

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	010-172, 029S-172, 123-172	1	25

STATE OF SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION

PLANS FOR PROPOSED

PROJECTS 010-172, 029 S-172, 123-172

**S.D. HIGHWAY 10
INTERSTATE 29 SBL
S.D. HIGHWAY 123**

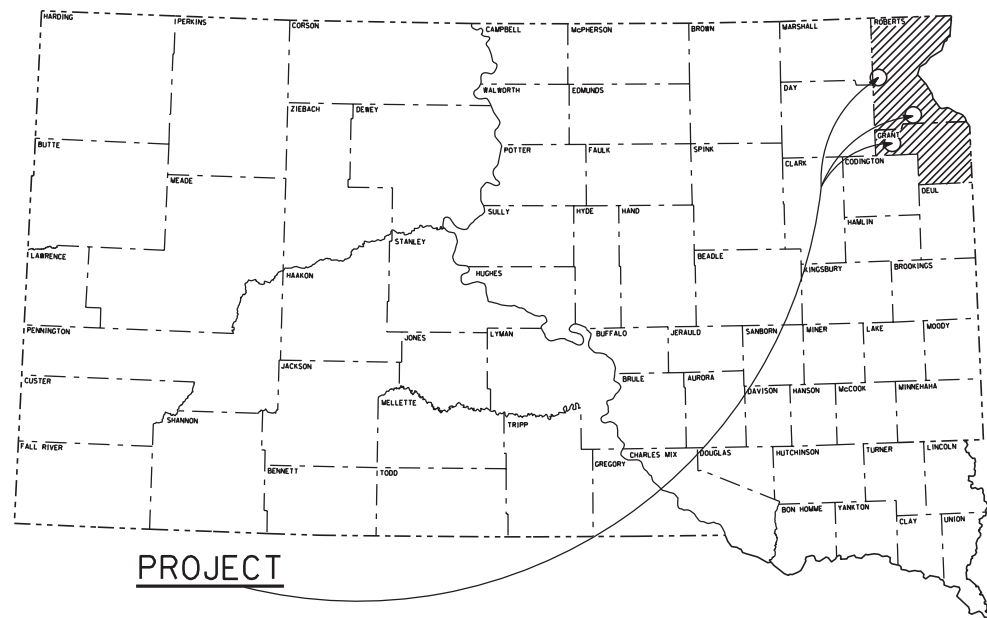
GRANT AND ROBERTS COUNTIES

CULVERT REPAIR AND REPLACEMENT

PCN I3P6, I3P7, I3P8

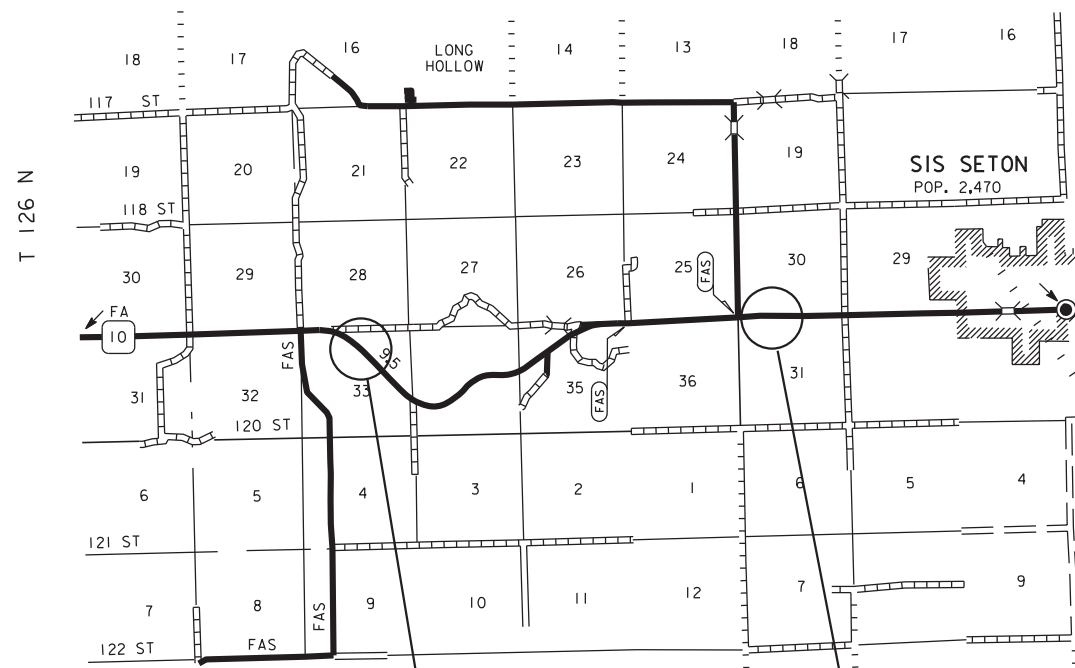
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PROJECT

R 52 W



DESIGN DESIGNATION

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

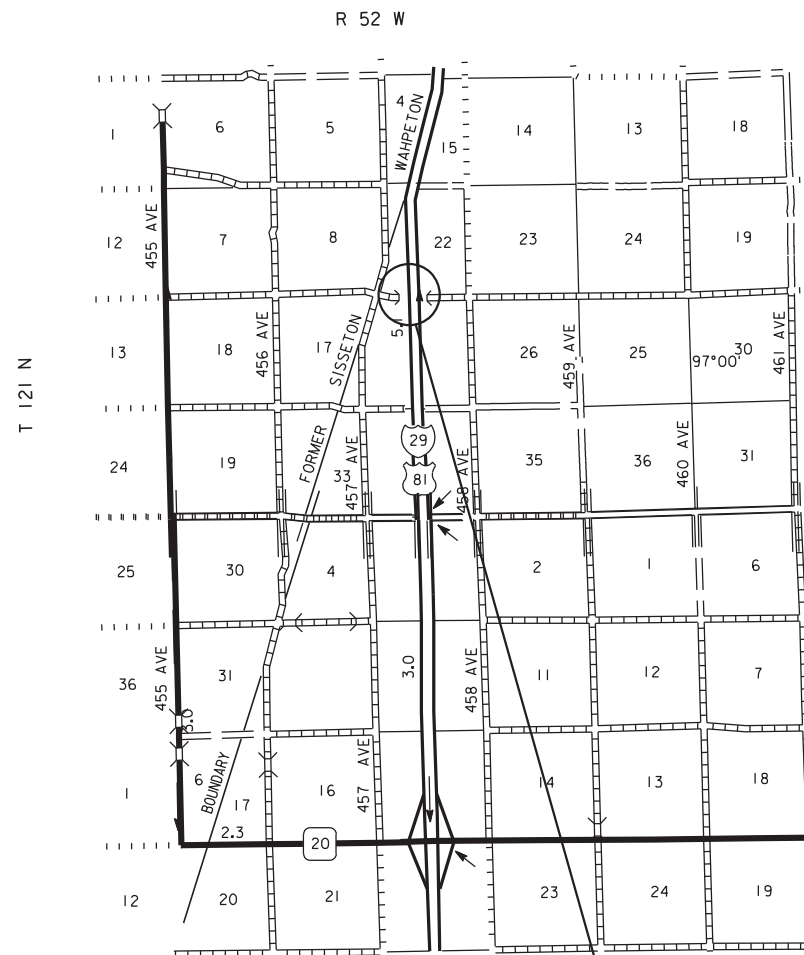
STORM WATER PERMIT
NONE REQUIRED

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

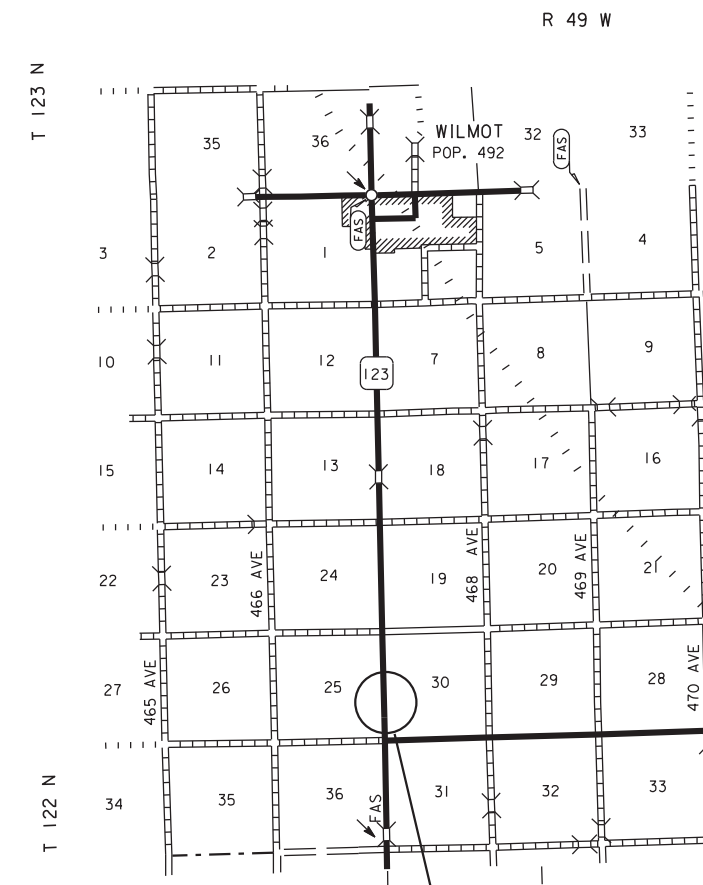


DESIGN DESIGNATION

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



DESIGN DESIGNATION

ADT (2014)	275
ADT (2024)	290
DHV	31.9
D	51.0%
T DHV	5.1%
T*ADT	11.2%
V	70mph

Site 4

123-172
PCN I3P8
Sta. 244+48
MRM 179.00
30" RCP

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	-----



ESTIMATE OF QUANTITIES AND ENVIRONMENTAL COMMITMENTS

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
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010-172 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	14	Ft
110E7500	Remove Pipe for Reset	8	Ft
230E0020	Placing 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	Hour
634E0100	Traffic Control	476	Unit
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	100	Ft

029S-172 I3P7

Bid Item Number	Item	Quantity	Unit
009E0010	Mobilization	Lump Sum	LS
110E0500	Remove Pipe Culvert	12	Ft
230E0020	Placing 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	29	Each
450E0142	24" RCP Class 2, Furnish	12	Ft
450E0150	24" RCP, Install	12	Ft
450E8900	Cleanout Pipe Culvert	1	Each
634E0010	Flagging	20	Hour
634E0100	Traffic Control	754	Unit
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0420	Type C Advance Warning Arrow Panel	1	Each
734E0154	12" Diameter Erosion Control Wattle	50	Ft
734E0604	High Flow Silt Fence	100	Ft

123-172 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	15.0	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 and 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 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.

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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.

SUMMARY TABLE OF CULVERT WORK

ROUTE	Placing Contractor Furnished Topsoil (Cu Yd)	Remove Pipe (Ft)	Furnish and Install				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)	Pipe Culvert Undercut (CuYd)	Control Density Fill (CuYd)	Base Course (Ton)	Asphalt Concrete Composite (Ton)
			24" CMP (Ft)	24" RCP (Ft)	30" RCP (Ft)	30" RCP Sloped End (Each)											
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	-	4	-	-	-	20
SD123 Site 4	20	-	-	-	42	2	-	-	-	-	-	-	-	18	4.5	7.1	15
TOTAL	60	18	6	12	42	2	8	8	3	40	57.8	18	4.5	7.1	35

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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 15 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 16 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 15 of 21.

- **Site 4**

This site 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. Refer to Sheet 17 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.

SD123 will be closed between MRM 178.20 and MRM 179.20 to allow the installation of the culvert at Site 4.

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.

For the installation of the culvert sections on SD123 at MRM 179.00, traffic control shall be per Road Closure Layout (Sheet 9). 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. 7 calendar days of Road Closure will be allotted to complete this work.

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.

Storage of vehicles and equipment shall be as near the right-of-way line as possible. Contractor's employees should mobilize at a location off the right-of-way and arrive at the work sites in a minimum number of vehicles necessary to perform the work. Indiscriminate driving and parking of vehicles within the right-of-way will not be permitted. Any damage to the vegetation, surfacing, embankment, delineators and existing signs resulting from such indiscriminate use shall be repaired and/or restored by the Contractor, at no expense to the State, and to the satisfaction of the Engineer.

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

Traffic approaching the project from intersecting roadways, streets, and approaches must be adequately accommodated. Major intersections or large commercial entrances may require additional signing, flaggers, and channelizing devices on a temporary basis until work activities pass these areas.

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.

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.

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 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.

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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.

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/outlet 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.

PIPE CULVERT REPLACEMENT (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 HWY 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.

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CONTROLLED DENSITY FILL FOR PIPE (cont.)

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	9.8
Total		9.8

TABLE OF PIPE CULVERT REPLACEMENT 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	

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.

Epoxy resin adhesive shall be of the type intended for horizontal applications and shall conform to the requirements of ASTM C 881, Type IV, Grade 3 (equivalent to AASHTO M235, Type IV, Grade 3).

The diameter of the drilled holes in the existing concrete pavement for the steel bars shall not be less than 1/8 inch nor more than 3/8 inch greater than the overall diameter of the steel bar. Holes drilled into the existing concrete pavement shall be located at mid-depth of the slab and true and normal. The drilled holes shall be blown out with compressed air using a device that will reach to the back of the hole to ensure that all debris or loose material has been removed prior to epoxy injection.

Mix the epoxy resin as recommended by the manufacturer and apply by an injection method approved by the Engineer. If an epoxy pump is utilized, it shall be capable of metering the components at the manufacturers designated rate and be equipped with an automatic shut-off. The pump shall shut off when any of the components are not being metered at the designated rate. Fill the drilled holes from the back to the front 1/3 to 1/2 full of epoxy or as recommended by the manufacturer, prior to insertion of the steel bar. Care shall be taken to prevent epoxy from running out of the horizontal hole prior to steel bar insertion. Rotate the steel bar during installation to eliminate voids and ensure complete bonding of the bar. Insertion of the bars by the dipping method will not be allowed.

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.

All costs for the installation of steel bars shall be incidental to the contract unit price per each for INSERT STEEL BAR IN PCC PAVEMENT.

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	010-172, 029S-172, 123-172	8	25

ASPHALT CONCRETE COMPOSITE

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

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

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

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.

SEED ORIGINATION 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 1/4" to 1/2".

All seed broadcast must be raked or dragged in (incorporated) within the top 1/4" to 1/2" 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 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

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:

<i>Glomus intraradices</i>	25%
<i>Glomus aggregatu</i>	25%
<i>Glomus mosseae</i>	25%
<i>Glomus etunicatum</i>	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.

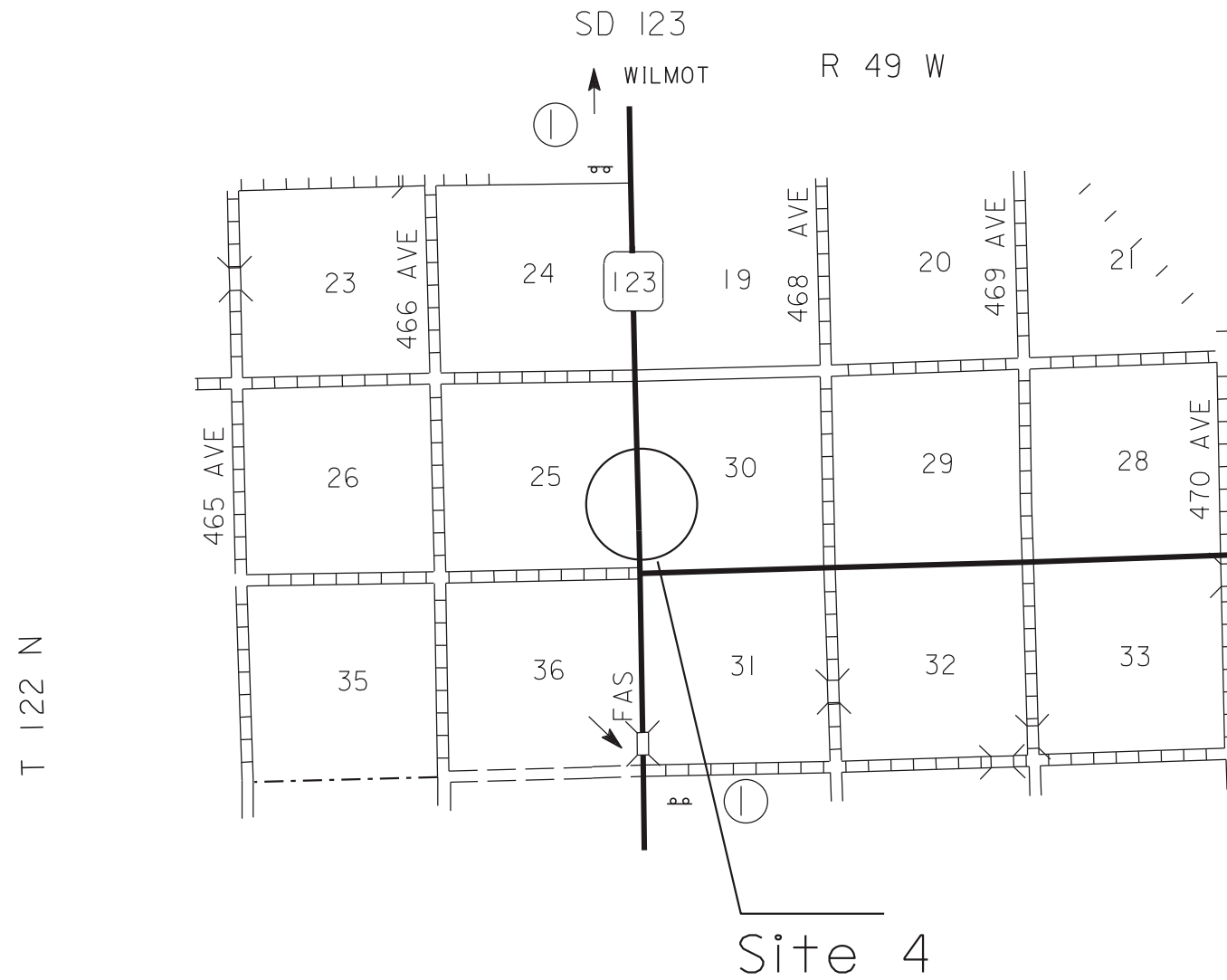
An additional quantity of 12" Diameter Erosion Control Wattles has been added to the Estimate of Quantities for temporary erosion and sediment control in highway ditch channels and as an alternative to low flow or high flow silt fence at wetland areas adjacent to the highway.

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, 123-172	9	25

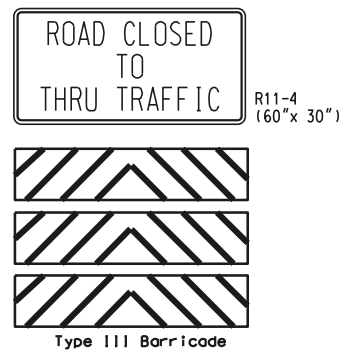
ROAD CLOSURE LAYOUT



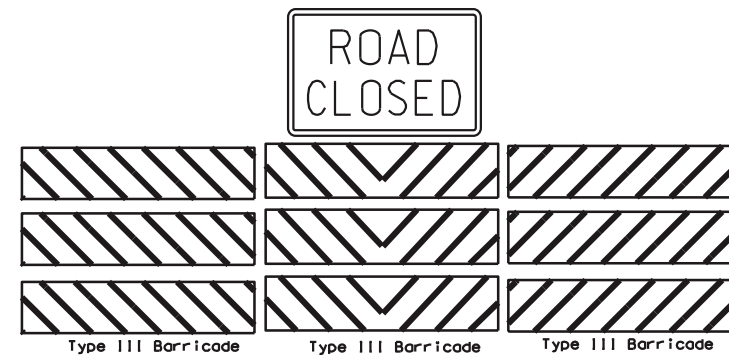
Road Closed Ahead 5 Miles Ahead signs shall be placed South of Wilmot and North of Hwy 12.



1

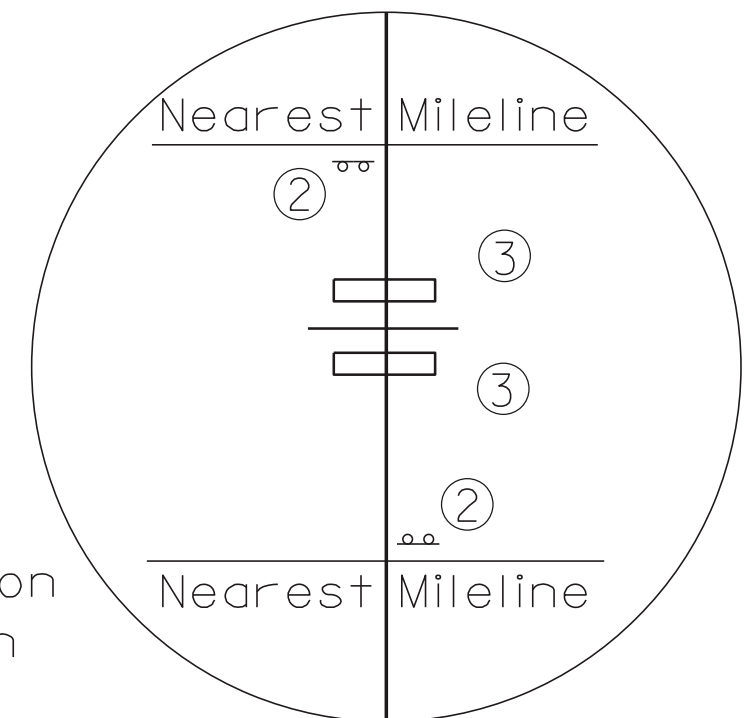


2



3

Pipe
Installation
Location



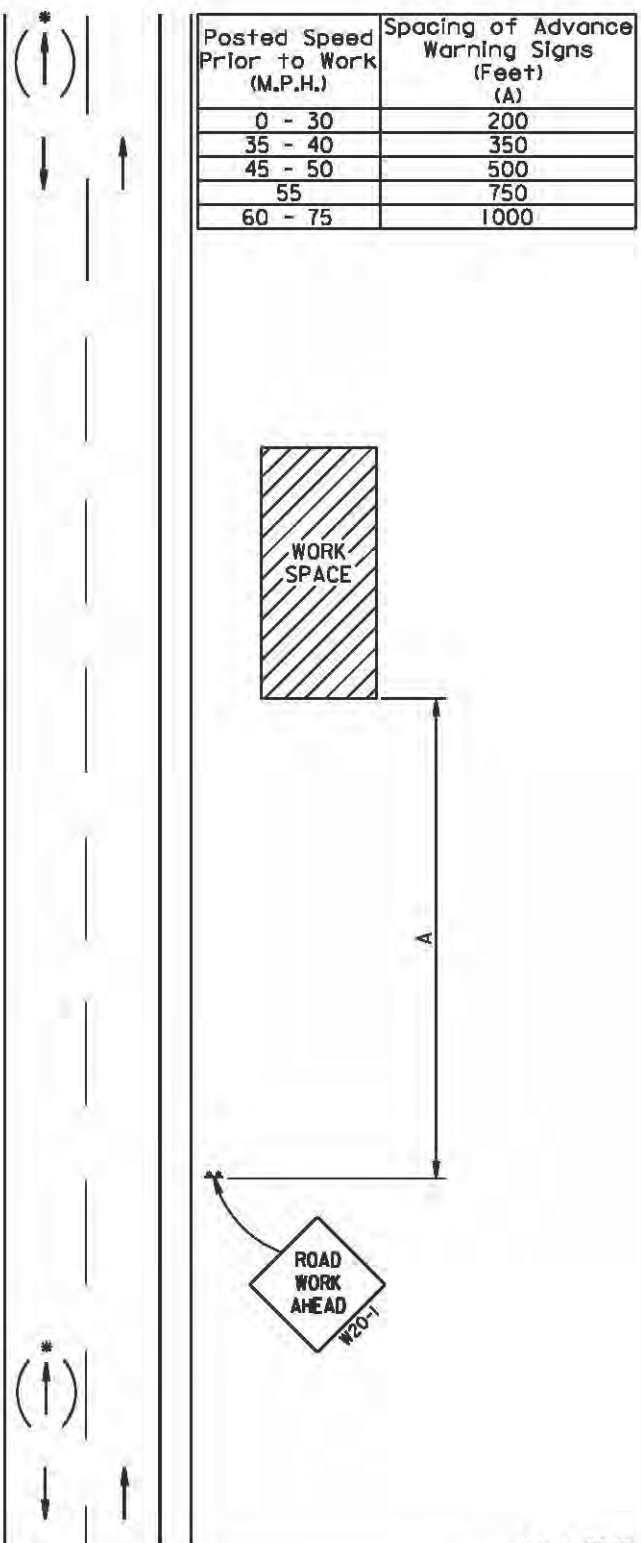
The signs illustrated are not required if the work space is behind a barrier, more than 2 feet behind the curb, or 15 feet or more from the edge of any roadway.

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.

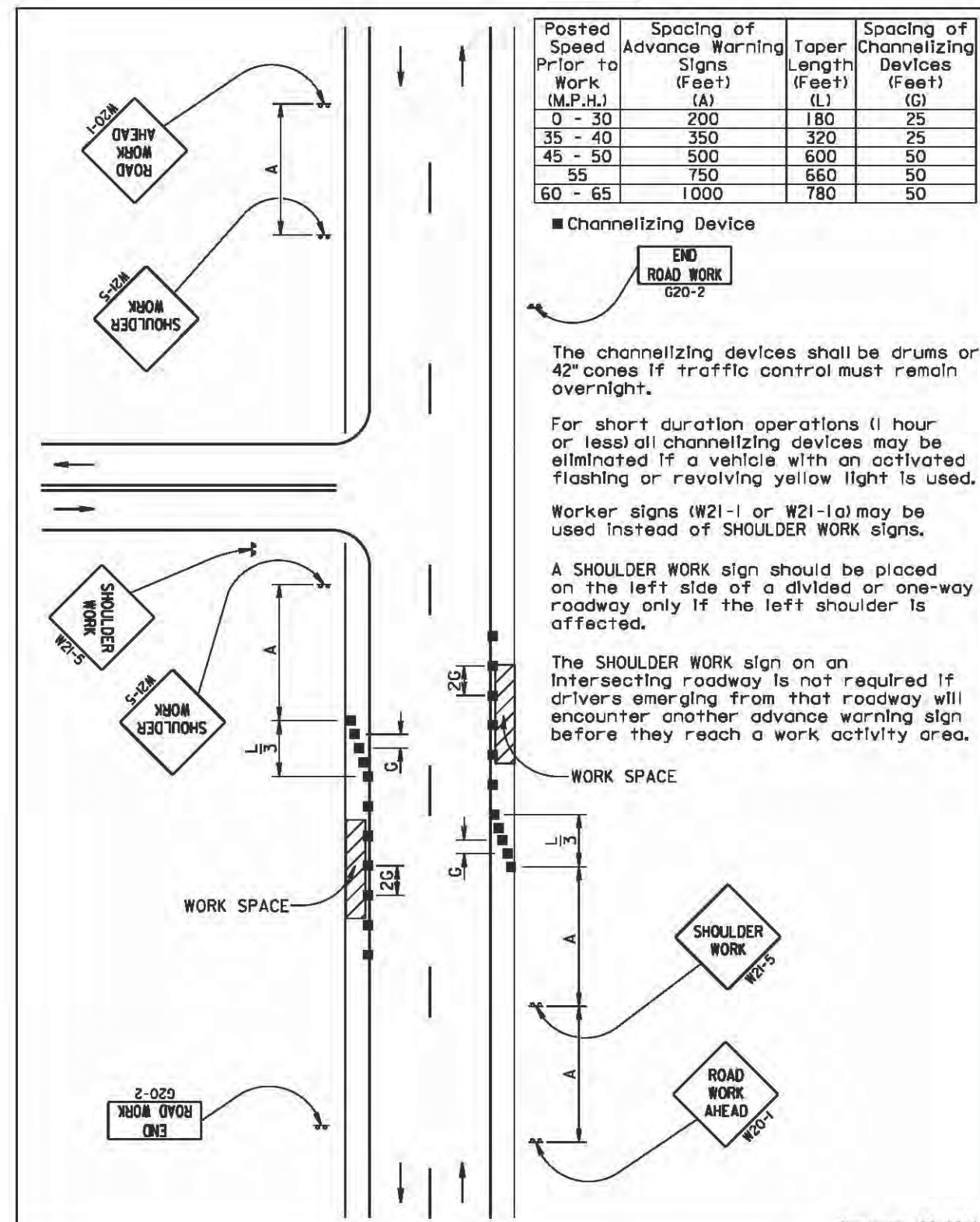
The ROAD WORK AHEAD sign may be replaced with other appropriate signs, such as the SHOULDER WORK sign. The SHOULDER WORK sign may be used for work adjacent to the shoulder.

* 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.



July 1, 2005



September 22, 2014

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

- Flagger
- Channelizing Device

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

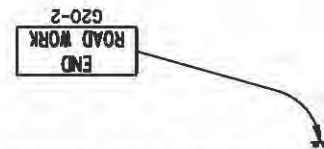
The ROAD WORK AHEAD and the END ROAD WORK signs may be omitted for short duration operations (1 hour or less).

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

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

The channelizing devices shall be drums or 42" cones.

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

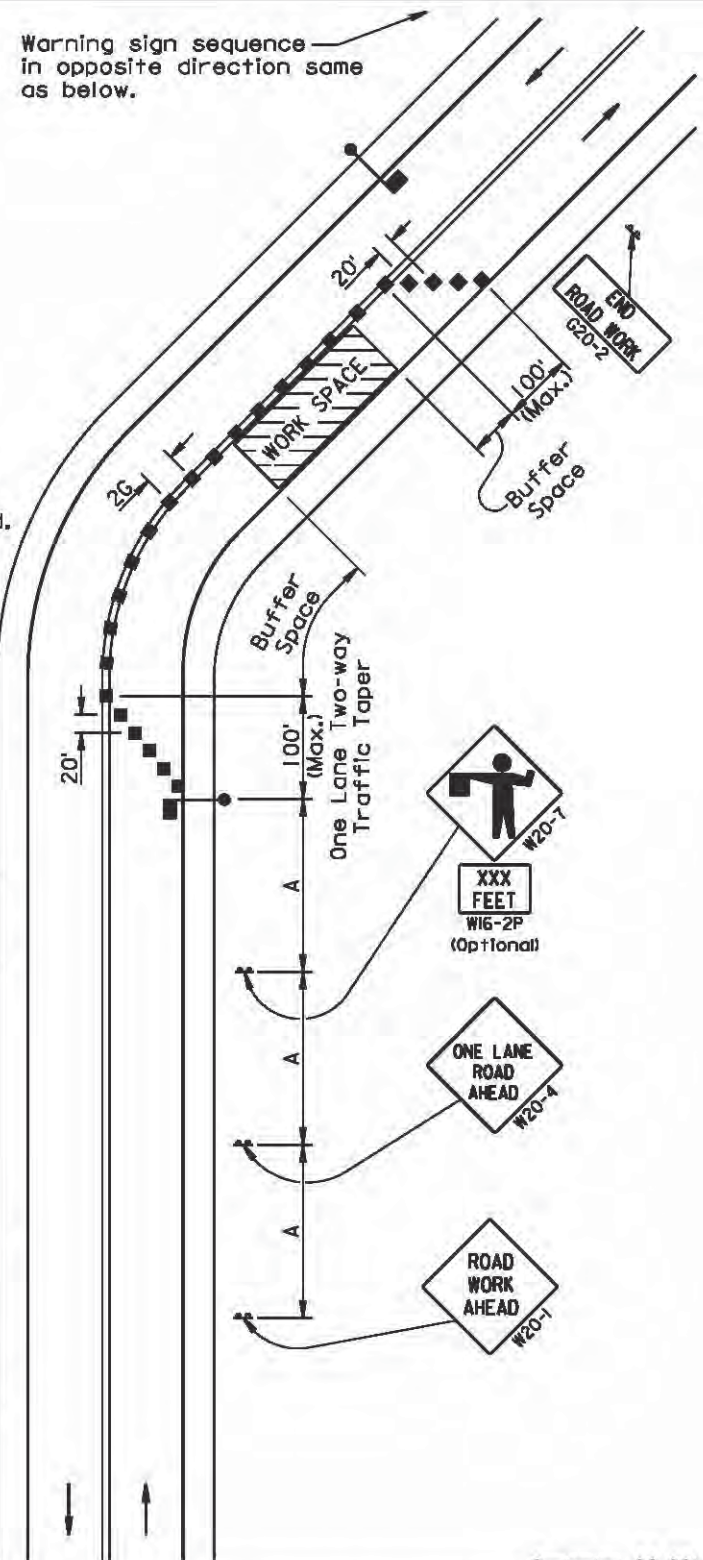


Channelizing devices and flaggers shall be used at intersecting roads to control intersecting road traffic as required.

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

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

Warning sign sequence in opposite direction same as below.



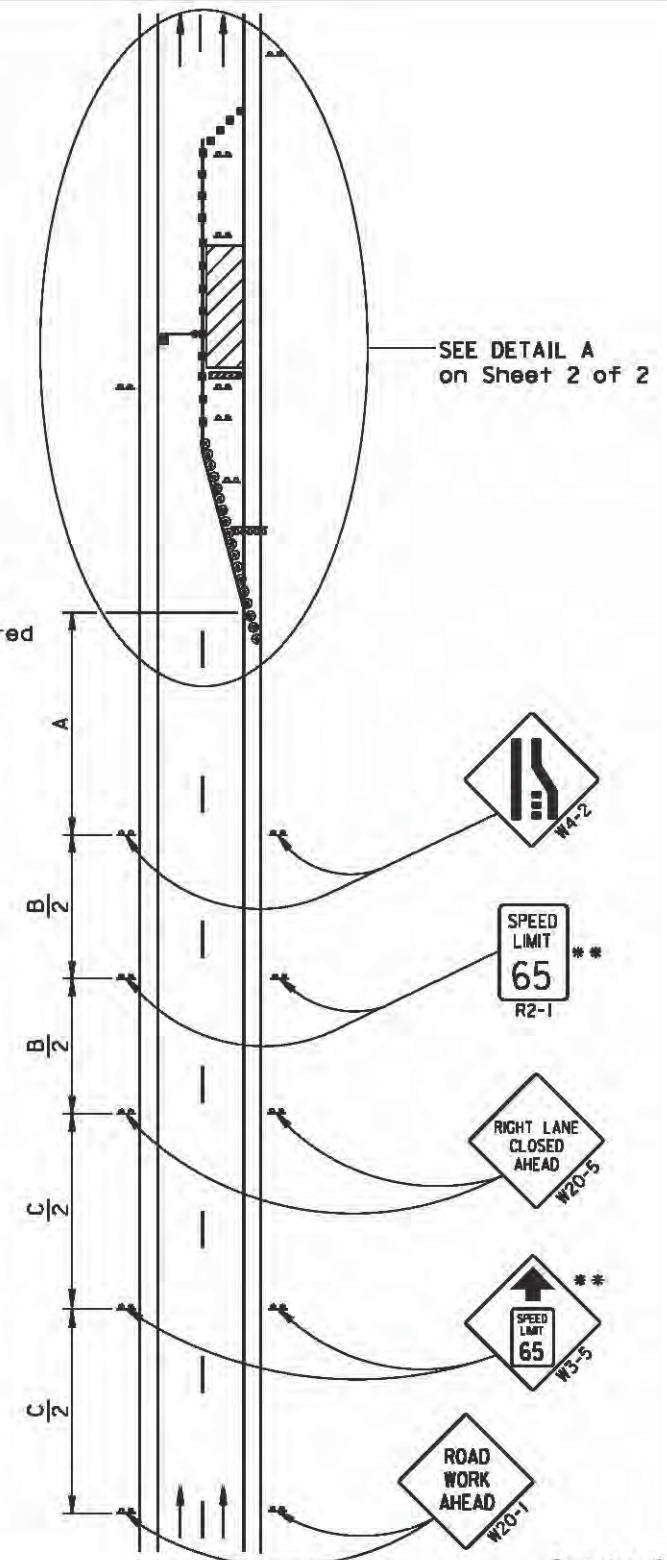
September 22, 2014

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 - 75	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.



December 16, 2014

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 - 75	50 *	900

* 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

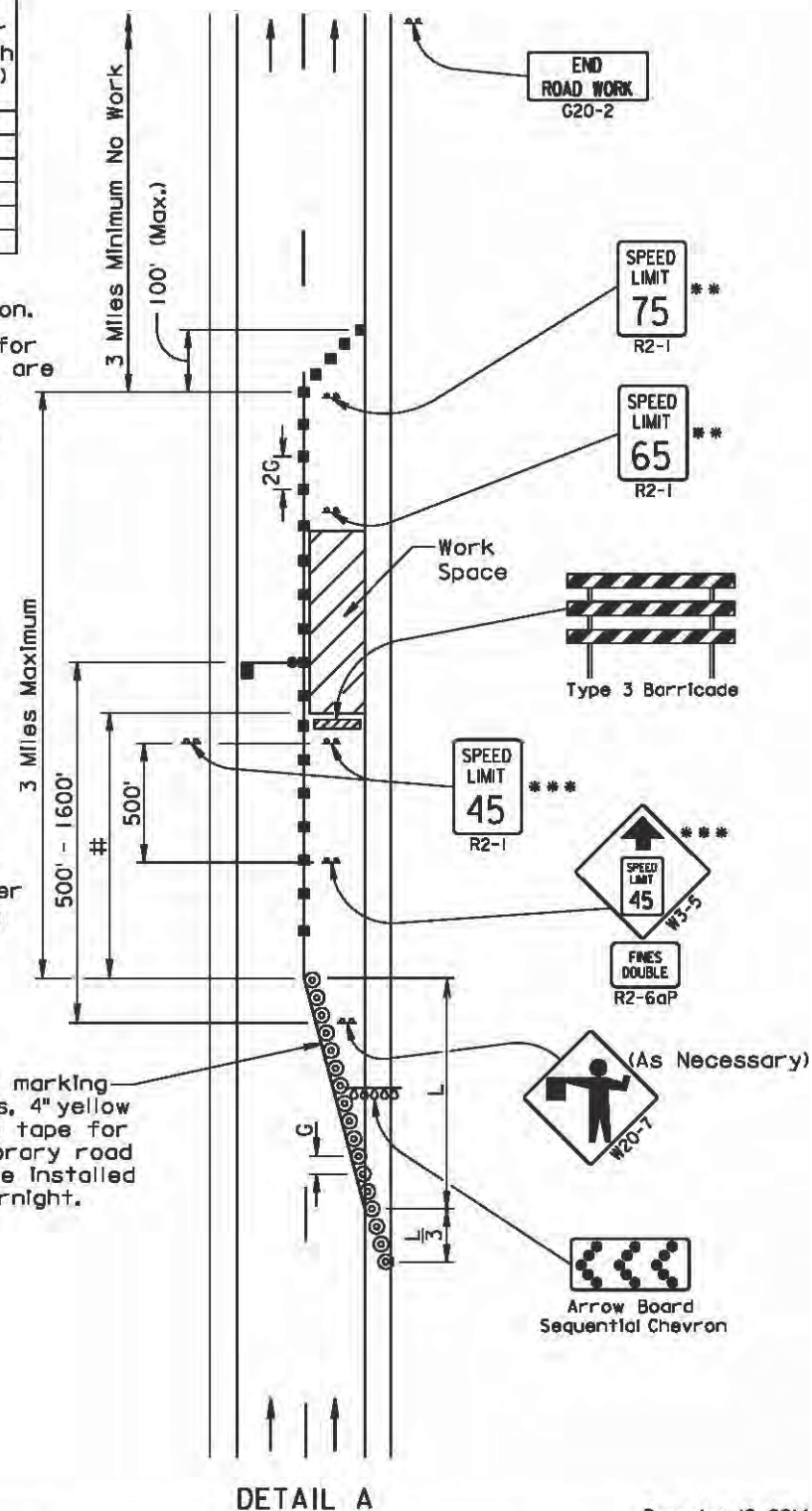
The Work Space shall be a minimum of 500' from the end of the taper.

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.

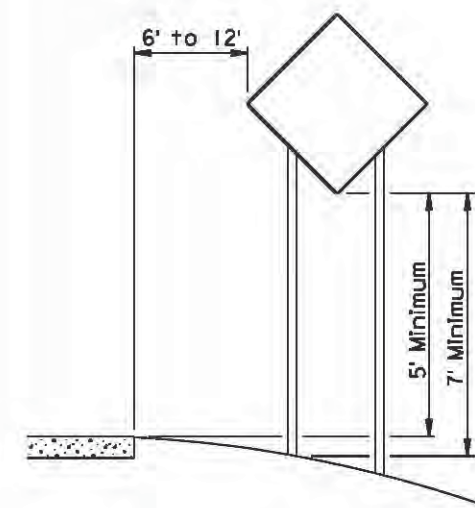


DETAIL A

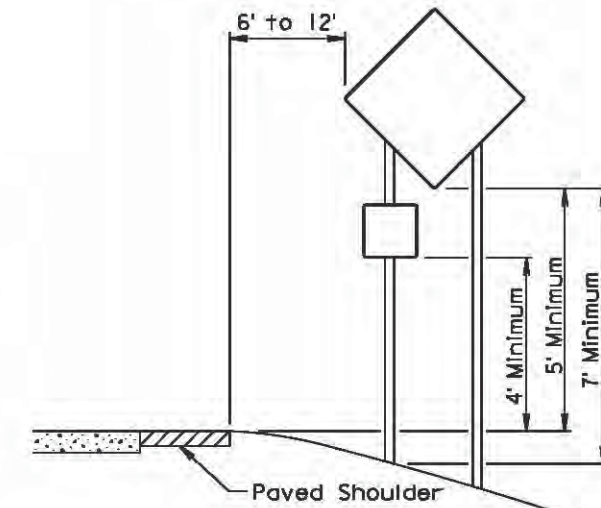
December 16, 2014

S D D O T	WORK ZONE SPEED REDUCTION FOR INTERSTATE AND HIGH SPEED MULTI-LANE HIGHWAYS	PLATE NUMBER 634.63
		Sheet 2 of 2

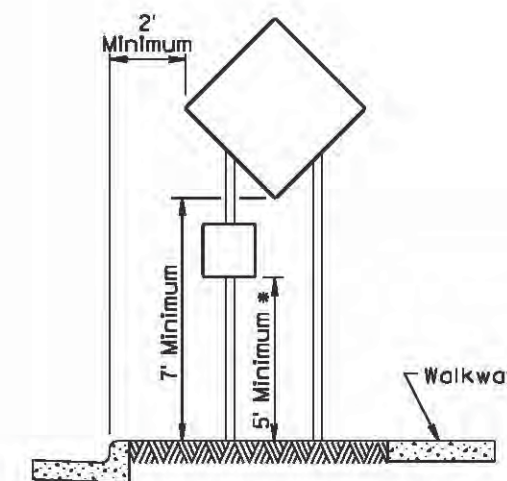
Published Date: 1st Qtr. 2015



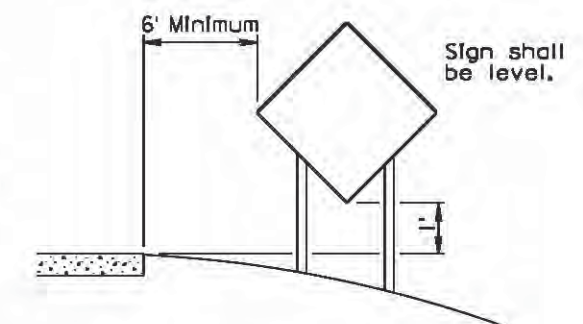
RURAL DISTRICT



RURAL DISTRICT WITH
SUPPLEMENTAL PLATE



URBAN DISTRICT



RURAL DISTRICT
3 DAY MAXIMUM

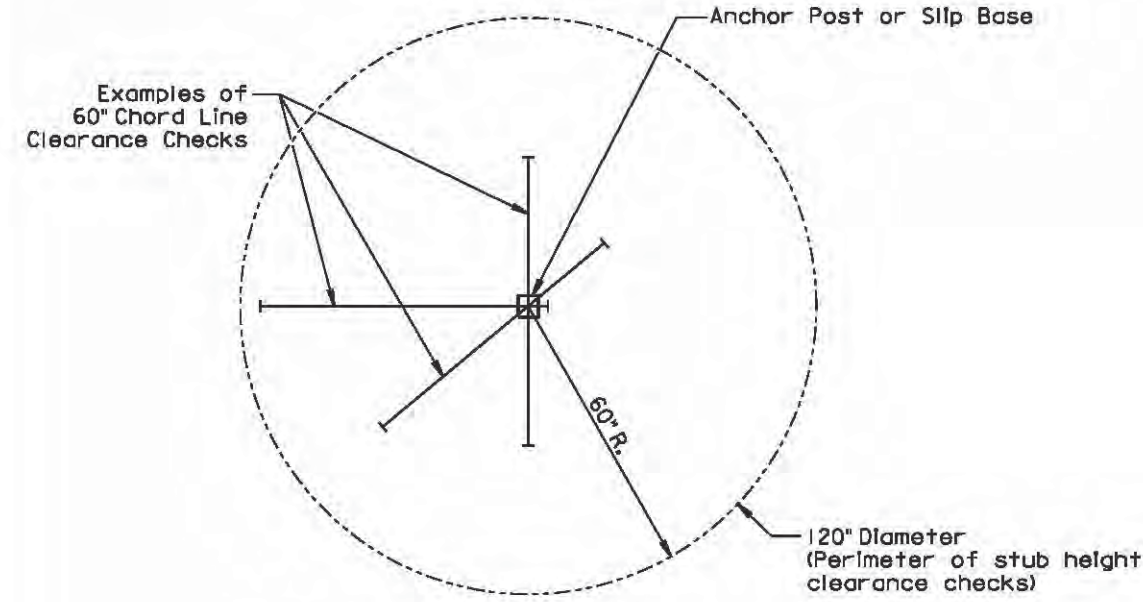
(Not applicable to regulatory signs)

* 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.

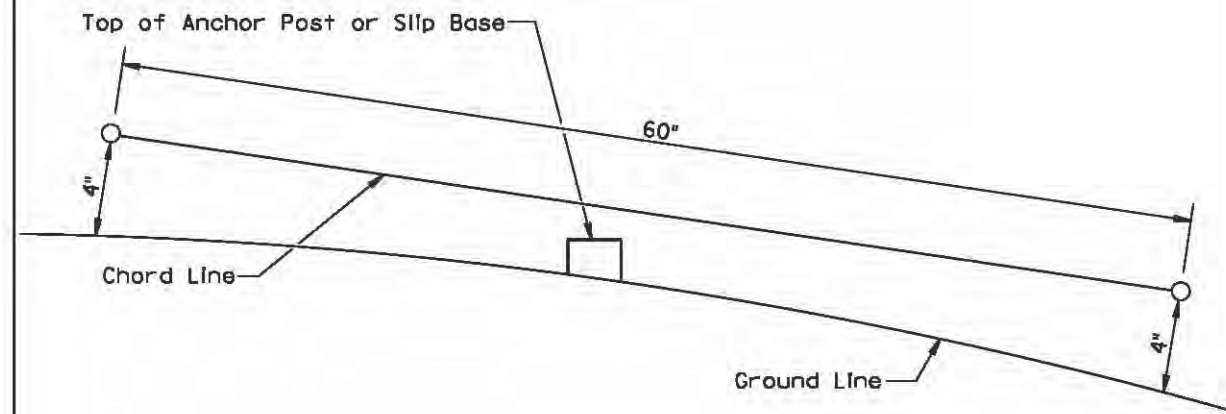
September 22, 2014

S D D O T	CRASHWORTHY SIGN SUPPORTS (Typical Construction Signing)	PLATE NUMBER 634.85
		Sheet 1 of 1

Published Date: 1st Qtr. 2015



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

<i>Published Date: 1st Qtr. 2015</i>	S D D O T	BREAKAWAY SUPPORT STUB CLEARANCE	PLATE NUMBER 634.99
			Sheet 1 of 1

ITEMIZED LIST FOR TRAFFIC CONTROL - 010-172 PCN I3P6

SIGN CODE	DESCRIPTION	CONVENTIONAL ROAD			
		NUMBER	SIGN SIZE	UNITS PER SIGN	UNITS
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	4	48" x 48"	34	136
G20-2	END ROAD WORK	4	36" x 18"	17	68
TOTAL UNITS					476

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

SIGN CODE	DESCRIPTION	EXPRESSWAY / INTERSTATE			
		NUMBER	SIGN SIZE	UNITS PER SIGN	UNITS
R2-1	SPEED LIMIT __	6	36" x 48"	29	174
R2-6aP	FINES DOUBLE (plaque)	2	36" x 24"	20	40
W3-5	SPEED REDUCTION AHEAD (__ MPH)	2	48" x 48"	34	68
W4-2	LEFT or RIGHT LANE ENDS (symbol)	4	48" x 48"	34	136
W20-1	ROAD WORK AHEAD	2	48" x 48"	34	68
W20-5	LEFT or RIGHT LANE CLOSED AHEAD	4	48" x 48"	34	136
W20-7	FLAGGER (symbol)	2	48" x 48"	34	68
G20-2	END ROAD WORK	1	48" x 24"	24	24
-	TYPE 3 BARRICADE - 8' single sided	1		40	40
TOTAL UNITS					754

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

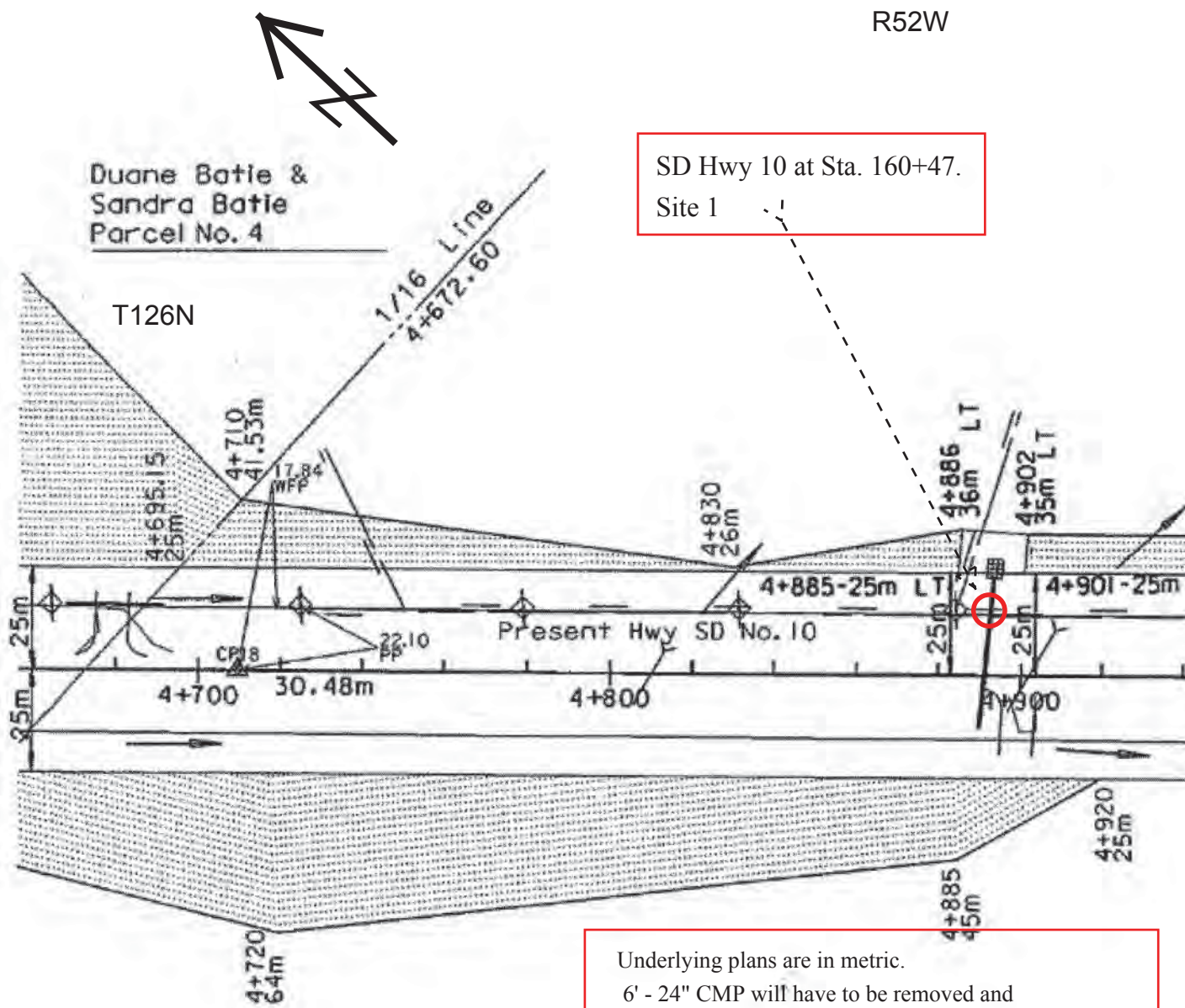
If a sign is required on a project and not listed in the above inventory, the units per sign will be determined as follows:

Signs 36" x 36" will be measured at 27 units each and signs 48" x 48" will be measured at 34 units each, otherwise:

If a sign measures less than 25" high and 25" wide the units per sign will be computed as sign size (sq ft) x 3.

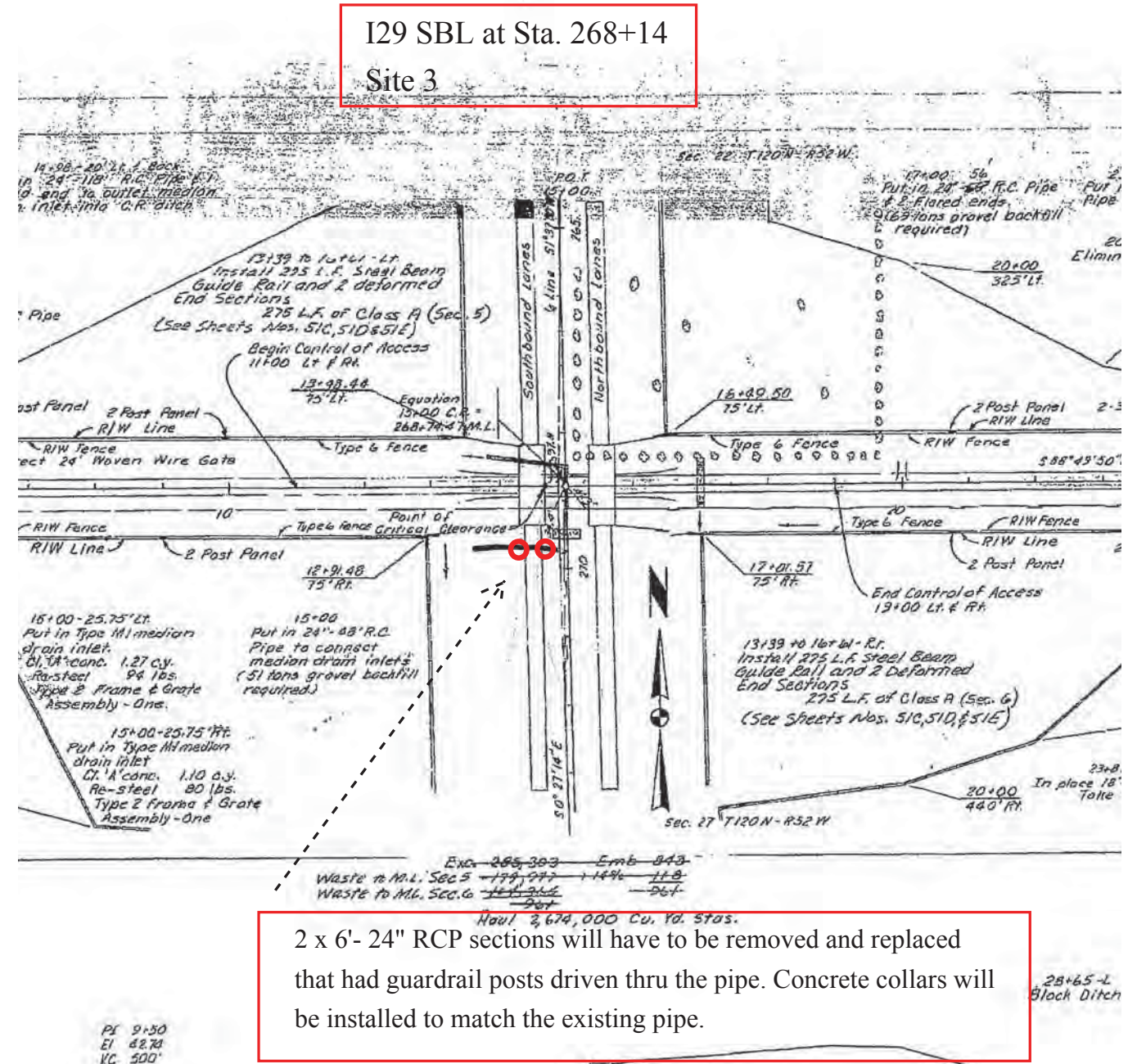
If a sign measures between 23" high and 37" high the units per sign will be computed as sign size (sq ft) x 1.2 + 15.

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	010-172, 029S-172, 123-172	15	25



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, 123-172	16	25



Site 2 - SD Hwy 10

Sec. 30 - T126N - R51W

Sec. 25 - T126N - R52W

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

Clearing Limits

Rip Rap Limits

Lot A property limits

Lot 2 Vellenga Addn

Lot 2 Waletich Addn

Heath's Outlot

Sec. 31 - T126N - R51W

Sec. 36 - T126N - R52W

Present SD Hwy 10

Present SD Hwy 10

Section Line

Section Line

66'

Section Line

Section Line

82'

82'

33'

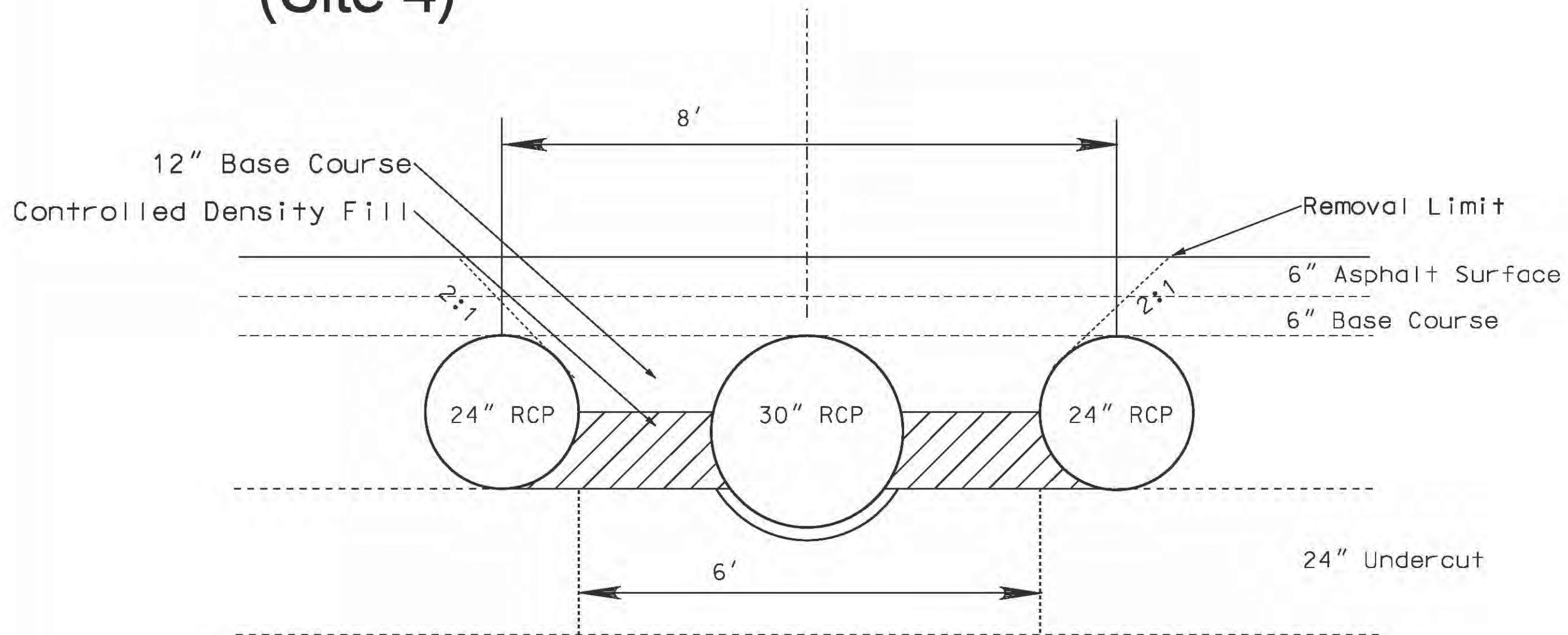
33'

66'

FILE

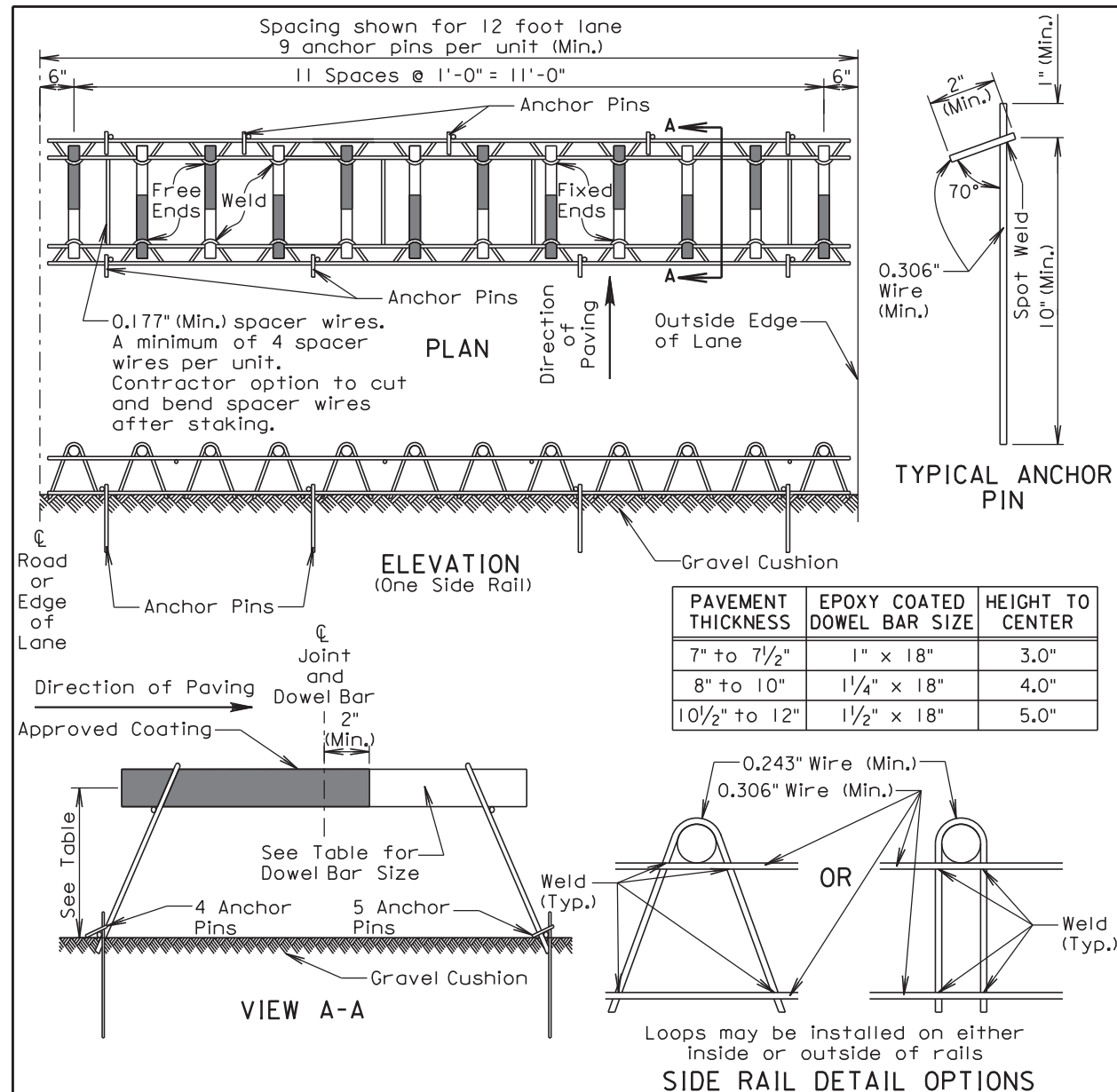
SD 123 Pipe Installation at Sta. 244+48

(Site 4)



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.



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 $\pm 1/8$ inch in 18 inches and to all other dowel bars in the assembly $\pm 1/16$ inch in 18 inches.

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

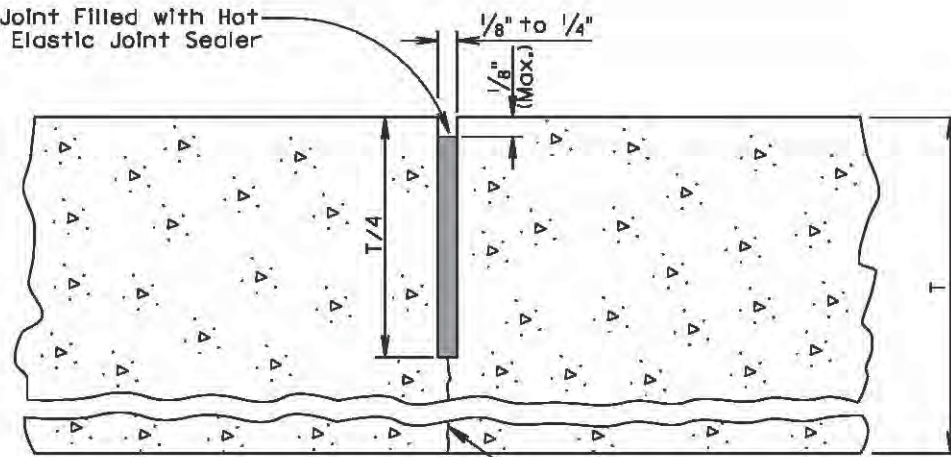
The transverse contraction joints shall be sawed perpendicular to the centerline of the roadway and the dowel bars shall be centered on the sawed joint ± 1 inch.

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

S D D O T	PCC PAVEMENT DOWEL BAR ASSEMBLY FOR TRANSVERSE CONTRACTION JOINTS 12 Bar Assembly on Granular Base Material	PLATE NUMBER 380.01
	Published Date: 2nd Qtr. 2015	Sheet 1 of 1

Sawed Joint Filled with Hot
Poured Elastic Joint Sealer



T = Pavement Thickness

Line of Fracture

GENERAL NOTES:

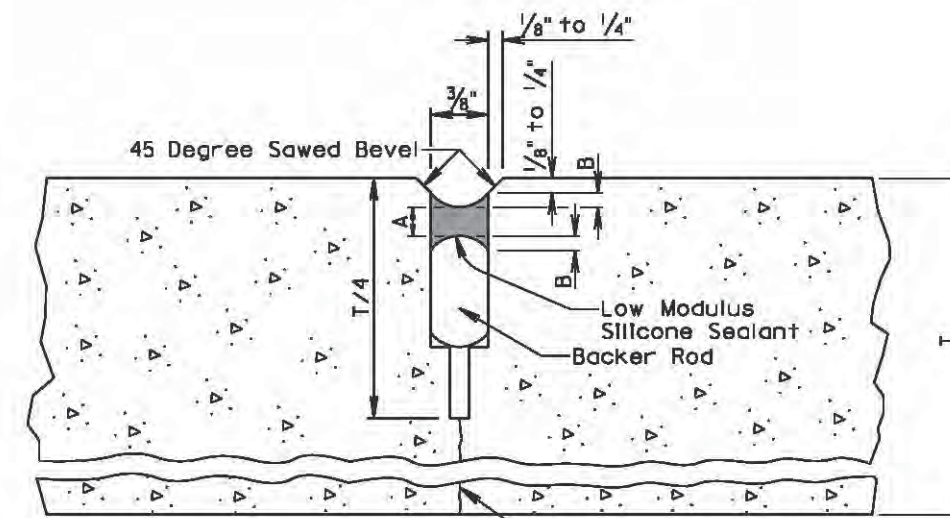
The saw cut to control cracking shall be a minimum of $\frac{1}{4}$ the thickness of the pavement.

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, 2013

S D D O T	PCC PAVEMENT TRANSVERSE CONTRACTION JOINT WITH OR WITHOUT DOWEL BAR ASSEMBLY	PLATE NUMBER 380.05
		Sheet 1 of 1

Published Date: 2nd Qtr. 2015



T = Pavement Thickness

Line of Fracture

LOW MODULUS SILICONE SEALANT ALLOWABLE CONSTRUCTION TOLERANCES			
A (Min.) (In.)	A (Max.) (In.)	B (Min.) (In.)	B (Max.) (In.)
$\frac{3}{16}$	$\frac{5}{16}$	$\frac{1}{8}$	$\frac{1}{4}$

GENERAL NOTES:

The first saw cut to control cracking shall be a minimum of $\frac{1}{4}$ 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.

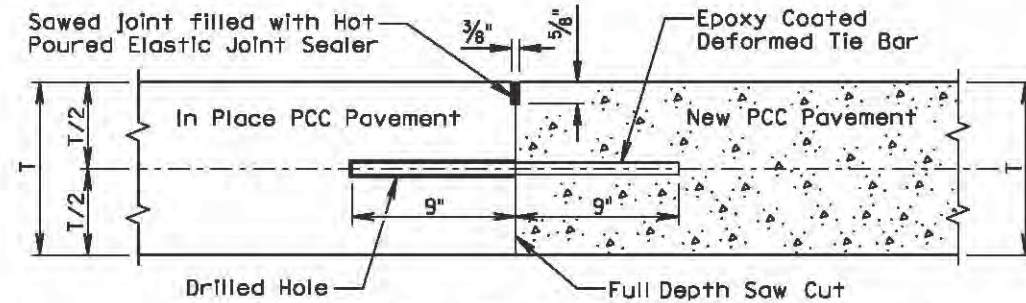
The backer rod shall be a nonmoisture absorbing resilient material approximately 25% larger in diameter than the width of the joint to be sealed.

June 26, 2013

S D D O T	PCC PAVEMENT BEVELED TRANSVERSE CONTRACTION JOINT WITH OR WITHOUT DOWEL BAR ASSEMBLY	PLATE NUMBER 380.06
		Sheet 1 of 1

Published Date: 2nd Qtr. 2015

DETAIL A TRANSVERSE CONSTRUCTION JOINT WITH TIE BARS



T = In Place PCC Pavement and New PCC Pavement Thickness

GENERAL NOTES:

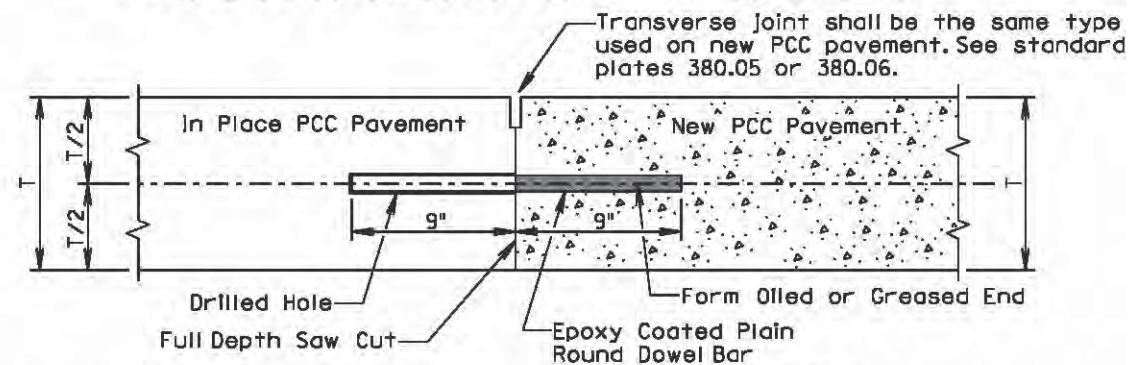
The term "In Place PCC Pavement" in the above drawing indicates that the in place PCC pavement was placed on a previous project.

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.

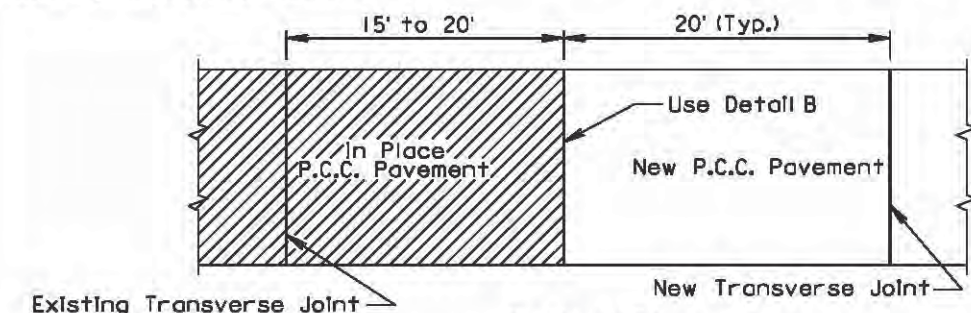
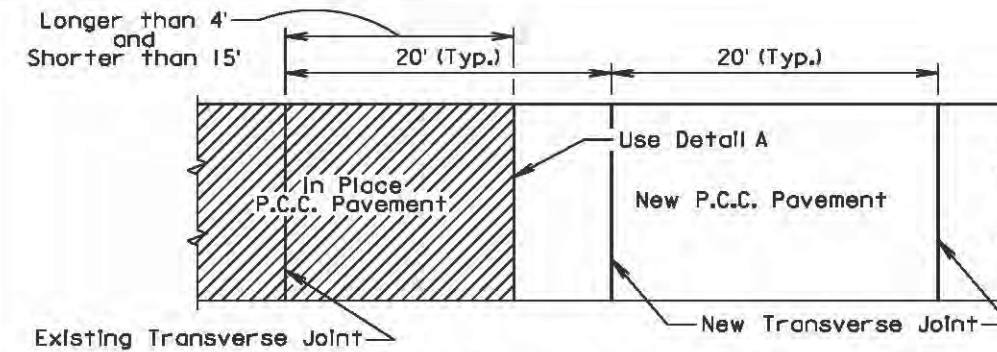
See sheet 2 of 2 of this standard plate to determine if Detail B shall be used.

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.

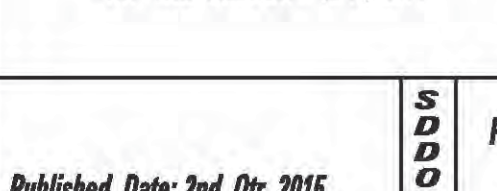
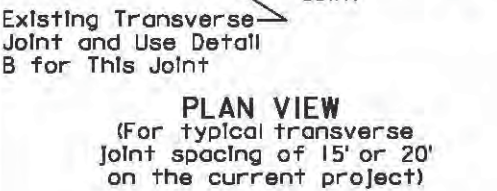
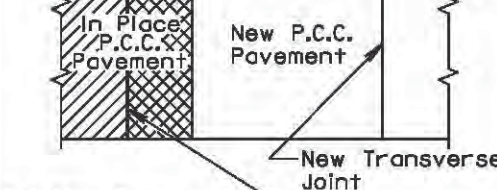
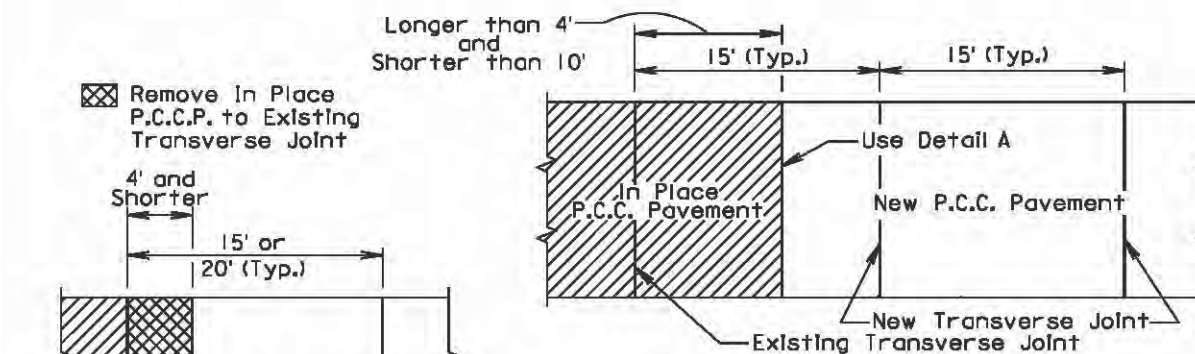
September 6, 2013

Published Date: 2nd Qtr. 2015	S D D O T	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)

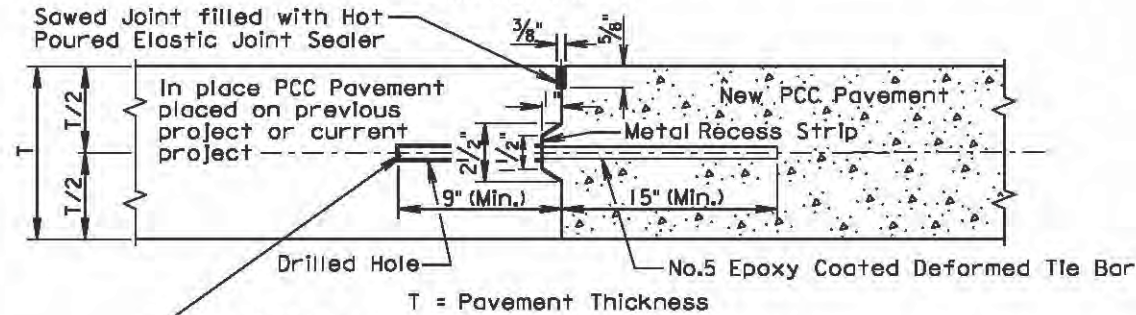
PLAN VIEW

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

September 6, 2013

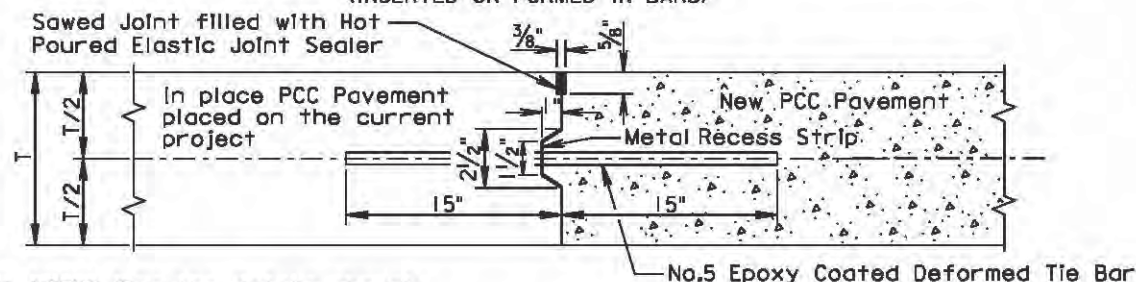
Published Date: 2nd Qtr. 2015	S D D O T	PCC PAVEMENT TRANSVERSE CONSTRUCTION JOINTS WITH TIE BARS OR DOWEL BARS	PLATE NUMBER 380.08
			Sheet 2 of 2

**LONGITUDINAL CONSTRUCTION JOINT WITH TIE BARS
(DRILLED IN BARS)**



T = Pavement Thickness
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.

**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.

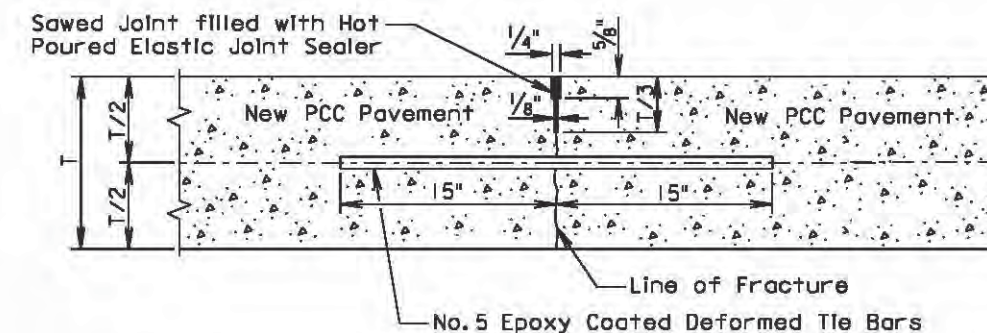
The keyway is optional and is not required. When concrete pavement is formed and a keyway is provided, a metal recess strip shall be used. When concrete pavement is slip formed, a metal recess strip is not required.

August 31, 2013

S D D O T	PCC PAVEMENT LONGITUDINAL JOINTS WITH TIE BARS	PLATE NUMBER 380.10
		Sheet 1 of 2

Published Date: 2nd Qtr. 2015

**SAWED LONGITUDINAL JOINT WITH TIE BARS
(POURED MONOLITHICALLY)**



T = Pavement Thickness

GENERAL NOTES (For the detail above):

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

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

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

The required number of tie bars as shown in the table shall be uniformly spaced within each panel with a maximum space of 48 inches center to center. The maximum tie bar spacing shall apply to tie bars within each panel.

The first saw cut to control cracking shall be a minimum of 1/3 the thickness of the pavement. Additional sawing for widening the saw cut to provide the width for the installation of the hot poured elastic joint sealer is necessary.

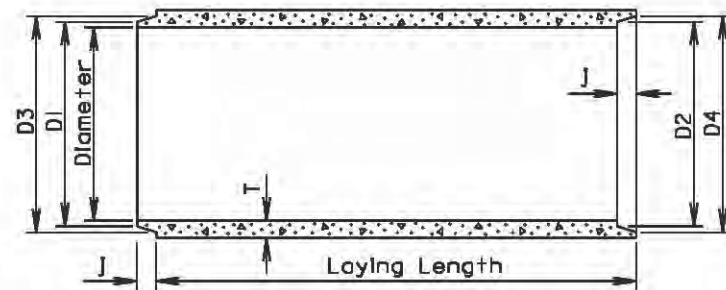
August 31, 2013

S D D O T	PCC PAVEMENT LONGITUDINAL JOINTS WITH TIE BARS	PLATE NUMBER 380.10
		Sheet 2 of 2

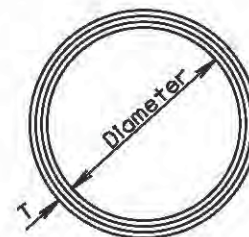
Published Date: 2nd Qtr. 2015

TOLERANCES IN DIMENSIONS

Diameters: $\pm 1.5\%$ for 24" Dia. or less and $\pm 1\%$ or $3/8"$ 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 $3/16"$, whichever is greater.
 Laying length: shall not underrun by more than $1/2"$.



LONGITUDINAL SECTION



END VIEW

GENERAL NOTES:

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

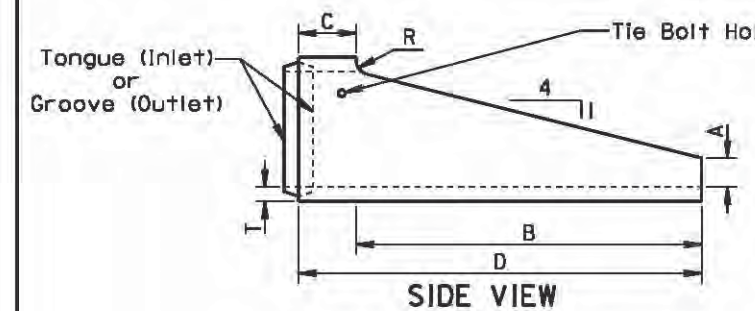
Not more than 2 four foot sections shall be permitted near the ends of any culvert. Four foot lengths shall be used only to secure the required length of culvert.

Diam. (In.)	Approx. Wt. /Ft. (lb.)	T (In.)	J (In.)	D1 (In.)	D2 (In.)	D3 (In.)	D4 (In.)
12	92	2	1 3/4	13 1/4	13 5/8	13 3/8	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 5/8	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 3/8	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

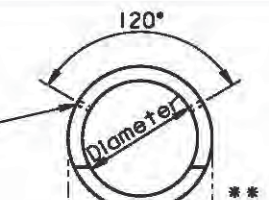
March 31, 2000

S D D O T	REINFORCED CONCRETE PIPE	PLATE NUMBER 450.01
		Sheet 1 of 1

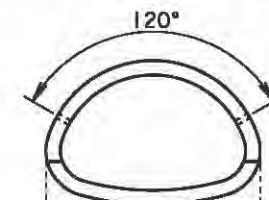
Published Date: 1st Qtr. 2015



SIDE VIEW



END VIEW "CIRCULAR"

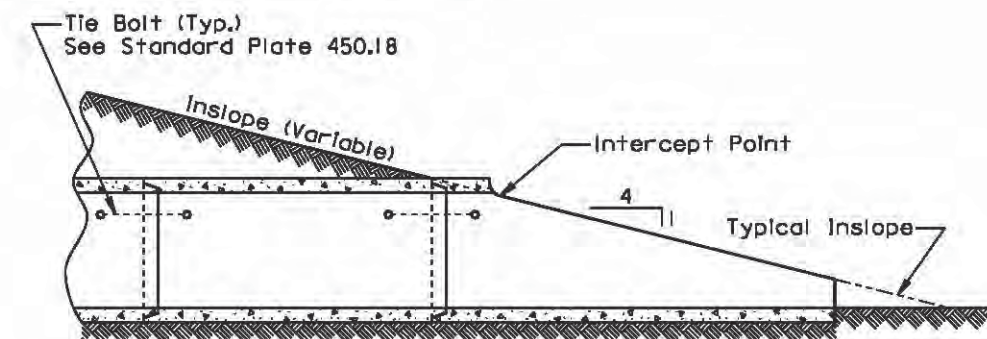


END VIEW "ARCH"

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

S D D O T	R. C. P. SLOPED ENDS	PLATE NUMBER 450.13
		Sheet 1 of 1

Published Date: 1st Qtr. 2015

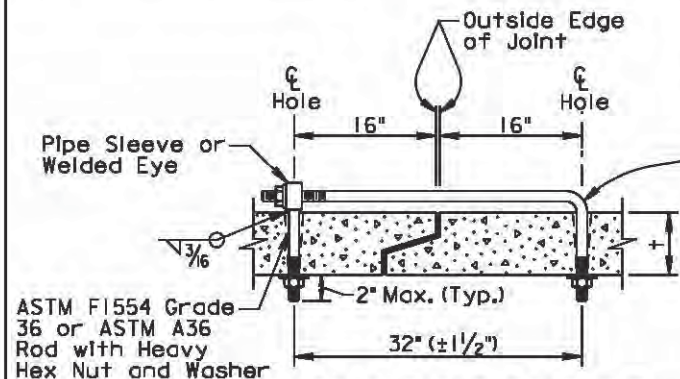
Wall "t" (In.)	Rod Dia. (In.)	Pipe Sleeve Dia. (nominal)
≤ 3/4	5/8	3/4
3/2-6/2	3/4	1
≥ 7	1	1 1/4

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

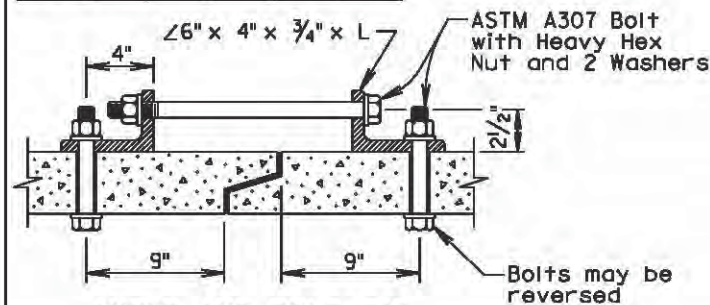
Pipe Dia. (In.)	"L" (In.)	Bolt Dia. (In.)
≤ 48	4	3/4
> 48	6	1

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.



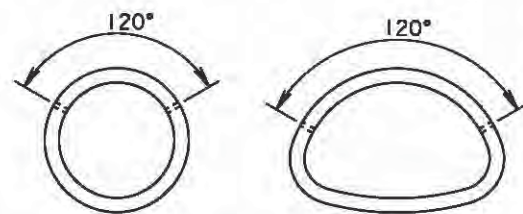
ANGLE AND BOLT TIE

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.

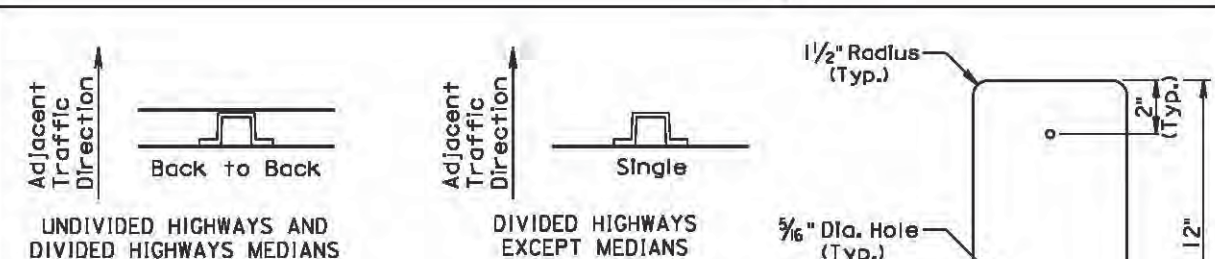


**END VIEW
"CIRCULAR"**

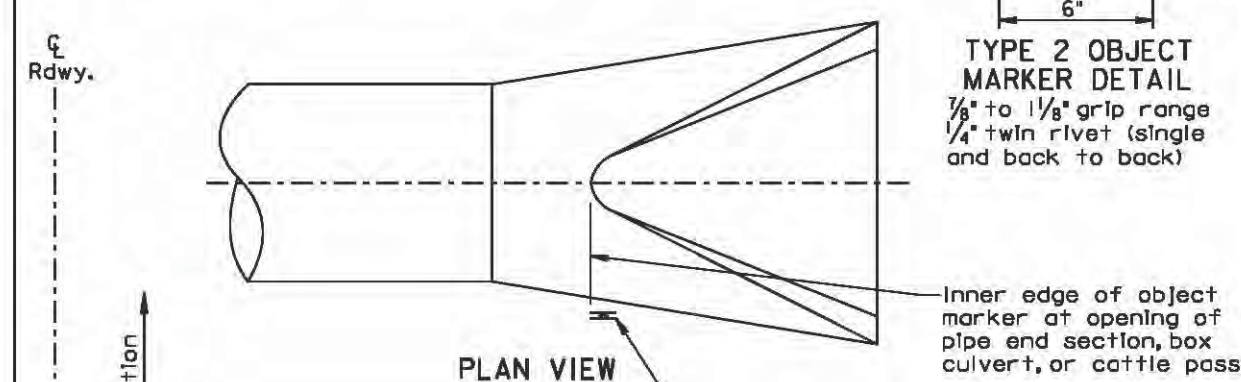
**END VIEW
"ARCH"**

February 28, 2013

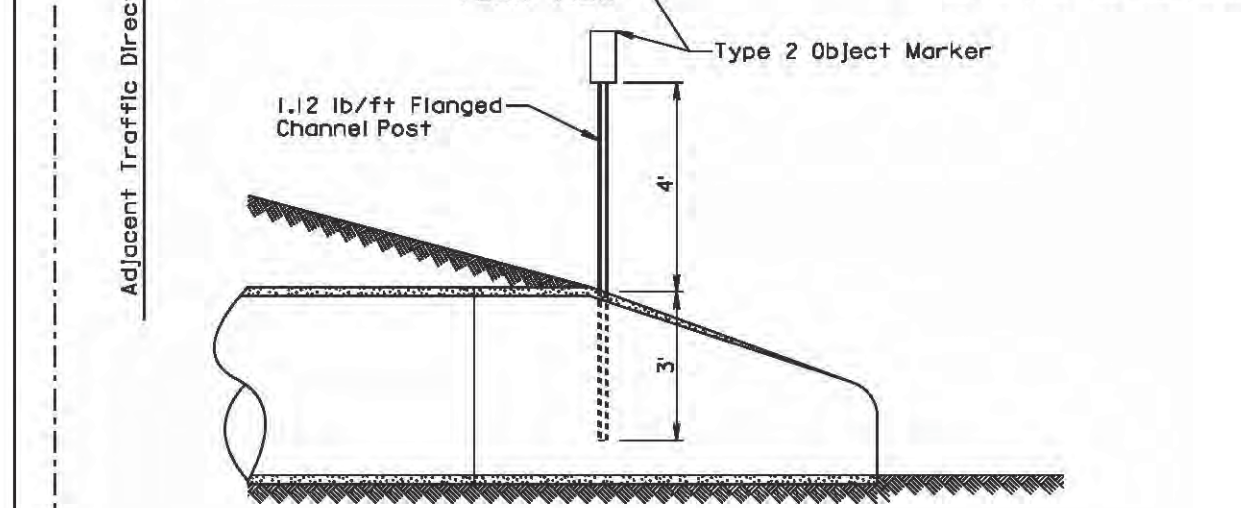
S D D O T	TIE BOLTS FOR R.C.P. AND R.C.P. ARCH	PLATE NUMBER 450.18
	Published Date: 1st Qtr. 2015	Sheet 1 of 1



TYPE 2 OBJECT MARKER DETAILS AND POST ORIENTATION



PLAN VIEW



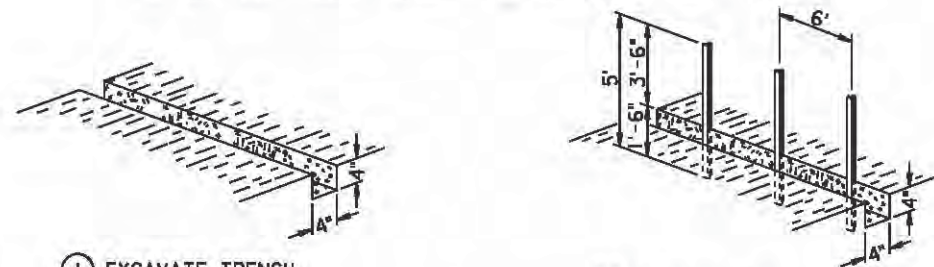
ELEVATION

GENERAL NOTES:
 The type 2 object markers shall conform to Standard Specifications Section 982.2 I.
 The 1.12 lb/ft flanged channel post shall conform to Standard Specifications Section 982.2 I. 6.
 Payment for the type 2 object markers shall be in conformance with Standard Specification Section 632.5 C.

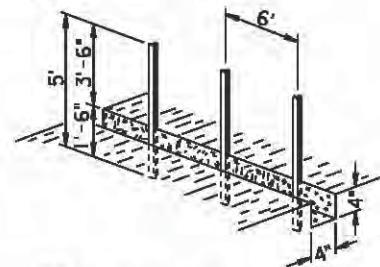
June 26, 2006

S D D O T	TYPE 2 OBJECT MARKER INSTALLATION AT PIPE CULVERTS, BOX CULVERTS, AND CATTLE PASSES	PLATE NUMBER 632.10
	Published Date: 1st Qtr. 2015	Sheet 1 of 1

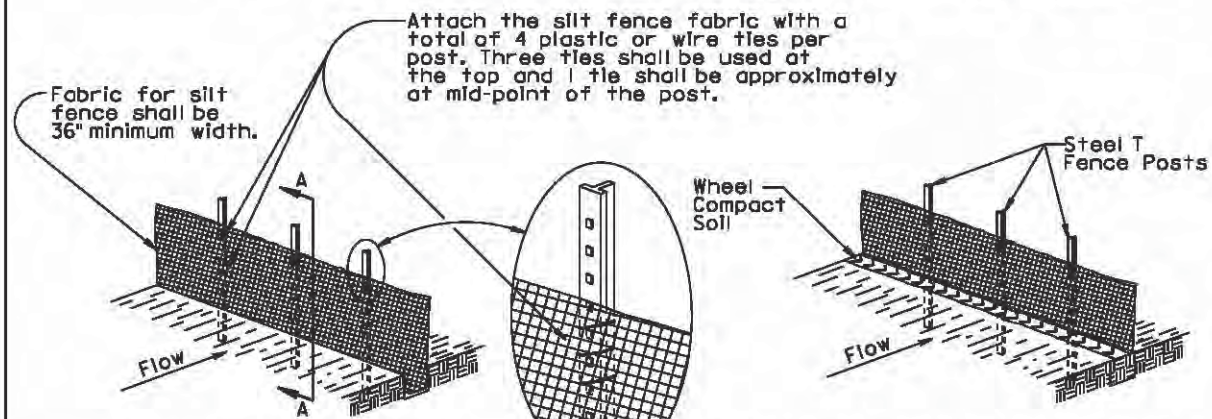
MANUAL HIGH FLOW SILT FENCE INSTALLATION



① EXCAVATE TRENCH

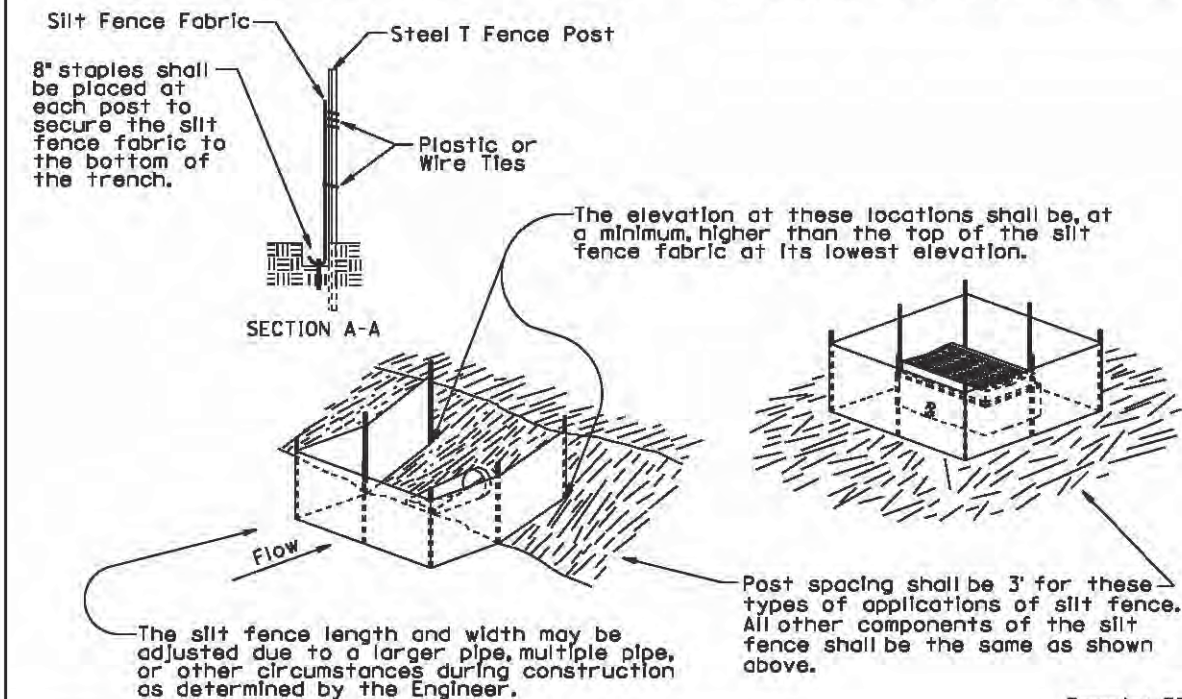


② DRIVE STEEL T FENCE POSTS



③ ATTACH SILT FENCE FABRIC

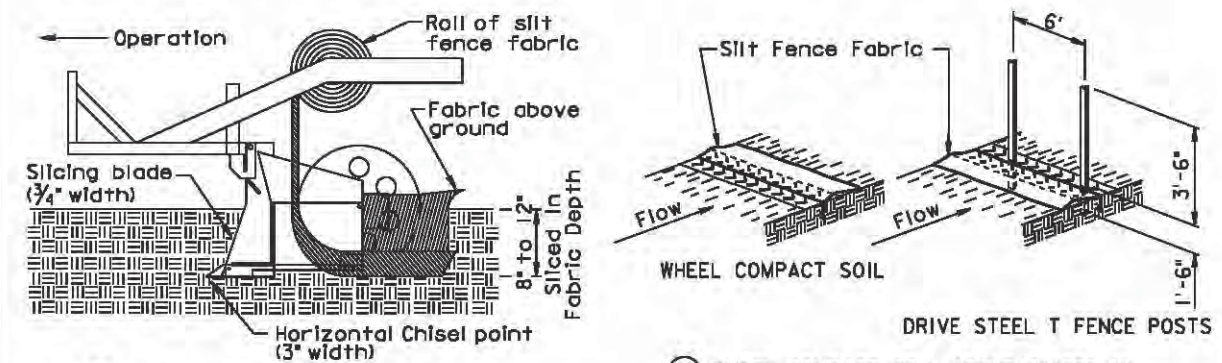
④ BACKFILL TRENCH AND WHEEL COMPACT SOIL



December 23, 2003

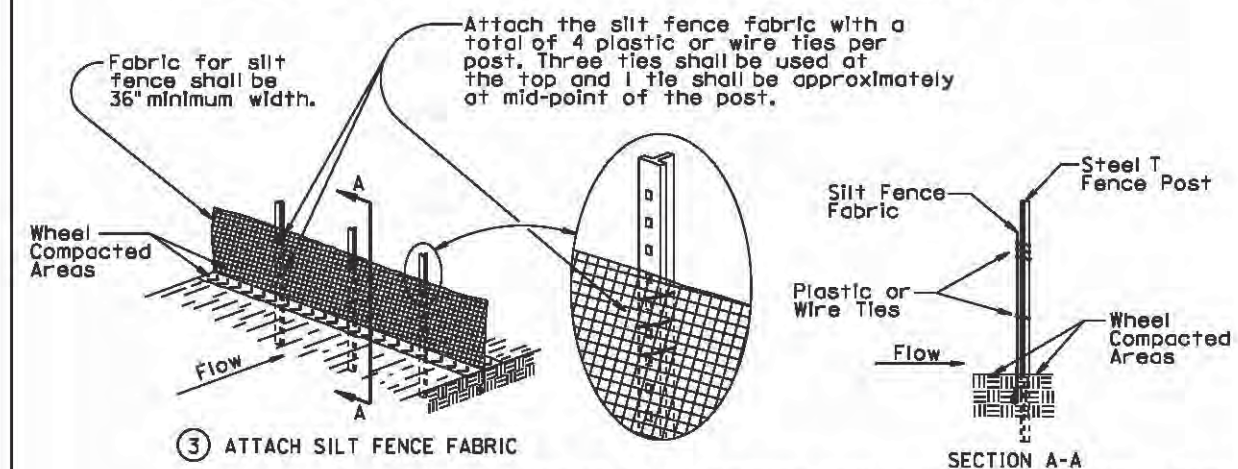
S D D O T	HIGH FLOW SILT FENCE	PLATE NUMBER
		734.05
Published Date: 1st Qtr. 2015		Sheet 1 of 2

MACHINE SLICED HIGH FLOW SILT FENCE INSTALLATION

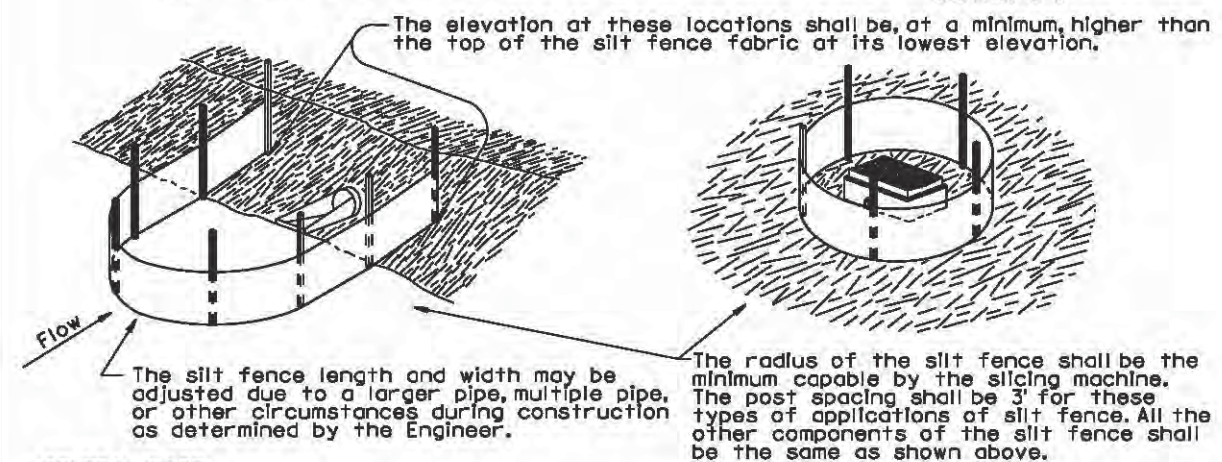


① INSTALL SILT FENCE FABRIC BY MACHINE SLICING METHOD.

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



③ ATTACH SILT FENCE FABRIC

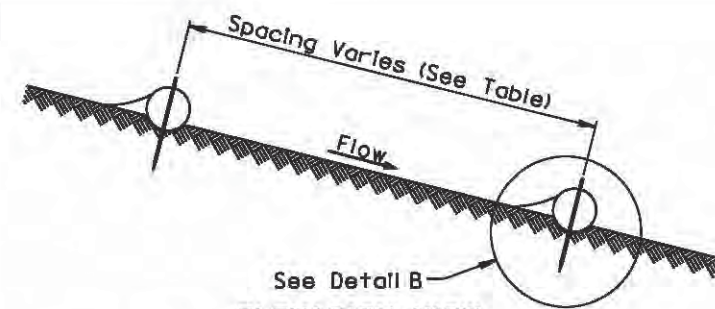


GENERAL NOTE:

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.

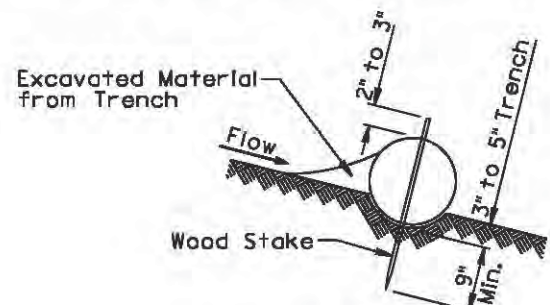
December 23, 2003

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

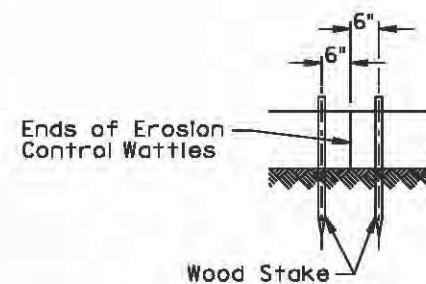


ELEVATION VIEW
CUT OR FILL SLOPE INSTALLATION

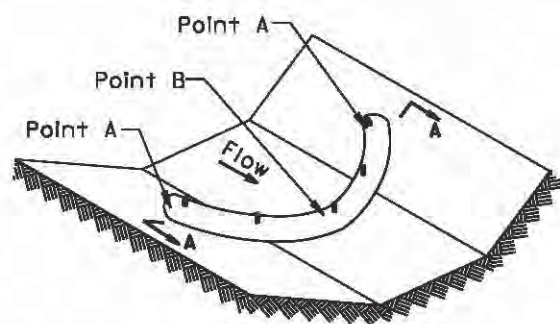
CUT OR FILL SLOPE INSTALLATION	
Slope	Spacing (Ft)
1:1	10
2:1	20
3:1	30
4:1	40



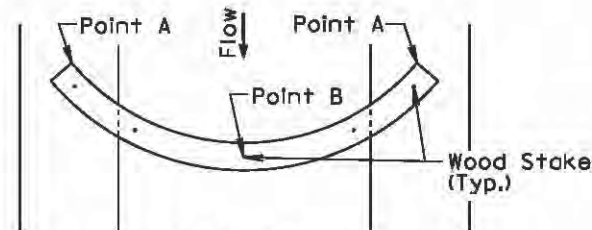
DETAIL B
(TYPICAL OF ALL INSTALLATIONS)



DETAIL C

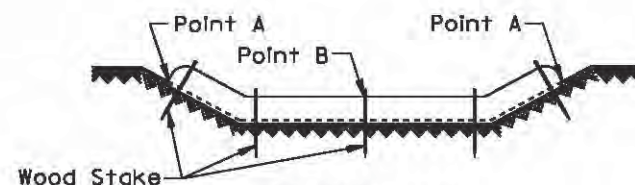


ISOMETRIC VIEW
DITCH INSTALLATION



PLAN VIEW
DITCH INSTALLATION

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



SECTION A-A

December 23, 2004

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'.

When 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