Feb 7, 2014

29-048.182

DESIGN DATA				
Traffic	Average Daily			
Current 2011	Pass: 1970	Trucks: 175	Total: 2145	
Forecast 2031	Pass: 2405	Trucks: 250	Total: 2655	
Clear Zone Distance: 42 ft		Design Speed: 65 mph		
Minimum Sight Dist. for Stopping: 645 ft		Bridges: 46-119.459 HS 20		
Sight Dist. for No Passing Zone: 1100 ft				
Pavement Design Life 20 (years)				
Design Accumulated One-way Flexible ESALs: 630,319				

STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
ND	SS-SAP-8-046(019)105	16389	1	1

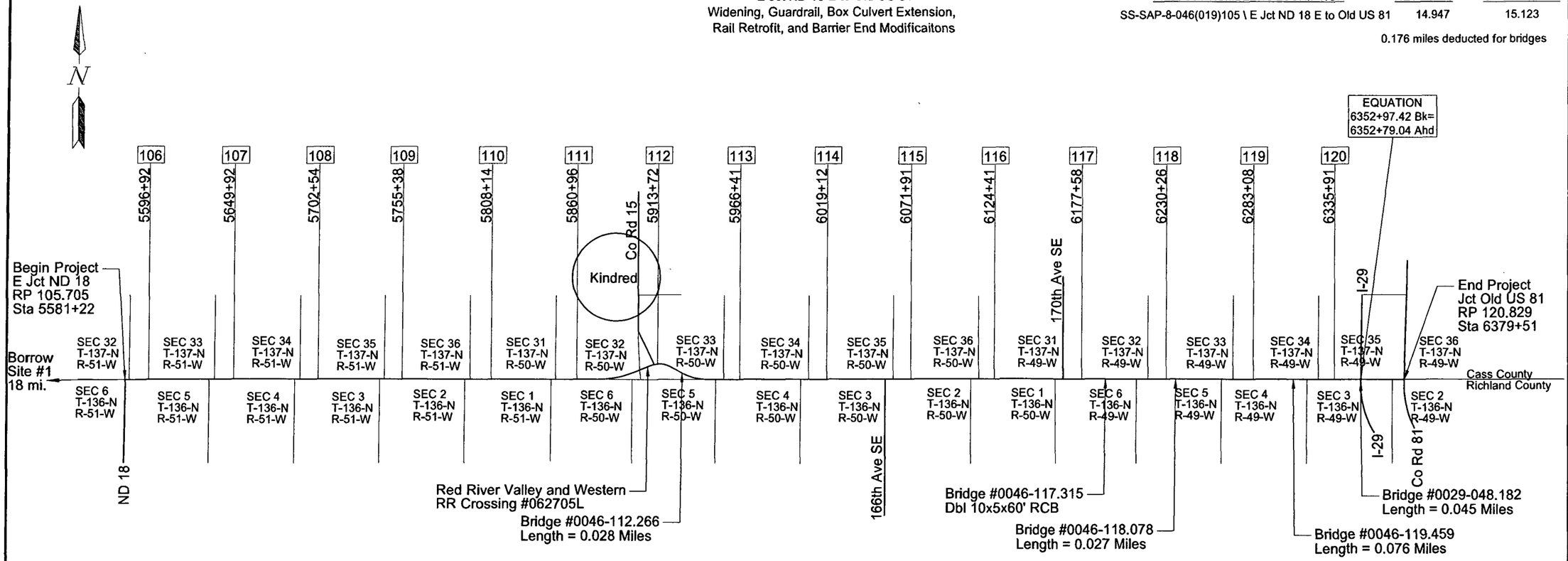
JOB # 27
NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

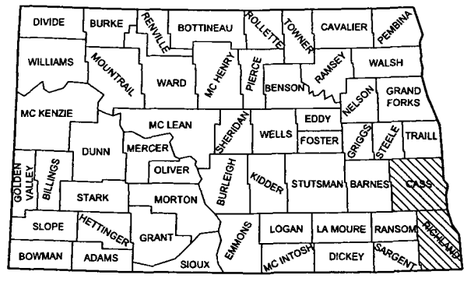
SS-SAP-8-046(019)105
FHWA Limited Involvement
Cass & Richland Counties
E Jct ND 18 E to Old US 81
Widening, Guardrail, Box Culvert Extension,
Rail Retrofit, and Barrier End Modificaitons

GOVERNING SPECIFICATIONS:
Standard Specifications adopted by the North Dakota Department of Transportation October 2008; Standard Drawings currently in effect; and other Contract Provisions submitted herein.

PROJECT NUMBER \ DESCRIPTION	NET MILES	GROSS MILES
SS-SAP-8-046(019)105 \ E Jct ND 18 E to Old US 81	14.947	15.123

0.176 miles deducted for bridges





STATE COUNTY MAP

DESIGNERS

Sarah BaeHurst /s/

Brian Rosin /s/

DISTRICT REVIEW

Kevin Gorder /s/
Fargo District

APPROVED DATE 09/25/13

Robert Fode /s/
OFFICE OF PROJECT DEVELOPMENT
ND DEPARTMENT OF TRANSPORTATION

I hereby certify that the attached plans were prepared by me or under my direct supervision and that I am a duly registered professional engineer under the laws of the state of ND.

APPROVED DATE 09/24/13

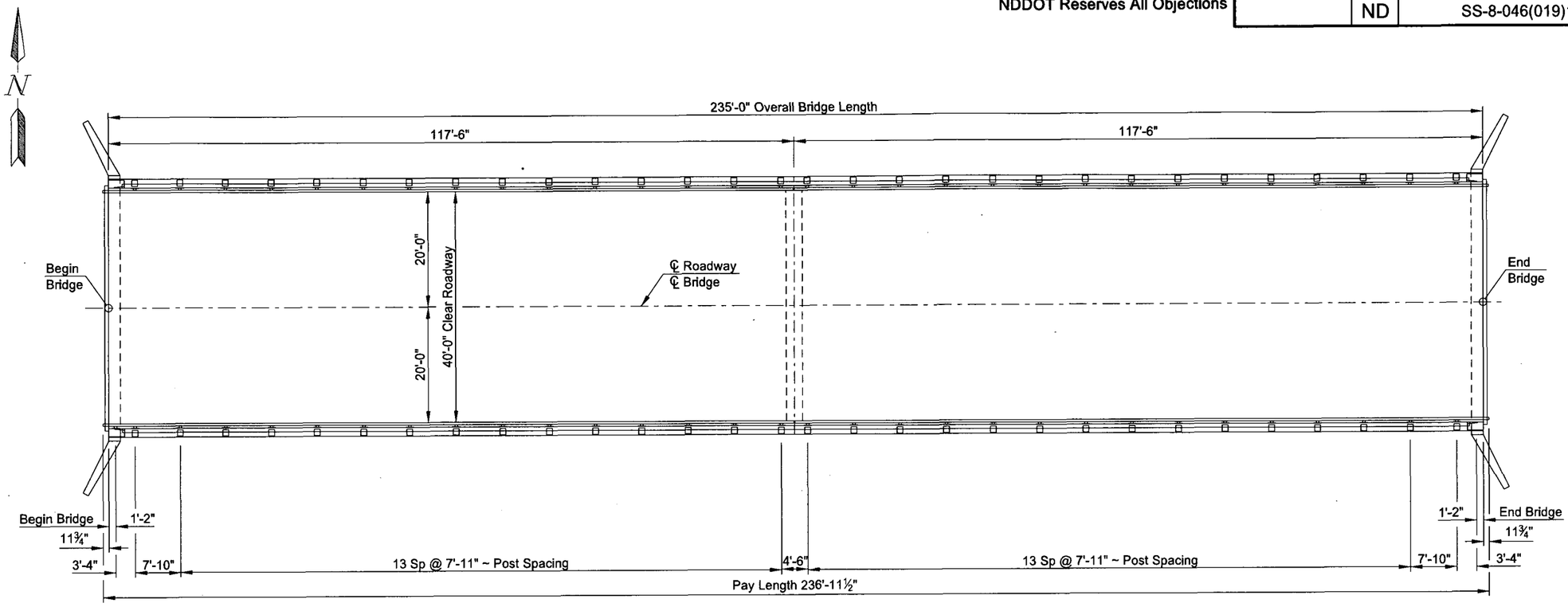
James Douglas Rath /s/
NDDOT Design Division

This document was originally issued and sealed by James Douglas Rath Registration Number PE- 4288, on 09/24/13 and the original document is stored at the North Dakota Department of Transportation

12/12/2013 2:52:09 PM sbaehurst R:\project\80046105.019\design\Sheets\001TS_001_titlesheet.dgn

23 U.S.C. 409
NDDOT Reserves All Objections

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	SS-8-046(019)105	170	18



NOTES:

100 SCOPE OF WORK: Work at this site consists of installing double box beam rail retrofit. A single lane of traffic shall be maintained at all times during the work.

BRIDGE BID ITEMS

SPEC	CODE	ITEM DESCRIPTION	UNIT	QUANTITY
624	3002	DOUBLE BOX BEAM RAIL RETROFIT - ERAIL	LF	473.9

This document was originally issued and sealed by Tim L Schwagler, Registration Number PE 3151, on 11/26/13 and the original document is stored at the North Dakota Department of Transportation

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

KINDRED INTERCHANGE

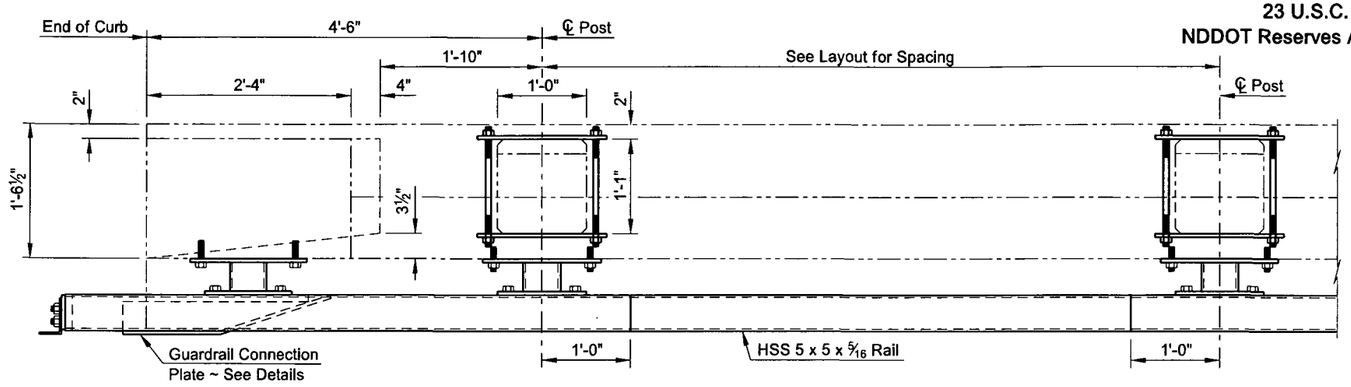
BRIDGE LAYOUT

PROJECT: SS-8-046(019)105
STATION: 6352+97.40
CASS COUNTY / RICHLAND COUNTY

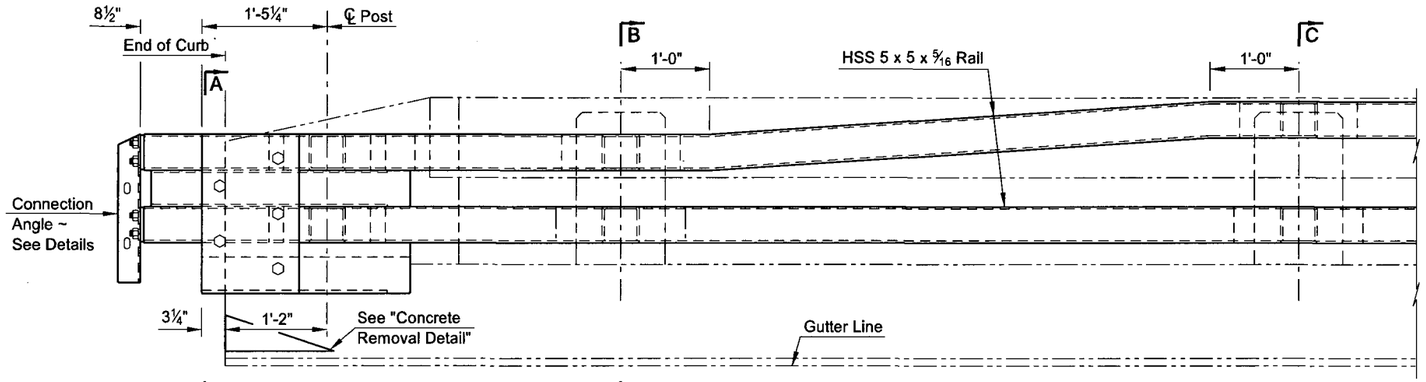
11/26/13 (DATE) Terrence R. Udland (BRIDGE ENGINEER)

23 U.S.C. 409
NDDOT Reserves All Objections

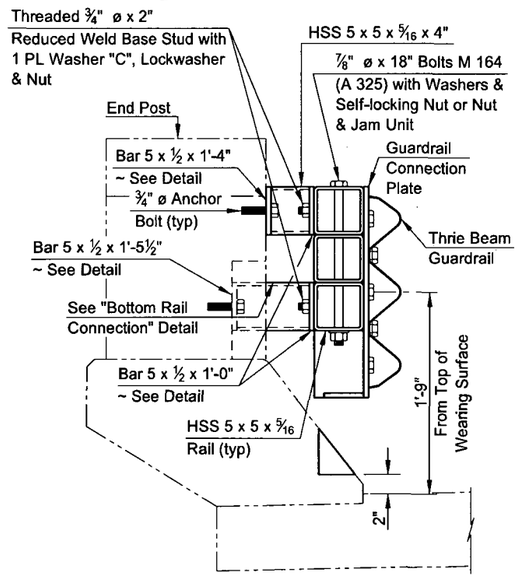
	STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
	ND	SS-8-046(019)105	170	19



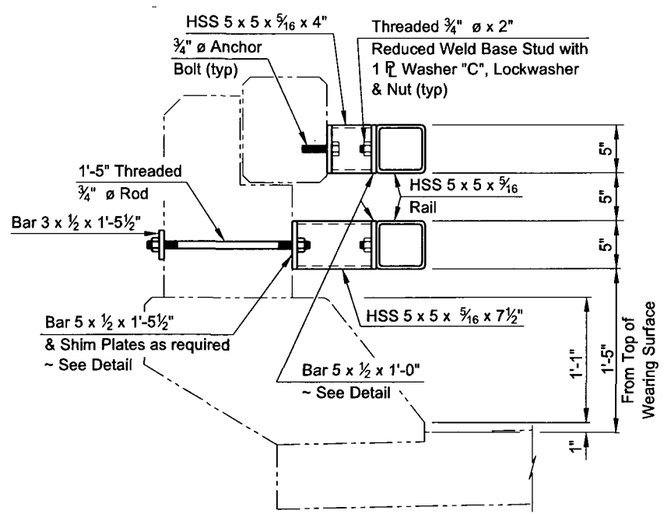
PART RAIL RETROFIT PLAN



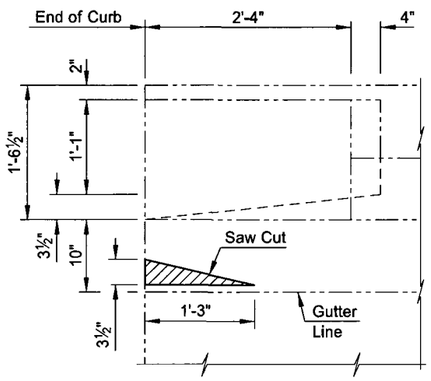
PART RAIL RETROFIT ELEVATION



A-A

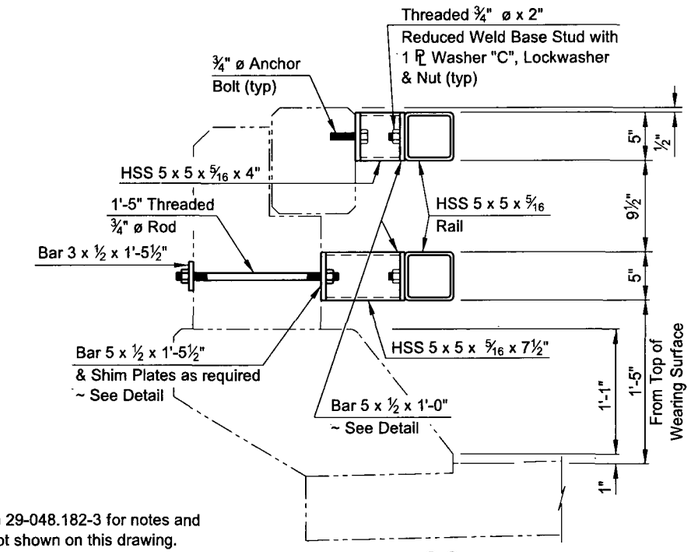


B-B



Indicates Concrete Removal

PLAN
CONCRETE REMOVAL DETAIL



C-C

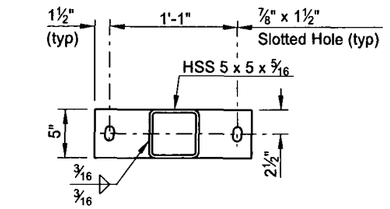
NOTE:

See Dwg 29-048.182-3 for notes and details not shown on this drawing.

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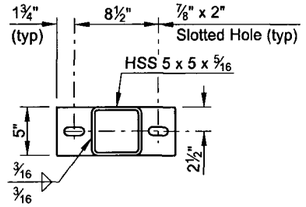
KINDRED INTERCHANGE

DOUBLE BOX BEAM
E-RAIL RETROFIT DETAILS



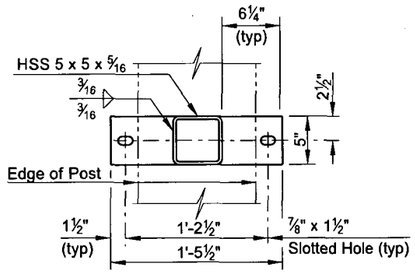
(CONCRETE RAIL CONNECTION)

BAR 5 X ½ X 1'-4" DETAIL



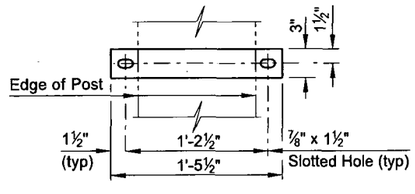
(RAIL CONNECTION)

BAR 5 X ½ X 1'-0" DETAIL



(CONCRETE POST CONNECTION)

BAR 5 X ½ X 1'-5½" DETAIL

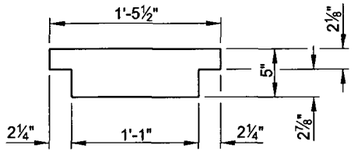


(CONCRETE POST CONNECTION)

BAR 3 X ½ X 1'-5½" DETAIL

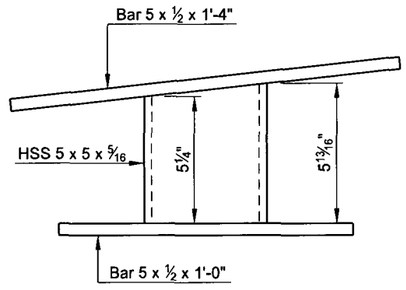
The filled circles indicate drilled and tapped holes for ⅞" ø bolts M 164 (A 325). See Detail "B."

The open circle indicates a drilled hole through the ½" plate for a ⅞" ø bolt M 164 (A 325).



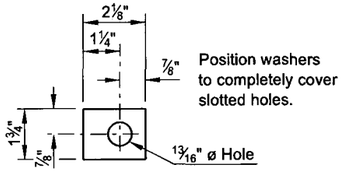
¼" & ⅛" Thickness
Quantity determined in field.

SHIM PLATE DETAIL



(ON MODIFIED END POST)

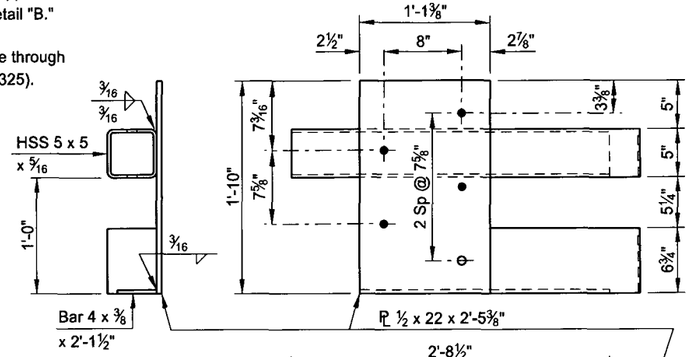
BOTTOM RAIL CONNECTION DETAIL



(GRADE 36)

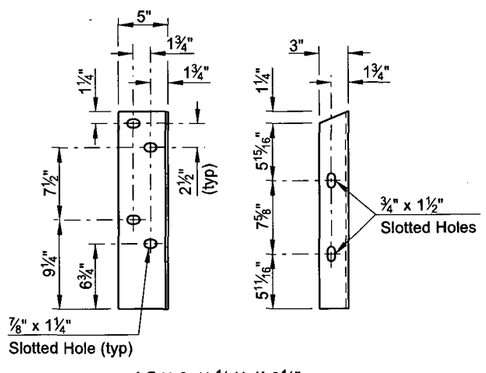
¼" ℄ WASHER "C"

23 U.S.C. 409
NDDOT Reserves All Objections



(4 REQUIRED)

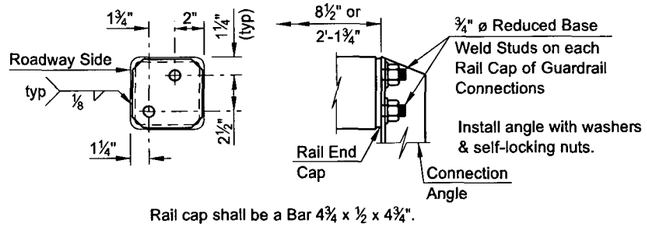
GUARDRAIL CONNECTION PLATE DETAILS



L5 X 3 X ¼ X 1'-8½"

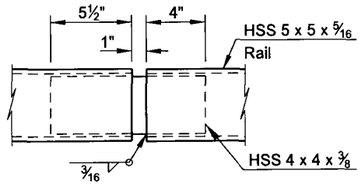
(4 REQUIRED)

CONNECTION ANGLE DETAILS

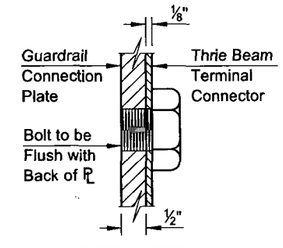


Rail cap shall be a Bar 4¾ x ½ x 4¾".
Cope corners 1" to provide zinc drains.

RAIL CAP DETAILS



RAIL SPLICE DETAIL



DETAIL "B"

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	SS-8-046(019)105	170	20

NOTES:

The bid item shall be "Double Box Beam Rail Retrofit - E-Rail." The pay length shall be end to end and in linear feet.

Payment for the railing shall include compensation for furnishing and installing the guardrail connection plates and for sawing and removing portions of the curb.

Railing shall be fabricated to the horizontal and vertical alignment of the structure. Rails shall be fabricated so that each rail segment between splices is attached to a minimum of two posts.

Rail elements shall be square structural tubing in accordance with ASTM Specification A 500 Grade B.

Steel plates and angles shall conform to ASTM Specification A 36, unless otherwise noted.

All structural steel shall be hot-dip galvanized after fabrication according to AASHTO M 111.

Threaded rods shall be Grade 36 steel and galvanized according to AASHTO M 232. The threaded rods shall be tightened to provide a minimum tensile force of 2,500 lbs and a maximum tensile force of 2,700 lbs.

All bolts and anchor bolts shall be ASTM A 325 or A 449. Reduced base studs shall be ASTM A 307 Grade C. Nuts shall be ASTM A 563 and washers shall be ASTM F 436. All bolts, studs, nuts and washers shall be galvanized according to AASHTO M 232.

Anchor bolts shall be embedded into the concrete with a chemical adhesive system that can develop a tensile strength of at least 17,500 lbs.

The Contractor shall field verify all dimensions and incorporate them into the shop drawings. The double box beam rail retrofit shop drawings shall be submitted for review to the Engineer before fabrication.

This document was originally issued and sealed by Tim L Schwagler, Registration Number PE 3151, on 11/26/13 and the original document is stored at the North Dakota Department of Transportation

KINDRED INTERCHANGE

DOUBLE BOX BEAM E-RAIL RETROFIT DETAILS

I-29 KINDRED INTERCHANGE BRIDGE E-RAIL

PAGE INDEX

COVER PAGE
BRIDGE LAYOUT - PAGE 1
RAIL LAYOUTS - PAGE 2-9
DETAILS/NOTES- PAGE 10-13

ND PROJECT # SS-SAP-8-046(019)105
BRIDGE # 29-048.182

CASS & RICHLAND COUNTY, ND

DAKOTA FENCE CO. - SUBCONTRACTOR
RILEY BROTHERS CONSTRUCTION INC. - PRIME CONTRACTOR

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION ENGINEER

Shop Drawings Have
Been Reviewed and
Checked As Submitted
and Are in Conformance
with Contract Documents
Dakota Fence Co.

NO EXCEPTIONS NOTED

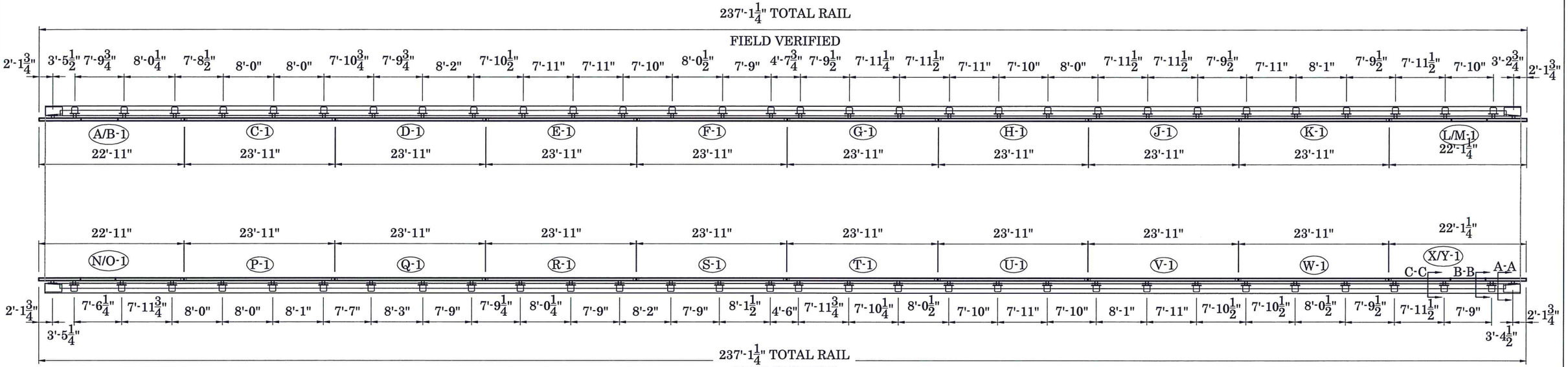
Dean Stolz

Digitally signed by Dean Stolz
DN: cn=Dean Stolz, o=ND DOT, ou=Bridge Division, email=dstolz@nd.gov, c=US
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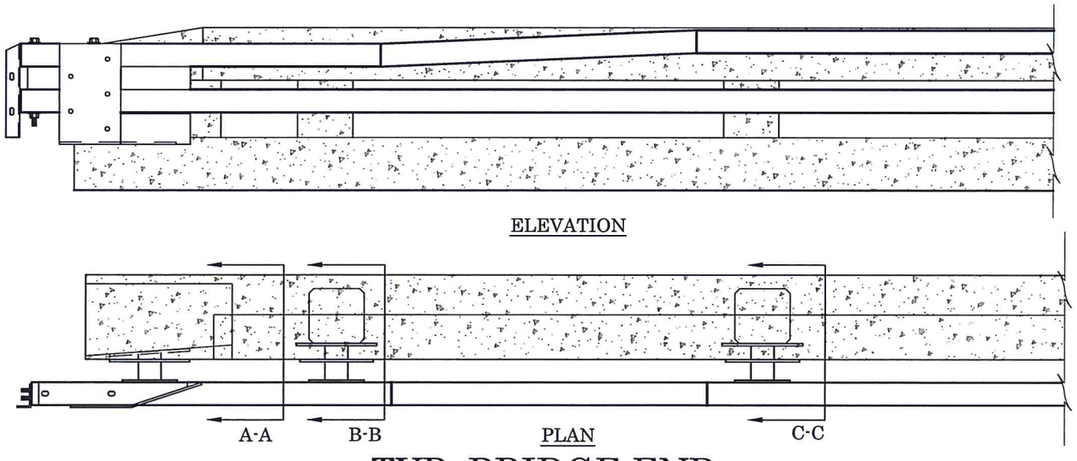
REVIEW DOES NOT RELIEVE CONTRACTOR FROM RESPONSIBILITY FOR ERRORS, OMISSIONS, OR DEVIATIONS FROM CONTRACT REQUIREMENTS

NDDOT

6/9/2014



BRIDGE E-RAIL LAYOUT



TYP. BRIDGE END

SEE PAGE 11 OF 13 FOR A-A, B-B, C-C DETAILS

N

Shop Drawings Have Been Reviewed and Checked As Submitted and Are in Conformance with Contract Documents
Dakota Fence Co.

No Exceptions Noted
BY: D Stolz
DATE: June 10, 2014
REVIEW DOES NOT RELIEVE CONTRACTOR FROM RESPONSIBILITY FOR ERRORS, OMISSIONS, OR DEVIATIONS FROM CONTRACT REQUIREMENTS
NDDOT

DUE TO SHOP PROCESS, SPLICES MAY OCCUR OTHER THAN SHOWN

PROJECT#	DRAWING#	SCALE:	REVISED:
14R4080	14.021	VARIES	5/30/14 NJS
DATE: 6/9/14	DRAWN BY: NJS		6/4/14 NJS

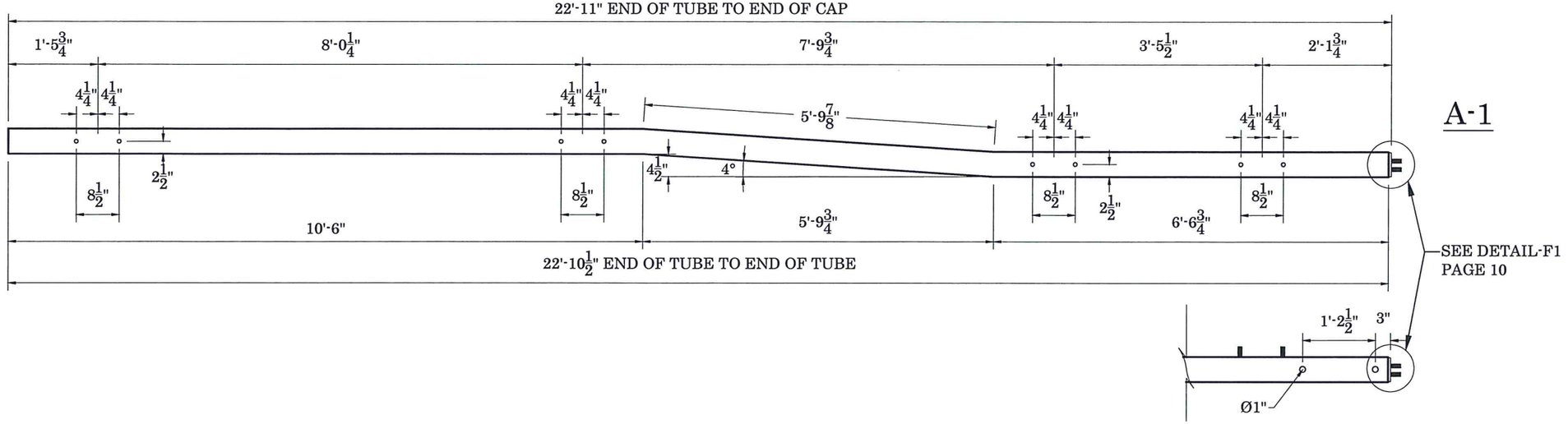
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ND PROJECT # SS-SAP-8-046(019)105 BRIDGE # 29-048.182
I-29 KINDRED INTERCHANGE BRIDGE E-RAIL
CASS & RICHLAND COUNTY, ND

RILEY BROTHERS CONST. INC.>>PRIME CONTRACTOR
DAKOTA FENCE CO.>> SUB-CONTRACTOR
NDDOT >> ENGINEER

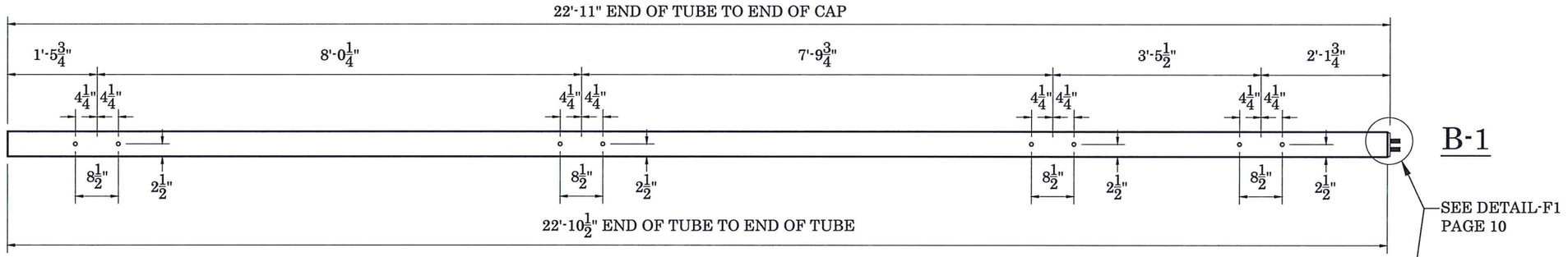
Dakota Fence.
FARGO, BISMARCK, MINOT, WILLISTON

1110 25th Ave N. BOX 1405 Fargo, ND 58107 Phone:(701) 237-6181 Fax: (701) 293-7811
1720 12th St. S. BOX 62 Bismarck, ND 58502 Phone:(701) 258-9095 Fax: (701) 223-3140
1915 20th Ave. SE. BOX 3066 Minot, ND 58702 Phone:(701) 852-6263 Fax: (701) 852-0931
6407 138th Ave. NW. Williston, ND 58802 Phone:(701) 826-6264



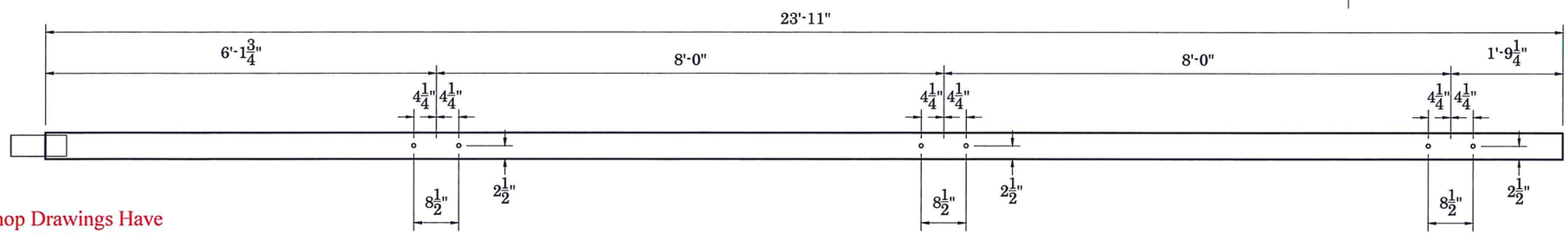
A-1

SEE DETAIL-F1
PAGE 10



B-1

SEE DETAIL-F1
PAGE 10



C-1

Shop Drawings Have
Been Reviewed and
Checked As Submitted
and Are in Conformance
with Contract Documents
Dakota Fence Co.

No Exceptions Noted
BY: D Stolz
DATE: June 10, 2014
REVIEW DOES NOT RELIEVE CONTRACTOR FROM RESPONSIBILITY FOR ERRORS, OMISSIONS, OR DEVIATIONS FROM CONTRACT REQUIREMENTS
NDDOT

NORTH RAIL SECTION DETAILS

PROJECT#	DRAWING#	SCALE:
14R4080	14.021	VARIES
DATE: 6/9/14	DRAWN BY: NJS	

REVISED:
5/30/14 NJS
6/4/14 NJS

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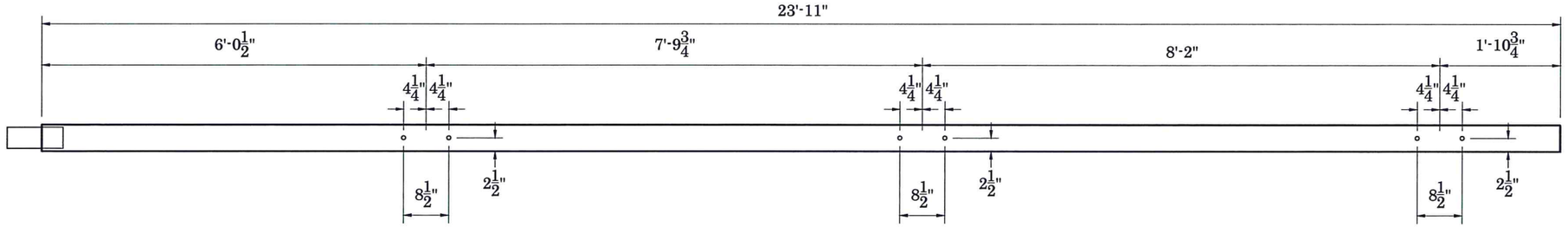
ND PROJECT # SS-SAP-8-046(019)105 BRIDGE # 29-048.182
I-29 KINDRED INTERCHANGE BRIDGE E-RAIL
CASS & RICHLAND COUNTY, ND

RILEY BROTHERS CONST. INC.>>PRIME CONTRACTOR
DAKOTA FENCE CO.>> SUB-CONTRACTOR
NDDOT >> ENGINEER

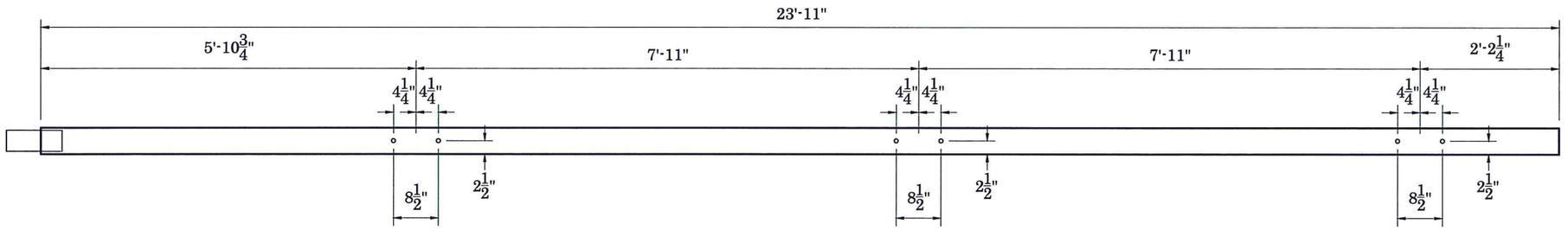
DUE TO SHOP PROCESS, SPLICES MAY OCCUR OTHER THAN SHOWN

Dakota Fence
FARGO, BISMARCK, MINOT, WILLISTON

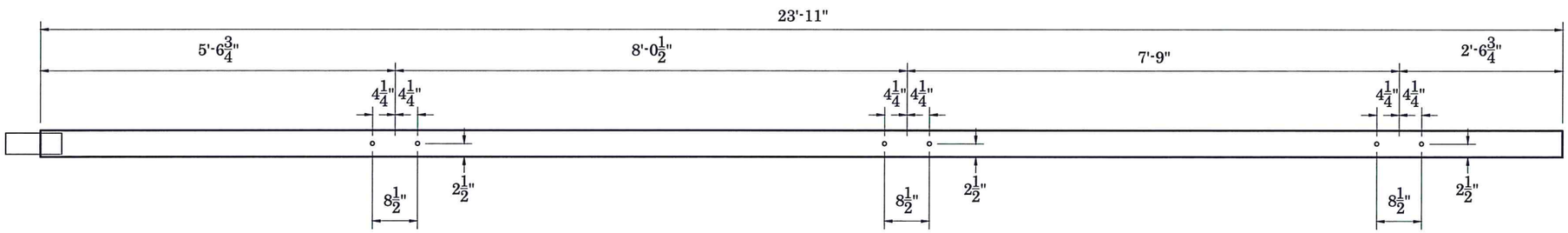
1110 25th Ave N. BOX 1408 Fargo, ND 58107 Phone:(701) 237-6181 Fax: (701) 293-7811
1720 12th St. S. BOX 62 Bismarck, ND 58502 Phone:(701) 258-9095 Fax: (701) 223-3140
1915 20th Ave. SE. BOX 3066 Minot, ND 58702 Phone:(701) 852-6263 Fax: (701) 852-0931
6407 138th Ave. NW. Williston, ND 58802 Phone:(701) 826-6264



D-1



E-1



F-1

Shop Drawings Have Been Reviewed and Checked As Submitted and Are in Conformance with Contract Documents
Dakota Fence Co.

No Exceptions Noted
BY: D Stolz
DATE: June 10, 2014
REVIEW DOES NOT RELIEVE CONTRACTOR FROM RESPONSIBILITY FOR ERRORS, OMISSIONS, OR DEVIATIONS FROM CONTRACT REQUIREMENTS
NDDOT

NORTH RAIL SECTION DETAILS

PROJECT#	DRAWING#	SCALE:	REVISED:
14R4080	14.021	VARIES	5/30/14 NJS
DATE: 6/9/14	DRAWN BY: NJS		6/4/14 NJS

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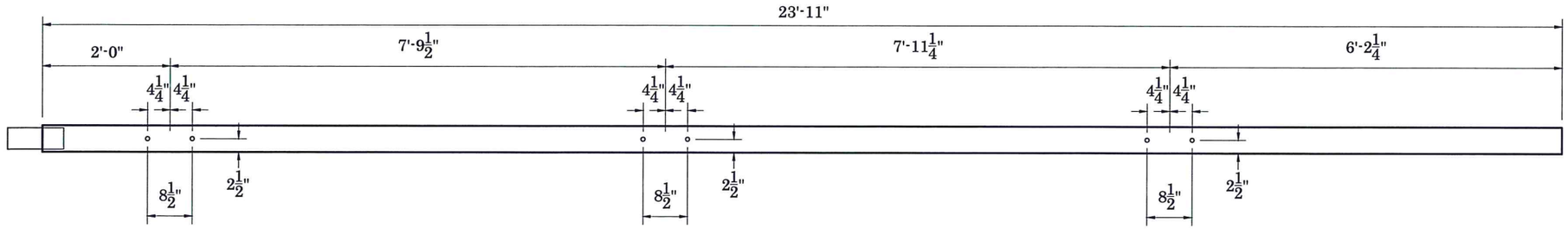
ND PROJECT # SS-SAP-8-046(019)105 BRIDGE # 29-048.182
I-29 KINDRED INTERCHANGE BRIDGE E-RAIL
CASS & RICHLAND COUNTY, ND

RILEY BROTHERS CONST. INC.>>PRIME CONTRACTOR
DAKOTA FENCE CO.>> SUB-CONTRACTOR
NDDOT >> ENGINEER

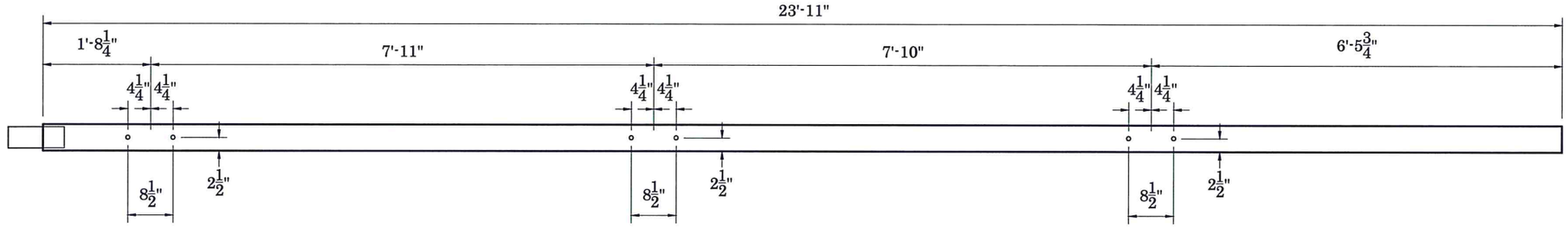
DUE TO SHOP PROCESS, SPLICES MAY OCCUR OTHER THAN SHOWN

Dakota Fence
FARGO, BISMARCK, MINOT, WILLISTON

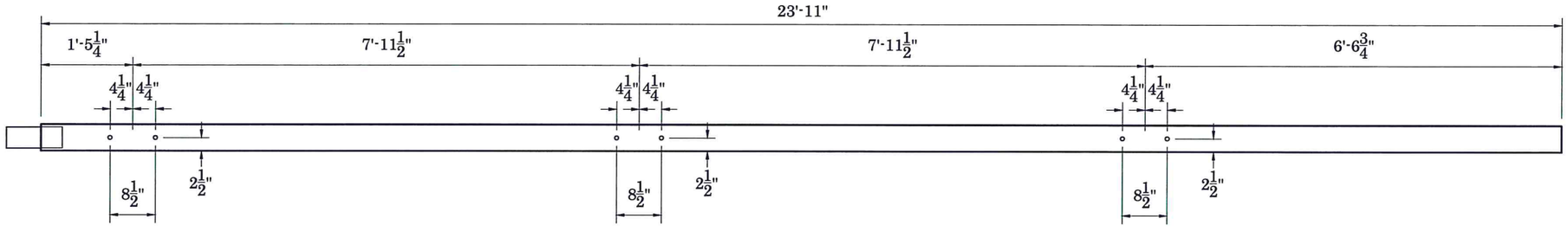
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6407 138th Ave. NW. Williston, ND 58802 Phone:(701) 826-6264



G-1



H-1



J-1

Shop Drawings Have Been Reviewed and Checked As Submitted and Are in Conformance with Contract Documents Dakota Fence Co.

No Exceptions Noted
BY: D Stolz
DATE: June 10, 2014
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NDDOT

NORTH RAIL SECTION DETAILS

PROJECT#	DRAWING#	SCALE:	REVISED:
14R4080	14.021	VARIES	5/30/14 NJS
DATE: 6/9/14	DRAWN BY: NJS		6/4/14 NJS

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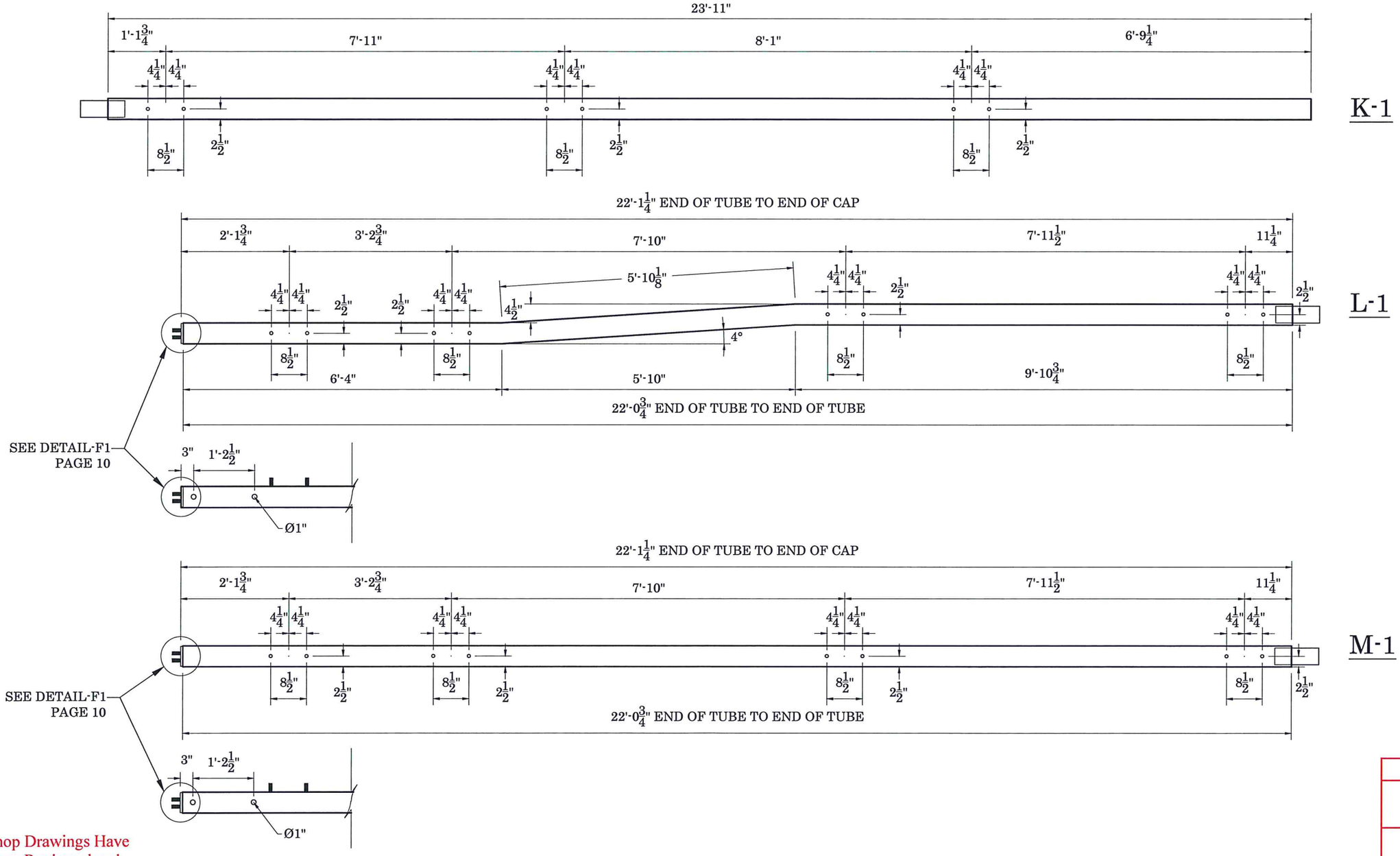
ND PROJECT # SS-SAP-8-046(019)105 BRIDGE # 29-048.182
I-29 KINDRED INTERCHANGE BRIDGE E-RAIL
CASS & RICHLAND COUNTY, ND

RILEY BROTHERS CONST. INC.>>PRIME CONTRACTOR
DAKOTA FENCE CO.>> SUB-CONTRACTOR
NDDOT >> ENGINEER

DUE TO SHOP PROCESS, SPLICES MAY OCCUR OTHER THAN SHOWN

Dakota Fence.
FARGO, BISMARCK, MINOT, WILLISTON

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1720 12th St. S. BOX 62 Bismarck, ND 58502 Phone:(701) 258-9095 Fax: (701) 223-3140
1915 20th Ave. SE. BOX 3066 Minot, ND 58702 Phone:(701) 852-6263 Fax: (701) 852-0931
6407 138th Ave. NW. Phone:(701) 826-6264 Williston, ND 58802



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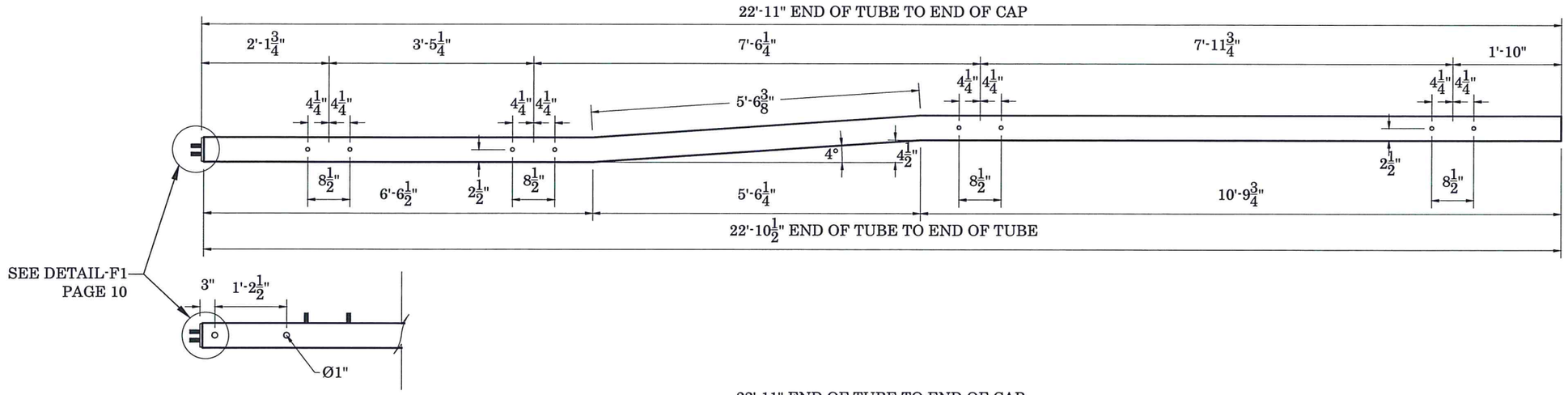
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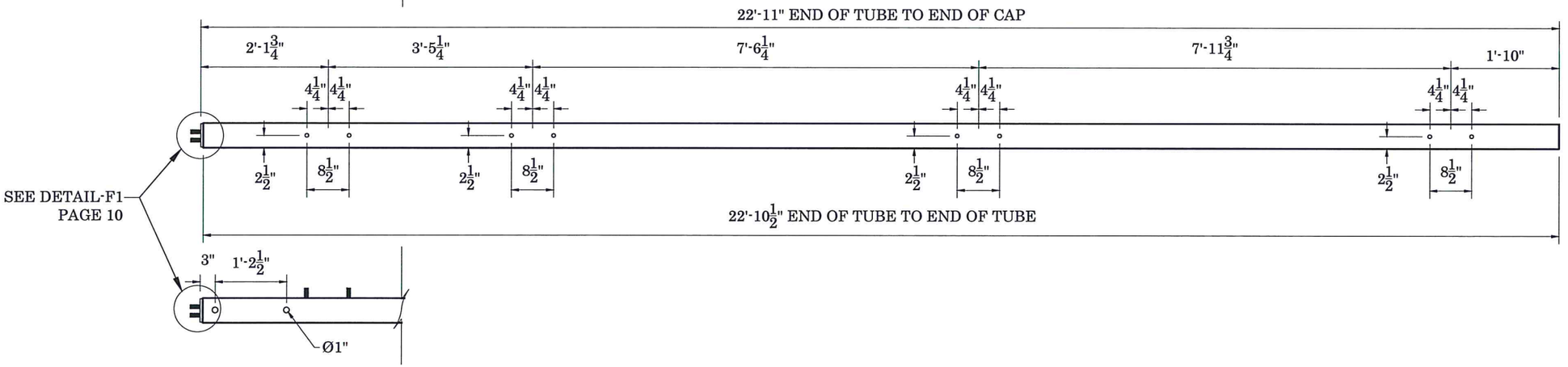
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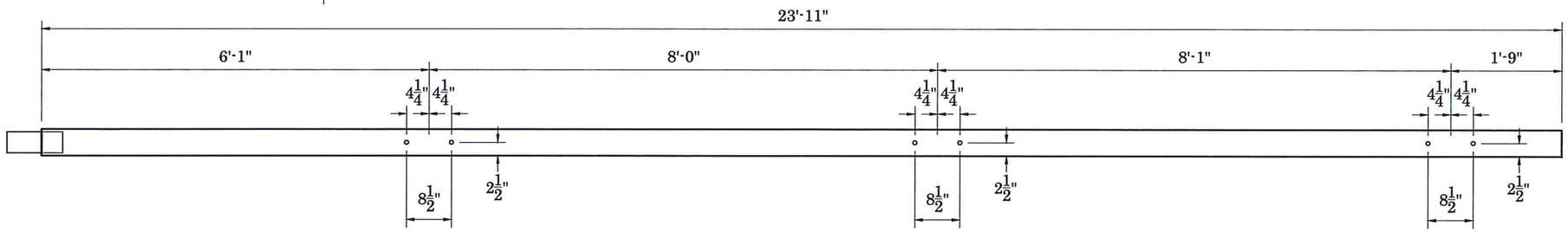
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N-1



O-1



P-1

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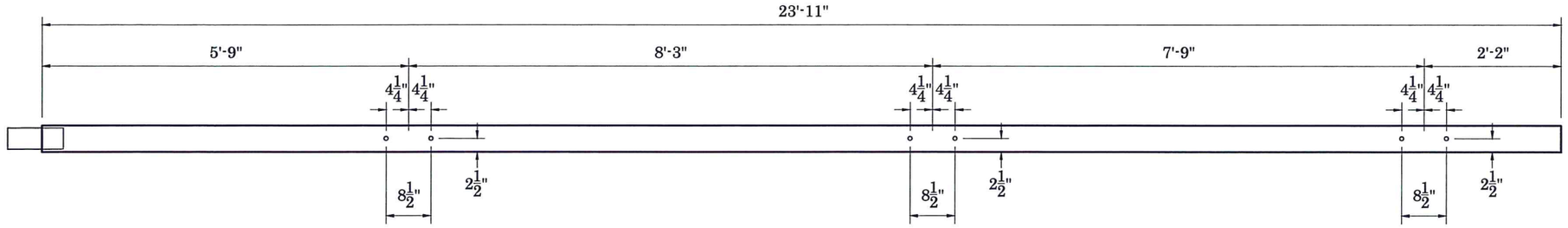
ND PROJECT # SS-SAP-8-046(019)105 BRIDGE # 29-048.182
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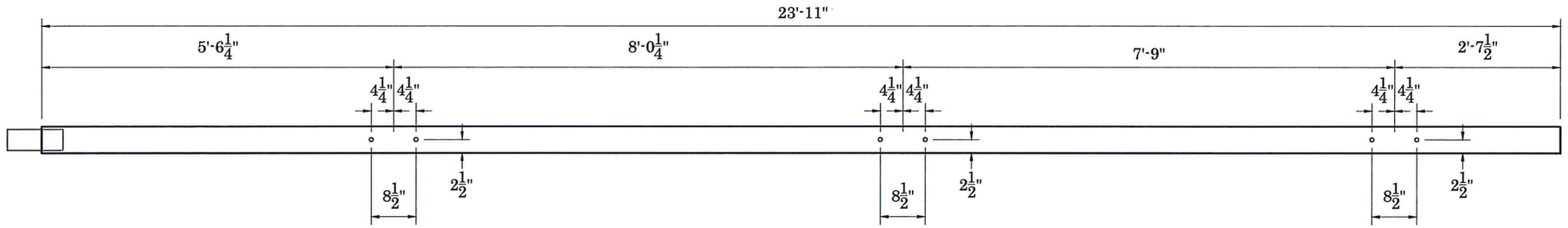
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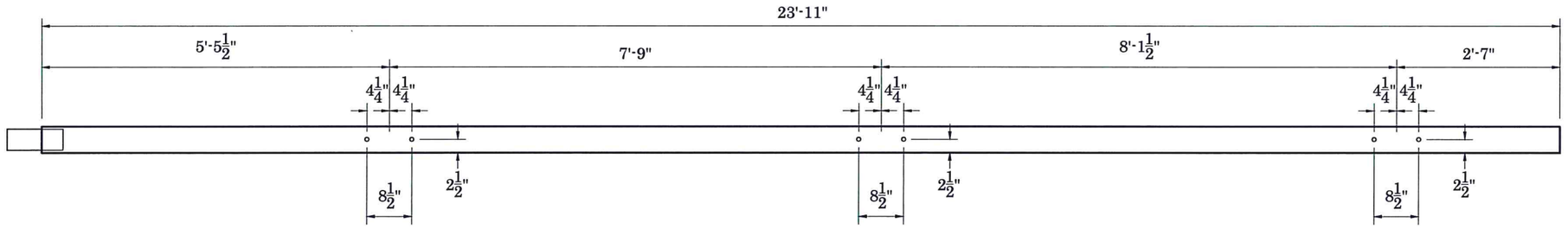
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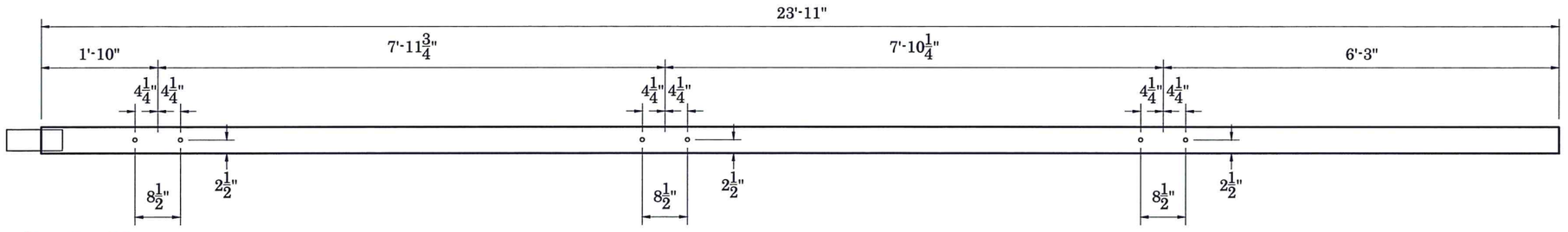
Q-1



R-1



S-1



T-1

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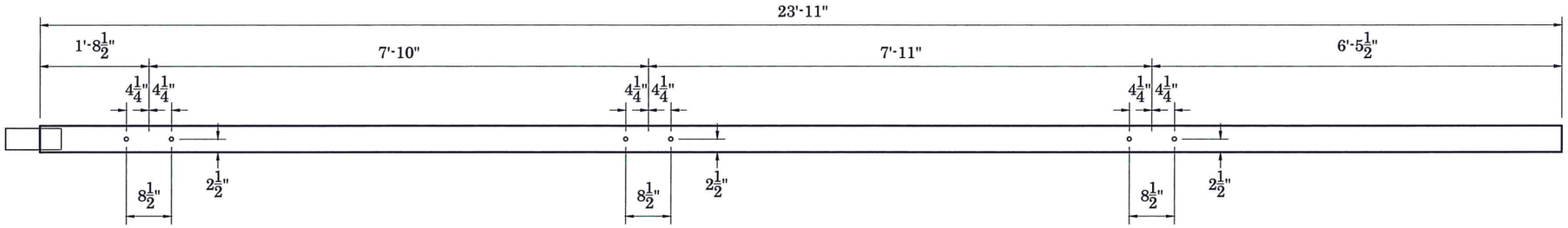
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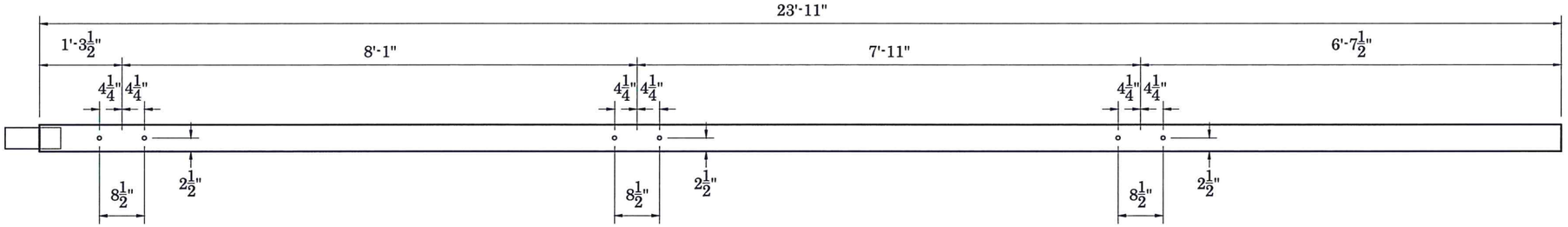
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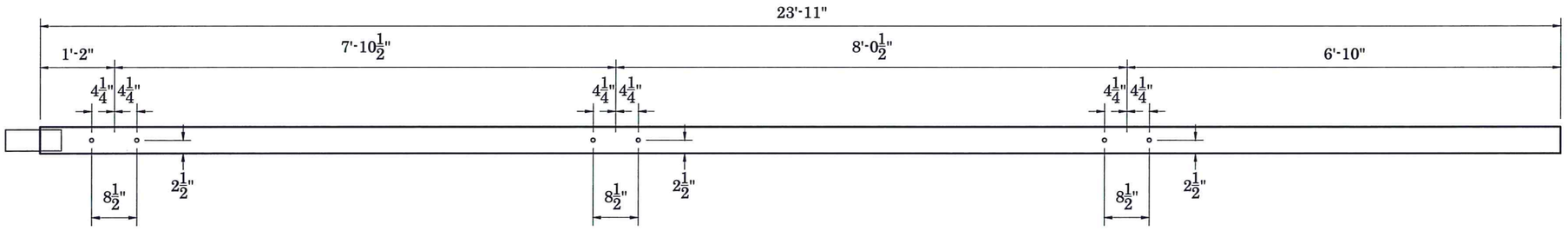
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U-1



V-1



W-1

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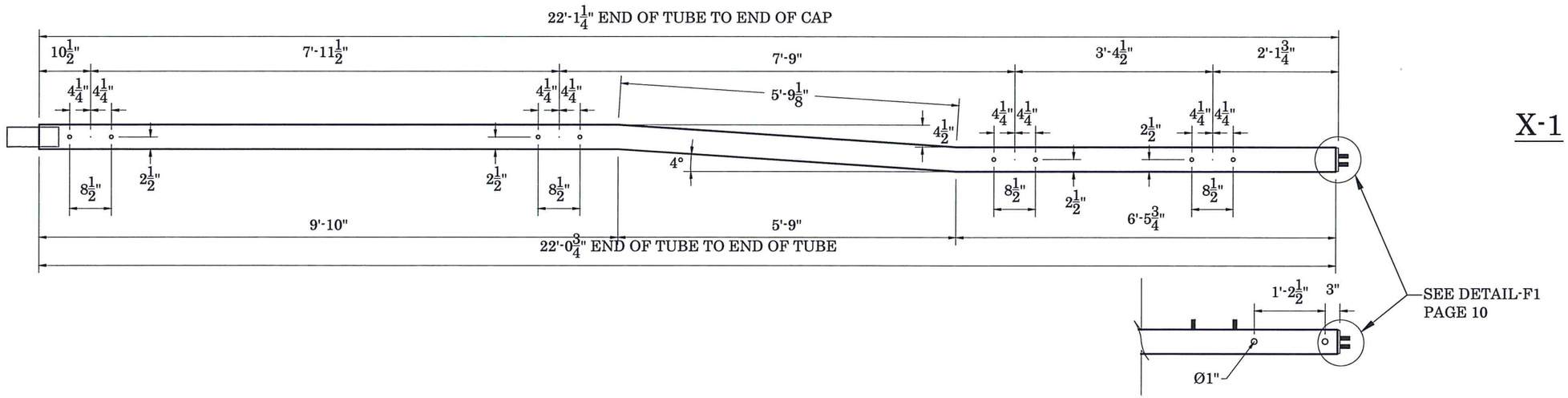
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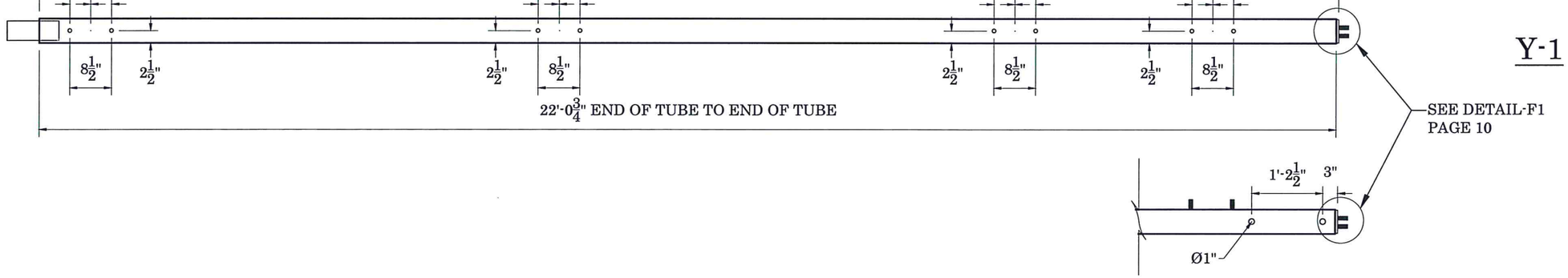
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X-1



Y-1

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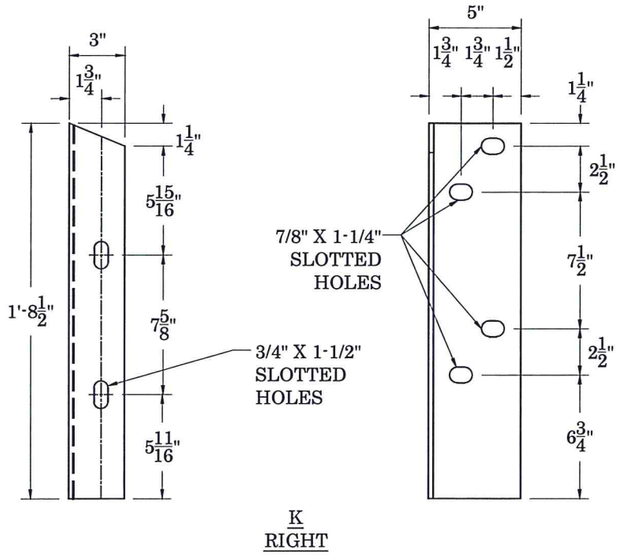
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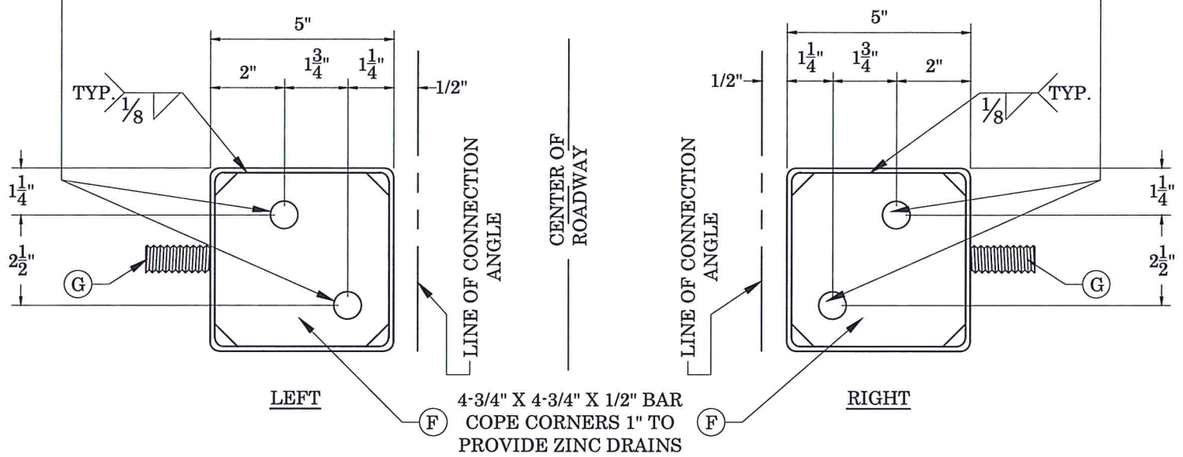
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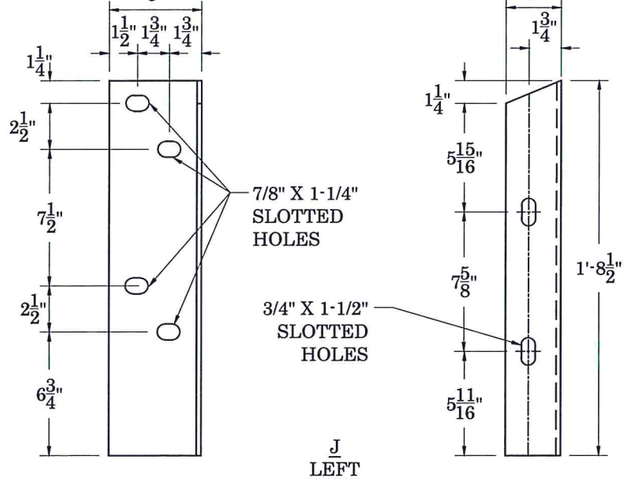


K
RIGHT

2 @ 3/4"Ø REDUCED BASE WELDED STUDS ON EACH RAIL CAP OF GUARD RAIL CONNECTIONS. STUDS 2" LONG. INSTALL CONNECTION ANGLE W/ NUTS & LOCK WASHERS.

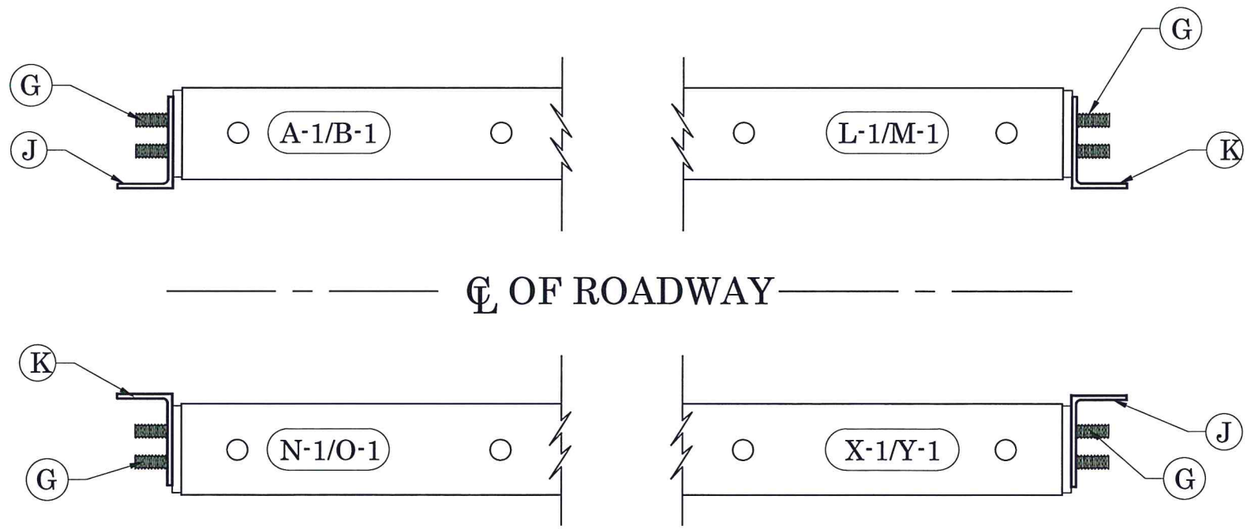


RAIL END CAP DETAILS - F1



J
LEFT

CONNECTION ANGLE DETAIL



CONNECTION ANGLE ATTACHMENT DETAIL

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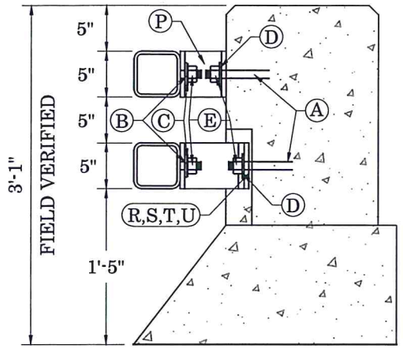
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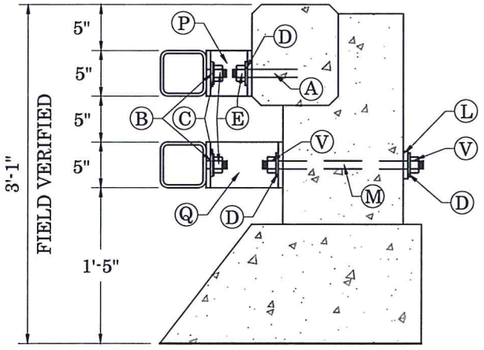
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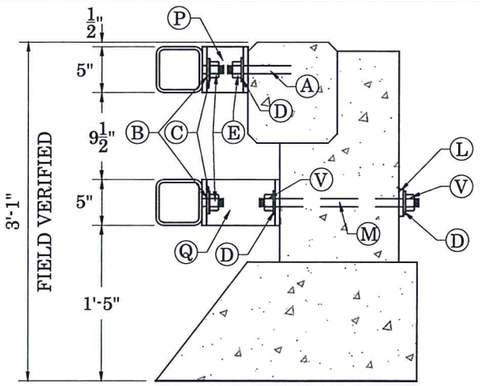
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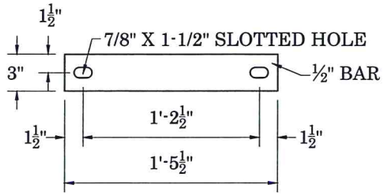
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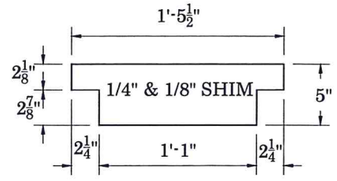
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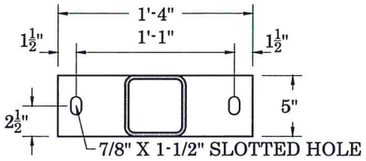
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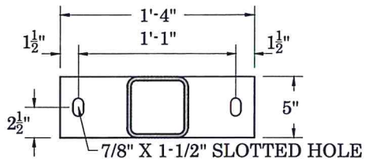


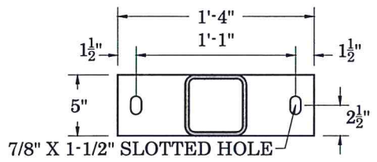
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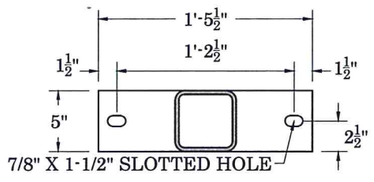


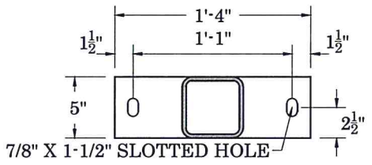
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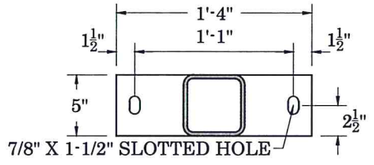


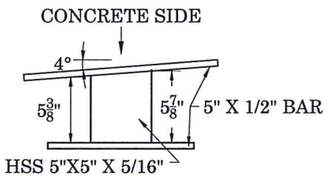






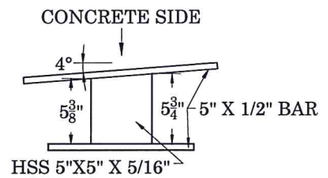






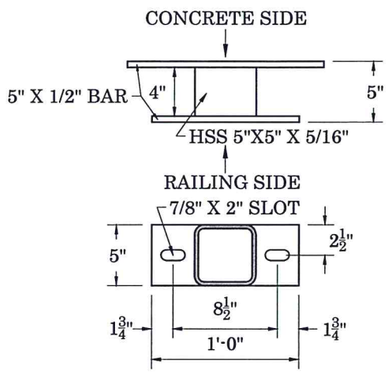
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NORTH WEST
CORNER

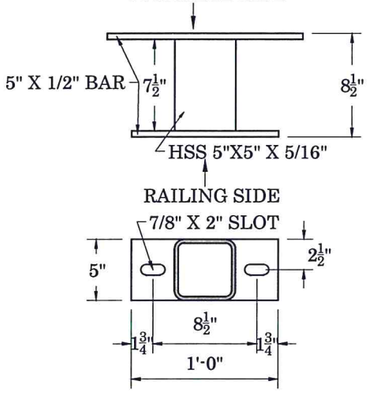


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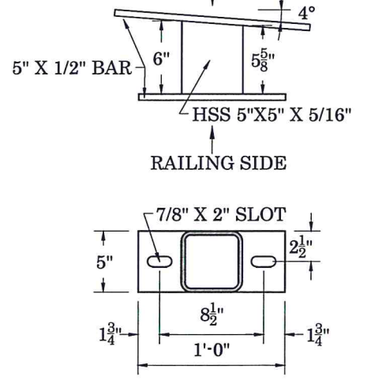
SOUTH WEST
CORNER



P

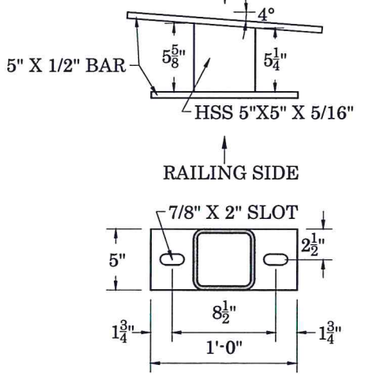


Q



R

SOUTH EAST
CORNER



S

NORTH EAST
CORNER

Shop Drawings Have Been Reviewed and Checked As Submitted and Are in Conformance with Contract Documents
Dakota Fence Co.

No Exceptions Noted
BY: D Stolz
DATE: June 10, 2014
REVIEW DOES NOT RELIEVE CONTRACTOR FROM RESPONSIBILITY FOR ERRORS, OMISSIONS, OR DEVIATIONS FROM CONTRACT REQUIREMENTS
NDDOT

NOTE:
SEE PAGE 1 OF 13 FOR A-A, B-B, C-C

PROJECT#	DRAWING#	SCALE:	REVISED:
14R4080	14.021	VARIES	5/30/14 NJS
DATE: 6/9/14	DRAWN BY: NJS		6/4/14 NJS

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ND PROJECT # SS-SAP-8-046(019)105 BRIDGE # 29-048.182
I-29 KINDRED INTERCHANGE BRIDGE E-RAIL
CASS & RICHLAND COUNTY, ND

RILEY BROTHERS CONST. INC.>>PRIME CONTRACTOR
DAKOTA FENCE CO.>> SUB-CONTRACTOR
NDDOT >> ENGINEER

DUE TO SHOP PROCESS, SPLICES MAY OCCUR OTHER THAN SHOWN

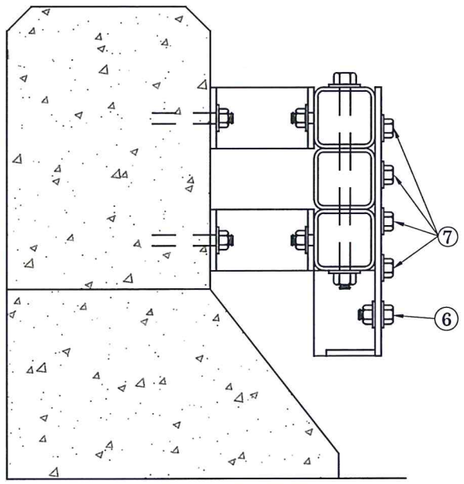
Dakota Fence.
FARGO, BISMARCK, MINOT, WILLISTON

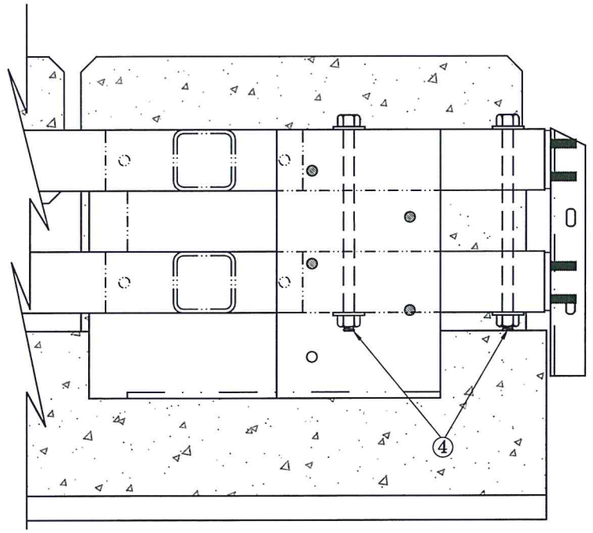
1110 25th Ave N. BOX 1408 Fargo, ND 58107 Phone:(701) 237-6181 Fax: (701) 293-7811
1720 12th St. S. BOX 62 Bismarck, ND 58502 Phone:(701) 258-9095 Fax: (701) 223-3140
1915 20th Ave. SE. BOX 3066 Minot, ND 58702 Phone:(701) 852-6263 Fax: (701) 852-0931
6407 138th Ave. NW. Phone:(701) 826-6264 Williston, ND 58802

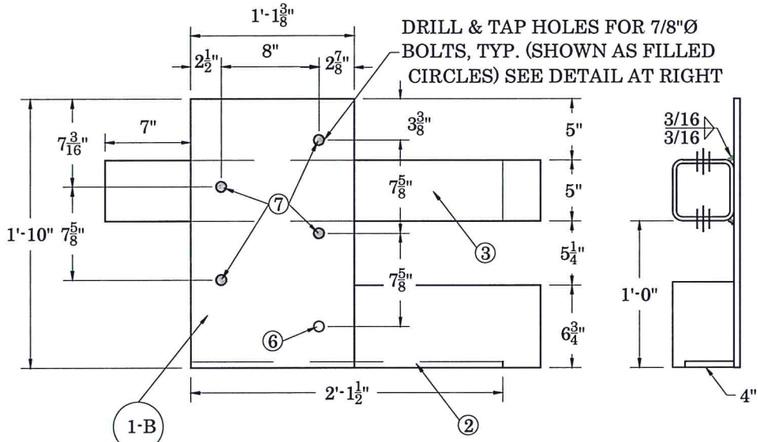
CONNECTION PLATE PARTS LIST

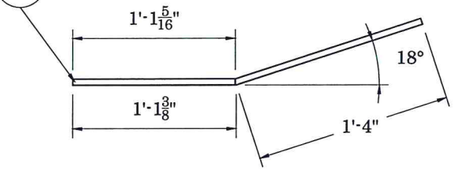
PART	QUANTITY	LENGTH	DESCRIPTION	MATERIAL
①-B	4	1'-10"	½" X 2'-5⅜" PLATE	ASTM A-36
②	4	2'-1½"	4" X ⅜" BAR	ASTM A-36
③	4	2'-8½"	HSS 5" X 5" X 5/16"	ASTM A500 GRADE B
④	8	18"	⅞" BOLT X 2 WASHERS, LOCK WASHER & NUT	ASTM A325,F436,A563
⑥	4	2½"	⅞" BOLT X 2 FLAT WASHERS, LOCK WASHER & NUT	ASTM A325,F436,A563
⑦	16	⅝"	⅞" X ⅝" BOLT 1 FLAT WASHER	ASTM A325,F436

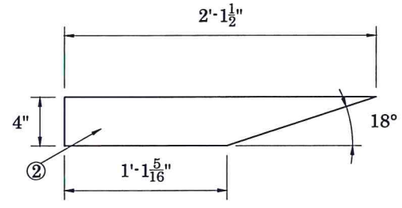
(TWO LEFT / TWO RIGHT)

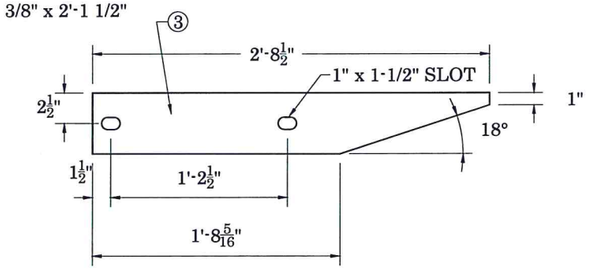


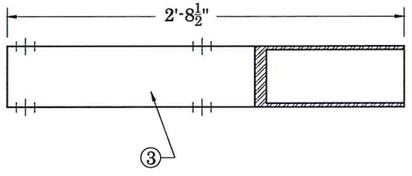


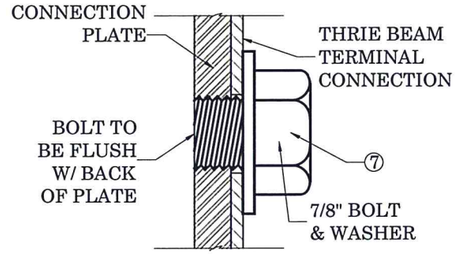












BOLT & TAP DETAIL

Shop Drawings Have Been Reviewed and Checked As Submitted and Are in Conformance with Contract Documents
Dakota Fence Co.

No Exceptions Noted
BY: D Stolz
DATE: June 10, 2014
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NDDOT

PROJECT#	DRAWING#	SCALE:	REVISED:
14R4080	14.021	VARIES	5/30/14 NJS
DATE: 6/9/14	DRAWN BY: NJS		6/4/14 NJS

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ND PROJECT # SS-SAP-8-046(019)105 BRIDGE # 29-048.182
I-29 KINDRED INTERCHANGE BRIDGE E-RAIL
CASS & RICHLAND COUNTY, ND

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DAKOTA FENCE CO.>> SUB-CONTRACTOR
NDDOT >> ENGINEER

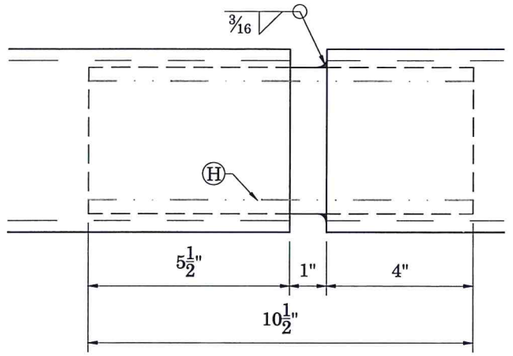
DUE TO SHOP PROCESS, SPLICES MAY OCCUR OTHER THAN SHOWN

Dakota Fence
FARGO, BISMARCK, MINOT, WILLISTON

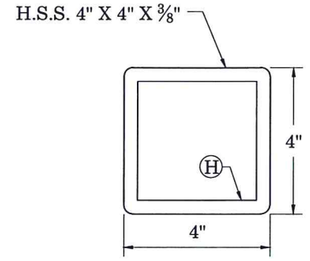
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6407 138th Ave. NW. Williston, ND 58802 Phone:(701) 826-6264

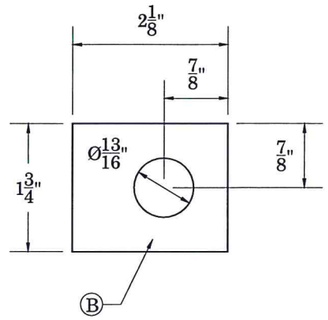
PARTS LIST

PART	QUANTITY	LENGTH	DESCRIPTION	MATERIAL
A	136	6"	¾" ANCHOR STUD	ASTM A449
B	256	2 ⅛"	¼" X 1 ¾" BAR WASHER	ASTM A-36
C	272	-	¾" LOCK WASHER	ASTM F436
D	376	-	¾" WASHER	ASTM F436
E	408	-	¾" NUT	ASTM A563
F	8	4 ¾"	4 ¾" X ½" BAR	ASTM A-36
G	272	2"	¾" X 2" STUD	ASTM A307 GR. C
H	36	10 ½"	HSS 4" X 4" X ⅜" SQ. TUBE	ASTM A500 GRADE B
J	2	1'-8 ½"	¼" X 5" X 3" CONN. ANGLE (LEFT)	ASTM A-36
K	2	1'-8 ½"	¼" X 5" X 3" CONN. ANGLE (RIGHT)	ASTM A-36
L	60	1'-5½"	½" X 3" MOUNTING BAR	ASTM A-36
M	120	1'-6"	¾" ROD (THREADED)	M-270 / A-36
N	10		¼" SHIM PLATE	ASTM A-36
O	10		⅛" SHIM PLATE	ASTM A-36
P	64	5"	RAIL SPACER ASSEMBLY	ASTM A-36
Q	60	8½"	RAIL SPACER ASSEMBLY	ASTM A-36
R	1	VARIES	RAIL SPACER ASSEMBLY	ASTM A-36
S	1	VARIES	RAIL SPACER ASSEMBLY	ASTM A-36
T	1	VARIES	RAIL SPACER ASSEMBLY	ASTM A-36
U	1	VARIES	RAIL SPACER ASSEMBLY	ASTM A-36
V	240	-	¾" NUT	ASTM A563
A-1	1	22'-10½"	HSS 5" X 5" X 5/16"	ASTM A500 GRADE B
B-1	1	22'-10½"	HSS 5" X 5" X 5/16"	ASTM A500 GRADE B
C-1	2	23'-11"	HSS 5" X 5" X 5/16"	ASTM A500 GRADE B
D-1	2	23'-11"	HSS 5" X 5" X 5/16"	ASTM A500 GRADE B
E-1	2	23'-11"	HSS 5" X 5" X 5/16"	ASTM A500 GRADE B
F-1	2	23'-11"	HSS 5" X 5" X 5/16"	ASTM A500 GRADE B
G-1	2	23'-11"	HSS 5" X 5" X 5/16"	ASTM A500 GRADE B
H-1	2	23'-11"	HSS 5" X 5" X 5/16"	ASTM A500 GRADE B
J-1	2	23'-11"	HSS 5" X 5" X 5/16"	ASTM A500 GRADE B
K-1	2	23'-11"	HSS 5" X 5" X 5/16"	ASTM A500 GRADE B
L-1	1	22'-0¾"	HSS 5" X 5" X 5/16"	ASTM A500 GRADE B
M-1	1	22'-0¾"	HSS 5" X 5" X 5/16"	ASTM A500 GRADE B
N-1	1	22'-10½"	HSS 5" X 5" X 5/16"	ASTM A500 GRADE B
O-1	1	22'-10½"	HSS 5" X 5" X 5/16"	ASTM A500 GRADE B
P-1	2	23'-11"	HSS 5" X 5" X 5/16"	ASTM A500 GRADE B
Q-1	2	23'-11"	HSS 5" X 5" X 5/16"	ASTM A500 GRADE B
R-1	2	23'-11"	HSS 5" X 5" X 5/16"	ASTM A500 GRADE B
S-1	2	23'-11"	HSS 5" X 5" X 5/16"	ASTM A500 GRADE B
T-1	2	23'-11"	HSS 5" X 5" X 5/16"	ASTM A500 GRADE B
U-1	2	23'-11"	HSS 5" X 5" X 5/16"	ASTM A500 GRADE B
V-1	2	23'-11"	HSS 5" X 5" X 5/16"	ASTM A500 GRADE B
W-1	2	23'-11"	HSS 5" X 5" X 5/16"	ASTM A500 GRADE B
X-1	1	22'-0 ¾"	HSS 5" X 5" X 5/16"	ASTM A500 GRADE B
Y-1	1	22'-0 ¾"	HSS 5" X 5" X 5/16"	ASTM A500 GRADE B



RAIL SPLICE DETAIL





BAR WASHER DETAIL

NOTES:
RAIL ELEMENTS SHALL BE SQUARE STRUCTURAL TUBING IN ACCORDANCE WITH ASTM SPECIFICATION A-500 GRADE B.

STEEL PLATES, BARS, AND ANGLES SHALL CONFORM TO ASTM A-36, UNLESS OTHERWISE NOTED.

RAILING SHALL BE FABRICATED TO THE HORIZONTAL AND VERTICAL ALIGNMENT OF THE STRUCTURE. RAILS SHALL BE FABRICATED SO THAT EACH RAIL SEGMENT BETWEEN SPLICES IS ATTACHED TO A MINIMUM OF TWO POSTS.

ALL BOLTS AND ANCHOR BOLTS SHALL BE ASTM A 325 AND A 449. ALL BOLTS, NUTS, AND WASHERS SHALL BE GALVANIZED TO AASHTO M 232.

ALL STRUCTURAL STEEL FASTENERS AASHTO M232 SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION ACCORDING TO THE AASHTO M111.

ANCHOR SYSTEM DATA

ANCHOR -¾" DIA. AASHTO M-164 (ASTM A325)

ADHESIVE- AT ACRYLIC-TIE ADHESIVE AS MANUFACTURED BY SIMPSON STRONG-TIE COMPANY.
THE ULTIMATE TENSION CAPACITY BASED ON THE BOND STRENGTH WITH fC=2,000psi AT AN EMBEDMENT OF 6¾" IN 37,616lb. THE EMBEDMENT REQUIRED TO DEVELOP AN ULTIMATE TENSION LOAD OF 17,000lb. WITH 4,000psi IS 4". THE EMBEDMENT REQUIRED TO DEVELOP AN ULTIMATE TENSION LOAD OF 20,000lb. WITH 4,000psi IN 4½".

Shop Drawings Have Been Reviewed and Checked As Submitted and Are in Conformance with Contract Documents
Dakota Fence Co.

No Exceptions Noted
BY: D Stolz
DATE: June 10, 2014
REVIEW DOES NOT RELIEVE CONTRACTOR FROM RESPONSIBILITY FOR ERRORS, OMISSIONS, OR DEVIATIONS FROM CONTRACT REQUIREMENTS
NDDOT

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14R4080	14.021	VARIES	5/30/14 NJS
DATE: 6/9/14	DRAWN BY: NJS		6/4/14 NJS

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ND PROJECT # SS-SAP-8-046(019)105 BRIDGE # 29-048.182
I-29 KINDRED INTERCHANGE BRIDGE E-RAIL
CASS & RICHLAND COUNTY, ND

RILEY BROTHERS CONST. INC.>>PRIME CONTRACTOR
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NDDOT >> ENGINEER

Dakota Fence.
FARGO, BISMARCK, MINOT, WILLISTON

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JOB# 19

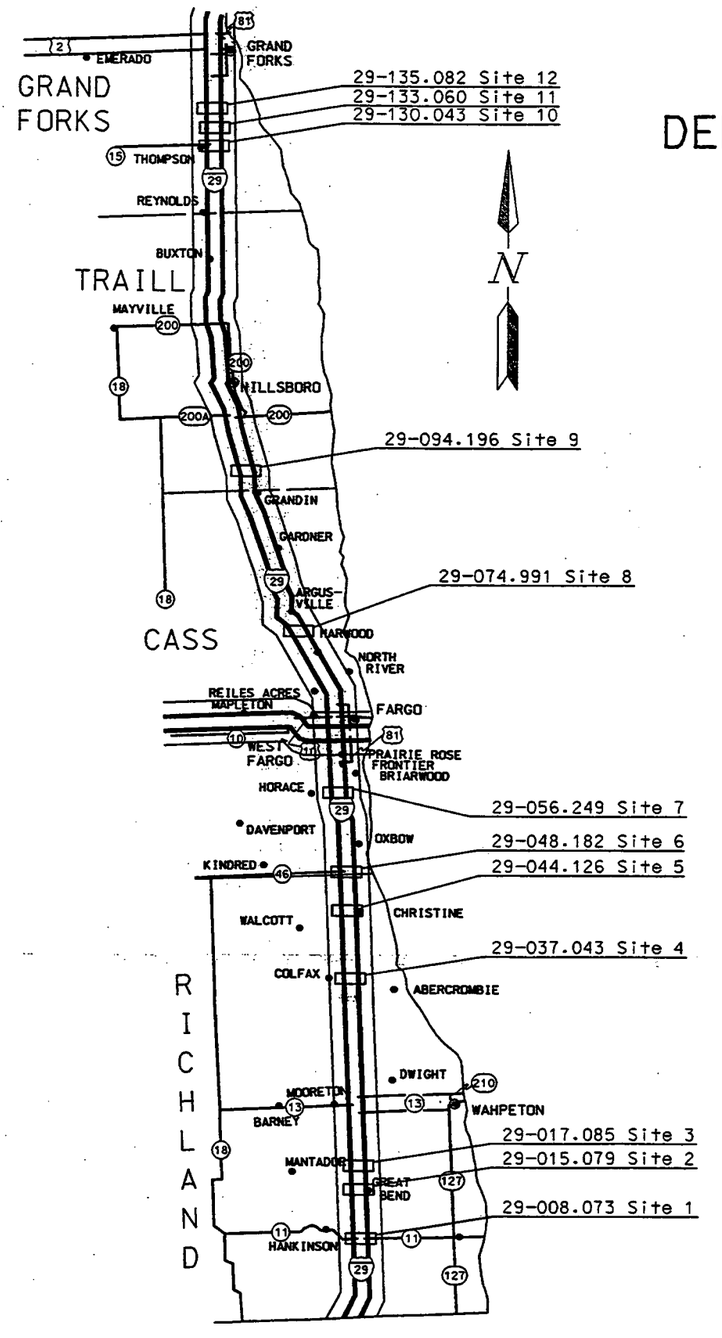
STATE	PROJECT NO.	PCN	SHEET NO.
ND	SIM-9-999(143)	14279	1

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

RICHLAND, CASS, TRAILL & GRAND FORKS COUNTIES

SIM-9-999(143)

CLEANING AND PAINTING
STRUCTURAL STEEL SURFACES ON
TWELVE BRIDGES ALONG INTERSTATE 29



SITE LOCATIONS

GOVERNING SPECIFICATIONS:

Standard Specifications adopted by the North Dakota Department of Transportation October 1997; Standard Drawings currently in effect; and other Contract Provisions submitted herein.

INDEX OF DRAWINGS

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	ESTIMATE OF QUANTITIES
3	BASIS OF ESTIMATE AND NOTES
4-5	STRUCTURAL STEEL PAINTING DETAILS

SPECIAL PROVISIONS

SP 357(97)	BRIDGE PAINTING

LIST OF STANDARD DRAWINGS

D-704-8	BREAKAWAY SYSTEMS FOR CONSTRUCTION ZONE SIGNS
D-704-9, 10, 11, 12	CONSTRUCTION SIGN DETAILS
D-704-13	BARRICADE DETAILS
D-704-14	CONSTRUCTION SIGN AND BARRICADE ASSEMBLY DETAILS
D-704-35	SIGN LAYOUT FOR ONE LANE CLOSURE INTERSTATE SYSTEM

I hereby certify that the attached plans were prepared by me or under my direct supervision and that I am a duly registered professional engineer under the laws of the state of ND.

APPROVED DATE March 23, 2001

Terrence R. Udland

BRIDGE ENGINEER
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

TERRENCE R. UDLAND
REGISTERED PROFESSIONAL ENGINEER
2674
NORTH DAKOTA

I hereby certify that the attached plans were prepared by me or under my direct supervision and that I am a duly registered professional engineer under the laws of the state of ND.

APPROVED DATE 3/23/2001

Ronald B. Zeigler

OFFICE OF INFRASTRUCTURE SUPPORT
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

title 01LCS029 BWR
...\90999000.143\bridge\title.dgn Mar. 22, 2001 13:43:46

ESTIMATE OF QUANTITIES

STATE	FED. AID PROJ. NO.	SHEET NO.
N.D.	SIM-9-999((143)	2

SPEC	CODE	ITEM DESCRIPTION	UNIT	I29 BRIDGES		TOTAL
103	0100	CONTRACT BOND	L SUM	1		1
630	0120	CLEANING & PAINTING	L SUM	1		1
702	0100	MOBILIZATION	L SUM	1		1
704	0100	FLAGGING	MHR	65		65
704	1100	TRAFFIC CONTROL	L SUM	1		1

STATE	PROJECT NUMBER	SHEET NO.
ND	SIM-9-999(143)	3

STRUCTURAL STEEL PAINTING ~ BASIS OF ESTIMATE

SITE	BRIDGE NO.	DISTRICT	LOCATION	AREAS TO BE PAINTED	SPANS	GIRDER LENGTH	FINISH COLOR	COLOR NO.	AREA (SF)	SPOT COAT (SF)	TOTAL (SF)
1	29-008.073	Fargo	Hankinson Interchange	Fascia Girders & Spot Paint	2	233'-8"	Blue-Gray	25184	3230	300	3530
2	29-015.079	Fargo	Great Bend Interchange	Fascia Girders & Spot Paint	2	233'-8"	Blue-Gray	25184	3145	300	3445
3	29-017.085	Fargo	Mantador Separation	Fascia Girders & Spot Paint	2	233'-8"	Maroon	10076	3105	100	3205
4	29-037.043	Fargo	Colfax Interchange	Fascia Girders & Spot Paint	2	233'-8"	Maroon	10076	2995	300	3295
5	29-044.126	Fargo	Christine Interchange	Fascia Girders & Spot Paint	2	233'-8"	Maroon	10076	3145	300	3445
6	29-048.182	Fargo	Kindred Interchange	Fascia Girders & Spot Paint	2	233'-8"	Green-Gray	24300	3230	300	3530
7	29-056.249	Fargo	Horace Interchange	Fascia Girders & Spot Paint	2	233'-8"	Green-Gray	24300	2995	300	3295
8	29-074.991	Fargo	Amenia Separation	Fascia Girders & Spot Paint	4	279'-7 1/4"	Green-Gray	24300	2955	200	3155
9	29-094.196	Fargo	Galesburg Separation	Fascia Girders & Spot Paint	4	264'-8"	Green-Gray	24300	2780	100	2880
10	29-130.043	Grand Forks	Thompson Interchange	Fascia Girders & Spot Paint	4	264'-8"	Green-Gray	24300	2770	400	3170
11	29-133.060	Grand Forks	Walle Separation	All Exposed Structural Steel	4	263'-8"	Blue-Gray	25184	8730	---	8730
12	29-135.082	Grand Forks	Merrifield Separation	Fascia Girders & Spot Paint	4	298'-4 1/4"	Maroon	10076	3205	200	3405
								TOTAL	42.285	2.800	45.085

NOTES:

100 SCOPE OF WORK: This project consists of cleaning and painting the fascia surfaces of exterior girders and miscellaneous spot coating of deteriorated areas on all remaining painted surfaces for Sites 1-10 and 12. All exposed structural steel shall be cleaned and painted for Site 11.

630 CLEANING AND PAINTING: All structural steel surfaces that are to be painted shall be cleaned and painted according to Special Provision 357(97). The finish coats at each site shall be the color shown in the above table and shall meet Federal Standard No. 595B colors.

The contractor shall shroud the work area to protect the motoring public. Shrouding shall be capable of preventing dust and paint overspray from reaching passing traffic and causing vehicle damage or impairing motorist visibility. The cost for protecting traffic at each site shall be included in the lump sum bid item "Cleaning & Painting."

Plan Sheets 29-008.073-2 and 29-008.073-3 show the approximate surface area of structural steel to be painted at each site. A complete set of plans for each structure can be viewed at the NDDOT Bridge Division.

704 TRAFFIC CONTROL: The traffic control shall be according to Standard Drawing D-704-35 for all sites. The traffic control shall be set up only while work is going on at the sites during daylight hours. The traffic control shall be removed and normal traffic operations restored at the end of each workday. All traffic control devices, labor and equipment required for traffic control at all twelve sites shall not be bid separately but shall be included in the lump sum bid item "Traffic Control."

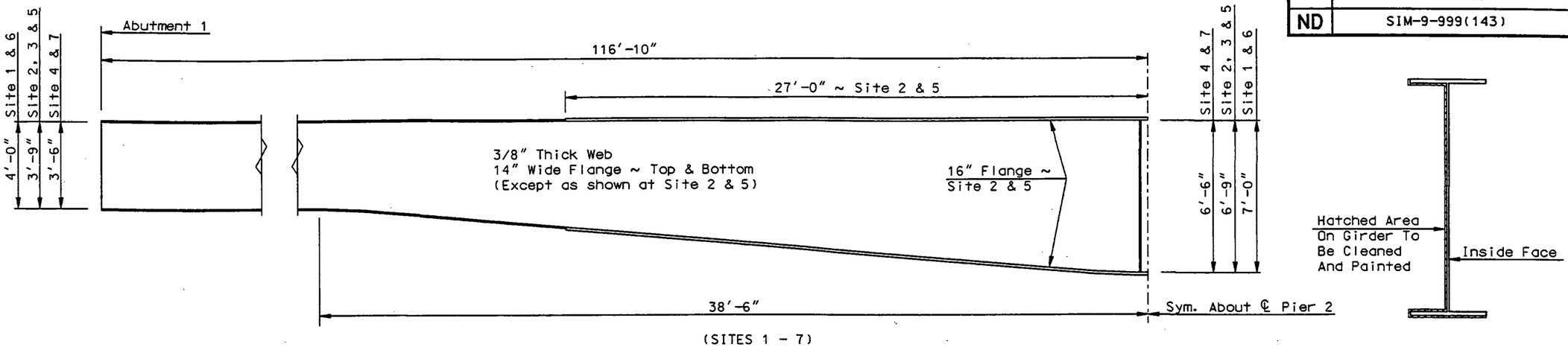
SPEC	CODE	ITEM DESCRIPTION	UNIT	QUANTITY
630	0120	CLEANING & PAINTING	L SUM	1

SPECIAL PROVISIONS	
SP 357(97)	BRIDGE PAINTING

BRIDGES ALONG I-29
(TWELVE SITES)

STRUCTURAL STEEL PAINTING
BASIS OF ESTIMATE & NOTES

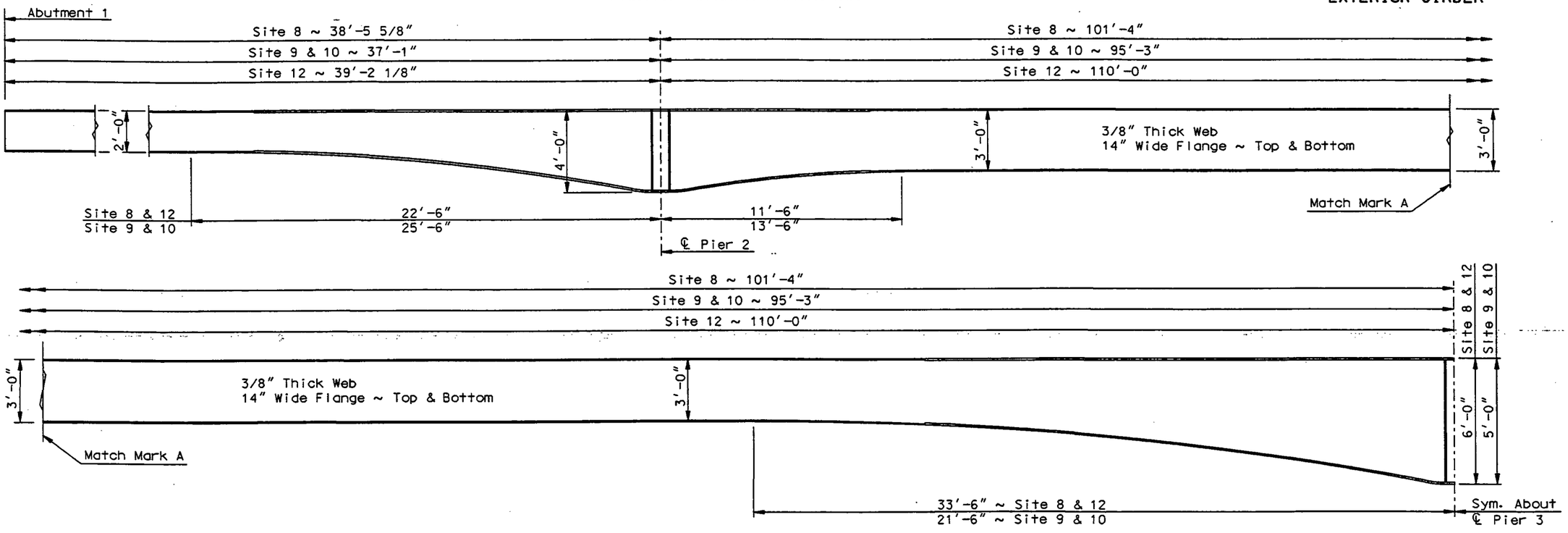
STATE	PROJECT NUMBER	SHEET NO.
ND	SIM-9-999(143)	4



(SITES 1 - 7)

PARTIAL GIRDER ELEVATION

EXTERIOR GIRDER



(SITES 8 - 10 & 12)

PARTIAL GIRDER ELEVATION

SITES 1 - 10 & 12

STRUCTURAL STEEL PAINTING DETAILS

DESIGN DATA				
Traffic	Average Daily			Est.Max.Hr.
Current 1998	Pass: 3,020	Trucks 520	Total 3,540	350
Forecast 2018	Pass: 5,740	Trucks 990	Total 6,730	800
Minimum Sight Dist. for:		Design Speed	70 MPH	
Stopping	600'	Bridges		
Full Control of Access				
No Point of Access Other Than at Interchange Ramps				

JOB# 12

FHWA REGION	STATE	PROJECT NO.	SHEET NO.
8	ND	IM-8-029(031)044	1

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

FEDERAL AID PROJECT IM-8-029(031)044

IN RICHLAND & CASS COUNTIES

Concrete Pavement Repair
Hot Bituminous Pavement Overlay
(Southbound Roadway)

GOVERNING SPECIFICATIONS:

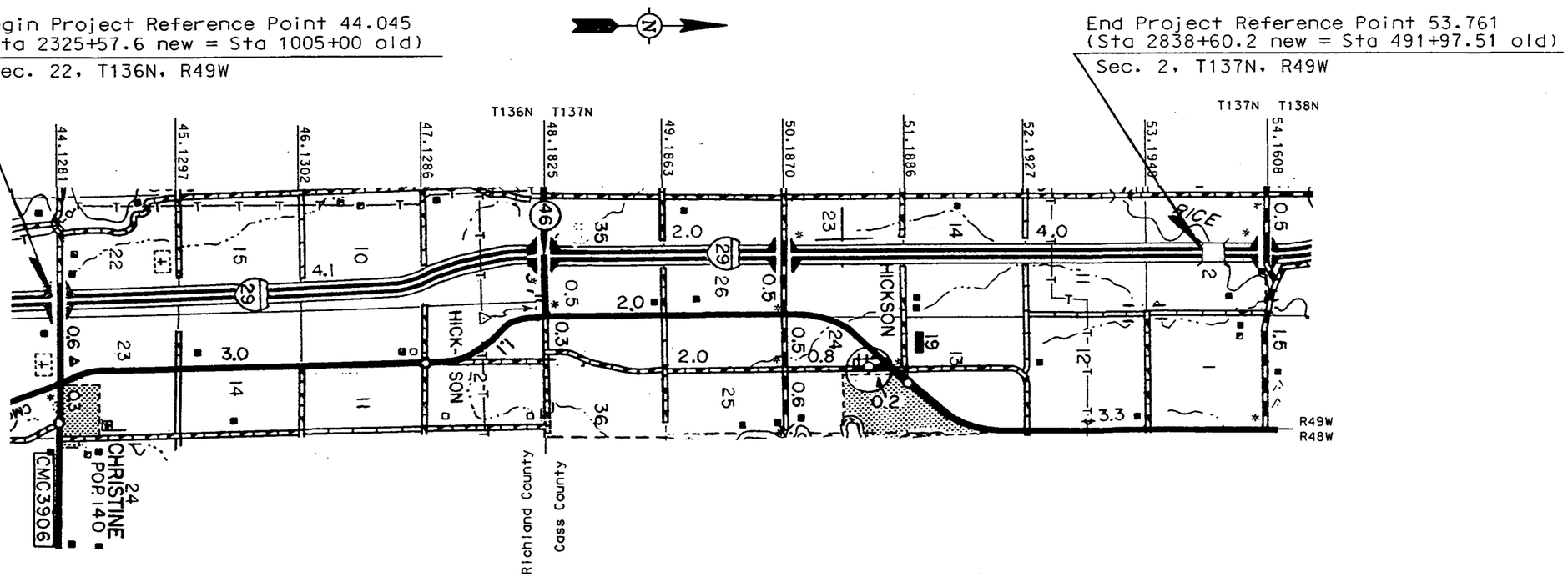
Standard Specifications adopted by the North Dakota Department of Transportation October 1997; Standard Drawings currently in effect; and other Contract Provisions submitted herein.

LENGTH OF PROJECT

Miles Gross	Miles Net
9.716	9.716

Begin Project Reference Point 44.045
(Sta 2325+57.6 new = Sta 1005+00 old)
Sec. 22, T136N, R49W

End Project Reference Point 53.761
(Sta 2838+60.2 new = Sta 491+97.51 old)
Sec. 2, T137N, R49W



PAVING SECTION Scott Woodhouse
URBAN SECTION _____
TRAFFIC SECTION _____
RURAL SECTION _____
RECOMMEND APPROVAL 1-23, 1998
DESIGN ENGINEER Kenneth S. Bitz

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

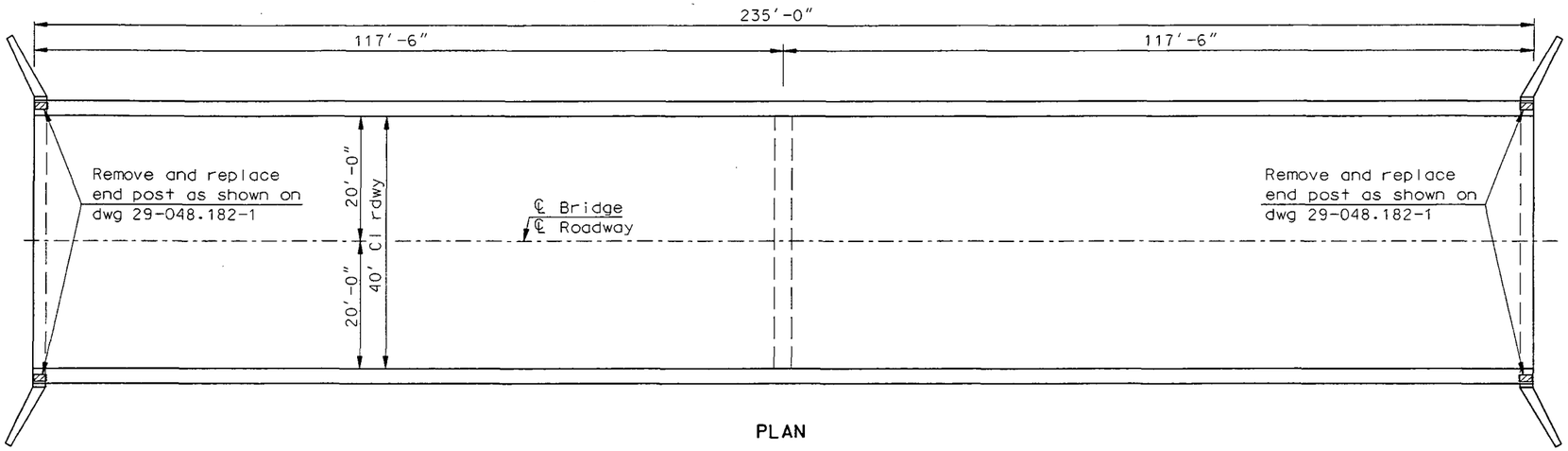
APPROVED

_____ _____
DIVISION ADMINISTRATOR DATE

APPROVED DATE 1-23-98
David K.O. Leer
P.E. 1199
DIRECTOR OF HIGHWAYS AND ENGINEERING
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

...\d_paving\title.dgn Jan. 05, 1998 08:10:34

BRIDGE CODE	FHWA REGION	STATE	FEDERAL AID PROJECT NUMBER	SHEET NO.
X-771	8	ND	IM-8-029(031)044	43



PLAN



SCOPE OF WORK: The work on this site consists of removing and replacing the end posts on the ends of the bridge, overlaying the bridge deck with low slump concrete and placing concrete between the abutments and the slope protection on both ends of the bridge.

BRIDGE DECK OVERLAY: The deck overlay shall be done in two stages to allow at least one lane of traffic at all times. All concrete removed from the deck shall be disposed of properly, off of the right of way, by the contractor.
The overlay shall meet the requirements of low-slump concrete as listed in Section 650.02.

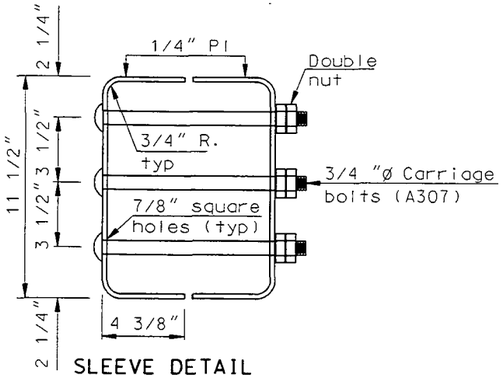
JOINT TREATMENT: The concrete slope protection has settled and pulled away from the abutments leaving a gap of 4" to 6". All debris and soil shall be cleaned out of the gap and filled with non-reinforced concrete to a minimum depth of 4 inches for the full width of the slope protection on both ends of the bridge. All materials and labor required to place concrete shall be included in the bid item "JOINT TREATMENT".

SPEC	CODE	ITEM DESCRIPTION	UNIT	QUANTITY
602	1210	BRIDGE END POST MODIFICATION	EA	4
650	0700	CLASS 1 OVERLAY	SY	1044
650	0701	CLASS 2 OVERLAY	SY	209
650	0702	CLASS 3 OVERLAY	SY	52
650	0703	CLASS 2A OVERLAY	LF	376
950	9712	JOINT TREATMENT	LF	112

KINDRED INTERCHANGE

BRIDGE LAYOUT

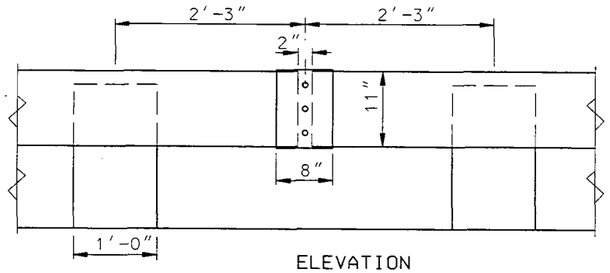
FHWA REGION	STATE	FEDERAL AID PROJECT NUMBER	SHEET NO.
8	ND	IM-8-029(031)044	44



SLEEVE DETAIL

NOTE:

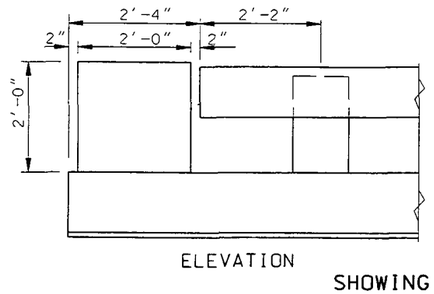
The steel plates shall be M183 steel. Plates, bolts and nuts shall be galvanized in accordance with AASHTO M111. Materials and labor to install the rail sleeves shall be incidental to "BRIDGE END POST MODIFICATION".



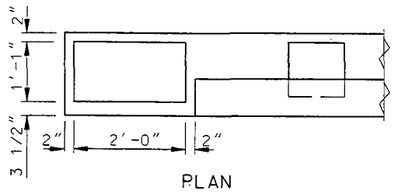
ELEVATION

SLEEVE AT RAIL JOINT

(2 required)

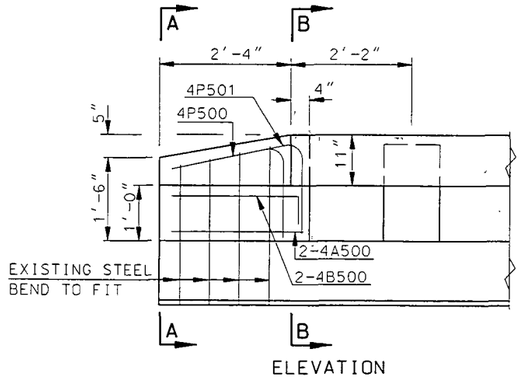


ELEVATION

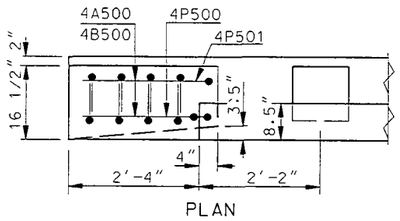


PLAN

SHOWING END POST REMOVAL LIMITS

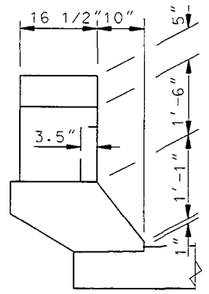


ELEVATION

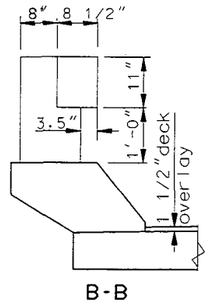


PLAN

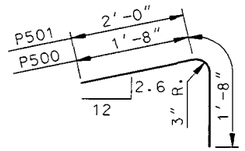
NEW END POST



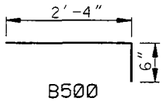
A-A



B-B



P500 & P501

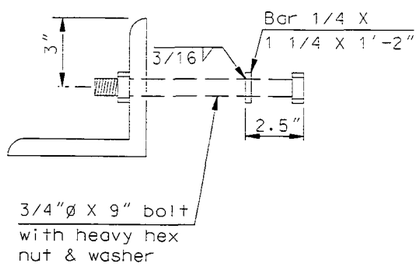


B500

BENT BAR DETAILS

BAR LIST (ONE POST)				
SIZE	MARK	NO.	LENGTH	SHAPE
4	A500	2	2'-4"	STR.
4	B500	2	2'-10"	BENT
4	P500	1	3'-4"	BENT
4	P501	1	3'-8"	BENT

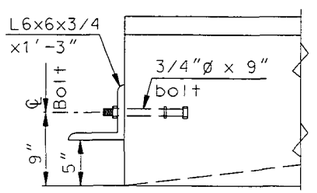
ESTIMATE OF QUANTITIES		
REMOVAL OF CONC.	0.16	C.Y.
CLASS AAE-3 CONC.	0.21	C.Y.
REINFORCING STEEL	12	LBS.



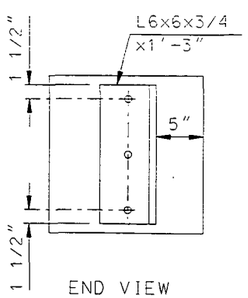
ANCHOR BOLT ASSEMBLY

NOTE:

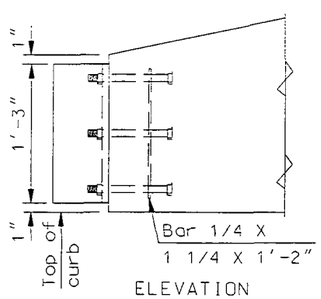
The 6 x 6 x 3/4 angle shall be used in lieu of the MC8x20 shown on Standard D-764-3.



PLAN



END VIEW



ELEVATION

END POST DETAIL

NOTE:

Modify bridge end posts at both ends of the bridge.

The concrete shall be class AAE-3 and the reinforcing steel shall be Grade 60.
The existing end posts shall be removed and properly disposed of. The quantities shown are for informational purposes only. All materials, labor and equipment including concrete, structural steel and reinforcing bars required to remove and replace the end posts shall be included in the pay item "BRIDGE END POST MODIFICATION".

Surface finish "D" shall be required for all surfaces of the end posts.

QUANTITIES		
BRIDGE END POST MODIFICATION	4	EA

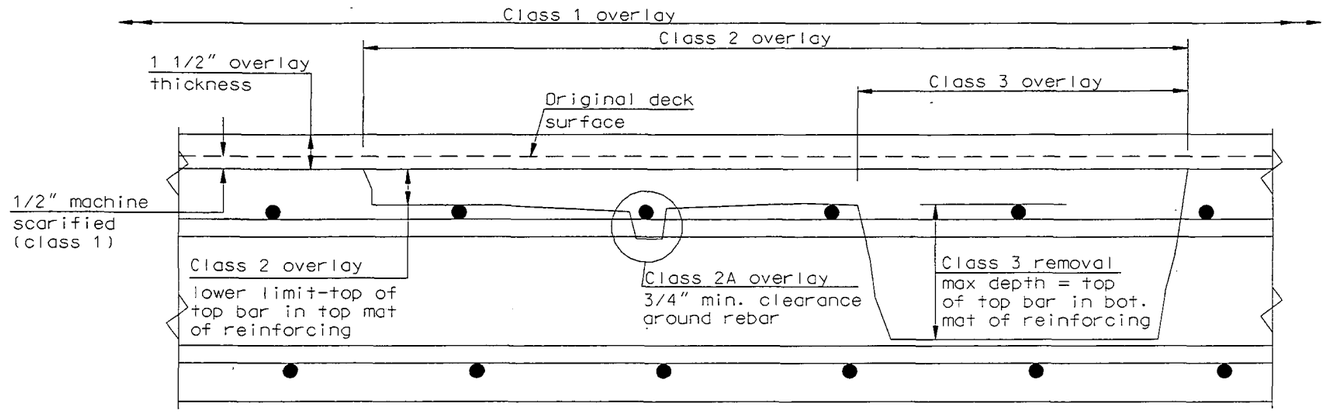
KINDRED INTERCHANGE

RAIL SLEEVES & END POST DETAILS

ENDPOST 97LCS063 LLS

29-048.182-1

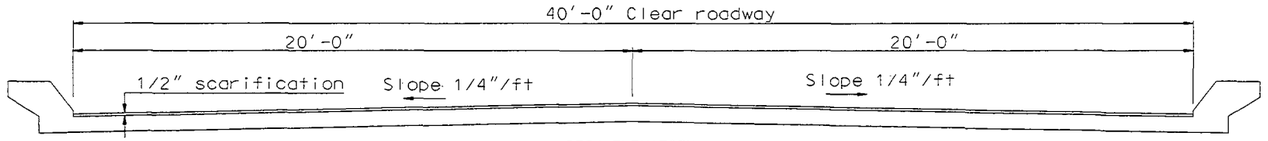
FHWA REGION	STATE	FEDERAL AID PROJECT NUMBER	SHEET NO.
8	ND	IM-8-029(031)044	45



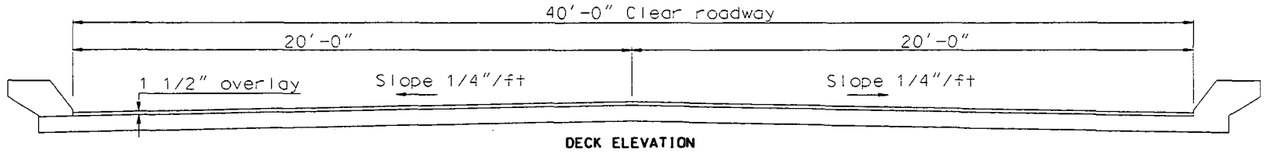
Class 4 removal shall be below limit of class 3 removal to full depth.

BRIDGE DECK

(Overlay classifications)



DECK ELEVATION
Showing removal



DECK ELEVATION
Showing overlay

QUANTITIES		
CLASS 1 OVERLAY	1044	SY
CLASS 2 OVERLAY	209	SY
CLASS 3 OVERLAY	52	SY
CLASS 2A OVERLAY	376	LF

KINDRED INTERCHANGE

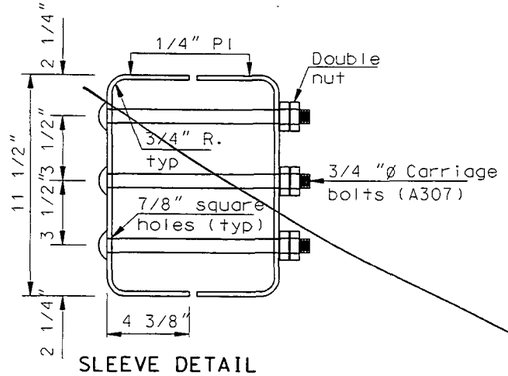
OVERLAY DETAILS

FHWA REGION	STATE	FEDERAL AID PROJECT NUMBER	SHEET NO.
8	ND	IM-8-029(031)044	46

BAR LIST (ONE POST)				
SIZE	MARK	NO.	LENGTH	SHAPE
4	A500	2	2'-4"	STR.
4	B500	2	2'-10"	BENT
4	P500	1	3'-4"	BENT
4	P501	1	3'-8"	BENT

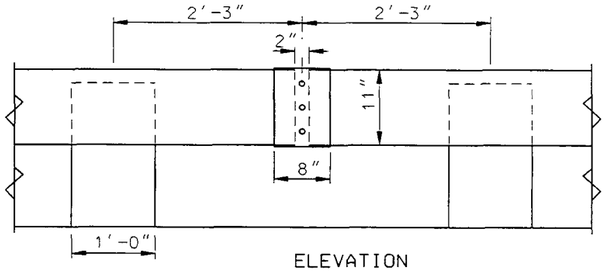
ESTIMATE OF QUANTITIES

REMOVAL OF CONC. 0.16 C.Y.
CLASS AAE-3 CONC. 0.21 C.Y.
REINFORCING STEEL 12 LBS.

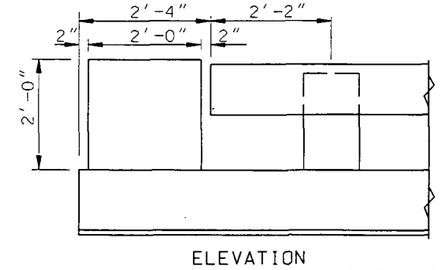


SLEEVE DETAIL

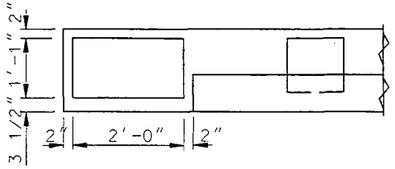
NOTE:
The steel plates shall be M183 steel. Plates, bolts and nuts shall be galvanized in accordance with AASHTO M111. Materials and labor to install the rail sleeves shall be incidental to "BRIDGE END POST MODIFICATION".



ELEVATION
SLEEVE AT RAIL JOINT
(2 required)

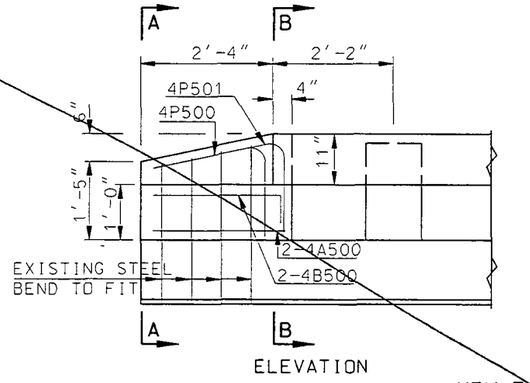


ELEVATION

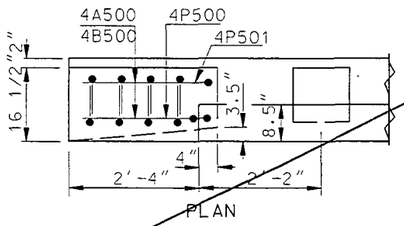


PLAN

SHOWING END POST REMOVAL LIMITS

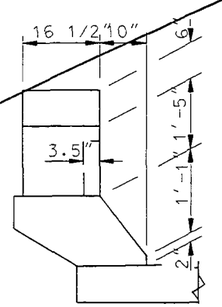


ELEVATION

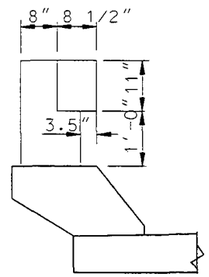


PLAN

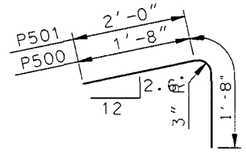
NEW END POST



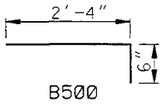
A-A



B-B

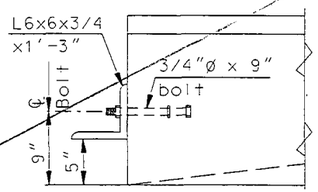


P500 & P501

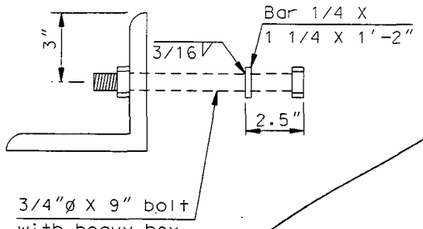


B500

BENT BAR DETAILS

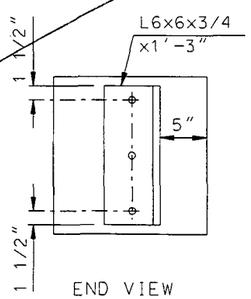


PLAN

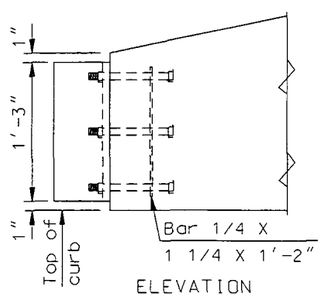


ANCHOR BOLT ASSEMBLY

NOTE:
The 6 x 6 x 3/4 angle shall be used in lieu of the MC8x20 shown on Standard D-764-3.



END VIEW



ELEVATION

END POST DETAIL

NOTE:

Modify bridge end posts at both ends of the bridge.

The concrete shall be class AAE-3 and the reinforcing steel shall be Grade 60.
The existing end posts shall be removed and properly disposed of. The quantities shown are for informational purposes only. All materials, labor and equipment including concrete, structural steel and reinforcing bars required to remove and replace the end posts shall be included in the pay item "BRIDGE END POST MODIFICATION".

Surface finish "D" shall be required for all surfaces of the end posts.

JOINT TREATMENT: The concrete slope protection has settled and pulled away from the abutments leaving a gap of 8" to 10". All debris and soil shall be cleaned out of the gap and filled with non-reinforced concrete to a minimum depth of 4 inches for the full width of the slope protection on both ends of the bridge. All materials and labor required to place concrete shall be included in the bid item "JOINT TREATMENT".

QUANTITIES		
BRIDGE END POST MODIFICATION	4	EA
JOINT TREATMENT	92	LF

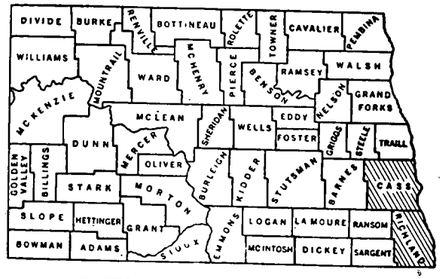
HICKSON INTERCHANGE

RAIL SLEEVES & END POST DETAILS

ENDPOST 97LCS065 LLS

29-050.186-1

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.
5	N.D.	I-29-1 (16)	1



SKETCH-MAP OF NORTH DAKOTA
SHOWING COUNTIES

N
W E
S

SCALES
- LAYOUT SHEET: 1 IN. = 4000 FT.
- PLAN AND PROFILE DRAWINGS: HOR. 1 IN. = 100 FT. / VERT. 1 IN. = 10 FT.
- STRUCTURAL DRAWINGS: AS SHOWN
- CROSS SECTION SHEETS: 1 IN. = 10 FT.

NORTH DAKOTA
STATE HIGHWAY DEPARTMENT

PLANS

FOR THE PROPOSED IMPROVEMENT OF A

STATE HIGHWAY

IN CASS & RICHLAND COUNTIES

FEDERAL AID PROJECT NO. I-29-1(16)48

STRUCTURAL

LENGTH OF PROJECT		
PROJECT	MILES-GROSS	MILES-NET
I-29-1(16)	2.004	0.000
TOTALS	2.004	0.000

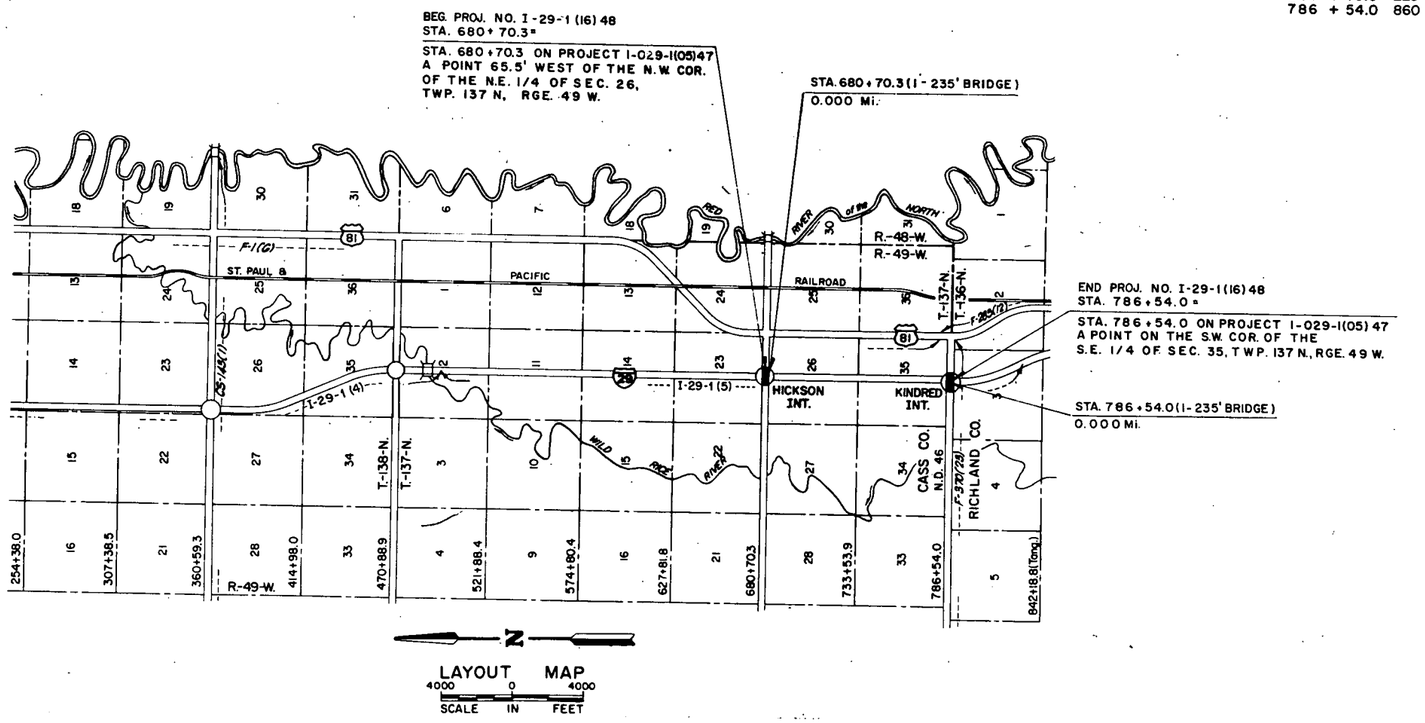
GOVERNING SPECIFICATIONS:

Standard Specifications adopted by the North Dakota State Highway department July 1971 and approved as standard by the Federal Highway Administration Sept. 29, 1971. Required Contract Provision (Form PR-1273) dated May 1971 and others submitted herewith.

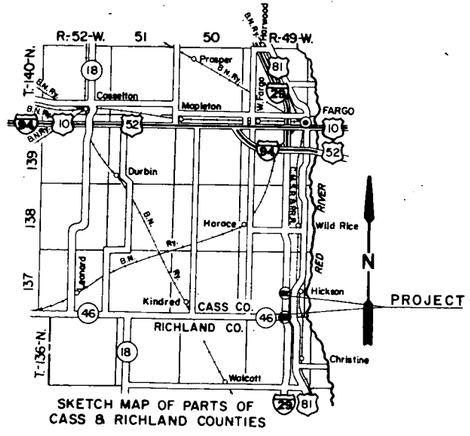
DESIGN DATA

TRAFFIC	AVERAGE DAILY	EST. 30TH MAX. HR.
CURRENT TRAFFIC (1972)	2430 PASS. 450 TRUCKS 2880 TOTAL	400
TRAFFIC FORECAST (1992)	4675 PASS. 825 TRUCKS 5500 TOTAL	800
DESIGN SPEED	80 MPH	
TRAFFIC CLASSIFICATION	"M"	
MINIMUM SIGHT DISTANCE (STOPPING)	750'	
FULL CONTROL OF ACCESS. (No point of access other than by ramps at Interchanges.)		

STA.	ADT 1992	CLEAR RDWY. WIDTH.	DESIGN LOADING
680 + 70.3	225	30'	H 20 (1944)
786 + 54.0	860	40'	HS 20 (1944)



LAYOUT MAP
4000 0 4000
SCALE IN FEET



SKETCH MAP OF PARTS OF
CASS & RICHLAND COUNTIES

APPROVED DATE 11-16-71

CHIEF ENGINEER
NORTH DAKOTA STATE
HIGHWAY DEPARTMENT

R. E. BRADLEY
REGISTERED PROFESSIONAL ENGINEER

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED

DIVISION ENGINEER DATE

5153

SYMBOLS

STATE & NATIONAL LINES

COUNTY LINE

TOWNSHIP & RANGE LINES

SECTION LINE

QUARTER SECTION LINE

SECTION CORNER

QUARTER SECTION CORNER

OLD RIGHT OF WAY LINE

NEW RIGHT OF WAY LINE

GRADE LINE

CENTERLINE OF CONSTRUCTION — 500

RAILROAD RIGHT OF WAY LINE

CITY OR VILLAGE CORPORATE LIMITS

PROPERTY LINE

EASEMENT LINE

FENCES

SNOW FENCE

DRAINAGE

WATERS EDGE

MARSH OR SWAMP

RIPRAP

DRAINAGE DITCH

APPROACH — 502 + 00

TRAVELED WAY

RAILROADS — NAME

GUARD RAIL

GUIDE POSTS

DELINEATORS

HEDGES AND TREES

INTERCHANGE

HIGHWAY GRADE SEPARATION — NO CONNECTION

OTHER BRIDGE

SERVICE ROAD

TERMINATED CROSS-ROAD

RAILROAD GRADE SEPARATION

BUILDINGS

TELEGRAPH LINES

TELEPHONE LINES

POWER LINES

CULVERTS (In Place)

CULVERTS (Install)

CONCRETE BOX CULVERTS (Install)

BRIDGES (Install)

CONCRETE CURB

CONCRETE CURB AND GUTTER

CONCRETE WALK

CATCH BASIN (Existing)

CATCH BASIN (New)

MANHOLE (Existing)

MANHOLE (New)

CURB INLET (Existing)

CURB INLET (New)

GROUND MOUNTED SIGNS

OVERHEAD SIGNS

HYDRANT

LIGHT STANDARDS

TRAFFIC SIGNALS (Plan & Profile Sheets)

TRAFFIC SIGNALS (Lighting Plan Sheets) — R Y G

GROUND ELEVATION 643.0 / 641.0

GRADE 245

CENTERLINE

SECTION LINE

DEFLECTION ANGLE (Delta)

SOD OR JUTE MESH

POLES TO BE MOVED

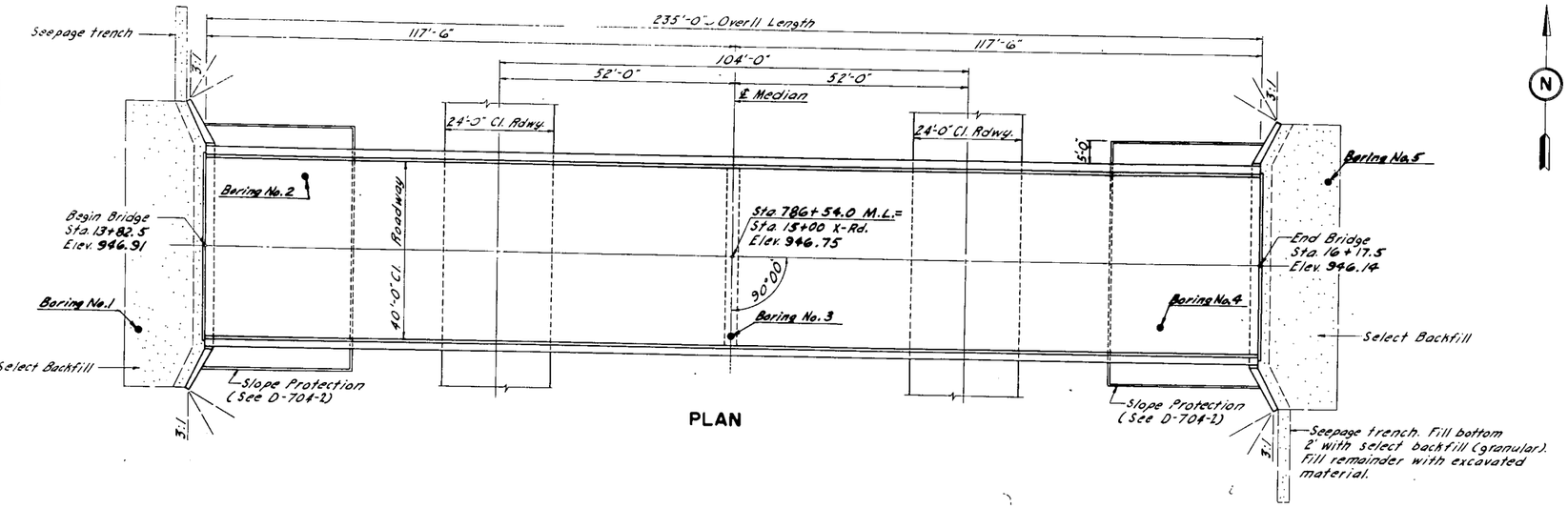
POLES TO BE LOWERED

ABBREVIATIONS

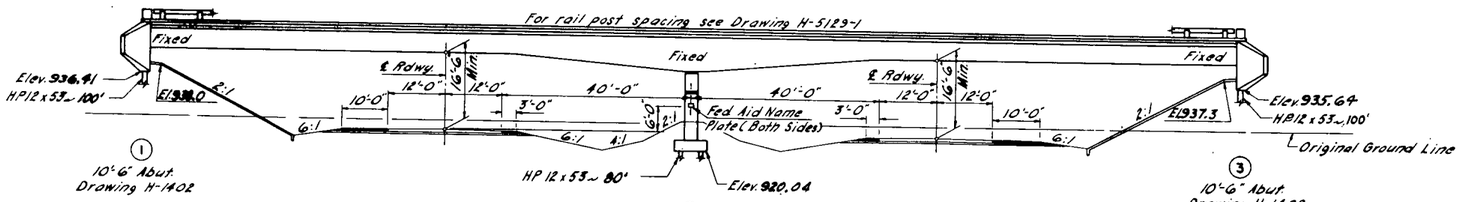
Aggr.	Aggregate
Ahd.	Ahead
Alt.	Alternate
Approx.	Approximate or Approximately
Appr.	Approach
Asph. Cem. or A.C.	Asphalt Cement
Asph. Conc.	Asphaltic Concrete
Bit.	Bituminous or Bitumen
Bk.	Back
B. M.	Bench Mark
Bldg.	Building
Br.	Bridge
C. A. E. S.	Corrugated Aluminum End Section
C. A. P.	Corrugated Aluminum Pipe
C. B.	Catch Basin
C. B. G.	Curb and Gutter
Ch. Blk.	Channel Block
Ch. Ch.	Channel Change
C. I.	Curb Inlet
C. I. P.	Cast Iron Pipe
Cl.	Class
C. S. E. S.	Corrugated Steel End Section
C. S. P.	Corrugated Steel Pipe
CMS	Cationic Medium Setting
Comp.	Compression
Const.	Construction
Conc.	Concrete
Cont. Reinf. Conc. Pvm't	Continuously Reinforced Concrete Pavement
Contn.	Contraction
Crn.	Crown
CRS	Cationic Rapid Setting
Crse.	Course
C. S.	Curve to Spiral
C. to C.	Center to Center
C. Y.	Cubic Yard
D	Degree of Curvature
D-Load	Dead Load
D. B.	Ditch Block
Def.	Deformed
Del.	Deliver
D. G.	Ditch Grade
El. or Elev.	Elevation
Ellipt.	Elliptical
Emb.	Embankment
Emul.	Emulsified
Engr.	Engineer
Eq.	Equation
E. R.	East Roadway
E. S.	End Section
Esmt.	Easement
Exc.	Excavation
Exp.	Expansion
F. D.	Field Drive
Found.	Foundation
F. P.	Fence Post
Furn.	Furnish
Ga.	Gage or Gauge
Gr.	Gravel
Grd.	Graded
G. V.	Gate Valve
Hel.	Helical
Hyd	Hydrant
Ident.	Identification
Inchg.	Interchange
I. M.	Iron Monument
Inst.	Install
Inter.	Intersection
Inv.	Invert
Jt.	Joint
L	Length of Curve
Lc	Length of Spiral
Levg.	Leveling
L. F.	Linear or Lineal Foot
Liq.	Liquid
Long	Longitudinal
L. P.	Light Pole
Lt.	Left
"M"	One Thousand
Matl.	Material
Max.	Maximum
MC	Medium Curing
M. H.	Manhole
Min.	Minimum
M. L.	Main Line
N. R.	North Roadway
Off. Loc.	Office Location
O. to O.	Out to Out
P. & P.	Plan and Profile
P. C.	Point of Curvature
P. C. C.	Point of Compound Curve
P. C. C. Pvm't	Portland Cement Concrete Pavement
P. D.	Private Drive
Pen.	Penetration
Perf.	Perforated
P. I.	Point of Intersection
P. O. C.	Point on Curve
P. O. T.	Point on Tangent
P. P.	Power Pole
P. R. C.	Point of Reverse Curvature
Pref.	Preformed
P. S. D.	Passing Sight Distance
P. T.	Point of Tangency
P. V. C.	Polyvinyl Chloride Sewer Pipe
Quant.	Quantity or Quantities
R	Radius
R or Rge.	Range
RC	Rapid Curing
R. C. E. S.	Reinforced Concrete End Section
R. C. P.	Reinforced Concrete Pipe
R. C. P. S.	Reinforced Concrete Pipe Sewer
Rd.	Road
Rdbd.	Roadbed
Rdwy.	Roadway
Refl.	Reflectorized
R. R.	Railroad
Rt.	Right
R/W	Right of Way
Salv.	Salvage
San.	Sanitary
S. C.	Spiral to Curve
SC	Slow Curing
Sc	Spiral Deflection Angle
S. D.	Sight Distance
S. E.	Superelevation
Sec.	Section
Sec. Line Appr.	Section Line Approach
Sep.	Separation
Serv.	Service
Sgr. Prep.	Subgrade Preparation
Shldr.	Shoulder
SP	Special Provision
S. P. P.	Structural Plate Pipe
S. P. P. A.	Structural Plate Pipe Arch
S. R.	South Roadway
SS	Slow Setting or Supplement Specification
S. S. D.	Stopping Sight Distance
S. T.	Spiral to Tangent
Sta.	Station
Std.	Standard
Std. Specs.	Standard Specifications
Struct.	Structure
Surf.	Surface or Surfacing
Surv.	Survey
S. W.	Sidewalk
S. Y.	Square Yard
T	Tangent Length (circular curve)
T or Twp.	Township
Tel.	Telephone
Temp.	Temporary
T. P.	Telephone Pole
Tr.	Traffic
Trans.	Transverse or Transition
Trtd.	Treated
Ts	Tangent Length (curve with spirals)
T. S.	Tangent to Spiral
U.S.C. & G.S.	United States Coast and Geodetic Survey
V.C.	Vertical Curve
V.C.P.	Vitrified Clay Pipe
W.M.	Water Main
W.M.V.	Water Main Valve
W.R.	West Roadway
Wrng.	Wearing
W.S.V.	Water Service Valve
X-Sec.	Cross Section
Xc	Spiral Coordinate
Yc	Spiral Coordinate

BRIDGE CODE	FED. HIGHWAY DIST. NO.	STATE	PROJ. NO.	SHEET NO.
X-771	5	N. D.	I-29-1(16)48	27

QUANTITIES MADE BY D.L.P. CHECKED BY G.A.L.



PLAN



① 10'-6" Abut. Drawing H-1402

② 18'-0" Bent Drawing H-1379

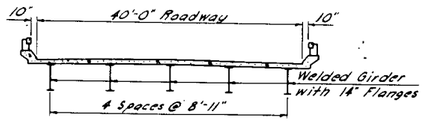
③ 10'-6" Abut. Drawing H-1402

100'

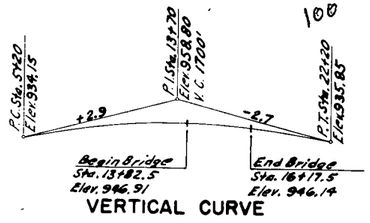
ELEVATION

1972
FEDERAL AID
PROJECT
I-29-1(16)
NORTH DAKOTA
29-48.21

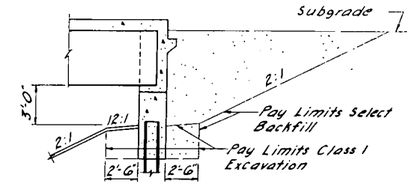
FEDERAL AID NAME PLATE
2 REQUIRED



DECK SECTION



VERTICAL CURVE



DETAIL AT ABUTMENT ON ℄

DESIGN STRESSES:

f_s = 20,000 psi ~ Reinforcing Steel
f'_c = 1,200 psi ~ Class AE-1 & AE-3 Concrete
f'_c = 1,700 psi ~ Class AAE-3 Concrete
f_s = 27,000 psi ~ Structural Steel A572 (Grade 50)
f_s = 20,000 psi ~ Structural Steel A36

BENCH MARKS

NO.	DESCRIPTION	LOCATION	ELEV.
60	P.O.T. Iron (Buried)	760+10.1 ~ ℄	919.76
61	R.R. Spike in P.P.	785+93 ~ 345' Lt.	922.27
61A	R.R. Spike in P.P.	5+93 ~ 97' Lt.	922.31
61B	R.R. Spike in P.P.	25+93 ~ 104' Lt.	924.72

PILE LOADING

LOCATION	DEAD LOAD	LIVE LOAD	EARTH LOAD	WIND 50 LB.	WIND 15 LB.	WIND 100 LB. L.L.	EMBANKMENT SETTLEMENT	DESIGN LOAD	MAXIMUM REQUIRED BEARING
Abut. No. 1 & 3	36.5 T.	12.5 T.					21.0 T.	70.0 T.	70.0 T.
Bent No. 2	52.8 T.	15.2 T.	2.0 T.					70.0 T.	70.0 T.

① See SP-116 for Structural Steel.
General Notes for this project are shown on Dwg. 29-48.21-1.

ESTIMATE OF QUANTITIES

SPEC. NO.	CODE NO.	BID ITEM	
208	0100	CLASS I EXCAVATION	175 CU. YD.
228	0100	SELECT BACKFILL	450 CU. YD.
610	1112	CLASS AE-1 CONCRETE SUBSTRUCTURES	93.0 CU. YD.
610	1134	CLASS AE-3 CONCRETE I BEAM SUPERSTRUCTURE	321.4 CU. YD.
610	0138	CLASS AAE-3 CONCRETE RAILING & POSTS	15.23 CU. YD.
612	0110	REINFORCING STEEL (GRADE 40)	107,235 LB.
616	5722	STRUCTURAL STEEL A572 ① WELDED GIRDER (GRADE 50)	118,822 LB.
616	0362	STRUCTURAL STEEL A36 ② WELDED GIRDER	122,502 LB.
622	0040	STEEL PILING (HP12 X 53)	2280 LIN. FT.
622	1370	STEEL TEST PILES (HP12 X 53) 90 FT.	1 EACH
728	0100	SODDING	834 SQ. YD
750	0100	LINSEED OIL TREATMENT	48 GAL.
704	0100	CONCRETE SLOPE PROTECTION	450 SQ. YD.
	3000	BRIDGE BENCH MARKS	1 SET

STRUCTURAL DRAWINGS

GENERAL DRAWING 29-48.21 (THIS SHEET), 29-48.21-1,2, D-704-2
SUBSTRUCTURE H-1402, H-1379, H-0401, D-900-6
SUPERSTRUCTURE H-5128-1,2, H-5129-1,2, H-0158, H-0501, D-900-1

DESIGN LOADING	SCALE
HS20 (1944)	1 INCH = 15 FEET

℄	1'-0" Begin Bridge	10 Eq. Sp. = 116'-6" ℄ Brg. Abut. 1	10 Eq. Sp. = 116'-6" ℄ Bent 2	℄ Brg. Abut. 3	1'-0" End Bridge
℄ OUTSIDE GIRDERS	946.54	946.54 946.61 946.67 946.70 946.69 946.66 946.61 946.54 946.48 946.43 946.38 946.35	946.33 946.31 946.30 946.28 946.24 946.16 946.06	945.92 945.78 945.71	
℄ ROADWAY	946.91	946.98 947.04 947.07 947.07 947.03 946.98 946.91 946.85 946.80 946.75 946.72	946.70 946.69 946.68 946.65 946.61 946.53 946.43	946.29 946.15 946.14	

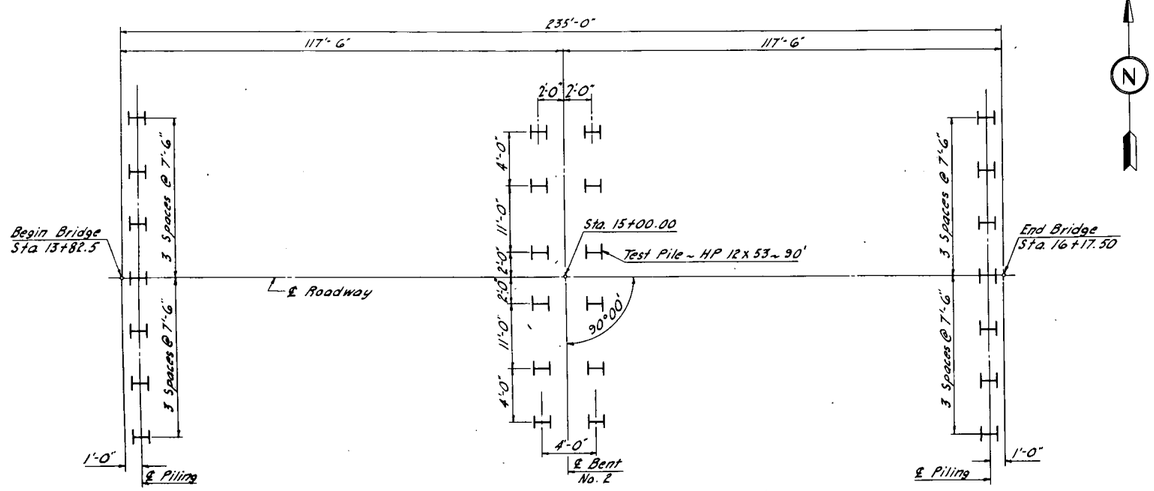
SCREED ELEVATION
Elevations are to top of finished concrete

NORTH DAKOTA
STATE HIGHWAY DEPARTMENT
KINDRED INTERCHANGE
BRIDGE LAYOUT
PROJECT I-29-1(16)48 STA. 786+54.0
CASS-RICHLAND COUNTY

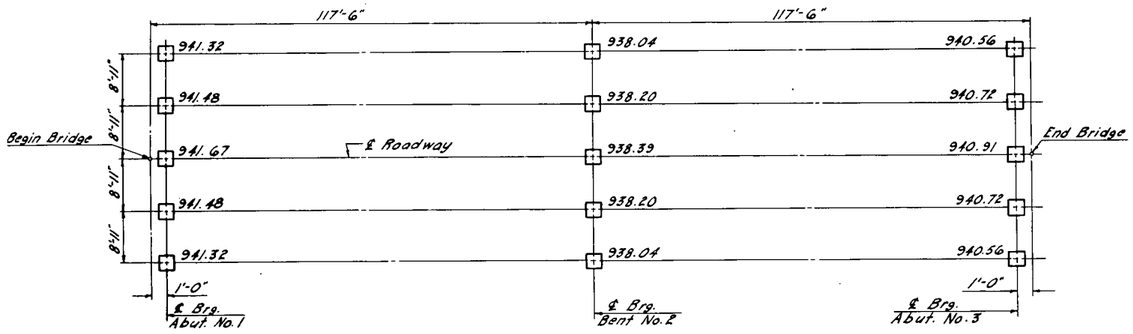
APPROVED
11-2-71 DATE
BRIDGE ENGINEER

29-48.21

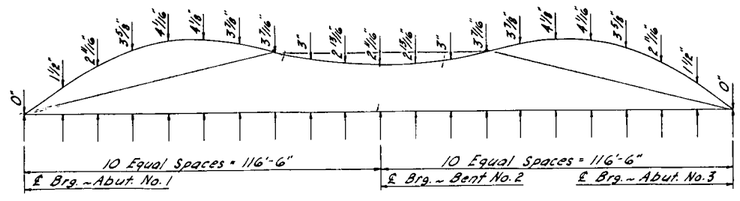
FED. ROAD DIST. NO.	STATE	PROJ. NO.	SHEET NO.
5	N.D.	F-29-(16)48	28



PILING LAYOUT
Not to Scale



BEARING PLATE LAYOUT
Elevations are to top of finished concrete
(Not to Scale)



SHOP CAMBER DIAGRAM

NOTES:

GENERAL:

WORK SHALL CONFORM TO ALL APPLICABLE PARAGRAPHS OF THE NORTH DAKOTA STATE HIGHWAY DEPARTMENT SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION.

THE COST OF FURNISHING AND PLACING JOINT FILLER, ASPHALT CURB SEAL, NAME PLATES, AND OTHER MISCELLANEOUS ITEMS SHALL BE INCLUDED IN THE PRICE BID FOR CONCRETE.

WELDING WILL NOT BE PAID FOR DIRECTLY BUT SHALL BE INCLUDED IN THE UNIT PRICE BID FOR STRUCTURAL STEEL.

BEARING AREAS SHALL BE FINISHED TRUE TO PLAN AND ELEVATION BY GRINDING, IF NECESSARY, BEFORE BEARING PLATES ARE SET.

ALL RIVETS OR HIGH STRENGTH BOLTS ARE TO BE 7/8" DIAMETER. OPEN HOLES ARE TO BE 15/16" DIAMETER EXCEPT AS NOTED. SHOP CONNECTIONS SHALL BE MADE AS SHOWN. FIELD CONNECTIONS SHALL BE MADE WITH HIGH TENSILE STRENGTH BOLTS OR SHALL BE RIVETED.

EMBANKMENT:

THE EMBANKMENT AT THE ABUTMENTS SHALL BE IN PLACE BEFORE PILING ARE DRIVEN. THE CONTRACTOR WILL BE REQUIRED TO PREDRILL THROUGH THE FILL AT THE ABUTMENTS BEFORE DRIVING PILING. ALL PILOT HOLES, NOT COMPLETELY FILLED BY THE PILES, SHALL BE BACKFILLED WITH SAND OR FINE GRAVEL BEFORE THE SUBSTRUCTURE IS PLACED.

EXCAVATION:

EXCAVATION CLASS I AT THE ABUTMENTS SHALL EXTEND FROM THE BOTTOM OF THE FOOTING TO THE UPPER LIMITS AS SHOWN ON THE BRIDGE LAYOUT DRAWING. EXCAVATION CLASS I AT THE BENT SHALL EXTEND FROM THE BOTTOM OF THE FOOTINGS TO THE FINISHED ELEVATION OF THE INTERSTATE MEDIAN.

BACKFILL:

ALL BACKFILLING SHALL BE DONE ACCORDING TO SECTION 228 AND 203-2.3.2 OF THE STANDARD SPECIFICATIONS. SELECT BACKFILL SHALL NOT BE PLACED ABOVE THE ELEVATION OF THE BERM UNTIL THE SUPERSTRUCTURE HAS CURED.

REINFORCING STEEL:

DIMENSIONS FOR BENT BARS ARE GIVEN OUT TO OUT AND TO TANGENT INTERSECTIONS UNLESS OTHERWISE NOTED. BENT BARS SHALL BE BENT AROUND ACI STANDARD SIZE PINS. THE BAR FABRICATOR SHALL ADD A PREFIX TO ALL BAR DESIGNATIONS TO DIFFERENTIATE BETWEEN THE SEVERAL PARTS OF THE STRUCTURE.

CONCRETE:

ALL CONCRETE SHALL BE COMPACTED BY VIBRATION. THE DECK SLAB CONCRETE SHALL BE STRUCK OFF AND COMPACTED BY AN APPROVED DECK FINISHING MACHINE. ALL EXPOSED EDGES OF CONCRETE SHALL BE BEVELED WITH 3/4" TRIANGULAR MOLDING UNLESS OTHERWISE NOTED.

ALL CONCRETE ABOVE THE TOP OF THE CURBS SHALL BE CLASS AAE-3. SLAB, CURBS, AND END WALLS SHALL BE CLASS AE-3. ABUTMENTS AND BENT SHALL BE CLASS AE-1.

THE "RUBBED SURFACE FINISH" OR THE "SPECIAL SURFACE FINISH" (SECTION 602-3.10.5) WILL BE REQUIRED FOR THE ROADWAY AND OUTSIDE FACES OF CURBS, EDGES OF SLAB, ALL FACES OF THE RAILS, RAIL POSTS AND END POSTS, ALL EXPOSED FACES OF THE BENT, AND ALL EXPOSED FACES OF THE ABUTMENT WINGS. ALL OTHER SURFACES SHALL BE GIVEN THE "ORDINARY SURFACE FINISH". ALL "ORDINARY SURFACE FINISH" SHALL BE COMPLETED WITHIN 24 HOURS AFTER REMOVAL OF THE FORMS.

IF THE EXPOSED FACES OF THE ABUTMENTS AND THE BENT HAVE A SURFACE FINISH ACCEPTABLE TO THE ENGINEER WITHOUT RUBBING, THE REQUIREMENT FOR "RUBBED OR SPECIAL SURFACE FINISH" MAY BE WAIVED AT THE OPTION OF THE ENGINEER AND THE "ORDINARY SURFACE FINISH" WILL APPLY.

STRUCTURAL STEEL:

THE GIRDERS SHALL BE CAMBERED IN THE SHOP AS DETAILED ON THIS SHEET. THE SHOP CAMBER DIAGRAM REPRESENTS THE TOTAL RISE, IN INCHES, ABOVE A CHORD BETWEEN THE CENTERLINES OF ABUTMENT BEARINGS THAT SHALL BE CUT INTO THE WEB PLATE OF THE GIRDER TO COMPENSATE FOR THE DEAD LOAD DEFLECTION OF THE SUPERSTRUCTURE PLUS THE VERTICAL CURVE OF THE ROADWAY. THE CAMBER SHOWN SHALL BE IN ADDITION TO THE RISE REQUIRED FOR THE GIRDER HAUNCH.

A MINIMUM OF TWO (2) CONTIGUOUS GIRDER SECTIONS SHALL BE PLACED ON THEIR SIDES AND IN THEIR CORRECT RELATIVE POSITIONS BEFORE DRILLING THE HOLES FOR THE GIRDER FIELD SPLICE BETWEEN THESE SECTIONS. THE PROPER ALIGNMENT SHALL BE MAINTAINED BETWEEN SECTIONS WHILE REAMING THE HOLES. TEMPLATES SHALL NOT BE USED IN LIEU OF THE ABOVE SHOP ASSEMBLY.

STEEL ERECTION:

FALSEWORK WITH PROVISIONS FOR JACKING MUST BE PROVIDED AT ALL SPLICE POINTS DURING ERECTION. BOTH SPLICE POINTS IN EACH GIRDER LINE SHALL BE BROUGHT TO THEIR PROPER ELEVATION AND SUPPORTED IN POSITION BEFORE THE BOLTS IN EITHER OF THE SPLICES ARE TIGHTENED. THE BOLTS IN BOTH OF THE SPLICES IN A GIRDER LINE SHALL BE TIGHTENED TO THE REQUIRED TENSION BEFORE ANY OF THE SUPPORTS ARE REMOVED.

MATERIALS: (STRUCTURAL STEEL)

GIRDER FLANGES: A572 (GRADE 50)

GIRDER WEB, WEB AND FLANGE SPLICE PLATES, STIFFENERS, DIAPHRAGMS, CHANNEL SHEAR CONNECTORS, BEARING PLATES, AND ANCHOR BOLTS: A36

BLAST CLEANING:

COMMERCIAL BLAST CLEANING OF ALL EXPOSED MAIN AND SECONDARY STEEL MEMBERS WILL BE REQUIRED PRIOR TO PAINTING. (INCLUDE IN UNIT PRICE BID FOR STRUCTURAL STEEL.)

PAINT:

PAINT AND PAINTING SHALL CONFORM TO THE STANDARD SPECIFICATIONS, SECTIONS 718 AND 870-1.2.

ALL EXPOSED STEEL SURFACES SHALL BE GIVEN ONE SHOP COAT OF RED LEAD PAINT (INCLUDING TOP OF UPPER FLANGES BUT NOT SHEAR CONNECTORS), ONE SPOT COAT OF RED LEAD PAINT AFTER ERECTION AND CONCRETE WORK IS COMPLETED, AND TWO FIELD COATS OF ENAMEL. THE FIRST FIELD COAT SHALL CONFORM TO GREEN COLOR NO. 24260 AND THE SECOND COAT SHALL CONFORM TO GRAY-GREEN COLOR NO. 24300. BOTH COATS SHALL MEET THE FEDERAL STANDARD NO. 595 FOR COLOR. COLOR CHIPS ARE ON FILE IN THE BRIDGE DIVISION OF THE NORTH DAKOTA STATE HIGHWAY DEPARTMENT, BISMARCK.

PILE HAMMERS:

THE PILES FOR THIS STRUCTURE SHALL BE DRIVEN BY A STEAM (OR AIR) OR DIESEL HAMMER HAVING A RATED ENERGY AND RAM WEIGHT NOT LESS THAN 37,320 FOOT-POUND-TONS AS COMPUTED BY THE FORMULA $W(E-11,025)+0.68E$ WHERE W IS THE WEIGHT OF THE RAM IN TONS AND E IS THE RATED HAMMER ENERGY AS ALLOWED IN SECTION 622. IN NO CASE SHALL THE RAM WEIGHT BE LESS THAN 4,800 POUNDS.

TEST PILE:

THE TEST PILE SHALL BE DRIVEN TO A BEARING OF NOT LESS THAN 125% OF THE DESIGN LOAD AS DETERMINED BY THE DYNAMIC FORMULA.

LINSEED OIL TREATMENT:

LINSEED OIL TREATMENT SHALL NOT BE DONE UNTIL ALL CONCRETE WORK IS COMPLETED AND THE ASPHALT CURB SEAL HAS BEEN INSTALLED.

CURING CONCRETE:

EXCEPT AS PROVIDED IN THE FOLLOWING PARAGRAPH, LIQUID MEMBRANE CURING COMPOUND SHALL NOT BE USED ON ANY CONCRETE WHICH IS TO RECEIVE FURTHER TREATMENT.

THE WATER SOLUBLE LIQUID MEMBRANE CURE (SECTIONS 550-4.13.2.1 AND 880-5 OF THE STANDARD SPECIFICATIONS) MAY BE USED FOR CURING THE DECK SLAB CONCRETE. A PROTECTIVE COVERING SHALL BE USED SO THAT LINSEED OIL IS NOT APPLIED TO THE AREA WITHIN THREE INCHES OF THE GUTTER LINE UNTIL AFTER THE ASPHALT CURB SEAL IS IN PLACE. IF THE CONTRACTOR ELECTS TO USE THIS METHOD OF CURING THE DECK SLAB CONCRETE, THE QUANTITY FOR LINSEED OIL TREATMENT MAY BE REDUCED WITHOUT ADJUSTMENT TO ITS UNIT BID PRICE.

STATIONING:

THE SURVEY STATIONING IS FROM NORTH TO SOUTH WHEREAS THE MILE POST GIVEN IS DETERMINED FROM SOUTH TO NORTH.

QUANTITIES

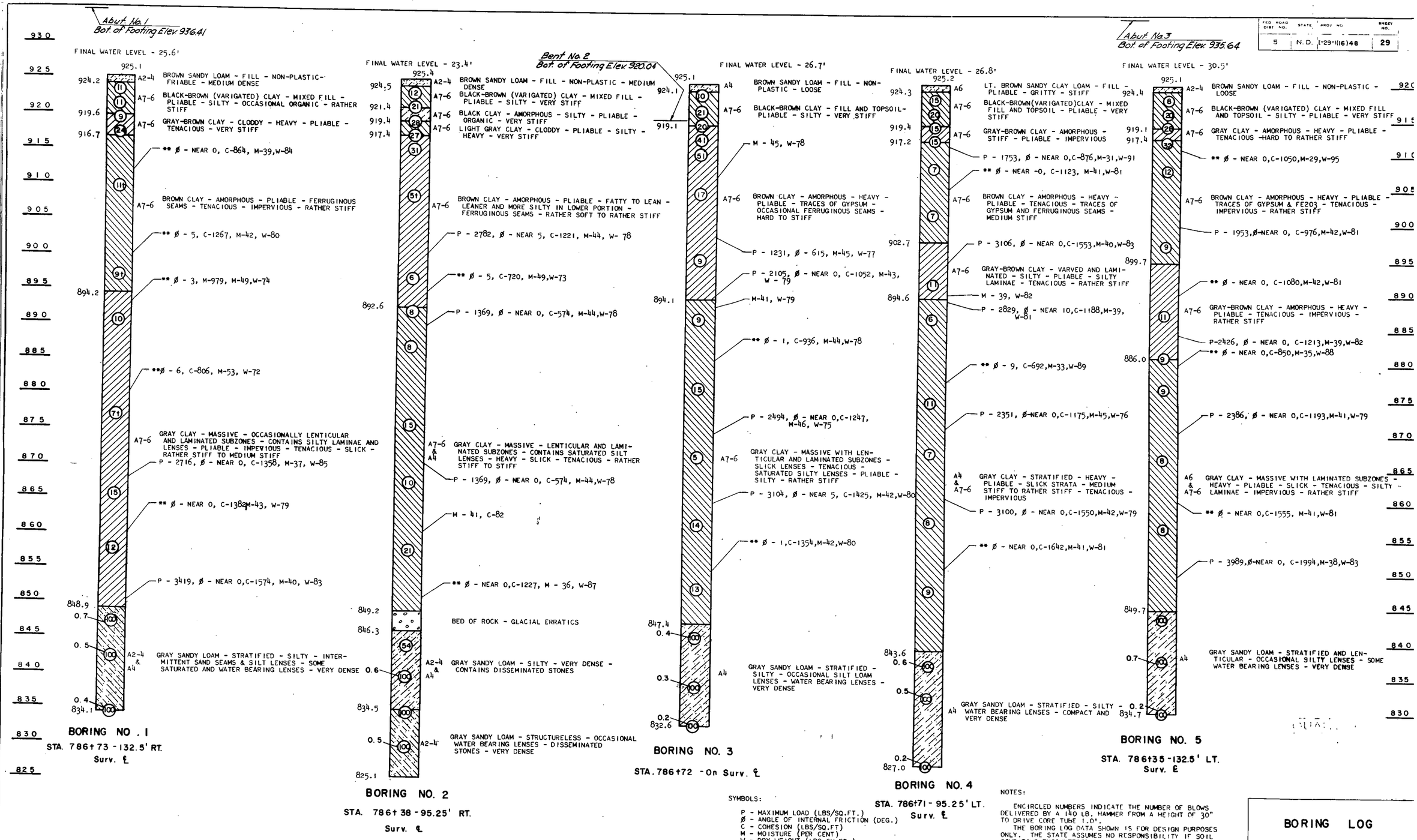
KINDRED INTERCHANGE

BEARING PLATE LAYOUT

PILING LAYOUT

GENERAL NOTES

FED. ROAD DIST. NO.	STATE	PROJ. NO.	SHEET NO.
5	N. D.	I-29-1(16)48	29



SYMBOLS:

P - MAXIMUM LOAD (LBS/SQ.FT.)
Ø - ANGLE OF INTERNAL FRICTION (DEG.)
C - COHESION (LBS/SQ.FT)
M - MOISTURE (PER CENT)
W - DRY WEIGHT (LBS.CU.FT.)
** - TRIAXIAL

NOTES:

ENCIRCLED NUMBERS INDICATE THE NUMBER OF BLOWS DELIVERED BY A 140 LB. HAMMER FROM A HEIGHT OF 30" TO DRIVE CORE TUBE 1.0'.

THE BORING LOG DATA SHOWN IS FOR DESIGN PURPOSES ONLY. THE STATE ASSUMES NO RESPONSIBILITY IF SOIL CONDITONS ENCOUNTERED DURING CONSTRUCTION DIFFER FROM THOSE SHOWN.

BORING LOG

KINDRED INTERCHANGE

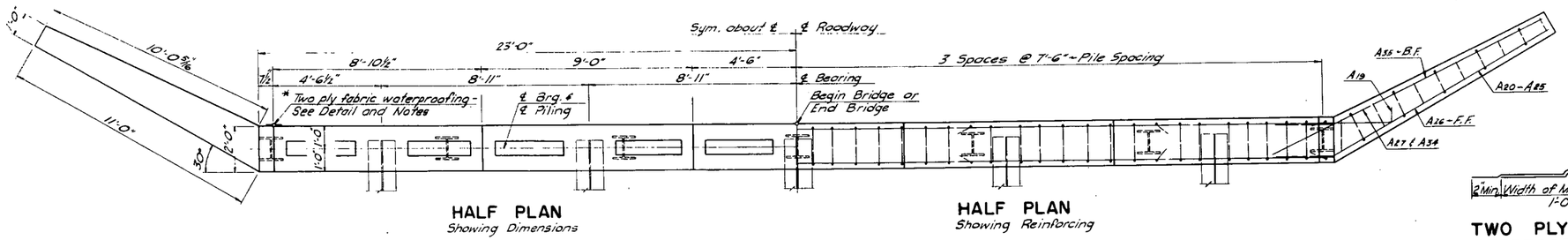
CASS-RICHLAND COUNTIES

29-48.21-2

29-48.21-2

TRACING MADE BY / CHECKED BY
QUANTITIES MADE BY / CHECKED BY
DESIGN DETAILS MADE BY / CHECKED BY
REVISIONS MADE BY DATE

FED. HWAY DIST. NO.	STATE	PROJ. NO.	SHEET NO.
5	N.D.	I-29-:(16)	30

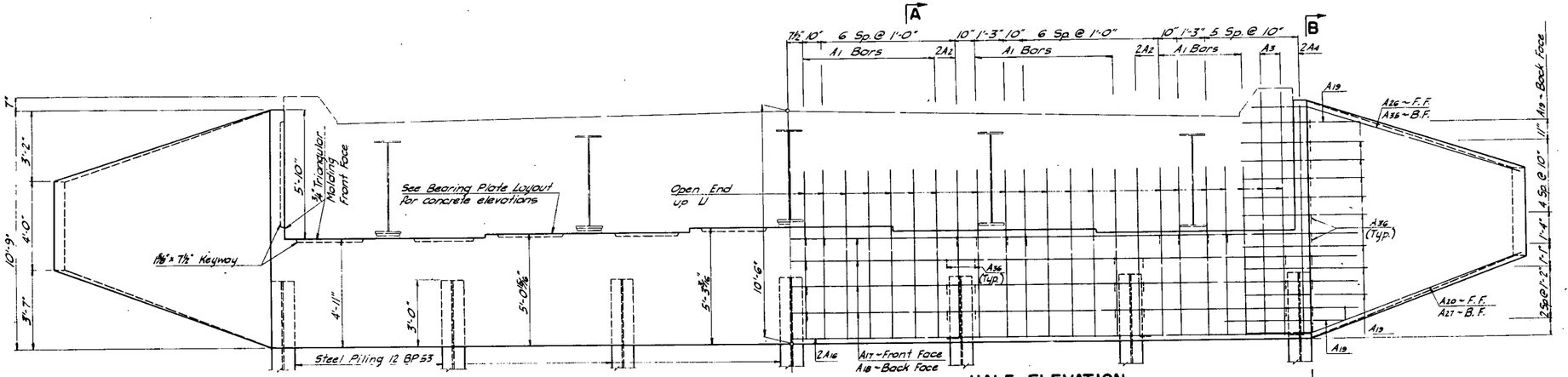


HALF PLAN
Showing Dimensions

HALF PLAN
Showing Reinforcing



TWO PLY FABRIC WATERPROOFING DETAIL



HALF ELEVATION
Showing Dimensions

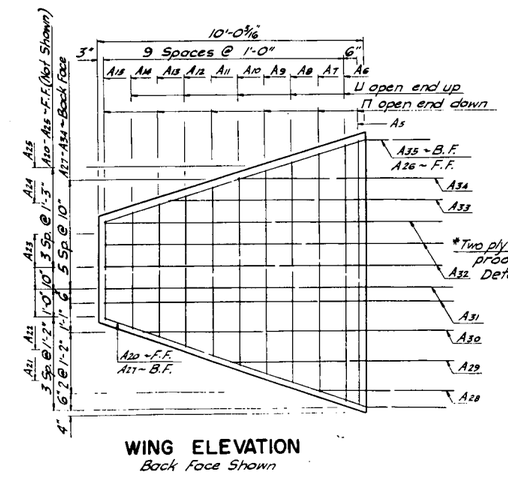
HALF ELEVATION
Showing Reinforcing

BAR LIST (ONE ABUT.)

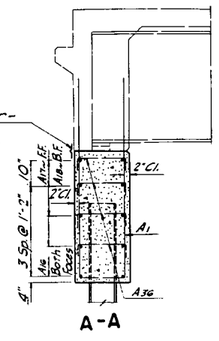
MARK	NUMBER	WALL		SIZE	LENGTH	SHAPE	UNIT WT.
A1	38			6	17'-2"	Bent	25.79
A2	8			6	8'-9"	"	13.14
A3	4			6	23'-6"	"	35.30
A4	4			6	11'-4"	"	17.02
A5	2			5	21'-11"	"	22.86
A6	2			5	21'-0"	"	21.91
A7	2			5	19'-7"	"	20.43
A8	2			5	18'-0"	"	18.78
A9	2			5	16'-7"	"	17.30
A10	2			5	15'-4"	"	16.00
A11	2			5	14'-0"	"	14.60
A12	2			5	12'-7"	"	13.13
A13	2			5	11'-0"	"	11.47
A14	2			5	9'-7"	"	10.00
A15	2			5	8'-2"	"	8.52
A16	4			6	24'-0"	Str.	36.05
A17	8			5	23'-10"	"	24.86
A18	8			5	25'-11"	"	27.03
A19	20			7	6'-6"	Bent	13.29
A20	2			7	14'-4"	"	29.30
A21	2			7	7'-1"	"	14.48
A22	2			7	10'-8"	"	21.81
A23	8			7	13'-7"	"	27.77
A24	2			7	11'-7"	"	23.83
A25	2			7	7'-0"	"	14.31
A26	2			6	13'-9"	"	20.65
A27	2			7	13'-4"	"	27.26
A28	2			8	5'-3"	"	14.02
A29	2			8	8'-6"	"	22.70
A30	2			8	11'-8"	Str.	31.15
A31	4			8	13'-2"	"	35.16
A32	6			7	12'-9"	"	26.07
A33	2			7	10'-4"	"	21.15
A34	2			7	7'-9"	"	15.84
A35	2			6	12'-9"	Bent	19.16
A36	18			4	2'-8"	"	1.78

NOTES:

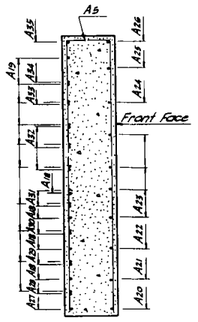
* Two ply fabric waterproofing shall be applied over the construction joint on the back face as shown on the detail.
"Two Ply Fabric Waterproofing" shall consist of furnishing materials and placing damp-proofing and fabric waterproofing in accordance with Section 736 of the Standard Specifications. All materials and work shall be considered incidental to the pay item for Class AE-1 Concrete.



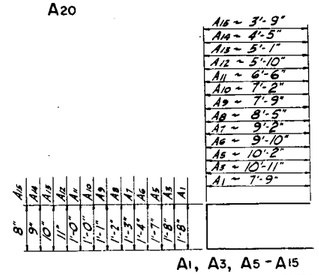
WING ELEVATION
Back Face Shown



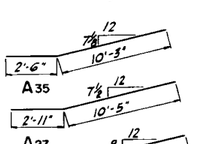
A-A



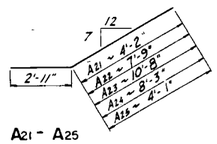
B-B



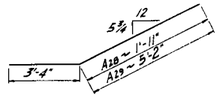
A1, A3, A5 - A15



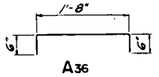
A20



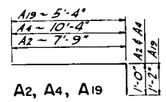
A21 - A25



A28 & A29



A36



A2, A4, A19

BENT BAR DETAILS
Dimensions shown are out to out

QUANTITIES (ONE ABUT.)

Class AE-1 Concrete	26.0 C.Y.
Reinforcing Steel	3677 Lbs.
Excavation (See Layout)	
Piling (See Layout)	

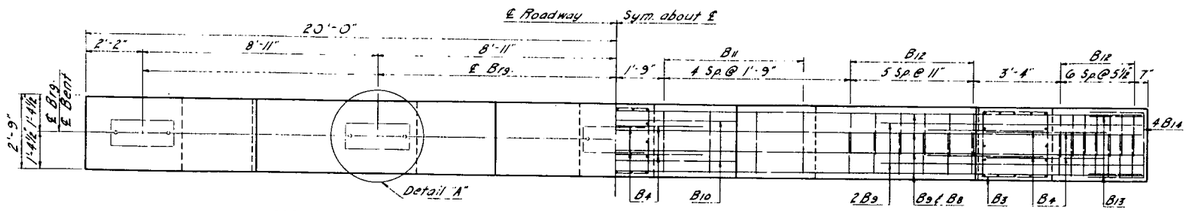
10'-6" ABUTMENT

WELDED GIRDER SPANS

40'-0" ROADWAY
HS20 LOADING

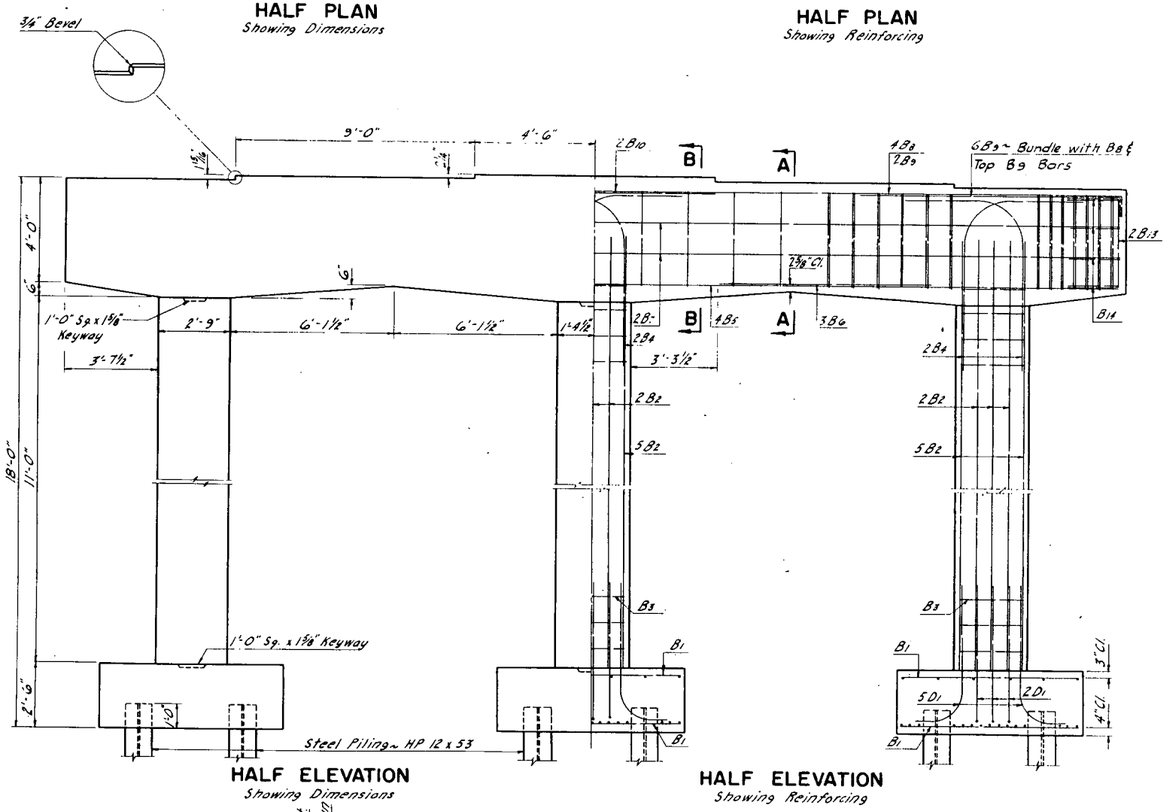
H-1402

FED. HIGHWAY DIST. NO.	STATE	PROJECT NO.	SHEET NO.
5	N D	I-29 1(6)	31



HALF PLAN
Showing Dimensions

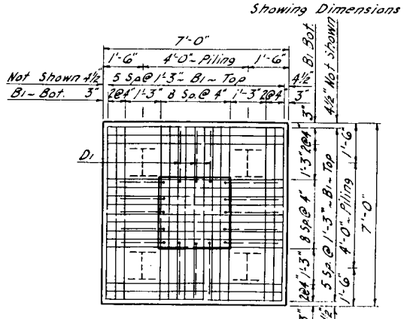
HALF PLAN
Showing Reinforcing



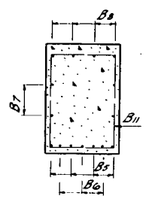
HALF ELEVATION
Showing Dimensions

HALF ELEVATION
Showing Reinforcing

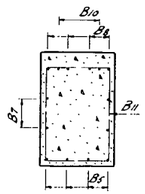
END VIEW



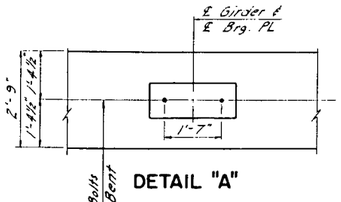
FOOTING PLAN ~ TYPICAL



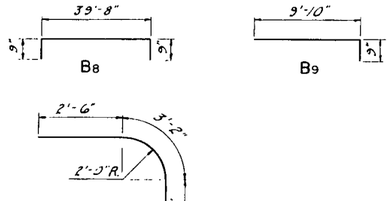
A-A



B-B



DETAIL "A"



BENT BAR DETAILS
All dimensions are out to out
Unless noted otherwise

BAR LIST

MARK	NUMBER CAP	NUMBER COLUMN	NUMBER FOOTING	SIZE	LENGTH	SHAPE	UNIT WT.
B1			126	5	6'-8"	Str.	6.93
B2		18		8	13'-6"	"	36.06
B3	3	33		3	10'-8"	Bent	4.01
B4		12		8	10'-5"	"	27.82
B5	4			10	39'-8"	Str.	81.10
B6	6			10	8'-0"	"	16.36
B7	4			6	39'-8"	"	59.56
B8	4			7	41'-2"	Bent	84.16
B9	16			7	10'-7"	"	21.64
B10	2			8	9'-0"	Str.	24.03
B11	8			5	13'-2"	Bent	13.73
B12	52			5	11'-8"	"	12.17
B13	4			6	7'-4"	"	11.02
B14	8			6	6'-1"	"	9.14
D1			98	8	6'-9"	"	18.02
SAMPLE*	1			4	3'-8"	Str.	
SAMPLE*	1			5	4'-0"	"	
SAMPLE*	1			6	4'-6"	"	
SAMPLE*	1			7	5'-0"	"	
SAMPLE*	1			8	5'-4"	"	

NOTE:

The concrete in the columns shall be allowed to set at least two (2) hours before the bent cap reinforcing is placed and concrete poured.

All exposed edges to be beveled with ¾" triangular molding.

** Sample replacement bar to be spliced to bar from which 2'-0" sample has been cut. Furnish only one set for the entire bridge. This is not a pay item and shall be included in the unit price bid for reinforcing steel.*

QUANTITIES

Class AE-1 Concrete	41.0 C.Y.
Reinforcing Steel	6,668 Lbs.
Steel Piling (See Layout)	
Excavation (See Layout)	

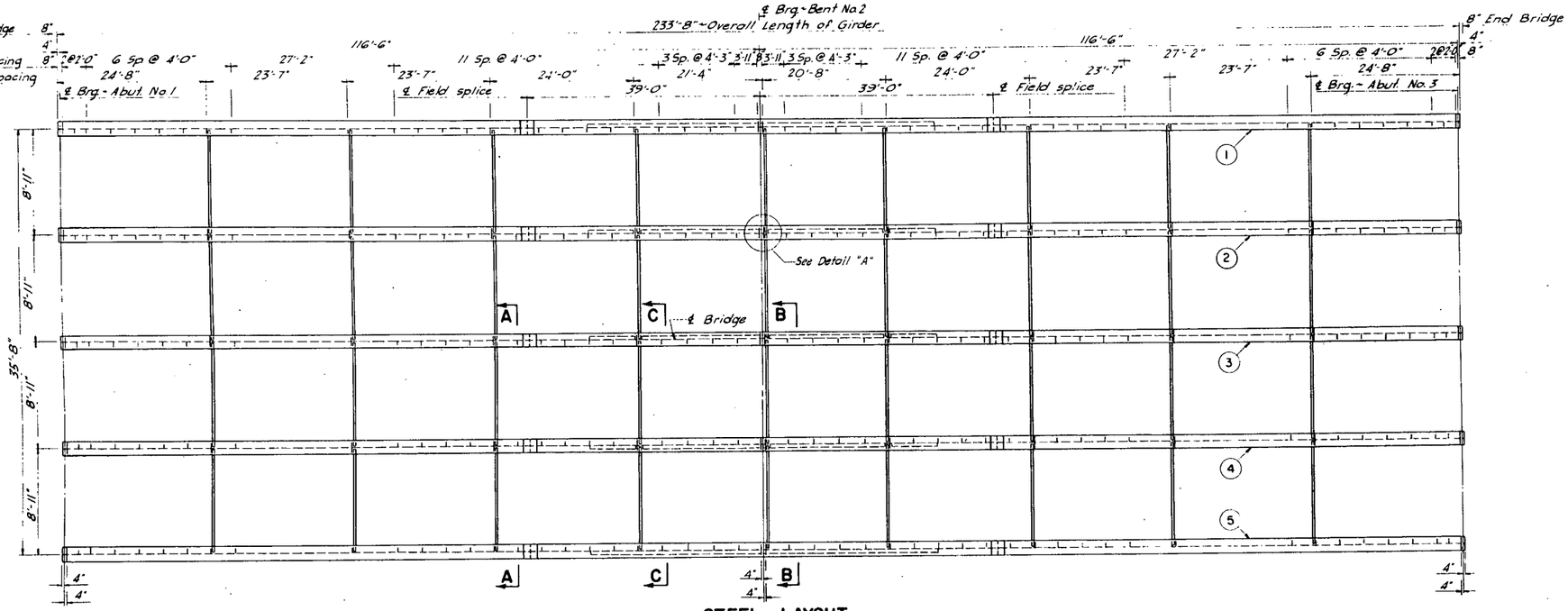
18'-0" BENT DETAIL
WELDED GIRDER SPANS
40'-0" ROADWAY
HS20 LOADING

DESIGN DETAILS CHECKED BY G.A.L.
QUANTITIES MADE BY L.E.G. CHECKED BY G.A.L.
DRAWING CHECKED BY G.A.L.
MADE BY L.E.G. CHECKED BY G.A.L.
REVISIONS
MADE BY
DATE

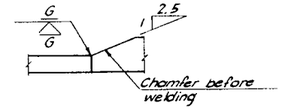
H-1379

H-1379

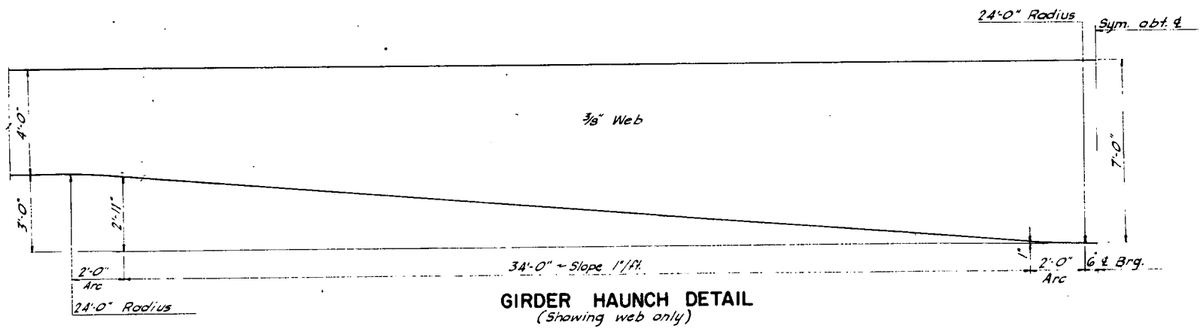
FED. ROAD DIST. NO.	STATE	PROJ. NO.	SHEET NO.
5	N.D.	I-29-1(16)32	



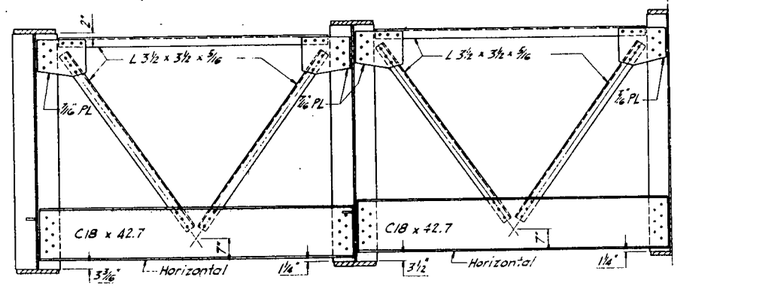
STEEL LAYOUT



TYPICAL SHOP FLANGE SPLICE
Top Flange Shown

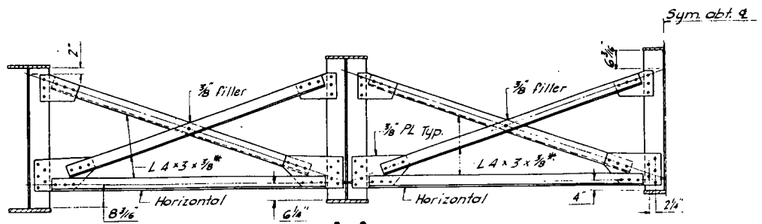


GIRDER HAUNCH DETAIL
(Showing web only)

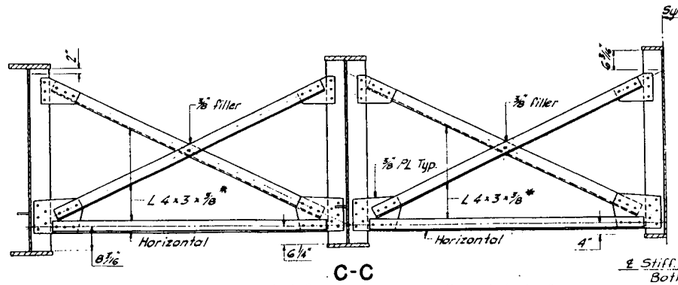


B-B

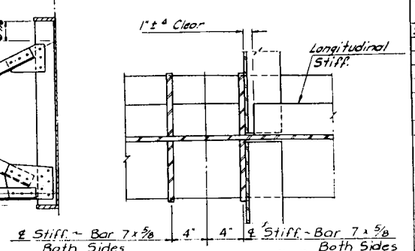
*Allow approximately 1" clearance as shown for installation of diaphragms.



A-A
Typical for diaphragms in positive moment regions.



C-C
Typical for diaphragms adjacent to bent
*4" Leg Vertical



DETAIL "A"

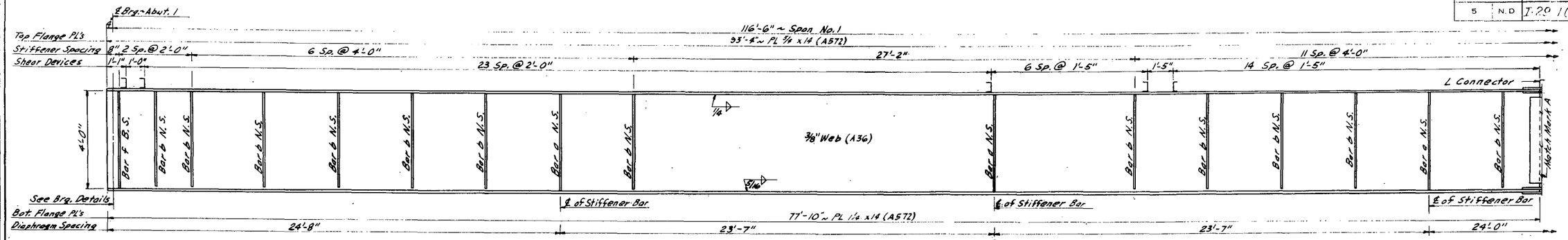
Designed for 25 #/S.F. F.W.S.

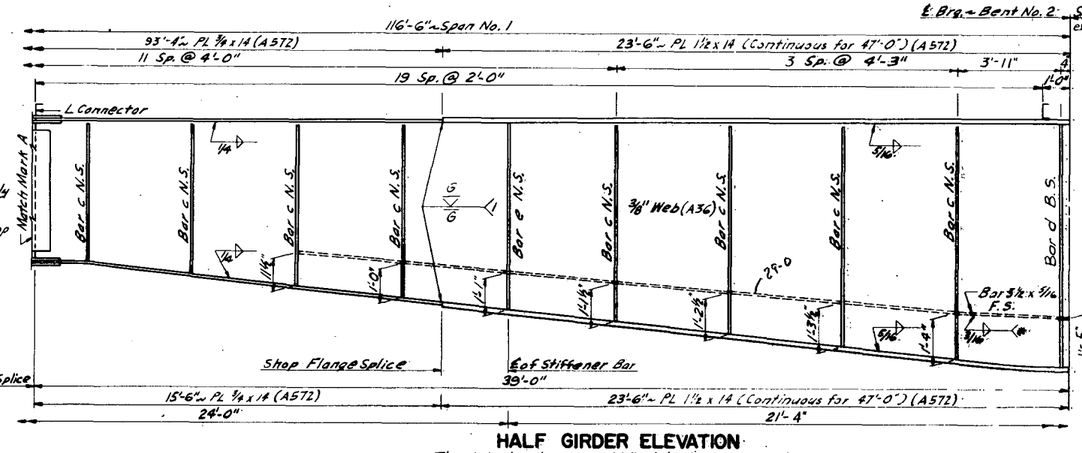
QUANTITIES
See Drawing H-5128-2

GIRDER & DIAPHRAGM DETAILS
WELDED GIRDER SPANS
40'-0" ROADWAY
HS20 LOADING

H-5128-1

FED. ROAD DIST. NO.	STATE	PROJ. NO.	SHEET NO.
5	N.D.	F-29 1(16)	33





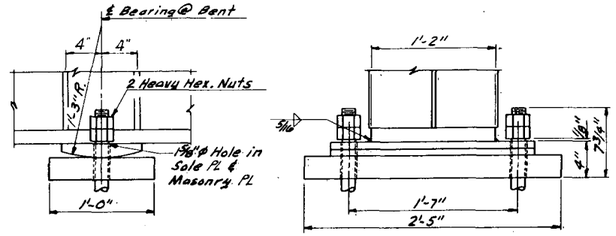
HALF GIRDER ELEVATION

The details shown on this drawing represent Girder No.1 in a five girder bridge. Girders No.2, No.3, No.4 and No.5 are similar to Girder No.1 and shall be fabricated in accordance with these details, drawing H-5128-1 and the shop camber diagram.

Sole Plate ~ Bar 8 x 1/2 x 13
Masonry Plate ~ Bar 8 x 1/4 x 13
Swedge Bolts ~ 1 1/2" ø x 1'-5"

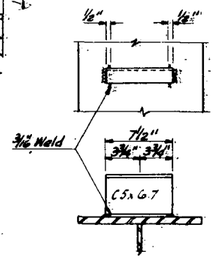
Note: Swedge Bolts to be drilled in and anchored in quick setting anchor grout.

ABUTMENT BEARING DETAILS

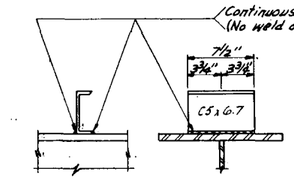


Sole Plate ~ PL 1 1/2 x 9 x 1'-3
Masonry Plate ~ PL 2'-2 1/2 x 1'-2 x 1'-9
Swedge Bolts ~ 1 1/2" ø x 2'-0"

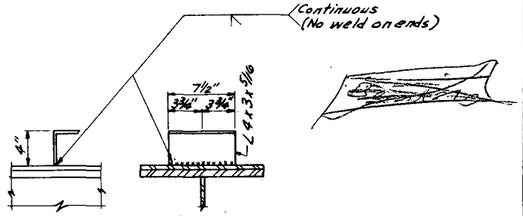
BENT BEARING DETAILS



Use in negative moment regions between field splices

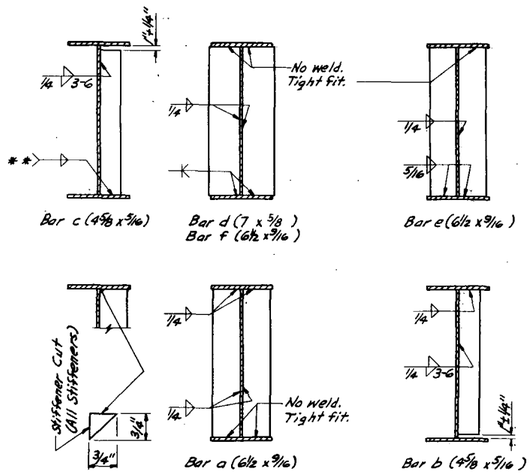


Use in positive moment region except over splice PL's

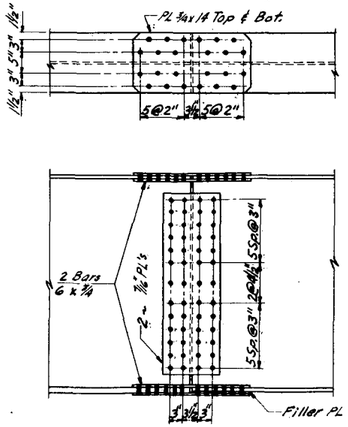


Use over splice PL's

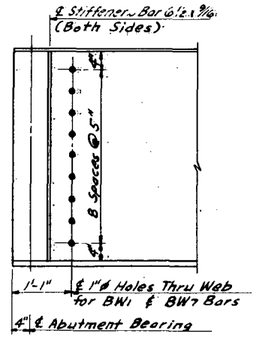
SHEAR DEVICE DETAILS



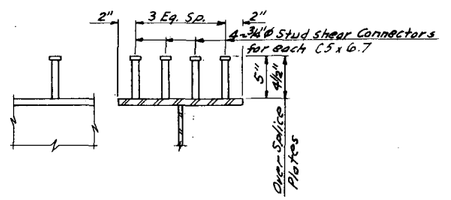
WEB STIFFENER DETAILS



FIELD SPLICE DETAILS



GIRDER DETAIL



ALTERNATE SHEAR DEVICE

Nomenclature:
N.S. = Near Side
B.S. = Both Sides
F.S. = Far Side

Designed for 25#/S.F. F.W.S.

QUANTITIES

Structural Steel A572	118,872 Lbs.
Structural Steel A36	12,502 Lbs.

GIRDER & BRG. DETAILS
WELDED GIRDER SPANS

40'-0" ROADWAY

HS20 LOADING

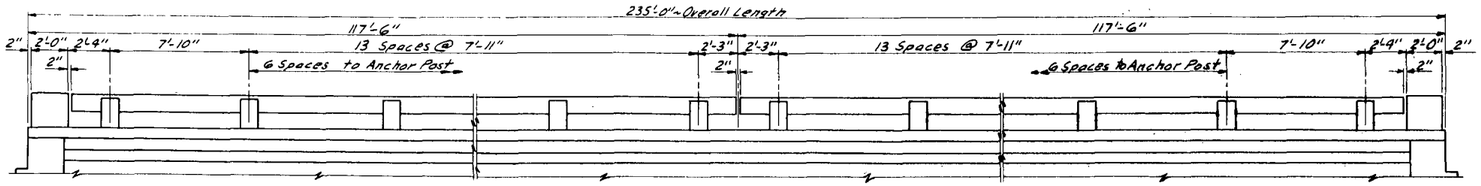
* * Weld size to be 1/4" for flange thickness of 3/4" and 5/16" for flange thickness over 3/4" to 1 1/2".

DESIGNED BY L.F.S.
DETAILED BY R.A.L.
QUANTITIES MADE BY L.Z.B.
CHECKED BY L.Z.B.
MADE BY L.P.H.
CHECKED BY G.A.L.
REVISIONS
MADE BY
DATE

H-5128-2

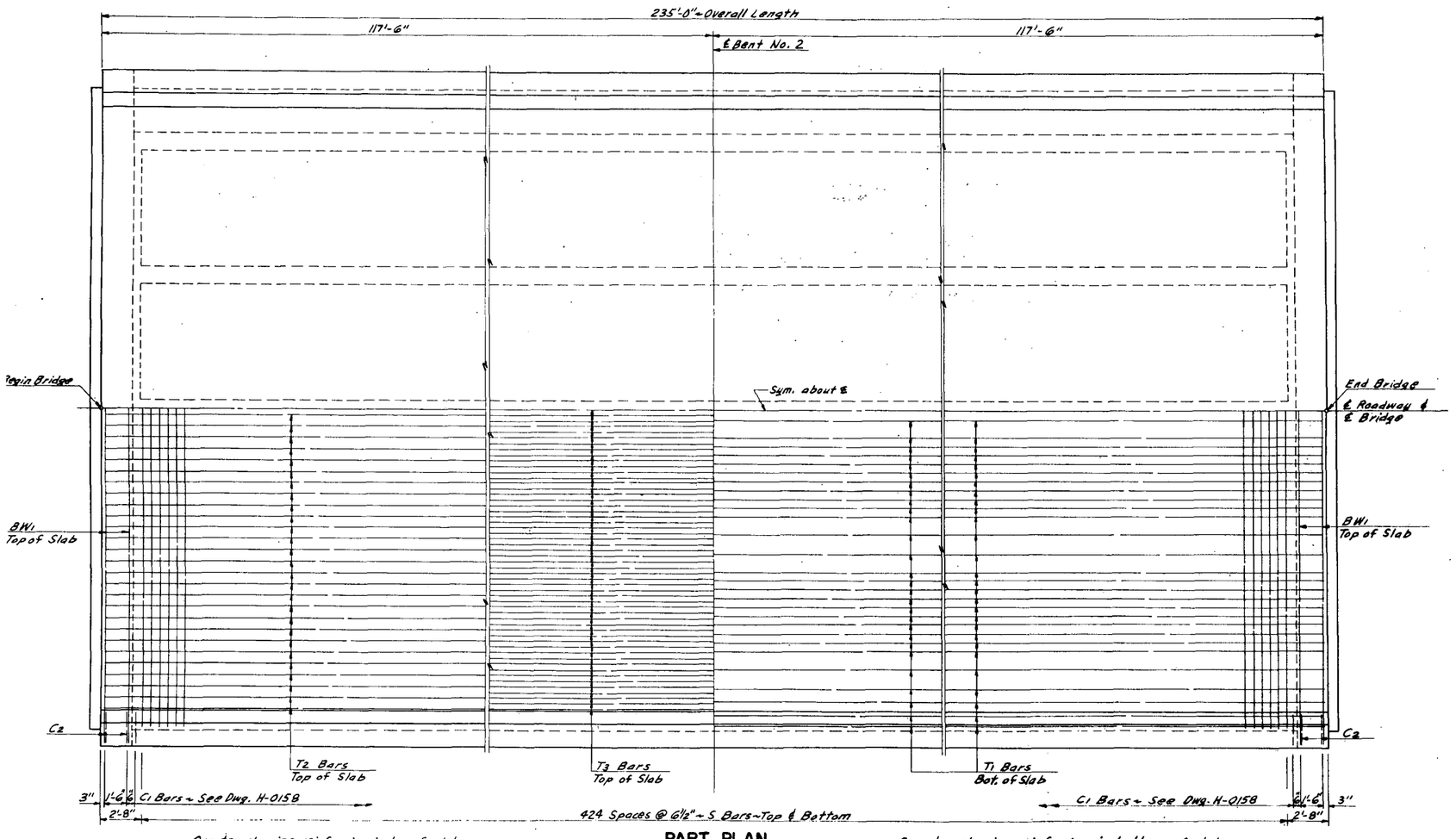
H-5128-2

FED. ROAD DIST. NO.	STATE	PROJ. NO.	SHEET NO.
5	N.D.	I-29-1(16)	34



PART ELEVATION

See H-0158 for Railing Details.

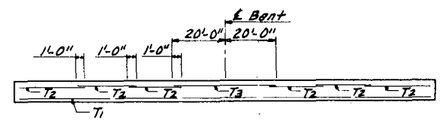


Quarter showing reinforcing in top of slab

PART PLAN

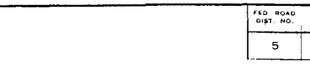
Half showing slab reinforcing
Typical both sides ~ by Rotation

Quarter showing reinforcing in bottom of slab



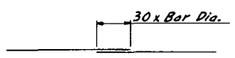
BAR LAYOUT

T2 & T3



R BAR SPLICING DETAIL

(Spans 1 & 2 Railing)



SPLICING DETAIL

T1, C3, C4

Designed for 25#/S.F. F.W.S.

QUANTITIES

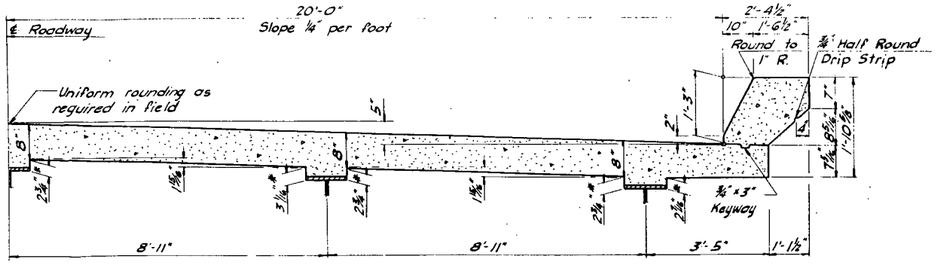
See Dwg. H-5129-2

SLAB & RAILING DETAILS

WELDED GIRDER SPANS

40'-0" ROADWAY

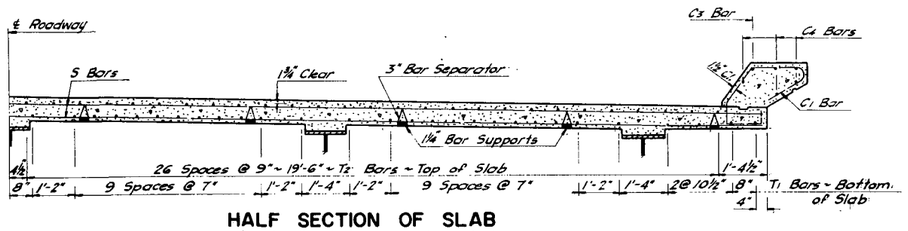
HS20 LOADING



HALF SECTION OF SLAB

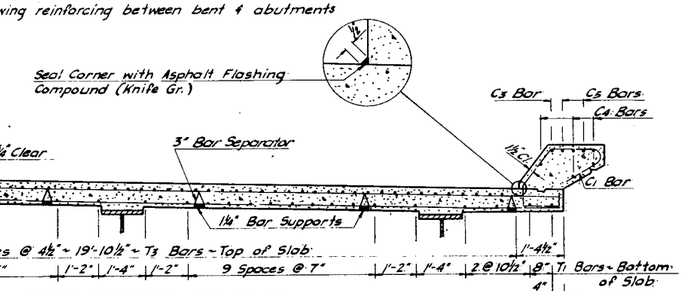
Showing Dimensions

*Allow for variation in girder elevation by adjusting the riser dimension to maintain required slab thickness.



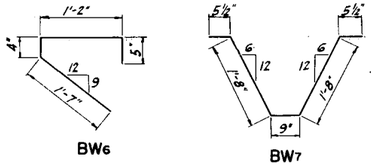
HALF SECTION OF SLAB

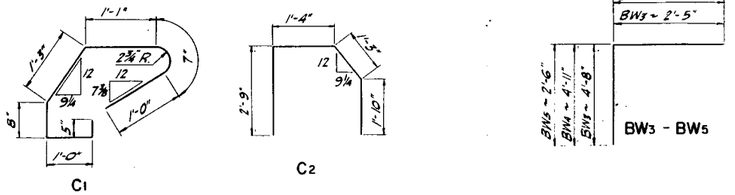
Showing reinforcing between bent & abutments



HALF SECTION OF SLAB

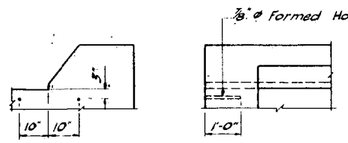
Showing reinforcing over bent



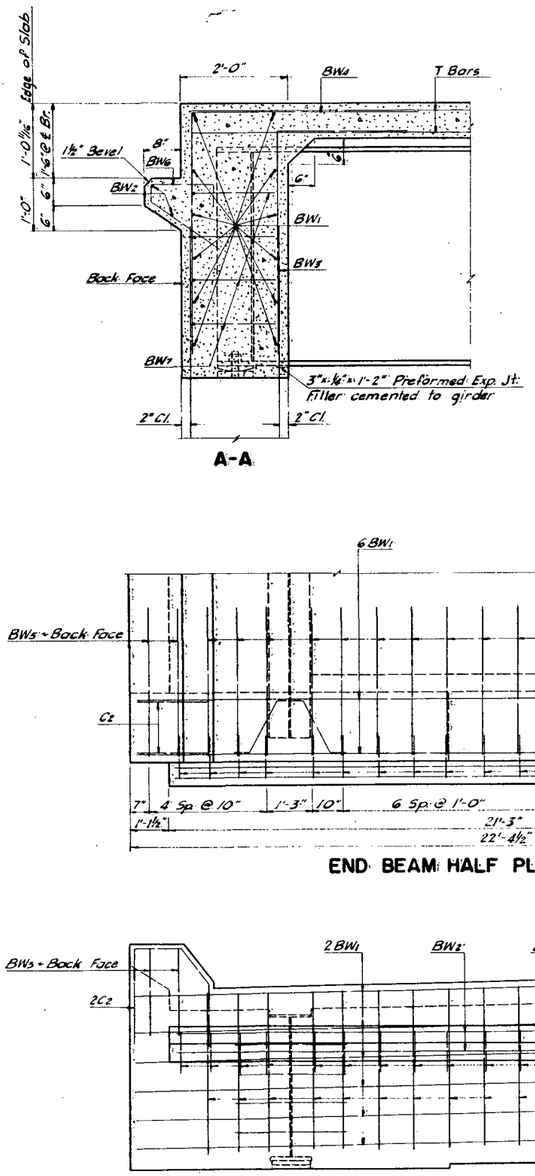


BENT BAR DETAILS

Dimensions shown are out at out

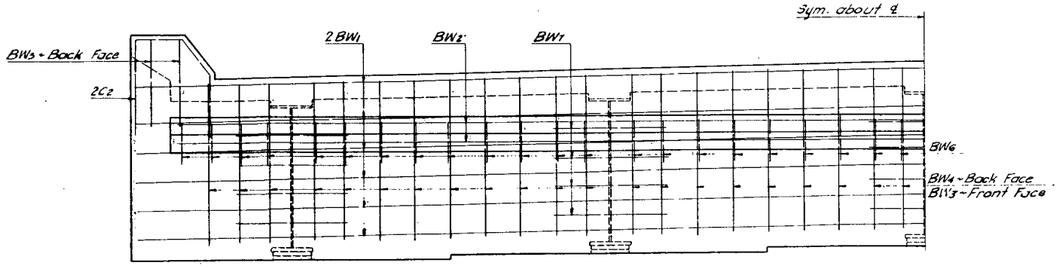


CURB SLEEVE DETAILS



A-A

END BEAM HALF PLAN



END BEAM HALF ELEVATION

BAR LIST

MARK	NUMBER: SLAB	RAILING POSTS	CURB	SIZE	LENGTH	SHAPE	UNIT WT.
BW1	24			6	44'-5"	Str.	66.72
BW2	4			5	42'-2"	"	43.98
BW3	84			6	7'-1"	Bent	10.64
BW4	84			6	9'-2"	"	13.77
BW5	8			6	6'-9"	"	10.14
BW6	88			4	3'-6"	"	2.34
BW7	40			5	5'-0"	"	5.22
C1	532			5	6'-0"	Bent	6.26
C2	8			5	7'-2"	"	7.48
C3			14	6	35'-2"	Str.	52.82
C4			70	5	34'-11"	"	36.42
C5			4	4	40'-0"	"	26.70
P4			168	6	4'-4"	Bent	6.51
P3			12	6	5'-1"	"	7.64
P2			120	5	4'-9"	"	4.95
P1		120		3	4'-2"	"	1.56
P8		112		3	3'-2"	"	1.19
P9		8		3	4'-8"	"	1.75
RC		416		3	3'-3"	Bent	1.22
R1		16		6	42'-6"	Str.	63.84
R2		16		6	36'-6"	"	54.83
R3		40		6	39'-6"	"	59.33
S	850			6	42'-2"	Str.	63.34
T1	392			5	34'-11"	Str.	36.42
T2	324			3	33'-6"	"	12.58
T3	107			4	40'-0"	"	26.70

NOTES:

It is assumed that the Contractor can place the slab concrete in one continuous operation in accordance with Sections 602-3.6.1 thru 602-3.6.2.1.4 of the Standard Specifications. If the Contractor cannot pour at the specified rate, he shall submit drawings to the Bridge Engineer, for approval, showing proposed construction joints and pouring sequence.

Each curb shall be poured in one continuous operation.

See Std. Drawing H-0158 for railing details.

See Drawing H-5128-1 & H-5128-2 for Structural Steel details.

The end beams shall be poured at the same time that the deck slab is poured. Special care shall be taken to completely fill the space under the girders in the end beams with concrete.

Designed for 25 #/S.F. F.W.S.

QUANTITIES

Class AE-3 Concrete	321.4	C.Y.
Class AAE-3 Concrete	15.23	C.Y.
Reinforcing Steel	93,213	Lbs.

Railing and end post quantities included.

SLAB, END BEAM & MISC. DETAILS

WELDED GIRDER SPANS

40'-0" ROADWAY
HS20 LOADING

DESIGN MADE BY L.L.G. CHECKED BY G.A.L.
TRACING CHECKED BY L.L.G.
QUANTITIES MADE BY L.L.G. CHECKED BY L.L.G.
REVISIONS MADE BY DATE

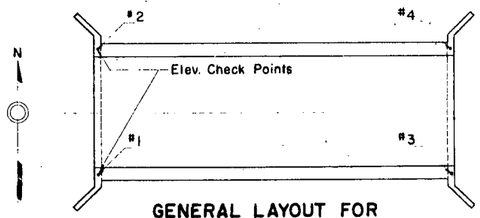
H-5129-2

H-5129-

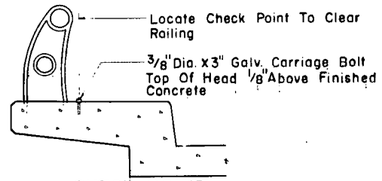
FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.
5	N. D.	I-29-1(16)	36

D-900-1

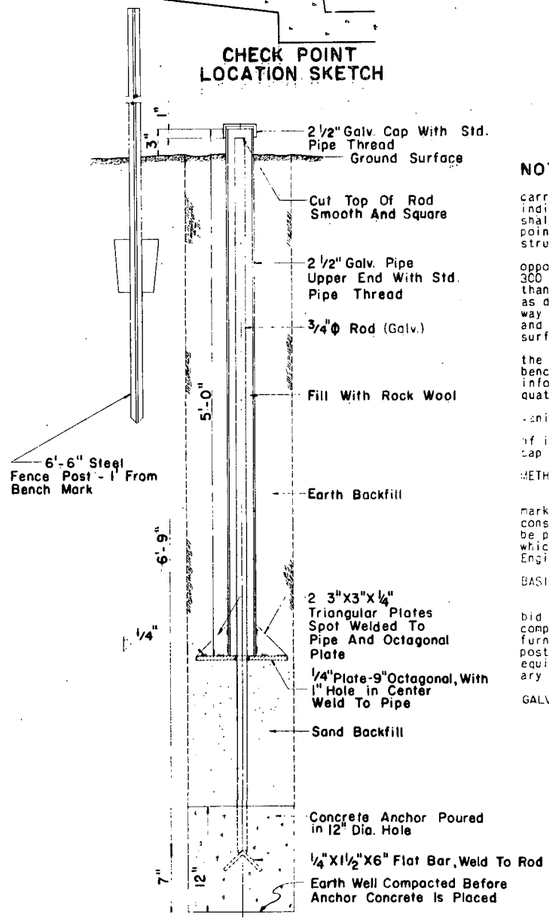
BRIDGE BENCH MARKS



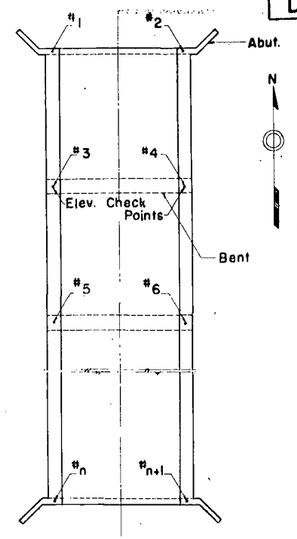
GENERAL LAYOUT FOR SINGLE SPAN



CHECK POINT LOCATION SKETCH



BENCH MARK DETAIL



GENERAL LAYOUT FOR MULTIPLE SPAN

NOTES:

Elevation check points shall consist of 3/8"x 3" galvanized carriage bolts (or equal) set in the concrete curb at the points indicated on the General Layout Sketches. The top of bolt head shall project above the finished concrete 1/8". Elevation check points shall be placed on each curb over each unit of the substructure for each bridge at a structural location.

Two bench marks as detailed hereon shall be set at diagonal opposite positions away from the structure location and at least 300 feet from the nearest point on the bridge or bridges (if more than one at a location). These bench marks shall be constructed as detailed on this sheet and located near the Highway Right-of-way lines. The steel fence post shall extend 4'-0" above ground and be painted with two coats of white paint suitable for steel surfaces.

The Project Engineer shall run a set of levels determining the elevation of each check point on the structure and the two bench marks immediately after the completion of the bridge. This information shall be submitted to the Bridge Engineer with adequate information locating each check point and bench mark.

Except for fence posts, all metal parts to be hot dip galvanized after punching, shearing, welding, and fabrication.

Threads of cap and pipe are not to be galvanized. At time of installation these threads are to be coated with grease and cap screwed to snug fit.

METHOD OF MEASUREMENT:

Each set of Bridge Bench Marks consisting of two bench marks and the required number of elevation check points shall be considered as one unit for bidding purposes and the quantity to be paid for shall be the number of sets of bridge bench marks which have been installed complete in place and accepted by the Engineer.

BASIS OF PAYMENT:

Bridge Bench Marks shall be paid for at the contract price bid for each set of Bridge Bench Marks, which price shall be full compensation for all excavation, backfill and clean-up, and for furnishing, hauling and placing all elevation check points, fence posts, galvanized pipe, caps, rods, sand backfill, concrete, rock equipment, tools and incidentals, including galvanizing, necessary to complete this item.

GALVANIZING:

After fabrication the complete assembly shall be Hot Dip Galvanized

NORTH DAKOTA
STATE HIGHWAY DEPARTMENT

Submitted: Joseph R. Kurby
Bridge Engineer

Recommended: M. Boyston
Director State Division

Approved: R. O. Bradley
Chief Engineer

Date: 3-3-58

Revised 10-20-59.
Revised 6-9-59.

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