

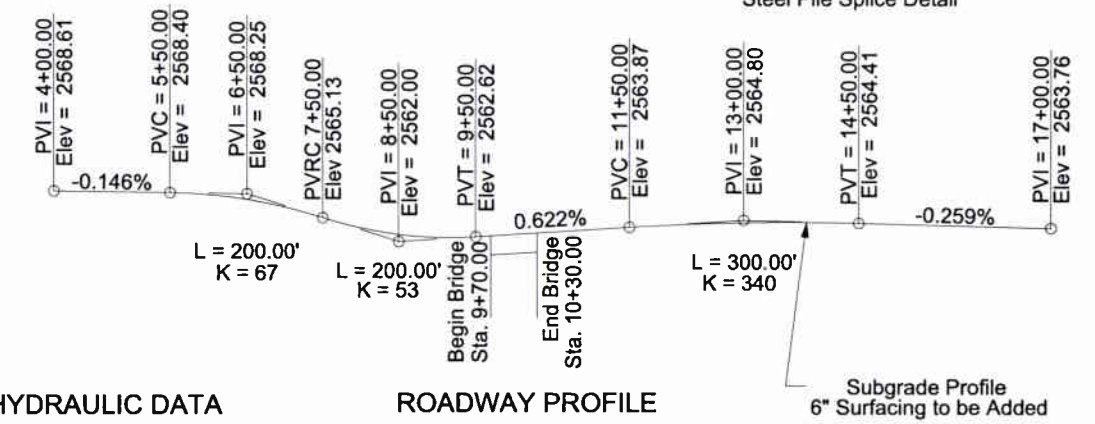
The elevations shown in these plans are based on the National Geodetic Survey (NGS) North American Vertical Datum of 1988 (NAVD88).

### INDEX OF BRIDGE SHEETS

- Sheet No. 1 General Drawing
- Sheet No. 2 Riprap Plan & Details
- Sheet No. 3-4 Notes & Quantities
- Sheet No. 5 Site Plan & Subsurface Profile Sheet
- Sheet No. 6-7 Abutment Details
- Sheet No. 8 Wingwall Details
- Sheet No. 9 Beam Details
- Sheet No. 10 Rail Details
- Sheet No. 11 Year Plate Detail & Steel Pile Splice Detail



Scale: 1" = 15'



### HYDRAULIC DATA

Q <sub>d</sub>	2,802	cfs
A <sub>d</sub>	528	sq. ft.
V <sub>d</sub>	6.9	fps
Q <sub>F</sub>	2,802	cfs
Q <sub>100</sub>	7,921	cfs
Q <sub>OTfr</sub>	5,000	cfs
V <sub>max</sub>	10.8	fps

Q<sub>d</sub> = Design discharge for the proposed bridge based on 10 year frequency. El. 2560.0

Q<sub>F</sub> = Designated peak discharge for the basin approaching proposed project based on 10 year frequency.

Q<sub>100</sub> = Computed discharge for the basin approaching proposed project based on 100 year frequency. El. 2565.3

Q<sub>OTfr</sub> = Overtopping discharge and frequency 32 year recurrence interval. El. 2563.4 @ Sta. 8+85

V<sub>max</sub> = Maximum computed outlet velocity for the proposed bridge based on 100 year frequency.

### GENERAL DRAWING

FOR  
60' SINGLE SPAN PRESTRESSED  
CONCRETE DOUBLE TEE BRIDGE

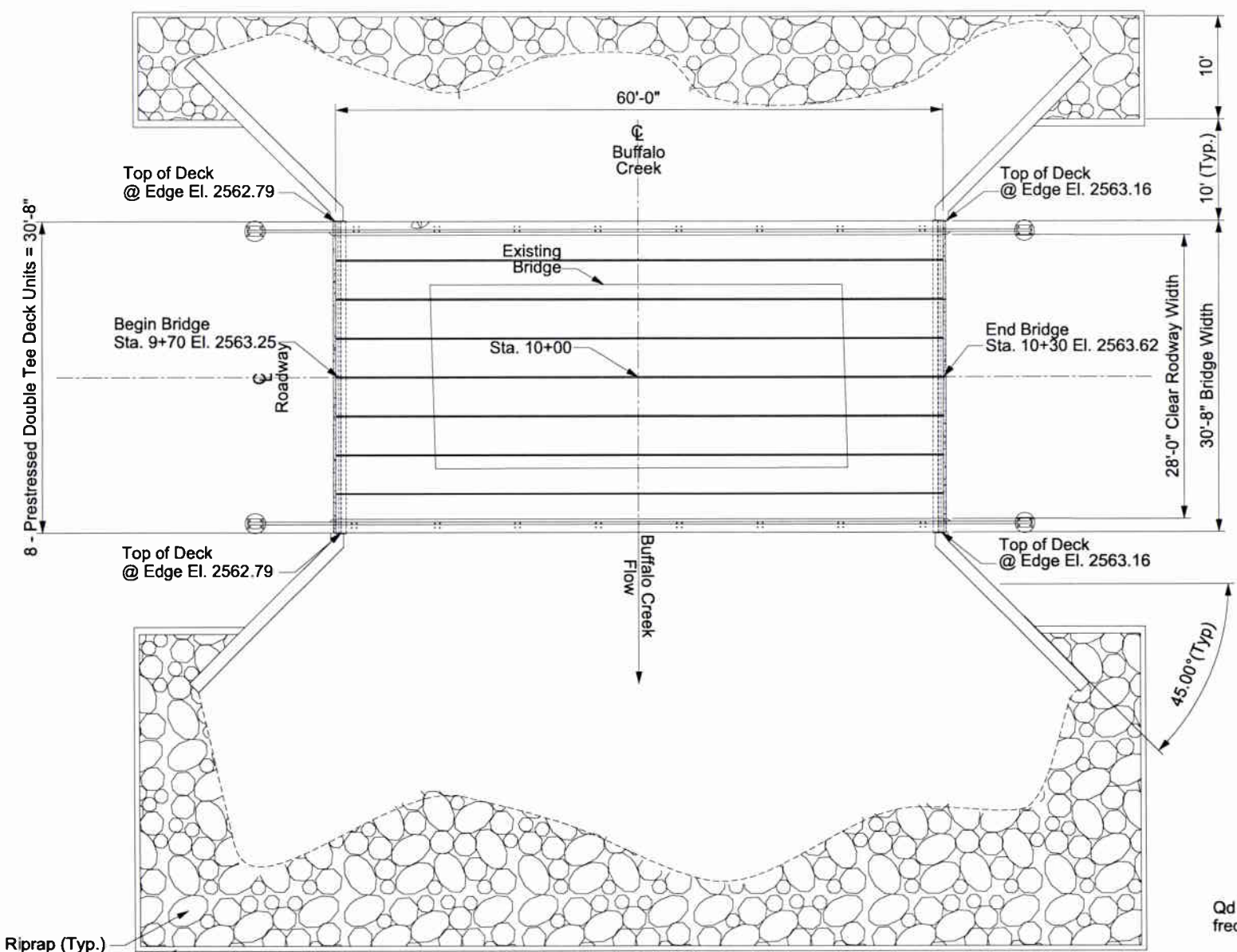
BUFFALO CREEK  
STA 9+70 TO 10+30  
STR. NO. 53-048-010  
PCN H119  
DATE: FEBRUARY, 2010

28'-0" ROADWAY  
0° SKEW  
SEC. 22, T23N, R10E  
BRO 8053(22)  
PERKINS COUNTY, SD

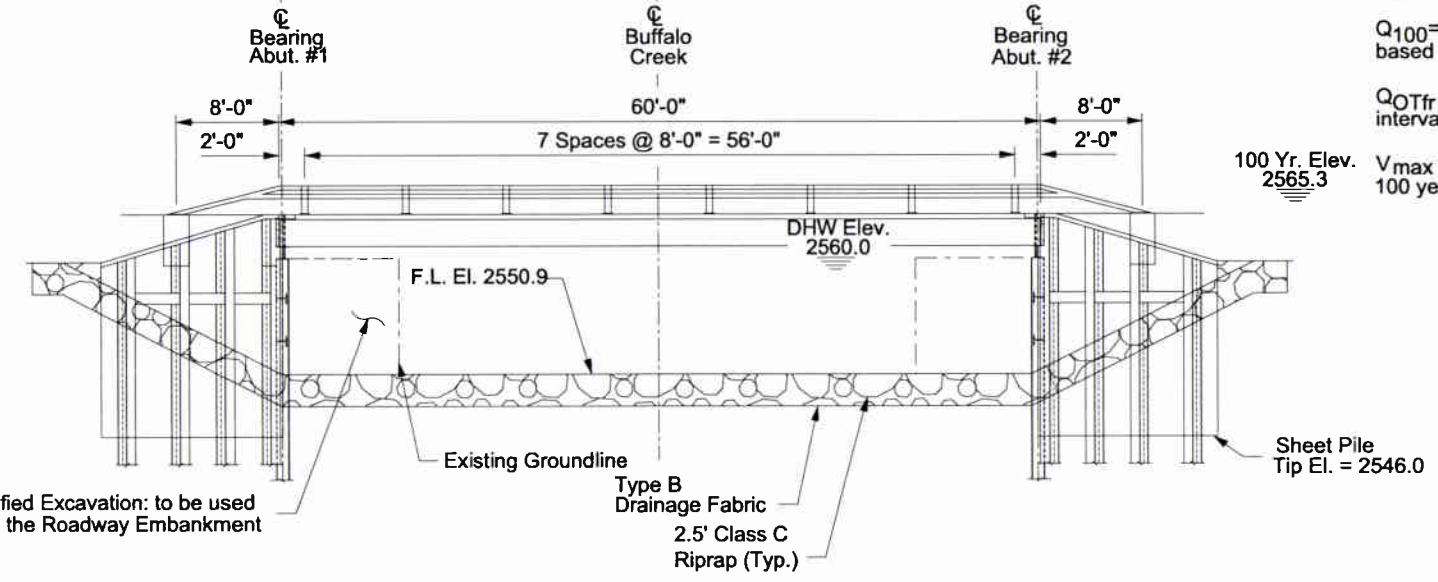
PREPARED BY:  
BROSZ ENGINEERING INC.  
PO BOX 357  
BOWMAN, NORTH DAKOTA

-X081- 1 of 11

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



### PLAN



### ELEVATION

Class C Riprap (Typ.)  
Type B  
Drainage Fabric (Typ.)

Unclassified Excavation: to be used  
in the Roadway Embankment

Existing Groundline  
Type B  
Drainage Fabric  
2.5' Class C  
Riprap (Typ.)

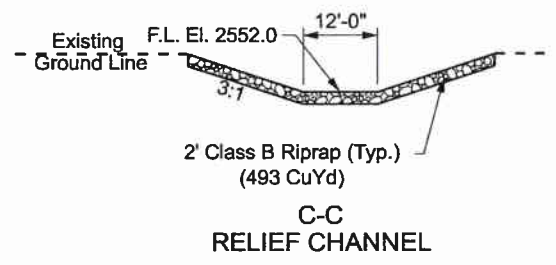
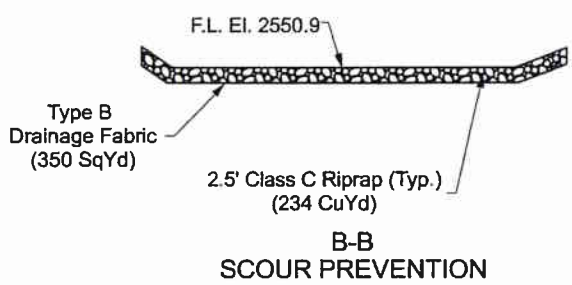
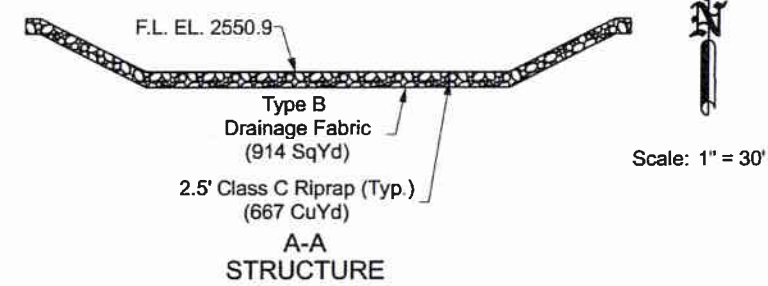
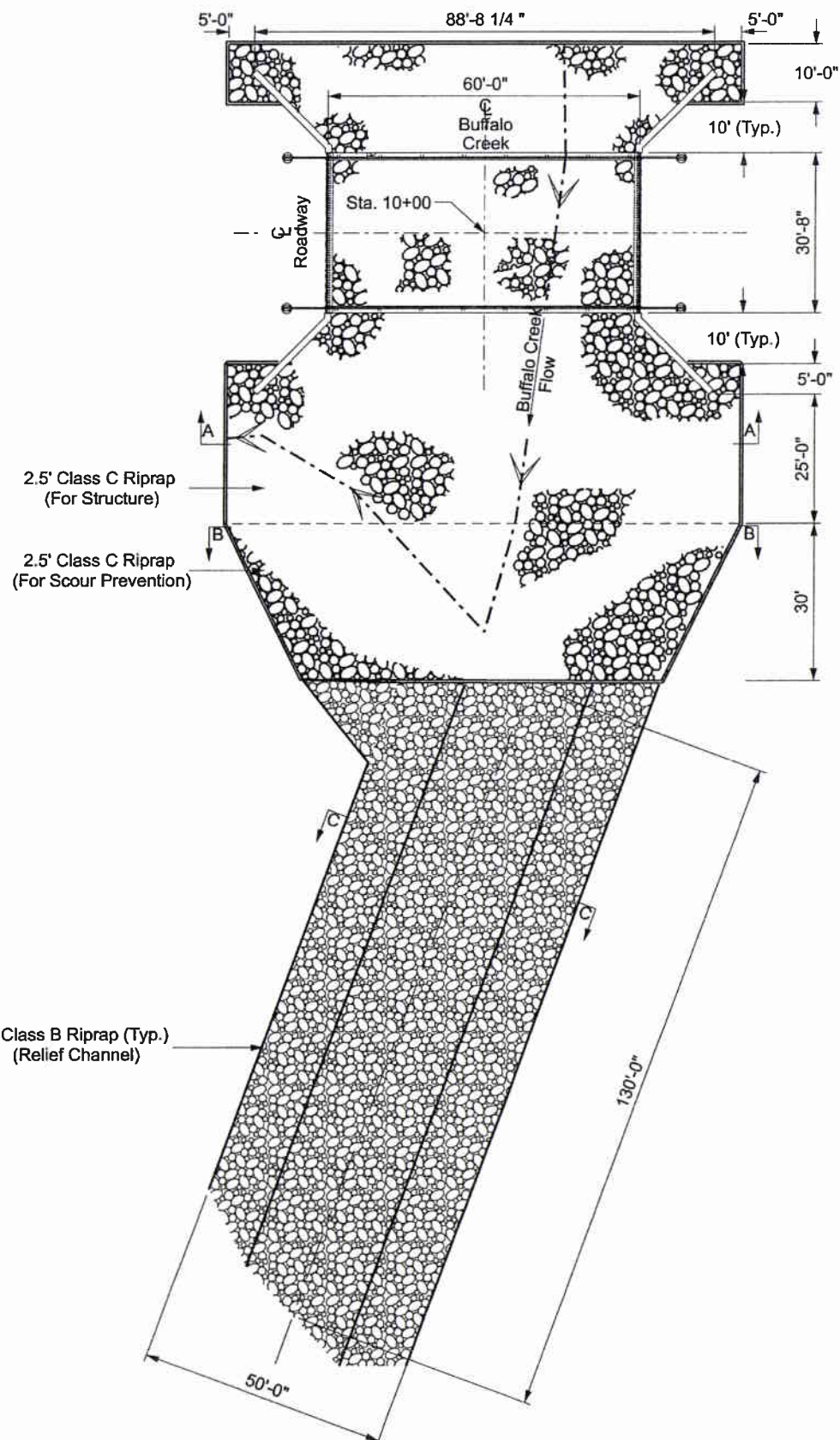
100 Yr. Elev.  
2565.3

DHW Elev.  
2560.0

F.L. El. 2550.9

Sheet Pile  
Tip El. = 2546.0

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL
	BRO 8053(22)	NO. 15	SHEETS 29
Plotting Date: 02/09/2010			
Revised Date: 4/12/10			
Initials: JG			



**RIPRAP PLAN & DETAILS**

FOR  
60' SINGLE SPAN PRESTRESSED  
CONCRETE DOUBLE TEE BRIDGE  
BUFFALO CREEK 28'-0" ROADWAY  
STA 9+70 TO 10+30 0° SKEW  
STR. NO. 53-048-010 SEC. 22, T23N, R10E  
PCN H119 BRO 8053(22)  
DATE: FEBRUARY, 2010 PERKINS COUNTY, SD

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

-X081- (2) of (11)

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**STRUCTURE INFORMATIONAL QUANTITIES:**

ITEM	Quantity	Unit
Incidental Work, Structure	Lump Sum	LS
Structural Steel, Miscellaneous	Lump Sum	LS
Field Painting	Lump Sum	LS
Structure Excavation, Bridge	856	CuYd
Type T101 Bridge Railing	152	Ft
HP 10x42 Steel Pile, Furnish and Drive	504	ft
HP 12x53 Steel Test Pile, Furnish and Drive	84	Ft
HP 12x53 Steel Pile, Furnish and Drive	1,058	Ft
Steel Sheet Piling, Furnish and Drive	2,606	SqFt
3'-10" Wide Deck x 30" Prstr Conc Double Tee	476	Ft
Precast Concrete Plank, Furnish	138.0	SqFt
Precast Concrete Plank, Install	138.0	SqFt
Class B Riprap	493	CuYd
Class C Riprap	901	CuYd
Type B Drainage Fabric	1,264	SqYd

**SPECIFICATION AND LOADING:**

Design specifications: AASHTO LRFD Bridge Design Specifications, 4th Edition 2007 with Interim Revisions through 2009.

Design loading: AASHTO LRFD HL-93 load. Design also includes provisions for a 22 psf future overlay.

**INCIDENTAL WORK, STRUCTURE:**

The remaining portion of the existing structure consists of concrete abutment backwalls and wingwalls, a fallen concrete bent lying under the bridge, on top of a concrete floor. All remaining components of the existing bridge shall be removed and disposed of by the contractor. The abutment and bents shall be removed to 3' below the flow line. The floor shall be entirely removed. All costs associated with structure removal and disposal shall be included in the contract lump sum price for "Incidental Work, Structure." All potential bidders are advised to visit the site to verify the extent of work involved.

**SHOP DRAWINGS:**

The fabricator for the deck units and steel bridge railing shall submit two (2) copies of the shop drawings to: Brosz Engineering, Inc., 109 South Main Street, Box 357, Bowman, ND 58623, for review.

One reviewed copy will be sent back to the fabricator who will then make changes, if any, and send Brosz Engineering, Inc. eight (8) corrected copies.

After review by Brosz Engineering, Inc., seven (7) copies will be forwarded to the SDDOT Bridge Construction Engineer, who will review them, authorize fabrication, and distribute the shop drawings.

**PRESTRESSED CONCRETE DOUBLE TEE DECK UNITS:**

- The maximum allowable vertical elevation difference between adjacent deck units will be 1/4" at any location along the deck.
- The year of construction of the bridge shall be imprinted on the side of an exterior beam in accordance with the S.D. Department of Transportation Standard Plate No. 460.02.
- Structural steel shall conform to, AASHTO M 183 (ASTM A36).
- Diaphragms shall be constructed at the ends of each deck unit as shown on the plans.
- Dimensions and elevations for this structure are based on 30" depth and 3'-10" width units. No changes in these dimensions will be permitted.
- All costs of installing the prestressed concrete double tee deck units, including welding, hardware, sand, mortar and other items necessary to complete the installation of the beams, as shown in the plans and required in the Standard Specifications, shall be included in the contract price per foot for "3'-10" Wide Deck x 30" Prestressed Concrete Double Tee".
- The prestressed concrete deck units shall be supplied and installed by the Contractor. The manufacturer shall supply 59'-6" concrete double tee beams which conform to AASHTO LRFD Bridge Design Specifications, 4th Edition 2007 with Interim Revisions through 2009. These units will consist of 2 Exterior Units, equipped with necessary fittings for Type T101 rail posts at locations shown in these plans, and 6 interior Units. All Units will be 59'-6" in length and have no skew.
- The elastomeric bearing pads shall have a nominal hardness of 70 durometers and shall not be laminated. Thickness shall be as shown on the plans. Cost of the elastomeric bearing pads shall be included in the contract unit price per foot for "3'-10" Wide Deck x 30" Prestressed Concrete Double Tee".
- Non-shrink grout for the shear key and the space around the dowel bars shall be a commercially available, non-metallic, non-shrink grout capable of attaining a compressive strength of 3500 psi and capable of 0.06% to 0.10% expansion. The grout shall be mixed with just enough clean water to make a stiff but workable mix. Non-shrink grout shall attain a compressive strength of 3500 psi before the structure is opened to traffic.

**PRESTRESSED CONCRETE DOUBLE TEE DECK UNITS (CONT):**

- The shear key formed between adjacent pre-stressed concrete double tee deck units will require about 0.05 cubic feet of grout per lineal foot for a total of approximately 21 cubic feet. The 7"x 4"x 5" block-out at each end of each prestressed concrete channel deck unit will require a total of approximately 1.3 cubic feet. The space between the 3" PVC pipe and the dowel bars at each end of each deck unit will require approximately 0.07 cubic feet of grout per location, for a total of approximately 1.1 cubic feet. All costs for furnishing and installing the non-shrink grout shall be included in the contract price per foot for "3'-10" Wide Deck x 30" Prestressed Concrete Double Tee."
- For informational purposes only, the approximate weight of each deck unit is 32,670 lbs.

**STRUCTURAL STEEL, MISCELLANEOUS:**

Structural steel shall conform to, AASHTO M 183 (ASTM A36).

This work shall consist of furnishing and installing cable, clamps and miscellaneous items needed to install the tie-back cable anchoring system behind the abutment as per the general notes included on the "Abutment Details" sheet.

This work shall also consist of furnishing and installing the HP12X53 pile cap, HP 10x42 walers, and bent plate for wingwall cap estimated at a total weight of 4,878 pounds per abutment.

**STRUCTURE EXCAVATION BRIDGE:**

The quantity of Structure Excavation included in the estimate of quantities includes the quantity of excavation necessary to install the sheet piling for abutment tie-back as shown on sheet 7 of 12 and the quantity of excavation that needs to be removed behind the existing bridge abutments and wingwalls.

**ESTIMATE OF STRUCTURE QUANTITIES AND NOTES  
FOR  
60'- 0" PRESTR. DOUBLE TEE BRIDGE  
Str. No. 53-048-010**

APRIL 2010

3 OF 11

DESIGNED BY G.B. BEI 09232	DRAWN BY: J.G. PCN H119	CHECKED BY: D.C.	APPROVED:  BRIDGE ENGINEER
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STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	BRO 8053(22)	17	29

**ABUTMENTS:**

- Design data: Lateral earth pressure at 45 lbs./cu.ft.
- All Abutment H-piles shall be driven to a field verified nominal bearing of 490 kips. Piling shall be designed for a maximum factored pile bearing resistance of 196 kips. One test pile is to be driven at each abutment and will become part of the pile scheme. The anticipated tip elevations at Stations 9+70.5 and 10+29.5 is 2523. The maximum that the vertical steel piles can be driven out of alignment is 1". The pile cap must be placed correctly for the bearing dowel bars to be welded to the bottom flange.
- The Contractor shall have sufficient splice material on hand before pile driving is started.
- Steel pile and abutment caps shall be painted prior to the placement of the deck units at locations where the deck units, when placed, would prohibit painting. The remaining piling and abutment caps, with the exception of piling underground, may be painted after erection of the deck units. Painting shall comply with Section 412 of the SD Standard Specifications. The topcoat shall be an approved green color. The cost of painting shall be incidental to the contract lump sum price for "Field Painting."
- Welding and weld inspection shall be done in accordance with the current edition of ANSI/AASHTO/AWS D 1.5-2002 Bridge Welding Code. Plan shown field welding shall be in accordance with the current edition of the ANSI/AWS D1.1 Structural Welding Code – Steel.
- All steel piling and structural steel parts shall conform to ASTM Specification A36.
- The abutment backwalls will be 10 gauge galvanized steel sheet piling, with a minimum section modulus of 2.25 in<sup>3</sup> per foot. The 10 gauge sheet pile shall conform to the requirements of ASTM designation A 929, Grade 36 and hot-dipped galvanized per ASTM A 653. The sheet pile shall have a bottom elevation of 2546.0.
- The precast concrete plank shall be attached to the ends of each deck unit. They shall have a minimum compressive strength of 4000 psi in 28 days. Reinforcing steel shall be Grade 60. Two ½" Ø X 4" galvanized ferrule loop inserts with a minimum capacity of 500 pounds tension each, galvanized according to ASTM A123, shall be installed in each plank for lifting purposes. One ¾" Ø X 3" galvanized sleeve shall be installed in the center of each plank. A ½" Ø concrete fastener shall be used to bolt the plank to the prestressed concrete double tee unit.
- Abutment wall tie back cables shall consist of ¾"Ø 6x19 galvanized wire rope meeting design requirements of Federal Specification RRW 410D. Cable shall have a minimum breaking strength of 40,000 lbs. Cable clamps shall be of Double Grip Drop forged construction meeting Federal Specification FFC 450D, Type 3, Class 1. There shall be 3 clamps per termination. Sufficient rope turnback length shall be provided such that the angle between the two legs of rope shall not exceed 25°.

**SDDOT's MODIFIED ENR EQUATION FOR PILE**

**LRFD Platform:**

To determine the nominal bearing capacity of driven pile, the SDDOT uses the U.S. Customary formulas below for timber, concrete, steel H-piling and shell type piles.

For Gravity (drop) hammers the following form is used.

$$Q \text{ (drive)} = \frac{10.5WH}{S + 0.35} \times \frac{W}{W + M}$$

For Double Action Steam or Air Hammers and Closed Cylinder Top Diesel Hammers;

$$Q \text{ (drive)} = \frac{10.5E}{S + 0.1} \times \frac{W}{W + M}$$

For Single Action Steam or Air Hammers and Open Cylinder Top Diesel Hammers:

$$Q \text{ (drive)} = \frac{10.5WH}{S + 0.1} \times \frac{W}{W + M}$$

Where:

**Q** = the nominal pile bearing resistance in **tons**

**W** = the weight of a gravity hammer, or the ram of an energy hammer in **tons**.

**H** = the height of free fall of the hammer or ram in **feet**.

**M** = the weight in **Tons** of the driven mass and shall include the weight of the pile, the weight of the driving cap and the weight of the anvil, if used.

**E** = the energy per blow in **foot-tons**.

**S** = the average penetration in **inches** of the pile per blow for the last five blows for gravity hammers and last 10 blows for energy hammers.

**ESTIMATE OF STRUCTURE QUANTITIES AND NOTES  
FOR  
60'- 0" PRESTR. DOUBLE TEE BRIDGE  
Str. No. 53-048-010**

APRIL 2010

4 OF 11

DESIGNED BY	DRAWN BY:	CHECKED BY:	APPROVED:
G.B.	J.G.	D.C.	
BEI 09232	PCN H119		BRIDGE ENGINEER

The Ludlow Formation is a coastal deposit of loosely consolidated fine to medium grained calcareous sandstone and shale with interbedded layers of siltstone and claystone. Textural classification varies from clay-silt to sand. Colors vary from white, tan, yellow and gray. Bands of lignite may be present.

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

**LEGEND**

- ⊕ Auger Test
- ⊙ Drive Test
- ▽ Water
- ⊖ Caved
- █ Sample Zone

Drive test are conducted by dropping a 490 pound hammer 30 inches to drive a 2 7/8 inch drill stem with attached retractable plug sampler for taking undisturbed samples and to measure the resistance to penetration of the soil.

**GROUND WATER ELEVATIONS**

as of November 2009

D1	2552.1
D3	2552.8

as of January 2010

D2	2551.3
D4	2552.1

**MEASURED SKIN FRICTION**

	Elev	psf
D2	2535.7	3,182
D4	2532.9	2,095

**SITE PLAN & SUBSURFACE PROFILE**

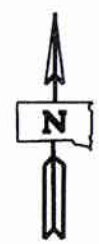
FOR  
60' SINGLE SPAN PRESTRESSED  
CONCRETE DOUBLE TEE BRIDGE  
BUFFALO CREEK 28'-0" ROADWAY  
STA 9+70 TO 10+30 0° SKEW  
STR. NO. 53-048-010 SEC. 22, T23N, R10E  
PCN H119 BRO 8053(22)  
DATE: FEBRUARY, 2010 PERKINS COUNTY, SD

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

-X081-

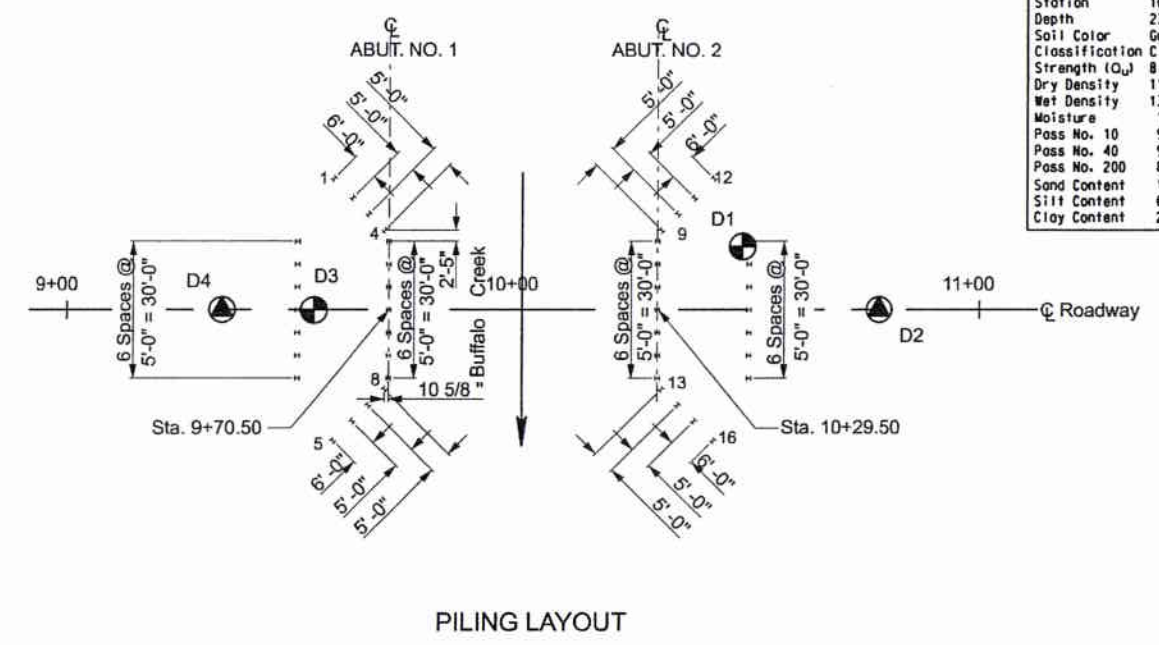
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DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
	NN	DV	

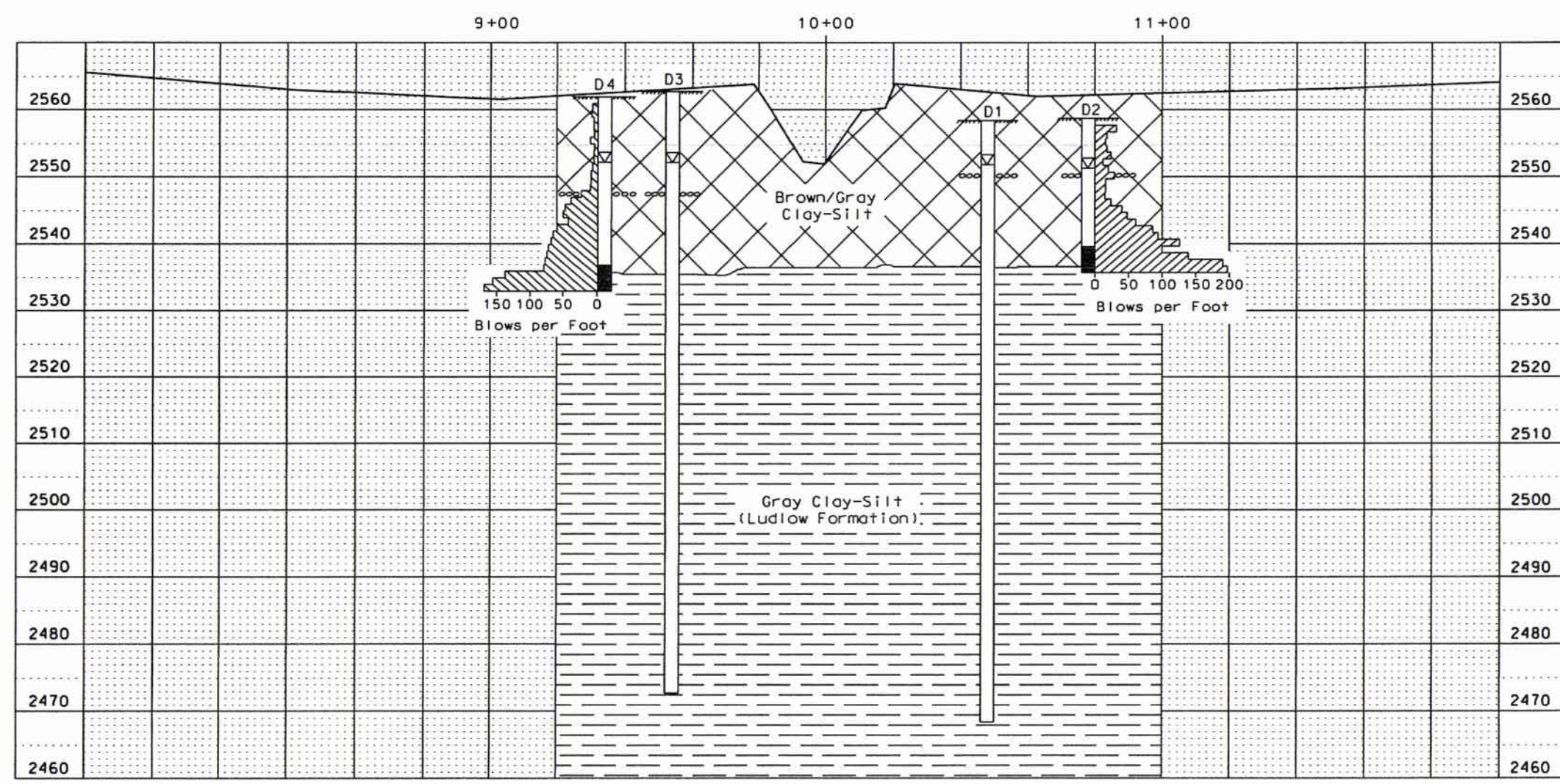


Sta. & Offset for Wingwall Pile

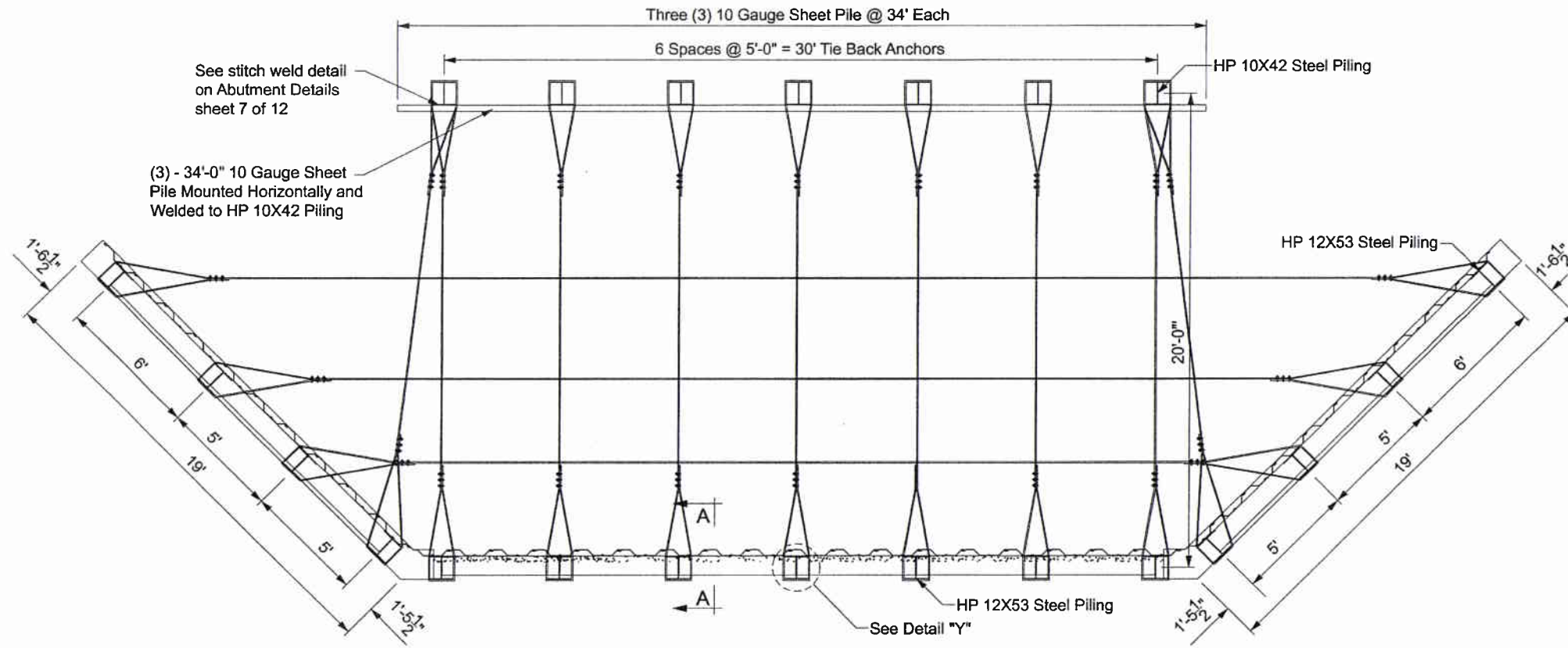
Pile #	Station	L/R	Pile #	Station	L/R
1	9+58.30	L 28.74'	9	10+30.39	L 17.43'
2	9+62.54	L 24.50'	10	10+34.92	L 20.96'
3	9+66.08	L 20.96'	11	10+37.46	L 24.50'
4	9+69.62	L 17.43'	12	10+41.70	L 28.74'
5	9+58.30	R 28.74'	13	10+30.39	R 17.43'
6	9+62.54	R 24.50'	14	10+34.92	R 20.96'
7	9+66.08	R 20.96'	15	10+37.46	R 24.50'
8	9+69.62	R 17.43'	16	10+41.70	R 28.74'



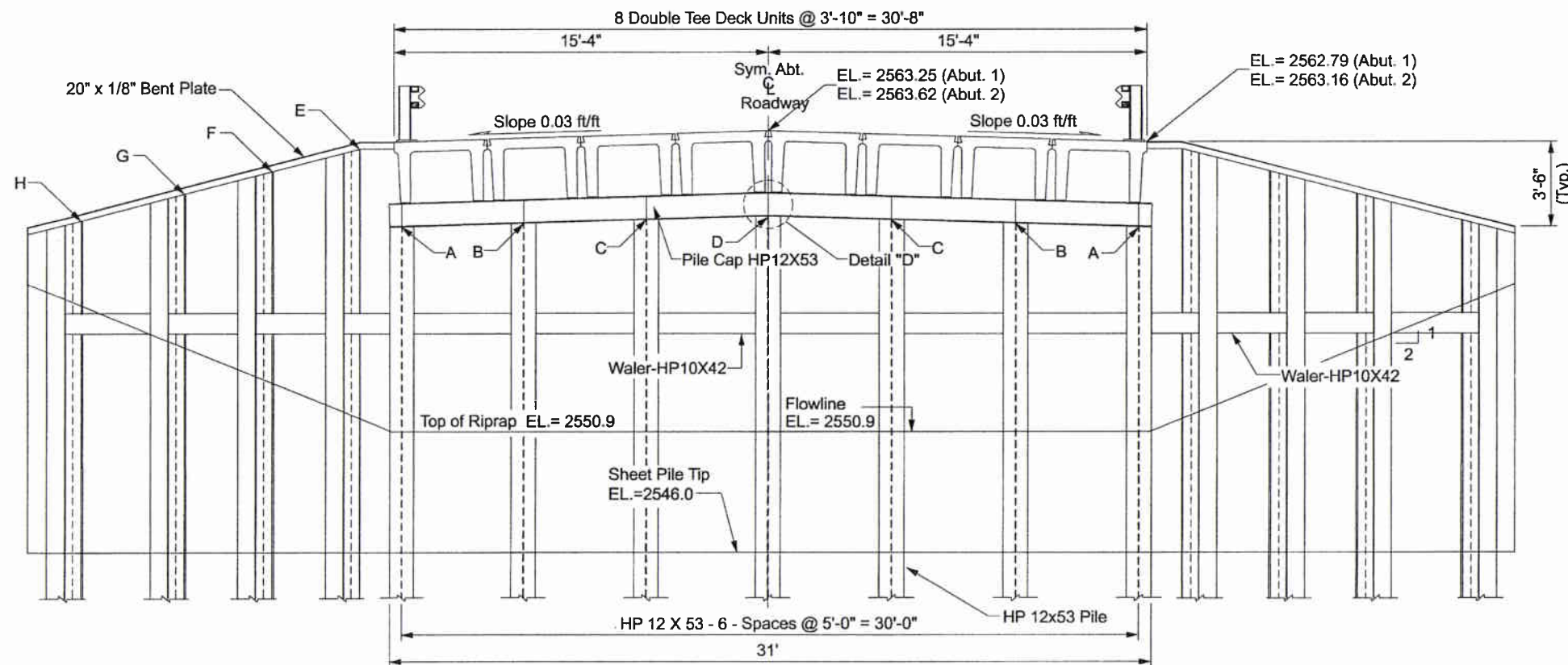
Hole Number	D2	Hole Number	D4
Station	10+78	Station	9+34
Depth	23.0 ft	Depth	29.0 ft
Soil Color	Gray	Soil Color	Lt. Gray
Classification	Clay-Silt	Classification	Silt-Clay
Strength (Q <sub>u</sub> )	8.178 psf	Strength (Q <sub>u</sub> )	6.172 psf
Dry Density	114.4 pcf	Dry Density	106.2 pcf
Wet Density	132.6 pcf	Wet Density	127.4 pcf
Moisture	15.9 %	Moisture	20.0 %
Pass No. 10	99.6 %	Pass No. 10	100.0 %
Pass No. 40	99.4 %	Pass No. 40	100.0 %
Pass No. 200	85.7 %	Pass No. 200	97.5 %
Sand Content	13.8 %	Sand Content	2.5 %
Silt Content	63.8 %	Silt Content	61.5 %
Clay Content	21.9 %	Clay Content	36.0 %



ESTIMATE OF QUANTITIES (One Abutment Only)		
Item	Unit	Quantity
Structure Excavation, Bridge	CUYD	428
HP 10X42 Steel Bearing Pile, F & D	FT	252
HP 12X53 Steel Test Pile, F & D	FT	42
HP 12X53 Steel Bearing Pile, F & D	FT	529
Sheet Piling, F & D	SQFT	1303
Structural Steel, Misc.	Lump Sum	L.S.



PLAN



ELEVATION

Pile Cutoff El. at Centerline of Pile Abutment 1	
A	2559.30
B	2559.45
C	2559.60
D	2559.75
E	2562.50
F	2561.58
G	2560.66
H	2559.55

Pile Cutoff El. at Centerline of Pile Abutment 2	
A	2559.67
B	2559.82
C	2559.97
D	2560.12
E	2562.87
F	2561.95
G	2561.03
H	2559.92

ABUTMENT DETAILS  
FOR

60' SINGLE SPAN PRESTRESSED CONCRETE DOUBLE TEE BRIDGE  
BUFFALO CREEK 28'-0" ROADWAY  
STA 9+70 TO 10+30 0° SKEW  
STR. NO. 53-048-010 SEC. 22, T23N, R10E  
PCN H119 BRO 8053(22)  
DATE: FEBRUARY, 2010 PERKINS COUNTY, SD

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STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	BRO 8053(22)	20	29
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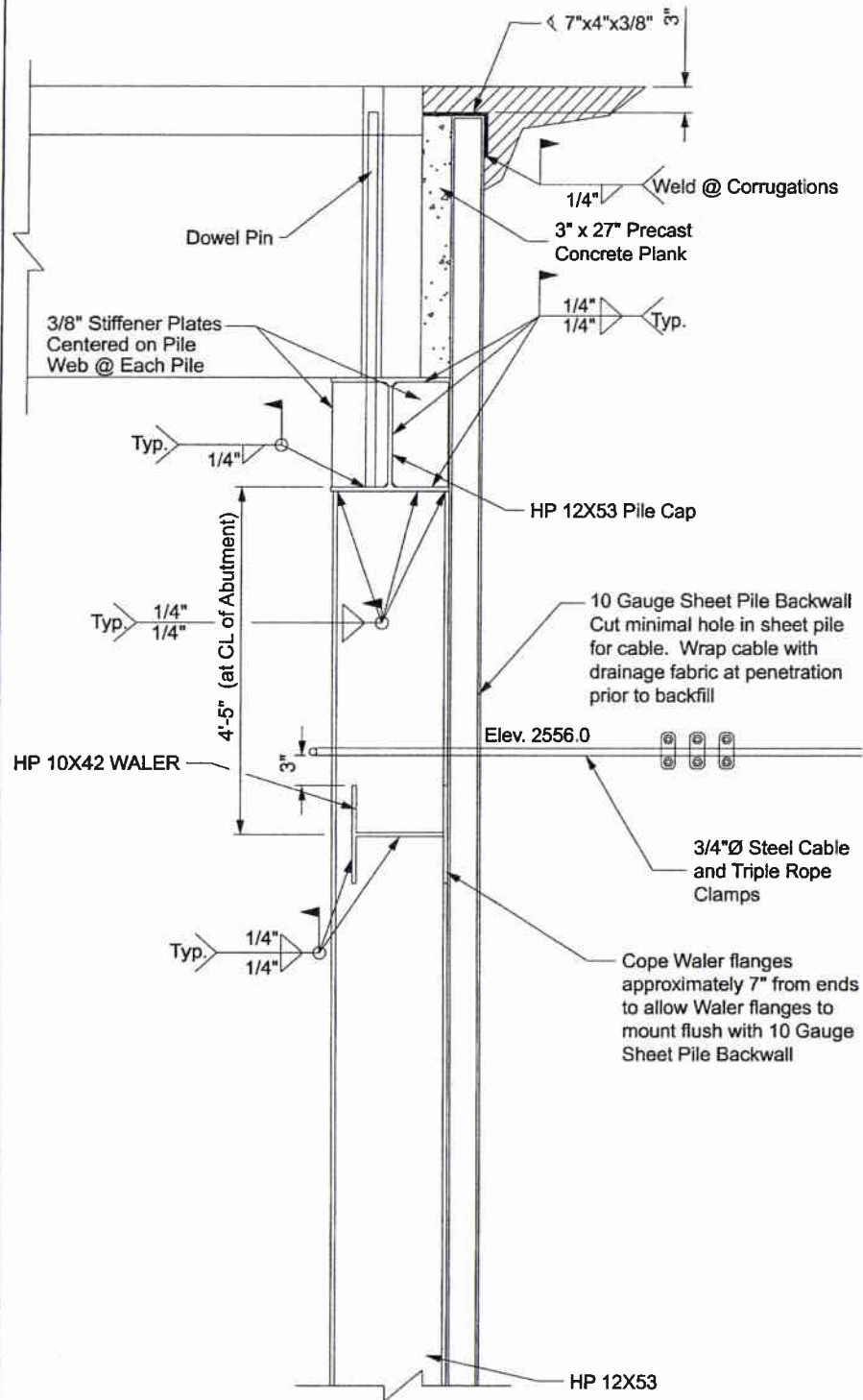
**GENERAL NOTES:**

Anchor cable shall be installed to a tension that eliminates cable sag. Care shall be taken by the Contractor during backfill operations not to damage the anchor cables. Anchor cables damaged by the Contractor shall be repaired by the Contractor at no additional expense to the State or County.

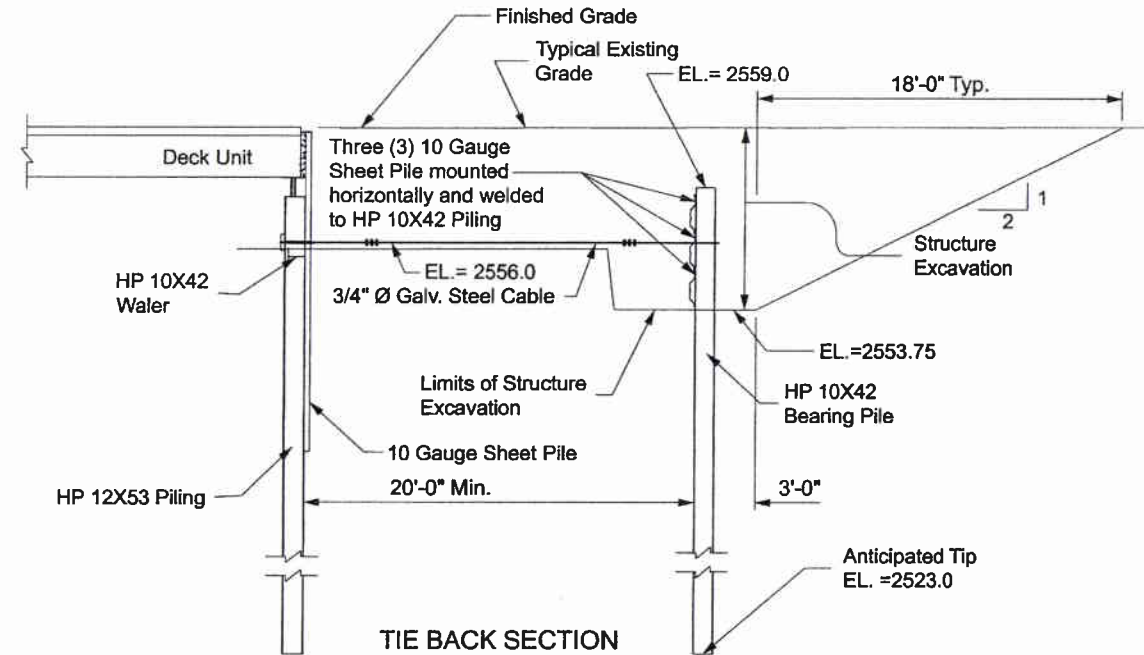
The piling for the tiebacks are to be driven into undisturbed soil.

All cost for furnishing and installing cable, clamps, and miscellaneous items needed to complete this work shall be included in the contract lump sum price for "Structural Steel, Miscellaneous".

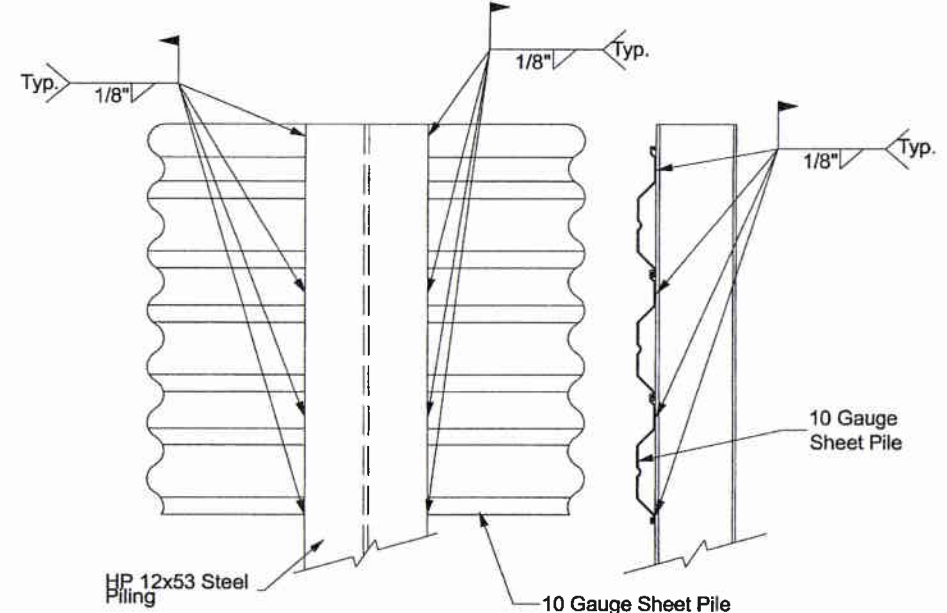
Precast Deck units shall be set in place and fastened to HP 12x53 cap prior to backfilling of Abutment.



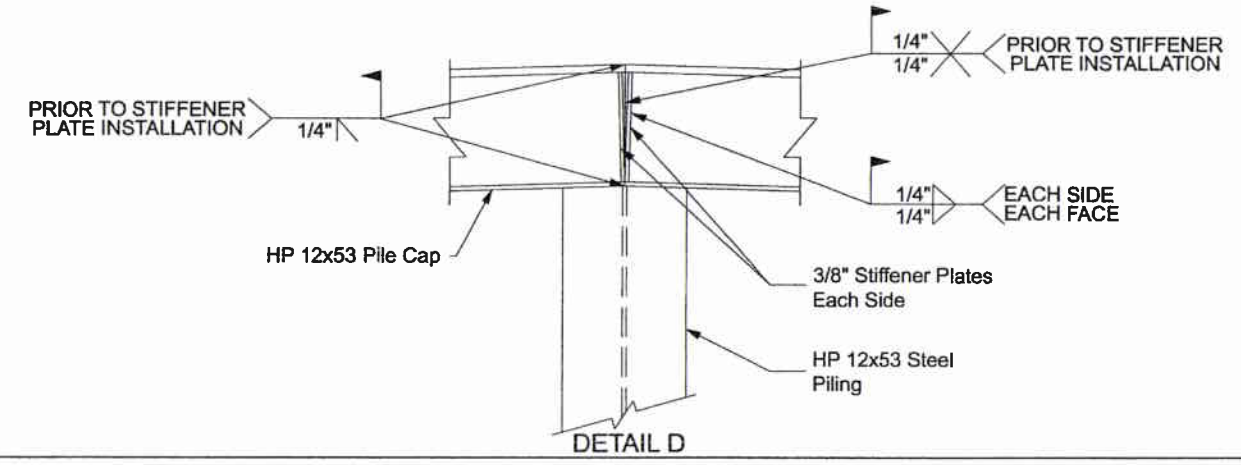
**SECTION A-A  
ABUTMENT SECTION WITH WALER DETAIL**



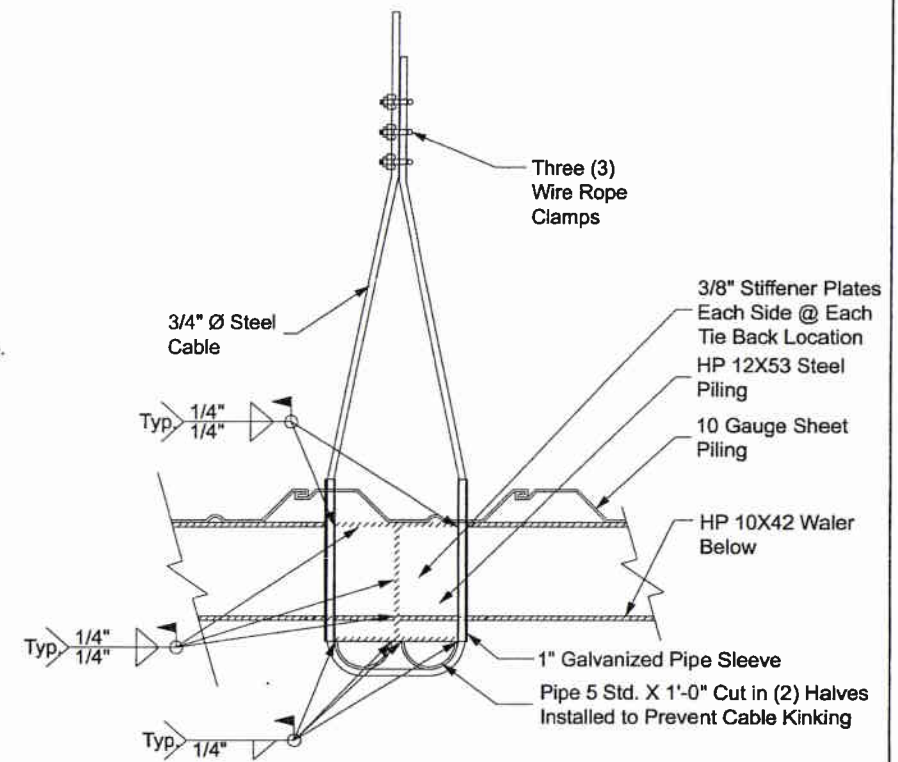
**TIE BACK SECTION**



**STITCH WELD DETAIL**



**DETAIL D**



**PLAN  
DETAIL 'Y'**

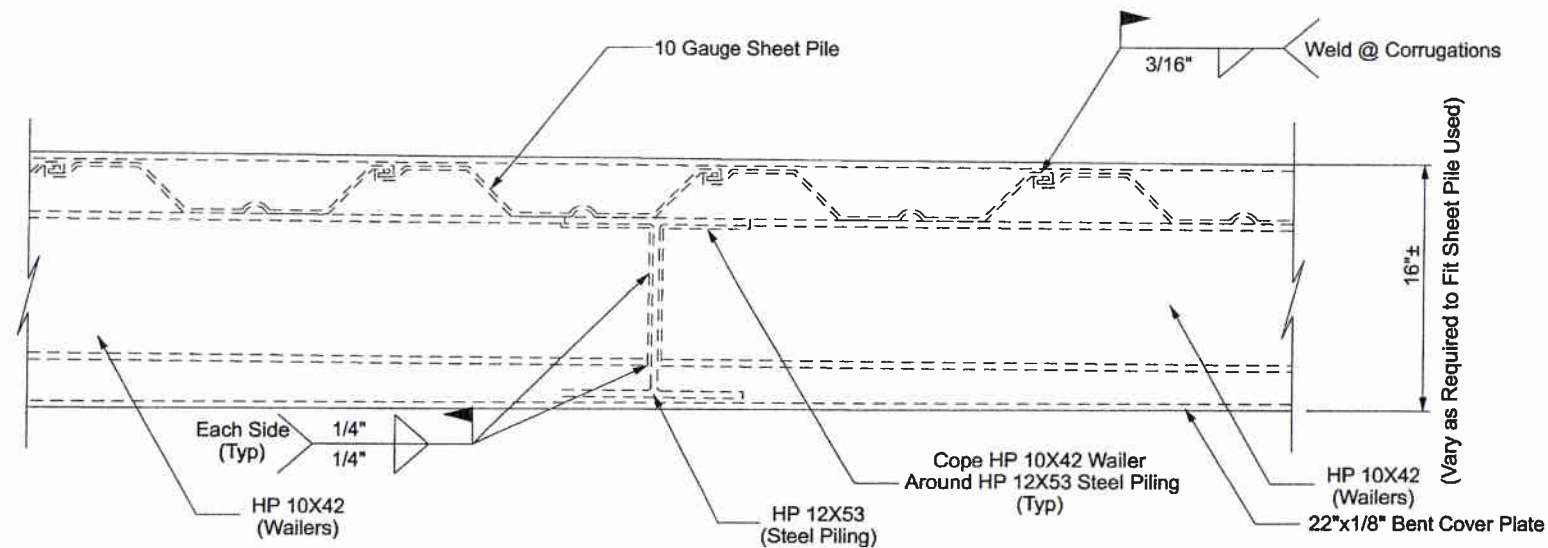
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FOR  
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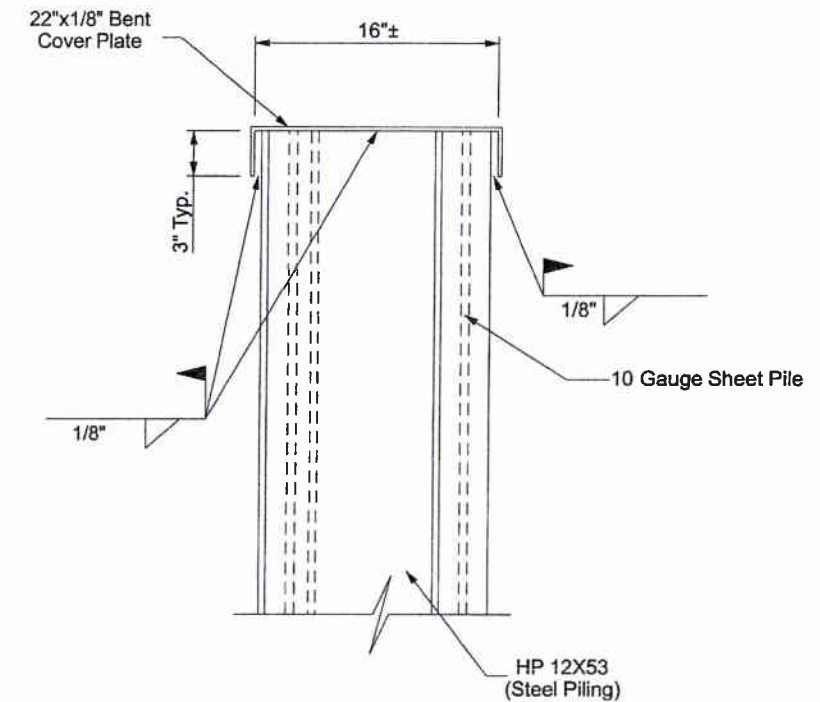
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-X081- (7) of (11)

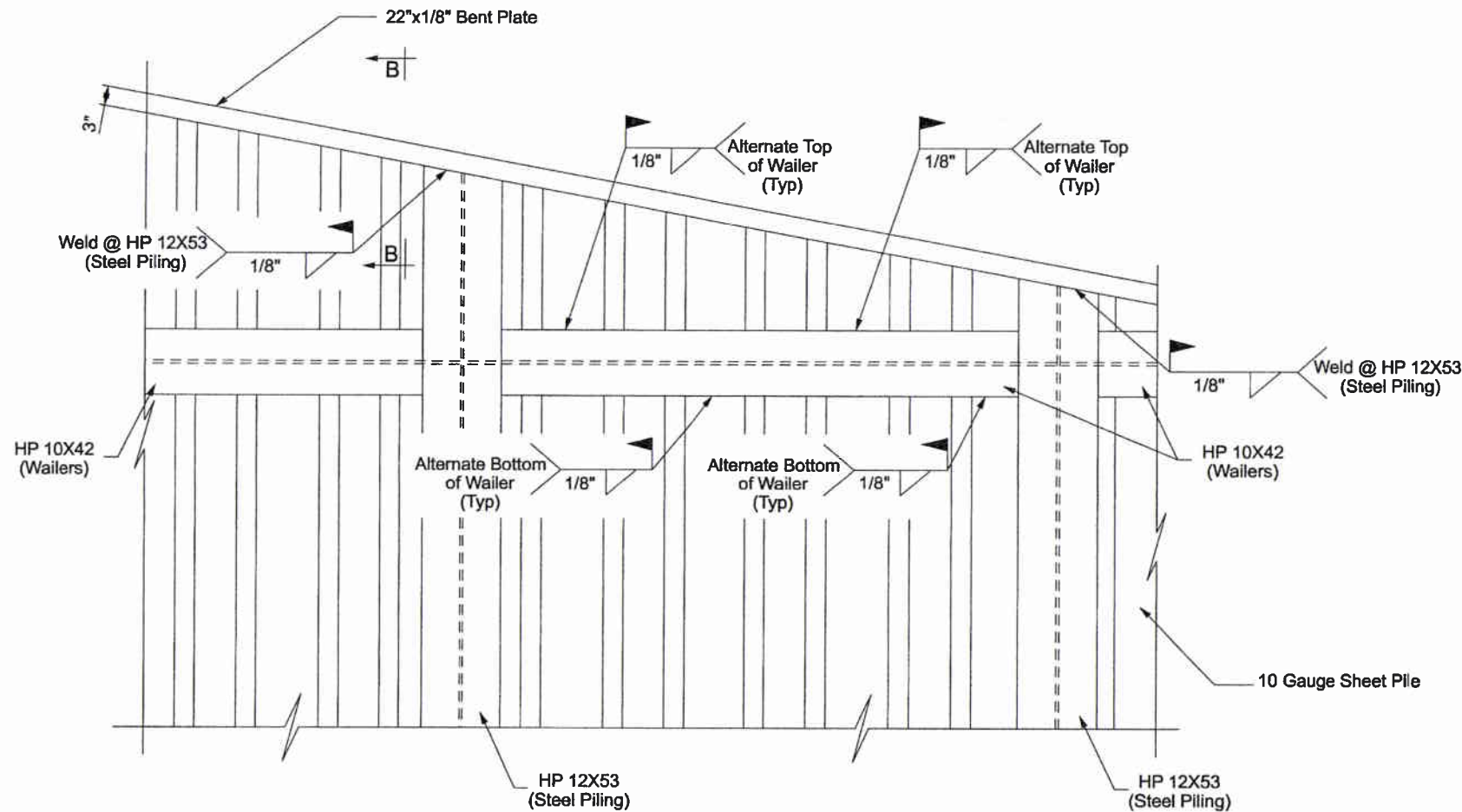
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G.B.	J.G.	D.C.	



WING WALL PLAN VIEW



SEC. B-B



WING WALL ELEVATION

WINGWALL DETAILS

FOR

60' SINGLE SPAN PRESTRESSED  
CONCRETE DOUBLE TEE BRIDGE

BUFFALO CREEK 28'-0" ROADWAY  
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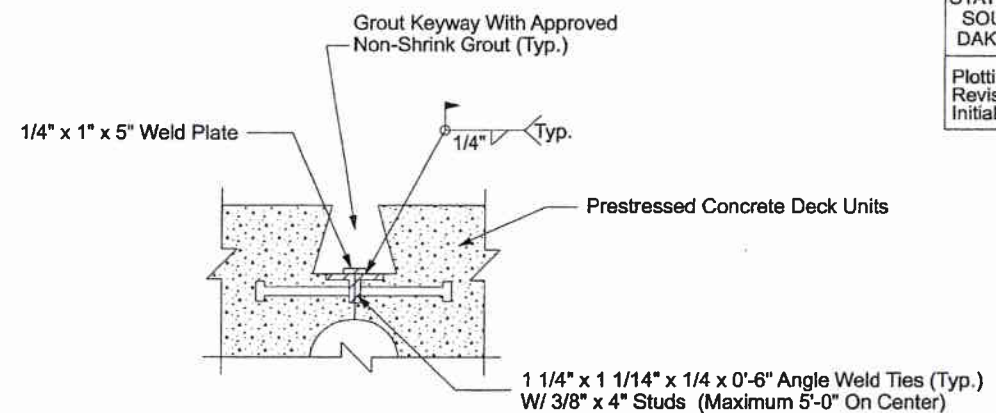
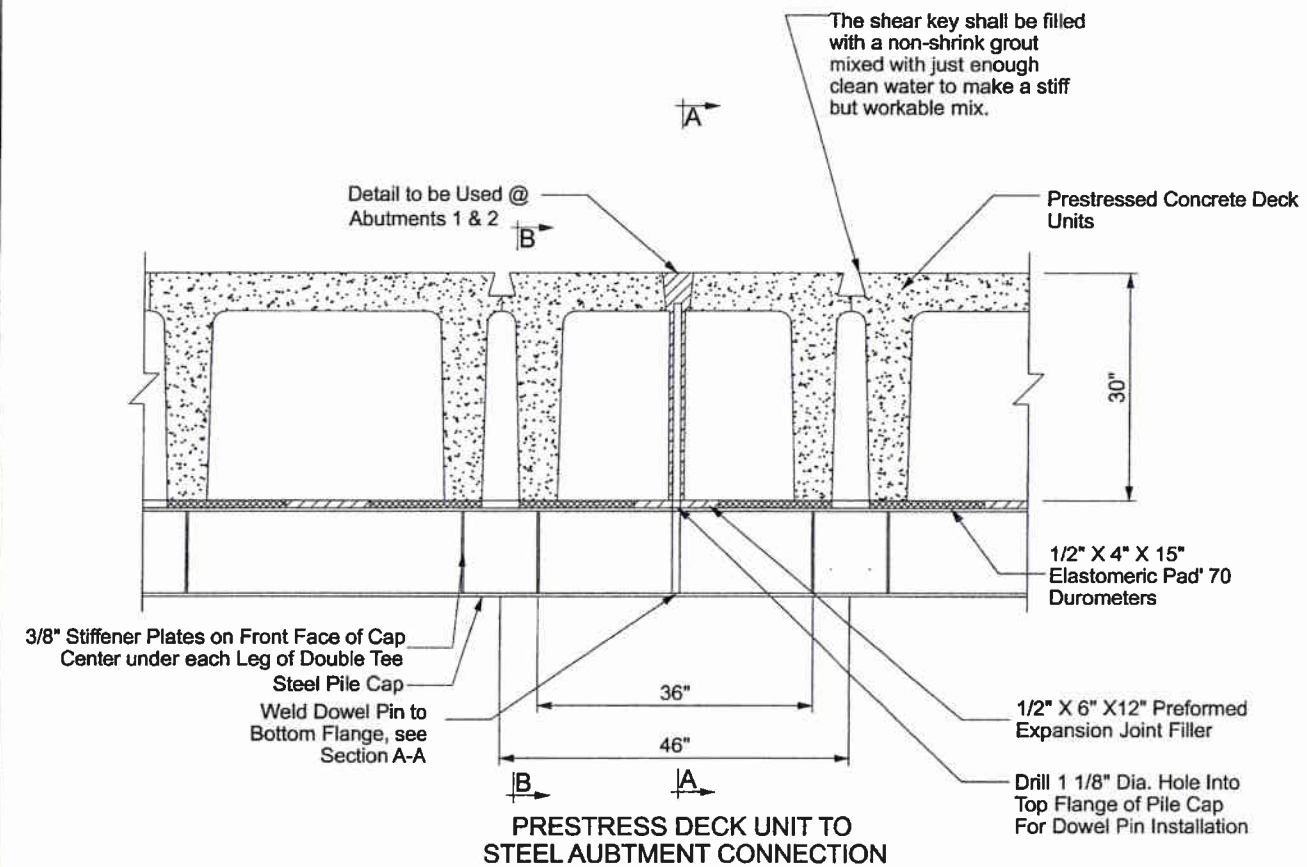
NOTE:  
Alternate Welds Between Sheet Piling and HP 10 X 42  
Wailers From Top to Bottom Edge of Flange on Every  
Other Sheet Pile Face

-X081-

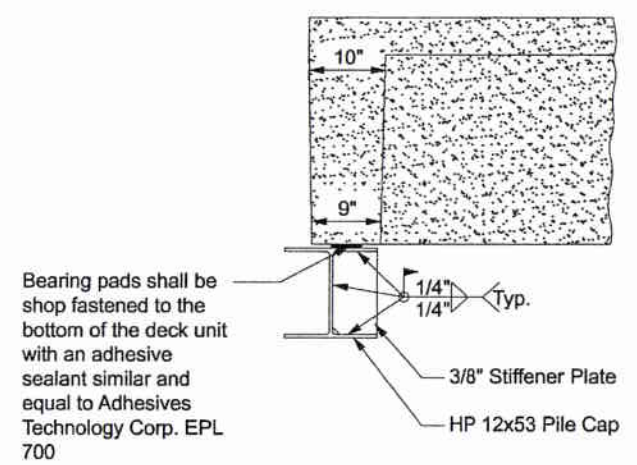
8 of 11

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

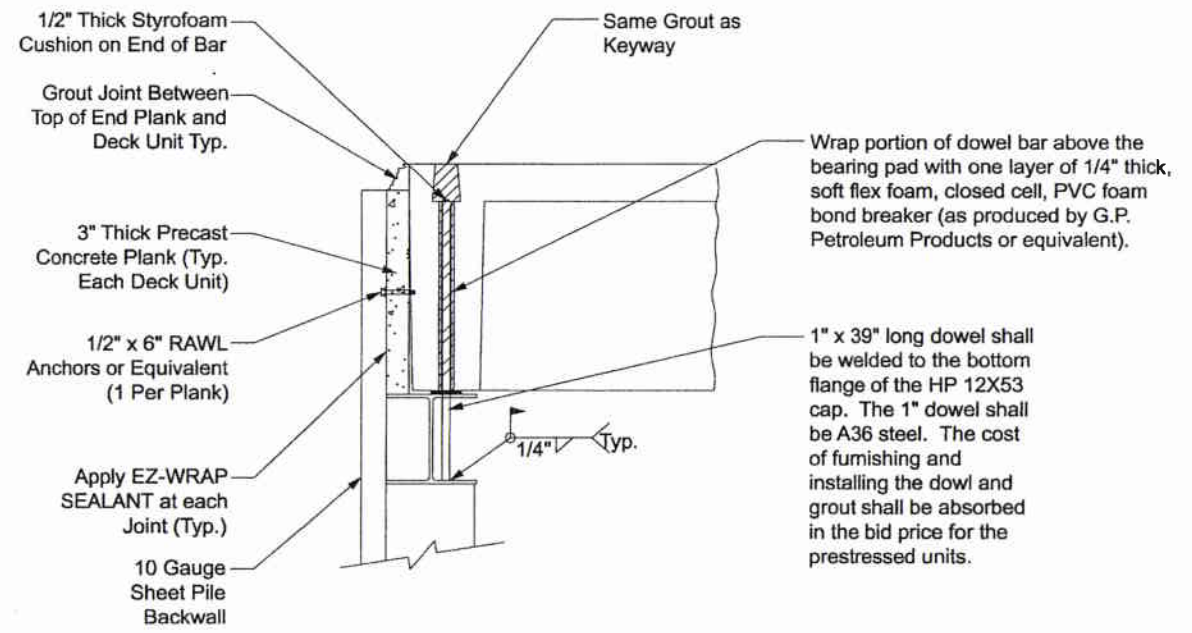




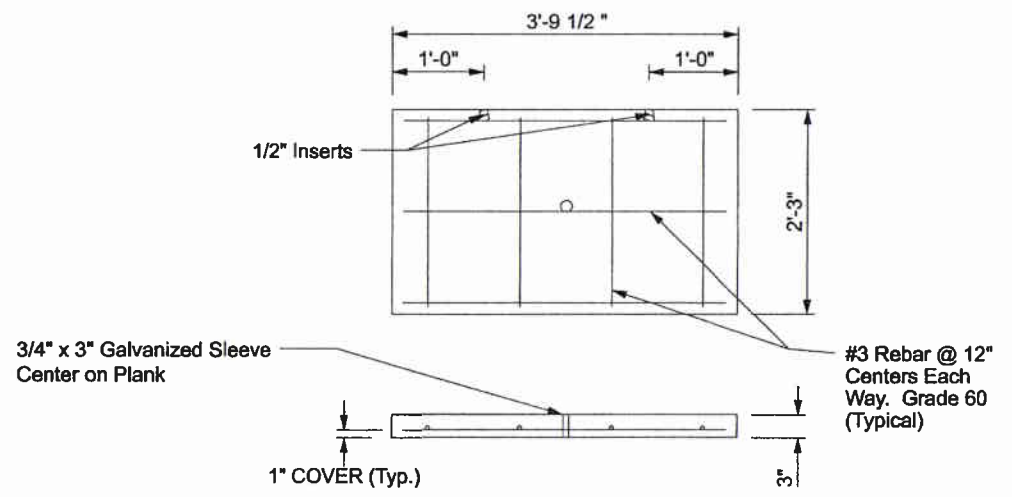
**DOUBLE TEE CONNECTION DETAIL**



**SEC. B-B**



**SEC. A-A AT ABUTMENT**



**PRECAST END PLANK DETAIL**

**BEAM DETAILS**

FOR  
60' SINGLE SPAN PRESTRESSED CONCRETE DOUBLE TEE BRIDGE

BUFFALO CREEK 28'-0" ROADWAY  
STA 9+70 TO 10+30 0° SKEW  
STR. NO. 53-048-010 SEC. 22, T23N, R10E  
PCN H119 BRO 8053(22)  
DATE: FEBRUARY, 2010 PERKINS COUNTY, SD

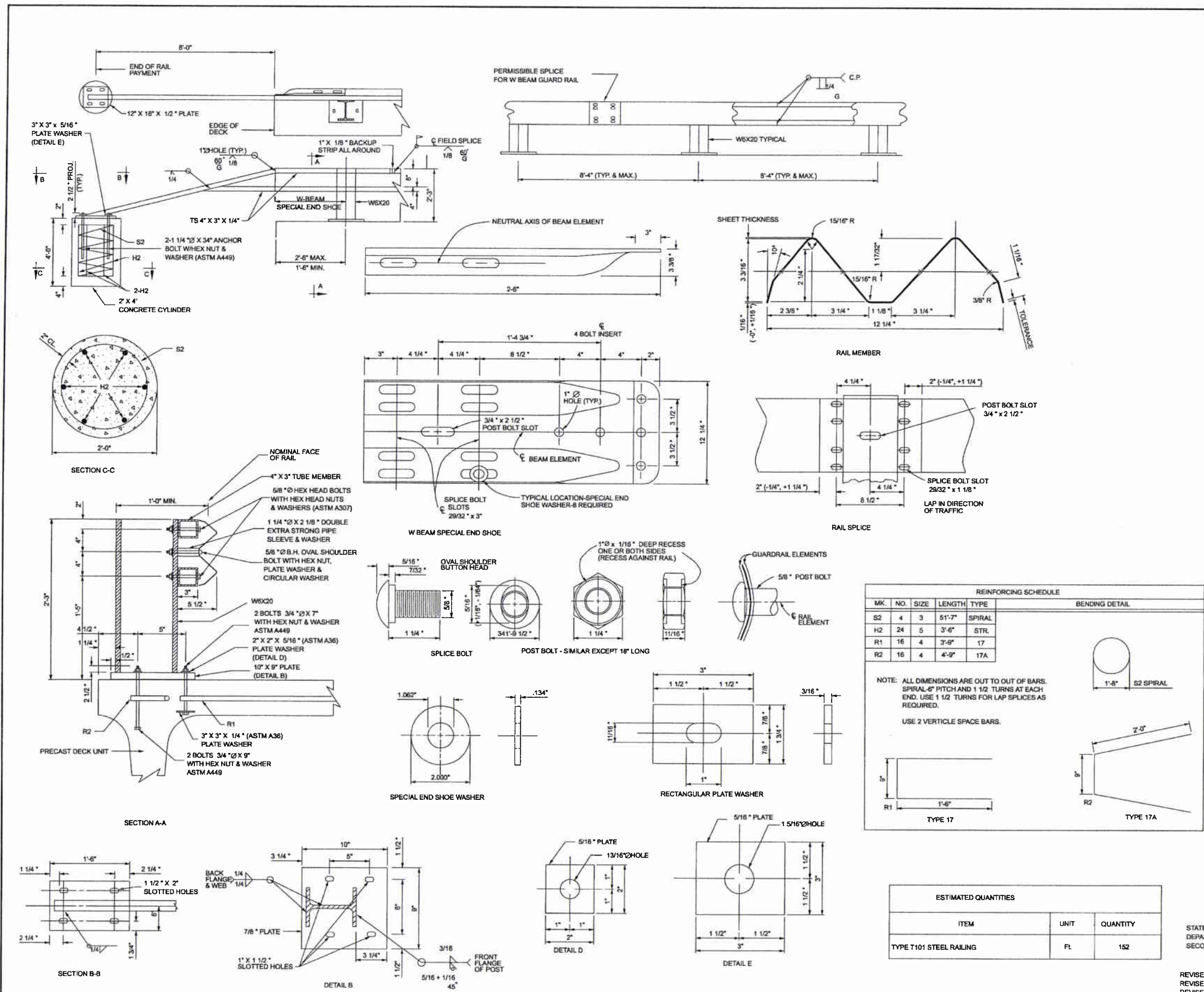
PREPARED BY:  
BROSZ ENGINEERING INC.  
PO BOX 357  
BOWMAN, NORTH DAKOTA

-X081- (9) of (11)

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

GENERAL NOTES:

- RAIL DESIGN CONFORMS TO CRASH TESTING REQUIREMENTS ACCORDING TO AASHTO LRFD SPECIFICATIONS FOR HIGHWAY BRIDGES 2007 EDITION AND INTERIM SPECIFICATIONS.
- RAIL POSTS SHALL BE PERPENDICULAR TO CENTERLINE OF ROADWAY.
- W-BEAM GUARD RAIL, PIPE SLEEVES NUTS, WASHERS, AND PLATE WASHERS THAT GO WITH THESE SHALL BE GALVANIZED. BOLTS, NUTS, AND WASHERS SHALL BE GALVANIZED ACCORDING TO ASTM A153. PIPE SLEEVES SHALL BE GALVANIZED ACCORDING TO ASTM A123.
- POST BOLTS SHALL BE 3/4" DIAMETER A325 OR A449. EACH BOLT SHALL HAVE ONE HARDENED AND ONE 2" X 2" X 5/16" ASTM A36 PLATE WASHER. NUTS SHALL BE A563.
- STEEL W BEAM GUARD RAIL SHALL BE CLASS A, TYPE 1, CONFORMING TO AASHTO M180 AND SHALL BE FABRICATED FROM STANDARD 12.5' OR 25' NOMINAL W-BEAM SECTIONS.
- THE RAIL POSTS, 4" X 3" TUBE MEMBERS, BASE PLATES AND PROJECTING PORTIONS OF THE ANCHOR BOLTS, NUTS, AND WASHERS SHALL BE SATISFACTORILY PAINTED IN ACCORDANCE WITH THE SPECIAL PROVISION FOR BRIDGE PAINTING. THE COLOR OF THE FINISHED COAT SHALL BE AN APPROVED GREEN, FEDERAL STANDARD NO. 24108. THE NUTS, BOLTS, AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153. THE RAIL POSTS AND TUBE MEMBERS MAY BE GALVANIZED IN ACCORDANCE WITH ASTM A123 IN SUBSTITUTION FOR PAINTING. IF GALVANIZING IS SELECTED, NO PAINT WILL BE APPLIED OVER GALVANIZED SURFACES.
- ALL STRUCTURAL STEEL PARTS FOR THE TYPE T101 STEEL RAILING SHALL CONFORM TO ASTM A709 GR. 36. TUBES SHALL CONFORM TO ASTM A500 GR. B.
- PROVIDE 1/2" DRAIN HOLES IN THE TUBES NEAR ENDS OF RAIL AND NEAR SPLICES.
- ALL CONCRETE SHALL BE CLASS M6 AS SPECIFIED IN SECTION 462.
- ALL REINFORCING STEEL SHALL CONFORM TO ASTM A615, GR 60.
- ALL BOLTS, NUTS, WASHERS, POSTS, PLATES, PIPE SLEEVES, STEEL W BEAM GUARD RAIL, WELDING, PAINTING, AND ALL COSTS OF INSTALLING FOUR RAIL ANCHORS INCLUDING CONCRETE, EXCAVATION, FORMING, REINFORCING STEEL, AND ANCHOR BOLTS SHALL BE INCLUDED IN THE UNIT PRICE BID PER LINEAR FOOT FOR T101 STEEL RAILING.
- MEASUREMENT FOR PAYMENT SHALL BE FROM CENTER OF ANCHOR TO CENTER OF ANCHOR FOR EACH SIDE OF THE BRIDGE.



RAIL DETAILS

FOR

60' SINGLE SPAN PRESTRESSED CONCRETE DOUBLE TEE BRIDGE

BUFFALO CREEK 28'-0" ROADWAY  
 STA 9+70 TO 10+30 0° SKEW  
 STR. NO. 53-048-010 SEC. 22, T23N, R10E  
 PCN H119 BRO 8053(22)  
 DATE: FEBRUARY, 2010 PERKINS COUNTY, SD

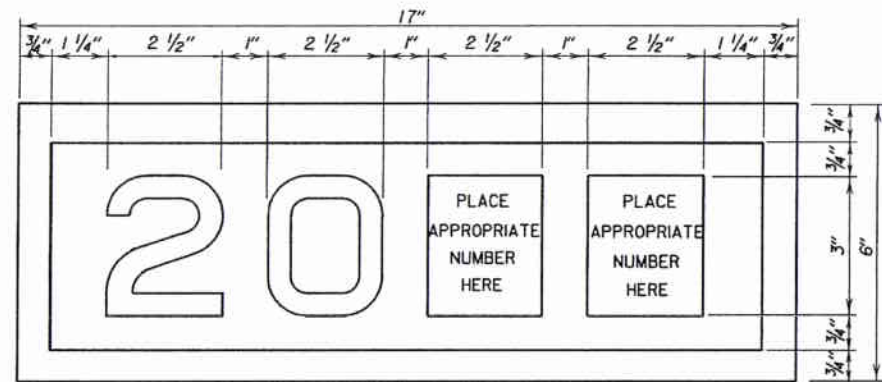
PREPARED BY:  
 BROSZ ENGINEERING INC.  
 PO BOX 357  
 BOWMAN, NORTH DAKOTA

STATE OF SOUTH DAKOTA  
 DEPARTMENT OF TRANSPORTATION  
 SECONDARY ROADS SECTION

REVISED 12-6-05. KF  
 REVISED 10-16-03. NJC  
 REVISED 3-30-98. BS

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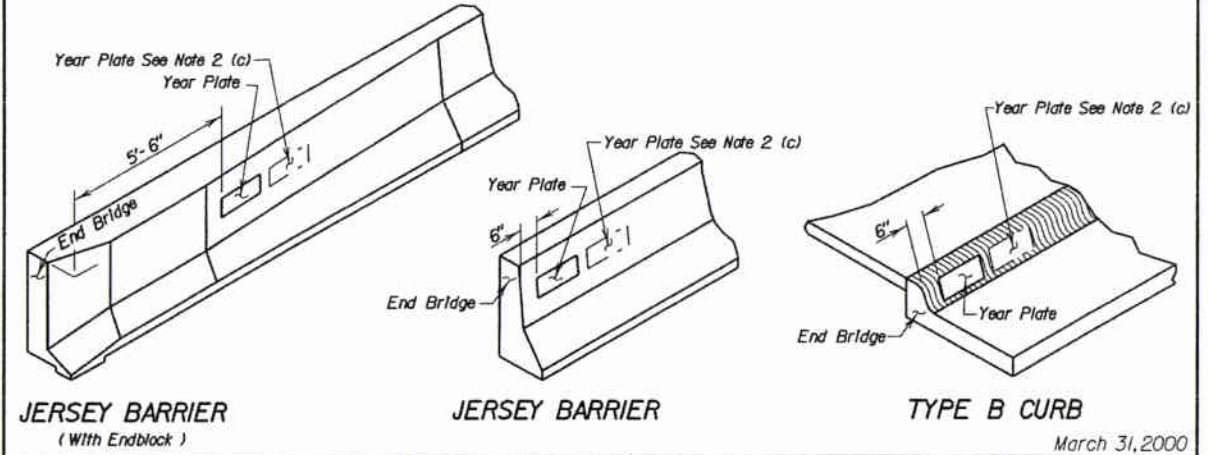
DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
G.B.	J.G.	D.C.	



YEAR PLATE DETAILS

NOTES:

- Year plates of the general dimensions shown shall be constructed on all box culverts and bridges. The year plates shall be constructed in reverse and attached to the forms in such a manner that the finished imprint in the concrete does not exceed one-half (1/2) inch in depth.
- Year plates shall be located on structure (s) as follows:
  - On cast-in-place box culverts the year plates shall be four and one-half (4 1/2) inches below the top of the upstream parapet wall and centered laterally on the upstream face. On precast box culverts the year plate shall be centered laterally on the upstream face of the top slab. Where an extended interior wall interferes with this location, the year plate shall be centered in an adjacent barrel.
  - On bridges with six (6) inch curbs or "Jersey" shaped barriers with no endblocks, the year plate shall be centered vertically on the curb face approximately six (6) inches from the end of the bridge, or as designated by the Engineer. On bridges with "Jersey" shaped barrier endblocks, the year plate shall be centered on the upper sloped portion of the barrier approximately 5'-6" from the end of the bridge, or as designated by the Engineer. There shall be one year plate at each end of the bridge on opposite sides.
  - When the plans specify that both the original date of construction and the date of reconstruction are to be shown, one date shall be placed as listed above and the other located adjacent to it. Both year plates shall be shown at each end of the bridge on opposite sides.
- There will be no separate measurement or payment made for year plates on box culverts and bridges. All costs for this work shall be incidental to the other contract items.



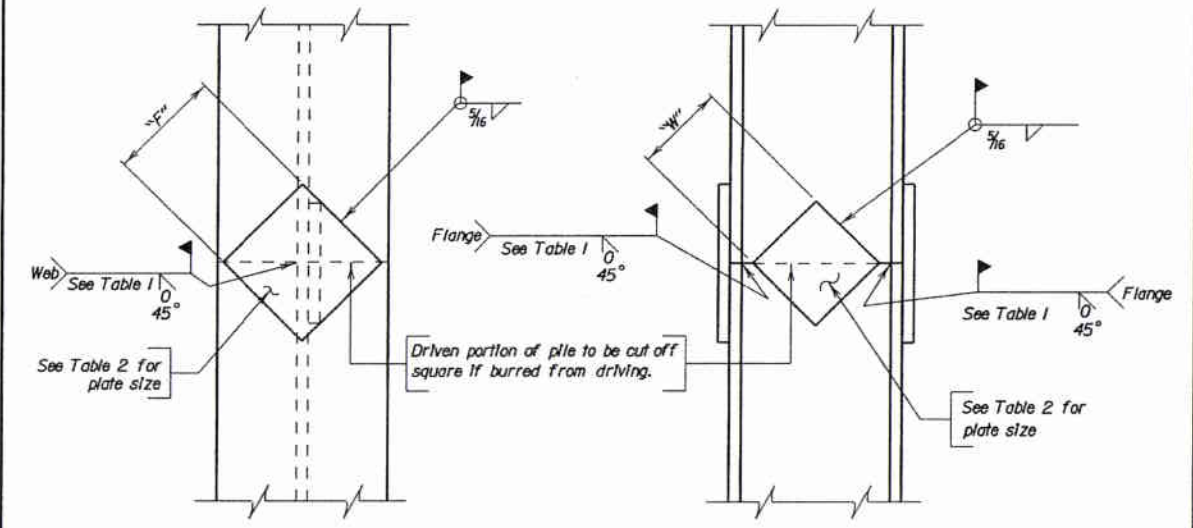
JERSEY BARRIER  
(With Endblock)

JERSEY BARRIER

TYPE B CURB

March 31, 2000

S D D O T	YEAR PLATE DETAILS	PLATE NUMBER 460.02
		Sheet 1 of 1
Published Date: 1st Qtr. 2010		



Flame scarf lower end of upper section on the ground and weld on splice plates; then place upper section on lower section and weld.

TABLE 1

WELD	PILE	TYPICAL APPLICATION
$\frac{1}{2} + \frac{5}{16}$ @ 45°	HP 14 X 102 HP 14 X 89 HP 12 X 74	
$\frac{3}{8} + \frac{5}{16}$ @ 45°	HP 14 X 73 HP 12 X 63 HP 10 X 57	
$\frac{5}{16} + \frac{5}{16}$ @ 45°	HP 12 X 53 HP 10 X 42 HP 8 X 36	

TABLE 2  
(1/16" SQUARE PLATES)

PILE	8"	10"	12"	14"
"F" FLANGE	5"	6 1/2"	8"	10"
"W" WEB	4"	5 1/2"	6 1/2"	8"

- NOTES:
- Steel for splice plates shall conform to ASTM A36.
  - Welding and weld inspection shall be in conformance with AWS D1.1 (Current Year) Structural Welding Code - Steel.

December 23, 2004

S D D O T	STEEL PILE SPlice DETAILS	PLATE NUMBER 510.40
		Sheet 1 of 1
Published Date: 1st Qtr. 2010		