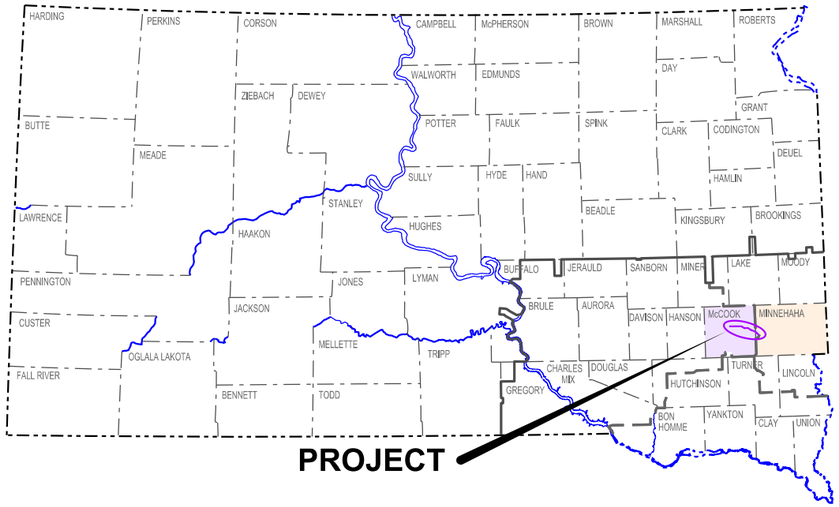
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0038(46)332	1	116

Plotting Date: 02/09/2024

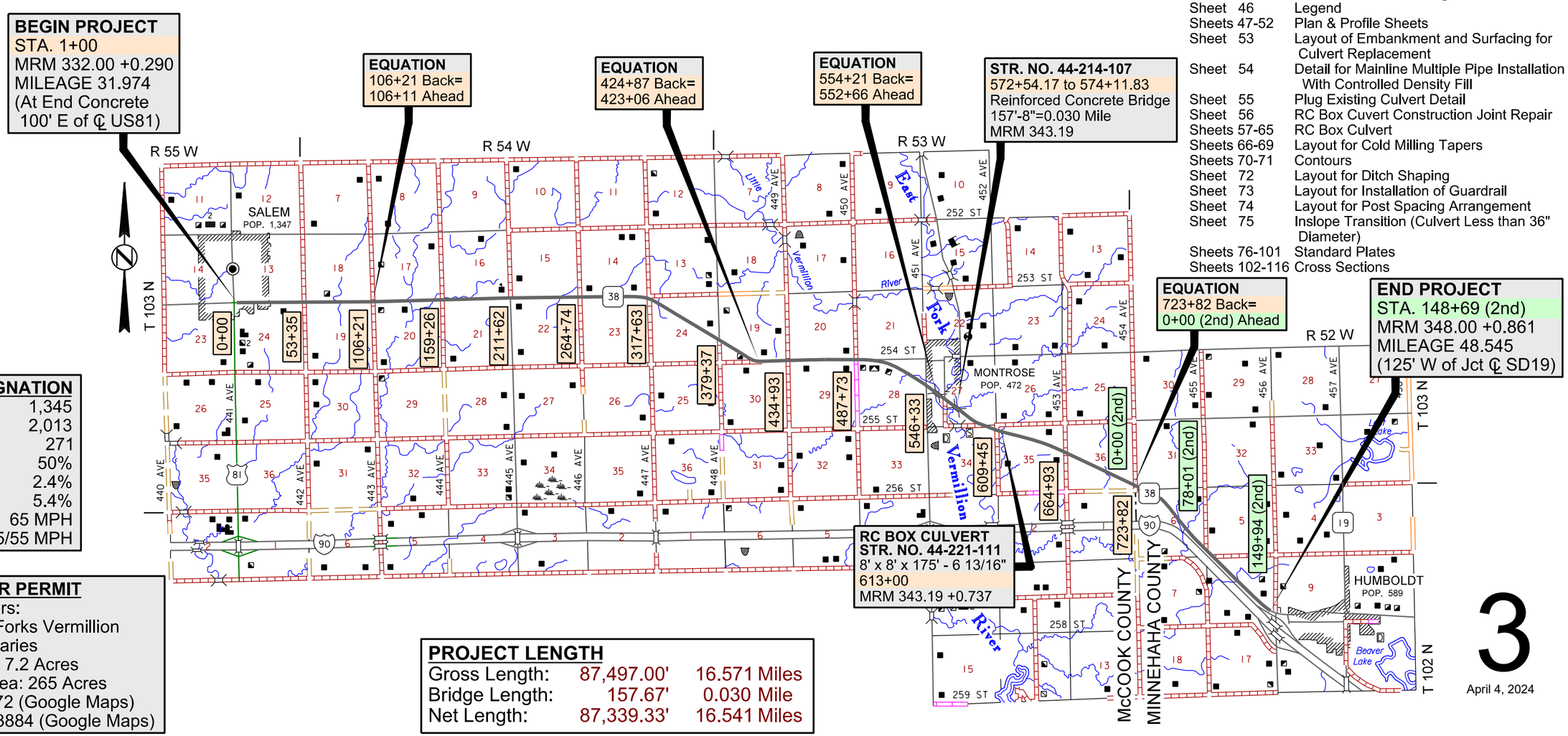
Rev. 02/09/24 GAW

STATE OF SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION
PLANS FOR PROPOSED
PROJECT P 0038(46)332
SD HIGHWAY 38
McCOOK & MINNEHAHA COUNTIES

COLD MILLING ASPHALT CONCRETE,
RC BOX CULVERT, TRAFFIC DIVERSION,
ASPHALT CONCRETE RESURFACING,
CULVERT WORK, PAVEMENT MARKING
& GUARDRAIL
PCN 05UR



INDEX OF SHEETS



DESIGN DESIGNATION

ADT(2022)	1,345
ADT(2042)	2,013
DHV	271
D	50%
T DHV	2.4%
T ADT	5.4%
V (Rural)	65 MPH
V (Urban)	45/55 MPH

STORM WATER PERMIT

Receiving Waters:
West & East Forks Vermillion River & Tributaries
Area Disturbed: 7.2 Acres
Total Project Area: 265 Acres
Latitude: 43.7172 (Google Maps)
Longitude: -97.3884 (Google Maps)

PROJECT LENGTH

Gross Length:	87,497.00'	16.571 Miles
Bridge Length:	157.67'	0.030 Mile
Net Length:	87,339.33'	16.541 Miles

3

April 4, 2024

PLOT SCALE - 1:8316

PLOTTED FROM - TRM111118

PLOT NAME - 1

FILE - ...\PRJ2023\MCCK05UR\TTL05UR.DGN

ESTIMATE OF QUANTITIES

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
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P 0038(46)332

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
004E0030	Maintenance of Traffic Diversion(s)	Lump Sum	LS
004E0050	Remove Traffic Diversion(s)	Lump Sum	LS
009E0010	Mobilization	Lump Sum	LS
009E3210	Construction Staking	16.571	Mile
009E3250	Miscellaneous Staking	16.571	Mile
009E3280	Slope Staking	0.322	Mile
009E3290	Structure Staking	1	Each
009E3301	Engineer Directed Surveying/Staking	40.0	Hour
110E0135	Remove Delineator	85	Each
110E0500	Remove Pipe Culvert	486	Ft
110E0510	Remove Pipe End Section	33	Each
110E0600	Remove Fence	1,006	Ft
110E0730	Remove Beam Guardrail	250.0	Ft
110E0800	Remove W Beam Guardrail End Terminal	4	Each
110E1010	Remove Asphalt Concrete Pavement	2,715.0	SqYd
110E7500	Remove Pipe for Reset	282	Ft
110E7510	Remove Pipe End Section for Reset	17	Each
120E0010	Unclassified Excavation	10,566	CuYd
120E0100	Unclassified Excavation, Digouts	828	CuYd
120E0600	Contractor Furnished Borrow Excavation	18,075	CuYd
120E6100	Water for Embankment	256.0	MGal
120E6200	Water for Granular Material	71.0	MGal
260E1010	Base Course	5,982.0	Ton
320E0005	PG 58-34 Asphalt Binder	2,033.3	Ton
320E1200	Asphalt Concrete Composite	1,290.0	Ton
320E1202	Class Q2R Hot Mixed Asphalt Concrete	39,730.0	Ton
320E1800	Asphalt Concrete Blade Laid	2,485.0	Ton
320E4000	Hydrated Lime	417.9	Ton
320E7008	Grind 8" Rumble Strip or Stripe in Asphalt Concrete	33.3	Mile
330E0100	SS-1h or CSS-1h Asphalt for Tack	189.5	Ton
330E0210	SS-1h or CSS-1h Asphalt for Flush Seal	77.3	Ton
330E2000	Sand for Flush Seal	978.0	Ton
332E0010	Cold Milling Asphalt Concrete	325,047	SqYd
421E0100	Pipe Culvert Undercut	212	CuYd
450E0142	24" RCP Class 2, Furnish	72	Ft
450E0150	24" RCP, Install	72	Ft
450E0162	30" RCP Class 2, Furnish	158	Ft
450E0170	30" RCP, Install	158	Ft
450E0182	36" RCP Class 2, Furnish	20	Ft
450E0190	36" RCP, Install	20	Ft
450E2008	18" RCP Flared End, Furnish	1	Each
450E2009	18" RCP Flared End, Install	1	Each
450E2024	30" RCP Flared End, Furnish	1	Each

P 0038(46)332 (CONTINUED)

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
450E2025	30" RCP Flared End, Install	1	Each
450E2200	24" RCP Sloped End, Furnish	12	Each
450E2201	24" RCP Sloped End, Install	12	Each
450E2204	30" RCP Sloped End, Furnish	6	Each
450E2205	30" RCP Sloped End, Install	6	Each
450E2208	36" RCP Sloped End, Furnish	4	Each
450E2209	36" RCP Sloped End, Install	4	Each
450E3012	24" RCP Arch Class 2, Furnish	310	Ft
450E3020	24" RCP Arch, Install	310	Ft
450E3022	30" RCP Arch Class 2, Furnish	186	Ft
450E3030	30" RCP Arch, Install	186	Ft
450E4600	24" RCP Arch Sloped End, Furnish	10	Each
450E4601	24" RCP Arch Sloped End, Install	10	Each
450E4604	30" RCP Arch Sloped End, Furnish	6	Each
450E4605	30" RCP Arch Sloped End, Install	6	Each
450E8300	Culvert Joint Cleaning	48.0	Ft
450E8305	Repair Culvert Joint	48.0	Ft
450E8310	Chemical Grout Void Fill	1.3	Gal
* 450E8900	Cleanout Pipe Culvert	5	Each
450E9000	Reset Pipe	282	Ft
450E9001	Reset Pipe End Section	17	Each
464E0100	Controlled Density Fill	21.1	CuYd
600E0300	Type III Field Laboratory	1	Each
620E0020	Type 2 Right-of-Way Fence	1,205	Ft
620E0515	Type 1A Temporary Fence	66	Ft
620E0520	Type 2 Temporary Fence	1,252	Ft
620E1020	2 Post Panel	22	Each
620E1030	3 Post Panel	3	Each
630E0500	Type 1 MGS	225.0	Ft
630E1505	Type 2A Guardrail Transition	4	Each
630E2017	MGS MASH Flared End Terminal	4	Each
632E2220	Guardrail Delineator	16	Each
632E2510	Type 2 Object Marker Back to Back	150	Each
633E1200	High Build Waterborne Pavement Marking Paint, White	749	Gal
633E1205	High Build Waterborne Pavement Marking Paint, Yellow	193	Gal
634E0010	Flagging	440.0	Hour
634E0020	Pilot Car	200.0	Hour
634E0110	Traffic Control Signs	1,142.0	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0275	Type 3 Barricade	2	Each
634E0630	Temporary Pavement Marking	66.3	Mile
720E1015	Bank and Channel Protection Gabion	16.0	CuYd
730E0202	Type B Permanent Seed Mixture	130	Lb

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BID ITEM NUMBER	ITEM	QUANTITY	UNIT
732E0100	Mulching	14.4	Ton
734E0102	Type 2 Erosion Control Blanket	760	SqYd
734E0103	Type 3 Erosion Control Blanket	390	SqYd
734E0510	Shaping for Erosion Control Blanket	297	Ft
831E0100	Type A Drainage Fabric	9	SqYd
831E0110	Type B Drainage Fabric	43	SqYd
831E0210	Non-woven Separator Fabric	250	SqYd
900E0010	Refurbish Single Mailbox	21	Each
900E1980	Storage Unit	1	Each

*** - Denotes Non-Participating**

Str. No. 44-221-111

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
420E0200	Structure Excavation, Box Culvert	68	CuYd
421E0200	Box Culvert Undercut	252	CuYd
460E0120	Class A45 Concrete, Box Culvert	174.3	CuYd
480E0100	Reinforcing Steel	30,339	Lb
700E0210	Class B Riprap	232.0	Ton
831E0110	Type B Drainage Fabric	2,323	SqYd

SPECIFICATIONS

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

ENVIRONMENTAL COMMITMENTS

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ENVIRONMENTAL COMMITMENTS

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

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

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

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

COMMITMENT A: AQUATIC RESOURCES

COMMITMENT A1: WETLANDS

All efforts to avoid and minimize wetland impacts from the project have resulted in approximately 0.35 acres of wetlands (includes temporary and permanent) becoming impacted. Refer to Section B – Grading Plans/plans for location and boundaries of the impacted wetlands.

Table of Impacted Wetlands

Wetland No.	Station	Perm. Impact Left (Acres)	Perm. Impact Right (Acres)	Temp. Impact Left (Acres)	Temp. Impact Right (Acres)	Total Impact (Acres)
W 1b	4+27	0.000	0.000	0.000	0.019	0.019
W 2b	50+93	0.000	0.000	0.005	0.000	0.005
W 3	116+90	0.039	0.045	0.000	0.000	0.084
W 4a	185+22	0.000	0.000	0.000	0.034	0.034
W 5	249+55	0.000	0.000	0.020	0.000	0.020
W 6a	263+83	0.000	0.000	0.019	0.000	0.019
W 7a	279+81	0.000	0.000	0.024	0.008	0.032
W 7 bc	284+81	0.000	0.000	0.023	0.028	0.051
W 8a	297+80	0.000	0.000	0.001	0.000	0.001
W 12	650+56	0.000	0.000	0.000	0.017	0.017
W 13b	10+00	0.000	0.000	0.012	0.000	0.012
W 15 b	144+80	0.000	0.000	0.004	0.010	0.004
W 20	263+31	0.000	0.000	0.009	0.000	0.009
W 21	58+75	0.000	0.000	0.018	0.017	0.035

COMMITMENT A1: WETLANDS (CONTINUED)

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 0.08 acre 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 Section B – Grading Plans. Prior to initiating temporary work in wetlands, the Contractor will submit a plan to the Project Engineer in accordance with Section 7.21 D of the Specifications.

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.

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

COMMITMENT A2: STREAMS

All efforts to avoid and minimize stream impacts from the project have resulted in approximately 0.12 acres of stream (includes temporary and permanent) becoming impacted. Refer to plans for location and boundaries of the impacted streams.

Table of Impacted Streams

Stream Name	Station	Perm. Impact Left (Acres)	Perm. Impact Right (Acres)	Temp. Impact Left (Acres)	Temp. Impact Right (Acres)	Total Impact (Acres)
I1	133+74	0.00	0.00	0.01	0.01	0.02
I2	613+00	0.01	0.01	0.07	0.02	0.11
I3	51+65	0.00	0.01	0.00	0.00	0.01

Action Taken/Required:

It has been determined that project impacts do not require mitigation. Temporary impacts identified in the Table of Impacted Streams will not be mitigated as the finished ground under the bridge will be shaped to match the upstream channel and flood plain and the existing low water channel will be maintained as near as practical to the existing location as designated in the plans.

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

COMMITMENT B: FEDERALLY THREATENED, ENDANGERED, AND PROTECTED SPECIES

COMMITMENT B2: WHOOPING CRANE

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

Action Taken/Required:

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

COMMITMENT C: WATER SOURCE

The Contractor 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 >

ENVIRONMENTAL COMMITMENTS

COMMITMENT D: WATER QUALITY STANDARDS

COMMITMENT D1: SURFACE WATER QUALITY

The East Fork Vermillion River is classified as warm water, marginal fishery with a total suspended solids standard of less than 150 mg/L 30-day average, less than 263 mg/L daily maximum.

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

Action Taken/Required:

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

COMMITMENT D2: SURFACE WATER DISCHARGE

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

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

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

Action Taken/Required:

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

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

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

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

COMMITMENT E: STORM WATER

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

Action Taken/Required:

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

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

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

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

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

The Contractor must adhere to the “Special Provision Regarding Storm Water Discharge to Waters of the United States within Indian Reservations”.

Storm Water Pollution Prevention Plan

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

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

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

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

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

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

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

COMMITMENT H: WASTE DISPOSAL SITE

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

Action Taken/Required:

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

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

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

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

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

The above requirements will not apply to waste disposal sites that are covered by an individual solid waste permit as specified in SDCL 34A-6-58, SDCL 34A-6-1.13, and ARSD 74:27:10:06.
Failure to comply with the requirements stated above may result in civil penalties in accordance with South Dakota Solid Waste Law, SDCL 34A-6-1.31.

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

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COMMITMENT I: HISTORIC PRESERVATION OFFICE CLEARANCES

The SDDOT has obtained concurrence with the State Historic Preservation Office (SHPO 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/THPO review does not relieve the Contractor of the responsibility for obtaining any additional permits and clearances for Contractor furnished material sources, material processing sites, stockpile sites, storage areas, plant sites, and waste areas that affect wetlands, threatened and endangered species, or waterways. The Contractor 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 J: CONSTRUCTION PRACTICES FOR TEMPORARY WORKS IN WATERWAYS OF THE U.S.

The Contractor is advised that special construction measures must be taken to ensure that the waterways of the U.S. are not impacted.

Action Taken/Required:

Excavation will not occur below the ordinary high-water elevation in waterways outside of caissons, cribs, cofferdams, steel piling, or sheeting. The natural streambed will not be disturbed unless specified by the plans and under the observation of the Project Engineer. Refer to the Table of U.S. Waterways to Protect for ordinary high-water elevations. Any structure work over or within the waterway will be constructed according to Section 7.21 C of the Specifications.

All dredged or excavated materials will be placed at a site above the ordinary high-water elevation in a confined area (not classified as a wetland) that is a minimum of 50 feet away from concentrated flows of storm water, drainage courses, and inlets to prevent return of such material to the waterway.

The construction of temporary work platforms, crossings, or berms below the ordinary high-water elevation will be allowed if all material placed below the ordinary high-water elevation consists of Class B or larger riprap.

All temporary caissons, cribs, cofferdams, steel piling, sheeting, work platforms, crossings, and berms will be removed with minimal disturbance to the streambed. Proper construction practices will be used to minimize increases in suspended solids and turbidity in the waterway.

Bridge berms, wing dams, traffic diversions, channel reconstruction, stream diversions, grading, etc. will be constructed in close conformity with the plans to ensure that the hydraulic capacity of the waterway is not changed.

Temporary waterway crossings required for the Contractor's construction operations will be constructed with an adequate drainage structure size and minimum fill height to reduce the potential for upstream flooding. The Contractor will be responsible for sizing the temporary drainage structure for these crossings.

All temporary works in waterways of the US are required to be covered in the Corp of Engineers 404 Permit. At the time of the preconstruction meeting, the Contractor will submit documentation for all temporary works for the purpose of complying with the 404 Permit requirements in accordance with Section 423.3 A of the Specifications.

Table of U.S. Waterways to Protect

Station	Waterway	Ordinary High-Water Elevation
613+00	Trib. To East Fork Vermillion River	1515.5

Stream channel excavation within "Waters of the US" is subject to USACE regulatory jurisdiction. Stream channel excavation cannot exceed the permitted quantities and/or surface area. The 404 Permit is included in the Special Provisions.

The Contractor will take all precautions necessary to prevent any incidental discharges associated with the excavation and hauling of material from the stream channel. This pertains to any excavation operations such as, foundation, pier, or abutment excavation, channel cleanout, excavation for riprap protection, and removal of any temporary fill associated with construction activities.

COMMITMENT L: CONTAMINATED MATERIAL

Contaminated soil and/or known gas stations, undergrounds storage tanks, etc. are located within the project limits. Petroleum contaminated soil may be located at the following sites:

Description	Station	L / R
Sabers Oil, 702 S Oliver, Salem	0+00	L
Central Farmers Coop, 44137 SD38	22+00	R
Friendly's, 201 Stofflerahn Dr, Humbolt	146+00	L

Action Taken/Required:

The Contractor will give notice to the Engineer when contaminated soil is encountered on the project. The Engineer will contact the Environmental Office so that contact with the DANR and consultant to inspect and monitor removal of any contaminated soil can be initiated.

The Contractor will be responsible for having the existing underground utilities located in the construction area. Underground utilities damaged by the Contractor due to negligence will be repaired at the Contractor's expense.

Petroleum contaminated soil may be disposed of at the Sioux Falls Landfill (phone 605-367-8162). Measurement of "Contaminated Material Excavation" will be in accordance with Section 120.4 of the Specifications. All costs for excavating and transporting the contaminated materials to the disposal site and all fees charged per cubic yard by the disposal site will be incidental to the contract unit price per cubic yard for "Contaminated Material Excavation".

The estimated quantity of "Contaminated Material Excavation" is 100 cubic yards. The quantity of "Contaminated Material Excavation" may vary from the plans. No adjustment will be made to the contract unit price for variations in the quantity of "Contaminated Material Excavation".

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.

ENVIRONMENTAL COMMITMENTS

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0038(46)332	5A	116

Rev. 02/12/24 GAW

COMMITMENT Q: ARCHAEOLOGICAL COORDINATION

As a result of a Cultural Resources Survey, historic properties have been identified within and/or adjacent to the project rights-of-way.

The following historic properties have been identified that require avoidance of construction activities:

Table of Historic Properties

Station	Offset (Ft.)	L/R	Environmental Sensitive Site	Action
618+00 to 621+00	xx	R	ESS1	Do Not Disturb

The locations and boundaries of the site(s) for avoidance are shown in the plans.

Action Taken/Required:

If evidence for cultural resources is uncovered 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 consult with the Archaeological Research Center (ARC), the SHPO, and FHWA, to determine the appropriate course of action.

All artifacts, features, or other items of interest uncovered by project construction activities will not be displaced unless the landowner and the SHPO consent to it.

These identified sites cannot be used for material sources, storage areas, waste sites, and/or any other project related activities outside the plan work limits.

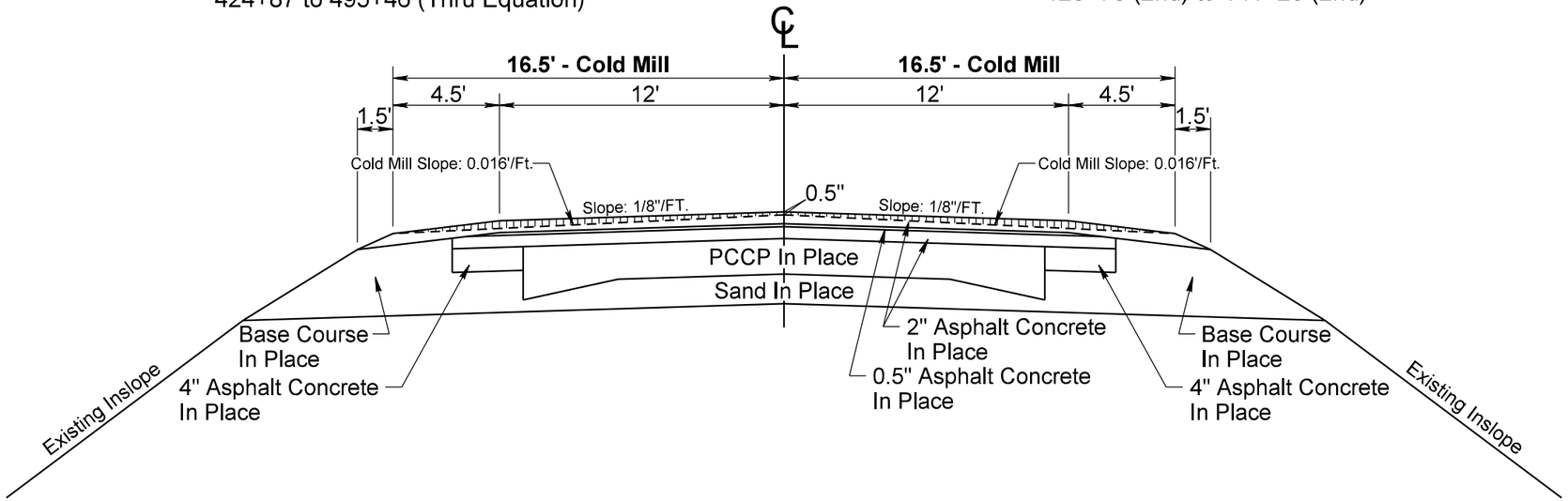
TYPICAL COLD MILLING SECTION

SECTION 1

1+00 to 234+51 (Thru Equation)
241+67 to 307+75
326+82 to 339+40
343+75 to 405+64
424+87 to 495+46 (Thru Equation)

520+83 to 527+35
535+10 to 542+98
553+56 to 563+10
579+60 to 586+17

603+59 to 646+89
659+50 to 15+16 (2nd) (Thru Equation)
36+35 (2nd) to 75+29 (2nd)
85+76 (2nd) to 118+32 (2nd)
128+78 (2nd) to 141+20 (2nd)



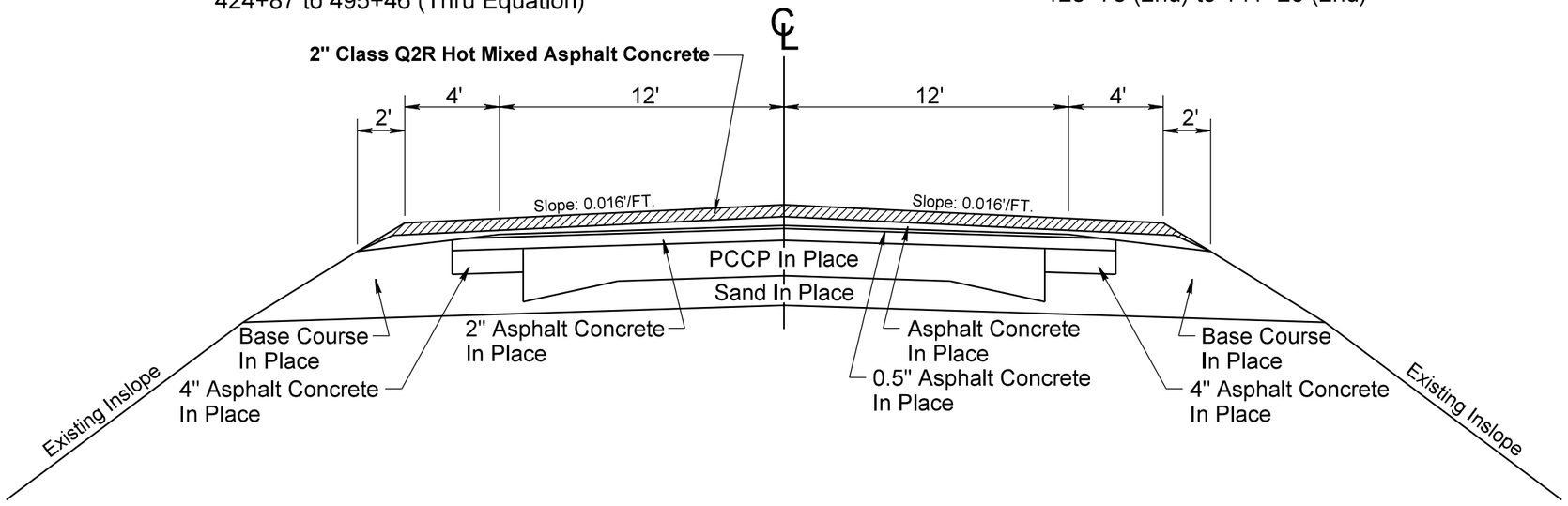
TYPICAL RESURFACING SECTION

SECTION 1

1+00 to 234+51 (Thru Equation)
241+67 to 307+75
326+82 to 339+40
343+75 to 405+64
424+87 to 495+46 (Thru Equation)

520+83 to 527+35
535+10 to 542+98
553+56 to 563+10
579+60 to 586+17

603+59 to 646+89
659+50 to 15+16 (2nd) (Thru Equation)
36+35 (2nd) to 75+29 (2nd)
85+76 (2nd) to 118+32 (2nd)
128+78 (2nd) to 141+20 (2nd)

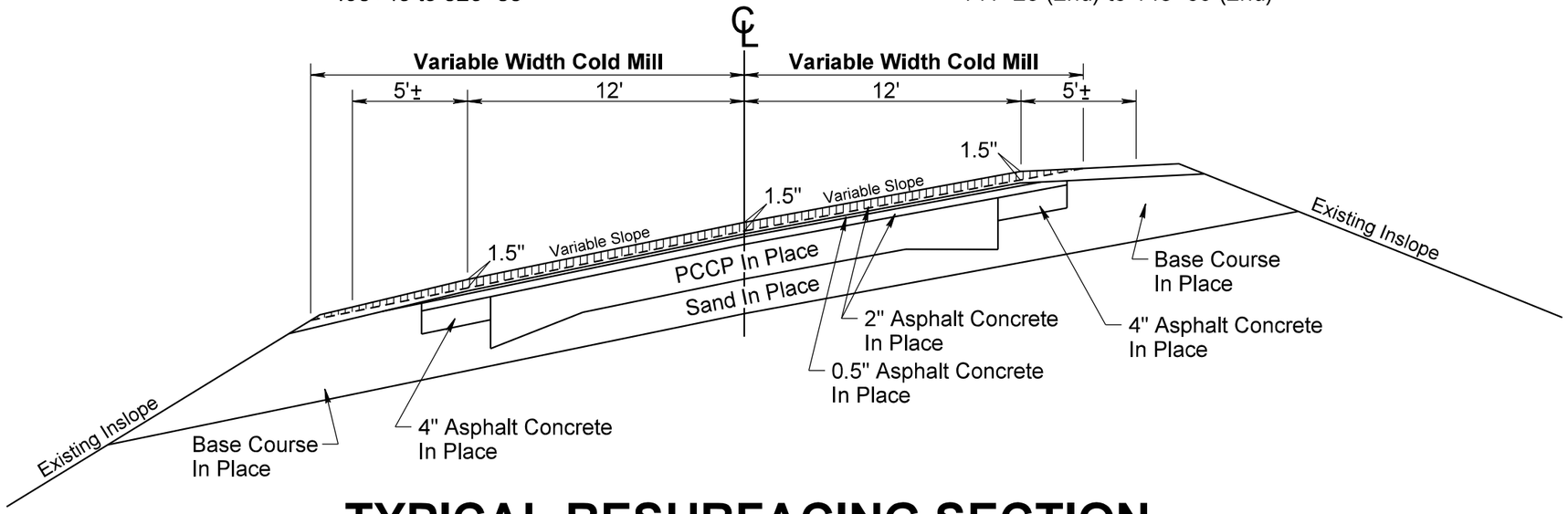


PLOT SCALE - 1:6
PLOT NAME - 2
FILE - ...\PRJ2023\MCCK05UR\TSEC05UR.DGN
PLOTTED FROM - TRM111118

TYPICAL COLD MILLING SECTION

SECTION 2

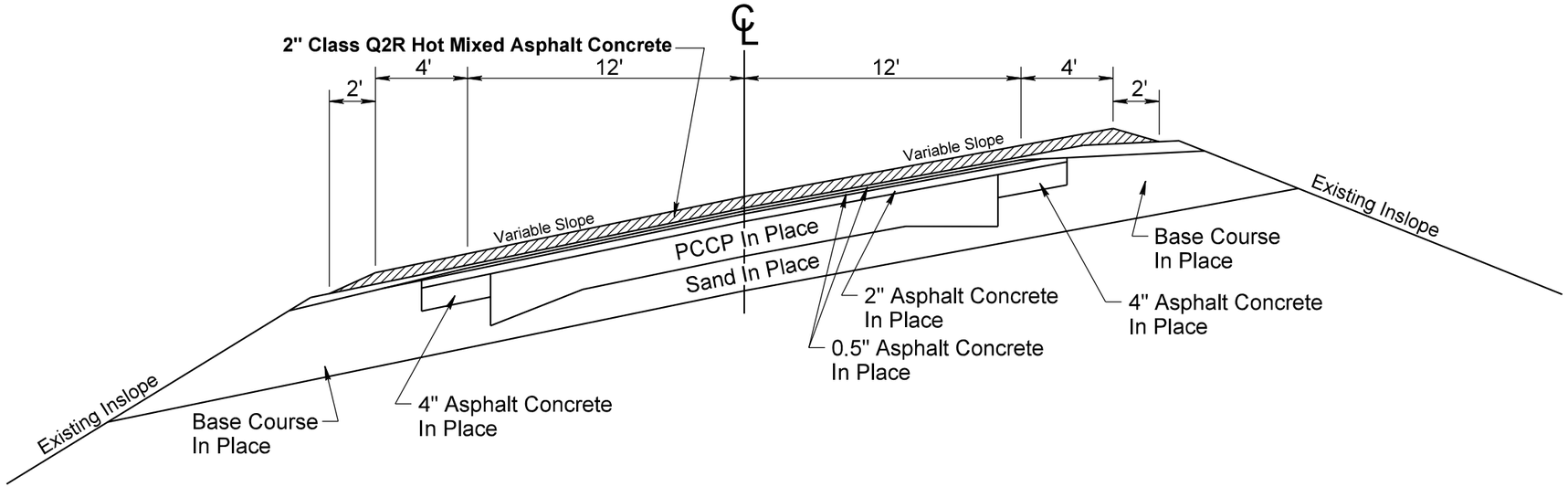
234+51 to 241+67	542+98 to 553+56 (Thru Equation)	15+16 (2nd) to 36+35 (2nd)
307+75 to 326+82	586+17 to 603+59	75+29 (2nd) to 85+76 (2nd)
405+64 to 424+87	646+89 to 659+50	118+32 (2nd) to 128+78 (2nd)
495+46 to 520+83		141+20 (2nd) to 148+69 (2nd)



TYPICAL RESURFACING SECTION

SECTION 2

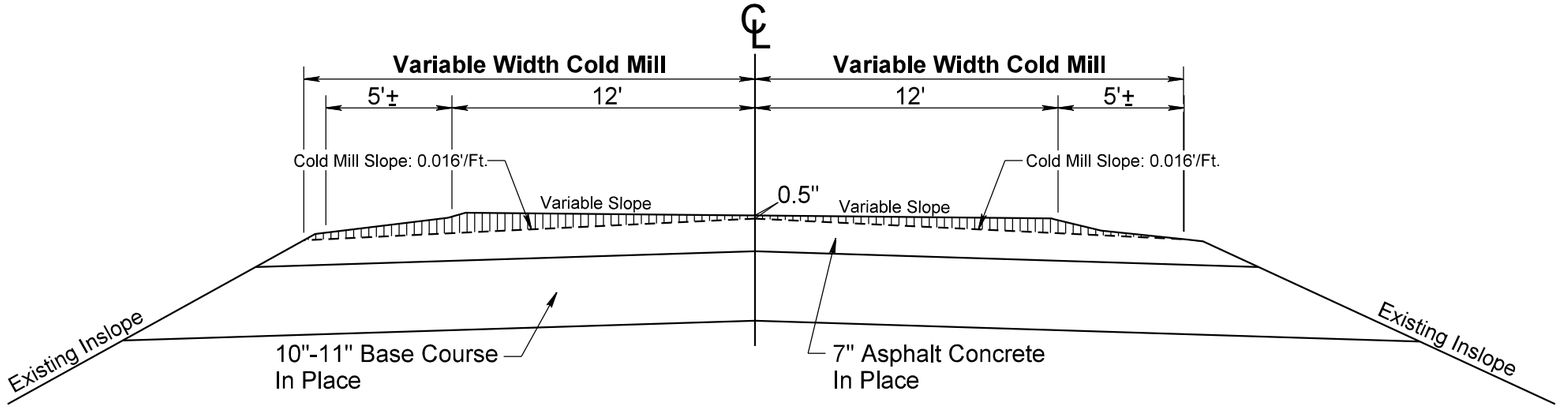
234+51 to 241+67	542+98 to 553+56 (Thru Equation)	15+16 (2nd) to 36+35 (2nd)
307+75 to 326+82	586+17 to 603+59	75+29 (2nd) to 85+76 (2nd)
405+64 to 424+87	646+89 to 659+50	118+32 (2nd) to 128+78 (2nd)
495+46 to 520+83		141+20 (2nd) to 148+69 (2nd)



PLOT SCALE - 1:6
PLOTTED FROM - TRMI11118
PLOT NAME - 3
FILE - ...\PRJ2023\MCCK05UR\TSEC05UR.DGN

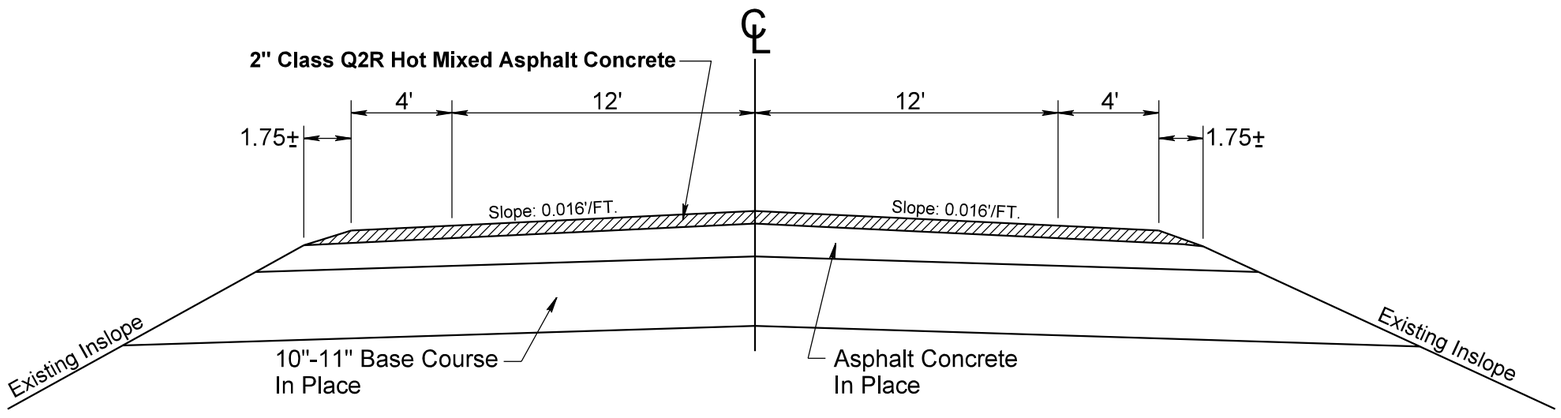
TYPICAL COLD MILLING SECTION

SECTION 3
339+40 to 343+75



TYPICAL RESURFACING SECTION

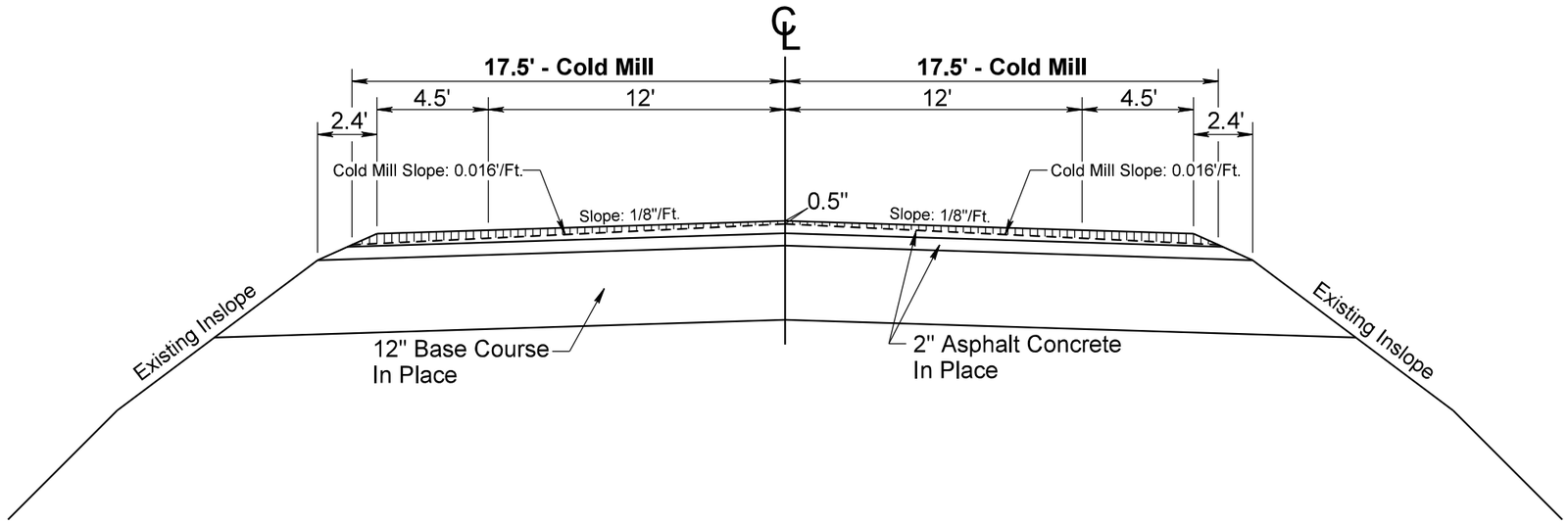
SECTION 3
339+40 to 343+75



PLOT SCALE - 1:6
PLOTTED FROM - TRM111118
PLOT NAME - 4
FILE - ...\PRJ2023\MCCK05UR\TSEC05UR.DGN

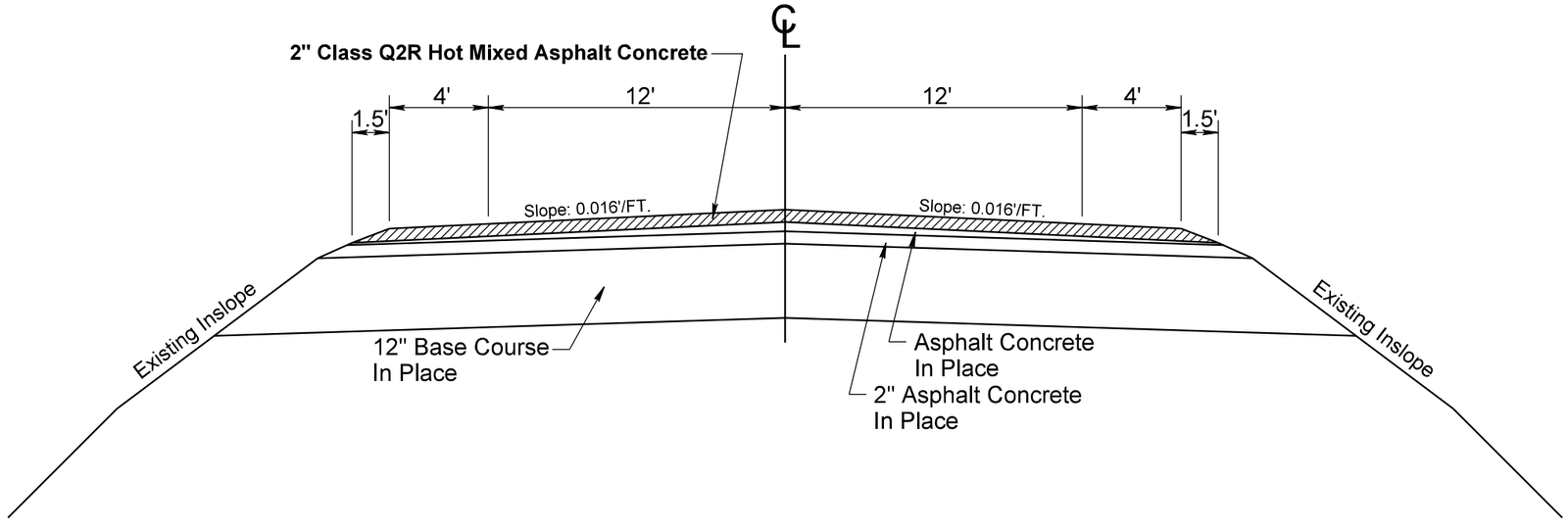
TYPICAL COLD MILLING SECTION

SECTION 4
527+35 to 535+10



TYPICAL RESURFACING SECTION

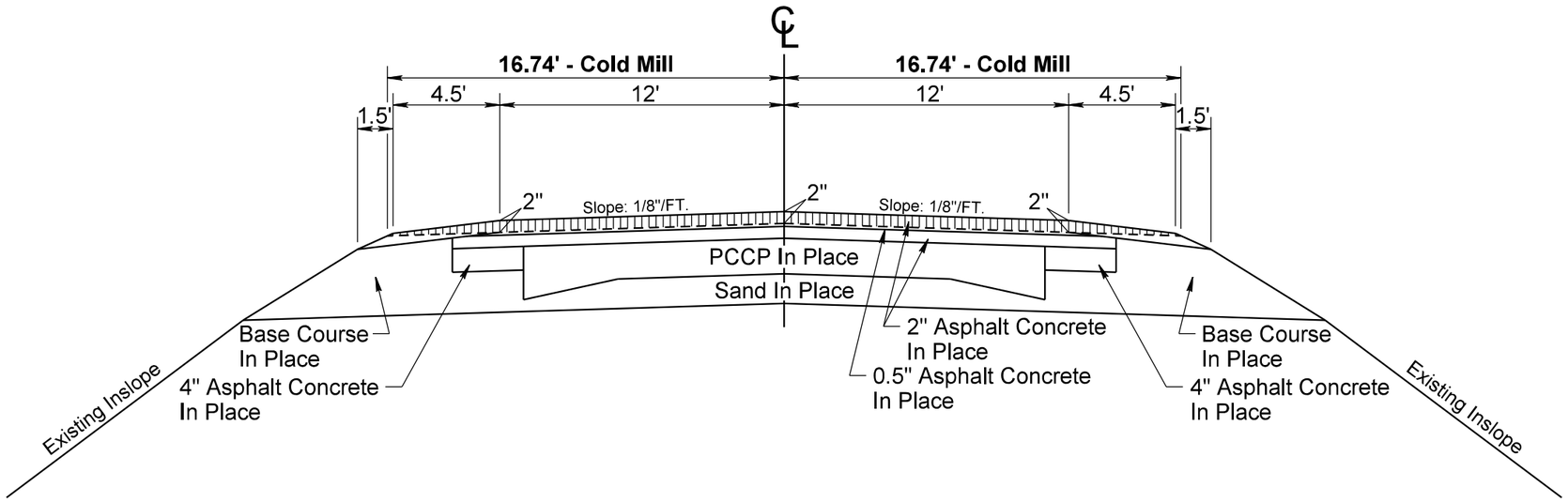
SECTION 4
527+35 to 535+10



PLOT SCALE - 1:6
PLOTTED FROM - TRMI11118
PLOT NAME - 5
FILE - ...\PRJ2023\MCCK05UR\TSEC05UR.DGN

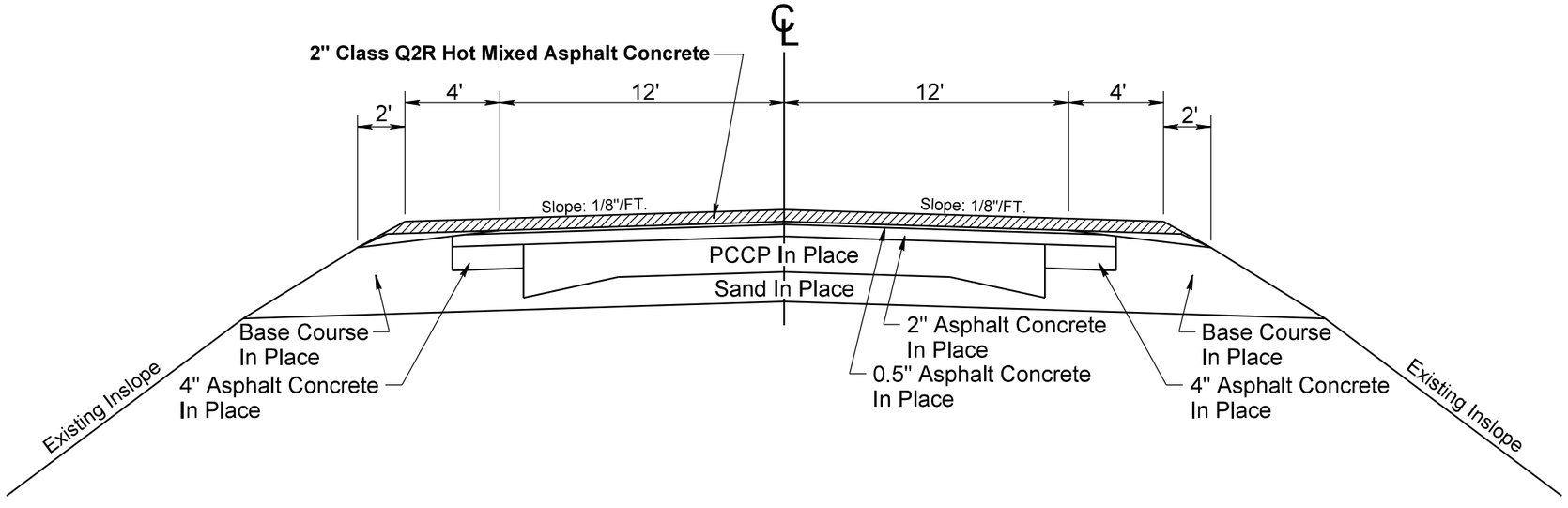
TYPICAL COLD MILLING SECTION

SECTION 5
563+10 to 579+60



TYPICAL RESURFACING SECTION

SECTION 5
563+10 to 579+60

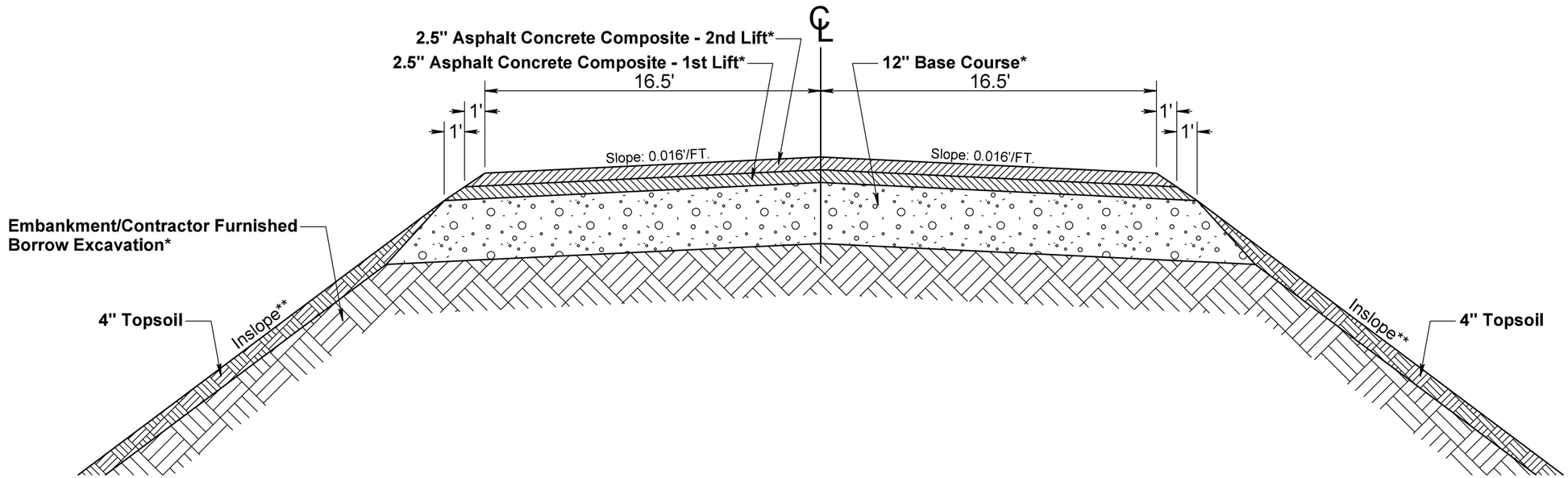


PLOT SCALE - 1:6
PLOT NAME - 6
FILE - ...\PRJ2023\MCCK05UR\TSEC05UR.DGN
PLOTTED FROM - TRMI11118

TYPICAL GRADING & INTERIM SURFACING SECTION

AT PIPE & BOX CULVERT PLACEMENT LOCATIONS

50+78 to 51+18
116+74 to 117+06
197+69 to 197+97
279+66 to 279+96
305+62 to 306+00
612+34 to 613+66



***Quantity is included in the Table of Additional Quantities.**

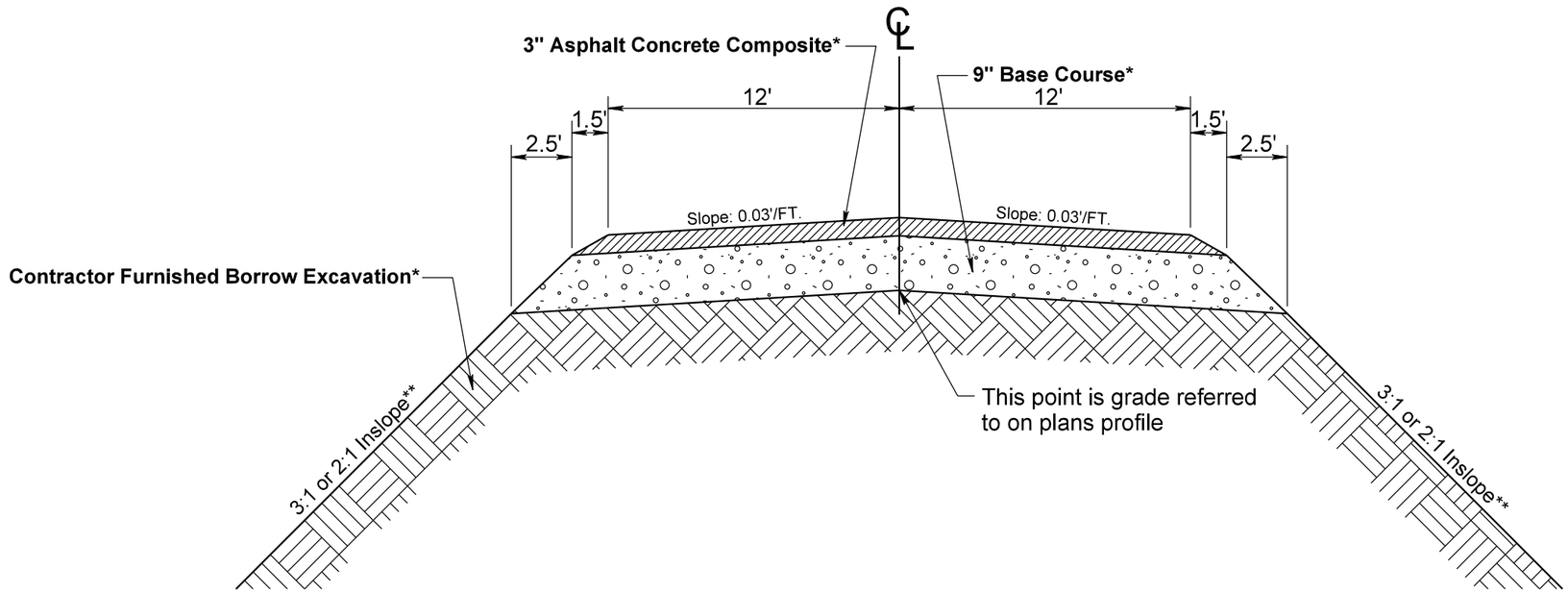
****Refer to 8' x 8' Box Culvert plan sheet and pipe cross sections for inslope.**

PLOT SCALE - 1:6
PLOT NAME - 7
FILE - ...\PRJ2023\MCCK05UR\TSEC05UR.DGN
PLOTTED FROM - TRMI11118

TYPICAL GRADING & SURFACING SECTION

TRAFFIC DIVERSION FOR BOX CULVERT INSTALLATION AT STA. 613+00

1+48 to 10+06 (Horizontal Alignment Div613)



**Transition:
1+48 to 4+80 (3:1)
4+80 to 5+20 (3:1 to 2:1)
5+20 to 5+90 (2:1)
5+90 to 6+30 (2:1 to 3:1)
6+30 to 10+06 (3:1)

***Quantity is included in the Table of Additional Quantities.**

PLOT SCALE - 1:6
PLOT NAME - 8
FILE - ...\PRJ2023\MCCK05UR\TSEC05UR.DGN
PLOTTED FROM - TRM111118

RATES OF MATERIALS

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0038(46)332	13	116

Section 1
Rural 2 Lane

1+00.00 to 106+21.00
106+11.00 to 234+51.00
241+67.00 to 307+75.00
326+82.00 to 339+40.00
343+75.00 to 405+64.00
423+06.00 to 495+46.00
520+83.00 to 527+35.00
535+10.00 to 542+98.00
553+56.00 to 554+21.00
552+66.00 to 563+10.00
579+60.00 to 586+17.00
603+59.00 to 646+89.00
659+50.00 to 723+82.00
0+00.00 (2nd) to 15+16.00 (2nd)
36+35.00 (2nd) to 75+29.00 (2nd)
85+76.00 (2nd) to 118+32.00 (2nd)
128+78.00 (2nd) to 141+20.00 (2nd)

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

2" CLASS Q2R HOT MIXED ASPHALT CONCRETE

Salvaged Asphalt Concrete	414 Tons
Crushed Aggregate	1658 Tons
PG 58-34 Asphalt Binder	102 Tons
	TOTAL: 2174 Tons
Hydrated Lime	22 Tons
	TOTAL: 2196 Tons

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

SS-1h or CSS-1h Asphalt for Tack at the rate of 5.5 tons applied 37 feet wide (Rate = 0.06 gallon per square yard).

FLUSH SEAL

SS-1h or CSS-1h Asphalt for Flush Seal at the rate of 4.5 tons applied 36 feet wide (Rate = 0.05 gallon per square yard).

Sand for Flush Seal at the rate of 56 tons applied 24 feet wide (Rate = 8 pounds per square yard).

Section 2
2 Lane Curve

234+51.00 to 241+67.00
307+75.00 to 326+82.00
405+64.00 to 424+87.00
495+46.00 to 520+83.00
542+98.00 to 554+21.00
552+66.00 to 553+56.00
586+17.00 to 603+59.00
646+89.00 to 659+50.00
15+16.00 (2nd) to 36+35.00 (2nd)
75+29.00 (2nd) to 85+76.00 (2nd)
118+32.00 (2nd) to 128+78.00 (2nd)
141+20.00 (2nd) to 148+69.00 (2nd)

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

2" CLASS Q2R HOT MIXED ASPHALT CONCRETE

Salvaged Asphalt Concrete	424 Tons
Crushed Aggregate	1699 Tons
PG 58-34 Asphalt Binder	105 Tons
	TOTAL: 2228 Tons
Hydrated Lime	22 Tons
	TOTAL: 2250 Tons

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

SS-1h or CSS-1h Asphalt for Tack at the rate of 5.5 tons applied 37 feet wide (Rate = 0.06 gallon per square yard).

FLUSH SEAL

SS-1h or CSS-1h Asphalt for Flush Seal at the rate of 4.5 tons applied 36 feet wide (Rate = 0.05 gallon per square yard).

Sand for Flush Seal at the rate of 56 tons applied 24 feet wide (Rate = 8 pounds per square yard).

Section 3
Rural 2 Lane
339+40.00 to 343+75.00

Asphaltic Quantities for Section 3 are included in the Table of Materials Quantities

2" CLASS Q2R HOT MIXED ASPHALT CONCRETE

Salvaged Asphalt Concrete	8.03 Tons
Crushed Aggregate	32.14 Tons
PG 58-34 Asphalt Binder	1.98 Tons
	TOTAL: 42.15 Tons
Hydrated Lime	0.42 Ton
	TOTAL: 42.57 Tons

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

SS-1h or CSS-1h Asphalt for Tack at the rate of 0.1 ton applied 37 feet wide (Rate = 0.06 gallon per square yard).

FLUSH SEAL

SS-1h or CSS-1h Asphalt for Flush Seal at the rate of 0.09 ton applied 36 feet wide (Rate = 0.05 gallon per square yard).

Sand for Flush Seal at the rate of 1.07 tons applied 24 feet wide (Rate = 8 pounds per square yard).

RATES OF MATERIALS

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0038(46)332	14	116

Section 4
Rural 2 Lane
527+35.00 to 535+10.00

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

2" CLASS Q2R HOT MIXED ASPHALT CONCRETE

Salvaged Asphalt Concrete	7.88	Tons
Crushed Aggregate	31.50	Tons
PG 58-34 Asphalt Binder	1.94	Tons
	TOTAL: 41.32	**Tons**
Hydrated Lime	0.41	Ton
	TOTAL: 41.73	**Tons**

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

SS-1h or CSS-1h Asphalt for Tack at the rate of 0.1 ton applied 36 feet wide (Rate = 0.06 gallon per square yard).

FLUSH SEAL

SS-1h or CSS-1h Asphalt for Flush Seal at the rate of 0.08 ton applied 35 feet wide (Rate = 0.05 gallon per square yard).

Sand for Flush Seal at the rate of 1.07 tons applied 24 feet wide (Rate = 8 pounds per square yard).

Section 5
Rural 2 Lane
563+10.00 to 579+60.00 (less 157.66' for one bridge)

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

2" CLASS Q2R HOT MIXED ASPHALT CONCRETE

Salvaged Asphalt Concrete	7.80	Tons
Crushed Aggregate	31.23	Tons
PG 58-34 Asphalt Binder	1.93	Tons
	TOTAL: 40.96	**Tons**
Hydrated Lime	0.41	Ton
	TOTAL: 41.37	**Tons**

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

SS-1h or CSS-1h Asphalt for Tack at the rate of 0.1 ton applied 37 feet wide (Rate = 0.06 gallon per square yard).

FLUSH SEAL

SS-1h or CSS-1h Asphalt for Flush Seal at the rate of 0.09 ton applied 36 feet wide (Rate = 0.05 gallon per square yard).

Sand for Flush Seal at the rate of 1.07 tons applied 24 feet wide (Rate = 8 pounds per square yard).

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0038(46)332	15	116

TABLE OF PROJECT STATIONING

SECTION	STATION	TO	STATION	DESCRIPTION	LENGTH	GROSS SECTION LENGTHS	BRIDGE LENGTHS	NET SECTION LENGTHS
1	1+00.00	to	106+21.00	Rural 2 Lane	10521.00'	**68532.00'**		**68532.00' 12.980 mi.**
	106+11.00	to	234+51.00		12840.00'			
	241+67.00	to	307+75.00		6608.00'			
	326+82.00	to	339+40.00		1258.00'			
	343+75.00	to	405+64.00		6189.00'			
	423+06.00	to	495+46.00		7240.00'			
	520+83.00	to	527+35.00		652.00'			
	535+10.00	to	542+98.00		788.00'			
	553+56.00	to	554+21.00		65.00'			
	552+66.00	to	563+10.00		1044.00'			
	579+60.00	to	586+17.00		657.00'			
	603+59.00	to	646+89.00		4330.00'			
	659+50.00	to	723+82.00		6432.00'			
	0+00.00 (2nd)	to	15+16.00 (2nd)		1516.00'			
	36+35.00 (2nd)	to	75+29.00 (2nd)		3894.00'			
	85+76.00 (2nd)	to	118+32.00 (2nd)		3256.00'			
	128+78.00 (2nd)	to	141+20.00 (2nd)		1242.00'			
2	234+51.00	to	241+67.00	2 Lane Curve	716.00'	**16260.00'**		**16260.00' 3.080 mi.**
	307+75.00	to	326+82.00		1907.00'			
	405+64.00	to	424+87.00		1923.00'			
	495+46.00	to	520+83.00		2537.00'			
	542+98.00	to	554+21.00		1123.00'			
	552+66.00	to	553+56.00		90.00'			
	586+17.00	to	603+59.00		1742.00'			
	646+89.00	to	659+50.00		1261.00'			
	15+16.00 (2nd)	to	36+35.00 (2nd)		2119.00'			
	75+29.00 (2nd)	to	85+76.00 (2nd)		1047.00'			
	118+32.00 (2nd)	to	128+78.00 (2nd)		1046.00'			
	141+20.00 (2nd)	to	148+69.00 (2nd)		749.00'			
3	339+40.00	to	343+75.00	Rural 2 Lane	435.00'	**435.00'**		**435.00' 0.082 mi.**
4	527+35.00	to	535+10.00	Rural 2 Lane	775.00'	**775.00'**		**775.00' 0.147 mi.**
5	563+10.00	to	579+60.00	Rural 2 Lane	1650.00'	**1650.00'**	**157.66'**	**1492.34' 0.283 mi.**
				Sects 1-5 Totals		**87652.00' 16.601 mi.**	**157.66' 0.030 mi.**	**87494.34' 16.571 mi.**

TABLE OF MATERIALS QUANTITIES

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

SECTION	UNCL. EXC. CuYd	UNCL. EXC. DIG-OUTS CuYd	REMOVE ASPHALT CONCRETE PAVEMENT SqYd	CONTRACTOR FURNISHED BORROW EXCAVATION CuYd	WATER FOR EMB. MGal	BASE COURSE Ton	WATER FOR GRAN. MATER. MGal	COLD MILLING ASPHALT CONCRETE SqYd	ASPHALT CONCRETE COMPOSITE Ton	ASPHALT CONCRETE BLADE LAID Ton	PG 58-34 ASPHALT BINDER <---- BLADE LAID ----> Ton	HYDRATED LIME <---- BLADE LAID ----> Ton	CLASS Q2R HOT MIXED ASPHALT CONCRETE Ton	PG 58-34 ASPHALT BINDER Ton	HYDRATED LIME Ton	SALV. MAT'L. N.A.B.I. Ton	SS-1h/ CSS-1h ASPH. FOR TACK Ton	SS-1h/ CSS-1h ASPH. FOR FLUSH SEAL Ton	SAND FOR FLUSH SEAL Ton
1	2880	649	974	2424	24	1298	16	251284	325	-	-	-	28504	1326.4	282.2	5379	71.4	58.4	727
2	121	154	231	-	-	308	4	58193	77	-	-	-	6930	322.5	68.6	1308	16.9	13.9	172
3	-	4	6	-	-	8	-	1654	2	-	-	-	185	8.6	1.8	35	0.4	0.4	5
4	-	7	11	-	-	15	-	3014	4	-	-	-	323	15.0	3.2	61	0.8	0.6	8
5	-	14	21	-	-	28	-	5552	7	-	-	-	617	28.7	6.1	116	1.5	1.3	16
Subtotals:	**3001**	**828**	**1243**	**2424**	**24**	**1657**	**20**	**319697**	**415**	**-**	**-**	**-**	**36559**	**1701.2**	**361.9**	**6899**	**91.0**	**74.6**	**928**
Add Quans for spot leveling and tight blading in Section 1									-	1947	144.6	19.3	1298	60.4	12.9	245	73.2	-	-
Add Quans for spot leveling and tight blading in Section 2									-	462	34.3	4.6	308	14.3	3.0	58	17.4	-	-
Add Quans for spot leveling and tight blading in Section 3									-	12	0.9	0.1	8	0.4	0.1	2	0.5	-	-
Add Quans for spot leveling and tight blading in Section 4									-	22	1.6	0.2	15	0.7	0.1	3	0.8	-	-
Add Quans for spot leveling and tight blading in Section 5									-	42	3.1	0.4	28	1.3	0.3	5	1.6	-	-
Add Quans for spot leveling and tight blading:	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2485**	**184.5**	**24.6**	**1657**	**77.1**	**16.4**	**313**	**93.5**	**-**	**-**
Table of Additional Quantities:	**7565**	**-**	**1472**	**15651**	**232**	**4325**	**51**	**5350**	**875**	**-**	**-**	**-**	**1514**	**70.5**	**15.0**	**286**	**5.0**	**2.7**	**50**
Totals:	**10566**	**828**	**2715**	**18075**	**256**	**5982**	**71**	**325047**	**1290**	**2485**	**184.5**	**24.6**	**39730**	**1848.8**	**393.3**	**7498**	**189.5**	**77.3**	**978**

TABLE OF ADDITIONAL QUANTITIES

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

LOCATION	UNCL. EXC. CuYd	REMOVE ASPHALT CONCRETE PAVEMENT SqYd	CONTRACTOR FURNISHED BORROW EXCAVATION CuYd	WATER FOR EMB. MGal	BASE COURSE Ton	WATER FOR GRAN. MATER. MGal	COLD MILLING ASPHALT CONCRETE SqYd	ASPHALT CONCRETE COMPOSITE 1ST LIFT Ton	ASPHALT CONCRETE COMPOSITE 2ND LIFT Ton	CLASS Q2R HOT MIXED ASPHALT CONCRETE Ton	PG 58-34 ASPHALT BINDER Ton	HYDRATED LIME Ton	SALV. MAT'L. N.A.B.I. Ton	SS-1h/ CSS-1h ASPH. FOR FLUSH SEAL Ton	SAND FOR FLUSH SEAL Ton
Other Locations															
Mainline Cross Pipe Replacement	-	656	-	-	883	11	-	95	89	-	-	-	-	-	-
Traffic Diversion at 613+00	5	-	9880	99	1420	17	-	534	-	-	-	-	-	-	-
RC Box Culvert at 613+00	7300	538	5565	129	435	5	-	80	75	-	-	-	-	-	-
RC Box Culvert at 699+29	10	11	-	-	-	-	-	1	1	-	-	-	-	-	-
Guardrail Locations															
See Guardrail Table	125	267	180	3	69	1	-	-	-	60	2.8	0.6	11	-	-
Other Miscellaneous Locations															
Approaches at 13+10 Lt & 18+60 Lt	-	-	-	-	20	-	172	-	-	-	-	-	-	-	-
Ditch Shaping 15+70 (2nd) Rt to 23+45 (2nd) Rt	125	-	-	1	-	-	-	-	-	-	-	-	-	-	-
Turnouts															
16 Mailbox Turnouts	-	-	-	-	-	-	-	-	-	64	3.0	0.6	12	-	-
1 Mailbox Turnouts (Multiple)	-	-	26	-	3	-	-	-	-	4	0.2	-	1	-	-
Resurface to ROW															
6 Intersecting Roads	-	-	-	-	-	-	1014	-	-	269	12.5	2.7	50	0.51	9.7
3 Intersecting Streets	-	-	-	-	-	-	408	-	-	74	3.4	0.7	14	0.14	2.7
1 Home Entrance	-	-	-	-	-	-	76	-	-	16	0.8	0.2	3	0.03	0.6
3 Commercial Entrances	-	-	-	-	-	-	384	-	-	78	3.6	0.8	15	0.15	2.8
Resurface to End of Radius															
27 Intersecting Roads	-	-	-	-	405	5	2407	-	-	712	33.2	7.1	135	1.36	25.6
12 Commercial Entrances	-	-	-	-	120	1	889	-	-	237	11.0	2.3	45	0.46	8.5
Pads															
4 Commercial Entrances	-	-	-	-	120	1	-	-	-	-	-	-	-	-	-
24 Farm Entrances	-	-	-	-	240	3	-	-	-	-	-	-	-	-	-
61 Field Entrances	-	-	-	-	610	7	-	-	-	-	-	-	-	-	-
TOTALS:	**7565**	**1472**	**15651**	**232**	**4325**	**51**	**5350**	**710**	**165**	**1514**	**70.5**	**15.0**	**286**	**2.65**	**49.9**

NOTES: 5.0 tons of SS-1h or CSS-1h Asphalt for Tack are included in the Estimate of Quantities and will be applied at the rate shown on the plans as directed by the Engineer.

The tonnage shown above for Base Course is based on a compacted depth of 4 inches for Guardrail Locations and Mailbox Turnouts and 2 inches for other locations.

The tonnage shown above for Asphalt Concrete Composite - 1st Lift is based on a compacted depth of 3 inches for the Traffic Diversion and 2.5 inches for other locations.
The tonnage shown above for Asphalt Concrete Composite - 2nd Lift is based on a compacted depth of 2.5 inches.
The tonnage shown above for Class Q2R Hot Mixed Asphalt Concrete is based on a compacted depth of 2 inches.

The above quantities are included in the Estimate of Quantities.

SUMMARY OF ASPHALT CONCRETE

	ASPHALT CONCRETE COMPOSITE 1ST LIFT COMPACTION WITH SPECIFIED DENSITY TONS	ASPHALT CONCRETE COMPOSITE 1ST LIFT COMPACTION WITHOUT SPECIFIED DENSITY TONS	ASPHALT CONCRETE COMPOSITE 2ND LIFT COMPACTION WITH SPECIFIED DENSITY TONS	ASPHALT CONCRETE COMPOSITE 2ND LIFT COMPACTION WITHOUT SPECIFIED DENSITY TONS	ASPHALT CONCRETE BLADE LAID COMPACTION WITH SPECIFIED DENSITY TONS	ASPHALT CONCRETE BLADE LAID COMPACTION WITHOUT SPECIFIED DENSITY TONS	CLASS Q2R HOT MIXED ASPHALT CONCRETE COMPACTION WITH SPECIFIED DENSITY TONS	CLASS Q2R HOT MIXED ASPHALT CONCRETE COMPACTION WITHOUT SPECIFIED DENSITY TONS
Section 1								
24' Finished Roadway Surface	-	-	-	-	-	-	20489	-
Shoulders	-	-	-	-	-	-	-	8015
Backfilling Digouts	-	325	-	-	-	-	-	-
Section 1 Totals:	**-**	**325**	**-**	**-**	**-**	**-**	**20489**	**8015**
Add Quans for spot leveling and tight blading	-	-	-	-	-	1947	-	1298
Section 2								
24' Finished Roadway Surface	-	-	-	-	-	-	4861	-
Shoulders	-	-	-	-	-	-	-	2069
Backfilling Digouts	-	77	-	-	-	-	-	-
Section 2 Totals:	**-**	**77**	**-**	**-**	**-**	**-**	**4861**	**2069**
Add Quans for spot leveling and tight blading	-	-	-	-	-	462	-	308
Section 3								
24' Finished Roadway Surface	-	-	-	-	-	-	130	-
Shoulders	-	-	-	-	-	-	-	55
Backfilling Digouts	-	2	-	-	-	-	-	-
Section 3 Totals:	**-**	**2**	**-**	**-**	**-**	**-**	**130**	**55**
Add Quans for spot leveling and tight blading	-	-	-	-	-	12	-	8
Section 4								
24' Finished Roadway Surface	-	-	-	-	-	-	232	-
Shoulders	-	-	-	-	-	-	-	91
Backfilling Digouts	-	4	-	-	-	-	-	-
Section 4 Totals:	**-**	**4**	**-**	**-**	**-**	**-**	**232**	**91**
Add Quans for spot leveling and tight blading	-	-	-	-	-	22	-	15
Section 5								
24' Finished Roadway Surface	-	-	-	-	-	-	446	-
Shoulders	-	-	-	-	-	-	-	171
Backfilling Digouts	-	7	-	-	-	-	-	-
Section 5 Totals:	**-**	**7**	**-**	**-**	**-**	**-**	**446**	**171**
Add Quans for spot leveling and tight blading	-	-	-	-	-	42	-	28
Table of Additional Quantities								
Other Locations	-	710	-	165	-	-	-	-
Miscellaneous Nondensity Locations	-	-	-	-	-	-	-	60
Turnouts, Int Roads, Ents & Pads	-	-	-	-	-	-	-	1454
Additional Totals:	**-**	**710**	**-**	**165**	**-**	**-**	**-**	**1514**
Totals:	**-**	**1125**	**-**	**165**	**-**	**2485**	**26158**	**13572**

26158	**TONS ASPHALT CONCRETE COMPACTION WITH SPECIFIED DENSITY**
17347	**TONS ASPHALT CONCRETE COMPACTION WITHOUT SPECIFIED DENSITY**
43505	**TONS TOTAL**

TABLE FOR REMOVAL AND INSTALLATION OF GUARDRAIL AND RELATED ITEMS

LOCATION	REMOVE BEAM GUARDRAIL	REMOVE W BEAM GUARDRAIL END TERMINAL	REMOVE ASPHALT CONCRETE PAVEMENT *	UNCL. EXC. *	CONTRACTOR FURNISHED BORROW EXCAVATION *	BASE COURSE *	CLASS Q2R HOT MIXED ASPHALT CONCRETE 4TH LIFT *	TYPE 1 MGS	TYPE 2A GUARDRAIL TRANSITION	MGS MASH FLARED END TERMINAL
BRIDGE CORNER	**Ft**	**Each**	**SqYd**	**CuYd**	**CuYd**	**Ton**	**Ton**	**Ft**	**Each**	**Each**
STRUCTURE 44-214-107 MRM 343.19										
Begin Bridge L	43.75	1	44	-	20	7	11	25	1	1
Begin Bridge R	81.25	1	83	-	80	22	19	87.5	1	1
End Bridge L	81.25	1	87	125	30	20	19	87.5	1	1
End Bridge R	43.75	1	53	-	50	20	11	25	1	1
TOTALS:	**250**	**4**	**267**	**125**	**180**	**69**	**60**	**225**	**4**	**4**

* Quantities for these guardrail work items are also included in the Table of Additional Quantities.

TABLE OF GUARDRAIL DELINEATORS & OBJECT MARKERS

LOCATION	TYPE 2 OBJECT MARKER BACK TO BACK	TYPE 2 OBJECT MARKER	GUARDRAIL TERMINAL END OBJECT MARKER (ADHESIVE)	GUARDRAIL DELINEATOR			
			N.A.B.I.	BEAM		CABLE	
	(M) #	(M) #	[E] #	(B) #		(C) #	
BRIDGE CORNER				**Yellow**	**White**	**Yellow**	**White**
STRUCTURE 44-214-107 MRM 343.19							
Begin Bridge L			1		4		
Begin Bridge R			1		4		
End Bridge L			1		4		
End Bridge R			1		4		
TOTALS	**-**	**-**	**4**	**-**	**16**	**-**	**-**
				16			

- For **KEY**, Refer to Standard Plate 632.40 - Sheet 1 of 4.

N.A.B.I. = Not A Bid Item - Cost is incidental to the contract unit prices for the various items.

TABLE FOR MAINLINE CULVERT WORK

rev: 02-26-2024 SAH

SITE NO	CUL-VERT ID	MRM	STATION	NO of PIPE - SIZE (DIA or W x H) DIA = IN W x H = FT	LENGTH FT	TYPE	DRAINAGE AREA ACRES	DRAINAGE DIRECTION	CLEAR ZONE 15 FT** SIDE OF ROAD Φ	ROW* FT	WORK DESCRIPTION	LENGTH FT	PIPE CLEANOUT EA	JOINT CLEANING FT	JOINT REPAIR FT	JOINT CHEMICAL GROUT GAL	JOINT TYE A DRAINAGE FABRIC SQ YD	REMOVE / RESET REMOVE PIPE FT	REMOVE / RESET REM PIPE FOR RESET FT	REMOVE / RESET RESET PIPE FT	NEW RCP CIRCULAR 24" FT	NEW RCP CIRCULAR 30" FT	NEW RCP CIRCULAR 36" FT	NEW RCP ARCH 24" FT	NEW RCP ARCH 30" FT	CULVERT ENDS TYPE EXISTING Δ	TYPE NEW Δ	REMOVE / RESET REM PIPE END EA	REMOVE / RESET REMOVE END FOR RESET EA	REMOVE / RESET RESET PIPE END EA	NEW RCP CIRCULAR FLARED 18" EA	NEW RCP CIRCULAR FLARED 30" EA	NEW RCP CIRCULAR SLOPED 24" EA	NEW RCP CIRCULAR SLOPED 30" EA	NEW RCP CIRCULAR SLOPED 36" EA	NEW RCP ARCH 24" EA	NEW RCP ARCH 30" EA	EARTHWORK UNCLASSIFIED EXCAVATION CU YD	PIPE UNDERCUT CU YD	CONTRACTOR FURNISHED BORROW CU YD	CDF CONTROLLED DENSITY FILL CU YD	DITCH / CHANNEL DITCH SHAPING / PROTECTION CHANNEL PROTECT AREA W x L FT	EROSION CONTROL BLANKET TYPE 2 SQ YD	EROSION CONTROL BLANKET TYPE 3 SQ YD	DITCH SHAPING FT	DRAIN-AGE FABRIC TYPE B SQ YD	GABION CU YD	FENCE REMOVE FT	TEMP TYPE 2 FT	TEMP TYPE 1A FT	NEW TYPE 2 FT	BRACING 2 PANEL EA	BRACING 3 PANEL EA	OBJ MARKER OM-2 & POST EXISTING EA	REMOVE EA	NEW Bk-Bk EA
SD 38				P 0038(46)332			PCN 05UR																																																	
E1	6583	332.37	4+27	1 - 18 DIA	72	RCP	11	N	N	50	**No Work**															-																												-		
									S	66	Remove Flared End + 6 ft of Pipe, Fill and Plug Pipe, Cleanout Ditch, Remove Pipe End Marker, Shape and Seed Ditch							6								FE		1											5				0 x 20	0		20									1	1	
E2	6584	332.42	6+62	1 - 30 DIA	84	RCP	66	N	N	50	**No Work**															**FE**																												**1**	**1**	**2**
									S	66	No Work															FE																												1	1	2
E3	6585	333.24	50+93	1 - 30 DIA	49	RCP	56	S	N	66	**Remove Flared End + 25 ft of Pipe, Install a New Sloped End + 30 ft of New 30" RCP Arch, Shape and Seed Ditch**							**25**							**30**	**FE**	**SL**	**1**										**1**	**93**	**10**	**46**														**1**	**1**	**2**
									S	66	Remove Flared End + 24 ft of Pipe, Install a New Sloped End + 32 ft of New 30" RCP Arch, Shape and Seed Ditch							24							32	FE	SL	1										1	93	10	92	**3.5**													1	1	2
			50+98	1 - 30 DIA	49	RCP		S	N	66	**Install a New Sloped End + 30 ft of New 30" RCP Arch, Cleanout Ditch, Shape and Seed Ditch**														**30**	**FE**	**SL**											**1**	**53**	**10**	**22**		**30 x 15**		**50**	**15**									**-**		**2**
									S	66	Install a New Sloped End + 32 ft of New 30" RCP Arch, Cleanout Ditch, Shape and Seed Ditch														32	FE	SL											1	53	10	22	**3.5**	35 x 15		59	15									-		2
			51+03	1 - 30 DIA	49	RCP		S	N	66	**Install a New Sloped End + 30 ft of New 30" RCP Arch, Shape and Seed Ditch**														**30**	**FE**	**SL**											**1**	**93**	**10**	**72**														**-**		**2**
									S	66	Install a New Sloped End + 32 ft of New 30" RCP Arch, Shape and Seed Ditch														32	FE	SL											1	93	10	101														-		2
E4	6586	333.31	54+41	1 - 18 DIA	49	RCP	13	S	N	66	**Cleanout Pipe**	**25**	1													**FE**																												**1**		
									S	66	Remove and Reset Flared End, Cleanout Pipe	25														FE			1	1									1																1	1	1
E5	6587	333.81	81+39	2 - 6 x 4	54	RCBC	1,510	S	N	66	**No Work**															**WW**																												**1**	**1**	**2**
									S	66	No Work															WW																												1	1	2
E6	6589	333.97	89+70	1 - 24 DIA	50	RCP	Eq	N / S	N	66	**No Work**															**FE**																												**1**		
									S	66	No Work															FE																												1		
E7	6590	334.38	109+00	1 - 18 DIA	50	RCP	8	S	N	66	**Cleanout Pipe**	**25**	1													**FE**																												**1**		
									S	66	Cleanout Pipe	25														FE																												1		
E8	6591	334.49	116+86	1 - 24 DIA	50	RCP	14	N / S	N	66	**Install a New Sloped End + 31 ft of New 24" RCP Arch, Shape and Seed Ditch**													**31**		**FE**	**SL**										**1**		**94**	**9**	**78**														**1**		
									S	66	Install a New Sloped End + 31 ft of New 24" RCP Arch, Shape and Seed Ditch													31		FE	SL										1		94	9	78	**2.6**													1		
			116+90	1 - 24 DIA	50	RCP		N / S	N	66	**Remove Flared End + 24 ft of Pipe, Install a New Sloped End + 31 ft of New 24" RCP Arch, Cleanout Ditch, Shape and Seed Ditch**							**24**						**31**		**FE**	**SL**	**1**									**1**		**72**	**9**	**23**		**100 x 30**	**334**		**30**									**1**	**1**	**1**
									S	66	Remove Flared End + 26 ft of Pipe, Install a New Sloped End + 31 ft of New 24" RCP Arch, Cleanout Ditch, Shape and Seed Ditch							26						31		FE	SL	1									1		72	9	23	**2.6**	100 x 30	334		30									1	1	1
			116+94	1 - 24 DIA	50	RCP		N / S	N	66	**Install a New Sloped End + 31 ft of New 24" RCP Arch, Shape and Seed Ditch**													**31**		**FE**	**SL**										**1**		**94**	**9**	**78**														**1**		
									S	66	Install a New Sloped End + 31 ft of New 24" RCP Arch, Shape and Seed Ditch													31		FE	SL										1		94	9	78														1		
											TOTALS THIS SHEET		2	-	-	-	-	105	-	-	-	-	-	186	186			5	1	1	-	-	-	-	-	6	6	1004	114	713	12.2		668	109	110	-	-	-	-	-	-	-	-		10	23

Δ - END TYPES: FE = FLARED END SL = SLOPED END SB = SAFETY or SLOPED END (w/BARS) SE = SAFETY END (NO BARS) DI = DROP INLET WW = WINGWALLS HW = HEADWALLS CN= CONNECTOR JT = JUNCTION TR = TRANSITION

* - RIGHT-OF-WAY MEASURED FROM ℄ ** - CLEARZONE FROM EDGELINE. Φ - (N)orth = LT, (S)outh = RT

TABLE FOR MAINLINE CULVERT WORK

rev: 02-26-2024 SAH

SITE NO	CUL-VERT ID	MRM	STATION	NO of PIPE - SIZE (DIA or W x H) (DIA = IN, W x H = FT)	LENGTH (FT)	TYPE	DRAINAGE AREA ACRES	DRAINAGE DIRECTION	CLEAR ZONE 15 FT** SIDE OF ROAD Φ	CLEAR ZONE ROW* (FT)	WORK DESCRIPTION	LENGTH (FT)	PIPE CLEANOUT (EA)	JOINT CLEANING (FT)	JOINT REPAIR (FT)	JOINT CHEMICAL GROUT (GAL)	JOINT TYE A DRAINAGE FABRIC (SQ YD)	REMOVE / RESET REMOVE PIPE (FT)	REMOVE / RESET REM PIPE FOR RESET (FT)	REMOVE / RESET RESET PIPE (FT)	NEW RCP CIRCULAR 24" (FT)	NEW RCP CIRCULAR 30" (FT)	NEW RCP CIRCULAR 36" (FT)	NEW RCP ARCH 24" (FT)	NEW RCP ARCH 30" (FT)	CULVERT ENDS TYPE EXISTING (Δ)	CULVERT ENDS TYPE NEW (Δ)	REMOVE / RESET REM PIPE END (EA)	REMOVE / RESET REMOVE END FOR RESET (EA)	REMOVE / RESET RESET PIPE END (EA)	NEW RCP CIRCULAR FLARED 18" (EA)	NEW RCP CIRCULAR FLARED 30" (EA)	NEW RCP CIRCULAR SLOPED 24" (EA)	NEW RCP CIRCULAR SLOPED 30" (EA)	NEW RCP CIRCULAR SLOPED 36" (EA)	NEW RCP ARCH 24" (EA)	NEW RCP ARCH 30" (EA)	EARTHWORK UNCLASSIFIED EXCAVATION (CU YD)	PIPE UNDERCUT (CU YD)	CONTRACTOR FURNISHED BORROW (CU YD)	CDF CONTROLLED DENSITY FILL (CU YD)	DITCH SHAPING / PROTECTION CHANNEL PROTECT AREA W x L (FT)	EROSION CONTROL BLANKET TYPE 2 (SQ YD)	EROSION CONTROL BLANKET TYPE 3 (SQ YD)	DITCH SHAPING (FT)	DRAINAGE FABRIC TYPE B (SQ YD)	GABION (CU YD)	FENCE REMOVE (FT)	TEMP TYPE 2 (FT)	TEMP TYPE 1A (FT)	NEW TYPE 2 (FT)	BRACING 2 PANEL (EA)	BRACING 3 PANEL (EA)	OBJ MARKER OM-2 & POST EXISTING (EA)	OM-2 & POST REMOVE (EA)	OM-2 & POST NEW Bk-Bk (EA)
SD 38				P 0038(46)332		PCN 05UR																																																		
E8	6592	334.81	133+74	1 - 7 x 4	54	RCBC	960	S	N	66	Cleanout Pipe, Cleanout Ditch, Shape and Seed Ditch	27	1													WW												2				10 x 10		12	10									1	1	2
									S	66	Cleanout Pipe, Cleanout Ditch, Shape and Seed Ditch	27														WW												2				10 x 10		12	10									1	1	2
E9	12668	335.07	146+25	1 - 4 x 4	52	RCBC	1,324	S	N	66	No Work															WW																												1	1	2
									S	66	No Work															WW																												1	1	2
E10	6594	335.32	159+81	1 - 18 DIA	54	RCP	15	N	N	66	No Work															FE																												1		
									S	66	No Work															FE																												1		
E11	6595	335.54	171+82	1 - 18 DIA	64	RCP	21	N	N	66	Remove and Reset Flared End + 6 ft of Pipe, Shape and Seed Ditch								6	6						FE			1	1								5																1	1	1
									S	66	No Work															FE																												1		
E12	6596	335.80	185+22	1 - 18 DIA	57	RCP	3?	S	N	66	Cleanout Pipe	29	1													FE																												1		
									S	66	Remove and Reset Flared End + 6 ft of Pipe, Install , Cleanout Pipe, Shape and Seed Ditch	29							6	6						FE			1	1								5																1	1	1
E13	6597	336.04	197+81	1 - 24 DIA	62	RCP	64	N	N	66	Install a New Sloped End + 31 ft of New 24" RCP Arch, Shape and Seed Ditch													31		FE	SL									1		86	9															-		1
									S	66	Install a New Sloped End + 31 ft of New 24" RCP Arch, Shape and Seed Ditch													31		FE	SL									1		86	9		2.6													-		1
			197+83	1 - 24 DIA	59	RCP		N	N	66	Remove Flared End + 29.5 ft of Pipe, Shape and Seed Ditch							29.5								FE		1										33																1	1	-
									S	66	Remove Flared End + 29.5 ft of Pipe, Shape and Seed Ditch							29.5								FE		1										33			2.6													1	1	-
			197+85	1 - 24 DIA	62	RCP		N	N	66	Install a New Sloped End + 31 ft of New 24" RCP Arch, Shape and Seed Ditch													31		FE	SL									1		86	9															-		1
									S	66	Install a New Sloped End + 31 ft of New 24" RCP Arch, Shape and Seed Ditch													31		FE	SL									1		86	9															-		1
E14	6642	336.38	215+31	1 - 18 DIA	75	RCP	3	S	N	66	No Work															FE																												1	1	1
									S	66	No Work															FE																												1	1	1
E15	3352	336.78	236+31	1 - 24 DIA	52	RCP	-	S	N	66	Remove Flared End, Install a New Sloped End, Shape and Seed Ditch															FE	SL	1					1					1																1	1	1
									S	66	Remove Flared End, Install a New Sloped End, Shape and Seed Ditch															FE	SL	1					1					1																1	1	1
E16	6663	336.87	241+81	1 - 18 DIA	48	RCP	11	S	N	66	No Work															FE																												1		
									S	66	No Work															FE																												1		
E17	6674	337.04	249+55	1 - 42 DIA	72	RCP	216	N	N	66	Remove and Reset Flared End + 12 ft of Pipe, Shape and Seed Ditch								12	12						FE			1	1								30																1	1	2
									S	66	No Work															FE																												1	1	2
E18	6685	337.32	263+83	1 - 24 DIA	54	RCP	21	N	N	66	Remove Flared End + 12 ft of Pipe, Reset Pipe, Install a New Sloped End + 6 ft of New 24" RCP, Shape and Seed Ditch								12	12	6					FE	SL	1					1					73		114														1	1	1
									S	66	Remove Flared End + 6 ft of Pipe, Reset Pipe, Install a New Sloped End + 6 ft of New 24" RCP, Shape and Seed Ditch								6	6	6					FE	SL	1					1					42		97														1	1	1
E19	6686	337.63	279+81	1 - 18 DIA	64	RCP	9	N	N	66	Remove Flared End + 32 ft of Pipe, Install a New Sloped End + 31 ft of New 24" RCP, Shape and Seed Ditch							32			31					FE	SL	1					1					109	9															1	1	1
									S	66	Remove Flared End + 32 ft of Pipe, Install a New Sloped End + 29 ft of New 24" RCP, Shape and Seed Ditch							32			29					FE	SL	1					1					109	9															1	1	1
											TOTALS THIS SHEET		2	-	-	-	-	123	42	42	72	-	-	124	-			8	3	3	-	-	6	-	-	4	-	789	54	211	5.2		-	24	20	-	-	-	-	-	-	-	-		18	26

Δ - END TYPES: FE = FLARED END SL = SLOPED END SB = SAFETY or SLOPED END (w/BARS) SE = SAFETY END (NO BARS) DI = DROP INLET WW = WINGWALLS HW = HEADWALLS CN= CONNECTOR JT = JUNCTION TR = TRANSITION

* - RIGHT-OF-WAY MEASURED FROM ℄ ** - CLEARZONE FROM EDGELINE. Φ - (N)orth = LT, (S)outh = RT

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0038(46)332	22	116

TABLE FOR MAINLINE CULVERT WORK

rev: 02-26-2024 SAH

SITE NO (CULVERT / LOCATION)	CUL-VERT ID	MRM	STATION	NO of PIPE - SIZE (DIA or W x H) DIA = IN, W x H = FT (PIPE DATA)	LENGTH FT	TYPE	DRAINAGE AREA ACRES	DRAINAGE DIRECTION	CLEAR ZONE 15 FT** SIDE OF ROAD Φ	ROW* FT	WORK DESCRIPTION	LENGTH FT	PIPE CLEANOUT EA	JOINT CLEANING FT	JOINT REPAIR FT	JOINT CHEMICAL GROUT GAL	JOINT TYE A DRAINAGE FABRIC SQ YD	REMOVE / RESET REMOVE PIPE FT	REMOVE / RESET REM PIPE FOR RESET FT	REMOVE / RESET RESET PIPE FT	NEW RCP CIRCULAR 24" FT	NEW RCP CIRCULAR 30" FT	NEW RCP CIRCULAR 36" FT	NEW RCP ARCH 24" FT	NEW RCP ARCH 30" FT	CULVERT ENDS TYPE EXISTING Δ	TYPE NEW Δ	REMOVE / RESET REM PIPE END EA	REMOVE / RESET REMOVE END FOR RESET EA	REMOVE / RESET RESET PIPE END EA	NEW RCP CIRCULAR FLARED 18" EA	NEW RCP CIRCULAR FLARED 30" EA	NEW RCP CIRCULAR SLOPED 24" EA	NEW RCP CIRCULAR SLOPED 30" EA	NEW RCP CIRCULAR SLOPED 36" EA	NEW RCP ARCH 24" EA	NEW RCP ARCH 30" EA	EARTHWORK UNCLASSIFIED EXCAVATION CU YD	PIPE UNDERCUT CU YD	CONTRACTOR FURNISHED BORROW CU YD	CDF CONTROLLED DENSITY FILL CU YD	DITCH / CHANNEL (DITCH SHAPING / PROTECTION) CHANNEL PROTECT AREA W x L FT	EROSION CONTROL BLANKET TYPE 2 SQ YD	EROSION CONTROL BLANKET TYPE 3 SQ YD	DITCH SHAPING FT	DRAINAGE FABRIC TYPE B SQ YD	GABION CU YD	FENCE REMOVE FT	TEMP TYPE 2 FT	TEMP TYPE 1A FT	NEW TYPE 2 FT	BRACING 2 PANEL EA	BRACING 3 PANEL EA	OBJ MARKER OM-2 & POST EXISTING EA	REMOVE EA	NEW Bk-Bk EA
SD 38				P 0038(46)332 PCN 05UR																																																				
E20	6687	337.70	284+81	1 - 30 DIA	50	RCP	54	N	N	66	Remove Flared End + 12 ft of Pipe, Reset Pipe, Install a New Sloped End + 6 ft of New 30" RCP, Shape and Seed Ditch								12	12		6				FE	SL	1						1				84		176														1	1	2
									S	66	Remove Flared End + 6 ft of Pipe, Reset Pipe, Install a New Sloped End + 8 ft of New 30" RCP, Shape and Seed Ditch								6	6		8				FE	SL	1						1				63		235														1	1	2
E21	6688	337.86	297+80	1 - 24 DIA	64	RCP	38	N	N	66	Remove and Reset Flared End + 18 ft of Pipe, Shape and Seed Ditch								18	18						FE			1	1								57																1		
									S	66	Remove and Reset Flared End + 12 ft of Pipe, Shape and Seed Ditch								12	12						FE			1	1								17																1		
E22	6689	338.12	305+78	1 - 30 DIA	52	RCP	165	N	N	66	Remove Flared End + 26 ft of Pipe, Install a New Sloped End + 33 ft of New 30" RCP, Shape and Seed Ditch							26				33				FE	SL	1						1				78	11	108	3.7													-		1
									S	66	Remove Flared End + 26 ft of Pipe, Install a New Sloped End + 33 ft of New 30" RCP, Shape and Seed Ditch							26				33				FE	SL	1						1				78	11	108														1	1	1
			305+84	1 - 30 DIA	52	RCP		N	N	66	Remove Flared End + 26 ft of Pipe, Install a New Sloped End + 33 ft of New 30" RCP, Shape and Seed Ditch							26				33				FE	SL	1						1				78	11	23														1	1	1
									S	66	Remove Flared End + 26 ft of Pipe, Install a New Sloped End + 33 ft of New 30" RCP, Shape and Seed Ditch							26				33				FE	SL	1						1				78	11	108														-		1
E23	6690	338.50	325+30	1 - 30 DIA	88	RCP	72	N	N	66	No Work															FE																												1	1	2
									S	66	No Work															FE																												1	1	2
E24	6691	338.67	335+00	1 - 18 DIA	60	RCP	7	N	N	66	No Work															FE																												1		
									S	66	No Work															FE																												1		
E25	6692	338.95	349+00	1 - 18 DIA	60	RCP	15	N	N	66	No Work															FE																												1		
									S	66	Remove and Reset Flared End + 12 ft of Pipe, Shape and Seed Ditch								12	12						FE			1	1								14																1	1	1
E26	6693	339.03	355+03	1 - 6 x 6	54	RCBC	-	N	N	66	No Work															WW																												1	1	2
									S	66	No Work															WW																												1	1	2
E27	6694	339.10	359+00	1 - 18 DIA	54	RCP	16	N	N	66	No Work															FE																												1		
									S	66	No Work															FE																												1		
E28	6695	339.58	384+00	1 - 36 DIA	56	RCP	94?	N	N	66	Remove Flared End, Install a New Sloped End + 4 ft of New 36" RCP, Shape and Seed Ditch												4			FE	SL	1							1			1		151														1	1	2
									S	66	Remove Flared End + 12 ft of Pipe, Reset Pipe, Install a New Sloped End + 4 ft of New 36" RCP, Shape and Seed Ditch								12	12			4			FE	SL	1							1			64		151														1	1	2
E29	6696	339.88	400+00	1 - 24 DIA	52	RCP	25	S	N	66	Remove Flared End + 12 ft of Pipe, Reset Pipe, Install a New Sloped End, Shape and Seed Ditch								12	12						FE	SL	1					1					28																1	1	1
									S	66	Remove Flared End + 6 ft of Pipe, Reset Pipe, Install a New Sloped End, Shape and Seed Ditch								6	6						FE	SL	1					1					7																1	1	1
E30	6697	339.92	401+98	1 - 6 x 6	54	RCBC	-	S	N	66	No Work															WW																												1	1	2
									S	66	No Work															WW																												1	1	2
											TOTALS THIS SHEET		-	-	-	-	-	104	90	90	-	146	8	-	-			10	3	3	-	-	2	6	2	-	-	647	44	1060	3.7		-	-	-	-	-	-	-	-	-	-	-		15	27

Δ - END TYPES: FE = FLARED END SL = SLOPED END SB = SAFETY or SLOPED END (w/BARS) SE = SAFETY END (NO BARS) DI = DROP INLET WW = WINGWALLS HW = HEADWALLS CN= CONNECTOR JT = JUNCTION TR = TRANSITION

* - RIGHT-OF-WAY MEASURED FROM ℄ ** - CLEARZONE FROM EDGELINE. Φ - (N)orth = LT, (S)outh = RT

TABLE 3 of 6

TABLE FOR MAINLINE CULVERT WORK

rev: 02-26-2024 SAH

CULVERT – LOCATION – SITE NO	CUL-VERT ID	MRM	STATION	PIPE DATA – NO of PIPE - SIZE (DIA or W x H) DIA = IN W x H = FT	LENGTH FT	TYPE	DRAINAGE AREA ACRES	DRAINAGE DIRECTION	CLEAR ZONE 15 FT** SIDE OF ROAD Φ	ROW* FT	WORK DESCRIPTION	LENGTH FT	PIPE CLEANOUT EA	JOINT – CLEANING FT	JOINT – REPAIR FT	JOINT – CHEMICAL GROUT GAL	JOINT – TYE A DRAINAGE FABRIC SQ YD	REMOVE / RESET – REMOVE PIPE FT	REMOVE / RESET – REM PIPE FOR RESET FT	REMOVE / RESET – RESET PIPE FT	NEW RCP CIRCULAR 24" FT	NEW RCP CIRCULAR 30" FT	NEW RCP CIRCULAR 36" FT	NEW RCP ARCH 24" FT	NEW RCP ARCH 30" FT	CULVERT ENDS – TYPE – EXISTING Δ	TYPE – NEW Δ	REMOVE / RESET – REM PIPE END EA	REMOVE / RESET – REMOVE END FOR RESET EA	REMOVE / RESET – RESET PIPE END EA	NEW RCP CIRCULAR FLARED 18" EA	NEW RCP CIRCULAR FLARED 30" EA	NEW RCP CIRCULAR SLOPED 24" EA	NEW RCP CIRCULAR SLOPED 30" EA	NEW RCP CIRCULAR SLOPED 36" EA	NEW RCP ARCH 24" EA	NEW RCP ARCH 30" EA	EARTHWORK – UNCLASSIFIED EXCAVATION CU YD	PIPE UNDERCUT CU YD	CONTRACTOR FURNISHED BORROW CU YD	CDF – CONTROLLED DENSITY FILL CU YD	DITCH / CHANNEL – DITCH SHAPING / PROTECTION – CHANNEL PROTECT AREA W x L FT	EROSION CONTROL BLANKET TYPE 2 SQ YD	EROSION CONTROL BLANKET TYPE 3 SQ YD	DITCH SHAPING FT	DRAIN-AGE FABRIC TYPE B SQ YD	GABION CU YD	FENCE – REMOVE FT	TEMP – TYPE 2 FT	TEMP – TYPE 1A FT	NEW – TYPE 2 FT	BRACING – 2 PANEL EA	BRACING – 3 PANEL EA	OBJ MARKER – OM-2 & POST – EXISTING EA	REMOVE EA	NEW Bk-Bk EA
	SD 38			P 0038(46)332		PCN 05UR																																																		
E31	6698	340.43	**425+26**	1 - 36 DIA	54	RCP	89	N	**N**	**66**	**Remove Flared End + 12 ft of Pipe, Reset Pipe, Install a New Sloped End + 6 ft of New 36" RCP, Shape and Seed Ditch**								**12**	**12**			**6**			**FE**	**SL**	**1**							**1**			**78**		**220**														**1**	**1**	**2**
									S	66	Remove Flared End + 12 ft of Pipe, Reset Pipe, Install a New Sloped End + 6 ft of New 36" RCP, Shape and Seed Ditch								12	12			6			FE	SL	1							1			78		220														1	1	2
E32	6699	341.02	**458+24**	1 - 24 DIA	54	RCP	35	N	**N**	**66**	**Remove and Reset Flared End + 6 ft of Pipe, Shape and Seed Ditch**								**6**	**6**						**FE**			**1**	**1**								**7**																**1**	**1**	**1**
									S	66	No Work															FE																												1	1	1
E33	6700	341.15	**466+90**	1 - 24 DIA	64	RCP	32	N	**N**	**66**	**No Work**															**FE**																												**1**		
									S	66	No Work															FE																												1		
E34	6701	341.22	**471+59**	1 -I'x2' DIA	54	RCBC	83	N	**N**	**66**	**No Work**															**WW**																												**1**	**1**	**2**
									S	66	No Work															WW																												1	1	2
E35	6702	341.87	**506+00**	1 - 18 DIA	120	RCP & CMP	19	N	**N**	**66**	**No Work**															**FE**																												**1**		
									S	66	No Work															SE																												1		
E36	6703	342.28	**529+00**	1 - 12 x 12	60	RCBC	4,306	N	**N**	**66**	**No Work**															**WW**																												**1**	**1**	**2**
									S	66	No Work															WW																												1	1	2
E37	6704	342.52	**541+00**	1 - 18 DIA	46	RCP	3	N	**N**	**66**	**No Work**															**FE**																												**1**		
									S	66	No Work															FE																												1		
E38	6705	342.58	**544+45**	1 - 18 DIA	68	RCP	5	N	**N**	**66**	**Cleanout Pipe**	**34**	1													**FE**																												**1**		
									S	66	Cleanout Pipe, Cleanout Ditch, Shape and Seed Ditch	34														FE												4				6 x 32	22		32									1		
E39	6706	342.69	**547+55**	1 - 48 DIA	100	RCP	152	N	**N**	**66**	**No Work**															**FE**																												**1**	**1**	**2**
									S	66	No Work															FE																												1	1	2
E40	6707	342.81	**553+25**	3 - 8 x 3	84	RCBC	1,021	S	**N**	**66**	**No Work**															**WW**																												**1**	**1**	**2**
									S	66	No Work															WW																												1	1	2
E41	10915	343.61	**589+46**	1 - 18 DIA	70	RCP	5	S	**N**	**66**	**No Work**															**FE**																												**1**		
									S	66	No Work															FE																												1		
E42	10917	343.68	**594+27**	1 - 30 DIA	100	RCP	46	S	**N**	**66**	**No Work**															**FE**																												**1**	**1**	**2**
									S	66	Remove Flared End + 12 ft of Pipe, Install a New Flared End + 12 ft of New 30" RCP, Cleanout Ditch, Shape and Seed Ditch							12				12				FE	FE	1				1						22																1	1	2
E43	10916	343.73	**600+27**	1 - 18 DIA	72	RCP	5	S	**N**	**66**	**No Work**															**FE**																												**1**	**1**	**1**
									S	66	Remove and Reset Flared End + 18 ft of Pipe, Shape and Seed Ditch								18	18						FE			1	1								30																1	1	1
E44	10918	343.94	**613+00**	1 - 84 DIA	142	RCP	1,048	S	**N**	**66**	**Remove 966 ft of Fence, Install Traffic Diversion. Remove Flared Ends + 142 ft of Pipe, Replace with New 8' x 8' RCBC with Wingwalls. Remove Traffic Diversion. Install 966 ft of New Fence. See Plans and Structure Sheets for Additional Details and Quantities.**							**71**								**FE**		**1**										◆	◆									**820**	**916**		**900**	**10**	**1**	**1**	**1**	**2**
									S	66								71								FE		1										◆	◆									146	336		265	10	-	1	1	2
E44	10919	344.39	**637+00**	1 - 36 DIA	92	RCP	69	S	**N**	**66**	**No Work**															**FE**																												**1**	**1**	**2**
									S	66	No Work															FE																												1	1	2
																																																						-		
																																																						-		
											TOTALS THIS SHEET		1	-	-	-	-	154	48	48	-	12	12	-	-			5	2	2	-	1	-	-	2	-	-	219	-	440	-		22	-	32	-	-	966	1252	-	1165	20	1		20	36

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◆ - QUANTITIES INCLUDED IN STRUCTURE PLANS.

* - RIGHT-OF-WAY MEASURED FROM ℄ ** - CLEARZONE FROM EDGELINE. Φ - (N)orth = LT, (S)outh = RT

TABLE FOR MAINLINE CULVERT WORK

rev: 02-26-2024 SAH

CULVERT — LOCATION / PIPE DATA

SITE NO	CUL-VERT ID	MRM	STATION	NO of PIPE - SIZE (DIA or W x H) DIA = IN, W x H = FT	LENGTH FT	TYPE	DRAINAGE AREA ACRES	DRAINAGE DIRECTION	CLEAR ZONE 15 FT** SIDE OF ROAD Φ	ROW* FT	WORK DESCRIPTION
SD 38				P 0038(46)332		PCN 05UR					
E46	10920	344.64	**650+56**	1 - 36 DIA	54	RCP	46	S	**N**	**66**	**Cleanout Ditch, Shape and Seed Ditch**
									S	66	Remove and Reset Flared End + 12 ft of Pipe, Shape and Seed Ditch
E47	10921	345.08	**673+00**	1 - 24 DIA	50	RCP	28	S	**N**	**66**	**Remove Flared End, Install a New Sloped End, Shape and Seed Ditch**
									S	66	Remove Flared End, Install a New Sloped End, Shape and Seed Ditch
E48	10922	345.58	**699+29**	1 - 4 x 6	63	RCBC	336	S	**N**	**66**	**Remove Asphalt Concrete Surfacimg and Sub-base to Expose Center RCBC Joint. Clean and Grout Joint, Cover with Drainage Fabric, Fill Sub-base and Cover with Asphalt Concrete Surfacing.**
									S	66	Remove Asphalt Concrete Surfacimg and Sub-base to Expose Center RCBC Joint. Clean and Grout Joint, Cover with Drainage Fabric, Fill Sub-base and Cover with Asphalt Concrete Surfacing.
E49	10923	345.72	**706+65**	1 - 18 DIA	70	RCP	3	S	**N**	**66**	**No Work**
									S	66	No Work
E50	10924	345.85	**714+00**	1 - 24 DIA	50	RCP	35??	S	**N**	**66**	**Remove Flared End, Install a New Sloped End, Shape and Seed Ditch**
									S	66	Remove Flared End, Install a New Sloped End, Shape and Seed Ditch
EQUATION: STA 723+82 BK= STA 0+00 (2nd) AH											
E51	10925	346.24	**10+00**	1 - 18 DIA	90	RCP	11	N	**N**	**66**	**Remove 40 ft of Fence, Remove and Reset Flared End + 6 ft of Pipe, Cleanout Ditch, Shape and Seed Ditch, Install New Fence**
									S	66	No Work
E52	10926	346.55	**25+80**	1 - 18 DIA	76	RCP	9	NE	**N**	**66**	**No Work**
									S	66	No Work
E53	10927	346.72	**35+08**	1 - 24 DIA	106	RCP	17	NE	**N**	**66**	**No Work**
									S	66	No Work
E54	10929	346.83	**41+68**	1 - 12 x 9	54	RCBC	1,416	SW	**N**	**66**	**No Work**
									S	66	No Work
E55	10930	346.93	**46+00**	1 - 18 DIA	62	RCP	5	SW	**N**	**66**	**No Work**
									S	66	No Work
E56	10931	347.08	**51+65**	1 - 5 x 7	54	RCBC	480	SW	**N**	**66**	**No Work**
									S	66	Install Gabion Channel Protection, Shape and Seed Ditch
E57	10932	347.23	**58+75**	1 - 18 DIA	90	RCP	15	SW	**N**	**66**	**Remove and Reset Flared End + 6 ft of Pipe, Shape and Seed Ditch**
									S	320	Remove and Reset Flared End + 6 ft of Pipe, Shape and Seed Ditch
E58	10933	347.46	**72+00**	1 - 36 DIA	92	RCP	96	SW	**N**	**66**	**No Work**
									S	320	Remove and Reset Flared End
											TOTALS THIS SHEET

CULVERT — LENGTH / JOINT / REMOVE / RESET / NEW

SITE NO	SIDE	LENGTH FT	PIPE CLEANOUT EA	JOINT CLEANING FT	JOINT REPAIR FT	CHEMICAL GROUT GAL	TYE A DRAINAGE FABRIC SQ YD	REMOVE PIPE FT	REM PIPE FOR RESET FT	RESET PIPE FT	NEW RCP CIRCULAR 24" FT	CIRCULAR 30" FT	CIRCULAR 36" FT	ARCH 24" FT	ARCH 30" FT
E46	N														
E46	S								12	12					
E47	N														
E47	S														
E48	N			**24**	**24**	**0.7**	**4.5**								
E48	S			24	24	0.7	4.5								
E49	N														
E49	S														
E50	N														
E50	S														
E51	N								**6**	**6**					
E51	S														
E52	N														
E52	S														
E53	N														
E53	S														
E54	N														
E54	S														
E55	N														
E55	S														
E56	N														
E56	S														
E57	N								**6**	**6**					
E57	S								6	6					
E58	N														
E58	S														
TOTALS THIS SHEET			-	48	48	1.3	9	-	30	30	-	-	-	-	-

CULVERT ENDS

SITE NO	SIDE	TYPE EXISTING Δ	TYPE NEW Δ	REM PIPE END EA	REMOVE END FOR RESET EA	RESET PIPE END EA	NEW RCP CIRCULAR FLARED 18" EA	FLARED 30" EA	SLOPED 24" EA	SLOPED 30" EA	SLOPED 36" EA	RCP ARCH 24" EA	RCP ARCH 30" EA
E46	N	**FE**											
E46	S	FE			1	1							
E47	N	**FE**	**SL**	**1**					**1**				
E47	S	FE	SL	1					1				
E48	N	**WW**											
E48	S	WW											
E49	N	**FE**											
E49	S	FE											
E50	N	**FE**	**SL**	**1**					**1**				
E50	S	FE	SL	1					1				
E51	N	**FE**			**1**	**1**							
E51	S	FE											
E52	N	**SE**											
E52	S	SE											
E53	N	**FE**											
E53	S	FE											
E54	N	**WW**											
E54	S	WW											
E55	N	**FE**											
E55	S	FE											
E56	N	**WW**											
E56	S	WW											
E57	N	**FE**			**1**	**1**							
E57	S	FE			1	1							
E58	N	**FE**											
E58	S	FE			1	1							
TOTALS THIS SHEET				4	5	5	-	-	4	-	-	-	-

EARTHWORK / DITCH / CHANNEL

SITE NO	SIDE	UNCLASSIFIED EXCAVATION CU YD	PIPE UNDERCUT CU YD	CONTRACTOR FURNISHED BORROW CU YD	CDF CONTROLLED DENSITY FILL CU YD	DITCH SHAPING / PROTECTION: CHANNEL PROTECT AREA W x L FT	EROSION CONTROL BLANKET TYPE 2 SQ YD	EROSION CONTROL BLANKET TYPE 3 SQ YD	DITCH SHAPING FT	DRAIN-AGE FABRIC TYPE B SQ YD	GABION CU YD
E46	N	**15**				**21 x 110**		**257**	**110**		
E46	S	48									
E47	N	**1**									
E47	S	1									
E48	N										
E48	S										
E49	N										
E49	S										
E50	N	**1**									
E50	S	1									
E51	N	**16**				**25 x 25**	**70**		**25**		
E51	S										
E52	N										
E52	S										
E53	N										
E53	S										
E54	N										
E54	S										
E55	N										
E55	S										
E56	N										
E56	S					15 x 21				43	15.5
E57	N	**5**									
E57	S	5									
E58	N										
E58	S	1									
TOTALS THIS SHEET		94	-	-	-		70	257	135	43	15.5

FENCE / OBJ MARKER

SITE NO	SIDE	FENCE REMOVE FT	TEMP TYPE 2 FT	TEMP TYPE 1A FT	NEW TYPE 2 FT	BRACING 2 PANEL EA	BRACING 3 PANEL EA	OM-2 & POST EXISTING EA	OM-2 & POST REMOVE EA	OM-2 & POST NEW Bk-Bk EA
E46	N							**1**	**1**	**2**
E46	S							1	1	2
E47	N							**1**	**1**	**1**
E47	S							1	1	1
E48	N							**1**	**1**	**2**
E48	S							1	1	2
E49	N							**-**		
E49	S							-		
E50	N							**1**	**1**	**1**
E50	S							1	1	1
E51	N	**40**		**66**	**40**	**2**	**2**	**1**	**1**	**1**
E51	S							1		
E52	N							**1**		
E52	S							1		
E53	N							**1**		
E53	S							1		
E54	N							**1**	**1**	**2**
E54	S							1	1	2
E55	N							**1**		
E55	S							1		
E56	N							**1**	**1**	**2**
E56	S							1	1	2
E57	N							**1**	**1**	**1**
E57	S							1	1	1
E58	N							**1**	**1**	**2**
E58	S							1	1	2
TOTALS THIS SHEET		40	-	66	40	2	2		17	27

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STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0038(46)332	25	116

TABLE FOR MAINLINE CULVERT WORK

rev: 02-26-2024 SAH

CULVERT – LOCATION – SITE NO	CUL-VERT ID	MRM	STATION	PIPE DATA – NO of PIPE - SIZE (DIA or W x H) DIA = IN W x H = FT	LENGTH FT	TYPE	DRAINAGE AREA ACRES	DRAINAGE DIRECTION	CLEAR ZONE 15 FT** SIDE OF ROAD Φ	CLEAR ZONE ROW* FT	WORK DESCRIPTION	LENGTH FT	PIPE CLEANOUT EA	JOINT – CLEANING FT	JOINT – REPAIR FT	JOINT – CHEMICAL GROUT GAL	JOINT – TYE A DRAINAGE FABRIC SQ YD	REMOVE / RESET – REMOVE PIPE FT	REMOVE / RESET – REM PIPE FOR RESET FT	REMOVE / RESET – RESET PIPE FT	NEW RCP CIRCULAR 24" FT	NEW RCP CIRCULAR 30" FT	NEW RCP CIRCULAR 36" FT	NEW RCP ARCH 24" FT	NEW RCP ARCH 30" FT	CULVERT ENDS – TYPE EXISTING Δ	TYPE NEW Δ	REMOVE / RESET – REM PIPE END EA	REMOVE / RESET – REMOVE END FOR RESET EA	REMOVE / RESET – RESET PIPE END EA	NEW RCP CIRCULAR FLARED 18" EA	NEW RCP CIRCULAR FLARED 30" EA	NEW RCP CIRCULAR SLOPED 24" EA	NEW RCP CIRCULAR SLOPED 30" EA	NEW RCP CIRCULAR SLOPED 36" EA	NEW RCP ARCH 24" EA	NEW RCP ARCH 30" EA	EARTHWORK – UNCLASSIFIED EXCAVATION CU YD	PIPE UNDERCUT CU YD	CONTRACTOR FURNISHED BORROW CU YD	CDF – CONTROLLED DENSITY FILL CU YD	DITCH / CHANNEL – DITCH SHAPING / PROTECTION – CHANNEL PROTECT AREA W x L FT	EROSION CONTROL BLANKET TYPE 2 SQ YD	EROSION CONTROL BLANKET TYPE 3 SQ YD	DITCH SHAPING FT	DRAINAGE FABRIC TYPE B SQ YD	GABION CU YD	FENCE – REMOVE FT	TEMP TYPE 2 FT	TEMP TYPE 1A FT	NEW TYPE 2 FT	BRACING 2 PANEL EA	BRACING 3 PANEL EA	OBJ MARKER – OM-2 & POST EXISTING EA	OM-2 & POST REMOVE EA	OM-2 & POST NEW Bk-Bk EA
SD 38				P 0038(46)332			PCN 05UR																																																	
E59	10934	347.67	83+00	1 - 18 DIA	86	RCP	8	SW	N	66	**No Work**															FE																												1		
									S	320	Remove Flared End, Install a New Flared End															FE	FE	1			1							1																1	1	1
E60	10935	347.96	98+50	1 - 18 DIA	72	RCP	6	SW	N	66	**No Work**															FE																												1		
									S	320	No Work															FE																												1		
E61	10936	348.05	105+20	1 - 84 DIA	114	RCP (45° RHF)	435	SW	N	66	**No Work**															FE																												1	1	2
									S	320	No Work															TR																												-		2
			105+20 R	1 - 24 DIA	60	RCP	-	NW	N	66	**No Work**															SB																												-		
									S	320	Remove and Reset Junction + 60 ft of Pipe, Shape and Seed Ditch								60	60						JT			1	1								247																1	1	1
			105+20 R	1 - 78 DIA	48	RCP	-	SW	N	66	**No Work**															TR																												-		
									S	320	No Work															CN																												-		2
E62	10937	348.42	124+00	1 - 18 DIA	86	RCP	6	SW	N	66	**No Work**															FE																												1		
									S	320	No Work															FE																												1		
E63	10938	348.65	137+05	1 - 5 x 7	54	RCBC	-	NE	N	66	**No Work**															WW																												1		
									S	320	No Work															WW																												1	1	2
E64	10939	348.81	144+80	1 - 18 DIA	74	RCP	Eq	N / S	N	66	**Remove and Reset Flared End + 6 ft of Pipe, Shape and Seed Ditch**								**6**	**6**						**FE**			**1**	**1**																								**1**		
									S	320	Remove and Reset Flared End + 6 ft of Pipe, Shape and Seed Ditch								6	6						FE			1	1																								1	1	1
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											TOTALS THIS SHEET		-	-	-	-	-	-	72	72	-	-	-	-	-			1	3	3	1	-	-	-	-	-	-	248	-	-	-		-	-	-	-	-	-	-	-	-	-	-		5	11
											P 0038(46)332 PCN 05UR TOTALS		**5**	**48**	**48**	**1.3**	**9**	**486**	**282**	**282**	**72**	**158**	**20**	**310**	**186**			**33**	**17**	**17**	**1**	**1**	**12**	**6**	**4**	**10**	**6**	**3001**	**212**	**2424**	**21.1**		**760**	**390**	**297**	**43**	**16**	**1006**	**1252**	**66**	**1205**	**22**	**3**		**85**	**150**

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Rev. 02/09/24 GAW

TABLE OF CONSTRUCTION STAKING

(See Special Provision for Contractor Staking)

Roadway and Description	Begin Station	End Station	Number of Lanes	Length (Ft)	Length (Mile)		Construction Staking Quantity (Mile)	Miscellaneous Staking Quantity (Mile)	Slope Staking Quantity (Mile)	Structure Staking Quantity (Each)
SD38 (Centerline Offset)	1+00	148+69 (2nd)	2	87,497	16.571		16.571	-	-	-
SD38 (Pipe Culvert Work & Traffic Diversion)	1+00	148+69 (2nd)	2	87,497	16.571		-	16.571	-	-
SD38 (Guardrail Embankment)	569+39	577+27	2	788	0.150		-	-	0.150	-
SD38 (RCBC Placement)	612+34	613+66	2	132	0.025		-	-	0.025	1
SD38 (Ditch Shaping)	15+70 (2nd)	23+45 (2nd)	2	775	0.147		-	-	0.147	-
						Totals:	16.571	16.571	0.322	1

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.

SURFACING/SUBGRADE INVESTIGATION

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

SURFACING THICKNESS DIMENSIONS

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

At those locations where material must be placed to achieve a required elevation, the depth/quantity may be varied to achieve the required elevation.

FLEXIBLE PAVEMENT SMOOTHNESS SPECIAL PROVISION

All sections, not excluded by the Special Provision for Flexible Pavement Smoothness, will be evaluated as two opportunities.

TYPE III FIELD LABORATORY

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

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

STORAGE UNIT

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

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

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

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

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

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

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

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

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

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

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

INTERSECTING ROADS AND ENTRANCES

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

SHOULDER WORK

Prior to construction, Department of Transportation maintenance forces will spray the shoulders to kill existing vegetation. It is the Contractor's responsibility to notify the State a minimum of 30 days prior to starting work on the surface of the highway. The State assumes no responsibility for the effectiveness of the herbicide applied.

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 asphalt concrete resurfacing. 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.

Cost for shoulder work including removal and replacement of topsoil will be incidental to the contract unit prices for the various items. Separate measurement and payment will not be made.

CONTRACTOR FURNISHED BORROW EXCAVATION

The Contractor will provide a suitable site for Contractor furnished borrow excavation material. The Contractor is responsible for obtaining required permits and clearances for the borrow site. The borrow material will be approved by the Engineer. The plans quantity for Contractor Furnished Borrow Excavation as shown in the Estimate of Quantities will be the basis of payment for this item.

Prior to placement or removal of fill material, the Contractor will be required to remove four inches of topsoil and replace it following the placement of the new fill material. Removing and replacing topsoil will not be measured for payment but will be incidental to the contract unit price per cubic yard for Contractor Furnished Borrow Excavation.

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

Cost for water will be included in the contract unit price per MGal for Water for Embankment.

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

UNCLASSIFIED EXCAVATION

The plan shown quantity will be the basis of payment. No measurement will be made.

WATER FOR EMBANKMENT

Water for compaction of earth embankment will be applied at the rate of 10 gallons per cubic yard of Unclassified Excavation. Cost for water will be included in the contract unit price per MGal for Water for Embankment.

REMOVE ASPHALT CONCRETE PAVEMENT

Where existing asphalt concrete is to be removed at guardrail installations, the Contractor will remove enough material so that a 2" lift of new guardrail surfacing can be placed. This material will become the property of the Contractor for disposal.

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 to the shoulder and backfilled with granular material that will daylight to the inslope to allow water to escape the subsurface.

WATER FOR COMPACTION

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

COLD MILLING ASPHALT CONCRETE

Cold milling will be done according to the typical sections. At intersecting roads, entrances, turnouts, pads and in areas where maintenance patches have raised and/or widened the road, additional milling will be done to provide a uniform typical section. Milling will be daylighted to the outside edge of the roadway. Quantities for milling additional width are included in the Table of Additional Quantities.

The Los Angeles Abrasion Loss value on the aggregate used for the in place asphalt concrete was unknown.

Cold milling is estimated to produce 16203 tons of cold milled asphalt concrete material. An estimated 7498 tons of cold milled asphalt concrete material will be used on these projects as RAP in the Class Q2R Hot Mixed Asphalt Concrete mixture. The Contractor is responsible to assure that enough cold milled asphalt concrete material is available for use as RAP in the Class Q2R Hot Mixed Asphalt Concrete.

RAP not reused on the project (estimated at 8705 tons) will become the property of the Contractor for disposal.

Cold milling operations ahead of asphalt concrete laydown will be limited by particular job conditions and will be subject to approval of the Engineer. In no case will cold milling operations ahead of asphalt concrete laydown operations exceed seven calendar days.

If resurfacing as per the typical section cannot be placed immediately after cold milling at project ends, bridge approaches, etc., then temporary asphalt mix ramps will be placed as directed by the Engineer. Cost for placing and removing the temporary ramps will be incidental to the contract unit prices for the various items.

Intersecting roads and entrances will be milled back for approximately ten feet from the shoulder edge so that additional surfacing may be placed at these locations.

COLD MILLING ASPHALT CONCRETE (CONTINUED)

Asphalt concrete intersecting roads and entrances will be milled-in for approximately ten feet at the ROW line so that additional surfacing may be placed at these locations.

Two approaches (13+10 Lt & 18+60 Lt) in Salem have asphalt concrete back to the end of the radius and gravel beyond the end of the radius. These approaches will be milled up and turned into a gravel approach as shown on standard plate 320.04. Quantities for this work are included in the Table of Additional Quantities.

COLD MILLING TAPERS

In order to construct the new surfacing flush with the asphalt concrete, it will be necessary to taper the depth of milling according to the details for Cold Milling Tapers.

The surface will be milled full roadway width.

Cost for this work will be incidental to the contract unit price per square yard for Cold Milling Asphalt Concrete.

Taper depth of Cold Milling at locations shown below:

STA	LOCATION	SIZE
1+00	Begin Project	100' long X 32' wide
234+51	Begin Section 2	40' long X 32' wide
241+67	End Section 2	40' long X 32' wide
307+75	Begin Section 2	40' long X 32' wide
326+82	End Section 2	40' long X 32' wide
405+64	Begin Section 2	40' long X 32' wide
424+87	End Section 2	40' long X 32' wide
495+46	Begin Section 2	40' long X 32' wide
520+83	End Section 2	40' long X 32' wide
542+98	Begin Section 2	40' long X 32' wide
553+56	End Section 2	40' long X 32' wide
563+10	Begin Section 5	60' long X 32' wide
579+60	End Section 5	60' long X 32' wide
586+17	Begin Section 2	40' long X 32' wide
603+59	End Section 2	40' long X 32' wide
646+89	Begin Section 2	40' long X 32' wide
659+50	End Section 2	40' long X 32' wide
15+16 (2nd)	Begin Section 2	40' long X 32' wide
36+35 (2nd)	End Section 2	40' long X 32' wide
75+29 (2nd)	Begin Section 2	40' long X 32' wide
85+76 (2nd)	End Section 2	40' long X 32' wide
118+32 (2nd)	Begin Section 2	40' long X 32' wide
128+78 (2nd)	End Section 2	40' long X 32' wide
141+20 (2nd)	Begin Section 2	40' long X 32' wide
148+69 (2nd)	End Project	40' long X 32' wide

ASPHALT CONCRETE COMPOSITE

Section 324 will apply except that Class Q2R 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 Concrete Composite will include MC-70 Asphalt for Prime placed at the rate of 0.30 gallons per square yard. The Asphalt for Prime will be applied to the Base Course for the full width of the bottom layer of Asphalt Concrete Composite plus one foot additional on the outside shoulder.

ASPHALT CONCRETE COMPOSITE (CONTINUED)

Asphalt for tack SS-1h or CSS-1h will be applied prior to each lift of Asphalt Concrete Composite. Asphalt for tack will be applied at a rate of 0.09 gallons per square yard on existing pavement or milled asphalt concrete surfaces and at a rate of 0.06 gallons per square yard on primed base course or new asphalt concrete pavement. The Asphalt for tack will be applied for the full width of the bottom layer of Asphalt Concrete Composite plus one-half foot additional on the outside shoulder.

ASPHALT CONCRETE BLADE LAID

Included in the Estimate of Quantities are 150 tons of Asphalt Concrete Blade Laid, 11.1 tons of PG 58-34 Asphalt Binder, 1.5 tons of Hydrated Lime and 5.4 tons of SS-1h or CSS-1h Emulsified Asphalt for Tack (Rate = 0.09 gallon per square yard) per mile and will be tight bladed on the existing surface 24' wide prior to the overlay.

A sufficient amount of material will be kept in front of the blade to fill and level all joints, cracks and other surface irregularities.

Mineral Aggregate for tight bladed material will use only the fine aggregate components combined in the same proportions as the Class Q2R 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 Q2R HOT MIXED ASPHALT CONCRETE

Mineral Aggregate:

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

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

The Class Q2R Hot Mixed Asphalt Concrete will include 20% percent RAP in the mixture. RAP will be obtained from the material produced by cold milling.

Mix Design Criteria:

Gyratory Controlled QC/QA Mix Design requirements for the Class Q2R Hot Mixed Asphalt concrete will conform to the requirements of Class Q2.

All remaining requirements for Class Q2 will apply.

ADDITIONAL QUANTITIES

Included in the Estimate of Quantities are 100 tons of Class Q2R Hot Mixed Asphalt Concrete, 4.7 tons of PG 58-34 Asphalt Binder and 1.0 tons of Hydrated Lime per mile for spot leveling, strengthening and repair of the existing surface throughout the project.

Included in the Estimate of Quantities are 4.2 tons of SS-1h or CSS-1h Asphalt for Tack for surface repair and leveling areas throughout the project. (Rate = 0.09 gallon per square yard).

FLUSH SEAL

Application of the flush seal will be completed within 10 working days following completion of the asphalt concrete resurfacing.

Application of flush seal may be eliminated by the Engineer. If the paved surface remains tight, the Engineer will notify the Contractor as soon as possible that the flush seal is unnecessary.

EDGELINE RUMBLE STRIPES

INSTALLATION:

Edgeline rumble stripes will be constructed according to Standard Plate 320.20.

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

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

ROADWAY CLEANING:

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

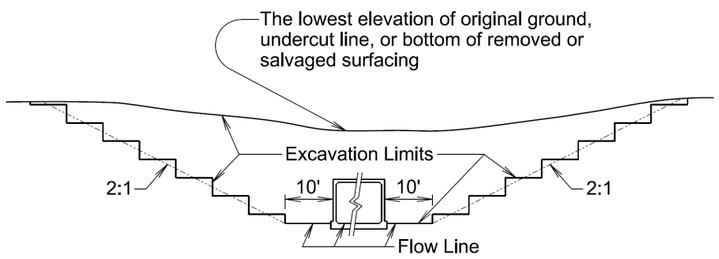
Cost for this work will be incidental to the contract unit price per mile for Grind 8" Rumble Strip or Stripe in Asphalt Concrete.

EXCAVATION FOR REINFORCED CONCRETE BOX CULVERT INSTALLATION

Included in the quantity of Unclassified Excavation are 7300 cubic yards of excavation for installation of reinforced concrete box culverts.

All work necessary to excavate a trench for installation of reinforced concrete box culverts including labor, equipment, and incidentals will be incidental to the contract unit price per cubic yard for Unclassified Excavation. Payment for excavation of reinforced concrete box culverts will be based only on plans quantity and measurement of these excavation quantities during construction will not be performed.

The quantities computed for excavation of the reinforced concrete box culverts are based on the limits shown in the drawing below.



MAINLINE CROSS PIPE REPLACEMENT

All pipe culvert replacements will be installed in accordance with the following notes and as shown on the Layout of Embankment and Surfacing for Culvert Replacement.

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

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

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

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

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

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

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

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

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

TABLE FOR MAINLINE CROSS PIPE REPLACEMENT

LOCATION	REMOVE ASPHALT CONCRETE (Sq.Yds)	SELECT FILL MATERIAL (Tons)	BASE COURSE (Tons)	1ST LIFT ASPHALT CONCRETE COMPOSITE (Tons)	2ND LIFT ASPHALT CONCRETE COMPOSITE (Tons)
50+93, 50+98 & 51+03	157	94	118	23	21
116+86, 116+90 & 116+94	125	77	98	18	17
197+81 & 197+85	110	64	86	16	15
279+81	117	53	87	17	16
305+78 & 305+84	147	93	113	21	20
Totals:	**656**	**381**	**502**	**95**	**89**

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

PIPE EXTENSIONS

For pipe extensions that are outside the new surfaced shoulder as shown in the typical sections, acceptance tests for pipe culvert backfill of pipe 48" or less in diameter may be performed by visual inspection to the satisfaction of the Engineer. All other pipe density testing requirements will apply.

REINFORCED CONCRETE PIPE JOINT REPAIR AND VOID GROUTING

The Contractor will provide a notarized statement, from the Manufacturer, that the products used for culvert joint repair meet the specified requirements, along with the Manufacturer's current product specification and installation instructions.

The Contractor will be an Approved Contractor of the Manufacturer of the specified product and will provide written certification from the Manufacturer attesting to their Approved Contractor status.

All product documentation and Contractor submittals must be submitted to the Engineer prior to or at the preconstruction conference. The Contractor must have the Engineer's approval prior to commencing any of this work.

The Contractor will follow the Manufacturer's installation instructions and specifications throughout the repair process.

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

The Contractor will provide worker and inspector safety protective gear in accordance with the manufacturer, including but not limited to chemical goggles, face shields, eye wash system and NBR gloves.

The Contractor will provide safe storage and handling of materials prior to delivery and at the project site. All material installation, handling and storage will be in accordance with the Manufacturer's recommendations.

The Contractor will visit the project to determine the extent of culvert joints to be cleaned and filled, prior to bidding.

Culvert Joint Cleaning and Repair Culvert Joint quantities will be based upon the following table showing circumference of joints based upon culvert size and shape.

REINFORCED CONCRETE PIPE JOINT REPAIR AND VOID GROUTING (CONTINUED)

Pipe Diameter	Round Pipe Circumference per Joint	Arch Pipe Circumference per Joint
(In)	(Ft)	(Ft)
36	9.4	
42	11.0	11.0
48	12.6	
54	14.1	
60	15.7	
66	17.3	
72	18.8	19.0
78	20.4	
84	22.0	

CULVERT JOINT CLEANING

This work will consist of cleaning of the culvert joints, washing the entire culvert and joints with a high-pressure washer, and if needed, wire brush cleaning of each joint to be repaired as directed by the Engineer. The entire culvert will be clean and dry and most notably the specified joints will be thoroughly cleaned to the satisfaction of the Engineer using a power washer with water pressure of at least 2500 psi. The culvert must be in a clean condition so that no deleterious material is trapped in the joints that are being repaired. The Contractor will dispose of all debris removed from the culverts during the cleaning operation as approved by the Engineer.

All costs for equipment, material and labor for the culvert joint cleaning work will be incidental to the contract unit price per foot for Culvert Joint Cleaning. Culvert Pipe Cleaning will be measured to the nearest 0.1 foot of joint which is cleaned for joint repair.

REPAIR CULVERT JOINT

The culvert joints will be repaired in accordance with the Chemical Grout Manufacturer's directions to prevent future infiltration/exfiltration of soils and water and to keep the chemical grout from expanding back into the structure during injection.

The culvert joint will be repaired with a sealant comprised of water reactive hydrophilic polyurethane resin and dry oil free oakum. All grout will be injected under such pressure so as not to damage the existing drainage structure or roadway structure.

The Contractor will submit to the Engineer for approval a detailed procedure for the installation of the polyurethane grout.

The work will include, but is not limited to sealing each pipe joint with a hydrophilic polyurethane grout meeting the following specifications:

GEL FOAM II (Saturated Oakum Rope Joint Packing) as manufactured by Green Mountain International, LLC or equal.

ULTRA (Single Component Grout for Joint Injection) as manufactured by Green Mountain International, LLC or equal.

REINFORCED CONCRETE PIPE JOINT REPAIR AND VOID GROUTING (CONTINUED)

Excess grout and oakum will be trimmed from the interior face of the joint prior to applying the UV Protection (Gel Coat). The epoxy gel coat compound will be as recommended by the Manufacturer for both surface sealing and protecting the hydrophilic grout from UV exposure. The epoxy gel compound will be mixed and handled in accordance with the Manufacturer's recommendations and will meet the following requirements:

Epoxy gel sealant compounds manufactured by Green Mountain Grouts, LLC or equal. Contact info: 235 Pigeon St.
Waynesville, NC 28786
(800) 942-5151
info@mountaingrout.com

All costs for all equipment, material and labor required to complete the work will be incidental to the contract unit price per foot for Repair Culvert Joint. Completion of the work includes initial saturated oakum rope packing of each joint, follow up injection of grout into the back side of each joint, trimming the excess grout and oakum from the interior face of the joint, application of the epoxy gel coat and site clean-up. Payment will be made per 0.1 foot of culvert joint repaired.

DUAL COMPONENT CHEMICAL GROUT FOR VOID FILLING

The external voids surrounding the culvert will be filled with an injected high expansion chemical grout compound. Holes will be strategically drilled as required and grout injected throughout the structure to effectively fill all voids that have developed outside of the structure due to the infiltration of external soils and materials into the culvert and "piping" (water running outside and under the structure due to separated joints). It is the Contractor's responsibility to locate reinforcing bars and conduit prior to drilling any grout holes. All grout will be injected under such pressure so as not to damage the existing drainage structure or roadway structure. All joints will be appropriately cleaned and sealed, with appropriate recommended cure time, prior to the injection of the void grouting. After completion of the void filling, all holes will be properly sealed.

The typical method consists of placing a layer of chemical grout behind or around the structure. The Contractor will submit for approval by the Engineer a detailed grouting plan showing the spacing, orientation and depth of the grout holes, as well as type of polyurethane grout to be used, range of gel times, equipment, mixing procedures, recommended injection pressure, technique for monitoring grout travel and any other pertinent information. The grouting plan should address the prevention of overfilling and prevention of damage to structures or roadway. The Contractor will submit this detailed procedure for the installation of the expansion grout to the Engineer for approval. The holes are drilled with a rotary percussion hammer drill using a sharp masonry bit with a minimum diameter of 3/8 inch to a maximum diameter of 5/8 inch. Care must be taken to prevent holes from causing damage to reinforcing bars or utility conduits. Drilled holes should be vacuumed and flushed. Use injection grout and methods as recommended by Manufacturer.

Injection can be monitored by either applicator's visual inspection or by pumping a specific amount of injection grout into each hole. The work will start at the inlet end of the pipe and proceed downstream to the outlet. Inject bottom row every other hole. When material appears at the adjacent port, discontinue injection at entry port and begin injection at the adjacent port. Continue injection process section by section from bottom of pipe to top of pipe in a continuous manner to next pipe section. Injection pressure will vary from 200 psi to 3000 psi depending on the width of the joint, thickness of the structure, and condition of the concrete.

REINFORCED CONCRETE PIPE JOINT REPAIR AND VOID GROUTING (CONTINUED)

The Contractor must supply the Engineer with three (3) prior job references of projects where they have successfully injected urethane resin for subgrade void filling applications, or soil stabilization.

In lieu of three (3) prior job references the Contractor will:
a) Obtain hands on training from the supplier on the installation procedures, and
b) Have the supplier on site to provide training to Contractor's staff. Supplier will be present for at least two complete pipe culvert repairs and until the Engineer is satisfied that Contractor's staff is competent in performing this work.

The chemical grout will be a dual component hydrophobic polyurethane grout compound which is non-flammable and non-toxic when cured.

The chemical grout mixture will have expansion properties listed in the data sheets of greater than eighteen (18) times its original volume and cure to rigid closed cell polyurethane foam. The grout will expand to fill any voids and must bond to the exterior surface of the structure. The chemical grout will be Mountain Grout U 4.0 dual component polyurethane grouts as manufactured by Green Mountain International LLC or equal.

All costs for equipment, material, and labor required to fill external voids surrounding the culvert will be incidental to the contract unit price per gallon for Chemical Grout Void Fill. Any overfilling of voids that results in damage to overlying pavement, highway user ride quality, or drainage structure integrity will be corrected and paid for by the Contractor. All corrections will be approved by the Engineer. Payment will be to the 0.1 gallon of chemical grout used, prior to expansion of the material.

A calibrated metering device will be used to measure the chemical grout and to assure proper mixing ratio of components.

After the grout cures, excess material will be removed flush with the pipe interior wall and the pipe left clean.

CULVERT CLEANOUT

Material in existing culverts as listed in the Table for Mainline Culvert Work will be cleaned out by water flushing or other approved methods.

It is the responsibility of the Contractor to visit the site to determine the extent of culvert cleaning work required.

Cost for this work will be included in the contract unit price per each for Cleanout Pipe Culvert.

The Contractor will implement appropriate sediment control measures prior to water flushing in order to prevent discharges from project boundaries, and to comply with the Storm Water Permit.

DITCH RESTORATION

The ditches will be excavated for approximately 50 feet in each direction (or as directed by the Engineer) from the new/reset pipe ends to obtain proper water flow through the pipe. The excavated material may be used as fill material for culvert work, etc. as approved by the Engineer.

Cost for this work will be incidental to the contract unit price per cubic yard for Contractor Furnished Borrow Excavation.

TIE BOLTS FOR RCP/RCP ARCH CULVERTS

Tie bolts will conform to Standard Plate 450.18.

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

For informational purposes:

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

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

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

INSLOPE TRANSITIONS

Inslope transitions will be required at various drainage structures and culvert locations. Refer to Standard Plate 120.05 and to the sheet titled Inslope Transition for details.

TABLE OF INSLOPE TRANSITIONS

Station	Side
263+83	L & R
284+81	L & R
305+78 & 305+84	L & R
384+00	L & R
425+26	L & R

EMBANKMENT ADJACENT TO CULVERTS

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

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

REFURBISH SINGLE MAILBOXES

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

STATION	CONTRACTOR FURNISHED BORROW EXCAVATION CU.YDS.	BASE COURSE TONS	CLASS Q2R HOT MIXED ASPHALT CONCRETE TONS	REFURBISH SINGLE MAILBOX EACH
12+85 L	-	-	4	1
35+30 R	-	-	4	1
43+10 R	26	3	4	3
50+45 R	-	-	4	1
66+60 L	-	-	4	1
70+45 L	-	-	4	1
129+85 L	-	-	4	1
217+65 R	-	-	4	1
244+45 R	-	-	4	1
268+65 L	-	-	4	1
306+20 L	-	-	-	1
423+50 L	-	-	4	1
453+10 R	-	-	4	1
487+50 R	-	-	-	1
491+75 R	-	-	4	1
539+95 R	-	-	4	1
552+85 R	-	-	4	1
564+65 R	-	-	4	1
143+85 (2nd) L	-	-	4	1
TOTALS:	**26**	**3**	**68**	**21**

The Contractor will be responsible for maintaining a temporary mailbox assembly until the refurbished mailbox assembly is complete in place.

Cost for removing existing mailboxes, providing temporary mailbox assemblies, and resetting mailboxes with new posts and necessary support hardware will be incidental to the contract unit price per each for Refurbish Single Mailbox.

TYPE 2 OBJECT MARKERS AT ROADSIDE OBSTACLES

At locations shown in the Table for Mainline Culvert Work where Type 2 Object Markers will be removed, cost for removing the existing Type 2 Object Markers will be included in the contract unit price per each for Remove Delineator.

New Type 2 Object Markers and posts will be furnished and installed according to the details of Standard Plates 632.01, 632.03 and 632.04 by the Contractor at the locations shown in the Table for Mainline Culvert Work. Cost for new Type 2 object marker and post installation is included in the contract unit price per each for Type 2 Object Marker Back to Back.

PERMANENT SEEDING AND MULCHING

The areas to be seeded and mulched consist of disturbed areas within the right-of-way resulting from the work required by this contract.

Type B Permanent Seed Mixture will consist of the following:

Grass Species	Variety	Pure Live Seed (PLS) (Pounds/Acre)
Western Wheatgrass	Arriba, Flintlock, Rodan, Rosana, Walsh	7
Switchgrass	Dacotah, Forestburg, Nebraska 28, Pathfinder, Summer, Sunburst, Trailblazer	3
Indiangrass	Holt, Tomahawk, Chief, Nebraska 54	3
Big Bluestem	Bison, Bonilla, Champ, Sunnyview, Rountree, Bonanza	3
Canada Wildrye	Mandan	2
	Total:	18

The areas to be seeded and mulched are estimated at 7.2 acres.

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 BLANKET

Erosion control blanket will be installed at the locations noted in the Table for Mainline Culvert Work.

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

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

TRAFFIC DIVERSION

The traffic diversion is located at Station 613+00. The traffic diversion will be constructed according to Section 4.5 A of the Specifications. Installation and removal of the traffic diversion will meet all requirements as set forth in the South Dakota Surface Water Quality Standards.

The traffic diversion located at Station 613+00 will be constructed according to the geometric layouts shown in the plans with the temporary drainage structure provided in the following table. If the Contractor proposes to use a different size drainage structure and/or a different geometric layout for the temporary diversion, the proposal must be submitted to the Engineer during the project preconstruction meeting. This information will be forwarded to the DOT Hydraulics Office for review. Construction of the traffic diversion will not be allowed until approval of the proposal is obtained from the Hydraulics Office.

Table of Temporary Drainage Structures in Traffic Diversions

Detour Option	Traffic Diversion Crossing	Design Flood $Q_{5\text{-YR}}$, CFS	Inlet Flowline Elev., ft	Diversion Crossing Slope, ft/ft	Diversion Overflow* Elev. ft	$HW_{5\text{-YR}}$ Elev. ft	$HW_{100\text{-YR}}$ Elev. ft
I	1-84” RCP	173	1513.7	0.0017	1530.2	1519.7	1531.5
Existing	1-84” RCP	173	----	----	1529.0	1519.7	1530.8

* For the existing condition, the abandoned railroad grade serves as the overflow section.

Costs to provide temporary drainage structures will be incidental to the contract lump sum price for Maintenance of Traffic Diversion.

The traffic diversion located at Station 613+00 will be constructed in accordance with the geometric layout shown in the plans with temporary drainage structure size adequate to reduce the potential for upstream flooding. This traffic diversion will use an existing 84” RCP under an abandoned railroad bed. Two other temporary pipe shall be placed as shown on the plan sheet to drain runoff from the ditch and abandoned railroad embankment. Non-woven Separator Fabric will be placed over wetlands and act as a barrior between the wetland and the traffic diversion embankment. The Non-woven Separator Fabric seams will have a 1 foot minimum overlap and pins or staples will be allowed to hold the fabric in place. The traffic diversions will be built in close conformity to the plan gradeline. The traffic diversion will be removed such that the original ground surface contours and elevations are restored and the hydraulic capacity of the waterway is maintained. The removal will be done in such a manner that there is minimal disturbance to the channel bed.

TABLE OF TRAFFIC DIVERSION SEPARATOR FABRIC

Station	L/R	Non-woven Separator Fabric (SqYd)
616+15	L	250
	Totals	250

SEQUENCE OF OPERATIONS

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

GENERAL TRAFFIC CONTROL

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, no work will be allowed during hours of darkness.

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

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

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

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

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

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

The Contractor will notify businesses/homeowners a minimum of two weeks prior to construction to inform them of upcoming construction and again a minimum of 48 hours prior to any blocked access to make appropriate arrangements.

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.

Flaggers and a pilot car will be used when traffic must be routed out of its normal lane for a distance greater than the two flaggers are able to communicate with each other.

The distance between the closest points of any two construction workspaces, including channeling devices, will not be less than 3 miles.

Pipe replacement will be phased half at a time to maintain an open lane of traffic. Traffic will be set up as a lane closure using stop signs, standard plate 634.25 or controlled using flaggers, standard plate 634.23.

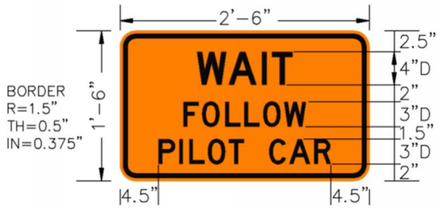
The Contractor will restore traffic to one lane each direction at the end of the day, prior to nightfall. Prior to opening the roadway to traffic the Contractor must clean the roadway surface each day.

The Contractor will provide a minimum traffic width of 12 feet for one-way operations and 24 feet for two-way operations during the daytime construction period. The Contractor will restore traffic to normal driving lanes at the end of the working day. The Contractor will place shoulder drop off signs where necessary.

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".

TEMPORARY PAVEMENT MARKING

The total length of no passing zone on this project is estimated to be 4.1 miles.

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

Temporary pavement marking 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.

Temporary pavement marking paint will not be allowed on the final lift of asphalt surfacing. Temporary pavement marking paint will not be allowed on the chip seal, fog seal, or flush seal. Temporary flexible vertical markers (tabs) must be used on the final lift of asphalt surfacing. The Contractor may use tabs with covers, uncovering them for the chip seal, fog seal, or flush seal. As an alternative, the Contractor may install new tabs for the fog seal or 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.

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 after each installation as detailed below at no additional cost to the State.

Quantities of Temporary Pavement Markings consist of:

- One pass on top of milled surface
- One pass on the first lift of asphalt concrete
- One pass on top of the final lift of asphalt concrete
- One pass after the flush seal

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

No adjustment in the contract unit price for "Temporary Pavement Marking" will be made because of a variation in quantities.

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

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

PERMANENT PAVEMENT MARKING

The Contractor will be required to repaint all existing pavement markings including centerline, edge line, lane lines, turn arrows and stop bars. This list is approximate. The Contractor will be required to document and be able to relocate for replacement of the existing turn arrows, stop bars, etc. before the markings are obliterated. Additional quantities are included in the estimate of quantities to paint the additional pavement marking. The cost to duplicate the existing marking locations will be incidental to the contract unit prices for the various contract items.

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

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

HIGH BUILD WATERBORNE PAVEMENT MARKING PAINT

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

Reflective media will consist of glass beads.

High Build Waterborne Pavement Marking Paint applied after October 15 must be formulated as cold-weather waterborne paint. Cold weather waterborne paint will meet the requirements of Section 980.1 C.

RATES OF MATERIALS FOR HIGH BUILD WATERBORNE PAVEMENT MARKING PAINT

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

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

RETROREFLECTIVITY FOR PAVEMENT MARKING PAINT

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

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

If the Department chooses to take readings, the minimum retro-reflectivity values will be 275 mc/m^2/lux for white and 170 mc/m^2/lux for yellow.

ITEMIZED LIST FOR TRAFFIC CONTROL SIGNS

		CONVENTIONAL ROAD			
SIGN CODE	SIGN DESCRIPTION	NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
R1-1	STOP	4	30"	5.2	20.8
W1-3	REVERSE TURN (L or R)	4	48" x 48"	16.0	64.0
W1-4	REVERSE CURVE (L or R)	4	48" x 48"	16.0	64.0
W1-6	LARGE ARROW (one direction)	2	48" x 24"	8.0	16.0
W3-1	STOP AHEAD (symbol)	4	48" x 48"	16.0	64.0
W3-4	BE PREPARED TO STOP	4	48" x 48"	16.0	64.0
W8-1	BUMP	4	48" x 48"	16.0	64.0
W8-6	TRUCK CROSSING	4	48" x 48"	16.0	64.0
W8-15	GROOVED PAVEMENT	4	48" x 48"	16.0	64.0
W13-1P	ADVISORY SPEED (plaque)	10	30" x 30"	6.3	63.0
W20-1	ROAD WORK AHEAD	14	48" x 48"	16.0	224.0
W20-4	ONE LANE ROAD AHEAD	8	48" x 48"	16.0	128.0
W20-7	FLAGGER (symbol)	8	48" x 48"	16.0	128.0
G20-1	ROAD WORK NEXT 4 MILES	1	36" x 18"	4.5	4.5
G20-1	ROAD WORK NEXT 6 MILES	1	36" x 18"	4.5	4.5
G20-1	ROAD WORK NEXT 7 MILES	1	36" x 18"	4.5	4.5
SPECIAL	WAIT FOLLOW PILOT CAR	4	30" x 18"	3.8	15.2
G20-1	ROAD WORK NEXT 9 MILES	1	36" x 18"	4.5	4.5
G20-1	ROAD WORK NEXT 10 MILES	1	36" x 18"	4.5	4.5
G20-1	ROAD WORK NEXT 12 MILES	1	36" x 18"	4.5	4.5
G20-1	ROAD WORK NEXT 16 MILES	2	36" x 18"	4.5	9.0
G20-2	END ROAD WORK	14	36" x 18"	4.5	63.0
		CONVENTIONAL ROAD TRAFFIC CONTROL SIGNS SQFT			1142.0

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** 265 Acres
- **5.3 (3b): Total Area to be Disturbed** 7.2 Acres
- **5.3 (3c): Maximum Area Disturbed at One Time** 7.2 Acres
- **5.3 (3d): Existing Vegetative Cover (%)**
- **5.3 (3d): Description of Vegetative Cover**
- **5.3 (3e): Soil Properties:** AASHTO Soil or USDA-NRCS Soil Series Classification
- **5.3 (3f): Name of Receiving Water Body/Bodies** West & East Forks Vermillion River & Tributaries
- **5.3 (3g): Location of Construction Support Activity Areas**

5.3 (3h): ORDER OF CONSTRUCTION ACTIVITIES

The Contractor will enter the Estimated Start Date.

Description	Estimated Start Date
Construct Traffic Diversion.	
Install Box Culvert.	
Place temporary surfacing at Box Culvert Replacement.	
Remove Traffic Diversion.	
Install Mainline Pipe Replacements.	
Place temporary surfacing at Mainline Pipe Replacements.	
Perform remaining Pipe work.	
Perform Cold Milling operations.	
Install Guardrail.	
Perform Ditch Shaping operations.	
Perform surfacing operations.	
Reseed disturbed areas.	

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**

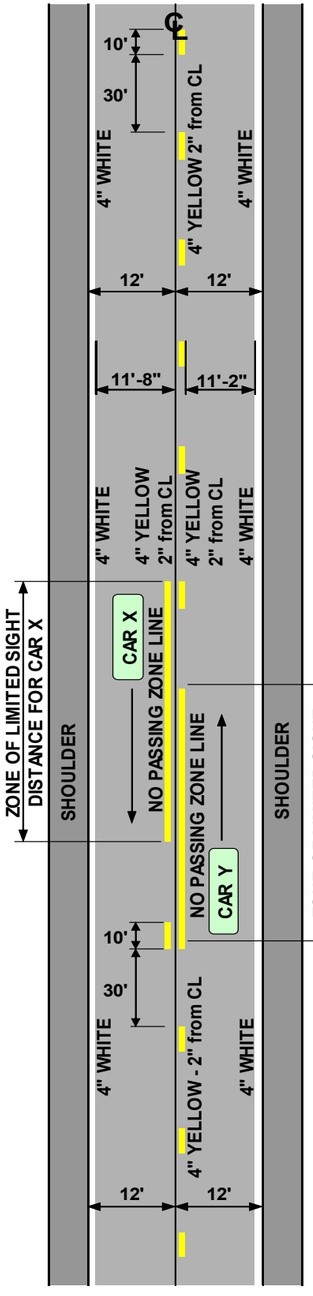
All modifications made to the SWPPP must be signed and certified as required in Section 7.4.

➢ **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.

TWO LANE ROADWAY



PAVEMENT MARKING

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

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

Application rates will be as follows:

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

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

ESTIMATED QUANTITIES (BASED ON ONE APPLICATION)	
HIGH BUILD	**QUANTITY**
WHITE	**749 GALLONS**
YELLOW	**193 GALLONS**

Included in the above quantities are:

Additional White (1 Application)			Additional Yellow (1 Application)		
Description		Gallons	Description		Gallons
4" Lines	-	-	Transitions	- -	-
8" Lines	-	-	4" Skip Lines	-	-
12" Gore Lines	-	-	8" Lines	-	-
Crosswalks	- -	-	12" Lines	-	-
24" Stop Lines	-	-	24" Hatches	-	-
24" Hatches	-	-	Solid Areas	-	-
Solid Areas	-	-	Additional Yellow:		-
Arrows					
Left Arrows	-	-			
Right Arrows	-	-			
Straight Arrows	-	-			
Combo Arrows	-	-			
Lane Drop Arrows	-	-			
Messages					
STOP	1 Ea	1			
STOP AHEAD	1 Ea	2			
R X R w/ Stop Lines	-	-			
SCHOOL X-ING	-	-			
Additional White:		3			

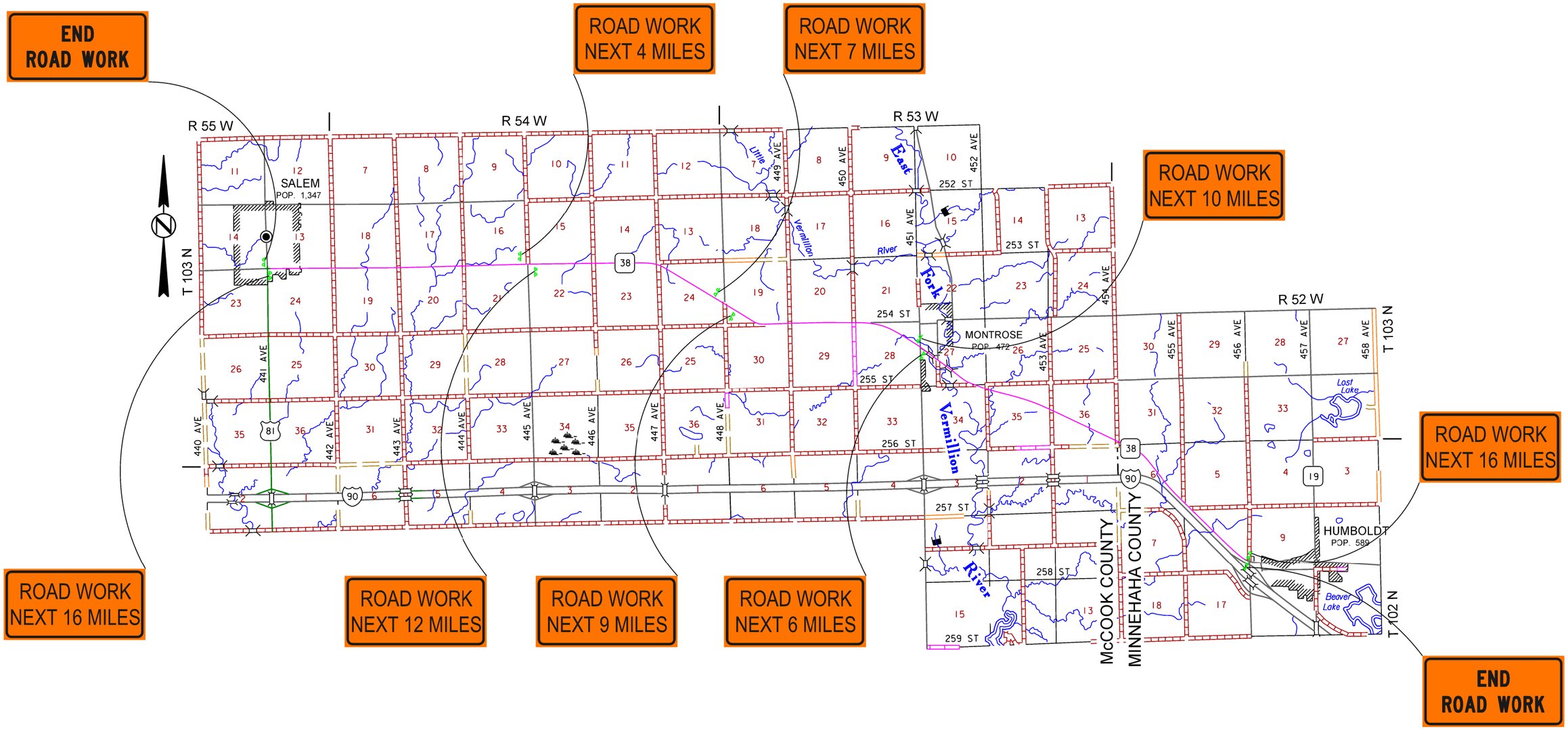
Additional Quantities

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

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

TRAFFIC CONTROL

Fixed Location Signs
(Ground Mounted Support)



NOTES:

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

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

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

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

PLOT SCALE - 1.8316
PLOTTED FROM - TRM113318
PLOT NAME - 1
FILE - ...\MCCK05URNTC\FLS 05UR.DGN

* 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.

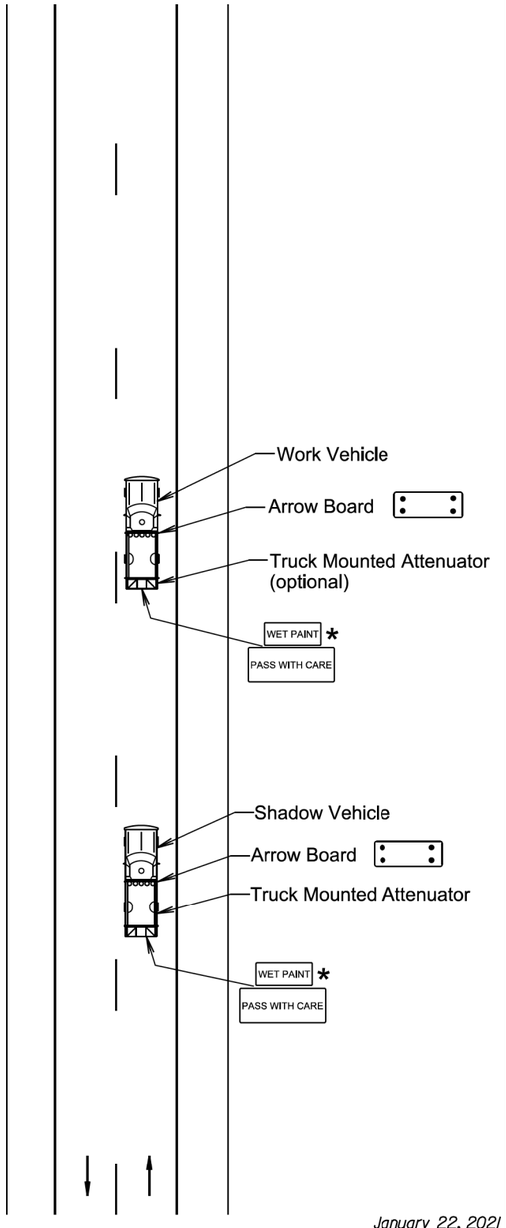
Shadow and Work vehicles will display high-intensity rotating, flashing, oscillating, or strobe lights, flags, signs, or arrow boards.

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: 2024	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)	Spacing of Channelizing Devices (Feet) (G)
0 - 30	200	25
35 - 40	350	25
45	500	25
50	500	50
55	750	50
60 - 65	1000	50

Flagger

Channelizing Device

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

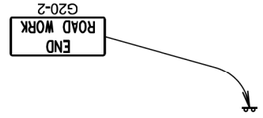
The ROAD WORK AHEAD and the END ROAD WORK signs may be omitted for short duration operations (1 hour or less).

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

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

The channelizing devices will be drums or 42" cones.

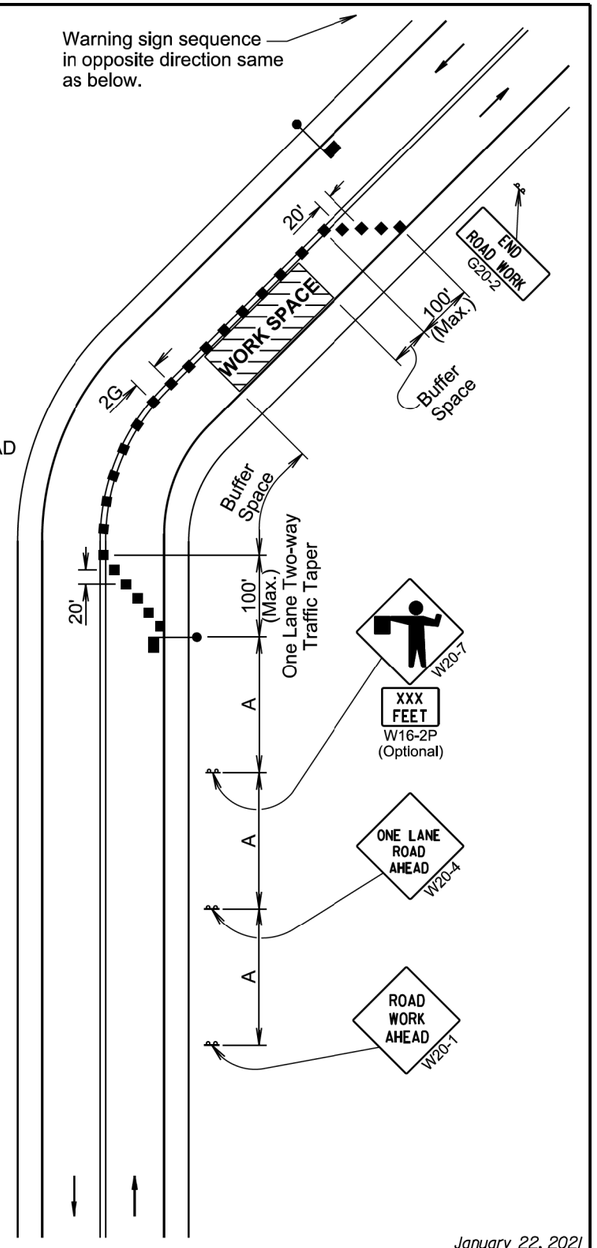
Channelizing devices are not required along the centerline adjacent to work area when pilot cars are utilized for escorting traffic through the work area.



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

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

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

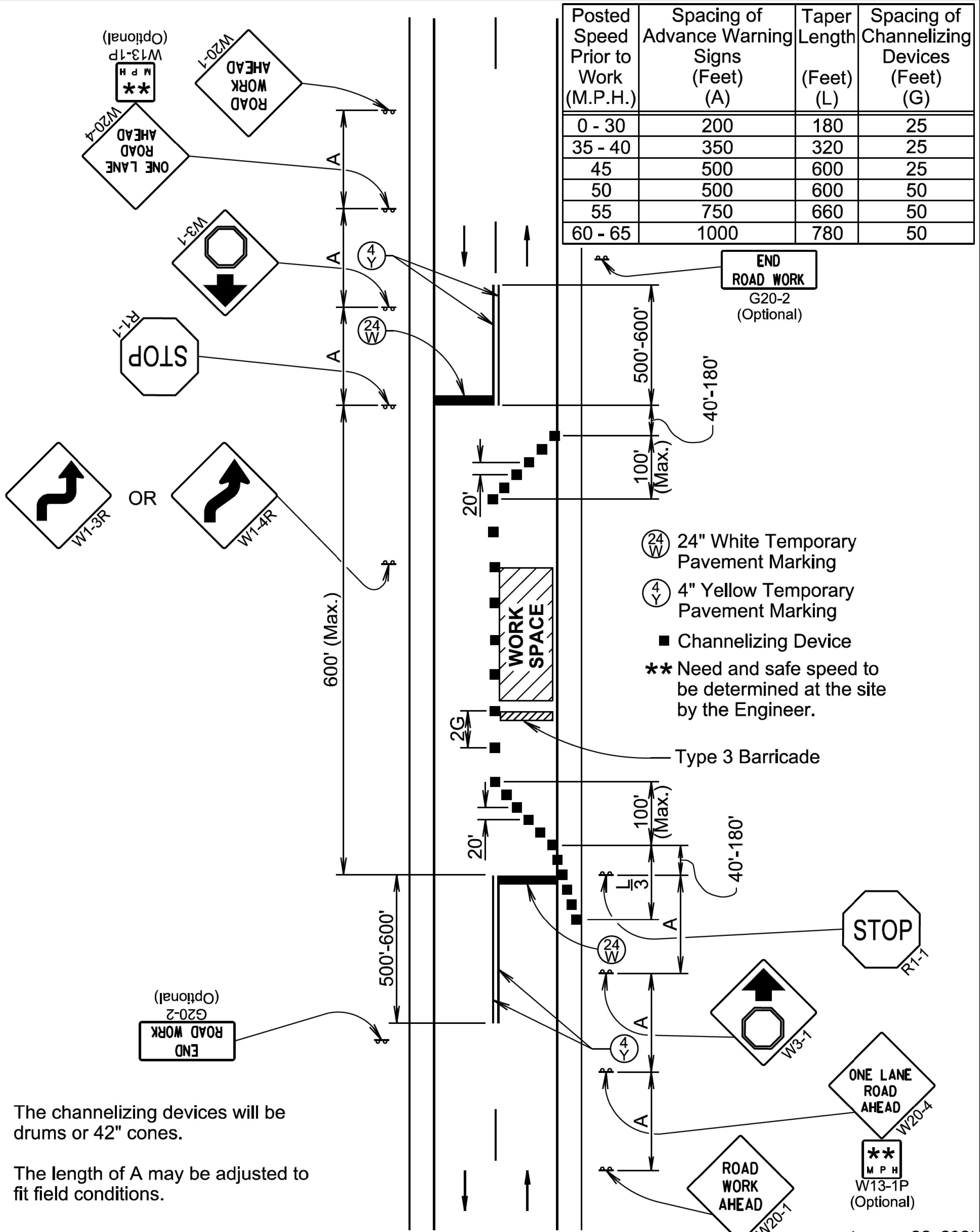


January 22, 2021

Published Date: 2024	SDDOT	LANE CLOSURE WITH FLAGGER PROVIDED	PLATE NUMBER 634.23
			Sheet 1 of 1

Plot Scale - 1:200
Plotted From - TRM113318
File - ...\mcck05UR\tc\tc Std Plates.dgn

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



The channelizing devices will be drums or 42" cones.

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

January 22, 2021

Published Date: 2024

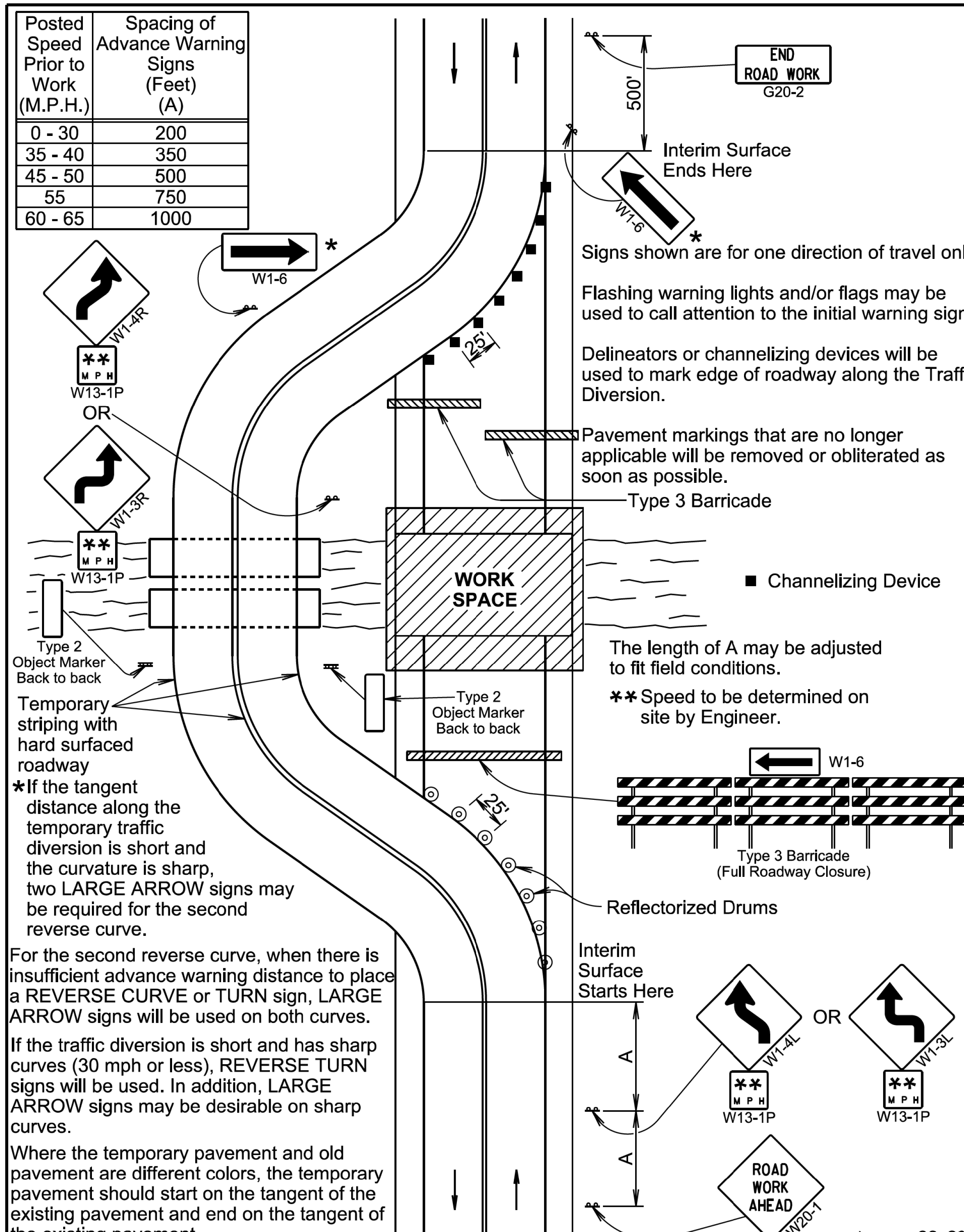
SDDOT

LANE CLOSURE USING STOP SIGNS

PLATE NUMBER 634.25

Sheet 1 of 1

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



* Signs shown are for one direction of travel only.

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

Delineators or channelizing devices will be used to mark edge of roadway along the Traffic Diversion.

Pavement markings that are no longer applicable will be removed or obliterated as soon as possible.

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

** Speed to be determined on site by Engineer.

Temporary striping with hard surfaced roadway

*If the tangent distance along the temporary traffic diversion is short and the curvature is sharp, two LARGE ARROW signs may be required for the second reverse curve.

For the second reverse curve, when there is insufficient advance warning distance to place a REVERSE CURVE or TURN sign, LARGE ARROW signs will be used on both curves.

If the traffic diversion is short and has sharp curves (30 mph or less), REVERSE TURN signs will be used. In addition, LARGE ARROW signs may be desirable on sharp curves.

Where the temporary pavement and old pavement are different colors, the temporary pavement should start on the tangent of the existing pavement and end on the tangent of the existing pavement.

January 22, 2021

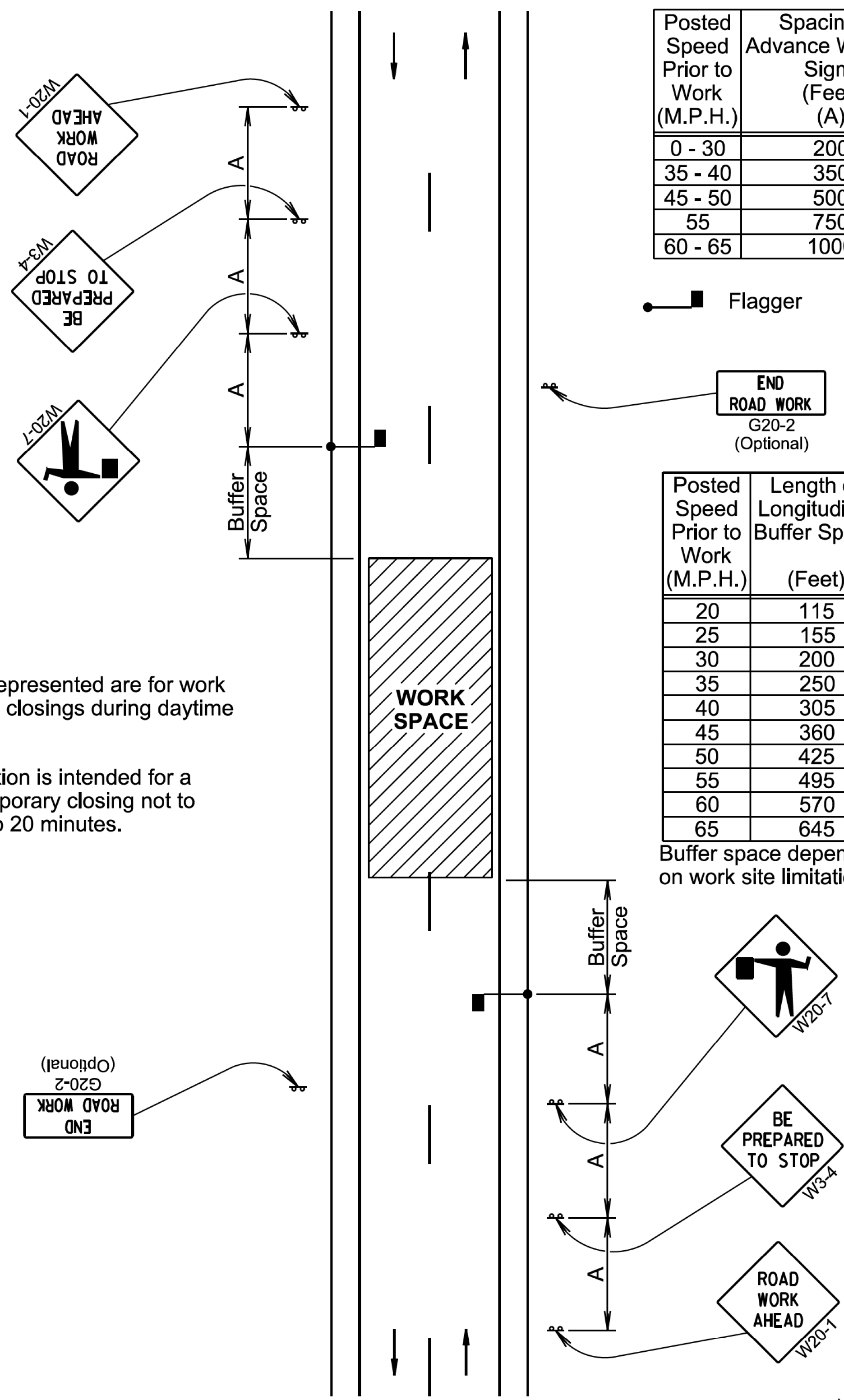
Published Date: 2024

SDDOT

ROAD CLOSED WITH TRAFFIC DIVERTED

PLATE NUMBER 634.28

Sheet 1 of 1



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

Posted Speed Prior to Work (M.P.H.)	Length of Longitudinal Buffer Space (Feet)
20	115
25	155
30	200
35	250
40	305
45	360
50	425
55	495
60	570
65	645

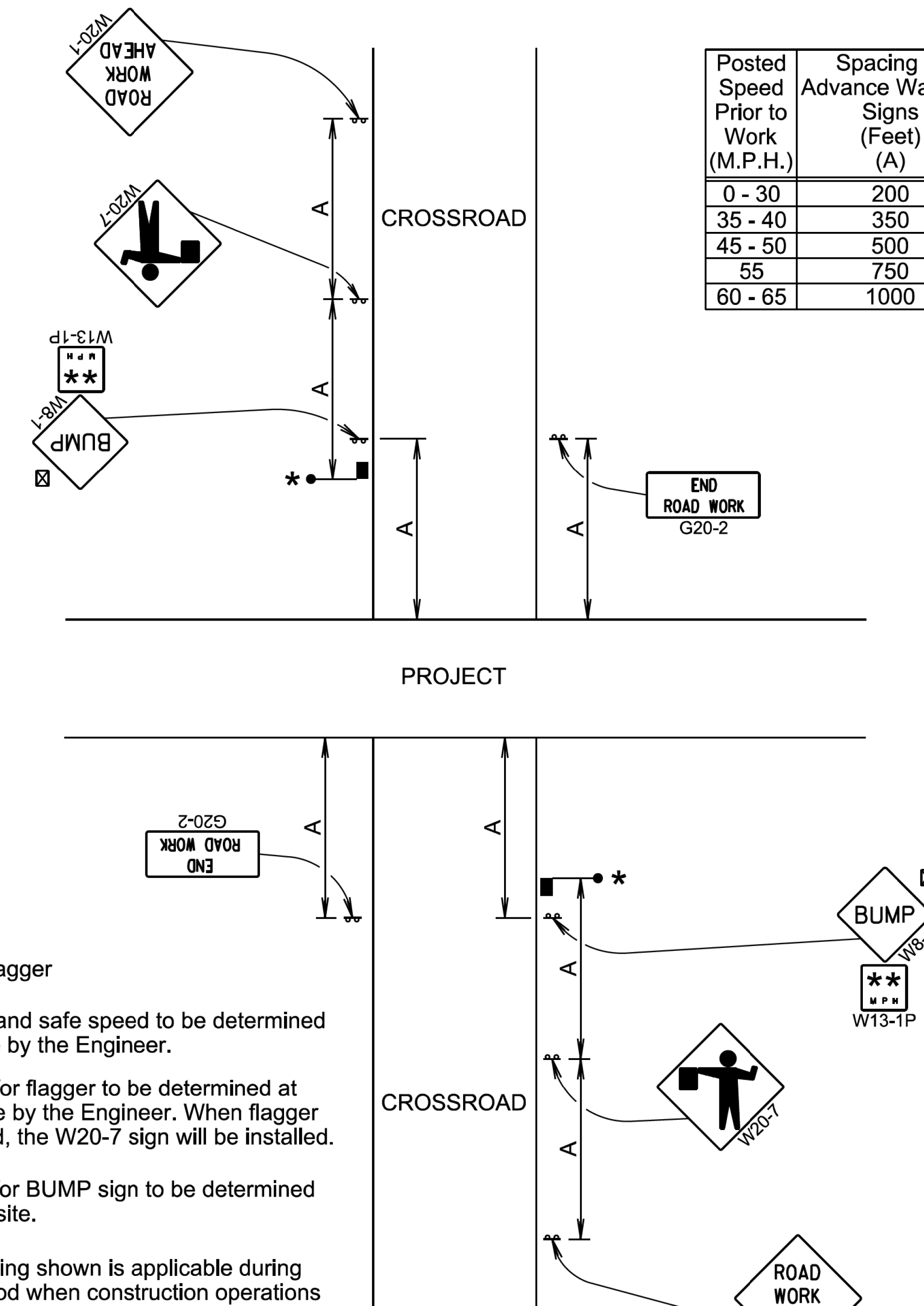
Buffer space dependent on work site limitations.

Conditions represented are for work that requires closings during daytime hours only.

This application is intended for a planned temporary closing not to exceed 15 to 20 minutes.

January 22, 2021

Published Date: 2024 | SDDOT | **TEMPORARY ROAD WORK** | PLATE NUMBER 634.30 | Sheet 1 of 1



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

Flagger

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

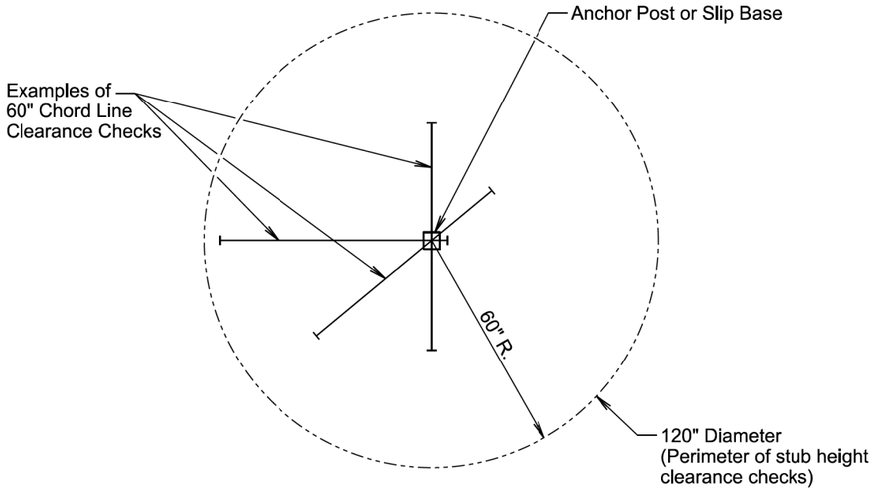
* Need for flagger to be determined at the site by the Engineer. When flagger is used, the W20-7 sign will be installed.

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

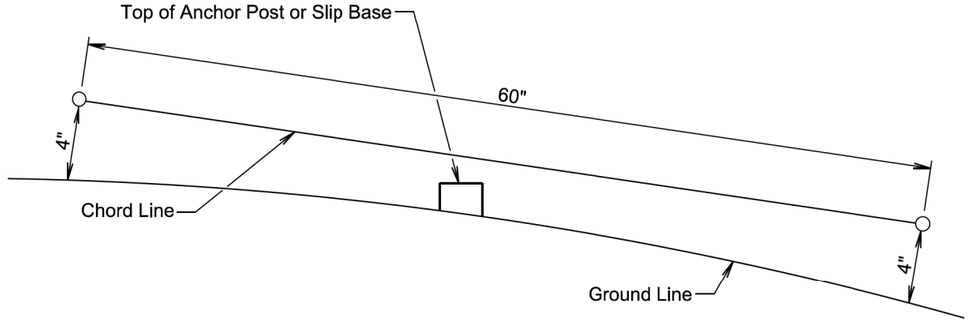
The signing shown is applicable during that period when construction operations are in progress in the vicinity of the crossroad. Need for such signing at specific crossroad locations will be determined at the site by the Engineer.

January 22, 2021

Published Date: 2024 | SDDOT | **PROJECT OPEN TO TRAFFIC FROM CROSSROAD** | PLATE NUMBER 634.38 | Sheet 1 of 1



PLAN VIEW
(Examples of stub height clearance checks)



ELEVATION VIEW

GENERAL NOTES:

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

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

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: 2024	SDDOT	BREAKAWAY SUPPORT STUB CLEARANCE	PLATE NUMBER 634.99
			Sheet 1 of 1

Plot Scale - 1:200
• Plotted From - TRM113318
File - ...\mcck05\RTc\tc Std Plates.dgn

CONTROL DATA

HORIZONTAL AND VERTICAL CONTROL POINTS						
POINT	STATION	OFFSET	DESCRIPTION	NORTHING	EASTING	ELEVATION
BM1	-	-	REFMRK	501991.02	2799667.30	1547.356
CP1	-	-	REFMRK	518937.548	2772962.16	1589.781
CP2	-	-	REFMRK	509420.557	2805209.409	1537.13

The coordinates shown on this sheet are based on the South Dakota State Plane Coordinate System. South Zone NAD 83(2011)
The elevations shown on this sheet are based on NAVD 88.

HORIZONTAL ALIGNMENT DATA

MAINLINE

Type	Station			Northing	Easting
POB	605+16.77			509448.498	2804858.903
		TL= 298.69	S 75°17'53" E		
PI	608+15.46			509372.693	2805147.816
		TL= 267.16	S 75°17'52" E		
PI	610+82.62			509304.889	2805406.229
		TL= 58.99	S 74°40'25" E		
PI	611+41.61			509289.298	2805463.117
		TL= 511.70	S 75°26'54" E		
PI	616+53.31			509160.733	2805958.401
		TL= 88.18	S 75°34'49" E		
PI	617+41.48			509138.775	2806043.799
		TL= 213.16	S 75°15'35" E		
PI	619+54.65			509084.539	2806249.946
		TL= 338.74	S 75°15'35" E		
POE	622+93.39			508998.351	2806577.538

Div613

Type	Station			Northing	Easting
POB	0+00.00			509372.693	2805147.812
		TL= 18.79	S 75°17'53" E		
PC	0+18.79			509367.924	2805165.989
PI	1+49.33	R = 400.00	Delta = 36°08'56" L	509334.793	2805292.257
PT	2+71.16			509382.525	2805413.761
		TL= 40.99	N 68°33'11" E		
PC	3+12.15			509397.514	2805451.915
PI	5+70.51	R = 400.00	Delta = 65°42'59" R	509491.980	2805692.384
PT	7+70.94			509311.637	2805877.385
		TL= 147.85	S 45°43'50" E		
PC	9+18.79			509208.430	2805983.257
PI	10+24.21	R = 400.00	Delta = 29°31'46" L	509134.843	2806058.745
PT	11+24.95			509108.020	2806160.697
		TL= 92.29	S 75°15'35" E		
POE	12+17.23			509084.539	2806249.946

The coordinates shown on this sheet are based on the South Dakota State Plane Coordinate System. South Zone NAD 83(2011)

LEGEND

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0038(46)332	46	116

Plotting Date: 09/15/2020

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

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

- Drainage Arrow

- Remove Concrete Pavement
- Remove Concrete Driveway Pavement
- Remove Asphalt Concrete Pavement
- Remove Concrete Sidewalk
- Remove Concrete Median Pavement
- Remove Concrete Curb and/or Gutter

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

Plot Scale - 1:200

Plotted From - TRPR14419

File - C:\Work\Legend.dgn

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0038(46)332	47	116

594+27 L
Remove One Type 2
Object Marker

594+27 R
Remove One Type 2
Object Marker

594+27 R
Remove Flared End
and 12 ft of Pipe Sections

594+27 R
Install 12 ft of New
30" RC Pipe and
Flared End

594+27 R
Shape and Seed Ditch

594+27 L
Install Two New
Double-sided Type 2
Object Markers

594+27 R
Install Two New
Double-sided Type 2
Object Markers

PC 587+94.9
PI 594+96.8
PT 602+20.4
D 31°59'18"
T 741.9
L 1465.5
R 9820.0

W1/2 SE1/4

Zimmer Living Trust
(INFORMATION ONLY)

E1/2 SE1/4

Sec. 27 - T103N - R53W

132'

592+00

593+00

Present SD Highway 38

594+00

595+00

596+00

597+00

598+00

599

595+35.3

596+15.2

33'

33'

132'

OH

W1/2 SE1/4

Benjamin J. Zimmer

Tract 2 of Zimmer's Addition in the W1/2 SE1/4
and in the E1/2 SW1/4 of Section 27 - Township
103 North - Range 53 West of the 5th P.M.

Parcel 1
0.01 ac, Permanent Easement
(259 sq ft) more or less

TRACT 2

ZIMMERMAN'S ADDITION

593+85.00 - 83.30' R

593+85.00 - 66.00' R

594+15.00 - 66.00' R

255th Street

33'

33'

Section Line

W1/2 NE1/4

E1/2 NE1/4

Sec. 34 - T103N - R53W

Roger E. Haugo
(INFORMATION ONLY)

1/16 Line

LOT A

R & K FIRST ADDITION

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0038(46)332	48	116

Plotting Date: 12/21/2023

613+00 L
Remove Two Type 2
Object Markers

613+00 R
Remove Two Type 2
Object Markers

609+72 L to 617+65 L
Remove 793' of Type 2 Fence

612+15 R to 613+80 R
Remove 165' of Type 2 Fence

3+85 (Div613)
(50° Skew RHF)
Install Temporary
158' - 24" CMP
(Maintenance of
Traffic Diversion)

613+15 L to 613+35 L
Do Not Disturb
84" - 86" RCP
(Under Abandoned RR
Grade)

9+00 (Div613)
(15° Skew LHF)
Install Temporary
160' - 24" CMP
(Maintenance of
Traffic Diversion)

613+00
Remove 142' - 84" RCP
& Two RCP Flared Ends
(Incidental Work, Grading)

613+00 (1.58 sq mi)
Install 8'x8'x175'-6 13/16" RCBC

613+00 L & R
Shape and Seed
Ditch Slope

613+00 R
Place Riprap
Refer to Bridge Sheets for
Details & Quantities

613+00 L
Install Two New
Double-sided Type 2
Object Markers

613+00 R
Install Two New
Double-sided Type 2
Object Markers

Even Farm, LLC

That part of the NW1/4 of Section 35 - Township 103 North - Range 53 West of the 5th PM., including former railroad right of way, lying north of Lot H-1 therein

Parcel 2
0.03 ac, R.O.W.
(1,345 sq ft) more or less

Div613
PI 1+49.33
N 509334.793
E 2805292.257
Del 36°08'56" L
Dc 14°19'26"
T 130.54
L 252.37
R 400.00

Div613
PI 5+70.51
N 509491.980
E 2805692.384
Del 65°42'59"R
Dc 14°19'26"
T 258.36
L 458.79
R 400.00

Div613
PI 10+24.21
N 509134.843
E 2806058.745
Del 39°00'04" L
Dc 19°05'55"
T 106.24
L 204.21
R 300.00

611+56 - 242' L

612+68.65 - 66.58' & 108.58' L
612+84.16 - 66.55' & 108.55' L
613+14.16 - 66.49' & 108.49' L
613+30.65 - 66.46' & 108.46' L

615+11 - 241' L

617+66 - 66' L

609+45.0

609+58 L
Begin Type 2
Fence

609+58.88 - 77.78' L
609+62.48 - 66' L

617+66 L
End Type 2 Fence

BEGIN Div613
608+15.46 (Mainline) =
0+00 (Div613)

END Div613
619+54.65 (Mainline) =
12+17.23 (Div613)

612+23 R
Begin Type 2 Fence

613+69 R
End Type 2 Fence

612+23.75 - 65.49' & 162' R
612+62.80 - 65.60' & 125.60' R
612+83.80 - 65.65' & 107.64' R
613+13.80 - 65.73' & 107.72' R
613+36.80 - 65.79' & 125.79' R
613+68.76 - 65.88' & 162' R

Troy A. Krouse & Kristi K. Krouse

Lot 1 of Donelan's Second Addition in the NW1/4 of Section 35 - Township 103 North - Range 53 West of the 5th P.M.

Parcel 3
0.07 ac, R.O.W.
(3,170 sq ft) more or less

Boundary Limits for ESS1

Do not disturb ESS1.
Refer to the
Environmental Commitments
for details.

Michael Roling & Mary Roling,
(INFORMATION ONLY)

Parcel 2
609+58.88 L to 617+66.00 L
Temporary Easement
containing 2.1 ac.
more or less

Parcel 3
612+23.75 R to 613+68.75 R
Temporary Easement
containing 0.3 ac.
more or less

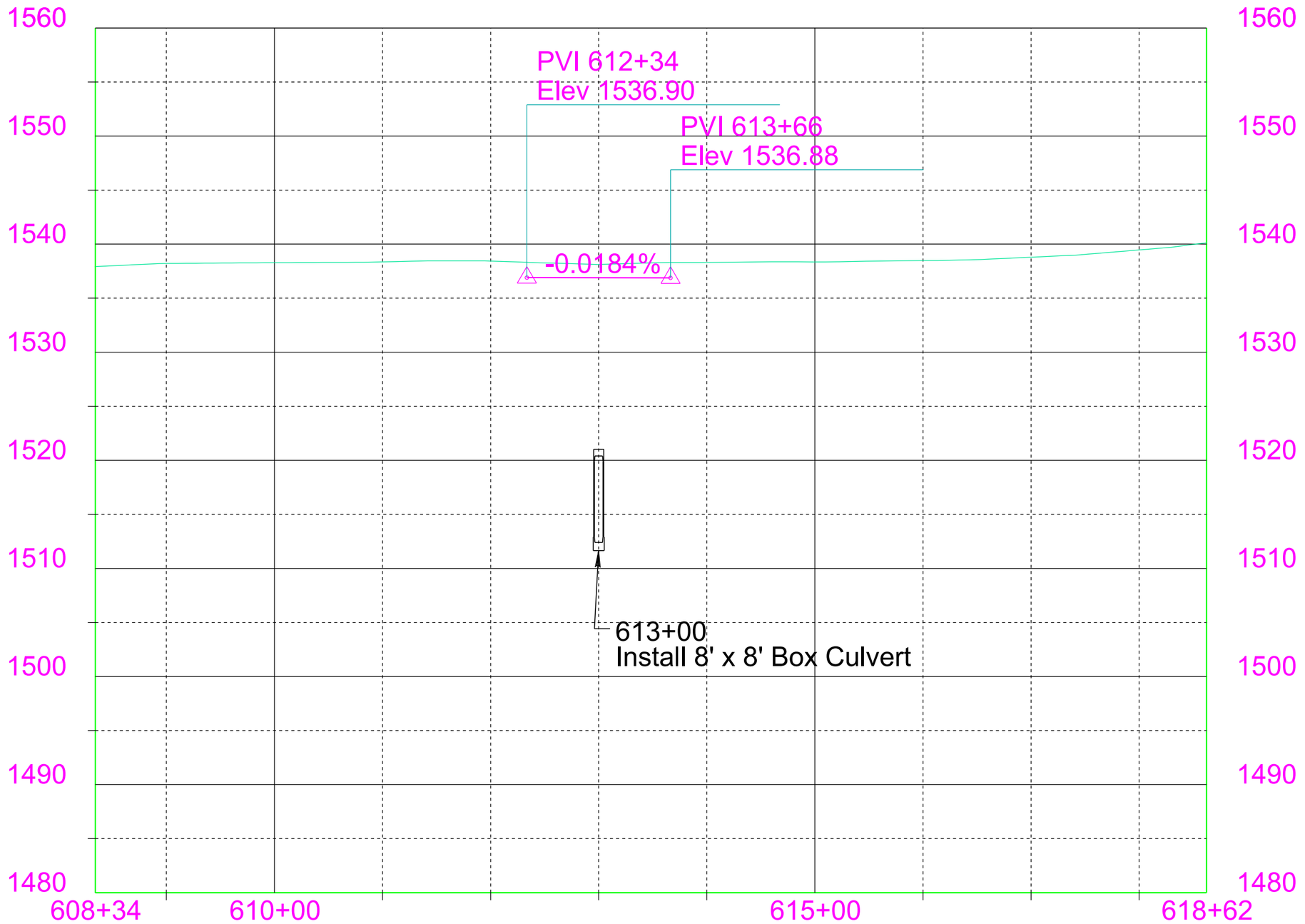
Section Line
255th Street
452nd Avenue
66' Old SD Hwy 38
E1/2 NE1/4
NW1/4
Lot 1
Lot A
DONELAN'S SECOND ADDITION
DONELAN'S FIRST ADDITION
Sec. 34 - T103N - R53W
Sec. 35 - T103N - R53W
SD38
33'
132'
2-2 PP
3 PP
N 68°33'11" E
S 45°43'50" E
S 75°17'53" E
S 75°15'35" E
0+00
610+00
615+00
620+00
5+00
T/F
W
HO

PLOT SCALE - 1:100
PLOTTED FROM - TRM111118
PLOT NAME - 9
FILE - ...\PRJ2023\MCCK05UR\61300.DGN

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0038(46)332	49	116

Plotting Date: 12/21/2023

PROFILE FOR BOX CULVERT INSTALLATION AT STA. 613+00
(Horizontal Alignment: Mainline)

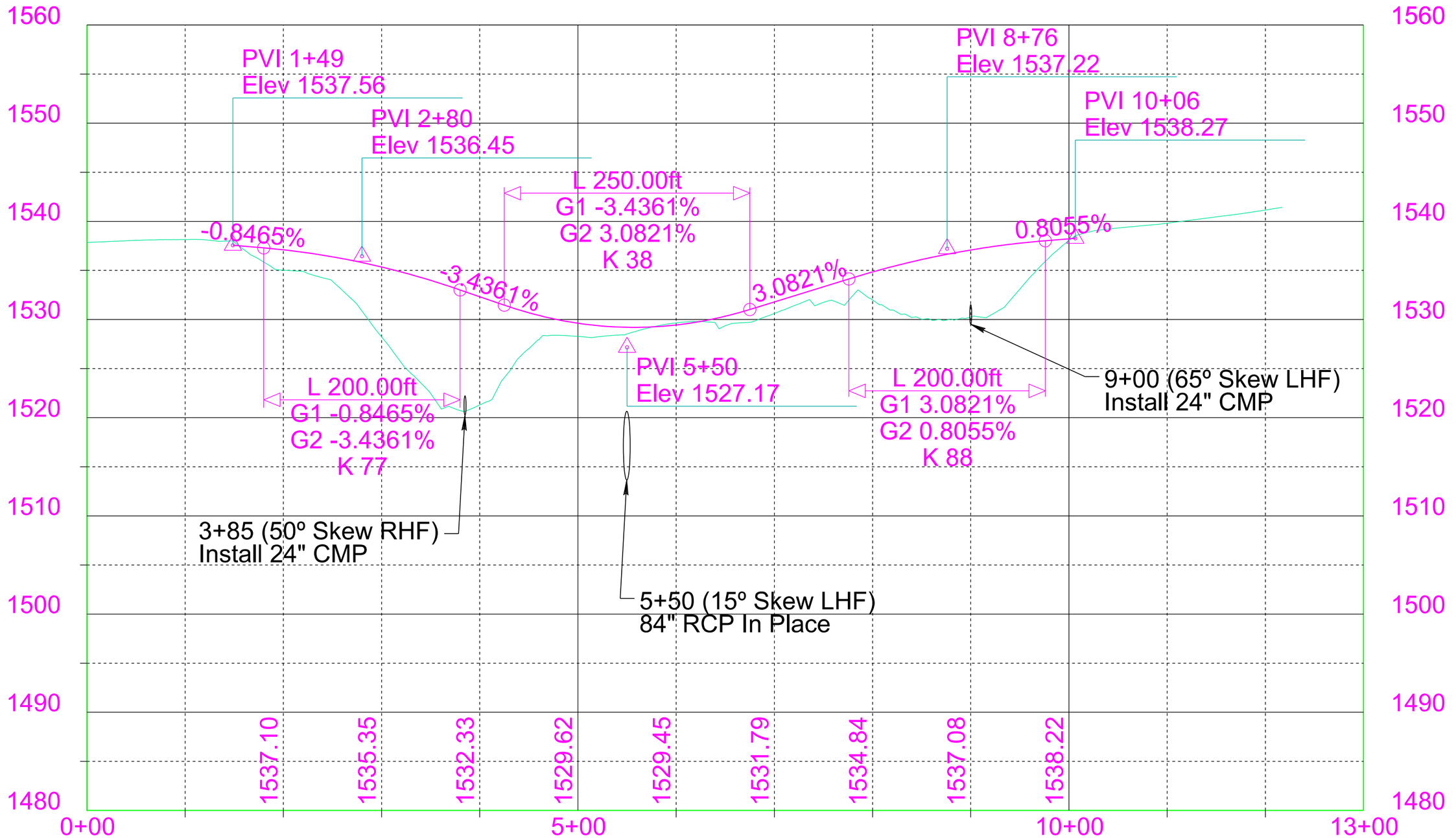


PLOT SCALE - 1:100
PLOTTED FROM - TRM111118
PLOT NAME - 10
FILE - ...\MCCK05UR\61300_PROFILE.DGN

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0038(46)332	50	116

Plotting Date: 12/21/2023

TRAFFIC DIVERSION PROFILE FOR BOX CULVERT INSTALLATION AT STA. 613+00
(Horizontal Alignment: Div613)



PLOT SCALE - 1:100
PLOTTED FROM - TRM111118
PLOT NAME - 11
FILE - ...\MCCK05UR\61300_PROFILE.DGN

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0038(46)332	51	116

650+56 L
Remove One Type 2
Object Marker

650+56 R
Remove One Type 2
Object Marker

650+56 R
Remove Flared End
and 12 ft of Pipe Sections

650+56 L
Cleanout Ditch, Shape
and Seed Ditch

650+56 L
Install Two New
Double-sided Type 2
Object Markers

650+56 R
Reset 12 ft of RC Pipe
and Flared End

650+56 R
Shape and Seed Ditch

650+56 R
Install Two New
Double-sided Type 2
Object Markers

℄ Abandoned RR Grade

200' Former Railroad Right of Way

132'

132'

Present SD Highway 38

648+00

649+00

650+00

651+00

651+81

652+00

653+00

654+00

NE1/4

Sec. 35 - T103N - R53W

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0038(46)332	52	116

10+00 L
Remove One Type 2
Object Marker

10+00 L
Remove Flared End
and 6 ft of Pipe Sections

10+00 L
Reset 6 ft of RC Pipe
and Flared End

10+00 L
Cleanout Ditch, Shape
and Seed Ditch

10+00 L
Install One New
Double-sided Type 2
Object Marker

℄ Abandoned RR Grade

Sec. 31 - T103N - R52W

33'

33'

Section Line

200' Former Railroad Right of Way

Government Lot 4

Robert G. White Trust,

In Government Lot 4 of Section 6 -
Township 102 North - Range 52 West
of the 5th P.M., except Lot H2, but
including the former railroad right of way

Parcel 4
0.01 ac, Permanent Easement
(540 sq ft) more or less

9+80 L
Begin Type 2 Fence

9+85.00 - 66.00' L
9+85.00 - 84.00' L

10+15.00 - 66.00' L
10+15.00 - 84.00' L

2 PP

2 PP

10+20 L
End Type 2 Fence

132'

132'

7+00

8+00

9+00

10+00

11+00

12+00

13+00

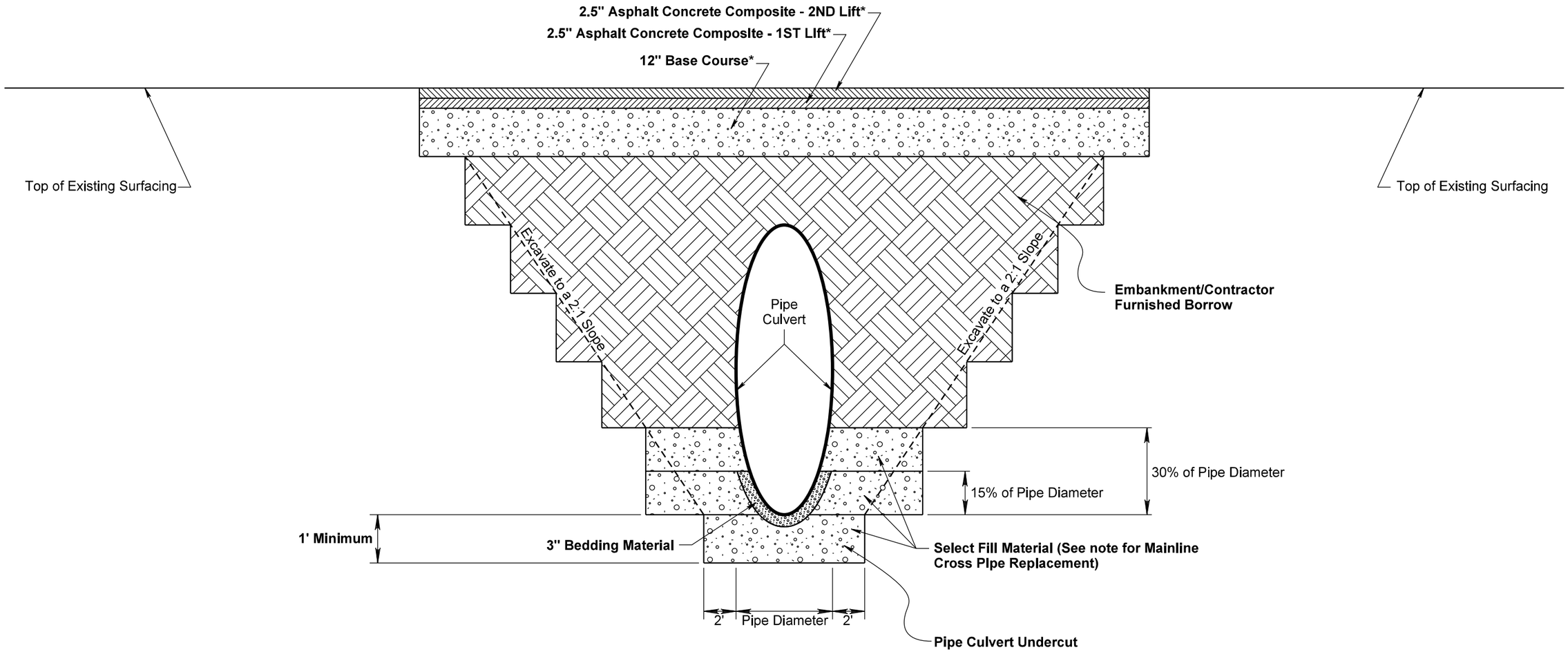
14+00

S 65°04'52" E

Present SD Highway 38

Sec. 6 - T102N - R52W

LAYOUT OF EMBANKMENT AND SURFACING FOR CULVERT REPLACEMENT AT 279+81



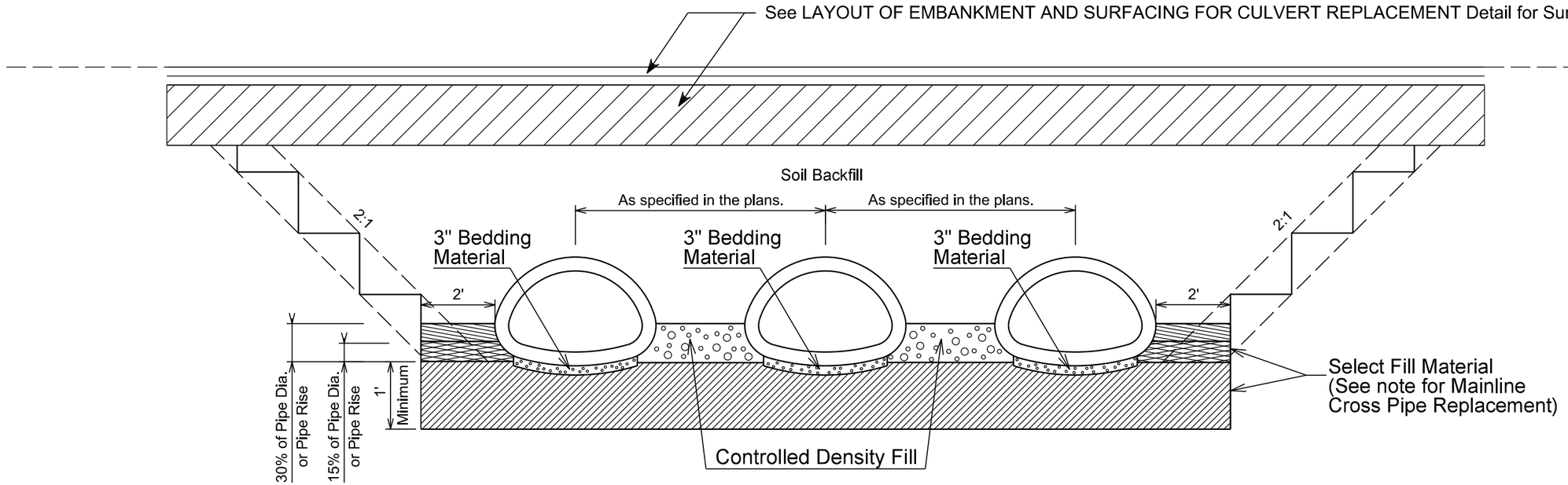
* Quantity is included in the Table of Additional Quantities.

PLOT SCALE - 1:6.5
PLOT NAME - 12
FILE - ...\PRJ2023\MCCK05UR\PIPEEXC.DGN
PLOTTED FROM - TRM111118

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0038(46)332	54	116

PIPE INSTALLATION DETAIL

Mainline Multiple Pipe Installation With Controlled Density Fill



STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0038(46)332	55	116

PLUG EXISTING CULVERT DETAIL

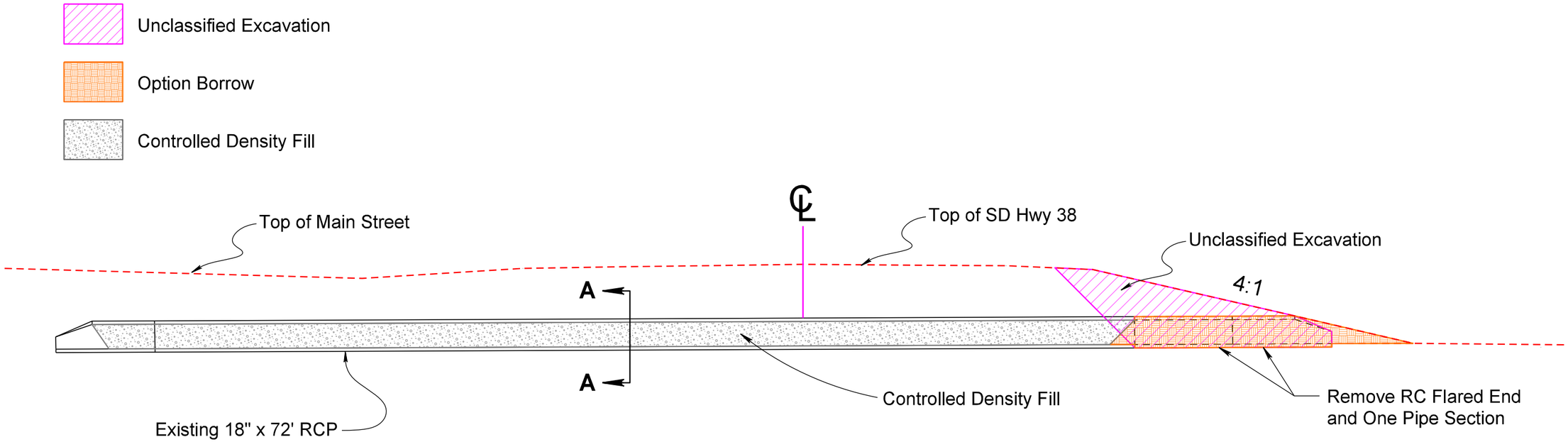
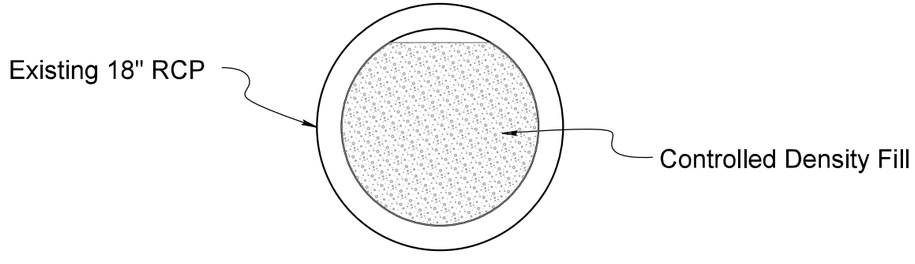


TABLE FOR PLUGGING EXISTING CULVERT

Project	Station	Unclassified Excavation CuYd	Contractor Furnished Borrow CuYd	Controlled Density Fill CuYd
P 0038(46)332	4+27	22	3	4.2

Quantities are included in the Table for Mainline Culvert Work

SECTION A-A



STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0038(46)332	56	116

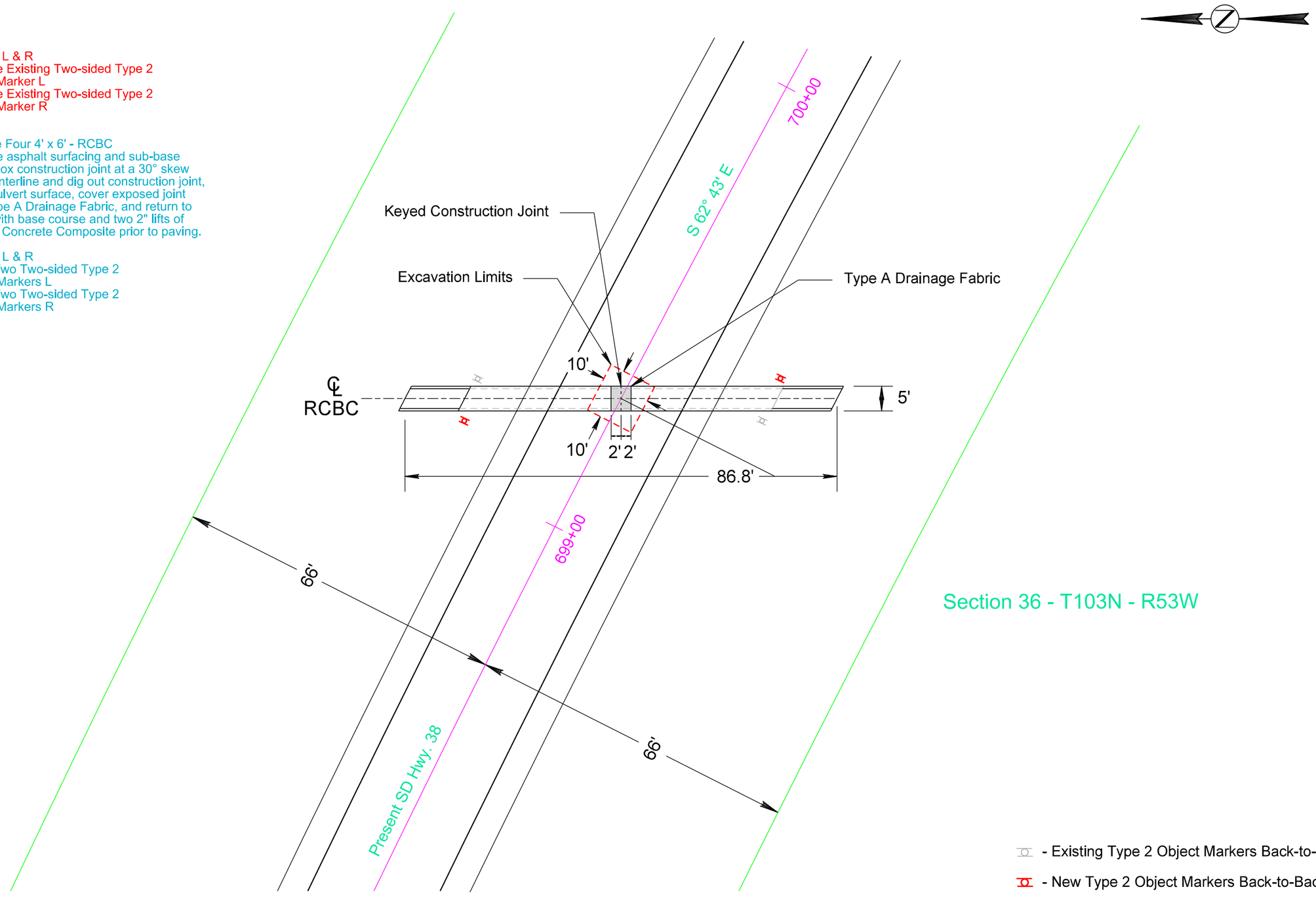
RC BOX CULVERT CONSTRUCTION JOINT REPAIR

Str. No. 44-239-119

699+29 L & R
Remove Existing Two-sided Type 2
Object Marker L
Remove Existing Two-sided Type 2
Object Marker R

699+29
In Place Four 4' x 6' - RCBC
Remove asphalt surfacing and sub-base at RC Box construction joint at a 30° skew from centerline and dig out construction joint, clean culvert surface, cover exposed joint with Type A Drainage Fabric, and return to grade with base course and two 2" lifts of Asphalt Concrete Composite prior to paving.

699+29 L & R
Install Two Two-sided Type 2
Object Markers L
Install Two Two-sided Type 2
Object Markers R

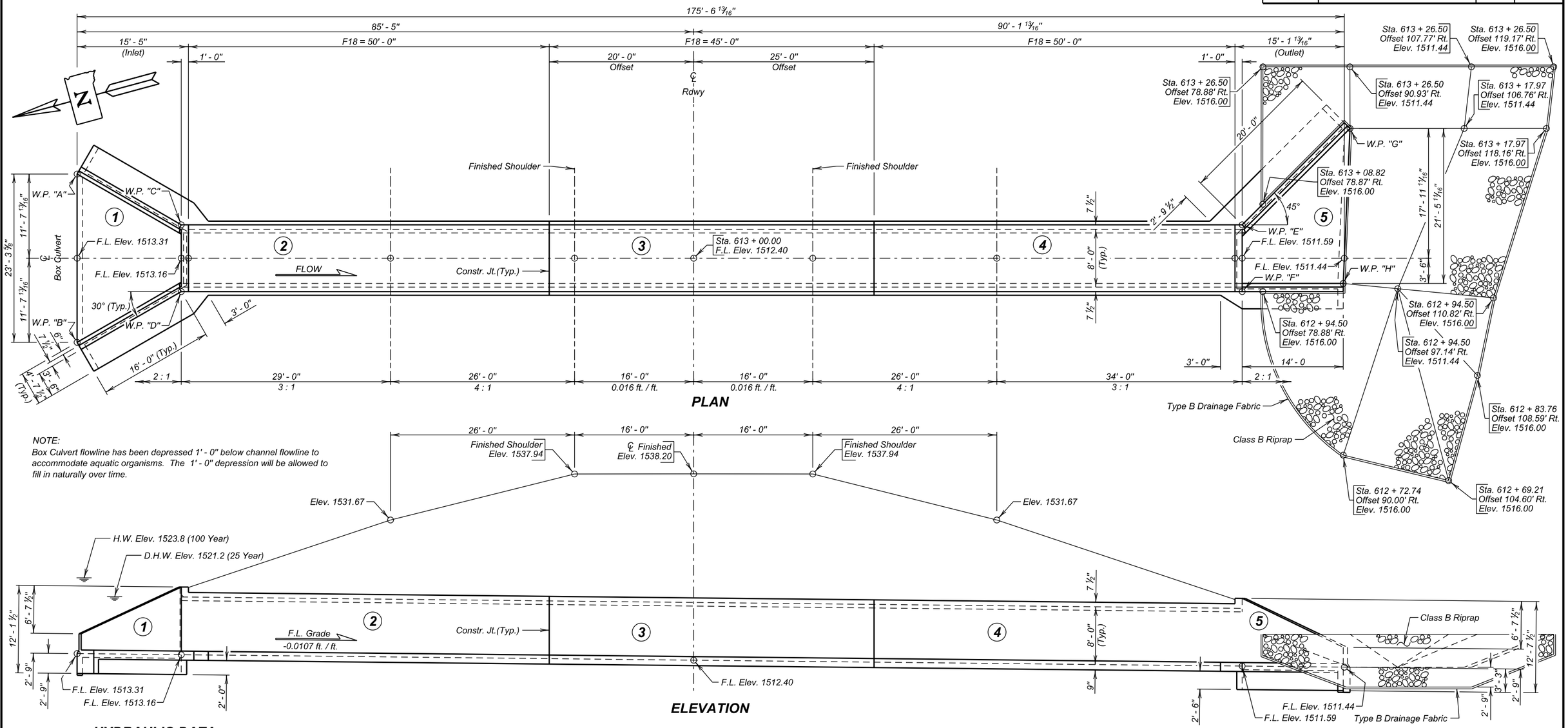


Section 36 - T103N - R53W

- Existing Type 2 Object Markers Back-to-Back
- New Type 2 Object Markers Back-to-Back

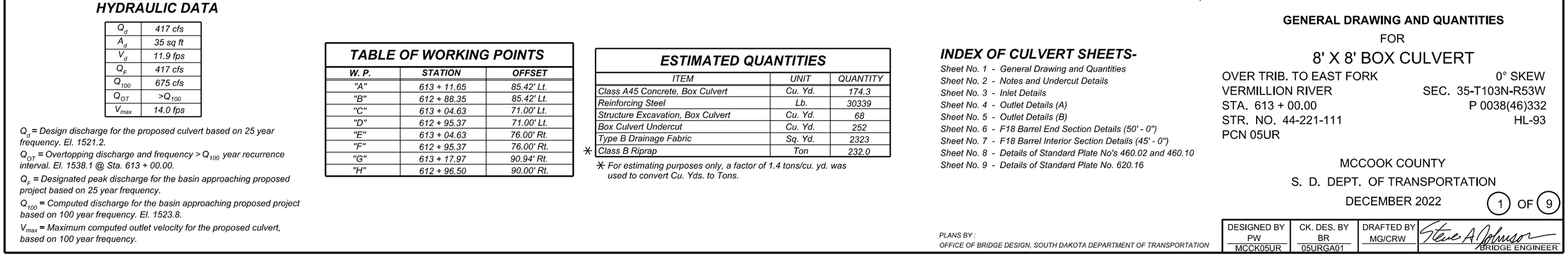
The elevations shown in these plans are based on the National Geodetic Survey (NGS) North American Vertical Datum of 1988 (NAVD88).

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	P 0038(46)332	57	116



PLAN

NOTE:
Box Culvert flowline has been depressed 1' - 0" below channel flowline to accommodate aquatic organisms. The 1' - 0" depression will be allowed to fill in naturally over time.



ELEVATION

HYDRAULIC DATA

Q_d	417 cfs
A_d	35 sq ft
V_d	11.9 fps
Q_F	417 cfs
Q_{100}	675 cfs
Q_{OT}	>Q_{100}
V_{max}	14.0 fps

Q_d = Design discharge for the proposed culvert based on 25 year frequency. El. 1521.2.

Q_{OT} = Overtopping discharge and frequency > Q_{100} year recurrence interval. El. 1538.1 @ Sta. 613 + 00.00.

Q_F = Designated peak discharge for the basin approaching proposed project based on 25 year frequency.

Q_{100} = Computed discharge for the basin approaching proposed project based on 100 year frequency. El. 1523.8.

V_{max} = Maximum computed outlet velocity for the proposed culvert, based on 100 year frequency.

TABLE OF WORKING POINTS

W. P.	STATION	OFFSET
"A"	613 + 11.65	85.42' Lt.
"B"	612 + 88.35	85.42' Lt.
"C"	613 + 04.63	71.00' Lt.
"D"	612 + 95.37	71.00' Lt.
"E"	613 + 04.63	76.00' Rt.
"F"	612 + 95.37	76.00' Rt.
"G"	613 + 17.97	90.94' Rt.
"H"	612 + 96.50	90.00' Rt.

ESTIMATED QUANTITIES

ITEM	UNIT	QUANTITY
Class A45 Concrete, Box Culvert	Cu. Yd.	174.3
Reinforcing Steel	Lb.	30339
Structure Excavation, Box Culvert	Cu. Yd.	68
Box Culvert Undercut	Cu. Yd.	252
Type B Drainage Fabric	Sq. Yd.	2323
Class B Riprap	Ton	232.0

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

INDEX OF CULVERT SHEETS-

GENERAL DRAWING AND QUANTITIES

FOR

8' X 8' BOX CULVERT

OVER TRIB. TO EAST FORK VERMILLION RIVER
STA. 613 + 00.00
STR. NO. 44-221-111
PCN 05UR

0° SKEW
SEC. 35-T103N-R53W
P 0038(46)332
HL-93

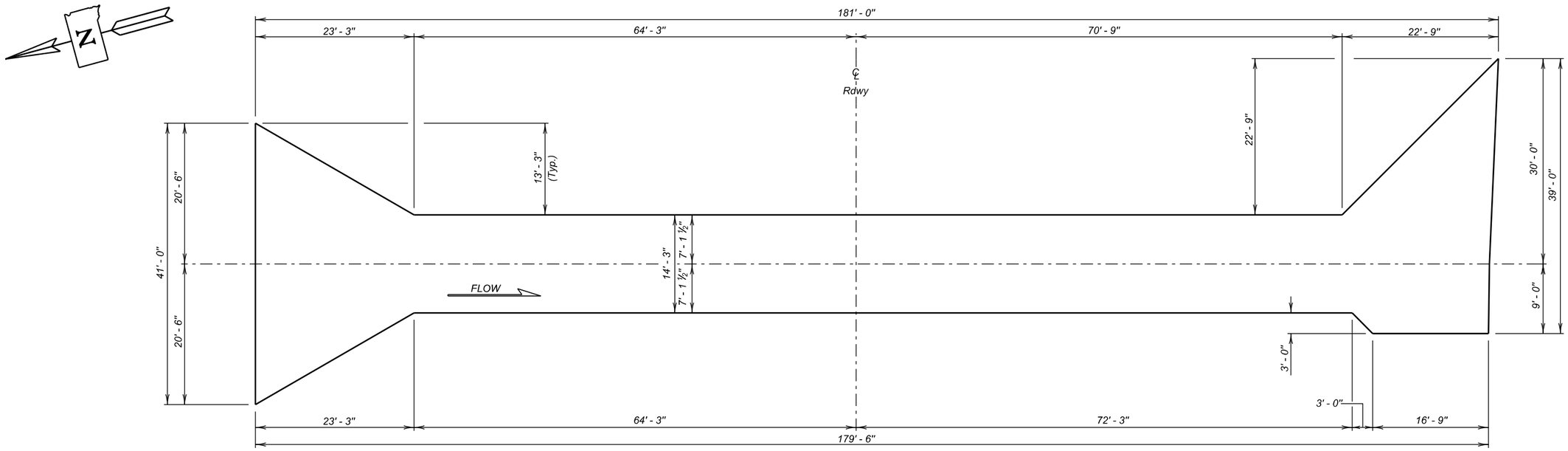
MCCOOK COUNTY
S. D. DEPT. OF TRANSPORTATION
DECEMBER 2022

1 OF 9

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

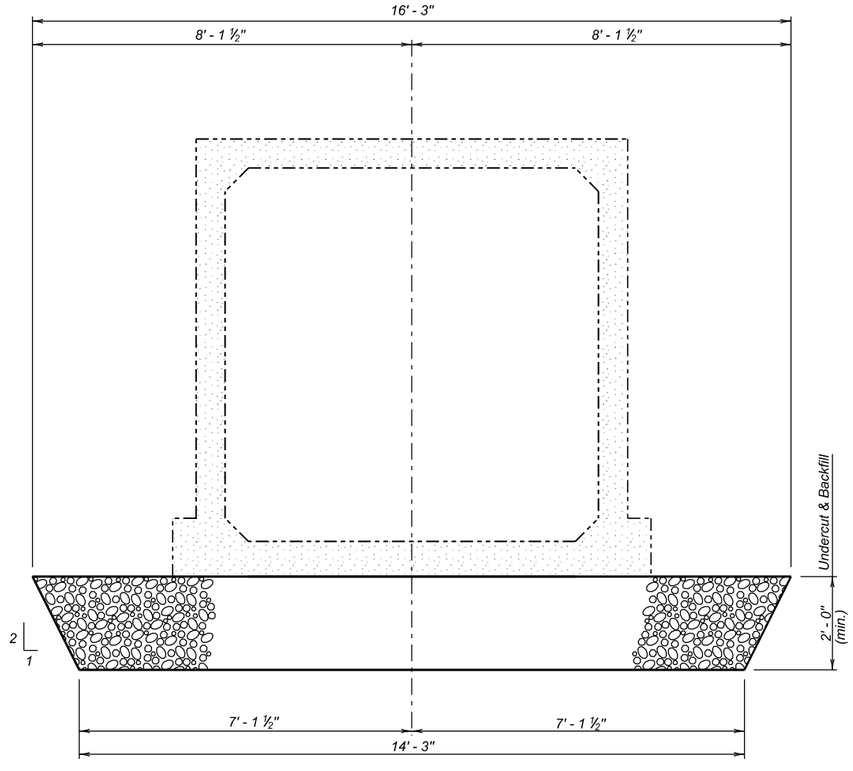
DESIGNED BY	CK. DES. BY	DRAFTED BY	
PW	BR	MG/CRW	Steve A Johnson BRIDGE ENGINEER
MCCK05UR	05URGA01		

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	P 0038(46)332	58	116



UNDERCUT LAYOUT

(Bottom Dimensions)



TYPICAL SECTION

(For Limits of Undercut)

SPECIFICATIONS

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

GENERAL NOTES

1. Design Live Load: HL-93 and construction loading consisting of one 7' - 6" gage axle with gross axle weight = 95,850 lbs. The construction load will not be applied until a minimum of 4 ft. of fill has been placed over the box culvert. Other construction loads in excess of legal load must be submitted thru proper channels to the Office of Bridge Design for analysis.
2. The design of the barrel section is based on a minimum fill height of 2 feet and includes all subsequent fill heights up to and including the maximum fill height of 18 ft. (F18).
3. Design Material Strengths: Concrete $f'c$ = 4500 p.s.i.
   Reinforcing Steel f_y = 60000 p.s.i.
4. All concrete will be Class A45 Concrete, Box Culvert conforming to Section 460 of the Construction Specifications.
5. All reinforcing steel will conform to ASTM A615 Grade 60.
6. All lap splices shown are contact lap splices unless noted otherwise.
7. All exposed edges will be chamfered ¾ inch unless noted otherwise in the plans.
8. Use 1 inch clear cover on all reinforcing steel EXCEPT as shown.
9. The Contractor will imprint on the structure the date of construction as specified and detailed on Standard Plate No. 460.02.
10. Care will be taken to establish Working Points (W.P.) as shown on the wings.
11. Circled numbers in PLAN and ELEVATION views on the General Drawing are section I.D. Numbers (see SDDOT Materials Manual).
12. Cost of Preformed Expansion Joint Filler used in apron construction will be incidental to the other contract items.
13. Soils below the bottom of the proposed RCBC consist of dark gray silt clay with sand. Groundwater was encountered in the borings at an elevation of 1513.94 feet in the boring during the subsurface investigation conducted in July 2022. Dewatering will be required during construction. All costs incurred for dewatering will be incidental to other contract items.

ESTIMATED QUANTITIES

	ITEM	UNIT	QUANTITY
℄	Box Culvert Undercut	Cu. Yd.	252

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

NOTES AND UNDERCUT DETAILS

FOR

8' X 8' BOX CULVERT

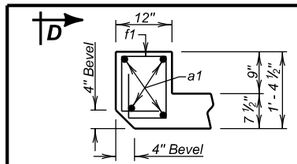
OVER TRIB. TO EAST FORK VERMILLION RIVER — 0° SKEW
STA. 613 + 00.00 — SEC. 35-T103N-R53W
STR. NO. 44-221-111 — P 0038(46)332
HL-93

MCCOOK COUNTY
S. D. DEPT. OF TRANSPORTATION
DECEMBER 2022

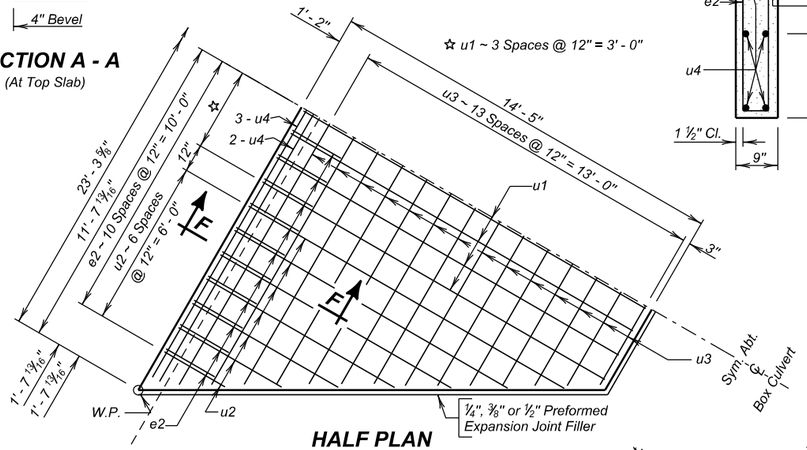
DESIGNED BY	CK. DES. BY	DRAFTED BY	
PW MCCK05UR	BR 05URGA02	CRW	Steve A Johnson BRIDGE ENGINEER

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	P 0038(46)332	59	116

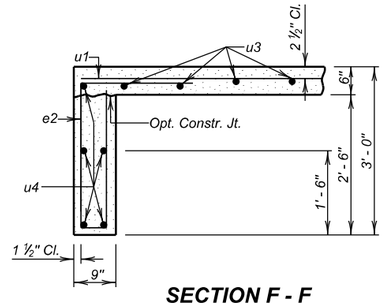
NOTE:
Apron will NOT be built monolithic with the Box Culvert.



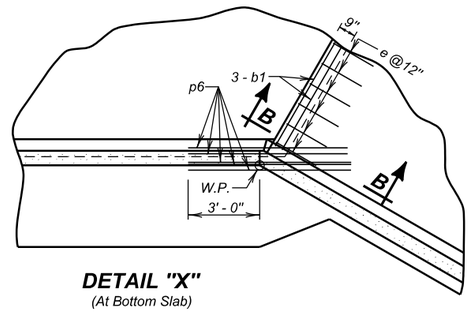
SECTION A - A
(At Top Slab)



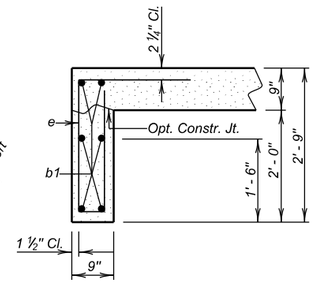
HALF PLAN
(Inlet Apron)



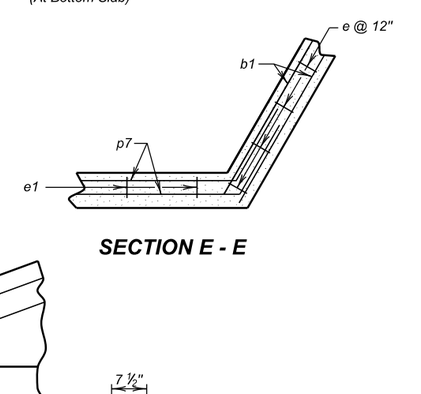
SECTION F - F



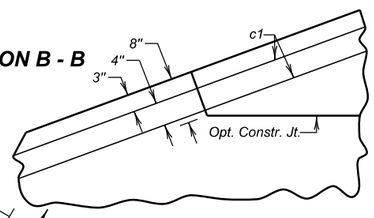
DETAIL "X"
(At Bottom Slab)



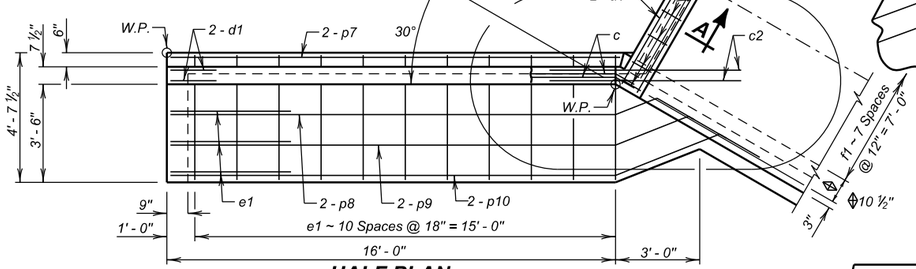
SECTION B - B



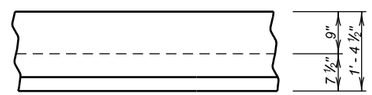
SECTION E - E



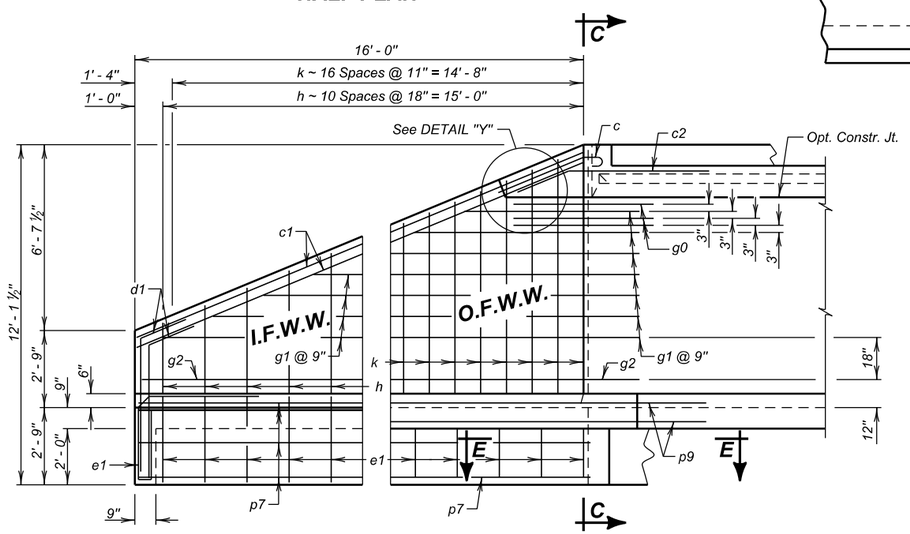
DETAIL "Y"
(Showing c1 bars only)



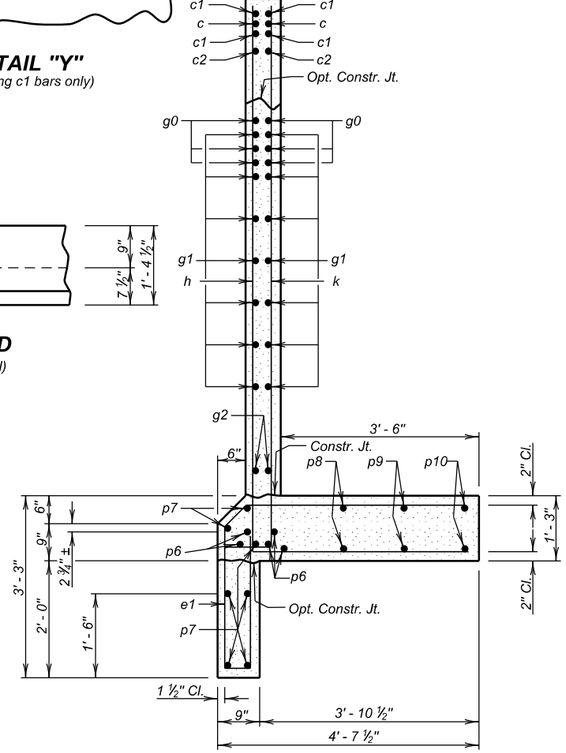
HALF PLAN



VIEW D - D
(At Interior Wall)



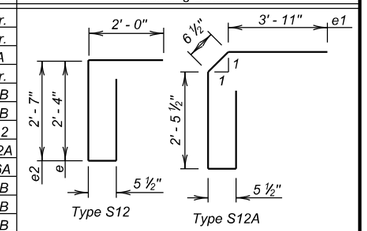
ELEVATION

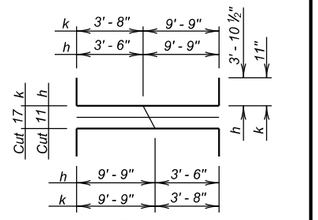


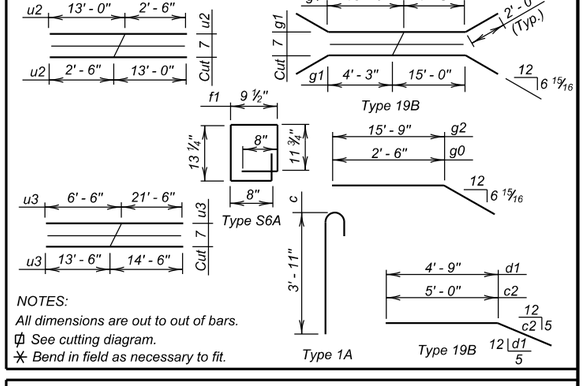
SECTION C - C

REINFORCING SCHEDULE

	Mk.	No.	Size	Length	Type	Bending Details
	a1	4	6	9' -0"	Str.	
	b1	6	6	7' - 3"	Str.	
*	c	4	5	4' - 6"	1A	
	c1	8	5	17' - 3"	Str.	
	c2	4	5	7' - 0"	19B	
	d1	8	5	6' - 6"	19B	
	e	8	4	7' - 0"	S12	
	e1	28	4	9' - 9"	S12A	
	f1	10	4	5' - 0"	S6A	
	g0	12	5	5' - 0"	19B	
℄	g1	14	4	23' - 3"	19B	
	g2	4	4	17' - 9"	19B	
℄	h	11	4	21' - 0"	17A	
℄	k	17	4	15' - 3"	17A	
	p6	10	6	7' - 0"	Str.	
*	p7	14	4	18' - 6"	Str.	
* *	p8	4	4	19' - 3"	Str.	
* *	p9	4	4	20' - 9"	Str.	
* *	p10	4	4	22' - 0"	Str.	
	INLET APRON					
	e2	21	4	7' - 6"	S12	
	u1	7	4	14' - 0"	Str.	
℄	u2	7	4	15' - 6"	Str.	
℄	u3	7	4	28' - 0"	Str.	
	u4	5	4	22' - 0"	Str.	







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

ESTIMATED QUANTITIES

ITEM	Class A45 Concrete, Box Culvert	Reinforcing Steel	Structure Excavation, Box Culvert
UNIT	Cu. Yd.	Lb.	Cu. Yd.
Inlet	15.2	1720	7.4
Inlet Apron	5.6	448	5.6

INLET DETAILS
FOR
8' X 8' BOX CULVERT

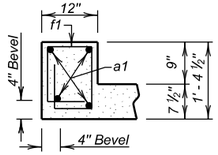
OVER TRIB. TO EAST FORK VERMILLION RIVER
STA. 613 + 00.00
STR. NO. 44-221-111

0° SKEW
SEC. 35-T103N-R53W
P 0038(46)332
HL-93

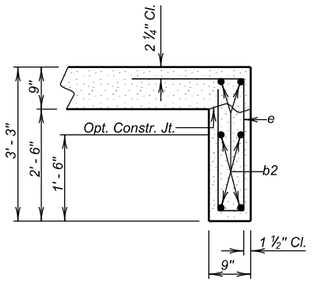
MCCOOK COUNTY
S. D. DEPT. OF TRANSPORTATION
DECEMBER 2022

DESIGNED BY	CK. DES. BY	DRAFTED BY	
PW	BR	MG/CRW	Steve A Johnson BRIDGE ENGINEER
MCCK05UR	05URGA03		

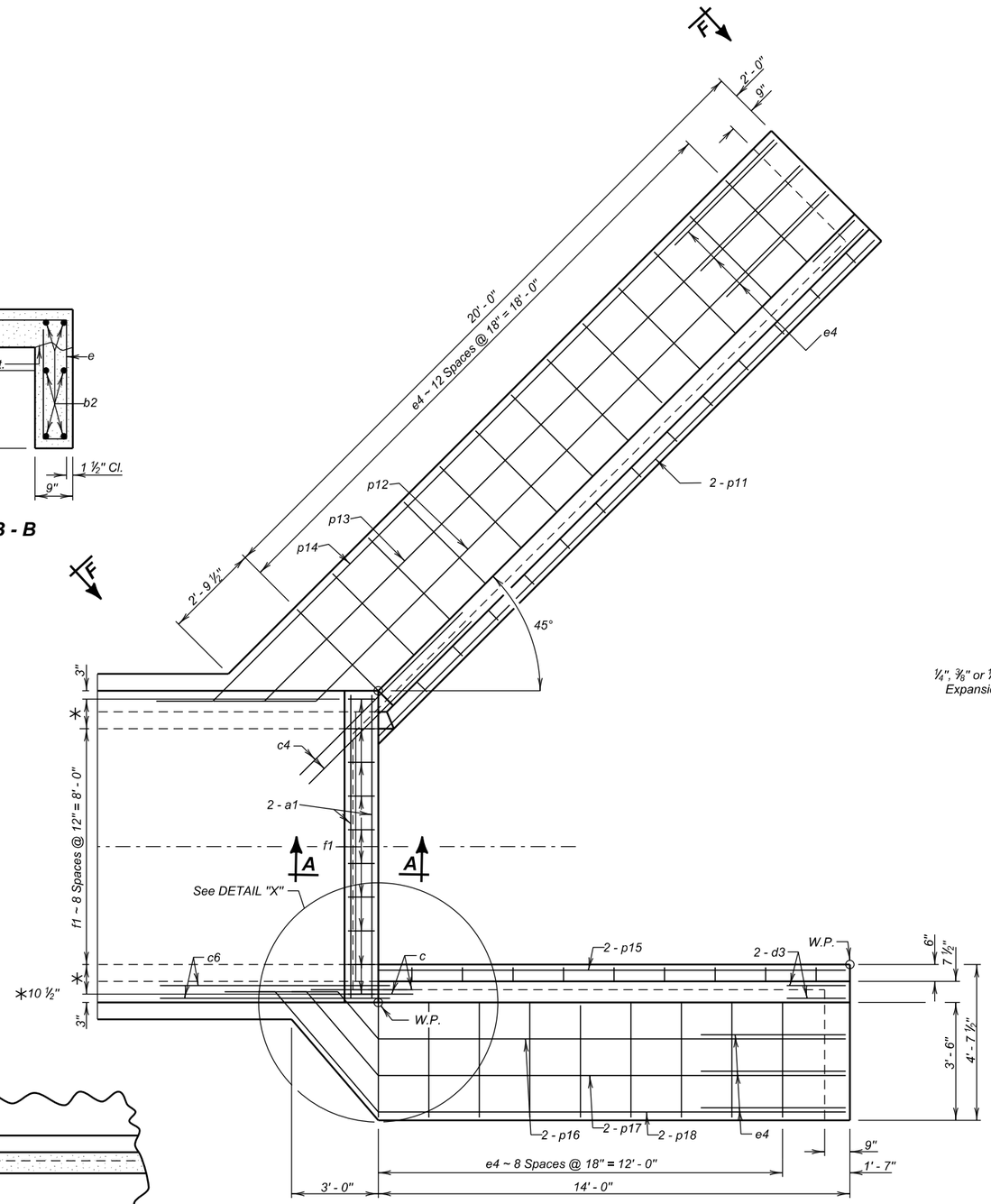
STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	P 0038(46)332	60	116



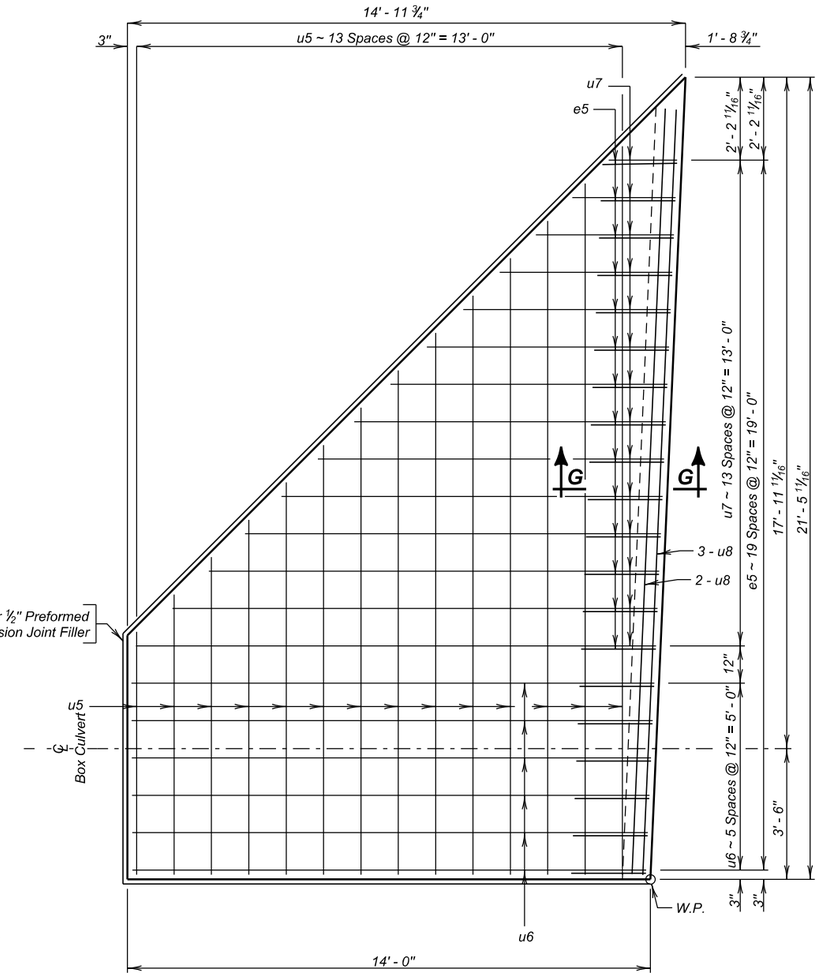
SECTION A - A
(At Top Slab)



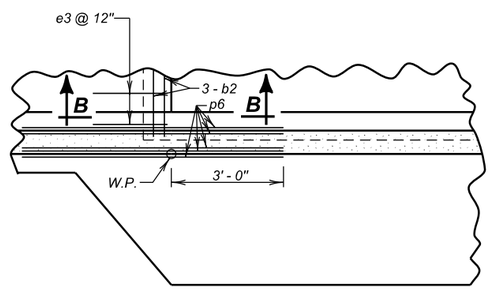
SECTION B - B



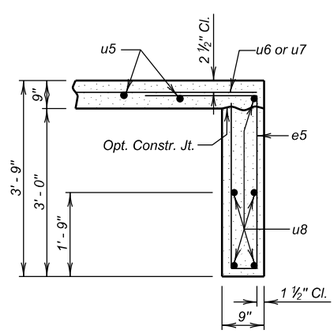
PLAN



PLAN
(Outlet Apron)



DETAIL "X"
(At Bottom Slab)



SECTION G - G

OUTLET DETAILS (A)

FOR

8' X 8' BOX CULVERT

OVER TRIB. TO EAST FORK VERMILLION RIVER
STA. 613 + 00.00
STR. NO. 44-221-111

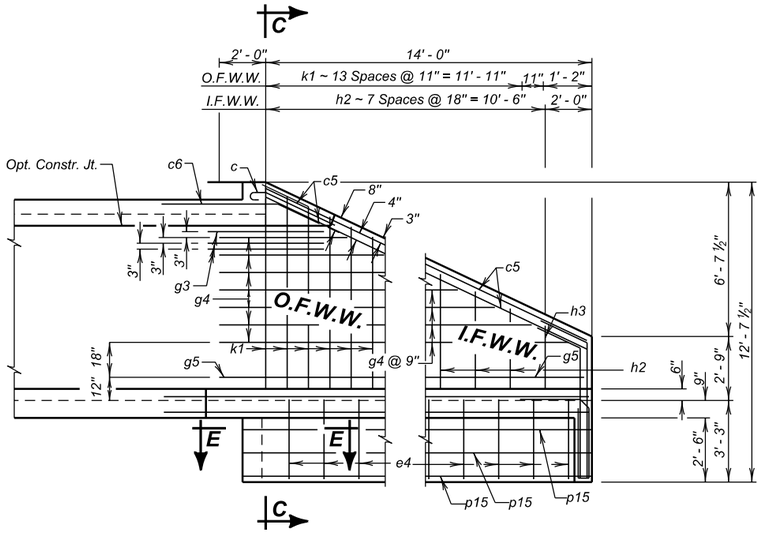
0° SKEW
SEC. 35-T103N-R53W
P 0038(46)332
HL-93

MCCOOK COUNTY
S. D. DEPT. OF TRANSPORTATION
DECEMBER 2022

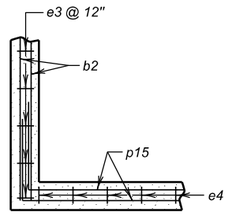
4 OF 8

DESIGNED BY	CK. DES. BY	DRAFTED BY	
PW	BR	CRW	Steve A Johnson BRIDGE ENGINEER
MCCK05UR	05URGA04		

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	P 0038(46)332	61	116



SECTION J - J



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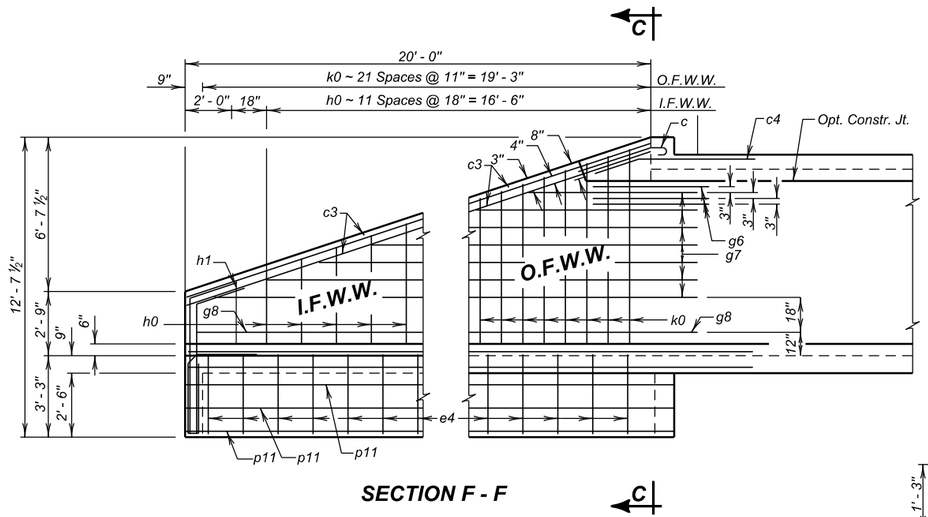
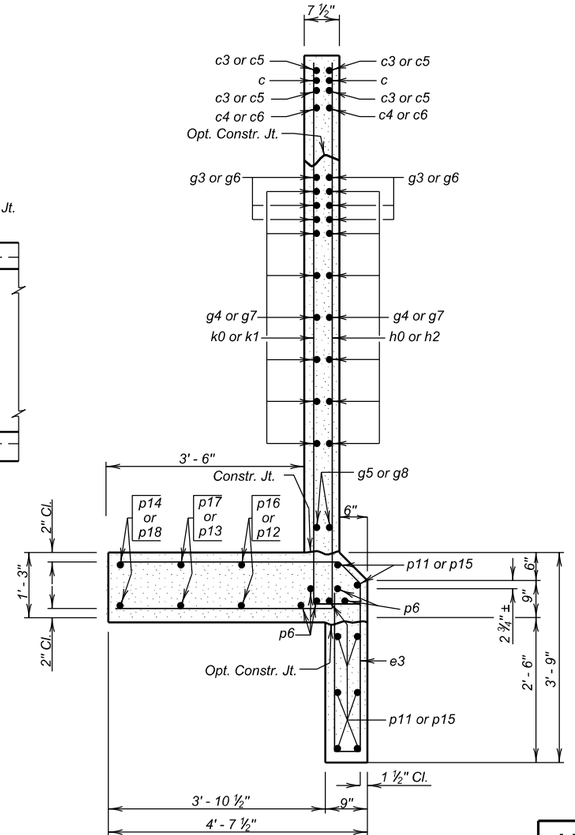


SECTION F - F

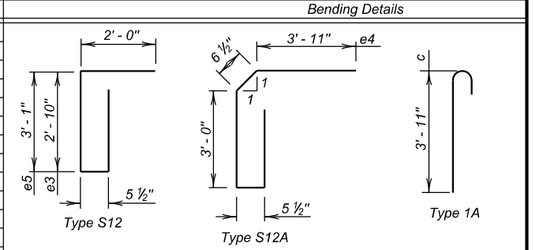


SECTION C - C

REINFORCING SCHEDULE

Mk.	No.	Size	Length	Type
a1	4	6	9' - 0"	Str.
b2	6	6	7' - 6"	Str.
c	4	5	4' - 6"	1A
c3	4	5	21' - 0"	Str.
c4	2	5	7' - 0"	19B
c5	4	5	15' - 3"	Str.
c6	2	5	7' - 0"	19B
d2	4	5	7' - 0"	19B
d3	4	5	7' - 0"	19B
e3	8	4	8' - 0"	S12
e4	28	4	10' - 9"	S12A
f1	10	4	5' - 0"	S6A
g3	6	5	5' - 0"	Str.
⌀ g4	7	4	20' - 6"	Str.
g5	2	4	15' - 9"	Str.
g6	6	5	5' - 0"	19B
⌀ g7	7	4	28' - 0"	19B
g8	2	4	21' - 6"	19B
⌀ h0	6	4	21' - 9"	17A
h1	1	4	7' - 6"	17A
⌀ h2	4	4	22' - 0"	17A
h3	1	4	8' - 0"	17A
⌀ k0	11	4	15' - 0"	17A
⌀ k1	7	4	15' - 6"	17A
k2	1	4	4' - 6"	17A
p6	10	6	7' - 0"	Str.
✳ p11	7	4	22' - 6"	Str.
✳ p12	2	4	23' - 0"	Str.
✳ p13	2	4	24' - 0"	Str.
✳ p14	2	4	25' - 3"	Str.
✳ p15	7	4	16' - 6"	Str.
✳ p16	2	4	17' - 6"	Str.
✳ p17	2	4	19' - 0"	Str.
✳ p18	2	4	20' - 6"	Str.
OUTLET APRON				
e5	20	4	8' - 6"	S12
⌀ u5	7	4	25' - 9"	Str.
u6	6	4	13' - 9"	Str.
⌀ u7	7	4	16' - 0"	Str.
u8	5	4	20' - 6"	Str.

Bending Details



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

ESTIMATED QUANTITIES

ITEM	Class A45 Concrete, Box Culvert	Reinforcing Steel	Structure Excavation, Box Culvert
UNIT	Cu. Yd.	Lb.	Cu. Yd.
Outlet	16.6	1798	8.4
Outlet Apron	5.5	432	5.5

LEGEND FOR PLACING RE-STEEL

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

OUTLET DETAILS (B)

FOR

8' X 8' BOX CULVERT

OVER TRIB. TO EAST FORK VERMILLION RIVER
STA. 613 + 00.00
STR. NO. 44-221-111

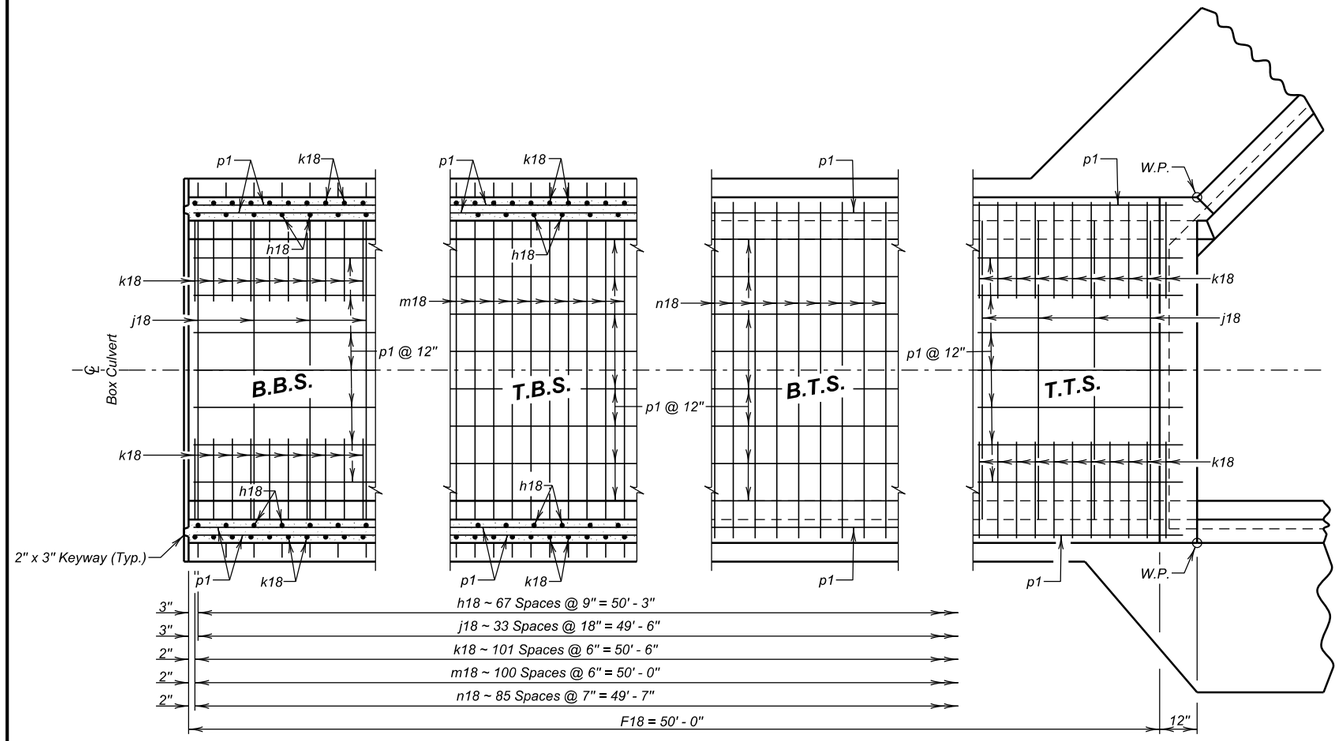
0° SKEW
SEC. 35-T103N-R53W
P 0038(46)332
HL-93

MCCOOK COUNTY
S. D. DEPT. OF TRANSPORTATION
DECEMBER 2022

5 OF 8

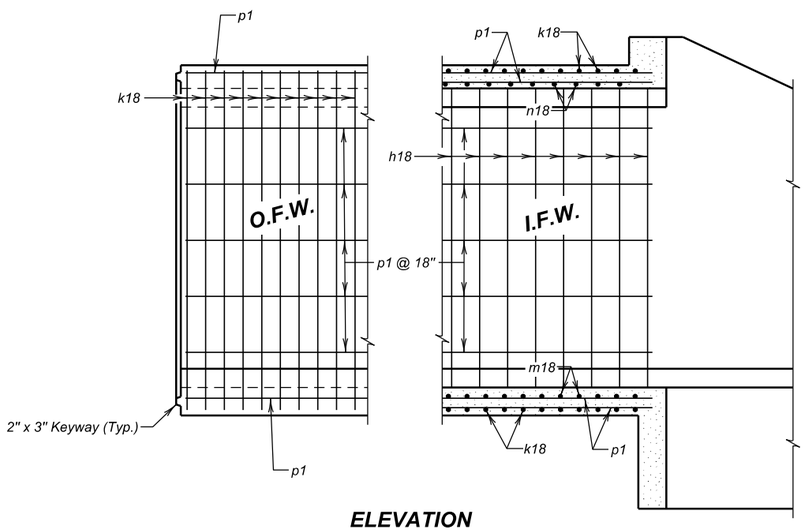
DESIGNED BY	CK. DES. BY	DRAFTED BY	
PW	BR	CRW	Steve A. Johnson BRIDGE ENGINEER
MCCK05UR	05URGA05		

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	P 0038(46)332	62	116

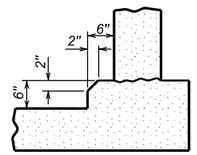


PLAN

(Outlet End shown, Inlet similar by rotation)



ELEVATION



OPTIONAL FILLET DETAIL

(At Bottom Slab)

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

OPTIONAL POUR - BOTTOM SLAB

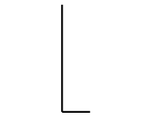
The Bottom Slab may be poured continuously, at the option of the Contractor, with the use of a Preformed Metal keyway conforming to the keyway dimensions and location as shown on the plans. The keyway length will be full width of the bottom slab. Care will be taken to maintain proper alignment of the keyway during the pour sequence. All additional costs of this option will be borne by the Contractor.

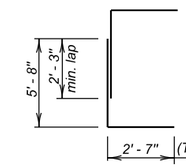
△ *Place z1 bars thru construction joint between barrel sections as shown on Standard Plate No. 460.10. Quantity of z1 bars is for two construction joints.*

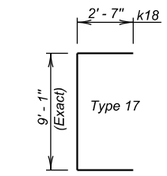
REINFORCING SCHEDULE

(For 2 - F18 Barrel End Sections)

Mk.	No.	Size	Length	Type	Bending Details
h18	272	4	9' - 9"	17A	
j18	136	4	8' - 0"	Str.	
k18	408	5	14' - 3"	17	
m18	202	6	10' - 0"	Str.	
n18	172	6	9' - 0"	Str.	
p1	116	4	50' - 6"	Str.	
△ z1	52	5	3' - 6"	Str.	







OPTIONAL k18 SPLICE DETAIL
Contractor may use optional reinforcing steel splice, as shown. The cost of the additional reinforcing steel shall be borne by the Contractor.

NOTES:

All dimensions are out to out of bars.

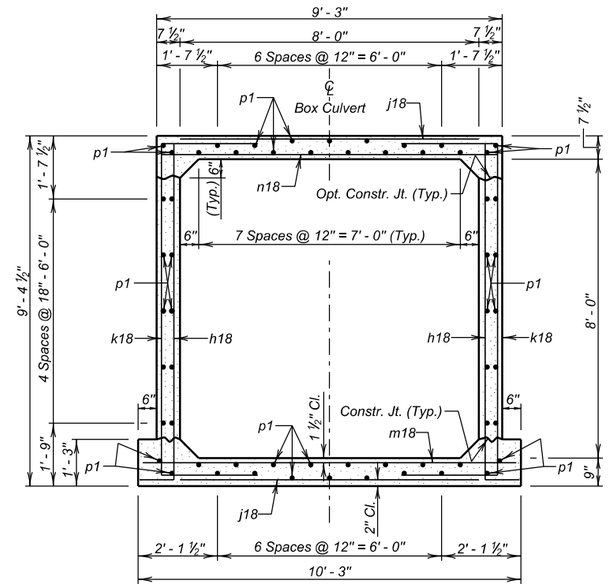
Request for additional reinforcing steel splices at points other than those shown, must be submitted to the Engineer for prior approval. If additional splices are approved, no payment will be allowed for the added quantity of reinforcing steel.

ESTIMATED QUANTITIES

ITEM	Class A45 Concrete, Box Culvert	Reinforcing Steel	Structure Excavation, Box Culvert
UNIT	Cu.Yd.	Lb.	Cu.Yd.
2 - F18 Barrel End Sections @ 50' - 0"	90.6	18024	28.5

LEGEND FOR PLACING RE-STEEL

T.T.S. - Top of Top Slab
B.T.S. - Bottom of Top Slab
T.B.S. - Top of Bottom Slab
B.B.S. - Bottom of Bottom Slab
O.F.W. - Outside Face of Wall
I.F.W. - Inside Face of Wall



F18 BARREL SECTION

(18' - 0" Maximum Fill)

F18 BARREL END SECTION DETAILS (50' - 0")

FOR

8' X 8' BOX CULVERT

OVER TRIB. TO EAST FORK VERMILLION RIVER
STA. 613 + 00.00
STR. NO. 44-221-111

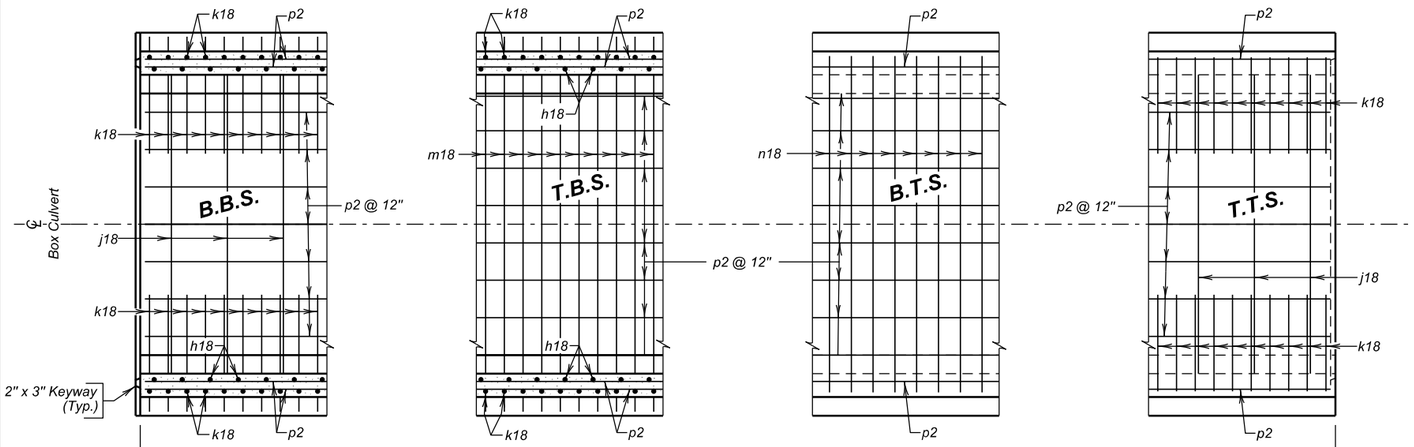
0° SKEW
SEC. 35-T103N-R53W
P 0038(46)332
HL-93

MCCOOK COUNTY
S. D. DEPT. OF TRANSPORTATION
DECEMBER 2022

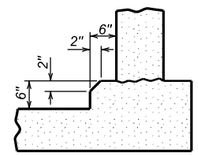
6 OF 9

DESIGNED BY	CK. DES. BY	DRAFTED BY	
PW	BR	CRW	Steve A Johnson BRIDGE ENGINEER
MCCK05UR	05URGA06		

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	P 0038(46)332	63	116



PLAN



OPTIONAL FILLET DETAIL

(At Bottom Slab)

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

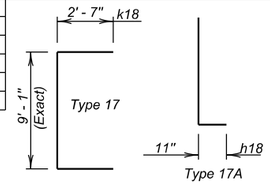
OPTIONAL POUR - BOTTOM SLAB

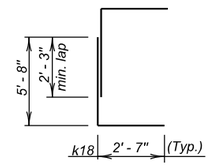
The Bottom Slab may be poured continuously, at the option of the Contractor, with the use of a Preformed Metal keyway conforming to the keyway dimensions and location as shown on the plans. The keyway length will be full width of the bottom slab. Care will be taken to maintain proper alignment of the keyway during the pour sequence. All additional costs of this option will be borne by the Contractor.

REINFORCING SCHEDULE

(For One F18 Barrel Interior Section)

Mk.	No.	Size	Length	Type	Bending Details
h18	120	4	9' - 9"	17A	
j18	60	4	8' - 0"	Str.	
k18	180	5	14' - 3"	17	
m18	90	6	10' - 0"	Str.	
n18	78	6	9' - 0"	Str.	
p2	58	4	44' - 9"	Str.	





OPTIONAL k18 SPLICE DETAIL

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

NOTES:

All dimensions are out to out of bars.

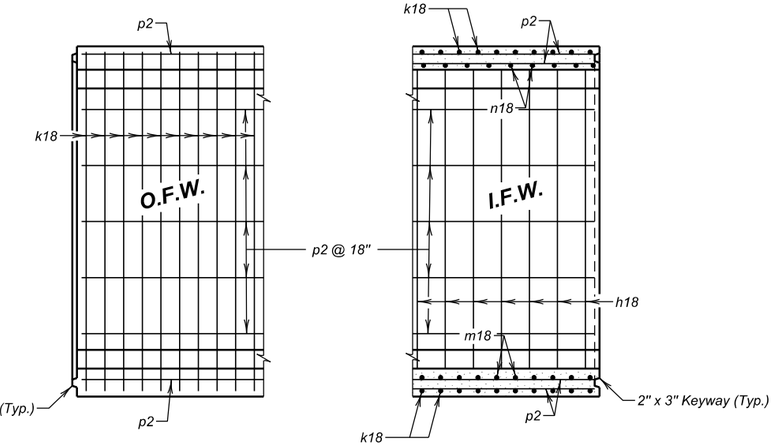
Request for additional reinforcing steel splices at points other than those shown, must be submitted to the Engineer for prior approval. If additional splices are approved, no payment will be allowed for the added quantity of reinforcing steel.

ESTIMATED QUANTITIES

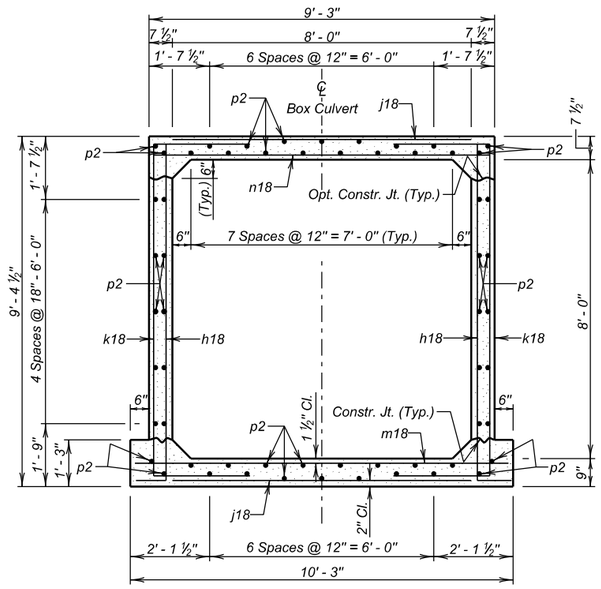
ITEM	Class A45 Concrete, Box Culvert	Reinforcing Steel	Structure Excavation, Box Culvert
UNIT	Cu.Yd.	Lb.	Cu.Yd.
F18 Barrel Interior Section @ 45' - 0"	40.8	7917	12.8

LEGEND FOR PLACING RE-STEEL

T.T.S.	- Top of Top Slab
B.T.S.	- Bottom of Top Slab
T.B.S.	- Top of Bottom Slab
B.B.S.	- Bottom of Bottom Slab
O.F.W.	- Outside Face of Wall
I.F.W.	- Inside Face of Wall



ELEVATION



F18 BARREL SECTION

(18' - 0" Maximum Fill)

F18 BARREL INTERIOR SECTION BETAILS (45' - 0")

FOR

8' X 8' BOX CULVERT

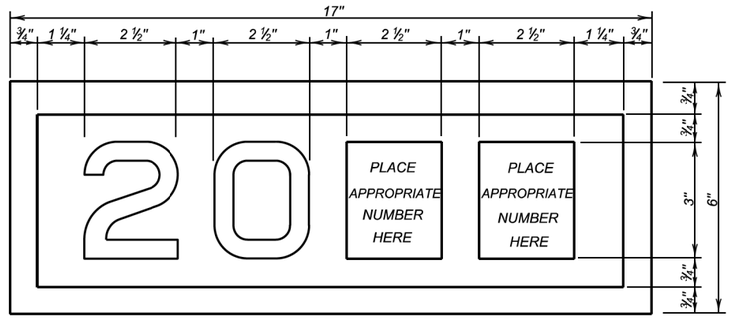
OVER TRIB. TO EAST FORK VERMILLION RIVER
STA. 613 + 00.00
STR. NO. 44-221-111

0° SKEW
SEC. 35-T103N-R53W
P 0038(46)332
HL-93

MCCOOK COUNTY
S. D. DEPT. OF TRANSPORTATION
DECEMBER 2022

DESIGNED BY	CK. DES. BY	DRAFTED BY	
PW	BR	CRW	Steve A Johnson BRIDGE ENGINEER
MCCK05UR	05URGA07		

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	P 0038(46)332	64	116



YEAR PLATE DETAILS

GENERAL NOTES:

1. Year plates of the general dimensions shown will be constructed on all box culverts and bridges. The year plates will be constructed in reverse and attached to the forms in such a manner that the finished imprint in the concrete does not exceed one-half (1/2) inch in depth.

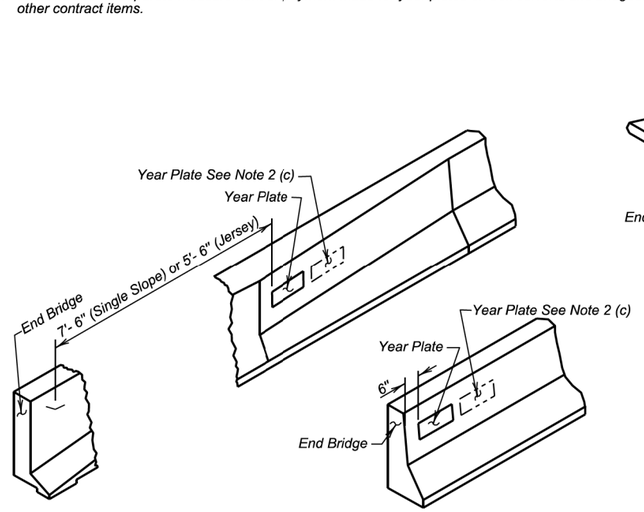
2. Year plates will be located on structure(s) as follows:

   a. On cast-in-place box culverts the year plates will be four and one - half (4 ½) inches below the top of the upstream parapet wall and centered laterally on the upstream face. On precast box culverts the year plate will be centered laterally on the upstream face of the top slab. Where an extended interior wall interferes with this location, the year plate will be centered in an adjacent barrel.

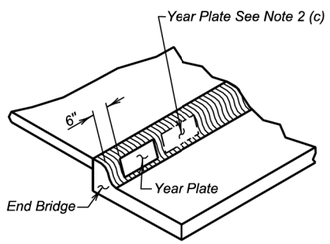
   b. On bridges with six (6) inch curbs, "Jersey" shaped barriers with no endblocks, or "Single Slope" shaped barriers with no endblocks, the year plate will be centered vertically on the curb face approximately six (6) inches from the end of the bridge, or as designated by the Engineer. On bridges with barrier endblocks, the year plate will be centered on the upper sloped portion of the barrier approximately 5'- 6" for "Jersey" shaped barriers from the end of the bridge and 7'-6" for "Single Slope" shaped barriers from the end of bridge, or as designated by the Engineer. There will be one year plate at each end of the bridge on opposite sides.

   c. When the plans specify that both the original date of construction and the date of reconstruction are to be shown, one date will be placed as listed above and the other located adjacent to it. Both year plates will be shown at each end of the bridge on opposite sides.

3. There will be no separate measurement or payment made for year plates on box culverts and bridges. All costs for this work will be incidental to other contract items.

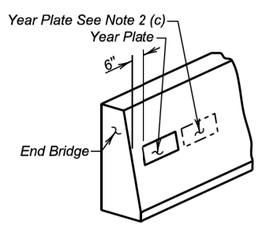


BARRIER
(With Endblock)



TYPE B CURB

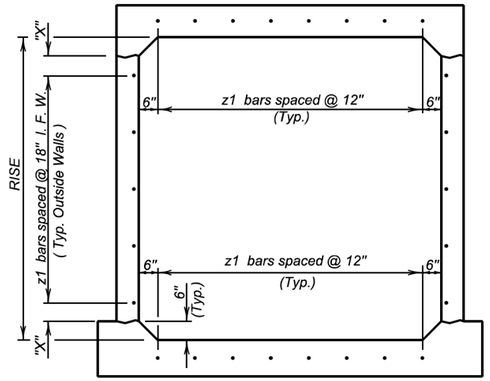
JERSEY BARRIER



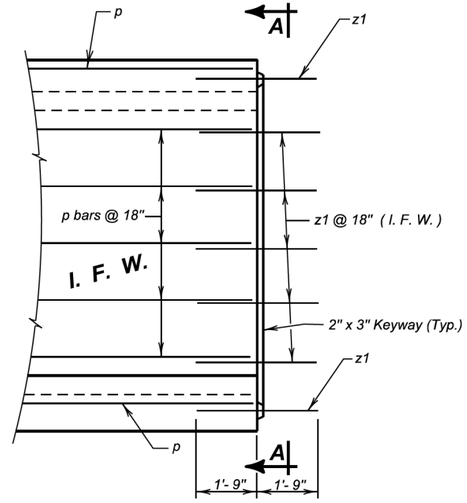
SINGLE SLOPE BARRIER

January 22,2021

Published Date: 2024	SDDOT	YEAR PLATE DETAILS	PLATE NUMBER 460.02
			Sheet 1 Of 1

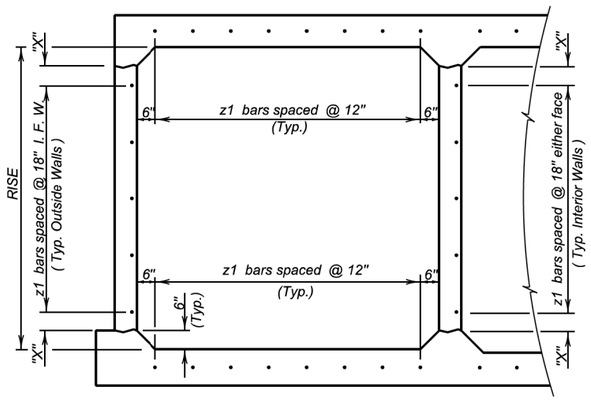


TYPICAL SINGLE BARREL VIEW A - A



ELEVATION

LEGEND FOR PLACING RE-STEEL
I. F. W. - Inside Face Wall



TYPICAL MULTIPLE BARREL VIEW A - A

RISE	"X"
3'- 0"	3"
4'- 0"	9"
5'- 0"	6"
6'- 0"	3"
7'- 0"	9"
8'- 0"	6"
9'- 0"	3"
10'- 0"	9"
11'- 0"	6"
12'- 0"	3"
13'- 0"	9"
14'- 0"	6"

GENERAL NOTES:

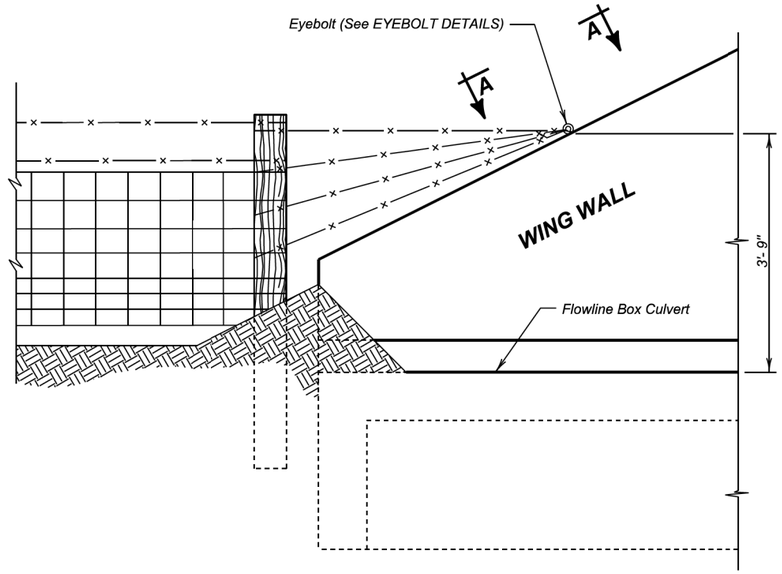
1. z1 bars will be placed in the middle of the 2" X 3" keyway in the top and bottom slabs. z1 bars will be lapped with the longitudinal p bars in the inside face of the wall for outside walls and in either face for interior walls. z1 bars are listed and included elsewhere in plans.

2. Drainage Fabric Protection will be placed in accordance with Section 422, or Section 560, whichever is applicable.

June 1, 2022

Published Date: 2024	SDDOT	BOX CULVERT BARREL TIE REINFORCEMENT	PLATE NUMBER 460.10
			Sheet 1 of 1

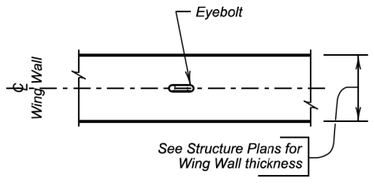
8' X 8' BOX CULVERT
STR. NO. 44-221-111
DECEMBER 2022



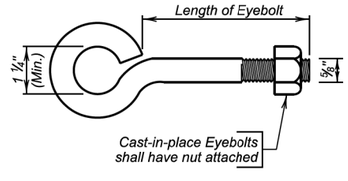
DETAIL FOR FENCE ANCHORS

GENERAL NOTES:

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



VIEW A - A



EYEBOLT DETAILS

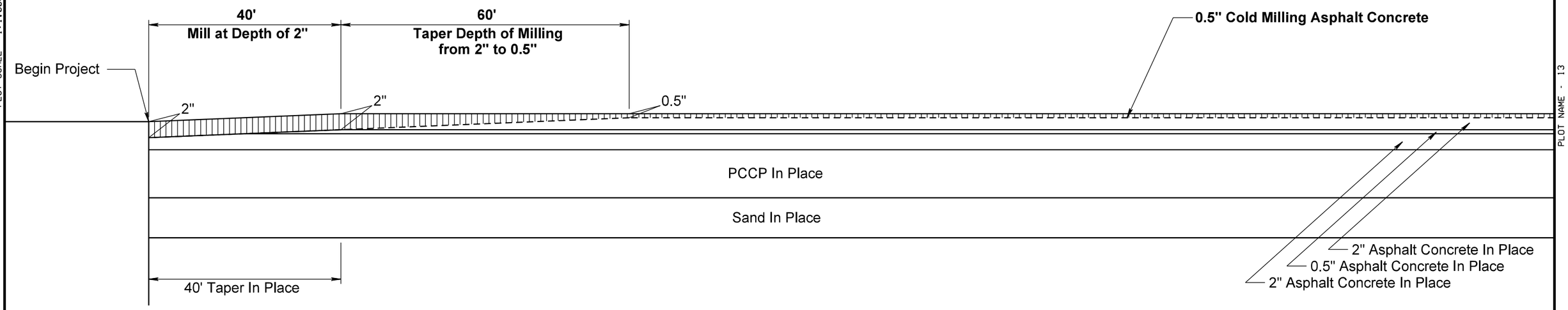
December 23,2012

Published Date: 2024	SDDOT	FENCE ANCHORS FOR BOX CULVERT WING WALLS	PLATE NUMBER 620.16
			Sheet 1 of 1

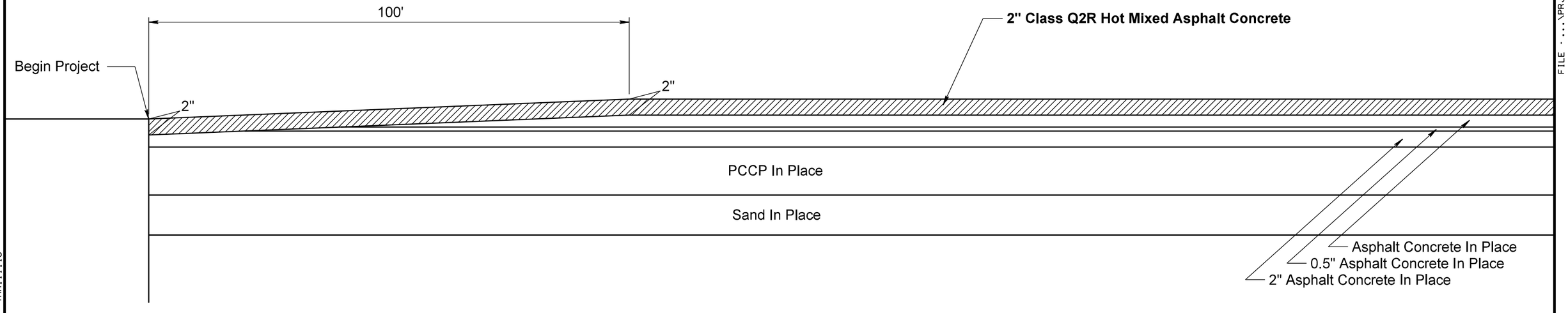
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0038(46)332	66	116

Plotting Date: 12/21/2023

DETAIL FOR COLD MILLING TAPER
AT BEGIN PROJECT



DETAIL FOR RESURFACING TAPER
AT BEGIN PROJECT



PLOT SCALE - 1:1.008

PLOT NAME - 13

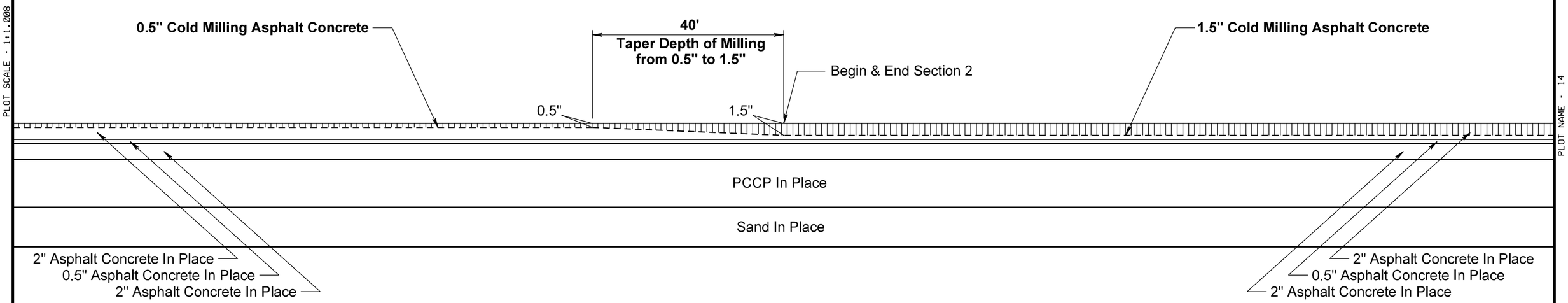
FILE - ...\PRJ2023\MCCK05UR\M1LL05UR.DGN

PLOTTED FROM - TRM111118

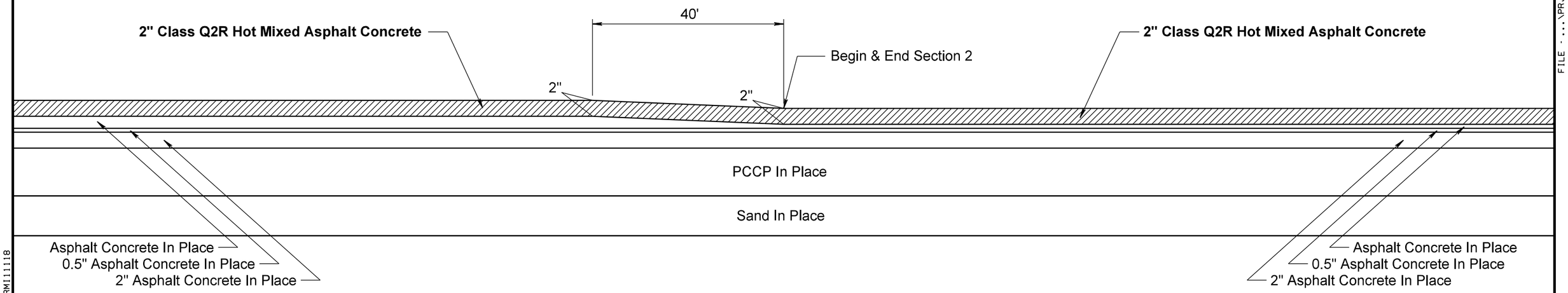
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0038(46)332	67	116

Plotting Date: 12/21/2023

DETAIL FOR COLD MILLING TAPER
AT BEGIN & END SECTION 2



DETAIL FOR RESURFACING TAPER
AT BEGIN & END SECTION 2



PLOT SCALE - 1:1.008

PLOT NAME - 14

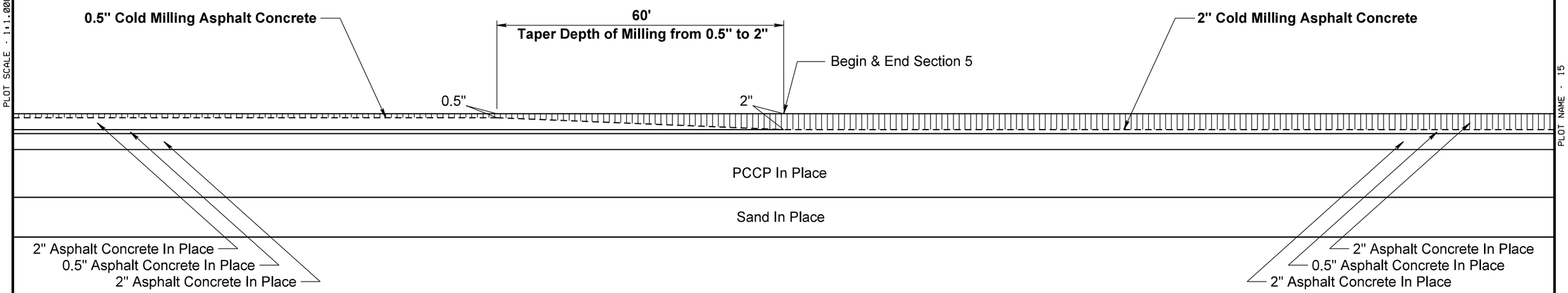
FILE - ...\PRJ2023\MCCK05UR\MILL05UR.DGN

PLOTTED FROM - TRMI11118

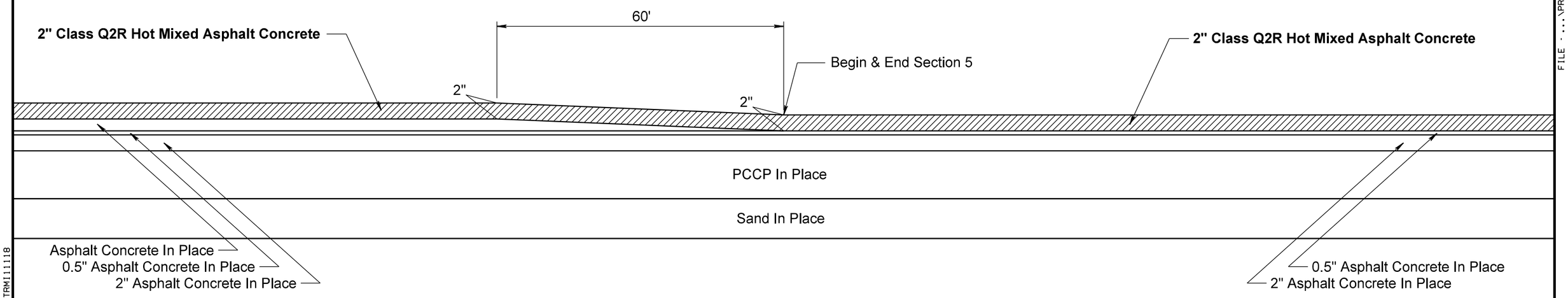
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0038(46)332	68	116

Plotting Date: 12/21/2023

DETAIL FOR COLD MILLING TAPER
AT BEGIN & END SECTION 5



DETAIL FOR RESURFACING TAPER
AT BEGIN & END SECTION 5

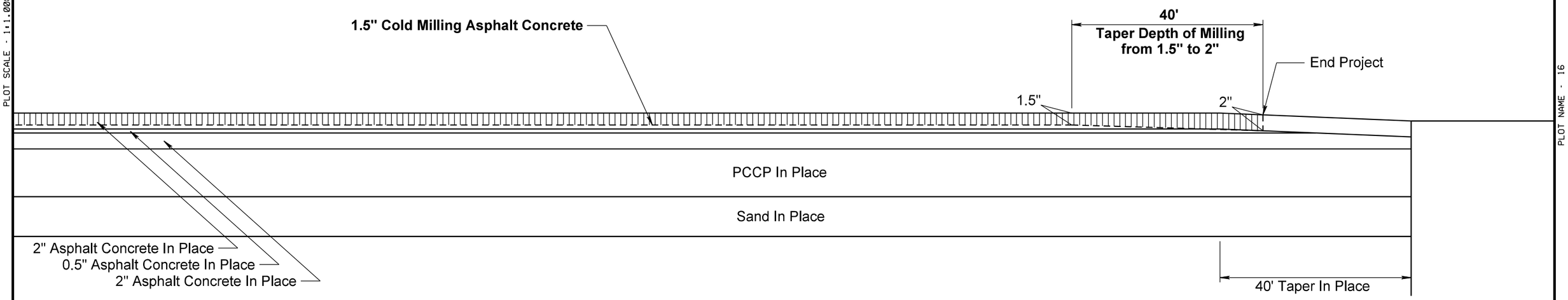


PLOT SCALE - 1:1.008
PLOT NAME - 15
FILE - ...\PRJ2023\MCCK05UR\MILL05UR.DGN
PLOTTED FROM - TRM111118

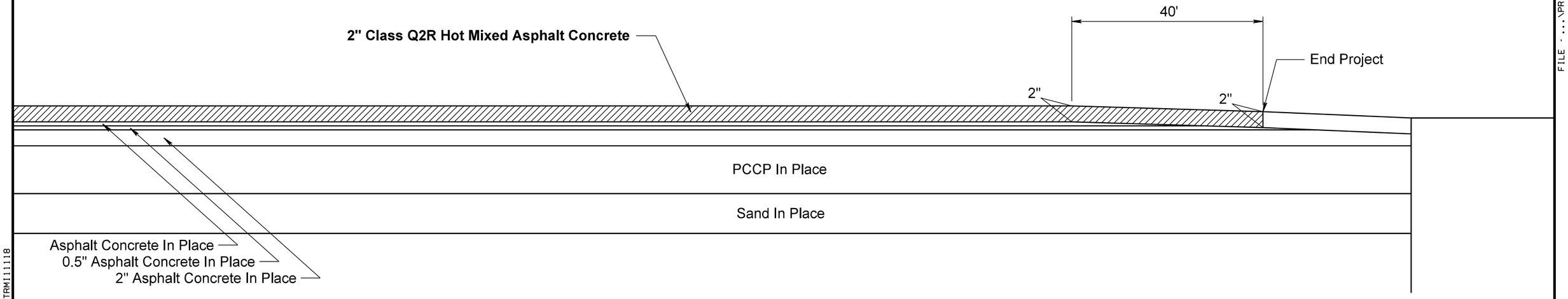
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0038(46)332	69	116

Plotting Date: 12/21/2023

DETAIL FOR COLD MILLING TAPER
AT END PROJECT



DETAIL FOR RESURFACING TAPER
AT END PROJECT



PLOT SCALE - 1:1.008

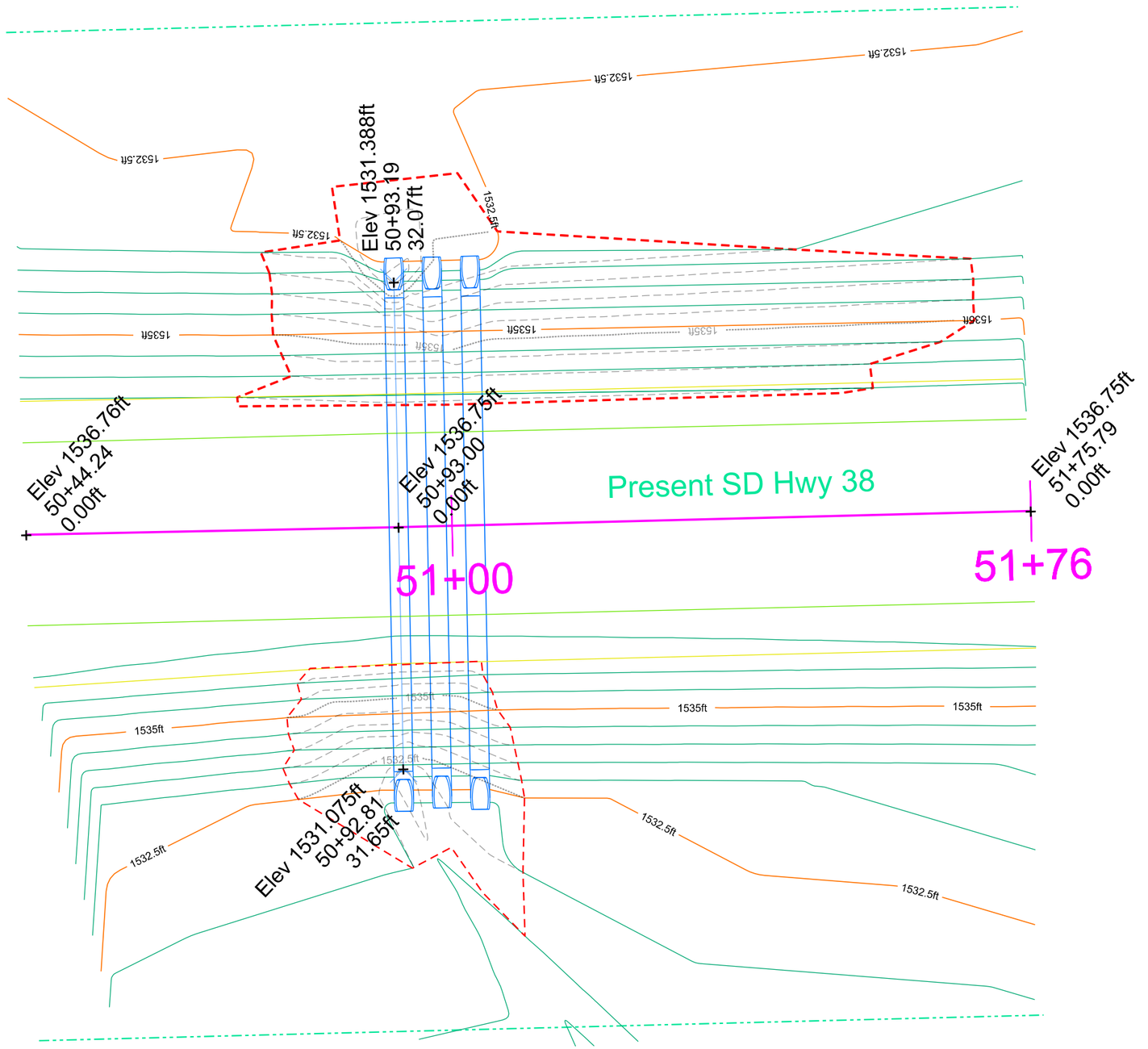
PLOT NAME - 16

FILE - ...\PRJ2023\MCCK05UR\M1LL05UR.DGN

PLOTTED FROM - TRM111118

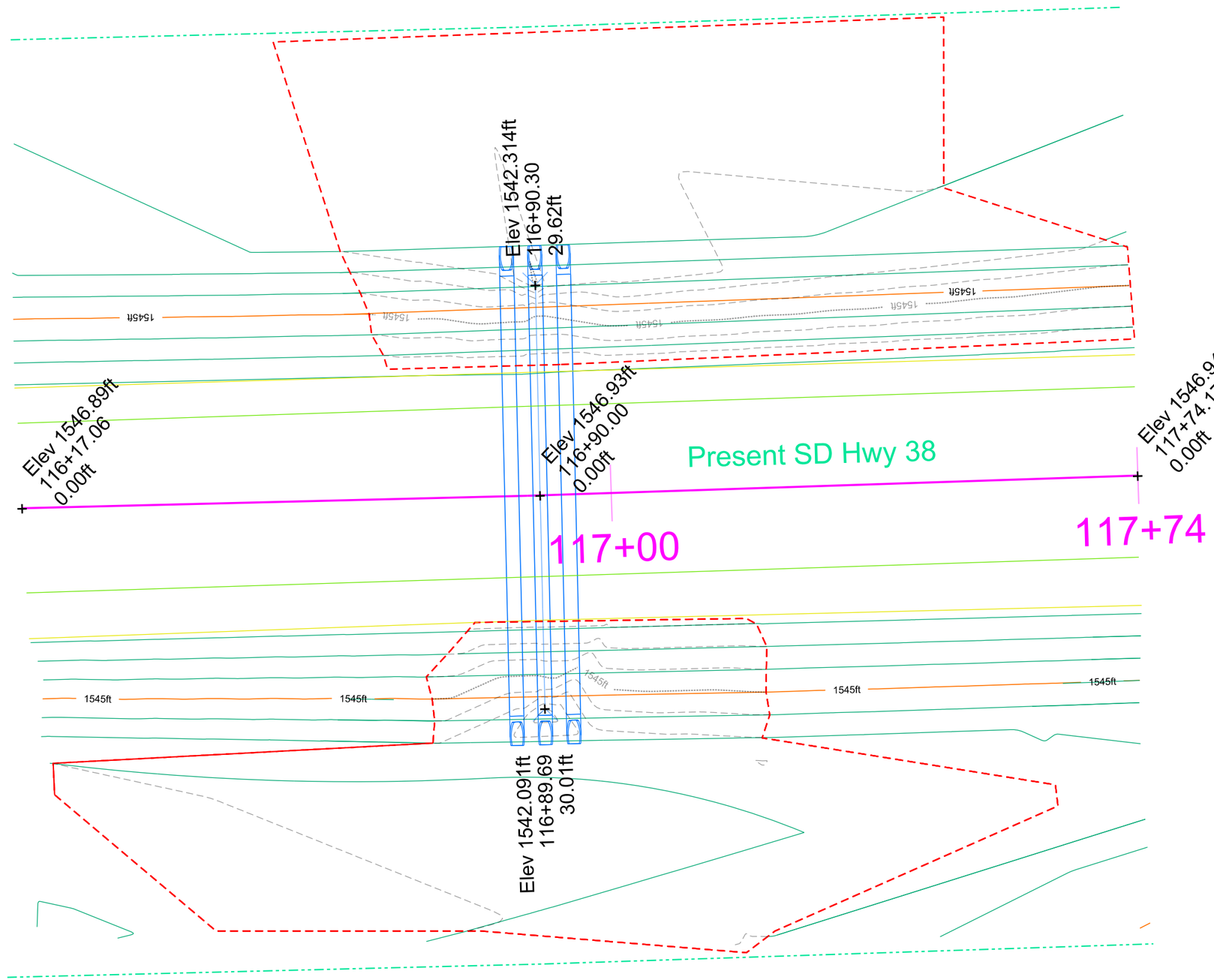
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0038(46)332	70	116

CONTOURS
50+93



STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0038(46)332	71	116

CONTOURS
116+90



DITCH SHAPING

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0038(46)332	72	116

Plotting Date: 12/21/2023

Sec. 6 - T102N - R52W

SD38

66'

66'

15+00 (2nd)

17+45 (2nd)

19+20 (2nd)

20+00 (2nd)

21+45 (2nd)

25+00 (2nd)

23+45 (2nd)

15+70 (2nd)

* Ditch slope is a 0.2' drop for every 25'.

775' Ditch Shaping/Cleanout

A

A

B

B

C

C

Item	Quantity	Unit
Unclassified Excavation	125*	CuYds

*Estimate 125 CuYds of Cut and 6 CuYds of Fill.

Section A-A

Match Existing Back Slope

4:1

Flat

Elev 1654.60

Section B-B

4:1

Flat

Elev 1656.00

Section C-C

Match Existing Back Slope

4:1

Flat

Elev 1654.20

PLOT SCALE - 1:80

PLOTTED FROM - TRM111118

PLOT NAME - 17

FILE - ...\MCCK05UR\05UR_DITCH.DGN

INSTALLATION OF GUARDRAIL

STR. 44-214-107 SD38 MRM 343.19

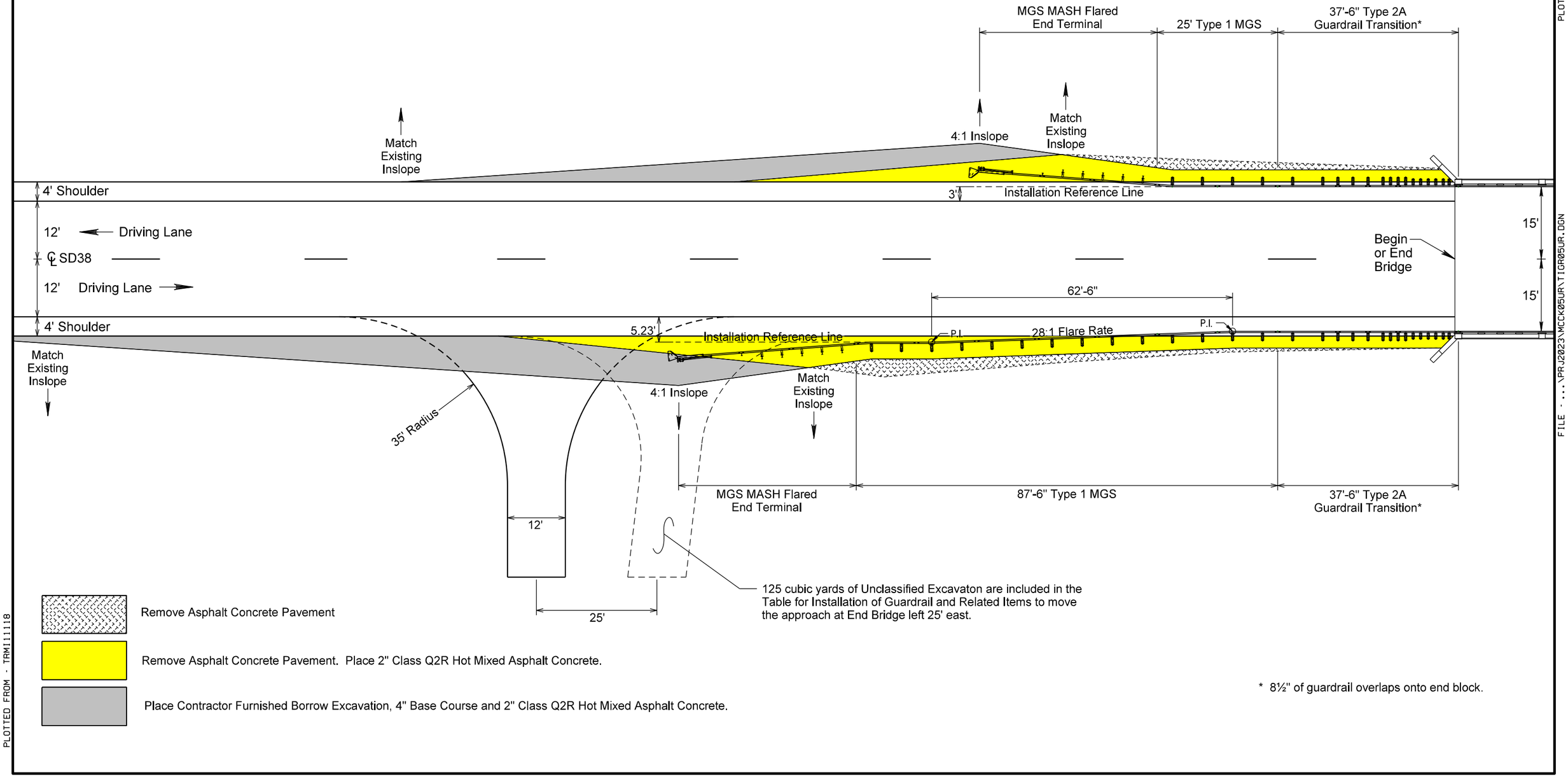
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0038(46)332	73	116

Plotting Date: 12/22/2023

PLOT SCALE - 1:20

PLOT NAME - 18

FILE - ...\PRJ2023\MCCK05UR\TIGR05UR.DGN

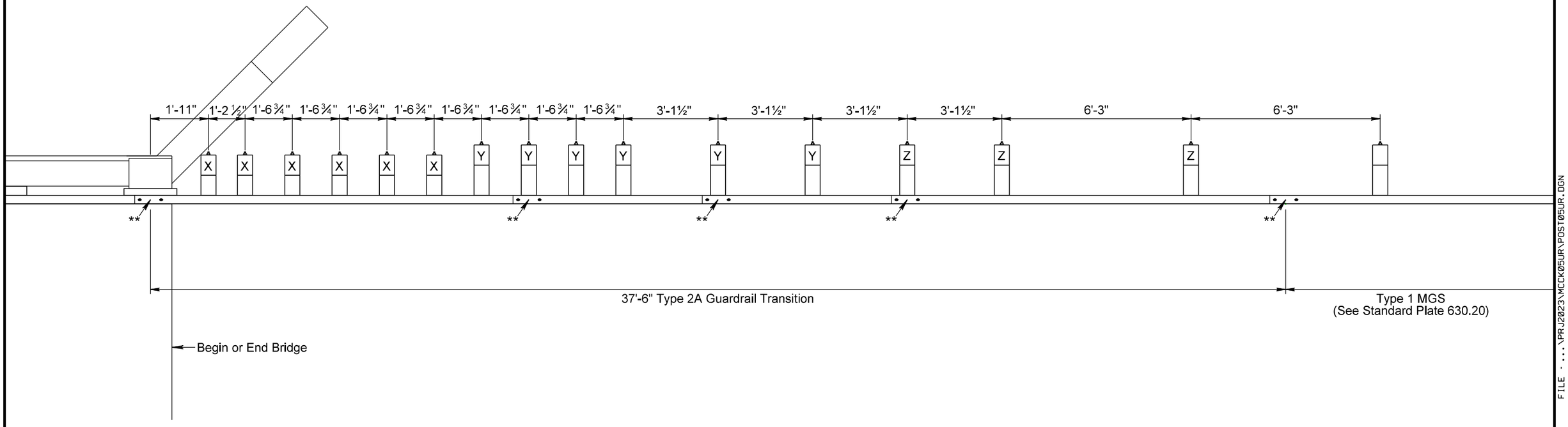


* 8½" of guardrail overlaps onto end block.

PLOTTED FROM - TRMI11118

POST SPACING ARRANGEMENT

STR. NO. 44-214-107 SD38 MRM 343.19



X: 6"x8"x7'-0" Wood Post and 6"x8"x19" Wood Blockout
Y: 6"x8"x6'-0" Wood Post and 6"x12"x19" Wood Blockout
Z: 6"x8"x6'-0" Wood Post and 6"x12"x14" Wood Blockout

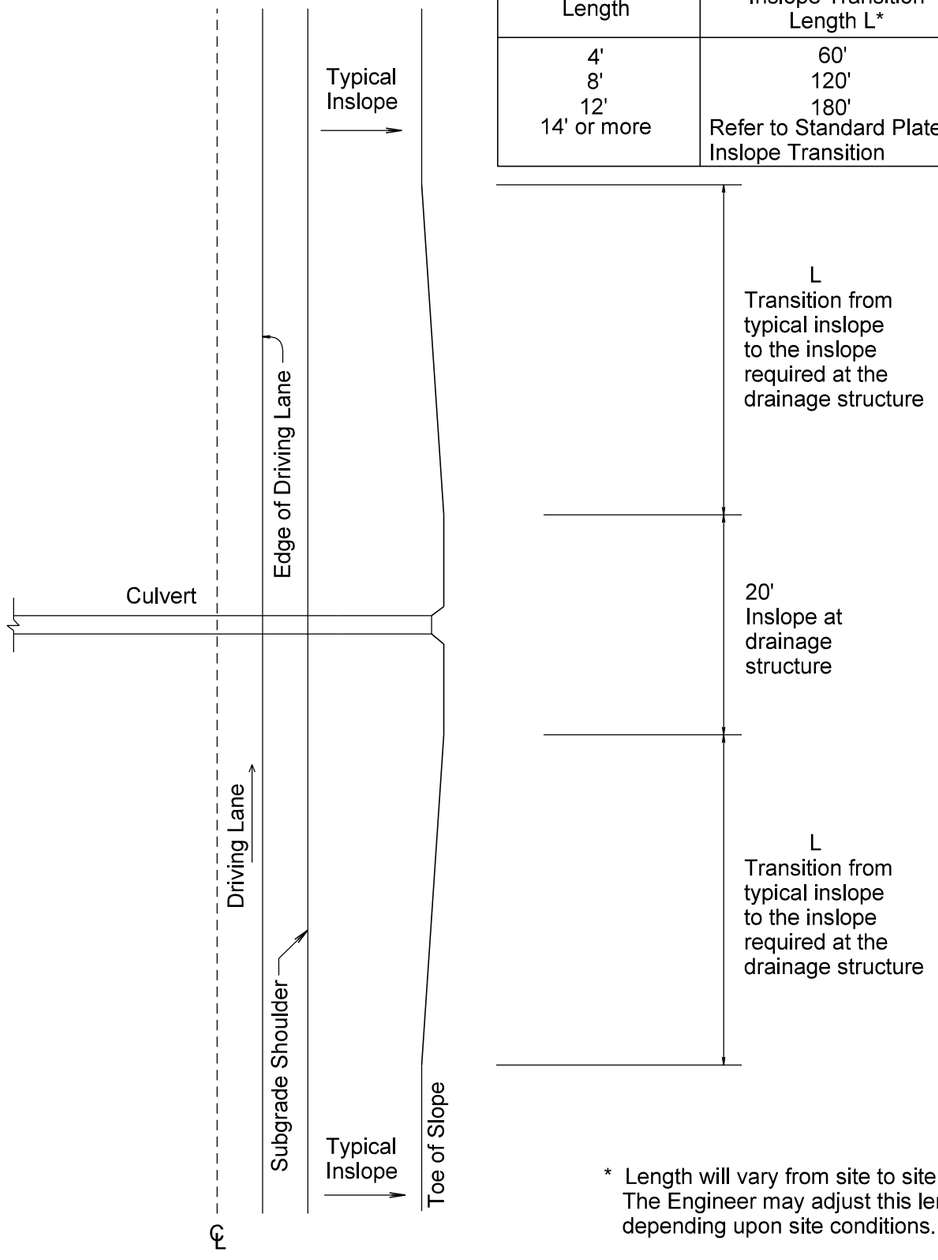
** Rail Splice

PLOT SCALE - 1:3.2
PLOT NAME - 19
FILE - ...\PRJ2023\MCCK05UR\POST05UR.DGN
PLOTTED FROM - TRMI11118

INSLOPE TRANSITION

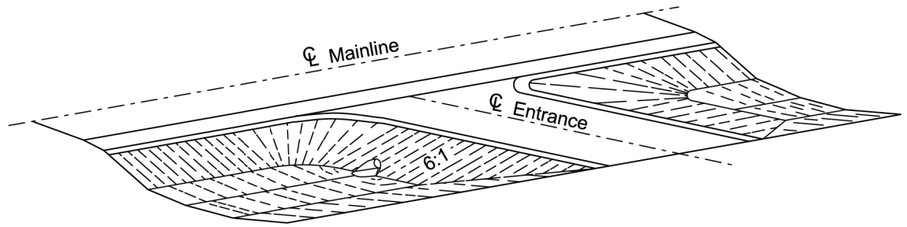
CULVERT LESS THAN 36" DIAMETER

Culvert Extension Length	Approximate Inslope Transition Length L*
4'	60'
8'	120'
12'	180'
14' or more	Refer to Standard Plate for Inslope Transition

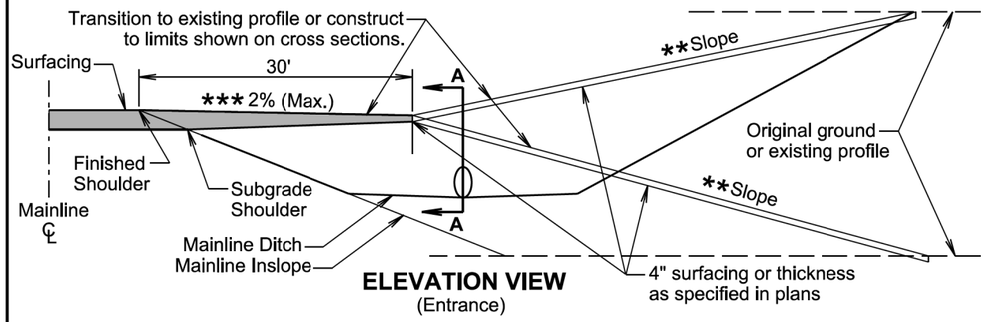


* Length will vary from site to site. The Engineer may adjust this length depending upon site conditions.

PLOT SCALE - 1:40
PLOTTED FROM - TRM111118
PLOT NAME - 20
FILE - ...\PRJ2023\MCCK05UR\INSLOPE.DGN



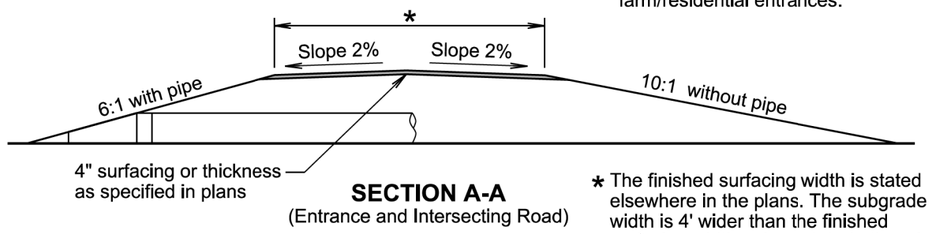
PERSPECTIVE OF ENTRANCE



ELEVATION VIEW
(Entrance)

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

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



SECTION A-A
(Entrance and Intersecting Road)

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

GENERAL NOTES:

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

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

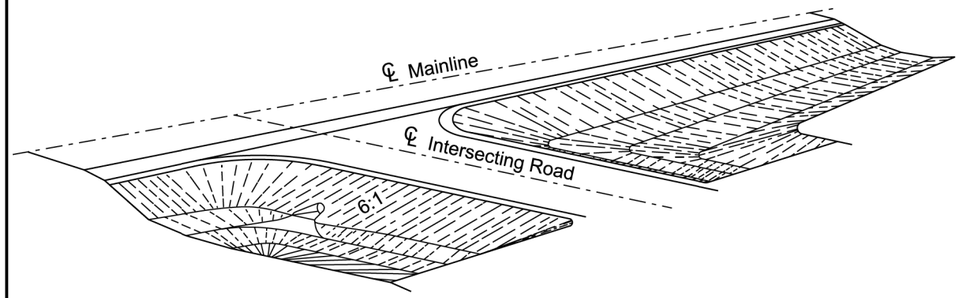
Pipe length will be adjusted if necessary during construction to obtain the 6:1 slope. For grading projects, the pipe length is estimated typically using a 4" thickness of surfacing directly over the subgrade above the pipe.

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

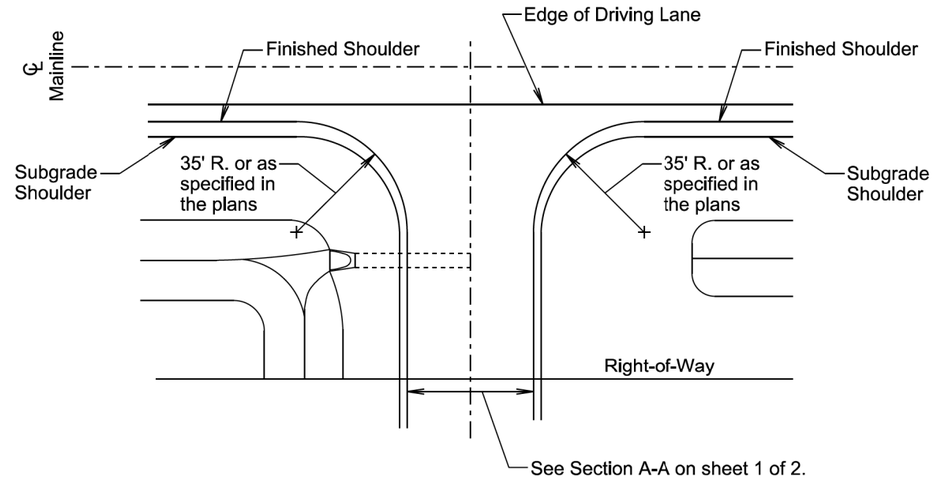
The turning radii will be 35' for intersecting roads and entrances unless stated otherwise in the plans.

November 19, 2021

Published Date: 2024	SDDOT	INTERSECTING ROADS AND ENTRANCES	PLATE NUMBER 120.01
			Sheet 1 of 2



PERSPECTIVE OF INTERSECTING ROAD



PLAN VIEW

GENERAL NOTES:

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

November 19, 2021

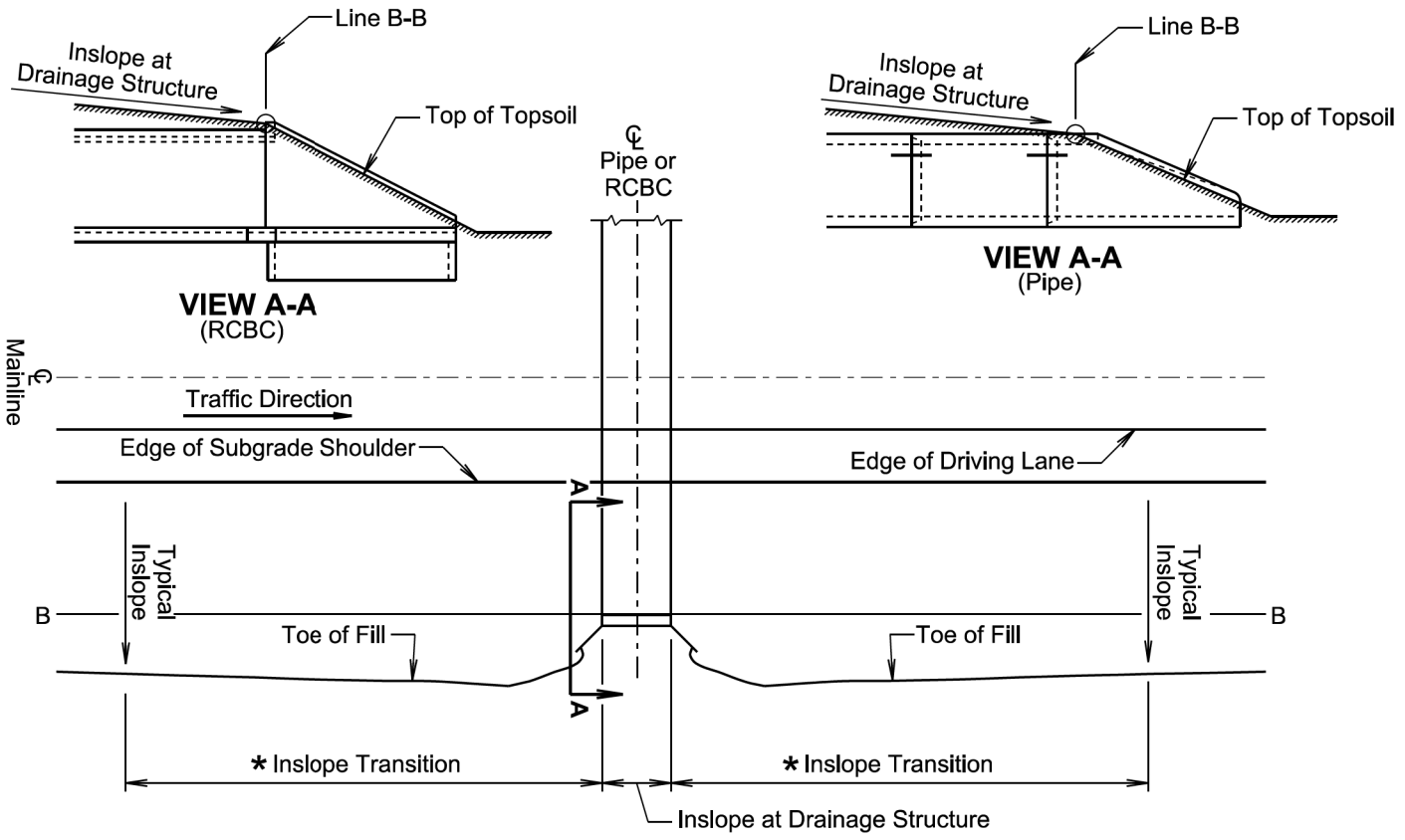
Published Date: 2024	SDDOT	INTERSECTING ROADS AND ENTRANCES	PLATE NUMBER 120.01
			Sheet 2 of 2

PLOT SCALE - 1:200

PLOT NAME - 1

FILE - ...\STANDARDPLATES_05UR.DGN

-PLOTTED FROM - TRM111118



TYPE 1 INSLOPE TRANSITION

GENERAL NOTES:

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

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

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

Published Date: 2024

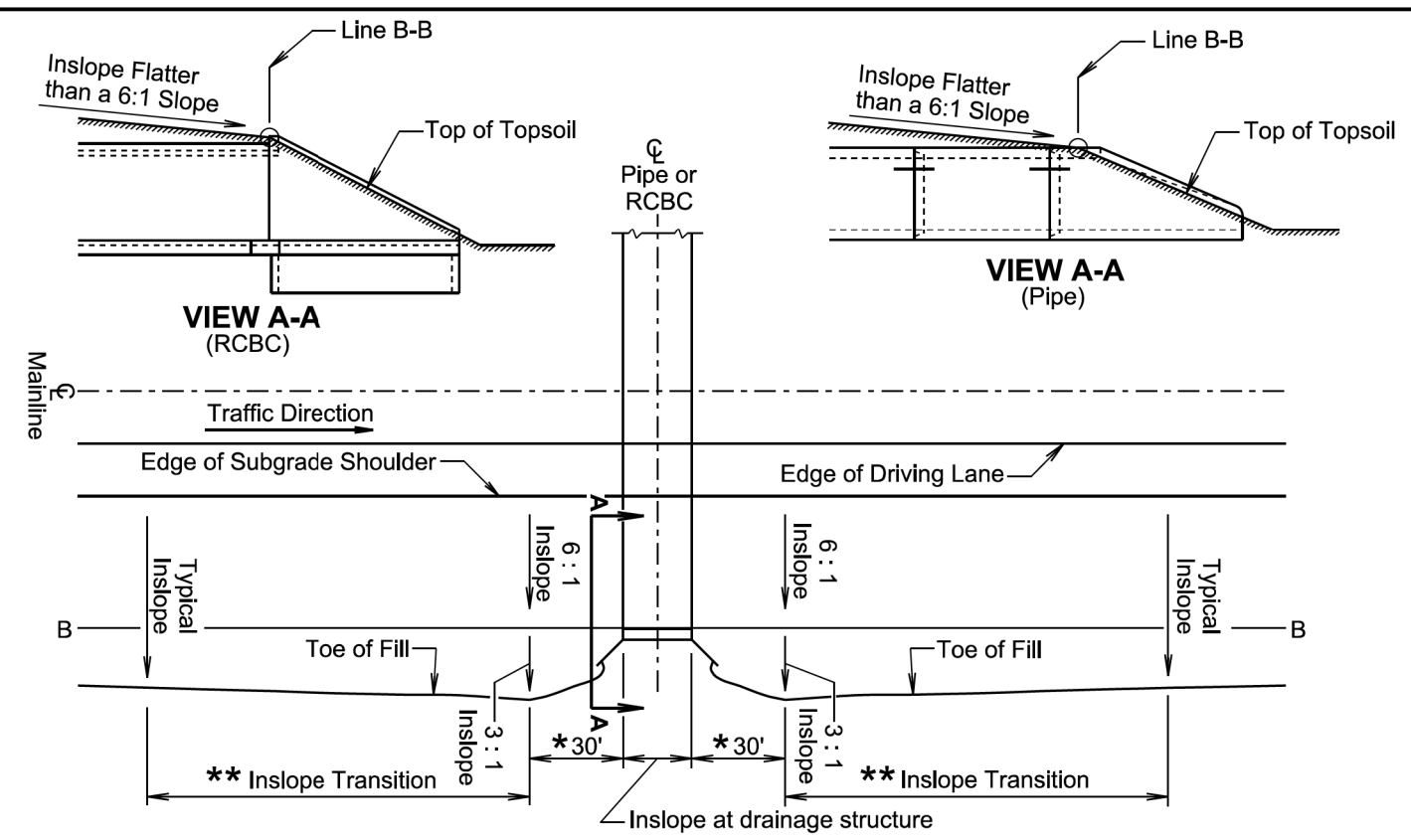
SDDOT

INSLOPE TRANSITIONS AT PIPE CULVERTS OR REINFORCED CONCRETE BOX CULVERTS

PLATE NUMBER 120.05

Sheet 1 of 2

September 14, 2018



TYPE 2 INSLOPE TRANSITION

GENERAL NOTES:

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

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

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

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

Published Date: 2024

SDDOT

INSLOPE TRANSITIONS AT PIPE CULVERTS OR REINFORCED CONCRETE BOX CULVERTS

PLATE NUMBER 120.05

Sheet 2 of 2

September 14, 2018

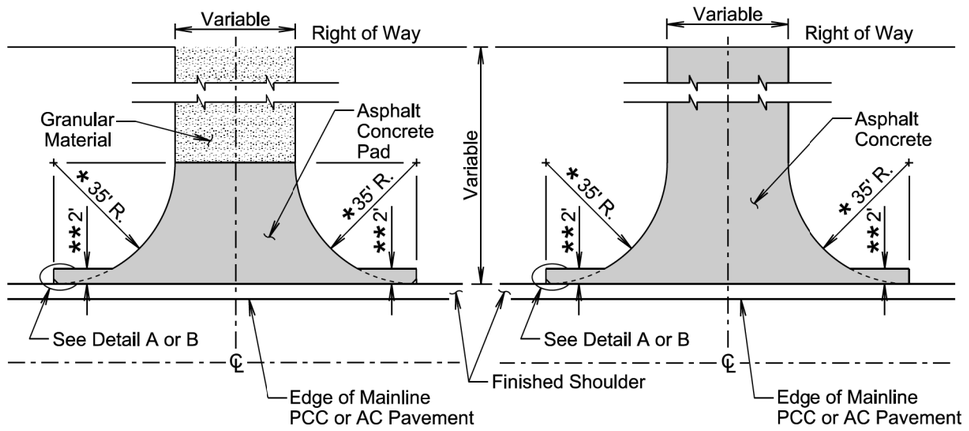
Plotting Date: 12/27/2023

STATE OF SOUTH DAKOTA

PROJECT P 0038(46)332

SHEET 77

TOTAL SHEETS 116



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:

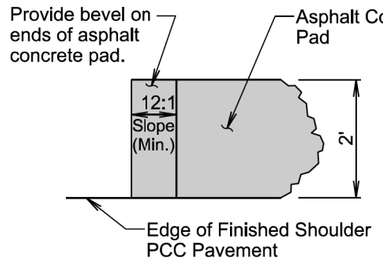
The precise construction limits for situations other than shown above will be determined by the Engineer during construction.

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

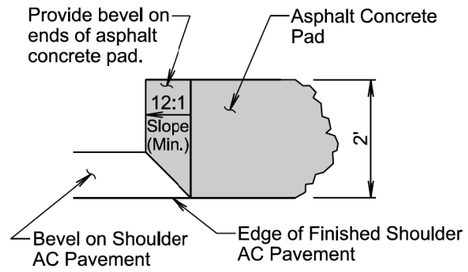
** The Contractor may adjust the screed of the paver during mainline paving operations to provide the 2-foot asphalt concrete pad or the Contractor may provide the 2-foot asphalt concrete pad during paving of the intersecting roads as shown above. The Engineer may eliminate the 2-foot asphalt concrete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

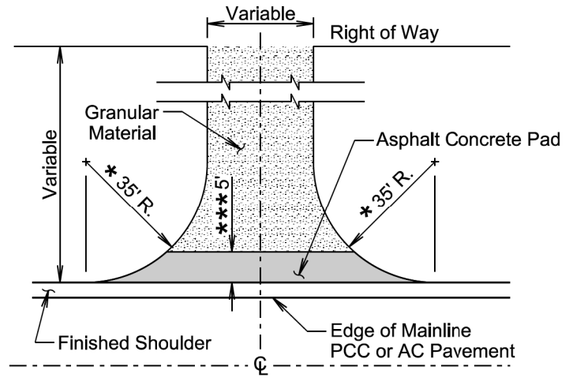
Published Date: 2024	SDDOT	SURFACING OR RESURFACING OF INTERSECTING ROADS AND ENTRANCES (MAINLINE AND SHOULDERS: PCC OR AC PAVEMENT)	PLATE NUMBER 320.04 Sheet 1 of 2



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



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



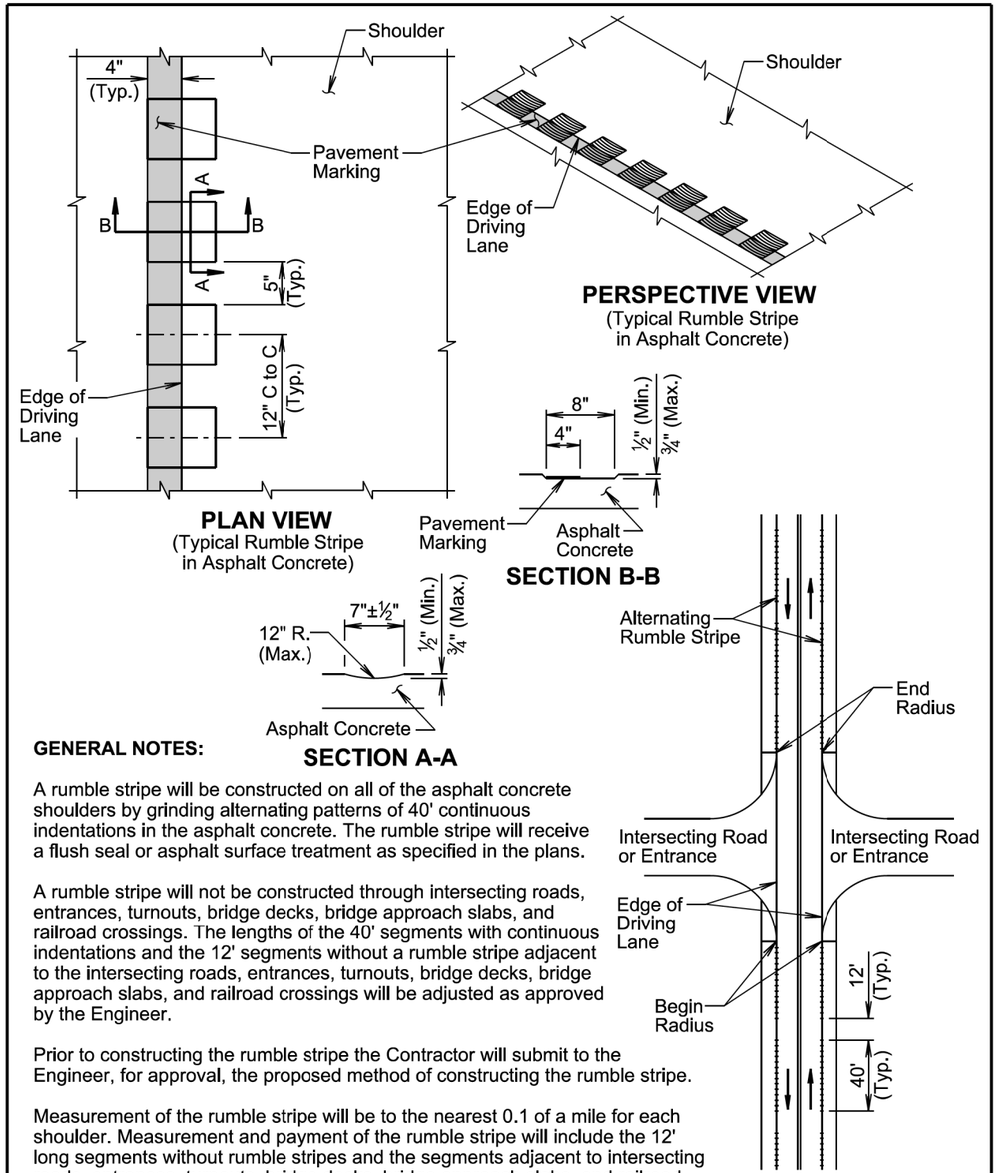
PLAN VIEW
(Entrance)

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

August 27, 2020

Published Date: 2024	SDDOT	SURFACING OR RESURFACING OF INTERSECTING ROADS AND ENTRANCES (MAINLINE AND SHOULDERS: PCC OR AC PAVEMENT)	PLATE NUMBER 320.04 Sheet 2 of 2

PLOT SCALE - 1:200
PLOT NAME - 3
FILE - ...\STANDARDPLATES_05UR.DGN
.PLOTTED FROM - TRM111118



GENERAL NOTES:

A rumble stripe will be constructed on all of the asphalt concrete shoulders by grinding alternating patterns of 40' continuous 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, 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 stripe 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 stripe the Contractor will submit to the Engineer, for approval, the proposed method of constructing the rumble stripe.

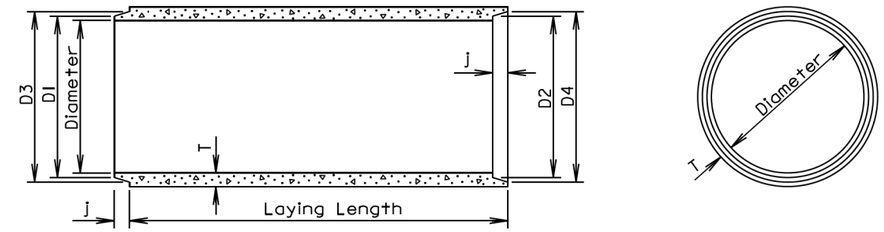
Measurement of the rumble stripe will be to the nearest 0.1 of a mile for each shoulder. Measurement and payment of the rumble stripe will include the 12' long segments without rumble stripes and the segments adjacent to intersecting roads, entrances, turnouts, bridge decks, bridge approach slabs, and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

September 14, 2019

Published Date: 2024	SDDOT	8" RUMBLE STRIPE IN ASPHALT CONCRETE ON NONDIVIDED HIGHWAY SHOULDERS	PLATE NUMBER 320.20
			Sheet 1 of 1

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.

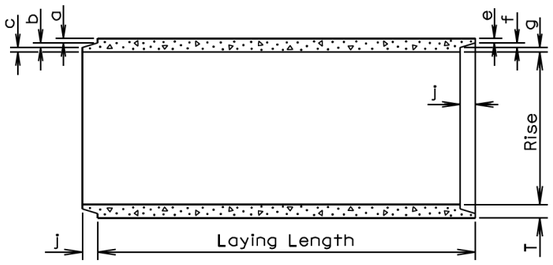
Not more than 2 four-foot sections shall be permitted near the ends of any culvert. Four-foot lengths shall be used only to secure the required length of culvert.

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

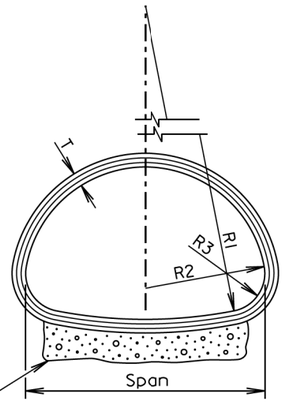
June 26, 2015

Published Date: 2024	SDDOT	REINFORCED CONCRETE PIPE	PLATE NUMBER 450.01
			Sheet 1 of 1

PLOT SCALE - 1:200
PLOT NAME - 4
FILE - ...\STANDARDPLATES_05UR.DGN
.PLOTTED FROM - TRM111118



LONGITUDINAL SECTION



END VIEW

TOLERANCES IN DIMENSIONS

Radial dimensions at joints: ± 1/8" for 65" span or less and ± 1/4" for longer spans.
Rise and Span: ±2% of tabular values.
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".

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

* Size (in.)	Approx. Wt./Ft. (lb.)	Rise (in.)	Span (in.)	T (in.)	a (in.)	b (in.)	c (in.)	j (in.)	e (in.)	f (in.)	g (in.)	R1 (in.)	R2 (in.)	R3 (in.)
18	170	13 1/2	22	2 1/2	1 3/8	3/8	3/4	2	1 1/8	3/8	1	27 1/2	13 3/4	5 1/4
24	320	18	28 1/2	3 1/2	1 5/8	1/2	1 3/8	3	1 3/8	1/2	1 5/8	40 11/16	14 3/4	4 5/8
30	450	22 1/2	36 1/4	4	1 13/16	5/8	1 9/16	3 1/2	1 9/16	5/8	1 13/16	51	18 3/4	6 1/8
36	600	26 5/8	43 3/4	4 1/2	2	3/4	1 3/4	4	1 3/4	3/4	2	62	22 1/2	6 1/2
42	740	31 5/16	51 1/8	4 1/2	2	3/4	1 3/4	4	1 3/4	3/4	2	73	26 1/4	7 3/4
48	890	36	58 1/2	5	2 1/4	3/4	2	5	2	3/4	2 1/4	84	30	8 7/8
54	1100	40	65	5 1/2	2 1/2	3/4	2 1/4	5	2 1/4	3/4	2 1/2	92 1/2	33 3/8	10
60	1400	45	73 1/2	6	3 5/16	3/4	1 15/16	5	2 3/4	3/4	2 1/2	105	37 1/2	11
72	1900	54	88	7	3 13/16	1	2 3/16	6	3 1/4	1	2 3/4	126	45	13 5/16
84	2500	62	102	8	4 1/8	1	2 7/8	6	3 1/2	1	3 1/2	162 1/2	52	14 1/2
96	3300	78	122 3/8	9	4 1/2	1	3 1/2	7	4	1	4	218	62	20
108	4200	88	138 1/2	10	5	1	4	7	4 1/2	1	4 1/2	269	70	22
120	5100	96 7/8	154	11	5 1/2	1	4 1/2	7	5	1	5	301 3/8	78	24
132	5100	106 1/2	168 3/4	10		1	4	7	4 1/2	1	4 1/2	329	85 5/8	26 7/8

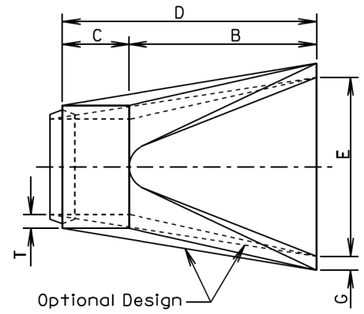
* Equivalent Diameter of Circular R. C. P.

GENERAL NOTES:

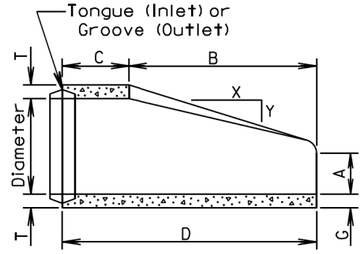
Construction of R.C.P. Arch shall conform to the requirements of Section 990 of the Specifications. Not more than 2 four-foot sections shall be permitted near the ends of any culvert. Four-foot lengths shall be used only to secure the required length of culvert.

June 26, 2015

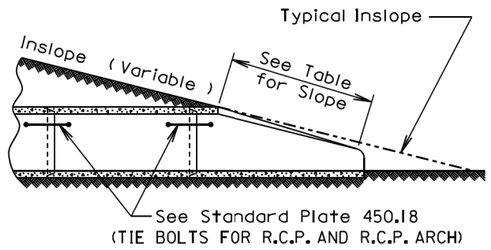
Published Date: 2024	SDDOT	REINFORCED CONCRETE PIPE ARCH	PLATE NUMBER 450.02 Sheet 1 of 1



TOP VIEW



LONGITUDINAL SECTION

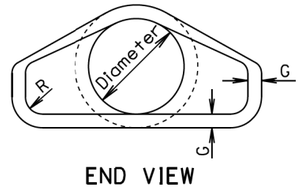


SLOPE DETAIL

GENERAL NOTES:

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

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



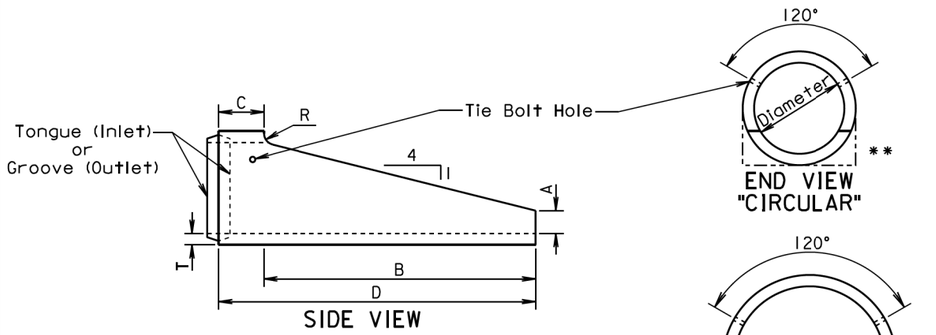
END VIEW

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

June 26, 2015

Published Date: 2024	SDDOT	R. C. P. FLARED ENDS	PLATE NUMBER 450.10 Sheet 1 of 1

PLOT SCALE - 1:200
PLOT NAME - 5
FILE ...\STANDARDPLATES_05UR.DGN
.PLOTTED FROM - TRM111118



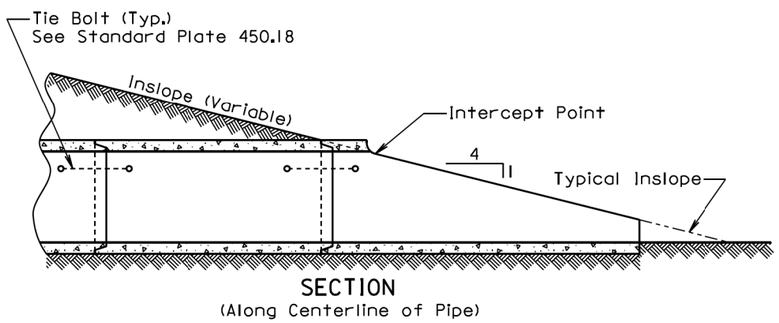
Dia. (in.)	T (in.)	A (in.)	B (in.)	C (in.)	D (in.)	R (in.)
FOR CIRCULAR PIPE						
24	3	6	72	12	84	3
30	3½	7½	90	12	102	3½
FOR ARCH PIPE						
* 24	3	6	48	12	60	3
* 30	3½	7½	60	12	72	3½
* 36	4½	8⅝	66	30	96	0
* 42	4½	10	77¼	18¾	96	0

ALTERNATE

Dia. (in.)	T (in.)	A (in.)	B (in.)	C (in.)	D (in.)	R (in.)
FOR CIRCULAR PIPE						
24	3	9	72	12	84	0
30	3½	11	90	12	102	0
FOR ARCH PIPE						
* 24	3	9	48	12	60	0
* 30	3½	11	60	12	72	0

* Equivalent Diameter of Circular R.C.P.

** Acceptable Flat Bottom Alternate.

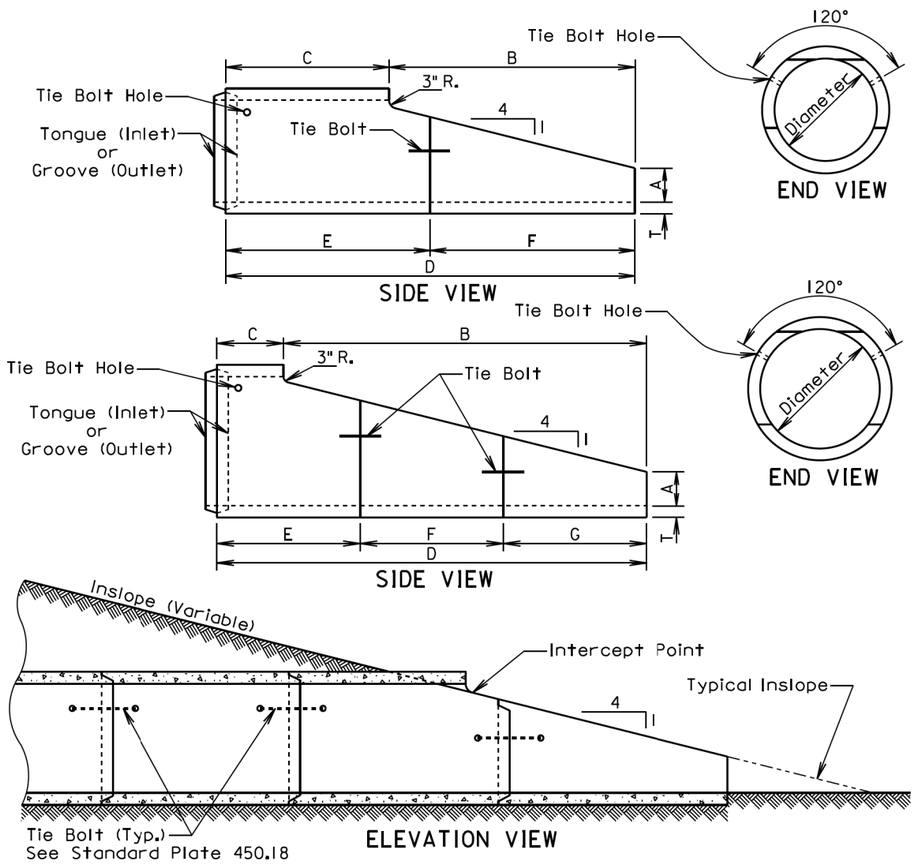


GENERAL NOTE:

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

September 22, 2006

Published Date: 2024	SDDOT	R. C. P. SLOPED ENDS	PLATE NUMBER 450.13 Sheet 1 of 1



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: 2024	SDDOT	R. C. P. SLOPED ENDS WITH OR WITHOUT BARS	PLATE NUMBER 450.14 Sheet 1 of 1

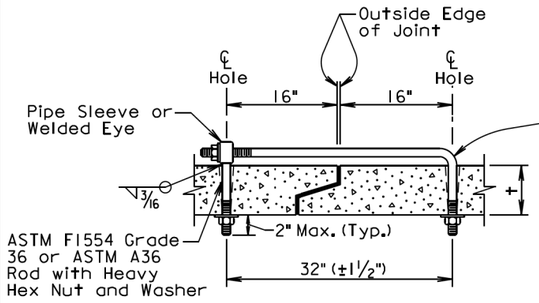
PLOT SCALE - 1:200

PLOT NAME - 6

FILE - ...\STANDARDPLATES_05UR.DGN

_PLOTTED FROM - TRM111118

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



ADJUSTABLE EYE BOLT TIE

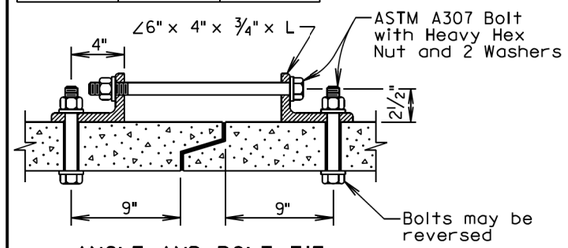
GENERAL NOTES:

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



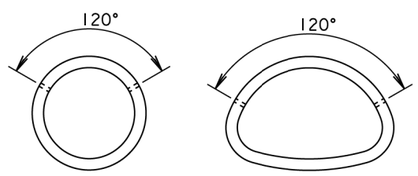
ANGLE AND BOLT TIE

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:

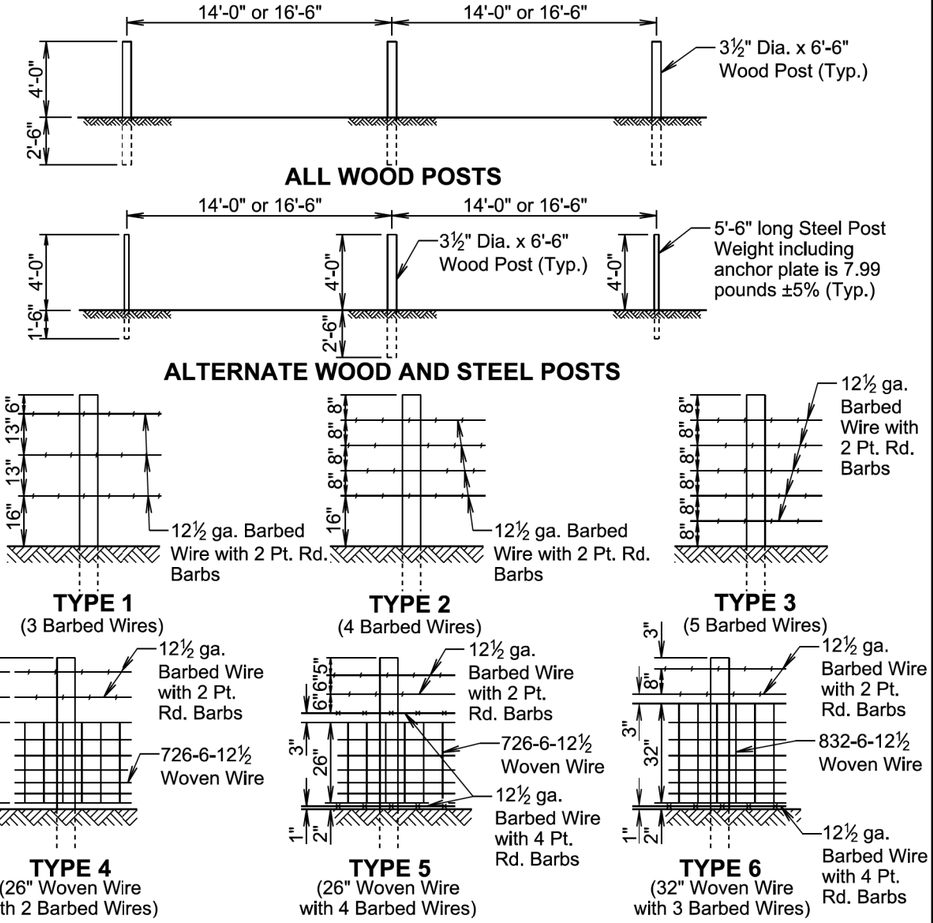
In lieu of the tie bolts detailed above other types of tie bolt connections may be installed as approved by the Office of Bridge Design.

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: 2024 | SDDOT | TIE BOLTS FOR R.C.P. AND R.C.P. ARCH | PLATE NUMBER 450.18 | Sheet 1 of 1



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

GENERAL NOTES:

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

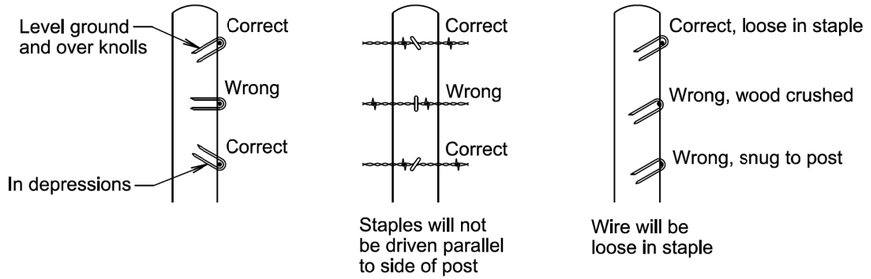
When type 5S or 6S is designated the bottom wire may be barbed, smooth, or left off.

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

June 26, 2019

Published Date: 2024 | SDDOT | RIGHT-OF-WAY FENCE | PLATE NUMBER 620.01 | Sheet 1 of 1

PLOT SCALE - 1:200
PLOT NAME - 7
FILE - ...\STANDARDPLATES_05UR.DGN
.PLOTTED FROM - TRM111118



STAPLE INSTALLATION

GENERAL NOTES:

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

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

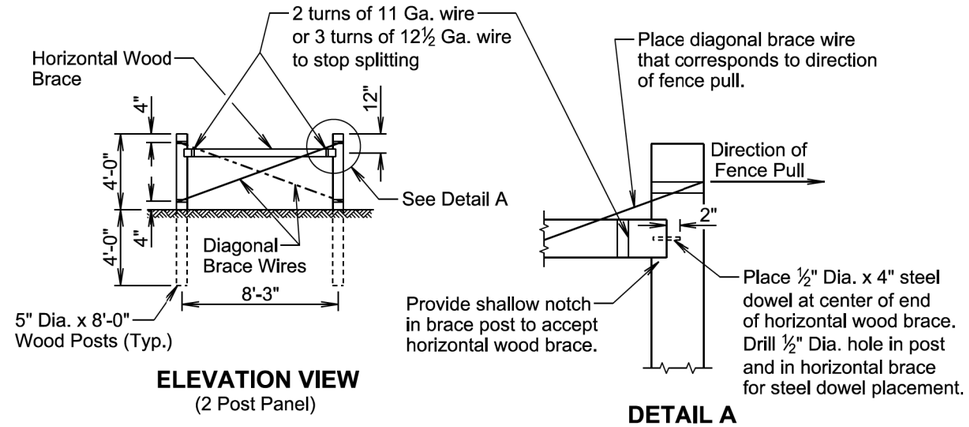
Right-of-Way fence other than on Interstate Projects will be constructed within one foot of the Right-of-Way on the Landowner's side except at bridge openings, cattle passes, and as otherwise directed by the Engineer.

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

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

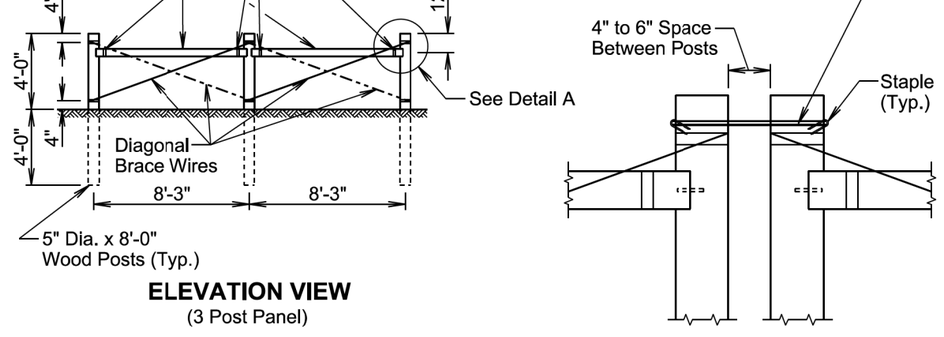
June 26, 2019

Published Date: 2024	SDDOT	STAPLE INSTALLATION AND GENERAL RIGHT-OF-WAY FENCE NOTES	PLATE NUMBER 620.02
			Sheet 1 of 1



ELEVATION VIEW
(2 Post Panel)

DETAIL A



ELEVATION VIEW
(3 Post Panel)

DETAIL B

GENERAL NOTES:

Two Post Panels will be installed at least every 1320' between corners.

Two Post Panels will be installed at any sharp vertical angle crest points and as directed by the Engineer.

Horizontal wood braces will consist of 4" dia. x 8' wood posts or rough 4" x 4" x 8' timbers.

Diagonal brace wires will be fabricated with 4 strands of 9 Ga. galvanized wire twisted tight. The diagonal brace wires will be installed in accordance with the direction of the fence pull. Two diagonal brace wires are required if fence pull is in both directions.

January 22, 2023

Published Date: 2024	SDDOT	BRACE PANELS AND APPLICATIONS OF BRACE PANELS	PLATE NUMBER 620.03
			Sheet 1 of 3

PLOT SCALE - 1:200
PLOT NAME - 8
FILE - ...\STANDARDPLATES_05UR.DGN
.PLOTTED FROM - TRM111118

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

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

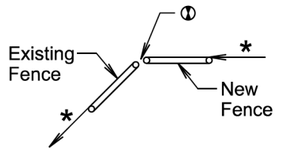
① See Detail B on Sheet 1 of 3.

GENERAL NOTE:

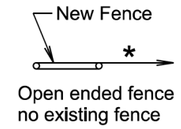
All degrees of curvature stated for fence are at centerline of roadway.

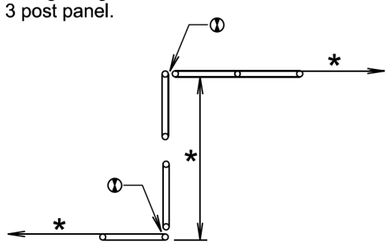
If fence length is less than 600' to next corner use a 2 post panel.

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

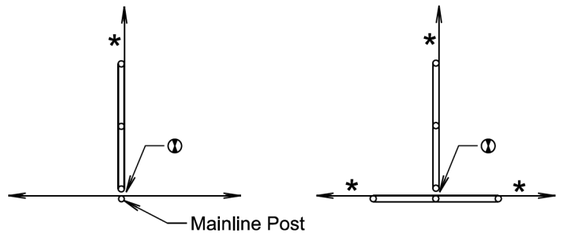


BEGIN OR END FENCE
(Where new fence ties into existing fence)

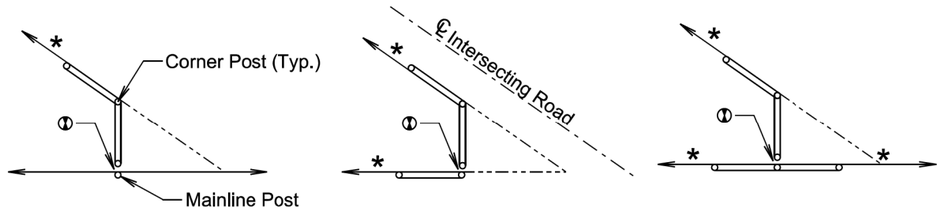




SHORT JOGS IN FENCE



CROSS FENCE



SHARP ANGLES IN CROSS FENCE

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

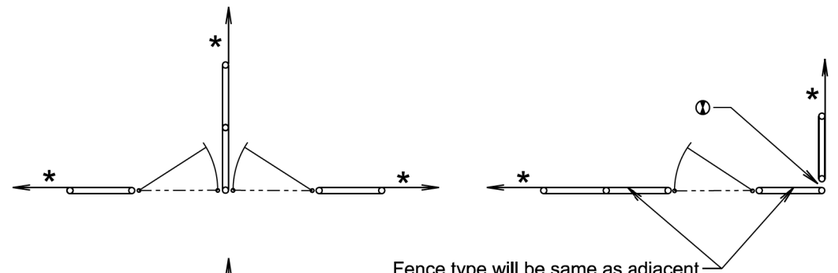
Additional fence panel is required when an angle in the mainline fence is greater than 10°.

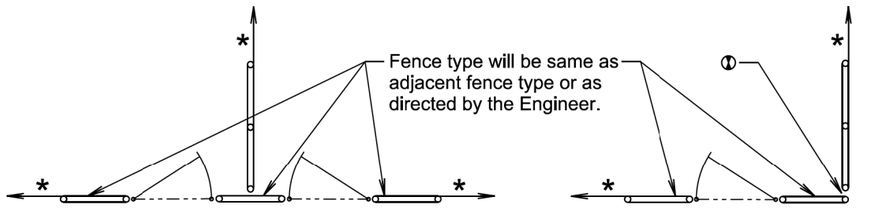
ANGLES IN MAINLINE FENCE

January 22, 2023

Published Date: 2024	SDDOT	BRACE PANELS AND APPLICATIONS OF BRACE PANELS	PLATE NUMBER 620.03 Sheet 2 of 3

ENTRANCE
(Not on corner)





DOUBLE ENTRANCES

ENTRANCES AT CORNERS

GATES

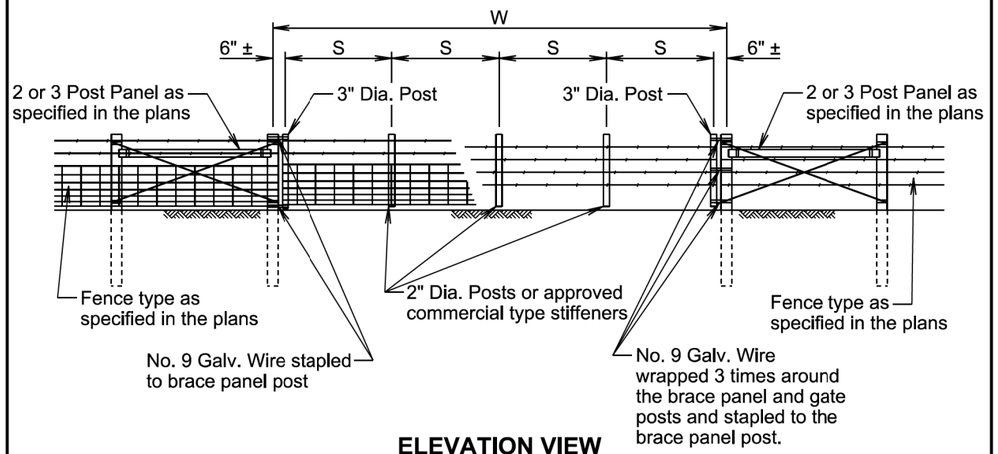
* If fence length is less than 600' to next corner use a 2 post panel.
If fence length is greater than 600' to next corner use a 3 post panel.

① See Detail B on Sheet 1 of 3.

January 22, 2023

Published Date: 2024	SDDOT	BRACE PANELS AND APPLICATIONS OF BRACE PANELS	PLATE NUMBER 620.03 Sheet 3 of 3

PLOT SCALE - 1:200
PLOT NAME - 9
FILE - ...\STANDARDPLATES_05UR.DGN
.PLOTTED FROM - TRM111118



ELEVATION VIEW

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

GENERAL NOTES:

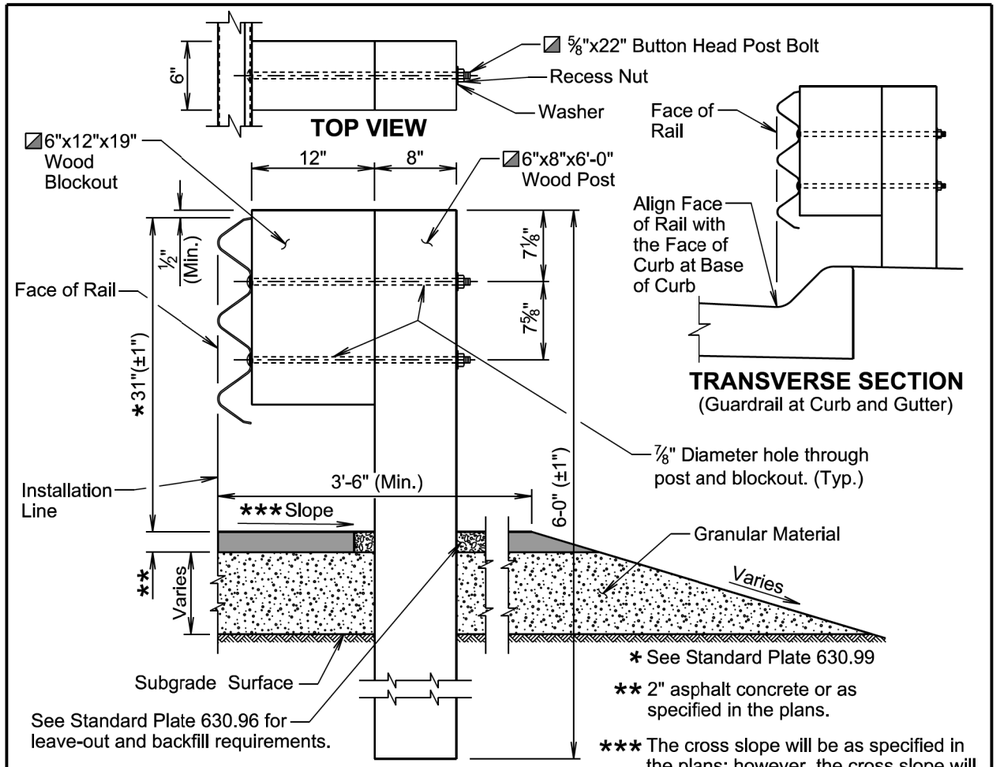
Creosote treatment of the gate posts will not be accepted.

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

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

June 26, 2019

Published Date: 2024	SDDOT	WIRE GATES	PLATE NUMBER 620.20
			Sheet 1 of 1



* 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.

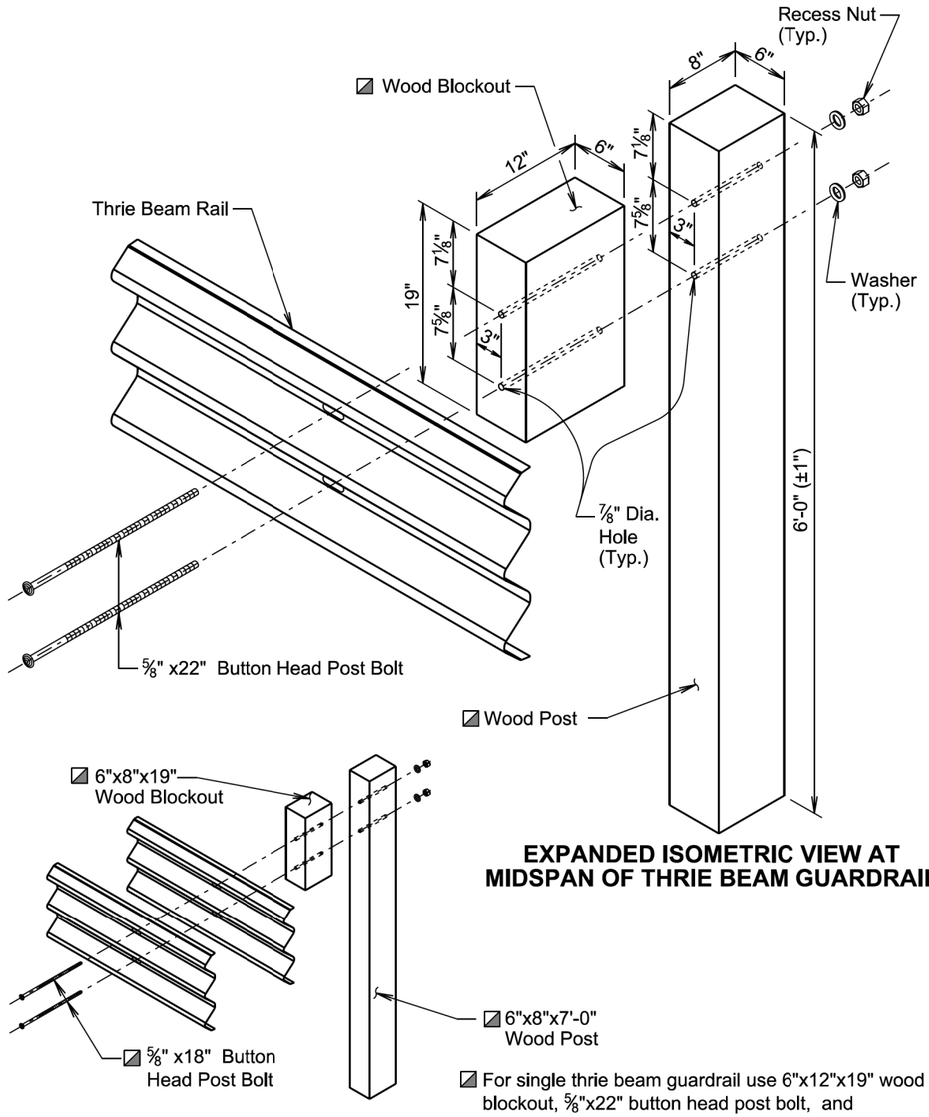
The top of post and top of block will have a true square cut. The top of block will be a maximum of ±½ inch from the top of the post.

September 14, 2019

Published Date: 2024	SDDOT	THRIE BEAM GUARDRAIL	PLATE NUMBER 630.01
			Sheet 1 of 5

PLOT SCALE - 1:200
PLOT NAME - 10
FILE - ...\STANDARDPLATES_05UR.DGN
_PLOTTED FROM - TRM111118

PLOT SCALE - 1:200



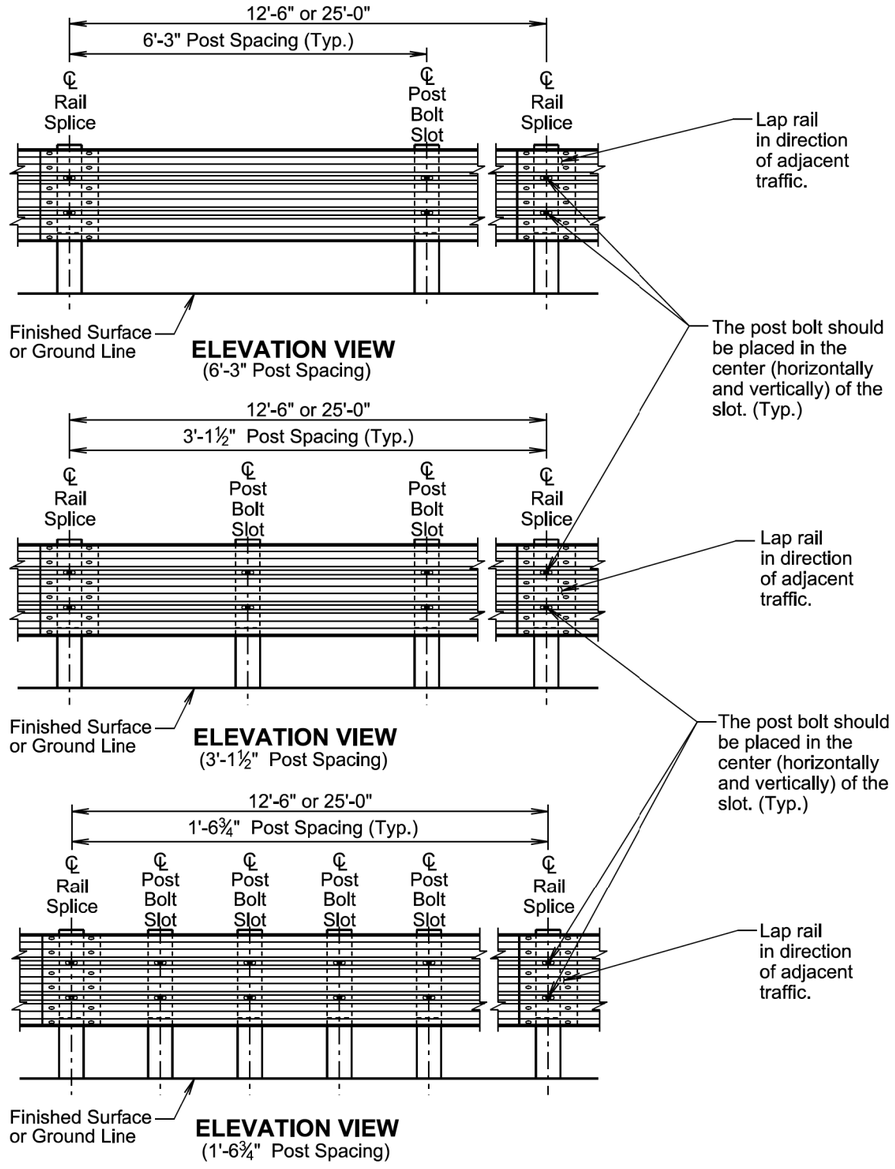
EXPANDED ISOMETRIC VIEW AT MIDSPAN OF THRIE BEAM GUARDRAIL

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: 2024	SDDOT	THRIE BEAM GUARDRAIL	PLATE NUMBER 630.01 Sheet 2 of 5



ELEVATION VIEW
(6'-3" Post Spacing)

ELEVATION VIEW
(3'-1½" Post Spacing)

ELEVATION VIEW
(1'-6¾" Post Spacing)

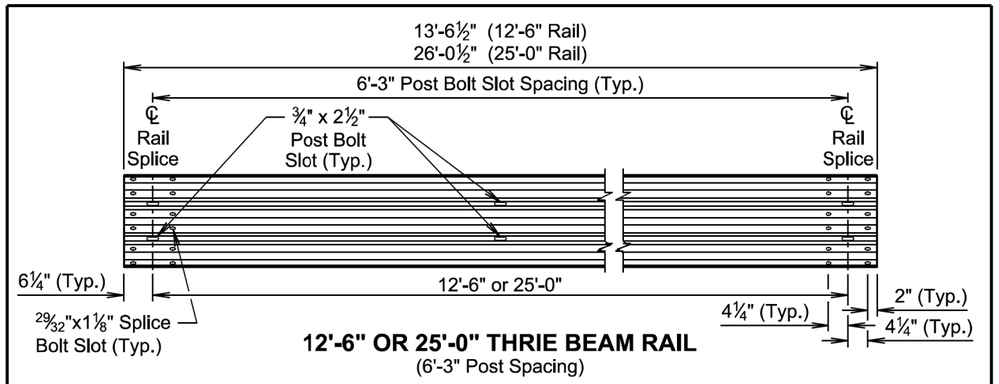
September 14, 2019

Published Date: 2024	SDDOT	THRIE BEAM GUARDRAIL	PLATE NUMBER 630.01 Sheet 3 of 5

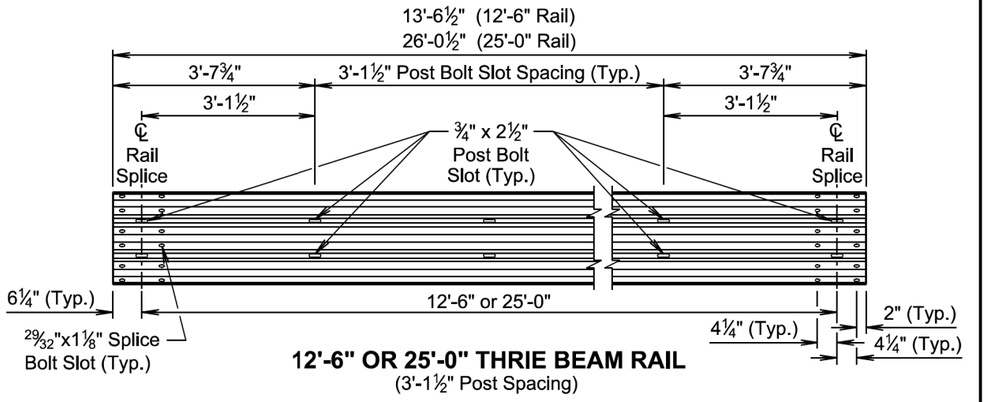
PLOTTED FROM - TRM111118

PLOT NAME - 11

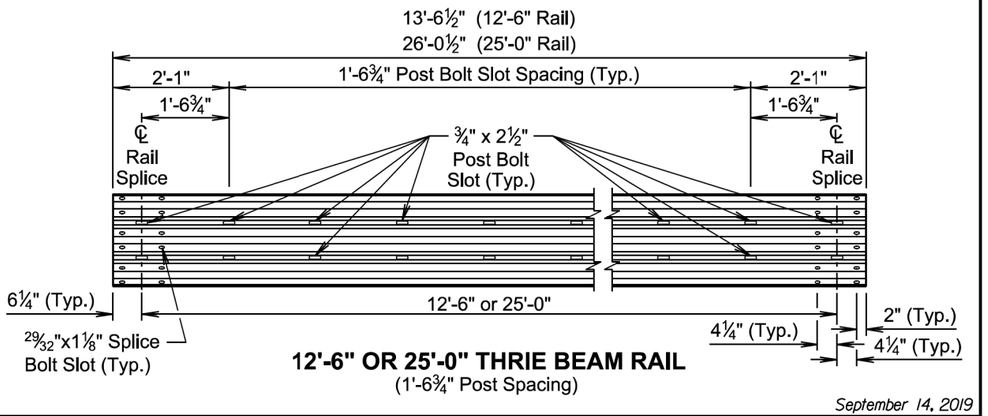
FILE - ...\STANDARDPLATES_05UR.DGN



12'-6" OR 25'-0" THRIE BEAM RAIL
(6'-3" Post Spacing)



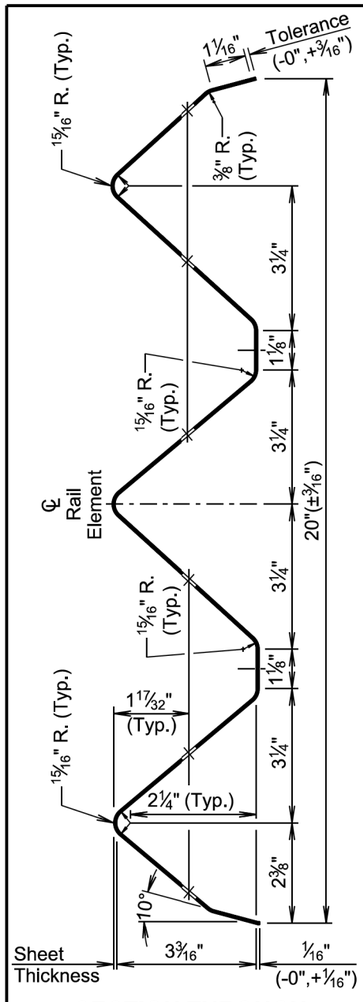
12'-6" OR 25'-0" THRIE BEAM RAIL
(3'-1½" Post Spacing)



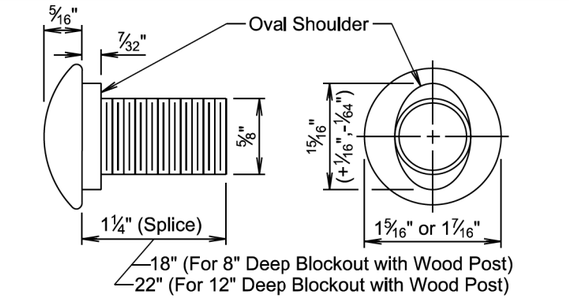
12'-6" OR 25'-0" THRIE BEAM RAIL
(1'-6¾" Post Spacing)

September 14, 2019

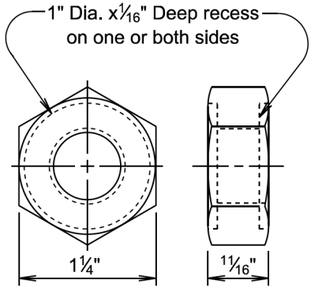
Published Date: 2024	SDDOT	THRIE BEAM GUARDRAIL	PLATE NUMBER 630.01
			Sheet 4 of 5



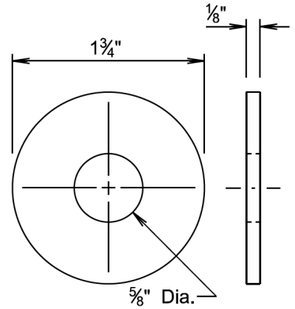
SECTION THROUGH THRIE BEAM RAIL



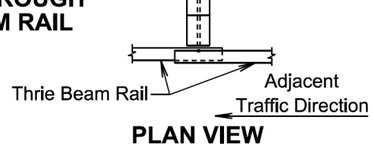
SPLICE BOLT AND POST BOLT
(⅝" Button Head Bolt)



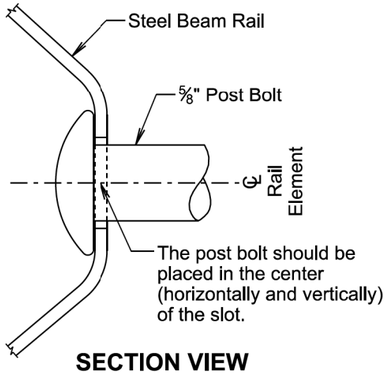
RECESS NUT
(At lap splices, the recess will be placed against the steel rail.)



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: 2024	SDDOT	THRIE BEAM GUARDRAIL	PLATE NUMBER 630.01
			Sheet 5 of 5

PLOT SCALE - 1:200
PLOT NAME - 12
FILE - ...\STANDARDPLATES_05UR.DGN
PLOTTED FROM - TRM111118

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.

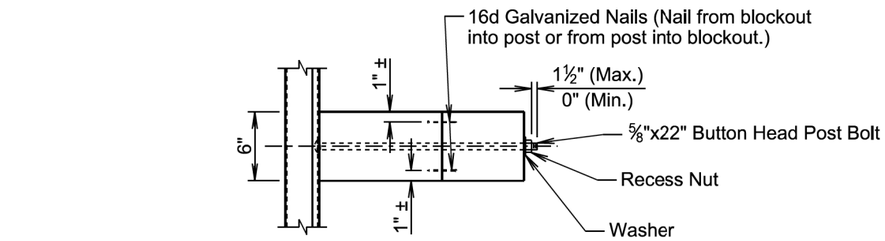
All W beam rail will be Type 1 and Class A (12 Ga.) unless specified otherwise in the plans.

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.

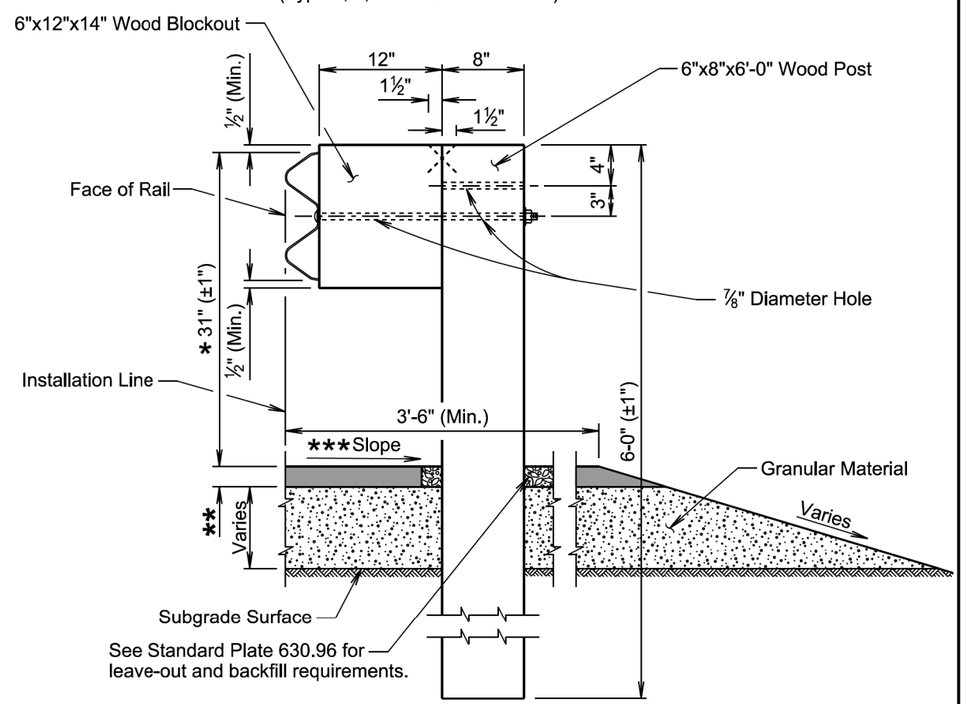
Slots in the rails will be provided as specified in the plans and by the manufacturer. A drilled hole through the rail is not allowed as a replacement for a slot. If the Contractor must create a slot, a cutting torch or plasma cutter is not allowed. The slot edges will be smooth and free of burrs or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



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



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

* See Standard Plate 630.99

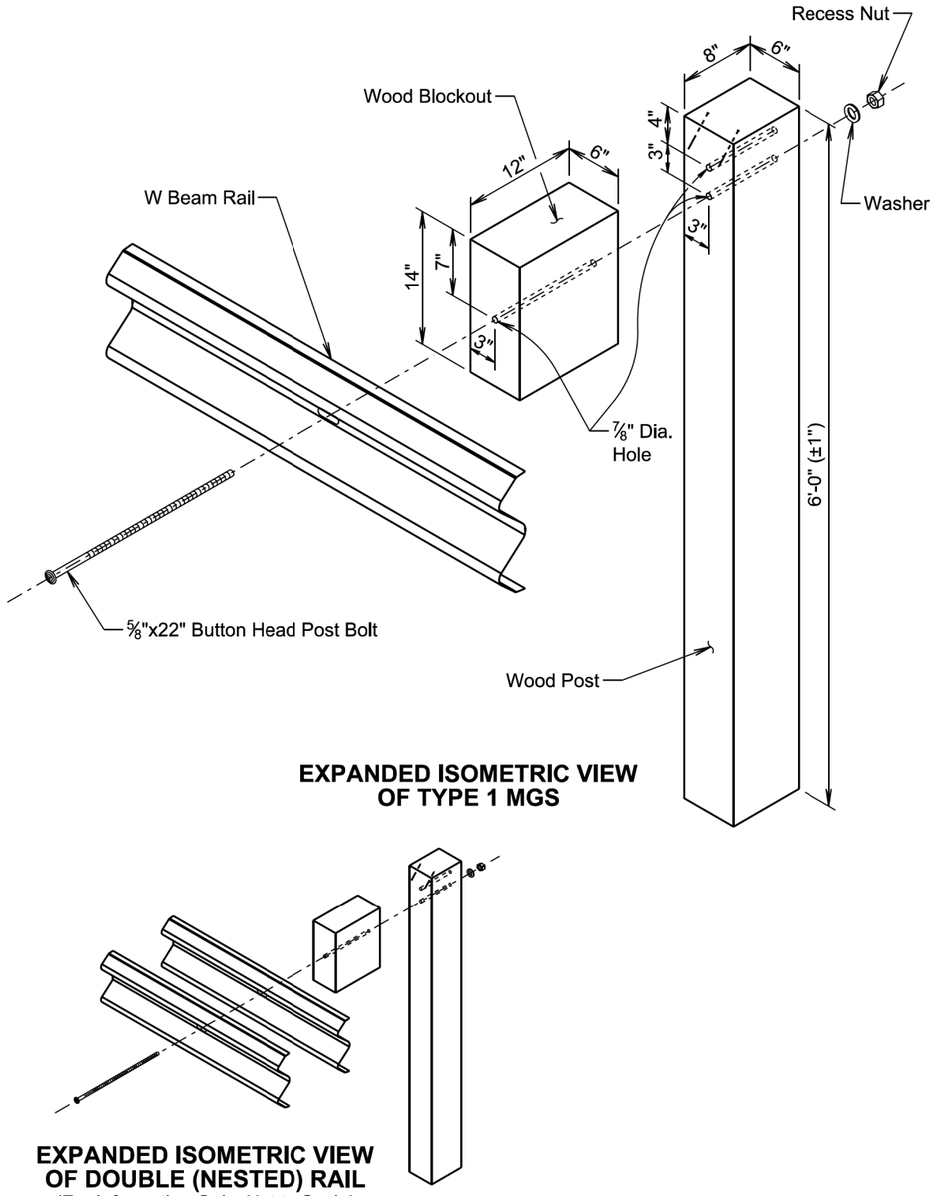
** 2" asphalt concrete or as specified in the plans.

*** 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

PLOT SCALE - 1:200
PLOT NAME - 13
FILE ...\STANDARDPLATES_05UR.DGN
_PLOTTED FROM - TRM111118

PLOT SCALE - 1:200
PLOT NAME - 14
FILE - ...\STANDARDPLATES_05UR.DGN
PLOTTED FROM - TRM111118

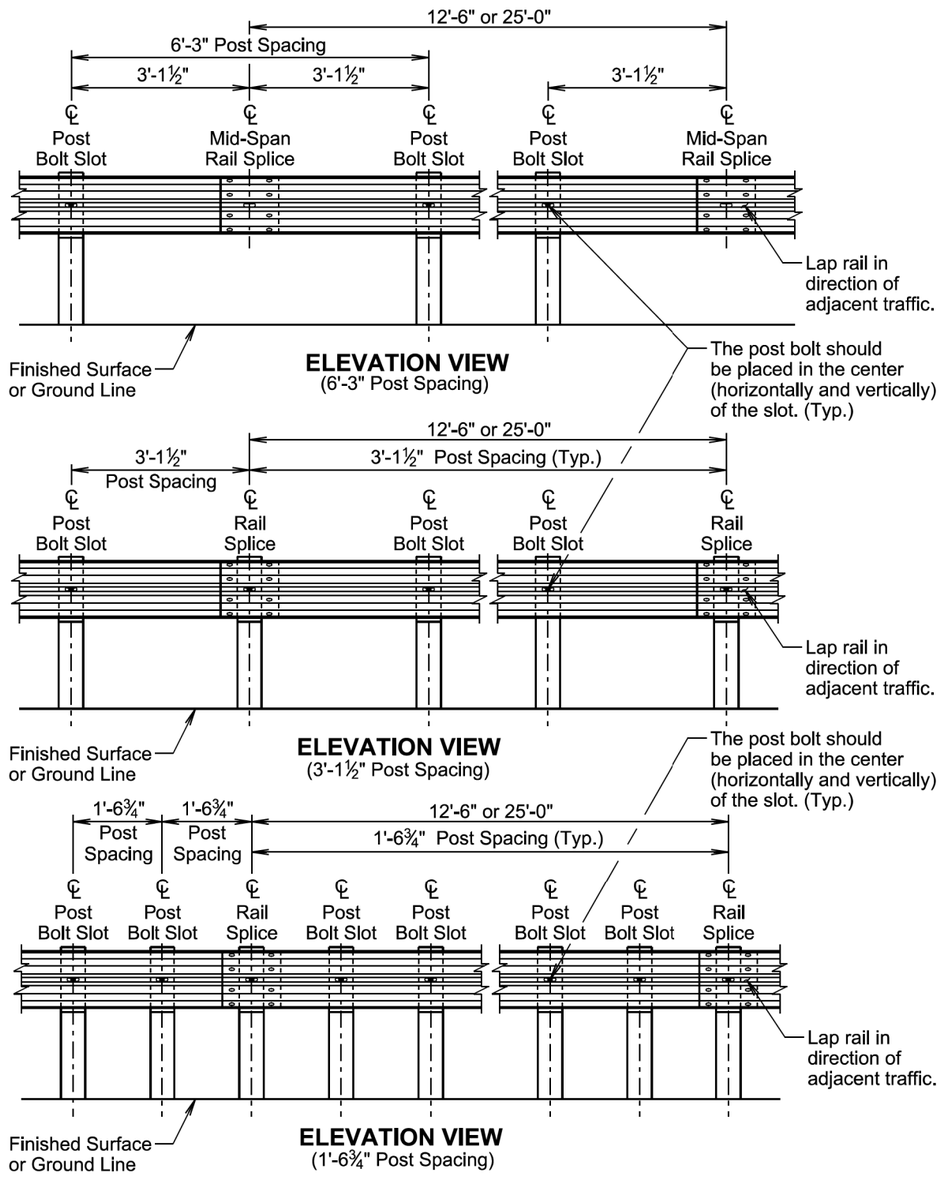


EXPANDED ISOMETRIC VIEW OF TYPE 1 MGS

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

September 14, 2019

Published Date: 2024	SDDOT	MIDWEST GUARDRAIL SYSTEM (MGS)	PLATE NUMBER 630.20
			Sheet 3 of 6



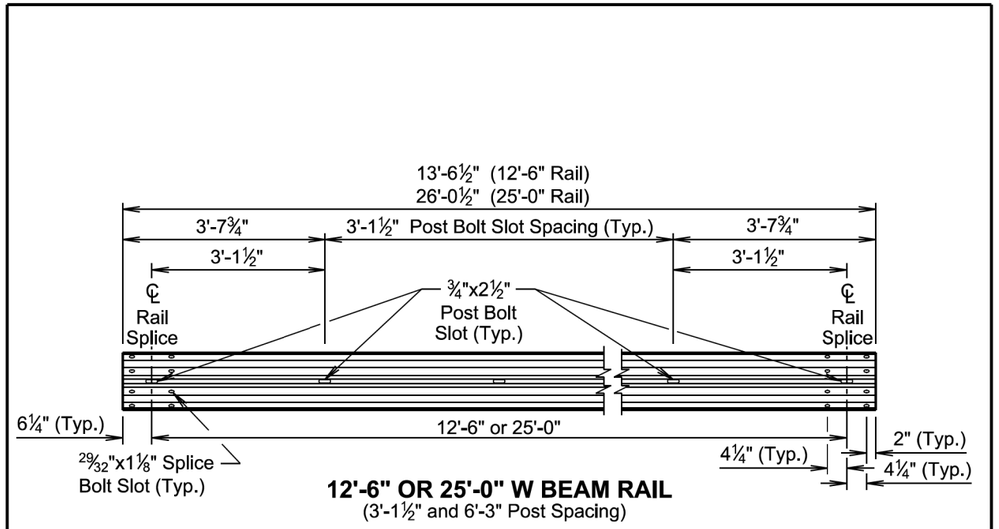
ELEVATION VIEW
(6'-3" Post Spacing)

ELEVATION VIEW
(3'-1½" Post Spacing)

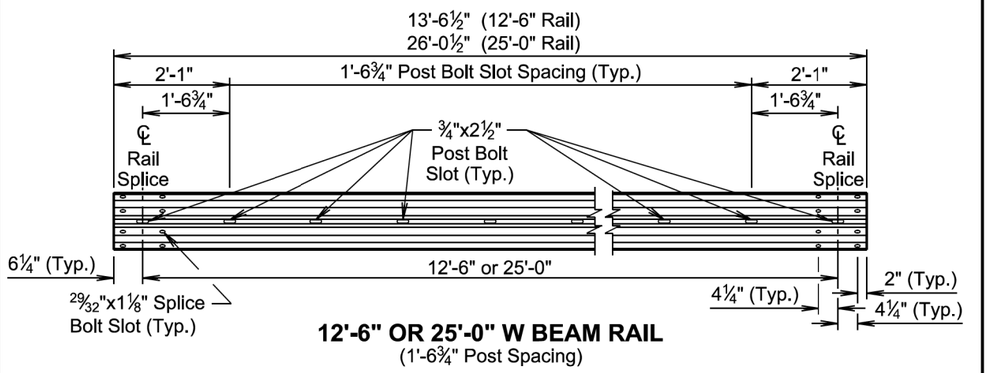
ELEVATION VIEW
(1'-6¾" Post Spacing)

September 14, 2019

Published Date: 2024	SDDOT	MIDWEST GUARDRAIL SYSTEM (MGS)	PLATE NUMBER 630.20
			Sheet 4 of 6



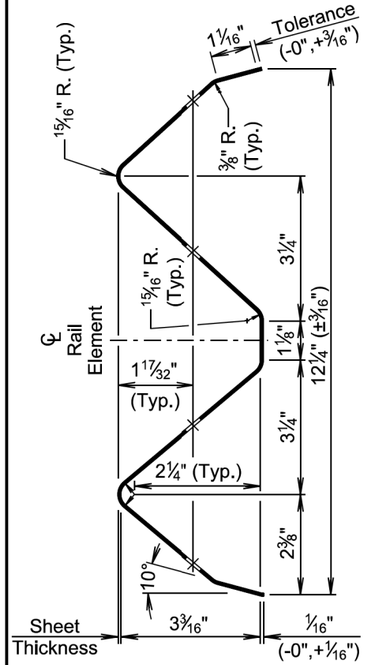
12'-6" OR 25'-0" W BEAM RAIL
(3'-1½" and 6'-3" Post Spacing)



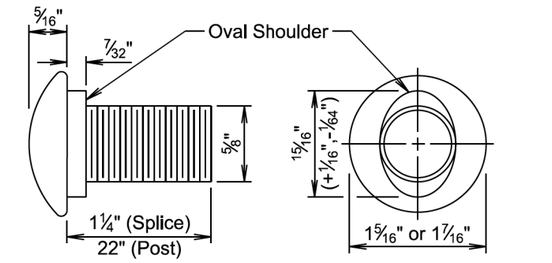
12'-6" OR 25'-0" W BEAM RAIL
(1'-6¾" Post Spacing)

September 14, 2019

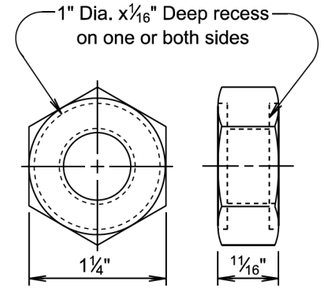
Published Date: 2024	SDDOT	MIDWEST GUARDRAIL SYSTEM (MGS)	PLATE NUMBER 630.20
			Sheet 5 of 6



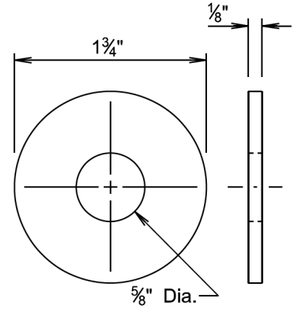
SECTION THROUGH W BEAM RAIL



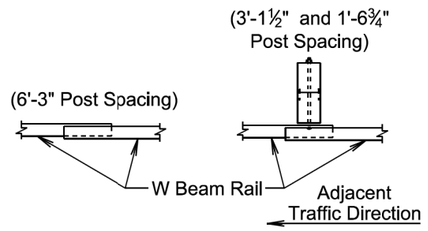
SPLICE BOLT AND POST BOLT
(⅝" Button Head Bolt)



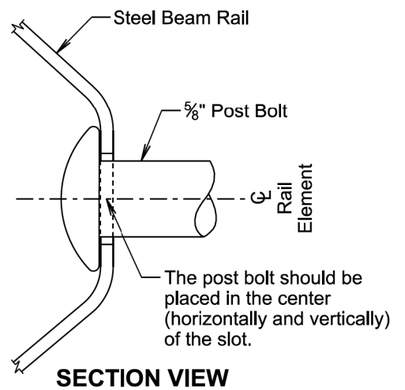
RECESS NUT
(At lap splices, the recess will be placed against the steel rail.)



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)

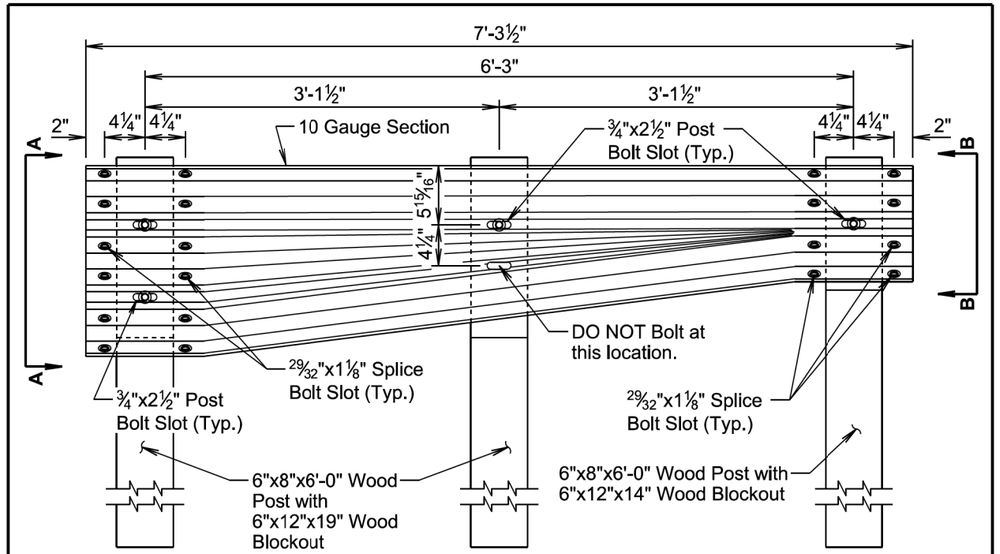


SECTION VIEW
(At Post Bolt)

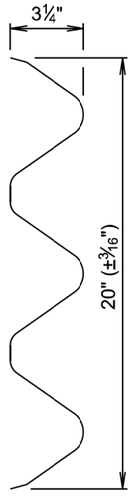
September 14, 2019

Published Date: 2024	SDDOT	MIDWEST GUARDRAIL SYSTEM (MGS)	PLATE NUMBER 630.20
			Sheet 6 of 6

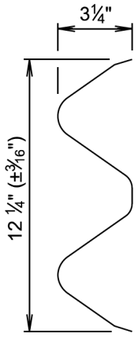
PLOT SCALE - 1:200
PLOT NAME - 15
FILE - ...\STANDARDPLATES_05UR.DGN
.PLOTTED FROM - TRM111118



ELEVATION VIEW



VIEW A-A



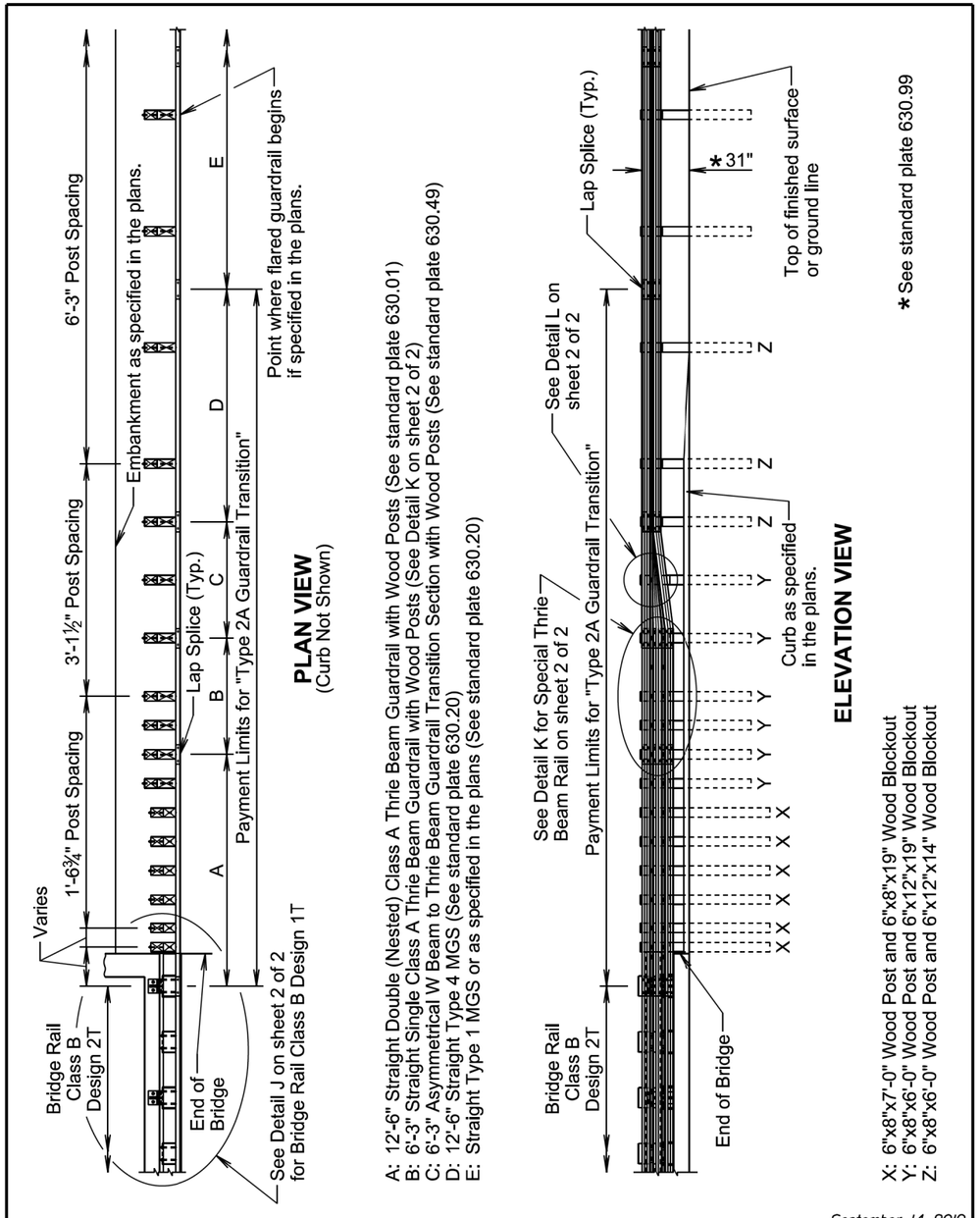
VIEW B-B

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: 2024	SDDOT	ASYMMETRICAL W BEAM TO THRIE BEAM GUARDRAIL TRANSITION SECTION	PLATE NUMBER 630.49
			Sheet 1 of 1



PLAN VIEW
(Curb Not Shown)

ELEVATION VIEW

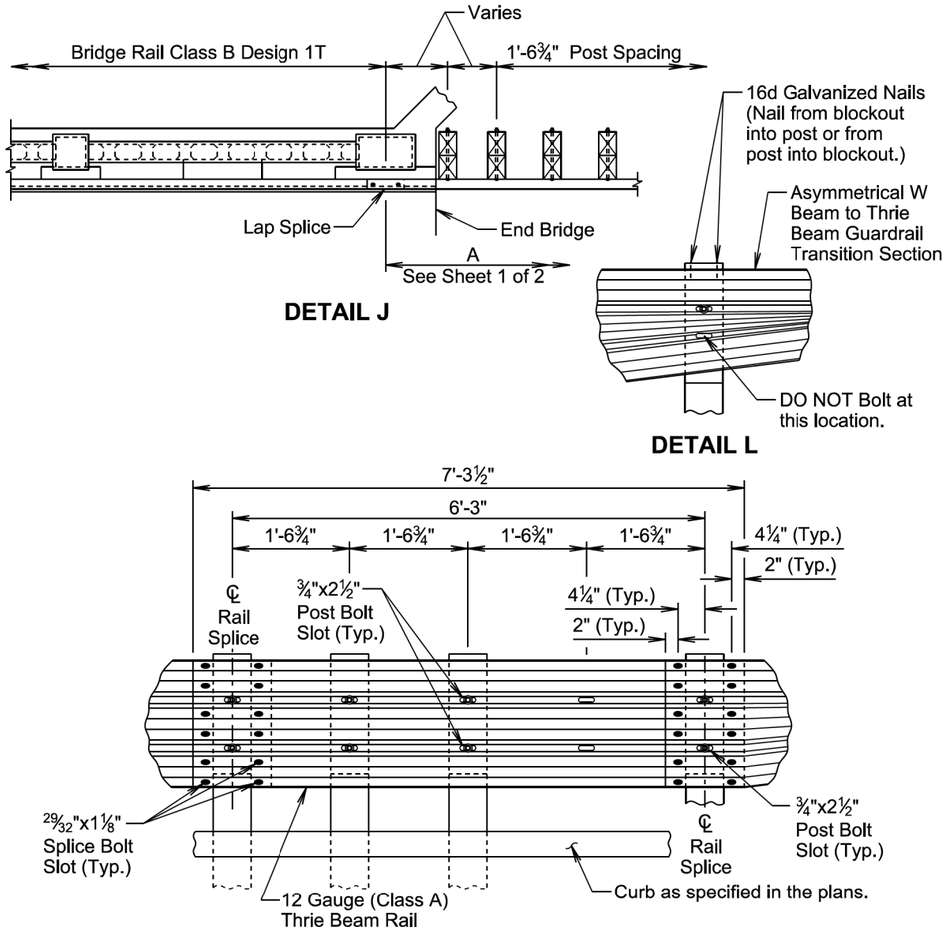
A: 12'-6" Straight Double (Nested) Class A Thrie Beam Guardrail with Wood Posts (See standard plate 630.01)
B: 6'-3" Straight Single Class A Thrie Beam Guardrail with Wood Posts (See Detail K on sheet 2 of 2)
C: 6'-3" Asymmetrical W Beam to Thrie Beam Guardrail Transition Section with Wood Posts (See standard plate 630.49)
D: 12'-6" Straight Type 4 MGS (See standard plate 630.20)
E: Straight Type 1 MGS or as specified in the plans (See standard plate 630.10)

X: 6"x8"x7'-0" Wood Post and 6"x8"x19" Wood Blockout
Y: 6"x8"x6'-0" Wood Post and 6"x12"x19" Wood Blockout
Z: 6"x8"x6'-0" Wood Post and 6"x12"x14" Wood Blockout

September 14, 2019

Published Date: 2024	SDDOT	TYPE 2A GUARDRAIL TRANSITION (BRIDGE RAIL CLASS B DESIGN 1T OR 2T TO MIDWEST GUARDRAIL SYSTEM (MGS))	PLATE NUMBER 630.54
			Sheet 1 of 2

PLOT SCALE - 1:200
PLOT NAME - 16
FILE - ...\STANDARDPLATES_05UR.DGN
PLOTTED FROM - TRM111118



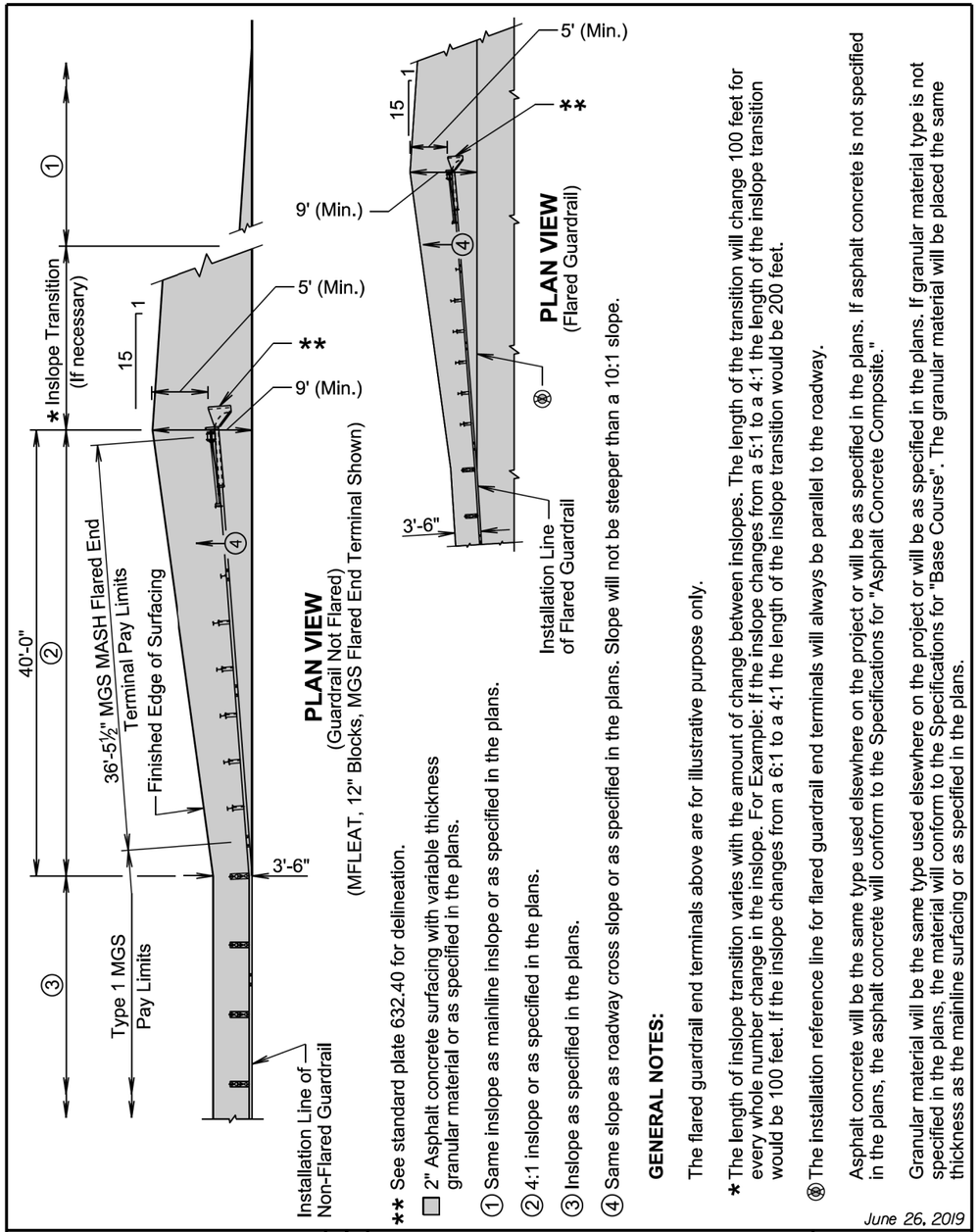
GENERAL NOTES:

Throughout the type 2A 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 2A guardrail transition including labor, equipment, and materials which includes all rail sections, posts and blockouts, hardware, and incidentals will be included in the contract unit price per each for "Type 2A Guardrail Transition".

September 14, 2019

Published Date: 2024	SDDOT	TYPE 2A GUARDRAIL TRANSITION (BRIDGE RAIL CLASS B DESIGN 1T OR 2T TO MIDWEST GUARDRAIL SYSTEM (MGS))	PLATE NUMBER 630.54 Sheet 2 of 2



** See standard plate 632.40 for delineation.

□ 2" Asphalt concrete surfacing with variable thickness granular material or as specified in the plans.

① Same inslope as mainline inslope or as specified in the plans.

② 4:1 inslope or as specified in the plans.

③ Inslope as specified in the plans.

④ Same slope as roadway cross slope or as specified in the plans.

GENERAL NOTES:

The flared guardrail end terminals above are for illustrative purpose only.

* The length of inslope transition varies with the amount of change between inslopes. The length of the transition will change 100 feet 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 200 feet. If the inslope changes from a 6:1 to a 4:1 the length of the inslope transition would be 200 feet.

Ⓡ The installation reference line for flared guardrail end terminals will always be parallel to the roadway.

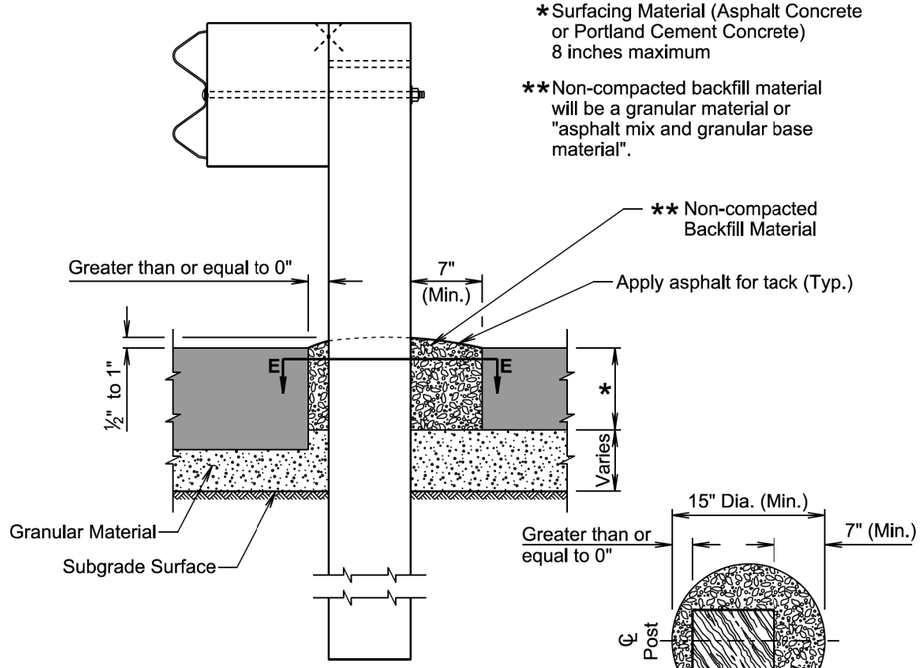
Asphalt concrete will be the same type used elsewhere on the project or will be as specified in the plans. If asphalt concrete is not specified in the plans, the asphalt concrete will conform to the Specifications for "Asphalt Concrete Composite."

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.

June 26, 2019

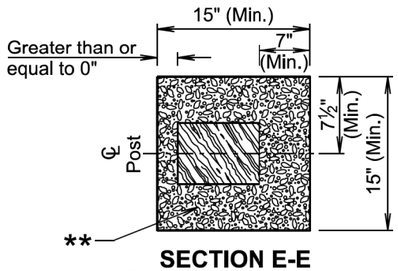
Published Date: 2024	SDDOT	EMBANKMENT, SURFACING, AND PAYMENT LIMITS FOR MGS MASH FLARED END TERMINAL	PLATE NUMBER 630.87 Sheet 1 of 1

PLOT SCALE - 1:200
PLOT NAME - 17
FILE ...\STANDARDPLATES_05UR.DGN
.PLOTTED FROM - TRM111118



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)



SECTION E-E
(Square 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.

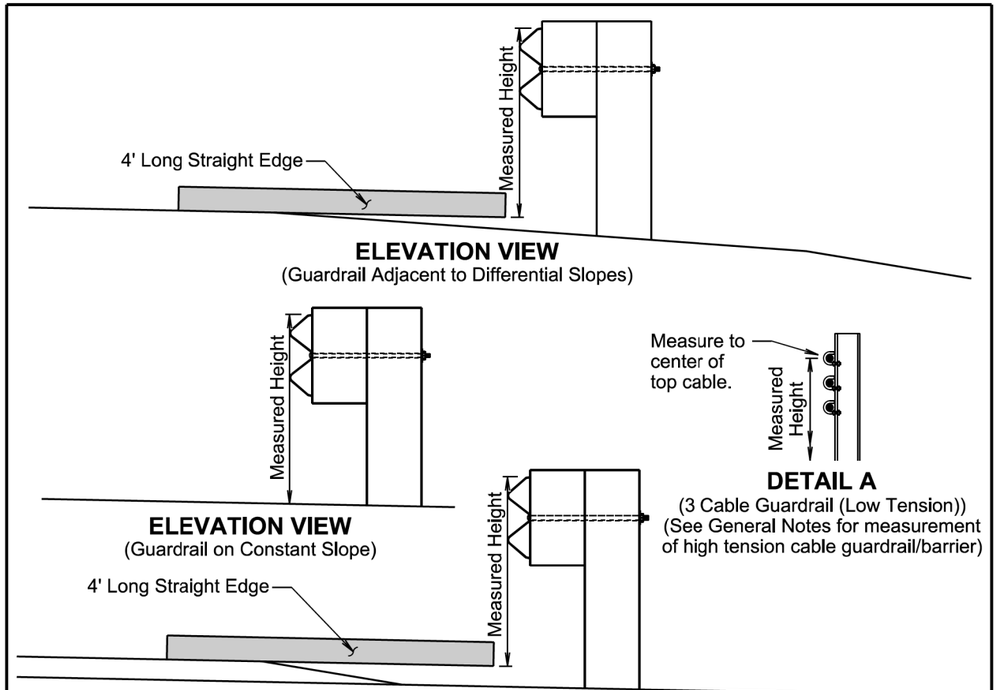
The backfill material will be mounded ½ inch to 1 inch above the top of the adjacent surfacing as illustrated above.

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.

November 19, 2021

Published Date: 2024	SDDOT	GUARDRAIL POST INSTALLED IN ASPHALT CONCRETE OR PORTLAND CEMENT CONCRETE	PLATE NUMBER 630.96
			Sheet 1 of 1

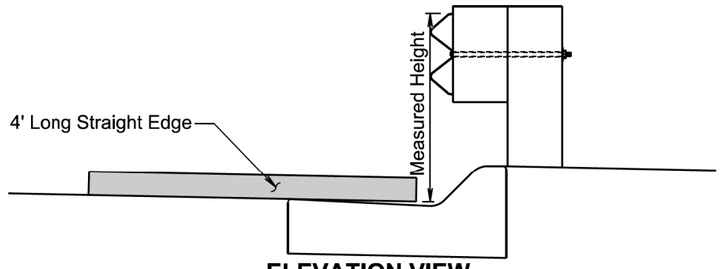


ELEVATION VIEW
(Guardrail Adjacent to Differential Slopes)

ELEVATION VIEW
(Guardrail on Constant Slope)

DETAIL A
(3 Cable Guardrail (Low Tension))
(See General Notes for measurement of high tension cable guardrail/barrier)

ELEVATION VIEW
(Guardrail Adjacent to Differential Surfacing Elevations)



ELEVATION VIEW
(Guardrail at Curb and Gutter)

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.

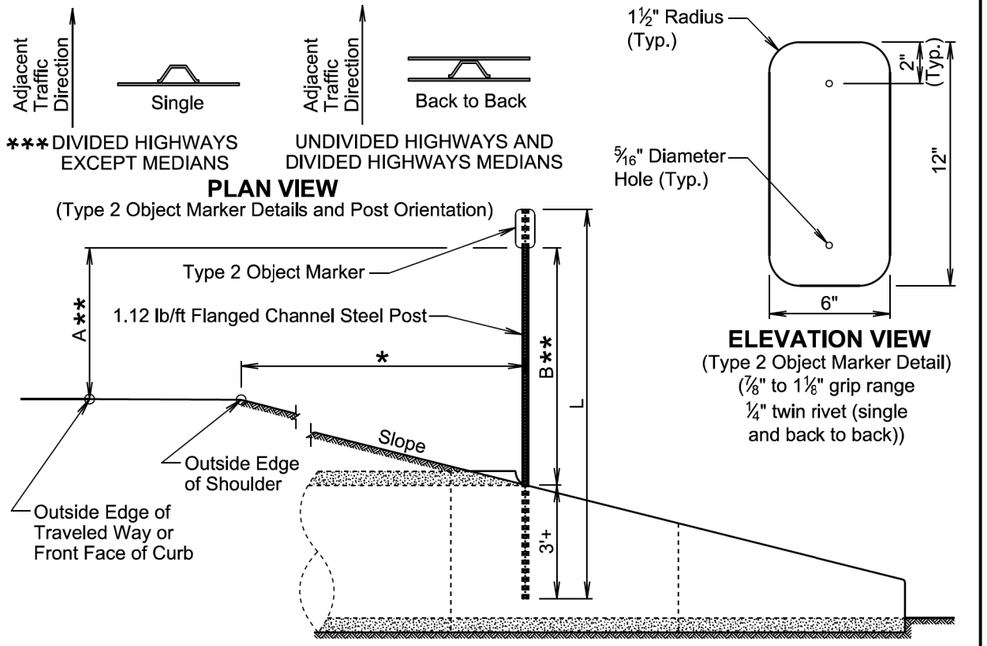
When measuring height of 3 cable guardrail (low tension) the height will be measured to the center of the top cable. See Detail A.

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

September 14, 2019

Published Date: 2024	SDDOT	MEASURING GUARDRAIL HEIGHT	PLATE NUMBER 630.99
			Sheet 1 of 1

PLOT SCALE - 1:200
PLOT NAME - 18
FILE - ...\STANDARDPLATES_05UR.DGN
_PLOTTED FROM - TRM111118



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

GENERAL NOTES:

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

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

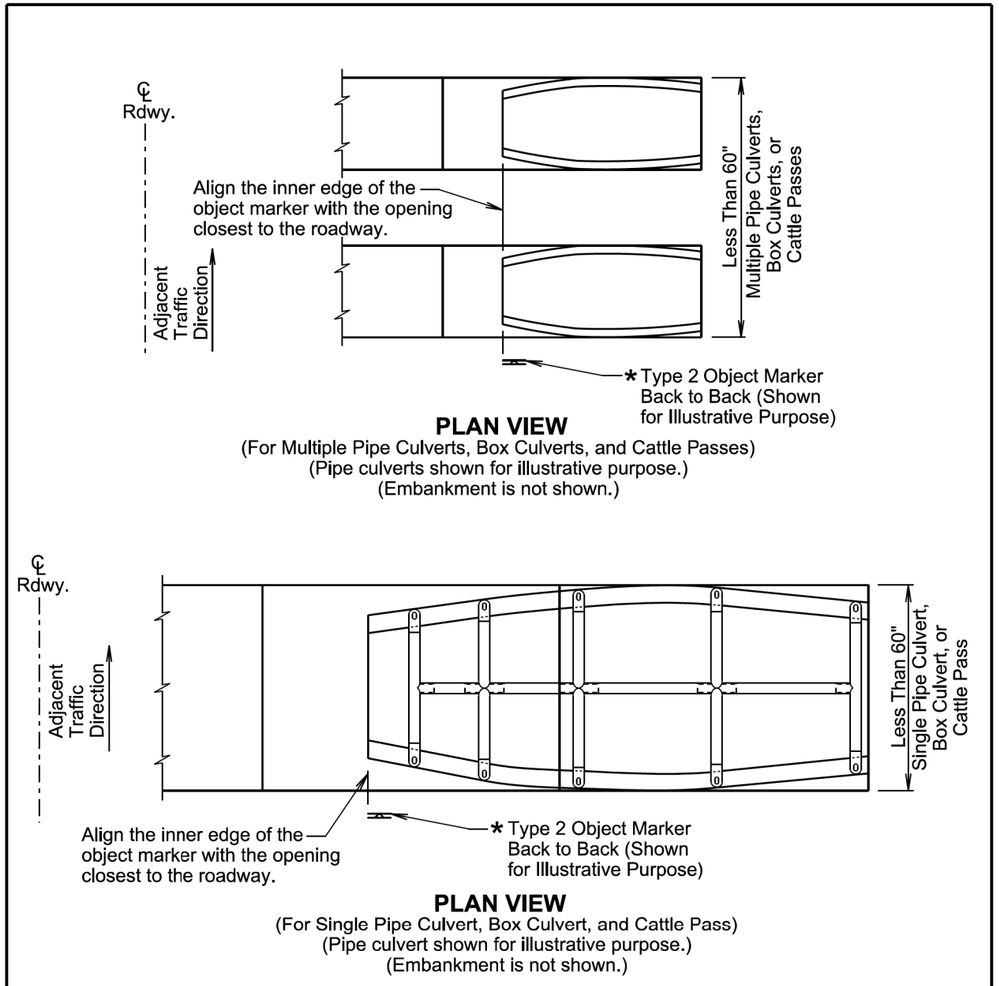
** Dimension A is 4 feet when the Offset * is 8 feet and less. Dimension B is 4 feet when Offset * is greater than 8 feet.

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

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

December 23, 2019

Published Date: 2024	SDDOT	TYPE 2 OBJECT MARKER (DIRECT DRIVE)	PLATE NUMBER 632.01
			Sheet 1 of 1



GENERAL NOTES:

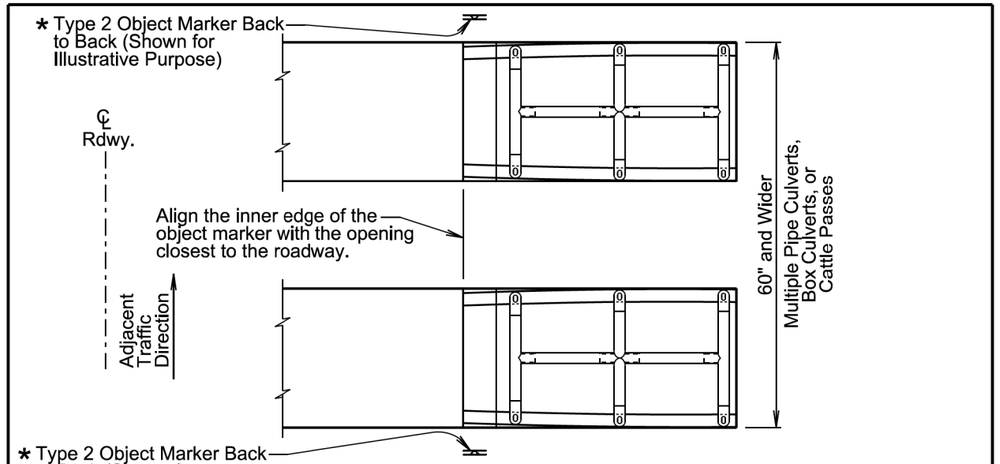
This standard plate will be used in conjunction with standard plate 632.01.

* 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.

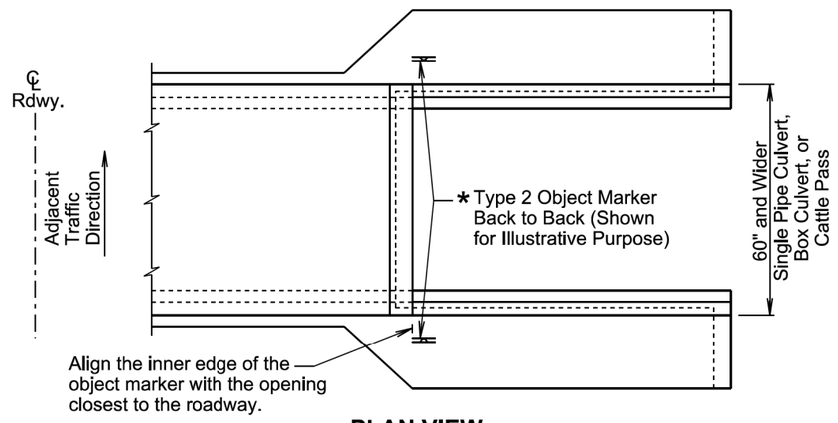
December 23, 2019

Published Date: 2024	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

PLOT SCALE - 1:200
PLOT NAME - 19
FILE - ...\STANDARDPLATES_05UR.DGN
.PLOTTED FROM - TRM111118



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.)

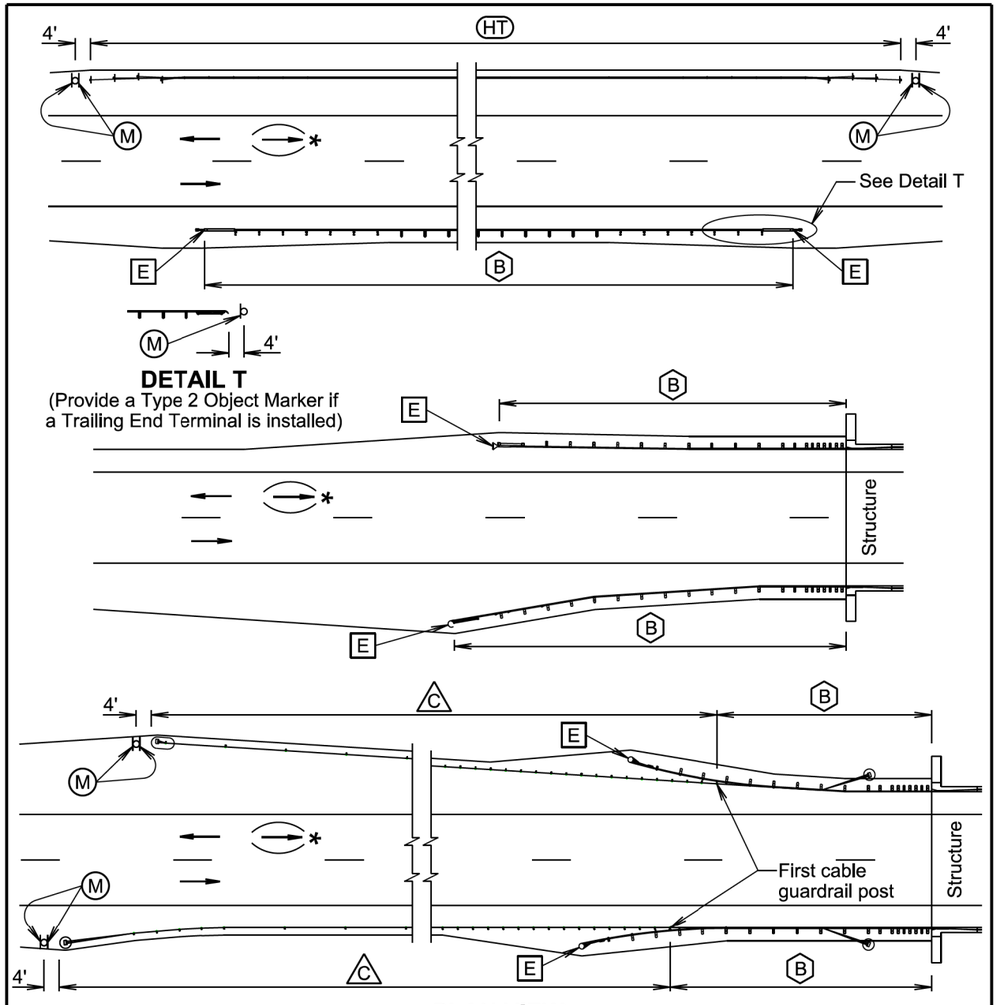
GENERAL NOTES:

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: 2024	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



PLAN VIEW
(Typical Guardrail Layouts)

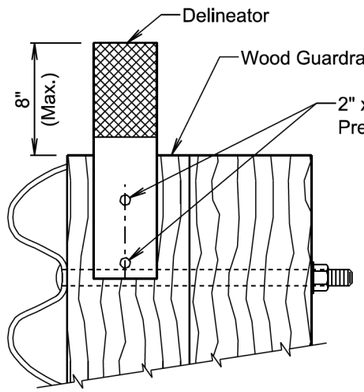
- (B) Steel Beam Guardrail Delineation
- (E) Guardrail End Terminal Object Marker
- (C) 3 Cable Guardrail (Low Tension) Delineation
- (HT) High Tension Cable Guardrail Delineation
- (M) Type 2 Object Marker

* 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.

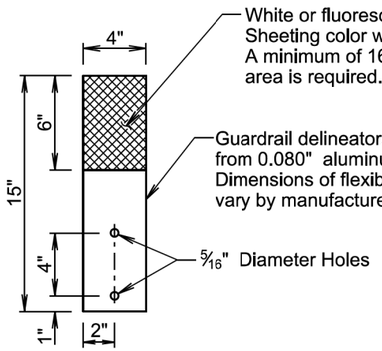
December 23, 2019

Published Date: 2024	SDDOT	DELINEATION OF GUARDRAIL	PLATE NUMBER 632.40 Sheet 1 of 4

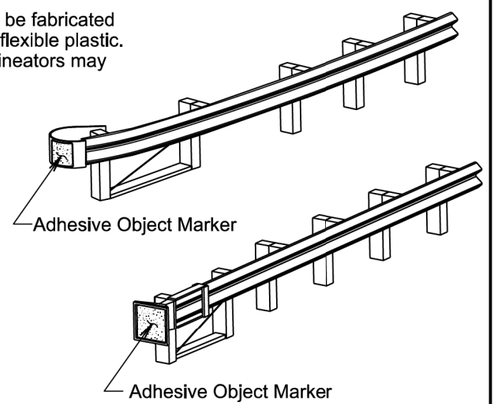
PLOT SCALE - 1:200
PLOT NAME - 20
FILE - ...\STANDARDPLATES_05UR.DGN
.PLOTTED FROM - TRM111118



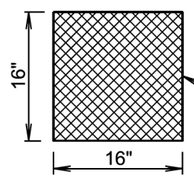
(B) STEEL BEAM GUARDRAIL DELINEATION



DELINEATOR
(For Steel Beam Guardrail)



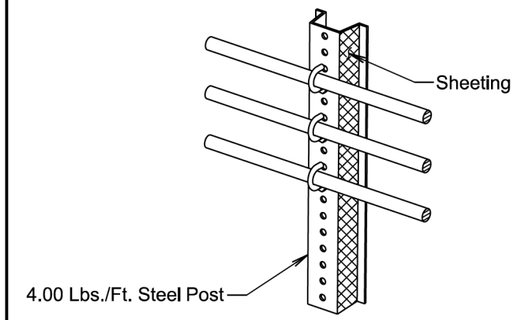
(E) GUARDRAIL END TERMINAL OBJECT MARKER



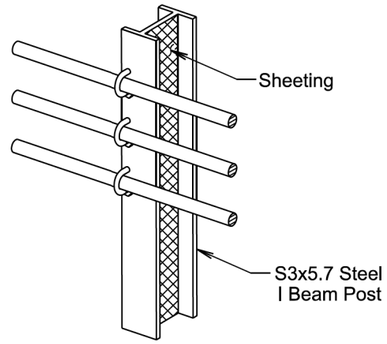
ADHESIVE OBJECT MARKER

December 23, 2019

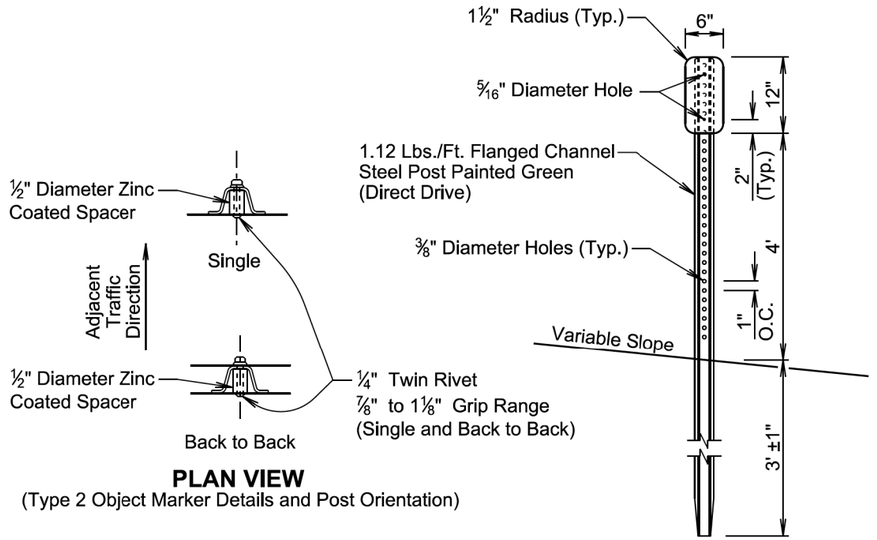
Published Date: 2024	SDDOT	DELINEATION OF GUARDRAIL	PLATE NUMBER 632.40
			Sheet 2 of 4



(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)

December 23, 2019

Published Date: 2024	SDDOT	DELINEATION OF GUARDRAIL	PLATE NUMBER 632.40
			Sheet 3 of 4

PLOT SCALE - 1:200
PLOT NAME - 21
FILE - ...\STANDARDPLATES_05UR.DGN
_PLOTTED FROM - TRM111118

GENERAL NOTES:

The delineation of high tension cable guardrail will be reflective sheeting placed back to back on every other post cap or cable spacer. The sheeting will be type XI in conformance with ASTM D4956. The color of the reflective sheeting shall 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".

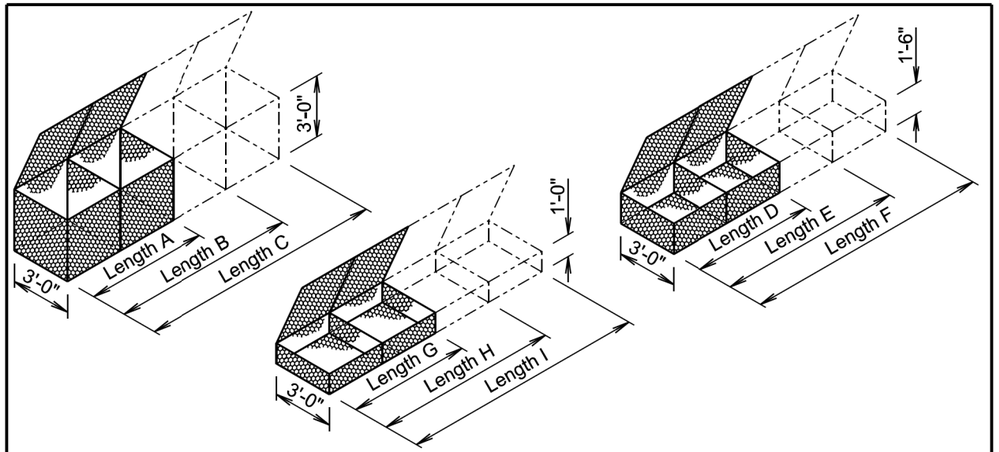
All costs for furnishing and installing the reflective sheeting on the cable spacers or post caps for the high tension cable guardrail will be incidental to the respective high tension cable guardrail contract item.

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. 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.

December 23, 2019

Published Date: 2024	SDDOT	DELINEATION OF GUARDRAIL	PLATE NUMBER 632.40
			Sheet 4 of 4



GABION DETAILS

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

Above dimensions subject to mill tolerances.

GENERAL NOTES:

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

The lacing procedure is as follows:

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

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

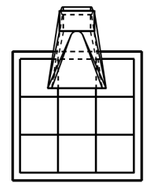
Interlocking fasteners for PVC coated gabions will be high tensile 0.120 inch diameter stainless steel wire conforming to ASTM A313, Type 302, Class 1. The spacing of the interlocking fasteners during all phases of assembly and construction will not exceed 6 inches.

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

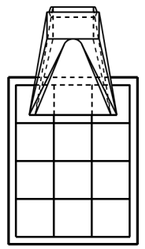
February 14, 2020

Published Date: 2024	SDDOT	BANK AND CHANNEL PROTECTION GABIONS	PLATE NUMBER 720.01
			Sheet 1 of 1

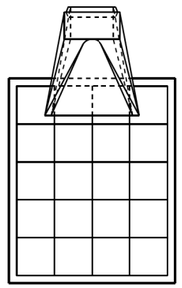
PLOT SCALE - 1:200
PLOT NAME - 22
FILE ...\STANDARDPLATES_Ø5UR.DGN
.PLOTTED FROM - TRM111118



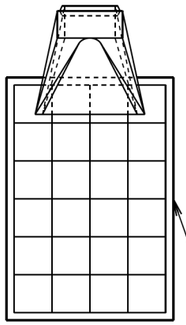
DETAIL 1



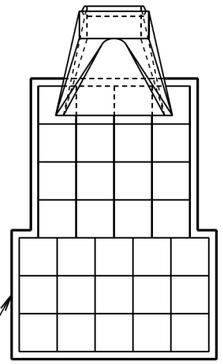
DETAIL 2



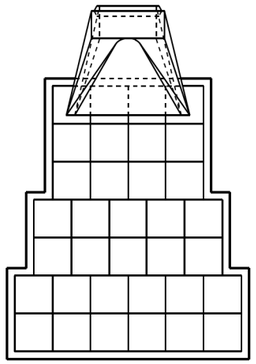
DETAIL 3



DETAIL 4



DETAIL 5



DETAIL 6

DETAIL 7

DETAIL 8

DETAIL 9

Type B Drainage Fabric (Typ.)

February 14, 2020

Published Date: 2024	SDDOT	BANK AND CHANNEL PROTECTION GABION PLACEMENT UNDER PIPE END SECTIONS	PLATE NUMBER 720.03
			Sheet 1 of 2

* ESTIMATED QUANTITIES				
	Detail	Pipe Diameter (Inches)	Gabion (Cu. Yd.)	Type B Drainage Fabric (Sq. Yd.)
RCP, RCP Arch, CMP, and CMP Arch	1	12, 18, and 24	4.5	15
	2	30 and 36	6.0	19
	3	42	10.0	29
	4	48 and 54	12.0	34
	5	60	15.5	43
	6	66	17.0	47
	7	72	21.5	57
	8	78	26.0	68
	9	84	27.0	70

GENERAL NOTES:

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

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

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

February 14, 2020

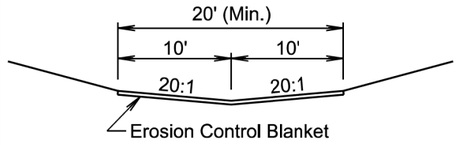
Published Date: 2024	SDDOT	BANK AND CHANNEL PROTECTION GABION PLACEMENT UNDER PIPE END SECTIONS	PLATE NUMBER 720.03
			Sheet 2 of 2

PLOT SCALE - 1:200

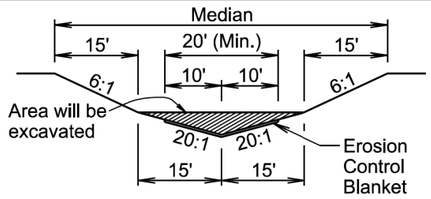
PLOT NAME - 23

FILE - ...\STANDARDPLATES_05UR.DGN

.PLOTTED FROM - TRM111118

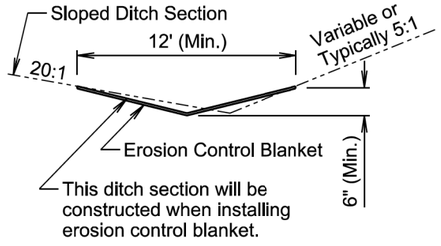


STANDARD DITCH SECTION

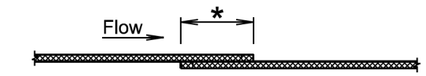


The median will be shaped to the limits shown in this detail where the erosion control blanket will be placed.

MEDIAN SECTION



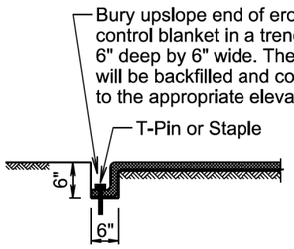
SLOPED DITCH SECTION



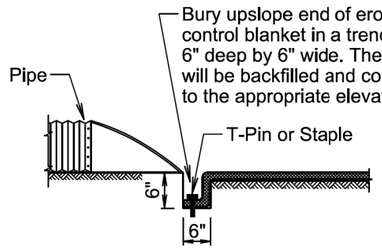
* Use a 4" (Min.) overlap wherever two widths of erosion control blanket are applied side by side.

* Use a 6" (Min.) overlap wherever one roll of erosion control blanket ends and another begins.

OVERLAP DETAIL



TRENCH DETAIL



PIPE END DETAIL

GENERAL NOTES:

Prior to placement of the erosion control blanket, the areas will be properly prepared, shaped, seeded, and fertilized.

Erosion control blanket will be unrolled in the direction of the flow of water when placed in ditches and on slopes. The upslope end of the erosion control blanket will be buried in a trench 6" wide by 6" deep. There will be at least a 6" overlap wherever one roll of erosion control blanket ends and another begins, with the upslope erosion control blanket placed on top of the downslope erosion control blanket.

The erosion control blanket will be pinned to the ground according to the manufacturer's installation recommendations.

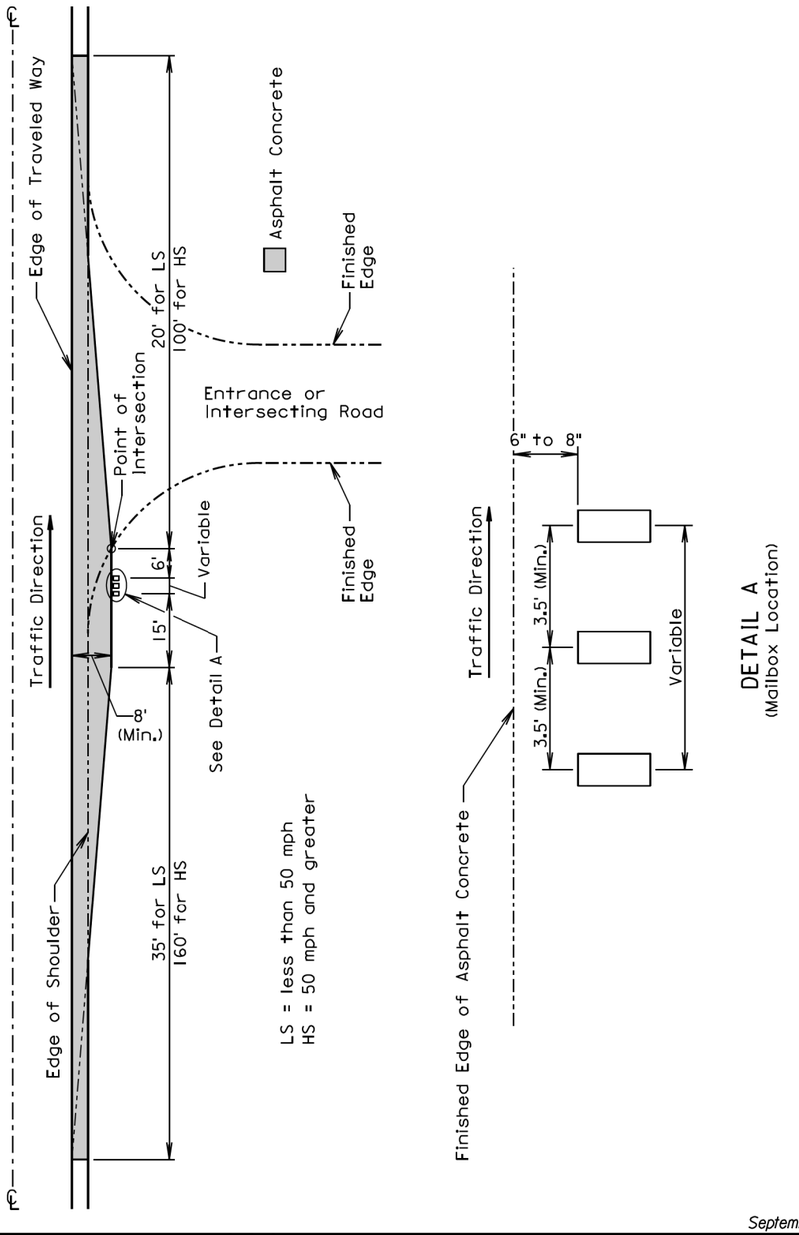
After the placement of the erosion control blanket, the Contractor will fine grade along all edges of the blanket to maintain a uniform slope adjacent to the blanket and level any low spots which might prevent uniform and unrestricted flow of side drainage directly onto the erosion control blanket.

All ditch sections will be shaped when installing the erosion control blanket. All costs for shaping the ditches will be incidental to the contract unit price per foot for "Shaping for Erosion Control Blanket".

February 14, 2020

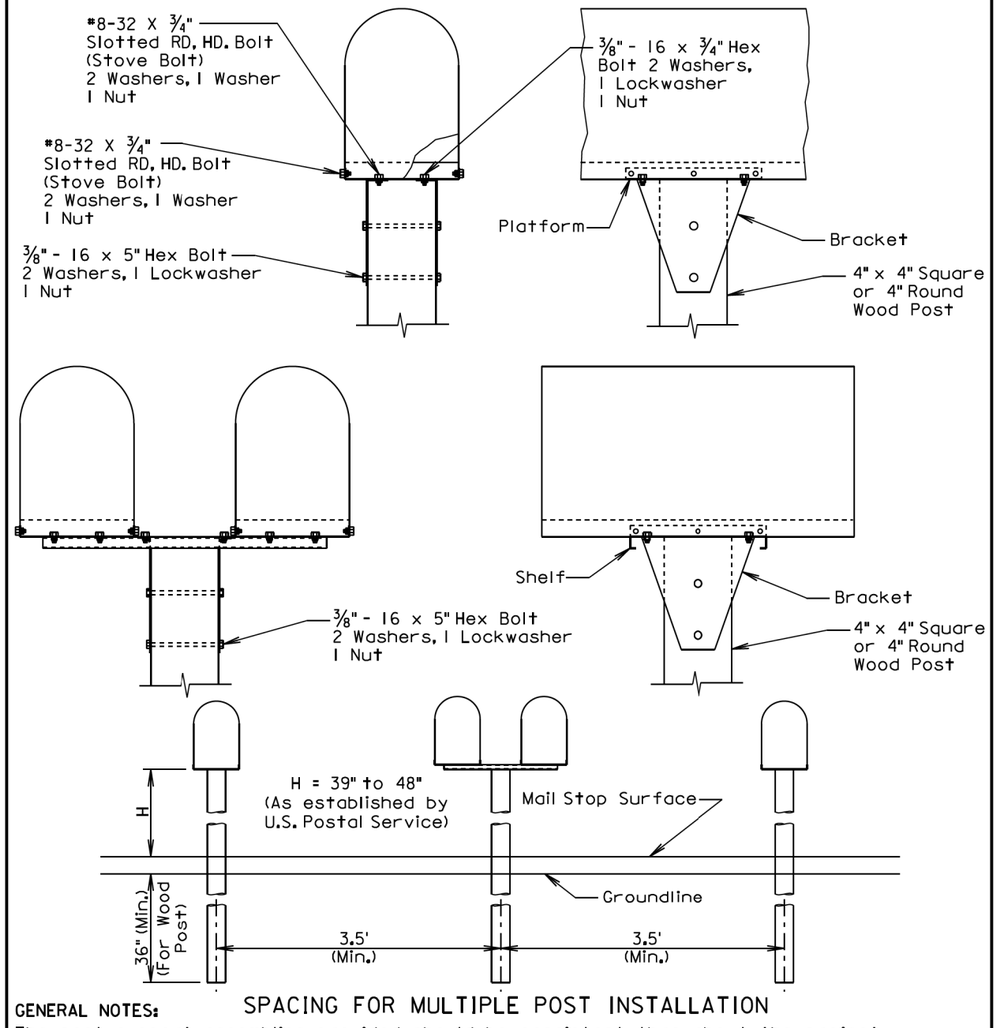
Published Date: 2024	SDDOT	***EROSION CONTROL BLANKET***	PLATE NUMBER 734.01
			Sheet 1 of 1

PLOT SCALE - 1:200
PLOT NAME - 24
FILE - ...\STANDARDPLATES_05UR.DGN
.PLOTTED FROM - TRM111118



September 6, 2015

Published Date: 2024	SDDOT	MAILBOX TURNOUT	PLATE NUMBER 900.01
			Sheet 1 of 1



SPACING FOR MULTIPLE POST INSTALLATION

GENERAL NOTES:

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

Single and double mailboxes may be in any sequence.

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

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

September 6, 2013

Published Date: 2024	SDDOT	SINGLE AND DOUBLE MAILBOX ASSEMBLIES	PLATE NUMBER 900.02
			Sheet 1 of 1

PLOT SCALE - 1:200
PLOT NAME - 25
FILE - ...\STANDARDPLATES_05UR.DGN
.PLOTTED FROM - TRMI11118

March 31, 2000

Published Date: 2024

SDDOT

MAILBOX SUPPORT HARDWARE

PLATE NUMBER
900.03

Sheet 1 of 1

PLOT SCALE - 1:200

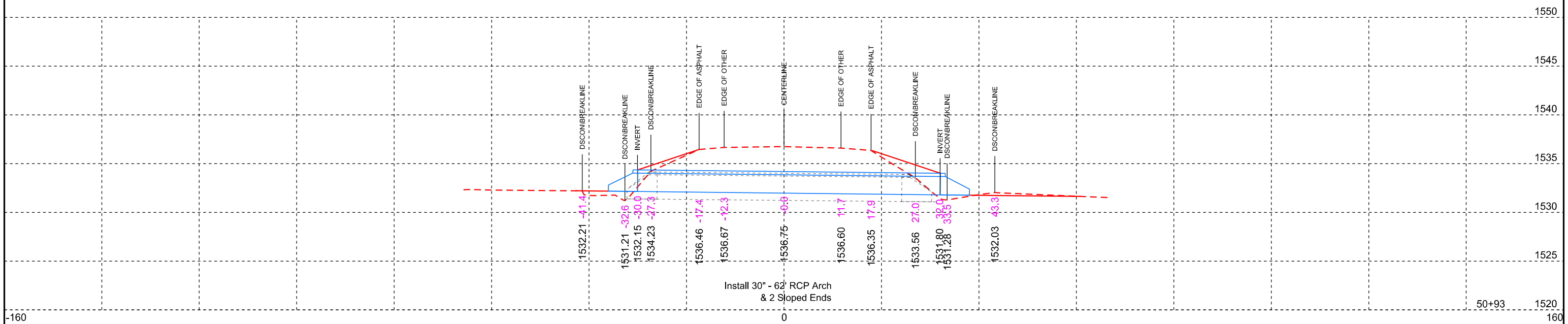
PLOTTED FROM - TRMI11118

PLOT NAME - 26

FILE - ...\STANDARDPLATES_05UR.DGN

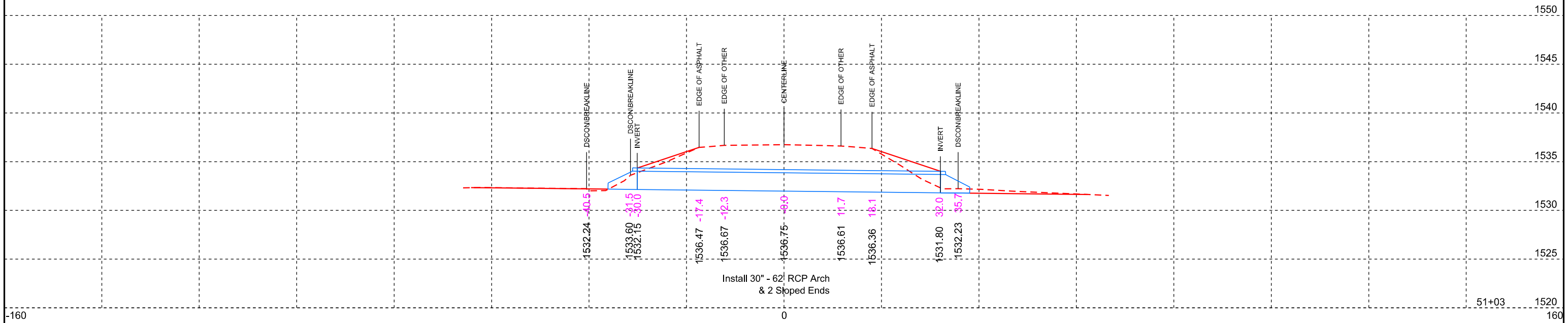
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0038(46)332	102	116

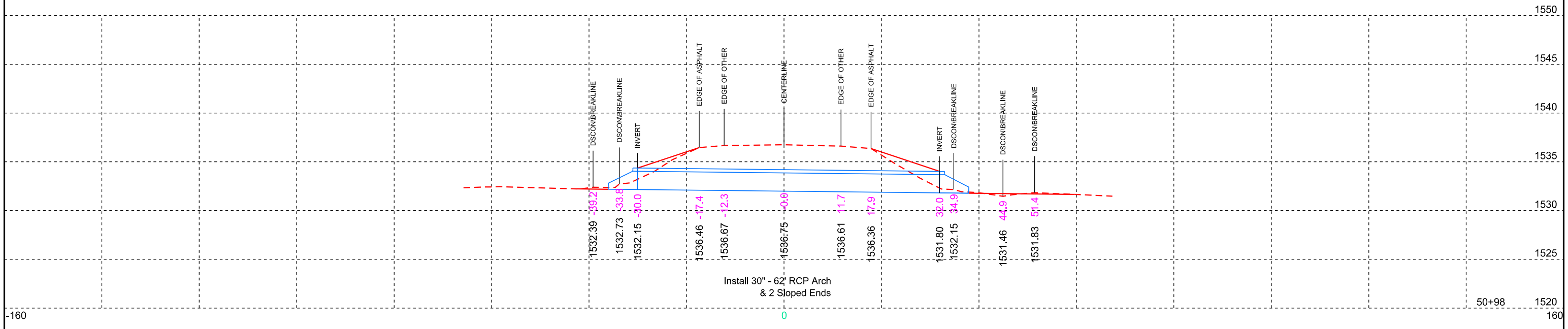
50+93



STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0038(46)332	103	116

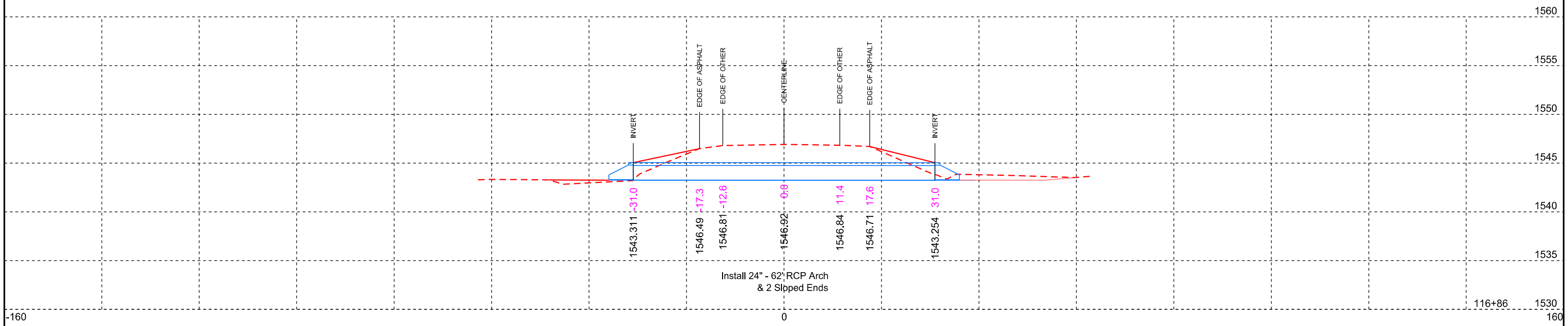
50+98 / 51+03





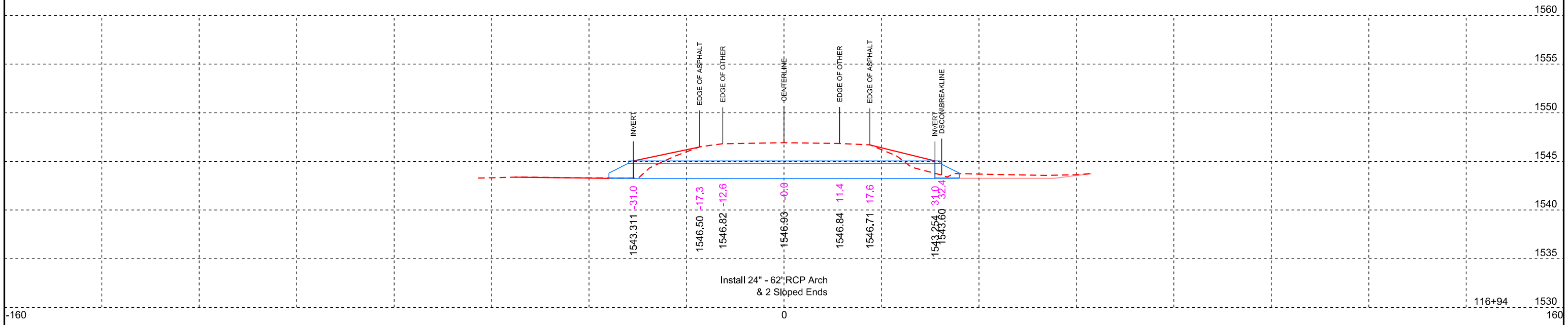
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0038(46)332	104	116

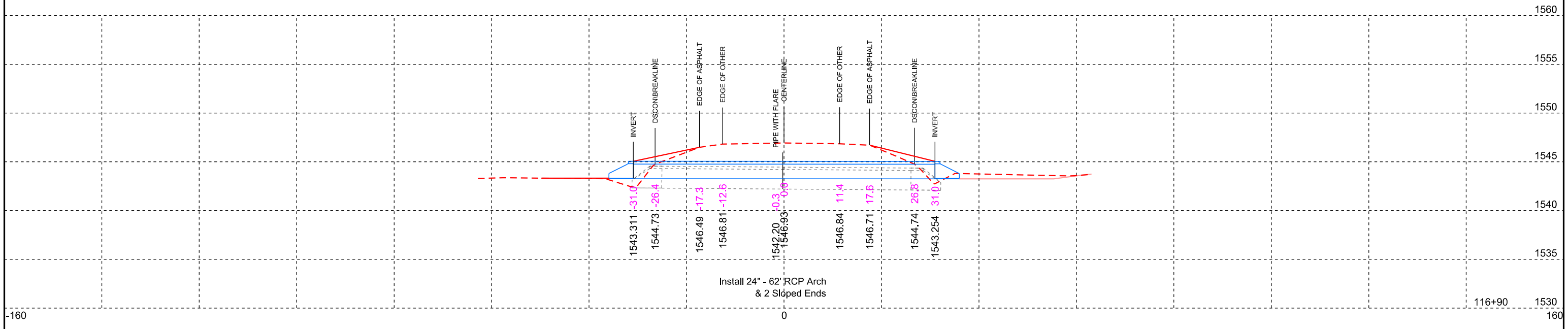
116+86



STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0038(46)332	105	116

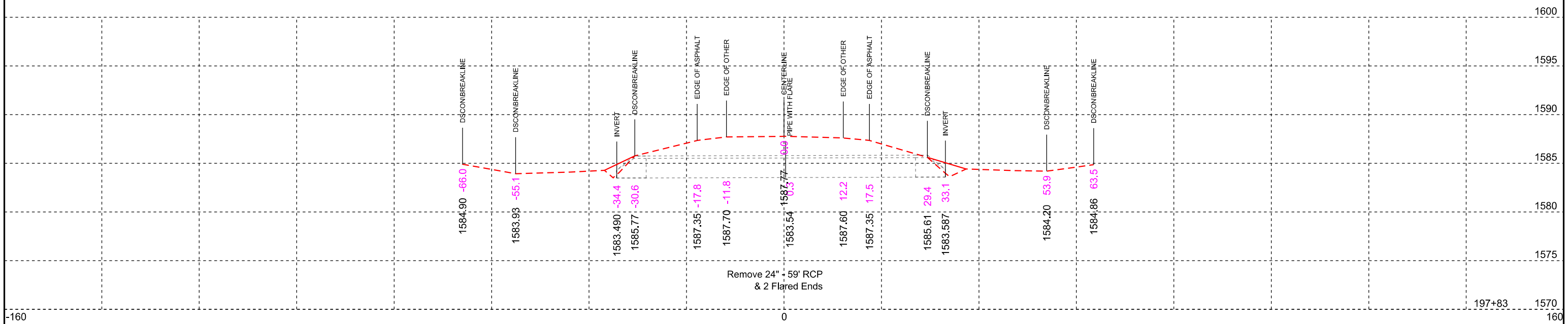
116+90 / 116+94





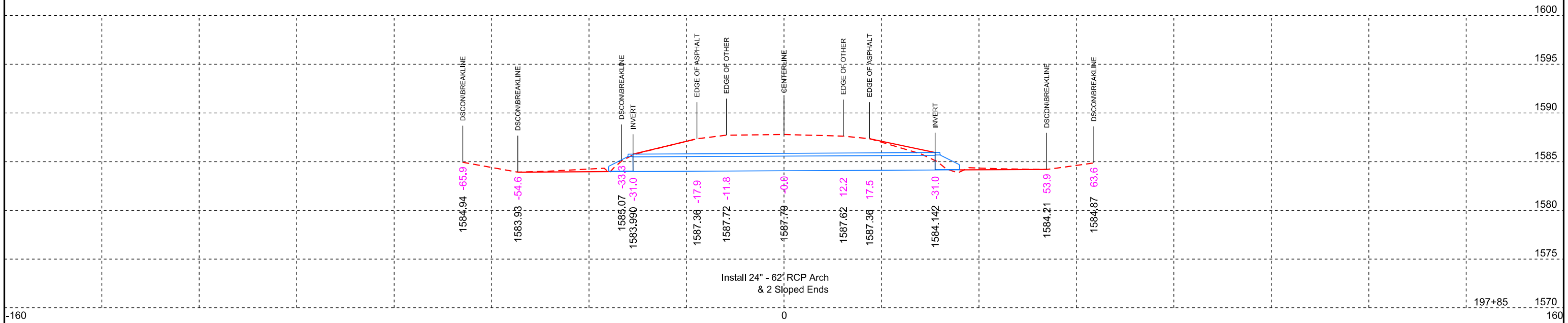
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0038(46)332	106	116

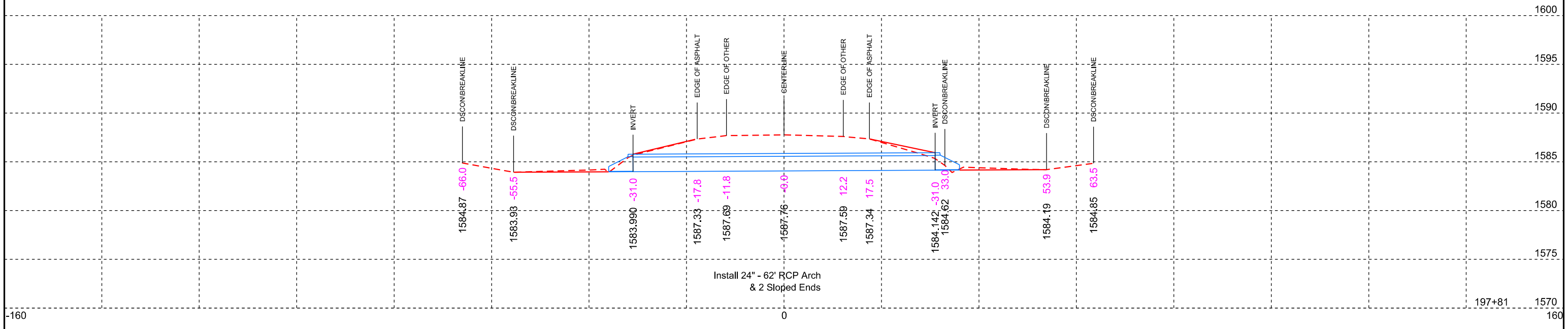
197+83



STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0038(46)332	107	116

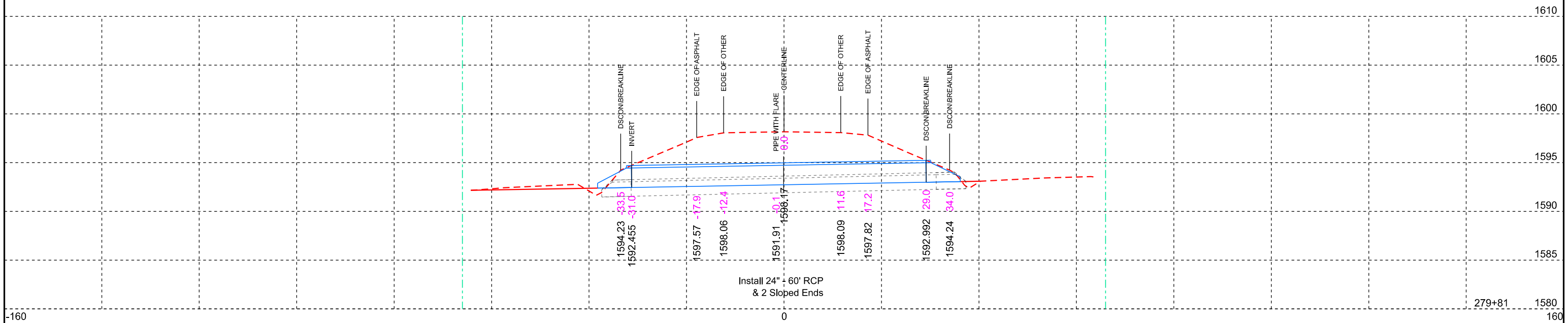
197+81 / 197+85





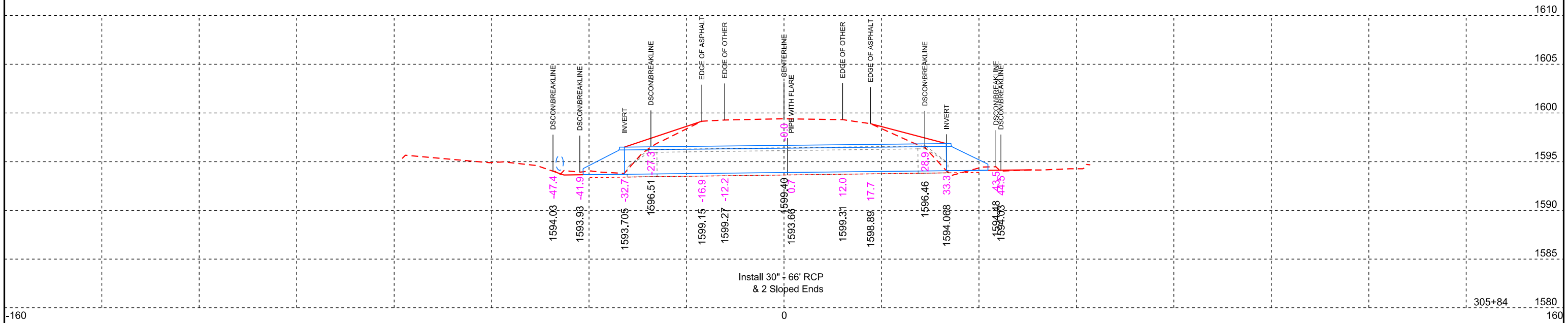
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0038(46)332	108	116

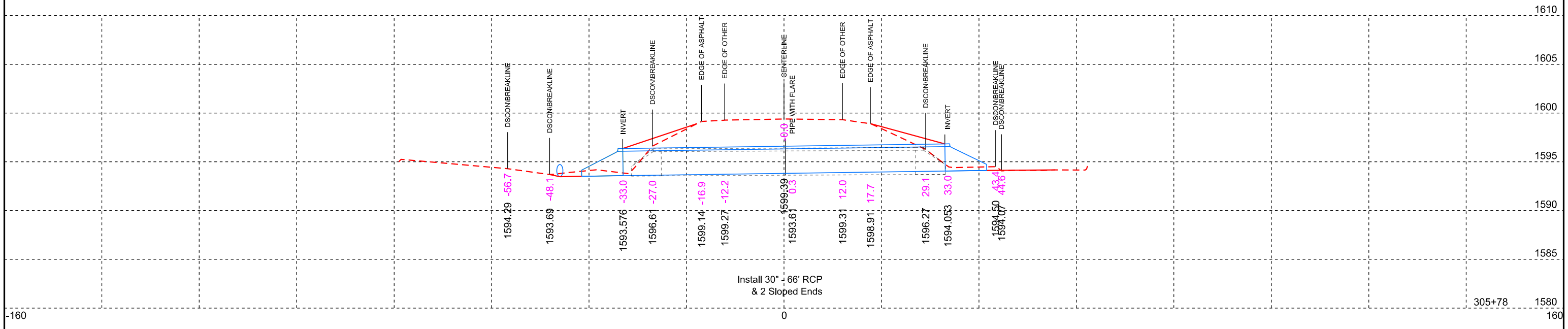
279+81



STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0038(46)332	109	116

305+78 / 305+84





Plotting Date: 09/20/2023

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	P 0038(46)332	110	116

TRAFFIC DIVERSION AT 613+00

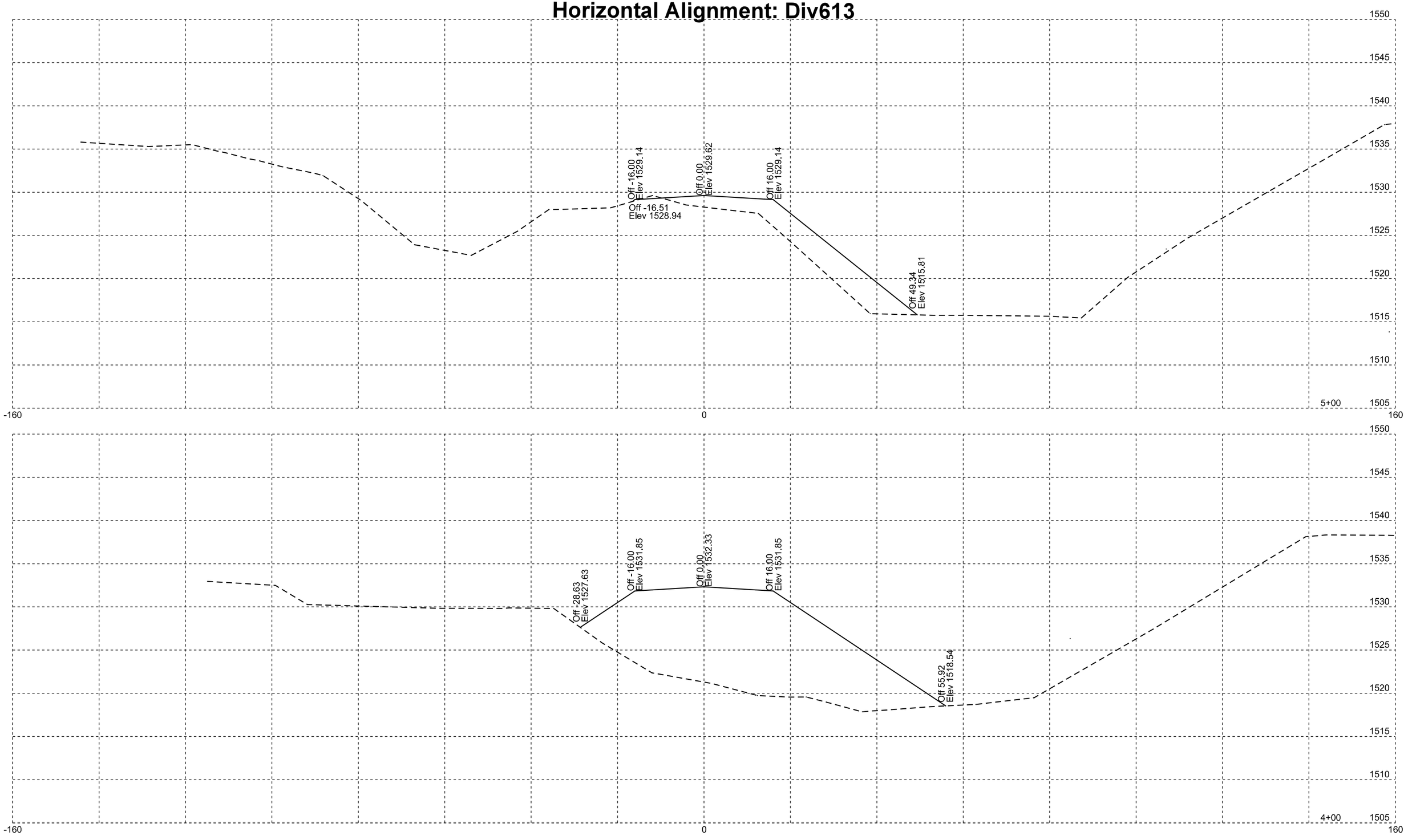
Horizontal Alignment: Div613

Plotting Date: 09/20/2023

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	P 0038(46)332	111	116

TRAFFIC DIVERSION AT 613+00

Horizontal Alignment: Div613

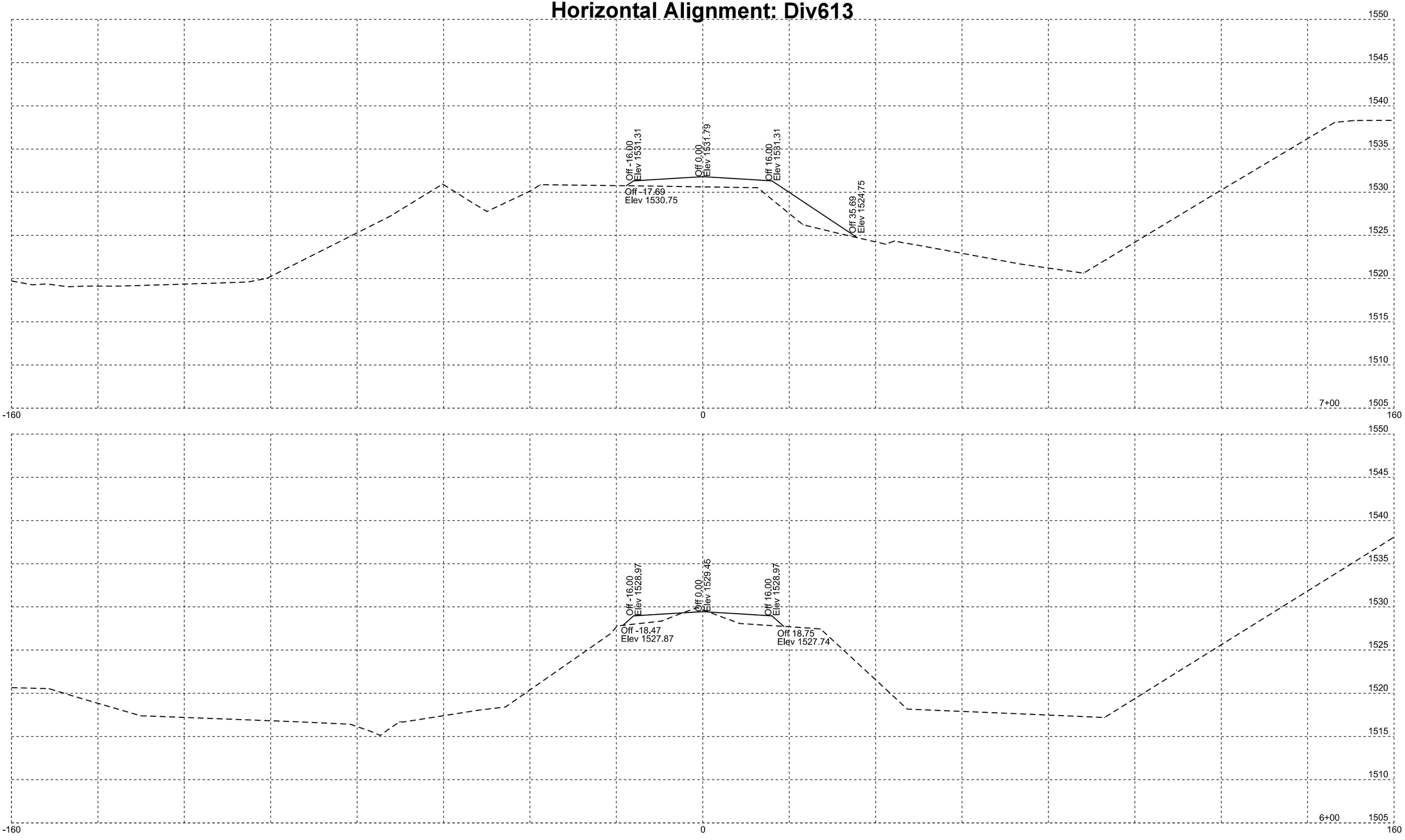


Plotting Date: 09/20/2023

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	P 0038(46)332	112	116

TRAFFIC DIVERSION AT 613+00

Horizontal Alignment: Div613

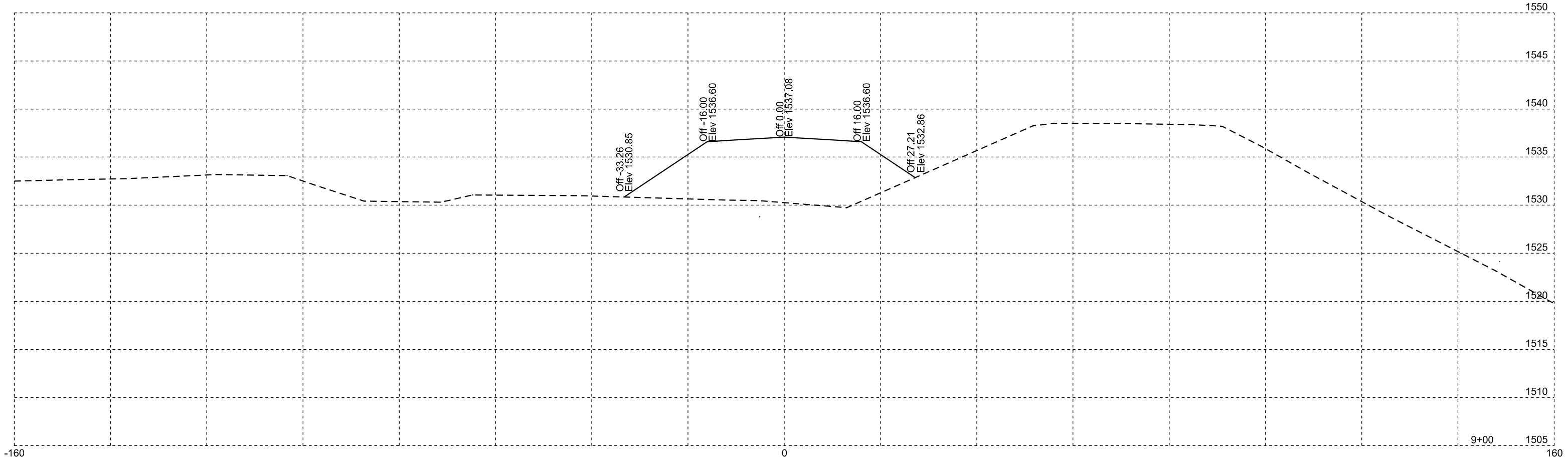


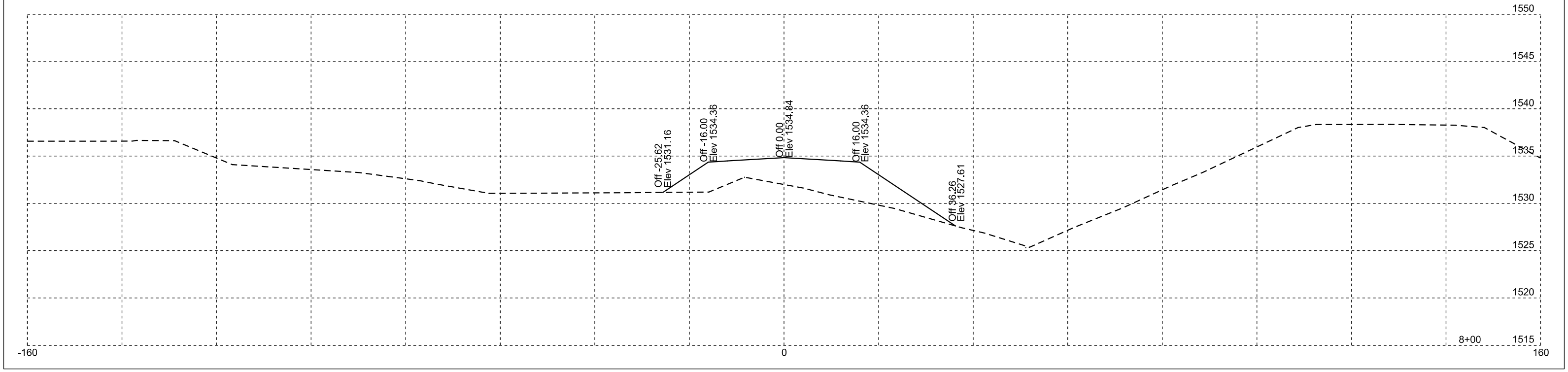
Plotting Date: 09/20/2023

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	P 0038(46)332	113	116

TRAFFIC DIVERSION AT 613+00

Horizontal Alignment: Div613



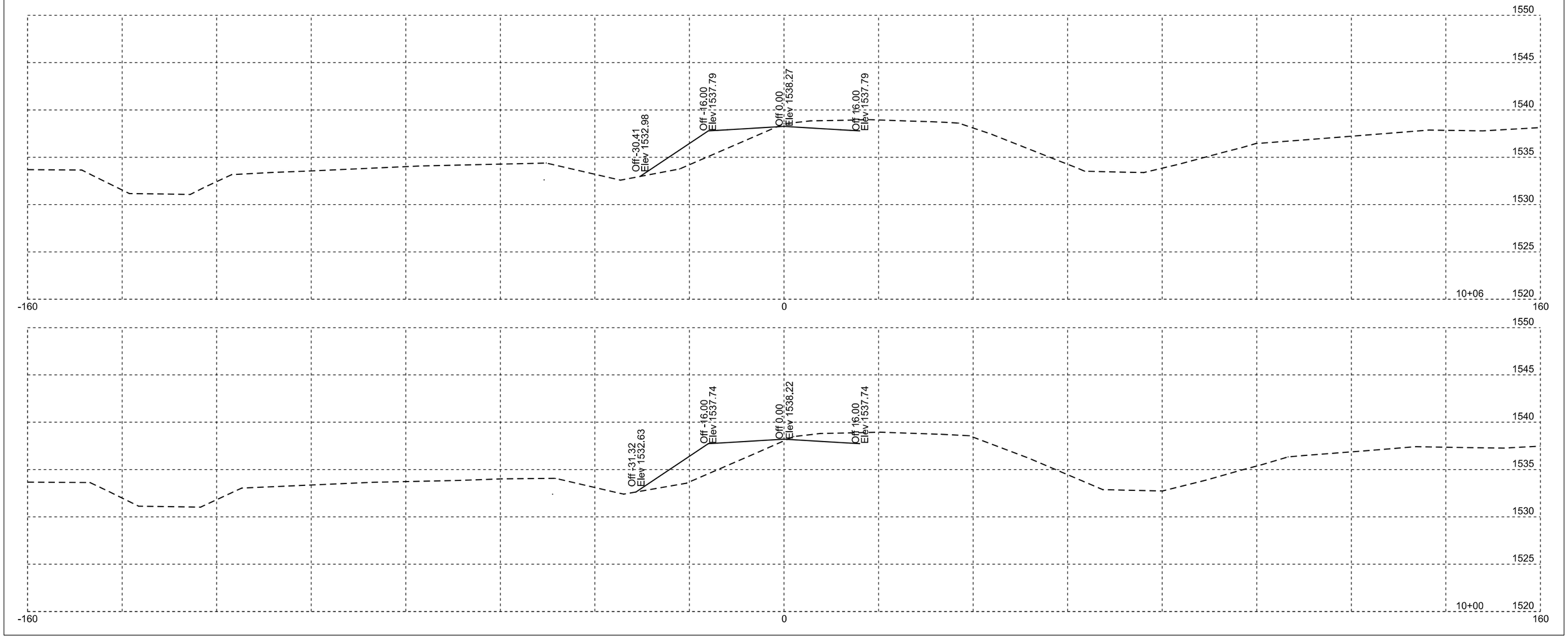


Plotting Date: 09/20/2023

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	P 0038(46)332	114	116

TRAFFIC DIVERSION AT 613+00

Horizontal Alignment: Div613

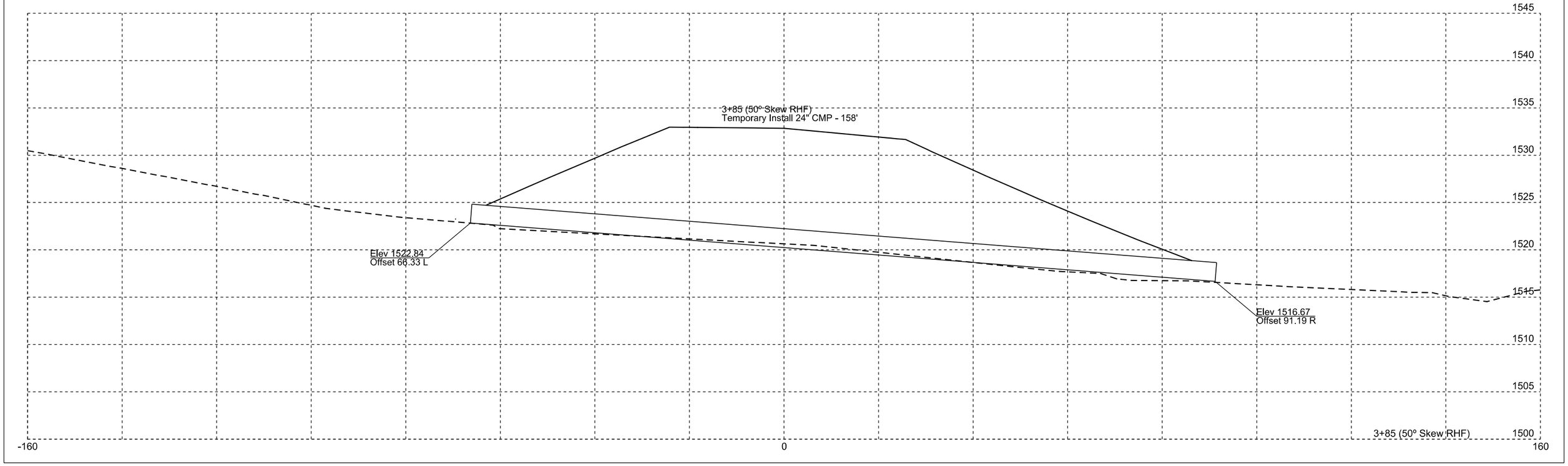


Plotting Date: 09/20/2023

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	P 0038(46)332	115	116

TRAFFIC DIVERSION AT 613+00

Horizontal Alignment: Div613



Plotting Date: 09/20/2023

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	P 0038(46)332	116	116

TRAFFIC DIVERSION AT 613+00

Horizontal Alignment: Div613