

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	044-251	1	12

Plotting Date: 03/27/2017

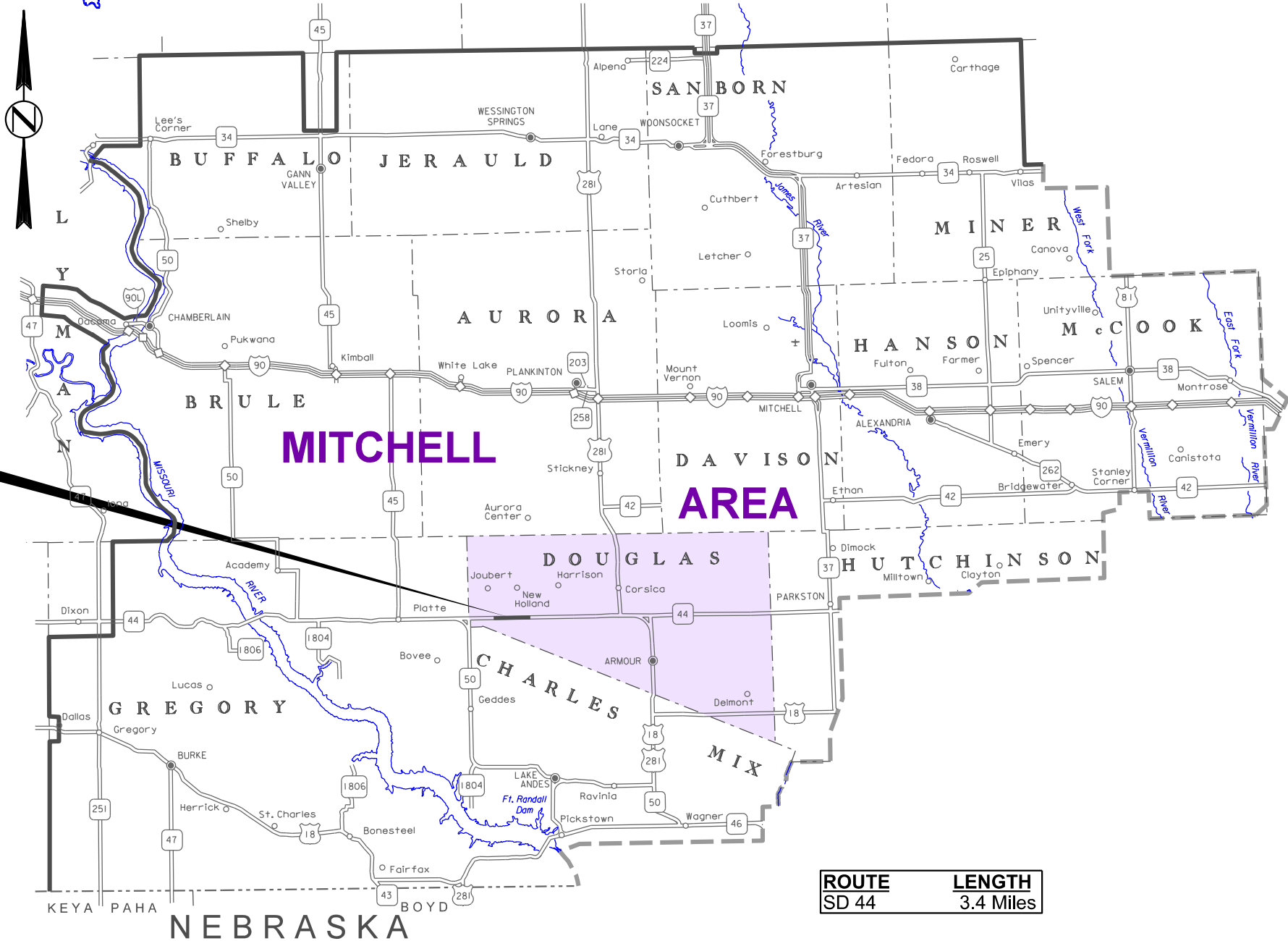
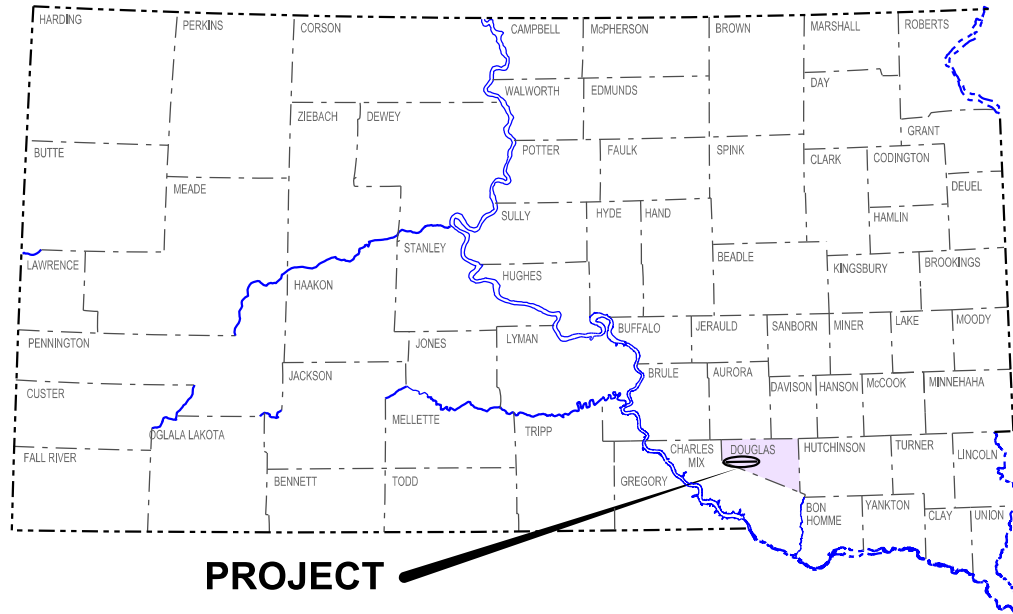
STATE OF SOUTH DAKOTA
 DEPARTMENT OF TRANSPORTATION
 PLANS FOR PROPOSED
PROJECT 044-251
SD HIGHWAY 44
DOUGLAS COUNTY
 CULVERT REPLACEMENT

PCN I4M0

INDEX OF SHEETS

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Sheets 4&5	Plan Notes
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PLOT SCALE - 1:80000



PROJECT 044-251
 MRM 316.00 +0.873
 MRM 319.00 +0.399
 MRM 320.00 +0.285

STORM WATER PERMIT
 (None required)

DESIGN DESIGNATION

ADT(2016)	1,366
ADT(2036)	1,962
DHV	268
D	50%
T DHV	12.9%
T ADT	28.4%
V	65 MPH

ROUTE	LENGTH
SD 44	3.4 Miles

PLOTTED FROM - TRM113349

FILE - ... \I4M0 PIPE REPAIR\TITL I4M0.DGN

ESTIMATE OF QUANTITIES & ENVIRONMENTAL COMMITMENTS

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	044-251	2	12

ESTIMATE OF QUANTITIES

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
110E0500	Remove Pipe Culvert	216	Ft
120E0010	Unclassified Excavation	995	CuYd
260E1010	Base Course	282.0	Ton
320E1200	Asphalt Concrete Composite	92.0	Ton
421E0100	Pipe Culvert Undercut	64	CuYd
450E0142	24" RCP Class 2, Furnish	80	Ft
450E0150	24" RCP, Install	80	Ft
450E0192	42" RCP Class 2, Furnish	98	Ft
450E0200	42" RCP, Install	98	Ft
450E2032	42" RCP Flared End, Furnish	4	Each
450E2033	42" RCP Flared End, Install	4	Each
450E2200	24" RCP Sloped End, Furnish	2	Each
450E2201	24" RCP Sloped End, Install	2	Each
634E0010	Flagging	10.0	Hour
634E0110	Traffic Control Signs	176.0	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0285	Type 3 Barricade, 8' Double Sided	1	Each
634E0330	Temporary Raised Pavement Markers	6,150	Ft
634E0600	4" Temporary Pavement Marking Tape Type I	432	Ft
734E0010	Erosion Control	Lump Sum	LS

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 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.

The Contractor shall not withdraw water directly from streams of the James, Big Sioux, and Vermillion watersheds without prior approval from the SDDOT Environmental Office.

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 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.

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 Public ROW.

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

Cost 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.

ENVIRONMENTAL COMMITMENTS (CONTINUED)

STATE OF SOUTH DAKOTA	PROJECT 044-251	SHEET 3	TOTAL SHEETS 12
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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 department designated sources and designated option material sources, stockpile sites, storage areas, and waste sites provided within the plans.

Action Taken/Required:

All earth disturbing activities not designated within the plans require review of cultural resources impacts. This work includes, but is not limited to: Contractor furnished material sources, material processing sites, stockpile sites, storage areas, plant sites, and waste areas.

The Contractor 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 Contractor furnished material sources, material processing sites, stockpile sites, storage areas, plant sites, and waste areas that affect wetlands, threatened and endangered species, or waterways. The Contractor 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.

SCOPE OF WORK

Work on this project entails replacing entire culverts completely though the section under the roadway.

SEQUENCE OF OPERATIONS

1. Install signing prior to start of work to close one half of the roadway.
2. Place erosion control as applicable.
3. Excavate and remove culverts 1/2 roadway width.
4. Place new culvert and sections 1/2 roadway width.
5. Backfill and compact the Subbase, Base Course and temporary ramps.
6. Switch traffic and repeat steps 3 through 5.
7. Seed the disturbed inslopes.
8. Remove ramps and place Asphalt Concrete Composite on both lanes.

UTILITIES

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

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

EXCAVATION FOR SHALLOW PIPE CULVERT REMOVAL

The Contractor shall be responsible for the maintenance of drainage between the phases of construction for the culvert replacement 1/2 roadway width at a time.

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

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

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

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

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

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

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

EXCAVATION FOR SHALLOW PIPE CULVERT REMOVAL (CONTINUED)

Cost for Base Course installed over the pipe replacement shall be included in the contract unit price per ton for Base Course.

Pipe flowline shall match that of existing pipe. This may require that ditches be excavated in each direction from the pipe ends to maintain proper water flow through the pipe. Material from the ditch cleanout may be placed on the inslopes at the ditch cleanout locations, or spread on the backslopes at some locations as directed by the Engineer.

Cleaning of existing ditches and disposal of soil shall be incidental to the contract unit prices for the various items.

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

Cost for cutting existing asphalt and removing and disposing of asphalt concrete material shall be incidental to the contract unit price per cubic yard of Unclassified Excavation.

Unclassified Excavation will be paid for at plans quantity.

TABLE OF EXCAVATION FOR SHALLOW PIPE REMOVAL

MRM	Disp.	Type	Quantity (CuYd)
316.00	+0.873	Pipe	464
319.00	+0.399	Pipe	280
320.00	+0.285	Pipe	251
Total:			995

MRM	Disp.	(Ton)	Asphalt Concrete Composite (5" Depth) (Ton)
			Base Course (12" Depth)
316.00	+0.873	99	32
319.00	+0.399	95	31
320.00	+0.285	88	29
Totals:		282	92

PIPE CULVERT UNDERCUT

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

The culvert will be bedded in accordance with Section 450.3 F.2, Class B Bedding with the following exception. The undercut area shall extend two feet from the outermost diameter on both sides of the pipe with the back of the excavated area being sloped 2:1 upward to the top of the roadway surface. Select fill material for Class B Bedding will conform to the gradation requirements of Base Course in Section 882. All other requirements of section 421 shall apply.

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

PIPE CULVERT UNDERCUT (CONTINUED)

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

MRM	Disp.	Undercut Depth (Ft)	Quantity (CuYd)
316.00	+ 0.873	1	23.6
319.00	+ 0.399	1	20.2
320.00	+ 0.285	1	20.2
Totals:			64

Pipe Culvert Undercut shall be paid for at the contract unit price per cubic yard for Pipe Culvert Undercut.

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

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

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

REMOVE PIPE CULVERT

The pipe culvert removed shall become the property of the Contractor for disposal.

REMOVE AND RESET TYPE 2 OBJECT MARKERS

The Contractor will be required to remove prior to the work and reset after the work the Type 2 Object Markers delineating the pipe ends. Cost for this work shall be incidental to the contract unit prices for the various items.

REMOVE AND REPLACE TOPSOIL

Prior to starting construction operations, a sufficient volume of topsoil shall be removed from the construction limits to cover the disturbed areas to the required thickness as indicated in these plans.

Following completion of grading operations, topsoil shall be spread evenly over the disturbed areas. The thickness will be approximately 4 inches.

Removal and replacement of topsoil will not be measured for payment but shall be incidental to the contract unit prices for the various items.

EROSION CONTROL

The areas to be seeded comprise of all newly graded areas and disturbed areas within the project limits. All disturbed areas shall be covered by Type 2 Erosion Control Blanket. The limits of erosion control work will be determined by the Engineer on construction.

Type G Permanent Seed Mixture shall consist of the following:

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

There shall be no Seasonal Limitations per 730.3 B for the seeding on this project due to the sensitivity of the disturbed areas. Seed and Erosion Control Blanket shall be applied to each site not more than 14 calendar days after the completion of the work at each site.

The area to be seeded is estimated at 0.2 acre. The area to be covered with Type 2 Erosion Control Blanket is estimated at 0.2 acre (800 square yards).

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

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

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

Cost for erosion control work for furnishing, placing, and maintaining erosion control including equipment, labor, seeding, and placing erosion control blanket shall be incidental to the contract lump sum price for Erosion Control.

GENERAL MAINTENANCE OF TRAFFIC

Sufficient traffic control devices have been included in these plans to sign one workspace. If the Contractor elects to work on additional sites simultaneously, the cost for additional traffic control devices shall be incidental to the contract unit price per square foot for Traffic Control Signs.

TEMPORARY PAVEMENT MARKING

Temporary pavement marking (except stop bars) shall consist of Temporary Raised Pavement Markers. (Three workspaces with 2-500' double yellow lines= 6000' and temporary pavement marking after top lift of asphalt placement = 150'; Total = 6150') Cost shall be included in the contract unit price per foot for Temporary Raised Pavement Markers.

Temporary pavement marking for 24" white stop bars shall consist of 4" Temporary Pavement Marking Tape Type I and shall be included in the contract unit price per foot for 4" Temporary Pavement Marking Tape Type I. (Three workspaces at 144' per workspace; Total 432')

ITEMIZED LIST FOR TRAFFIC CONTROL SIGNS

SIGN CODE	SIGN DESCRIPTION	CONVENTIONAL ROAD			
		NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
R1-1	STOP	2	30"	5.2	10.4
W1-4	REVERSE CURVE (R)	1	48" x 48"	16.0	16.0
W3-1	STOP AHEAD (symbol)	2	48" x 48"	16.0	32.0
W13-1P	ADVISORY SPEED (plaque)	2	30" x 30"	6.3	12.6
W20-1	ROAD WORK AHEAD	2	48" x 48"	16.0	32.0
W20-4	ONE LANE ROAD AHEAD	2	48" x 48"	16.0	32.0
W20-7	FLAGGER (symbol)	2	48" x 48"	16.0	32.0
G20-2	END ROAD WORK	2	36" x 18"	4.5	9.0
CONVENTIONAL ROAD TRAFFIC CONTROL SIGNS					176.0
SQFT					

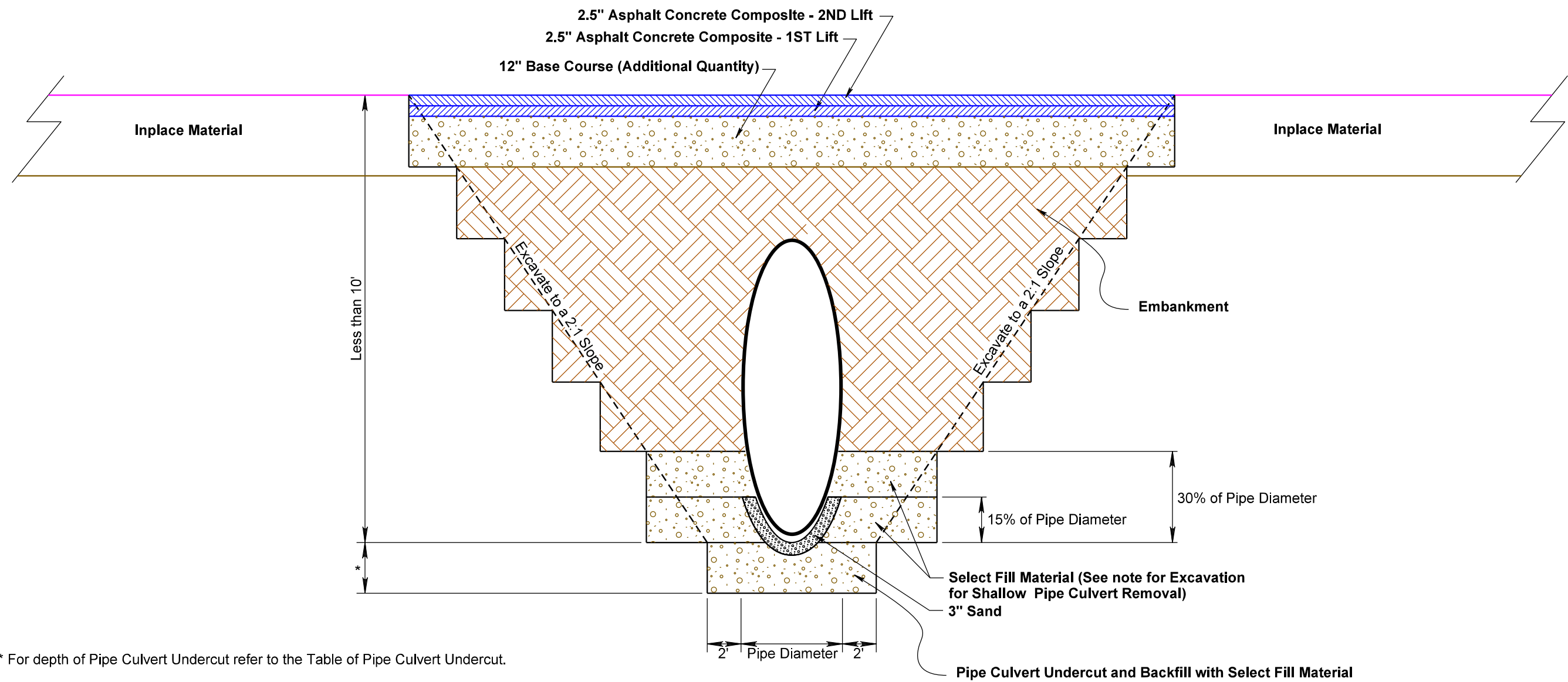
TYPE 3 BARRICADES

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

TABLE OF PIPE REPLACEMENT

ROUTE	MRM	+	DISP	SIZE AND TYPE	REMOVE PIPE CULVERT (FT)	FURNISH AND INSTALL 24 INCH RCP (FT)	FURNISH AND INSTALL 42 INCH RCP (FT)	FURNISH AND INSTALL 24 INCH RCP SLOPED END (EACH)	FURNISH AND INSTALL 42 INCH RCP FLARED END (EACH)	COMMENTS	APPROXIMATE GPS COORDINATES	
											NORTHING	EASTING
044-251	316	+	0.873	18" RCP	88	80		2		18" Existing- 24" Install	N 43.23038	E 98.37319
044-251	319	+	0.399	42" RCP	66		50		2		N 43.23031	E 98.34309
044-251	320	+	0.285	42" RCP	62		48		2		N 43.23023	E 98.33269
TOTALS:					216	80	98	2	4			

LAYOUT OF EMBANKMENT AND SURFACING AT SHALLOW CULVERTS BEING REPLACED

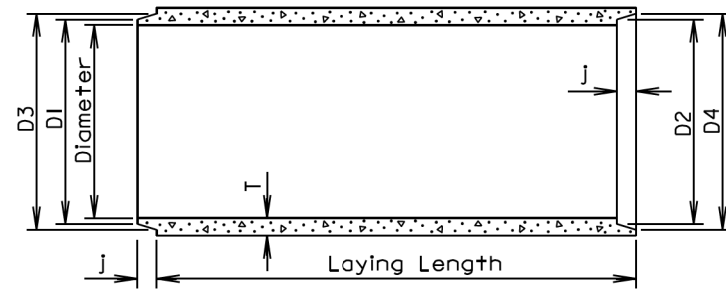


* For depth of Pipe Culvert Undercut refer to the Table of Pipe Culvert Undercut.

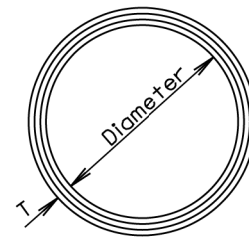
Plotting Date: 03/27/2017

TOLERANCES IN DIMENSIONS

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



LONGITUDINAL SECTION



END VIEW

GENERAL NOTES:

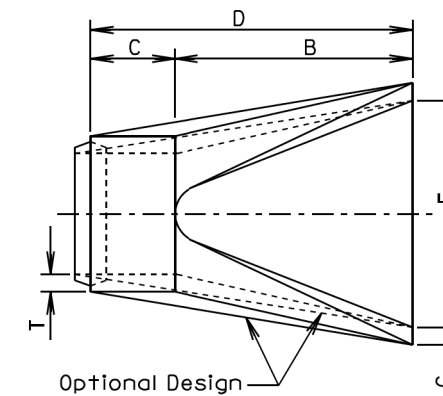
Construction of R.C.P. shall conform to the requirements of Section 990 of the Specifications.

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.

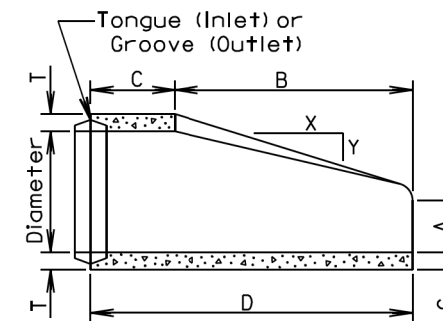
Diam. (in.)	Approx. Wt. / Ft. (lb.)	T (in.)	J (in.)	D1 (in.)	D2 (in.)	D3 (in.)	D4 (in.)
12	92	2	1 3/4	13 1/4	13 5/8	13 7/8	14 1/4
15	127	2 1/4	2	16 1/2	16 7/8	17 1/4	17 5/8
18	168	2 1/2	2 1/4	19 5/8	20	20 3/8	20 3/4
21	214	2 3/4	2 1/2	22 1/8	23 1/4	23 3/4	24 1/8
24	265	3	2 3/4	26	26 3/8	27	27 3/8
27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

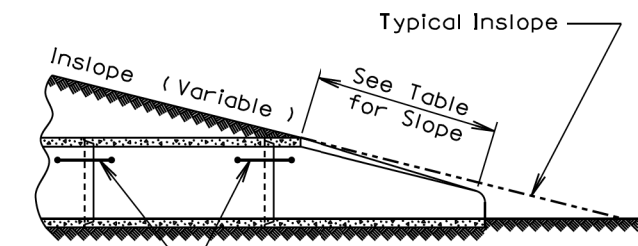
S D D O T	REINFORCED CONCRETE PIPE	PLATE NUMBER 450.01
	Published Date: 1st Qtr. 2017	Sheet 1 of 1



TOP VIEW



LONGITUDINAL SECTION



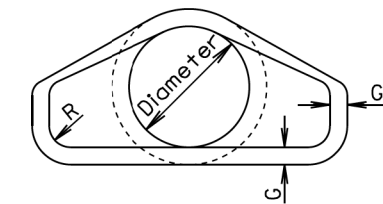
See Standard Plate 450.18
(TIE BOLTS FOR R.C.P. AND R.C.P. ARCH)

SLOPE DETAIL

GENERAL NOTES:

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

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



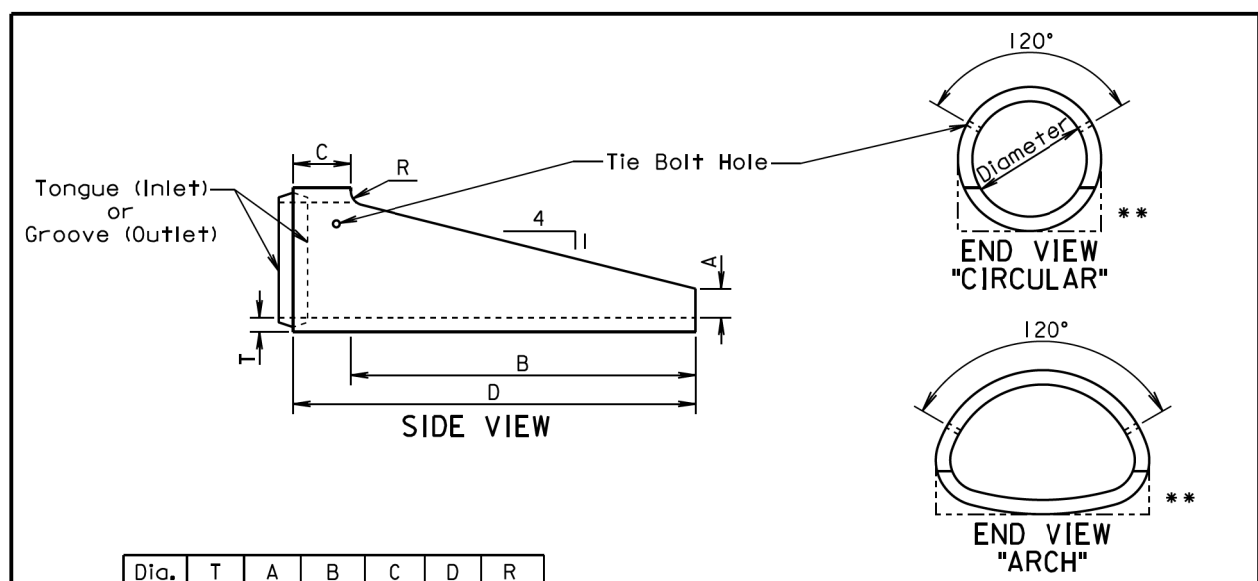
END VIEW

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

June 26, 2015

S D D O T	R. C. P. FLARED ENDS	PLATE NUMBER 450.10
	Published Date: 1st Qtr. 2017	Sheet 1 of 1

Plotting Date: 03/27/2017

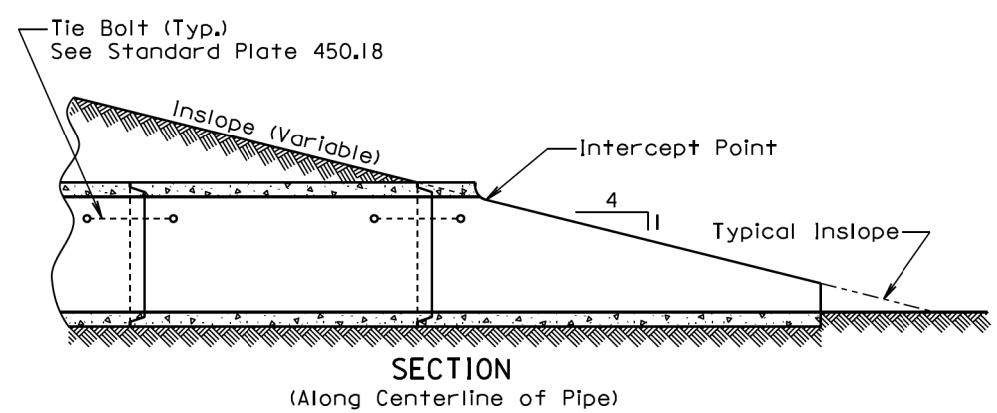


Dia. (in.)	T (in.)	A (in.)	B (in.)	C (in.)	D (in.)	R (in.)
FOR CIRCULAR PIPE						
24	3	6	72	12	84	3
30	3 1/2	7 1/2	90	12	102	3 1/2
FOR ARCH PIPE						
* 24	3	6	48	12	60	3
* 30	3 1/2	7 1/2	60	12	72	3 1/2
* 36	4 1/2	8 5/8	66	30	96	0
* 42	4 1/2	10	77 1/4	18 3/4	96	0

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

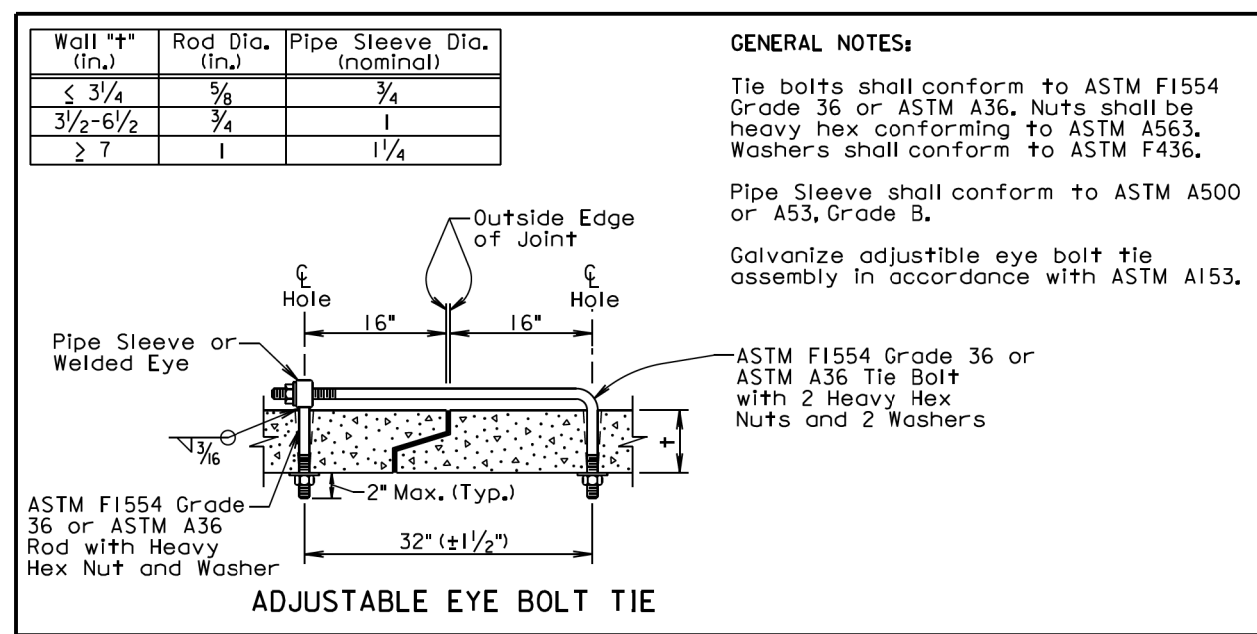
* Equivalent Diameter of Circular R.C.P.
 ** Acceptable Flat Bottom Alternate.



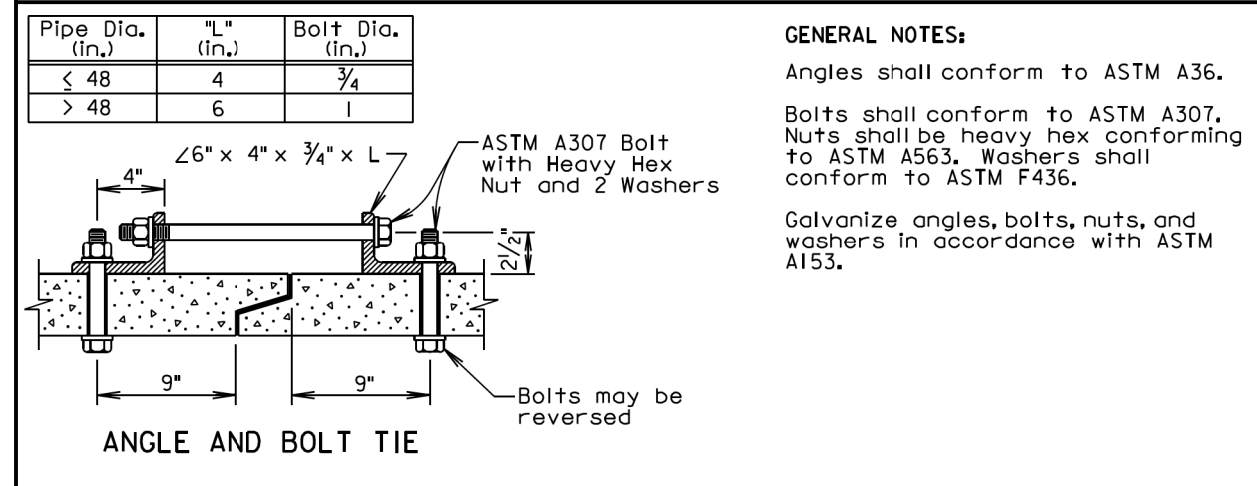
GENERAL NOTE:
 The length of concrete pipe shown in the construction plans is between sloped ends.

September 22, 2006

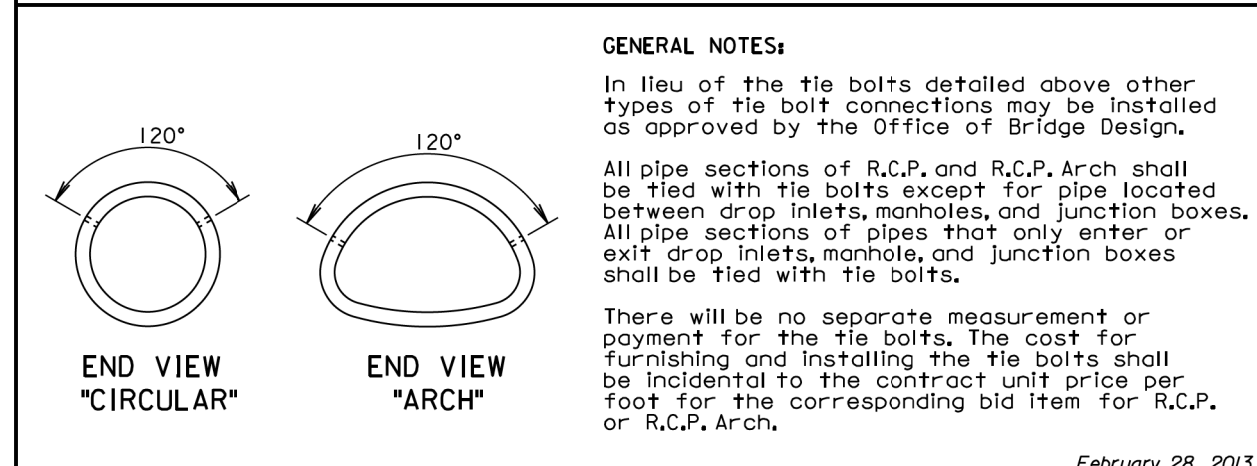
S D D O T	R. C. P. SLOPED ENDS	PLATE NUMBER 450.13
	Published Date: 1st Qtr. 2017	Sheet 1 of 1



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.



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.



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

S D D O T	TIE BOLTS FOR R.C.P. AND R.C.P. ARCH	PLATE NUMBER 450.18
	Published Date: 1st Qtr. 2017	Sheet 1 of 1

PLOT SCALE - 1:200

PLOTTED FROM - IRML13349

PLOT NAME - 3
 FILE - ... \STANDARDPLATES44.DGN

Plotting Date: 03/27/2017

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

- Flagger
- Channelizing Device

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

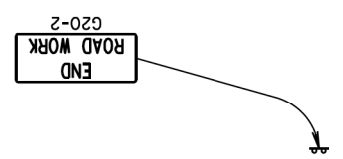
The ROAD WORK AHEAD and the END ROAD WORK signs may be omitted for short duration operations (1 hour or less).

For tack and/or flush seal operations, when flaggers are not being used, the FRESH OIL sign (W21-2) 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.

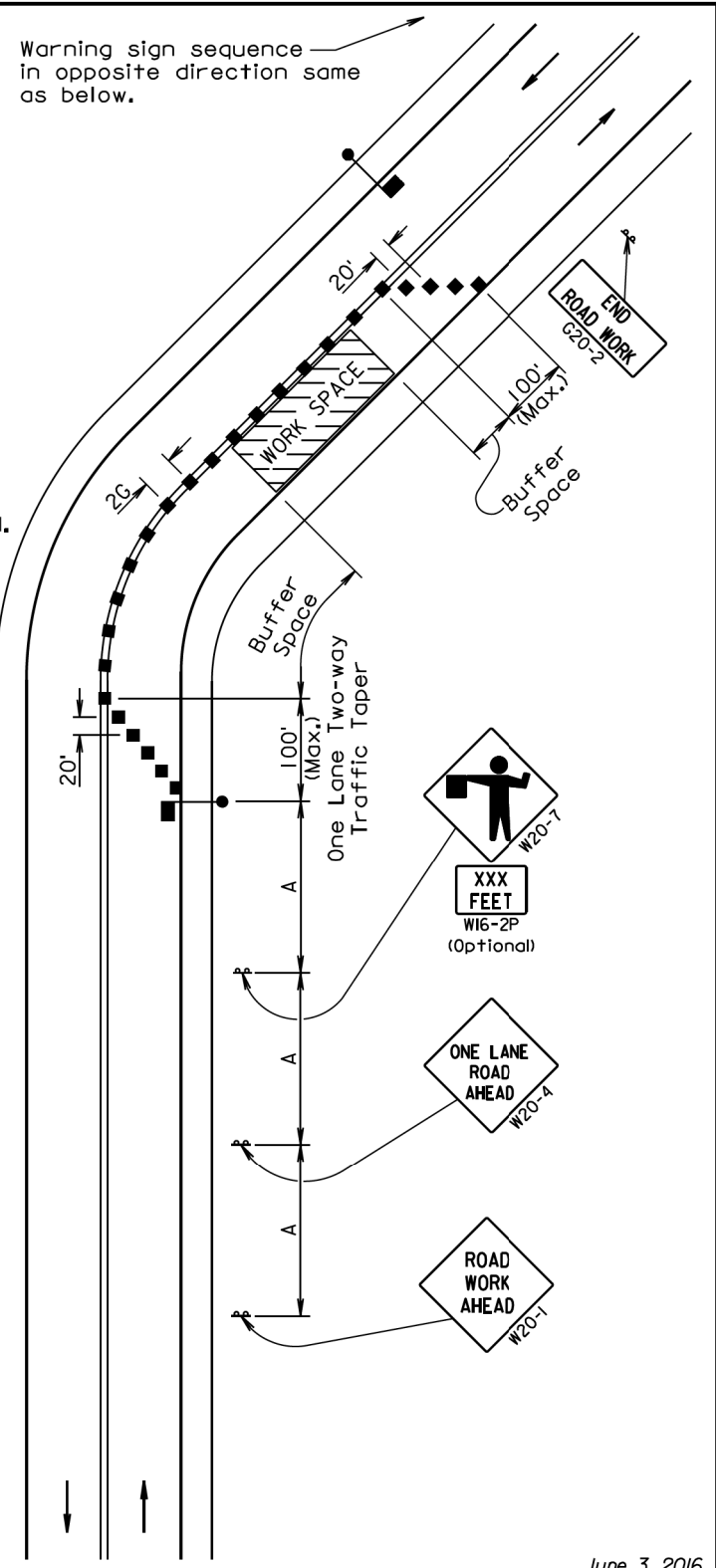
Channelizing devices are not required along the centerline adjacent to work area when pilot cars are utilized for escorting traffic through the work area.



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.



June 3, 2016

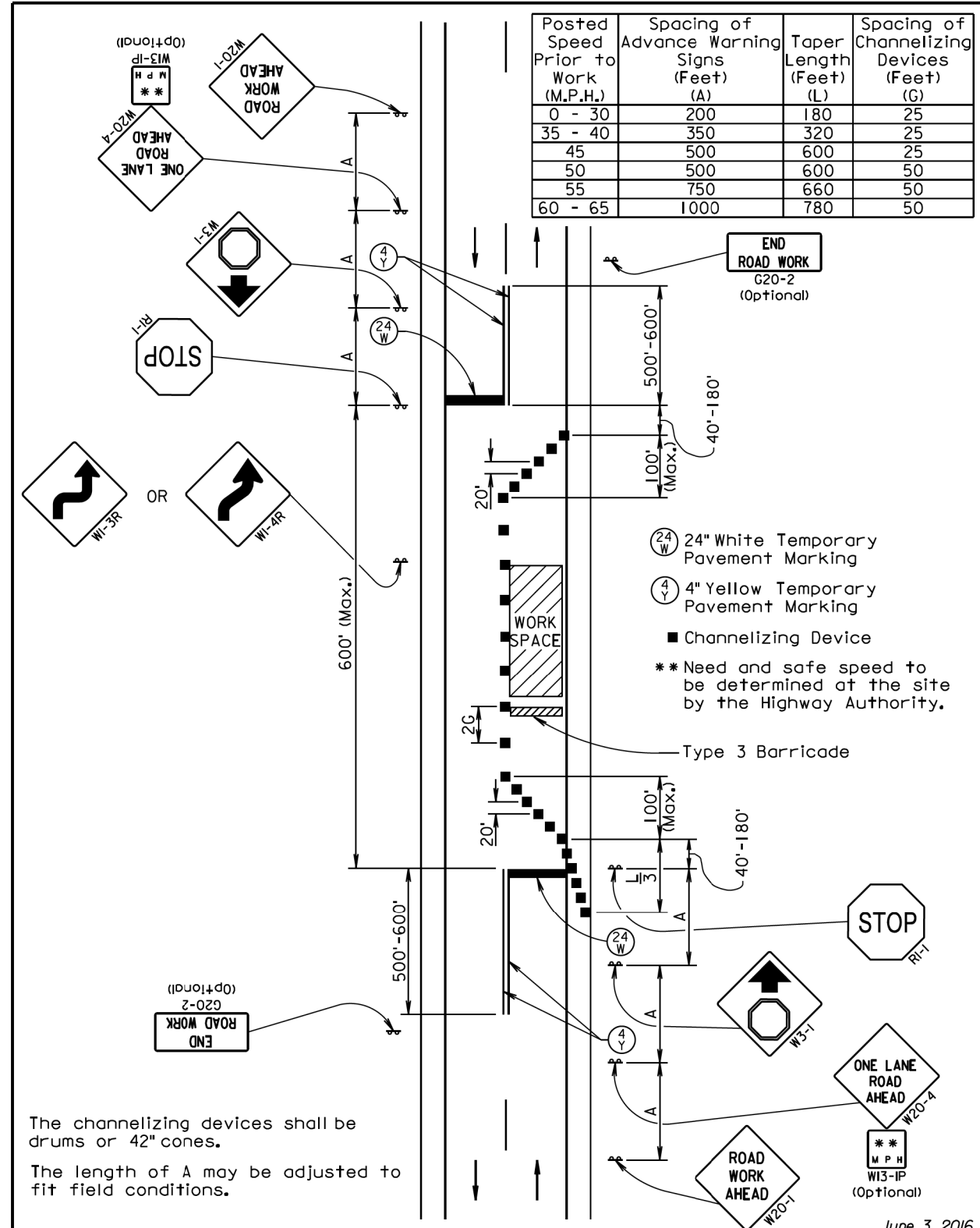
S D D O T	GUIDES FOR TRAFFIC CONTROL DEVICES LANE CLOSURE WITH FLAGGER PROVIDED	PLATE NUMBER 634.23
	<i>Published Date: 1st Qtr. 2017</i>	Sheet 1 of 1

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

- Flagger
- Channelizing Device

The channelizing devices shall be drums or 42" cones.

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



June 3, 2016

S D D O T	GUIDES FOR TRAFFIC CONTROL DEVICES LANE CLOSURE USING STOP SIGNS	PLATE NUMBER 634.25
	<i>Published Date: 1st Qtr. 2017</i>	Sheet 1 of 1

PLOT SCALE - 1:200

PLOTTED FROM - TRM113349

PLOT NAME - 4

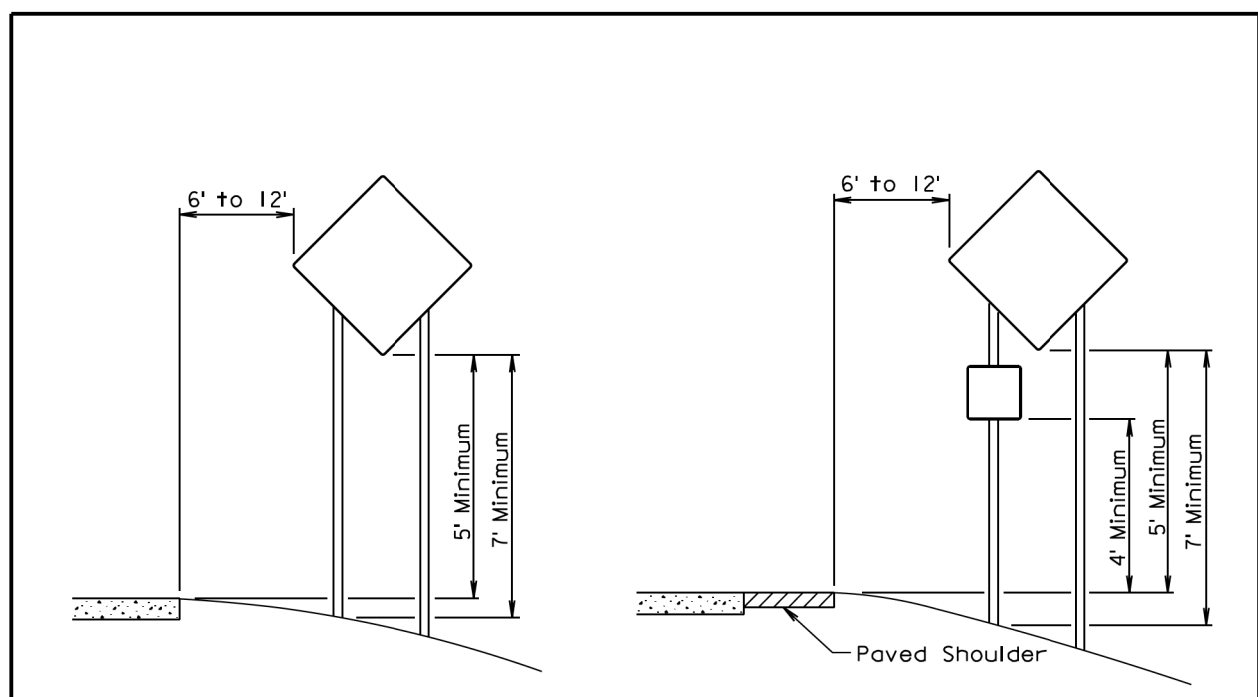
FILE - ... \STANDARDPLATES44.DGN

Plotting Date: 03/27/2017

PLOT SCALE - 1:200

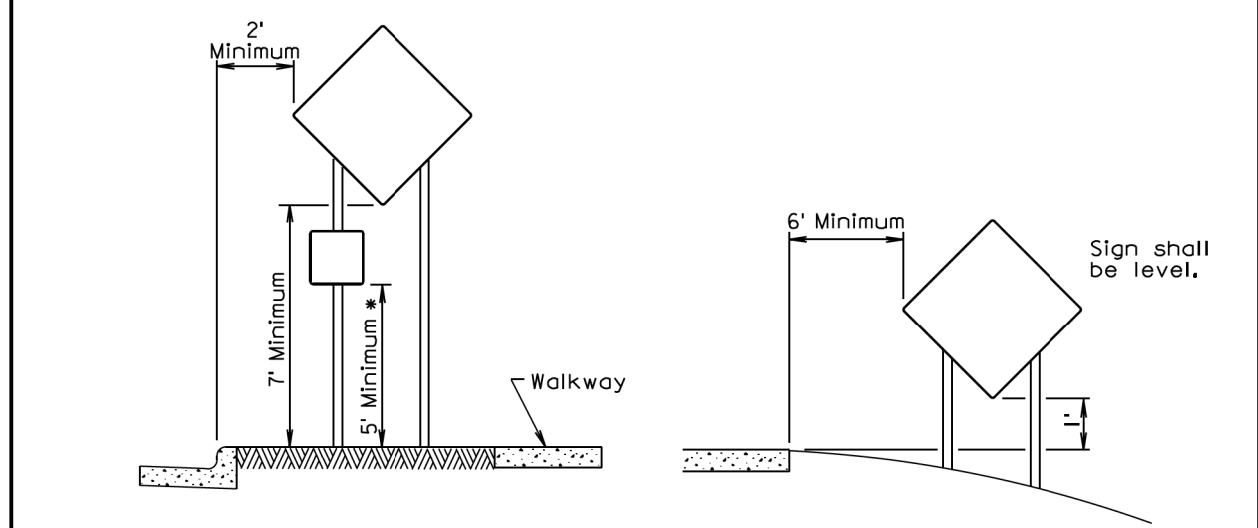
PLOT NAME - 5

FILE - ... \STANDARDPLATES44.DGN



RURAL DISTRICT

RURAL DISTRICT WITH SUPPLEMENTAL PLATE



URBAN DISTRICT

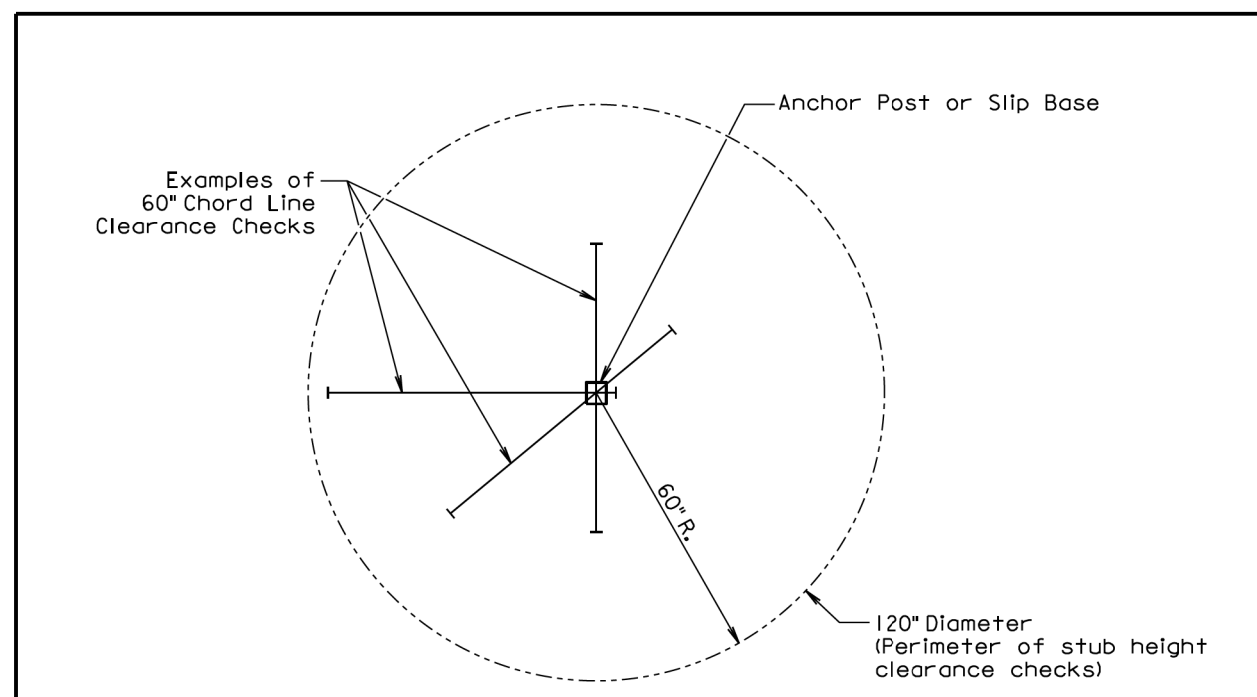
RURAL DISTRICT 3 DAY MAXIMUM

* 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.

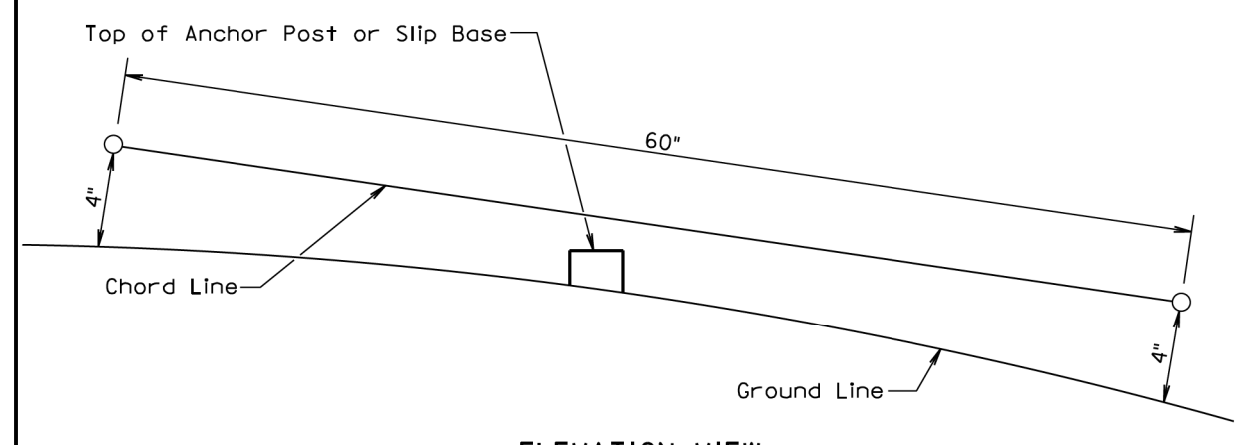
(Not applicable to regulatory signs)

September 22, 2014

Published Date: 1st Qtr. 2017	S D D O T	CRASHWORTHY SIGN SUPPORTS (Typical Construction Signing)	PLATE NUMBER 634.85
			Sheet 1 of 1



PLAN VIEW
(Examples of stub height clearance checks)



ELEVATION VIEW

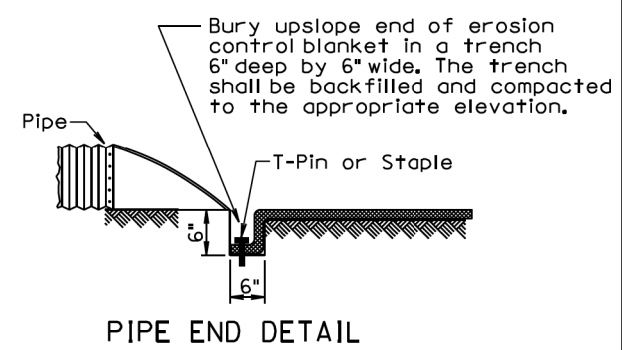
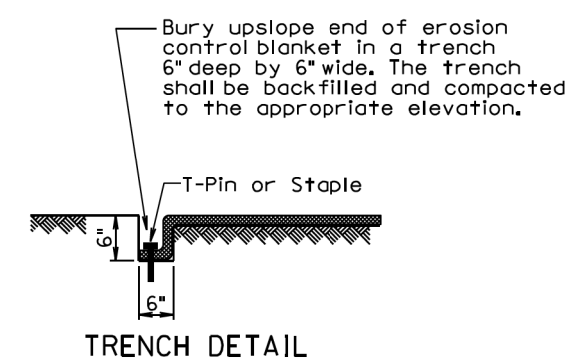
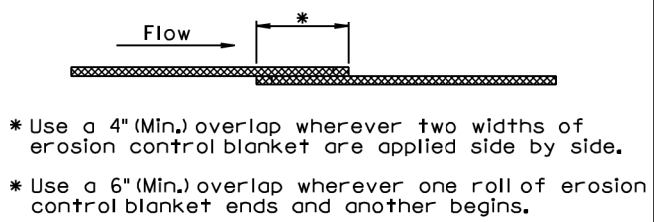
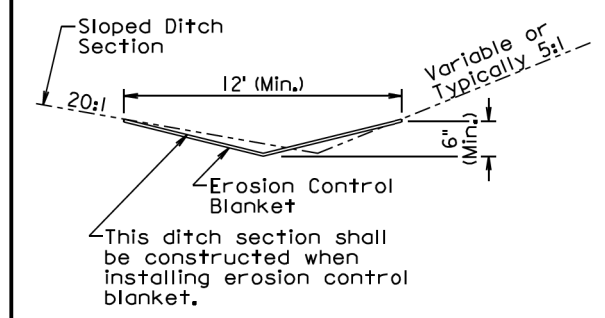
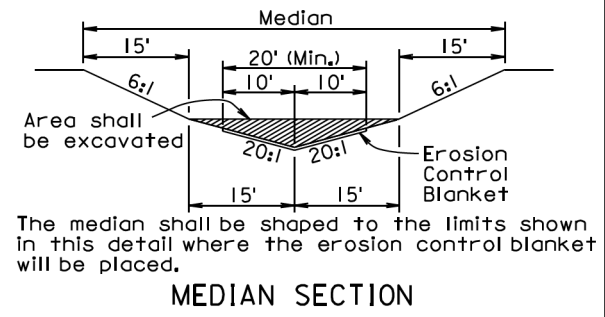
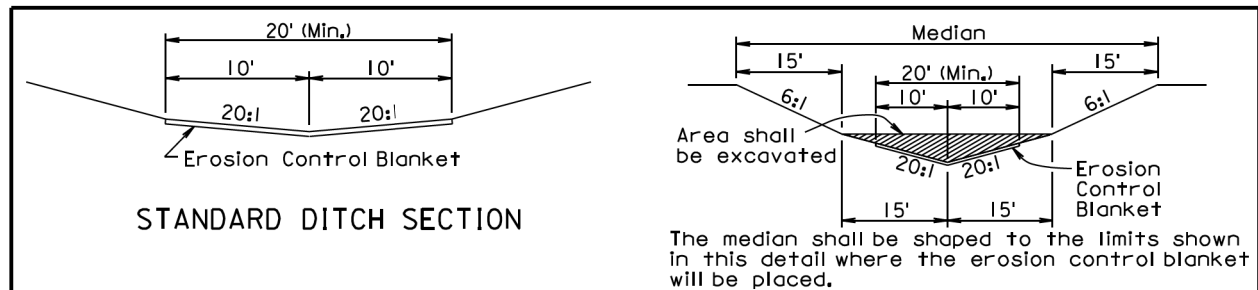
GENERAL NOTES:

The top of anchor posts and slip bases SHALL NOT extend above a 60" chord line within a 120" diameter circle around the post with ends 4" above the ground.
 At locations where there is curb and gutter adjacent to the breakaway sign support, the stub height shall be a maximum of 4" above the ground line at the localized area adjacent to the breakaway support stub.
 The 4" stub height clearance is not necessary for U-channel lap splices where the support is designed to yield (bend) at the base.

July 1, 2005

Published Date: 1st Qtr. 2017	S D D O T	BREAKAWAY SUPPORT STUB CLEARANCE	PLATE NUMBER 634.99
			Sheet 1 of 1

PLOTTED FROM - IRML13349



GENERAL NOTES:

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

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

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

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

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

December 23, 2004

S D D O T	EROSION CONTROL BLANKET	PLATE NUMBER 734.01
		Sheet 1 of 1

Published Date: 1st Qtr. 2017

PLOT SCALE - 1:200

PLOTTED FROM - IRML13349

PLOT NAME - 6

FILE - ... \STANDARDPLATES44.DGN