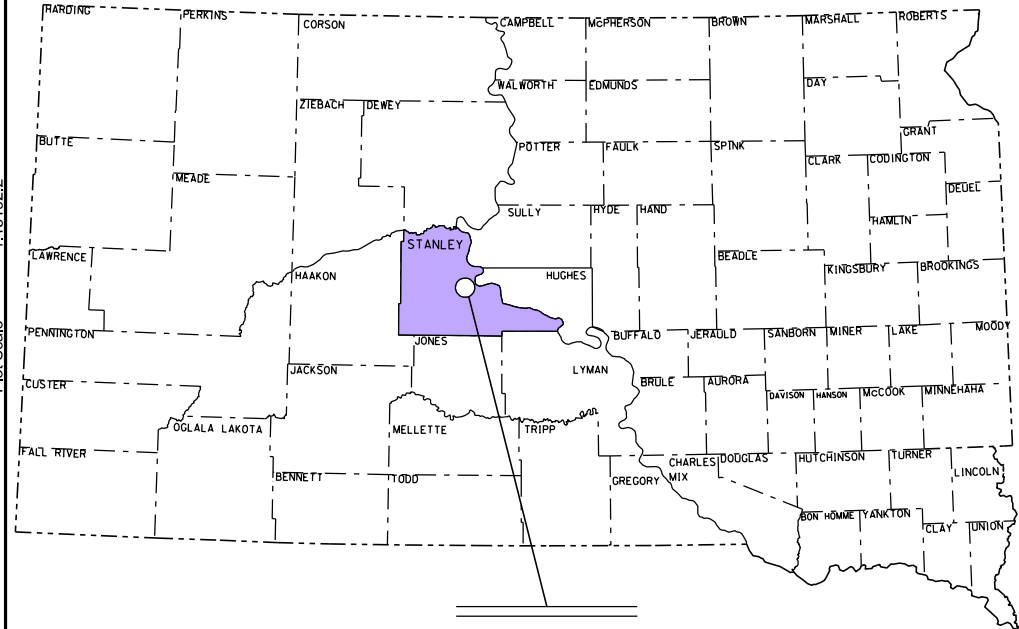


Plot Scale - 1:15192.2

trp25584

Plotted From -



PROJECT

DESIGN DESIGNATION

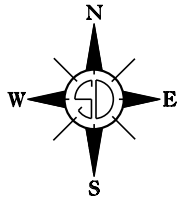
083-368 PCN i4HM  
Str. No. 59-398-295  
MRM 118.50  
ADT (2015) 6185  
ADT (2035) 9364  
DHV 1461  
D 50%  
T DHV 4.3%  
T ADT 9.4%  
V 30 MPH

STORM WATER PERMIT  
(None Required)

STATE OF SOUTH DAKOTA  
DEPARTMENT OF TRANSPORTATION  
PLANS FOR PROPOSED  
**083-368**  
**US HIGHWAY 83**  
**STANLEY COUNTY**  
BRIDGE RAIL REPAIR  
PCN i4HM

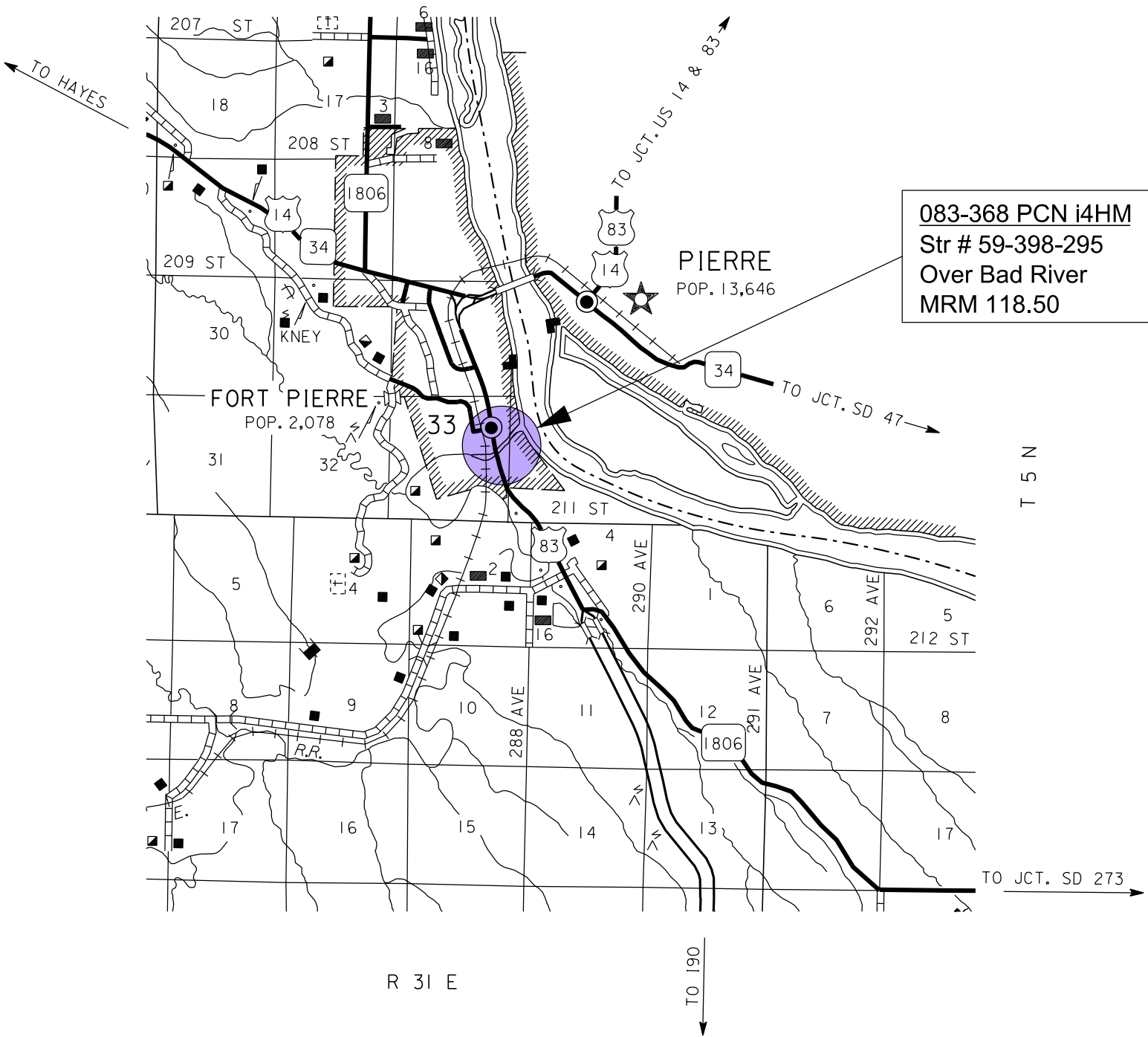
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	083-368	1	21

Plotting Date: 05/08/2017



INDEX OF SECTIONS

Section A: Estimate of Quantities  
Section C: Traffic Control Plans  
Section E: Structure Plans



# ESTIMATE OF QUANTITIES

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	083-368	A1	A2

## SECTION C ~ TRAFFIC CONTROL

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
633E6005	Pavement Marking Masking, 5"	1,000	Ft
633E6030	Pavement Marking Masking, Arrow	2	Each
634E0010	Flagging	10.0	Hour
634E0110	Traffic Control Signs	165.3	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0285	Type 3 Barricade, 8' Double Sided	2	Each
634E0600	4" Temporary Pavement Marking Tape Type I	480	Ft
634E2000	Longitudinal Pedestrian Barricade	10	Ft

## SECTION E ~ STRUCTURE # 59-398-295

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
460E0174	Concrete Patching Material, Miscellaneous	7.5	CuFt
460E0300	Breakout Structural Concrete	0.3	CuYd
460E0380	Install Dowel in Concrete	13	Each
480E0200	Epoxy Coated Reinforcing Steel	18	Lb

## SPECIFICATIONS

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

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	083-368	A2	A2

**ENVIRONMENTAL COMMITMENTS**

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

**COMMITMENT B: FEDERALLY THREATENED, ENDANGERED, AND PROTECTED SPECIES**

**COMMITMENT B2: WHOOPING CRANE**

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

**Action Taken/Required:**

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

**COMMITMENT B4: BALD EAGLE**

Bald eagles are known to occur in this area.

**Action Taken/Required:**

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

**COMMITMENT E: STORM WATER**

Construction activities constitute less than 1 acre of disturbance.

**Action Taken/Required:**

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

**COMMITMENT H: WASTE DISPOSAL SITE**

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

**Action Taken/Required:**

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

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

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

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

1. Construction and/or demolition debris consisting of concrete, asphalt concrete, or other similar materials shall be buried in a trench completely separate from wood debris. The final cover over the construction and/or demolition debris shall consist of a minimum of 1 foot of soil capable of supporting vegetation. Waste disposal sites provided outside of the Public 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 Public ROW through the use of fences, gates, and placement of a sign or signs at the entrance to the site stating “No Dumping Allowed”.

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

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

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

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

**COMMITMENT I: HISTORICAL PRESERVATION OFFICE CLEARANCES**

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

**Action Taken/Required:**

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

The Contractor shall arrange and pay for a cultural resource survey and/or records search. The Contractor has the option to contact the state

Archaeological Research Center (ARC) at 605-394-1936 or another qualified archaeologist, to obtain either a records search or a cultural resources survey. A record search might be sufficient for review; however, a cultural resources survey may need to be conducted by a qualified archaeologist.

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

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

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

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

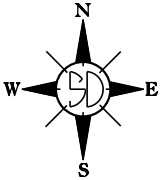
1:7087.29  
Plot Scale -

Plotted From -  
trp25584

# SECTION C: TRAFFIC CONTROL PLANS

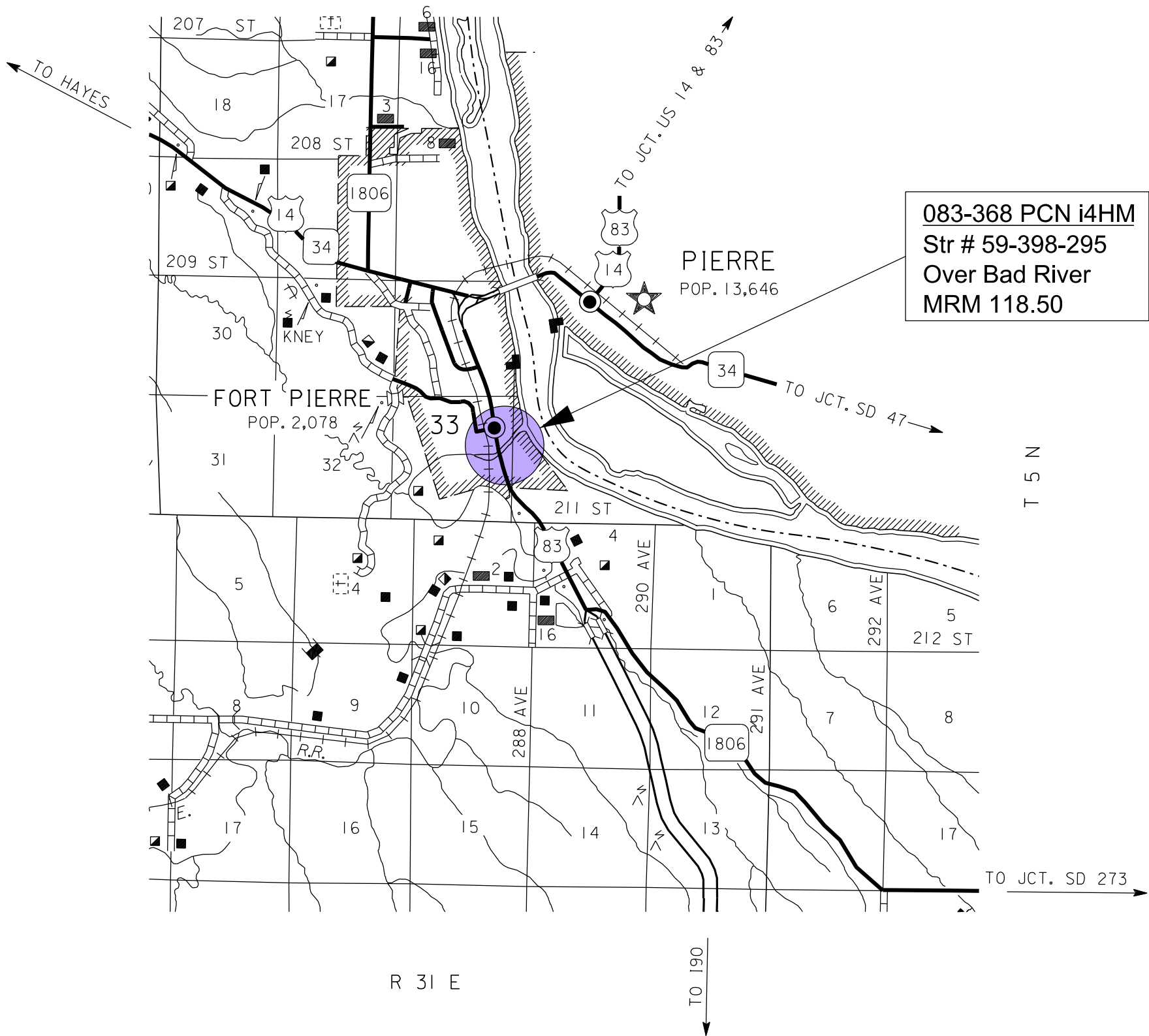
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	083-368	C1	C6

Plotting Date: 05/08/2017



## INDEX OF SHEETS

Sheet C1	Layout Map and Index
Sheet C2	Estimate and Notes
Sheet C3	Pedestrian Sign Layout
Sheet C4	Project Sign Tabulation
Sheet C5 to C6	Standard Plates





STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	083-368	C2	C6

ESTIMATE OF QUANTITIES

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
633E6005	Pavement Marking Masking, 5"	1,000	Ft
633E6030	Pavement Marking Masking, Arrow	2	Each
634E0010	Flagging	10.0	Hour
634E0110	Traffic Control Signs	165.3	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0285	Type 3 Barricade, 8' Double Sided	2	Each
634E0600	4" Temporary Pavement Marking Tape Type I	480	Ft
634E2000	Longitudinal Pedestrian Barricade	10	Ft

SEQUENCE OF OPERATIONS

The Contractor shall submit a proposed sequence of operations for the Engineer’s review and approval at least two weeks prior to the preconstruction meeting.

The sidewalk on the Bad River Bridge shall be closed to pedestrian traffic during construction activities. The Contractor shall use applicable signs and barricades during the sidewalk closure. Upon the close of construction activities for the day the Contractor shall re-open the sidewalk for pedestrian traffic. The sidewalk shall be clear of all debris, equipment, or all other items that would impede upon the movements of pedestrians as determined by the Engineer. The Contractor shall coordinate with the Area Engineer for the necessary public notifications prior to sidewalk being closed.

The Contractor shall use care when working on the bridge deck to ensure no damage occurs to the existing bridge deck polymer chip seal. Any damage done due to the Contractor’s operation shall be repaired to the satisfaction of the SDDOT at the Contractor’s expense.

Traffic shall be maintained through the project at ALL times. The Contractor may perform work on the roadway during daylight hours only, unless additional hours are approved by the Engineer.

GENERAL MAINTENANCE OF TRAFFIC

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

Channelizing devices in a series shall be of the same type.

A shadow vehicle, equipped with flashing amber light and a ROAD MACHINERY AHEAD sign prominently displayed, shall be used in advance of landscaping, clean up, and other mobile work activities. The cost of ROAD MACHINERY AHEAD sign shall be incidental to the contract lump sum price for “Traffic Control, Miscellaneous”.

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

TEMPORARY PAVEMENT MARKING

The Contractor shall mask any existing pavement marking that will interfere with the installation of the traffic control for the work zone. The cost of placing, removing, and disposing of the masking material shall be incidental to the contract unit prices for the “Pavement Marking Masking” items.

Flagger symbol signs (W20-7) and flaggers, or a shadow vehicle with rotating yellow lights or strobe lights shall be positioned on the roadway shoulder in advance of workers for both directions of traffic during the installation of temporary pavement markings. The traffic control device used shall be moved to provide proper warning of the work operation. A ROAD WORK AHEAD (W20-1), a Workers symbol sign (W21-1) or a BE PREPARED TO STOP (W3-4) warning sign shall be mounted on the rear of the shadow vehicle. The method of traffic control used by the Contractor for this work shall be approved by the Engineer.

A quantity of temporary pavement markings has been set up for the traffic control. Temporary Pavement Marking Tape, Type 1 shall be used for all pavement marking shown on Standard Plate 634.53.

The Contractor will be paid only once for tape placement. The Contractor is responsible for maintaining and cleaning the tape throughout the duration of the project and for removing all temporary pavement marking tape when it is no longer required.

TRAFFIC CONTROL

The Contractor shall designate an employee to be responsible for the maintenance of traffic. The Engineer must approve the employee selected. The name and phone number of person(s) shall be provided to the SD Department of Transportation (605-773-5294), SD Highway Patrol (Pierre State Radio (605-773-3536)), and Stanley County Sheriff Department (605-223-7792).

All traffic control devices shall be in “like new” condition.

LONGITUDINAL PEDESTRIAN BARRICADE

Longitudinal Pedestrian Barricades should not be used to provide positive protection for pedestrians.

Longitudinal Pedestrian Barricades shall be installed on each end of the bridge to prevent pedestrians from using the sidewalk. Each night the barricades shall be removed to allow pedestrians to use the sidewalk.

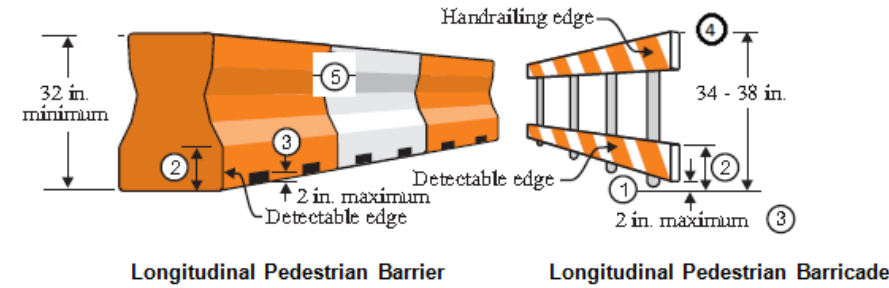
Barricade rail supports may not project into pedestrian routes more than 4 inches from the face of the barricade. To prevent any tripping hazard to pedestrians, ballast shall be located behind or internal to the device.

When Longitudinal Pedestrian Barricades are combined in a series, the maximum gap between devices that do not interlock shall be one inch. Joints between devices that do interlock shall be closed and flush to prevent canes or small wheels from being trapped and to facilitate safe hand trailing. When used as a sidewalk closure mechanism, Longitudinal Pedestrian Barricade must run the entire width of the sidewalk. Longitudinal Pedestrian Barricade should provide a color contrasting pattern. Black should not be used to color any base on a device. The devices should comply with the general color and stripe pattern requirements of Section 6F.68 of the MUTCD.

Longitudinal Pedestrian Barricade shall have continuous bottom and top surfaces. A gap height or opening from the walkway surface up to a maximum of 2 inches is allowed for drainage purposes. The top edge of the bottom portion

shall be a minimum of 8 inches above the walkway. The top of the top portion shall be between 34 and 38 inches above the walkway. The top surface shall be smooth to allow safe hand trailing. Both upper and lower surfaces shall share a common vertical plane.

All costs shall be incidental to the contract unit price per foot for LONGITUDINAL PEDESTRIAN BARRICADE.

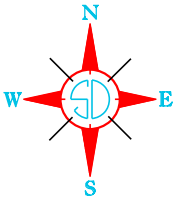




STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	083-368	C3	C6

Plotting Date: 03/10/2017

PEDESTRIAN SIGN LAYOUT



**SIDEWALK  
CLOSED**  
R9-9

 Longitudinal Pedestrian  
Barricade

**SIDEWALK  
CLOSED**  
R9-9



PROJECT SIGN TABULATION

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	083-368	C4	C6

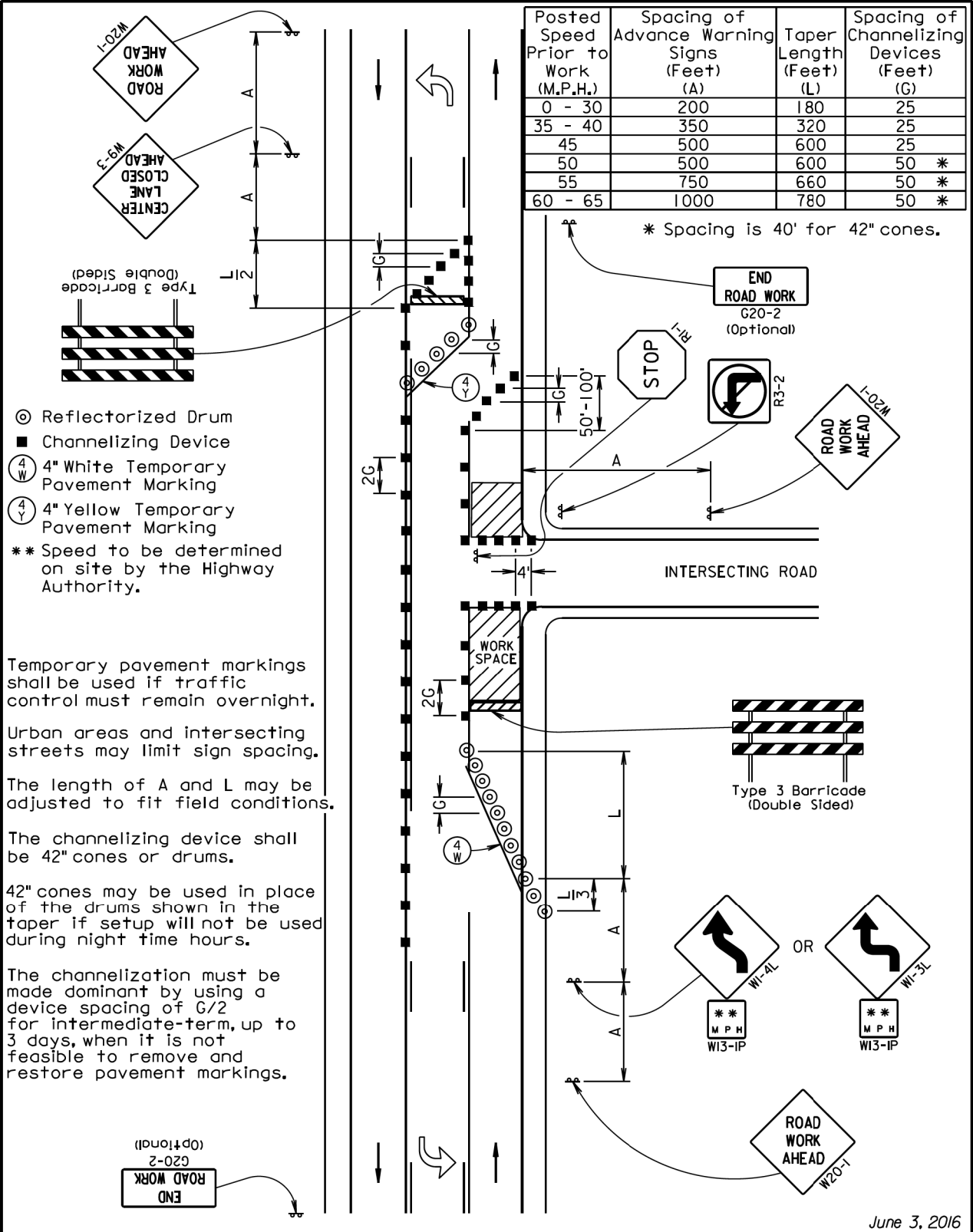
ITEMIZED LIST FOR TRAFFIC CONTROL SIGNS

SIGN CODE	SIGN DESCRIPTION	CONVENTIONAL ROAD			
		NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
R9-9	SIDEWALK CLOSED	3	24" x 12"	2.0	6.0
W1-3	REVERSE TURN (L or R)	1	48" x 48"	16.0	16.0
W3-4	BE PREPARED TO STOP	2	48" x 48"	16.0	32.0
W9-3	CENTER LANE CLOSED AHEAD	1	48" x 48"	16.0	16.0
W13-1P	ADVISORY SPEED (plaque)	1	30" x 30"	6.3	6.3
W20-1	ROAD WORK AHEAD	3	48" x 48"	16.0	48.0
W21-1	WORKERS (symbol)	2	48" x 48"	16.0	32.0
G20-2	END ROAD WORK	2	36" x 18"	4.5	9.0
		CONVENTIONAL ROAD TRAFFIC CONTROL SIGNS SQFT			
		165.3			

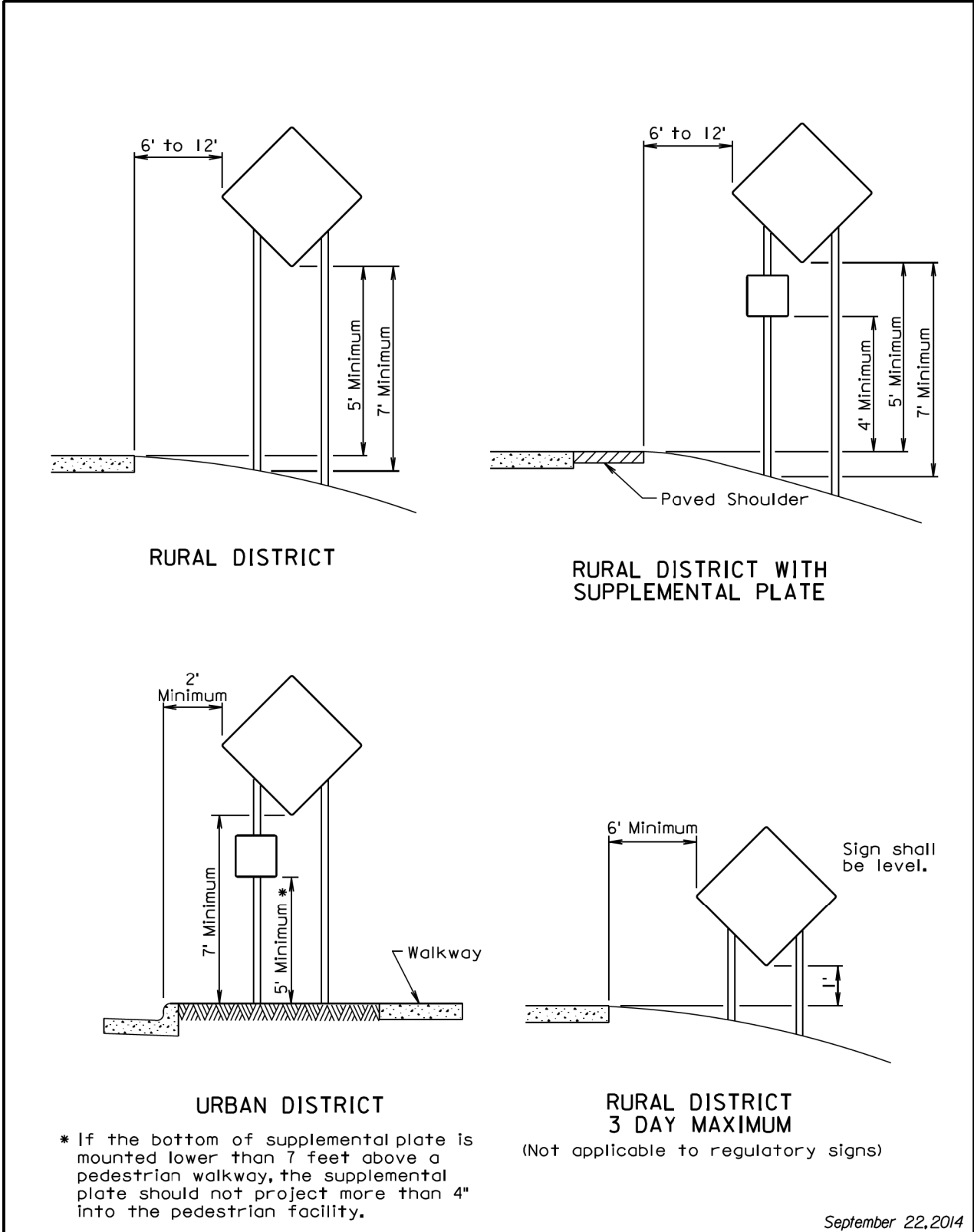
TYPE 3 BARRICADES

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

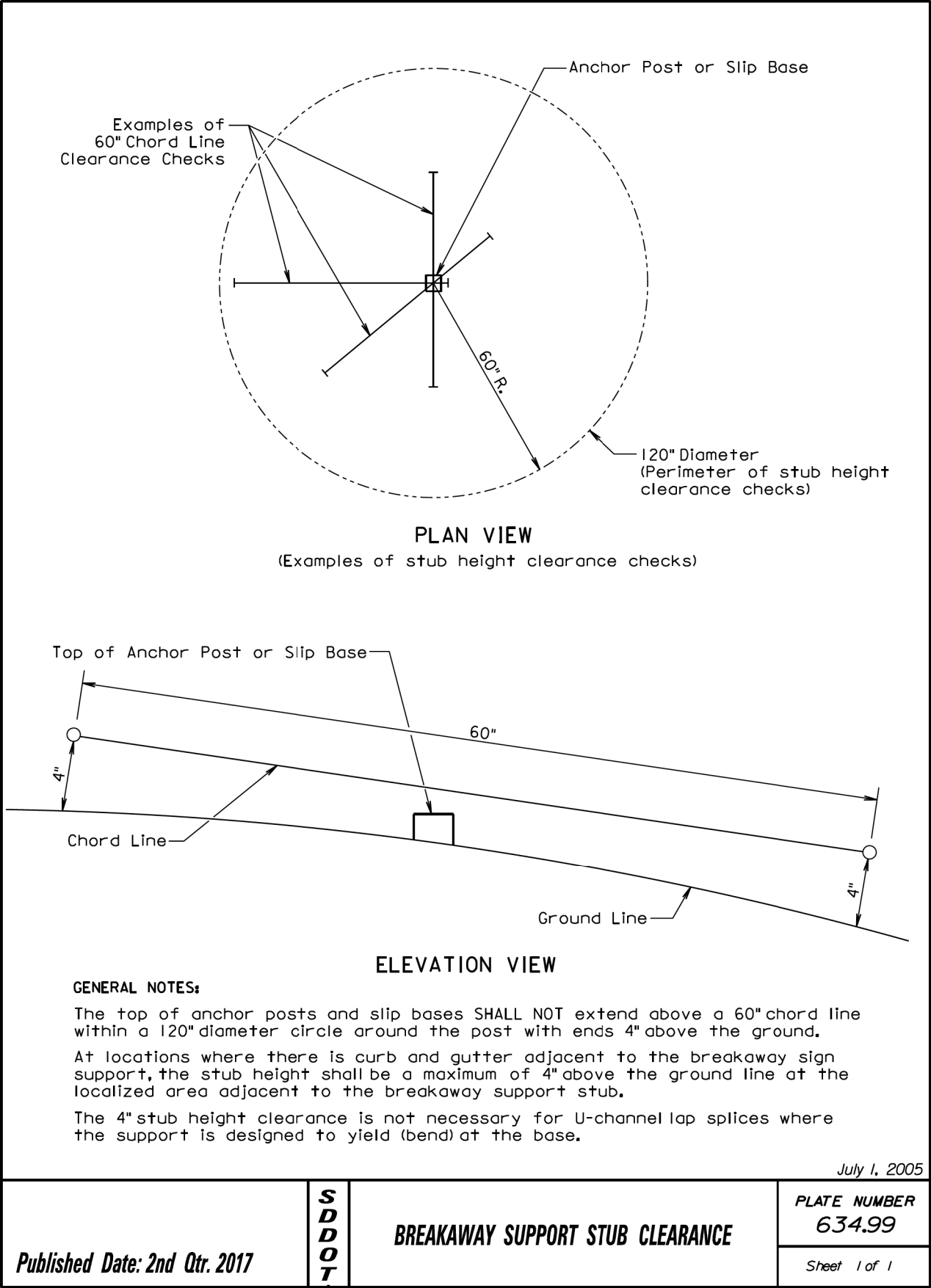
Plotting Date: 05/08/2017



June 3, 2016



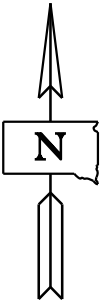
September 22, 2014





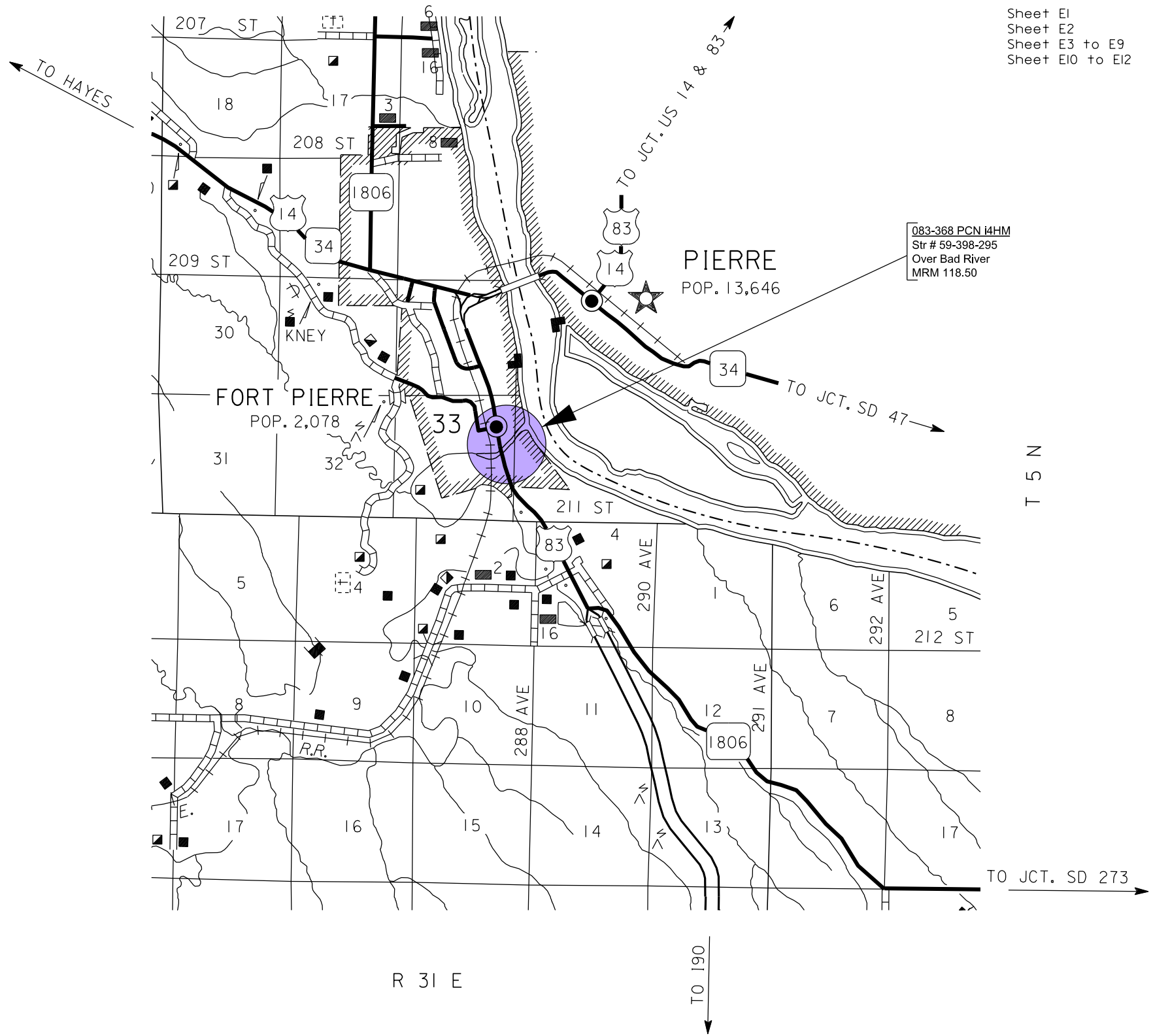
STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	083 368	E1	E12

# Section E: Structure Plans



INDEX OF SHEETS -

Sheet E1	Layout Map and Index
Sheet E2	Estimate of Structure Quantities
Sheet E3 to E9	434' - 0" CONT. GIRDER BRIDGE
Sheet E10 to E12	ORIGINAL CONSTRUCTION PLANS



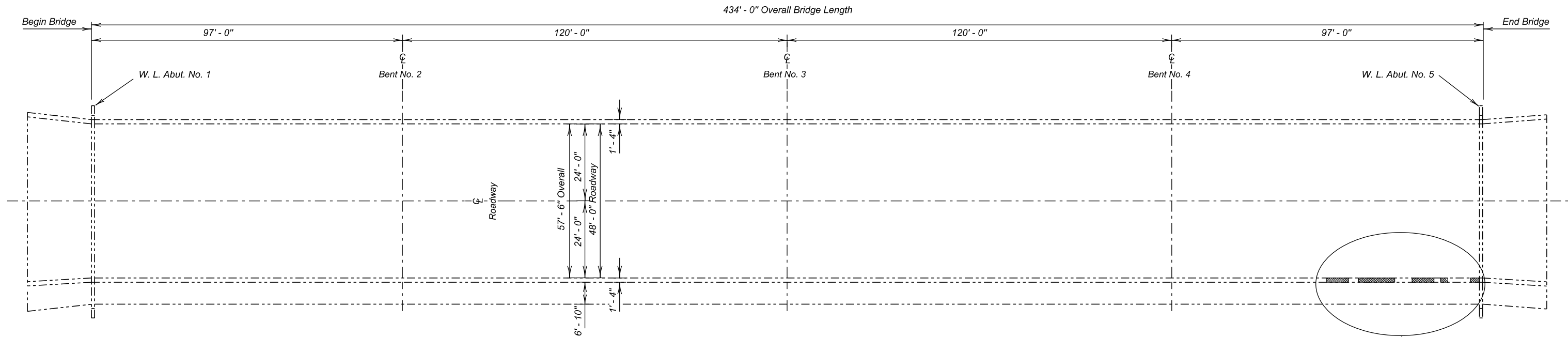
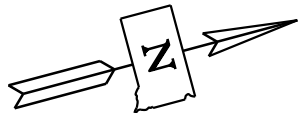
STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	083 368	E2	E12

**SECTION E – ESTIMATE OF STRUCTURE QUANTITIES**

**Str. No. 59-398-295**

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
460E0174	Concrete Patching Material, Miscellaneous	7.5	CuFt
460E0300	Breakout Structural Concrete	0.3	CuYd
460E0380	Install Dowel in Concrete	13	Each
480E0200	Epoxy Coated Reinforcing Steel	18	Lb

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	083 368	E3	E12



PLAN

INDEX OF BRIDGE SHEETS

- Sheet No. 1 - Layout for Upgrading
- Sheet No. 2 - Estimate of Structure Quantities and Notes
- Sheet No. 3 - Notes (Continued)
- Sheet No. 4 - Breakout Details
- Sheet No. 5 - Details on Repair Sections
- Sheet No. 6 - Details on Repair Sections (Continued)
- Sheet No. 7 - Details on Repair Sections (Continued)
- Sheet No. 8 thru 10 - Original Construction Plans

LAYOUT FOR UPGRADING  
FOR  
434' - 0" CONT. GIRDER BRIDGE

48' - 0" ROADWAY  
STR. NO. 59-398-295  
OVER BAD RIVER

0° SKEW  
SEC. 33-T5N-R31E  
M 083 368

STANLEY COUNTY  
S. D. DEPT. OF TRANSPORTATION  
MARCH 2017

1 OF 10

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

DESIGNED BY CM STANI4HM	CK. DES. BY MM I4HMA01	DRAFTED BY CM	 BRIDGE ENGINEER
-------------------------------	------------------------------	------------------	--

ESTIMATE OF STRUCTURE QUANTITIES

ITEM NO.	DESCRIPTION	QUANTITY	UNIT
460E0300	Breakout Structure Concrete	0.3	CuYd
480E0200	Epoxy Coated Reinforcing Steel	18	Lb
460E0174	Concrete Patching Material, Miscellaneous	7.5	CuFt
460E0380	Install Dowel in Concrete	13	Each

SPECIFICATIONS

- Design Specifications: AASHTO Standard Specifications for Highway Bridges 17th Edition using Working Stress Design.
- 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.

DETAILS AND DIMENSIONS OF EXISTING BRIDGE

All details and dimensions of the existing bridge, contained in these plans, are based on the original construction plans and shop plans and are provided as information only. It is the Contractor's responsibility to inspect and verify the actual field conditions and any necessary as-built dimensions affecting the satisfactory completion of the work required for this project.

SCOPE OF BRIDGE WORK & SEQUENCE OF OPERATIONS

All work on this structure shall be accomplished with the traffic control shown in the plans. Alternate sequence of operations may be submitted by the Contractor for approval by the Engineer at the pre-construction meeting.

- Remove existing concrete in areas determined damaged.
- Place dowel bars in locations specified.
- Install new anchor bolts, nuts and washers in locations specified
- Place concrete patching material in areas of removed concrete.

GENERAL CONSTRUCTION - BRIDGE

- All mild reinforcing steel shall conform to ASTM A615, Grade 60.
- All exposed concrete corners and edges shall match existing chamfer unless otherwise noted in the plans.
- Use 2" clear cover on all reinforcing steel except as shown otherwise.
- Snap ties, if used in the barrier curb formwork, shall be epoxy coated. The epoxy coating shall be inert in concrete and compatible with the coating applied to the new epoxy coated reinforcing steel.

CONCRETE BREAKOUT

- The existing barrier shall be broken out to the limits shown on the plans. Breakout limits shall be defined with a 3/4" deep sawcut (unless specified otherwise in these plans), where practical, as approved by the Engineer. Reinforcing steel that is exposed and is scheduled for use in the new construction shall be cleaned and straightened to the satisfaction of the Engineer. Care shall be taken not to damage the existing reinforcing steel that is to be reused in the new construction during concrete breakout. Any reinforcing steel that is damaged during concrete breakout shall be replaced or repaired, as approved by the Engineer, by the Contractor at no cost to the Department. The existing reinforcing steel that is to be reused in the new construction and that is exposed during concrete breakout shall be epoxy coated in accordance with the "Epoxy Coating Existing Reinforcing Steel" notes.
- All broken out concrete shall be disposed of by the Contractor. Any disposal of discarded material shall be in accordance with the Environmental Commitments.
- The contract unit price per cubic yard for "Breakout Structural Concrete" shall include breaking out concrete, cleaning and straightening existing reinforcing steel, and disposal of all broken out material.
- During concrete removal operations, no broken out concrete shall be allowed to fall into Bad River.

EPOXY COATING EXISTING REINFORCING STEEL

- The existing resteel in the barrier that is exposed during concrete breakout, and is to be reused, shall be epoxy coated in the field.
- The reinforcing steel shall be abrasive blasted clean and then epoxy coated. The epoxy coating shall be inert in concrete and compatible with the coating applied to the new epoxy coated reinforcing steel. This coating shall be the epoxy touch up coating material supplied by an epoxy coating manufacturer who supplies coating material for new epoxy coated reinforcing steel. The abrasive blasted reinforcing steel shall be coated promptly and before detrimental oxidation occurs. The coating shall be allowed to cure for 24 hours or as per the manufacturer's recommendations, whichever is more stringent, before concrete can be placed. These bars shall be clean and free from all surface contaminants before coating.

ESTIMATE OF STRUCTURE QUANTITIES AND NOTES  
FOR

434' - 0" CONT. GIRDER BRIDGE

48' - 0" ROADWAY  
STR. NO. 59-398-295  
OVER BAD RIVER

0° SKEW  
SEC. 33-T5N-R31E  
M 083 368

STANLEY COUNTY  
S. D. DEPT. OF TRANSPORTATION

MARCH 2017

2 OF 10

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	083 368	E5	E12

**INSTALLING DOWELS IN CONCRETE**

- Holes drilled in the existing concrete shall be true and normal or as shown in the plans. Drilling holes using a core drill shall not be allowed. Care shall be taken not to damage the existing reinforcing steel. It is likely that some of the existing reinforcing steel shown in the original construction plans may have been placed out of position during original construction. Therefore, prior to the start of drilling any holes in the concrete, an effort will be made by Department forces to mark on the concrete surface where practical any locations of the in-place reinforcing steel. In spite of this precaution, the Contractor can still expect to encounter and have to drill through reinforcing steel.
- The epoxy resin mixture shall be of a type for bonding steel to hardened concrete and shall conform to AASHTO M235 Type IV. (Equivalent to ASTM C881, Type IV, Grade 3). Grade 1, 2, or 3 may be used for vertical dowels.
- The diameter of the drilled holes shall not be less than 1/8 inch greater, nor more than 3/8 inch greater than the diameter of the dowels or as per the Manufacturer's recommendations. The drilled holes shall be blown out with compressed air using a device that will reach the back of the hole to ensure that all debris or loose material has been removed prior to epoxy injection.
- Mix epoxy resin as recommended by the Manufacturer and apply by an injection method as approved by the Engineer. Beginning at the back of the drilled holes, fill the holes 1/3 to 1/2 full of epoxy, or as recommended by the Manufacturer, prior to insertion of the steel bar. Care shall be taken to prevent epoxy from running out of the horizontal holes prior to steel bar insertion. Rotate the steel bar during installation to eliminate voids and ensure complete bonding of the bar. Insertion of the bars by the dipping or painting method will not be allowed.
- No loads shall be applied to the epoxy grouted dowel bars until the epoxy resin has had sufficient time to cure as specified by the epoxy resin manufacturer.
- Dowel bars shall be deformed bars conforming to ASTM A615, Grade 60.
- The cost of epoxy resin, dowels, installation and other incidental items shall be incidental to the contract unit price per each for "Install Dowel in Concrete".

**PLACING CONCRETE PATCHING MATERIAL**

- Concrete patching material shall be packaged, dry, rapid hardening cementitious mortar or concrete materials conforming to the requirements of ASTM C 928, Type R-3 shall contain a bonding agent and shall not contain any chlorides, magnesium or phosphates.
- Water used for the concrete patching material shall be in conformance with Section 790 of the Construction Specifications.
- Upon completion of the concrete removal and immediately prior to placing any concrete patching material into the concrete removal areas, the removal areas shall be thoroughly cleaned of loose and foreign material by abrasive blasting. The surface of the area to receive the concrete patching material shall be in accordance with the manufacturer's recommendations. The abrasive blasting shall be to the extent that all surfaces laitance is removed. Abrasive blast cleaning shall expose the coarse aggregate and remove rust from any exposed reinforcing steel. After abrasive blasting, the surface shall be cleaned by the use of compressed air to the satisfaction of the Engineer. The air compressor used for cleaning shall be equipped with trap devices capable of providing moisture-free and oil free air at a pressure of 90 psi.
- The existing surface at the time of placement of the concrete patching material shall be at least 40°F, measured by a thermometer placed against the concrete surface and covered with an insulating blanket. The concrete patching material shall be mixed and placed in accordance with the manufacturer's technical data sheet. The Contractor shall provide a manufacturer's technical data sheet to the Engineer prior to performing work. The concrete patching material shall be maintained at or above 45°F for at least 72 hours after placement.
- Care will need to be taken to make sure patching material is filled in under the base plates and around bolts with no pockets.
- Immediately after finishing the concrete patching material, the surface of the concrete patching material shall be covered with a double layer of wet curing blanket. Within one hour of covering the wet curing blanket, polyethylene sheeting shall be placed on the wet curing blanket. The surface shall be wet cured for a minimum of 48 hours or in accordance with the manufacture's recommendations, whichever is more stringent. Following the wet cure, the curing blanket and polyethylene sheeting shall be removed and the surface allowed to air dry for a minimum of 48 hours after removal of the curing blanket and polyethylene sheeting.
- Concrete Patching Material, Miscellaneous will be measured to nearest 0.1 cubic feet as determined from the theoretical yield per bag of Concrete Patching Material, Bridge Deck. Concrete Patching Material, Bridge Deck will be paid for at the contract unit price per cubic foot. Payment will be full compensation for all labor, equipment, materials, and all incidental work required to abrasive blast clean the removal areas, and furnish, place and cure the concrete patching material within the removal areas.

**INSTALLING BOLTS, NUTS AND WASHERS**

- All anchor bolts and nuts for railing shall conform to F1554, Grade 55. The threaded bolts used to attach the rail posts to the barrier shall be 3/4" diameter x 0'-8" long. Washers shall be 3/16" thick and conform to ASTM F436. All components shall be galvanized in accordance with ASTM A153 or ASTM F2329, as applicable. The bolts shall be hex head "structural" type with heavy hex nuts and round washers.
- All anchor bolts shall be tightened to a torque of 120 ft- lbs. (approximated without the use of a calibrated torque wrench).
- 2 inches shall remain exposed above the top elevation of the barrier.
- One washer and one heavy hex nut shall be placed on the bottom side of the railing baseplate and another washer and heavy hex nut shall be placed on the top of the railing baseplate according to the plans.
- The cost of threaded bolts, nuts and washers shall be incidental to the contract unit price per cubic foot for "Concrete Patching Material, Miscellaneous".

**NOTES (CONTINUED)  
FOR  
434' - 0" CONT. GIRDER BRIDGE**

48' - 0" ROADWAY  
STR. NO. 59-398-295  
OVER BAD RIVER

0° SKEW  
SEC. 33-T5N-R31E  
M 083 368

STANLEY COUNTY  
S. D. DEPT. OF TRANSPORTATION  
MARCH 2017

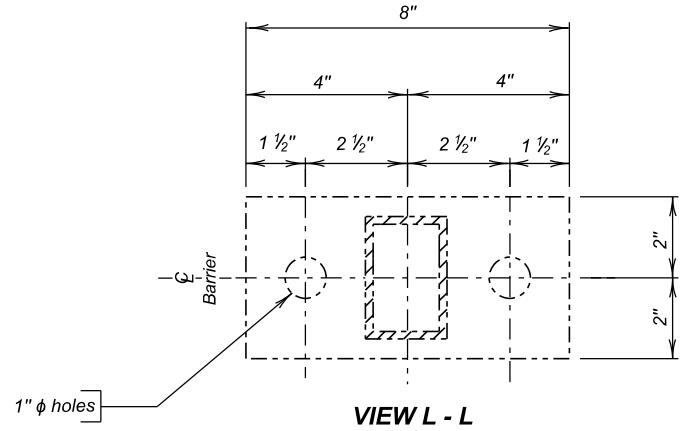
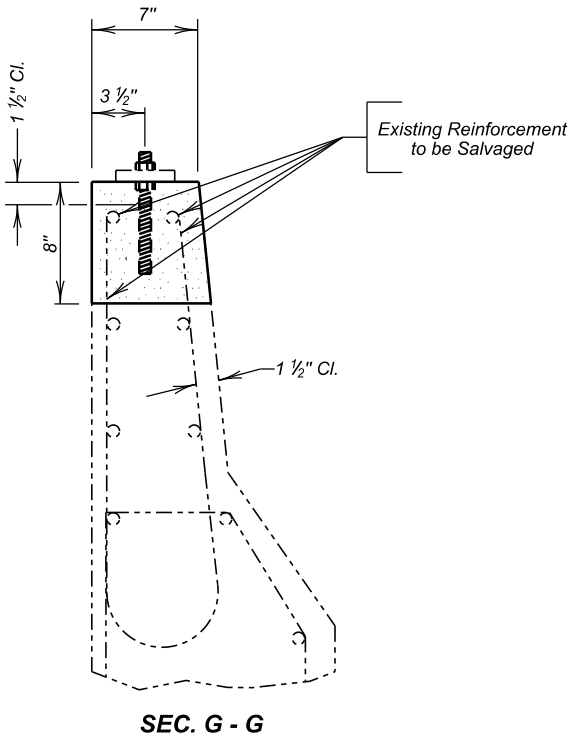
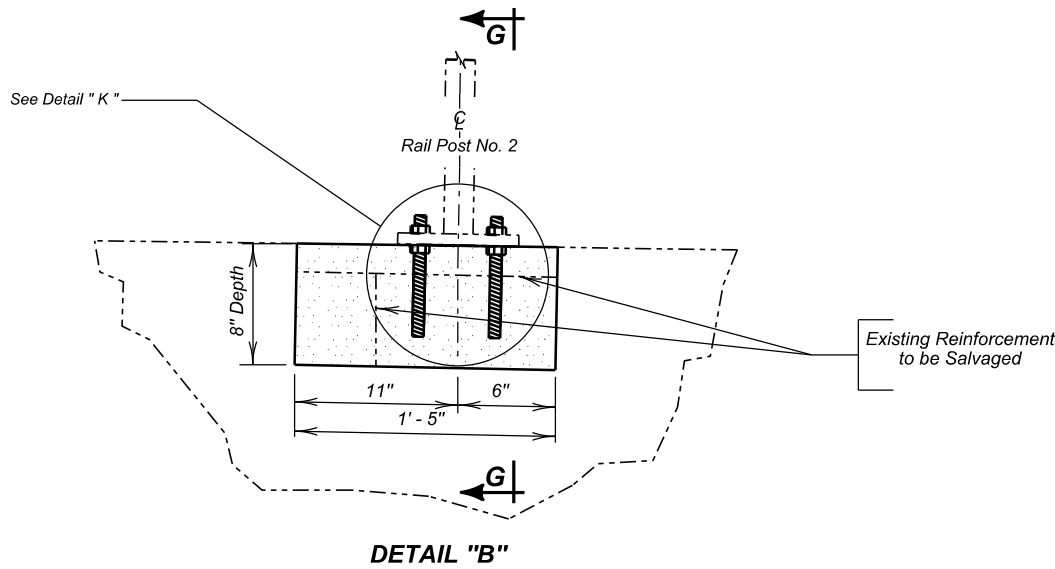
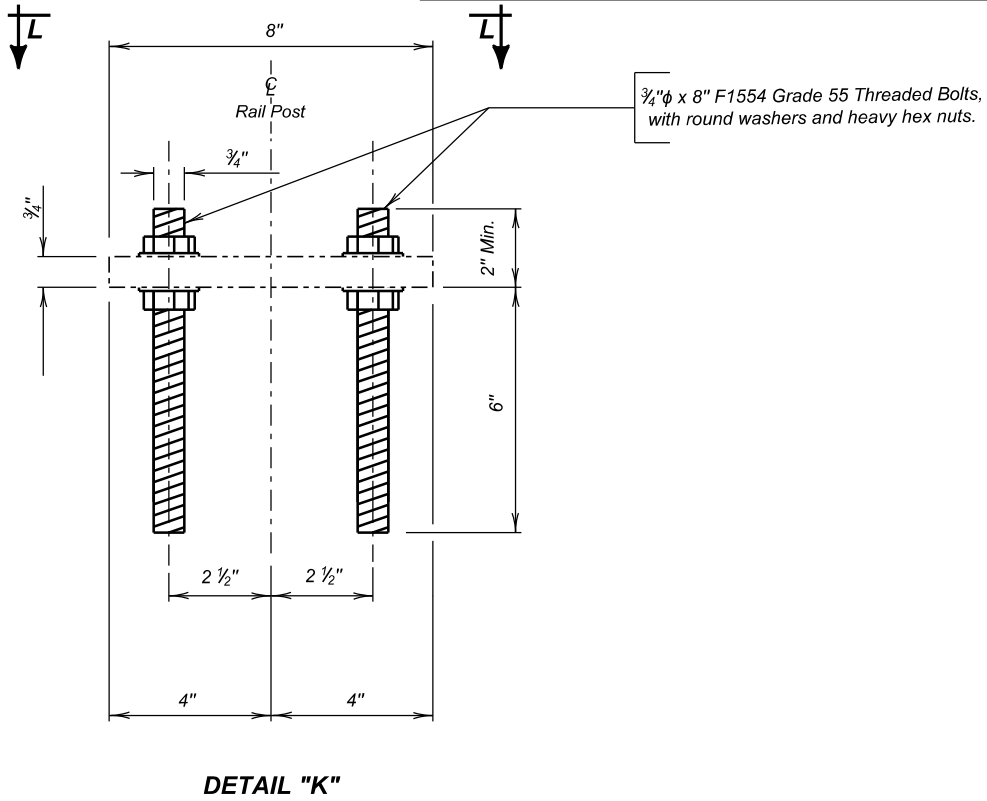
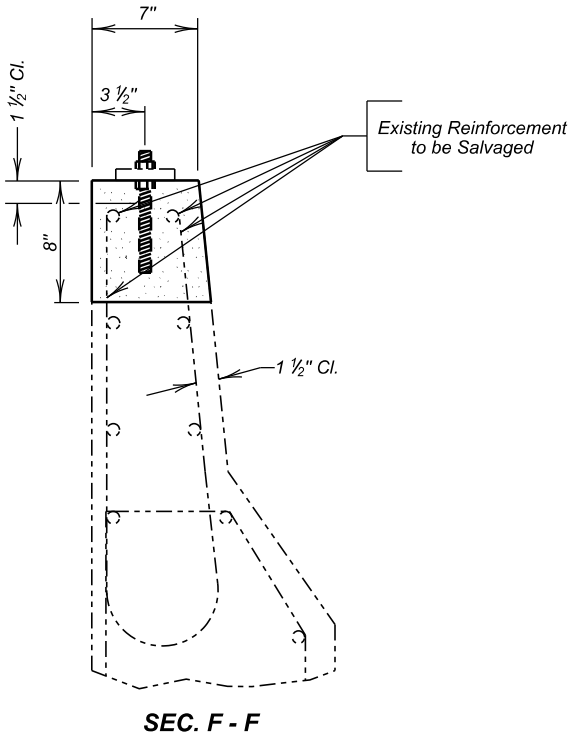
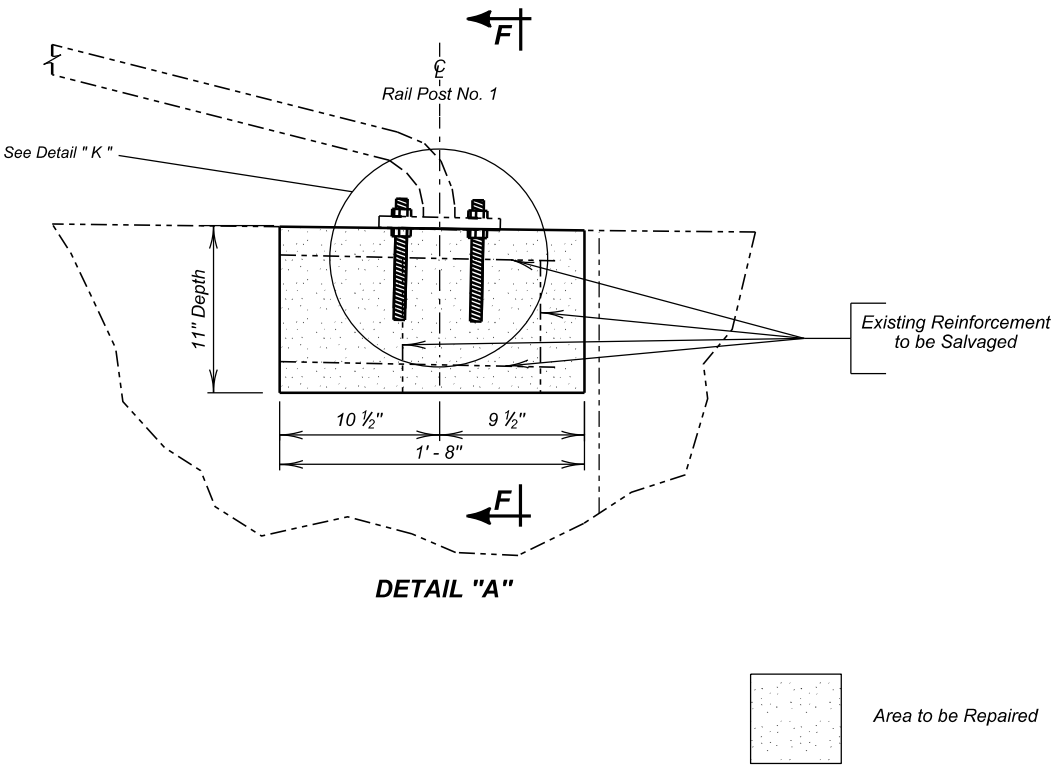
3 OF 10

DESIGNED BY CM STANI4HM	CK. DES. BY MM I4HMA03	DRAFTED BY CM	 BRIDGE ENGINEER
-------------------------------	------------------------------	------------------	--





STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	083 368	E7	E12



DETAILS ON REPAIR SECTIONS  
FOR  
434' - 0" CONT. GIRDER BRIDGE

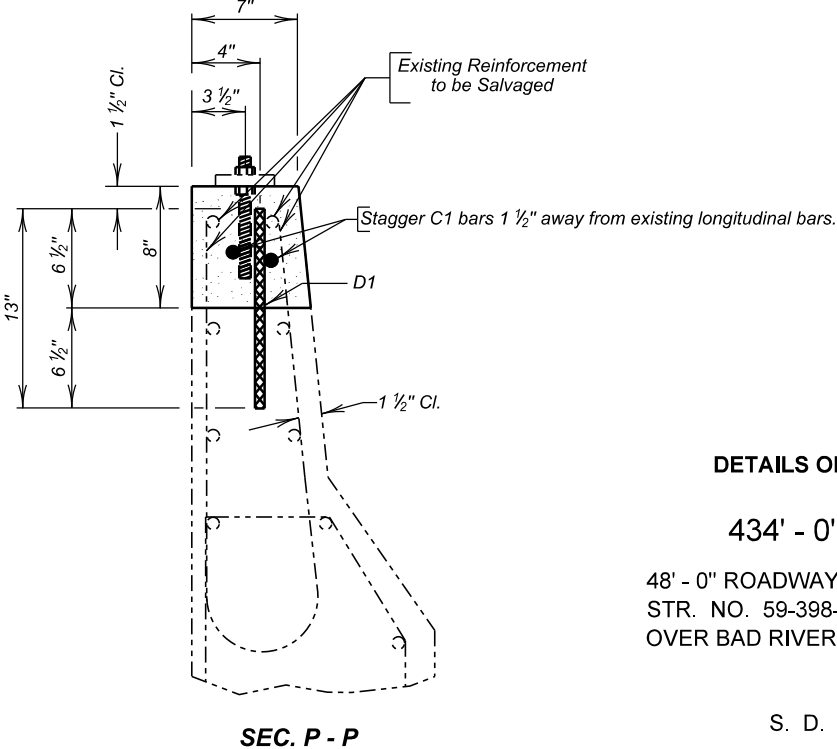
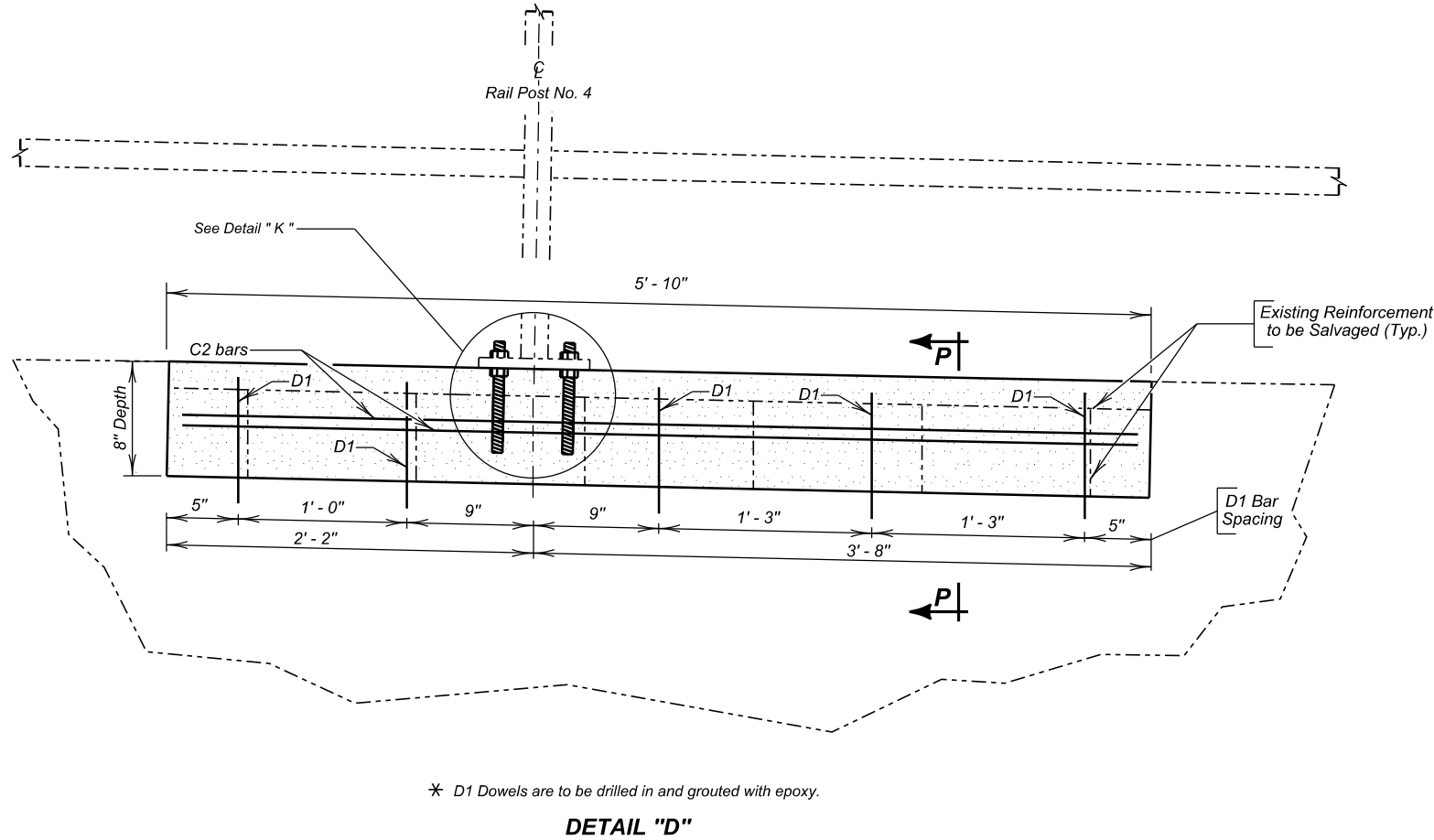
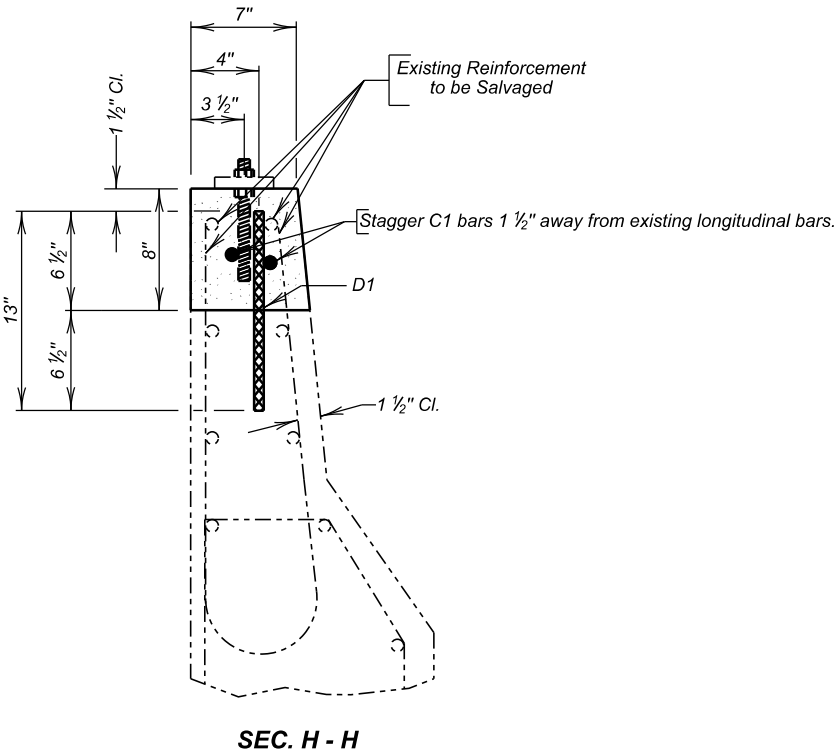
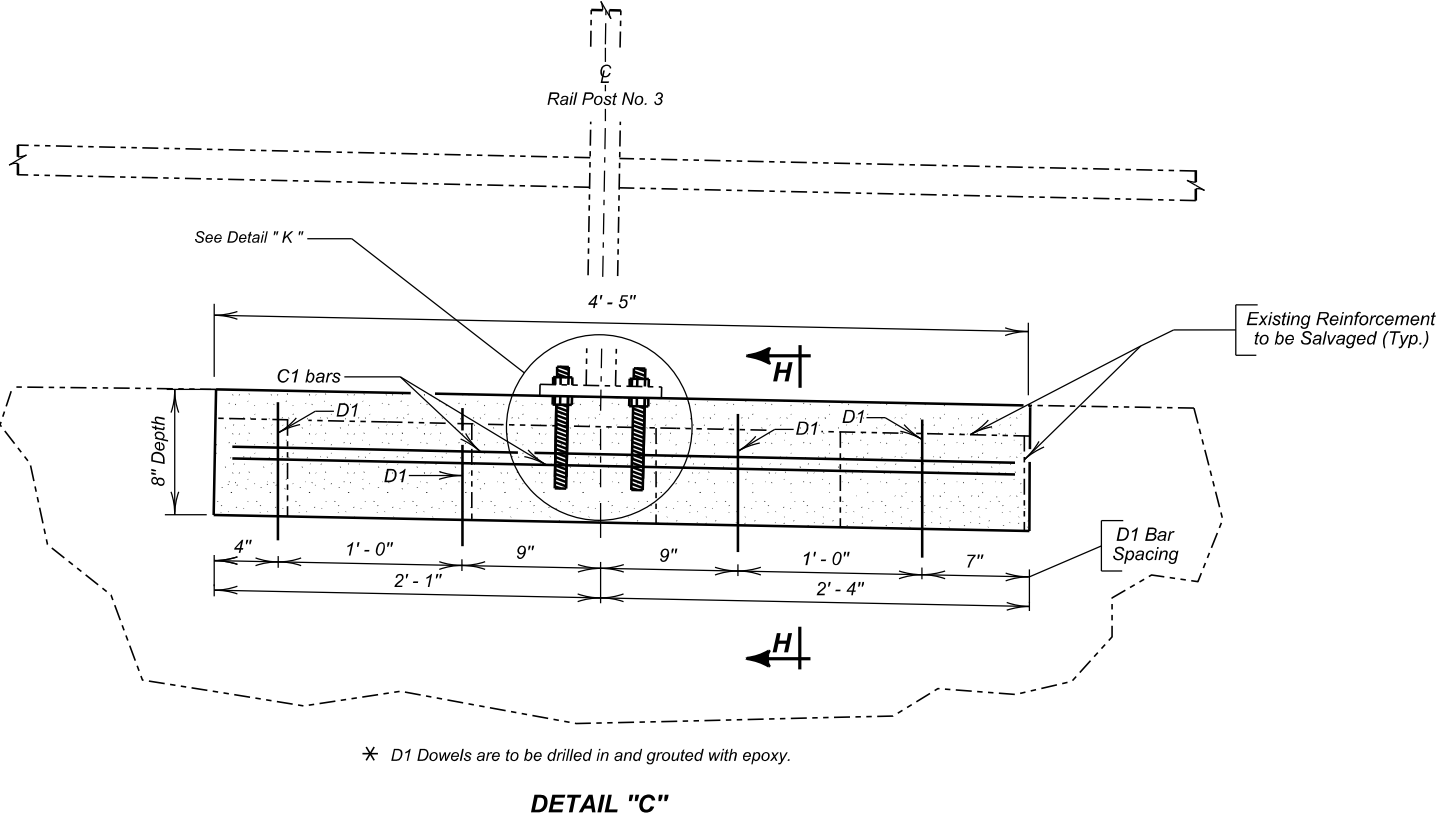
48' - 0" ROADWAY  
STR. NO. 59-398-295  
OVER BAD RIVER

0° SKEW  
SEC. 33-T5N-R31E  
M 083 368

STANLEY COUNTY  
S. D. DEPT. OF TRANSPORTATION  
MARCH 2017

DESIGNED BY CM STANI4HM	CK. DES. BY MM I4HMA05	DRAFTED BY CM CM	Steve A. Johnson BRIDGE ENGINEER
-------------------------------	------------------------------	------------------------	-------------------------------------

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	083 368	E8	E12

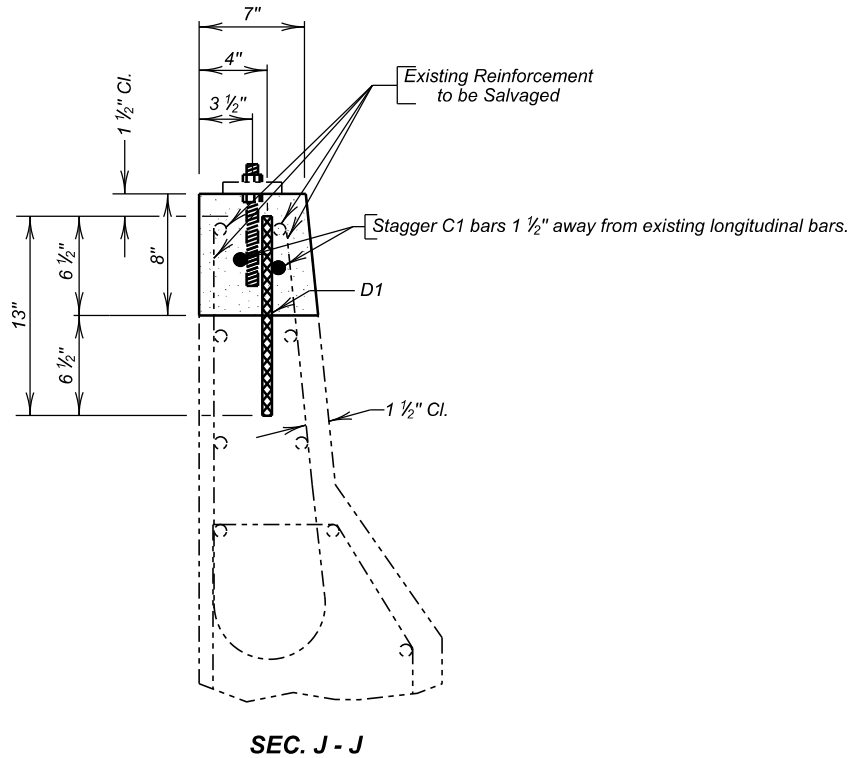
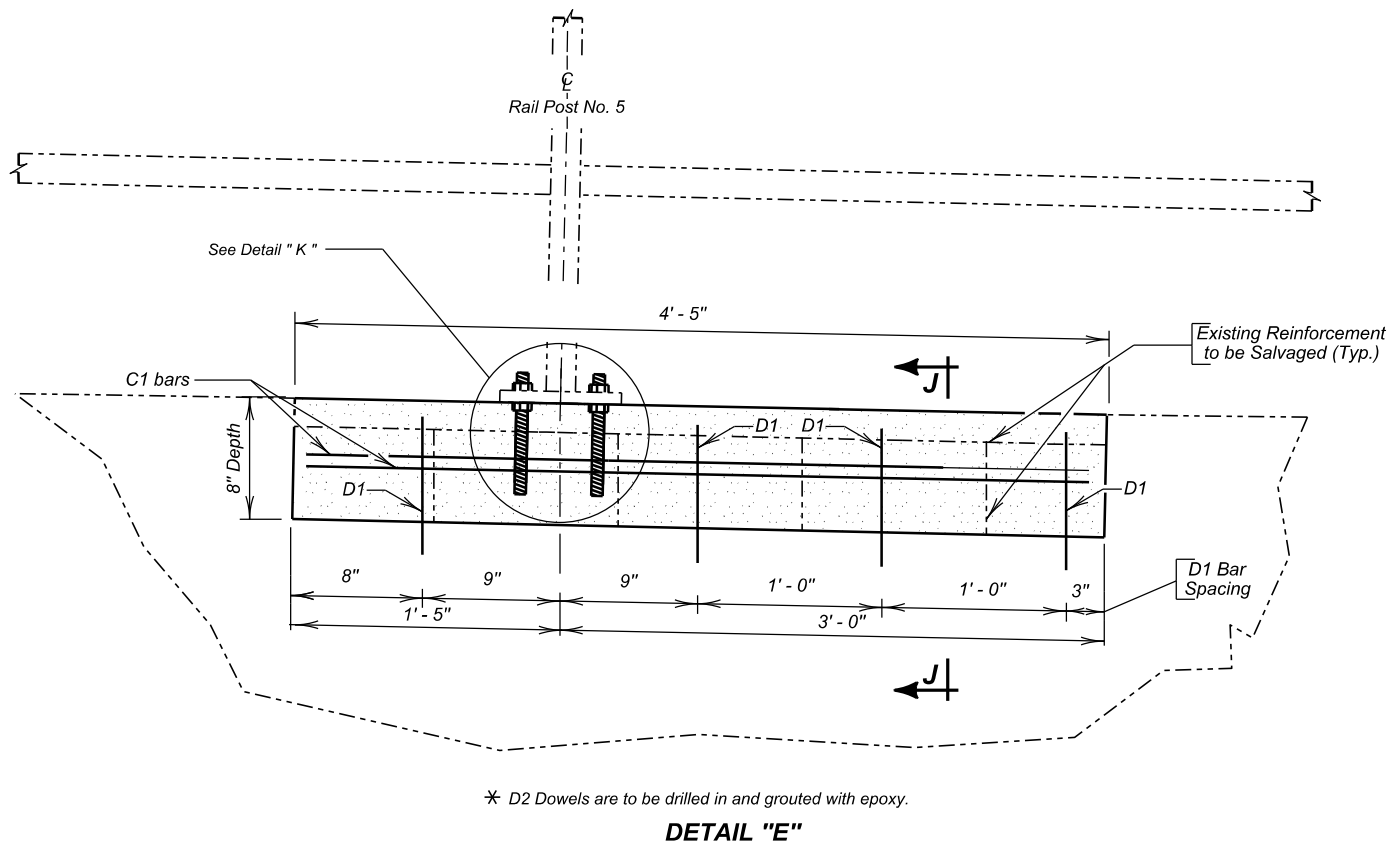


**DETAILS ON REPAIR SECTIONS (CONTINUED)**  
**FOR**  
**434' - 0" CONT. GIRDER BRIDGE**  
 48' - 0" ROADWAY  
 STR. NO. 59-398-295  
 OVER BAD RIVER

0° SKEW  
 SEC. 33-T5N-R31E  
 M 083 368

STANLEY COUNTY  
 S. D. DEPT. OF TRANSPORTATION  
 MARCH 2017

DESIGNED BY CM STANI4HM	CK. DES. BY MM I4HMA06	DRAFTED BY CM	<i>Steve A. Johnson</i> BRIDGE ENGINEER
-------------------------------	------------------------------	------------------	--



REINFORCING SCHEDULE				
Mk.	No.	Size	Length	Type
C1	4	4	4' - 1"	Str.
C2	2	4	5' - 6"	Str.
ΔD1	13	5	1' - 1"	Str.

NOTES :  
Δ Dowels  
All bars are epoxy coated.  
All dimensions are out to out of bars.

ESTIMATED QUANTITIES		
ITEM	UNIT	QUANTITY
Breakout Structure Concrete	Cu.Yd.	0.3
Concrete Patching Material, Miscellaneous	Cu.Ft.	7.5
Install Dowel in Concrete	Each	13
★ Epoxy Coated Reinforcing Steel	Lb.	18

★ Does not include the following quantities for D1 bars as these are paid for in the Bid Item "Install Dowel in Concrete". Dowels = 15 Lb.



DETAILS ON REPAIRED SECTIONS (CONTINUED)  
FOR

434' - 0" CONT. GIRDER BRIDGE

48' - 0" ROADWAY 0° SKEW  
STR. NO. 59-398-295 SEC. 33-T5N-R31E  
OVER BAD RIVER M 083 368

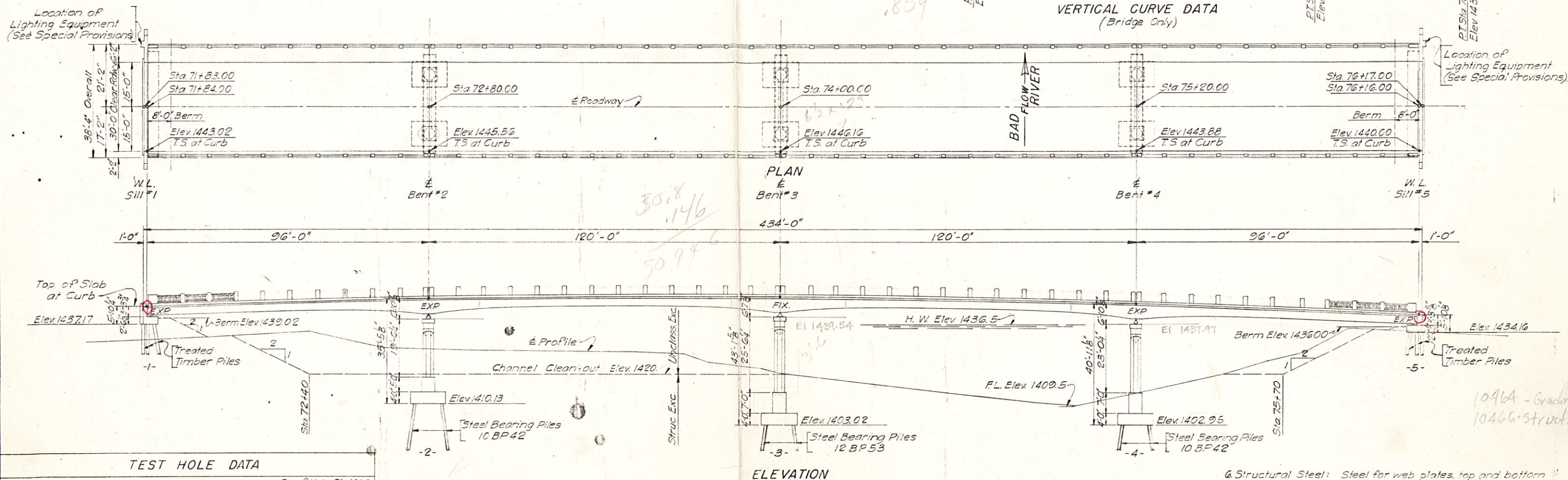
STANLEY COUNTY  
S. D. DEPT. OF TRANSPORTATION  
MARCH 2017



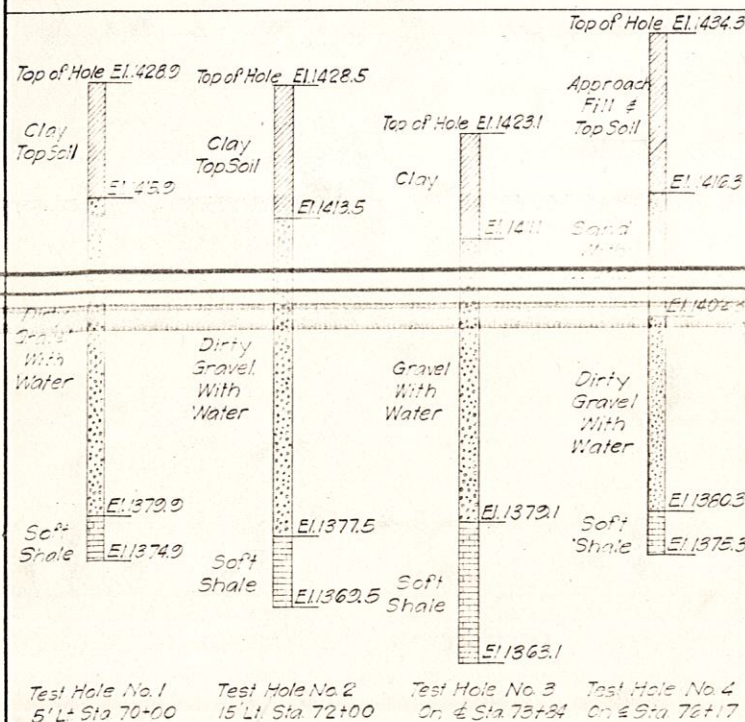
## INDEX OF BRIDGE SHEETS.-

- Sheet No. 1 General Drawing and Quantities.  
 Sheet No. 2 Details of Sills No. 1 and No. 5.  
 Sheet No. 3 Details of Bents No. 2, No. 3 and No. 4.  
 Sheet No. 4 Details of Superstructure.  
 Sheet No. 5 Details of Superstructure and Shoes.  
 Sheet No. 6 Details of Expansion Devices.  
 Sheet No. 7 Details of Railing, Sidewalk, Curb and Drains.

B.M. #8 - Elev 1428.33  
 Iron Bar #6ds.  
 50 Lt. Sta. 72+00



## TEST HOLE DATA



## ESTIMATED QUANTITIES

ITEM	Concrete - Cu.Yds	Steel - Lbs	Railing Lin.Ft	Treated Timber Piles - #Lin.Ft	Steel Bearing Piles - #Lbs	Excavation - Cu.Yds	Struct. Unclass.	Struct. Work	Lighting Equipment
Superstr. - 432' Cont. Unit	328.0	8,400	33,400	85,200	863.1				
Substr. - Sill #1	24.9	2,220		10,500	800				
Substr. - Sill #2	24.9	2,220		10,500	800				
Substr. - Sill #3	24.9	2,220		10,500	800				
Substr. - Sill #4	24.9	2,220		10,500	800				
Totals	311.1	8,400	33,400	85,200	863.1				

1. One Treated Timber Test Pile shall be driven at Sills #1 and #5 before remaining piles are ordered.  
 2. One Steel Bearing Test Pile shall be driven at Bent #3 before remaining piles are ordered.  
 3. See Grading Plans for Unclassified Excavation.  
 4. See Special Provisions.

## SPECIFICATION NOTES.-

1. Use current South Dakota Standard Specifications for Roads and Bridges except as noted in the Special Provisions.  
 2. In Section 513(m) of South Dakota Standard Specifications for Roads and Bridges, change the bearing value formula as follows:  $R = \frac{W}{S+C} \times \frac{W}{N+M}$  in which  
 R = Safe bearing value in tons.  
 W = Energy of hammer per blow in foot tons.  
 S = 10.35 for gravity hammer.  
 C = 0.10 for steam hammer.

- S = Average penetration of pile per blow for last 5 blows for gravity hammer or last 10 blows for steam hammer in inch.  
 W = Weight of gravity hammer or ram of steam hammer in ton.  
 M = Weight of pile plus driving cap in tons.  
 3. Design Loading: H 20-44 (1953)  
 4. Unit Stresses: Concrete = 1,600 p.s.i.  
 Re-steel = 20,000 p.s.i. (Intermediate Grade).  
 5. All reinforcing steel bars shall conform to A.S.T.M. - A305-50T and A15-50T (Intermediate Grade).

6. Structural Steel: Steel for web plates, top and bottom flange plates and web splice plates for all girders shall conform to Structural Low-Alloy Steel, A.S.T.M. - A242-49T. All other structural steel, except for bearing piles, shall conform to A.S.T.M. - A373-54T. Structural steel for bearing piles shall conform to Structural Carbon Steel, A.S.T.M. - A 7-50T.

## ORIGINAL CONSTRUCTION PLANS

## 434'-0" CONT. COMP GIRDER VIADUCT

30'-0" ROADWAY - ONE 5'-0" SIDEWALK  
 OVER BAD RIVER CITY OF FORT PIERRE  
 STA. 71+83.00 TO 76+17.00 F 231(3)  
 (ST. WK.)

STANLEY COUNTY  
 STR. NO. 59-398-295 SOUTH DAKOTA H20-44  
 STATE HIGHWAY COMMISSION

-X031- JAN. 1955

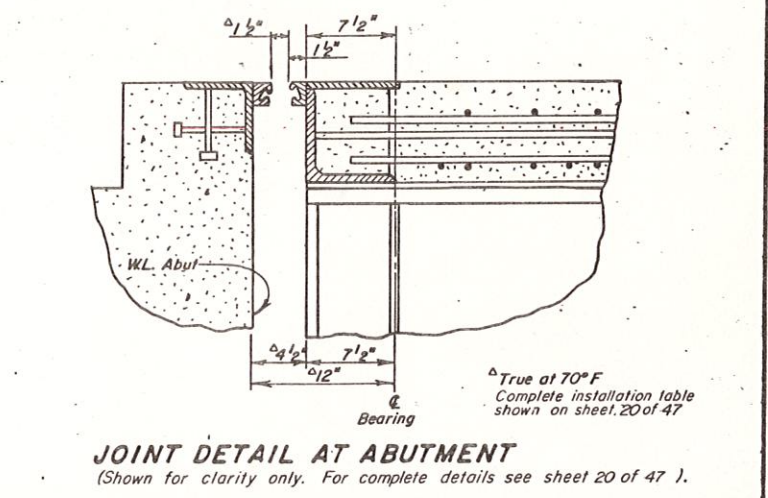
8 OF 10

DESIGNED BY  
 DRAWN BY  
 CHECKED BY  
 APPROVED BY  
 BRIDGE ENGINEER



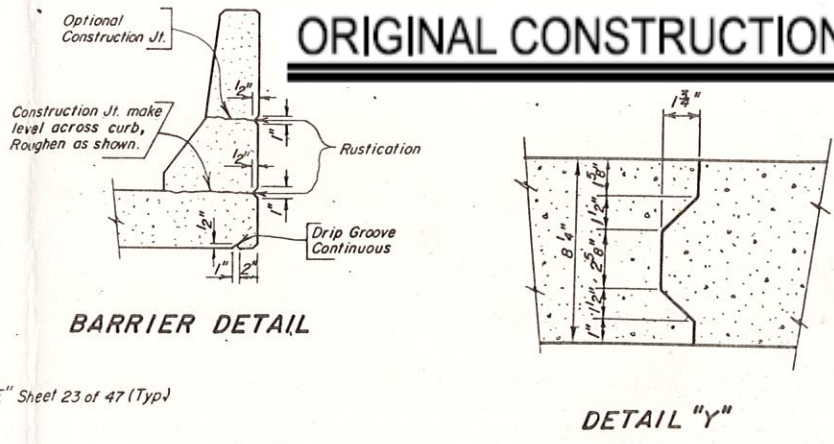
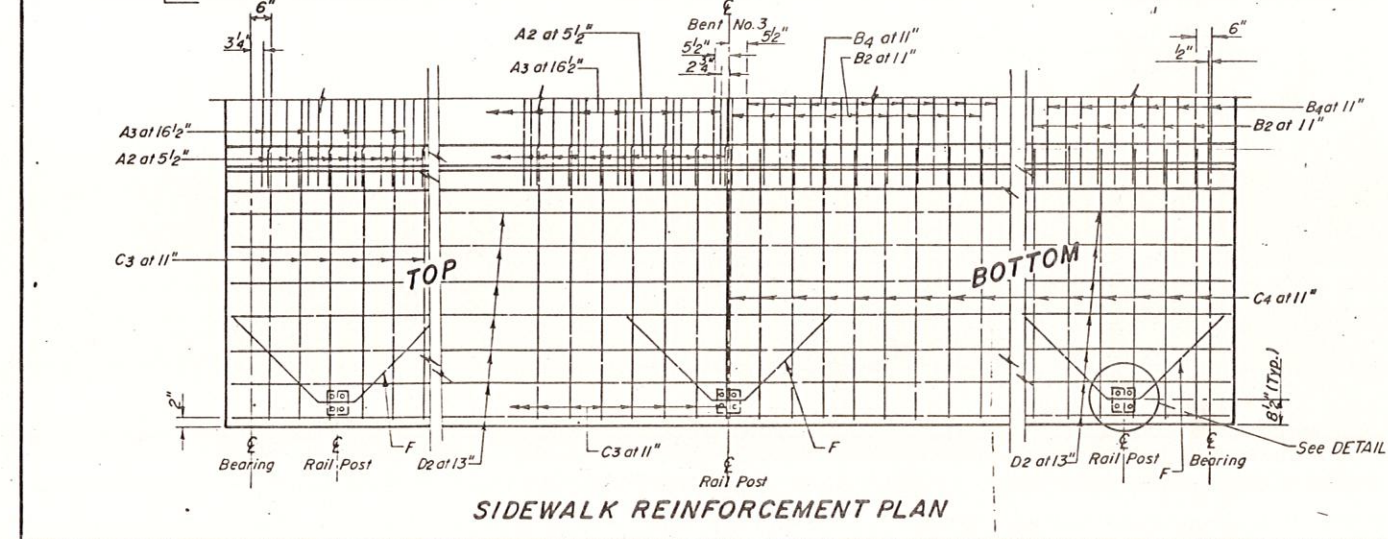
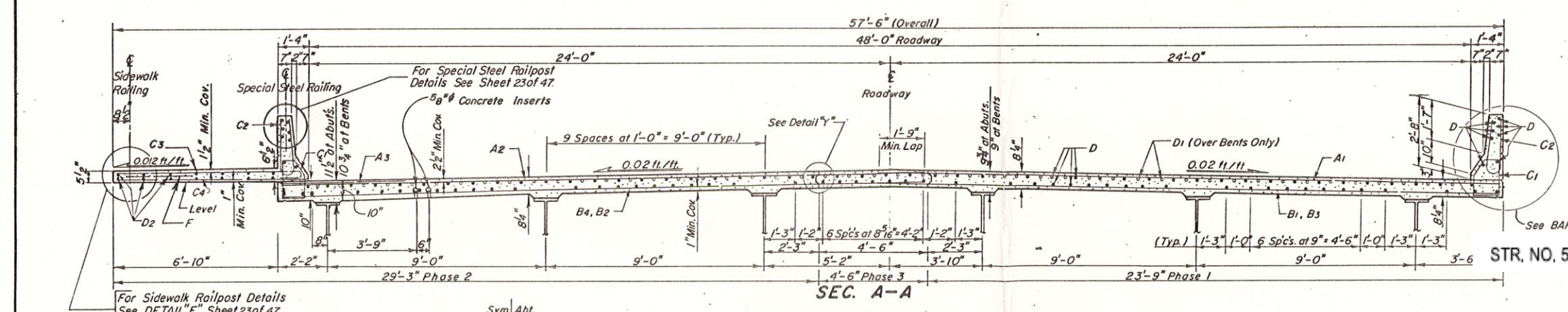
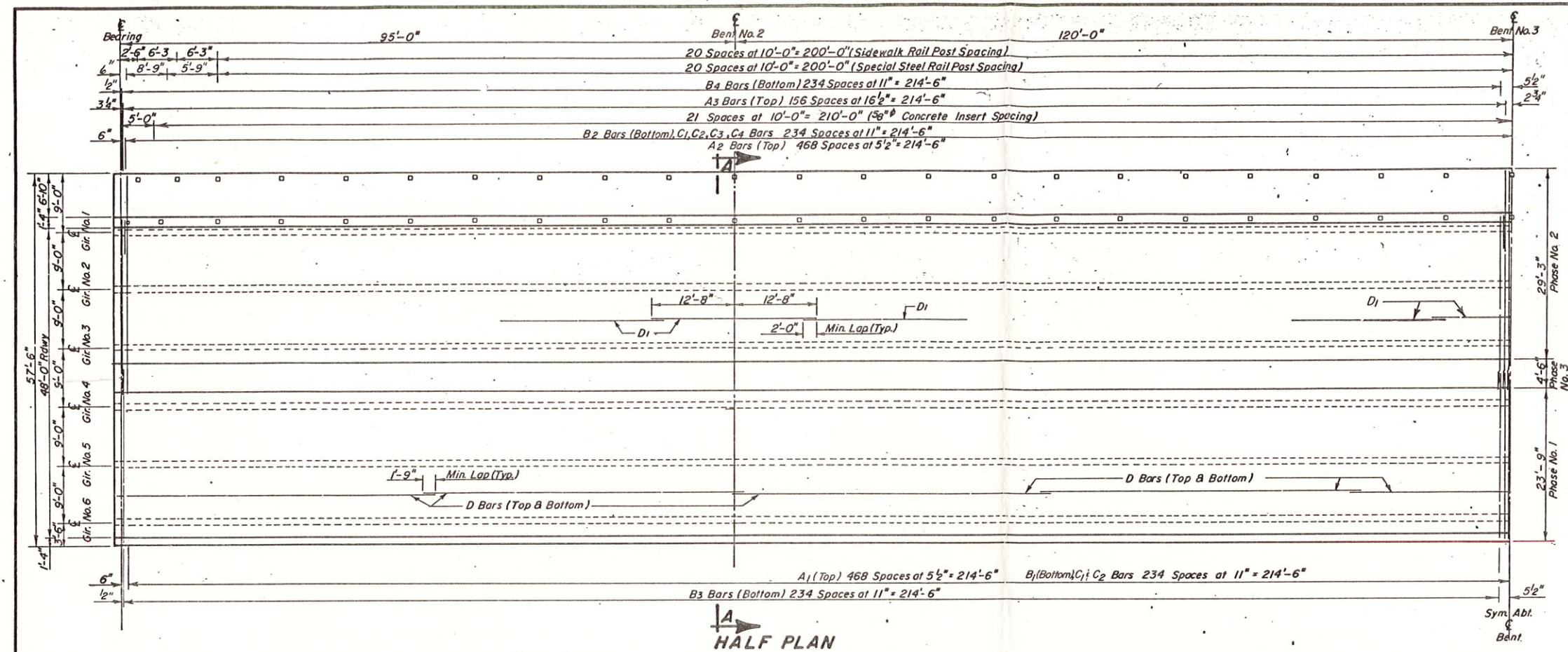
REINFORCING SCHEDULE					Bending Detail	
MK.	No.	Size	Length	Type		
A1	937	5	25'-9"	Str.		
A2	937	5	26'-7"	Str.		
A3	314	5	6'-0"	Str.		
B1	469	4	25'-9"	Str.		
B2	469	4	26'-7"	Str.		
B3	470	5	25'-9"	Str.		
B4	470	5	26'-7"	Str.		
D	1035	5	49'-6"	Str.		
D1	432	6	25'-4"	Str.		
D2	126	3	49'-6"	Str.		
C1	938	4	5'-6"	T2A		
C2	938	4	5'-1"	S11		
F	45	3	8'-0"	14A		
C3	469	5	8'-10"	2A		
C4	469	5	7'-10"	Str.		

All reinforcing steel shall be epoxy coated.  
All dimensions are out to out of bars.



ESTIMATED QUANTITIES		
ITEM	UNIT	QUANTITY
Class "A45" Concrete Bridge Deck	Sq. Yds.	707.9
Epoxy Coated Reinforcing Steel	Lbs.	182,298
Structural Steel	Lump Sum	Lump Sum
Bridge Sidewalk Chain Link Fence	Lin. Ft.	440.0
Steel Railing, Sidewalk	Lin. Ft.	469
Special Steel Railing	Lin. Ft.	429
Temporary Pedestrian Rail	Lin. Ft.	434

For informational purposes only, the estimated weight of structural steel is 598,361 lbs.



**ORIGINAL CONSTRUCTION PLANS**

**SLAB DETAILS FOR 434'-0" CONT. COMP. GIRDER BRIDGE**

48'-0" ROADWAY OVER BAD RIVER  
ONE 6'-0" SIDEWALK  
CITY OF FT. PIERRE  
STA. 71+83.00 TO 76+17.00  
STR. NO. 59-398-295  
BRFO083(35) I18  
HS 20-44 (8 ALT.)  
STANLEY COUNTY  
S. D. DEPT. OF TRANSPORTATION

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
LAS 4/29	LAK	EA+TDW	

BRIDGE ENGINEER



