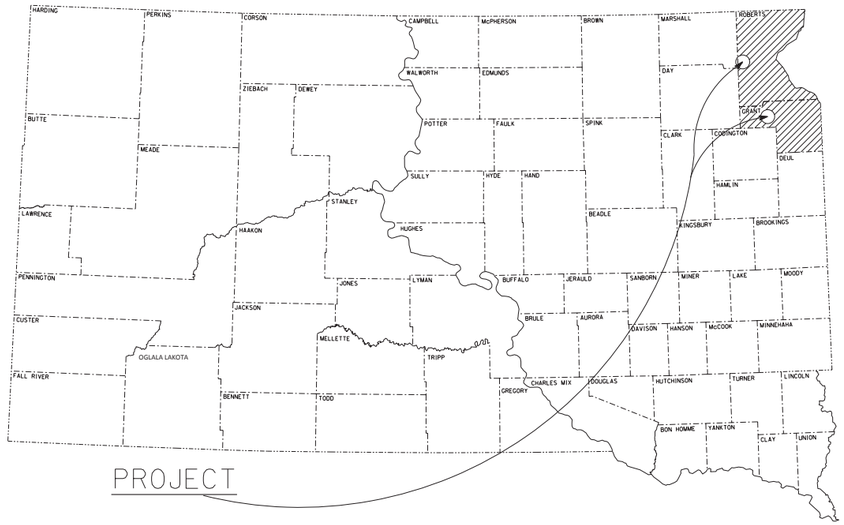
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	010-172, 029S-172	1	21



STATE OF SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION
PLANS FOR PROPOSED

PROJECTS 010–172, 029 S–172

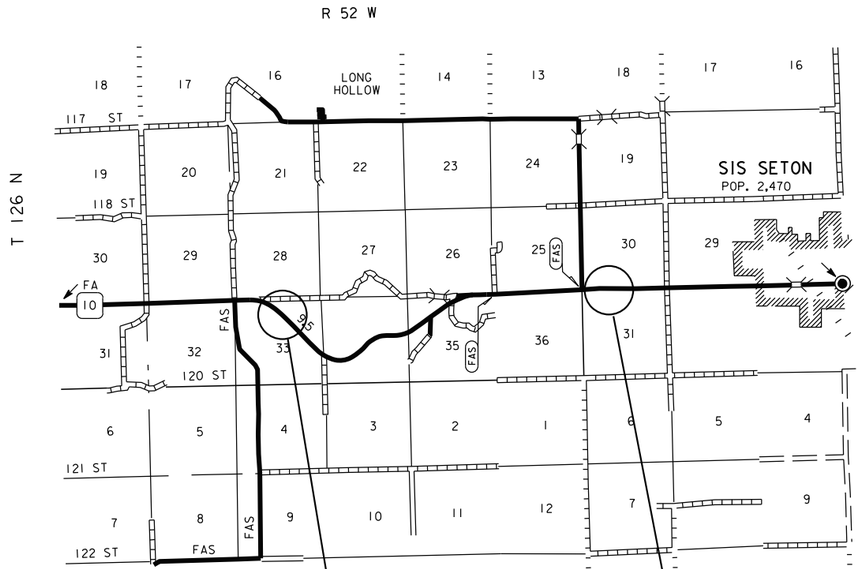
S.D. HIGHWAY 10
INTERSTATE 29 SBL

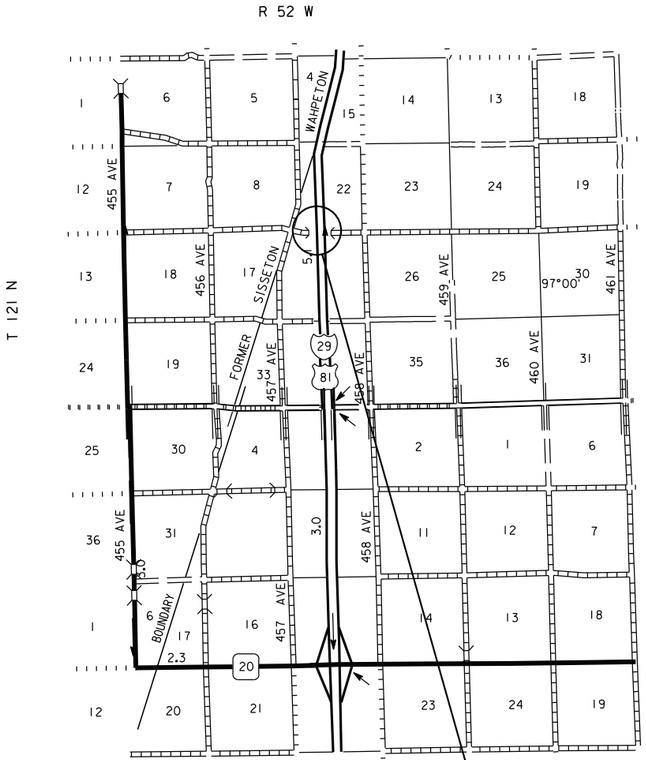
Roberts and Grant Counties

CULVERT REPAIR AND REPLACEMENT

PCN I3P6, I3P7

INDEX OF SHEETS





DESIGN DESIGNATION

ADT (2014)	1070
ADT (2023)	1128
DHV	124.1
D	51.0%
T DHV	3.7%
T•ADT	8.1%
V	70mph

STORM WATER PERMIT
NONE REQUIRED

Site 1
010-172
PCN I3P6
Sta. 160+47
MRM 352.00+.600
24" CMP

Site 2
010-172
PCN I3P6
Sta. 354+24
MRM 356.00+.300
30" RCP

DESIGN DESIGNATION

ADT (2014)	3140
ADT (2024)	3881
DHV	496.8
D	51.0%
T DHV	11.6%
T•ADT	25.4%
V	75mph

Site 3
029 S-172
PCN I3P7
Sta. 268+14
MRM 197.00+.970
18" CMP x 2

LEGEND

- STATE AND NATIONAL LINE
- COUNTY LINE
- SECTION LINE
- QUARTER LINE
- SIXTEENTH LINE
- PROPERTY LINE
- SURVEY LINE
- R.O.W. LINE
- FILL SLOPES
- CUT SLOPES

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
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ESTIMATE OF QUANTITIES AND ENVIRONMENTAL COMMITMENTS

010-172 PCN I3P6

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
100E0020	Clear and Grub Tree	2	Each
100E0100	Clearing	Lump Sum	LS
110E0500	Remove Pipe Culvert	6	Ft
110E7500	Remove Pipe for Reset	8	Ft
230E0020	Contractor Furnished Topsoil	20	CuYd
450E4769	24" CMP 16 Gauge, Furnish	6	Ft
450E4770	24" CMP, Install	6	Ft
450E8900	Cleanout Pipe Culvert	2	Each
450E9000	Reset Pipe	8	Ft
634E0010	Flagging	30.0	Hour
634E0110	Traffic Control Signs	212	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
700E0110	Class A Riprap	40.0	Ton
734E0010	Erosion Control	Lump Sum	LS
734E0154	12" Diameter Erosion Control Wattle	50	Ft
734E0604	High Flow Silt Fence	150	Ft

029S-172 PCN I3P7

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
110E0500	Remove Pipe Culvert	12	Ft
230E0020	Contractor Furnished Topsoil	20	CuYd
320E1200	Asphalt Concrete Composite	20.0	Ton
380E5030	Nonreinforced PCC Pavement Repair	57.8	SqYd
380E6000	Dowel Bar	24	Each
380E6110	Insert Steel Bar in PCC Pavement	5	Each
450E0142	24" RCP Class 2, Furnish	12	Ft
450E0150	24" RCP, Install	12	Ft
450E8900	Cleanout Pipe Culvert	1	Each
634E0010	Flagging	20.0	Hour
634E0110	Traffic Control Signs	316	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0280	Type 3 Barricade, 8' Single Sided	1	Each
634E0420	Type C Advance Warning Arrow Panel	1	Each
734E0154	12" Diameter Erosion Control Wattle	50	Ft
734E0604	High Flow Silt Fence	150	Ft

SPECIFICATIONS

Standard Specifications for Roads and Bridges, 2015 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 B: FEDERALLY THREATENED, ENDANGERED, AND PROTECTED SPECIES

COMMITMENT B2: WHOOPING CRANE

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

Action Taken/Required:

Harassment or other measures to cause the Whooping Crane to leave the site is a violation of the Endangered Species Act. If a Whooping Crane is sighted roosting in the vicinity of the project, borrow 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

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.

SUMMARY TABLE OF CULVERT WORK

ROUTE	Placing Contractor Furnished Topsoil (Cu Yd)	Remove Pipe (Ft)	Furnish and Install 24" CMP (Ft)	Furnish and Install 24" RCP (Ft)	Remove Pipe for Reset (Ft)	Reset Pipe (Ft)	Clean-out Pipe Culvert (Each)	Class A Riprap (Ton)	Nonreinforced PCC Pavement Repair (SyYd)	Insert Steel Bar In PCC Pavement (Each)	Dowel Bar (Each)	Asphalt Concrete Composite (Ton)
SD10 Site 1	10	6	6	-	-	-	1	-	-	-	-	-
SD10 Site 2	10	-	-	-	8	8	1	40	-	-	-	-
I29 SBL Site 3	20	12	-	12	-	-	1	-	57.8	5	24	20
TOTAL	**40**	**18**	**6**	**12**	**8**	**8**	**3**	**40**	**57.8**	**5**	**24**	**20**

SCOPE OF WORK

Work on this project entails repairing pipe culverts where individual pipe culvert sections have become separated from the adjacent culvert section. Pipe culvert sections shall be removed, cleaned, realigned, reset, tie bolts installed and the roadway inslope restored. Several culvert locations will require repairs to the culvert that extend under the asphalt surfacing in which case the asphalt surfacing requires repair.

- **Site 1**
  This site has a 24" CMP that has a 6' section of the pipe that requires removal and replacement. The damaged pipe is on the shoulder and inslope on the left side of the roadway prior to the outlet. If asphalt roadway or inslope is disturbed, this will have to be repaired. Refer to Sheet 12 of 21.

- **Site 2**
  This site has had 2 – 30" RCP sections separate and required resetting. Clearing & grubbing and tree removal will be required. Placement of Class A rip rap along the side and in front of the end section has been added. Refer to Sheet 13 of 21.

- **Site 3**
  This site has had guard rail posts driven thru the 24" RCP on each side of the south end of the bridge. These two 6' sections of pipe will have to be removed and replaced. Concrete collars can be used to connect this new pipe to the existing pipe. Refer to Sheet 12 of 21.

SEQUENCE OF OPERATIONS

The following Sequence of Operations shall be adhered to. 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. Place erosion control, as applicable.
3. Excavate to expose culvert sections.
4. Remove, clean, realign, reset and tie culvert sections.
5. Repair the gravel and asphalt shoulders, when applicable.
6. Restore the roadway inslopes.
7. Seed the disturbed inslopes.

Should a culvert repair site require repairs to the asphalt shoulder or mainline driving surface; the asphalt surfacing shall be repaired within 10 Calendar Days of starting work at that culvert repair site.

Culvert repairs shall be totally completed in site before proceeding to the next site. Once work starts at a site work shall proceed in a continuous manner until the work is completed at that site. Leaving the project or working on other segments of the project will not be permitted unless authorized by the Engineer.

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.

TRAFFIC CONTROL

Most culvert repair sites will require signing as depicted on Standard Plate 634.03. For the traffic control layout shown on Standard Plate 634.03, the maximum work zone length shall be 1.0 mile.

When and where culvert repair work extends onto the roadway shoulder or into the driving lanes of the roadway, traffic control shall be per Standard Plate 634.23. If the culvert repairs require repairs to the asphalt shoulder, signage per Standard Plate 634.63 shall be in place until such time as the asphalt has been repaired and there is no hazard to the traveling public.

Should the culvert repairs extend into the driving lanes such that the asphalt surfacing in the driving lanes is disturbed, the Engineer shall determine the type of traffic control to install at each particular location. Standard Plate 634.63 has been included in the plans as one potential method for traffic control for the time period after the culvert repairs have been made until such time as the asphalt surfacing can be repaired.

Removing, relocating, covering, salvaging and resetting of existing traffic control devices, including delineation, shall be the responsibility of the Contractor. Cost of this work shall be incidental to the various contract items unless otherwise specified in the plans. Delineators and signs damaged or lost shall be replaced by the Contractor at no cost to the State.

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

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.

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. Portable sign supports may be used as long as the duration is less than 3 days. If the duration is more than 3 days the signs shall be on fixed location, ground mounted, breakaway supports.

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.

PLACING CONTRACTOR FURNISHED TOPSOIL

Several culvert repair site locations require additional material to fill holes in the inslopes over the culverts. 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 CONTRACTOR FURNISHED TOPSOIL.

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

RCP/CMP CULVERT REPAIRS FOR MAINLINE CULVERTS

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

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

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

Prior to culvert repair work the Contractor shall remove and stockpile all of 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. Removal and replacement of topsoil will not be measured for payment but shall be incidental to the contract unit prices for the various culvert contract items.

Compaction of inslope embankments shall be to the satisfaction of the Engineer.

It is not anticipated that water for compaction will be required. However, if in the opinion of the Engineer the fill material is extremely dry, water may be ordered and placed to the satisfaction of the Engineer. All costs for any added water shall be incidental to the contract unit prices for the various culvert contract items.

Haul of embankment material on established traveled roadways shall be limited to trucks or small scrapers hauling legal loads and which do not sustain damage to the roadway, as approved by the Engineer. Hauling of material in the roadway ditches will not be allowed.

Additional excavation may be required to ensure positive drainage into and out of extended culverts. Excavated material may be incorporated into the inslope embankment.

The Contractor shall be responsible for restoration of any areas disturbed outside the limits of the work area.

Joints between concrete pipe culvert sections shall be protected against infiltration as indicated in Section 450.3.A of the Standard Specifications. If an existing concrete pipe culvert section has a damaged joint or there is poor alignment of the joints, 2 layers of drainage fabric shall be placed over the joint.

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

When necessary to remove end sections of CMP culverts, they may be cut with a torch. If the culvert is cut the damaged area shall be painted with a galvanizing paint approved by the Engineer. All costs associated with cutting and painting shall be incidental to the contract unit price per foot for REMOVE PIPE CULVERT.

RCP/CMP CULVERT REPAIRS FOR MAINLINE CULVERTS (cont.)

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.

CLEANOUT PIPE CULVERTS

At those culvert locations where Cleanout Pipe Culvert is required, as indicated on the Table of Mainline Culvert Work, the ditches at the inlet and outlet shall also be cleaned.

Cleanout of pipe culverts shall be done in advance of culvert repair operations. At those locations where further evaluation of culvert repairs are required, the culvert cleaning shall be scheduled such that there is adequate time to evaluate what repairs are required and allow for ordering and delivery of culvert materials.

Material in all existing culverts shall be cleaned out by water flushing or other approved methods.

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

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

DITCH CLEANOUT

Ditch cleanout is required at all locations where the Summary Table of Culvert Work indicates Cleanout Pipe Culvert is required. There shall be no specific contract item for ditch cleanout. Ditch cleanout shall be included in the contract unit prices for CLEANOUT PIPE CULVERT, and the various culvert contract items.

Ditch cleanout shall include cleaning of the culvert end treatment apron which is typically a Flared End on this project. There will be no payment of the contract item Cleanout Pipe Culvert if all that is required is cleaning of the culvert end treatment apron.

Ditch cleanout shall extend from the end of the culvert to within 1 foot of the Right-of-Way (ROW) Line. The bottom of the ditch cleanout shall be a minimum of 10 feet wide and the side slopes on the channel shall be 20:1 or flatter. For those locations where there is no channel from the inlet/out let of the culvert to the ROW Line ditch cleanout shall be completed such that there is a flat area of 100 Square Feet created at the inlet/outlet and the sides slopes around the flat area shall be 20:1 or flatter.

BASE COURSE

Aggregate for Base Course shall conform to the Standard Specifications, except that the density shall be to the satisfaction of the Engineer.

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.

NONREINFORCED PCC PAVEMENT REPAIR

Concrete mainline or shoulders that require replacement, as determined by the Engineer, will be measured and paid for under the contract item for NONREINFORCED PCC PAVEMENT REPAIR.

Class M-6 Concrete shall be used for the Nonreinforced PCC Pavement Repair mix. The coarse aggregate shall be crushed ledge rock. Slump and Entrained Air shall meet the requirements set forth in Section 380.3.A of the Specifications.

Concrete shall be cured for a minimum of 72 hours before opening to traffic. The 72 hours is based upon a concrete temperature of 60 degrees Fahrenheit or higher throughout the cure period. If the concrete temperature falls below 60 degrees Fahrenheit, the cure time shall be extended or other measures shall be taken, at no additional cost to the State. In addition to the time requirements a strength of 4,000 psi must be attained prior to opening to traffic.

A broom finish will be required. A transverse metal tine finish will be required as specified by the Engineer. Prior to opening to traffic, transverse and longitudinal joints shall be temporarily sealed with a backer rod of sufficient size approved by the Engineer. The cost of the backer rod and its installation shall be incidental to the contract unit price per square yard for NONREINFORCED PCC PAVEMENT REPAIR. This backer rod shall be removed during permanent joint sealing operations.

Longitudinal and Transverse Joints shall be constructed in accordance with the Standard Plates contained within these plans. Contractor may use silicone or hot pour as designated by Standard Plates 380.05 or 380.06. All costs associated with sealing the joints shall be incidental to the contract unit price per square yard for NONREINFORCED PCC PAVEMENT REPAIR.

If the area of removal requires a transverse contraction joint to be reestablished, a dowel bar assembly shall be installed at the joint and paid for at the contract unit price per each for DOWEL BAR. Centerline of individual dowel bars in the dowel bar assembly shall be parallel to the roadway centerline. Sawing of the contraction joint shall commence when the concrete has hardened sufficiently to permit sawing without raveling.

Tie bars that require drilling holes and epoxy injection shall be measured and paid for at the contract unit price per each for INSERT STEEL BAR IN PCC PAVEMENT.

Placement of NONREINFORCED PCC PAVEMENT REPAIR will be paid for at the contract unit price per square yard. This payment will be full compensation for removal of in place concrete, for concrete, and for equipment, labor, and incidentals necessary to satisfactorily complete the work.

STEEL BAR INSTALLATION

The Contractor shall install the steel bars (**1 1/4** inch epoxy coated plain round dowel bars and No. **5** epoxy coated deformed tie bars) into drilled holes in the existing concrete pavement. An epoxy resin adhesive must be used to anchor the steel bar in the drilled hole.

The steel bars shall be cut to the specified length by sawing and shall be free from burring or deformations. Shearing will not be permitted.

Steel bars shall not be placed closer than 6 inches to any longitudinal joint, not closer than 18 inches to any transverse joint, and not closer than 15 inches to any construction joint.

Concrete shall be placed when the epoxy for anchoring the steel bars has hardened sufficiently to permit no movement of the steel bars as recommended by the manufacturer.

ASPHALT CONCRETE COMPOSITE

Asphalt Concrete Composite is included in the contract to repair the asphalt shoulders at those locations where culvert repairs extend under the in place asphalt shoulders. It is possible that the asphalt shoulder repairs could extend into the driving lane at some locations. Depth of Asphalt Concrete shall match that of the in place section or be a minimum of 3 inches in depth, whichever is thicker. Placement and compaction shall be by methods and equipment to the satisfaction of the Engineer.

PERMANENT SEEDING

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

Type C Permanent Seed Mixture shall be used at all locations. The estimated area to seed is **1** 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

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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 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 lump sum price for EROSION CONTROL.

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 **300** 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 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.

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

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	010-172, 029S-172	8	21

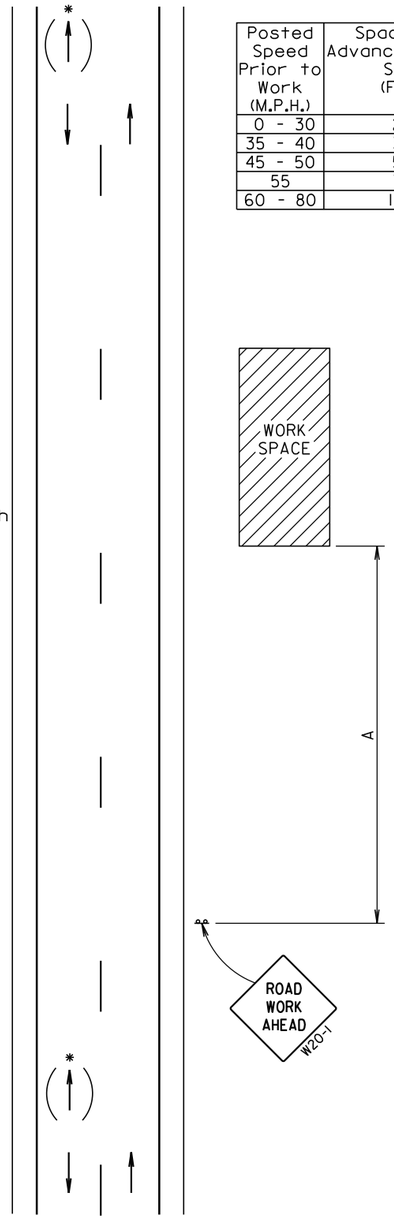
The signs illustrated are not required if the work space is behind a barrier, more than 2 feet behind the curb, or 15 feet or more from the edge of any roadway.

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 - 80	1000

April 15, 2015

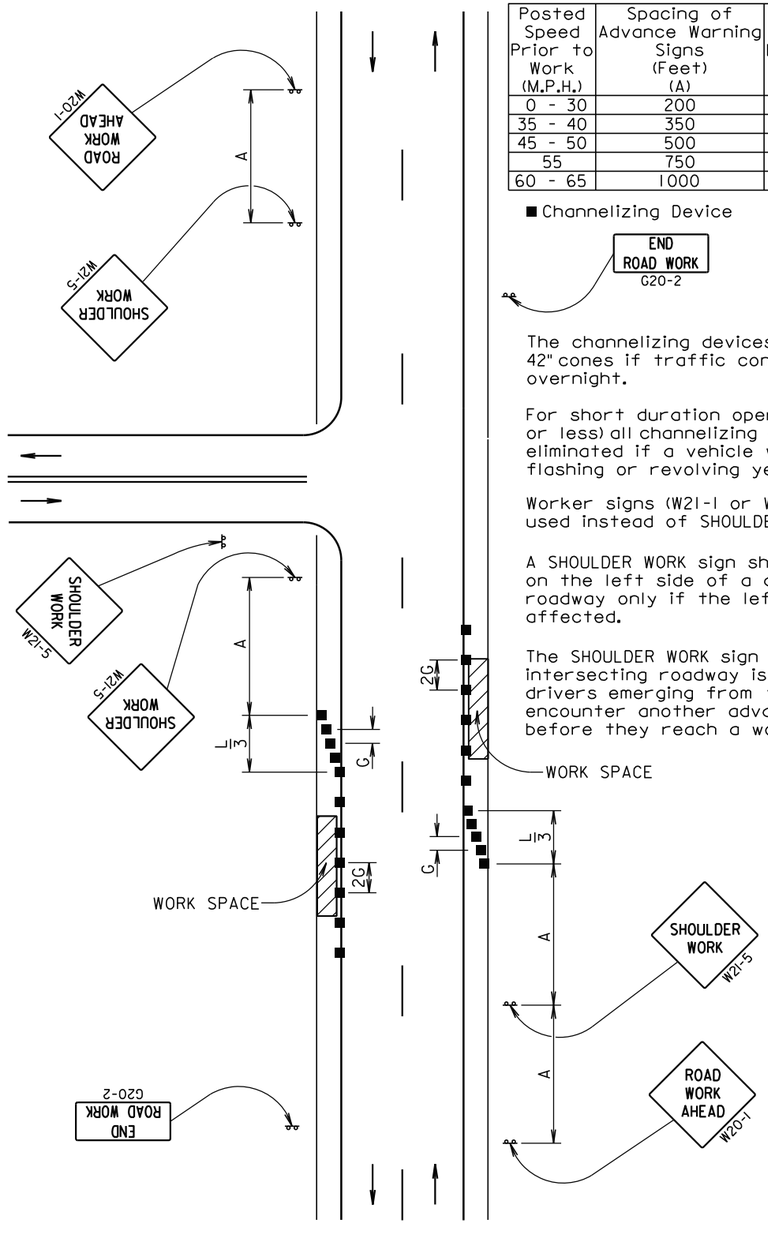
Published Date: 1st Qtr. 2016

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: 1st Qtr. 2016

SDDOT

GUIDES FOR TRAFFIC CONTROL DEVICES
WORK ON SHOULDERS

PLATE NUMBER 634.03

Sheet 1 of 1

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	010-172, 029S-172	9	21

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.

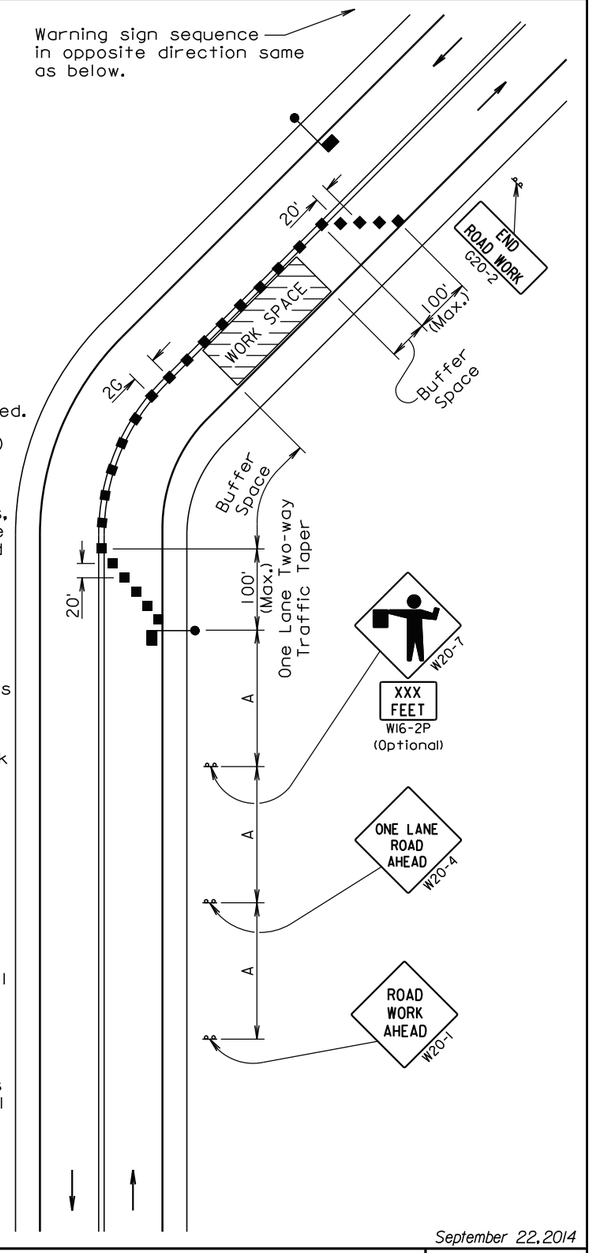
Channelizing devices are not required along the centerline adjacent to work area when pilot cars are utilized for escorting traffic through the work area.

END ROAD WORK G20-2

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: 1st Qtr. 2016	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) (B) (C)
0 - 30	200
35 - 40	350
45 - 50	500
55	750
60 - 65	1000
	(A) (B) (C)
70 - 80	1000 1500 2640

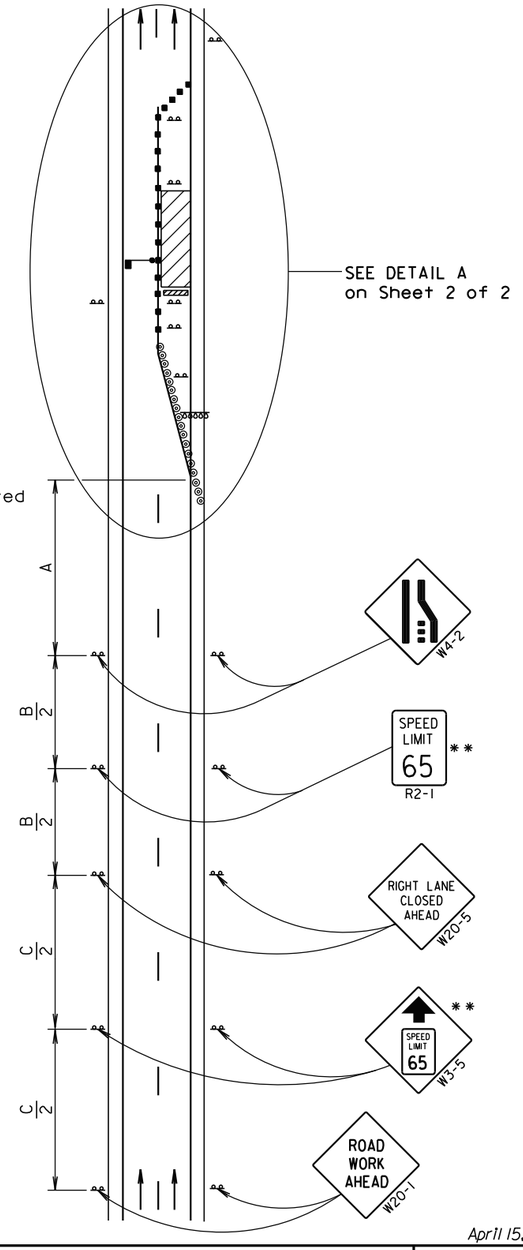
** Speed appropriate for location.

◎ Reflectorized Drum

■ Channelizing Device

ROAD WORK AHEAD sign is only required in advance of the first lane closure.

High speed is defined as having a posted speed limit greater than 45 mph.



April 15, 2015

Published Date: 1st Qtr. 2016	SDDOT	WORK ZONE SPEED REDUCTION FOR INTERSTATE AND HIGH SPEED MULTI-LANE HIGHWAYS	PLATE NUMBER 634.63
			Sheet 1 of 2

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	010-172, 029S-172	10	21

Posted Speed Prior to Work (M.P.H.)	Spacing of Channelizing Devices (Feet) (G)	Taper Length (Feet) (L)
0 - 30	25	180
35 - 40	25	320
45 - 50	50 *	600
55	50 *	660
60 - 65	50 *	780
70 - 80	50 *	960

* Spacing is 40' for 42" cones.

**Speed appropriate for location.

***Use speed limit designated for the condition when workers are present in the work space. Signs shall be covered or removed when workers are not present.

Flagger (As Necessary)

◎ Reflectorized Drum

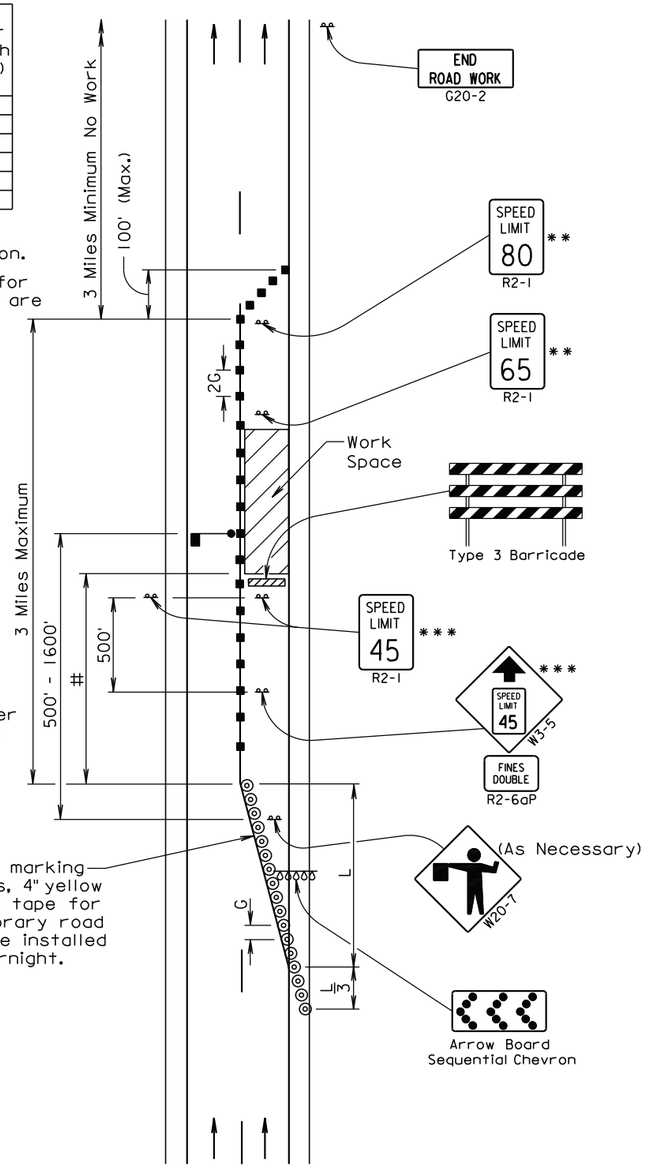
■ Channelizing Device

The Work Space shall be a minimum of 500' from the end of the taper.

The FLAGGER sign shall be used whenever there is a Flagger present.

The channelizing devices shall be 42" cones or drums.

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

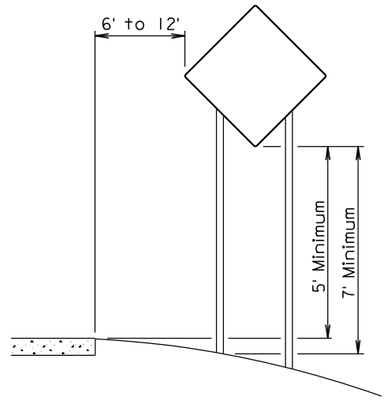


4" white temporary pavement marking tape for right lane closures, 4" yellow temporary pavement marking tape for left lane closures, or temporary road markers at 5' spacing shall be installed when the lane is closed overnight.

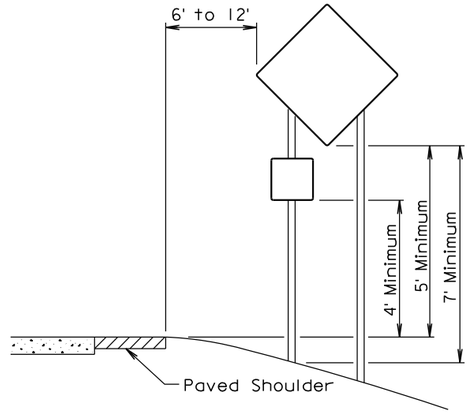
DETAIL A

April 15, 2015

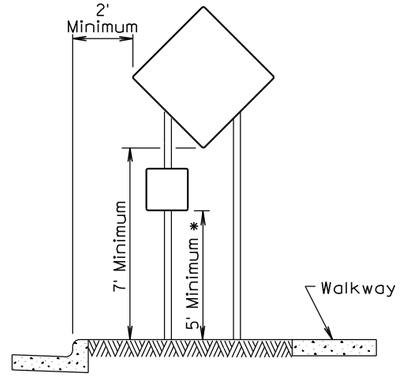
Published Date: 1st Qtr. 2016	SDDOT	WORK ZONE SPEED REDUCTION FOR INTERSTATE AND HIGH SPEED MULTI-LANE HIGHWAYS	PLATE NUMBER 634.63
			Sheet 2 of 2



RURAL DISTRICT

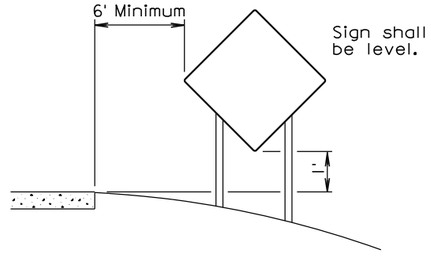


RURAL DISTRICT WITH SUPPLEMENTAL PLATE



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.

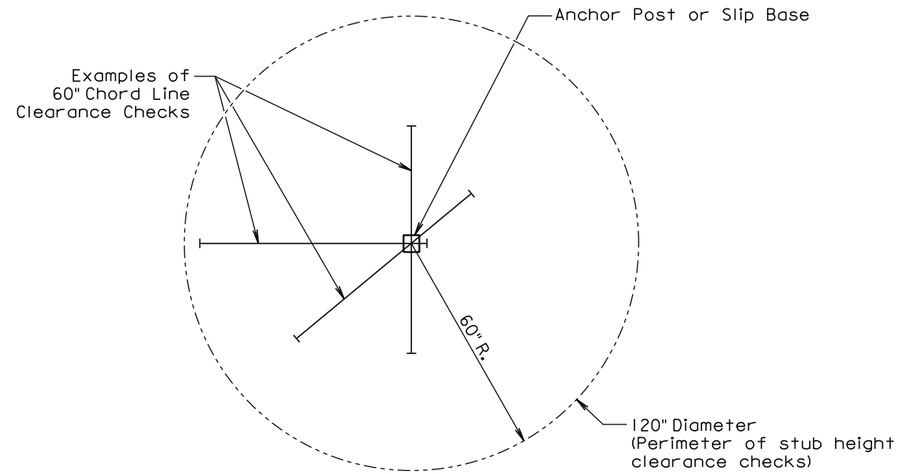


RURAL DISTRICT
3 DAY MAXIMUM
(Not applicable to regulatory signs)

September 22, 2014

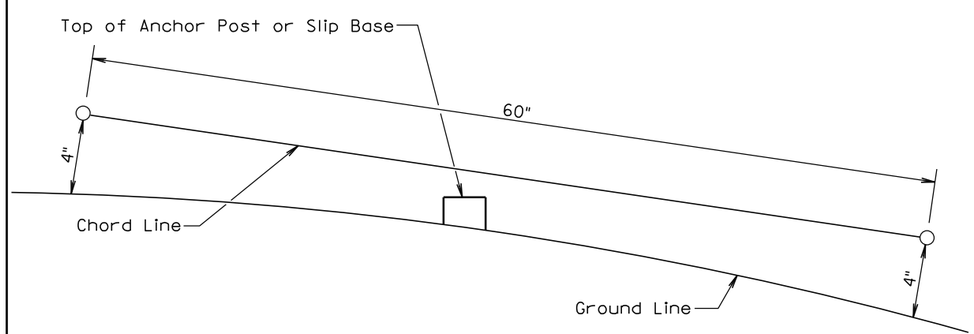
Published Date: 1st Qtr. 2016	SDDOT	CRASHWORTHY SIGN SUPPORTS (Typical Construction Signing)	PLATE NUMBER 634.85
			Sheet 1 of 1

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	010-172, 029S-172	11	21



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: 1st Qtr. 2016	SDDOT	**BREAKAWAY SUPPORT STUB CLEARANCE**	*PLATE NUMBER* 634.99
			Sheet 1 of 1

ITEMIZED LIST FOR TRAFFIC CONTROL SIGNS - 010-172 PCN I3P6

		CONVENTIONAL ROAD			
SIGN CODE	SIGN DESCRIPTION	NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
W20-1	ROAD WORK AHEAD	4	48" x 48"	16	64
W20-4	ONE LANE ROAD AHEAD	2	48" x 48"	16	32
W20-7	FLAGGER (symbol)	2	48" x 48"	16	32
W21-5	SHOULDER WORK	4	48" x 48"	16	64
G20-2	END ROAD WORK	4	36" x 18"	5	20
		CONVENTIONAL ROAD TRAFFIC CONTROL SIGNS SQFT			212

ITEMIZED LIST FOR TRAFFIC CONTROL SIGNS - 029 S-172 PCN I3P7

		EXPRESSWAY / INTERSTATE			
SIGN CODE	SIGN DESCRIPTION	NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
R2-1	SPEED LIMIT __	6	36" x 48"	12	72
R2-6aP	FINES DOUBLE (plaque)	2	36" x 24"	6	12
W3-5	SPEED REDUCTION AHEAD (__ MPH)	2	48" x 48"	16	32
W4-2	LEFT or RIGHT LANE ENDS (symbol)	4	48" x 48"	16	64
W20-1	ROAD WORK AHEAD	2	48" x 48"	16	32
W20-5	LEFT or RIGHT LANE CLOSED AHEAD	4	48" x 48"	16	64
W20-7	FLAGGER (symbol)	2	48" x 48"	16	32
G20-2	END ROAD WORK	1	48" x 24"	8	8
		EXPRESSWAY / INTERSTATE TRAFFIC CONTROL SIGNS SQFT			316

TYPE 3 BARRICADES

ITEM DESCRIPTION	QUANTITY
Type 3 Barricade, 8' Single Sided	1 Each

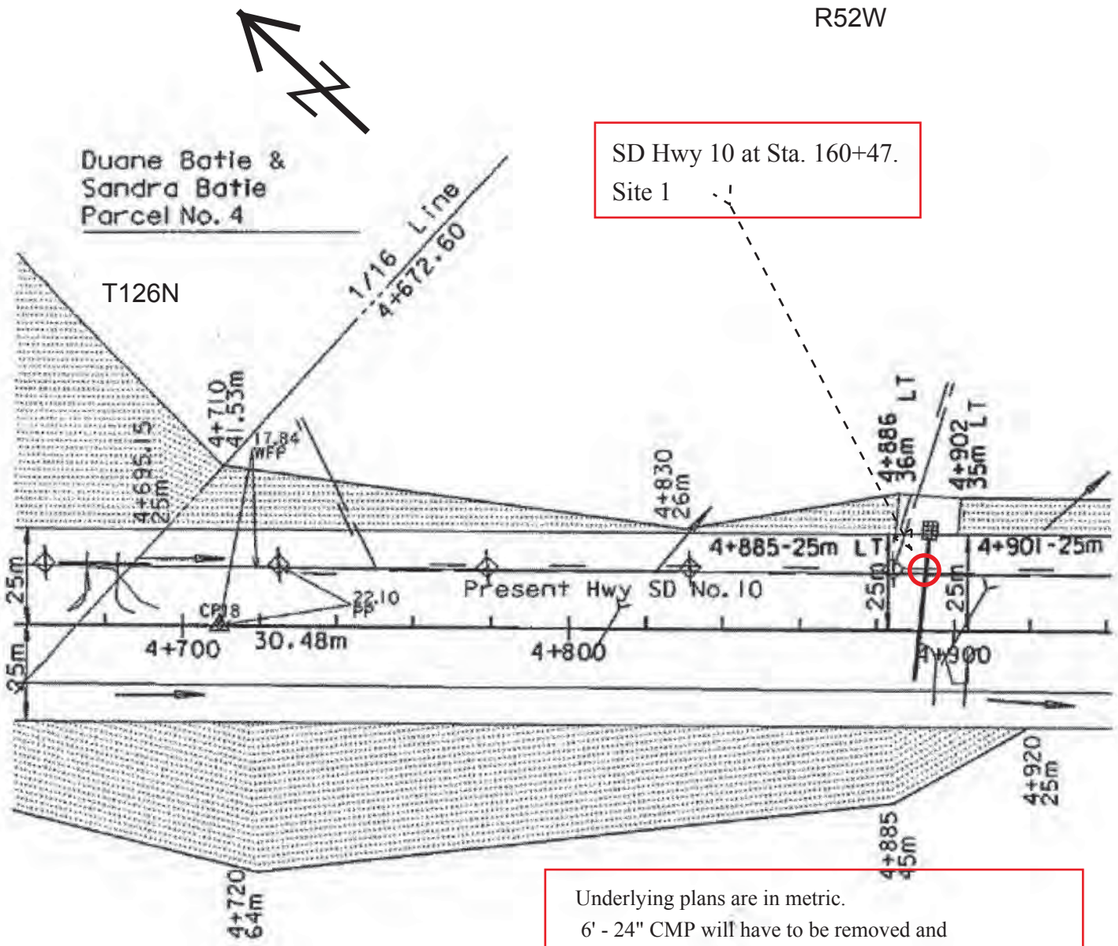
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	010-172, 029S-172	12	21

R52W

Duane Batie &
Sandra Batie
Parcel No. 4

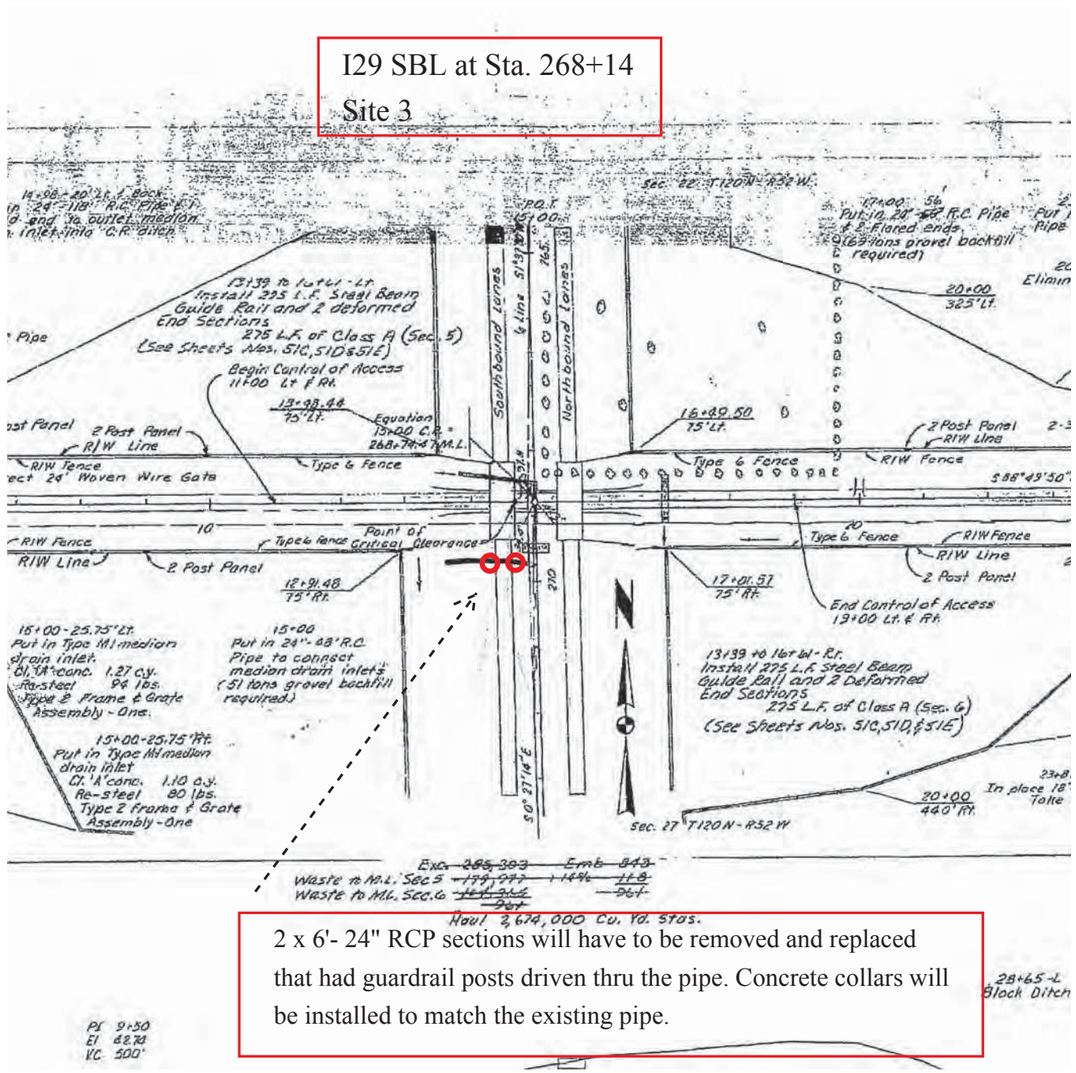
T126N

SD Hwy 10 at Sta. 160+47.
Site 1



Underlying plans are in metric.
6' - 24" CMP will have to be removed and replaced at the damaged area. Banding the new pipe to the existing pipe is what is expected to limit the amount of area that is disturbed.

I29 SBL at Sta. 268+14
Site 3



2 x 6'- 24" RCP sections will have to be removed and replaced that had guardrail posts driven thru the pipe. Concrete collars will be installed to match the existing pipe.

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	010-172, 029S-172	13	21

Site 2 - SD Hwy 10

Sec. 25 - T126N - R52W

Section Line

66'

Sec. 30 - T126N - R51W

Sta. 354+24 - Site 2

2 - 30" RCP Sections separated at the outlet of this pipe. These 2 - 4' sections will need to be reset and tied back into the main pipe. The outlet will need riprap installed along the south side and end. Exact extent of riprap to be determined in the field. Clearing will be required to access the location.

Exact location of the tree removal will be determined in the field.

30" RCP

82'

Present SD Hwy 10

Present SD Hwy 10

82'

Clearing Limits

Rip Rap Limits

Lot A property limits

Lot 2
Vellenga
Addn

33'

Section Line

33'

66'

OH

OH

OH

OH

OH

Section Line

Lot 2
Waletich
Addn

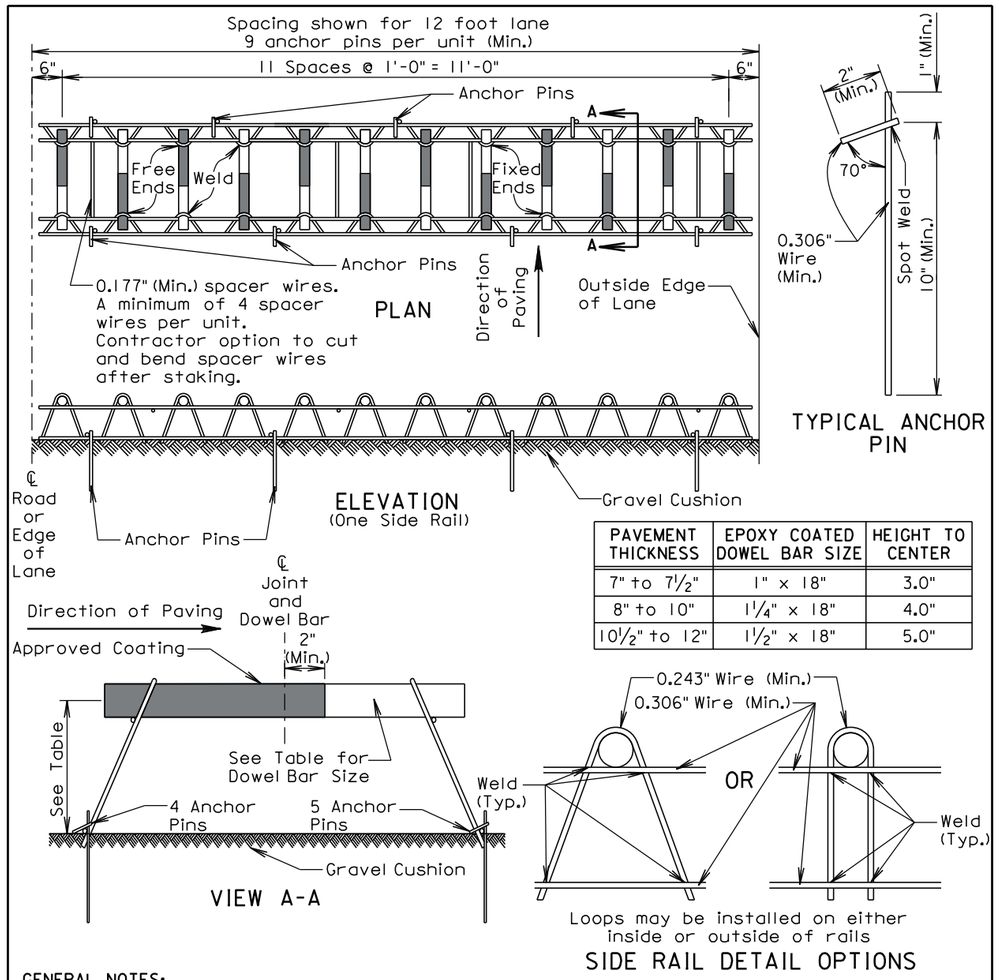
Section Line

Heath's
Outlet

Sec. 36 - T126N - R52W

Sec. 31 - T126N - R51W

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	010-172, 029S-172	14	21



PAVEMENT THICKNESS	EPOXY COATED DOWEL BAR SIZE	HEIGHT TO CENTER
7" to 7½"	1" x 18"	3.0"
8" to 10"	1¼" x 18"	4.0"
10½" to 12"	1½" x 18"	5.0"

GENERAL NOTES:

Longitudinal joint tie bars shall be placed a minimum of 15 inches from the transverse contraction joint.

Centerline of individual dowel bars shall be parallel to top of subgrade ±1/8 inch in 18 inches and to all other dowel bars in the assembly ±1/16 inch in 18 inches.

Centerline of individual dowel bars shall be parallel to the centerline of the roadway ±1/2 inch in 18 inches.

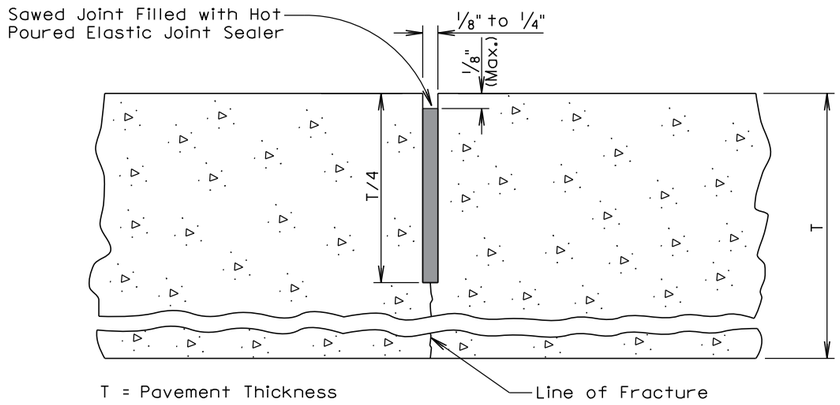
The transverse contraction joints shall be sawed perpendicular to the centerline of the roadway and the dowel bars shall be centered on the sawed joint ±1 inch.

Supporting devices as shown on this sheet, or equivalent as approved by the Engineer, shall be used to maintain proper horizontal and vertical alignment of the dowel bars.

August 30, 2013

Published Date: 1st Qtr. 2016	SDDOT	**PCC PAVEMENT DOWEL BAR ASSEMBLY FOR TRANSVERSE CONTRACTION JOINTS 12 Bar Assembly on Granular Base Material**	PLATE NUMBER 380.01
			Sheet 1 of 1

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	010-172, 029S-172	15	21



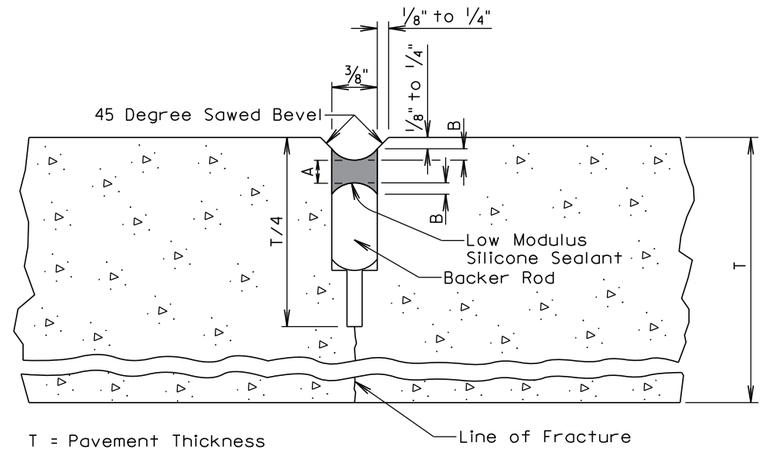
GENERAL NOTES:

If an early entrance sawcut does not develop the full transverse crack, then the saw cut to control cracking shall be a minimum of 1/4 the thickness of the pavement.

All hot poured elastic joint sealer material spilled on the surface of the concrete pavement shall be removed as soon as the material has cooled. The extent of removal of material shall be to the satisfaction of the Engineer. All costs for removal of the spilled joint sealer material shall be borne by the Contractor.

June 26, 2015

Published Date: 1st Qtr. 2016	SDDOT	PCC PAVEMENT TRANSVERSE CONTRACTION JOINT WITH OR WITHOUT DOWEL BAR ASSEMBLY	PLATE NUMBER 380.05
			Sheet 1 of 1



LOW MODULUS SILICONE SEALANT ALLOWABLE CONSTRUCTION TOLERANCES			
A (Min.) (In.)	A (Max.) (In.)	B (Min.) (In.)	B (Max.) (In.)
3/16	5/16	1/8	1/4

GENERAL NOTES:

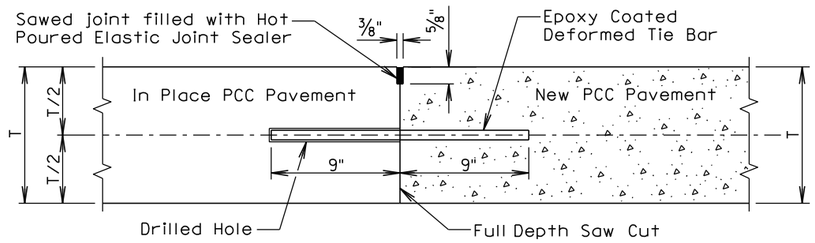
The first saw cut to control cracking shall be a minimum of 1/4 the thickness of the pavement. Additional sawing for widening the saw cut to provide the width for the installation of the low modulus silicone joint sealant will be necessary.

The backer rod shall be a nonmoisture absorbing resilient material approximately 25% larger in diameter than the width of the joint to be sealed.

June 26, 2013

Published Date: 1st Qtr. 2016	SDDOT	PCC PAVEMENT BEVELED TRANSVERSE CONTRACTION JOINT WITH OR WITHOUT DOWEL BAR ASSEMBLY	PLATE NUMBER 380.06
			Sheet 1 of 1

DETAIL A
TRANSVERSE CONSTRUCTION JOINT WITH TIE BARS



T = In Place PCC Pavement and New PCC Pavement Thickness

GENERAL NOTES:

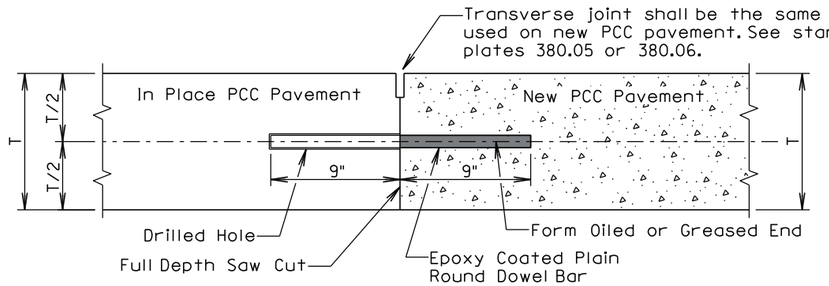
The term "In Place PCC Pavement" in the above drawing indicates that the in place PCC pavement was placed on a previous project.

See sheet 2 of 2 of this standard plate to determine if Detail A shall be used.

The tie bars shall be embedded a minimum depth of 9 inches into the in place PCC pavement and anchored with an epoxy resin adhesive.

No. 9 epoxy coated deformed tie bars shall be used in 10 inch thickness and less PCC Pavement and No. 11 epoxy coated deformed tie bars shall be used in 10.5 inch thickness and greater PCC Pavement. The tie bar spacing shall be 18 inches center to center and shall be a minimum of 3 inches and a maximum of 9 inches from the pavement edges.

DETAIL B
TRANSVERSE CONSTRUCTION JOINT WITH DOWEL BARS



T = In Place PCC Pavement and New PCC Pavement Thickness

GENERAL NOTES:

The term "In Place PCC Pavement" in the above drawing indicates that the in place PCC pavement was placed on a previous project or current project.

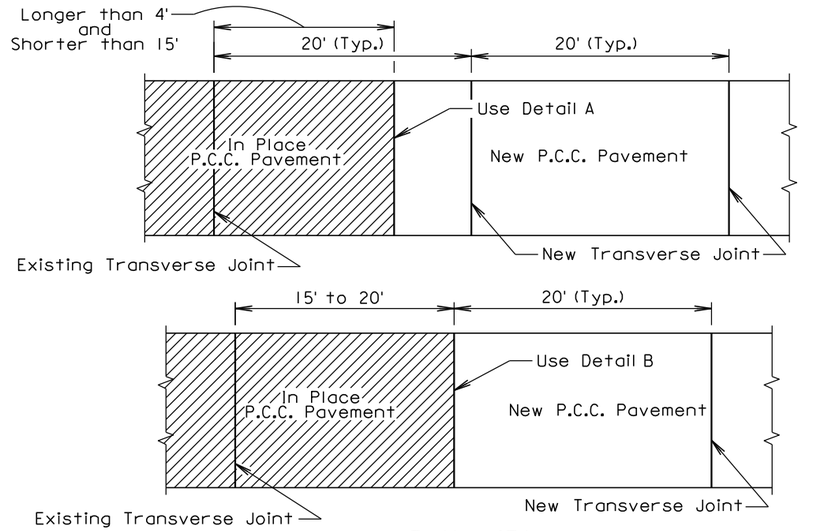
See sheet 2 of 2 of this standard plate to determine if Detail B shall be used.

The plain round dowel bars shall be embedded a minimum depth of 9 inches into the in place PCC pavement and anchored with an epoxy resin adhesive.

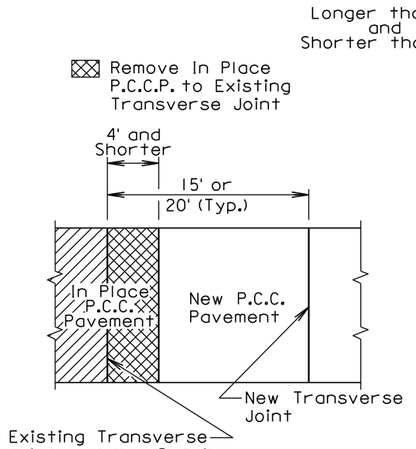
The epoxy coated plain round dowel bar size, number, and spacing shall be the same as detailed on the corresponding dowel bar assembly standard plate (380.01, 380.02, 380.03, or 380.04). The epoxy coated plain round dowel bars shall be a minimum of 3 inches and a maximum of 6 inches from the pavement edges.

September 6, 2013

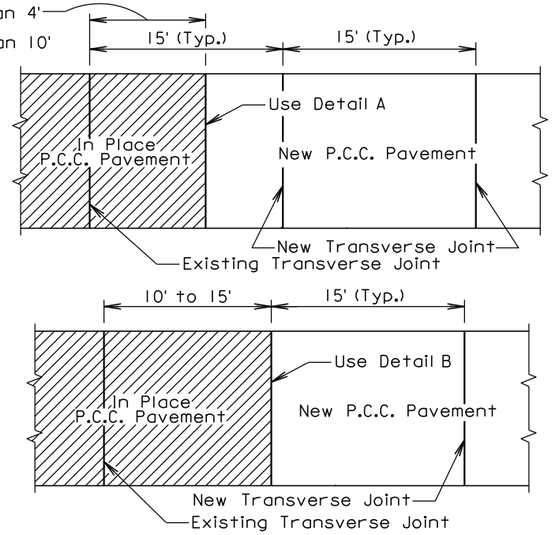
Published Date: 1st Qtr. 2016	SDDOT	PCC PAVEMENT TRANSVERSE CONSTRUCTION JOINTS WITH TIE BARS OR DOWEL BARS	PLATE NUMBER 380.08
			Sheet 1 of 2



PLAN VIEW
(For typical transverse joint spacing of 20' on the current project)



PLAN VIEW
(For typical transverse joint spacing of 15' or 20' on the current project)



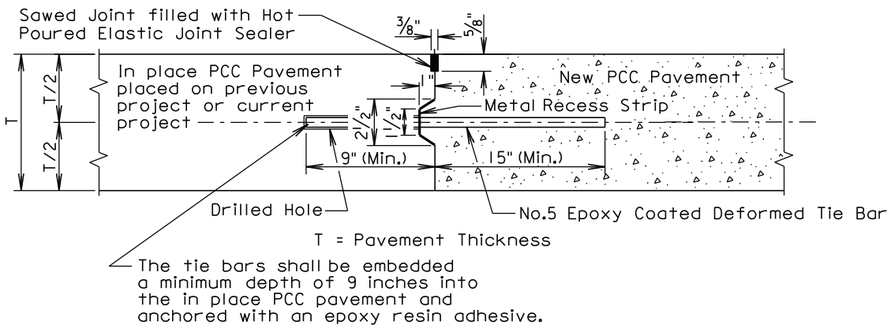
PLAN VIEW
(For typical transverse joint spacing of 15' on the current project)

September 6, 2013

Published Date: 1st Qtr. 2016	SDDOT	PCC PAVEMENT TRANSVERSE CONSTRUCTION JOINTS WITH TIE BARS OR DOWEL BARS	PLATE NUMBER 380.08
			Sheet 2 of 2

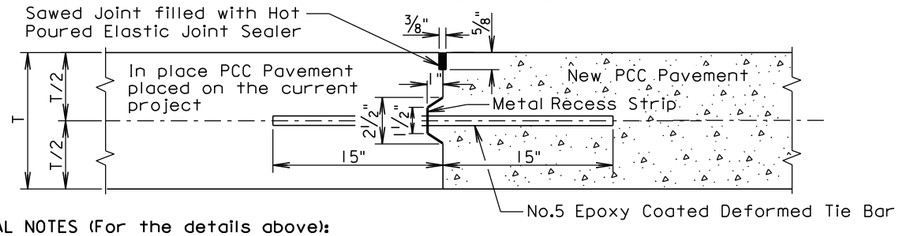
LONGITUDINAL CONSTRUCTION JOINT WITH TIE BARS

(DRILLED IN BARS)



LONGITUDINAL CONSTRUCTION JOINT WITH TIE BARS

(INSERTED OR FORMED IN BARS)



GENERAL NOTES (For the details above):

The epoxy coated deformed tie bars shall be spaced in accordance with the following tables:

Tie Bar Spacing 48" Maximum	
Transverse Contraction Joint Spacing	Number of Tie Bars
6.5' to 10'	2
10.5' to 14'	3
14.5' to 18'	4
18.5' to 22'	5

Tie Bar Spacing 30" Maximum	
Transverse Contraction Joint Spacing	Number of Tie Bars
5' to 7'	2
7.5' to 9.5'	3
10' to 12'	4
12.5' to 14.5'	5
15' to 17'	6
17.5' to 19.5'	7
20' to 22'	8

The tie bars shall be placed a minimum of 15 inches from transverse contraction joints.

The required number of tie bars as shown in the table shall be uniformly spaced within each panel. The uniformly spaced tie bars shall be spaced a maximum of 48 inches center to center for a female keyway and shall be spaced a maximum of 30 inches center to center for a vertical face and male keyway. The maximum tie bar spacing shall apply to tie bars within each panel.

The keyway illustrated in the above details depict a female keyway.

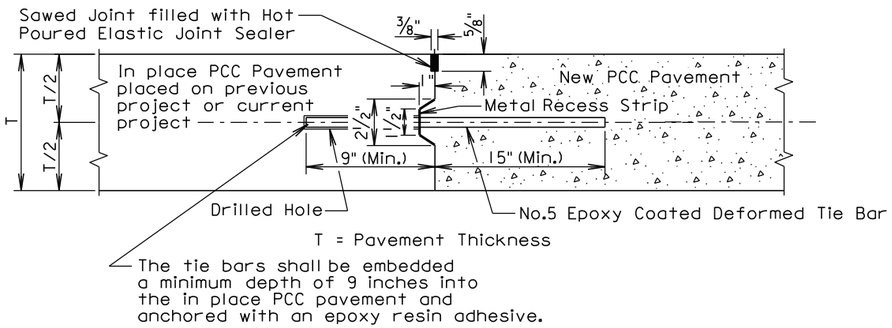
The keyway is optional and is not required. When concrete pavement is formed and a keyway is provided, a metal recess strip shall be used. When concrete pavement is slip formed, a metal recess strip is not required.

August 31, 2013

Published Date: 1st Qtr. 2016	SDDOT	***PCC PAVEMENT LONGITUDINAL JOINTS WITH TIE BARS***	***PLATE NUMBER 380.10***
			Sheet 1 of 2

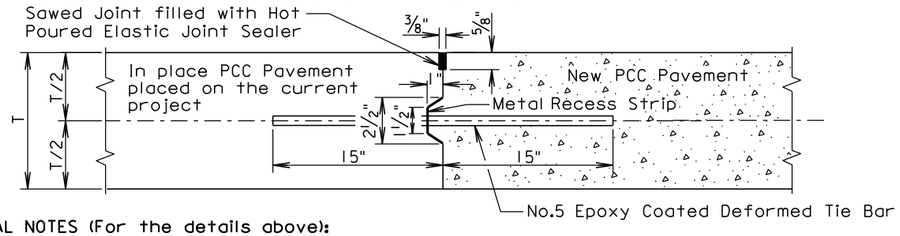
LONGITUDINAL CONSTRUCTION JOINT WITH TIE BARS

(DRILLED IN BARS)



LONGITUDINAL CONSTRUCTION JOINT WITH TIE BARS

(INSERTED OR FORMED IN BARS)



GENERAL NOTES (For the details above):

The epoxy coated deformed tie bars shall be spaced in accordance with the following tables:

Tie Bar Spacing 48" Maximum	
Transverse Contraction Joint Spacing	Number of Tie Bars
6.5' to 10'	2
10.5' to 14'	3
14.5' to 18'	4
18.5' to 22'	5

Tie Bar Spacing 30" Maximum	
Transverse Contraction Joint Spacing	Number of Tie Bars
5' to 7'	2
7.5' to 9.5'	3
10' to 12'	4
12.5' to 14.5'	5
15' to 17'	6
17.5' to 19.5'	7
20' to 22'	8

The tie bars shall be placed a minimum of 15 inches from transverse contraction joints.

The required number of tie bars as shown in the table shall be uniformly spaced within each panel. The uniformly spaced tie bars shall be spaced a maximum of 48 inches center to center for a female keyway and shall be spaced a maximum of 30 inches center to center for a vertical face and male keyway. The maximum tie bar spacing shall apply to tie bars within each panel.

The keyway illustrated in the above details depict a female keyway.

The keyway is optional and is not required. When concrete pavement is formed and a keyway is provided, a metal recess strip shall be used. When concrete pavement is slip formed, a metal recess strip is not required.

August 31, 2013

Published Date: 1st Qtr. 2016

SDDOT

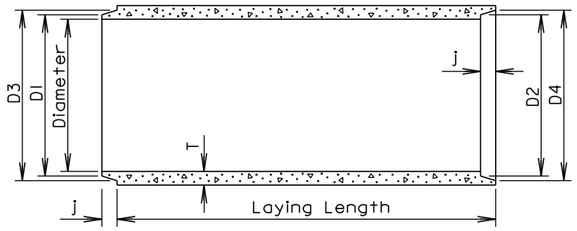
PCC PAVEMENT LONGITUDINAL JOINTS WITH TIE BARS

PLATE NUMBER 380.10

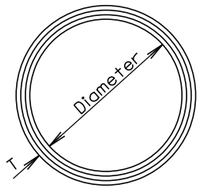
Sheet 1 of 2

TOLERANCES IN DIMENSIONS

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



LONGITUDINAL SECTION



END VIEW

GENERAL NOTES:

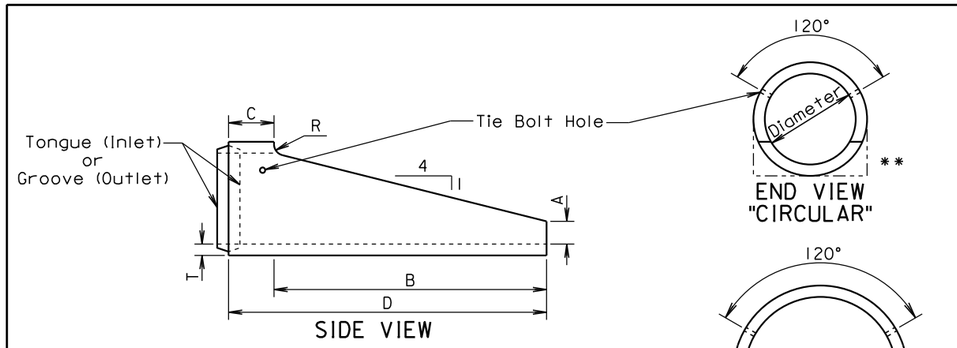
Construction of R. C. P. shall conform to the requirements of Section 990 of the Specifications.

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

Diam. (in.)	Approx. Wt. /Ft. (lb.)	T (in.)	J (in.)	D1 (in.)	D2 (in.)	D3 (in.)	D4 (in.)
12	92	2	1 3/4	13 1/4	13 5/8	13 7/8	14 1/4
15	127	2 1/4	2	16 1/2	16 7/8	17 1/4	17 5/8
18	168	2 1/2	2 1/4	19 5/8	20	20 3/8	20 3/4
21	214	2 3/4	2 1/2	22 7/8	23 1/4	23 3/4	24 1/8
24	265	3	2 3/4	26	26 3/8	27	27 3/8
27	322	3 1/4	3	29 1/4	29 5/8	30 1/4	30 5/8
30	384	3 1/2	3 1/4	32 3/8	32 3/4	33 1/2	33 7/8
36	524	4	3 3/4	38 3/4	39 1/4	40	40 1/2
42	685	4 1/2	4	45 1/8	45 5/8	46 1/2	47
48	867	5	4 1/2	51 1/2	52	53	53 1/2
54	1070	5 1/2	4 1/2	57 7/8	58 3/8	59 3/8	59 7/8
60	1296	6	5	64 1/4	64 3/4	66	66 1/2
66	1542	6 1/2	5 1/2	70 5/8	71 1/8	72 1/2	73
72	1810	7	6	77	77 1/2	79	79 1/2
78	2098	7 1/2	6 1/2	83 3/8	83 7/8	85 5/8	86 1/8
84	2410	8	7	89 3/4	90 1/4	92 1/8	92 5/8
90	2740	8 1/2	7	95 3/4	96 1/4	98 1/8	98 5/8
96	2950	9	7	102 1/8	102 5/8	104 1/2	105
102	3075	9 1/2	7 1/2	109	109 1/2	111 1/2	112
108	3870	10	7 1/2	115 1/2	116	118	118 1/2

June 26, 2015

Published Date: 1st Qtr. 2016	SDDOT	REINFORCED CONCRETE PIPE	PLATE NUMBER 450.01
			Sheet 1 of 1



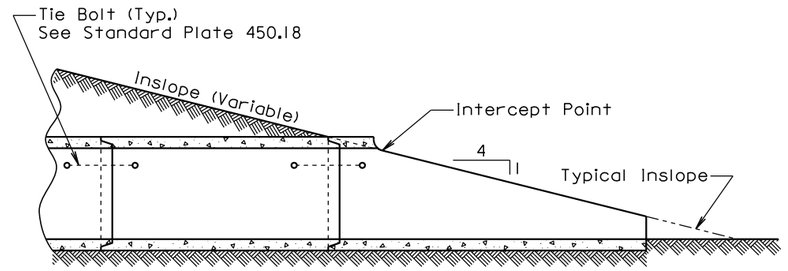
Dia. (in.)	T (in.)	A (in.)	B (in.)	C (in.)	D (in.)	R (in.)
FOR CIRCULAR PIPE						
24	3	6	72	12	84	3
30	3 1/2	7 1/2	90	12	102	3 1/2
FOR ARCH PIPE						
* 24	3	6	48	12	60	3
* 30	3 1/2	7 1/2	60	12	72	3 1/2
* 36	4 1/2	8 5/8	66	30	96	0
* 42	4 1/2	10	77 1/4	18 3/4	96	0

ALTERNATE

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

* Equivalent Diameter of Circular R.C.P.

** Acceptable Flat Bottom Alternate.



SECTION
(Along Centerline of Pipe)

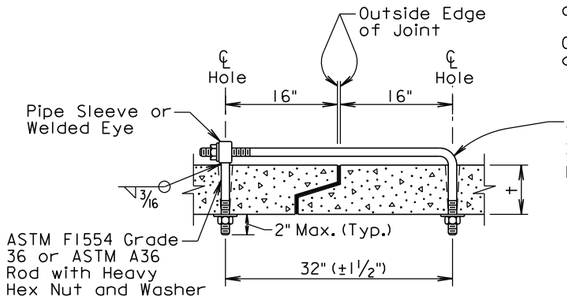
GENERAL NOTE:

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

September 22, 2006

Published Date: 1st Qtr. 2016	SDDOT	R. C. P. SLOPED ENDS	PLATE NUMBER 450.13
			Sheet 1 of 1

Wall "t" (in.)	Rod Dia. (in.)	Pipe Sleeve Dia. (nominal)
≤ 3 1/4	5/8	3/4
3 1/2-6 1/2	3/4	1
≥ 7	1	1 1/4



ADJUSTABLE EYE BOLT TIE

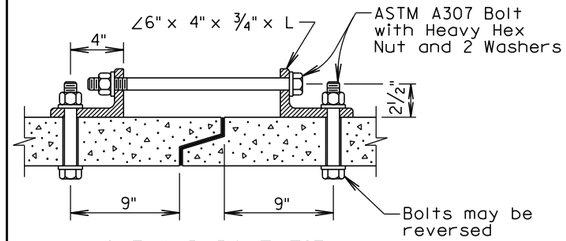
GENERAL NOTES:

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	3/4
> 48	6	1



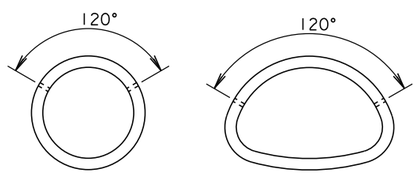
ANGLE AND BOLT TIE

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:

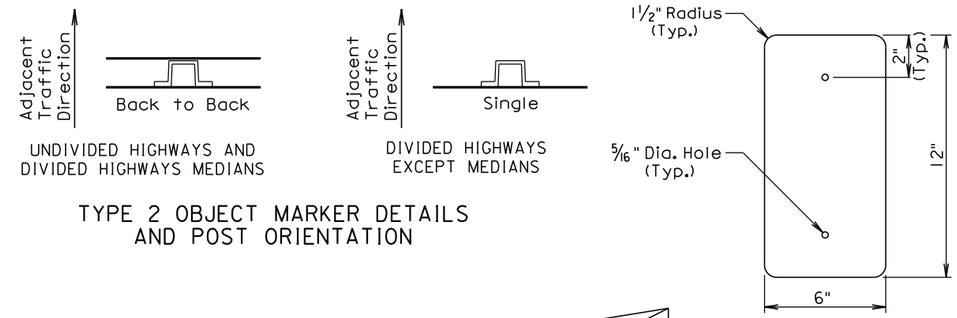
In lieu of the tie bolts detailed above other types of tie bolt connections may be installed as approved by the Office of Bridge Design.

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

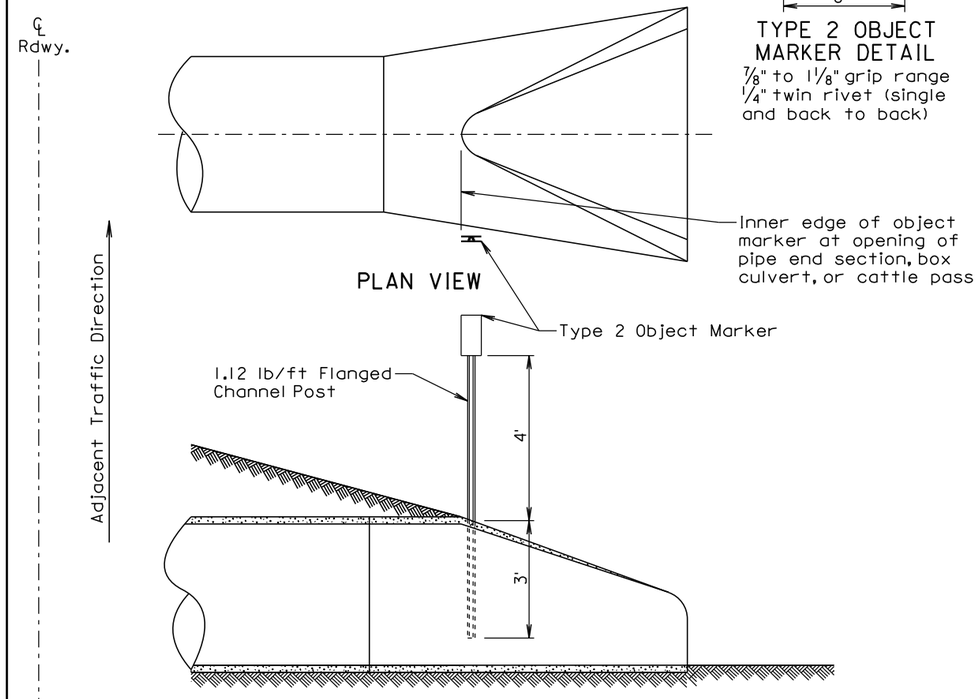
Published Date: 1st Qtr. 2016	SDDOT	TIE BOLTS FOR R.C.P. AND R.C.P. ARCH	PLATE NUMBER 450.18
			Sheet 1 of 1



TYPE 2 OBJECT MARKER DETAILS AND POST ORIENTATION

TYPE 2 OBJECT MARKER DETAIL

7/8" to 1 1/8" grip range
1/4" twin rivet (single and back to back)



ELEVATION

GENERAL NOTES:

The type 2 object markers and the 1.12 lb/ft flanged channel posts shall be in conformance with Specifications Section 982.2 J.

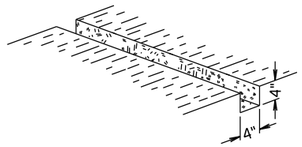
Payment for the type 2 object markers shall be in conformance with Specification Section 632.5 B.

June 26, 2015

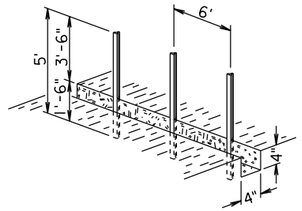
Published Date: 1st Qtr. 2016	SDDOT	TYPE 2 OBJECT MARKER INSTALLATION AT PIPE CULVERTS, BOX CULVERTS, AND CATTLE PASSES	PLATE NUMBER 632.10
			Sheet 1 of 1

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	010-172, 029S-172	20	21

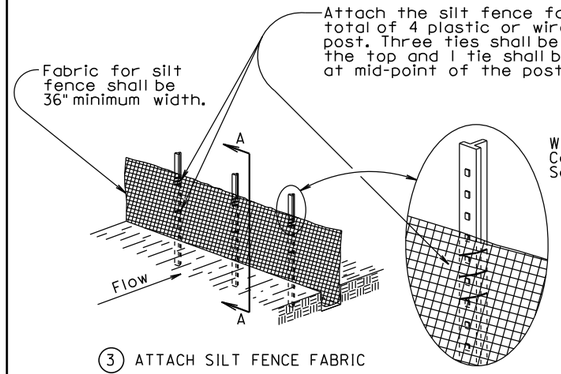
MANUAL HIGH FLOW SILT FENCE INSTALLATION



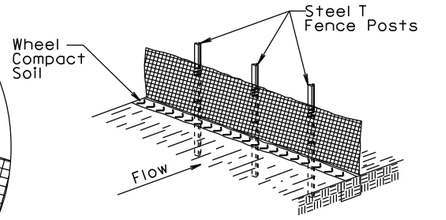
(1) EXCAVATE TRENCH



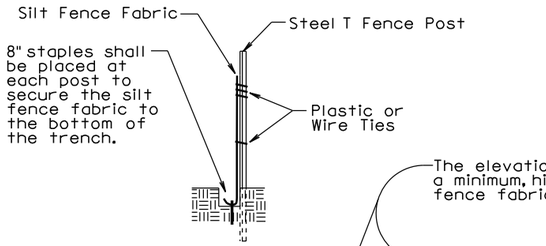
(2) DRIVE STEEL T FENCE POSTS



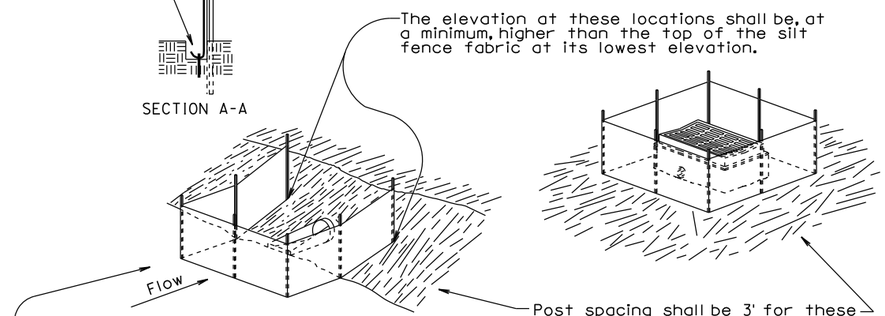
(3) ATTACH SILT FENCE FABRIC



(4) BACKFILL TRENCH AND WHEEL COMPACT SOIL



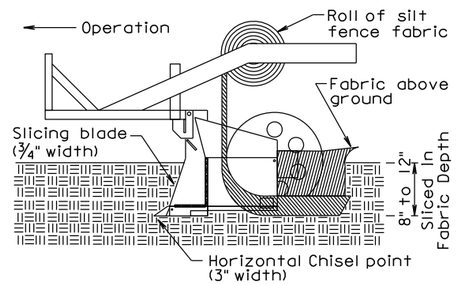
SECTION A-A



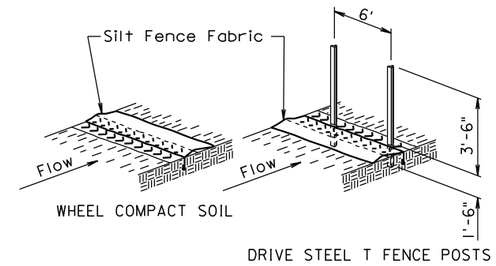
December 23, 2003

Published Date: 1st Qtr. 2016	SDDOT	HIGH FLOW SILT FENCE	PLATE NUMBER 734.05
			Sheet 1 of 2

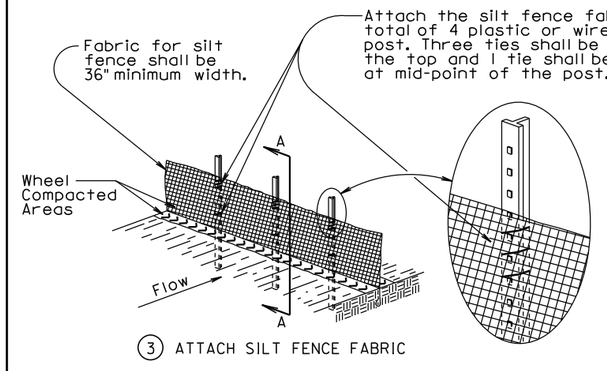
MACHINE SLICED HIGH FLOW SILT FENCE INSTALLATION



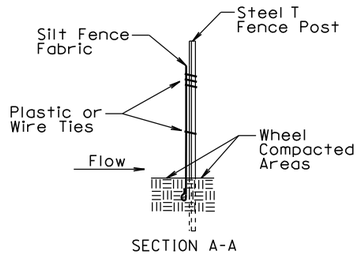
(1) INSTALL SILT FENCE FABRIC BY MACHINE SLICING METHOD.



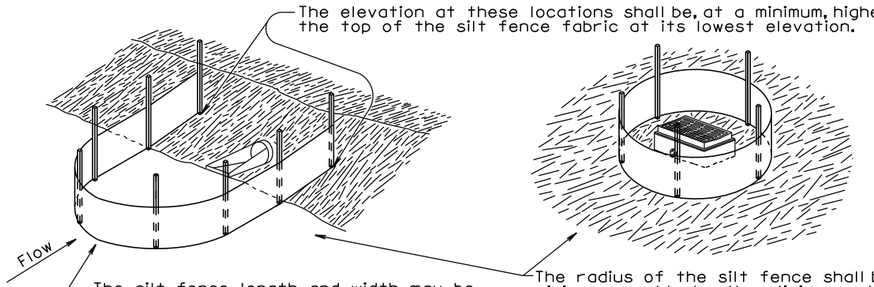
(2) WHEEL COMPACT SOIL ABOVE SLICED IN PORTION OF FABRIC AND THEN DRIVE STEEL T FENCE POSTS.



(3) ATTACH SILT FENCE FABRIC



SECTION A-A



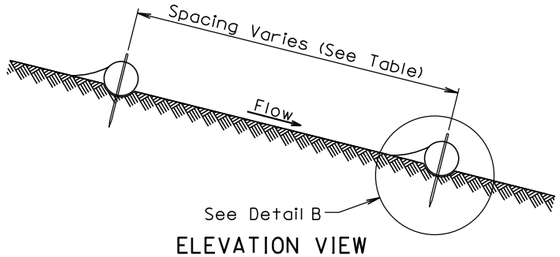
GENERAL NOTE:

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

December 23, 2003

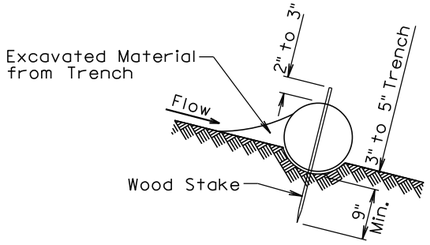
Published Date: 1st Qtr. 2016	SDDOT	HIGH FLOW SILT FENCE	PLATE NUMBER 734.05
			Sheet 2 of 2

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	010-172, 029S-172	21	21

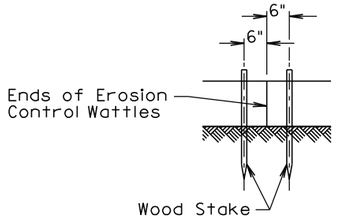


ELEVATION VIEW
CUT OR FILL SLOPE INSTALLATION

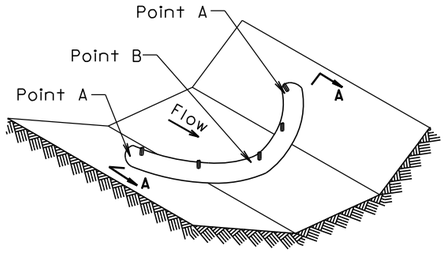
CUT OR FILL SLOPE INSTALLATION	
Slope	Spacing (Ft)
1:1	10
2:1	20
3:1	30
4:1	40



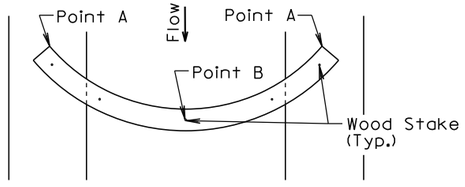
DETAIL B
(TYPICAL OF ALL INSTALLATIONS)



DETAIL C

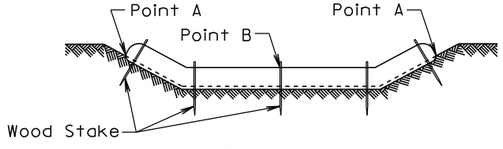


ISOMETRIC VIEW
DITCH INSTALLATION



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: 1st Qtr. 2016	SDDOT	EROSION CONTROL WATTLE	PLATE NUMBER 734.06
			Sheet 1 of 2

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: 1st Qtr. 2016	SDDOT	EROSION CONTROL WATTLE	PLATE NUMBER 734.06
			Sheet 2 of 2