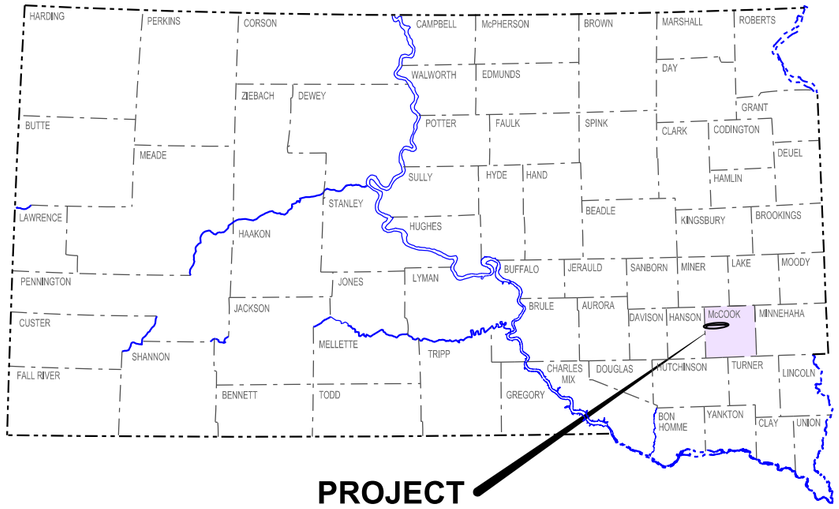
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0038(43)321	1	80

Plotting Date: 11/13/2014

STATE OF SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION
PLANS FOR PROPOSED

PROJECT P 0038(43)321
SD HIGHWAY 38
McCOOK COUNTY

COLD MILLING ASPHALT CONCRETE,
BLEND, HAUL & STOCKPILE,
ASPHALT CONCRETE RESURFACING,
RCBC REPLACEMENT, CULVERT REPLACEMENT,
FLATTENING SLOPES ON APPROACHES,
CULVERT WORK & GUARDRAIL



PCN 03T6

STR. NO. 44-095-090
Sta 1029+40.84 to Sta 1030+29.17
Cont. Reinforced Conc. Slab Bridge
88'-4"=0.017 Mile
MRM 330.81

EQUATION
Sta. 550+51.2 Back=
Sta. 575+58.8 Ahead

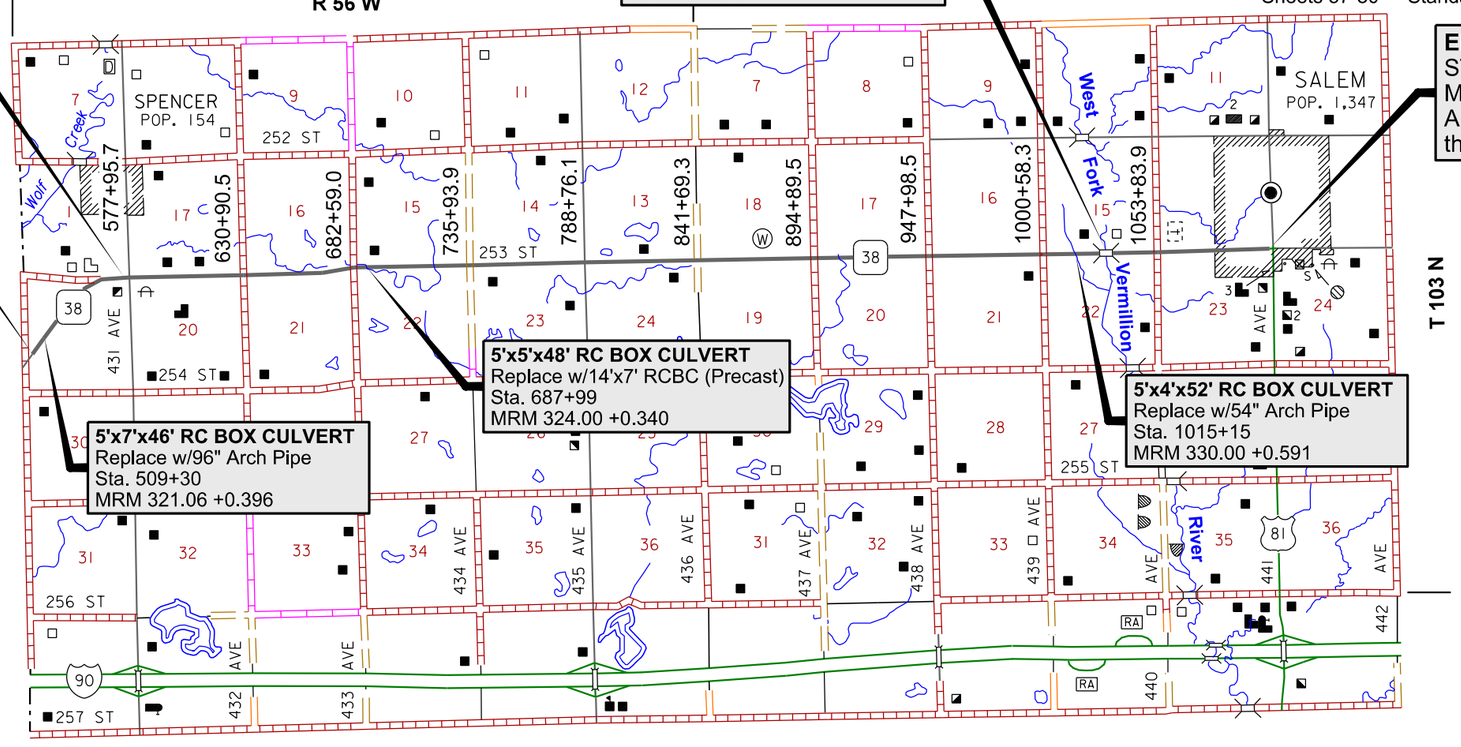
BEGIN PROJECT
STA. 496+50
MRM 321.00 +0.201
Approx. 769' NE
of the County Line

END PROJECT
STA. 1106+00.1
MRM 332.00 +0.252
Approx. 103' W of
the CL of US81

5'x5'x48' RC BOX CULVERT
Replace w/14'x7' RCBC (Precast)
Sta. 687+99
MRM 324.00 +0.340

5'x7'x46' RC BOX CULVERT
Replace w/96" Arch Pipe
Sta. 509+30
MRM 321.06 +0.396

5'x4'x52' RC BOX CULVERT
Replace w/54" Arch Pipe
Sta. 1015+15
MRM 330.00 +0.591



INDEX OF SHEETS

DESIGN DESIGNATION

ADT(2011)	1,040
ADT(2031)	1,201
DHV	150
D	53%
T DHV	6.9%
T ADT	15.1%
V	65 MPH

STORM WATER PERMIT
Receiving Waters:
Wolf Creek & Tributaries,
West Fork Vermillion R & Tributaries
Area Disturbed: 10.9 Acres
Total Project Area: 135 Acres
Latitude: 43.7075 (Google Maps)
Longitude: -97.6051 (Google Maps)

PROJECT LENGTH

Gross Length:	58,442.50'	11.069 Miles
Bridge Length:	88.33'	0.017 Mile
Net Length:	58,354.17'	11.052 Miles

2

PLOT SCALE - 1:7000
PLOT NAME - 1
PLOTTED FROM - TRM111118
FILE - ...\PRJ2015\MCCK03T6\TITL03T6.DGN

ESTIMATE OF QUANTITIES

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0038(43)321	2	80

Rev. 1/27/15 GAW

	Bid Item Number	Item	Quantity	Unit
	009E0010	Mobilization	Lump Sum	LS
	009E4200	Construction Schedule, Category II	Lump Sum	LS
	110E0500	Remove Pipe Culvert	808	Ft
	110E0510	Remove Pipe End Section	6	Each
	110E0600	Remove Fence	575	Ft
	110E0800	Remove W Beam Guardrail End Terminal	2	Each
	110E1690	Remove Sediment	4.0	CuYd
	110E1700	Remove Silt Fence	800	Ft
	110E7500	Remove Pipe for Reset	280	Ft
	120E0010	Unclassified Excavation	6,025	CuYd
	120E0100	Unclassified Excavation, Digouts	553	CuYd
	120E0600	Contractor Furnished Borrow	8,965	CuYd
	120E6100	Water for Embankment	150.0	MGal
	120E6200	Water for Granular Material	47.0	MGal
	250E0020	Incidental Work, Grading	Lump Sum	LS
	260E1010	Base Course	1,936.0	Ton
	260E1050	Base Course, Salvaged Asphalt Mix	2,411.0	Ton
*	260E6000	Granular Material, Furnish	10,282.0	Ton
*	270E0200	Blend, Haul, and Stockpile Granular Material	20,564.0	Ton
	320E0005	PG 58-34 Asphalt Binder	1,267.3	Ton
	320E1200	Asphalt Concrete Composite	507.0	Ton
	320E1202	Class Q2R Hot Mixed Asphalt Concrete	25,682.0	Ton
	320E1800	Asphalt Concrete Blade Laid	1,658.0	Ton
	320E4000	Hydrated Lime	270.6	Ton
	320E7008	Grind 8" Rumble Strip or Stripe in Asphalt Concrete	22.1	Mile
	330E0100	SS-1h or CSS-1h Asphalt for Tack	86.5	Ton
	330E0210	SS-1h or CSS-1h Asphalt for Flush Seal	45.5	Ton
	330E2000	Sand for Flush Seal	636.2	Ton
	332E0010	Cold Milling Asphalt Concrete	172,177	SqYd
	420E0200	Structure Excavation, Box Culvert	52	CuYd
	421E0100	Pipe Culvert Undercut	355	CuYd
	421E0200	Box Culvert Undercut	182	CuYd
	450E0102	12" RCP Class 2, Furnish	6	Ft
	450E0110	12" RCP, Install	6	Ft
	450E0112	15" RCP Class 2, Furnish	218	Ft
	450E0120	15" RCP, Install	218	Ft
	450E0122	18" RCP Class 2, Furnish	112	Ft
	450E0130	18" RCP, Install	112	Ft
	450E0142	24" RCP Class 2, Furnish	312	Ft
	450E0150	24" RCP, Install	312	Ft
	450E2008	18" RCP Flared End, Furnish	24	Each
	450E2009	18" RCP Flared End, Install	24	Each
	450E2016	24" RCP Flared End, Furnish	18	Each
	450E2017	24" RCP Flared End, Install	18	Each
	450E2024	30" RCP Flared End, Furnish	5	Each
	450E2025	30" RCP Flared End, Install	5	Each
	450E2028	36" RCP Flared End, Furnish	2	Each
	450E2029	36" RCP Flared End, Install	2	Each
	450E2200	24" RCP Sloped End, Furnish	14	Each
	450E2201	24" RCP Sloped End, Install	14	Each
	450E2204	30" RCP Sloped End, Furnish	2	Each
	450E2205	30" RCP Sloped End, Install	2	Each
	450E2300	15" RCP Safety End, Furnish	31	Each
	450E2303	15" RCP Safety End, Install	31	Each
	450E2304	18" RCP Safety End, Furnish	26	Each
	450E2307	18" RCP Safety End, Install	26	Each
	450E3062	54" RCP Arch Class 2, Furnish	56	Ft
	450E3070	54" RCP Arch, Install	56	Ft
	450E3102	96" RCP Arch Class 2, Furnish	84	Ft
	450E3110	96" RCP Arch, Install	84	Ft
	450E4524	54" RCP Arch Flared End, Furnish	2	Each
	450E4525	54" RCP Arch Flared End, Install	2	Each
	450E4637	96" RCP Arch Sectional End, Furnish	2	Each
	450E4638	96" RCP Arch Sectional End, Install	2	Each
	450E4749	15" CMP 16 Gauge, Furnish	10	Ft
	450E4750	15" CMP, Install	10	Ft
	450E4759	18" CMP 16 Gauge, Furnish	22	Ft
	450E4760	18" CMP, Install	22	Ft
	450E4769	24" CMP 16 Gauge, Furnish	8	Ft
	450E4770	24" CMP, Install	8	Ft
	450E4779	30" CMP 16 Gauge, Furnish	4	Ft
	450E4780	30" CMP, Install	4	Ft
	450E5005	15" CMP Elbow, Furnish	2	Each
	450E5006	15" CMP Elbow, Install	2	Each
	450E5010	18" CMP Elbow, Furnish	1	Each
	450E5011	18" CMP Elbow, Install	1	Each
	450E5100	CMP Tee, Furnish	1	Each
	450E5101	CMP Tee, Install	1	Each
	450E5160	CMP Reducer, Furnish	1	Each
	450E5161	CMP Reducer, Install	1	Each
	450E5211	18" CMP Flared End, Furnish	1	Each
	450E5212	18" CMP Flared End, Install	1	Each
	450E5215	24" CMP Flared End, Furnish	4	Each
	450E5216	24" CMP Flared End, Install	4	Each
	450E5219	30" CMP Flared End, Furnish	2	Each
	450E5220	30" CMP Flared End, Install	2	Each
	450E5402	15" CMP Safety End, Furnish	1	Each
	450E5403	15" CMP Safety End, Install	1	Each
	450E5406	18" CMP Safety End, Furnish	7	Each
	450E5407	18" CMP Safety End, Install	7	Each
	450E5410	24" CMP Safety End, Furnish	2	Each
	450E5411	24" CMP Safety End, Install	2	Each
	450E8205	15" Smooth Tapered Sleeve, Furnish	2	Each
	450E8206	15" Smooth Tapered Sleeve, Install	2	Each
	450E8209	18" Smooth Tapered Sleeve, Furnish	2	Each
	450E8210	18" Smooth Tapered Sleeve, Install	2	Each
*	450E8900	Cleanout Pipe Culvert	14	Each
	450E9000	Reset Pipe	280	Ft
	560E0244	14'x7' Precast Concrete Box Culvert, Furnish	80.0	Ft
	560E0245	14'x7' Precast Concrete Box Culvert, Install	80.0	Ft
	560E1244	14'x7' Precast Concrete Box Culvert End Section, Furnish	2	Each
	560E1245	14'x7' Precast Concrete Box Culvert End Section, Install	2	Each
	600E0300	Type III Field Laboratory	1	Each
	620E0020	Type 2 Right-of-Way Fence	600	Ft
	620E0030	Type 3 Right-of-Way Fence	100	Ft
	620E0510	Type 1 Temporary Fence	600	Ft
	620E1020	2 Post Panel	10	Each
	630E1010	Straight Class A W Beam Guardrail with Wood Posts	25.0	Ft
	630E2015	W Beam Guardrail Flared End Terminal	2	Each
	632E2220	Guardrail Delineator	4	Each
	632E2510	Type 2 Object Marker Back to Back	4	Each
	632E2520	Type 2 Object Marker	42	Each
	632E3520	Remove, Salvage, Relocate, and Reset Traffic Sign	48	Each
	633E0050	Cold Applied Plastic Pavement Marking, Message	2	Word
	633E1300	Pavement Marking Paint, White	748.0	Gal
	633E1305	Pavement Marking Paint, Yellow	98.0	Gal
	633E5035	Grooving for Cold Applied Plastic Pavement Marking, Message	2	Word
	634E0010	Flagging	570	Hour
	634E0020	Pilot Car	290	Hour
	634E0100	Traffic Control	4,706	Unit
	634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
	634E0630	Temporary Pavement Marking	33.2	Mile
	634E1002	Detour Signing	523.5	SqFt
	700E0210	Class B Riprap	72.7	Ton
	720E1015	Bank and Channel Protection Gabion	9.0	CuYd
	730E0212	Type G Permanent Seed Mixture	283	Lb
	732E0100	Mulching	21.8	Ton
	734E0102	Type 2 Erosion Control Blanket	56	SqYd
	734E0154	12" Diameter Erosion Control Wattle	1,910	Ft
	734E0602	Low Flow Silt Fence	800	Ft
	734E0610	Mucking Silt Fence	56	CuYd
	734E0620	Repair Silt Fence	200	Ft
	734E0900	Temporary Diversion Channel and/or Pipe	3	Each
	831E0110	Type B Drainage Fabric	100	SqYd
	831E0210	Non-woven Geotextile Separator	848	SqYd
	900E0010	Refurbish Single Mailbox	8	Each
	900E1980	Storage Unit	1	Each

* - Denotes Non-Participating

SPECIFICATIONS

Standard Specifications for Roads and Bridges, 2004 Edition and Required Provisions, Supplemental Specifications and Special Provisions as included in the Proposal.

ENVIRONMENTAL COMMITMENTS

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0038(43)321	3	80

ENVIRONMENTAL COMMITMENTS

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

COMMITMENT B: FEDERALLY THREATENED, ENDANGERED, AND PROTECTED SPECIES

COMMITMENT B1: CONSTRUCTION PRACTICES FOR STREAMS INHABITED BY THE TOPEKA SHINER

The US Fish and Wildlife Service (USFWS) have designated the following as Topeka Shiner streams associated with this project.

Table of Topeka Shiner Streams

Station	Stream Name	Ordinary High Water Elevation
509+30	Tributary to Wolf Creek	1374.8
687+79	Tributary to Wolf Creek	1419.9
1015+15	Tributary to West Fork Vermillion River	1474.0

Action Taken/Required:

The Contractor shall adhere to the "Special Provision for Construction Practices in Streams Inhabited by the Topeka Shiner".

Stream turbidity will be monitored during all stages of the project. Turbidity measurements should be taken in conjunction with normal storm water inspections.

The Contractor shall produce a comprehensive Construction Plan that includes all products, materials, and methods of construction and removal for temporary water barriers, cofferdams, and diversion channels including de-watering, handling, storage, and disposal of excavated material and pumped effluent throughout all phases of construction, including post-construction stabilization. This plan shall be approved by the SDDOT Environmental office prior to any work occurring in the above streams. Upon plan approval the Construction Plan shall be amended to the SWPPP document.

COMMITMENT B2: WHOOPING CRANE

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

Action Taken/Required:

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

COMMITMENT C: WATER SOURCE

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

Action Taken/Required:

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

COMMITMENT D: WATER QUALITY STANDARDS

COMMITMENT D1: SURFACE WATER QUALITY

The West Fork of the Vermillion River is classified as warm water, marginal fishery with a total suspended solids standard of 150 milligrams/liter. Because of these beneficial uses, special construction measures may have to be taken to ensure that this water body is not impacted.

Action Taken/Required:

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

COMMITMENT D2: SURFACE WATER DISCHARGE

The West Fork of the Vermillion River is classified as warm water, marginal fishery with a total suspended solids standard of 150 milligrams/liter. Because of these beneficial uses, special construction measures may have to be taken to ensure that this water body is not impacted.

Action Taken/Required:

If construction dewatering is required, the Contractor shall obtain a Temporary Discharge Permit from the DENR and provide a copy to the Project Engineer. Contact the DENR Surface Water Program at 605-773-3351 to apply for a permit.

COMMITMENT E: STORM WATER

Construction activities constitute 1 acre or more of earth disturbance.

Action Taken/Required:

The DENR and the US Environmental Protection Agency (EPA) have issued separate general permits for the discharge of storm water runoff. The DENR permit applies to discharges on state land and the EPA permit applies to discharges on federal or reservation land. The Contractor is advised this project is regulated under the Phase II Storm Water Regulations and must receive coverage under the General Permit for Construction Activities. A Notice of Intent (NOI) will be submitted to DENR a minimum of 15 days prior to project start by the DOT Environmental Office. A letter must be received from DENR that acknowledges project coverage under this general permit before project start. The Contractor is advised that permit coverage may also be required by off-site activities, such as borrow and staging areas, which are the responsibility of the Contractor.

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

A major component of the storm water construction permits is development and implementation of a Storm Water Pollution Prevention Plan (SWPPP), which is a joint effort and responsibility of the SDDOT and the Contractor. Erosion control measures and best management practices will be implemented in accordance with the SWPPP. The SWPPP is a dynamic document and is to be available on-site at all times.

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

SDDOT:
http://sddot.com/business/environmental/stormwater/Default.aspx

DENR: http://www.denr.sd.gov/des/sw/stormwater.aspx

EPA: http://cfpub.epa.gov/npdes/home.cfm?program_id=6

Contractor Certification Form:

The "Department of Environmental and Natural Resources – Contractor Certification Form" (SD EForm – 2110LDV1-ContractorCertification.pdf) shall be completed by the Contractor or their certified Erosion Control Supervisor after the award of the contract. Work may not begin on the project until this form is signed.

The form certifies under penalty of law that the Contractor understands and will comply with the terms and conditions of the Surface Water Discharge General Permit for Storm Water Discharges Associated with Construction Activities for the Project.

The online form can be found at:
http://denr.sd.gov/des/sw/eforms/E2110LDV1-ContractorCertification.pdf

ENVIRONMENTAL COMMITMENTS

COMMITMENT H: WASTE DISPOSAL SITE

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

Action Taken/Required:

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

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

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

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

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

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

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

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

COMMITMENT I: HISTORICAL PRESERVATION OFFICE CLEARANCES

The SDDOT has obtained concurrence with the State Historical Preservation Office (SHPO or THPO) for all work included within the project limits and all designated option borrow sites provided within the plans.

Action Taken/Required:

All earth disturbing activities not designated within the plans require review of cultural resources impacts. This work includes, but is not limited to: staging areas, borrow sites, waste disposal sites, and all material processing sites.

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

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

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

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

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

COMMITMENT N: SECTION 404 PERMIT

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

Action Taken/Required:

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

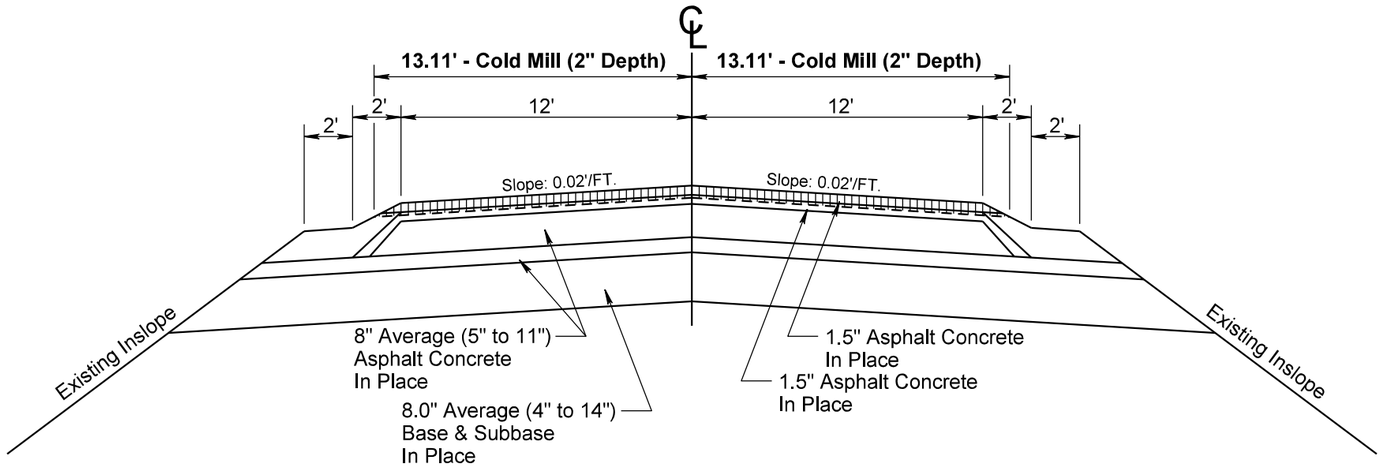
The Contractor shall also be responsible for obtaining a Section 404 permit for any dredge, excavation, or fill activities associated with staging areas, borrow sites, waste disposal sites, or material processing sites that affect wetlands or waters of the United States.

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0038(43)321	5	80

Plotting Date: 11/07/2014

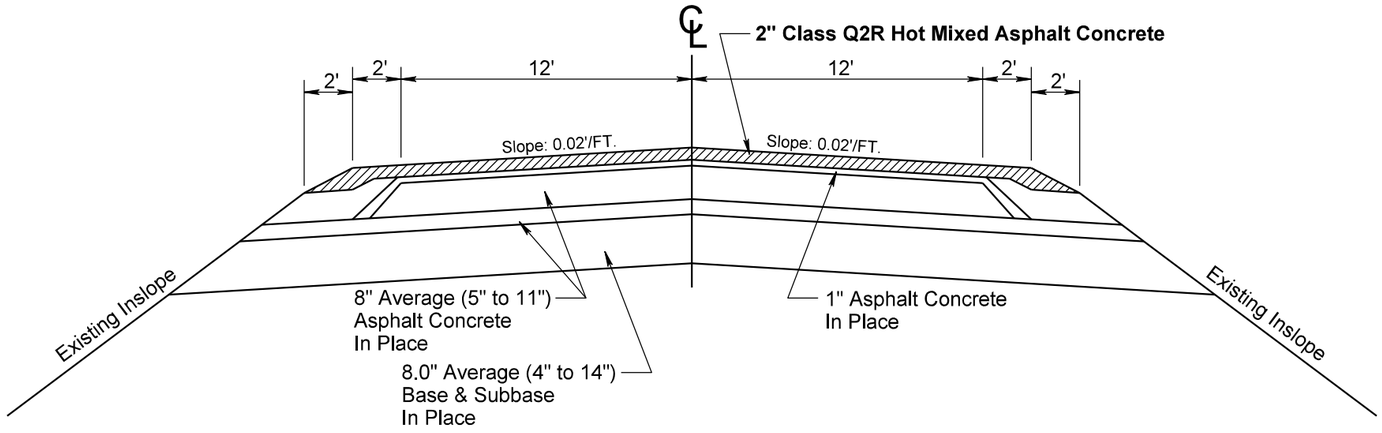
TYPICAL COLD MILLING SECTION

496+50 to 1106+00.1 (Thru Equation)



TYPICAL RESURFACING SECTION

496+50 to 1106+00.1 (Thru Equation)



PLOT SCALE - 1:6.25

PLOT NAME - 2

FILE - ...\PRJ2015\MCCK03T6\TSEC03T6.DGN

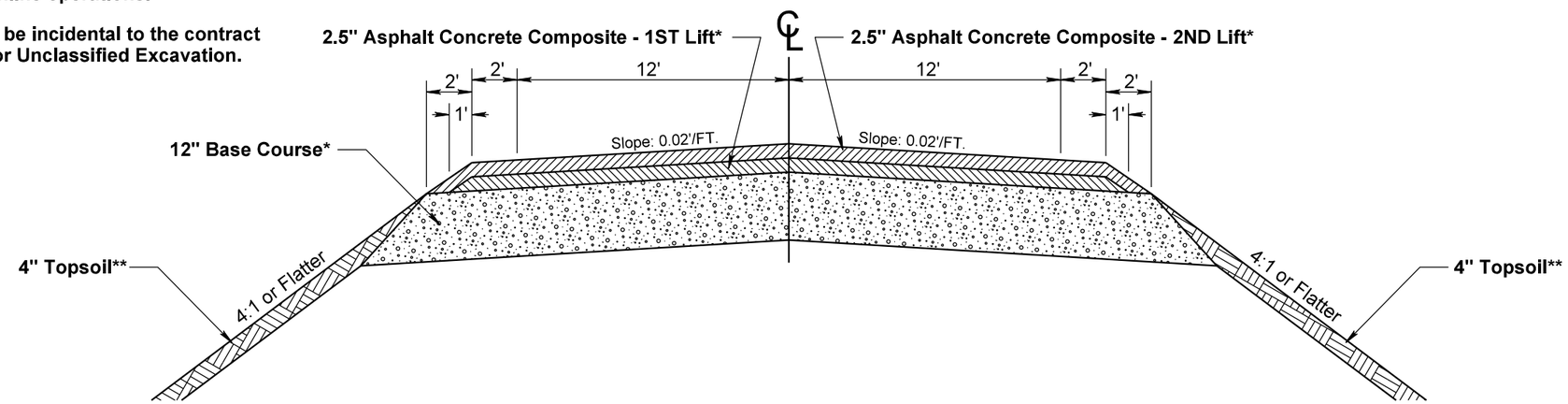
PLOTTED FROM - TRM111118

TYPICAL SURFACING SECTION

AT RCBC & PIPE REPLACEMENT LOCATIONS

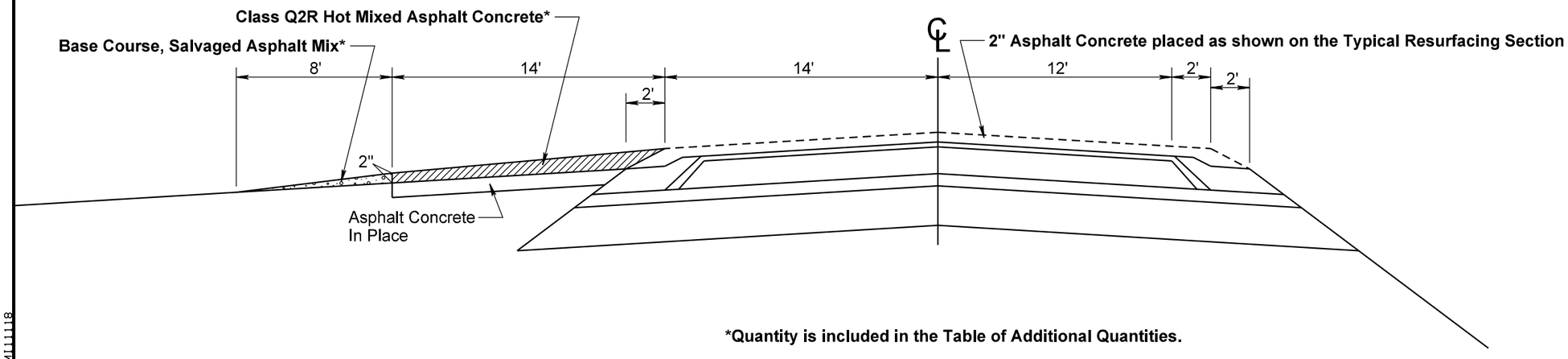
***Quantity is included in the Table of Additional Quantities. Two inchs of the 2ND lift of Asphalt Concrete Composite will be Cold Milled and replaced with Class Q2R Hot Mixed Asphalt Concrete with mainline operations.**

****Placement of Topsoil shall be incidental to the contract unit price per cubic yard for Unclassified Excavation.**



TYPICAL RESURFACING SECTION IN FRONT OF CEMETERY

1048+50 Lt to 1061+00 Lt



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

RATES OF MATERIALS

496+50.00 to 550+51.20 (less 88.33' for one bridge)
575+58.80 to 1106+00.10

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

2" CLASS Q2R HOT MIXED ASPHALT CONCRETE

Salvaged Asphalt Concrete	402	Tons
Crushed Aggregate	1607	Tons
PG 58-34 Asphalt Binder	95	Tons
	TOTAL: 2104	**Tons**
Hydrated Lime	21	Tons
	TOTAL: 2125	**Tons**

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

SS-1h or CSS-1h Asphalt for Tack at the rate of 4.1 tons applied 33 feet wide (Rate = 0.05 gallon per square yard).

FLUSH SEAL

SS-1h or CSS-1h Asphalt for Flush Seal at the rate of 4 tons applied 32 feet wide (Rate = 0.05 gallon per square yard).

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

TABLE OF ADDITIONAL QUANTITIES

LOCATION	UNCL. EXC. CuYd	CONTRACTOR FURNISHED BORROW CuYd	WATER FOR EMB. MGal	BASE COURSE Ton	BASE COURSE SALVAGED ASPHALT MIX Ton	WATER FOR GRAN. MATER. MGal	COLD MILLING ASPHALT CONCRETE SqYd	CLASS Q2R HOT MIXED ASPHALT CONCRETE Ton	PG 58-34 ASPHALT BINDER Ton	HYDRATED LIME Ton	SALV. MAT'L. N.A.B.I. Ton	ASPHALT CONCRETE COMPOSITE 1ST LIFT Ton	ASPHALT CONCRETE COMPOSITE 2ND LIFT Ton	SS-1h/ CSS-1h ASPH. FOR FLUSH SEAL Ton	SAND FOR FLUSH SEAL Ton
Bridge Ends	-	-	-	-	-	-	-	-	-	-	-	67	-	-	-
Guardrail Locations															
See Guardrail Table	-	200	2	-	31	-	-	20	0.9	0.2	4	-	-	-	-
Other (Nondensity) Locations															
Culvert Replacement Locations	6025	-	60	1226	-	15	-	-	-	-	-	212	228	-	-
In Front of Cemetery (1048+50 Lt to 1061+00 Lt)	-	-	-	-	60	1	-	270	12.0	2.7	51	-	-	0.4	-
Culvert Undercut	-	-	-	710	-	9	-	-	-	-	-	-	-	-	-
5 Mailbox Turnouts	-	560	6	-	75	1	-	40	1.8	0.4	8	-	-	-	-
Resurface to ROW															
4 Intersecting Roads	-	-	-	-	-	-	520	117	5.2	1.2	22	-	-	0.2	4
1 Intersecting Streets	-	-	-	-	-	-	214	24	1.1	0.2	5	-	-	0.1	1
2 House Entrances	-	-	-	-	-	-	216	23	1.0	0.2	4	-	-	0.0	0.8
2 Cemetery Entrances	-	-	-	-	-	-	22	12	0.5	0.1	2	-	-	0.0	0.4
Resurface to End of Radius															
15 Intersecting Roads	-	-	-	-	225	2	1127	280	12.5	2.8	53	-	-	0.5	10
1 Intersecting Streets	-	-	-	-	15	-	73	20	0.9	0.2	4	-	-	-	1
Pads															
0 Approaches	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2 Double Approaches	-	-	-	-	40	-	-	9	0.4	0.1	2	-	-	-	-
6 Commercial Entrances	-	-	-	-	180	2	-	37	1.6	0.4	7	-	-	-	-
11 Farm Entrances	-	-	-	-	110	1	-	41	1.8	0.4	8	-	-	-	-
52 Field Entrances	-	-	-	-	520	5	-	194	8.6	1.9	37	-	-	-	-
1 Cemetery Entrances	-	-	-	-	10	-	-	4	0.2	-	1	-	-	-	-
4 Cemetery Entrances	-	-	-	-	40	-	-	-	-	-	-	-	-	-	-
TOTALS:	**6025**	**760**	**68**	**1936**	**1306**	**36**	**2172**	**1091**	**48.5**	**10.8**	**208**	**279**	**228**	**1.3**	**17.2**

NOTES: 2.0 tons of SS-1h or CSS-1h Asphalt for Tack are included in the Estimate of Quantities and shall be applied at the rate shown on the plans as directed by the Engineer.

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

The tonnage shown above for Class Q2R Hot Mixed Asphalt Concrete is based on a compacted depth of 2 inches.
The tonnage shown above for Asphalt Concrete Composite is based on a compacted depth shown on the layouts.

The above quantities are included in the Estimate of Quantities.

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

SUMMARY OF ASPHALT CONCRETE

	ASPHALT CONCRETE BLADE LAID WITHOUT SPECIFIED DENSITY COMPACTION TONS	CLASS Q2R HOT MIXED ASPHALT CONCRETE WITH SPECIFIED DENSITY COMPACTION TONS	CLASS Q2R HOT MIXED ASPHALT CONCRETE WITHOUT SPECIFIED DENSITY COMPACTION TONS	ASPHALT CONCRETE COMPOSITE 1ST LIFT WITHOUT SPECIFIED DENSITY COMPACTION TONS	ASPHALT CONCRETE COMPOSITE 2ND LIFT WITHOUT SPECIFIED DENSITY COMPACTION TONS
Finished Roadway Surface	-	17445	-	-	-
Shoulders	-	6041	-	-	-
Totals:	**-**	**23486**	**-**	**-**	**-**
Additional Quantities for spot leveling and/or tight blading	1658	-	1105	-	-
Table of Additional Quantities					
Bridge Ends	-	-	-	67	-
Table of Additional Quantities except items listed above	-	-	1091	212	228
Additional Totals:	**-**	**-**	**1091**	**279**	**228**
Totals:	**1658**	**23486**	**2196**	**279**	**228**

23486	**TONS ASPHALT CONCRETE WITH SPECIFIED DENSITY COMPACTION**
4361	**TONS ASPHALT CONCRETE WITHOUT SPECIFIED DENSITY COMPACTION**
27847	**TONS TOTAL**

TABLE FOR MAINLINE CULVERT WORK

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0038(43)321	10	80

STA.	CULVERT	UNCLASSIFIED EXCAVATION CUYD L	R	CONTRACTOR FURNISHED BORROW CUYD L	R	RCP EXTENSIONS 24" FT L	R	54" Arch FT L	R	96" Arch FT L	R	CMP EXTENSIONS 18" FT L	R	30" FT L	R	RCP FLARED ENDS 18" EACH L	R	24" EACH L	R	30" EACH L	R	36" EACH L	R	54" Arch EACH L	R	96" Arch EACH L	R	RCP SLOPED ENDS 24" EACH L	R	30" EACH L	R	CMP FLARED ENDS 18" EACH L	R	24" EACH L	R	30" EACH L	R	CMP SAFETY END 18" EACH L	R	CMP TEE 18" EACH L	R	CMP ELBOW 18" EACH L	R	CMP REDUCER EACH L	R	SMOOTH TAPERED SLEEVE 15" EACH L	R	18" EACH L	R	REMOVE PIPE CULVERT FT L	R	REMOVE & RESET PIPE FT L	R	CLEANOUT PIPE CULVERT EACH	DITCH RESTORATION	CLASS B RIPRAP TONS L	R	TYPE B DRAINAGE FABRIC SQYDS L	R	BANK & CHANNEL PROTECTION GABION CUYDS L	R
509+30	5' x 7' x46' RC Box Culvert	1680 ***		1010	920					84 **																1	1																							*						35.9		51			
		***Included in the Table of Additional Quantities are 220 Tons of Base Course and 38 Tons 1st Lift & 41 Tons 2nd Lift of Asphalt Concrete Composite.								**Refer to Cross Section for details.																																								*Cost for removal shall be included in Incidental Work, Grading											
519+35	24" x 56' RCP			5	5																							1	1																					4	4	4	4								
528+00 Rt	6" CMP	No Work																																																											
533+00	Twin 24" x 66' RCP			5	5																							2	2																					8	8				Lt. Side						
																																																		(4'/pipe)	(4'/pipe)										
Equation 550+51.2 Back =575+58.8 Ahead																																																													
577+53	15"x192' RCP				*								12 **																										1		1		1		1		1		1		6 ***										
				*Quantity is included in the table for Slope Flattening of Intersecting Roads, Approaches & Ditch Blocks at 577+96 Rt.								**Refer to Detail for Pipe Culvert Work at 577+53																																(7.5º)							***Remove Pipe from 18" RCP Approach Pipe.											
586+02	30" x 54' RCP 2 FE			90	60																					1	1																																				4								
611+13	36" x 88' RCP			15	15																	1	1																											8	4		4								
636+50	18" x 66' RCP			5	5											1	1																																	4	4	8								4.5	
641+50	18" x 70' CMP	380 ***				66												1	1																															70											
		***Included in the Table of Additional Quantities are 104 Tons of Base Course and 18 Tons 1st Lift & 20 Tons 2nd Lift of Asphalt Concrete Composite.																																																												
656+00	30" x 124' RCP			10	10																1																														4	16	4								
663+75	18" x 72' RCP			5	5											1	1																																	4	4										
671+00	24" x 88' CMP	1070 ***		15	15	78												1	1																															90											
		***Included in the Table of Additional Quantities are 274 Tons of Base Course and 48 Tons 1st Lift & 51 Tons 2nd Lift of Asphalt Concrete Composite.																																																													
680+00	18" x 78' RCP			5	5											1	1																																	8	4										
687+79 &	5' x 5' x48' RC Box Culvert	1535 ***		835	835																																													*											
687+99		***Included in the Table of Additional Quantities are 233 Tons of Base Course and 40 Tons 1st Lift & 43 Tons 2nd Lift of Asphalt Concrete Composite.																																																*Cost for removal shall be included in Incidental Work, Grading											
697+16	24" x 78' RCP			10	15													1	1																															4	4	4	4								
714+05	24" x 60' CMP	130 ***				56												1	1																															60											
		***Included in the Table of Additional Quantities are 73 Tons of Base Course and 13 Tons 1st Lift & 14 Tons 2nd Lift of Asphalt Concrete Composite.																																																													
718+92	30" x 70' RCP			10	10															1	1																													4	4	16	12								
728+32	18" x 74' RCP			10	5											1	1																																	4	4	16		1							
748+46	24" x 60' CMP			5	5																													1	1															4	1				Rt. Side						
776+00	24" x 58' CMP	90 ***				54												1	1																															58											
		***Included in the Table of Additional Quantities are 65 Tons of Base Course and 11 Tons 1st Lift & 12 Tons 2nd Lift of Asphalt Concrete Composite.																																																													
790+58	18" x 62' CMP	195 ***				58												1	1																															62					Rt. Side						
		***Included in the Table of Additional Quantities are 83 Tons of Base Course and 14 Tons 1st Lift & 15 Tons 2nd Lift of Asphalt Concrete Composite.																																																													
819+42	18" x 66' RCP			5	5											1	1																																	4	4	4	8								
833+52	18" x 64' RCP			5	5											1	1																																	4	4	12	8								
840+76	18" x 62' RCP			5	5											1	1																																	4	4	4	8								4.5
848+58	30" x 56' RCP			10	10																									1	1																			4	4	4	4	1	Rt. Side						
861+00	Twin 24" x 52' RCP			5	5																							2	2																					8	8	8	8								
																																																		(4'/pipe)	(4'/pipe)	(4'/pipe)	(4'/pipe)								
906+30	24" x 72' RCP			10	10													1	1																															6	6										
915+96	24" x 66' CMP			5	5																													1	1															1	1				Lt. & Rt. Sides						
925+65	30" x 60' CMP			10	45										4																					1	1													1	2										
945+00	24" x 72' RCP			15	10													1	1																															4	4	4	4								
949+50	18" x 66' RCP			5	5											1	1																																	8	4	8	4								

TABLE FOR MAINLINE CULVERT WORK

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0038(43)321	11	80

STA.	CULVERT	UNCLASSIFIED EXCAVATION CUYD L	UNCLASSIFIED EXCAVATION CUYD R	CONTRACTOR FURNISHED BORROW CUYD L	CONTRACTOR FURNISHED BORROW CUYD R	RCP EXTENSIONS 24" FT L	RCP EXTENSIONS 24" FT R	RCP EXTENSIONS 54" Arch FT L	RCP EXTENSIONS 54" Arch FT R	RCP EXTENSIONS 96" Arch FT L	RCP EXTENSIONS 96" Arch FT R	CMP EXTENSIONS 18" FT L	CMP EXTENSIONS 18" FT R	CMP EXTENSIONS 30" FT L	CMP EXTENSIONS 30" FT R	RCP FLARED ENDS 18" EACH L	RCP FLARED ENDS 18" EACH R	RCP FLARED ENDS 24" EACH L	RCP FLARED ENDS 24" EACH R	RCP FLARED ENDS 30" EACH L	RCP FLARED ENDS 30" EACH R	RCP FLARED ENDS 36" EACH L	RCP FLARED ENDS 36" EACH R	RCP FLARED ENDS 54" Arch EACH L	RCP FLARED ENDS 54" Arch EACH R	RCP FLARED ENDS 96" Arch EACH L	RCP FLARED ENDS 96" Arch EACH R	RCP SLOPED ENDS 24" EACH L	RCP SLOPED ENDS 24" EACH R	RCP SLOPED ENDS 30" EACH L	RCP SLOPED ENDS 30" EACH R	CMP FLARED ENDS 18" EACH L	CMP FLARED ENDS 18" EACH R	CMP FLARED ENDS 24" EACH L	CMP FLARED ENDS 24" EACH R	CMP FLARED ENDS 30" EACH L	CMP FLARED ENDS 30" EACH R	CMP SAFETY END 18" EACH L	CMP SAFETY END 18" EACH R	CMP TEE 18" EACH L	CMP TEE 18" EACH R	CMP ELBOW 18" EACH L	CMP ELBOW 18" EACH R	CMP REDUCER EACH L	CMP REDUCER EACH R	SMOOTH TAPERED SLEEVE 15" EACH L	SMOOTH TAPERED SLEEVE 15" EACH R	SMOOTH TAPERED SLEEVE 18" EACH L	SMOOTH TAPERED SLEEVE 18" EACH R	REMOVE PIPE CULVERT FT L	REMOVE PIPE CULVERT FT R	REMOVE & RESET PIPE FT L	REMOVE & RESET PIPE FT R	CLEANOUT PIPE CULVERT EACH	DITCH RESTORATION	CLASS B RIPRAP TONS L	CLASS B RIPRAP TONS R	TYPE B DRAINAGE FABRIC SQYDS L	TYPE B DRAINAGE FABRIC SQYDS R	BANK & CHANNEL PROTECTION GABION CUYDS L	BANK & CHANNEL PROTECTION GABION CUYDS R
970+03	18" x 70' RCP			5	5											1	1																													4	4		4								
974+94	24" x 60' RCP			15	10													1	1																											8	4		4								
1015+15	5' x 4' x52' RC Box Culvert	945 ***		-	45			56 **																1	1																			*															
		***Included in the Table of Additional Quantities are 174 Tons of Base Course and 30 Tons 1st Lift & 32 Tons 2nd Lift of Asphalt Concrete Composite.						**Refer to Cross Section for details.																																						*Cost for removal shall be included in Incidental Work, Grading											
1051+37	18" x 92' RCP			5	5												1																	1														1		4	4	8	4						
1054+24	18" x 88' RCP			5	5												1																																			4	8						
1063+00	18" x 64' RCP			5	5											1	1																																			4	4						
1071+27	18" x 70' RCP			5	5											1	1																																			8	4		4						
1084+77	Twin 24" x 56' RCP			5	5																									2	2																			8	8	8	16		Rt. Side				
																																																		(4'/pipe)	(4'/pipe)	(4'/pipe)	(8'/pipe)						
	TOTALS:	**6025 ***		**4260**		**312**		**56**		**84**		**12**		**4**		**24**		**18**		**5**		**2**		**2**		**2**		**14**		**2**		**1**		**4**		**2**		**1**		**1**		**1**		**1**		**2**		**596**		**240**		**2**		**35.9**		**51**		**9**	

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

SLOPE FLATTENING OF INTERSECTING ROADS, APPROACHES & DITCH BLOCKS

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0038(43)321	12	80

STATION	SIDE	*LEFT OR RIGHT	FINAL SLOPE	FILL DIST FROM APPR. CL. Ft	CONTRACTOR FURNISHED BORROW CuYd	CULVERT SIZE AND TYPE	REMOVE PIPE CULVERT Ft	REMOVE FLARED END Each	REMOVE & RESET PIPE Ft	CULVERT EXTENSION Ft	SAFETY END Each	FLUSH PIPE Each	DITCH RESTOR.
510 + 90.0	RT	LT	No Work										
510 + 90.0	RT	RT	No Work										
514 + 30.0	LT	LT	6:1	27	30	18 " RCP	4	0	0	8	1	-	-
514 + 30.0	LT	RT	6:1	23	20	18 " RCP	2.5	0	0	6	1		-
514 + 30.0	RT	LT	6:1	34	30	15 " RCP	4	0	0	10	1	1	Yes
514 + 30.0	RT	RT	6:1	30	20	15 " RCP	4	0	0	8	1		Yes
523 + 50.0	LT	LT	10:1	24	10	15 " RCP	4	0	0	4	1	-	-
523 + 50.0	LT	RT	9.4:1	24	10	15 " RCP	4	0	0	4	1		-
538 + 32.0	LT	LT	10:1	44	50	-	0	0	0	0	0	-	-
538 + 32.0	LT	RT	9:1	55	80	-	0	0	0	0	0		-
539 + 0.0	RT	LT	6:1	31.9	40	15 " RCP	0	0	0	10	1	1	Yes
539 + 0.0	RT	RT	6:1	27.6	35	15 " RCP	4	0	0	12	1		Yes
541 + 93.0	LT	LT	No Work										
541 + 93.0	LT	RT	10:1	21	10	-	0	0	0	0	0		-
545 + 73.0	LT	LT	No Work										
545 + 73.0	LT	RT	10:1	-	20	-	0	0	0	0	0		
548 + 32.0	LT	LT	10:1	28.4	5	-	0	0	0	0	0	-	-
548 + 32.0	LT	RT	9:1	24	5	-	0	0	0	0	0		-
549 + 70.0	RT	LT	6:1	29.4	5 *	18 " RCP	4	0	0	0	1	-	-
549 + 70.0	RT	RT	6:1	29	5 *	18 " RCP	6	0	0	0	1		-
*Reshape Approach - No Contractor Furnished Borrow needed.													
577 + 96.0	RT	LT	6:1	*	30	-	0	0	0	0	0	-	-
577 + 96.0	RT	RT	8.3:1	64	65	-	0	0	0	0	0		-
*Refer to the Table for Mainline Culvert Work on details of pipe work at 577+53.													
577 + 96.0	LT	LT	No Work										
577 + 96.0	LT	RT	No Work										
579 + 46.0	RT	LT	6:1	34.6	5	18 " RCP	0	0	0	0	1	1	-
579 + 46.0	RT	RT	6:1	38.3	10	18 " RCP	0	0	0	4	1		Yes
586 + 39.0	LT	LT	6:1	31.4	25	18 " RCP	0	0	4	6	1	-	-
586 + 39.0	LT	RT	6:1	36	20	18 " RCP	4	0	0	12	1		-
599 + 37.0	RT	LT	6:1	33.1	35	15 " RCP	4	0	0	8	1	1	-
599 + 37.0	RT	RT	6:1	33.1	35	15 " RCP	4	0	0	8	1		-
604 + 75.0	RT	ELIMINATE APPROACH				15 " RCP	16	0	0	0	0	-	-
604 + 75.0	RT	ELIMINATE APPROACH				15 " RCP	16	0	0	0	0		-
607 + 27.0	RT	LT	8:1	26.8	20	-	0	0	0	0	0	-	-
607 + 27.0	RT	RT	9:1	26.3	25	-	0	0	0	0	0		-
607 + 27.0	LT	LT	10:1	50	40	-	0	0	0	0	0	-	-
607 + 27.0	LT	RT	10:1	51	70	-	0	0	0	0	0		-
617 + 85.0	RT	LT	6:1	33.7	40	18 " RCP	4	0	0	10	1	-	-
617 + 85.0	RT	RT	6:1	32.2	35	18 " RCP	4	0	0	8	1		-
619 + 90.0	LT	LT	No Work										
619 + 90.0	LT	RT	No Work										
630 + 90.0	RT	LT	8.8:1	37.6	50	-	0	0	0	0	0	-	-
630 + 90.0	RT	RT	7.9:1	38.1	45	-	0	0	0	0	0		-
630 + 90.0	LT	LT	6.9:1	29.9	35	-	0	0	0	0	0	-	-
630 + 90.0	LT	RT	8.1:1	38.2	60	-	0	0	0	0	0		-
643 + 47.0	RT	LT	6:1	32	35	15 " RCP	4	0	0	12	1	1	-
643 + 47.0	RT	RT	6:1	25.6	25	15 " RCP	4	0	0	10	1		-
644 + 45.0	LT	LT	8.5:1	23.8	10	-	0	0	0	0	0	-	-
644 + 45.0	LT	RT	7.2:1	27.3	10	-	0	0	0	0	0		-

STATION	SIDE	*LEFT OR RIGHT	FINAL SLOPE	FILL DIST FROM APPR. CL. Ft	CONTRACTOR FURNISHED BORROW CuYd	CULVERT SIZE AND TYPE	REMOVE PIPE CULVERT Ft	REMOVE FLARED END Each	REMOVE & RESET PIPE Ft	CULVERT EXTENSION Ft	SAFETY END Each	FLUSH PIPE Each	DITCH RESTOR.
651 + 80.0	LT	LT	No Work										
651 + 80.0	LT	RT	No Work										
661 + 86.0	RT	LT	No Work										
661 + 86.0	RT	RT	9:1	35	35	-	0	0	0	0	0		-
661 + 86.0	LT	LT	9:1	40	40	-	0	0	0	0	0	-	-
661 + 86.0	LT	RT	8.4:1	26.3	15	-	0	0	0	0	0		-
669 + 86.0	RT	LT	9.5:1	25	25	-	0	0	0	0	0	-	-
669 + 86.0	RT	RT	9.5:1	28	45	-	0	0	0	0	0		-
682 + 59.0	RT	LT	9:1	40	45	-	0	0	0	0	0	-	-
682 + 59.0	RT	RT	7.5:1	36.8	45	-	0	0	0	0	0		-
682 + 59.0	LT	LT	10:1	58.4	50	-	0	0	0	0	0	-	-
682 + 59.0	LT	RT	9:1	32	25	-	0	0	0	0	0		-
692 + 90.0	LT	LT	9:1	60	50	-	0	0	0	0	0	-	-
692 + 90.0	LT	RT	10:1	64	70	-	0	0	0	0	0		-
695 + 0.0	LT	LT	No Work										
695 + 0.0	LT	RT	10:1	-	5	-	0	0	0	0	0		-
696 + 34.0	RT	LT	8.5:1	19.9	15	-	0	0	0	0	0	-	-
696 + 34.0	RT	RT	10:1	31	35	-	0	0	0	0	0		-
709 + 16.0	RT	LT	10:1	*	50	-	0	0	0	0	0	-	-
709 + 16.0	RT	RT	No Work										
*Widden the Approach to the West.													
709 + 16.0	LT	LT	No Work										
709 + 16.0	LT	RT	8.8:1	23.8	10	-	0	0	0	0	0		-
718 + 3.0	LT	LT	10:1	15	15	-	0	0	0	0	0	-	-
718 + 3.0	LT	RT	10:1	19.3	15	-	0	0	0	0	0		-
718 + 23.0	RT	LT	7.8:1	18	10	-	0	0	0	0	0	-	-
718 + 23.0	RT	RT	8.3:1	12	10	-	0	0	0	0	0		-
730 + 21.0	RT	LT	8.9:1	25.3	20	-	0	0	0	0	0	-	-
730 + 21.0	RT	RT	9:1	27.7	20	-	0	0	0	0	0		-
735 + 93.9	RT	LT	6.3:1	20.7	10	-	0	0	0	0	0	-	-
735 + 93.9	RT	RT	7.6:1	30.5	25	-	0	0	0	0	0		-
735 + 93.9	LT	LT	10:1	28	20	-	0	0	0	0	0	-	-
735 + 93.9	LT	RT	10:1	22	20	-	0	0	0	0	0		-
746 + 20.0	RT	LT	6:1	34.6	50	15 " RCP	4	0	0	14	1	-	-
746 + 20.0	RT	RT	6:1	31	25	15 " RCP	4	0	0	12	1		-
746 + 70.0	LT	LT	6:1	33	10	15 " RCP	4	0	4	0	1	-	-
746 + 70.0	LT	RT	6:1	32.6	10	15 " RCP	4	0	0	6	1		Yes
761 + 0.0	RT	LT	10:1	26	10	-	0	0	0	0	0	-	-
761 + 0.0	RT	RT	10:1	28	10	-	0	0	0	0	0		-
761 + 0.0	LT	LT	10:1	23.9	10	-	0	0	0	0	0	-	-
761 + 0.0	LT	RT	10:1	27.2	10	-	0	0	0	0	0		-
786 + 40.0	RT	LT	8.3:1	36.6	25	-	0	0	0	0	0	-	-
786 + 40.0	RT	RT	8.7:1	31.5	20	-	0	0	0	0	0		-
786 + 40.0	LT	LT	9.3:1	24.2	10	-	0	0	0	0	0	-	-
786 + 40.0	LT	RT	8.3:1	28.9	15	-	0	0	0	0	0		-
788 + 76.0	RT	LT	8.9:1	35	20	-	0	0	0	0	0	-	-
788 + 76.0	RT	RT	10:1	44	30	-	0	0	0	0	0		-
788 + 76.0	LT	LT	No Work										
788 + 76.0	LT	RT	No Work										

*The left and right orientation is determined by looking from the approach toward the roadway.

SLOPE FLATTENING OF INTERSECTING ROADS, APPROACHES & DITCH BLOCKS

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0038(43)321	13	80

STATION	SIDE	*LEFT OR RIGHT	FINAL SLOPE	FILL DIST FROM APPR. CL. Ft	CONTRACTOR FURNISHED BORROW CuYd	CULVERT SIZE AND TYPE	REMOVE PIPE CULVERT Ft	REMOVE FLARED END Each	REMOVE & RESET PIPE Ft	CULVERT EXTENSION Ft	SAFETY END Each	FLUSH PIPE Each	DITCH RESTOR.
803 + 57.0	LT	LT	6:1	22.9	10	18 " RCP	4	0	0	4	1	1	-
803 + 57.0	LT	RT	6:1	24.9	10	18 " RCP	4	0	0	6	1		-
815 + 0.0	RT	LT	8.8:1	25.9	10	-	0	0	0	0	0	-	-
815 + 0.0	RT	RT	8.9:1	25.7	10	-	0	0	0	0	0		-
815 + 0.0	LT	LT	8.3:1	39.6	25	-	0	0	0	0	0	-	-
815 + 0.0	LT	RT	8.5:1	39.3	15	-	0	0	0	0	0		-
826 + 70.0	RT	LT	10:1	33	10	-	0	0	0	0	0	-	-
826 + 70.0	RT	RT	10:1	24	10	-	0	0	0	0	0		-
829 + 63.0	LT	LT	6:1	20.5	20	18 " RCP	2.5	0	0	6	1	-	Yes
829 + 63.0	LT	RT	6:1	21.3	20	18 " RCP	2.5	0	0	6	1		Yes
829 + 63.0	RT	LT	No Work										
829 + 63.0	RT	RT	No Work										
838 + 87.0	LT	LT	10:1	-	10	-	0	0	0	0	0	-	-
838 + 87.0	LT	RT	10:1	-	10	-	0	0	0	0	0		-
829 + 0.0	LT	LT	10:1	-	20	-	0	0	0	0	0	-	-
829 + 0.0	LT	RT	10:1	-	25	-	14	0	0	0	0		-
841 + 0.0	LT	LT	10:1	-	20	-	0	0	0	0	0	-	-
841 + 0.0	LT	RT	10:1	-	25	-	0	0	0	0	0		-
841 + 69.0	LT	LT	7.6:1	29.2	10	-	0	0	0	0	0	-	-
841 + 69.0	LT	RT	10:1	35	20	-	0	0	0	0	0		-
841 + 69.0	RT	LT	10:1	57	15	-	0	0	0	0	0	-	-
841 + 69.0	RT	RT	10:1	45	25	-	0	0	0	0	0		-
843 + 50.0	LT	LT	No Work										
843 + 50.0	LT	RT	No Work										
846 + 0.0	LT	LT	9.7:1	27.7	15	-	0	0	0	0	0	-	-
846 + 0.0	LT	RT	8.5:1	34	25	-	0	0	0	0	0		-
868 + 23.0	LT	LT	6:1	23.5	5	18 " RCP	4	0	0	4	1	-	-
868 + 23.0	LT	RT	6:1	21.7	10	18 " RCP	0	0	4	0	1		-
868 + 23.0	RT	LT	6:1	25.5	15	18 " RCP	0	0	4	0	1	-	-
868 + 23.0	RT	RT	6:1	25.8	15	18 " RCP	4	0	4	4	1		-
868 + 83.0	RT	LT	6:1	21.3	5	18 " RCP	2.5	0	0	0	1	-	-
868 + 83.0	RT	RT	6:1	24.1	5	18 " RCP	2.5	0	0	0	1		-
894 + 30.0	LT	LT	6:1	-	35	15 " RCP	0	0	0	10 * CMP	1 CMP	-	-
894 + 30.0	LT	RT	6:1	-	20	15 " RCP	4	0	0	6	1		-

*Starting at the end of the 15" RCP, install Smooth Tapered Sleeve, 4' pipe, 2 45º Bends, 6' pipe and a Safety End.

894 + 89.5	RT	LT	10:1	51	20	-	0	0	0	0	0	-	-
894 + 89.5	RT	RT	10:1	51	25	-	0	0	0	0	0		-
894 + 89.5	LT	LT	10:1	43	15	-	0	0	0	0	0	-	-
894 + 89.5	LT	RT	10:1	-	*	-	0	0	0	0	0		-

*Quantity included on the LT side of 894+30 LT.

911 + 75.0	LT	LT	6:1	24.7	20	18 " RCP	4	0	0	6	1	-	-
911 + 75.0	LT	RT	6:1	28.3	30	18 " RCP	0	0	0	4	1		-
915 + 10.0	RT	LT	10:1	-	15	-	0	0	0	0	0	-	-
915 + 10.0	RT	RT	10:1	-	15	-	0	0	0	0	0		-
921 + 40.0	RT	LT	No Work										
921 + 40.0	RT	RT	8.1:1	27.4	15	-	0	0	0	0	0		-
923 + 0.0	LT	LT	10:1	-	10	-	0	0	0	0	0	-	-
923 + 0.0	LT	RT	10:1	-	10	-	0	0	0	0	0		-
923 + 0.0	RT	LT	Remove Ditch Block										
923 + 0.0	RT	RT	Remove Ditch Block										

STATION	SIDE	*LEFT OR RIGHT	FINAL SLOPE	FILL DIST FROM APPR. CL. Ft	CONTRACTOR FURNISHED BORROW CuYd	CULVERT SIZE AND TYPE	REMOVE PIPE CULVERT Ft	REMOVE FLARED END Each	REMOVE & RESET PIPE Ft	CULVERT EXTENSION Ft	SAFETY END Each	FLUSH PIPE Each	DITCH RESTOR.
928 + 80.0	RT	LT	6:1	30.8	25	15 " RCP	4	0	0	10	1	1	-
928 + 80.0	RT	RT	6:1	29.9	20	15 " RCP	4	0	0	6	1		-
942 + 10.0	LT	LT	10:1	34	10	-	0	0	0	0	0	-	-
942 + 10.0	LT	RT	8.8:1	31.5	10	-	0	0	0	0	0		-
942 + 10.0	RT	LT	8.3:1	28.9	15	-	0	0	0	0	0	-	-
942 + 10.0	RT	RT	8.7:1	33.3	20	-	0	0	0	0	0		-
947 + 98.5	RT	LT	No Work										
947 + 98.5	RT	RT	No Work										
947 + 98.5	LT	LT	8:1	38	15	-	0	0	0	0	0	-	-
947 + 98.5	LT	RT	8:1	35.8	15	-	0	0	0	0	0		-
957 + 9.0	RT	LT	8.8:1	26.9	15	-	0	0	0	0	0	-	-
957 + 9.0	RT	RT	9:1	26.7	15	-	0	0	0	0	0		-
957 + 9.0	LT	LT	9.2:1	28	20	-	0	0	0	0	0	-	-
957 + 9.0	LT	RT	9.2:1	25.9	20	-	0	0	0	0	0		-
974 + 15.0	RT	LT	8.8:1	30.8	20	-	0	0	0	0	0	-	-
974 + 15.0	RT	RT	7.9:1	32.6	25	-	0	0	0	0	0		-
982 + 60.0	RT	LT	No Work										
982 + 60.0	RT	RT	No Work										
982 + 60.0	LT	LT	10:1	20	10	-	0	0	0	0	0	-	-
982 + 60.0	LT	RT	10:1	18	10	-	0	0	0	0	0		-
999 + 40.0	RT	LT	6:1	19.3	10	15 " RCP	4	0	0	4	1	1	-
999 + 40.0	RT	RT	6:1	23.6	20	15 " RCP	4	0	0	4	1		Yes
999 + 40.0	LT	LT	6:1	25.3	10	18 " RCP	0	0	4	0	1	-	-
999 + 40.0	LT	RT	6:1	24	10	18 " RCP	0	0	4	0	1		-
1000 + 58.3	LT	LT	7.8:1	32.2	35	-	0	0	0	0	0	-	-
1000 + 58.3	LT	RT	7.7:1	28.4	20	-	0	0	0	0	0		-
1000 + 58.3	RT	LT	9:1	33.3	25	-	0	0	0	0	0	-	-
1000 + 58.3	RT	RT	8:1	43.7	50	-	0	0	0	0	0		-
1014 + 0.0	RT	LT	6:1	-	10	15 " RCP	0	0	4	0	1	-	-
1014 + 0.0	RT	RT	6:1	-	10	15 " RCP	0	0	4	0	1		Yes
1018 + 0.0	LT	LT	10:1	-	20	-	0	0	0	0	0	-	-
1018 + 0.0	LT	RT	10:1	-	20	-	0	0	0	0	0		-
1023 + 0.0	LT	LT	6:1	36.4	70	15 " RCP	4	0	0	10	1	-	-
1023 + 0.0	LT	RT	6:1	33	55	15 " RCP	0	0	0	4	1		-
1023 + 0.0	RT	LT	6:1	29.7	20	15 " RCP	4	0	0	8	1	1	-
1023 + 0.0	RT	RT	6:1	34.2	55	15 " RCP	4	0	0	12	1		-
1033 + 12.0	RT	LT	9:1	48	50	-	0	0	0	0	0	-	-
1033 + 12.0	RT	RT	8.4:1	36.8	35	-	0	0	0	0	0		-
1033 + 12.0	LT	LT	6:1	29.6	35	18 " RCP	4	0	0	8	1	-	-
1033 + 12.0	LT	RT	6:1	34.7	45	18 " RCP	4	0	0	10	1		-
1045 + 80.0	LT	LT	6:1	-	5	18 " CMP	0	1	0	0	1	-	-
1045 + 80.0	LT	RT	6:1	-	5	18 " CMP	0	1	0	0	1		-
1048 + 45.0	LT	LT	6:1	-	0	18 " CMP	0	0	0	0	1	-	-
1048 + 45.0	LT	RT	6:1	-	10	18 " CMP	0	0	0	4	1		-
1051 + 3.0	LT	LT	6:1	-	0	12 " RCP	4	0	0	0	0	1	-
1051 + 3.0	LT	RT	6:1	-	0	12 " RCP	0	0	0	0	0		Yes
1053 + 83.9	LT	LT	No Work										
1053 + 83.9	LT	RT	No Work										

*The left and right orientation is determined by looking from the approach toward the roadway.

SLOPE FLATTENING OF INTERSECTING ROADS, APPROACHES & DITCH BLOCKS

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0038(43)321	14	80

STATION	SIDE	*LEFT OR RIGHT	FINAL SLOPE	FILL DIST FROM APPR. CL. Ft	CONTRACTOR FURNISHED BORROW CuYd	CULVERT SIZE AND TYPE	REMOVE PIPE CULVERT Ft	REMOVE FLARED END Each	REMOVE & RESET PIPE Ft	CULVERT EXTENSION Ft	SAFETY END Each	FLUSH PIPE Each	DITCH RESTOR.
1053 + 83.9	RT	LT	8:1	43	30	-	0	0	0	0	0	-	-
1053 + 83.9	RT	RT	10:1	35	35	-	0	0	0	0	0		-
1058 + 40.0	RT	ELIMINATE APPROACH				-	0	0	0	0	0	-	-
1058 + 40.0	RT	ELIMINATE APPROACH				-	0	0	0	0	0		-
1067 + 20.0	LT	LT	8.8:1	23.7	10	-	0	0	0	0	0	-	-
1067 + 20.0	LT	RT	8.3:1	26.6	20	-	0	0	0	0	0		-
1067 + 20.0	RT	ELIMINATE APPROACH				-	0	0	0	0	0	-	-
1067 + 20.0	RT	ELIMINATE APPROACH				-	0	0	0	0	0		-
1080 + 50.0	RT	LT	8.5:1	25.8	10	-	0	0	0	0	0	-	-
1080 + 50.0	RT	RT	10:1	30	35	-	0	0	0	0	0		-
1080 + 50.0	LT	LT	8.5:1	23.5	10	-	0	0	0	0	0	-	-
1080 + 50.0	LT	RT	8.9:1	25	15	-	0	0	0	0	0		-
1094 + 5.0	LT	LT	6.7:1	42	10	15 " RCP	0	1	0	8	1	-	-
1094 + 5.0	LT	RT	6:1	51.8	20	15 " RCP	0	1	0	8	1		-
1094 + 5.0	RT	LT	6:1	28.7	20	15 " RCP	0	0	4	6	1	-	-
1094 + 5.0	RT	RT	6:1	22.9	10	15 " RCP	4	0	0	4	1		Yes
1098 + 0.0	LT	LT	No Work										
1098 + 0.0	LT	RT	No Work										
1100 + 40.0	LT	LT	No Work									1	-
1100 + 40.0	LT	RT	6:1	-	10	12 " RCP	0	0	0	6	0		-
1102 + 26.0	LT	LT	6:1	31.2	10	15 " RCP	4	0	0	6	1	1	-
1102 + 26.0	LT	RT	6:1	32.5	15	15 " RCP	0	0	0	4	1		-
1104 + 20.0	RT	LT	6:1	47.7	15	24 " CMP	1	1	0	4	1	-	-
1104 + 20.0	RT	RT	6:1	46.6	30	24 " CMP	0	1	0	4	1		-
1104 + 20.0	LT	LT	6:1	29.1	10	18 " CMP	2	0	0	6	1	-	-
1104 + 20.0	LT	RT	6:1	36.3	15	18 " CMP	0	0	0	0	1		-
				TOTALS:	**3945**		**212**	**6**	**40**	**364**	**66**	**12**	

*The left and right orientation is determined by looking from the approach toward the roadway.

TABLE FOR REMOVAL AND INSTALLATION OF GUARDRAIL AND RELATED ITEMS

LOCATION BRIDGE CORNER	REMOVE W BEAM GUARDRAIL END TERMINAL	CONTRACTOR FURNISHED BORROW	BASE COURSE SALVAGED ASPHALT MIX	CLASS Q2R HOT MIXED ASPHALT CONCRETE	STRAIGHT CLASS A W BEAM GUARDRAIL WITH WOOD POSTS	W BEAM GUARDRAIL FLARED END TERMINAL
	Each	CuYd	Ton	Ton	Ft	Each
STR.NO. 44-095-090						
MRM 330.81						
Begin Bridge L	-	-	-	-	-	-
Begin Bridge R	1	125	18	10	12.5	1
End Bridge L	1	75	13	10	12.5	1
End Bridge R	-	-	-	-	-	-
TOTALS:	**2**	**200**	**31**	**20**	**25**	**2**

TABLE OF GUARDRAIL DELINEATORS & OBJECT MARKERS

LOCATION BRIDGE CORNER	TYPE 2 OBJECT MARKER BACK TO BACK	TYPE 2 OBJECT MARKER	GUARDRAIL TERMINAL END OBJECT MARKER (ADHESIVE)	GUARDRAIL DELINEATOR			
			N.A.B.I.	BEAM		CABLE	
	M #	M #	E #	B #		C #	
				Yellow	White	Yellow	White
STR.NO. 44-095-090							
MRM 330.81							
Begin Bridge L					1		
Begin Bridge R			1		1		
End Bridge L			1		1		
End Bridge R					1		
TOTALS	**-**	**-**	**2**	**-**	**4**	**-**	**-**
				4			

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

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

SURFACING/SUBGRADE INVESTIGATION

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

SURFACING THICKNESS DIMENSIONS

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

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

FLEXIBLE PAVEMENT SMOOTHNESS PROVISION

All sections, not excluded by the Special Provision for Flexible Pavement Smoothness, will be profiled as 2 opportunity.

TYPE III FIELD LABORATORY

The lab shall be equipped with an internet connection such as DSL, cable modem, or other approved service. The internet connection shall be provided with a multi-port wireless router. The internet connection shall be a minimum speed of 512 Kb unless limited by job location and approved by the DOT. Prior to installing the wireless router the Contractor shall submit the wireless router's technical data to the Area Office to check for compatibility with the state's computer equipment. The internet connection is intended for state personnel usage only. The Contractor's personnel are prohibited from using the internet connection unless pre-approved by the Project Engineer.

The Contractor shall submit a copy of each monthly bill for calls charged to this phone at the end of each month. The Project Engineer will then audit the bills to ensure all calls are legitimate and then initiate a Construction Change Order (CCO) to reimburse the Contractor for the actual phone calls made, including local and long distance calls. Reimbursement will not be made for fees associated with the purchase, installation, disconnection, monthly line charges, and incidentals involved in the installation, maintenance, and disconnection of the phone (including attachments). These items shall be incidental to the contract unit price per each for Type III Field Laboratory.

STORAGE UNIT

The Contractor shall 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.

STORAGE UNIT (CONTINUED)

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

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

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

1. The portable storage container shall be constructed of steel.
2. The portable storage container shall 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 shall apply when the storage unit provided on the project is a semi-trailer:

1. A set of steps and hand railings shall be provided at the exterior door.
2. If the floor of the semi-trailer is 18 inches or more above the ground, a landing shall be constructed at the exterior door. The minimum dimensions for the landing shall be 4 feet by 5 feet. The top of the landing shall 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 shall be a minimum of 48 inches wide and contain handrails installed at 32 inches above the deck of the walkway. The walkway shall be constructed such that it is stable and the deck does not deform during use and allows for proper door operation. Walkway construction shall 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 shall be included in the contract unit price per each for Storage Unit.

INCIDENTAL WORK, GRADING

Station	Remarks
509+30	Take out 5'x7'x46' RCBC
687+79	Take out 5'x5'x48' RCBC
1015+15	Take out 5'x4'x52' RCBC

INTERSECTING ROADS AND ENTRANCES

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

SHOULDER WORK

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

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

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

EXCAVATION FOR DEEP PIPE AND BOX CULVERT REMOVAL

Unclassified Excavation is required for removal of deep pipes and box culverts. Deep pipes and box culverts are existing mainline pipes or box culverts at depths of 10 feet or greater (measured from the flow line to the lowest elevation of either the existing ground line, undercut line, or bottom of removed or salvaged surfacing).

This work shall be completed prior to the commencement of cold milling operations on the project.

After the existing pipes have been removed, the new pipe culvert shall be undercut and the undercut backfilled according to the notes for Table of Pipe Culvert Undercut.

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

The minimum testing as shown in M.S.T.R. Section 4.1.E.3.a.1 will be required.

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

All work necessary to excavate and backfill the deep pipes and box culverts including labor, equipment, and incidentals shall be incidental to the contract unit price per cubic yard for Unclassified Excavation. Payment for deep pipe and box culvert excavation shall be based only on plans quantity and measurement of these excavation quantities during construction shall not be performed.

The cost for asphalt composite installed over the pipe replacement shall be paid for at the contract unit price per ton for Asphalt Concrete Composite.

The cost for Base Course installed over the pipe replacement shall be paid for at the contract unit price per ton for Base Course.

EXCAVATION FOR DEEP PIPE AND BOX CULVERT REMOVAL (CONTINUED)

The quantities computed for excavation of the deep pipes and box culverts are based on the limits shown in the drawing below. The drawing shows a box culvert for illustration purposes only; the limits are similar for a pipe.

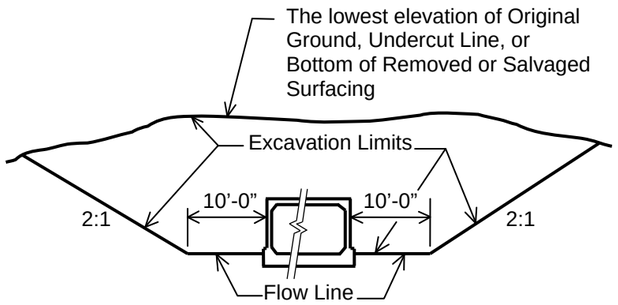


TABLE OF EXCAVATION FOR DEEP PIPE AND BOX CULVERT REMOVAL

Station	Type	Quantity (CuYd)
509+30	RCBC	#
671+00	Pipe	#
687+79*	RCBC	#
1015+15	RCBC	#

Quantity is shown in the Table for Mainline Culvert Work.

***** The excavation quantity includes excavation for the installation of the new RCBC at Station 687+99.

EXCAVATION FOR SHALLOW PIPE CULVERT REMOVAL

Unclassified Excavation is required for removal of shallow pipes. Shallow pipes are existing mainline pipes at depths of less than 10 feet (measured from the flow line to the lowest elevation of either the existing ground line, undercut line, or bottom of removed or salvaged surfacing).

This work shall be completed prior to the commencement of cold milling operations on the project.

After the existing pipes have been removed, the new pipe culvert shall be undercut and the undercut backfilled according to the notes for Table of Pipe Culvert Undercut.

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

The minimum testing as shown in M.S.T.R. Section 4.1.E.3.a.1 will be required.

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

EXCAVATION FOR SHALLOW PIPE CULVERT REMOVAL (CONTINUED)

All work necessary to excavate and backfill the deep pipes including labor, equipment, and incidentals shall be incidental to the contract unit price per cubic yard for Unclassified Excavation. Payment for shallow pipe excavation shall be based only on plans quantity and measurement of these excavation quantities during construction shall not be performed.

The cost for asphalt composite installed over the pipe replacement shall be paid for at the contract unit price per ton for Asphalt Concrete Composite.

The cost for Base Course installed over the pipe replacement shall be paid for at the contract unit price per ton for Base Course.

Pipe flowline shall match that of existing pipe. This may require that ditches be excavated in each direction from the pipe ends to maintain proper water flow through the pipe. The excavated material shall become the property of the Contractor for his disposal. Cost associated with this work shall be incidental to the contract unit price per cubic yard for Contractor Furnished Borrow.

The quantities computed for excavation of the shallow pipe are based on the limits shown in the Layout of Embankment and Surfacing at Shallow Culverts Being Placed.

TABLE OF EXCAVATION FOR SHALLOW PIPE REMOVAL

Station	Type	Quantity (CuYd)
641+50	Pipe	#
714+05	Pipe	#
776+00	Pipe	#
790+58	Pipe	#

Quantity is shown in the Table for Mainline Culvert Work.

TABLE OF PIPE CULVERT UNDERCUT

The Table of Pipe Culvert Undercut is intended to be used to establish an estimated quantity of Pipe Culvert Undercut for bidding purposes only. The depth of undercut is an estimate and the actual depth necessary shall be determined during construction. The Engineer will determine how much undercut shall be done in accordance with Section 421 of the Specifications, but will not reduce the undercut to less than one foot in depth. Compaction of the undercut backfill will be in accordance with Section 421.3.A.

Station	Undercut Depth (Ft)	Pipe Culvert Undercut (CuYd)	Non-woven Geotextile Separator (SqYd)	Base Course (Ton)
509+30	2	158	327	316
641+50	1	25	-	50
671+00	1	29	-	58
714+05	1	22	-	44
776+00	1	21	-	42
790+58	1	23	-	46
1015+15	2	77	147	154
	Total:	355	474	710*

*Quantity is included in the Table of Additional Quantities.

When calculating pipe culvert undercut, the length of pipe ends should be included in the overall pipe length.

TABLE OF PIPE CULVERT UNDERCUT (CONTINUED)

A layer of Non-woven Geotextile Separator shall be placed at the bottom of the undercut at Station 509+30 and 1015+15 prior to backfilling with granular material.

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

The geotextile will be placed at taut as possible with minimal wrinkles. Placement will be done so that subsequent granular cover material does not shove, wrinkle or distort the in place geotextile. The overlaps will be shingled in a manner that assures granular material will not be forced under the geotextile during backfilling operations. The geotextile may be held in place with small piles of granular material or staples. No traffic will be allowed on the uncovered geotextile. The granular material shall be placed in lifts not exceeding 6 inch loose depth and compacted to 95% maximum dry density as determined by the Specified Density Method.

Geotextile Specification:

The geotextile will conform to specification for Geotextiles and Impermeable Plastic Membrane, Non-woven Geotextile Separator (Section 831.1). The geotextile will be on the Approved Products List for this material or will be certified by the supplier to meet this specification prior to installation.

Geotextile will be paid for at the contract unit price per square yard for Non-woven Geotextile Separator. 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 geotextile only.

The subsurface soils from the shoulder of the road at station 509+30 consist of brown to gray silt-clay to 4' below existing flow line. Classification results of soil samples collected from below flow line during the subsurface investigation were sand-clay to clay-silt.

The culvert will be bedded in accordance with Section 450.3.F.2, Class B Bedding with the following exception. The undercut area shall extend two feet from the outermost diameter on both sides of the pipe with the back of the excavated area being sloped 2:1 upward to the top of the roadway surface. The Select Granular Backfill for the Class B Bedding will conform to the specification for Base Course.

Pipe Culvert Undercut shall be paid for at the contract unit price per Cubic Yard for Pipe Culvert Undercut.

Base Course for the undercut backfill will be paid for at the contract unit price per ton for Base Course.

CONTRACTOR FURNISHED BORROW

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

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

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

Compaction of the fill material shall be to the satisfaction of the Engineer.

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

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

EXCAVATION OF UNSTABLE MATERIAL

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

Backfill shall be paid for at the contract unit price per ton for Base Course, Salvaged Asphalt Mix.

BASE COURSE, SALVAGED ASPHALT MIX

Base Course, Salvaged Asphalt Mix shall be obtained from milled material on the project and may be used without further testing.

If necessary, water shall be added to the Base Course, Salvaged Asphalt Mix to bring the material to ±2% of optimum moisture at the time of compaction. Compaction shall be to the satisfaction of the Engineer.

Material obtained from Cold Milling Asphalt Concrete operations shall be used as Base Course, Salvaged Asphalt Mix.

Base Course, Salvaged Asphalt Mix placed on the mainline and/or shoulders shall be compacted according to Section 260.3.B. of the specifications except that a pneumatic tired roller will be required.

Included in the Estimate of Quantities are 100 tons per mile of Base Course, Salvaged Asphalt Mix and 1 MGal per mile of Water for Granular Material for backfill of the Unclassified Excavation, Digouts.

To ensure water can drain from the digout, the Base Course, Salvaged Asphalt Mix shall be placed so that it is daylighted to the inslope. If the material cannot be daylighted to the inslope, a drain tube shall be placed at the bottom of the digout and an outlet provided to the closest available point. Cost for the drain tube and associated work shall be incidental to the contract unit price per ton for Base Course, Salvaged Asphalt Mix.

WATER FOR COMPACTION

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

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

COLD MILLING ASPHALT CONCRETE

The Los Angeles Abrasion Loss value of the aggregate used for the in place asphalt concrete could not be determined.

Cold Milling is estimated to produce 17549 tons of salvaged asphalt concrete material. An estimated 4856 tons of salvaged asphalt concrete will be used in the Class Q2R Hot Mixed Asphalt Concrete mixture. An estimated 2411 tons of salvaged asphalt concrete will be used as Base Course, Salvaged Asphalt Mix. The Contractor is responsible to assure enough salvaged asphalt concrete is available for the Class Q2R Hot Mixed Asphalt Concrete. The remaining 10282 tons of salvaged asphalt concrete shall be blended, hauled and stockpiled. Estimated quantities are for information purposes only and the exact quantity will be determined upon construction. No allowance will be made for loss of expected reimbursement or loss of anticipated profit.

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

Milled material achieved for project use and/or other uses is based on the dimensions given in the typical section. Field conditions will vary from that given in the typical section. Therefore, the Contractor will be required to adjust the mill depth, as necessary, to provide the quantity of milled material specified by the plans.

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

In areas where maintenance patches have raised and/or widened the road, additional asphalt concrete shall be milled to provide a uniform typical section from centerline to the edge of the finished shoulder. Milling shall be daylighted to the outside edge of the roadway.

TABLE OF MAINTENANCE PATCHES

STA TO STA	AVERAGE WIDTH	AVERAGE DEPTH
634+20 to 637+85 (EBL)	12’	1”
656+40 to 660+90 (EBL)	12’	1”
733+85 to 736+00 (EBL)	12’	1”
885+70 to 888+65 (EBL)	12’	1”
1040+15 to 1043+70 (EBL)	12’	1”
1054+15 to 1058+05 (EBL)	12’	1”
1064+70 to 1074+80 (EBL)	12’	1”

Cost for cold milling to remove the additional depth of the maintenance patches shall be incidental to the contract unit price per square yard for Cold Milling Asphalt Concrete.

COLD MILLING ASPHALT CONCRETE (CONTINUED)

Additional full width maintenance patches (not listed in the Table of Maintenance Patches) exist on SD38. At these locations, the Contractor will be required to mill a 40’ long taper at both ends of the maintenance patch. Milling depth on the maintenance patch (between the tapers) will remain at the same depth shown on the typical section. Cost for milling these transitions shall be incidental to the contract unit price per square yard for Cold Milling Asphalt Concrete.

Intersecting gravel roads and streets shall be milled back an additional ten feet from the edge of the mainline milling so that additional surfacing may be placed at these locations.

Intersecting asphalt roads, streets and entrances shall be milled back to the right of way so that they may be resurfaced.

COLD MILLING TAPERS

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

The surface shall be milled full roadway width.

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

Taper depth of Cold Milling at locations shown below:

STA	LOCATION	SIZE
1029+40.84	Begin Bridge	190’ long X 30’ wide
1030+29.17	End Bridge	190’ long X 30’ wide

GRANULAR MATERIAL, FURNISH

Granular Material for blending stockpile material shall be Base Course meeting the requirements of Section 882 of the specifications except that the material may not be produced from a ledge rock source.

BLEND, HAUL AND STOCKPILE GRANULAR MATERIAL

Milled material not reused on the project shall be hauled to the State stockpile site located in the SDDOT Maintenance Yard in Salem in Section 24, T 103 N, R 55 W. A computerized scale along with a scale operator shall be provided by the Contractor at the State stockpile site to weigh milled material prior to blending.

Milled material shall be blended and stockpiled at the State stockpile site with Granular Material, Furnish at a rate of 50% milled material and 50% Granular Material, Furnish to obtain stockpile material. Prior to incorporation into the stockpile, milled material shall be run over a 1½” screen to remove large chunks. Large chunks shall become the property of the Contractor and shall be subtracted from the overall quantity. No further testing of the material will be required. The use of a pugmill to blend the material will be accepted.

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

Cost for hauling, weighing, stockpiling, and blending milled material with Granular Material, Furnish shall be included in the contract unit price per ton for Blend, Haul and Stockpile Granular Material.

SAWING IN EXISTING SURFACING

Where new asphalt concrete is placed adjacent to existing asphalt concrete or concrete pavement, the existing asphalt concrete or concrete pavement shall be sawed full depth to a true line with a vertical face. No separate payment will be made for sawing.

CLASS Q2R HOT MIXED ASPHALT CONCRETE

Asphalt concrete aggregate shall consist of salvaged asphalt concrete and virgin mineral aggregate.

Virgin mineral aggregate for Class Q2R Hot Mixed Asphalt Concrete shall conform to the requirements of the Special Provision for Gyratory Controlled Quality Control/Quality Assurance Specifications for Hot Mixed Asphalt Concrete Pavement for Class Q2.

Salvaged asphalt concrete shall be obtained from the material produced by cold milling and may be used without further testing. Salvaged asphalt concrete shall be crushed so that the maximum particle size in the cold feed will not exceed 1½ inches.

Class Q2R Hot Mixed Asphalt Concrete shall include 20% salvaged asphalt concrete in the mixture. Job mix formula tolerances for the salvaged asphalt concrete shall be ±5% from the target value.

The mix design criteria for the Class Q2R Hot Mixed Asphalt Concrete shall conform to the requirements of the Special Provision for Class Q2. Gyratory Compaction Effort shall be as shown in the following table:

Gyratory Compactive Effort:

	$N_{initial}$	N_{design}	$N_{maximum}$
Class Q2	6	50	75

All remaining requirements of the Special Provision for Class Q2 Hot Mixed Asphalt Concrete shall apply.

Asphalt concrete placed on the shoulders will not be compacted to a specified density. The shoulders shall be compacted using the same rolling pattern used on the adjacent mainline asphalt concrete or as directed by the Engineer.

All other requirements for Class Q2 Asphalt Concrete shall apply.

FLUSH SEAL

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

ADDITIONAL QUANTITIES

Included in the Estimate of Quantities are 100 tons of Class Q2R Hot Mixed Asphalt Concrete, 4.5 tons of PG 58-34 Asphalt Binder and 1 ton of Hydrated Lime per mile for spot leveling, strengthening and repair of the existing surface.

Included in the Estimate of Quantities are 6 tons of SS-1h or CSS-1h Asphalt for Tack for surface repair and leveling areas throughout the project. (Rate = 0.05 gallon per square yard).

ASPHALT CONCRETE BLADE LAID

Included in the Estimate of Quantities are 150 tons of Asphalt Concrete Blade Laid, 11.1 tons of PG 58-34 Asphalt Binder, 1.5 tons of Hydrated Lime and 3 tons of SS-1h or CSS-1h Emulsified Asphalt for Tack (Rate = 0.05 gallon per square yard) per mile and shall be tight bladed on the existing surface 24' wide prior to the overlay. A sufficient amount of material shall be kept in front of the blade to fill and level all joints, cracks and other surface irregularities.

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

A paver may be used to place the material provided it is equipped with a solid screed bar plate measuring a minimum of 12" wide by 1 ½" thick that forces the mixture into the joints and cracks to adequately level and fill them while not exceeding the application rate set up in the plans.

Mineral Aggregate for tight bladed material shall use only the fine aggregate components combined in the same proportions as the Class Q2R Hot Mixed Asphalt Concrete mix. No quality testing will be done on any of the coarse aggregate (+No. 4 sieve) in the mix.

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

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

ASPHALT CONCRETE COMPOSITE

Virgin mineral aggregate for the Asphalt Concrete Composite shall conform to the requirements for Class E, Type 1.

Asphalt Concrete Composite may include up to 20 percent salvaged asphalt concrete (RAP) in the mixture.

RAP, if used in the mixture, shall be obtained from milled material produced on this project, may be used without further quality testing and shall meet the following requirements:

Job mix formula tolerances for the RAP shall be ± 5% from the target value.

RAP shall be introduced into the drum and combined with the virgin aggregate so that the RAP does not come into direct contact with the burner flame. Asphalt binder shall be added to the mixture in the drum after the aggregates have been combined.

RAP shall be crushed to provide a homogenous mixture of material so that the maximum particle size in the cold feed will not exceed 1½ Inches (37.5mm).

Salvaged asphalt mix, virgin aggregate material and asphalt binder shall be mixed by a conventional hot mix batch plant or a drum mix type hot plant.

The asphalt binder used in the mixture shall be PG 58-28, PG 58-34, PG 64-22, PG 64-28 or PG 64-34 Asphalt Binder.

All other requirements in the specifications for Asphalt Concrete Composite shall apply.

RUMBLE STRIPES

INSTALLATION:

Rumble stripes shall be constructed according to the details of Standard Plate 320.20.

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

Rumble stripes shall not be installed on bridge decks, through curb & gutter sections, through mailbox turnouts, through intersecting roads or through approaches. They also shall not be placed within 50 feet of any railroad crossing.

Gaps for rumble stripes installation as detailed on the standard plates are included with the measurement and payment.

Cost for asphalt concrete rumble stripes shall be included in the contract unit price per mile for Grind 8" Rumble Strip or Stripe in Asphalt Concrete.

ROADWAY CLEANING:

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

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

FLATTENING SLOPES ON APPROACHES

The new slope construction on all approaches shall end within two feet of the right-of-way line.

CULVERT CLEANOUT

Material in existing culverts (approach and mainline culverts) as listed in the Table for Mainline Culvert Work and Slope Flattening of Intersecting Roads, Approaches & Ditch Blocks shall be cleaned out by water flushing or other approved methods.

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

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

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

DITCH RESTORATION

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

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

REMOVING CORRUGATED METAL PIPE

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

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

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

CORRUGATED METAL PIPE

Corrugated metal pipes shall have 2 ⅔-inch X ½-inch corrugations for 42-inch and smaller round pipe and 48-inch and smaller arch pipe unless otherwise stated in the plans. Corrugated metal pipes shall have 3-inch X 1-inch or 5-inch X 1-inch corrugations for 48-inch and larger round pipe and 54-inch and larger arch pipe unless otherwise stated in the plans.

The gauge of the corrugated metal elbows, tees and ends shall match the thickest gauge of corrugated metal pipe it is connected to.

PIPE FOR APPROACHES AND INTERSECTING ROADS

Class II reinforced concrete pipe and high density polyethylene pipe may be substituted for corrugated metal pipe at approaches and intersecting roads at no additional cost to the State.

Acceptance of high-density polyethylene pipe will be by certification.

The end sections for the high density polyethylene pipe shall be metal, conform to the type of end section as shown in the plans, and be compatible with the high-density polyethylene pipe.

TIE BOLTS FOR RCP/RCP ARCH CULVERTS

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

For informational purposes:

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

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

CULVERT EXTENSION OPTION

Whenever Concrete to Metal Pipe Transitions and/or Smooth Tapered Sleeves are specified with CMP/CMP ARCH extensions and end sections, the Contractor may elect to perform the extension using all RCP/RCP ARCH including end sections. It will be the responsibility of the Contractor to include the cost for using this option in the contract unit prices for the effected culvert items in the Estimate of Quantities.

INSLOPE TRANSITIONS

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

TABLE OF INSLOPE TRANSITIONS

Station	Side
509+30	Lt & Rt
586+02	Lt & Rt
687+99	Lt & Rt
925+65	Rt

WORK ADJACENT TO EXISTING GUARDRAIL

Beam guardrail exists at numerous locations along the shoulders of the project. The Contractor shall conduct operations so as not to disturb the existing guardrail. Any guardrail disturbed / damaged due to the Contractor's operations shall be replaced by the Contractor at no expense to the State.

TABLE OF FENCE QUANTITIES

LOCATION	REMOVE FENCE FEET	TYPE 1 TEMPORARY FENCE FEET	TYPE 2 RIGHT OF WAY FENCE FEET	TYPE 3 RIGHT OF WAY FENCE FEET	2 POST PANEL EACH
509+30 Lt	175	-	300	-	4
656+00 Lt	100	200	-	100	2
687+99 Rt	300	400	300	-	4
TOTALS:	**575**	**600**	**600**	**100**	**10**

REFURBISH SINGLE MAILBOXES

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

STATION	CONTRACTOR FURNISHED BORROW CU.YDS.	BASE COURSE SALVAGED ASPHALT MIX TONS	CLASS Q2R HOT MIXED ASPHALT CONCRETE TONS	REFURBISH SINGLE MAILBOX EACH
576+95 Lt	-	-	-	1
585+80 Lt	60	15	8	1
607+17 Lt	No Work			
692+60 Lt	-	-	-	1
746+52 Rt	-	-	-	1
815+34 Lt	100	15	8	1
843+40 Lt	100	15	8	1
973+80 Rt	No Work			
1023+12 Rt	150	15	8	1
1033+36 Rt	150	15	8	1
TOTALS:	**560**	**75**	**40**	**8**

The Contractor will be responsible for maintaining a temporary mailbox until the mailbox is reset.

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

PERMANENT SEEDING AND MULCHING

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

All permanent seed shall be planted in the topsoil at a depth of ¼" to ½".

All seed broadcast must be raked or dragged in (incorporated) within the top ¼" to ½" of topsoil when possible. This requirement may be waived by the Engineer during construction when raking or dragging is deemed not feasible by conventional methods.

The varieties listed for seed mixtures are preferred varieties.

Native harvest seed will be allowed.

Type G Permanent Seed Mixture shall consist of the following:

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

Bales with noxious weed contamination will be rejected and the Contractor will be required to remove the contaminated bales from the project.

The areas to be seeded and mulched are estimated at 10.9 acres.

DRILLS

In addition to the drills specified in Section 730 of the Specifications, other types of drills including no-till drills will be allowed as long as they have baffles, partitions, agitators, or augers which keep the seed distributed throughout the seed box and the seed is planted at a depth of ¼" to ½".

MYCORRHIZAL INOCULUM

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

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

All seed shall be inoculated by the seed supplier with a minimum of 100,000 live propagules of mycorrhizal fungi per acre. All costs of inoculating the seed shall be incidental to the contract unit price per pound for the corresponding permanent seed mixture.

LOW FLOW SILT FENCE

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

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

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

The quantity of Low Flow Silt Fence shown in the table is for temporary sediment control. Placement of Silt Fence shall be directed by the Engineer.

TABLE OF LOW FLOW SILT FENCE

Station	L/R	Location	Quantity (Ft)
509+30	L	96” RCP Arch	200
509+30	R	96” RCP Arch	200
687+99	L	14’x7’ Box Culvert	200
687+99	R	14’x7’ Box Culvert	200
		Total:	800

MUCKING SILT FENCE

Mucking silt fence shall consist of removing muck trapped by the silt fence and spreading the material evenly over the adjacent area to conform to the existing grade.

REMOVE SILT FENCE

The Silt Fence shall be removed after seeding is completed and shall be replaced with what is shown on the Erosion Control layouts.

EROSION CONTROL WATTLE

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

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

Erosion control wattles shall remain on the project to decompose.

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

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

TABLE OF EROSION CONTROL WATTLE

Station	L/R	Diameter (Inch)	Location	Quantity (Ft)
509+30	L	12	96” RCP Arch	470
509+30	R	12	96” RCP Arch	470
687+99	L	12	14’x7’ Box Culvert	485
687+99	R	12	14’x7’ Box Culvert	485
			Total:	1910

EROSION CONTROL BLANKET

Erosion control blanket shall be installed at the locations noted in the table and at locations determined by the Engineer during construction.

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

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

The Contractor shall install erosion control blanket according to the manufacturer’s installation instructions.

Ditch shaping as noted in the Standard Plate will not be required.

TABLE OF EROSION CONTROL BLANKET

Station	L/R	Location	Type	Quantity (SqYd)
509+30	L	96” RCP Arch	2	14
509+30	R	96” RCP Arch	2	14
687+99	L	14’x7’ Box Culvert	2	14
687+99	R	14’x7’ Box Culvert	2	14
			Total:	56

INSTALLATION OF TYPE 2 OBJECT MARKERS AT ROADSIDE OBSTACLES

Type 2 Object Markers and posts shall be furnished and installed by the Contractor at the locations shown in the table below:

STATION	DESCRIPTION	TYPE 2 OBJECT MARKER (EACH)	TYPE 2 OBJECT MARKER BACK TO BACK (EACH)	REMOVE & RESET TYPE 2 OBJECT MARKER BACK TO BACK (EACH)
509+30	96” RCP Arch	4	-	-
519+35	24” RCP	-	-	2
533+00	Twin 24” RCP	4	-	-
586+02	30” RCP	4	-	-
611+13	36” RCP	4	-	-
636+50	18” RCP	-	-	2
641+50	24” RCP	-	1 Lt	1 Rt
656+00	30” RCP	2 Rt	-	-
663+75	18” RCP	-	-	2
671+00	24” RCP	-	-	2
680+00	18” RCP	-	-	2
687+99	14’x7’ RCBC	4	-	-
697+16	24” RCP	-	-	2
714+05	24” RCP	-	1 Rt	1 Lt
718+92	30” RCP	4	-	-
728+32	18” RCP	-	-	2
748+46	24” CMP	-	-	2
776+00	24” RCP	-	-	2
790+58	24” RCP	-	-	2
819+42	18” RCP	-	-	2
833+52	18” RCP	-	-	2
840+76	18” RCP	-	-	2
848+58	30” RCP	-	-	2
861+00	Twin 24” RCP	4	-	-
906+30	24” RCP	-	-	2
915+96	24” CMP	-		2
925+65	30” CMP	4	-	-
945+00	24” RCP	-	-	2
949+50	18” RCP	-	-	2
970+03	18” RCP	-		2
974+94	24” RCP	-	1 Lt	1 Rt
1015+15	54” RCP Arch	4	-	-
1051+37	18” RCP	-	-	2
1054+24	18” RCP	-	1 Rt	1 Lt
1063+00	18” RCP	-	-	2
1071+27	18” RCP	-	-	2
1084+77	Twin 24” RCP	4	-	-
	TOTAL:	**42**	**4**	**48**

At locations where culvert end marker posts are in place, the Contractor shall remove the culvert end marker posts and haul and stockpile the posts to the Department of Transportation Maintenance Yard at Salem.

Costs for salvaging and hauling existing end markers shall be incidental to the contract unit price per each for Type 2 Object Marker Back to Back or Type 2 Object Marker.

At locations where Type 2 Object Markers are in place and culvert work will be performed, the Contractor shall remove and reset the existing Type 2 Object Marker.

Costs for removing and resetting existing Type 2 Object Markers shall be included in the contract unit price per each for Remove, Salvage, Relocate and Reset Traffic Sign.

STORM WATER POLLUTION PREVENTION PLAN CHECKLIST

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

❖ SITE DESCRIPTION (4.2 1)

- **Project Limits: See Title Sheet (4.2 1.b)**
- **Project Description: See Title Sheet (4.2 1.a.)**
- **Site Map(s): See Title Sheet and Plans (4.2 1.f. (1)-(6))**
- **Major Soil Disturbing Activities** (check all that apply)
  - ☐ Clearing and grubbing
  - ☒ Excavation/borrow
  - ☐ Grading and shaping
  - ☐ Filling
  - ☒ Cutting and filling
  - ☐ Other (describe):
- **Total Project Area** 135 Acres **(4.2 1.b.)**
- **Total Area To Be Disturbed** 10.9 Acres **(4.2 1.b.)**
- **Existing Vegetative Cover (%)**
- **Soil Properties:** AASHTO Soil or USDA-NRCS Soil Series Classification **(4.2 1. d.)**
- **Name of Receiving Water Body/Bodies** Wolf Creek and its' tributaries & West Fork Vermillion River and its' tributaries **(4.2 1.e.)**

❖ ORDER OF CONSTRUCTION ACTIVITIES (4.2 1.c.)

(Stabilization measures shall be initiated as soon as possible, but in no case later than 14 days after the construction activity in that portion of the site has temporarily or permanently ceased. Initiation of final or temporary stabilization may exceed the 14-day limit if earth disturbing activities will be resumed within 21 days.)

- **Remove and store topsoil.**
- **Place Silt Fence as directed by the Engineer.**
- **Perform work necessary to replace Box Culverts.**
- **Replace topsoil.**
- **Reseed topsoil and areas disturbed by removal activities**.
- **Place Erosion Control Blanket and Wattles as shown on the layouts.**
- **Remove Silt Fence.**

❖ EROSION AND SEDIMENT CONTROLS (4.2 2.a.(1)(a)-(f))

(Check all that apply)

- **Stabilization Practices (See Detail Plan Sheets)**
  - ☐ Temporary Seeding (Cover Crop Seeding)
  - ☒ Permanent Seeding
  - ☐ Sodding
  - ☐ Planting (Woody Vegetation for Soil Stabilization)
  - ☒ Mulching (Grass Hay or Straw)
  - ☐ Hydraulic Mulch (Wood Fiber Mulch)
  - ☐ Soil Stabilizer
  - ☐ Bonded Fiber Matrix
  - ☒ Erosion Control Blankets or Mats
  - ☐ Vegetation Buffer Strips
  - ☐ Roughened Surface (e.g. tracking)
  - ☐ Dust Control
  - ☐ Other:
- **Structural Temporary Erosion and Sediment Controls**
  - ☒ Silt Fence
  - ☐ Floating Silt Curtain
  - ☐ Straw Bale Check
  - ☐ Temporary Berm
  - ☐ Temporary Slope Drain
  - ☒ Straw Wattles or Rolls
  - ☐ Turf Reinforcement Mat
  - ☐ Rip Rap
  - ☐ Gabions
  - ☐ Rock Check Dams
  - ☐ Sediment Traps/Basins
  - ☐ Inlet Protection
  - ☐ Outlet Protection
  - ☐ Surface Inlet Protection (Area Drain)
  - ☐ Curb Inlet Protection
  - ☐ Stabilized Construction Entrances
  - ☐ Entrance/Exit Equipment Tire Wash
  - ☐ Interceptor Ditch
  - ☐ Concrete Washout Area
  - ☐ Temporary Diversion Channel
  - ☐ Work Platform
  - ☐ Temporary Water Barrier
  - ☐ Temporary Water Crossing
  - ☐ Other:
- **Wetland Avoidance**

  Will construction and/or erosion and sediment controls impinge on regulated wetlands? Yes ☐ No ☒ If yes, the structural and erosion and sediment controls have been included in the total project wetland impacts and have been included in the 404 permit process with the USACE.
- **Storm Water Management (4.2 2.b., (1) and (2))**

  Storm water management will be handled by temporary controls outlined in "EROSION AND SEDIMENT CONTROLS" above, and any permanent controls needed to meet permanent storm water management needs in the post construction period. Permanent controls will be shown on the plans and noted as permanent.
- **Other Storm Water Controls (4.2 2.c., (1) and (2))**
  - **Waste Disposal**

    All liquid waste materials will be collected and stored in sealed metal containers approved by the project engineer. All trash and construction debris from the site will be deposited in the approved containers. Containers will be serviced as necessary, and the trash will be hauled to an approved disposal site or licensed landfill. All onsite personnel will be instructed in the proper procedures for waste disposal, and notices stating proper practices will be posted in the field office. The general contractor's representative responsible for the conduct of work on the site will be responsible for seeing waste disposal procedures are followed.
  - **Hazardous Waste**

    All hazardous waste materials will be disposed of in a manner specified by local or state regulations or by the manufacturer. Site personnel will be instructed in these practices, and the individual designated as the contractor's on-site representative will be responsible for seeing that these practices are followed.
  - **Sanitary Waste**

    Portable sanitary facilities will be provided on all construction sites. Sanitary waste will be collected from the portable units in a timely manner by a licensed waste management contractor or as required by any local regulations.

❖ Maintenance and Inspection (4.2 3. and 4.2 4.)

- **Maintenance and Inspection Practices**
  - Inspections will be conducted at least one time per week and after a storm event of 0.50 inches or greater.
  - All controls will be maintained in good working order. Necessary repairs will be initiated within 24 hours of the site inspection report.
  - Silt fence will be inspected for depth of sediment and for tears in order to ensure the fabric is securely attached to the posts and that the posts are well anchored. Sediment buildup will be removed from the silt fence when it reaches $^{1}/_{3}$ of the height of the silt fence.
  - Sediment basins and traps will be checked. Sediment will be removed when depth reaches approximately 50 percent of the structure's capacity, and at the conclusion of the construction.
  - Check dams will be inspected for stability. Sediment will be removed when depth reaches ½ the height of the dam.
  - All seeded areas will be checked for bare spots, washouts, and vigorous growth free of significant weed infestations.
  - Inspection and maintenance reports will be prepared on form DOT 298 for each site inspection, this form will also be used to document changes to the SWPPP. A copy of the completed inspection form will be filed with the SWPPP documents.
  - The SDDOT Project Engineer and contractor's site superintendent are responsible for inspections. Maintenance, repair activities are the responsibility of the contractor. The SDDOT Project Engineer will complete the inspection and maintenance reports and distribute copies per the distribution instructions on DOT 298.

❖ Non-Storm Water Discharges (3.0)

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

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

❖ Materials Inventory (4.2. 2.c.(2))

The following materials or substances are expected to be present on the site during the construction period. These materials will be handled as noted under the headings "EROSION AND SEDIMENT CONTROLS" and "SPILL PREVENTION" (check all that apply).

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

❖ **Spill Prevention (4.2 2.c.(2))**

➢ **Material Management**

- Housekeeping
  - Only needed products will be stored on-site by the contractor.
  - Except for bulk materials the contractor will store all materials under cover and in appropriate containers.
  - Products must be stored in original containers and labeled.
  - Material mixing will be conducted in accordance with the manufacturer's recommendations.
  - When possible, all products will be completely used before properly disposing of the container off site.
  - The manufacturer's directions for disposal of materials and containers will be followed.
  - The contractor's site superintendent will inspect materials storage areas regularly to ensure proper use and disposal.
  - Dust generated will be controlled in an environmentally safe manner.
  - Vegetation areas not essential to the construction project will be preserved and maintained as noted on the plans.
- Hazardous Materials
  - Products will be kept in original containers unless the container is not resealable.
  - Original labels and material safety data sheets will be retained in a safe place to relay important product information.
  - If surplus product must be disposed of, manufacturer's label directions for disposal will be followed.
  - Maintenance and repair of all equipment and vehicles involving oil changes, hydraulic system drain down, de-greasing operations, fuel tank drain down and removal, and other activities which may result in the accidental release of contaminants will be conducted on an impervious surface and under cover during wet weather to prevent the release of contaminants onto the ground.
  - Wheel wash water will be collected and allowed to settle out suspended solids prior to discharge. Wheel wash water will not be discharged directly into any storm water system or storm water treatment system.
  - Potential pH-modifying materials such as: bulk cement, cement kiln dust, fly ash, new concrete washings, concrete pumping, residuals from concrete saw cutting (either wet or dry), and mixer washout waters will be collected on site and managed to prevent contamination of storm water runoff.

➢ **Product Specific Practices (6.8)**

- Petroleum Products
  All on-site vehicles will be monitored for leaks and receive regular preventive maintenance to reduce the chance of leakage. Petroleum products will be stored in tightly sealed containers which are clearly labeled.
- Fertilizers
  Fertilizers will be applied only in the amounts specified by the SDDOT. Once applied, fertilizers will be worked into the soil to limit the exposure to storm water. Fertilizers will be stored in an enclosed area. The contents of partially used fertilizer bags will be transferred to sealable containers to avoid spills.
- Paints
  All containers will be tightly sealed and stored when not required for use. The excess will be disposed of according to the manufacturer's instructions and any applicable state and local regulations.
- Concrete Trucks
  Contractors will provide designated truck washout areas on the site. These areas must be self contained and not connected to any storm water outlet of the site. Upon completion of construction washout areas will be properly stabilized.

➢ **Spill Control Practices (4.2 2 c.(2))**

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

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

➢ **Spill Response (4.2 2 c.(2))**

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

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

❖ **Spill Notification**

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

➢ A release or spill of a regulated substance (includes petroleum and petroleum products) must be reported to DENR immediately **if any one of the following** conditions exists:

- The discharge threatens or is in a position to threaten the waters of the state (surface water or ground water).
- The discharge causes an immediate danger to human health or safety.
- The discharge exceeds 25 gallons.
- The discharge causes a sheen on surface water.
- The discharge of any substance that exceeds the ground water quality standards of ARSD (Administrative Rules of South Dakota) chapter 74:51:01.
- The discharge of any substance that exceeds the surface water quality standards of ARSD chapter 74:51:01.
- The discharge of any substance that harms or threatens to harm wildlife or aquatic life.
- The discharge of crude oil in field activities under SDCL (South Dakota Codified Laws) chapter 45-9 is greater than 1 barrel (42 gallons).

To report a release or spill, call DENR at 605-773-3296 during regular office hours (8 a.m. to 5 p.m. Central time). To report the release after hours, on weekends or holidays, call State Radio Communications at 605-773-3231. Reporting the release to DENR does not meet any obligation for reporting to other state, local, or federal agencies. Therefore, the responsible person must also contact local authorities to determine the local reporting requirements for releases. DENR recommends that spills also be reported to the National Response Center at (800) 424-8802.

❖ **Construction Changes (4.4)**

When changes are made to the construction project that will require alterations in the temporary erosion controls of the site, the Storm Water Pollution Prevention Plan (SWPPP) will be amended to provide appropriate protection to disturbed areas, all storm water structures, and adjacent waters. The SDDOT Project Engineer will modify the SWPPP plan (DOT 298) and drawings to reflect the needed changes. Copies of changes will be routed per DOT 298. Copies of forms and the SWPPP will be retained in a designated place for review over the course of the project.

❖ CERTIFICATIONS

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

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

➢ South Dakota Department of Transportation

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

Authorized Signature (See the General Permit, Section 6.7.1.C.)

➢ Prime Contractor

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

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

_____

Authorized Signature

❖ CONTACT INFORMATION

➢ Contractor Information:

- Prime Contractor Name:
- Contractor Contact Name:
- Address:
- Address:
- City: State: Zip:
- Office Phone: Field:
- Cell Phone: Fax:

➢ Erosion Control Supervisor

- Name:
- Address:
- Address:
- City: State: Zip:
- Office Phone: Field:
- Cell Phone: Fax:

➢ SDDOT Project Engineer

- Name:
- Business Address:
- Job Office Location:
- City: State: Zip:
- Office Phone: Field:
- Cell Phone: Fax:

➢ SD DENR Contact Spill Reporting

- Business Hours Monday-Friday (605) 773-3296
- Nights and Weekends (605) 773-3231

➢ SD DENR Contact for Hazardous Materials.

- (605) 773-3153

➢ National Response Center Hotline

- (800) 424-8802.

SEQUENCE OF OPERATIONS

The following Sequence of Operations shall be followed by the Contractor unless an alternate Sequence of Operations is submitted in writing two weeks prior to the preconstruction meeting and approved by the Engineer.

Phase 1

Install road closure/detour traffic control in accordance with the plan details and close State Highway 38 to traffic.

Complete box culvert and pipe work.

Install temporary surfacing, pavement markings, and signing at locations of box culvert and pipe work.

Remove road closure/detour traffic control and reopen State Highway 38 to traffic.

Phase 2

Install one lane road closures, shoulder closures, and off roadway work traffic control when applicable in accordance with the plan details.

Complete flattening of slopes on approaches.

Perform cold milling of asphalt surfacing work.

Complete asphalt concrete resurfacing and flush seal.

Install permanent pavement markings.

Complete landscaping and cleanup work.

Remove all traffic control devices upon project completion.

Phases 1 and 2 may be worked concurrently.

MAINTENANCE OF TRAFFIC

Once the work required of Phase 1 has begun, the work shall be pursued to completion without interruption to minimize the road closure time of State Highway 38.

The Contractor shall maintain access to residences at all times. Work on pipe between Sta. 682+59.0 to Sta. 772+00 shall not be completed simultaneously with work on pipe between Sta. 772+00 to Sta. 788+76.1.

Road closure/detour traffic control shall be used during Phase 1 box culvert and pipe work.

Upon completion of the box culvert and pipe work, the road shall be opened and traffic shall be maintained at all times.

The Contractor shall cover or remove permanent signing that conflicts with project traffic control. Removing, relocating, covering, salvaging and resetting of permanent traffic control devices, including delineation, shall be the responsibility of the Contractor. Cost for this work shall be incidental to the contract unit prices for the various items unless otherwise specified in the plans. Any delineators and signs damaged or lost shall be replaced by the Contractor at no cost to the State.

Storage of vehicles and equipment shall be outside the clear zone and as near as possible to the right-of-way line. Contractor's employees should mobilize at a location off the right-of-way and arrive at the work sites in a minimum number of vehicles necessary to perform the work.

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

The Contractor shall provide documentation that all breakaway sign supports comply with FHWA NCHRP 350 or MASH crash-worthy requirements. The Contractor shall provide installation details at the preconstruction meeting for all breakaway sign support assemblies.

TEMPORARY PAVEMENT MARKING

The total length of no passing zone on this project is estimated to be 2.9 miles.

It is estimated that 14 DO NOT PASS and 13 PASS WITH CARE signs will be required to mark the no passing zones, should the Contractor elect to use these signs.

Use of DO NOT PASS and PASS WITH CARE signs will be allowed for a two week duration.

Cost for furnishing, installing and removing the DO NOT PASS and PASS WITH CARE signs shall be incidental to the contract unit price per mile for Temporary Pavement Marking.

Temporary road markers may be used. If used, the Contractor shall remove and dispose of them after Permanent Pavement Marking is applied. Method of removal shall be nondestructive to the road surface and shall be accomplished within one week of completion of the Permanent Pavement Marking.

Temporary road markers shall be required on the top lift of asphalt surfacing.

Cost for furnishing, applying, uncovering, removing and disposing of the Temporary Road Markers shall be included in the contract unit price per mile for Temporary Pavement Marking.

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

Cost for the traffic control to install and remove the Temporary Road Markers shall be incidental to the contract unit price per mile for Temporary Pavement Marking.

PERMANENT PAVEMENT MARKING

The Contractor shall advise the Engineer a minimum of 2 weeks prior to the application of the permanent pavement marking to allow the State to check and mark the location of no passing zones.

Application of permanent pavement marking shall be completed within 14 days following completion of the final surfacing.

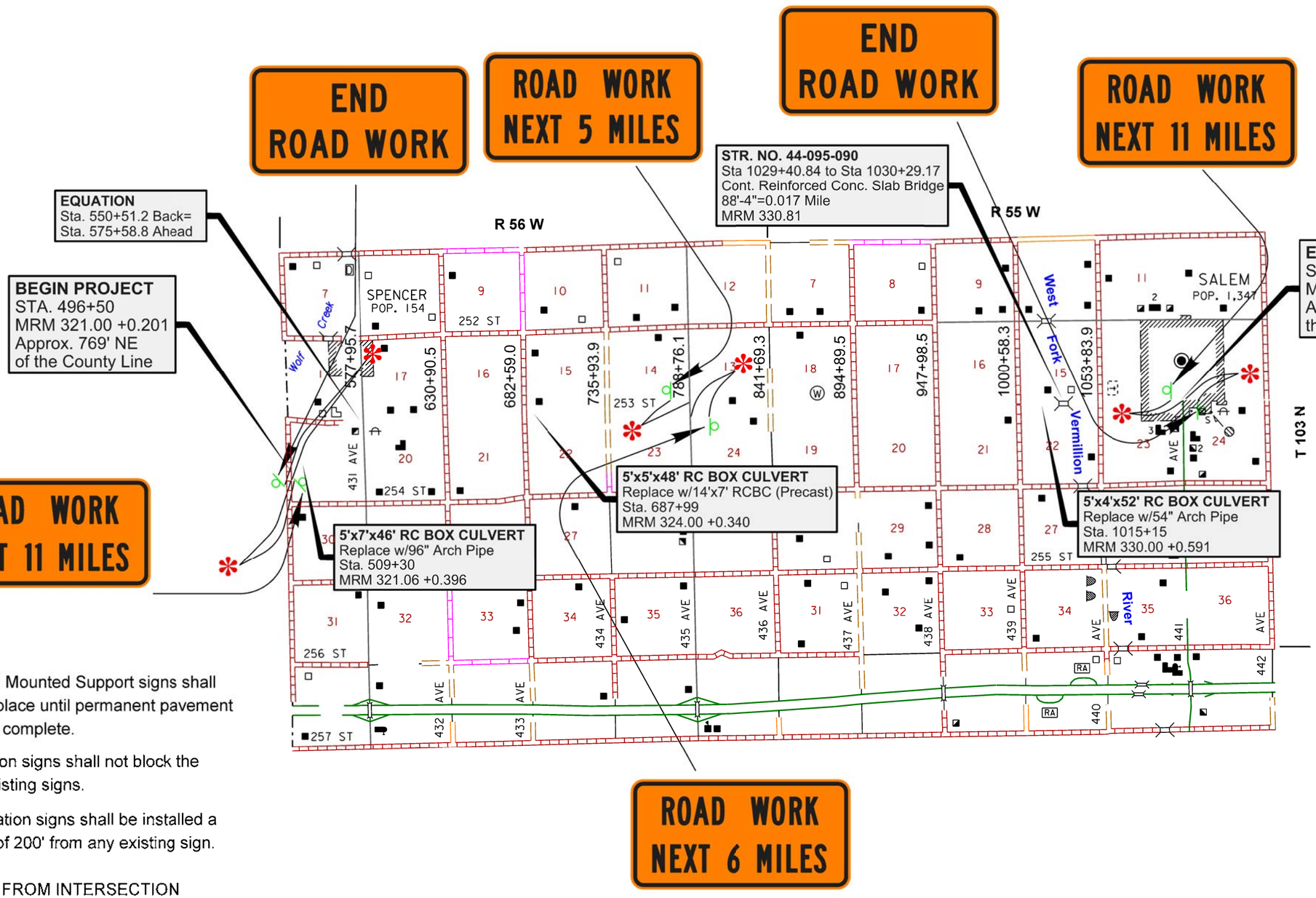
Cost for the two word STOP AHEAD message eastbound on SD38 in advance of US 81 in Salem shall be included in the contract unit price per word for Cold Applied Plastic Pavement Marking, Message.

TRAFFIC CONTROL

FIXED LOCATION SIGNING

N
W E
S

NO SCALE



NOTES :

All Ground Mounted Support signs shall remain in place until permanent pavement marking is complete.

Construction signs shall not block the view of existing signs.

Fixed Location signs shall be installed a minimum of 200' from any existing sign.

✻ - 25' to 100' FROM INTERSECTION

DETOUR/CLOSURE SIGNING

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0038(43)321	27	80

Plotting Date: 11/13/2014

PLOT SCALE - 1:6400

PLOT NAME - 2

PLOTTED FROM - TRM1INT17

FILE - ...\MCCK03T6 TRAFFIC CONTAINER.DGN

NO SCALE

TAB ON EXISTING
Spencer
90 3
Spencer 4
Mitchell 18
(EXISTING)

TAB ON EXISTING
Spencer 4
Epiphany 10
90 2
(EXISTING)

SHOULDER MOUNT 400' IN ADVANCE OF EXISTING STOP AHEAD

DETOUR EAST 38 (EXISTING)

DETOUR AHEAD

JCT 38 (EXISTING)

(EXISTING) STOP

SHOULDER MOUNT AT EXISTING

DETOUR EAST 38 (EXISTING) 25 (EXISTING) 38 COVER EXISTING

(EXISTING)

WEST 38 (EXISTING)

END DETOUR

DETOUR AHEAD

DETOUR EAST 38

SHOULDER MOUNT AT EXISTING

NO PASSING ZONE (EXISTING)

Spencer
Salem

SHOULDER MOUNT MIDWAY BETWEEN EXISTING D-BOARD AND ROUTE MARKER ASSEMBLY

(EXISTING) 25 38 COVER EXISTING

DETOUR EAST 38

SHOULDER MOUNT AT EXISTING

SOUTH 25 (EXISTING)

DETOUR EAST 38

SHOULDER MOUNT AT EXISTING

STOP (EXISTING)

DETOUR WEST 38

SHOULDER MOUNT 400' IN ADVANCE OF EXISTING STOP AHEAD

(EXISTING)

ROAD CLOSED
3 MILES AHEAD
LOCAL TRAFFIC ONLY
DETOUR

ROAD CLOSED
3 MILES AHEAD
LOCAL TRAFFIC ONLY
DETOUR

DETOUR WEST 38 (EXISTING) 25 38 COVER EXISTING

SHOULDER MOUNT AT EXISTING

FARMER
POP. 10

25

253 ST

430 AVE

SPENCER
POP. 154

38

ROAD CLOSED

INSTALL 1200' EAST OF 430 AVE

ROAD CLOSED 1000 FT

ROAD CLOSED 500 FT

INSTALL IN ADVANCE OF CLOSURE

431 AVE

ROAD CLOSED

INSTALL 1200' SOUTH OF 253 STREET

ROAD CLOSED 1000 FT

ROAD CLOSED 500 FT

INSTALL IN ADVANCE OF CLOSURE

SEE SHEET 2 of 2 >

INTERSTATE 90

EXIT 350

EXIT 353

DETOUR EAST 38

SHOULDER MOUNT AT EXISTING

SOUTH 25 (EXISTING)

WEST 90

Spencer
Salem

SHOULDER MOUNT 250'± IN ADVANCE OF EXISTING ROUTE MARKER ASSEMBLY

DETOUR EAST 38

SHOULDER MOUNT AT EXISTING

EAST 90 (EXISTING)

TO 38
Alexandria
Sioux Falls
(EXISTING)

38 EAST
CLOSED
DETOUR
90 EAST

SHOULDER MOUNT MIDWAY BETWEEN EXISTING ROUTE MARKER ASSEMBLY AND EXISTING D-BOARD.

25 Emery Farmer (EXISTING)

25 Emery Farmer 1 MILE (EXISTING)

DETOUR WEST 38

SHOULDER MOUNT MIDWAY BETWEEN ADVANCE EXIT DIRECTIONAL AND EXIT DIRECTIONAL

NORTH 25 (EXISTING)

EAST 90

25 (EXISTING)

DETOUR WEST 38

SHOULDER MOUNT AT EXISTING

DETOUR WEST 38

SHOULDER MOUNT AT EXISTING EXIT DIRECTIONAL

DETOUR EAST 38

SHOULDER MOUNT AT EXISTING EXIT DIRECTIONAL

EXIT 353
Spencer Emery
(EXISTING)

DETOUR WEST 38

SHOULDER MOUNT AT EXISTING EXIT DIRECTIONAL

EXIT 353
Spencer
(EXISTING)

DETOUR ROUTE - - - -

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0038(43)321	28	80

Plotting Date: 11/13/2014

DETOUR/CLOSURE SIGNING

NO SCALE

SALEM
POP. 1,347

435 AVE

SEE SHEET 1 of 2

EXIT 357

EXIT 364

SALEM

DOUGLAS ST.

To Montrose
Mitchell
Mitchell
TAB ON EXISTING

DETOUR AHEAD
(EXISTING) JCT 38

TO INTERSTATE 90
COVER EXISTING 38 81
(EXISTING)

SHOULDER MOUNT AT EXISTING
DETOUR WEST 38

TAB ON EXISTING
Mitchell
Mitchell TO INTERSTATE 90 Madison

COVER EXISTING SOUTH 81 38
(EXISTING)

DETOUR WEST EAST 38 38
SHOULDER MOUNT AT EXISTING

DETOUR WEST 38
SHOULDER MOUNT 200'± SOUTH OF SD38

END DETOUR

DETOUR AHEAD
(EXISTING) JCT 81 38

DETOUR EAST 38

ROAD CLOSED 1 MILE AHEAD LOCAL TRAFFIC ONLY
DETOUR

ROAD CLOSED 1 MILE AHEAD LOCAL TRAFFIC ONLY
DETOUR

TAB ON EXISTING
Madison
Mitchell
Montrose

COVER EXISTING NORTH 81 38
{EXISTING}

DETOUR EAST 38
SHOULDER MOUNT AT EXISTING

SHOULDER MOUNT AT EXISTING EXIT DIRECTIONAL
DETOUR EAST 38
EXIT 357
Bridgewater Canova
(EXISTING)

DETOUR WEST 38
SHOULDER MOUNT AT EXISTING EXIT DIRECTIONAL

EXIT 357
Bridgewater Canova
(EXISTING)

435 AVE

SHOULDER MOUNT MIDWAY BETWEEN ADVANCE EXIT DIRECTIONAL AND EXIT DIRECTIONAL
DETOUR EAST 38

SHOULDER MOUNT AT EXISTING EXIT DIRECTIONAL
DETOUR EAST 38
SHOULDER MOUNT AT EXISTING

DETOUR WEST (EXISTING) JCT 90 81

Humboldt
Alexandria
(EXISTING)

Mitchell
SHOULDER MOUNT MIDWAY BETWEEN EXISTING GUIDE SIGN AND ROUTE MARKER ASSEMBLIES

DETOUR WEST 38
SHOULDER MOUNT AT EXISTING

SOUTH 81 WEST 90
(EXISTING)

WEST 90
(EXISTING)

Mitchell
SHOULDER MOUNT 250'± IN ADVANCE OF EXISTING ROUTE MARKER ASSEMBLY

EXIT 364
81
Salem
Yankton
1 MILE
(EXISTING)

EXIT 364
81
Salem
Yankton
(EXISTING)

(EXISTING)

DETOUR EAST 38
(EXISTING) 81
SHOULDER MOUNT BETWEEN EXISTING

NORTH 81 EAST 90
(EXISTING)

38 WEST
CLOSED
DETOUR
90 WEST
SHOULDER MOUNT MIDWAY BETWEEN EXISTING GUIDE SIGN AND ROUTE MARKER ASSEMBLIES

Alexandria
Humboldt
(EXISTING)

DETOUR ROUTE - - - -

PLOT SCALE - 1:6400
PLOTTED FROM - TRMINT17
PLOT NAME - 3
FILE - ...\MCCK0376 TRAFFIC CONTAINER.DGN

SIGN DETAILS

SIGN NUMBER	SPECIAL
WIDTH x HEIGHT	7'-0" X 2'-0"
BORDER WIDTH	1.5"
CORNER RADIUS	3.0"
LEGEND	8" E MODIFIED
BACKGROUND	TYPE: MICROPRISMATIC
	COLOR: FLUORESCENT ORANGE
LEGEND/BORDER	TYPE: OPAQUE
	COLOR: BLACK

SYMBOL	WID	HT
UP ARROW, 90°	8	12

SIGN NUMBER	SPECIAL
WIDTH x HEIGHT	6'-0" X 2'-6"
BORDER WIDTH	1.5"
CORNER RADIUS	4.0"
LEGEND	6" E MODIFIED
BACKGROUND	TYPE: MICROPRISMATIC
	COLOR: FLUORESCENT ORANGE
LEGEND/BORDER	TYPE: OPAQUE
	COLOR: BLACK

SYMBOL	WID	HT
UP ARROW, 90°	6	9

SIGN NUMBER	SPECIAL
WIDTH x HEIGHT	7'-0" X 2'-0"
BORDER WIDTH	1.5"
CORNER RADIUS	3.0"
LEGEND	8" E MODIFIED
BACKGROUND	TYPE: MICROPRISMATIC
	COLOR: FLUORESCENT ORANGE
LEGEND/BORDER	TYPE: OPAQUE
	COLOR: BLACK

SYMBOL	WID	HT
UP ARROW, 270°	8	12

SIGN NUMBER	SPECIAL
WIDTH x HEIGHT	6'-0" X 2'-6"
BORDER WIDTH	1.5"
CORNER RADIUS	4.0"
LEGEND	6" E MODIFIED
BACKGROUND	TYPE: MICROPRISMATIC
	COLOR: FLUORESCENT ORANGE
LEGEND/BORDER	TYPE: OPAQUE
	COLOR: BLACK

SYMBOL	WID	HT
UP ARROW, 270°	6	9

INCLUDED IN DET

SIGN DETAILS

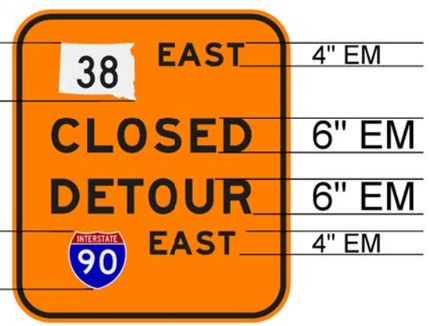
12" A(M1-1) SYMBOL (TYPE III HI-INTENSITY SHEETING)

12" M1-1 SYMBOL (TYPE III HI-INTENSITY SHEETING)

SIGN NUMBER	SPECIAL
WIDTH x HEIGHT	5'-6" X 5'-6"
BORDER WIDTH	1.5"
CORNER RADIUS	8.0"
LEGEND	6"/8" E MODIFIED
BACKGROUND	TYPE: MICROPRISMATIC
	COLOR: FLUORESCENT ORANGE
LEGEND/BORDER	TYPE: OPAQUE
	COLOR: BLACK

10" A(M1-1) SYMBOL (TYPE III HI-INTENSITY SHEETING)

10" M1-1 SYMBOL (TYPE III HI-INTENSITY SHEETING)



SIGN NUMBER	SPECIAL
WIDTH x HEIGHT	4'-0" X 4'-6"
BORDER WIDTH	1.5"
CORNER RADIUS	6.0"
LEGEND	4"/6" E MODIFIED
BACKGROUND	TYPE: MICROPRISMATIC
	COLOR: FLUORESCENT ORANGE
LEGEND/BORDER	TYPE: OPAQUE
	COLOR: BLACK

SIGN NUMBER	SPECIAL
WIDTH x HEIGHT	6'-6" X 1'-0"
BORDER WIDTH	NO BORDER
CORNER RADIUS	NONE
BACKGROUND	TYPE: HIGH INTENSITY
	COLOR: GREEN

SIGN NUMBER	SPECIAL
WIDTH x HEIGHT	6'-6" X 1'-2"
BORDER WIDTH	NO BORDER
CORNER RADIUS	NONE
BACKGROUND	TYPE: HIGH INTENSITY
	COLOR: GREEN

SIGN NUMBER	SPECIAL
WIDTH x HEIGHT	7'-0" X 1'-3"
BORDER WIDTH	NO BORDER
CORNER RADIUS	NONE
LEGEND	8" E MODIFIED
BACKGROUND	TYPE: MICROPRISMATIC
	COLOR: FLUORESCENT ORANGE
LEGEND/BORDER	TYPE: OPAQUE
	COLOR: BLACK

SYMBOL	WID	HT
UP ARROW	8	12

SIGN NUMBER	SPECIAL
WIDTH x HEIGHT	6'-6" X 1'-3"
BORDER WIDTH	NO BORDER
CORNER RADIUS	NONE
LEGEND	6" E MODIFIED
BACKGROUND	TYPE: MICROPRISMATIC
	COLOR: FLUORESCENT ORANGE
LEGEND/BORDER	TYPE: OPAQUE
	COLOR: BLACK

SYMBOL	WID	HT
UP ARROW, 90°	6	9

SIGN NUMBER	SPECIAL
WIDTH x HEIGHT	6'-6" X 1'-0"
BORDER WIDTH	NO BORDER
CORNER RADIUS	NONE
LEGEND	6" E MODIFIED
BACKGROUND	TYPE: MICROPRISMATIC
	COLOR: FLUORESCENT ORANGE
LEGEND/BORDER	TYPE: OPAQUE
	COLOR: BLACK

SYMBOL	WID	HT
UP ARROW	6	9

ITEMIZED LIST FOR DETOUR SIGNING

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0038(43)321	31	80

Plotting Date: 11/13/2014

ITEMIZED LIST FOR DETOUR SIGNING - 634E1002

DESCRIPTION/ILLUSTRATION	DIMENSIONS (INCHES)	AREA (SqFt)	QUANTITY	TOTAL (SqFt)
	78" X 12"	6.5	1	6.5
	78" X 14"	7.6	1	7.6
	48" X 54"	18.0	1	18.0
	66" X 66"	30.3	1	30.3
	78" X 15"	8.2	1	8.2
	78" X 12"	6.5	1	6.5
	84" X 15"	8.8	1	8.8
			COLUMN TOTAL	85.9

DESCRIPTION/ILLUSTRATION	DIMENSIONS (INCHES)	AREA (SqFt)	QUANTITY	TOTAL (SqFt)
DETOUR AHEAD	48" X 48"	16.0	4	64.0
END DETOUR	24" X 18"	3.0	2	6.0
DETOUR	24" X 12"	2.0	28	56.0
SD 38 ROUTE MARKER	24" X 24"	4.0	28	112.0
DIRECTIONAL MARKER WEST (SD)	24" X 12"	2.0	14	28.0
DIRECTIONAL MARKER EAST (SD)	24" X 12"	2.0	14	28.0
ADVANCE TURN 90 LEFT ARROW (SD)	21" X 15"	2.2	3	6.6
ADVANCE TURN 90 RIGHT ARROW (SD)	21" X 15"	2.2	2	4.4
ADVANCE TURN 45 RIGHT ARROW (SD)	21" X 15"	2.2	2	4.4
45 RIGHT UP ARROW (SD)	21" X 15"	2.2	2	4.4
HORIZONTAL SINGLE HEAD ARROW (SD)	21" X 15"	2.2	10	22.0
VERTICAL SINGLE HEAD ARROW (SD)	21" X 15"	2.2	9	19.8
DETOUR ON LEFT ARROW	48" X 18"	6.0	2	12.0
DETOUR ON RIGHT ARROW	48" X 18"	6.0	2	12.0
	72" X 30"	15.0	1	15.0
	72" X 30"	15.0	1	15.0
	84" X 24"	14.0	1	14.0
	84" X 24"	14.0	1	14.0
			COLUMN TOTAL	437.6
			TOTAL (SqFt)	523.5

PLOT SCALE - 1.192

PLOTTED FROM - TRMIINT17

PLOT NAME - 4

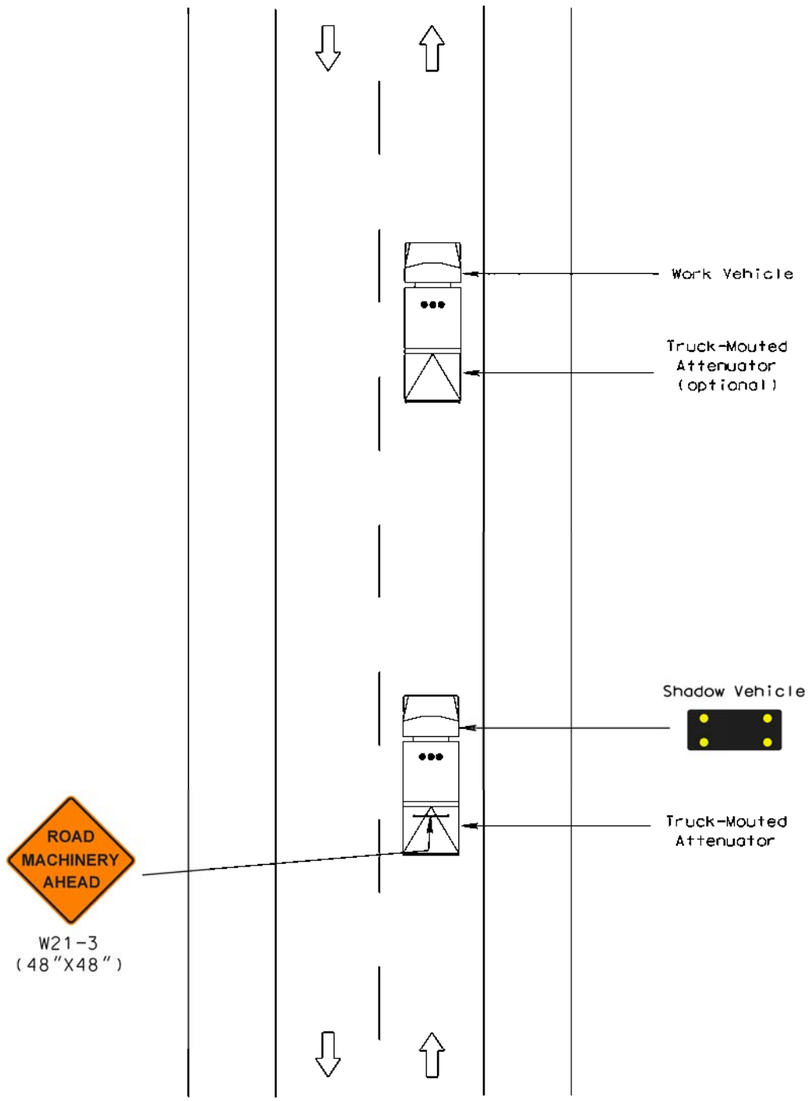
FILE - ...\MCCK03T6 TRAFFIC CONTAINER.DGN

PLOT SCALE - 1.1163.2

MOBILE OPERATIONS ON TWO–LANE ROAD
(TYPICAL)

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0038(43)321	32	80

Plotting Date: 11/13/2014



Notes for Mobile Operations on Two-lane Road (Typical)

Standard:

1. Vehicle-mounted signs shall be mounted in a manner such that they are not obscured by equipment or supplies. Sign legends on vehicle-mounted signs shall be covered or turned from view when work is not in progress.
2. Shadow and work vehicles shall display high-intensity rotating, flashing, oscillating, or strobe lights.
3. If an arrow board is used, it shall be used in the caution mode.

Guidance:

4. Where practical and when needed, the work and shadow vehicles should pull over periodically to allow vehicular traffic to pass.
5. Whenever adequate stopping sight distance exists to the rear, the shadow vehicle should maintain the minimum distance from the work vehicle and proceed at the same speed. The shadow vehicle should slow down in advance of vertical or horizontal curves that restrict sight distance.
6. The shadow vehicles should also be equipped with two high-intensity flashing lights mounted on the rear, adjacent to the sign.

Option:

7. The distance between the work and shadow vehicles may vary according to terrain, paint drying time, and other factors.
8. Additional shadow vehicles to warn and reduce the speed of oncoming or opposing vehicular traffic may be used. Law enforcement vehicles may be used for this purpose.
9. A truck-mounted attenuator may be used on the shadow vehicle or on the work vehicle.
10. If the work and shadow vehicles cannot pull over to allow vehicular traffic to pass frequently, a DO NOT PASS sign may be placed on the rear of the vehicle blocking the lane.

Support:

11. Shadow vehicles are used to warn motor vehicle traffic of the operation ahead.

Standard:

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

PLOTTED FROM - TRM11NT17

PLOT NAME - ?

FILE - ...\MCCK0316 TRAFFIC CONTAINER.DGN

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0038(43)321	33	80

ITEMIZED LIST FOR TRAFFIC CONTROL

		CONVENTIONAL ROAD			
SIGN CODE	DESCRIPTION	NUMBER	SIGN SIZE	UNITS PER SIGN	UNITS
R1-1	STOP		30" x 30"	21	
R1-2	YIELD		36" x 36"	27	
R2-1	SPEED LIMIT __		24" x 30"	18	
R2-6aP	FINES DOUBLE (plaque)		24" x 18"	15	
R4-1	DO NOT PASS	14	24" x 30"	18	252
R4-2	PASS WITH CARE	13	24" x 30"	18	234
R4-7	KEEP RIGHT (symbol)		24" x 30"	18	
R5-1	DO NOT ENTER		30" x 30"	21	
R5-1a	WRONG WAY		36" x 24"	20	
R10-6	STOP HERE ON RED		24" x 36"	20	
R11-2	ROAD CLOSED	14	48" x 30"	27	378
R11-3a	ROAD CLOSED 3 MILES AHEAD LOCAL TRAFFIC ONLY	2	60" x 30"	30	60
R11-3a	ROAD CLOSED 1 MILE AHEAD LOCAL TRAFFIC ONLY	2	60" x 30"	30	60
W1-1	LEFT or RIGHT TURN ARROW		48" x 48"	34	
W1-2	LEFT or RIGHT CURVE ARROW		48" x 48"	34	
W1-3	REVERSE TURN (L or R)		48" x 48"	34	
W1-4	REVERSE CURVE (L or R)		48" x 48"	34	
W3-1	STOP AHEAD (symbol)		48" x 48"	34	
W3-2	YIELD AHEAD (symbol)		48" x 48"	34	
W3-3	SIGNAL AHEAD (symbol)		48" x 48"	34	
W3-4	BE PREPARED TO STOP	2	48" x 48"	34	68
W3-5	SPEED REDUCTION AHEAD (__ MPH)		48" x 48"	34	
W4-1	MERGE (symbol)		48" x 48"	34	
W4-2	LEFT or RIGHT LANE ENDS (symbol)		48" x 48"	34	
W4-3	ADDED LANE (symbol)		48" x 48"	34	
W5-3	ONE LANE BRIDGE		48" x 48"	34	
W7-3aP	NEXT __ MILES (plaque)		36" x 30"	23	
W8-1	BUMP	4	48" x 48"	34	136
W8-6	TRUCK CROSSING	2	48" x 48"	34	68
W8-9	LOW SHOULDER	6	48" x 48"	34	204
W8-11	UNEVEN LANES	2	48" x 48"	34	68
W8-17	SHOULDER DROP-OFF (symbol)	6	48" x 48"	34	204
W8-17P	SHOULDER DROP-OFF (plaque)		30" x 24"	18	
W13-1P	ADVISORY SPEED (plaque)	4	30" x 30"	21	84
W20-1	ROAD WORK AHEAD	4	48" x 48"	34	136
W20-3	ROAD CLOSED 1000 FT	12	48" x 48"	34	408
W20-3	ROAD CLOSED 500 FT	12	48" x 48"	34	408
W20-4	ONE LANE ROAD AHEAD	2	48" x 48"	34	68
W20-5	LEFT or RIGHT LANE CLOSED AHEAD		48" x 48"	34	
W20-7	FLAGGER (symbol)	4	48" x 48"	34	136
W21-1	WORKERS (symbol)		48" x 48"	34	
W21-2	FRESH OIL	2	48" x 48"	34	68
W21-3	ROAD MACHINERY AHEAD	1	48" x 48"	34	34
W21-5	SHOULDER WORK	4	48" x 48"	34	136
W21-5a	LEFT or RIGHT SHOULDER CLOSED		48" x 48"	34	
W21-5b	LEFT or RIGHT SHOULDER CLOSED AHEAD		48" x 48"	34	
G20-1	ROAD WORK NEXT 5 MILES	1	36" x 18"	17	17
G20-1	ROAD WORK NEXT 6 MILES	1	36" x 18"	17	17
G20-1	ROAD WORK NEXT 11 MILES	2	36" x 18"	17	34
G20-2	END ROAD WORK	4	36" x 18"	17	68
G20-5aP	WORK ZONE (plaque)		24" x 18"	15	
-	TYPE III OBJECT MARKER		12" x 36"	15	
-	TYPE 3 BARRICADE - 8' single sided	34		40	1360
-	TYPE 3 BARRICADE - 8' double sided			56	
				TOTAL UNITS	4706

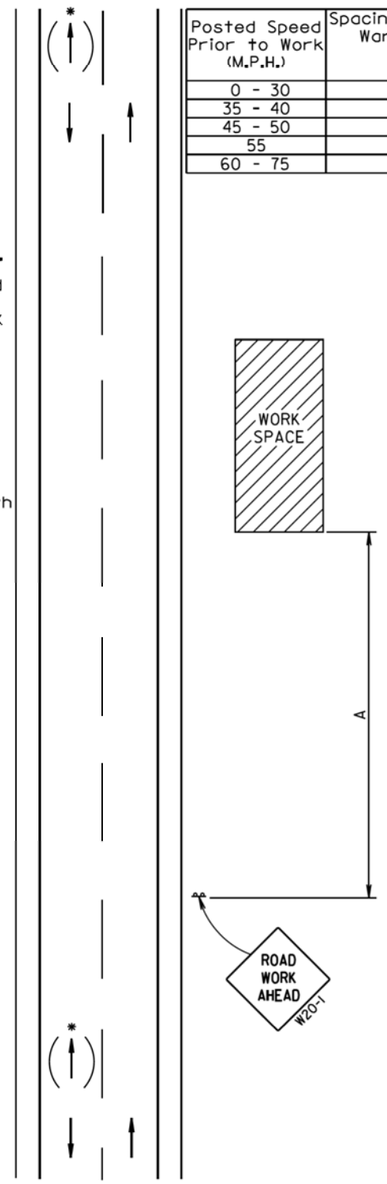
The signs illustrated are not required if the work space is behind a barrier, more than 2 feet behind the curb, or 15 feet or more from the edge of any roadway.

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

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

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

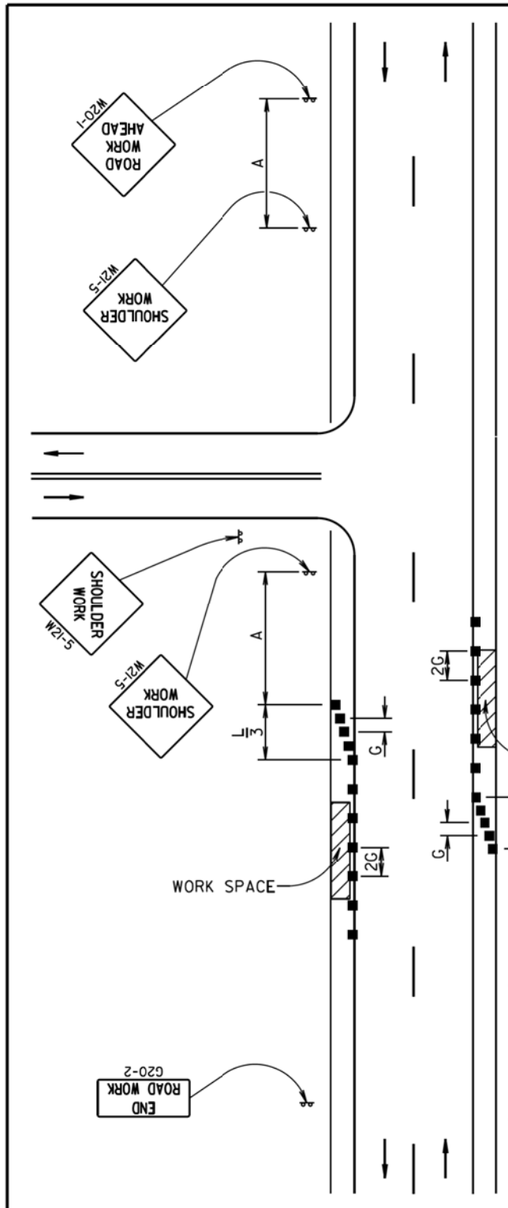
For short term, short duration, or mobile operations, all signs and channelizing devices may be eliminated if a vehicle with an activated flashing or revolving yellow light is used.



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

July 1, 2005

Published Date: 4th Qtr. 2014	SDDOT	GUIDES FOR TRAFFIC CONTROL DEVICES WORK BEYOND THE SHOULDER	PLATE NUMBER 634.01 Sheet 1 of 1



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

■ Channelizing Device

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

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

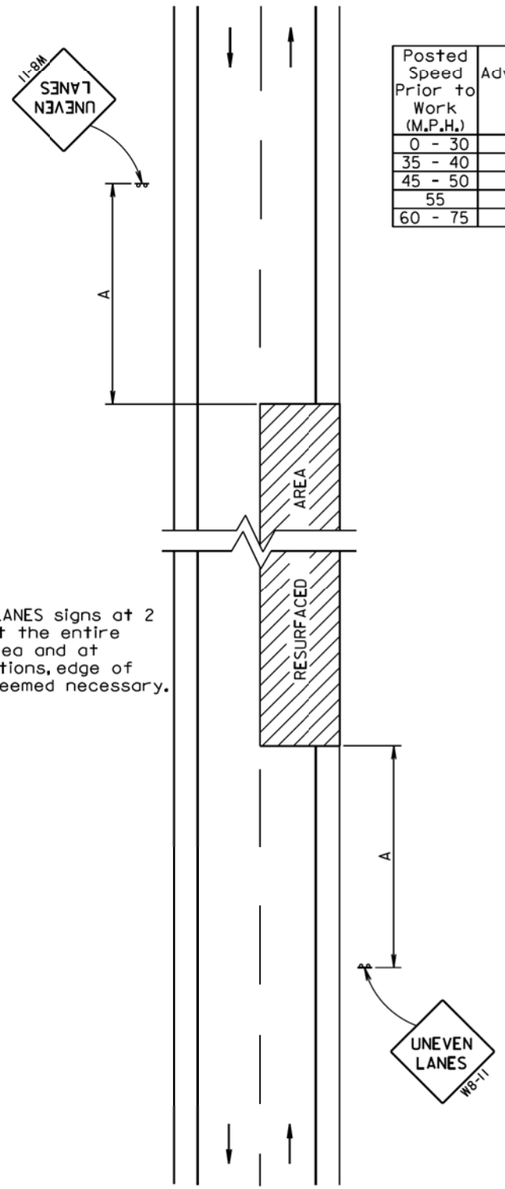
Worker signs (W21-1 or W21-1a) may be used instead of SHOULDER WORK signs.

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

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

September 22, 2014

Published Date: 4th Qtr. 2014	SDDOT	GUIDES FOR TRAFFIC CONTROL DEVICES WORK ON SHOULDERS	PLATE NUMBER 634.03 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.

July 1, 2005

Published Date: 4th Qtr. 2014

SDDOT

GUIDES FOR TRAFFIC CONTROL DEVICES
UNEVEN ROAD SURFACE

PLATE NUMBER 634.22

Sheet 1 of 1

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

Flagger

Channelizing Device

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

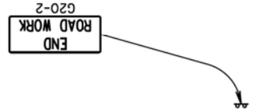
The ROAD WORK AHEAD and the END ROAD WORK signs may be omitted for short duration operations (1 hour or less).

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

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

The channelizing devices shall be drums or 42" cones.

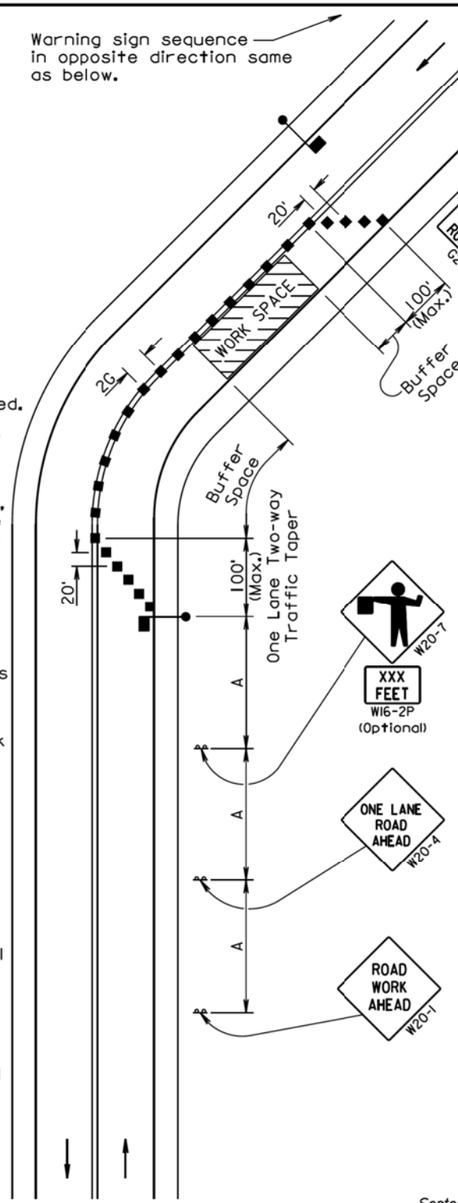
Channelizing devices are not required along the centerline adjacent to work area when pilot cars are utilized for escorting traffic through the work area.



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

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

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



September 22, 2014

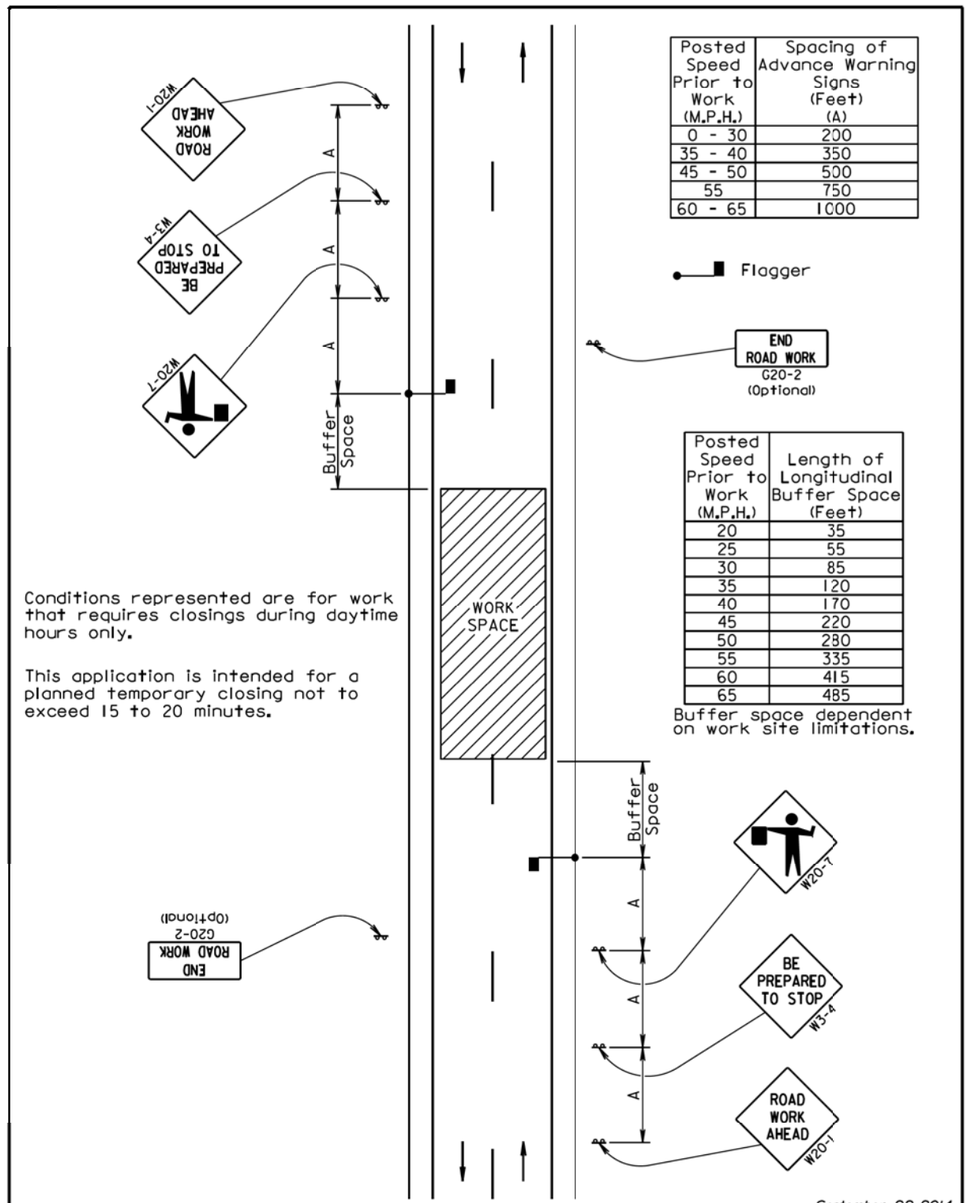
Published Date: 4th Qtr. 2014

SDDOT

GUIDES FOR TRAFFIC CONTROL DEVICES
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)
0 - 30	200
35 - 40	350
45 - 50	500
55	750
60 - 65	1000

Posted Speed Prior to Work (M.P.H.)	Length of Longitudinal Buffer Space (Feet)
20	35
25	55
30	85
35	120
40	170
45	220
50	280
55	335
60	415
65	485

Buffer space dependent on work site limitations.

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

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

September 22, 2014

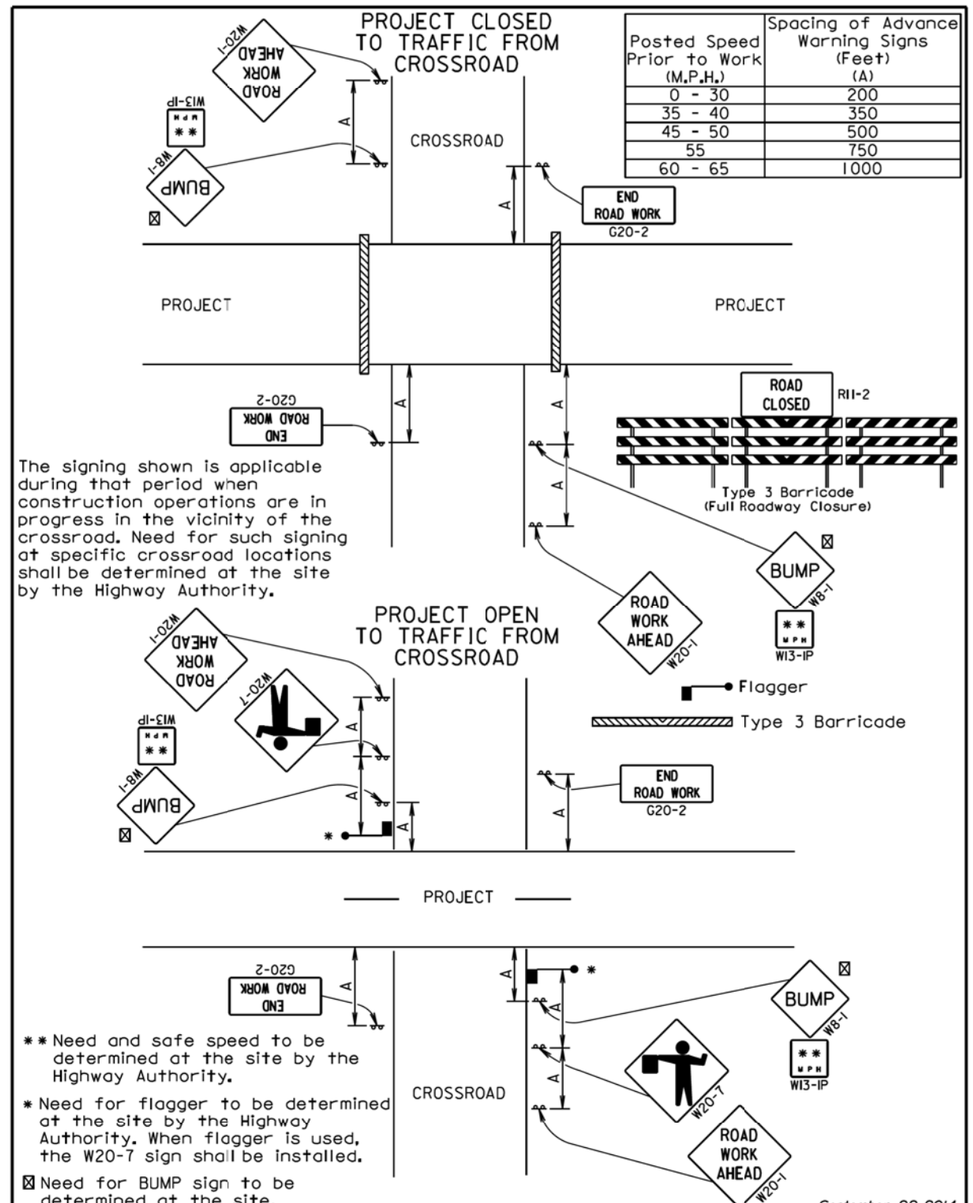
Published Date: 4th Qtr. 2014

SDDOT

GUIDES FOR TRAFFIC CONTROL DEVICES
TEMPORARY ROAD WORK

PLATE NUMBER 634.30

Sheet 1 of 1



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

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

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

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

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

September 22, 2014

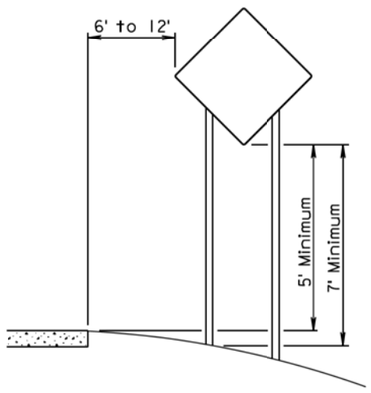
Published Date: 4th Qtr. 2014

SDDOT

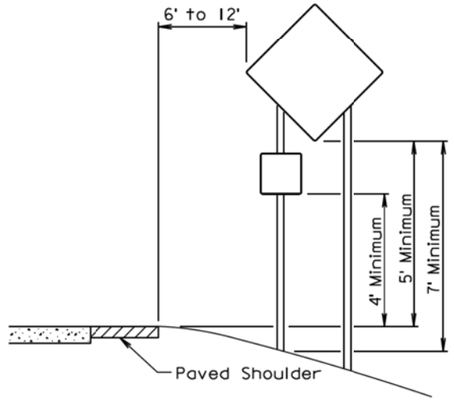
GUIDES FOR TRAFFIC CONTROL DEVICES
CROSSROAD SIGNING

PLATE NUMBER 634.32

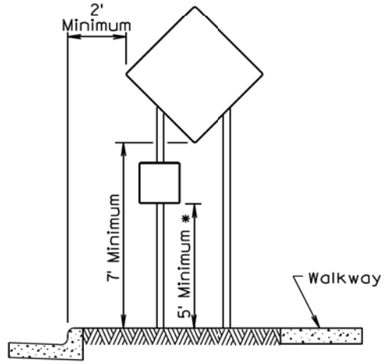
Sheet 1 of 1



RURAL DISTRICT

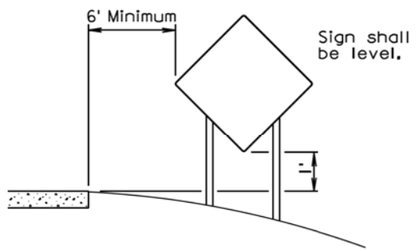


RURAL DISTRICT WITH SUPPLEMENTAL PLATE



URBAN DISTRICT

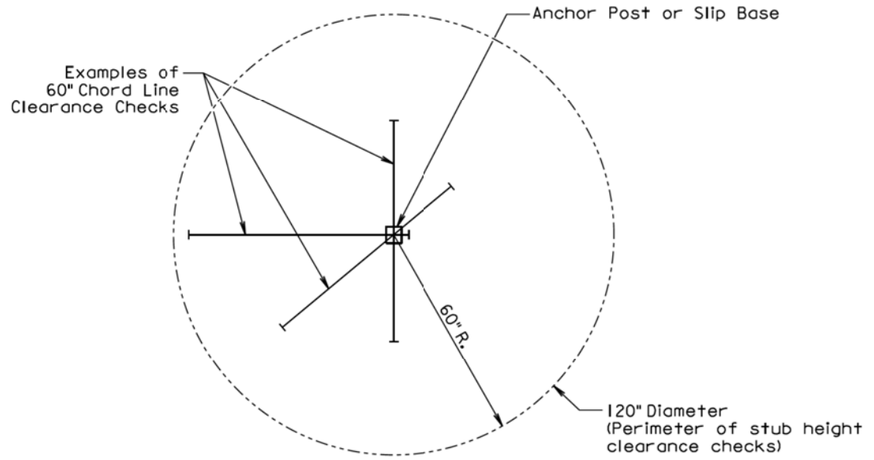
* If the bottom of supplemental plate is mounted lower than 7 feet above a pedestrian walkway, the supplemental plate should not project more than 4" into the pedestrian facility.



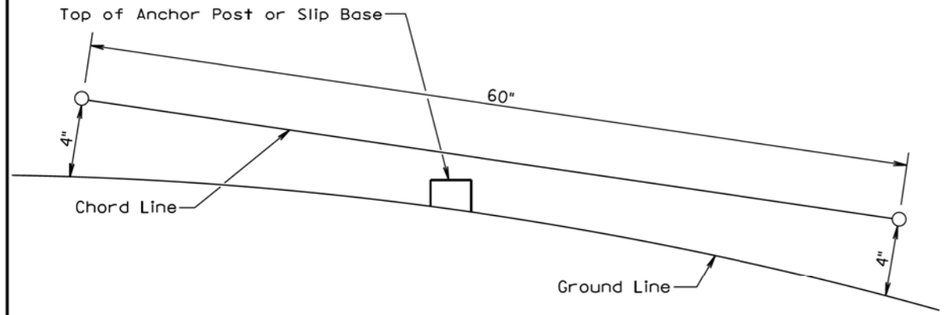
RURAL DISTRICT
3 DAY MAXIMUM
(Not applicable to regulatory signs)

September 22,2014

Published Date: 4th Qtr. 2014	SDDOT	CRASHWORTHY SIGN SUPPORTS (Typical Construction Signing)	PLATE NUMBER 634.85
			Sheet 1 of 1



PLAN VIEW
(Examples of stub height clearance checks)



ELEVATION VIEW

GENERAL NOTES:

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

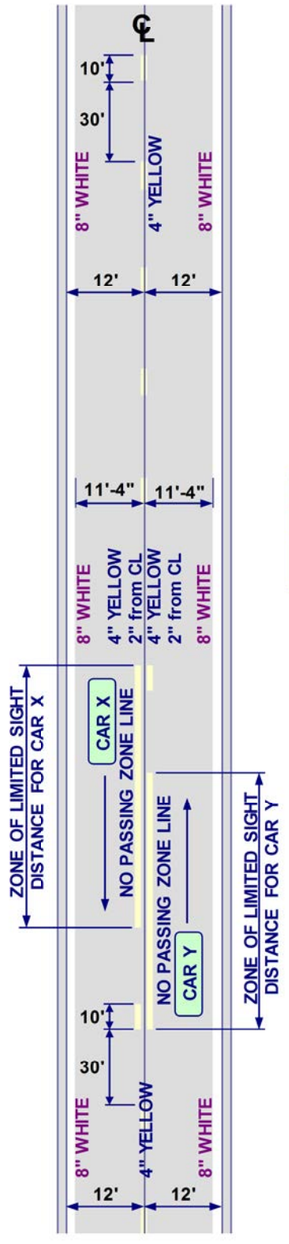
At locations where there is curb and gutter adjacent to the breakaway sign support, the stub height shall be a maximum of 4" above the ground line at the localized area adjacent to the breakaway support stub.

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

July 1, 2005

Published Date: 4th Qtr. 2014	SDDOT	BREAKAWAY SUPPORT STUB CLEARANCE	PLATE NUMBER 634.99
			Sheet 1 of 1

TWO LANE ROADWAY



PAVEMENT MARKING

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

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

Application rates shall be as follows:

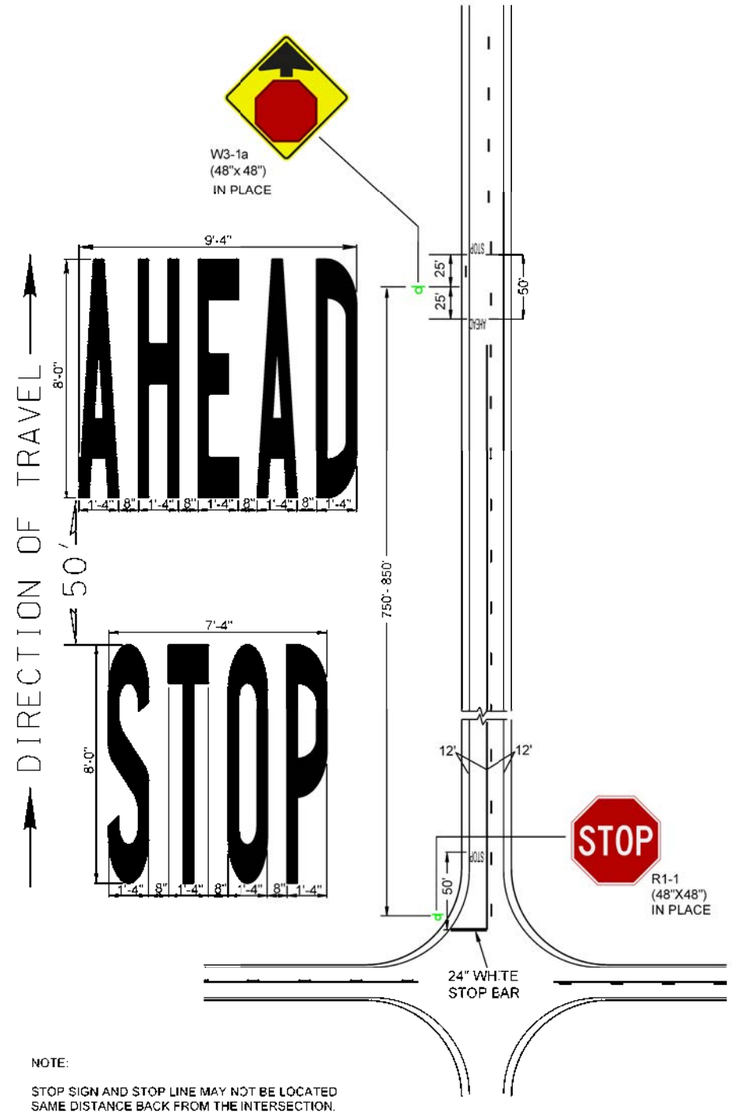
Two Lane Roadway (Rates for one line)
Dashed Yellow Centerline Rate = 4.6 Gals./Pass-Mile
Solid Yellow Centerline Rate = 16.9 Gals./Pass-Mile
Solid White Edgeline Rate = 33.8 Gals./Pass-Mile
Glass Beads = 8 Lbs./Gal.

ESTIMATED QUANTITIES	
PAINT	QUANTITY
WHITE	748 GALLONS
YELLOW	98 GALLONS

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

SIGNING AND STOP PAVEMENT MARKING LAYOUT

(Typical)

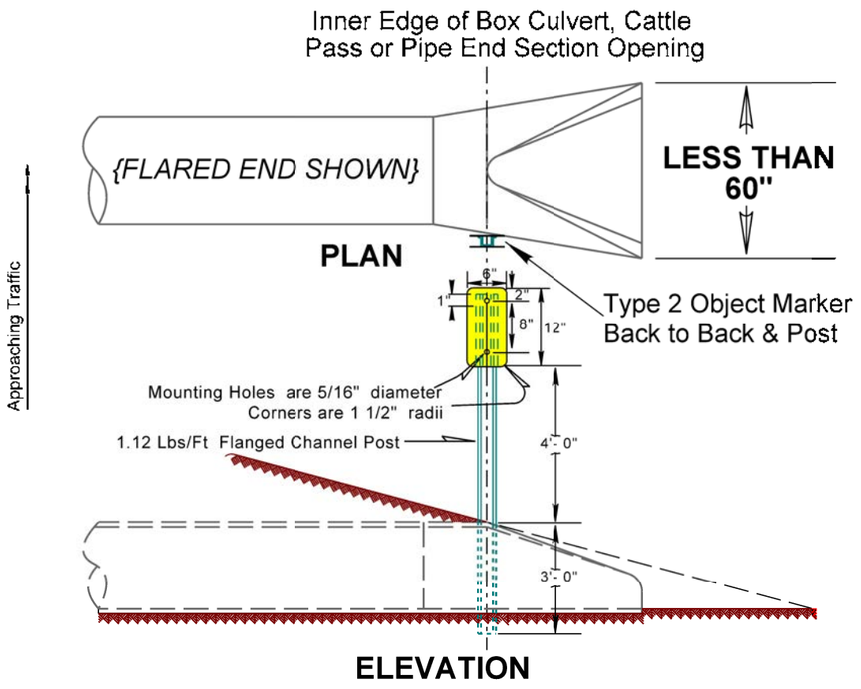


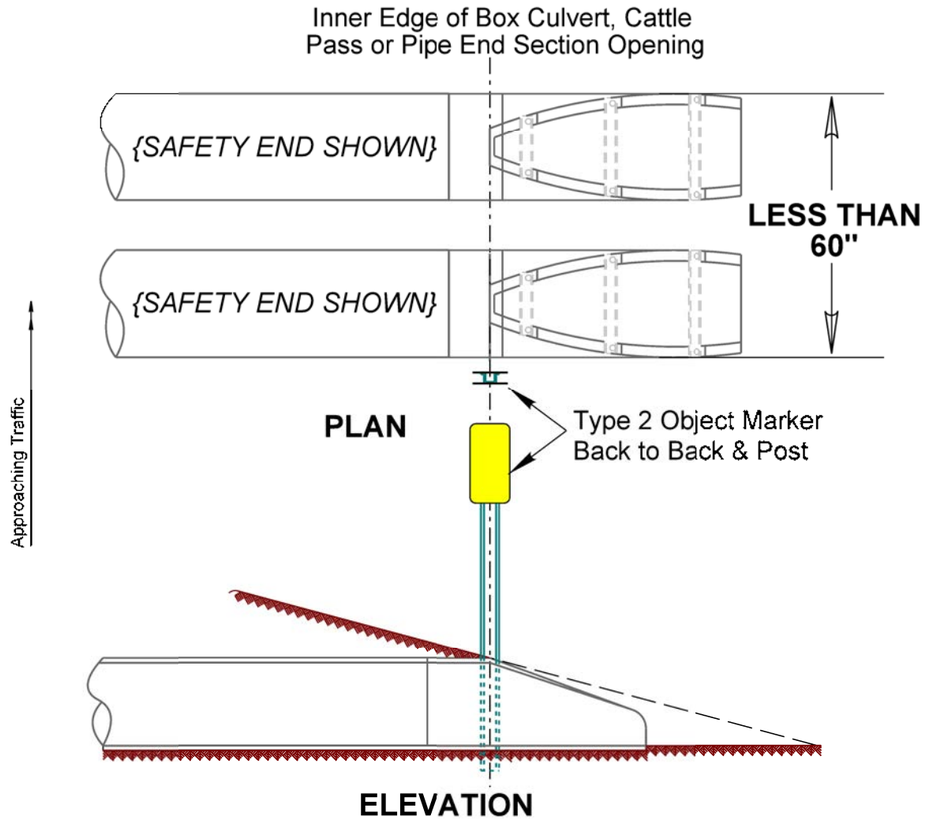
NOTE:

STOP SIGN AND STOP LINE MAY NOT BE LOCATED SAME DISTANCE BACK FROM THE INTERSECTION.

OBJECT MARKER ERECTION DETAILS

TYPICAL AT CULVERT, CATTLE PASS END, OR MULTIPLE PIPES WITH OUTSIDE DIMENSION OR A COMBINED WIDTH OF LESS THAN 60"



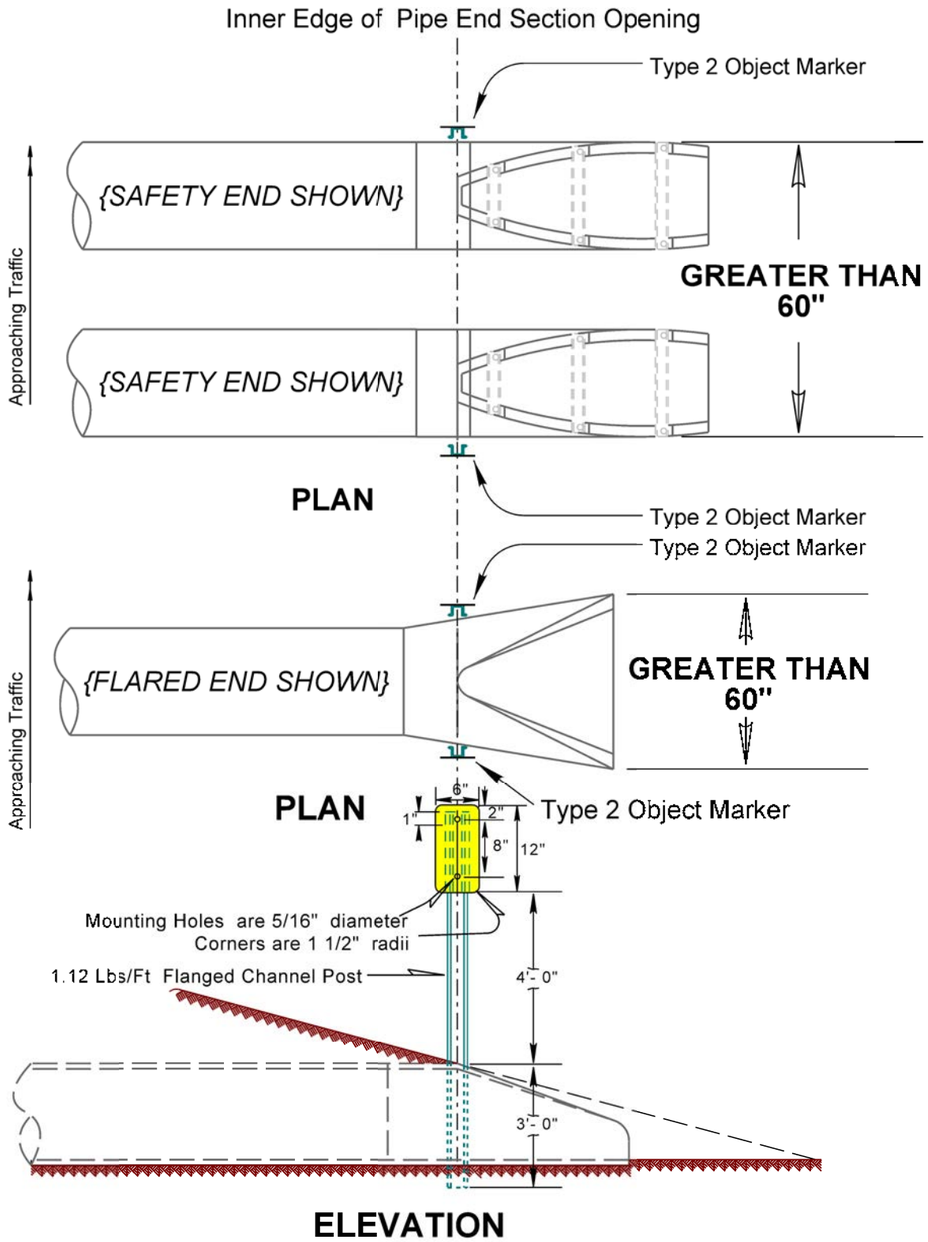


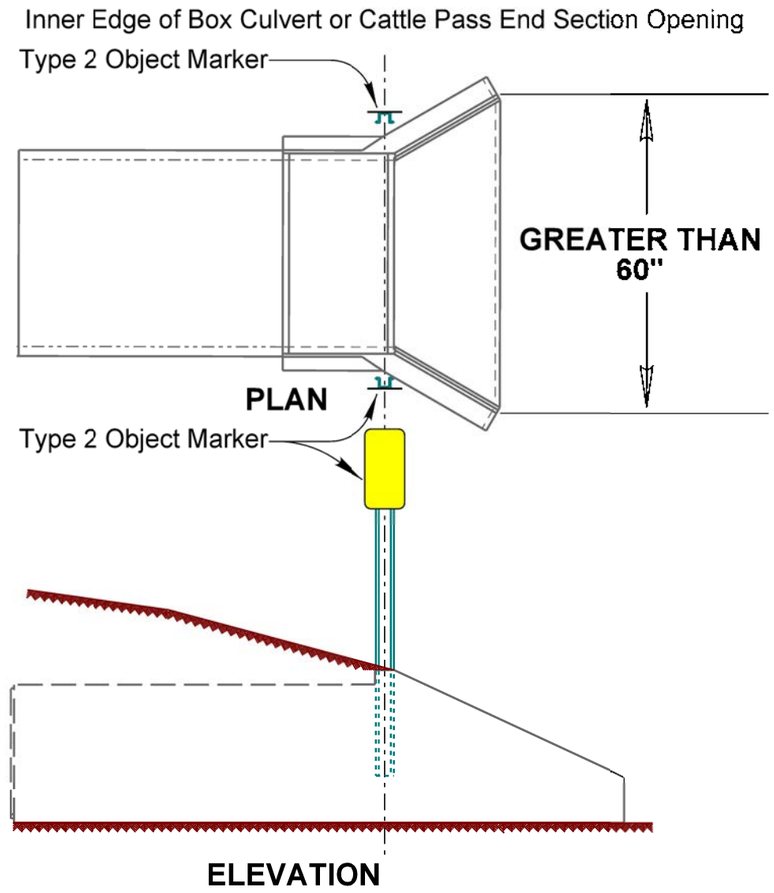
OBJECT MARKER ERECTION DETAILS

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0038(43)321	40	80

Plotting Date: 11/13/2014

TYPICAL AT SINGLE OR MULTIPLE PIPES WITH OUTSIDE DIMENSION OR A COMBINED WIDTH GREATER THAN 60”





PLOT SCALE - 1.6.7728

PLOTTED FROM - TRMIINT17

PLOT NAME - 14

FILE - ...\MCCK0316 TRAFFIC CONTAINER.DGN

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0038(43)321	41	80

Plotting Date: 11/07/2014

Sec. 19 - T103N - R56W

509+30
Take out 5'x7'x46' RCBC with Wingwalls
(Incidental Work, Grading)

509+30
Install 96"x84' RC ARCH & 2 Sectional Ends

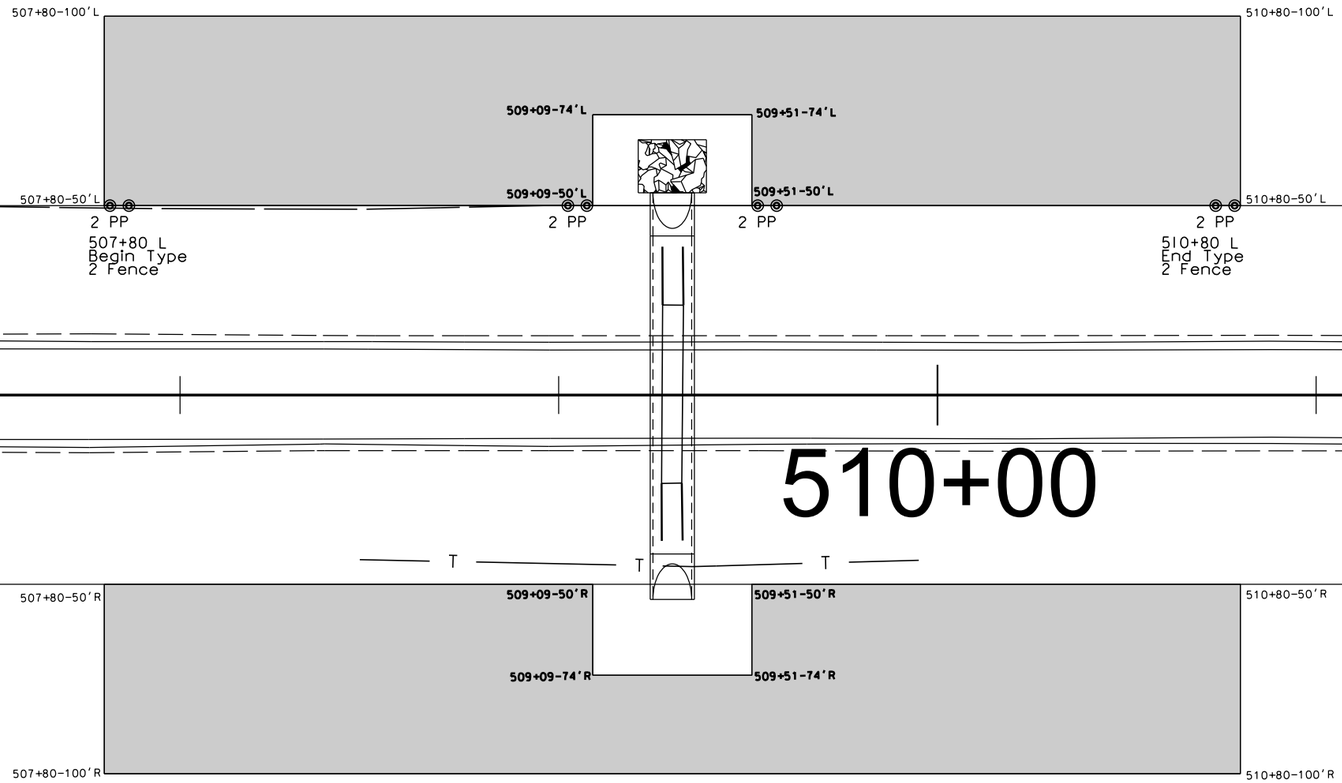
509+30 - 53' Lt
Place Class B Riprap
14'x18'x2'-9" (35.9 Tons)
and Type B Drainage Fabric
(51 SqYd)

Spencer Quarries, Inc.
Contact: Robert Everist

The NW1/4 of Section 19 - Township 103 North - Range 56 West of the 5th P.M., except Lot H-1 and except the West 40 Rods and 6 Feet thereof

Parcel 1
Permanent Easement
0.02 ac. (1008 sq ft)
more or less

Parcel 1
507+80 to 510+80 L
Temporary Easement for
drainage pipe work and
riprap placement containing
0.32 ac. (13992 sq ft) more or less



An Undivided 1/2 Interest to: Mark Hofer Revocable Living Trust
An Undivided 1/2 Interest to: Kathryn Hofer Revocable Living Trust
Mark Hofer & Kathryn Hofer, Trustees

The NW1/4 lying South and East of Lot H-1 of said NW1/4 all in Section 19 - Township 103 North - Range 56 West of the 5th P.M.

Parcel 2
Permanent Easement
0.02 ac. (1008 sq ft)
more or less

Parcel 2
507+80 to 510+80 R
Temporary Easement for
drainage pipe work containing
0.32 ac. (13992 sq ft) more or less

PLOT SCALE - 1:40
PLOT NAME - 4
FILE - ...\PRJ2015\MCCK0316\50930.DGN
PLOTTED FROM - TRM111118

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0038(43)321	42	80

Plotting Date: 11/07/2014

Sec. 16 - T103N - R56W

Jeremy J. McGregor and Shawnya L. McGregor,
joint tenants with right of survivorship

The E1/2 of the SW1/4 of Section 16 -
Township 103 North - Range 56 West
of the 5th P.M.

1/4 Line

66'

Section Line

656+00*
30" RCP In Place
Lt - Reset 16' Pipe
Rt - Remove 4' Pipe, Reset 4' Pipe & Install Flared End

655+72-100'L

656+72-100'L

655+85-82'L

656+15-82'L

Parcel 3
655+72 to 656+72 L
Temporary Easement for
drainage pipe work containing
0.09 ac. (4040 sq ft) more or less

655+72-50'L

655+85-50'L

656+15-50'L

656+72-50'L

2 PP
655+72 L
Begin Type
3 Fence

2 PP
656+72 L
End Type
3 Fence

100'

SD38

655+00

655+50-50'R

655+85-50'R

656+15-50'R

656+50-50'R

655+85-85'R

656+15-85'R

655+50-100'R

656+50-100'R

Parcel 3
Permanent Easement
0.05 ac. (2010 sq ft)
more or less

Parcel 3
655+50 to 656+50 R
Temporary Easement for
drainage pipe work containing
0.09 ac. (3950 sq ft) more or less

Michele Neuharth

The W1/2 of Section 21 - Township 103 North
- Range 56 West of the 5th P.M., except Lot
H-1 in the NW1/4 and except Tracts 1A and 2A
of Hofer's Addition in the SW1/4 of the SW1/4

Sec. 21 - T103N - R56W

CURVE DATA

PC:	657+11.5
PI:	660+92.9
PT:	664+73.2
Radius:	5730
Delta:	7°37' Lt
Degree of Curvature:	1°00'
Length:	761.7
Tangent:	381.4

*No utility survey is provided at this location.

PLOT SCALE - 1:40

PLOT NAME - 5

FILE - ...\PR\2015\MCCK0376\65500.DGN

PLOTTED FROM - TRM111118

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0038(43)321	43	80

Plotting Date: 11/07/2014

Sec. 15 - T103N - R56W

Dennis E. Kobernusz and Marilyn M. Kobernusz

The SW1/4, except Lot H-1 therof, all in Section 15 - Township 103 North - Range 56 West of the 5th P.M.

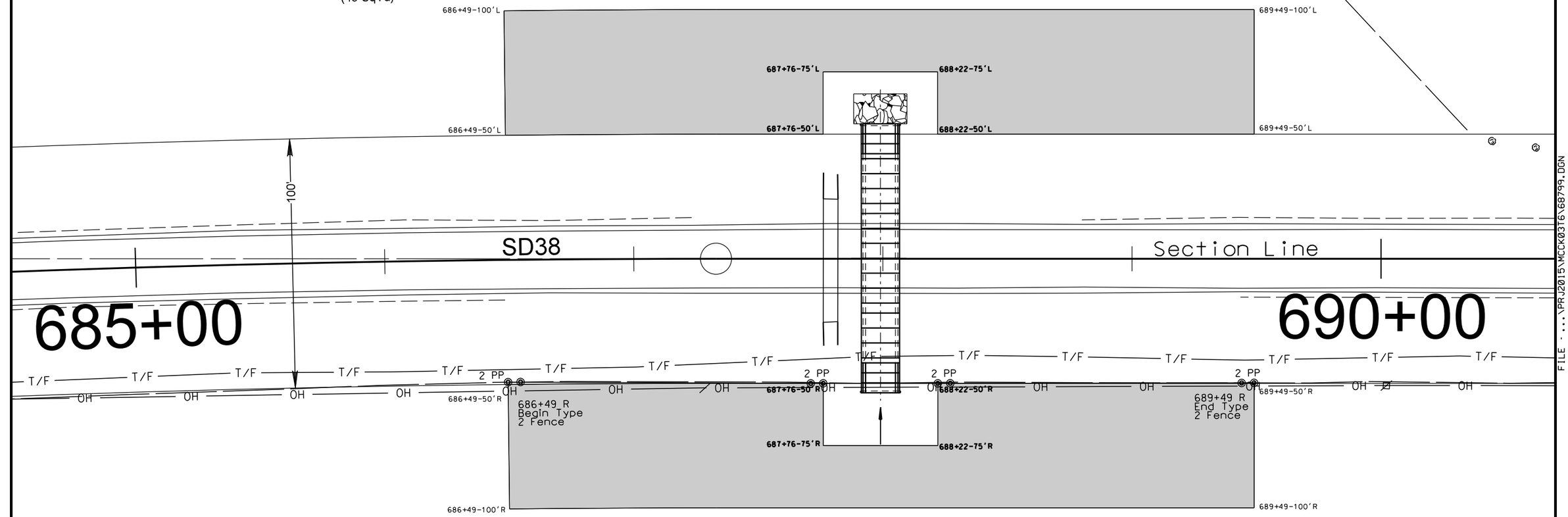
687+79
Take out 5'x5'x48' RCBC with Wingwalls
(Incidental Work, Grading)

687+99
(DA 5.2 Sq. Mi.)
Install 14'x7' Precast Box Culvert

687+99 - 54' Lt
Place Class B Riprap
12'x21'-6"x2'-9" (36.8 Tons)
and Type B Drainage Fabric
(49 SqYd)

Parcel 4
Permanent Easement
0.03 ac. (1150 sq ft)
more or less

Parcel 4
686+49 to 689+49 L
Temporary Easement for
Box Culvert work and
riprap placement containing
0.32 ac. (13850 sq ft) more or less



Parcel 5
Permanent Easement
0.03 ac. (1150 sq ft)
more or less

Parcel 5
686+49 to 689+49 R
Temporary Easement for
drainage pipe work containing
0.32 ac. (13850 sq ft) more or less

CURVE DATA

PC:	677+84.10
PI:	682+59.16
PT:	687+33.00
Radius:	7640'
Delta:	7°06'58" Rt
Degree of Curvature:	0°45'
Length:	948.90'
Tangent:	475.06'

Sec. 22 - T103N - R56W

An Undivided 1/2 Interest to: Dennis R. Bennett and Janice Bennett.
An Undivided 1/2 Interest to: Ronald Bennett and LeEtta Bennett.

The W1/2 of the NW1/4 of Section 22 - Township 103 North - Range 56 West of the 5th P.M.

PLOT SCALE - 1:40
PLOT NAME - 6
FILE - ....\PRJ2015\MCCK03176\68799.DGN
PLOTTED FROM - TRM111118

DETAIL FOR PIPE CULVERT WORK AT 577+53

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0038(43)321	44	80

Plotting Date: 11/07/2014

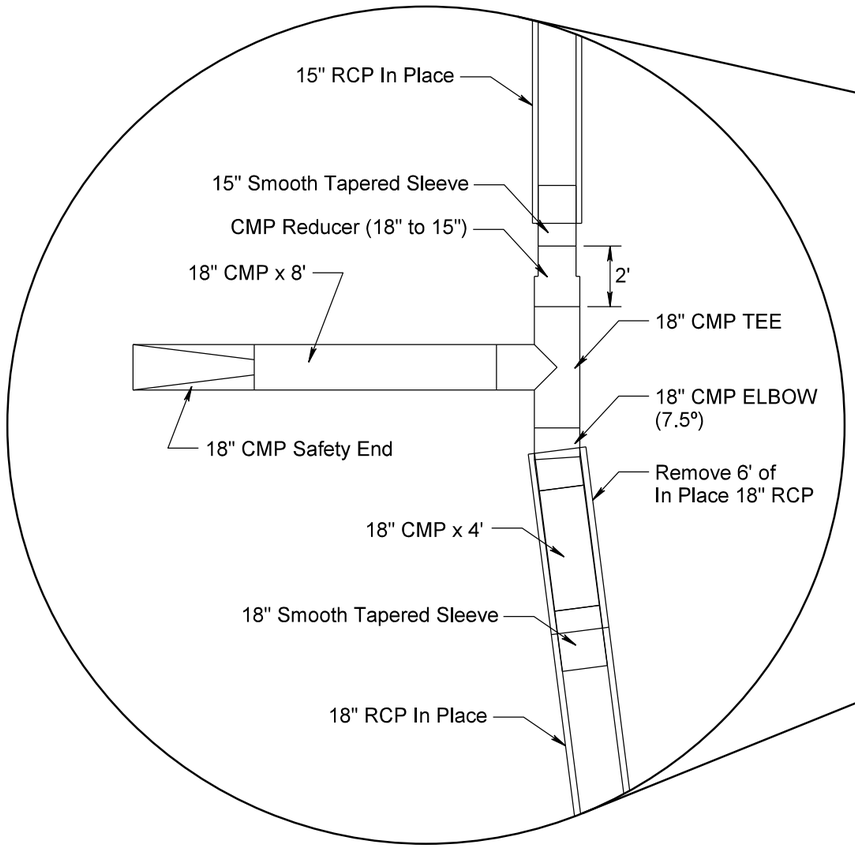
PLOT SCALE - 1:10

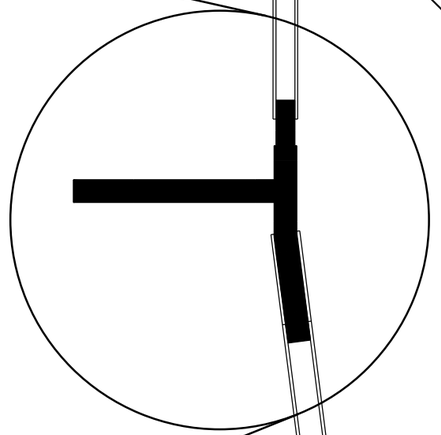
PLOT NAME - 7

FILE - ...\PRJ2015\MCCK03T6\57796RT.DGN

PLOTTED FROM - TRM111118

℄ SD38





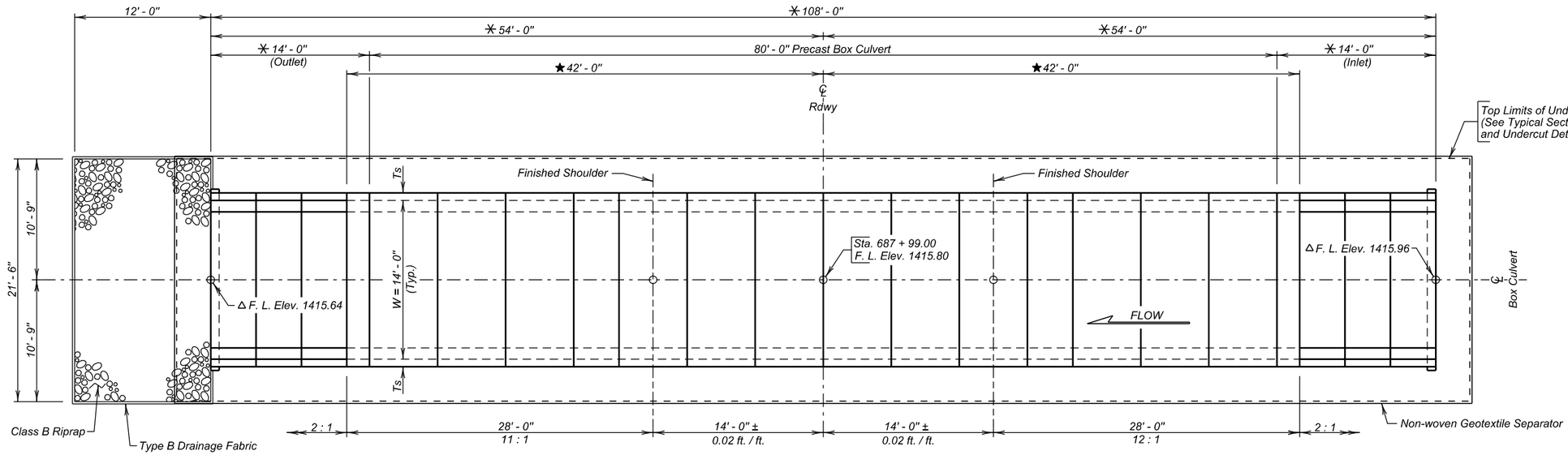
Driveway In Place

℄ 431 Ave.

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

⚹ Dimension may vary with fabricator and/or installation. See Shop Plans for actual installation length.
★ Minimum distance to satisfy clear zone.
△ Based on dimensions shown.

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	P 0038(43)321	45	80



PLAN

HYDRAULIC DATA

Q_d	382 cfs
A_d	65 sq. ft.
V_d	5.9 fps
Q_F	382 cfs
Q_{100}	758 cfs
Q_{OT}	849 cfs
V_{max}	9.9 fps

Q_d = Design discharge for the proposed culvert based on 25 year frequency. El. 1422.4

Q_{OT} = Overtopping discharge and frequency > Q_{100} year recurrence interval. El. 1426.0 @ Sta. 686 + 66 ±.

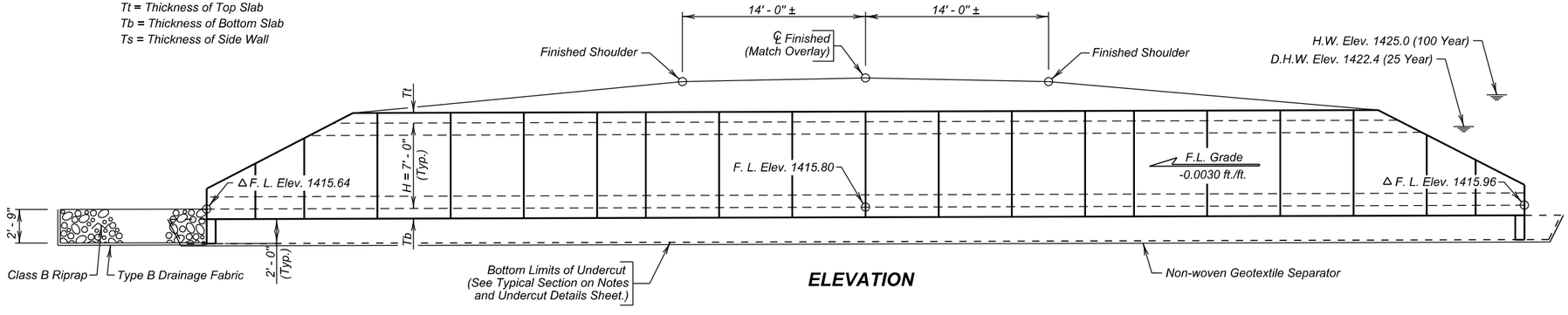
Q_F = Designated peak discharge for the basin approaching proposed project based on 25 year frequency.

Q_{100} = Computed discharge for the basin approaching proposed project based on 100 year frequency. El. 1425.0

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

LEGEND

W = Width of Opening
H = Height of Opening
Tt = Thickness of Top Slab
Tb = Thickness of Bottom Slab
Ts = Thickness of Side Wall



ELEVATION

INDEX OF CULVERT SHEETS

NOTE:

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

ESTIMATED QUANTITIES

	ITEM	UNIT	QUANTITY
≙	Structure Excavation, Box Culvert	Cu. Yd.	51.7
	Box Culvert Undercut	Cu. Yd.	182
≠	Class B Riprap	Ton	36.8
	Type B Drainage Fabric	Sq. Yd.	49
	Non-woven Geotextile Separator	Sq. Yd.	374
	14' X 7' Precast Concrete Culvert, Furnish	Ft.	80
	14' X 7' Precast Concrete Culvert, Install	Ft.	80
	14' X 7' Precast Concrete Culvert End Section, Furnish	Each	2
	14' X 7' Precast Concrete Culvert End Section, Install	Each	2

≙ Quantity is based on 10" bottom slab, 10" top slab and 8" walls.
≠ For estimating purposes only, a factor of 1.4 tons/cu. yd. was used to convert Cu. Yd. to Tons.

⚹ Topeka Shiner Stream

GENERAL DRAWING AND QUANTITIES
FOR
14' X 7' BOX CULVERT (PRECAST)

⚹ OVER TRIB. TO WOLF CREEK — 0° SKEW
STA. 687 + 99.00 — SEC. 15/22-T103N-R56W
STR. NO. 44-031-090 — P 0038(43)321
PCN 03T6 — HL-93

McCOOK COUNTY
S. D. DEPT. OF TRANSPORTATION
SEPTEMBER 2013

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

DESIGNED BY	CK. DES. BY	DRAFTED BY	
DM	JMH	BT/MG	Kevin N. Goeden BRIDGE ENGINEER
MCCK03T6	03T6TA01		

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	P 0038(43)321	46	80

SPECIFICATIONS

Use South Dakota Standard Specifications for Roads and Bridges, 2004 Edition and Required Provisions, Supplemental Specifications and Special Provisions as included in the Proposal.

GENERAL NOTES

Design shall be in accordance with Section 560 of the Specifications with the following criteria:

1. *Box culvert and box culvert end section design shall conform to the AASHTO LRFD Bridge Design Specifications, 2012 Edition with 2013 interims.*
2. *Design Live Load: HL-93. No construction loading in excess of legal load is anticipated. If construction loading in excess of legal load is anticipated by the Contractor, the Contractor shall submit a proposal including a design analysis for the anticipated construction loading, through the proper channels, to the Office of Bridge Design for approval. Upon approval, the construction load shall not be applied until the depth of fill over the box culvert as required by analysis has been placed. At a minimum, 4 ft. of fill shall be placed over the box culvert prior to applying the construction load All costs associated with accommodating any construction loads shall be borne by the Contractor.*
3. *The box culvert shall be load rated in accordance with the AASHTO Manual for Bridge Evaluation, 2010 Edition with the latest Interim Revisions using the LRFR method. The rating shall include evaluation at the Design Load rating for the HL-93 truck at both Inventory and Operating levels and at the Legal Load rating for three SD legal trucks (Type 3, 3S2 and 3-2) as well as the notional rating load and four specialized hauling vehicles noted in the AASHTO Manual for Bridge Evaluation. All sections of the box culvert shall rate at HL-93 or better (Inventory Level). The three SD Legal Loads, the notional rating load and the four specialized hauling vehicles shall rate greater than 1.0 at legal load rating level. Submit Load Rating calculations with the Design and Check Design calculations or shop plans, as appropriate.*
4. *The design of the barrel sections shall be based on a minimum fill height of 1 foot and include all subsequent fill heights up to and including the maximum fill height of 5 ft. over the box culvert.*
5. *Mimimum inside corner fillet shall be 6 in.*
6. *Minimum precast barrel section length shall be 4 ft.*
7. *Lift holes shall be plugged with an approved nonshrinkable grout.*
8. *The Fabricator shall imprint on the structure the date of construction as specified and detailed on Standard Plate No. 460.02.*
9. *Alternate end section details will be allowed, subject to the approval of the Bridge Construction Engineer. No additional payment will be made for any change in the barrel/end section configuration.*
10. *Installation of the precast sections shall be in accordance with the final approved shop plans.*
11. *Compaction of earth embankment and box culvert backfill shall be governed by the Specified Density method.*
12. *A layer of Non-woven Geotextile Separator shall be placed at the bottom of the undercut prior to backfilling with granular material.*
13. *The top of the subgrade shall be prepared by smoothing the surface of the subgrade to minimize any ruts, ridges, and depressions. Any rocks or other protrusions that might damage the geotextile will be removed. The geotextile will be unrolled perpendicular to the centerline and overlapped a minimum of 2 feet.*
14. *The geotextile will be placed as taut as possible with minimal wrinkles. Placement will be done so that subsequent granular cover material does not shove, wrinkle or distort the in place geotextile. The overlaps will be shingled in a manner that assures granular material will not be forced under the geotextile during backfilling operations. The geotextile may be held in place with small piles of granular material or staples. No traffic will be allowed on the uncovered geotextile. The granular material shall be placed in lifts not exceeding 6 inch loose depth and compacted to 95% maximum dry density as determined by the Specified Density Method.*

GEOTEXTILE SPECIFICATION

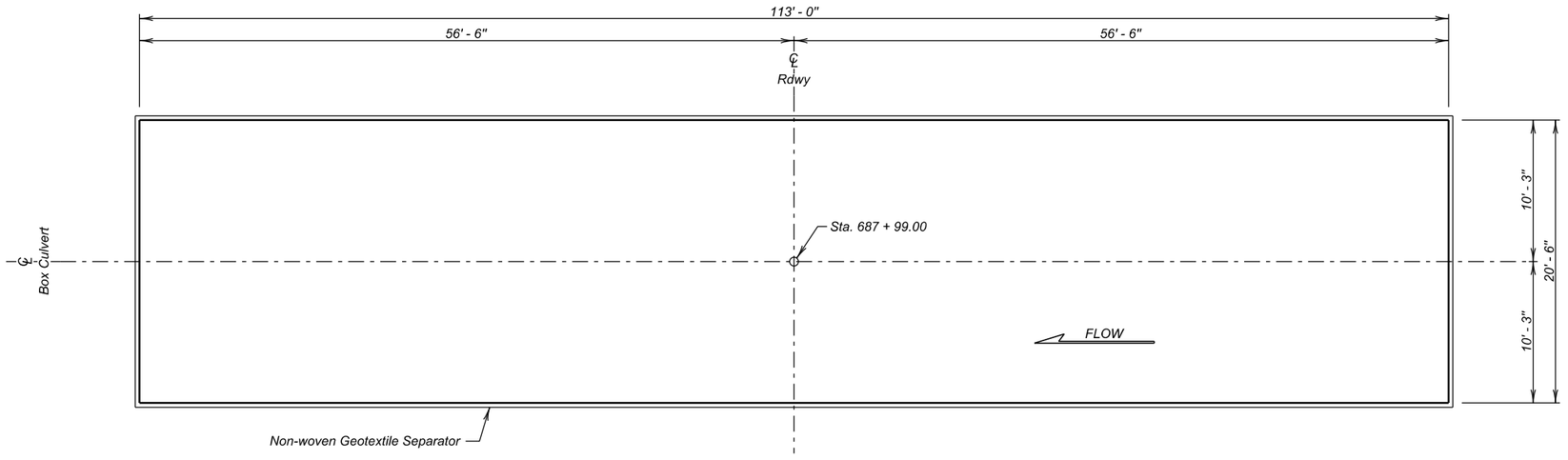
1. *The geotextile will conform to specification for Geotextiles and Impermeable Plastic Membrane, Non-woven Geotextile Separator (Section 831.1 of the Specifications). The geotextile will be on the Approved Products List for this material or will be certified by the supplier to meet this specification prior to installation.*
2. *Payment will be full compensation for furnishing and installing geotextile only.*

DESIGN MIX OF CONCRETE

1. *Mix shall be as per fabricator's design, however minimum compressive strength shall not be less than 4500 p.s.i. at 28 days.*
2. *Type II cement is required.*

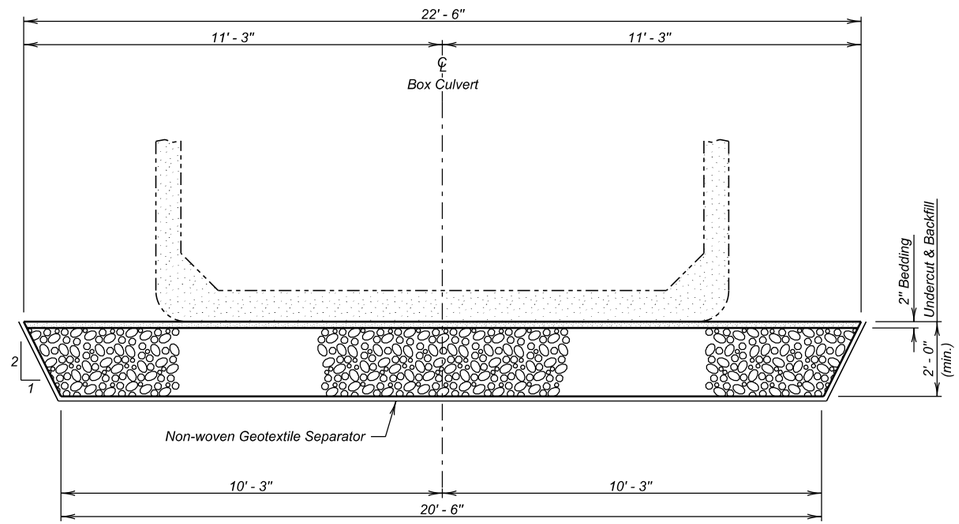
SHOP PLANS

Shop plans shall be required as specified by the Specifications. In lieu of paper copies, shop plans may be submitted electronically in Adobe PDF. Send shop plan submittals to the Office of Bridge Design.



UNDERCUT LAYOUT

(Bottom Dimensions)



TYPICAL SECTION

(For Limits of Undercut)

ESTIMATED QUANTITIES

	ITEM	UNIT	QUANTITY
⧠	Box Culvert Undercut	Cu. Yd.	182
⧄	Non-Woven Geotextile Separator	Sq. Yd.	374

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

⧄ *For payment, quantity is based on plan shown bottom undercut dimensions. Quantity includes 15% for overlapping.*

NOTES AND UNDERCUT DETAILS

FOR

14' X 7' BOX CULVERT (PRECAST)

OVER TRIB. TO WOLF CREEK — 0° SKEW

STA. 687 + 99.00 — SEC. 15/22-T103N-R56W

STR. NO. 44-031-090 — P 0038(43)321

HL-93

McCOOK COUNTY

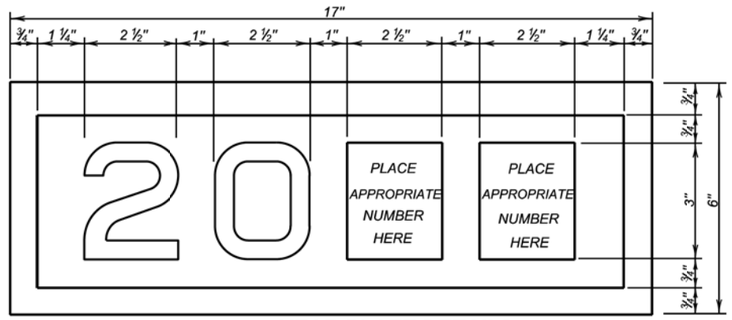
S. D. DEPT. OF TRANSPORTATION

SEPTEMBER 2013

2 OF 4

DESIGNED BY	CK. DES. BY	DRAFTED BY	
DM	JMH	MG	Kevin N. Goeden BRIDGE ENGINEER
MCCK03T6	03T6TA02		

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	P 0038(43)321	47	80



YEAR PLATE DETAILS

GENERAL NOTES:

1. Year plates of the general dimensions shown shall be constructed on all box culverts and bridges. The year plates shall be constructed in reverse and attached to the forms in such a manner that the finished imprint in the concrete does not exceed one-half (½) inch in depth.

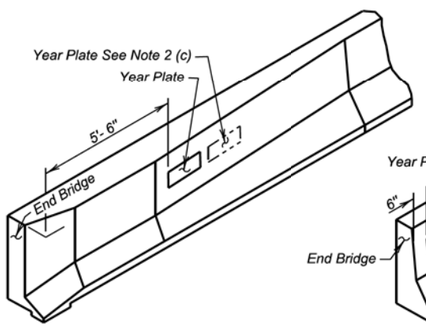
2. Year plates shall be located on structure (s) as follows:

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

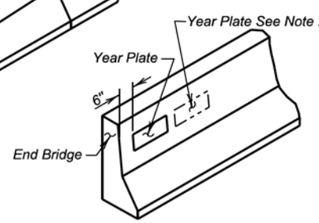
   b. On bridges with six (6) inch curbs or "Jersey" shaped barriers with no endblocks, the year plate shall be centered vertically on the curb face approximately six (6) inches from the end of the bridge, or as designated by the Engineer. On bridges with "Jersey" shaped barrier endblocks, the year plate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

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

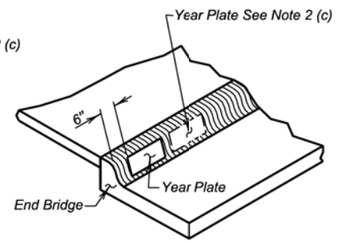
3. There will be no separate measurement or payment made for year plates on box culverts and bridges. All costs for this work shall be incidental to other contract items.



JERSEY BARRIER
(With Endblock)



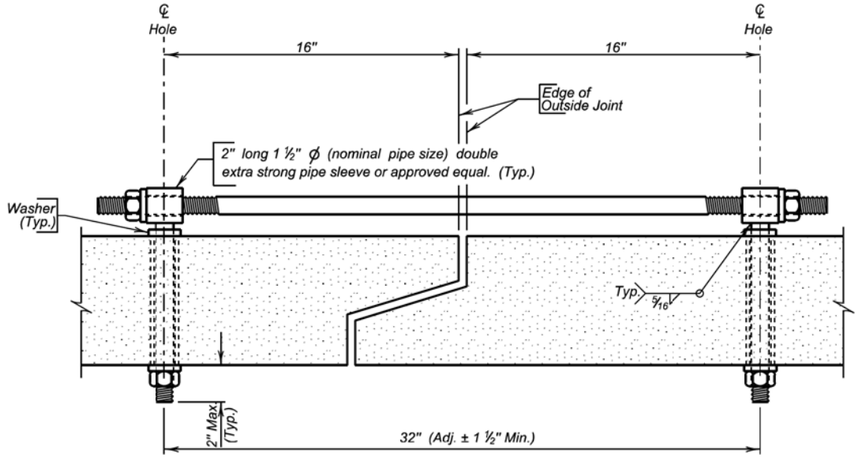
JERSEY BARRIER



TYPE B CURB

June 26, 2012

Published Date: 4th Qtr. 2014	SDDOT	YEAR PLATE DETAILS	PLATE NUMBER 460.02 Sheet 1 Of 1



TIE BOLT ASSEMBLY

GENERAL NOTES:

1. All holes for tie bolts shall be cast-in-place, 16 inches from outside edge of joint. Cast in inserts or sleeves, if used, shall be made of a corrosion resistant material.

2. Ties shall be 1 inch ∅ and conform to the requirements of ASTM A36. Nuts shall be heavy hex in conformance with ASTM A563. Washers shall conform to ASTM F436, Type 1. The welded pipe sleeve shall conform to ASTM A53, Grade B.

3. Welding and weld inspection shall be in conformance with AWS/ANSI D1.1 - (Current Year) Structural Welding Code - Steel.

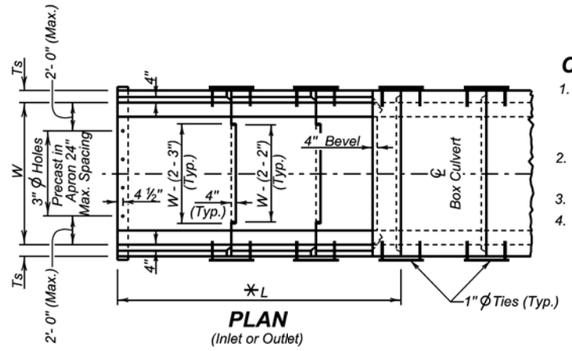
4. Tie Bolt Assembly shall be galvanized in accordance with ASTM A153.

5. Tie Bolt Assembly details may vary from that shown, but alternate tie bolt assemblies are subject to testing to demonstrate equal strength. Submit details, through proper channels, to the Office of Bridge Design for approval.

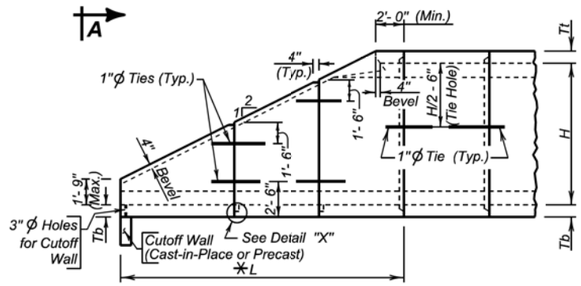
6. All costs for furnishing and installing the precast box culvert tie bolt assembly shall be incidental to the contract unit price per Foot for "Precast Concrete Box Culvert, Furnish".

December 23, 2012

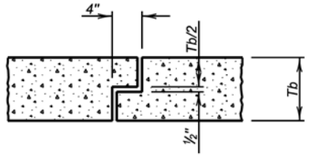
Published Date: 4th Qtr. 2014	SDDOT	PRECAST BOX CULVERT TIE BOLT ASSEMBLY DETAILS	PLATE NUMBER 560.01 Sheet 1 of 1



PLAN
(Inlet or Outlet)

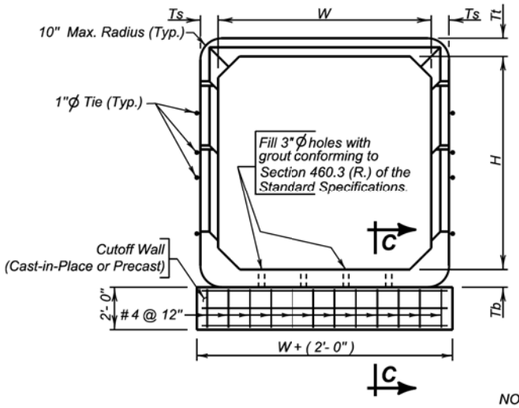


ELEVATION
(Inlet or Outlet)

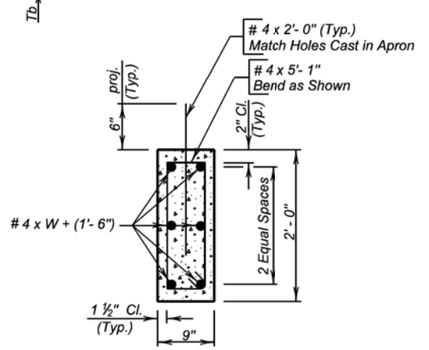


DETAIL " X "

NOTE: Joint details may vary from that shown, according to the manufacturer's design. Submit details with shop plans for approval.



VIEW A - A



SEC. C - C

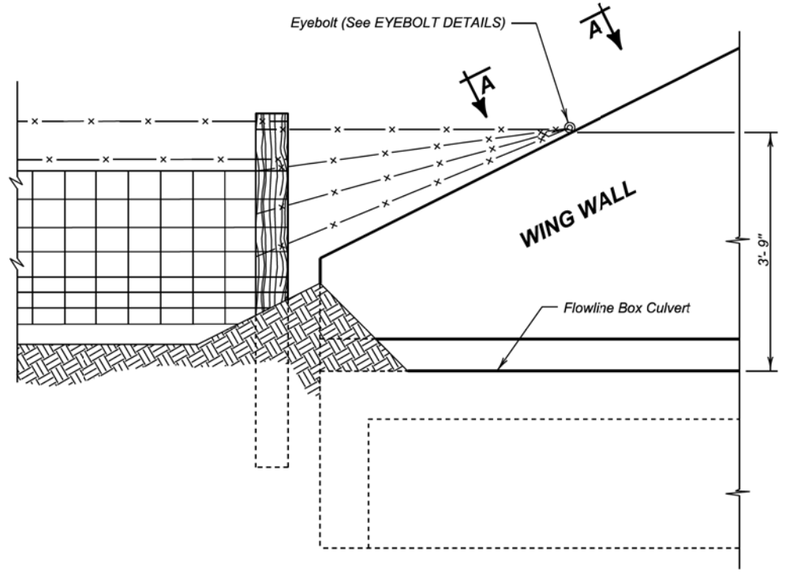
LEGEND

W = Width of Opening
H = Height of Opening
Tt = Thickness of Top Slab
Tb = Thickness of Bottom Slab
Ts = Thickness of Side Wall
L = Length of End Section

NOTES:
See GENERAL DRAWING for W and H dimensions.
Tt, Tb, L, and Ts dimensions shall be furnished by the Contractor.
* Length and number of units may vary from that shown.

December 23, 2012

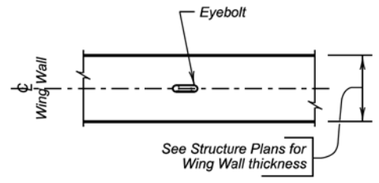
Published Date: 4th Qtr. 2014	SDDOT	PRECAST SINGLE BOX CULVERT SLOPED END SECTION DETAILS WITH 2'–0" CUTOFF WALL	PLATE NUMBER 560.10
			Sheet 1 of 1



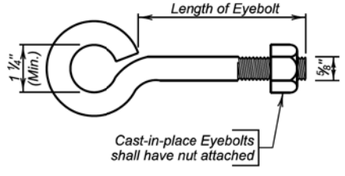
DETAIL FOR FENCE ANCHORS

GENERAL NOTES:

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



VIEW A - A



EYEBOLT DETAILS

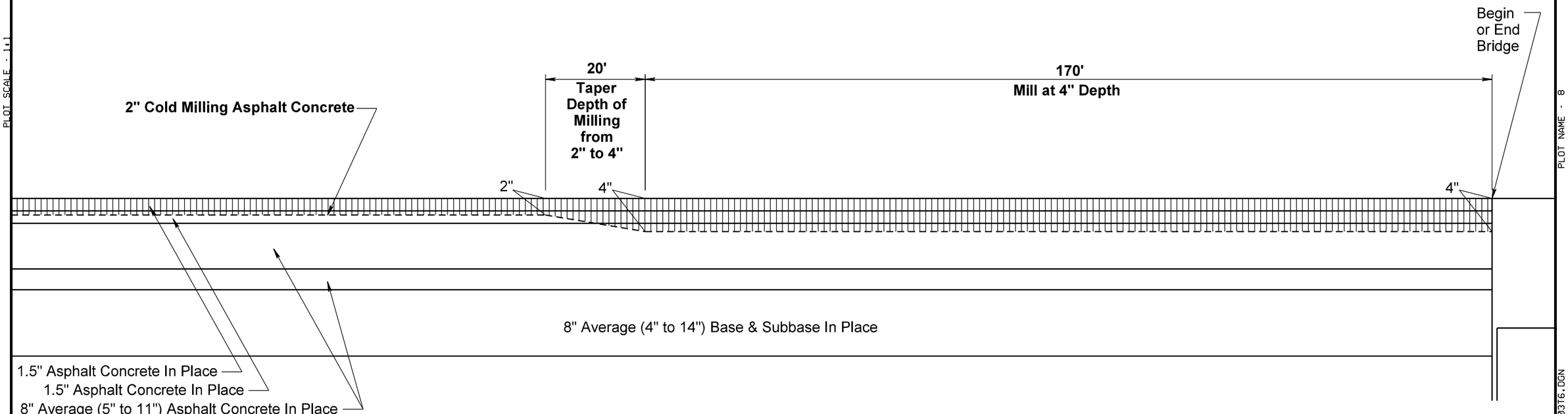
December 23, 2012

Published Date: 4th Qtr. 2014	SDDOT	FENCE ANCHORS FOR BOX CULVERT WING WALLS	PLATE NUMBER 620.16
			Sheet 1 of 1

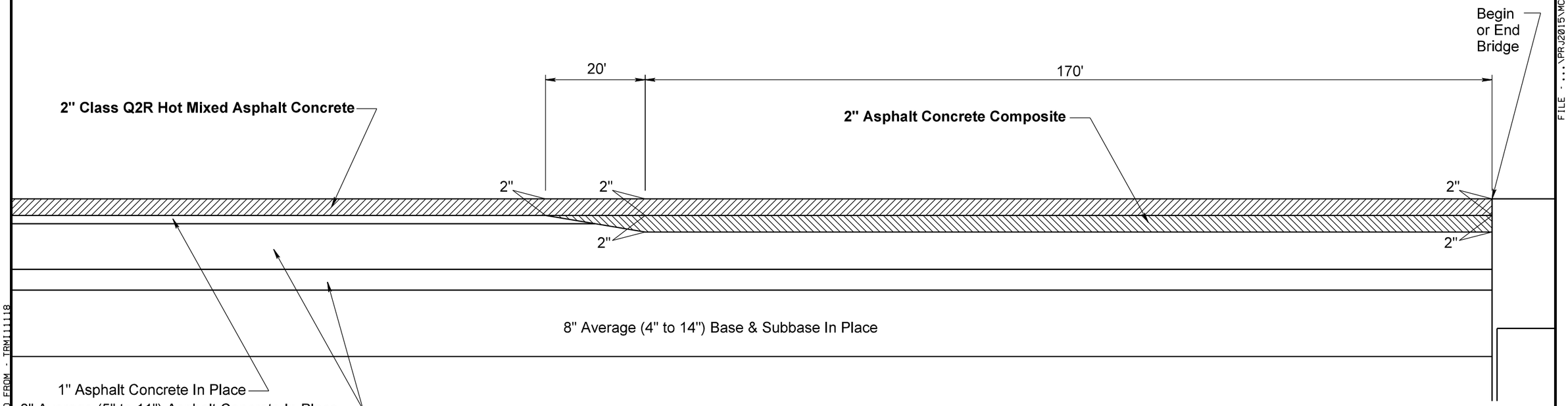
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0038(43)321	49	80

Plotting Date: 11/07/2014

DETAIL FOR COLD MILLING TAPER
AT BEGIN OR END BRIDGE



DETAIL FOR RESURFACING TAPER
AT BEGIN OR END BRIDGE



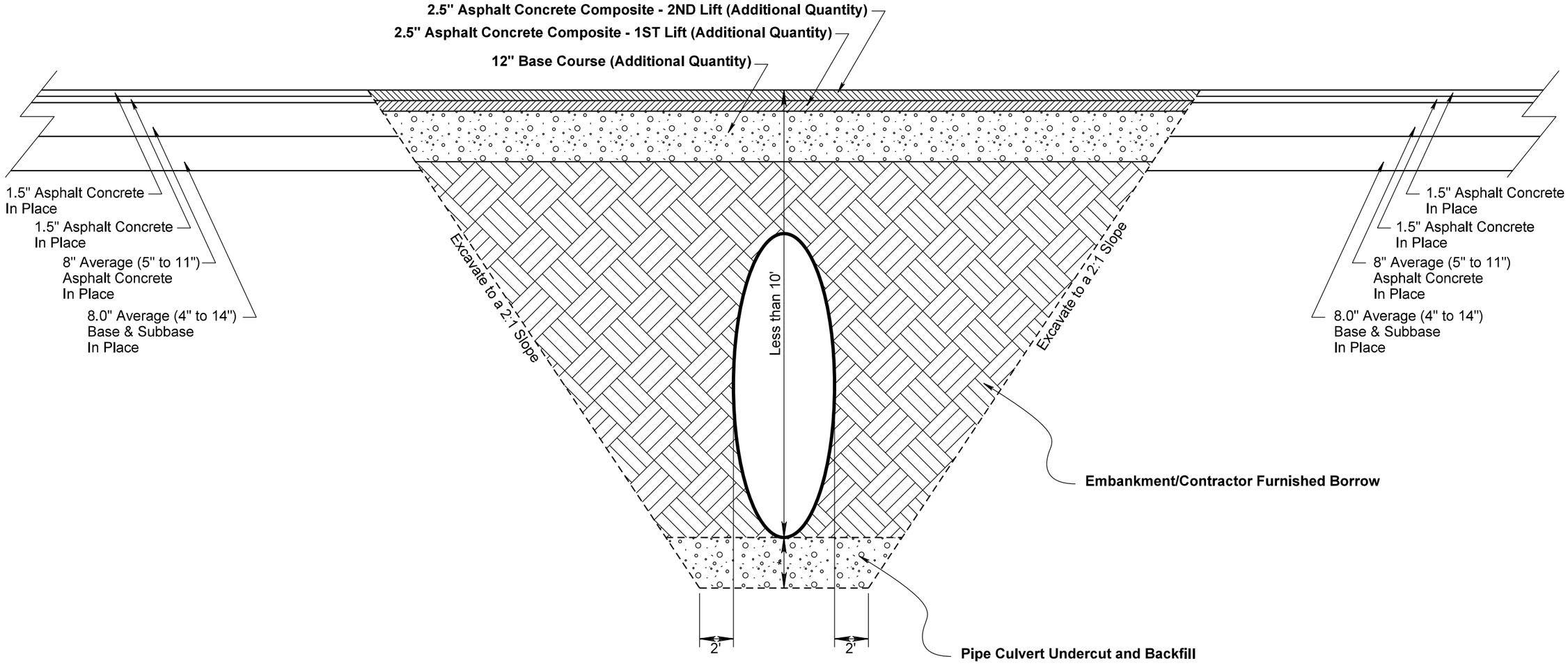
PLOT SCALE - 1:1

PLOT NAME - 8

FILE - ...\PRJ2015\MCCK03T6\MILL03T6.DGN

PLOTTED FROM - TRM111118

LAYOUT OF EMBANKMENT AND SURFACING AT SHALLOW CULVERTS BEING REPLACED



*For a depth of Pipe Culvert Undercut refer to the Table of Pipe Culvert Undercut.

INSTALLATION OF GUARDRAIL

STR. NO. 44-095-090 SD38 MRM 330.81

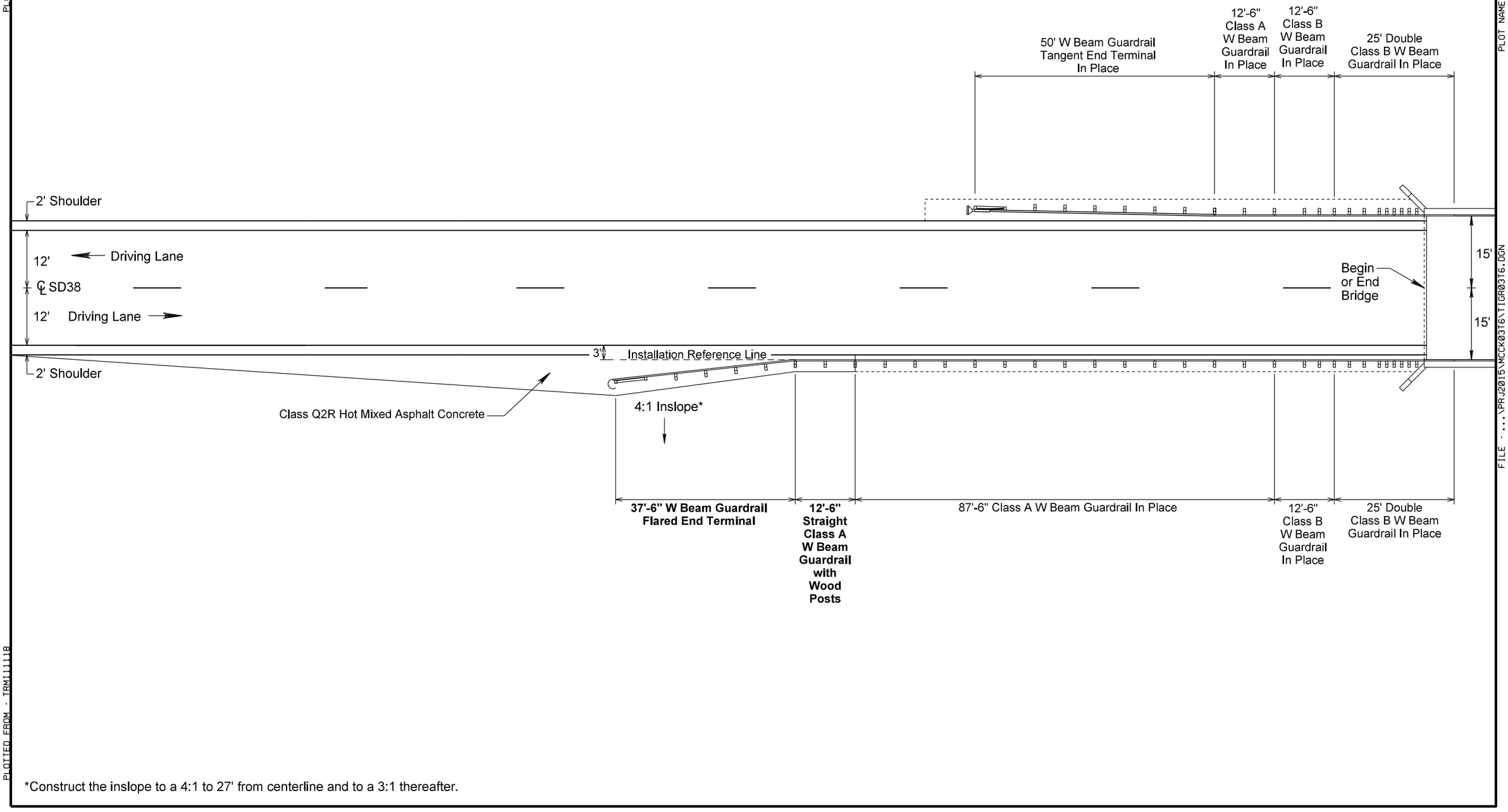
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0038(43)321	51	80

Plotting Date: 11/07/2014

PLOT SCALE - 1:20

PLOT NAME - 10

FILE - ...\PRJ2015\MCCK03T6\TIGR03T6.DGN



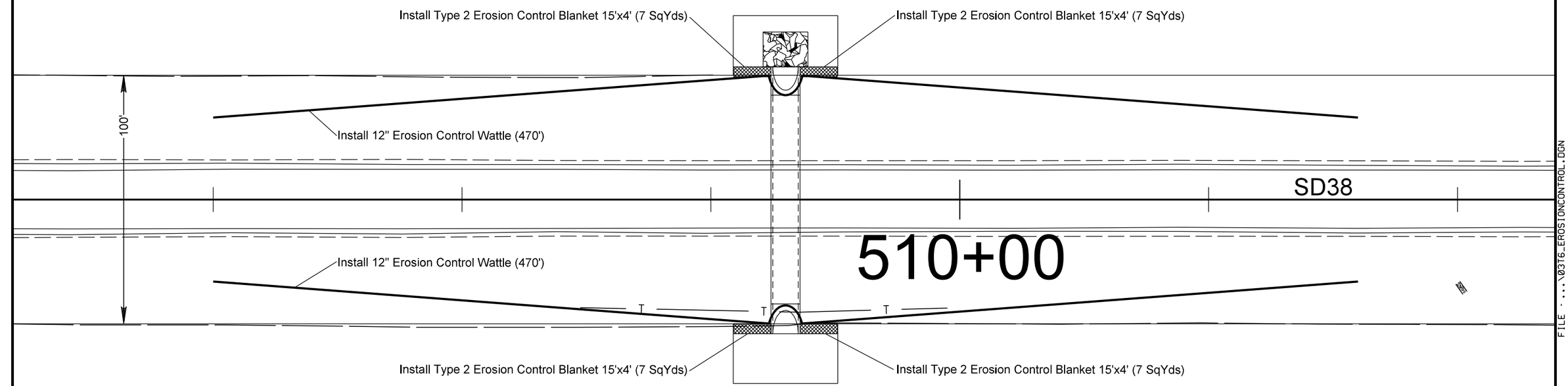
*Construct the inslope to a 4:1 to 27' from centerline and to a 3:1 thereafter.

PLOTTED FROM - TRM111118

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0038(43)321	52	80

Plotting Date: 11/07/2014

EROSION CONTROL
AT 509+30



PLOT SCALE - 1:40

PLOT NAME - 11

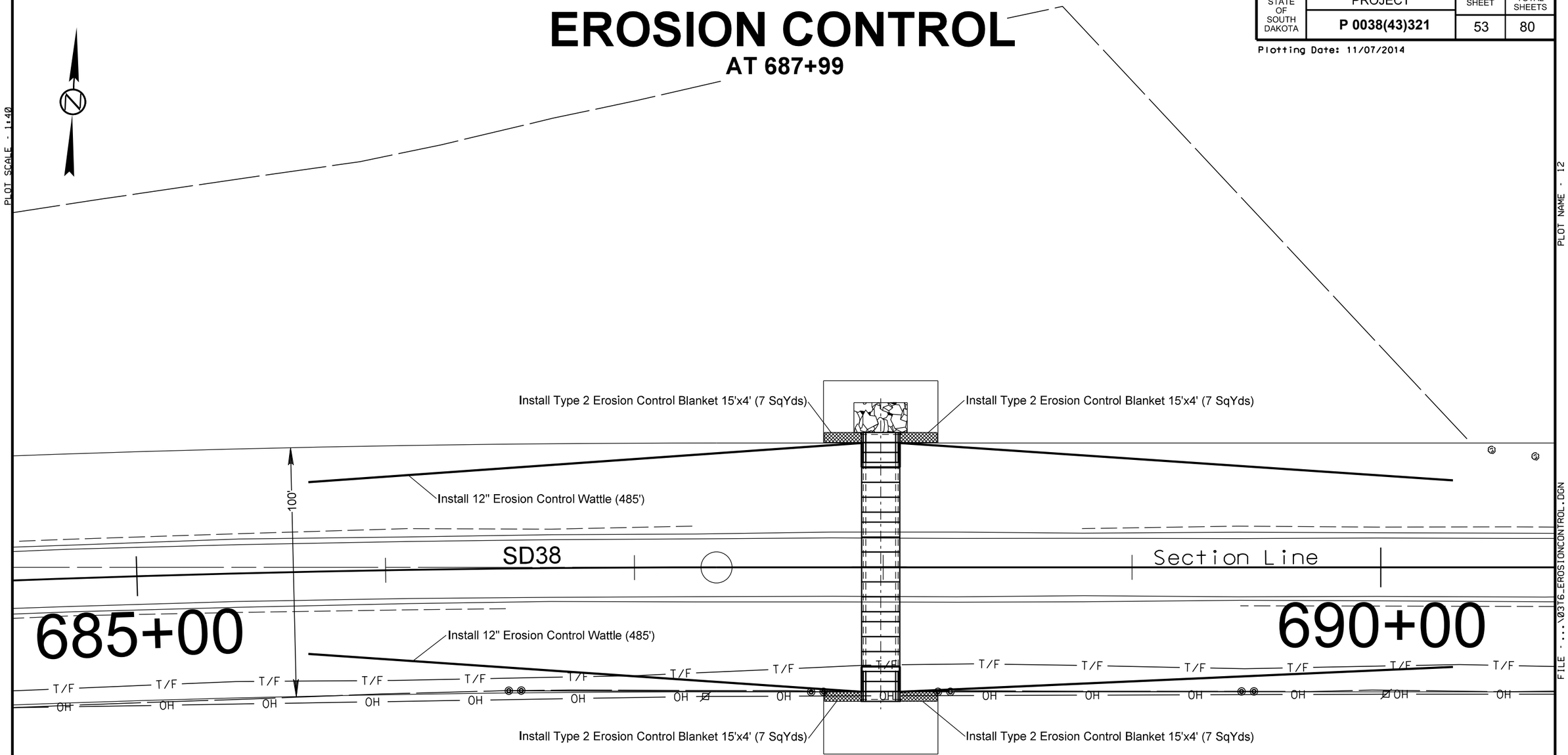
FILE - ...\0376_EROSIONCONTROL.DGN

PLOTTED FROM - TRM111118

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0038(43)321	53	80

Plotting Date: 11/07/2014

EROSION CONTROL
AT 687+99



CURVE DATA

PC:	677+84.10
PI:	682+59.16
PT:	687+33.00
Radius:	7640'
Delta:	7°06'58" Rt
Degree of Curvature:	0°45'
Length:	948.90'
Tangent:	475.06'

PLOT SCALE - 1:40

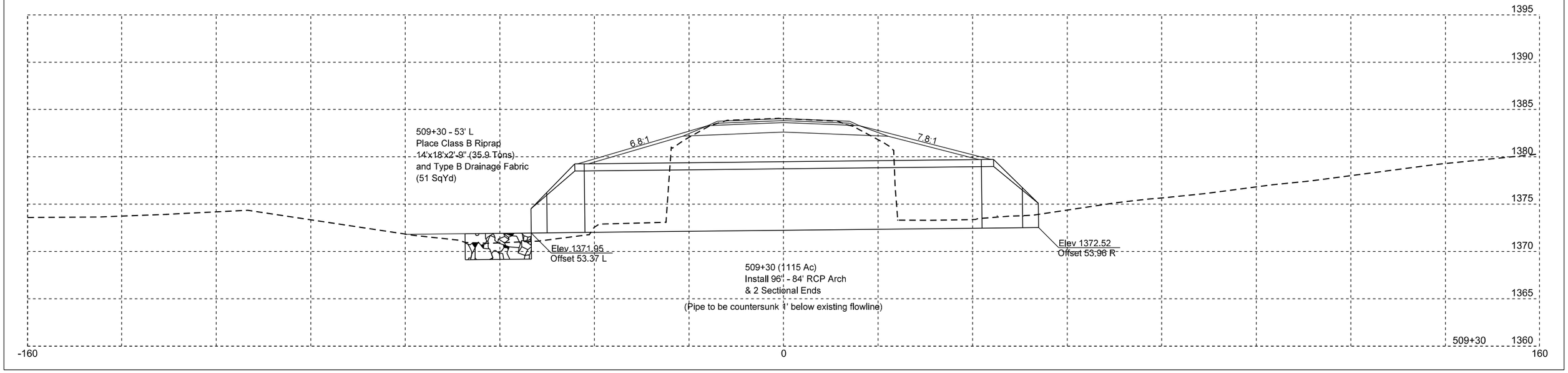
PLOT NAME - 12

FILE ....\0376_EROSIONCONTROL.DGN

PLOTTED FROM - TRM111118

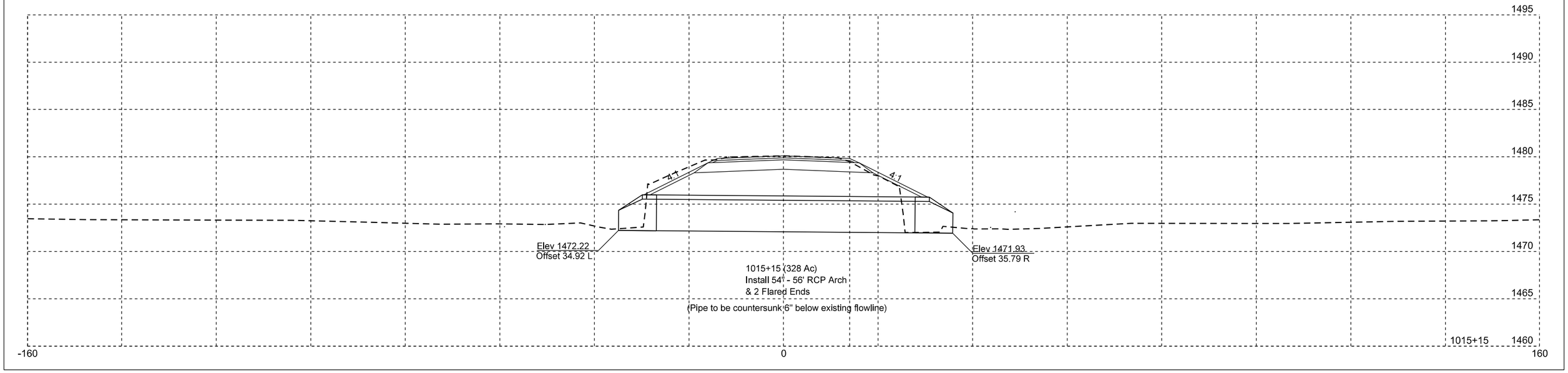
Plotting Date: 11/07/2014

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	P 0038(43)321	54	80



Plotting Date: 11/07/2014

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	P 0038(43)321	55	80



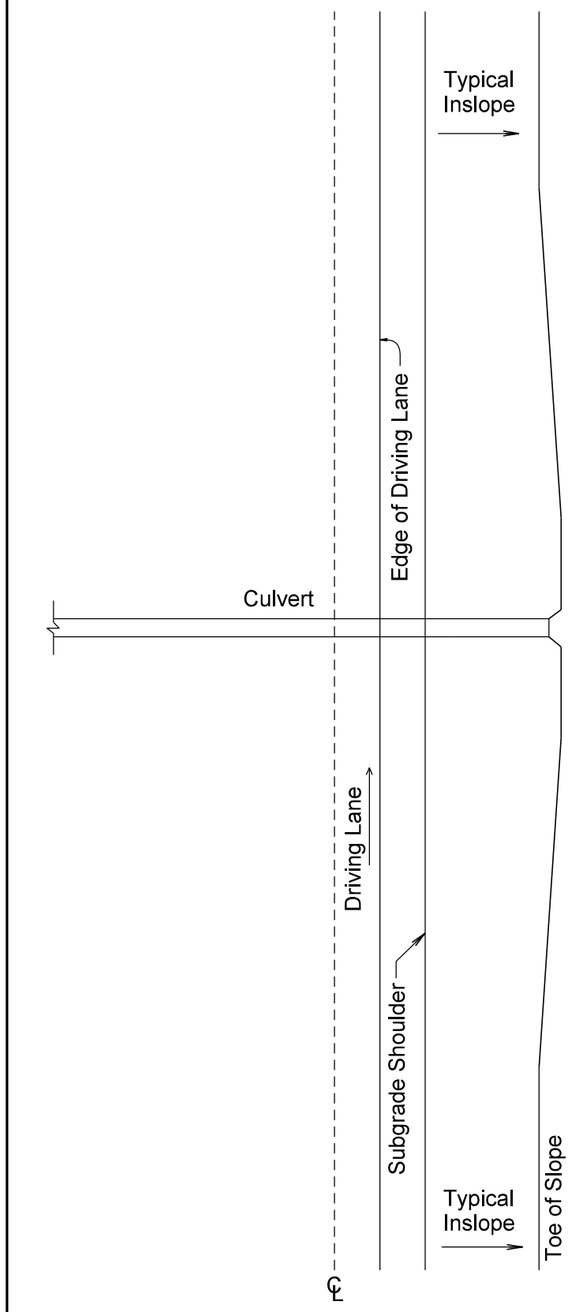
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0038(43)321	56	80

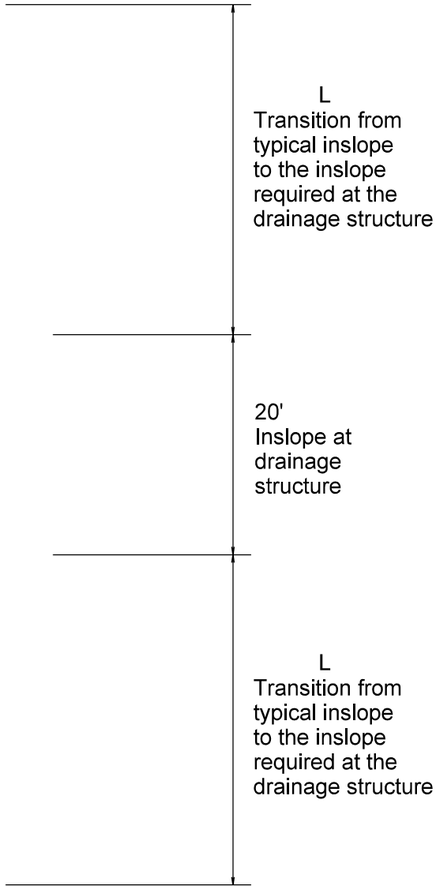
Plotting Date: 11/07/2014

INSLOPE TRANSITION

CULVERT LESS THAN 36" DIAMETER

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





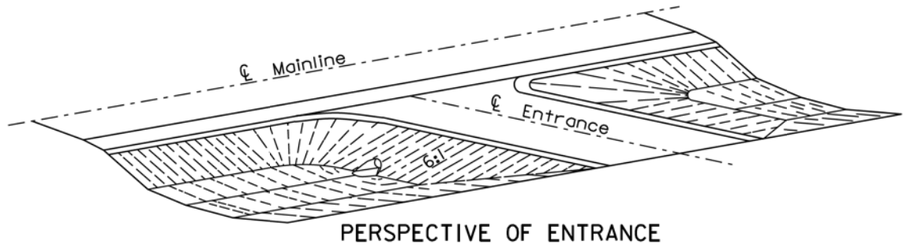
* Length will vary from site to site. The Engineer may adjust this length depending upon site conditions.

PLOT SCALE - 1:40

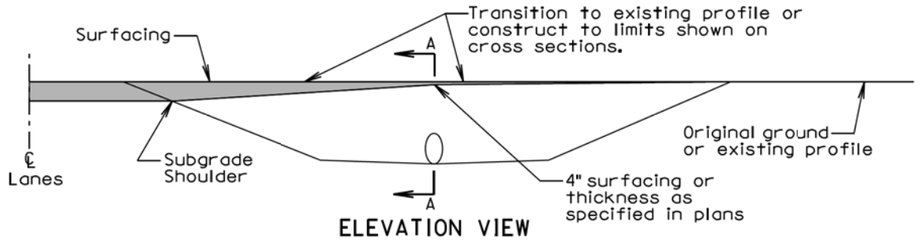
PLOTTED FROM - TRM111118

PLOT NAME - 15

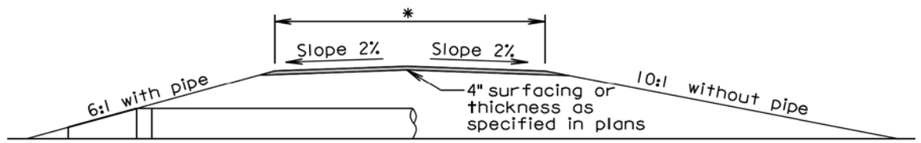
FILE - ...\PRJ2015\MCCK03T6\INSLOPE.DGN



PERSPECTIVE OF ENTRANCE



ELEVATION VIEW (ENTRANCE)



SECTION A-A (ENTRANCE)

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

GENERAL NOTES:

The ditch section shown above in the perspective and elevation view is only for illustrative purposes.

A 6:1 inslope shall be constructed for an entrance when a pipe is required. A 10:1 inslope shall be constructed when a pipe is not required.

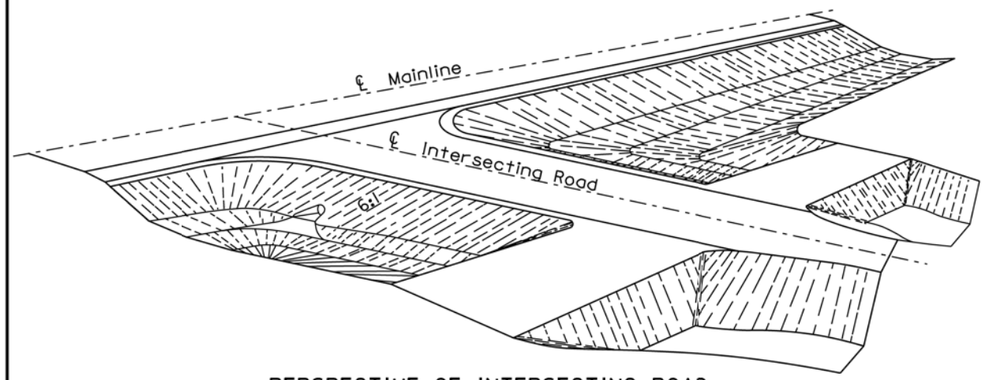
Pipe lengths shall be adjusted if necessary during construction to obtain the 6:1 slopes. For grading projects, the pipe lengths are estimated typically using a 4" thickness of surfacing directly over the subgrade above the pipe.

The transition area between the mainline inslope and the approach inslope for entrances shall be rounded to eliminate an abrupt transition.

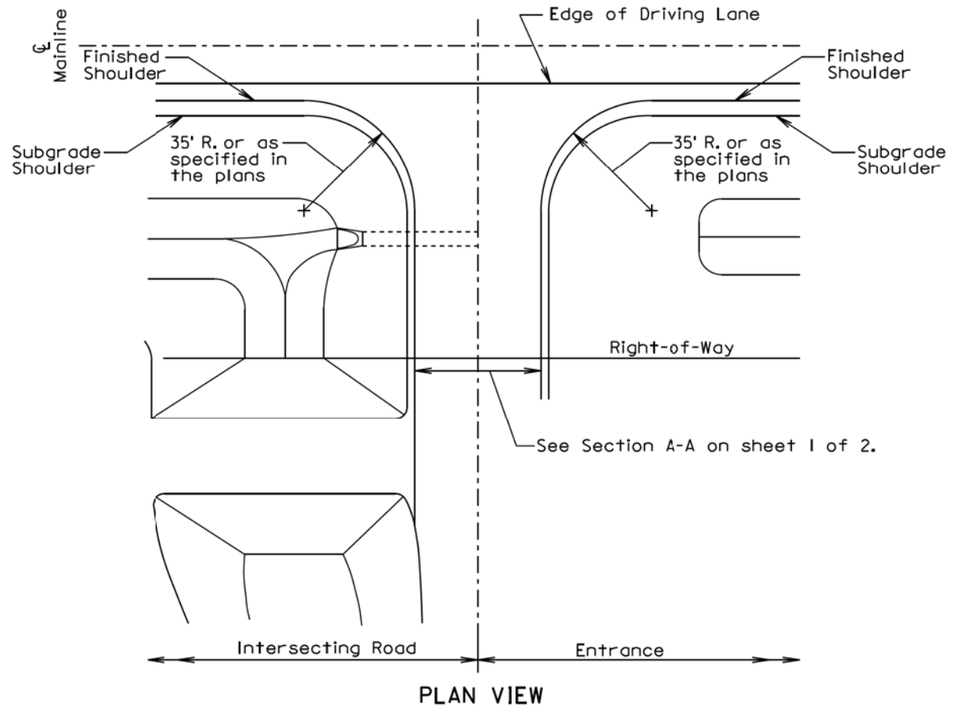
The turning radii shall be 35' for intersecting roads and entrances unless stated otherwise in the plans.

September 6, 2013

Published Date: 4th Qtr. 2014	SDDOT	INTERSECTING ROADS AND ENTRANCES	PLATE NUMBER 120.01
			Sheet 1 of 2



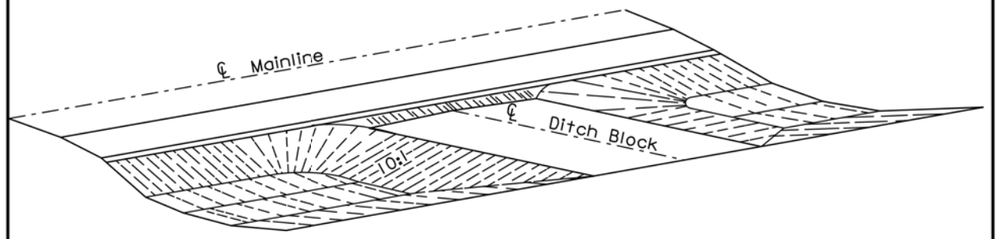
PERSPECTIVE OF INTERSECTING ROAD



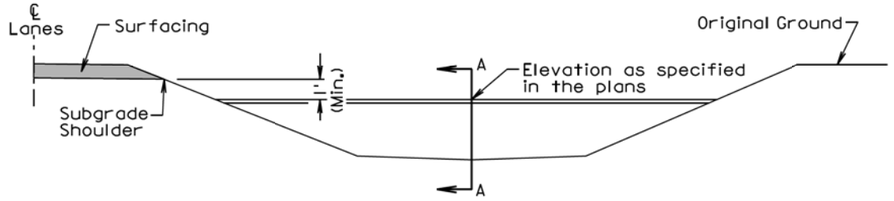
PLAN VIEW

September 6, 2013

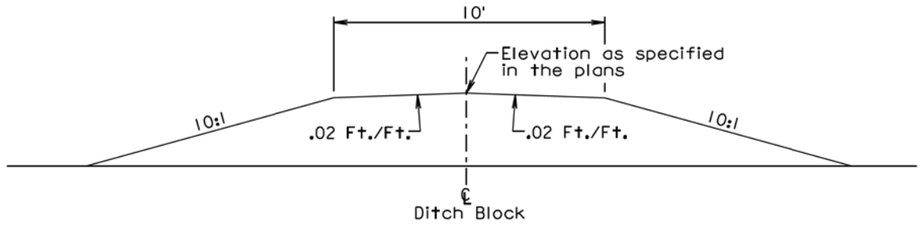
Published Date: 4th Qtr. 2014	SDDOT	INTERSECTING ROADS AND ENTRANCES	PLATE NUMBER 120.01
			Sheet 2 of 2



PERSPECTIVE OF DITCH BLOCK



ELEVATION VIEW



SECTION A-A

GENERAL NOTES:

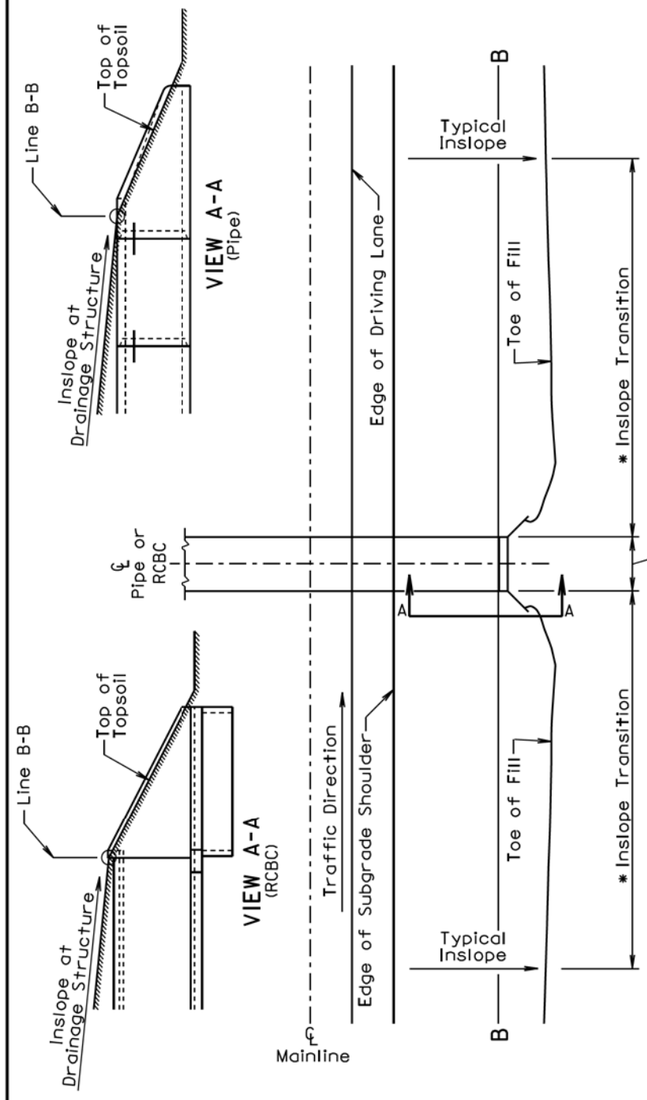
The ditch section shown above in the perspective and elevation view is only for illustrative purposes.

The inslopes of the ditch block shall be 10:1 or as specified in the plans.

The transition area between the mainline inslope and the ditch block inslope shall be rounded to eliminate an abrupt transition.

February 14, 2011

Published Date: 4th Qtr. 2014	SDDOT	DITCH BLOCK	PLATE NUMBER 120.02
			Sheet 1 of 1



TYPE 1 INSLOPE TRANSITION

GENERAL NOTES:

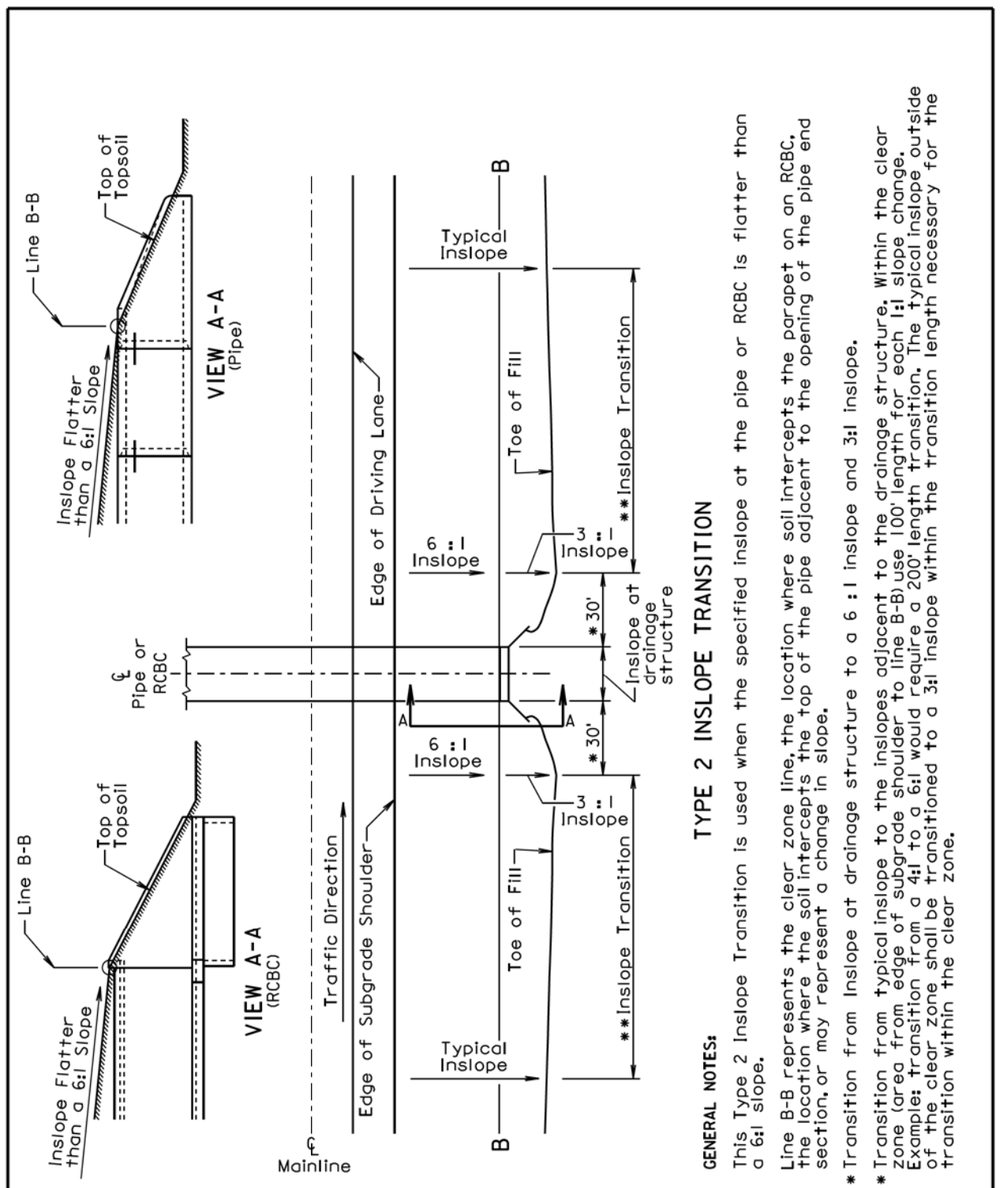
This Type 1 Inslope Transition is used when the specified inslope at the drainage structure is flatter than the typical inslope and the inslope at the drainage structure is between a 4:1 slope and 6:1 slope.

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

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

February 14, 2011

Published Date: 4th Qtr. 2014	SDDOT	INSLOPE TRANSITIONS AT PIPE CULVERTS OR REINFORCED CONCRETE BOX CULVERTS	PLATE NUMBER 120.05
			Sheet 1 of 2



TYPE 2 INSLOPE TRANSITION

GENERAL NOTES:

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

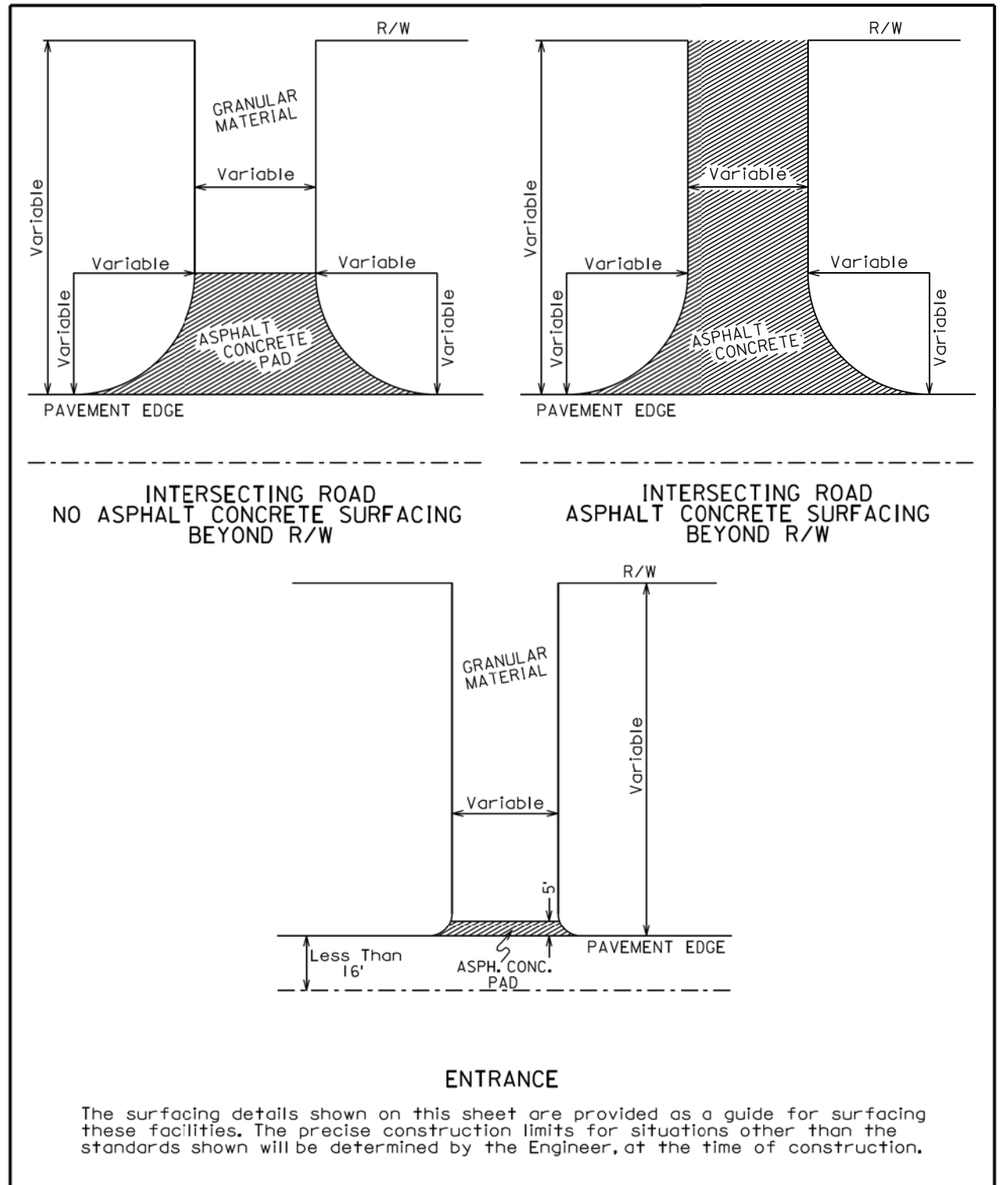
Line B-B represents the clear zone line, the location where soil intercepts the parapet on an RCBC, the location where the soil intercepts the top of the pipe adjacent to the opening of the pipe end section, or may represent a change in slope.

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

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

February 14, 2011

Published Date: 4th Qtr. 2014	SDDOT	INSLOPE TRANSITIONS AT PIPE CULVERTS OR REINFORCED CONCRETE BOX CULVERTS	PLATE NUMBER 120.05 Sheet 2 of 2



INTERSECTING ROAD
NO ASPHALT CONCRETE SURFACING BEYOND R/W

INTERSECTING ROAD
ASPHALT CONCRETE SURFACING BEYOND R/W

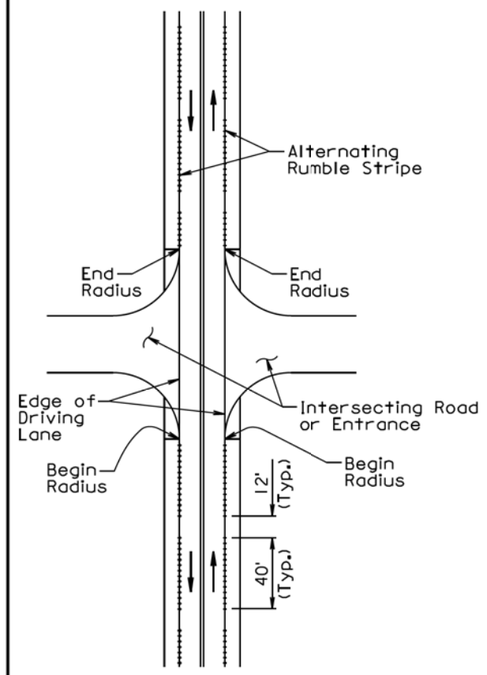
ENTRANCE

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

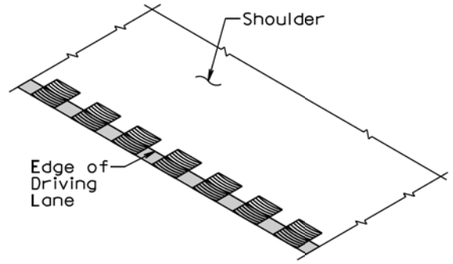
ROADWAY WITH OR WITHOUT SHOULDER

March 31, 2000

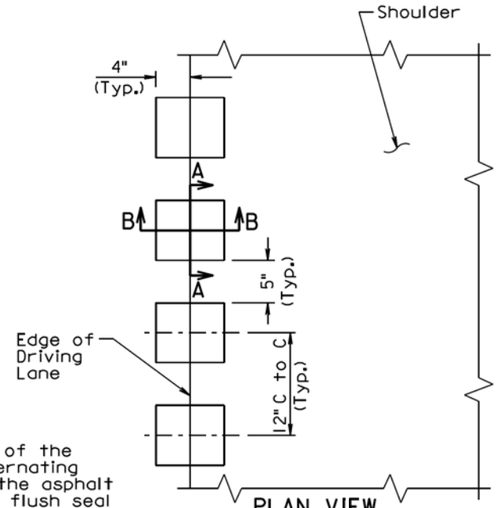
Published Date: 4th Qtr. 2014	SDDOT	RESURFACING OF INTERSECTING ROADS AND ENTRANCES	PLATE NUMBER 320.10 Sheet 1 of 1



PLAN VIEW



PERSPECTIVE OF TYPICAL RUMBLE STRIPE IN ASPHALT CONCRETE



PLAN VIEW
TYPICAL RUMBLE STRIPE IN ASPHALT CONCRETE

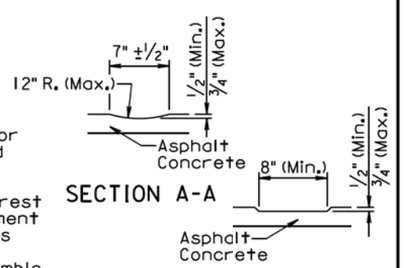
GENERAL NOTES:

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

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

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

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



SECTION A-A

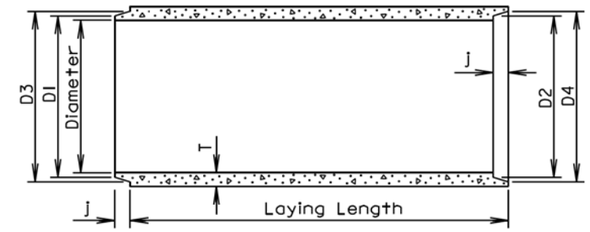
SECTION B-B

June 26, 2011

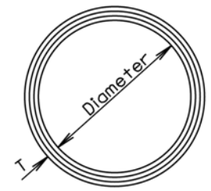
Published Date: 4th Qtr. 2014	SDDOT	8" RUMBLE STRIPE IN ASPHALT CONCRETE ON NONDIVIDED HIGHWAY SHOULDERS	PLATE NUMBER 320.20
			Sheet 1 of 1

TOLERANCES IN DIMENSIONS

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



LONGITUDINAL SECTION



END VIEW

GENERAL NOTES:

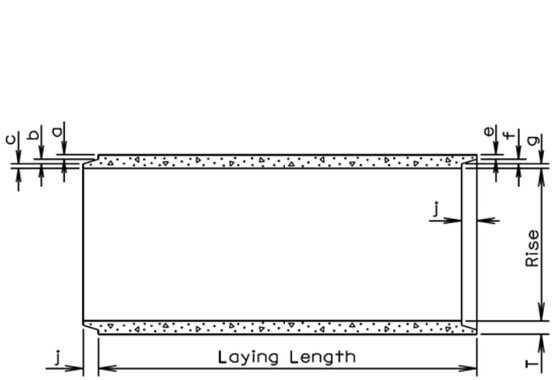
Construction of R.C.P. shall conform to the requirements of Section 990 of the Standard Specifications for Roads and Bridges.

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.

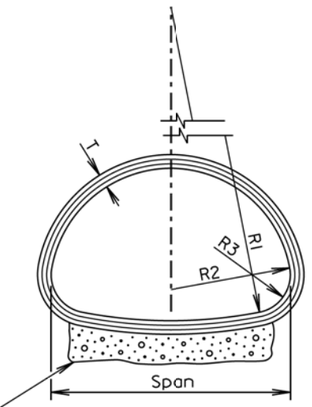
Diam. (in.)	Approx. Wt. /Ft. (lb.)	T (in.)	J (in.)	D1 (in.)	D2 (in.)	D3 (in.)	D4 (in.)
12	92	2	1 3/4	13 1/4	13 5/8	13 7/8	14 1/4
15	127	2 1/4	2	16 1/2	16 7/8	17 1/4	17 5/8
18	168	2 1/2	2 1/4	19 5/8	20	20 3/8	20 3/4
21	214	2 3/4	2 1/2	22 7/8	23 1/4	23 3/4	24 1/8
24	265	3	2 3/4	26	26 3/8	27	27 3/8
27	322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

March 31, 2000

Published Date: 4th Qtr. 2014	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

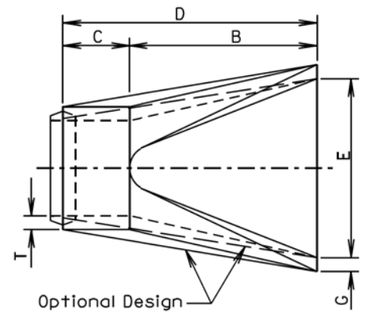
* Equivalent Diameter of Circular R. C. P.

GENERAL NOTES:

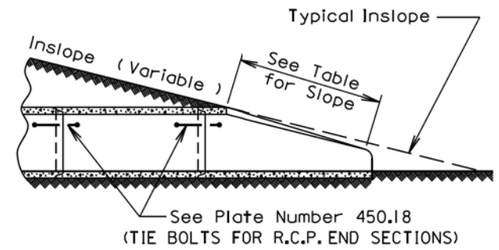
Construction of R.C.P. Arch shall conform to the requirements of Section 990 of the Standard Specifications for Roads and Bridges. Not more than 2 four foot sections shall be permitted near the ends of any culvert. Four foot lengths shall be used only to secure the required length of culvert.

March 31, 2000

Published Date: 4th Qtr. 2014	SDDOT	REINFORCED CONCRETE PIPE ARCH	PLATE NUMBER 450.02
			Sheet 1 of 1



TOP VIEW

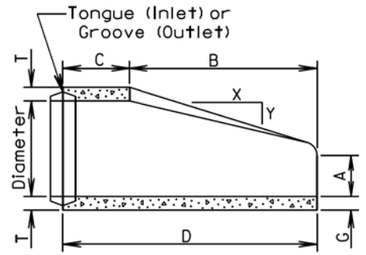


SLOPE DETAIL

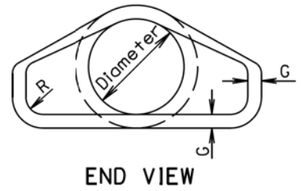
GENERAL NOTES:

Lengths of concrete pipe shown on Plan Sheets are between flared Ends only.

Construction of R.C.P. Flared End shall conform to the requirements of Section 990 of the Standard Specifications for Roads and Bridges.



LONGITUDINAL SECTION

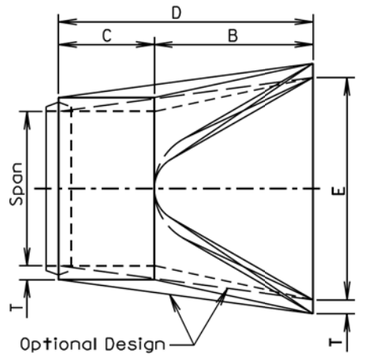


END VIEW

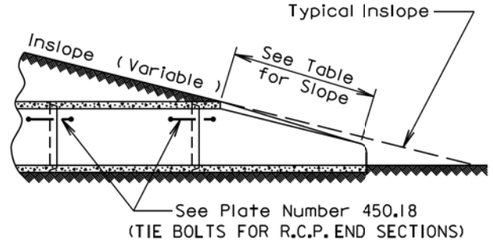
Dia. (in.)	Approx. Wt. of Section (lbs.)	Approx. Slope (X to Y)	T (in.)	A (in.)	B (in.)	C (in.)	D (in.)	E (in.)	G (in.)	R (in.)
12	530	2.4: 1	2	4	24	48 7/8	72 7/8	24	2	1 1/2
15	740	2.4: 1	2 1/4	6	27	46	73	30	2 1/4	1 1/2
18	990	2.3: 1	2 1/2	9	27	46	73	36	2 1/2	1 1/2
21	1280	2.4: 1	2 3/4	9	36	37 1/2	73 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

March 31, 2000

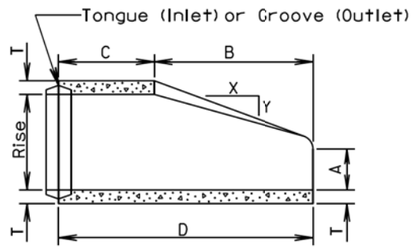
Published Date: 4th Qtr. 2014	SDDOT	R. C. P. FLARED ENDS	PLATE NUMBER 450.10
			Sheet 1 of 1



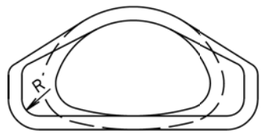
TOP VIEW



SLOPE DETAIL



LONGITUDINAL SECTION



END VIEW

GENERAL NOTES:

Lengths of concrete pipe shown on Plan Sheets are between Flared Ends only.

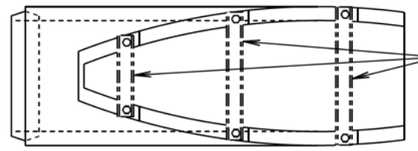
Construction of R. C. P. Arch Flared End shall conform to the requirements of Section 990 of the Standard Specifications for Roads and Bridges.

* 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.

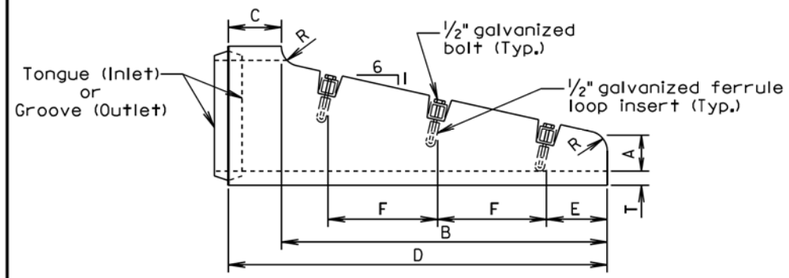
March 31, 2000

Published Date: 4th Qtr. 2014	SDDOT	R. C. P. ARCH FLARED ENDS	PLATE NUMBER 450.11 Sheet 1 of 1

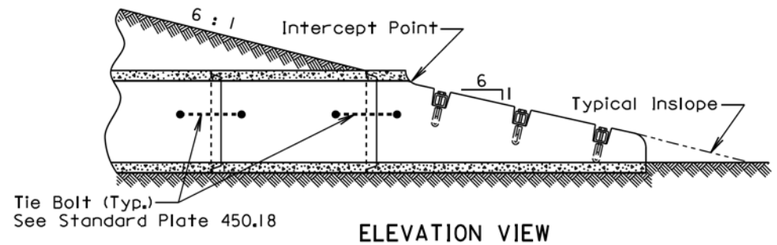


TOP VIEW

If bars are specified in the plans then provide HSS 2.5X2.5X.1875 Structural Steel Tubing in conformance with ASTM A500, Grade B or 3" Diameter Schedule 40 Pipe in conformance with ASTM A53, Grade B.



SIDE VIEW



ELEVATION VIEW

Dia. (in.)	T (in.)	R (in.)	A (in.)	B (in.)	C (in.)	D (in.)	E (in.)	F (in.)	No. Sections	No. Bars
FOR CIRCULAR PIPE										
15	2 1/4	3	6	48	9	57	6	18	1	3
18	2 1/2	3	6	69	9	78	9	24	1	3
*24	3	3	6	111	9	120	6	24	1 or 2	5
FOR ARCH PIPE										
**18	2 1/2	1	6	39	33	72	6	24	1	2

*The use of 2 sections must be an approved design.
**Equivalent Diameter of Circular R. C. P.

GENERAL NOTES:

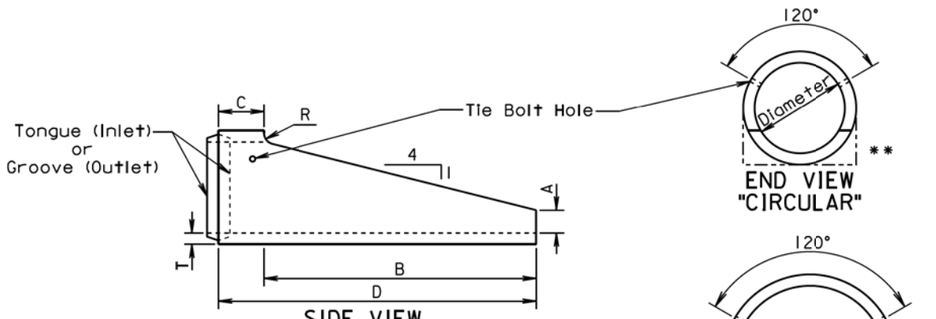
The length of concrete pipe shown on the plans is between safety ends.

Safety ends without bars are acceptable with or without the bar notches.

Bars shall be galvanized after fabrication in accordance with ASTM A123.

August 31, 2013

Published Date: 4th Qtr. 2014	SDDOT	R. C. P. SAFETY ENDS WITH OR WITHOUT BARS	PLATE NUMBER 450.12 Sheet 1 of 1



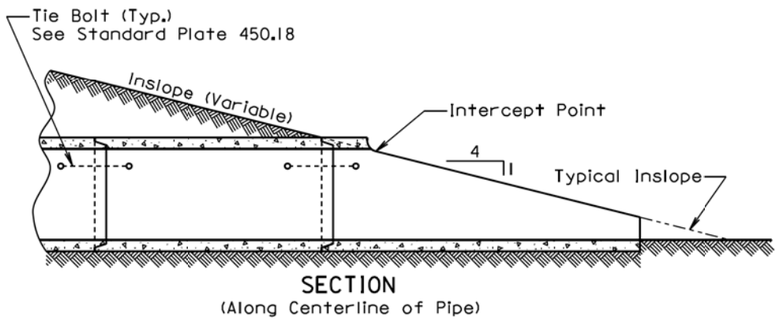
Dia. (in.)	T (in.)	A (in.)	B (in.)	C (in.)	D (in.)	R (in.)
FOR CIRCULAR PIPE						
24	3	6	72	12	84	3
30	3½	7½	90	12	102	3½
FOR ARCH PIPE						
* 24	3	6	48	12	60	3
* 30	3½	7½	60	12	72	3½
* 36	4½	8⅝	66	30	96	0
* 42	4½	10	77¼	18¾	96	0

ALTERNATE

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

* Equivalent Diameter of Circular R.C.P.

** Acceptable Flat Bottom Alternate.

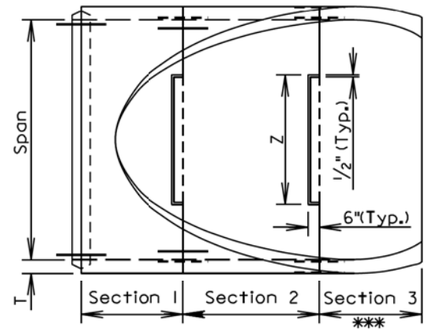


GENERAL NOTE:

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

September 22, 2006

Published Date: 4th Qtr. 2014	SDDOT	R. C. P. SLOPED ENDS	PLATE NUMBER 450.13
			Sheet 1 of 1

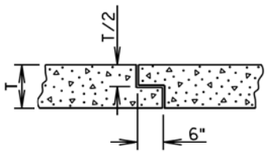


TOP VIEW

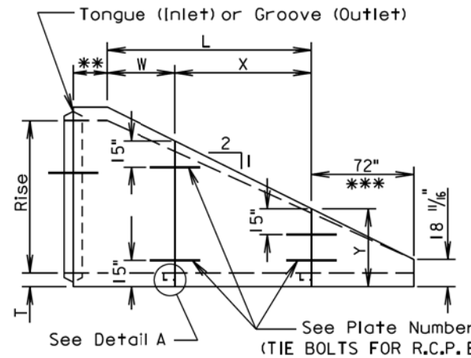
GENERAL NOTES:

Construction of R.C.P. Arch Sectional Ends shall conform to the requirements of Section 990 of the Standard Specifications for Roads and Bridges.

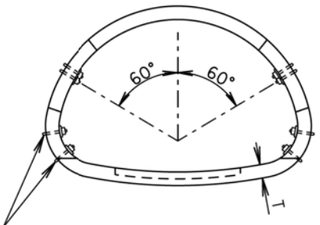
Lengths of concrete pipe shown on plan sheets are between sectional ends only.



DETAIL A



SIDE VIEW



END VIEW

* Size (in.)	Approx. Weight Sect. 1 (lbs.)	Approx. Weight Sect. 2 (lbs.)	Approx. Weight Sect. 3 (lbs.)	Rise (in.)	Span (in.)	T (in.)	L (in.)	W (in.)	X (in.)	Y (in.)	Z (in.)
90	19100	3950		72	115½	8½	102¼	72	30¼	37⅞	48
96	22000	6050		78	122⅜	9	112½	72	40½	39	54
108	23000	15800		88	138½	10	129½	48	81½	42⅜	66
120	27000	24600		96⅞	154	11	144	48	96	46⅞	78
132	27950	25260	13640	106½	168¾	10	144	48	96		90

*Equivalent Diameter of Circular R. C. P.

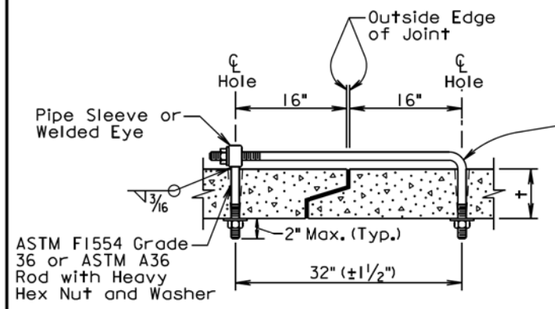
**2'- 0" for Groove End and 2'- 7" for Tongue End.

***Section 3 available for 132" size only.

March 31, 2000

Published Date: 4th Qtr. 2014	SDDOT	R. C. P. ARCH SECTIONAL ENDS	PLATE NUMBER 450.17
			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

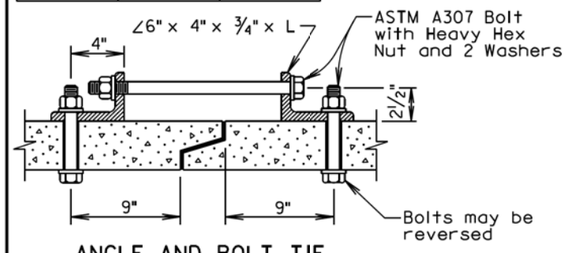
GENERAL NOTES:

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



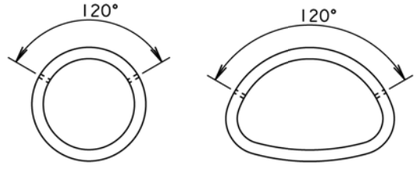
ANGLE AND BOLT TIE

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:

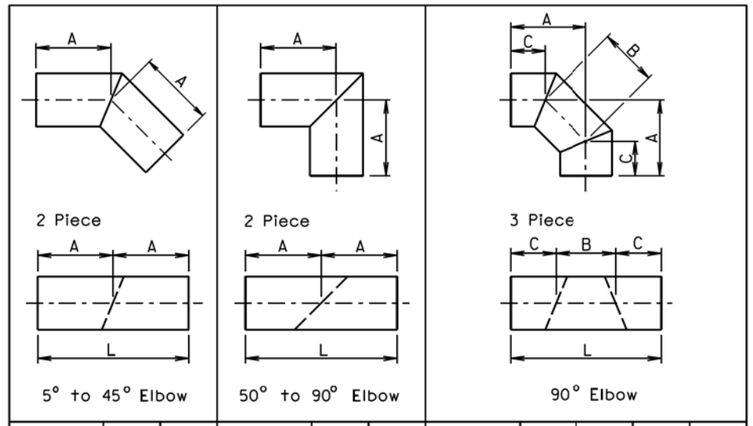
In lieu of the tie bolts detailed above other types of tie bolt connections may be installed as approved by the Office of Bridge Design.

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. 2014	SDDOT	TIE BOLTS FOR R.C.P. AND R.C.P. ARCH	PLATE NUMBER 450.18
			Sheet 1 of 1



Diameter	A	L	Diameter	A	L	Diameter	A	B	C	L
Inches	Feet	Feet	Inches	Feet	Feet	Inches	Inches			Feet
12	1	2	12	2	4	12	25½	11	18½	4
15	1	2	15	2	4	15	26½	12	18	4
18	1	2	18	2	4	18	27	14	17	4
21	2	4	21	2	4	21	27	15	16½	4
24	2	4	24	2	4	24	27½	16	16	4
27	2	4	27	2	4	27	27½	17	15½	4
30	2	4	30	3	6	30	40	19	26½	6
33	2	4	33	3	6	33	40	20	26	6
36	2	4	36	3	6	36	40½	21	25½	6
42	2	4	42	3	6	42	41	23	24½	6
48	2	4	48	4	8	48	53½	26	35	8
54	3	6	54	4	8	54	54	28	34	8
60	3	6	60	4	8	60	54½	31	32½	8
66	3	6	66	4	8	66	54	33	31½	8
72	3	6	72	5	10	72	67½	36	42	10
78	3	6	78	5	10	78	68	39	40½	10
84	3	6	84	5	10	84	68½	41	39½	10
90	3	6	90	6	12	90	70	46	37	10
96	3	6	96	6	12	96	82	46	49	12

FABRICATED ELBOW LENGTHS FOR ALL CORRUGATIONS

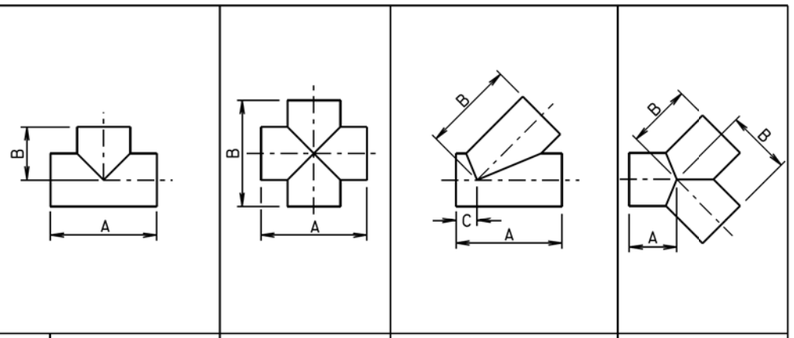
GENERAL NOTES:

All dimensions shown are nominal.

L = Linear Feet of C.M.P. required to fabricate fitting.

June 26, 2001

Published Date: 4th Qtr. 2014	SDDOT	C.M.P. FABRICATED LENGTHS FOR ELBOWS	PLATE NUMBER 450.32
			Sheet 1 of 1



	Tee			Cross			45° Lateral				45° Wye		
Diameter	A	B	L	A	B	L	A	B	C	L	A	B	L
Inches	Feet			Feet			Feet		Inches	Feet	Feet		
12	4	2	6	4	4	8	4	2	17	6	2	2	6
15	4	2	6	4	4	8	4	4	18	8	2	2	6
18	4	2	6	4	4	8	4	4	13	8	2	2	6
21	4	2	6	4	4	8	6	4	22	10	2	2	6
24	4	2	6	4	4	8	6	4	23	10	2	2	6
27	4	2	6	4	4	8	6	4	20	10	2	2	6
30	4	2	6	4	4	8	6	4	21	10	2	2	6
33	6	4	10	6	6	12	6	6	19	12	2	3	8
36	6	4	10	6	6	12	8	6	19	14	2	3	8
42	6	4	10	6	6	12	8	6	21	14	2	3	8
48	6	4	10	6	6	12	10	8	28	18	2	3	8
54	6	4	10	6	6	12	10	8	23	18	4	4	12
60	8	4	12	8	8	16	12	10	30	22	4	4	12
66	8	4	12	8	8	16	12	10	32	22	4	4	12
72	8	4	12	8	8	16	14	10	45	24	4	5	14
78	10	6	16	10	10	20	14	10	46	24	4	5	14
84	10	6	16	10	10	20	16	12	47	28	4	5	14
90	10	6	16	10	10	20	16	12	49	28	4	5	14
96	10	6	16	10	10	20	16	12	50	28	4	5	16

FABRICATED LENGTHS FOR TEES, CROSSES, AND WYES FOR ALL CORRUGATIONS

GENERAL NOTES:

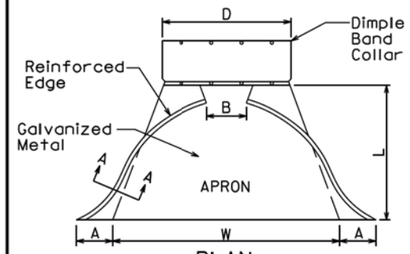
All dimensions shown are nominal.

L = Linear Feet of C.M.P. required to fabricate fitting.

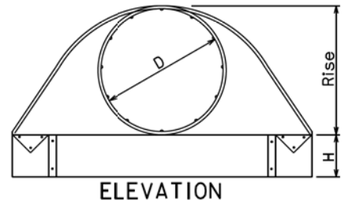
June 26, 2001

Published Date: 4th Qtr. 2014	SDDOT	C.M.P. FABRICATED LENGTHS FOR TEES, CROSSES, AND WYES	PLATE NUMBER 450.33
			Sheet 1 of 1

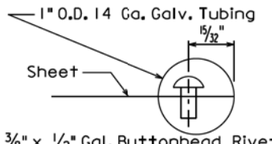
Alternate Type Connector Sections may be used with approval of the Engineer.



PLAN

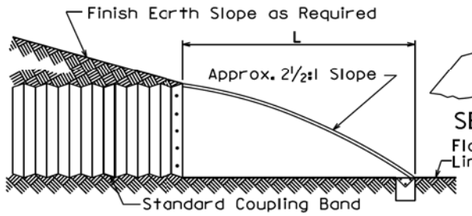


ELEVATION



3/8" x 1/2" Gal. Buttonhead Rivets spaced 6" C. to C. Overall length of rivets=0.78"

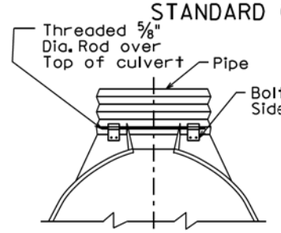
TUBING ATTACHMENT DETAILS
SECTION A-A



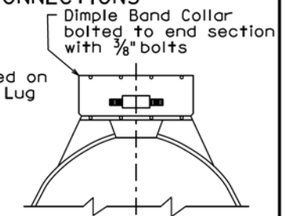
TYPICAL CROSS-SECTION

Dia. D (in.)	Ga.	DIMENSIONS (in.) A	B	H	L	W	Approx. Slope	Body
12	16	6	6	6	21	24	2½:1	1 Pc.
15	16	7	8	6	26	30	2½:1	1 Pc.
18	16	8	10	6	31	36	2½:1	1 Pc.
21	16	9	12	6	36	42	2½:1	1 Pc.
24	16	10	13	6	41	48	2½:1	1 Pc.
30	14	12	16	8	46	60	2½:1	1 Pc.
36	14	14	19	9	51	72	2½:1	2 Pc.
42	12	16	22	11	60	84	2½:1	2 Pc.
48	12	18	27	12	69	90	2¼:1	2 Pc.
54	12	18	30	12	78	102	2:1	3 Pc.
60	12	18	33	12	84	114	1¾:1	3 Pc.
66	12	18	36	12	87	120	1½:1	3 Pc.
72	12	18	39	12	87	126	1⅓:1	3 Pc.
78	12	18	42	12	87	132	1¼:1	3 Pc.
84	12	18	45	12	87	138	1⅙:1	3 Pc.

STANDARD CONNECTIONS

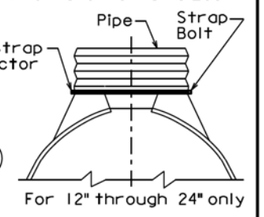


For 30" through 84"

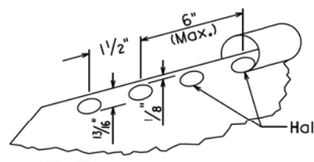


Alternate for all sizes

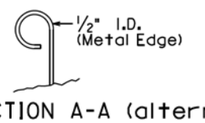
NOTE:
Tubing is slipped over the sheet and rivets or lugs prior to forming operations of the apron.



For 12" through 24" only



SECTION A-A (alternate)



SECTION A-A (alternate)

GENERAL NOTES:

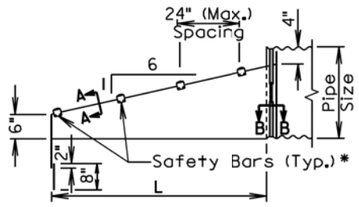
All 3 pc. bodies shall have 12 Ga. sides and 10 Ga. center panels. Width of center panels shall be greater than 20% of the pipe periphery. Multiple panel bodies to have lap seams tightly joined by ⅜" Dia. galvanized rivets or bolts.

For 60" through 84" sizes, reinforced edges shall be supplemented with galvanized stiffener angles. The angles will be 2" x 2" x ¼" for 60" through 72" diameters and 2½" x 2½" x¼" for 78" and 84" diameters. The angles shall be attached by ⅜" diameter galvanized nuts and bolts.

Rivets and Bolts shall be ⅜" Dia. Min. for 10 Ga. and 12 Ga. sheet, and 5/16" Dia. Min. for 14 Ga. and 16 Ga. sheets. Tighten nuts with torque wrench to 25 lbs. torque.

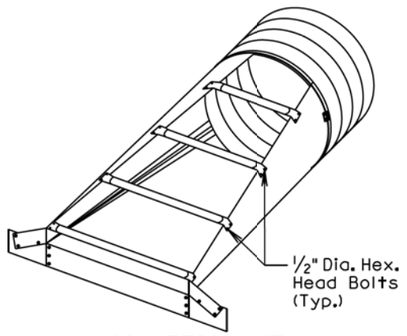
March 31, 2000

Published Date: 4th Qtr. 2014	SDDOT	C.M.P. FLARED ENDS	PLATE NUMBER 450.35
			Sheet 1 of 1

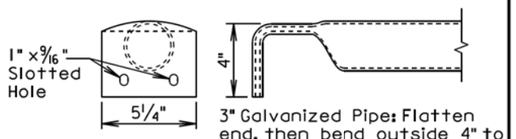


ELEVATION VIEW

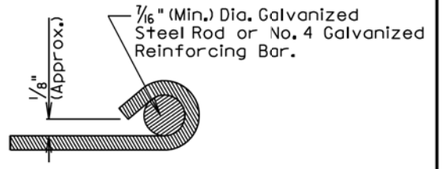
*Number of bars required will vary depending on the length of the end section.



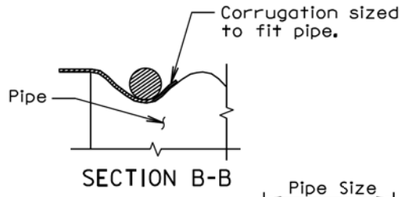
ISOMETRIC VIEW



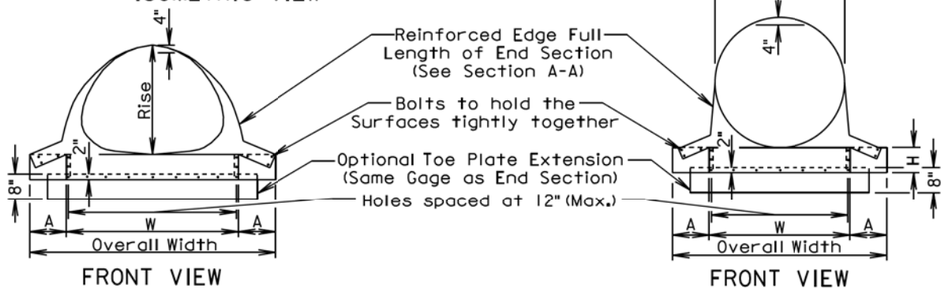
DETAIL OF SAFETY BARS



SECTION A-A

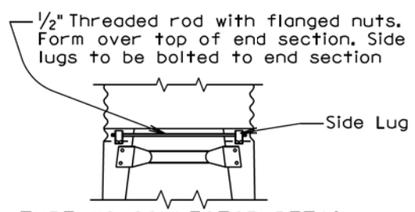


SECTION B-B

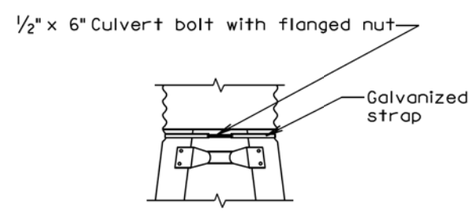


FRONT VIEW

FRONT VIEW



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



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

August 31, 2013

Published Date: 4th Qtr. 2014	SDDOT	C. M. P. SAFETY ENDS	PLATE NUMBER 450.38 Sheet 1 of 2

ARCH C.M.P. SAFETY ENDS

Equv. Dia. (Inch)	(Inches) Span	Rise	Min. Thick. Inch	Gage	Dimensions (Inches) A	H	W	Overall Width	L Dimensions Slope	Length (Inch)
18	21	15	.064	16	8	6	27	43	6:1	30
21	24	18	.064	16	8	6	30	46	6:1	48
24	28	20	.064	16	8	6	34	50	6:1	60
30	35	24	.079	14	12	9	41	65	6:1	84
36	42	29	.109	12	12	9	48	72	6:1	114
42	49	33	.109	12	16	12	55	87	6:1	138
48	57	38	.109	12	16	12	63	95	6:1	168
54	64	43	.109	12	16	12	70	102	6:1	198
60	71	47	.109	12	16	12	77	109	6:1	222
72	83	57	.109	12	16	12	89	121	6:1	282

CIRCULAR C.M.P. SAFETY ENDS

Pipe Dia. (Inch)	Min. Thick. Inch	Gage	Dimensions (Inches) A	H	W	Overall Width	L Dimensions Slope	Length (Inch)
15	.064	16	8	6	21	37	6:1	30
18	.064	16	8	6	24	40	6:1	48
21	.064	16	8	6	27	43	6:1	66
24	.064	16	8	6	30	46	6:1	84
30	.109	12	12	9	36	60	6:1	120
36	.109	12	12	9	42	66	6:1	156
42	.109	12	16	12	48	80	6:1	192
48	.109	12	16	12	54	86	6:1	228
54	.109	12	16	12	60	92	6:1	264
60	.109	12	16	12	66	98	6:1	300

GENERAL NOTES:

Safety ends shall be fabricated from galvanized steel conforming to the requirements of the Standard Specifications.

Safety bars shall be fabricated from steel schedule 40 pipe in conformance with ASTM A53, grade B or HSS 3.5X.216 in conformance with ASTM A500, grade B.

Slotted holes for safety bar attachment shall be provided for all end sections.

Attachment to circular pipes 15" through 24" diameter shall be made with Type #1 straps. All other sizes shall be attached with Type #2 rods and lugs.

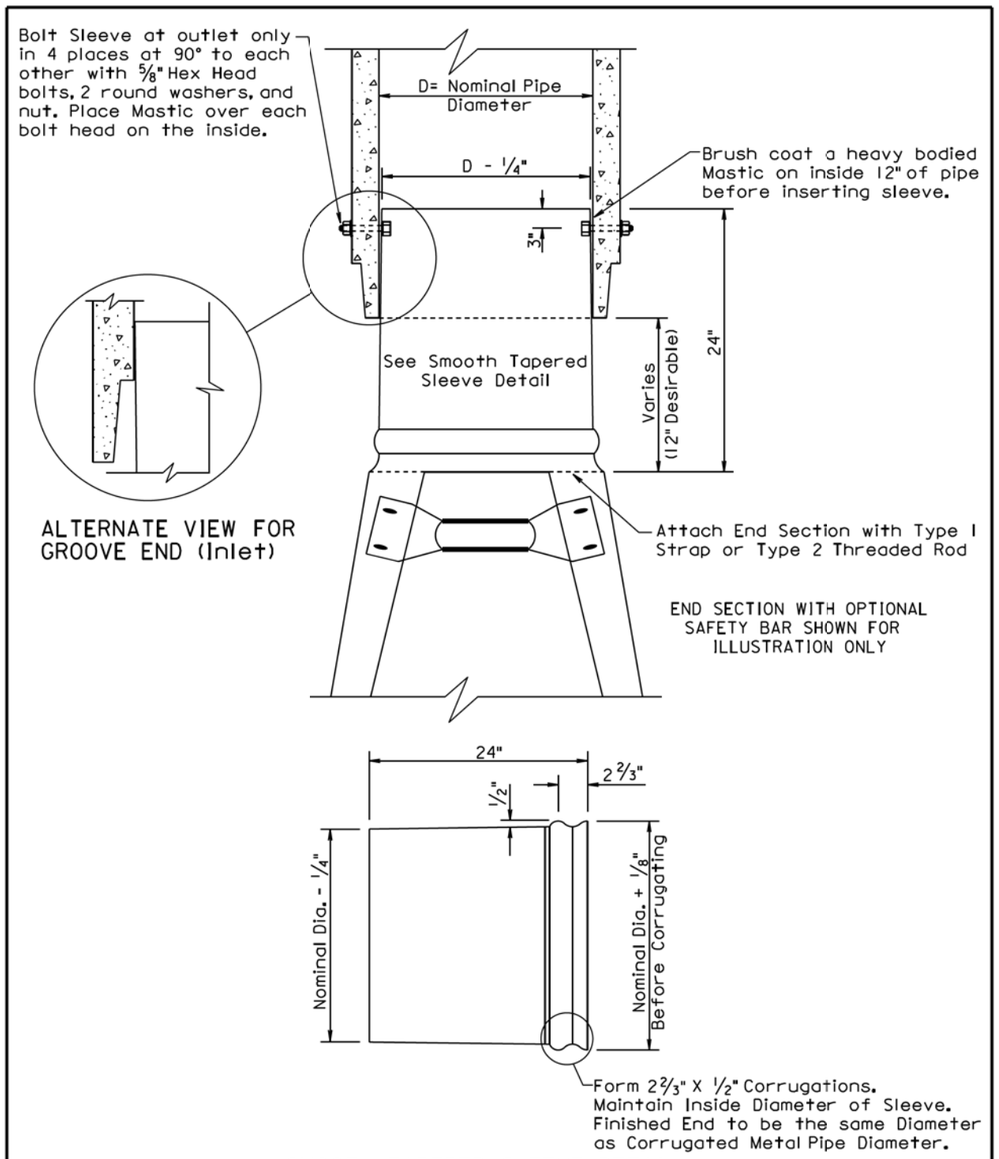
When stated in the plans, optional toe plate extension shall be punched and bolted to end section apron lip with ⅜" diameter galvanized bolts. Steel for toe plate extension shall be same gauge as end section. Dimensions shall be overall width less 6" by 8" high.

Installation shall be performed in accordance with the Standard Specifications.

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

August 31, 2013

Published Date: 4th Qtr. 2014	SDDOT	C. M. P. SAFETY ENDS	PLATE NUMBER 450.38 Sheet 2 of 2



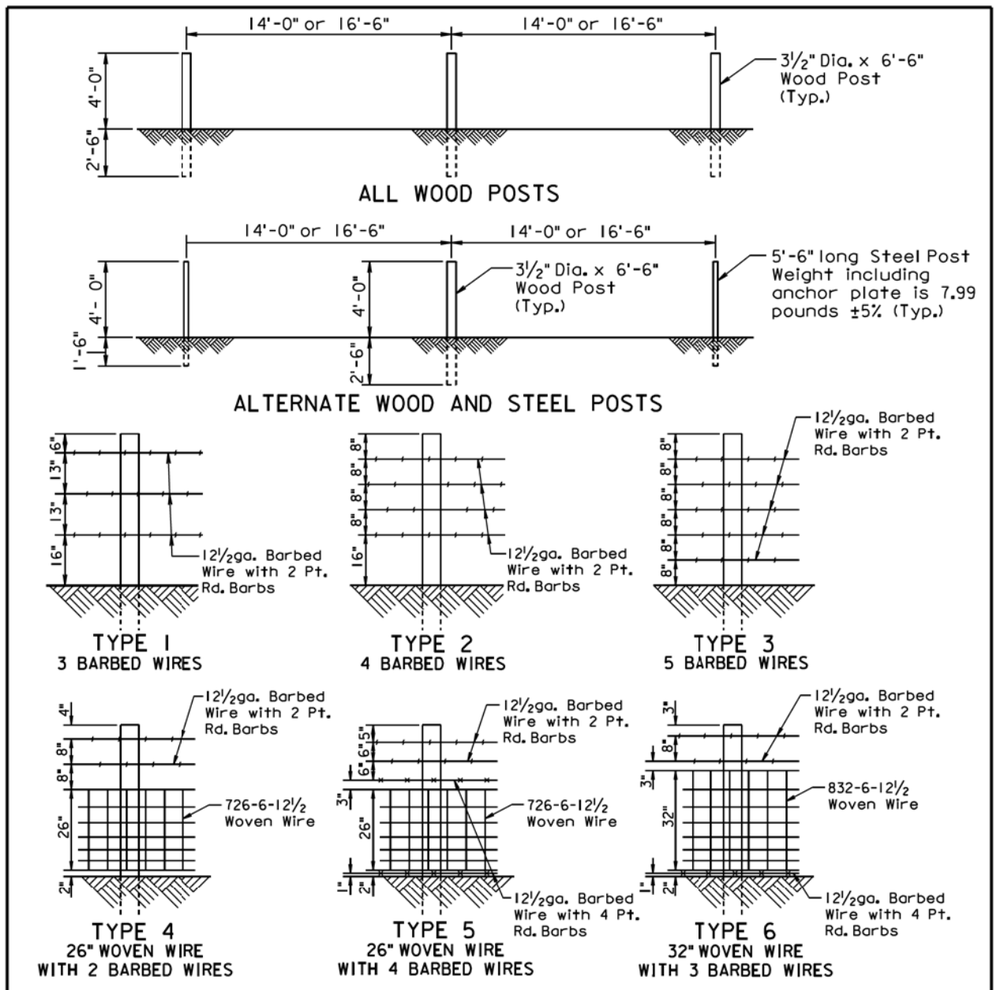
SMOOTH TAPERED SLEEVE DETAIL

GENERAL NOTE:

Metal shall be 12 gauge smooth Galvanized in accordance with AASHTO M218.

March 31, 2000

Published Date: 4th Qtr. 2014	SDDOT	SMOOTH TAPERED SLEEVE	PLATE NUMBER 450.51
			Sheet 1 of 1



TYPE OF FENCE		LINE POST SPACING	BARBED WIRE		WOVEN WIRE
			WIRE GAGE	NUMBER AND SHAPE OF BARBS	STYLE OR DESIGN NO.
TYPE	DESCRIPTION				
1	3 Barbed Wires	16'-6"	12 1/2	2 Point Round	—
2	4 Barbed Wires	16'-6"	12 1/2	2 Point Round	—
3	5 Barbed Wires	16'-6"	12 1/2	2 Point Round	—
4	26" Woven Wire with 2 Barbed Wires	14'-0"	12 1/2	2 Point Round	726-6-12 1/2
5	26" Woven Wire with 4 Barbed Wires	14'-0"	12 1/2	2 wires with 2 Pt. Rd. 2 wires with 4 Pt. Rd.	726-6-12 1/2
6	32" Woven Wire with 3 Barbed Wires	14'-0"	12 1/2	2 wires with 2 Pt. Rd. 1 wire with 4 Pt. Rd.	832-6-12 1/2

GENERAL NOTES:

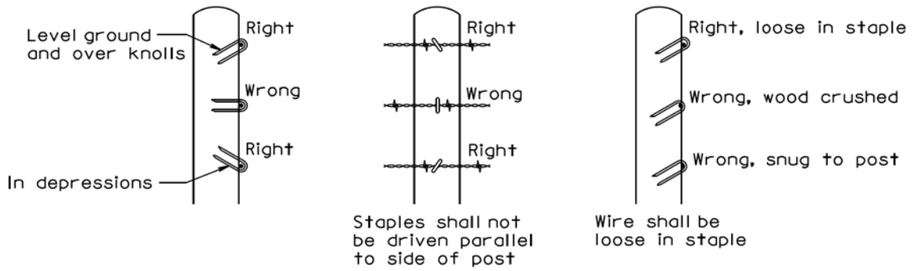
Fence types designated on the plans that are followed by the letter S shall have smooth (barbless) wires.

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.

September 14, 2009

Published Date: 4th Qtr. 2014	SDDOT	RIGHT-OF-WAY FENCE	PLATE NUMBER 620.01
			Sheet 1 of 1



STAPLE INSTALLATION

GENERAL NOTES:

The Right-of-Way fence shall consist of barbed wire or a combination of woven wire and barbed wire. The barbed wire and/or woven wire shall be fastened to all wood posts or fastened to alternating wood and steel posts. Only wood posts shall be used for brace panels. Gates shall be of the type designated in the plans or as otherwise directed by the Engineer. Fence shall 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 shall be constructed one foot within the Interstate Right-of-Way lines except at bridge openings, cattle passes, and as otherwise directed by the Engineer.

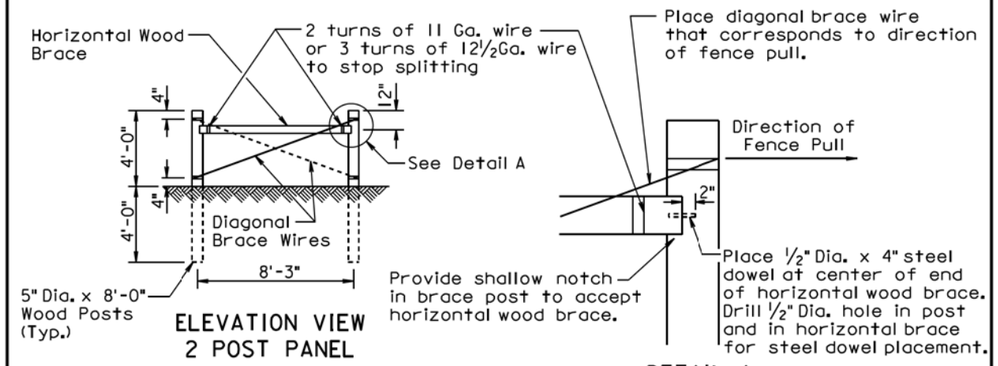
Right-of-Way fence other than on Interstate Projects shall be constructed within one foot of the Right-of-Way on the Landowner's side except at bridge openings, cattle passes, and as otherwise directed by the Engineer.

Barbs shall be fabricated from zinc coated 14 ga. wire. Two point barbs shall be wrapped twice around one main strand at 4" spacings and the four point barbs shall be interlocked and wrapped around both main strands at 5" 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 shall be as stated in AASHTO M281. Woven wire shall conform to design and specifications of ASTM A116 and barbed wire shall conform to ASTM A121.

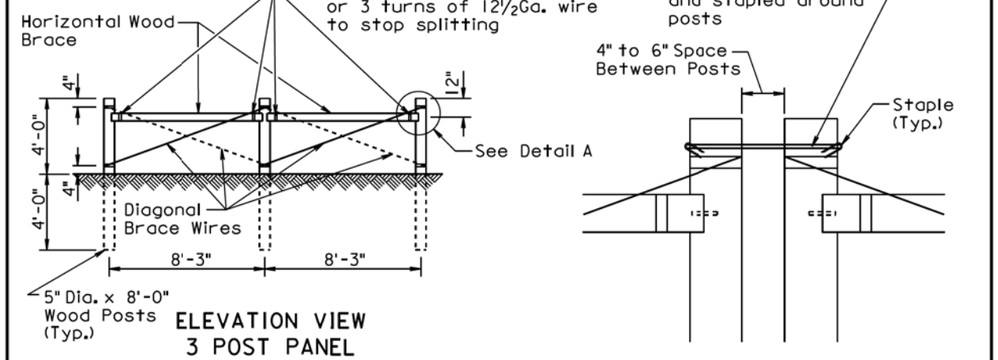
December 23, 2004

Published Date: 4th Qtr. 2014	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 shall be installed at least every 1320' between corners.

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

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

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

December 23, 2004

Published Date: 4th Qtr. 2014	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.

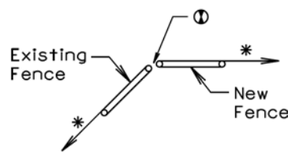
GENERAL NOTE:

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

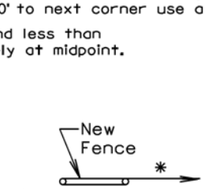
* If fence length is less than 600' to next corner use a 2 post panel.
If fence length is greater than 600' to next corner use a 3 post panel.

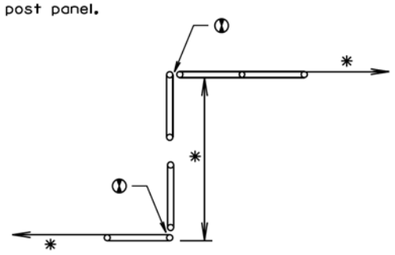
** Fence lengths greater than 1320' and less than 2640' place 2 Post Panel approximately at midpoint.

① See Detail B on Sheet 1 of 3.

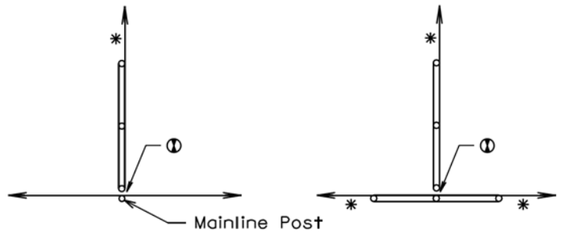


BEGIN OR END FENCE
(where new fence ties into existing fence)

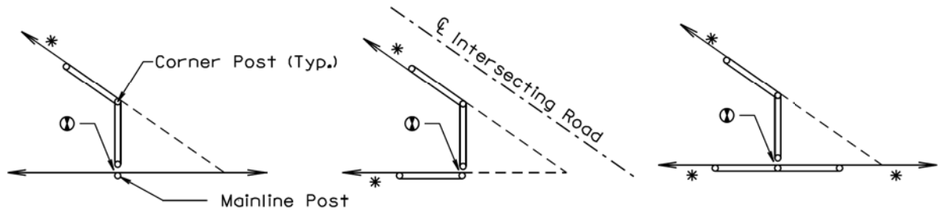




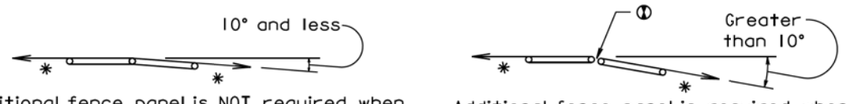
SHORT JOGS IN FENCE



CROSS FENCE



SHARP ANGLES IN CROSS FENCE



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

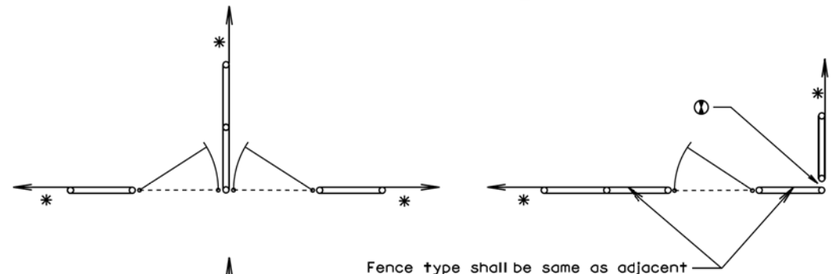
Additional fence panel is required when an angle in the mainline fence is greater than 10°.

ANGLES IN MAINLINE FENCE

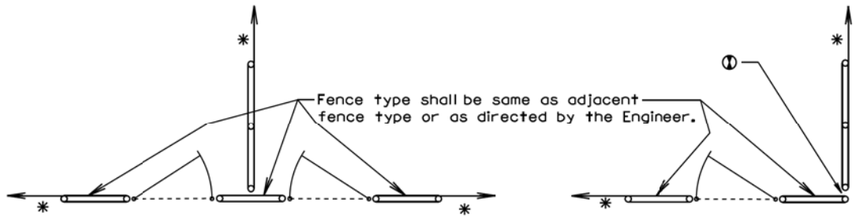
December 23, 2004

Published Date: 4th Qtr. 2014	SDDOT	BRACE PANELS AND APPLICATIONS OF BRACE PANELS	PLATE NUMBER 620.03
			Sheet 2 of 3

ENTRANCE
(NOT ON CORNER)



Fence type shall 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.

December 23, 2004

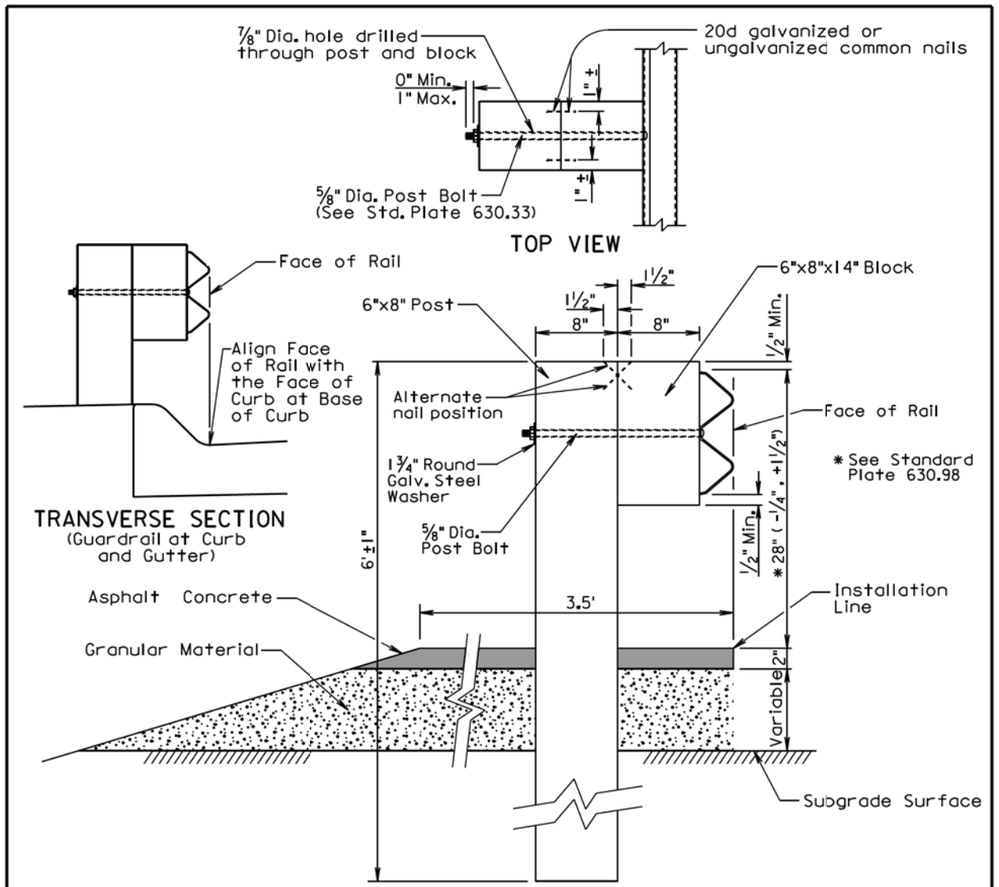
Published Date: 4th Qtr. 2014	SDDOT	BRACE PANELS AND APPLICATIONS OF BRACE PANELS	PLATE NUMBER 620.03
			Sheet 3 of 3

PLOT SCALE - 1:200

PLOT NAME - 13

FILE - ...\STANDARDPLATES_0376.DGN

PLOTTED FROM - TRM111118



TRANSVERSE SECTION

GENERAL NOTES:

Asphalt concrete shall be the same type used elsewhere on the project or shall be as specified in the plans. If asphalt concrete is not specified in the plans, the asphalt concrete shall conform to the SD Standard Specifications for "Asphalt Concrete Composite." For informational purposes, the Rate of Materials for the 3.5' wide section of asphalt concrete as shown above shall be 4.80 Tons per Station.

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

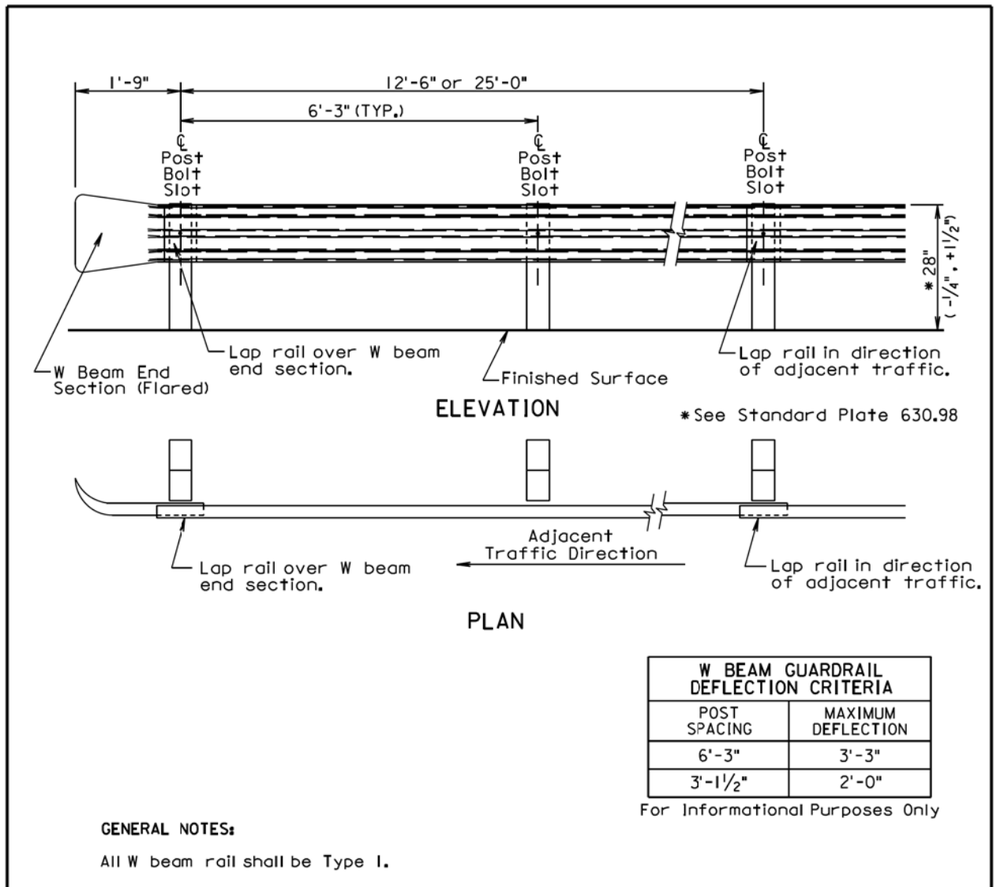
Surfacing and embankment quantities will be paid for separately and will NOT be incidental to the "W Beam Guardrail" bid item.

The cross slope for the surfacing and subgrade surface shall be as specified in the plans (See Typical Sections and/or Cross Sections).

The top of posts and top of block shall have a true square cut. The top of post and top of block shall be flush.

December 23, 2010

Published Date: 4th Qtr. 2014	SDDOT	**W BEAM GUARDRAIL POST INSTALLATION**	*PLATE NUMBER* 630.31 *Sheet 1 of 1*



W BEAM GUARDRAIL DEFLECTION CRITERIA	
POST SPACING	MAXIMUM DEFLECTION
6'-3"	3'-3"
3'-1 1/2"	2'-0"

For Informational Purposes Only

GENERAL NOTES:

All W beam rail shall be Type I.

There will be no separate payment for furnishing and installing W Beam End Sections (Flared) and W Beam Terminal Connectors. All costs for the W Beam End Sections (Flared) and W Beam Terminal Connectors shall be incidental to the contract unit price per foot for the respective "W Beam Guardrail" bid item.

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

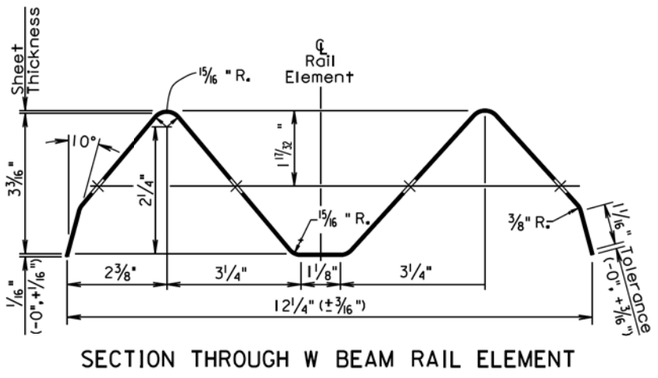
W Beam End Sections (Flared) shall only be used in a one way traffic situation. See Standard Plate 630.80 for W Beam End Section (Flared) in the Beam Guardrail Trailing End Terminal.

All costs for constructing W beam guardrail including labor, equipment, and materials including all posts, blocks, steel beam rail, and hardware shall be incidental to the contract unit price per foot for the respective "W Beam Guardrail" bid item.

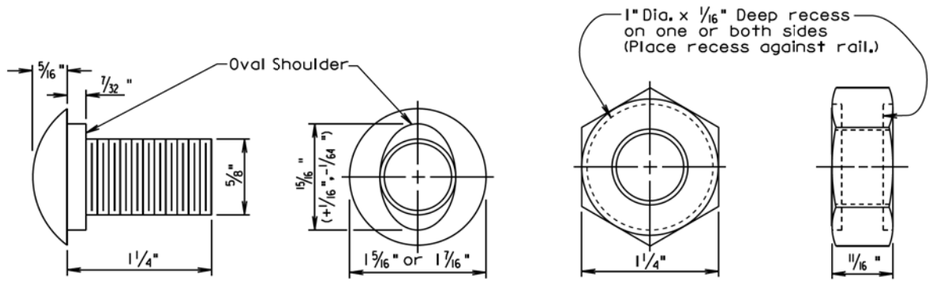
Surfacing and embankment quantities will be paid for separately and will NOT be incidental to the "W Beam Guardrail" bid item.

December 23, 2010

Published Date: 4th Qtr. 2014	SDDOT	**W BEAM GUARDRAIL INSTALLATION**	*PLATE NUMBER* 630.32 *Sheet 1 of 1*

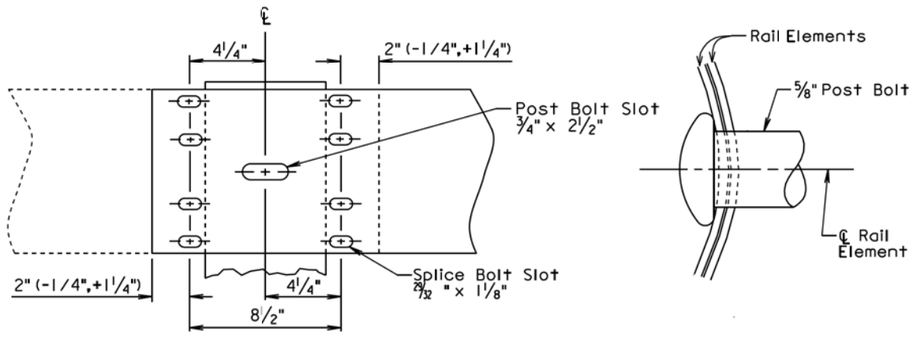


SECTION THROUGH W BEAM RAIL ELEMENT



The Post Bolt is similar except the post bolt is 18" long.

SPLICE BOLT
(5/8" BUTTON HEAD BOLT AND RECESS NUT)

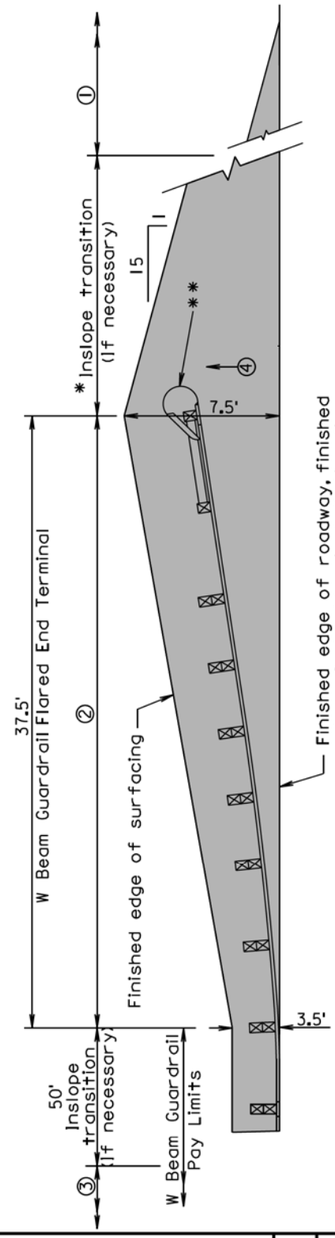


Lap in direction of traffic.

RAIL SPLICE

December 23, 2004

Published Date: 4th Qtr. 2014	SDDOT	W BEAM RAIL, RAIL SPLICE, AND HARDWARE	PLATE NUMBER 630.33 Sheet 1 of 1



2" Asphalt concrete surfacing with variable thickness granular material

① Same inslope as mainline inslope
② 4:1 inslope
③ 2:1 inslope or flatter, or inslope as specified in plans
④ Same slope as roadway cross slope

PLAN

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

GENERAL NOTES:

The W beam guardrail flared end terminal shall be installed according to the manufacturer's installation instructions.

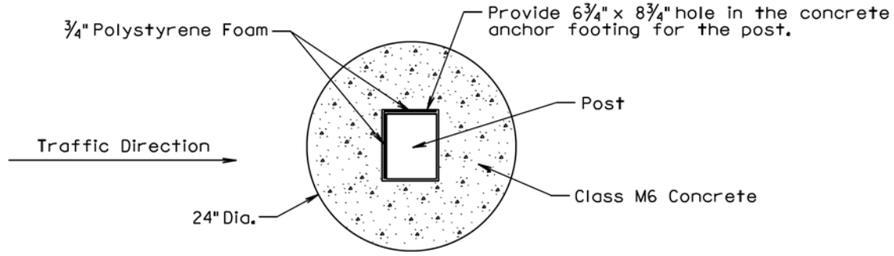
** An adhesive object marker shall be placed on the end section buffer or extruder after placement of the end section buffer or extruder. The adhesive object marker dimensions may be 16"x 16" or other variation due to the shape of the end section buffer or extruder. A minimum of 256 square inches of object marker reflective sheeting area is required. The reflective sheeting shall be fluorescent yellow super or very high intensity. All costs for furnishing and installing the adhesive object marker shall be incidental to various contract items.

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

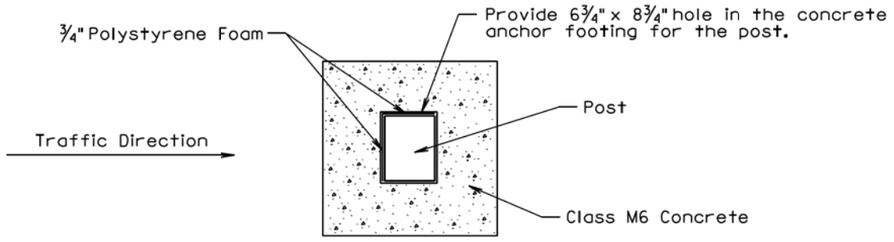
Granular material shall be the same type used elsewhere on the project or shall be as specified in the plans. If granular material type is not specified in the plans, the material shall conform to the SD Standard Specifications for "Base Course". The granular material shall be placed the same thickness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

September 6, 2009

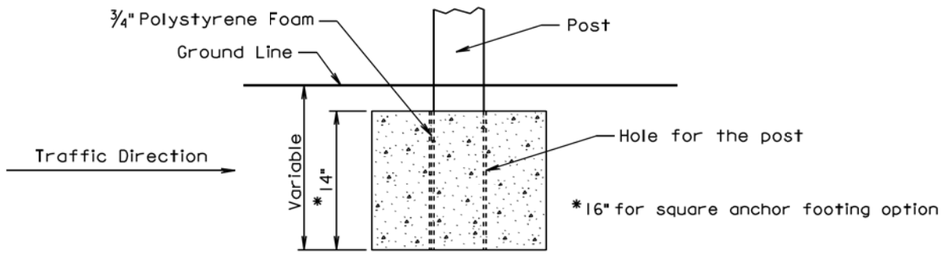
Published Date: 4th Qtr. 2014	SDDOT	EMBANKMENT AND SURFACING FOR W BEAM GUARDRAIL FLARED END TERMINAL	PLATE NUMBER 630.45 Sheet 1 of 1



PLAN
(PREFERRED 24" DIA. ROUND CONCRETE ANCHOR FOOTING)



PLAN
(20" x 20" SQUARE CONCRETE ANCHOR FOOTING)



ELEVATION

GENERAL NOTES:

In areas where the required guardrail wood post depth is not obtainable, shorter posts may be used and shall be anchored in concrete in accordance with the details shown on this standard plate.

A 20" x 20" square concrete anchor footing may be used in lieu of the 24" diameter round anchor footing.

Forms for the concrete anchor footing hole is not required.

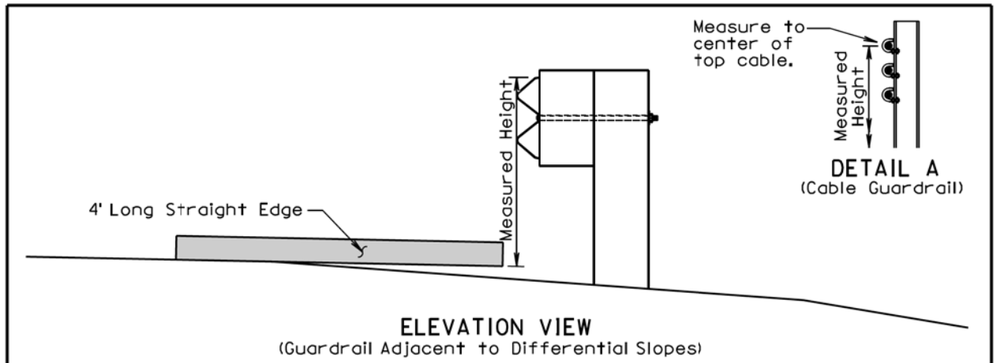
Concrete for the concrete anchor footing shall be Class M6.

Three quarter inch polystyrene foam shall be attached to two sides of the posts. See details above for placement position of the polystyrene foam.

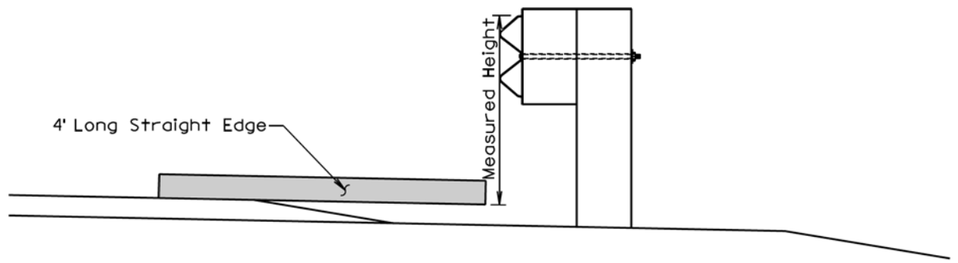
There will be no separate payment for furnishing and installing the concrete anchor footing for short guardrail post. All costs for concrete anchor footings shall be incidental to the contract unit price per foot for the respective "Thrie Beam or W Beam Guardrail" bid item.

March 31, 2000

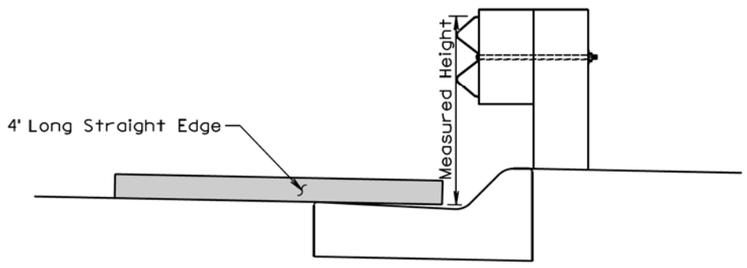
Published Date: 4th Qtr. 2014	SDDOT	CONCRETE ANCHOR FOOTING FOR SHORT GUARDRAIL POST	PLATE NUMBER 630.84
			Sheet 1 of 1



ELEVATION VIEW
(Guardrail Adjacent to Differential Slopes)



ELEVATION VIEW
(Guardrail Adjacent to Differential Surfacing Elevations)



ELEVATION VIEW
(Guardrail at Curb and Gutter)

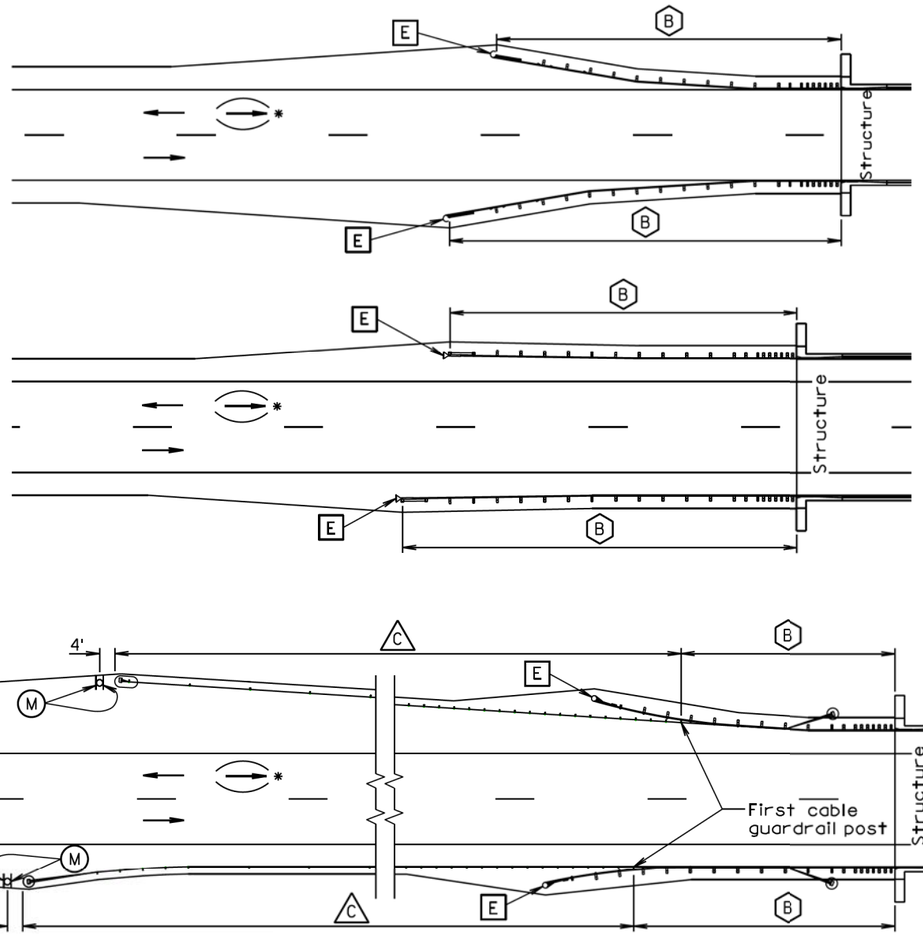
GENERAL NOTES:

The W Beam guardrail shown is for illustrative purpose. The guardrail height for all types of guardrail systems shall be measured in accordance with this standard plate.

When measuring height of cable guardrail or cable barrier the height shall be measured to the center of the top cable. See Detail A.

June 26, 2010

Published Date: 4th Qtr. 2014	SDDOT	MEASURING GUARDRAIL HEIGHT	PLATE NUMBER 630.98
			Sheet 1 of 1



TYPICAL GUARDRAIL LAYOUTS

(B) Steel Beam Guardrail Delineation

[E] Guardrail Terminal End Object Marker

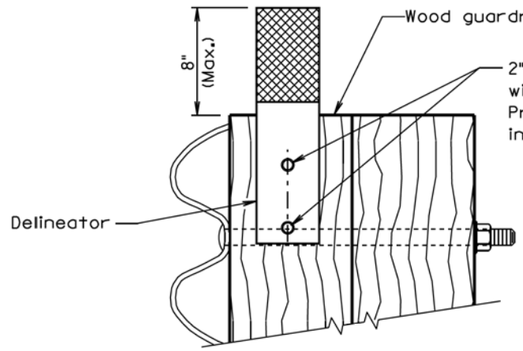
(C) 3 Cable Guardrail Delineation

(M) Type 2 Object Marker

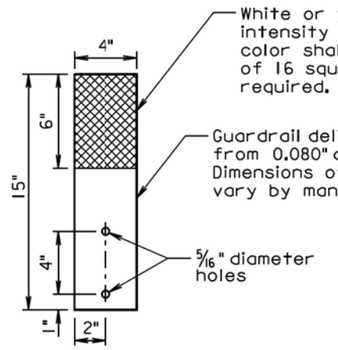
* For two-way traffic, install delineation at the opposite end of structure the same as shown. Back-to-back delineation is required for two-way traffic, single-sided delineation for one-way traffic.

June 26, 2011

Published Date: 4th Qtr. 2014	SDDOT	DELINEATION OF GUARDRAIL AT BRIDGES	PLATE NUMBER 632.40
			Sheet 1 of 4



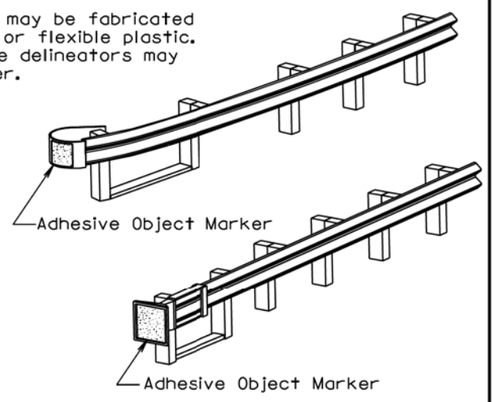
(B) STEEL BEAM GUARDRAIL DELINEATION



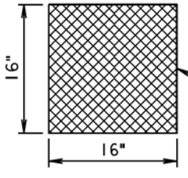
White or yellow super or very high intensity fluorescent sheeting. Sheeting color shall match edgeline color. A minimum of 16 square inches of sheeting area is required.

Guardrail delineators may be fabricated from 0.080" aluminum or flexible plastic. Dimensions of flexible delineators may vary by manufacturer.

DELINEATOR
(For Steel Beam Guardrail)



[E] GUARDRAIL TERMINAL END OBJECT MARKER

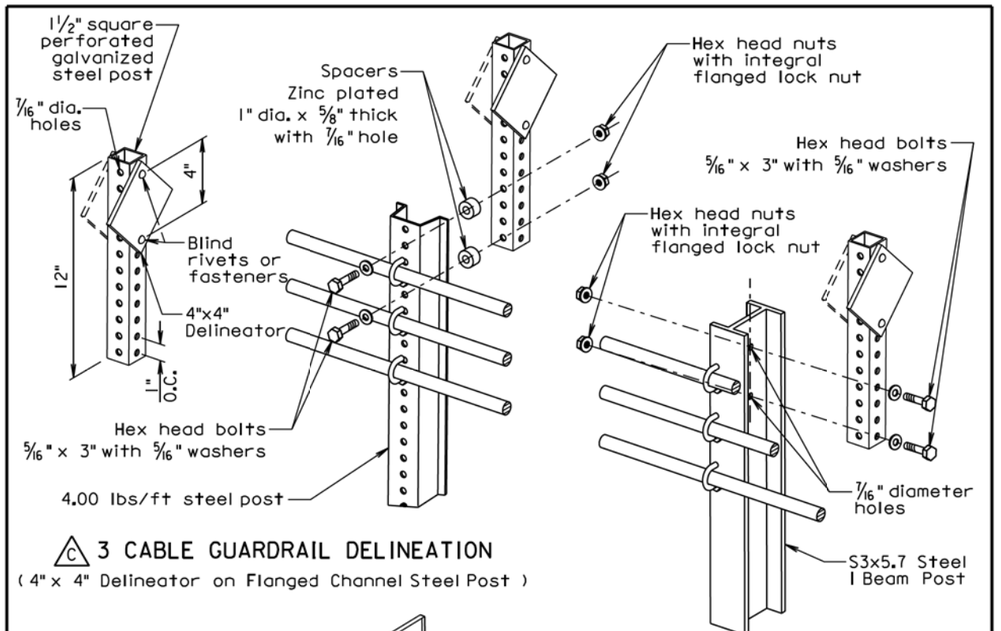


ADHESIVE OBJECT MARKER

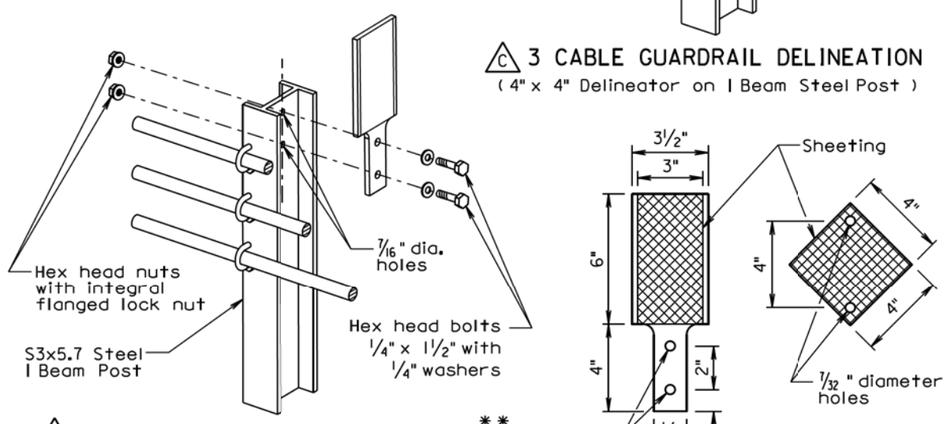
Adhesive object marker dimensions may vary due to shape of terminal end. A minimum of 256 square inches of object marker sheeting area is required. The sheeting shall be fluorescent yellow super or very high intensity.

June 26, 2011

Published Date: 4th Qtr. 2014	SDDOT	DELINEATION OF GUARDRAIL AT BRIDGES	PLATE NUMBER 632.40
			Sheet 2 of 4



C 3 CABLE GUARDRAIL DELINEATION
(4" x 4" Delineator on Flanged Channel Steel Post)



C 3 CABLE GUARDRAIL DELINEATION
(4" x 4" Delineator on I Beam Steel Post)

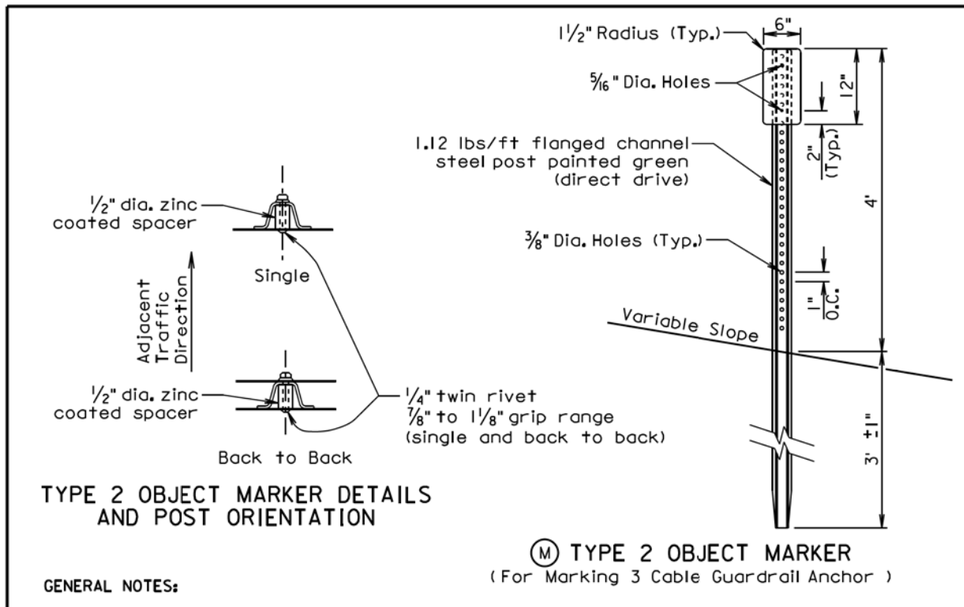
C 3 CABLE GUARDRAIL DELINEATION**
(Flexible 3" x 6" Delineator on I Beam Post)

DELINEATORS***
(For 3 Cable Guardrail)

** Flexible delineators may be attached to post with manufacturer approved adhesive instead of bolts.

*** Dimensions of flexible delineators may vary by manufacturer. A minimum of 16 square inches of sheeting area is required. The sheeting shall be white or yellow super or very high intensity fluorescent sheeting. The sheeting color shall match the edgeline color.

June 26, 2011



TYPE 2 OBJECT MARKER DETAILS AND POST ORIENTATION

M TYPE 2 OBJECT MARKER
(For Marking 3 Cable Guardrail Anchor)

GENERAL NOTES:

The delineators shall be covered with a minimum of 16 square inches of reflective sheeting. The reflective sheeting shall be of either very high intensity or super high intensity material. For bridges along two-way roadways the sheeting shall be on both sides of the delineator and shall be white in color. For one-way roadways the sheeting will only be required on the side facing traffic and the color will be the same as the nearest pavement marking, yellow on the left side of the roadway and white on the right side.

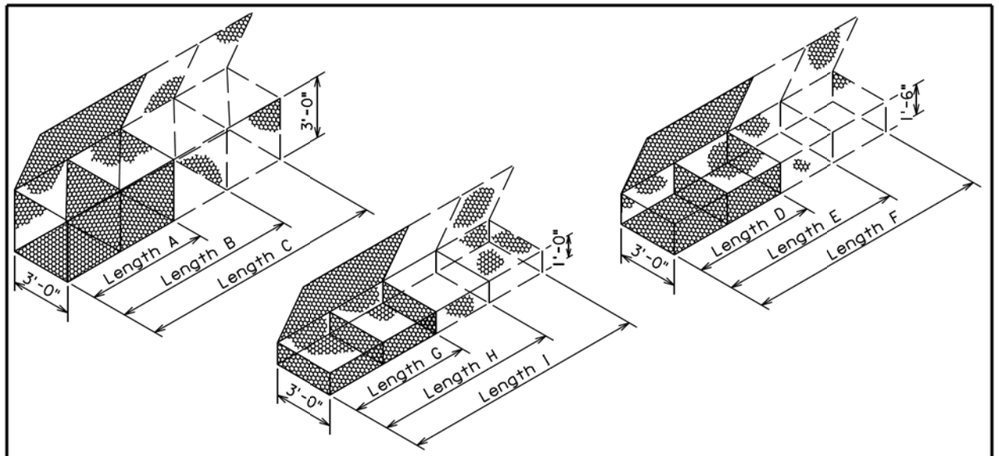
The first delineator shall be attached to the post nearest the bridge with additional delineators spaced in advance of the bridge at approximately 50 foot intervals. At bridges with short lengths of guardrail, less than 200 feet, a minimum of 4 delineators shall be placed in addition to the yellow object marker. The spacing between the delineators shall be approximately one third of the length of the guardrail. This will provide for a shorter spacing. At bridges with longer lengths of guardrail, greater than 200 feet, including bridges that have cable guardrail transitioning into the steel beam guardrail, the delineators will be placed at a spacing of approximately 50 feet. Delineation shall extend throughout the length of the guardrail system.

All costs for furnishing and installing single or back to back guardrail delineation shall be included in the contract unit price per each for "Guardrail Delineator".

An adhesive object marker shall be placed on the end of the W beam guardrail end terminal. The adhesive object marker dimensions may vary due to the shape of the terminal end. A minimum of 256 square inches of object marker reflective sheeting area is required. The reflective sheeting shall be fluorescent yellow super or very high intensity. All costs for furnishing and installing the adhesive object marker shall be incidental to various contract items.

A type 2 object marker shall be placed adjacent to the 3 cable guardrail anchor at the location noted on sheet 1 of this standard plate. The type 2 object marker (6" x 12") shall have a fluorescent yellow very high or super high intensity reflective sheeting. All costs for furnishing and installing the type 2 object marker including the steel post, 6" x 12" reflective panel, and hardware shall be included in the contract unit price per each for "Type 2 Object Marker" for single-sided and "Type 2 Object Marker Back to Back" for back to back type 2 object markers.

June 26, 2011



GABION DETAILS

STANDARD SIZES

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

Above Dimensions subject to mill tolerances.

GENERAL NOTES:

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

The lacing procedure is as follows:

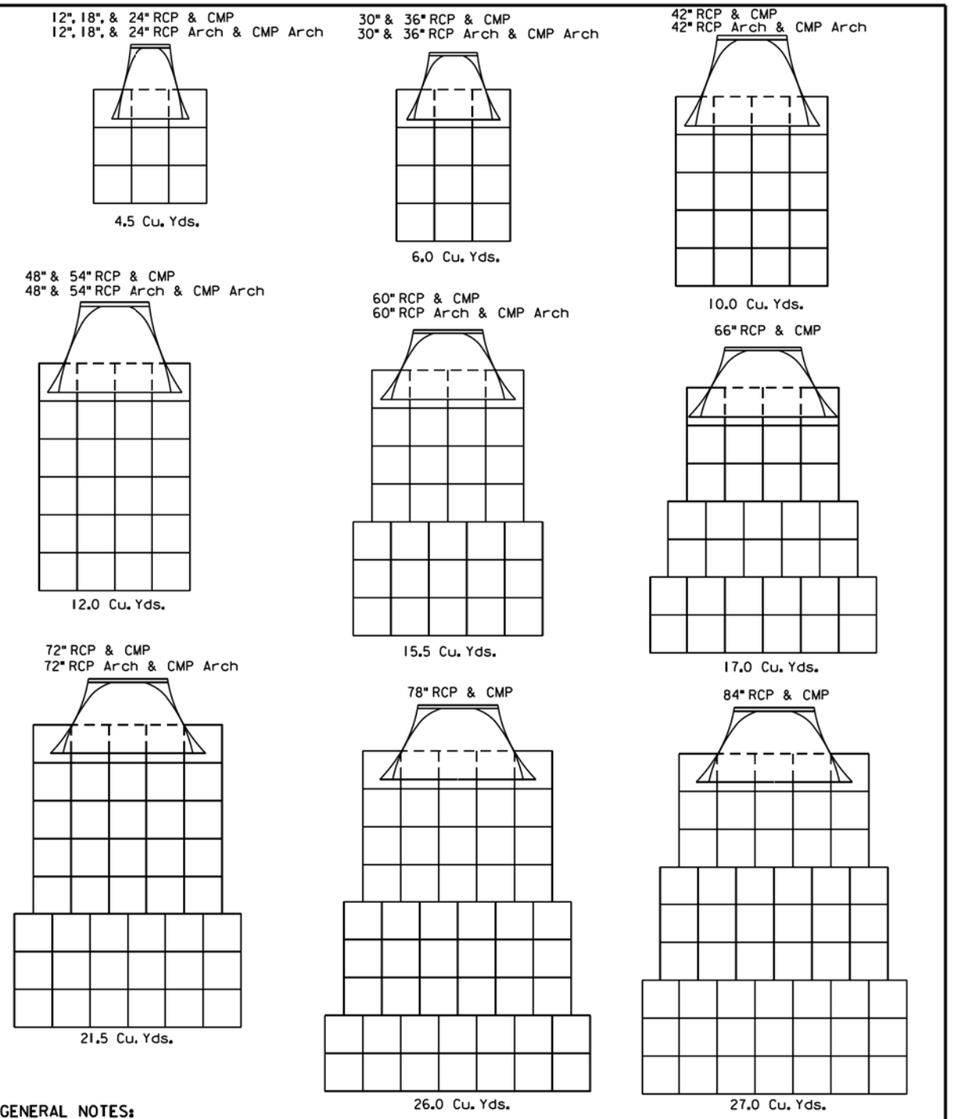
1. Cut a length of lacing wire approximately 1 ½ times the distance to be laced but not exceeding 5 feet.
2. Secure the wire terminal at the corner by looping and twisting.
3. Proceed lacing with alternating single and double loops at a spacing not to exceed 6 inches.
4. Securely fasten the other lacing wire terminal.

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

Interlocking fasteners for PVC coated gabions shall be high tensile 0.120 inch diameter stainless steel wire conforming to ASTM A313, Type 302, Class 1. The spacing of the interlocking fasteners during all phases of assembly and construction shall not exceed 6 inches. All fasteners shall be placed where the mesh weaves around the selvage wire at the vertical and horizontal joints.

June 26, 2001

Published Date: 4th Qtr. 2014	SDDOT	BANK AND CHANNEL PROTECTION GABIONS	PLATE NUMBER 720.01
			Sheet 1 of 1



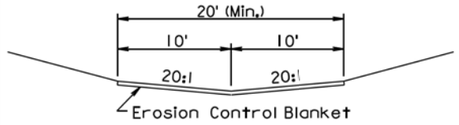
GENERAL NOTES:

Gabions at outlets of C. M. pipe and R. C. pipe shall be placed under the end section a distance of 2' from the outlet end of the section. For C. M. pipe end section installations, the upper fabric of the gabions shall be modified to accommodate the metal end section in a manner approved by the Engineer.

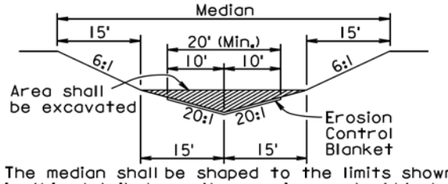
Quantities shown on this standard plate are based on standard gabion sizes D, E, and F (See Standard Plate 720.01).

June 26, 2001

Published Date: 4th Qtr. 2014	SDDOT	BANK AND CHANNEL PROTECTION GABION PLACEMENT UNDER PIPE END SECTIONS	PLATE NUMBER 720.03
			Sheet 1 of 1

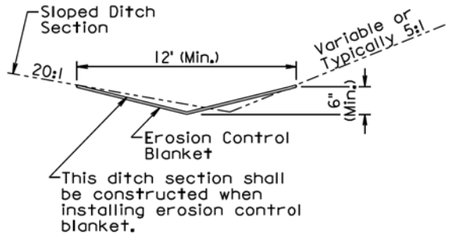


STANDARD DITCH SECTION

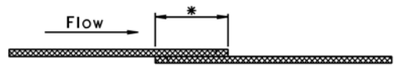


The median shall be shaped to the limits shown in this detail where the erosion control blanket will be placed.

MEDIAN SECTION



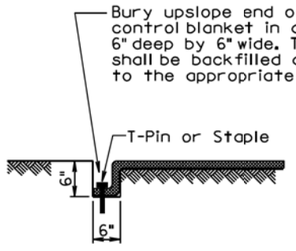
SLOPED DITCH SECTION



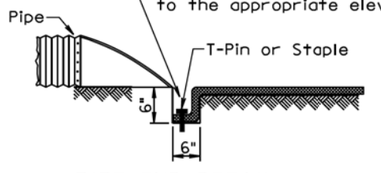
* Use a 4" (Min.) overlap wherever two widths of erosion control blanket are applied side by side.

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

OVERLAP DETAIL



TRENCH DETAIL



PIPE END DETAIL

GENERAL NOTES:

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

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

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

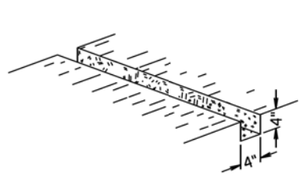
After the placement of the erosion control blanket, the Contractor shall fine grade along all edges of the blanket to maintain a uniform slope adjacent to the blanket and level any low spots which might prevent uniform and unrestricted flow of side drainage directly onto the erosion control blanket.

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

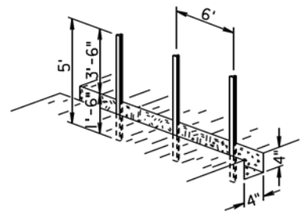
December 23, 2004

Published Date: 4th Qtr. 2014	SDDOT	EROSION CONTROL BLANKET	PLATE NUMBER 734.01
			Sheet 1 of 1

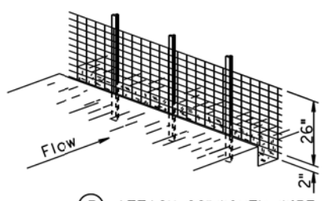
MANUAL LOW FLOW SILT FENCE INSTALLATION



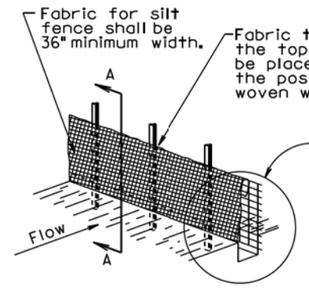
(1) EXCAVATE TRENCH



(2) DRIVE STEEL T FENCE POSTS



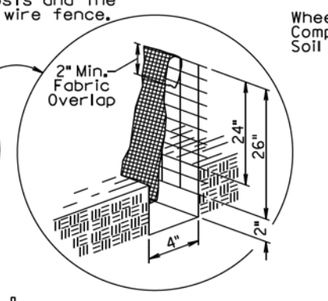
(3) ATTACH 26" WOVEN WIRE FENCE TO POSTS

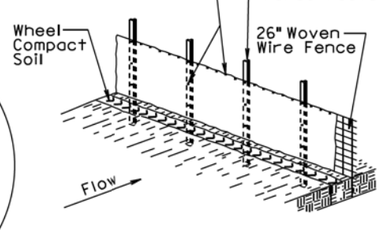


(4) ATTACH SILT FENCE FABRIC

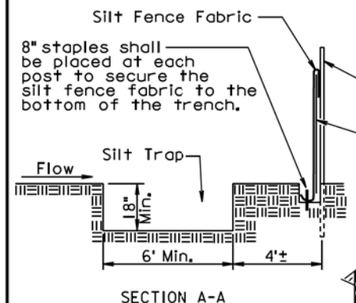
Attach the silt fence fabric with plastic ties, wire ties, or hog rings at 12" max. horizontal spacing on the top and bottom wires of the woven wire fence and with plastic or wire ties at 12" max. vertical spacing on the posts.

Fabric that overlaps the top of fence shall be placed between the posts and the woven wire fence.

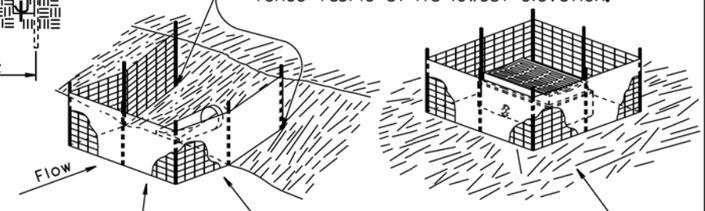




(5) BACKFILL TRENCH AND WHEEL COMPACT SOIL



SECTION A-A



The elevation at these locations shall be, at a minimum, higher than the top of the silt fence fabric at its lowest elevation.

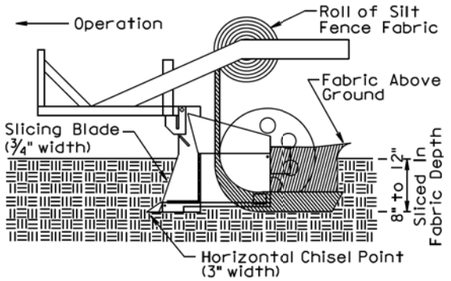
The silt fence length and width may be adjusted due to a larger pipe, multiple pipe, or other circumstances during construction as determined by the Engineer.

Post spacing shall be 3' for these types of applications of silt fence. All other components of the silt fence shall be the same as shown above.

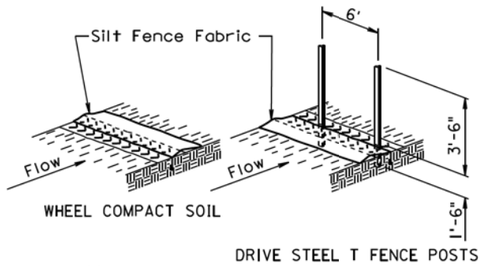
December 23,2003

Published Date: 4th Qtr. 2014	SDDOT	LOW FLOW SILT FENCE AND SILT TRAP	PLATE NUMBER 734.04
			Sheet 1 of 2

MACHINE SLICED LOW FLOW SILT FENCE INSTALLATION

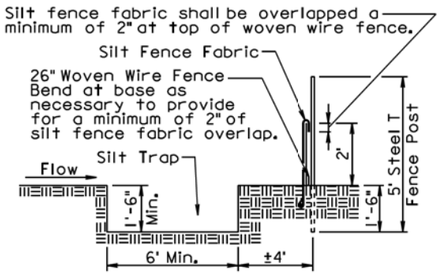


(1) INSTALL SILT FENCE FABRIC BY MACHINE SLICING METHOD.

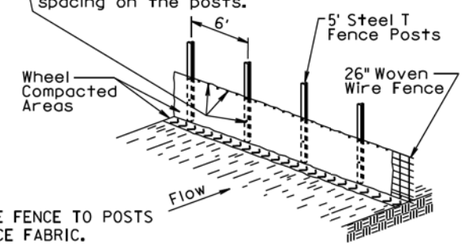


(2) WHEEL COMPACT SOIL ABOVE SLICED IN PORTION OF FABRIC AND THEN DRIVE STEEL T FENCE POSTS.

Silt fence fabric shall be overlapped a minimum of 2" at top of woven wire fence.

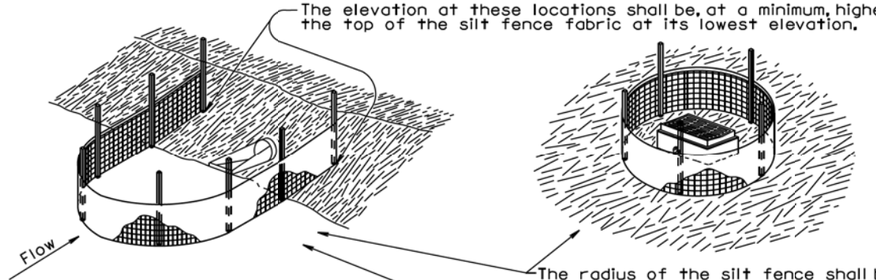


Attach the silt fence fabric with plastic ties, wire ties, or hog rings at 12" max. horizontal spacing on the top and bottom wires of the woven wire fence and with plastic or wire ties at 12" max. vertical spacing on the posts.



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

The elevation at these locations shall be, at a minimum, higher than the top of the silt fence fabric at its lowest elevation.



The silt fence length and width may be adjusted due to a larger pipe, multiple pipe, or other circumstances during construction as determined by the Engineer.

The radius of the silt fence shall be the minimum capable by the slicing machine. The post spacing shall be 3' for these types of applications of silt fence. All the other components of the silt fence shall be the same as shown above.

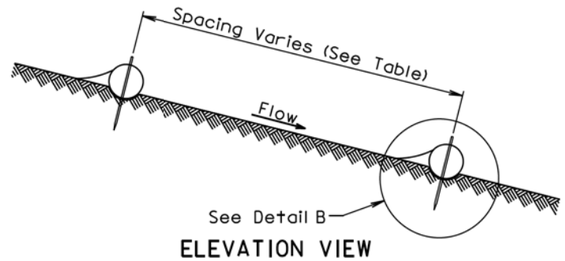
GENERAL NOTES:

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

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

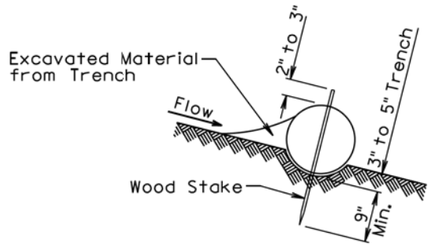
December 23, 2003

Published Date: 4th Qtr. 2014	SDDOT	LOW FLOW SILT FENCE AND SILT TRAP	PLATE NUMBER 734.04
			Sheet 2 of 2

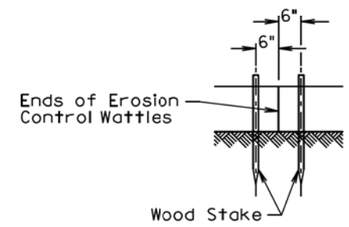


ELEVATION VIEW
CUT OR FILL SLOPE INSTALLATION

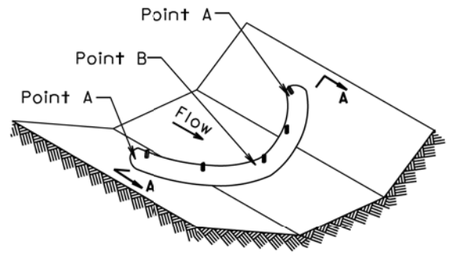
CUT OR FILL SLOPE INSTALLATION	
Slope	Spacing (Ft)
1:1	10
2:1	20
3:1	30
4:1	40



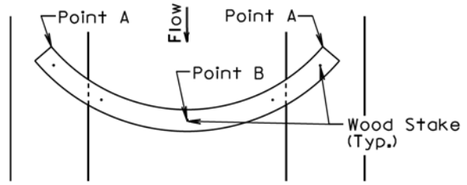
DETAIL B
(TYPICAL OF ALL INSTALLATIONS)



DETAIL C

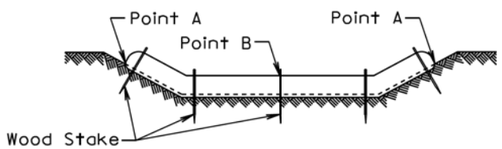


ISOMETRIC VIEW
DITCH INSTALLATION



PLAN VIEW
DITCH INSTALLATION

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



SECTION A-A

December 23, 2004

Published Date: 4th Qtr. 2014	SDDOT	EROSION CONTROL WATTLE	PLATE NUMBER 734.06
			Sheet 1 of 2

PLOT SCALE - 1:200

PLOT NAME - 22

FILE - ...\STANDARDPLATES_03T6.DGN

GENERAL NOTES:

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

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

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

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

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

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

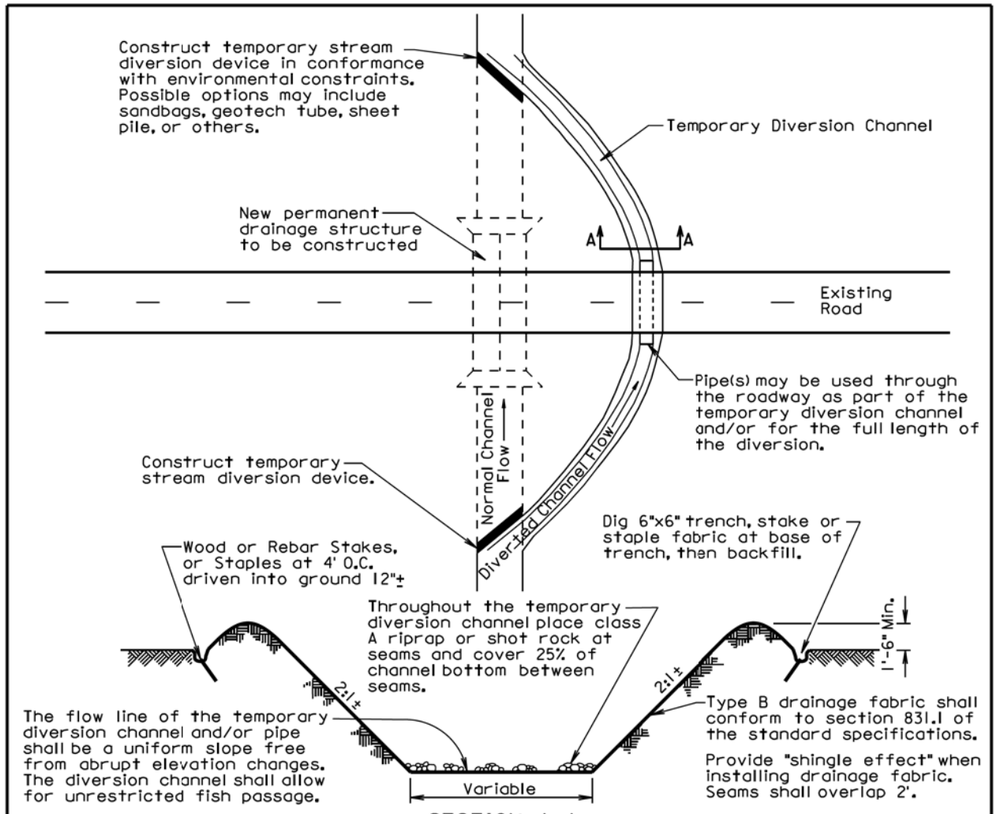
Sediment removal, disposal, or necessary shaping shall be as directed by the Engineer. All costs for removing accumulated sediment, disposal of sediment, and necessary shaping shall be incidental to the contract unit price per cubic yard for "Remove Sediment".

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

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

December 23, 2004

Published Date: 4th Qtr. 2014	SDDOT	EROSION CONTROL WATTLE	PLATE NUMBER 734.06
			Sheet 2 of 2



SECTION A-A

TEMPORARY DIVERSION CHANNEL

GENERAL NOTES:

A temporary diversion channel and/or pipe(s) shall be used to divert stream or drainage away from a construction area to provide a dry work area for construction. The diversion of streams and waterways is intended to protect the streams and waterways from various construction contaminants and sediment. Disturbing the existing stream channel and riparian zone should be minimized. Equipment shall not cross through the stream outside of the work area.

Sizing of the temporary diversion channel and/or pipe(s) shall be the Contractor's responsibility.

The method and materials used to construct the stream diversion device shall be the Contractor's responsibility, however, earthen berms are not acceptable since their removal causes siltation problems.

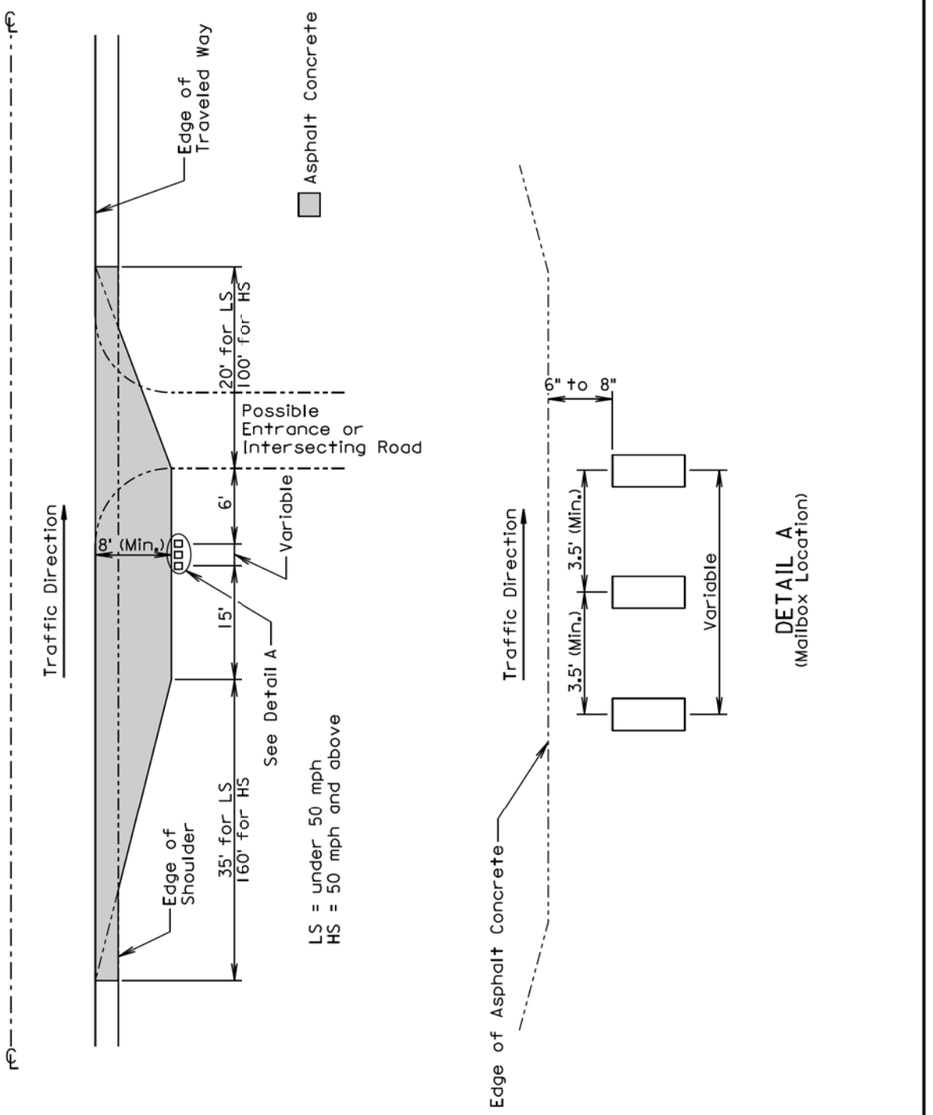
The Contractor shall restore the original channel bottom to its original condition prior to returning any flows. Upon completion of the new permanent drainage structure, the temporary stream diversion block or device shall be removed in a manner that will not cause violation of water quality standards. The temporary diversion channel shall then be backfilled and any pipe(s) (if used) shall be removed. The entire work area shall be cleaned and restored to smooth/even contours.

All costs for labor, equipment, materials and incidentals as indicated on this sheet to complete a satisfactory Temporary Diversion Channel and/or Pipe(s) shall be incidental to the contract unit price per each for "Temporary Diversion Channel and/or Pipe(s)". "Temporary Diversion Channel and/or Pipe(s)" will be paid for once per structure site regardless or the number of times water is diverted at the individual site.

December 23, 2004

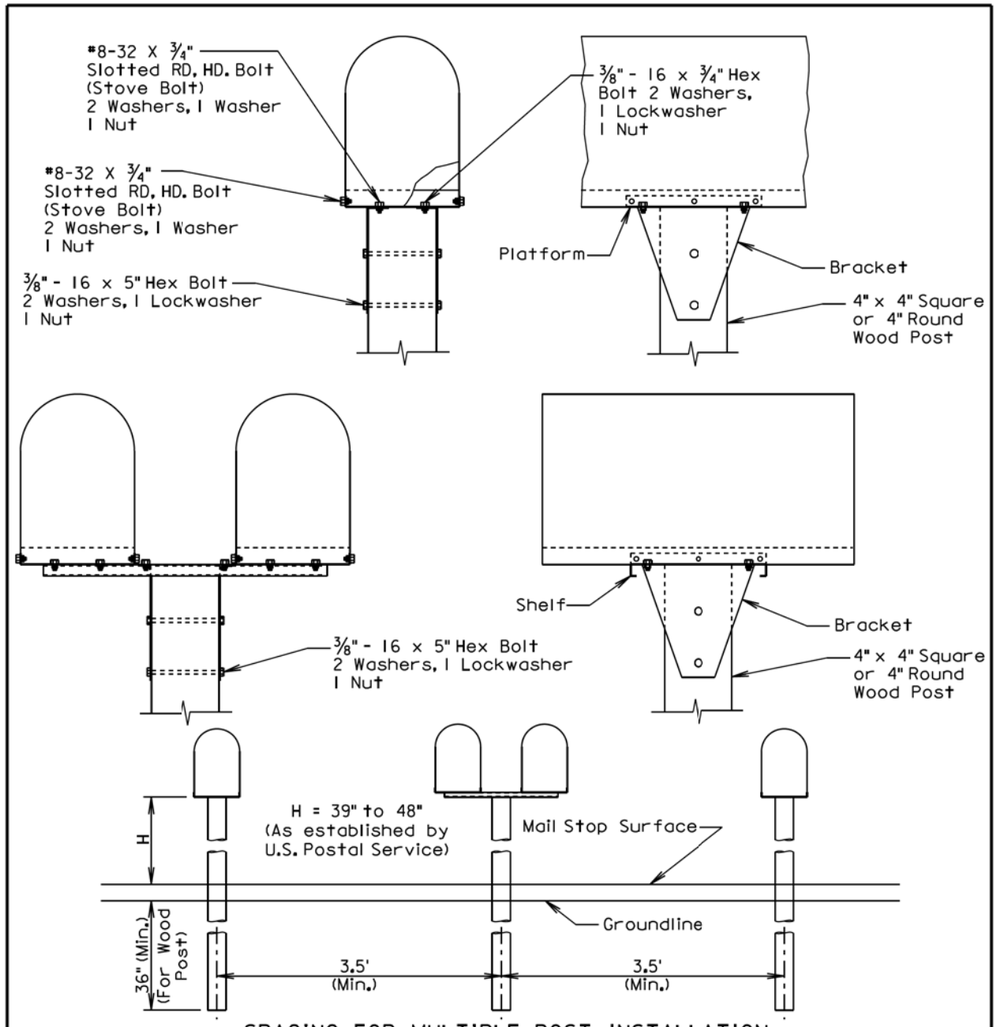
Published Date: 4th Qtr. 2014	SDDOT	TEMPORARY DIVERSION CHANNEL	PLATE NUMBER 734.30
			Sheet 1 of 1

PLOTTED FROM - TRM111118



August 31, 2013

Published Date: 4th Qtr. 2014	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. 2014	SDDOT	SINGLE AND DOUBLE MAILBOX ASSEMBLIES	PLATE NUMBER 900.02
			Sheet 1 of 1

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0038(43)321	80	80

Plotting Date: 11/07/2014

March 31, 2000

Published Date: 4th Qtr. 2014	SDDOT	MAILBOX SUPPORT HARDWARE	PLATE NUMBER 900.03
			Sheet 1 of 1

PLOT SCALE - 1:200

PLOTTED FROM - TRM111118

PLOT NAME - 24

FILE - ....\STANDARDPLATES_0376.DGN