STATE OF SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION

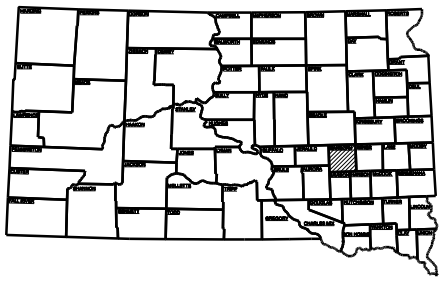
PLANS FOR PROPOSED

PROJECT 0342-253
SANBORN COUNTY

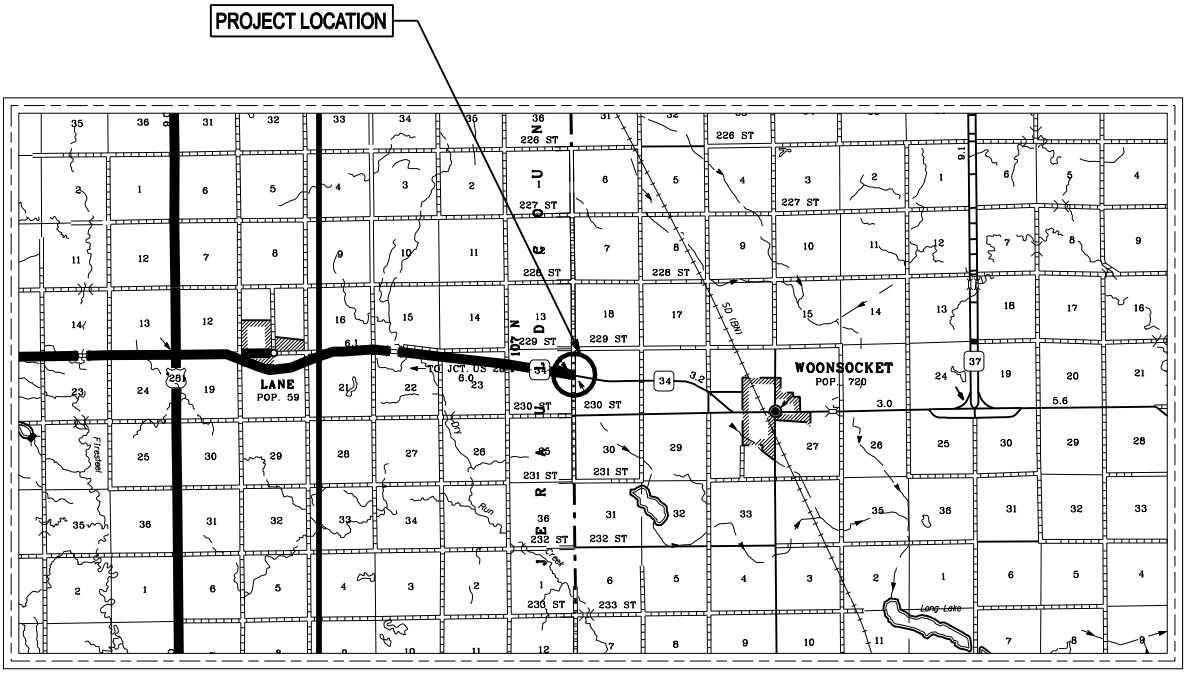
TWIN 30" PIPE REPLACEMENT

PCN I1MU

MRM 324.99



INDEX OF SHEETS



PLANS

Survey by: Brosz Engineering, Inc. Pierre, SD

Plans by: Brosz Engineering, Inc. Pierre, SD

ESTIMATE OF QUANTITIES

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
110E0500	Remove Pipe Culvert	134	Ft
110E1010	Remove Asphalt Concrete Pavement	178	SqYd
120E0010	Unclassified Excavation	210	CuYd
250E0010	Incidental Work	Lump Sum	LS
260E1010	Base Course	105	Ton
320E1200	Asphalt Concrete Composite	40	Ton
421E0100	Pipe Culvert Undercut	50	CuYd
450E0162	30" RCP Class 2, Furnish	134	Ft
450E0170	30" RCP, Install	134	Ft
450E2204	30" RCP Sloped End, Furnish	4	Each
450E2205	30" RCP Sloped End, Install	4	Each
462E0200	Controlled Density Fill	48	CuYd
634E0010	Flagging	120	Hour
634E0100	Traffic Control	602	Unit
634E0120	Traffic Control Miscellaneous	Lump Sum	LS
634E0610	4” Temporary Pavement Marking Tape Type 2	144	Ft
634E0640	Temporary Pavement Marking	1400	Ft
734E0010	Erosion Control	Lump Sum	LS

SPECIFICATIONS

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

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.

SCOPE OF WORK

The following scope of work and sequence of operation shall be as shown below unless otherwise approved by the Engineer:

1. Install Traffic Control to complete the installation of the Impermeable Water Barrier on both ends of the existing pipes. Traffic shall be maintained with Flaggers.
2. Set up work zone lane closure maintaining traffic on ½ of the roadway width as per either Std. Plate 634.23 or 634.25.
3. Dewater site & remove surfacing as marked by the Engineer.
4. Excavate & Remove existing 30” CMP Pipes from the area closed to traffic.
5. Prepare pipe bed & Install Twin 30” Class 2, RCP with tie bolts.
6. Controlled Density Fill shall be used to backfill around pipes.
7. Continue to backfill site to within 16” of the existing surface.
8. Place 12” Base Course & 4” Asphalt Concrete Composite.
9. Reset Traffic Control for the remaining replacement area & repeat steps 4 thru 8.
10. Remove Traffic Control.

TEMPORARY PAVEMENT MARKING

The Contractor shall place and maintain temporary pavement marking in accordance with Section 634 of the Standard Specifications, Supplemental Specifications, Section 6F.71 of the MUTCD, and the details in these plans.

White Temporary Pavement Marking Tape Type 2 shall be used for the stop bars, as detailed in these plans and shall be included in the contract unit price per foot for 4” Temporary Pavement Marking Tape Type 2.

All other temporary pavement marking shall be included in the contract unit price per foot for Temporary Pavement Marking.

Existing pavement marking that conflict with the temporary pavement marking detailed in the traffic control shall be removed by the Contractor unless otherwise specified. Cost for pavement marking removal shall be incidental to the contract unit price per foot for Temporary Pavement Marking.

PERMANENT PAVEMENT MARKING

The Contractor shall advise the Engineer a minimum of 2 weeks prior to opening to traffic to allow the State to place permanent pavement marking before the roadway opens to traffic.

COMPLETION DATE

All work shall be completed on or before November 20th, 2009.

GENERAL MAINTENANCE OF TRAFFIC

Work activities shall be conducted during daylight hours only. During nights, weekends and other nonworking hours, all materials and equipment shall be removed from the roadway. Storage of vehicles and equipment shall be outside the clear zone area a minimum of 30 feet from the driving lanes and as near as possible to the right-of-way line.

Contractor's employees should mobilize at a location off the right-of-way and arrive at the work site in a minimum number of vehicles necessary to do the work. Indiscriminate driving and parking of vehicles within the right-of-way will not be permitted. Any damage to 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 owner and to the satisfaction of the Engineer.

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

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

The Contractor shall furnish any flagging required. Only SDDOT certified flaggers shall be allowed. Tickets showing the name, certification number of the flagger and the number of hours flagging shall be supplied to the Engineer, ***daily***.

WASTE DISPOSAL SITE

The Contractor will be required to furnish a disposal site(s) for the construction/demolition debris generated by this project. Construction/demolition debris may not be disposed of within the 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.

WASTE DISPOSAL SITE(continued)

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 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/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/demolition debris shall consist of a minimum of 1 foot of soil capable of supporting vegetation. Waste disposal sites provided outside of the 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 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.

INCIDENTAL WORK

The Contractor shall install an impermeable water barrier on each end of the work site and dewater the work area before excavation begins. Sump pits and pumping will be allowed provided the work site remains dry.

The Contractor shall provide a description of the water barrier when submitting his bid for the work. The plan will be reviewed and approved prior to beginning the work.

All costs associated with impermeable barrier/dewater site including the materials, equipment, installation, maintenance and removal of the barrier shall be included in the lump sum unit price for Incidental Work.

WATER QUALITY

Surface Water Quality - The Contractor is advised the South Dakota Surface Water Quality Standards, administered by the Department of Environment and Natural Resources (DENR), apply to this project.

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

Storm Water - 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.

UNCLASSIFIED EXCAVATION

Plans quantity will be the basis of payment for the item Unclassified Excavation. No separate measurement will be made unless the limits are extended by the Engineer.

Included in the quantities for Unclassified Excavation are 15 cubic yards for the removal of the topsoil on the in-slopes within the work site. The removal, stockpile and placing of topsoil shall be paid on a plans quantity basis per cubic yard of Unclassified Excavation.

PIPE CULVERT UNDERCUT

The depth of undercut is estimated to be 1'. The actual depth necessary shall be determined during construction. Pipes shown may or may not require undercutting. The Engineer will determine how the pipe shall be undercut in accordance with Section 421 of the Standard Specifications.

The basis of payment for pipe culvert undercut will be determined by field measurements.

CONTROLLED DENSITY FILL

1. Controlled density fill shall be placed around the RCP Pipe to 2/3 up the pipe bottom. The quantity in the bid documents is an estimate only; Contractor shall be paid based on batch plant tickets for the quantity actually used at the site.

2. Controlled density fill shall be a flowable mortar material. Material and mixing shall be in accordance with Section 462 of the SD Standard Specifications, except as modified below. The mix shall be as follows:

MATERIAL	RATE PER CUBIC YARD
Portland Cement, Type II	100 lb
Fine Aggregate	2600 lb
Water	60 gal
Fly Ash, Type C	300 lb

CONTROLLED DENSITY FILL(continued)

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

Percent Passing 3/8 inch sieve	100
Percent Passing No. 200 sieve	0 – 10

4. The mix shown above is designed to produce a minimum compressive strength of 100 psi. The Engineer may adjust the proportion of water at the site to provide the necessary mix consistency.

5. No backfill material shall be placed sooner than 4 hours after placement of the controlled density fill.

6. All costs for furnishing and installing the controlled density fill, including formwork, 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. Payment will be based on actual quantity placed.

EROSION CONTROL

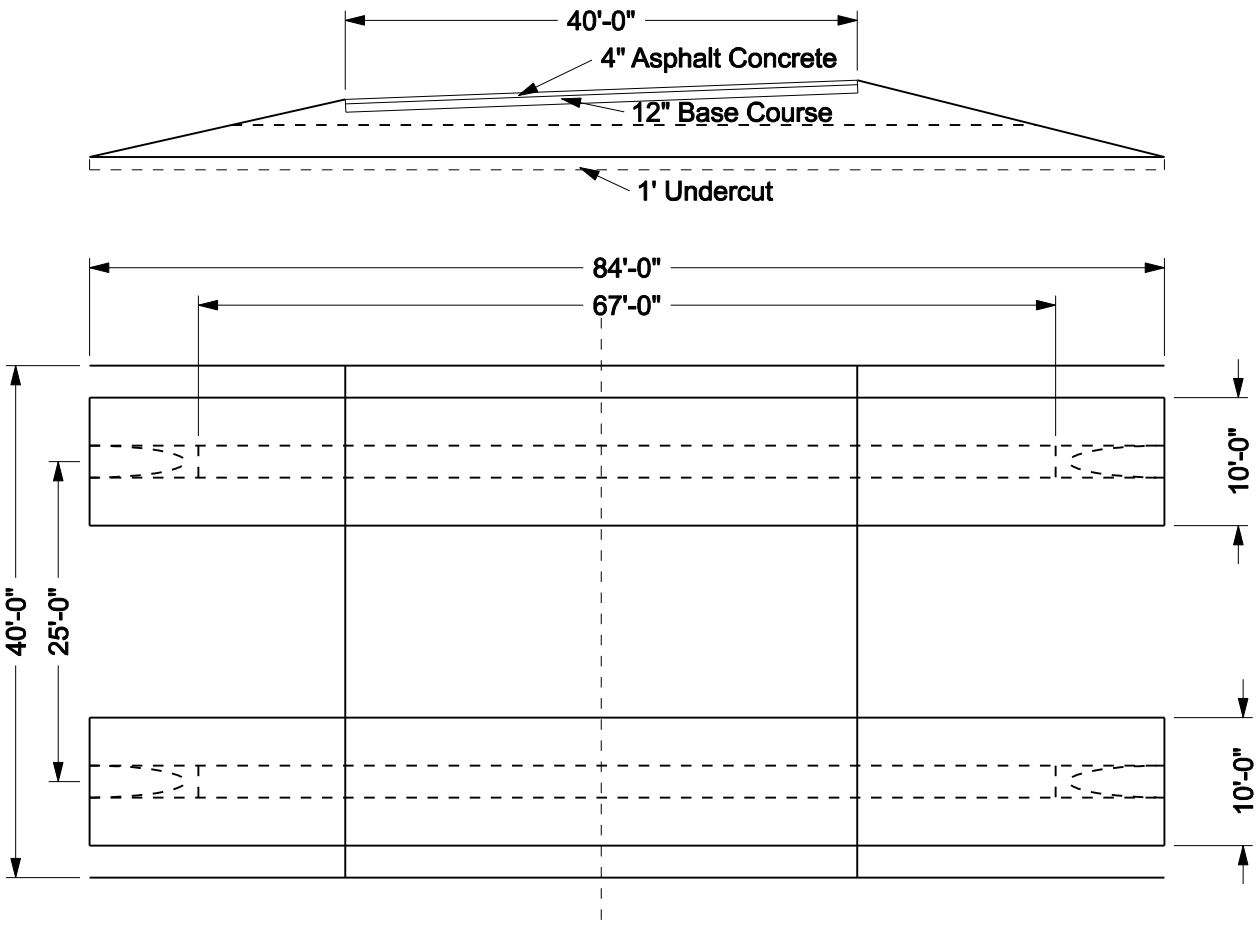
Erosion Control shall consist of all labor, equipment, materials, seed, mulch and low flow silt fence to prevent soil and sediment from leaving the work site and to restore the vegetation on the disturbed in-slopes once the new pipes have been installed. The permanent seed type C required to properly restore the vegetation is estimate to be 10 pounds. The mulch required to adequately cover the disturbed area is estimated to be 1000 pounds. The low flow silt fence estimated to adequately protect the work site is estimated to be 200 lineal feet.

The basis of payment is plans quantity lump sum for the work completed and accepted by the Engineer.

ITEMIZED LIST OF TRAFFIC CONTROL

SIGN CODE	SIGN SIZE	DESCRIPTION	NUMBER REQUIRED	UNITS PER SIGN	UNITS
G20-2A	36" x 18"	END ROAD WORK	2	17	34
R1-1	48" x 48"	STOP	2	34	68
W1-4a	48" x 48"	REVERSE CURVE SIGN (LEFT OR RIGHT)	2	34	68
W3-1A	48" x 48"	STOP AHEAD (SYMBOL)	2	34	68
W20-1	48" x 48"	ROAD WORK #### FT. OR AHEAD	2	34	68
W20-4	48" x 48"	ONE LANE ROAD #### FT. OR AHEAD	2	34	68
W20-7a	48" x 48"	FLAGGER	2	34	68
*****	*****	TYPE III BARRICADE - 8 FT. SINGLE SIDED	4	40	160
				TOTAL UNITS	**602**

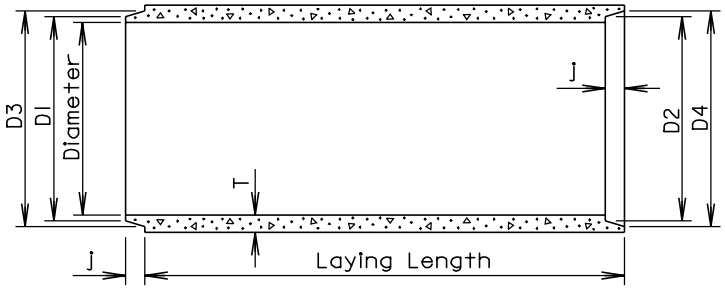
Plan Sheet



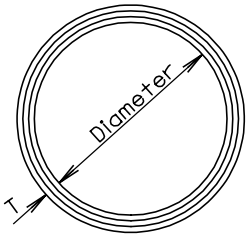
Equalizer pipes- flow lines will be determined by the Engineer during Construction

TOLERANCES IN DIMENSIONS

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



LONGITUDINAL SECTION



END VIEW

GENERAL NOTES:

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

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

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

March 31, 2000

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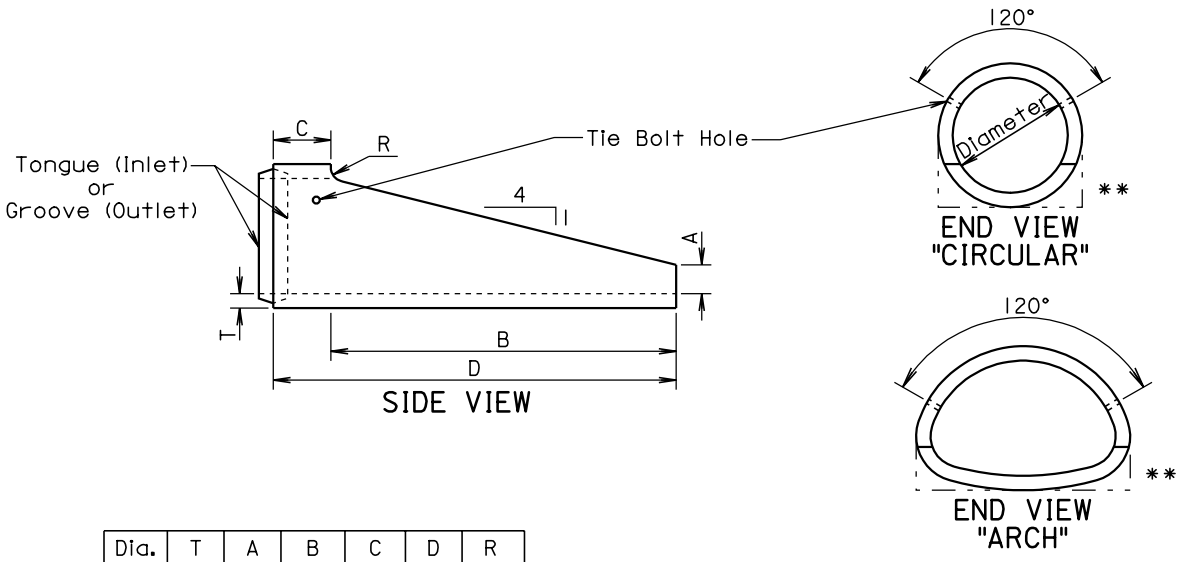
SDDOT

REINFORCED CONCRETE PIPE

PLATE NUMBER
450.01

Sheet 1 of 1



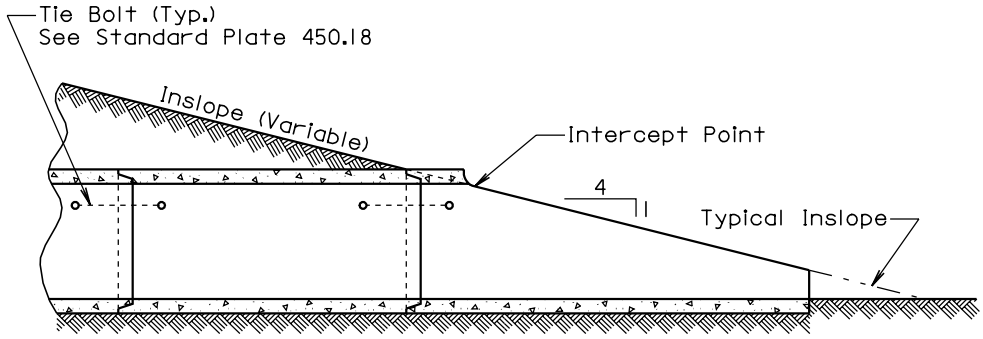
Dia. (in.)	T (in.)	A (in.)	B (in.)	C (in.)	D (in.)	R (in.)
FOR CIRCULAR PIPE						
24	3	6	72	12	84	3
30	3½	7½	90	12	102	3½
FOR ARCH PIPE						
* 24	3	6	48	12	60	3
* 30	3½	7½	60	12	72	3½
* 36	4½	8⅝	66	30	96	0
* 42	4½	10	77¼	18¾	96	0

ALTERNATE

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

* Equivalent Diameter of Circular R.C.P.

** Acceptable Flat Bottom Alternate.

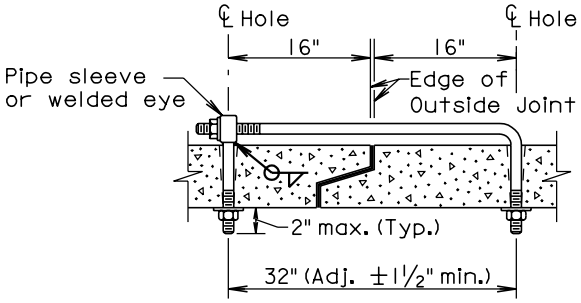


GENERAL NOTE:

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

September 22, 2006

Published Date: 3rd Qtr. 2009	SDDOT	R. C. P. SLOPED ENDS	PLATE NUMBER 450.13 Sheet 1 of 1

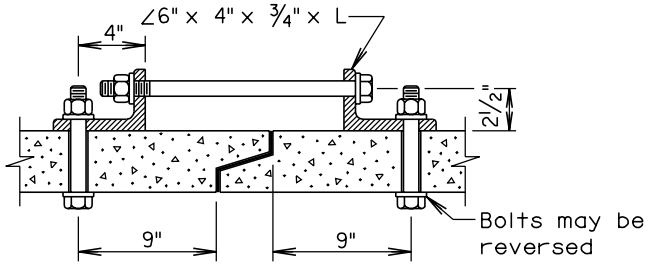


ADJUSTABLE EYE BOLT TIE

GENERAL NOTES:

Tie bolts to be furnished with 2 washers and 2 nuts except for the 9/16" rod which has unthreaded legs.

Use 9/16" rod diameter and 5/8" thread diameter for pipe wall thickness of 2" to 3¼".
Use 11/16" rod diameter and ¾" thread diameter for pipe wall thickness of 3½" to 6½".
Use 29/32" rod diameter and 1" thread diameter for pipe wall thickness of 7" and larger.

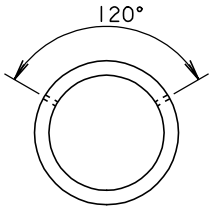


ANGLE AND BOLT TIE

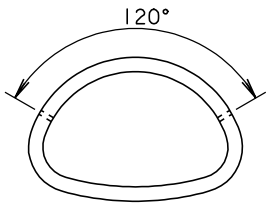
GENERAL NOTES:

L = 4" for ¾" Bolt. L = 6" for 1" Bolt.

Use 3/4" Tie Bolts for pipe diameters less than 48".



END VIEW
"CIRCULAR"



END VIEW
"ARCH"

GENERAL NOTES:

In lieu of Tie Bolts detailed above, Tecktonius Fasteners or other type Tie Bolt connections may be installed if approved by the Engineer.

There will be no separate measurement or payment for Tie Bolts.

The cost of the Tie Bolts shall be incidental to the contract unit price per Foot for the corresponding Bid Item for R.C.P. and/or R.C.P. Arch.

The first three Sections (both inlet and outlet) on R.C.P. and R.C.P. Arch up to and including the 78" diameter or equivalent pipe shall be tied with Tie Bolts. Pipe sizes above 78" diameter or equivalent diameter shall have all Sections tied. Each End Section is considered as one section.

March 31, 2000

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SDDOT

TIE BOLTS FOR
R.C.P. END SECTIONS

PLATE NUMBER
450.18

Sheet 1 of 1

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

Flagger

Channelizing Device

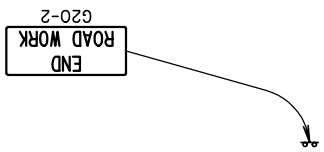
For low-volume traffic situations with short work zones on straight roadways where the flagger is visible to road users approaching from both directions, a single flagger may be used.

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

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

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

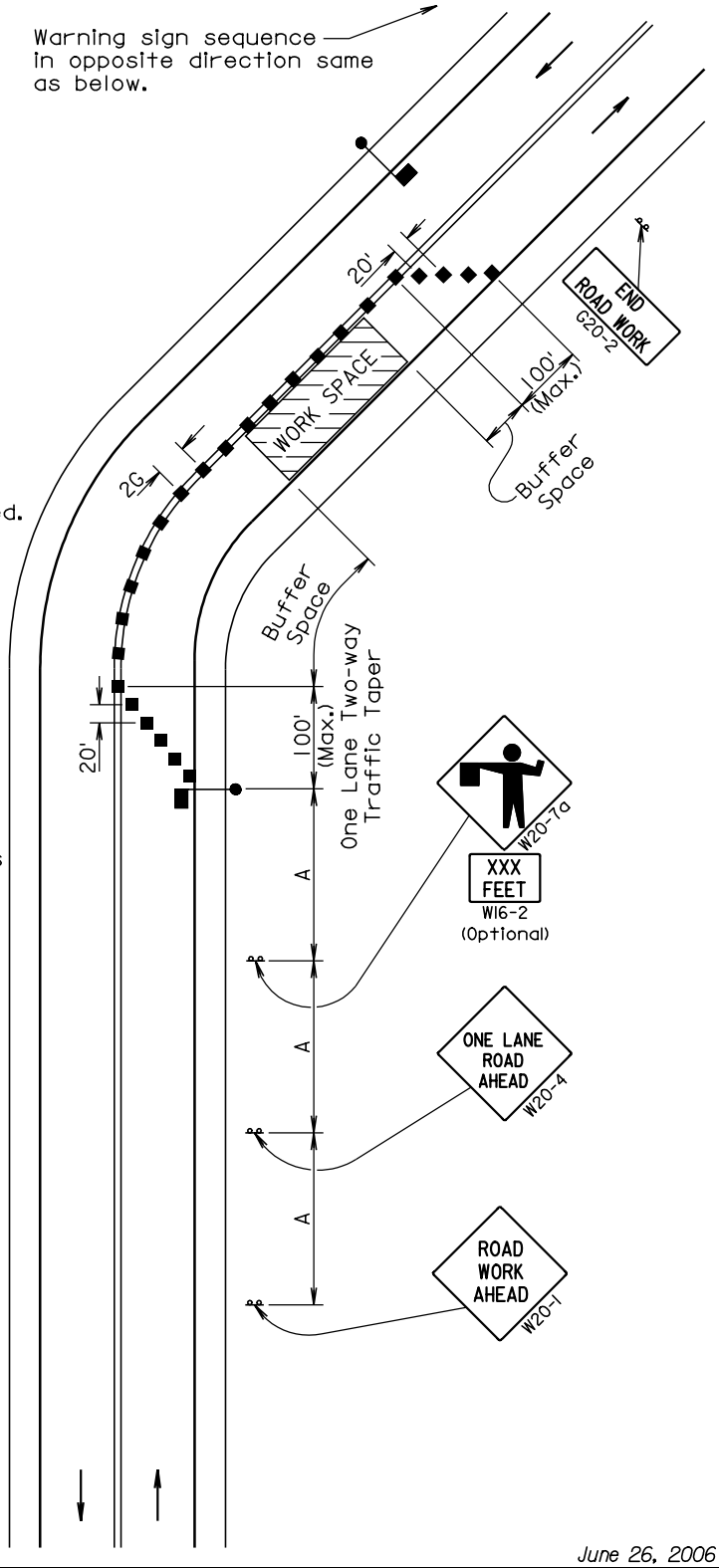
The channelizing devices shall be drums or type II barricades if traffic control must remain overnight or longer. During daylight hours, 42" cones may be used in lieu of drums or type II barricades along the centerline.



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 shall be a sufficient length so that the channelizing devices are visible to approaching traffic.



June 26, 2006

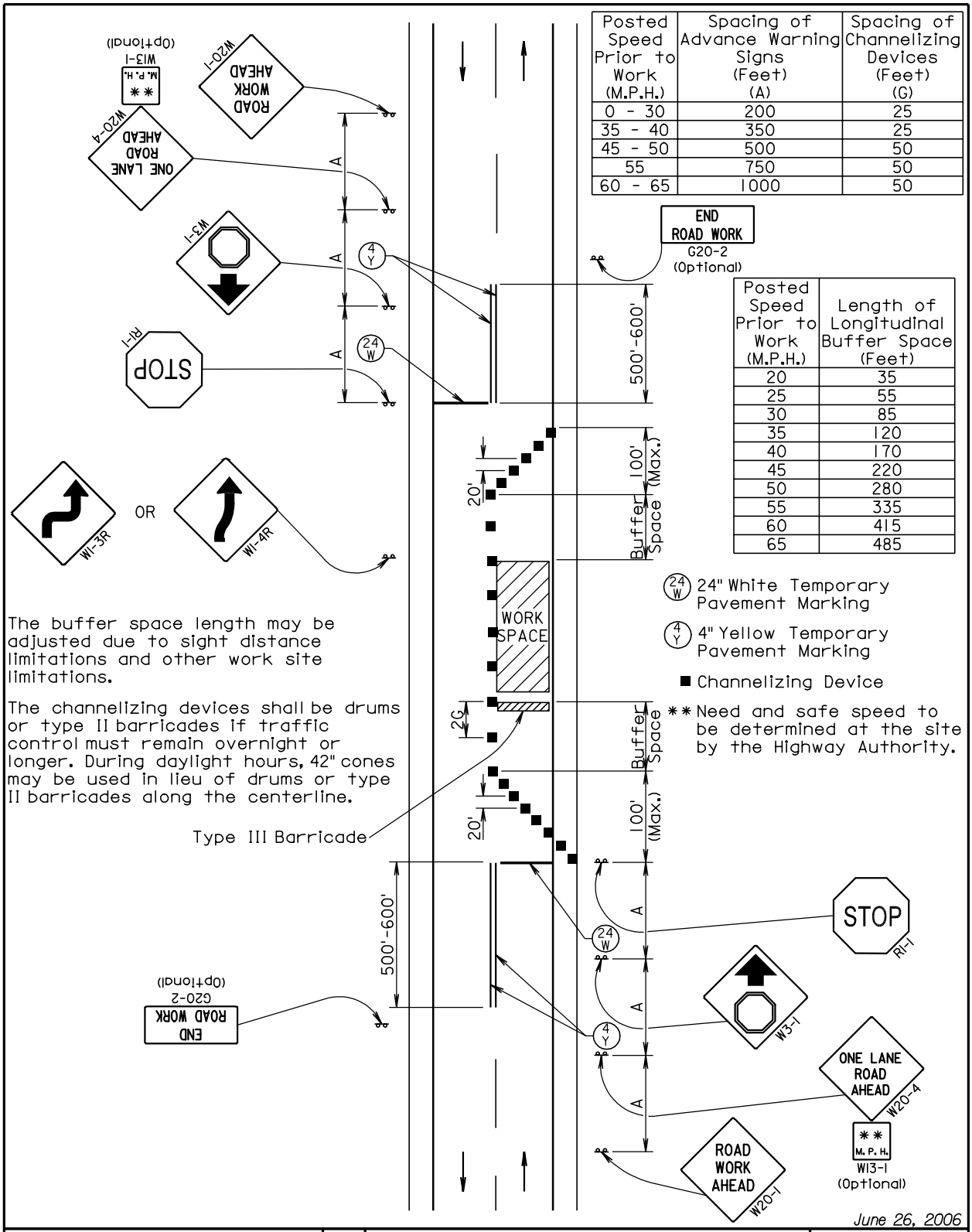
Published Date: 3rd Qtr. 2009

SDDOT

GUIDES FOR TRAFFIC CONTROL DEVICES
LANE CLOSURE WITH FLAGGER PROVIDED

PLATE NUMBER
634.23

Sheet 1 of 1



Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet) (A)	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

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

June 26, 2006

Published Date: 3rd Qtr. 2009

SDDOT

GUIDES FOR TRAFFIC CONTROL DEVICES
LANE CLOSURE USING STOP SIGNS

PLATE NUMBER
634.25

Sheet 1 of 1