DEPARTMENT OF TRANSPORTATION

Planning & Engineering
Office of Project Development
700 East Broadway Avenue
Pierre, South Dakota 57501-2586
O: 605.773.3268 | F: 605.773.2614
dot.sd.gov

December 16, 2022

All Contracting Parties and Suppliers

RE: Buy America Requirements

Effective 1/11/2023, new Buy America requirements take effect. Please refer to the Special Provision for Buy America included in the proposal packet for each project. Supplemental information on Buy America Requirements and Bid Item Guidance for Buy America Requirements can be found on the Bid Letting Website at the following link: https://apps.sd.gov/HC65BidLetting/ebsbiddinginfo.aspx.

Regards,

SDDOT Office of Project Development
Bid Letting Staff

PLOT SCALE - 1:11483.5

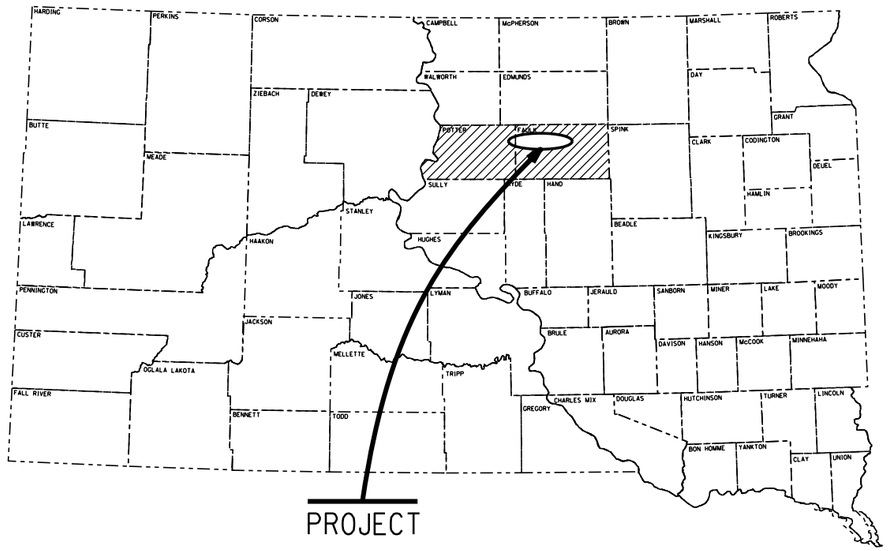
PLOT NAME - 1

FILE - ...\AREA\060D_TITLE_SHEET.DGN

PLOTTED FROM - TRABIL017

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	P 0020(197)267	1	61

Plotting Date: 11/08/2022



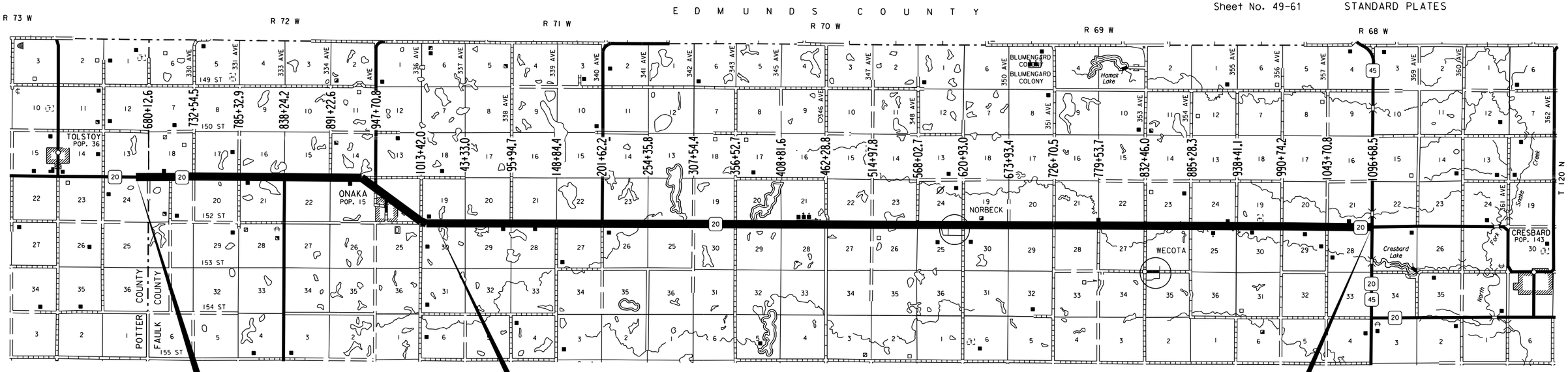
STATE OF SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION
PLANS FOR PROPOSED

PROJECT P 0020(197)267
SD HIGHWAY 20
FAULK & POTTER COUNTIES

COLD MILLING ASPHALT CONCRETE,
ASPHALT CONCRETE RESURFACING
AND MAINLINE CROSS PIPE REPAIR

PCN 060D

INDEX OF SHEETS



DESIGN DESIGNATION

ADT (2020)	220
ADT (2040)	262
DHV	35
D	51%
DHV T%	14.8%
AADT T%	32.5%
V	65 MPH

STORM WATER PERMIT
(None Required)

Gross Length	144,784.6 FEET	27.421 MILES
Length of Exceptions	0 FEET	0 MILES
Net Length	144,784.6 FEET	27.421 MILES

6

February 1, 2023

ESTIMATE OF QUANTITIES AND ENVIRONMENTAL COMMITMENTS

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0020(197)267	2	61

Rev. 11-17-22 AT

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
004E0020	Construction and Maintenance of Detour(s)	Lump Sum	LS
009E0010	Mobilization	Lump Sum	LS
110E0500	Remove Pipe Culvert	4	Ft
110E0510	Remove Pipe End Section	57	Each
110E0600	Remove Fence	300	Ft
110E1010	Remove Asphalt Concrete Pavement	2,337.0	SqYd
110E1700	Remove Silt Fence	75	Ft
110E7150	Remove Sign for Reset	1	Each
110E7500	Remove Pipe for Reset	106	Ft
110E7510	Remove Pipe End Section for Reset	13	Each
120E0100	Unclassified Excavation, Digouts	1,371	CuYd
120E0600	Contractor Furnished Borrow Excavation	125	CuYd
230E0100	Remove and Replace Topsoil	Lump Sum	LS
250E0020	Incidental Work, Grading	Lump Sum	LS
260E1010	Base Course	304.6	Ton
260E1030	Base Course, Salvaged	6,492.1	Ton
* 260E6000	Granular Material, Furnish	7,823.5	Ton
260E6000	Granular Material, Furnish	2,596.9	Ton
* 270E0200	Blend, Haul, and Stockpile Granular Material	19,558.7	Ton
270E0220	Blend and Stockpile Granular Material	6,492.1	Ton
320E0005	PG 58-34 Asphalt Binder	3,309.2	Ton
320E1200	Asphalt Concrete Composite	83.0	Ton
320E1202	Class Q2R Hot Mixed Asphalt Concrete	64,696.7	Ton
320E1800	Asphalt Concrete Blade Laid	4,113.2	Ton
320E4000	Hydrated Lime	678.5	Ton
320E7008	Grind 8" Rumble Strip or Stripe in Asphalt Concrete	54.8	Mile
320E7040	Grind 6" Transverse Rumble Strip in Asphalt Concrete	476.0	Ft
330E0100	SS-1h or CSS-1h Asphalt for Tack	337.8	Ton
330E0210	SS-1h or CSS-1h Asphalt for Flush Seal	120.5	Ton
330E2000	Sand for Flush Seal	1,443.6	Ton
332E0010	Cold Milling Asphalt Concrete	501,190	SqYd
421E0100	Pipe Culvert Undercut	29	CuYd
450E0142	24" RCP Class 2, Furnish	4	Ft
450E0150	24" RCP, Install	4	Ft
450E0192	42" RCP Class 2, Furnish	78	Ft
450E0200	42" RCP, Install	78	Ft
450E2008	18" RCP Flared End, Furnish	34	Each
450E2009	18" RCP Flared End, Install	34	Each
450E2016	24" RCP Flared End, Furnish	16	Each
450E2017	24" RCP Flared End, Install	16	Each
450E2024	30" RCP Flared End, Furnish	2	Each
450E2025	30" RCP Flared End, Install	2	Each
450E2032	42" RCP Flared End, Furnish	2	Each
450E2033	42" RCP Flared End, Install	2	Each
450E4508	30" RCP Arch Flared End, Furnish	2	Each
450E4509	30" RCP Arch Flared End, Install	2	Each
450E4516	42" RCP Arch Flared End, Furnish	1	Each
450E4517	42" RCP Arch Flared End, Install	1	Each
450E8300	Culvert Joint Cleaning	86.9	Ft
450E8305	Repair Culvert Joint	86.9	Ft
450E8310	Chemical Grout Void Fill	57.0	Gal
* 450E8900	Cleanout Pipe Culvert	1	Each
450E9000	Reset Pipe	106	Ft
450E9001	Reset Pipe End Section	13	Each
600E0300	Type III Field Laboratory	1	Each
620E0020	Type 2 Right-of-Way Fence	55	Ft
620E1020	2 Post Panel	2	Each
632E2510	Type 2 Object Marker Back to Back	2	Each
632E3500	Reset Sign	1	Each
633E0030	Cold Applied Plastic Pavement Marking, 24"	30	Ft
633E0040	Cold Applied Plastic Pavement Marking, Arrow	3	Each
633E1200	High Build Waterborne Pavement Marking Paint, White	1,234	Gal
633E1205	High Build Waterborne Pavement Marking Paint, Yellow	280	Gal
633E5015	Grooving for Cold Applied Plastic Pavement Marking, 24"	30	Ft
633E5025	Grooving for Cold Applied Plastic Pavement Marking, Arrow	3	Each
634E0010	Flagging	1,500.0	Hour
634E0020	Pilot Car	500.0	Hour
634E0110	Traffic Control Signs	820.2	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0275	Type 3 Barricade	8	Each
634E0600	4" Temporary Pavement Marking Tape Type I	2,350	Ft
634E0630	Temporary Pavement Marking	110.0	Mile
734E0010	Erosion Control	Lump Sum	LS
734E0154	12" Diameter Erosion Control Wattle	100	Ft
734E0604	High Flow Silt Fence	75	Ft
734E0610	Mucking Silt Fence	5	CuYd
831E1010	Geogrid Reinforcement	330	SqYd
900E0010	Refurbish Single Mailbox	10	Each
900E0012	Refurbish Double Mailbox	2	Each
900E1080	Orange Plastic Safety Fence	800	Ft
900E1980	Storage Unit	1	Each

* - Denotes Non-Participating

SPECIFICATIONS

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

ENVIRONMENTAL COMMITMENTS

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

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

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

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

COMMITMENT A: WETLANDS

All efforts to avoid and minimize wetland impacts from the project have resulted in approximately 0.54 acre(s) 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)
1	267+77	0.00	0.00	0.021	0.00	0.021
2	309+23	0.00	0.00	0.010	0.00	0.010
3	318+93	0.00	0.00	0.00	0.008	0.008
4	340+16	0.00	0.00	0.025	0.017	0.041
5	389+14	0.00	0.00	0.00	0.012	0.012
6	583+50	0.00	0.00	0.00	0.028	0.028
7	689+73	0.00	0.00	0.024	0.00	0.024
8	703+36	0.00	0.00	0.017	0.00	0.017
9	709+98	0.00	0.00	0.024	0.00	0.024
10	725+46	0.00	0.00	0.031	0.00	0.031
11	761+60	0.00	0.00	0.029	0.0	0.029
12	773+57	0.00	0.00	0.026	0.00	0.026
13	801+64	0.00	0.00	0.039	0.00	0.039
14	838+38	0.00	0.00	0.036	0.031	0.067
15	864+00	0.00	0.00	0.024	0.00	0.024
16	1041+13	0.00	0.00	0.00	0.034	0.034

Action Taken/Required:

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.

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.

Action Taken/Required:

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

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

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

COMMITMENT D: WATER QUALITY STANDARDS

COMMITMENT D1: SURFACE WATER QUALITY

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

Action Taken/Required:

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

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

Action Taken/Required:

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

Action Taken/Required:

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

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

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

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

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

Storm Water Pollution Prevention Plan

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

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

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

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

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

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

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

COMMITMENT H: WASTE DISPOSAL SITE

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

Action Taken/Required:

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

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

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

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

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

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

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

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

COMMITMENT I: HISTORIC PRESERVATION OFFICE CLEARANCES

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

Action Taken/Required:

All earth disturbing activities not designated within the plans require a cultural resource review prior to scheduling the pre-construction meeting. This work includes but is not limited to: Contractor furnished material sources, material processing sites, stockpile sites, storage areas, plant sites, and waste areas.

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

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

The Contractor will submit the cultural resources survey report to SDDOT Environmental Office, 700 East Broadway Avenue, Pierre, SD 57501-2586. SDDOT will submit the information to the appropriate SHPO/THPO. Allow **30 Days** from the date this information is submitted to the Environmental Engineer for SHPO/THPO review.

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

SHPO review does not relieve the Contractor of the responsibility for obtaining any additional permits and clearances for Contractor furnished material sources, material processing sites, stockpile sites, storage areas, plant sites, and waste areas that affect wetlands, threatened and endangered species, or waterways. The Contractor will not utilize a site known or suspected of having contaminated soil or water. The Contractor will provide the required permits and clearances to the Project Engineer at the preconstruction meeting.

COMMITMENT N: SECTION 404 PERMIT

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

Action Taken/Required:

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

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

COMMITMENT Q: ARCHAEOLOGICAL COORDINATION

As a result of a Cultural Resources Survey, historically sensitive areas have been identified adjacent to the project rights-of-way.

The following historically sensitive sites have been identified that require avoidance of construction activities:

Table of Historic/Archaeological Sites

Station	Offset (Ft.)	L/R	Environmental Sensitive Site	Action
82+40 to 93+40	30	L/R	ESS1	Do Not Disturb and Site Fencing
594+75 to 596+05	30	L/R	ESS2	Do Not Disturb and Site Fencing

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.

Prior to the pre-construction meeting, the Contractor will contact the ARC (Phone: 605-394-1936) to coordinate the installation schedule of orange plastic safety fence around the perimeter of the sensitive site(s) listed in the Table of Historic/Archeological Sites to ensure proper location, quality, and visibility of the orange safety fence. The exact location of the safety fence will be determined later in the field by the ARC representative.

The Contractor will give written notice to the Engineer seven (7) days prior to the commencement of earth disturbing activities near listed sites identified in the Table of Historic/Archaeological Site so the Engineer may notify ARC of the day work will start and schedule the installation of orange safety fence. ARC is to be present during earth disturbing activities to monitor the removal of topsoil, ensure avoidance of the fenced sites, and identify any culturally sensitive sites that may be uncovered.

Work within the vicinity of the site(s) will not begin until the safety fence is installed. All costs associated with furnishing and installing the orange safety fence will be incidental to the contract unit price per foot for “Orange Plastic Safety Fence”. 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 SURFACING SECTIONS

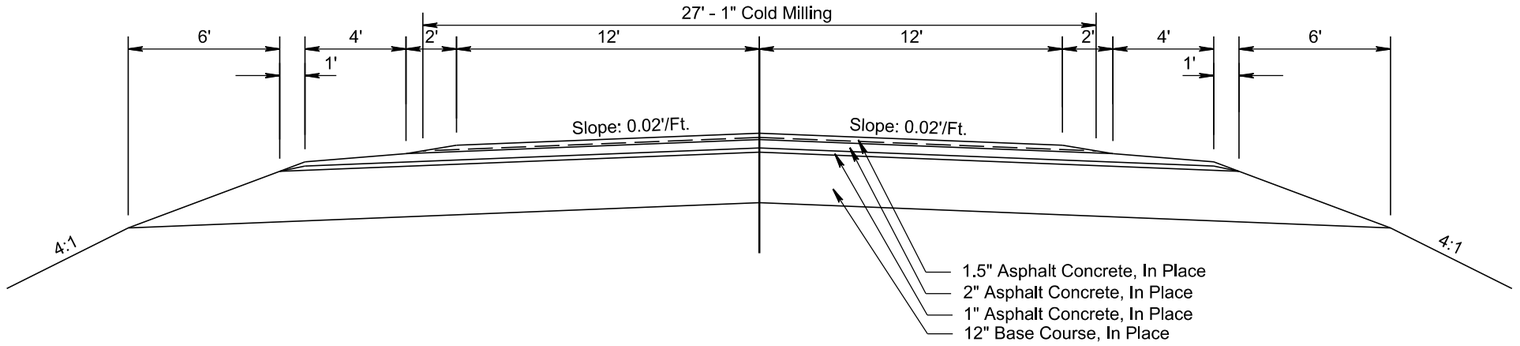
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0020(197)267	6	61

Plotting Date: 11/07/2022

Section 1

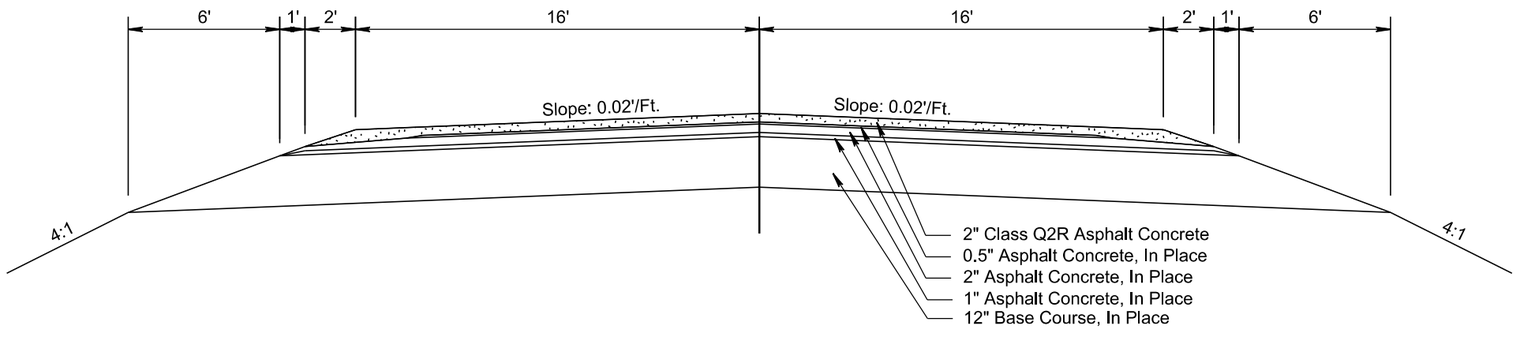
Sta. 671+50 to Sta. 679+80

In Place & Cold Milling Section



Sta. 671+50 to Sta. 679+80

Resurfacing Section



TYPICAL SURFACING SECTIONS

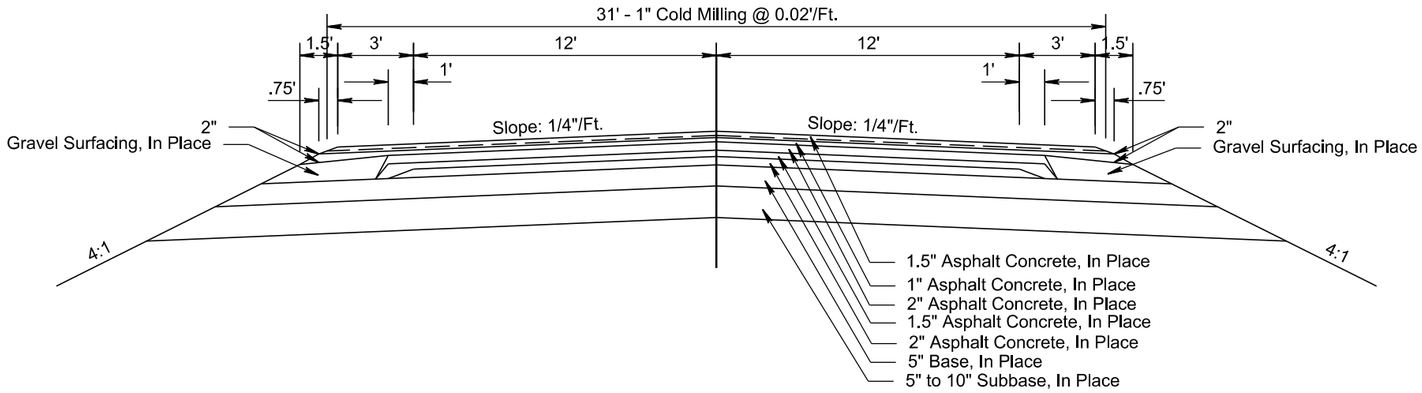
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0020(197)267	7	61

Plotting Date: 11/07/2022

Section 2

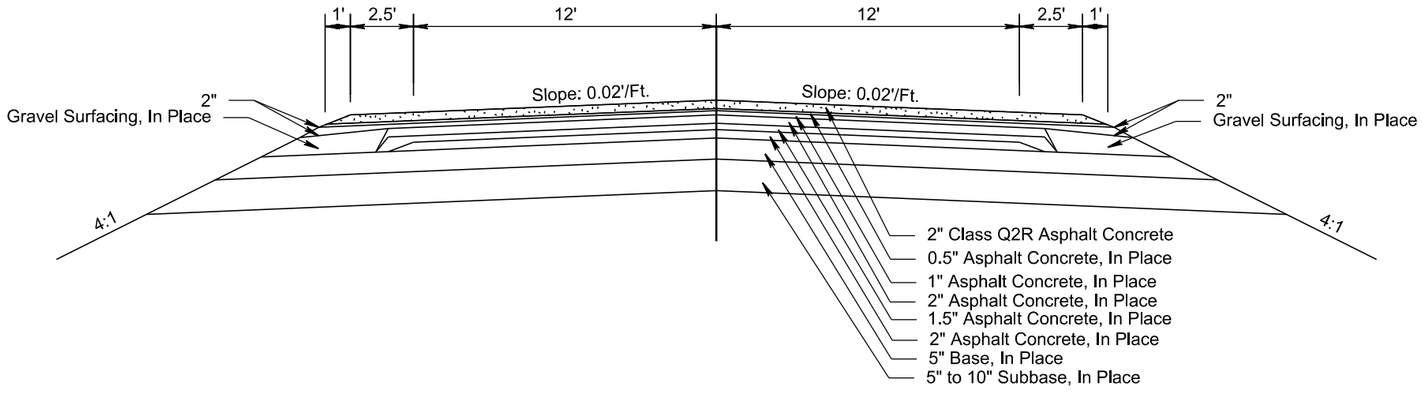
Sta. 679+80.0 to Sta. 1022+90.6

In Place & Cold Milling Section



Sta. 679+80.0 to Sta. 1022+90.6

Resurfacing Section



PLOT SCALE - 1:6.00001

PLOT NAME - 2

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PLOTTED FROM - TRABIL017

TYPICAL SURFACING SECTIONS

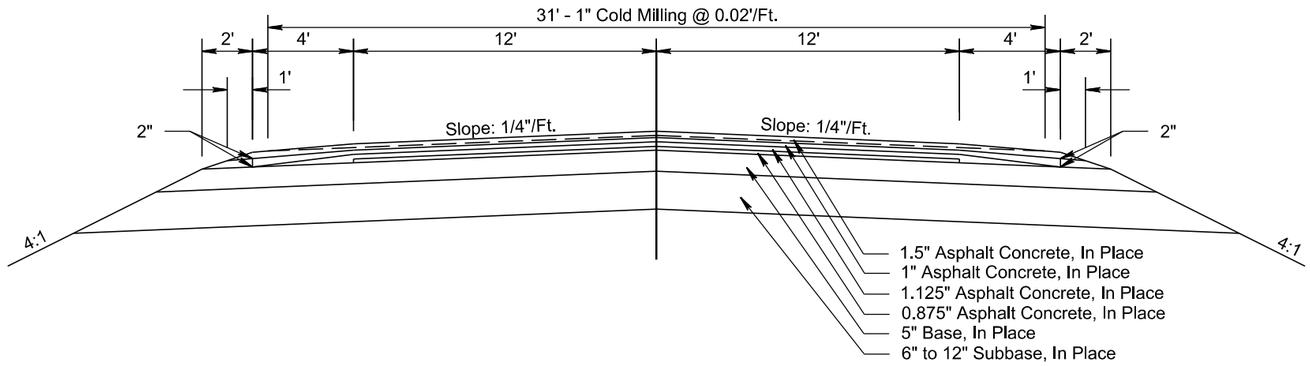
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0020(197)267	8	61

Plotting Date: 11/07/2022

Section 3

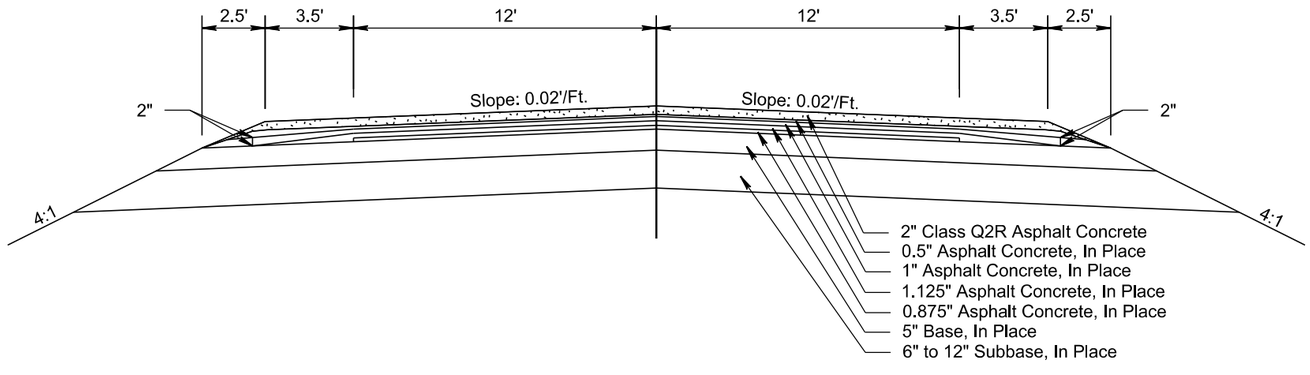
Sta. a0+00.0 to Sta. a1096+44.0

In Place & Cold Milling Section



Sta. a0+00.0 to Sta. a1096+44.0

Resurfacing Section



RATES OF MATERIALS

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

STA 671+50.00 to 679+80.00 (Section 1)

TACK FOR BLADE LAID
SS-1h or CSS-1h Emulsified Asphalt for Tack at the rate of **0.11** tons applied **25** feet wide.
(Rate = 0.09 Gal./Sq.Yd.).

TACK
SS-1h or CSS-1h Emulsified Asphalt for Tack at the rate of **0.07** tons applied **24** feet wide.
(Rate = 0.06 Gal./Sq.Yd.)

SS-1h or CSS-1h Emulsified Asphalt for Tack at the rate of **0.03** tons per shoulder applied **6** feet wide for one shoulder.
(Rate = 0.09 Gal./Sq.Yd.)

CLASS Q2R HOT MIXED ASPHALT CONCRETE – 2" LIFT

Crushed Aggregate	34.48 Tons/sta.
Salvaged Asphalt Concrete	8.62 Tons/sta.
PG 58-34 Asphalt Binder	2.13 Tons/sta.
Total without Lime	**45.23 Tons/sta.**
Hydrated Lime	0.45 Tons/sta.
Total with Lime	**45.68 Tons/sta.**

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

FLUSH SEAL
SS-1h or CSS-1h Emulsified Asphalt for Flush Seal at the rate of **0.09** tons applied **36** feet wide.
(Rate = 0.05 Gal./Sq.Yd.).

Sand for Flush Seal at the rate of **0.98** tons applied **22** feet wide.
(Rate = 8 Lb./Sq.Yd.).

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

STA 679+80.00 to 1022+90.60 (Section 2)

TACK FOR BLADE LAID
SS-1h or CSS-1h Emulsified Asphalt for Tack at the rate of **5.6** tons applied **25** feet wide.
(Rate = 0.09 Gal./Sq.Yd.).

TACK
SS-1h or CSS-1h Emulsified Asphalt for Tack at the rate of **3.6** tons applied **24** feet wide.
(Rate = 0.06 Gal./Sq.Yd.)

SS-1h or CSS-1h Emulsified Asphalt for Tack at the rate of **0.79** tons per shoulder applied **3.5** feet wide for one shoulder.
(Rate = 0.09 Gal./Sq.Yd.)

CLASS Q2R HOT MIXED ASPHALT CONCRETE – 2" LIFT

Crushed Aggregate	1486 Tons/mile
Salvaged Asphalt Concrete	372 Tons/mile
PG 58-34 Asphalt Binder	92 Tons/mile
Total without Lime	**1950 Tons/mile**
Hydrated Lime	20 Tons/mile
Total with Lime	**1970 Tons/mile**

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

FLUSH SEAL
SS-1h or CSS-1h Emulsified Asphalt for Flush Seal at the rate of **3.9** tons applied **31** feet wide.
(Rate = 0.05 Gal./Sq.Yd.).

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

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

STA a0+00.00 to a1096+44.00 (Section 3)

TACK FOR BLADE LAID
SS-1h or CSS-1h Emulsified Asphalt for Tack at the rate of **5.6** tons applied **25** feet wide.
(Rate = 0.09 Gal./Sq.Yd.).

TACK
SS-1h or CSS-1h Emulsified Asphalt for Tack at the rate of **3.6** tons applied **24** feet wide.
(Rate = 0.06 Gal./Sq.Yd.)

SS-1h or CSS-1h Emulsified Asphalt for Tack at the rate of **1.4** tons per shoulder applied **6** feet wide for one shoulder.
(Rate = 0.09 Gal./Sq.Yd.)

CLASS Q2R HOT MIXED ASPHALT CONCRETE – 2" LIFT

Crushed Aggregate	1628 Tons/mile
Salvaged Asphalt Concrete	407 Tons/mile
PG 58-34 Asphalt Binder	100 Tons/mile
Total without Lime	**2135 Tons/mile**
Hydrated Lime	21 Tons/mile
Total with Lime	**2156 Tons/mile**

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

FLUSH SEAL
SS-1h or CSS-1h Emulsified Asphalt for Flush Seal at the rate of **4.5** tons applied **36** feet wide.
(Rate = 0.05 Gal./Sq.Yd.).

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

TABLE OF ADDITIONAL QUANTITIES

LOCATIONS:	Base Course, Salvaged TON	CLASS Q2R HOT MIXED ASPHALT CONCRETE (w/out Specified Density) TON	PG 58-34 ASPHALT BINDER TON	HYDRATED LIME TON	Recycled Asphalt (RAP) N.A.B.I. TON	Virgin Aggregate 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	COLD MILLING ASPHALT CONCRETE SQ YD
Intersecting Roads										
1 - Paved to the ROW Line on Paved Road (Faulk County Hwy Nos. 5)	-	65.7	3.1	0.7	12.4	49.6	0.24	-	-	178
1 - City Street (Onaka) Paved to ROW Line on Paved Road (MRM 272.92)	-	55.7	2.6	0.6	10.5	42.0	0.20	-	-	197
3 - Paved to the ROW Line (151st Street & 336th Ave.)	45	154.4	7.2	1.5	29.1	116.5	0.56	-	-	-
34 - Paved to Radius Point	680	833.0	38.8	8.3	157.2	628.7	3.03	-	-	-
Field/Farm Entrances:										
2 - Farm Entrances - 5' wide pad (Section 2)	30	15.9	0.7	0.2	3.0	12.0	0.06	-	-	-
29 - Field Entrances - 5' wide pad (Section 2)	435	230.1	10.7	2.3	43.4	173.6	0.84	-	-	-
1 - Farm Entrances - Paved to the ROW Line (MRM 272.04)	15	28.2	1.3	0.3	5.3	21.3	0.10	-	-	-
11 - Farm Entrances - 5' wide pad (Section 3)	165	87.3	4.1	0.9	16.5	65.9	0.32	-	-	-
99 - Field Entrances - 5' wide pad (Section 3)	1485	785.4	36.5	7.9	148.2	592.8	2.86	-	-	-
2 - Farm Entrances - Paved to Radius Point (Section 3)	30	49.0	2.3	0.5	9.2	37.0	0.18	-	-	-
Superelevated Curves (High Side):										
Sta. 919+02 to 935+33	-	80.0	3.7	0.8	15.1	60.4	0.29	0.16	3.19	-
Sta. 1006+57 to 1022+91	-	80.0	3.7	0.8	15.1	60.4	0.29	0.16	3.19	-
Sta. 958+90 (a Sta) to 969+70 (a Sta)	-	50.0	2.3	0.5	9.4	37.7	0.18	0.10	1.99	-
Sta. 985+55 (a Sta) to 995+93 (a Sta)	-	50.0	0.0	0.5	9.9	39.6	0.18	0.10	1.90	-
East End Project (SD45 Jct):										
Radius	-	107.0	5.0	1.1	20.2	80.8	0.39	0.22	4.08	708
Right Turn Lane - 12' Wide	-	72.0	3.4	0.7	13.6	54.3	0.26	0.15	2.74	600
Widening along SD20 on North Side of Roadway - 6' Wide typical	-	61.0	2.8	0.6	11.5	46.0	0.22	-	-	-
Other:										
1/4 Line Road, Sherman Ave. (MRM 267.99)	15	25.7	1.2	0.3	4.9	19.4	0.09	-	-	-
Former Elevator Road at Norbeck (MRM 285.27)	50	22.8	1.1	0.2	4.3	17.2	0.08	-	-	-
Enterprise Ave at Norbeck (MRM 285.45)	20	21.2	1.0	0.2	4.0	16.0	0.08	-	-	-
Immanual Lutheran Church (MRM 291.262)	30	6.8	0.3	0.1	1.3	5.1	0.02	-	-	-
Immanual Lutheran Cemetery (MRM 292.32)	60	29.8	1.4	0.3	5.6	22.5	0.11	-	-	-
2 Mailbox Turnouts (Section 2) (Average 10 tons of Class Q2R Hot Mixed Asphalt Concrete)	-	22.4	1.0	0.2	4.2	16.9	0.08	-	-	196
10 Mailbox Turnouts (Section 3) (Average 10 tons of Class Q2R Hot Mixed Asphalt Concrete)	-	112.0	5.2	1.1	21.1	84.5	0.41			978
Repair and Leveling	-	-					6.90	-	-	-
TOTALS	**3750.0**	**3317.2**	**152.0**	**33.2**	**626.4**	**2505.6**	**19.0**	**1.4**	**27.9**	**2857**

The tonnage shown in the Table of Additional Quantities for Class Q2R Hot Mix Asphalt Concrete is based on an average compacted thickness of 2 inches, unless otherwise indicated.

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

The above quantities are included in the Estimate of Quantities.

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0020(197)267	11	61

TABLE OF PROJECT STATIONING

SECTION	STATION	TO	STATION	LENGTH (Ft)	GROSS SECTION LENGTH (Ft)	GROSS SECTION LENGTH (Miles)
1	671+50.00	to	679+80.00	830.00	830.00	0.157
2	679+80.00	to	1022+90.60	34310.60	34310.60	6.498
3	a +0.00	to	a 1096+44.00	109644.00	109644.00	20.766
TOTAL:					144784.60	27.421

TABLE OF MATERIAL QUANTITIES

	UNCLASSIFIED EXCAVATION, DIGOUTS	BASE COURSE, SALVAGED	COLD MILLING ASPHALT CONCRETE	Estimated Cold Milled Material produced	REMOVE ASPHALT CONCRETE PAVEMENT	CLASS Q2R HOT MIXED ASPHALT CONCRETE	HYDRATED LIME	PG 58-34 ASPHALT BINDER	SALVAGED ASPHALT CONCRETE (RAP) (N.A.B.I.)	VIRG. AGGR. (N.A.B.I.)	ASPHALT CONCRETE BLADE LAID	HYDRATED LIME	PG 58-34 ASPHALT BINDER	VIRG. AGGR. (N.A.B.I.)	CLASS Q2R HOT MIXED ASPHALT CONCRETE	HYDRATED LIME	PG 58-34 ASPHALT BINDER	SALVAGED ASPHALT CONCRETE (RAP) (N.A.B.I.)	VIRG.. AGGR. (NABI.)	CLASS Q2R HOT MIXED ASPHALT CONCRETE	HYDRATED LIME	PG 58-34 ASPHALT BINDER	RAP (20%) NABI	VIRG. AGGR. (NABI.)	SS-1h/ CSS-1h ASPH. FOR TACK	SS-1h/ CSS-1h ASPH. FOR FLUSH SEAL	SAND FOR FLUSH SEAL
						<----------Backfilling of Digouts---------->					<----------Blade Laid---------->				<----------Spot Leveling---------->					<----------2" Lift---------->							
SECTION	CuYd	Ton	SqYd	(Ton)	SqYd	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton
1	7.9	15.7	2490	138	11.8	3.9	0.0	0.2	0.7	3.0	23.6	0.2	1.7	21.6	15.7	0.2	0.7	3.0	11.9	379.1	3.7	17.7	71.5	286.2	1.9	0.7	8.1
2	324.9	649.8	118181	6566	487.4	162.5	1.6	7.6	30.7	122.6	974.7	9.7	72.1	892.9	649.8	6.5	30.5	122.6	490.3	12801.5	130.0	597.8	2417.3	9656.4	70.0	25.1	335.5
3	1038.3	2076.6	377663	20981	1557.4	519.1	5.2	24.2	98.0	391.8	3114.9	31.1	230.5	2853.2	2076.6	20.8	97.6	391.6	1566.6	44771.3	436.1	2076.6	8451.7	33806.9	247.0	93.2	1072.1
Sub totals	1371.1	2742.1	498334	27685	2056.6	685.5	6.9	31.9	129.4	517.4	4113.2	41.1	304.4	3767.7	2742.1	27.5	128.8	517.2	2068.7	57951.9	569.8	2692.1	10940.5	43749.5	318.8	119.0	1415.7
Additional Quantities	-	3750.0	2857	159	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3317.2	33.2	152.0	626.4	2505.6	19.0	1.4	27.9
Totals	1371	6492.1	501190	27843.9	2057	685.5	6.9	31.9	129.4	517.4	4113.2	41.1	304.4	3767.7	2742.1	27.5	128.8	517.2	2068.7	61269.1	603.0	2844.1	11566.9	46255.1	337.8	120.5	1443.6

SUMMARY OF ASPHALT CONCRETE

LOCATIONS:	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' wide)	248.4	-
Section 2 (24' wide)	10267.8	-
Section 3 (24' wide)	32812.0	-
Section 1 (4' shoulder and 2' sluff)	-	130.7
Section 2 (2.5' shoulder and 1' sluff)	-	2533.7
Section 3 (3.5' shoulder and 2.5' sluff)	-	11959.3
Backfill of Digouts	-	685.5
Spot Leveling	-	2742.1
Table of Additional Quantities	-	3317.2
TOTAL	**43328.1**	**21368.6**

Total Class Q2R Hot Mixed Asphalt Concrete: 64696.7 *Tons*

TABLE OF QUANTITIES FOR CULVERT REPLACEMENT

STATION	UNDERCUT DEPTH N.A.B.I.	REMOVE ASPHALT CONCRETE PAVEMENT	PIPE CULVERT UNDERCUT	GEOGRID REINFORCEMENT	ASPHALT CONCRETE COMPOSITE (5" for surfacing)	BASE COURSE			CONTRACTOR FURNISHED BORROW EXCAVATION FOR INSLOPE TRANSITION	REMOVE FENCE	TYPE 2 RIGHT-OF-WAY FENCE	2 POST PANNEL
						FOR PIPE CULVERT UNDERCUT BACKFILL	FOR SELECT FILL MATERIAL ALONG SIDES OF CULVERT	FOR 12" OF SURFACING				
	(Ft)	(SqYd)	(CuYd)	(SqYd)	(Ton)	(Ton)	(Ton)	(Ton)	(CuYd)	(Ft)	(Ft)	(Each)
a761+60	1	280	29	330	77	54.5	49.5	185.6	125	300	55	2

SD 20 TABLE OF MAINLINE CULVERT WORK

Culvert #	MRM	+ Disp	Station	Side	Per Original Plans: In Place Culvert Size and Type		Culvert Length (Ft)	Culvert End Type	Direction of Flow	Drainage Area Acre	Incidental Work, Grading LS	Remove Pipe: Culvert (Ft)	Remove Pipe: for Reset (Ft)	Remove Pipe: End Section (Each)	Remove Pipe: End Section for Reset (Each)	Furnish and Install: 24" RCP (Ft)	42" RCP (Ft)	18" RCP Flared End (Each)	24" RCP Flared End (Each)	30" RCP Flared End (Each)	42" RCP Flared End (Each)	30" RCPA Flared End (Each)	42" RCP Arch Flared End (Each)	Reset Pipe (Ft)	Reset Pipe End Section (Each)	Clean-out Pipe Culvert (Each)	Culvert Joint Cleaning (Ft)	Repair Culvert Joint (Ft)	Chemical Grout Void Fill (Gallons)	Base Course (Ton)	Asphalt Concrete Composite (Ton)	Repair Comments
1	267.52	0.22	691+00	L	24"	CMP		Flared	North	38																						No Work Required.
				R				Flared																								
2	268.00	0.00	706+42	L	24"	RCP	66	Flared	North	29																						No Work Required.
				R				Sloped																								
3	268.00	0.39	727+00	L	18"	CMP	80	Flared	South	13																						No Work Required. (Culvert lined in 2021.)
				R				Flared																								
4	268.00	0.91	754+00	L	18"	RCP	62	Flared	North	16																						No Work Required.
				R				Flared																								
5	269.00	0.02	760+00	L	18"	RCP	62	Flared	North	17																						No Work Required.
				R				Flared																								
6	269.00	0.25	772+00	L	18"	RCP	64	Flared	South	6				1				1														Replace FE
				R				Flared							1									1								Reset FE
7	269.00	0.41	780+36	L	18"	RCP	60	Flared	North	14					1									1								Reset FE
				R				Flared																								No Work Required.
8	269.00	0.80	801+00	L	24"	RCP	64	Flared	North	7?					1									1								Reset FE
				R				Flared																								No Work Required.
9	270.00	0.03	812+42	L	36"	CMP	72	Flared	South	140																						No Work Required.
				R				Flared																								
10	270.00	0.29	826+15	L	24"	CMP	86	Flared	North																							No Work Required.
				R				Flared																								

PLOT SCALE - 1:200

PLOTTED FROM - TRAB10200

PLOT NAME - 1

FILE - ...\MSTATION\XXX_BORDER.DGN

SD 20 TABLE OF MAINLINE CULVERT WORK

Culvert #	MRM	+ Disp	Station	Side	Per Original Plans: In Place Culvert Size and Type		Culvert Length (Ft)	Culvert End Type	Direction of Flow	Drainage Area Acre	Incidental Work, Grading LS	Remove Pipe: Culvert (Ft)	Remove Pipe: for Reset (Ft)	Remove Pipe: End Section (Each)	Remove Pipe: End Section for Reset (Each)	Furnish and Install: 24" RCP (Ft)	42" RCP (Ft)	18" RCP Flared End (Each)	24" RCP Flared End (Each)	30" RCP Flared End (Each)	42" RCP Flared End (Each)	30" RCPA Flared End (Each)	42" RCP Arch Flared End (Each)	Reset Pipe (Ft)	Reset Pipe End Section (Each)	Clean-out Pipe Culvert (Each)	Culvert Joint Cleaning (Ft)	Repair Culvert Joint (Ft)	Chemical Grout Void Fill (Gallons)	Base Course (Ton)	Asphalt Concrete Composite (Ton)	Repair Comments
11	270.00	0.53	839+00	L	18"	RCP	56	Flared	North				6	1				1						6								Replace FE. Reset 6'.
				R				Flared							1										1							Reset FE.
12	271.00	0.03	865+46	L	18"	RCP	56	Flared	South	8					1										1							Reset FE
				R				Flared																								No Work Required.
13	271.00	0.93	913+00	L	30"	RCP	56	Flared	North	52																						No Work Required.
				R				Flared							1										1							Reset FE
14	272.00	0.13	923+00	L	18"	RCP	80	Flared	North	20																						
				R				Flared																								
15	272.00	0.34	935+53	L	48"	**RCPA**		Flared	North																							No Work Required.
				R				Flared																								
16	272.00	0.51	944+00	L	18"	RCP	58	Flared	North	3				1				1														Replace FE.
				R				Flared																								No Work Required.
17	272.00	0.68	953+00	L	18"	RCP	76	Flared	North	18																						No Work Required.
				R				Flared							1										1							Reset FE.
18	273.00	0.11	976+00	L	24"	CMP	92	Flared	Eq	53																						No Work Required. (Culvert lined in 2021.)
				R				Flared																								
19	273.00	0.13	978+40	L	4'X5'	RC CATTLE PASS		Flared																								
				R				Flared																								
20	273.00	0.53	998+00	L	4'X5'	RC CATTLE PASS	42	Flared	South																							
				R				Flared																								

PLOT SCALE - 1:200

PLOTTED FROM - TRAB10200

PLOT NAME - 1

FILE - ...\MSTATION\XXX_BORDER.DGN

SD 20 TABLE OF MAINLINE CULVERT WORK

Culvert #	MRM	+ Disp		Station	Side	Per Original Plans: In Place Culvert Size and Type		Culvert Length (Ft)	Culvert End Type	Direction of Flow	Drainage Area Acre	Incidental Work, Grading LS	Remove Pipe: Culvert (Ft)	Remove Pipe: for Reset (Ft)	Remove Pipe: End Section (Each)	Remove Pipe: End Section for Reset (Each)	Furnish and Install: 24" RCP (Ft)	42" RCP (Ft)	18" RCP Flared End (Each)	24" RCP Flared End (Each)	30" RCP Flared End (Each)	42" RCP Flared End (Each)	30" RCPA Flared End (Each)	42" RCP Arch Flared End (Each)	Reset Pipe (Ft)	Reset Pipe End Section (Each)	Clean-out Pipe Culvert (Each)	Culvert Joint Cleaning (Ft)	Repair Culvert Joint (Ft)	Chemical Grout Void Fill (Gallons)	Base Course (Ton)	Asphalt Concrete Composite (Ton)	Repair Comments
21	273.00	0.69		1006+57	L	24"	RCP	66	Flared	South	30																					
					R				Flared																							
22	273.00	0.80		1012+00	L	18"	RCP	66	Flared	North	3																					No Work Required.
					R				Flared							1									1						Reset FE.
23	274.00	0.24	a	18+68	L	24"	CMP	54	Flared	Eq																					No Work Required. (Culvert lined in 2021.)
					R				Flared																						
24	274.00	0.60	a	31+34	L	24"	CMP	110	Sloped	Eq																					No Work Required. (Culvert lined in 2021.)
					R				Sloped																						
25	274.00	0.86	a	45+15	L	30"	RCP	70	Flared	South	114																					No Work Required.
					R				Sloped																						
26	275.00	0.02	a	53+80	L	24"	RCP	62	Flared	South	?																					No Work Required.
					R				Flared																						
27	275.00	0.25	a	66+18	L	30"	RCP	60	Flared	South	95																					No Work Required.
					R				Sloped																						
28	275.00	0.74	a	91+40	L	4'X5'	RC CATTLE PASS		Flared	South	30																					No Work Required.
					R				Flared																						
29	275.00	0.89	a	99+39	L	36"	RCP	54	Flared	South	100																					No Work Required.
					R				Flared																						
30	276.00	0.32	a	122+39	L	18"	RCP	54	Flared	North	2																					No Work Required.
					R				Flared						1					1											Replace FE.

SD 20 TABLE OF MAINLINE CULVERT WORK

Culvert #	MRM	+ Disp		Station	Side	Per Original Plans: In Place Culvert Size	and Type	Culvert Length (Ft)	Culvert End Type	Direction of Flow	Drainage Area Acre	Incidental Work, Grading LS	Remove Pipe: Culvert (Ft)	for Reset (Ft)	End Section (Each)	End Section for Reset (Each)	Furnish and Install: 24" RCP (Ft)	42" RCP (Ft)	18" RCP Flared End (Each)	24" RCP Flared End (Each)	30" RCP Flared End (Each)	42" RCP Flared End (Each)	30" RCPA Flared End (Each)	42" RCP Arch Flared End (Each)	Reset Pipe (Ft)	Reset Pipe End Section (Each)	Clean-out Pipe Culvert (Each)	Culvert Joint Cleaning (Ft)	Repair Culvert Joint (Ft)	Chemical Grout Void Fill (Gallons)	Base Course (Ton)	Asphalt Concrete Composite (Ton)	Repair Comments
31	276.00	0.62	a	138+00	L	24"	RCP	62	Flared	South	27				1					1													Replace FE
					R				Flared																								No Work Required.
32	277.00	0.15	a	166+39	L	36"	RCP	62	Flared	North	88																						No Work Required.
					R				Flared																								
33	277.00	0.30	a	174+09	L	30"	RCP	72	Flared	North	73																						No Work Required.
					R				Flared																								
34	277.00	0.81	a	201+02	L	24"	CMP w/HDPE Liner	126	Sloped	Eq																							No Work Required.
					R				Sloped																								
35	277.00	0.84	a	202+68	L	24"	CMP w/HDPE Liner	126	Sloped	Eq																							No Work Required.
					R				Sloped																								
36	278.00	0.11	a	216+77	L	18"	RCP	70	Flared	South	24				1				1														Replace FE
					R				Flared						1				1														Replace FE
37	278.00	0.40	a	231+90	L	18"	RCP	60	Flared	South	16																						No Work Required.
					R				Flared																								
38	278.00	0.59	a	241+96	L	8'X8'	RCBC	68	Flared	South																			32	32	12		Seal & Void Fill CL joint.
					R				Flared																								
39	278.00	0.89	a	258+01	L	18"	RCP	74	Flared	North	8				1				1														Replace FE
					R				Flared						1				1														Replace FE
40	279.00	0.04	a	265+77	L	30"	RCP		Flared	North	65				1						1												Replace FE
					R				Flared																								No Work Required.

PLOT SCALE - 1:200

PLOTTED FROM - TRAB10200

PLOT NAME - 1

FILE - ...\MSTATION\XXX_BORDER.DGN

SD 20 TABLE OF MAINLINE CULVERT WORK

Culvert #	MRM	+ Disp		Station	Side	Per Original Plans: In Place Culvert Size and Type		Culvert Length (Ft)	Culvert End Type	Direction of Flow	Drainage Area Acre	Incidental Work, Grading LS	Remove Pipe: Culvert (Ft)	for Reset (Ft)	End Section (Each)	End Section for Reset (Each)	Furnish and Install: 24" RCP (Ft)	42" RCP (Ft)	18" RCP Flared End (Each)	24" RCP Flared End (Each)	30" RCP Flared End (Each)	42" RCP Flared End (Each)	30" RCPA Flared End (Each)	42" RCP Arch Flared End (Each)	Reset Pipe (Ft)	Reset Pipe End Section (Each)	Clean-out Pipe Culvert (Each)	Culvert Joint Cleaning (Ft)	Repair Culvert Joint (Ft)	Chemical Grout Void Fill (Gallons)	Base Course (Ton)	Asphalt Concrete Composite (Ton)	Repair Comments
41	279.00	0.37	a	283+60	L	24"	RCP	62	Flared		86				1					1												Replace FE
					R				Flared																							No Work Required.
42	279.00	0.86	a	309+23	L	24"	RCP		Flared	North	8																						No Work Required.
					R				Flared						1					1												Replace FE
43	280.00	0.04	a	318+93	L	30"	RCP	58	Flared	North	88																						No Work Required.
					R				Flared					8	1						1				8							Replace FE. Reset 8'.
44	280.00	0.27	a	331+00	L	18"	RCP		Flared	South	24																						No Work Required.
					R				Flared					8	1				1						8							Replace FE. Reset 8'.
45	280.00	0.45	a	340+16	L	18"	RCP	72	Flared	South	14				1				1														Replace FE.
					R				Flared						1				1														Replace FE.
46	280.00	0.80	a	358+50	L	24"	CMP	80	Flared	Eq																							No Work Required. (Culvert lined in 2021.)
					R				Flared																							
47	281.00	0.03	a	369+12	L	36"	RCP	52	Flared	North																							No Work Required.
					R				Flared																							
48	281.00	0.18	a	377+75	L	18"	RCP		Flared	North	23																						No Work Required.
					R				Flared																							
49	281.00	0.40	a	389+14	L	18"	RCP	76	Flared	South	18																	1					Clean out FE.
					R				Flared						1				1													Replace FE.
50	281.00	0.60	a	399+82	L	24"	CMP	140	Flared	South	19																						No Work Required. (Culver liner installed on PCN 06EC)
					R				Flared																							

SD 20 TABLE OF MAINLINE CULVERT WORK

Culvert #	MRM	+ Disp		Station	Side	Per Original Plans: In Place Culvert Size and Type		Culvert Length (Ft)	Culvert End Type	Direction of Flow	Drainage Area Acre	Incidental Work, Grading LS	Remove Pipe: Culvert (Ft)	Remove Pipe: for Reset (Ft)	Remove Pipe: End Section (Each)	Remove Pipe: End Section for Reset (Each)	Furnish and Install: 24" RCP (Ft)	42" RCP (Ft)	18" RCP Flared End (Each)	24" RCP Flared End (Each)	30" RCP Flared End (Each)	42" RCP Flared End (Each)	30" RCPA Flared End (Each)	42" RCP Arch Flared End (Each)	Reset Pipe (Ft)	Reset Pipe End Section (Each)	Clean-out Pipe Culvert (Each)	Culvert Joint Cleaning (Ft)	Repair Culvert Joint (Ft)	Chemical Grout Void Fill (Gallons)	Base Course (Ton)	Asphalt Concrete Composite (Ton)	Repair Comments
51	281.00	0.87	a	414+11	L	18"	RCP	60	Flared	South	37																						No Work Required.
					R				Flared																								
52	282.00	0.36	a	441+00	L	42"	RCP	68	Flared	South																							No Work Required.
					R				Flared																								
53	283.00	0.02	a	476+40	L	4'X5'	RC CATTLE PASS		Flared																								No Work Required.
					R				Flared																								
54	283.00	0.04	a	477+30	L	18"	CMP	100	Flared	South	28																						No Work Required.
					R				Flared																								
55	283.00	0.32	a	492+89	L	18"	RCP	62	Flared	South	38																						No Work Required.
					R				Flared																								
56	283.00	0.74	a	514+28	L	24"	RCP	54	Flared	North	50			6	1						1					6						Replace FE. Reset 6'
					R				Flared																								No Work Required.
57	284.00	0.18	a	537+11	L	30"	CMP	144	Flared	Eq																							No Work Required. (Culver liner installed on PCN 06EC)
					R				Flared																								
58	284.00	0.74	a	566+38	L	18"	RCP	56	Flared	North	14				1				1														Replace FE
					R				Flared						1				1														Replace FE
59	285.00	0.06	a	583+50	L	18"	RCP	56	Flared	South	12				1				1														Replace FE
					R				Flared						1				1														Replace FE
60	285.00	0.39	a	600+80	L	18"	RCP	96	Flared	North	12																						No Work Required.
					R				Flared																								

SD 20 TABLE OF MAINLINE CULVERT WORK

Culvert #	MRM	+ Disp		Station	Side	Per Original Plans: In Place Culvert Size and Type		Culvert Length (Ft)	Culvert End Type	Direction of Flow	Drainage Area Acre	Incidental Work, Grading LS	Remove Pipe: Culvert (Ft)	for Reset (Ft)	End Section (Each)	End Section for Reset (Each)	Furnish and Install: 24" RCP (Ft)	42" RCP (Ft)	18" RCP Flared End (Each)	24" RCP Flared End (Each)	30" RCP Flared End (Each)	42" RCP Flared End (Each)	30" RCPA Flared End (Each)	42" RCP Arch Flared End (Each)	Reset Pipe (Ft)	Reset Pipe End Section (Each)	Clean-out Pipe Culvert (Each)	Culvert Joint Cleaning (Ft)	Repair Culvert Joint (Ft)	Chemical Grout Void Fill (Gallons)	Base Course (Ton)	Asphalt Concrete Composite (Ton)	Repair Comments
61	285.00	0.56	a	609+49	L	18"	CMP	90	Flared	Eq																						No Work Required. (Culvert lined in 2021.)
					R				Flared																							
62	285.00	0.85	a	625+02	L	18"	RCP	78	Flared	South					1				1													Replace FE.
					R				Flared						1				1													Replace FE.
63	285.00	1.00	a	632+68	L	24"	RCP	96	Flared	North	50				1					1												Replace FE.
					R				Flared						1					1												Replace FE.
64	286.00	0.53	a	681+15	L	36"	RCP	52	Flared	North				6		1									6	1						Reset FE & 6'
					R				Flared																							No Work Required.
65	287.00	0.09	a	689+73	L	18"	RCP	84	Flared	North	54																					No Work Required.
					R				Flared						1				1													Replace FE.
66	287.00	0.35	a	703+36	L	18"	RCP	66	Flared	North	21				1				1													Replace FE.
					R				Flared																							No Work Required.
67	287.00	0.47	a	709+98	L	18"	RCP	68	Flared	South	40				1				1													Replace FE.
					R				Flared																							No Work Required.
68	287.00	0.77	a	725+46	L	18"	RCP	56	Flared	North	14				1				1													Replace FE.
					R				Flared						1				1													Replace FE.
69	287.00	0.96	a	735+60	L	18"	RCP	62	Flared	South					1				1													Replace FE.
					R				Flared																							No Work Required.
70	288.00	0.09	a	741+64	L	24"	RCP	76	Flared	South	25			4	1					1					4							Replace FE. Reset 4'.
					R				Flared																							No Work Required.

PLOT SCALE - 1:200

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SD 20 TABLE OF MAINLINE CULVERT WORK

Culvert #	MRM	+ Disp		Station	Side	Per Original Plans: In Place Culvert Size and Type		Culvert Length (Ft)	Culvert End Type	Direction of Flow	Drainage Area Acre	Incidental Work, Grading LS	Remove Pipe: Culvert (Ft)	for Reset (Ft)	End Section (Each)	End Section for Reset (Each)	Furnish and Install: 24" RCP (Ft)	42" RCP (Ft)	18" RCP Flared End (Each)	24" RCP Flared End (Each)	30" RCP Flared End (Each)	42" RCP Flared End (Each)	30" RCPA Flared End (Each)	42" RCP Arch Flared End (Each)	Reset Pipe (Ft)	Reset Pipe End Section (Each)	Clean-out Pipe Culvert (Each)	Culvert Joint Cleaning (Ft)	Repair Culvert Joint (Ft)	Chemical Grout Void Fill (Gallons)	Base Course (Ton)	Asphalt Concrete Composite (Ton)	Repair Comments
71	288.00	0.26	a	750+56	L	24"	RCP	90	Flared	North	7				1					1												Replace FE.
					R				Flared						1					1												Replace FE.
72	288.00	0.47	a	761+60	L	4'X6'	RC CATTLE PASS		Flared	South	217	Lump Sum										1											
					R				Flared									78				1										Replace. Refer to plan/profile sheet.
73	288.00	0.70	a	773+57	L	24"	RCP	100	Flared	South	39				1					1												Replace FE.
					R				Flared																							No Work Required.
74	288.00	0.85	a	781+65	L	7'X7'	RCBC		Flared	South	1290																						
					R				Flared																							No Work Required.
75	289.00	0.01	a	790+27	L	18"	RCP	72	Flared	South	22			6	1				1						6							Replace FE. Reset 6'.
					R				Flared																							No Work Required.
76	289.23		a	801+64	L	24"	RCP	64	Flared	South	29		4		1		4			1												Replace FE & 4'.
					R				Flared																							No Work Required.
77	289.00	0.44	a	813+12	L	24"	RCP	80	Flared	South	54				1					1												Replace FE.
					R				Flared																							No Work Required.
78	289.00	0.62	a	822+45	L	18"	CMP	92	Flared	Eq																							
					R				Flared																							No Work Required. (Culvert lined in 2021.)
79	289.00	0.93	a	838+38	L	24"	RCP	94	Flared	North	35				1					1												Replace FE.
					R				Flared						1					1												Replace FE.
80	290.00	0.19	a	858+16	L	24"	CMP	88	Flared	South	65																						
					R				Flared																							No Work Required. (Culvert lined in 2021.)

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SD 20 TABLE OF MAINLINE CULVERT WORK

Culvert #	MRM	+ Disp		Station	Side	Per Original Plans: In Place Culvert Size and Type		Culvert Length (Ft)	Culvert End Type	Direction of Flow	Drainage Area Acre	Incidental Work, Grading LS	Remove Pipe: Culvert (Ft)	for Reset (Ft)	End Section (Each)	End Section for Reset (Each)	Furnish and Install: 24" RCP (Ft)	42" RCP (Ft)	18" RCP Flared End (Each)	24" RCP Flared End (Each)	30" RCP Flared End (Each)	42" RCP Flared End (Each)	30" RCPA Flared End (Each)	42" RCP Arch Flared End (Each)	Reset Pipe (Ft)	Reset Pipe End Section (Each)	Clean-out Pipe Culvert (Each)	Culvert Joint Cleaning (Ft)	Repair Culvert Joint (Ft)	Chemical Grout Void Fill (Gallons)	Base Course (Ton)	Asphalt Concrete Composite (Ton)	Repair Comments
81	290.00	0.44	a		L	42"	**RCPA**	106	Flared						1									1									Replace FE
					R				Flared							1										1							Reset FE
82	290.00	0.78	a	883+37	L	4'X6'	RC CATTLE PASS	42	Flared		356																						
					R				Flared																								
83	290.00	0.83	a	885+90	L	18"	RCP	72	Flared	South	3					1										1							Reset FE.
					R				Flared						1				1													Replace FE.
84	290.00	0.98	a	893+46	L	24"	RCP	80	Sloped	Eq																							
					R				Sloped																								No Work Required.
85	291.00	0.09	a	899+25	L	24"	RCP	66	Flared	South				12	1					1					12								Replace FE. Reset 12'
					R				Flared																								No Work Required.
86	291.00	0.66	a	928+25	L	36"	CMP	100	Flared	South					1																		No Work Required. (Culver liner installed on PCN 06EC)
					R				Flared						1																		
87	291.00	0.67	a	928+80	L	4'X6'	RC CATTLE PASS	42	Flared																				54.9	54.9	45			Seal north 2 joints.
					R				Flared																								Seal southern most joint.
88	291.00	0.87	a	940+28	L	18"	RCP	68	Flared	South	7				1				1														Replace FE
					R				Flared																								No Work Required.
89	292.00	0.02	a	948+23	L	4'X5'	RC CATTLE PASS		Flared																								No Work Required.
					R				Flared																								
90	292.00	0.28	a	962+48	L	18"	RCP	56	Flared	South	20																						No Work Required.
					R				Flared						1				1														Replace FE

SD 20 TABLE OF MAINLINE CULVERT WORK

Culvert #	MRM	+ Disp		Station	Side	Per Original Plans: In Place Culvert Size and Type		Culvert Length (Ft)	Culvert End Type	Direction of Flow	Drainage Area Acre	Incidental Work, Grading LS	Remove Pipe: Culvert (Ft)	Remove Pipe: for Reset (Ft)	Remove Pipe: End Section (Each)	Remove Pipe: End Section for Reset (Each)	Furnish and Install: 24" RCP (Ft)	42" RCP (Ft)	18" RCP Flared End (Each)	24" RCP Flared End (Each)	30" RCP Flared End (Each)	42" RCP Flared End (Each)	30" RCPA Flared End (Each)	42" RCP Arch Flared End (Each)	Reset Pipe (Ft)	Reset Pipe End Section (Each)	Clean-out Pipe Culvert (Each)	Culvert Joint Cleaning (Ft)	Repair Culvert Joint (Ft)	Chemical Grout Void Fill (Gallons)	Base Course (Ton)	Asphalt Concrete Composite (Ton)	Repair Comments
91	292.00	0.74	a	986+75	L	24"	RCP	52	Flared	South																							No Work Required.
					R				Sloped																								
92	292.00	0.85	a	992+16	L	24"	RCP	62	Flared	South	51																						No Work Required.
					R				Flared						1					1												Replace FE.
93	293.00	0.17	a	1009+11	L	24"	**RCPA**	62	Flared	South	32																						No Work Required.
					R				Flared																								
94	293.00	0.30	a	1015+06	L	18"	RCP	54	Flared	North	9				1				1														Replace FE
					R				Flared																								No Work Required.
95	293.00	0.45	a	1024+00	L	18"	RCP	64	Flared	South					1				1														Replace FE
					R				Flared																								No Work Required.
96	293.00	0.57	a	1030+15	L	18"	RCP	52	Flared	South	21			10		1									10	1				5	2	Reset FE & 10' Will need to repair AC shoulder.
					R				Flared																								No Work Required.
97	293.00	0.78	a	1041+13	L	18"	RCP	56	Flared	South	23			8	1				1						8								Replace FE. Reset 8'
					R				Flared						1				1														Replace FE.
98	293.00	0.91	a	1047+66	L	18"	RCP	54	Flared	South	6			8	1				1						8								Replace FE. Reset 8'
					R				Flared																								No Work Required.
99	294.00	0.06	a	1054+15	L	18"	RCP	54	Flared	South	25			6	1				1						6								Replace FE. Reset 6'.
					R				Flared					6		1									6	1							Reset FE & 6'.
100	294.00	0.26	a	1064+84	L	24"	**RCPA**	70	Flared	South	50																						No Work Required.
					R				Flared																								

PLOT SCALE - 1:200

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SD 20 TABLE OF MAINLINE CULVERT WORK

Culvert #	MRM	+ Disp		Station	Side	Per Original Plans: In Place Culvert Size and Type		Culvert Length (Ft)	Culvert End Type	Direction of Flow	Drainage Area Acre	Incidental Work, Grading LS	Remove Pipe: Culvert (Ft)	for Reset (Ft)	End Section (Each)	End Section for Reset (Each)	Furnish and Install: 24" RCP (Ft)	42" RCP (Ft)	18" RCP Flared End (Each)	24" RCP Flared End (Each)	30" RCP Flared End (Each)	42" RCP Flared End (Each)	30" RCPA Flared End (Each)	42" RCP Arch Flared End (Each)	Reset Pipe (Ft)	Reset Pipe End Section (Each)	Clean-out Pipe Culvert (Each)	Culvert Joint Cleaning (Ft)	Repair Culvert Joint (Ft)	Chemical Grout Void Fill (Gallons)	Base Course (Ton)	Asphalt Concrete Composite (Ton)	Repair Comments
101	294.00	0.72	a	1088+76	L	30"	**RCPA**		Flared	South	72			6	1								1		6						5	2	Replace FE. Reset 6'. Repair AC shoulder.
					R				Flared					6	1								1		6						5	2	Replace FE. Reset 6'. Repair AC shoulder.
TOTAL												**Lump Sum**	**4**	**106**	**57**	**13**	**4**	**78**	**34**	**16**	**2**	**2**	**2**	**1**	**106**	**13**	**1**	**86.9**	**86.9**	**57**	**15**	**6**	

Left and Right based upon project station, thus Left is North side and Right is South side.

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

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

Initial Inspection held on 6-3-20 & 6-4-20. Above table produced from that inspection.

SURFACING THICKNESS DIMENSIONS

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

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

SCOPE OF WORK

Work on this project involves cold milling asphalt concrete, placement of 2" asphalt concrete pavement, culvert repair, culvert replacement, rumble strips and pavement markings.

SEQUENCE OF OPERATIONS

Culvert repair work will be completed prior to starting the cold milling of asphalt concrete.

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.

Mainline culvert replacement at Sta. a761+60 will be done approximately half width at a time such that one lane of traffic can be maintained at all times. A minimum roadway width of 16' will be maintained at all times. The replacement of the culverts will be completed at least 2 weeks prior to starting cold milling on the project. Mainline culvert replacement work will be completed such that traffic is not disrupted for more than 7 calendar days.

GENERAL NOTES

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

UTILITIES

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

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

GENERAL TRAFFIC CONTROL

SD20 will remain open to traffic at all times.

Traffic control for mainline culvert replacement at Sta. a761+60 will be as per Standard Plate 634.25. Type 3 Barricades will be placed on each side of the open cut and also in front of any equipment and material on the roadway. Maximum spacing of channelizing devices along the work space will be 20 feet.

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

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

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

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

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

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

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

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

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

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

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

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

Traffic Control for culvert repair work will be as follows:

For signing purposes, a work area will be no longer than two miles for culvert repair operations.

Flaggers and FLAGGER symbol signs will be in place when hauling material from one side of the roadway to the other. These will also be provided when work activities or equipment present a hazard to workers and/or through traffic, or encroaches into driving lanes open to traffic.

FLAGGING

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

Included in the Estimate of Quantities are WAIT FOLLOW PILOT CAR signs for use on low volume intersecting roads as determined by the Engineer. WAIT FOLLOW PILOT CAR signs will not block the view of the stop sign.

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

TYPE III FIELD LABORATORY

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

STORAGE UNIT

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

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

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

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

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

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

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

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

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

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

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

REMOVE AND REPLACE TOPSOIL

Topsoil will be salvaged and stockpiled prior to starting the culvert replacement site work. Limits of this work, depth of salvage, and stockpile location will be directed by the Engineer. Following completion of construction, topsoil will be spread evenly over the disturbed areas.

All costs associated with removing and replacing the topsoil will be incidental to the contract lump sum price for “Remove and Replace Topsoil”.

RCP AND CMP CULVERTS

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

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

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

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

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

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

Culvert barrel and culvert end treatments that are to be removed and reset will be cleaned prior to resetting. There will be no payment of the contract item Cleanout Pipe Culvert to clean sections of culverts that are removed and reset.

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.

Pipe Diameter (In)	Round Pipe Circumference per Joint (Ft)	Arch Pipe Circumference per Joint (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.

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.

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.

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.

CLEANOUT PIPE CULVERT

Material in existing pipe culvert will be cleaned out by water flushing or other approved methods.

Material removed from the pipe culvert will become property of the Contractor for disposal.

The Contractor will implement appropriate sediment control measures prior to water flushing to prevent discharges from the project boundaries.

The pipe culvert will be cleaned to the satisfaction of the Engineer.

All costs to dewater, clean pipe, and dispose of removed materials will be incidental to the contract unit price per each for "Cleanout Pipe Culvert".

PIPE CULVERT UNDERCUT

Pipe culvert undercut may be required for this project. The Engineer will determine which pipe will be undercut in accordance with Section 421 of the Specifications.

If pipe culvert undercut is required, the table below contains the rate for one-foot depth of pipe culvert undercut per foot of pipe length. When calculating pipe culvert undercut, the length of pipe ends should be included in the overall pipe length.

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

Station	Undercut Depth (Ft)	Granular Material (Ton)
a761+60	1	28.8
	Total:	28.8

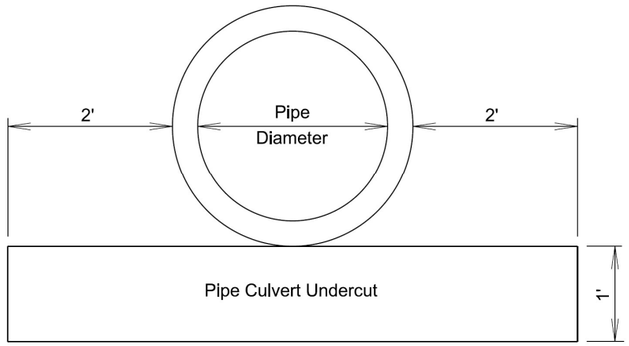
The table below contains the rate for one-foot depth of pipe culvert undercut per foot of pipe length and should be used as an aid in determining the actual amount of undercut to be performed during construction. The table is derived from the drawing below and conforms to the Specifications. When calculating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

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

(Table on Following Page)

PIPE CULVERT UNDERCUT (CONTINUED)

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



MAINLINE CROSS PIPE REPLACEMENT

The pipe culvert at Station a761+60 will be installed in accordance with the following notes and as shown on the Pipe Installation Detail.

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

After the existing cattle pass 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 3:1 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 3:1 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.

The Contractor will be required to widen the shoulders with borrow material and base course surfacing to maintain traffic through the culvert site (Sta. a761+60). All costs to temporarily widen the roadway at the culvert replacement site will be incidental to the contract lump sum price for "Construction and Maintenance of Detour(s)". At a minimum, the widening will be constructed so that no part of the in slope is steeper than 3:1 and that a minimum of 12" of base course surfacing is placed to accommodate traffic. Upon completion of the new culvert installation, any excess material used for temporary widening no longer required will be removed from the project. All costs to remove the temporary widening will be incidental to the contract lump sum price for "Construction and Maintenance of Detour(s)".

REMOVE FENCE & TYPE 2 RIGHT-OF-WAY FENCE

The Contractor will remove the fence that used to direct the cattle through the cattle pass at Station a761+60 and replace the opening portion of the fence into the field with Type 2 Right-of-Way Fence.

All costs associated with the work will be incidental to the contract unit price for "Remove Fence", "Type 2 Right-of-Way Fence", and "2 Post Panel".

SHOULDER CLEARING

Prior to mainline paving, the shoulders will be bladed and broomed of all vegetation and loose/accumulated material to the satisfaction of the Engineer. Shoulder Clearing will not be measured for payment, and all costs associated with Shoulder Clearing will be incidental to the various contract items.

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

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

CONTRACTOR FURNISHED BORROW EXCAVATION

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

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

GEOGRID

The base course portion of the surfacing section will be reinforced with geogrid for culvert at Station a761+60 to minimize differential settlement and subsequent distortion of the surfacing. After the subgrade has been rebuilt to grade, 4 inches of base course will be placed and compacted in preparation for geogrid placement. Place biaxial geogrid followed by 8 inches of base course.

Geogrid Specification:

The geogrid will be a biaxial grid of single layer construction. Vibratory welded, integrally formed, or woven and coated geogrids will be acceptable. Grids with laser welded grid junctions will not be allowed. The geogrid will be certified by the supplier to meet the following specification prior to installation:

Property	Test	MARV
Wide Width Strip Tensile Strength (Ultimate)	ASTM D6637 Method B	850 lb/ft MD and XD

Approximately 330 square yards (78' x 38') of Geogrid will be required. Geogrid will be paid for at the contract unit price per square yard. Payment quantities will be based on area covered plus 15%. Overlaps are accounted for by the additional 15%. Payment will be full compensation for furnishing and installing the geogrid only. Granular backfill materials will be paid for under a different bid item.

GEOGRID INSTALLATION PROCEDURE

Place the geogrid on as level and smooth surface of surface as possible. Any protrusions that might damage the geogrid will be removed prior to placing the geogrid. No equipment will be allowed on the geogrid until the granular material is in place. The geogrid should be kept as taut as possible prior to backfilling.

The geogrid may be cut and realigned to prevent the propagation of wrinkles as the geogrid is unrolled. All seams in the geogrid will be overlapped at least 2 feet and shingled as to prevent granular material being forced between the geogrid layers. Damaged areas may be repaired by placing additional geogrid over the damaged area. The geogrid patch will cover the damaged area plus 2 feet minimum in all directions as directed by the Engineer.

Granular material will be dumped at least 20 feet behind the leading edge of the fill and pushed into place with a loader or dozer. Granular material will be placed in 4-inch max. lifts and compacted as per the Specified Density Method.

COLD MILLING ASPHALT CONCRETE

The Los Angeles Abrasion Loss value on the aggregate used for the in-place asphalt concrete was 20. This value was obtained from testing during construction of the in-place asphalt concrete.

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

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

Cold Milling of Asphalt will consist of removing the in place asphalt to an average depth of **1"**. This material is to be removed at a constant slope of **0.02 FT/FT**. from the in place shoulder elevation to centerline of the roadway.

Cold milling asphalt is estimated to produce 27,844 tons of cold milled asphalt concrete material. An estimated 12,213 tons of cold milled asphalt concrete material will be used on this project as RAP in the Class Q2R Hot Mixed Asphalt Concrete mixture. The Contractor is responsible to assure enough asphalt concrete salvage is available for the Class Q2R Hot Mixed Asphalt Concrete.

An estimated 3,895 tons of cold milled asphalt concrete material will be used on this project as Base Course, Salvaged Asphalt Mix at 60% for Base Course, Salvaged.

The remainder of the salvaged asphalt concrete will be blended and stockpiled at the Faulkton SDDOT Maintenance Shop.

GRANULAR MATERIAL, FURNISH

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

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

BASE COURSE, SALVAGED

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

The Contractor will ensure the Base Course, Salvaged material contains no more than 60% salvaged asphalt mix material and at least 40% granular material (salvaged or virgin). Blended material will be to the satisfaction of the Engineer.

All other requirements for Base Course, Salvaged will apply.

BLEND, HAUL, AND STOCKPILE GRANULAR MATERIAL

Excess salvaged asphalt concrete material estimated at 11,735 tons (for informational purposes only) will be blended with 7,824 tons of Granular Material, Furnish and will be hauled, blended and stockpiled in the south half of Section 14, Township 118 North, Range 69 West of the 5th P.M, Faulk County, South Dakota at the Faulkton SDDOT Maintenance Shop. The Contractor will have approval from the Engineer of the stockpile location prior to stockpiling the material within the aforementioned site.

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

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

Salvaged asphalt concrete material will be blended with Granular Material, Furnish at a rate of 60% salvaged asphalt mix material and 40% Granular Material, Furnish to obtain stockpile material.

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

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

ASPHALT CONCRETE COMPOSITE

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, Salvaged for the full width of the bottom layer of Asphalt Concrete Composite plus one foot additional on the outside shoulder.

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 0.06 gallons per square yard on primed base course. 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.

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.

BLEND AND STOCKPILE GRANULAR MATERIAL

An Estimated 3,895 tons (for informational purposes only) of Salvaged Asphalt Mix Material will be blended with 2,597 tons of Granular Material, Furnish and stockpiled at the Contractor’s furnished stockpile site.

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

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

Salvaged asphalt mix material will be blended with Granular Material, Furnish at a rate of 60% salvaged asphalt mix material and 40% Granular Material, Furnish to obtain stockpile material. Material will be uniformly blended to the satisfaction of the Engineer.

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

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

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.

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, Salvaged. 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, Salvaged 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.

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

WATER FOR COMPACTION OF GRANULAR MATERIALS

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

ASPHALT CONCRETE BLADE LAID

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

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%.

ASPHALT FOR TACK

Included in the Table of Additional Quantities are 6.9 tons of SS-1h or CSS-1h Asphalt for Tack for surface repair, strengthening, and spot leveling areas throughout the project. (Rate = 0.06 Gal./ Sq. Yd.).

CLASS Q2R HOT MIXED ASPHALT CONCRETE

Mineral Aggregate:

Asphalt concrete aggregates 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 on this project.

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** 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. This material will be placed where and as directed by the Engineer.

FLUSH SEAL

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

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.

SAND FOR FLUSH SEAL

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

RUMBLE STRIPES

Rumble Stripe installation will be completed prior to application of the Flush Seal and Permanent Pavement Markings. In the event the Flush Seal is eliminated from the contract, the Contractor will still be required to apply a Flush Seal to the newly installed 8” Rumble Stripes at a width of 12” and at the same rate as specified in this plan set. No adjustment in the contract unit price will be made and SS-1h or CSS-1h will be paid at the contract unit price per ton.

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 and it will be the Contractor’s responsibility to ensure the loose material does not enter any vegetated areas and/or waterways.

All costs associated with the work will be incidental to the contract unit price per mile for “Grind 8" Rumble Strip or Stripe In Asphalt Concrete”.

TABLE OF 8” RUMBLE STRIPES

Station to Station	Length (Ft)	Length (Miles)
671+50.0 to 1022+90.6 (Both Shoulders)	70281.2	
a0+00 to a1096+44.0 (Both Shoulders)	219,288.0	
Total	289,569.2	54.8

GRIND TRANSVERSE RUMBLE STRIPS IN ASPHALT

Advance intersection warning Transverse Asphalt Rumble Strips will be constructed on the mainline pavement, at the SD 20 & SD 45 Junction, as detailed in the plan set. Plans quantity will be the basis of payment.

Transverse Rumble Strips will be completed prior to application of the Flush Seal and Permanent Pavement Markings. In the event the Flush Seal is eliminated from the contract, the Contractor will still be required to apply a Flush Seal to the newly installed Transverse Rumble Strips at the same rate as specified in this plan set. No adjustment in payment will be made and SS-1h or CSS-1h Asphalt for Flush Seal will be paid at the contract unit price per ton.

TEMPORARY PAVEMENT MARKINGS

The total length of no passing zone on this project is estimated to be **4.8** miles.

It is estimated that 35 DO NOT PASS (R4-1) and 34 PASS WITH CARE (R4-2) signs will be required to mark the no passing zones, should the Contractor elect to use these signs.

Quantities of Temporary Pavement Markings consist of:

One pass on top of the Cold Milled Asphalt Concrete
One pass on top of the Blade Laid Asphalt Concrete
One pass on top of the Class Q2R Asphalt Concrete
One pass on top of the Flush Seal, length as determined by the Engineer

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 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 flush seal. As an alternative, the Contractor may install new tabs for 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.

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

Covers on the tabs will be sufficiently secured to prevent traffic from dislodging the cover and when removed, the covers will be properly disposed of. The Contractor will remove and properly dispose of the tabs after permanent pavement marking is applied. Method of removal will be nondestructive to the road surface and will be accomplished within one week of completion of the permanent pavement marking.

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

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.

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

4" TEMPORARY PAVEMENT MARKING TAPE TYPE I

Temporary pavement marking for stop lines will consist of 4" Temporary Pavement Marking Tape Type I. Placement of each 24" white stop line will be accomplished by placing six pieces of 4" x 12' tape adjacent to one another. Each workspace requires two stop lines which is an equivalent of approximately 144' of 4" tape. Temporary pavement marking on centerline will consist of temporary flexible vertical markers (tabs) or temporary raised pavement markers and will be used as depicted on standard plate 634.25 when the stop condition must remain in place during nighttime hours, 9:00 pm to 6:00 am.

A quantity of 2,350 feet of temporary pavement marking tape has been provided for in the Estimate of Quantities for the culvert replacement location.

PERMANENT PAVEMENT MARKING

The Contractor will be required to repaint all existing pavement markings including centerline, edge line, lane lines, turn arrows (2), and stop bars (1),. 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. The cost to duplicate the existing marking locations will be incidental to the contract unit prices for the various contract items.

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

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

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 paint will begin no sooner than 7 calendar days following completion of final surfacing (including Flush Seal if applied). 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

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

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

RETROREFLECTIVITY FOR PAVEMENT MARKING PAINT

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

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

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

COLD APPLIED PLASTIC PAVEMENT MARKING

30 Feet of Cold Applied Plastic Pavement Marking, 24" and 3 Arrows of Cold Applied Plastic Pavement Marking, Arrow have been included in the Estimate of Quantities for marking the Stop Bar at the SD 20 & SD 45 Jct.

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

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

GROOVING FOR COLD APPLIED PLASTIC PAVEMENT MARKING

30 Feet of Groove Pavement for Pavement Marking, 24" and 3 Arrows of Groove Pavement for Pavement Marking, Arrow have been included in the Estimate of Quantities for marking the Stop Bar at the SD 20 & SD 45 Jct.

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

TYPE 2 OBJECT MARKERS

For culverts 60" and greater overall width, install per Standard Plate 634.04. 2 New back to back object markers with new posts will be installed in addition to the 2 present back to back object markers for the 7' x 7' RCBC at MRM 288.00 + 0.85.

All costs associated with removal of in place pipe markers and installation of new back to back object markers will be incidental to the contract unit price per each for "Type 2 Object Marker Back to Back".

REMOVE SIGN FOR RESET AND RESET SIGN

Signs that are scheduled for reset will be dismantled and reassembled to the extent needed by the Contractor to properly reset the sign. Signs will be handled with care so that the existing signs, posts, and bases are not damaged during the relocation process. The Contractor will replace and pay for any reset signs damaged in their care.

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

On this project the STOP AHEAD sign symbol located near the SD 45 junction will be removed, and then reset at the location indicated on Standard Plate 320.45.

REFURBISH MAILBOXES

Existing mailboxes will be removed, turnouts constructed, and mailboxes reset on new posts with the necessary support hardware for single or double mailbox assemblies (See Standard Plate No's. 900.01, 900.02 and 900.03). The local Postmaster will determine the recommended mounting height of the mailboxes throughout the project. The Contractor will coordinate with the Engineer on the proper postal representative to contact.

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

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

TABLE OF REFURBISH MAILBOX

MRM	L/R	Single (Each)	Double (Each)	Turnout
272.04	R	1		Yes
273.45	R	1		Yes
275.59	R	1		Yes
275.64	R	1		Yes
276.39	R	1		Yes
285.45	L	1		Yes
286.14	L	1		Yes
288.86	L	1		Yes
291.67	R	1		Yes
292.09	R		1	Yes
293.24	R		1	Yes
294.36	R	1		Yes
Totals:		10	2	

ORANGE PLASTIC SAFETY FENCE

As a result of a Cultural Resources Survey, historically sensitive areas have been identified adjacent to the project rights-of-way.

The following historically sensitive sites have been identified that require avoidance of construction activities:

Table of Historic/Archaeological Sites

Station	Offset (Ft.)	L/R	Environmental Sensitive Site	Action
82+40 to 93+40	30	L/R	ESS1	Do Not Disturb and Site Fencing
594+75 to 596+05	30	L/R	ESS2	Do Not Disturb and Site Fencing

Work within the vicinity of the site(s) will not begin until the safety fence is installed. All costs associated with furnishing and installing the orange safety fence will be incidental to the contract unit price per foot for “Orange Plastic Safety Fence”. 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.

EROSION CONTROL

The estimated area requiring erosion control is **0.9** acres. All costs for the erosion control work for furnishing, placing, and maintaining erosion control including equipment, labor, seeding and mulching will be incidental to the contract lump sum price for EROSION CONTROL.

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

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 the following fungal species:

25% *Glomus intraradices*
25% *Glomus aggregatum or deserticola*
25% *Glomus mosseae*
25% *Glomus etunicatum*

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 lump sum price for EROSION CONTROL.

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

Permanent Seeding

The areas to be seeded consist of all disturbed areas within the project limits.

Type C Permanent Seed Mixture will consist of the following:

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

Application of fertilizer will not be required on this project.

Mulching (Grass Hay or Straw)

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

EROSION CONTROL WATTLE

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

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

Erosion control wattles will remain on the project to decompose.

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

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

HIGH FLOW SILT FENCE

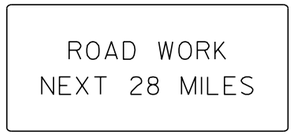
The high flow silt fence fabric provided will be from the approved product list. The approved product list for high flow silt fence may be viewed at the following internet site:

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

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

FIXED LOCATION GROUND MOUNTED BREAKAWAY SUPPORT SIGNS

A



G20-1

B

G20-1

C

G20-1

D

G20-1

E

G20-1

F

G20-1

G

G20-1

H

G20-1

I

W8-15P

W7-3aP

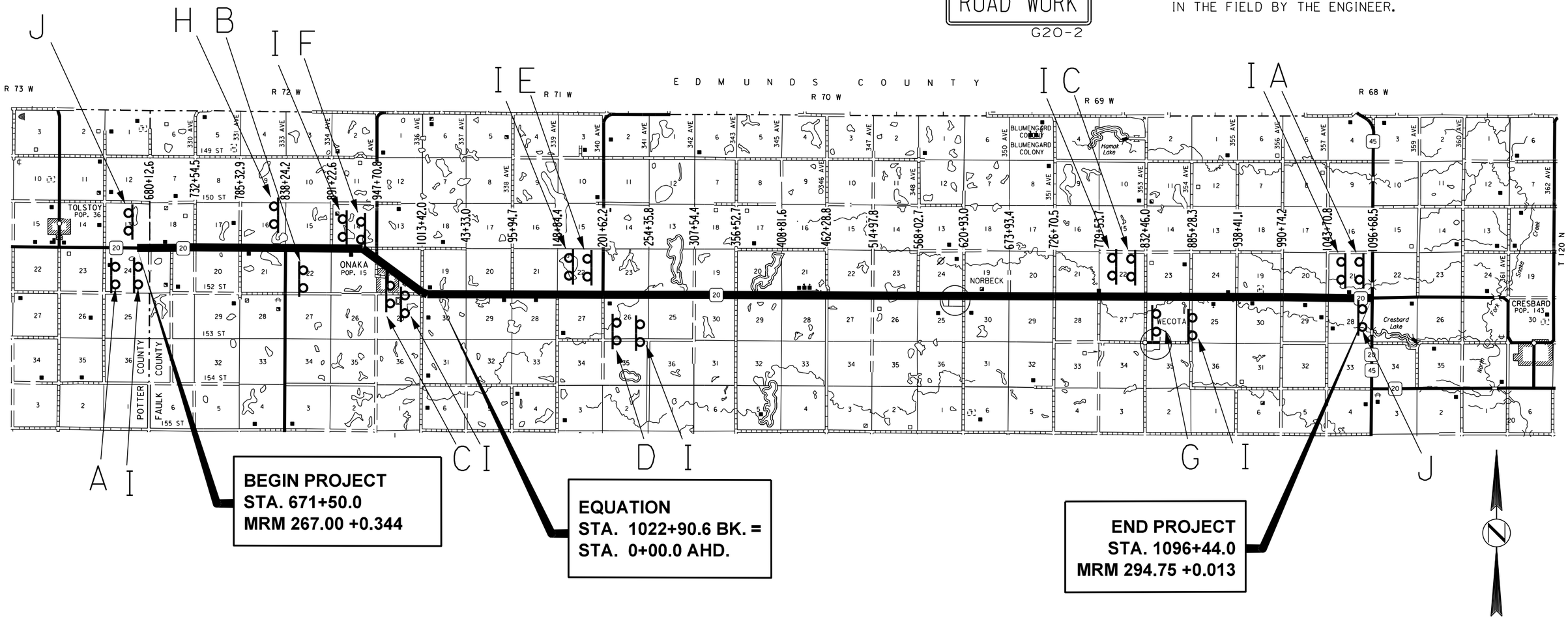
W8-15 GROOVED PAVEMENT signs must only be visible when the condition exists. Signs will be covered or removed when the grooved road condition is not present.

J

G20-2

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

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



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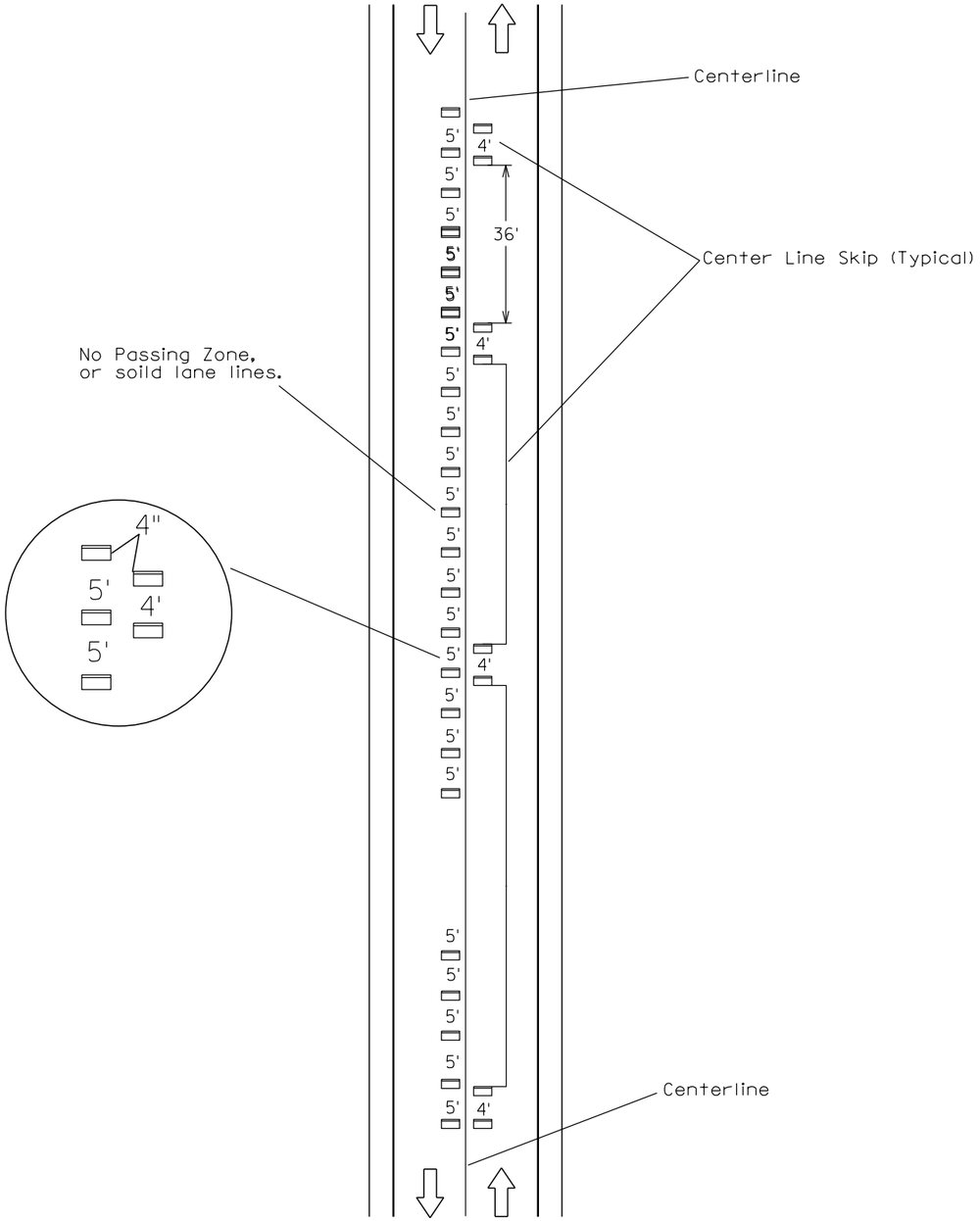
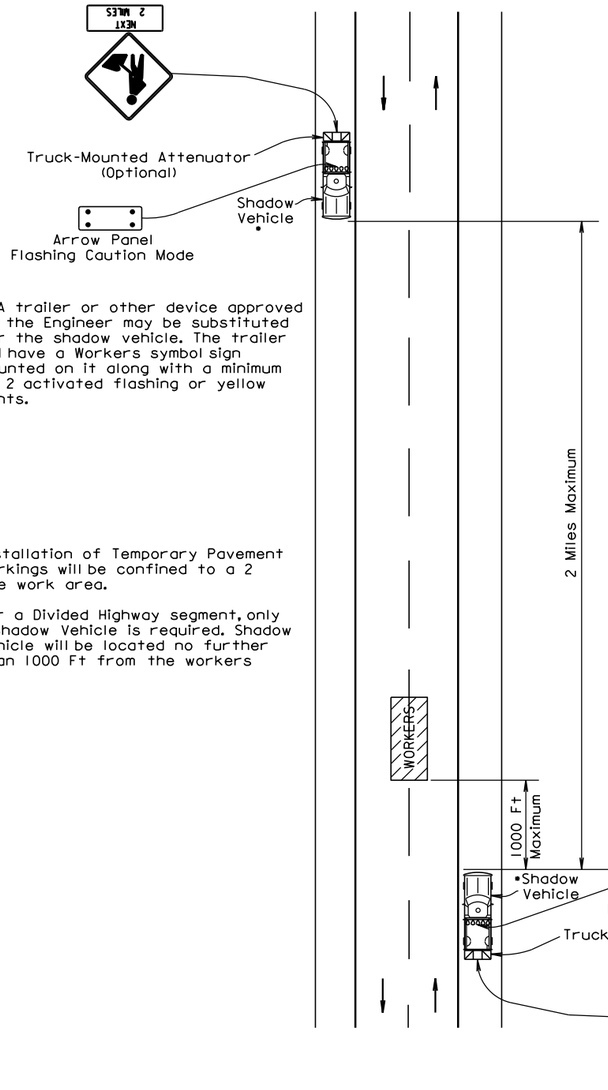
GUIDES FOR TRAFFIC CONTROL DEVICES TEMPORARY ROAD MARKER INSTALLATION



GUIDES FOR TRAFFIC CONTROL DEVICES APPLICATION OF TEMPORARY PAVEMENT MARKING TABS



* A trailer or other device approved by the Engineer may be substituted for the shadow vehicle. The trailer will have a Workers symbol sign mounted on it along with a minimum of 2 activated flashing or yellow lights.

Installation of Temporary Pavement Markings will be confined to a 2 Mile work area.

For a Divided Highway segment, only 1 Shadow Vehicle is required. Shadow Vehicle will be located no further than 1000 Ft from the workers

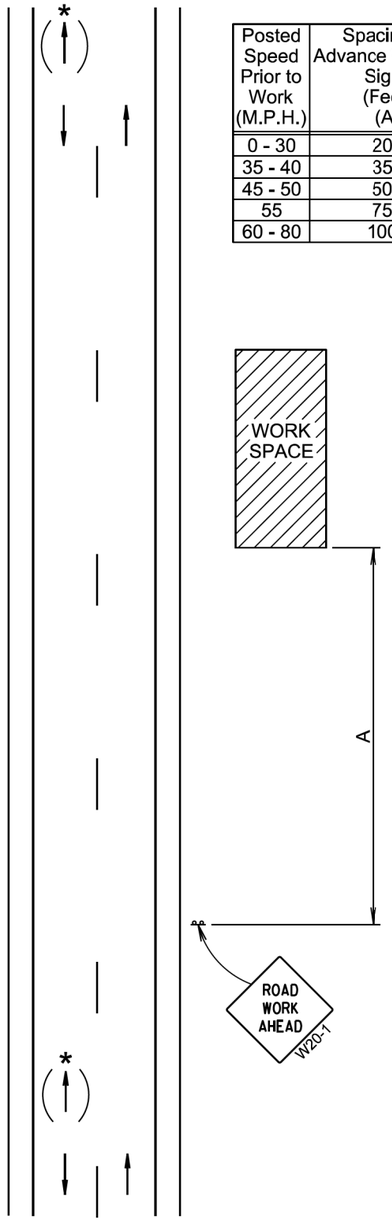
The signs illustrated are not required if the work space is behind a barrier, more than 2 feet behind the curb, or 15 feet or more from the edge of any roadway.

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

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

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

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



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

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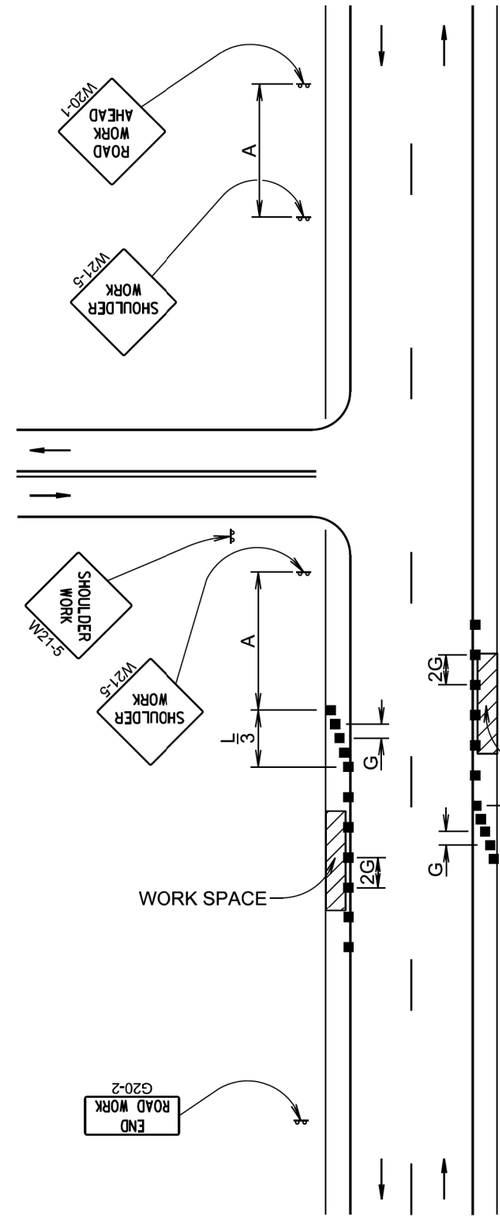
SDDOT

WORK BEYOND THE SHOULDER

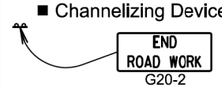
PLATE NUMBER 634.01

Sheet 1 of 1



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

■ Channelizing Device



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

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

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

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

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

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SDDOT

WORK ON SHOULDERS

PLATE NUMBER 634.03

Sheet 1 of 1

*In situations where multiple work locations in a limited distance make it practical to place stationary signs, the distance between the advance warning sign and the work should not exceed 5 miles.

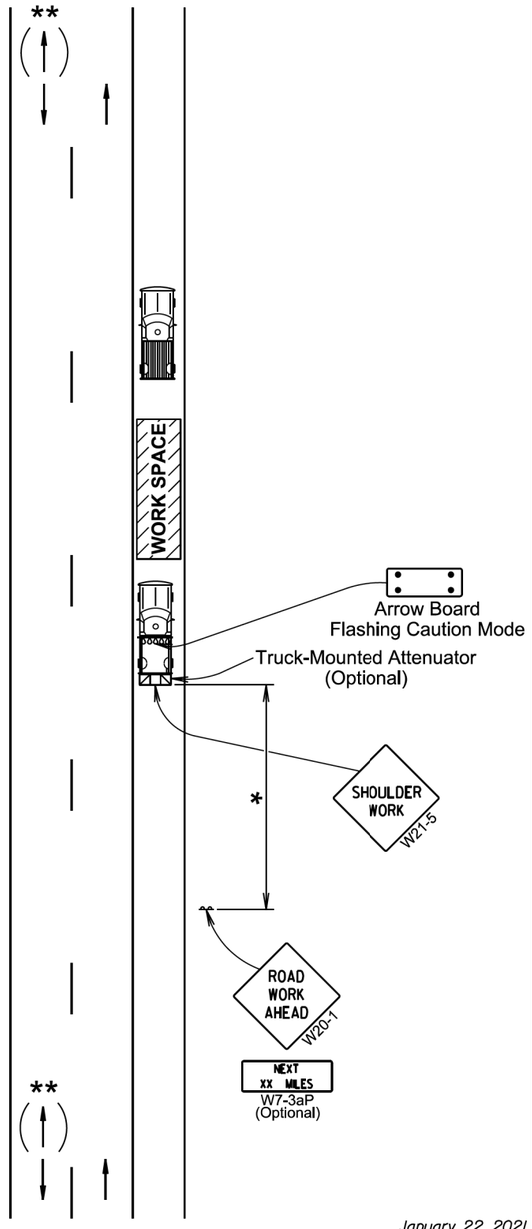
The ROAD WORK NEXT xx MILES sign may be used instead of the ROAD WORK AHEAD sign if the work locations occur over a distance of more than 2 miles.

Arrow board is required for intermittently and continuously moving mobile operations when work exceeds 1 hour.

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

In situations where the distance between the advance warning signs and the work is 2 miles to 5 miles, a Supplemental Distance plaque should be used with the ROAD WORK AHEAD sign.

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".



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SDDOT

MOBILE OPERATIONS ON SHOULDERS

PLATE NUMBER 634.04

Sheet 1 of 1

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

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

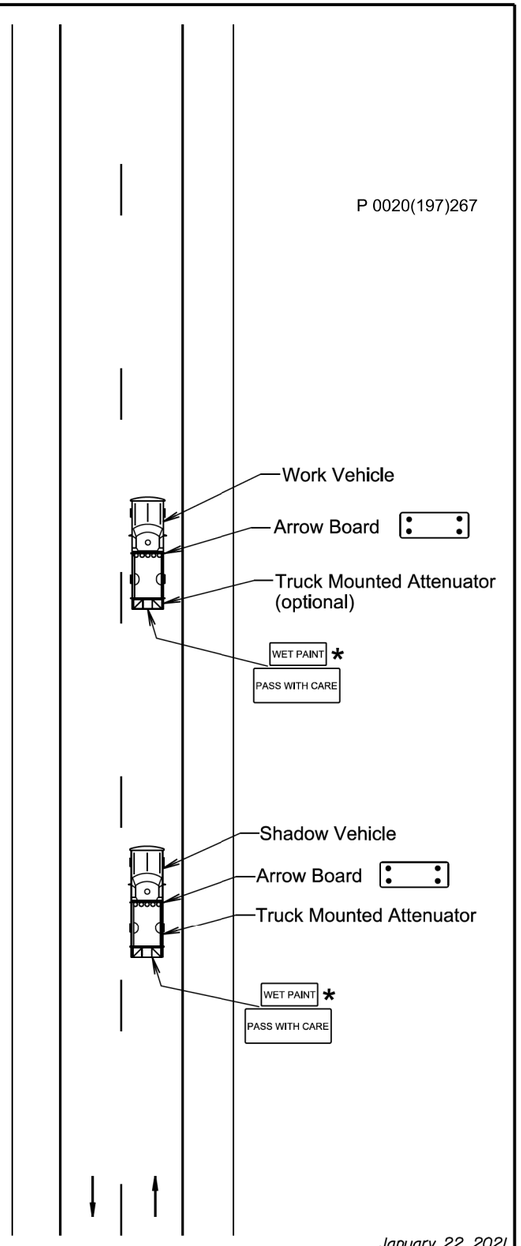
Shadow and Work vehicles will display high-intensity rotating, flashing, oscillating, or strobe lights, flags, signs, or arrow boards.

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

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

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

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



January 22, 2021

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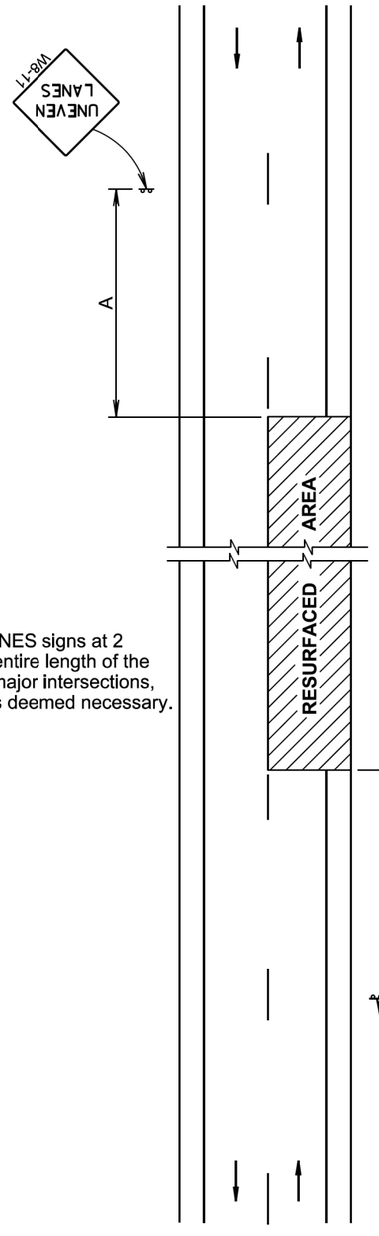
SDDOT

MOBILE OPERATIONS ON 2-LANE ROAD

PLATE NUMBER 634.06

Sheet 1 of 1



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

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

January 22, 2021

Published Date: 4th Qtr. 2022

SDDOT

UNEVEN ROAD SURFACE

PLATE NUMBER 634.22

Sheet 1 of 1

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

Flagger

Channelizing Device

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

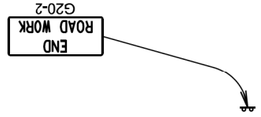
The ROAD WORK AHEAD and the END ROAD WORK signs may be omitted for short duration operations (1 hour or less).

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

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

The channelizing devices will be drums or 42" cones.

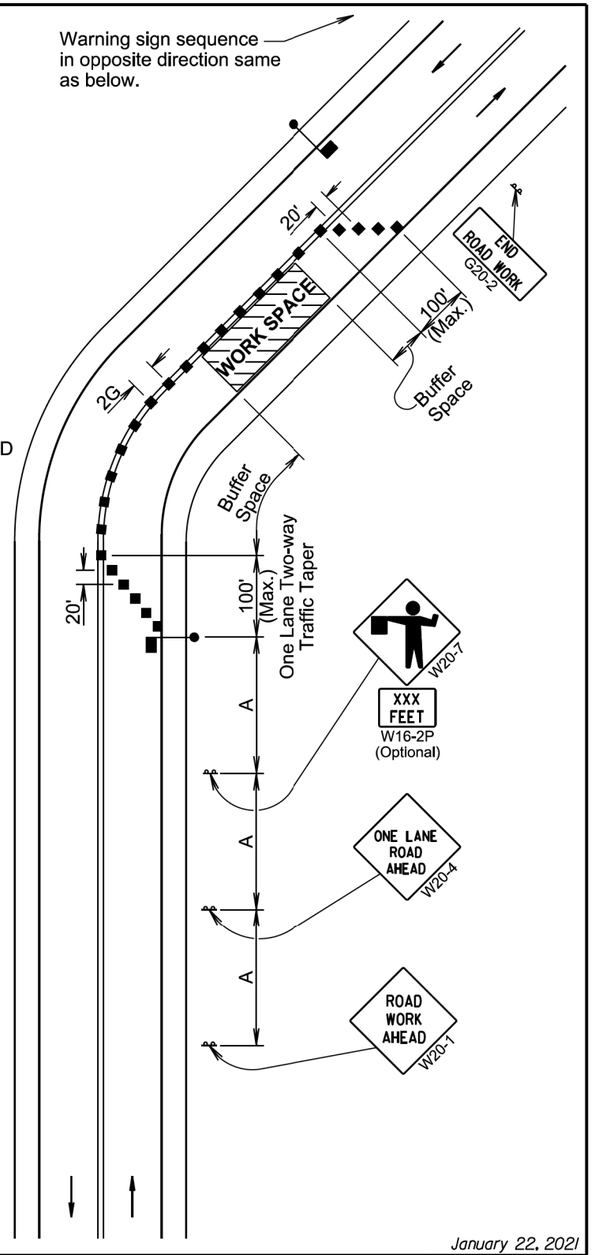
Channelizing devices are not required along the centerline adjacent to work area when pilot cars are utilized for escorting traffic through the work area.



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

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

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



January 22, 2021

Published Date: 4th Qtr. 2022

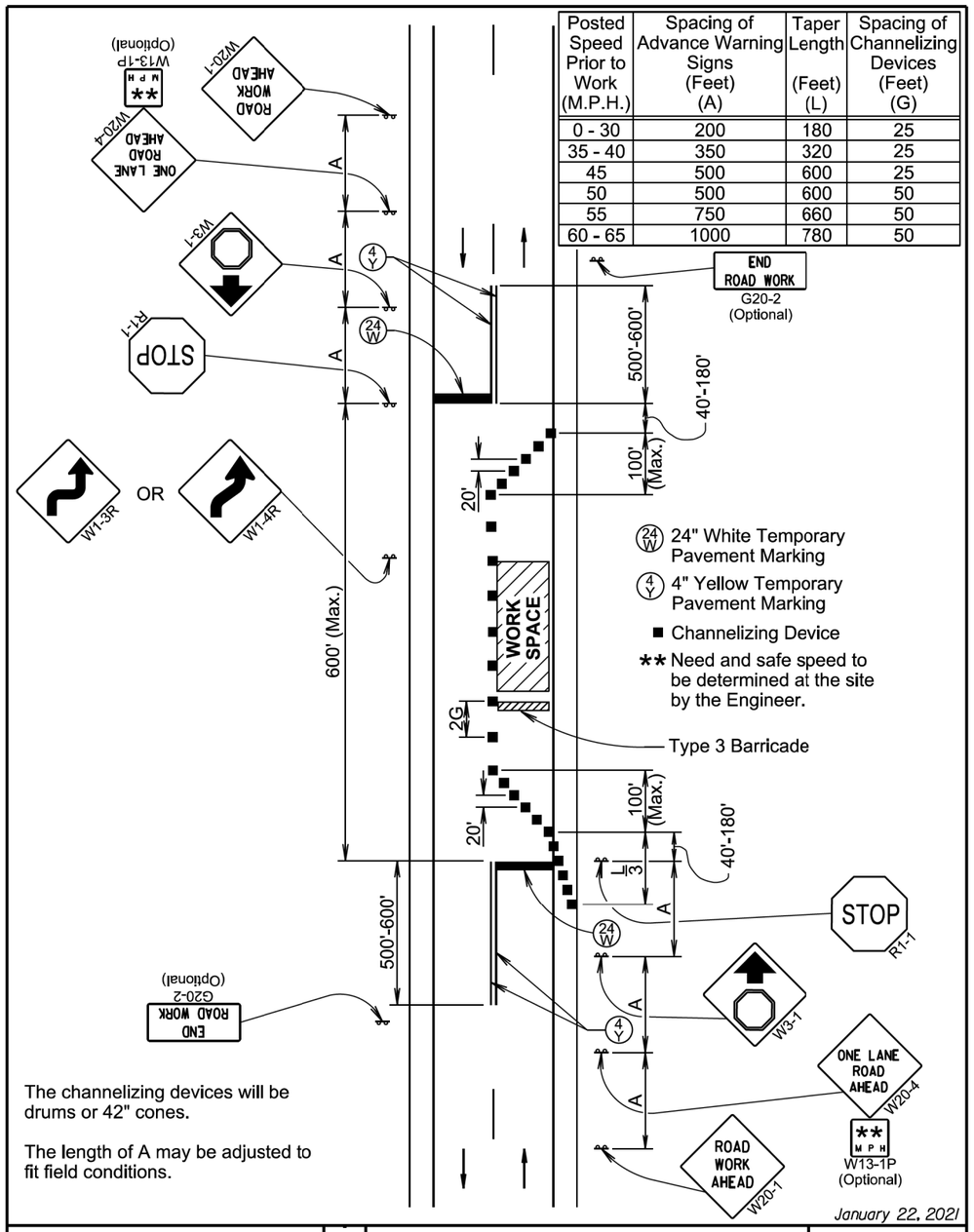
SDDOT

LANE CLOSURE WITH FLAGGER PROVIDED

PLATE NUMBER 634.23

Sheet 1 of 1

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



24 W 24" White Temporary Pavement Marking

4 Y 4" Yellow Temporary Pavement Marking

■ Channelizing Device

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

The channelizing devices will be drums or 42" cones.

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

January 22, 2021

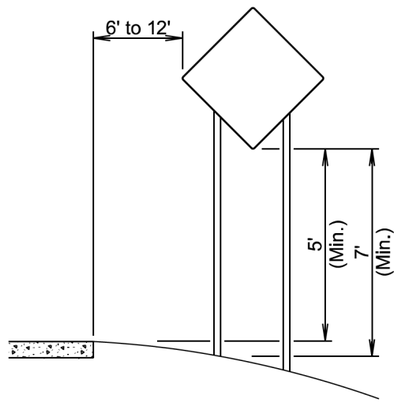
Published Date: 4th Qtr. 2022

SDDOT

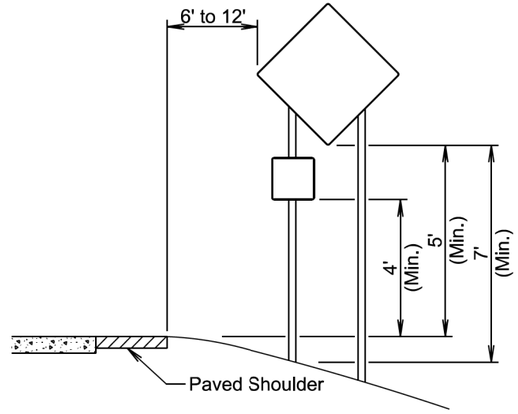
LANE CLOSURE USING STOP SIGNS

PLATE NUMBER 634.25

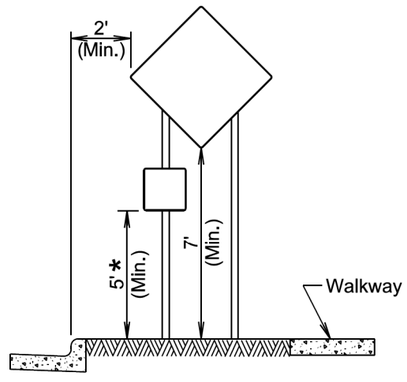
Sheet 1 of 1



RURAL DISTRICT

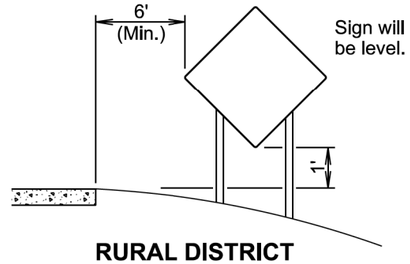


RURAL DISTRICT WITH SUPPLEMENTAL PLATE



URBAN DISTRICT

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



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

January 22, 2021

Published Date: 4th Qtr. 2022

SDDOT

CRASHWORTHY SIGN SUPPORTS (Typical Construction Signing)

PLATE NUMBER 634.85

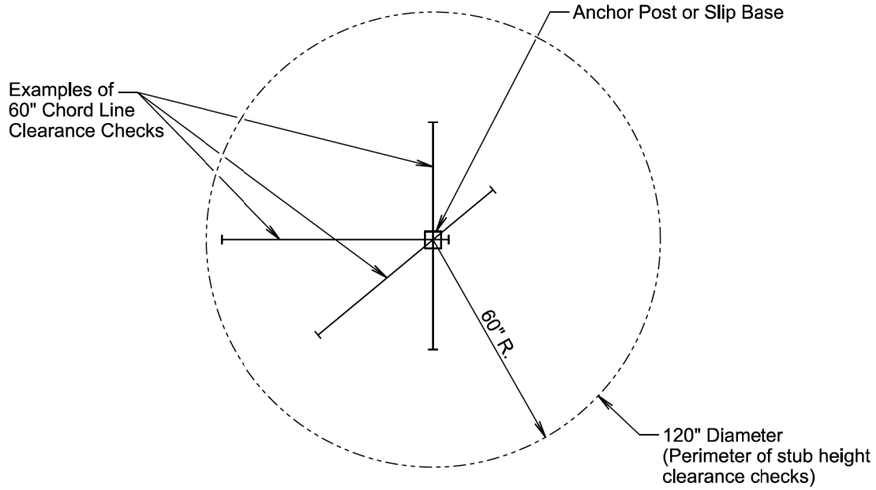
Sheet 1 of 1

PLOT SCALE - 1:200

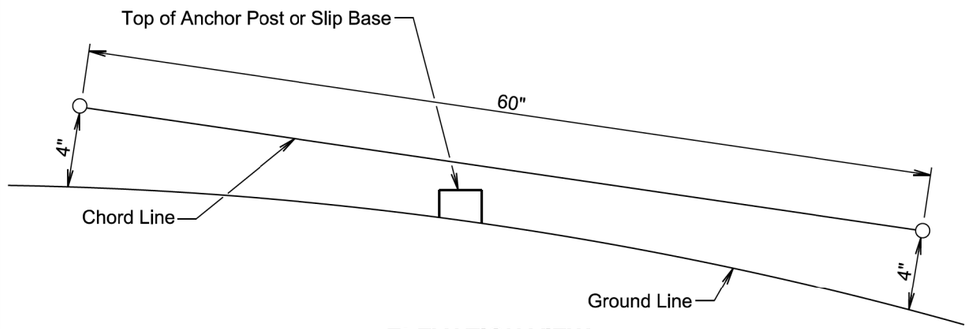
PLOT NAME - 4

FILE - ...\06OD_STANDARD PLATES, TRAFFIC CONTROL.DGN

-PLOTTED FROM - TRABIL017



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: 4th Qtr. 2022	SDDOT	**BREAKAWAY SUPPORT STUB CLEARANCE**	PLATE NUMBER 634.99
			Sheet 1 of 1

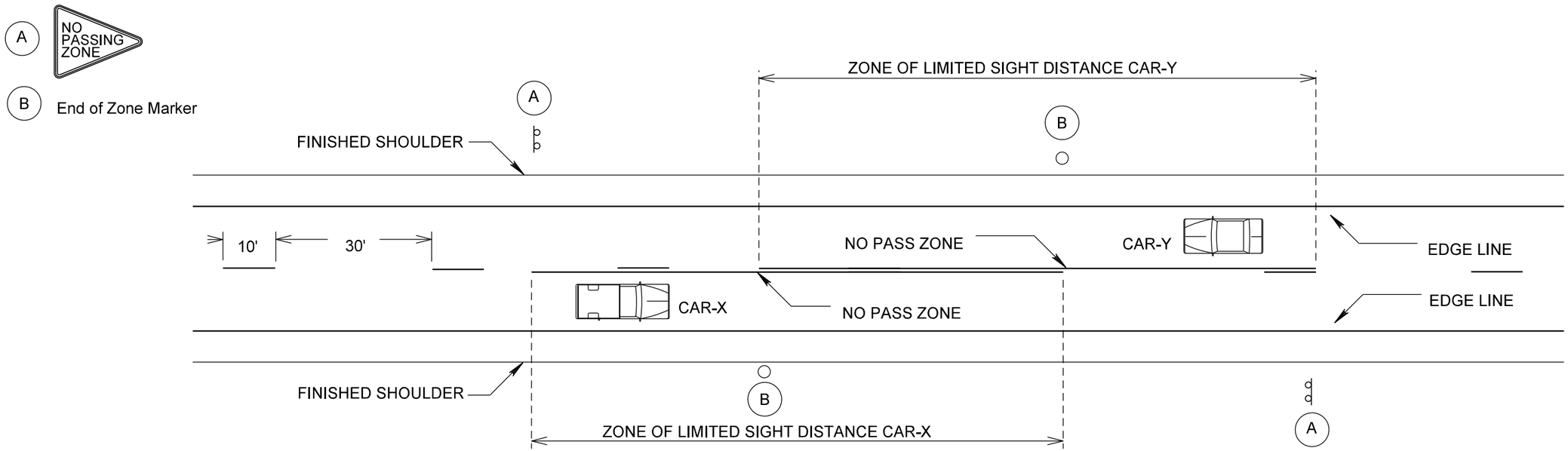
ITEMIZED LIST FOR TRAFFIC CONTROL SIGNS

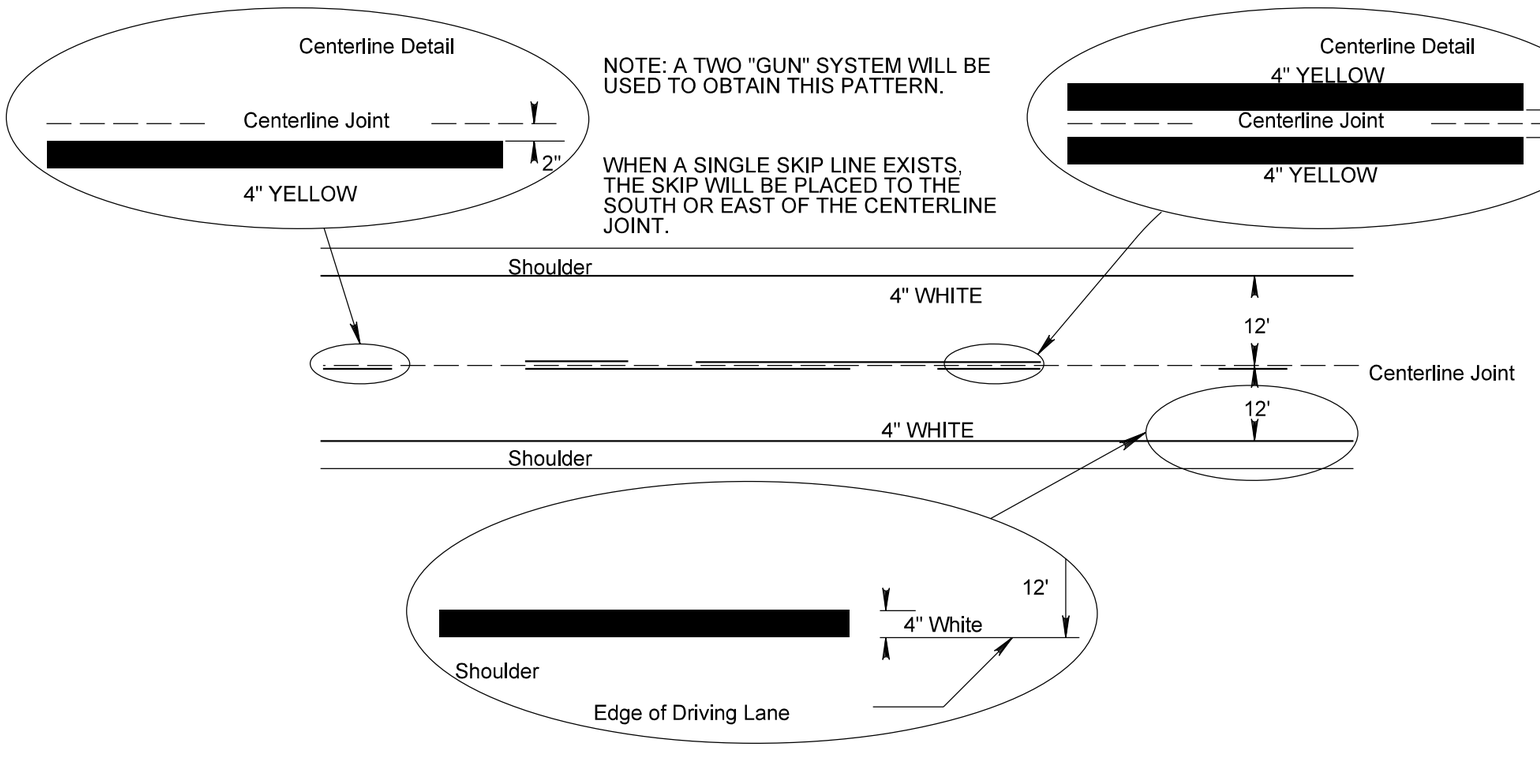
SIGN CODE	SIGN DESCRIPTION	*CONVENTIONAL ROAD NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
R1-1	STOP	2	30"	5.2	10.4
W3-1	STOP AHEAD (symbol)	2	48" x 48"	16.0	32.0
W8-11	UNEVEN LANES	8	48" x 48"	16.0	128.0
W8-15	GROOVED PAVEMENT	8	48" x 48"	16.0	128.0
W8-15P	MOTORCYCLE (plaque)	8	24" x 18"	3.0	24.0
W13-1P	ADVISORY SPEED (plaque)	2	30" x 30"	6.3	12.6
W20-1	ROAD WORK AHEAD	12	48" x 48"	16.0	192.0
W20-4	ONE LANE ROAD AHEAD	6	48" x 48"	16.0	96.0
W20-7	FLAGGER (symbol)	4	48" x 48"	16.0	64.0
W21-5	SHOULDER WORK	4	48" x 48"	16.0	64.0
G20-1	ROAD WORK NEXT 28 MILES	2	36" x 18"	4.5	9.0
G20-1	ROAD WORK NEXT 24 MILES	1	36" x 18"	4.5	4.5
G20-1	ROAD WORK NEXT 22 MILES	2	36" x 18"	4.5	9.0
G20-1	ROAD WORK NEXT 17 MILES	1	36" x 18"	4.5	4.5
G20-1	ROAD WORK NEXT 11 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 5 MILES	1	36" x 18"	4.5	4.5
G20-1	ROAD WORK NEXT 3 MILES	1	36" x 18"	4.5	4.5
G20-2	END ROAD WORK	2	36" x 18"	4.5	9.0
SPECIAL	WAIT FOLLOW PILOT CAR	4	30" x 18"	3.8	15.2
		CONVENTIONAL ROAD TRAFFIC CONTROL SIGNS SQFT			**820.2**

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	P 0020(197)267	40	61

Plotting Date: 02-22-22

TYPICAL PAVEMENT MARKING LAYOUT





FURNISHING AND APPLYING HIGH BUILD WATERBORNE PAVEMENT MARKING PAINT

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

   Undivided Roadway

   Dashed 4" Line
   6.2 Gallons/Pass-Mile

   Solid 4" Line
   22.5 Gallons/Pass-Mile

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

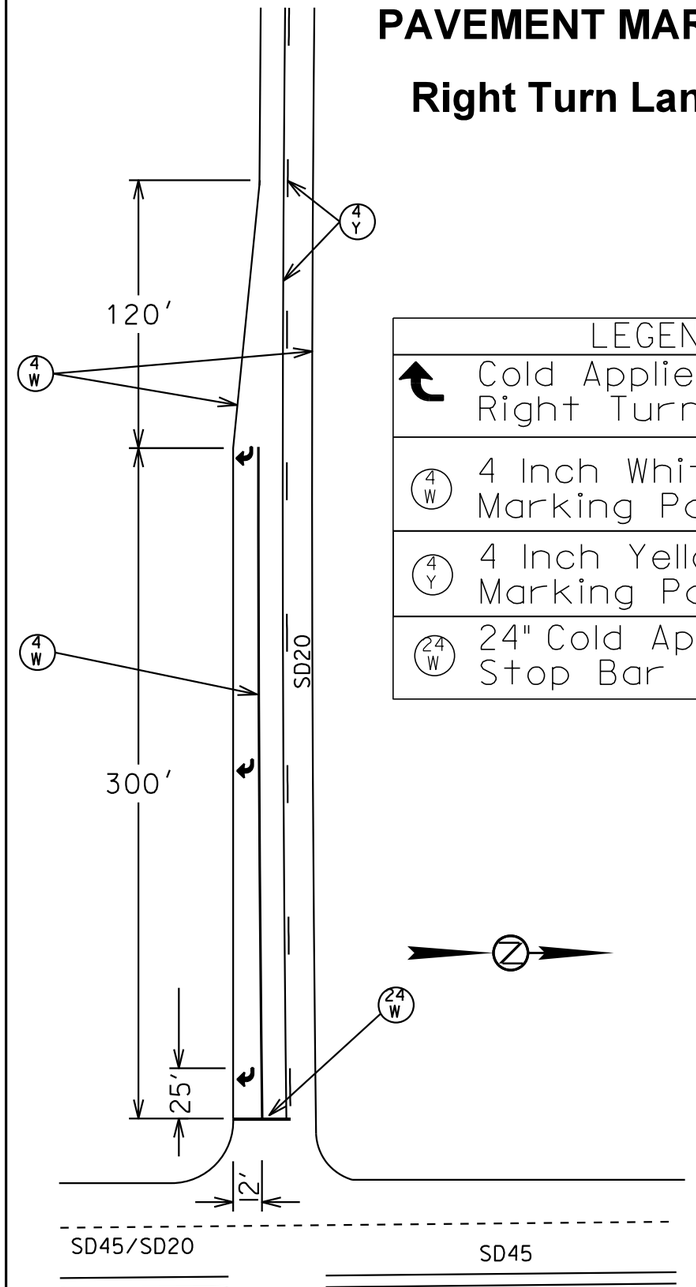
3. Exact location of the NO PASSING ZONE lines will be determined in the field by the Engineer. A dash of white paint will mark the beginning and end of all no passing zones. NO PASSING ZONE signs and the ending post in fence lines, if present, will not be used as the beginning and ending NO PASSING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

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

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	P 0020(197)267	41	61
Plotting Date: 08/22/2022			

PAVEMENT MARKING LAYOUT

Right Turn Lane - SD45 JCT



LEGEND	
	Cold Applied Plastic Right Turn Arrow
4 W	4 Inch White Pavement Marking Paint
4 Y	4 Inch Yellow Pavement Marking Paint
24 W	24" Cold Applied Plastic Stop Bar

PLOT SCALE - 1:40

PLOTTED FROM - TRABIL017

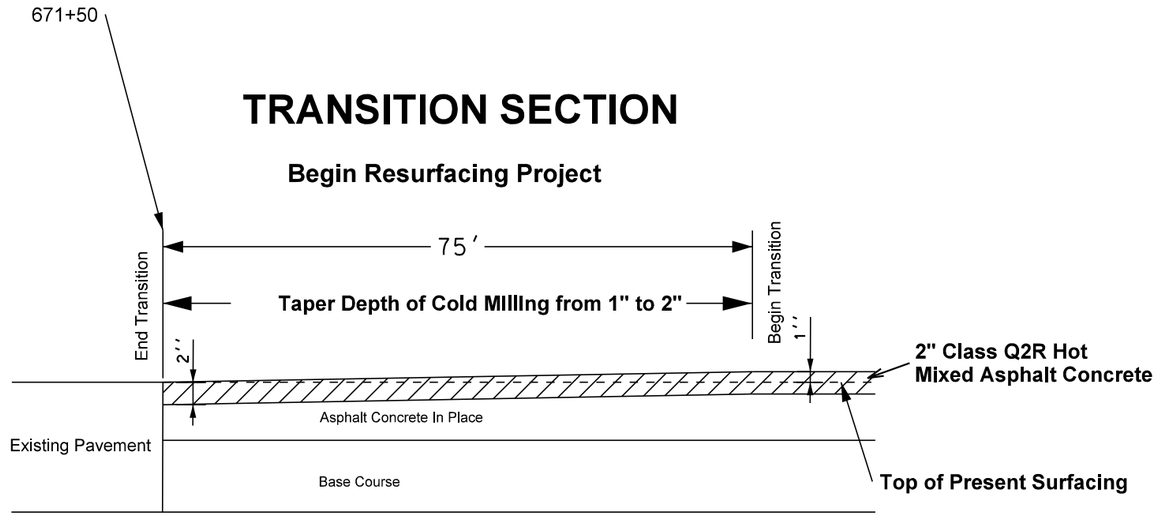
PLOT NAME - 1

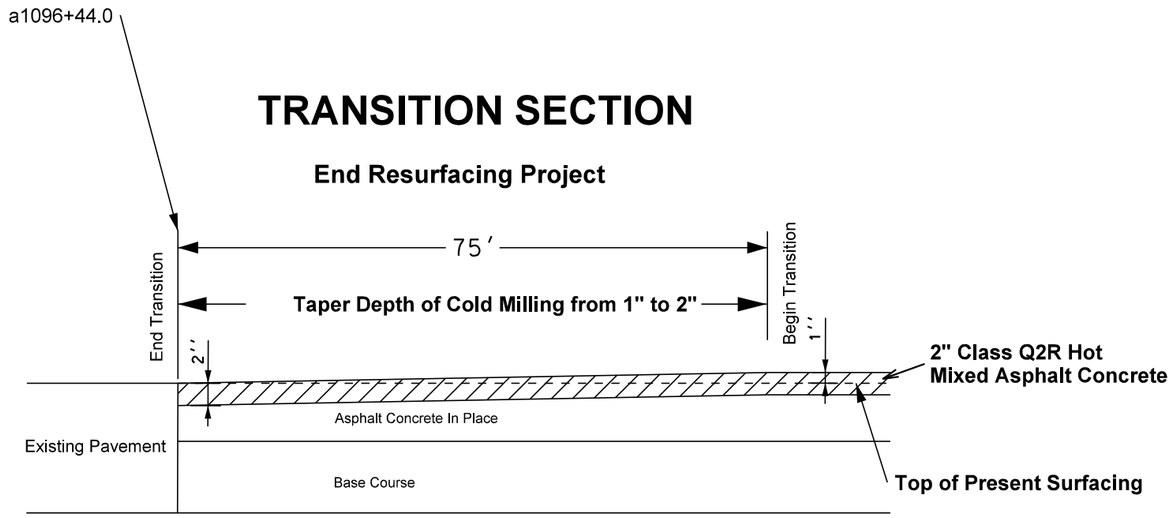
FILE - ...\AREA\060D_RIGHT_TURN_LANE.DGN

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	P 0020(197)267	42	61

Plotting Date: 09/14/2022

TRANSITION DETAILS FOR PROJECT LIMITS





Note: Width of Cold Milling Asphalt Concrete at beginning and end of the project will match adjacent surfacing width.

Cost for tapering the width and depth of cold milling will be incidental to the contract unit price per square yard for Cold Milling Asphalt Concrete, unless otherwise indicated.

LEGEND

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	P 0020(197)267	43	61
Plotting Date: 01/08/2021			

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

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

- Drainage Arrow

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

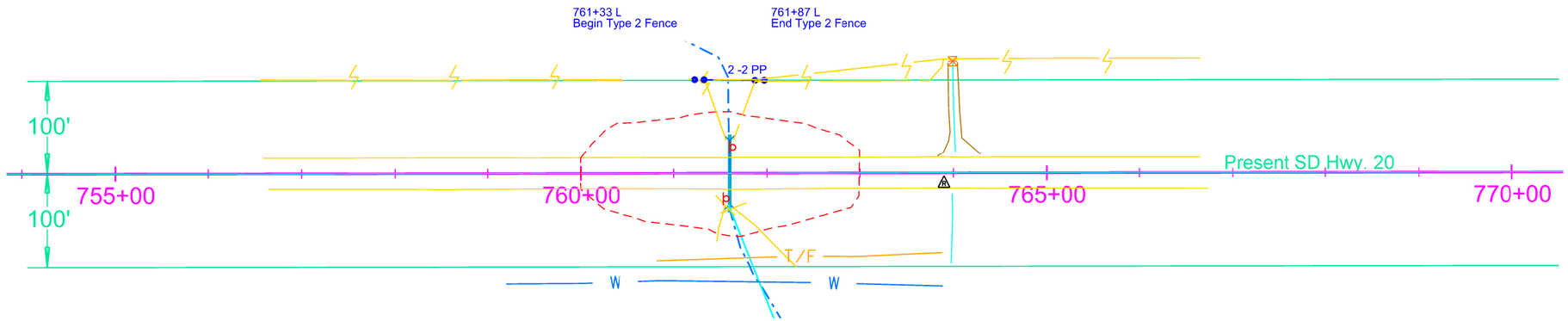
- Detectable Warning
- Pedestrian Push Button Pole and 30" x 48" Clear Space with 1.5% slope

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	P 0020(197)267	44	61
Plotting Date: 11/02/2022			

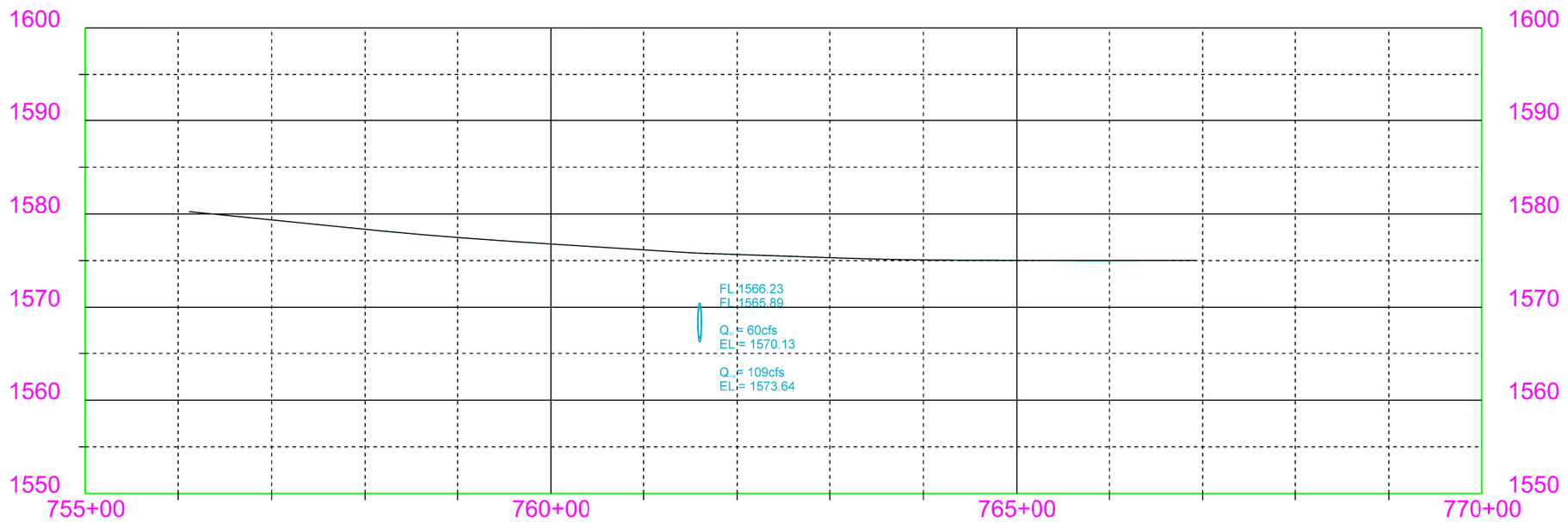
761+60
Remove 4'x6' Cattle Pass
& 2 Flared Ends
(Incidental Work, Grading)

761+60 (670 ac.)
Install 78' - 42" RCP
& 2 Flared Ends

Sec. 21 - T120N - R69W



Sec. 28 - T120N - R69W



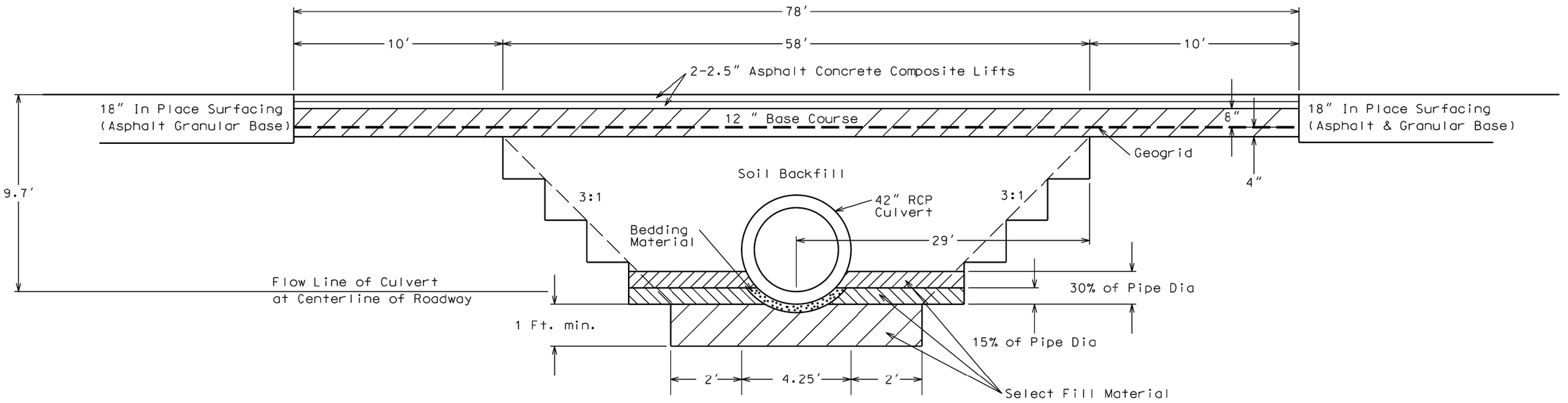
PLOT SCALE - 1:1140
PLOT NAME - 1
FILE - ...\PRJ\FALK060D\DRAINAGE\755.DGN
PLOTTED FROM - TRAB10200

PLOT SCALE - 1:1.3

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	P 0020(197)267	45	61
Plotting Date: 08/03/2022			

CULVERT REPLACEMENT DETAIL

STA. 761+60



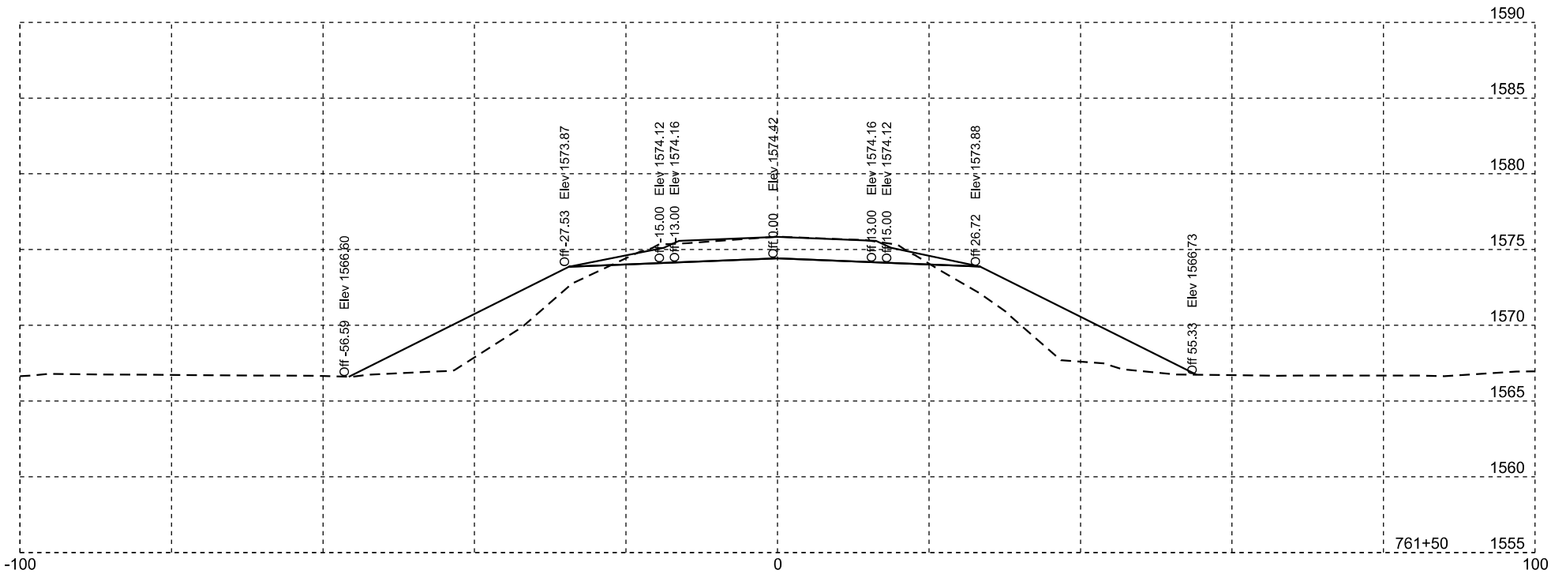
* This detail does not show the ultimate resurfacing section which will include Cold Milling Asphalt Concrete and the 2" Class Q2R Asphalt Concrete overlay that will be completed after the culvert replacement has been completed.

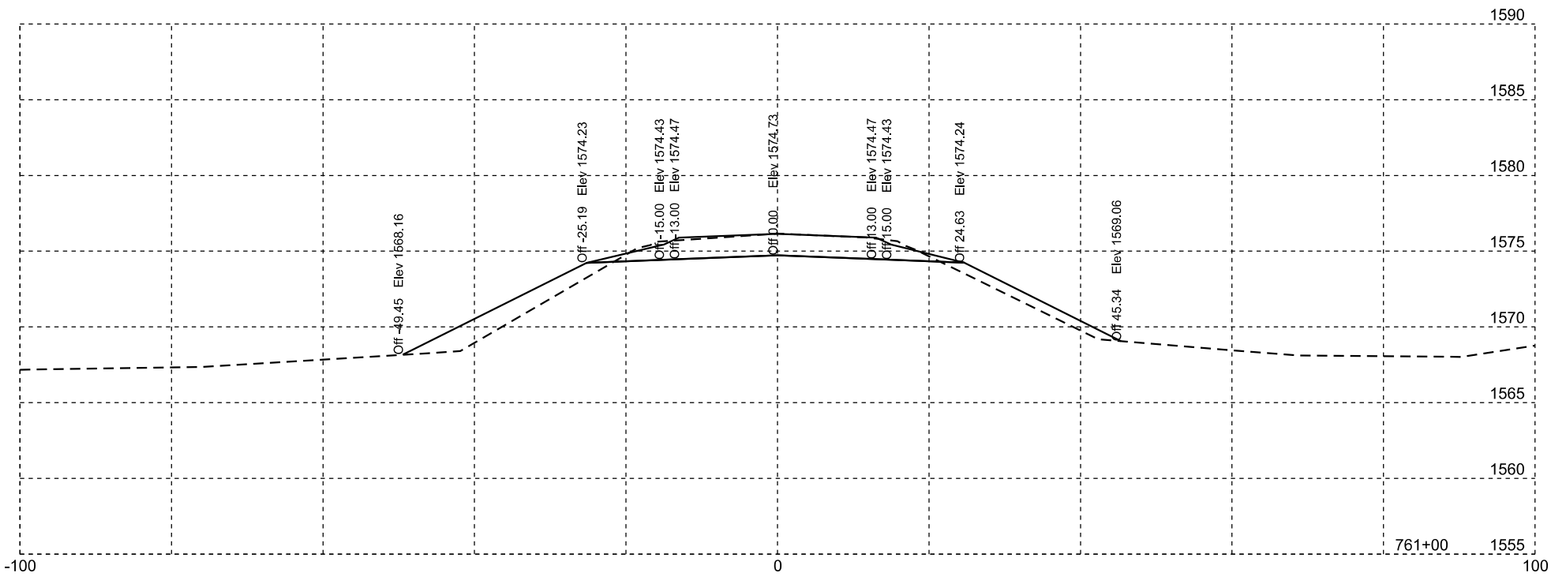
DRAWINGS
NOT TO SCALE

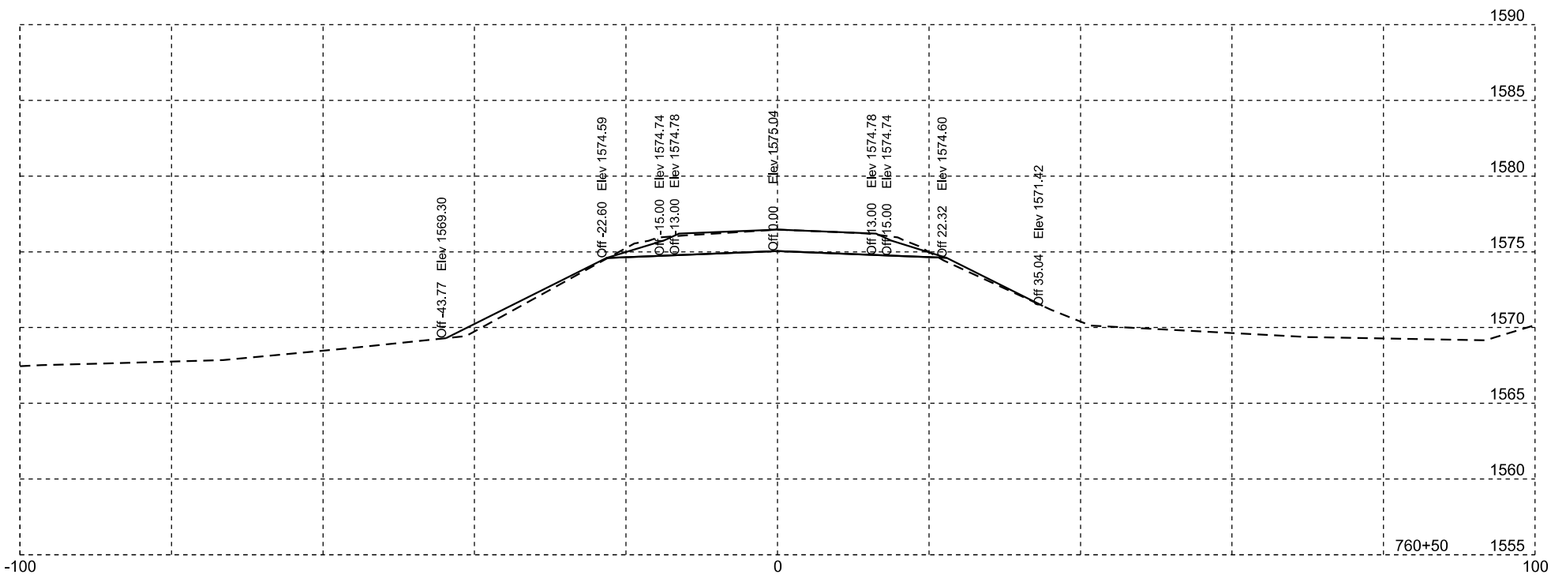
PLOTTED FROM - TRAB10200

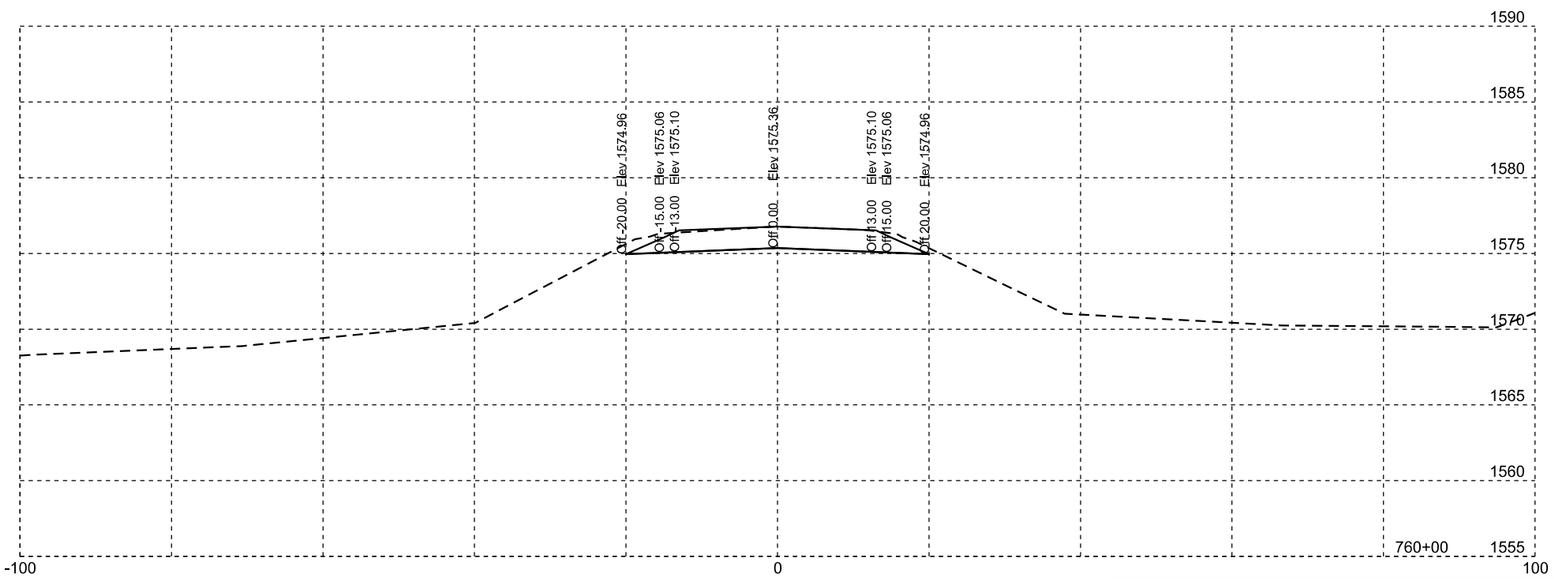
PLOT NAME - 1

FILE -...\CULVERT REPLACEMENT (MAINLINE).DGN



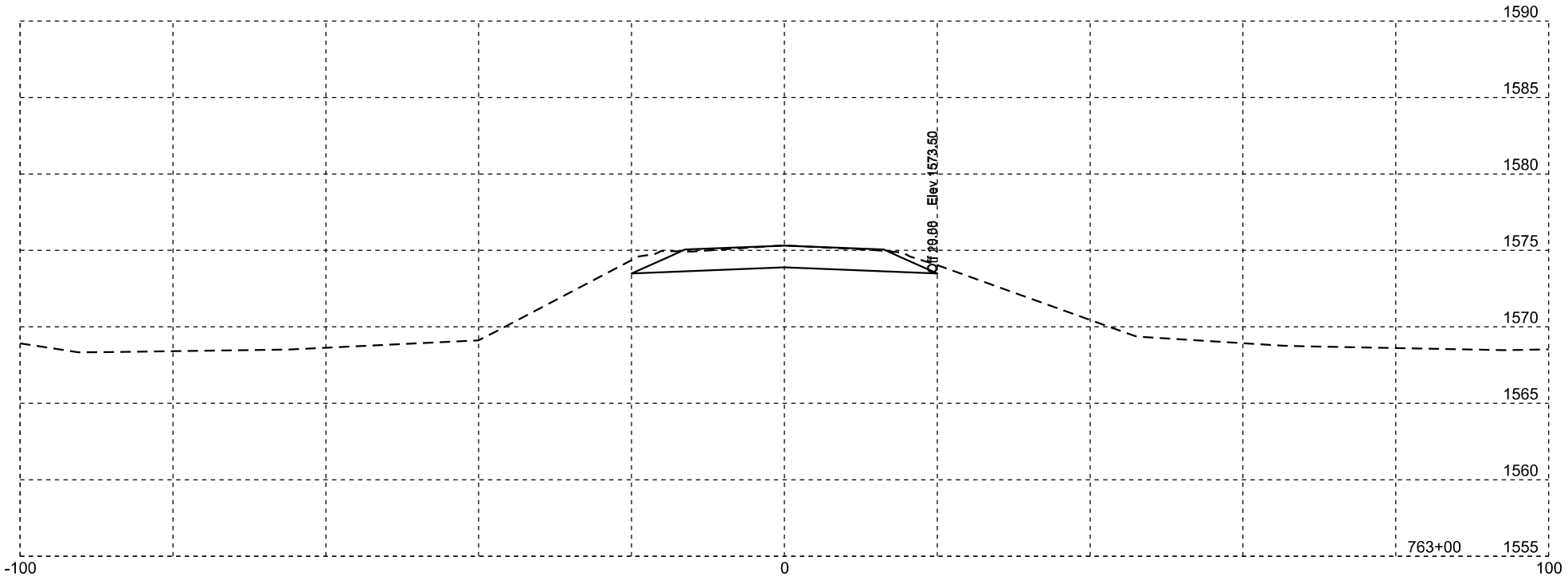


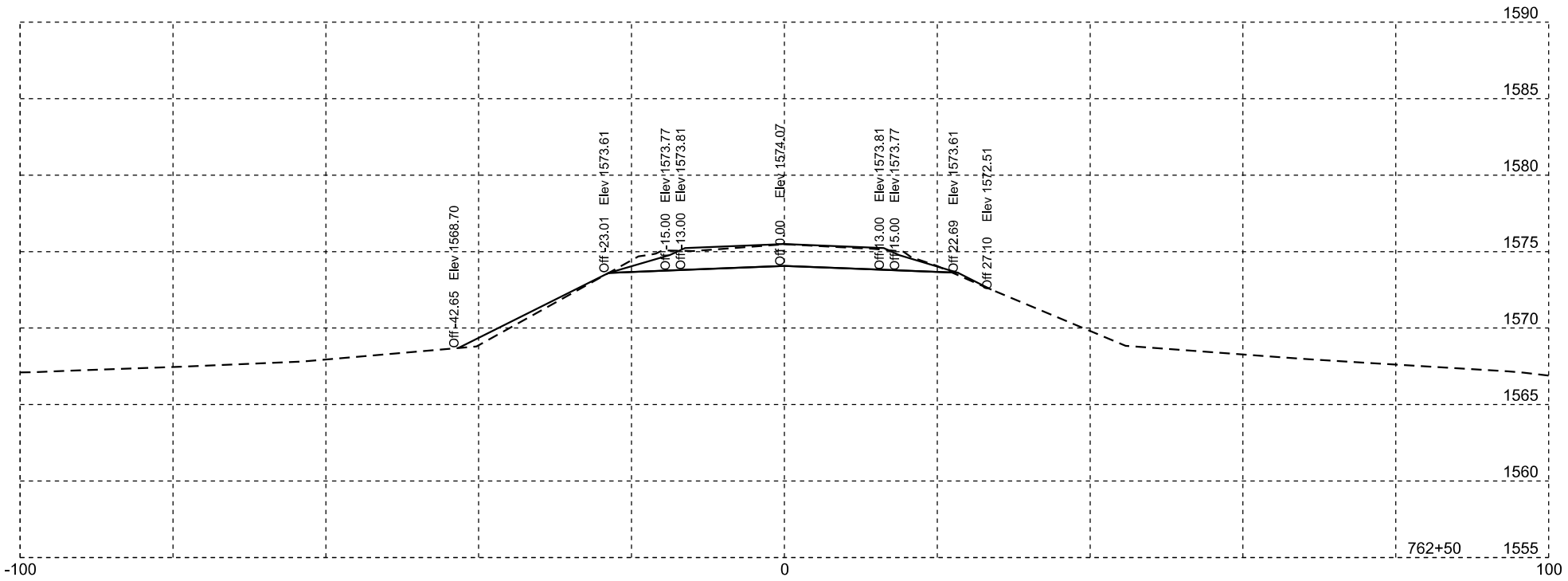


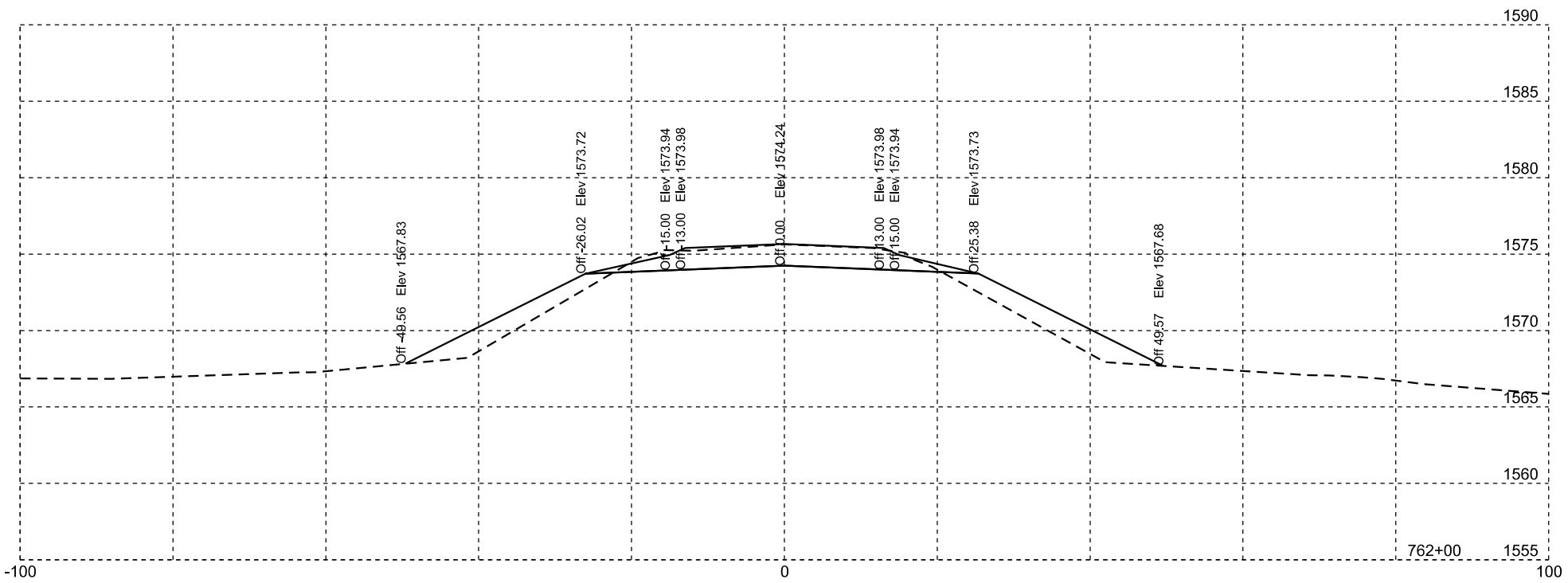


Plotting Date: 11/02/2022

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	P 0020(197)267	46	61

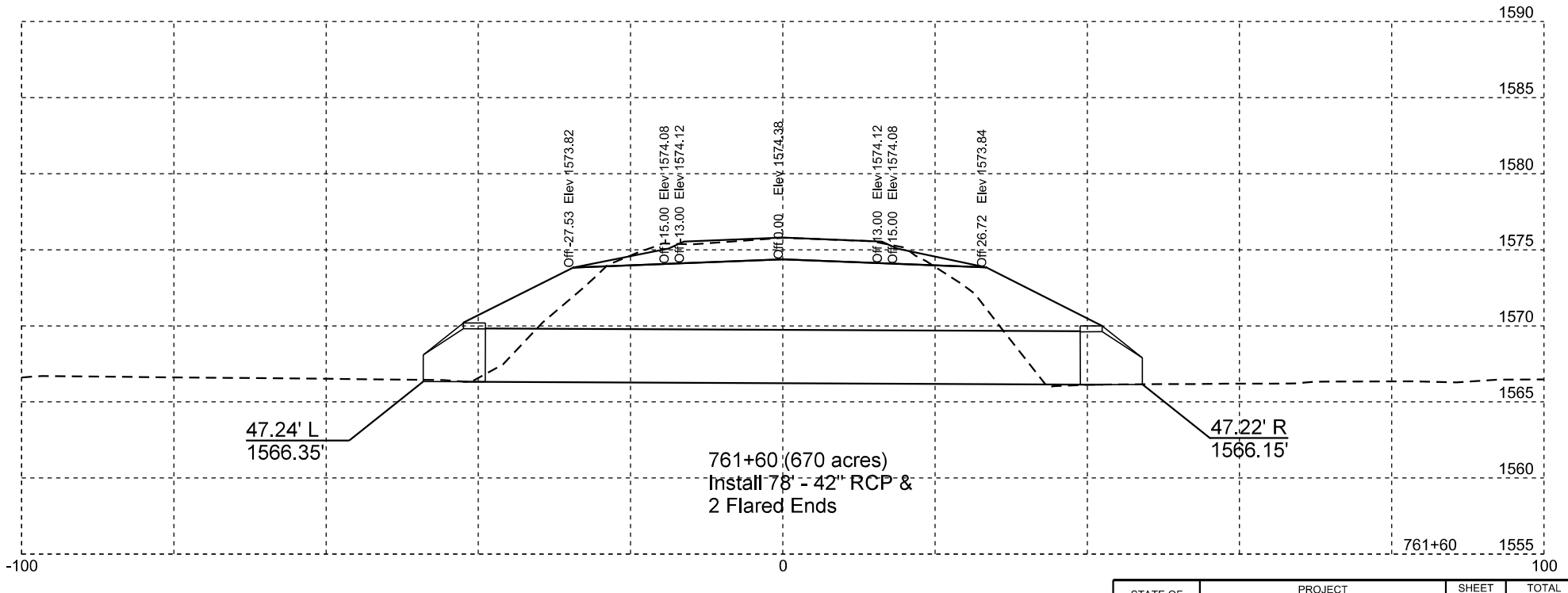






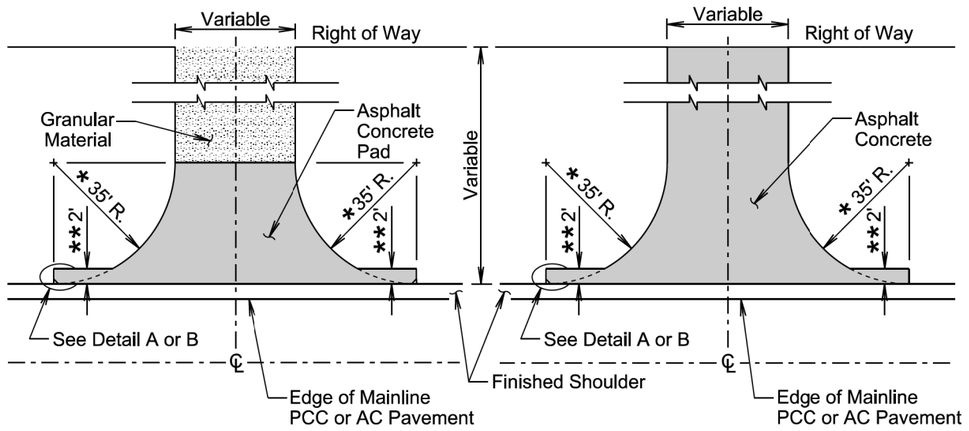
Plotting Date: 11/02/2022

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	P 0020(197)267	47	61



Plotting Date: 11/02/2022

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	P 0020(197)267	48	61



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:

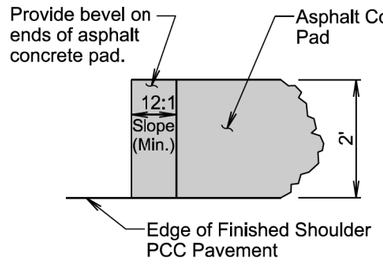
The precise construction limits for situations other than shown above will be determined by the Engineer during construction.

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

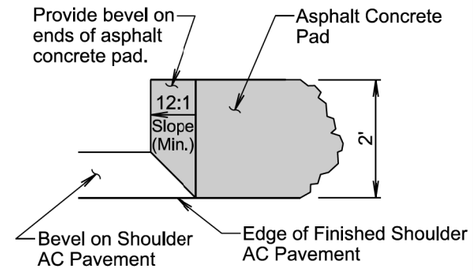
** The Contractor may adjust the screed of the paver during mainline paving operations to provide the 2-foot asphalt concrete pad or the Contractor may provide the 2-foot asphalt concrete pad during paving of the intersecting roads as shown above. The Engineer may eliminate the 2-foot asphalt concrete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

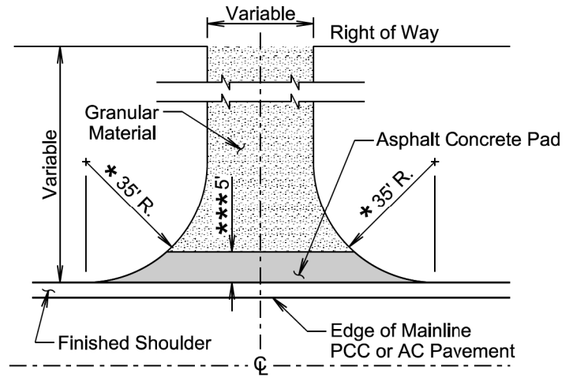
Published Date: 4th Qtr. 2022	SDDOT	SURFACING OR RESURFACING OF INTERSECTING ROADS AND ENTRANCES (MAINLINE AND SHOULDERS: PCC OR AC PAVEMENT)	PLATE NUMBER 320.04 Sheet 1 of 2



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



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

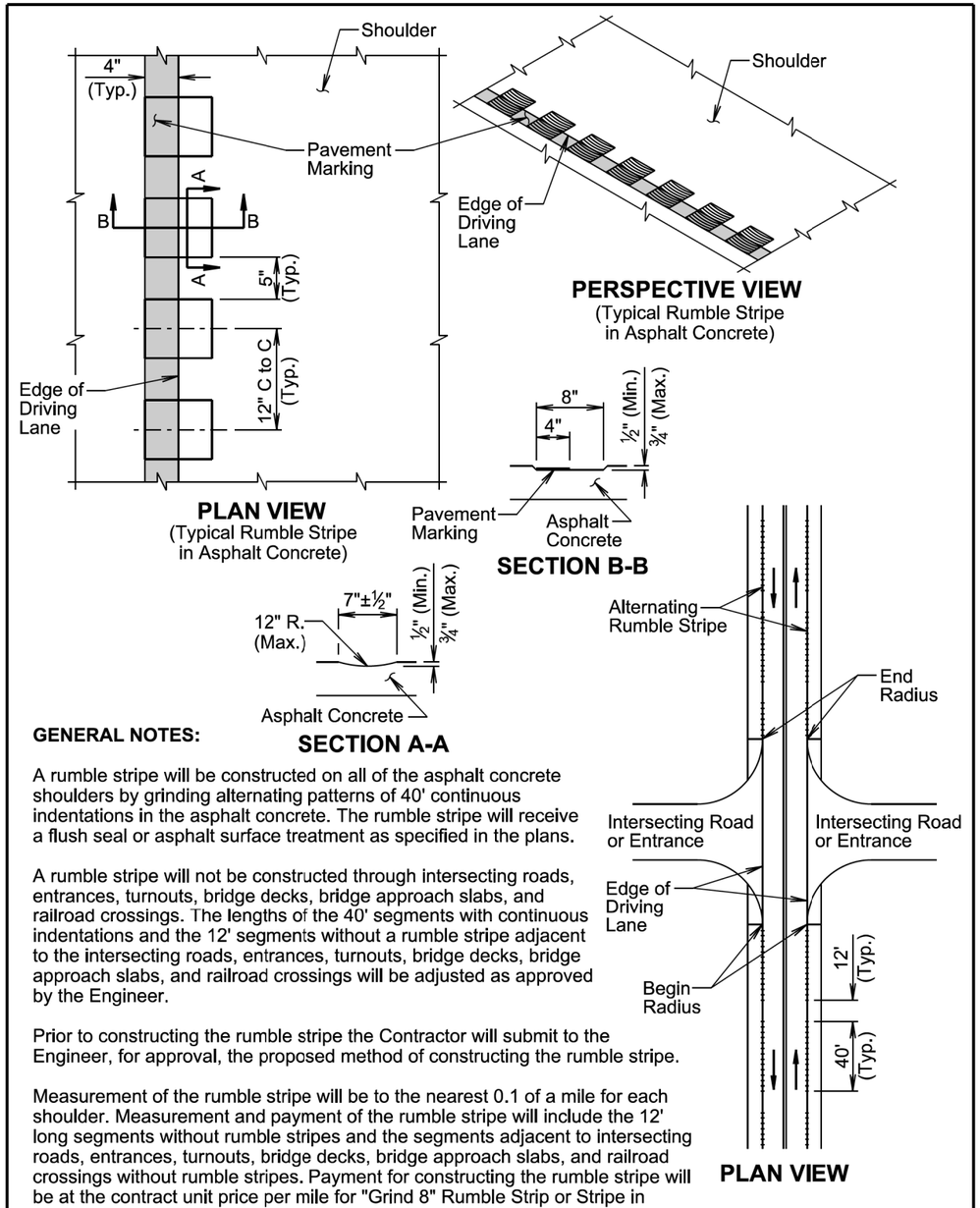


PLAN VIEW
(Entrance)

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

August 27, 2020

Published Date: 4th Qtr. 2022	SDDOT	SURFACING OR RESURFACING OF INTERSECTING ROADS AND ENTRANCES (MAINLINE AND SHOULDERS: PCC OR AC PAVEMENT)	PLATE NUMBER 320.04 Sheet 2 of 2



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.

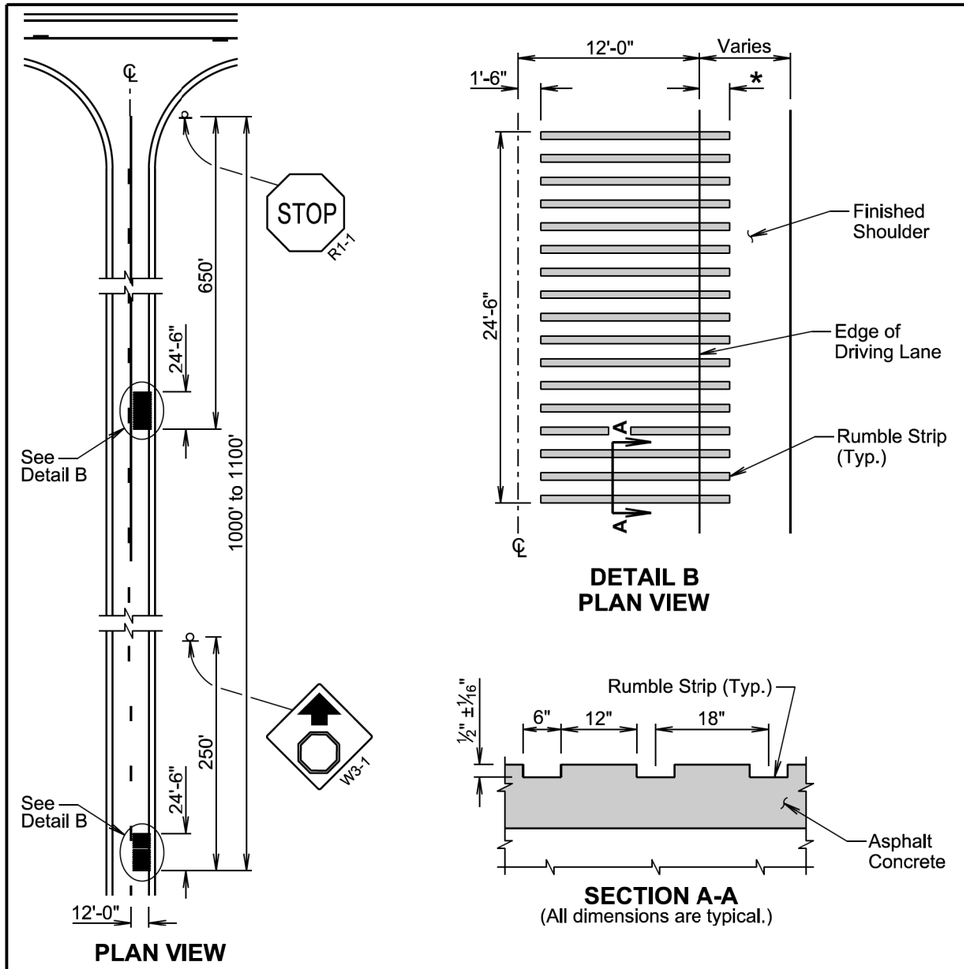
A rumble stripe will not be constructed through intersecting roads, entrances, turnouts, bridge decks, bridge approach slabs, and railroad crossings. The lengths of the 40' segments with continuous indentations and the 12' segments without a rumble stripe adjacent to the intersecting roads, entrances, 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: 4th Qtr. 2022	SDDOT	8" RUMBLE STRIPE IN ASPHALT CONCRETE ON NONDIVIDED HIGHWAY SHOULDERS	PLATE NUMBER 320.20
			Sheet 1 of 1



GENERAL NOTES:

Transverse rumble strips will be constructed by grinding, routing, or cutting recessed indentations into the asphalt concrete as approved by the Engineer. The transverse rumble strips will receive a flush seal or fog seal as specified in the plans.

* The transverse rumble strips will extend into the finished shoulder as approved by the Engineer.

Measurement of the recessed transverse rumble strips will be to the nearest foot. Payment for constructing the recessed transverse rumble strips will be at the contract unit price per foot for "Grind 6" Transverse Rumble Strip in Asphalt Concrete".

January 22, 2021

Published Date: 4th Qtr. 2022	SDDOT	TRANSVERSE RUMBLE STRIP IN ASPHALT CONCRETE HIGHWAY ADJACENT TO STOP CONTROLLED INTERSECTION	PLATE NUMBER 320.45
			Sheet 1 of 1

PLOT SCALE - 1:200

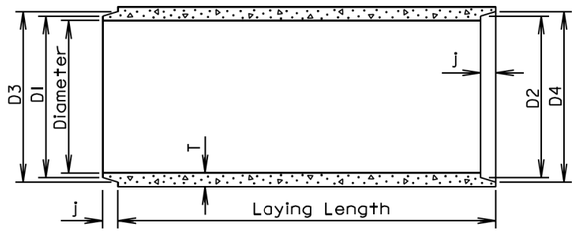
PLOT NAME - 3

FILE - ...\FILES\0600_STANDARD PLATES.DGN

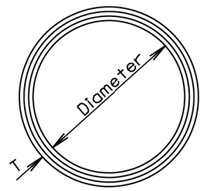
-PLOTTED FROM - TRAB11L017

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:

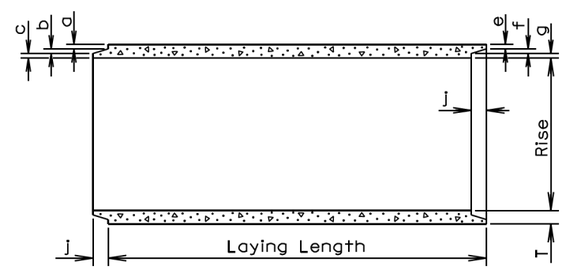
Construction of R. C. P. shall conform to the requirements of Section 990 of the Specifications.

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.

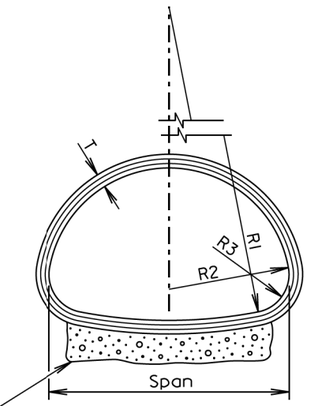
Diam. (in.)	Approx. Wt. /Ft. (lb.)	T (in.)	J (in.)	D1 (in.)	D2 (in.)	D3 (in.)	D4 (in.)
12	92	2	1 3/4	13 1/4	13 5/8	13 7/8	14 1/4
15	127	2 1/4	2	16 1/2	16 7/8	17 1/4	17 5/8
18	168	2 1/2	2 1/4	19 5/8	20	20 3/8	20 3/4
21	214	2 3/4	2 1/2	22 7/8	23 1/4	23 3/4	24 1/8
24	265	3	2 3/4	26	26 3/8	27	27 3/8
27	322	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: 4th Qtr. 2022	SDDOT	REINFORCED CONCRETE PIPE	PLATE NUMBER 450.01
			Sheet 1 of 1



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

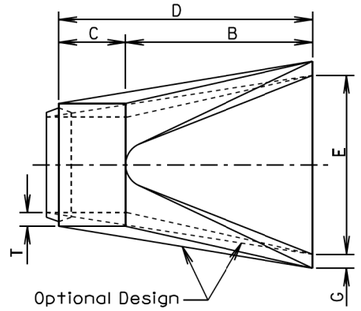
* Equivalent Diameter of Circular R. C. P.

GENERAL NOTES:

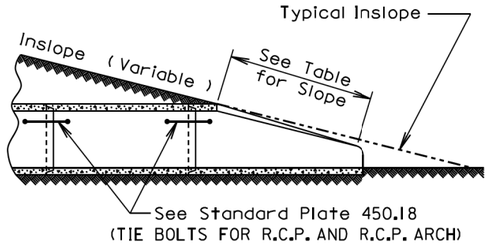
Construction of R.C.P. Arch shall conform to the requirements of Section 990 of the Specifications. Not more than 2 four-foot sections shall be permitted near the ends of any culvert. Four-foot lengths shall be used only to secure the required length of culvert.

June 26, 2015

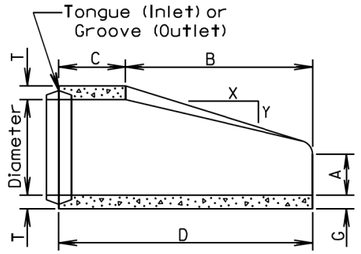
Published Date: 4th Qtr. 2022	SDDOT	REINFORCED CONCRETE PIPE ARCH	PLATE NUMBER 450.02
			Sheet 1 of 1



TOP VIEW



SLOPE DETAIL

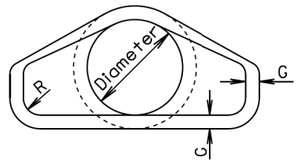


LONGITUDINAL SECTION

GENERAL NOTES:

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

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

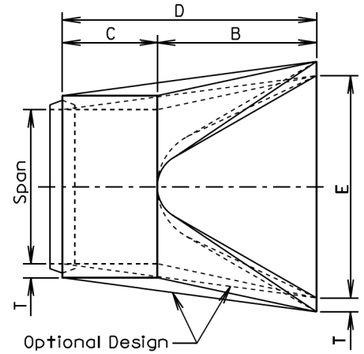


END VIEW

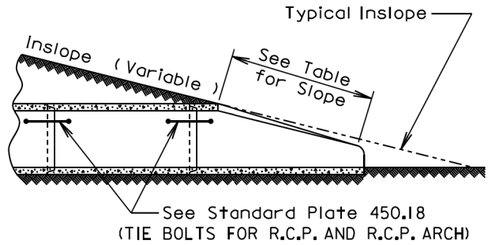
Dia. (in.)	Approx. Wt. of Section (lbs.)	Approx. Slope (X to Y)	T (in.)	A (in.)	B (in.)	C (in.)	D (in.)	E (in.)	G (in.)	R (in.)
12	530	2.4:1	2	4	24	48 7/8	72 7/8	24	2	1 1/2
15	740	2.4:1	2 1/4	6	27	46	73	30	2 1/4	1 1/2
18	990	2.3:1	2 1/2	9	27	46	73	36	2 1/2	1 1/2
21	1280	2.4:1	2 3/4	9	36	37 1/2	73 1/2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

June 26, 2015

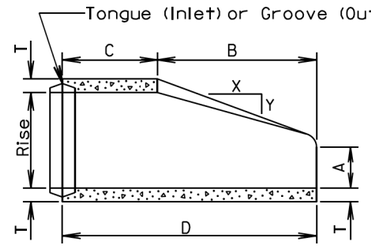
Published Date: 4th Qtr. 2022	SDDOT	R. C. P. FLARED ENDS	PLATE NUMBER 450.10
			Sheet 1 of 1



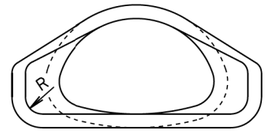
TOP VIEW



SLOPE DETAIL



LONGITUDINAL SECTION



END VIEW

GENERAL NOTES:

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

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

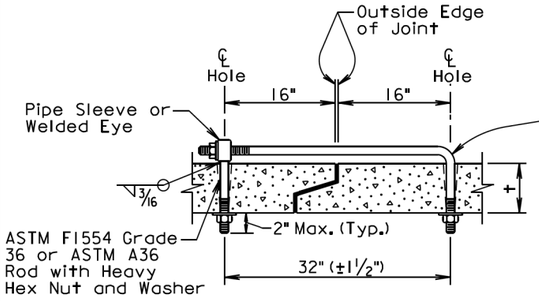
* Size (in.)	Approximate Weight of Section (lbs.)	Rise (in.)	Span (in.)	Slope (X:Y)	T (in.)	A (in.)	B (in.)	C (in.)	D (in.)	E (in.)	R (in.)
18	1100	13 1/2	22	3:1	2 1/2	7	27	45	72	36	2
24	1750	18	28 1/2	3:1	3 1/2	8 1/2	39	33	72	48	3
30	3300	22 1/2	36 1/4	3:1	4	9 1/2	50	46	96	60	3
36	4350	26 5/8	43 3/4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

*Equivalent Diameter of Circular R. C. P.

June 26, 2015

Published Date: 4th Qtr. 2022	SDDOT	R. C. P. ARCH FLARED ENDS	PLATE NUMBER 450.11
			Sheet 1 of 1

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



ADJUSTABLE EYE BOLT TIE

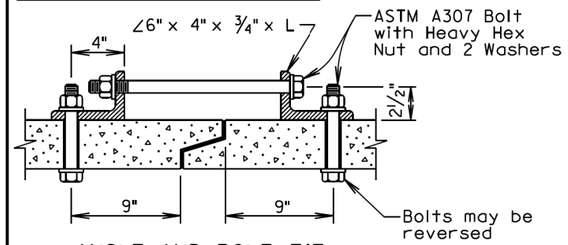
GENERAL NOTES:

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



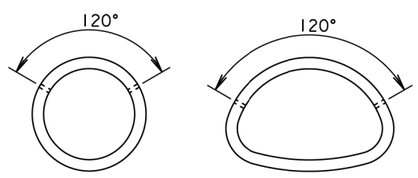
ANGLE AND BOLT TIE

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:

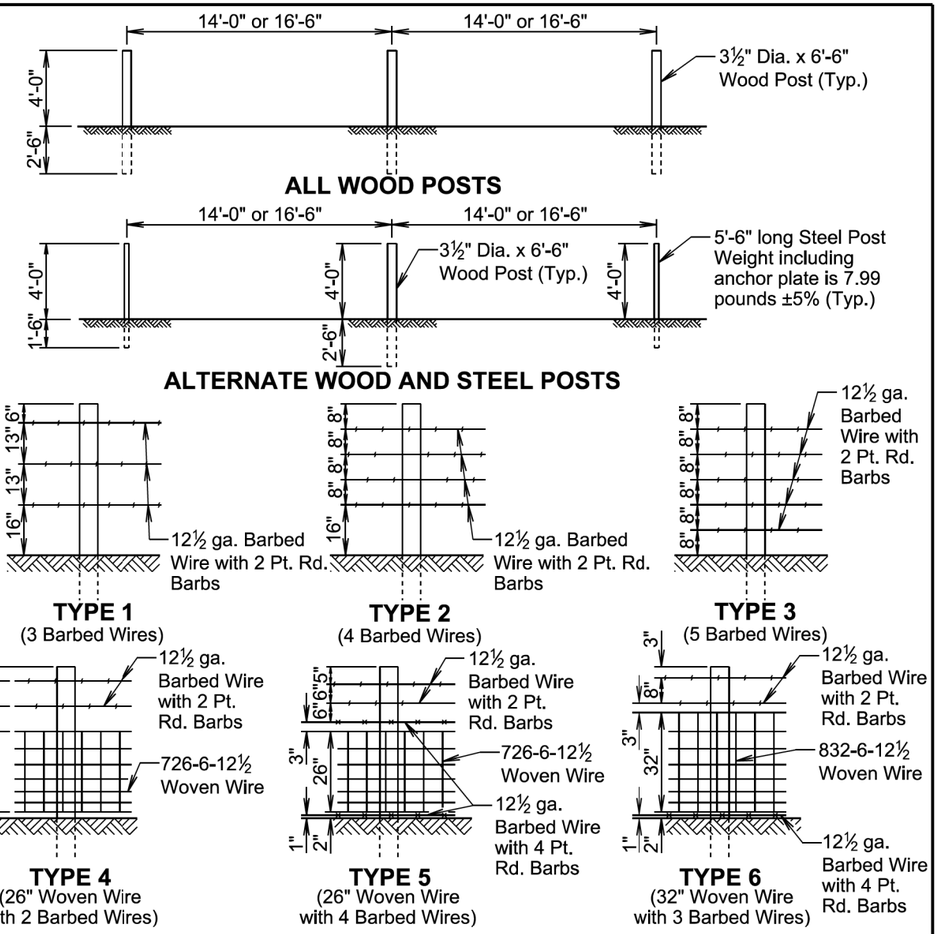
In lieu of the tie bolts detailed above other types of tie bolt connections may be installed as approved by the Office of Bridge Design.

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: 4th Qtr. 2022	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:

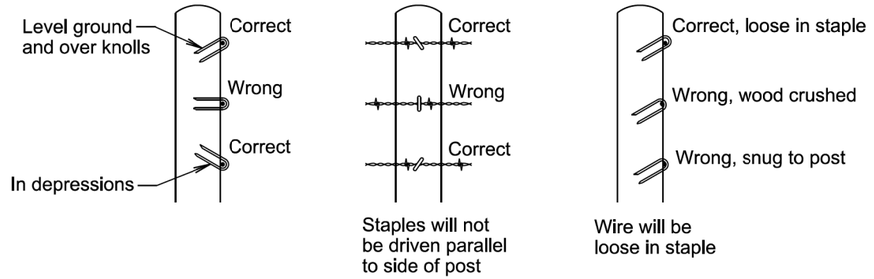
Fence types designated on the plans that are followed by the letter S will have smooth (barbless) wires.

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: 4th Qtr. 2022	SDDOT	RIGHT-OF-WAY FENCE	PLATE NUMBER 620.01
			Sheet 1 of 1



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.

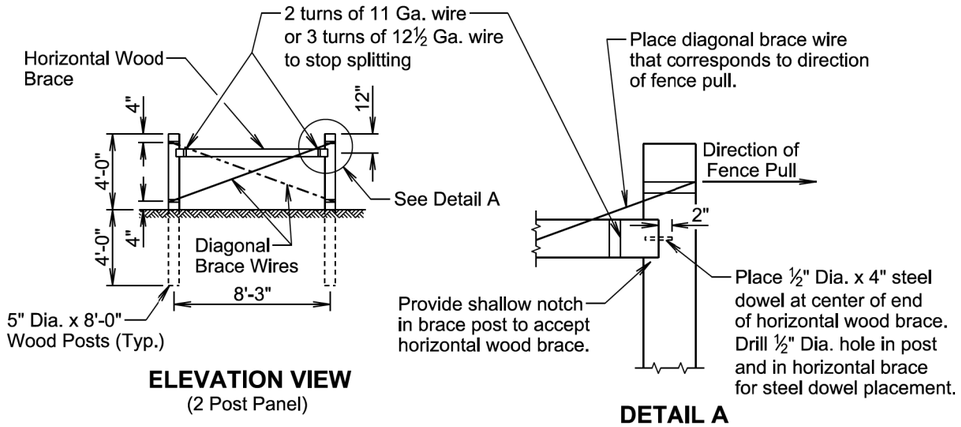
Right-of-Way fence other than on Interstate Projects will be constructed within one foot of the Right-of-Way on the Landowner's side except at bridge openings, cattle passes, and as otherwise directed by the Engineer.

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.

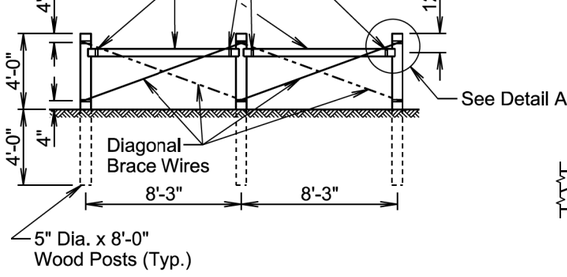
June 26, 2019

Published Date: 4th Qtr. 2022	SDDOT	STAPLE INSTALLATION AND GENERAL RIGHT-OF-WAY FENCE NOTES	PLATE NUMBER 620.02
			Sheet 1 of 1

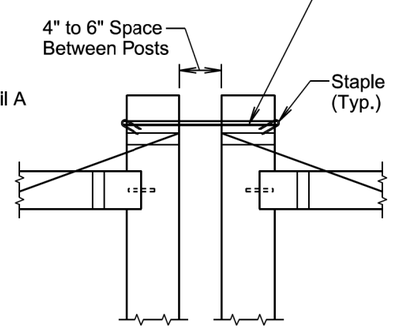


ELEVATION VIEW
(2 Post Panel)

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.

June 26, 2019

Published Date: 4th Qtr. 2022	SDDOT	BRACE PANELS AND APPLICATIONS OF BRACE PANELS	PLATE NUMBER 620.03
			Sheet 1 of 3

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

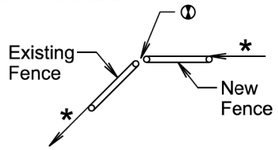
GENERAL NOTE:

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

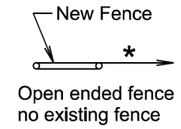
* If fence length is less than 600' to next corner use a 2 post panel.
If fence length is greater than 600' to next corner use a 3 post panel.

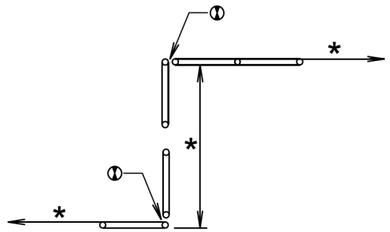
** Fence lengths greater than 1320' and less than 2640' place 2 Post Panel approximately at midpoint.

① See Detail B on Sheet 1 of 3.

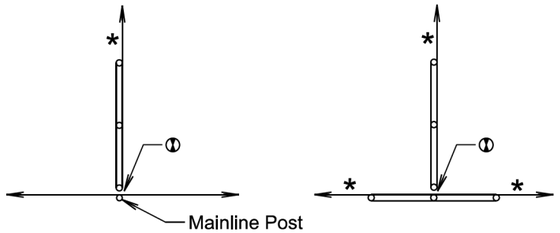


BEGIN OR END FENCE
(Where new fence ties into existing fence)

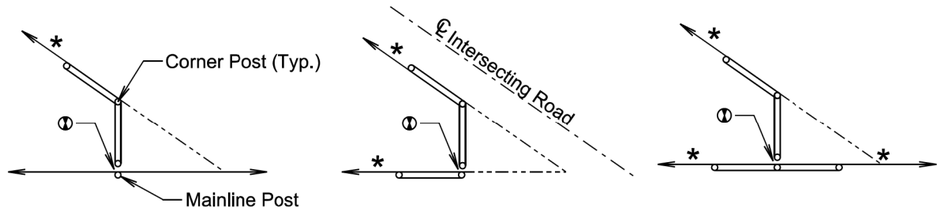




SHORT JOGS IN FENCE



CROSS FENCE



SHARP ANGLES IN CROSS FENCE

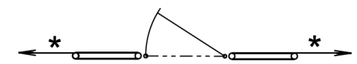
Additional fence panel is NOT required when an angle in the mainline fence is 10° and less.

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

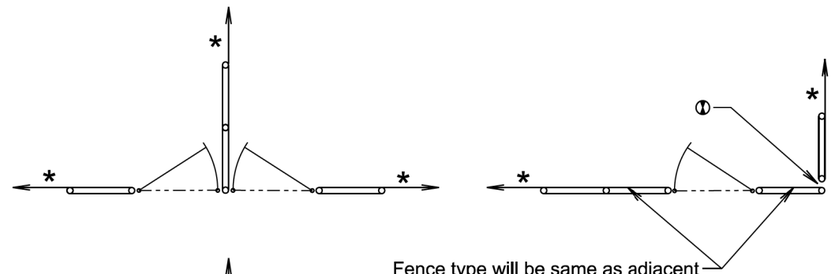
ANGLES IN MAINLINE FENCE

June 26, 2019

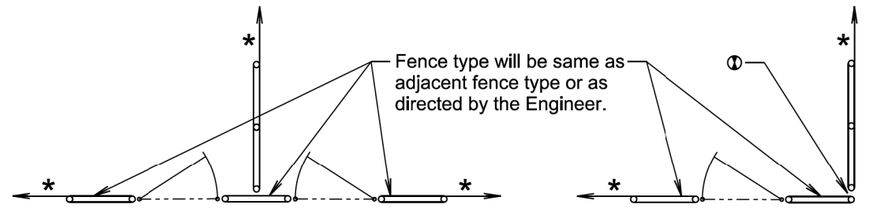
Published Date: 4th Qtr. 2022	SDDOT	BRACE PANELS AND APPLICATIONS OF BRACE PANELS	PLATE NUMBER 620.03 Sheet 2 of 3



ENTRANCE
(Not on corner)



Fence type will be same as adjacent fence type or as directed by the Engineer.



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.

June 26, 2019

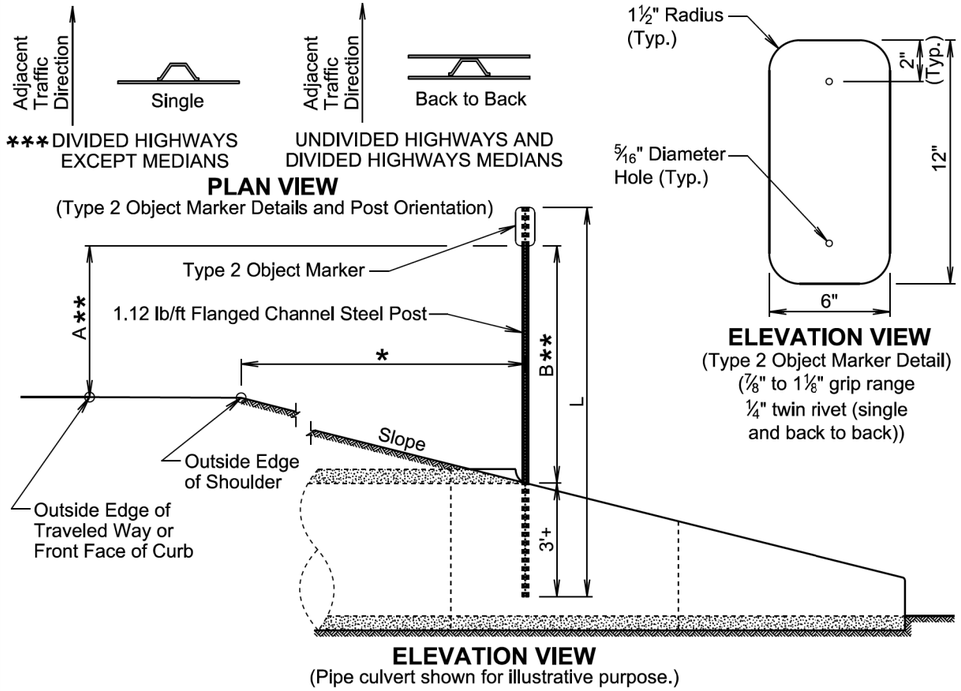
Published Date: 4th Qtr. 2022	SDDOT	BRACE PANELS AND APPLICATIONS OF BRACE PANELS	PLATE NUMBER 620.03 Sheet 3 of 3

PLOT SCALE - 1:200

PLOT NAME - 7

FILE ...\FILES\060D_STANDARD PLATES.DGN

PLOTTED FROM - TRABIL017



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.

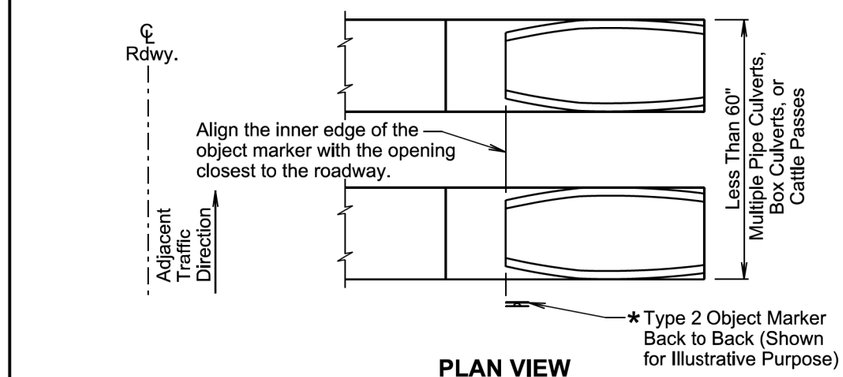
** Dimension A is 4 feet when the Offset * is 8 feet and less. Dimension B is 4 feet when Offset * is greater than 8 feet.

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.

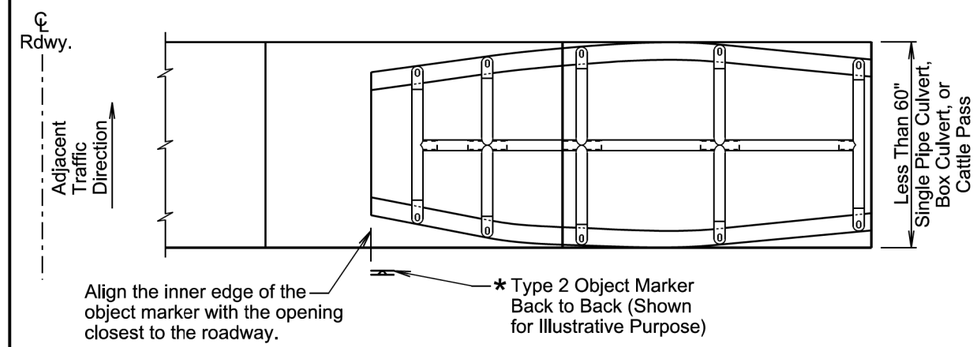
Payment for the type 2 object marker will be in conformance with Specification Section 632.5 B.

December 23, 2019

Published Date: 4th Qtr. 2022	SDDOT	TYPE 2 OBJECT MARKER (DIRECT DRIVE)	PLATE NUMBER 632.01 Sheet 1 of 1



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



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

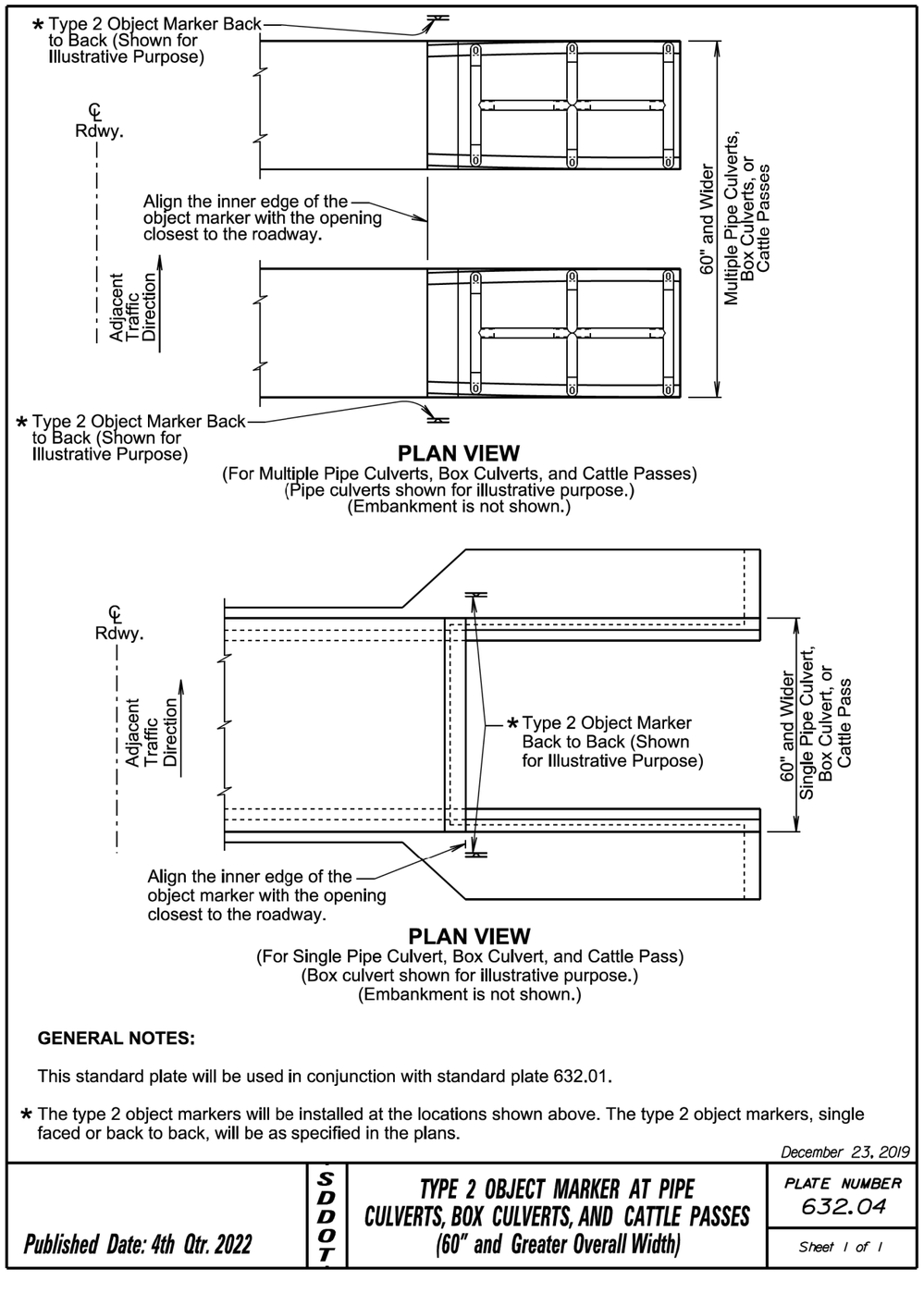
GENERAL NOTES:

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

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

December 23, 2019

Published Date: 4th Qtr. 2022	SDDOT	TYPE 2 OBJECT MARKER AT PIPE CULVERTS, BOX CULVERTS, AND CATTLE PASSES (Less than 60" Overall Width)	PLATE NUMBER 632.03 Sheet 1 of 1



PLAN VIEW
(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:

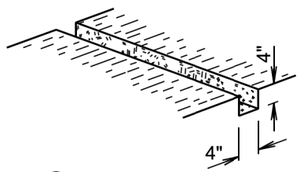
This standard plate will be used in conjunction with standard plate 632.01.

* 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.

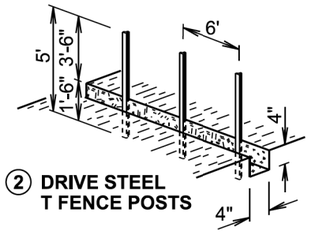
December 23, 2019

Published Date: 4th Qtr. 2022	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

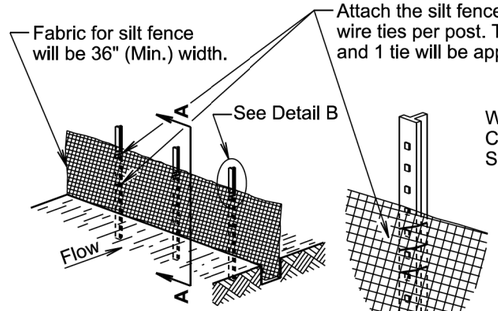
MANUAL HIGH FLOW SILT FENCE INSTALLATION



① EXCAVATE TRENCH

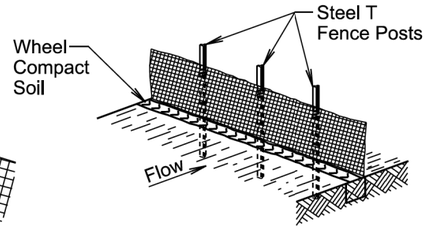


② DRIVE STEEL T FENCE POSTS

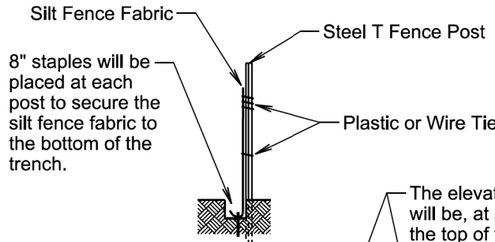


③ ATTACH SILT FENCE FABRIC

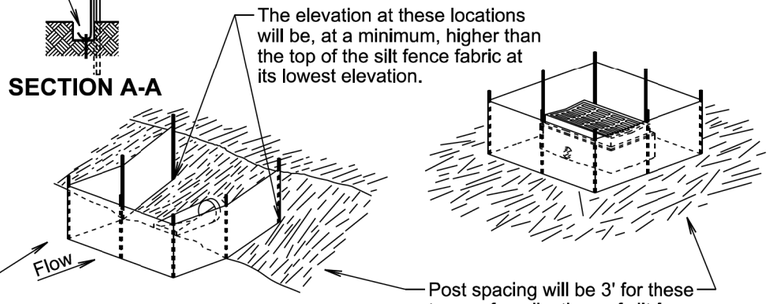
DETAIL B



④ BACKFILL TRENCH AND WHEEL COMPACT SOIL



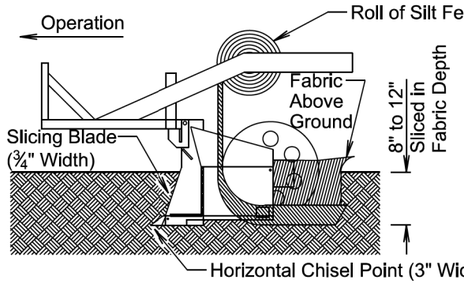
SECTION A-A



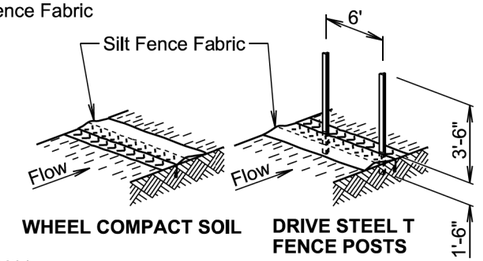
February 14, 2020

Published Date: 4th Qtr. 2022	SDDOT	HIGH FLOW SILT FENCE	PLATE NUMBER 734.05
			Sheet 1 of 2

MACHINE SLICED HIGH FLOW SILT FENCE INSTALLATION

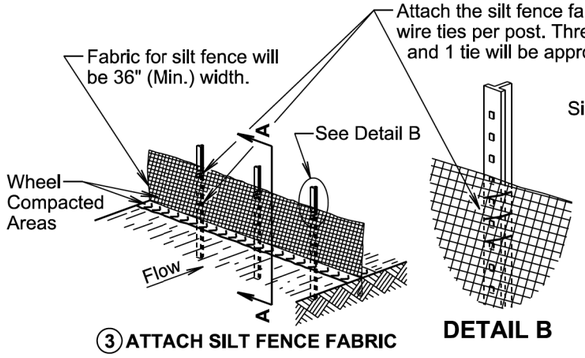


① INSTALL SILT FENCE FABRIC BY MACHINE SLICING METHOD.



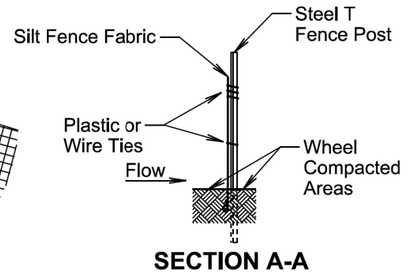
WHEEL COMPACT SOIL — DRIVE STEEL T FENCE POSTS

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

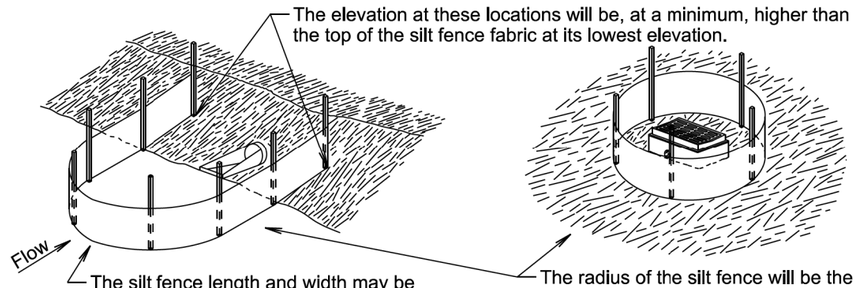


③ ATTACH SILT FENCE FABRIC

DETAIL B



SECTION A-A

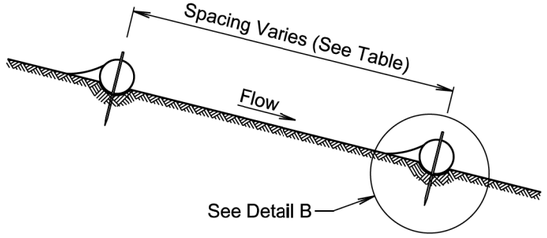


GENERAL NOTE:

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

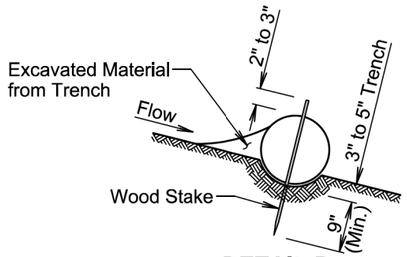
February 14, 2020

Published Date: 4th Qtr. 2022	SDDOT	HIGH FLOW SILT FENCE	PLATE NUMBER 734.05
			Sheet 2 of 2

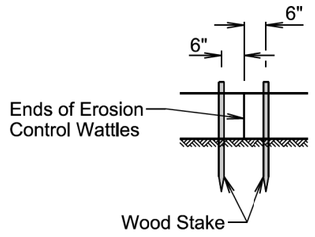


ELEVATION VIEW
(Cut or Fill Slope Installation)

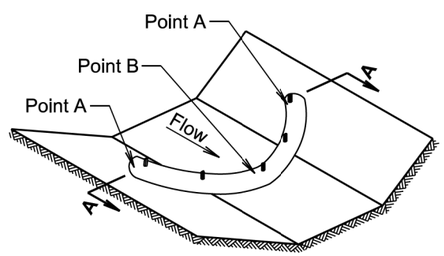
CUT OR FILL SLOPE INSTALLATION	
Slope	Spacing (Ft.)
1:1	10
2:1	20
3:1	30
4:1	40



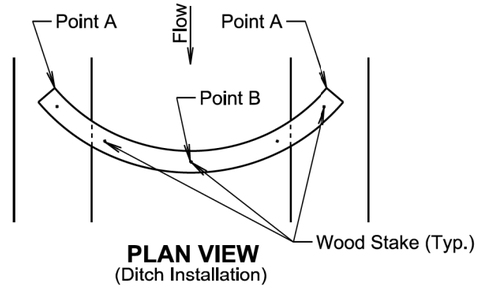
DETAIL B
(Typical of All Installations)



DETAIL C
(See General Notes)

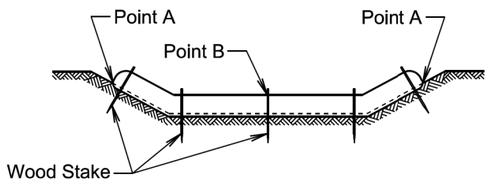


ISOMETRIC VIEW
(Ditch Installation)



PLAN VIEW
(Ditch Installation)

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



SECTION A-A

February 14, 2020

Published Date: 4th Qtr. 2022	SDDOT	EROSION CONTROL WATTLE	PLATE NUMBER 734.06
			Sheet 1 of 2

GENERAL NOTES:

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

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

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

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

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

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

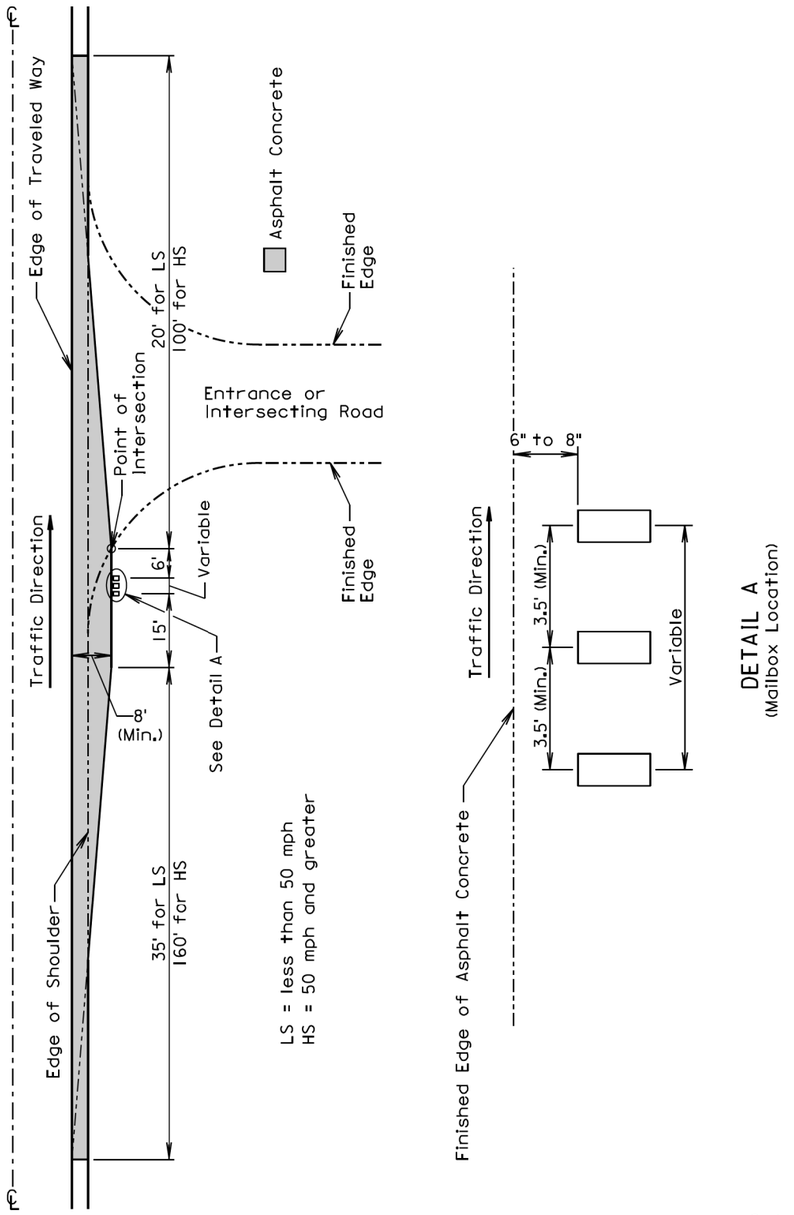
Sediment removal, disposal, or necessary shaping will be as directed by the Engineer. All costs for removing accumulated sediment, disposal of sediment, and necessary shaping will be incidental to the contract unit price per cubic yard for "Remove Sediment".

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

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

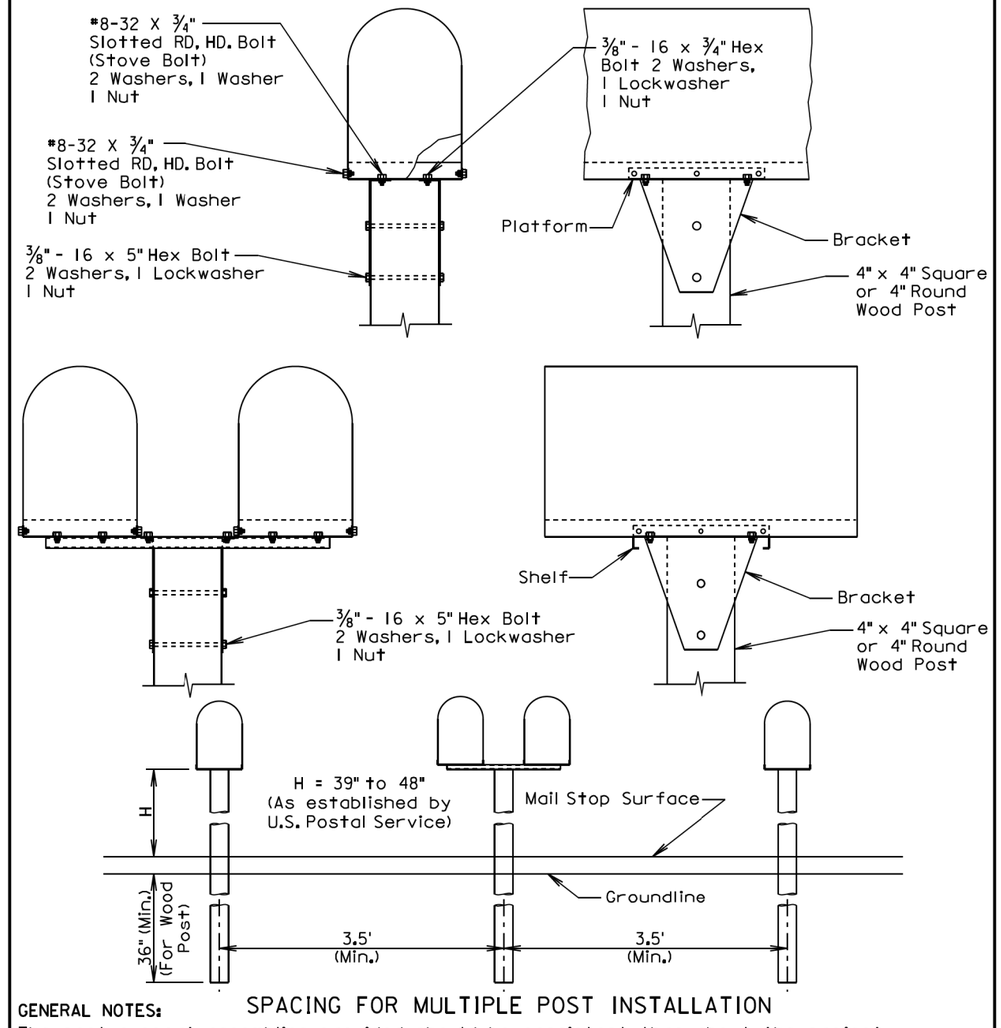
February 14, 2020

Published Date: 4th Qtr. 2022	SDDOT	EROSION CONTROL WATTLE	PLATE NUMBER 734.06
			Sheet 2 of 2



September 6, 2015

Published Date: 4th Qtr. 2022	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: 4th Qtr. 2022	SDDOT	SINGLE AND DOUBLE MAILBOX ASSEMBLIES	PLATE NUMBER 900.02
			Sheet 1 of 1

Published Date: 4th Qtr. 2022

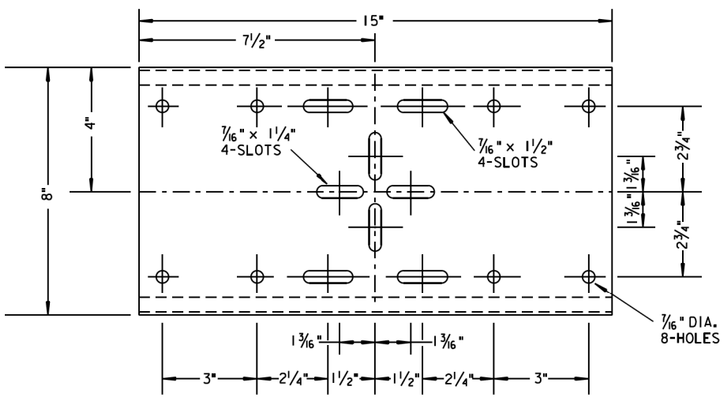
SDDOT

MAILBOX SUPPORT HARDWARE

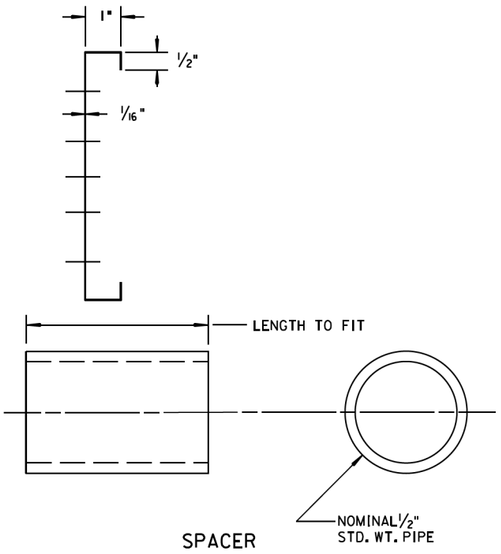
PLATE NUMBER 900.03

March 31, 2000

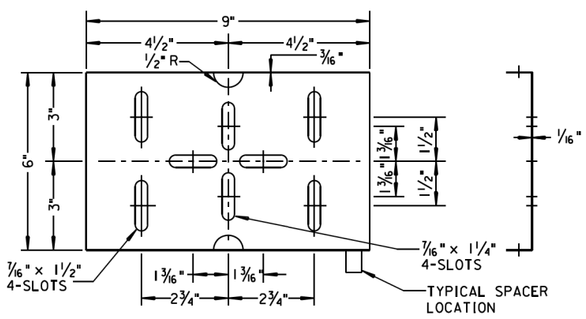
Sheet 1 of 1

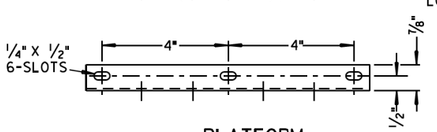


SHELF
(Double Assemblies)

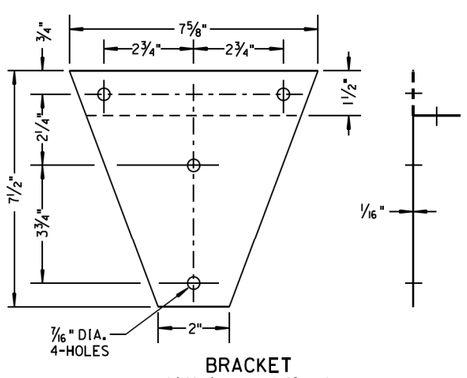


SPACER





PLATFORM
(All Assemblies)



BRACKET
(All Assemblies)

Plotting Date: 11/07/2022

STATE OF SOUTH DAKOTA	PROJECT
	P 0020(197)267
SHEET	61
TOTAL SHEETS	61