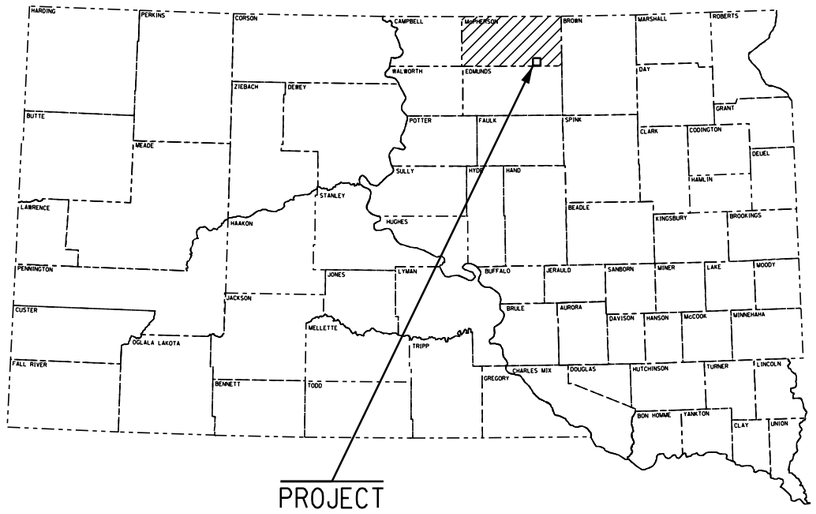
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	045-152	1	20
Plotting Date: 02/25/2020			

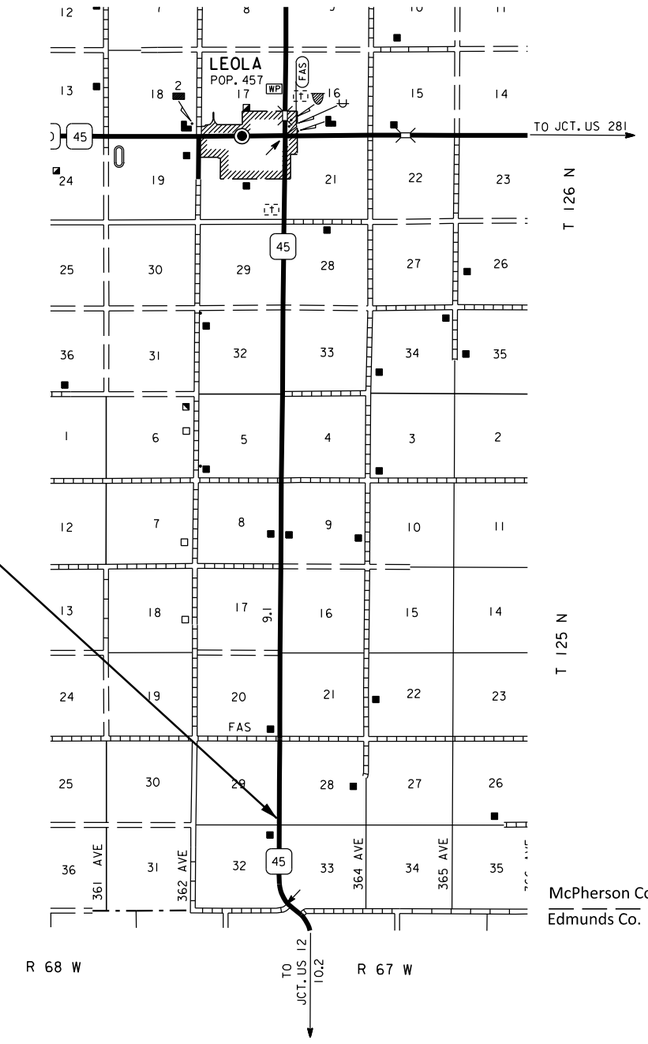


STATE OF SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION
PLANS FOR PROPOSED

PROJECT 045-152
S.D. HIGHWAY 45
MCPHERSON COUNTY

BOX CULVERT REPAIR & SCOUR PROTECTION at the Inlet

PCN i5UG



Work Site
Left End Sections
Precast Double Box Culvert 9' x 8'
Structure No. 45-380-230
MRM 193.00 + 0.810

INDEX OF SHEETS

DESIGN DESIGNATION

ADT (2018)	363
ADT (2038)	472
DHV	51
D	51%
T DHV	14.7%
T ADT	32.2%
V	65 M.P.H.

STORM WATER PERMIT
None Required

PLOT SCALE - 1:5400
PLOTTED FROM - TRABIL017
PLOT NAME - 1
FILE - ...\MCPHI5UG\I5UG_TITLE SHEET.DGN

ESTIMATE OF QUANTITIES AND ENVIRONMENTAL COMMITMENTS

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	045 -152	2	20

Estimate of Quantities

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
110E1693	Remove Erosion Control Wattle	150	Ft
110E7560	Remove Precast Concrete Box Culvert End Section for Reset	1	Each
120E0600	Contractor Furnished Borrow Excavation	150	CuYd
260E1010	Base Course	32.0	Ton
560E5111	Reset Precast Concrete Box Culvert End Section	1	Each
634E0010	Flagging	24.0	Hour
634E0110	Traffic Control Signs	121.0	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0275	Type 3 Barricade	3	Each
720E1015	Bank and Channel Protection Gabion	84.0	CuYd
734E0010	Erosion Control	Lump Sum	LS
734E0101	Type 1 Erosion Control Blanket	60	SqYd
734E0154	12" Diameter Erosion Control Wattle	150	Ft
831E0110	Type B Drainage Fabric	170	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

The SDDOT is committed to protecting the environment and uses Environmental Commitments as a communication tool for the Engineer and Contractor to ensure that attention is given to avoid, minimize, and/or mitigate an environmental impact. Environmental commitments to various agencies and the public have been made to secure approval of this project. An agency with permitting authority can delay a project if identified 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.

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 pits, or staging areas associated with the project, cease construction activities in the affected area until the Whooping Crane departs and immediately contact the Project Engineer. The Project Engineer will contact the Environmental Office so that the sighting can be reported to USFWS.

COMMITMENT C: WATER SOURCE

The Contractor will not withdraw water with equipment previously used outside the State of South Dakota or previously used in aquatic invasive species waters within South Dakota without prior approval from the SDDOT Environmental Office. Thoroughly wash all construction equipment to prevent and control the introduction and spread of invasive species into the project vicinity.

Action Taken/Required:

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

Additional information and mapping of Aquatic Invasive Species in South Dakota can be accessed at: http://sdleastwanted.com/maps/default.aspx.

COMMITMENT D2: SURFACE WATER DISCHARGE

The DENR General Permit for Temporary Discharge is required for temporary dewatering and discharges to waters of the state. The effluent limit for total suspended solids will be 90 mg/L 30-day average. The effluent limit applies to discharges to all waters of the state except discharges to waters classified as cold water permanent fish life propagation waters according to the ARSD 74:51:01:45. For discharges to waters of the state classified as cold water permanent fish life propagation waters, the effluent limit for total suspended solids will be 53 mg/L daily maximum.

The permittee has the option of completing effluent testing or implementing a pollution prevention plan for compliance with this permit. If the permittee develops a pollution prevention plan instead of total suspended solids sampling, the plan must be developed and implemented prior to discontinuing total suspended solids sampling. Refer to section 3.0 of the permit. If any pollutants are suspected of being discharged, a sample must be taken for those parameters listed in section 2.2 of the permit.

Action Taken/Required:

If construction dewatering is required, the Contractor will obtain the General Permit for Temporary Discharge Activities from the DENR Surface Water Program, 605-773-3351.
http://denr.sd.gov/des/sw/swqformsandpermits.aspx

The Contractor will provide a copy of the approved permit to the Project Engineer prior to proceeding with any dewatering activities. The approved permit must be kept on-site and as part of the project records.

Effluent monitoring, as a result of dewatering activities, will be summarized for each month and recorded on a separate Discharge Monitoring Report (DMR) and submitted to DENR monthly. Additional information can be found at http://denr.sd.gov/des/sw/WhatisaDMR.aspx

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.

ESTIMATE OF QUANTITIES AND ENVIRONMENTAL COMMITMENTS

COMMITMENT H: WASTE DISPOSAL SITE

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

Action Taken/Required:

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

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

The waste disposal site(s) will 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 Environmental Office and the Project Engineer.

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

1. Construction and/or demolition debris consisting of concrete, asphalt concrete, or other similar materials will be buried in a trench completely separate from wood debris. The final cover over the construction and/or demolition debris will consist of a minimum of 1 foot of soil capable of supporting vegetation. Waste disposal sites provided outside of the Public ROW will be seeded in accordance with Natural Resources Conservation Service recommendations. The seeding recommendations may be obtained through the appropriate County NRCS Office. The Contractor will control the access to waste disposal sites not within the Public ROW with 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 will 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) will be incidental to the various contract items.

COMMITMENT I: HISTORICAL PRESERVATION OFFICE CLEARANCES

State Historical Preservation Office (SHPO or THPO) concurrence has not been obtained for this project.

Action Taken/Required:

All earth disturbing activities require a cultural resource review prior to scheduling the pre-construction meeting. 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 will arrange and pay for a record search and when necessary, a cultural resource survey. 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 if the site was previously surveyed; however, a cultural resources survey may need to be conducted by a qualified archaeologist.

The Contractor will provide ARC with the following: a topographical map or aerial view of 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 will submit the cultural resources survey report to SDDOT Environmental Office, 700 East Broadway Avenue, Pierre, SD 57501-2586. 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.

In the event of an inadvertent discovery of human remains, funerary objects, or if evidence of cultural resources is identified during project construction activities, then such activities will immediately cease and the Project Engineer will be immediately notified. The Project Engineer will contact the SDDOT Environmental Office to determine an appropriate course of action.

The Contractor is responsible 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 will not utilize a site known or suspected of having contaminated soil or water. The Contractor will 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 USACE for the permanent actions associated with this project.

Action Taken/Required:

The Contractor will comply with all requirements contained in the Section 404 Permit.

The Contractor will also be responsible for obtaining a Section 404 Permit for any dredge, excavation, or fill activities associated with material sources, storage areas, waste sites, and Contractor work sites outside the plan work limits that affect wetlands, floodplains, or waters of the United States.

SCOPE OF WORK

Work involves removing and resetting three end sections of a Precast Concrete Box Culvert, PCBC, and installation of gabion baskets according to plan details and standard plates. Furnishing and placing Contractor furnished borrow or performing excavation will be done as necessary. Dewatering may be required depending on seasonal conditions.

The Contractor is encouraged to visit the sites prior to bidding to verify the extent of work needed.

ORIGINAL CONSTRUCTION PLANS

Construction plans and shop drawings included for reference are from Project P 0045(12)192 PCN 1282 Grading, Structures & Interim Surfacing for S.D. Highway No. 45 in McPherson County.

For additional information, contact the Aberdeen Area South Dakota Department of Transportation at (605)626-7885.

SEQUENCE OF OPERATIONS

1. Install traffic control devices.
2. Install erosion control measures.
3. Remove end sections for reset.
4. Excavate/Fill as needed.
5. Reset PCBC end sections.
6. Install and backfill Gabion Baskets.
7. Place Salvaged Topsoil.
8. Seed and mulch.
9. Install erosion control blanket.

Contractor requests to deviate from the sequence of operations will 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 will be submitted for review a minimum of one week prior to potential implementation.

GENERAL TRAFFIC CONTROL

Existing guide, route, informational logo, regulatory, and warning signs will be temporarily reset and maintained during construction. Removing, relocating, covering, salvaging, and resetting of existing traffic control devices including type II object markers will be the responsibility of the Contractor. Cost for this work will be incidental to the contract unit prices for various items. Any delineators, object markers, and signs damaged or lost will be replaced by the Contractor at no cost to the State.

Standard Plate 632.01 and 632.04 have been included in the plans to indicate how Type II Object Markers shall be reset upon completion of work.

All temporary traffic control sign locations will be set in the field by the Contractor and verified by the Engineer prior to installation.

All lane closer traffic control will be removed at night, and traffic control will be set up according to Standard Plate 634.03.

Type III barricades will be used on the inslope to the satisfaction of the Engineer.

All construction operations will be conducted in the general direction of traffic movement.
If there is a discrepancy between the traffic control plans, standard plates, and the MUTCD, whichever is more stringent will be used, as determined by the Engineer.

Unless otherwise stated in these plans, work will not be allowed during hours of darkness.

Traffic Control Signs, as shown in the Estimate of Quantities, are estimates. Contractor's operation may require adjustments in quantities, either more or less. Payment will be for used signs ordered by the Engineer.

Fixed location signing placed more than 4 calendar days prior to the start of construction will be covered or laid down until the time of construction. The covers must be approved by the Engineer prior to installation. The cost of materials, labor, and equipment necessary to complete this work will be incidental to other contract items. No separate payment will be made.

All fixed location signs, sign posts, and breakaway bases will be removed within 7 calendar days following install of erosion control blanket.

All haul trucks will be equipped with an additional flashing amber light that is visible from the backside of the haul truck. The costs for the flashing amber lights will be incidental to the various related contract items.

At no time will a vertical drop-off of greater than 3 inches be left overnight adjacent to the traveled way. The Contractor will utilize embankment material to ensure a 3-inch vertical drop-off is not exceeded. The slope of the embankment material will not be steeper than a 4:1 within 30 feet of the traveled way.

Traffic will be maintained on the driving lanes. Use of the shoulder as a driving lane will not be permitted. Any damage to the shoulder due to rerouted traffic or Contractor's equipment will be repaired at no expense to the Department.

FLAGGING

Operations will be conducted so that the traveling public will not have to wait longer than 15 minutes at the flagger station.

It is required that the flaggers be able to communicate with one another. If an emergency vehicle needs to pass through the project, the Contractor will be required to expedite traffic movement. All costs associated with this will be incidental to the contract unit price per hour for "Flagging".

UTILITIES

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

GRADING OPERATIONS

No separate payment will be made for "Water for Embankment" and all costs associated will be incidental to the contract unit price per cubic yard of "Contractor Furnished Borrow Excavation".

The Contractor will salvage and stockpile topsoil prior to culvert end section reset and gabion installation. Limits of this work, depth of salvage, and stockpile location will be to the satisfaction of the Engineer. Following completion of construction, topsoil will be spread evenly at a minimum 4" depth over the disturbed areas that are to be seeded.

Payment for this work will be incidental to the contract unit price per cubic yard for "Contractor Furnished Borrow Excavation".

PRECAST CONCRETE BOX CULVERT END SECTION RESET

There are three PCBC end sections to be removed and reset along with a cutoff wall. Payment for all three sections and the cutoff wall removal and install will be noted respectably as a quantity of one removal and one reset in the Estimate of Quantities for "Remove Precast Concrete Box Culvert End Section for Reset" and "Reset Precast Concrete Box Culvert End Section".

Any damage to box culvert sections caused by the Contractor will be repaired by the Contractor to the satisfaction of the Engineer.

After removal for reset, the installation area will be undercut to a minimum depth of 1 foot and backfilled with base course. The depth of undercut is an estimate and the actual depth necessary will be determined during construction. The Engineer will determine how much undercut will be done in accordance with Section 421.3 of the Specifications, but will not reduce the undercut to less than 1 foot in depth. Compaction of the undercut backfill will be in accordance with Section 421.3 A.

The remainder of the PCBC excavation will be backfilled with soils taken from the removal excavation or other suitable material designated as Contractor Furnished Borrow as approved by the Engineer.

PCBC base course for the undercut backfill will be paid for at the contract unit price per ton for "Base Course".

Flowline will match that of existing. If needed, sandbagging around wet areas will be done and the cost will be incidental to various contract items.

All reset precast PCBC end sections will be tied. New tie bolt assemblies will be provided by the Contractor and installed according to Standard Plate 560.01 at locations designated on Standard Plate 560.02. The PCBC end section connection to the cutoff wall is unknown with no Shop Plan from PCN 1282. Supplies needed for the cutoff wall will be provided by the Contractor. Cost of all ties and reset of the cutoff wall will be incidental to "Reset Precast Concrete Box Culvert End Section".

INSTALLATION OF GABION BASKETS

Gabions Baskets will be installed according to the Structure Details Sheet and Standard plate 720.01. Gabions installed on the inslopes near the box culvert inlet will be installed to match the existing inslopes. Gabions installed under the flow line will match the slope of the channel flow line. Gabion baskets will be backfilled to match the existing ground level.

Payment for excavation and back filling of the borrow material will be incidental to the contract unit price per cubic yard for “Contractor Furnished Borrow Excavation”. Compaction of the Contractor Furnished Borrow will be to the satisfaction of the Engineer. The basis of payment will be plans quantity. There will be no additional payment for dewatering if it is needed.

Type B drainage fabric will be placed under the gabions and around the exterior sides (perimeter) of the gabions as approved by the Engineer. The type B drainage fabric shall be in conformance with Section 831 of the Specifications. Measurement and payment of the type B drainage fabric will be in conformance with Section 720 of the Specifications.

INSLOPE TRANSITIONS

The finished inslope will be in compliance with Standard Plate 120.05.

SHRINKAGE FACTOR:

Quantities were computed using a 40% shrinkage factor.

CONTRACTOR FURNISHED BORROW

Contractor will provide a suitable site for Contractor Furnished Borrow Excavation material. The Contractor is responsible for obtaining all required permits and clearances for the borrow site. The borrow material will be approved by 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.

Restoration of the Contractor Furnished Borrow Excavation Site will be the responsibility of the Contractor.

EROSION CONTROL

The estimated area requiring erosion control is 2,000 square feet. All costs for equipment, labor, seeding, and fiber mulching will be incidental to the contract lump sum price for “Erosion Control”.

The limits of erosion control work will be determined by the Engineer during construction.

Mycorrhizal inoculum

Mycorrhizal inoculum will 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 will provide certification of the fungal species claimed and the live propagule count. The inoculum will include the following fungal species:

25% *Glomus intraradices*
25% *Glomus aggregatum or deserticola*
25% *Glomus mosseae*
25% *Glomus etunicatum*

All seed will 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 will be incidental to the contract Lump Sum price for “Erosion Control”.

The mycorrhizal inoculum will be as shown below or an approved equal:

Product	Manufacturer
MycoApply	Mycorrhizal Applications, Inc. Grants Pass, OR Phone: 1-866-476-7800 www.mycorrhizae.com
Am 120 multi species blend	Reforestation technologies int. Gilroy, ca Phone: 1-800-784-4769 www.reforest.com

Fertilizing

Application of fertilizer will not be required on this project.

Permanent seeding

The areas to be seeded consist of all newly graded areas within the project limits.

Type C Permanent Seed Mixture will consist of the following:

Grass Species	Variety	Pure Live Seed (PLS) (Pounds/Acre)
Western Wheatgrass	Arriba, Flintlock, Rodan, Rosana, Walsh	16
Canada Wildrye	Mandan	2
	Total:	18

Cover crop seeding

Cover crop seeding may be used on this project as a temporary erosion control measure. The actual limits and use of cover crop seeding will be determined by the Engineer during construction, and all costs will be incidental to the contract Lump Sum price for “Erosion Control”.

Fiber mulching

Fiber mulch will be applied in a separate operation following permanent seeding.

Fiber mulch will be applied at the rate of 2,000 pounds per acre.

The Contractor will allow the fiber mulch to cure a minimum of 18 hours prior to watering or any storm event to ensure proper cohesion between the soil and fiber particles.

All costs for additional tackifier added to the fiber mulch including labor, equipment, and materials will be incidental to the contract Lump Sum price for “Erosion Control".

The fiber mulch provided will be from the approved product list. The approved product list for fiber mulch may be viewed at the following internet site:

http://apps.sd.gov/HC60ApprovedProducts/main.aspx

EROSION CONTROL WATTLE

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

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

Erosion control wattles will remain on the project to decompose.

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

http://apps.sd.gov/HC60ApprovedProducts/main.aspx

EROSION CONTROL BLANKET

The erosion control blanket will be installed at locations of disturbed ground to be seeded and/or locations determined by the Engineer during construction. Shaping for the erosion control blanket is not needed. Standard Plate 734.01 will be referenced for all other requirements.

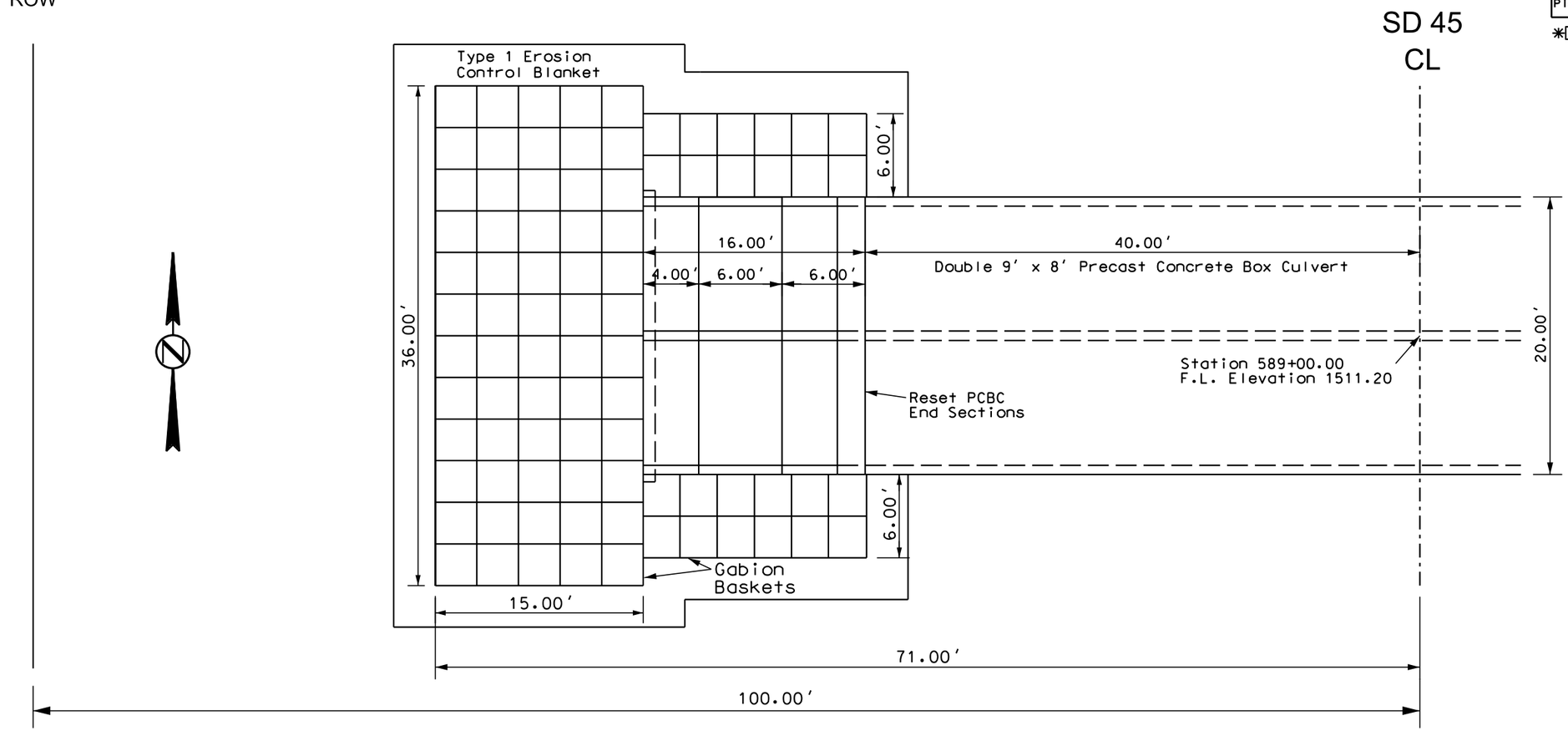
The erosion control blanket provided will be from the approved product list and may be viewed at the following internet site:

http://apps.sd.gov/HC60ApprovedProducts/main.aspx

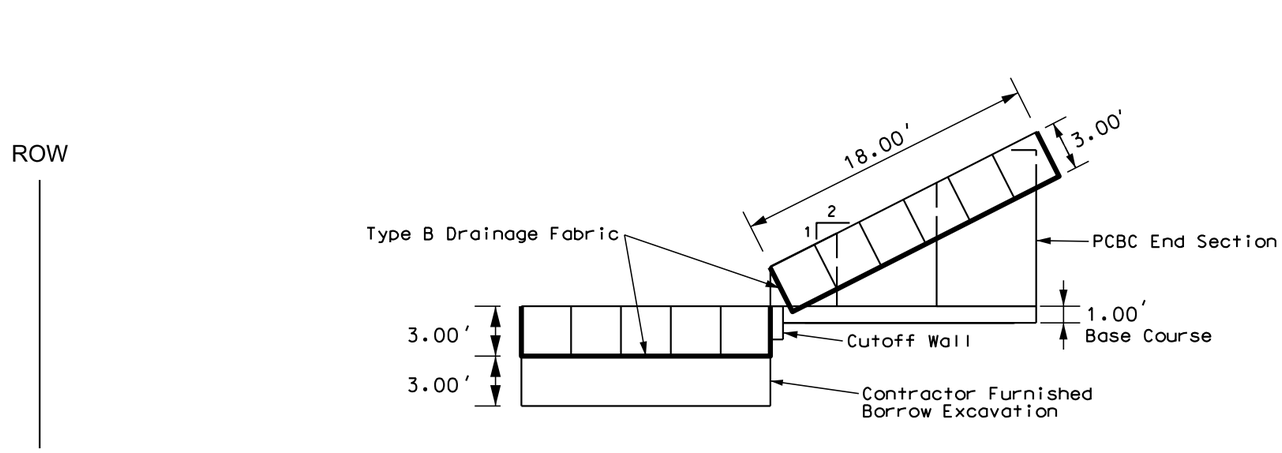
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	045 - 152	6	20

Plotting Date: 02/24/2020

*Drawings not to scale.



Plan View



Side View

PLOT SCALE - 1:9.12

PLOT NAME - 1

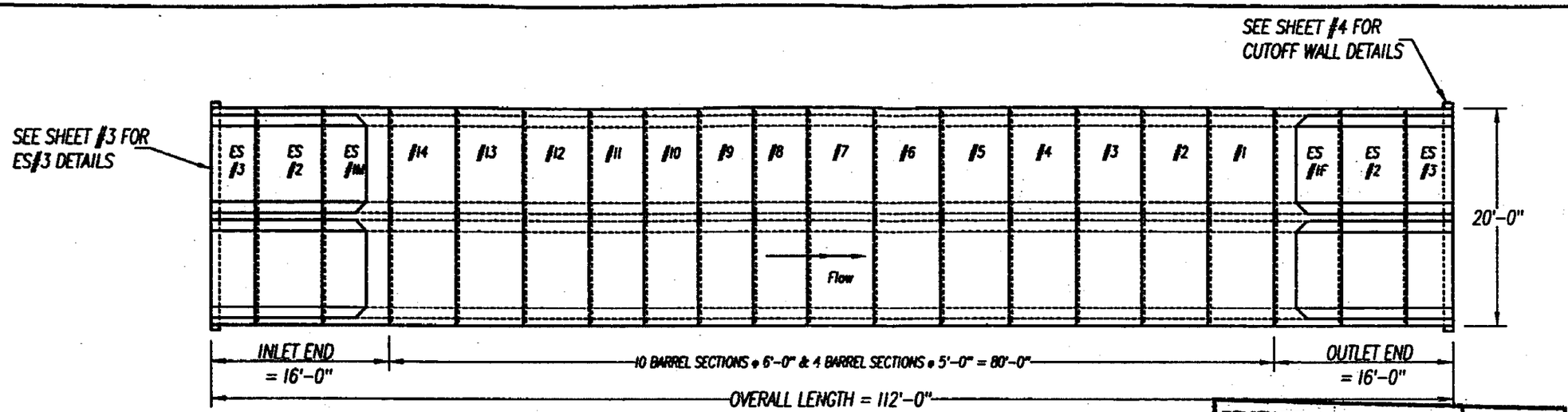
FILE - ...\15U0_STRUCTUREDETAILSHEET.DGN

PLOTTED FROM - TRABIL017

Original Shop Drawing

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	045-152	7	20
Plotting Date: 01/22/2020			

1



PLAN VIEW

REVIEWED - NO EXCEPTIONS TAKEN	X
MAKE CORRECTIONS NOTED	
REVISE AND RESUBMIT	
APPROVED FOR FABRICATION	X

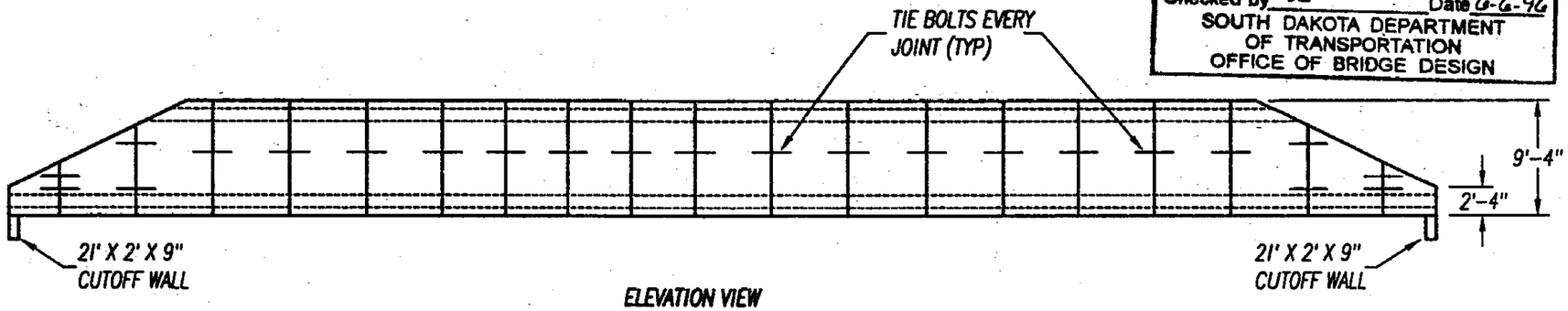
Approval shall not relieve the Contractor of responsibility given in the contract document.

Sheets 1-9

Checked by DL Date 6-6-96

SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGE DESIGN

N



ELEVATION VIEW

SECTION WEIGHTS

6'-0" BBL SECTION = 42,500 lbs.
5'-0" BBL SECTION = 35,400 lbs.
ES#1 = 33,400 lbs.
ES#2 = 22,800 lbs.
ES#3 = 12,200 lbs.
CUTOFF WALL = 4,725 lbs.

PLACE OF FABRICATION – MENOKEN, ND
CONTRACTOR – WEATHERTON CONTRACTING
R/S # 416063

SOUTH DAKOTA CONCRETE PRODUCTS
PIERRE, SOUTH DAKOTA

2-9' X 8' PRECAST BOX CULVERT
PROJ. #P 0045(12)192 – McPHERSON COUNTY

SCALE	none	DRAWING NUMBER
DATE	5-31-96	MCB6-196
DRAWN	DLP	

PLOT SCALE - 1:5400
PLOT NAME - 1
PLOTTED FROM - TRABIL017
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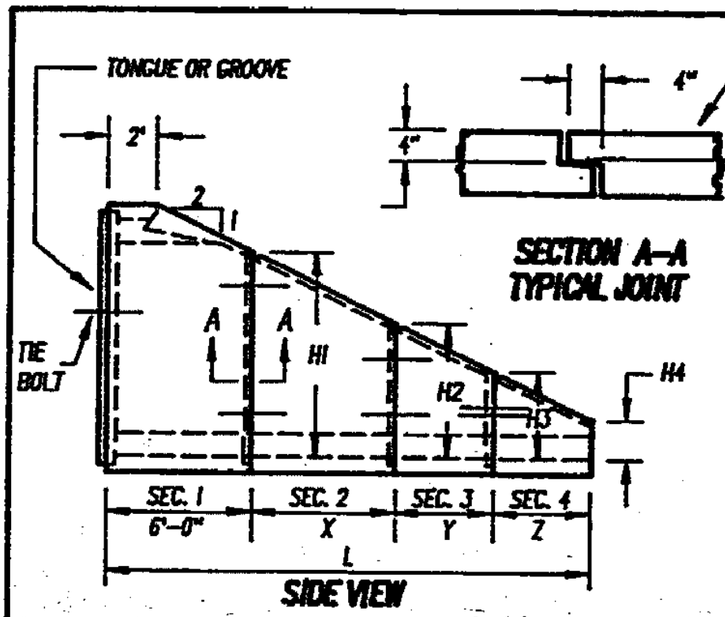
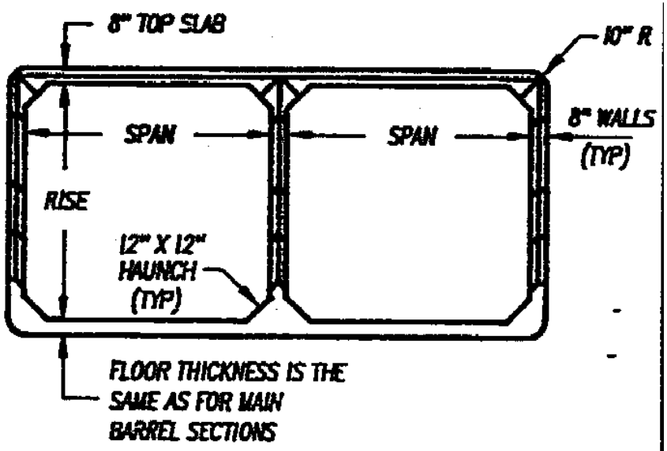
7



SECTION A-A
TYPICAL JOINT

SIDE VIEW



END VIEW

SPAN X RISE	L ft	X ft-in	Y ft-in	Z ft-in	H1 ft-in	H2 ft-in	H3 ft-in	H4 ft-in
DBL 7 X 3	6	--	--	--	1-8	--	--	--
DBL 7 X 4	8	2-0	--	--	2-8	1-8	--	--
DBL 7 X 5	10	4-0	--	--	3-8	1-8	--	--
DBL 7 X 6	12	6-0	--	--	4-8	1-8	--	--
DBL 7 X 7	14	4-0	4-0	--	5-8	3-8	1-8	--
DBL 8 X 4	8	2-0	--	--	2-8	1-8	--	--
DBL 8 X 5	10	4-0	--	--	3-8	1-8	--	--
DBL 8 X 6	12	6-0	--	--	4-8	1-8	--	--
DBL 8 X 7	14	4-0	4-0	--	5-8	3-8	1-8	--
DBL 8 X 8	16	6-0	4-0	--	6-8	3-8	1-8	--
DBL 9 X 4	6	--	--	--	2-8	--	--	--
DBL 9 X 5	10	4-0	--	--	3-8	1-8	--	--
DBL 9 X 6	12	6-0	--	--	4-8	1-8	--	--
DBL 9 X 7	14	4-0	4-0	--	5-8	3-8	1-8	--
DBL 9 X 8	16	6-0	4-0	--	6-8	3-8	1-8	--
DBL 9 X 9	18	6-0	6-0	--	7-8	4-8	1-8	--
DBL 10 X 4	8	2-0	--	--	2-8	1-8	--	--
DBL 10 X 5	10	4-0	--	--	3-8	1-8	--	--
DBL 10 X 6	12	6-0	--	--	4-8	1-8	--	--
DBL 10 X 7	14	4-0	4-0	--	5-8	3-8	1-8	--
DBL 10 X 8	16	6-0	4-0	--	6-8	3-8	1-8	--
DBL 10 X 9	18	6-0	6-0	--	7-8	4-8	1-8	--
DBL 10 X 10	20	6-0	4-0	4-0	8-8	5-8	3-8	1-8
DBL 11 X 4	8	2-0	--	--	2-8	1-8	--	--
DBL 11 X 5	10	4-0	--	--	3-8	1-8	--	--
DBL 11 X 6	12	6-0	--	--	4-8	1-8	--	--
DBL 11 X 7	14	4-0	4-0	--	5-8	3-8	1-8	--
DBL 11 X 8	16	6-0	4-0	--	6-8	3-8	1-8	--
DBL 11 X 9	18	6-0	6-0	--	7-8	4-8	1-8	--
DBL 11 X 10	20	6-0	4-0	4-0	8-8	5-8	3-8	1-8
DBL 11 X 11	22	6-0	6-0	4-0	9-8	6-8	3-8	1-8
DBL 12 X 4	8	2-0	--	--	2-8	1-8	--	--
DBL 12 X 5	10	4-0	--	--	3-8	1-8	--	--
DBL 12 X 6	12	6-0	--	--	4-8	1-8	--	--
DBL 12 X 7	14	4-0	4-0	--	5-8	3-8	1-8	--
DBL 12 X 8	16	6-0	4-0	--	6-8	3-8	1-8	--
DBL 12 X 9	18	6-0	6-0	--	7-8	4-8	1-8	--
DBL 12 X 10	20	6-0	4-0	4-0	8-8	5-8	3-8	1-8
DBL 12 X 11	22	6-0	6-0	4-0	9-8	6-8	3-8	1-8
DBL 12 X 12	24	6-0	6-0	6-0	10-8	7-8	4-8	1-8

1) END SECTIONS HAVE SAME FULL JOINT AS THE FULL BARREL SECTION. THE JOINT ON END SECTION PIECES #2, #3 AND #4 OF THE OUTLET END HAVE THE JOINT DIRECTION REVERSED TO FACILITATE CONSTRUCTION.

2) THE REINFORCEMENT IS THE SAME AS FOR BARREL SECTIONS WITH AN ADDITIONAL #4 BAR PLACED PARALLEL TO SLOPED EDGE.

3) EACH INDIVIDUAL SECTION WEIGHS LESS THAN FULL BARREL SECTION.

4) ALL 6'-0" END SECTION LENGTHS ARE AVAILABLE UPON REQUEST.

REV 3-15-94

SOUTH DAKOTA CONCRETE PRODUCTS
PIERRE, SOUTH DAKOTA

DOUBLE CELL BOX CULVERT
TYPE - I SLOPED END SECTIONS

SCALE	none
DATE	8-26-93
DRAWN	DLP

DRAWING NUMBER
BC 305

Original Precast Concrete Box Culvert End Section Fabrication

Plotting Date: 01/22/2020

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	045-152	8	20

FED.HWY. ADMIN.NO.	STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
8	S.D.	P 0045(12)192	9	20

SPECIFICATIONS-

Construction Specifications: South Dakota Standard Specifications for Roads and Bridges, 1990 Edition and Required Provisions. Supplemental Specifications and/or Special Provisions as included in the Proposal.

DESIGN MIX OF CONCRETE

1 - Mix shall be designed to produce a concrete having a minimum compressive strength of 4500 p.s.i. at 28 days.

2 - Type II Cement is required.

3 - Because of the presence of corrosive soils on the project, Class C Fly Ash will not be permitted in Box Culvert Concrete.

GENERAL NOTES-

Design shall be in accordance with Section 560 of the South Dakota Standard Specifications with the following criteria:

1 - Design Live Load: HS 20-44 and Alternate Loading. No Construction Loading in excess of legal load shall be considered.

2 - The design of the barrel sections shall be based on a minimum fill height of one (1) foot and include all subsequent fill heights up to and including the maximum fill height of 6 ft. over the box culvert.

3 - Minimum inside corner fillet shall be 6 inches.

4 - Minimum precast section length shall be 4 ft.

5 - Lift holes shall be plugged with an approved nonshrinkable grout.

6 - The Fabricator shall imprint on the structure the date of construction as specified and detailed on Standard Plate No. 460.10 which is on Sheet No. 4 of 5 .

SHOP PLANS-

The fabricator shall initially submit two (2) copies of the shop plans to the Office of Bridge Design for review. One reviewed copy will be sent back to the fabricator who will then make changes, if any, and then send the Office of Bridge Design seven (7) final approved copies for distribution. Include design and check design, if applicable, with initial submittal.

UNDERCUT BACKFILL-

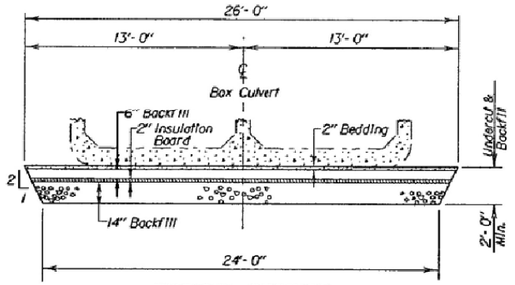
1. Backfill material shall conform to the following: A tolerance of five percent in material retained on a one inch sieve will be permitted, provided all material passes a one and one - half inch sieve. A minimum of twenty - five percent shall be retained on a No. 4 sieve and not more than eighteen percent shall pass a No. 200 sieve.

2. Backfill shall be compacted to ninety - five percent of the maximum dry density.

3. Bedding material shall be sand or selected sandy soil all of which passes a 3/8 inch sieve and not more than ten percent of which passes a No. 200 sieve.

4. The extruded insulation board (polystyrene) shall meet the requirments of AASHTO M230 70.

5. To avoid damage to the extruded insulation board (polystyrene), the equipment used to spread the 6 inch top layer shall not be operated on less than full depth of the layer.



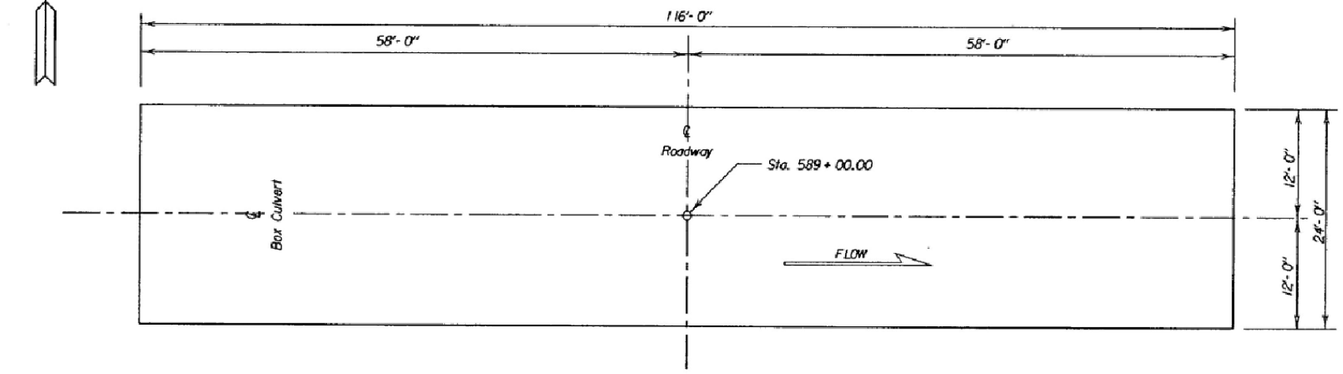
TYPICAL SECTION
(For Limits of Undercut)

ESTIMATED QUANTITIES (Informational)

	ITEM	UNIT	QUANTITY
⌽	Undercutting Box Culvert	Cu. Yd.	217
	Extruded Insulation Board	Sq. Yd.	330

⌽ For payment, quantity is based on plan shown undercut dimensions and will not be measured unless the Engineer orders a change.

Original Undercut Construction Plans



UNDERCUT LAYOUT
(Bottom Dimensions)

SITE A
OPTION III
NOTES & UNDERCUT
FOR
2 - 9' X 8' BOX CULVERT (PRECAST)
0° SKEW

OVER CREEK
STA. 589 + 00.00
STR. NO. 45-380-230

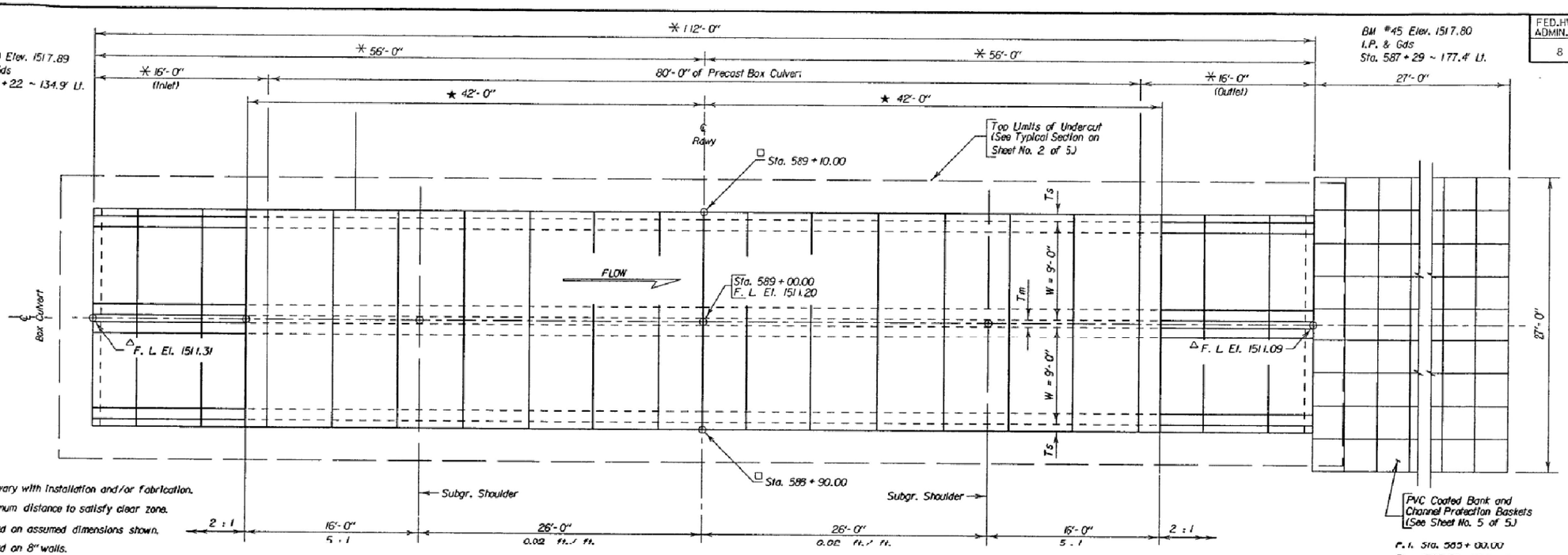
SEC. 29/28-T125N-R67W
P 0045(12)192
HS 20-44
(& ALT.)

McPHERSON COUNTY
S. D. DEPT. OF TRANSPORTATION
SEPTEMBER 1994

(2) OF (5)

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
YL/HE MCPH1282	TP 1282PA16	YL/HE	BRIDGE ENGINEER

FED.HWY. ADMIN.NO.	STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
8	S.D.	P 0045(12)192	10	20



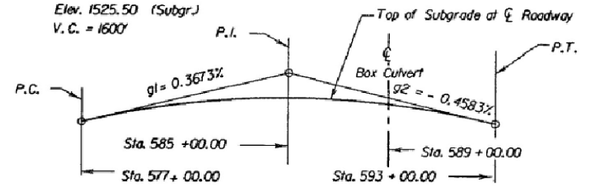
✳ May vary with installation and/or fabrication.
★ Minimum distance to satisfy clear zone.
△ Based on assumed dimensions shown.
□ Based on 8" walls.

PLAN

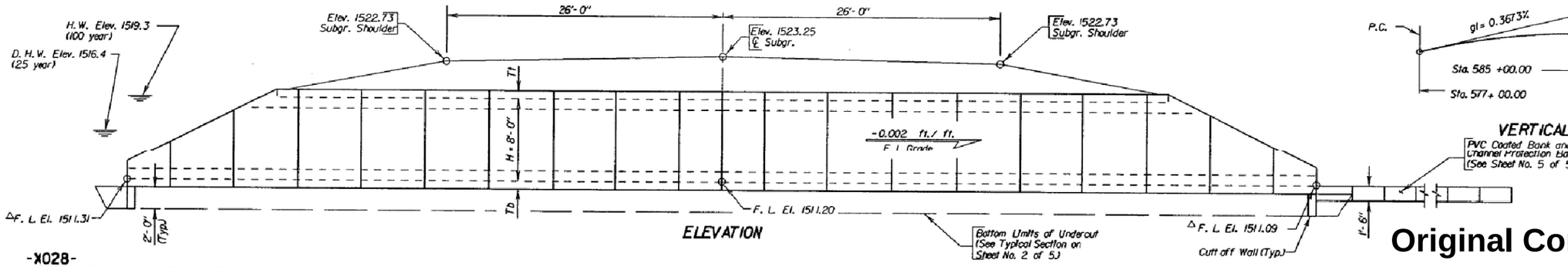
LEGEND

W = Width of Opening
H = Height of Opening
Tt = Thickness of Top Slab
Tb = Thickness of Bottom Slab
Ts = Thickness of Side Wall
Tm = Thickness of Middle Wall

P.I. Sta. 585+00.00
Elev. 1525.50 (Subgr.)
V.C. = 1600'



VERTICAL CURVE DATA



ELEVATION

-X028-
INDEX OF CULVERT SHEETS-

HYDRAULIC DATA

Q_d	485 cfs
A_d	51 sq. ft.
V_d	9.5 fps
Q_F	485 cfs
Q_{100}	955 cfs
V_{Max}	11.9 fps

Q_d = Design discharge for the proposed culvert based on 25 year frequency. El. 1516.4

Q_F = Designated peak discharge for the basin approaching proposed project based on 25 year frequency.

Q_{100} = Computed discharge for the basin approaching proposed project based on 100 year frequency. El. 1519.3

V_{Max} = Maximum computed velocity for the proposed Box Culvert based on 100 year frequency.

ESTIMATED QUANTITIES (Informational)

	ITEM	UNIT	QUANTITY
	Precast Dbl. 9' x 8' Box Culvert Section - Furnish	L.F.	80
	Precast Dbl. 9' x 8' Box Culvert Section - Install	L.F.	80
	Precast Dbl. 9' x 8' Box Culvert End Section - Furnish	Each	2
	Precast Dbl. 9' x 8' Box Culvert End Section - Install	Each	2
△	Structure Excavation, Box Culvert	Cu. Yd.	55.3
	Undercutting Box Culvert	Cu. Yd.	217
	Extruded Insulation Board	Sq. Yd.	330
⧖	PVC Coated Bank and Channel Protection Baskets	Cu. Yd.	40.5

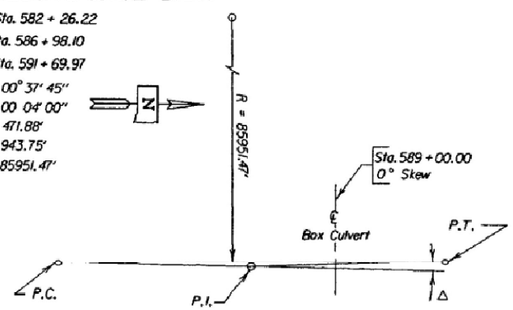
△ Quantity is based on 8" bottom slab & 8" walls for precast portion.

◈ Quantities shown are for informational purposes only. The Bid item will be for Drainage Structure Site A (See Special Provision for Drainage Structure Options).

⧖ Quantity is based on the use of 27 size E Gabions. Any combination of D, E or F Gabions may be used that meet or exceed the minimum dimensions shown. Payment will be for plans quantity.

HORIZONTAL CURVE DATA

P.C. Sta. 582+26.22
P.I. Sta. 586+98.10
P.T. Sta. 591+69.97
Δ = 00° 37' 45"
D = 00° 04' 00"
T = 471.88'
L = 943.75'
R = 85951.47'



Original Construction Plans
SITE A
OPTION III
GENERAL DRAWING & QUANTITIES
FOR
2 - 9' X 8' BOX CULVERT (PRECAST)
0° SKEW

OVER CREEK — SEC. 29/28-T125N-R67W
STA. 589+00.00 — P 0045(12)92
STR. NO. 45-380-230 — HS 20-44
PCEMS NO. 1282 — (& ALT.)

McPHERSON COUNTY
S. D. DEPT. OF TRANSPORTATION
SEPTEMBER 1994

-X028- (1) OF (5)

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
YL/HE	YL/TP	YL/HE	John C. Cole BRIDGE ENGINEER
MCPHI282	1282PA15		

PLANS BY : OFFICE OF BRIDGE DESIGN, SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION

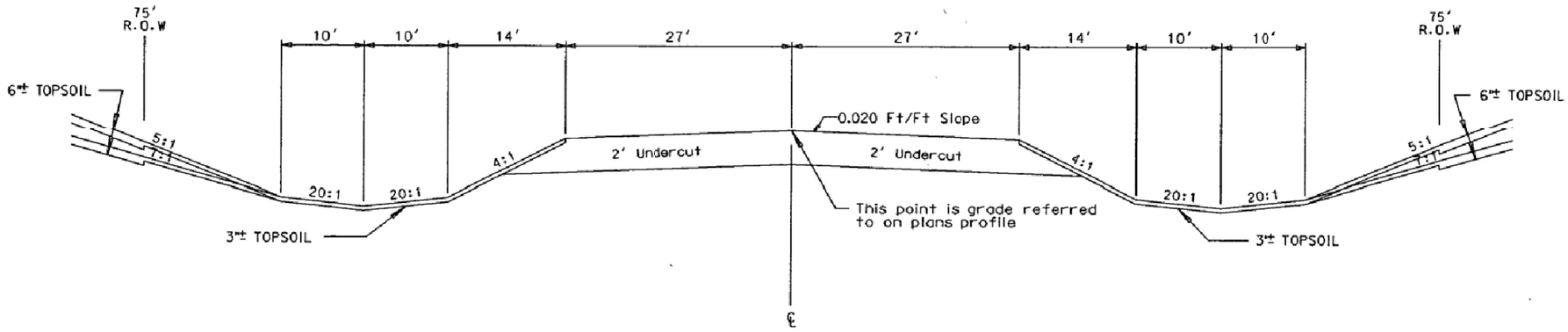
PLOT SCALE - 1:5400
PLOT NAME - 1
PLOTTED FROM - TRABIL017
FILE - ...\MCPHI15U0\15U0_TITLE SHEET.DGN

FED. HWY. ADMIN. NO.	STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
8	S.D.	P 0045(12)192	11	20

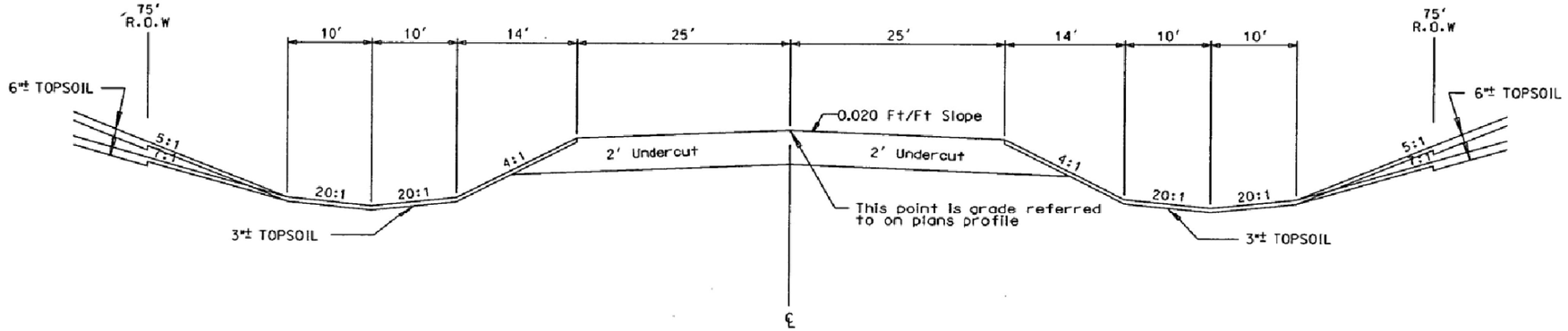
Original Construction Plans

Typical Grading Sections

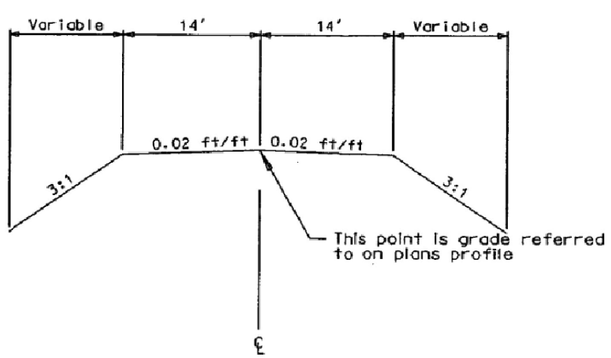
Sta. 548+90 TO Sta. 554+00



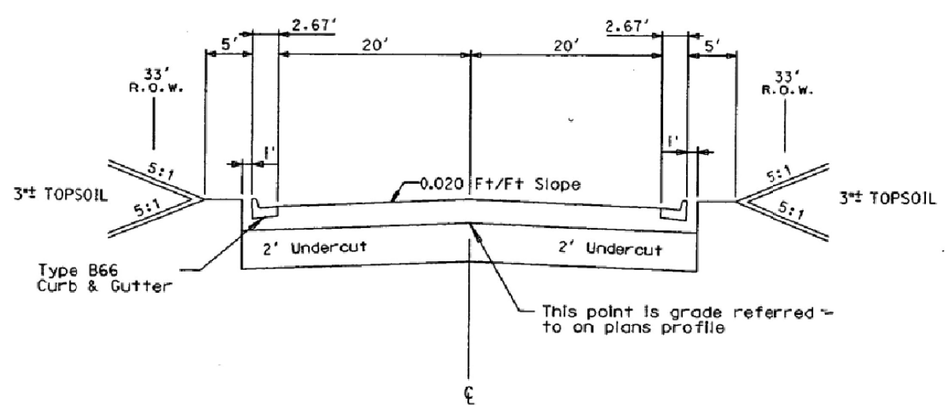
Sta. 556+00 TO Sta. 993+27



Detours



995+27 TO 1009+85



PLOT SCALE - 1:5400

PLOTTED FROM - TRABIL017

PLOT NAME - 1

FILE - ...\MCPH15UG\15UG_TITLE SHEET.DGN

Original Construction Plans

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	045-152	12	20
Plotting Date: 01/22/2020			

588+64
Take out 10'X 5'- 36'
R C B C
(Incidental Work)

598+02
Take out 4'X 2'- 32'
R C B C
(Incidental Work)

598+92 - 60' Lt.
Take out 15"- 22'
R C Pipe
(Incidental Work)

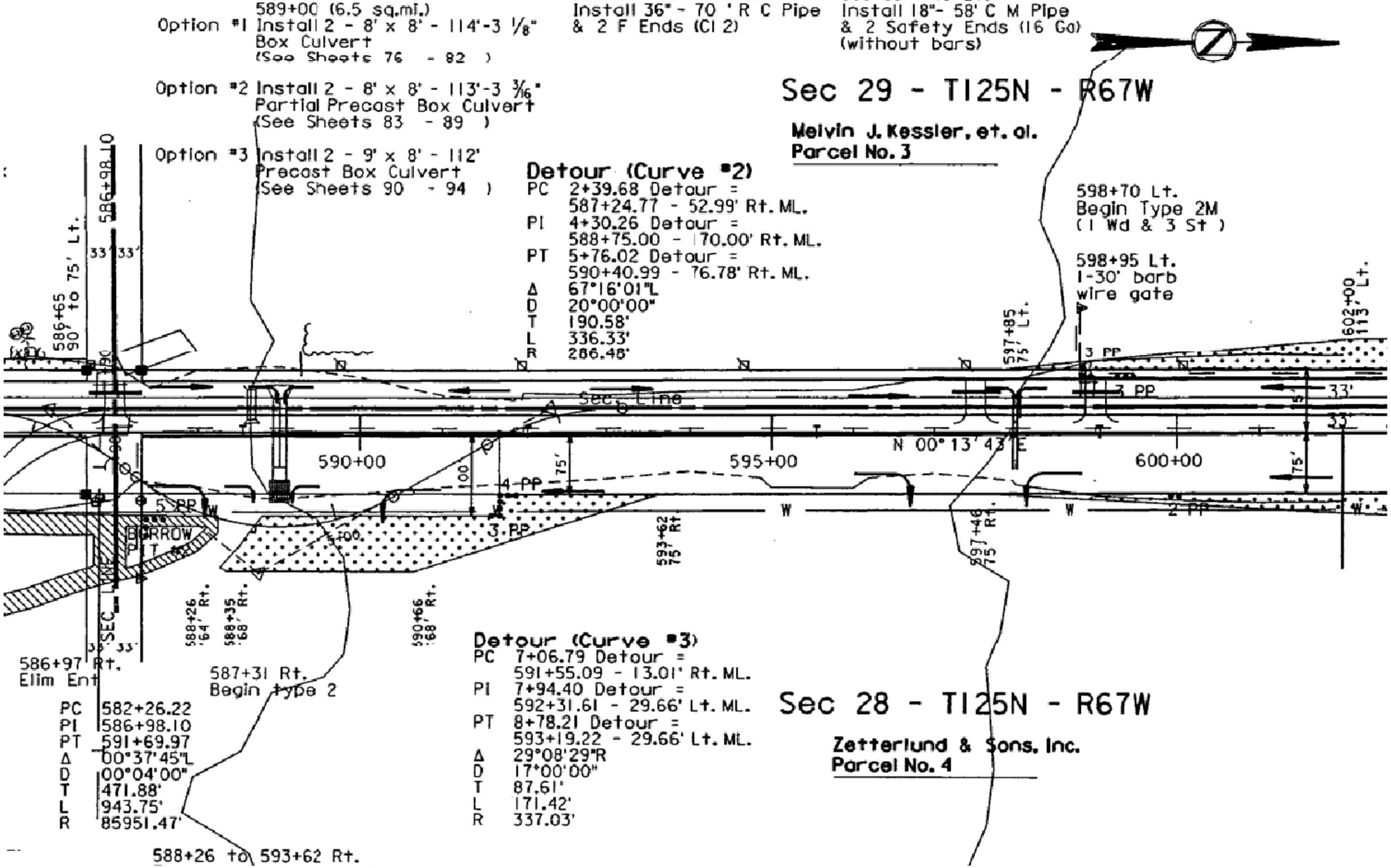
Site A
589+00 (6.5 sq.mi.)
Option #1 Install 2 - 8' x 8' - 114'-3 1/8"
Box Culvert
(See Sheets 76 - 82)

Option #2 Install 2 - 8' x 8' - 113'-3 3/16"
Partial Precast Box Culvert
(See Sheets 83 - 89)

Option #3 Install 2 - 9' x 8' - 112'
Precast Box Culvert
(See Sheets 90 - 94)

598+00 (164 acres)
Install 36" - 70 ' R C Pipe
& 2 F Ends (Cl 2)

598+95 - 49' Lt.
Install 18"- 58' C M Pipe
& 2 Safety Ends (16 Ga)
(without bars)



PLOT SCALE - 1:5400
PLOTTED FROM - TRABIL017
PLOT NAME - 1
FILE - ...\MCPH15UG\15UG_TITLE SHEET.DGN

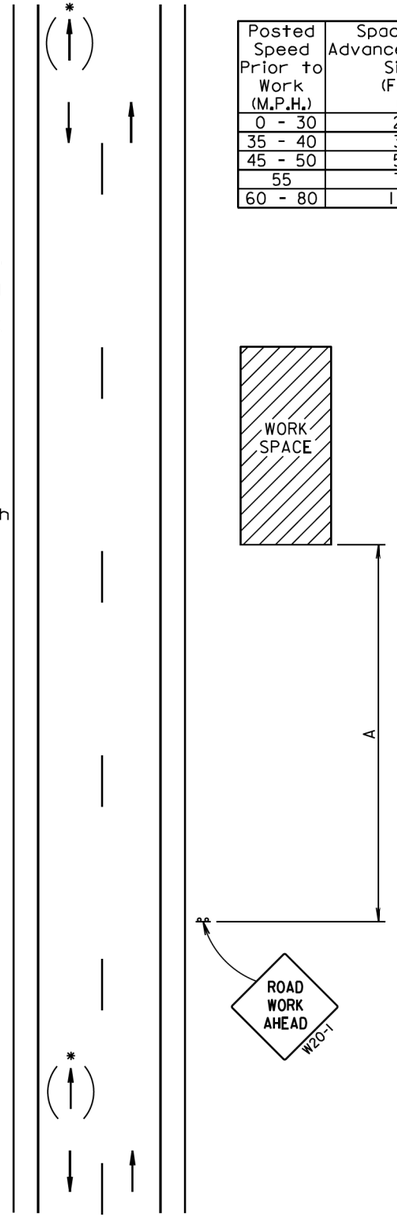
The signs illustrated are not required if the work space is behind a barrier, more than 2 feet behind the curb, or 15 feet or more from the edge of any roadway.

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 - 80	1000

April 15, 2015

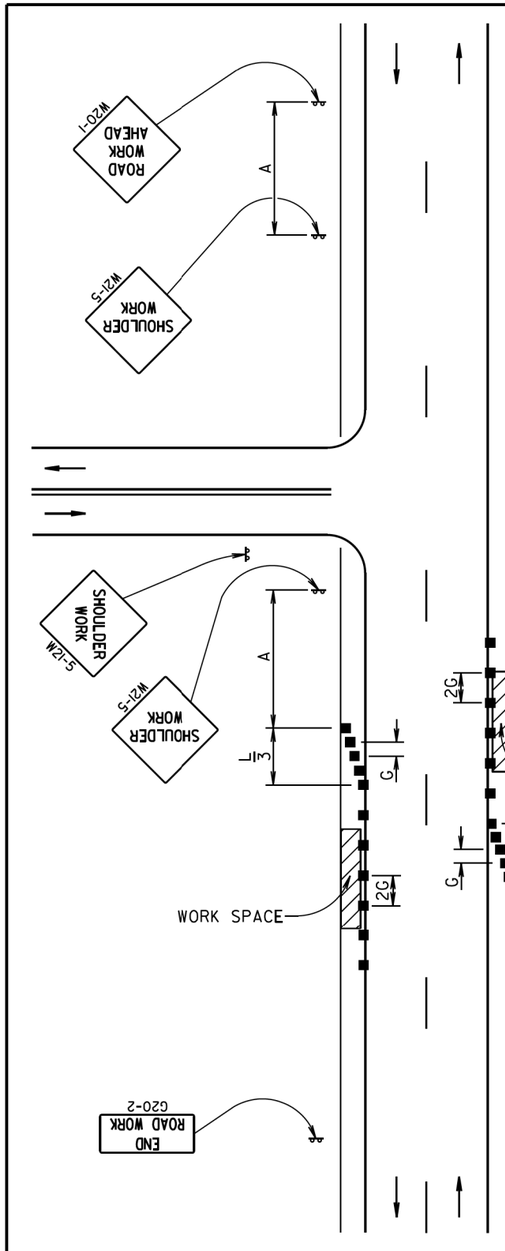
Published Date: 1st Qtr. 2020

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	500	600	25
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.

June 3, 2016

Published Date: 1st Qtr. 2020

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	500	25
50	500	50
55	750	50
60 - 65	1000	50

Flagger

Channelizing Device

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

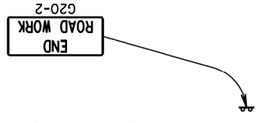
The ROAD WORK AHEAD and the END ROAD WORK signs may be omitted for short duration operations (1 hour or less).

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

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

The channelizing devices shall be drums or 42" cones.

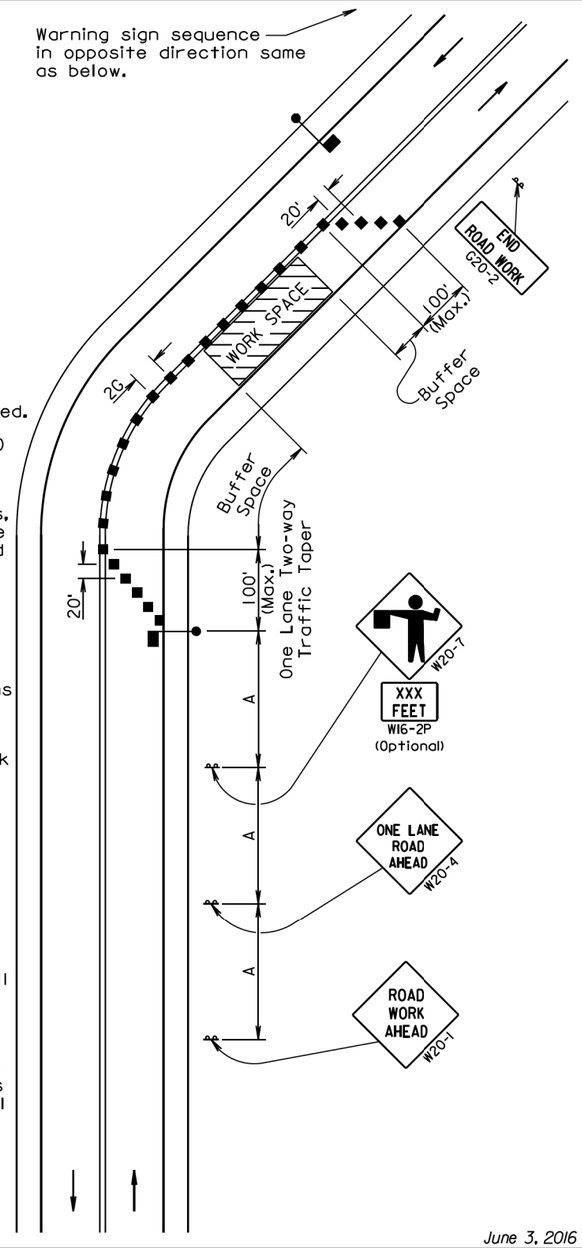
Channelizing devices are not required along the centerline adjacent to work area when pilot cars are utilized for escorting traffic through the work area.



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

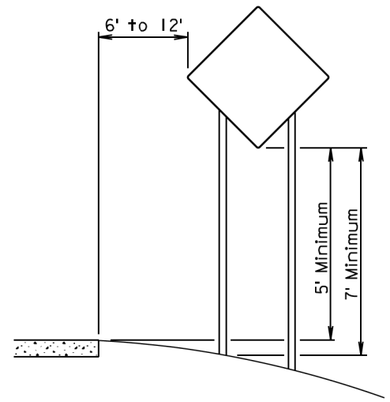
The buffer space should be extended so that the two-way traffic taper is placed before a horizontal or vertical curve to provide adequate sight distance for the flagger and queue of stopped vehicles.

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

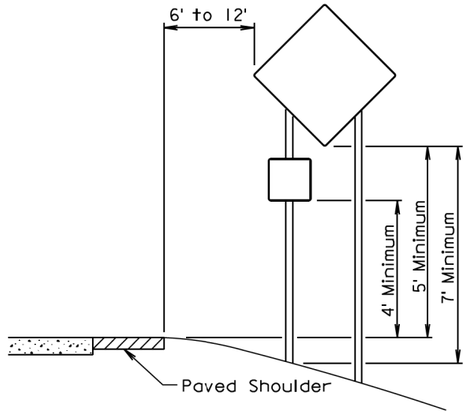


June 3, 2016

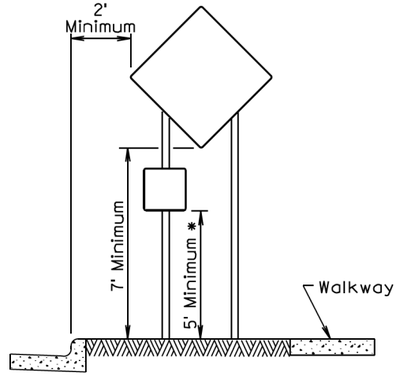
Published Date: 1st Qtr. 2020	SDDOT	GUIDES FOR TRAFFIC CONTROL DEVICES LANE CLOSURE WITH FLAGGER PROVIDED	PLATE NUMBER 634.23
			Sheet 1 of 1



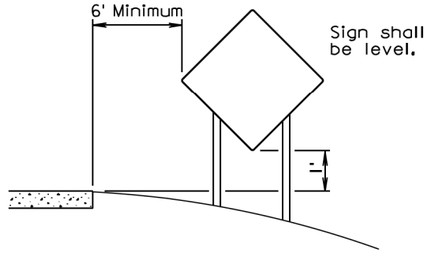
RURAL DISTRICT



RURAL DISTRICT WITH SUPPLEMENTAL PLATE



URBAN DISTRICT



RURAL DISTRICT
3 DAY MAXIMUM
(Not applicable to regulatory signs)

* If the bottom of supplemental plate is mounted lower than 7 feet above a pedestrian walkway, the supplemental plate should not project more than 4" into the pedestrian facility.

September 22, 2014

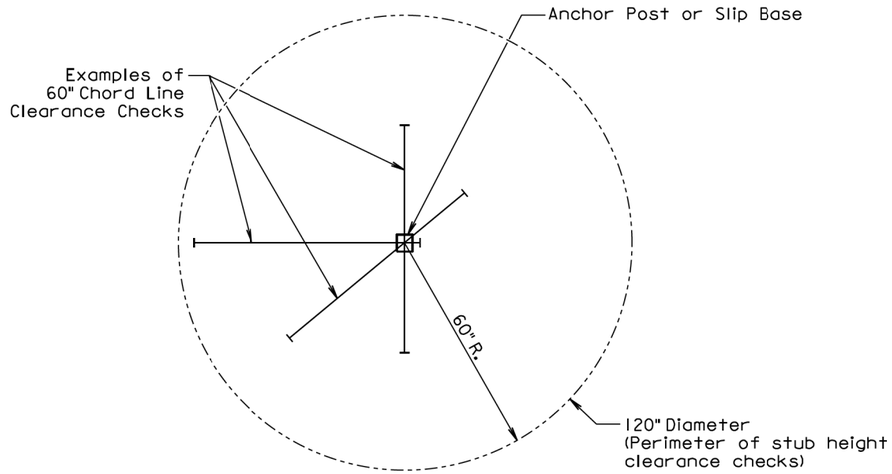
Published Date: 1st Qtr. 2020	SDDOT	CRASHWORTHY SIGN SUPPORTS (Typical Construction Signing)	PLATE NUMBER 634.85
			Sheet 1 of 1

PLOT SCALE - 1:200

PLOT NAME - 2

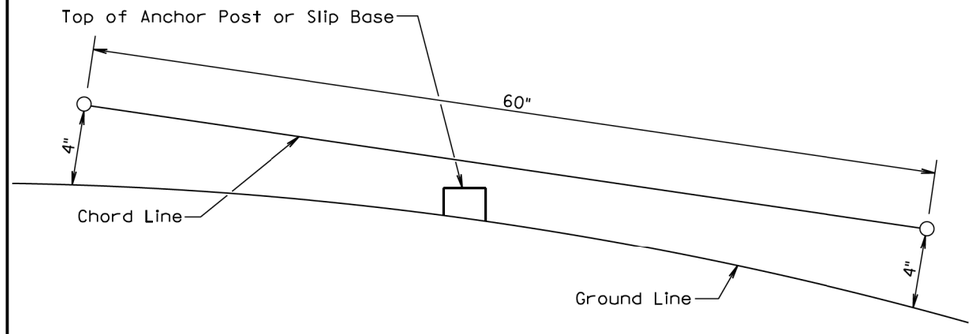
FILE - ...\15UG-STANDARD PLATES.DGN

-PLOTTED FROM - TRAB11.017



PLAN VIEW

(Examples of stub height clearance checks)



ELEVATION VIEW

GENERAL NOTES:

The top of anchor posts and slip bases SHALL NOT extend above a 60" chord line within a 120" diameter circle around the post with ends 4" above the ground.

At locations where there is curb and gutter adjacent to the breakaway sign support, the stub height shall be a maximum of 4" above the ground line at the localized area adjacent to the breakaway support stub.

The 4" stub height clearance is not necessary for U-channel lap splices where the support is designed to yield (bend) at the base.

July 1, 2005

Published Date: 1st Qtr. 2020	SDDOT	***BREAKAWAY SUPPORT STUB CLEARANCE***	*PLATE NUMBER* 634.99
			Sheet 1 of 1

ITEMIZED LIST FOR TRAFFIC CONTROL SIGNS

SIGN CODE	SIGN DESCRIPTION	CONVENTIONAL ROAD NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
W20-1	ROAD WORK AHEAD	2	48" x 48"	16.0	32.0
W20-4	ONE LANE ROAD AHEAD	2	48" x 48"	16.0	32.0
W20-7	FLAGGER (symbol)	2	48" x 48"	16.0	32.0
W21-5	SHOULDER WORK	1	48" x 48"	16.0	16.0
G20-2	END ROAD WORK	2	36" x 18"	4.5	9.0
		CONVENTIONAL ROAD TRAFFIC CONTROL SIGNS SQFT			121.0

Published Date: 1st Qtr. 2020

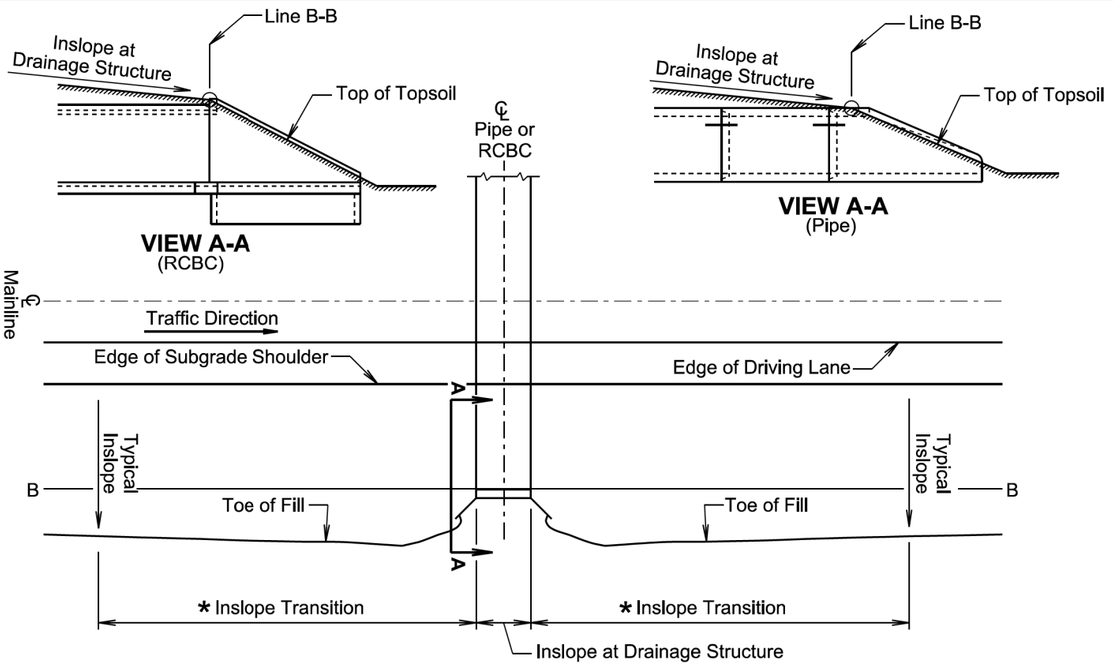
SDDOT

INSLOPE TRANSITIONS AT PIPE CULVERTS OR REINFORCED CONCRETE BOX CULVERTS

PLATE NUMBER 120.05

Sheet 1 of 2

September 14, 2018



TYPE 1 INSLOPE TRANSITION

GENERAL NOTES:

This Type 1 Inslope Transition is used when the specified inslope at the drainage structure is flatter than the typical inslope and the inslope at the drainage structure is between a 4:1 slope and 6:1 slope.

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

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

Published Date: 1st Qtr. 2020

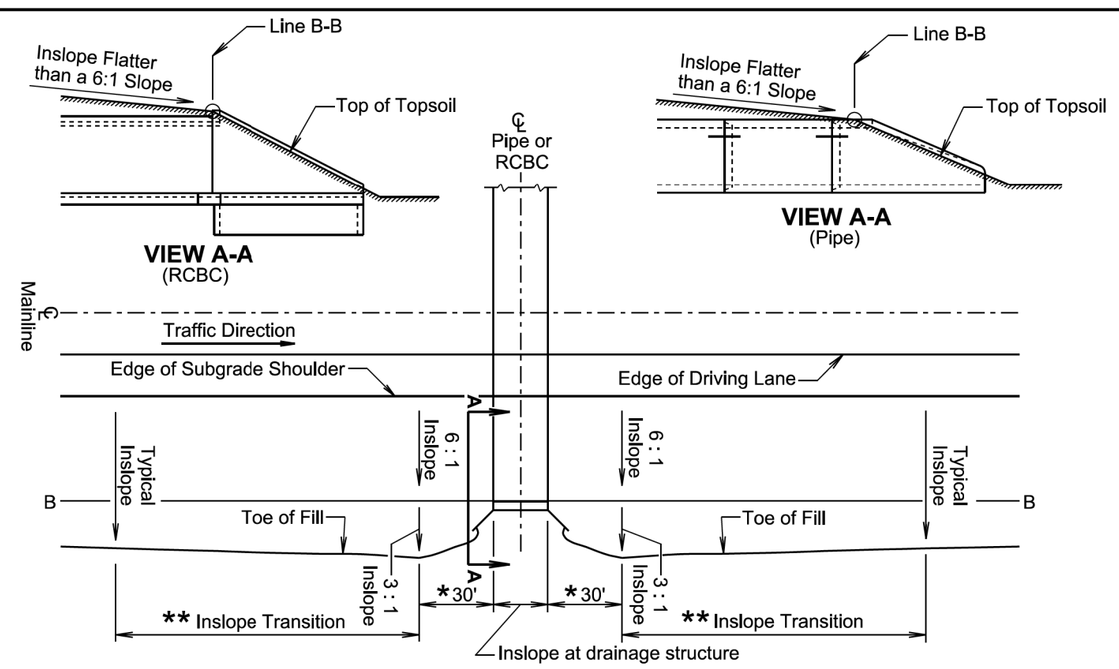
SDDOT

INSLOPE TRANSITIONS AT PIPE CULVERTS OR REINFORCED CONCRETE BOX CULVERTS

PLATE NUMBER 120.05

Sheet 2 of 2

September 14, 2018



TYPE 2 INSLOPE TRANSITION

GENERAL NOTES:

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

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

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

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

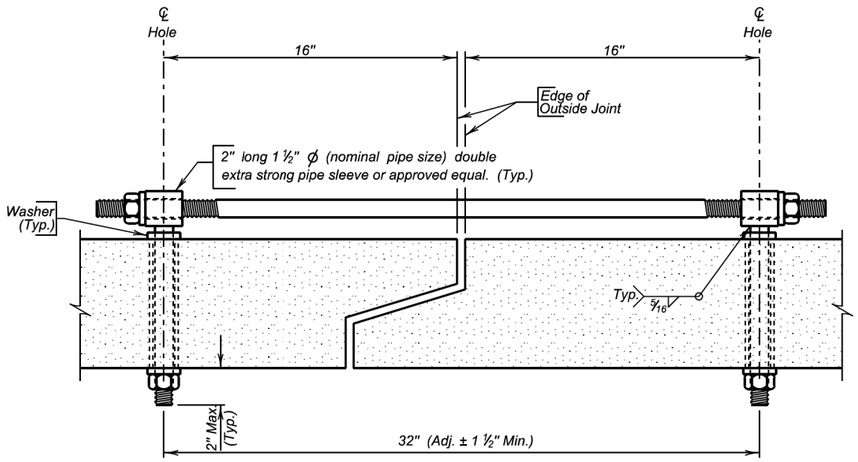
STATE OF SOUTH DAKOTA

PROJECT 045-152

Plotting Date: 02/14/2020

SHEET NO. 16

TOTAL SHEETS 20



TIE BOLT ASSEMBLY

GENERAL NOTES:

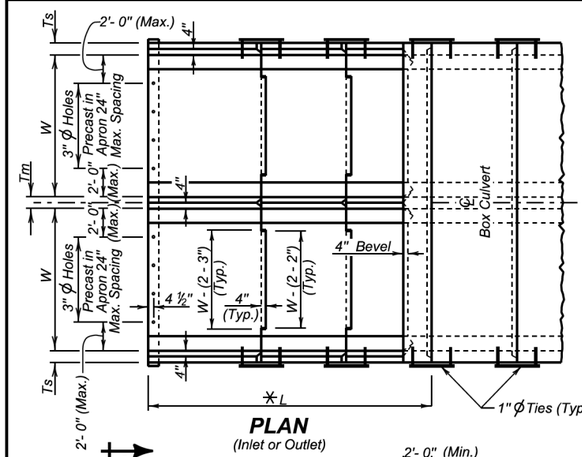
1. All holes for tie bolts shall be cast-in-place,16 inches from outside edge of joint. Cast in inserts or sleeves, if used, shall be made of a corrosion resistant material.
2. Ties shall be 1 inch ∅ and conform to the requirements of ASTM A36, ASTM A307, or ASTM F1554, Gr. 36. Nuts shall be heavy hex in conformance with ASTM A563. Washers shall conform to ASTM F436, Type 1. The welded pipe sleeve shall conform to ASTM A53, Grade B.
3. Welding and weld inspection shall be in conformance with AWS/ANSI D1.1 - (Current Year) Structural Welding Code - Steel.
4. Tie Bolt Assembly shall be galvanized in accordance with ASTM A153 or ASTM F2329 as applicable.
5. Tie Bolt Assembly details may vary from that shown, but alternate tie bolt assemblies are subject to testing to demonstrate equal strength. Submit details, through proper channels, to the Office of Bridge Design for approval.
6. All costs for furnishing and installing the precast box culvert tie bolt assembly shall be incidental to the contract unit price per Foot for "Precast Concrete Box Culvert, Furnish".

March 21, 2016

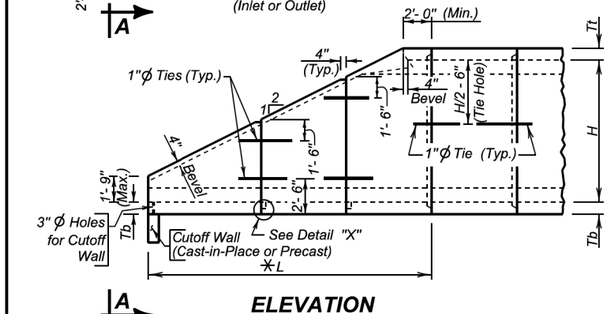
Published Date: 1st Qtr. 2020	SDDOT	PRECAST BOX CULVERT TIE BOLT ASSEMBLY DETAILS	PLATE NUMBER 560.01
			Sheet 1 of 1

CUTOFF WALL

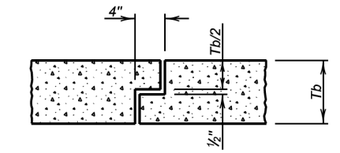
1. All costs associated with furnishing and installing the Cutoff Wall, whether precast or cast-in-place, shall be incidental to the contract unit price per each for "Precast Box Culvert End Section, Furnish".
2. Concrete for cast-in-place cutoff wall shall be Class M6 concrete in accordance with Section 462 of the Specifications.
3. All reinforcing steel shall conform to ASTM A615 Grade 60.
4. Alternate details will be allowed, subject to the approval of the Bridge Construction Engineer.



PLAN
(Inlet or Outlet)

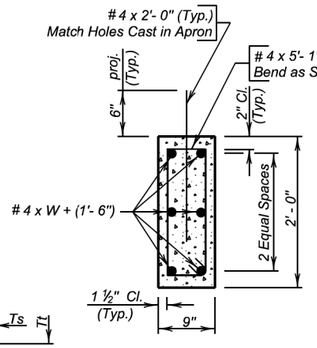


ELEVATION
(Inlet or Outlet)

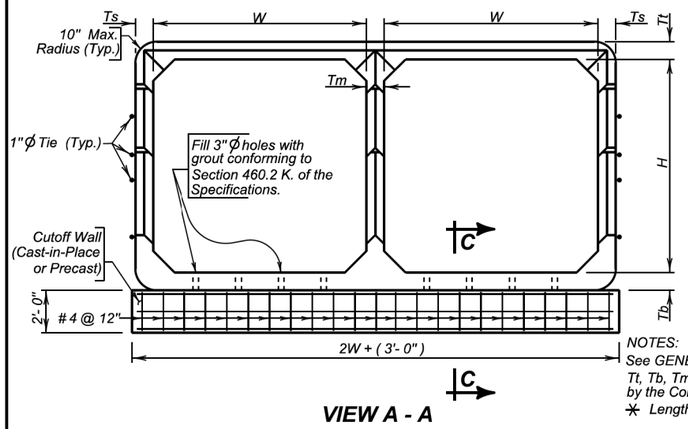


DETAIL "X"

NOTE: Joint details may vary from that shown, according to the manufacturer's design. Submit details with shop plans for approval.



SEC. C - C



VIEW A - A

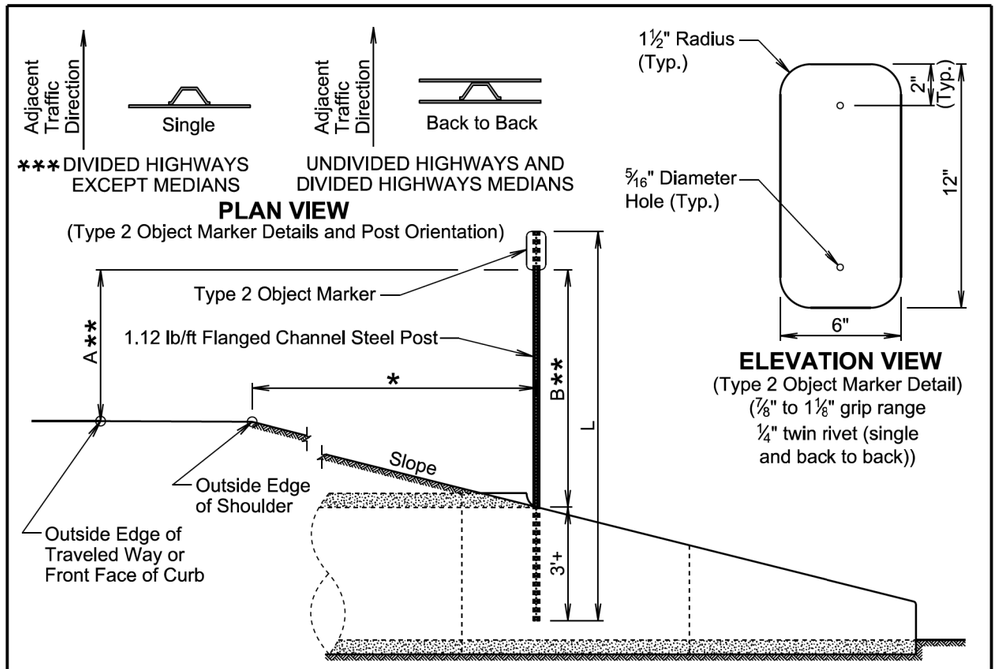
LEGEND

W = Width of Opening
H = Height of Opening
Tt = Thickness of Top Slab
Tb = Thickness of Bottom Slab
Ts = Thickness of Side Wall
Tm = Thickness of Middle Wall
L = Length of End Section

NOTES:
See GENERAL DRAWING for W and H dimensions.
Tt, Tb, Tm, L, and Ts dimensions shall be furnished by the Contractor.
⁎ Length and number of units may vary from that shown.

June 26, 2015

Published Date: 1st Qtr. 2020	SDDOT	PRECAST DOUBLE BOX CULVERT SLOPED END SECTION DETAILS WITH 2'-0" CUTOFF WALL	PLATE NUMBER 560.20
			Sheet 1 of 1



TYPE 2 OBJECT MARKER POST LENGTHS									
OFFSET (*)		1'	2'	3'	4'	5'	6'	7'	8'	Greater Than 8'
		POST LENGTH (L)								
SLOPE	3:1	8'-6"	8'-9"	9'-3"	9'-6"	9'-9"	10'-3"	10'-6"	10'-9"	8'-0"
	4:1	8'-6"	8'-9"	9'-0"	9'-3"	9'-9"	9'-9"	10'-0"	10'-3"	8'-0"
	5:1	8'-3"	8'-6"	8'-9"	9'-0"	9'-3"	9'-3"	9'-6"	9'-9"	8'-0"
	6:1	8'-3"	8'-6"	8'-9"	8'-9"	9'-0"	9'-3"	9'-3"	9'-6"	8'-0"

GENERAL NOTES:

*** The type 2 object marker may be installed back to back when specified in the plans.

Post Length L was calculated based on a shoulder width of 6 feet at a crosslope of 4 percent and L was rounded up to the nearest 3 inches.

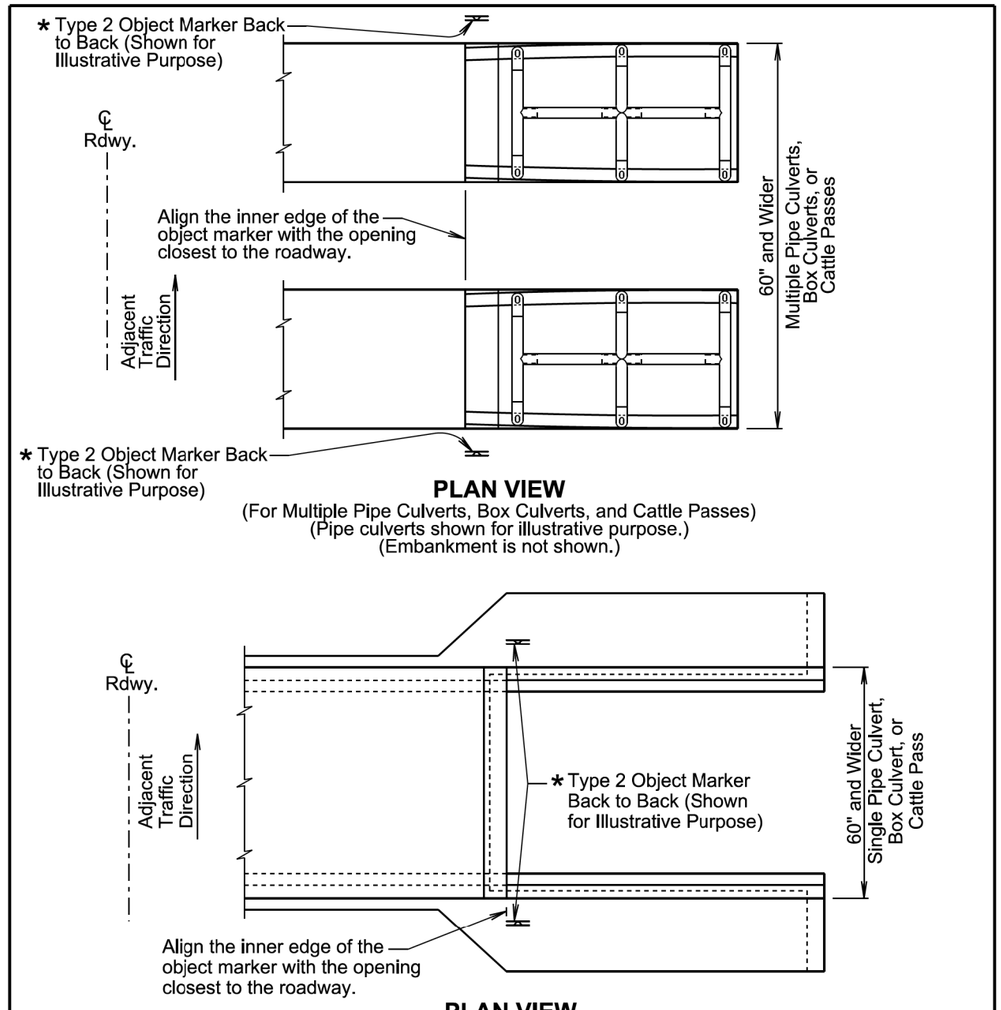
** Dimension A is 4 feet when the Offset * is 8 feet and less. Dimension B is 4 feet when Offset * is greater than 8 feet.

The type 2 object marker and the 1.12 lb/ft flanged channel steel post will be in conformance with Specifications Section 982.2 J.

Payment for the type 2 object marker will be in conformance with Specification Section 632.5 B.

December 23, 2019

Published Date: 1st Qtr. 2020	SDDOT	TYPE 2 OBJECT MARKER (DIRECT DRIVE)	PLATE NUMBER 632.01
			Sheet 1 of 1



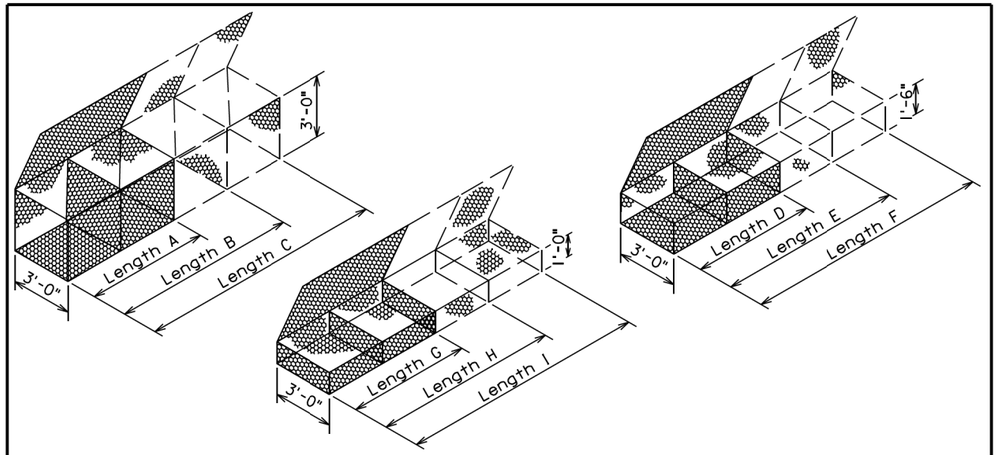
GENERAL NOTES:

This standard plate will be used in conjunction with standard plate 632.01.

* The type 2 object markers will be installed at the locations shown above. The type 2 object markers, single faced or back to back, will be as specified in the plans.

December 23, 2019

Published Date: 1st Qtr. 2020	SDDOT	TYPE 2 OBJECT MARKER AT PIPE CULVERTS, BOX CULVERTS, AND CATTLE PASSES (60" and Greater Overall Width)	PLATE NUMBER 632.04
			Sheet 1 of 1



GABION DETAILS

STANDARD SIZES

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

Above Dimensions subject to mill tolerances.

GENERAL NOTES:

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

The lacing procedure is as follows:

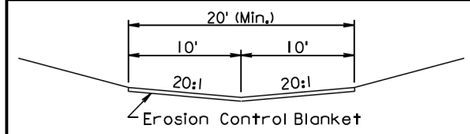
1. Cut a length of lacing wire approximately 1 ½ times the distance to be laced but not exceeding 5 feet.
2. Secure the wire terminal at the corner by looping and twisting.
3. Proceed lacing with alternating single and double loops at a spacing not to exceed 6 inches.
4. Securely fasten the other lacing wire terminal.

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

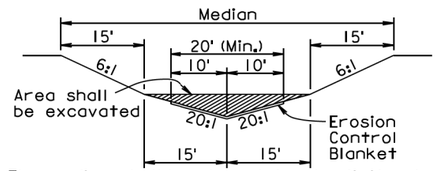
Interlocking fasteners for PVC coated gabions shall be high tensile 0.120 inch diameter stainless steel wire conforming to ASTM A313, Type 302, Class 1. The spacing of the interlocking fasteners during all phases of assembly and construction shall not exceed 6 inches. All fasteners shall be placed where the mesh weaves around the selvage wire at the vertical and horizontal joints.

June 26, 2001

Published Date: 1st Qtr. 2020	SDDOT	BANK AND CHANNEL PROTECTION GABIONS	PLATE NUMBER 720.01
			Sheet 1 of 1

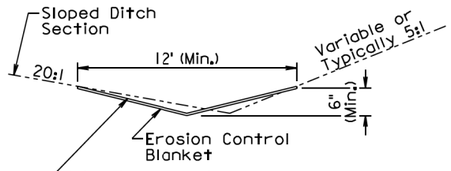


STANDARD DITCH SECTION

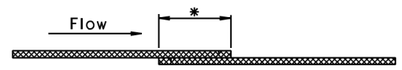


The median shall be shaped to the limits shown in this detail where the erosion control blanket will be placed.

MEDIAN SECTION



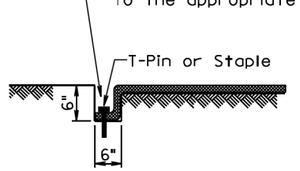
SLOPED DITCH SECTION



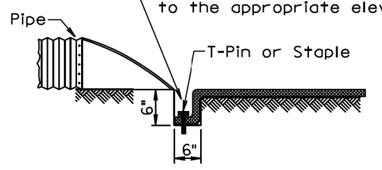
* Use a 4" (Min.) overlap wherever two widths of erosion control blanket are applied side by side.

* Use a 6" (Min.) overlap wherever one roll of erosion control blanket ends and another begins.

OVERLAP DETAIL



TRENCH DETAIL



PIPE END DETAIL

GENERAL NOTES:

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

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

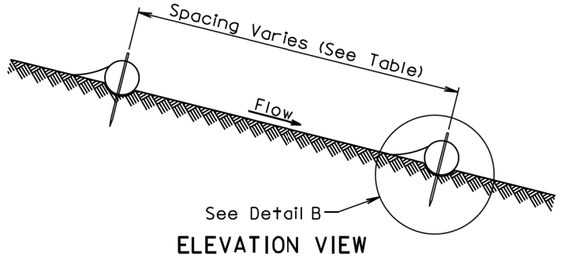
The erosion control blanket shall be pinned to the ground according to the manufacturer's installation recommendations.

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

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

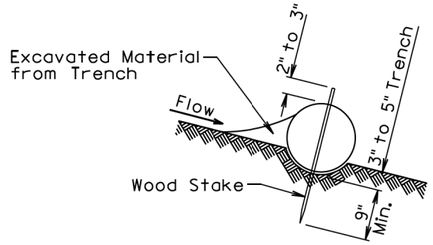
December 23, 2004

Published Date: 1st Qtr. 2020	SDDOT	EROSION CONTROL BLANKET	PLATE NUMBER 734.01
			Sheet 1 of 1

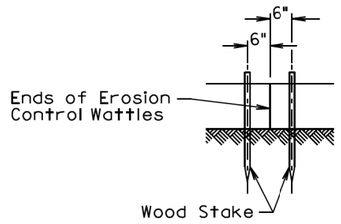


ELEVATION VIEW
CUT OR FILL SLOPE INSTALLATION

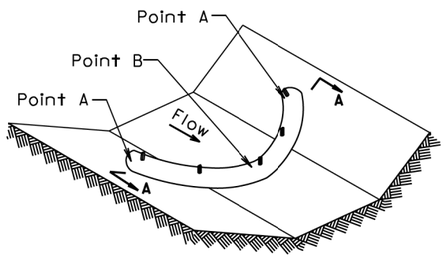
CUT OR FILL SLOPE INSTALLATION	
Slope	Spacing (Ft)
1:1	10
2:1	20
3:1	30
4:1	40



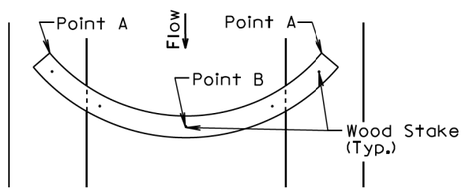
DETAIL B
(TYPICAL OF ALL INSTALLATIONS)



DETAIL C

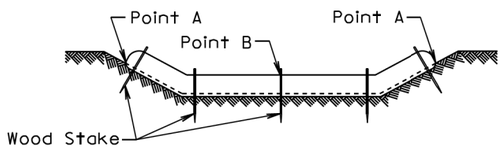


ISOMETRIC VIEW
DITCH INSTALLATION



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. 2020	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. 2020	SDDOT	EROSION CONTROL WATTLE	PLATE NUMBER 734.06
			Sheet 2 of 2