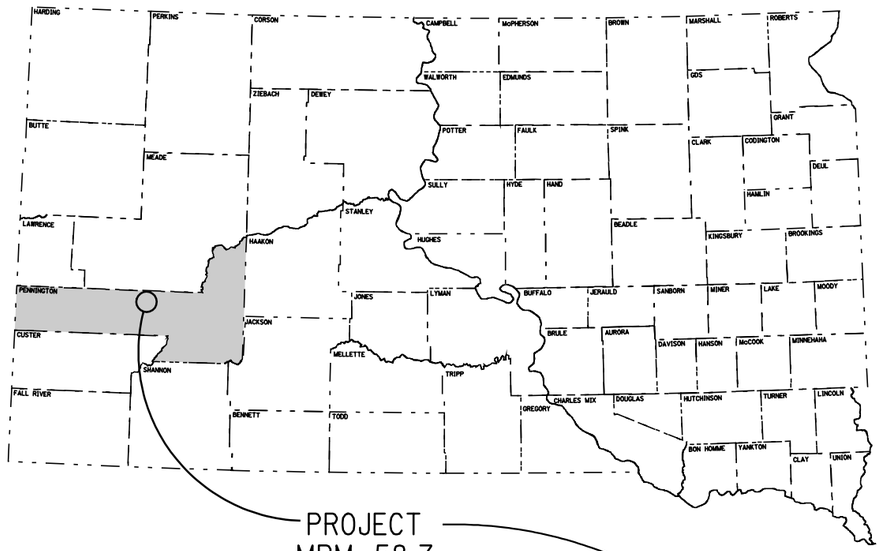
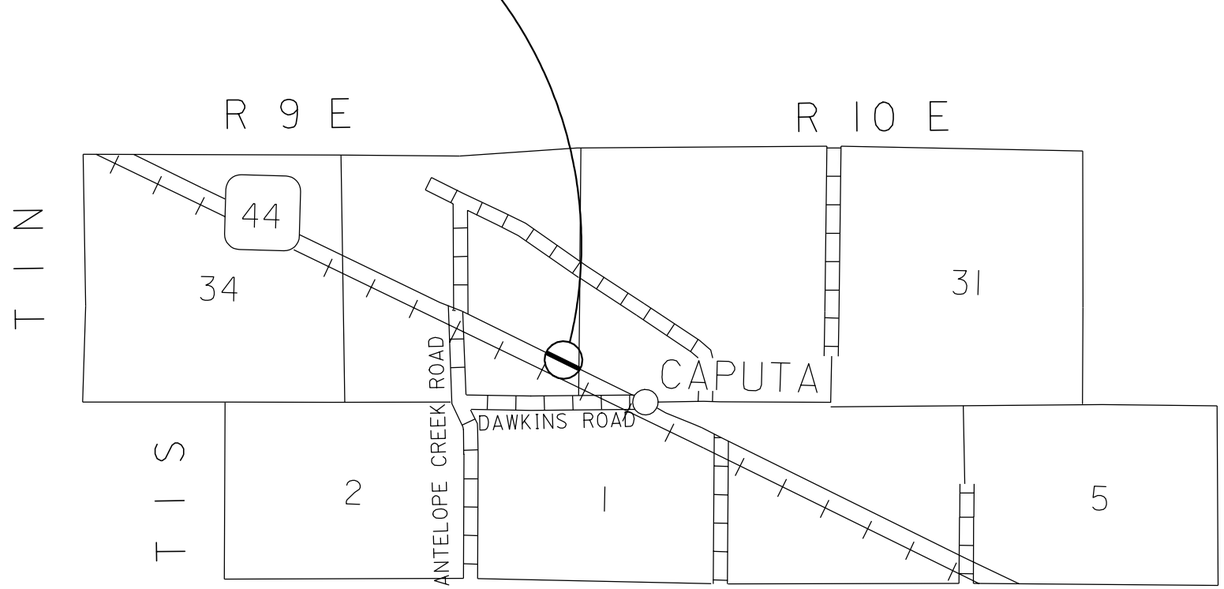


PROJECT
MRM 58.7



STATE OF SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION
PLANS FOR PROPOSED

PROJECT 044–452
SD HIGHWAY 44
PENNINGTON COUNTY

PIPE REPAIR
PCN 11QV

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	044-452	1	14

Plotting Date: 27-APR-2011

INDEX OF SHEETS

DESIGN DESIGNATION

ADT (2009)	1935
ADT (2029)	2390
DHV	360
D	50%
T DHV	4.2%
T ADT	9.3%
V	65 mph

STORM WATER PERMIT

No storm water permit required.

ESTIMATE OF QUANTITIES

Bid Item Number	Item	Quantity	Unit
009E0010	Mobilization	Lump Sum	LS
110E1010	Remove Asphalt Concrete Pavement	58.3	SqYd
110E7802	Remove Fence for Reset	37	Ft
120E0010	Unclassified Excavation	35	CuYd
230E0100	Remove and Replace Topsoil	Lump Sum	LS
250E0010	Incidental Work	Lump Sum	LS
250E0020	Incidental Work, Grading	Lump Sum	LS
260E1010	Base Course	22.2	Ton
320E1200	Asphalt Concrete Composite	11.4	Ton
450E5509	18" CMP Arch 16 Gauge, Furnish	90	Ft
450E5510	18" CMP Arch, Install	90	Ft
450E5710	18" CMP Arch Elbow, Furnish	1	Each
450E5711	18" CMP Arch Elbow, Install	1	Each
450E6006	18" CMP Arch Safety End, Furnish	2	Each
450E6007	18" CMP Arch Safety End, Install	2	Each
462E0200	Controlled Density Fill	6.0	CuYd
620E0520	Type 2 Temporary Fence	201	Ft
620E4100	Reset Fence	37	Ft
634E0010	Flagging	10	Hour
634E0100	Traffic Control	238	Unit
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
730E0210	Type F Permanent Seed Mixture	3	Lb
731E0100	Fertilizing	16	Lb
732E0100	Mulching	0.1	Ton
734E0154	12" Diameter Erosion Control Wattle	160	Ft

SPECIFICATIONS

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

UTILITIES

The Contractor shall coordinate with the local irrigation district to ensure that work on this project shall be undertaken only when there is no water being run through the irrigation pipe. The contact person for the irrigation district is:

NAME: Keith Ham
PHONE NUMBER: (605) 393-0198
CELL: (605) 545-3081

Although no utilities other than the irrigation pipe are planned to be affected on this project there are phone lines in close proximity of the project limits. 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.

WORK DESCRIPTION

Work on this project will consist of the following:

1. Partially remove old CMP Culvert.
2. Plug remaining old CMP Culvert.
3. Install new CMP Culvert.
4. Reshape ditch ahead.
5. Grade and flatten approach slopes.

SEQUENCE OF OPERATIONS

The intent of the plan sequence of operations is to have the least amount of impact on the traveling public and adjacent landowners. Requests to deviate from the sequence of operations shall be submitted in writing to the Engineer for review. Approval of an alternate sequence of operations will only be allowed when the proposed changes meet with the Department's intent for traffic control and sequencing of the work. An alternate sequence shall be submitted for review a minimum of two week prior to potential implementation. Work shall proceed according to the following sequence or as approved by the Engineer:

1. Set up Traffic Control.
2. Remove fence for reset and install temporary fence.
3. Excavate in-place CMP culvert required for installation of new 18" CMP.
4. Fill remaining CMP culvert with controlled density fill.
5. Install new CMP Culvert under existing irrigation pipe without disturbing the in-place facility.
6. Finish installing CMP Culvert.
7. Grade ditches as shown in plans and place topsoil.
8. Seed, mulch, and install erosion control measures.
9. Surface approach.
10. Reset fence.
11. Remove Traffic Control

GENERAL MAINTENANCE OF TRAFFIC

1. Removing, relocating, covering, salvaging and resetting of permanent traffic control devices, including delineation, shall be the responsibility of the Contractor. The cost of this work shall be incidental to the various contract bid 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.

2. Traffic control shall be in accordance with MUTCD Standards, the Standard Specifications and the layouts contained in these plans.

3. The Contractor shall at all times, keep the portion of the project being used by public traffic in a condition that will adequately and safely accommodate traffic. The landowner shall have access to their property at all times. A gravel surface for access shall be provided.

4. Storage of vehicles, materials, and equipment shall be not closer than 30' from the edge of the driving lane. 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.

5. The Contractor shall provide documentation that all breakaway sign supports 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.

6. Non-applicable signing will be covered or removed and reset during periods of in-activity. All costs to do this work shall be incidental to Traffic Control, Miscellaneous.

GENERAL MAINTENANCE OF TRAFFIC (CONTINUED)

7. All Contractors' vehicles or equipment entering or leaving a closed work area shall display a flashing amber light.

8. Construction signing that remains in the same location for more than 3 days shall be mounted on fixed location, ground mounted, breakaway supports, unless approved by the Engineer.

9. The Contractor or designated traffic control subcontractor shall make night (after dark) inspections at the initial set up of traffic control and every week thereafter to ensure the adequacy, legibility and reflectivity of each sign and device. A written summary of each inspection shall be given to the Engineer within 24 hours after completion of the inspection. The cost for the nighttime inspection work shall be incidental to the related contract items.

10. The Contractor shall be required to have a person available 24 hour/day, 7 days/week to maintain traffic control devices. The name and cellular telephone number of this individual shall be given to the Engineer at the preconstruction meeting.

11. The Contractor shall coordinate his operations such that during non-working hours the roadway shall be open to two-way traffic on a uniform driving surface for the entire width of the roadway.

12. Work activities shall only be during daylight hours. Daylight hours are considered to be ½ hour before sunrise until ½ hour after sunset.

HISTORICAL PRESERVATION OFFICE CLEARANCES

To obtain State Historical Preservation Office (SHPO) clearance, a cultural resources survey may need to be conducted by a qualified archaeologist. In lieu of a cultural resources survey, the Contractor could request a records search from Jim Donohue, State Archaeological Research Center (SARC). 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. The Contractor shall arrange and pay for the cultural resource survey and/or records search.

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 to the DOT Environmental Engineer, 700 East Broadway Avenue, Pierre, SD 57501-2586 (605-773-3268). 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.

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

The waste disposal site(s) shall not be located in a wetland, within 200 feet of surface water, or in an area that adversely affects wildlife, recreation, aesthetic value of an area, or any threatened or endangered species, as approved by the 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. The seeding recommendations may be obtained through the appropriate County NRCS Office. The Contractor shall control the access to waste disposal sites not within the State ROW through the use of fences, gates, and placement of a sign or signs at the entrance to the site stating “No Dumping Allowed”.

2. Concrete and asphalt concrete debris may be stockpiled within view of the ROW for a period of time not to exceed the duration of the project. Prior to project completion, the waste shall be removed from view of the ROW or buried and the waste disposal site reclaimed as noted above.

The above requirements will not apply to waste disposal sites that are covered by an individual solid waste permit as specified in SDCL 34A-6-58, SDCL 34A-6-1.13, and ARSD 74:27:10:06.

Failure to comply with the requirements stated above may result in civil penalties in accordance with South Dakota Solid Waste Law, SDCL 34A-6-1.31.

All costs associated with furnishing waste disposal site(s), disposing of waste, maintaining control of access (fence, gates, and signs), and reclamation of the waste disposal site(s) shall be incidental to the various contract items.

MAINTENANCE OF APPROACHES DURING OPERATIONS

Operations shall be conducted such that access to individual entrances shall be maintained at all times throughout the project.

FENCE

Existing 3-rail wood fencing shall be removed for reset, stored, and reset in its original location. Temporary fence shall be installed for the duration of the project as shown in these plans. Temporary fence shall be Type 2 Temporary Fence.

GRADING OPERATIONS

Water for Embankment is estimated at the rate of 10 gallons of water per cubic yard of Embankment minus Waste. The estimated quantity of Water for Embankment is 0.5 MGal. No separate payment will be made for the Water for Embankment and all costs associated shall be incidental to the contract unit price per cubic yard of “Unclassified Excavation”.

Special ditch grades and other sections different from the typical sections. shall be constructed to the limits shown on the cross sections. If significant changes to the cross sections are necessary during construction, the Engineer shall contact the Designer for the proposed change.

Generally, all shallow inlet and outlet ditches as noted on the plan sheets shall be cut with a 10-foot wide bottom with 5:1 backslopes. However, the Engineer may direct the Contractor to adjust the ditch width for proper alignment with the drainage structure.

Temporary fence and/or permanent fence shall be placed ahead of the grading operation unless otherwise directed by the Engineer.

INCIDENTAL WORK

Included in this item are the following

1. Sawing

SAWING

The existing surface will be sawed full depth to a true line with a vertical face where asphalt concrete is to be placed adjacent to existing asphalt or concrete.

All costs associated with this work shall be incidental to the contract lump sum price for Incidental Work.

INCIDENTAL WORK, GRADING

Station	L/R	Remarks
230+35 to 231+40	L	Remove Approximately 45' -24" CMP, 1 45^{o} 24" CMP Elbow, & 2 Flared End Sections for the installation of new 18” CMP Arch.

UNCLASSIFIED EXCAVATION

The ditch grading work on both sides of the approach will be paid for at the contract unit price per cubic yard for Unclassified Excavation.

Excavated material shall be used to fill areas shown on the cross sections and to fill in the west side of the approach as shown on the profile sheet.

It is estimated that 19 CuYd of material will be required for ditch grading. Any excess material shall be hauled to the waste site.

Description	Total (CuYd)
Excavation for Ditch Grading	16
Excavation for New Surfacing	19
Total Unclassified Excavation	35
Embankment for Ditch Grading	19
Waste	16

Field measurement will not be required and plans quantity shall be the basis of payment.

BASE COURSE

Base Course shall be placed 8” deep.

Compaction shall be to the satisfaction of the Engineer.

Base Course may be used for the maintenance of traffic prior to the installation of the new asphalt concrete

ASPHALT CONCRETE COMPOSITE

Asphalt Concrete Composite shall be used to replace asphalt removed for culvert installation.

Asphalt Concrete Composite shall be placed in two 1-½” lifts.

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

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

The asphalt binder used in the mixture shall be either PG 64-28 or PG 64-34 Asphalt Binder.

REMOVE AND REPLACE TOPSOIL

Prior to beginning operations, a 4” depth of topsoil shall be removed and stockpiled outside the clear zone. Following completion of operations, topsoil shall be placed back in the original location.

The estimated amount of topsoil to be removed and replaced is 100 CuYd.

All cost associated with removing and replacing the topsoil along areas to be resurfaced shall be incidental to the lump sum price for “Remove and Replace Topsoil”.

INSTALLATION OF 18” CMP ARCH

Prior to installation of the 18” CMP Arch, the in-place 24” CMP, shall be removed to the extent required for installation of the new 18” CMP Arch. The remaining section of 24” CMP will be left in place and backfilled with Controlled Density Fill. All costs for removal of the 24” pipe shall be paid for at the contract lump sum price for Incidental Work, Grading.

The 18” CMP Arch and accompanying bend & end sections shall be installed as shown in these plans. The new CMP Arch shall be installed under the existing 36” RCP irrigation line without disturbing the in-place facility. Cost for installation of the 18” CMP Arch including any additional bracing required to maintain the integrity of the in-place irrigation line shall be paid for at the contract unit price per Ft for 18" CMP Arch, Install. Installation of the 18” CMP Arch Bend and 18” CMP Arch safety ends shall be paid for under their respective contract items.

A concrete collar, as detailed in these plans, shall be poured around the new 18” CMP Arch where it passes under the in-place irrigation pipe. The concrete shall be Class M6All costs associated with installation of the concrete collar shall be incidental to the contract unit price per Ft for 18" CMP Arch, Install. Approximately 2.2 CuYd of concrete will be required for the concrete collar.

Any damage caused to the in-place RCP irrigation line during construction of this project shall be the responsibility of the Contractor and shall be repaired by the Contractor at no additional cost to the State.

All costs associated with dewatering shall be the responsibility of the Contractor at no additional cost to the State.

REMOVAL OF PIPE END SECTIONS

Removed Pipe End Sections that are not reset will become property of the Contractor.

CONTROLLED DENSITY FILL FOR PIPE

Material	Rate per Cubic Yard
Portland Cement, Type I	200 Lb
Fine Aggregate	2600 Lb
Coarse Aggregate	None
Water	35 Gal
“W.R. Grace – Darafill” or approved equal	1 (3 oz.) capsule or equivalent *

* Shall be one 3 ounce capsule or equivalent CLSM performance additive (foaming admixture).

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

Passing 3/8 Inch Sieve	100%
Passing No. 200 Sieve	0-10%

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

Controlled density fill shall be contained within the required limits with sandbags or other methods approved by the Engineer.

The Contractor shall prevent the flotation or movement of the culvert due to the buoyant force from the controlled density fill until the controlled density fill hardens. Overlying surfacing materials shall not be placed sooner than four hours after placement of the controlled density fill.

All costs for furnishing and installing the controlled density fill, including sandbags, labor, materials, equipment and incidentals necessary to complete the work shall be included in the contract unit price per cubic yard for “Controlled Density Fill.”

Approximately 6 CuYd of Controlled Density Fill will be required to fill the remaining 24” CMP left in-place.

Plans quantity will be the basis for payment unless otherwise ordered by the Engineer.

PERMANENT SEEDING

The areas to be seeded comprise of all newly graded areas within the project limits except for the top of roadways and temporary easements under cultivation.

All permanent seed shall be planted in the topsoil at a depth of ¼” to ½”.

All seed broadcast must be raked or dragged in (incorporated) within the top ¼” to ½” of topsoil when possible. This requirement may be waived by the Engineer during construction when raking or dragging is deemed not feasible by conventional methods.

Type 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

A commercial fertilizer with a minimum guaranteed analysis of 22-5-10 shall be applied to all areas designated for permanent seeding.

The application rate of fertilizer shall be 3 pounds per 1000 SqFt.

MULCHING (GRASS HAY OR STRAW)

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

EROSION CONTROL WATTLE

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

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

An additional quantity of 40 feet of 12” Diameter Erosion Control Wattles has been added to the Estimate of Quantities for temporary erosion and sediment control in highway ditch channels and as an alternative to low flow or high silt fence at wetland areas adjacent to the highway.

EROSION CONTROL WATTLE (CONTINUED)

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

Product	Manufacturer
AEC Premier Straw Wattles	American Excelsior Company Arlington, TX Phone: 1-800-777-7645 www.amerexcel.com
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	GroNatural Winsted, MN Phone: 1-320-485-2800 www.gronatural.com
EarthTec Erosion Control Wattles	EarthTec/the Dukes, Inc. Devils Lake, ND Phone: 1-701-662-6666
Bio Logs	Flaxtech, LLC Rock Lake, ND Phone: 1-866-444-3529
Stenlog	Erosion Control Blanket Riverton, MB Phone: 1-866-280-7327 www.erosioncontrolblanket.com
Winters Wattles	Winters Excelsior Company Birmingham, AL Phone: 1-800-248-7237 www.wintersexcelsior.com
Patriot Straw Wattles	Patriot Environmental Products, Inc. Mesa, AZ Phone: 1-480-345-7293 www.digitaldesigncore.com/patriot/WattleSpecs.pdf

TABLE OF EROSION CONTROL WATTLE

Station	L/R	Diameter (Inch)	Location	Quantity (Ft)
230+31	L	12	Around Culvert Inlet	80
232+00	L	12	Ditch Bottom	40
			Additional Quantity	40
			Total:	160

INVENTORY OF TRAFFIC CONTROL DEVICES

SIGN CODE	SIGN SIZE	DESCRIPTION	NUMBER REQUIRED	UNITS PER SIGN	UNITS
G20-2	36" x 18"	END ROAD WORK	2	17	34
W20-1	48" x 48"	ROAD WORK #### FT. OR AHEAD	2	34	68
W20-7a	48" x 48"	FLAGGER	2	34	68
W21-5	48" x 48"	SHOULDER WORK	2	34	68
				TOTAL UNITS	**238**

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	044-452	6	14

Plotting Date: 27-APR-2011

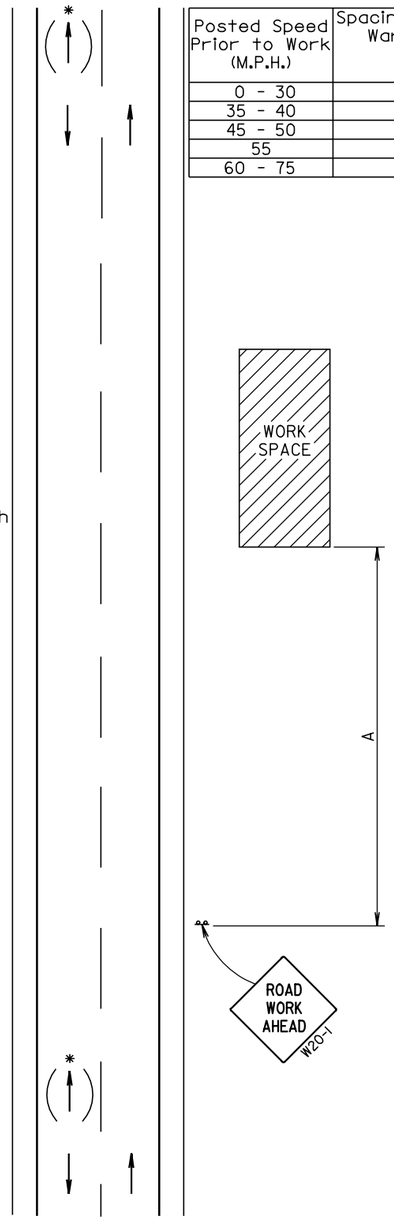
The signs illustrated are not required if the work space is behind a barrier, more than 2 feet behind the curb, or 15 feet or more from the edge of any roadway.

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

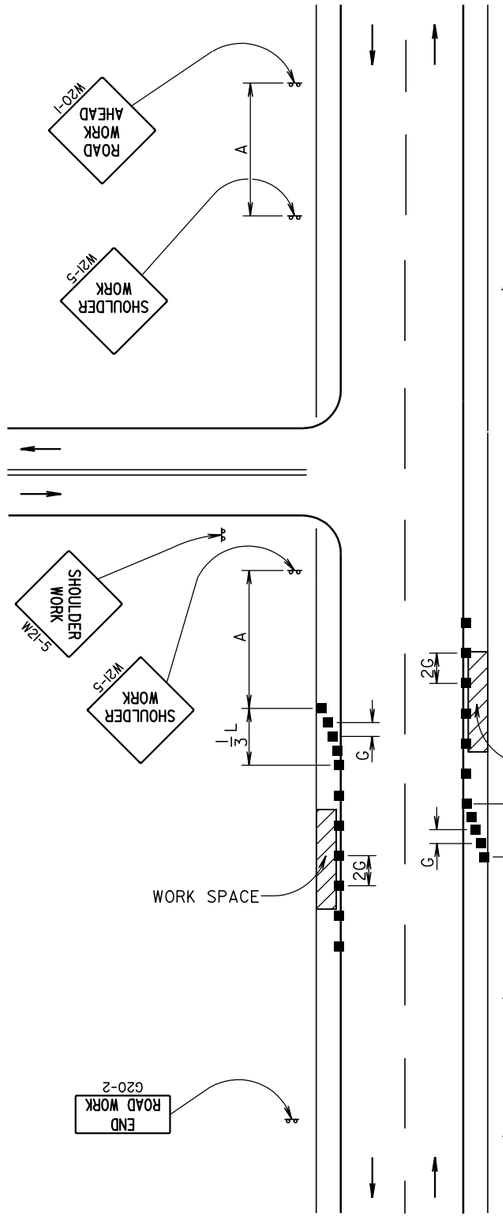
Published Date: 1st Qtr. 2011

SDDOT

GUIDES FOR TRAFFIC CONTROL DEVICES
WORK BEYOND THE SHOULDER

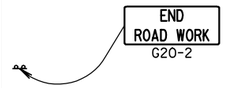
PLATE NUMBER 634.01

Sheet 1 of 1



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

■ Channelizing Device



The channelizing devices shall be drums or type II barricades 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.

July 1, 2005

Published Date: 1st Qtr. 2011

SDDOT

GUIDES FOR TRAFFIC CONTROL DEVICES
WORK ON SHOULDERS

PLATE NUMBER 634.03

Sheet 1 of 1

Username - trrc12608

PLAN SHEET

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	044-452	7	14

Plotting Date: 27-APR-2011

Sta. 230+35 - 60' L to
Sta. 231+40 - 80' L
Remove Approximately 45'-24" CMP
1 45° 24" CMP Elbow
& 2 Flared End Sections
(Incidental Work, Grading)
Fill remainder of existing pipe with
Controlled Density Fill

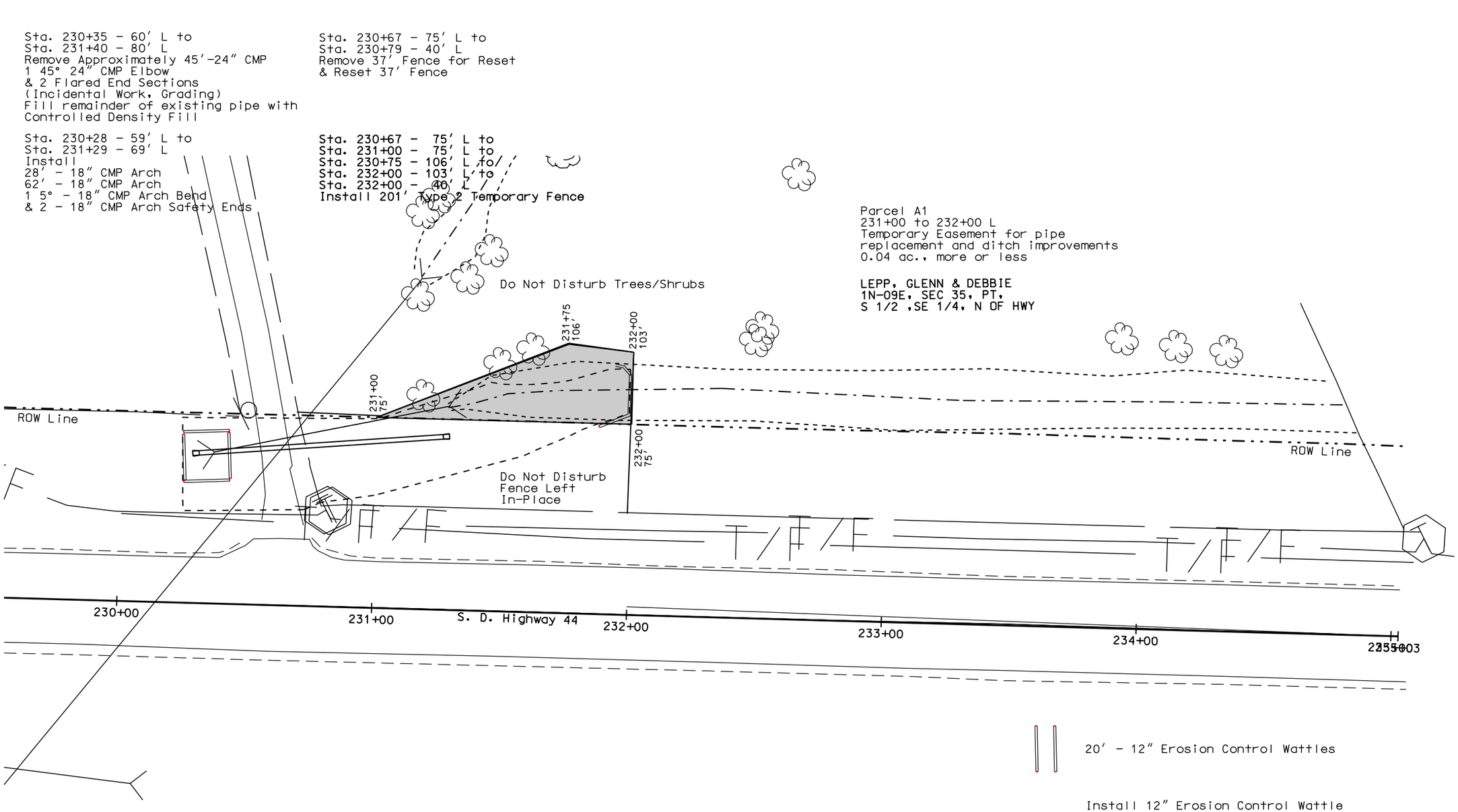
Sta. 230+28 - 59' L to
Sta. 231+29 - 69' L
Install
28' - 18" CMP Arch
62' - 18" CMP Arch
1 5° - 18" CMP Arch Bend
& 2 - 18" CMP Arch Safety Ends

Sta. 230+67 - 75' L to
Sta. 230+79 - 40' L
Remove 37' Fence for Reset
& Reset 37' Fence

Sta. 230+67 - 75' L to
Sta. 231+00 - 75' L to
Sta. 230+75 - 106' L to
Sta. 232+00 - 103' L to
Sta. 232+00 - 40' L
Install 201' Type 2 Temporary Fence

Parcel A1
231+00 to 232+00 L
Temporary Easement for pipe
replacement and ditch improvements
0.04 ac., more or less

LEPP, GLENN & DEBBIE
1N-09E, SEC 35, PT,
S 1/2 ,SE 1/4, N OF HWY



20' - 12" Erosion Control Wattles

Install 12" Erosion Control Wattle
at the Following Locations:
230+31 - L 80' - 12"
232+00 - L 40' - 12"

PLOT SCALE - 40.0000000:1.0000000

PLOTTED FROM - TRRC12008

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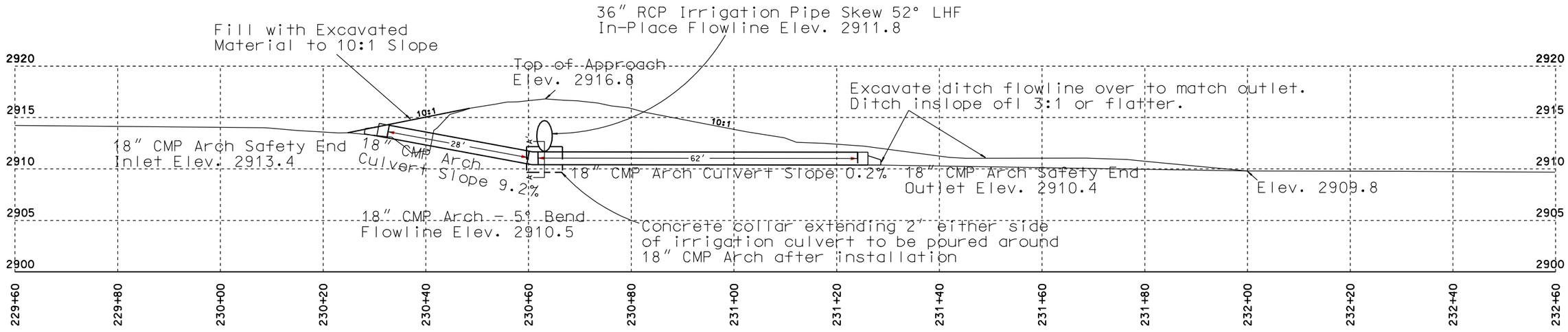
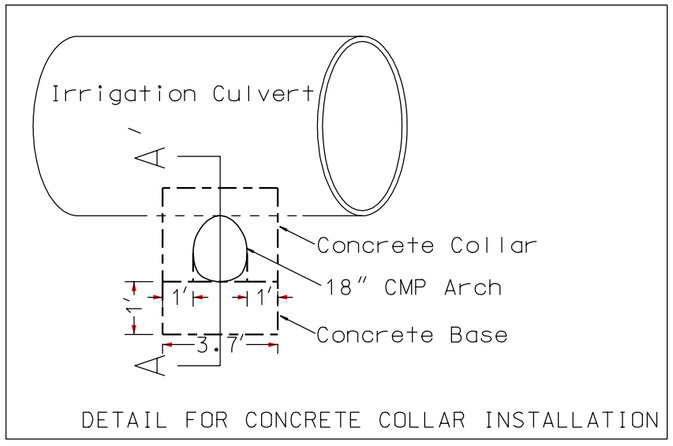
PROFILE SHEET

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	044-452	8	14

Plotting Date: 27-APR-2011





DETAIL FOR CONCRETE COLLAR INSTALLATION

PLOT SCALE - 20.250000:1.000000

PLOTTED FROM - TRRC12608

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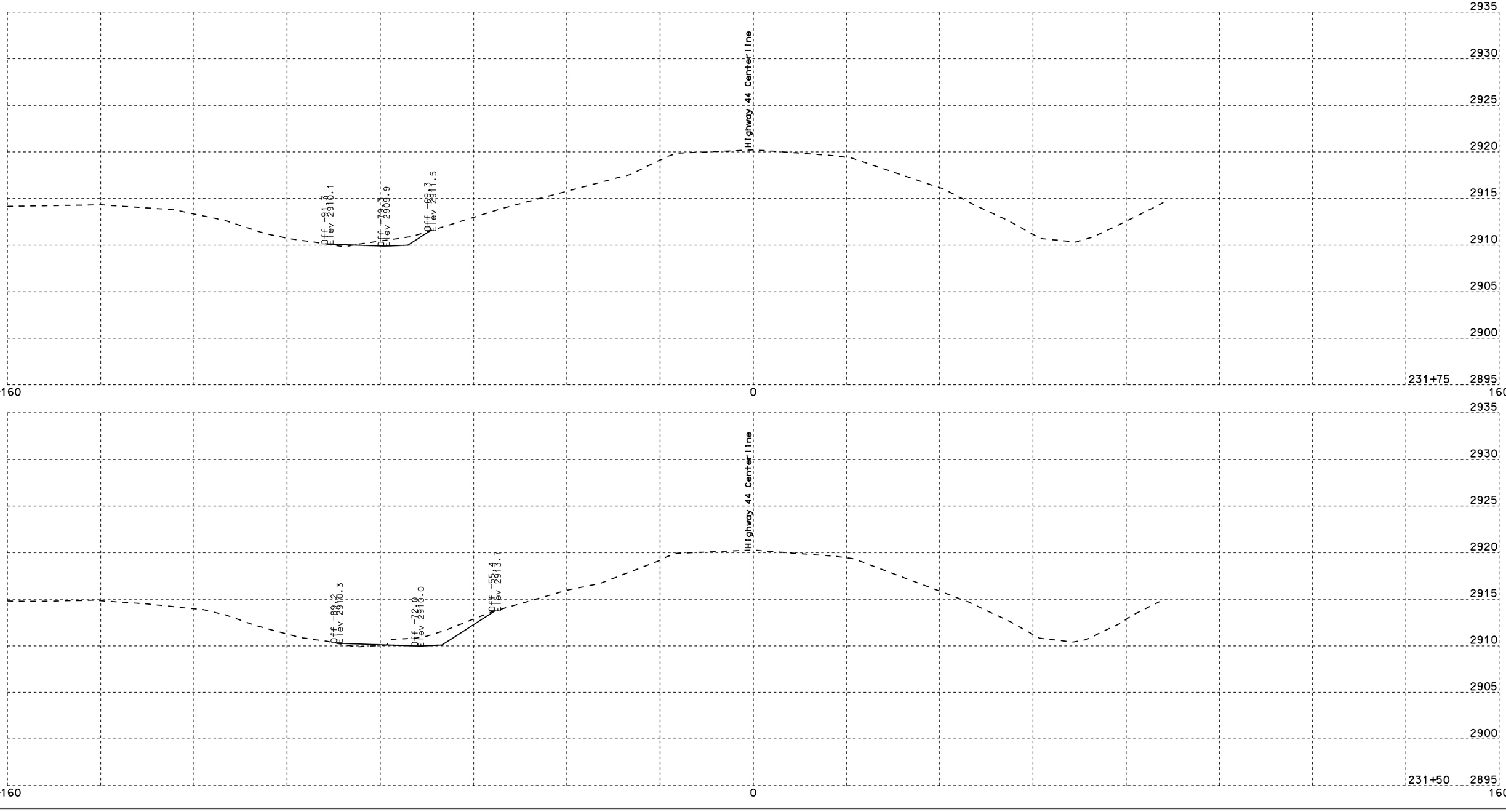
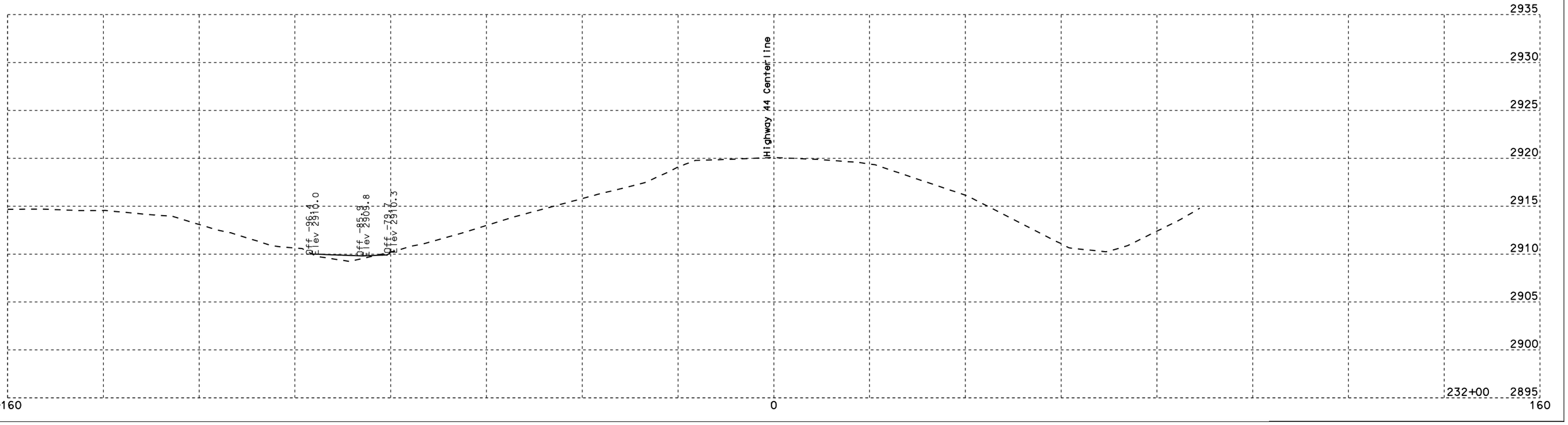
Plotting Date: 27-APR-2011

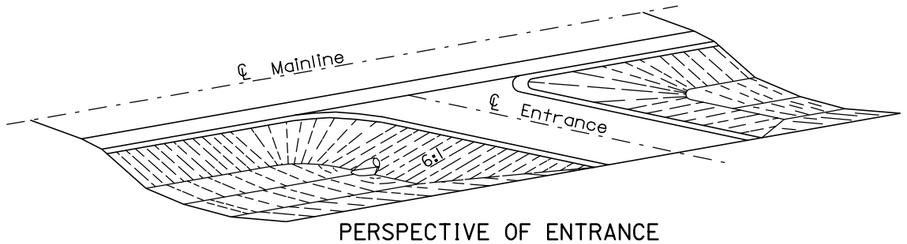
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	044-452	9	14



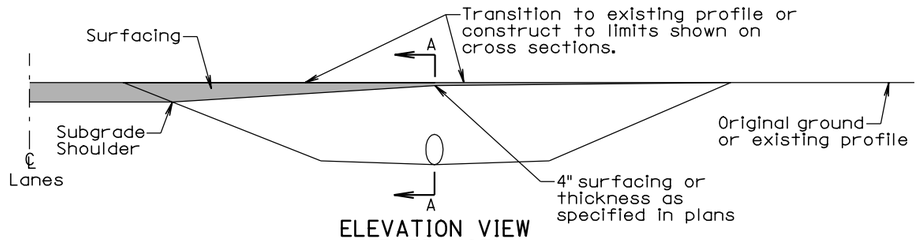
Plotting Date: 27-APR-2011

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	044-452	10	14

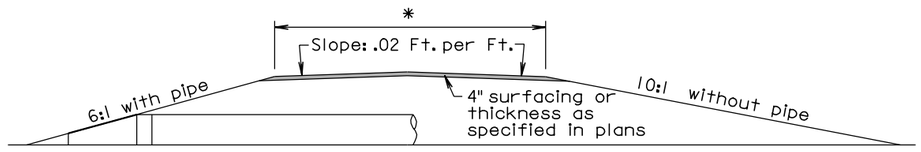




PERSPECTIVE OF ENTRANCE



ELEVATION VIEW (ENTRANCE)



SECTION A-A (ENTRANCE)

*The finished surfacing width is stated elsewhere in the plans. The subgrade width is 4' wider than the finished surfacing width unless stated otherwise in the plans.

GENERAL NOTES:

The ditch section shown above in the perspective and elevation view is only for illustrative purposes.

A 6:1 inslope shall be constructed for an entrance when a pipe is required. A 10:1 inslope shall be constructed when a pipe is not required.

Pipe lengths shall be adjusted if necessary during construction to obtain the 6:1 slopes. For grading projects, the pipe lengths are estimated typically using a 4" thickness of surfacing directly over the subgrade above the pipe.

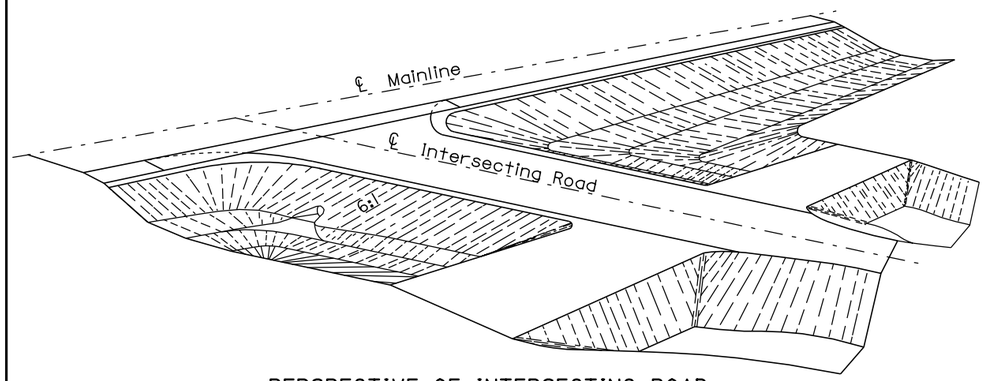
The transition area between the mainline inslope and the approach inslope for entrances shall be rounded to eliminate an abrupt transition.

For entrances other than intersecting roads, the radii shall be 15' unless stated otherwise in the plans.

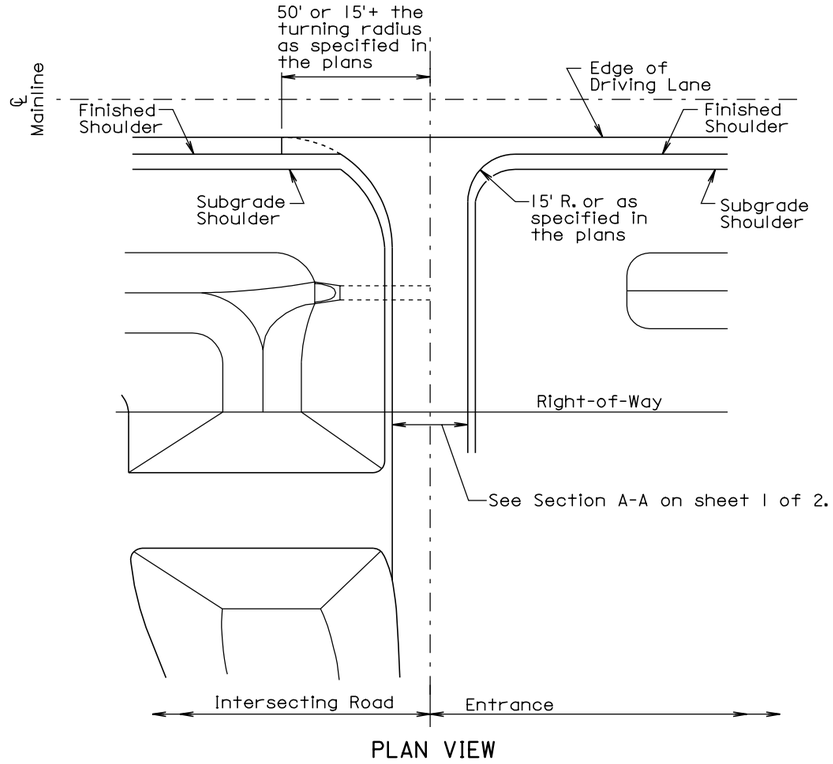
The turning radii shall be 35' for intersecting roads unless stated otherwise in the plans.

December 23, 2010

Published Date: 1st Qtr. 2011	SDDOT	INTERSECTING ROADS AND ENTRANCES	PLATE NUMBER 120.01
			Sheet 1 of 2



PERSPECTIVE OF INTERSECTING ROAD



PLAN VIEW

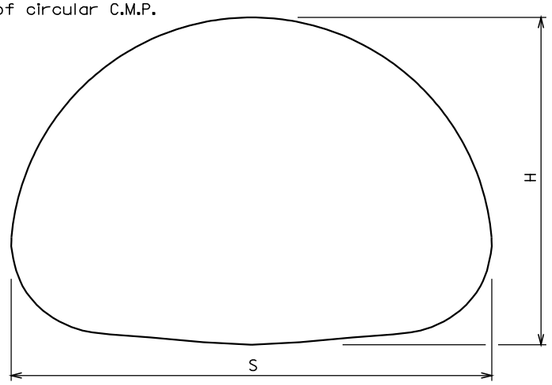
December 23, 2010

Published Date: 1st Qtr. 2011	SDDOT	INTERSECTING ROADS AND ENTRANCES	PLATE NUMBER 120.01
			Sheet 2 of 2

Username - trrcl2608

	2⅔" x ½" CORRUGATIONS			3" X 1" CORRUGATIONS		
* Dia. (In.)	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

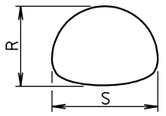
* Equivalent diameter of circular C.M.P.

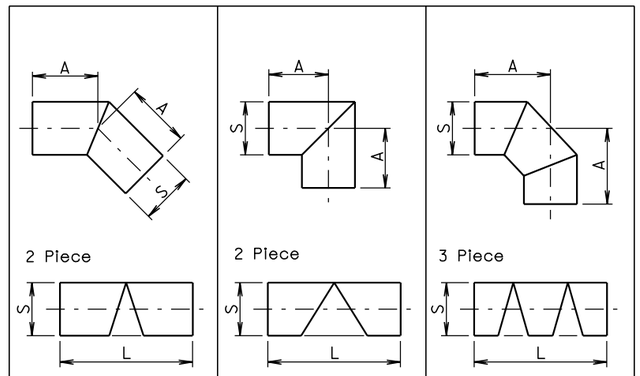


GENERAL NOTE:
All dimensions measured from inside crest.

March 31, 2000

Published Date: 1st Qtr. 2011	SDDOT	CORRUGATED METAL PIPE ARCH CULVERT	PLATE NUMBER 450.30
			Sheet 1 of 1





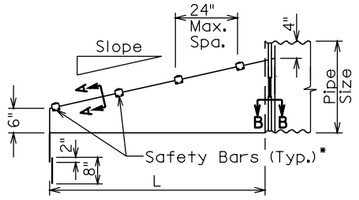
Equivalent Round Diameter	Span	Rise	45° Elbow 2 Piece		90° Elbow 2 Piece		90° Elbow 2 Piece	
	S	R	A	L	A	L	A	L
Inches	Inches		Inches	Feet	Inches	Feet	Inches	Feet
15	18	11	20	4	27	6	31	6
18	22	13	20	4	25	6	30	6
21	25	16	19	4	24	6	29	6
24	29	18	18	4	34	8	28	6
30	36	22	16	4	30	8	38	8
36	43	27	27	6	38	10	35	8
42	50	31	25	6	35	10	45	10
48	58	36	24	6	43	12	42	10
54	65	40	34	8	52	14	52	12
60	72	44	33	8	60	16	62	14
66	79	49	43	10	56	16	60	14
72	85	53	42	10	56	18	70	16

FABRICATED ELBOW LENGTHS

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

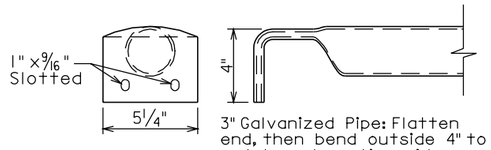
June 26, 2001

Published Date: 1st Qtr. 2011	SDDOT	C.M.P. ARCH FABRICATED LENGTHS FOR ELBOWS	PLATE NUMBER 450.34
			Sheet 1 of 1

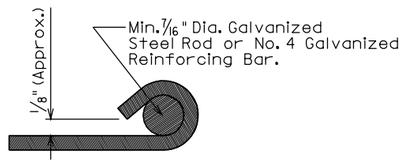


SIDE ELEVATION

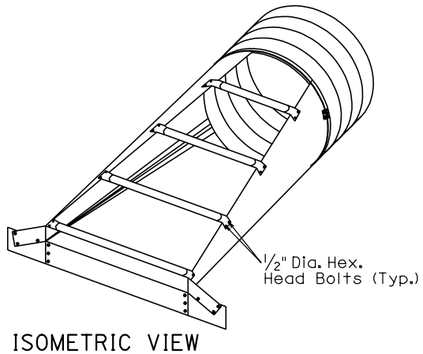
* Number of bars required will vary depending on the length of the End Section.



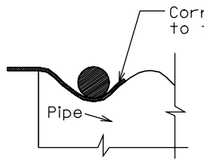
DETAIL OF SAFETY BARS



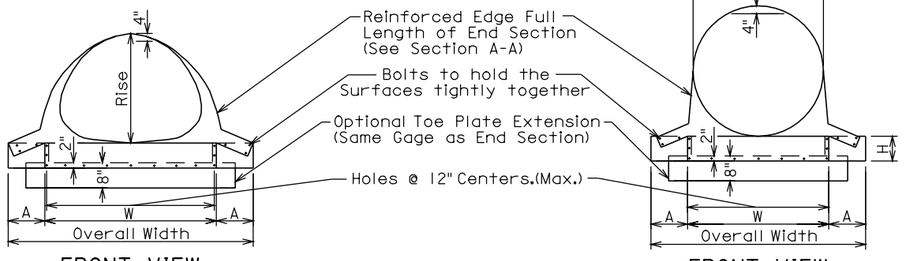
SECTION A-A



ISOMETRIC VIEW

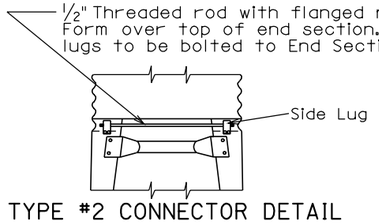


SECTION B-B

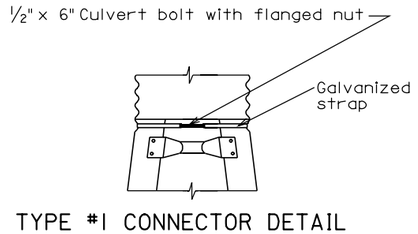


FRONT VIEW

FRONT VIEW



TYPE #2 CONNECTOR DETAIL
For 30" and Larger
21" x 15" and Larger



TYPE #1 CONNECTOR DETAIL
15" Through 24"

March 31, 2000

Published Date: 1st Qtr. 2011	SDDOT	C. M. P. SAFETY ENDS	PLATE NUMBER 450.38
			Sheet 1 of 2

ARCH C.M.P. SAFETY ENDS

Equv. Dia. (In.)	(Inches) Span	Rise	Min. Thick. In.	Gage	Dimensions (Inches) A	H	W	Overall Width	L Dimensions Slope	Length (In.)
18	21	15	.064	16	8	6	27	43	6:1	30
21	24	18	.064	16	8	6	30	46	6:1	48
24	28	20	.064	16	8	6	34	50	6:1	60
30	35	24	.079	14	12	9	41	65	6:1	84
36	42	29	.109	12	12	9	48	72	6:1	114
42	49	33	.109	12	16	12	55	87	6:1	138
48	57	38	.109	12	16	12	63	95	6:1	168
54	64	43	.109	12	16	12	70	102	6:1	198
60	71	47	.109	12	16	12	77	109	6:1	222
72	83	57	.109	12	16	12	89	121	6:1	282

CIRCULAR C.M.P. SAFETY ENDS

Pipe Dia. (In.)	Min. Thick. In.	Gage	Dimensions (Inches) A	H	W	Overall Width	L Dimensions Slope	Length (In.)
15	.064	16	8	6	21	37	6:1	30
18	.064	16	8	6	24	40	6:1	48
21	.064	16	8	6	27	43	6:1	66
24	.064	16	8	6	30	46	6:1	84
30	.109	12	12	9	36	60	6:1	120
36	.109	12	12	9	42	66	6:1	156
42	.109	12	16	12	48	80	6:1	192
48	.109	12	16	12	54	86	6:1	228
54	.109	12	16	12	60	92	6:1	264
60	.109	12	16	12	66	98	6:1	300

GENERAL NOTES:

Safety bars shall be attached to safety ends over 24" in diameter only.

Safety ends shall be fabricated from galvanized steel conforming 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.

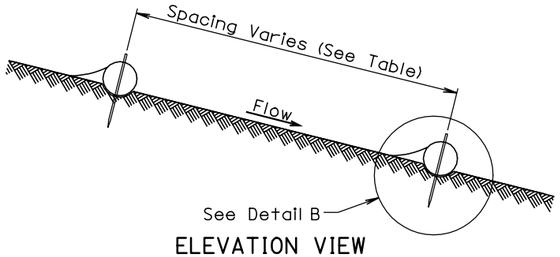
All work and materials required for fabrication and installation of safety ends shall be incidental to the bid items for the various sizes of safety ends.

March 31, 2000

Published Date: 1st Qtr. 2011	SDDOT	C. M. P. SAFETY ENDS	PLATE NUMBER 450.38
			Sheet 2 Of 2

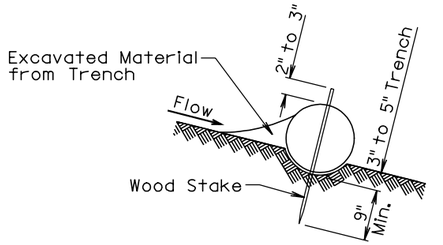
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	044-452	14	14

Plotting Date: 27-APR-2011

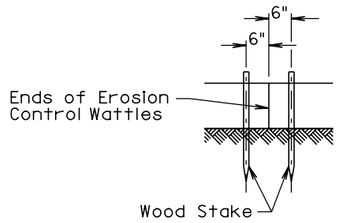


ELEVATION VIEW
CUT OR FILL SLOPE INSTALLATION

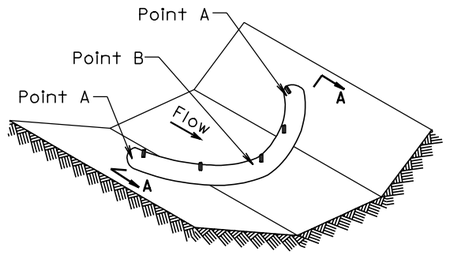
CUT OR FILL SLOPE INSTALLATION	
Slope	Spacing (Ft)
1:1	10
2:1	20
3:1	30
4:1	40



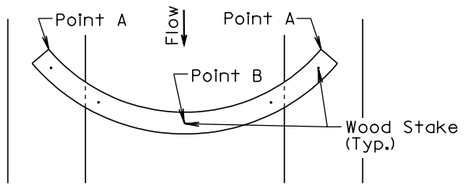
DETAIL B
(TYPICAL OF ALL INSTALLATIONS)



DETAIL C

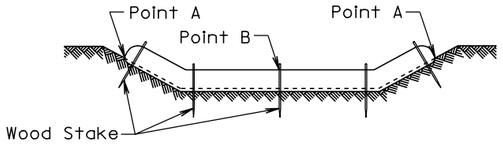


ISOMETRIC VIEW
DITCH INSTALLATION



PLAN VIEW
DITCH INSTALLATION

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



SECTION A-A

December 23, 2004

Published Date: 1st Qtr. 2011	SDDOT	EROSION CONTROL WATTLE	PLATE NUMBER 734.06
			Sheet 1 of 2

GENERAL NOTES:

At cut or fill slope installations, wattles shall be installed along the contour and perpendicular to the water flow.

At ditch installations, point A must be higher than point B to ensure that water flows over the wattle and not around the ends.

The Contractor shall dig a 3" to 5" trench, install the wattle tightly in the trench so that daylight can not be seen under the wattle, and then compact the soil excavated from the trench against the wattle on the uphill side. See Detail B.

The stakes shall be 1"x2" or 2"x2" wood stakes, however, other types of stakes such as rebar may be used only if approved by the Engineer. The stakes shall be placed 6" from the ends of the wattles and the spacing of the stakes along the wattles shall be 3' to 4'.

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

The Contractor and Engineer shall inspect the erosion control wattles once every week and within 24 hours after every rainfall event greater than ½". The Contractor shall remove, dispose, or reshape the accumulated sediment when necessary as determined by the Engineer.

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

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

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

December 23, 2004

Published Date: 1st Qtr. 2011	SDDOT	EROSION CONTROL WATTLE	PLATE NUMBER 734.06
			Sheet 2 of 2

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