STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	BRO 8029(18)	1	36

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION

PLANS FOR PROPOSED

PROJECT BRO 8029(18)
HAMLIN COUNTY

STRUCTURE REPLACEMENT AND APPROACH GRADING

STRUCTURE NO. 29-218-030

PCN 01DT

PROJECT LOCATION

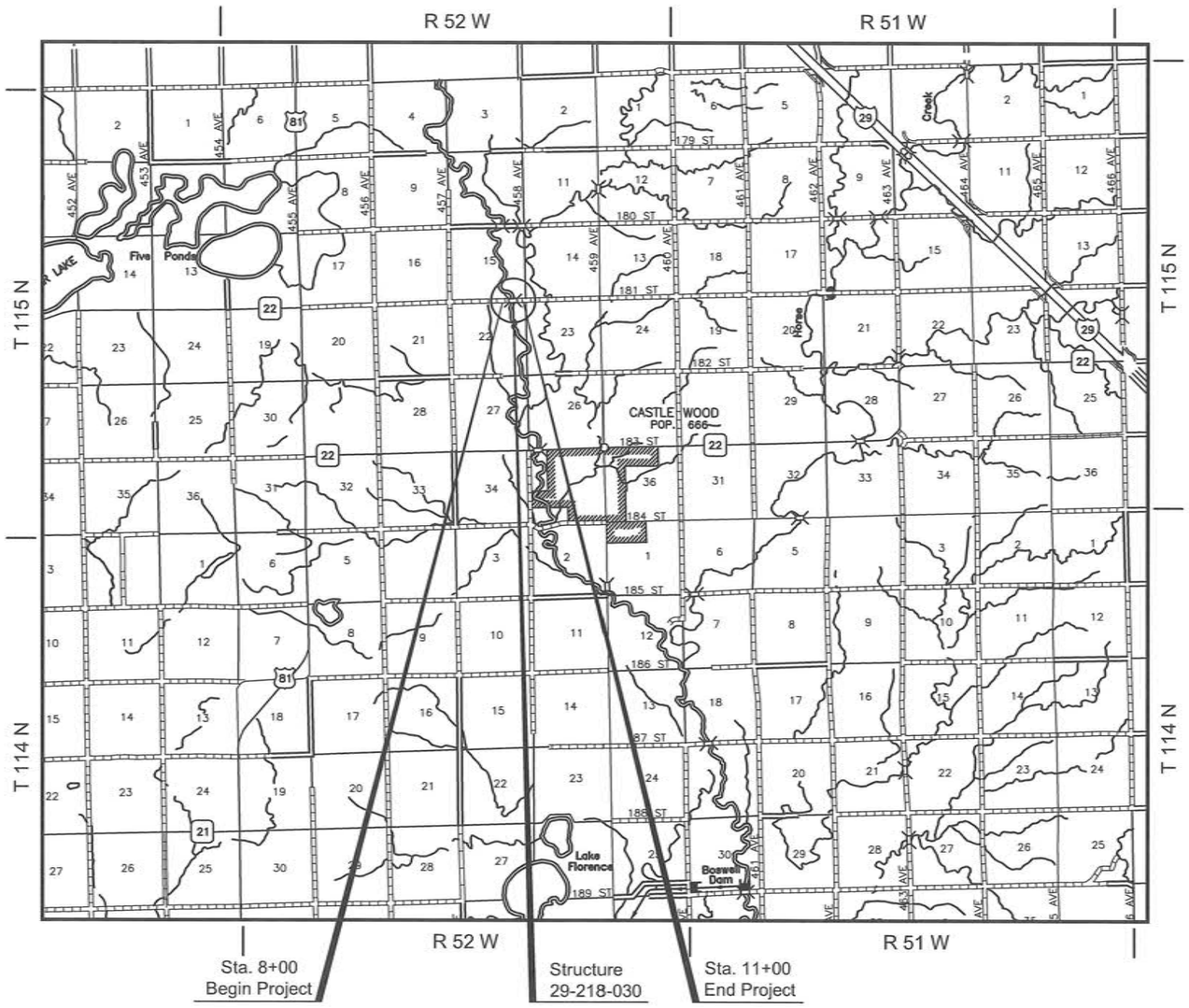
DESIGN DESIGNATION

ADT (2007)	26
ADT (2027)	30
DHV	4
d	50%
T DHV	4.60%
T ADT	10.10%

STORM WATER PERMIT

MAJOR STREAM:	BIG SIOUX RIVER
AREA DISTURBED:	0.38 ACRES
PROJECT AREA:	0.76 ACRES

LATITUDE:	44°45'38"N
LONGITUDE:	97°03'00"W



LOCATION MAP

INDEX OF SHEETS

COUNTY OFFICIALS

HIGHWAY SUPERINTENDENT	BRYAN PEDERSEN P.O. BOX 297 HAYTI, SD 57241 PHONE: (605) 783-3626 FAX: (605) 783-2208
COMMISSIONERS	RANDY RUDEBUSCH LELAND ROE DOUG NOEM REID TUOHINO LARRY SAATHOFF

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 10964
VANESSA L. VICTOR
SOUTH DAKOTA

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CLARK ENGINEERING
114 1st Avenue NW
Watertown, SD 57201
Phone: (605) 878-0414
Fax: (605) 331-2602
watertown@clark-eng.com
EOE

ESTIMATE OF QUANTITIES

GRADING

BID ITEM NUMBER	ITEM	QTY	UNIT
009E0010	Mobilization	Lump Sum	LS
100E0100	Clearing	Lump Sum	LS
120E0010	Unclassified Excavation	436	CuYd
230E0010	Placing Topsoil	110	CuYd
600E0200	Type II Field Laboratory	1	Each
634E0110	Traffic Control Signs	152	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0265	Type 3 Barricade, 6' Double Sided	2	Ea
634E0280	Type 3 Barricade, 8' Single Sided	6	Ea
734E0010	Erosion Control	Lump Sum	LS
734E0102	Type 2 Erosion Control Blanket	1,100	SqYd
734E0154	12" Diameter Erosion Control Wattle	100	Ft
734E0510	Shaping for Erosion Control Blanket	422	Ft
734E0604	High Flow Silt Fence	500	Ft
734E0610	Mucking Silt Fence	35	CuYd
734E0620	Repair Silt Fence	125	Ft
734E0630	Floating Silt Curtain	300	Ft

STRUCTURE (Prestressed Girder)

BID ITEM NUMBER	ITEM	QTY	UNIT
250E0030	Incidental Work, Structure	Lump Sum	LS
410E0030	Structural Steel, Miscellaneous	Lump Sum	LS
420E0100	Structure Excavation, Bridge	104	CuYd
460E0030	Class A45 Concrete, Bridge Deck	87.8	CuYd
460E0050	Class A45 Concrete, Bridge	49.2	CuYd
470E0420	Type T101 Bridge Railing	224	Ft
480E0100	Reinforcing Steel	8,784	Lb
480E0200	Epoxy Coated Reinforcing Steel	16,458	Lb
510E0300	Preboring Pile	140	Ft
510E3401	HP 12x53 Steel Test Pile, Furnish and Drive	160	Ft
510E3405	HP 12x53 Steel Bearing Pile, Furnish and Drive	900	Ft
560E8045	45" Minnesota Shape Prestressed Concrete Beam	377	Ft
700E0210	Class B Riprap	760.0	Ton
831E0110	Type B Drainage Fabric	948	SqYd

SPECIFICATIONS

South Dakota Standard Specifications for Roads and Bridges, 2015 edition, 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 B1: CONSTRUCTION PRACTICES FOR STREAMS INHABITED BY THE TOPEKA SHINER

The US Fish and Wildlife Service (USFWS) has designated Topeka Shiner Streams associated with this project.

Action Taken/Required:
The Contractor shall adhere to the "Special Provision for Construction Practices in Streams Inhabited by the Topeka Shiner".

Stream turbidity will be monitored during all stages of the project. Turbidity measurements should be taken in conjunction with normal storm water inspections.

The Contractor shall produce a comprehensive Construction Plan that includes all products, materials, and methods of construction and removal for temporary water barriers, cofferdams, and diversion channels including de-watering, handling, storage, and disposal of excavated material and pumped effluent throughout all phases of construction, including post-construction stabilization. This plan shall be approved by the SDDOT Environmental office prior to any work occurring in the above streams. Upon plan approval the Construction Plan shall be amended to the SWPPP document located in Section D – Erosion and Sediment Control Plans.

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.

The Contractor shall not withdraw water directly from streams of the James, Big Sioux, and Vermillion watersheds without prior approval from the SDDOT Environmental Office.

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 Big Sioux River 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 Big Sioux River 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.

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PLANS BY: CLARK ENGINEERING, WATERTOWN, SD

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.

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

Contractor Certification Form:

The "Department of Environmental and Natural Resources – Contractor Certification Form" (SD EForm – 2110LDV1-ContractorCertification.pdf) shall be completed by the Contractor or their certified Erosion Control Supervisor after the award of the contract. Work may not begin on the project until this form is signed.

The form certifies under penalty of law that the Contractor understands and will comply with the terms and conditions of the Surface Water Discharge General Permit for Storm Water Discharges Associated with Construction Activities for the Project.

The online form can be found at:
http://denr.sd.gov/des/sw/eforms/E2110LDV1-ContractorCertification.pdf

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

Action Taken/Required:

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

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

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

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

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 designated option borrow 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: staging areas, borrow sites, waste disposal sites, and all material processing sites.

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 staging areas, borrow sites, waste disposal sites, or material processing sites that affect wetlands, threatened and endangered species, or waterways. The Contractor shall provide the required permits and clearances to the Project Engineer at the preconstruction meeting.

COMMITMENT N: SECTION 404 PERMIT

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

Action Taken/Required:

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

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

TYPE II FIELD LABORATORY

Substitution of a cellular telephone for the hard-wired touch-tone telephone is not allowed, as state personnel need the ability to download information over direct phone lines. The phone is intended for state personnel usage only. Contractor personnel are prohibited from using this phone unless pre-approved by the Project Engineer. The Contractor shall submit a copy of each monthly bill for calls charged to this phone at the end of each month. The Project Engineer will then audit the bills to ensure all calls are legitimate and then initiate a Construction Change Order (CCO) to reimburse the Contractor for the actual phone calls made, including local and long distance calls. Reimbursement will not be made for fees associated with the purchase, installation, disconnection, monthly line charges, and incidentals involved in the installation, maintenance, and disconnection of the phone (including attachments). These items shall be incidental to the contract unit price per each for "Type II Field Laboratory".

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REVISION 11/16/15

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STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	BRO 8029(18)	4	36

SEQUENCE OF OPERATIONS

The Contractor shall utilize the following sequence unless an alternative sequence is submitted in writing and approved by the Engineer:

1. Install traffic control devices as shown on the plans.
2. Install erosion control measures.
3. Dismantle and remove existing structure.
4. Construct the new structure and grade the roadway.
5. Open the roadway to through traffic.
6. Complete the miscellaneous cleanup under traffic.

COUNTY RESPONSIBILITIES

Hamlin County shall be responsible for the following at no cost to the Contractor:

1. Right of way and temporary and permanent easements.
2. Coordination of any utility adjustments.
3. Furnish and install temporary and/or permanent fencing.
4. Furnish and install final surfacing.
5. Furnish and install new permanent signing of (1) type 3 object marker and (4) delineators at each of the four corners of the bridge.
6. Remove silt fence and erosion control wattles in permanently seeded areas.

UTILITIES

The Contractor shall be aware that the existing utilities shown in the plans were surveyed prior to the design of this project and might have been relocated or replaced by a new utility facility prior to construction of this project, might be relocated or replaced by a new utility facility during the construction of this project, or might not require adjustment and may remain in its current location. The Contractor shall contact each utility owner and confirm the status of all existing and new utility facilities. The utility contact information is provided elsewhere in the plans or bidding documents.

Hamlin County will coordinate any utility adjustments.

CLEARING

Before clearing activities begin, the Contractor shall contact the Engineer to determine the limits of clearing for the project. If the trees or shrubs that are supposed to remain within the limits of work are damaged or destroyed by the Contractor, the Contractor shall replace them with the same size and type at the Contractor's expense.

PLACING TOPSOIL

The thickness will be approximately 3" within the limits of the project.

The estimated amount of topsoil to be removed and replaced is 110 CuYd.

All cost associated with placing the topsoil along areas to be resurfaced shall be incidental to the contract unit price per cubic yard for "Placing Topsoil".

The plans quantity for "Placing Topsoil" as shown in the estimate of quantities will be the basis for payment for this item.

GRADING OPERATIONS

Water for Embankment is estimated at the rate of 10 gallons of water per cubic yard of Embankment minus Waste. The estimated quantity of Water for Embankment is 9,980 Gal. No separate payment will be made for the Water for Embankment and all costs associated shall be incidental to the contract unit price per cubic yard of "Unclassified Excavation".

Compaction of earth and road embankment and bridge berm material shall be governed by the Specified Density Method. Excavation and construction of embankments for grading shall be performed in accordance with Section 120 of the *Specifications*.

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 sections shall be constructed to the limits shown on the cross sections. If significant changes to the cross sections are necessary during construction, the Engineer shall contact the Designer for the proposed change.

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

SHRINKAGE FACTOR

Embankment plus 35%.

EARTHWORK BALANCE

Excavation	436	CuYd		Embankment	733	CuYd
Other Excavation	647	CuYd		35% Shrinkage	256	CuYd
				Waste	94	CuYd
Total	1,083	CuYd			1,083	CuYd

Other Excavation includes the sum of the quantities for the following:
Structure Excavation, Bridge (104 CuYd.)
Excavation for Class B Riprap (543 CuYd.)

These quantities are for information purposes only, compensation for these are accounted for within various bid items.

The Contractor may, at the discretion of the Engineer, use the material from Other Excavation in the inslopes and as sub-base with the condition that said material meets all requirements as set forth in the *Standard Specifications*.

It is assumed (for the purposes of earthwork balance) that the Contractor will be able to use 85% of the material from Other Excavation and will have to waste the remaining material at (a) site(s) provided by the Contractor and approved by the Engineer. All costs for labor, materials, and equipment necessary to waste material as well as restoration of the waste site(s) shall be incidental to the contract unit price per cubic yard of "Unclassified Excavation".

PERMANENT SEEDING

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

Type C Permanent Seed Mixture will cover approximately 9,500 square feet and shall consist of the following:

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

The cost of seeding will be incidental to the lump sum price for "Erosion Control."

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.

An additional quantity of 20 feet of 12" Diameter Erosion Control Wattles has been added to the Estimate of Quantities for temporary erosion and sediment control in highway ditch channels and as an alternative to low flow or high flow silt fence at adjacent wetland areas

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

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TABLE OF EROSION CONTROL WATTLE

Station	L/R	Diameter (Inch)	Quantity (Ft)
9+20	L	12	20
9+21	R	12	20
10+80	L	12	20
10+75	R	12	20
		Misc.	20
		Total:	100

REMOVE EROSION CONTROL WATTLE

Erosion control wattles shall be removed by the County once vegetation is established.

HIGH FLOW SILT FENCE

The high flow silt fence fabric provided shall be from the approved product list. The approved product list for high flow silt fence may be viewed at the following internet site: http://apps.sd.gov/Applications/HC54ApprovedProducts/main.asp

High 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 734.05 for details.

An additional 35 feet of High Flow Silt Fence has been added to the Estimate of Quantities for temporary sediment control.

TABLE OF HIGH FLOW SILT FENCE

Station - Side		Station - Side	Quantity (ft)
8+00 – 34' LT	To	9+25 – 70' LT	130
8+00 – 32' RT	To	9+00 – 60' RT	104
9+25 – 70' LT	To	9+48 – 66' LT	24
9+00 – 60' RT	To	9+60 – 61' RT	60
10+31 – 34' LT	To	11+00 – 60' LT	75
10+31 – 42' RT	To	11+00 – 60' RT	72
		Misc.	35
		Total:	500

REMOVE SILT FENCE

Silt Fence shall be removed by the County once vegetation is established.

FLOATING SILT CURTAIN

Floating silt curtains shall be installed at locations noted in the table and at locations determined by the Engineer during construction.

The Contractor shall determine the water depth and other waterway characteristics such as stream flow velocity and seek technical advice from the manufacturer before ordering the floating silt curtain so that the floating silt curtain installed is the correct type for the individual sites.

The Contractor shall install the floating silt curtain according to the Manufacturer's installation instructions or as directed by the Engineer.

The Contractor shall maintain the floating silt curtains for the duration of the project to ensure continuous protection of the waterway.

A list of known manufacturers of floating silt curtain is shown below for informational purpose. The Contractor may use floating silt curtain from manufacturers that are not included in the list as well.

ABASCO, LLC Houston, TX Phone: 1-800-242-7745 www.abasco.net	Aer-Flo, Inc. Bradenton, FL Phone: 1-800-823-7356 www.aerflo.com
American Boom and Barrier Corp. Cape Canaveral, FL Phone: 1-800-843-2110 www.abbcobom.com	ENVIRO-USA, LLC Cocoa, FL Phone: 1-321-222-9551 www.enviro-usa.com
Elastec/American Marine, Inc. Carmi, IL Phone: 1-618-382-2525 www.turbiditycurtains.com	Geo-Synthetics, LLC (GSI) Waukesha, WI Phone: 1-800-444-5523 www.geosynthetics.com
Parker Systems, Inc. Chesapeake, VA Phone: 1-866-472-7537 www.parkersystemsinc.com	

TABLE OF FLOATING SILT CURTAIN

Station - Side		Station - Side	Quantity (ft)
9+48 – 66' LT	To	9+60 – 60' RT	166
10+31 – 34' LT	To	10+31 – 42' RT	83
		Misc.	51
		Total:	300

EROSION CONTROL BLANKET

Erosion control blanket shall be installed 16 feet wide at the locations noted in the table and at locations determined by the Engineer during construction.

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

http://apps.sd.gov/Applications/HC54ApprovedProducts/main.asp

An additional 44 square yards of Type 2 Erosion Control Blanket has been added to the Estimate of Quantities for temporary erosion control.

TABLE OF EROSION CONTROL BLANKET

Station to	Station	L/R	Type	Quantity (SqYd)
8+00	9+54	LT	2	491
8+00	9+52	RT	2	335
10+46	11+00	LT	2	126
10+46	11+00	RT	2	104
			Misc.	44
			Total Type 2 Erosion Control Blanket:	1,100

SHAPING FOR EROSION CONTROL BLANKET

The ditches shall be shaped for the erosion control blanket as specified on Standard Plate 734.01.

GENERAL MAINTENANCE OF TRAFFIC

Removing, relocating, covering, salvaging, and resetting of existing traffic control devices, including delineation, shall be the responsibility of the County.

The Contractor will be required to maintain local access/traffic to each residence. Construction shall be phased so that adjacent landowners may have access to their properties at various windows of time each day.

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 replaced by the Contractor, at no expense to the County, and to the satisfaction of the Engineer.

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PLANS BY: CLARK ENGINEERING, WATERTOWN, SD

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TYPICAL SECTION

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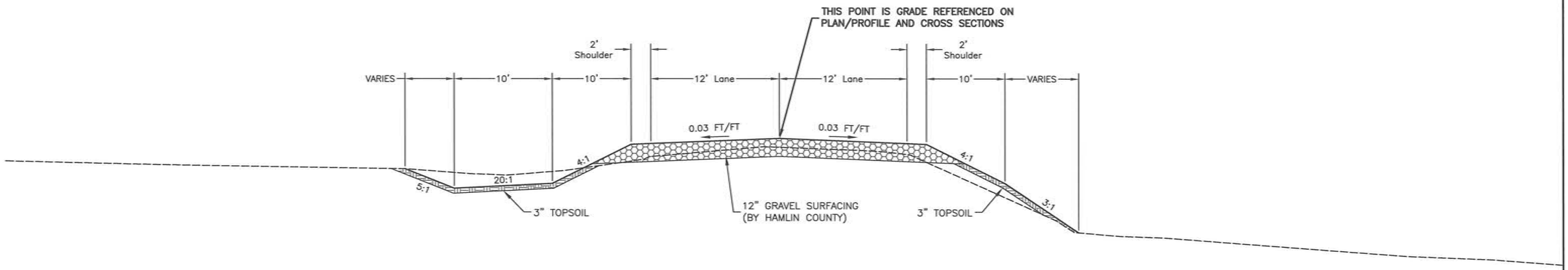

CUT SECTION

FILL SECTION

TYPICAL GRADING AND SURFACING SECTION

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10-15-15

PLANS BY: CLARK ENGINEERING, WATERTOWN, SD

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** 0.76 acres **(4.2 1.b.)**
- **Total Area To Be Disturbed** 0.38 acres **(4.2 1.b.)**
- **Existing Vegetative Cover (%)** 100
- **Soil Properties:** USDA-NRCS Soil Series Classification fairdale loam, divide loam, fordtown loam. **(4.2 1. d.)**
- **Name of Receiving Water Body/Bodies** Big Sioux River **(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.)

- **Special sequencing requirements (see sheet).**
- **Complete traffic control installation and protection devices.**
- **Install perimeter protection where runoff sheets from the site.**
- **Install channel and ditch bottom protection.**
- **Clearing and grubbing.**
- **Remove and store topsoil.**
- **Stabilize disturbed areas.**
- **Remove existing structure.**
- **Install proposed structure.**
- **Complete final grading.**
- **Reseed areas disturbed by removal activities.**

❖ 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:
- **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
  - ☒ Riprap
  - ☐ 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, residuals from concrete saw cutting (either wet or dry), 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.
- 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 74:51:01.
- The discharge of any substance that exceeds the surface water quality standards of ARSD chapter 74:51:01.
- 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.

Tom Lehrkamp

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

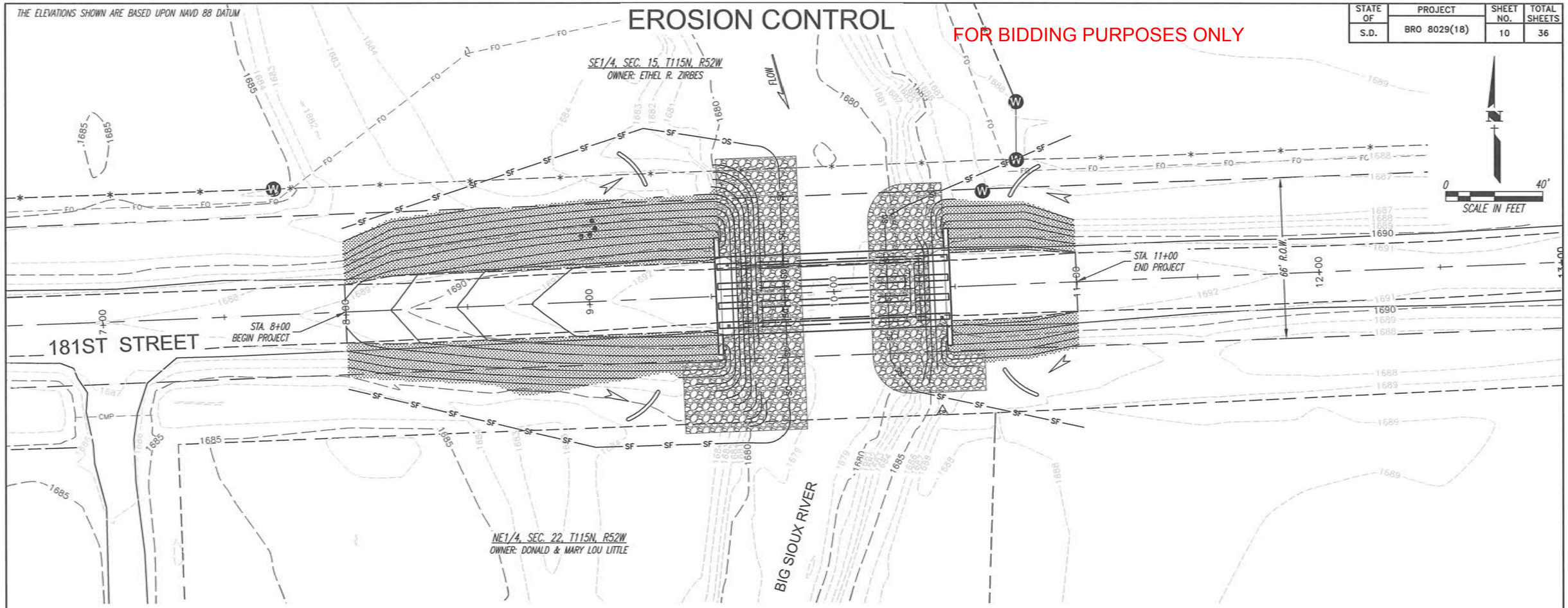
- (800) 424-8802.

THE ELEVATIONS SHOWN ARE BASED UPON NAVD 88 DATUM

EROSION CONTROL

FOR BIDDING PURPOSES ONLY

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	BRO 8029(18)	10	36



EROSION CONTROL LEGEND	
EROSION CONTROL BLANKET	
RIPRAP	
HIGH FLOW SILT FENCE	SF
SILT CURTAIN	SC
DRAINAGE ARROW	
WATTLE	

HIGH FLOW SILT FENCE			
STA. 8+00 – 34' LT	TO	STA. 9+25 – 70' LT	130 Ft
STA. 8+00 – 32' RT	TO	STA. 9+00 – 60' RT	104 Ft
STA. 9+25 – 70' LT	TO	STA. 9+48 – 66' LT	24 Ft
STA. 9+00 – 60' RT	TO	STA. 9+60 – 61' RT	60 Ft
STA. 10+31 – 34' LT	TO	STA. 11+00 – 60' LT	75 Ft
STA. 10+31 – 42' RT	TO	STA. 11+00 – 60' RT	72 Ft
		MISC.	35 Ft
		TOTAL	500 Ft

EROSION BLANKET			
STA. 8+00 LT	TO	STA. 9+54 LT	491 SqYd
STA. 8+00 RT	TO	STA. 9+52 RT	335 SqYd
STA. 10+46 LT	TO	STA. 11+00 LT	126 SqYd
STA. 10+46 RT	TO	STA. 11+00 RT	104 SqYd
		MISC.	44 SqYd
		TOTAL	1,100 SqYd

FLOATING SILT CURTAIN			
STA. 9+48 – 66' LT	TO	STA. 9+60 – 60' RT	166 Ft
STA. 10+31 – 34' LT	TO	STA. 10+31 – 42' RT	83 Ft
		MISC.	51 Ft
		TOTAL	300 Ft

EROSION CONTROL WATTLES		
STA. 9+20	54' LT	20 Ft
STA. 9+21	44' RT	20 Ft
STA. 10+80	42' LT	20 Ft
STA. 10+75	41' RT	20 Ft
	MISC.	20 Ft
	TOTAL	100 Ft

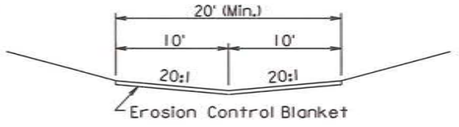
REGISTERED PROFESSIONAL ENGINEER
REG. NO.
10964
VANESSA L.
VICTOR
SOUTH DAKOTA

10-15-15

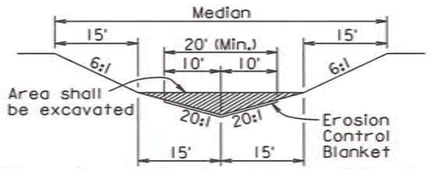
PLANS BY: CLARK ENGINEERING, WATERTOWN, SD

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	BRO 8029(18)	11	36

FOR BIDDING PURPOSES ONLY

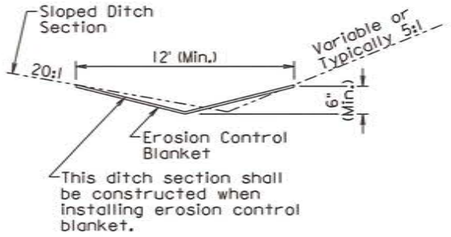


STANDARD DITCH SECTION

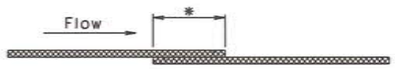


The median shall be shaped to the limits shown in this detail where the erosion control blanket will be placed.

MEDIAN SECTION



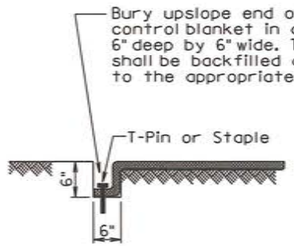
SLOPED DITCH SECTION



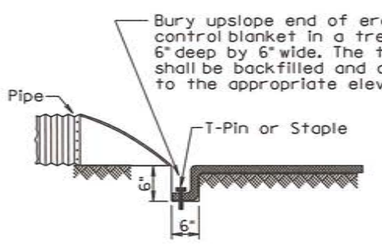
* Use a 4" (Min.) overlap wherever two widths of erosion control blanket are applied side by side.

* 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

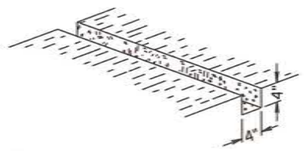
Published Date: 3rd Qtr. 2015	SDDOT	EROSION CONTROL BLANKET	PLATE NUMBER 734.01
			Sheet 1 of 1

PLANS BY: CLARK ENGINEERING, WATERTOWN, SD

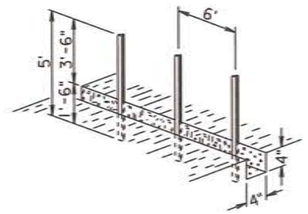
STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	BRO 8029(18)	12	36

FOR BIDDING PURPOSES ONLY

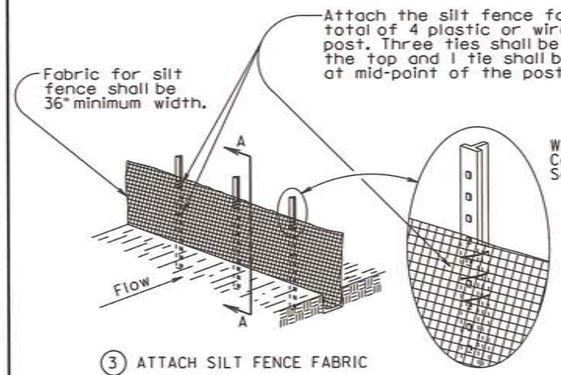
MANUAL HIGH FLOW SILT FENCE INSTALLATION



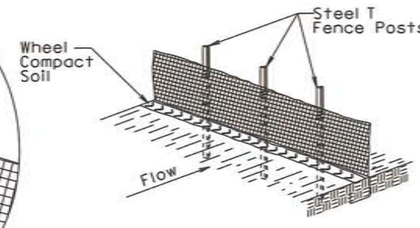
(1) EXCAVATE TRENCH



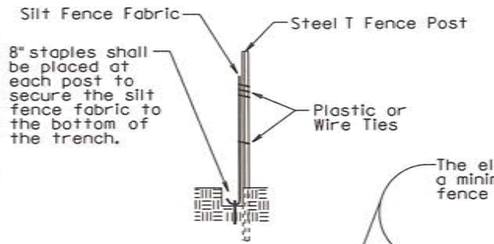
(2) DRIVE STEEL T FENCE POSTS



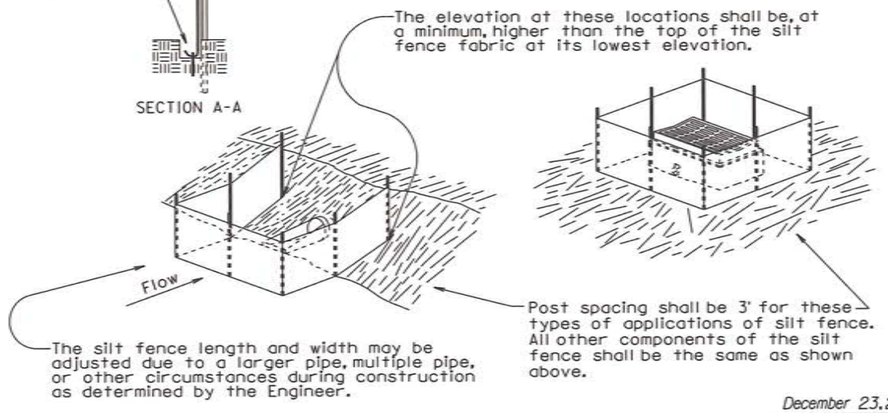
(3) ATTACH SILT FENCE FABRIC



(4) BACKFILL TRENCH AND WHEEL COMPACT SOIL



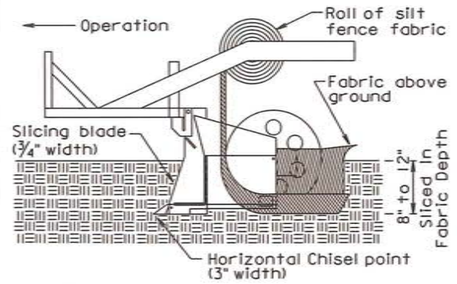
SECTION A-A



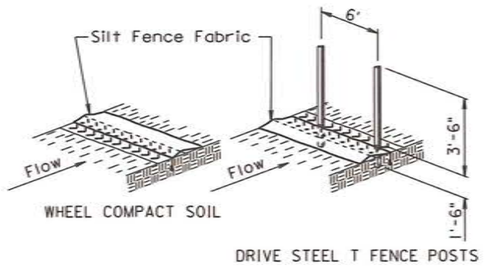
December 23,2003

Published Date: 3rd Qtr. 2015	SDDOT	HIGH FLOW SILT FENCE	PLATE NUMBER 734.05
			Sheet 1 of 2

MACHINE SLICED HIGH FLOW SILT FENCE INSTALLATION



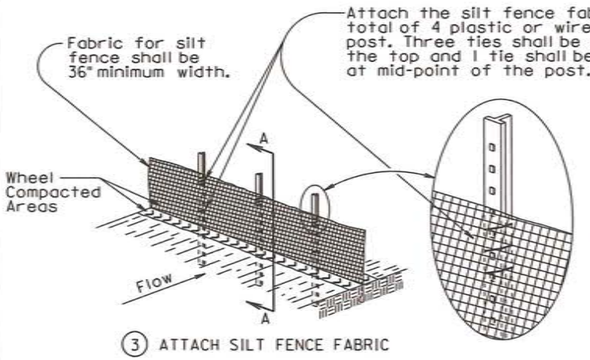
(1) INSTALL SILT FENCE FABRIC BY MACHINE SLICING METHOD.



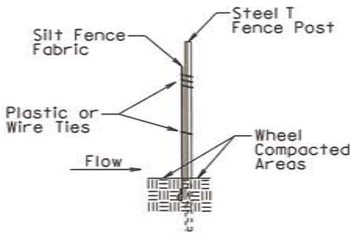
WHEEL COMPACT SOIL

DRIVE STEEL T FENCE POSTS

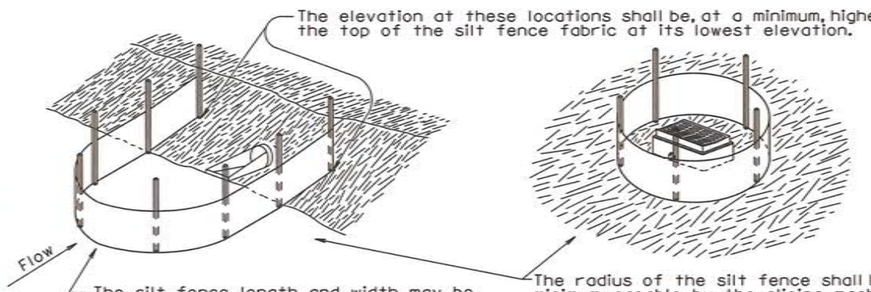
(2) WHEEL COMPACT SOIL ABOVE SLICED IN PORTION OF FABRIC AND THEN DRIVE STEEL T FENCE POSTS.



(3) ATTACH SILT FENCE FABRIC



SECTION A-A



GENERAL NOTE:

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

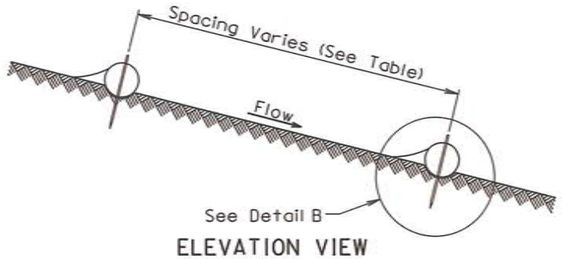
December 23,2003

Published Date: 3rd Qtr. 2015	SDDOT	HIGH FLOW SILT FENCE	PLATE NUMBER 734.05
			Sheet 2 of 2

PLANS BY: CLARK ENGINEERING, WATERTOWN, SD

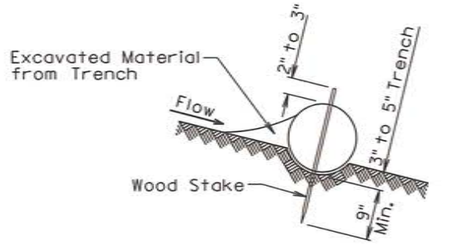
STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	BRO 8029(18)	13	36

FOR BIDDING PURPOSES ONLY

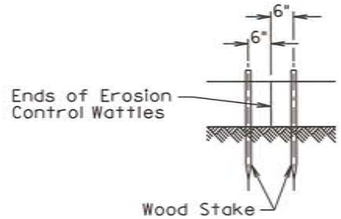


ELEVATION VIEW
CUT OR FILL SLOPE INSTALLATION

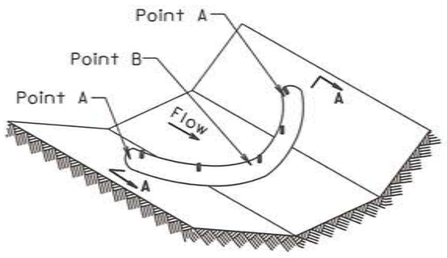
CUT OR FILL SLOPE INSTALLATION	
Slope	Spacing (Ft)
1:1	10
2:1	20
3:1	30
4:1	40



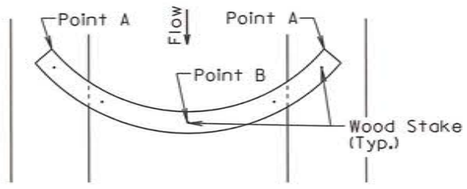
DETAIL B
(TYPICAL OF ALL INSTALLATIONS)



DETAIL C

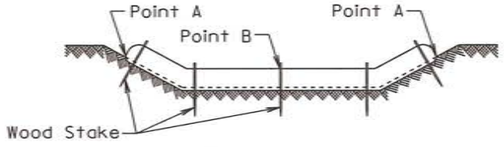


ISOMETRIC VIEW
DITCH INSTALLATION



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: 3rd 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: 3rd Qtr. 2015	SDDOT	EROSION CONTROL WATTLE	PLATE NUMBER 734.06
			Sheet 2 of 2

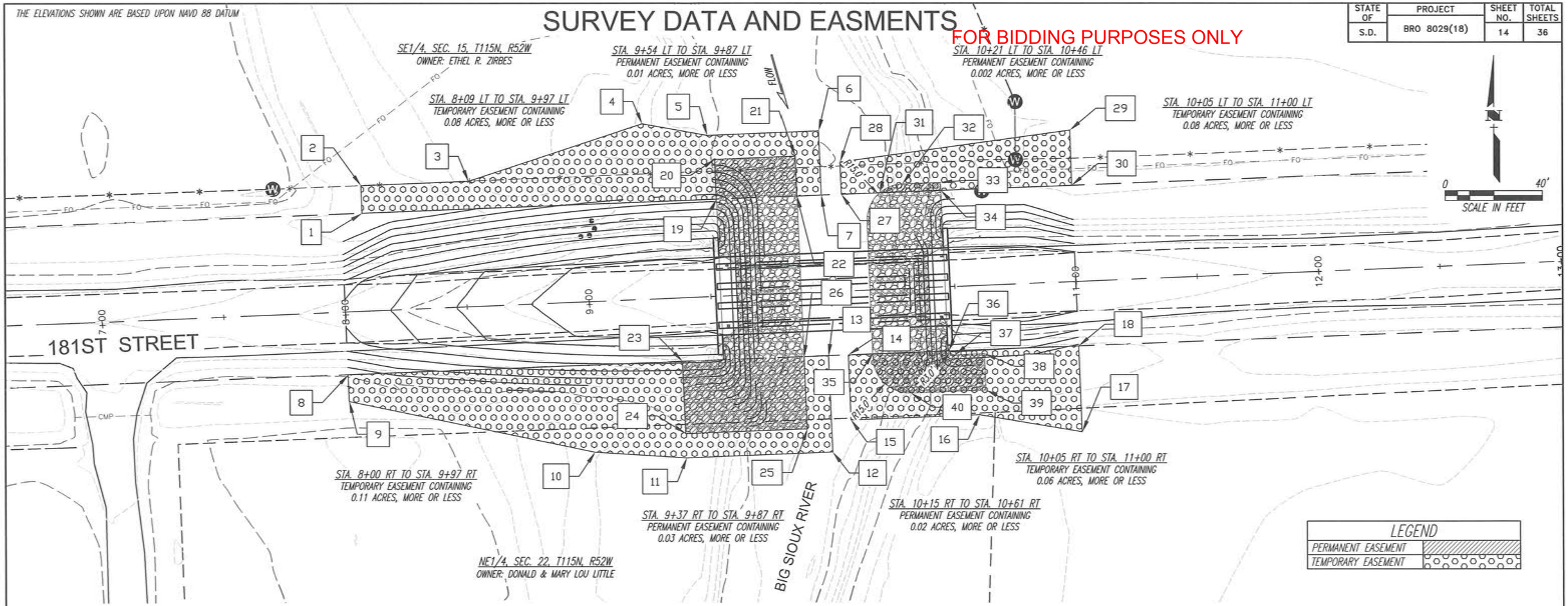
PLANS BY: CLARK ENGINEERING, WATERTOWN, SD

THE ELEVATIONS SHOWN ARE BASED UPON NAVD 88 DATUM

SURVEY DATA AND EASMENTS

FOR BIDDING PURPOSES ONLY

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	BRO 8029(18)	14	36



HORIZONTAL/VERTICAL CONTROL POINTS

POINT	STATION	OFFSET	NORTHING (y)	EASTING (x)	ELEVATION	DESCRIPTION
BASE #1	13+91	54' LT	10,000.00	15,000.00	1,690.16	5/8" REBAR WITH ALUMINUM CAP STAMPED "CLARK ENGR. CORP. 29-218-030 BASE PT."
BM #3	-----	-----	-----	-----	1,720.54	NGS BM-DISK SET IN TOP OF A CONCRETE MONUMENT. NGS - PID: PR00451
SC #4	-----	-----	9,967.92	15,421.19	-----	NE CORNER OF SECTION 22, 5/8" REBAR
QC #6	-----	-----	9,864.78	12,764.23	-----	NORTH 1/4 CORNER OF SECTION 22, 5/8" REBAR
BM #9	10+44	14' RT	-----	-----	1,692.12	YELLOW BENCH TIE WITH TAG, SET IN SE WOODEN WING WALL, AT THE TOP OF CENTER WOODEN PILE.

HORIZONTAL ALIGNMENT DATA - TANGENT

POINT TYPE	LENGTH	STATION	DIRECTION	NORTHING (y)	EASTING (x)
START		8+00		9921.62	14413.86
	300'		N 87°38'13" E		
END		11+00		9933.99	14713.60

PERMANENT & TEMPORARY EASEMENTS

#	STATION	OFFSET	NORTHING (y)	EASTING (x)	#	STATION	OFFSET	NORTHING (y)	EASTING (x)
1	8+09	40' LT	9962.12	14420.85	21	9+87	56' LT	9985.40	14598.28
2	8+09	52' LT	9973.49	14420.41	22	9+87	40' LT	9969.03	14598.96
3	8+53	52' LT	9975.20	14464.47	23	9+37	26' RT	9901.16	14551.97
4	9+25	72' LT	9998.76	14535.69	24	9+37	56' RT	9871.41	14553.20
5	9+51	66' LT	9993.92	14562.34	25	9+87	56' RT	9873.37	14602.91
6	9+97	66' LT	9995.80	14607.86	26	9+87	26' RT	9903.09	14601.68
7	9+97	40' LT	9969.42	14608.95	27	10+05	40' LT	9969.74	14617.17
8	8+00	26' RT	9895.84	14414.92	28	10+05	53' LT	9983.01	14616.64
9	8+00	37' RT	9884.83	14415.35	29	11+00	62' LT	9996.12	14711.28
10	9+00	62' RT	9863.79	14516.04	30	11+00	40' LT	9973.42	14711.98
11	9+37	66' RT	9861.42	14553.59	31	10+21	40' LT	9970.34	14632.78
12	9+97	66' RT	9863.77	14613.31	32	10+30	43' LT	9974.00	14642.03
13	9+97	26' RT	9903.47	14611.67	33	10+46	43' LT	9974.62	14657.88
14	10+05	26' RT	9903.79	14619.77	34	10+46	40' LT	9971.32	14658.01
15	10+05	53' RT	9876.98	14620.84	35	10+15	26' RT	9904.18	14629.77
16	10+58	53' RT	9879.16	14673.68	36	10+46	26' RT	9905.39	14661.02
17	11+00	62' RT	9872.13	14716.07	37	10+49	28' RT	9903.77	14663.68
18	11+00	27' RT	9907.47	14714.70	38	10+61	28' RT	9904.27	14675.79
19	9+54	40' LT	9967.75	14566.08	39	10+61	43' RT	9889.28	14676.41
20	9+54	56' LT	9984.04	14565.41	40	10+30	43' RT	9888.00	14645.44

REGISTERED PROFESSIONAL ENGINEER
REG. NO.
10964
VANESSA L.
VICTOR
SOUTH DAKOTA

10-15-15

PLANS BY: CLARK ENGINEERING, WATERTOWN, SD

THE ELEVATIONS SHOWN ARE BASED UPON NAVD 88 DATUM

PLAN & PROFILE

FOR BIDDING PURPOSES ONLY

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	BRO 8029(18)	15	36

SE1/4, SEC. 15, T115N, R52W
OWNER: ETHEL R. ZIRBES

FLOW
BIG SIOUX RIVER

FIBER OPTIC
INTERSTATE TELECOMMUNICATIONS CO-OP
TERRY PEDERSON
312 FOURTH STREET WEST
P.O. BOX 920
CLEAR LAKE, SD 57226
PH: 605-874-2181
FAX: 605-874-2014

STA. 9+62.07 TO STA. 10+37.84
REMOVE IN-PLACE 76± SINGLE SPAN PRATT TRUSS BRIDGE (INCIDENTAL WORK, STRUCTURE)

STA. 10+48 TO STA. 11+00
INSTALL 12" GRAVEL SURFACING (BY COUNTY)

BEGIN PROPOSED STRUCTURE STA.=9+52.00

END PROPOSED STRUCTURE STA.=10+48.00

BEGIN PROJECT STA.=8+00

END PROJECT STA.=11+00

181ST STREET

STA. 9+52.00 TO STA. 10+48.00
INSTALL 96'-0" PRESTRESSED GIRDER BRIDGE (SEE STRUCTURE SHEETS)
DA = 517.8 SQ. MI.

STA. 8+00 TO STA. 9+52.00
INSTALL 12" GRAVEL SURFACING (BY COUNTY)

NE1/4, SEC. 22, T115N, R52W
OWNER: DONALD & MARY LOU LITTLE

UNCLASSIFIED EXCAVATION	436	CuYd	EMBANKMENT	733	CuYd
OTHER EXCAVATION	647	CuYd	35% SHRINKAGE	256	CuYd
			WASTE	94	CuYd
TOTAL	1,083	CuYd	TOTAL	1,083	CuYd

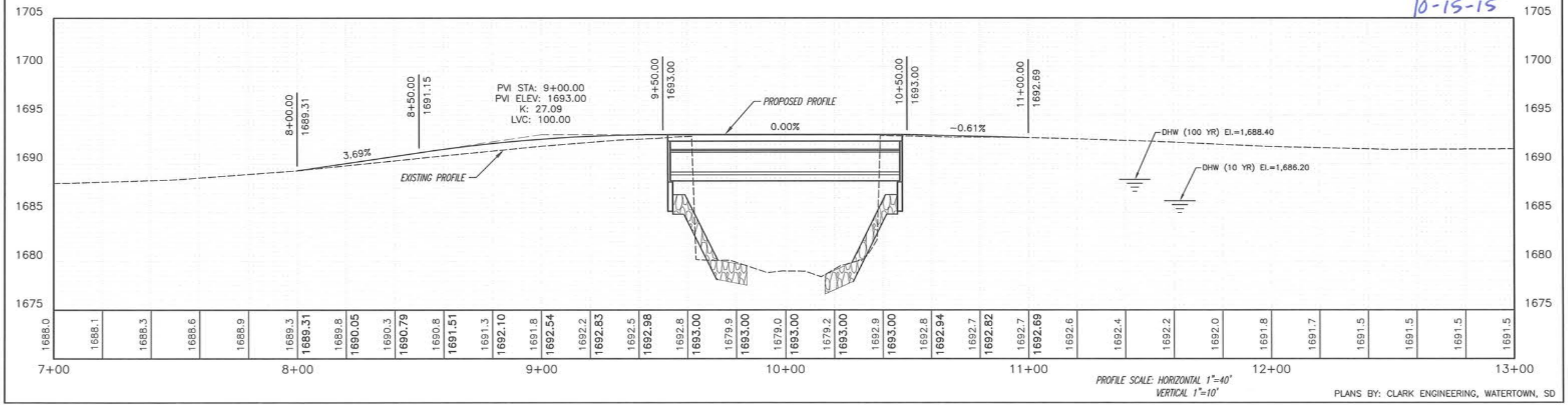
N

0 40'
SCALE IN FEET

FINAL GRAVEL SURFACING BY COUNTY

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 10964
VANESSA L. VICTOR
SOUTH DAKOTA

10-15-15



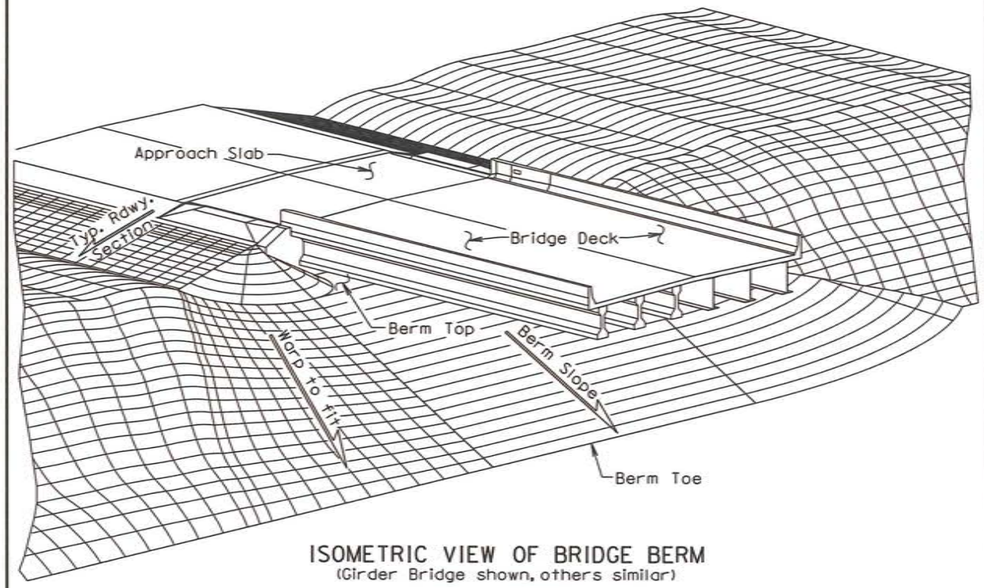
PROFILE SCALE: HORIZONTAL 1"=40'
VERTICAL 1"=10'

PLANS BY: CLARK ENGINEERING, WATERTOWN, SD

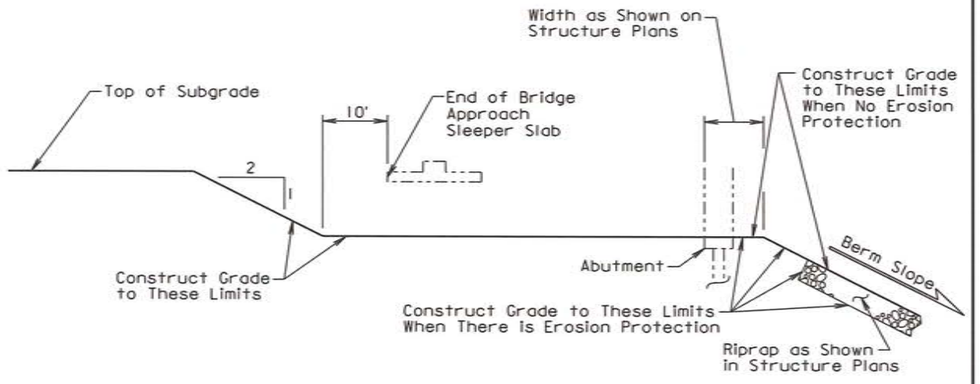
FOR BIDDING PURPOSES ONLY

REVISION 11/16/15

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	BRO 8029(18)	16	36



ISOMETRIC VIEW OF BRIDGE BERM
(Girder Bridge shown, others similar)



TYPICAL GRADING PROFILE AT BRIDGE BERM
(Normal to ℄ Abutment at ℄ Roadway)

GENERAL NOTE:

The bridge berm elevation and slope shall be as shown in the structure plans.

September 6, 2006

Published Date: 4th Qtr. 2015	SDDOT	BRIDGE BERM (NONPROJECTING EMBANKMENT)	PLATE NUMBER 120.10*
			Sheet 1 of 1

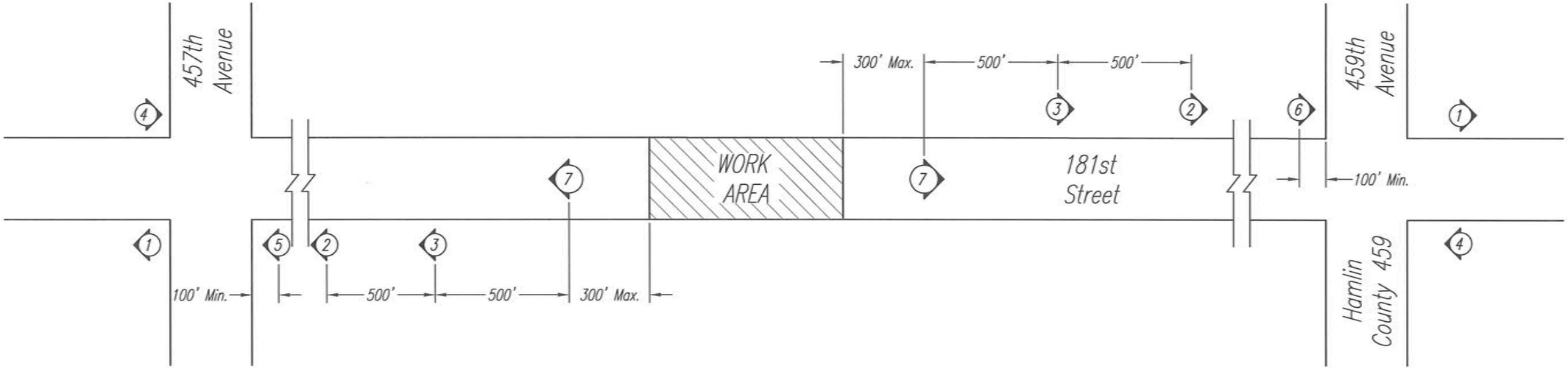
*STRUCTURE DOES NOT HAVE APPROACH SLAB AND WILL NOT REQUIRE THE NECESSARY PROVISIONS ASSOCIATED WITH AN APPROACH SLAB

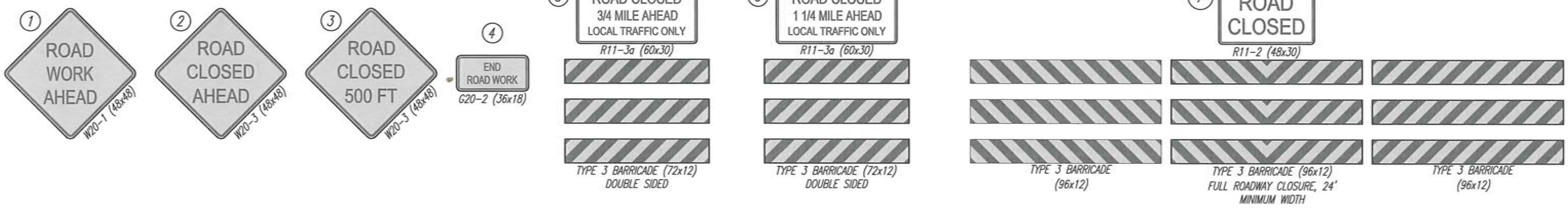
PLANS BY: CLARK ENGINEERING, WATERTOWN, SD

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	BRO 8029(18)	17	36

FOR BIDDING PURPOSES ONLY

TRAFFIC CONTROL AT PROJECT SITE





ITEMIZED LIST FOR TRAFFIC CONTROL SIGNS

		CONVENTIONAL ROAD			
SIGN CODE	SIGN DESCRIPTION	NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
R11-2	ROAD CLOSED	2	48" x 30"	10	20
R11-3a	ROAD CLOSED 3/4 or 1 1/4 MILES AHEAD LOCAL TRAFFIC ONLY	2	60" x 30"	13	26
W20-1	ROAD WORK AHEAD	2	48" x 48"	16	32
W20-3	ROAD CLOSED AHEAD or 500 FT	4	48" x 48"	16	64
G20-2	END ROAD WORK	2	36" x 18"	5	10
		CONVENTIONAL ROAD TRAFFIC CONTROL SIGNS SQFT			152

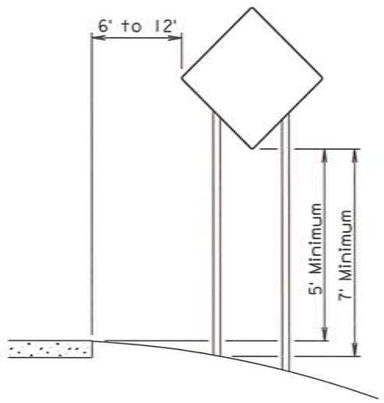
TYPE 3 BARRICADES

ITEM DESCRIPTION	QUANTITY
Type 3 Barricade, 8' Single Sided	6 Each
Type 3 Barricade, 6' Double Sided	2 Each

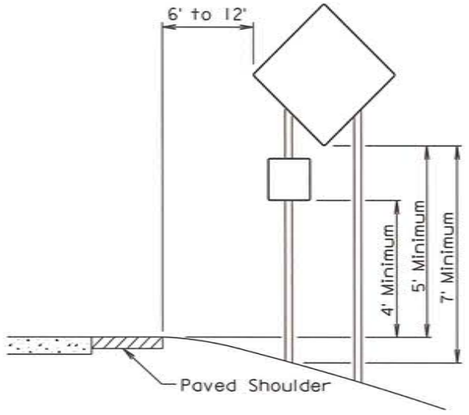
REGISTERED PROFESSIONAL ENGINEER
REG. NO. 10964
VANESSA L. VICTOR
SOUTH DAKOTA
10-15-15

PLANS BY: CLARK ENGINEERING, WATERTOWN, SD

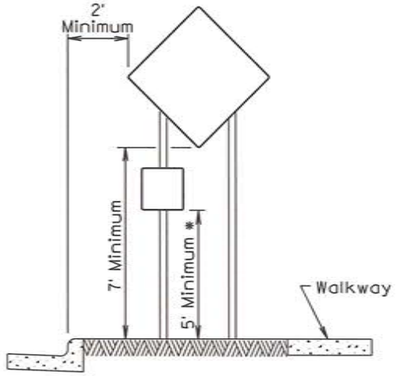
FOR BIDDING PURPOSES ONLY



RURAL DISTRICT

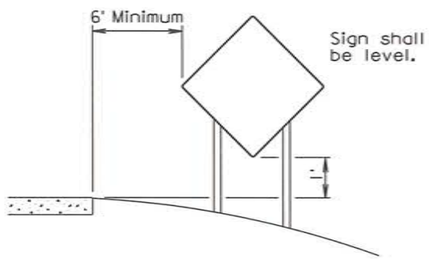


RURAL DISTRICT WITH SUPPLEMENTAL PLATE



URBAN DISTRICT

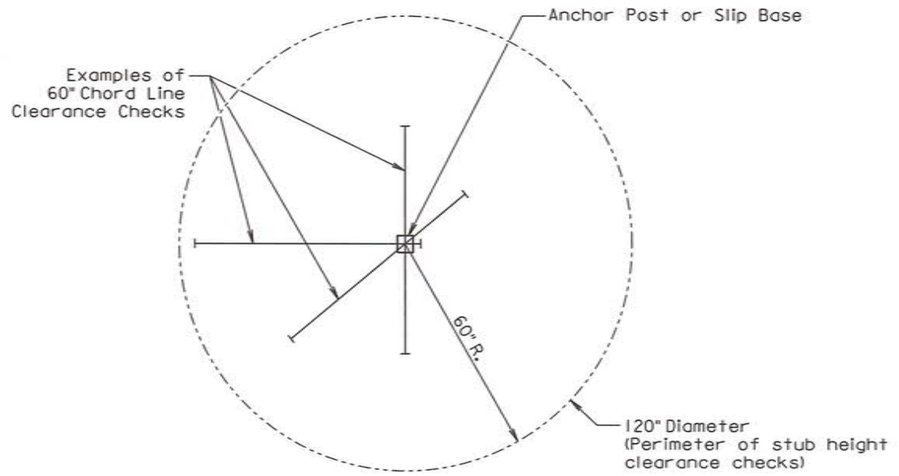
* If the bottom of supplemental plate is mounted lower than 7 feet above a pedestrian walkway, the supplemental plate should not project more than 4" into the pedestrian facility.



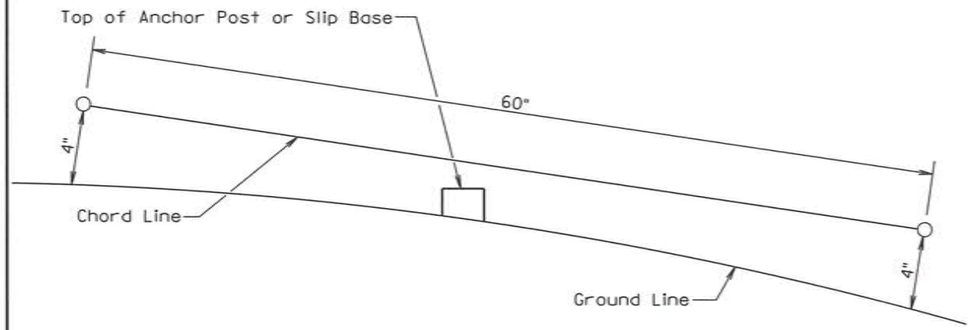
RURAL DISTRICT
3 DAY MAXIMUM
(Not applicable to regulatory signs)

September 22,2014

Published Date: 3rd 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.

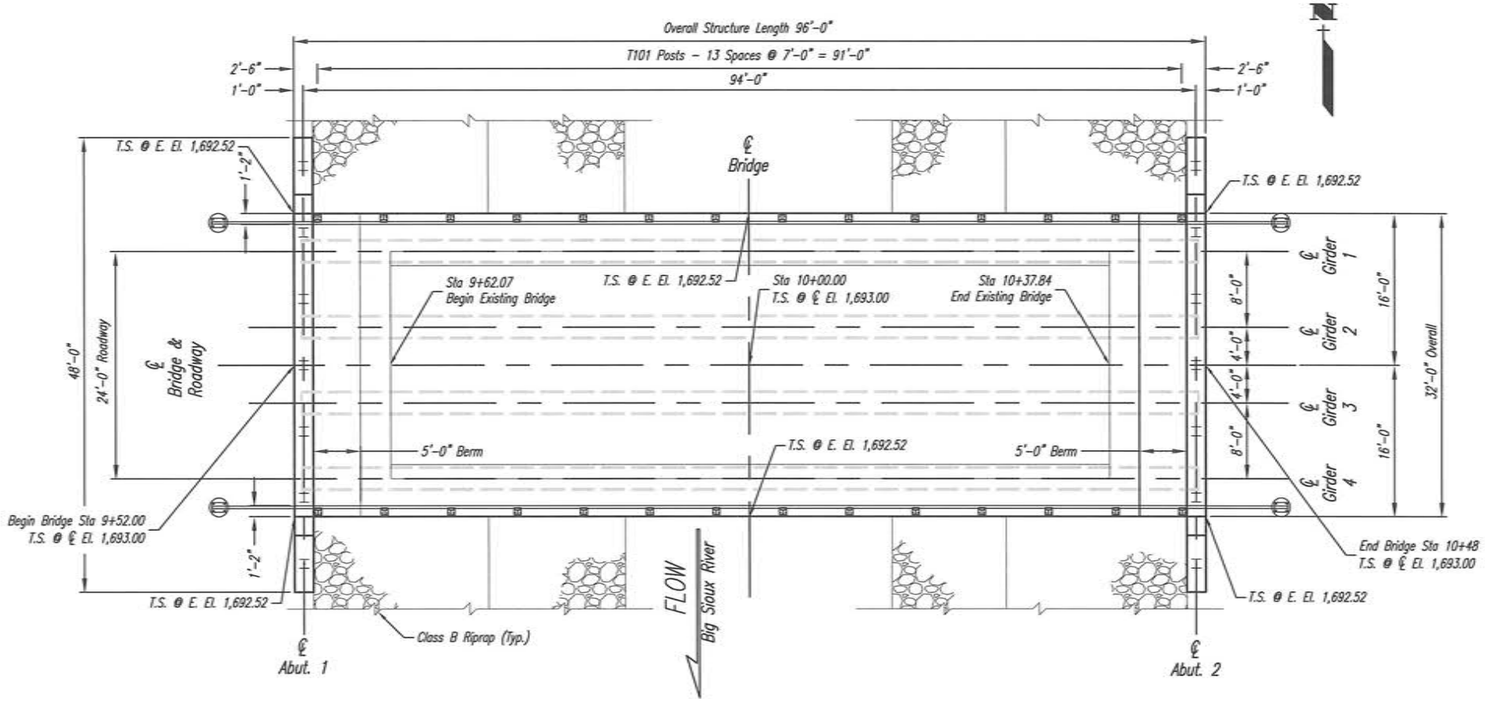
July 1, 2005

Published Date: 3rd Qtr. 2015	SDDOT	BREAKAWAY SUPPORT STUB CLEARANCE	PLATE NUMBER 634.99
			Sheet 1 of 1

THE ELEVATIONS SHOWN ARE BASED UPON NAVD 88 DATUM

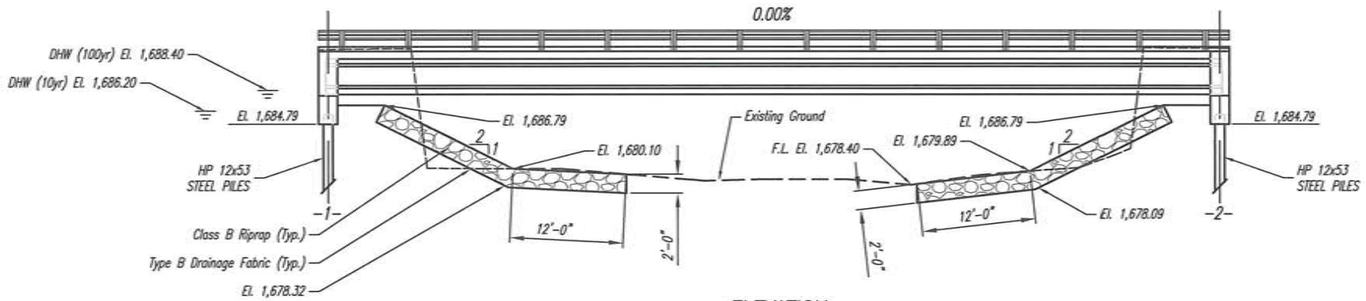
FOR BIDDING PURPOSES ONLY

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	BRO 8029(18)	19	36



PLAN

Notes:
T.S. @ E. El. = Top of Slab @ Edge of Deck Elevation
T.S. @ ℄ El. = Top of Slab @ Centerline of Roadway Elevation



ELEVATION

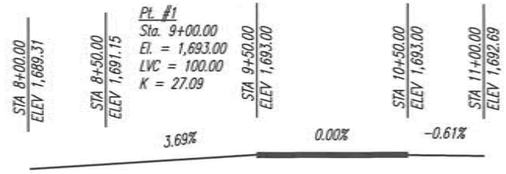
-X081-

INDEX OF BRIDGE SHEETS

ESTIMATED QUANTITIES

ITEM	UNIT	QUANTITY
INCIDENTAL WORK, STRUCTURE	LS	LUMP SUM
STRUCTURAL STEEL, MISCELLANEOUS	LS	LUMP SUM
STRUCTURE EXCAVATION, BRIDGE	CUYD	104
CLASS A45 CONCRETE, BRIDGE DECK	CUYD	87.8
CLASS A45 CONCRETE, BRIDGE	CUYD	49.2
TYPE T101 BRIDGE RAILING	FT	224
REINFORCING STEEL	LB	8,784
EPOXY COATED REINFORCING STEEL	LB	16,458
PREBORING PILE	FT	140
HP 12x53 STEEL TEST PILE, FURNISH & DRIVE	FT	160
HP 12x53 STEEL BEARING PILE, FURNISH & DRIVE	FT	900
45" MINNESOTA SHAPE PRESTRESSED CONCRETE BEAM	FT	377
* CLASS B RIPRAP	TON	760.0
TYPE B DRAINAGE FABRIC	SQYD	948

* FOR ESTIMATING PURPOSES ONLY, A FACTOR OF 1.4 TONS/CUYD WAS USED TO CONVERT CUYDS TO TONS. THE ESTIMATE IS EQUIVALENT TO APPROXIMATELY 542.9 CUYDS.



VERTICAL CURVE DATA
ELEVATIONS SHOWN ARE FINISHED GRADE
ELEVATIONS AT THE CENTERLINE OF THE ROAD

HYDRAULIC DATA	
Qd	2,335 cfs
Ad	449.0 SqFt
Vd	5.2 fps
QF	2,335 cfs
Q100	4,915 cfs
QOTtr	4,383 cfs
Vmax	9.6 fps

Q_d= DESIGN DISCHARGE FOR THE PROPOSED BRIDGE BASED ON 10 YEAR FREQUENCY. ELEV = 1,686.2.
Q_F= DESIGNATED PEAK DISCHARGE FOR THE BASIN APPROACHING PROPOSED PROJECT BASED ON 10 YEAR FREQUENCY.
Q_{100}= COMPUTED DISCHARGE FOR THE BASIN APPROACHING PROPOSED PROJECT BASED ON 100 YEAR FREQUENCY. ELEV = 1,688.4.
Q_{OTtr}= OVERTOPPING DISCHARGE AND FREQUENCY 68 YEAR RECURRENCE INTERVAL. ELEV = 1,687.8 LOCATED APPROXIMATELY 670' WEST OF THE STRUCTURE.
V_{max}= MAXIMUM COMPUTED OUTLET VELOCITY FOR THE PROPOSED BRIDGE BASED ON A 100 YEAR FREQUENCY.

THE HYDRAULIC DATA CONTAINED IN THESE PLANS IS VALID ONLY IF THE OVERFLOW SECTION IS MAINTAINED. ALTERATION OF THE OVERFLOW SECTION WILL REQUIRE RE-ANALYSIS OF THE HYDRAULICS AT THIS SITE TO DETERMINE ITS EFFECT ON PUBLIC SAFETY.

*DENOTES THIS STREAM IS A TOPEKA SHINER HABITAT.

REGISTERED PROFESSIONAL ENGINEER
REG. NO.
10964
VANESSA L.
VICTOR
SOUTH DAKOTA

10-15-15

PLANS BY CLARK ENGINEERING: WATERTOWN, SD

General Drawing & Quantities
FOR
96'-0" Prestressed Girder Bridge

over Big Sioux River* Sec. 15/22-T115N-R52W
29'-8" Roadway BRO 8029(18)
Sta. 9+52.00 to Sta. 10+48.00 0° SKEW
STr. No. 29-218-030 HL-93
PCN 01DT

Hamlin County
S.D. DEPT. OF TRANSPORTATION
OCTOBER 2015

-X081-

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
ARP	ARP/ES	VLV	BRIDGE ENGINEER

FOR BIDDING PURPOSES ONLY

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	BRO 8029(18)	20	36

SPECIFICATIONS FOR BRIDGE

1. Design Specifications: AASHTO LRFD Bridge Design Specifications, 2014 Edition with 2015 interims.
2. Construction Specifications: South Dakota Standard Specifications for Roads and Bridges, 2015 Edition and required provisions, supplemental specifications and special provisions as included in the Proposal.

BRIDGE DESIGN LOADING

1. AASHTO HL-93.
2. Dead Load includes 22 psf for future wearing surface on the roadway.

DESIGN MATERIAL STRENGTHS*

Concrete	f'c = 4,500 psi.
Reinforcing Steel	fy = 60,000 psi
Structural Steel	fy = 36,000 psi
Piling	fy = 50,000 psi

*For prestressed beams, see notes regarding Prestressed Girders.

GENERAL CONSTRUCTION

1. All mild reinforcing steel shall conform to ASTM A615, Grade 60.
2. All exposed concrete corners and edges shall be chamfered 3/4" unless noted otherwise.
3. Use 2" clear cover on all reinforcing steel except as shown.
4. The Contractor shall imprint on the structure the date of new construction as specified and detailed on Standard Plate No. 460.02.
5. Request for construction joints or reinforcing steel splices at points other than those shown, must be submitted to the Engineer for prior approval. If additional splices are approved, no payment will be allowed for the added quantity of reinforcing steel.
6. Surfaces of fresh concrete at construction joints shall be rough floated sufficiently to consolidate the surface. All construction joints shall be cleaned of surface laitance, curing compound and other foreign materials prior to placing fresh concrete against the joint.

NOTICE - LEAD BASED PAINT

Be advised that the paint on the steel surfaces of the existing structures is a paint containing lead. The Contractor should plan his/her operations accordingly, and inform his/her employees of the hazards of lead exposure.

DESIGN MIX OF CONCRETE

1. All structural concrete shall be Class A45 unless otherwise indicated.
2. Type II cement is required, except Type III may be used for the prestressed beams.
3. Coarse aggregate to be used in concrete shall consist of either crushed quartzite or other crushed ledge rock. If crushed ledge rock other than quartzite is to be used, it shall be from a source approved by the Engineer.
4. Grout design mix shall be as specified in Section 460.2K of the *Specifications*. A compressive strength of 2,000 psi shall be attained by the grout prior to erection of any beams. Chamfer edges of grout pads ¾". The quantity of grout is included in and shall be paid for at the contract unit price per cubic yard for "Class A45 Concrete, Bridge."

INCIDENTAL WORK, STRUCTURE

1. In place centerline Sta. 9+62.07 to centerline Sta. 10+37.84 is a 75.7' 1 span steel Pratt thru truss bridge with approximately 23'-6" of clear roadway. The existing structure consists of a timber deck with concrete abutments and steel railings.
2. Break down and remove the existing bridge to 1 foot below finished ground line, or as required to construct new structure in accordance with Section 110 of the *Specifications*. All portions of the existing bridge shall be removed and disposed of by the Contractor on a site obtained by the Contractor and approved by the Engineer in accordance with the Environmental Commitments found elsewhere in these plans.
3. The existing timber deck planks shall be salvaged for future highway related use. The salvaged timber deck planks shall be stockpiled at the Hamlin County Highway Department shop located in Hayti, SD. Hamlin County Highway Department may be contacted at (605) 783-3626. Care shall be taken during the dismantling, transporting, and stockpiling operations not to damage the structure properties of the salvaged items.
4. During demolition of the structure, efforts shall be taken to prevent material from falling into the river.
5. The foregoing is a general description of the in-place bridge and should not be construed to be complete in all details. Before preparing the 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.
6. Costs associated with the foregoing work shall be incidental to the contract lump sum price for "Incidental Work, Structure."

ABUTMENTS

1. Preboring piling at each abutment is required to whichever is greater, ten feet or to natural ground.
2. The HP 12x53 Piling were designed using a factored bearing resistance of 98 tons per pile. Piling shall develop a field verified nominal bearing resistance of 245 tons per pile.
3. One test pile shall be driven at each abutment and will become part of the pile group.
4. The Contractor shall have sufficient pile splice material on hand before pile driving is started. See Standard Plate No. 510.40.
5. Piles shall not be driven out of position by more than two inches in the direction normal to the abutment centerline. A pile-driving template shall be used to insure this accuracy.
6. Abutment backwalls above the construction joint may be cast separately from the deck slab. The concrete used for the backwalls and wings shall be Class A45 Concrete, Bridge. All abutment and bridge deck concrete shall have attained design strength prior to backfilling. Abutment wingwalls shall be cast either concurrently or after the deck has been poured.
7. Each finished abutment shall include a Bridge Survey Marker. See Standard Plate No. 460.05

ABUTMENT BACKWALL COATING

The material for waterproofing the abutment backwall shall be one of the products from the approved products list. The acceptable abutment backwall coating suppliers are listed on the approved products list at the following internet address:
http://apps.sd.gov/applications/HC60ApprovedProducts/ProductList.aspx

The cost for furnishing and applying the coating shall be incidental to the contract unit price per cubic yard for "Class A45 Concrete, Bridge".

PILE DRIVING EQUIPMENT

A drivability analysis was performed using the wave equation analysis program (GRLWEAP). The pile hammers listed below were evaluated and found to produce acceptable driving stresses. Pile hammers not listed will require evaluation and approval prior to use from the Geotechnical Engineering Activity.

Delmag D25-32 Delmag D30-32 SPI D30

PRESTRESSED GIRDERS

1. Minimum concrete compressive strength f'c = 7,500 psi at 28 days for all girders and fci = 7,000 psi for all girders.
2. All mild reinforcing steel shall be deformed bars conforming to ASTM A615, Grade 60.
3. Individual tendons in all pretensioned sections shall consist of seven wire uncoated Type 270K Strands having a nominal diameter of 0.6" and a minimum ultimate strength of 58,600 lbs. per cable. An initial tensile force of 43,500 lbs. shall be applied to all 0.6" cables in all girders. All prestressing steel shall conform to AASHTO M203 (low lax strands).
4. All prestressed girders within a span shall be cast within an 8 day period. If not, the newest girder shall be at least 6 weeks old before the deck slab is poured. The girders shall be poured in all steel forms.
5. Prestressed concrete girders shall always be lifted by the devices provided in the top flanges near the ends of the girders. Types of lifting devices other than those shown on the plans may be used provided they are approved by the Office of Bridge Design. The design of the lifting devices shall be the responsibility of the Fabricator.
6. Each beam shall be marked showing structure number, casting date, and beam number. Marking shall be on the face of the beam near the end and so located that they will be exposed after the diaphragms have been cast. Fascia beams shall be marked on an inside face. All markings shall be stenciled and clearly legible. For beam designations and locations, see Superstructure Details and Slab Form Elevation plan sheets.
7. The physical properties of the elastomeric bearing pads shall conform to the requirements of Section 18.2 of the AASHTO LFRD Bridge Construction Specification and the AASHTO Materials Specification M251.The elastomeric bearing pads shall conform to Grade 70 (durometer).The cost of the pads shall be incidental to the contract unit price per cubic yard for "Class A45 Concrete, Bridge". Certification that pads are 70 durometer and meet the requirements of AASHTO LFRD Bridge Construction Specification Section 18.2 and AASHTO Materials Specification M251 shall be furnished to the Engineer with the shop drawings. No laminated bearing pads will be allowed.
8. All exposed corners shall be chamfered 3/4" or rounded to 3/4" radius.

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 10964
VANESSA L. VICTOR
SOUTH DAKOTA
10-15-15

PLANS BY CLARK ENGINEERING: WATERTOWN, SD

Structure Notes
FOR
96'–0" Prestressed Girder Bridge
over Big Sioux River* Sec. 15/22–T115N–R52W
29'–8" Roadway BRO 8029(18)
Sta. 9+52.00 to Sta. 10+48.00 0° SKEW
Str. No. 29–218–030 HL–93
PCN 01DT

Hamlin County
S.D. DEPT. OF TRANSPORTATION
OCTOBER 2015

–X081–

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
ARP	ARP	VLV	BRIDGE ENGINEER

FOR BIDDING PURPOSES ONLY

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	BRO 8029(18)	21	36

PRESTRESSED GIRDERS (continued)

9. Dead Load of girder is taken as effective at transfer. Cut strands, except those extended and bent, flush with the end of girder and coat end of strands with mortar.
10. The Contractor shall be responsible for ensuring that transportation stresses, handling, and erection do not cause damage to the girders.
11. All costs of furnishing and installing the girders, including reinforcement, cement mortar, hardware, and other items necessary to complete the installation shall be incidental to the contract unit price per foot of "45" Minnesota Shape Prestressed Concrete Beam".
12. For informational purposes only, the approximate weight of each girder is 650 lbs. per ft. = 61,425 lbs±.

SUPERSTRUCTURE

1. Girder lifting hooks shall be cut off before placement of the concrete deck slab.
2. The Contractor shall place the concrete for the specified diaphragms ahead of the deck concrete in such a manner that advancement of the deck concrete reaches the diaphragm just as placement of concrete in the diaphragm is complete.
3. The deck finishing machine shall be adjusted and operated in such a manner that the roller screed or screeds are parallel to the skew of the bridge. Concrete placement in front of the finish machine shall be kept parallel to the machine.
4. The Contractor shall not pour the deck during the day if the forecast high temperature is above 80° F.
5. The bridge deck must be placed and finished continuously at a minimum rate of 32 feet of the deck per hour measured along Centerline Roadway. This rate is exclusive of concrete placed in the diaphragms (see note 2). If concrete cannot be placed and finished at this rate, the Engineer shall order a header installed and operations stopped. Notify the Bridge Construction Engineer if deck pour operations are stopped. Operations may resume only when the Engineer is satisfied that a rate of 32 feet of deck per hour can be achieved and the concrete in the previous pour has attained a minimum compressive strength of 2,000 psi.

CLASS A45 CONCRETE, BRIDGE DECK

1. Concrete used in the bridge deck slab shall be in accordance with the requirements for bridge deck concrete as specified in Section 460.3A of the *Specifications*. In addition, the concrete used in the bridge deck slab shall have Class F Modified Fly Ash substituted for a portion of the cement in accordance with Section 605 of the *Specifications*. The amount to be replaced shall be 20 percent by weight. The ratio of substitution of fly ash to cement shall be 1:1 by weight.

BOLT TESTING

The certified mill test reports for all bolts used on the project shall include the test results for all of the testing specified in section 972.2 D of the *Specifications*. Some of these tests are supplemental tests that must be requested at the time the bolts are ordered. It is the responsibility of the Contractor to notify the bolt supplier of these requirements.

SHOP PLANS

Shop plans are required for both the prestressed girders and any fabricated steel items. The fabricator shall submit shop plans in accordance with the *Specifications*. Send shop plan submittals to Clark Engineering, 114 1st Ave NW, Watertown, SD 57201 (vvictor@clark-eng.com). After review, corrections (if necessary), and approval by Clark Engineering, the Office of Bridge Design will review the submittals, authorize fabrication, arrange for fabrication inspection, and distribute the shop drawings.

FALSEWORK

The Contractor shall be required to include with the Falsework Plans, details for the construction of an adequate "Walk-Way" including railing.

FALL PROTECTION

1. The Contractor shall install a Fall Protection System conforming to OSHA Regulations. When working on the girders prior to decking installation, a Horizontal Lifeline, or other OSHA approved system, shall be installed. The Contractor shall have one Personal Fall Arrest System (PFAS) available for use by a Department Inspector. The PFAS shall be compatible with the installed Fall Protection System.
2. Modifications to any bridge components used to accommodate the Fall Protection System shall be shown on the Falsework Plans and/or the appropriate Shop Plans. Field welding to bridge components will not be allowed. Field placed concrete inserts or drilled-in anchor bolts will be allowed if approved by the Engineer. All costs associated with providing the Fall Protection System shall be incidental to the other contract items.

RIPRAP

Class B Riprap shall be quarried ledge rock; field stone shall not be used.

REGISTERED PROFESSIONAL ENGINEER
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10-15-15

PLANS BY CLARK ENGINEERING: WATERTOWN, SD

Structure Notes
FOR
96'–0" Prestressed Girder Bridge

over Big Sioux River* Sec. 15/22–T115N–R52W
29'–8" Roadway BRO 8029(18)
Sta. 9+52.00 to Sta. 10+48.00 0° SKEW
STr. No. 29–218–030 HL–93
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Hamlin County
S.D. DEPT. OF TRANSPORTATION
OCTOBER 2015

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DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
ARP	ARP	VLV	BRIDGE ENGINEER

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	BRO 8029(18)	22	36

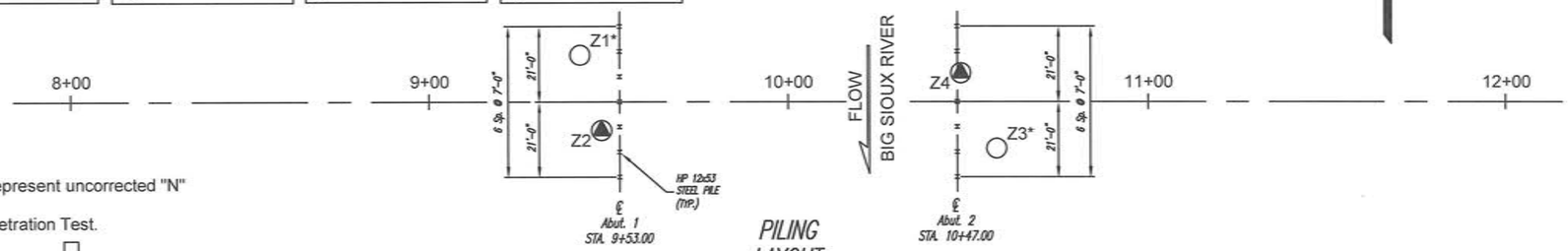
FOR BIDDING PURPOSES ONLY

Hole Number	V2	
Station	23+25	
Depth	64.0	ft
Soil Color	Dark Gray	
Classification	Sand-Clay	
Strength (Q_u)	10,380	psf
Dry Density	113.6	pcf
Wet Density	133.0	pcf
Moisture	17.1	%
Pass No. 10	96.0	%
Pass No. 40	88.1	%
Pass No. 200	69.0	%
Sand Content	27.0	%
Silt Content	32.5	%
Clay Content	36.5	%

Hole Number	V4	
Station	24+19	
Depth	66.0	ft
Soil Color	Dark Gray	
Classification	Sand-Clay	
Strength (Q_u)	7,778	psf
Dry Density	113.0	pcf
Wet Density	133.0	pcf
Moisture	17.7	%
Pass No. 10	96.3	%
Pass No. 40	88.8	%
Pass No. 200	69.6	%
Sand Content	26.6	%
Silt Content	31.1	%
Clay Content	38.5	%

Hole Number	3	
Station	10+58	
Depth	30.2	ft
Soil Color	Grey/Brwn	
Classification	Clay-Silt	
Strength (Q_u)	4,737	psf
Dry Density	114.2	pcf
Wet Density	133.7	pcf
Moisture	17.1	%
Pass No. 10	97.8	%
Pass No. 40	89.0	%
Pass No. 200	62.1	%
Sand Content	35.7	%
Silt Content	32.6	%
Clay Content	29.6	%

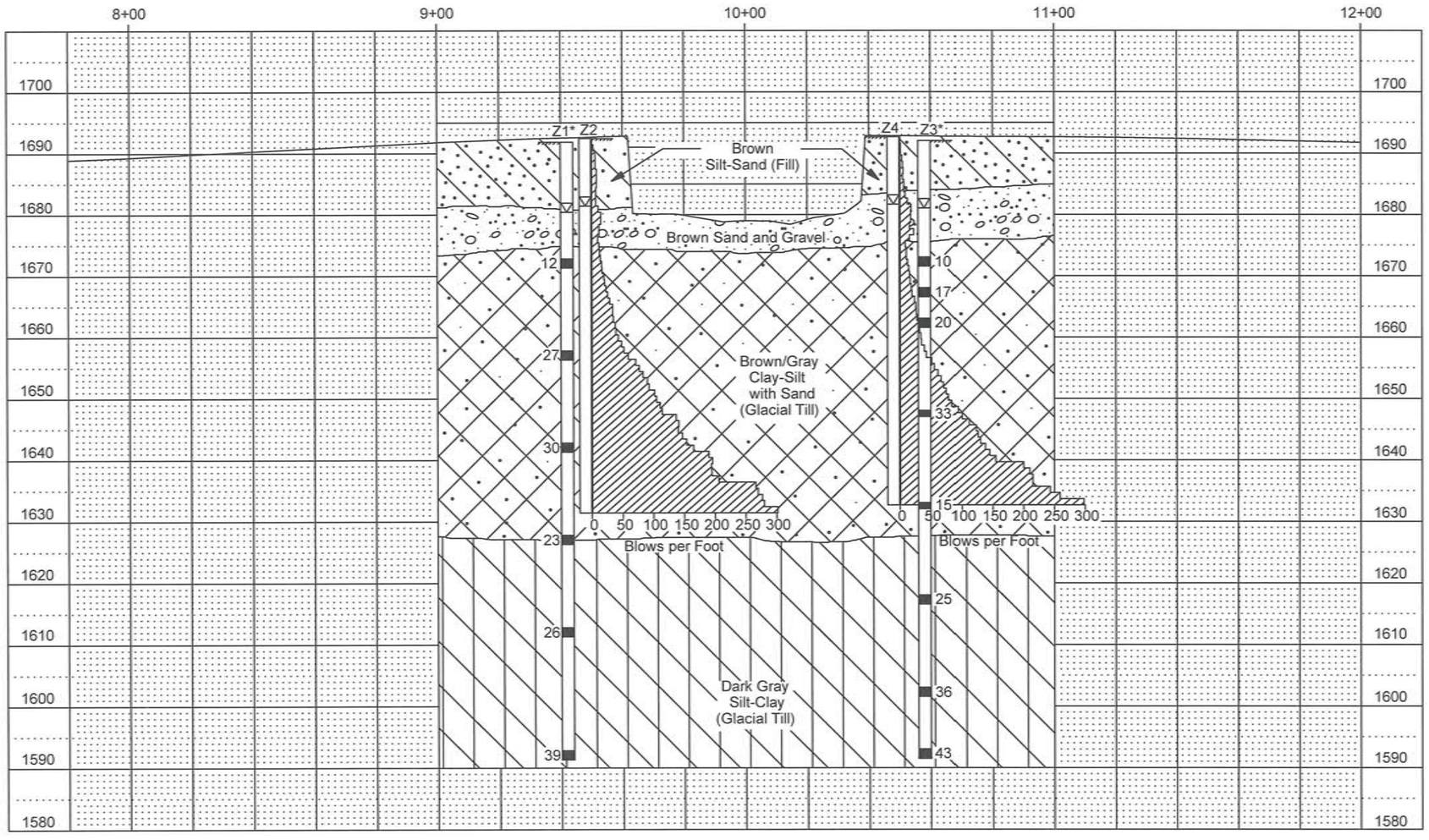
Hole Number	3	
Station	10+58	
Depth	74.8	ft
Soil Color	Dark Gray	
Classification	Silt-Clay	
Strength (Q_u)	4,686	psf
Dry Density	99.8	pcf
Wet Density	124.7	pcf
Moisture	24.9	%
Pass No. 10	99.9	%
Pass No. 40	97.8	%
Pass No. 200	88.0	%
Sand Content	11.9	%
Silt Content	45.8	%
Clay Content	42.2	%



PILING LAYOUT

* Values represent uncorrected "N" values from Penetration Test.

Sample Zone — 48 Blows Per Foot



Glaciated Terrain contains all sizes of natural mineral sediment ranging from clay to boulders. Streams originating in or flowing through glaciated topography contain sediment loads derived from glaciated sources. Stream and river crossings contain sediment naturally sorted and randomly concentrated. Alluvial sediment located at this project location may have concentrated coarser gravel such as pebbles, cobbles, and boulders. The borings shown only represent material that was found at the exact location of the small diameter drill hole. Coarse granular material may be present in areas not penetrated by the depicted borings.

The Geotechnical Engineering Activity has on file all of the boring logs for this project. These logs and additional results of laboratory test, if any, are available for review at the Central Office in Pierre.

LEGEND

- ○ Penetration Test
- ◭ Drive Test
- ▽ Water
- ⊖ Caved
- ▮ Sample Zone

Drive test are conducted by dropping a 490 pound hammer 30 inches to drive a $2\frac{7}{8}$ inch drill stem to measure the resistance to penetration of the soil.

Penetration test holes are drilled with a $6\frac{5}{8}$ inch diameter hollow stem auger. Penetration tests are conducted by dropping a 140 pound hammer 30 inches to obtain 2 inch nominal diameter samples and to measure the resistance to penetration of the soil.

GROUND WATER ELEVATIONS

as of SEPTEMBER 2014

Z1	1680.4
Z2	1681.4
Z3	1681.1
Z4	1681.7

MEASURED SKIN FRICTION

	ELEV.	PSF
Z2	1631.4	711
Z4	1632.7	678

Subsurface Investigation & Piling Layout FOR 96'–0" Prestressed Girder Bridge

over Big Sioux River* Sec. 15/22–T115N–R52W
29'–8" Roadway BRO 8029(18)
Sta. 9+52.00 to 10+48.00 0° SKEW
Str. No. 29–218–030 HL–93
PCN 01DT

Hamlin County
S.D. DEPT. OF TRANSPORTATION
OCTOBER 2015

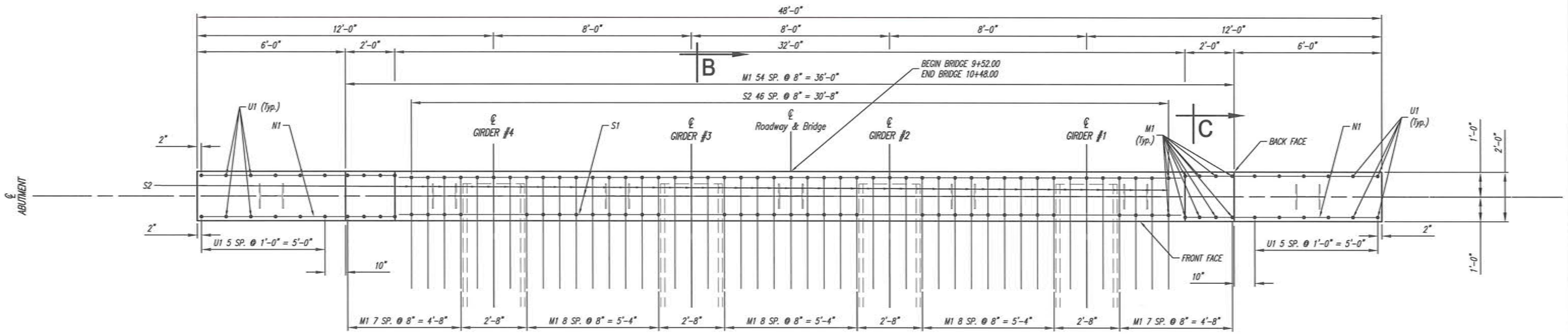
–X081–

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
	JL	JW	BRIDGE ENGINEER

PLANS BY CLARK ENGINEERING: WATERTOWN, SD

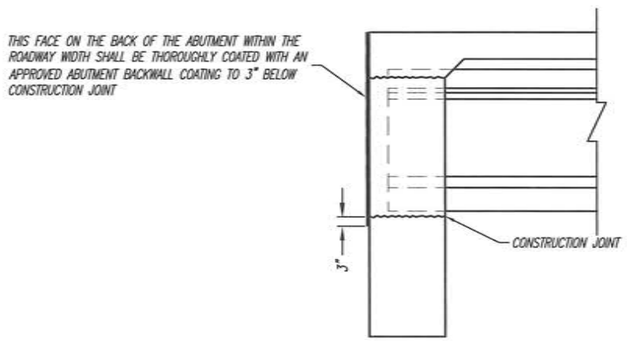
FOR BIDDING PURPOSES ONLY

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	BRO 8029(18)	23	36



PLAN

(ABUT. #1 SHOWN, ABUT #2 OPPOSITE HAND)
E & G BARS IN BACKWALL NOT SHOWN FOR CLARITY



BACKWALL COATING DETAIL

NOTE: USE THIS SHEET IN CONJUNCTION WITH SHEET 6 & 7.

REGISTERED PROFESSIONAL ENGINEER
REG. NO.
10964
VANESSA L.
VICTOR
SOUTH DAKOTA

10-15-15

PLANS BY CLARK ENGINEERING: WATERTOWN, SD

Abutment Details (1 of 3)
FOR
96'-0" Prestressed Girder Bridge

over Big Sioux River* Sec. 15/22-T115N-R52W
29'-8" Roadway BRO 8029(18)
Sta. 9+52.00 to 10+48.00 0° SKEW
Str. No. 29-218-030 HL-93
PCN 01DT

Hamlin County
S.D. DEPT. OF TRANSPORTATION
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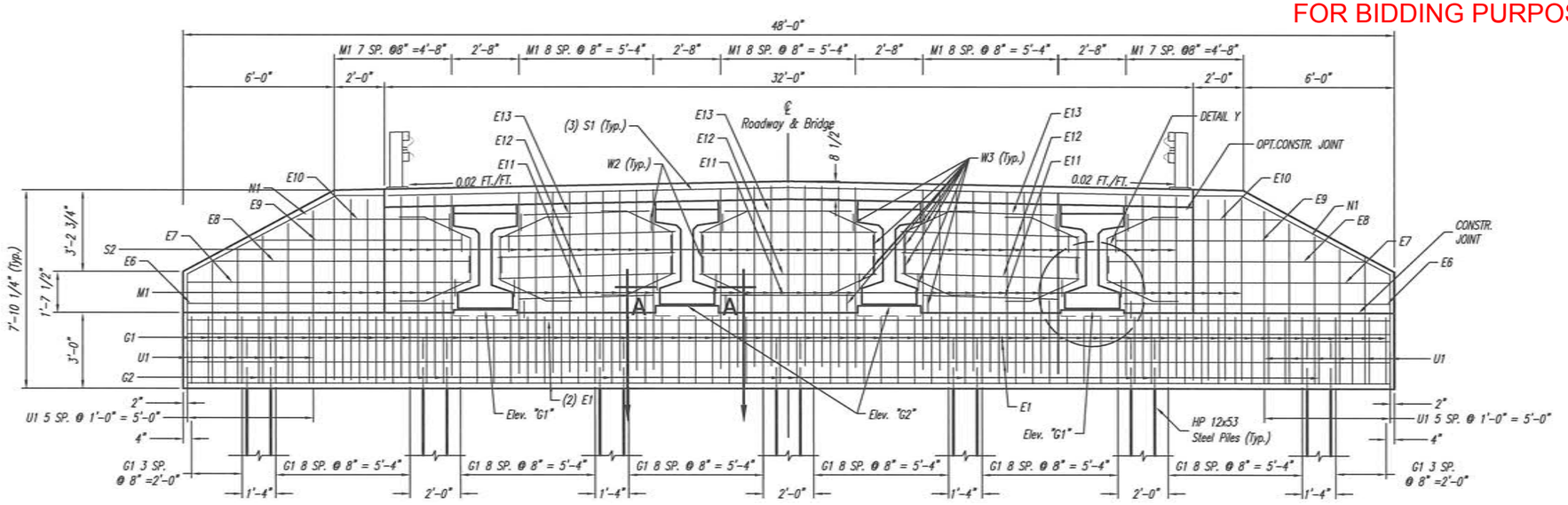
DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
ARP	ARP/EGS	VLV	BRIDGE ENGINEER

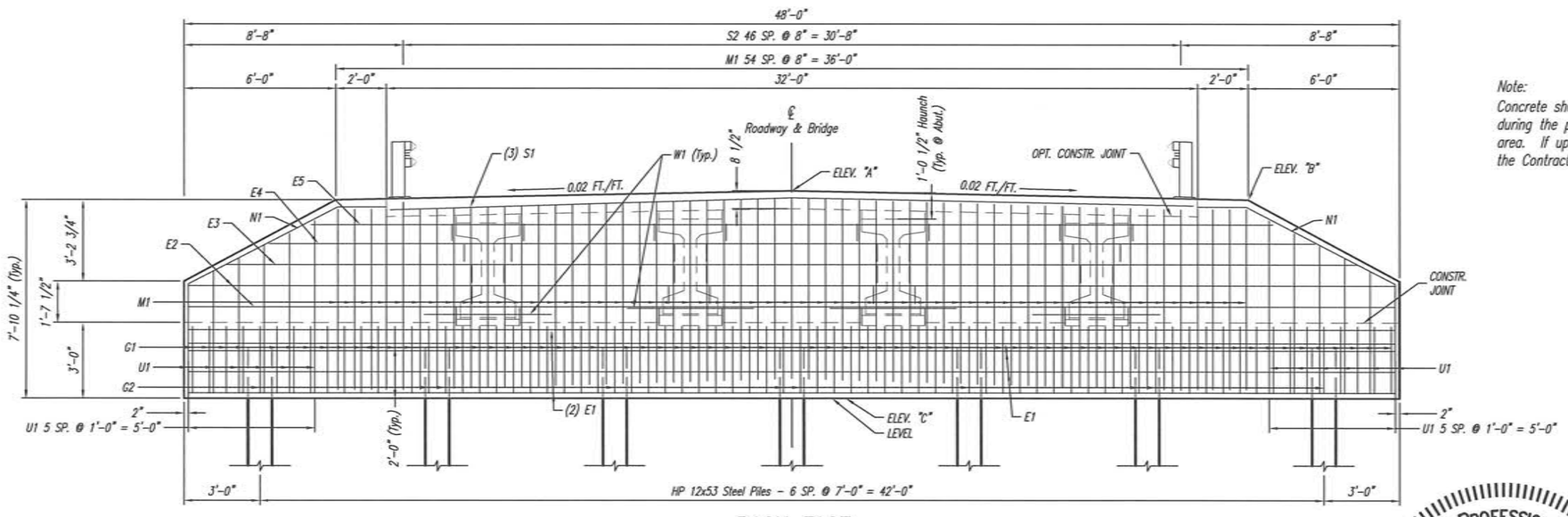
STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	BRO 8029(18)	24	36

FOR BIDDING PURPOSES ONLY



FRONT FACE

(ABUT. #1 SHOWN, ABUT #2 OPPOSITE HAND)



BACK FACE

(ABUT. #1 SHOWN, ABUT #2 OPPOSITE HAND)

Note:
Concrete shall be placed in the space under the beams (within the backwall width) during the pour. Care shall be taken to get the concrete consolidated into this area. If upon form removal the space is not completely filled and consolidated, the Contractor shall grout in the remaining voids.

TABLE OF ELEVATIONS

ABUTMENT	ELEV. 'A'	ELEV. 'B'	ELEV. 'C'	ELEV. 'G1'	ELEV. 'G2'
NO. 1	1,693.00	1,692.64	1,684.79	1,687.91	1,688.07
NO. 2	1,693.00	1,692.64	1,684.79	1,687.91	1,688.07

ELEVATIONS 'A' AND 'B' ARE AT THE TOP OF THE DECK SLAB. ELEVATIONS 'C' IS AT THE BOTTOM OF THE ABUTMENT CAP. ELEVATIONS 'G1' AND 'G2' ARE AT THE TOP OF THE GROUT PAD AT THE CENTER OF THE ABUTMENT, ALONG THE CENTERLINE OF THE GIRDER.

NOTE: USE THIS SHEET IN CONJUNCTION WITH SHEET 5 & 7.

REGISTERED PROFESSIONAL ENGINEER
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10-15-15

PLANS BY CLARK ENGINEERING: WATERTOWN, SD

Abutment Details (2 of 3)
FOR
96'–0" Prestressed Girder Bridge

over Big Sioux River* Sec. 15/22–T115N–R52W
29'–8" Roadway BRO 8029(18)
Sta. 9+52.00 to 10+48.00 0° SKEW
Str. No. 29–218–030 HL–93
PCN 01DT

Hamlin County
S.D. DEPT. OF TRANSPORTATION
OCTOBER 2015

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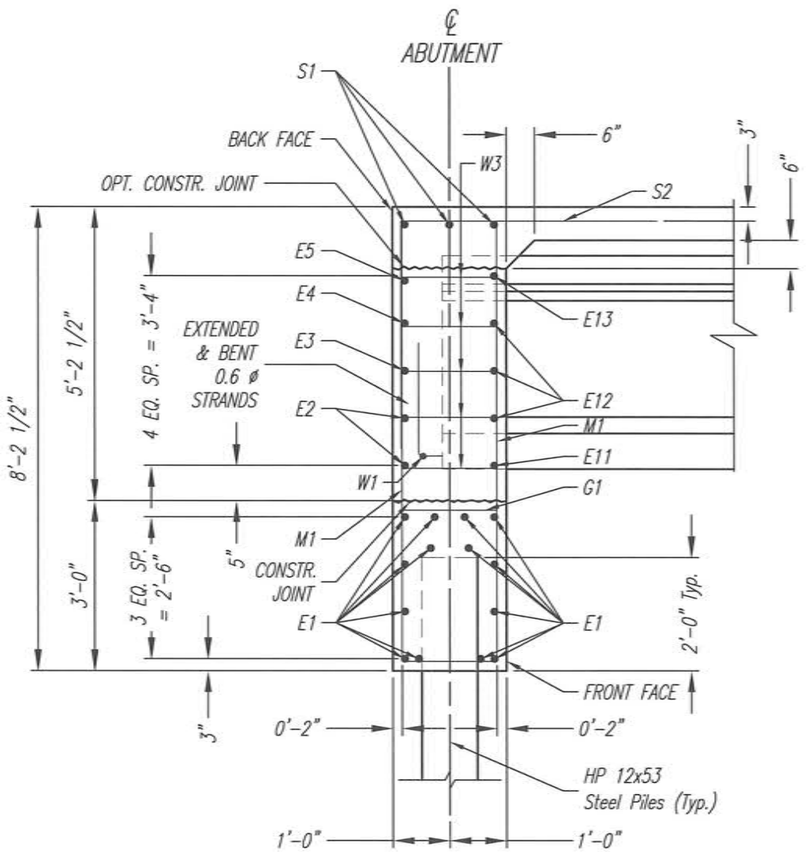
–X081–

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
ARP	ARP/EGS	VLV	BRIDGE ENGINEER

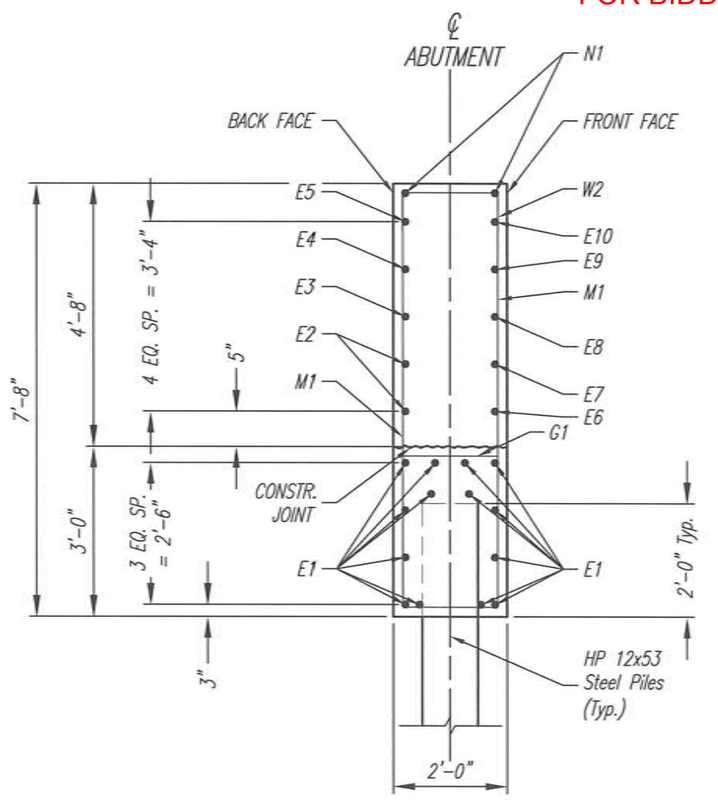
STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	BRO 8029(18)	25	36

FOR BIDDING PURPOSES ONLY

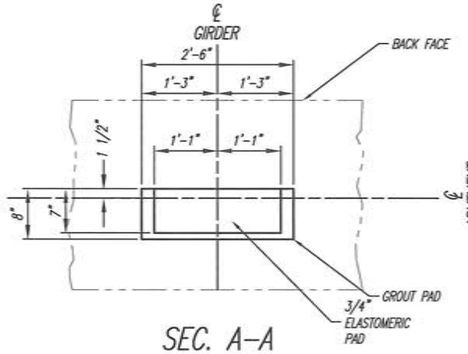


SEC. B–B

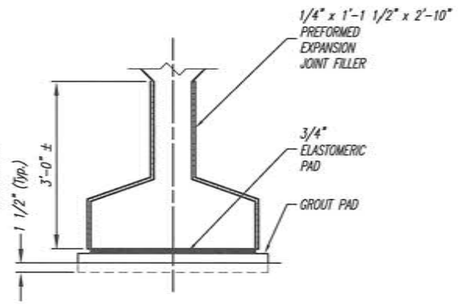
SHOWN @ ℄ OF ABUT.



SEC. C–C



SEC. A–A



DETAIL Y

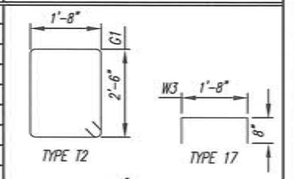
(TYPICAL AT GIRDER ENDS)

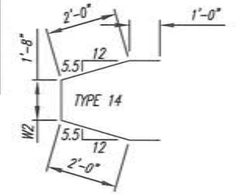
NOTE: USE THIS SHEET IN CONJUNCTION WITH SHEET 5 & 6.

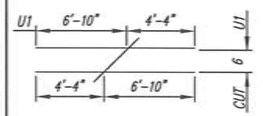
REINFORCING SCHEDULE

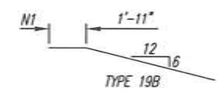
(FOR ONE ABUTMENT)

MK.	NO.	SIZE	LENGTH	TYPE	BENDING DETAILS
E1	14	9	47'-8"	STR.	
E2	2	5	47'-8"	STR.	
E3	1	5	44'-8"	STR.	
E4	1	5	41'-3"	STR.	
E5	1	5	38'-0"	STR.	
E6	2	5	10'-7"	STR.	
E7	2	5	11'-3"	STR.	
E8	2	5	10'-3"	STR.	
E9	2	5	8'-2"	STR.	
E10	2	5	6'-0"	STR.	
E11	3	5	5'-4"	STR.	
E12	9	5	7'-0"	STR.	
E13	3	5	5'-0"	STR.	
G1	62	5	9'-1"	T2	
G2	10	5	8'-1"	S6	
M1	98	5	7'-1"	STR.	
N1	4	4	8'-6"	19B	
Δ S1	3	8	31'-8"	STR.	
Δ S2	47	5	8'-0"	17A	
* U1	12	5	11'-2"	STR.	
W1	4	5	5'-0"	STR.	
W2	8	4	7'-8"	14	
W3	40	4	3'-0"	17	









* SEE CUTTING DIAGRAM.

Δ BARS TO BE EPOXY COATED

NOTE: ALL DIMENSIONS ARE OUT TO OUT OF BARS

ESTIMATED QUANTITIES

ITEM	UNIT	QUANTITY ABUT. NO. 1	QUANTITY ABUT. NO. 2
STRUCTURE EXCAVATION, BRIDGE	CUYD	52.1	52.1
CLASS A45 CONCRETE, BRIDGE	CUYD	24.6	24.6
REINFORCING STEEL	LB	4,392	4,392
EPOXY COATED REINFORCING STEEL	LB	646	646
PREBORING PILING	FT	7 @ 10' = 70'	7 @ 10' = 70'
HP 12x53 STEEL TEST PILE, FURNISH AND DRIVE	FT	1 @ 80' = 80'	1 @ 80' = 80'
HP 12x53 STEEL BEARING PILE, FURNISH AND DRIVE	FT	6 @ 75' = 450'	6 @ 75' = 450'

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 10964
VANESSA L. VICTOR
SOUTH DAKOTA

10-15-15

PLANS BY CLARK ENGINEERING: WATERTOWN, SD

Abutment Details (3 of 3)

FOR

96'–0" Prestressed Girder Bridge

over Big Sioux River* Sec. 15/22–T115N–R52W

29'–8" Roadway BRO 8029(18)

Sta. 9+52.00 to 10+48.00 0° SKEW

Str. No. 29–218–030 HL–93

PCN 01DT

Hamlin County

S.D. DEPT. OF TRANSPORTATION

OCTOBER 2015

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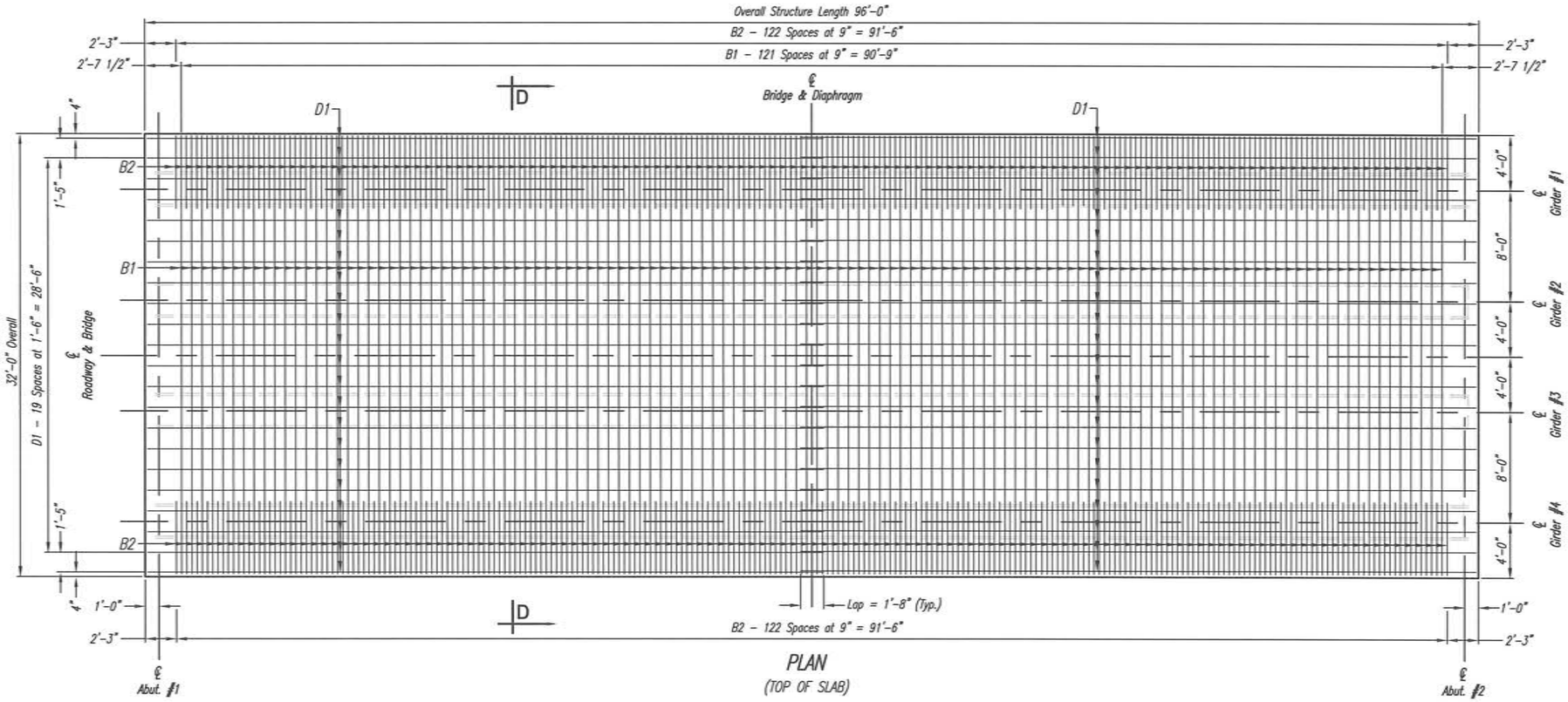
–X081–

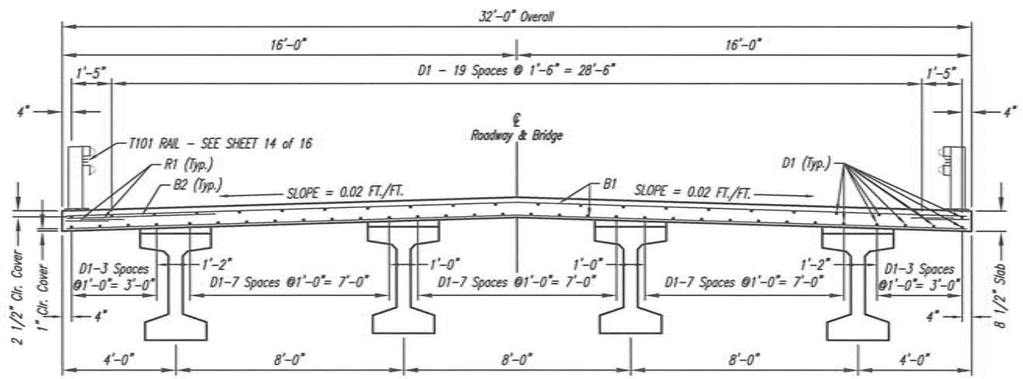
DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
ARP	ARP/EGS	VLV	BRIDGE ENGINEER

FOR BIDDING PURPOSES ONLY

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	BRO 8029(18)	26	36



PLAN
(TOP OF SLAB)



SEC. D-D

NOTE: USE THIS SHEET IN CONJUNCTION WITH SHEET 9.

Superstructure Details (1 of 2)
FOR
96'-0" Prestressed Girder Bridge

over Big Sioux River* Sec. 15/22-T115N-R52W
29'-8" Roadway Bro 8029(18)
Sta. 9+52.00 to 10+48.00 0° SKEW
Str. No. 29-218-030 HL-93
PCN 01DT

Hamlin County
S.D. DEPT. OF TRANSPORTATION
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REGISTERED PROFESSIONAL ENGINEER
REG. NO. 10964
VANESSA L. VICTOR
SOUTH DAKOTA

10-15-15

PLANS BY CLARK ENGINEERING: WATERTOWN, SD

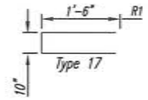
DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
ARP	ARP/EGS	VLV	BRIDGE ENGINEER

FOR BIDDING PURPOSES ONLY

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	BRO 8029(18)	27	36

REINFORCING SCHEDULE

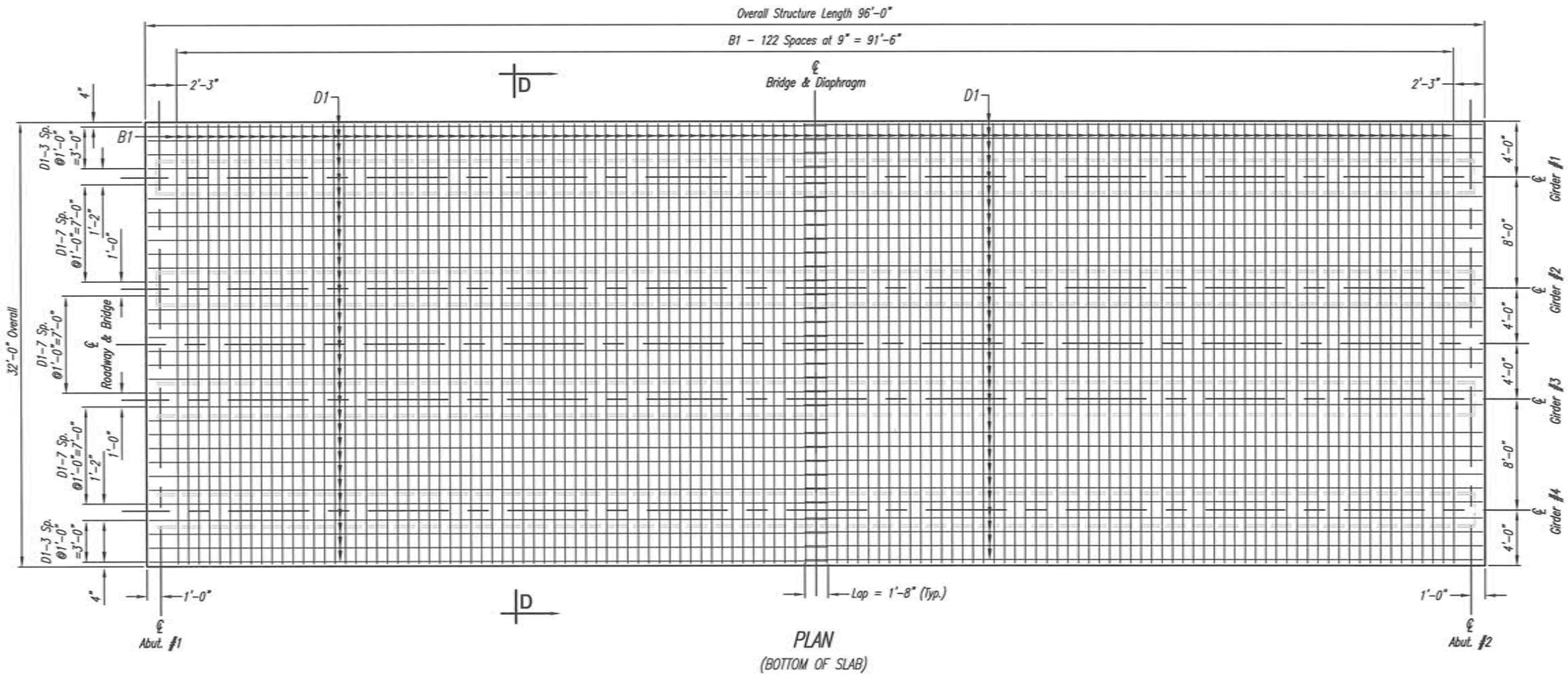
MK.	NO.	SIZE	LENGTH	TYPE	BENDING DETAILS
* B1	245	5	31'-9"	STR.	
B2	246	5	5'-3"	STR.	
D1	108	5	48'-8"	STR.	
R1	56	5	3'-10"	17	



* BEND AS NECESSARY TO FIT
ALL BARS TO BE EPOXY COATED
NOTE: ALL DIMENSIONS ARE OUT TO OUT OF BARS

ESTIMATED QUANTITIES

ITEM	UNIT	QUANTITY
CLASS A45 CONCRETE, BRIDGE DECK	CUYD	87.8
EPOXY COATED REINFORCING STEEL	LB	15,166
45" MINNESOTA SHAPE PRESTRESSED CONCRETE BEAM	FT	377.0'



PLAN
(BOTTOM OF SLAB)

NOTE: USE THIS SHEET IN CONJUNCTION WITH SHEET 8.

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 10964
VANESSA L. VICTOR
SOUTH DAKOTA
10-15-15

PLANS BY CLARK ENGINEERING: WATERTOWN, SD

Superstructure Details (2 of 2)
FOR
96'–0" Prestressed Girder Bridge

over Big Sioux River* Sec. 15/22–T115N–R52W
29'–8" Roadway Bro 8029(18)
Sta. 9+52.00 to 10+48.00 0° SKEW
Str. No. 29–218–030 HL–93
PCN 01DT

Hamlin County
S.D. DEPT. OF TRANSPORTATION
OCTOBER 2015

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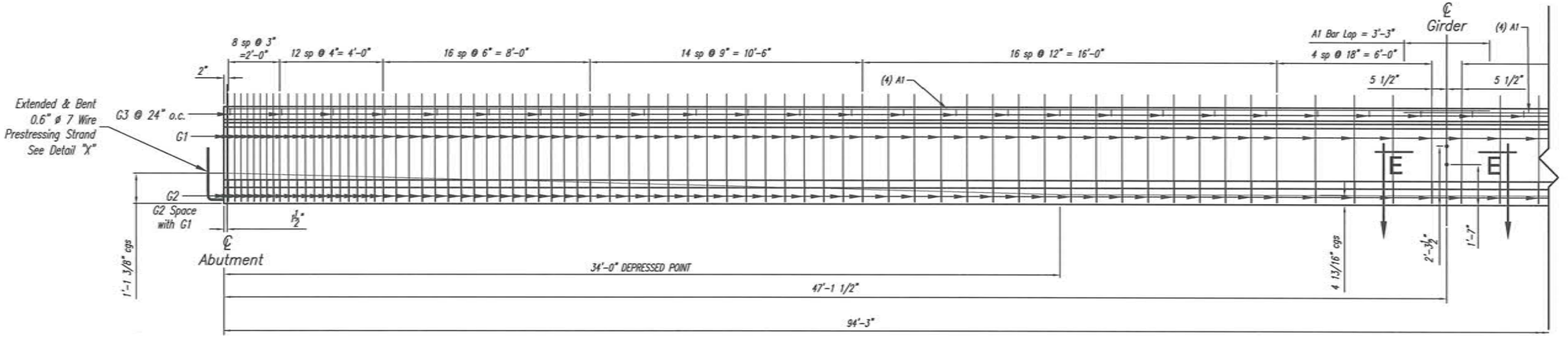
DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
ARP	ARP/EGS	VLV	BRIDGE ENGINEER

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	BRO 8029(18)	28	36

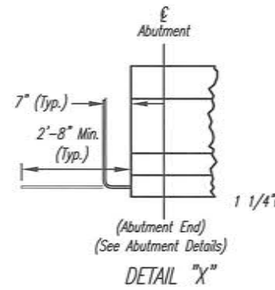
FOR BIDDING PURPOSES ONLY



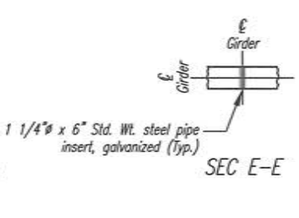
ELEVATION

94'-3" GIRDER
(34- 0.6" ø Type 270K Low Lax Strands)

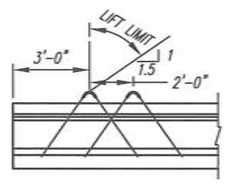
NOTE: GIRDER IS SYMMETRICAL ABOUT CENTERLINE



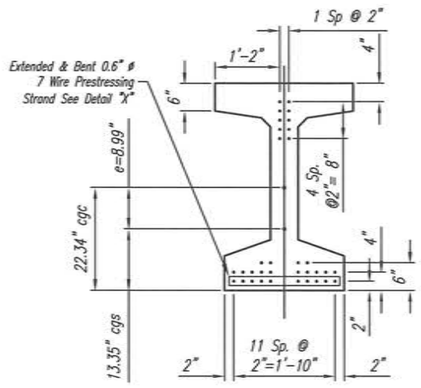
DETAIL "X"



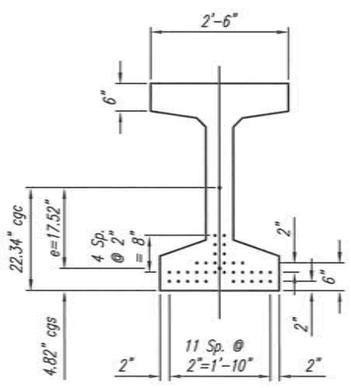
SEC E-E



TYPICAL LIFTING DEVICE

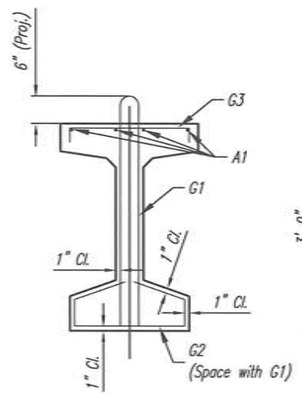


SECTION VIEW AT END

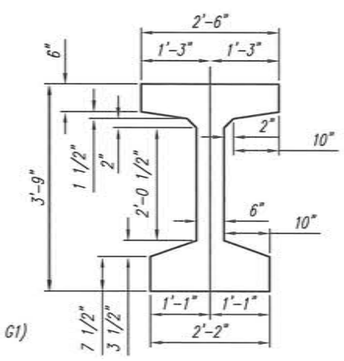


SECTION VIEW AT MIDSPAN

cgs = Center of Gravity of Prestressing Steel
cgc = Center of Gravity of Concrete



STIRRUP DETAILS

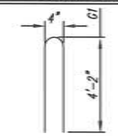


TYPE 45 GIRDER

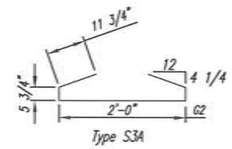
REINFORCING SCHEDULE
(FOR ONE GIRDER)

MK.	NO.	SIZE	LENGTH	TYPE	BENDING DETAILS
A1	8	8	48'-7"	STR.	
G1	142	5	8'-6"	S11	
G2	142	4	4'-11"	S3A	
G3	48	4	2'-8"	17	

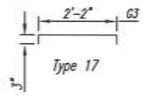
NOTE: ALL DIMENSIONS ARE OUT TO OUT OF BARS.



Type S11



Type S3A



Type 17

94'-3" Girder Details
FOR
96'-0" Prestressed Girder Bridge

over Big Sioux River* Sec. 15/22-T115N-R52W
29'-8" Roadway BRO 8029(18)
Sta. 9+52.00 to 10+48.00 0° SKEW
Str. No. 29-218-030 HL-93
PCN 01DT

Hamlin County
S.D. DEPT. OF TRANSPORTATION
OCTOBER 2015

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REGISTERED PROFESSIONAL ENGINEER
REG. NO.
10964
VANESSA L.
VICTOR
SOUTH DAKOTA

10-15-15

PLANS BY CLARK ENGINEERING: WATERTOWN, SD

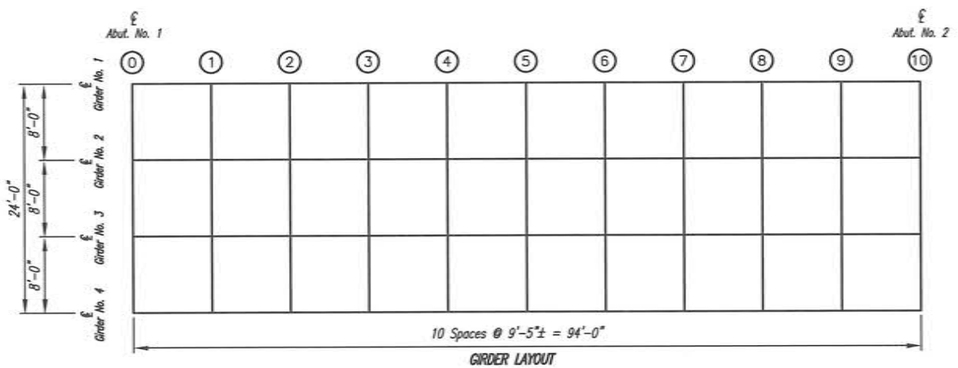
DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
VLV	VLV	ARP	BRIDGE ENGINEER

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	BRO 8029(18)	29	36

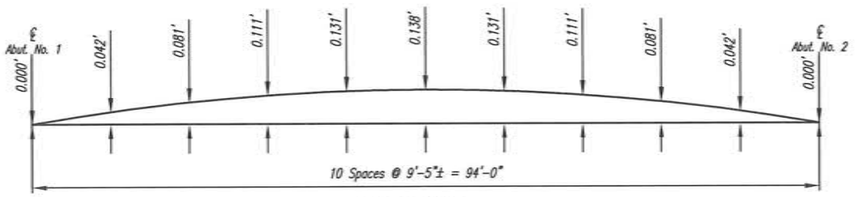
FOR BIDDING PURPOSES ONLY

TABLE OF SLAB FORM ELEVATIONS AND CALCULATIONS

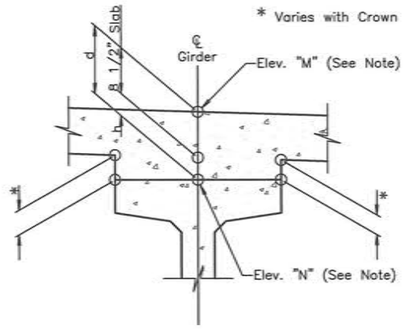
		0	1	2	3	4	5	6	7	8	9	10
Girder No. 1	Elev. "M"	1692.64	1692.68	1692.72	1692.75	1692.77	1692.78	1692.77	1692.75	1692.72	1692.68	1692.64
	(–) Elev. "N"											
	(=) d											
	(–) 0.708'											
	(=) h											
Girder No. 2	Elev. "M"	1692.88	1692.92	1692.96	1692.99	1693.01	1693.02	1693.01	1692.99	1692.96	1692.92	1692.88
	(–) Elev. "N"											
	(=) d											
	(–) 0.708'											
	(=) h											
Girder No. 3	Elev. "M"	1692.88	1692.92	1692.96	1692.99	1693.01	1693.02	1693.01	1692.99	1692.96	1692.92	1692.88
	(–) Elev. "N"											
	(=) d											
	(–) 0.708'											
	(=) h											
Girder No. 4	Elev. "M"	1692.64	1692.68	1692.72	1692.75	1692.77	1692.78	1692.77	1692.75	1692.72	1692.68	1692.64
	(–) Elev. "N"											
	(=) d											
	(–) 0.708'											
	(=) h											



GIRDER LAYOUT



CAMBER DIAGRAM



The table contains the information necessary to determine the depth of concrete over the girders at points shown. Calculations may be carried in the spaces provided. Elev. "M" is the design elevation of the top of the slab before any concrete has been poured. This elevation includes correction for camber and dead load deflection. Elev. "N" is a field measured elevation taken on top of girders at the points shown with the girders in their positions. This elevation must be taken after erection is completed, but prior to placing any of the deck concrete. Girders shall not be supported between bearings when elevations are taken.

The Camber shown is the amount which has been added to the theoretical slab elevations to get slab elevations shown in the table of Slab Form Elevations and Calculations. Camber shown is for D.L. of slab and camber growth, but does not include initial beam camber at erection and D.L. of beams.

Based on a "d" of 12 1/2" at the ℄ of each abutment. It is anticipated that the midspan haunch dimension "h" for each girder at the ℄ of the span will be 1". If when computing the dimensions in the table, it is found that any dimension "h" is less than zero or greater than 4" the office of Bridge Design of the South Dakota Department of Transportation shall be notified immediately. After the "Table of Slab Form Elevations and Calculations" has been filled out and approved for deck forming, a copy must be forwarded to the Office of Bridge Design for review and analysis for the purpose of securing information relative to camber growth in the beams. This information is necessary for preparing plans for future structures of this type.

REGISTERED PROFESSIONAL ENGINEER
REG. NO.
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VANESSA L.
VICTOR
SOUTH DAKOTA

10-15-15

PLANS BY CLARK ENGINEERING: WATERTOWN, SD

Slab Form Elevations
FOR
96'–0" Prestressed Girder Bridge

over Big Sioux River* Sec. 15/22–T115N–R52W
29'–8" Roadway BRO 8029(18)
Sta. 9+52.00 to 10+48.00 0° SKEW
Str. No. 29–218–030 HL–93
PCN 01DT

Hamlin County
S.D. DEPT. OF TRANSPORTATION
OCTOBER 2015

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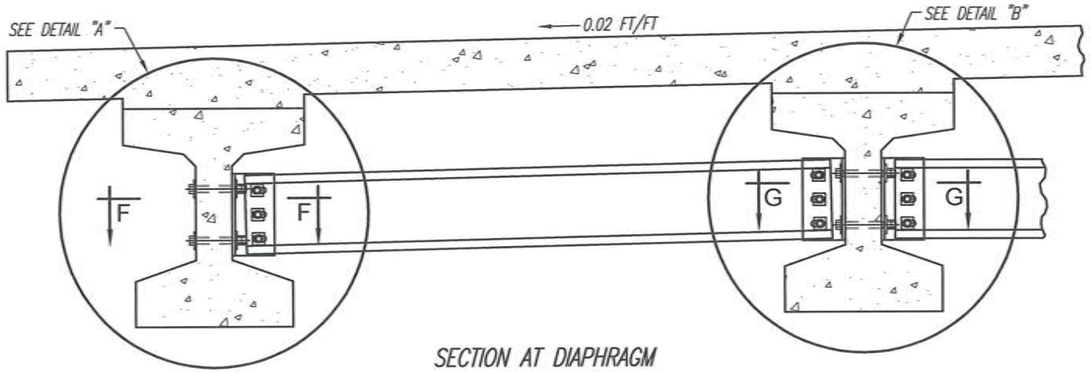
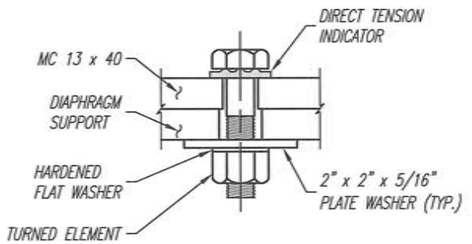
DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
VLV	VLV	ARP	BRIDGE ENGINEER

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	BRO 8029(18)	30	36

FOR BIDDING PURPOSES ONLY



SECTION AT DIAPHRAGM



DIRECT TENSION INDICATOR DETAIL

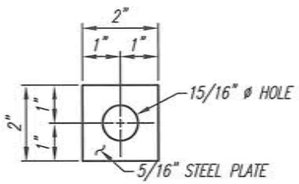


PLATE WASHER DETAIL

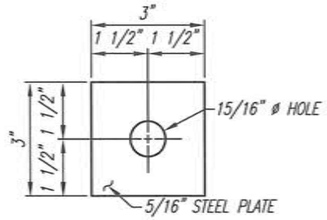
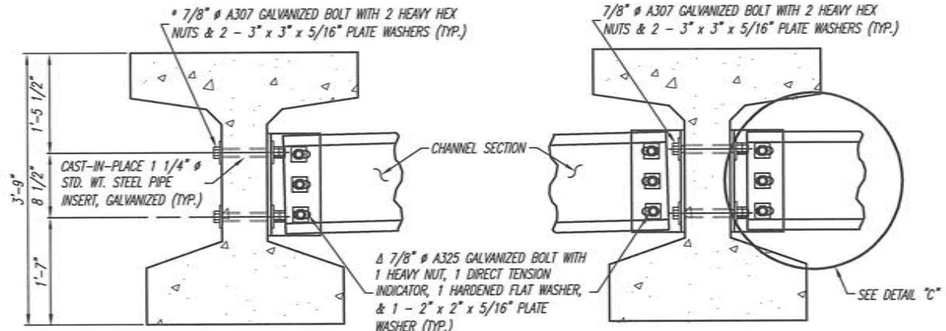
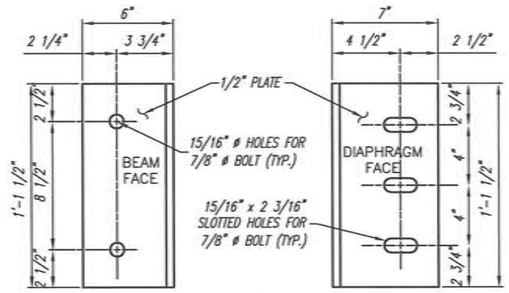


PLATE WASHER DETAIL

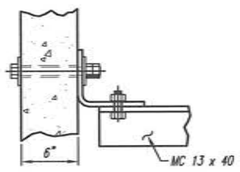


DETAIL "A"
(TYP. EXTERIOR GIRDER)

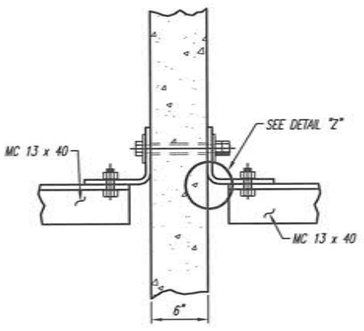
DETAIL "B"
(TYP. INTERIOR GIRDER)



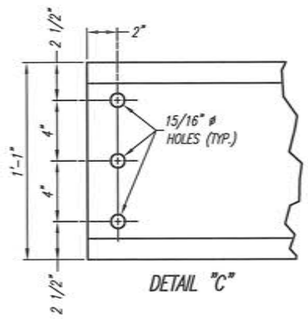
DIAPHRAGM SUPPORT



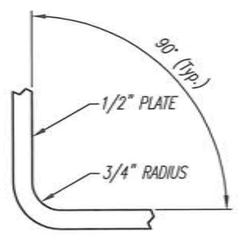
SEC. F-F



SEC. G-G



DETAIL "C"



DETAIL "Z"

* BOLT HEAD AND 3" x 3" x 5/16" PLATE WASHER SHALL BE ADJACENT TO THE EXTERIOR FACE OF THE EXTERIOR GIRDER.

Δ BOLT HEAD & DIRECT TENSION INDICATOR SHALL BE ADJACENT TO 15/16" ø HOLES IN CHANNEL SECTION.

NOTE: USE THIS SHEET IN CONJUNCTION WITH SHEET 10.

NOTES:

1. ALL STEEL FOR THE DIAPHRAGMS INCLUDING PLATE WASHERS SHALL CONFORM TO ASTM A36 AND SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A123. BOLTS, NUTS, AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A2329
2. THE STEEL DIAPHRAGMS BETWEEN ADJACENT GIRDERS SHALL BE INSTALLED AS SOON AS POSSIBLE AND IN CONJUNCTION WITH GIRDER ERECTION.
3. ALL COSTS ASSOCIATED WITH FURNISHING, FABRICATING, ASSEMBLY, AND INSTALLATION OF DIAPHRAGMS SHALL BE INCIDENTAL TO THE LUMP SUM PRICE FOR STRUCTURAL STEEL, MISCELLANEOUS.
4. DIAPHRAGMS ARE LOCATED AT MIDSPAN BETWEEN GIRDERS.

ESTIMATED QUANTITIES		
ITEM	UNIT	QUANTITY
Δ STRUCTURAL STEEL, MISCELLANEOUS	LS	LUMP SUM

Δ FOR INFORMATIONAL PURPOSES, THE ESTIMATED WEIGHT OF STRUCTURAL STEEL IS 1,450 LBS.

REGISTERED PROFESSIONAL ENGINEER
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SOUTH DAKOTA

10-15-15

PLANS BY CLARK ENGINEERING: WATERTOWN, SD

Diaphragm Details
FOR
96'–0" Prestressed Girder Bridge

over Big Sioux River* Sec. 15/22–T115N–R52W
29'–8" Roadway BRO 8029(18)
Sta. 9+52.00 to 10+48.00 0° SKEW
Str. No. 29–218–030 HL–93
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Hamlin County
S.D. DEPT. OF TRANSPORTATION
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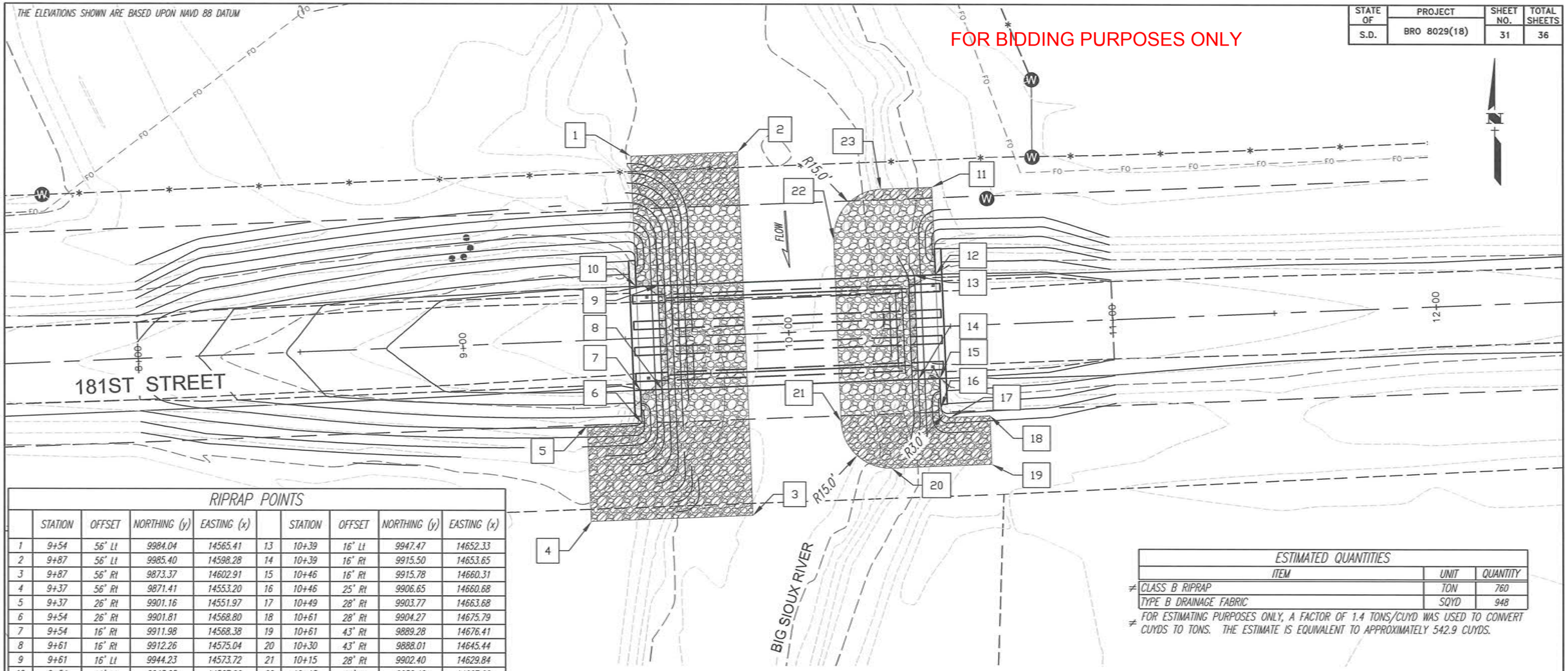
DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
ARP	EGS	VLV	BRIDGE ENGINEER

THE ELEVATIONS SHOWN ARE BASED UPON NAVD 88 DATUM

FOR BIDDING PURPOSES ONLY

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	BRO 8029(18)	31	36



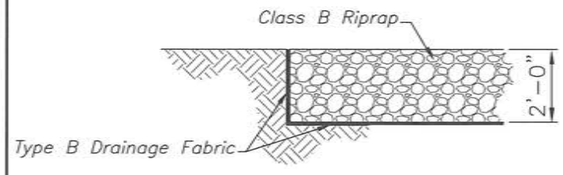
RIPRAP POINTS

	STATION	OFFSET	NORTHING (y)	EASTING (x)		STATION	OFFSET	NORTHING (y)	EASTING (x)
1	9+54	56' Lt	9984.04	14565.41	13	10+39	16' Lt	9947.47	14652.33
2	9+87	56' Lt	9985.40	14598.28	14	10+39	16' Rt	9915.50	14653.65
3	9+87	56' Rt	9873.37	14602.91	15	10+46	16' Rt	9915.78	14660.31
4	9+37	56' Rt	9871.41	14553.20	16	10+46	25' Rt	9906.65	14660.68
5	9+37	26' Rt	9901.16	14551.97	17	10+49	28' Rt	9903.77	14663.68
6	9+54	26' Rt	9901.81	14568.80	18	10+61	28' Rt	9904.27	14675.79
7	9+54	16' Rt	9911.98	14568.38	19	10+61	43' Rt	9889.28	14676.41
8	9+61	16' Rt	9912.26	14575.04	20	10+30	43' Rt	9888.01	14645.44
9	9+61	16' Lt	9944.23	14573.72	21	10+15	28' Rt	9902.40	14629.84
10	9+54	16' Lt	9943.95	14567.06	22	10+15	28' Lt	9958.42	14627.62
11	10+46	43' Lt	9974.63	14657.88	23	10+30	43' Lt	9974.00	14642.03
12	10+46	16' Lt	9947.75	14658.99					

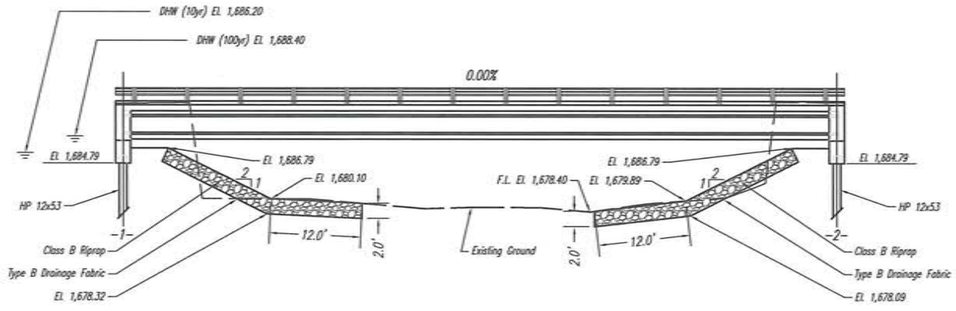
ESTIMATED QUANTITIES

	ITEM	UNIT	QUANTITY
≠	CLASS B RIPRAP	TON	760
	TYPE B DRAINAGE FABRIC	SQYD	948

≠ FOR ESTIMATING PURPOSES ONLY, A FACTOR OF 1.4 TONS/CUYD WAS USED TO CONVERT CUYDS TO TONS. THE ESTIMATE IS EQUIVALENT TO APPROXIMATELY 542.9 CUYDS.



DRAINAGE FABRIC DETAIL



ELEVATION VIEW

REGISTERED PROFESSIONAL ENGINEER
REG. NO.
10964
VANESSA L.
VICTOR
SOUTH DAKOTA

10-15-15

PLANS BY: CLARK ENGINEERING, WATERTOWN, SD

Rip Rap Layout
FOR
96'–0" Prestressed Girder Bridge

over Big Sioux River* Sec. 15/22–T115N–R52W
29'–8" Roadway BRO 8029(18)
Sta. 9+52.00 to Sta. 10+48.00 0° SKEW
STr. No. 29–218–030 HL–93
PCN 01DT

Hamlin County
S.D. DEPT. OF TRANSPORTATION
OCTOBER 2015

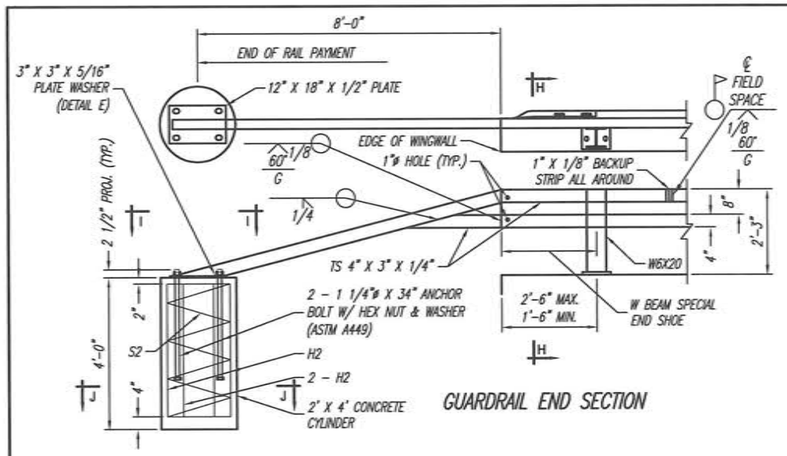
13 OF 16

–X081–

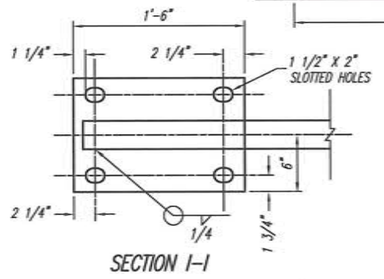
DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
ARP	ARP/EGS	VLV	BRIDGE ENGINEER

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	BRO 8029(18)	32	36

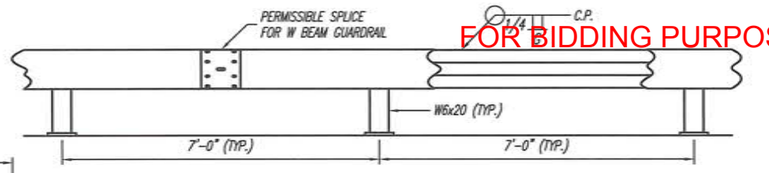
FOR BIDDING PURPOSES ONLY



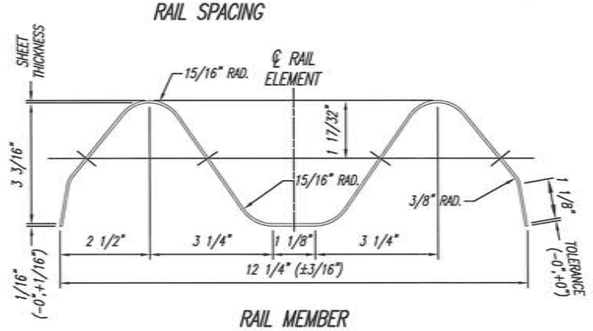
GUARDRAIL END SECTION



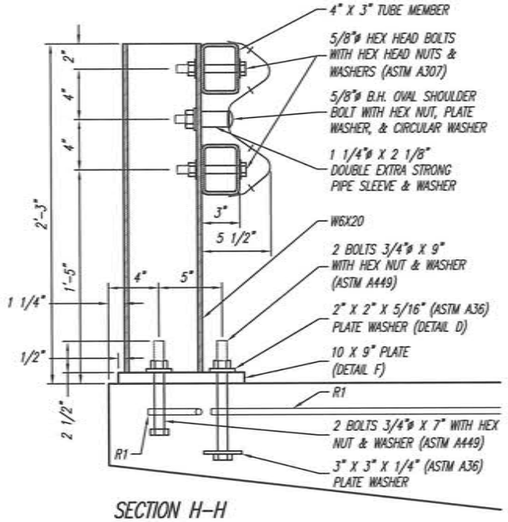
SECTION I-I



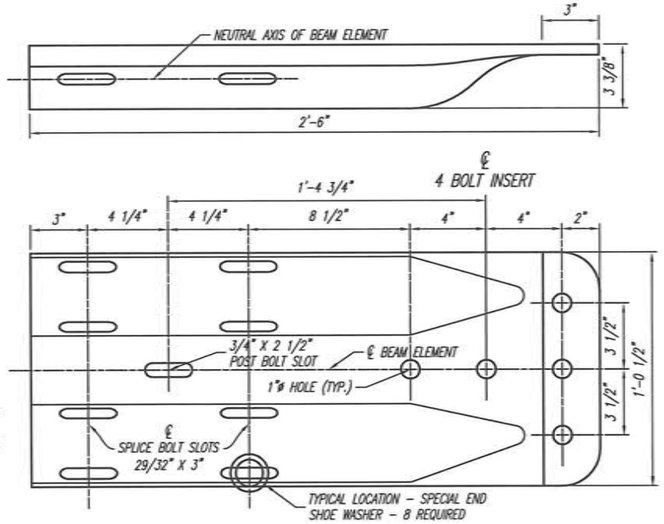
RAIL SPACING



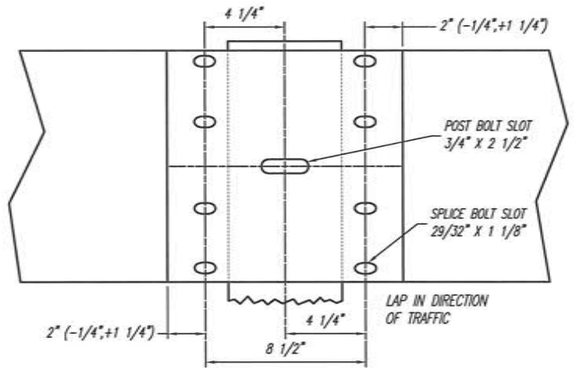
RAIL MEMBER



SECTION H-H



W BEAM SPECIAL END SHOE



RAIL SPLICE

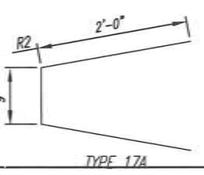
NOTES:

1. RAIL DESIGN SHALL BE ACCORDING TO AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES (CURRENT) EDITION AND INTERIM SPECIFICATIONS.
2. RAIL POSTS SHALL BE PERPENDICULAR TO CENTERLINE OF ROADWAY.
3. W-BEAM GUARD RAIL, PIPE SLEEVES, NUTS, WASHERS, AND PLATE WASHERS THAT GO WITH THESE SHALL BE GALVANIZED. BOLTS, NUTS, AND WASHERS SHALL BE GALVANIZED ACCORDING TO ASTM A153. PIPE SLEEVES SHALL BE GALVANIZED ACCORDING TO ASTM A123.
4. POST BOLTS SHALL BE 3/4" DIAMETER A325 OR A449. EACH BOLT SHALL HAVE ONE HARDENED AND ONE 2" x 2" x 5/16" ASTM A36 PLATE WASHER. NUTS SHALL BE A563.
5. STEEL W BEAM GUARD RAIL SHALL BE CLASS A, TYPE 1, CONFORMING TO AASHTO M180 AND SHALL BE FABRICATED FROM STANDARD 12.5' OR 25' NOMINAL W BEAM SECTIONS.
6. THE RAIL POSTS, 3" x 4" TUBE MEMBERS, BASE PLATES AND PROJECTING PORTIONS OF THE ANCHOR BOLTS, NUTS, AND WASHERS SHALL BE SATISFACTORILY PAINTED IN ACCORDANCE WITH SECTON 411 OF THE SPECIFICATIONS. THE COLOR OF THE FINISHED COAT SHALL BE AN APPROVED GREEN, FEDERAL STANDARD NO. 24108. THE NUTS, BOLTS, AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153. THE RAIL POSTS AND TUBE MEMBERS MAY BE GALVANIZED IN ACCORDANCE WITH ASTM A123 IN SUBSTITUTION FOR PAINTING. IF GALVANIZING IS SELECTED, NO PAINT WILL BE APPLIED OVER GALVANIZED SURFACES.
7. ALL STRUCTURAL STEEL PARTS FOR THE TYPE T101 STEEL RAILING SHALL CONFORM TO ASTM A709 GR. 36. TUBES SHALL CONFORM TO ASTM A500 GR. B.
8. PROVIDE 1 1/2" DRAIN HOLES IN THE TUBES NEAR ENDS OF RAIL AND NEAR SPLICES.
9. ALL CONCRETE SHALL BE CLASS M6 AS SPECIFIED IN SECTION 462 OF THE SPECIFICATIONS.
10. ALL REINFORCING STEEL SHALL CONFORM TO ASTM A615, GR. 60.
11. ALL BOLTS, NUTS, WASHERS, POSTS, PLATES, PIPE SLEEVES, STEEL W BEAM GUARD RAIL, WELDING, PAINTING, AND ALL COSTS OF INSTALLING FOUR RAIL ANCHORS INCLUDING CONCRETE, EXCAVATION, FORMING, REINFORCING STEEL, AND ANCHOR BOLTS SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE PER FOOT FOR TYPE T101 BRIDGE RAILING.
12. MEASUREMENT FOR PAYMENT SHALL BE FROM CENTER OF ANCHOR TO CENTER OF ANCHOR FOR EACH SIDE OF THE BRIDGE.

REINFORCING SCHEDULE

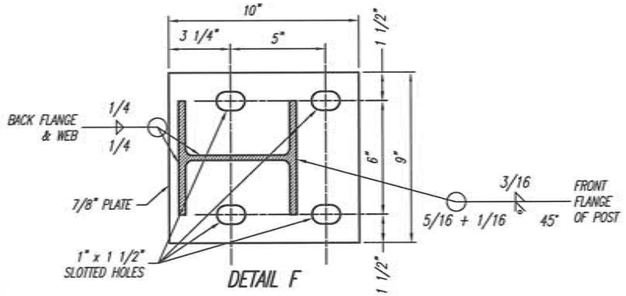
MK.	NO.	SIZE	LENGTH	TYPE	BENDING DETAIL
S2	4	3	51'-7"	SPIRAL	
H2	24	5	3'-6"	STR.	
R1	56	4	3'-9"	17	

NOTES: ALL DIMENSIONS ARE OUT TO OUT OF BARS.
SPIRAL - 6" PITCH AND 1 1/2 TURNS AT EACH END.
USE 1 1/2 TURNS FOR LAP SPLICES AS REQUIRED.
USE 2 VERTICAL SPACE BARS.

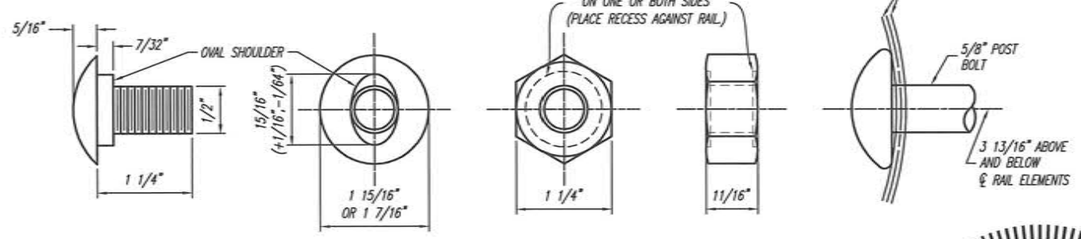


ESTIMATED QUANTITIES

ITEM	UNIT	QUANTITY
TYPE 101 BRIDGE RAILING	FT	224.0

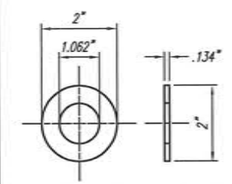


DETAIL F

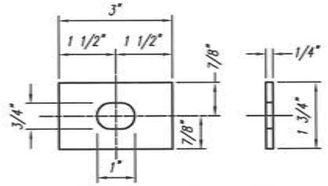


SPLICE BOLT

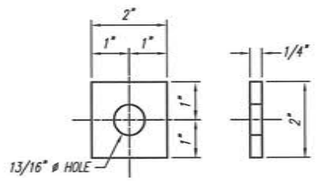
THE POST BOLT IS SIMILAR EXCEPT THE POST BOLT IS 18" LONG.



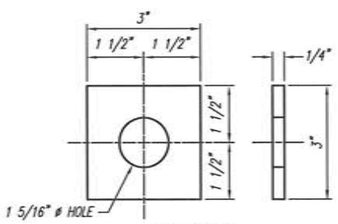
SPECIAL END SHOE WASHER



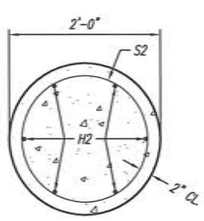
RECTANGULAR PLATE WASHER



DETAIL D



DETAIL E



SECTION J-J

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 10964
VANESSA L. VICTOR
SOUTH DAKOTA
10-15-15

PLANS BY CLARK ENGINEERING: WATERTOWN, SD

T101 Railing Details
FOR
96'-0" Prestressed Girder Bridge

over Big Sioux River* Sec. 15/22-T115N-R52W
29'-8" Roadway BRO 8029(18)
Sta. 9+52.00 to 10+48.00 0° SKEW
Str. No. 29-218-030 HL-93
PCN 01DT

Hamlin County
S.D. DEPT. OF TRANSPORTATION
OCTOBER 2015

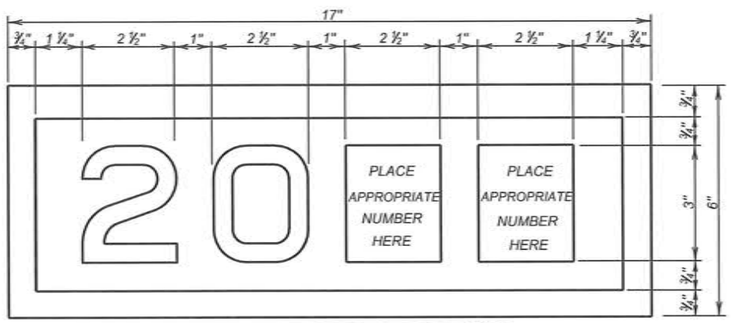
14 OF 16

-X081-

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
ARP	EGS	VLV	BRIDGE ENGINEER

FOR BIDDING PURPOSES ONLY

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	BRO 8029(18)	33	36



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.

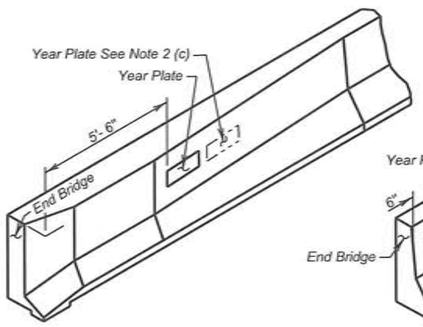
2. Year plates shall be located on structure (s) as follows:

   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.

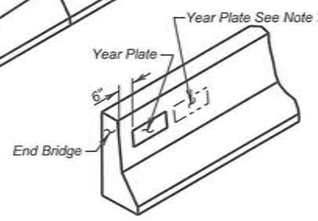
   b. On bridges with six (6) inch curbs or "Jersey" shaped barriers with no endblocks, the year plate shall be centered vertically on the curb face approximately six (6) inches from the end of the bridge, or as designated by the Engineer. On bridges with "Jersey" shaped barrier endblocks, the year plate 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.

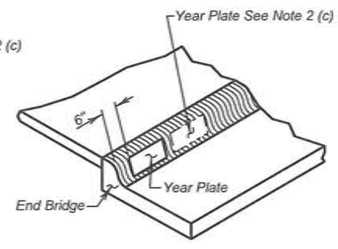
3. There will be no separate measurement or payment made for year plates on box culverts and bridges. All costs for this work shall be incidental to other contract items.



JERSEY BARRIER
(With Endblock)



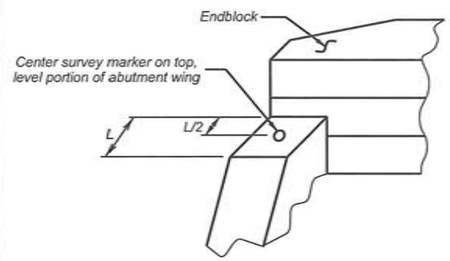
JERSEY BARRIER



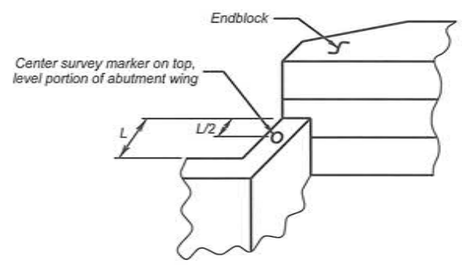
TYPE B CURB

June 26,2012

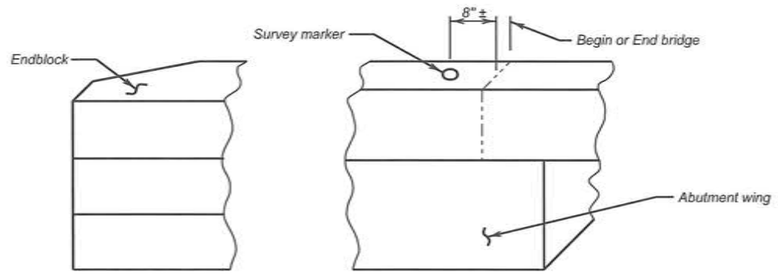
Published Date: 3rd Qtr. 2015	SDDOT	YEAR PLATE DETAILS	PLATE NUMBER 460.02 Sheet 1 Of 1



ABUTMENT WITH "STRAIGHT" WINGS



ABUTMENT WITH "SWEPT BACK" WINGS



ABUTMENT WITH "SWEPT BACK" WINGS
(Endblock on top of wings)

GENERAL NOTES:

1. Survey markers shall be located at each abutment on the same side of the bridge as the year plate. Place survey markers on abutment wings as shown. Two survey markers will be required at each bridge.

2. Survey markers shall be of a type intended for installation in concrete, be made of solid brass or bronze, have a domed top and be either a 3" top diameter (with a ¾" X 2" long ribbed shank), or a US Army Corps of Engineers Type C Disc with a 3 ½" top diameter.

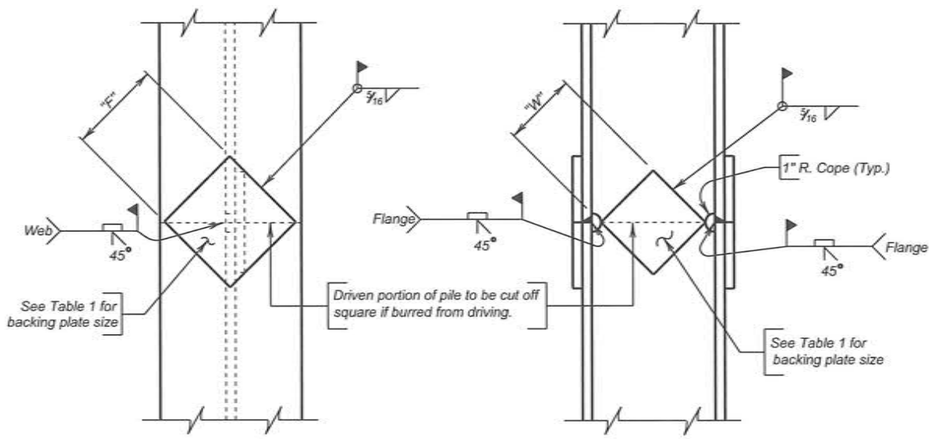
3. There will be no separate measurement or payment made for survey markers. All costs for this work shall be incidental to the other contract items.

June 26,2012

Published Date: 3rd Qtr. 2015	SDDOT	BRIDGE SURVEY MARKER	PLATE NUMBER 460.05 Sheet 1 of 1

PLANS BY CLARK ENGINEERING: WATERTOWN, SD

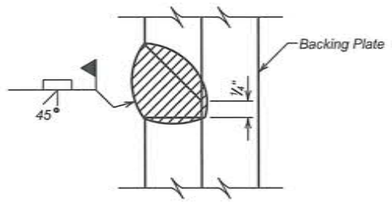
STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	BRO 8029(18)	34	36



NOTE:

Prepare joint surfaces lower end of upper section on the ground and weld on backing plates; then place upper section on lower section and weld.

COMPLETE JOINT PENETRATION WELD DETAIL



GENERAL NOTES:

1. Steel for backing plates shall conform to ASTM A709 Grade 50.
2. Welding and weld inspection shall be in conformance with AWS D1.5 (Current Year) Bridge Welding Code - Steel.
3. Welder must be certified and registered with the SDDOT.
4. Backing plate shall at a minimum be as thick as the web of the pile being spliced.
5. Web must be coped with 1 inch radius.
6. Submit Welding Procedure Specification (WPS) to Bridge Construction Engineer for approval prior to pile driving.

TABLE 1
(BACKING PLATES)

PILE	10"	12"	14"
"F" FLANGE	6 ½"	8"	10"
"W" WEB	4 ¾"	6 ¼"	7 ½"

December 23, 2012

Published Date: 3rd Qtr. 2015

SDDOT

STEEL PILE SPLICE DETAILS

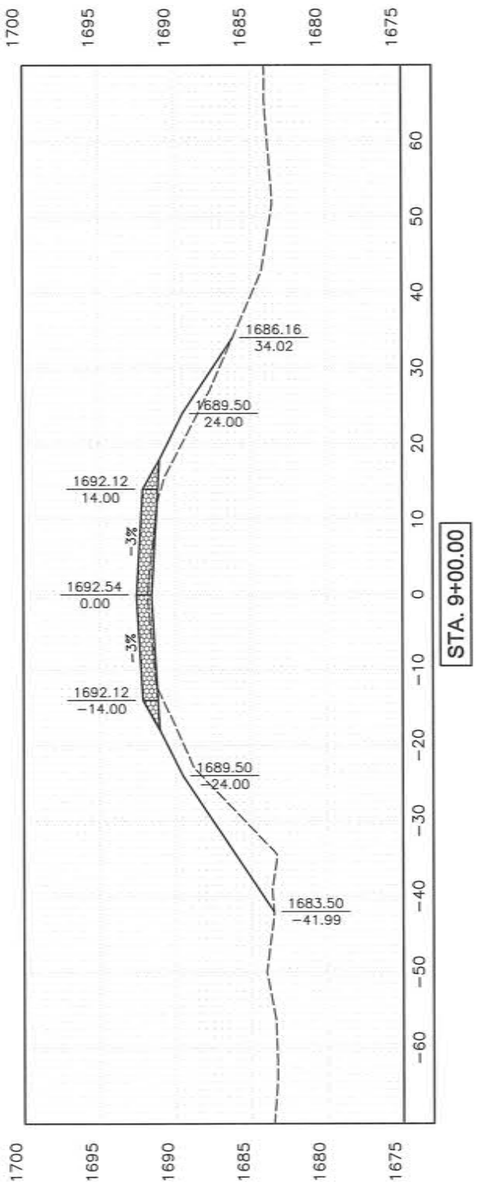
PLATE NUMBER 510.40

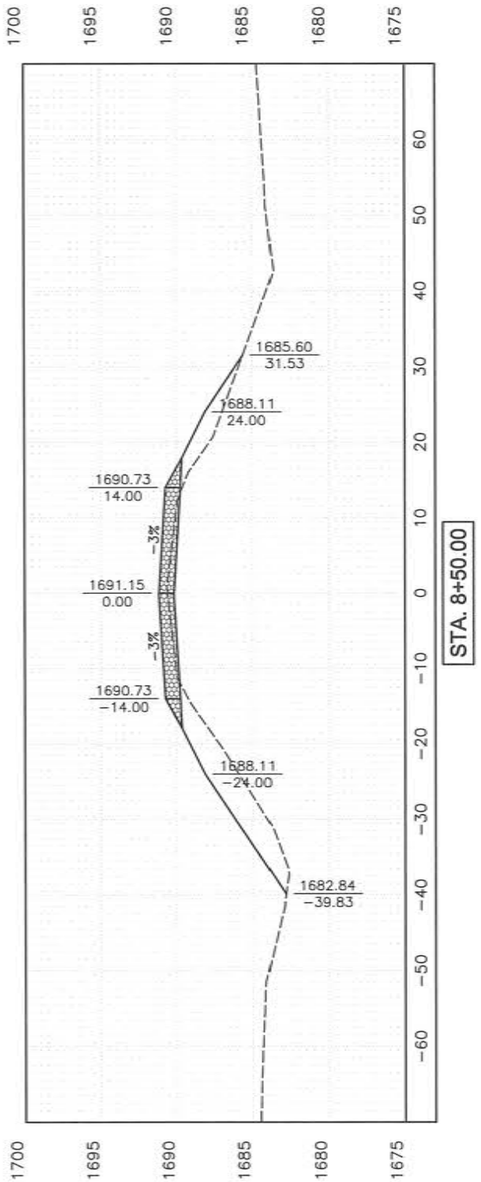
Sheet 1 of 1

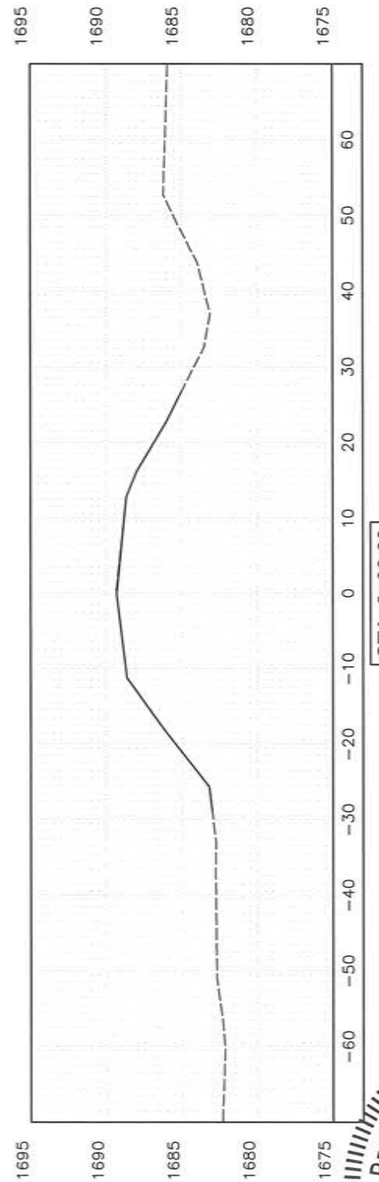
CROSS SECTIONS

FOR BIDDING PURPOSES ONLY

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	BRO 8029(18)	35	36







PROFILE SCALE: HORIZONTAL 1"=20'
VERTICAL 1"=10'

REGISTERED PROFESSIONAL ENGINEER
REG. NO.
10964
VANESSA L.
VICTOR
SOUTH DAKOTA

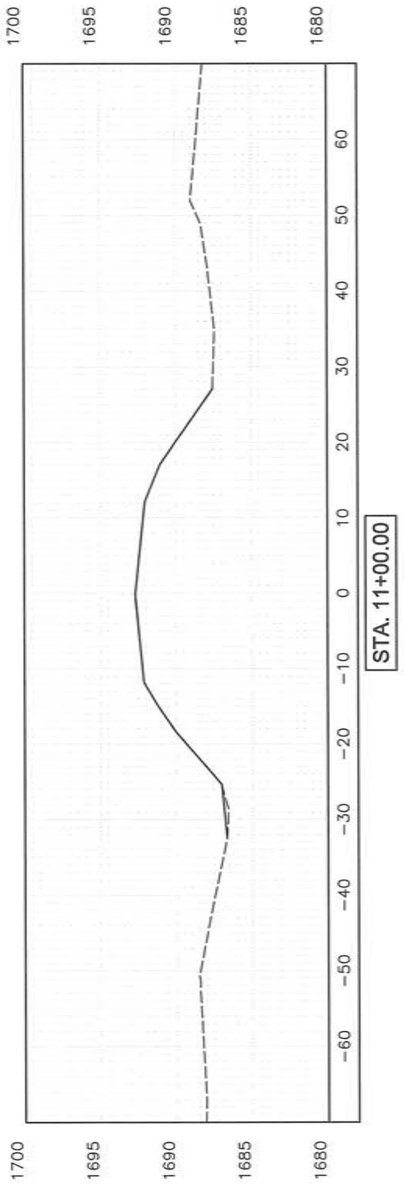
10-15-15

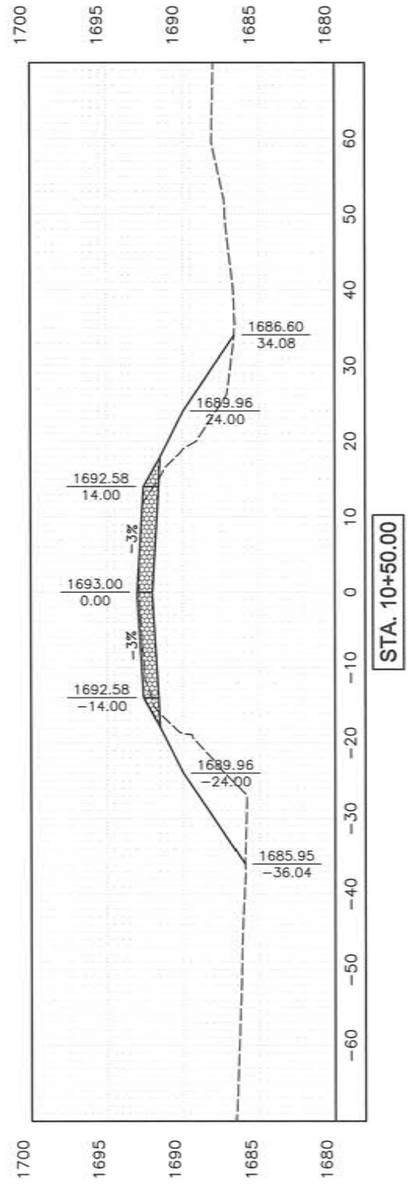
PLANS BY: CLARK ENGINEERING, WATERTOWN, SD

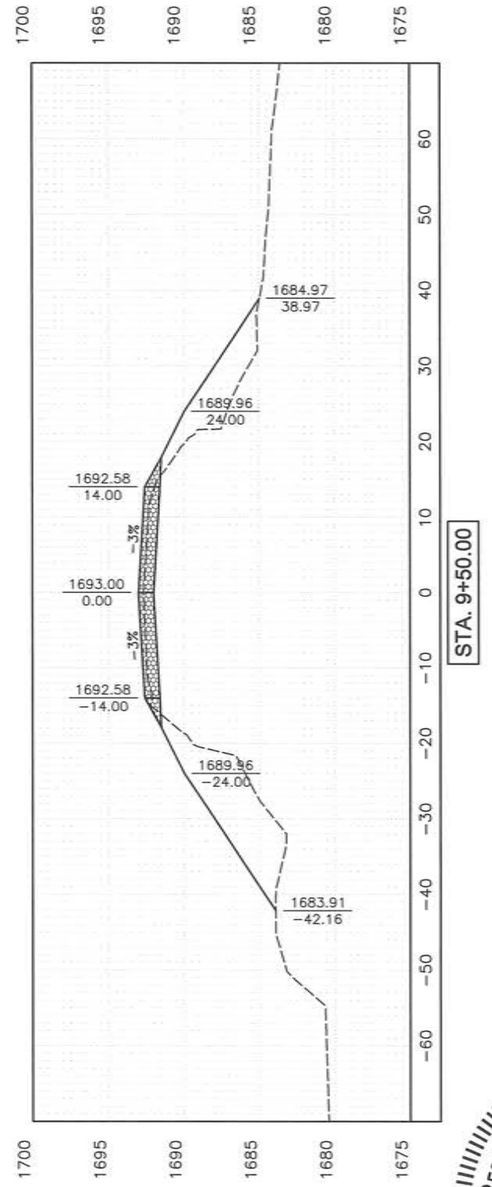
CROSS SECTIONS

FOR BIDDING PURPOSES ONLY

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	BRO 8029(18)	36	36







REGISTERED PROFESSIONAL ENGINEER
REG. NO.
10964
VANESSA L.
VICTOR
SOUTH DAKOTA

10-15-15

PROFILE SCALE: HORIZONTAL 1"=20'
VERTICAL 1"=10'

PLANS BY: CLARK ENGINEERING, WATERTOWN, SD