

STATE OF SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION
PLANS FOR PROPOSED
PROJECT 044-392
SD HIGHWAY 44
TRIPP COUNTY
PIPE AND EROSION REPAIR
PCN 121H

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	044-392	1	19

INDEX OF SHEETS

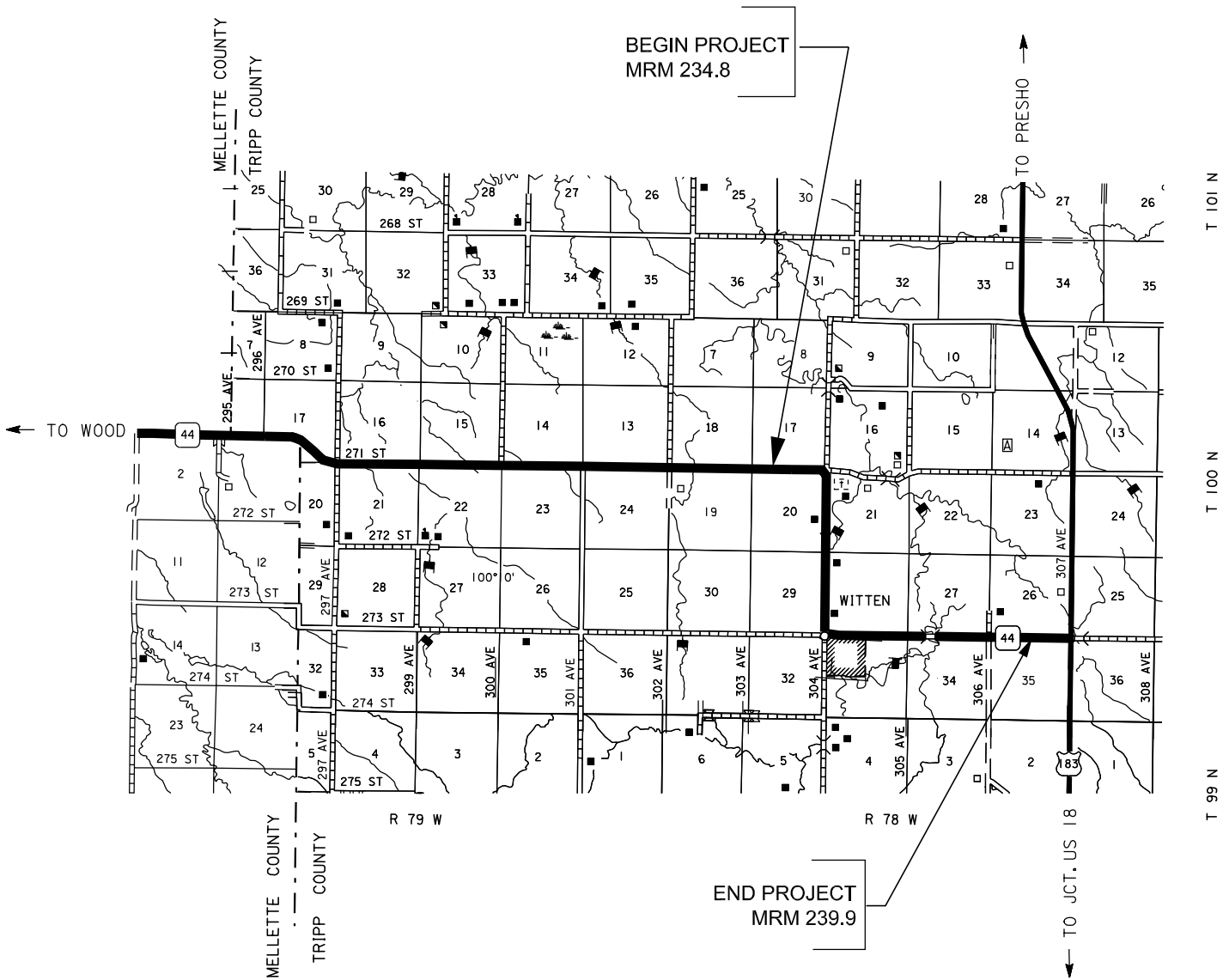
Sheet No.	1	Title Sheet & Layout Map
Sheet No.	2	Estimate of Quantities
Sheet Nos.	2-5	Plan Notes
Sheet Nos.	6-7	Scope of Work
Sheet No.	8	Summary of Quantities
Sheet No.	9	Sign Tabulation
Sheet Nos.	10-19	Standard Plates

DESIGN DESIGNATION

ADT (2008)	340
ADT (2028)	550
DHV	85
D	50%
T DHV	6.9%
T ADT	15.1%
V	55 MPH

STORM WATER PERMIT

None Required



ESTIMATE OF QUANTITIES

Bid Item Number	Item	Quantity	Unit
009E0010	Mobilization	Lump Sum	LS
100E0020	Clear and Grub Tree	1	Each
110E0510	Remove Pipe End Section	12	Each
110E7500	Remove Pipe For Reset	4	Ft
110E7510	Remove Pipe End Section For Reset	2	Each
120E0600	Contractor Furnished Borrow	4,252	CuYd
120E4100	Reprofiling Ditch	33.6	Sta
230E0100	Remove and Replace Topsoil	Lump Sum	LS
450E0122	18" RCP Class 2, Furnish	20	Ft
450E0130	18" RCP, Install	20	Ft
450E0142	24" RCP Class 2, Furnish	6	Ft
450E0150	24" RCP, Install	6	Ft
450E2008	18" RCP Flared End, Furnish	2	Each
450E2009	18" RCP Flared End, Install	2	Each
450E2016	24" RCP Flared End, Furnish	2	Each
450E2017	24" RCP Flared End, Install	2	Each
450E4759	18"CMP 16 Gauge, Furnish	94	Ft
450E4760	18" CMP, Install	94	Ft
450E4769	24" CMP 16 Gauge, Furnish	10	Ft
450E4770	24" CMP, Install	10	Ft
450E4779	30" CMP 16 Gauge Furnish	14	Ft
450E4780	30" CMP, Install	14	Ft
450E5010	18" CMP Elbow, Furnish	1	Each
450E5011	18" CMP Elbow, Install	1	Each
450E5211	18" CMP Flared End, Furnish	6	Each
450E5212	18" CMP Flared End, Install	6	Each
450E5215	24" CMP Flared End, Furnish	2	Each
450E5216	24" CMP Flared End, Install	2	Each
450E5219	30" CMP Flared End, Furnish	2	Each
450E5220	30" CMP Flared End, Install	2	Each
450E5306	18" CMP Sloped End, Furnish	2	Each
450E5307	18" CMP Sloped End, Install	2	Each
450E5539	36" CMP Arch 16 Gauge, Furnish	32	Ft
450E5540	36" CMP Arch, Install	32	Ft
450E5814	36" CMP Arch Flared End, Furnish	4	Each
450E5815	36" CMP Arch Flared End, Install	4	Each
450E9000	Reset Pipe	4	Ft
450E9001	Reset Pipe End Section	2	Each
634E0010	Flagging	25	Hour
634E0100	Traffic Control	442	Unit
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
700E0310	Class C Riprap	26.0	Ton
720E1015	Bank and Channel Protection Gabion	14.0	CuYd
730E0212	Type F Permanent Seed Mixture	102	Lb
732E0100	Mulching	7.9	Ton
734E0154	12" Diameter Erosion Control Wattle	100	Ft
831E0110	Type B Drainage Fabric	46	SqYd

SPECIFICATIONS

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

GENERAL MAINTENANCE OF TRAFFIC

The Sign Tabulation was based on the units from Standard Plate Numbers 634.01, 634.03, and 634.23. The Contractor shall be allowed to work in only one work area. The Contractor may submit a proposal, for the Engineer’s approval at the preconstruction meeting, to work in multiple work areas. Traffic Control devices moved between work sites on the same project will be paid for only once.

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

Storage of vehicles and equipment shall be outside the clear zone 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 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.

GENERAL MAINTENANCE OF TRAFFIC (CONTINUED)

All construction operations shall be conducted in the general direction of traffic movement. Portable sign supports may be used as long as the duration is less than 3 days. 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. If the duration is more than 3 days the signs shall meet the minimum mounting heights of 5 foot for rural areas and 7 foot for urban areas.

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

Traffic control signs furnished will be paid for only once. The cost of moving signs within project limits or from project to project shall be incidental to the contract unit price per unit for “Traffic Control”.

Additional standard signs, as ordered by the Engineer, shall be available within two (2) working days. Failure to provide signs within this time limit will result in liquidated damages being assessed in the amount of \$100.00 per calendar day. Payment for additional signs will be paid for using the contract unit price per unit for “Traffic Control”.

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.

The Contractor shall furnish, install and maintain Truck Crossing signs. The exact number and location will be determined on construction. Payment shall be incidental to the contract unit price per unit for “Traffic Control” and will be paid for once on the project.

. 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 company 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 Project Engineer to determine modifications that will be necessary to avoid utility impacts.

PIPE NOTES

The Contractor is responsible for verifying the size of each pipe prior to ordering any pipe. The Contractor shall obtain the approval of the Engineer before ordering any pipe.

Pipe culverts that are removed and not reset shall become the property of the Contractor. Pipe culverts shall be disposed of as per the waste disposal site notes and shall not be in view from the project upon completion of the project.

The excavation required to expose existing pipe and ends shall be incidental to the contract unit prices for Remove Pipe End Section, Remove Pipe For Reset, Remove Pipe End Section for Reset, and corresponding pipe install bid items.

When it is necessary to remove damaged CMP or a damaged CMP end, it may be cut with a torch. If the pipe is cut with a torch, it shall be painted with a galvanizing paint approved by the Engineer. The cost of removing damaged portions of CMP shall be incidental to the contract unit prices for Remove Pipe End Section, Remove Pipe For Reset, Remove Pipe End Section for Reset, and corresponding pipe install bid items

TIE BOLTS FOR RCP

Tie Bolts shall be installed at the inlet and outlet on the first three sections of new/reset culvert and on new/reset culvert ends (requires connection from existing culvert to new end section).

For informational purposes: Field drilling will be required to install the tie bolts on reset culvert, on reset culvert ends and on existing culvert when installing a new/reset end section.

Cost for removing tie bolts, drilling tie bolt holes and furnishing and installing tie bolts shall be incidental to the contract unit prices for installing or resetting RCP Culverts and End Sections. Existing tie bolts may be salvaged and reused if condition is acceptable to the Engineer.

CONTRACTOR FURNISHED BORROW

Contractor Furnished Borrow shall be required to fill in scour holes and other erosion as noted in the scope of work for the individual repair sites. All fill material shall meet with the approval of the Engineer. Borrow Areas within the right-of-way may be available with prior approval of the Engineer. The plans quantity for “Contractor Furnished Borrow” as shown in the Estimate of Quantities will be the basis of payment for this item unless the Engineer orders changes. The Contractor is responsible for obtaining all required permits and clearances for the borrow site.

All work shall be accomplished within the right-of-way. Once a work site is opened up at a given location, work shall proceed in a continuous matter to minimize the potential for erosion.

It is anticipated that water for compaction will not be required. When, in the opinion of the Engineer, the fill material is dry, water may be ordered and placed to the satisfaction of the Engineer. The cost of water shall be incidental to the contract unit price per cubic yard for “Contractor Furnished Borrow”.

Restoration of the Contractor furnished borrow site shall be the responsibility of the Contractor.

CONTRACTOR FURNISHED BORROW (CONTINUED)

Compaction of Contractor Furnished Borrow shall be to the satisfaction of the Engineer.

HISTORICAL PRESERVATION CLEARANCES

To obtain State Historical Preservation Office (SHPO) clearance, a cultural resources survey may need to be conducted by a qualified archaeologist. The Contractor shall arrange and pay for the cultural resource survey and/or records search. In lieu of a cultural resources survey, the Contractor could request a records search from Jim Donohue, State Archaeological Research Center (SARC) at 605-394-1937. Provide SARC 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 no artifacts have been found on the site.

If any earth disturbing activities occur within the current geographical or historic boundaries of any South Dakota reservation, the Contractor shall obtain Tribal Historical Preservation Office (THPO) clearance. If no THPO exists, the required SHPO clearance shall suffice, with documentation of Tribal contact efforts provided to SHPO.

To facilitate SHPO or THPO responses, the Contractor should submit a records search or cultural resources survey report along with a legal description of the site, a topographical map with the site clearly marked, and evidence of prior site disturbance to Tom Lehmkuhl, DOT Environmental Engineer, 700 East Broadway Avenue, Pierre, SD 57501-2586 (605-773-3180). Allow 30 days from the date this information is submitted to the Environmental Engineer for SHPO/THPO approval. The Contractor is responsible for obtaining all required permits and clearances for staging areas, borrow sites, waste disposal sites, and all material processing sites. The Contractor shall provide the required permits and clearances to the Engineer at the preconstruction meeting.

WASTE DISPOSAL SITE

The Contractor will be required to furnish a site(s) for the disposal of construction/demolition debris generated by this project.

Construction/demolition debris may not be disposed of within the State ROW.

All construction/demolition debris generated by this project shall be cleaned up and disposed by the Contractor.

The waste disposal site(s) shall be managed and reclaimed in accordance with the following from the Administrative Rules of South Dakota (Solid Waste) Article 74:27 administered by the Department of Environmental 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 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 State ROW shall be seeded in accordance with Natural Resources Conservation Service recommendations. 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”.

WASTE DISPOSAL SITE (CONTINUED)

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 will remove and reset existing yellow pipe marking posts at repair sites. This work shall be incidental to the contract unit prices for pipe and pipe end removal and corresponding pipe install bid items.

REMOVE AND REPLACE TOPSOIL

Prior to placement of fill material, the Contractor will be required to remove 3 inches of topsoil and replace it on the newly constructed embankments. Payment for the above shall incidental to the lump sum price for “Remove and Replace Topsoil”.

TYPE F PERMANENT SEED MIXTURE

All disturbed areas within the right-of-way shall be seeded with Type F Permanent Seed Mixture. All permanent seed shall be planted in the topsoil at a depth of ¼” to ½”.

Permanent Seeding will be measured and paid for where embankment work is accomplished.

Seeding of borrow areas within the right-of-way will be required as specified above but will not be measured for payment. Restoration of borrow areas outside the right-of-way will be as per agreement with the landowner and will not be paid for.

All seed broadcast must be raked or dragged in (incorporated) with the top 1/4 to 1/2 inch of topsoil to the satisfaction of the Engineer. This requirement may be waived by the Engineer during construction when raking or dragging is deemed not feasible by conventional methods. Hydroseeding or hand seeding devices approved by the Engineer will be allowed.

Type F Permanent Seed Mixture shall consist of the following:

Grass Species	Variety	Pure Live Seed (PLS) (Pounds/Acre)
Western Wheatgrass	Flintlock, Rodan, Rosana	7
Green Needlegrass	Lodorm	4
Sideoats Grama	Butte, Killdeer, Pierre, Trailway	3
Blue Grama	Bad River, Willis	2
Oats or Spring Wheat: April through July; Winter Wheat: August through November		10
Total:		26

FERTILIZING

Application of fertilizer will not be required on this project.

MULCHING (HAY OR STRAW)

Following permanent seeding, mulch consisting of grass hay or straw shall be blown on at the rate of 2 tons per acre and punched in on slopes 3:1 and flatter and on 2:1 slopes where equipment can be operated without rutting the slope due to slippage.

Bales shall be inspected for noxious weeds by the County Weed Supervisor in which the bales are to be used. This shall be done prior to construction activities. The Contractor shall provide written verification from the County Weed Supervisor stating the bales are free of noxious weeds.

Bales with noxious weed contamination will be rejected and the Contractor will be required to remove the contaminated bales from the project.

Mulch may be used for temporary erosion control on areas determined by the Engineer during construction for temporary stabilization.

EROSION CONTROL WATTLES

Erosion control wattles for restraining the flow of runoff and sediment shall be installed at locations determined by the Engineer during construction. Refer to Standard Plate 734.06 for details.

The Contractor shall provide certification that the erosion control wattles do not contain noxious weed seeds.

A quantity of 100 feet of 12” Diameter Erosion Control Wattles has been added to the Estimate of Quantities for temporary erosion and sediment control around excavation and/or borrow piles and the pipe ends while pipe clean out work is being completed.

EROSION CONTROL WATTLES (CONTINUED)

The erosion control wattle provided shall be from the list shown below:

Product	Manufacturer
Curlex Sediment Log AEC Premier Straw Wattles	American Excelsior Company Arlington, TX Phone: 1-800-777-7645 www.amerexcel.com
Aspen Excelsior Logs and Excel Straw Logs	Western Excelsior Corporation Mancos, CO Phone: 1-800-833-8573 www.westernexcelsior.com
Earth Saver Rice Straw Wattles	R.H. Dyck Inc. Winters, CA Phone: 1-866-928-8537 www.earth-savers.com
Amber Waves Straw Wattles	Limpert Environmental Litchfield, MN Phone: 1-320-693-2565 www.limpertenvironmental.com
Bio Logs	Flaxtech, LLC Rock Lake, ND Phone: 1-866-444-3529
Stenlog	ECB Bioproducts St. Andrews, MB Phone: 1-866-317-3346 www.erosioncontrolblanket.com
Winters Wattles	Winters Excelsior Company Birmingham, AL Phone: 1-800-248-7237 www.wintersexcelsior.com
Patriot Wood Fiber Logs and Patriot Straw Wattles	Patriot Environmental Products, Inc. Mesa, AZ Phone: 1-480-345-7293 www.digitaldesigncore.com/patriot/WattleSpecs.pdf

SCOPE OF WORK

MRM 234.8 The site work on the right consists of filling an area 100 feet long x 25 feet width x 6 feet depth over new pipe and end with Contractor Furnished Borrow, adding a 12 feet section and flared end to the existing 18” CMP, removing and resetting the yellow pipe marking post, and reprofiling ditch 100 feet east and 100 feet west of the pipe end. The site work on the left consists of filling an area over new pipe and end 100 feet long x 20 feet width x 4 feet depth with Contractor Furnished Borrow, adding a 12 feet section and flared end to the existing 18” CMP, removing and resetting the yellow pipe marking post, and reprofiling ditch 100 feet east and west of the pipe end. All disturbed areas shall be seeded and mulched

MRM 235.1 The site work on the right consists of filling an area over new pipe and end 100 feet length x 25 feet width x 6 feet depth with Contractor Furnished Borrow, adding a 12 feet section and flared end to the existing 18” CMP, removing and resetting the yellow pipe marking post, and reprofiling ditch 100 feet east and west of the pipe end. The site work on the left consists of filling an area over new pipe and end 50 feet length x 20 feet width x 3 feet depth with Contractor Furnished Borrow, adding a 12 feet section and flared end to existing 18” CMP, removing and resetting the yellow pipe marking post, and reprofiling ditch 100 feet east and 100 feet west of the pipe end. All disturbed areas shall be seeded and mulched.

MRM 235.3 The site work on the right consists of removing and resetting 4 feet of 18” RCP, adding 12 feet of new 18” RCP and flared end with male end, filling an area over new pipe 25 feet length x 6 feet width with Contractor Furnished Borrow, removing and resetting the yellow marking post, and reprofiling ditch 75 feet east and west of pipe end. The site work on the left consists of adding 12 feet of new 18” RCP and flared end with female end, filling an area over new pipe 100 feet x 4 feet x 25 ft with Contractor Furnished Borrow, removing and resetting yellow marking post, and reprofiling ditch for 50 feet east and west of pipe end. All disturbed areas will be seeded and mulched. Contractor will repair broken male end on existing pipe prior to adding pipe end with metal sleeve or other suitable repair. This work will be incidental to the contract unit price for 18” RCP Flared End, Install.

SCOPE OF WORK (CONTINUED)

MRM 235.5 The site work on the right consists of filling an area 100 feet length x 25 feet width x 3 feet depth over new pipe end with Contractor Furnished Borrow, adding a 24” RCP Flared End, and reprofiling ditch 50 feet east and west of existing pipe end. The site work on the left consists of filling an area 100 feet length x 20 feet width x 2 feet depth over new pipe and flared end with Contractor Furnished Borrow, adding a 6 feet section and flared end to existing 24” RCP, and reprofiling ditch 50 feet east and west of pipe end. All disturbed areas will be seeded and mulched.

MRM 235.8 The site work on the right consists of reprofiling ditch 75 feet south and north of existing 24” CMP pipe end. There is no site work required on the left. All disturbed areas will be seeded and mulched.

MRM 236.4 The site work on the right consists of reprofiling ditch 100 feet south and north of approach. There is no site work required on the left. All disturbed areas will be seeded and mulched.

MRM 236.5 The site work on the right consists of filling an area over new pipe and end 50 feet length x 6 feet width x 2 feet depth with Contractor Furnished Borrow, removing existing 24” CMP flared end, adding a 6 feet section and 24” CMP flared end, removing and resetting the yellow pipe marking post, and reprofiling ditch 100 feet south and north of pipe. The site work on the left consists of filling an area 50 feet length x 4 feet width x 2 feet depth over new pipe and end with Contractor Furnished Borrow, removing existing 24” CMP flared end, adding a 4 feet section and 24” CMP flared end, placing Class C riprap and Type B drainage fabric at end of pipe 50 feet length x 4 feet width x 2 feet depth, removing and resetting the yellow pipe marking post, and reprofiling ditch 100 feet south/ahead of pipe. All disturbed areas will be seeded and mulched.

SCOPE OF WORK (CONTINUED)

MRM 236.8 The site work on the right side consists of filling an area 20 feet length x 10 feet width x 1 feet depth over new pipe and end with Contractor Furnished Borrow, removing existing 18” CMP Flared End, adding a 6 feet section, 45 degree elbow and 18” CMP Flared End, and reprofiling ditch 100 feet ahead/south of existing pipe. The site work on the left side consists of filling an area 50 feet length x 20 feet width x 1 feet depth over new pipe and end with Contractor Furnished Borrow, removing existing 18” CMP Flared End, adding an 8 feet section and 18” CMP Flared End, and reprofiling ditch 50 feet ahead and back of existing pipe end. All disturbed areas will be seeded and mulched.

MRM 237.5 There is a twin 18” CMP with 9 feet center-to-center spacing between pipes at this site. Each side has one flared end and one sloped end. The site work on the right consists of filling an area 100 feet x 10 feet x 4 feet over new pipes and ends with Contractor Furnished Borrow, removing 18” CMP Flared End, removing and resetting 18” CMP Sloped End, adding one 8 feet section to each existing twin 18” CMP, adding a 18” CMP Sloped End, removing and resetting yellow pipe marking posts, and reprofiling ditch length 100 feet. The site work on the left consists of filling an area 100 feet length x 10 feet width x 4 feet depth over new pipes and ends with Contractor Furnished Borrow, removing 18” CMP Flared End, removing and resetting 18” CMP Sloped End, adding one 8 feet section to each existing twin 18” CMP, adding a 18” CMP Sloped End, removing and resetting yellow pipe marking posts, and reprofiling ditch length 100 feet. All disturbed areas will be seeded and mulched.

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
SD	044-392	7	19

SCOPE OF WORK (CONTINUED)

MRM 237.7 The site work on the right side consists of filling an area 100 feet length x 10 feet width x 6 feet depth over new pipe and end with Contractor Furnished Borrow, removing 30” CMP Flared End, adding an 8 feet section and flared end to existing 30” CMP, removing and resetting the yellow pipe marking post, and reprofiling ditch 50 feet east and west of existing pipe end. The site work on the left side consists of filling an area 100 feet length x 8 feet width x 6 feet depth over new pipe and end with Contractor Furnished Borrow, removing 30” CMP Flared End, adding a 6 feet section and flared end to existing 30” CMP, removing and resetting the yellow pipe marking post, reprofiling ditch 100 feet to west and 50 feet to east of existing pipe, and removing a tree with 3 trunks approximately 8-14” thick. All disturbed areas will be seeded and mulched. All work to remove tree shall be incidental to the contract unit price for “Clear and Grub Tree”.

MRM 238.1 There is no site work required on the right side. The site work on the left consists of reprofiling ditch a distance of 100 feet west from approach pipe. All disturbed areas will be seeded and mulched.

MRM 238.7 The site work on the right side consists of shaping an area 30 feet x 45 feet from the inlet to ROW fence to reestablish drainage. There is no site work required on the left side. All disturbed areas will be seeded and mulched.

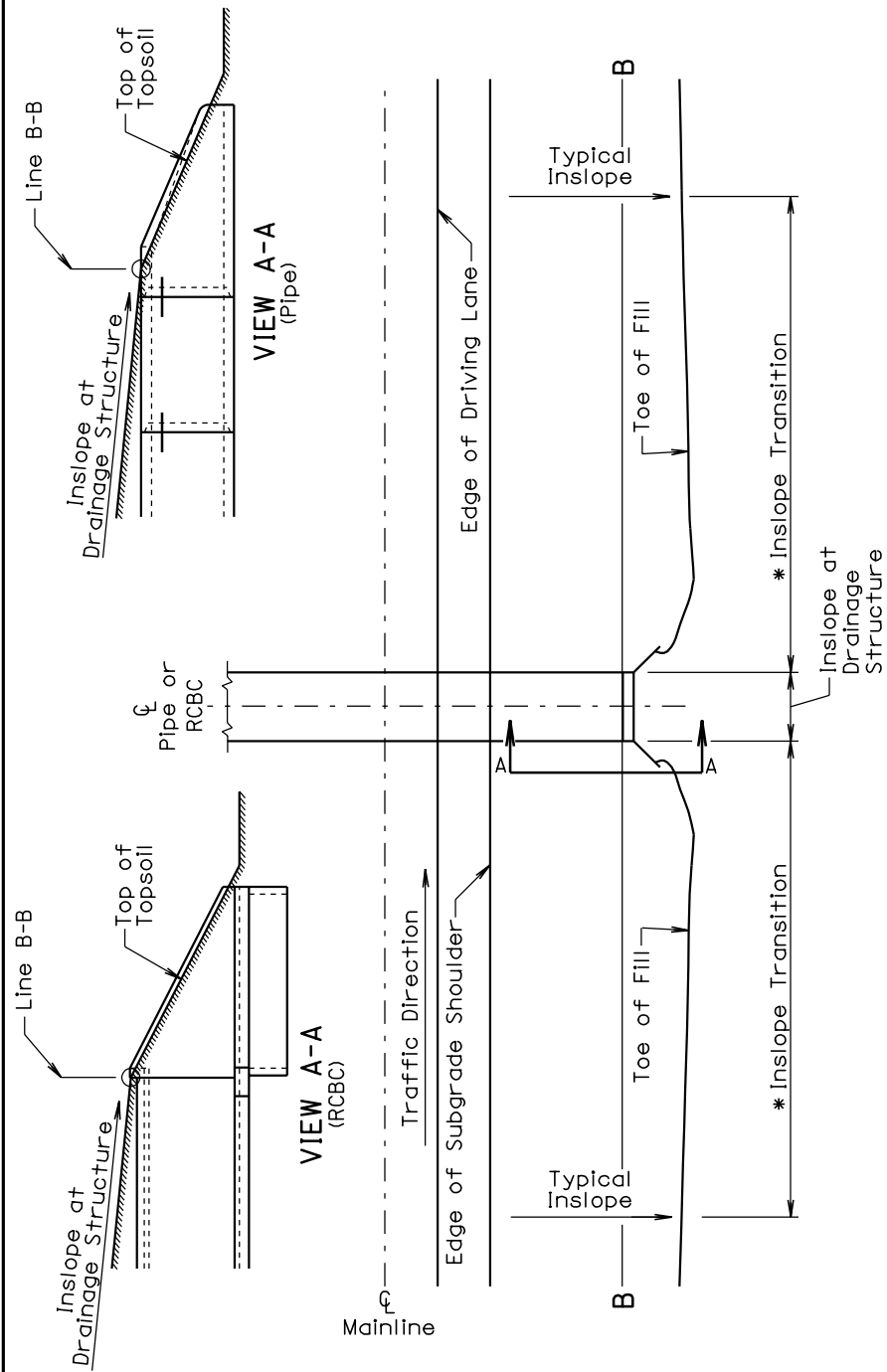
MRM 238.8 The site work on the right side consists of shaping an area 30 feet x 45 feet from the inlet to ROW fence to reestablish drainage. There is no site work required on the left side. All disturbed areas will be seeded and mulched.

SCOPE OF WORK (CONTINUED)

MRM 239.9 There is a twin 36” CMP Arch pipe with a 10 feet center-to-center spacing at this site. The site work on the right. side consists of filling an area 100 feet length x 8 feet width x 6 feet depth over new pipe and ends with Contractor Furnished Borrow, removing 2 flared ends, adding an 8 feet section and flared end to each of the existing twin 36” CMP, removing and resetting the yellow pipe marking posts, and reprofiling ditch 200 feet to the east and 100 feet to the west. The site work on the left side consists of filling an area 100 feet length x 8 feet width x 5 feet depth over new pipe and ends with Contractor Furnished Borrow, removing 2 flared ends, adding an 8 feet section and flared end to each of the existing twin 36” CMP, installing channel protection gabions to each pipe end, removing and resetting the yellow pipe marking posts, and reprofiling ditch 200 feet to the east and 50 feet to the west. Channel protection gabions shall be installed in accordance with Standard Plates 720.01 & 720.03. 4 Size E gabions will be required at each pipe end plus 1 Size F gabion placed between the Size E gabions to fill in the area due to the 10 feet center-to-center spacing of the twin pipes. All disturbed areas will be seeded and mulched.

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
SD	044-392	9	19

SIGN CODE	SIGN SIZE	DESCRIPTION	NUMBER REQUIRED	UNITS PER SIGN	UNITS
G20-2A	36" x 18"	END ROAD WORK	2	17	34
W8-6	48" x 48"	TRUCK CROSSING	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
W21-3	48" x 48"	ROAD MACHINERY AHEAD	2	34	68
W21-5	48" x 48"	SHOULDER WORK	2	34	68
TOTAL UNITS					442



TYPE 1 INSLOPE TRANSITION

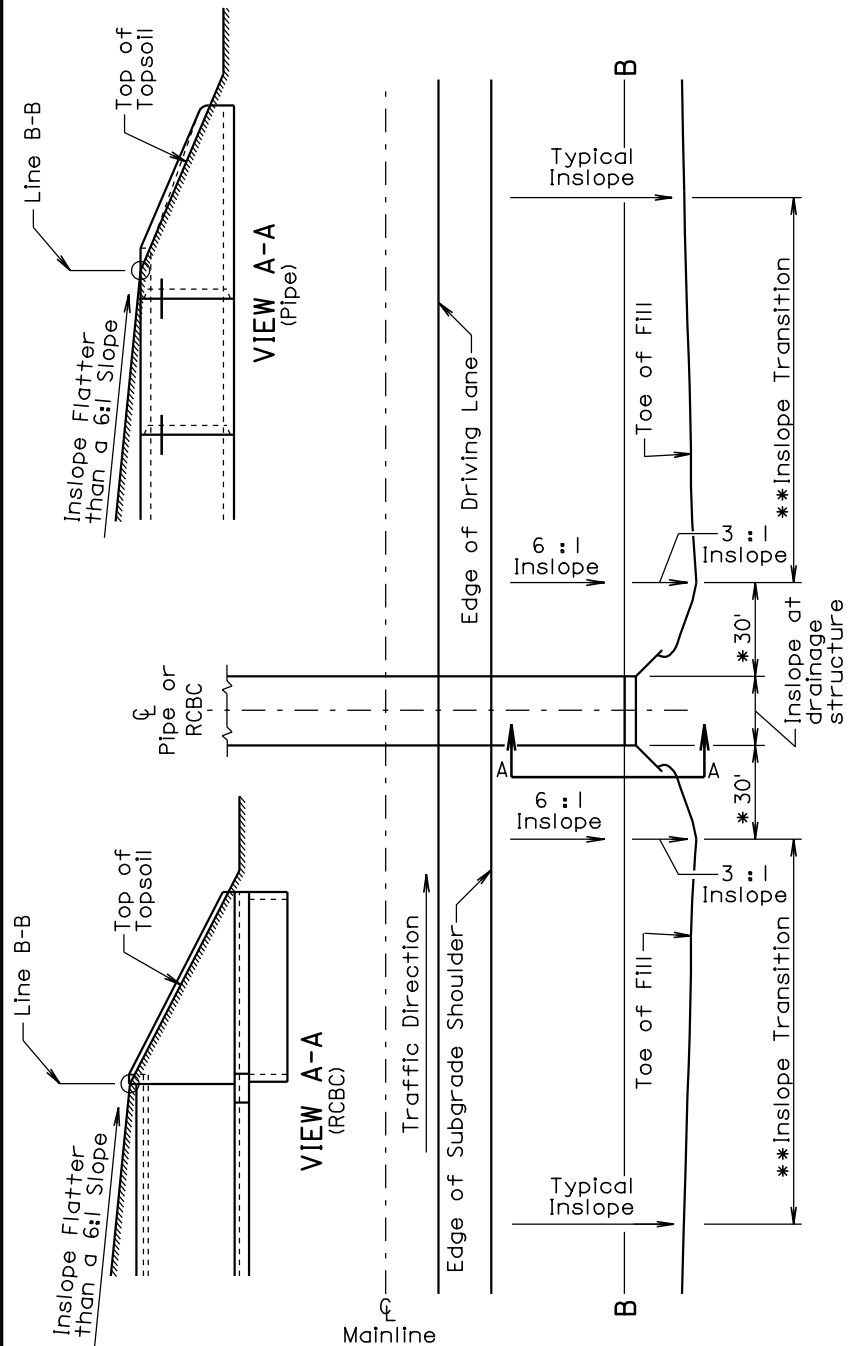
GENERAL NOTES:

This Type 1 Inslope Transition is used when the specified inslope at the drainage structure is flatter than the typical inslope and the inslope at the drainage structure is between a 4:1 slope and 6:1 slope. Line B-B represents the clear zone line, the location where soil intercepts the parapet on an RCBC, the location where the soil intercepts the top of the pipe adjacent to the opening of the pipe end section, or may represent a change in slope.

* Transition from the typical inslope to the inslope at the drainage structure. Within the clear zone (area from edge of subgrade shoulder to line B-B) use 100' length for each 1:1 slope change. Example: transition from a 4:1 to a 6:1 would require a 200' length transition. The typical inslope outside of the clear zone shall be transitioned gradually to the slope necessary adjacent to the RCBC wing wall or pipe culvert end section within the transition length necessary for the transition within the clear zone.

February 14, 2011

Published Date: 2nd Qtr. 2011	S D D T	INSLOPE TRANSITIONS AT PIPE CULVERTS OR REINFORCED CONCRETE BOX CULVERTS	PLATE NUMBER 120.05
			Sheet 1 of 2



TYPE 2 INSLOPE TRANSITION

GENERAL NOTES:

This Type 2 Inslope Transition is used when the specified inslope at the pipe or RCBC is flatter than a 6:1 slope.

Line B-B represents the clear zone line, the location where soil intercepts the parapet on an RCBC, the location where the soil intercepts the top of the pipe adjacent to the opening of the pipe end section, or may represent a change in slope.

* Transition from inslope at drainage structure to a 6:1 inslope and 3:1 inslope.

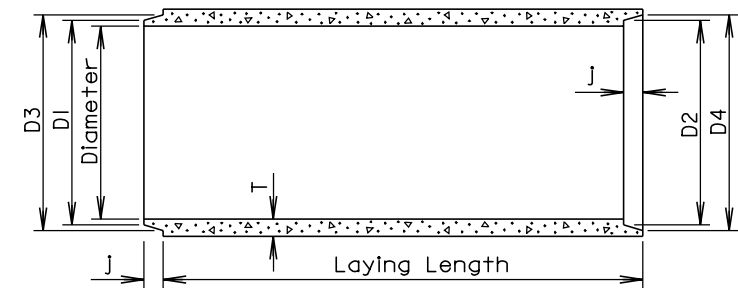
** Transition from typical inslope to the inslopes adjacent to the drainage structure. Within the clear zone (area from edge of subgrade shoulder to line B-B) use 100' length for each 1:1 slope change. Example: transition from a 4:1 to a 6:1 would require a 200' length transition. The typical inslope outside of the clear zone shall be transitioned to a 3:1 inslope within the transition length necessary for the transition within the clear zone.

February 14, 2011

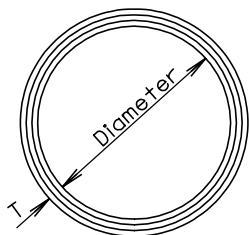
Published Date: 2nd Qtr. 2011	S D D T	INSLOPE TRANSITIONS AT PIPE CULVERTS OR REINFORCED CONCRETE BOX CULVERTS	PLATE NUMBER 120.05
			Sheet 2 of 2

TOLERANCES IN DIMENSIONS

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



LONGITUDINAL SECTION



END VIEW

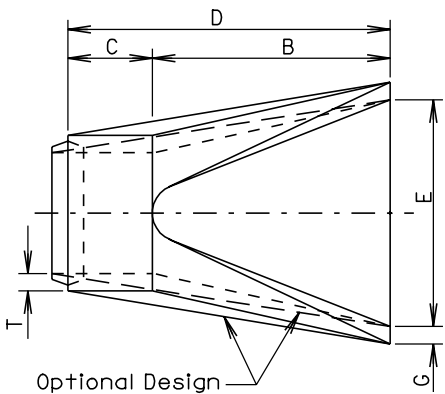
GENERAL NOTES:

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

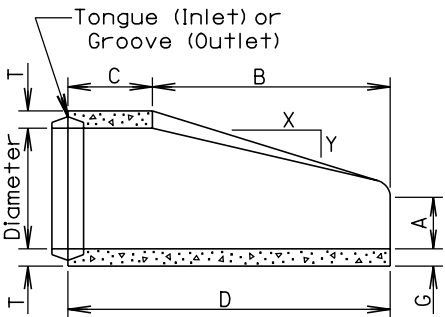
Not more than 2 four foot sections shall be permitted near the ends of any culvert. Four foot lengths shall be used only to secure the required length of culvert.

Diam. (In.)	Approx. Wt. /Ft. (lb.)	T (In.)	J (In.)	D1 (In.)	D2 (In.)	D3 (In.)	D4 (In.)
12	92	2	1 3/4	13 1/4	13 5/8	13 7/8	14 1/4
15	127	2 1/4	2	16 1/2	16 7/8	17 1/4	17 5/8
18	168	2 1/2	2 1/4	19 5/8	20	20 3/8	20 3/4
21	214	2 3/4	2 1/2	22 7/8	23 1/4	23 3/4	24 1/8
24	265	3	2 3/4	26	26 3/8	27	27 3/8
27	322	3 1/4	3	29 1/4	29 5/8	30 1/4	30 5/8
30	384	3 1/2	3 1/4	32 3/8	32 3/4	33 1/2	33 5/8
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

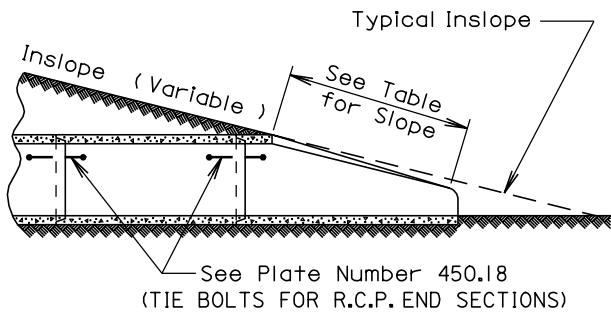
March 31, 2000



TOP VIEW



LONGITUDINAL SECTION

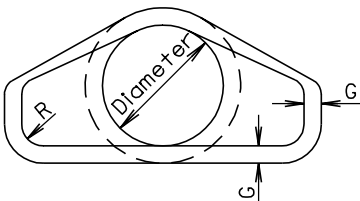


SLOPE DETAIL

GENERAL NOTES:

Lengths of concrete pipe shown on Plan Sheets are between flared Ends only.

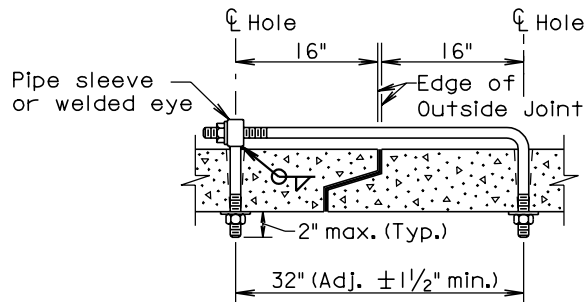
Construction of R.C.P. Flared End shall conform to the requirements of Section 990 of the Standard Specifications for Roads and Bridges.



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 7/8	72 7/8	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

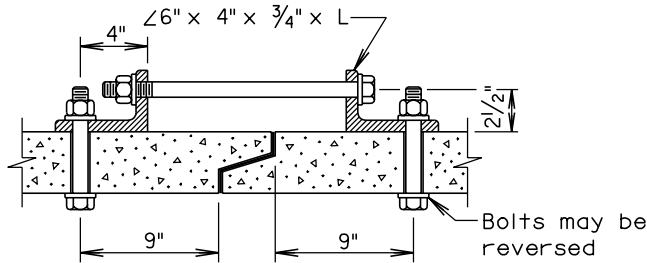
March 31, 2000



ADJUSTABLE EYE BOLT TIE

GENERAL NOTES:

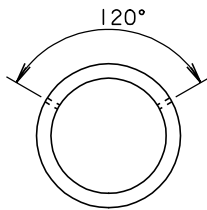
Tie bolts to be furnished with 2 washers and 2 nuts except for the 5/16" rod which has unthreaded legs.
Use 5/16" rod diameter and 5/8" thread diameter for pipe wall thickness of 2" to 3 1/4".
Use 1/2" rod diameter and 3/4" thread diameter for pipe wall thickness of 3 1/2" to 6 1/2".
Use 3/4" rod diameter and 1" thread diameter for pipe wall thickness of 7" and larger.



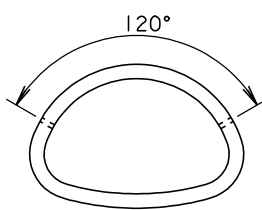
ANGLE AND BOLT TIE

GENERAL NOTES:

L = 4" for 3/4" 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

Published Date: 2nd Qtr. 2011

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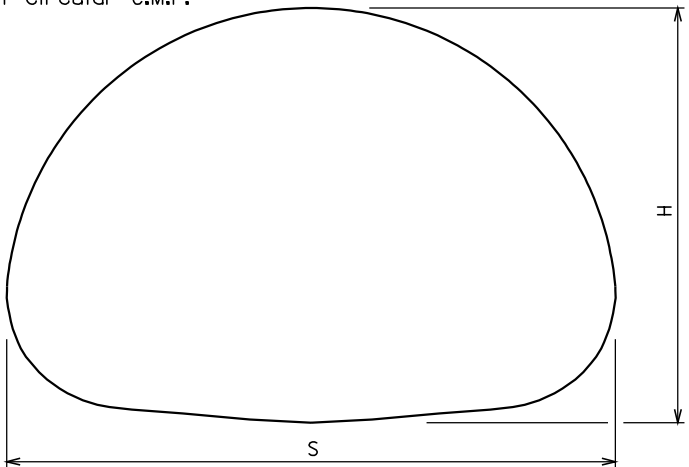
TIE BOLTS FOR
R.C.P. END SECTIONS

PLATE NUMBER
450.18

Sheet 1 of 1

* Dia. (In.)	2 2/3" x 1/2" CORRUGATIONS			3" X 1" CORRUGATIONS		
	S Span (In.)	H Rise (In.)	Area (Sq. Ft.)	S Span (In.)	H Rise (In.)	Area (Sq. Ft.)
15	17	13	1.1			
18	21	15	1.6			
21	24	18	2.2			
24	28	20	2.8			
30	35	24	4.4			
36	42	29	6.4	40	31	7.0
42	49	33	8.7	46	36	9.4
48	57	38	11.4	53	41	12.3
54	64	43	14.3	60	46	15.6
60	71	47	17.6	66	51	19.3
66	77	52	21.3	73	55	23.2
72	83	57	25.3	81	59	27.4
78				87	63	32.1
84				95	67	37.0
90				103	71	42.4
96				112	75	48.0
102				117	79	54.2
108				128	83	60.8
114				137	87	67.4
120				142	91	74.5

* Equivalent diameter of circular C.M.P.



GENERAL NOTE:

All dimensions measured from inside crest.

March 31, 2000

Published Date: 2nd Qtr. 2011

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CORRUGATED METAL PIPE ARCH CULVERT

PLATE NUMBER
450.30

Sheet 1 of 1

Plotting Date: 20-MAY-2011

2 Piece	2 Piece	3 Piece								
5° to 45° Elbow	50° to 90° Elbow	90° Elbow								
Diameter	A	L	Diameter	A	L	Diameter	A	B	C	L
Inches	Feet	Feet	Inches	Feet	Feet	Inches	Inches			Feet
12	1	2	12	2	4	12	25½	11	18½	4
15	1	2	15	2	4	15	26½	12	18	4
18	1	2	18	2	4	18	27	14	17	4
21	2	4	21	2	4	21	27	15	16½	4
24	2	4	24	2	4	24	27½	16	16	4
27	2	4	27	2	4	27	27½	17	15½	4
30	2	4	30	3	6	30	40	19	26½	6
33	2	4	33	3	6	33	40	20	26	6
36	2	4	36	3	6	36	40½	21	25½	6
42	2	4	42	3	6	42	41	23	24½	6
48	2	4	48	4	8	48	53½	26	35	8
54	3	6	54	4	8	54	54	28	34	8
60	3	6	60	4	8	60	54½	31	32½	8
66	3	6	66	4	8	66	54	33	31½	8
72	3	6	72	5	10	72	67½	36	42	10
78	3	6	78	5	10	78	68	39	40½	10
84	3	6	84	5	10	84	68½	41	39½	10
90	3	6	90	6	12	90	70	46	37	10
96	3	6	96	6	12	96	82	46	49	12

FABRICATED ELBOW LENGTHS FOR ALL CORRUGATIONS

GENERAL NOTES:
All dimensions shown are nominal.
L = Linear Feet of C.M.P. required to fabricate fitting.

June 26, 2001

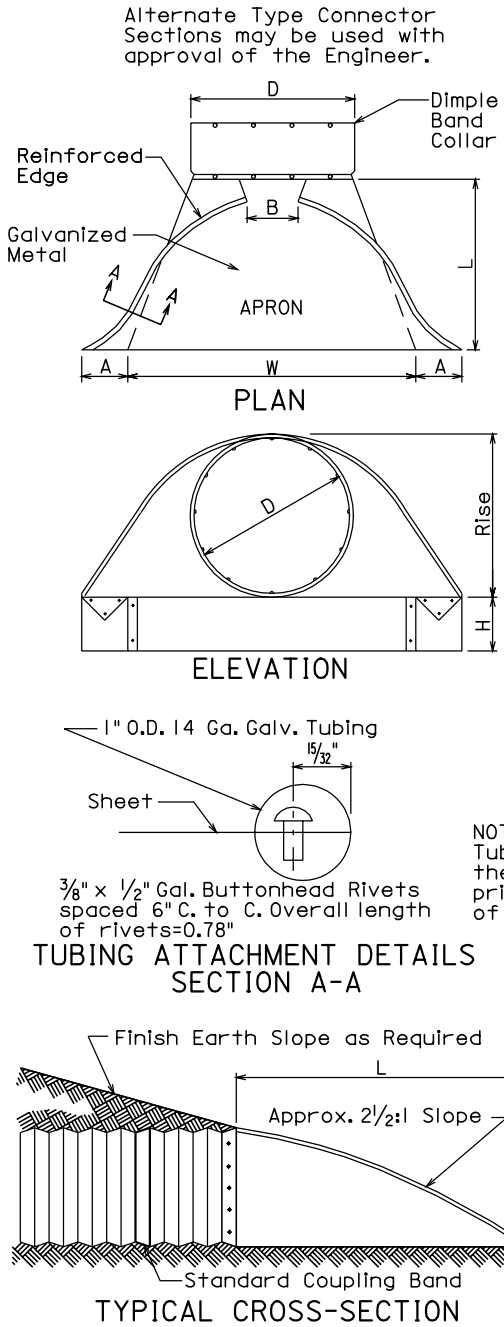
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C.M.P. FABRICATED LENGTHS FOR ELBOWS

PLATE NUMBER
450.32

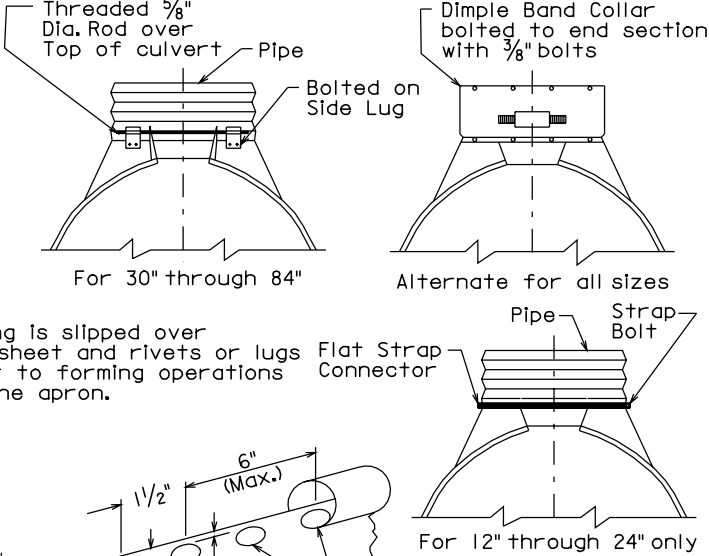
Sheet 1 of 1

Published Date: 2nd Qtr. 2011



Dia. D (in.)	Ga.	DIMENSIONS (in.)						Approx. Slope	Body
		A	B	H	L	W			
12	16	6	6	6	21	24	2½:1	1 Pc.	
15	16	7	8	6	26	30	2½:1	1 Pc.	
18	16	8	10	6	31	36	2½:1	1 Pc.	
21	16	9	12	6	36	42	2½:1	1 Pc.	
24	16	10	13	6	41	48	2½:1	1 Pc.	
30	14	12	16	8	46	60	2½:1	1 Pc.	
36	14	14	19	9	51	72	2½:1	2 Pc.	
42	12	16	22	11	60	84	2½:1	2 Pc.	
48	12	18	27	12	69	90	2¼:1	2 Pc.	
54	12	18	30	12	78	102	2:1	3 Pc.	
60	12	18	33	12	84	114	1¾:1	3 Pc.	
66	12	18	36	12	87	120	1½:1	3 Pc.	
72	12	18	39	12	87	126	1⅓:1	3 Pc.	
78	12	18	42	12	87	132	1¼:1	3 Pc.	
84	12	18	45	12	87	138	1⅓:1	3 Pc.	

STANDARD CONNECTIONS



NOTE:
Tubing is slipped over the sheet and rivets or lugs prior to forming operations of the apron.

GENERAL NOTES:
All 3 pc. bodies shall have 12 Ga. sides and 10 Ga. center panels. Width of center panels shall be greater than 20% of the pipe periphery. Multiple panel bodies to have lap seams tightly joined by 3/8" Dia. galvanized rivets or bolts.
For 60" through 84" sizes, reinforced edges shall be supplemented with galvanized stiffener angles. The angles will be 2" x 2" x 1/4" for 60" through 72" diameters and 2½" x 2½" x 1/4" for 78" and 84" diameters. The angles shall be attached by 3/8" diameter galvanized nuts and bolts.
Rivets and Bolts shall be 3/8" Dia. Min. for 10 Ga. and 12 Ga. sheet, and 5/16" Dia. Min. for 14 Ga. and 16 Ga. sheets. Tighten nuts with torque wrench to 25 lbs. torque.

March 31, 2000

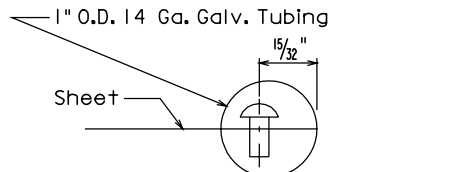
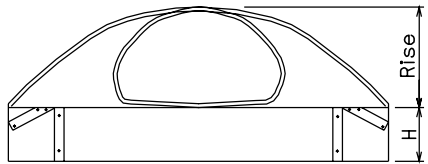
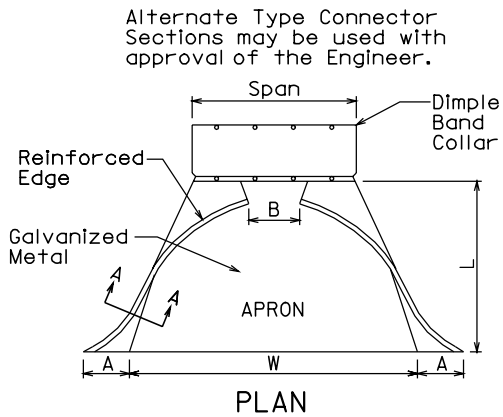
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C.M.P. FLARED ENDS

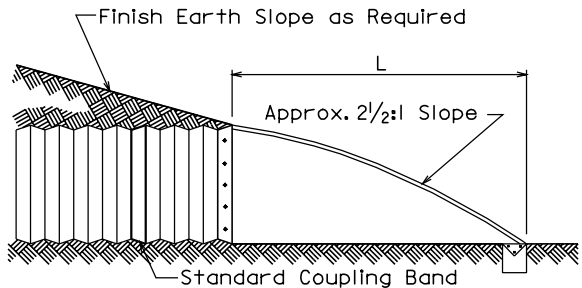
PLATE NUMBER
450.35

Sheet 1 of 1

Published Date: 2nd Qtr. 2011



TUBING ATTACHMENT DETAILS
SECTION A-A



TYPICAL CROSS-SECTION

GENERAL NOTES:

All 3 pc. bodies shall have 12 Ga. sides and 10 Ga. center panels. Width of center panels shall be greater than 20% of the pipe periphery. Multiple panel bodies shall have lap seams tightly joined by 3/8" Dia. galvanized rivets or bolts.

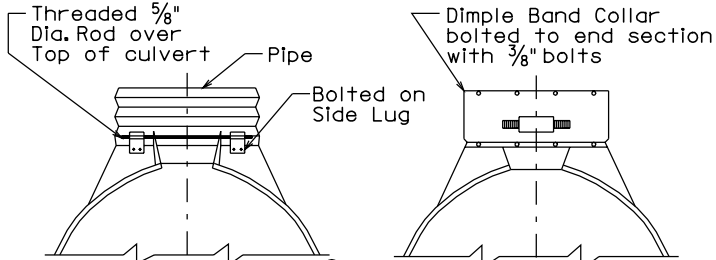
For 77" x 52" and 83" x 57" sizes, reinforced edges shall be supplemented with galvanized stiffener angles. The angles will be 2" x 2" x 1/4" for both the 77" x 52" size and the 83" x 57" size. The angles shall be attached by 3/8" Dia. galvanized nuts and bolts.

Rivets and Bolts shall be 3/8" Dia. Min. for 10 Ga. and 12 Ga. sheet, and 5/16" Dia. Min. for 14 Ga. and 16 Ga. sheets. Tighten nuts with torque wrench to 25 lbs. torque.

March 31, 2000

Span x Rise (In.)x(In.)	Equiv. Dia. (In.)	Ga.	APPROX. DIMENSIONS (In.)					Approx. Slope	Body
			A	B	H	L	W		
17x13	15	16	7	9	6	19	30	2 1/2:1	1 Pc.
21x15	18	16	7	10	6	23	36	2 1/2:1	1 Pc.
24x18	21	16	8	12	6	28	42	2 1/2:1	1 Pc.
28x20	24	16	9	14	6	32	48	2 1/2:1	1 Pc.
35x24	30	14	10	16	6	39	60	2 1/2:1	1 Pc.
42x29	36	14	12	18	8	46	75	2 1/2:1	1 Pc.
49x33	42	12	13	21	9	53	85	2 1/2:1	2 Pc.
57x38	48	12	16	26	12	63	90	2 1/2:1	2 Pc.
64x43	54	12	18	30	12	70	102	2 1/4:1	2 Pc.
71x47	60	12	18	33	12	77	114	2 1/4:1	3 Pc.
77x52	66	12	18	36	12	77	126	2:1	3 Pc.
83x57	72	12	18	39	12	77	133	2:1	3 Pc.

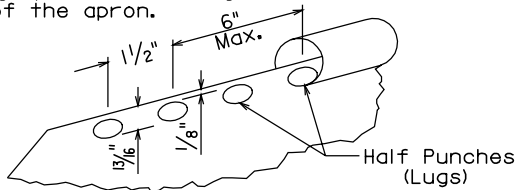
STANDARD CONNECTIONS



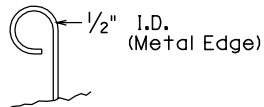
For 17"x13" through 83"x57" Alternate for all sizes

① For 17" through 28" span pipe-arches a flat strap connector may be used in place of the rod connection. Strap connector shall be 1" wide, 12 ga. strap with standard 6" long x 1/2" dia. bond bolt and nut.

NOTE:
Tubing is slipped over the sheet and rivets or lugs prior to forming operations of the apron.



SECTION A-A (alternate)



SECTION A-A (alternate)

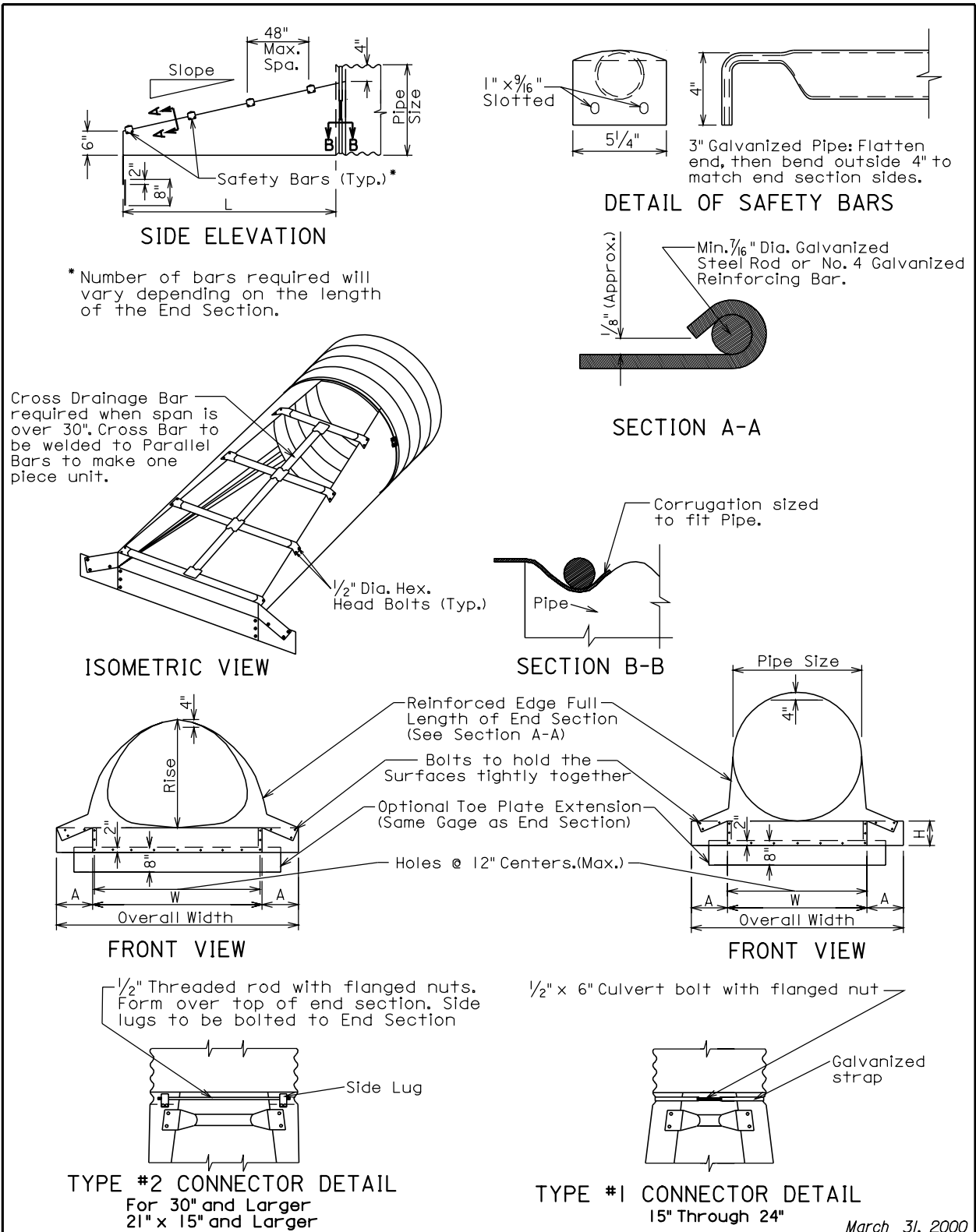
Published Date: 2nd Qtr. 2011

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C.M.P. ARCH FLARED ENDS

PLATE NUMBER
450.36

Sheet 1 of 1



March 31, 2000

ARCH C.M.P. SLOPED ENDS										
Equiv. Dia. (In.)	(Inches)		Min. Thick.		Dimensions (Inches)				L Dimensions	
	Span	Rise	In.	Gage	A	H	W	Overall Width	Slope	Length (In.)
18	21	15	.064	16	8	6	27	43	4:1	20
21	24	18	.064	16	8	6	30	46	4:1	32
24	28	20	.064	16	8	6	34	50	4:1	40
30	35	24	.079	14	12	9	41	65	4:1	56
36	42	29	.109	12	12	9	48	72	4:1	76
42	49	33	.109	12	16	12	55	87	4:1	92
48	57	38	.109	12	16	12	63	95	4:1	112
54	64	43	.109	12	16	12	70	102	4:1	132
60	71	47	.109	12	16	12	77	109	4:1	148
72	83	57	.109	12	16	12	89	121	4:1	188

CIRCULAR C.M.P. SLOPED ENDS									
Pipe Dia. (In.)	Min. Thick.		Dimensions (Inches)					L Dimensions	
	In.	Gage	A	H	W	Overall Width	Slope	Length (In.)	
15	.064	16	8	6	21	37	4:1	20	
18	.064	16	8	6	24	40	4:1	32	
21	.064	16	8	6	27	43	4:1	44	
24	.064	16	8	6	30	46	4:1	56	
30	.109	12	12	9	36	60	4:1	80	
36	.109	12	12	9	42	66	4:1	104	
42	.109	12	16	12	48	80	4:1	128	
48	.109	12	16	12	54	86	4:1	152	
54	.109	12	16	12	60	92	4:1	176	
60	.109	12	16	12	66	98	4:1	200	

GENERAL NOTES:

Safety bars shall be attached to sloped ends over 30" in diameter only.

Sloped ends shall be fabricated from galvanized steel and shall conform to the requirements of the Standard Specifications.

Safety bars shall be fabricated from steel pipe conforming to the requirements of ASTM A-53 Schedule 40 Specifications.

Slotted holes for safety bar attachment shall be provided for all end sections.

Attachment to circular pipes 15" through 24" diameter shall be made with Type #1 straps. All other sizes shall be attached with Type #2 rods and lugs.

When stated in the plans, optional toe plate extension shall be punched and bolted to end section apron lip with 3/8" diameter galvanized bolts. Steel for toe plate extension shall be same gauge as end section. Dimensions shall be overall width less 6" by 8" high.

Installation shall be performed in accordance with the Standard Specifications.

All work and materials required for fabrication and installation of sloped ends shall be incidental to the bid items for the various sizes of sloped ends.

March 31, 2000

Plotting Date: 20-MAY-2011

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

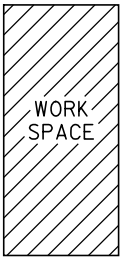
The signs illustrated shall be used where there are distracting situations; such as: vehicles parked on shoulder, vehicles accessing the work site via the highway, and equipment traveling on or crossing the roadway to perform work operations.

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

* If the work space is on a divided highway, an advance warning sign should also be placed on the left side of the directional roadway.

For short term, short duration, or mobile operations, all signs and channelizing devices may be eliminated if a vehicle with an activated flashing or revolving yellow light is used.

Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet) (A)
0 - 30	200
35 - 40	350
45 - 50	500
55	750
60 - 75	1000



July 1, 2005

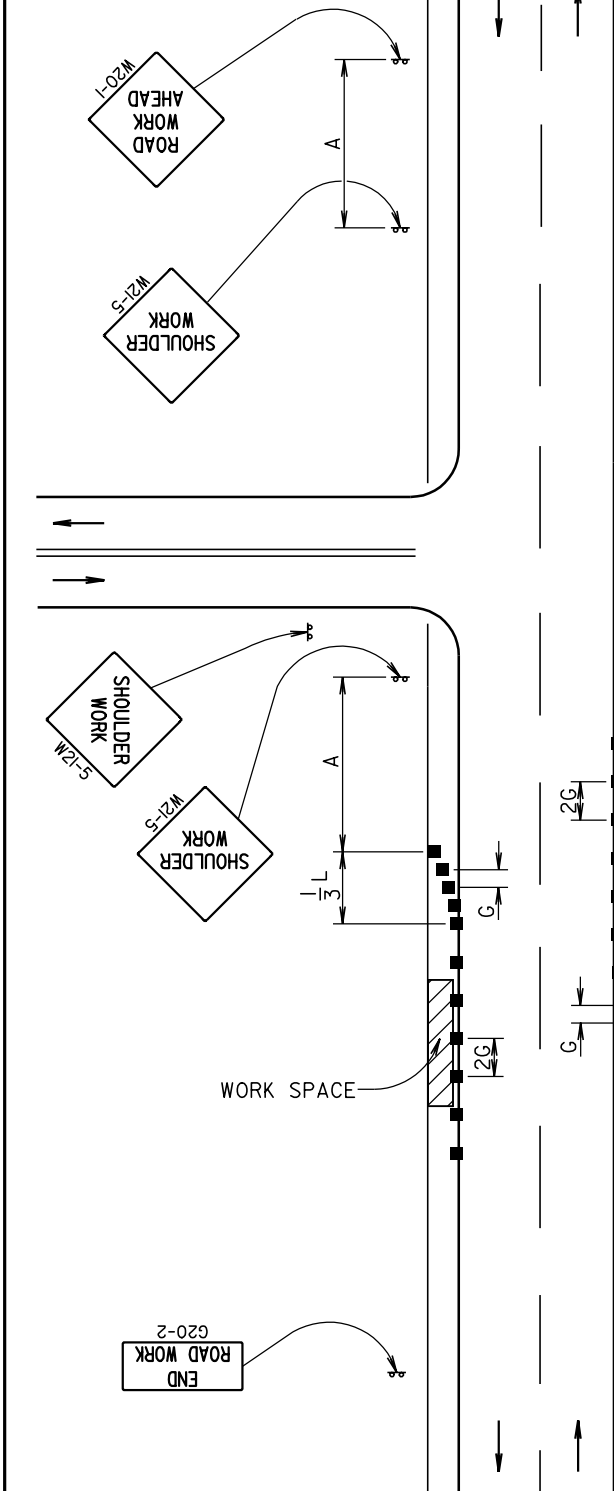
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GUIDES FOR TRAFFIC CONTROL DEVICES
WORK BEYOND THE SHOULDER

PLATE NUMBER
634.01

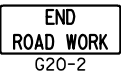
Sheet 1 of 1

Published Date: 2nd Qtr. 2011



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	100 - 200	180	25
35 - 40	350	320	25
45 - 50	500	600	50
55	750	660	50
60 - 65	1000	780	50

Channelizing Device



The channelizing devices shall be drums or 42" cones if traffic control must remain overnight or longer.

For short duration operations (1 hour or less) all signs and channelizing devices may be eliminated if a vehicle with an activated flashing or revolving yellow light is used.

Worker signs (W21-1 or W21-1a) may be used instead of SHOULDER WORK signs.

A SHOULDER WORK sign should be placed on the left side of a divided or one-way roadway only if the left shoulder is affected.

The SHOULDER WORK sign on an intersecting roadway is not required if drivers emerging from that roadway will encounter another advance warning sign before they reach a work activity area.

WORK SPACE



February 14, 2011

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GUIDES FOR TRAFFIC CONTROL DEVICES
WORK ON SHOULDERS

PLATE NUMBER
634.03

Sheet 1 of 1

Published Date: 2nd Qtr. 2011

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.

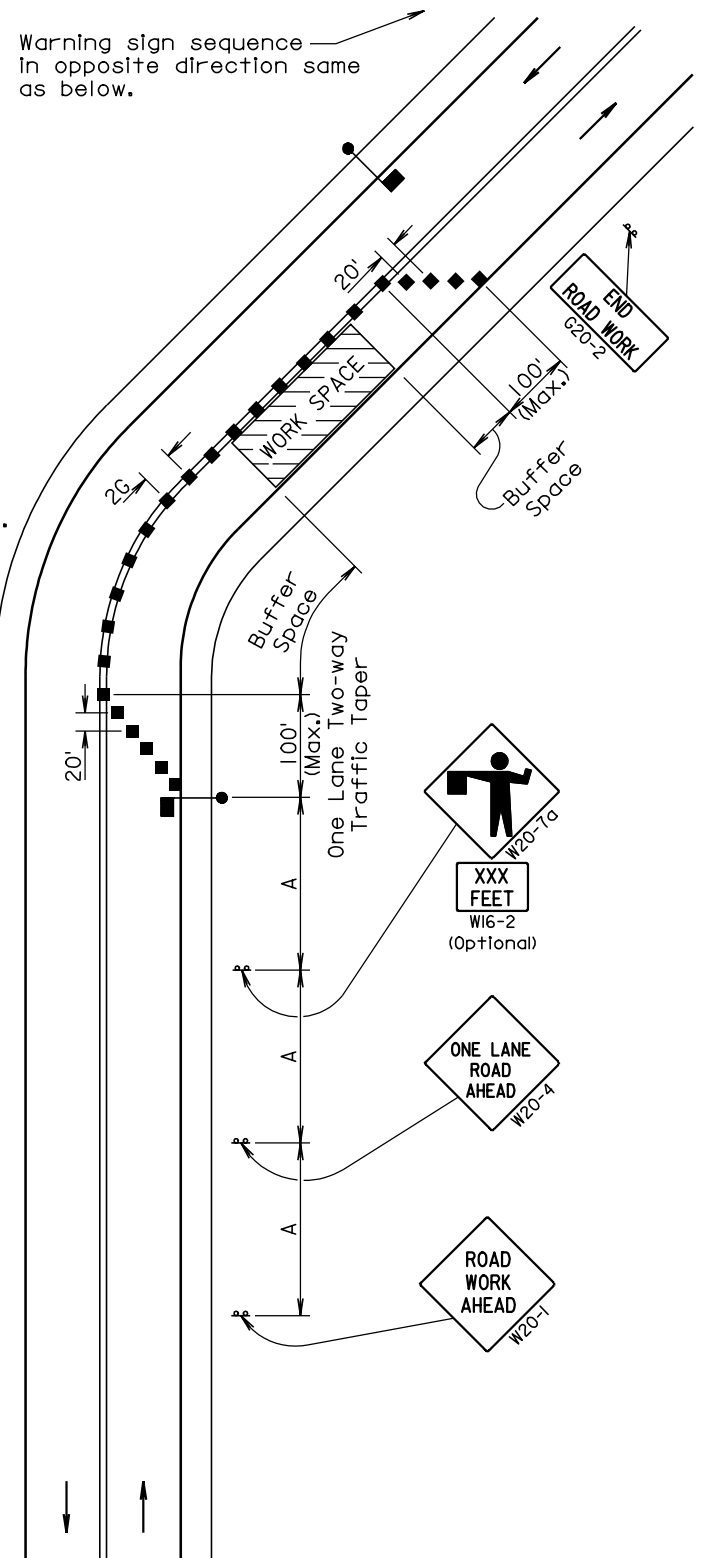
The channelizing devices shall be drums or 42" cones.

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.

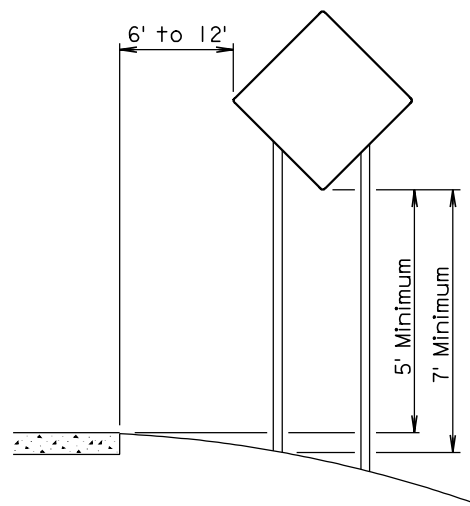
The buffer space should be extended so that the two-way traffic taper is placed before a horizontal or vertical curve to provide adequate sight distance for the flagger and queue of stopped vehicles.

Warning sign sequence in opposite direction same as below.

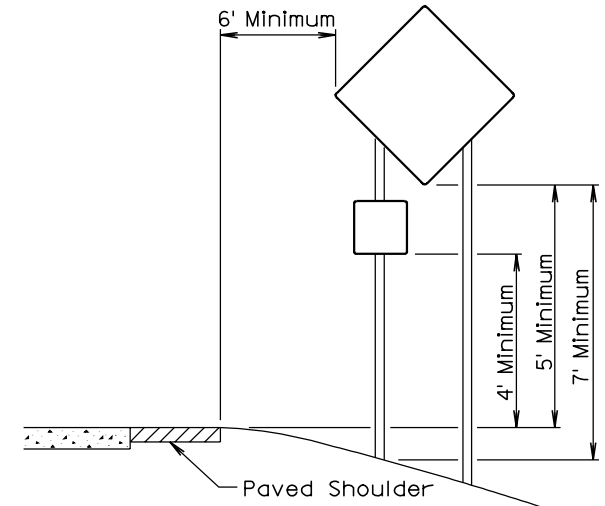


February 14, 2011

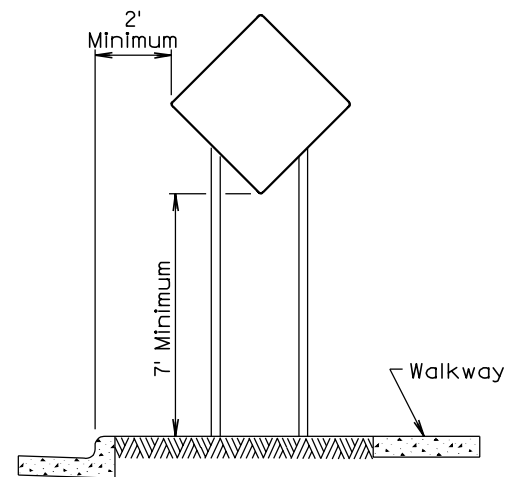
Published Date: 2nd Qtr. 2011	S D D O T	GUIDES FOR TRAFFIC CONTROL DEVICES LANE CLOSURE WITH FLAGGER PROVIDED	PLATE NUMBER 634.23
			Sheet 1 of 1



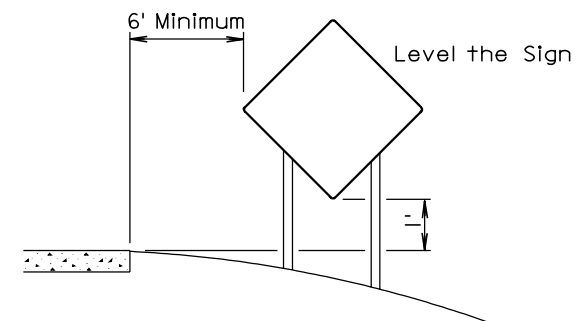
RURAL DISTRICT



RURAL DISTRICT WITH
SUPPLEMENTAL PLATE



URBAN DISTRICT

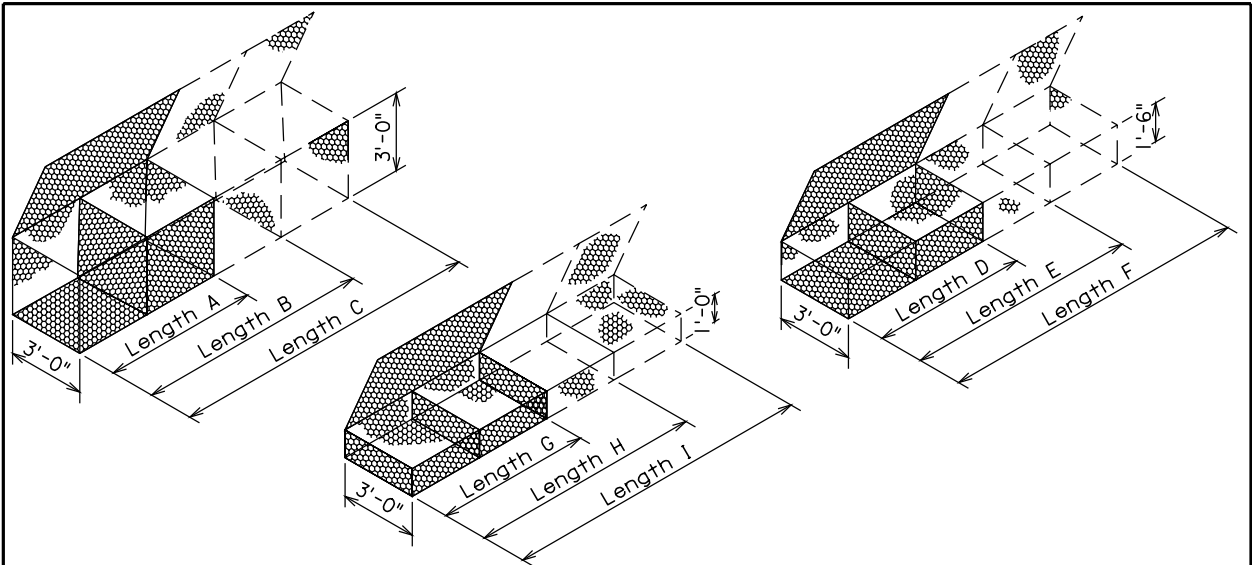


RURAL DISTRICT
3 DAY MAXIMUM

February 14, 2011

Published Date: 2nd Qtr. 2011	S D D O T	CRASHWORTHY SIGN SUPPORTS (Typical Construction Signing)	PLATE NUMBER 634.85
			Sheet 1 of 1

Plotting Date: 20-MAY-2011



GABION DETAILS
STANDARD SIZES

SIZE	LENGTH	WIDTH	HEIGHT	NUMBER OF CELLS	CAPACITY, Cu. Yd.
A	6'-0"	3'-0"	3'-0"	2	2.0
B	9'-0"	3'-0"	3'-0"	3	3.0
C	12'-0"	3'-0"	3'-0"	4	4.0
D	6'-0"	3'-0"	1'-6"	2	1.0
E	9'-0"	3'-0"	1'-6"	3	1.5
F	12'-0"	3'-0"	1'-6"	4	2.0
G	6'-0"	3'-0"	1'-0"	2	0.7
H	9'-0"	3'-0"	1'-0"	3	1.0
I	12'-0"	3'-0"	1'-0"	4	1.3

Above Dimensions subject to mill tolerances.

GENERAL NOTES:

Lacing and internal connecting wire shall be 0.0866 inch diameter steel wire ASTM A641 Class 3 soft temper measured after galvanizing and for PVC coated gabions shall be 0.0866 inch diameter steel wire measured after galvanizing but before PVC coating.

The lacing procedure is as follows:

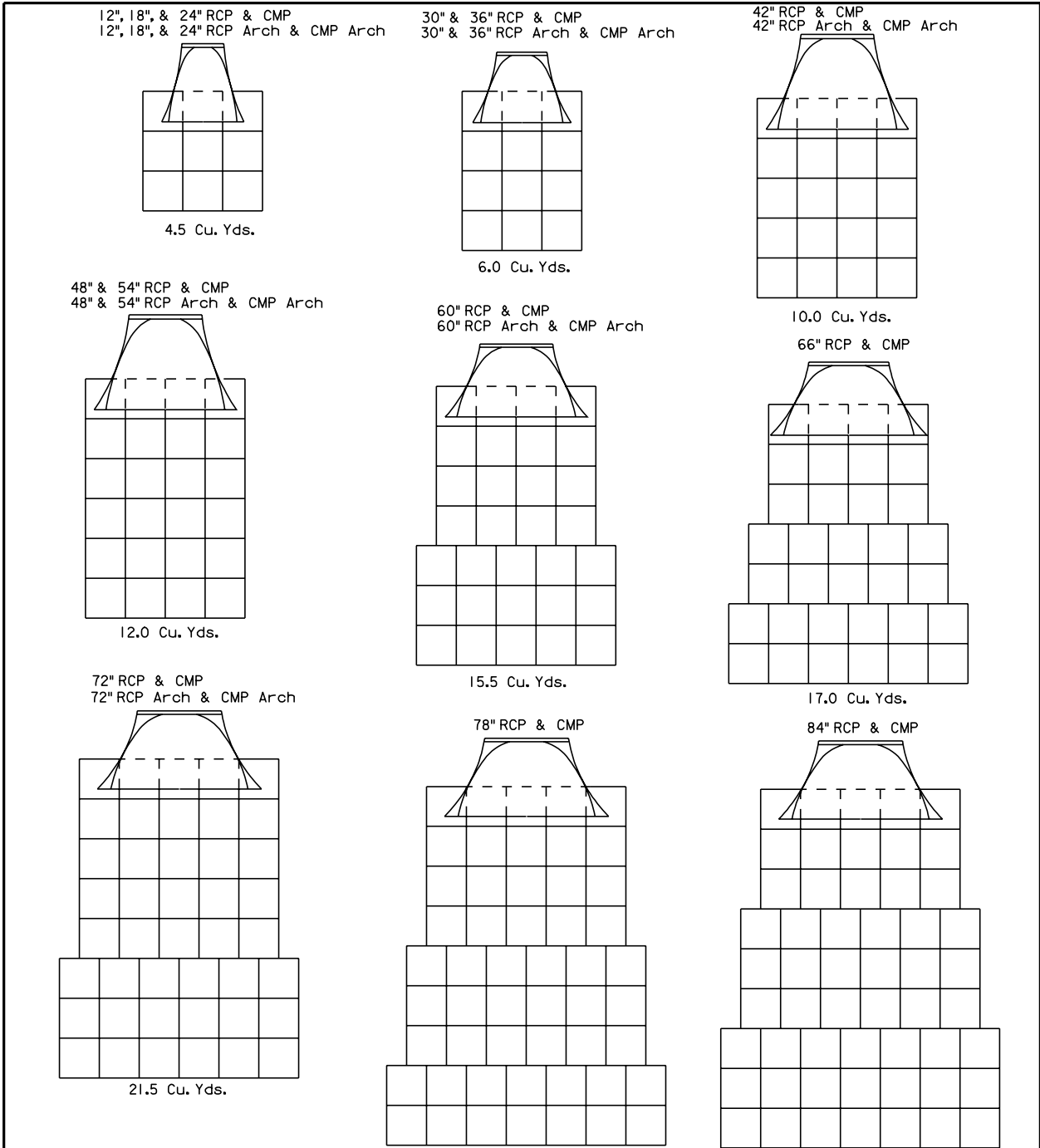
1. Cut a length of lacing wire approximately 1 1/2 times the distance to be laced but not exceeding 5 feet.
2. Secure the wire terminal at the corner by looping and twisting.
3. Proceed lacing with alternating single and double loops at a spacing not to exceed 6 inches.
4. Securely fasten the other lacing wire terminal.

Wire lacing or interlocking type fasteners shall be used for gabion assembly and final construction of gabion structures. Interlocking fasteners for galvanized gabions shall be high tensile 0.120 inch diameter galvanized steel wire measured after galvanizing. The galvanizing shall conform to ASTM A641-92 Class 3 coating. Fasteners shall also be in accordance with ASTM A764, Class II, Type III.

Interlocking fasteners for PVC coated gabions shall be high tensile 0.120 inch diameter stainless steel wire conforming to ASTM A313, Type 302, Class I. The spacing of the interlocking fasteners during all phases of assembly and construction shall not exceed 6 inches. All fasteners shall be placed where the mesh weaves around the selvage wire at the vertical and horizontal joints.

June 26, 2001

Published Date: 2nd Qtr. 2011	S D D O T	BANK AND CHANNEL PROTECTION GABIONS	PLATE NUMBER 720.01
			Sheet 1 of 1



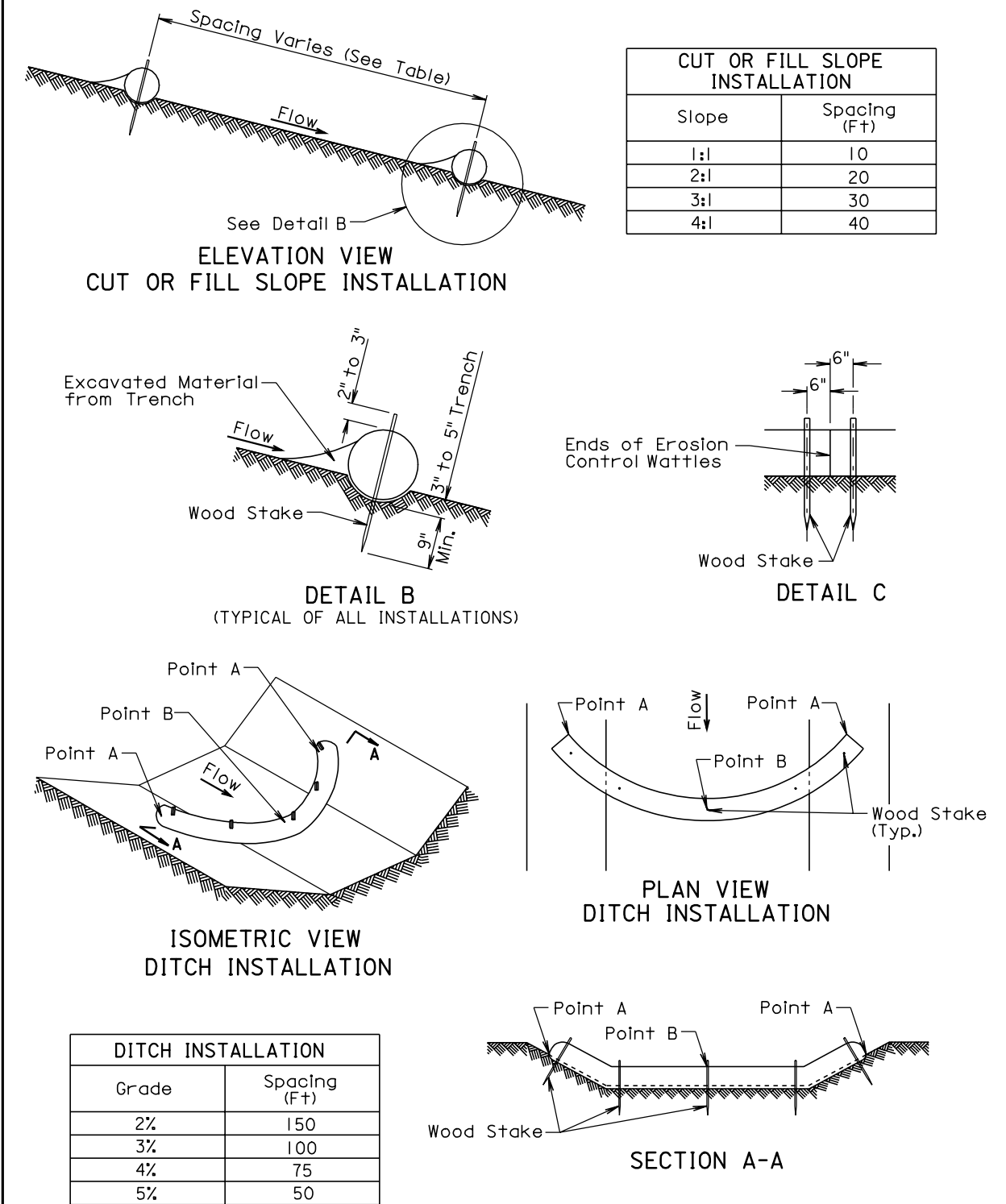
GENERAL NOTES:

Gabions at outlets of C.M. pipe and R.C. pipe shall be placed under the end section a distance of 2' from the outlet end of the section. For C.M. pipe end section installations, the upper fabric of the gabions shall be modified to accommodate the metal end section in a manner approved by the Engineer.

Quantities shown on this standard plate are based on standard gabion sizes D, E, and F (See Standard Plate 720.01).

June 26, 2001

Published Date: 2nd Qtr. 2011	S D D O T	BANK AND CHANNEL PROTECTION GABION PLACEMENT UNDER PIPE END SECTIONS	PLATE NUMBER 720.03
			Sheet 1 of 1



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'.

Where installing running lengths of wattles, the Contractor shall butt the second wattle tightly against the first and shall not overlap the ends. See Detail C.

The Contractor and Engineer shall inspect the erosion control wattles once every week and within 24 hours after every rainfall event greater than 1/2". The Contractor shall remove, dispose, or reshape the accumulated sediment when necessary as determined by the Engineer.

Sediment removal, disposal, or necessary shaping shall be as directed by the Engineer. All costs for removing accumulated sediment, disposal of sediment, and necessary shaping shall be incidental to the contract unit price per cubic yard for "Remove Sediment".

All costs for furnishing and installing the erosion control wattles including labor, equipment, and materials shall be incidental to the contract unit price per foot for the corresponding erosion control wattle bid item.

All costs for removing the erosion control wattle from the project including labor, equipment, and materials shall be incidental to the contract unit price per foot for "Remove Erosion Control Wattle".

December 23, 2004