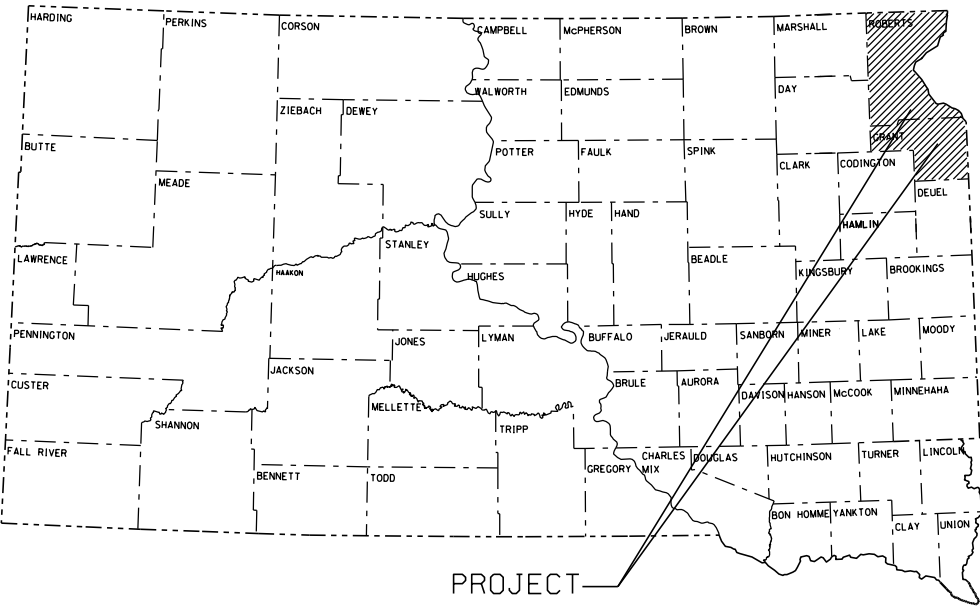


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PLOTTED FROM - TRWAINT14



STATE OF SOUTH DAKOTA  
DEPARTMENT OF TRANSPORTATION  
PLANS FOR PROPOSED

PROJECT NO. 015-172, 020-172, & 123-172  
GRANT AND ROBERTS COUNTIES

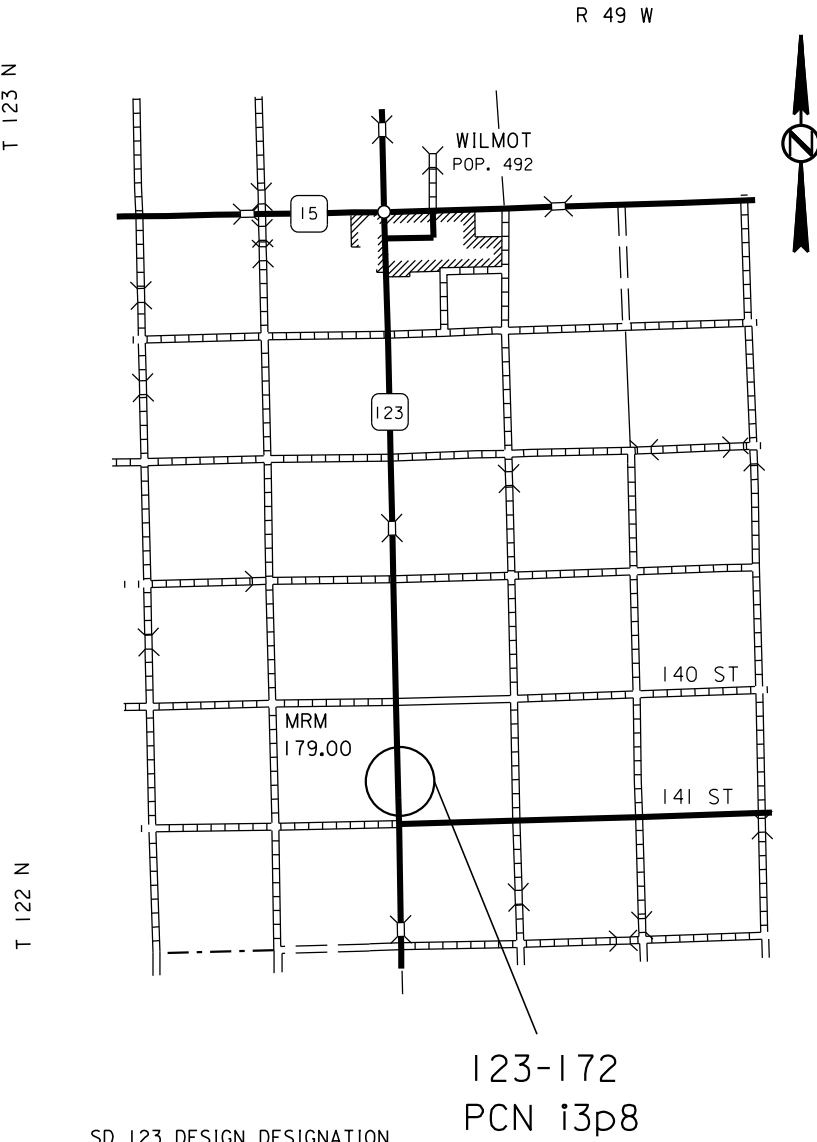
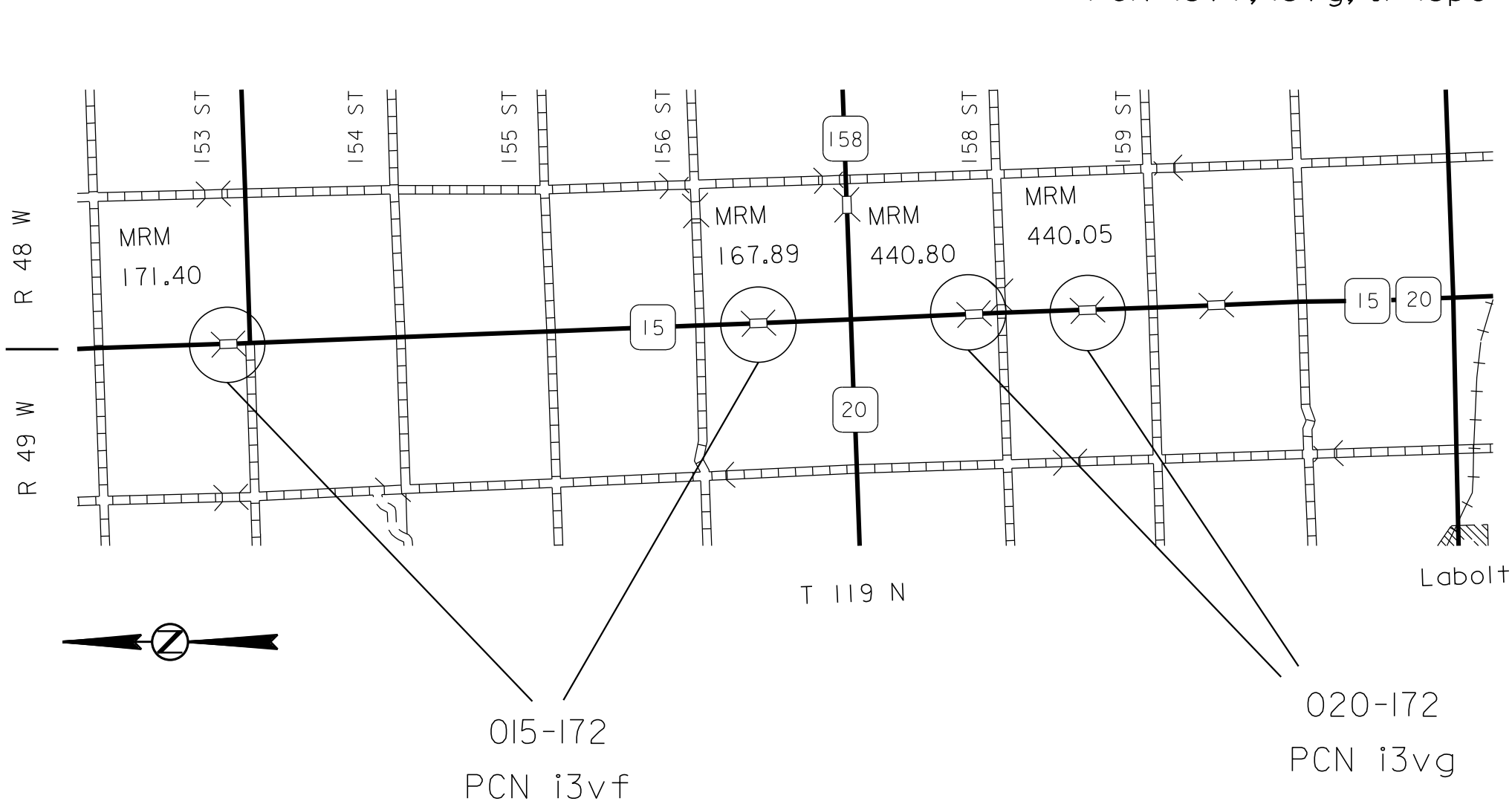
ASPHALT CONCRETE PAVEMENT REPAIR  
& PIPE CULVERT PLACEMENT

PCN i3vf, i3vg, & i3p8

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	015-172, 020-172 & 123-172	1	17
Plotting Date: 05/12/2015			

INDEX OF SHEETS

Sheet No. 1	Title Sheet
Sheet No. 2-3	Estimate of Quantities & Environmental Commitments
Sheet No. 4	Typical Sections
Sheet No. 5-8	Plan Notes & Tables
Sheet No. 9-12	Traffic Control Sheets
Sheet No. 13	Pipe Placement Detail
Sheet No. 14-17	Standard Plates



STORM WATER PERMIT  
(None Required)

SD 15 DESIGN DESIGNATION	
ADT (2014)	2240
ADT (2034)	2836
DHV	309.1
D	51%
T DHV	7.6%
T ADT	16.7%

SD 20 DESIGN DESIGNATION	
ADT (2014)	1785
ADT (2034)	2260
DHV	253.1
D	53%
T DHV	1.7%
T ADT	3.8%

SD 123 DESIGN DESIGNATION	
ADT (2014)	275
ADT (2024)	290
DHV	31.9
D	51.0%
T DHV	5.1%
T*ADT	11.2%

PLOT NAME - 1

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SHEET - OF 17 SHEETS

ESTIMATE OF QUANTITIES AND ENVIRONMENTAL COMMITMENTS

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	015-172, 020-172 & 123-172	2	17

ESTIMATE OF QUANTITIES

015-172 PCN i3vf

BID ITEM			
NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
230E0020	Placing Contractor Furnished Topsoil	10	CuYd
260E1010	Base Course	282.8	Ton
320E1200	Asphalt Concrete Composite	99	Ton
634E0010	Flagging	80	Hour
634E0100	Traffic Control	792	Unit
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
680E0040	4" Underdrain Pipe	61	Ft
734E0010	Erosion Control	Lump Sum	LS
831E0300	MSE Geotextile Fabric	282.8	SqYd

020-172 PCN i3vg

BID ITEM			
NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
230E0020	Placing Contractor Furnished Topsoil	10	CuYd
260E1010	Base Course	260.0	Ton
320E1200	Asphalt Concrete Composite	158	Ton
634E0010	Flagging	80	Hour
634E0100	Traffic Control	792	Unit
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
680E0040	4" Underdrain Pipe	76	Ft
734E0010	Erosion Control	Lump Sum	LS
831E0300	MSE Geotextile Fabric	260.0	SqYd

123-172 PCN i3p8

BID ITEM			
NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
230E0020	Placing Contractor Furnished Topsoil	20	CuYd
260E1010	Base Course	7.1	Ton
320E1200	Asphalt Concrete Composite	15	Ton
421E0100	Pipe Culvert Undercut	18	CuYd
450E0162	30" RCP Class 2, Furnish	42	Ft
450E0170	30" RCP, Install	42	Ft
450E2204	30" RCP Sloped End, Furnish	2	Each
450E2205	30" RCP Sloped End, Install	2	Each
462E0200	Controlled Density Fill	4.5	CuYd
634E0100	Traffic Control	740	Unit
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
734E0010	Erosion Control	Lump Sum	LS
734E0154	12" Diameter Erosion Control Wattle	50	Ft
734E0604	High Flow Silt Fence	100	Ft

SPECIFICATIONS

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

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 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 B4: BALD EAGLE

Bald eagles are known to occur in this area.

Action Taken/Required:

If a nest is observed within one mile of the project site, notify the Project Engineer immediately so that he/she can consult with the Environmental Office for an appropriate course of action.

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 D2: SURFACE WATER DISCHARGE

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 less than 1 acre of disturbance.

Action Taken/Required:

At a minimum and regardless of project size, appropriate erosion and sediment control measures must be installed to control the discharge of pollutants from the construction site.

# ESTIMATE OF QUANTITIES AND ENVIRONMENTAL COMMITMENTS

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	015-172, 020-172 & 123-172	3	17

**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.

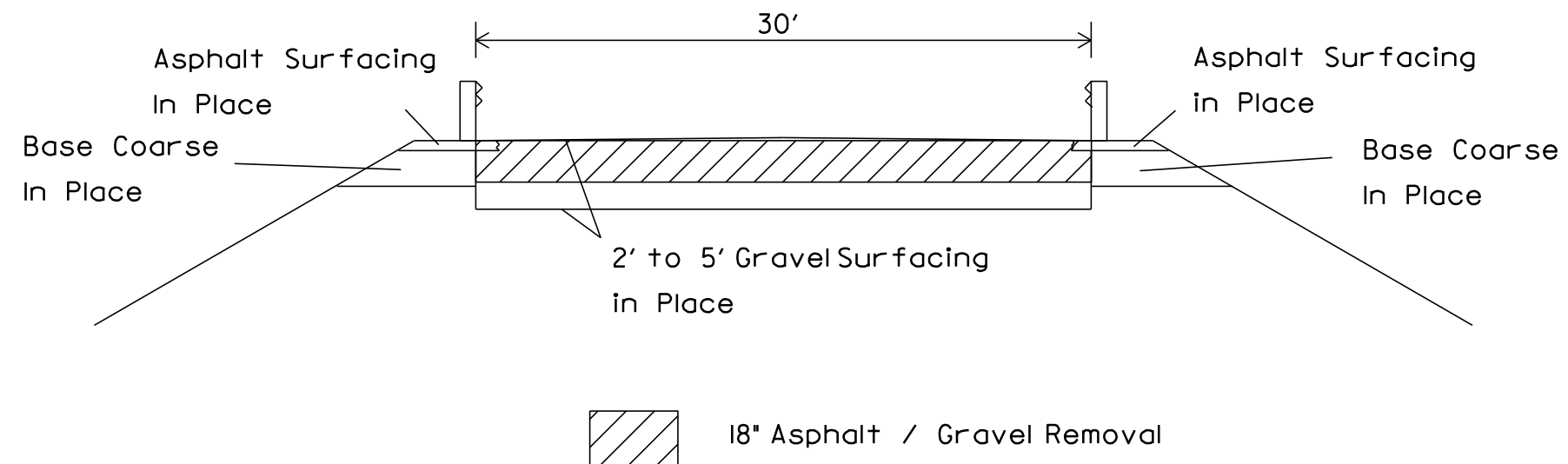
SHPO/THPO review does not relieve the Contractor of the responsibility for obtaining any additional permits and clearances for staging areas, borrow sites, waste disposal sites, or material processing sites that affect wetlands, threatened and endangered species, or waterways. The Contractor shall provide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

# TYPICAL SECTIONS

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	015-172, 020-172 & 123-172	4	17

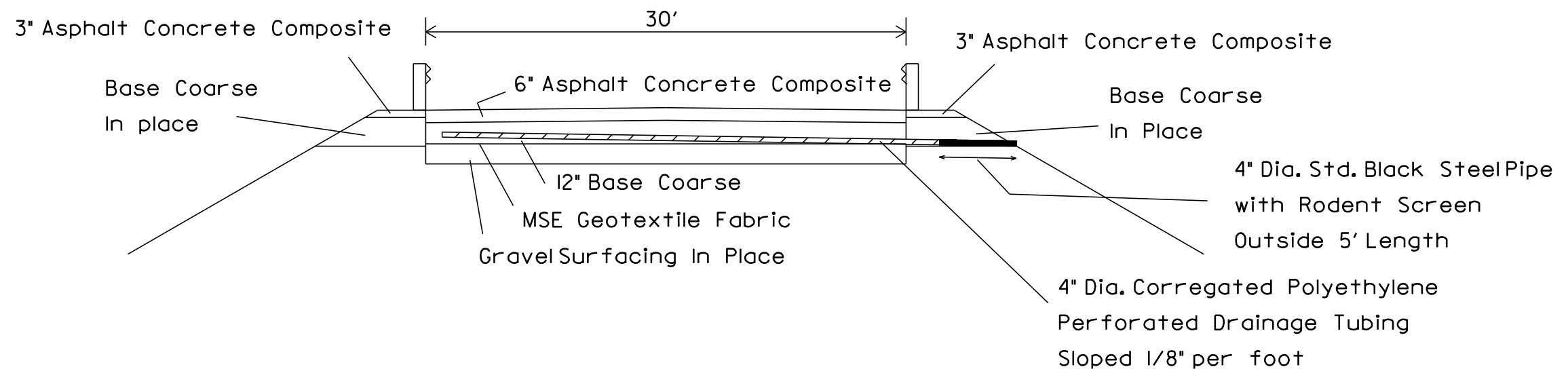
## EXISTING SECTION

SD 15 / SD 20



## FINAL RESURFACING SECTION

SD 15 / SD 20



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STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	015-172, 020-172 & 123-172	5	17

SCOPE OF WORK

Work on the SD 15 / SD 20 projects includes, but is not limited to, removal and replacement of asphalt / gravel surfacing, installing underdrain pipe, and placing asphalt concrete pavement at four locations.

Work on the SD 123 project requires a 30" RCP and Sloped Ends to be installed in-between the two existing 24" RCP. Control Density Fill will be used to backfill and stabilize this pipe. Base Course will be required to complete the backfilling that will be covered with 6" Asphalt Concrete Composite.

SEQUENCE OF OPERATIONS

The following Sequence of Operations shall be adhered to for SD 123 Pipe Placement. Any changes must be approved in writing by the Area Engineer prior to changes being made.

1. Install signing / close roadway prior to start of work.
2. Place erosion control, as applicable.
3. Excavate to expose culvert sections.
4. Complete undercut as needed.
5. Place and tie culvert sections.
6. Place control density fill.
7. Place the gravel and asphalt.
8. Restore the roadway inslopes.
9. Seed the disturbed inslopes.

SD123 will be closed between MRM 178.20 and MRM 179.20 to allow the installation of the culvert.

The following Sequence of Operations shall be adhered to for SD 15 / SD 20 Asphalt Pavement Repair. Any changes must be approved in writing by the Area Engineer prior to changes being made.

1. Install signing prior to start of work.
2. Remove asphalt and gravel surfacing.
3. Complete digouts as needed.
4. Place MSE Fabric.
5. Install 4" underdrain.
6. Install base course backfill.
7. Repeat process for opposing lane.
8. Remove 6" of base course.
9. Place asphalt composite.
10. Restore the roadway inslopes.
11. Seed the disturbed inslopes.

One lane of traffic shall be maintained on SD 15 and SD 20 at all times. Standard Plate 634.23 shall be utilized at all locations.

UTILITIES

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

MAINTENANCE OF TRAFFIC

The Contractor shall accommodate over-width vehicles through the work areas.

Locations of signs on traffic control layouts are diagrammatic. Portable stands may be used on the shoulders or on driving lanes closed to traffic. The bottom of signs on portable or temporary supports shall not be less than seven feet above the pavement in urban areas and one foot above the pavement in rural areas.

A maximum of two closures shall be paid for. If more closures are utilized, additional cost of signing shall be at the Contractor's expense. No payment will be made for signs being reused at different repair areas.

Damage to the shoulders or ditch due to the Contractor's operations shall be repaired by the Contractor, to the satisfaction of the Engineer, at no expense to the State. This includes the routing of traffic onto these shoulders around the work zones.

Type III Barricades 8' wide shall protect the sites during open excavation and paving periods.

Open excavations shall not be left overnight. Contractor shall plan operations such that all open excavations shall be backfilled prior to nightfall.

Maintenance of existing delineators shall be the Contractor's responsibility.

For the installation of the culvert sections on SD123 at MRM 179.00, traffic control shall be per Road Closure Layout. Type III Barricades shall be placed at each end of the section to close off the mile section. Loose Gravel and Bump signs will be required if the area is left un-paved.

An advisory Speed Plate displaying 30 M.P.H. shall be attached to all "Bump" signs used on the project. Speed plates are included in the Traffic Control Devices Inventory sheet in these plans.

Work activities during non-daylight hours are subject to prior approval.

The Contractor shall not park equipment on or alongside of the roadway within a 30 foot clear distance from the edge of the driving lane. The Contractor shall remove all equipment from the roadway during non-working hours.

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

Traffic Control units, as shown in the Estimate of Quantities, are estimates. Contractor's operation may require adjustments in quantities, either more or less. Payment will be for those signs actually ordered by the Engineer and used.

BASE COURSE

In place at each site location on SD 15 / SD 20 is 2 to 5 feet of gravel surfacing which has been placed by SDDOT Maintenance Crews due to soft areas off the end of the bridges. The Contractor shall saw cut the existing asphalt concrete at

the removal limits and remove the top 18 inches of remaining asphalt and granular material. Upon completion of this removal, the Engineer shall evaluate the condition of the remaining material. If unstable material exists, additional material removal may be ordered. MSE Geotextile Fabric shall be placed at the bottom of the removal area to prevent any loss of granular material into the subgrade at the direction of the Engineer. The Contractor should not operate equipment directly on the MSE Geotextile Fabric.

The Contractor shall backfill all repair areas with Base Course up to the existing asphalt surfacing, with the intent that normal traffic will aid in seating the material in its final position.

After both sides of each repair area has been repaired and backfilled, the Contractor shall remove and dispose of 6" of granular material just prior to asphalt paving. A 6" depth of asphalt concrete composite shall be placed as a patch matching the existing asphalt concrete.

Required saw cutting of existing asphalt concrete, removal of required asphalt or granular material, backfill at each site with a minimum of 18" Base Course, and digging out and disposing of 6" of granular material to accept the asphalt concrete shall be paid for at the contract unit price per ton for BASE COURSE.

Aggregate for Base Course shall conform to the specifications, except that the compaction shall be to the satisfaction of the Engineer.

4" UNDERDRAIN PIPE

The Contractor shall place the 4" Underdrain Pipe as detailed in the plans. This 4" Underdrain Pipe is intended to be placed toward the bottom of the 12" Base Coarse to prevent this newly placed base coarse from becoming saturated. The 4" Underdrain Pipe shall be sloped at 1/8" per foot and drain to one side of the roadway at the direction of the Engineer. The outside 5' of 4" Underdrain Pipe shall be Standard Black Steel Pipe with installed rodent screen as approved by the Engineer.

The Contractor shall place the 4" Underdrain Pipe such that the pipe is between the existing guardrail posts. Significant handwork may be required to place this pipe at the correct elevation and orientation to avoid contact with the in-place guardrail posts. Any damage to the existing guardrail or posts shall be corrected by the Contractor at no expense to the State of South Dakota.

Furnishing and installing 4" Underdrain Pipe at each site shall be paid for at the contract unit price per foot for 4" UNDERDRAIN PIPE.

PLACING CONTRACTOR FURNISHED TOPSOIL

The Contractor will be required to furnish and place topsoil on roadway inslopes and other areas as determined by the Engineer during construction.

All costs to furnish and place the topsoil shall be incidental to the contract unit price per cubic yard for PLACING CONTRACTOR FURNISHED TOPSOIL.

Basis of payment will be plans quantity of PLACING CONTRACTOR FURNISHED TOPSOIL. No separate field measurements will be taken. Topsoil material shall be obtained from Contractor furnished sources and approved by the Engineer.

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	015-172, 020-172 & 123-172	6	17

PIPE CULVERT INSTALLATION (SD123 @ MRM 179.0)

The Contractor shall remove and stockpile all the in place topsoil from the construction areas. On completion of construction operations this salvaged topsoil shall be spread evenly over the newly constructed embankment inslopes.

After the excavating material has been removed, the area shall be undercut to a depth of 2 foot and backfilled with Base Course. The undercut area shall extend 2 feet from the outermost diameter on both sides of the pipe with the back of the excavated area being sloped upward to the top of the roadway surface. The remainder of the pipe shall be backfilled with Controlled Density Fill backfill material as approved by the Engineer. This flowable material must be contained to allow distribution around the entire pipe. This material must have time to obtain strength as per specification. All costs to saw cut asphalt, remove and dispose of Asphalt, excavate and dispose of the material to the bottom of the pipe and slope the excavating limits at a safe backslope shall be incidental to the contract unit price per cuyd for CONTROLLED DENSITY FILL. Undercut shall be paid for at the contract unit price per cubic yard for PIPE CULVERT UNDERCUT. Refer to the Culvert Installation detail for SD 123 @ MRM 179.0 for additional details.

**CONTROLLED DENSITY FILL FOR PIPE**

Controlled density fill shall be a flowable mortar material. Materials shall be in accordance with the Specifications, except as modified below. The mix design shall be one of the following:

Material	Rate per Cubic Yard
Portland Cement Type I, II, III, or V	100 Lb
Fine Aggregate	2600 Lb
Coarse Aggregate	None
Water	60 Gal
Fly Ash, Type C	300 Lb

Or alternative mix design with CLSM (Controlled Low Strength Material):

Material	Rate per Cubic Yard
Portland Cement Type I, II, III, or V	200 Lb
Fine Aggregate	2600 Lb
Coarse Aggregate	None
Water	35 Gal
“W.R. Grace – Darafill” or approved equal	1 (3 oz.) capsule or equivalent *

\* Shall be one 3 ounce capsule or equivalent CLSM performance additive (foaming admixture).

The fine aggregate shall be natural sand consisting of mineral aggregate particles conforming to the following gradation requirements:

Passing 3/8 Inch Sieve	100%
Passing No. 200 Sieve	0-10%

Both of the mix designs shown above are designed to produce a minimum compressive strength of 100 psi. The Engineer may allow adjustments to the proportion of water at the site to provide the necessary consistency of the mix.

Controlled density fill shall be contained within the required limits with sandbags or other methods approved by the Engineer.

The Contractor shall prevent the flotation or movement of the culvert due to the buoyant force from the controlled density fill until the controlled density fill hardens. Overlying surfacing materials shall not be placed sooner than four hours after placement of the controlled density fill.

All costs for furnishing and installing the controlled density fill, including sandbags, labor, materials, equipment and incidentals necessary to complete the work shall be included in the contract unit price per cubic yard for “Controlled Density Fill.”

Plans quantity will be the basis for payment unless otherwise ordered by the Engineer.

Station	Quantity (CuYd)	Fill Height (between pipes)
244+48	4.5	1.0'

TABLE OF PIPE CULVERT UNDERCUT

The depth of undercut is an estimate and the actual depth necessary shall be determined during construction. Pipes shown may or may not require undercutting. Engineer will determine if undercut is required in accordance with Section 421 of the Standard Specifications.

Route & MRM	Undercut Depth(ft)	Quantity (Cu Yd)
SD 123 @ MRM 179.00	2	18.0
<b>Total</b>		<b>18.0</b>

TABLE OF PIPE CULVERT INSTALLATION SURFACING QUANTITIES

Route & MRM	Base Course (6") (Ton)	Approximate Elevation Difference Between Top of Roadway at Centerline and Pipe Flow Line
SD 123 @ MRM 179.00	7.1	4'
Total	7.1	

WATER FOR COMPACTION OF GRANULAR MATERIALS

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

SAWING IN EXISTING SURFACING

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

The Contractor may need to saw near the existing concrete bridge ends. Care shall be taken when sawing such that no damage to the concrete bridge ends occurs. Any damage to the concrete bridge ends shall be repaired by the Contractor at no cost to the Department of Transportation.

SEED ORIGATION LIMITATIONS

Grass seed furnished shall be the grass species listed in these plans. The Contractor may use one of the grass varieties listed in these plans for the specified grass species or the Contractor may use a different grass variety of the same grass species specified. If the Contractor uses a grass variety listed in these plans for the specified grass species, the grass seed origin limitations will not apply. If the Contractor uses a grass variety not listed in these plans for the specified grass species, the grass seed furnished must originate in South Dakota, North Dakota, Montana, Wyoming, Nebraska, Iowa, Minnesota, Kansas, Colorado, or Wisconsin. Grass seed grown outside this area may be approved after the Contractor has furnished written certification from three seed suppliers confirming seed grown within this area is not readily available.

PERMANENT SEEDING

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

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.

Type C Permanent Seed Mixture shall be used at all locations. The estimated area to seed is **0.4** Acre.

All costs to seed the disturbed areas shall be incidental to the contract lump sum price for EROSION CONTROL.

Type C Permanent Seed Mixture shall consist of the following:

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

PLOTTED FROM - TRWAINT14

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	015-172, 020-172 & 123-172	7	17

**HIGH FLOW SILT FENCE**

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

<http://apps.sd.gov/Applications/HC54ApprovedProducts/main.asp>

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

A quantity of 100 feet of high flow silt fence has been included to the Estimate of Quantities for temporary erosion and sediment control in highway ditch channels and at wetland areas adjacent to the highway.

**REMOVE SILT FENCE**

Silt fence shall be removed when vegetation is established. Some or all of the silt fence may be left on the project until vegetation is established.

**EROSION CONTROL WATTLE**

Erosion control wattles for restraining the flow of runoff and sediment shall be installed 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.

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

The erosion control wattle provided 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>

**ASPHALT CONCRETE COMPOSITE**

Project site locations shall receive 6” of Asphalt Concrete Composite on mainline of SD 15, SD 20, and SD 123. At adjacent guardrail surfacing locations, 3” of Asphalt Concrete Composite shall be placed for any disturbed areas below in-place guardrail. Significant handwork may be required to place asphalt concrete composite around and between guardrail posts. Any damage to the existing guardrail or posts shall be corrected by the Contractor at no expense to the State of South Dakota.

Repair location on SD 20 at MRM 440.80 shall receive a 2” asphalt overlay full width of the roadway and extending approximately 175’ south of the repair area limits at the direction of the Engineer.

Mineral aggregate for the Asphalt Concrete Composite shall conform to the requirements of the Standard Specifications for Class E, Type 1.

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

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

**TABLE OF REMOVAL & REPAIR (SD 15 / SD 20)**

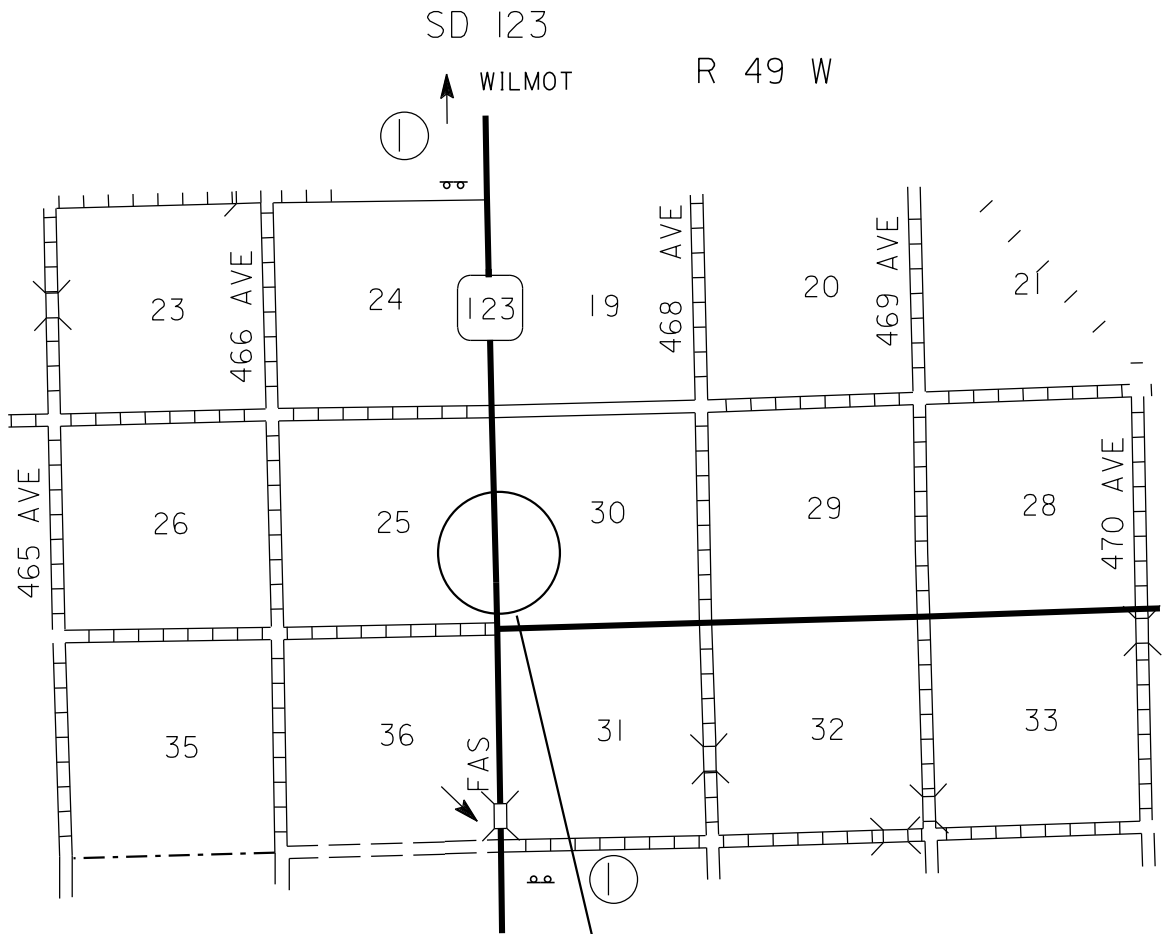
ROUTE	MRM	LENGTH	WIDTH	BASE COURSE	4” UNDER-DRAIN PIPE	ASPHALT CONCRETE COMPOSITE
		(FT)	(FT)	(TONS)	(FT)	(TONS)
SD 15	171.40	26.6	12.2	36.1	23	14
SD 15	167.89	74	30	246.7	38	85
SD 20	440.80	41	30	136.7	38	113
SD 20	440.05	37	30	123.3	38	45
Totals				542.8	137	257

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	015-172, 020-172 & 123-172	8	17

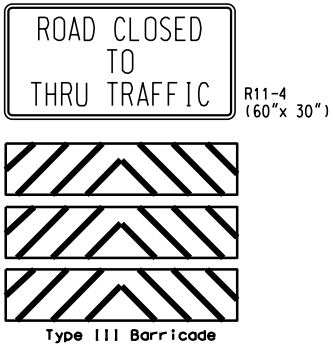
SUMMARY TABLE OF CULVERT WORK							
ROUTE	Placing Contractor Furnished Topsoil	Furnish and Install		Pipe Culvert Undercut	Control Density Fill	Base Course	Asphalt Concrete Composite
		30" RCP	30" RCP Sloped End				
	(Cu Yd)	(Ft)	(Each)	(CuYd)	(CuYd)	(Ton)	(Ton)
SD123 Pipe	20	42	2	18	4.5	7.1	15
TOTAL	20	42	2	18	4.5	7.1	15



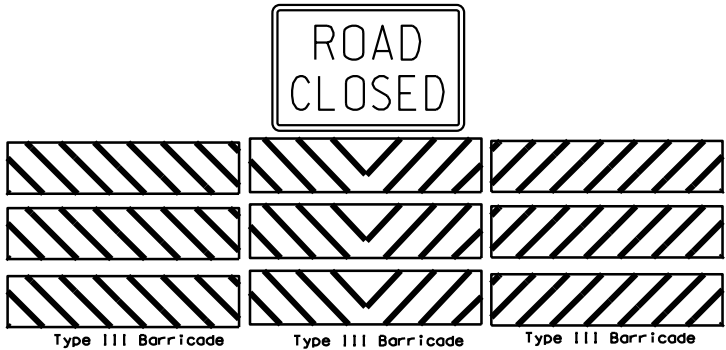
ROAD CLOSURE LAYOUT



1



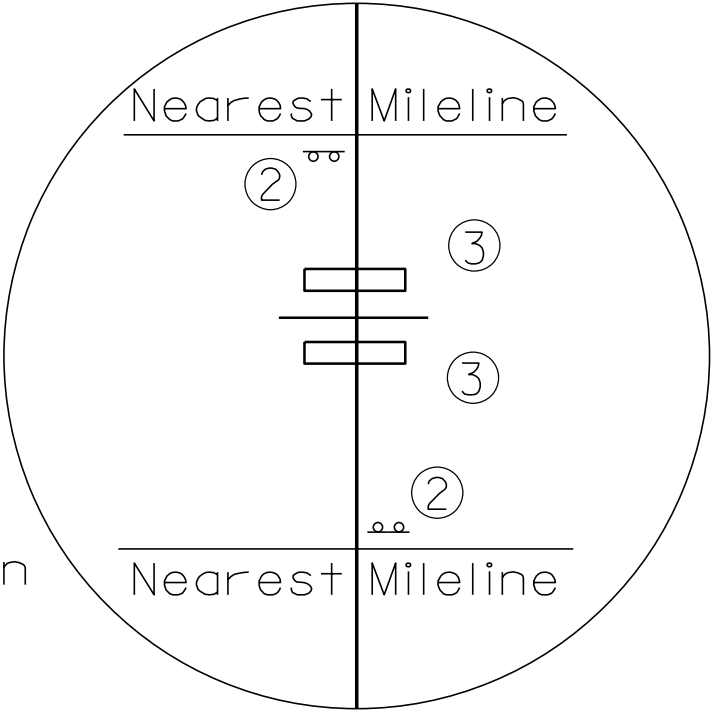
2

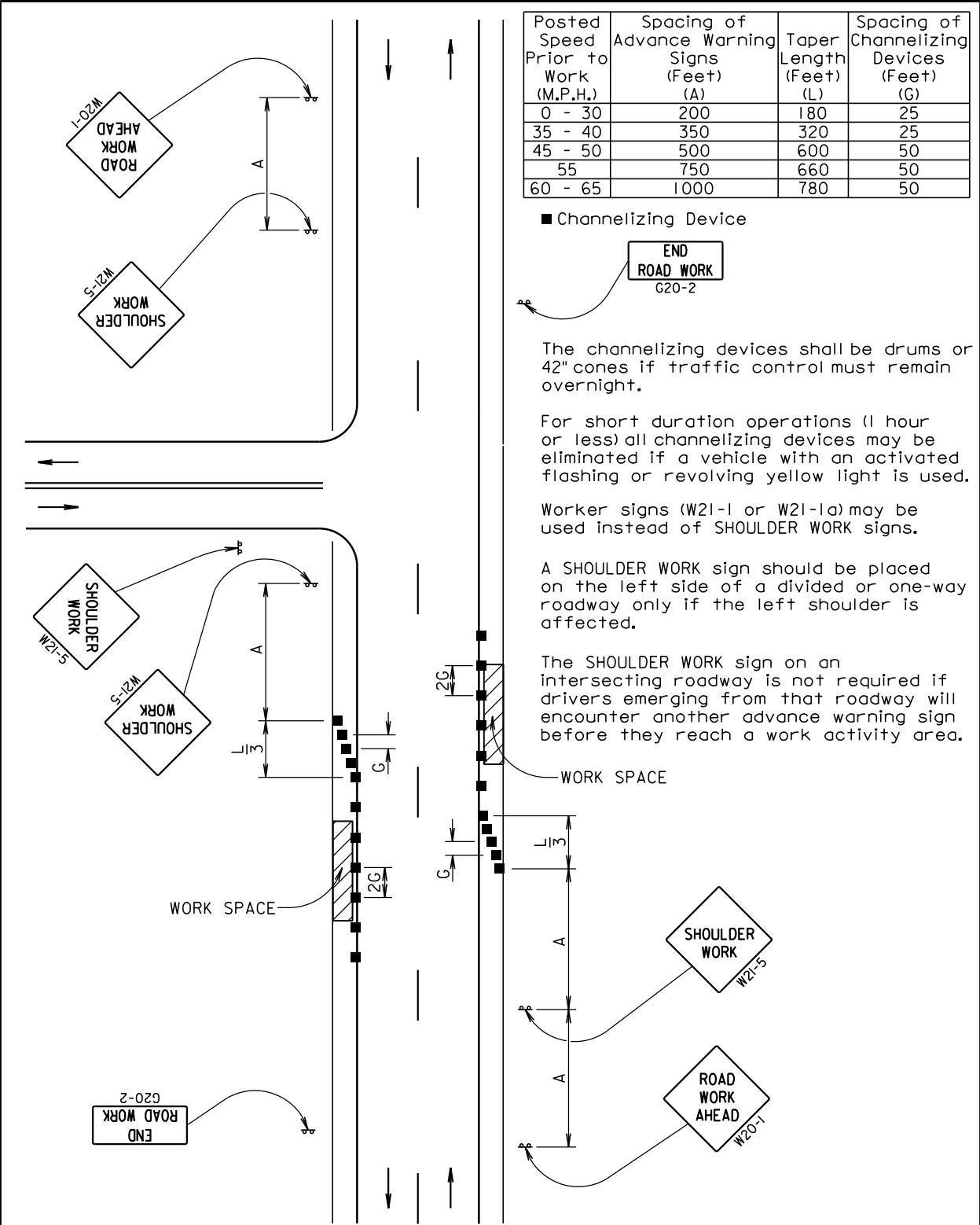


3

Pipe Replacement Location

Pipe Installation Location





September 22, 2014

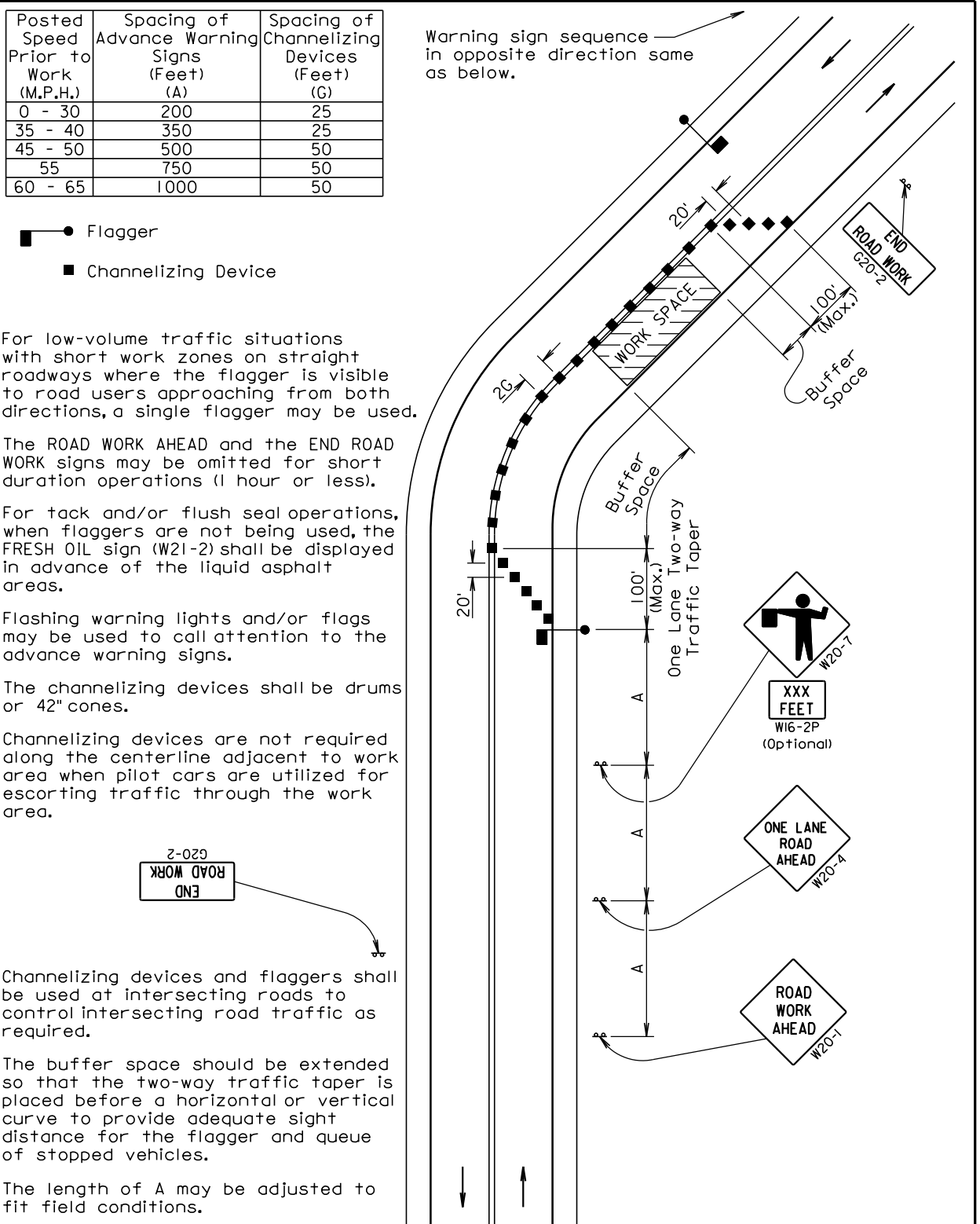
Published Date: 2nd Qtr. 2015

SDOT

GUIDES FOR TRAFFIC CONTROL DEVICES  
WORK ON SHOULDERS

PLATE NUMBER  
634.03

Sheet 1 of 1



September 22, 2014

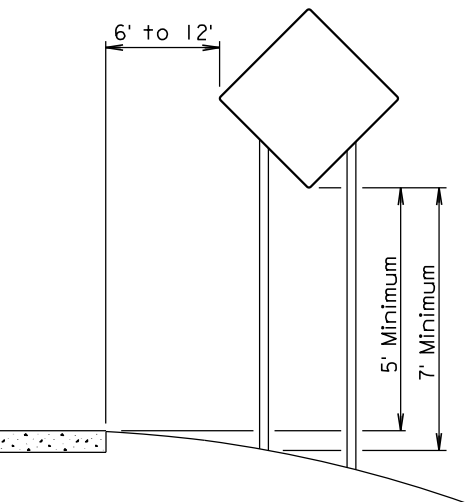
Published Date: 2nd Qtr. 2015

SDOT

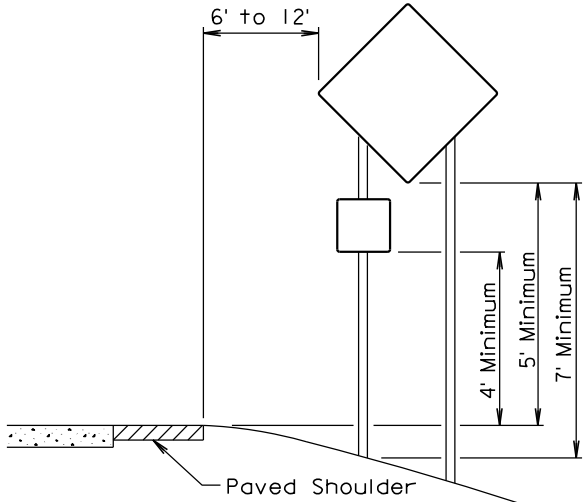
GUIDES FOR TRAFFIC CONTROL DEVICES  
LANE CLOSURE WITH FLAGGER PROVIDED

PLATE NUMBER  
634.23

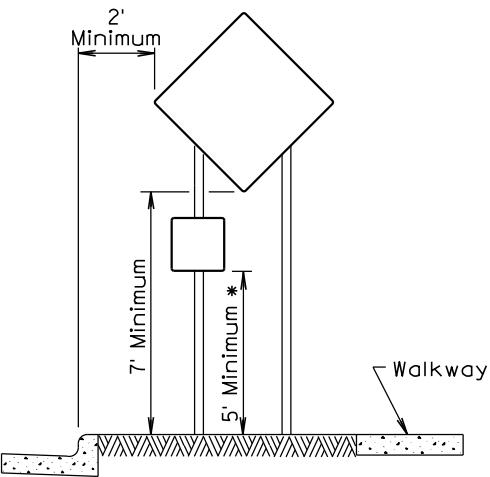
Sheet 1 of 1



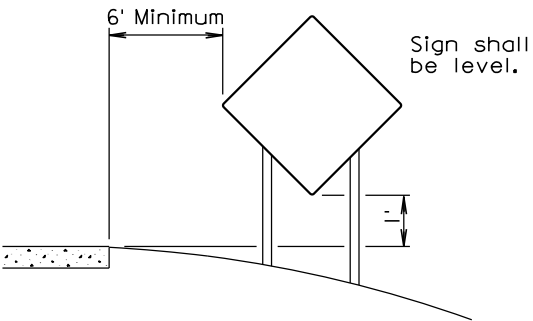
RURAL DISTRICT



RURAL DISTRICT WITH  
SUPPLEMENTAL PLATE



URBAN DISTRICT



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

\* 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.

September 22, 2014

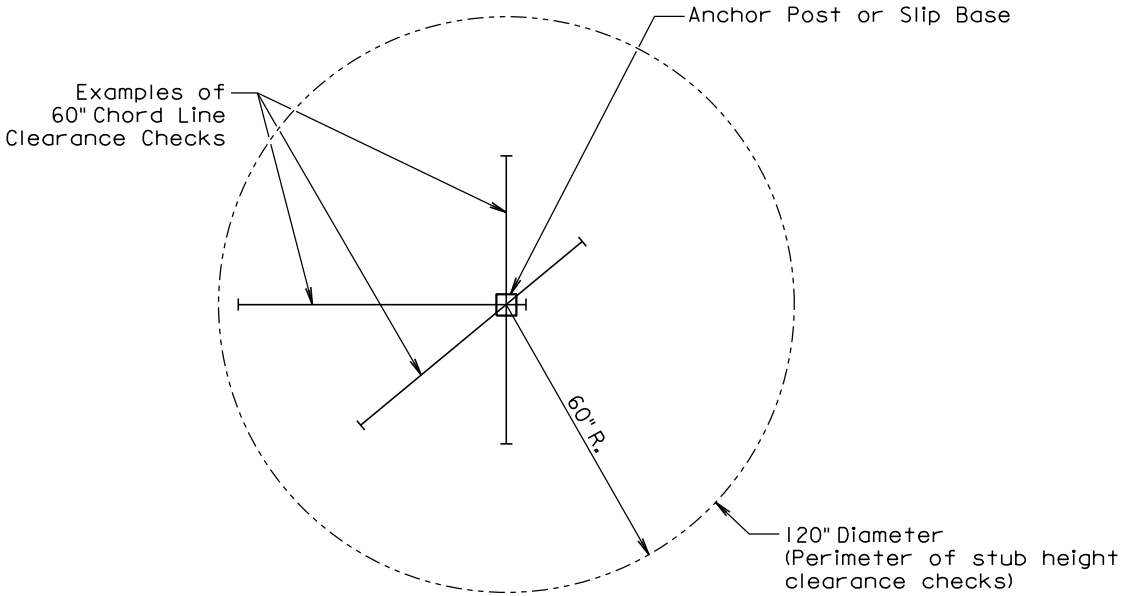
Published Date: 2nd Qtr. 2015

S  
D  
D  
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T

CRASHWORTHY SIGN SUPPORTS  
(Typical Construction Signing)

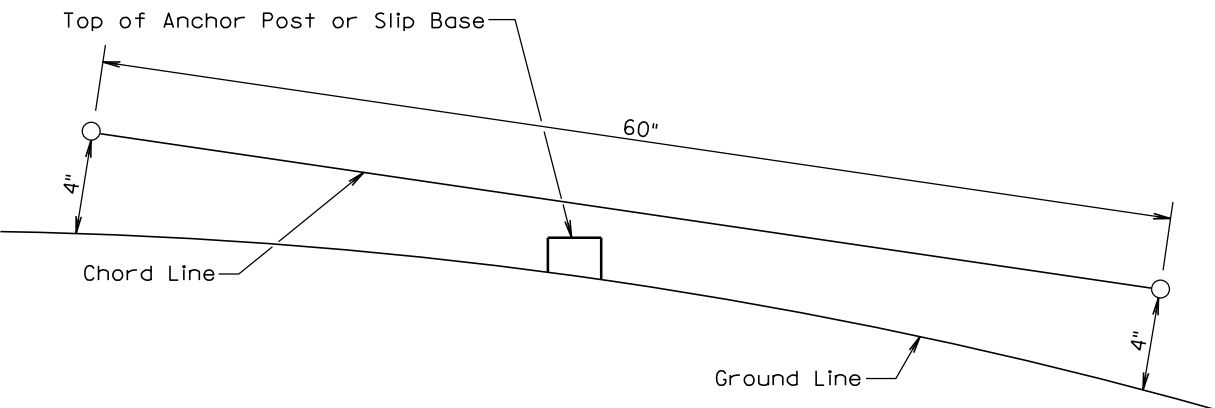
PLATE NUMBER  
634.85

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: 2nd Qtr. 2015

S  
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BREAKAWAY SUPPORT STUB CLEARANCE

PLATE NUMBER  
634.99

Sheet 1 of 1

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	015-172, 020-172 & 123-172	12	17

ITEMIZED LIST FOR TRAFFIC CONTROL - PCN i3vf

SIGN CODE	DESCRIPTION	CONVENTIONAL ROAD			
		NUMBER	SIGN SIZE	UNITS PER SIGN	UNITS
W8-1	BUMP	4	48" x 48"	34	136
W8-7	LOOSE GRAVEL	4	48" x 48"	34	136
W20-1	ROAD WORK AHEAD	4	48" x 48"	34	136
W20-4	ONE LANE ROAD AHEAD	2	48" x 48"	34	68
W20-7	FLAGGER (symbol)	2	48" x 48"	34	68
W21-5	SHOULDER WORK	2	48" x 48"	34	68
G20-2	END ROAD WORK	4	36" x 18"	17	68
-	TYPE 3 BARRICADE - 8' double sided	2		56	112
TOTAL UNITS					792

ITEMIZED LIST FOR TRAFFIC CONTROL - PCN i3vg

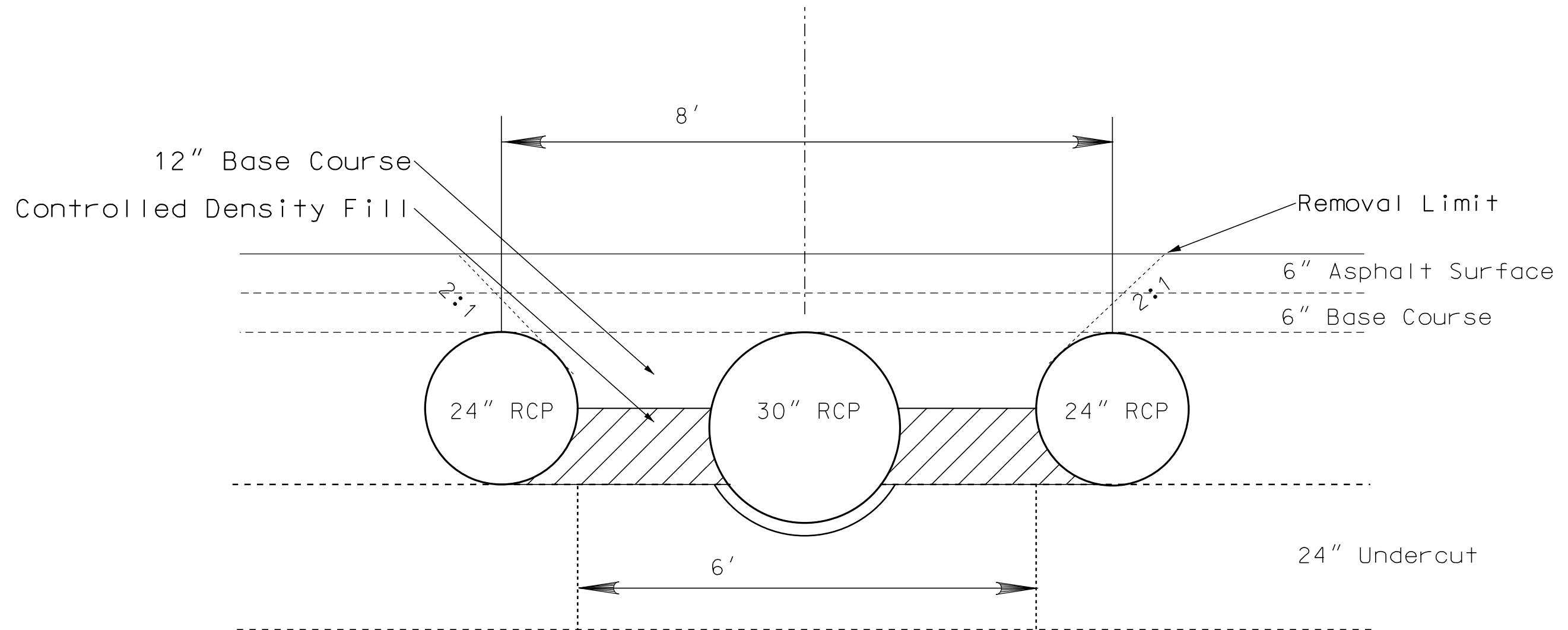
SIGN CODE	DESCRIPTION	CONVENTIONAL ROAD			
		NUMBER	SIGN SIZE	UNITS PER SIGN	UNITS
W8-1	BUMP	4	48" x 48"	34	136
W8-7	LOOSE GRAVEL	4	48" x 48"	34	136
W20-1	ROAD WORK AHEAD	4	48" x 48"	34	136
W20-4	ONE LANE ROAD AHEAD	2	48" x 48"	34	68
W20-7	FLAGGER (symbol)	2	48" x 48"	34	68
W21-5	SHOULDER WORK	2	48" x 48"	34	68
G20-2	END ROAD WORK	4	36" x 18"	17	68
-	TYPE 3 BARRICADE - 8' double sided	2		56	112
TOTAL UNITS					792

ITEMIZED LIST FOR TRAFFIC CONTROL - 123-172 PCN I3P8

SIGN CODE	DESCRIPTION	CONVENTIONAL ROAD			
		NUMBER	SIGN SIZE	UNITS PER SIGN	UNITS
R11-2	ROAD CLOSED	2	48" x 30"	27	54
R11-3a	ROAD CLOSED ___ MILES AHEAD LOCAL TRAFFIC ONLY	2	60" x 30"	30	60
R11-4	ROAD CLOSED TO THRU TRAFFIC	2	60" x 30"	30	60
W8-1	BUMP	2	48" x 48"	34	68
W13-1P	ADVISORY SPEED (plaque)	2	30" x 30"	21	42
W20-1	ROAD WORK AHEAD	2	48" x 48"	34	68
W20-3	ROAD CLOSED AHEAD	2	48" x 48"	34	68
-	TYPE 3 BARRICADE - 8' single sided	8		40	320
TOTAL UNITS					740

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	015-172, 020-172 & 123-172	13	17

# SD 123 Pipe Installation at MRM 179.00



30" RCP and Ends installed in between two 24" RCP's.  
The area between the culverts will be filled with  
Controlled Density Fill.

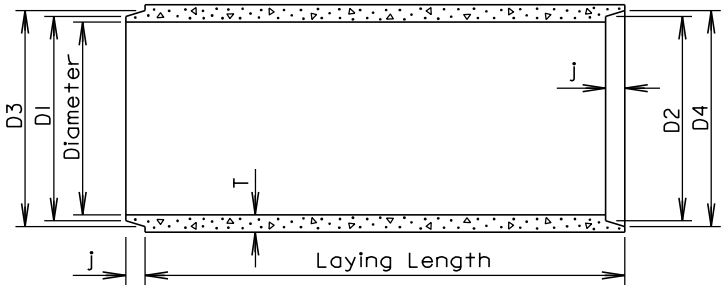
As stated in the plans, Undercut may not be required  
due to the recent installation of the two 24" RCP's.  
All that is expected is to install a cradle and bedding for  
this 30" RCP.

PLOTTED FROM - TRVAINT14

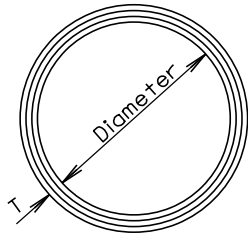
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	015-172, 020-172 & 123-172	14	17

TOLERANCES IN DIMENSIONS

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



LONGITUDINAL SECTION



END VIEW

GENERAL NOTES:

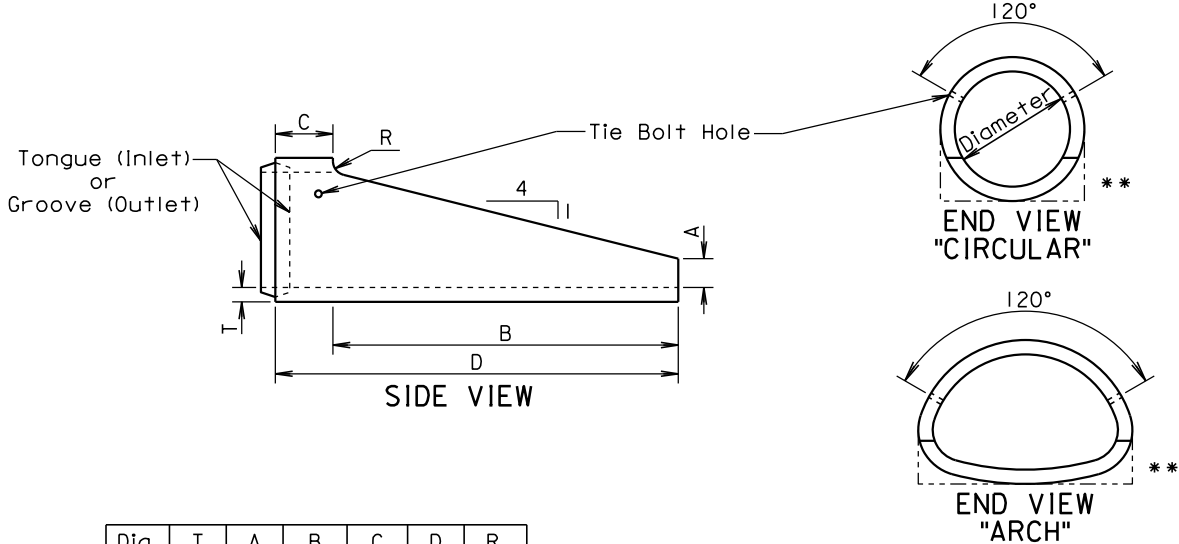
Construction of R. C. P. shall conform to the requirements of Section 990 of the Standard Specifications for Roads and Bridges.

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 1/8
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: 1st Qtr. 2015	S D D O T	REINFORCED CONCRETE PIPE	PLATE NUMBER 450.01
			Sheet 1 of 1

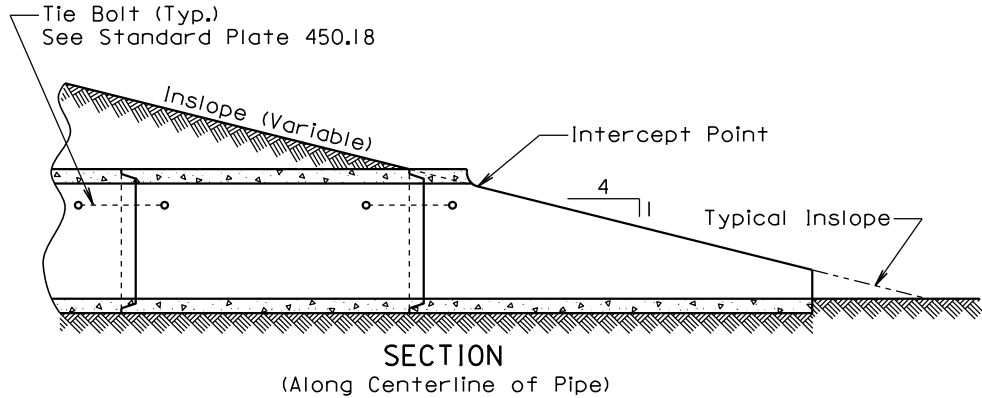


Dia. (in.)	T (in.)	A (in.)	B (in.)	C (in.)	D (in.)	R (in.)
FOR CIRCULAR PIPE						
24	3	6	72	12	84	3
30	3 1/2	7 1/2	90	12	102	3 1/2
FOR ARCH PIPE						
* 24	3	6	48	12	60	3
* 30	3 1/2	7 1/2	60	12	72	3 1/2
* 36	4 1/2	8 5/8	66	30	96	0
* 42	4 1/2	10	77 1/4	18 3/4	96	0

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

\* Equivalent Diameter of Circular R.C.P.

\*\* Acceptable Flat Bottom Alternate.



GENERAL NOTE:

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

September 22, 2006

Published Date: 1st Qtr. 2015	S D D O T	R. C. P. SLOPED ENDS	PLATE NUMBER 450.13
			Sheet 1 of 1

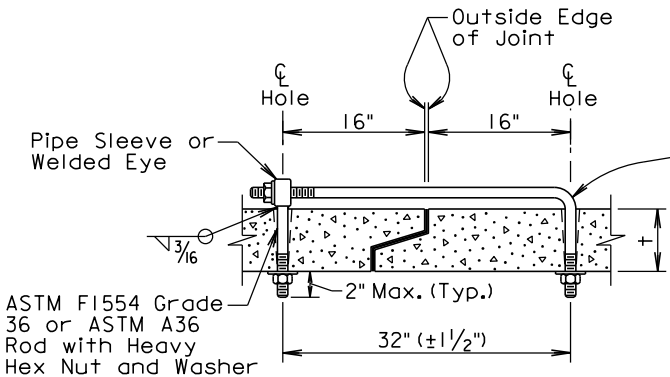
Wall "t" (in.)	Rod Dia. (in.)	Pipe Sleeve Dia. (nominal)
$\leq 3\frac{1}{4}$	$\frac{5}{8}$	$\frac{3}{4}$
$3\frac{1}{2}$ - $6\frac{1}{2}$	$\frac{3}{4}$	1
$\geq 7$	1	$1\frac{1}{4}$

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 adjustable eye bolt tie assembly in accordance with ASTM A153.



ADJUSTABLE EYE BOLT TIE

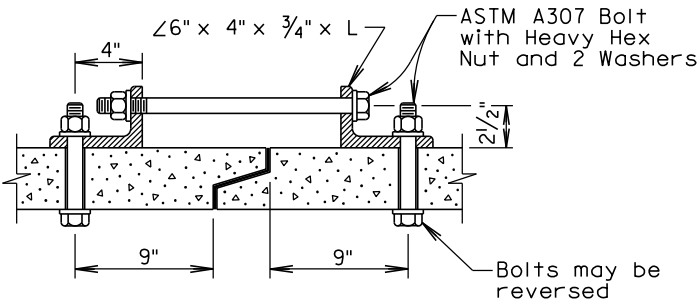
Pipe Dia. (in.)	"L" (in.)	Bolt Dia. (in.)
$\leq 48$	4	$\frac{3}{4}$
$> 48$	6	1

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.



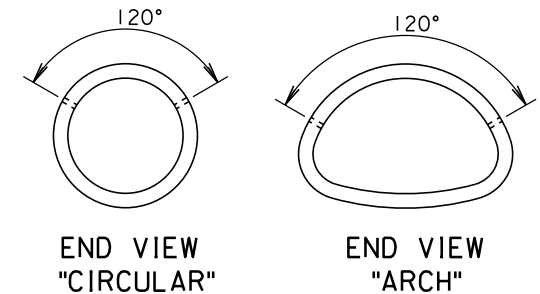
ANGLE AND BOLT TIE

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.

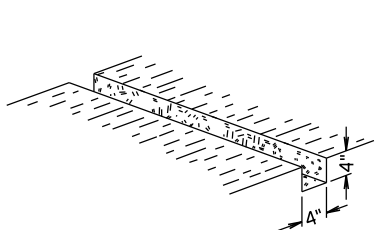
There will be no separate measurement or payment for the tie bolts. The cost for furnishing and installing the tie bolts shall be incidental to the contract unit price per foot for the corresponding bid item for R.C.P. or R.C.P. Arch.



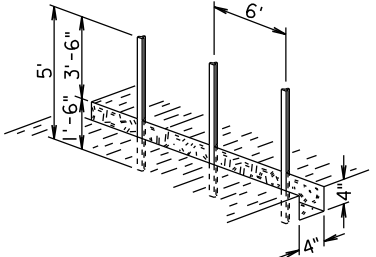
February 28, 2013

Published Date: 1st Qtr. 2015	S D D O T	TIE BOLTS FOR R.C.P. AND R.C.P. ARCH	PLATE NUMBER 450.18
			Sheet 1 of 1

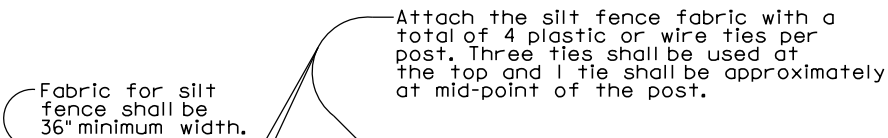
MANUAL HIGH FLOW SILT FENCE INSTALLATION



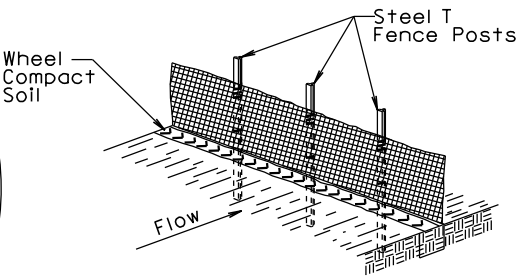
① EXCAVATE TRENCH



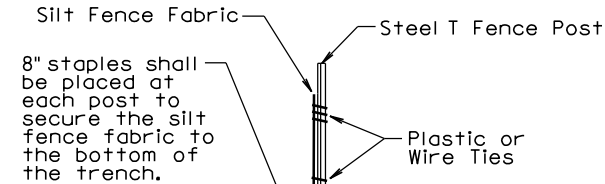
② DRIVE STEEL T FENCE POSTS



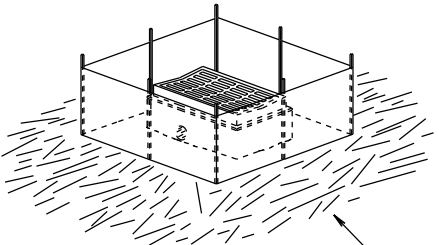
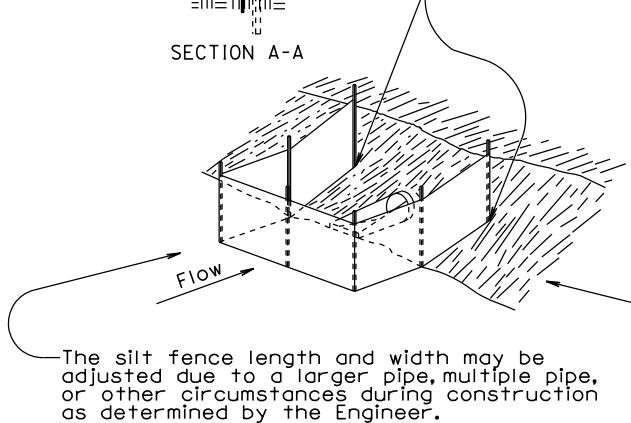
③ ATTACH SILT FENCE FABRIC



④ BACKFILL TRENCH AND WHEEL COMPACT SOIL



SECTION A-A



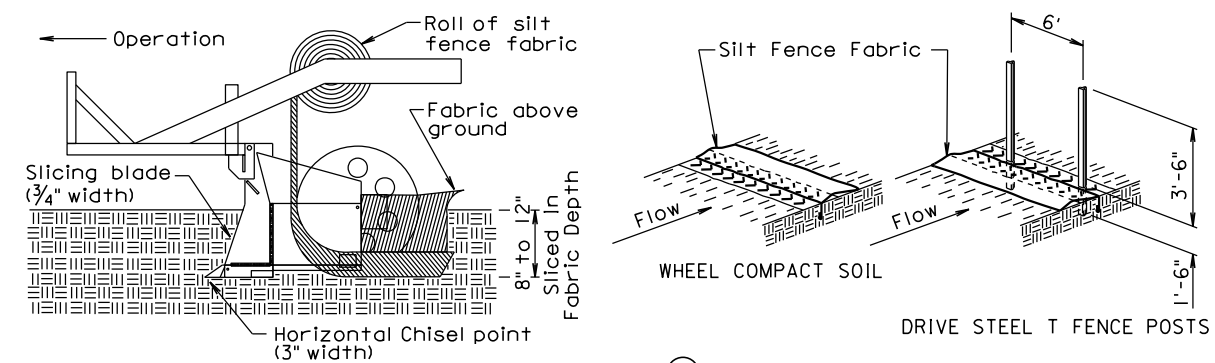
Post spacing shall be 3' for these types of applications of silt fence. All other components of the silt fence shall be the same as shown above.

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.

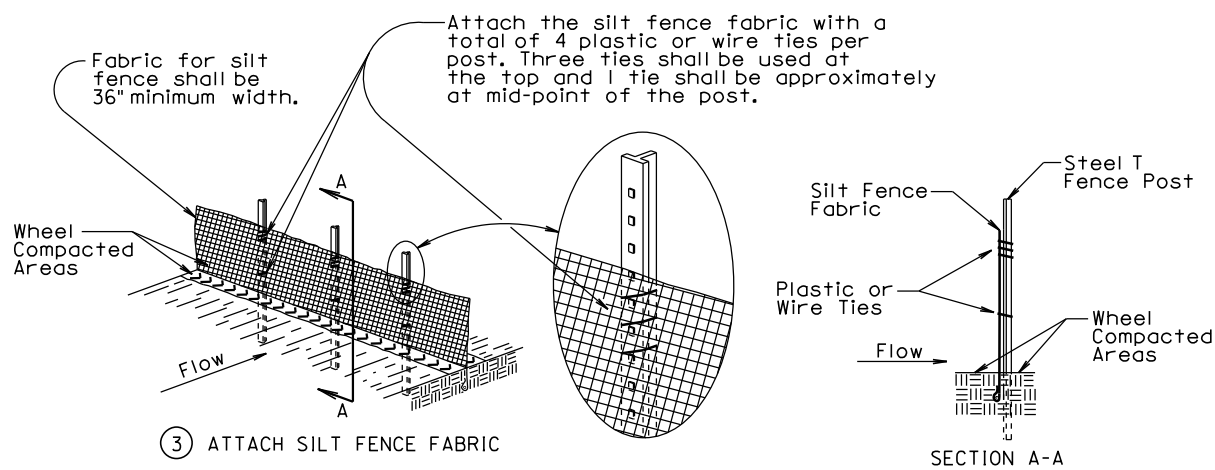
December 23, 2003

Published Date: 1st Qtr. 2015	S D D O T	HIGH FLOW SILT FENCE	PLATE NUMBER 734.05
			Sheet 1 of 2

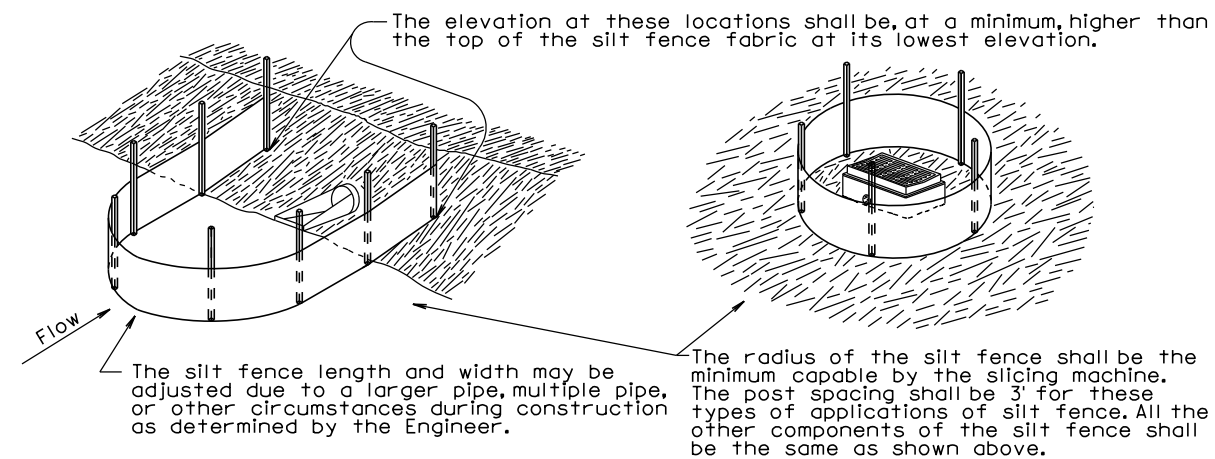
### MACHINE SLICED HIGH FLOW SILT FENCE INSTALLATION



- ① INSTALL SILT FENCE FABRIC BY MACHINE SLICING METHOD.
- ② WHEEL COMPACT SOIL ABOVE SLICED IN PORTION OF FABRIC AND THEN DRIVE STEEL T FENCE POSTS.



- ③ ATTACH SILT FENCE FABRIC

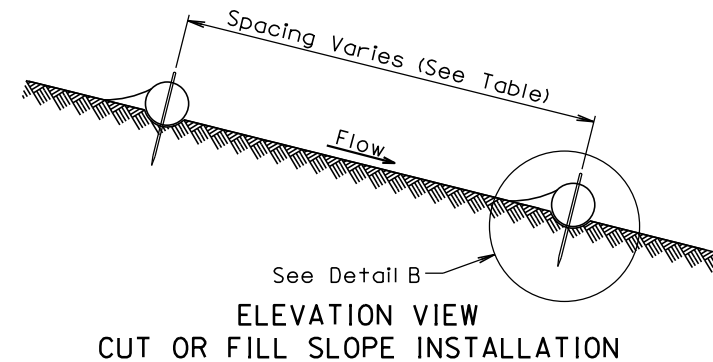


#### GENERAL NOTE:

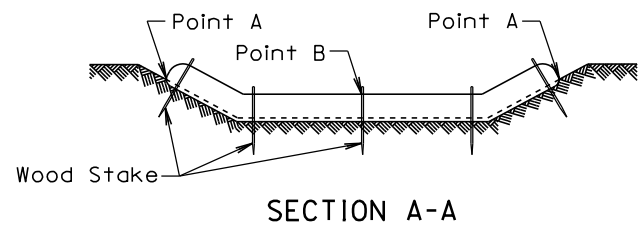
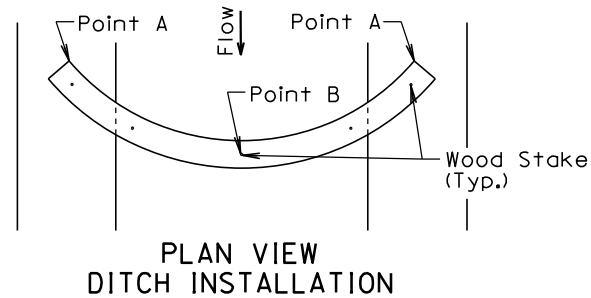
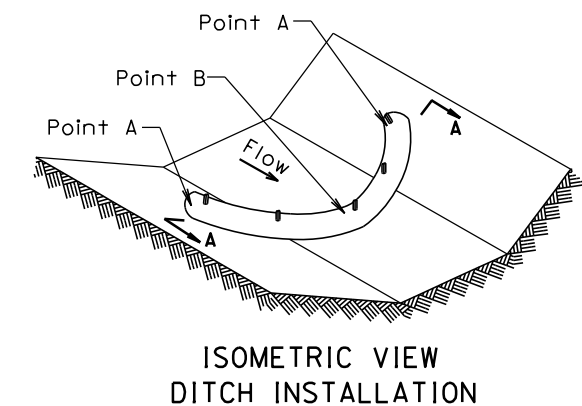
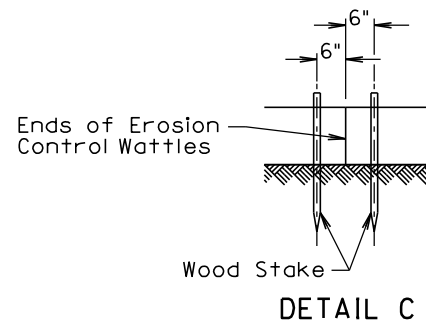
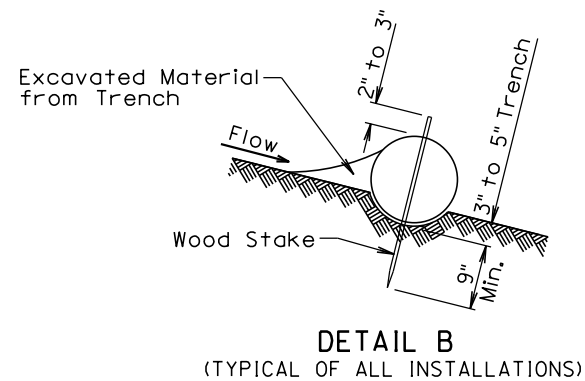
If a trench can not be dug or the silt fence fabric can not be sliced in due to the type of earthen material (such as rock), then a row of 30 to 40 pound sandbags butted end to end shall be provided on top of the extra length of silt fence fabric to prevent underflow.

December 23, 2003

Published Date: 1st Qtr. 2015	S D D O T	HIGH FLOW SILT FENCE	PLATE NUMBER 734.05
			Sheet 2 of 2



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



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

December 23, 2004

Published Date: 1st Qtr. 2015	S D D O T	EROSION CONTROL WATTLE	PLATE NUMBER 734.06
			Sheet 1 of 2



STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	015-172, 020-172 & 123-172	17	17

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 1/2". 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

<i>Published Date: 1st Qtr. 2015</i>	<b>S D D O T</b>	<b>EROSION CONTROL WATTLE</b>	<b>PLATE NUMBER</b> <b>734.06</b>
			<i>Sheet 2 of 2</i>