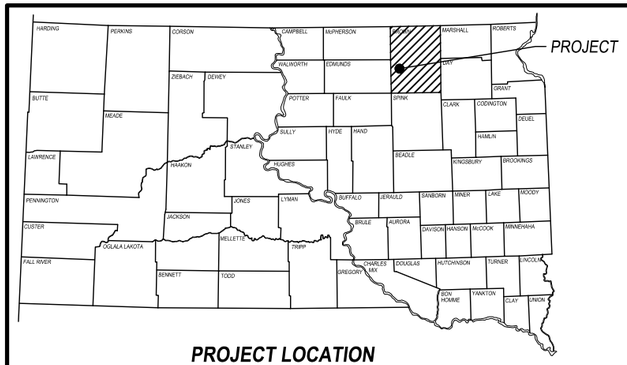


PROJECT LOCATION

STATE OF SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION
PLANS FOR PROPOSED

PROJECT PH 8007 (214)
GUARDRAIL RETROFIT
BROWN COUNTY,SD

STR. NO. 07-040-275
PCN 091E

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	PH 8007 (214)	1	21

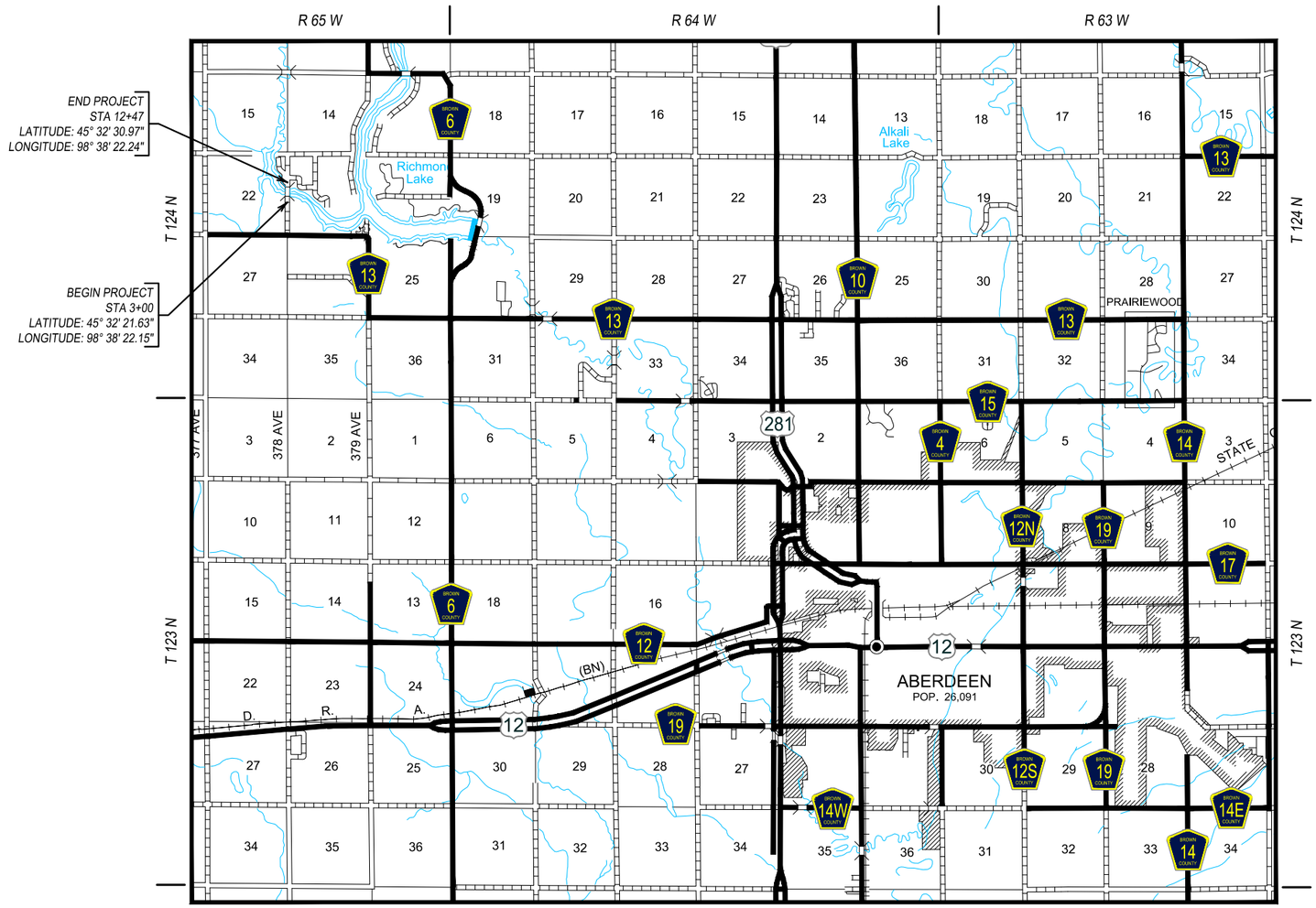
INDEX OF SHEETS

DESIGN DESIGNATION

ADT (2020)	*98*
ADT (2048)	*130*
DHV	*20*
d	*50%*
T DHV	*1.3%*
T ADT	*2.9%*
V	*35 mph*

STORM WATER PERMIT

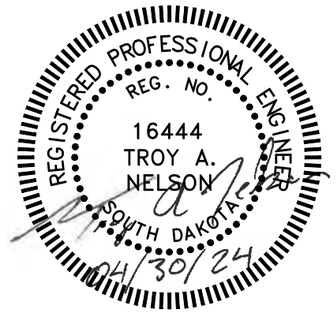
NONE REQUIRED



LOCATION MAP

COUNTY OFFICIALS

Highway Superintendent	*Dirk Rogers* *3133 8th Ave NE* *Aberdeen, SD 57401* *Phone: (605) 626-7118* *Fax: (605) 725-5050*
Commissioners	*Duane Sutton* *Doug Fjeldheim* *Mike Wiese* *Drew Dennert* *Mike Gage*



Know what's **below.**
Call before you dig.

IMEG

August 21, 2024

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	PH 8007 (214)	2	21

FOR BIDDING PURPOSES ONLY

ESTIMATE OF QUANTITIES

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
629E0109	High Tension 3 Cable Guardrail	1,238	Ft
629E0290	High Tension Cable Guardrail Anchor Assembly	4	Each
* 629E1109	Furnish High Tension Cable Guardrail Post and Sleeve	20	Each
632E2510	Type 2 Object Marker Back to Back	4	Each
634E0010	Flagging	100.0	Hour
634E0110	Traffic Control Signs	105.0	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS

*** - Denotes Non-Participating**

SPECIFICATIONS

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

ENVIRONMENTAL COMMITMENTS

The SDDOT is committed to protecting the environment and uses Environmental Commitments as a communication tool for the Engineer and Contractor to ensure that attention is given to avoid, minimize, and/or mitigate an environmental impact. Environmental commitments to various agencies and the public have been made to secure approval of this project. An agency with permitting authority can delay a project if identified environmental impacts have not been adequately addressed. Unless otherwise designated, the Contractor's primary contact regarding matters associated with these commitments will be the Project Engineer. During construction, the Project Engineer will verify that the Contractor has met Environmental Commitment requirements. These environmental commitments are not subject to change without prior written approval from the SDDOT Environmental Office.

Additional guidance on SDDOT's Environmental Commitments can be accessed through the Environmental Procedures Manual found at: <https://dot.sd.gov/media/documents/EnvironmentalProceduresManual.pdf >

For questions regarding change orders in the field that may have an effect on an Environmental Commitment, the Project Engineer will contact the Environmental Engineer at 605-773-3180 or 605-773-4336 to determine whether an environmental analysis and/or resource agency coordination is necessary.

Once construction is complete, the Project Engineer will review all environmental commitments for the project and document their completion.

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

COMMITMENT 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 C: WATER SOURCE

The Contractor will not withdraw water with equipment previously used outside the State of South Dakota or previously used in aquatic invasive species (AIS) positive waters within South Dakota without prior approval from the SDDOT Environmental Office. To prevent and control the introduction and spread of invasive species into the project vicinity, all equipment will be power washed with hot water (≥140 °F) and completely dried for a minimum of 7 days prior to subsequent use. South Dakota administrative rule 41:10:04:02 forbids the possession and transport of AIS; therefore, all attached dirt, mud, debris and vegetation must be removed and all compartments and tanks capable of holding standing water must be drained. This includes, but is not limited to, all equipment, pumps, lines, hoses and holding tanks.

Action Taken/Required:

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

Additional information and mapping of water sources impacted by Aquatic Invasive Species in South Dakota can be accessed at:
< https://sdleastwanted.sd.gov/maps/default.aspx>

< South Dakota Administrative Rule 41:10:04 Aquatic Invasive Species: https://sdlegislature.gov/rules/DisplayRule.aspx?Rule=41:10:04 >

COMMITMENT E: STORM WATER

Construction activities constitute less than one 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 will furnish a site(s) for the disposal of construction and/or demolition debris generated by this project.

Action Taken/Required:

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

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

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

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

1. Construction and/or demolition debris consisting of concrete, asphalt concrete, or other similar materials will be buried in a trench separate from wood debris. The final cover over the construction and/or demolition debris will consist of a minimum of 1 foot of soil capable of supporting vegetation. Waste disposal sites provided outside of the Public ROW will be seeded in accordance with Natural Resources Conservation Service recommendations. The seeding recommendations may be obtained through the appropriate County NRCS Office. The Contractor will control the access to waste disposal sites not within the Public ROW with fences, gates, and placement of a sign or signs at the entrance to the site stating, "No Dumping Allowed".

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

The above requirements will not apply to waste disposal sites that are covered by an individual solid waste permit as specified in SDCL 34A-6-58, SDCL 34A-6-1.13, and ARSD 74:27:10:06.
Failure to comply with the requirements stated above may result in civil penalties in accordance with South Dakota Solid Waste Law, SDCL 34A-6-1.31.

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

REGISTERED PROFESSIONAL ENGINEER
REG. NO.
16444
TROY A.
NELSON
SOUTH DAKOTA
04/30/24

FOR BIDDING PURPOSES ONLY

COMMITMENT I: HISTORICAL PRESERVATION OFFICE CLEARANCES

The SDDOT has obtained concurrence with the State Historic 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 a cultural resource review prior to scheduling the pre-construction meeting. This work includes but is not limited to: Contractor furnished material sources, material processing sites, stockpile sites, storage areas, plant sites, and waste areas.

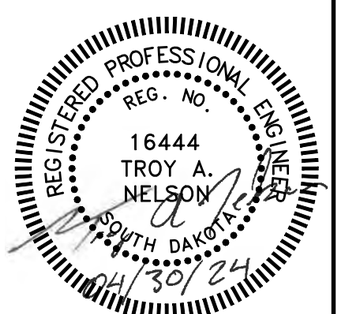
The Contractor will arrange and pay for a record search and when necessary, a cultural resource survey. The Contractor has the option to contact the state Archaeological Research Center (ARC) at 605-394-1936 or another qualified archaeologist, to obtain either a records search or a cultural resources survey. A record search might be sufficient for review if the site was previously surveyed; however, a cultural resources survey may need to be conducted by a qualified archaeologist.

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

The Contractor will submit the cultural resources survey report to SDDOT Environmental Office, 700 East Broadway Avenue, Pierre, SD 57501-2586. SDDOT will submit the information to the appropriate SHPO/THPO. Allow **30 Days** from the date this information is submitted to the Environmental Engineer for SHPO/THPO review.

In the event of an inadvertent discovery of human remains, funerary objects, or if evidence of cultural resources is identified during project construction activities, then such activities within 100 feet of the inadvertent discovery will immediately cease and the Project Engineer will be immediately notified. The Project Engineer will contact the SDDOT Environmental Office, who will contact the appropriate SHPO/THPO within 48 hours of the discovery 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 will not utilize a site known or suspected of having contaminated soil or water. The Contractor will provide the required permits and clearances to the Project Engineer at the preconstruction meeting.



FOR BIDDING PURPOSES ONLY

SCOPE OF WORK

Work will consist of retrofitting new 3-Cable High Tension Guardrail, specifically the Gibraltar TL-3 Cable System Layout, onto the existing structure. The Base-Plated Option will be used across the deck and the Driven Socket Option will be used extending on either side of the structure along the corridor. The existing Designed Rail across the structure will remain in place.

HIGH TENSION CABLE GUARDRAIL

The Contractor will furnish and install a high-tension cable guardrail system that meets the Test Level 3 crash testing requirements of the NCHRP Report 350. The High Tension Cable used will be the following product:

Gibraltar – TL-3 Cable System

The high-tension cable guardrail system will be in compliance with Specifications Section 6.9 Buy America.

The Contractor will install the system according to the manufacturer's installation recommendations except where stated otherwise in the plans. A copy of the detail drawings and installation instructions for the high-tension cable guardrail and anchor assemblies will be given to the Engineer a minimum of 4 weeks prior to installation of the high-tension cable guardrail system.

All posts will be galvanized and inserted into driven galvanized steel sleeves with soil plates. The driven sleeves must be designed for a minimum frost depth of 42" and to resist the additional lateral component of curved cable sections. Posts across the deck will be the Base-Plated option installed in accordance with the manufacturer's recommendations.

Delineation of the high-tension cable guardrail will be in conformance with standard plate 632.40.

The cables provided will be pre-stretched in the factory.

The Contractor will check and adjust the tension of the cables a minimum of 3 weeks after installation and not longer than 6 weeks after installation. Cost for this work will be incidental to the contract unit price per foot for "High Tension 3 Cable Guardrail".

High tension cable guardrail will be installed on a 10:1 or flatter slope and the embankment limits will match the high-tension cable guardrail limits. The embankment quantities may vary from plans quantity.

The lengths of high-tension cable guardrail stated in the plans are based on a minimum effective length (length of need). The length and location of the high-tension cable guardrail at each site will need to be adjusted during construction as necessary depending on the system provided and will be approved by the Design Engineer before installation.

The Contractor will provide a signed letter of compliance to the Engineer upon completion of the high-tension cable guardrail installation(s) stating that the high tension cable barrier system has been installed in conformance to the manufacturer installation instructions and specifications, meets the Test Level 3 crash test requirements of the NCHRP Report 350, and is terminated with an approved anchor assembly.

The high-tension cable guardrail will be measured along the centerline of the cable guardrail from the beginning to the end of the minimum effective length.

All costs for furnishing and installing the high-tension cable guardrail system including all labor, materials, and equipment will be incidental to the contract unit price per foot for "High Tension 3 Cable Guardrail".

HIGH TENSION CABLE GUARDRAIL ANCHOR ASSEMBLY

The beginning and end of each "run" of high-tension cable guardrail will terminate with an anchor assembly. The High-Tension Cable Anchor Assemblies will be the following product:

Gibraltar – TL-3 Cable Terminal

The footing(s) for the anchor assembly will be designed to allow for 1 inch maximum of lateral deflection. The allowable design soil pressure will be 1000 psf. The top 2 feet of soil pressure will be neglected in the design of the footing(s). The footing(s) will be a minimum of 5' deep. The footing(s) design will be submitted through proper channels to the Office of Bridge Design for a one-time approval. Any changes to the anchor assembly that could affect footing size including configuration changes such as different number of cables and different number of footings will be resubmitted for approval. The approval will be obtained a minimum of 4 weeks prior to construction of the anchor footing(s).

All costs for furnishing and installing the High-Tension Cable Guardrail Anchor Assembly including all labor, equipment, and materials which include the anchor footing(s), hardware, and all attachments to the anchor footing(s), will be incidental to the contract unit price per each for "High Tension Cable Guardrail Anchor Assembly".

FURNISH HIGH TENSION CABLE GUARDRAIL POST AND SLEEVE

The Contractor will furnish an additional 20 galvanized posts with all necessary hardware and accessories to complete the post installation, 10 sleeves with soil plates, and 20 caps or cable spacers with back-to-back reflective sheeting and will deliver and stockpile the materials to the Brown County Highway Department, 3133 8th Avenue NE in Aberdeen, South Dakota or as approved by the Engineer. The posts and sleeves will be the same type of posts provided in the installation of the high-tension cable guardrail on the project. Specifically, 6 Base-Plated Posts, 10 Line Posts, and 4 Terminal Posts will be furnished.

All costs for furnishing the posts and caps and delivering them to the Brown County Highway Department will be incidental to the contract unit price per each for "Furnish High Tension Cable Guardrail Post and Sleeve".

UTILITIES

The Contractor is specifically cautioned that the location and/or elevation of existing utilities as shown on these plans are based on records of the various utility companies and, where possible, measurements taken in the field. The information is not to be relied on as being exact or complete. The Contractor will call the appropriate utility companies at least 48 hours before any excavation to request exact field location of utilities.
The Contractor will be responsible for locating the Sanitary Sewer line on the East side of the road specifically for the Anchor Assembly at Station 4+65.

All utilities SD-ONE CALL
P.O.C. 1-800-781-7474
Richmond Lake Sanitary District, Aberdeen, South Dakota (605) 229-4477

TRAFFIC CONTROL SIGNS

SIGN CODE	DESCRIPTION	NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
G20-2	END ROAD WORK	2	36"x18"	4.5	9.0
W20-1	ROAD WORK AHEAD	2	48"x48"	16.0	32.0
W20-4	ONE LANE ROAD AHEAD	2	48"x48"	16.0	32.0
W20-7	FLAGGER (SYMBOL)	2	48"x48"	16.0	32.0
				TOTAL:	105.0

TABLE OF GUARDRAIL QUANTITIES

Location	High Tension 3 Cable Guardrail (Ft)	Driven Posts (Each) N.A.B.I.	Base-Plated Posts (Each) N.A.B.I.	Terminal Posts (Each) N.A.B.I.	Anchor Assembly (Each)
Sta. 4+65 to Sta. 4+92.5 Lt.	27.5 Noneffective	-	-	4	1
Sta. 4+65 to Sta. 4+92.5 Rt.	27.5 Noneffective	-	-	4	1
Sta. 4+92.5 to Sta. 9+70.5 Lt.	478	48	-	-	-
Sta. 4+92.5 to Sta. 9+70 Rt.	477.5	48	-	-	-
Sta. 9+70 to Sta. 10+30 Lt.	60	-	6	-	-
Sta. 9+70 to Sta. 10+30 Rt.	60	-	6	-	-
Sta. 10+30 to Sta. 11+24.5 Lt.	94.5	10	-	-	-
Sta. 10+30 to Sta. 10+97.5 Rt.	67.5	7	-	-	-
Sta. 11+24.5 to Sta. 11+52 Lt.	27.5 Noneffective	-	-	4	1
Sta. 10+97.5 to Sta. 11+25 Rt.	27.5 Noneffective	-	-	4	1
Totals:	1,237.5	113	12	16	4

REGISTERED PROFESSIONAL ENGINEER
REG. NO.
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SOUTH DAKOTA
06/21/24

ALIGNMENT CONTROL DATA

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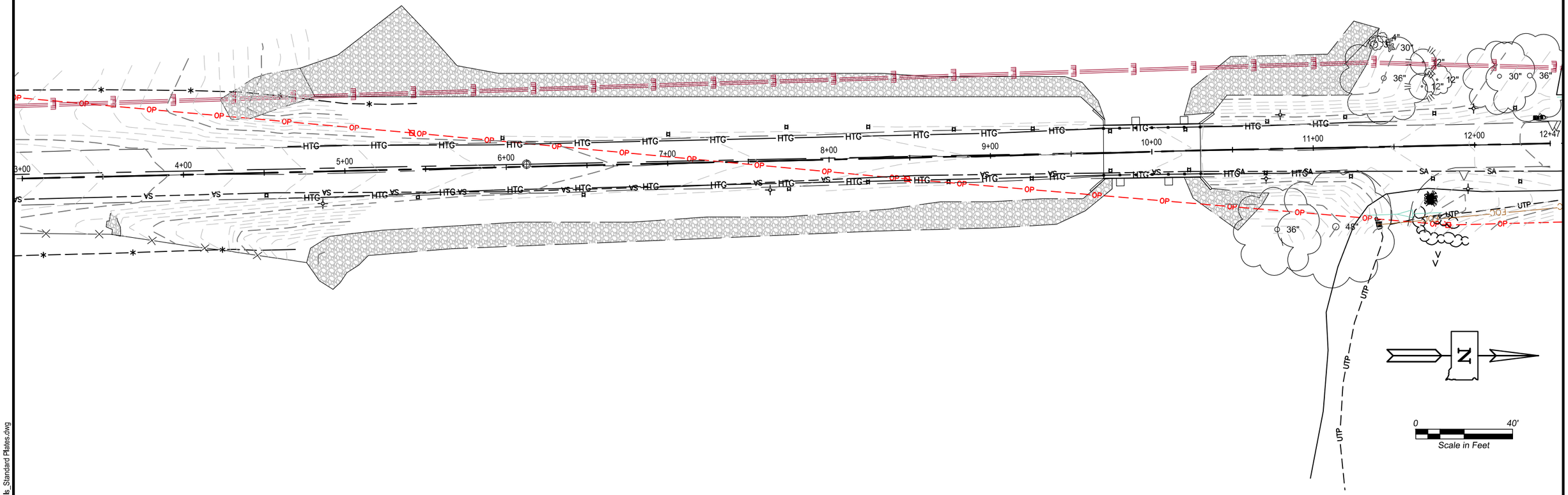
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	PH 8007 (214)	5	21



HORIZONTAL ALIGNMENT DATA					
Type	**Station**			**Northing**	**Easting**
P.O.B.	3+00.14			624,910.94	2,317,099.47
		TL=669.48	N 01°20'43" W		
P.I.	9+69.62			625,582.24	2,317,083.78
		TL=60.66	N 01°39'42" W		
P.I.	10+30.28			625,640.88	2,317,082.02
		TL=216.52	N 01°07'46" W		
P.O.E.	12+46.80			625,857.36	2,317,077.75

REGISTERED PROFESSIONAL ENGINEER
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SOUTH DAKOTA
04/30/24

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LEGEND

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STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	PH 8007 (214)	6	21

CONTROL LEGEND

Benchmark	
Control Point	

SANITARY SEWER LEGEND

Sanitary Manhole	SA
Sewer Cleanout	
Unknown Manhole	?
Force Main	FM
Sanitary Sewer	

STORM SEWER LEGEND

Storm Inlet	
Storm Double Inlet	
Storm Manhole	ST
Flared End Section	
Downspout - Above Ground	AG
Downspout - Underground	UG
Storm Sewer	
Pipe Underdrain	

WATER LEGEND

Curb Stop	
Fire Hydrant	
Post Indicator Valve	PIV
Sprinkler Head	S
Sprinkler Box	V
Water Meter	W
Water Valve	W
Water Well	W
Underground Water	

COMMUNICATIONS LEGEND

Fiber Optic Cable	FOC FOC
Telephone Manhole	T
Telephone Pedestal	T
Telephone Pole	
Telephone Line	T T
Cable Television Pedestal	C
Television Line	TV

GAS LEGEND

Gas Meter	G
Gas Valve	
Gas Line	G

GENERIC UTILITY LEGEND

Utility Manhole	U
Utility Marker	
Handhole (Single/Double)	H H H
Utility Line	UT UT

ELECTRIC LEGEND

Air Conditioner/Cooling Unit	A
Guy Pole	
Guy Wire	
Light Pole	
Vapor Light	
Electric Manhole	E
Electric Pedestal/Transformer	E
Electric Meter	E
Power Pole	
Power Pole with Light	
Power Pole with Meter	
Junction Box	J
Traffic Signal	
Traffic Cantilever	
Traffic Signal Controller	
Overhead Electric	OE OE
Underground Electric	E E

FENCING/POST LEGEND

Post/Bollard	P
Wire Fence	
Chain Link Fence	
Woven Wire Fence	
Guardrail	

SIGN/PARK LEGEND

Mail Box	
Single Post Sign	
Double Post Sign	
Flagpole	
ADA Stall	

VEGETATION LEGEND

Bush	
Coniferous Tree	
Deciduous Tree	
Tree Stump	
Edge of Woods	

EROSION CONTROL LEGEND

Fiber Reinforced Matrix	
Erosion Control Wattles	
Riprap	
Silt Curtain	SC SC SC
Silt Fence	SF SF SF
Temporary Diversion Channel	

BOUNDARY

Found Corner	
Set Corner	
Section Line	
Quarter Line	
16th Line	
32nd Line	
Easement Line	
Right of Way Line	

REGISTERED PROFESSIONAL ENGINEER
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STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	PH 8007 (214)	7	21

TYPICAL SECTION

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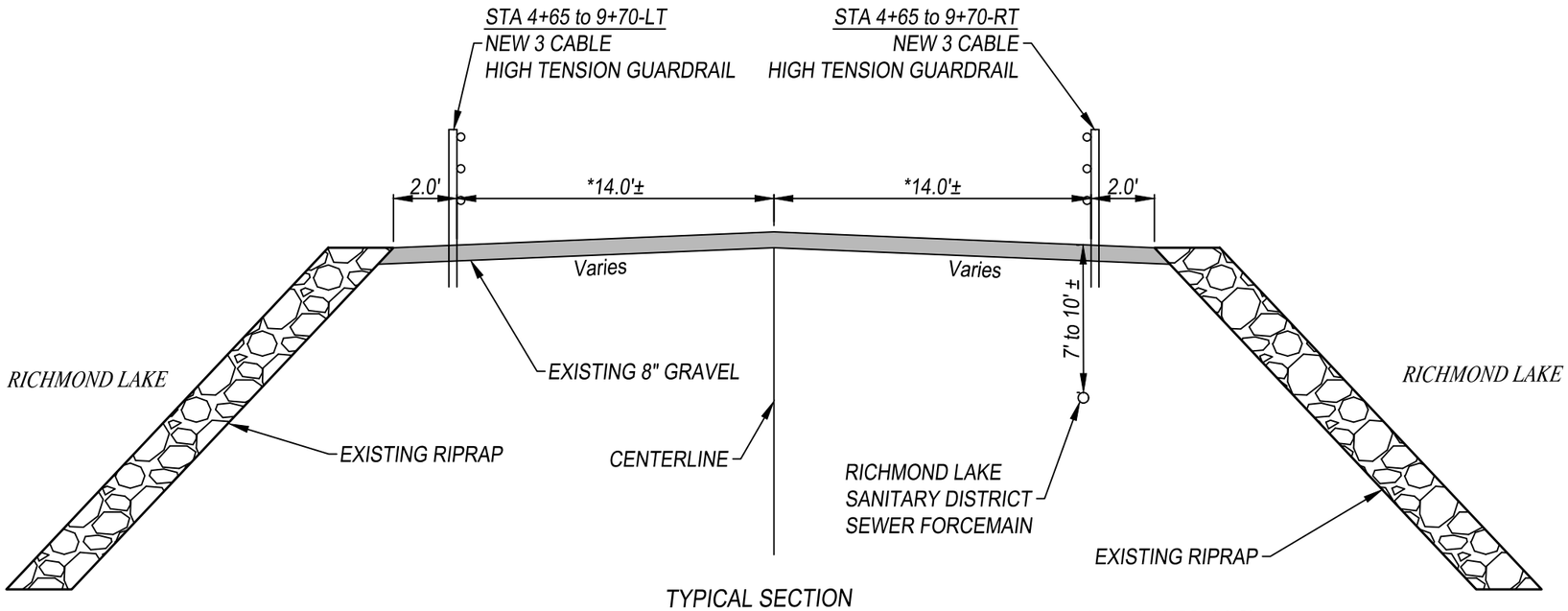

TYPICAL SECTION
4+65 TO 9+70

*TAPERS FROM 16.0' TO 14.0'

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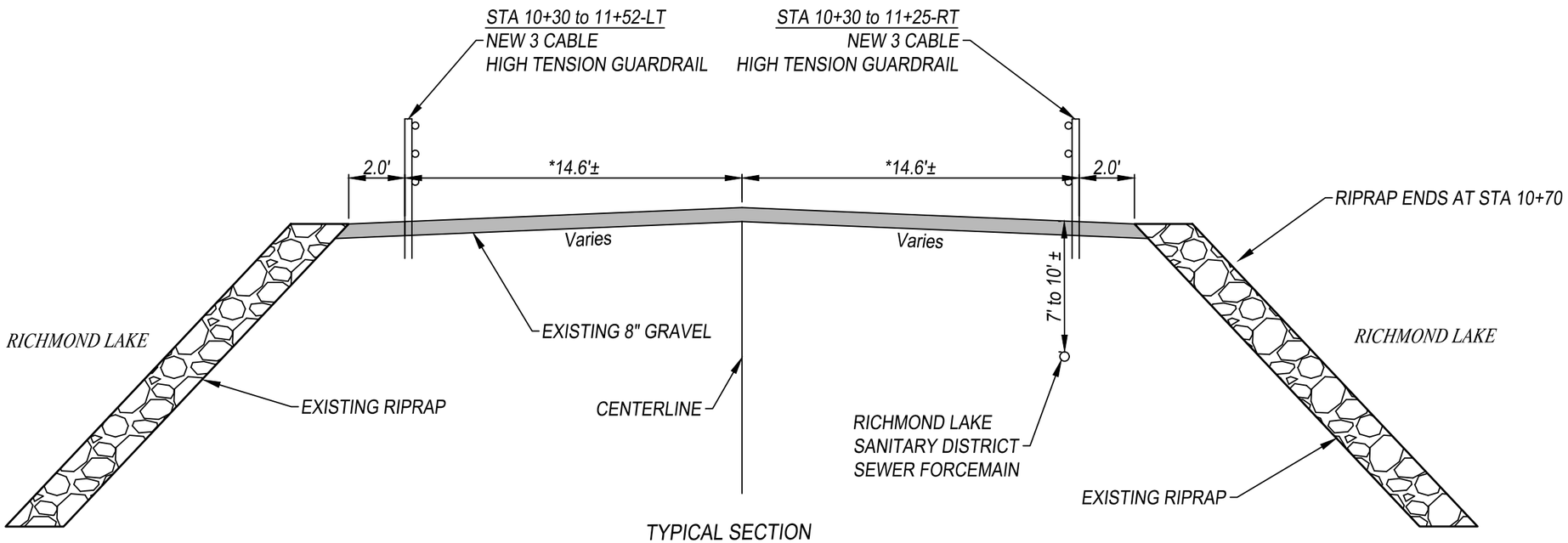
SOUTH DAKOTA
04/30/24



TYPICAL SECTION
10+30 TO 11+52

*TAPERS FROM 14.6' TO 15.5'

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BRIDGE TYPICAL SECTION

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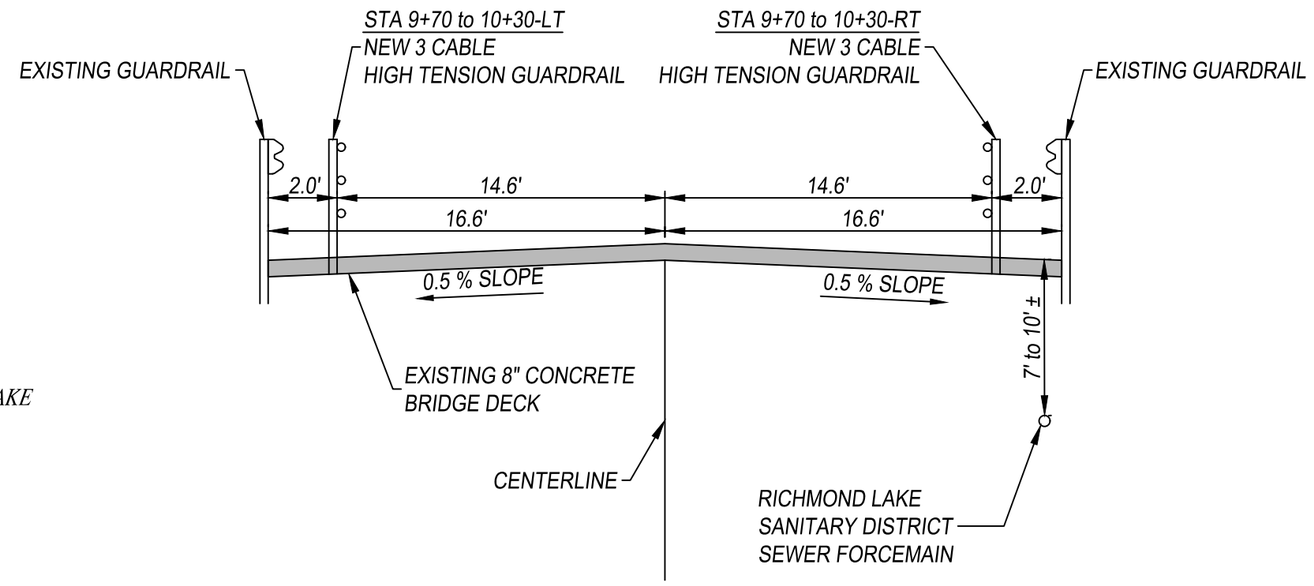
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	PH 8007 (214)	8	21



TYPICAL SECTION
9+70 TO 10+30

REGISTERED PROFESSIONAL ENGINEER
REG. NO.
16444
TROY A.
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SOUTH DAKOTA
04/30/24

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REG. NO.
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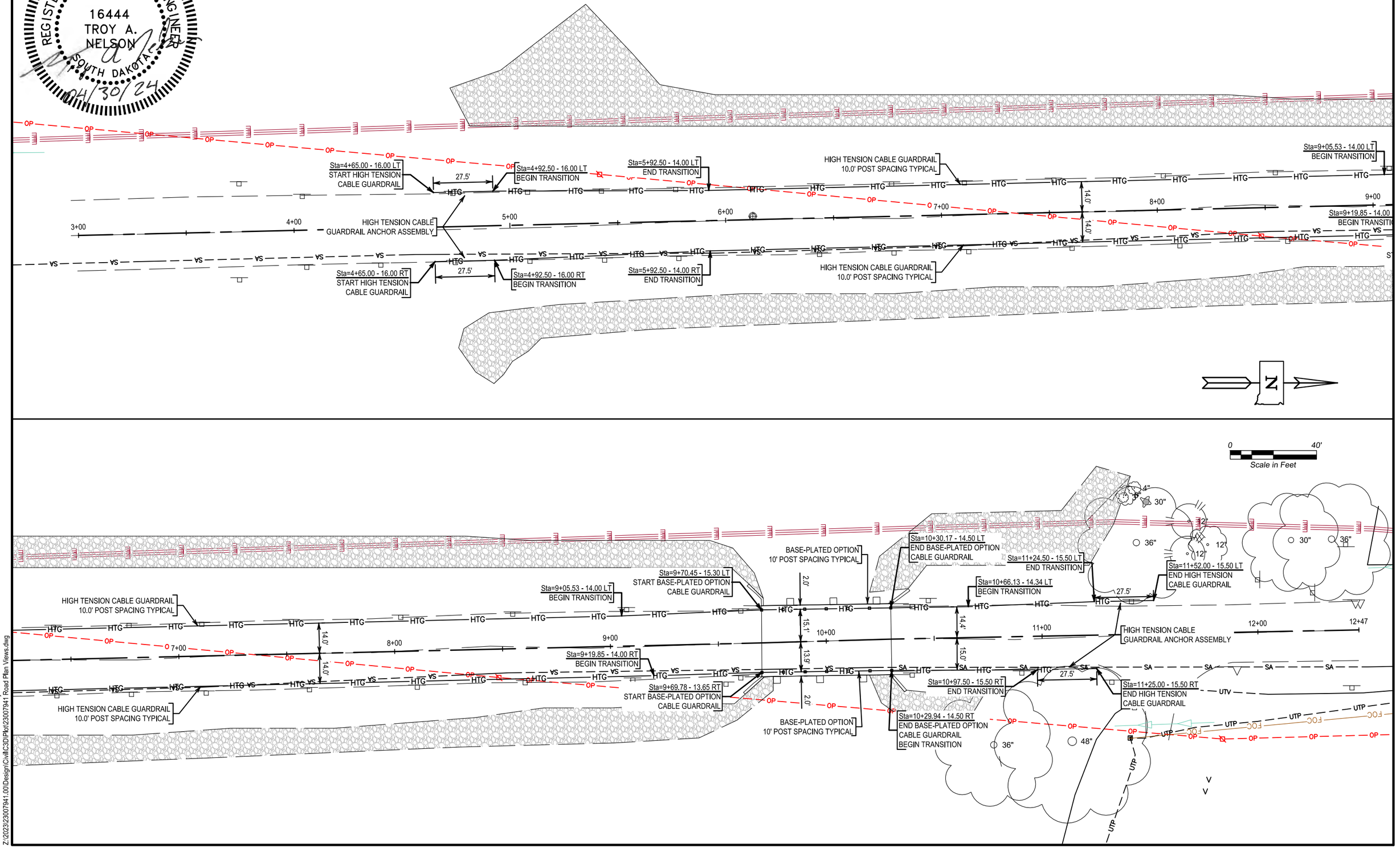
SOUTH DAKOTA
04/30/24

ROAD PLAN VIEWS

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	PH 8007 (214)	9	21



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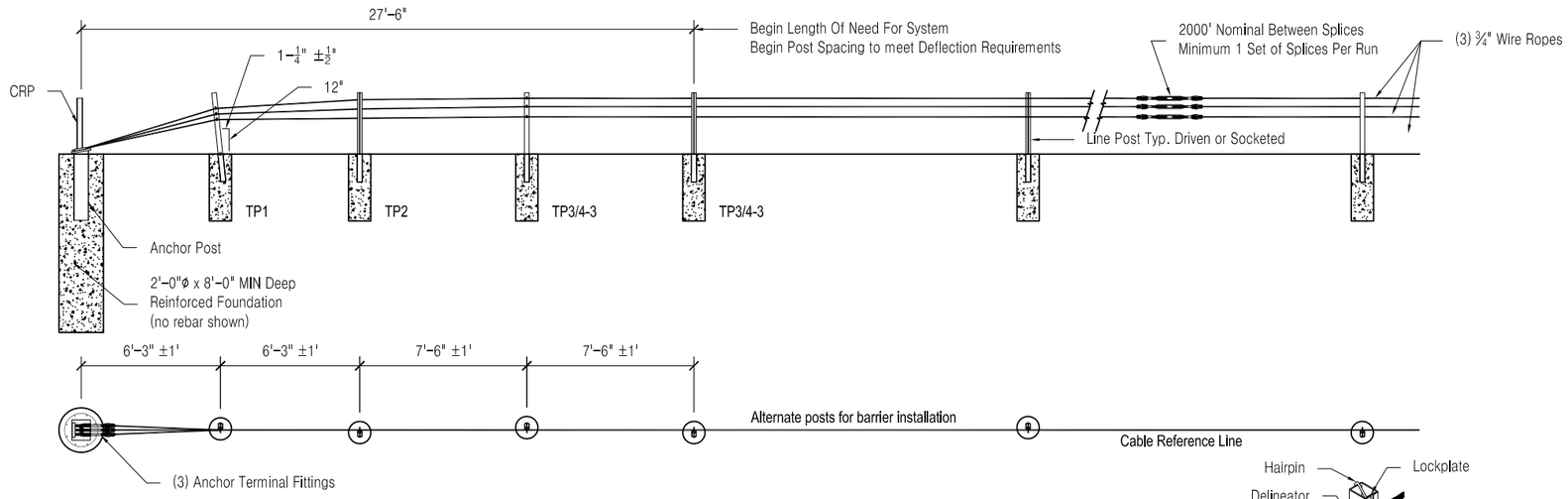
PLAN DETAILS

FOR BIDDING PURPOSES ONLY

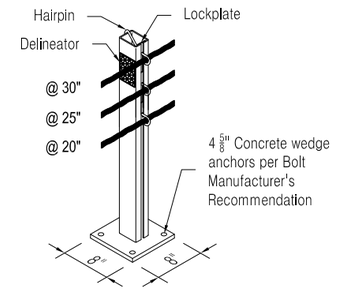
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	PH 8007 (214)	10	21

	Sheet:	Rev:	Rev Date:	Approver:
	01 OF 01	11	10-18-17	BH
Job #	Gibraltar Job #	County:		
xxx	xxx	xxx		
	##/##/##	-		

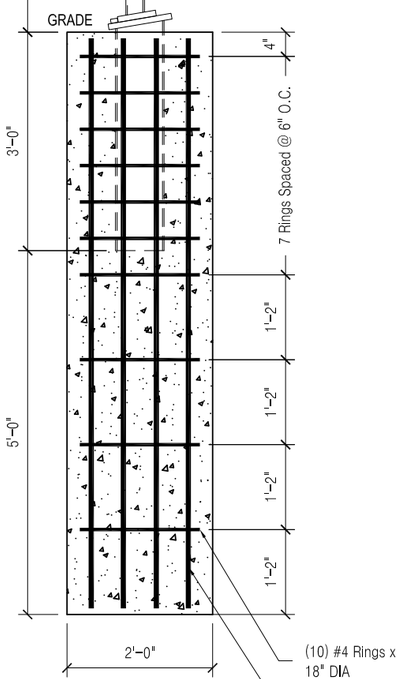


3/4" MIN T/B Cable Splice Fitting

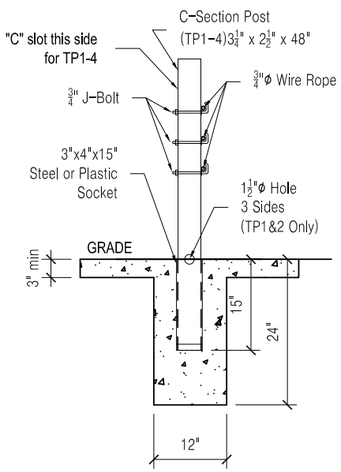
3/4" MIN Terminal Fitting



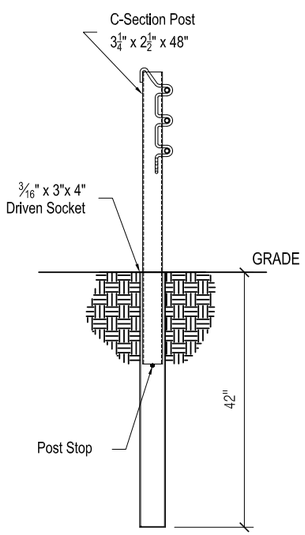
Line Post
(BASE-PLATED OPTION)
Low-Fill Box Culvert-Less than 15" Fill



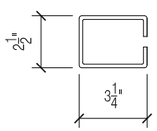
Cable Release & Anchor Post



Terminal Post
(SHOWN WITH CONCRETE MOWSTRIP)



Line Post
(Driven Socket Option)



C-Section Post

Deflection	
Deflection	Post Spacing
9'-3"	30 FT
9'-0"	28FT
8'-0"	20 FT
7'-0"	12 FT
6'-8"	10 FT

Cable Tension Chart*	
-10 °F	8000
0 °F	7600
10 °F	7200
20 °F	6800
30 °F	6400
40 °F	6000
50 °F	5600
60 °F	5200
70 °F	4800
80 °F	4400
90 °F	4000
100 °F	3600
110 °F	3200

*Allowable Deviation from Chart +/- 10%

GENERAL NOTES

1. For additional information contact Gibraltar, Inc. at 1-833-715-0810, or see the manufacturer's product manual.
2. All concrete shall be per specification; minimum 2,500psi.
3. The Cable Barrier System shall be installed on shoulders or on medians with slopes of 6:1 or flatter.
4. The Cable Barrier System is accepted by the FHWA Test Level - 3.
5. See specification for delineation requirements.
6. Rock Clause: Where solid rock is encountered:
   - 6.A. For socketed post, continue digging 12" diameter, 15" deep into rock or the required plan depth, whichever comes first.
   - 6.B. For driven post and driven socket, core drill a 4" diameter hole 18" deep into rock or the required plan depth, whichever comes first.
   - 6.C. For Anchor post, continue digging 24" diameter, 30" deep into rock or the required plan depth, whichever comes first.
7. Tolerances:
   - Linepost = 3"(max) out of plumb, at top
   - Cable height= ±1"
   - Anchor Post ± 5" off of Cable Reference Line
8. The Gibraltar cable barrier system shall be installed in NCHRP Report 350 standard compacted soil. Soil must be well drained.
9. All non-welded rebar by others.
10. Minimum recommended line post foundation.
    - 10.A. Without mowstrip, 36" Deep x 12" diameter foundations with #3 rebar ring x 8" diameter with two #4 rebar vertical bars 30" long or 30" welded rebar socket.
    - 10.B. With 4" minimum depth hot mix asphalt, 30" deep x 12" diameter foundations with #3 rebar ring x 8" diameter with two #4 rebar vertical bars 30" long or 30" welded rebar socket.
    - 10.C. With 3" minimum depth concrete mowstrip, 24" deep x 12" diameter foundations. (No rebar required).
    - 10.D. Direct drive driven post and driven socket 42" deep.

PROPRIETARY TO GIBRALTAR

TL-3 Cable System Layout		
Gibraltar Cable Barrier Systems		
Scale: NTS	Date: 10-18-17	
Layout: ANSI B	Drafter: BH	

STRUCTURAL GENERAL NOTES

1. ALL STRUCTURAL STEEL SHAPES AND PLATES SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M 270 GRADE 50W (ASTM A709 / ASTM A588 WEATHERING STEEL), HSS STRUCTURAL TUBING SHALL CONFORM TO THE REQUIREMENTS OF (ASTM A847 / ASTM A588 WEATHERING STEEL), UNLESS NOTED OTHERWISE.

2. TL-1 GUARDRAIL DESIGN IN ACCORDANCE WITH OWNER REQUIREMENTS, DESIGN FROM CONTRACT DOCUMENTS. GUARDRAIL DESIGN HAS NOT BEEN CRASH-TESTED PER AASHTO REQUIREMENTS.

3. STEEL DECKING SHALL BE ICB0 APPROVED AND FABRICATED BY A MANUFACTURER WHO IS A MEMBER OF THE "STEEL DECK INSTITUE" AND SHALL CONFORM TO ASTM A446 GRADE A OR HIGHER WITH A MINIMUM STRENGTH OF 33 KSI. DECK GALVANIZING SHALL BE IN ACCORDANCE WITH ASTM A525 G-60. INDIVIDUAL SHEET LENGTH SHALL BE CONTINUOUS FOR 3 OR MORE SPANS UNLESS NOTED OTHERWISE AND APPROVED BY THE ENGINEER. MINIMUM SHEET END AND SIDE LAP LENGTH SHALL BE PER MANUFACTURER'S RECOMMENDATIONS.

   COMPOSITE STEEL FLOOR DECK SHALL BE 20 GAUGE GALVANIZED STEEL, UNLESS NOTED OTHERWISE. DECK PROFILE SHALL BE TYPE C WITH 2" NOMINAL CORRUGATION DEPTH DESIGNED IN ACCORDANCE WITH THE SDI SPECIFICATIONS FOR COMPOSITE STEEL FLOOR DECK. REQUIRED MINIMUM SECTION PROPERTIES:
   I = 0.409 in^4/ft, Sp = 0.341 in^3/ft, Sn = 0.346 in^3/ft

4. ALL STRUCTURAL STEEL CONNECTIONS SHALL BE MADE WITH HIGH STRENGTH BOLTS (ASTM A325X TYPE 3), NUTS (ASTM A563 GR DH3), AND WASHERS (ASTM F436 TYPE 3) CONFORMING TO AASHTO M 164, UNLESS NOTED OTHERWISE. TYPICAL CONNECTIONS ARE "SNUG TIGHT" BEARING CONNECTIONS WITH STANDARD WASHERS. USE LOAD INDICATOR WASHERS AT ALL BOLTED DIAPHRAGM SPLICE CONNECTIONS (NOTED AS TCB) OR CONNECTIONS LISTED AS FULLY TENSIONED OR SLIP CRITICAL. LOAD INDICATING DEVICES, DTI'S OR SQUIRTER DTI'S, SHALL CONFORM TO ASTM F959. TENSION CONTROL BOLTS SHALL CONFORM TO ASTM F1852 TYPE 3. GIRDER SHEAR STUDS SHALL CONFORM TO ASTM A108 GR 1015. ANCHOR RODS SHALL CONFORM TO ASTM F1554 GR 36.

5. CERTIFIED MILL TEST REPORTS SHALL BE FURNISHED FOR THE STEEL STRINGERS, STRUCTURAL STEEL PLATES AND SHAPES, STEEL BRIDGE DECKING, HIGH STRENGTH BOLTS, PLAIN ELASTOMERIC PADS (PEP) AND ANCHOR BOLTS, IF REQUIRED BY OWNER.

6. ALL WELDING SHALL BE IN ACCORDANCE WITH AWS D1.5, BRIDGE WELDING CODE. ALL ELECTRODES SHALL BE AS FOLLOWS:
   I. FCAW - E71T AND E81T WEATHERING
   II. SMAW - E70XX L.H. AND E80XX L.H. WEATHERING

7. ALL WELDING OF HSS SHALL BE IN ACCORDANCE WITH AWS D1.1, STRUCTURAL WELDING CODE - STEEL.

8. ALL WELDING OF STEEL DECKING SHALL BE IN ACCORDANCE WITH AWS D1.3 STRUCTURAL WELDING CODE.
   IJ. GMAW - E70C - XM

9. INSPECTION AND TESTING REQUIRMENTS:
   I. VISUAL INSPECTION
   II. NO MAGNETIC PARTICLE TESTING REQUIRED
   III. NO ULTRASONIC TESTING REQUIRED
   IV. DECK INSPECTION; VISUALLY, AT LEAST 10% OF ALL WELDS

10. PLAIN ELASTOMERIC PADS (PEP) SHALL BE HARDNESS (SHORE A) 60 AND SHALL CONFORM TO AASHTO M 251 AND ASTM D4014.

11. EPOXY SHALL BE PER MIL A 81236 (OS), BOND BEARING PAD TO ANCHOR PLATE.

12. EXTERIOR SURFACES SHALL BE CLEANED PER SSPC-SP 6 PRIOR TO SHIPMENT TO ASSURE UNIFORM WEATHERING IN ACCORDANCE WITH OWNER REQUIREMENTS.

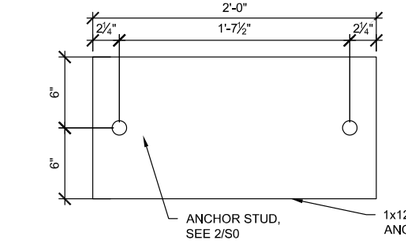
13. CAST IN PLACE CONCRETE SHALL COMPLY WITH THE LATEST EDITION OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS AND THE FOLLOWING:

   I. ALL CONCRETE SHALL BE CLASS A.
   II. CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENCTH OF F'C = 4500 PSI AT 28 DAYS, NORMAL WEIGHT.
   III. CONCRETE SHALL BE AIR ENTRAINED IN CONFORMANCE WITH THE LATEST EDITION OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 5.4.2.1, FOR DURABILITY. AIR CONTENT SHALL BE 6.0% +/- 1.5%.
   IV. CONCRETE MAXIMUM WATER-CEMENTITIOUS MATERIAL RATIO SHALL BE 0.45.
   V. PLAIN-CARBON CONCRETE REINFORCING BARS AS CALLED OUT ON THE "DECK SCHEDULE" SHALL MEET THE REQUIREMENTS OF ASTM A615.
   VI. EPOXY COATED CONCRETE REINFORCING BARS AS CALLED OUT ON THE "DECK SCHEDULE" SHALL MEET THE REQUIREMENTS OF ASTM A934.

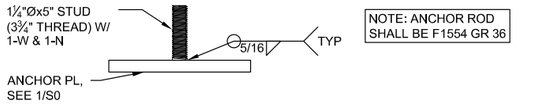
14. GUARDRAIL SHALL BE 12 GAUGE W-BEAM GALVANIZED CONFORMING TO THE REQUIREMENTS OF AASHTO M 180. BOLTS , NUTS AND WASHERS SHALL BE GALVANIZED ACCORDING TO ASTM A153. PIPE SLEEVES SHALL CONFORM TO THE REQUIRMENTS OF ASTM A53, GRADE B.

15. FOUNDATIONS ARE TO BE DESIGNED BY OTHERS. ALL LOADING CAN BE FOUND ON THESE DRAWINGS. DCI SUGGESTS A PROFESSIONAL GEOTECHNICAL CONSULTANT SHOULD BE HIRED BY THE OWNER AND/OR CONTRACTOR TO VERIFY THE SOIL CONDITIONS AND PROVIDE FILL MATERIAL AND COMPACTION. FILL BEHIND BACKWALL SHALL BE COMPETENT, FREE DRAINING, NON-FROST SUSCEPTIBLE MATERIAL FREE OF ORGANICS OR DEBRIS.

16. THE OWNER SHALL BE RESPONSIBLE FOR PROVIDING A STATEMENT OF SPECIAL INSPECTIONS PREPARED BY A REGISTERED DESIGN PROFESSIONAL IN CHARGE PER THE LATEST EDITION OF THE IBC SECTIONS 1704 THROUGH 1710. THE OWNER SHALL EMPLOY ONE OR MORE QUALIFIED SPECIAL INSPECTORS TO PROVIDE INSPECTIONS DURING ONSITE INSTALLATION OF THE BRIDGE FOR THE TYPES OF WORK LISTED IN THE STATEMENT OF SPECIAL INSPECTIONS.

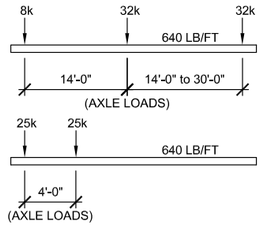


1 ANCHOR PLATE PLAN
SCALE: 1½"=1'-0"



2 ANCHOR PLATE SECTION
SCALE: 1½"=1'-0"

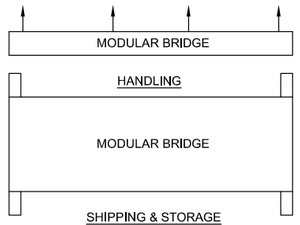
DESIGN NOTES



1. DESIGN LIVE LOAD: HL93 (GVW 36 TONS).
2. DESIGN IS BASED ON AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS 4TH EDITION AND ALL INTERIM REVISIONS.
3. LIVE LOAD DEFLECTION AT MIDSPAN IS L/806.
4. TOTAL BRIDGE WEIGHT: APPROX 84,404 LB.
   INTERIOR MODULE WEIGHT: APPROX 18,989 LB PER MODULE.
   OUTER MODULE WEIGHT: APPROX 23,035 LB PER MODULE.
5. (BRIDGE WEIGHT DOES INCLUDE STEEL DECK BUT DOES NOT INCLUDE CONCRETE DECK OR FUTURE WEARING SURFACE).

THE OWNER OR OWNER'S REPRESENTATIVE (SITE ENGINEER OF RECORD) IS RESPONSIBLE FOR THE REVIEW OF BRIDGE STRUCTURE DIMENSIONS AND LAYOUT SHOWN HEREIN. ANY DISCREPANCIES BETWEEN REQUIRED FIELD DIMENSIONS AND THOSE SHOWN HEREIN ARE NOT THE RESPONSIBILITY OF TRUENORTH STEEL OR DCI ENGINEERS UNLESS THE DISCREPANCIES HAVE BEEN SPECIFICALLY NOTED WITHIN THIS REVIEW SET OR PREVIOUSLY CONVEYED IN WRITING. YOUR SIGNATURE BELOW ACKNOWLEDGES THIS RESPONSIBILITY AND SERVES AS NOTICE TO PROCEED WITH BRIDGE FABRICATION.

OWNER OR REPRESENTATIVE NAME:
OWNER OR REPRESENTATIVE SIGNATURE:
DATE:



1. LIFTING FORCES MUST BE APPLIED VERTICALLY AND SIMULTANEOUSLY AT PADEYE HANDLING PICK POINTS AS INDICATED.
2. USE SPREADER BAR WHEN HANDLING.
3. LIFTING PIN TO BE WITHIN ⅛" OF PADEYE HOLE SIZE.
4. PADEYE LIFTING CAPACITY: 16.25 KIPS.

SHEET INDEX

S/N
60MB32HL93-PRC0178

TrueNorth Steel

Registered Professional Engineer
REG. No. PE9493
ROGER L. HEERINGA
SOUTH DAKOTA

EXPIRES: 03/31/20

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CIVIL / STRUCTURAL

PROJECT IDEN.
60'L x 32'W HL93 BROWN CO BRIDGE, ABERDEEN, SOUTH DAKOTA

ISSUE BLOCK

FIN	06/25/2018	FINAL
APP	06/15/2018	FOR APPROVAL
CHK	05/24/2018	CHECK PRINT

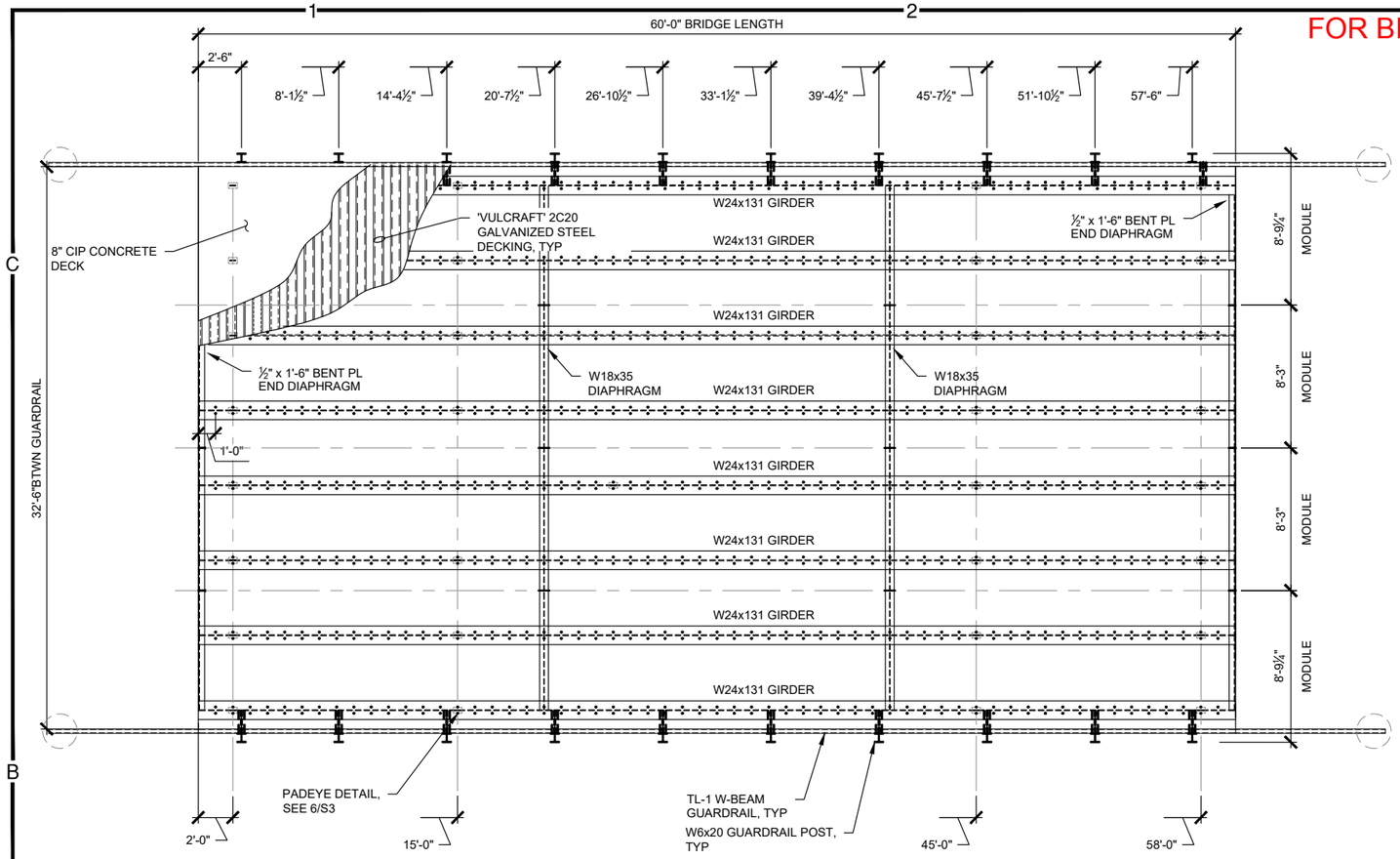
MANAGEMENT	
JOB NO.:	PRC0178
PROJECT NO.:	18161-0052
DRAWN BY:	ARH
CHECKED BY:	TRB

SHEET TITLE
STRUCTURAL GENERAL NOTES

SHEET IDENTIFICATION
S0
1 OF 7

ORIGINAL CONSTRUCTION PLANS

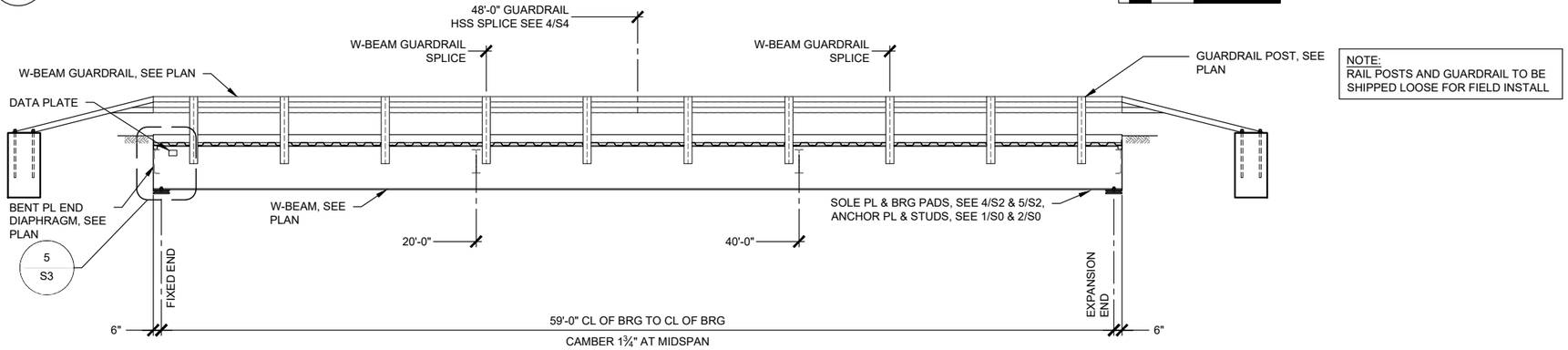
FOR BIDDING PURPOSES ONLY



1 PLAN

SCALE: 3/16"=1'-0"

0' 2' 10'



NOTE:
RAIL POSTS AND GUARDRAIL TO BE SHIPPED LOOSE FOR FIELD INSTALL

2 ELEVATION

SCALE: 3/16"=1'-0"

0' 2' 10'

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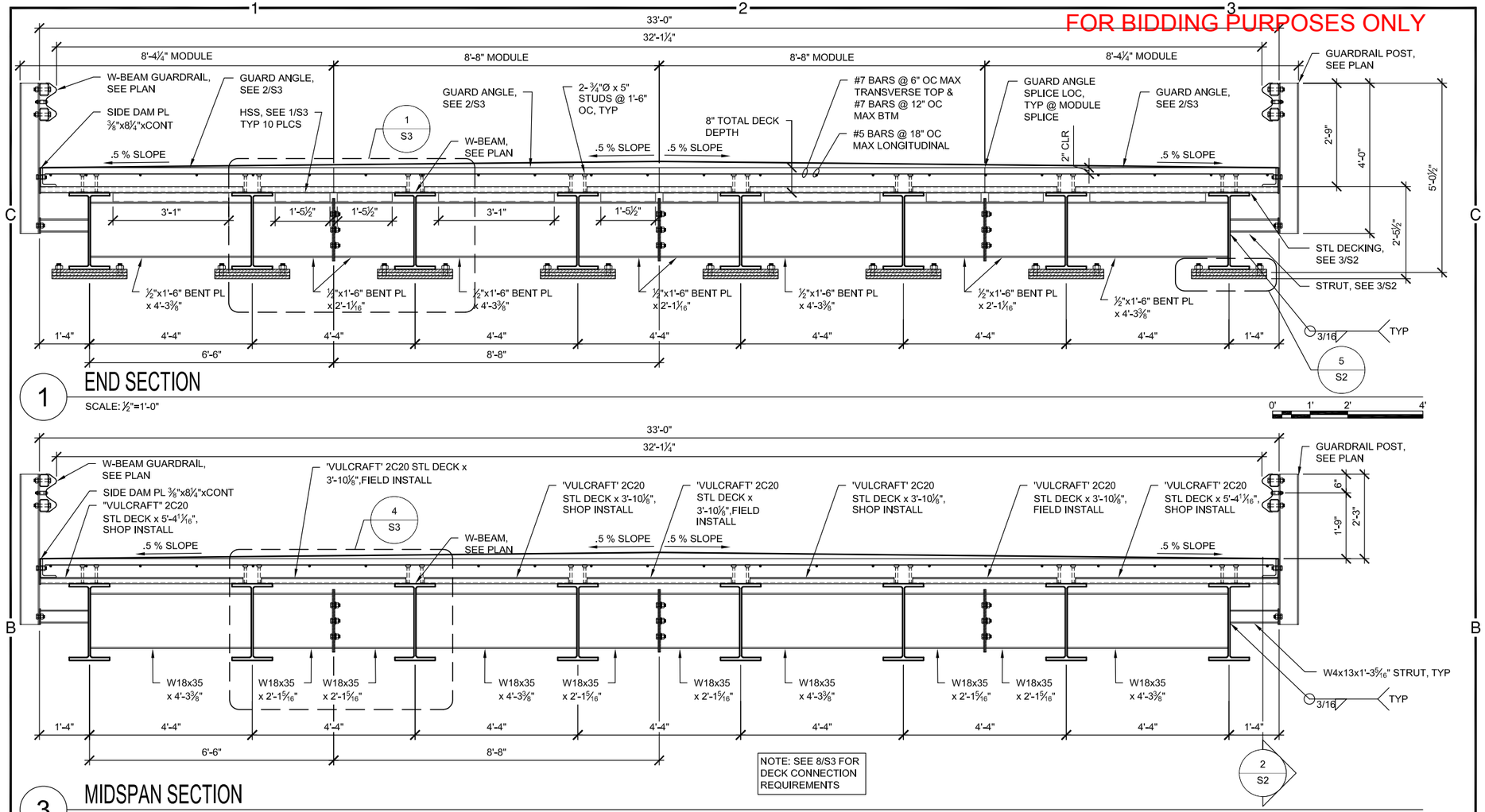
SHEET TITLE
BRIDGE PLAN & ELEVATION

SHEET IDENTIFICATION
S1
2 OF 7

ORIGINAL CONSTRUCTION PLANS

FOR BIDDING PURPOSES ONLY

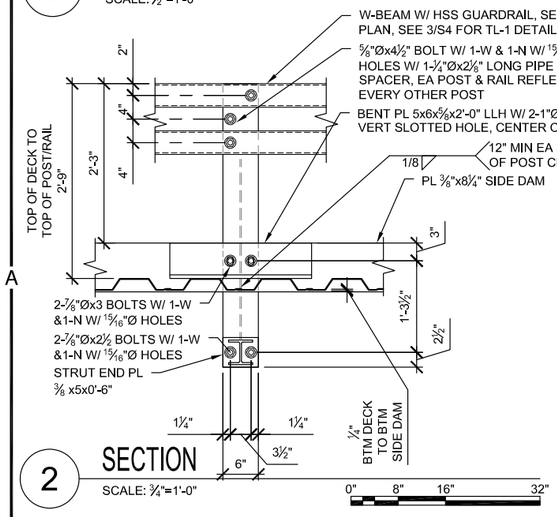


1 END SECTION

SCALE: ½"=1'-0"

3 MIDSPAN SECTION

SCALE: ½"=1'-0"



2 SECTION

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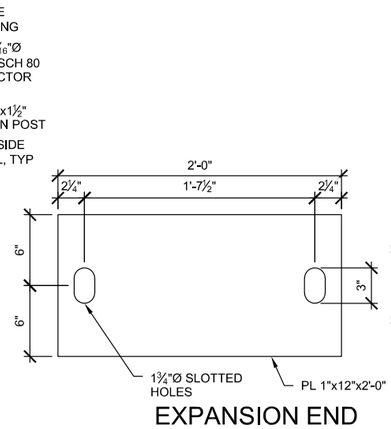
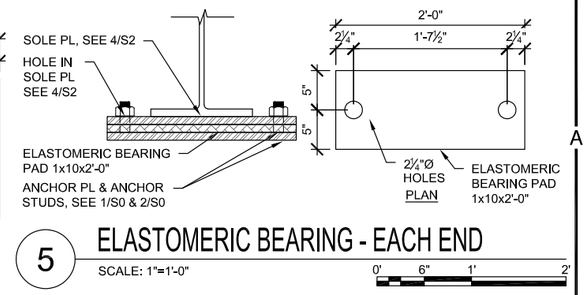


EXPANSION END

FIXED END

4 SOLE PLATE DETAIL

SCALE: 1½"=1'-0"



5 ELASTOMERIC BEARING - EACH END

SCALE: 1"=1'-0"

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SHEET TITLE

BRIDGE SECTIONS & BEARING DETAILS

SHEET IDENTIFICATION

S2

ORIGINAL CONSTRUCTION PLANS

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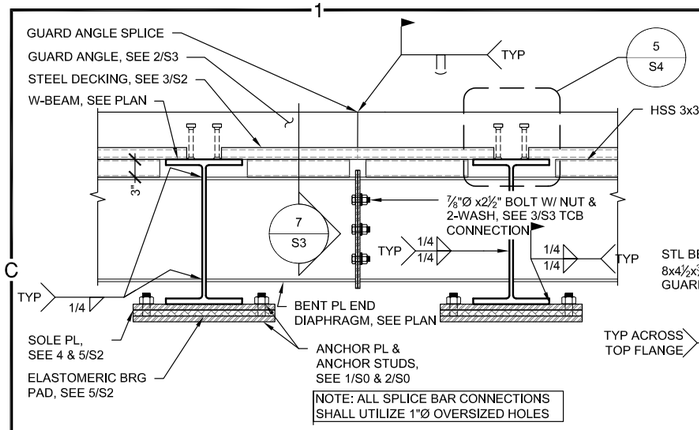
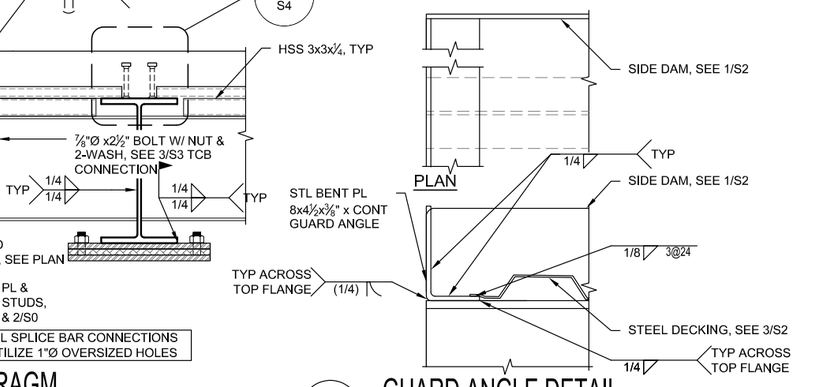


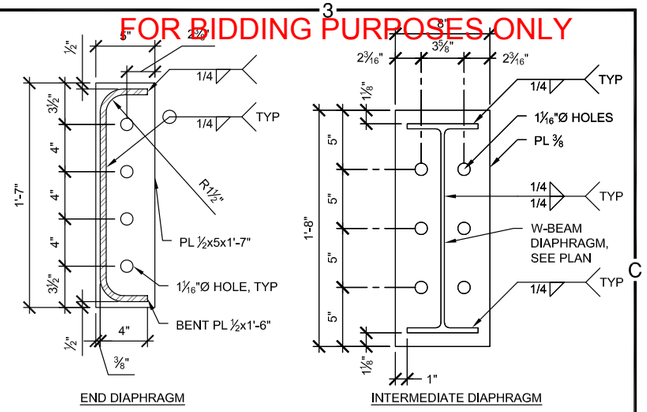
1 DETAIL @ END DIAPHRAGM

SCALE: ¾"=1'-0"



2 GUARD ANGLE DETAIL

SCALE: 1½"=1'-0"

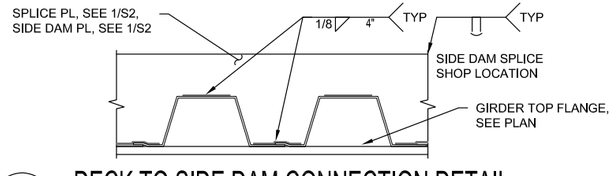


3 SPLICE CONNECTION - TCB

SCALE: 1½"=1'-0"

4 DETAIL @ MIDSPAN

SCALE: ¾"=1'-0"

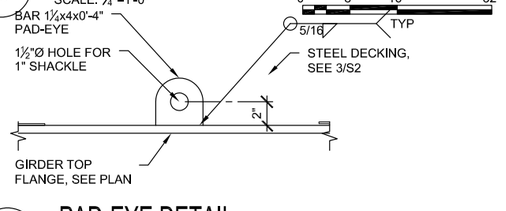


7 DECK TO SIDE DAM CONNECTION DETAIL

SCALE: 1½"=1'-0"

5 END BEARING SECTION

SCALE: ¾"=1'-0"



9 PAD-EYE DETAIL

SCALE: 1½"=1'-0"

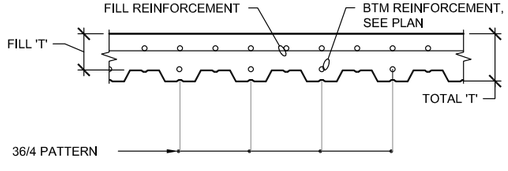
6 PADEYE DETAIL-PLAN

SCALE: 1½"=1'-0"

10 SQUIRT DTI WASHER DETAIL

SCALE: 3"=1'-0"

DECK SCHEDULE							
MARK	GA	TYPE	FILL 'T'	TOTAL 'T'	FILL REINF	ATTACHMENTS	
						PERP SUPPORTS	SIDE LAPS (SEE NOTE 1)
1	20	2C	6"	8"	SEE PLAN	4-⅝"Ø PUDDLE WELDS EACH SHEET	#10 TEK SCREWS @ 36" OC



NOTE:
1. IN LIEU OF TEK SCREW SIDE LAP FASTENER, THE FOLLOWING OPTION CAN BE UTILIZED IN FIELD:
   1.1. ⅝"Ø PUDDLE WELD @ 36" OC
2. FILL REINFORCEMENT SHALL BE EPOXY COATED PER THE REQUIREMENTS OF ASTM A934
3. BTM REINFORCEMENT SHALL BE EITHER PLAIN CARBON-STEEL MEETING THE REQUIREMENTS OF ASTM A615 OR EPOXY COATED PER THE REQUIREMENTS OF ASTM A934

8 METAL DECK FASTENING SCHEDULE AND SECTION PROPERTIES

SCALE: ¾"=1'-0"

S/N 60MB32HL93-PRC0178

TrueNorth Steel

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CHECKED BY:	TRB

SHEET TITLE
DETAILS

SHEET IDENTIFICATION
S3
4 OF 7

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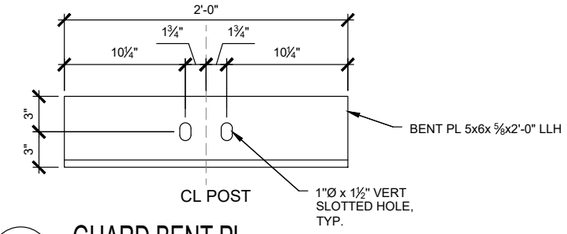
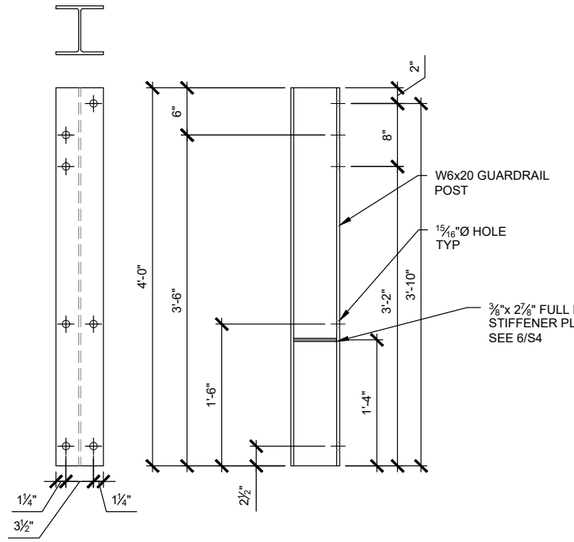
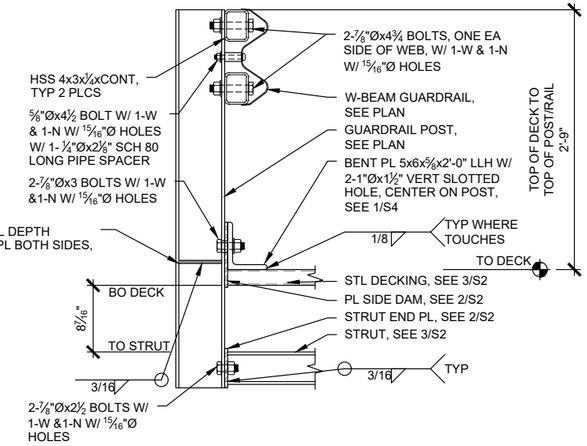


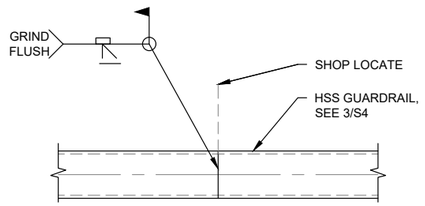
1 GUARD BENT PL
SCALE: 1½"=1'-0"



2 TYP TL-1 GUARDRAIL POST
SCALE: 1"=1'-0"

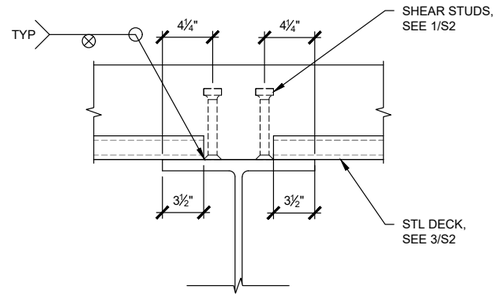


3 GUARDRAIL SYSTEM TL-1 W-BEAM
SCALE: 1"=1'-0"

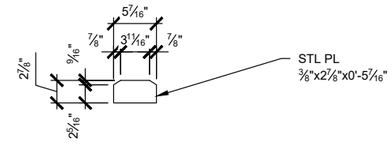


4 TYP GR HSS SPLICE
SCALE: 1½"=1'-0"

NOTE:
SEE 8/S3 FOR STL DECK CONNECTION INFO



5 TYP COMPOSITE DECK BRG
SCALE: 1½"=1'-0"



6 GUARD POST STIFFENER PL
SCALE: 1"=1'-0"

S/N
60MB32HL93-PRC0178

TrueNorth Steel

Registered Professional Engineer
REG. No.
PE9493
ROGER L. HEERINGA
SOUTH DAKOTA

EXPIRES: 03/31/20

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PROJECT IDEN.
60'L x 32'W HL93
BROWN CO
BRIDGE,
ABERDEEN,
SOUTH DAKOTA

ISSUE BLOCK

FIN	06/25/2018	FINAL
APP	06/15/2018	FOR APPROVAL
CHK	05/24/2018	CHECK PRINT

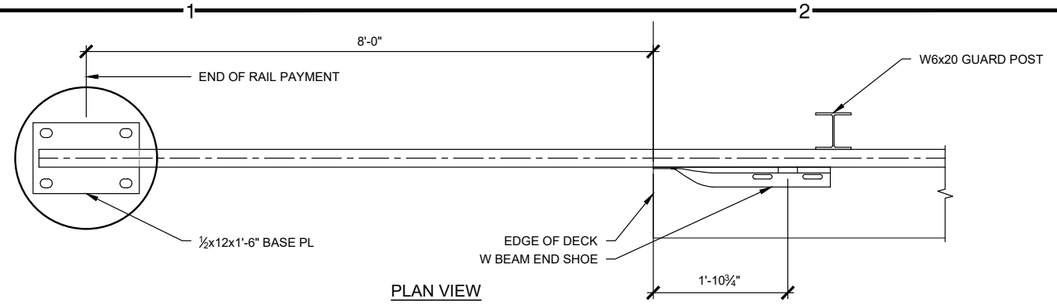
MANAGEMENT	
JOB NO.:	PRC0178
PROJECT NO.:	18161-0052
DRAWN BY:	ARH
CHECKED BY:	TRB

SHEET TITLE
DETAILS

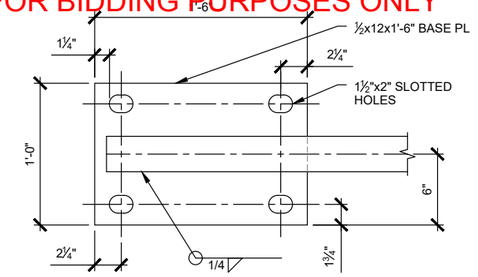
SHEET IDENTIFICATION
S4
5 OF 7

ORIGINAL CONSTRUCTION PLANS

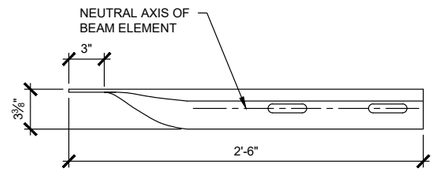
FOR BIDDING PURPOSES ONLY



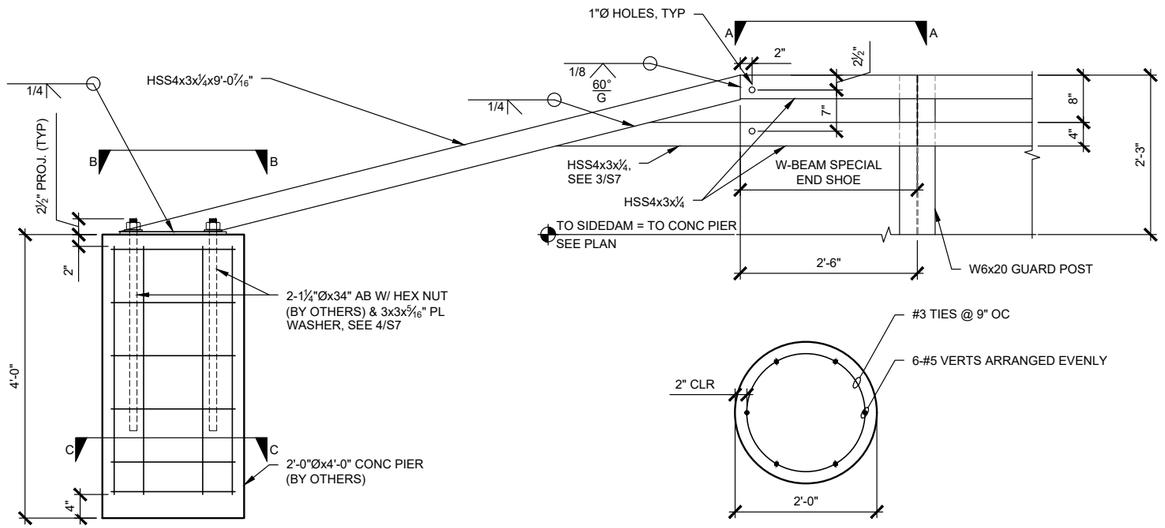
PLAN VIEW



SECTION B-B

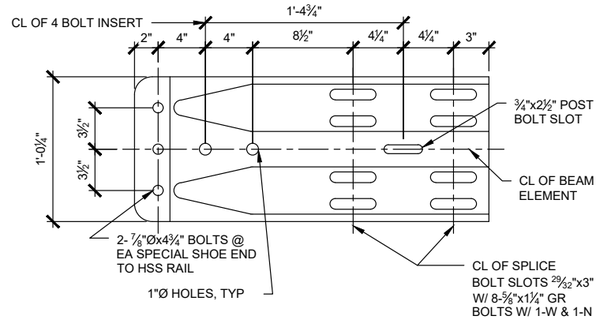


SECTION A-A



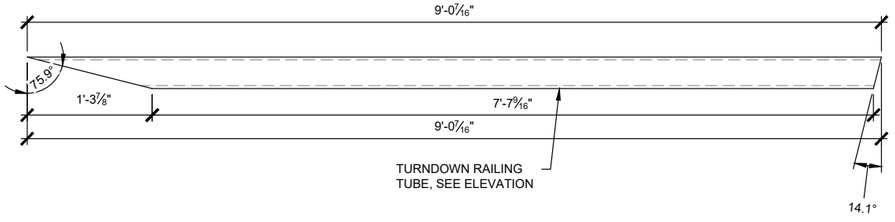
ELEVATION

SECTION C-C



1 TYPE T101 STEEL RAILING TURNDOWN

SCALE: NTS

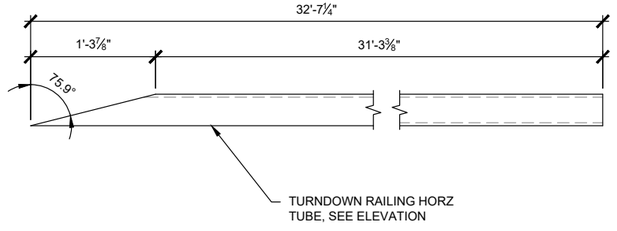


2 TURNDOWN RAILING TUBE

SCALE: 1"=1'-0"

0' 6" 1' 2'

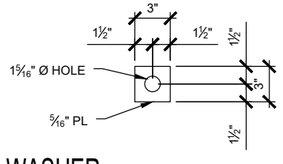
W-BEAM SPECIAL END SHOE (SHIP LOOSE)



3 TURNDOWN RAILING HORZ TUBE

SCALE: 1"=1'-0"

0' 6" 1' 2'



4 PL WASHER

SCALE: 1½"=1'-0"

0" 4" 8" 16"

S/N
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60'L x 32'W HL93 BROWN CO BRIDGE, ABERDEEN, SOUTH DAKOTA

ISSUE BLOCK		
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CHK	05/24/2018	CHECK PRINT

MANAGEMENT	
JOB NO.:	PRC0178
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DRAWN BY:	ARH
CHECKED BY:	TRB

SHEET TITLE
GUARDRAIL DETAILS

SHEET IDENTIFICATION
S5
6 OF 7

BILL OF MATERIALS

MAJOR MARK	MINOR MARK	QTY	DESCRIPTION	UNIT LENGTH	TOTAL LENGTH	REMARKS	UNIT (LB)	TOTAL (LB)
GR			GUARD RAIL ASSEMBLY TL-1					
	GR1	20	POST	4'-0"	80'-0"	W6x20	80.00	1600.0
	GR2	20	STRUT PL	-	-	PL 3/8"x5x0'-6"	3.20	64.0
	GR3	2	RAIL	57'-3"	114'-6"	12 GA W-BEAM M 180 GALV	372.13	744.3
	GR4	4	RAIL END TREATMENT	-	-	10 GA GALV SPECIAL END SHOE	21.00	84.0
	GR5	20	STRUT	1'-3 5/16"	25'-6 1/4"	W4x13	16.59	331.8
	GR6	4	HSS TUBE	30'-0"	120'-0"	HSS4x3x1/4	314.38	1257.5
	GR7	4	HSS TUBE	32'-7 1/4"	130'-5"	HSS4x3x1/4	341.67	1366.7
	GR8	4	HSS TUBE	9'-0 7/16"	36'-1 3/4"	HSS4x3x1/4	94.70	378.8
	GR9	4	BASE PL	-	-	PL 1/2"x12x1'-6"	30.63	122.5
	GR10	20	GUARD BENT PL	-	-	BENT PL 5x6x5/8x2'-0"	46.80	936.0
	GR11	20	1 1/4"ø x 2 1/8" LONG SPACER	-	-	SCH 80 A500	0.42	8.4
	GR12	40	STIFFENER PL	-	-	PL 3/8"x2 7/8x0'-5 7/16"	5.86	234.4
	SB	14	REFLECTOR WASHER	-	-	TAB CRYSTAL 2 GALV	0.07	1.0
	SB	24	RECTANGULAR WASHER	-	-	GALV	0.07	1.7
	SB	20	5/8"ø BOLT	4 1/2"	-	A307 GR A GALV	0.43	8.6
	SB	64	5/8"ø BOLT	1 1/4"	-	A307 GR A GALV	0.19	12.2
	SB	84	5/8"ø NUT HVY HEX	-	-	M 180 GALV	0.30	25.2
	SB	84	5/8"ø WASHER	-	-	F436 GALV	0.03	2.5
	SB	16	PL WASHER	-	-	PL 5/16"X3X0'-3"	0.80	12.8
	SB	40	7/8"ø BOLT	2 1/2"	-	A325X TYPE 3	0.67	26.8
	SB	40	7/8"ø BOLT	3"	-	A325X TYPE 3	0.80	32.0
	SB	40	7/8"ø BOLT	4 3/4"	-	A325X TYPE 3	1.10	44.0
	SB	8	7/8"ø BOLT	4 3/4"	-	A325X GALV	1.10	8.8
	SB	120	7/8"ø NUT	-	-	A563 GR DH3	0.30	36.0
	SB	120	7/8"ø WASHER	-	-	F436 TYPE 3	0.07	8.4
	SB	8	7/8"ø NUT	-	-	A563 GR DH GALV	0.30	2.4
	SB	8	7/8"ø WASHER	-	-	F436 GALV	0.07	0.6
								7348.3
DK			METAL DECK					
	DK1	7	SIDE DAM	18'-9"	131'-3"	PL 3/8"x8 1/4xCONT	197.44	1382.1
	DK2	4	GUARD ANGLE	7'-9 5/8"	31'-2 1/2"	BENT PL 8x4-1/2x3/8	124.47	497.9
	DK3	4	GUARD ANGLE	8'-8"	34'-8"	BENT PL 8x4-1/2x3/8	138.26	553.0
	DK4	40	GALV DECKING (SHOP INSTL)	5'-4 11/16"	215'-7 1/2"	VULCRAFT' 2C20 x 36" WIDTH	31.86	1274.3
	DK5	40	GALV DECKING (SHOP INSTL)	3'-10 1/8"	153'-9"	VULCRAFT' 2C20 x 36" WIDTH	22.72	908.7
	DK6	60	GALV DECKING (FIELD INSTL)	3'-10 1/8"	230'-7 1/2"	VULCRAFT' 2C20 x 36" WIDTH	22.72	1363.0
								5979.0
DP			DIAPHRAGM					
	DP1	12	CONNECTION PL	-	-	PL 3/8"x8x1'-8"	17.00	204.0
	DP1	12	CONNECTION PL	-	-	PL 1/2"x5x1'-7"	13.47	161.6
	DP2	4	EDGE DIAPHRAGM	4'-3 3/8"	17'-1 1/2"	W18x35	149.84	599.4
	DP3	12	CENTER DIAPHRAGM	2'-1 5/16"	25'-3 3/4"	W18x35	73.83	885.9
	DP4	4	CENTER DIAPHRAGM	4'-4 3/8"	17'-5 1/2"	W18x35	152.76	611.0
	DP2	4	EDGE DIAPHRAGM	4'-3 3/8"	17'-1 1/2"	BENT PL 1/2x1'-6"	131.13	524.5
	DP3	12	CENTER DIAPHRAGM	2'-1 1/16"	25'-0 3/4"	BENT PL 1/2x1'-6"	63.97	767.7
	DP4	4	CENTER DIAPHRAGM	4'-4 3/8"	17'-5 1/2"	W18x35	152.76	611.0
	DP5	8	GUARD ANGLE SUPPORT	3'-1"	24'-8"	HSS3x3x1/4	27.07	216.5
	DP6	12	GUARD ANGLE SUPPORT	1'-5 1/2"	17'-6"	HSS3x3x1/4	12.80	153.6
	FB	72	7/8"ø BOLT	2 1/2"	-	A325X TYPE 3	0.67	48.2
	FB	72	7/8"ø NUT	-	-	A563 GR DH3	0.30	21.6
	FB	72	7/8"ø WASHER	-	-	F436 TYPE 3	0.07	5.0
	FB	72	7/8"ø SQUIRT DTI WASHER	-	-	F959 TYPE A325-3	0.07	5.0
								4815.3
BM			W-BEAM GIRDER					
	BM1	8	TYP GIRDER	60'-0"	480'-0"	W24x131	7860.00	62880.0
	BM2	8	SOLE PL FIXED	-	-	PL 1"x12x2'-0"	81.68	653.4
	BM3	8	SOLE PL EXPANSION	-	-	PL 1"x12x2'-0"	81.68	653.4
	BM4	16	ELASTOMERIC PAD	-	-	PAD 1"x10x2'-0" DURO 60	14.52	232.3
	BM5	32	PADEYE	-	-	PL 1/2"x4x0'-4"	1.76	56.3
	SS10	16	ANCHOR PL	-	-	PL 1"x12x2'-0"	81.68	1306.9
	SB	656	3/4"ø STUD	5"	-	NELSON CFL A108	0.60	393.6
	SB	32	1 1/4"ø ANCHOR STUD	5"	-	F1554 GR 36	1.74	55.7
	SB	32	1 1/4"ø NUT	-	-	A563 GR DH	0.79	25.3
	SB	32	1 1/4"ø WASHER	-	-	F436	0.14	4.5
								66261.4
						APPROX BRIDGE WEIGHT (LB)		84404.0
						APPROX INT MODULE WEIGHT (LB)		18989.1
						APPROX OUTER MODULE WEIGHT (LB)		23035.4

NOTE: TRUENORTH STEEL TO VERIFY CONTENTS OF BILL OF MATERIALS LIST PRIOR TO FABRICATION.

S/N
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ISSUE BLOCK

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MANAGEMENT	
JOB NO.:	PRC0178
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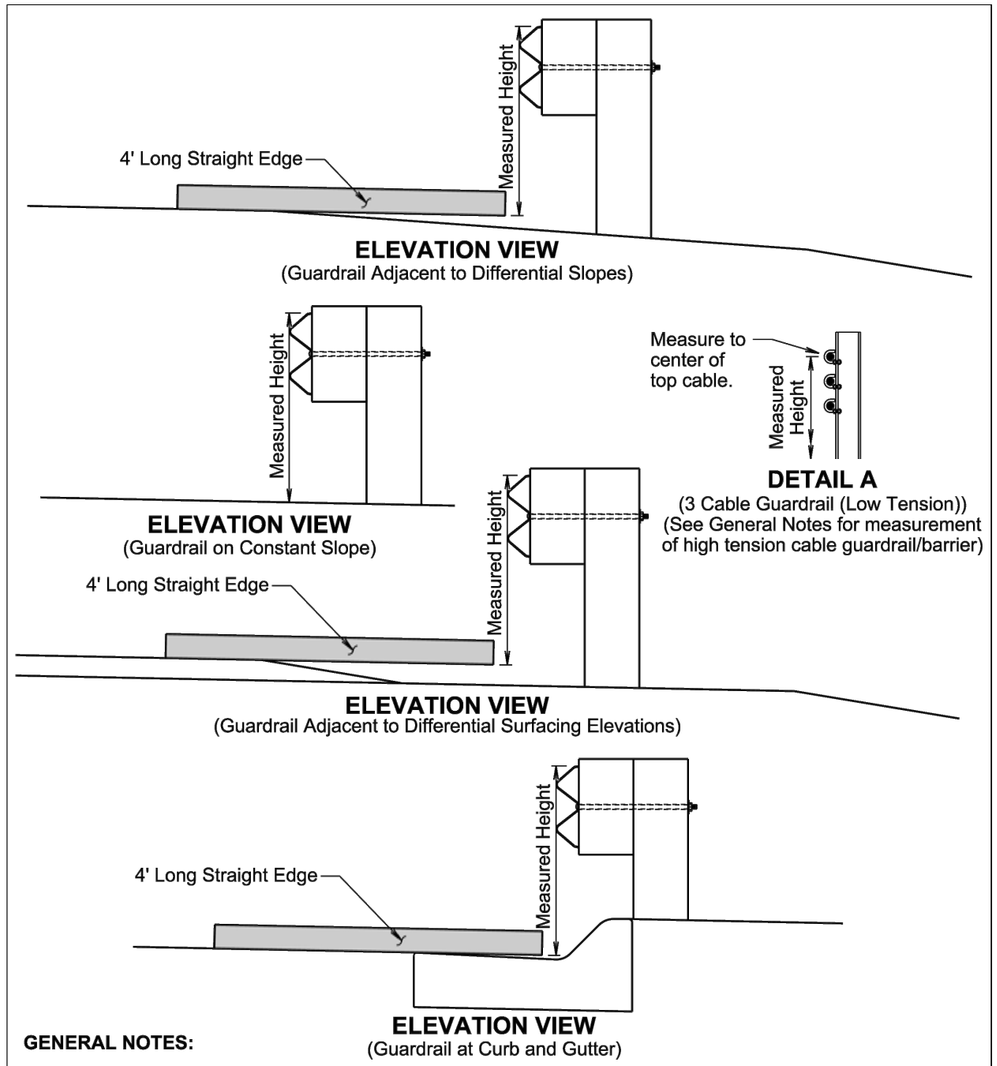
DRAWN BY:	ARH
CHECKED BY:	TRB

SHEET TITLE
BILL OF MATERIALS

SHEET IDENTIFICATION
S-BOM1
7 OF 7



GENERAL NOTES:

The W Beam guardrail shown is for illustrative purpose. The guardrail height for all types of guardrail systems except for high tension cable guardrail/barrier will be measured in accordance with this standard plate.

When measuring height of 3 cable guardrail (low tension) the height will be measured to the center of the top cable. See Detail A.

The height of high tension cable guardrail/barrier will be measured in accordance with the Manufacturer's installation instructions.

September 14, 2019

Published Date: 2024	SDDOT	***MEASURING GUARDRAIL HEIGHT***	***PLATE NUMBER*** 630.99 Sheet 1 of 1

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

Flagger

Channelizing Device

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

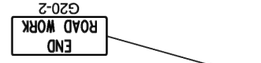
The ROAD WORK AHEAD and the END ROAD WORK signs may be omitted for short duration operations (1 hour or less).

For tack and/or flush seal operations, when flaggers are not being used, the FRESH OIL sign (W21-2) will 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 will be drums or 42" cones.

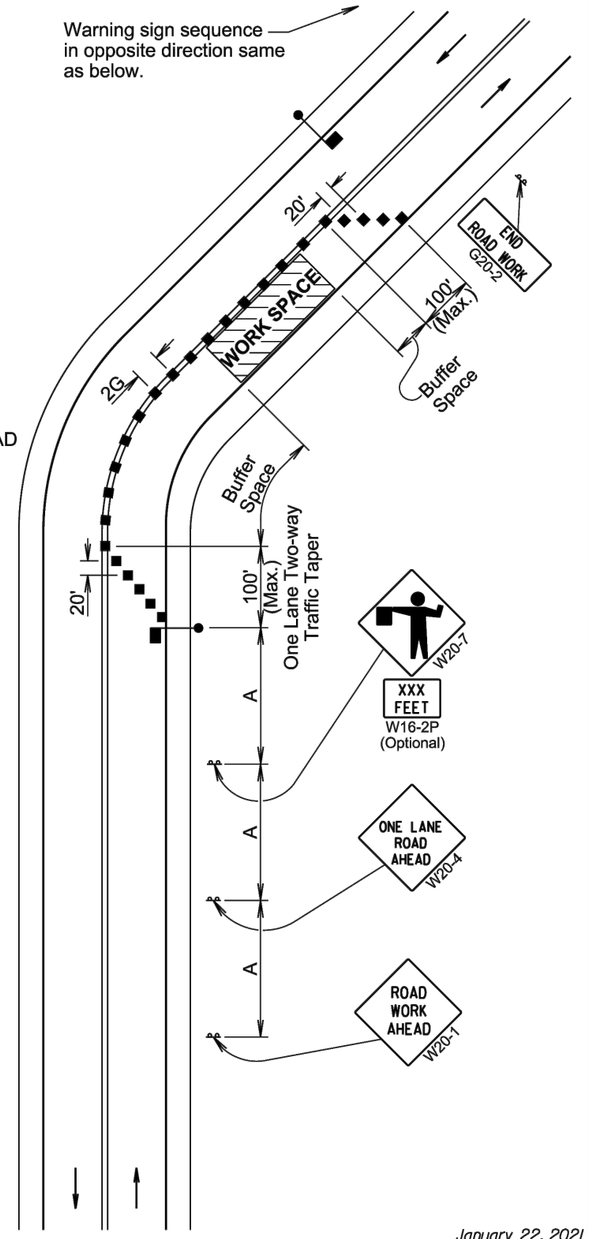
Channelizing devices are not required along the centerline adjacent to work area when pilot cars are utilized for escorting traffic through the work area.



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

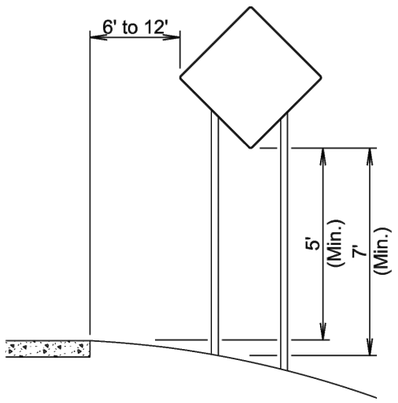
The buffer space should be extended so that the two-way traffic taper is placed before a horizontal or vertical curve to provide adequate sight distance for the flagger and queue of stopped vehicles.

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

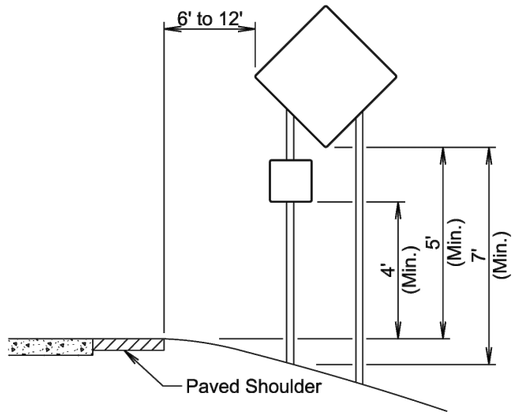


January 22, 2021

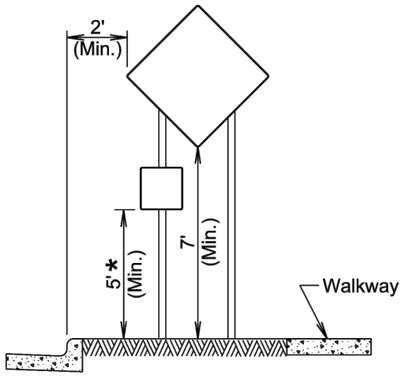
Published Date: 2024	SDDOT	***LANE CLOSURE WITH FLAGGER PROVIDED***	***PLATE NUMBER*** 634.23 Sheet 1 of 1



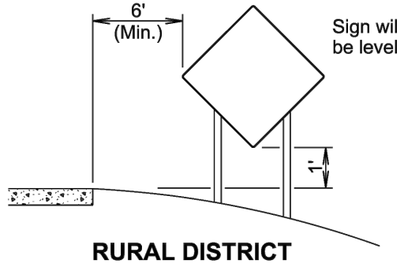
RURAL DISTRICT



RURAL DISTRICT WITH SUPPLEMENTAL PLATE



URBAN DISTRICT

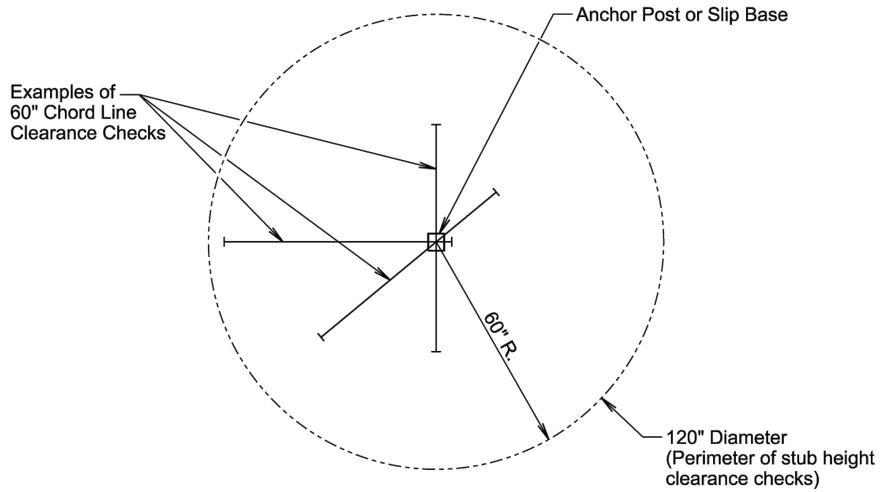


RURAL DISTRICT 3 DAY MAXIMUM
(Not applicable to regulatory signs)

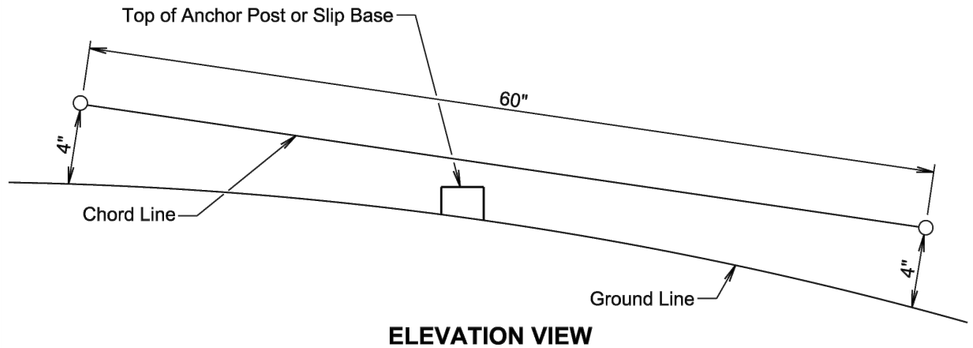
* If the bottom of supplemental plate is mounted lower than 7 feet above a pedestrian walkway, the supplemental plate should not project more than 4" into the pedestrian facility.

January 22, 2021

Published Date: 2024	SDDOT	CRASHWORTHY SIGN SUPPORTS (Typical Construction Signing)	PLATE NUMBER 634.85
			Sheet 1 of 1



PLAN VIEW
(Examples of stub height clearance checks)



ELEVATION VIEW

GENERAL NOTES:

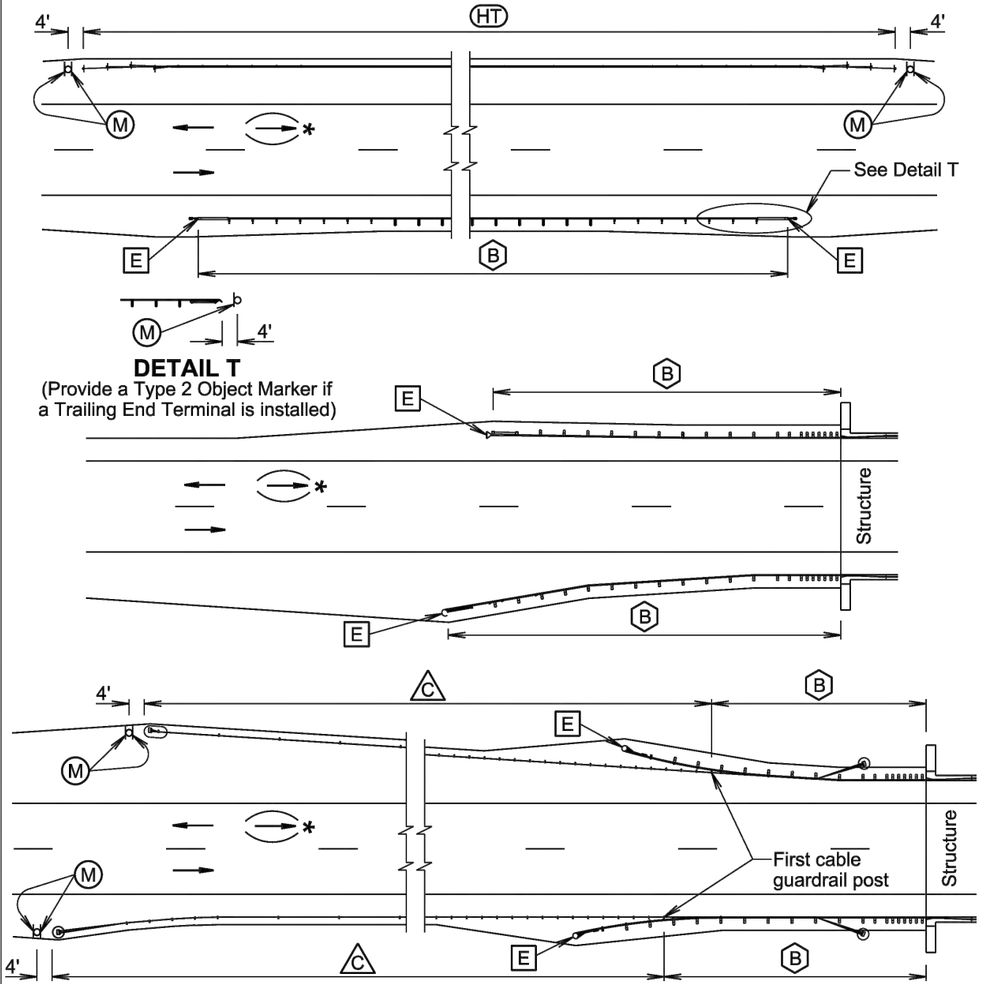
The top of anchor posts and slip bases WILL NOT extend above a 60" chord line within a 120" diameter circle around the post with ends 4" above the ground.

At locations where there is curb and gutter adjacent to the breakaway sign support, the stub height will 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.

January 22, 2021

Published Date: 2024	SDDOT	BREAKAWAY SUPPORT STUB CLEARANCE	PLATE NUMBER 634.99
			Sheet 1 of 1



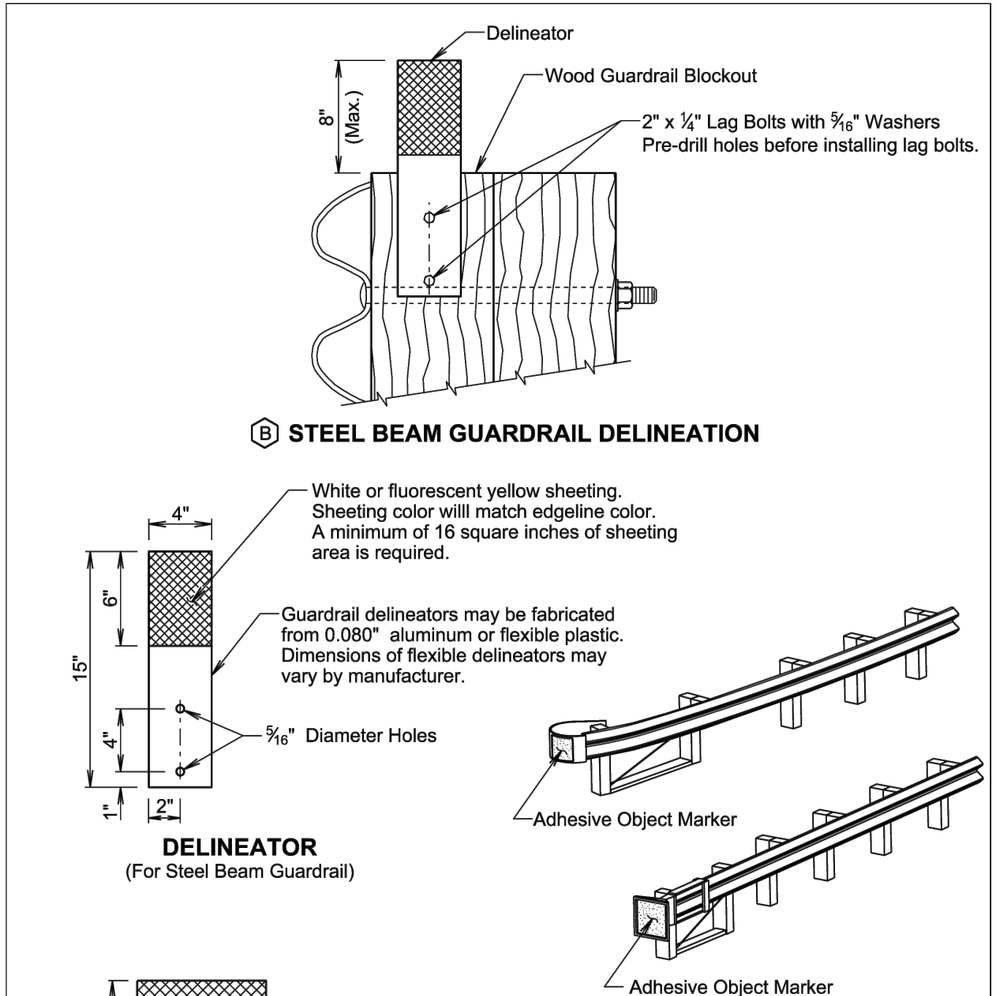
PLAN VIEW
(Typical Guardrail Layouts)

- (B) Steel Beam Guardrail Delineation
- [E] Guardrail End Terminal Object Marker
- (C) 3 Cable Guardrail (Low Tension) Delineation
- (HT) High Tension Cable Guardrail Delineation
- (M) Type 2 Object Marker

*For two-way traffic, install delineation at the opposite end of structure the same as shown. Back-to-back delineation is required for two-way traffic, single-sided delineation for one-way traffic.

December 23, 2019

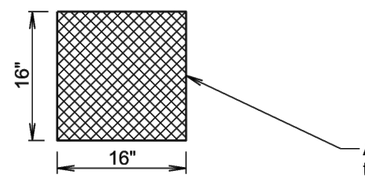
Published Date: 2024	SDDOT	DELINEATION OF GUARDRAIL	PLATE NUMBER 632.40
			Sheet 1 of 4



(B) STEEL BEAM GUARDRAIL DELINEATION

DELINEATOR
(For Steel Beam Guardrail)

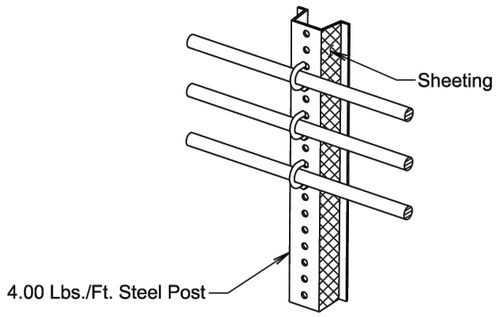
[E] GUARDRAIL END TERMINAL OBJECT MARKER



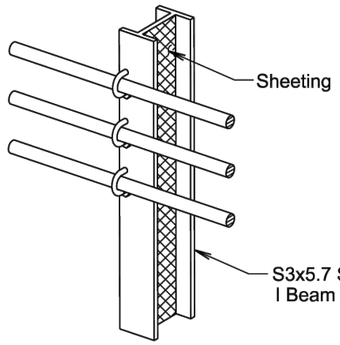
ADHESIVE OBJECT MARKER

December 23, 2019

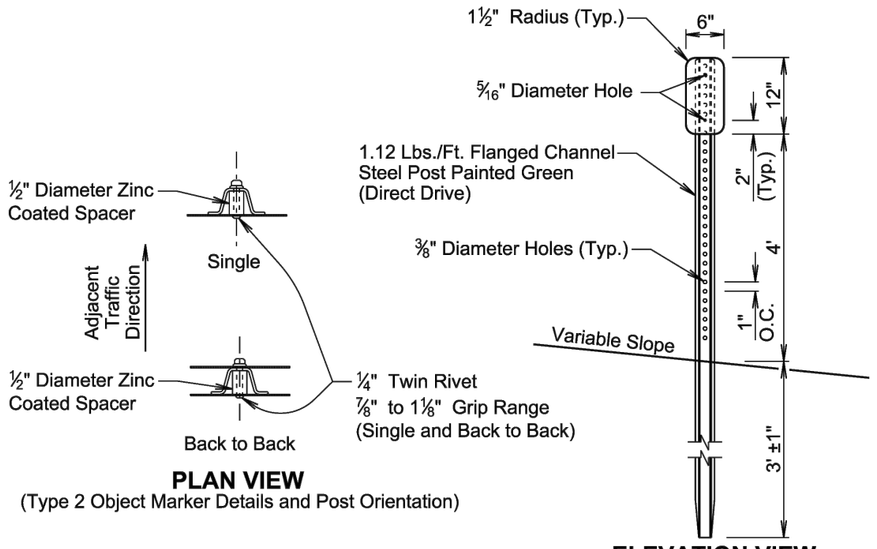
Published Date: 2024	SDDOT	DELINEATION OF GUARDRAIL	PLATE NUMBER 632.40
			Sheet 2 of 4



C 3 CABLE GUARDRAIL (LOW TENSION) DELINEATION



C 3 CABLE GUARDRAIL (LOW TENSION) DELINEATION



PLAN VIEW
(Type 2 Object Marker Details and Post Orientation)

ELEVATION VIEW
Ⓜ (Type 2 Object Marker)
(For Marking 3 Cable Guardrail (Low Tension) Anchor, High Tension Cable Guardrail Anchor, and Trailing End Terminal)

December 23, 2019

Published Date: 2024	SDDOT	DELINEATION OF GUARDRAIL	PLATE NUMBER 632.40
			Sheet 3 of 4

GENERAL NOTES:

The delineation of high tension cable guardrail will be reflective sheeting placed back to back on every other post cap or cable spacer. The sheeting will be type XI in conformance with ASTM D4956. The color of the reflective sheeting shall be the same as the nearest pavement marking.

The delineators for steel beam guardrail and sheeting on 3 cable guardrail (low tension) posts will be covered with a minimum of 16 square inches of reflective sheeting. The reflective sheeting will be type XI in conformance with ASTM D4956. Along two-way roadways the sheeting will be on both sides of the delineators and guardrail posts and will be white in color. For one-way roadways the sheeting will only be required on the side facing traffic and the color will be the same as the nearest pavement marking, yellow on the left side of the roadway and white on the right side.

When steel beam guardrail is attached to a bridge the first delineator will be attached to the post nearest the bridge.

At bridges with guardrail less than 200 feet in length, a minimum of 4 delineators will be placed in addition to the end terminal yellow object marker. The spacing between the delineators will be approximately one third of the length of the guardrail.

At bridges with guardrail 200 feet and greater in length, including bridges that have steel beam guardrail transitioning to 3 cable guardrail (low tension), the delineators will be placed at a spacing of approximately 50 feet. Delineation will extend throughout the length of the guardrail system.

Steel beam guardrail that is not attached to a bridge and is less than 200 feet in length, a minimum of 4 delineators will be placed in addition to the end terminal yellow object markers. The spacing between the delineators will be approximately one third of the length of the guardrail.

Steel beam guardrail that is not attached to a bridge and is 200 feet and greater in length, including steel beam guardrail transitioning to 3 cable guardrail (low tension), the delineators will be placed at a spacing of approximately 50 feet. Delineation will extend throughout the length of the guardrail system.

All costs for furnishing and installing single or back to back guardrail delineation on 3 cable guardrail and steel beam guardrail will be included in the contract unit price per each for "Guardrail Delineator".

All costs for furnishing and installing the reflective sheeting on the cable spacers or post caps for the high tension cable guardrail will be incidental to the respective high tension cable guardrail contract item.

An adhesive object marker will be placed on the end of the W beam guardrail or MGS end terminal. The adhesive object marker dimensions may vary due to the shape of the terminal end. A minimum of 256 square inches of object marker reflective sheeting area is required. The reflective sheeting will be fluorescent yellow type XI sheeting in conformance with ASTM D4956. All costs for furnishing and installing the adhesive object marker will be incidental to various contract items.

A type 2 object marker will be placed adjacent to the 3 cable guardrail (low tension) anchor, high tension cable guardrail anchor, and trailing end terminal at the location noted on sheet 1 of this standard plate. The type 2 object marker (6" x 12") will have fluorescent yellow type XI sheeting in conformance with ASTM D4956. All costs for furnishing and installing the type 2 object marker including the steel post, 6" x 12" reflective panel, and hardware will be included in the contract unit price per each for "Type 2 Object Marker" for single-sided and "Type 2 Object Marker Back to Back" for back to back type 2 object markers.

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