FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	BRO 8016(08)	1	25

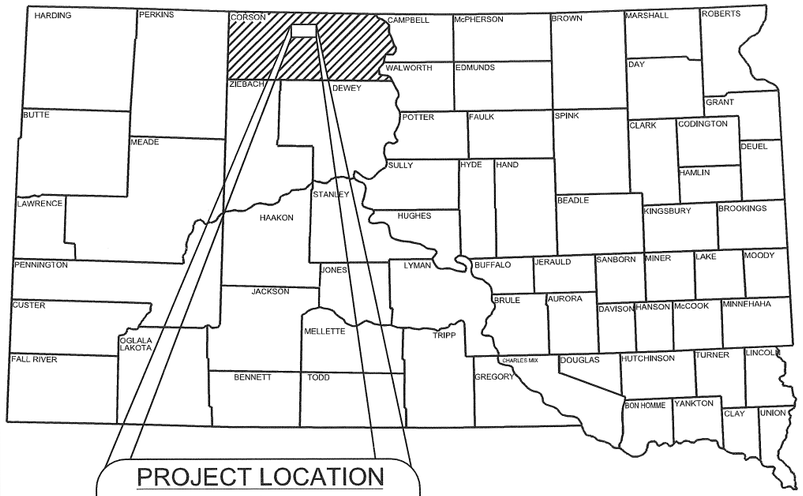
Revised Date: 1-27-2016

STATE OF SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION

PLANS FOR PROPOSED

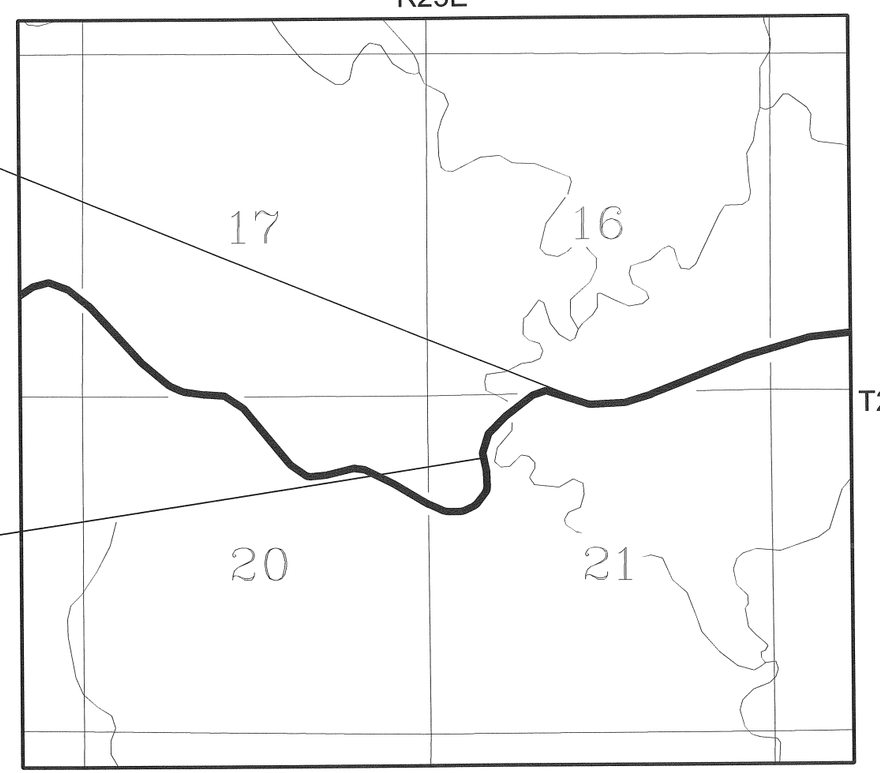
PROJECT BRO 8016(08)
WHITE SHIRT CREEK
CORSON COUNTY

PRECAST BOX CULVERT AND APPROACH GRADING
PCN 01DN



PROJECT LOCATION
9.7 miles South and
2.4 miles East of
McIntosh, South Dakota
over White Shirt Creek

R23E



T21N

END PROJECT - CORSON COUNTY BRO 8016(08)

At Sta. 13+50 = A Point Approximately 1,617.1' East and 174.2' South of the NW Corner of Section 21, T21N, R23E.

BEGIN PROJECT - CORSON COUNTY BRO 8016(08)

At Sta. 7+00 = A Point Approximately 1,123.6' East and 597.2' South of the NW Corner of Section 21, T21N, R23E.

INDEX OF SHEETS

SHEET NO. 1	TITLE AND LAYOUT MAP
SHEET NO. 2	ESTIMATE OF QUANTITIES AND TYPICAL SECTION
SHEET NO. 3-5	PLAN NOTES
SHEET NO. 6-7	TRAFFIC CONTROL
SHEET NO. 8	EROSION CONTROL
SHEET NO. 9-11	SWPPP NOTES
SHEET NO. 12	PLAN & PROFILE
SHEET NO. 13-16	DOUBLE 14' X 14' BOX CULVERT (PRECAST)
SHEET NO. 17-19	STANDARD PLATES
SHEET NO. 20-25	CROSS SECTIONS

DESIGN DESIGNATION

ADT (2007)	70
ADT (2027)	90
DHV	15
D	50%
T DHV	1.8%
T*ADT	3.9%
V	35 mph

Gross length 650 Feet 0.123 Miles

Net length 650 Feet 0.123 Miles

STRUCTURE PLANS

SURVEY BY	BROSZ ENGINEERING, INC. BOWMAN, NORTH DAKOTA
PLANS BY	BROSZ ENGINEERING, INC. BOWMAN, NORTH DAKOTA

STORM WATER PERMIT DATA

Major Receiving Body of Water: White Shirt Creek
Area Disturbed: 1.5 Acres
Total Project Area: 2.5 Acres
Latitude: 45° - 46' - 27.40" N
Longitude: 101° - 16' - 52.94" W

REGISTERED PROFESSIONAL ENGINEER
Reg. No. 7184
GARY BRENNAN
SOUTH DAKOTA
1/27/16

ESTIMATE OF QUANTITIES

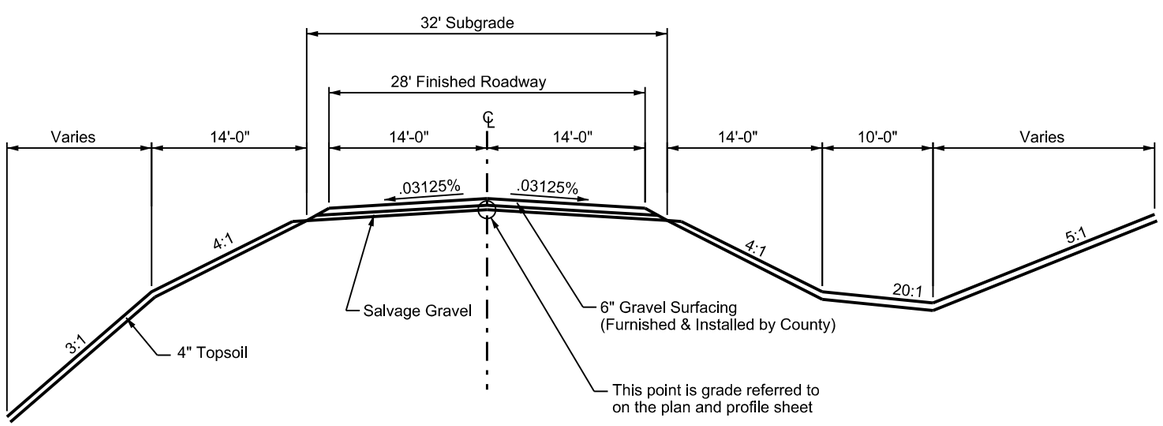
GRADING QUANTITES:

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
110E1690	Remove Sediment	30	CuYd
120E0010	Unclassified Excavation	1,459	CuYd
120E0600	Contractor Furnished Borrow Excavation	5,306	CuYd
230E0010	Placing Topsoil	612	CuYd
250E0020	Incidental Work Grading	Lump Sum	LS
634E0110	Traffic Control Signs	109	SqFt
634E0120	Traffic Control Miscellaneous	1	LS
634E0285	Type 3 Barricade, 8' Double Sided	8	Each
730E0210	Type F Permanent Seed Mixture	39	Lb
732E0100	Mulching	5.0	Ton
734E0154	12" Diameter Erosion Control Wattle	90	Ft
734E0602	Low Flow Silt Fence	250	Ft
734E0610	Mucking Silt Fence	17	CuYd
734E0620	Repair Silt Fence	63	Ft

STRUCTURE QUANTITIES:

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
250E0030	Incidental Work, Structure	Lump Sum	LS
420E0200	Structure Excavation, Box Culvert	122	CuYd
421E0200	Box Culvert Undercut	543	CuYd
560E2240	2-14'X14' Precast Concrete Box Culvert, Furnish	76	Ft
560E2241	2-14'X14' Precast Concrete Box Culvert, Install	76	Ft
560E3240	2-14'X14' Precast Concrete Box Culvert End Section, Furnish	2	Each
560E3241	2-14'X14' Precast Concrete Box Culvert End Section, Install	2	Each
700E0210	Class B Riprap	198.2	Ton
831E0110	Type B Drainage Fabric	313	SqYd

TYPICAL SECTION
NOT TO SCALE



BASIS OF ESTIMATE

WATER

10 Gal/CuYd for Excavation & Borrow
30 Gal/CuYd for Salvage Gravel

NOTE:
The payment for water required for Embankment and Granular Material shall be incidental to "Incidental Work Grading."

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 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

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 D: WATER QUALITY STANDARDS

COMMITMENT D1: SURFACE WATER QUALITY

The White Shirt Creek is classified as fish and wildlife propagation, recreation, irrigation, and stock watering waters. Because of these beneficial uses, special construction measures may have to be taken to ensure that this water body is not impacted.

Action Taken/Required:

The Contractor is advised the South Dakota Surface Water Quality Standards, administered by the Department of Environment and Natural Resources (DENR), apply to this project. Special construction measures shall be taken to ensure the above standard(s) of the surface waters are maintained and protected.

COMMITMENT D2: SURFACE WATER DISCHARGE

The White Shirt Creek is classified as fish and wildlife propagation, recreation, irrigation and stock watering waters. Because of these beneficial uses, special construction measures may have to be taken to ensure that this water body is not impacted.

Action Taken/Required:

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

COMMITMENT E: STORM WATER

Construction activities constitute 1 acre or more of earth disturbance.

Action Taken/Required:

The DENR and the US Environmental Protection Agency (EPA) have issued separate general permits for the discharge of storm water runoff. The DENR permit applies to discharges on state land and the EPA permit applies to discharges on federal or reservation land. The Contractor is advised this project is regulated under the Phase II Storm Water Regulations and must receive coverage under the General Permit for Construction Activities. A Notice of Intent (NOI) will be submitted to DENR a minimum of 15 days prior to project start by the DOT Environmental Office. A letter must be received from DENR that acknowledges project coverage under this general permit before project start. The Contractor is advised that permit coverage may also be required by off-site activities, such as borrow and staging areas, which are the responsibility of the Contractor.

The Contractor shall adhere to the "Special Provision Regarding Storm Water Discharge to Waters of the United States within Indian Reservations".

A major component of the storm water construction permits is development and implementation of a Storm Water Pollution Prevention Plan (SWPPP), which is a joint effort and responsibility of the SDDOT and the Contractor. Erosion control measures and best management practices will be implemented in accordance with the SWPPP. The SWPPP is a dynamic document and is to be available on-site at all times.

Information on storm water permits and SWPPPs are available on the following websites:

SDDOT: http://www.sddot.com/business/environmental/stormwater/Default.aspx

DENR: http://www.denr.sd.gov/des/sw/stormwater.aspx

EPA: http://cfpub.epa.gov/npdes/home.cfm?program_id=6

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 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:

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 J: CONSTRUCTION PRACTICES FOR TEMPORARY WORKS IN WATERWAYS OF THE U.S.

The Contractor is advised that special construction measures have to be taken to ensure that the waterways of the U.S. are not impacted.

Action Taken/Required:

No excavation shall be made below the ordinary high water elevation in waterways outside of caissons, cribs, cofferdams, steel piling, or sheeting; and the natural streambed shall not be disturbed unless specified by the plans and under the observation of the Project Engineer.

All dredged or excavated materials shall be placed at a site above the ordinary high water elevation in a confined area (not classified as a wetland) that is a minimum of 50 feet away from concentrated flows of storm water, drainage courses, and inlets to prevent return of such material to the waterway.

The construction of temporary work platforms, crossings, or berms below the ordinary high water elevation will be allowed provided that all material placed below the ordinary high water elevation consists of Class B or larger riprap.

All temporary caissons, cribs, cofferdams, steel piling, sheeting, work platforms, crossings, and berms shall be removed with minimal disturbance to the streambed. Proper construction practices shall be used to minimize increases in suspended solids and turbidity in the waterway.

Bridge berms, wing dams, traffic diversions, channel reconstruction, grading, etc. shall be constructed in close conformity with the plans to ensure that the hydraulic capacity of the waterway is not changed.

Temporary waterway crossings required for the Contractors construction operations shall be constructed with an adequate drainage structure size and minimum fill height to reduce the potential for upstream flooding. The Contractor will be responsible for sizing the temporary drainage structure for these crossings.

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.

GRADING OPERATIONS:

Compaction of earth embankment and box culvert backfill material shall be governed by the specified density method. Water for Embankment is estimated at the rate of 10 gallons of water per cubic yard of Embankment minus Waste. The payment for water required for Embankment shall be incidental to “Incidental Work Grading”.

The estimated cubic yards of excavation and/or embankment required to construct outlet ditches, ditch blocks, and approaches are included in the earthwork balance notes on the profile sheets.

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

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

Inslope transitions will be required at the structure. Refer to Standard Plate 120.05 for details.

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

UNCLASSIFIED EXCAVATION

All excavation that must be performed to construct the new grade in conformance with the cross sections and plan details will be included in the contract unit price per cubic yard for "Unclassified Excavation." The plans quantity for “Unclassified Excavation” as shown in the Estimate of Quantities shall be the basis of payment for this item without further field measurement. If changes are necessary on construction, the altered quantities will be measured for payment.

CONTRACTOR FURNISHED BORROW EXCAVATION

The Contractor shall 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.

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

The plans quantity for “Contractor Furnished Borrow Excavation” as shown in the Estimate of Quantities shall be the basis of payment for this item without further field measurement. If changes are necessary on construction, the altered quantities will be measured for payment.

CORSON COUNTY REQUIREMENTS

The County will be responsible for the following items without federal participation.

1. Right of way and temporary and permanent easements.
2. Coordination of any utility adjustments.
3. Furnish and install final surfacing.
4. Furnish and install temporary and-or permanent fencing.
5. Remove silt fence, and wattles in permanently seeded areas, after the vegetation is established.
6. Furnish and install any permanent signing.

SHRINKAGE:

A shrinkage factor for embankment of plus 30% was used.

GENERAL MAINTENANCE OF TRAFFIC

Removing, relocating, covering, salvaging and resetting of existing traffic control devices, shall be the responsibility of the Contractor. Cost for this work shall be incidental to the contract unit prices for 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.

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 unit price per pound for the corresponding permanent seed mixture.

PERMANENT SEEDING

Type F Permanent Seed Mixture shall consist of the following:

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

FERTILIZING

Application of fertilizer will not be required on this project.

MULCHING (GRASS HAY OR STRAW)

An additional 2 tons of Grass Hay or Straw Mulch has been added to the Estimate of Quantities for temporary erosion control on areas determined by the Engineer during construction for temporary stabilization.

EROSION CONTROL WATTLE

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

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

Erosion control wattles shall remain on the project until vegetation has been established and then they shall be removed in accordance with the Engineer, by the County.

An additional quantity of 50 feet of 12" Diameter Erosion Control Wattles has been added to the Estimate of Quantities for the Engineers discretion.

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

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

TABLE OF EROSION CONTROL WATTLE

Station	Lt/Rt	Diameter (Inch)	Location	Quantity (Ft)
10+51	Rt	12	Ditch bottom	20
10+89	Rt	12	Ditch bottom	20
			Engineer's Discretion	50
			Total	90

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 locations noted in the table and at locations that will 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.

An additional quantity of Low Flow Silt Fence has been added to the Estimate of Quantities for temporary sediment control.

TABLE OF LOW FLOW SILT FENCE

Station	Lt/Rt	Location	Quantity (Ft)
9+57	Lt & Rt	Ditch Bottom	100
10+42	Lt & Rt	Ditch Bottom	100
		Engineer's Discretion	50
		Total:	250

REMOVE SEDIMENT

This work shall consist of removing sediment collected by the temporary erosion and sediment control devices after a rainfall event. Any sediment collected on the upstream side of the sediment control device that would render the sediment control device ineffective shall be removed by the Contractor and blended back into the cut or fill of the graded area.

The Contractor and Engineer shall inspect and maintain the sediment control devices once every week and within 24 hours after every rainfall event greater than 1/2".

All costs for removing and disposing of sediment collected by the sediment control device shall be incidental to the contract unit price per cubic yard for "Remove Sediment".

INCIDENTAL WORK GRADING

The Contractor shall be responsible for locating all utilities All costs involved in utility locations shall be incidental to the contract lump sum price for "Incidental Work, Grading."

All delineators in advance of the structure are to be removed, salvaged, and reset. The remaining traffic control signs shall be removed. Care shall be taken when removing signs, delineators, and posts so that minimal damage is done to them. Salvage materials shall become the property of the Corson County Highway Department and stockpiled as directed by the County. The Contractor shall dispose of unsalvageable materials. It shall be the Contractor's responsibility to contact and to coordinate their work schedule with the Corson County Highway Department. Cost for this work shall be incidental to the contract lump sum price for "Incidental Work, Grading."

The cost for water required for embankment and granular material shall be incidental to the contract lump sum price for "Incidental Work Grading."

UTILITIES

The utilities as shown on the plans are for information purposes only. It shall be the contractor's responsibility to contact and to coordinate their work schedule with the County and the utility companies. There may be additional utilities added since the time the survey was completed, in addition to those shown in these plans. The contractor shall be responsible for all damages to utilities in the limits of the proposed construction at no cost to the owners. Adequate time shall be provided for the utilities to be relocated and adjusted, prior to work that may disrupt the utilities as per section 5.6 of the Specifications.

SD 1 Call: 1-800-781-7474

Century Link
Watertown, SD 57201
(913) 216-1387

FOR BIDDING PURPOSES ONLY

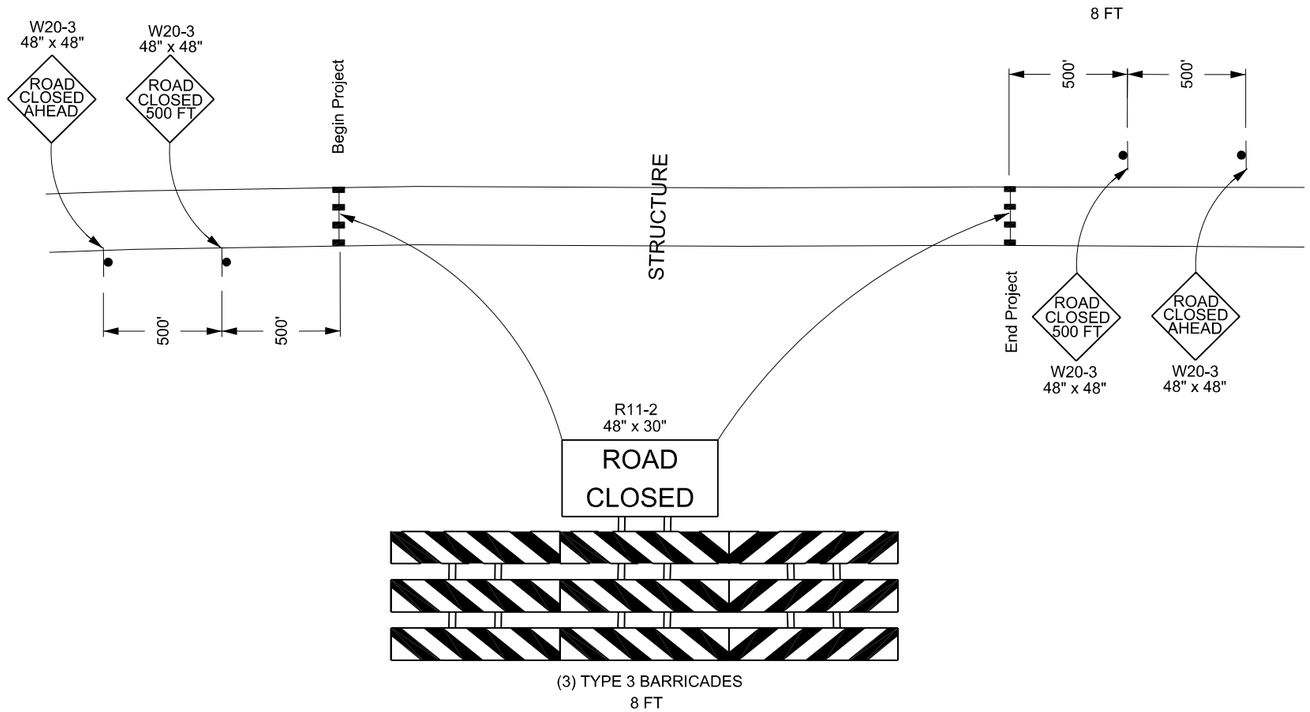
Revised Date: 1-27-2015

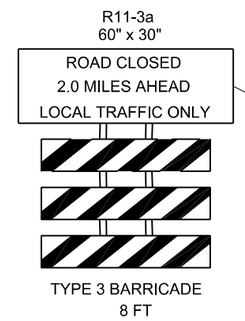
ITEMIZED LIST FOR TRAFFIC CONTROL SIGNS

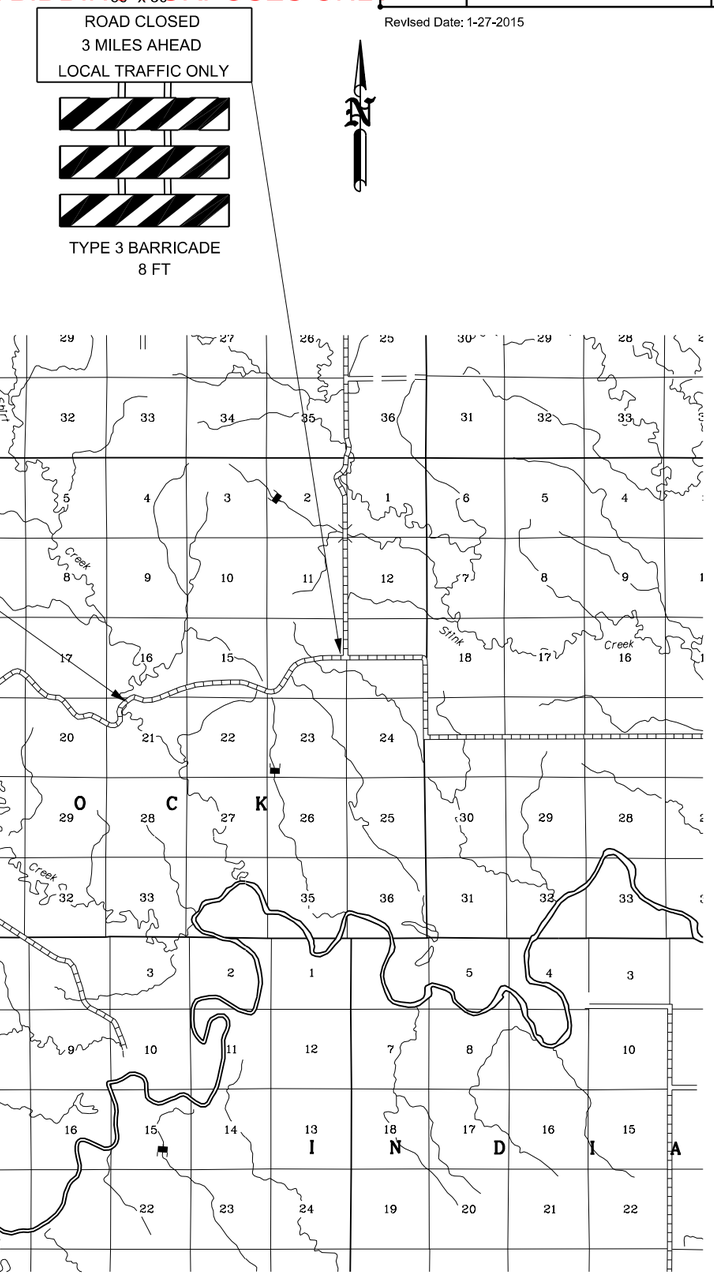
SIGN CODE	SIGN DESCRIPTION	CONVENTIONAL ROAD NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
R11-2	ROAD CLOSED	2	48" x 30"	10	20
R11-3a	ROAD CLOSED __ MILES AHEAD LOCAL TRAFFIC ONLY	2	60" x 30"	12.5	25
W20-3	ROAD CLOSED AHEAD	4	48" x 48"	16	64
		CONVENTIONAL ROAD TRAFFIC CONTROL SIGNS SQFT			109

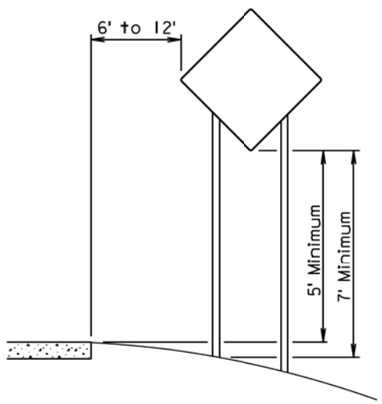
TYPE 3 BARRICADES

ITEM DESCRIPTION	QUANTITY
Type 3 Barricade, 8' Double Sided	8 Each

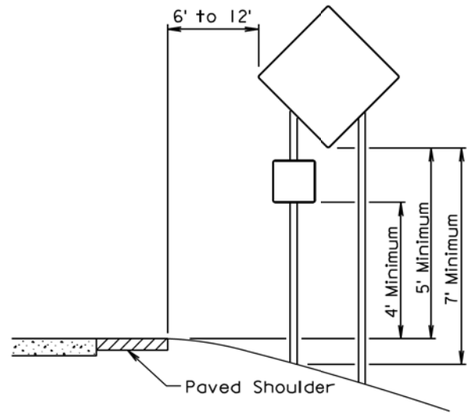




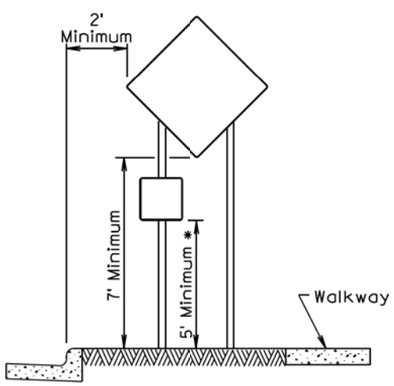




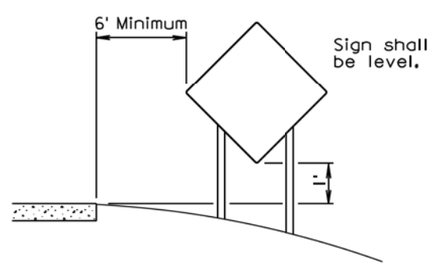
RURAL DISTRICT



RURAL DISTRICT WITH SUPPLEMENTAL PLATE



URBAN DISTRICT

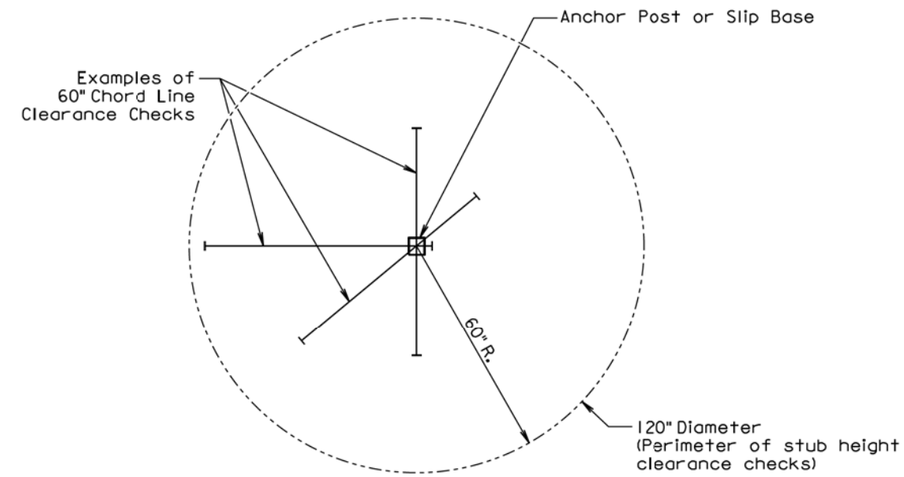


RURAL DISTRICT
3 DAY MAXIMUM
(Not applicable to regulatory signs)

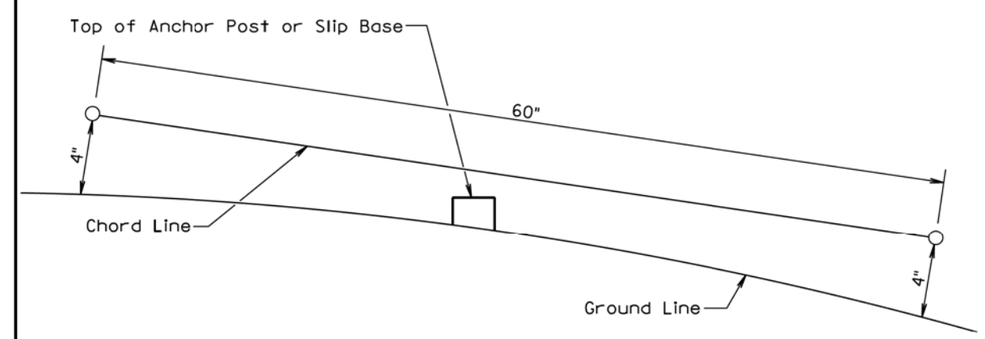
* If the bottom of supplemental plate is mounted lower than 7 feet above a pedestrian walkway, the supplemental plate should not project more than 4" into the pedestrian facility.

September 22, 2014

Published Date: 4th Qtr. 2015	SDDOT	CRASHWORTHY SIGN SUPPORTS (Typical Construction Signing)	PLATE NUMBER 634.85 Sheet 1 of 1



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

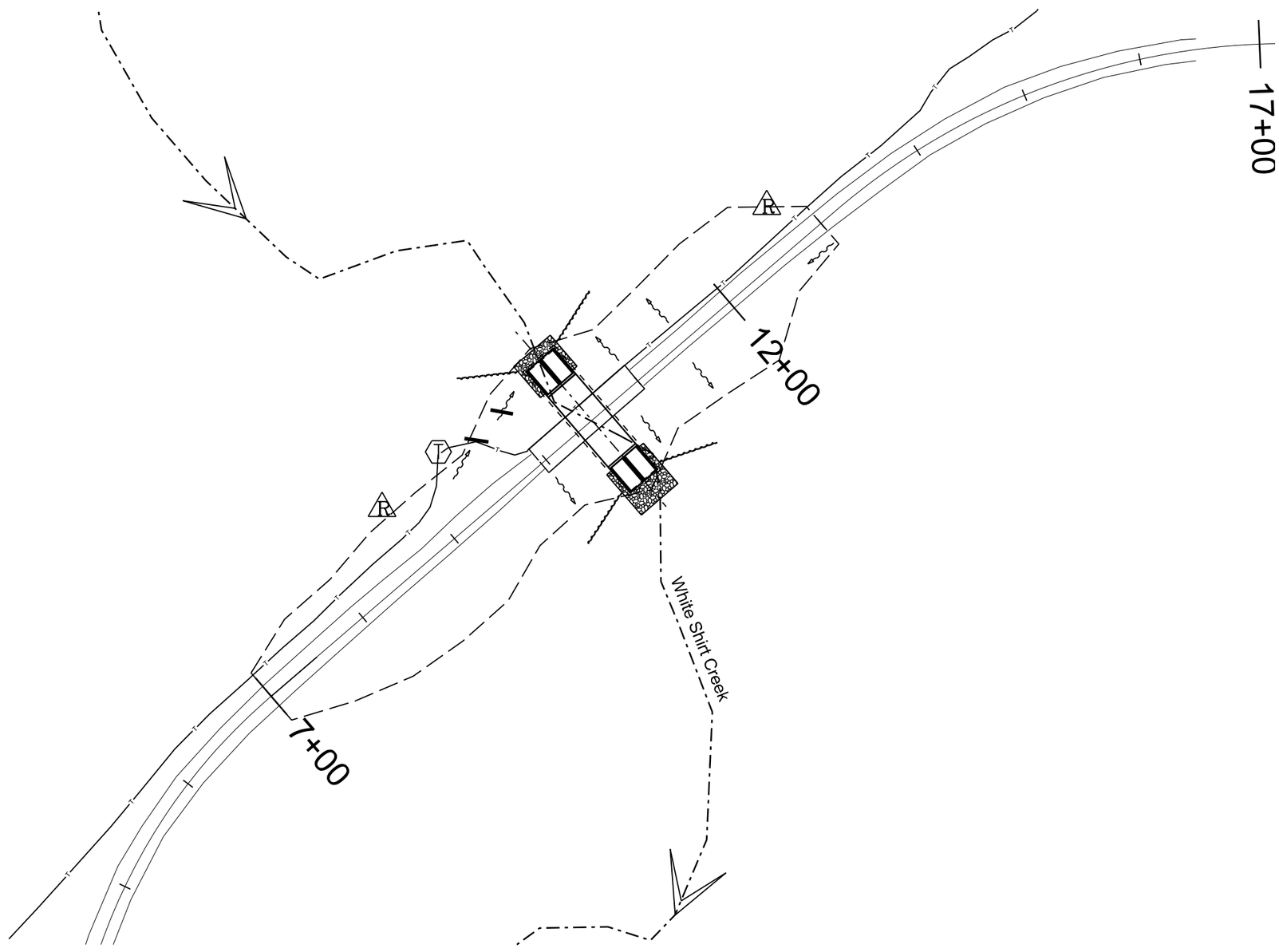
Published Date: 4th Qtr. 2015	SDDOT	BREAKAWAY SUPPORT STUB CLEARANCE	PLATE NUMBER 634.99 Sheet 1 of 1

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	BRO 8016(08)	8	25

FOR BIDDING PURPOSES ONLY

Plotting Date: 12-11-2015

EROSION CONTROL LAYOUT



Scale:
1" = 100'

LEGEND

- Erosion Wattle
- Flow Direction
- Silt Fence

12" Dia Erosion Control Wattles

	LT	RT
9+60	20 Ft	
10+00	20 Ft	
Engineer's Discretion		50 Ft
Total		90 Ft

Low Flow Silt Fence

	LT	RT
10+00	50 Ft	50 Ft
10+85	50 Ft	50 Ft
Engineer's Discretion		50 Ft
Total		250 Ft

STORM WATER POLLUTION PREVENTION PLAN CHECKLIST

*(The numbers right of the title headings are **reference numbers** to the GENERAL PERMIT FOR STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITIES*

❖ **SITE DESCRIPTION (4.2 1)**

- **Project Limits: See Title Sheet (4.2 1.b)**
- **Project Description: See Title Sheet (4.2 1.a.)**
- **Site Map(s): See Title Sheet and Plans (4.2 1.f. (1)-(6))**
- **Major Soil Disturbing Activities** (check all that apply)
  - ☐ Clearing and grubbing
  - ☒ Excavation/borrow
  - ☒ Grading and shaping
  - ☒ Filling
  - ☒ Cutting and filling
  - ☐ Other (describe):
- **Total Project Area** 2.50 Acres (**4.2 1.b.)**
- **Total Area To Be Disturbed** 1.50 Acres (**4.2 1.b.)**
- **Existing Vegetative Cover (%)** 90%
- **Soil Properties:** AASHTO Soil or USDA-NRCS Soil Series A-2, 4 & 7 Clay Loam/Sand **(4.2 1. d.)**
- **Name of Receiving Water Body/Bodies** White Shirt Creek **(4.2 1.e.)**

❖ **ORDER OF CONSTRUCTION ACTIVITIES (4.2 1.c.)**

(Stabilization measures shall be initiated as soon as possible, but in no case later than 14 days after the construction activity in that portion of the site has temporarily or permanently ceased. Initiation of final or temporary stabilization may exceed the 14-day limit if earth disturbing activities will be resumed within 21 days.)

- **Install sediment control protection adjacent to waterway.**
- **Clearing and grubbing.**
- **Remove and stock pile topsoil and gravel surfacing.**
- **Install Box Culvert and rough grade roadway.**
- **Install riprap.**
- **Complete final grading.**
- **Replace topsoil and salvage gravel.**
- **Reseed and mulch disturbed area.**
- **Install ditch bottom protection devices.**

❖ **EROSION AND SEDIMENT CONTROLS (4.2 2.a.(1)(a)-(f))**

(Check all that apply)

- **Stabilization Practices (See Detail Plan Sheets)**
  - ☐ Temporary Seeding (Cover Crop Seeding)
  - ☒ Permanent Seeding
  - ☐ Sodding
  - ☐ Planting (Woody Vegetation for Soil Stabilization)
  - ☒ Mulching (Grass Hay or Straw)
  - ☐ Hydraulic Mulch (Wood Fiber Mulch)
  - ☐ Soil Stabilizer
  - ☐ Bonded Fiber Matrix
  - ☐ Erosion Control Blankets or Mats
  - ☐ Vegetation Buffer Strips
  - ☐ Roughened Surface (e.g. tracking)
  - ☐ Dust Control
  - ☒ Other Loose Rock Riprap
- **Structural Temporary Erosion and Sediment Controls**
  - ☒ Silt Fence
  - ☐ Floating Silt Curtain
  - ☐ Straw Bale Check
  - ☐ Temporary Berm
  - ☐ Temporary Slope Drain
  - ☒ Straw Wattles or Rolls
  - ☐ Turf Reinforcement Mat
  - ☒ Rip Rap
  - ☐ Gabions
  - ☐ Rock Check Dams
  - ☐ Sediment Traps/Basins
  - ☐ Inlet Protection
  - ☐ Outlet Protection
  - ☐ Surface Inlet Protection (Area Drain)
  - ☐ Curb Inlet Protection
  - ☐ Stabilized Construction Entrances
  - ☐ Entrance/Exit Equipment Tire Wash
  - ☐ Interceptor Ditch
  - ☐ Concrete Washout Area
  - ☐ Temporary Diversion Channel
  - ☐ Work Platform
  - ☐ Temporary Water Barrier
  - ☐ Temporary Water Crossing
  - ☐ Other
- **Wetland Avoidance**

  Will construction and/or erosion and sediment controls impinge on regulated wetlands? Yes ☐ No ☒ If yes, the structural and erosion and sediment controls have been included in the total project wetland impacts and have been included in the 404 permit process with the USACE.
- **Storm Water Management (4.2 2.b., (1) and (2))**

  Storm water management will be handled by temporary controls outlined in "EROSION AND SEDIMENT CONTROLS" above, and any permanent controls needed to meet permanent storm water management needs in the post construction period. Permanent controls will be shown on the plans and noted as permanent.
- **Other Storm Water Controls (4.2 2.c., (1) and (2))**
  - **Waste Disposal**

    All liquid waste materials will be collected and stored in sealed metal containers approved by the project engineer. All trash and construction debris from the site will be deposited in the approved containers. Containers will be serviced as necessary, and the trash will be hauled to an approved disposal site or licensed landfill. All onsite personnel will be instructed in the proper procedures for waste disposal, and notices stating proper practices will be posted in the field office. The general contractor's representative responsible for the conduct of work on the site will be responsible for seeing waste disposal procedures are followed.
  - **Hazardous Waste**

    All hazardous waste materials will be disposed of in a manner specified by local or state regulations or by the manufacturer. Site personnel will be instructed in these practices, and the individual designated as the contractor's on-site representative will be responsible for seeing that these practices are followed.
  - **Sanitary Waste**

    Portable sanitary facilities will be provided on all construction sites. Sanitary waste will be collected from the portable units in a timely manner by a licensed waste management contractor or as required by any local regulations.

❖ **Maintenance and Inspection (4.2 3. and 4.2 4.)**

- **Maintenance and Inspection Practices**
  - Inspections will be conducted at least one time per week and after a storm event of 0.50 inches or greater.
  - All controls will be maintained in good working order. Necessary repairs will be initiated within 24 hours of the site inspection report.
  - Silt fence will be inspected for depth of sediment and for tears in order to ensure the fabric is securely attached to the posts and that the posts are well anchored. Sediment buildup will be removed from the silt fence when it reaches $^1/_3$ of the height of the silt fence.
  - Sediment basins and traps will be checked. Sediment will be removed when depth reaches approximately 50 percent of the structure's capacity, and at the conclusion of the construction.
  - Check dams will be inspected for stability. Sediment will be removed when depth reaches ½ the height of the dam.
  - All seeded areas will be checked for bare spots, washouts, and vigorous growth free of significant weed infestations.
  - Inspection and maintenance reports will be prepared on form DOT 298 for each site inspection, this form will also be used to document changes to the SWPPP. A copy of the completed inspection form will be filed with the SWPPP documents.
  - The SDDOT Project Engineer and contractor's site superintendent are responsible for inspections. Maintenance, repair activities are the responsibility of the contractor. The SDDOT Project Engineer will complete the inspection and maintenance reports and distribute copies per the distribution instructions on DOT 298.

❖ **Non-Storm Water Discharges (3.0)**

The following non-storm water discharges are anticipated during the course of this project (check all that apply).

- ☐ Discharges from water line flushing.
- ☐ Pavement wash-water, where no spills or leaks of toxic or hazardous materials have occurred.
- ☒ Uncontaminated ground water associated with dewatering activities.

❖ **Materials Inventory (4.2. 2.c.(2))**

The following materials or substances are expected to be present on the site during the construction period. These materials will be handled as noted under the headings "EROSION AND SEDIMENT CONTROLS" and "SPILL PREVENTION" (check all that apply).

- ☒ Concrete and Portland Cement
- ☐ Detergents
- ☐ Paints
- ☒ Metals
- ☐ Bituminous Materials
- ☒ Petroleum Based Products
- ☒ Cleaning Solvents
- ☐ Wood
- ☐ Cure
- ☐ Texture
- ☐ Chemical Fertilizers
- ☐ Other

❖ **Spill Prevention (4.2 2.c.(2))**

➢ **Material Management**

- Housekeeping
  - Only needed products will be stored on-site by the contractor.
  - Except for bulk materials the contractor will store all materials under cover and in appropriate containers.
  - Products must be stored in original containers and labeled.
  - Material mixing will be conducted in accordance with the manufacturer's recommendations.
  - When possible, all products will be completely used before properly disposing of the container off site.
  - The manufacturer's directions for disposal of materials and containers will be followed.
  - The contractor's site superintendent will inspect materials storage areas regularly to ensure proper use and disposal.
  - Dust generated will be controlled in an environmentally safe manner.
  - Vegetation areas not essential to the construction project will be preserved and maintained as noted on the plans.

- Hazardous Materials
  - Products will be kept in original containers unless the container is not resealable.
  - Original labels and material safety data sheets will be retained in a safe place to relay important product information.
  - If surplus product must be disposed of, manufacturer's label directions for disposal will be followed.
  - Maintenance and repair of all equipment and vehicles involving oil changes, hydraulic system drain down, de-greasing operations, fuel tank drain down and removal, and other activities which may result in the accidental release of contaminants will be conducted on an impervious surface and under cover during wet weather to prevent the release of contaminants onto the ground.
  - Wheel wash water will be collected and allowed to settle out suspended solids prior to discharge. Wheel wash water will not be discharged directly into any storm water system or storm water treatment system.
  - Potential pH-modifying materials such as: bulk cement, cement kiln dust, fly ash, new concrete washings, concrete pumping, and mixer washout waters will be collected on site and managed to prevent contamination of storm water runoff.

➢ **Product Specific Practices (6.8)**

- Petroleum Products
  All on-site vehicles will be monitored for leaks and receive regular preventive maintenance to reduce the chance of leakage. Petroleum products will be stored in tightly sealed containers which are clearly labeled.
- Fertilizers
  Fertilizers will be applied only in the amounts specified by the SDDOT. Once applied, fertilizers will be worked into the soil to limit the exposure to storm water. Fertilizers will be stored in an enclosed area. The contents of partially used fertilizer bags will be transferred to sealable containers to avoid spills.
- Paints
  All containers will be tightly sealed and stored when not required for use. The excess will be disposed of according to the manufacturer's instructions and any applicable state and local regulations.

➢ **Product Specific Practices CONT.**

- Concrete Trucks
  Contractors will provide designated truck washout areas on the site. These areas must be self-contained and not connected to any storm water outlet of the site. Upon completion of construction washout areas will be properly stabilized.

➢ **Spill Control Practices (4.2 2 c.(2))**

In addition to the previous housekeeping and management practices, the following practices will be followed for spill prevention and cleanup if needed.

- For all hazardous materials stored on site, the manufacturer's recommended methods for spill clean up will be clearly posted. Site personnel will be made aware of the procedures and the locations of the information and cleanup supplies.
- Appropriate cleanup materials and equipment will be maintained by the contractor in the materials storage area on-site. As appropriate, equipment and materials may include items such as brooms, dust pans, mops, rags, gloves, goggles, kitty litter, sand, sawdust, and plastic and metal trash containers specifically for clean up purposes.
- All spills will be cleaned immediately after discovery and the materials disposed of properly.
- The spill area will be kept well ventilated and personnel will wear appropriate protective clothing to prevent injury from contact with a hazardous substance.
- After a spill a report will be prepared describing the spill, what caused it, and the cleanup measures taken. The spill prevention plan will be adjusted to include measures to prevent this type of spill from reoccurring, as well as clean up instructions in the event of reoccurrences.
- The contractor's site superintendent, responsible for day-to-day operations, will be the spill prevention and cleanup coordinator. The contractor is responsible for ensuring that the site superintendent has had appropriate training for hazardous materials handling, spill management, and cleanup.

➢ **Spill Response (4.2 2 c.(2))**

The primary objective in responding to a spill is to quickly contain the material(s) and prevent or minimize migration into storm water runoff and conveyance systems. If the release has impacted on-site storm water, it is critical to contain the released materials on-site and prevent their release into receiving waters. If a spill of pollutants threatens storm water or surface water at the site, the spill response procedures outlined below must be implemented in a timely manner to prevent the release of pollutants.

- The contractor's site superintendent will be notified immediately when a spill or the threat of a spill is observed. The superintendent will assess the situation and determine the appropriate response.
- If spills represent an imminent threat of escaping erosion and sediment controls and entering receiving waters, personnel will be directed to respond immediately to contain the release and notify the superintendent after the situation has been stabilized.
- Spill kits containing appropriate materials and equipment for spill response and cleanup will be maintained by the contractor at the site.
- If oil sheen is observed on surface water (e.g. settling ponds, detention ponds, swales), action will be taken immediately to remove the material causing the sheen. The contractor will use appropriate materials to contain and absorb the spill. The source of the oil sheen will also be identified and removed or repaired as necessary to prevent further releases.
- If a spill occurs the superintendent or the superintendent's designee will be responsible for completing the spill reporting form and for reporting the spill to SD DENR.
- Personnel with primary responsibility for spill response and clean up will receive training by the contractor's site superintendent or designee. The training must include identifying the location of the spill kits and other spill response equipment and the use of spill response materials.
- Spill response equipment will be inspected and maintained as necessary to replace any materials used in spill response activities.

❖ **Spill Notification**

In the event of a spill, the contractor's site superintendent will make the appropriate notification(s), consistent with the following procedures:

➢ A release or spill of a regulated substance (includes petroleum and petroleum products) must be reported to DENR immediately **if any one of the following** conditions exists:

- The discharge threatens or is in a position to threaten the waters of the state (surface water or ground water).
- The discharge causes an immediate danger to human health or safety.
- The discharge exceeds 25 gallons.
- The discharge causes a sheen on surface water.
- The discharge of any substance that exceeds the ground water quality standards of ARSD (Administrative Rules of South Dakota) chapter 74:54:01.
- The discharge of any substance that exceeds the surface water quality standards of ARSD chapter 74:54:01.
- The discharge of any substance that harms or threatens to harm wildlife or aquatic life.
- The discharge of crude oil in field activities under SDCL (South Dakota Codified Laws) chapter 45-9 is greater than 1 barrel (42 gallons).

To report a release or spill, call DENR at 605-773-3296 during regular office hours (8 a.m. to 5 p.m. Central time). To report the release after hours, on weekends or holidays, call State Radio Communications at 605-773-3231. Reporting the release to DENR does not meet any obligation for reporting to other state, local, or federal agencies. Therefore, the responsible person must also contact local authorities to determine the local reporting requirements for releases. DENR recommends that spills also be reported to the National Response Center at (800) 424-8802.

❖ **Construction Changes (4.4)**

When changes are made to the construction project that will require alterations in the temporary erosion controls of the site, the Storm Water Pollution Prevention Plan (SWPPP) will be amended to provide appropriate protection to disturbed areas, all storm water structures, and adjacent waters. The SDDOT Project Engineer will modify the SWPPP plan (DOT 298) and drawings to reflect the needed changes. Copies of changes will be routed per DOT 298. Copies of forms and the SWPPP will be retained in a designated place for review over the course of the project.

❖ CERTIFICATIONS

➢ **Certification of Compliance with Federal, State, and Local Regulations**

The Storm Water Pollution Prevention Plan (SWPPP) for this project reflects the requirements of all local municipal jurisdictions for storm water management and sediment and erosion control as established by ordinance, as well as other state and federal requirements for sediment and erosion control plans, permits, notices or documentation as appropriate.

➢ **South Dakota Department of Transportation**

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Authorized Signature (See the General Permit, Section 6.7.1.C.)

➢ **Prime Contractor**

This section is to be executed by the General Contractor after the award of the contract. This section may be executed any time there is a change in the Prime Contractor of the project.

I certify under penalty of law that this document and all attachments will be revised or maintained under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

_____

Authorized Signature

CONTACT INFORMATION

➢ **Contractor Information**:

- Prime Contractor Name: _____
- Contractor Contact Name: _____
- Address: _____
- _____
- City: _____State: _____Zip: _____
- Office Phone: _____Field: _____
- Cell Phone: _____Fax: _____

➢ **Erosion Control Supervisor**

- Name: _____
- Address: _____
- _____
- City: _____State: _____Zip: _____
- Office Phone: _____Field: _____
- Cell Phone: _____Fax: _____

➢ **SDDOT Project Engineer**

- Name: _____
- Business Address: _____
- Job Office Location: _____
- City: _____State: _____Zip: _____
- Office Phone: _____Field: _____
- Cell Phone: _____Fax: _____

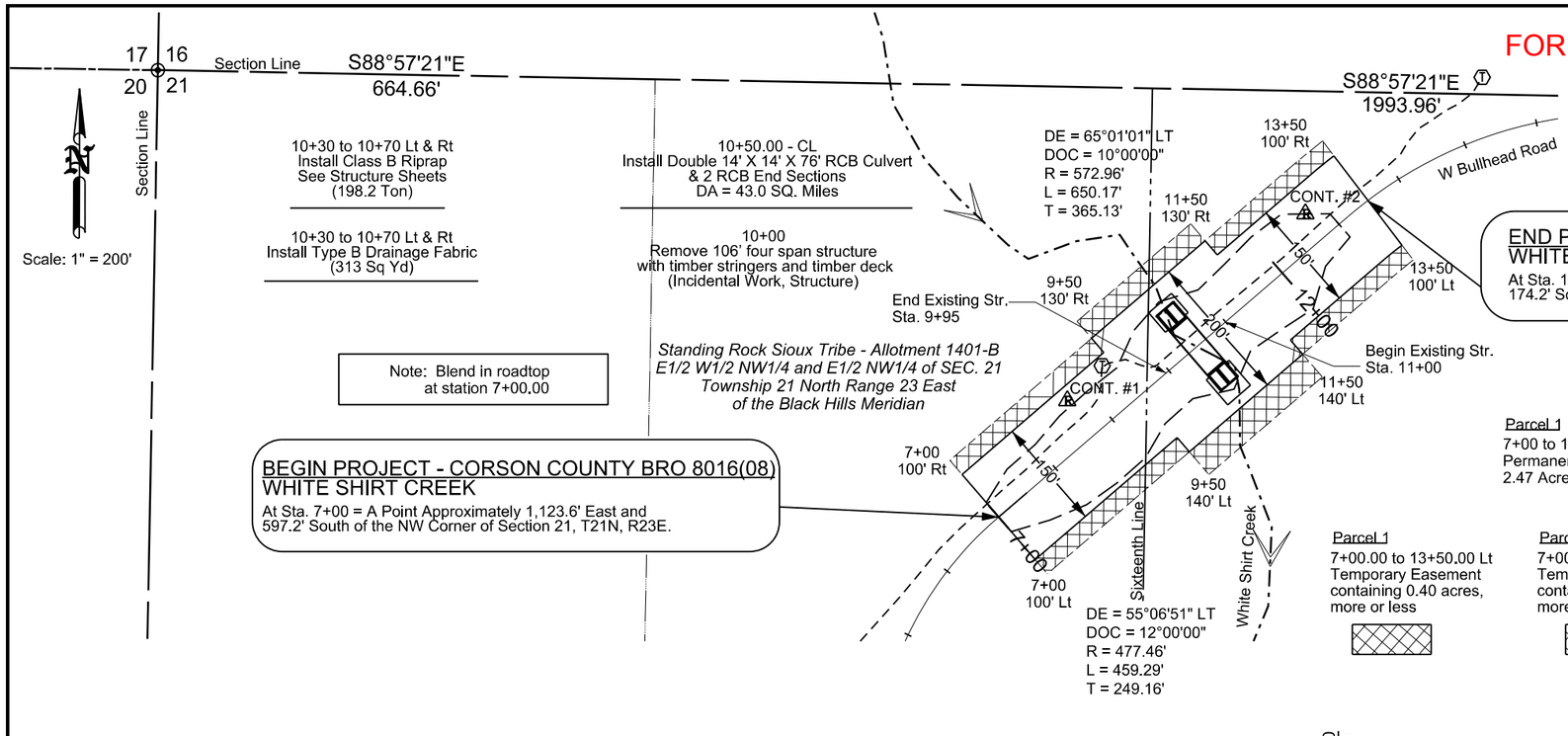
➢ **SD DENR Contact Spill Reporting**
- Business Hours Monday-Friday (605) 773-3296
- Nights and Weekends (605) 773-3231

➢ **SD DENR Contact for Hazardous Materials.**
- (605) 773-3153

➢ **National Response Center Hotline**
- (800) 424-8802.

FOR BIDDING PURPOSES ONLY

Plotting Date: 12-11-2015



Legend

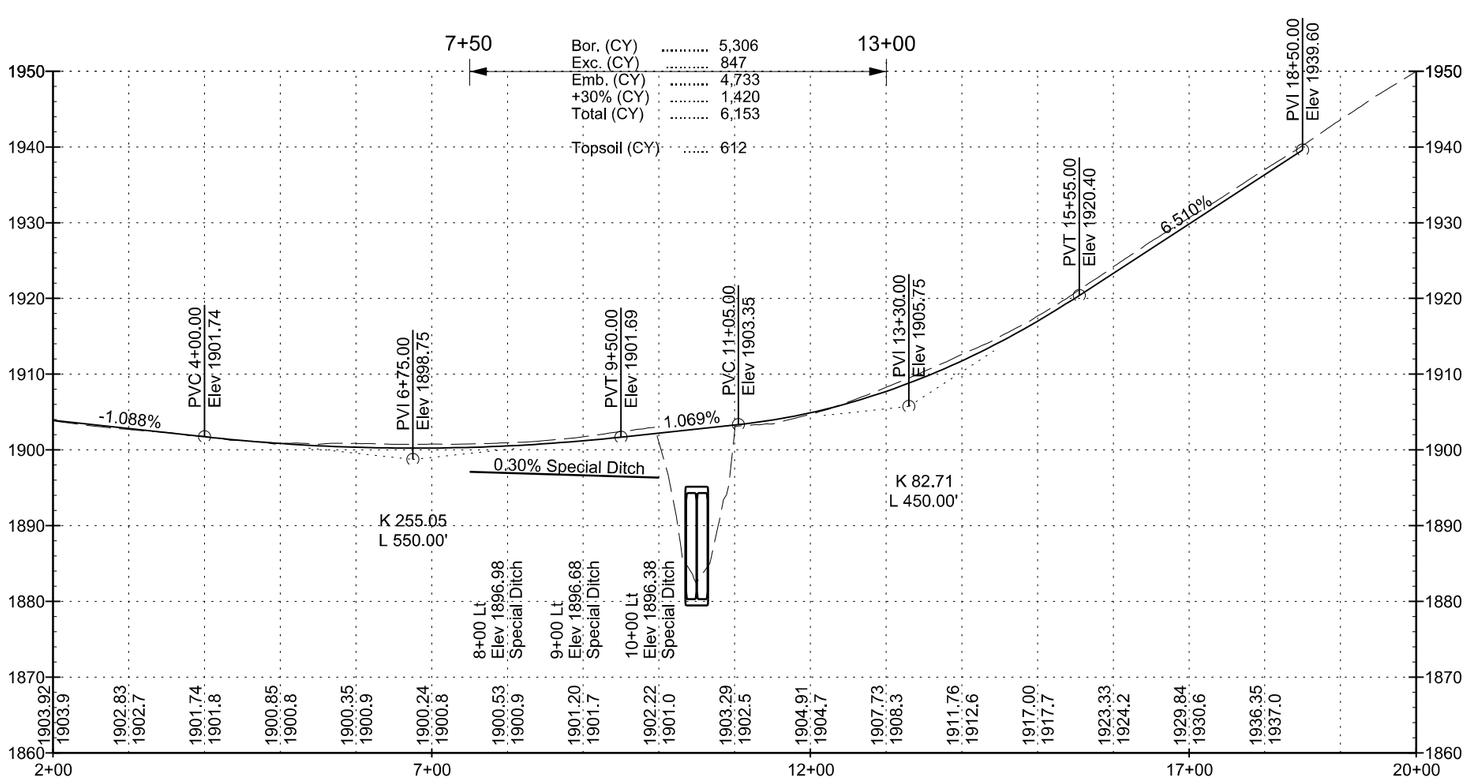
New ROW	
Temporary Easement	
Creek	
Telephone	
Edge of Excavation	

Hydraulic Data

For Roadway Profile	
Flow	Elevation
Qd = 1,103 cfs	1890.5'
Q100 = 3,186 cfs	1895.1'
Qot = N/A =	N/A

TABLE OF SUPERELEVATION

Station to Station	Description
0+00.00 - 0+32.19	Normal Crown Section
0+32.19 - 2+54.41	Superelevation Transition
2+54.41 - 6+50.94	12°00'00" Curve Right
	4.000% Superelevation Rate
6+50.94 - 6+82.06	Point Of Rotation Centerline
6+82.06 - 7+93.17	Superelevation Transition
7+93.17 - 11+09.37	Normal Crown Section
11+09.37 - 13+31.59	Superelevation Transition
	10°00'00" Curve Right
13+31.59 - 19+19.01	4.000% Superelevation Rate
	Point Of Rotation Centerline
19+19.01 - 20+61.23	Superelevation Transition
20+61.23 - 21+72.34	Normal Crown Section



CONTROL POINT #1
Sta 8+71.19 57.74' Lt
N = 710173.59
E = 1641370.24
Elev = 1900.13

CONTROL POINT #2
Sta 12+75.45 39.73' Lt
N = 710423.5
E = 1641688.51
Elev = 1902.55

Road Alignment

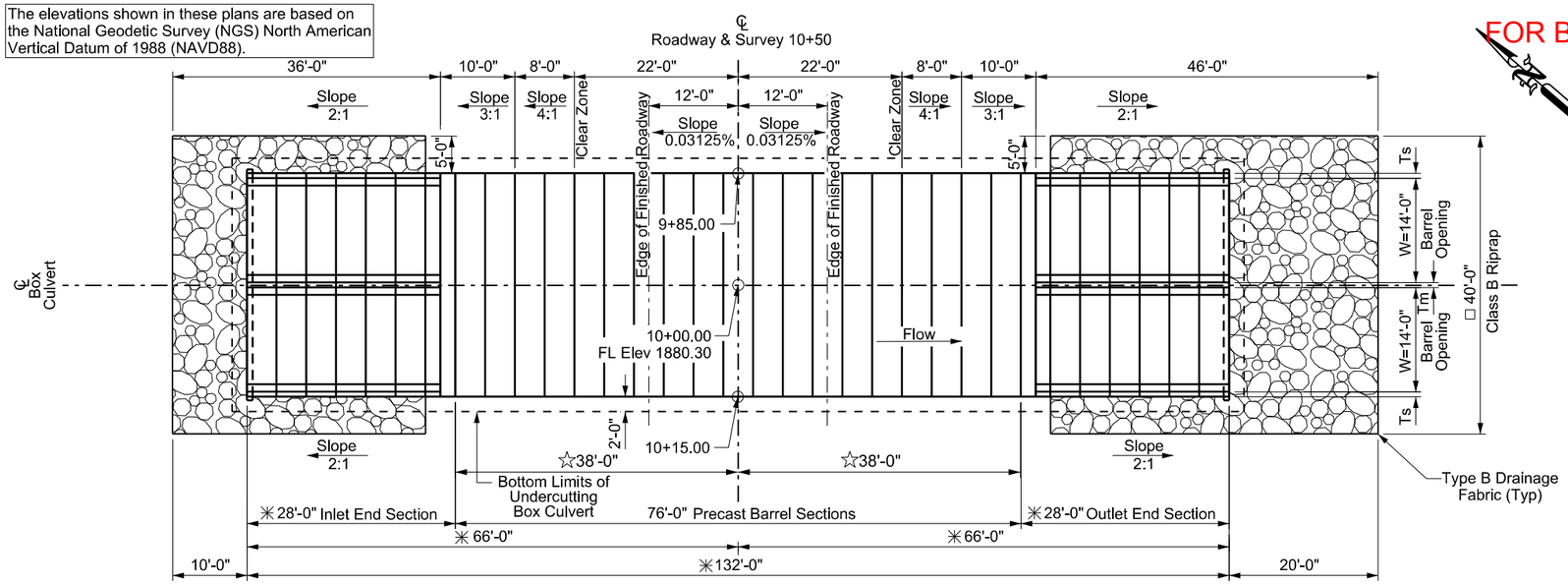
	Curve Data	Station	Northing	Easting
POB		1+50.94	709519.28	1641121.62
PC		2+38.59	709606.48	1641112.75
	DE = 55°06'51" RT			
	DOC = 12°00'00"			
	R = 477.46'			
	L = 459.29'			
	T = 249.16'			
PT		6+97.88	710016.81	1641276.47
PC		13+15.77	710419.66	1641744.98
	DE = 65°01'01" RT			
	DOC = 10°00'00"			
	R = 572.96'			
	L = 650.17'			
	T = 365.13'			
PT		19+65.94	710507.32	1642354.55
POE		20+50.00	710472.69	1642431.15

The elevations shown in these plans are based on the National Geodetic Survey (NGS) North American Vertical Datum of 1988 (NAVD88).

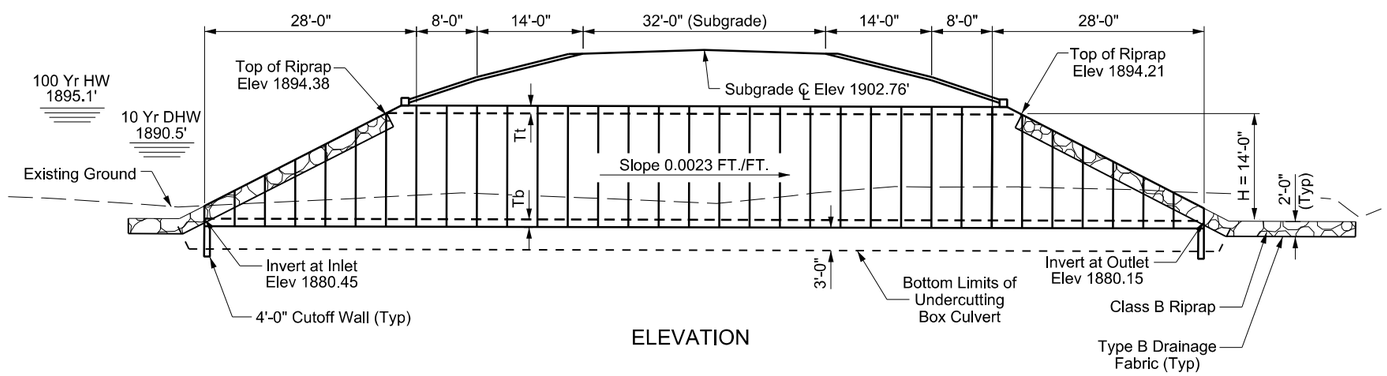
FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	BRO 8016(08)	13	25

Plotting Date: 12-11-2015



PLAN



ELEVATION

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

HYDRAULIC DATA

Hydraulic Summary	
Qd	1,103 cfs
Ad	240 sq. ft.
Vd	4.6 fps
Qf	1,103 cfs
Q 100	3,186 cfs
Q OT fr	N/A cfs
VMax	10.5 fps

Qd = design discharge for the proposed culvert based on 10 year frequency. Elev 1890.5

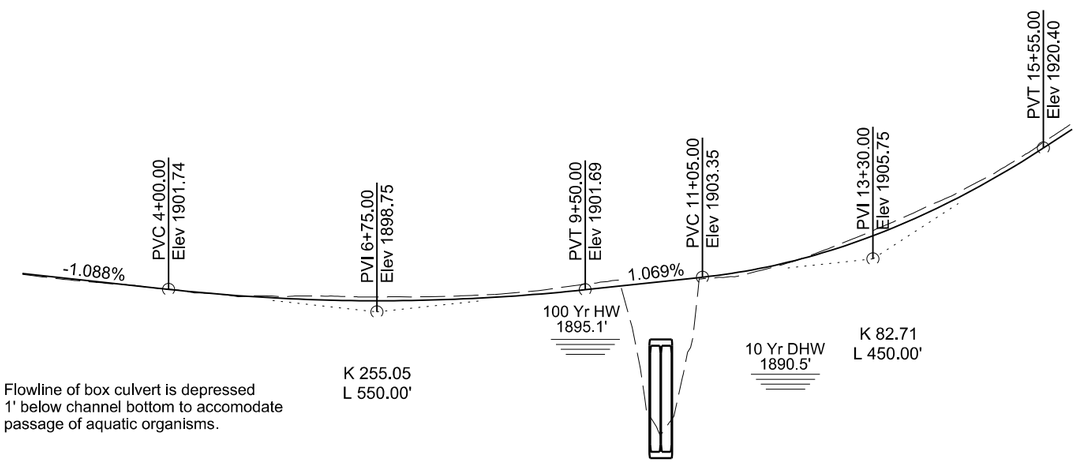
Q OT fr = overtopping discharge and frequency > 100 yr. recurrence interval. Elev 1900.9 . Located at station 6+75 .

Qf = designated peak discharge for the basin approaching proposed project based on 10 year frequency.

Q100 = computed discharge for the basin approaching proposed project based on 100 year frequency, Elev 1895.1

Vmax = maximum computed outlet velocity for the proposed culvert based on a 100 year frequency.

The hydraulic data contained in theses plans is valid only if the overflow section is maintained. Alternation of the overflow section will require re-analysis of the hydraulics at this site to determine its effect on public safety.



NOTE: Flowline of box culvert is depressed 1' below channel bottom to accomodate passage of aquatic organisms.

VERTICAL CURVE DATA
(Subgrade)

-X028-

INDEX OF SHEETS

Sheet No. 1 General Drawing & Estimated Quantities
Sheet No. 2 Notes & Undercutting Details
Sheet No. 3 Standard Plate No. 460.02 & No. 560.01
Sheet No. 4 Standard Plate No. 560.21 & No. 620.16

Legend

✳ Dimensions may vary with installation and/or fabrication. See shop plans for actual installation length.
☆ Minimum distance to satisfy fill slope.
△ Based on dimensions shown.
□ Based on 8" walls

NOTE: Some channel cleanout may be required at the inlet and outlet ends of the structure. This work will not be paid for seperately, but shall be included in the contract lump sump price for "Incidental Work, Structure."

Estimated Quantities

⅄ Structure Excavation, Box Culvert	Cu. Yd.	122
⅄ Box Culvert Undercut	Cu. Yd.	543
2-14'X14' Precast Concrete Box Culvert, Furnish	Ft.	76
2-14'X14' Precast Concrete Box Culvert, Install	Ft.	76
2-14'X14' Precast Concrete Box Culvert End Section, Furnish	Each	2
2-14'X14' Precast Concrete Box Culvert End Section, Install	Each	2
Class B Riprap	Ton	198.2
⅄ Type B Drainage Fabric	Sq. Yd.	313

⅄ Quantity is based on 10" top and bottom slab and 8" walls.

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

Note: The conversion factor for Class B Riprap from tons to cubic yards is 1.4 tons per loose cubic yard.

GENERAL DRAWING & ESTIMATED QUANTITIES

FOR

DOUBLE 14'X14' BOX CULVERT (PRECAST)

WHITE SHIRT CREEK
STA 10+50.00
STR. NO. 16-354-116
PCN 01DN
DATE: DECEMBER, 2015

SKEW 0°
SEC. 21, T21N, R23E
BRO 8016(08)
CORSON COUNTY, SD
HL-93

PREPARED BY:
BROSZ ENGINEERING INC.
PO BOX 357
BOWMAN, NORTH DAKOTA

-X028-

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
G.B.	J.G.	D.C.	

SPECIFICATIONS

Use South Dakota Standard Specifications For Roads and Bridges, 2015 edition and Required Provisions, Supplemental Specifications and/or Special Provisions, as included in the Proposal.

DESIGN MIX OF CONCRETE

1. The design minimum 28 day compressive strength of concrete shall be as per fabricators design, however shall not be less than 4,500 psi.

2. Type II Cement shall be used.

GENERAL NOTES

Design shall be in accordance with Section 560 of the Specifications, with the following criteria:

1. Box culvert and box culvert end section design shall conform to the AASHTO LRFD Bridge Design Specifications, 2014 Edition with 2015 interims.

2. Design Live Load: HL-93. No construction loading in excess of legal load is anticipated. If construction loading in excess of legal load is anticipated by the Contractor, the Contractor shall submit a proposal including a design analysis for the anticipated construction loading, through the proper channels, to the Office of Bridge Design for approval. Upon approval, the construction load shall not be applied until the depth of fill over the box culvert as required by analysis has been placed. At a minimum, 4 ft. of fill shall be placed over the box culvert prior to applying the construction load. All costs associated with accommodating any construction loads shall be borne by the Contractor.

3. The box culvert shall be load rated in accordance with the AASHTO Manual for Bridge Evaluation, 2010 Edition with latest Interim Revisions using the LRFR method. The rating shall include evaluation at the Design Load rating for the HL-93 truck at both Inventory and Operating levels and at the Legal Load rating for the three SD legal trucks (Type 3, 3S2 and 3-2) as well as the notional rating load and four specialized hauling vehicles noted in the *AASHTO Manual for Bridge Evaluation*. All sections of the box culvert shall rate at HL-93 or better (Inventory Level). The three SD Legal Loads, the notional rating load and the four specialized hauling vehicles shall rate greater than 1.0 at legal load rating level. Submit Load Rating calculations with the Design and Check Design calculations or shop plans, as appropriate.

4. The design of the barrel sections shall be based on a minimum fill height of 1 foot and include all subsequent fill heights up to and including the maximum fill height of 9 ft. over the box culvert.

5. Minimum inside corner fillet shall be 6 inches.

6. Minimum precast barrel section length shall be 4 feet.

7. Lift holes shall be plugged with an approved nonshrink grout, or approved cover.

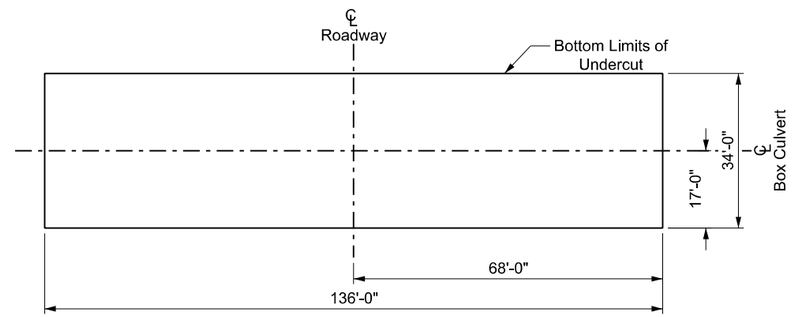
8. The Fabricator shall imprint on the structure the date of construction as specified and detailed on Standard Plate No. 460.02.

9. Alternate end section details will be allowed, subject to the approval of the Bridge Construction Engineer. No additional payment will be made for any change in the barrel/end section configuration.

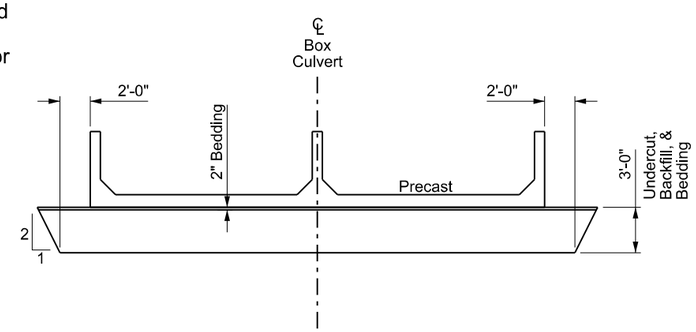
10. Installation of the precast sections shall be in accordance with the final approved shop drawings.

11. All costs associated with furnishing and installing the Parapets shall be incidental to the contract unit price per foot for "2-14'x14' Precast Concrete Box Culvert, Furnish".

12. A minimum of two tie bolts per joint per side shall be used to fasten each precast section together, for a minimum of 4 tie bolts total per joint. All costs associated with furnishing and installing the tie bolts shall be incidental to the contract unit price per foot for "2-14'x14' Precast Concrete Box Culvert, Furnish".



UNDERCUT LAYOUT
(Bottom Dimensions)



TYPICAL SECTION
(For Limits of Undercut)

Estimated Quantities		
⌂ Box Culvert Undercut	Cu. Yd.	543

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

SHOP PLANS

The fabricator shall submit shop plans in accordance with the specifications to Brosz Engineering Inc., PO Box 357, Bowman, ND 58623 (garyb@broszengineering.com) for review. Include design, check design and load ratings with initial submittal. After review, corrections (if necessary), and approval by Brosz Engineering Inc., the Office of Bridge Design will review the submittals, authorize fabrication, arrange for fabrication inspection, and distribute the shop drawings.

INCIDENTAL WORK, STRUCTURE

1. The in place structure is a 106' four span structure with timber stringers and a timber deck.

2. The Contractor shall remove and dispose of the in-place structure. The Contractor shall salvage the timber beams and steel piling. The piling shall be cut off a minimum of 1' below the bottom of the undercut elevation. The salvageable material shall be stockpiled within the right of way for pickup by County forces. The Contractor will dispose of items not salvaged. The bents, abutments and wingwalls shall be removed to the bottom of the undercut.

3. The foregoing is a general description of the in-place structure and should not be construded to be complete in all details. Before preparing a bid, it shall be the responsibility of the Contractor to make a visual inspection of the structure to verify the extent of the work and materials involved.

4. All costs associated with the foregoing work shall be included in the contract lump sum price for "Incidental Work, Structure".

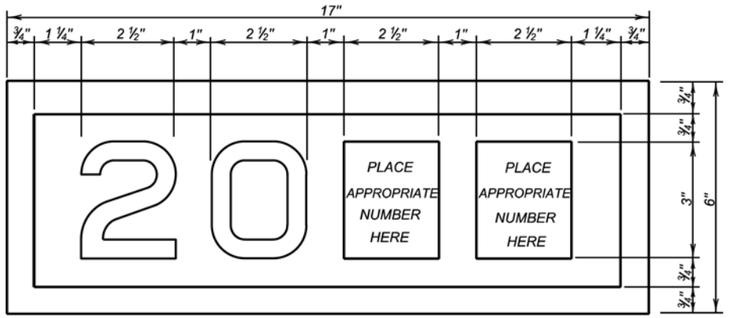
NOTES & UNDERCUTTING DETAILS
FOR
DOUBLE 14'X14' BOX CULVERT (PRECAST)

WHITE SHIRT CREEK
STA 10+50.00
STR. NO. 16-354-116
PCN 01DN
DATE: DECEMBER, 2015

SKEW 0°
SEC. 21, T21N, R23E
BRO 8016(08)
CORSON COUNTY, SD
HL-93

PREPARED BY:
BROSZ ENGINEERING INC.
PO BOX 357
BOWMAN, NORTH DAKOTA

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
G.B.	J.G.	D,C,	



YEAR PLATE DETAILS

GENERAL NOTES:

1. Year plates of the general dimensions shown shall be constructed on all box culverts and bridges. The year plates shall be constructed in reverse and attached to the forms in such a manner that the finished imprint in the concrete does not exceed one-half (½) inch in depth.

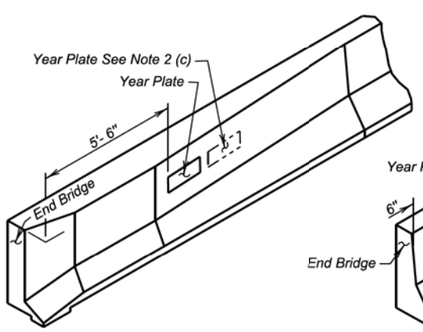
2. Year plates shall be located on structure (s) as follows:

   a. On cast-in-place box culverts the year plates shall be four and one - half (4 ½) inches below the top of the upstream parapet wall and centered laterally on the upstream face. On precast box culverts the year plate shall be centered laterally on the upstream face of the top slab. Where an extended interior wall interferes with this location, the year plate shall be centered in an adjacent barrel.

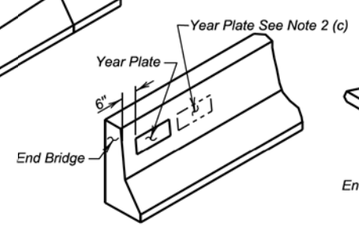
   b. On bridges with six (6) inch curbs or "Jersey" shaped barriers with no endblocks, the year plate shall be centered vertically on the curb face approximately six (6) inches from the end of the bridge, or as designated by the Engineer. On bridges with "Jersey" shaped barrier endblocks, the year plate shall be centered on the upper sloped portion of the barrier approximately 5'- 6" from the end of the bridge, or as designated by the Engineer. There shall be one year plate at each end of the bridge on opposite sides.

   c. When the plans specify that both the original date of construction and the date of reconstruction are to be shown, one date shall be placed as listed above and the other located adjacent to it. Both year plates shall be shown at each end of the bridge on opposite sides.

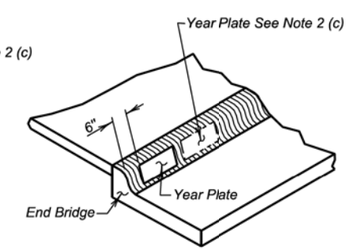
3. There will be no separate measurement or payment made for year plates on box culverts and bridges. All costs for this work shall be incidental to other contract items.



JERSEY BARRIER
(With Endblock)



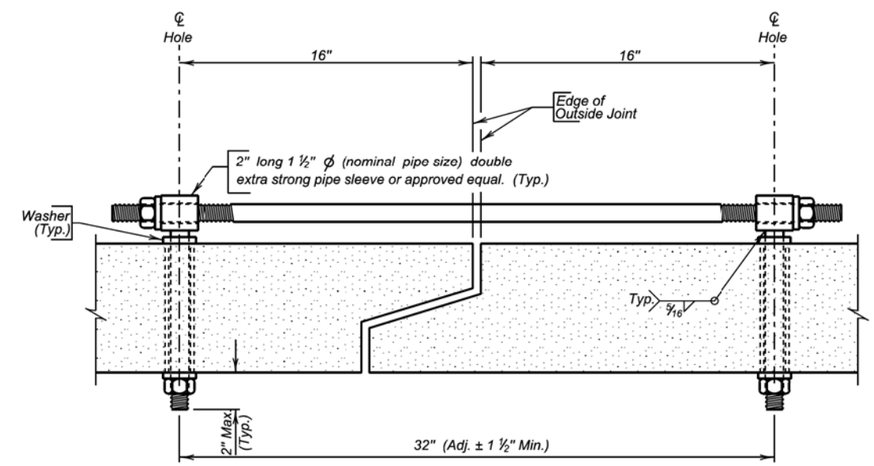
JERSEY BARRIER



TYPE B CURB

June 26, 2012

Published Date: 4th Qtr. 2015	SDDOT	YEAR PLATE DETAILS	PLATE NUMBER 460.02
			Sheet 1 Of 1



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 ø and conform to the requirements of ASTM A36. 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.

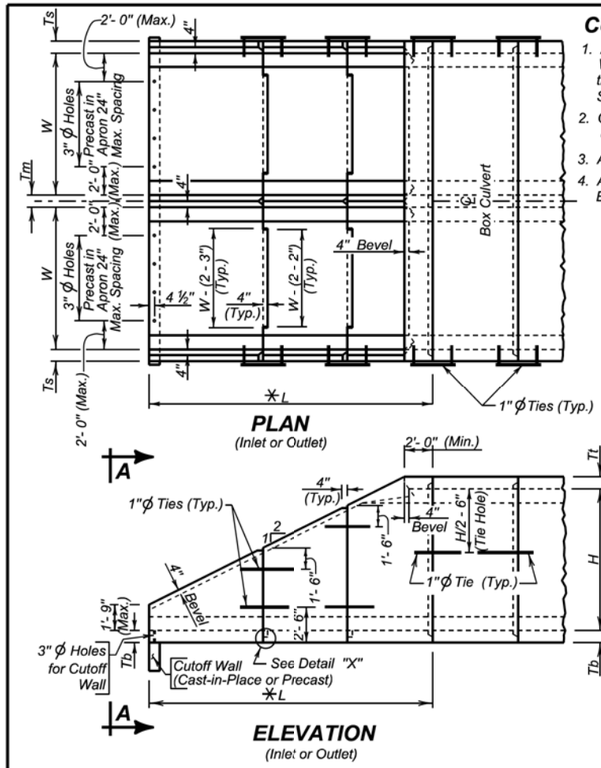
4. Tie Bolt Assembly shall be galvanized in accordance with ASTM A153.

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".

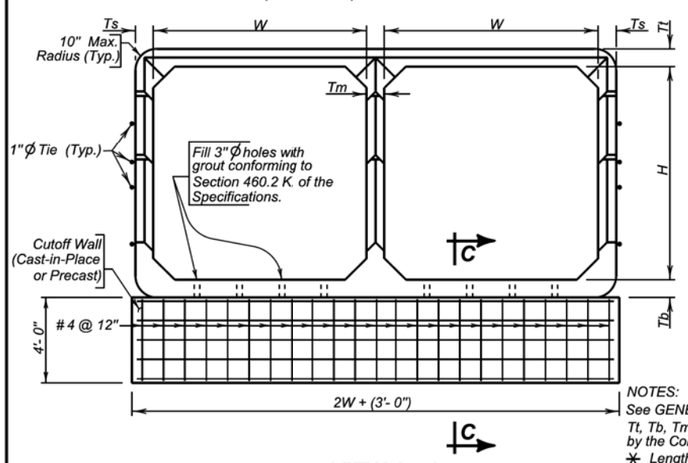
December 23, 2012

Published Date: 4th Qtr. 2015	SDDOT	PRECAST BOX CULVERT TIE BOLT ASSEMBLY DETAILS	PLATE NUMBER 560.01
			Sheet 1 of 1



PLAN
(Inlet or Outlet)

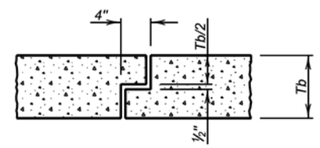
ELEVATION
(Inlet or Outlet)



VIEW A - A

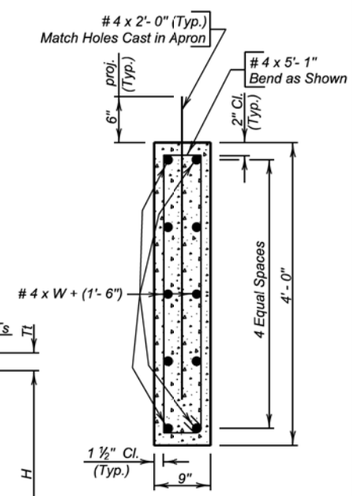
CUTOFF WALL

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.



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

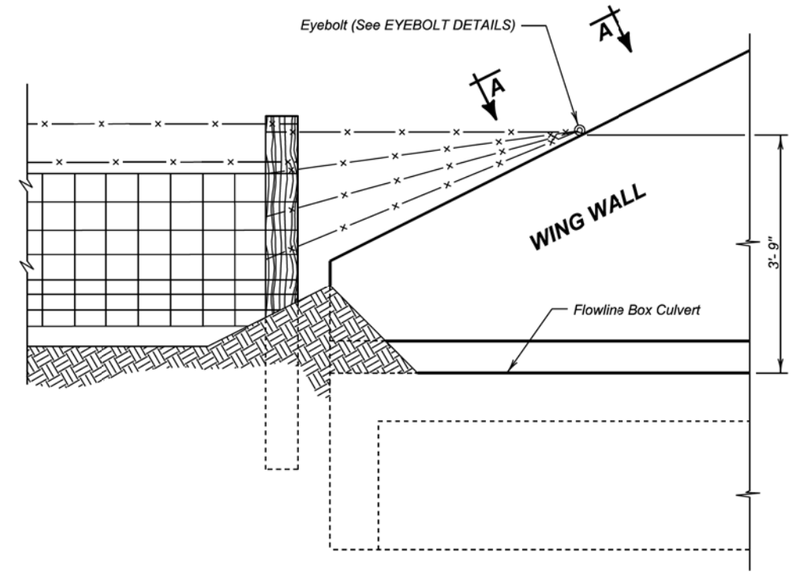
LEGEND

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

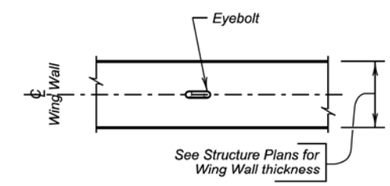
Published Date: 4th Qtr. 2015	SDDOT	PRECAST DOUBLE BOX CULVERT SLOPED END SECTION DETAILS WITH 4'-0" CUTOFF WALL	PLATE NUMBER 560.21
			Sheet 1 of 1



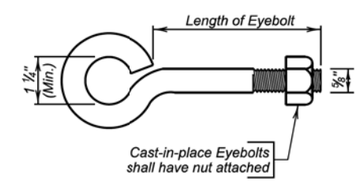
DETAIL FOR FENCE ANCHORS

GENERAL NOTES:

1. The fence and post details shown are for illustrative purpose only. The fence shall be as specified elsewhere in the plans.
2. Eyebolts shall be placed on all of the box culvert wing walls.
3. Eyebolts shall be ⅝ inch diameter and shall conform to ASTM A307.
4. Eyebolts, nuts, and concrete inserts shall be galvanized in accordance with AASHTO M232 (ASTM A153). Concrete inserts of corrosion resistant material need not be galvanized.
5. Cast-in-place eyebolts shall have a nut attached, be 4 ½ inches (Min.) in length and shall be embedded such that the eye of the bolt is flush with the concrete surface. (See Eyebolt Details) As an alternate, cast-in-place concrete inserts, capable of developing the full strength of the ⅝ inch diameter threaded eyebolt, may be used and shall be set in the concrete in accordance with the manufacturer's recommendations. The eyebolt shall be of sufficient length to develop its full strength. The eye of the eyebolt shall be flush with the concrete surface.
6. The cost for furnishing and installing eyebolts and/or concrete inserts shall be incidental to various contract items.



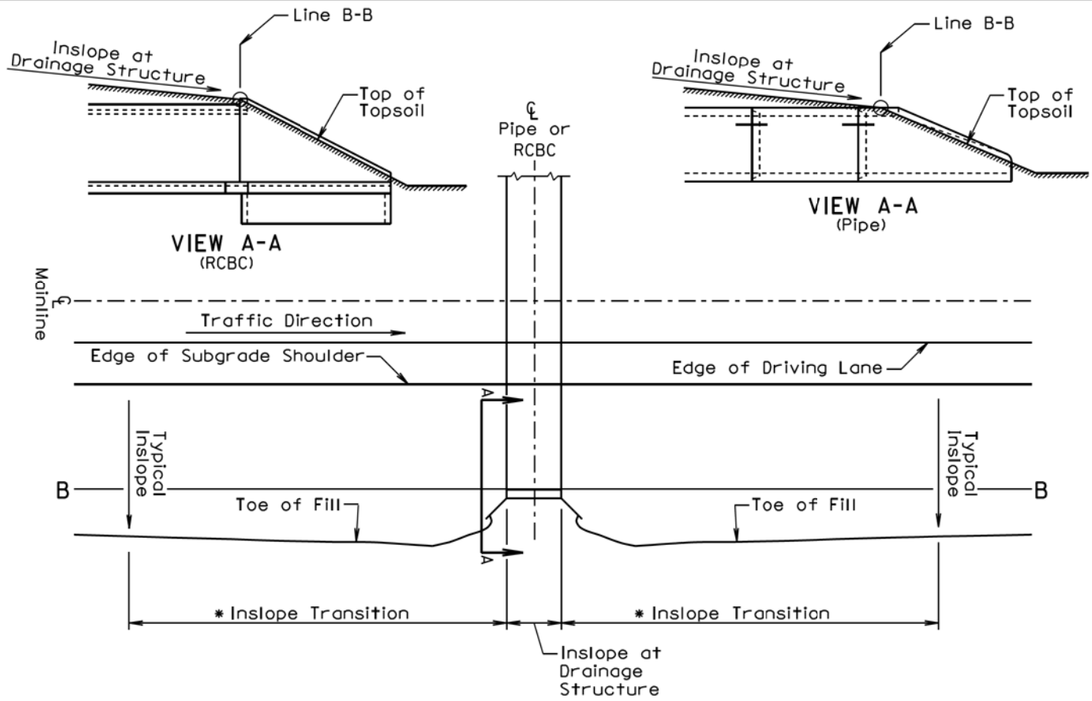
VIEW A - A



EYEBOLT DETAILS

December 23, 2012

Published Date: 4th Qtr. 2015	SDDOT	FENCE ANCHORS FOR BOX CULVERT WING WALLS	PLATE NUMBER 620.16
			Sheet 1 of 1



TYPE 1 INSLOPE TRANSITION

GENERAL NOTES:

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

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

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

SDDOT

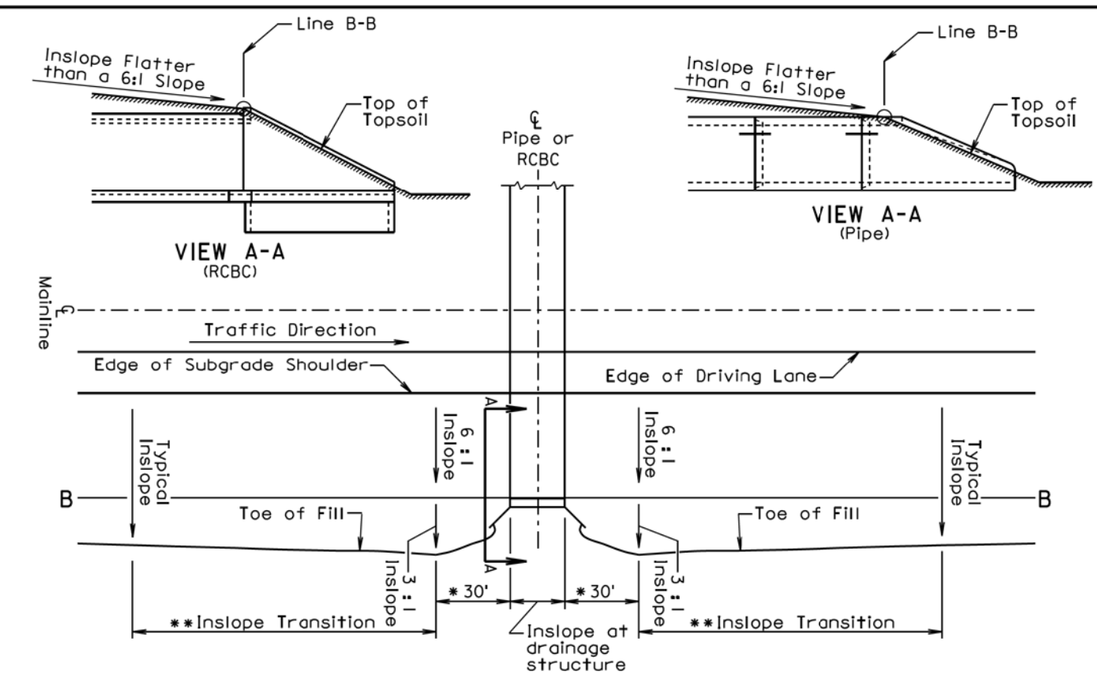
INSLOPE TRANSITIONS AT PIPE CULVERTS OR REINFORCED CONCRETE BOX CULVERTS

PLATE NUMBER 120.05

Sheet 1 of 2

Published Date: 4th Qtr. 2015

February 14, 2011



TYPE 2 INSLOPE TRANSITION

GENERAL NOTES:

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

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

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

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

SDDOT

INSLOPE TRANSITIONS AT PIPE CULVERTS OR REINFORCED CONCRETE BOX CULVERTS

PLATE NUMBER 120.05

Sheet 2 of 2

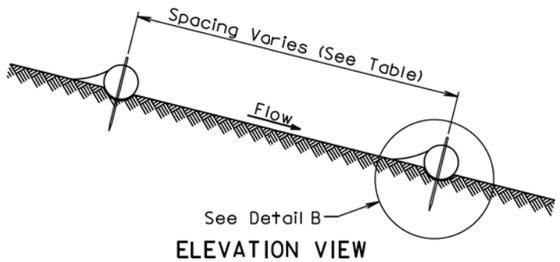
Published Date: 4th Qtr. 2015

February 14, 2011

FOR BIDDING PURPOSES ONLY

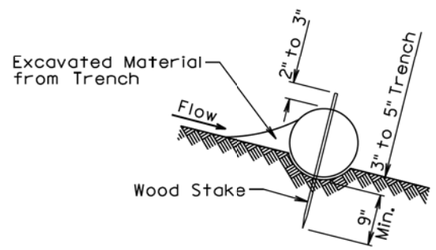
Plotting Date: 12-11-2015

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	BRO 8016(08)	17	25

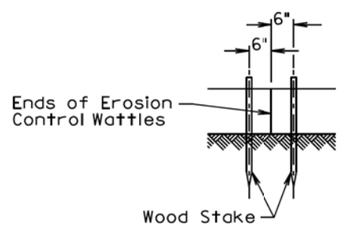


ELEVATION VIEW
CUT OR FILL SLOPE INSTALLATION

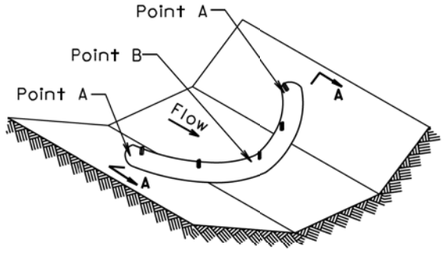
CUT OR FILL SLOPE INSTALLATION	
Slope	Spacing (Ft)
1:1	10
2:1	20
3:1	30
4:1	40



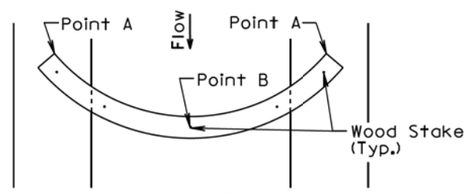
DETAIL B
(TYPICAL OF ALL INSTALLATIONS)



DETAIL C

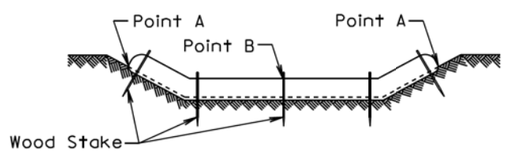


ISOMETRIC VIEW
DITCH INSTALLATION



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: 4th Qtr. 2015 | 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".

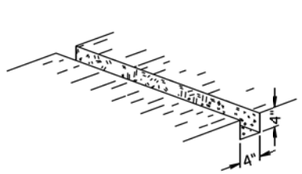
All costs for furnishing and installing the erosion control wattles including labor, equipment, and materials shall be incidental to the contract unit price per foot for the corresponding erosion control wattle bid item.

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".

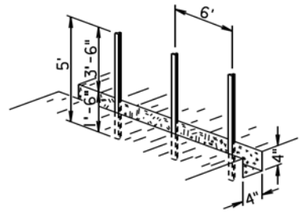
December 23, 2004

Published Date: 4th Qtr. 2015 | SDDOT | EROSION CONTROL WATTLE | PLATE NUMBER 734.06 | Sheet 2 of 2

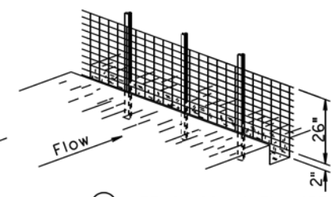
MANUAL LOW FLOW SILT FENCE INSTALLATION



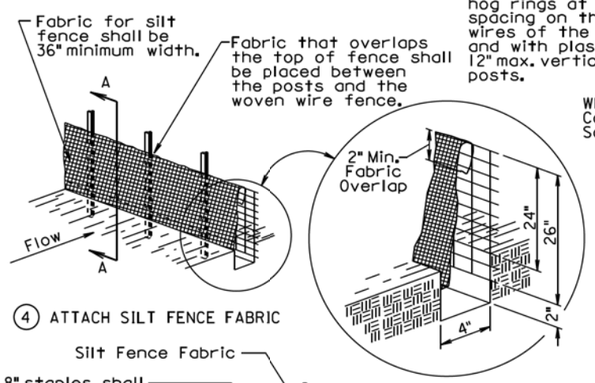
① EXCAVATE TRENCH



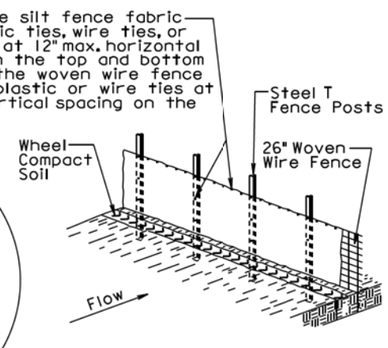
② DRIVE STEEL T FENCE POSTS



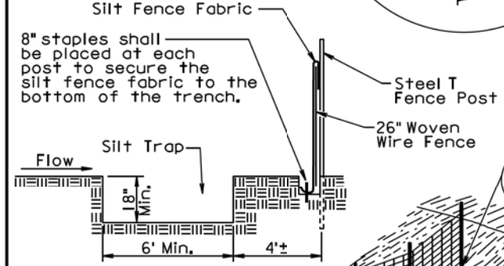
③ ATTACH 26" WOVEN WIRE FENCE TO POSTS



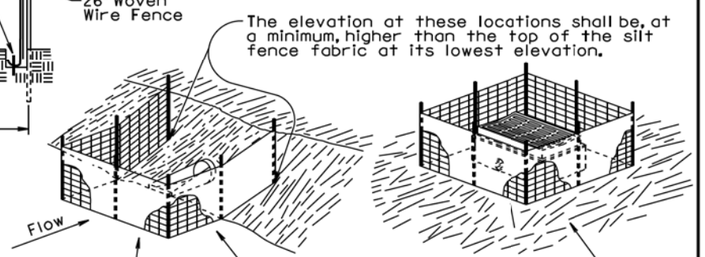
④ ATTACH SILT FENCE FABRIC



⑤ BACKFILL TRENCH AND WHEEL COMPACT SOIL



SECTION A-A



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

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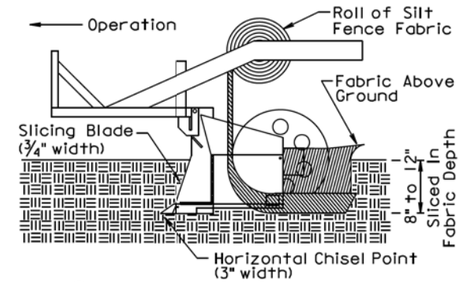
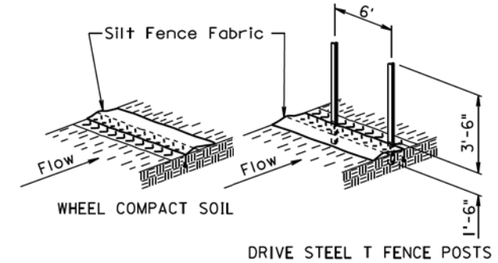
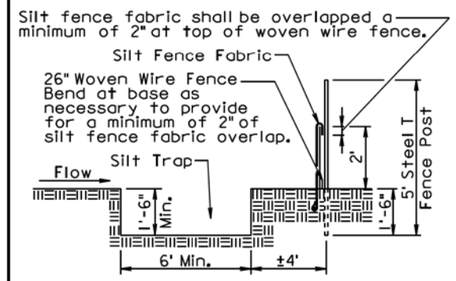
MACHINE SLICED LOW FLOW SILT FENCE INSTALLATION

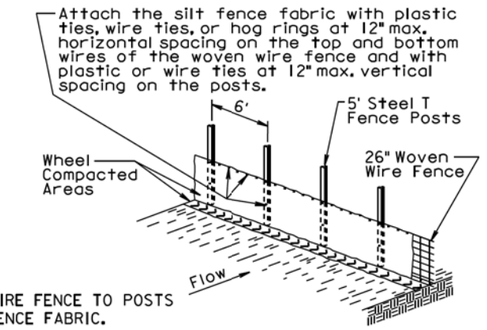


① INSTALL SILT FENCE FABRIC BY MACHINE SLICING METHOD.

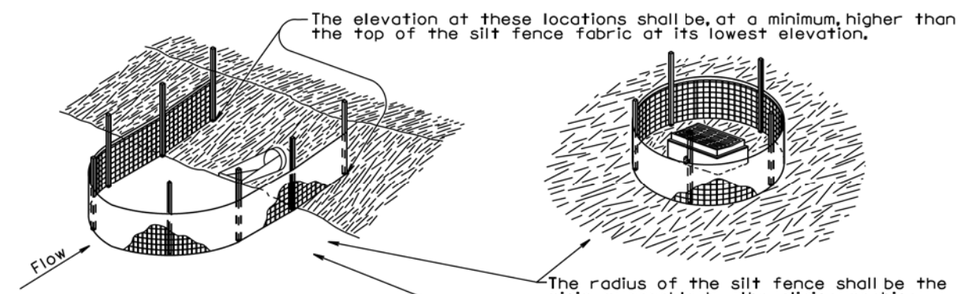


② WHEEL COMPACT SOIL ABOVE SLICED IN PORTION OF FABRIC AND THEN DRIVE STEEL T FENCE POSTS.





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



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.

The radius of the silt fence shall be the minimum capable by the slicing machine. The post spacing shall be 3' for these types of applications of silt fence. All the other components of the silt fence shall be the same as shown above.

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

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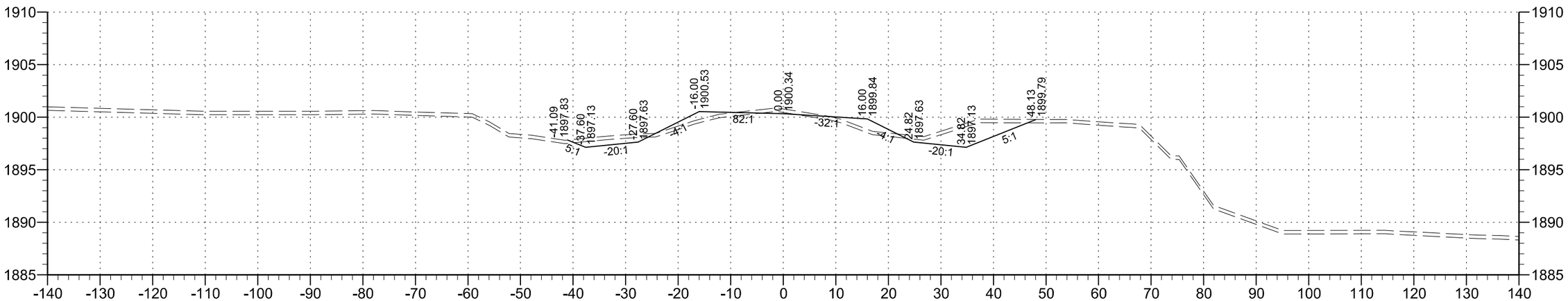
			Sheet 2 of 2

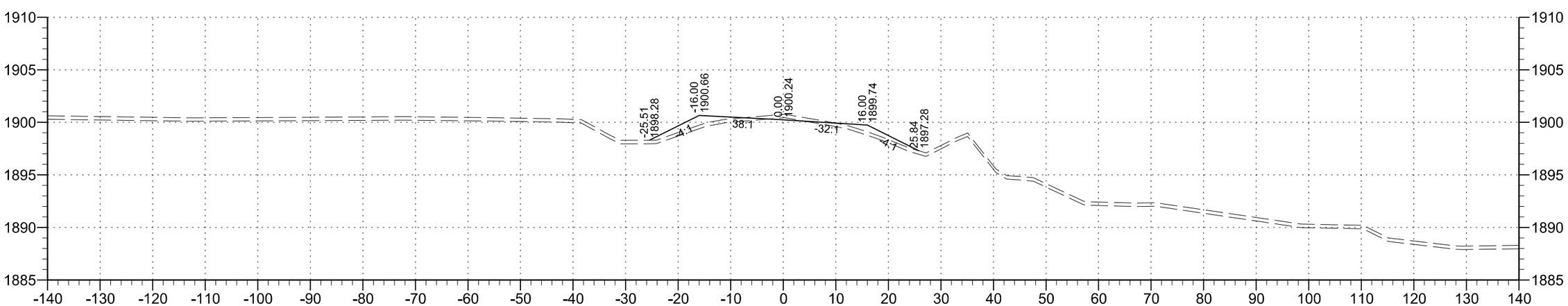
FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	BRO 8016(08)	20	25

Plotting Date: 12-11-2015



7+50

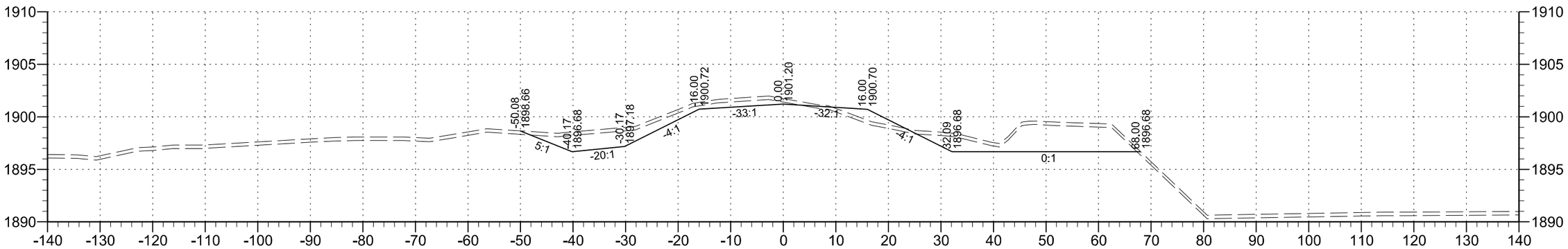


7+00

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	BRO 8016(08)	21	25

Plotting Date: 12-11-2015



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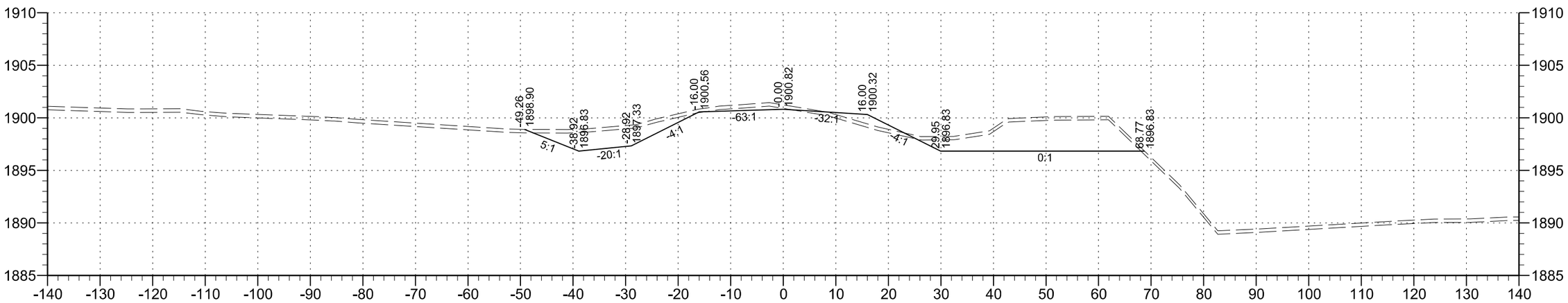

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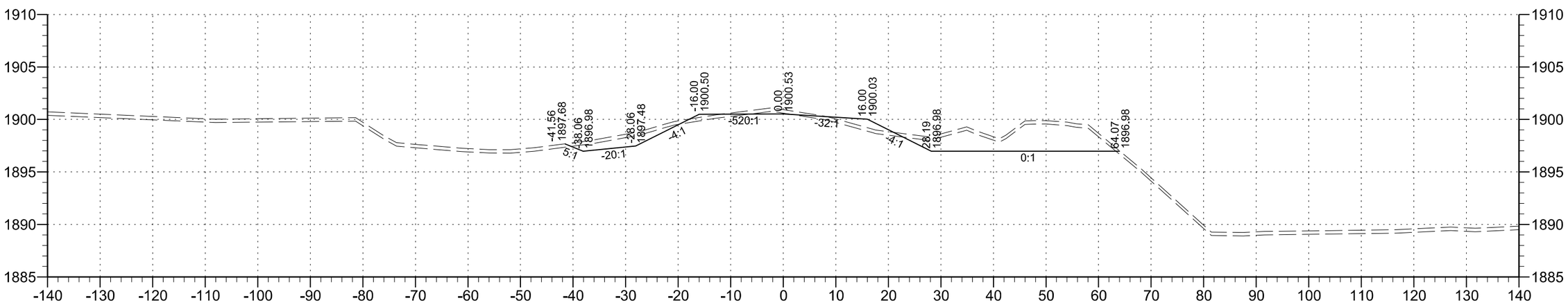
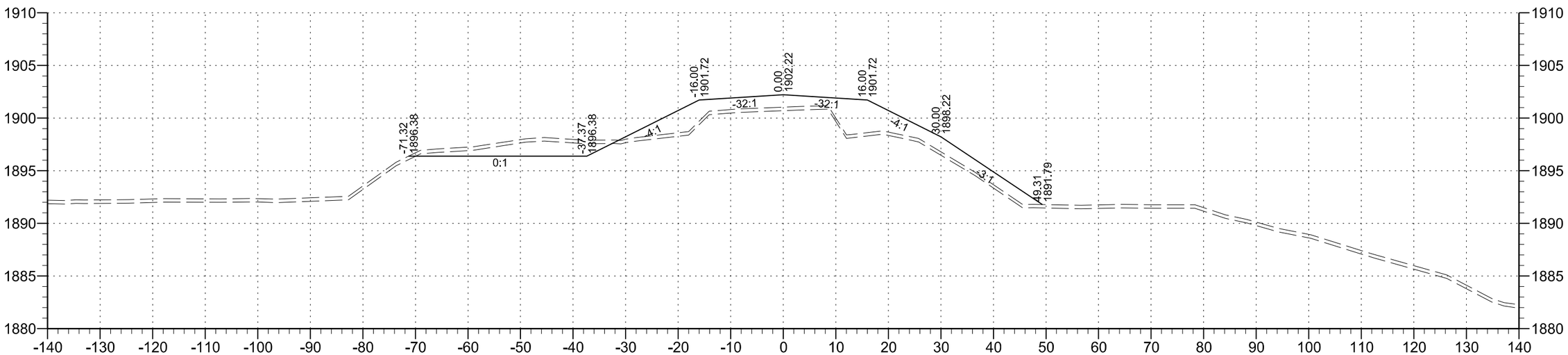


8+00

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	BRO 8016(08)	22	25

Plotting Date: 12-11-2015



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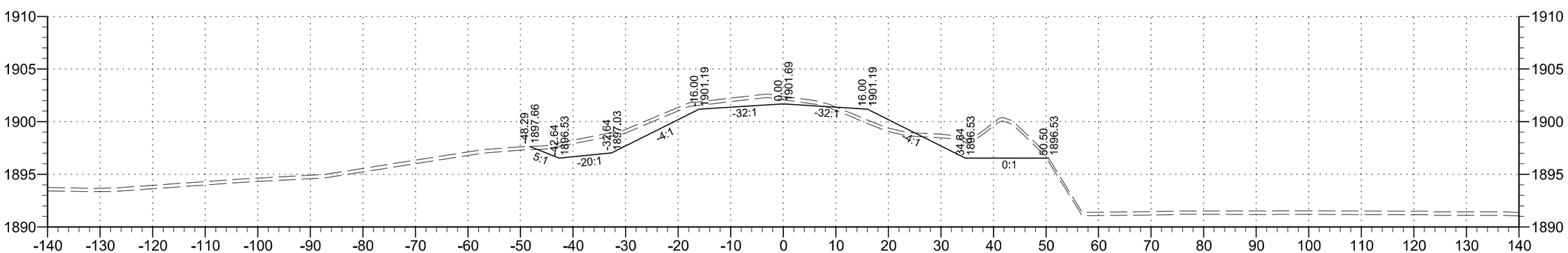

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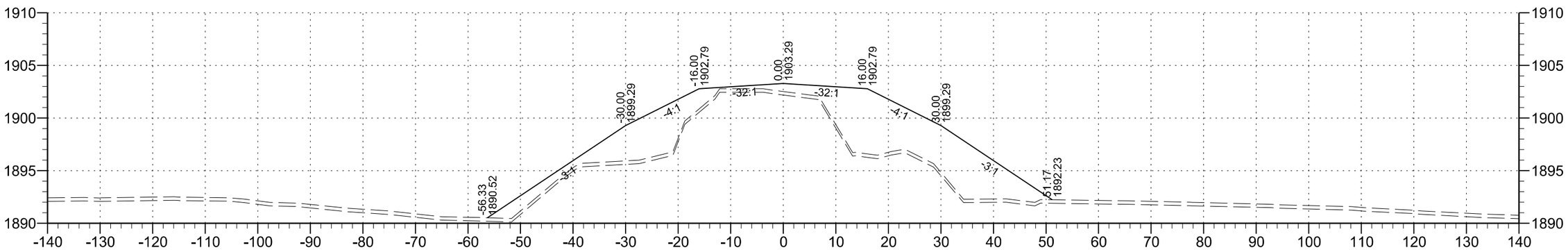
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1899.29
-16.00
1902.79
0.00
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16.00
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30.00
1899.29
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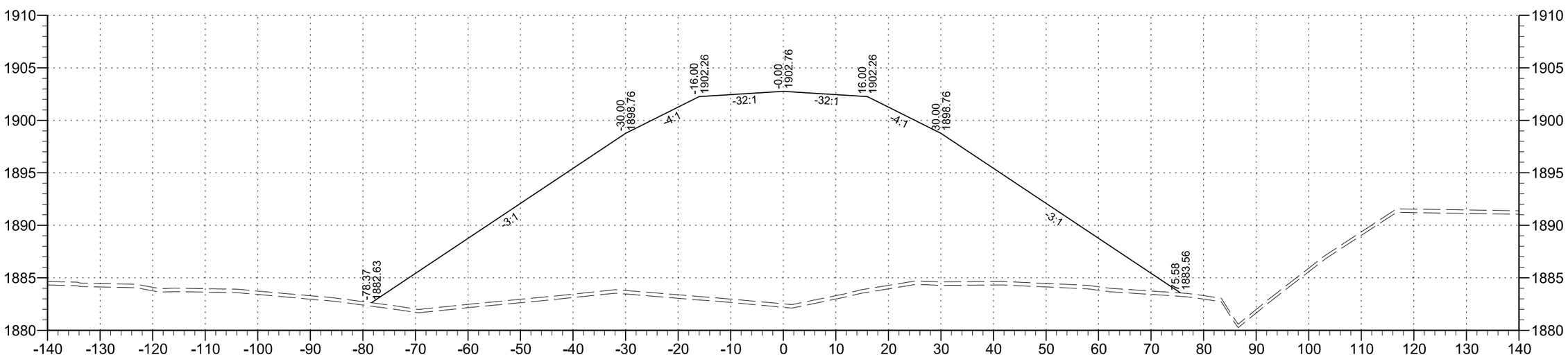
1892.23
-3:1
-4:1
-32:1
-32:1
-4:1
-3:1

11+00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75.58
1883.56
-3:1
-4:1
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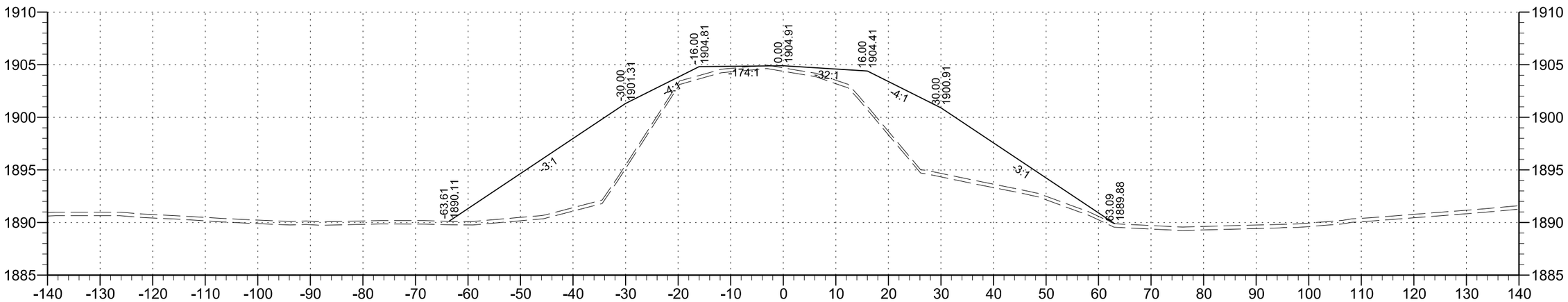
-32:1
-4:1
-3:1

10+50

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	BRO 8016(08)	24	25

Plotting Date: 12-11-2015



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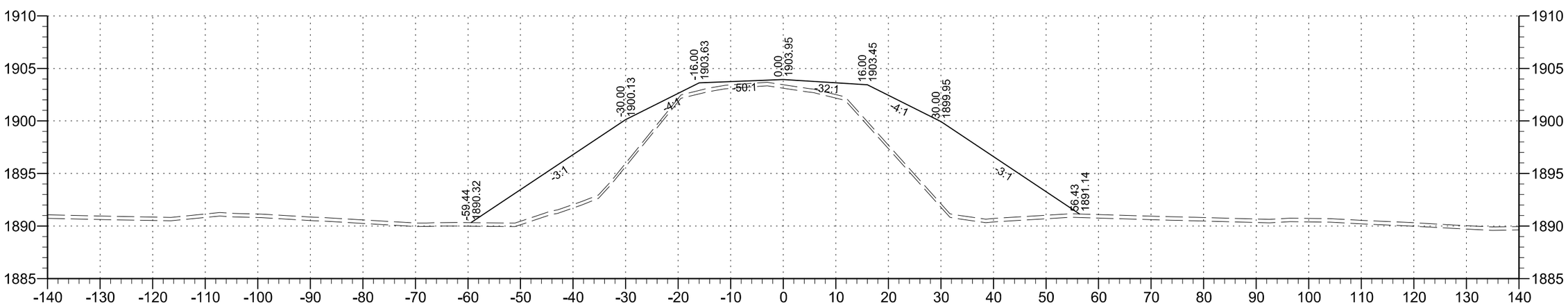

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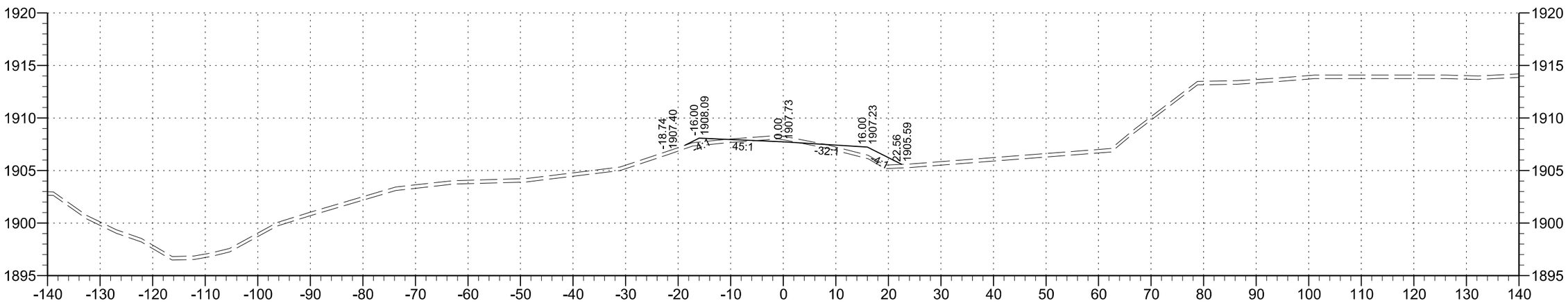
FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	BRO 8016(08)	25	25

Plotting Date: 12-11-2015



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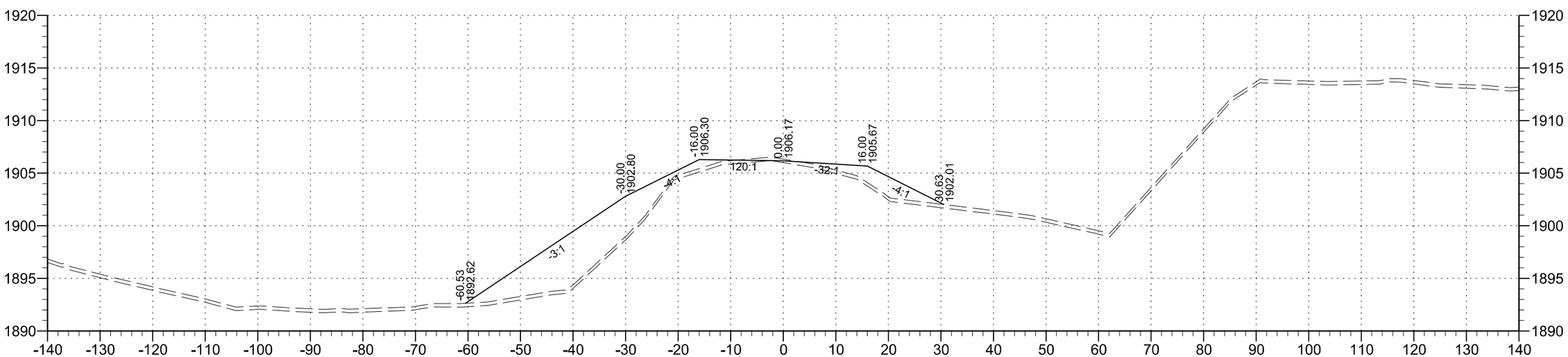

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