning and end of the project and the beginning and end of the exception will match adjacent surfacing width.
Width of Cold Milling Asphalt Concrete at beginning and end of Str. No. 15-190-186 will be approximately 66 feet wide.

Cost for tapering the width and depth of cold milling at the End of the project and at Bridge Ends will be incidental to the contract unit price per square yard for Cold Milling Asphalt Concrete.

Additional quantities for Class Q3R Hot Mixed Asphalt Concrete and Cold Milling Asphalt Concrete are included in the Table of Additional Quantities.

TRANSITION SECTIONS

Sta. 28+72 (14th Ave) Lt.
Sta. 33+27 (Driveway) Rt.
Sta. 33+79 (Driveway) Lt.
Sta. 47+10 (Driveway) Rt.
Sta. 48+70 (Driveway) Lt.
Sta. 50+52 (Driveway) Lt.
Sta. 53+54 (Driveway) Lt.
Sta. 53+84 (Driveway) Rt.
Sta. 54+59 (Driveway) Lt.
Sta. 71+49 (24th Ave) Rt.
Sta. 74+99 (Driveway) Rt.
Sta. 78+07 (Driveway) Rt.
Sta. 92+96 (28th Ave) Rt.
Sta. 108+05 (Driveway) Rt.
Sta. 124+98 (Driveway) Lt.
Sta. 168+44 (175th St) Lt.
Sta. 216+61 (176th St) Lt.
Sta. 53+54 (Driveway) Lt.
Sta. a 149+36 (SD 22) Rt.
Sta. a 202+27 (Driveway) Lt.



Cold Milling Asphalt Concrete

Note: Width of Cold Milling Asphalt Concrete will match adjacent surfacing width. Basis of payment will be plans quantity regardless of width of the Intersecting Roads.

Additional quantities for Class Q3R Hot Mixed Asphalt Concrete and Cold Milling Asphalt Concrete are included in the Table of Additional Quantities.

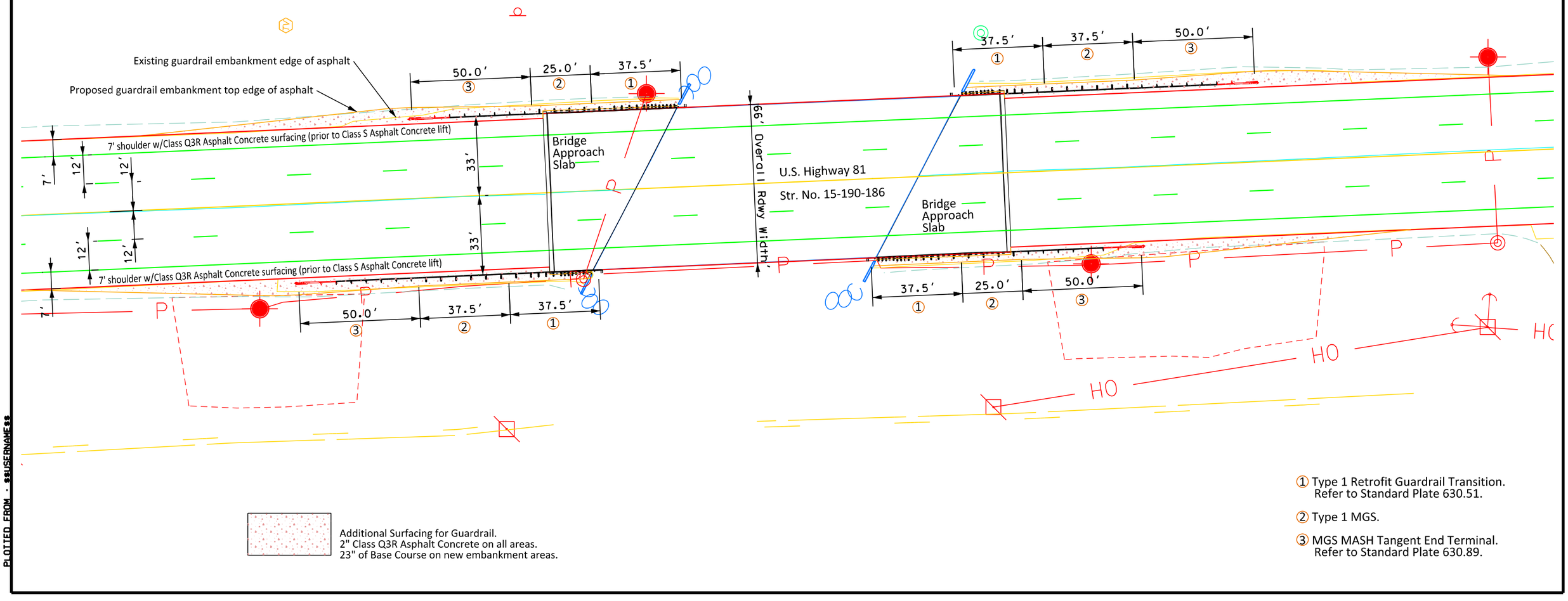
PLOTTED FROM - $$USERNAME$$

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(120)145	48	93

GUARDRAIL LAYOUT
STR. NO. 15-190-186
MRM 155.40

Design Critera:
Clear Zone: 30'
Runout Length: 135'
Design Speed: 45 mph

The width of the Class S Asphalt Concrete will be increased in front of the beam guardrail such that mainline cross slope width extend to match the width of the bridge approach slab.



Additional Surfacing for Guardrail.
2" Class Q3R Asphalt Concrete on all areas.
23" of Base Course on new embankment areas.

① Type 1 Retrofit Guardrail Transition. Refer to Standard Plate 630.51.

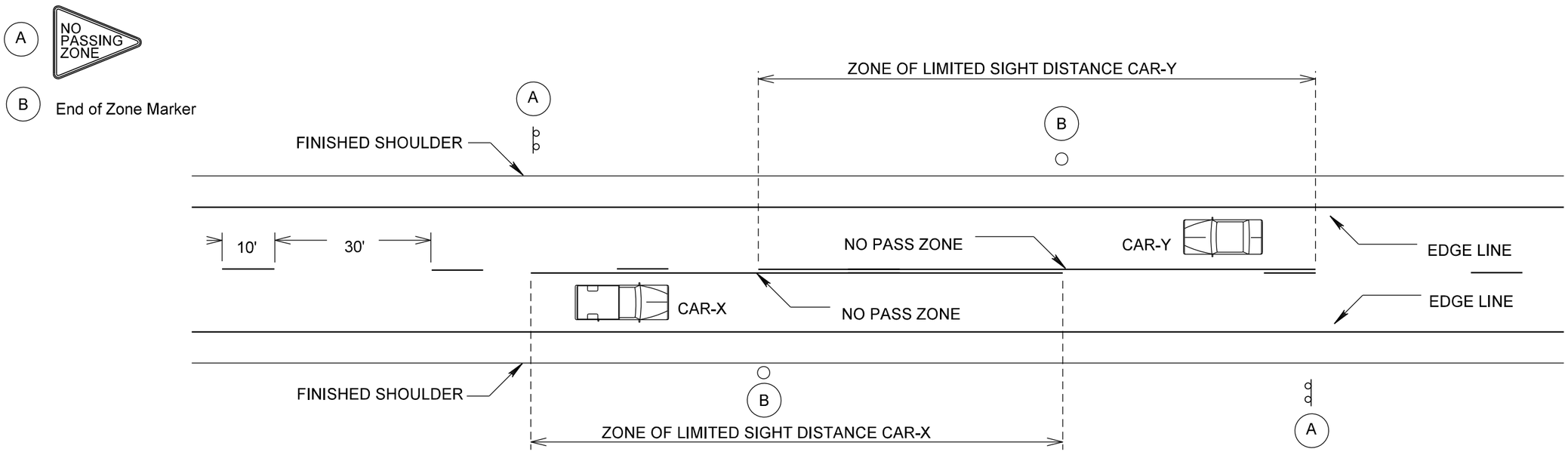
② Type 1 MGS.

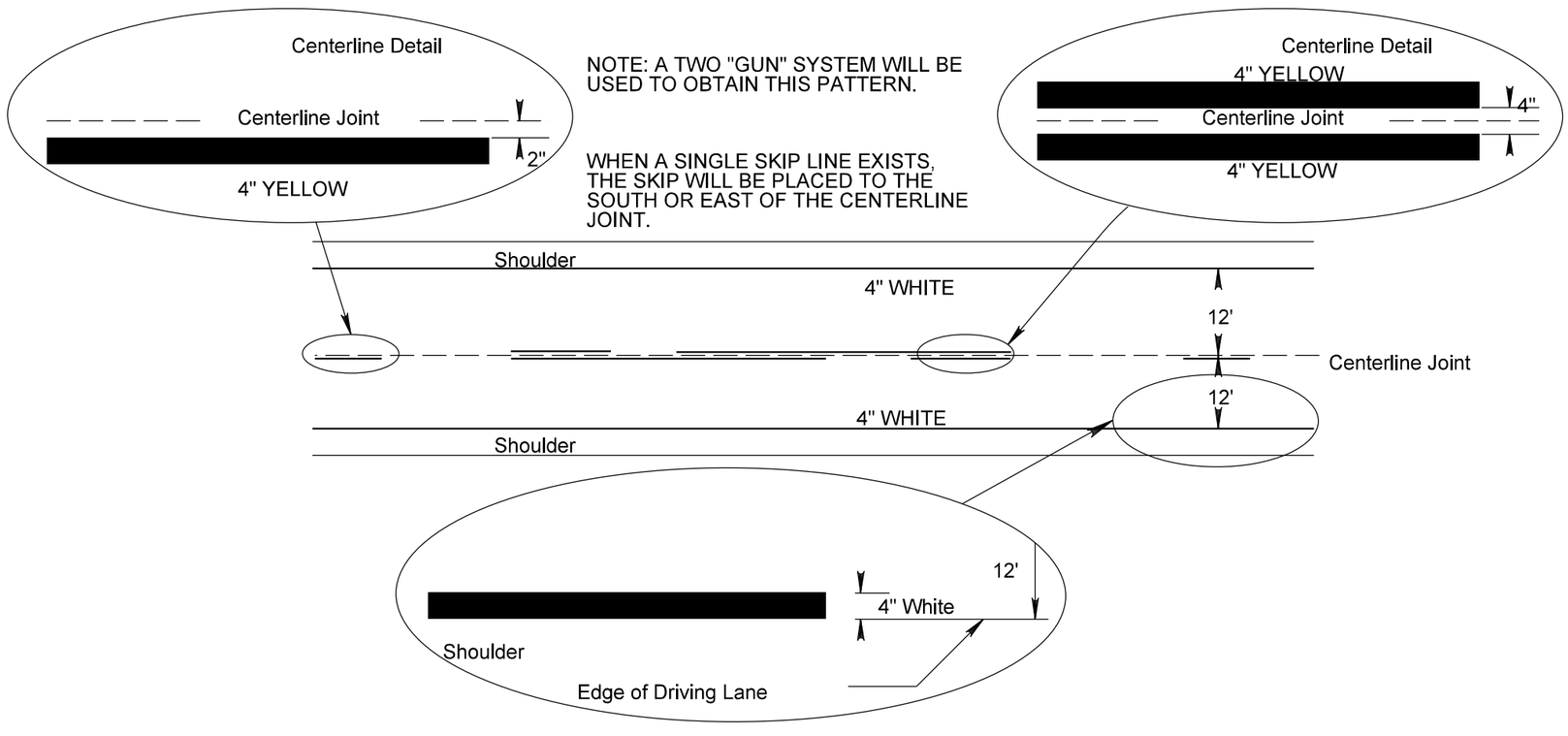
③ MGS MASH Tangent End Terminal. Refer to Standard Plate 630.89.

PLOTTED FROM - $$USERNAME$$

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(120)145	49	93

TYPICAL PAVEMENT MARKING LAYOUT





FURNISHING AND APPLYING DURABLE MARKINGS OR HIGH BUILD WATERBORNE PAVEMENT MARKING PAINT

1. The typical pavement markings as shown on this sheet will be applied throughout the entire length of the project.
2. Exact location of the NO PASSING ZONE lines will be determined in the field by the Engineer. A dash of white paint will mark the beginning and end of all no passing zones. NO PASSING ZONE signs and the ending post in fence lines, if present, will not be used as the beginning and ending NO PASSING ZONE lines.
3. 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 or advance warning arrow panel.

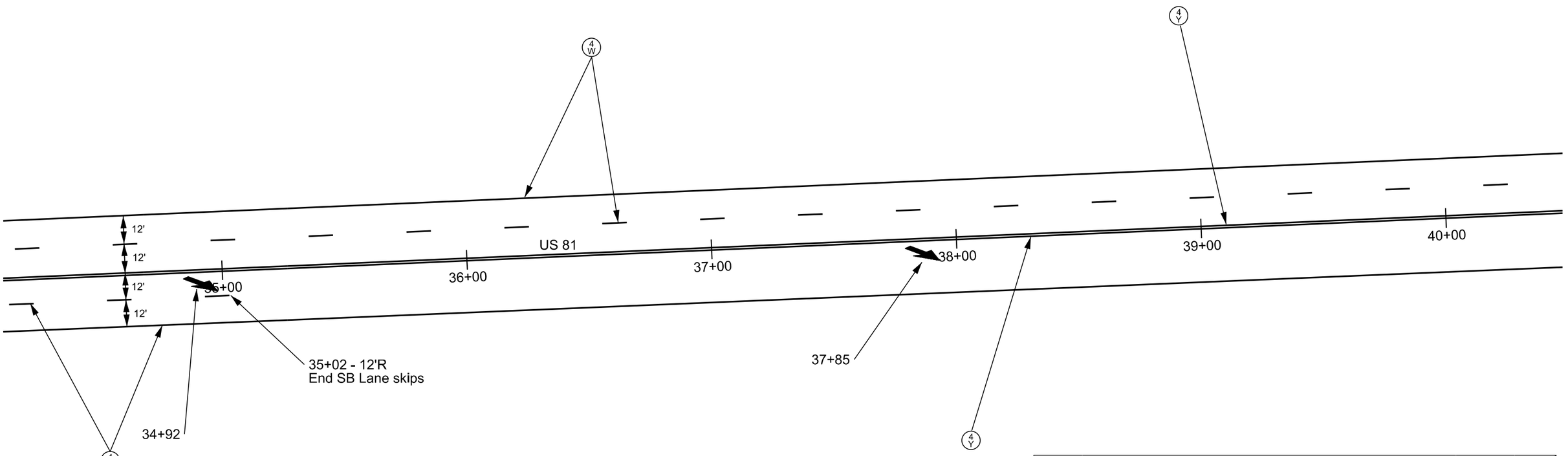
PLOTTED FROM - $$USERNAME$$

(Sheet 1 of 4)

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(120)145	50	93

PAVEMENT MARKING LAYOUT

US 81 - North of Roundabout



ESTIMATE OF QUANTITIES (US 81 - North of Roundabout)			
KEY	ITEM	QUANTITY	UNIT
24 Y	Cold Applied Plastic Pavement Marking, 24" (Yellow)	80	Ft
	Cold Applied Plastic Pavement Marking, Arrow	8	Each
	Cold Applied Plastic Pavement Marking, Lane Reduction Arrow	4	Each
	Grooving for Cold Applied Plastic Pavement Marking, 24"	80	Ft
	Grooving for Cold Applied Plastic Pavement Marking, Arrow	8	Each
	Grooving for Cold Applied Plastic Pavement Marking, Lane Reduction Arrow	4	Each

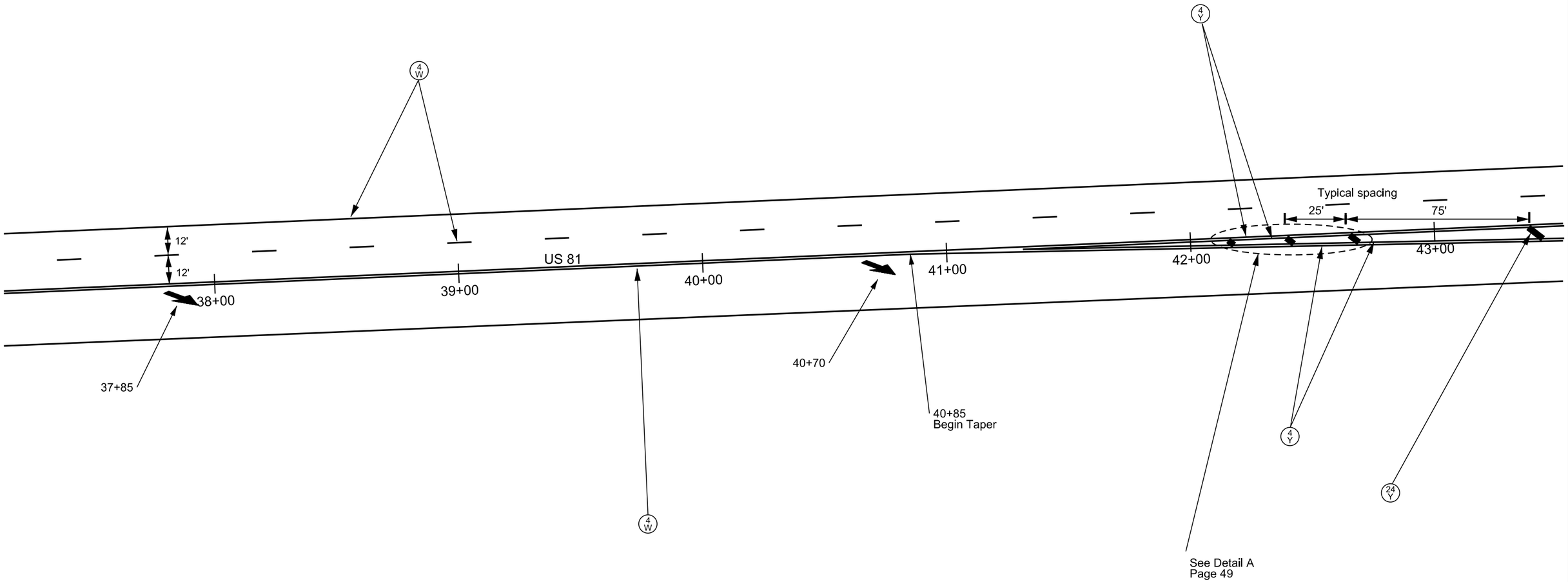
4" White markings will be Durable Pavement Marking, 4" White.
4" Yellow markings will be High Build Waterborne Pavement Marking Paint with Reflective Elements, Yellow.

PLOTTED FROM - $USERNAME$$

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(120)145	51	93

PAVEMENT MARKING LAYOUT

US 81 - North of Roundabout



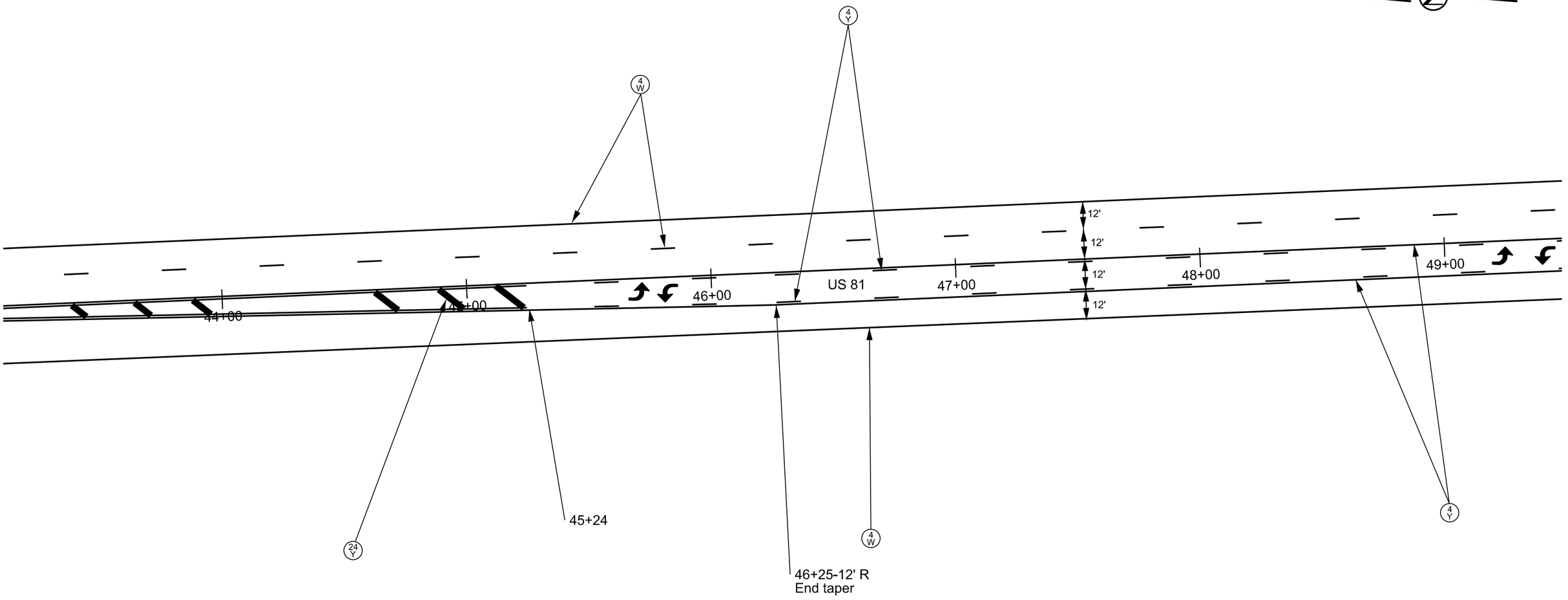
PLOTTED FROM - $$USERNAME$$

(Sheet 3 of 4)

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(120)145	52	93

PAVEMENT MARKING LAYOUT

US 81 - North of Roundabout

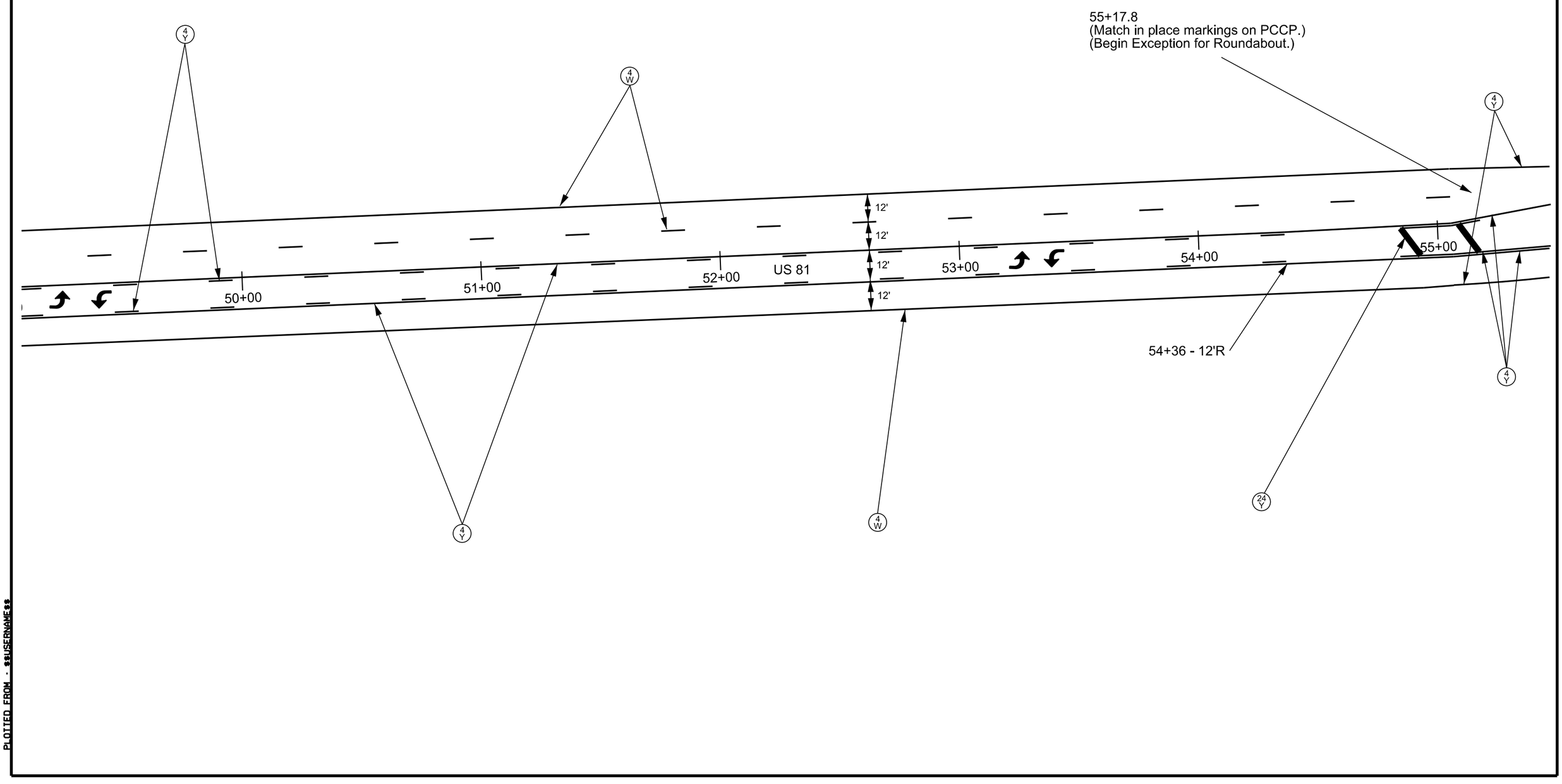


PLOTTED FROM - $$USERNAME$$

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(120)145	53	93

PAVEMENT MARKING LAYOUT

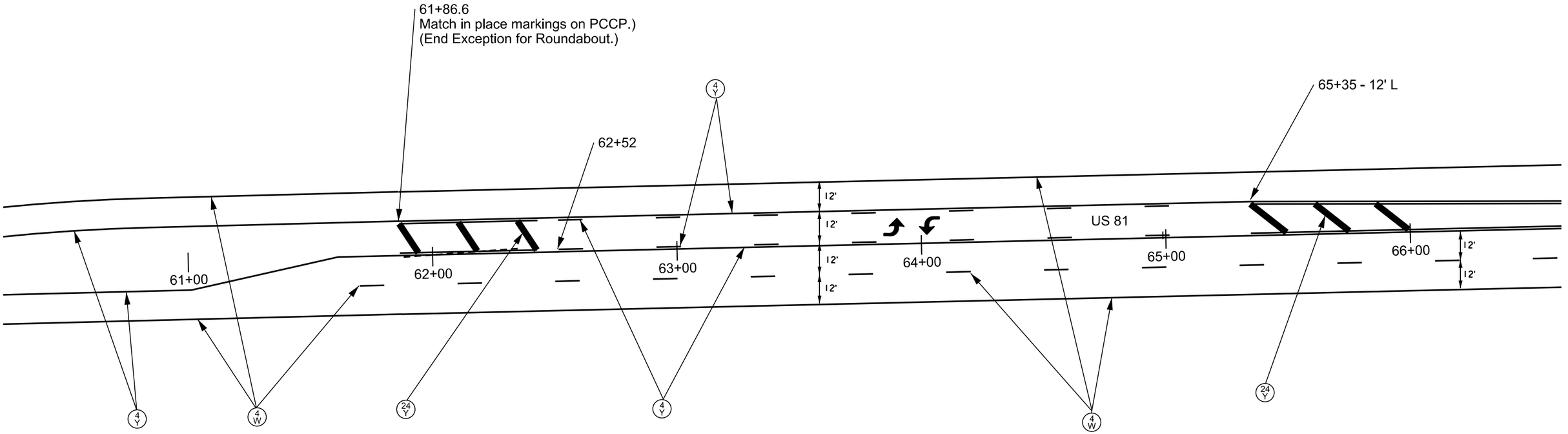
US 81 - North of Roundabout



STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(120)145	54	93

PAVEMENT MARKING LAYOUT

US 81 - South of Roundabout



ESTIMATE OF QUANTITIES (US 81 - South of Roundabout)			
KEY	ITEM	QUANTITY	UNIT
24 Y	Cold Applied Plastic Pavement Marking, 24" (Yellow)	200	Ft
	Cold Applied Plastic Pavement Marking, Arrow	2	Each
	Cold Applied Plastic Pavement Marking, Lane Reduction Arrow	4	Each
	Grooving for Cold Applied Plastic Pavement Marking, 24"	200	Ft
	Grooving for Cold Applied Plastic Pavement Marking, Arrow	2	Each
	Grooving for Cold Applied Plastic Pavement Marking, Lane Reduction Arrow	4	Each

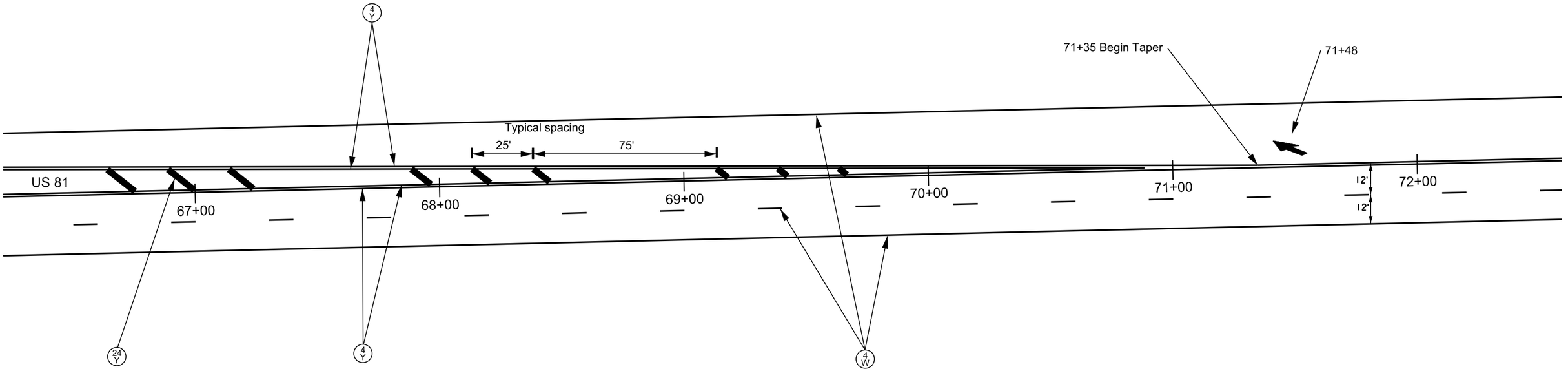
4" White markings will be Durable Pavement Marking, 4" White.
4" Yellow markings will be High Build Waterborne Pavement Marking Paint with Reflective Elements, Yellow.

PLOTTED FROM - $$USERNAME$$

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(120)145	55	93

PAVEMENT MARKING LAYOUT

US 81 - South of Roundabout

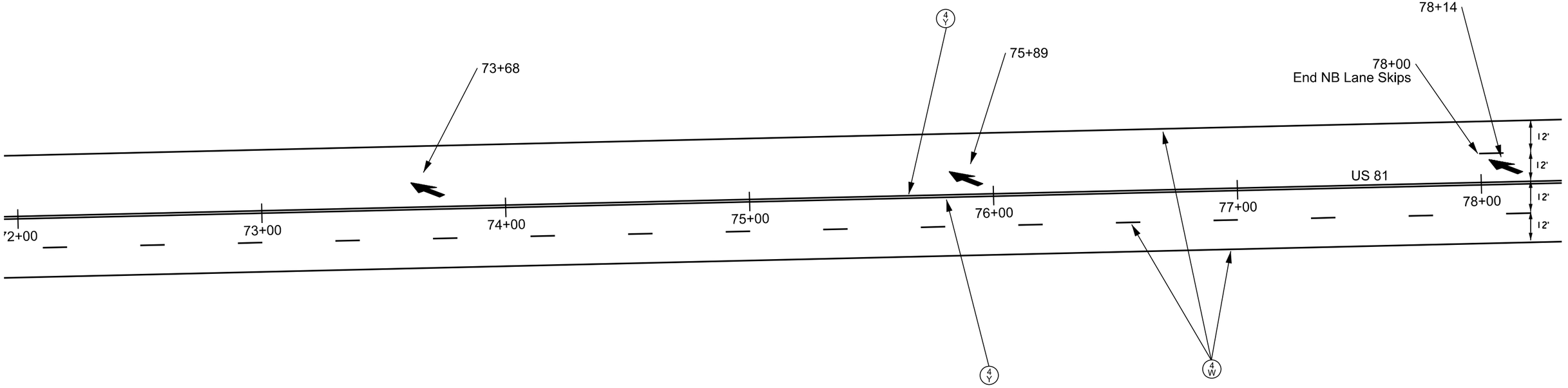


(Sheet 3 of 3)

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(120)145	56	93

PAVEMENT MARKING LAYOUT

US 81 - South of Roundabout

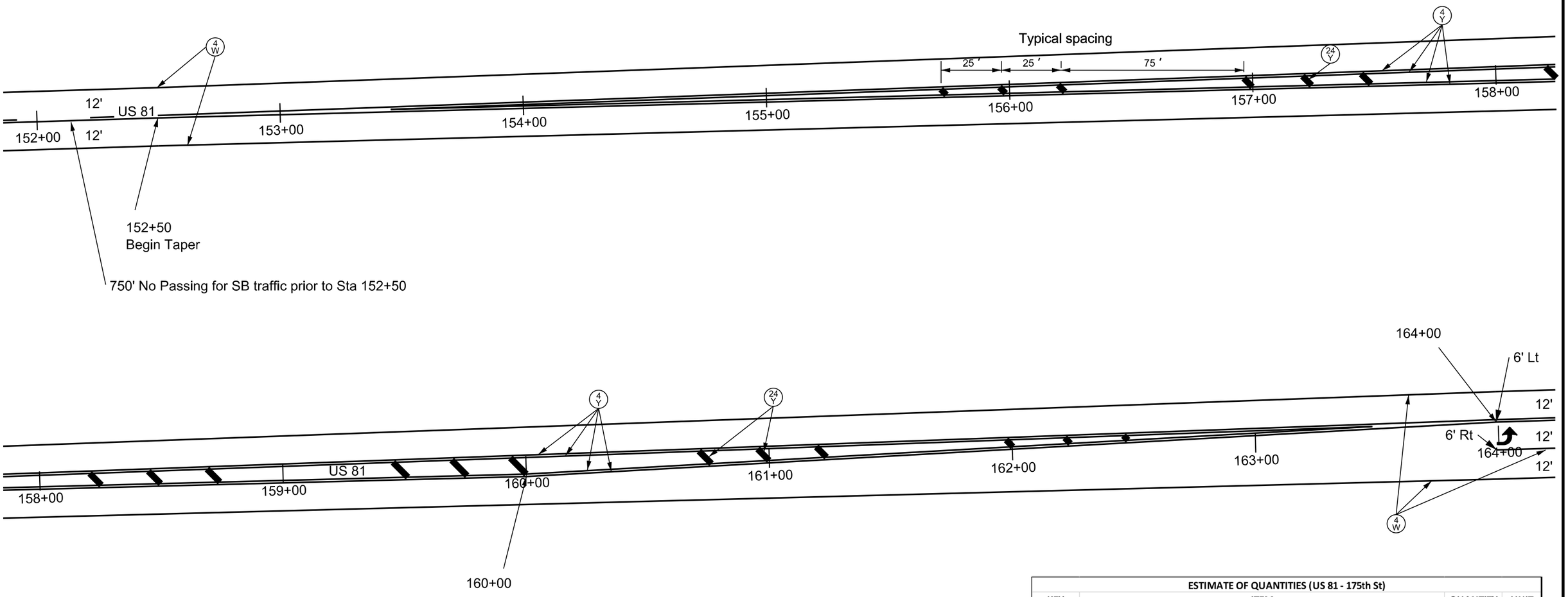


PLOTTED FROM - $$USERNAME$$

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(120)145	57	93

PAVEMENT MARKING LAYOUT

US 81 - 175th ST



ESTIMATE OF QUANTITIES (US 81 - 175th St)

KEY	ITEM	QUANTITY	UNIT
24 Y	Cold Applied Plastic Pavement Marking, 24" (Yellow)	275	Ft
	Cold Applied Plastic Pavement Marking, Arrow	3	Each
	Grooving for Cold Applied Plastic Pavement Marking, 24"	275	Ft
	Grooving for Cold Applied Plastic Pavement Marking, Arrow	3	Each

4" White markings will be Durable Pavement Marking, 4" White.
4" Yellow markings will be High Build Waterborne Pavement Marking Paint with Reflective Elements, Yellow.

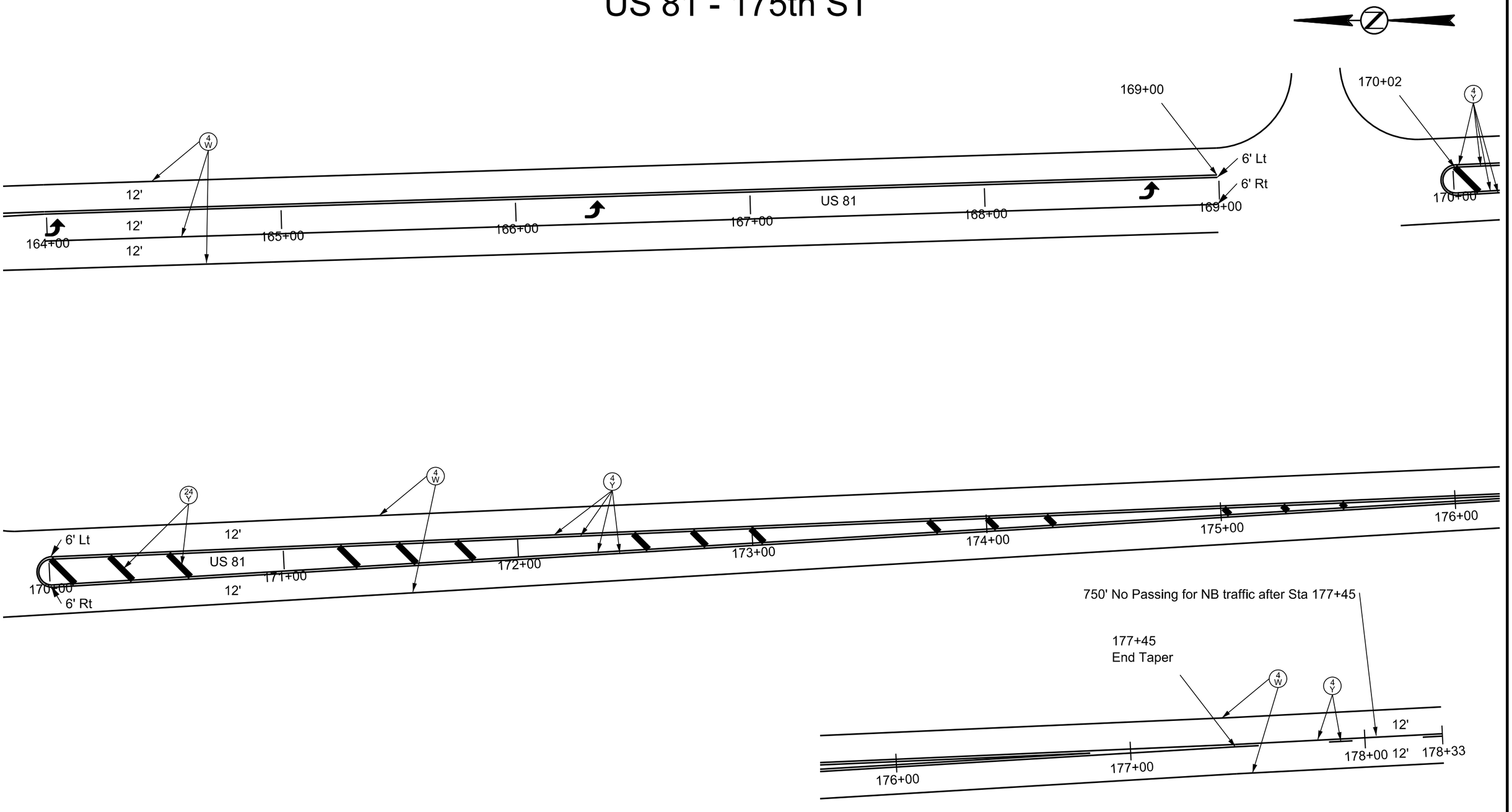
PLOTTED FROM - $$USERNAME$$

(Sheet 2 of 2)

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(120)145	58	93

PAVEMENT MARKING LAYOUT

US 81 - 175th ST

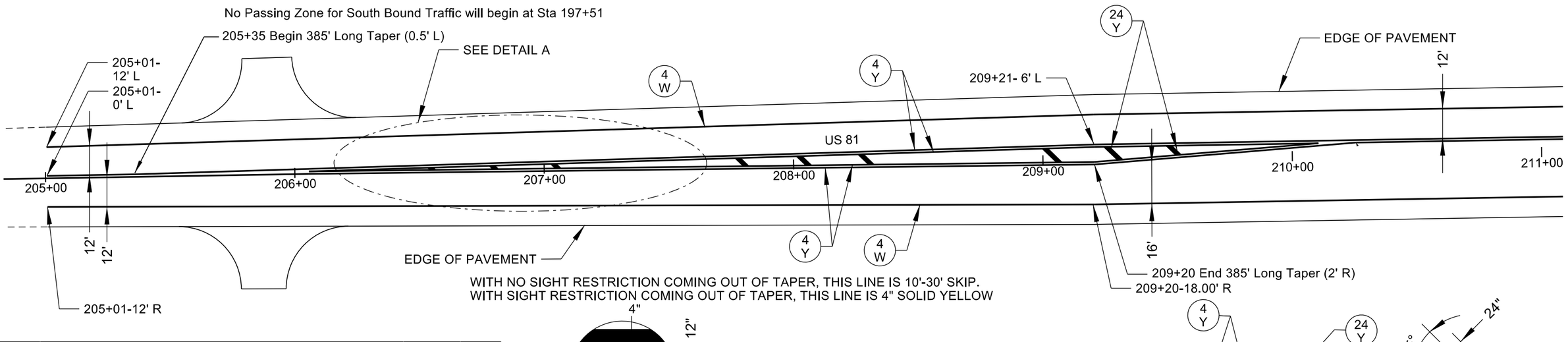


PLOTTED FROM - $$USERNAME$$

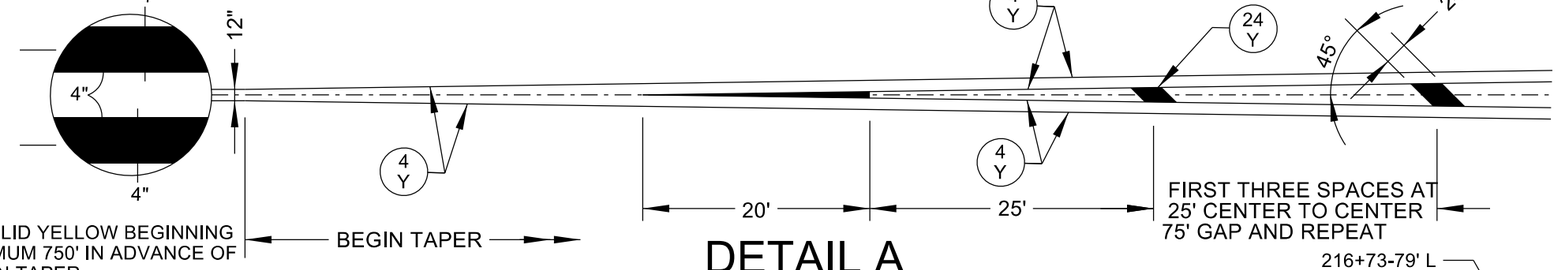
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(120)145	59	93

PAVEMENT MARKING LAYOUT

US 81 - 176th St



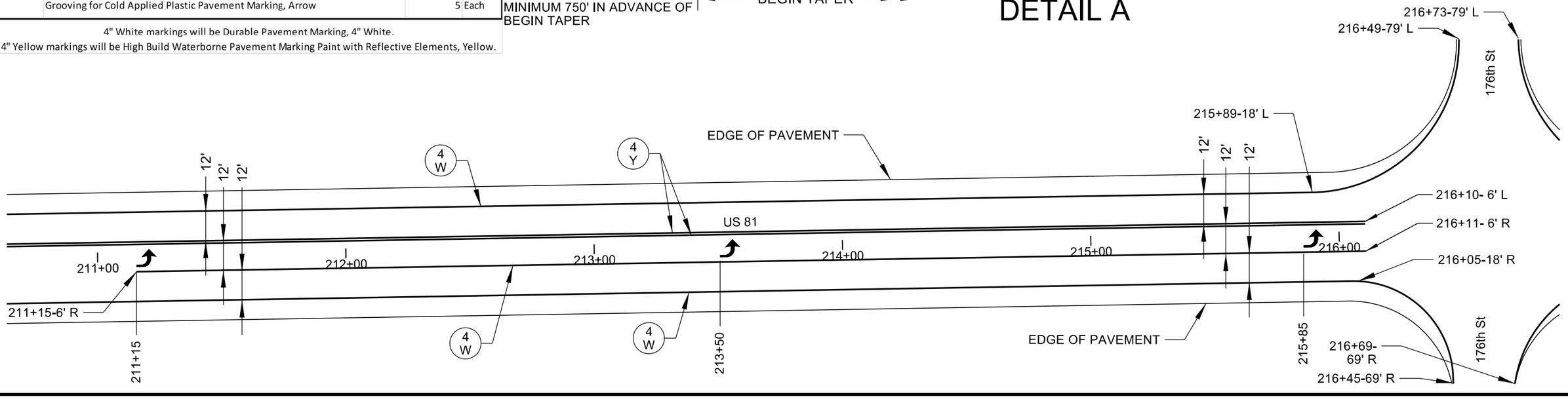
WITH NO SIGHT RESTRICTION COMING OUT OF TAPER, THIS LINE IS 10'-30' SKIP.
WITH SIGHT RESTRICTION COMING OUT OF TAPER, THIS LINE IS 4" SOLID YELLOW



DETAIL A

ESTIMATE OF QUANTITIES (US 81 - 176th St)			
KEY	ITEM	QUANTITY	UNIT
24 Y	Cold Applied Plastic Pavement Marking, 24" (Yellow)	85	Ft
↰	Cold Applied Plastic Pavement Marking, Arrow	5	Each
	Grooving for Cold Applied Plastic Pavement Marking, 24"	85	Ft
	Grooving for Cold Applied Plastic Pavement Marking, Arrow	5	Each

4" White markings will be Durable Pavement Marking, 4" White.
4" Yellow markings will be High Build Waterborne Pavement Marking Paint with Reflective Elements, Yellow.

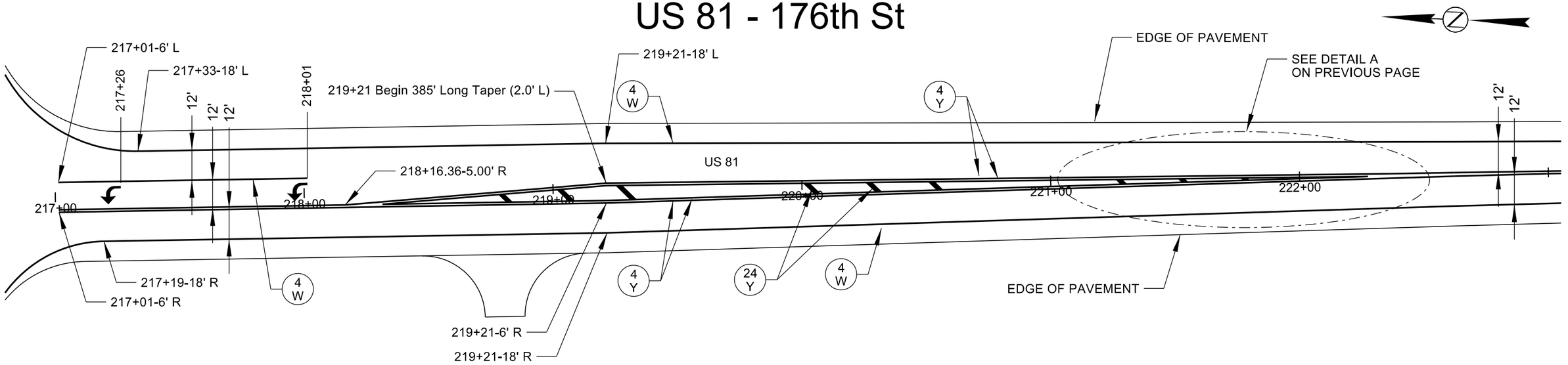


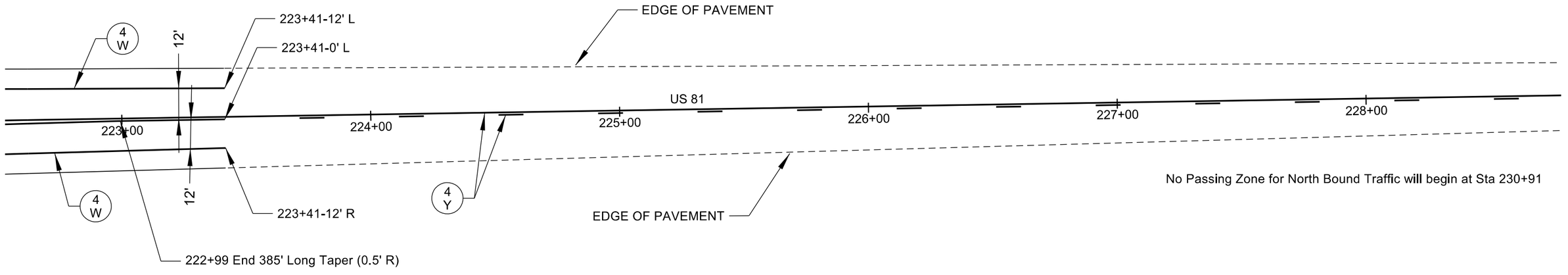
PLOTTED FROM - $$USERNAME$$

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(120)145	60	93

PAVEMENT MARKING LAYOUT

US 81 - 176th St



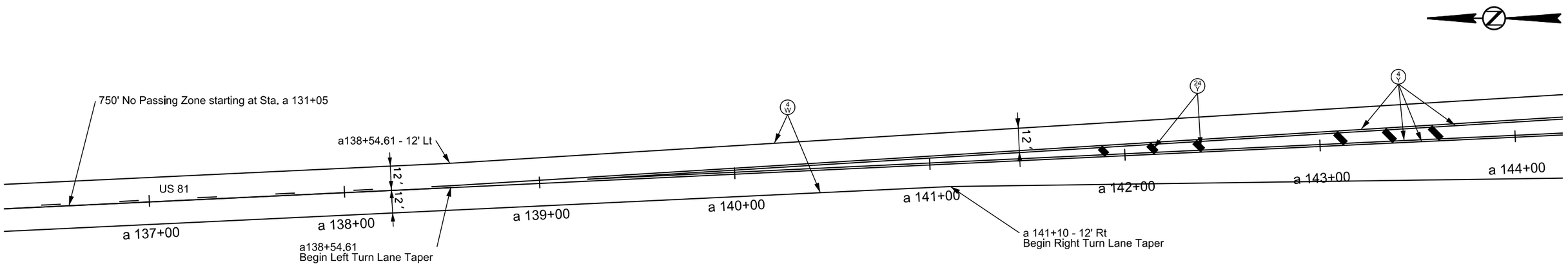


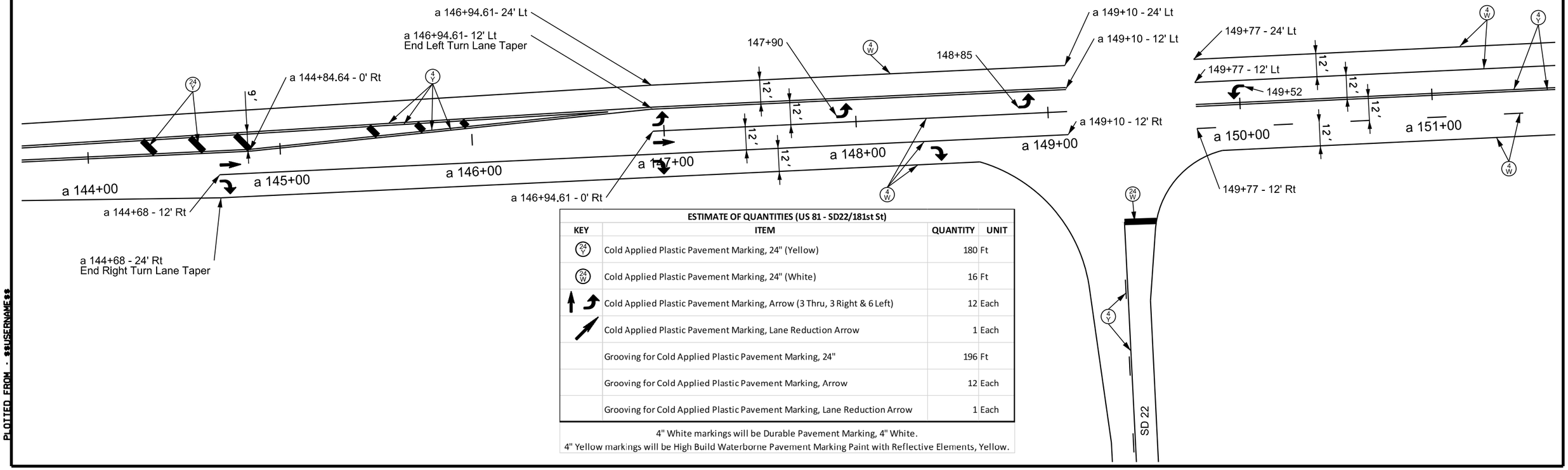
PLOTTED FROM - $$USERNAME$$

PAVEMENT MARKING LAYOUT
US 81 - SD22/181st ST

(Sheet 1 of 2)

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(120)145	61	93





ESTIMATE OF QUANTITIES (US 81 - SD22/181st St)

KEY	ITEM	QUANTITY	UNIT
24Y	Cold Applied Plastic Pavement Marking, 24" (Yellow)	180	Ft
24W	Cold Applied Plastic Pavement Marking, 24" (White)	16	Ft
	Cold Applied Plastic Pavement Marking, Arrow (3 Thru, 3 Right & 6 Left)	12	Each
	Cold Applied Plastic Pavement Marking, Lane Reduction Arrow	1	Each
	Grooving for Cold Applied Plastic Pavement Marking, 24"	196	Ft
	Grooving for Cold Applied Plastic Pavement Marking, Arrow	12	Each
	Grooving for Cold Applied Plastic Pavement Marking, Lane Reduction Arrow	1	Each

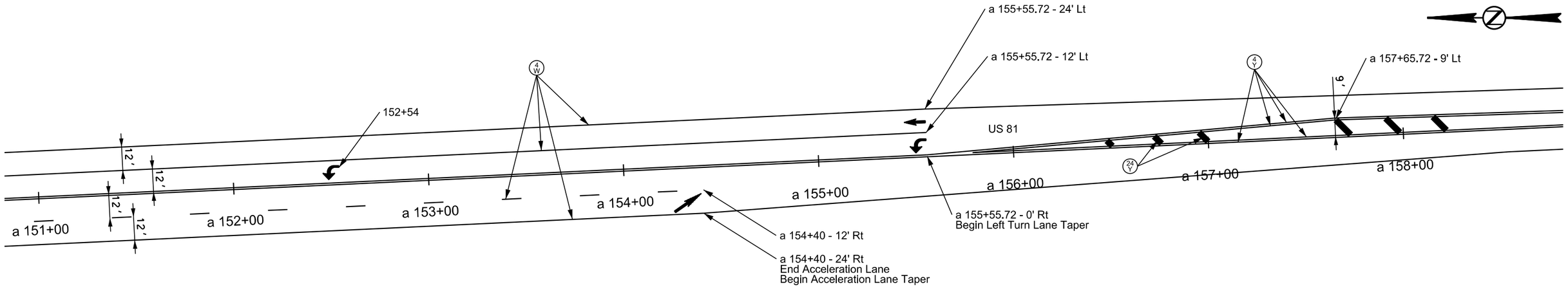
4" White markings will be Durable Pavement Marking, 4" White.
4" Yellow markings will be High Build Waterborne Pavement Marking Paint with Reflective Elements, Yellow.

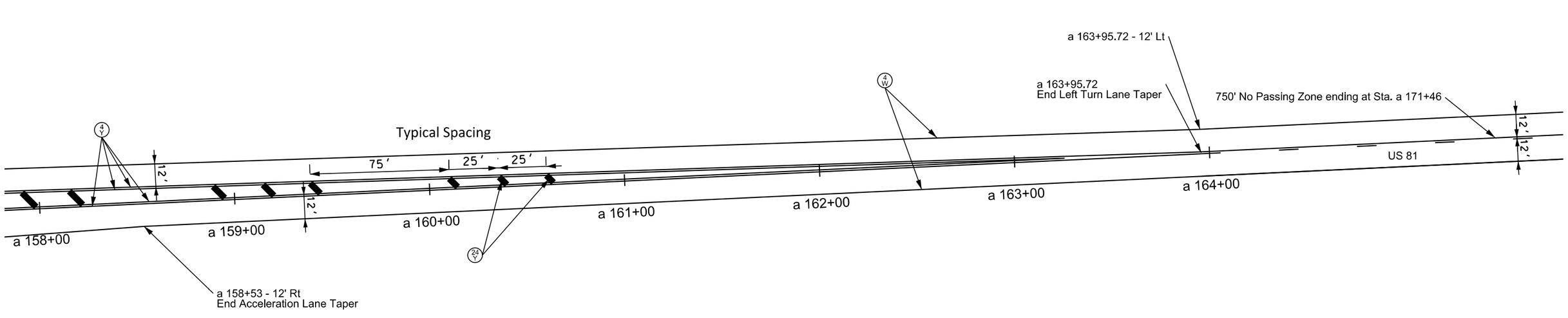
PLOTTED FROM - $$USERNAME$$

PAVEMENT MARKING LAYOUT
US 81 - SD22/181st ST

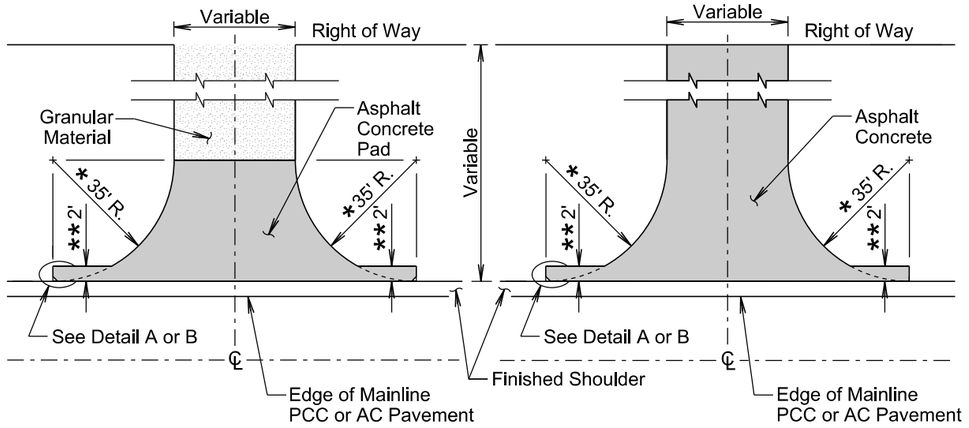
(Sheet 2 of 2)

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(120)145	62	93





PLOTTED FROM - $$USERNAME$$



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:

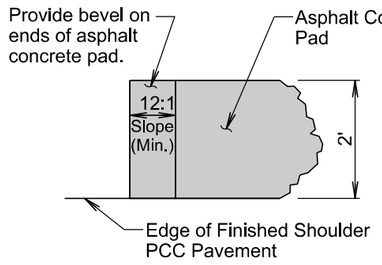
The precise construction limits for situations other than shown above will be determined by the Engineer during construction.

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

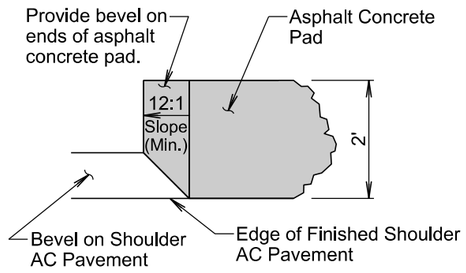
** The Contractor may adjust the screed of the paver during mainline paving operations to provide the 2-foot asphalt concrete pad or the Contractor may provide the 2-foot asphalt concrete pad during paving of the intersecting roads as shown above. The Engineer may eliminate the 2-foot asphalt concrete 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

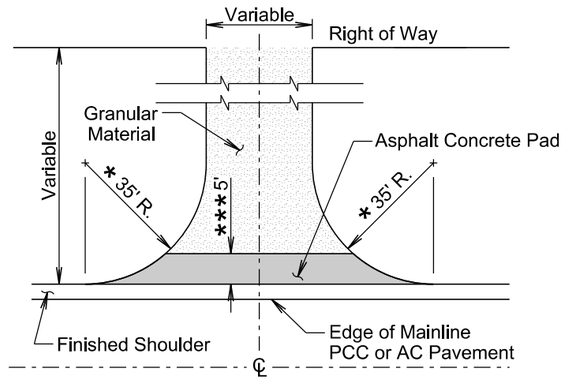
Published Date: 2025	SDDOT	SURFACING OR RESURFACING OF INTERSECTING ROADS AND ENTRANCES (MAINLINE AND SHOULDERS: PCC OR AC PAVEMENT)	PLATE NUMBER 320.04 Sheet 1 of 2



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



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



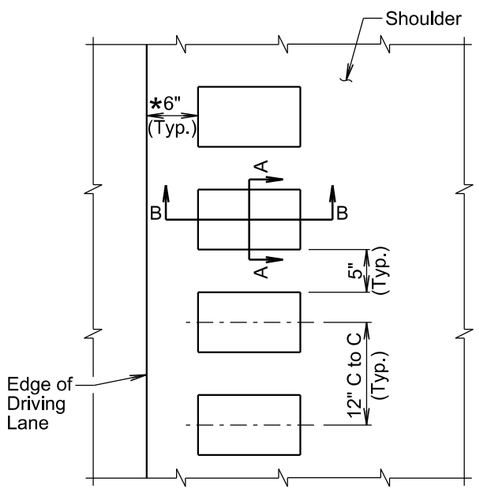
PLAN VIEW
(Entrance)

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

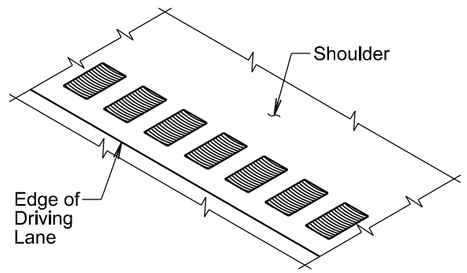
August 27, 2020

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

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(120)145	64	93

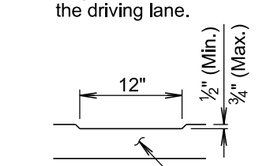


PLAN VIEW
(Typical Rumble Strip in Asphalt Concrete)

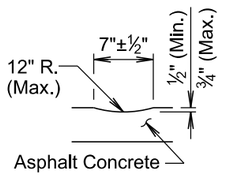


PERSPECTIVE VIEW
(Typical Rumble Strip in Asphalt Concrete)

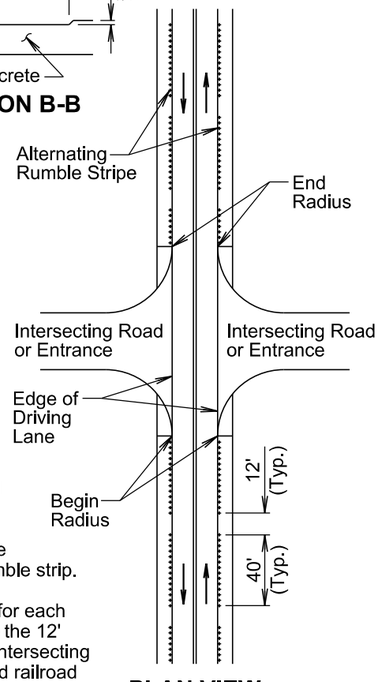
* When PCC pavement width from centerline to edge of pavement is 12', the rumble strip may be placed a maximum of 2' from the edge of the driving lane.



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.

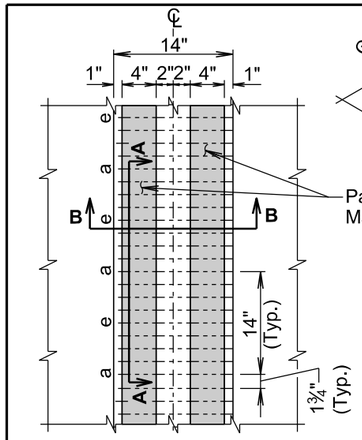
A rumble strip will not be constructed through intersecting roads, entrances, turnouts, bridge decks, bridge approach slabs, and railroad crossings. The lengths of the 40' segments with continuous indentations and the 12' segments without a rumble strip adjacent to the intersecting roads, entrances,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

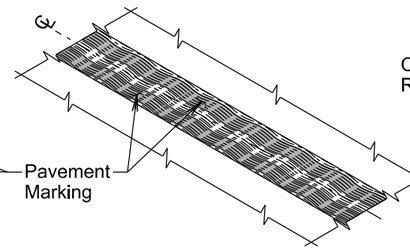
Measurement of the rumble strip will be to the nearest 0.1 of a mile for each shoulder. Measurement and payment of the rumble strip will include the 12' long segments without rumble strips and the segments adjacent to intersecting roads, entrances, turnouts, bridge decks, bridge approach slabs, and railroad 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

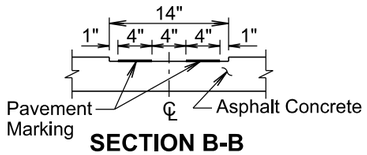


PLAN VIEW
(Typical Rumble Strip in Asphalt Concrete)

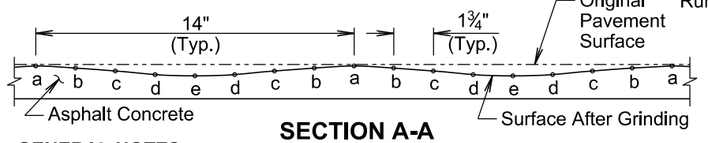


PERSPECTIVE VIEW
(Typical Rumble Strip in Asphalt Concrete)

SINUSOIDAL GRINDING	
Location	* Depth (In.)
a	1/16
b	5/32
c	9/32
d	7/16
e	1/2



SECTION B-B



SECTION A-A

GENERAL NOTES:

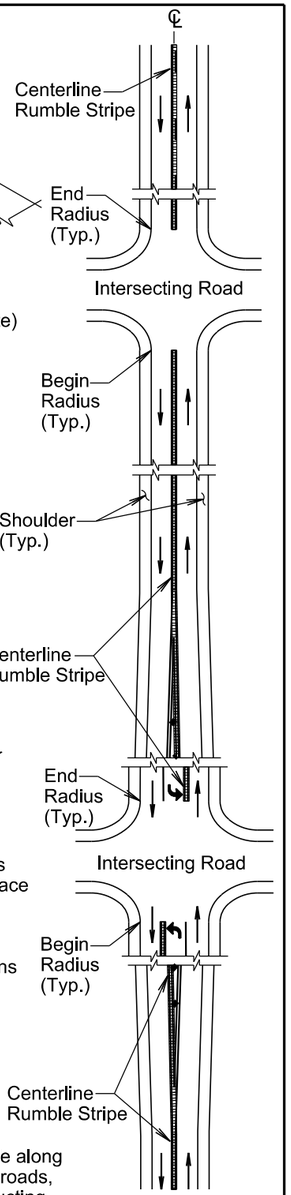
A rumble stripe will be constructed by grinding continuous sinusoidal indentations in the asphalt concrete. The rumble stripe will receive a flush seal or asphalt surface treatment as specified in the plans.

A rumble stripe will not be constructed through intersecting roads, bridge decks, bridge approach slabs, and railroad crossings. The beginning and ending locations of the rumble stripe at intersecting roads, bridge decks, bridge approach slabs, and railroad crossings will be adjusted as approved by the Engineer.

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

* The sinusoidal rumble stripe construction grinding tolerance will be ± 1/16 inch.

Measurement and payment of the rumble stripe will be to the nearest 0.1 of a mile along the centerline and will include segments without the rumble stripe at intersecting roads, bridge decks, bridge approach slabs, and railroad crossings. Payment for constructing the rumble stripe will be at the contract unit price per mile for "Grind Sinusoidal Centerline Rumble Stripe in Asphalt Concrete".



PLAN VIEW

September 14, 2019

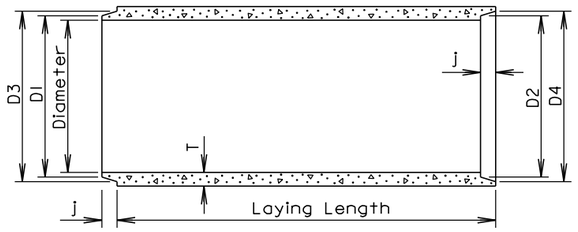
Published Date: 2025	SDDOT	SINUSOIDAL CENTERLINE RUMBLE STRIPE IN ASPHALT CONCRETE	PLATE NUMBER 320.40
			Sheet 1 of 1

PLOTTED FROM - $$USERNAME$$

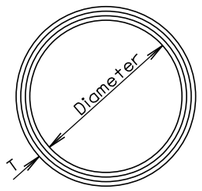
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(120)145	65	93

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:

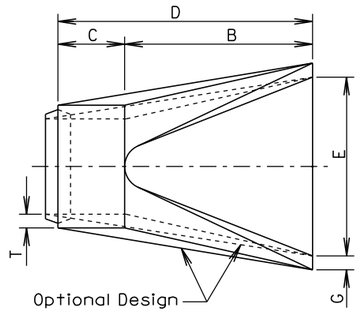
Construction of R.C.P. shall conform to the requirements of Section 990 of the Specifications.

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.

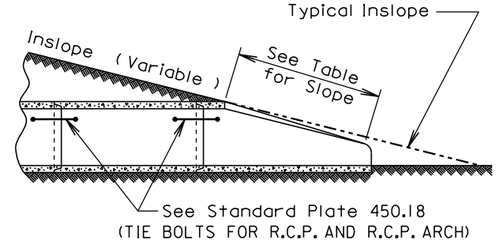
Diam. (in.)	Approx. Wt. /Ft. (lb.)	T (in.)	J (in.)	D1 (in.)	D2 (in.)	D3 (in.)	D4 (in.)
12	92	2	1 3/4	13 1/4	13 5/8	13 7/8	14 1/4
15	127	2 1/4	2	16 1/2	16 7/8	17 1/4	17 5/8
18	168	2 1/2	2 1/4	19 5/8	20	20 3/8	20 3/4
21	214	2 3/4	2 1/2	22 7/8	23 1/4	23 3/4	24 1/8
24	265	3	2 3/4	26	26 3/8	27	27 3/8
27	322	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

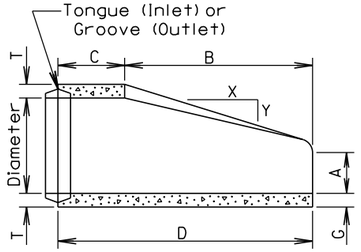
Published Date: 2025	SDDOT	REINFORCED CONCRETE PIPE	PLATE NUMBER 450.01
			Sheet 1 of 1



TOP VIEW



SLOPE DETAIL

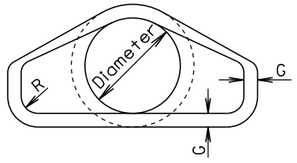


LONGITUDINAL SECTION

GENERAL NOTES:

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

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



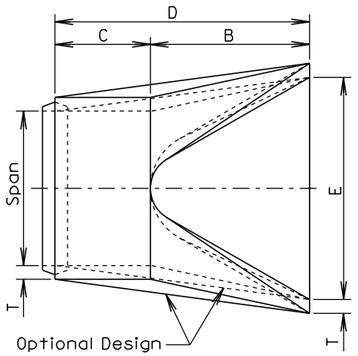
END VIEW

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

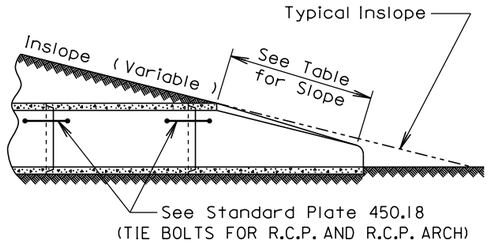
June 26, 2015

Published Date: 2025	SDDOT	R. C. P. FLARED ENDS	PLATE NUMBER 450.10
			Sheet 1 of 1

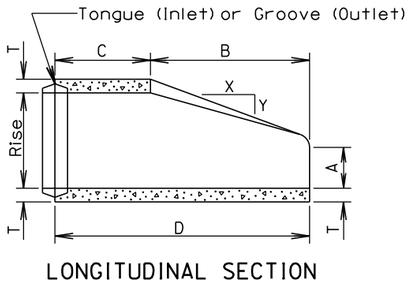
PLOTTED FROM - $$USERNAME$$



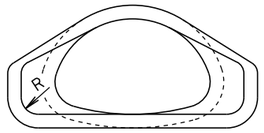
TOP VIEW



SLOPE DETAIL



LONGITUDINAL SECTION



END VIEW

GENERAL NOTES:

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

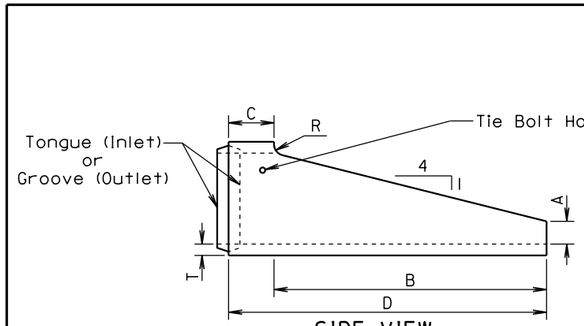
Construction of R. C. P. Arch Flared End shall conform to the requirements of Section 990 of the Specifications.

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

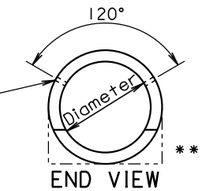
*Equivalent Diameter of Circular R. C. P.

June 26, 2015

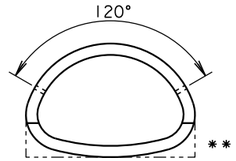
Published Date: 2025	SDDOT	R. C. P. ARCH FLARED ENDS	PLATE NUMBER 450.11 Sheet 1 of 1



SIDE VIEW



END VIEW
"CIRCULAR"



END VIEW
"ARCH"

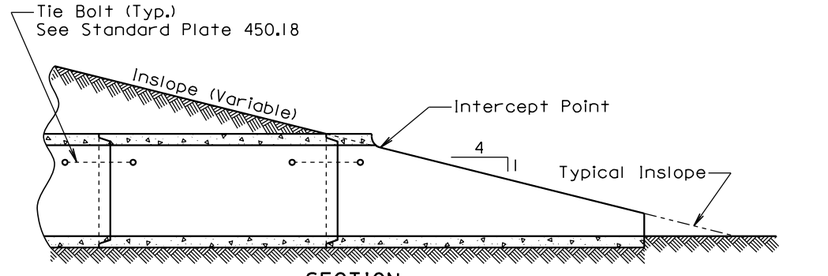
Dia. (in.)	T (in.)	A (in.)	B (in.)	C (in.)	D (in.)	R (in.)
FOR CIRCULAR PIPE						
24	3	6	72	12	84	3
30	3 1/2	7 1/2	90	12	102	3 1/2
FOR ARCH PIPE						
* 24	3	6	48	12	60	3
* 30	3 1/2	7 1/2	60	12	72	3 1/2
* 36	4 1/2	8 5/8	66	30	96	0
* 42	4 1/2	10	77 1/4	18 3/4	96	0

ALTERNATE

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

* Equivalent Diameter of Circular R.C.P.

** Acceptable Flat Bottom Alternate.



SECTION
(Along Centerline of Pipe)

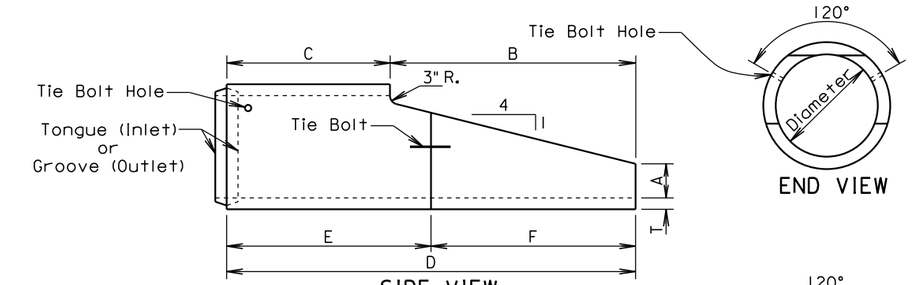
GENERAL NOTE:

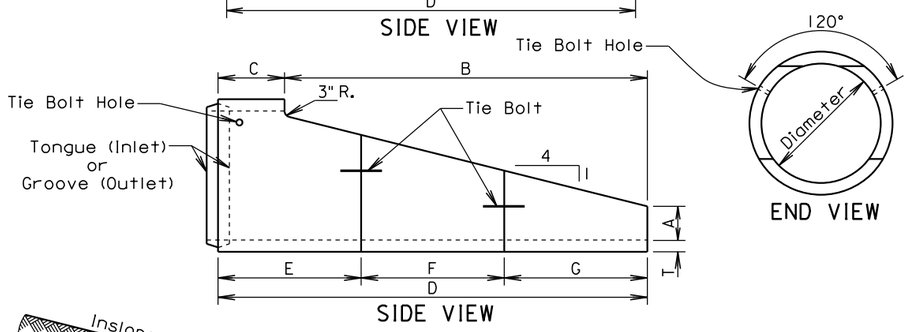
The length of concrete pipe shown in the construction plans is between sloped ends.

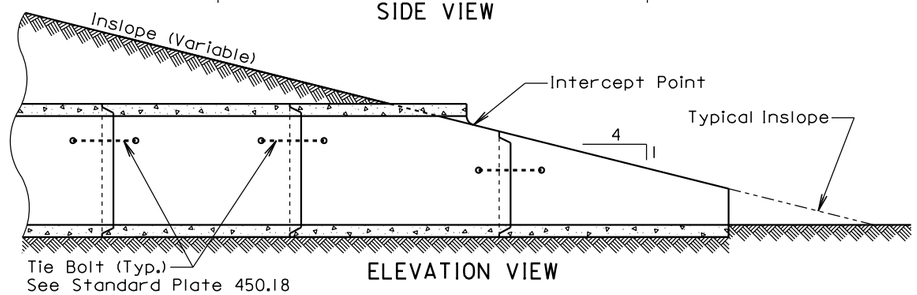
September 22, 2006

Published Date: 2025	SDDOT	R. C. P. SLOPED ENDS	PLATE NUMBER 450.13 Sheet 1 of 1

PLOTTED FROM - $$USERNAME$$







Dia. (in.)	T (in.)	A (in.)	B (in.)	C (in.)	D (in.)	E (in.)	F (in.)	G (in.)
36	4	12	86.5	57.5	144	72	72	
42	4.5	12	110.5	33.5	144	72	72	
48	5	12	134.5	33.5	168	96	72	
54	5.5	12	158.5	33.5	192	96	96	
60	6	12	182.5	33.5	216	72	72	72

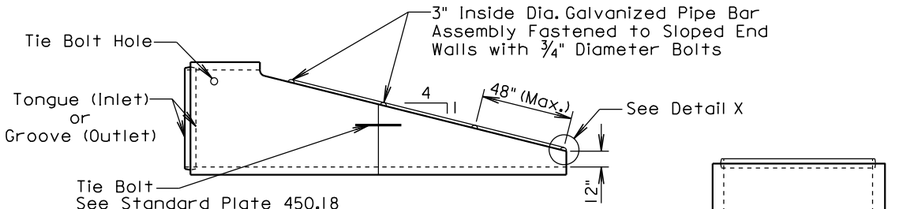
GENERAL NOTE:

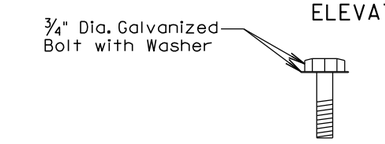
The length of concrete pipe shown in the construction plans is between sloped ends.

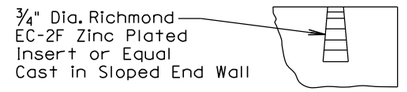
If bars are specified in the plans, then the bar assemblies shall be constructed in accordance with Standard Plate 450.15.

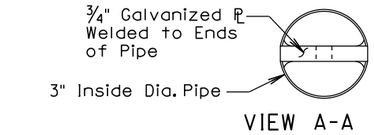
August 31, 2013

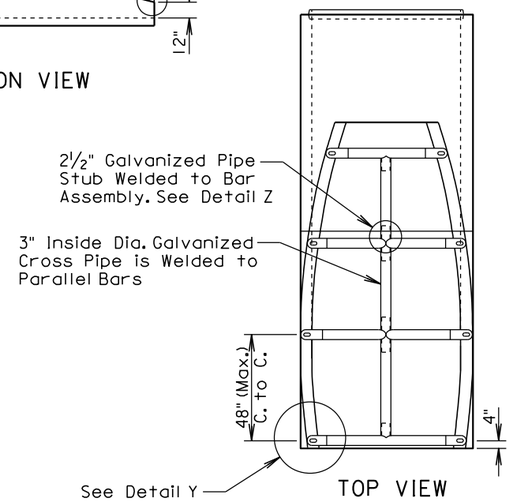
Published Date: 2025	SDDOT	***R. C. P. SLOPED ENDS WITH OR WITHOUT BARS***	*PLATE NUMBER* 450.14 *Sheet 1 of 1*

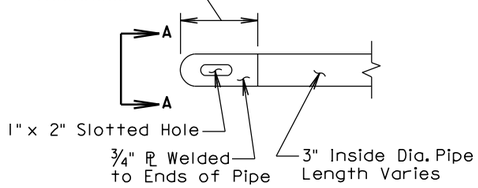


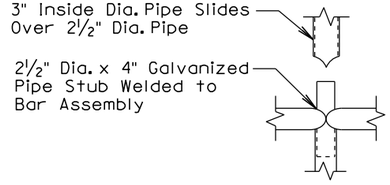












GENERAL NOTES:

The bar assembly shall be fabricated from steel in accordance with ASTM A53, Grade B or ASTM A500, Grade B.

The schedule 40 pipe sizes on the bar assembly drawings indicate sizes in regards to specification ASTM A53, Grade B. The allowable ASTM A500, Grade B sizes are HSS 3.5X.216 (for 3" schedule 40 pipe) and HSS 3X.25 (for 2.5" schedule 40 pipe).

Welding shall be accomplished by a certified welder. Installation shall be performed in accordance with the Specifications.

The bar assembly shall be galvanized after fabrication in accordance with ASTM A123.

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

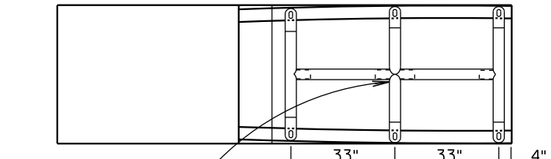
June 26, 2015

Published Date: 2025	SDDOT	***R. C. P. SLOPED END BAR ASSEMBLIES***	*PLATE NUMBER* 450.15 *Sheet 1 of 2*

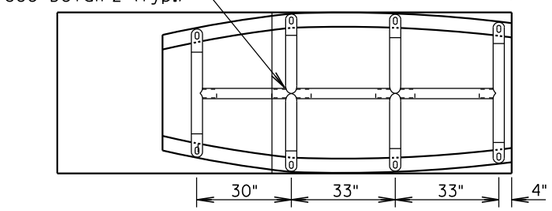
PLOTTED FROM - $$USERNAME$$

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(120)145	68	93

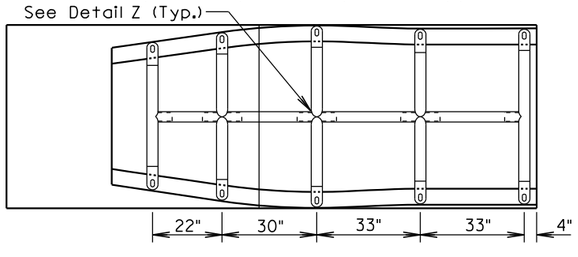
Revised 2-29-24 BRO



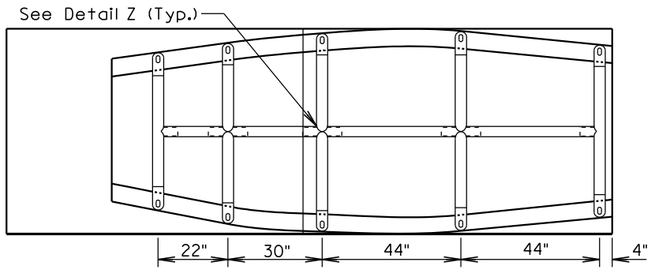
36"
SLOPED END



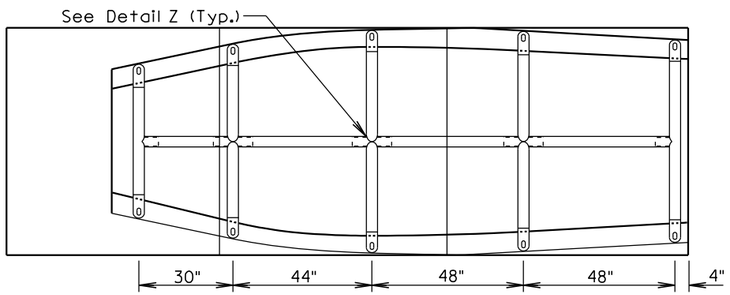
42"
SLOPED END



48"
SLOPED END



54"
SLOPED END

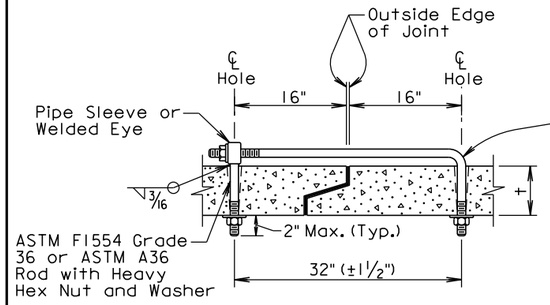


60"
SLOPED END

June 26, 2015

Published Date: 2025	SDDOT	R. C. P. SLOPED END BAR ASSEMBLIES	PLATE NUMBER 450.15
			Sheet 2 of 2

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



ADJUSTABLE EYE BOLT TIE

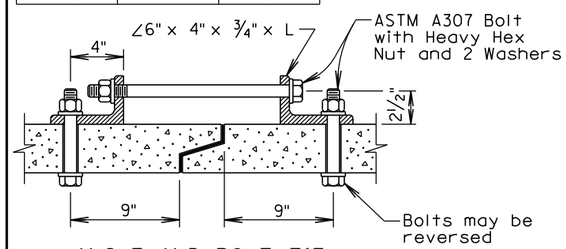
GENERAL NOTES:

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

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

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

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



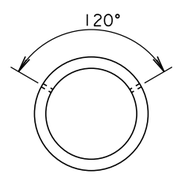
ANGLE AND BOLT TIE

GENERAL NOTES:

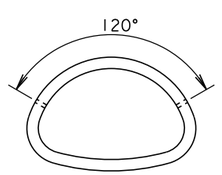
Angles shall conform to ASTM A36.

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

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



END VIEW "CIRCULAR"



END VIEW "ARCH"

GENERAL NOTES:

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

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

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

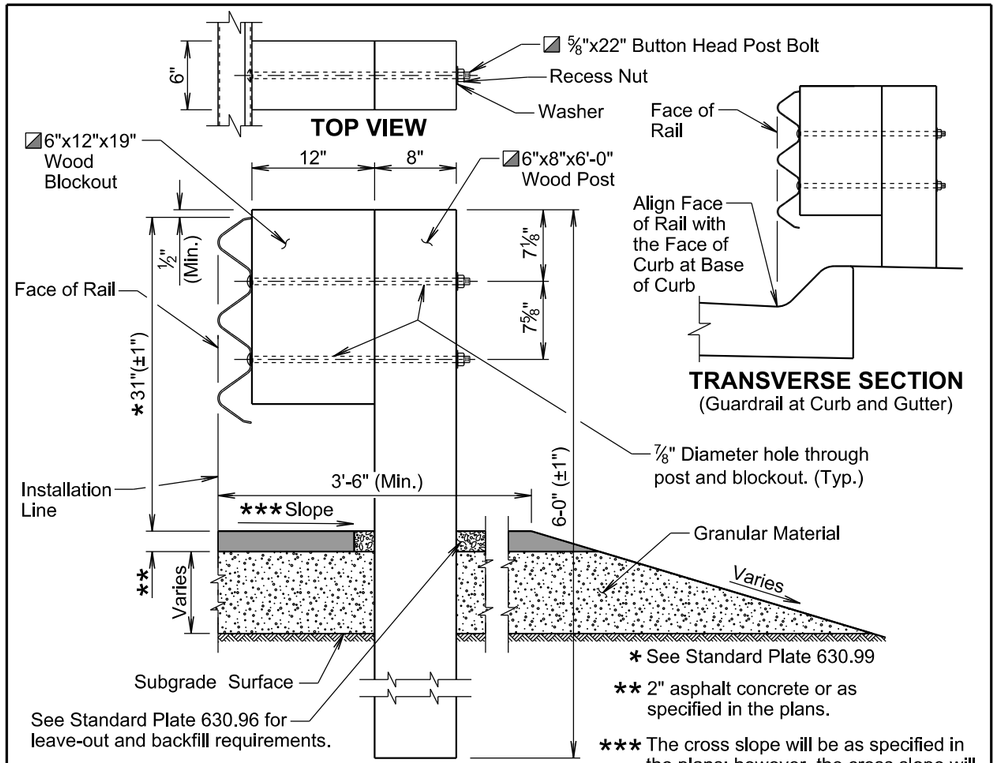
February 28, 2013

Published Date: 2025	SDDOT	TIE BOLTS FOR R.C.P. AND R.C.P. ARCH	PLATE NUMBER 450.18
			Sheet 1 of 1

PLOTTED FROM - $$USERNAME$$

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(120)145	69	93

Revised 2-29-24 BRO



∗ See Standard Plate 630.99

∗∗ 2" asphalt concrete or as specified in the plans.

∗∗∗ The cross slope will be as specified in the plans; however, the cross slope will not be steeper than a 10:1 slope.

GENERAL NOTES:

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

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

Topsoil is not shown in the transverse section drawing.

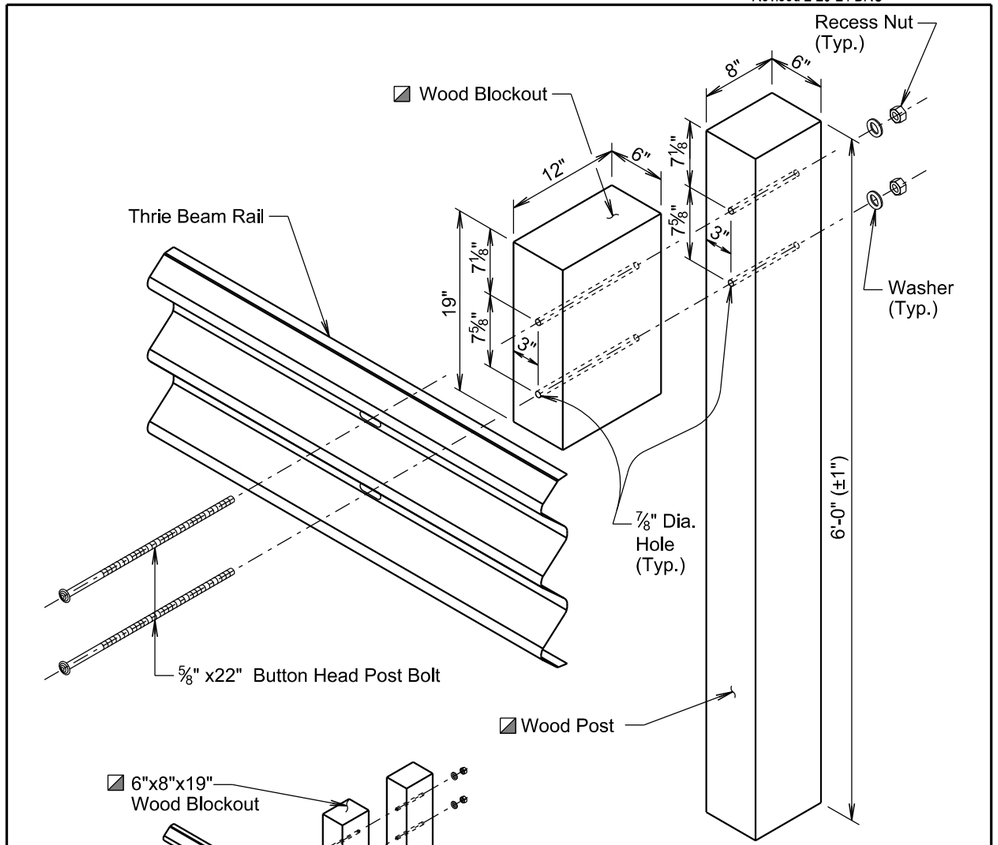
☑ The post and blockout illustrated above is typical for single thrie beam guardrail. When other variations of posts and blockouts are specified on other standard plates (e.g. transitions) then the posts and blockouts will be as specified on the other standard plates or as specified in the plans.

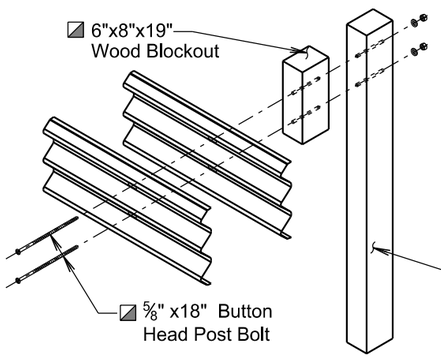
Slots in the rails will be provided as specified in the plans and by the manufacturer. A drilled hole through the rail is not allowed as a replacement for a slot. If the Contractor must create a slot, a cutting torch or plasma cutter is not allowed. The slot edges will be smooth and free of burrs or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

The top of post and top of block will have a true square cut. The top of block will be a maximum of ±½ inch from the top of the post.

September 14, 2019

Published Date: 2025	SDDOT	THRIE BEAM GUARDRAIL	PLATE NUMBER 630.01
			Sheet 1 of 5





EXPANDED ISOMETRIC VIEW OF DOUBLE (NESTED) THRIE BEAM GUARDRAIL AT MIDSPAN
(For Information Only, Not to Scale)

☑ For single thrie beam guardrail use 6"x12"x19" wood blockout, ⅝"x22" button head post bolt, and 6"x8"x6'-0" wood post. For double (nested) thrie beam guardrail use 6"x8"x19" wood blockout, ⅝"x18" button head post bolt, and 6"x8"x7'-0" wood post.

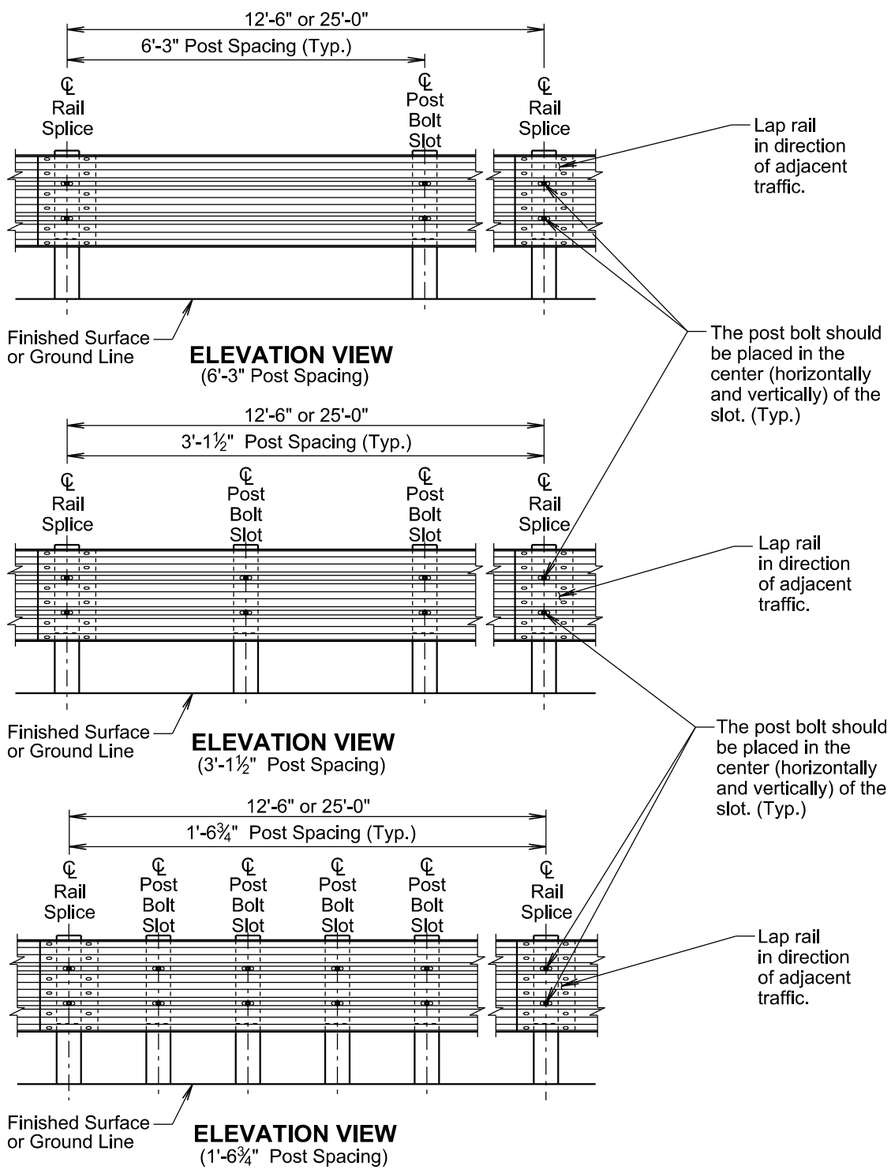
September 14, 2019

Published Date: 2025	SDDOT	THRIE BEAM GUARDRAIL	PLATE NUMBER 630.01
			Sheet 2 of 5

PLOTTED FROM - $$USERNAME$$

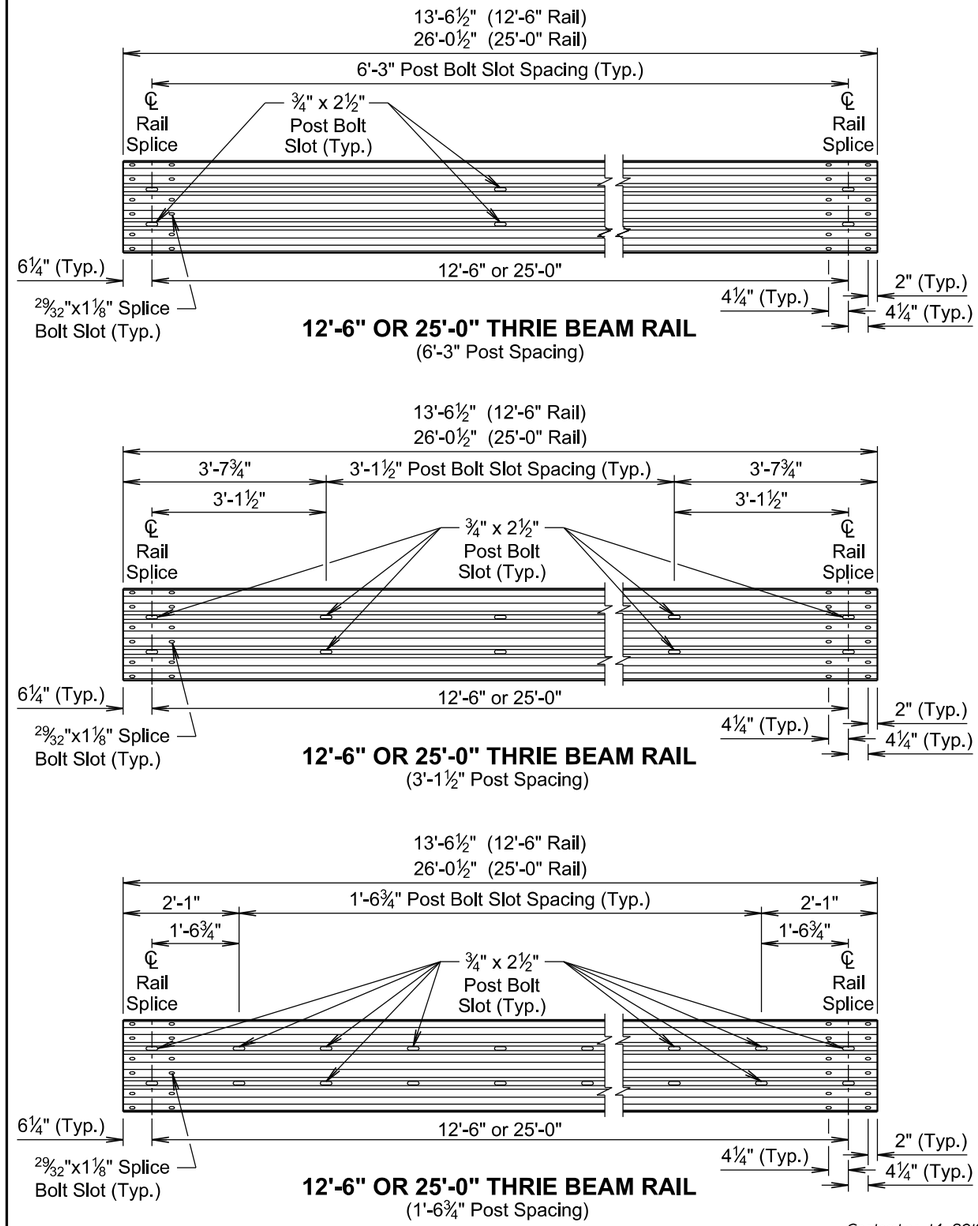
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(120)145	70	93

Revised 2-29-24 BRO



September 14, 2019

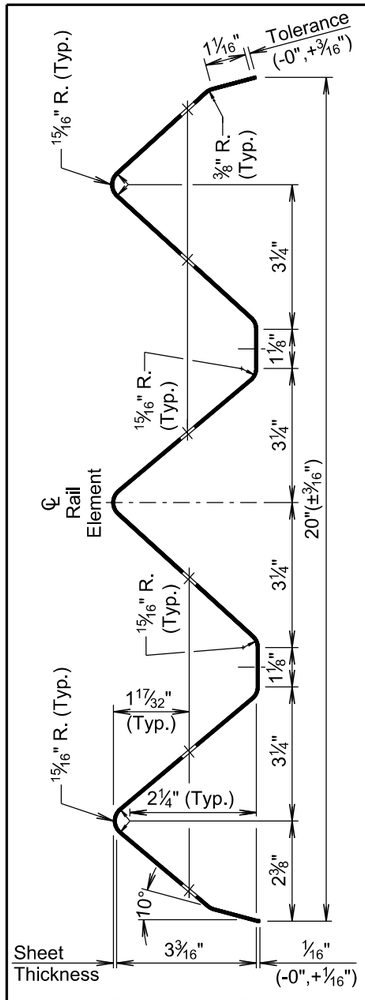
Published Date: 2025	SDDOT	THRIE BEAM GUARDRAIL	PLATE NUMBER 630.01
			Sheet 3 of 5



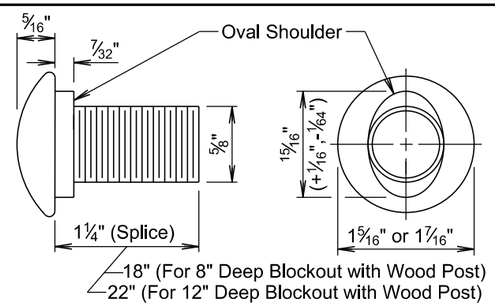
September 14, 2019

Published Date: 2025	SDDOT	THRIE BEAM GUARDRAIL	PLATE NUMBER 630.01
			Sheet 4 of 5

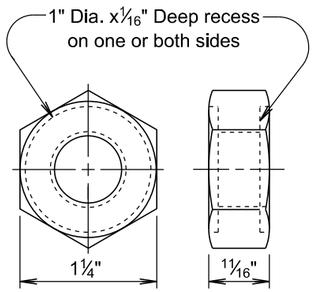
PLOTTED FROM - $$USERNAME$$



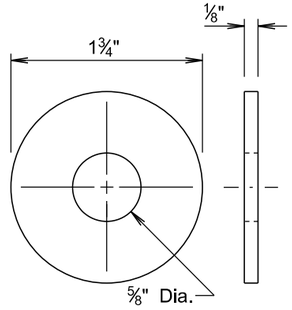
SECTION THROUGH THRIE BEAM RAIL



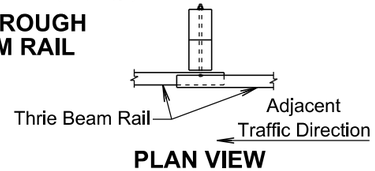
SPLICE BOLT AND POST BOLT
(5/8" Button Head Bolt)



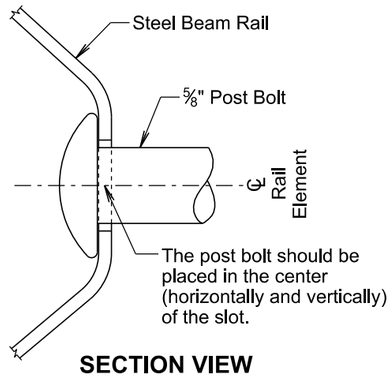
RECESS NUT
(At lap splices, the recess will be placed against the steel rail.)



WASHER
(The washer will be placed between the back side of wood post and the recess nut, see sheet 1 and 2.)



PLAN VIEW
(Lap Splice)
(Lap rail in direction of adjacent traffic.)
(12 splice bolts and 12 recess nuts per splice, NO washers)



SECTION VIEW
(At Post Bolt)

September 14, 2019

Published Date: 2025	SDDOT	THRIE BEAM GUARDRAIL	PLATE NUMBER 630.01
			Sheet 5 of 5

TYPE AND DETAILS OF MGS

Type of MGS	W Beam Rail Single or Double (Nested)	Blockout Size	Blockout Material	Post Size	Post Material	Post Spacing
1	Single	6"x12"x14"	Wood	6"x8"x6'-0"	Wood	6'-3"
1C	Single	6"x12"x14"	Wood	6"x8"x7'-6"	Wood	6'-3"
2	Single	6"x12"x14"	Wood	6"x8"x6'-0"	Wood	3'-1½"
3	Single	6"x12"x14"	Wood	6"x8"x6'-0"	Wood	1'-6¾"
4	Double	6"x12"x14"	Wood	6"x8"x6'-0"	Wood	6'-3"

STANDARD PLATE REFERENCE

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

GENERAL NOTES:

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

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

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

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

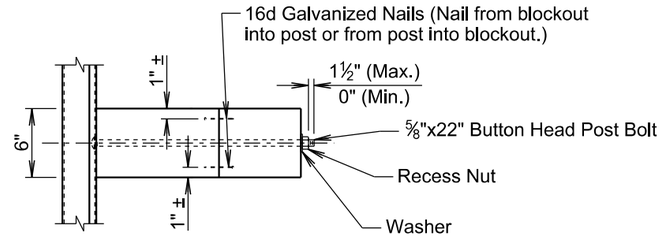
W beam rail section lengths may be 12'-6" and/or 25'-0". The combination of section lengths used will be compatible with the total length of rail per site as shown in the plans.

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

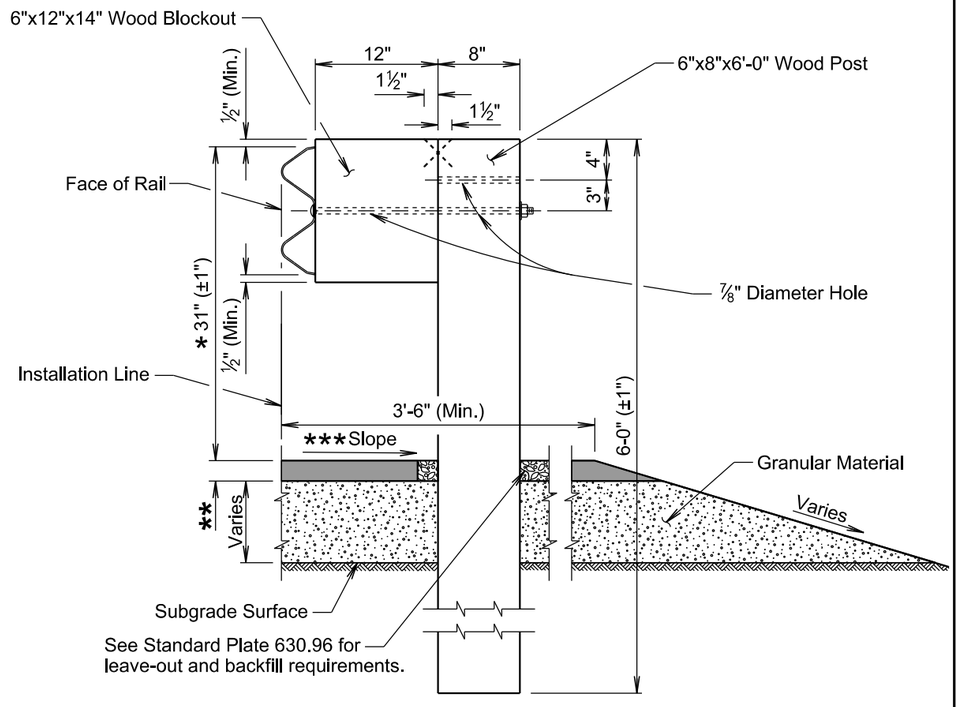
All costs for constructing the MGS including labor, equipment, and materials including all posts, blockouts, steel beam rail, and hardware will be incidental to the contract unit price per foot for the respective MGS contract item.

September 14, 2019

Published Date: 2025	SDDOT	MIDWEST GUARDRAIL SYSTEM (MGS)	PLATE NUMBER 630.20
			Sheet 1 of 6



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



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

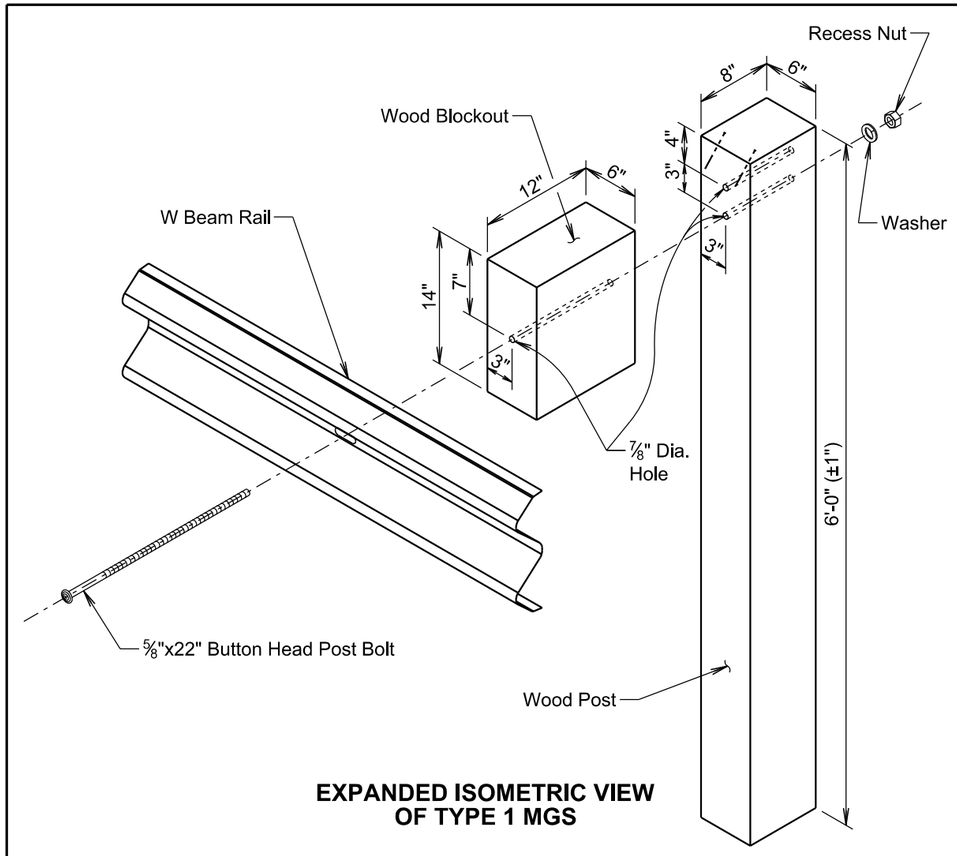
* See Standard Plate 630.99

** 2" asphalt concrete or as specified in the plans.

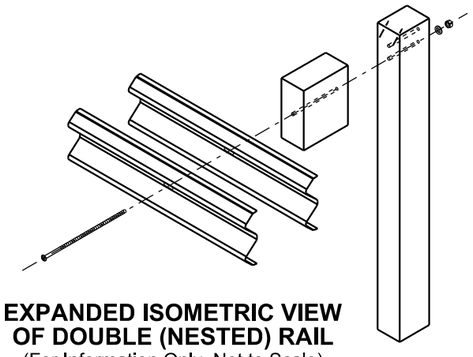
*** The cross slope will be as specified in the plans; however, the cross slope will not be steeper than a 10:1 slope.

September 14, 2019

Published Date: 2025	SDDOT	MIDWEST GUARDRAIL SYSTEM (MGS)	PLATE NUMBER 630.20
			Sheet 2 of 6



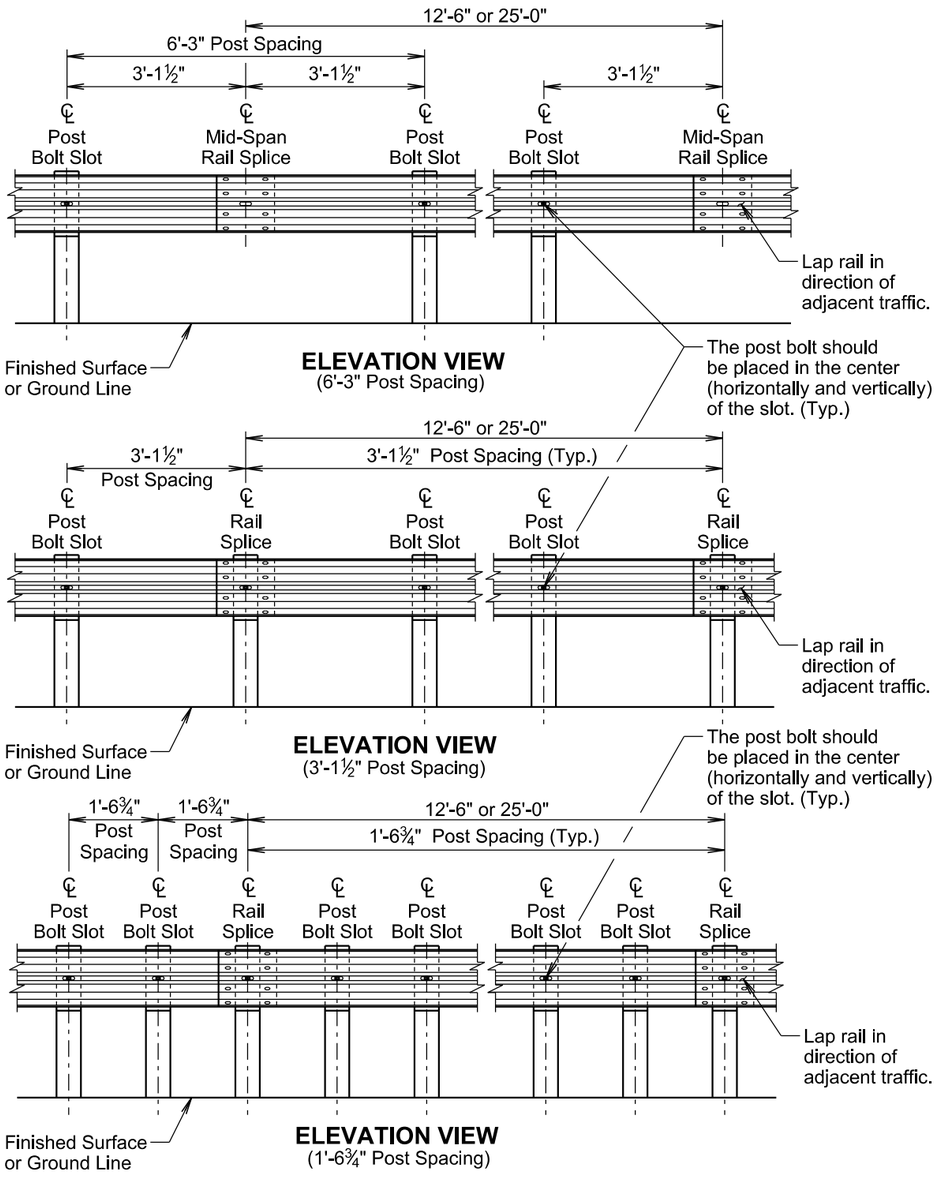
EXPANDED ISOMETRIC VIEW OF TYPE 1 MGS



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

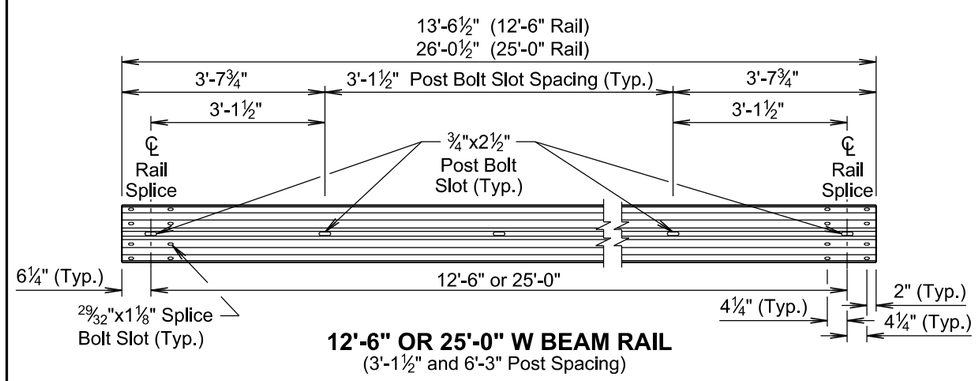
September 14, 2019

Published Date: 2025	SDDOT	MIDWEST GUARDRAIL SYSTEM (MGS)	PLATE NUMBER 630.20
			Sheet 3 of 6

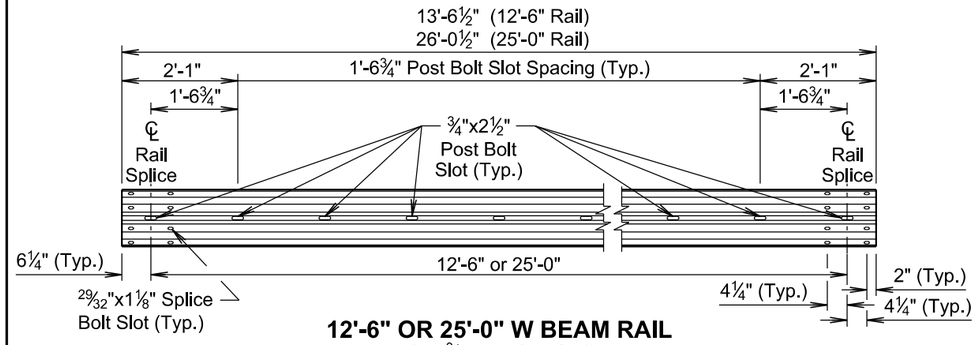


September 14, 2019

Published Date: 2025	SDDOT	MIDWEST GUARDRAIL SYSTEM (MGS)	PLATE NUMBER 630.20
			Sheet 4 of 6



12'-6" OR 25'-0" W BEAM RAIL
(3'-1½" and 6'-3" Post Spacing)

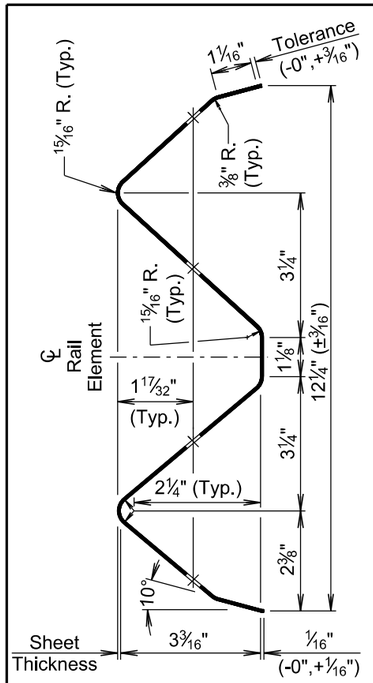


12'-6" OR 25'-0" W BEAM RAIL
(1'-6¾" Post Spacing)

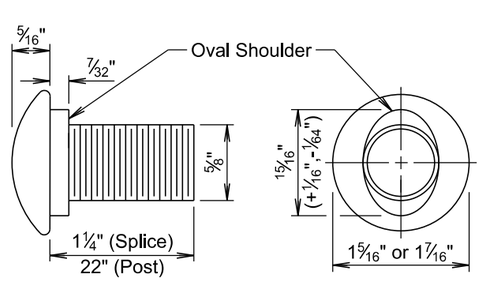
September 14, 2019

Published Date: 2025	SDDOT	MIDWEST GUARDRAIL SYSTEM (MGS)	PLATE NUMBER 630.20
			Sheet 5 of 6

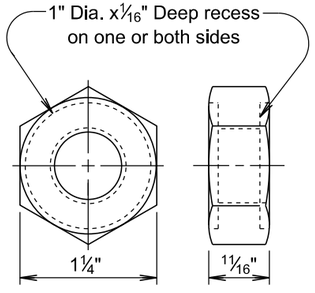
PLOTTED FROM - $$USERNAME$$



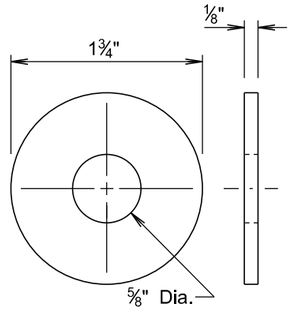
SECTION THROUGH W BEAM RAIL



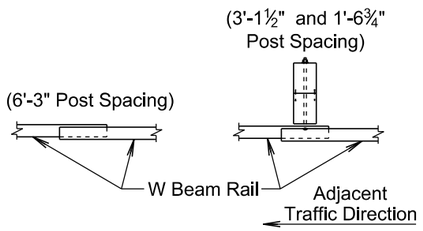
SPLICE BOLT AND POST BOLT
(5/8" Button Head Bolt)



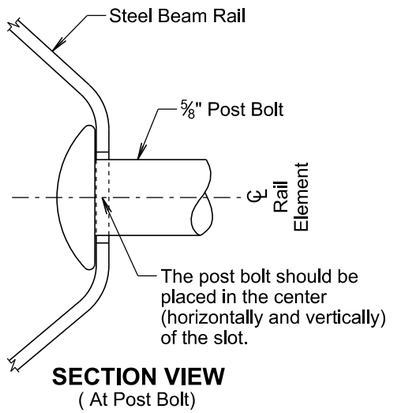
RECESS NUT
(At lap splices, the recess will be placed against the steel rail.)



WASHER
(The washer will be placed between the back side of wood post and the recess nut, see sheet 2 and 3.)



PLAN VIEW
(Lap Splice)
(Lap rail in direction of adjacent traffic.)
(8 splice bolts and 8 recess nuts per splice, NO washers)

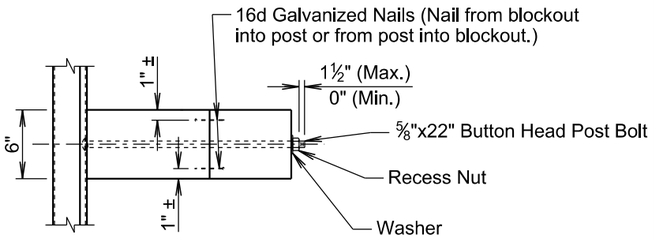


SECTION VIEW
(At Post Bolt)

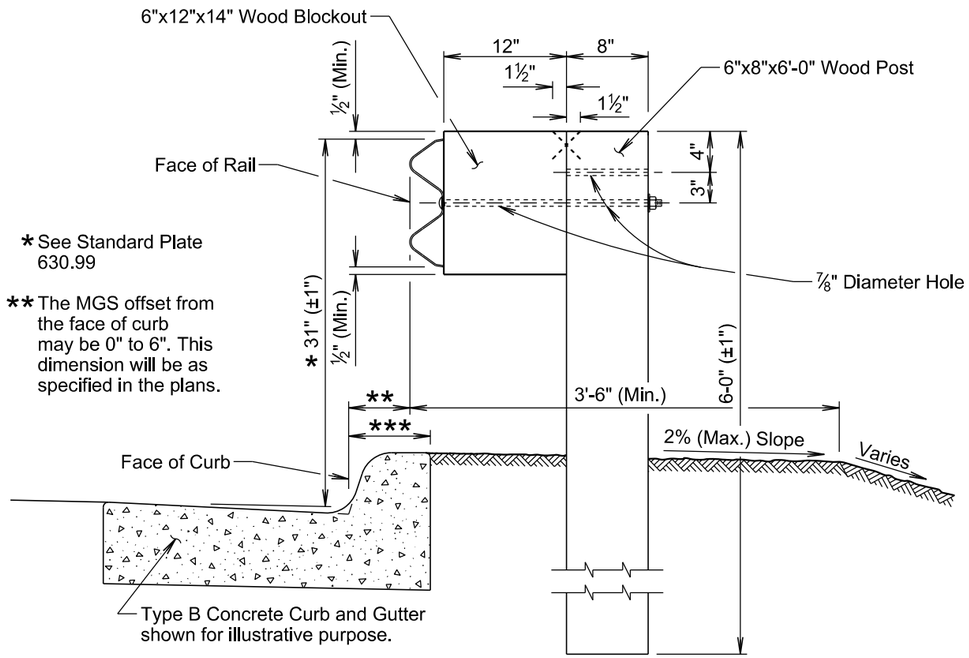
September 14, 2019

Published Date: 2025	SDDOT	MIDWEST GUARDRAIL SYSTEM (MGS)	PLATE NUMBER 630.20
			Sheet 6 of 6

CONCRETE CURB AND GUTTER TYPE	DIMENSION *** (in.)
B and BL	8
D	12
F and FL	10
R	11



TOP VIEW



TRANSVERSE SECTION

GENERAL NOTES:

The guardrail on this standard plate is Type 1 MGS. See standard plate 630.20 for specifications regarding Type 1 MGS.

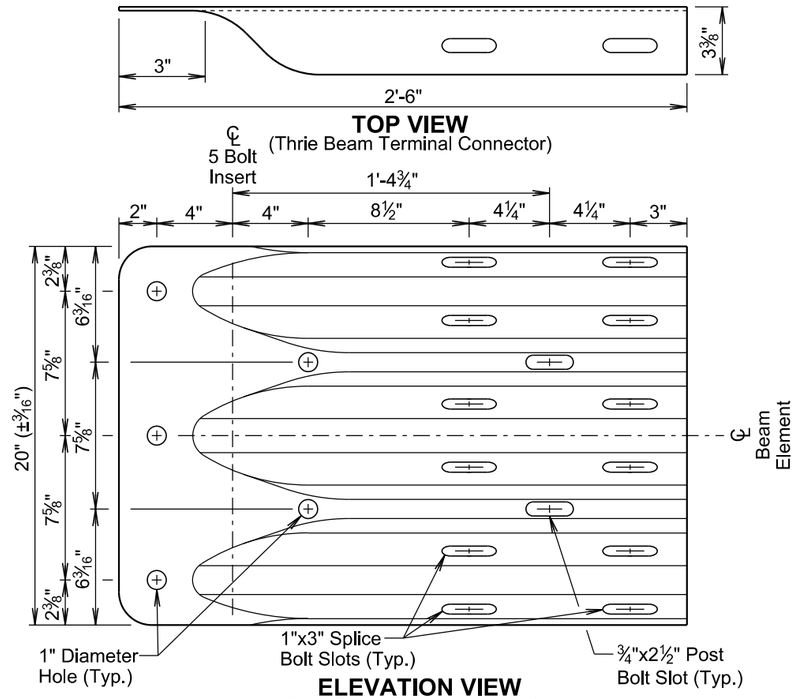
When PCC pavement or asphalt concrete pavement is adjacent to the post, see standard plate 630.96 for leave-out and backfill requirements.

September 14, 2019

Published Date: 2025	SDDOT	MIDWEST GUARDRAIL SYSTEM (MGS) AT CURB AND GUTTER	PLATE NUMBER 630.22
			Sheet 1 of 1

PLOTTED FROM - $$USERNAME$$

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(1201)145	75	93



GENERAL NOTES:

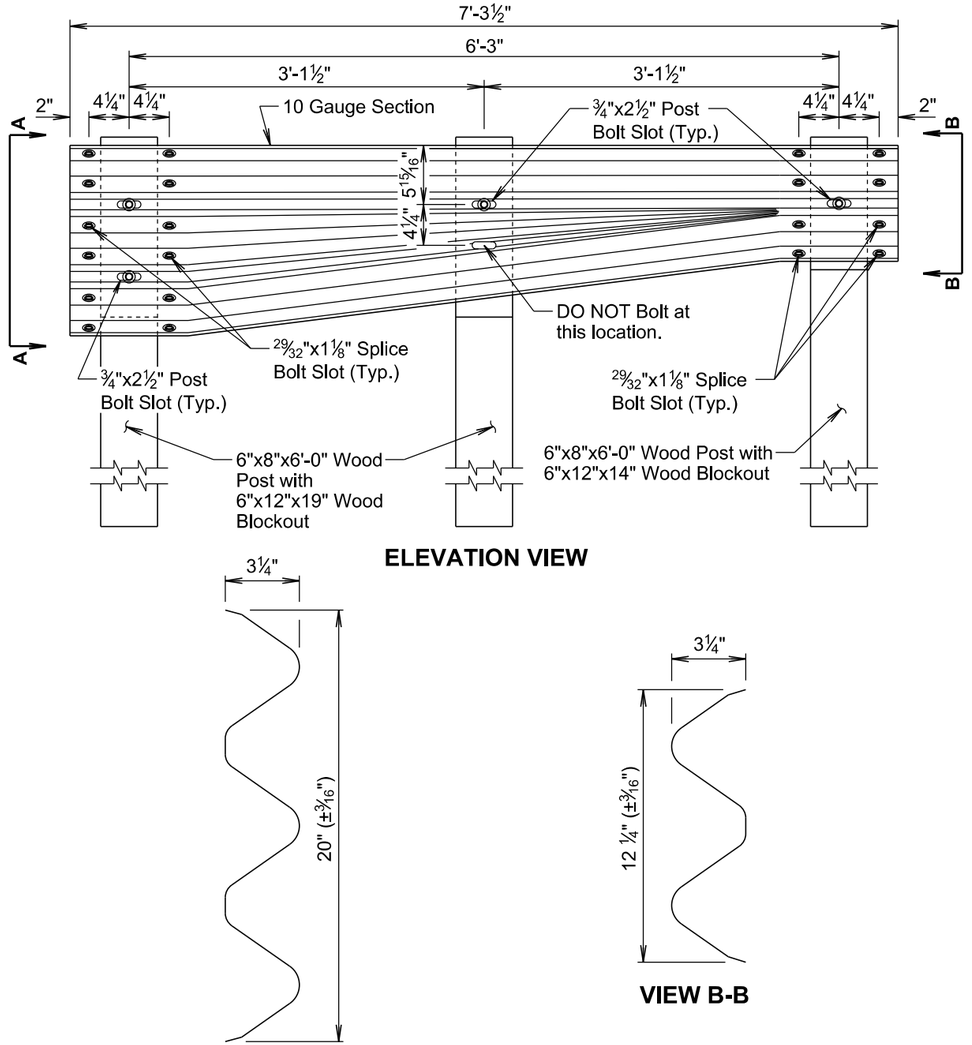
Thrie Beam Terminal Connectors will be 10 gauge.

When the thrie beam terminal connector is used to connect the rail to the bridge or concrete end block, 1" steel washers will be used at the lap splice and the washers will be in direct contact with the 3" slots of the thrie beam terminal connector. See the drawings above for the typical locations of the 1" steel washers.

There will be no separate payment for furnishing and installing the thrie beam terminal connector. All costs for furnishing and installing the thrie beam terminal connector will be incidental to the contract unit price of the respective guardrail item it is attached to.

September 14, 2019

Published Date: 2025	SDDOT	THRIE BEAM TERMINAL CONNECTOR	PLATE NUMBER 630.47
			Sheet 1 of 1



GENERAL NOTES:

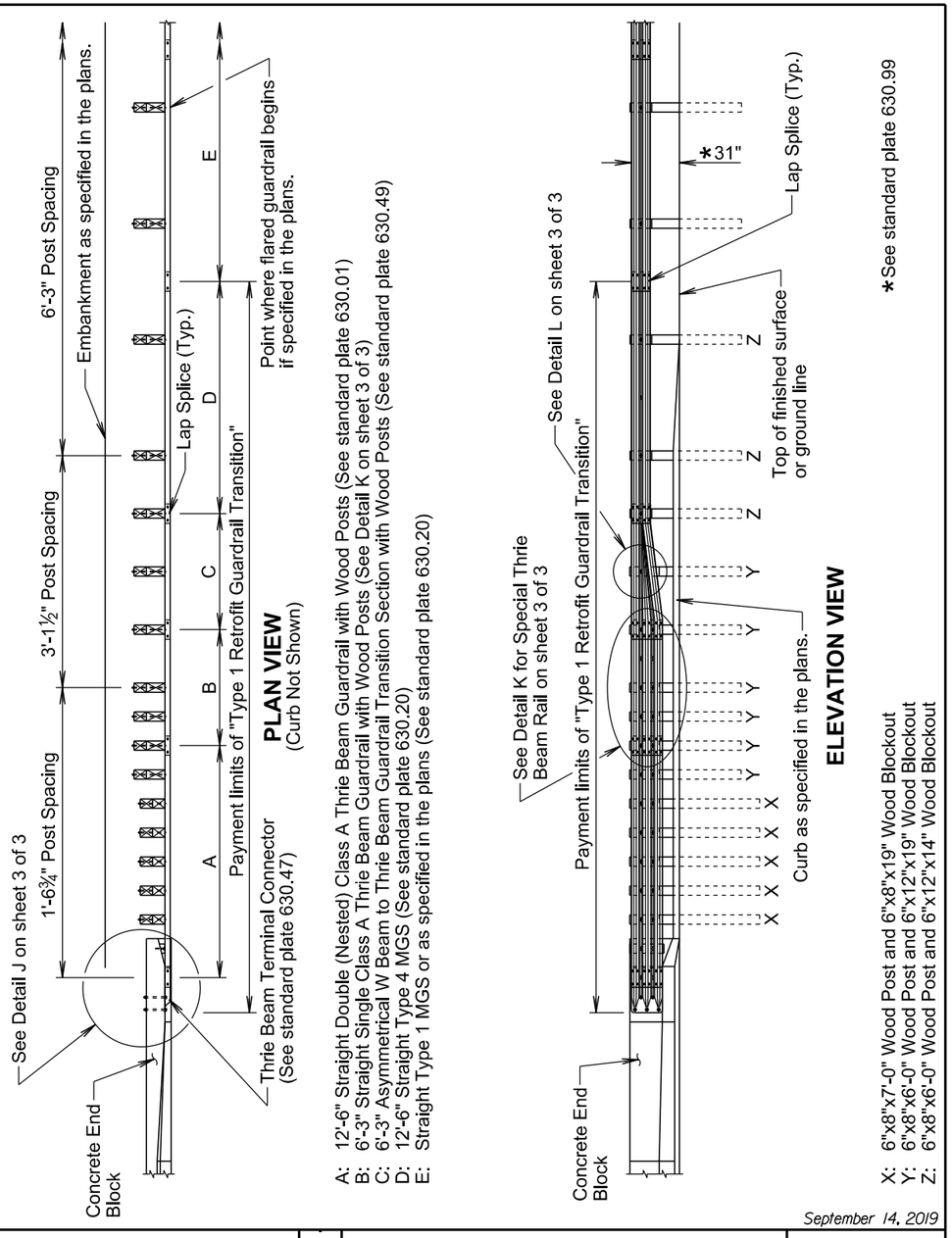
All costs for furnishing and installing the asymmetrical W beam to thrie beam guardrail transition including labor, equipment, and materials including two posts, two blocks, asymmetrical W beam to thrie beam transition section, and hardware will be incidental to the contract unit price per each for the corresponding guardrail transition contract item.

September 14, 2019

Published Date: 2025	SDDOT	ASYMMETRICAL W BEAM TO THRIE BEAM GUARDRAIL TRANSITION SECTION	PLATE NUMBER 630.49
			Sheet 1 of 1

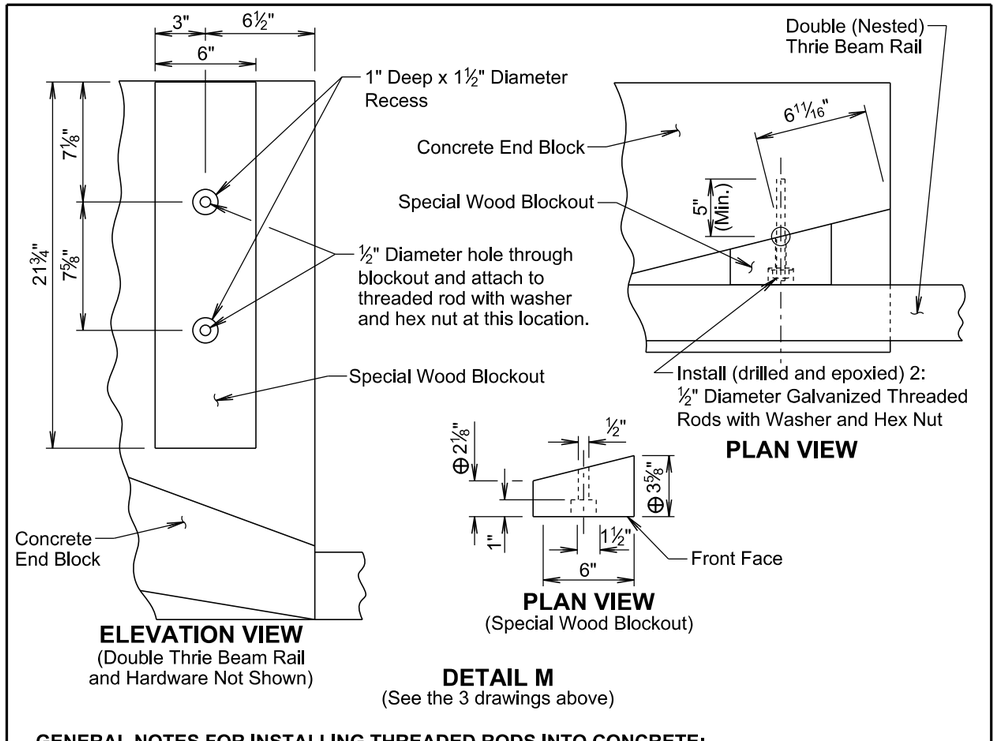
PLOTTED FROM - $USERNAME$$

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(120)145	76	93



September 14, 2019

Published Date: 2025	SDDOT	TYPE 1 RETROFIT GUARDRAIL TRANSITION (CONCRETE END BLOCK TO MIDWEST GUARDRAIL SYSTEM (MGS))	PLATE NUMBER 630.51
			Sheet 1 of 3



DETAIL M
(See the 3 drawings above)

GENERAL NOTES FOR INSTALLING THREADED RODS INTO CONCRETE:

⊕ The dimensions shown are estimated based on original construction plans of the concrete end block. The special wood blockout will be cut as necessary such that the front face of the special wood blockout will align with the vertical front face of the concrete end block ±½".

The threaded rods will be ½" diameter and conform to ASTM F1554, Grade 55. The threaded rods will be embedded a minimum of 5" into the concrete.

The diameter of the drilled holes will not be less than ⅛" greater or more than ⅜" greater than the diameter of the threaded rods or as per the Manufacturer's recommendations. The 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 the epoxy injection.

The epoxy resin mixture will be of a type for bonding steel to hardened concrete and will conform to AASHTO M235 Type IV, Grade 3 (Equivalent to ASTM C881, Type IV, Grade 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 ⅓ to ½ full of epoxy, or as recommended by the Manufacturer, prior to insertion of the steel rod. Rotate the steel rod during installation to eliminate voids and ensure complete bonding of the rod. Insertion of the rods by the dipping or painting methods will not be allowed.

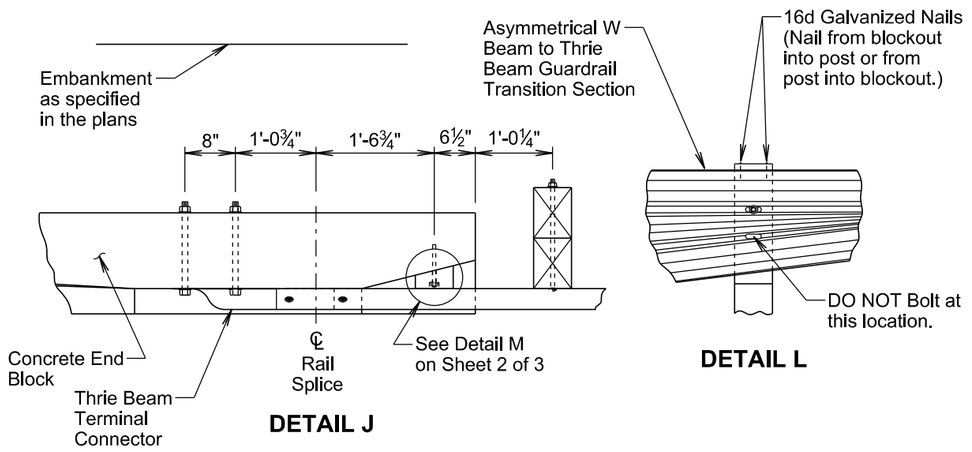
Loads will not be applied to the epoxy grouted threaded rods until the epoxy resin has had sufficient time to cure as specified by the epoxy resin Manufacturer.

September 14, 2019

Published Date: 2025	SDDOT	TYPE 1 RETROFIT GUARDRAIL TRANSITION (CONCRETE END BLOCK TO MIDWEST GUARDRAIL SYSTEM (MGS))	PLATE NUMBER 630.51
			Sheet 2 of 3

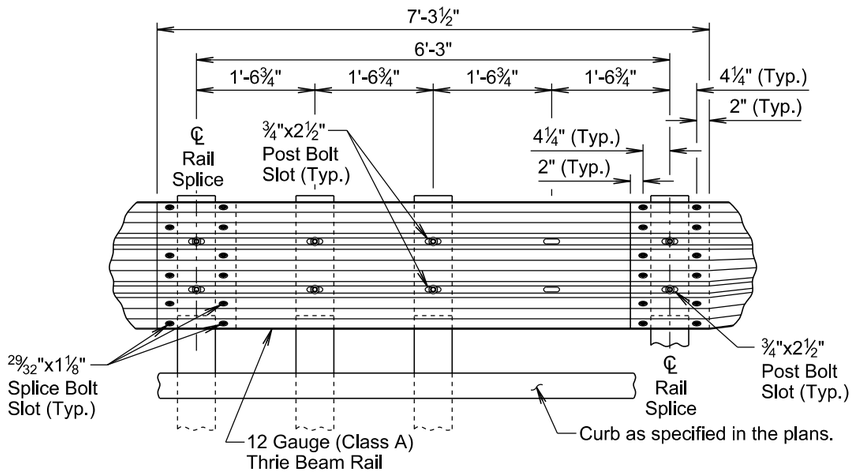
PLOTTED FROM - $$USERNAME$$

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(120)145	77	93



DETAIL J

DETAIL L



DETAIL K
(Special Thrie Beam Rail)

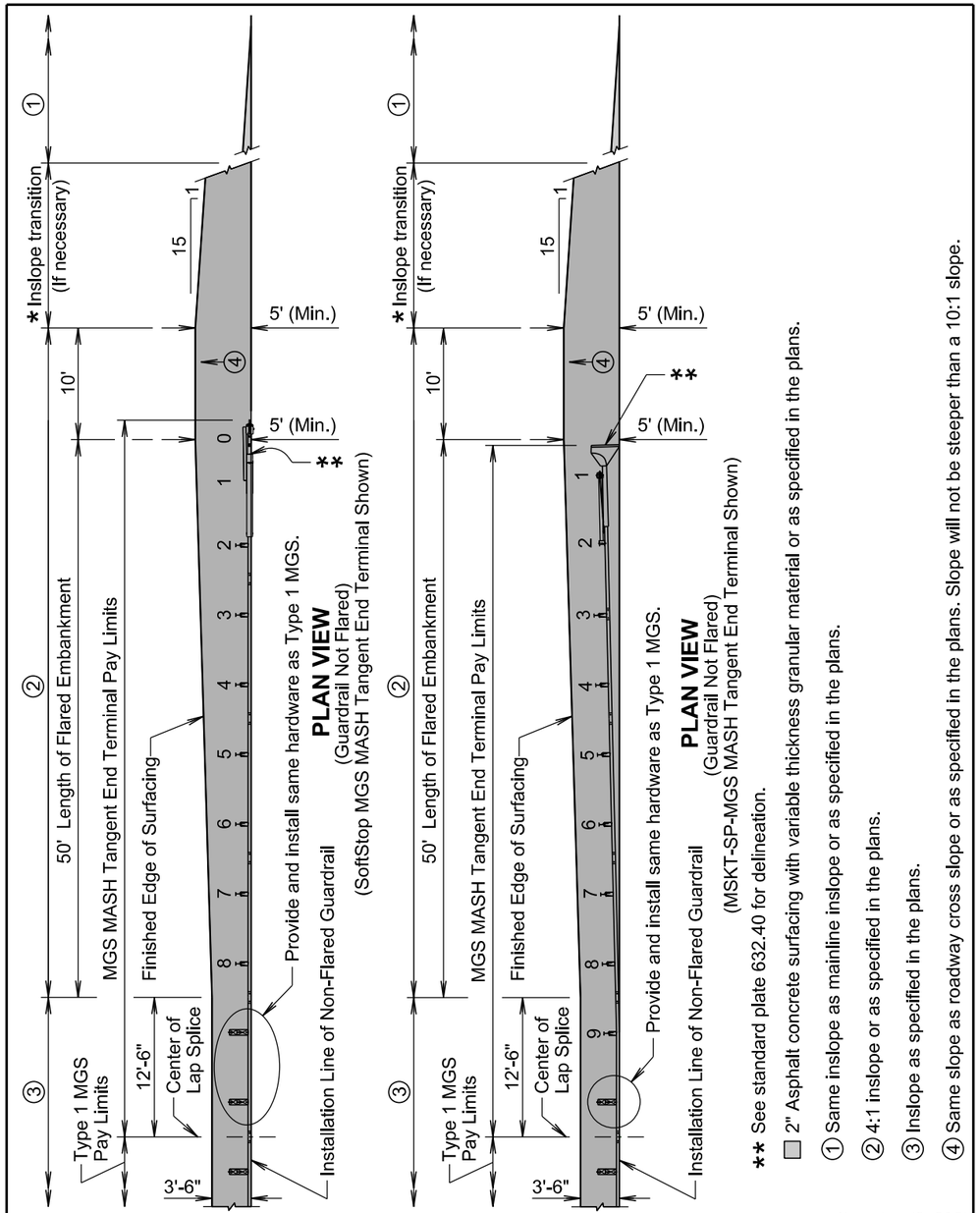
GENERAL NOTES:

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

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

September 14, 2019

Published Date: 2025	SDDOT	TYPE 1 RETROFIT GUARDRAIL TRANSITION (CONCRETE END BLOCK TO MIDWEST GUARDRAIL SYSTEM (MGS))	PLATE NUMBER 630.51
			Sheet 3 of 3

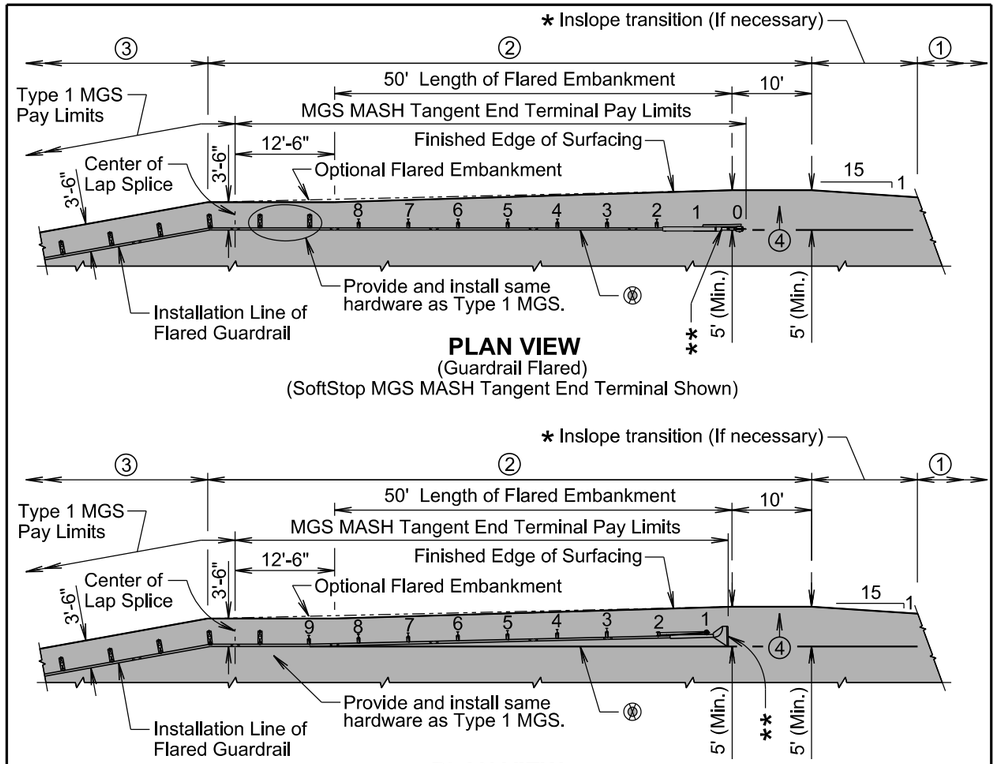


November 19, 2021

Published Date: 2025	SDDOT	EMBANKMENT, SURFACING, AND PAYMENT LIMITS FOR MGS MASH TANGENT END TERMINAL	PLATE NUMBER 630.89
			Sheet 1 of 2

PLOTTED FROM - $USERNAME$$

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(120)145	78	93



PLAN VIEW
(Guardrail Flared)
(SoftStop MGS MASH Tangent End Terminal Shown)

PLAN VIEW
(Guardrail Flared)
(MSKT-SP-MGS MASH Tangent End Terminal Shown)

GENERAL NOTES:

The MGS MASH tangent end terminals above are for illustrative purpose only. Pay limit length of the MGS MASH tangent end terminal is 62'-6".

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

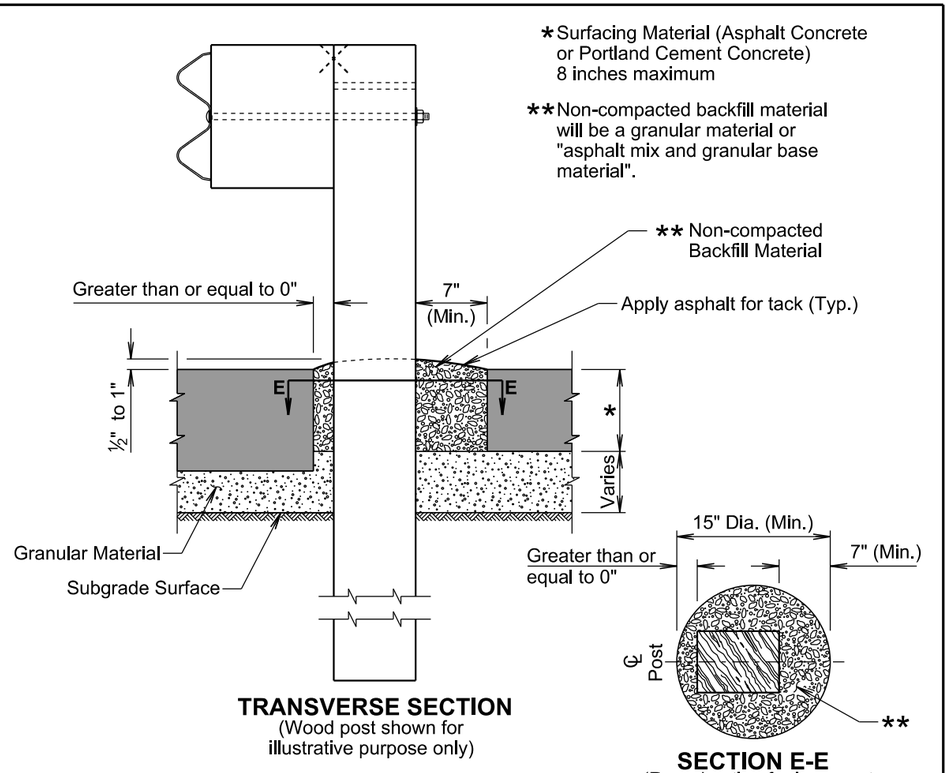
Ⓜ The installation reference line for MGS MASH tangent end terminals will always be parallel to the roadway.

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

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

November 19, 2021

Published Date: 2025	SDDOT	EMBANKMENT, SURFACING, AND PAYMENT LIMITS FOR MGS MASH TANGENT END TERMINAL	PLATE NUMBER 630.89
			Sheet 2 of 2



TRANSVERSE SECTION
(Wood post shown for illustrative purpose only)

SECTION E-E
(Round option for leave-out and backfill limits)
(Wood post shown for illustrative purpose only)

GENERAL NOTES:

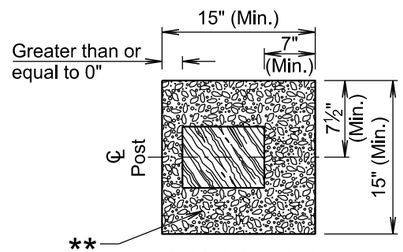
The leave-out limits may be increased to accommodate construction equipment and tolerances.

When posts are installed in augured or dug holes, the backfill material will be compacted to the bottom of the pavement surfacing material to the satisfaction of the Engineer. The backfill material for the thickness of the pavement surfacing material will be non-compacted.

The backfill material will be mounded ½ inch to 1 inch above the top of the adjacent surfacing as illustrated above.

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

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



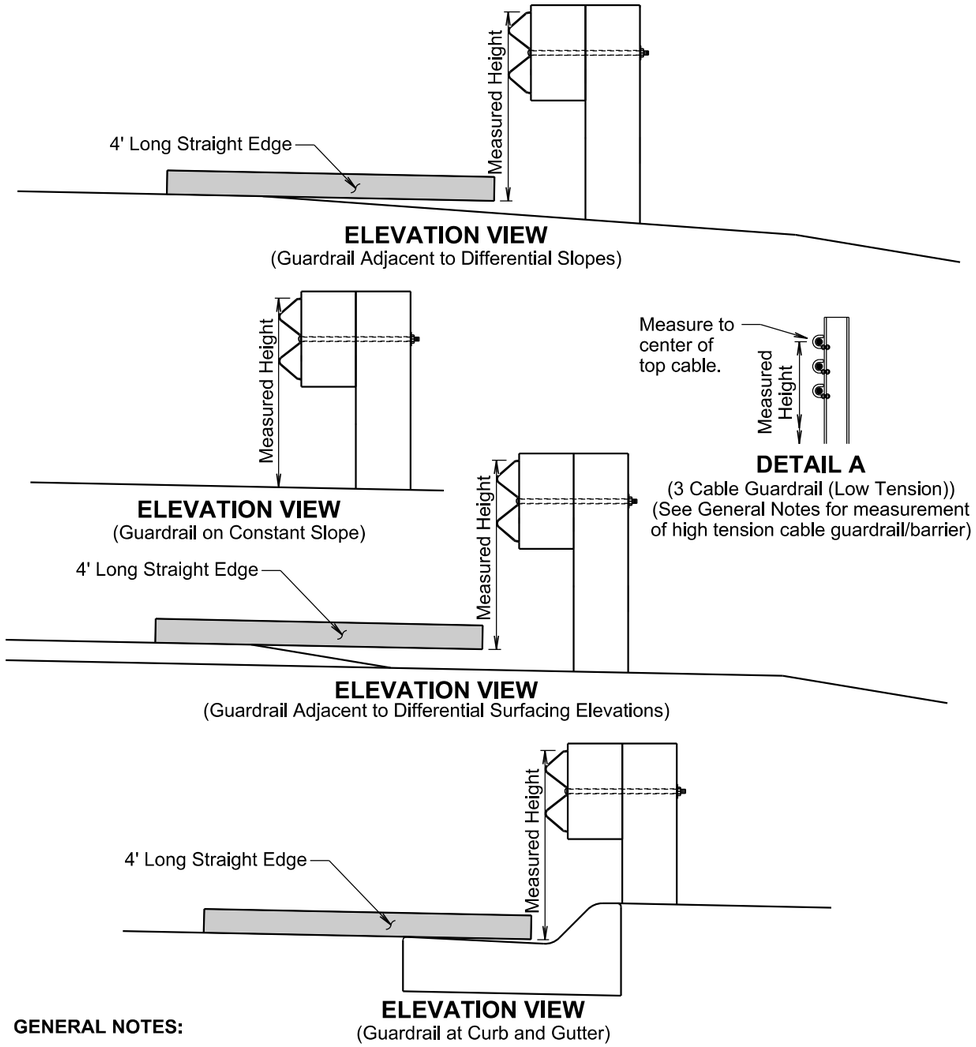
SECTION E-E
(Square option for leave-out and backfill limits)
(Wood post shown for illustrative purpose only)

November 19, 2021

Published Date: 2025	SDDOT	GUARDRAIL POST INSTALLED IN ASPHALT CONCRETE OR PORTLAND CEMENT CONCRETE	PLATE NUMBER 630.96
			Sheet 1 of 1

PLOTTED FROM - $$USERNAME$$

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(120)145	79	93



GENERAL NOTES:

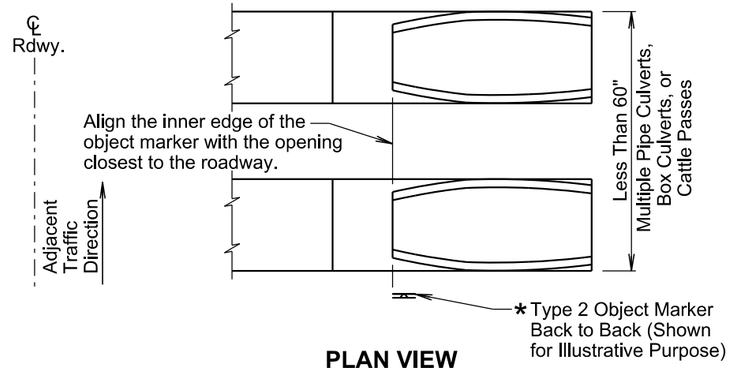
The W Beam guardrail shown is for illustrative purpose. The guardrail height for all types of guardrail systems except for high tension cable guardrail/barrier will be measured in accordance with this standard plate.

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

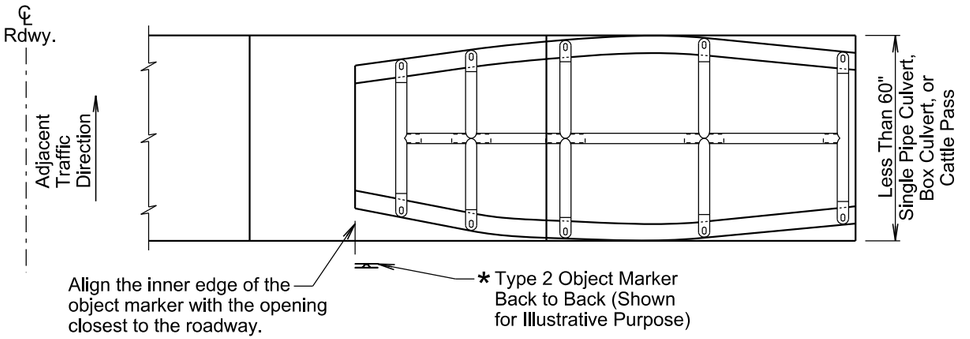
The height of high tension cable guardrail/barrier will be measured in accordance with the Manufacturer's installation instructions.

September 14, 2019

Published Date: 2025	SDDOT	MEASURING GUARDRAIL HEIGHT	PLATE NUMBER 630.99 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.

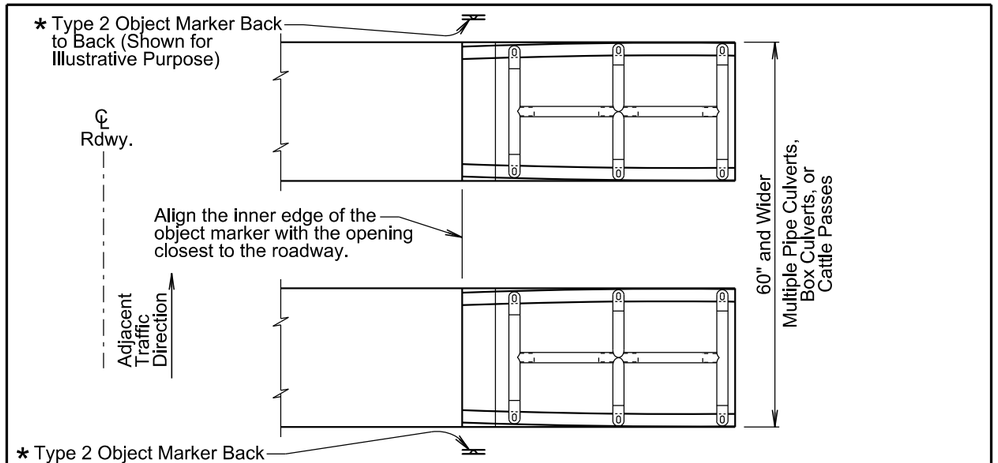
* The type 2 object markers will be installed at the locations shown above. The type 2 object markers, single faced or back to back, will be as specified in the plans.

December 23, 2019

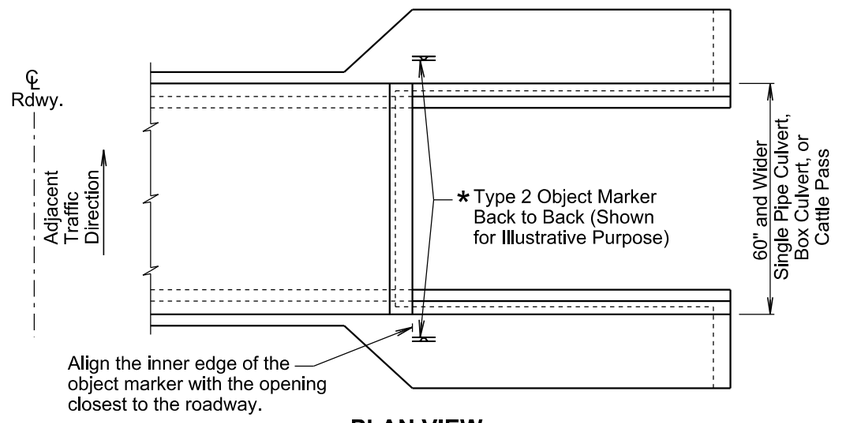
Published Date: 2025	SDDOT	TYPE 2 OBJECT MARKER AT PIPE CULVERTS, BOX CULVERTS, AND CATTLE PASSES (Less than 60" Overall Width)	PLATE NUMBER 632.03 Sheet 1 of 1

PLOTTED FROM - $USERNAME$$

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(120)145	80	93



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)
(Box culvert shown for illustrative purpose.)
(Embankment is not shown.)

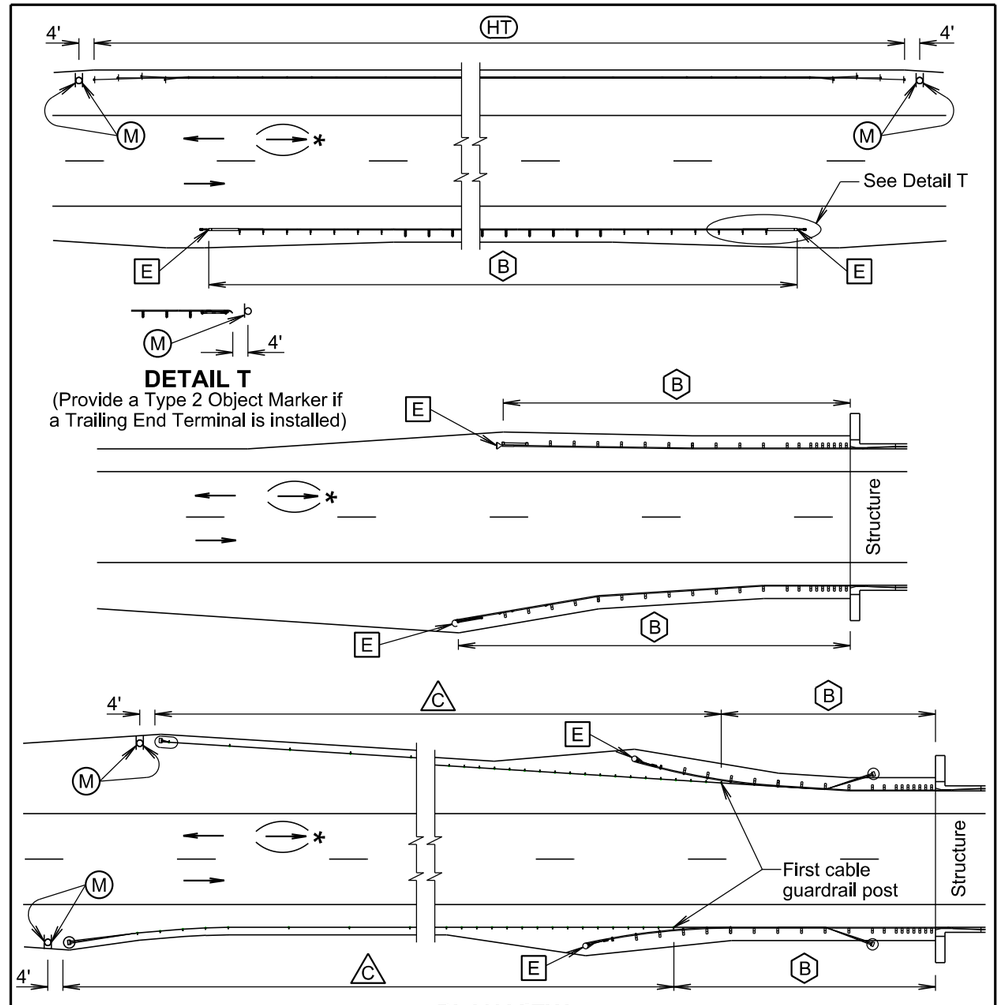
GENERAL NOTES:

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 (60" and Greater Overall Width)	PLATE NUMBER 632.04 Sheet 1 of 1



DETAIL T
(Provide a Type 2 Object Marker if a Trailing End Terminal is installed)

PLAN VIEW
(Typical Guardrail Layouts)

- (B) Steel Beam Guardrail Delineation
- [E] Guardrail End Terminal Object Marker
- <C> 3 Cable Guardrail (Low Tension) Delineation
- (HT) High Tension Cable Guardrail Delineation
- (M) Type 2 Object Marker

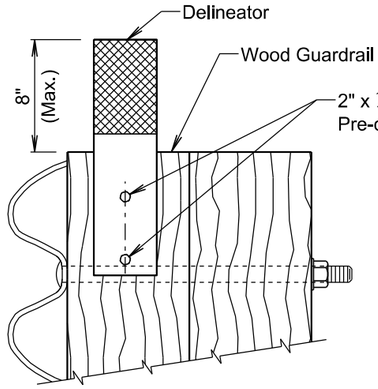
* For two-way traffic, install delineation at the opposite end of structure the same as shown. Back-to-back delineation is required for two-way traffic, single-sided delineation for one-way traffic.

March 31, 2024

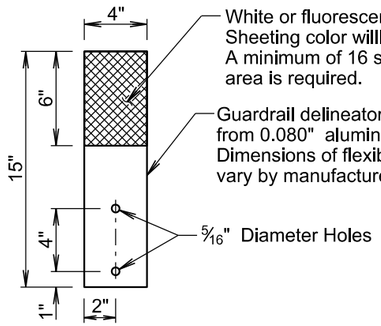
Published Date: 2025	SDDOT	DELINEATION OF GUARDRAIL	PLATE NUMBER 632.40 Sheet 1 of 4

PLOTTED FROM - $$USERNAME$$

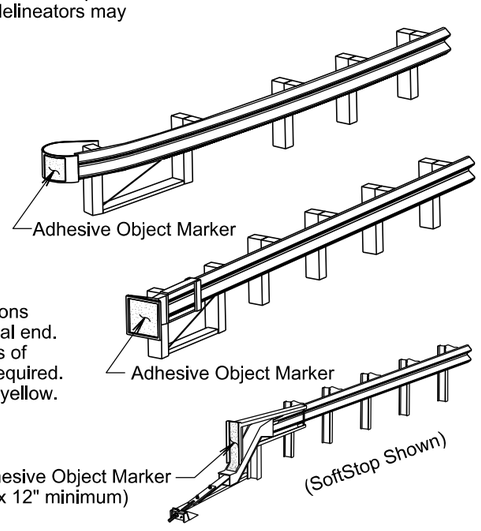
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(120)145	81	93



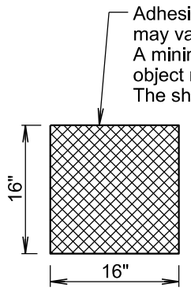
(B) STEEL BEAM GUARDRAIL DELINEATION



DELINEATOR
(For Steel Beam Guardrail)



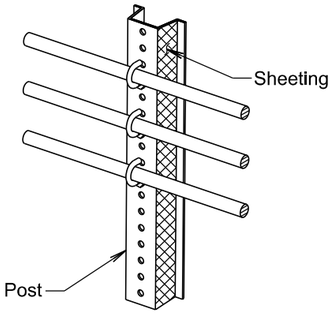
(E) GUARDRAIL END TERMINAL OBJECT MARKER



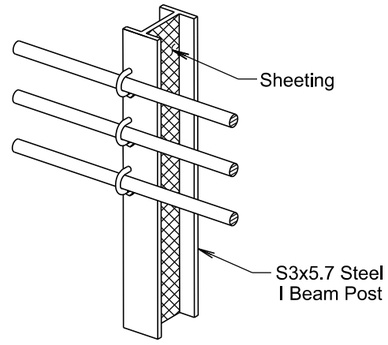
ADHESIVE OBJECT MARKER

March 31, 2024

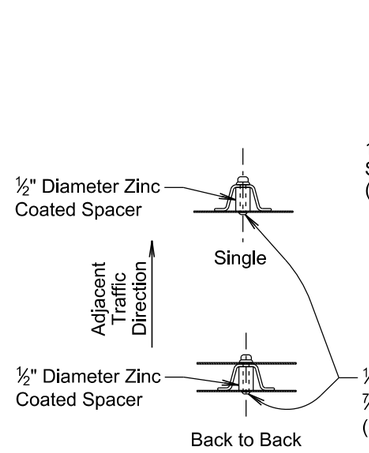
Published Date: 2025	SDDOT	DELINEATION GUARDRAIL	PLATE NUMBER 632.40
			Sheet 2 of 4



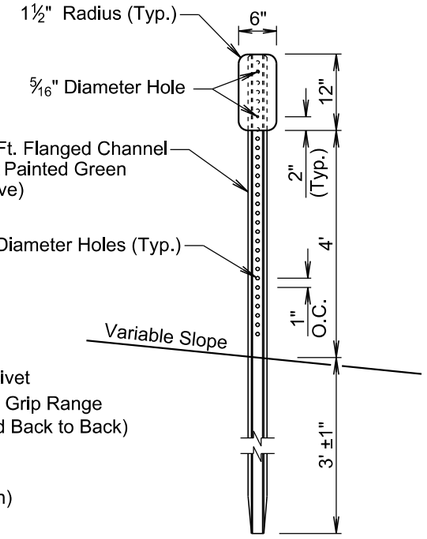
(C) 3 CABLE GUARDRAIL (LOW TENSION) DELINEATION



(C) 3 CABLE GUARDRAIL (LOW TENSION) DELINEATION



PLAN VIEW
(Type 2 Object Marker Details and Post Orientation)



ELEVATION VIEW
(M) (Type 2 Object Marker)
(For Marking 3 Cable Guardrail (Low Tension) Anchor, High Tension Cable Guardrail Anchor, and Trailing End Terminal)

March 31, 2024

Published Date: 2025	SDDOT	DELINEATION OF GUARDRAIL	PLATE NUMBER 632.40
			Sheet 3 of 4

PLOTTED FROM - $USERNAME$$

GENERAL NOTES:

The delineation of high tension cable guardrail will be reflective sheeting placed back to back on every third post cap or cable spacer. Maximum spacing of delineation will not exceed 35 feet. The sheeting will be type XI in conformance with ASTM D4956. The color of the reflective sheeting will be the same as the nearest pavement marking.

The delineators for steel beam guardrail and sheeting on 3 cable guardrail (low tension) posts will be covered with a minimum of 16 square inches of reflective sheeting. The reflective sheeting will be type XI in conformance with ASTM D4956. Along two-way roadways the sheeting will be on both sides of the delineators and guardrail posts and will be white in color. For one-way roadways the sheeting will only be required on the side facing traffic and the color will be the same as the nearest pavement marking, yellow on the left side of the roadway and white on the right side.

When steel beam guardrail is attached to a bridge the first delineator will be attached to the post nearest the bridge.

At bridges with guardrail less than 200 feet in length, a minimum of 4 delineators will be placed in addition to the end terminal yellow object marker. The spacing between the delineators will be approximately one third of the length of the guardrail.

At bridges with guardrail 200 feet and greater in length, including bridges that have steel beam guardrail transitioning to 3 cable guardrail (low tension), the delineators will be placed at a spacing of approximately 50 feet. Delineation will extend throughout the length of the guardrail system.

Steel beam guardrail that is not attached to a bridge and is less than 200 feet in length, a minimum of 4 delineators will be placed in addition to the end terminal yellow object markers. The spacing between the delineators will be approximately one third of the length of the guardrail.

Steel beam guardrail that is not attached to a bridge and is 200 feet and greater in length, including steel beam guardrail transitioning to 3 cable guardrail (low tension), the delineators will be placed at a spacing of approximately 50 feet. Delineation will extend throughout the length of the guardrail system.

All costs for furnishing and installing single or back to back guardrail delineation on 3 cable guardrail and steel beam guardrail will be included in the contract unit price per each for "Guardrail Delineator".

All costs for furnishing and installing the reflective sheeting on the cable spacers or post caps for the high tension cable guardrail will be incidental to the respective high tension cable guardrail contract item.

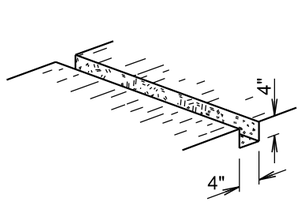
An adhesive object marker will be placed on the end of the W beam guardrail or MGS end terminal. The adhesive object marker dimensions may vary due to the shape of the terminal end. A minimum of 256 square inches of object marker reflective sheeting area is required on end terminals with sufficient surface area. Other end terminals (SoftStop) will require an adhesive object marker with a minimum size of 6" x 12". The reflective sheeting will be fluorescent yellow type XI sheeting in conformance with ASTM D4956. All costs for furnishing and installing the adhesive object marker will be incidental to various contract items.

A type 2 object marker will be placed adjacent to the 3 cable guardrail (low tension) anchor, high tension cable guardrail anchor, and trailing end terminal at the location noted on sheet 1 of this standard plate. The type 2 object marker (6" x 12") will have fluorescent yellow type XI sheeting in conformance with ASTM D4956. All costs for furnishing and installing the type 2 object marker including the steel post, 6" x 12" reflective panel, and hardware will be included in the contract unit price per each for "Type 2 Object Marker" for single-sided and "Type 2 Object Marker Back to Back" for back to back type 2 object markers.

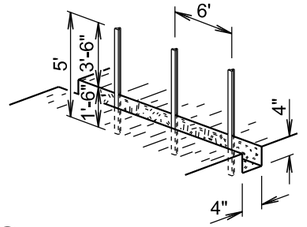
March 31, 2024

Published Date: 2025	SDDOT	DELINEATION OF GUARDRAIL	PLATE NUMBER 632.40
			Sheet 4 of 4

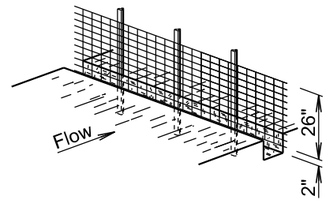
MANUAL LOW FLOW SILT FENCE INSTALLATION



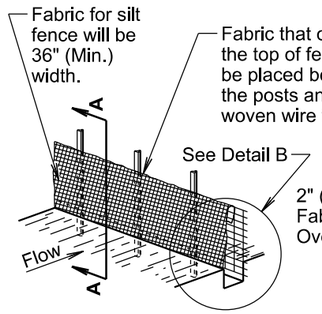
① EXCAVATE TRENCH



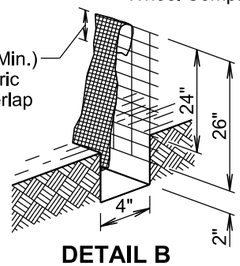
② DRIVE STEEL T FENCE POSTS



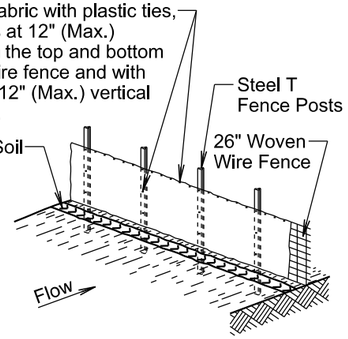
③ ATTACH 26" WOVEN WIRE FENCE TO POSTS



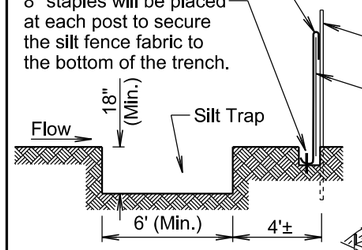
④ ATTACH SILT FENCE FABRIC



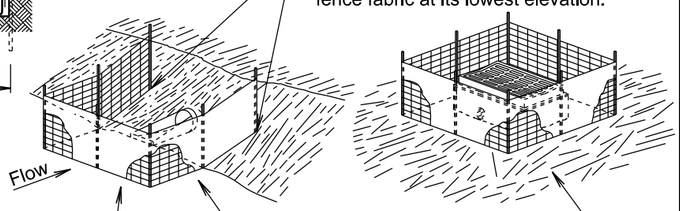
DETAIL B



⑤ BACKFILL TRENCH AND WHEEL COMPACT SOIL



SECTION A-A

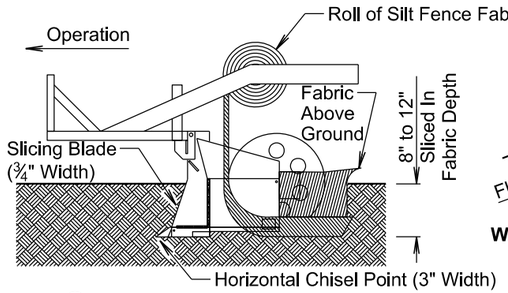


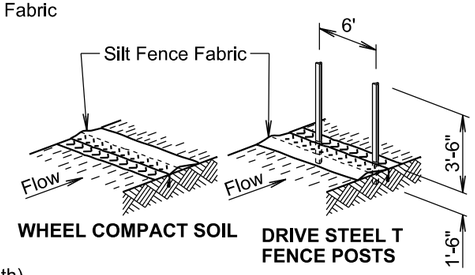
February 14, 2020

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

PLOTTED FROM - $$USERNAME$$

MACHINE SLICED LOW FLOW SILT FENCE INSTALLATION

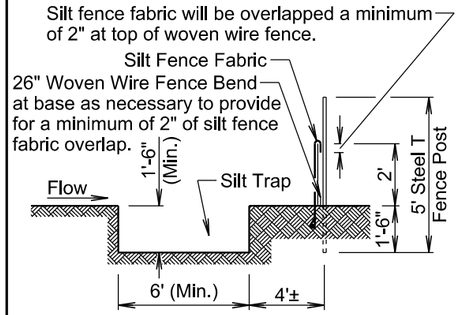




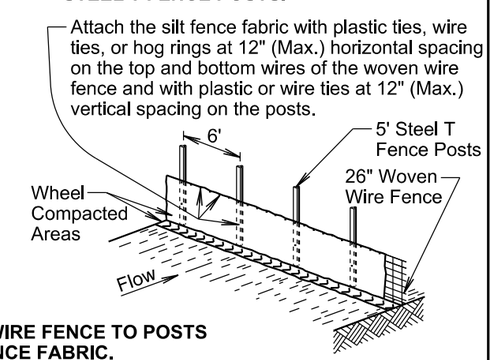
WHEEL COMPACT SOIL

DRIVE STEEL T FENCE POSTS

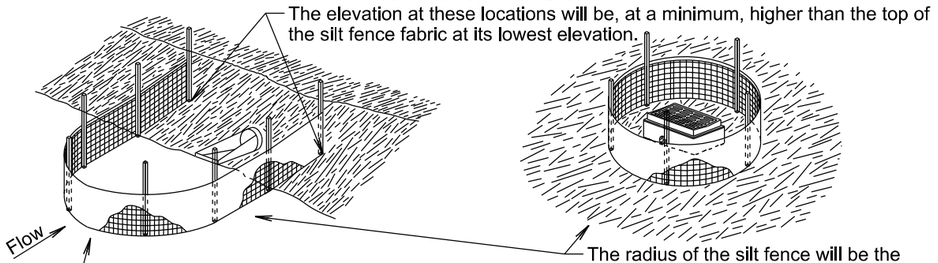
(1) INSTALL SILT FENCE FABRIC BY MACHINE SLICING METHOD.



(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.



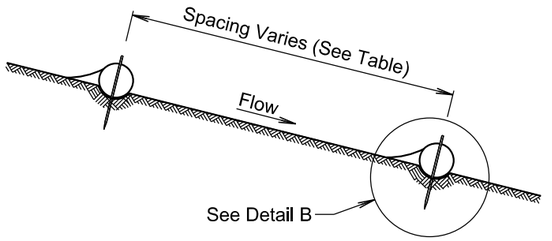
GENERAL NOTES:

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.

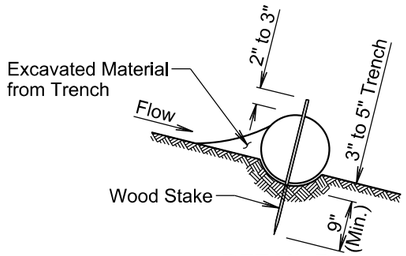
February 14, 2020

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

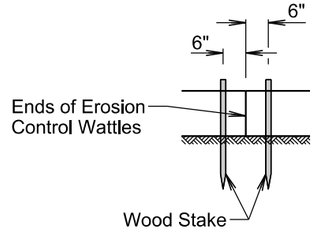


ELEVATION VIEW
(Cut or Fill Slope Installation)

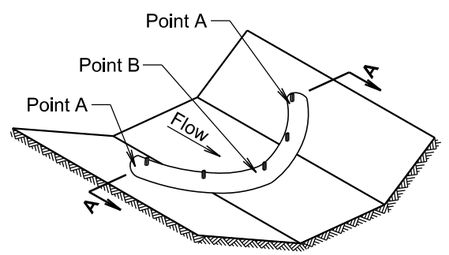
CUT OR FILL SLOPE INSTALLATION	
Slope	Spacing (Ft.)
1:1	10
2:1	20
3:1	30
4:1	40



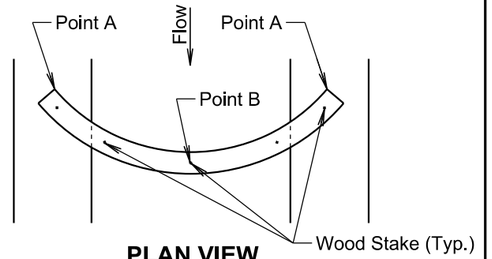
DETAIL B
(Typical of All Installations)



DETAIL C
(See General Notes)

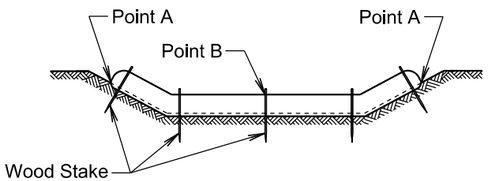


ISOMETRIC VIEW
(Ditch Installation)



PLAN VIEW
(Ditch Installation)

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



SECTION A-A

February 14, 2020

Published Date: 2025	SDDOT	EROSION CONTROL WATTLE	PLATE NUMBER 734.06
			Sheet 1 of 2

PLOTTED FROM - $$USERNAME$$

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(1201)145	84	93

GENERAL NOTES:

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

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

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

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

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

The Contractor and Engineer will inspect the erosion control wattles in accordance with the storm water permit. The Contractor will remove, dispose, or reshape the accumulated sediment when necessary as determined by the Engineer.

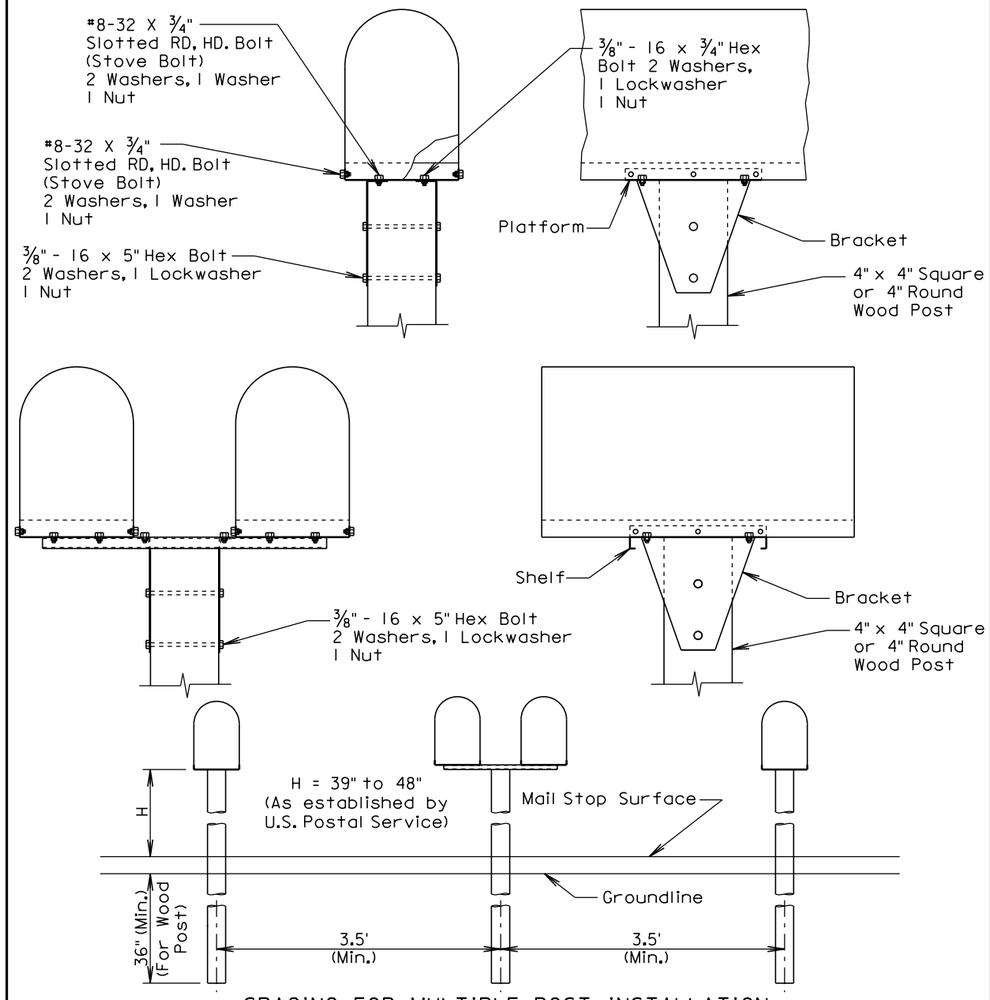
Sediment removal, disposal, or necessary shaping will be as directed by the Engineer. All costs for removing accumulated sediment, disposal of sediment, and necessary shaping will be incidental to the contract unit price per cubic yard for "Remove Sediment".

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

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

February 14, 2020

Published Date: 2025	SDDOT	EROSION CONTROL WATTLE	PLATE NUMBER 734.06
			Sheet 2 of 2



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.

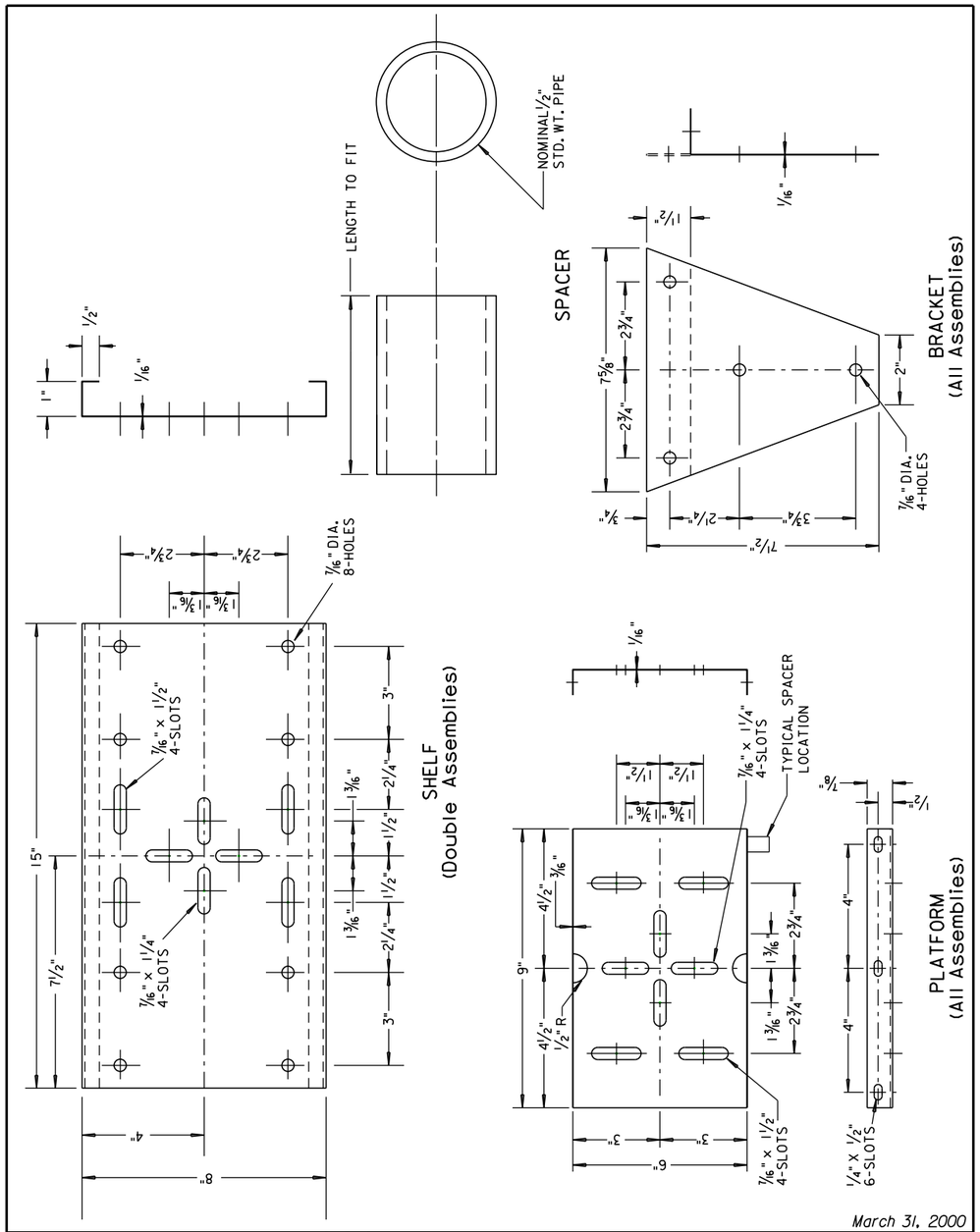
Alternate mailbox support assemblies shall be approved by the Engineer prior to installation. The Contractor shall provide the Engineer written certification that the mailbox support assembly has met the crash testing requirements and will be installed in accordance with the manufacturer's installation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

September 6, 2013

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

PLOTTED FROM - $$USERNAME$$

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(120)145	85	93



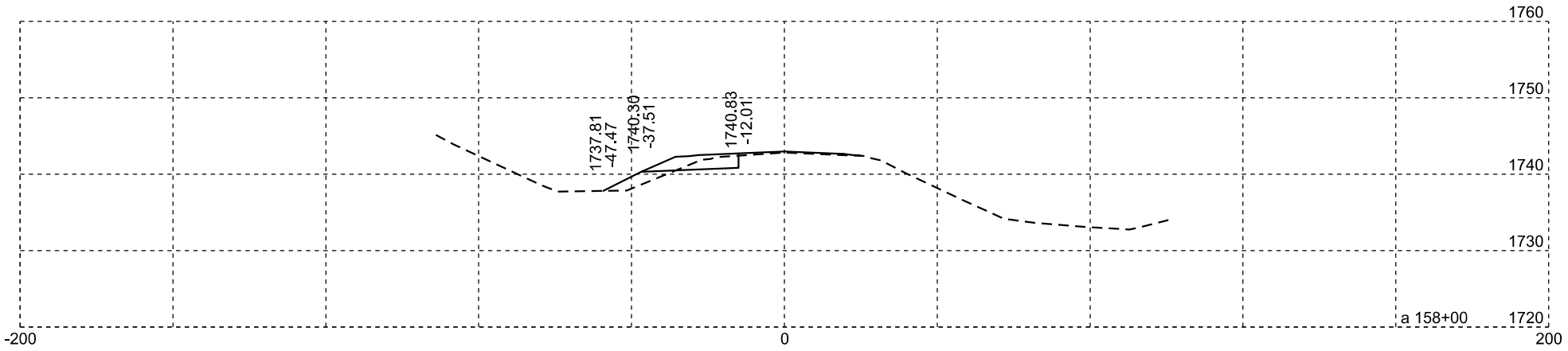
March 31, 2000

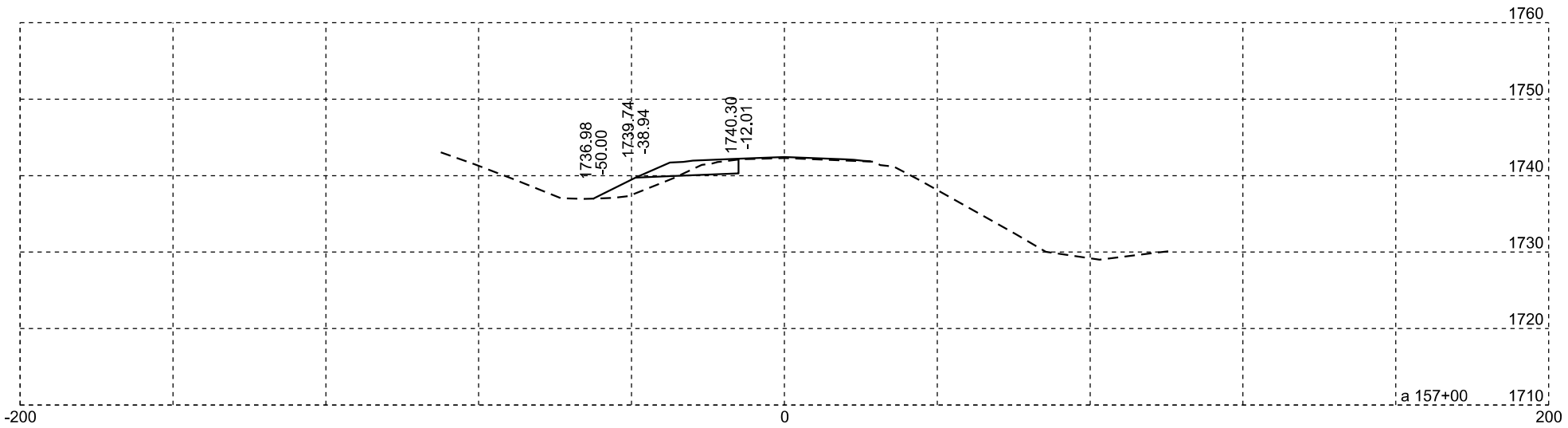
Published Date: 2025	SDDOT	MAILBOX SUPPORT HARDWARE	PLATE NUMBER 900.03
			Sheet 1 of 1

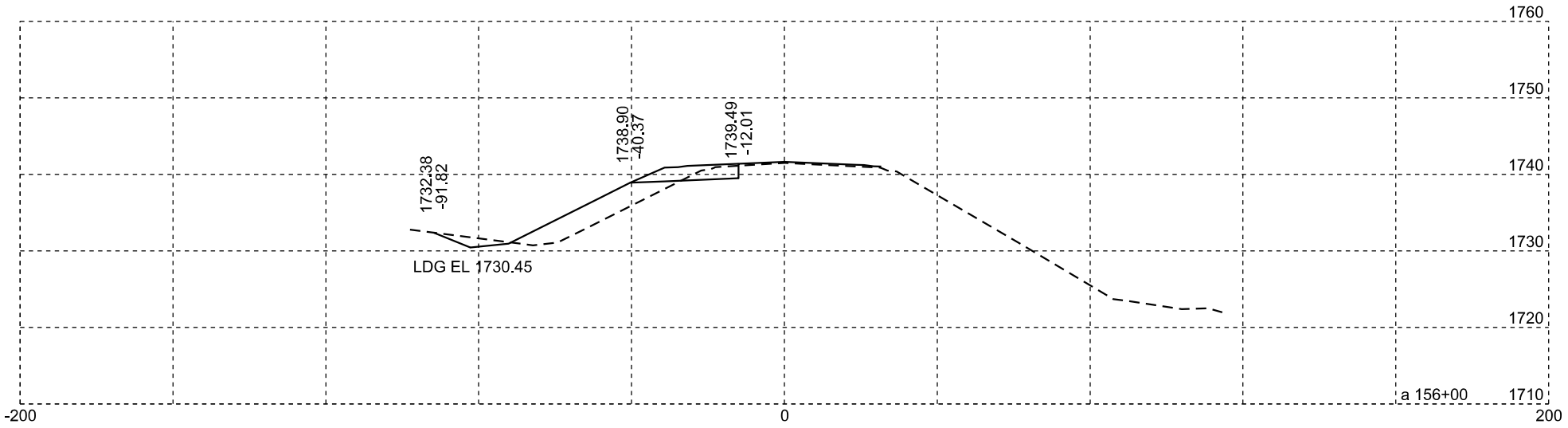
PLOTTED FROM - $$USERNAME$$

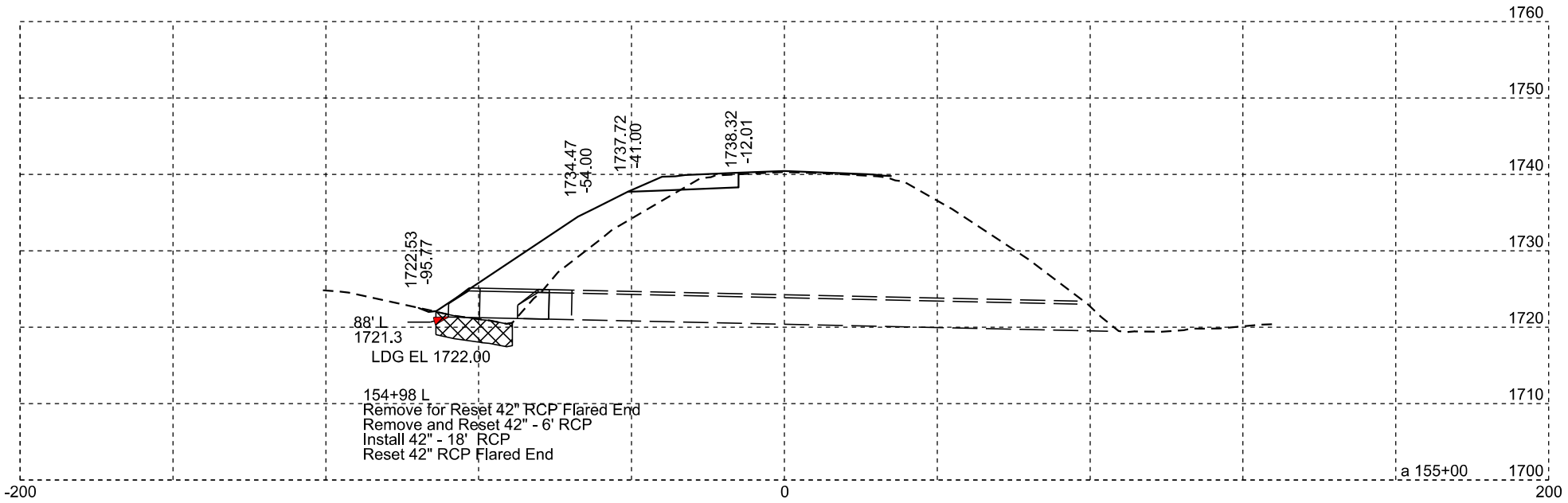
Plotting Date: 10/07/2024

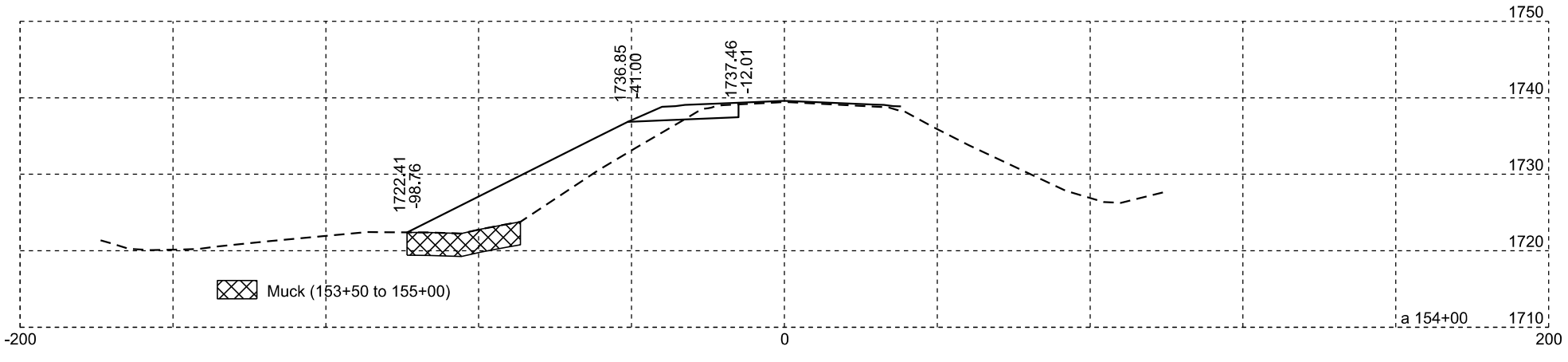
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(120)145	86	93









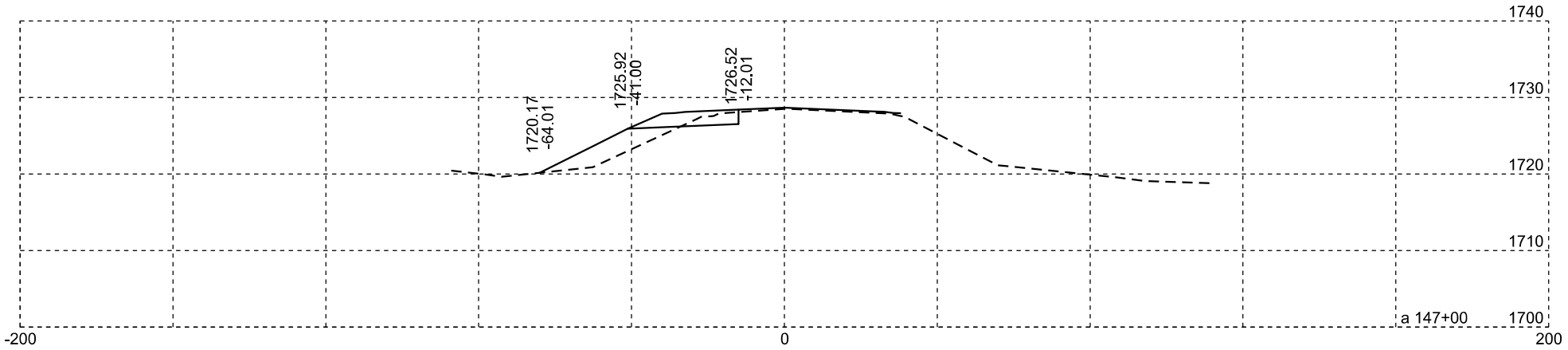


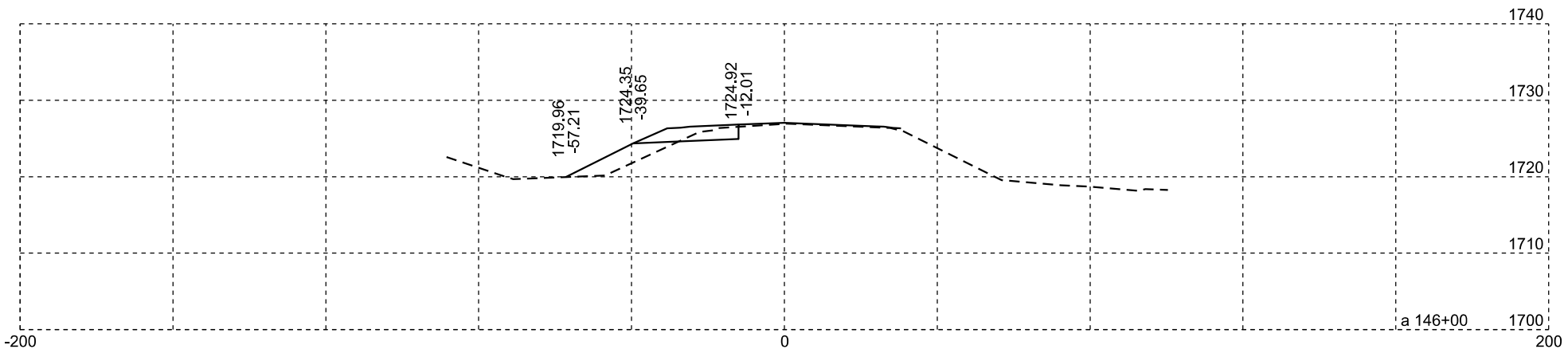
Plotting Date: 10/07/2024

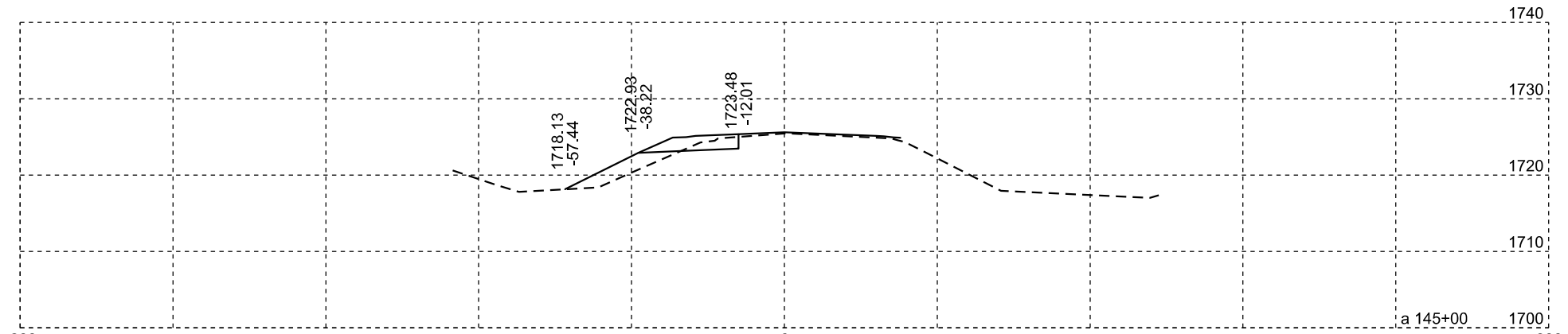
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(120)145	87	93

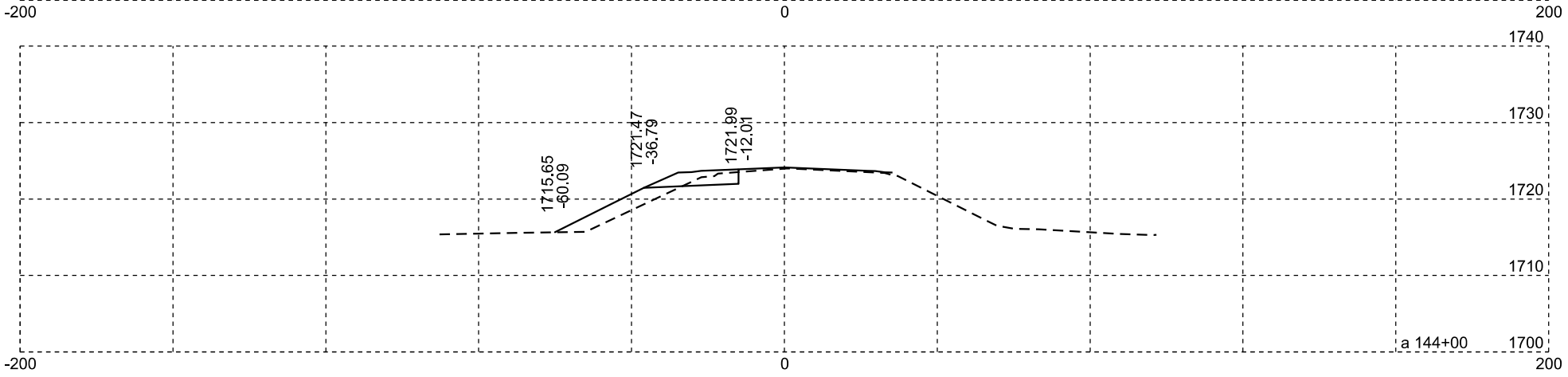
Plotting Date: 10/07/2024

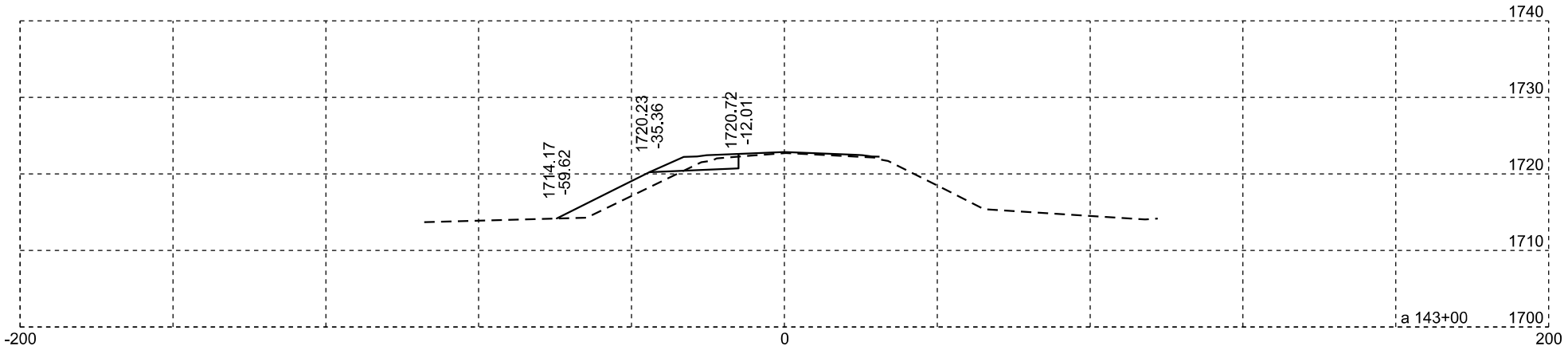
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(120)145	88	93

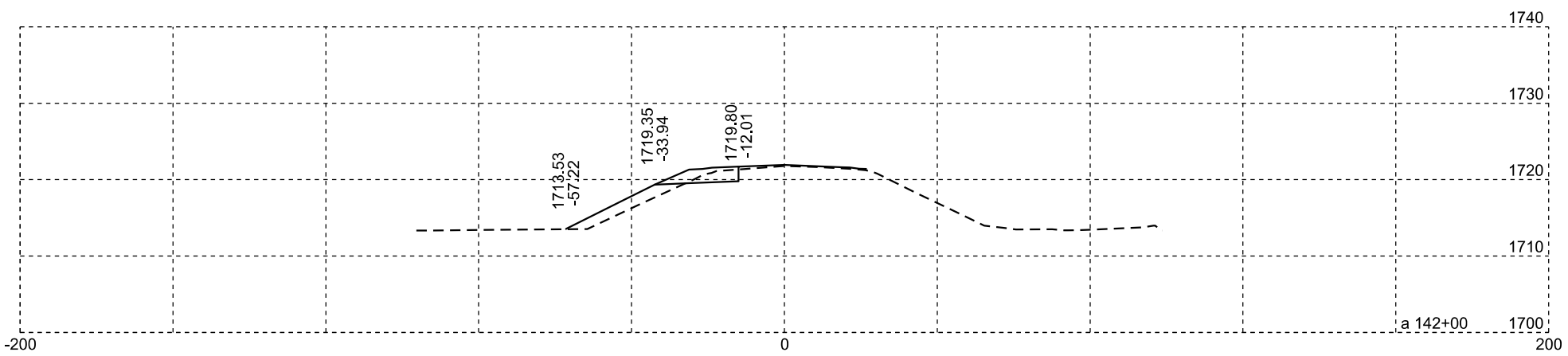










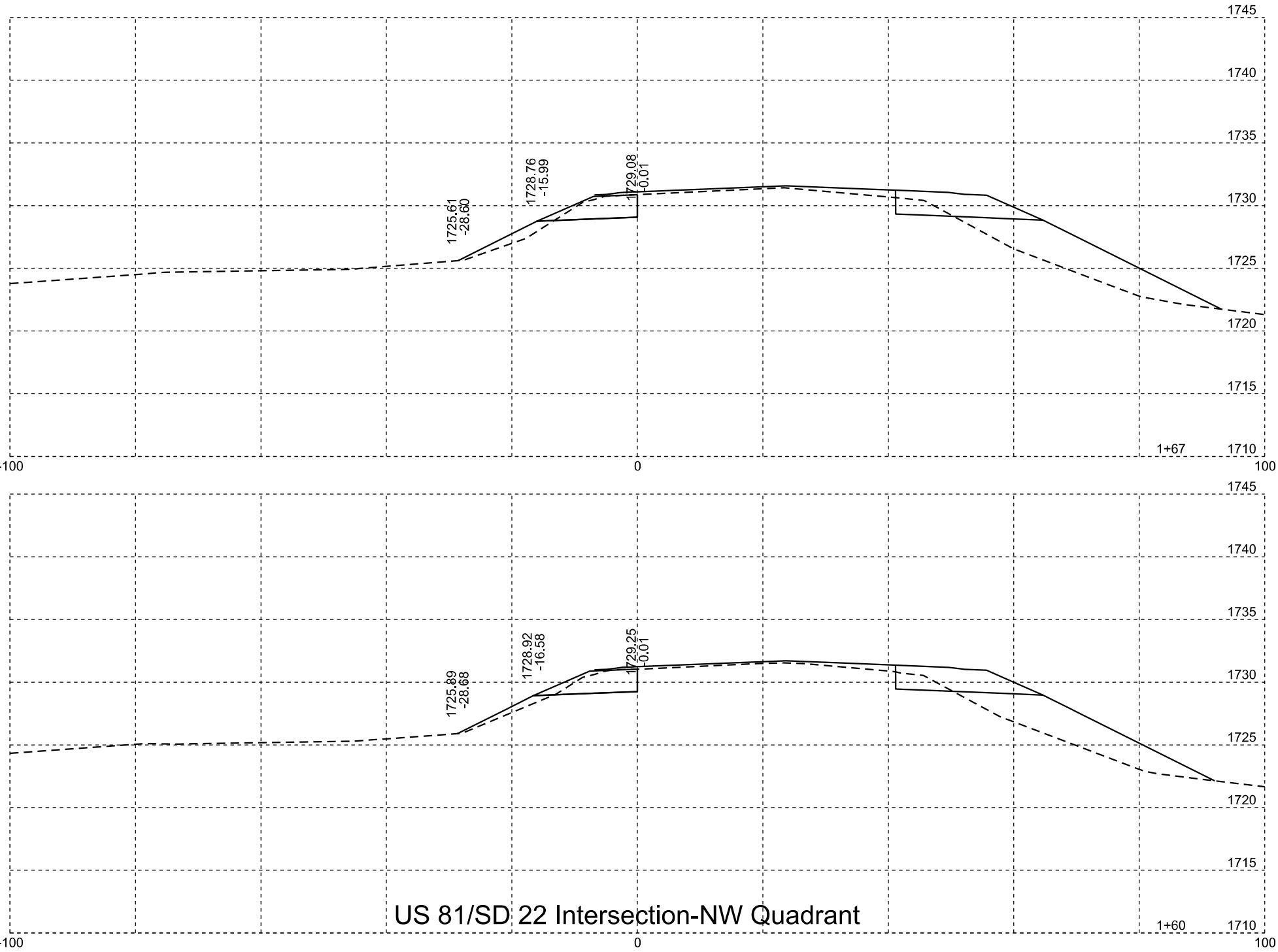


Plotting Date: 10/07/2024

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(120)145	89	93

Plotting Date: 10/07/2024

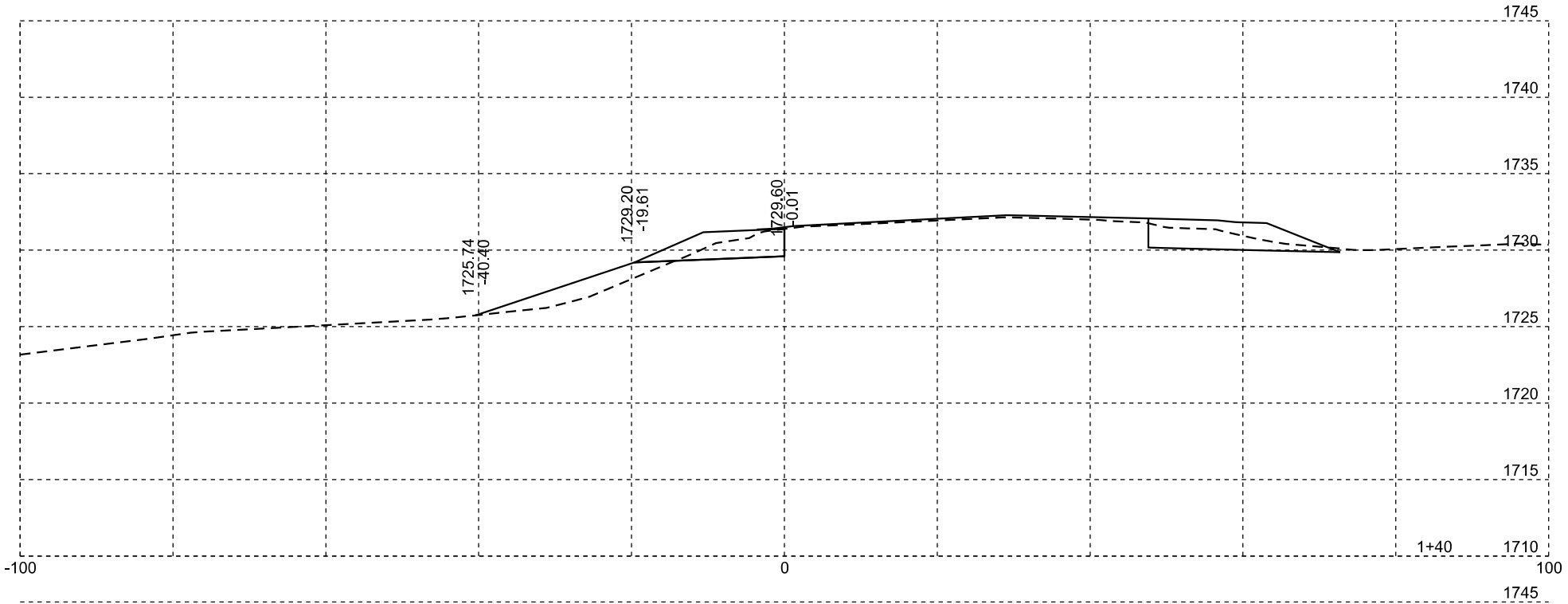
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(120)145	90	93

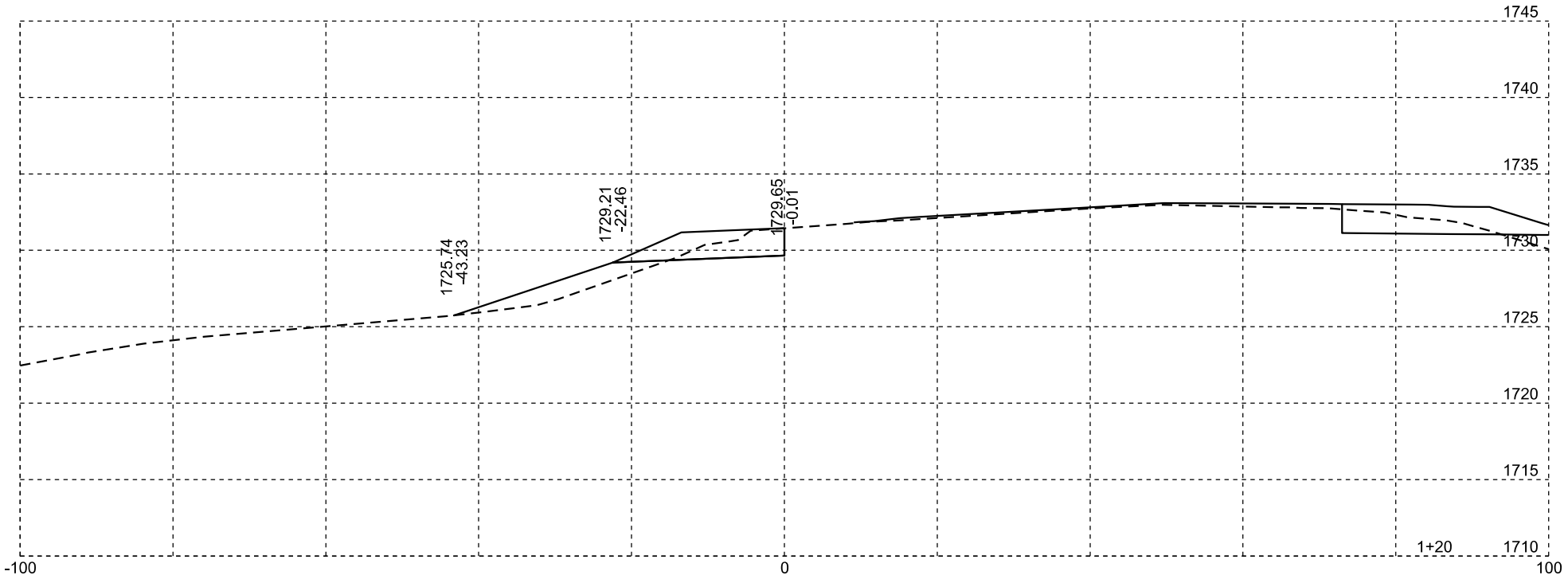


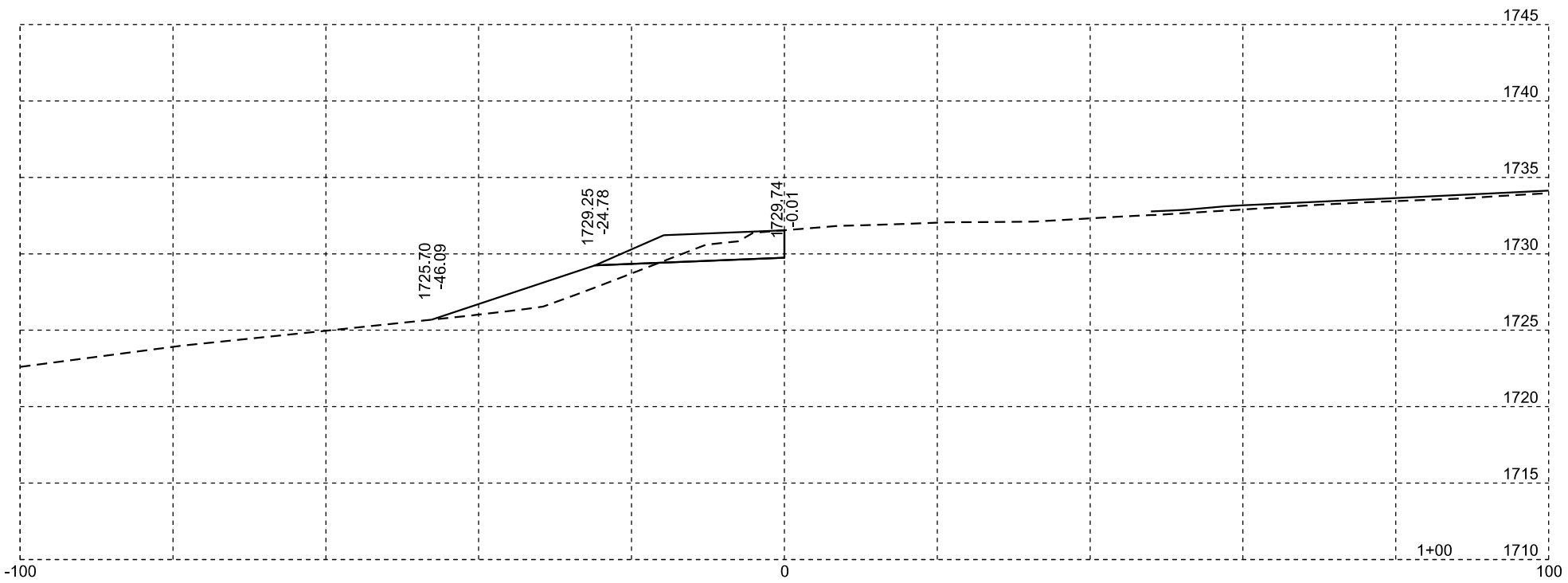
US 81/SD 22 Intersection-NW Quadrant

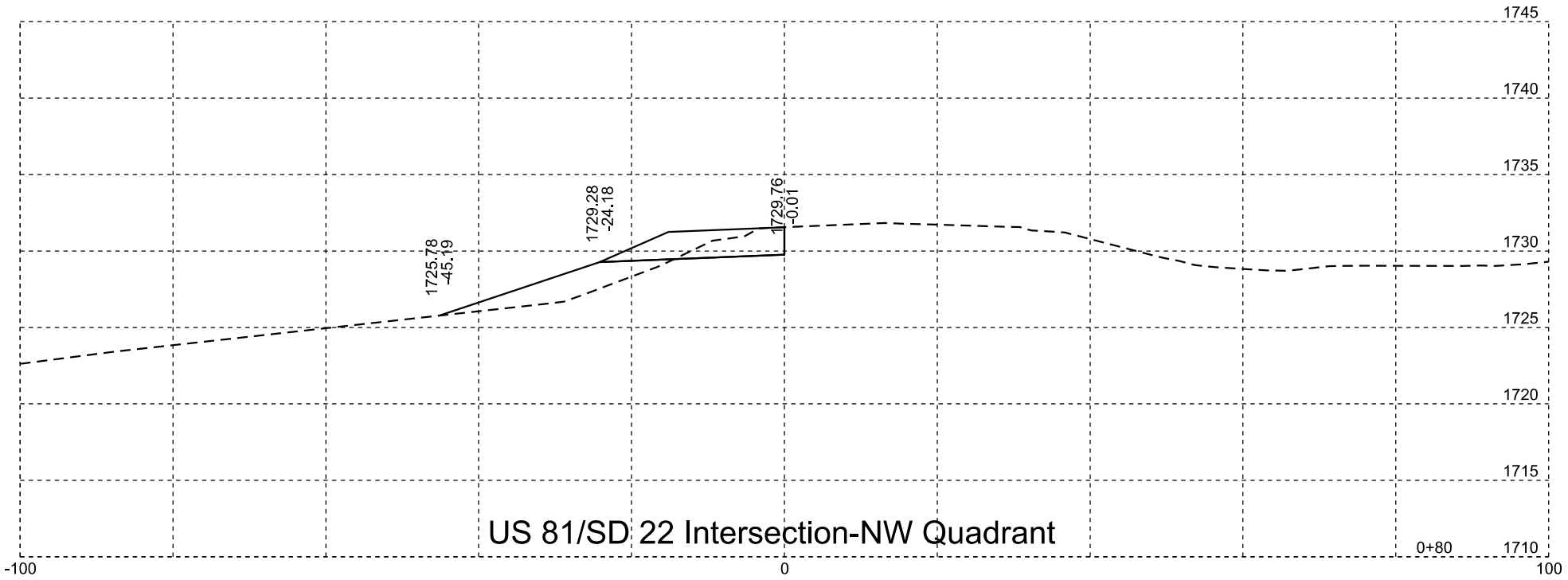
Plotting Date: 10/07/2024

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(120)145	91	93





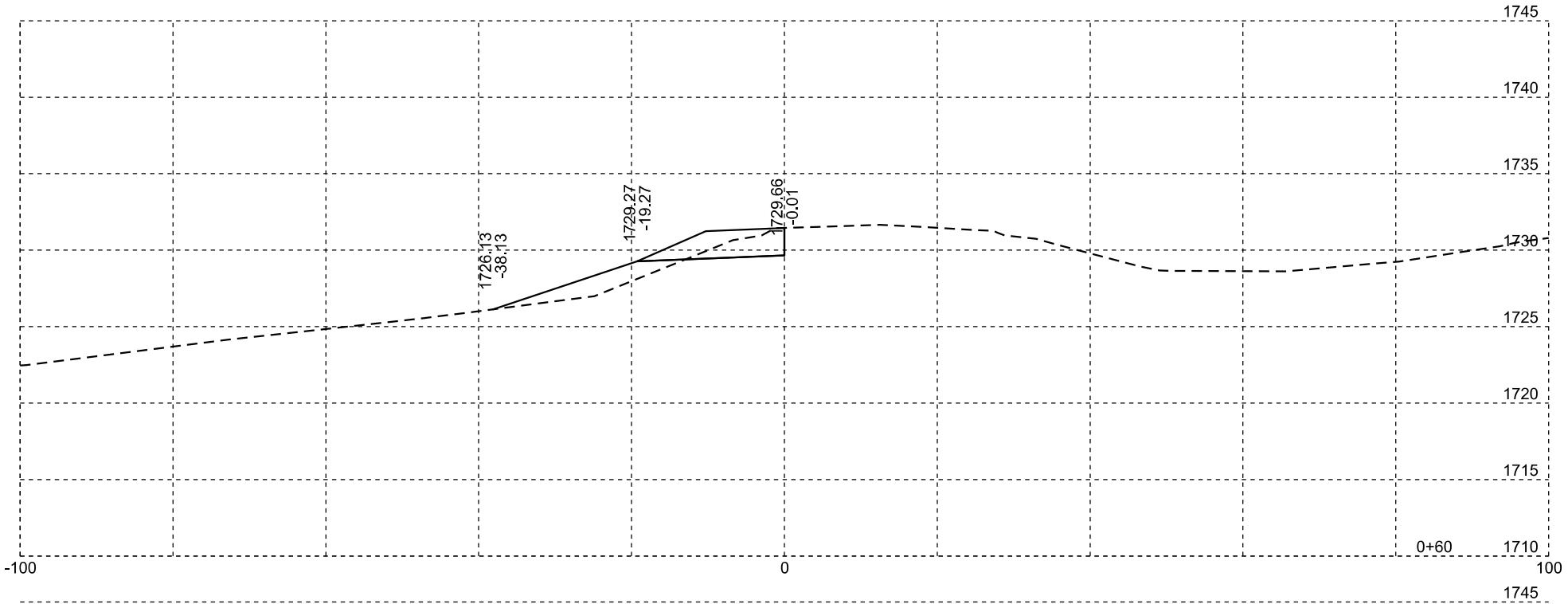


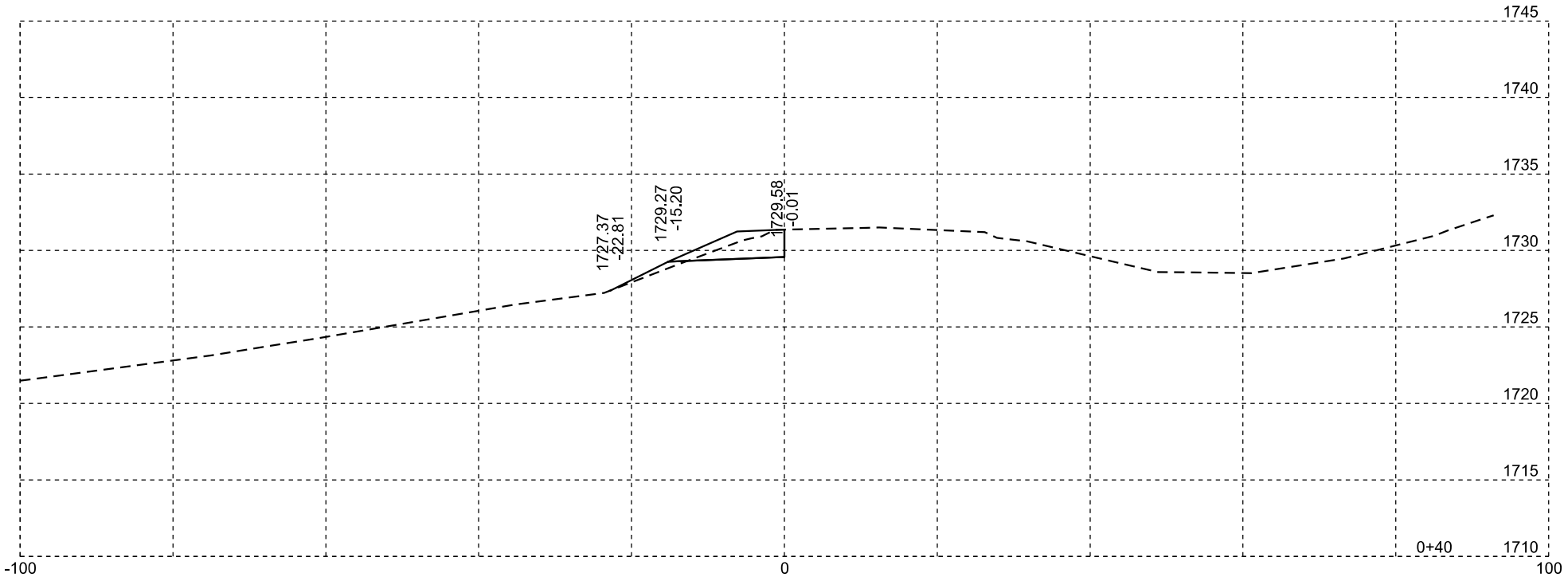


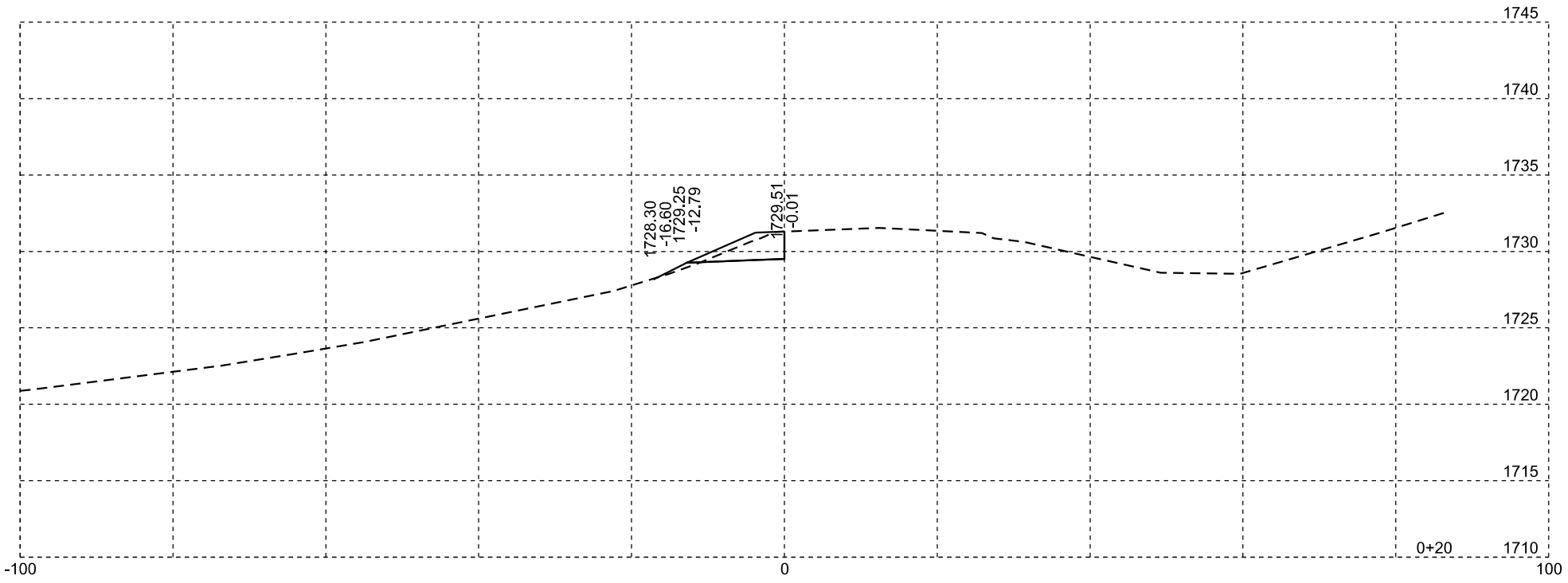
US 81/SD 22 Intersection-NW Quadrant

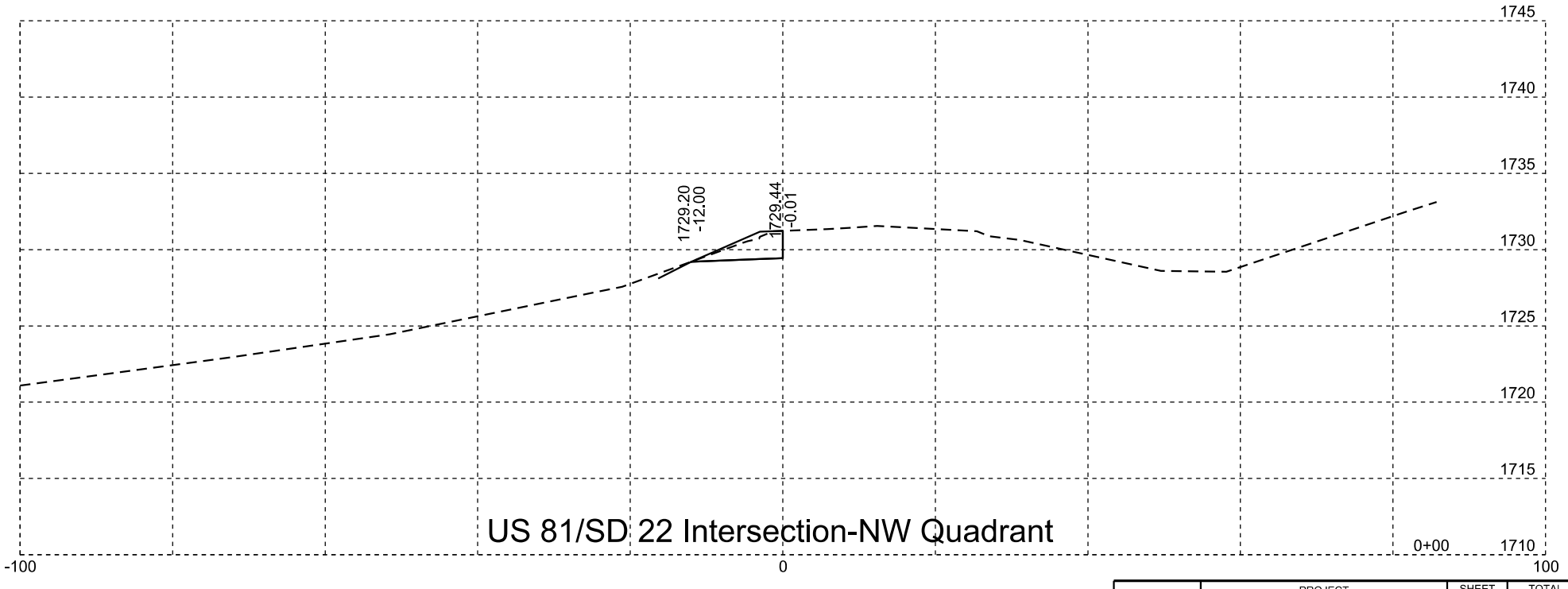
Plotting Date: 10/07/2024

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(120)145	92	93









US 81/SD 22 Intersection-NW Quadrant

Plotting Date: 10/07/2024

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0081(120)145	93	93