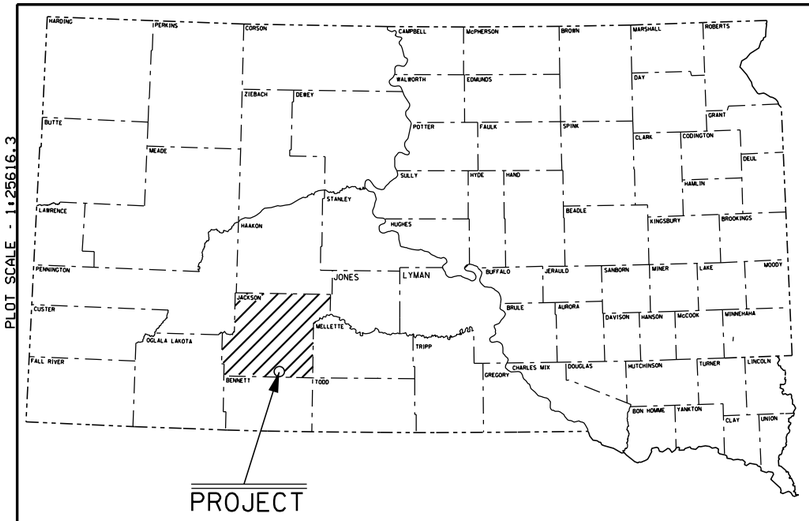


STATE OF SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION
PLANS FOR PROPOSED

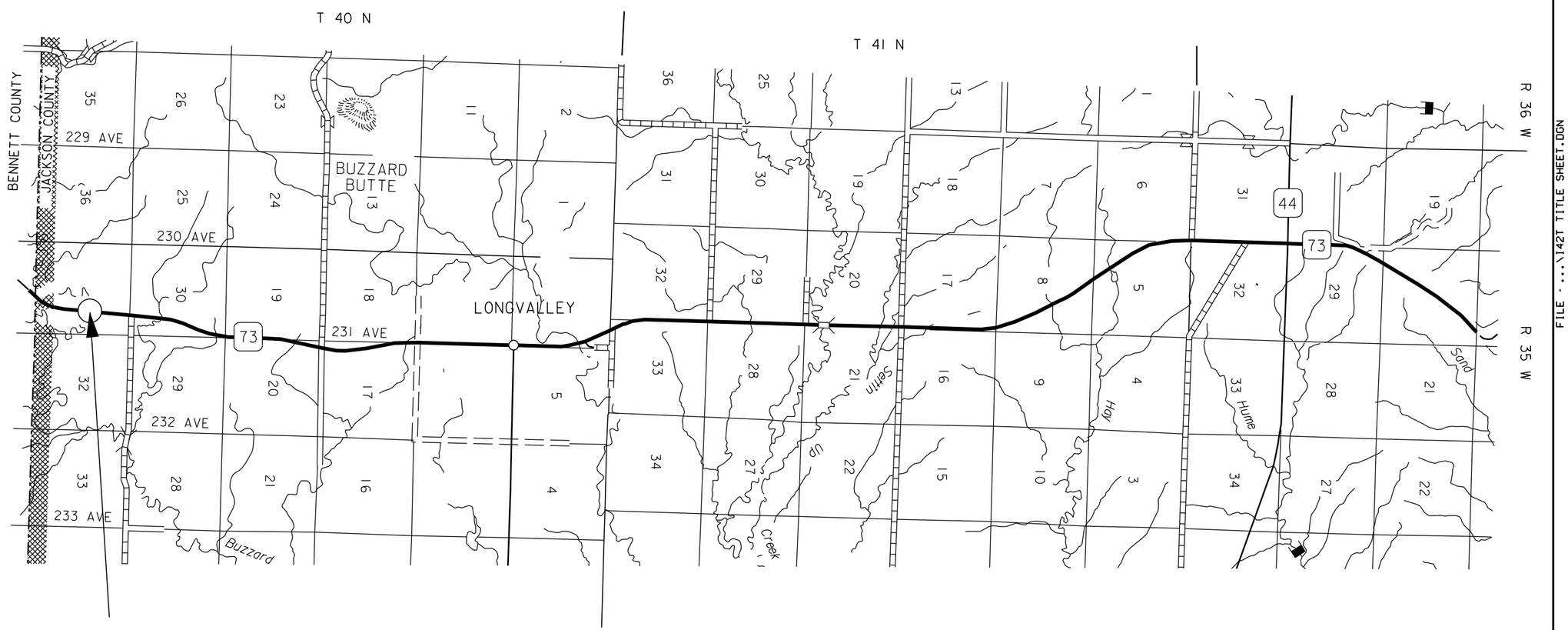
PROJECT 073–392
SD HIGHWAY 73
JACKSON COUNTY

Pipe and Erosion Repair
PCN 142T

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	073-392	1	17

Plotting Date: 03/22/2016

INDEX OF SHEETS



BEGIN/END PROJECT
MRM 38.00 + 0.100

DESIGN DESIGNATION

SD73

ADT (2015)	462
ADT (2035)	518
DHV	64.2
D	52%
T DHV	11.1%
T ADT	24.4%
V	65 MPH

STORM WATER PERMIT
NO PERMIT REQUIRED

Estimate of Quantities

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
110E0500	Remove Pipe Culvert	82	Ft
110E0510	Remove Pipe End Section	2	Each
110E1700	Remove Silt Fence	25	Ft
110E7802	Remove Fence for Reset	120	Ft
120E0600	Contractor Furnished Borrow Excavation	300	CuYd
230E0100	Remove and Replace Topsoil	Lump Sum	LS
450E4768	24" CMP 14 Gauge, Furnish	82	Ft
450E4770	24" CMP, Install	82	Ft
450E5015	24" CMP Elbow, Furnish	2	Each
450E5016	24" CMP Elbow, Install	2	Each
450E5215	24" CMP Flared End, Furnish	1	Each
450E5216	24" CMP Flared End, Install	1	Each
450E5410	24" CMP Safety End, Furnish	1	Each
450E5411	24" CMP Safety End, Install	1	Each
620E4100	Reset Fence	120	Ft
634E0010	Flagging	100.0	Hour
634E0020	Pilot Car	50.0	Hour
634E0110	Traffic Control Signs	180	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
700E0210	Class B Riprap	54.0	Ton
734E0010	Erosion Control	Lump Sum	LS
734E0131	Type 1 Turf Reinforcement Mat	93.0	SqYd
734E0602	Low Flow Silt Fence	100	Ft
734E0610	Mucking Silt Fence	7	CuYd
734E0620	Repair Silt Fence	25	Ft
831E0110	Type B Drainage Fabric	90	SqYd

SPECIFICATIONS

Standard Specifications for Roads and Bridges, 2015 Edition and Required Provisions, Supplemental Specifications and Special Provisions as included in the Proposal.

ENVIRONMENTAL COMMITMENTS

An Environmental Commitment is a measure that SDDOT commits to implement in order to avoid, minimize, and/or mitigate a real or potential environmental impact. Environmental commitments to various agencies and the public have been made to secure approval of this project. An agency mentioned below with permitting authority can influence a project if perceived environmental impacts have not been adequately addressed. Unless otherwise designated, the Contractor's primary contact regarding matters associated with these commitments will be the Project Engineer. These environmental commitments are not subject to change without prior written approval from the SDDOT Environmental Office. The environmental commitments associated with this project are as follows:

COMMITMENT B: FEDERALLY THREATENED, ENDANGERED, AND PROTECTED SPECIES

COMMITMENT B2: WHOOPING CRANE

The Whooping Crane is a spring and fall migratory bird in South Dakota that is about 5 feet tall and typically stops on wetlands, rivers, and agricultural lands along their migration route. An adult Whooping Crane is white with a red crown and a long, dark, pointed bill. Immature Whooping Cranes are cinnamon brown. While in flight, their long necks are kept straight and their long dark legs trail behind. Adult Whooping Cranes' black wing tips are visible during flight.

Action Taken/Required:

Harassment or other measures to cause the Whooping Crane to leave the site is a violation of the Endangered Species Act. If a Whooping Crane is sighted roosting in the vicinity of the project, borrow pit, or staging site associated with the project, cease construction activities in the affected area until the Whooping Crane departs and contact the Project Engineer. The Project Engineer will contact the Environmental Office so that the sighting can be reported to USFWS.

ENVIRONMENTAL COMMITMENTS - CONTINUED

COMMITMENT B3: AMERICAN BURYING BEETLE

This project is located in an area that contains habitat associated with the American Burying Beetle. Project clearance with the SD-USFWS office has been achieved for all work included within the project limits and all designated option borrow sites provided in the plans.

Action Taken/Required:

Earth disturbing activities shall not occur outside the plans designated work limits unless specifically addressed in the plans. The Contractor is responsible for obtaining USFWS review for any borrow sites, staging areas, waste sites, additional easement, and other ground disturbing activities outside the project limits as shown in the plans. The Contractor shall provide the Project Engineer a copy of the USFWS review prior to commencing any work outside the project limits as shown in the plans.

COMMITMENT B4: BALD EAGLE

Bald eagles are known to occur in this area.

Action Taken/Required:

If a nest is observed within one mile of the project site, notify the Project Engineer immediately so that he/she can consult with the Environmental Office for an appropriate course of action.

COMMITMENT C: WATER SOURCE

The Contractor shall not withdraw water with equipment previously used outside the State of South Dakota without prior approval from the SDDOT Environmental Office. Thoroughly wash all construction equipment before entering South Dakota to reduce the risk of invasive species introduction into the project vicinity.

Action Taken/Required:

The Contractor shall obtain the necessary permits from the regulatory agencies such as the Department of Environment and Natural Resources (DENR) and the United States Army Corps of Engineers (COE) prior to executing water extraction activities.

COMMITMENT E: STORM WATER

Construction activities constitute less than 1 acre of disturbance.

Action Taken/Required:

At a minimum and regardless of project size, appropriate erosion and sediment control measures must be installed to control the discharge of pollutants from the construction site.

COMMITMENT H: WASTE DISPOSAL SITE

The Contractor shall furnish a site(s) for the disposal of construction and/or demolition debris generated by this project.

Action Taken/Required:

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

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

The waste disposal site(s) shall not be located in a wetland, within 200 feet of surface water, or in an area that adversely affects wildlife, recreation, aesthetic value of an area, or any threatened or endangered species, as approved by the Project Engineer.

If the waste disposal site(s) is located such that it is within view of any ROW, the following additional requirements shall apply:

COMMITMENT H: WASTE DISPOSAL SITE - CONTINUED

1. Construction and/or demolition debris consisting of concrete, asphalt concrete, or other similar materials shall be buried in a trench completely separate from wood debris. The final cover over the construction and/or demolition debris shall consist of a minimum of 1 foot of soil capable of supporting vegetation. Waste disposal sites provided outside of the State ROW shall be seeded in accordance with Natural Resources Conservation Service recommendations. The seeding recommendations may be obtained through the appropriate County NRCS Office. The Contractor shall control the access to waste disposal sites not within the State ROW through the use of fences, gates, and placement of a sign or signs at the entrance to the site stating “No Dumping Allowed”.

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

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

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

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

COMMITMENT I: HISTORICAL PRESERVATION OFFICE CLEARANCES

The SDDOT has obtained concurrence with the State Historical Preservation Office (SHPO or THPO) for all work included within the project limits and all department designated sources and designated option material sources, stockpile sites, storage areas, and waste sites provided within the plans.

Action Taken/Required:

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

The Contractor shall arrange and pay for a cultural resource survey and/or records search. The Contractor has the option to contact the state Archaeological Research Center (ARC) at 605-394-1936 or another qualified archaeologist, to obtain either a records search or a cultural resources survey. A record search might be sufficient for review; however, a cultural resources survey may need to be conducted by a qualified archaeologist.

The Contractor shall provide ARC with the following: a topographical map or aerial view on which the site is clearly outlined, site dimensions, project number, and PCN. If applicable, provide evidence that the site has been previously disturbed by farming, mining, or construction activities with a landowner statement that artifacts have not been found on the site.

The Contractor shall submit the records search or cultural resources survey report and if the location of the site is within the current geographical or historic boundaries of any South Dakota reservation to SDDOT Environmental Engineer, 700 East Broadway Avenue, Pierre, SD 57501-2586 (605-773-3180). SDDOT will submit the information to the appropriate SHPO/THPO. Allow **30 Days** from the date this information is submitted to the Environmental Engineer for SHPO/THPO review.

If evidence for cultural resources is uncovered during project construction activities, then such activities shall cease and the Project Engineer shall be immediately notified. The Project Engineer will contact the SDDOT Environmental Engineer in order to determine an appropriate course of action.

SHPO/THPO review does not relieve the Contractor of the responsibility for obtaining any additional permits and clearances for Contractor furnished material sources, material processing sites, stockpile sites, storage areas, plant sites, and waste areas that affect wetlands, threatened and endangered species, or waterways. The Contractor shall provide the required permits and clearances to the Project Engineer at the preconstruction meeting.

COMMITMENT N: SECTION 404 PERMIT

The SDDOT has obtained a Section 404 Permit from the US Army Corps of Engineers for the permanent actions associated with this project.

Action Taken/Required:

The Contractor shall comply with all requirements contained in the Section 404 permit.

The Contractor shall also be responsible for obtaining a Section 404 permit for any dredge, excavation, or fill activities associated with staging areas, borrow sites, waste disposal sites, or material processing sites that affect wetlands or waters of the United States.

SCOPE OF WORK

MRM 38.00 + 0.100 The site work consists of removing the existing 18" x 82' CMP downspout, 2 -15 degree elbows, 1 Flared End and one Safety End. This existing CMP downspout was installed in August 2012. The pipe is still in place but the embankment backfill has been washed out down to the pipe grade on the downspout portion. This pipe will be replaced with a 24" x 82' CMP, 2 – 15 degree elbows, 1 Flared End and 1 Safety End. The existing ditch block elevation shall be raised to 2' above the new pipe inlet flowline. Type B Drainage Fabric and Class B Riprap shall be placed at both the inlet and outlet of the newly installed pipe. Type B Drainage Fabric placed at the inlet shall be 2.5' deep x 12' wide x 10' in length. In addition, the Type B Drainage Fabric and Class B Riprap at the inlet shall extend to the top of the ditch block for the full width of placement. Type B Drainage Fabric and Class B Riprap placed at the outlet shall be 2.5' deep x 12' wide x 10' in length. Type 1 Turf Reinforcement Mat shall be placed 12' wide from the top of the ditch block extending down the slope to the outlet. The existing 4.5 cubic yard Bank and Channel Gabion may have to be removed to allow for installation of Class B Riprap at the outlet. Removal of the Bank and Channel Gabion if necessary shall be incidental to the contract unit price per ton for Class B RipRap.

GENERAL MAINTENANCE OF TRAFFIC

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

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.

If operations exist where the traveling public will be delayed at a flagging station more than 5 minutes, it is required that the flaggers and pilot car operators all have radio or telephone contact with one another. This equipment is to be used to assist with Traffic movement in the event that an emergency vehicle such as ambulance, police or fire vehicles need to pass through the project in an expedient manner.

The maximum allowed delay at a flagger station shall be 15 minutes. Work zone lengths in the field shall be adjusted accordingly to comply with the maximum allowed delay.

The Contractor shall furnish, install and maintain Truck Crossing Signs. The exact number and location will be determined on construction. Payment for additional signs will be based on the contract unit price per square foot for "Traffic Control Signs".

The Truck Crossing signs shall be displayed at all times when haul vehicles are hauling material. When the truck haul condition no longer exists, and also during nighttime hours, the signs shall be covered or removed from view.

Reflectorized Sheeting Requirements for Temporary Traffic Control Devices

Delete the first paragraph of Section 984.1 and replace with the following:

Temporary traffic control devices, including signs, drums, cones, tubular markers, barricades, vertical panels, and direction indicator barricades shall be reflectorized with sheeting applied to a satisfactory backing. For all temporary traffic control warning signs, the reflective sheeting shall meet or exceed the standards of Type VII, Type VIII, Type IX, or Type XI as defined by AASHTO M 268 (ASTM D4956). For all other temporary traffic control signs, the reflective sheeting shall meet or exceed the standards of Type IV, Type V, Type VII, Type VIII, Type IX, or Type XI as defined by AASHTO M 268 (ASTM D4956). For barricades, vertical panels, and direction indicator barricades; the reflective sheeting shall meet or exceed the standards of Type III as defined by AASHTO M 268 (ASTM D4956). Round surfaced temporary traffic control devices including, but not limited to; drums, cones, and tubular markers shall be reflectorized with reflectorized sheeting meeting or exceeding the standards of Type IV as defined by AASHTO M 268 (ASTM D4956). All orange colored material shall be fluorescent.

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 excavation required to expose existing pipe and ends will be incidental to the contract unit prices for the corresponding pipe remove and install bid items. The existing pipe and ends shall become property of the contractor.

CORRUGATED METAL PIPE

Corrugated metal pipes shall have 2 2/3-inch X ½-inch corrugations for 42-inch and smaller round pipe and 48-inch and smaller arch pipe unless otherwise stated in the plans. Corrugated metal pipes shall have 3-inch X 1-inch or 5-inch X 1-inch corrugations for 48-inch and larger round pipe and 54-inch and larger arch pipe unless otherwise stated in the plans.

The soils within the project area are highly corrosive to steel. Corrugated metal pipe in these areas shall be 14 gauge steel. Corrugated metal pipe in these areas including the connection bands and transitions shall be polymer coated and shall be in conformance with AASHTO M245 and AASHTO M36. The connection bands shall be 24 inches wide.

CORRUGATED METAL PIPE – CONTINUED

All damage to the polymer coating shall be repaired in accordance with the manufacturer's recommendations prior to installation of the pipe.

All costs associated with the polymer coating including repair of polymer coating shall be incidental to the corresponding CMP bid items.

Metal pipe end sections shall be aluminum-coated (Type 2) in accordance with AASHTO M36. All costs associated for gauge, coating, and connections shall be incidental to the corresponding CMP End Section bid items.

PIPE FOR DOWNSPOUTS

High density polyethylene pipe may be substituted for corrugated metal pipe downspouts at no additional cost to the state. All necessary connections and transitions shall be approved by the Engineer.

Acceptance of high density polyethylene pipe will be by certification.

The end sections for the high density polyethylene pipe shall be metal, conform to the type of end sections as shown in the plans, and be compatible with the high density polyethylene pipe.

REMOVING, STOCKPILING, AND REPLACING TOPSOIL

Prior to excavation or placement of fill material, the Contractor will be required to remove and salvage 4 inches of the existing topsoil.

The Contractor shall stockpile the material at a site approved by the Engineer, and/or windrow the material near the disturbed areas to control potential sediment runoff as determined by the Engineer.

The replacement of topsoil shall be spread evenly throughout all disturbed areas upon completion of the work. Any clumps larger than 3 inches shall be broken up prior to seeding the areas.

All topsoil removal, stockpiling, salvaging, windrowing, and replacement shall be done as according to the plans and/or as directed by the Engineer.

All cost associated with removing, salvaging, stockpiling, windrowing, and replacing topsoil shall be incidental to the contract lump sum price for "Remove and Replace Topsoil".

CONTRACTOR FURNISHED BORROW EXCAVATION

Contractor Furnished Borrow Excavation shall be required to backfill the newly installed CMP Downspout. 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 Excavation" 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.

Once work begins, work shall proceed in a continuous manner 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 Excavation".

Compaction of the fill material shall be to the satisfaction of the Engineer.

EROSION CONTROL

The areas disturbed as a result of work on this project shall be restored and/or reshaped to the satisfaction of the Engineer. All disturbed areas shall be seeded and mulched.

The varieties listed for the seed mixture are preferred varieties. Native harvest seed will be allowed.

Type F Permanent Seed Mixture shall consist of the following:

Grass Species	Variety	Pure Live Seed (PLS) (Pounds/Acre)
Western Wheatgrass	Arriba, 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 May; Winter Wheat: August through November		10
	Total:	26

It is estimated that 0.10 acres of disturbed area will require seeding. Limits of the work shall be determined by the Engineer at the time of Construction.

EROSION CONTROL - CONTINUED

It is anticipated that the mulch quantity will be very minimal as the majority of the disturbed area will be covered with Type 1 Turf Reinforcement Mat and Class B Riprap. Mulch required shall be applied at a rate of 2 ton/acre. Hand placement and spreading of mulch will be allowed.

Application of fertilizer will not be required on this project.

All costs associated with furnishing/placing the seed, mulch, and inoculum, along with all labor, and equipment shall be incidental to the contract lump sum price for “Erosion Control”.

MYCORRHIZAL INOCULUM

Mycorrhizal inoculum shall consist of mycorrhizal fungi spores and mycorrhizal fungi-infected root fragments in a solid carrier. The carrier may include organic materials, calcinated clay, or other materials consistent with application and good plant growth. The supplier shall provide certification of the fungal species claimed and the live propagule count. The inoculum shall include the following fungal species:

Glomus intraradices 25%
Glomus aggregatu 25%
Glomus mosseae 25%
Glomus etunicatum 25%

All seed shall be inoculated by the seed supplier with a minimum of 100,000 live propagules of mycorrhizal fungi per acre. All costs of inoculating the seed shall be incidental to the contract lump sum price for Erosion Control.

CLASS B RIPAP

Class B Riprap shall meet the requirements of Section 830.1 of the Standard Specifications with the following exception. If field stone is utilized for the Class B Riprap, the stone shall have a minimum of 2 crushed faces.

TABLE OF RIPRAP AND DRAINAGE FABRIC

Location	L/R	Class B Riprap (Ton)	Type B Drainage Fabric (SqYd)
Inlet	Lt	15.5	28.3
Inslope of Inlet	Lt	23.0	33.1
Outlet	Lt	15.5	28.3
	Total:	54.0	89.7

LOW FLOW SILT FENCE

The low flow silt fence fabric provided shall be from the approved product list. The approved product list for low flow silt fence may be viewed at the following internet site:

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

Low flow silt fence shall be placed at the outlet end of the repair work as perimeter control to minimize siltation of adjacent streams, lakes, dams, or drainage areas as determined by the Engineer during construction. Refer to Standard Plate 734.04 for details.

REMOVE/RESET ROW FENCE

The existing right of way fence located near the pipe repair location will have to be removed and reset in order to perform the work required. It is estimated that 120’ of existing fence will have to be removed and reset in order to perform the work. Actual quantity will be measured on site and will be dependent on the contractor’s operation. Temporary fence may be required if livestock is present at the time of construction. If Temporary Fence is utilized, payment shall be incidental to the unit price per foot for “Remove Fence for Reset” and “Reset Fence”.

ITEMIZED LIST FOR TRAFFIC CONTROL

SIGN CODE	SIGN DESCRIPTION	NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
W8-6	TRUCK CROSSING	2	48" x 48"	16	32
W16-2P	___ FEET (supplemental distance plaque)	2	30" x 24"	5	10
W20-1	ROAD WORK AHEAD	2	48" x 48"	16	32
W20-4	ONE LANE ROAD AHEAD	2	48" x 48"	16	32
W20-7	FLAGGER (symbol)	2	48" x 48"	16	32
W21-5	SHOULDER WORK	2	48" x 48"	16	32
G20-2	END ROAD WORK	2	36" x 18"	5	10
		CONVENTIONAL ROAD TRAFFIC CONTROL SIGNS SQFT			180

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	073-392	8	17

Plotting Date: 03/22/2016

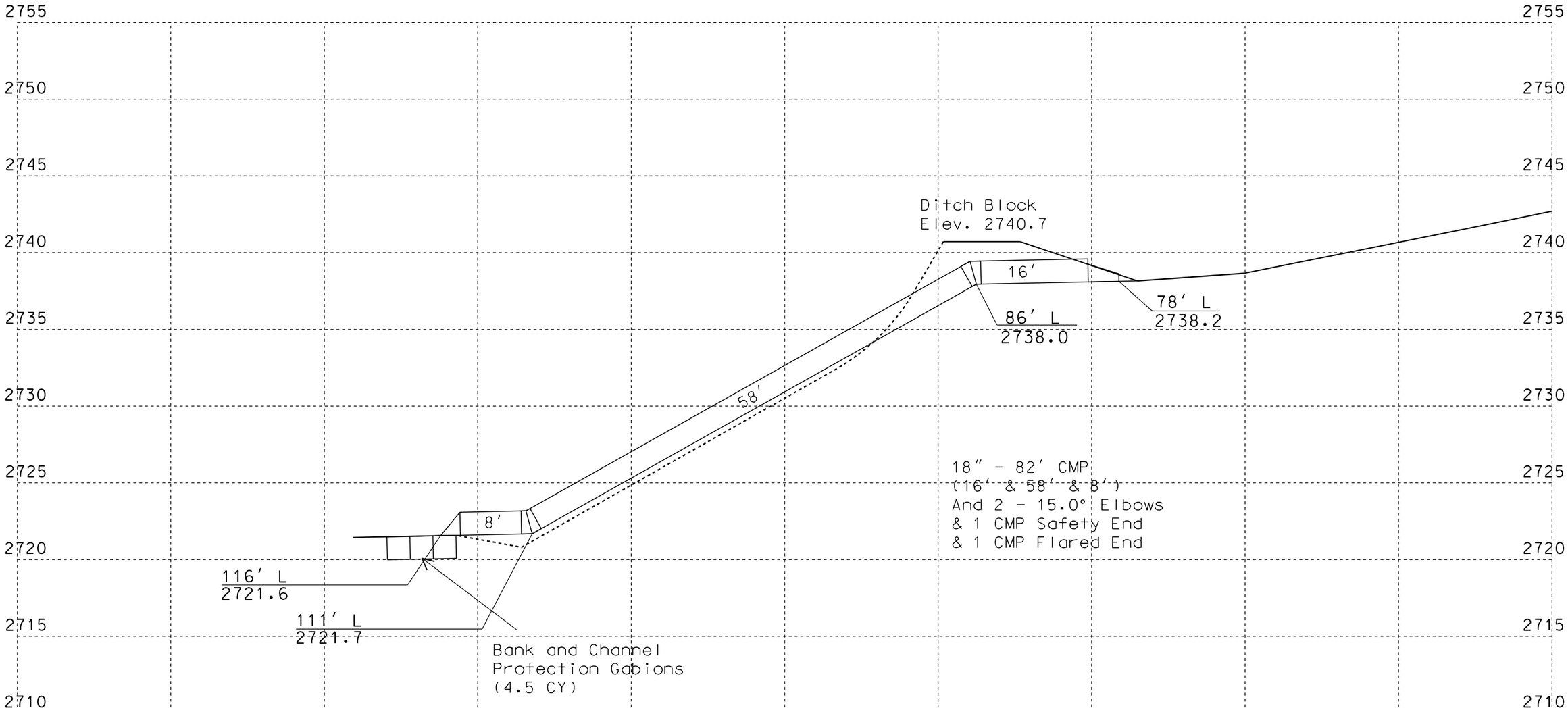
PLOT SCALE - 1:25616.3

PLOT NAME - 1

FILE - ...\DESIGN FILES\ORIGSECT.DGN

PLOTTED FROM - TRWLINT29

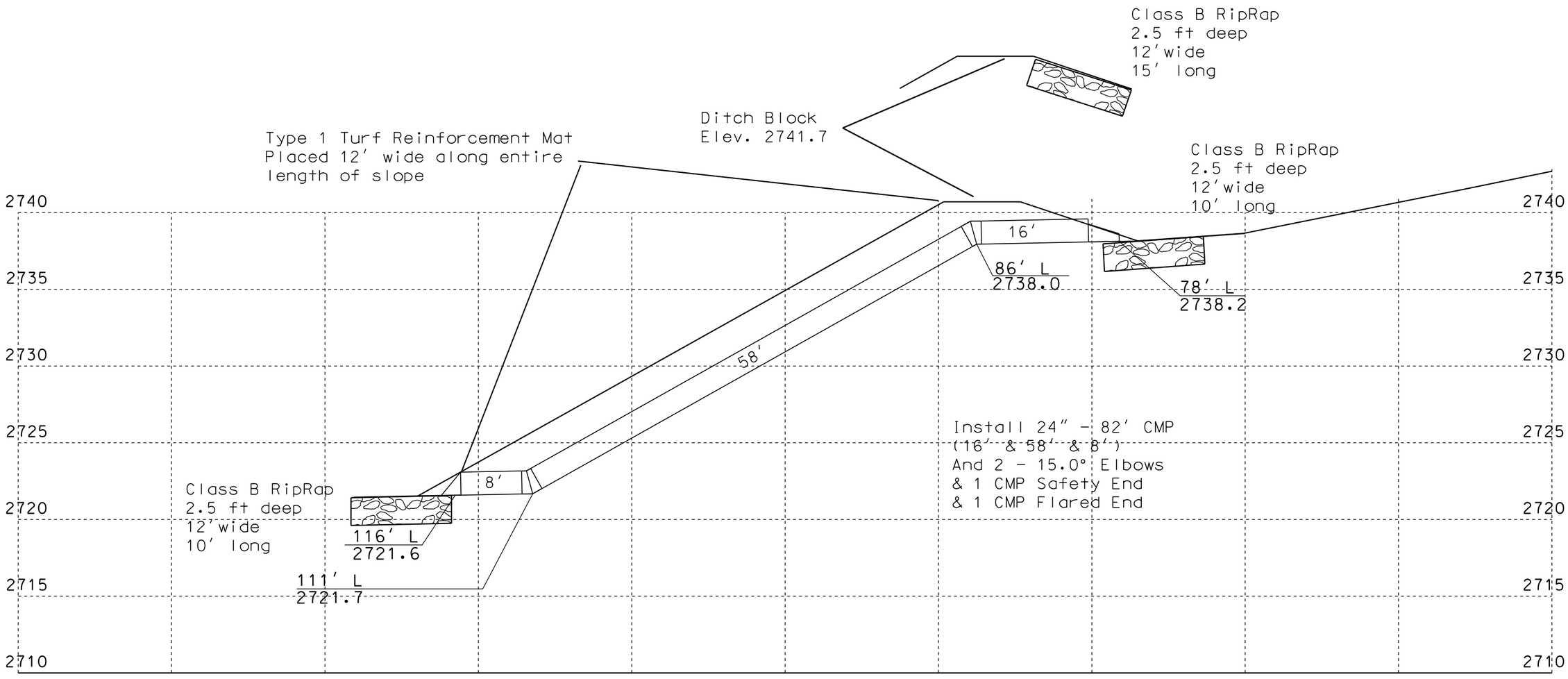
EXISTING PIPE SECTION



STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	073-392	9	17

Plotting Date: 03/22/2016

NEW PIPE SECTION



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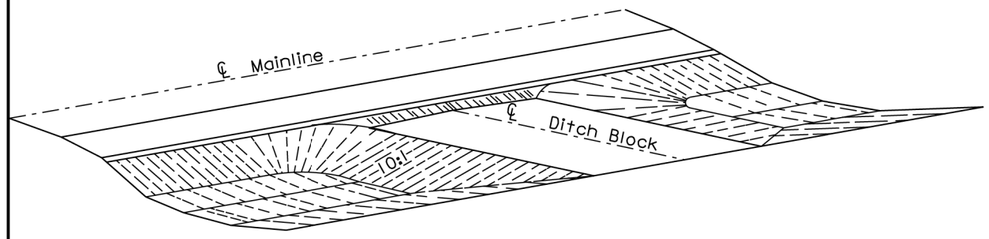
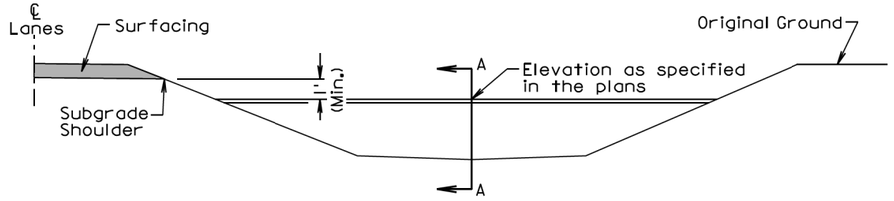
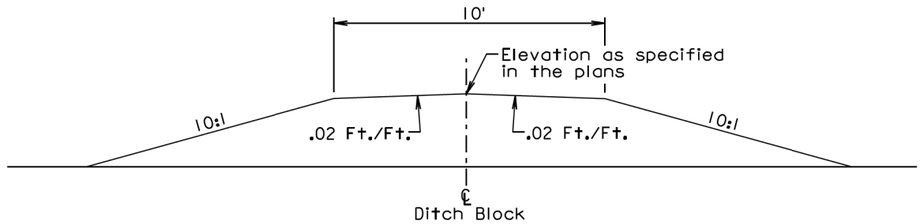


PERSPECTIVE OF DITCH BLOCK



ELEVATION VIEW



SECTION A-A

GENERAL NOTES:

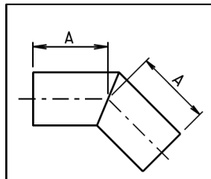
The ditch section shown above in the perspective and elevation view is only for illustrative purposes.

The inslopes of the ditch block shall be 10:1 or as specified in the plans.

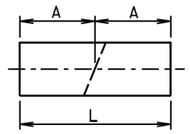
The transition area between the mainline inslope and the ditch block inslope shall be rounded to eliminate an abrupt transition.

February 14, 2011

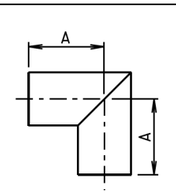
Published Date: 1st Qtr. 2016	SDDOT	***DITCH BLOCK***	***PLATE NUMBER*** 120.02 *Sheet 1 of 1*



2 Piece



5° to 45° Elbow



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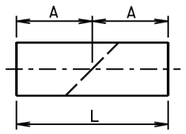
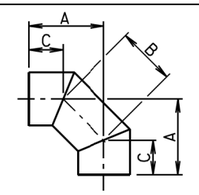
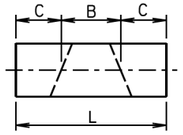


50° to 90° Elbow



3 Piece



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:

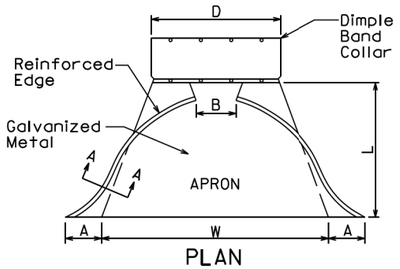
All dimensions shown are nominal.

L = Linear Feet of C.M.P. required to fabricate fitting.

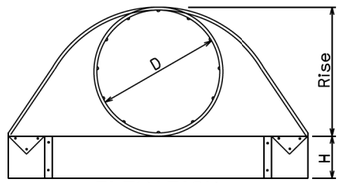
June 26, 2001

Published Date: 1st Qtr. 2016	SDDOT	***C.M.P. FABRICATED LENGTHS FOR ELBOWS***	***PLATE NUMBER*** 450.32 *Sheet 1 of 1*

Alternate Type Connector Sections may be used with approval of the Engineer.



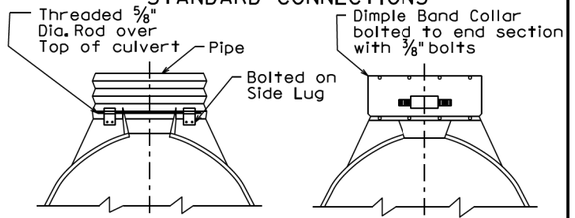
PLAN

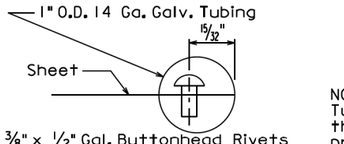


ELEVATION

Dia. D (in.)	Ga.	DIMENSIONS (in.) A	B	H	L	W	Approx. Slope	Body
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	1⅙:1	3 Pc.

STANDARD CONNECTIONS

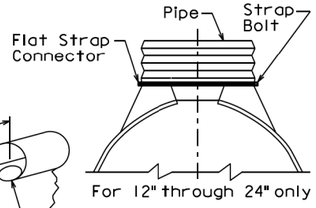




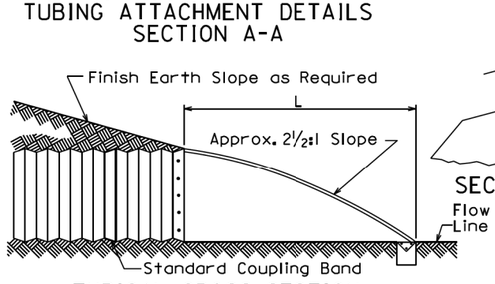
⅜" x ½" Gal. Buttonhead Rivets spaced 6" C. to C. Overall length of rivets=0.78"

TUBING ATTACHMENT DETAILS
SECTION A-A

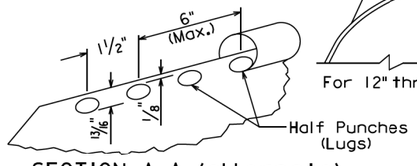
NOTE:
Tubing is slipped over the sheet and rivets or lugs prior to forming operations of the apron.



For 12" through 24" only



TYPICAL CROSS-SECTION



SECTION A-A (alternate)

SECTION A-A (alternate)

GENERAL NOTES:

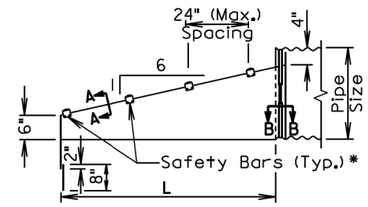
All 3 pc. bodies shall have 12 Ga. sides and 10 Ga. center panels. Width of center panels shall be greater than 20% of the pipe periphery. Multiple panel bodies to have lap seams tightly joined by ⅜" Dia. galvanized rivets or bolts.

For 60" through 84" sizes, reinforced edges shall be supplemented with galvanized stiffener angles. The angles will be 2" x 2" x ¼" for 60" through 72" diameters and 2½" x 2½" x ¼" for 78" and 84" diameters. The angles shall be attached by ⅜" diameter galvanized nuts and bolts.

Rivets and Bolts shall be ⅜" Dia. Min. for 10 Ga. and 12 Ga. sheet, and ⅝" Dia. Min. for 14 Ga. and 16 Ga. sheets. Tighten nuts with torque wrench to 25 lbs. torque.

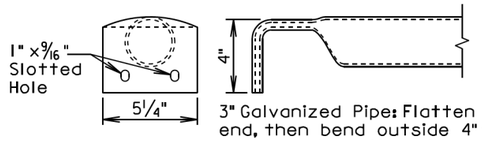
March 31, 2000

Published Date: 1st Qtr. 2016	SDDOT	C.M.P. FLARED ENDS	PLATE NUMBER 450.35
			Sheet 1 of 1



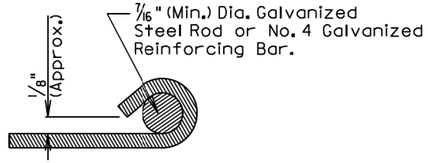
ELEVATION VIEW

* Number of bars required will vary depending on the length of the end section.

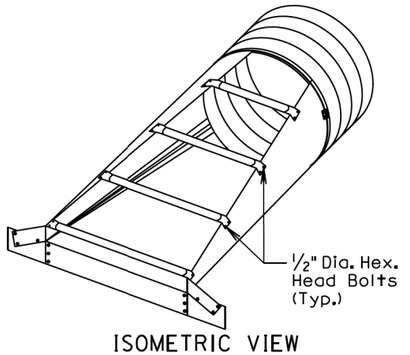


3" Galvanized Pipe: Flatten end, then bend outside 4" to match end section sides.

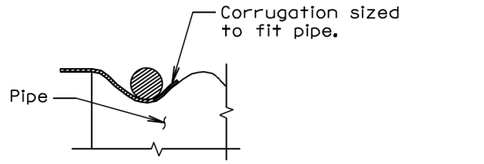
DETAIL OF SAFETY BARS



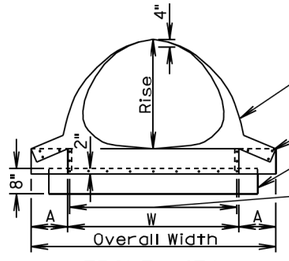
SECTION A-A



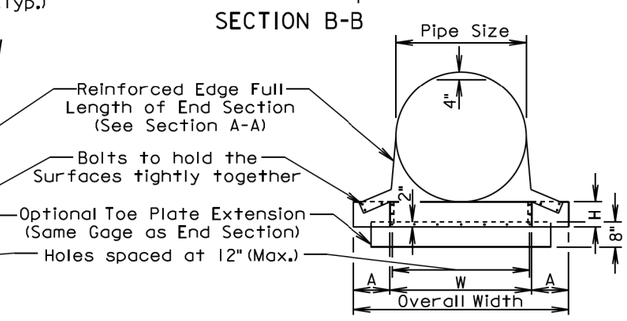
ISOMETRIC VIEW



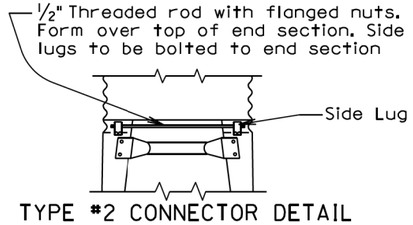
SECTION B-B



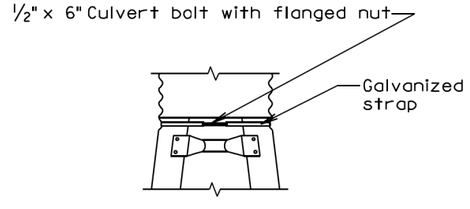
FRONT VIEW



FRONT VIEW



TYPE #2 CONNECTOR DETAIL
(For 30" and Larger)
(For 21" X 15" and Larger)



TYPE #1 CONNECTOR DETAIL
(For 15" Through 24")

June 26, 2015

Published Date: 1st Qtr. 2016	SDDOT	C. M. P. SAFETY ENDS	PLATE NUMBER 450.38
			Sheet 1 of 2

ARCH C.M.P. SAFETY ENDS										
Equv. Dia. (Inch)	(Inches)		Min. Thick.		Dimensions (Inches)				L Dimensions	
	Span	Rise	Inch	Gage	A	H	W	Overall Width	Slope	Length (Inch)
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. (Inch)	Min. Thick.		Dimensions (Inches)				L Dimensions	
	Inch	Gage	A	H	W	Overall Width	Slope	Length (Inch)
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 ends shall be fabricated from galvanized steel conforming to the requirements of the Specifications.

Safety bars shall be fabricated from steel schedule 40 pipe in conformance with ASTM A53, grade B or HSS 3.5X.216 in conformance with ASTM A500, grade B.

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.

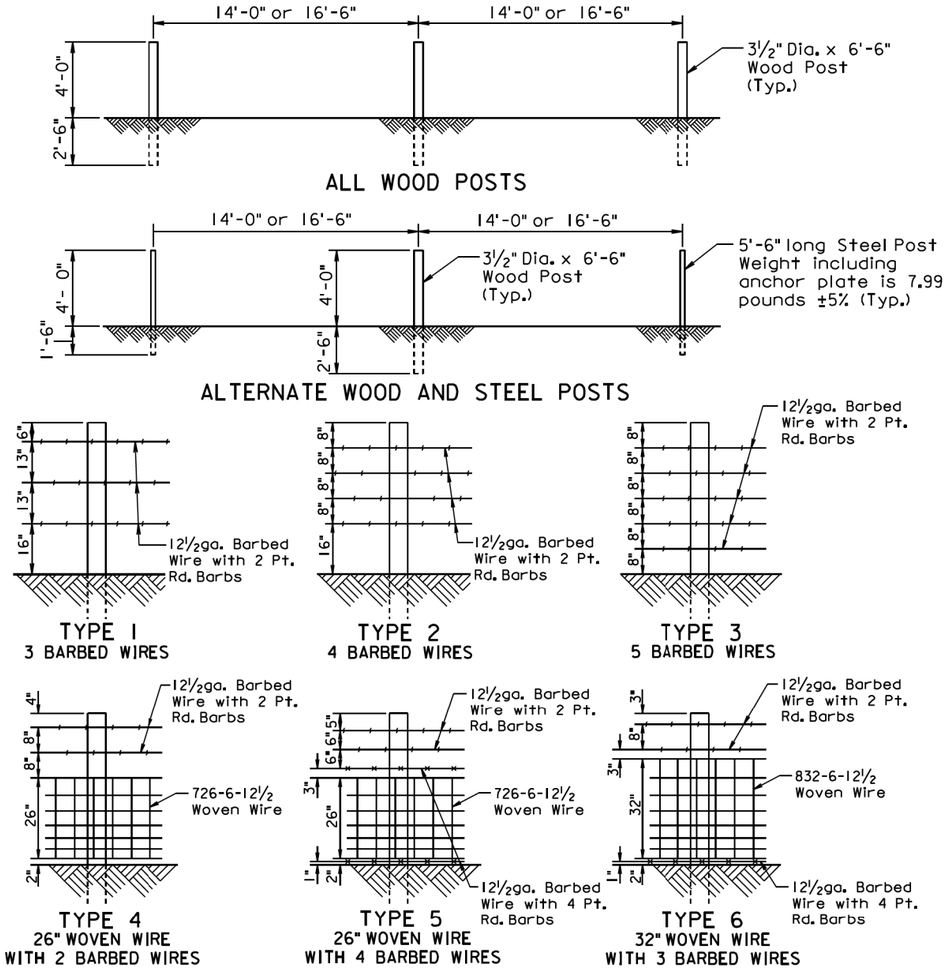
When stated in the plans, optional toe plate extension shall be punched and bolted to end section apron lip with 3/8" diameter galvanized bolts. Steel for toe plate extension shall be same gauge as end section. Dimensions shall be overall width less 6" by 8" high.

Installation shall be performed in accordance with the Specifications.

Cost of 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.

June 26, 2015

Published Date: 1st Qtr. 2016	SDDOT	C. M. P. SAFETY ENDS	PLATE NUMBER 450.38
			Sheet 2 of 2



TYPE OF FENCE		LINE POST SPACING	BARBED WIRE		WOVEN WIRE
			WIRE GAGE	NUMBER AND SHAPE OF BARBS	STYLE OR DESIGN NO.
TYPE	DESCRIPTION				
1	3 Barbed Wires	16'-6"	12½	2 Point Round	—
2	4 Barbed Wires	16'-6"	12½	2 Point Round	—
3	5 Barbed Wires	16'-6"	12½	2 Point Round	—
4	26" Woven Wire with 2 Barbed Wires	14'-0"	12½	2 Point Round	726-6-12½
5	26" Woven Wire with 4 Barbed Wires	14'-0"	12½	2 wires with 2 Pt. Rd. 2 wires with 4 Pt. Rd.	726-6-12½
6	32" Woven Wire with 3 Barbed Wires	14'-0"	12½	2 wires with 2 Pt. Rd. 1 wire with 4 Pt. Rd.	832-6-12½

GENERAL NOTES:

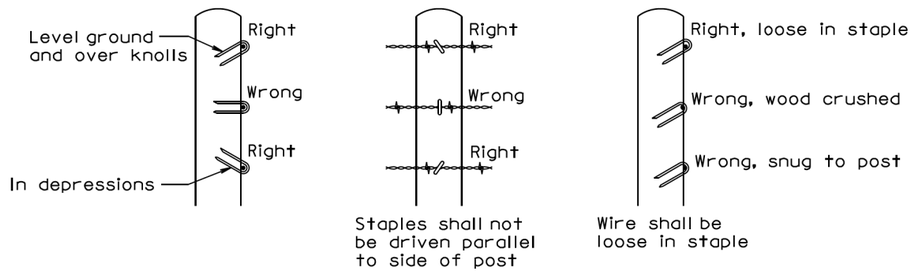
Fence types designated on the plans that are followed by the letter S shall have smooth (barbless) wires.

When type 5S or 6S is designated the bottom wire may be barbed, smooth, or left off.

All degrees of curvature stated for fence are at centerline of roadway.

September 14, 2009

Published Date: 1st Qtr. 2016	SDDOT	RIGHT-OF-WAY FENCE	PLATE NUMBER 620.01
			Sheet 1 of 1



STAPLE INSTALLATION

GENERAL NOTES:

The Right-of-Way fence shall consist of barbed wire or a combination of woven wire and barbed wire. The barbed wire and/or woven wire shall be fastened to all wood posts or fastened to alternating wood and steel posts. Only wood posts shall be used for brace panels. Gates shall be of the type designated in the plans or as otherwise directed by the Engineer. Fence shall be constructed conforming to the details on the standard plates and in the plans unless otherwise directed by the Engineer.

Right-of-Way fence on Interstate Projects shall be constructed one foot within the Interstate Right-of-Way lines except at bridge openings, cattle passes, and as otherwise directed by the Engineer.

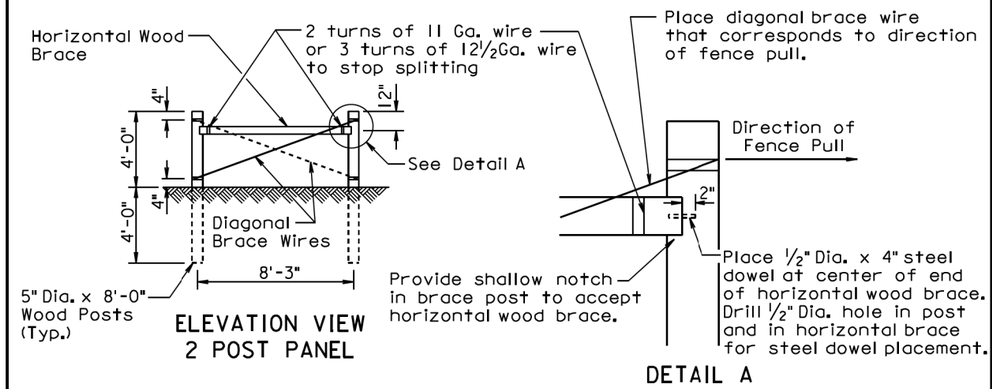
Right-of-Way fence other than on Interstate Projects shall be constructed within one foot of the Right-of-Way on the Landowner's side except at bridge openings, cattle passes, and as otherwise directed by the Engineer.

Barbs shall be fabricated from zinc coated 14 ga. wire. Two point barbs shall be wrapped twice around one main strand at 4" spacings and the four point barbs shall be interlocked and wrapped around both main strands at 5" spacings.

The gages of wire and wood post lengths and sizes are the minimum acceptable unless otherwise specified in the plans. The tolerances for steel posts shall be as stated in AASHTO M281. Woven wire shall conform to design and specifications of ASTM A116 and barbed wire shall conform to ASTM A121.

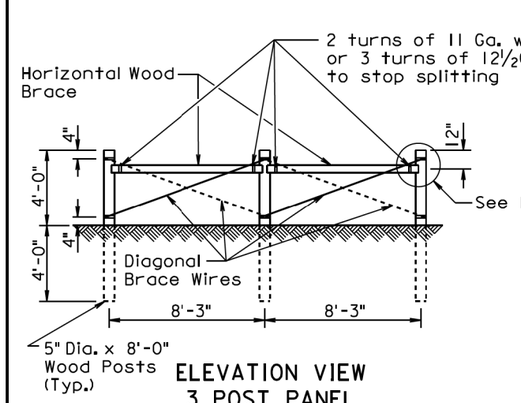
December 23, 2004

Published Date: 1st Qtr. 2016	SDDOT	**STAPLE INSTALLATION AND GENERAL RIGHT-OF-WAY FENCE NOTES**	***PLATE NUMBER*** 620.02 *Sheet 1 of 1*

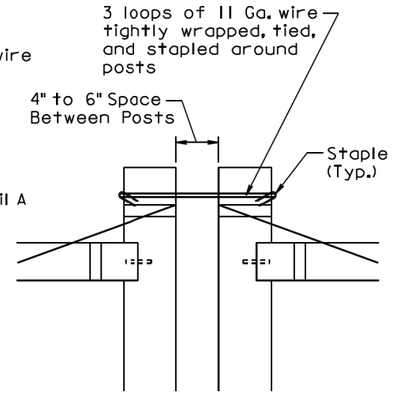


ELEVATION VIEW 2 POST PANEL

DETAIL A



ELEVATION VIEW 3 POST PANEL



DETAIL B

GENERAL NOTES:

Two Post Panels shall be installed at least every 1320' between corners.

Two Post Panels shall be installed at any sharp vertical angle crest points and as directed by the Engineer.

Horizontal wood braces shall consist of 4" dia. x 8' wood posts or rough 4" x 4" x 8' timbers.

Diagonal brace wires shall be fabricated with 4 strands of 9 Ga. galvanized wire twisted tight. The diagonal brace wires shall be installed in accordance with the direction of the fence pull. Two diagonal brace wires are required if fence pull is in both directions.

December 23, 2004

Published Date: 1st Qtr. 2016	SDDOT	**BRACE PANELS AND APPLICATIONS OF BRACE PANELS**	***PLATE NUMBER*** 620.03 *Sheet 1 of 3*

SPACING OF 2 POST PANELS WITHIN CURVES	
DEGREE OF CURVE	SPACING OF 2 POST PANEL
less than 3°15'	** 1320'
3°15' and greater	**At P.C., P.T., and at every 1320' between P.C. and P.T.

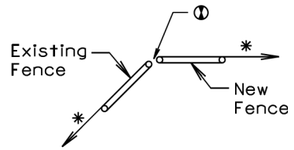
GENERAL NOTE:

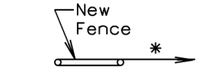
All degrees of curvature stated for fence are at centerline of roadway.

* If fence length is less than 600' to next corner use a 2 post panel.
If fence length is greater than 600' to next corner use a 3 post panel.

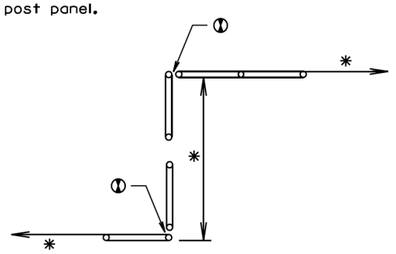
** Fence lengths greater than 1320' and less than 2640' place 2 Post Panel approximately at midpoint.

① See Detail B on Sheet 1 of 3.

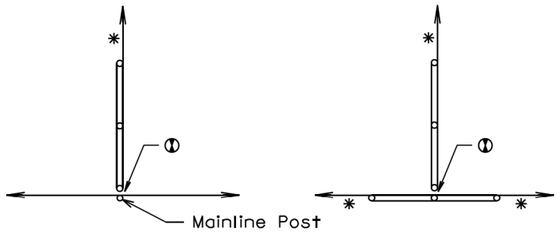




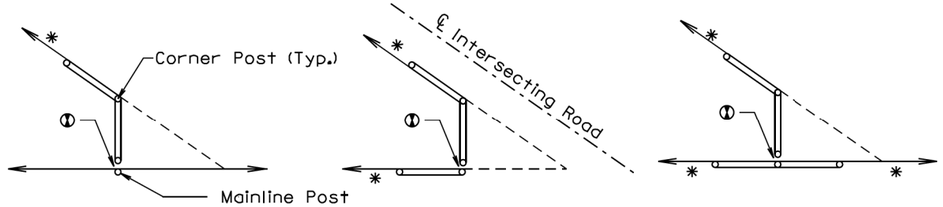
BEGIN OR END FENCE
(where new fence ties into existing fence)



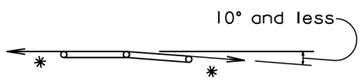
SHORT JOGS IN FENCE



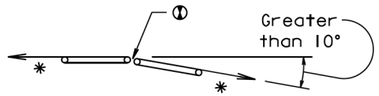
CROSS FENCE



SHARP ANGLES IN CROSS FENCE



Additional fence panel is NOT required when an angle in the mainline fence is 10° and less.



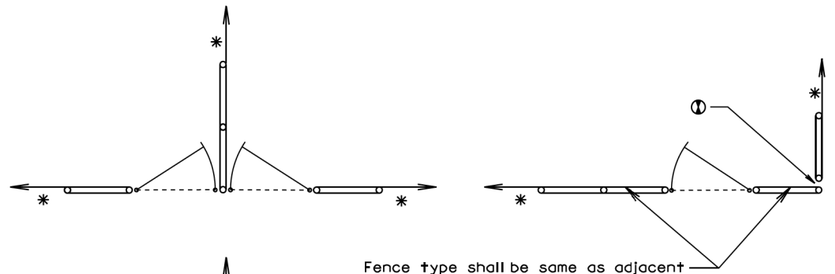
Additional fence panel is required when an angle in the mainline fence is greater than 10°.

ANGLES IN MAINLINE FENCE

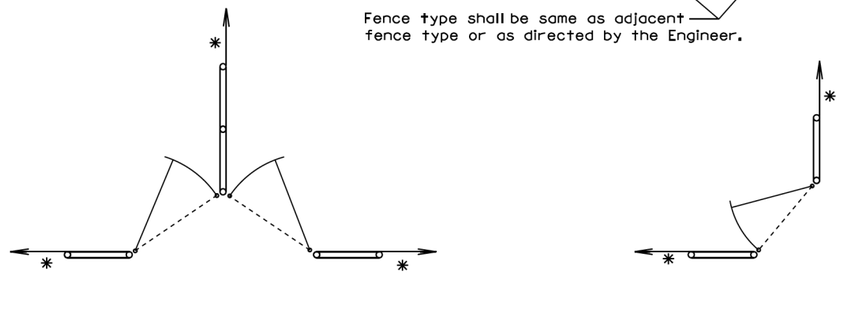
December 23, 2004

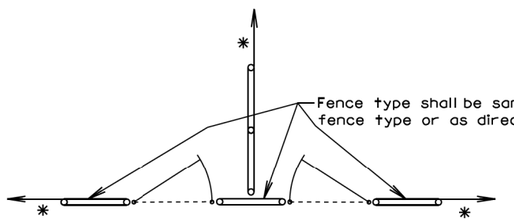
Published Date: 1st Qtr. 2016	SDDOT	BRACE PANELS AND APPLICATIONS OF BRACE PANELS	PLATE NUMBER 620.03 Sheet 2 of 3

ENTRANCE
(NOT ON CORNER)

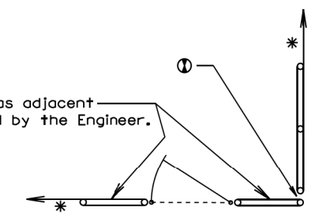


Fence type shall be same as adjacent fence type or as directed by the Engineer.





DOUBLE ENTRANCES



ENTRANCES AT CORNERS

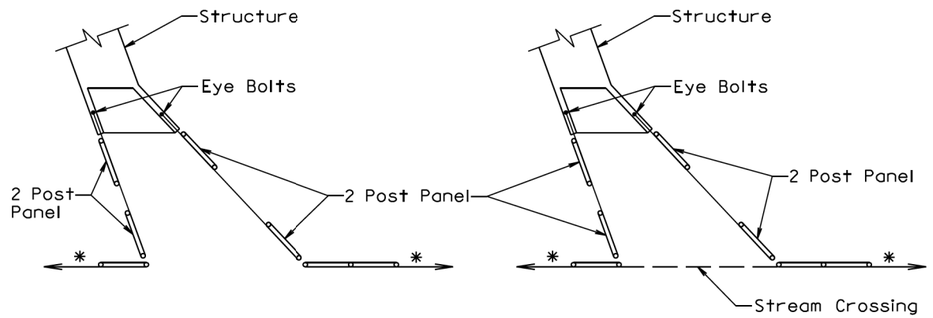
GATES

* If fence length is less than 600' to next corner use a 2 post panel.
If fence length is greater than 600' to next corner use a 3 post panel.

① See Detail B on Sheet 1 of 3.

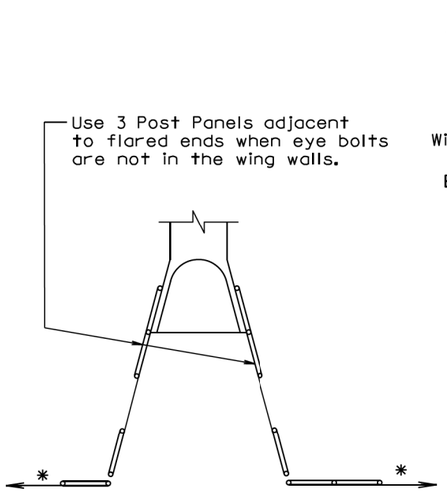
December 23, 2004

Published Date: 1st Qtr. 2016	SDDOT	BRACE PANELS AND APPLICATIONS OF BRACE PANELS	PLATE NUMBER 620.03 Sheet 3 of 3

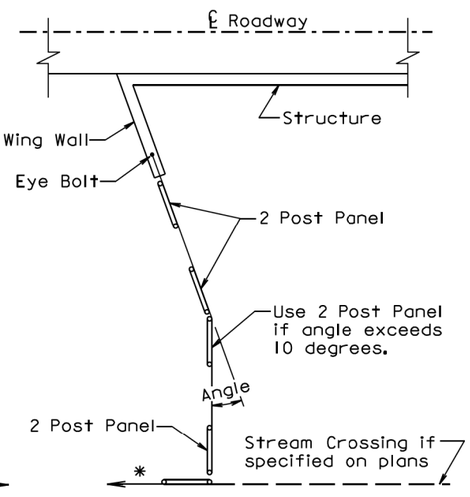


R.C. BOX CULVERT
OR CATTLE PASS

STRUCTURE WITH STREAM
CROSSING FENCE



R.C. BOX CULVERT
OR CATTLE PASS

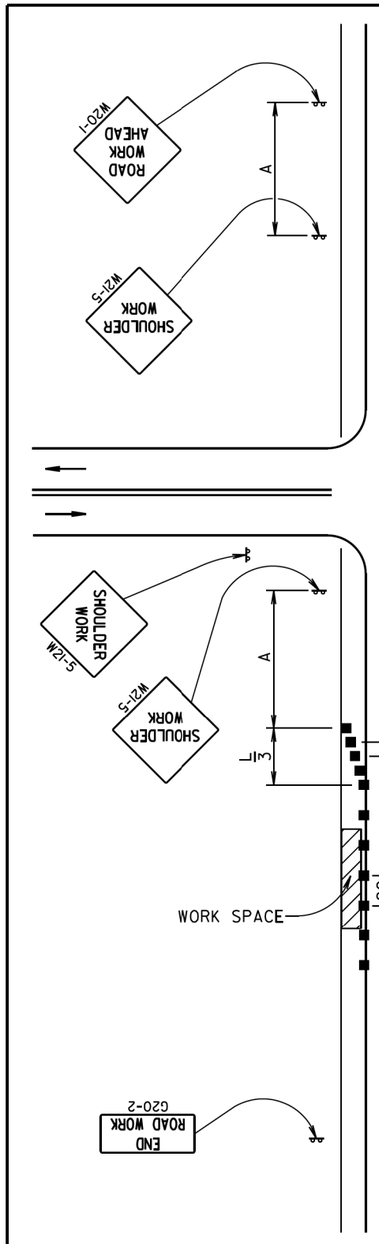


BRIDGE

* If fence length is less than 600' to next corner use a 2 post panel.
If fence length is greater than 600' use a 3 post panel.

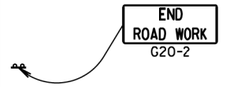
December 23, 2010

Published Date: 1st Qtr. 2016	SDDOT	BRACE PANEL APPLICATIONS AT STRUCTURES	PLATE NUMBER 620.04
			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 42" cones if traffic control must remain overnight.

For short duration operations (1 hour or less) all 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.

September 22, 2014

Published Date: 1st Qtr. 2016	SDDOT	GUIDES FOR TRAFFIC CONTROL DEVICES WORK ON SHOULDERS	PLATE NUMBER 634.03
			Sheet 1 of 1

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

Flagger

Channelizing Device

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

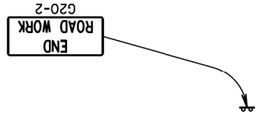
The ROAD WORK AHEAD and the END ROAD WORK signs may be omitted for short duration operations (1 hour or less).

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

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

The channelizing devices shall be drums or 42" cones.

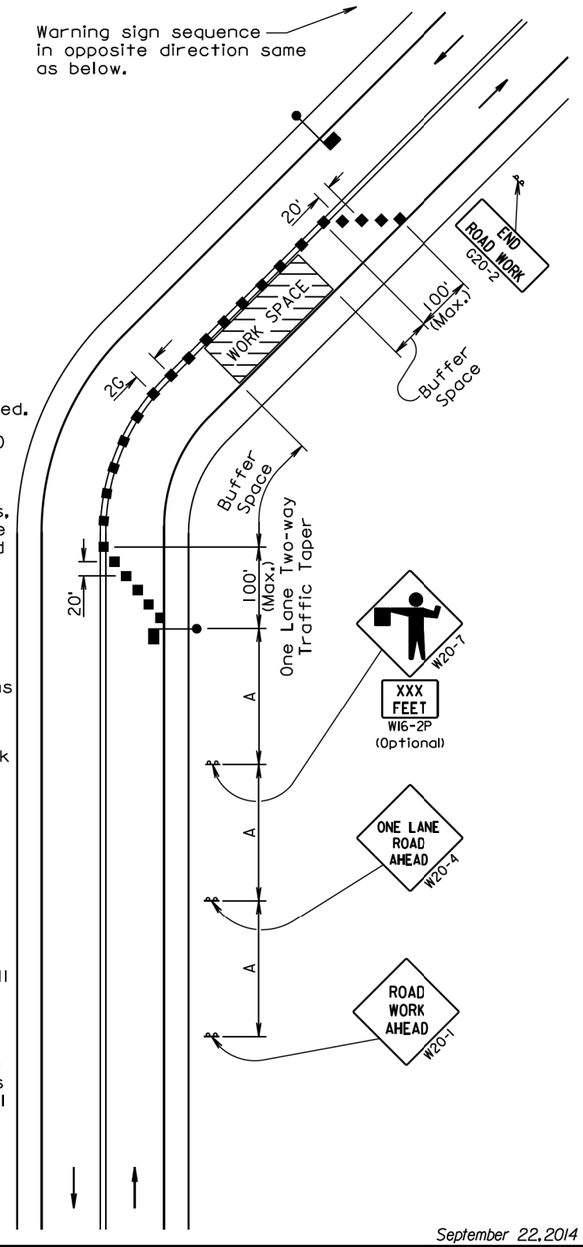
Channelizing devices are not required along the centerline adjacent to work area when pilot cars are utilized for escorting traffic through the work area.



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

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

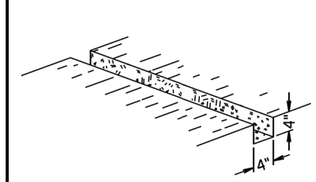
The length of A may be adjusted to fit field conditions.



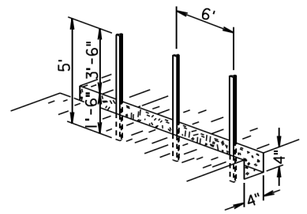
September 22, 2014

Published Date: 1st Qtr. 2016	SDDOT	***GUIDES FOR TRAFFIC CONTROL DEVICES LANE CLOSURE WITH FLAGGER PROVIDED***	*PLATE NUMBER* 634.23 *Sheet 1 of 1*

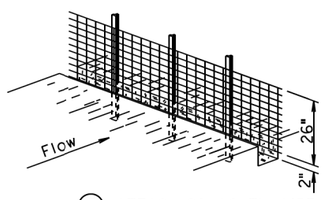
MANUAL LOW FLOW SILT FENCE INSTALLATION



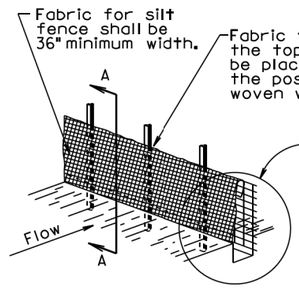
(1) EXCAVATE TRENCH



(2) DRIVE STEEL T FENCE POSTS



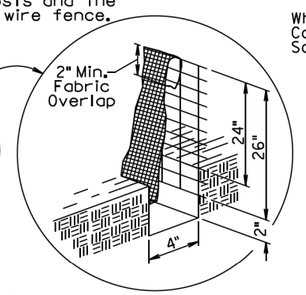
(3) ATTACH 26" WOVEN WIRE FENCE TO POSTS

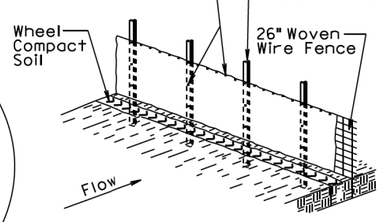


(4) ATTACH SILT FENCE FABRIC

Attach the silt fence fabric with plastic ties, wire ties, or hog rings at 12" max. horizontal spacing on the top and bottom wires of the woven wire fence and with plastic or wire ties at 12" max. vertical spacing on the posts.

Fabric that overlaps the top of fence shall be placed between the posts and the woven wire fence.





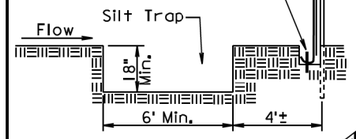
(5) BACKFILL TRENCH AND WHEEL COMPACT SOIL

Silt Fence Fabric

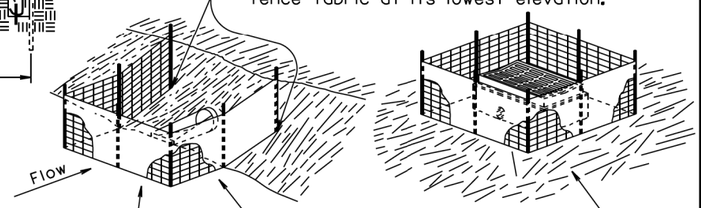
8" staples shall be placed at each post to secure the silt fence fabric to the bottom of the trench.

Steel T Fence Post

26" Woven Wire Fence



SECTION A-A



The elevation at these locations shall be, at a minimum, higher than the top of the silt fence fabric at its lowest elevation.

The silt fence length and width may be adjusted due to a larger pipe, multiple pipe, or other circumstances during construction as determined by the Engineer.

Post spacing shall be 3' for these types of applications of silt fence. All other components of the silt fence shall be the same as shown above.

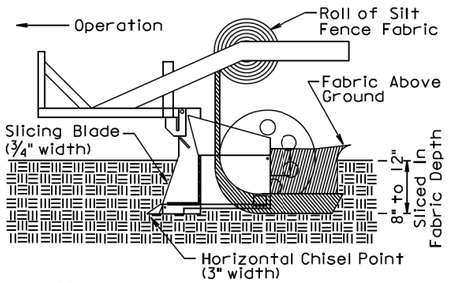
December 23, 2003

Published Date: 1st Qtr. 2016	SDDOT	***LOW FLOW SILT FENCE AND SILT TRAP***	*PLATE NUMBER* 734.04 *Sheet 1 of 2*

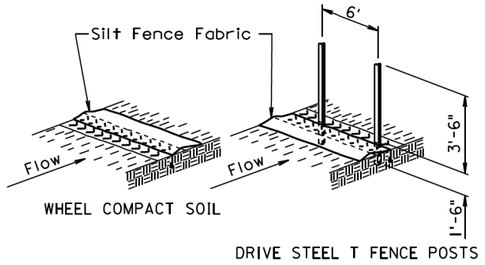
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	073-392	17	17

Plotting Date: 03/21/2016

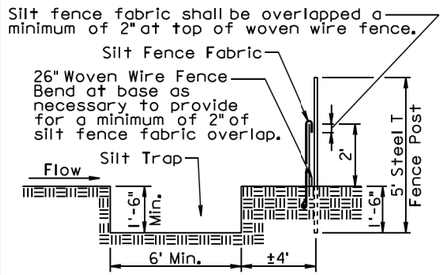
MACHINE SLICED LOW FLOW SILT FENCE INSTALLATION

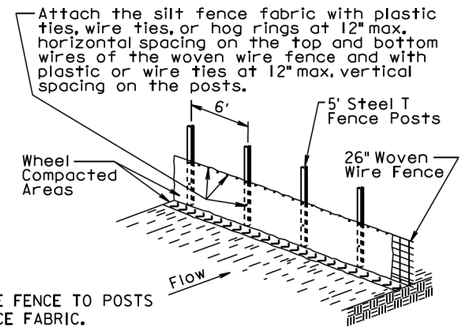


(1) INSTALL SILT FENCE FABRIC BY MACHINE SLICING METHOD.

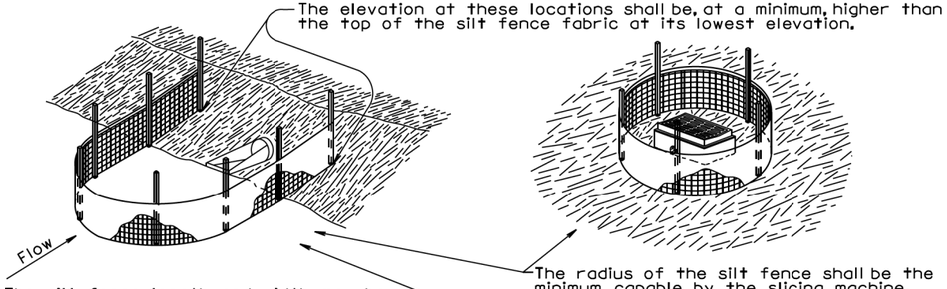


(2) WHEEL COMPACT SOIL ABOVE SLICED IN PORTION OF FABRIC AND THEN DRIVE STEEL T FENCE POSTS.





(3) ATTACH 26" WOVEN WIRE FENCE TO POSTS AND ATTACH SILT FENCE FABRIC.



GENERAL NOTES:

A silt trap shall be provided when specified by a plan note. All costs for constructing the silt trap shall be incidental to the contract unit price per cubic yard for "Silt Trap".

If a trench can not be dug or the silt fence fabric can not be sliced in due to the type of earthen material (such as rock), then a row of 30 to 40 pound sandbags butted end to end shall be provided on top of the extra length of silt fence fabric to prevent underflow.

December 23, 2003

Published Date: 1st Qtr. 2016	SDDOT	***LOW FLOW SILT FENCE AND SILT TRAP***	***PLATE NUMBER*** *734.04*
			Sheet 2 of 2