29-104.155

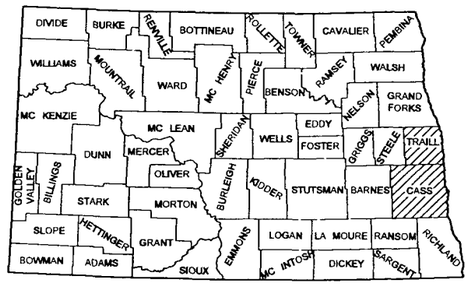
JOB# 43

STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
ND	SIM-8-029(111)066	17286	001	1
	SIM-8-029(103)085	16882		

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

SIM-8-029(111)066
SIM-8-029(103)085
Cass & Traill Counties

PAINTING BRIDGE STRUCTURAL STEEL



STATE COUNTY MAP



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
SIM-8-029(111)066	0.0574	0.0574
SIM-8-029(103)085	0.1548	0.1548

INDEX OF DRAWINGS

SECTION NO.	SHEET NO.	DESCRIPTION
001	1	TITLE SHEET
8	1	ESTIMATE OF QUANTITIES
100	1	TRAFFIC CONTROL DEVICES LIST
170	1	BASIS OF ESTIMATE AND NOTES
	1, 3-8	STRUCTURAL STEEL PAINTING DETAILS

SPECIAL PROVISIONS

SP 030(08) BRIDGE PAINT

LIST OF STANDARD DRAWINGS

D-704-7,8	BREAKAWAY SYSTEMS FOR CONSTRUCTION ZONE SIGNS
D-704-9, 10, 11, 12, 12A	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
D-704-50	PORTABLE SIGN SUPPORT ASSEMBLIES
D-704-60	INTERIOR LANE CLOSURE ON 6 LANE INTERSTATE
D-704-61	LEFT LANE CLOSURE ON 6 LANE INTERSTATE
D-704-62	RIGHT LANE CLOSURE ON 6 LANE INTERSTATE

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.

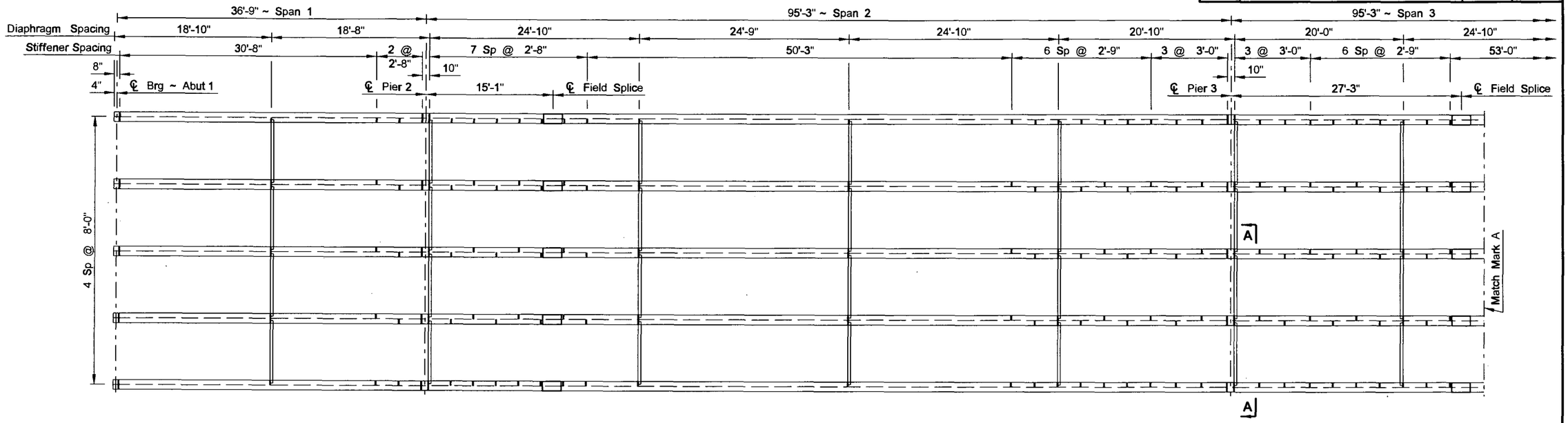
APPROVED DATE 10/01/08

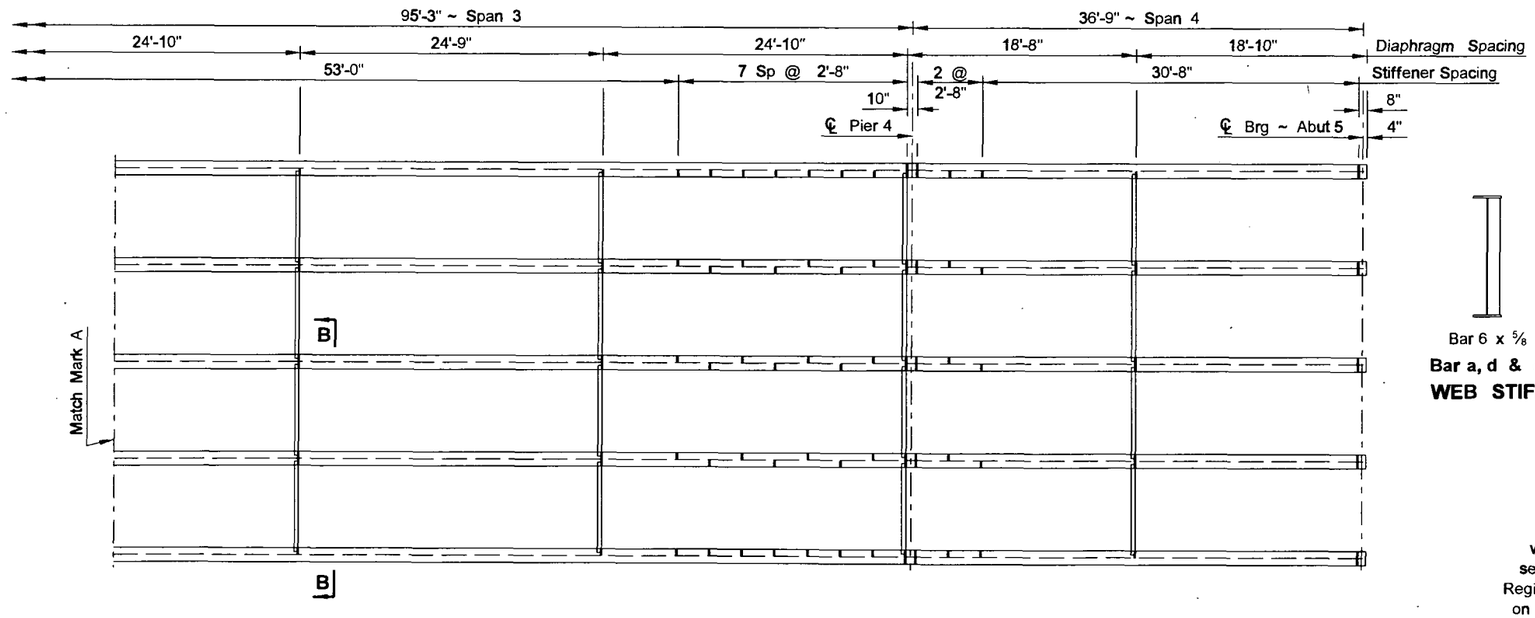
Terrence R Udland
NDDOT DIV-DIST OR CONSULTANT FIRM

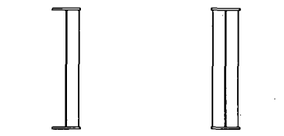
This document was originally issued and sealed by Terrence R Udland Registration Number PE- 2674 , on 10/01/08 and the original document is stored at the North Dakota Department of Transportation

1/22/2009 8:31:55 AM F:\BRIDGE\Painting Project 2009\001TS_001_Title.dgn

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	sim-8-029(103)085	170	7

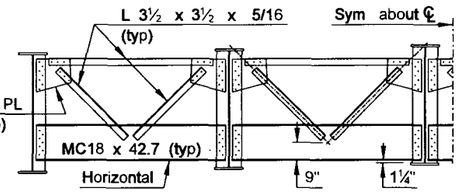






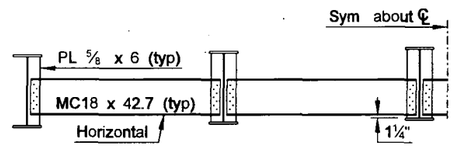
Bar a, d & e **Bar b & c**

WEB STIFFENER DETAILS



Typical at Pier 3 Only

A-A



Typical at Piers 2 & 4 and all intermediate diaphragms

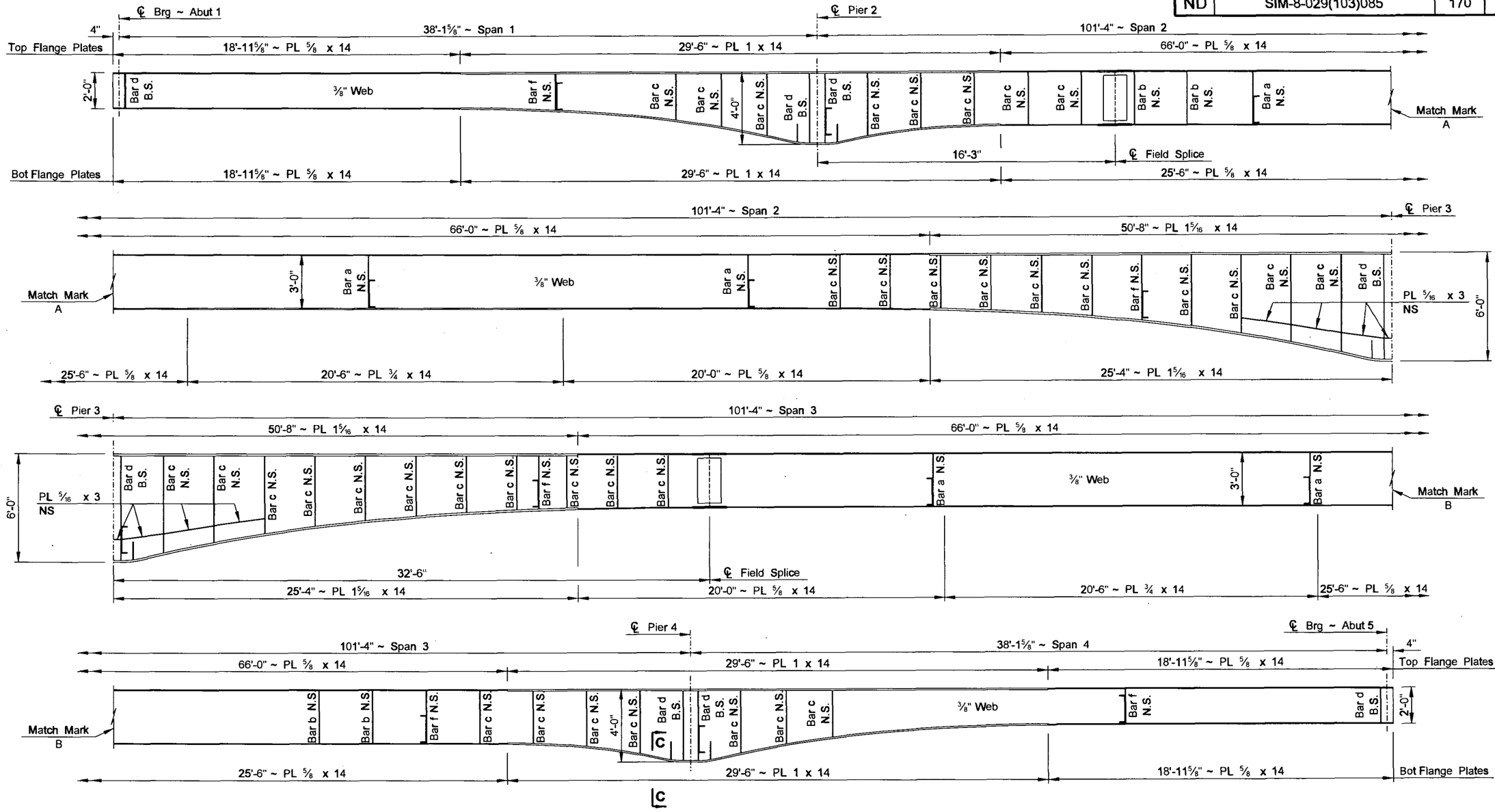
B-B

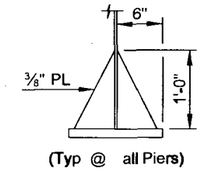
This document was originally issued and sealed by Gary L Doerr Registration Number PE 2844 on 08/26/08 and the original document is stored at the North Dakota Department of Transportation

HILLSBORO INTERCHANGE

STRUCTURAL STEEL PAINTING DETAILS

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	SIM-8-029(103)085	170	6





(Typ @ all Piers)

C-C

NOTE:

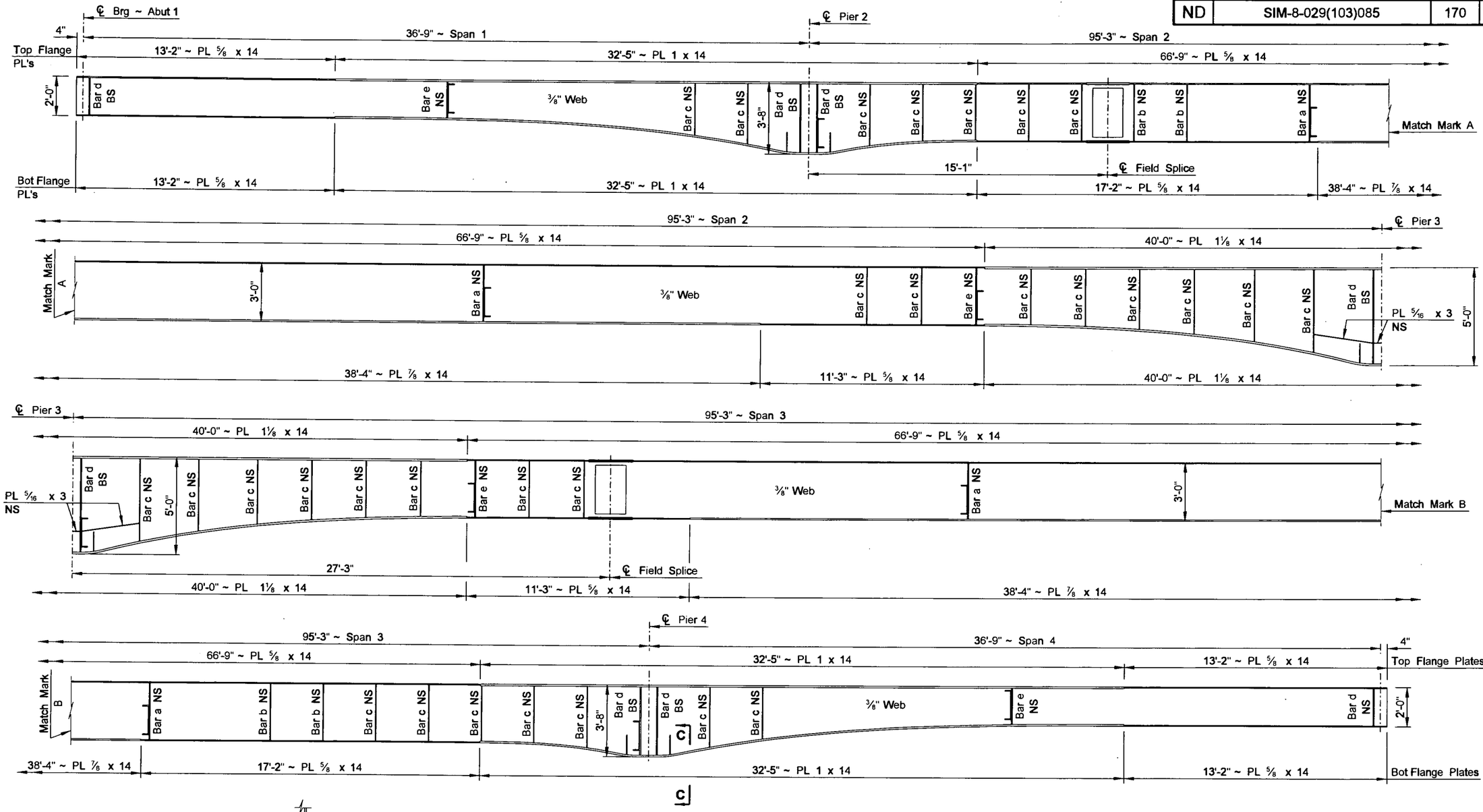
See Dwg 29-092.142-1 for Steel Layout, Diaphragms and Web Stiffener Details.

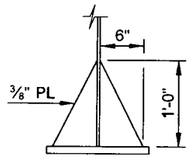
This document was originally issued and sealed by Gary Doerr Registration Number PE 2844 on 08/26/08 and the original document is stored at the North Dakota Department of Transportation

GRANDIN INTERCHANGE

STRUCTURAL STEEL PAINTING DETAILS

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	SIM-8-029(103)085	170	8





(Typ @ all Piers)

C-C

NOTE:

See Dwg 29-104.155-1 for Steel Layout, Diaphragms and Web Stiffener Details.

This document was originally issued and sealed by Gary L Doerr Registration Number PE 2844 on 08/26/08 and the original document is stored at the North Dakota Department of Transportation

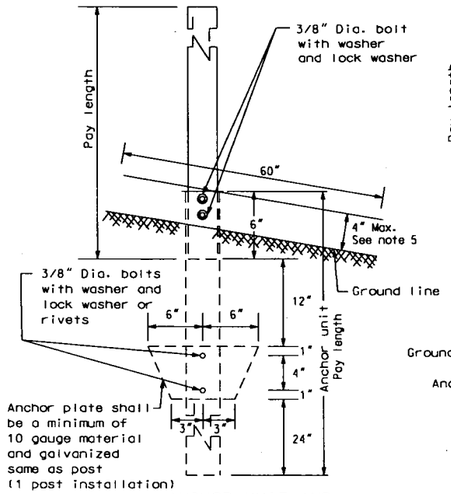
HILLSBORO INTERCHANGE

STRUCTURAL STEEL PAINTING DETAILS

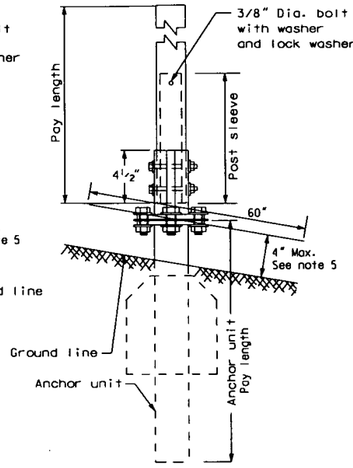
BREAKAWAY SYSTEMS FOR CONSTRUCTION ZONE SIGNS

PERFORATED TUBE

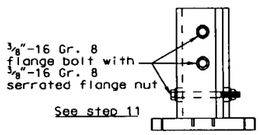
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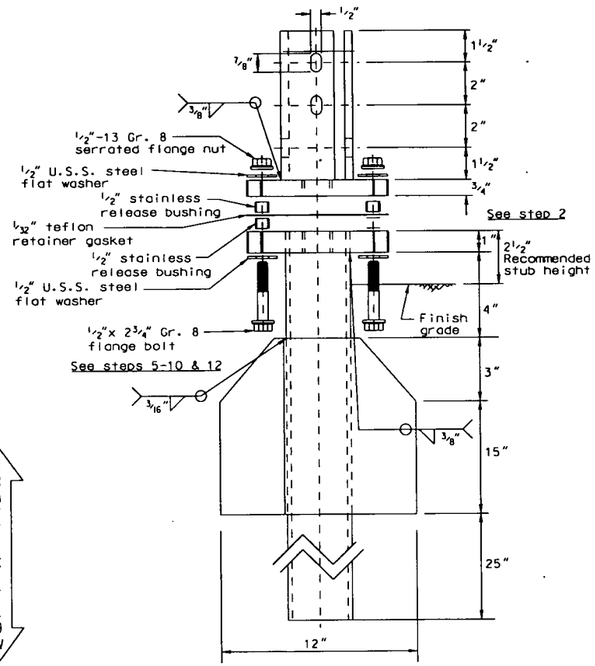


ANCHOR UNIT AND POST ASSEMBLY

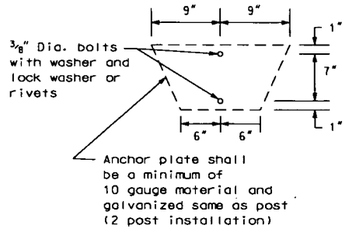


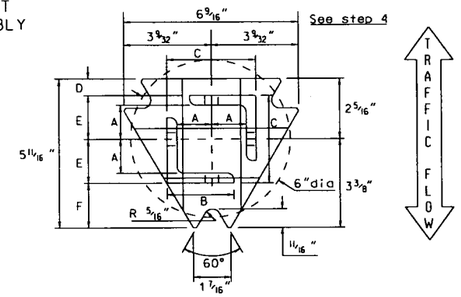
SLIP BASE ANCHOR UNIT AND POST SLEEVE ASSEMBLY





MULTI-DIRECTIONAL SLIP BASE ASSEMBLY



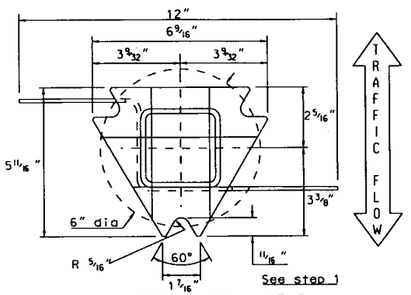


TOP POST RECEIVER

Materials: Plate - ASTM A572 grade 50
Angle receiver - 2 1/2"x 2 1/2"x 3/8" ASTM A36 structural angle

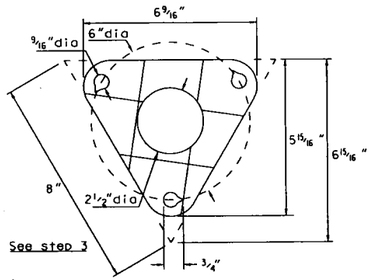
TOP POST RECEIVER DATA TABLE						
Square Post Sizes	A	B	C	D	E	F
2 3/16" x 10 Ga. Square Post	1 9/64"	2 1/2"	3 1/32"	25/32"	1 11/64"	1 7/8"
2 1/2" x 10 Ga. Square Post	1 9/32"	2 1/2"	3 5/16"	5/8"	1 21/32"	1 3/4"

2 3/16" x 10 gauge may be inserted into 2 1/2" x 10 gauge for additional wind load.



BOTTOM SOIL STUB

Materials: Tube - 3"x 3"x 7 gauge ASTM A500 Gr B tube
Stabilizing Wing - 7 gauge H.R.P.O. ASTM A 569
Plate - ASTM A572 grade 50



BOLT RETAINER FOR BASE CONNECTION

Materials: 1/32" reprocessed Teflon

MULTI-DIRECTIONAL SLIP BASE ASSEMBLY	
STEP	INSTALLATION PROCEDURE
1.	Install bottom soil anchor stub plumb and squared up with road. with point of plate facing oncoming traffic.
2.	Depth of imbedment to leave 2 1/2" from grade to top of anchor plate.
3.	Place teflon bolt retainer gasket on top of bottom plate (make sure that notches in holes are pointing counter clockwise).
4.	Place top post receiver on to retainer gasket, properly indexed so that angle receivers are squared up with road.
5.	Slide 1 each 1/2" flat washer on to 1 each inverted 1/2"-13 gr. 8 flange bolt, followed by 1 each stainless steel release bushing.
6.	Insert above bolt with washer and bushing up through notched points of top and bottom plates, passing through hole in gasket.
7.	Slide second bushing down on to above bolt until it rests on top of gasket followed by second washer.
8.	Complete by threading 1/2"-13 gr. 8 serrated flange nut snugly down against top of washer.
9.	Repeat steps 5,6,7 & 8 at the two remaining notched triangle points.
10.	Insert sign post into angle receivers on top half until post(s) bottom out. *NOTE: Where higher wind load is desired, insert the next size smaller square post inside bottom of main upright post (Minimum of 48", not to exceed beyond bottom edge of sign).
11.	Secure posts into receivers using 3 each 3/8"-16 gr. 8 flange bolts and 3 each 3/8"-16 serrated flange nuts in receiver slots (top 2 bolts should be parallel to highway) do not tighten nuts until all bolts are in place.
12.	After all sub-assembly hardware is tightened, then torque the three 1/2"-13 nuts to 42 ft-lbs. in a circular pattern until all bolt assemblies reach the required torque. *NOTE: On multi-leg installations, be sure that all anchors are squared and lined up with each other.

Notes
1. Slip base bolts shall be torqued as specified by the manufacturer.
2. The 2 3/16" size 10 gauge is shown as 2.19" size on the plans. The 2 1/2" size 10 gauge is shown as 2.51" size on the plans.
3. Anchor for 2", 2 1/4", and 2 1/2" posts.
4. Anchor material shall be 7 gauge H.R.P.O. Commercial quality ASTM A569 and 3"x 3"x 7 gauge ASTM A500 Grade B. Anchor shall have a yield strength of 43.9 KSI and tensile strength of 59.3 KSI. Anchor shall be hot dipped galvanized per ASTM A123/A153. All tolerances on anchor unit and slip base bottom assembly are ± 0.005 unless otherwise noted.
5. 4" vertical clearance of anchor or breakaway base. The 4" x 60" measurement shall be made above and below post location and also back and ahead of post.
6. When used in concrete sidewalk, anchor shall be the same except without the wings.
7. Four post signs shall have over 8' between the first and fourth posts.

Telescoping Perforated Tubes						
Number of Posts	Post Size In.	Wall Thick-ness Gauge	Sleeve Size In.	Wall Thick-ness Gauge	Slip Base	Anchor Size Without Slip Base In.
1	2	12			No	2 1/4
1	2 1/4	12			No	2 1/2
1	2 1/2	12			B	3
1	2 1/2	10			Yes	
1	2 1/4	12	2	12	Yes	
1	2 1/2	12	2 1/4	12	Yes	
2	2	12			No	2 1/4
2	2 1/4	12			No	2 1/2
2	2 1/2	12			Yes	
2	2 1/2	10			Yes	
2	2 1/4	12	2	12	Yes	
2	2 1/2	12	2 1/4	12	Yes	
3 & 4	2 1/2	12			Yes	
3 & 4	2 1/2	10			Yes	
3 & 4	2 1/2	12	2 1/4	12	Yes	
3 & 4	2 1/4	12	2	12	Yes	
3 & 4	2 1/2	10	2 3/16	10	Yes	

B - The 2 1/2", 12 gauge posts do not need breakaway bases when placed in standard soils, but require a shim as specified by the manufacturer. The breakaway base is required when the support is placed in weak soils. The Engineer shall determine if the soils are weak. Weak soils are classified as boggy, wet, or loose soil areas.

Telescoping Perforated Tubes						
Tube Size In.	Wall Thickness In.	U.S. Standard Gauge	Weight Per Foot Lbs.	Moment of Inertia In.4	Cross Sect. area In.2	Section Modulus In.3
1 1/2 x 1 1/2	0.105	12	1.702	0.129	0.380	0.172
2 x 2	0.105	12	2.416	0.372	0.590	0.372
2 1/4 x 2 1/4	0.105	12	2.773	0.561	0.695	0.499
2 3/16 x 2 3/16	0.135	10	3.432	0.605	0.841	0.590
2 1/2 x 2 1/2	0.105	12	3.141	0.804	0.803	0.643
2 1/2 x 2 1/2	0.135	10	4.006	0.979	1.010	0.785
4 x 4	0.250	1/4	6.600	3.040	1.940	1.050

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
11-21-02	
REVISIONS	
DATE	CHANGE
12-01-04	PE stamp added

This document was originally issued and sealed by MARK S GAYDOS, Registration Number PE-4518, on 12/01/04 and the original document is stored at the North Dakota Department of Transportation

DESIGN DATA					
SIM-8-029(080)085-GARDNER INTERCHANGE					
Traffic		Average Daily			Max.Hr.
Current	2006	Pass:	Trucks:	Total: 630	65
Forecast	2026	Pass:	Trucks:	Total: 1045	105
			Design Speed: 55 mph		
SIM-8-029(081)092-GRANDIN INTERCHANGE					
Current	2006	Pass:	Trucks:	Total: 850	85
Forecast	2026	Pass:	Trucks:	Total: 1405	145
			Design Speed: 55 mph		
SIM-029(084)104-HILLSBORO INTERCHANGE					
Current	2006	Pass:	Trucks:	Total: 1875	190
Forecast	2026	Pass:	Trucks:	Total: 3095	310
Design Speed (Eastbound): 55 mph			Design Speed (Westbound): 45 mph		

JOB# 36

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
ND	SIM-8-029(080)085	15931	1	1
	SIM-8-029(081)092	15932		
	SIM-8-029(084)104	15933		

FEDERAL AID PROJECTS: SIM-8-029(080)085, SIM-8-029(081)092 & SIM-8-029(084)104

BRIDGE DECK OVERLAY, RAIL RETROFIT
GUARDRAIL & PAVEMENT MARKING

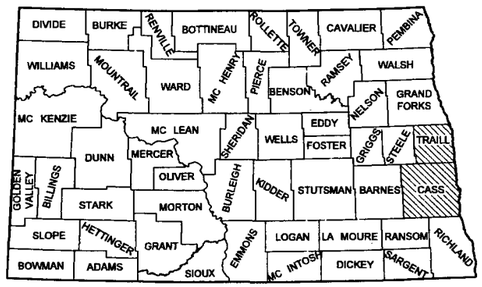
IN CASS & TRAILL COUNTY

GOVERNING SPECIFICATIONS:

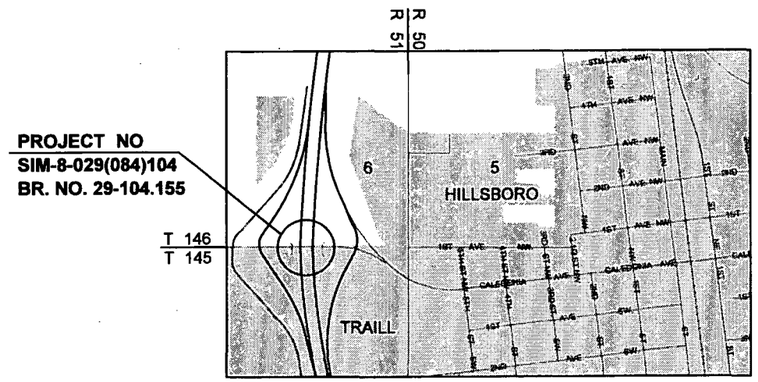
Standard Specifications adopted by the North Dakota Department of Transportation October 2002; Standard Drawings currently in effect; and other Contract Provisions submitted herein.

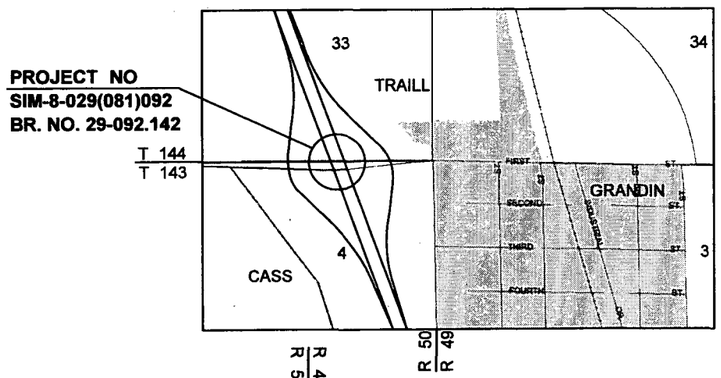
LENGTH OF PROJECT

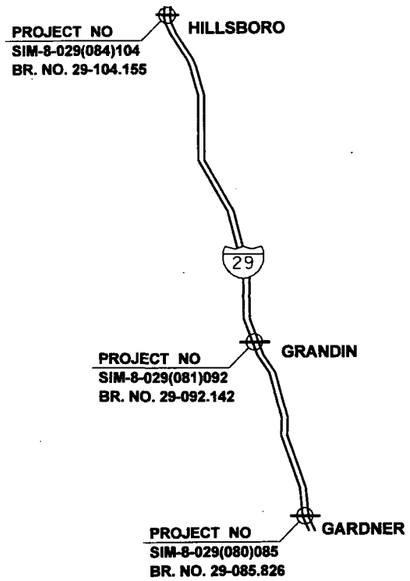
PROJECT NO. SIM-8-029(080)085 = 0.052 MILES
PROJECT NO. SIM-8-029(081)092 = 0.061 MILES
PROJECT NO. SIM-8-029(084)104 = 0.058 MILES

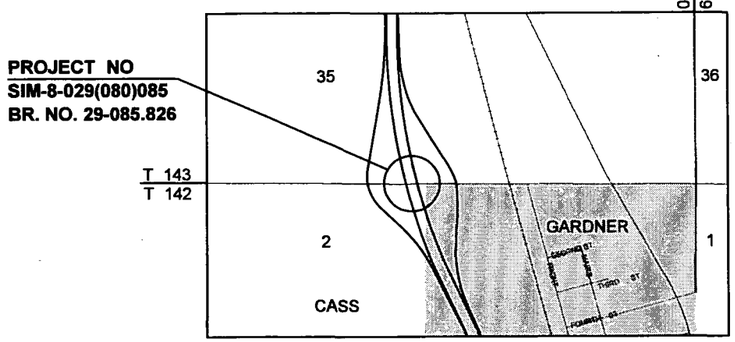


STATE COUNTY MAP









DESIGNERS

Jason R. Thorenson

APPROVED DATE _____

OFFICE OF PROJECT DEVELOPMENT
ND DEPARTMENT OF TRANSPORTATION

APPROVED DATE _____

FEDERAL HIGHWAY ADMINISTRATION
U.S. 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 2-26-07

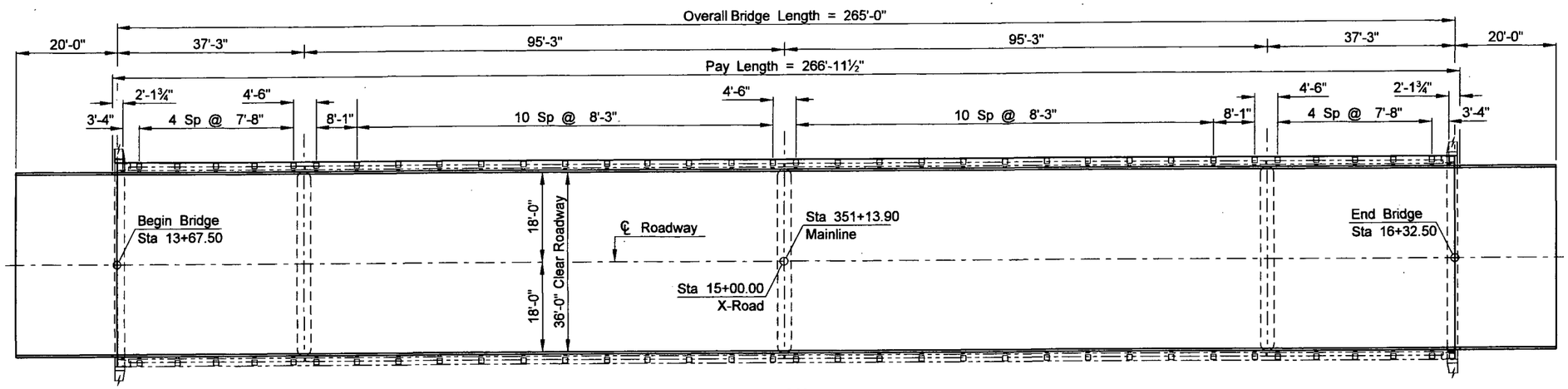
Terrence R. Udland
NDDOT DIV-DIST OR CONSULTANT FIRM

REGISTERED PROFESSIONAL ENGINEER
TERRENCE R. UDLAND
P.E. 2674
DATE 2-26-07
NORTH DAKOTA

2/23/2007 9:09:29 AM R:\project\80029085.080\bridge\29-085.826\001TS_001_TITLE.DGN

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

BRIDGE CODE	STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
X-771	ND	SIM-8-029(084)104	170	9

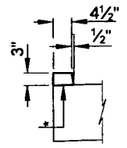


PLAN

100 SCOPE OF WORK: Work at this site consists of installing double box beam rail retrofit, placing a deck overlay, removing safety shape transitions, removing a portion of the approach slab and placing concrete curbs on all 4 corners of the bridge.

650 Class 1 removal shall be completed as specified in Section 650.04A of the Standard Specifications, except the depth of removal shall be 2¼".

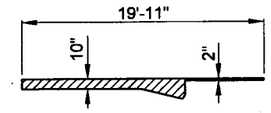
764 REMOVE CONCRETE SAFETY SHAPE TRANSITION: The removal of the safety shape transitions and portion of slab as shown shall be included in the price bid for "Remove Concrete Safety Shape Transition." All materials removed shall become the property of the Contractor and shall be disposed off the right of way.



CURB

* BUSH HAMMER FINISH: Before any concrete is placed against existing concrete, the surface shall be prepared with a bush hammer to produce a clean rough surface.

Indicates concrete slab removal



SAFETY SHAPE & APPROACH SLAB PLAN

SPEC	CODE	ITEM DESCRIPTION	UNIT	QUANTITY
202	0101	REMOVAL OF CONCRETE	EA	4
624	3002	DOUBLE BOX BEAM RAIL RETROFIT - E-RAIL	LF	533.9
650	0700	CLASS 1 OVERLAY	SY	1060
650	0701	CLASS 2 OVERLAY	SY	212
650	0702	CLASS 3 OVERLAY	SY	53
650	0703	CLASS 2A OVERLAY	LF	382
748	0540	CURB	LF	79.7

REGISTERED PROFESSIONAL ENGINEER
JASON R. THORENSON
P.E. 5048
DATE 2/15/07
NORTH DAKOTA

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION
HILLSBORO INTERCAHNGE

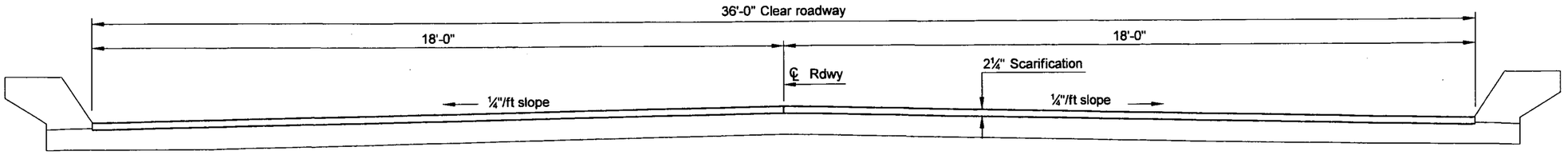
BRIDGE LAYOUT

PROJECT: SIM-8-029(084)104
I-29 STATION: 351+13.90 X-Road Sta: 15+00.00
TRAILL COUNTY

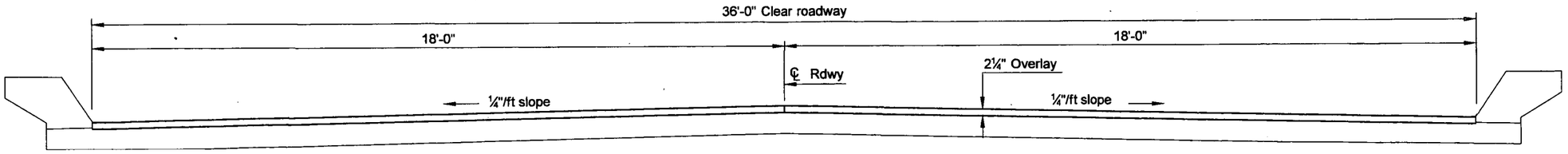
2-26-07 DATE
BRIDGE ENGINEER

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	SIM-8-029(084)104	170	10

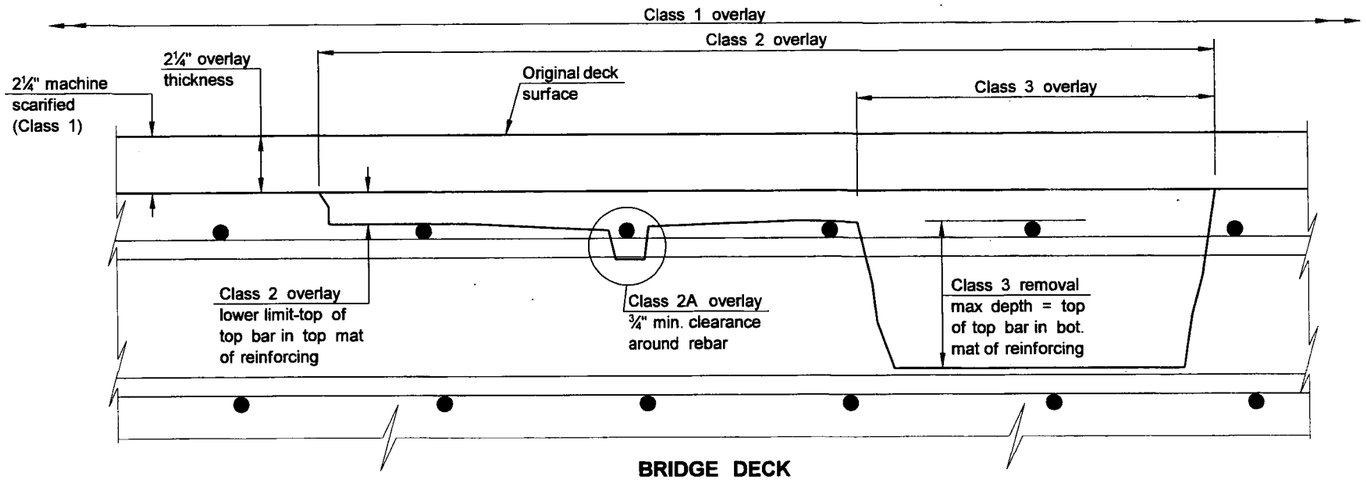
23 U.S.C. 409
NDDOT Reserves All Objections



DECK ELEVATION
Showing Scarification



DECK ELEVATION
Showing Overlay



BRIDGE DECK
(Overlay classifications)

NOTES:

Class 2A overlay is paid for the top rebar in the top mat of reinforcing only. If a rebar that is identified for 2A is in an area that becomes Class 3 or Class 4, it shall not be paid for as Class 2A overlay.

Class 4 removal shall be below the limits of Class 3 removal to full depth.

QUANTITIES	
CLASS 1 OVERLAY	1060 SY
CLASS 2 OVERLAY	212 SY
CLASS 3 OVERLAY	53 SY
CLASS 2A OVERLAY	382 LF

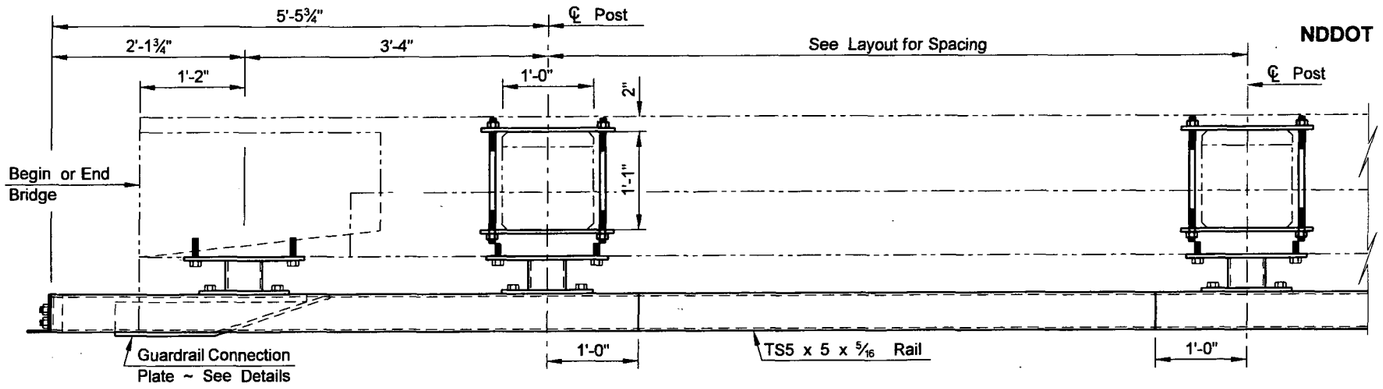
REGISTERED PROFESSIONAL ENGINEER
JASON R. THORENSON
P.E. 5048
DATE 2/15/07
NORTH DAKOTA

HILLSBORO INTERCHANGE

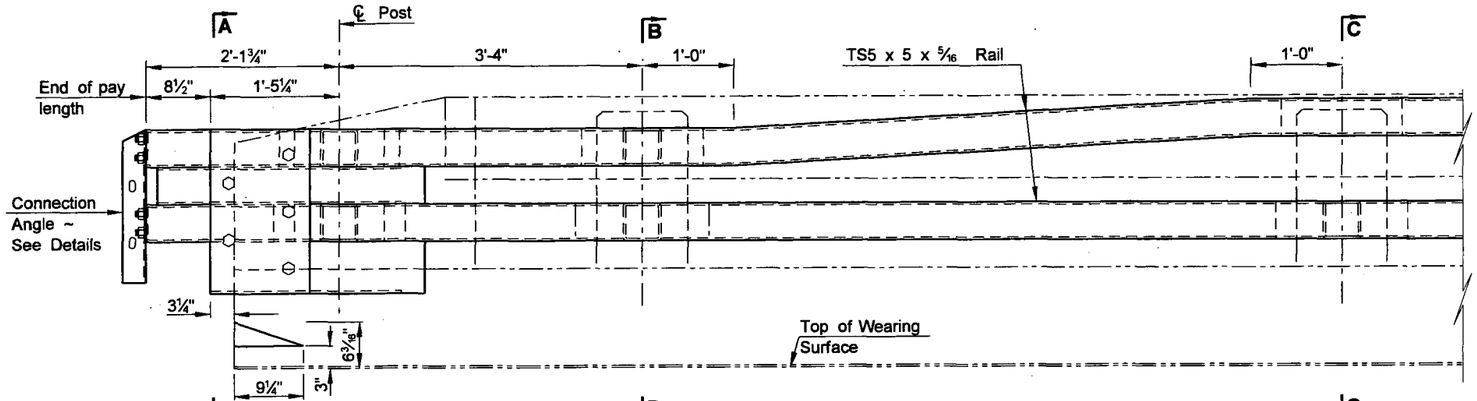
DECK OVERLAY DETAILS

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

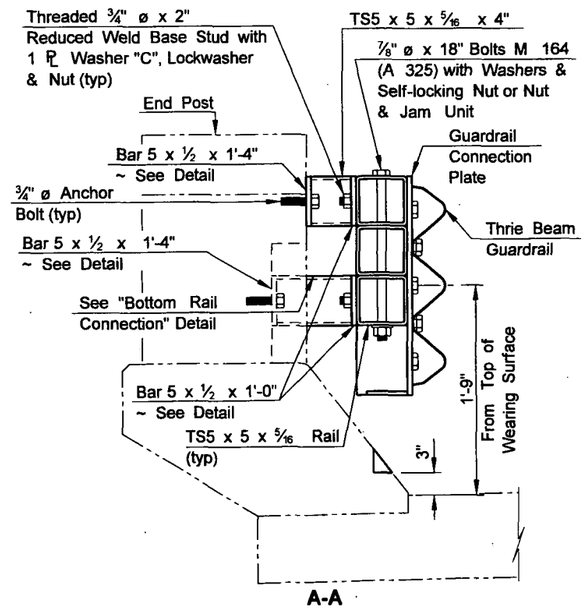
STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	SIM-8-029(084)104	170	11



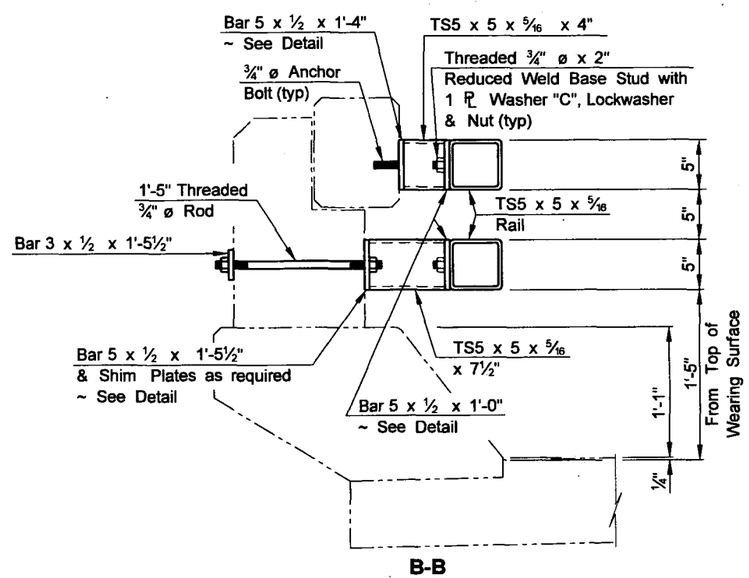
RAIL RETROFIT PART PLAN



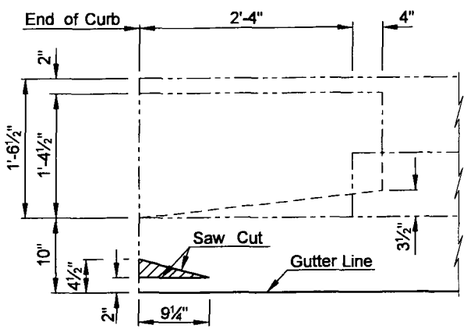
RAIL RETROFIT PART ELEVATION



A-A



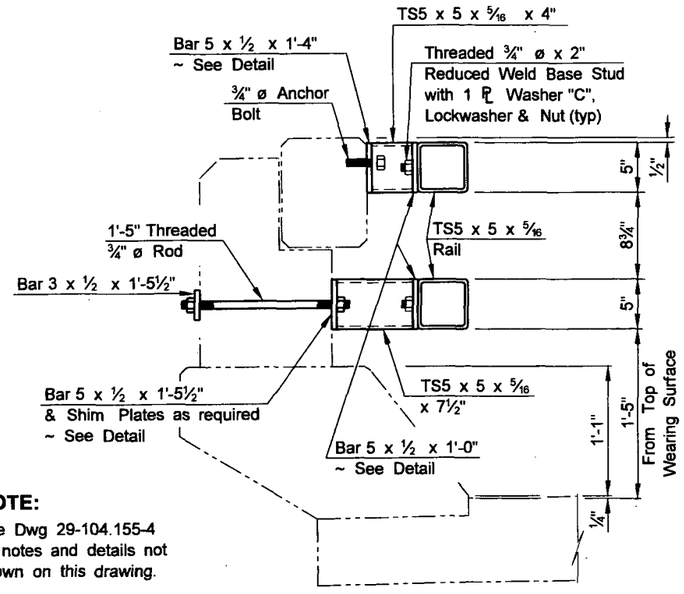
B-B



PLAN

CONCRETE REMOVAL DETAIL

Indicates Concrete Removal



C-C

NOTE:
See Dwg 29-104.155-4 for notes and details not shown on this drawing.

REGISTERED PROFESSIONAL ENGINEER
JASON R. THORENSON
P.E. 5048
DATE 2/15/07
NORTH DAKOTA

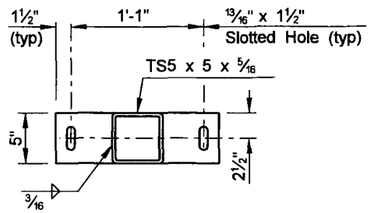
QUANTITIES
SEE DWG 29-104.155-4

HILLSBORO INTERCHANGE

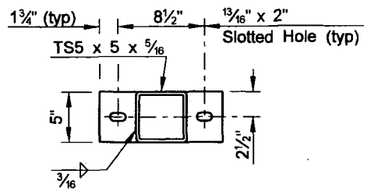
DOUBLE BOX BEAM E-RAIL RETROFIT DETAILS

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

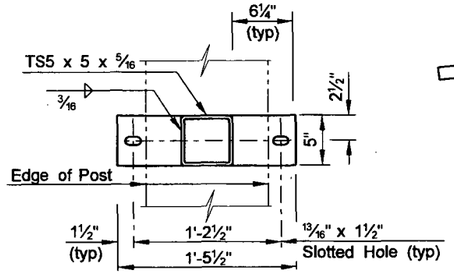
STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	SIM-8-029(084)104	170	12



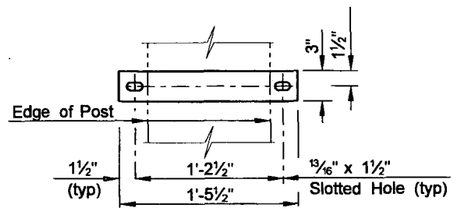
(CONCRETE RAIL CONNECTION)
BAR 5 X ½ X 1'-4" DETAIL



(RAIL CONNECTION)
BAR 5 X ½ X 1'-0" DETAIL



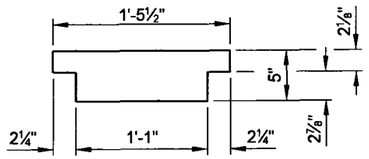
(CONCRETE POST CONNECTION)
BAR 5 X ½ X 1'-5½" DETAIL



(CONCRETE POST CONNECTION)
BAR 3 X ½ X 1'-5½" DETAIL

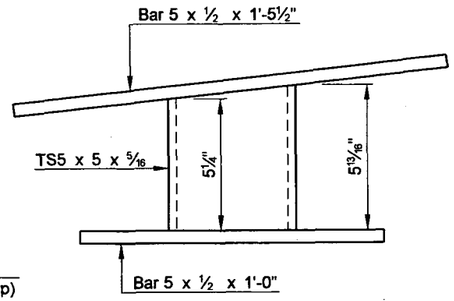
The filled circles indicate drilled and tapped holes for ⅞" ø bolts M 164 (A 325). See Detail "B."

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

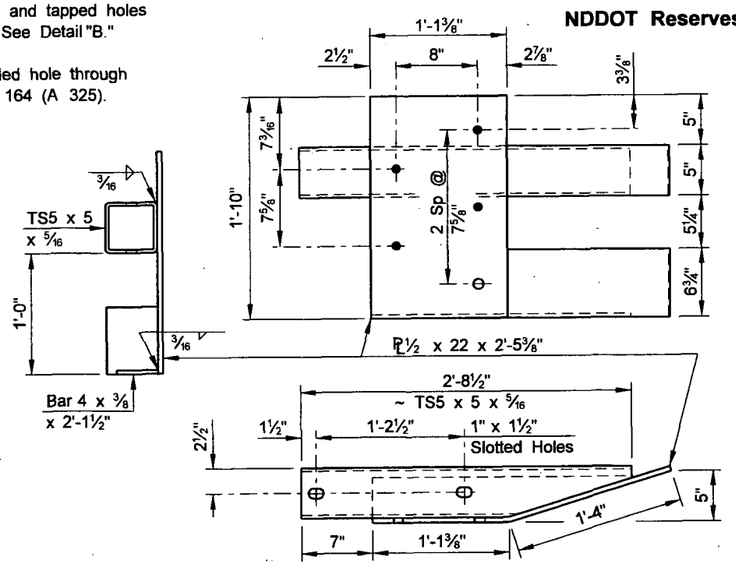


¼" & ⅛" Thickness
Quantities determined in field

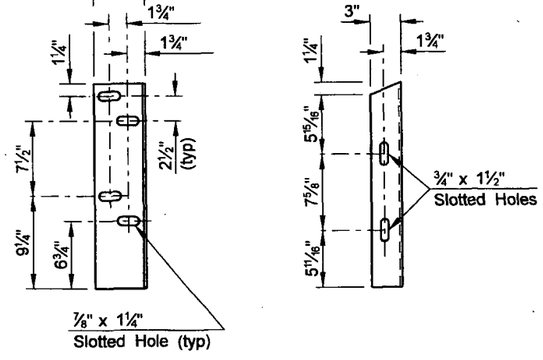
SHIM PLATE DETAIL



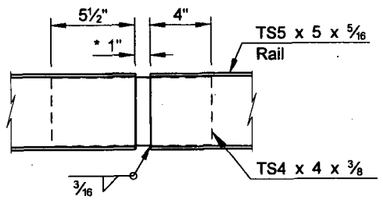
(ON MODIFIED END POST)
BOTTOM RAIL CONNECTION DETAIL



(4 REQUIRED)
GUARDRAIL CONNECTION PLATE DETAILS

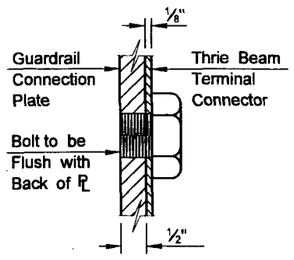


(L5 X 3 X ¼ X 1'-8½")
(4 REQUIRED)
CONNECTION ANGLE DETAILS

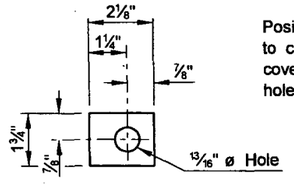


* 2" at expansion splices.

RAIL SPLICE DETAIL

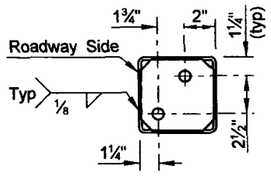


DETAIL "B"



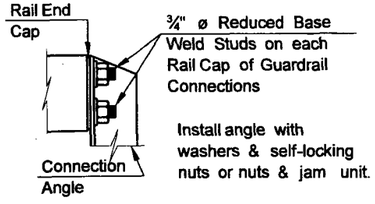
Position washers to completely cover slotted holes.

(1/4" PL AASHTO M 270 GRADE 36)
PL WASHER "C"



Rail cap shall be a Bar 4¾ x ⅜ x 4¾".
Cope corners 1" to provide zinc drains.

RAIL CAP DETAILS



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.

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

Steel plates and angles shall conform to AASHTO Specification M 270 Grade 36, unless otherwise noted.

Railing shall be fabricated to the horizontal and vertical alignment of the structure.

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

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

Rails shall be fabricated so that each rail segment between splices is attached to a minimum of two posts.

The threaded rods & u-bolts shall be M 270 Grade 36 Steel and galvanized according to M 232. The u-bolts shall be tightened to provide a minimum tensile force of 2,500 lbs. and a maximum tensile force of 2,700 lbs.

The 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.

All anchor and splice bolts shall be AASHTO M 164 (A 325) and shall be galvanized according to M 232.

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.

REGISTERED PROFESSIONAL ENGINEER
JASON R. THORENSON
P.E. 5048
DATE 2/15/07
NORTH DAKOTA

QUANTITIES	
E-RAIL RETROFIT	533.9 LF

HILLSBORO INTERCHANGE

DOUBLE BOX BEAM
E-RAIL RETROFIT DETAILS

DESIGN DATA				
Traffic	Average Daily			Est. Max. Hr.
Current 2000	Pass: 3.385	Trucks 835	4.220	425
Forecast 2020	Pass: 5.420	Trucks 1.420	Total 6.840	685
Minimum Sight Dist. for:		Design Speed 70		
Stopping 625'		Bridges		
Limited Access Control				

JOB# 15

FHWA REGION	STATE	PROJECT NO.	SHEET NO.
8	ND	IM-8-029(040)099	1

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

Federal Aid Project IM-8-029(040)099
In Traill County
Concrete Pavement Repair, Dowel Bar Retrofit, Grinding, Mill and Overlay
(Northbound Roadway)
Mill and Overlay (Southbound Roadway)

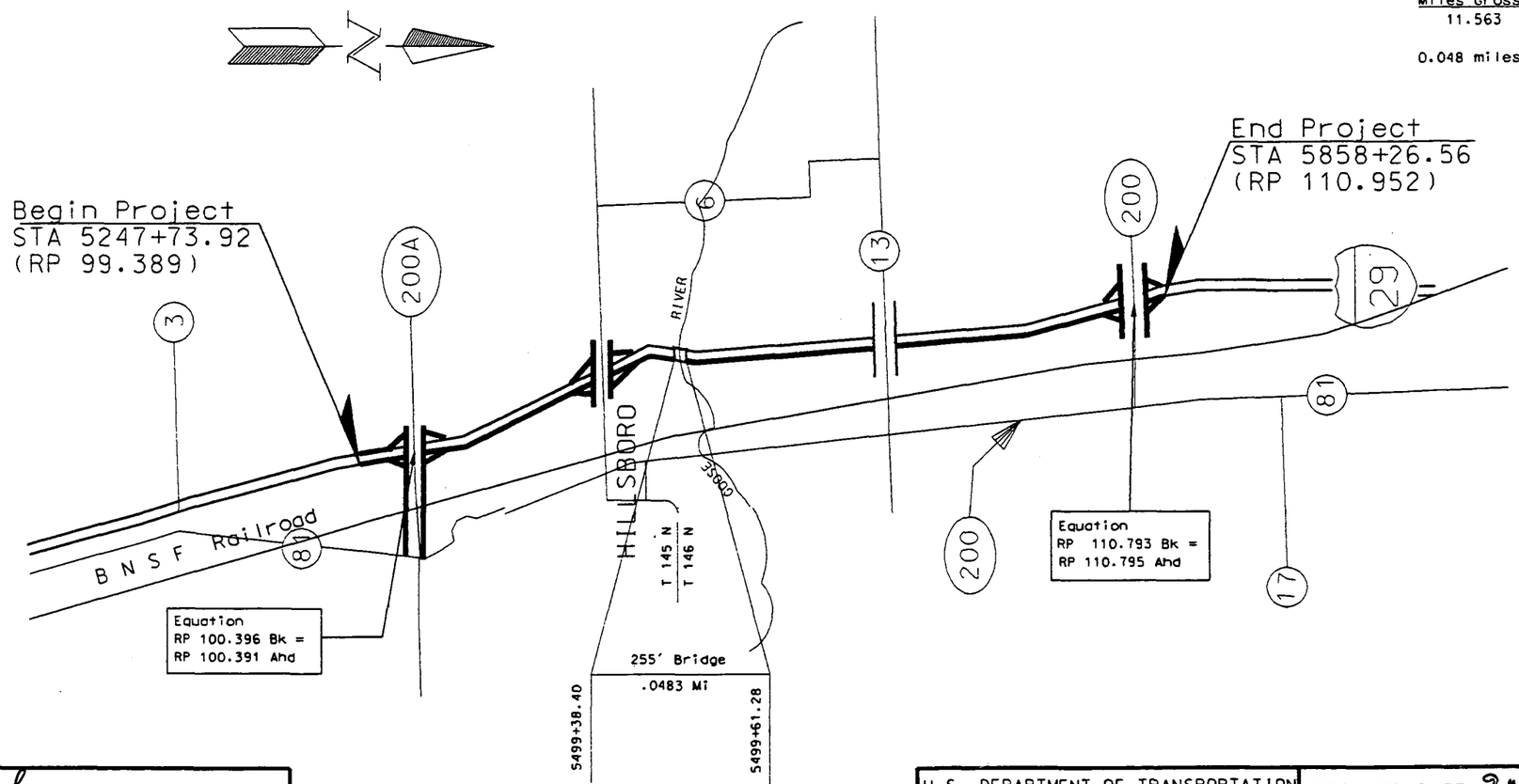
GOVERNING SPECIFICATIONS:

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
11.563	11.515

0.048 miles deducted for bridge



DESIGNER Jacqueline Maschl
DESIGNER _____
DESIGNER _____
RECOMMEND APPROVAL _____, 19___
DESIGN ENGINEER _____

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED

_____ _____
DIVISION ADMINISTRATOR DATE

APPROVED DATE 9 MAR 00

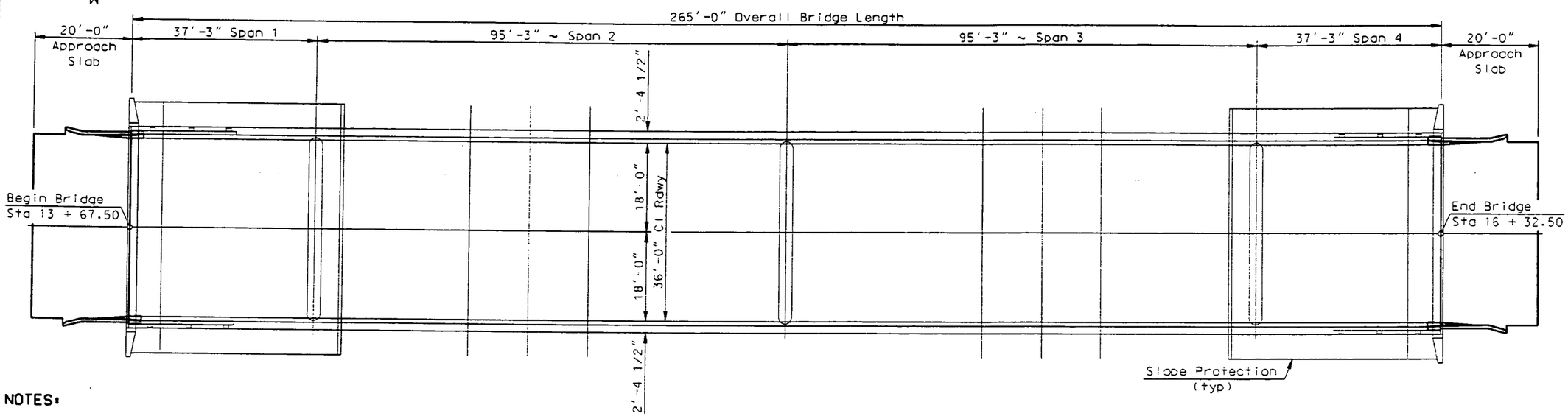
DISTRICT ENGINEER

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

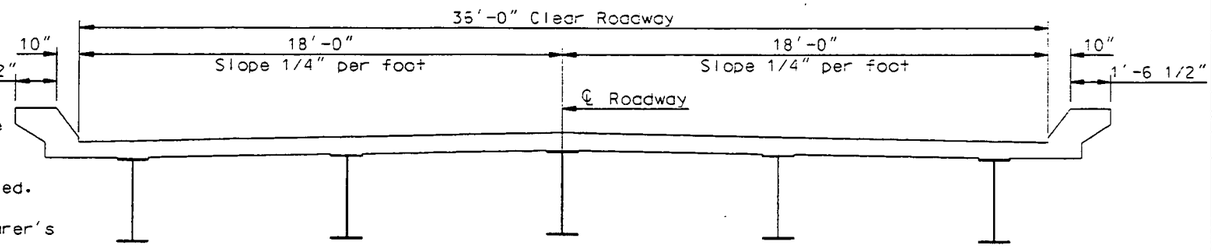
ROBERT R. WALTON, JR. REGISTERED PROFESSIONAL PE 4040 ENGINEER NORTH DAKOTA

d:\80029099.040\plan\title.dgn Mar. 09, 2000 07:49:46

FHWA REGION	STATE	FEDERAL AID PROJECT NUMBER	SHEET NO.
8	ND	IM-8-029(040)099	80



PLAN



TYPICAL DECK SECTION

NOTES:

930 NOSING CONCRETE: The nosing concrete material shall be an elastomeric concrete or a polymeric concrete that will provide a durable edge that can withstand live-load traffic without chipping or spalling. The nosing concrete material shall be SILSPEC 900 PNS, manufactured by Silicone Specialties Inc.; WABOCRETE II, manufactured by Watson Bowman Acme; ELASTOMERIC CONCRETE, manufactured by D.S. Brown Company or an approved equal. The nosing concrete shall be mixed and installed according to the manufacturer's recommendation. All labor and materials required to install the nosing concrete shall be included in the bid item "Nosing Concrete".

930 SILICONE: The silicone sealant shall be a rapid cure, self leveling, cold applied, two component silicone sealant that will bond to and be compatible to the nosing concrete used. The sealant shall be installed according to the manufacturer's recommendations. The silicone sealant and the nosing concrete must be supplied by the same manufacturer as a complete system. The backer rod and any necessary bonding materials shall be included in the bid item "Silicone Sealant".

930 TECHNICAL ASSISTANCE: The Contractor shall acquire a technical assistance from the manufacturer of the nosing concrete and the silicone sealant for the surface preparation and installation of the nosing concrete and silicone sealant. A technical representative must be present for the start of surface preparation and installation for at least one day. The Contractor shall contact the manufacturer at least two weeks prior to the installation. The technical assistance shall be provided at no additional cost to the Department.

SPEC	CODE	ITEM DESCRIPTION	UNIT	QUANTITY
550	0215	CONCRETE BRIDGE APPROACH SLAB	SY	169.2
602	1210	BRIDGE END POST MODIFICATION	EA	4
930	8642	NOSING CONCRETE	CF	7.0
930	8644	SILICONE SEALANT	LF	72

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

HILLSBORO INTERCHANGE

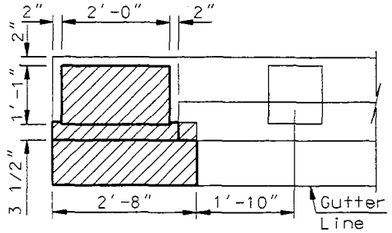
BRIDGE LAYOUT

PROJECT: IM-8-029(040)099
STATION 15 + 00.0

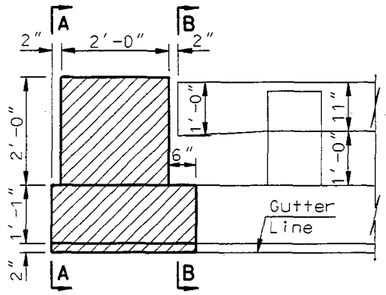
TRAILL COUNTY

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

FHWA REGION	STATE	FED. AID PROJ. NO.	SHEET NO.
8	ND	IM-8-029(040)099	81



PLAN



ELEVATION

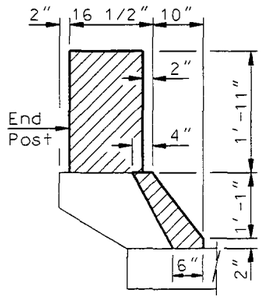
Hatched areas indicate concrete to be removed.

Care shall be taken to ensure no damage is done to the existing reinforcing steel that is to remain in place.

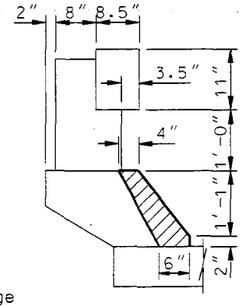
END POST REMOVAL DETAILS

NOTE:

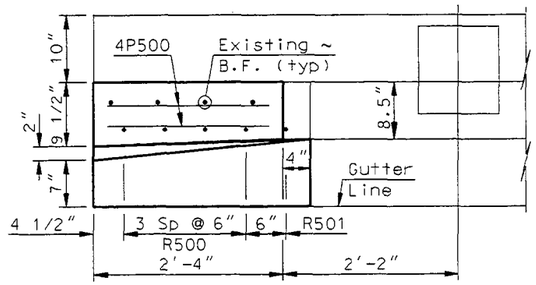
The steel plates shall be M183 steel. Plates, bolts and nuts shall be galvainzed in accordance with AASHTO M111. All materials and labor required to install the rail sleeves shall be included in the pay item "Bridge End Post Modification".



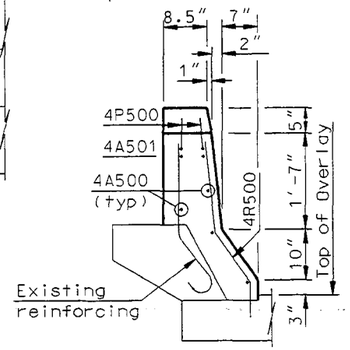
A-A



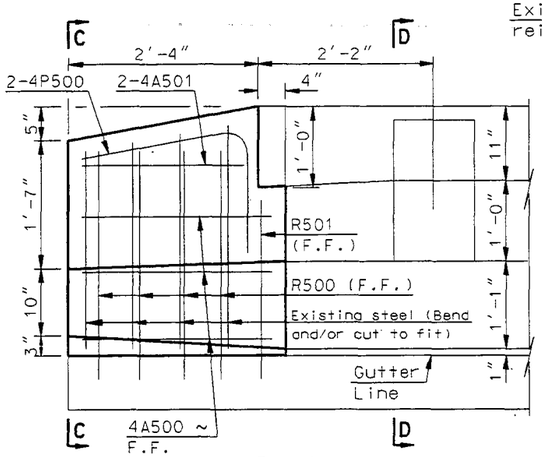
B-B



PLAN

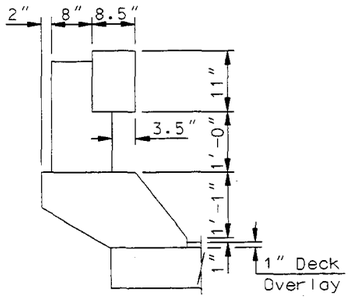


C-C

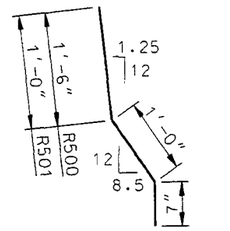


ELEVATION

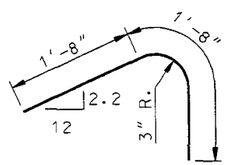
END POST MODIFICATION DETAILS



D-D



R500 & R501



P500

DIMENSIONS SHOWN ARE OUT TO OUT

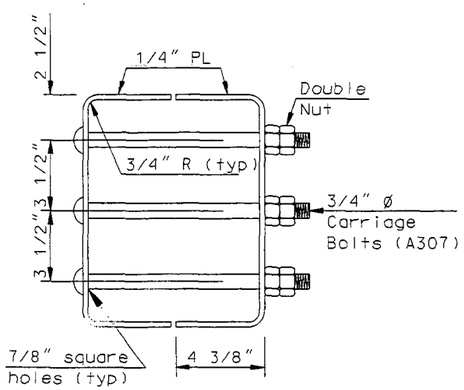
BENT BAR DETAILS

BAR LIST (ONE POST)

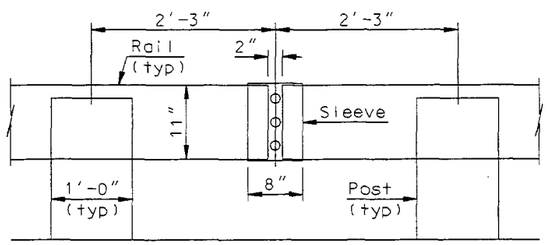
SIZE	MARK	NO.	LENGTH	SHAPE
4	A500	4	2'-4"	STR.
4	A501	2	2'-0"	STR.
4	P500	2	3'-4"	BENT
4	R500	4	3'-1"	BENT
4	R501	1	2'-7"	BENT

ESTIMATE OF QUANTITIES

REMOVAL OF CONCRETE	0.21 CY
CLASS AAE-3 CONCRETE	0.21 CY
REINFORCING STEEL	23 LBS



SLEEVE DETAIL



(6 Required)
ELEVATION

SLEEVE AT RAIL JOINT

NOTE:

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 4R500's & 4R501's shall be installed according to the manufacturers recommendations, with a high strength adhesive specifically intended for concrete anchorage in accordance with section 806.02 of the NDDOT Standard Specifications.

The quantities shown are for informational purposes only. All materials, labor and equipment including concrete 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.

HILLSBORO INTERCHANGE

RAIL SLEEVE & END POST MODIFICATION DETAILS

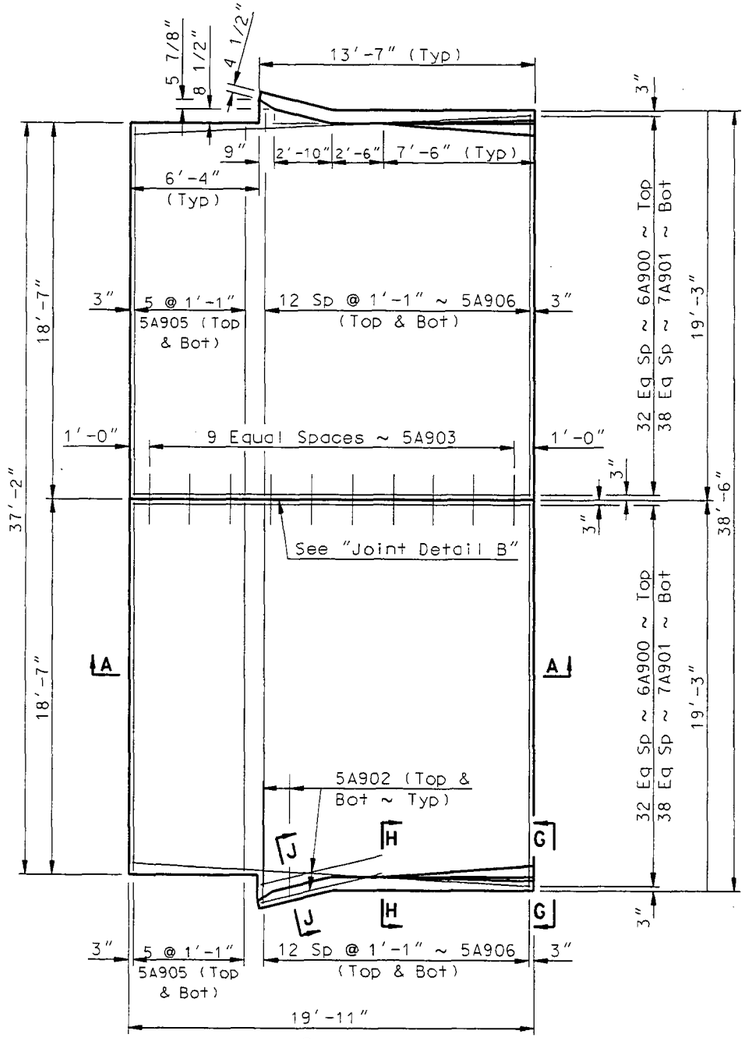
ENDPOST OODLS25 LLS

29-104.155-1

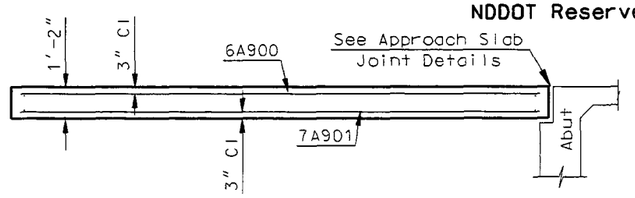
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23 U.S.C. 409
NDDOT Reserves All Objections

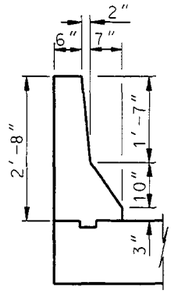
FHWA REGION	STATE	FEDERAL AID PROJECT NUMBER	SHEET NO.
8	ND	IM-8-029(040)099	82



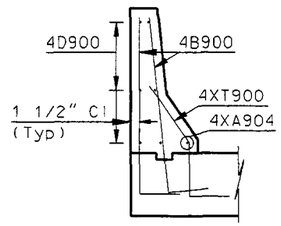
PLAN



A-A



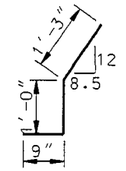
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G-G



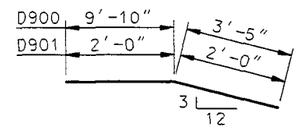
(Field bend 4XT900's to fit as required)
(SHOWING REINFORCING)
G-G



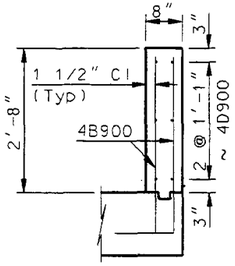
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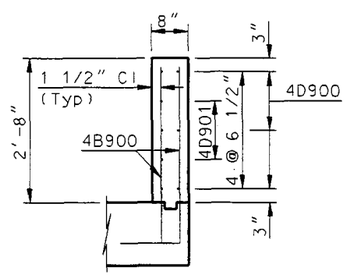
XT900



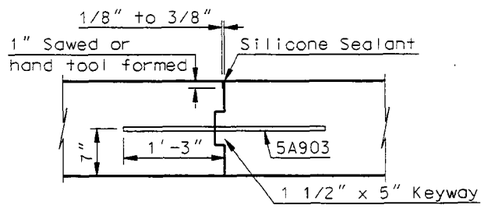
D900 & D901



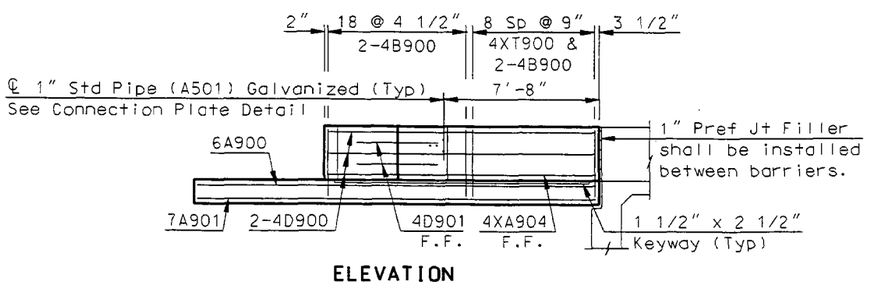
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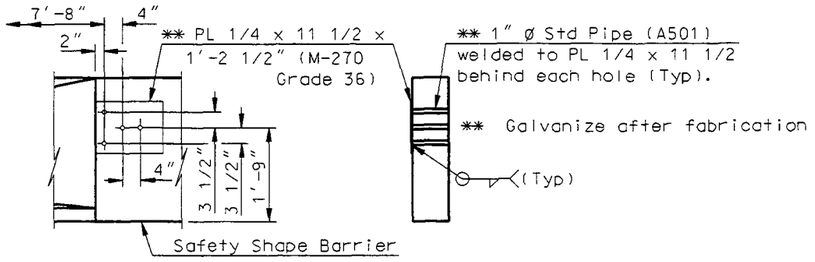
J-J



JOINT DETAIL B



ELEVATION



(SHOWING INSIDE FACE)
CONNECTION PLATE DETAILS

SKEW ANGLE = 0°

BAR LIST - ONE SLAB

SIZE	MARK	NO.	LENGTH
6	A900	66	19'-7"
7	A901	78	19'-7"
5	A902	16	6'-0"
5	A903	10	2'-6"
4	XA904	2	7'-6"
5	A905	24	18'-3"
5	A906	52	18'-11"
4	B900	112	4'-0"
4	D900	12	13'-3"
4	D901	4	4'-0"
4	XT900	18	3'-0"

ESTIMATED MATERIAL QUANTITIES

REINFORCING STEEL (LBS.)	CONCRETE (C.Y.)
7135	36.6

NOTE:
See Dwg 29-104.155-3 for Notes.

QUANTITIES	(ONE SLAB)
APPROACH SLAB	84.6 SY

HILLSBORO INTERCHANGE

APPROACH SLAB DETAILS

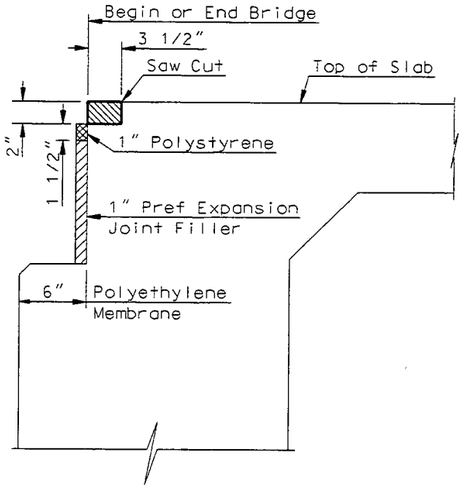
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29-104.155-2

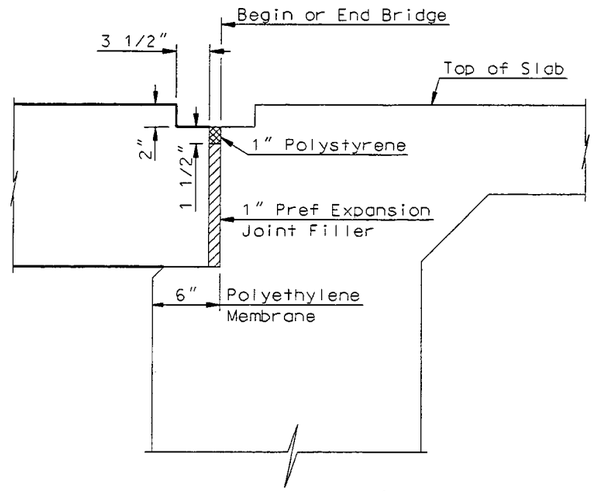
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FHWA REGION	STATE	FED. AID PROJ. NO.	SHEET NO.
8	ND	IM-8-029(040)099	83

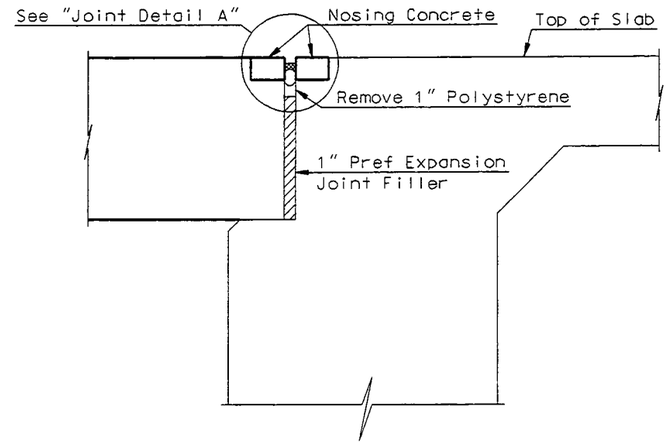
Indicates Concrete Removal



STAGE 1



STAGE 2



STAGE 3

NOTES:

STAGE 1:

1. Remove concrete at ends of deck to allow for nosing concrete.

2. Place the 1" preformed expansion joint filler, the 1/2" x 4" preformed expansion joint filler, the 1" polystyrene and the polyethylene membrane.

STAGE 2:

3. Place the new approach slab concrete. A 2" x 3 1/2" blockout shall be formed between the curbs in the approach slab as shown.

STAGE 3:

4. Remove the 1" polystyrene.

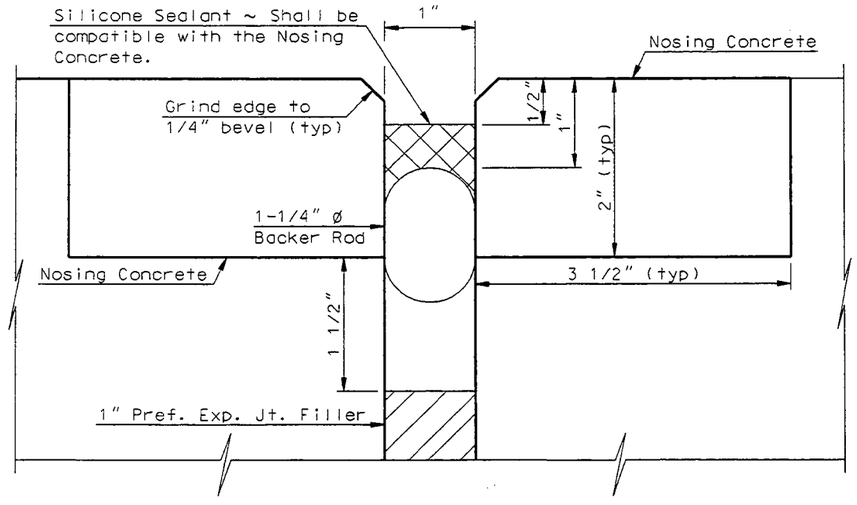
5. Place nosing concrete in the blockout areas, both in the deck and in the approach slab.

6. After the nosing concrete has cured, grind the 1/4" beveled edge. Clean and prepare the joint, apply any necessary bonding material. Install the backer rod and the silicone sealant.

All estimated material quantities shown on drawing number 29-100.391-2 are for information purposes only. All materials including concrete, reinforcing bars, polythylene membrane, preformed joint filler and labor required to build the approach slabs and approach slab barriers and the removal of asphalt shall be included in the pay item, "Concrete Bridge Approach Slab".

The concrete shall be Class AE-3 and the reinforcing steel shall be Grade 60. The polyethylene membrane shall meet the requirements of AASHTO M171.

Surface Finish "D" shall be required for all surfaces of the curb transitions.



JOINT DETAIL A

QUANTITIES (TWO APPROACHES)	
NOSING CONCRETE	7.0 CF
SILICONE SEALANT	72.0 LF

HILLSBORO INTERCHANGE

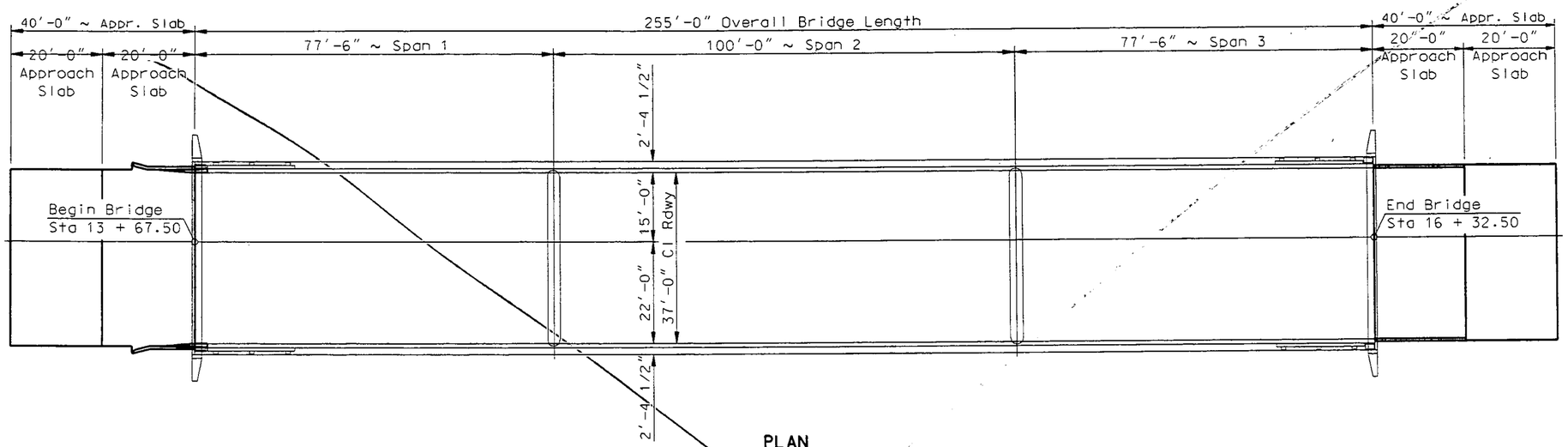
APPROACH SLAB JOINT DETAILS & NOTES

29-104.155-3

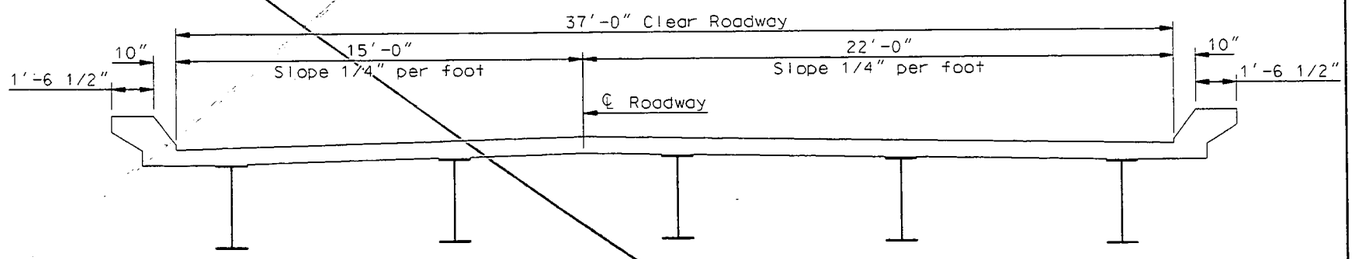
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FHWA REGION	STATE	FEDERAL AID PROJECT NUMBER	SHEET NO.
8	ND	IM-8-029(040)099	84



PLAN



TYPICAL DECK SECTION

NOTES:

930 NOSING CONCRETE: The nosing concrete material shall be an elastomeric concrete or a polymeric concrete that will provide a durable edge that can withstand live-load traffic without chipping or spalling. The nosing concrete material shall be SILSPEC 900 PNS, manufactured by Silicone Specialties Inc.; WABOCRETE II, manufactured by Watson Bowman Acme; ELASTOMERIC CONCRETE, manufactured by D.S. Brown Company or an approved equal. The nosing concrete shall be mixed and installed according to the manufacturer's recommendation. All labor and materials required to install the nosing concrete shall be included in the bid item "Nosing Concrete".

930 SILICONE: The silicone sealant shall be a rapid cure, self leveling, cold applied, two component silicone sealant that will bond to and be compatible to the nosing concrete used. The sealant shall be installed according to the manufacturer's recommendations. The silicone sealant and the nosing concrete must be supplied by the same manufacturer as a complete system. The backer rod and any necessary bonding materials shall be included in the bid item "Silicone Sealant".

930 TECHNICAL ASSISTANCE: The Contractor shall acquire a technical assistance from the manufacturer of the nosing concrete and the silicone sealant for the surface preparation and installation of the nosing concrete and silicone sealant. A technical representative must be present for the start of surface preparation and installation for at least one day. The Contractor shall contact the manufacturer at least two weeks prior to the installation. The technical assistance shall be provided at no additional cost to the Department.

SPEC	CODE	ITEM DESCRIPTION	UNIT	QUANTITY
550	0217	BRIDGE APPROACH SLAB - REMOVE & REPLACE	SY	340.2
602	1210	BRIDGE END POST MODIFICATION	EA	2
930	8642	NOSING CONCRETE	CF	12.6
930	8644	SILICONE SEALANT	LF	74

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

GOOSE RIVER

BRIDGE LAYOUT

PROJECT: IM-8-029(040)099
STATION 328 + 88.5

TRAILL COUNTY

BRLO OODLS33 LLS

29-104.576R

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29-104.155

FHWA REGION	STATE	PROJECT	SHEET NO.
8	N. D.	IR-029-2(51)092 IR-029-3(37)114, F-6-018(17)122 F-6-200(13)406	1

NORTH DAKOTA
STATE HIGHWAY DEPARTMENT

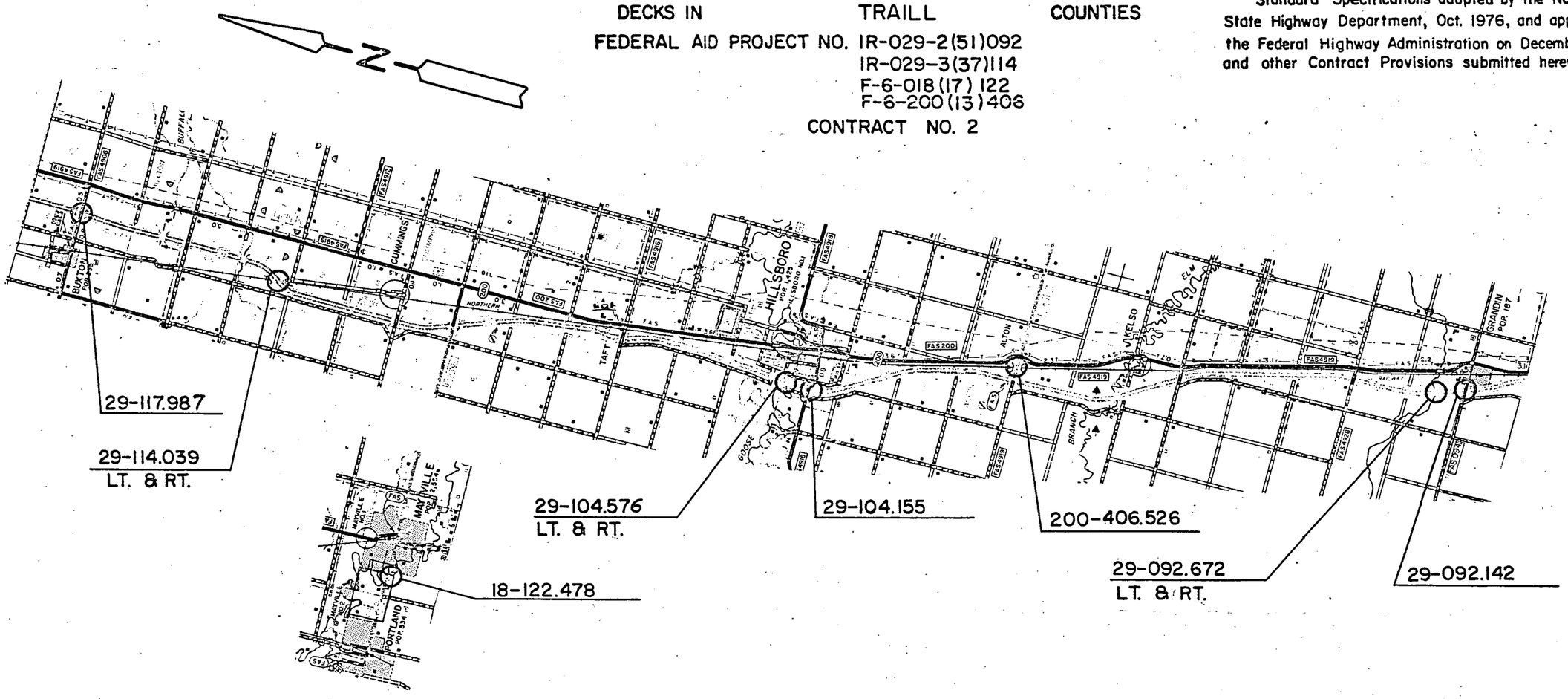
REPAIR & OVERLAY PORTLAND CEMENT CONCRETE BRIDGE DECKS IN TRAILL COUNTIES

FEDERAL AID PROJECT NO. IR-029-2(51)092
IR-029-3(37)114
F-6-018(17) 122
F-6-200(13)406

CONTRACT NO. 2

GOVERNING SPECIFICATIONS

Standard Specifications adopted by the North Dakota State Highway Department, Oct. 1976, and approved by the Federal Highway Administration on December 17, 1976, and other Contract Provisions submitted herewith.



APPROVED DATE 9-23-82

Forrest B. Burrow

BRIDGE ENGINEER
NORTH DAKOTA
STATE HIGHWAY DEPARTMENT

APPROVED DATE 9-24-82

Roy Zink

CHIEF ENGINEER
NORTH DAKOTA
STATE HIGHWAY DEPARTMENT

RAY ZINK REGISTERED PROFESSIONAL ENGINEER NORTH DAKOTA

U. S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED

DIVISION ENGINEER DATE

FHWA REGION	STATE	FED. AID PROJ. NO.	SHEET NO.
8	N.D.	IR-029-2(51)092	2

IR-029-3(37)114, F-6-018(17)122
F-6-200(13)406

SHEET NO.	DESCRIPTION
1	Title Sheet
2	Table of Contents
3	Notes, Quantities and Special Provisions
4	Grandin Interchange
5 - 6	South Branch of Elm River
7	BNRR Separation
8	Hillsboro Interchange
9	Goose River at Hillsboro
10	Goose River at Mayville
11-16	Guardrail Details - Goose River West of Mayville
17-18	BNRR Separation
19	Buxton Interchange
20	Overlay Details
21	Sign Layout for Left Lane Closure Details
22	Sign Layout for Right Lane Closure Details
23	Attenuation Device Detail
24	Sign Layout for One Lane Closure (Two Lane Roadway) Detail (Hillsboro Interchange, Goose River at Mayville, BNRR Sep. East of the Blanchard Interchange)
25	Construction Sign Layout for Low Volume Interchanges

SHEET NO.		STANDARD DRAWINGS
26	D-708-1	Valley Gutter and Curb & Gutter
27	D-708-6	Combined Concrete Curb & Gutter for Bridge Approaches
28	D-722-1	Beam Guardrail General Details
29	D-722-14	Box Beam Guardrail at Bridge Ends
30	D-722-15	Box Beam Guardrail at Bridge Ends
31	D-722-16	Box Beam Guardrail at Bridge Ends Attachment Details
32	D-722-18	Box Beam Guardrail at Bridge Ends Attachment Details

NOTES

GENERAL

THE CONTRACTOR SHALL NOTIFY THE DISTRICT OFFICE OF THE STATE HIGHWAY DEPARTMENT WELL IN ADVANCE OF ANY WORK REQUIRED TO BE DONE BY THE STATE MAINTENANCE SO AS NOT TO INTERFERE WITH THE CONTRACTOR'S OPERATIONS.

STRUCTURAL DETAILS OF SPECIFIC STRUCTURES ARE AVAILABLE AT THE DISTRICT OFFICE OR AT THE BRIDGE DIVISION OF THE CENTRAL OFFICE IN BISMARCK.

LIMITS OF CLASS 2 AND 3 OVERLAY SHALL BE DETERMINED BY THE ENGINEER AND OUTLINED WITH SOME SUITABLE MARKING. THESE AREAS SHALL NOT BE EXPANDED UNLESS APPROVED BY THE ENGINEER. ANY REINFORCING STEEL THAT IS REPLACED IN THE DECK OR ABUTMENT SHALL BE PAID FOR IN ACCORDANCE WITH SECTION 109-5 OF THE ND STANDARD SPECIFICATIONS FOR ROADS AND BRIDGES. THE LAP LENGTH SHALL BE A MINIMUM OF 30 DIAMETERS. NO WELDED SPLICES WILL BE ALLOWED. THE OVERLAY SHALL BE PLACED OVER ONE-HALF OF THE BRIDGE FROM LONGITUDINAL CENTERLINE TO THE CURB IN ONE CONTINUOUS POUR UNLESS OTHERWISE SHOWN. TRAFFIC SHALL BE MAINTAINED ON THE OTHER HALF OF THE ROADWAY.

CANOPY

SHOULD THE DEPTH OF CONCRETE REMOVAL MAKE IT POSSIBLE FOR THE CHIPPING HAMMER TO PENETRATE THE FULL DEPTH OF THE SLAB, A MEANS OF PROTECTING THE ROADWAY BENEATH THE STRUCTURE FROM FALLING DEBRIS SHALL BE PROVIDED AS DIRECTED BY THE ENGINEER. PAYMENT FOR SUCH PROTECTION WILL BE MADE IN ACCORDANCE WITH SECTION 109.5 OF THE ND STANDARD SPECIFICATIONS FOR ROADS AND BRIDGES.

SUB-BASE MATERIAL

THE COST OF PLACING ANY REQUIRED AGGREGATE UNDER THE REPLACED APPROACH PANELS AND/OR PCC PAVEMENT PANELS, INCLUDING THAT REQUIRED TO BRING THEM TO THE PROPER GRADE, SHALL BE INCIDENTAL TO THE ITEMS REMOVE AND REPLACE APPROACH SLABS AND REMOVE AND REPLACE PCC PAVEMENT.

PANEL REMOVAL

THE THICKNESS OF THE EXISTING APPROACH SLAB AND/OR PCC PAVEMENT PANELS MAY VARY FROM THE ORIGINAL PLACEMENT THICKNESS DUE TO MUD JACKING WHICH HAS BEEN DONE BY THE MAINTENANCE FORCES ON SOME STRUCTURES. THE COST OF ANY EXTRA REMOVAL SHALL BE INCIDENTAL TO THE ITEMS REMOVE AND REPLACE APPROACH SLAB AND REMOVE AND REPLACE PCC PAVEMENT.

CLASS OF CONCRETE

THE CONCRETE MIX USED IN THE OVERLAYS SHALL BE AS SPECIFIED IN THE SPECIAL PROVISIONS. UNLESS OTHERWISE SPECIFIED, ALL OTHER CONCRETE SHALL BE EITHER CLASS AE-1 OR AE-3 AT THE OPTION OF THE CONTRACTOR.

SHOULDER REPAIR

AREAS OF BITUMINOUS SURFACED SHOULDERS USED TO CARRY TRAFFIC DURING CONSTRUCTION SHALL BE MAINTAINED BY THE CONTRACTOR, AND AFTER COMPLETION OF THE WORK, SHALL BE RESTORED TO SATISFACTORY CONDITION. THE CONTRACTOR WILL BE REIMBURSED AT THE BID PRICE FOR "HOT BITUMINOUS PAVEMENT-SPECIAL" FOR THE HOT MIX USED TO MAINTAIN AND REPAIR THE SHOULDER. THIS PAYMENT WILL CONSTITUTE FULL REIMBURSEMENT FOR ALL MATERIALS, LABOR, AND EQUIPMENT REQUIRED TO MAINTAIN AND REPAIR THE SHOULDERS.

HOT BITUMINOUS PAVEMENT

WHERE SPECIFIED, ASPHALT ADDED TO BRIDGE APPROACHES ON THE MAINLINE (I-29) STRUCTURES SHALL BE HOT BITUMINOUS PAVEMENT (TACONITE TAILINGS). THE ASPHALT TAPERS ON THE CROSS OVER STRUCTURES AND ANY USED ON SHOULDER REPAIR SHALL BE HOT BITUMINOUS PAVEMENT-SPECIAL. THE TACK COAT IS NOT A SEPARATE PAY ITEM, BUT SHALL BE INCLUDED IN THE PRICE BID FOR HOT BITUMINOUS PAVEMENT-SPECIAL OR HOT BITUMINOUS PAVEMENT(TACONITE TAILINGS). THE TYPE AND GRADE OF TACK SHALL BE APPROVED BY THE ENGINEER. THE ASPHALT CEMENT WILL BE PAID FOR UNDER BID ITEM 85-100 ASPHALT CEMENT. THE MINIMUM AIR TEMPERATURE AT THE TIME OF LAYDOWN SHALL BE 50 DEGREES. F. OR AS APPROVED BY THE ENGINEER. THE HOT BITUMINOUS PAVEMENT MATERIAL SHALL BE HOT MIXED AND MACHINE LAID. THE AGGREGATE USED IN THE HOT BITUMINOUS PAVEMENT-SPECIAL SHALL BE APPROVED BY THE FIELD ENGINEER.

THE AGGREGATE USED IN THE HOT BITUMINOUS PAVEMENT (TACONITE TAILINGS) SHALL HAVE A GRADATION AS FOLLOWS:

SIEVE	PERCENT PASSING
1/2	100
3/8	90-100
4	60-100
10	50-90
40	5-40
200	0-5

THE TEMPERATURE OF THE HOT BITUMINOUS PAVEMENT AT DISCHARGE FROM THE MIXER SHALL NOT EXCEED 300 DEGREES F. THE TEMPERATURE OF THE MIX AT LAYDOWN SHALL NOT BE LESS THAN 210 DEGREES F., IF THE AIR TEMPERATURE IS ABOVE 60 DEGREES, AND SHALL NOT BE LESS THAN 225 DEGREES F. IF THE AIR TEMPERATURE IS LESS THAN 60 DEGREES F. THE ACTUAL MIXING TEMPERATURE SHALL BE ADJUSTED AS DIRECTED BY THE ENGINEER WITHIN THE ALLOWABLE LIMITATIONS TO BEST SUIT CONSTRUCTION CONDITIONS.

THE COMPACTION EQUIPMENT FOR PAVING SHALL INCLUDE NOT LESS THAN ONE APPROVED STEEL ROLLER OR APPROVED VIBRATORY ROLLER AND ONE APPROVED PNEUMATIC TIRED ROLLER. THE INITIAL COMPACTION SHALL BE COMPLETED BEFORE THE MAT DROPS BELOW 170 DEGREES F., AND THE SPECIFIED DENSITY SHALL BE OBTAINED BEFORE THE MAT TEMPERATURE DROPS BELOW 140 DEGREES F.

TWO-LANE, TWO-WAY ROADWAYS

THE MAINTENANCE AND PROTECTION OF TRAFFIC FOR TWO-LANE, TWO-WAY ROADWAYS AT HILLSBORO INTER. 29-104.155 AND GOOSE RIVER AT MAYVILLE BR. 18-122.478 PROVIDES FOR FLAGGING THE TRAFFIC AT ALL TIMES, UNTIL THE ROADWAY IS COMPLETELY OPEN TO TRAFFIC. THE COST OF FLAGGING DURING THE TIME ONE-LANE TRAFFIC IS MAINTAINED SHALL BE CONSIDERED INCIDENTAL AND SHALL BE INCLUDED IN THE PRICE BID FOR TRAFFIC CONTROL. IN LIEU OF PROVIDING FLAGGING DURING THE TIME ONE-LANE TRAFFIC IS MAINTAINED, A TRAFFIC SIGNAL SYSTEM MAY BE PROVIDED, ELIMINATING THE NEED FOR FLAGGING DURING THIS PERIOD. THE TRAFFIC SIGNAL SYSTEM SHALL BE APPROVED BY THE ENGINEER PRIOR TO THE PRECONSTRUCTION CONFERENCE. IF A TRAFFIC SIGNAL SYSTEM IS USED, A WATCHMAN IS STILL NECESSARY IN CASE THE SYSTEM MALFUNCTIONS.

PORTABLE PRECAST CONCRETE MEDIAN BARRIERS

THE NUMBER OF PRECAST CONCRETE MEDIAN BARRIERS REQUIRED ON THE PROJECT SHALL BE 65- 10 FOOT UNITS. THIS NUMBER PROVIDES FOR THE LONGEST STRUCTURE AND APPROACH ON THIS PROJECT. THE BARRIERS SHALL BE OBTAINED FROM THE FARGO AND BISMARCK DISTRICT STORAGE YARDS, TRANSPORTED TO THE WORK SITE AND ASSEMBLED AS REQUIRED. THERE ARE 13 AVAILABLE IN THE BISMARCK DISTRICT AND 52 AVAILABLE IN THE FARGO DISTRICT. UPON COMPLETION OF THE PROJECT THE CONTRACTOR SHALL RETURN THE BARRIERS TO THE DISTRICT THEY WERE OBTAINED FROM. ANY BARRIERS THAT BECOME DAMAGED DURING HANDLING, TRANSPORTING, OR PLACING SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE. IN LIEU OF USING THE STATE FURNISHED BARRIERS, THE CONTRACTOR MAY FURNISH THE REQUIRED BARRIERS. THE COST OF OBTAINING, TRANSPORTING, INSTALLING, MOVING AND RETURNING THE PRECAST CONCRETE MEDIAN BARRIERS SHALL BE INCIDENTAL TO PRICE BID FOR TRAFFIC CONTROL. IF THE CONTRACTOR CHOOSES TO WORK ON MORE THAN ONE STRUCTURE, ADDITIONAL BARRIERS AND ATTENUATION DEVICES SHALL BE FURNISHED AT HIS OWN EXPENSE.

ATTENUATION DEVICE

THE CONTRACTOR SHALL PROVIDE THE ATTENUATION DEVICE AS SHOWN IN THE PLANS.

CURB AND GUTTER FOR BRIDGE APPROACHES

WHERE SPECIFIED, THE CURB AND GUTTER SHALL BE BUILT TO MATCH THE NEW GRADE AS ESTABLISHED FOR THE BRIDGE APPROACHES. THE CURB SHALL TRANSITION FROM THE EXISTING SECTION ON THE BRIDGE TO THE TYPICAL SECTION SHOWN ON THE GROUND AS SHOWN ON STANDARD D-708-6, OR D-708-1 AS SPECIFIED ON THE DRAWINGS. THE MOUNTABLE CURB AND GUTTER SHALL TRANSITION FROM THE EXISTING SECTION ON THE BRIDGE TO THE TYPICAL SECTION IN A DISTANCE OF 10 FEET.

CONSTRUCTION JOINTS

ALL EXISTING CONSTRUCTION OR RELIEF JOINTS, TRANSVERSE OR LONGITUDINAL, SHALL BE CLEANED OUT PRIOR TO THE PLACEMENT OF THE OVERLAY. THE OVERLAY SHALL THEN BE SAW CUT AT THESE LOCATIONS WITHIN 24 HOURS OF PLACEMENT. THE JOINT SHALL THEN BE SEALED WITH HOT POURED ELASTIC TYPE JOINT SEALER 0 INCH TO 1/8 INCH BELOW THE FINISHED PAVEMENT. THE COST OF ANY SUCH WORK SHALL BE INCIDENTAL TO CLASS 1 OVERLAY OR OVERLAY TAPER.

GUARD RAIL AND/OR END POSTS

WITH THE EXCEPTION OF THOSE SPECIFIED, ANY APPROACH GUARD RAIL OR END POSTS REMOVED IN CONNECTION WITH PLACING CURB AND GUTTER SECTIONS, APPROACH TAPERS, OR DECK OVERLAYS, SHALL BE FOR THE CONTRACTOR'S CONVENIENCE ONLY. THE COST OF ANY SUCH REMOVAL SHALL BE AT THE CONTRACTOR'S EXPENSE AND THE REMOVED ITEMS SHALL BE REPLACED TO EXISTING CONDITIONS.

GUARDRAIL EMBANKMENT

THE EMBANKMENT MATERIAL REQUIRED TO CONSTRUCT THE GUARDRAIL EMBANKMENT MAY BE OBTAINED FROM WITHIN THE RIGHT OF WAY. ALL AVAILABLE TOPSOIL IN THE AREAS TO BE DISTURBED SHALL BE SALVAGED AND STOCKPILED SO IT MAY BE SPREAD ON THE EMBANKMENT INSLOPES AND OVER THE BORROW AREAS AND SEEDED. THE ENGINEER SHALL APPROVE THE AREAS FROM WHICH THE EMBANKMENT MATERIAL IS OBTAINED AND THE TYPE OF SEED USED. COMPACTION SHALL BE IN ACCORDANCE WITH SEC. 203-2.5 (TYPE C) OF THE STANDARD SPECIFICATIONS. ALL INSLOPES ON AREAS THAT ARE TO BE WIDENED REGARDLESS OF RATE OF SLOPE SHALL BE BENCHED UNLESS OTHERWISE DIRECTED BY THE ENGINEER. BENCHES SHALL BE DEEP ENOUGH TO PROVIDE A SUFFICIENT WIDTH TO PERMIT PLACING, SPREADING AND COMPACTING EQUIPMENT TO OPERATE. EACH BENCH SHALL BE THOROUGHLY COMPACTED BEFORE ADDITIONAL EMBANKMENT IS PLACED. COST FOR BENCHING, PLACING OF EMBANKMENT, TOP SOIL SALVAGING, STOCKPILING, SPREADING AND SEEDING SHALL BE INCLUDED IN THE PRICE BID FOR BOX BEAM GUARDRAIL.

FED ROAD DIST. NO.	STATE	Federal Aid Project Number	TOTAL SHEETS
8	N.D.	IR-29-3(51)092 M-29-3(57)114 F-6-2000(3)406 F-6-018(17) 122	3

SPECIAL PROVISIONS

NO.	NAME
SP-103.3	AWARD AND EXECUTION OF CONTRACT
SP-107-7	LEGAL RELATIONS AND RESPONSIBILITY TO PUBLIC
SP-108-9	PROSECUTION AND PROGRESS
SP-108-19	PROSECUTION AND PROGRESS
SP-109-4	MEASUREMENT AND PAYMENT
SP-402	REPAIR AND OVERLAY OF P.C.C. BRIDGE DECKS WITH LOW SLUMP CONCRETE
SP-406-11	HOT BITUMINUS PAVEMENT
SP-746-1	FLAGGING
SP-756-2	FIELD LABORATORY
SP-762-6	MAINTENANCE & PROTECTION OF TRAFFIC
SP-610-3	PORTLAND CEMENT CONCRETE
SP-806-3	AGGREGATE FOR PORTLAND CEMENT
SP-370	RAILWAY PROTECTION INSURANCE
SP-722-2	GUARDRAIL, GUARD POSTS, AND GUIDE POSTS
SP-850-2	GUARDRAIL AND GUARD POSTS

LIST OF STANDARDS

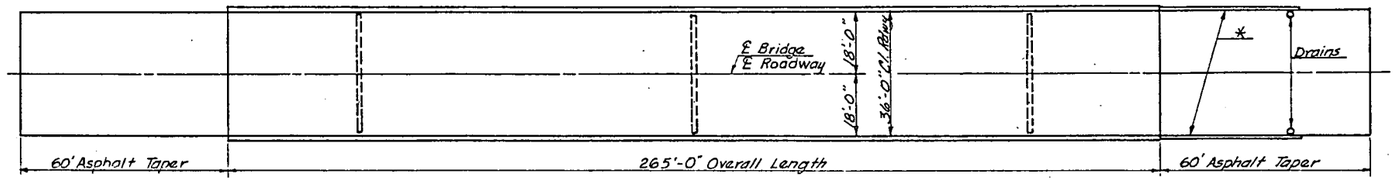
D-708-1
D-708-6
D-722-1, 14, 15, 16 & 18

SUMMARY OF QUANTITIES

SPEC. NO.	103	406	602	705	708	716	722	746	750	756	762	900	900	900	900	900	900	708	722	722	722	406	322
CODE NO.	0100	0230	0130	0100	0410	0100	0150	0100	0100	0100	3298	9501	9690	9700	9701	9702	9705	0420	0118	0119	0600	0100	0360
BRIDGE NO.	CONTRACT BOND	HOT BITUMINOUS PAVEMENT-SPECIAL	CLASS AAE-3 CONCRETE	MOBILIZATION	MOUNTABLE CURB AND GUTTER TYPE I	ADJUST CATCH BASIN	REMOVE & RESET GUARDRAIL	FLAGGING	LINSEED OIL TREATMENT	FIELD LABORATORY TYPE "A"	TRAFFIC CONTROL	APPROACH SLAB REMOVE & REPLACE	CURB OVERLAY	CLASS 1 OVERLAY	CLASS 2 OVERLAY	CLASS 3 OVERLAY	OVERLAY TAPER	CURB & GUTTER TYPE I REINFORCED	BOX BEAM GUARD RAIL	BOX BEAM GUARD RAIL – END TREATMENT	BOX BEAM GUARDRAIL FLARED END TREATMENT & TRANSITION	HOT BIT. PAVEMENT (TACONITE TAILINGS)	85-100 ASPHALT CEMENT
	L.S.	TON	C.Y.	L.S.	L.F.	EA.	L.F.	M. HR.	GAL.	L.S.	L.S.	S.Y.	L.F.	S.Y.	S.Y.	S.Y.	S.Y.	L.F.	L.F.	EA.	EA.	TON	TON
GRANDIN INT. 29-092.142	1	24.0		1	160	4		25	14.0	1	1			933.3	186.7	46.7							1.6
S. BRANCH ELM RIVER 29-092.672 LT.								35	15.3			82.2		698.9	139.8	34.9	320						
S. BRANCH ELM RIVER 29-092.672 RT.								35	15.3			164.4		698.9	139.8	34.9	320						
HILLSBORO INT. 29-104.155		24.0			80	2		35	15.9					1060.0	212.0	53.0							1.6
GOOSE RIVER 29-104.57 LT.								25	20.5					1048.3	209.7	52.4	330						
GOOSE RIVER 29-104.57 RT.								25	20.5					1048.3	209.7	52.4	330						
BR. SEP. LT. 29-114.039			11.3			4	100	35	20.3					1356.7	271.3	67.8						215.0	14.0
BR. SEP. RT. 29-114.039			11.3			4	100	35	20.3					1356.7	271.3	67.6						215.0	14.0
BUFFALO INT. 29-117.98		20.0						35	13.3					883.3	176.7	44.2							1.3
SUB-TOTAL		68.0	22.6	1	240	14	200	285	155.4	1	1	246.6		9,084.4	1,817.0	454.1	1280					430.0	32.5
ENGER-BLANCHARD 200-NDA 529 INT.		29.0			160	4		35	15.5				440	880.0	176.0	44.0							1.9
GOOSE RIVER & MAYVILLE 19-122.478		27.0						25	11.7					777.8	155.6	38.9		80.0	524.6	2	2		1.8
TOTAL	1	124.0	22.6	1	400	18	200	345	182.6	1	1	246.6	440	10,742.2	2,148.6	537.0	1280	80.0	524.6	2	2	430.0	36.2

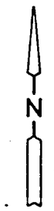
NOTES & QUANTITIES

FHWA REGION	STATE	FED. AID PROJ. NO.	SHEET NO.
8	N.D.	IR-29-2(51)092	8



PLAN

36'-0" Clear Roadway

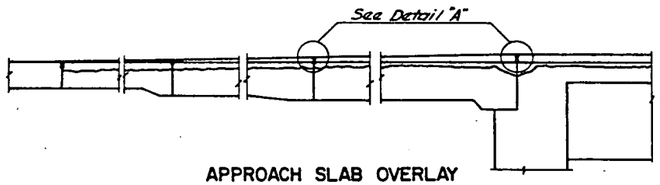


* Remove existing curb & gutter & replace with Mountable Curb & Gutter Type I. East end only.

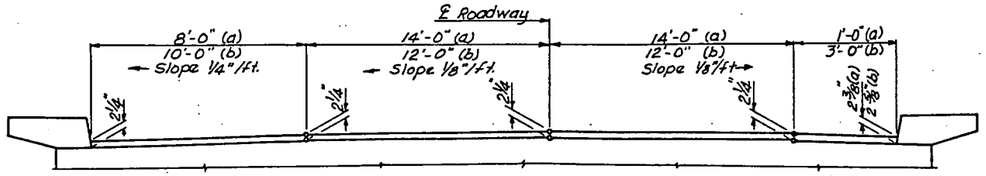
Drains to be adjusted.

HILLSBORO INTERCHANGE

FHWA REGION	STATE	FED. AID PROJ. NO.	SHEET NO.
8	N.D.	IR-29-2(51)092 IR-29-3(57)114 F-6-200(13)406 F-6-018(17)122	20

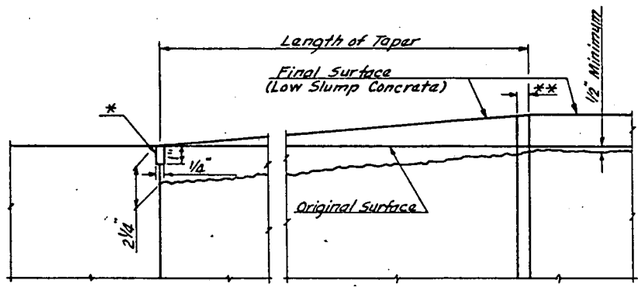


APPROACH SLAB OVERLAY



ELEVATION

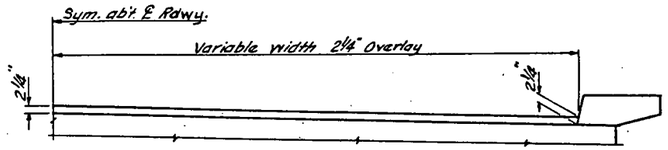
(a) S. BRANCH ELM RIVER LT. & RT
(b) GOOSE RIVER LT. & RT.
(b) BNRR SEP. LT. & RT.



DETAIL "A"

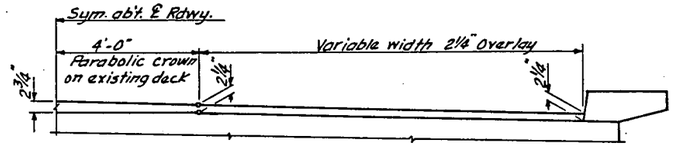
* To be filled with hot poured joint filler

** Remove existing premolded joint filler & fill hot poured joint filler. Width 1½".



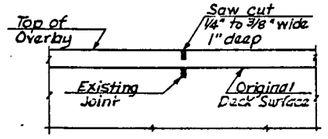
ELEVATION

GRANDIN INT.
BNRR SEP. (200-406.526)
HILLSBORO INT.
BUXTON INT.



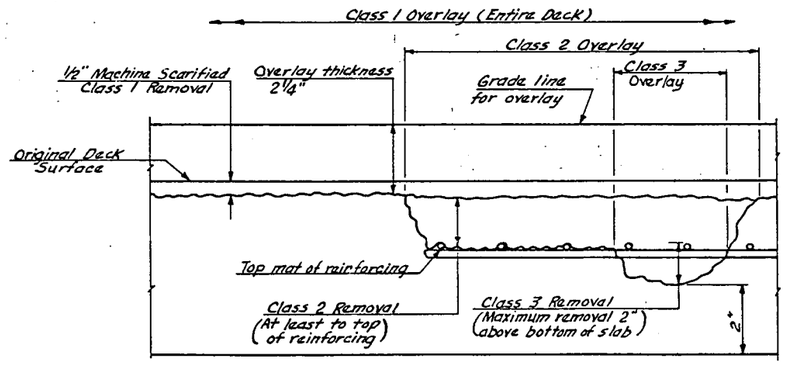
ELEVATION

GOOSE RIVER (18-122.478)



CONSTRUCTION OR RELIEF JOINTS
(TRANSVERSE & LONGITUDINAL)

Incidental to Class 1 Overlay or Overlay Taper



BRIDGE DECK

NOTE:

Maximum limits for Class 3 Overlay will be determined in the field, but will be less than full depth of slab. (See Special Provisions)

OVERLAY DETAILS

CONTRACT NO. 2 29-13

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
5	N. D.	I-29-2(26)	1	44

NORTH DAKOTA
STATE HIGHWAY DEPARTMENT

PLANS

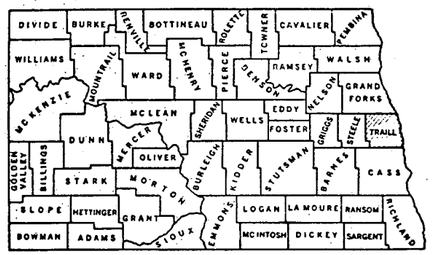
FOR THE PROPOSED IMPROVEMENT OF A

STATE HIGHWAY

IN TRAILL COUNTY

FEDERAL AID PROJECT NO. I-29-2 (26) 104

STRUCTURAL



SKETCH-MAP OF NORTH DAKOTA
SHOWING COUNTIES

SCALES
- LAYOUT SHEET 1 IN. = 5000 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. & 1 IN. = 20 FT.

INDEX OF DRAWINGS

SHEET NO. 1	TITLE PAGE & SUMMARY OF QUANTITIES
SHEETS NO. 2 - 8	INCL. PLAN AND PROFILE DRAWINGS.
SHEETS NO. 9 - 34	INCL. STRUCTURAL DRAWINGS
SHEETS NO. 35 - 36	INCL. SIGNING & DETAILS & TYPICAL SECTIONS
SHEETS NO. 37 - 44	INCL. CROSS SECTIONS

COVERNING SPECIFICATIONS.

Standard Specifications adopted by the North Dakota State Highway department Jan. 1965 and approved as standard by the Bureau of Public Roads June 23, 1965. Required Contract Provisions (Form PR-1273) dated October 1968 and others submitted herewith.

DESIGN DATA

I-29-2 (20) 99

TRAFFIC	AVERAGE DAILY	EST 30TH MAX HR
CURRENT TRAFFIC (1969)	2300 PASS 400 TRUCKS 2700 TOTAL	340
TRAFFIC FORECAST (1989)	5050 PASS 890 TRUCKS 5940 TOTAL	750

DESIGN SPEED 70 MPH
TRAFFIC CLASSIFICATION "M"
MINIMUM SIGHT DISTANCE (NON PASSING) 600'
FULL CONTROL OF ACCESS.
NO POINT OF ACCESS OTHER THAN BY RAMPS AT INTERCHANGES.

Aggr. Surface Course has been provided on the grading contract for the Crossroads. In the event that structural work has not progressed sufficiently to allow the grading contractor to install this item at structure ends, the structural contractor shall install this item in accordance with the plan. The grading contractor will furnish the materials at the site. Temp. curbing shall be installed (See Sheet #55). The cost of this work shall be incidental to other items.

SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS	
NAME	NO.
Piling	SP-2
Conc. Slope Protection	SP-25
Backfill	SP-27
Conc. Structures	SP-29
Reinforcement	SP-32
Struct. Steel	SP-35
Painting	SP-33
Quick Setting Anchor Grout	SP-34
Bidding Requirement & Conditions	SP-9
Legal Relations & Resp. to the Public	SS-1016
General Statement	SS-248 SF-4
Prosecution & Progress	SP-9
Mobilization	SP-10
Value Engineer. Incentive	SP-11
Maintenance Protection of Traffic	SP-15C
Scope of Work	SP-25
Field Laboratory	SS-7

LENGTH OF PROJECT		
PROJECT	MILES-GROSS	MILES-NET
I-29-2(26)	3.529	.000
TOTALS	3.529	.000

LIST OF STANDARDS	STD. NO.
Slope Protection	7.5A
Federal Aid Name Plate	14.98
Bridge Bench Marks	7.6
Const. Ident. Sign	14.25
Standard Signs	14.1A-1 thru 14.1A-10

LIST OF STRUCT. ST'DS.	SHEET NO.
H-0401	32
H-0153	33
H-0501	34

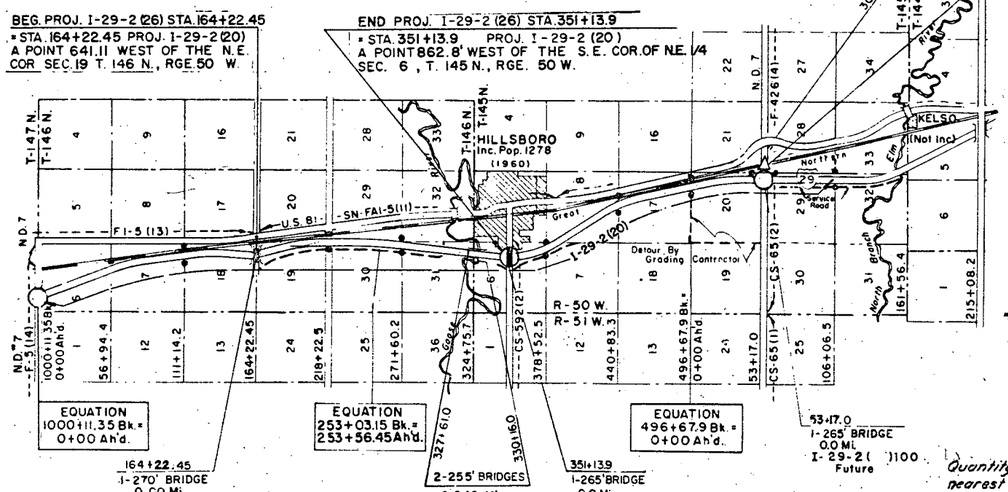
The grading contractor shall be responsible for maintenance and protection of traffic while the grading contract is active. The structural contractor shall be responsible for maintenance and protection of traffic on the detours as soon as he begins work if the grading contract is complete, or suspended while the structural contract is active. The detours will be removed on the future surfacing contract. The cost of maintenance of detours and protection of traffic shall be paid for as maintenance and protection of traffic (Two X-Road Detours)

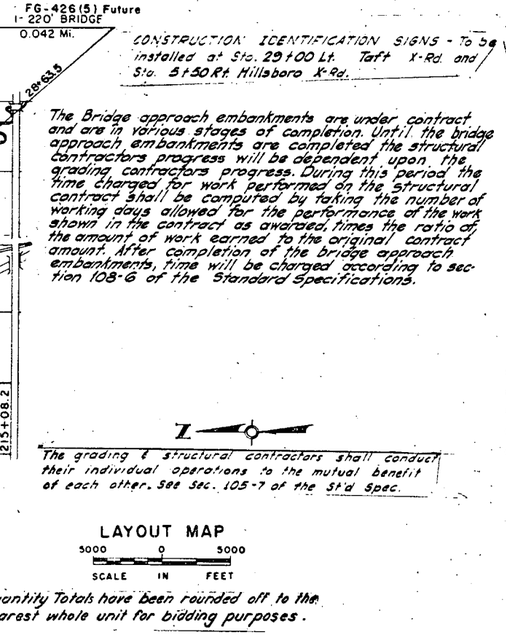
LEGEND

- INTERCHANGE
- HIGHWAY GRADE SEPARATION - NO CONNECTION.
- OTHER BRIDGE
- SERVICE ROAD
- TERMINATED CROSS-ROAD
- △ RAILROAD GRADE SEPARATION

BEG. PROJ. I-29-2 (26) STA. 164+22.45
= STA. 164+22.45 PROJ. I-29-2 (20)
A POINT 641.11 WEST OF THE N.E. COR. SEC. 19 T. 146 N., RGE. 50 W.

END PROJ. I-29-2 (26) STA. 351+13.9
= STA. 351+13.9 PROJ. I-29-2 (20)
A POINT 862.8' WEST OF THE S.E. COR. OF NE. 1/4 SEC. 6, T. 145 N., RGE. 50 W.





The Bridge approach embankments are under contract and are in various stages of completion. Until the bridge approach embankments are completed the structural contractors progress will be dependent upon the grading contractors progress. During this period the time charged for work performed on the structural contract shall be computed by taking the number of working days allowed for the performance of the work shown in the contract as awarded, times the ratio of the amount of work earned to the original contract amount. After completion of the bridge approach embankments, time will be charged according to section 108-6 of the Standard Specifications.

The grading & structural contractors shall conduct their individual operations to the mutual benefit of each other. See Sec. 105-7 of the Std Spec.

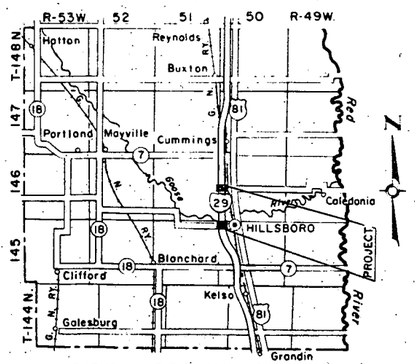
LAYOUT MAP
5000 0 5000
SCALE IN FEET

Quantity Totals have been rounded off to the nearest whole unit for bidding purposes.

KEY TO CONVENTIONAL SIGNS

- STATE & NATIONAL LINES
- COUNTY LINE
- TOWNSHIP & RANGE LINES
- GRADE LINE
- CENTERLINE OF CONSTRUCTION (600)
- OLD RIGHT OF WAY LINE
- NEW RIGHT OF WAY LINE
- ABANDONED RIGHT OF WAY LINE
- PROPERTY LINE
- STONE WALL
- OTHER FENCES (KIND)
- POLE LINES (KIND)
- POWER LINES (KIND)
- BRIDGE
- GROUND ELEVATION (4500 / 4245)
- GRADE
- TRAVELED WAY
- RAILROADS (KIND & NAME)
- HEDGES AND TREES (KIND)
- TRAILS
- CITY OR VILLAGE CORPORATE LIMITS
- SECTION CORNER
- QUARTER SECTION CORNER
- BUILDINGS
- OLD CULVERTS
- NEW CULVERTS
- DRAINAGE
- BENCH MARKS (BM)
- WATERS EDGE
- MARSH
- WIRE ROPE GUARD RAIL
- SNOW FENCE
- RIPRAP
- GUARD POSTS
- COBBLE GUTTERS
- CONCRETE GUTTERS (CONCRETE GUTTER 18" 24")
- SODDING AND JUTE MESH

STA.	CLEAR RDWY. WIDTH	DESIGN LOADING
164+22.45	30'	H_{20} (1944)
351+13.9	36'	HS_{20} (1944)



SKETCH MAP OF TRAILL COUNTY

QUANTITIES																				
SPEC. NO.	208	228	610	610	610	612	616	616	622	622	622	622		750	704		756			745
CODE NO.	0100	0100	1112	1134	0138	0110	0362	4412	0020	0040	0550	290 (50')	380 (95')	0100	0100	3000	0100	7520	3331	0100
LOCATION	CLASS I EXCAVATION	SELECT BACKFILL	CLASS AE-1 CONCRETE (SUBSTRUCT.)	CLASS AE-3 CONCRETE (T-BEAM SUPERSTRUCT.)	CLASS AAE-3 CONCRETE (RAILING)	REINFORCING STEEL GRADE 40	STRUCTURAL STEEL (A-36) (WELDED BEAM)	STRUCTURAL STEEL (A-441) (WELDED BEAM)	STEEL PILING (10BP42)	STEEL PILING (12BP53)	STEEL TEST PILES (10BP42) 115'	STEEL TEST PILES (12BP53)		LINSEED OIL TREATMENT	CONC. SLOPE PROTECTION	BRIDGE BENCH MARKS	FIELD LABORATORY	MOBILIZATION	MAINTENANCE & PROTECTION OF TRAFFIC 2-CROSS ROAD DETOURS	FLAGGING
	C.Y.	C.Y.	C.Y.	C.Y.	C.Y.	L.B.	L.B.	L.B.	Lin. Ft.	Lin. Ft.	EA.	EA.	EA.	Gal.	S.Y.	Set	EA.	Lump Sum	Lump Sum	Man Hr's.
164+22.45	195	150	129.3	263.9	17.36	102,752	25,700	142,700	750	1,705	1		1	43	480	1				100
351+13.9	240	180	143.1	298.0	17.13	112,183	32,100	174,400	675	1,115		1		50	540	1				100
TOTAL	435	330	272	562	35	214935	57800	317100	1425	2820	1	1	1	93	1020	2	1	1	1	200

APPROVED DATE 10-9-68

CHIEF ENGINEER
NORTH DAKOTA STATE
HIGHWAY DEPARTMENT

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
BUREAU OF PUBLIC ROADS

APPROVED

DIVISION ENGINEER DATE

BRIDGE CODE	FED. ROAD DIST NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
X-771	5	N. D.	I-29-2(26)		21	44

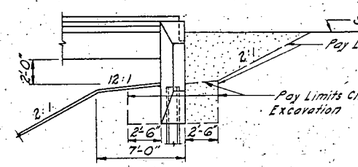
	DATE	CH'KD BY	MADE BY	REVISIONS

	PLOTTED BY	CHECKED BY
TOPOGRAPHY		
DETAILS	MADE BY D.L.P.	CHECKED BY A.E.B.
TRACING	MADE BY D.L.P.	CHECKED BY C.A.L.
QUANTITIES	MADE BY C.A.L.	CHECKED BY A.E.B.

265'-0" ± Overall Length
37'-3" 95'-3" 104'-0" 52'-0" 52'-0" 95'-3" 37'-3"
℄ Median
24'-0" Cl. Roadway
36'-0" Cl. Roadway
Seepage trench
Begin Bridge Sta. 13+67.50 Elev. 929.73
Sta. 14+04.75 Elev. 929.59
℄ Rdwy. & ℄ Bridge
Sta. 15+00.00 X-Road Elev. 928.55
Sta. 351+13.9 Main Line
90°00'
Sta. 15+95.25 Elev. 926.54
Boring No. 2
End Bridge Sta. 16+32.50 Elev. 925.49
Select Backfill
Boring No. 1
Slope Protection (See Std. 7.5 A)
3:1

PLAN

Seepage trench. Fill bottom 2' with select backfill (granular). Fill remainder with excavated material.



DETAIL AT ABUTMENTS

See SP-34 for Quick Setting Anchor Grout.
See SP-29 for Optional Concrete Surface Finish.
① See SP-33 for Painting.
① See SP-35 for Structural Steel.
② See SS-21 for Piling.
③ See SP-45 for Concrete Slope Protection.
④ See SP-32 for Reinforcing Steel.
⑤ See SP-27 for Select Backfill.
General notes for this project are shown on drawing 29-60-1.

For Rail Post Spacing See Drawing 29-60-9
Fixed
Fed. Aid Name Plate (For Side)
℄ Rdwy.
30'-0" 10'-0" 12'-0" 12'-0" 3'-0" 40'-0" 40'-0" 3'-0" 12'-0" 12'-0" 10'-0" 30'-0"
16'6" Min.
2:1
6:1
Elev. 921.73
7'-0"
Elev. 924.30
10 BP 42 ~ 70'
Elev. 917.49
10 BP 42 ~ 65'
Elev. 920.00
Original Ground Line
① 115' 8'-0" Abut. Drawing 29-60-3
Elev. 903.56
12 BP 53
② 21'-0" Bent Drawing 29-60-4
Elev. 897.19
③ 25'-0" Bent Drawing 29-60-5
Elev. 900.51
④ 21'-0" Bent Drawing 29-60-4
⑤ 115' 8'-0" Abut. Drawing 29-60-3
95'+20'
30'+20'
95'+20' outside

ELEVATION

For cut-off elevations and length of piling in bents see drawing 29-60-4 and 29-60-5.

P.C. Sta. 9+25 Elev. 922.25
+4%
P.I. Sta. 13+50.00 Elev. 927.25 L.C. 450'
-4%
P.T. Sta. 17+25 Elev. 922.25
Begin Bridge Sta. 13+67.50 Elev. 929.73
End Bridge Sta. 16+32.50 Elev. 925.49

VERTICAL CURVE

℄ OUTSIDE GIRDERS	929.40	929.40	929.37	929.35	929.29	929.26	929.23	929.20	929.15	929.08	928.98	928.85	928.70	928.54	928.37	928.22	928.07	927.93	927.79	927.66	927.55	927.46	927.38	927.32	927.29	927.28
℄ ROADWAY	929.33	929.33	929.30	929.66	929.62	929.59	929.56	929.53	929.49	929.42	929.32	929.19	929.04	928.87	928.71	928.55	928.40	928.26	928.12	927.99	927.89	927.79	927.73	927.69	927.68	927.69

6' Begin Bridge	℄ Eq. Sp. 36'-9 ℄ Brg. Abut. 1	10 Eq. Sp. = 95'-3" ℄ Bent 2	10 Eq. Sp. = 95'-3" ℄ Bent 3	℄ Eq. Sp. 36'-9 ℄ Bent 4 ℄ Brg. Abut. 5	6' End Bridge

SCREED ELEVATION

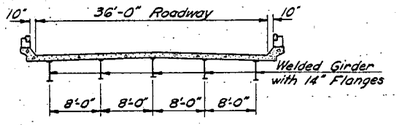
Elevations are to top of finished concrete

1970 FEDERAL AID PROJECT I-29-2(26) NORTH DAKOTA 29-60

FEDERAL AID NAME PLATE
2 REQUIRED

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 A-441 (¾" and under)
f_s = 25,000 psi ~ Structural Steel A-441 (¾" to 1½")
f_s = 23,000 psi ~ Structural Steel A-441 (1½" to 4")
f_s = 20,000 psi ~ Structural Steel A-36



DECK SECTION

BENCH MARKS

NO.	DESCRIPTION	LOCATION	ELEV.
39	Iron Mon. by P.P.	Sta. 350+26 ~ 253' Rt.	907.25
40	Iron Mon. by P.P.	Sta. 356+88 ~ 212' Rt.	907.35

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
Abutments	13.8T.	10.0T.					30.0T.	53.8T.	53.0T.
Bents 2 & 4	45.8T.	18.4T.	1.5T.					63.7T.	70.0T.
Bent 3	51.5T.	16.0T.	1.5T.					69.0T.	70.0T.

ESTIMATE OF QUANTITIES

SPEC. NO.	CODE NO.	BID ITEM	
203	0100	COMMON EXCAVATION	CU. YD.
208	0100	CLASS I EXCAVATION	240 CU. YD.
228	0100	SELECT BACKFILL ⑤	180 CU. YD.
216	0100	WATER	"M" GAL.
610	1112	CLASS AE-1 CONCRETE (SUBSTRUCTURE)	143.1 CU. YD.
610	1134	CLASS AE-3 CONCRETE (SUPERSTRUCTURE)	298.0 CU. YD.
610	0138	CLASS AAE-3 CONCRETE (RAILING)	17.13 CU. YD.
612	0110	REINFORCING STEEL ④ GRADE 40	112,183 LB.
615	4412	STRUCTURAL STEEL (A-441) ① (WELDED GIRDER)	174,400 LB.
615	0362	STRUCTURAL STEEL (A-36) ① (WELDED GIRDER)	32,100 LB.
622	0020	STEEL PILING (10 BP 42) ②	675 LIN. FT.
622	0040	STEEL PILING (12 BP 53) ②	1115 LIN. FT.
622	1290	STEEL TEST PILES (12 BP 53) ② 50 FT.	1 EACH
750	0100	LINSEED OIL TREATMENT	50 GAL.
704	0100	CONCRETE SLOPE PROTECTION ③	540 SQ. YD.
	3000	BRIDGE BENCH MARKS	1 SET

STRUCTURAL DRAWINGS

GENERAL DRAWING 29-60 (THIS SHEET), 29-60-1, 29-60-2, STD. 7.5 A
SUBSTRUCTURE 29-60-3, 29-60-4, 29-60-5, H-0401, STD. 14.9B
SUPERSTRUCTURE 29-60-6, 29-60-7, 29-60-8, 29-60-9, 29-60-10, H-0133, STD. 7.0 (DETR. W. BRAND)

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

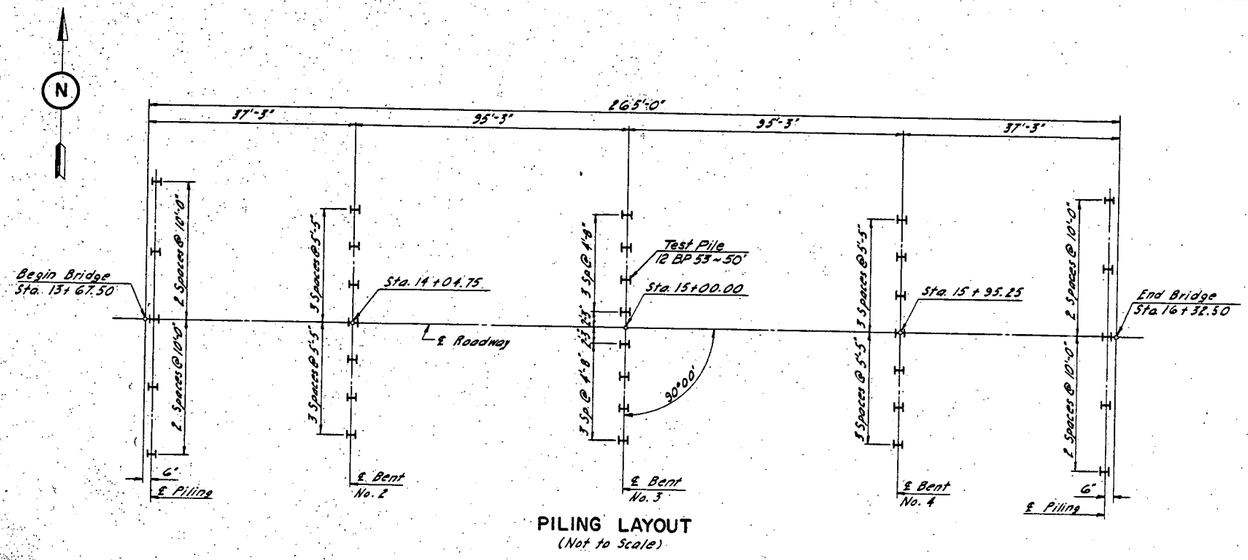
NORTH DAKOTA
STATE HIGHWAY DEPARTMENT
HILLSBORO INTERCHANGE
BRIDGE LAYOUT
PROJECT I-29-2(26) STA. 351+13.9
TRAILL COUNTY

APPROVED
10-2-69 DATE
Joseph P. Kirby BRIDGE ENGINEER

DETR. W. BRAND REGISTERED PROFESSIONAL ENGINEER NO. 1470

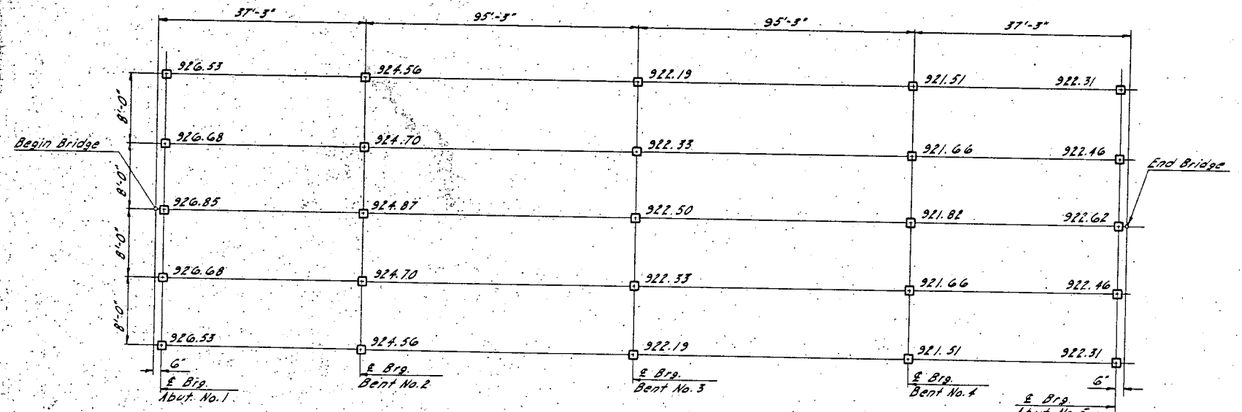
29-60

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	N. D.	I-29-2261		22	44



PILING LAYOUT

(Not to Scale)



BEARING PLATE LAYOUT

Elevations are to top of finished concrete
(Not to Scale)

NOTES:

GENERAL:

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.

DEAD LOAD DEFLECTIONS AND VERTICAL CURVE CORRECTIONS HAVE BEEN ACCOUNTED FOR IN THE SHOP CAMBER OF THE GIRDERS.

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

IF HIGH STRENGTH BOLTS ARE USED IN THE WEB AND FLANGE SPLICES, THE BOLTS SHALL BE PLACED WITH THE NUTS ON THE INTERIOR SIDE OF THE WEB AND ON THE UPPER SIDE OF THE FLANGE.

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 SUB-STRUCTURE IS PLACED.

EXCAVATION:

EXCAVATION CLASS I AT THE ABUTMENTS SHALL EXTEND FROM THE BOTTOM OF THE FOOTINGS TO THE UPPER LIMITS AS SHOWN ON THE BRIDGE LAYOUT DRAWING. EXCAVATION CLASS I AT THE BENTS SHALL EXTEND FROM THE BOTTOM OF THE FOOTING TO THE FINISHED ELEVATION OF THE INTERSTATE MEDIAN AT BENT 3, AND TO THE FINISHED PROFILE UNDER THE SLOPE PROTECTION AT BENTS 2 AND 4.

BACKFILL:

THE BACKFILL SHALL BE COMPACTED TO NOT LESS THAN 95% OF THE MAXIMUM DRY DENSITY AS DETERMINED BY AASHO DESIGNATION T-99. THE MOISTURE CONTENT IN THE SOIL AT THE TIME OF COMPACTION SHALL NOT BE LESS THAN FOUR PERCENTAGE POINTS BELOW OPTIMUM NOR MORE THAN THAT WHICH WILL PERMIT COMPACTION TO THE REQUIRED DENSITY. SELECT BACKFILL SHALL NOT BE PLACED ABOVE THE BERM ELEVATIONS UNTIL THE ENTIRE SUPERSTRUCTURE SLAB HAS CURED.

REINFORCING STEEL:

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

CONCRETE:

ALL EXPOSED CORNERS OF CONCRETE SHALL BE BEVELED WITH 3/4" TRIANGULAR MOLDING UNLESS OTHERWISE NOTED. THE DECK SLAB CONCRETE SHALL BE STRUCK OFF AND COMPACTED BY AN APPROVED DECK FINISHING MACHINE. 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 BENTS SHALL BE CLASS AE-1.

ALL CONCRETE SHALL BE COMPACTED BY VIBRATION. THE "RUBBED SURFACE FINISH" OR THE "SPECIAL SURFACE FINISH" (SEE SP-29) 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 BENTS, AND ALL EXPOSED FACES OF THE ABUTMENT WINGS. ALL OTHER SURFACES SHALL BE GIVEN THE "ORDINARY SURFACE FINISH".

IF THE EXPOSED FACES OF THE ABUTMENTS AND BENTS 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.

ALL "ORDINARY SURFACE FINISH" SHALL BE COMPLETED WITHIN 24 HOURS AFTER REMOVAL OF FORMS.

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

STRUCTURAL STEEL:

THE NORTH DAKOTA STANDARD SPECIFICATIONS 616-3.3.12, FLAME CUTTING, SHALL GOVERN THE FLAME CUTTING PREPARATION OF A36 AND A441 STEELS. IN ADDITION, PREHEATING OF THE A36 AND A441 STEEL SHALL BE REQUIRED JUST PRIOR TO FLAME CUTTING, THE STEEL SHALL BE PREHEATED TO A TEMPERATURE CONFORMING TO TABLE 2, PAGE 3 OF SPECIAL PROVISION 35 GOVERNING THE PREHEATING OF STEEL WHEN LOW HYDROGEN ELECTRODES ARE USED IN WELDING.

THE BEND TEST, UNDER 616-3.3.12.2, SHALL BE REQUIRED FOR THE THICKEST A36 AND A441 STEEL USED IN THE PROJECT. AS STATED IN PARAGRAPHS 616-3.3.12.3," IN LIEU OF PREHEATING, THE FLAME CUT EDGES SHALL BE REMOVED TO A DEPTH OF AT LEAST 1/8" BY MILLING OR GRINDING OR IN THE CASE OF MACHINE FLAME CUTTINGS, THE EDGES MAY BE FLAME SOFTENED AFTER CUTTING."

IN ACCORDANCE WITH SP 35, PARAGRAPH 406(G) THE TEST PLATE SIZE SHALL BE 5/8"x14"

THE GIRDERS SHALL BE CAMBERED IN THE SHOP AS DETAILED ON DRAWING 29-60-6. SUFFICIENT PARTS OF THE STRUCTURE SHALL BE SHOP ASSEMBLED AND ADJUSTED TO LINE, GRADE AND CAMBER OR OTHER PROPER FIT UP IN ORDER TO ESTABLISH THE ACCURACY OF THE WORKMANSHIP AND SHOP DRAWINGS. AFTER SUBPUNCHING OR SUBDRILLING, EACH FULL LENGTH GIRDER LINE WITH ITS FIELD SPLICE PLATES IN PLACE SHALL BE SHOP ASSEMBLED TO THE CORRECT LINE AND GRADE BEFORE REAMING. TEMPLATES SHALL NOT BE USED IN LIEU OF COMPLETE ASSEMBLY.

ALTERNATE SHEAR DEVICES WILL BE PAID FOR AS CHANNEL SHEAR DEVICES. ALTERNATE STUD SHEAR DEVICES SHALL BE MANUFACTURED OF C-1015 OR C-1020 COLD ROLLED STEEL WHICH CONFORMS TO ASTM A 108-61T SPECIFICATIONS, AND SHALL CONFORM TO THE DIAMETER AND OTHER DIMENSIONS AS SHOWN. THE CONTRACTOR IS REQUIRED TO OBTAIN A PRODUCT CERTIFICATION OF THE STUD SHEAR DEVICES USED ON THIS BRIDGE IN ACCORDANCE WITH SECTION 802 OF THE 1965 NORTH DAKOTA "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION". THE STUD MANUFACTURER SHALL HAVE SUBMITTED A CERTIFICATION RECORD QUALIFYING HIS CONNECTOR ACCORDING TO THE LATEST AASHO SPECIFICATION, BEFORE IT WILL BE ACCEPTED BY THE NORTH DAKOTA STATE HIGHWAY DEPARTMENT.

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 25,300 FOOT-POUND-TONS AS COMPUTED BY THE FORMULA $W(E-10,900)+.5E$ WHERE W IS THE WEIGHT OF THE RAM IN TONS AND E IS THE RATED HAMMER ENERGY AS ALLOWED IN THE SPECIAL PROVISIONS. IN NO CASE SHALL THE RAM WEIGHT BE LESS THAN 2,800 POUNDS.

TEST PILES:

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

MATERIALS: (STRUCTURAL STEEL)

GIRDER FLANGES, WEBS, FLANGE AND WEB SPLICE PLATES: A 441; STIFFENERS, DIAPHRAGMS, CHANNEL SHEAR DEVICES, BEARING PLATES AND ANCHOR BOLTS: A 36.

PAINT:

PAINT AND PAINTING SHALL CONFORM TO THE NORTH DAKOTA STANDARD SPECIFICATION FOR ROAD AND BRIDGE CONSTRUCTION, SECTIONS 718 AND 870-1.2, AND THE SPECIAL PROVISION ON PAINTING.

ALL EXPOSED STEEL SURFACES SHALL BE GIVEN ONE SHOP COAT OF RED LEAD PAINT (INCLUDING TOP OF UPPER GIRDER FLANGES BUT NOT SHEAR DEVICES), 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 GRAY-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.

LINSEED OIL TREATMENT:

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

BLAST CLEANING:

COMMERCIAL BLAST CLEANING OF ALL EXPOSED MAIN AND SECONDARY STEEL MEMBERS WILL BE REQUIRED PRIOR TO PAINTING. SEE S.P. 33. (INCLUDE IN UNIT BID PRICE FOR STRUCTURAL STEEL).

QUANTITIES

HILLSBORO INTERCHANGE

BEARING PLATE LAYOUT

PILING LAYOUT

GENERAL NOTES

TRACING MADE BY L.L.G. CHECKED BY G.A.E.

QUANTITIES MADE BY CHECKED BY

29-60-1

29-60-1

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR.	SHEET NO.	TOTAL SHEETS
5	N.D.	I-29-2(26)		23	44

Btm. of Footing Abut No. 1
Elev. 921.73

910
905
900
895
890
885
880
875
870
865
860
855
850
845

FINAL WATER LEVEL - 30.8'

909.9'

(12) (28) A7-6 BLACK-BROWN CLAY - VARIGATED - MIXED FILL AND TOPSOIL - SILTY - STIFF TO VERY STIFF

904.3

(36) (47)

Btm of Footing Bent No. 4
Elev. 900.51

** Ø - 2, C-950, M-44, W-77

(7) A7-6 BROWN-GRAY MOTTLED CLAY - VARVED AND LAMINATED - HEAVY - PLIABLE - SILTY LAMINAE - TRACES OF FE2O3 - TENACIOUS - IMPERVIOUS - MEDIUM STIFF TO STIFF

P - 3065, Ø - NEAR 5, C-1401, M-49, W-73

(13)

880.0

** Ø - 2, C-590, M-65, W-62

(7) GRAY CLAY - MASSIVE - PLIABLE - HEAVY - SLICK - TENACIOUS - IMPERVIOUS - MEDIUM STIFF

M - 29, W-94

P - 3120, Ø - NEAR 15, C-1172, M-28, W-95

864.6

(101) A4 GRAY SILT LOAM - STRATIFIED AND VARVED - NUMEROUS CLAY VARVES - CONTAINS SAND STRATIFICATIONS AND LENSES - WATER BEARING SAND LENSES - COMPACT AND VERY DENSE

0.9
849.8 (100) (100)

BORING NO. 1
STA. 351 +28.9 - 132.50' RT.
Surv. ℄

FINAL WATER LEVEL - 5.7'

909.4

(10) (21) A7-6 BLACK AND BROWN VARIGATED CLAY - MIXED FILL AND TOPSOIL - SILTY - RATHER STIFF TO VERY STIFF

905.2

(38) (47)

** Ø - 14, C-461, M - 45, W- 77

(16) A7-5 BROWN-GRAY CLAY - AMORPHOUS TO VARVED AND TIGHTLY LAMINATED - HEAVY - SILTY LAMINAE - FAIRLY PLIABLE - IMPERVIOUS - VERY STIFF
M - 53, W-71

(16)

879.8

P - 2562, Ø - NEAR 0, C-1281, M-56, W-69

(6) A7-6 GRAY CLAY - VARVED AND LAMINATED TO MASSIVE - PLIABLE - SLICK - TENACIOUS - IMPERVIOUS - MEDIUM STIFF

** Ø - 4, C-965, M-39, W-84

866.8

P - 6078, Ø - NEAR 30, C-1752, M-25, W-100

(20)

0.9
(100) A4 GRAY SILT LOAM - LENTICULAR - VARVED AND LAMINATED - CONTAINS WATER BEARING LENSES AND CLAY VARVES - COMPACT AND VERY DENSE

P - 1579, Ø - NEAR 28, C-526, M-34, W-91

0.9
850.8 (100)

BORING NO. 2
STA. 350+98.9 - 95.25' LT.
Surv. ℄

SYMBOLS:

P - MAXIMUM LOAD (LBS/SQ.FT.)
Ø - SHEAR ANGLE (DEGREES)
C - COHESION (LBS/SQ.FT.)
M - MOISTURE PER CENT)
W - DRY WEIGHT (LBS/CU.FT.)

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 CONDITIONS ENCOUNTERED DURING CONSTRUCTION DIFFER FROM THOSE SHOWN.

BRIDGE NO. 29-60

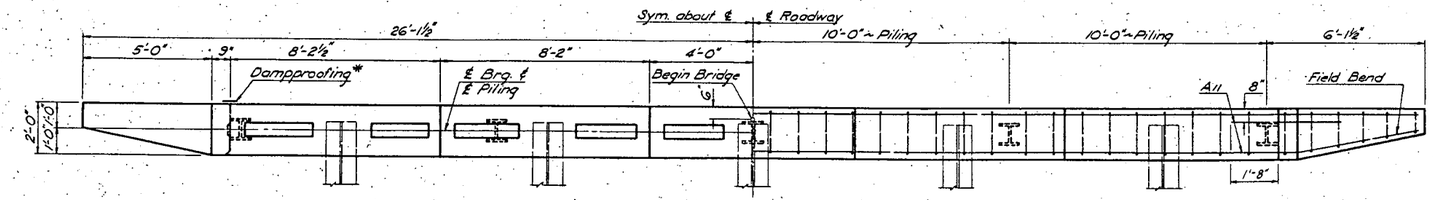
HILLSBORO INTERCHANGE

TRAILL COUNTY

29-60-2

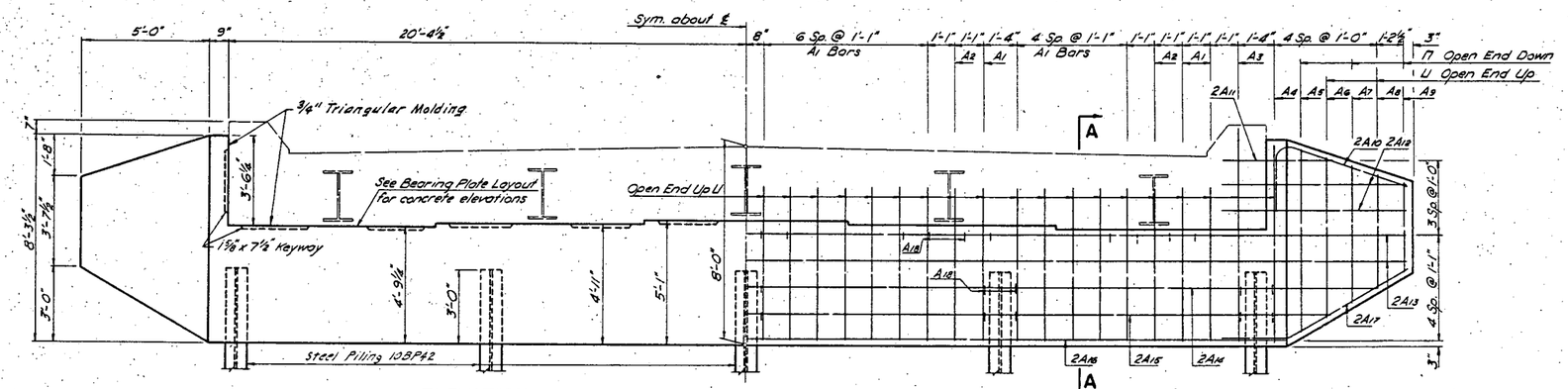
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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	N. D.	I-29-2(26)		24	44.



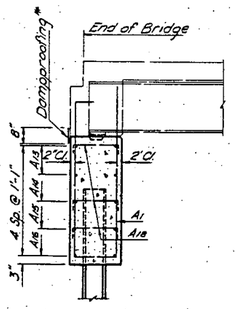
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Showing Dimensions

PLAN
Showing Reinforcing

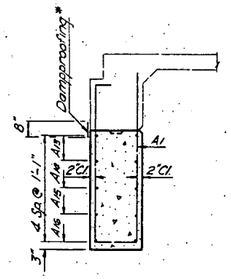


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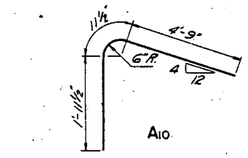
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Showing Reinforcing



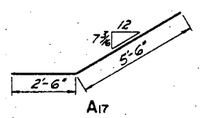
℄ **SECTION**



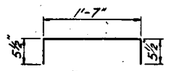
A-A



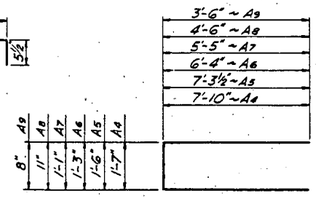
A10



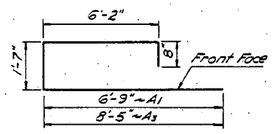
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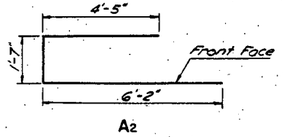
A18



A4-A9 BARS



A1 & A3



A2

BENT BAR DETAILS
Dimensions shown are center to center

ABUTMENT (ONE ABUT.)

MARK	NUMBER WALL	SIZE	LENGTH	SHAPE
A1	30	6	15'-2"	Bent
A2	4	6	12'-2"	"
A3	2	6	16'-10"	"
A4	2	6	17'-3"	"
A5	2	5	16'-1"	"
A6	2	5	13'-11"	"
A7	2	5	11'-11"	"
A8	2	5	9'-11"	"
A9	2	5	7'-8"	"
A10	4	6	7'-8"	"
A11	4	5	4'-5"	Str.
A12	8	5	7'-3"	"
A13	8	5	26'-8"	"
A14	4	5	25'-3"	"
A15	4	5	23'-5"	"
A16	4	6	21'-11"	"
A17	4	6	8'-0"	Bent
A18	40	4	2'-6"	"

PROJECT I-29-2( )
DRAWING 29-60-3

NOTE:
* Two coats of dampproofing shall be applied over the construction joint on the back face as shown on the detail.
"Dampproofing Two Coats" shall be applied, in accordance with Section 735 of the Standard Specifications. Dampproofing will not be paid for directly, but shall be included in the unit price bid for Class AE-1 Concrete.

QUANTITIES (ONE ABUT.)

Class AE-1 Concrete	191	C.Y.
Reinforcing Steel	17180	Lb.
Excavation (See Layout)		
Piling (See Layout)		

HILLSBORO INTERCHANGE

8'-0" ABUTMENT

36'-0" ROADWAY
HS20 LOADING

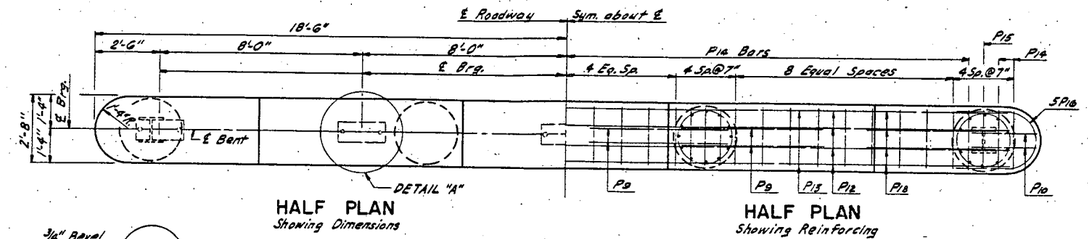
DRAWING CHECKED BY G.A.L.
QUANTITIES MADE BY G.A.L.
QUANTITIES CHECKED BY L.E.S.

29-60-3

DESIGN	MADE BY	D.D.A.
	CHECKED BY	A.P.H.
DETAILS	MADE BY	G.A.H.
	CHECKED BY	A.L.G.
TRACING	MADE BY	C.D.H.
	CHECKED BY	A.L.G.
QUANTITIES	MADE BY	D.A.R.
	CHECKED BY	G.A.H.

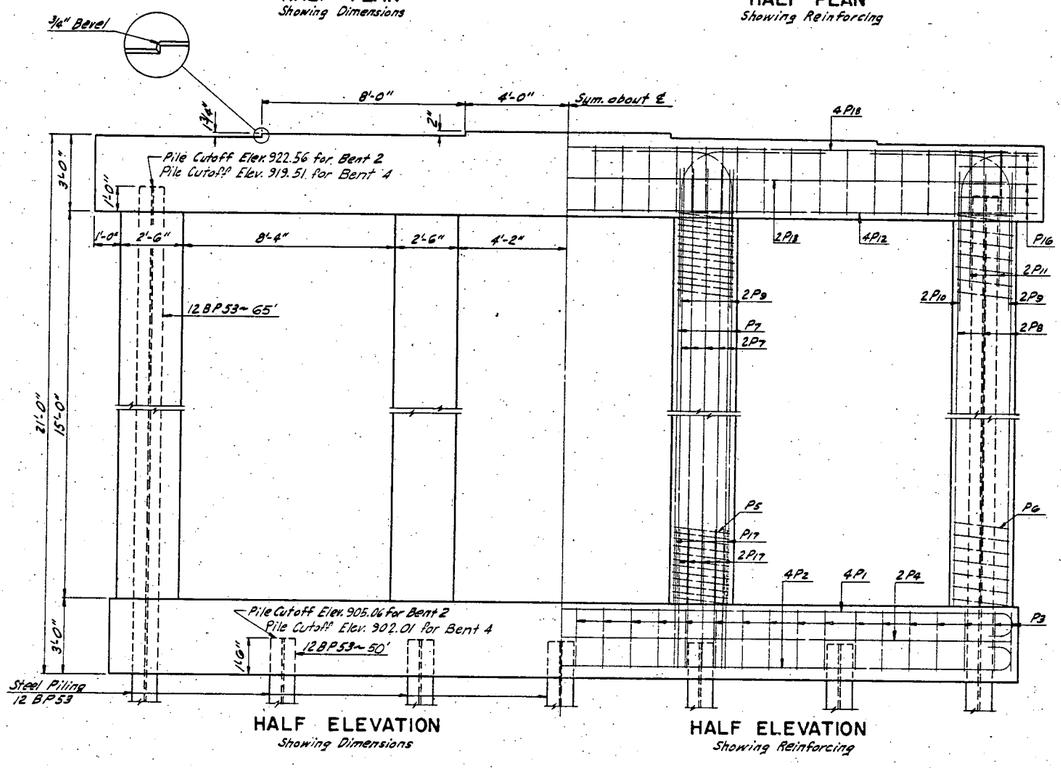
REVISIONS	MADE BY	CHKD BY	DATE

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	N.D.	I-29-2(26)		23	44



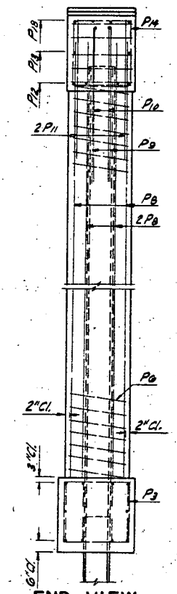
HALF PLAN
Showing Dimensions

HALF PLAN
Showing Reinforcing

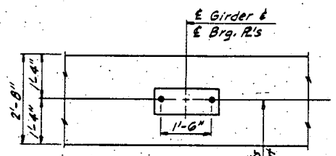


HALF ELEVATION
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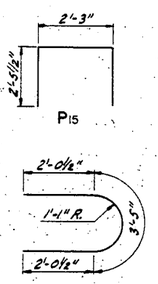
HALF ELEVATION
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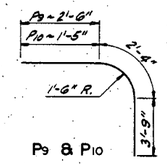


END VIEW

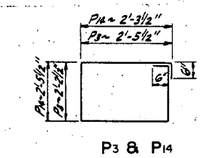


DETAIL "A"

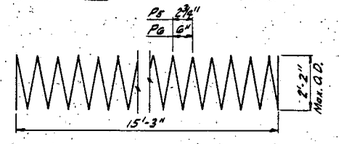




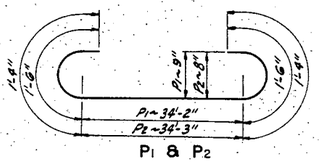
P9 & P10



P3 & P14

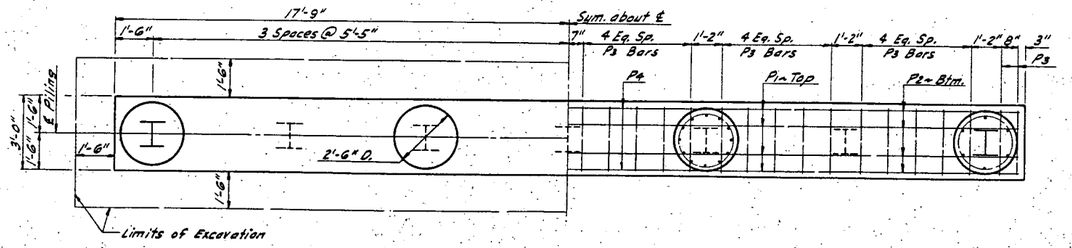


P5 & P6
(Plain)



P1 & P2

BENT BAR DETAILS
Dimensions shown are center to center



HALF FOOTING PLAN
Showing Dimensions

HALF FOOTING PLAN
Showing Reinforcing

BAR LIST (ONE BENT)

PROJECT I-29-2(26)
DRAWING 29-60-4

MARK	NUMBER CAP	NUMBER COLUMN	NUMBER FOOTING	SIZE	LENGTH	SHAPE
P1			4	9	37'-2"	Bent
P2			4	8	36'-11"	"
P3			34	5	10'-4"	"
P4			2	5	35'-0"	Str.
P5		2		4	466'-0"	Spiral
P6		2		3	225'-0"	"
P7		24		7	17'-0"	Str.
P8		12		5	17'-0"	"
P9		12		8	8'-7"	Bent
P10		4		8	7'-6"	"
P11		8		6	5'-6"	Str.
P12	4			8	34'-6"	"
P13	2			4	34'-6"	"
P14	39			5	10'-6"	Bent
P15	2			5	7'-2"	"
P16	10			5	7'-6"	"
P17			24	7	5'-6"	Str.
P18	4			9	34'-6"	"
SP1*		1		4	3'-8"	Str.
SP2*		1		5	4'-0"	"
SP3*		1		6	4'-6"	"
SP4*		1		7	5'-0"	"
SP5*		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 (ONE BENT)

Class AE-1 Concrete	34.0 C.Y.
Reinforcing Steel	5270 Lb.
Steel Piling (See Layout)	
Excavation (See Layout)	

HILLSBORO INTERCHANGE

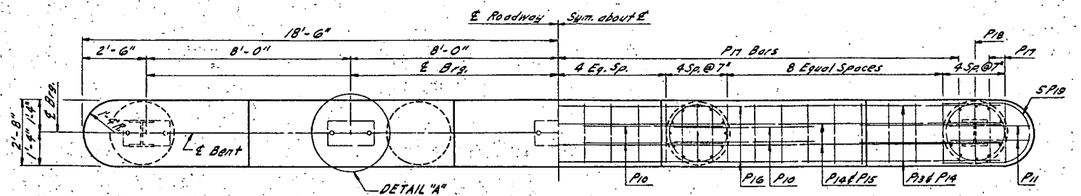
21'-0" BENT

36'-0" ROADWAY

HS20 LOADING

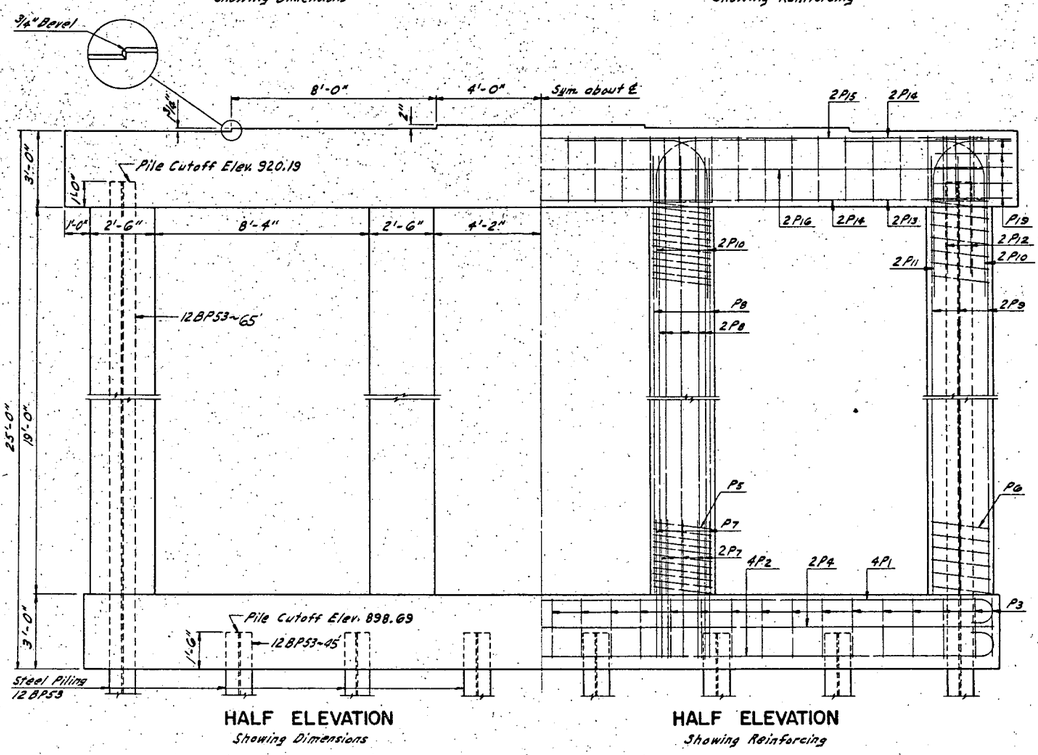
29-60-4

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	N. D.	I-29-2(26)		26	44



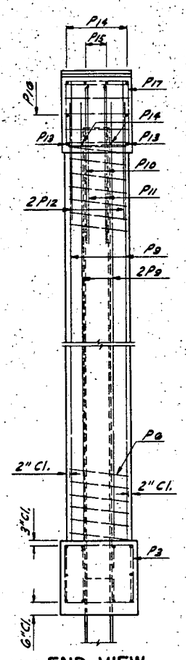
HALF PLAN
Showing Dimensions

HALF PLAN
Showing Reinforcing

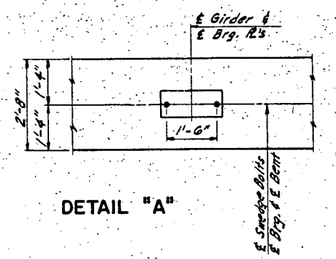


HALF ELEVATION
Showing Dimensions

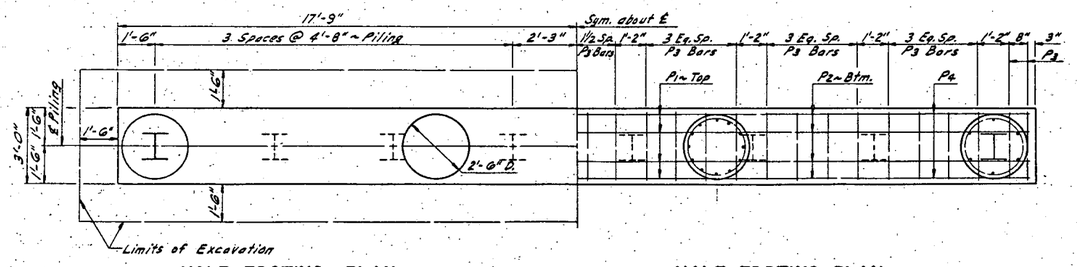
HALF ELEVATION
Showing Reinforcing



END VIEW

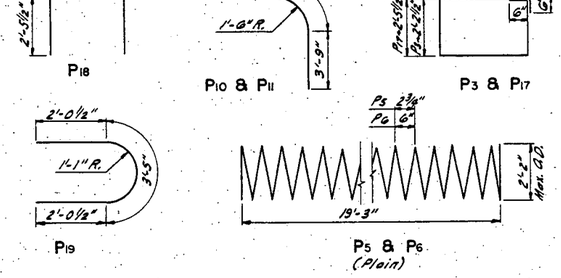


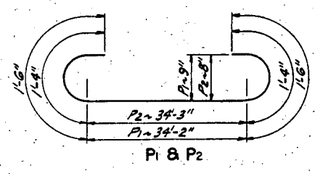
DETAIL "A"



HALF FOOTING PLAN
Showing Dimensions

HALF FOOTING PLAN
Showing Reinforcing





BENT BAR DETAILS
Dimensions shown are center to center

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 3/4" triangular molding.

BAR LIST (ONE BENT)

PROJECT I-29-2(26) DRAWING 29-60-5

MARK	NUMBER CAP	NUMBER COLUMN	NUMBER FOOTING	SIZE	LENGTH	SHAPE
P1			4	9	37'-2"	Bent
P2			4	8	36'-11"	"
P3			32	5	101'-8"	"
P4			2	5	35'-0"	Str.
P5	2		4	5	581'-0"	Spiral
P6	2		3	6	278'-0"	"
P7			24	7	5'-6"	Str.
P8	24			7	21'-0"	"
P9	12			5	21'-0"	"
P10	12			8	8'-7"	Bent
P11	4			8	7'-6"	"
P12	8			6	5'-6"	Str.
P13	2			9	34'-6"	"
P14	4			10	34'-6"	"
P15	2			11	34'-6"	"
P16	2			4	34'-6"	"
P17	39			5	10'-6"	Bent
P18	2			5	7'-2"	"
P19	10			5	7'-6"	"

QUANTITIES (ONE BENT)

Class AE-1 Concrete	36.9 C.Y.
Reinforcing Steel	6048 Lbs.
Steel Piling (See Layout)	
Excavation (See Layout)	

HILLSBORO INTERCHANGE

25'-0" BENT

36'-0" ROADWAY
HS20 LOADING

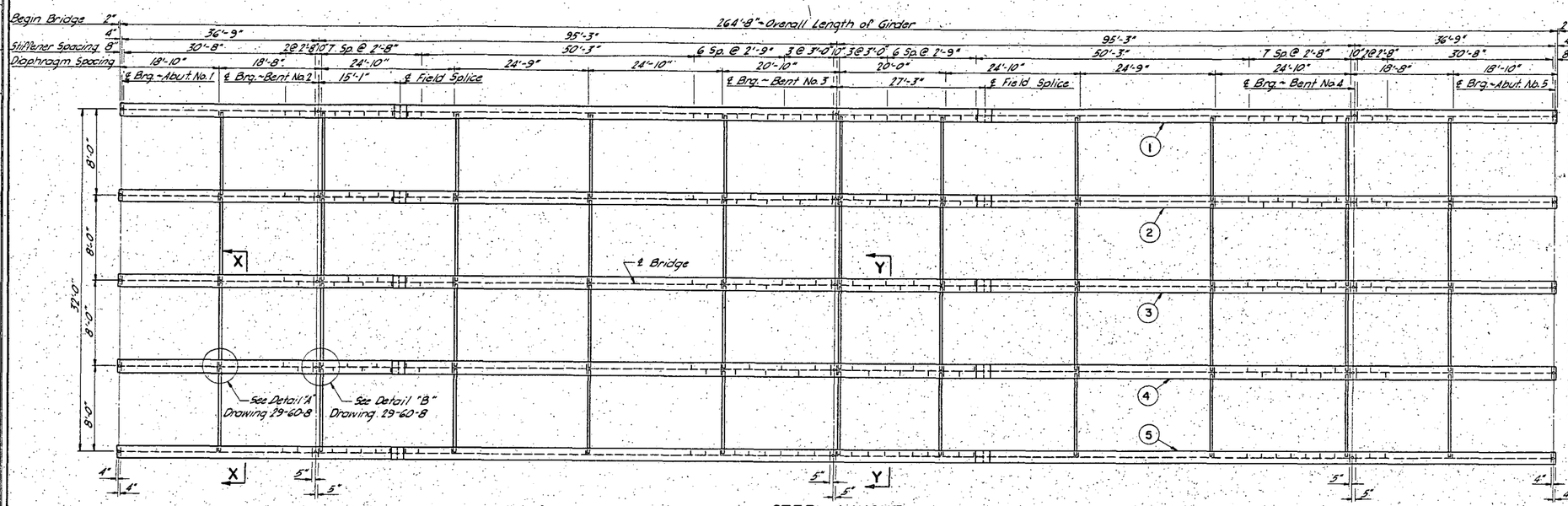
CHECKED BY L.E.G.

29-60-5

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	N. D.	I-29-2(26)		27	44

REVISIONS	DATE	CHK'D BY

DESIGN	MADE BY	D.D.A.
	CHECKED BY	L.F.H.
DETAILS	MADE BY	G.A.L.
	CHECKED BY	L.E.G.
TRACING	MADE BY	G.A.L.
	CHECKED BY	D.L.R.
QUANTITIES	MADE BY	G.A.L.
	CHECKED BY	D.L.R.



STEEL LAYOUT

FIELD SPLICES:

TWO FIELD SPLICES ARE PROVIDED ON DRAWING 29-60-7. FALSEWORK WITH PROVISIONS FOR JACKING MUST BE PROVIDED DURING ERECTION TO HOLD THE GIRDERS IN ALIGNMENT WHILE SPLICES ARE BEING MADE.

OPTIONAL FIELD SPLICES:

IN ADDITION TO THE TWO FIELD SPLICES ON DRAWING 29-60-7, TWO OPTIONAL FIELD SPLICES ARE SHOWN. THESE TWO ADDITIONAL FIELD SPLICES MAY BE USED BY THE CONTRACTOR UNDER THE FOLLOWING CONDITIONS:

1. THEY ARE MADE AT NO EXPENSE TO THE STATE.
2. FLANGE AND WEB SPLICE PLATES AND BOLTS WILL BE AS SHOWN IN DETAILS ON DRAWING 29-60-8.
3. FALSEWORK AT THESE SPLICE POINTS WITH PROVISIONS FOR JACKING MUST BE PROVIDED DURING ERECTION TO HOLD THE GIRDERS IN ALIGNMENT WHILE SPLICES ARE BEING MADE.

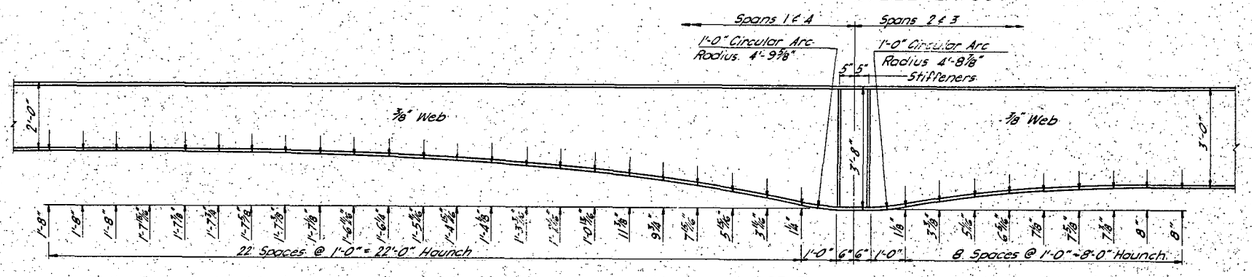
THE SHOP FABRICATION AND ERECTION DRAWING MUST INDICATE FOUR PICK-UP POINTS FOR EACH MEMBER OVER 100 FEET LONG TO BE USED DURING SHIPPING AND ERECTION.

THE DETAILS SHOWN ON DRAWING 29-60-7 REPRESENT GIRDER NO. 1 IN A FIVE (5) 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 AND DRAWINGS 29-60-7 AND 29-60-8.

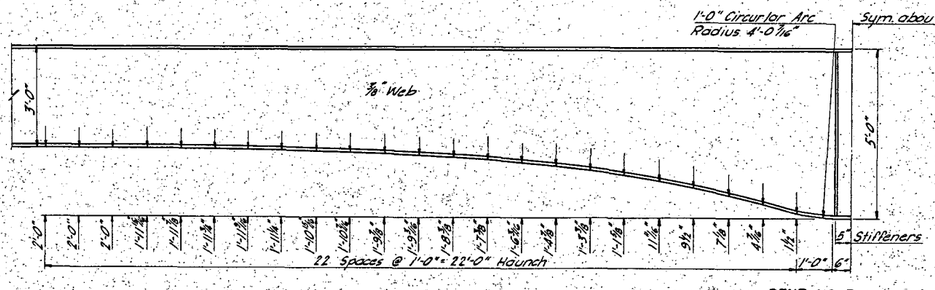
ALL SHOP BUTT WELDS IN THE FLANGE PLATES SHALL BE MADE BEFORE FINAL FITTING AND WELDING INTO THE GIRDER.

OPTIONAL WEB SPLICES:

THE PAY QUANTITY FOR STRUCTURAL STEEL WILL BE BASED ON THE USE OF THE OPTIONAL SHOP WEB SPLICES.

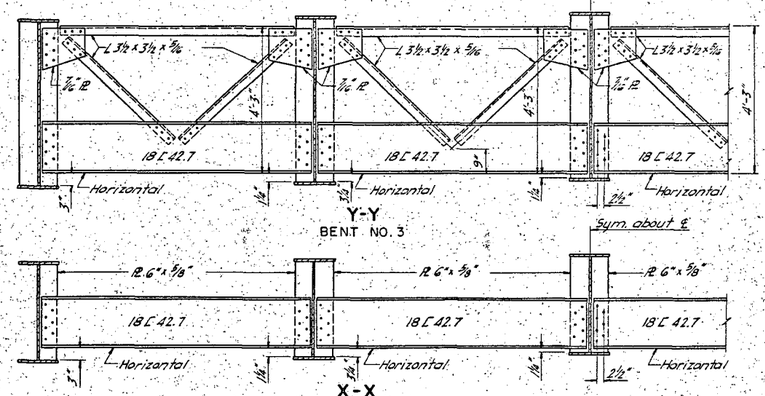


BENT NO. 2 & 4



BENT NO. 3

GIRDER HAUNCH DETAILS



Typical for diaphragms at Bent 2 and 4 and all intermediate diaphragms



SHOP CAMBER DIAGRAM

The shop camber diagram above represents the total rise in inches above a chord between the ℄ of abutment bearings that shall be cut into the web plate of the girders 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. The depth of the web plate will also vary according to the thickness of the flange plates.

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

QUANTITIES

See Drawing 29-60-8.

HILLSBORO INTERCHANGE

SUPERSTRUCTURE DETAILS

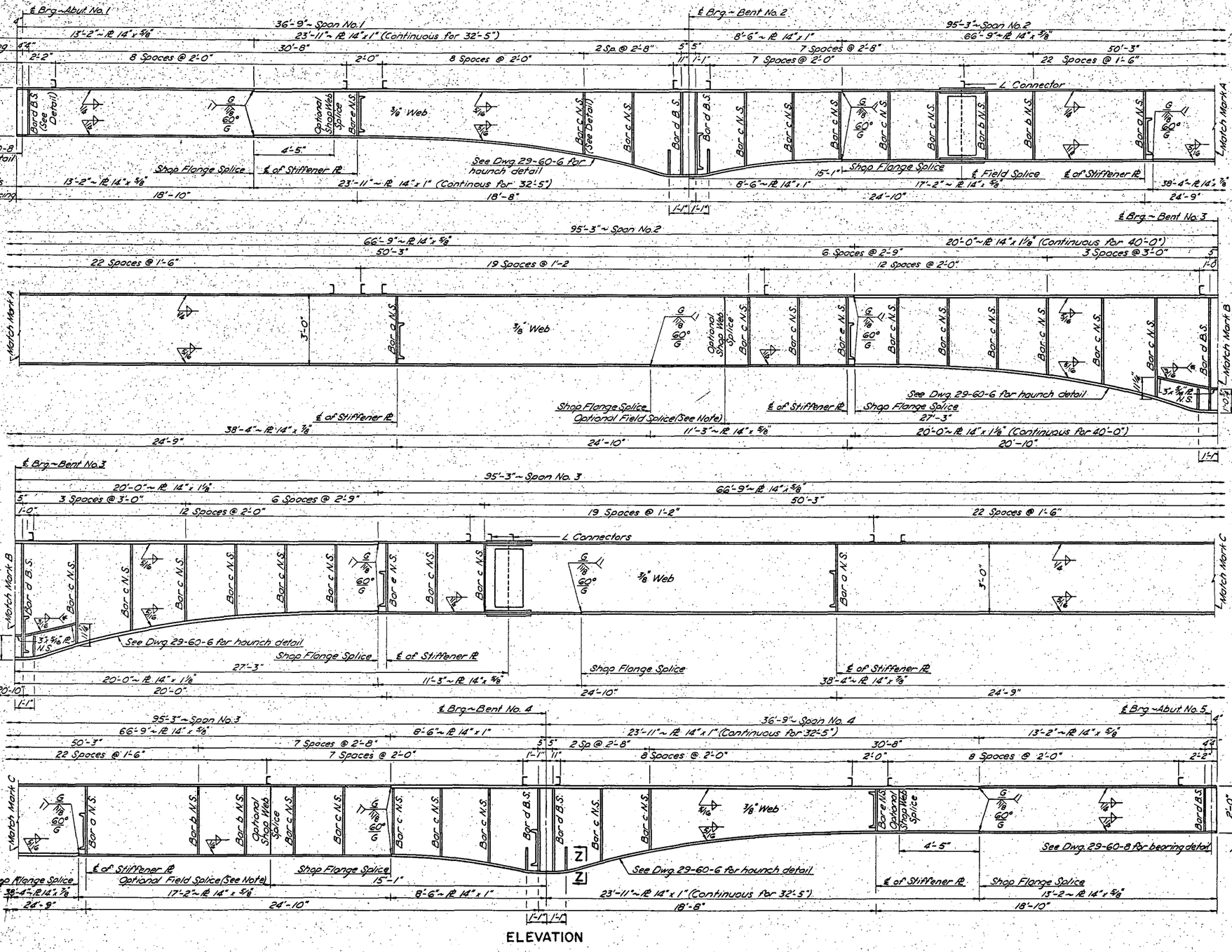
36'-0" ROADWAY

HS20 LOADING

29-60-6

29-60-6

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	N. D.	F-29-2(26)		28	44



ELEVATION

*Weld to web only.

SHOP WEB SPLICE

If optional field splices are used in Spans 2 and 3, shop web splice shall not be used in those spans.

See Drawing 29-60-8 for Z-Z.

Designed for 25 #/S.F. FWS

QUANTITIES

See Drawing 29-60-8

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

HILLSBORO INTERCHANGE

WELDED GIRDER DETAIL

36'-0" ROADWAY

HS_{20} LOADING

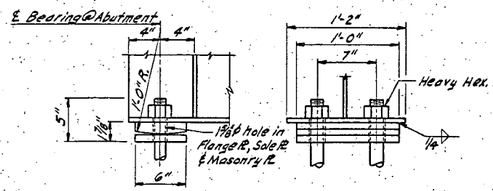
CHECKED BY: J.L.T.

29-60-7

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	N.D.	I-29-2(26)		29	44

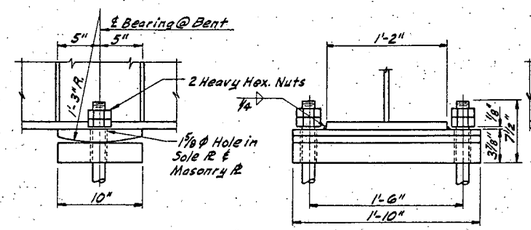
		MADE BY	CHK'D BY	DATE
DESIGN	MADE BY	R.D.A.		
	CHECKED BY	A.P.K.		
DETAILS	MADE BY	A.E.G.		
	CHECKED BY	G.A.L.		
TRACING	MADE BY	A.D.H.		
	CHECKED BY	G.A.L.		
QUANTITIES	MADE BY	G.A.L.		
	CHECKED BY	D.L.R.		

REVISIONS



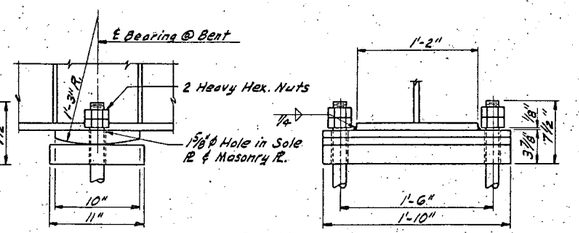
Sole ℝ ~ 6"x 1⅛"x 1'-0"
Masonry ℝ ~ 6"x 3/4"x 1'-0"
Swedge Bolts ~ 1½" ϕ x 2'-0"
Note: Swedge bolts to be drilled, and anchored in quick setting grout. See Special Provisions.

ABUTMENT BEARING DETAILS



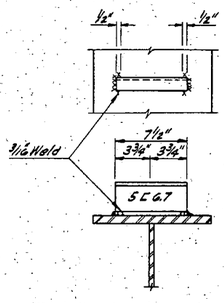
Sole ℝ ~ 10"x 1⅛"x 1'-10"
Masonry ℝ ~ 10"x 2¼"x 1'-10"
Swedge Bolts ~ 1½" ϕ x 2'-0"

BENT BEARING DETAILS
BENTS 2 & 4

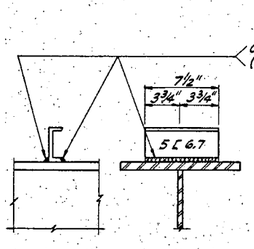


Sole ℝ ~ 10"x 1⅛"x 1'-10"
Masonry ℝ ~ 11" x 2¼"x 1'-10"
Swedge Bolts ~ 1½" ϕ x 2'-0"

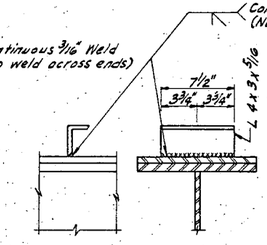
BENT BEARING DETAILS
BENT 3



Use in Span 1 and in negative moment regions where spacing is 2'-0".

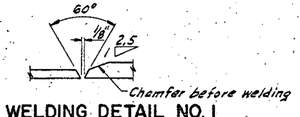


Use in positive moment region except over splice ℝ's.

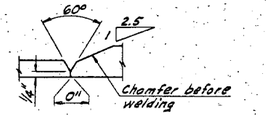


Use over splice ℝ's.

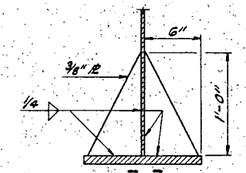
SHEAR DEVICE DETAILS



WELDING DETAIL NO. 1
SHOP FLANGE SPLICE
Bottom Flange Shown
For manual shielded arc welding use joint B-L2 (Shown above)

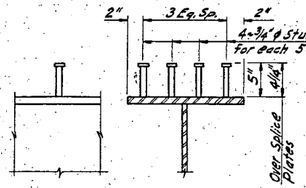


ALTERNATE DETAIL NO. 1
SHOP FLANGE SPLICE
Bottom Flange Shown
Submerged Arc AWS B-L2b-S
If submerged arc welding is used AWS B-L2b-S is an acceptable replacement for B-L2 (Manual).

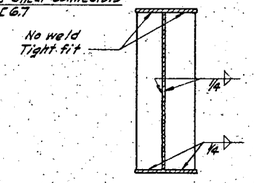


Typical for bents 2, 3 & 4
See 29-60-7 for Z-Z

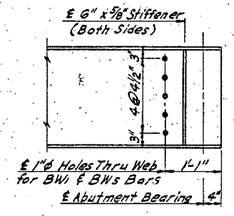
Z-Z



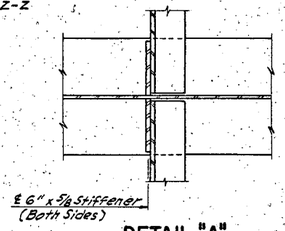
ALTERNATE SHEAR DEVICE



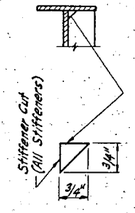
bar e (6" x ⅝")

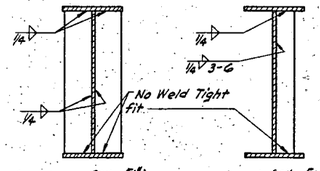


BEAM DETAILS

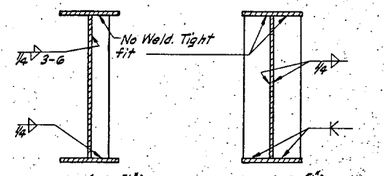


DETAIL "A"



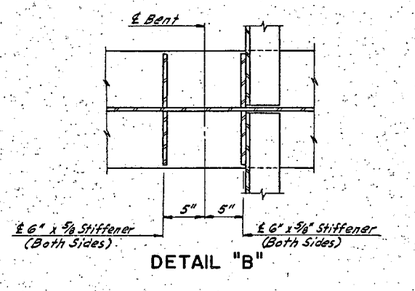


bar a (6" x ⅝") bar b (4" x 5/16")

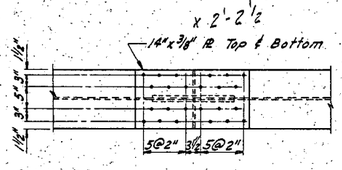


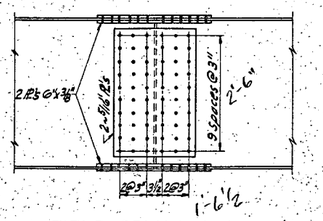
bar c (4" x 5/16") bar d (6" x ⅝")

WEB STIFFENER DETAILS



DETAIL "B"





FIELD SPLICE PLATE

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

QUANTITIES

Structural Steel (A-441)	174,400 Lbs.
Structural Steel (A-36)	32,100 Lbs.

HILLSBORO INTERCHANGE

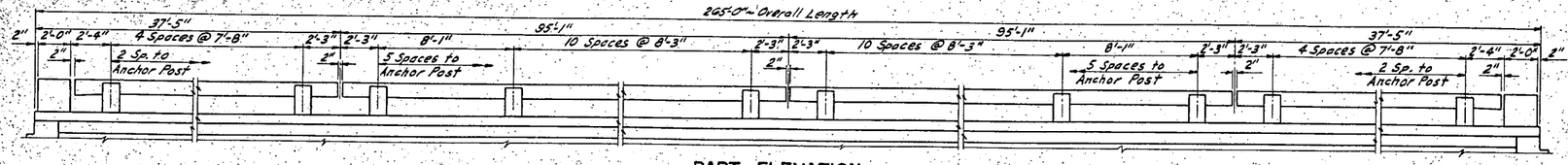
SUPERSTRUCTURE DETAILS

36'-0" ROADWAY
HS20 LOADING

29-60-8

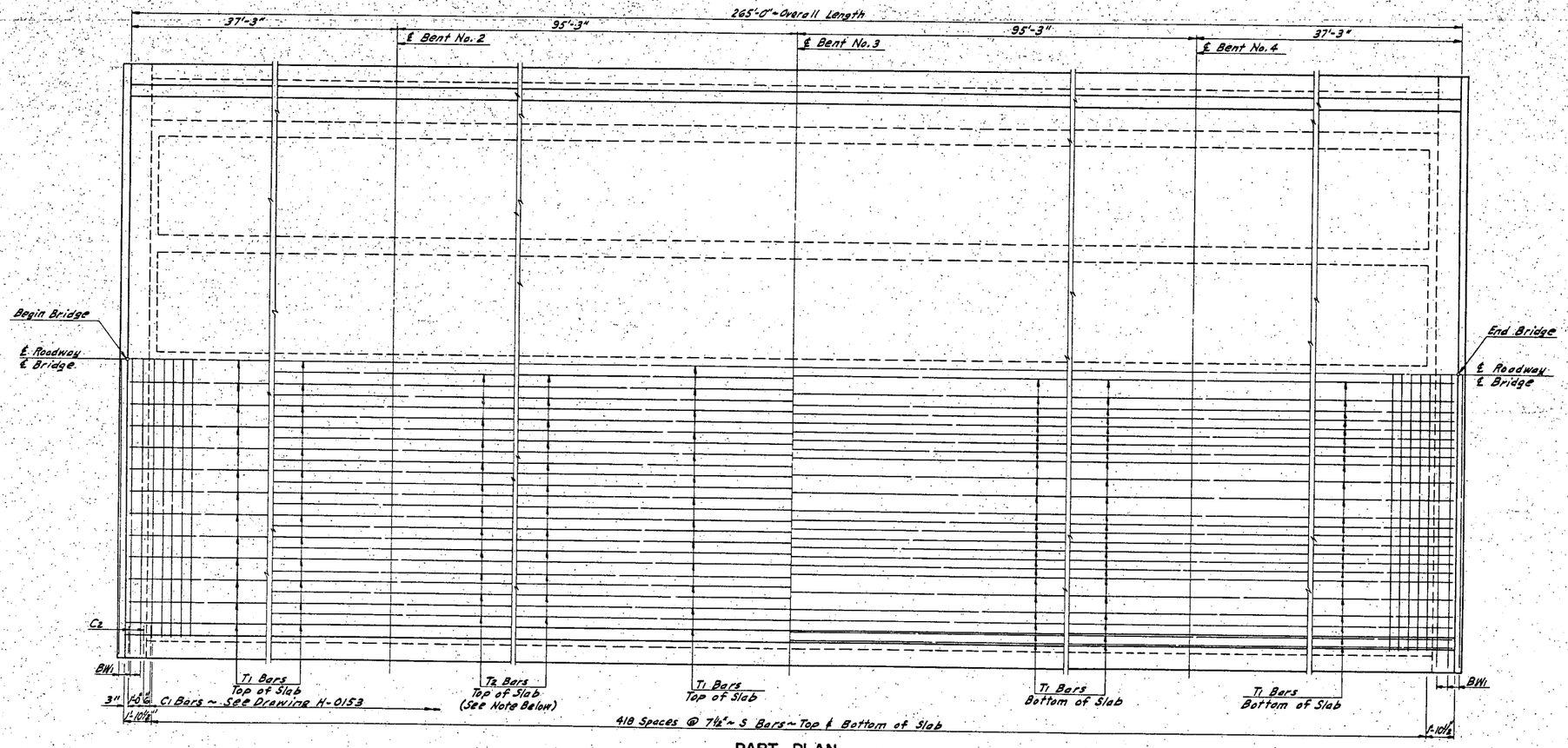
29-60-8

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	N.D.	I-29-2(82)		30	44



PART ELEVATION

See H-0153 for Railing Details

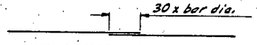


PART PLAN

Half Showing Slab Reinforcing
Typical Both Sides ~ by Rotation

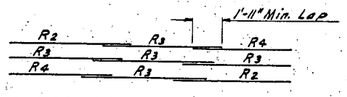
NOTE:

T2 Bar Placement: (Slab & Curb)
At Bent #2 - 15 feet in Span #1, 25 feet in Span #2
At Bent #3 - Center over Bent
At Bent #4 - 25 feet in Span #3, 15 feet in Span #4



SPLICING DETAIL

T1, E1, & E2



R BAR SPLICING DETAIL

(Spans 2 & 3 Railing)
Use R1 bars in end spans railing

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

QUANTITIES

See Sheet 29-60-10 for Quantities

HILLSBORO INTERCHANGE

SLAB & RAILING DETAILS

36'-0" ROADWAY

HS20 LOADING

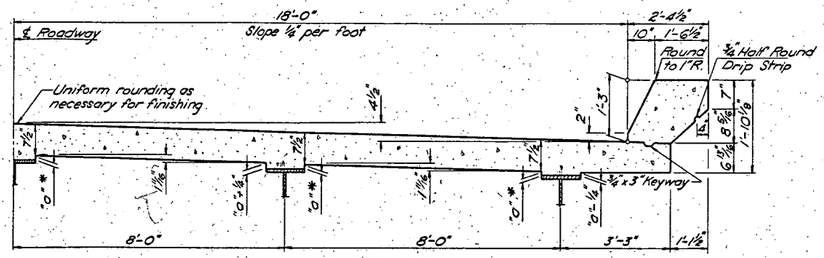
QUANTITIES CHECKED BY A.L.G.

29-60-9

29-60-9

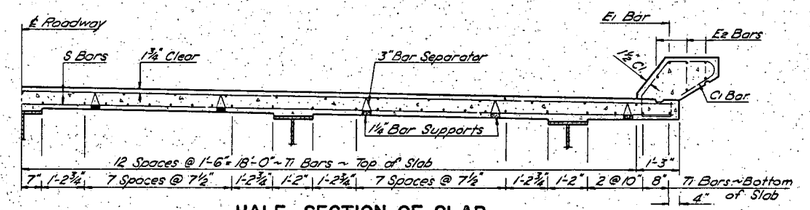
DESIGN	DETAILS	TRACING	QUANTITIES
MADE BY DOA	MADE BY GAL	MADE BY DLP	MADE BY GAL
CHECKED BY LPH	CHECKED BY LEG	CHECKED BY GAL	CHECKED BY LEG

REVISIONS	MADE BY	CH'KD BY	DATE

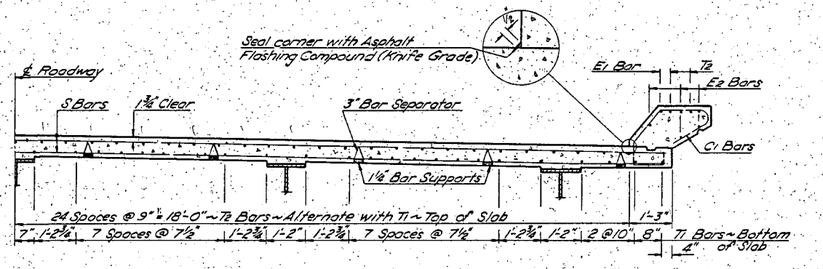


HALF SECTION OF SLAB
Showing Dimensions

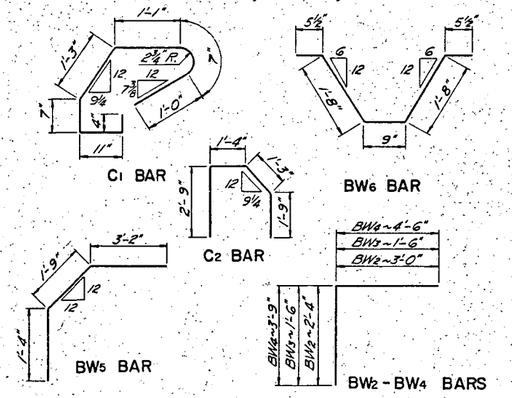
* "o" equals 1⅛" @ ℄ bearings of bents and abutments. At intermediate points "o" equals screed elevation at ℄ Roadway minus top of girder elevation minus 10.948 outside girders)(0.802 inside girders)(0.635 center girder).



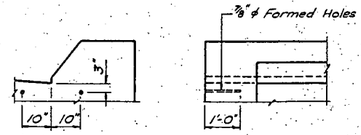
HALF SECTION OF SLAB
Showing Reinforcing between Bents ℄ Abutments



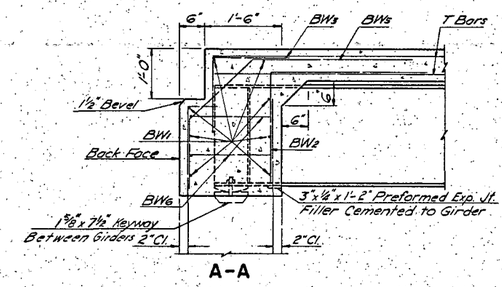
HALF SECTION OF SLAB
Showing Reinforcing over Bents



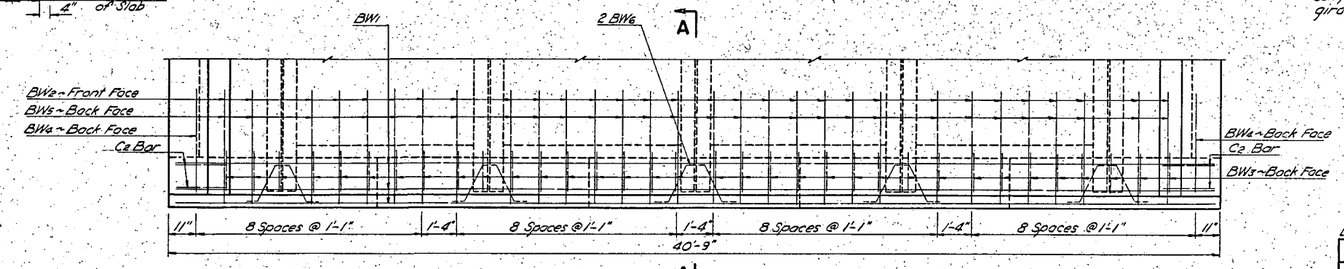
BENT BAR DETAILS (Dimensions shown are center to center)



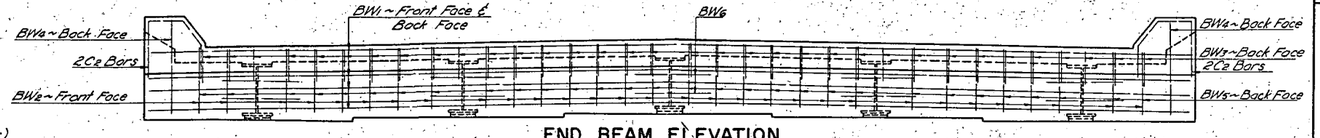
CURB SLEEVE DETAILS



A-A



END BEAM PLAN



END BEAM ELEVATION

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	N. D.	I-29-2(26)		31	44

SUPERSTRUCTURE

MARK	NUMBER SLAB	NUMBER RAILING & POSTS	NUMBER CURB	SIZE	LENGTH	SHAPE
BW1	16		6		40'-4"	Str.
BW2	60		6		5'-4"	Bent
BW3	68		6		3'-0"	"
BW4	4		6		8'-3"	"
BW5	60		6		6'-3"	"
BW6	20		5		5'-0"	"
C1	592		5		5'-9"	Bent
C2	8		5		7'-1"	"
E1		16	6		35'-3"	Str.
E2		80	5		35'-0"	"
P4		180	6		3'-8"	Bent
P5		24	6		4'-5"	"
P6		136	5		4'-11"	"
P7	136		3		3'-10"	"
P8	120		3		2'-10"	"
P9	16		3		4'-4"	"
PC	468		3		2'-11"	Bent
R1	24		6		34'-8"	Str.
R2	16		6		35'-10"	"
R3	40		6		32'-10"	"
R4	16		6		23'-10"	"
S	838		6		38'-2"	Str.
T1	657		5		3'-3"	Str.
T2	64		6		40'-0"	"

PROJECT I-29-2(26)
DRAWING 29-60-10

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-0153 for railing details.

See sheets 29-60-6 thru 29-60-8 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 ᴹᴾᴴ S.F. F.W.S.

QUANTITIES

Class AE-3 Concrete	298.0 C.Y.
Class AAE-3 Concrete	17.13 C.Y.
Reinforcing Steel	92,035 Lb.
Railing and End Post quantities included	

HILLSBORO INTERCHANGE

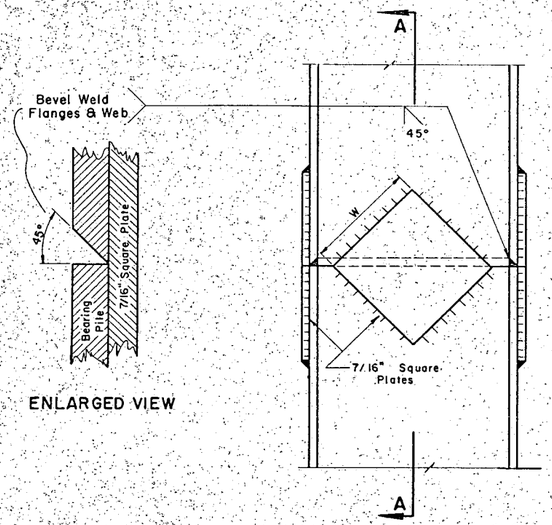
SLAB, END BEAM & MISC. DETAILS

36'-0" ROADWAY
HS20 LOADING

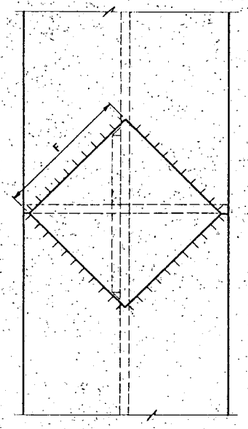
29-60-10

29-60-10

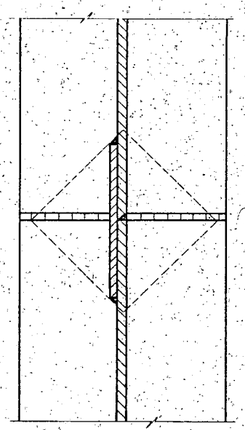
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	N.J.			32	



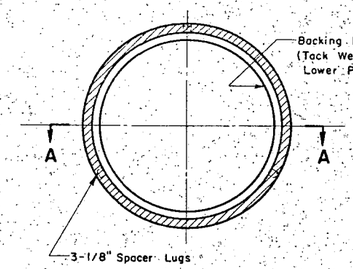
ENLARGED VIEW



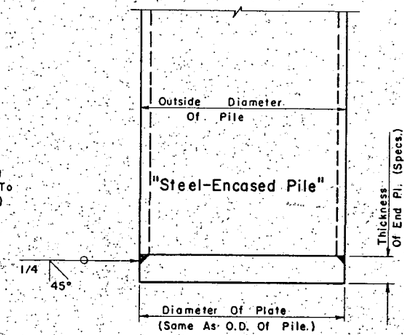
Flame Scarf Inside Of Both Flanges And One Side Of Web Of Upper Section



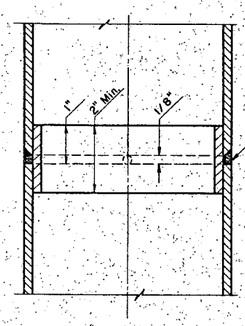
A-A

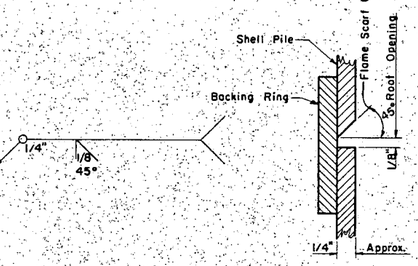


Backing Ring may be made from pile cut-offs or other material of a like quality.



END PLATE DETAIL

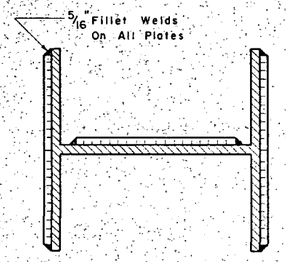




ENLARGED VIEW

A-A

SHELL PILE SPLICE DETAIL



PILE	8"	10"	12"	14"
F FLANGE	5"	6½"	8"	10"
W WEB	4"	5½"	6½"	8"

H-PILE SPLICE DETAIL

All welding shall conform to the current specification for "Welded Highway and Railway Bridges of the American Welding Society."

PILE SPLICE DETAILS

REVISED 12-12-66

H-0401

H-0401