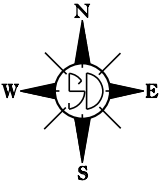


PROJECT

STATE OF SOUTH DAKOTA  
DEPARTMENT OF TRANSPORTATION  
PLANS FOR PROPOSED  
**PROJECT 014-368**  
**US HIGHWAY 14**  
**HAAKON COUNTY**  
BRIDGE RAIL REPAIR  
PCN i4XC

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	014-368	1	23

Plotting Date: 12/07/2017

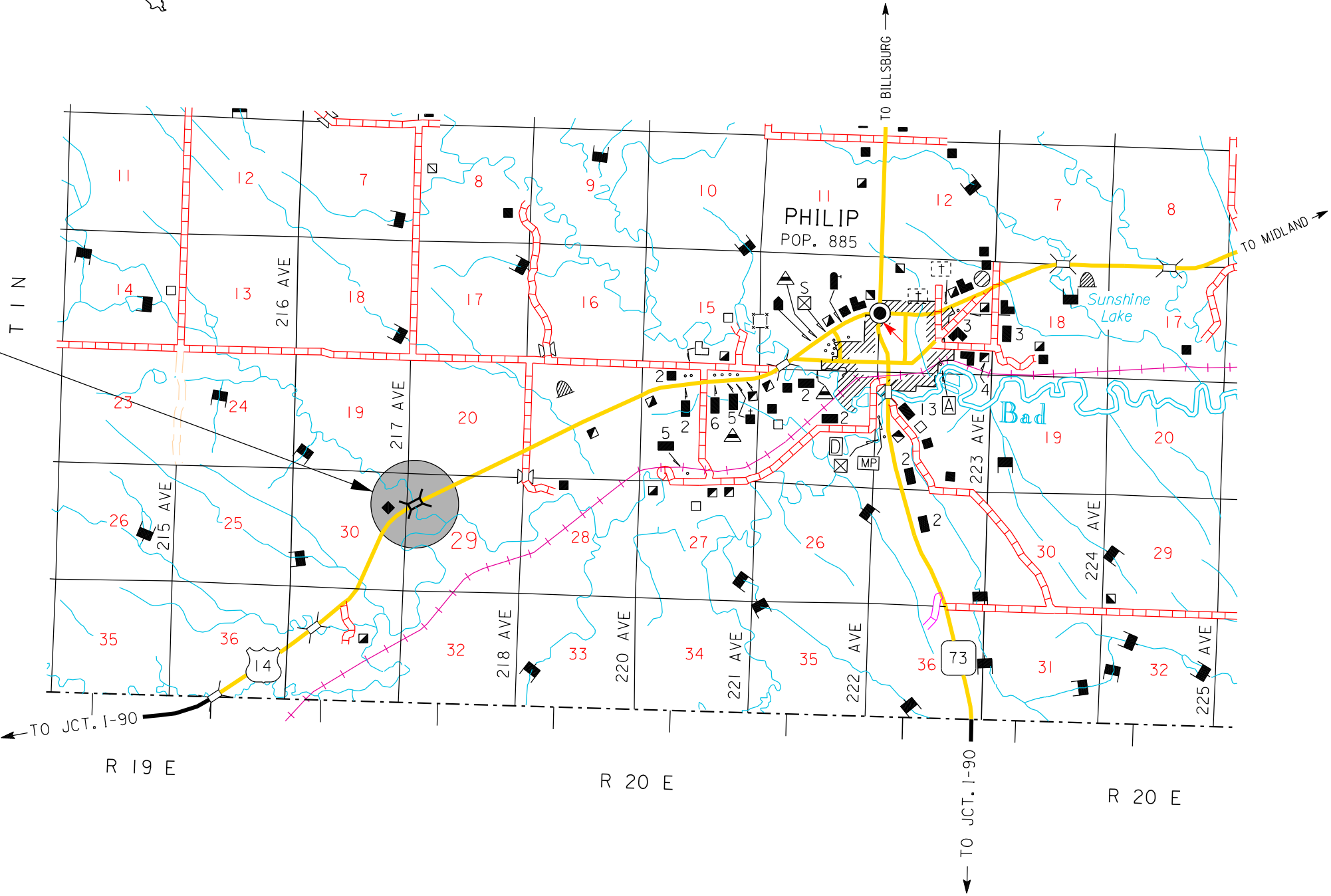


Structure No. 28-131-503  
Steel Girder Bridge  
Over Creek  
153.5 Feet = 0.029 Mile  
MRM 138.20

**DESIGN DESIGNATION**  
(US14 MRM 138.2)

ADT (2016)	1004
ADT (2036)	1145
DHV	179
D	50%
T DHV	6.0%
T ADT	13.2%
V	65 MPH

**STORM WATER PERMIT**  
(None Required)



# ESTIMATE OF QUANTITIES

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	014-368	A1	A2

## SECTION C ~ TRAFFIC CONTROL

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
634E0010	Flagging	20.0	Hour
634E0110	Traffic Control Signs	218.0	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	2,544	Ft

Index of Sheets	
Sheet A1:	Estimate of Quantities for Sections C and E
Sheet A2:	Environmental Commitment Notes

## SECTION E ~ STRUCTURE # 28-131-503

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
110E0020	Remove Bridge Railing	25	Ft
460E0174	Concrete Patching Material, Miscellaneous	3.7	CuFt
460E0300	Breakout Structural Concrete	0.2	CuYd
460E0380	Install Dowel in Concrete	4	Each
460E0600	Housing and Heating Concrete	0.2	CuYd
470E0380	Modify Bridge Rail	25	Ft
480E5000	Galvanic Anode	2	Each

## 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.	014-368	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 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.

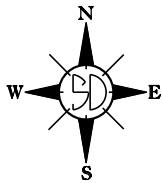
Plot Scale - 1:7087.29

Plotted From - tpr25289

# SECTION C: TRAFFIC CONTROL PLANS

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	014-368	C1	C5

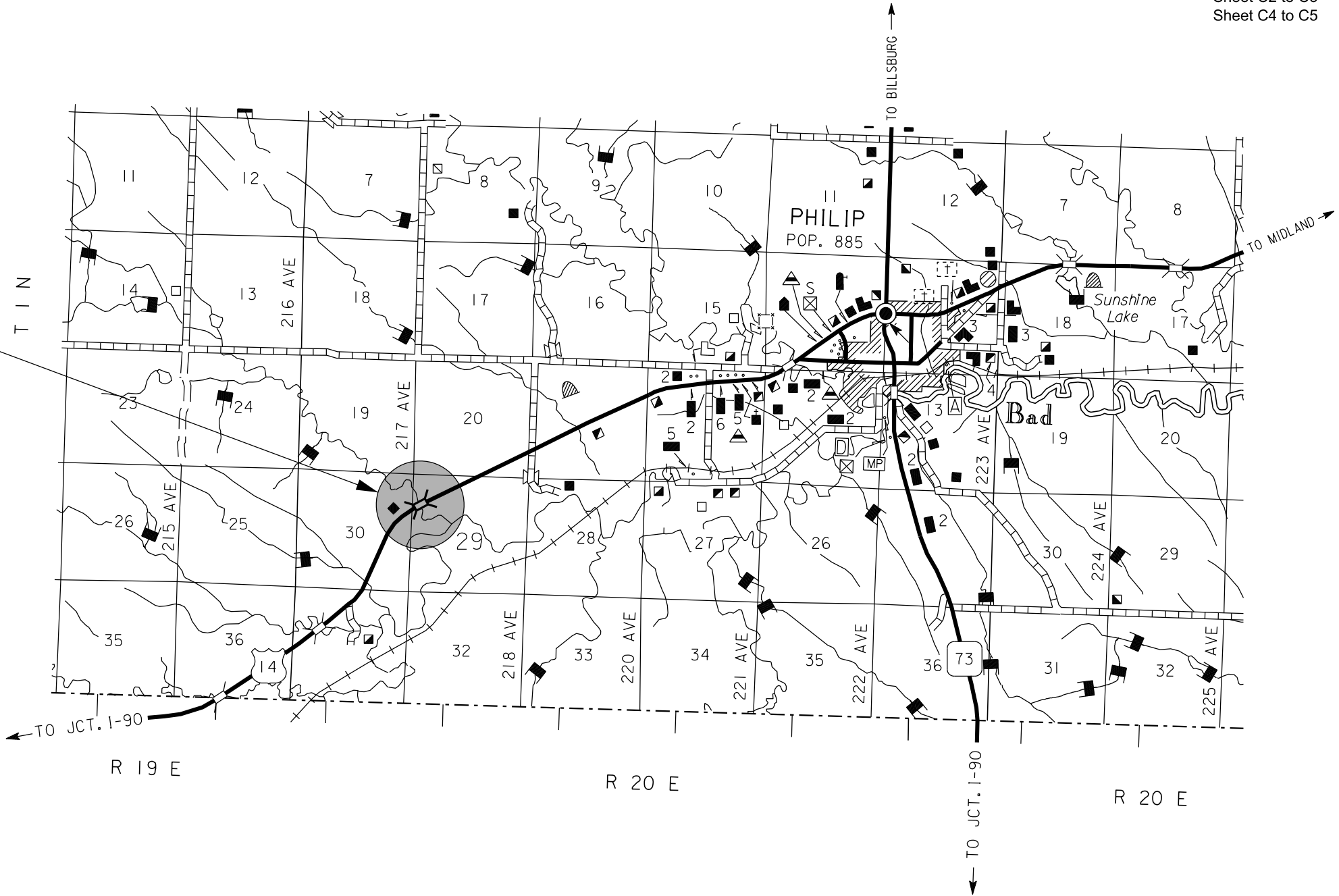
Plotting Date: 08/24/2017



## INDEX OF SHEETS

Sheet C1	Layout Map and Index
Sheet C2 to C3	Estimate and Notes
Sheet C4 to C5	Standard Plates

Structure No. 28-131-503  
Steel Girder Bridge  
Over Creek  
153.5 Feet = 0.029 Mile  
MRM 138.20





ESTIMATE OF QUANTITIES

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
634E0010	Flagging	20.0	Hour
634E0110	Traffic Control Signs	218.0	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	2,544	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.

Traffic shall be maintained through the project at ALL times. The Contractor shall maintain access on and off the highway for local residences and county roads. 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.

Type 3 Barricade, 8’ Double Sided shall mark both ends of the construction work zone.

Channelizing devices in a series shall be of the same type. The cost of additional channelizing devices shall be incidental to the contract lump sum price for “Traffic Control, Miscellaneous”.

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

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.

Temporary Pavement Marking Tape, Type 1 shall be used for all pavement marking shown on Standard Plate 634.25.

Approximately 144 feet of 4 inch white (24" stop bar reduced to 4" equivalent) and 2,400 feet of 4 inch yellow will be required at the structure site. 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.

TABLE OF ESTIMATED TEMPORARY PAVEMENT TAPE

Location	4" Temporary Pavement Marking Tape, Type I		
	4W	4Y	Stop Bar (4W)
Structure # 28-131-503 MRM 138.20	--	2400	144
Total:	--	2400	144

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 (Rapid City/Pennington Co. ESCC (605-393-8121)), and Haakon County Sheriff Department (605-859-2741).

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

PROJECT SIGN TABULATION

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	014-368	C3	C5

ITEMIZED LIST FOR TRAFFIC CONTROL SIGNS

SIGN CODE	SIGN DESCRIPTION	CONVENTIONAL ROAD			
		NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
R1-1	STOP	2	30"	5.2	10.4
W1-3	REVERSE TURN (L or R)	1	48" x 48"	16.0	16.0
W3-1	STOP AHEAD (symbol)	2	48" x 48"	16.0	32.0
W3-4	BE PREPARED TO STOP	1	48" x 48"	16.0	16.0
W13-1P	ADVISORY SPEED (plaque)	2	30" x 30"	6.3	12.6
W16-2P	___ FEET (supplemental distance plaque)	2	30" x 24"	5.0	10.0
W20-1	ROAD WORK AHEAD	2	48" x 48"	16.0	32.0
W20-4	ONE LANE ROAD AHEAD	2	48" x 48"	16.0	32.0
W20-7	FLAGGER (symbol)	2	48" x 48"	16.0	32.0
W21-1	WORKERS (symbol)	1	48" x 48"	16.0	16.0
G20-2	END ROAD WORK	2	36" x 18"	4.5	9.0
		CONVENTIONAL ROAD TRAFFIC CONTROL SIGNS			
		SQFT			
		218.0			

TYPE 3 BARRICADES

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

Plotting Date: 12/27/2017

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

● Flagger

■ Channelizing Device

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

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

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

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

The channelizing devices shall be drums or 42" cones.

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

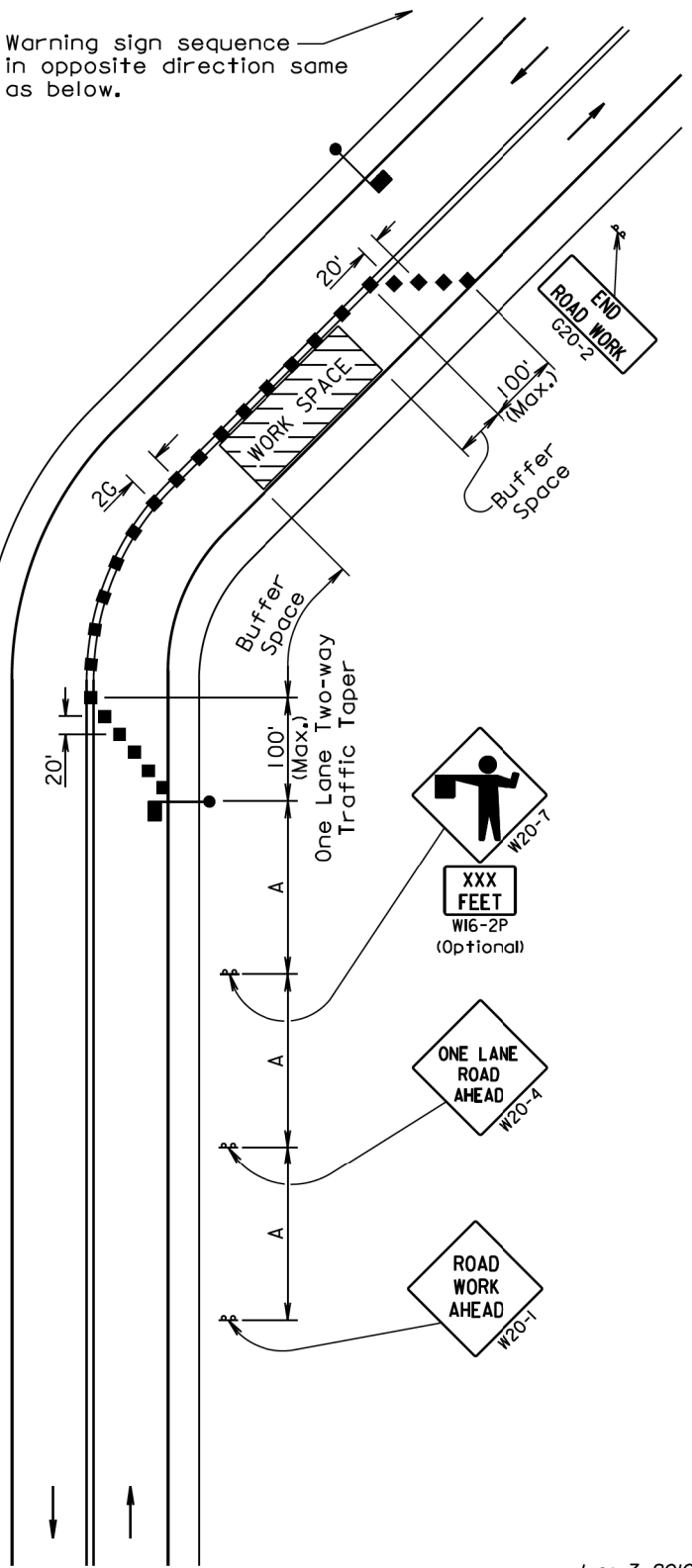
END ROAD WORK  
G20-2

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

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

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

Warning sign sequence in opposite direction same as below.



June 3, 2016

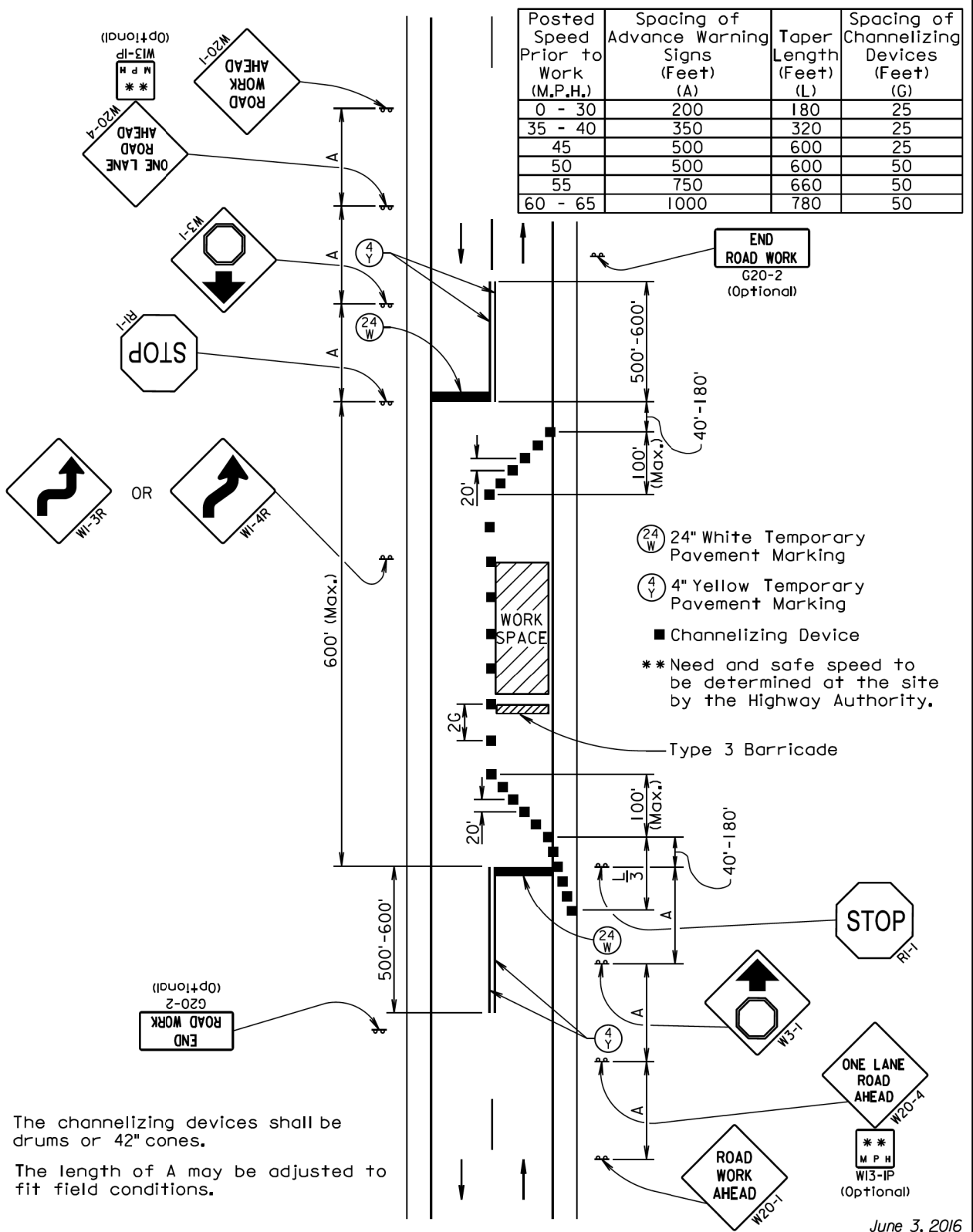
Published Date: 4th Qtr. 2017

SD  
DOT

GUIDES FOR TRAFFIC CONTROL DEVICES  
LANE CLOSURE WITH FLAGGER PROVIDED

PLATE NUMBER  
634.23

Sheet 1 of 1



Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet) (A)	Taper Length (Feet) (L)	Spacing of Channelizing Devices (Feet) (G)
0 - 30	200	180	25
35 - 40	350	320	25
45	500	600	25
50	500	600	50
55	750	660	50
60 - 65	1000	780	50

(24 W) 24" White Temporary Pavement Marking

(4 Y) 4" Yellow Temporary Pavement Marking

■ Channelizing Device

\*\* Need and safe speed to be determined at the site by the Highway Authority.

Type 3 Barricade

The channelizing devices shall be drums or 42" cones.

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

Published Date: 4th Qtr. 2017

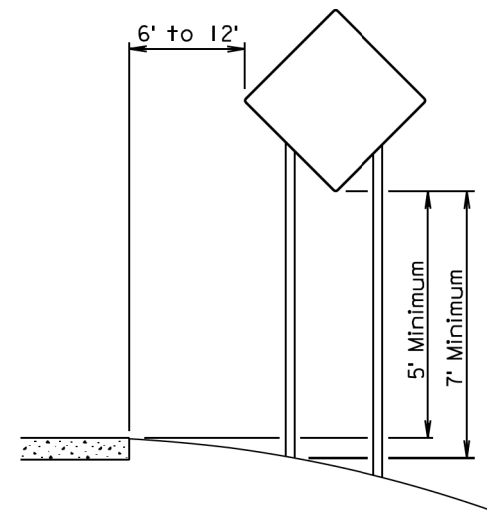
SD  
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GUIDES FOR TRAFFIC CONTROL DEVICES  
LANE CLOSURE USING STOP SIGNS

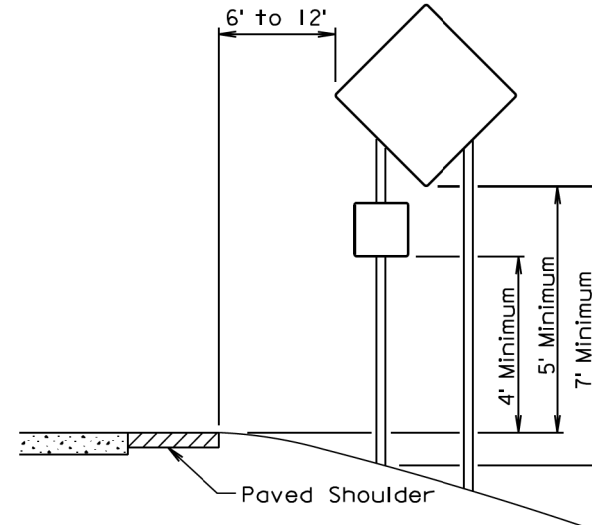
PLATE NUMBER  
634.25

Sheet 1 of 1

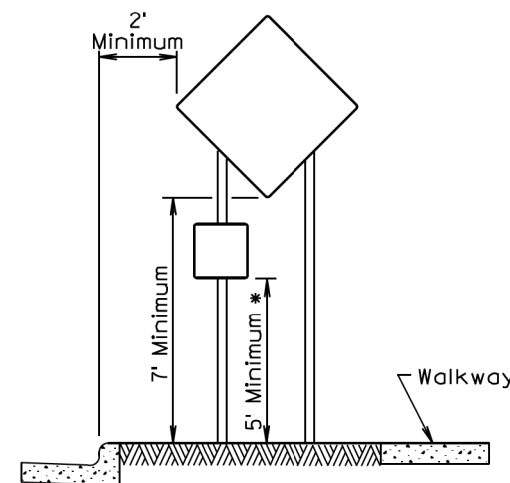
Plotting Date: 12/27/2017



RURAL DISTRICT

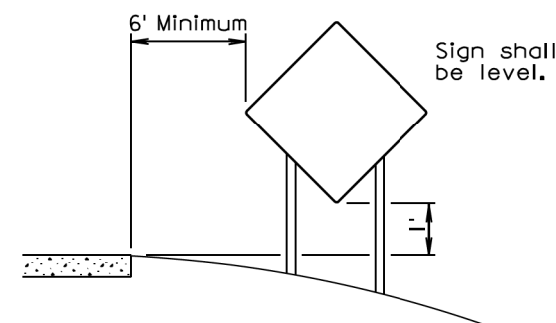


RURAL DISTRICT WITH  
SUPPLEMENTAL PLATE



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

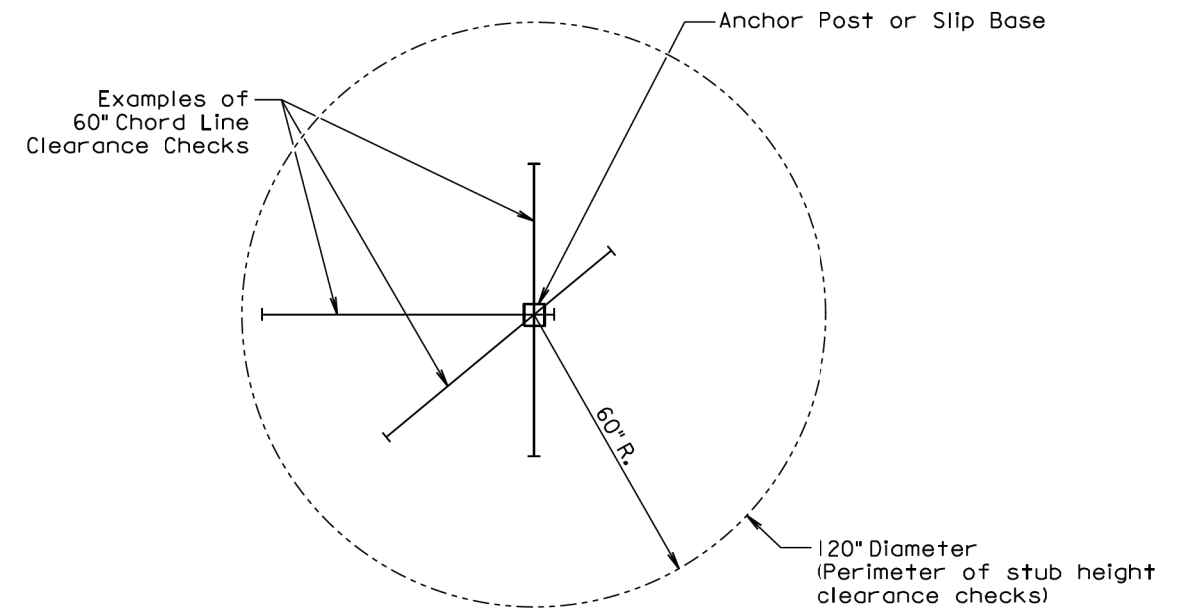
Published Date: 4th Qtr. 2017

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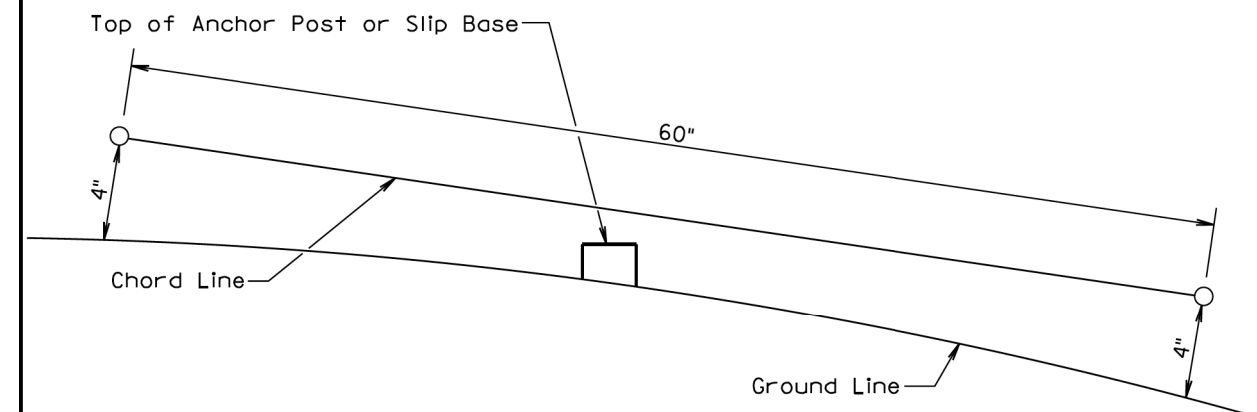
**CRASHWORTHY SIGN SUPPORTS**  
(Typical Construction Signing)

PLATE NUMBER  
634.85

Sheet 1 of 1



PLAN VIEW  
(Examples of stub height clearance checks)



ELEVATION VIEW

**GENERAL NOTES:**

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

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

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

July 1, 2005

Published Date: 4th Qtr. 2017

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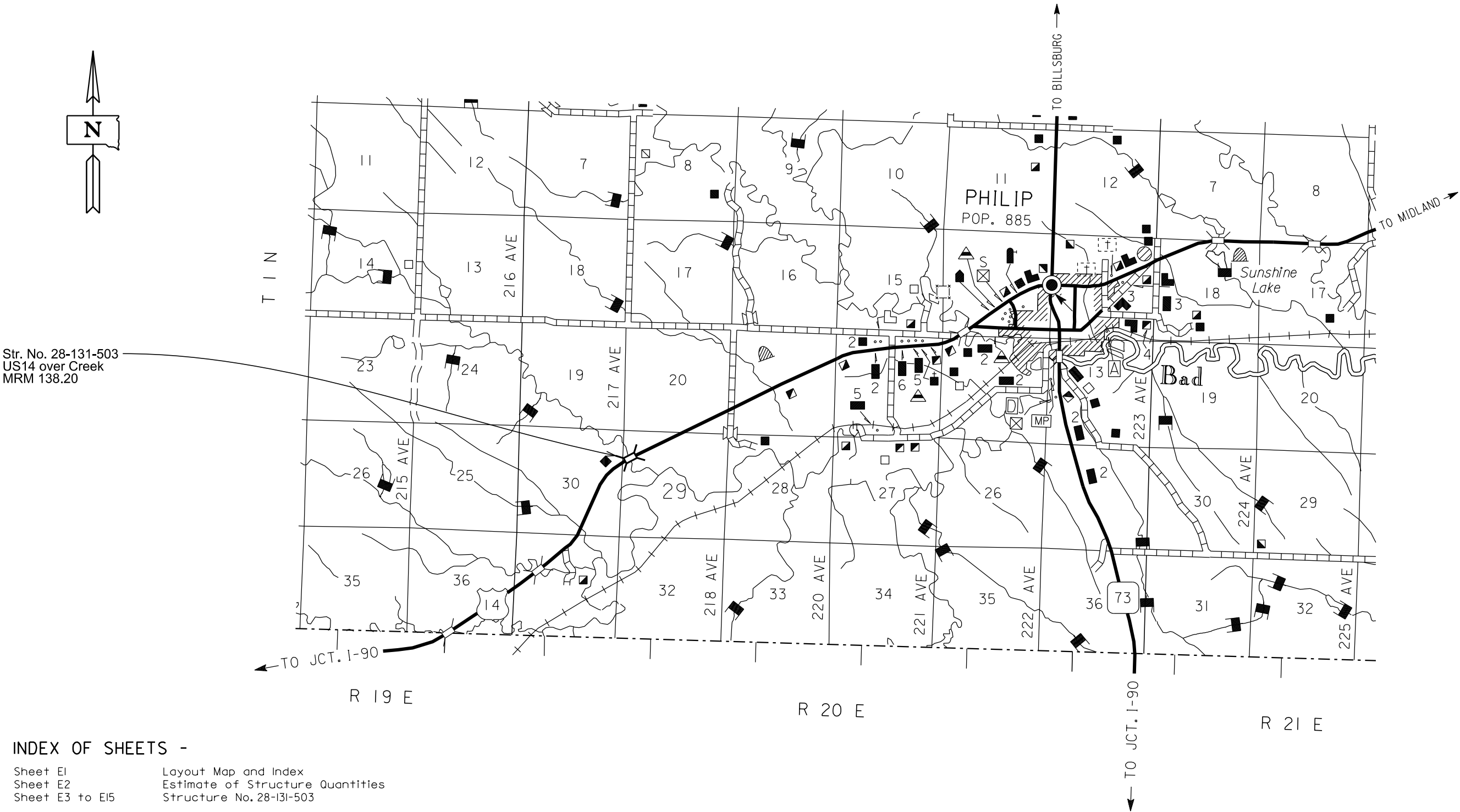
**BREAKAWAY SUPPORT STUB CLEARANCE**

PLATE NUMBER  
634.99

Sheet 1 of 1

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	014-368	E1	E15

# Section E: Structure Plans



INDEX OF SHEETS -	
Sheet E1	Layout Map and Index
Sheet E2	Estimate of Structure Quantities
Sheet E3 to E15	Structure No. 28-131-503



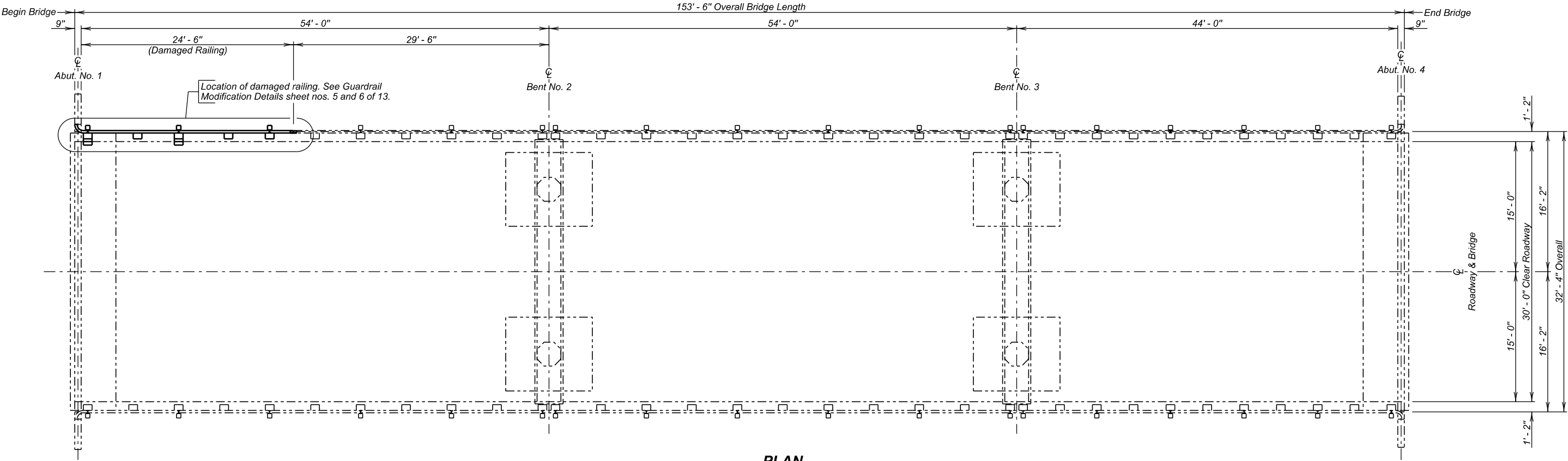
STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	014-368	E2	E15

**SECTION E – ESTIMATE OF STRUCTURE QUANTITIES**

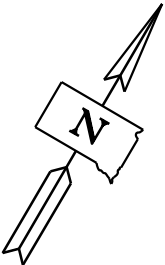
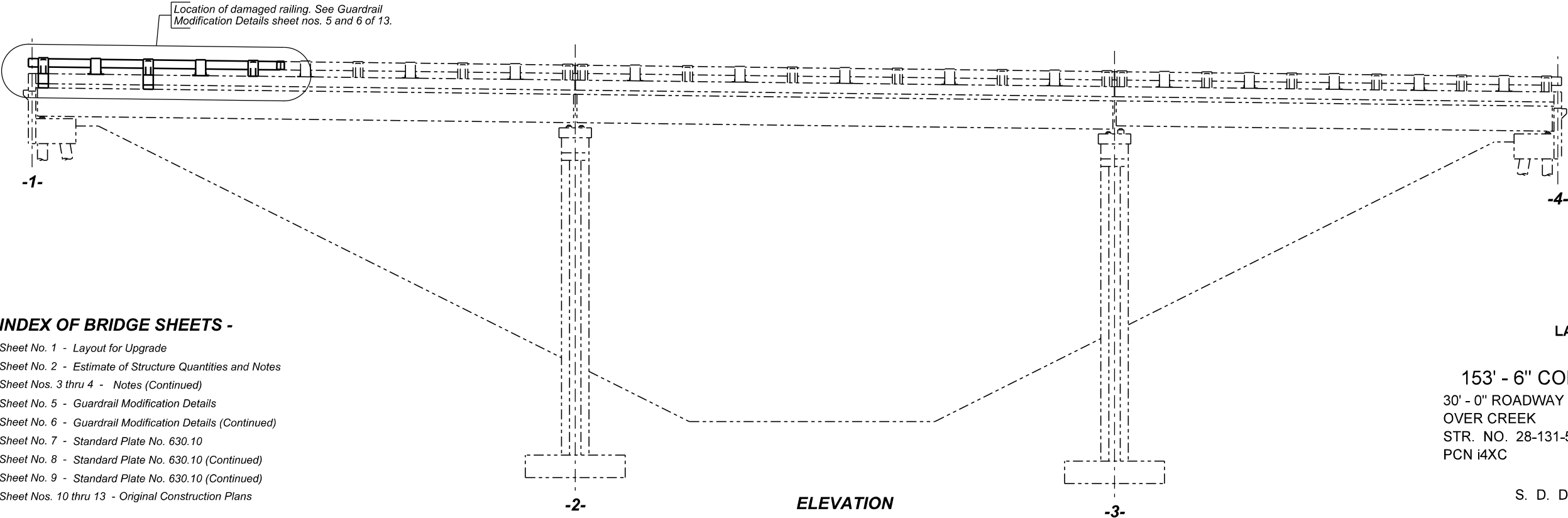
**Section E - Str. No. 28-131-503**

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
110E0020	Remove Bridge Railing	25	Ft
460E0174	Concrete Patching Material, Miscellaneous	3.7	CuFt
460E0300	Breakout Structural Concrete	0.2	CuYd
460E0380	Install Dowel in Concrete	4	Each
460E0600	Housing and Heating Concrete	0.2	CuYd
470E0380	Modify Bridge Rail	25	Ft
480E5000	Galvanic Anode	2	Each

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	014-368	E3	E15



PLAN



**INDEX OF BRIDGE SHEETS -**

- Sheet No. 1 - Layout for Upgrade
- Sheet No. 2 - Estimate of Structure Quantities and Notes
- Sheet Nos. 3 thru 4 - Notes (Continued)
- Sheet No. 5 - Guardrail Modification Details
- Sheet No. 6 - Guardrail Modification Details (Continued)
- Sheet No. 7 - Standard Plate No. 630.10
- Sheet No. 8 - Standard Plate No. 630.10 (Continued)
- Sheet No. 9 - Standard Plate No. 630.10 (Continued)
- Sheet Nos. 10 thru 13 - Original Construction Plans

LAYOUT FOR UPGRADE  
FOR  
153' - 6" COMPOSITE I-BEAM VIADUCT  
30' - 0" ROADWAY 0° SKEW  
OVER CREEK SEC. 29-T1N-R20E  
STR. NO. 28-131-503 014-368  
PCN i4XC

HAAKON COUNTY  
S. D. DEPT. OF TRANSPORTATION  
DECEMBER 2017

DESIGNED BY TJM HAKN4XC	CK. DES. BY JKI i4XCGA01	DRAFTED BY MDG	Steve A. Johnson BRIDGE ENGINEER
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ESTIMATE OF STRUCTURE QUANTITIES

ITEM NO.	DESCRIPTION	QUANTITY	UNIT
110E0020	Remove Bridge Railing	25	Ft
460E0174	Concrete Patching Material, Miscellaneous	3.7	CuFt
460E0300	Breakout Structural Concrete	0.2	CuYd
460E0380	Install Dowel in Concrete	4	Each
460E0600	Housing and Heating Concrete	0.2	CuYd
470E0380	Modify Bridge Rail	25	Ft
480E5000	Galvanic Anode	2	Each

SPECIFICATIONS

- Construction Specifications: South Dakota Standard Specifications for Roads and Bridges, 2015 Edition and Required Provisions, Supplemental Specifications and/or Special Provisions as included in the Proposal.
- Welding and Welding Inspection shall be in conformance with ANSI/AASHTO/AWS D1.5M/D1.5:2015 Bridge Welding Code unless otherwise noted in this plan set.

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 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.

GENERAL CONSTRUCTION NOTES

- All steel structural W sections shall be ASTM A992. All structural channel and angle sections shall conform to ASTM A36. All steel plates shall be ASTM A36. All anchors shall be ASTM F1554 grade 36. The 5/8" bolts for attachment of guardrail to the timber blocks shall be ASTM A307 grade A.
- All bolts, nuts, and washers shall be galvanized in accordance with ASTM A153 or ASTM F2329, as applicable.
- Welder certification shall be in accordance with section 410.3.D of the Construction Specifications.

NOTICE - LEAD BASED PAINT

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

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.

- Shop fabricate structural steel sections of bridge railing. Shop paint section to extent indicated.

- Remove existing guardrail, posts, spacers, steel railing, and associated hardware as indicated. Patch holes in top of curb at intermediate post locations.
- Breakout structural concrete as indicated and position new anchors.
- Place galvanic anodes and patch concrete.
- Install dowels in curb top for relocated intermediate posts.
- Install new structural steel railing section using template to ensure fit. Field weld railing splice. Paint sliced section weather permitting.
- Install new W Beam guardrail system.

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 Construction 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 shall be required as specified by Section 410.3 A of the Construction Specifications.

REMOVE BRIDGE RAIL

- The section of existing railing, guardrail, post, indicated anchors, and associated hardware as shown on the plan sheets shall be completely removed by the Contractor and disposed of in accordance with Environmental Commitments. If the Contractor elects to salvage the rail for his own use, they must be removed from view of the ROW to the satisfaction of the Engineer prior to project completion.
- Care shall be taken to avoid gouging the channel rail during removal operations. Any gouges resulting from removal operations shall be built up with low hydrogen weld material and ground smooth as approved by the Engineer. Horizontal grinders shall be used and the motion of the grinding shall be parallel with the rail.
- The anchors mounted on the top of the curb at intermediate post shall be removed or cut flush where the damage did not loosen them. The holes shall then be sealed with a one part low modulus silicone sealant material to prevent any water penetration as approved by the engineer.
- The cost of all labor, tools, materials, and incidentals necessary to cut and remove the existing steel rail, top mounted anchors, W beam guardrail, and posts shall be incidental to the contract unit price per foot for "Remove Bridge Railing".

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 around bolts with no pockets.

ESTIMATE OF STRUCTURE QUANTITIES AND NOTES  
FOR  
153' - 6" COMPOSITE I-BEAM VIADUCT

STR. NO. 28-131-503  
DECEMBER 2017

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	014-368	E5	E15

**PLACING CONCRETE PATCHING MATERIAL CONTINUED**

6. 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 manufacturer'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.
7. "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. 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.
8. The anchor rods, nuts, and washer for new side mounted railing supports and their installation shall be incidental to the contract unit price per cubic foot for "Concrete Patching Material, Miscellaneous".

**CONCRETE BREAKOUT**

1. The existing curb 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.
2. All broken out concrete shall be disposed of by the Contractor. Any disposal of discarded material shall be in accordance with the Environmental Commitments.
3. The contract unit price per cubic yard for "Breakout Structural Concrete" shall include breaking out concrete, cleaning and straightening existing reinforcing steel, removal of side mounted rail anchors, and disposal of all broken out material.
4. During concrete removal operations, no broken out concrete shall be allowed to fall into the creek.

**INSTALLING DOWELS IN CONCRETE**

1. 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 or shift the dowel spacing as approved by the Engineer to miss the existing reinforcing steel. If the Contractor shifts the dowel spacing, the unused drill holes shall be completely filled with the epoxy resin.
2. The epoxy resin mixture shall be of a type for bonding steel to hardened concrete and shall conform to AASHTO M235 Type IV, Grade 3 (Equivalent to ASTM C881, Type IV, Grade 3).
3. 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 dowel 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.
4. Mix epoxy resin as recommended by the Manufacturer and apply by an injection method as recommended by the manufacturer.
5. No loads shall be applied to the epoxy grouted anchors until the epoxy resin has had sufficient time to cure as specified by the epoxy resin manufacturer.
6. Anchors used to attach the intermediate guardrail post to the curb shall be 1" threaded conforming to ASTM F1554 Grade 36. Threaded rods shall be galvanized in accordance with ASTM A153.
7. The cost of epoxy resin, dowels, bolts, nuts, washers, installation, and other incidental items shall be incidental to the contract unit price per each for "Install Dowel in Concrete".

**MODIFY BRIDGE RAIL**

1. A portion of the existing bridge rail needs to be removed and replaced as a result of a vehicle hit.
2. Repair to the bridge rail will be paid for at the contract unit price per foot for "Modify Bridge Rail" and shall include the cost of structural steel, W beam guardrail, timber posts and spacers, nuts, bolts washers, welding and fabrication of railing and posts, painting, and all other items incidental to fabricating and constructing the railing and guard rail.
3. The structural steel portion of the rail including the angles for the intermediate railing post shall be shop painted to the extents shown in the plans.

4. Prior to welding the splice, the surface of the existing structural steel shall be clean of dirt, rust, and paint for a distance of 2 inches from each side of the outside lines of the welds.

**PAINT RESIDUE REMOVAL AND CONTAINMENT**

1. Paint removal on the existing bridge shall be in accordance with Section 412 of the Construction Specifications, Bridge Repainting Class I except as modified by these notes.
2. The Contractor shall plan his operations to prevent releases of lead-containing material and other particulate matter into the surrounding air, water, and onto the ground, soil, slope protection, and pavement. The Contractor shall be responsible for any corrective actions should a spill occur.
3. Collect all visible paint particles and blasting residue containing paint at the end of each workday from the work area. Inspect outside the containment and collect any paint particles or blasting residue that escaped the work area. Collect waste material by manual means, vacuum, or another method approved by the Engineer. Do not use air pressure or streaming water to assist in the waste collection process that could disperse the waste material. All labor, equipment, material and incidentals necessary for the containment and collection on paint particles and blasting residue shall be incidental to the contract unit price per foot for "Modify Bridge Rail".
4. In the event of a spill or inadvertent release, the Contractor shall immediately stop work, notify the Engineer, and report the release to the South Dakota Department of Environmental and Natural Resources (DENR). The Contractor shall be responsible for completing a spill reporting form and for all costs associated with appropriate corrective actions.

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 Contractor 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.

**NOTES (CONTINUED)**

FOR

**153' - 6" COMPOSITE I-BEAM VIADUCT**

STR. NO. 28-131-503

DECEMBER 2017

3 OF 13

DESIGNED BY TJM HAKNI4XC	CK. DES. BY JKI I4XCMA03	DRAFTED BY TJM	 BRIDGE ENGINEER
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PAINT RESIDUE REMOVAL AND CONTAINMENT CONTINUED

5. The Contractor shall haul and unload the 55 gallon containment drums with paint residue, blasting media, etc. to the SDDOT Maintenance Yard located in Philip for temporary storage and disposal. The Philip maintenance yard is located on US Highway 14 in the town of Philip. Contact number for the Philip maintenance yard is (605) 859-2772. All costs associated with this work shall be included in the contract lump sum price for "Paint Residue Containment".
6. If the Contractor elects to use containers other than 55 gallon barrels to hold paint residue the Contractor shall be responsible for all testing and disposal at a permitted regional landfill. The Contractor shall be responsible for compliance of laws and regulations regarding storage, handling and shipping. Copies of all tests, shipping and disposal documents shall be provided to the Office of Bridge Design.

CONCRETE PATCHING MATERIAL COLD WEATHER PROTECTION REQUIREMENTS

Concrete patching material shall conform to the following requirements unless the manufacturer's requirements are more stringent:

1. Concrete Patching Material Mix: Maximum temperature of mixing water: 160 °F, maximum temperature of aggregates: 100 °F, and aggregates shall be free of frozen lumps, ice or snow.
2. The surface temperature or anything which will come into contact with the fresh concrete patching material shall be above freezing prior to placement, including forms, reinforcing steel, and adjacent concrete.
3. The minimum concrete patching material temperature at placement shall be 50 °F.
4. The minimum concrete patching material temperature shall be 50 °F. for the first 72 hours and 40 °F. for the next 48 hours or manufacturer's recommendations. Concrete patching material temperatures below 35 °F. during the protection period shall be cause for rejection.
5. The maximum concrete patching material temperature during the protection period shall be 100 °F.
6. At the end of the protection period, the concrete patching material temperature shall not be permitted to fall more than 40 °F. for each 24 hour period.
7. Enclosures for the protection of the concrete patching material must be in place before any part of the concrete patching material falls below 50 °F.
8. Enclosures shall be capable of maintaining the specified temperature and permit free circulation of artificial heat.
9. No artificial heat source shall be used which uses an open flame or introduces carbon dioxide into the enclosure where it can come into contact with fresh concrete patching material.

10. The Contractor shall provide remote reading indoor/outdoor type thermometers for monitoring the concrete patching material temperature during the protection period. The number and spacing of thermometers shall be determined by the Engineer. Thermometers shall generally be installed to measure the internal concrete patching material temperature at a location approximately one inch from the exterior surface of the concrete patching material.
11. During the protection period, the Contractor shall be responsible for monitoring the enclosure at intervals acceptable to the Engineer. The Contractor shall monitor concrete patching material temperature, humidity (if required), and the structural integrity of the enclosure.
12. Falsework shall remain in place until the end of the protection period.
13. The Contractor shall submit a Cold Weather Protection Plan to the Engineer for approval, a minimum of 14 days prior to any concrete patching material placement. Such a plan shall contain, at a minimum, information on the number and type of heat source to be used; a sketch detailing the enclosure to be used, including information on the enclosure materials; and any other information that is appropriate.
14. All costs associated with housing and heating of the concrete patching material repairs including any incidentals, labor, equipment and materials necessary to complete the construction outlined by these plans shall be included in the contract unit price per cubic yard for "Housing and Heating Concrete". Payment shall be for the plan quantity shown in the Estimate of Quantities.

GALVANIC ANODE

1. The Contractor shall furnish and place galvanic anodes in the concrete repair areas specified in this plan set.
2. The galvanic anodes shall be supplied as one of the following:
- a. Galvashield XP2  
Vector Corrosion Technologies  
13312 N 56<sup>th</sup> St, Suite 102  
Tampa, FL 33617  
Phone: (813) 830-7566  
Website: [www.vector-corrosion.com](http://www.vector-corrosion.com)
- b. Sentinel Silver  
Euclid Chemical Company  
19218 Redwood Road  
Cleveland, OH 44110  
Phone: (800) 321-7628  
Website: [www.euclidchemical.com](http://www.euclidchemical.com)
- c. Sika FerroGard 670  
Sika Corporation US  
201 Polito Avenue  
Lyndhurst, NJ 07071  
Phone: (800) 933-7452  
Website: <http://usa.sika.com>

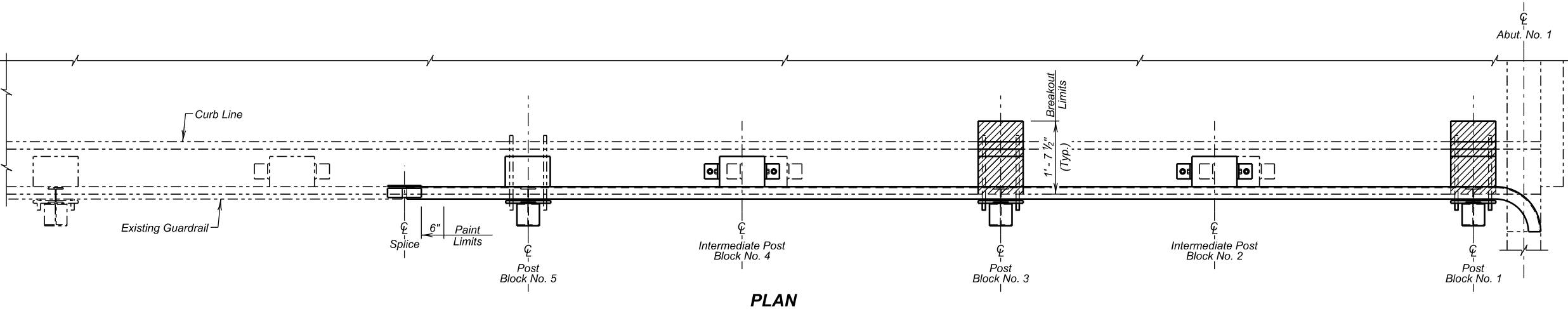
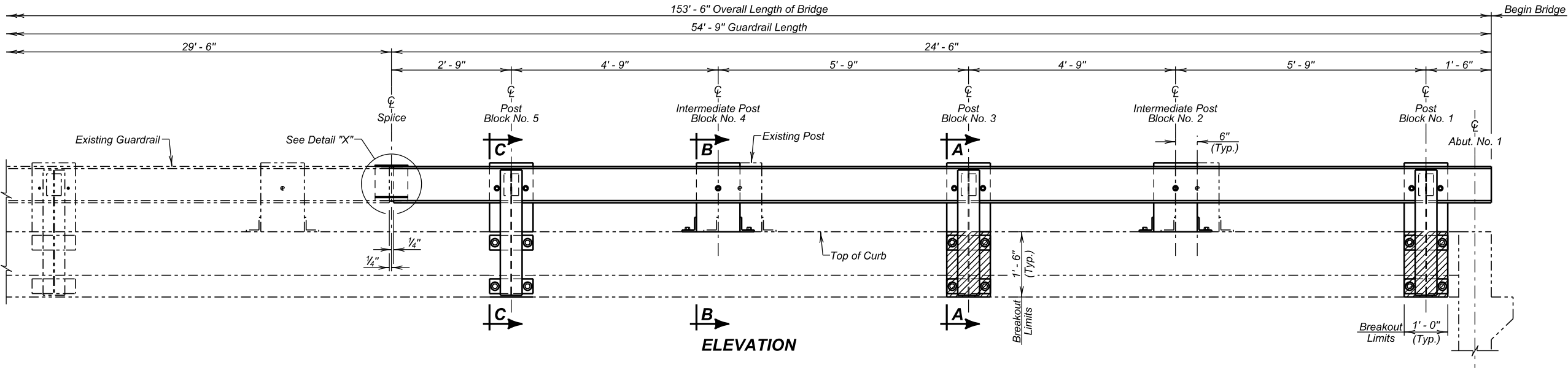
3. The anodes shall be placed in accordance with manufacturer's recommendations and as approved by the Engineer. The anodes have not been shown on the drawings. The Contractor shall provide shop drawings of the galvanic anode installation including locations of the individual anodes to the Office of Bridge Design.
4. The anodes shall be placed with a minimum ¾" cover and shall be set in embedding mortar per the manufacturer's recommendations. The anodes shall be fully encased in the concrete repair material. Where adequate cover does not exist, a concrete pocket shall be chipped out behind the anode to provide sufficient cover. The Contractor may need to chip around the reinforcing bar locally at the anode installation to make the electrical connection. The reinforcing steel at the connection location shall be cleaned per the manufacturer's recommendations to provide sufficient electrical connection and mechanical bond.
5. The electrical continuity of the electrical connections and reinforcing steel shall be confirmed per the manufacturer's recommendations.
6. The Contractor shall provide manufacturer's product literature and installation instructions to the Engineer 10 days prior to installation.
7. All costs associated with placing anodes including labor, equipment, materials and incidentals shall be included in the contract unit price per each for "Galvanic Anode".

NOTES (CONTINUED)  
FOR  
153' - 6" COMPOSITE I-BEAM VIADUCT


STR. NO. 28-131-503  
DECEMBER 2017



STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	014-368	E7	E15

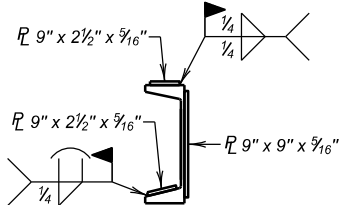
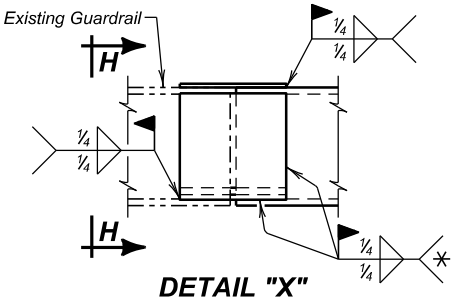


LEGEND:

 Shaded areas indicate limits of Concrete Breakout.

NOTE:

\* Shop fabricated side of weld can be shop welded in lieu of a field weld for back plate only.



GUARDRAIL MODIFICATION DETAILS

FOR

153' - 6" COMPOSITE I-BEAM VIADUCT

30' - 0" ROADWAY 0° SKEW

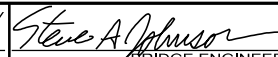
OVER CREEK SEC. 29-T1N-R20E

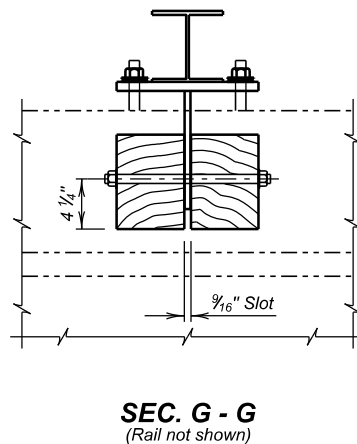
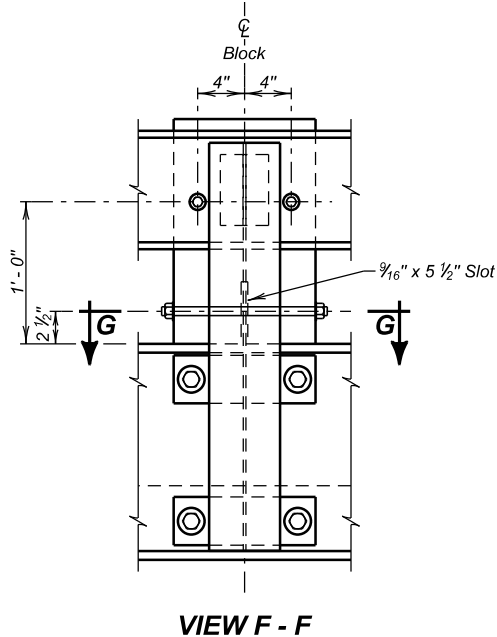
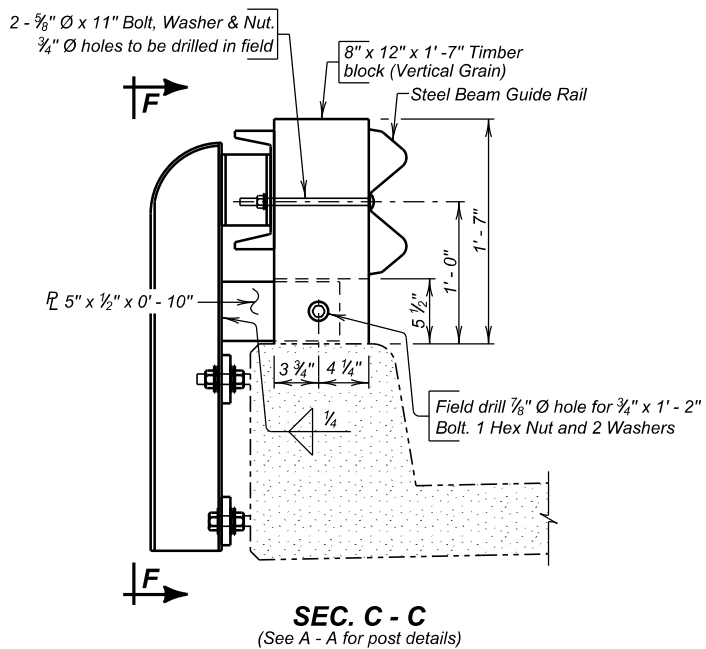
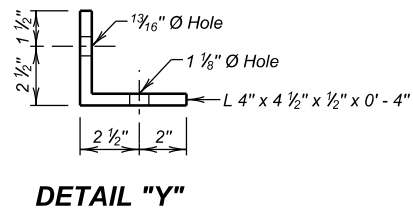
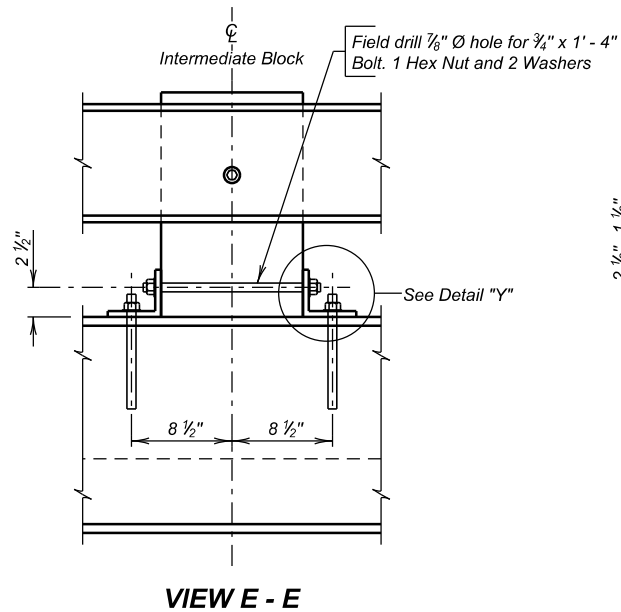
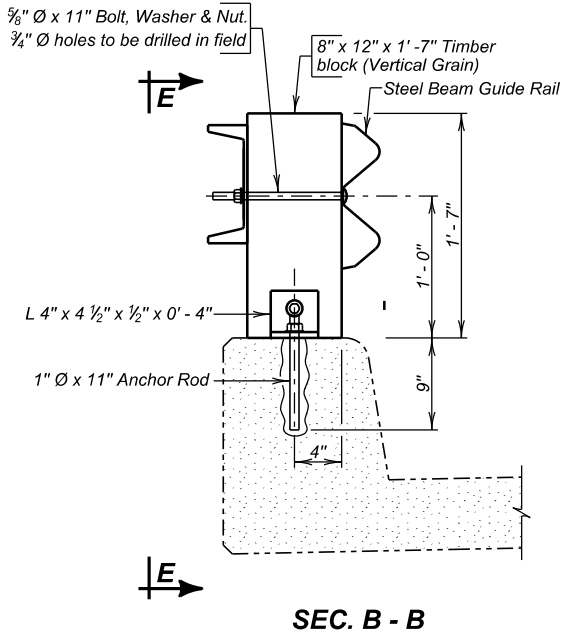
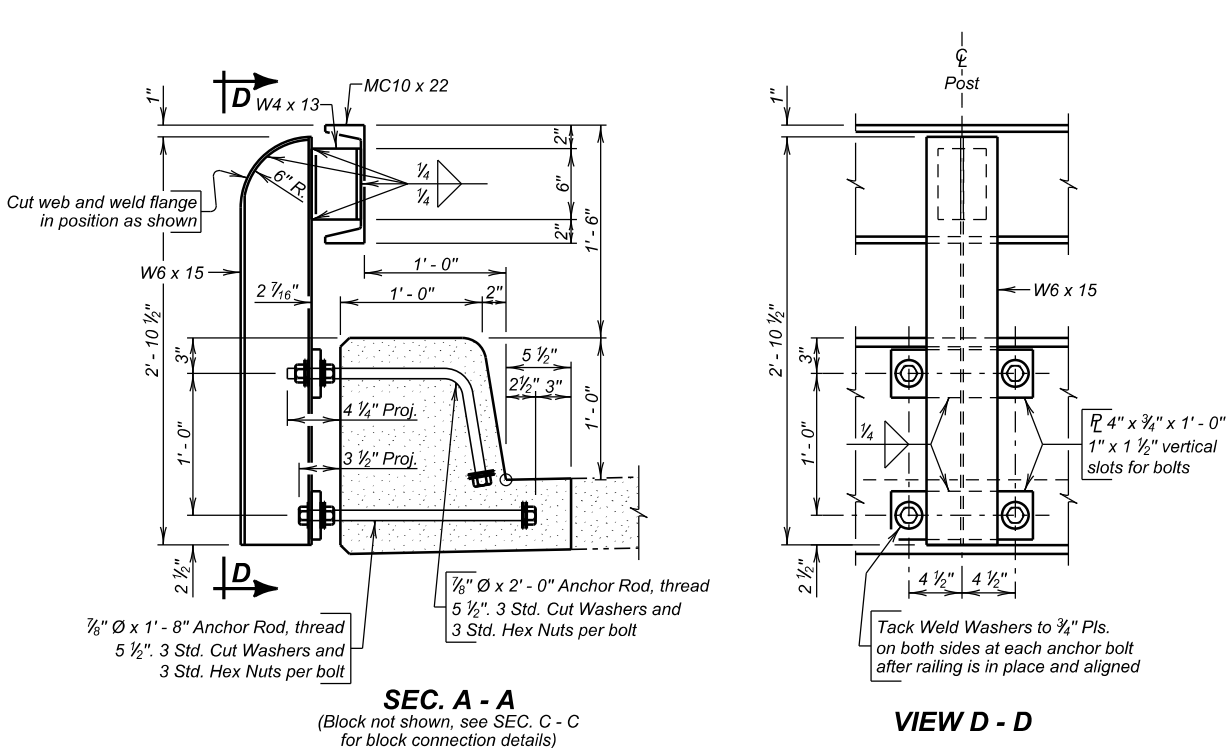
STR. NO. 28-131-503 014-368

HAAKON COUNTY

S. D. DEPT. OF TRANSPORTATION

DECEMBER 2017

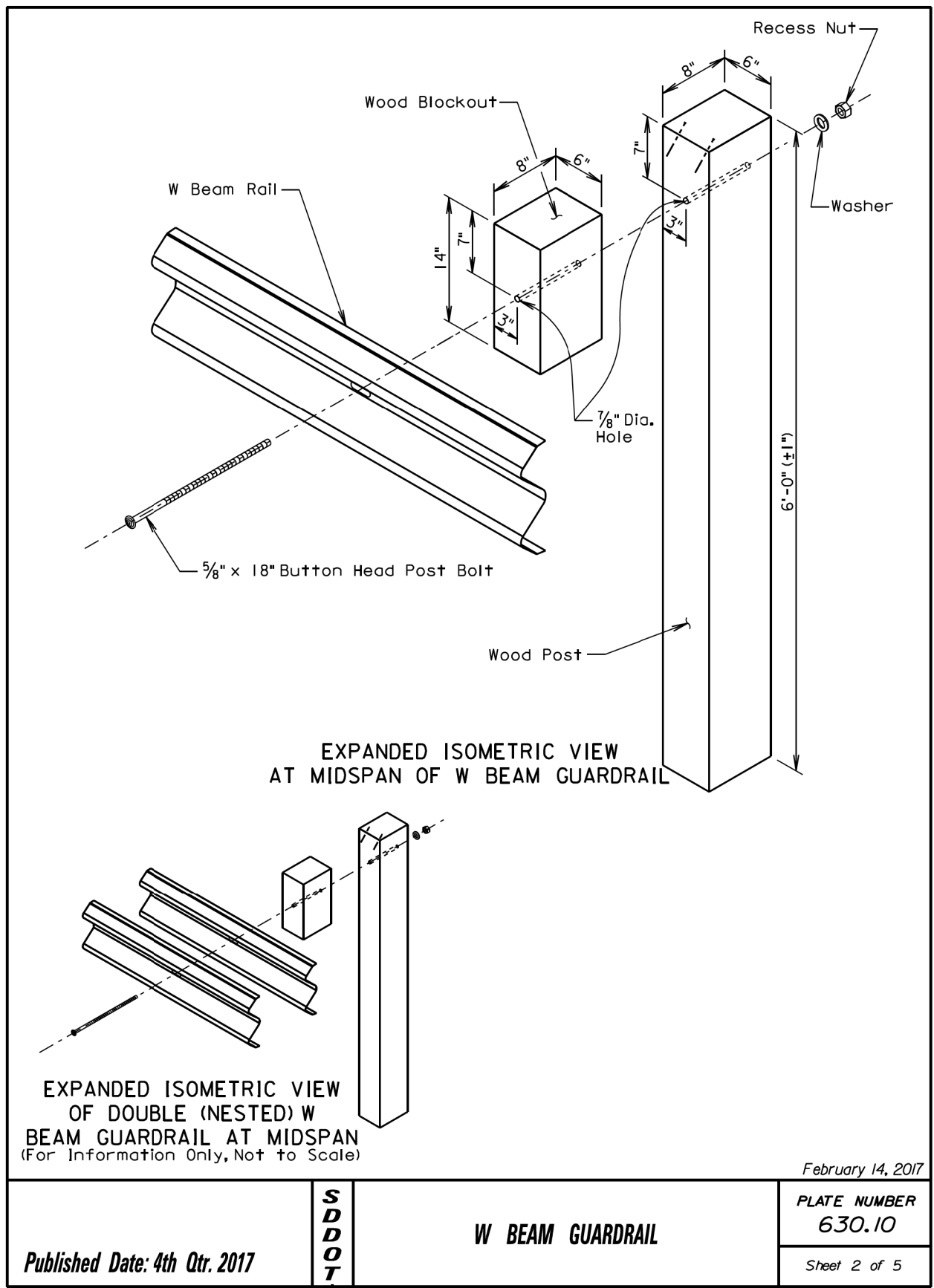
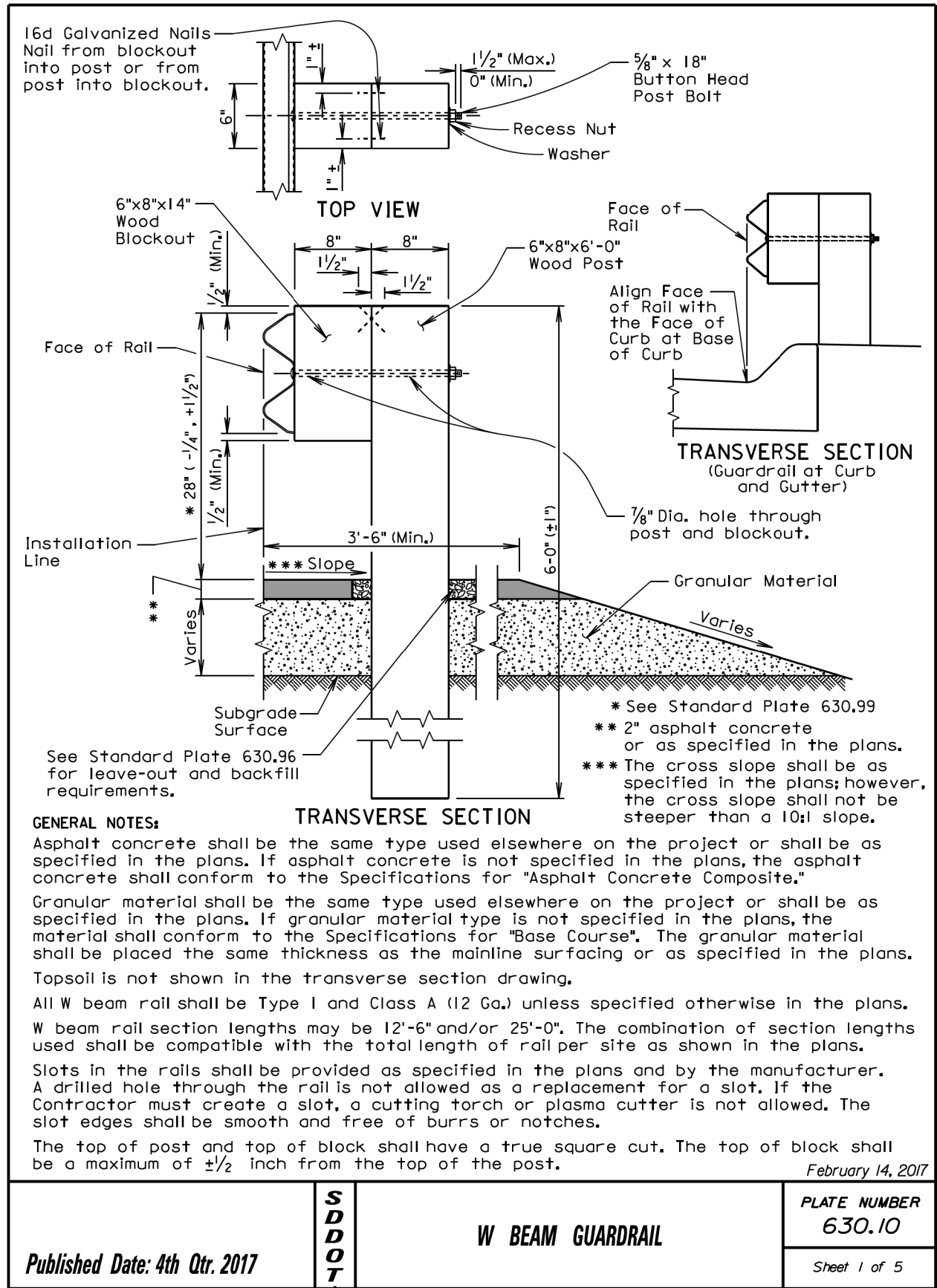
DESIGNED BY	CK. DES. BY	DRAFTED BY	BRIDGE ENGINEER
TJM	JKI	MDG	
HAKN4XC	I4XCGA05		

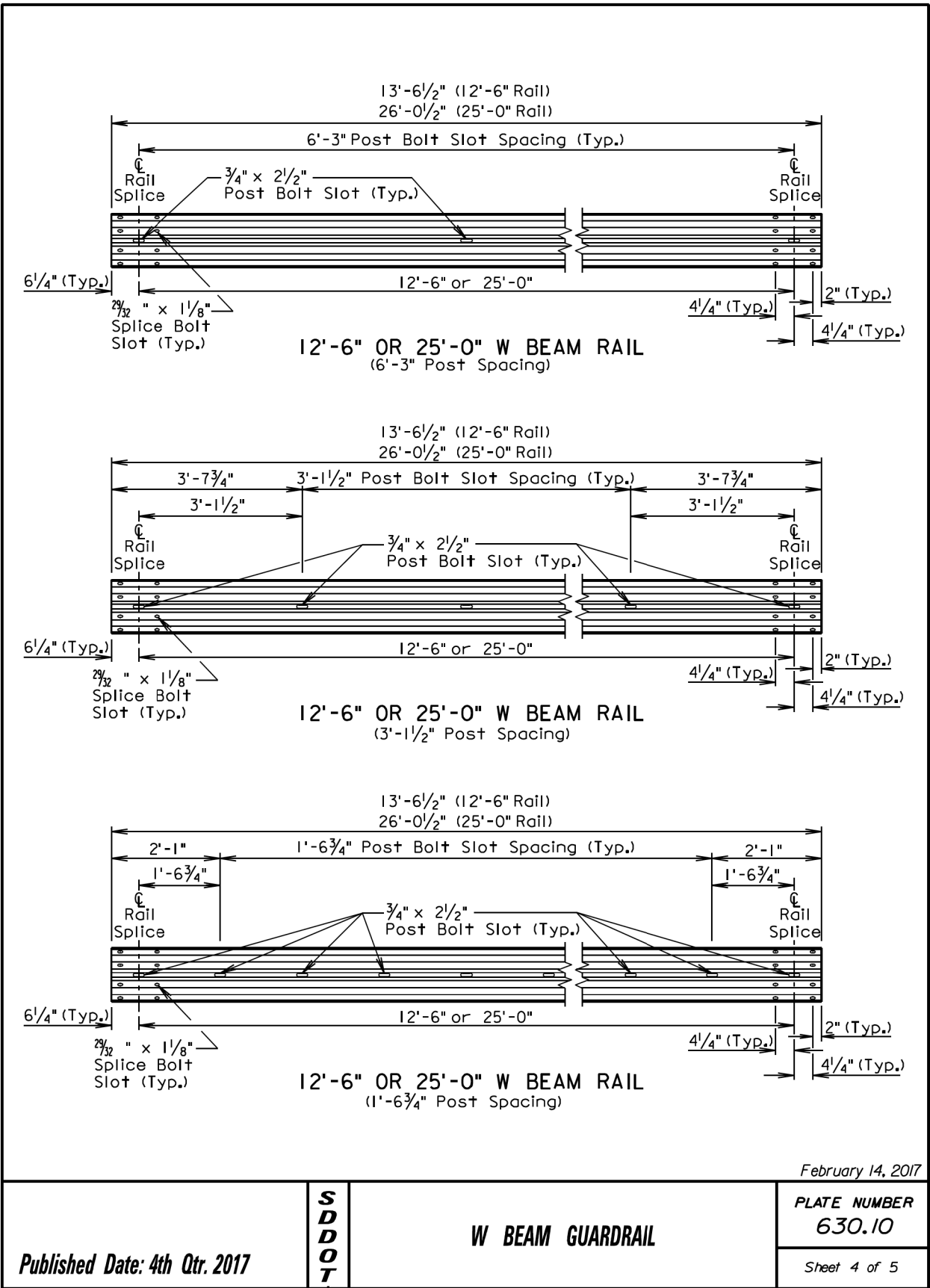
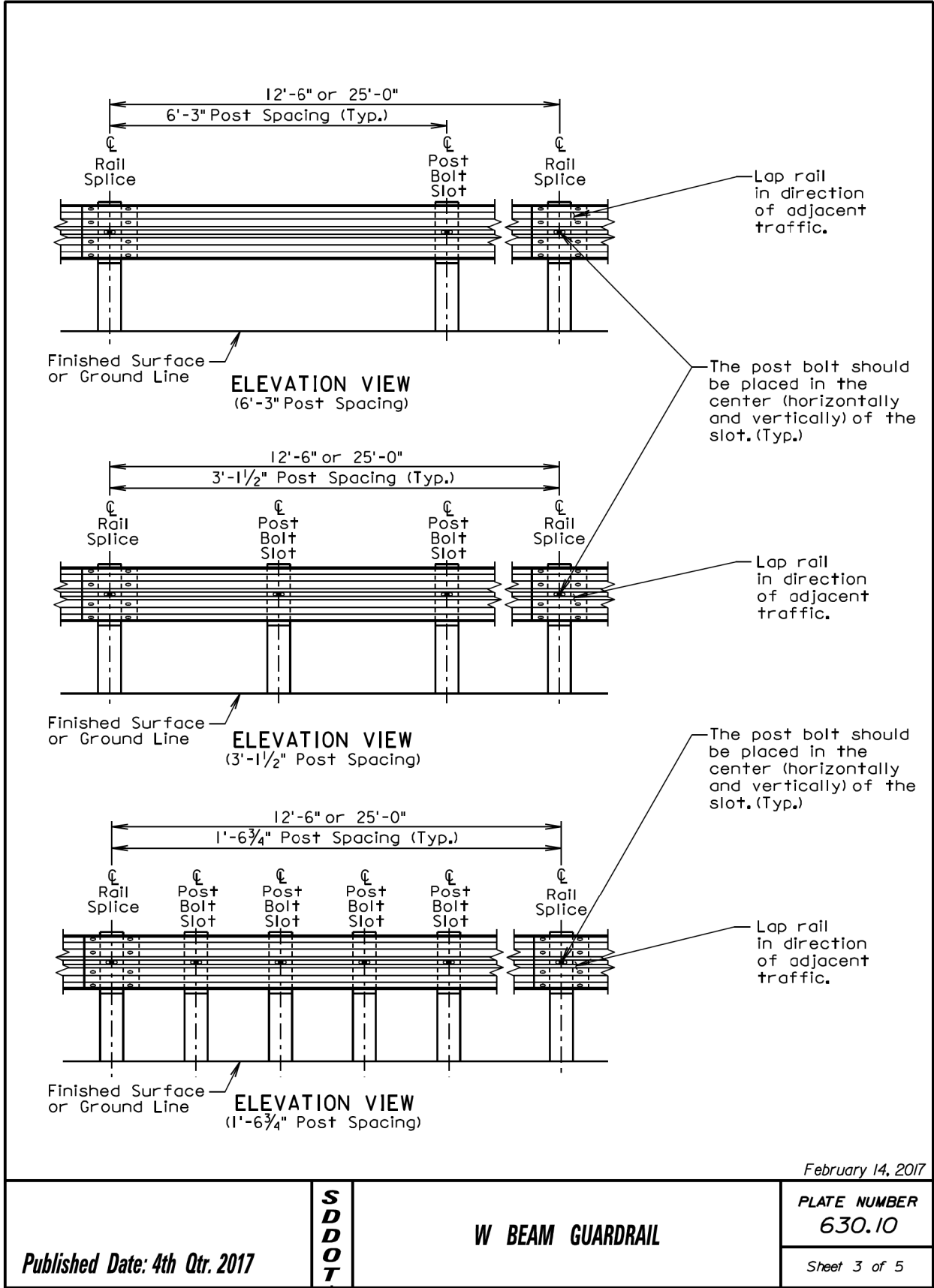


ESTIMATED QUANTITIES		
ITEM	UNIT	QUANTITY
Remove Bridge Railing	Ft	25
Concrete Patching Material, Miscellaneous	CuFt	3.7
Breakout Structural Concrete	CuYd	0.2
Install Dowel in Concrete	Each	4
Housing and Heating Concrete	CuYd	0.2
Modify Bridge Rail	Ft	25
Galvanic Anode	Each	2

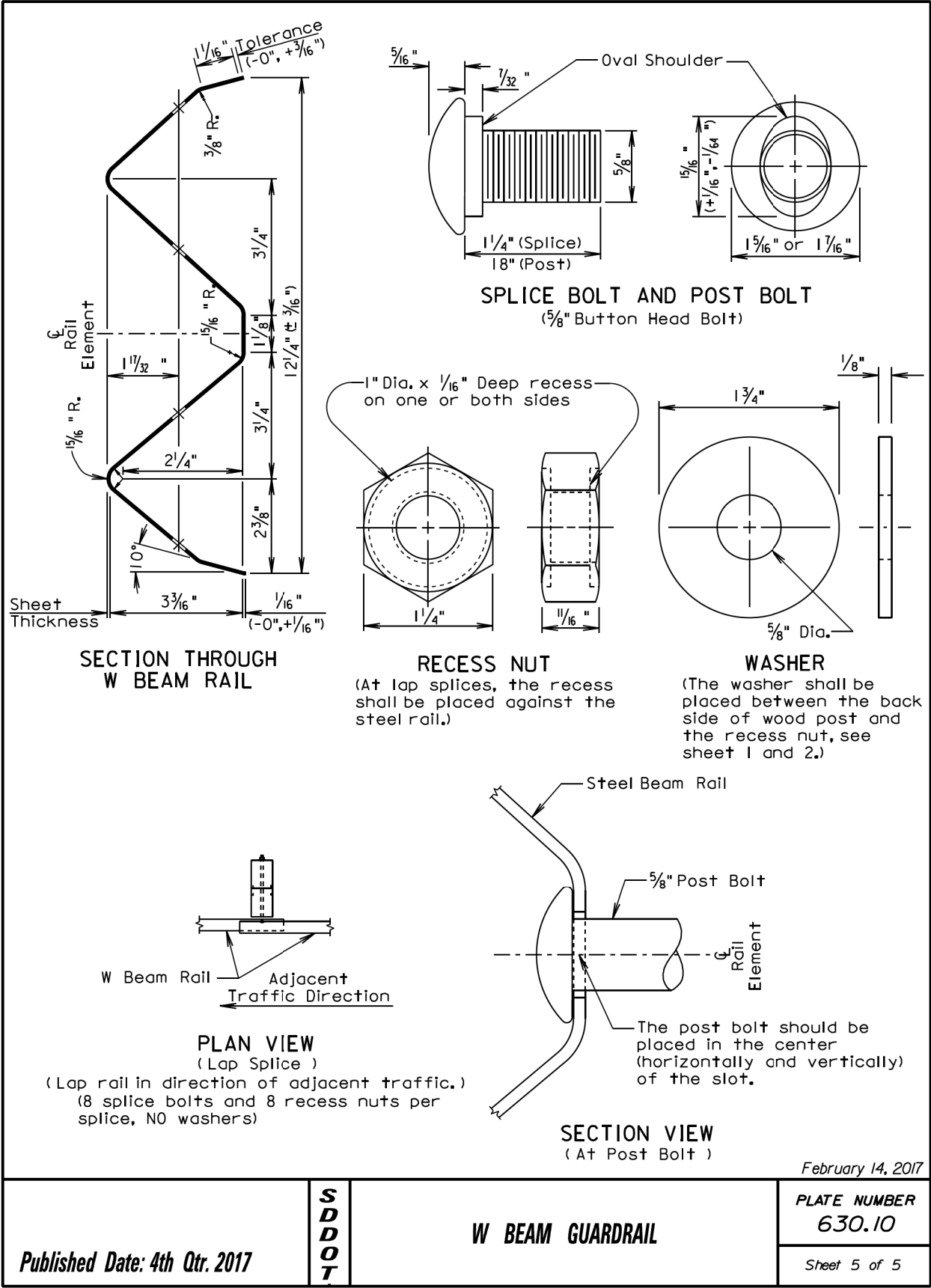
GUARDRAIL MODIFICATION DETAILS (CONTINUED)  
FOR  
153' - 6" COMPOSITE I-BEAM VIADUCT  
30' - 0" ROADWAY  
OVER CREEK  
STR. NO. 28-131-503  
0° SKEW  
SEC. 29-T1N-R20E  
014-368

HAAKON COUNTY  
S. D. DEPT. OF TRANSPORTATION  
DECEMBER 2017





STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
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-X031-

## INDEX OF BRIDGE SHEETS

Sheet No.1 General Drawing and Quantities  
Sheet No.2 Det. for Std. Reinf. Conc. Sill WP-44-30-00-R  
Sheet No.3 Det. for Std. Reinf. Conc. Sill WP-54-30-00-R  
Sheet No.4 Det. for Std. Reinf. Conc. Bent CB-30-00-B (3-16-54)  
Sheet No.5 Det. for Std. I-Beam Viaduct SIB-44-30-00-R1 (5-19-50)  
Sheet No.6 Det. for Std. I-Beam Viaduct SIB-54-30-00-R1 (7-7-52)  
Sheet No.7 Special Details  
Sheet No.8 Std. Railing and Drain Details RA-1 (12-4-51)

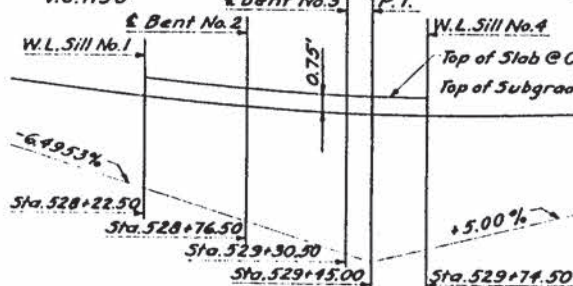
Q	c.f.s.
A	or
V	1/sec.

### EXCAVATION NOTE.-

Footings for Bents No.2 & 3 shall be cast against solid undisturbed shale and carried into same 1'. Limits of shale excavation for these footings shall be bounded as nearly as practicable by the neat lines as shown in details of bent footing on Sheet No. 4 of 8.

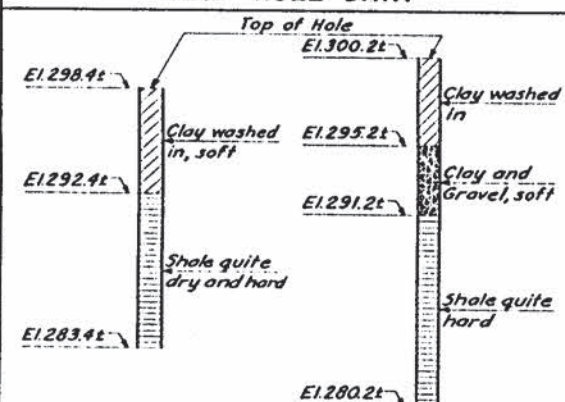
B.M. No. 55A - El. 347.47  
Iron Pin  
100' Rt. Sta. 525+04.90

P.I. Sta. 529+45  
El. 309.25  
V.C. 1150'



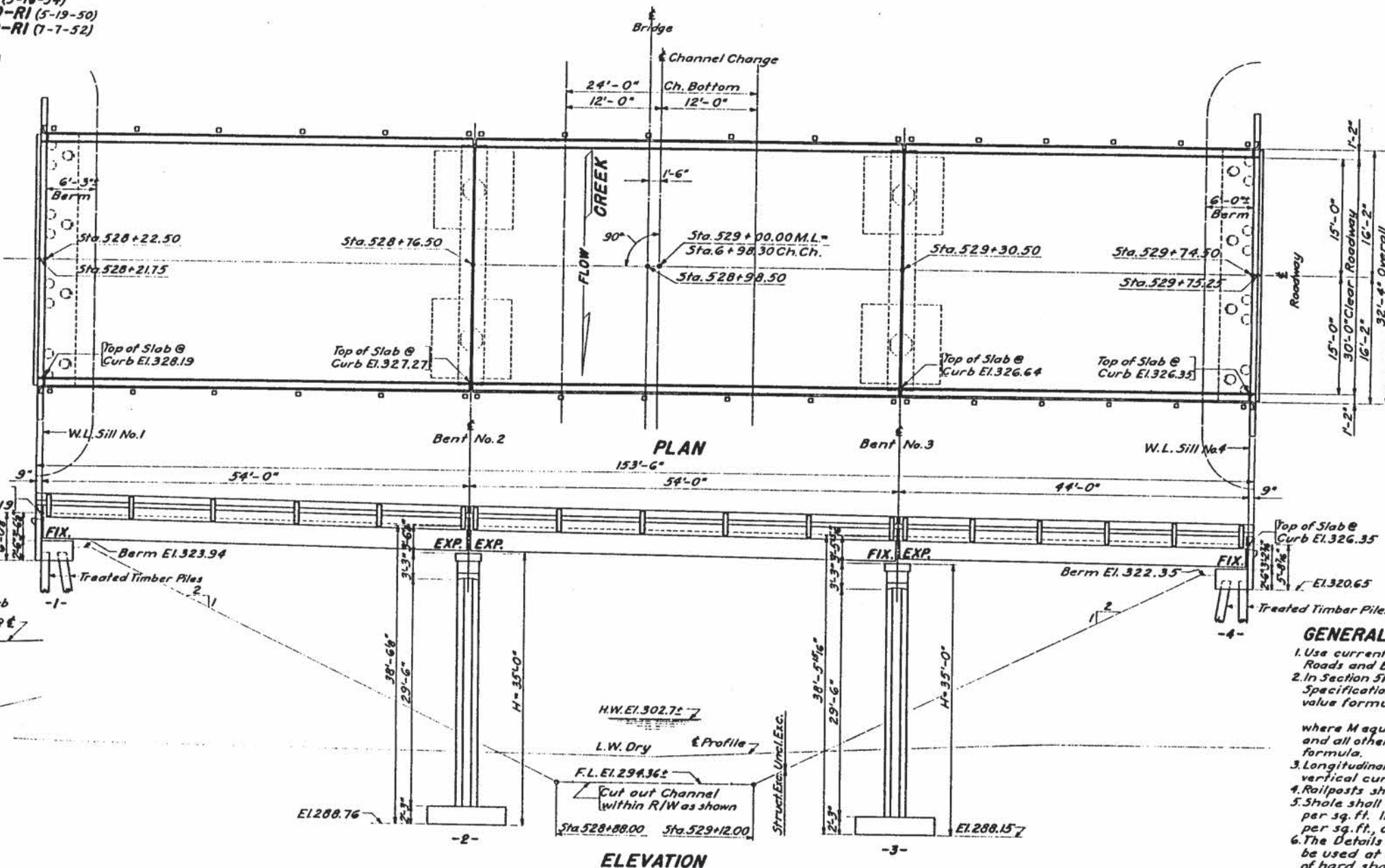
SUBGRADE CURVE DATA

### TEST HOLE DATA



Test Hole No. 1  
4' Lt. of Sta. 528+20

Test Hole No. 2  
on Sta. 529+70



ESTIMATED QUANTITIES						
ITEM	Conc. Cu. Yds.	Steel Reinf. Lbs.	Struct. Lin. Ft.	Railing Lin. Ft.	Treated Timber Piles Lin. Ft.	Excavation - Cu. Yds.
Superstructure - 44' Span	80.3	6,670	28,840	90.6		
Superstructure - 2-54' Spans	74.8	16,080	65,966	218.6		
Substructure - Sill No. 1	19.3	1,975			12 @ 35' = 420	15
Substructure - Sill No. 4	8.9	1,951			12 @ 35' = 420	15
Substructure - Bents No. 2 & 3	15.6	17,300				17
Totals	219.9	44,276	89,805	409.2	840	200

\* One Treated Timber Test Pile shall be driven at Sills No. 1 & No. 4 before remaining piles are ordered.  
\* See Grading Plans for Unclassified Excavation.

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
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### GENERAL NOTES.-

- Use current South Dakota Standard Specifications for Roads and Bridges.
- In Section 51.3 (m) of South Dakota Standard Specifications for Roads and Bridges, change the bearing value formula for gravity hammers to  $\frac{3WH}{5+0.35 \times W \times M}$  where M equals the weight of the pile plus driving head, and all other values are the same as in the replaced formula.
- Longitudinal elements of the slab shall conform to the vertical curve.
- Railposts shall be built vertical.
- Shale shall develop a minimum bearing value of 3.75 tons per sq. ft. If the bearing value is less than 3.75 tons per sq. ft., communicate with the office.
- The Details for Std. Reinf. Conc. Bent CB-30-00-B shall be used at Bents No. 2 & 3. Due to the underlying strata of hard shale the footing details and quantities for the columns and footings shall be revised as shown on Sheet No. 7 of 8.

### GENERAL DRAWING AND QUANTITIES

## 153'-6" COMPOSITE I-BEAM VIADUCT

30'-0" ROADWAY

OVER CREEK SEC. 29-TIN-R20E

STA. 528+21.75 TO 529+75.25 F-F1162 (III)

HAakon COUNTY

SOUTH DAKOTA H 20-44

STATE HIGHWAY COMMISSION

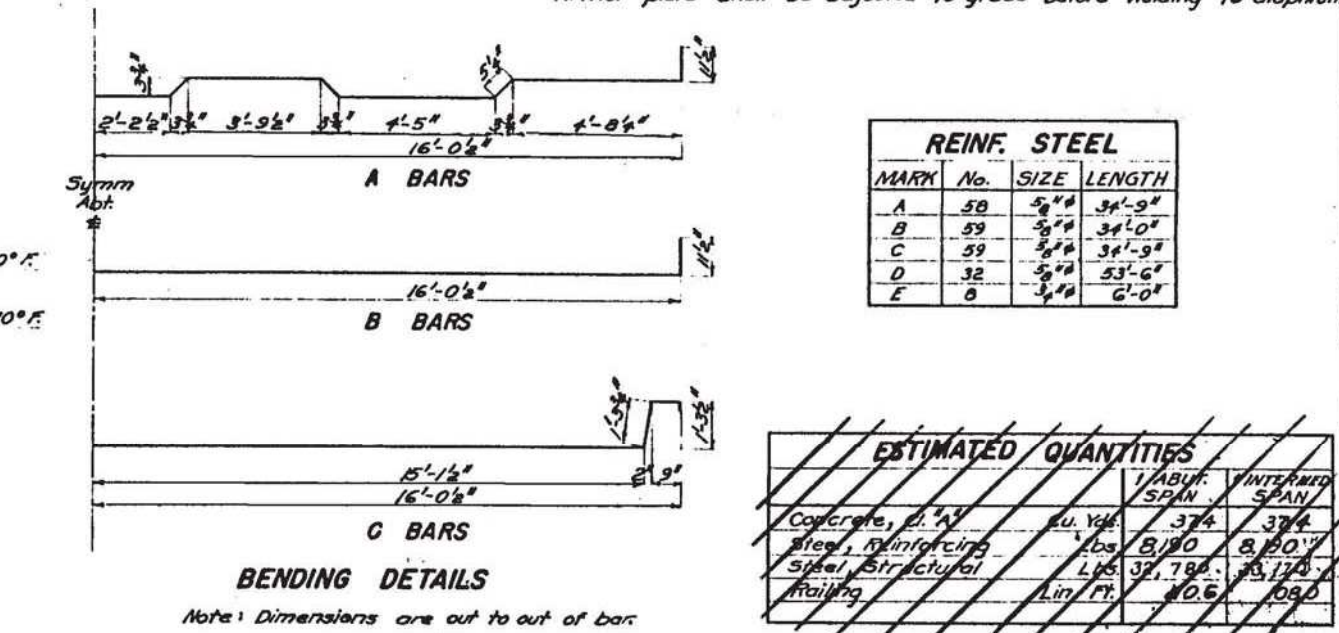
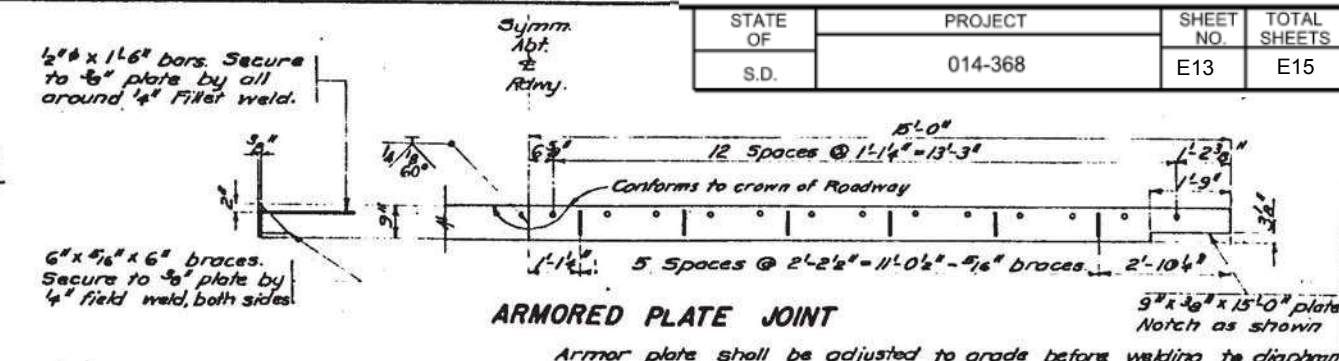
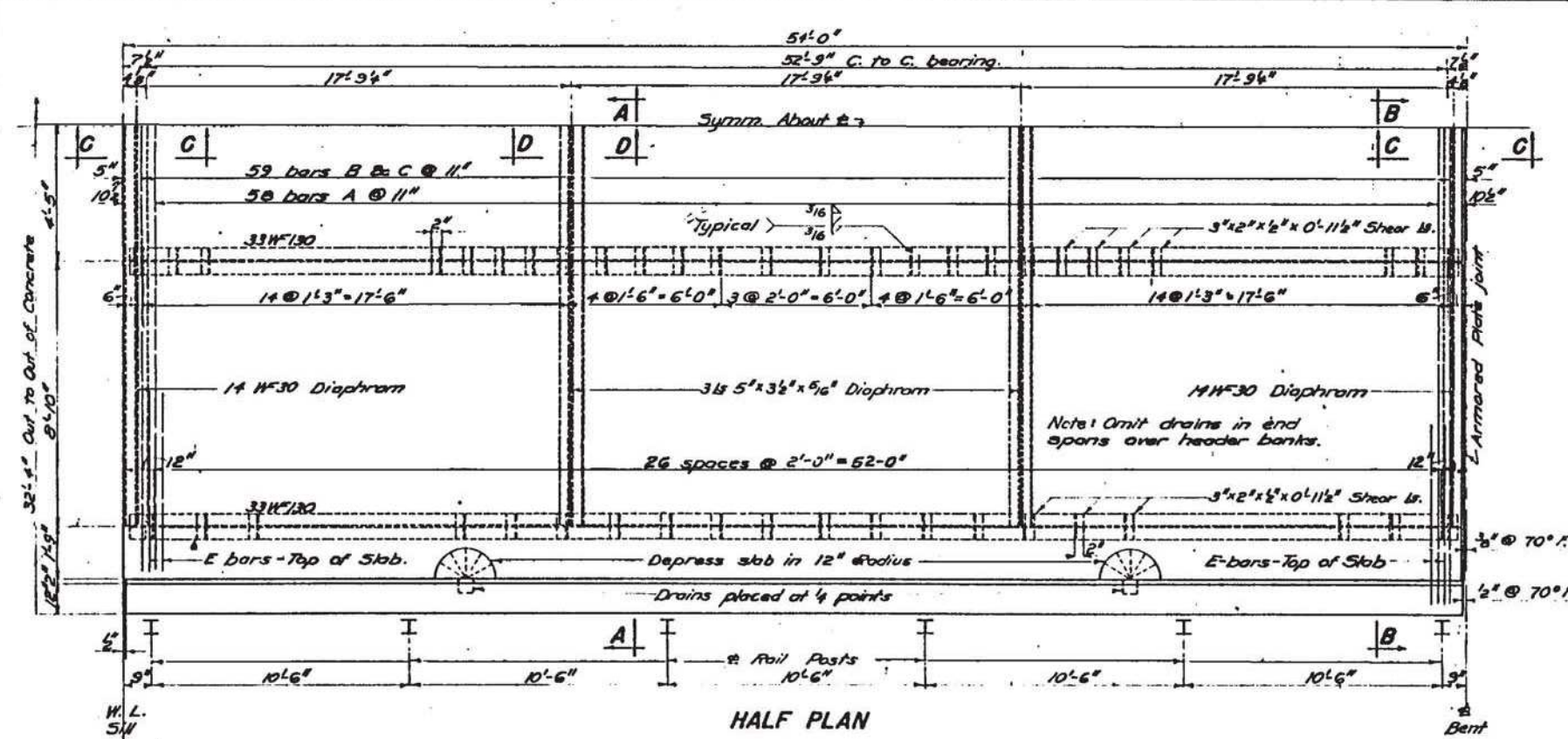
MAY 1954

10 OF 13

## ORIGINAL CONSTRUCTION PLANS

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
	R.K.	DEE	
BRIDGE ENGINEER			





REINF. STEEL			
MARK	No.	SIZE	LENGTH
A	50	5/8"	34'-9"
B	59	5/8"	34'-0"
C	59	5/8"	34'-9"
D	32	5/8"	53'-6"
E	0	3/4"	6'-0"

ESTIMATED QUANTITIES			
	1 ABUT. SPAN	INTERMED. SPAN	
Concrete, C. A.	cu. Yds.	37.4	37.4
Steel, Reinforcing	Lbs.	8,100	8,100
Steel Structural	Lbs.	32,780	33,120
Roofing	Lin. Ft.	20.6	69.0

**GENERAL NOTES:**

Cost of welding shall be absorbed in the unit price bid for structural steel.

Lead plates and lead washers shall be paid for under the item of structural steel.

All exposed steel surfaces shall be painted one shop coat of red lead paint and two field coats of aluminum or other approved paint.

Beams do not require mill cambering.

Cost of canvas and red lead under bearing plates shall be absorbed in the unit price bid for C. A. concrete.

All exposed concrete edges shall be chamfered, 1" unless otherwise noted.

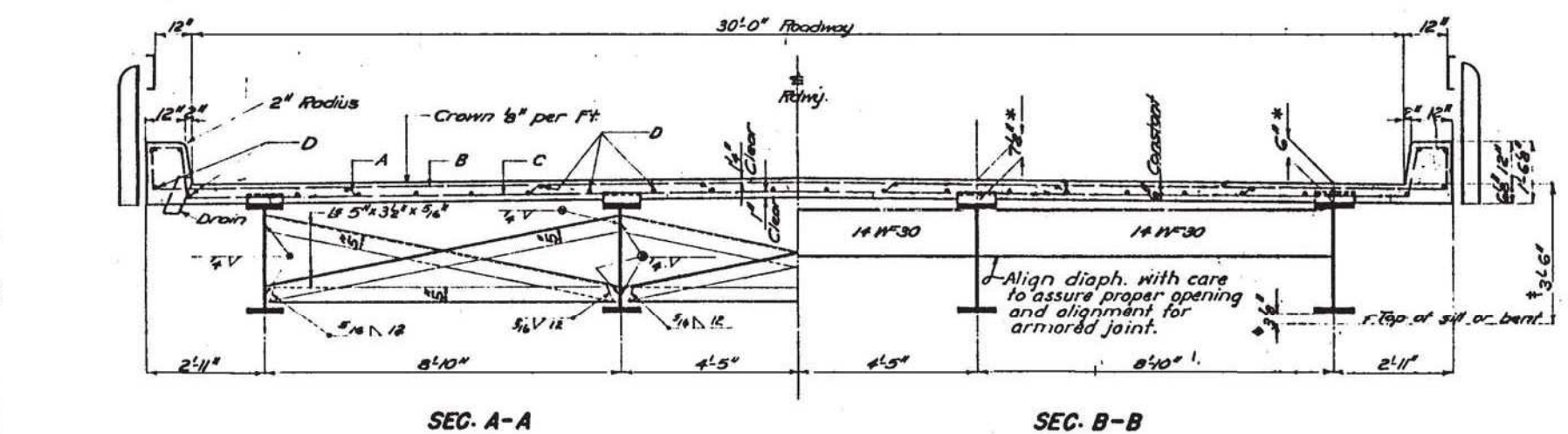
See standard Railing Sheet for details of handrails and drains.

Design Loading: H20-44 (T-3-45) A.A.S.H.O.

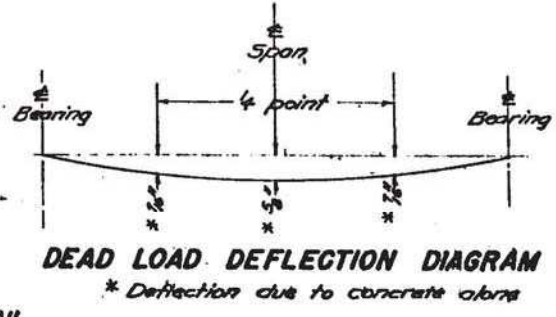
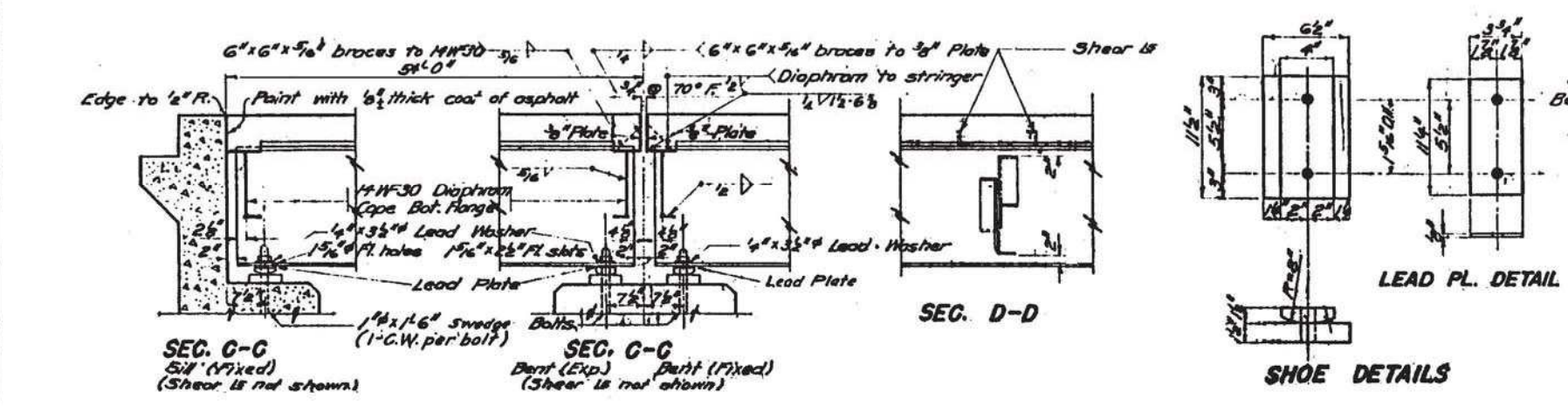
Unit stresses: Re-steel fs = 20,000 p.s.i. (Intermed. Gr. steel)

Concrete fc = 1350 p.s.i.

Class A Concrete shall develop a minimum allowable compressive strength of 1000 p.s.i. at 28 days.



\* Dimensions shown apply only at 2' of bearing. Intermediate points must be increased for ordinates shown in DEAD LOAD DEFLECTION DIAGRAM plus or minus any irregularity or deflection in beam when erected.



# ORIGINAL CONSTRUCTION PLANS

DETAILS FOR  
STANDARD I-BEAM VIADUCT  
COMPOSITE SECTION.  
30'-0" ROADWAY 54'-0" SPAN  
SOUTH DAKOTA  
STATE HIGHWAY COMMISSION.

STR. NO. 28-131-503

Revised Sheet, Rev. 7-7-52

DESIGNED BY

DRAWN BY

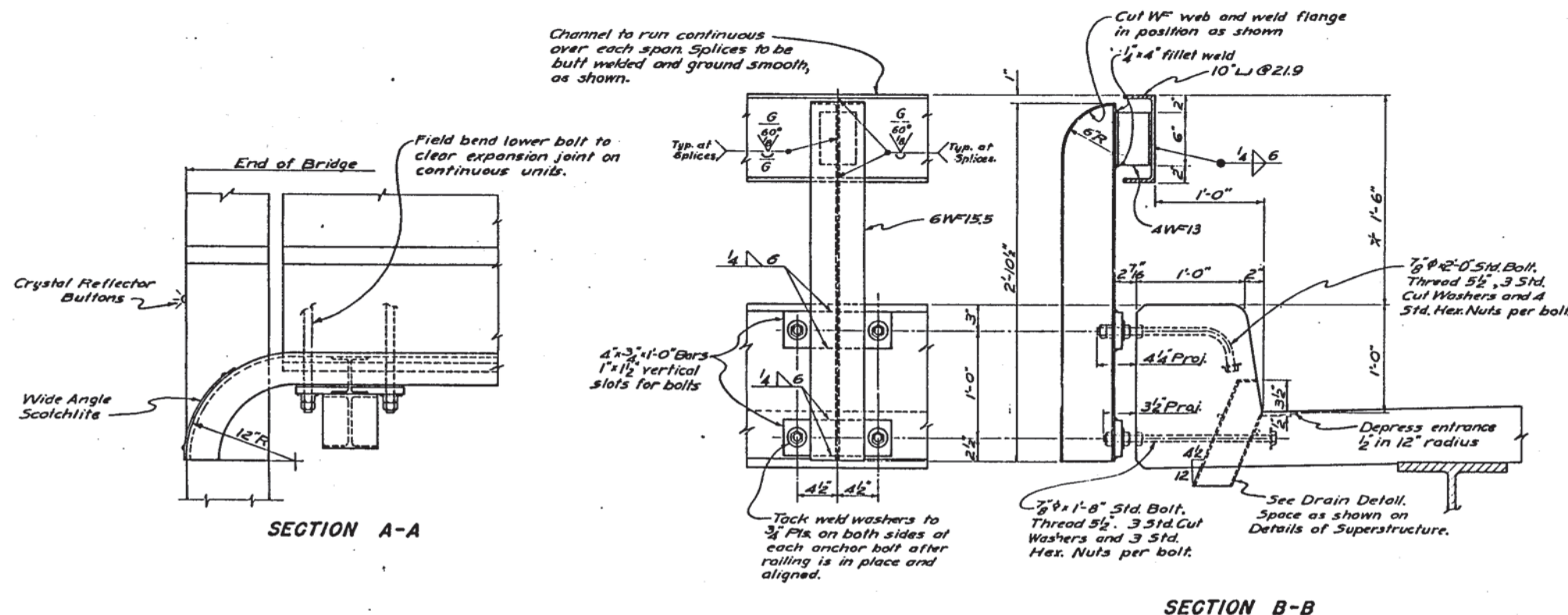
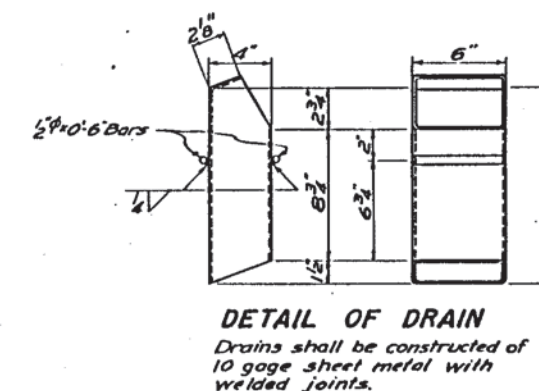
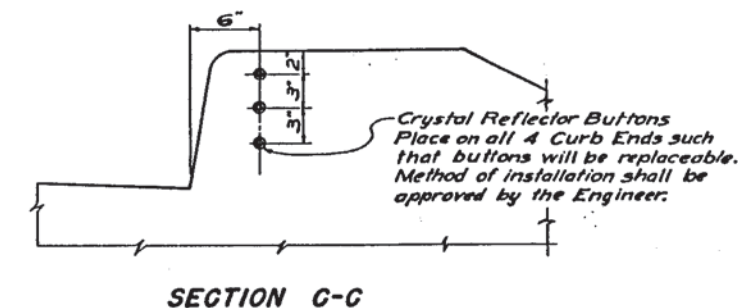
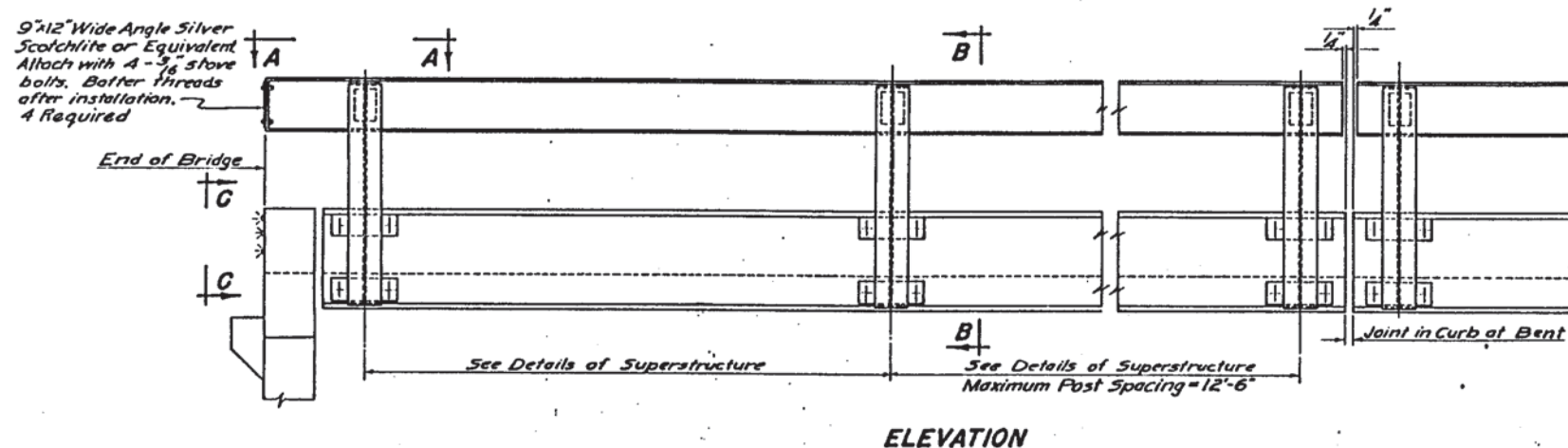
CHECKED BY

APPROVED

BRIDGE ENGINEER



STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	014-368	E14	E15



#### GENERAL NOTES:-

Cost of Anchor Bolts, Nuts, & Washers shall be absorbed in the unit price bid for Railing.

Cost of Scotchlite (or equiv) shall be absorbed in the unit price bid for Railing.

Cost of Crystal Reflector Buttons shall be absorbed in the unit price bid for Class A Concrete.

Railing shall be painted with one shop coat of Red Lead Paint and two field coats of Aluminum or other approved paint. Cost of painting of Railing shall be absorbed in the unit price bid for Railing.

All Railing Posts shall be constructed vertical.

Railing anchor bolts shall be bent at the acute angle end of skewed spans to provide a minimum cover of 1 1/2" of concrete.

Cost of welding shall be absorbed in the unit price bid for Railing.

## ORIGINAL CONSTRUCTION PLANS

STANDARD  
RAILING AND DRAIN DETAILS  
FOR  
STANDARD I-BEAM VIADUCTS  
SOUTH DAKOTA  
STATE HIGHWAY COMMISSION

STR. NO. 28-131-503

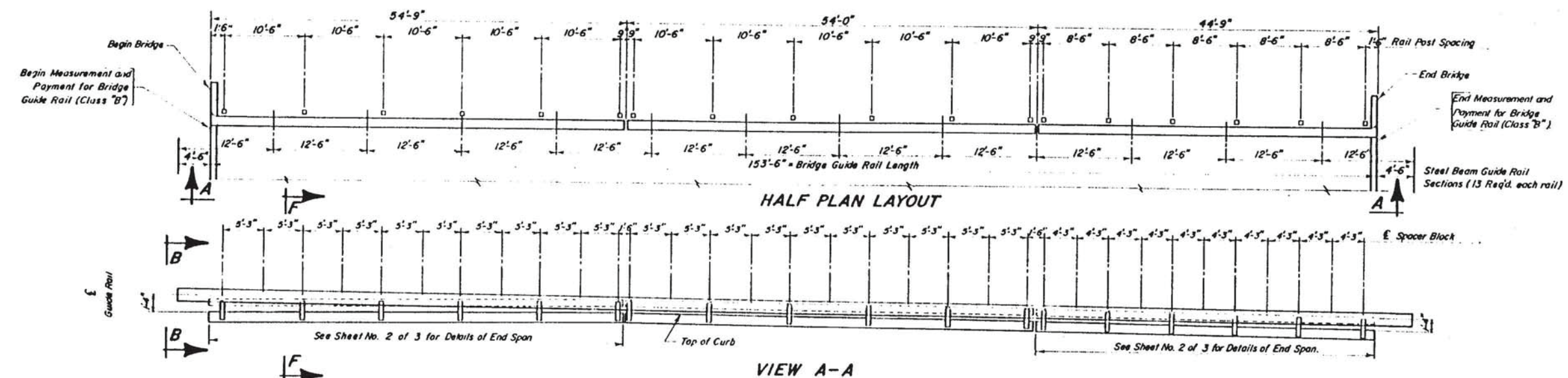
1947

(12) OF (13)

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
J.H.H.	D.H.H.	J.H.H.	J.H.H.
Rev. 12-4-51	Rev. 4-25-49	Rev. 12-28-48	Rev. 7-22-48
Rev. 3-9-48	Rev. 2-7-48		

RA-1





ESTIMATED QUANTITIES		
ITEM	UNIT	QUANTITY
Bridge Guide Rail - Class "B" (Type II)	Ln. Ft.	1,070
Type "RA-1" Rail Splice	Each	4

### NOTES -

- All bolts shall be galvanized in accordance with A.S.T.M. Specifications A153.
- All  $\frac{1}{2}$ " bars and  $\frac{1}{2}$ " x  $\frac{1}{2}$ " x  $\frac{1}{2}$ " angles shall be galvanized in accordance with A.S.T.M. Specifications A123.
- Bridge Guide Rail is considered as that portion of Rail placed between begin and end Bridge with pay length being the plan shown quantity. The portions of the standard 12'-6" steel beam sections extending beyond the Bridge Ends shall be included with and paid for as steel beam guide rail, Class "B" (Slab Post).
- Bridge Guide Rail will be paid for at the contract unit price per foot in place, which price shall be payment in full for furnishing all materials, galvanizing specified material, treating timber blocks with preservative, drilling holes through existing steel rail and drilling through new steel beam guide rail for connecting guide rail to bridge, drilling through  $\frac{1}{2}$ " bars and  $\frac{1}{2}$ " x  $\frac{1}{2}$ " x  $\frac{1}{2}$ " angles, cutting slots in blocks, welding  $\frac{1}{2}$ " bars, drilling holes in concrete for  $\frac{1}{2}$ " anchor bolts and constructing guide rail complete as shown on these plans.
- Field drill bolt holes in steel beam guide rail, existing steel rail,  $\frac{1}{2}$ " bars,  $\frac{1}{2}$ " x  $\frac{1}{2}$ " x  $\frac{1}{2}$ " angles and concrete curbs at locations as directed by the Engineer.
- The wood and the preservative treatment of the timber blocks shall be in accordance with Section 1020 and 950 respectively, of the S. Dak. Standard Specifications.
- Steel for  $\frac{1}{2}$ " x  $\frac{1}{2}$ " x  $\frac{1}{2}$ " bars and  $\frac{1}{2}$ " x  $\frac{1}{2}$ " x  $\frac{1}{2}$ " angles shall conform to A.S.T.M. - A36.
- The  $\frac{1}{2}$ " x  $\frac{1}{2}$ " x  $\frac{1}{2}$ " and  $\frac{1}{2}$ " x  $\frac{1}{2}$ " x  $\frac{1}{2}$ " bolts shall conform to A.S.T.M. - A307.
- Material for the  $\frac{1}{2}$ " x  $\frac{1}{2}$ " x  $\frac{1}{2}$ " anchor bolts, nuts, washers and expansion wedges shall be at the option of the manufacturer. The anchor bolts shall be equipped with expansion double-wedge anchors of a design similar or equivalent to that of the Standard "Wedge-It" bolts as manufactured by "Wedge-It" Corporation, Atlas Industrial Park, Broomfield, Colorado 80020. Bolts shall be set in the concrete in accordance with recommendations of the manufacturer and shall have ultimate tensile and shear strengths of not less than 17,000 pounds when imbedded 4" in 4,000 p.s.i. concrete. The Contractor shall obtain from the manufacturer and submit to the Engineer certified copies of test results indicating that the anchor bolts meet these tensile and shear requirements.
- The cost of shipping timber blocks to fit Type "RA-1" splices shall be absorbed in the unit price bid for Bridge Rail (Class "B").
- After welding the  $\frac{1}{2}$ " bars to the railposts, clean the weld affected areas and apply an approved galvanizing paint as directed by the Engineer.

## ORIGINAL CONSTRUCTION PLANS

BRIDGE STATIONING - STA. 528+21.75 TO STA. 529+75.25

S. D. DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS