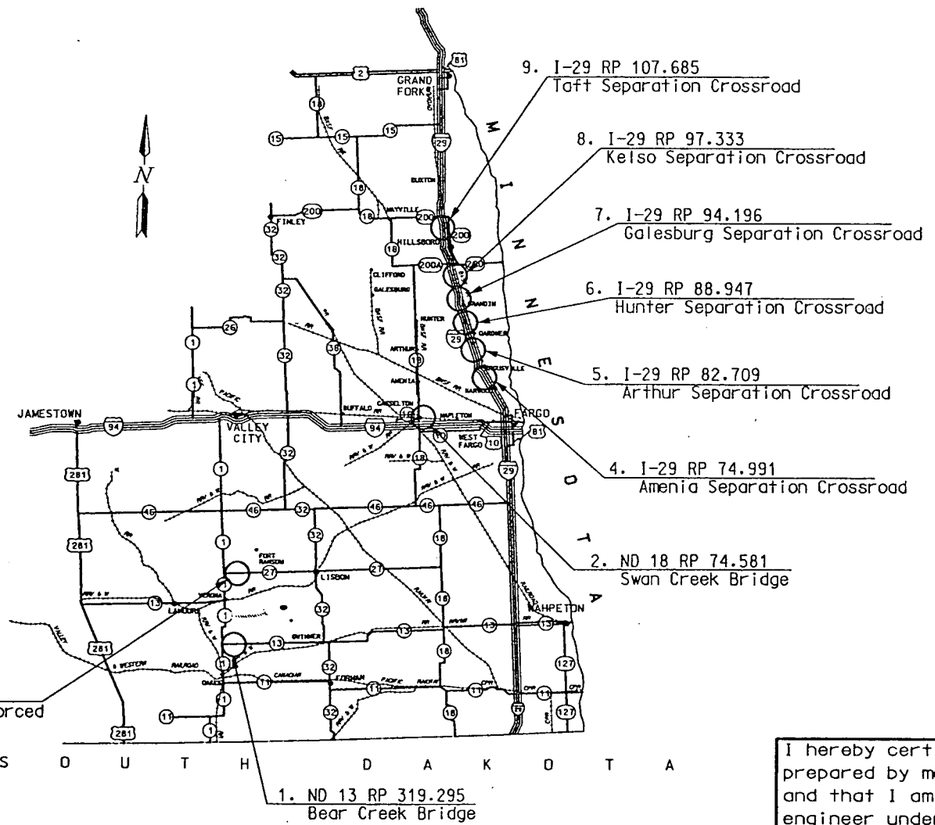
NOTE: See Design Data Sheet for Design Data at each location.

JOB# 13

STATE	PROJECT NO.	PCN	SHEET NO.
ND	HSP-8-999(014)	15528	1

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

Federal Aid Project HSP-8-999(014)
Bridge Rail Retrofit, Guardrail, RCB Extension and Incidentals
at Various Locations in Cass, Dickey, LaMoure and Traill Counties



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.

DESIGNER Gregg L. Fridlund
DESIGNER
DESIGNER
DESIGNER
DESIGNER

Retain Paper Original: X Yes ___No

APPROVED DATE

DIVISION ADMINISTRATOR
FEDERAL HIGHWAY ADMINISTRATION
U.S. DEPARTMENT OF TRANSPORTATION

APPROVED DATE 3/31/04

DIRECTOR,
OFFICE OF PROJECT DEVELOPMENT
ND DEPARTMENT OF TRANSPORTATION

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

APPROVED DATE 3-30-04

BRIDGE ENGINEER
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

TERRENCE R. UDLAND REGISTERED PROFESSIONAL PE 2674 ENGINEER NORTH DAKOTA

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

APPROVED DATE 3/31/04

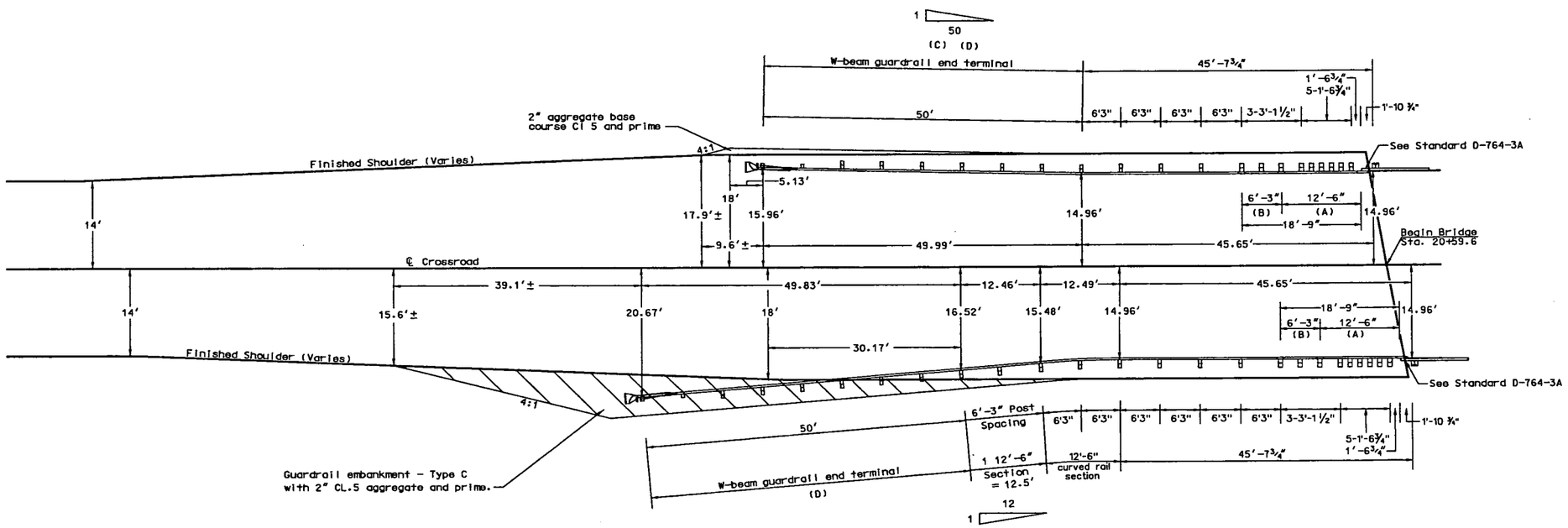
DESIGN DIVISION
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

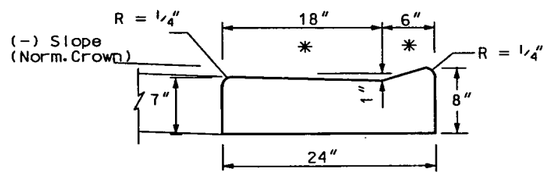
RONALD JASON HENKE REGISTERED PROFESSIONAL PE 4963 ENGINEER NORTH DAKOTA

.../80999000.014/TRAFFIC/Title.dgn 03/18/2004 07:09:22 AM

STATE	PROJECT NO.	SHEET NO.
ND	HSP-8-999(014)	23

23 USC §409 Documents
NDDOT Reserves All Objections





Mountable Curb & Gutter
Type I At Bridge End

* Transition flow line in 20 feet to standard mountable curb section.

(A) Thrie beam rail (double thickness)

(B) W-thrie beam transition section (double thickness)

(C) If the ET-2000 end terminal is to be installed, a 50:1 taper shall be used for this end terminal.

If the FLEAT is to be installed, the flare shown on Standard D-764-2C shall be used.

(D) The Slotted Rail Terminal (SRT) shall not be used at this location.

Thrie/W-Beam Guardrail Layout at beginning of bridge

Taft Separation Crossroad

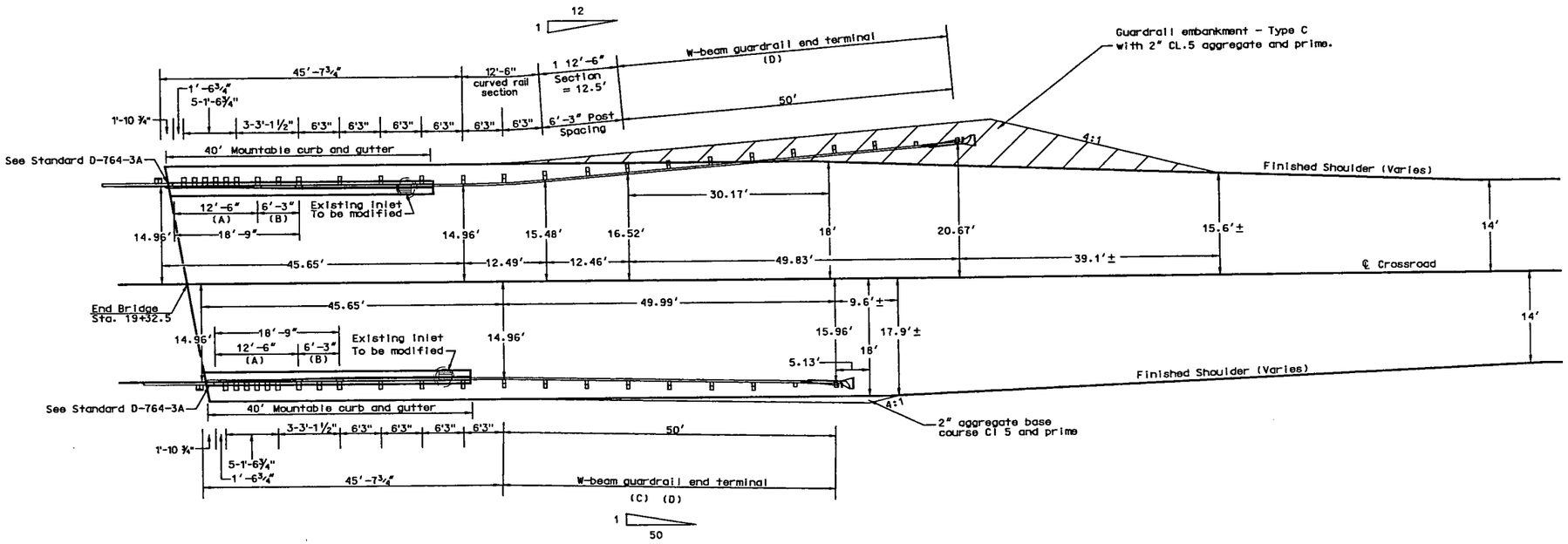
RP 107.685

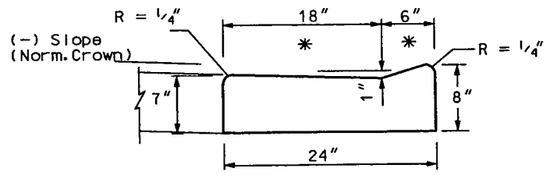
I-29

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23 USC §409 Documents
NDDOT Reserves All Objections

STATE	PROJECT NO.	SHEET NO.
ND	HSP-8-999(014)	24





Mountable Curb & Gutter
Type I At Bridge End

* Transition flow line in 20 feet to standard mountable curb section.

(A) Thrie beam rail (double thickness)

(B) W-thrie beam transition section (double thickness)

(C) If the ET-2000 end terminal is to be installed, a 50:1 taper shall be used for this end terminal.

If the FLEAT is to be installed, the flare shown on Standard D-764-2C shall be used.

(D) The Slotted Rail Terminal (SRT) shall not be used at this location.

Thrie/W-Beam Guardrail Layout at end of bridge

Taft Separation Crossroad

RP 107.685

I-29

23 USC §409 Documents
NDDOT Reserves All Objections

STATE	PROJECT NO.	SHEET NO.
N.D.	HSP-8-999(014)	25

W-BEAM SUMMARY SHEET

THRIE/W-BEAM GUARDRAIL AT BRIDGE ENDS

LOCATION	(A) 5/8" @ x 18" LONG GUARD-RAIL BOLT	(A) 6" x 8" x 6'-0" TIMBER POST	(A) 6" x 8" x 14" TIMBER BLOCK	(A) 5/8" @ x 1 1/4" LONG GUARD-RAIL BOLT	(A) 12'- 6" CURVED W-BEAM RAIL SECTION	(A) REFL-ECTOR-IZED PLATES	(A) 8"x8" x 6' WOOD POST	(A) 8"x8" x 22" WOOD OFF-SET BLOCK	(A) 8"x8" x 18" WOOD OFF-SET BLOCK	(A) 8"x8" x 14" WOOD OFF-SET BLOCK	(A) 6'-3" DOUBLE W-THRIE BEAM TRANS-ITION SECTION	(A) 12'-6" DOUBLE THRIE BEAM SECTION	(A) 2'-6" THRIE BEAM TERM-INAL CON-NECTOR	(A) 7/8" @ x VAR-IABLE LONG. BOLT	(A) 3/4" @ x 2-1/2" LONG POST BOLT	(B) EMBANK-MENT TYPE C
	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	CY
Sta 20+05.26 to 20+17.75 rt	3	3	3	8	1	2										39
Sta 20+42.75 to 20+63.40 rt	17			32		4	9	7	1	1	1	1	1	5	2	
Sta 20+36.88 to 20+57.53 lt	17			32		5	9	7	1	1	1	1	1	5	2	
Sta 23+31.67 to 23+52.32 rt	17			32		5	9	7	1	1	1	1	1	5	2	
Sta 23+25.80 to 23+46.45 lt	17			32		4	9	7	1	1	1	1	1	5	2	
Sta 23+71.45 to 23+83.94 lt	3	3	3	8	1	2										59
TOTAL	74	6	6	144	2	22	36	28	4	4	4	4	4	20	8	98

W-BEAM GUARDRAIL

Sta 20+05.26 to 20+17.75 rt	12.5 LF
Sta 20+42.75 to 20+63.40 rt	20.7 LF
Sta 20+36.88 to 20+57.53 lt	20.7 LF
Sta 23+31.67 to 23+52.32 rt	20.7 LF
Sta 23+25.80 to 23+46.45 lt	20.7 LF
Sta 23+71.45 to 23+83.94 lt	12.5 LF
Total	107.8 LF

GUARDRAIL EMBANKMENT - TYPE C

Sta 19+03.87 to 20+17.75 rt	1 ea
Sta 23+71.45 to 24+85.33 lt	1 ea
Total	2 ea

RESET W-BEAM GUARDRAIL

Sta 19+92.80 to 20+05.26 rt	12.5 LF
Sta 20+17.75 to 20+42.75 rt	25 LF
Sta 20+11.88 to 20+36.88 lt	25 LF
Sta 23+52.32 to 23+77.32 rt	25 LF
Sta 23+46.45 to 23+71.45 lt	25 LF
Sta 23+83.94 to 23+96.40 lt	12.5 LF
Total	125 LF (C)

REMOVE W-BEAM GUARDRAIL & POSTS

Sta 19+63.43 to 20+63.43 rt	100 LF
Sta 20+07.56 to 20+57.56 lt	50 LF
Sta 23+30.90 to 23+80.90 rt	50 LF
Sta 23+25.07 to 24+25.07 lt	100 LF
Total	300 LF

W-BEAM GUARDRAIL END TERMINAL

Sta 19+42.97 to 19+92.80 rt	1 ea
Sta 19+61.89 to 20+11.88 lt	1 ea
Sta 23+77.32 to 24+27.31 rt	1 ea
Sta 23+96.40 to 24+46.23 lt	1 ea
Total	4 ea

REMOVAL OF CURB & GUTTER

Sta 23+32.2 to 23+72.2 rt	40 LF
Sta 23+27.0 to 23+67.0 lt	40 LF
Total	80 LF

CASTING MOUNTABLE CURB - TYPE A

Sta 23+65.6 rt	1 ea
Sta 23+65.6 lt	1 ea
Total	2 ea

MOUNTABLE CURB & GUTTER - TYPE 1 SEC A

Sta 23+32.2 to 23+72.2 rt	40 LF
Sta 23+27.0 to 23+67.0 lt	40 LF
Total	80 LF

(A) These items are not to be bid separately but shall be included in the price bid for the item "W-Beam Guardrail".

(B) The amount of Embankment - type C (cubic yards), is for informational purposes only.

(C) The existing guardrail posts are steel "Z" posts. The steel posts and their associated timber blocks shall not be reset. To reset this guardrail, the contractor will be required to supply the following new items:

(18) 6" X 8" X 6'-0" timber posts
(18) 6" X 8" X 14" timber blocks
(18) 5/8" X 18" long guardrail bolts

These items are not to be bid separately, but shall be included in the price bid for the item "Reset W-beam guardrail."

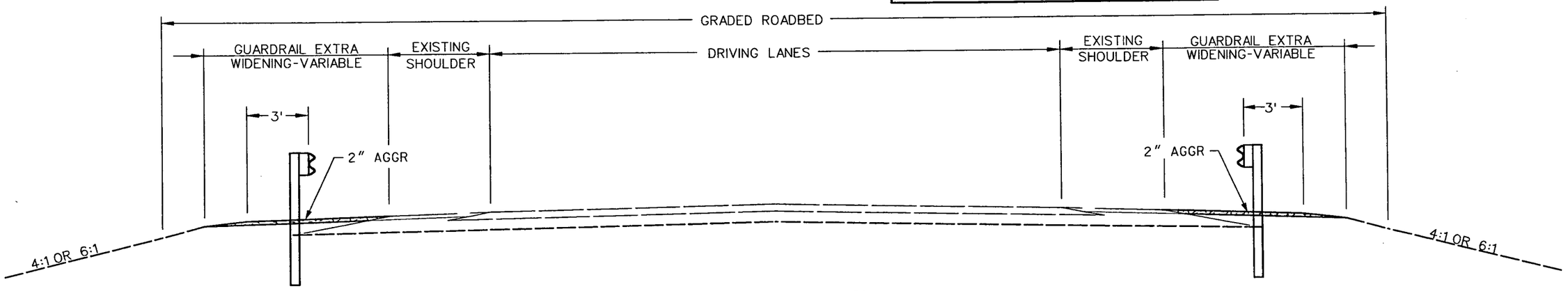
Thrie/W-Beam Guardrail Quantities

Taft Separation Crossroad

RP 107.685
I-29

23 USC §409 Documents
NDDOT Reserves All Objections

STATE	PROJECT NO.	SHEET NO.
ND	HSP-8-999(014)	26



ESTIMATED QUANTITIES

ND 13 RP 319.295 - Bear Creek Bridge		BEGIN BRIDGE		END BRIDGE	
	UNIT	RT	LT	LT	RT
CL 5 AGGR	TON	18.6	7.1	17.7	7.1
PRIME	GAL	62.6	24.0	59.5	24.0
BLOTTER	TON	1.1	0.4	1.0	0.4

I-29 RP 74.991 - Amenia Separation Crossroad		BEGIN BRIDGE		END BRIDGE	
	UNIT	RT	LT	LT	RT
CL 5 AGGR	TON	7.1	2.9	7.1	2.9
PRIME	GAL	23.8	9.7	23.8	9.7
BLOTTER	TON	0.4	0.2	0.4	0.2

I-29 RP 88.947 - Hunter Separation Crossroad		BEGIN BRIDGE		END BRIDGE	
	UNIT	RT	LT	LT	RT
CL 5 AGGR	TON	4.1	0.4	4.1	0.4
PRIME	GAL	13.8	1.2	13.8	1.2
BLOTTER	TON	0.2	0.1	0.2	0.1

I-29 RP 97.333 - Kelso Separation Crossroad		BEGIN BRIDGE		END BRIDGE	
	UNIT	RT	LT	LT	RT
CL 5 AGGR	TON	8.0	3.6	8.0	3.6
PRIME	GAL	26.7	11.9	26.7	11.9
BLOTTER	TON	0.5	0.2	0.5	0.2

ND 18-RP-74.581 - Swan Creek Bridge		BEGIN BRIDGE		END BRIDGE	
	UNIT	RT	LT	LT	RT
CL 5 AGGR	TON	3.5	3.7	3.5	15.6
PRIME	GAL	11.7	12.3	11.7	52.1
BLOTTER	TON	0.2	0.2	0.2	0.9

I-29 RP 82.709 - Athur Separation Crossroad		BEGIN BRIDGE		END BRIDGE	
	UNIT	RT	LT	LT	RT
CL 5 AGGR	TON	4.1	0.4	4.1	0.4
PRIME	GAL	13.8	1.2	13.8	1.2
BLOTTER	TON	0.2	0.1	0.2	0.1

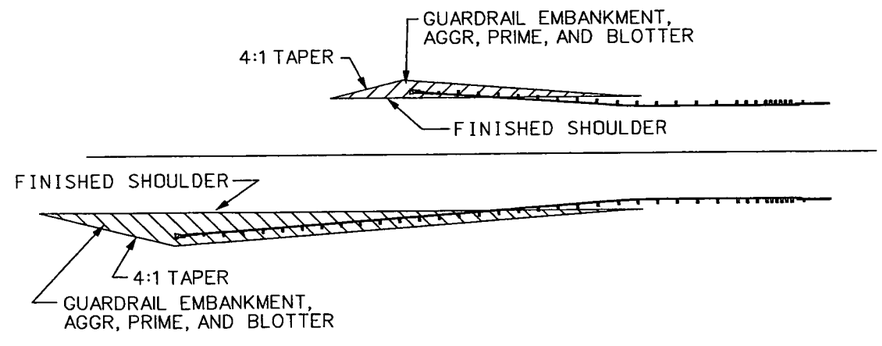
I-29 RP-94.196 - Galesburg Separation Crossroad		BEGIN BRIDGE		END BRIDGE	
	UNIT	RT	LT	LT	RT
CL 5 AGGR	TON	4.1	0.4	4.1	0.4
PRIME	GAL	13.8	1.2	13.8	1.2
BLOTTER	TON	0.2	0.1	0.2	0.1

I-29 RP 107.685 - Taft Separation Crossroad		BEGIN BRIDGE		END BRIDGE	
	UNIT	RT	LT	LT	RT
CL 5 AGGR	TON	4.2	0.4	4.2	0.4
PRIME	GAL	14.1	1.2	14.1	1.2
BLOTTER	TON	0.2	0.1	0.2	0.1

NOTE: PRIME SHALL BE MC70 OR 250 LIQUID ASPHALT AND BLOTTER SHALL BE CLASS 44.

THE APPLICATION RATE FOR PRIME SHALL BE .35 GALLONS PER SQUARE YARD.

BLOTTER SHALL BE APPLIED AT A RATE OF APPROXIMATELY 12 LB. PER SQUARE YARD.

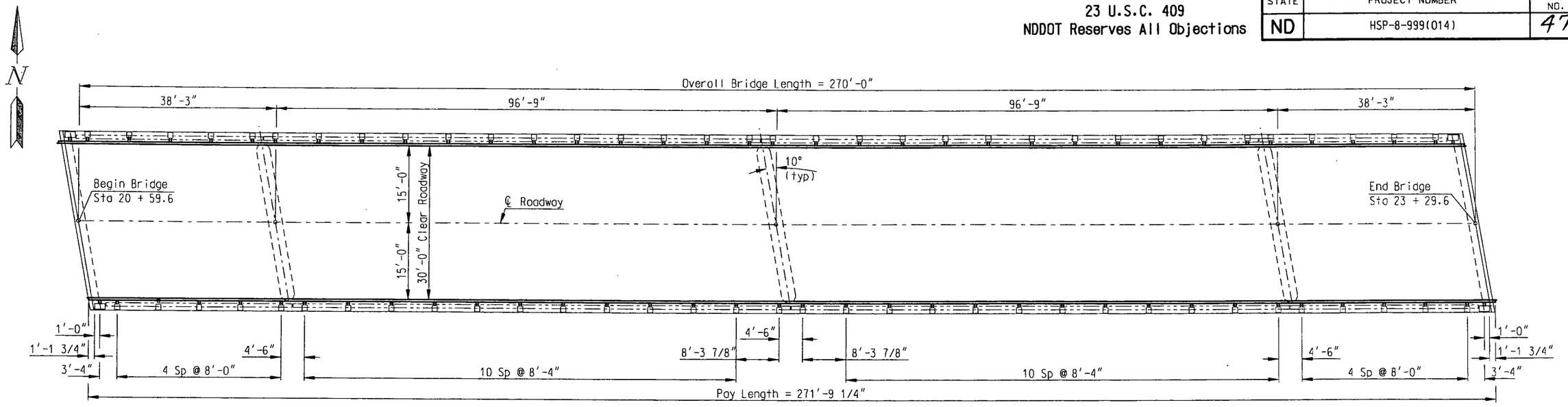


TYPICAL AGGREGATE BASE AND PRIME

TYPICAL AGGREGATE BASE AND PRIME FOR GUARDRAIL EMBANKMENT AREAS AND PRIVATE DRIVES

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

STATE	PROJECT NUMBER	SHEET NO.
ND	HSP-8-999(014)	47



PLAN

NOTE:

The work at this site consists of installing an E-Rail retrofit.

SPEC	CODE	ITEM DESCRIPTION	UNIT	QUANTITY
624	3002	DOUBLE BOX BEAM RAIL RETROFIT - E-RAIL	LF	543.5

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

TAFT SEPARATION

BRIDGE LAYOUT

PROJECT: HSP-8-999(014)
STATION 164 + 22.45

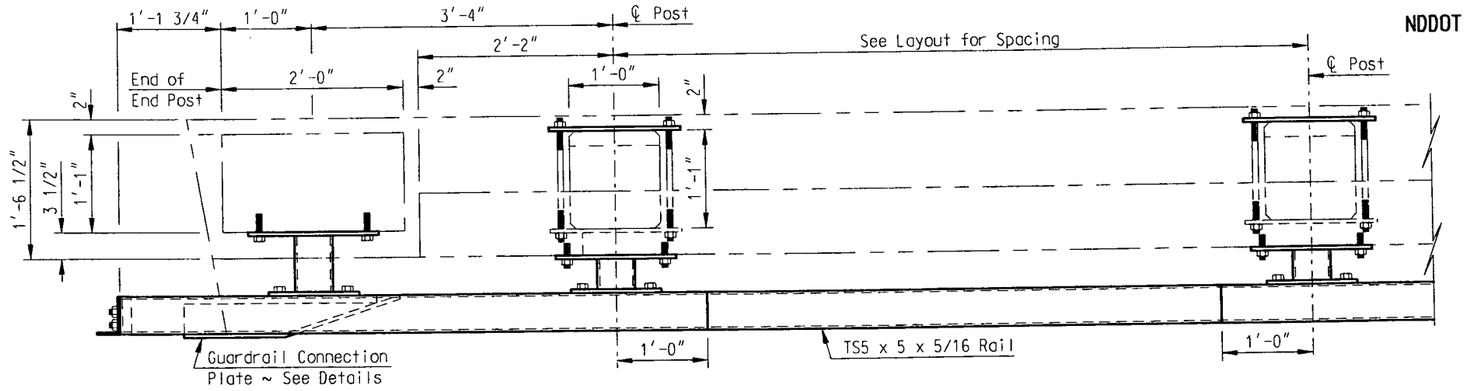
TRAILL COUNTY

brlo 04LCS042 JDS

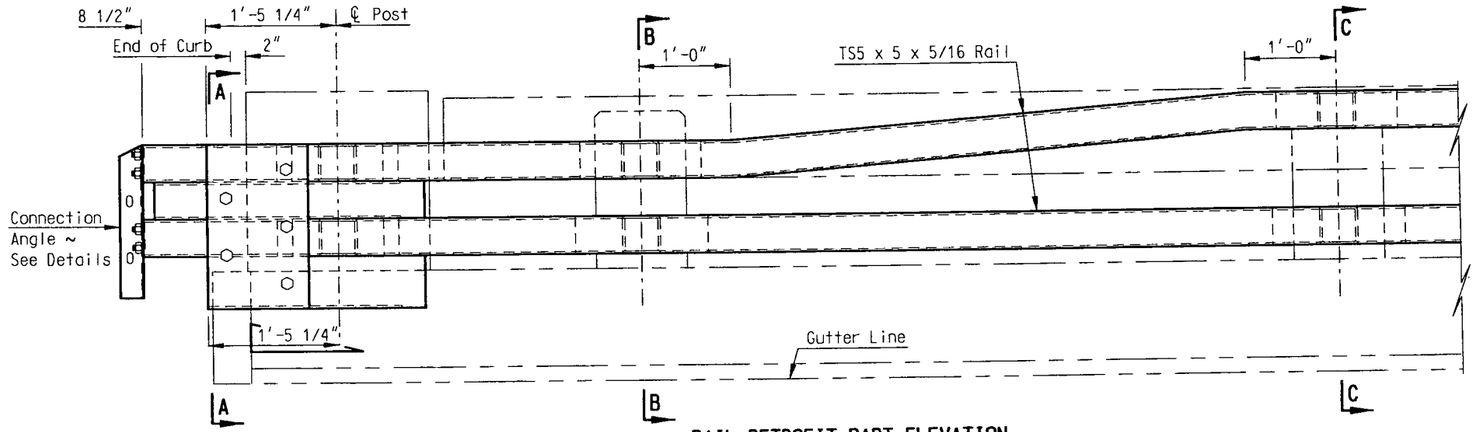
29-107.685

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

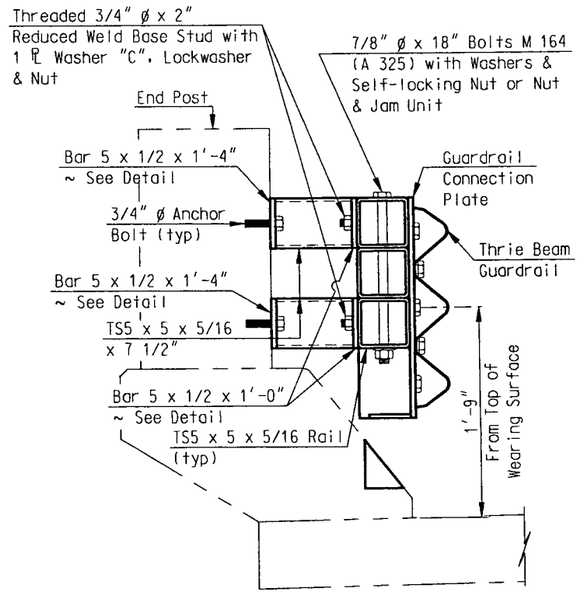
STATE	PROJECT NUMBER	SHEET NO.
ND	HSP-8-999(014)	48



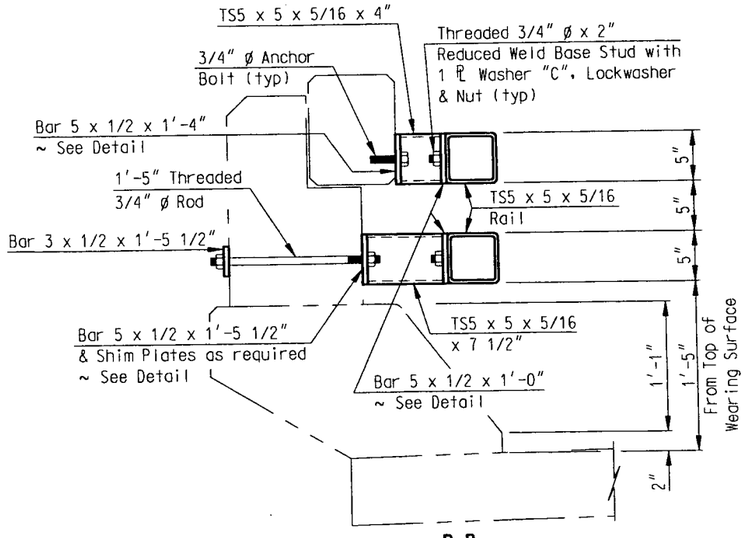
RAIL RETROFIT PART PLAN



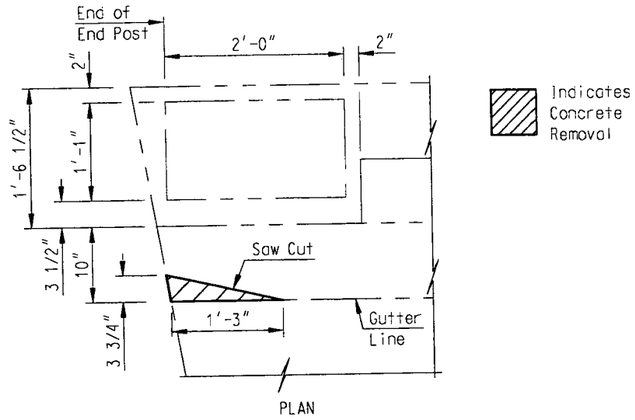
RAIL RETROFIT PART ELEVATION



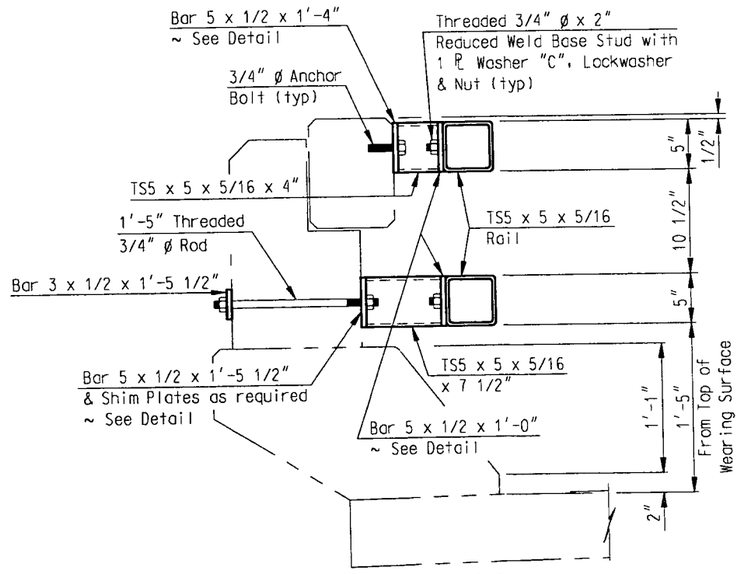
A-A



B-B



CONCRETE REMOVAL DETAIL



C-C

NOTE:

See Dwg 29-107.685-2 for notes and details not shown on this drawing.

QUANTITIES

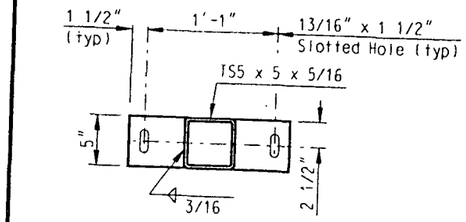
SEE DWG 29-107.685-2

TAFT SEPARATION

DOUBLE BOX BEAM E-RAIL RETROFIT DETAILS

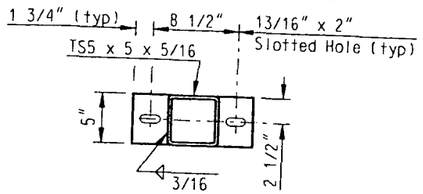
29-107.685-1

ERETRO 04LCS043 JDS



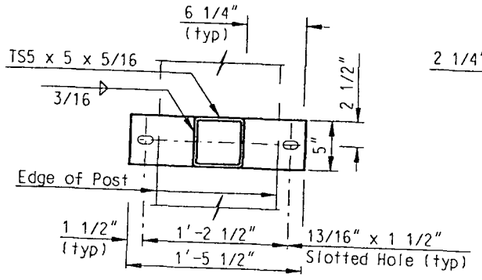
(CONCRETE RAIL CONNECTION)

BAR 5 X 1/2 X 1'-4" DETAIL



(RAIL CONNECTION)

BAR 5 X 1/2 X 1'-0" DETAIL

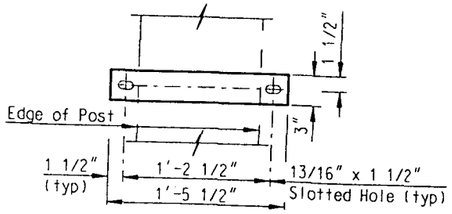


(CONCRETE POST CONNECTION)

BAR 5 X 1/2 X 1'-5 1/2" DETAIL

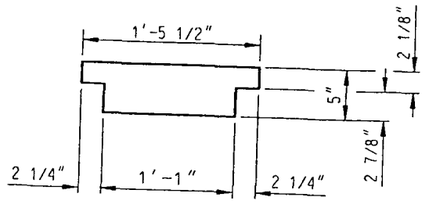
The filled circles indicate drilled and tapped holes for 7/8" ø bolts M 164 (A 325). See Detail "B."

The open circle indicates a drilled hole through the 1/2" plate for a 7/8" ø bolt M 164 (A 325).



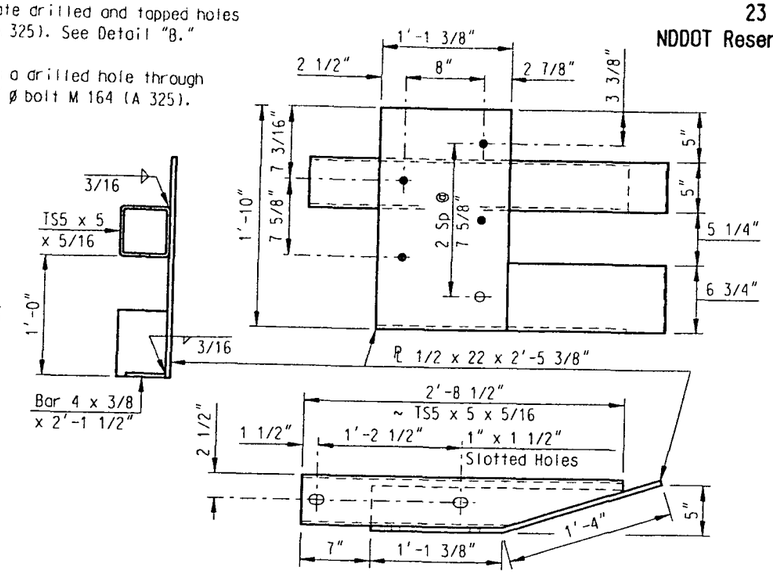
(CONCRETE POST CONNECTION)

BAR 3 X 1/2 X 1'-5 1/2" DETAIL



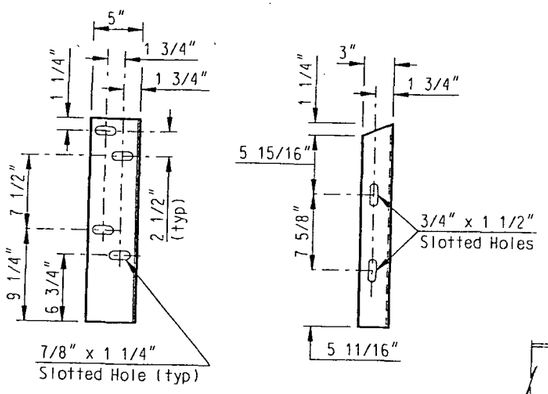
1/4" & 1/8" Thickness
Quantities determined in field

SHIM PLATE DETAIL



(4 REQUIRED)

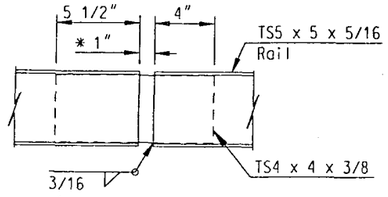
GUARDRAIL CONNECTION PLATE DETAILS



(L5 X 3 X 1/4 X 1'-8 1/2")

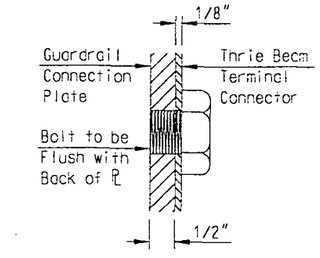
(4 REQUIRED)

CONNECTION ANGLE DETAILS

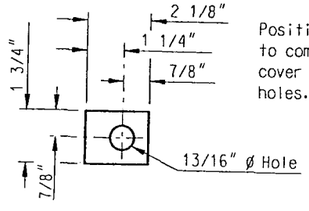


* 2" at expansion splices.

RAIL SPLICE DETAIL



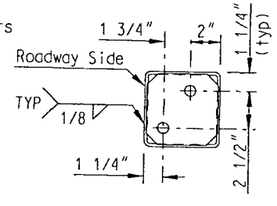
DETAIL "B"



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

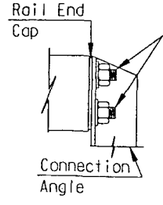
PL WASHER "C"

Position washers to completely cover slotted holes.



Rail cap shall be a Bar 4 3/4 x 3/16 x 4 3/4". Cope corners 1" to provide zinc drains.

RAIL CAP DETAILS



3/4" ø Reduced Base Weld Studs on each Rail Cap of Guardrail Connections

Install angle with washers & self-locking nuts or nuts & jam unit.

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

STATE	PROJECT NUMBER	SHEET NO.
ND	HSP-8-999(014)	49

NOTES:

The bid item shall be "Double Box Beam Rail Retrofit - E-Rail." The pay length shall be end to end one 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 shall be M 270 Grade 36 Steel and galvanized according to M 232. The threaded rods shall be tightened to provide a minimum tensile force of 2,500 lbs. and a maximum tensile force of 2,700 lbs.

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 approval to the Construction Office before fabrication.

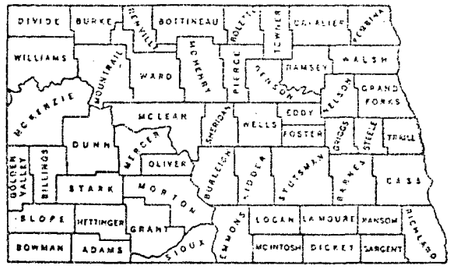
QUANTITIES	
E-RAIL RETROFIT	543.5 LF

TAFT SEPARATION

DOUBLE BOX BEAM
E-RAIL RETROFIT DETAILS

ERETR01 04LCS044 JDS

29-107.685-2



SKETCH-MAP OF NORTH DAKOTA
SHOWING COUNTIES

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

SCALES: LAYOUT SHEET 1 IN = 5000 FT
PLAN AND PROFILE DRAWINGS (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
SHEET NO 2	TO 8 INCL	PLAN AND PROFILE DRAWINGS
SHEETS NO 9	TO 34 INCL	STRUCTURAL DRAWINGS
SHEETS NO 35	TO 36 INCL	SIGNING & DETAILS & TYPICAL SECTIONS
SHEETS NO 37	TO 44 INCL	CROSS SECTIONS

PROJECT ACCEPTED & APPROVED NO. I-29-2(26)

GOVERNING SPECIFICATIONS

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

KEY TO CONVENTIONAL SIGNS

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

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.

LENGTH OF PROJECT

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

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 #35). The cost of this work shall be incidental to other items.

STRUCTURAL

SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS

NAME	NO
Piling	SS-21
Conc. Slope Protection	SP-45
Backfill	SP-27
Conc. Structures	SP-29
Reinforcement	SP-30
Struct. Steel	SP-33
Painting	SP-33
Quick Setting Anchor Grout	SP-34
Bidding Requirement & Conditions	SS-9
Legal Relations & Resp. to the Public	SS-10,16
General Statement	SS-24 SP-41
Prosecution & Progress	SP-9
Mobilization	SP-10
Value Engineer. Incentive	SP-11
Maintenance Protection of Traffic	SP-16C
Scope of Work	SS-25
Field Laboratory	SS-7

LIST OF STANDARDS

	STD. NO.
Slope Protection	7.5a
Federal Aid Name Plate	14.98
Bridge Bench Marks	7.6
Const. Iden. 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)

FG-426(5) Future
I-220' BRIDGE
0.042 Mi.

CONSTRUCTION IDENTIFICATION SIGNS - To be installed at Sta. 29+00 Lt. Taft X-Rd. and/ Sta. 51+50 Rt. Hillsboro X-Rd.

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.

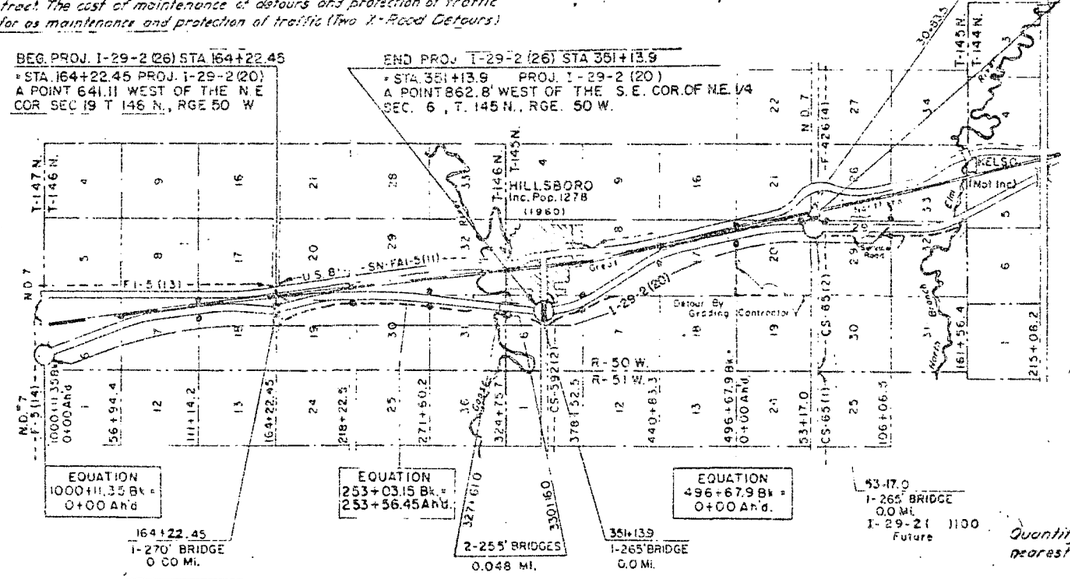
LEGEND

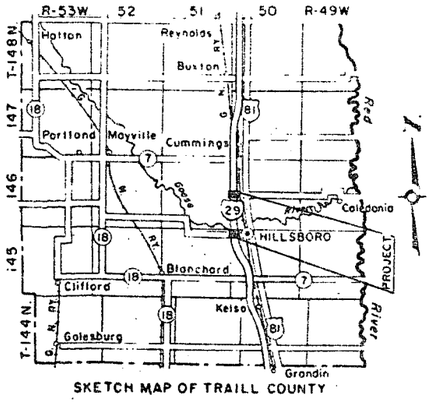
- INTERCHANGE
- HIGHWAY GRADE SEPARATION - NO CONNECTION.
- OTHER BRIDGE
- SERVICE ROAD
- TERMINATED CROSS-ROAD
- △ RAILROAD GRADE SEPARATION

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

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 N.E. 1/4 SEC. 6, T. 145 N., RGE. 50 W.





SKETCH MAP OF TRAILL COUNTY

LAYOUT MAP
5000 0 5000
SCALE IN FEET

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

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	380	0100	0100	3000	0100	7520	3331		0100
LOCATION	CLASS 1 EXCAVATION	SELECT BACKFILL	CLASS AE-1 CONCRETE (SUBSTRUCT.)	CLASS AE-3 CONCRETE (I.-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 50'	STEEL TEST PILES 95'	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	17.56	122,752	25,700	112,700	750	1,705	1		1	43	480	1					100
351+13.9	240	180	145.1	298.0	17.13	112,183	32,100	174,400	675	1,115		1		50	540	1					100
TOTAL	435	330	272	562	35	234935	57800	287100	1425	2820	1	1	1	93	1020	2	1	1	1		200

APPROVED DATE 10-8-69
CHIEF ENGINEER
NORTH DAKOTA STATE
HIGHWAY DEPARTMENT

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

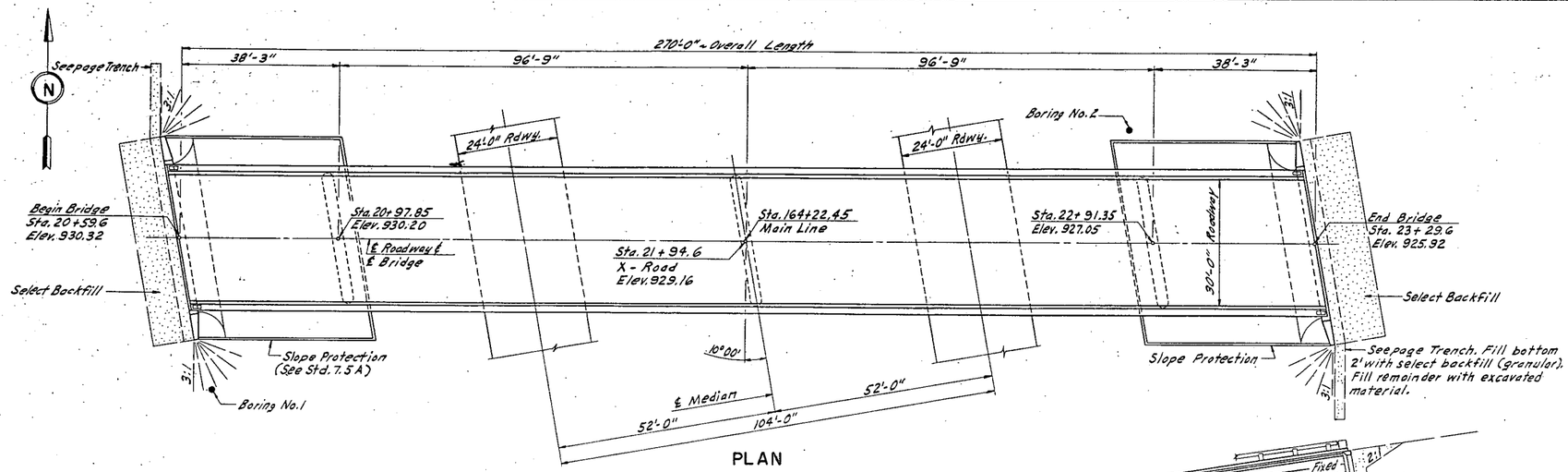
APPROVED

DIVISION ENGINEER DATE

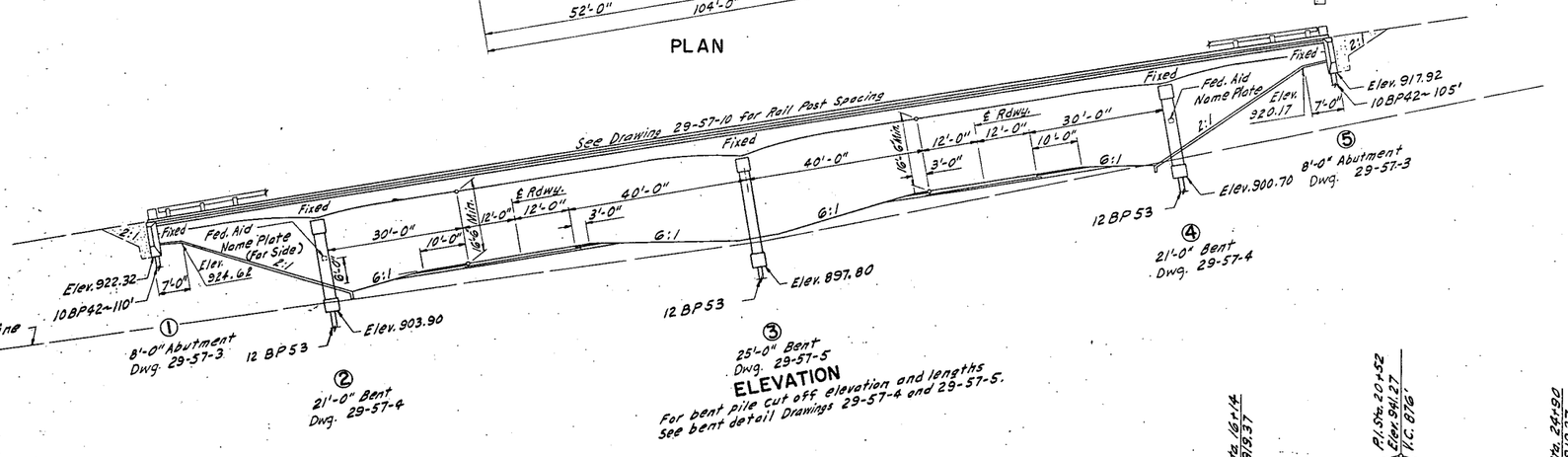
I-29-2(26)104

BRIDGE CODE	FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
X-771	5	N. D.	I-29-2(26)		9	44

	DATE
	CHK'D BY
	MADE BY
REVISIONS	
TOPOGRAPHY	PLOTTED BY —
	CHECKED BY G.A.L.
DETAILS	MADE BY
	CHECKED BY L.E.G.
TRACING	MADE BY E.O.H.
	CHECKED BY F.D.K.
QUANTITIES	MADE BY
	CHECKED BY D.L.P.

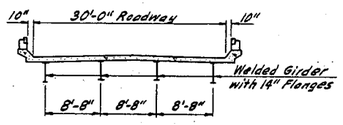


PLAN

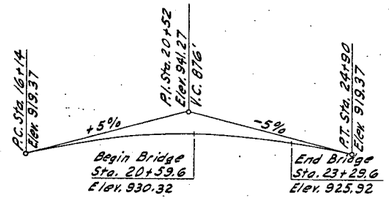


ELEVATION

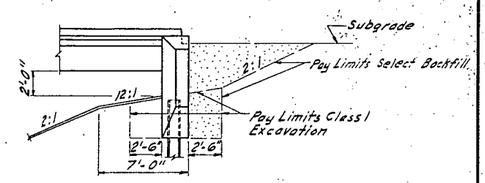
For bent pile cut off elevation and lengths see bent detail Drawings 29-57-4 and 29-57-5.



DECK SECTION



VERTICAL CURVE DATA



DETAIL AT ABUTMENTS

① See SP-33 for Painting.
① See SP-35 for Structural Steel.
② See S S-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.
See SP-29 for Optional Concrete Surface Finish.
See SP-34 for Quick Setting Anchor Grout.

The General Notes for this project are shown on Drawing 23-57-1.

ESTIMATE OF QUANTITIES

SPEC. NO.	CODE NO.	BID ITEM	
203	0100	COMMON EXCAVATION	CU YD
208	0100	CLASS I EXCAVATION	195 CU YD
228	0100	SELECT BACKFILL ③	150 CU. YD.
216	0100	WATER	M GAL.
610	1112	CLASS AE-1 CONCRETE (SUBSTRUCTURE)	129.3 CU. YD.
610	1134	CLASS AE-3 CONCRETE (SUPERSTRUCTURE)	263.9 CU. YD.
610	0138	CLASS AAE-3 CONCRETE (RAILING)	17.36 CU. YD.
612	0110	REINFORCING STEEL ④ (GRADE 40)	102,752 LB.
616	4412	STRUCTURAL STEEL (A-441) ① (WELDED GIRDER)	142,700 LB.
616	0362	STRUCTURAL STEEL (A-36) ① (WELDED GIRDER)	25,700 LB.
			1 CAY
622	0020	STEEL PILING (10BP42) ②	750 LIN. FT.
622	0040	STEEL PILING (12BP53) ②	1705 LIN. FT.
622	0850	STEEL TEST PILES (10BP42) ② @ 115 FT.	1, EACH
622	1380	STEEL TEST PILES (12BP53) ② @ 95 FT.	1 EACH
750	0100	LINSEED OIL TREATMENT	43 GAL.
704	0100	CONCRETE SLOPE PROTECTION ③	480 SQ. YD.
	3000	BRIDGE BENCH MARKS	1 SET

STRUCTURAL DRAWINGS

GENERAL DRAWING 29-57 (THIS SHEET), 29-57-1, 29-57-2, STD. 7.5A	
SUBSTRUCTURE 29-57-3, 29-57-4, 29-57-5, H-0401, STD.14.98	
SUPERSTRUCTURE 29-57-6, 29-57-7, 29-57-8, 29-57-9, 29-57-10, 29-57-11, H-0153, STD. 7.5, H-0501.	
DESIGN LOADING H20 (1944)	SCALE 1 INCH = 15 FEET

1970
FEDERAL AID
PROJECT
I-29-2(26)
NORTH DAKOTA
29-57

FEDERAL AID NAME PLATE
2 REQUIRED

DESIGN STRESSES:

fs = 20,000 psi ~ Reinforcing Steel
fc = 1,200 psi ~ Class AE-1 & AE-3 Concrete
fc = 1,700 psi ~ Class AAE-3 Concrete
fs = 20,000 psi ~ Structural Steel A-36
fs = 27,000 psi ~ Structural Steel A-441 (3/4" and under)
fs = 25,000 psi ~ Structural Steel A-441 (3/4" to 1 1/2")
fs = 23,000 psi ~ Structural Steel A-441 (1 1/2" to 4")

BENCH MARKS

NO.	DESCRIPTION	LOCATION	ELEV.
17	Iron Mon. by T.P.	155+44-Lt.	903.63
18	Iron Mon. by T.P.	166+14-Lt.	903.71

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	DESIGN LOAD
Abut. 1&5	16.0 T.	10.0 T.					13.8	39.8 T.	55 T.	
Bents 2&4	43.8 T.	21.3 T.	1.4					66.5 T.	70 T.	
Bent 3	51.3 T.	11.5 T.	1.2					70.0 T.	70 T.	

℄	Begin Bridge	6 1/2"	℄ Brg. Abut. 1	4 Eq. Sp. = 37'-8"	℄ Bent 2	10 Eq. Sp. = 96'-9"	℄ Bent 3	10 Eq. Sp. = 96'-9"	℄ Bent 4	4 Eq. Sp. = 37'-8"	℄ Brg. Abut. 5	6 1/2"	End Bridge
LEFT GIRDER	930.05		930.05		930.00	929.97	929.94	929.92	929.90	928.86	929.79	929.65	929.57	929.42	929.09	928.93	928.78	928.63	928.49	928.33	928.15	927.95	927.69	927.41	927.17	926.84	926.56	926.29	926.02	925.74	925.72
℄ RIGHT GIRDER	930.04		930.04		930.01	929.98	929.95	929.92	929.89	929.86	929.82	929.75	929.65	929.57	929.36	929.19	929.02	928.85	928.70	928.55	928.40	928.24	928.05	927.83	927.58	927.30	927.01	926.72	926.43	926.16	925.89	925.59	925.38
℄ ROADWAY	930.32	930.32	930.29	930.23	930.20	930.18	930.15	930.11	930.04	929.94	929.84	929.68	929.49	929.33	929.16	929.01	928.86	928.71	928.55	928.37	928.15	927.91	927.63	927.34	927.05	926.77	926.50	926.22	925.94	925.62	925.32

SCREED ELEVATION

Elevations are to top of finished concrete

NORTH DAKOTA
STATE HIGHWAY DEPARTMENT

TAFT SEPARATION
BRIDGE LAYOUT

PROJECT I-29-2(26) STA. 164+22.45

TRAILL COUNTY

APPROVED

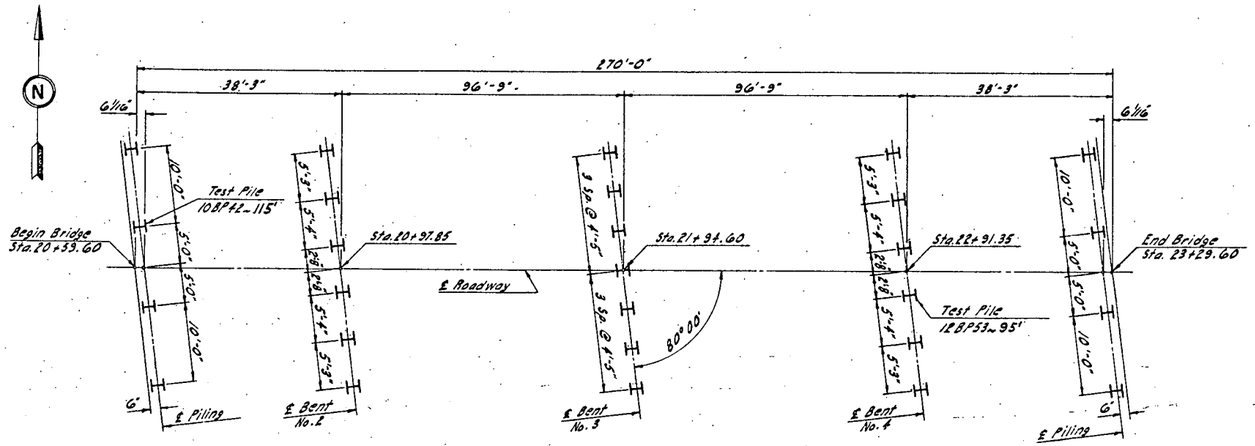
10-2-69
DATE

Joseph R. Kirby
BRIDGE ENGINEER

JOSEPH R. KIRBY REGISTERED PROFESSIONAL ENGINEER NORTH DAKOTA

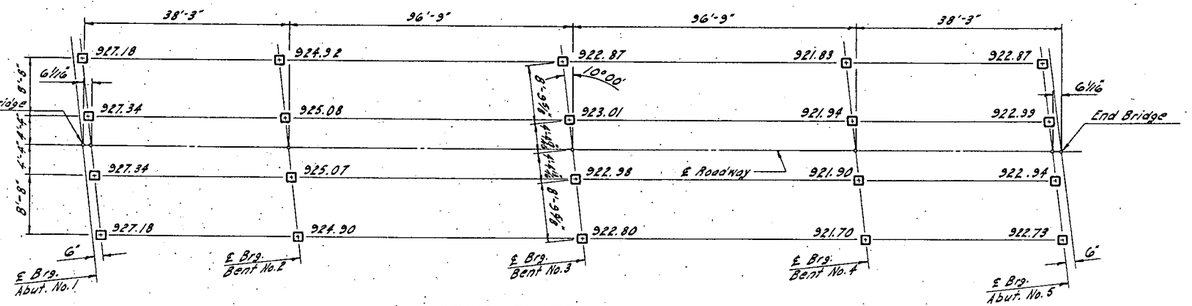
29-57

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	N. D.	I-29-2(26)		10	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 SUPERSTRUCTURE IS PLACED.

EXCAVATION:

EXCAVATION CLASS I AT THE ABUTMENTS SHALL EXTEND FROM THE BOTTOM OF THE FOOTING TO THE UPPER LIMITS AS SHOWN ON THE BRIDGE LAYOUT DRAWING. EXCAVATION CLASS I AT THE 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 EDGES 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" 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 ABUTMENT WINGS. ALL OTHER SURFACES SHALL BE GIVEN THE "ORDINARY SURFACE FINISH". (SEE OPTION BELOW)

IF THE EXPOSED FACES OF THE ABUTMENTS AND BENTS HAVE A SURFACE FINISH ACCEPTABLE TO THE ENGINEER WITHOUT RUBBING THE REQUIREMENT FOR "RUBBED 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.

THE CONTRACTOR HAS THE OPTION OF USING THE SPECIAL SURFACE FINISH AS PROVIDED IN SPECIAL PROVISION NO. 29, CONCRETE STRUCTURES, IN LIEU OF THE RUBBED SURFACE FINISH (602-3.10.3) CALLED FOR ABOVE.

LINSEED OIL TREATMENT:

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

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 THICKNESSES 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 29-57-8. 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". AASHO REQUIREMENTS FOR WELDABILITY OF STUD CONNECTORS SHALL BE MET AND CERTIFIED.

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 41,100 FOOT-POUND-TONS AS COMPUTED BY THE FORMULA W(E-10,500)+0.79E 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 4,800 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, SHEAR DEVICES, BEARING PLATES AND ANCHOR BOLTS: A 36, EXCEPT ALTERNATE STUD SHEAR DEVICES.

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 MAROON COLOR NO. 20199 AND THE SECOND COAT SHALL CONFORM TO MAROON COLOR NO. 10076. 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.

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

TAFT SEPARATION
BEARING PLATE LAYOUT
PILING LAYOUT
GENERAL NOTES

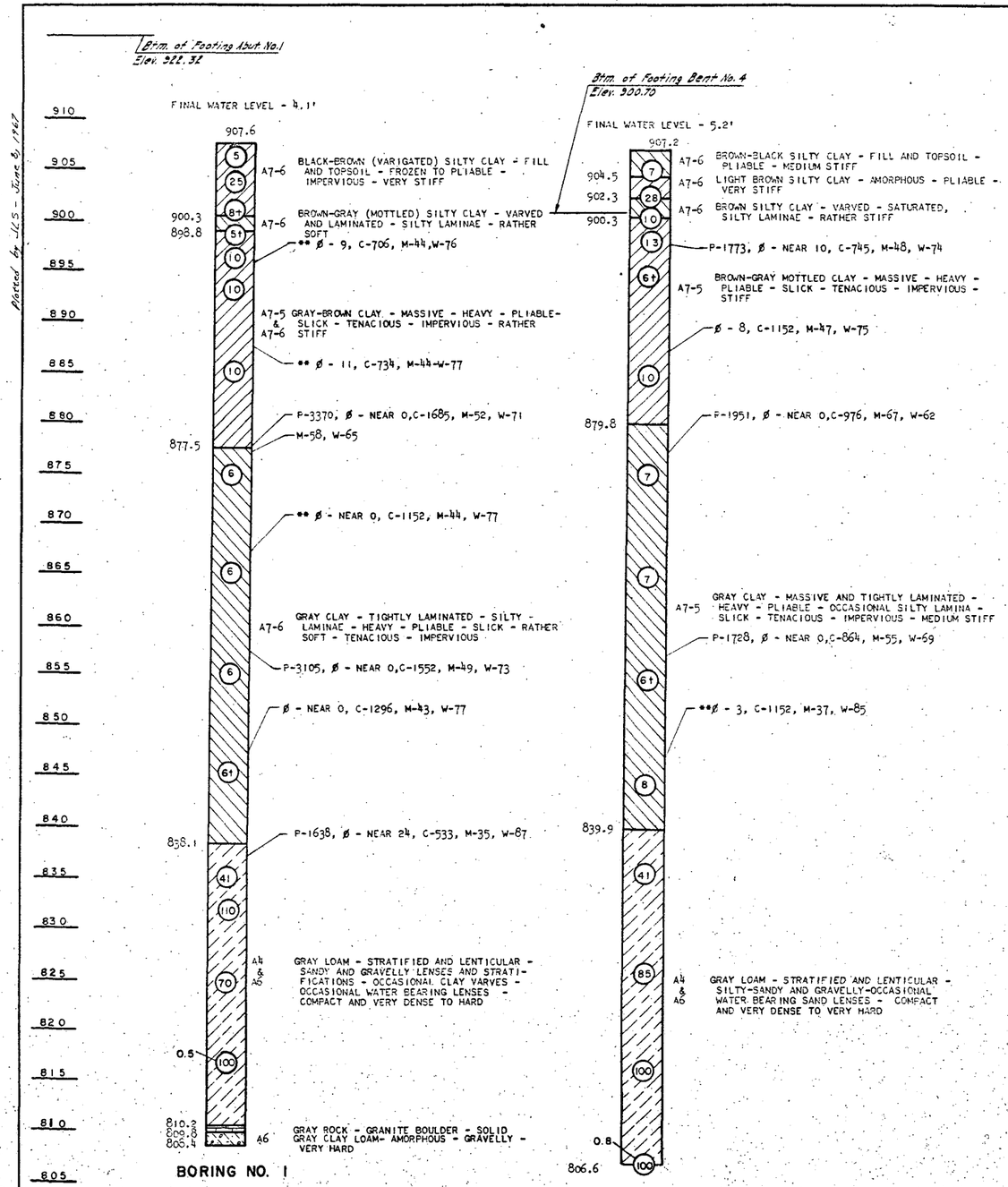
29-57-1

QUANTITIES CHECKED BY

L-10-67

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	N.D.	I-29-2126		11	44

Revised by JLS - June 6, 1967



BORING NO. 1
STA. 164+35.25 - 132.2' R.T.

BORING NO. 2
STA. 164+11.65 - 94.8' LT.

SYMBOLS:

P- MAXIMUM LOAD (LBS/SQ.FT.)
Ø- SHEAR ANGLE (DEGREES)
C- COHESION (LBS/SQ.FT.)
M- MOISTURE (PERCENT)
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 PURPOSE ONLY. THE STATE ASSUMES NO RESPONSIBILITY IF SOIL CONDITIONS ENCOUNTERED DURING CONSTRUCTION DIFFER FROM THOSE SHOWN.

BRIDGE NO. 29-57

BORING LOG

TAFT SEPARATION

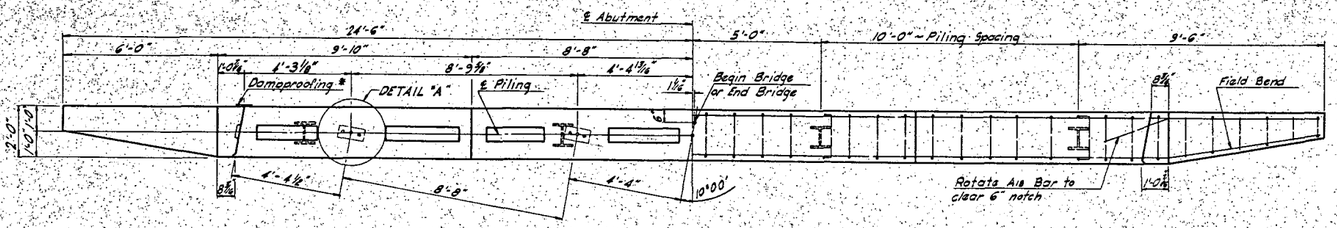
TRAILL COUNTY

29-57-2

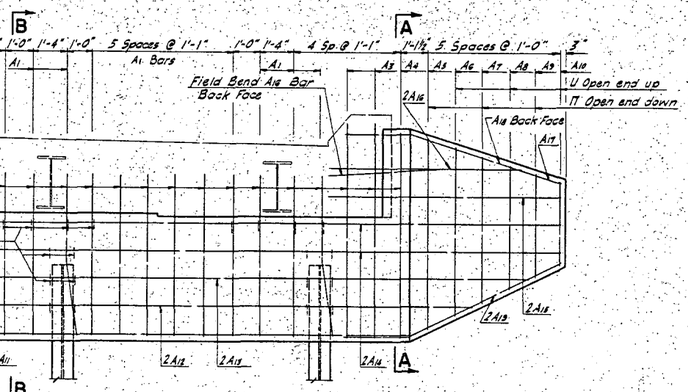
29-57-2

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	N. D.	I-29-2(26)		12	44

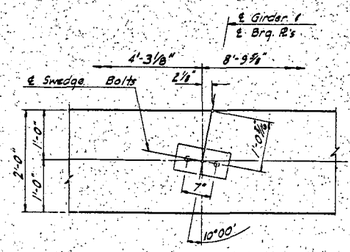
TRACING — MADE BY: G.A.J. — CHECKED BY: L.E.S.
QUANTITIES — MADE BY: D.L.R. — CHECKED BY: A.D.K.



HALF PLAN
Showing Dimensions



HALF PLAN
Showing Reinforcing

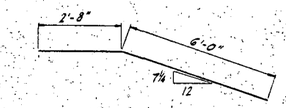


DETAIL "A"

ABUTMENT (ONE ABUT.)

MARK	NUMBER	WALL	SIZE	LENGTH	SHAPE
A1	28		6	15'-2"	Bent
A2	40		4	2'-6"	"
A3	4		6	16'-9"	"
A4	2		6	17'-5"	"
A5	2		5	16'-7"	"
A6	2		5	14'-7"	"
A7	2		5	12'-7"	"
A8	2		5	10'-7"	"
A9	2		5	9'-1"	"
A10	2		5	7'-2"	"
A11	2		6	37'-0"	Str.
A12	4		5	21'-11"	"
A13	4		5	23'-11"	"
A14	8		5	25'-1"	"
A15	4		5	8'-8"	"
A16	4		5	6'-10"	"
A17	2		6	8'-6"	Bent
A18	2		6	8'-8"	"
A19	4		6	9'-0"	"

PROJECT 1-29-2(26)
DRAWING 29-57-3

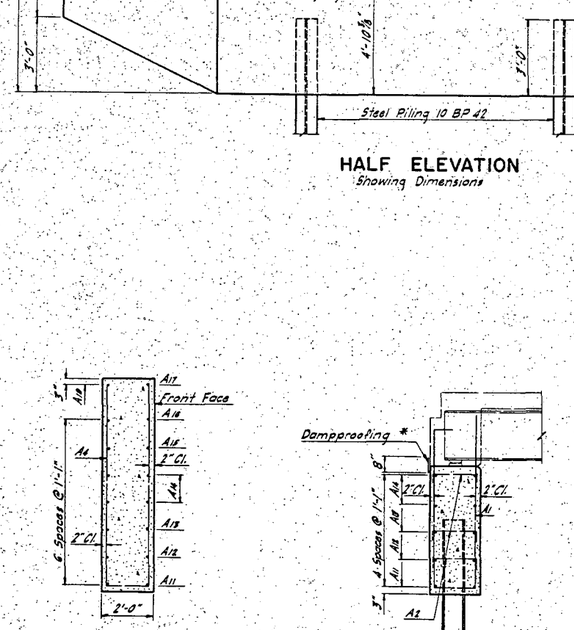


A18

NOTES:

* Two coats of damproofing shall be applied over the construction joint on the back face as shown on the detail.

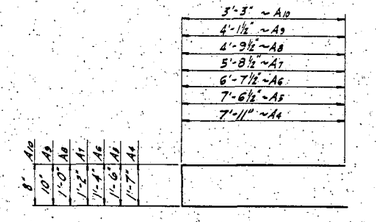
"Damproofing Two Coats" shall be applied in accordance with Section 736 of the Standard Specifications. Damproofing will not be paid for directly, but shall be included in the unit price bid for Class AE-1 Concrete.



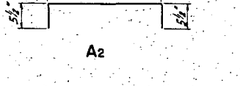
HALF ELEVATION
Showing Dimensions

Looking West

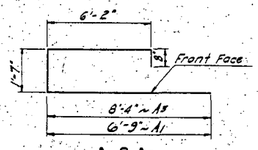
HALF ELEVATION
Showing Reinforcing



A4–A10 BARS



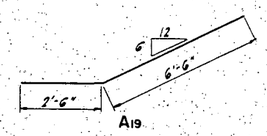
A2



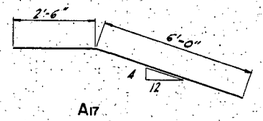
A1 & A3

A-A

B-B



A19



A17

BENT BAR DETAILS

Dimensions shown are center to center



ABUTMENT NO. 5
Looking East

QUANTITIES (ONE ABUT.)

Class AE-1 Concrete	181 C.Y.
Reinforcing Steel	1685 Lbs.
Excavation (See Layout)	
Piling (See Layout)	

TAFT SEPARATION
8'-0" ABUTMENT
30'-0" ROADWAY
H20 LOADING

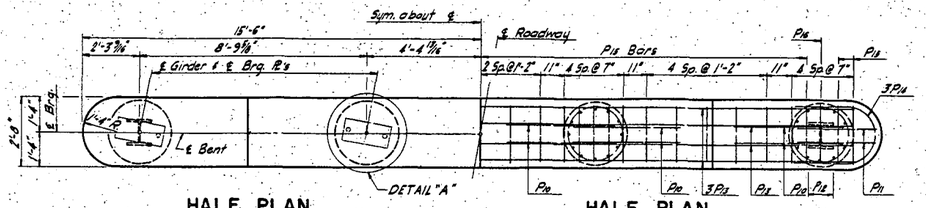
29-57-3

29-57-3

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	N. D.	I-29-2(26)		13	44

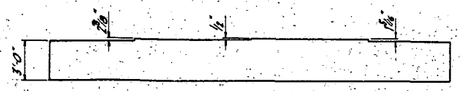
DESIGN	MADE BY	D.O.A.	
	CHECKED BY	K.P.H.	
DETAILS	MADE BY	G.A.L.	
	CHECKED BY	L.E.G.	
TRACING	MADE BY	G.A.L.	
	CHECKED BY	A.E.B.	
QUANTITIES	MADE BY	A.E.B.	
	CHECKED BY	W.L.S.	

REVISIONS | MADE BY | CHK'D BY | DATE

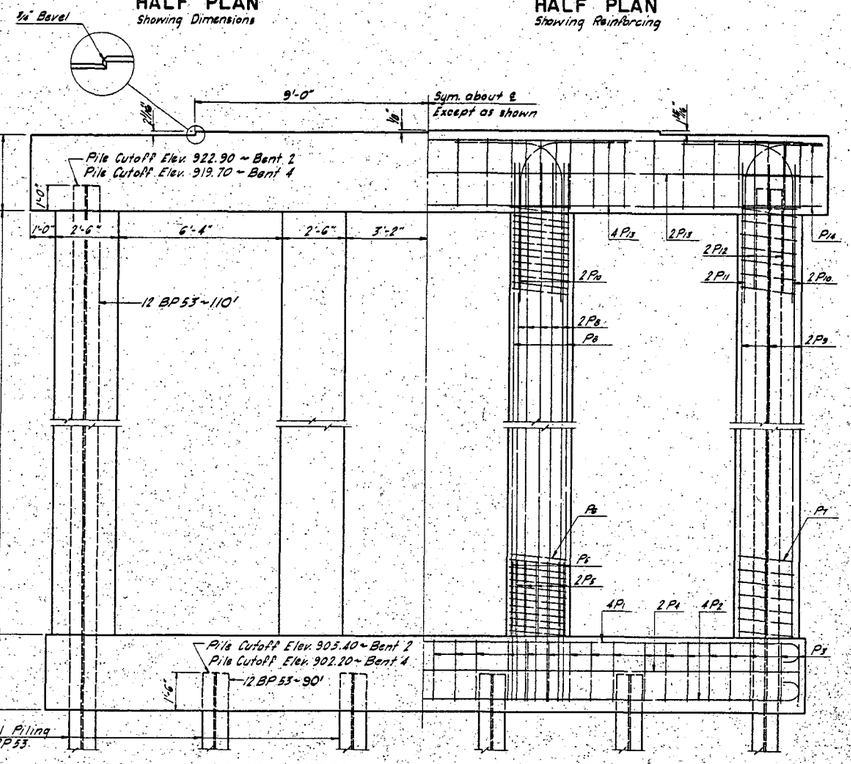


HALF PLAN
Showing Dimensions

HALF PLAN
Showing Reinforcing



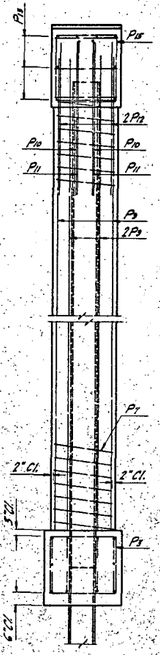
CAP ELEVATION
Bent No. 4 ~ Looking West



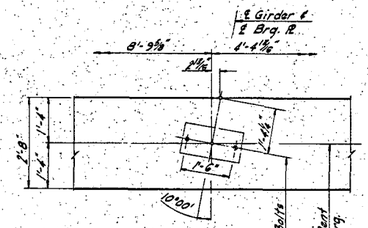
HALF ELEVATION
Showing Dimensions

HALF ELEVATION
Showing Reinforcing

Bent 2 ~ Looking West



END VIEW



DETAIL "A"

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.

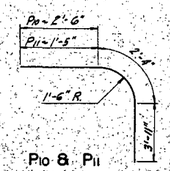
BAR LIST (ONE BENT)

MARK	NUMBER: CAP	NUMBER: COLUMN	NUMBER: FOOTING	SIZE	LENGTH	SHAPE
P1			4	8	30'-11"	Bent
P2			4	9	31'-2"	"
P3			34	5	10'-4"	"
P4			2	5	29'-0"	Str.
P5			24	7	5'-6"	"
P6		2		4	464'-0"	Spiral
P7		2		3	225'-0"	"
P8		24		7	17'-0"	Str.
P9		12		5	17'-0"	"
P10		12		8	8'-9"	Bent
P11		4		8	7'-8"	"
P12		8		6	5'-6"	Str.
P13	10			6	28'-10"	"
P14	6			5	7'-6"	Bent
P15	33			5	10'-6"	"
P16	2			5	7'-3"	"

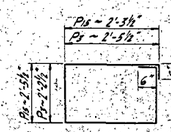
PROJECT I-29-2(26)
DRAWING 29-57-4



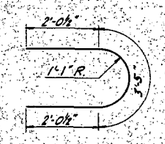
P16



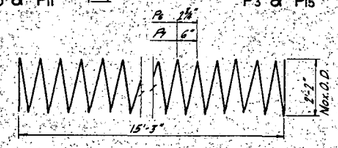
P10 & P11



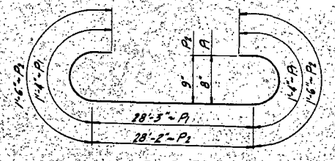
P3 & P15



P14



P6 & P7
(Plain)



P1 & P2

BENT BAR DETAILS
Dimensions shown are center to center

QUANTITIES (ONE BENT)

Class AE-1 Concrete	30.7	C.Y.
Reinforcing Steel	4571	Lbs.
Steel Piling (See Layout)		
Excavation (See Layout)		

TAFT SEPARATION

21'-0" BENT

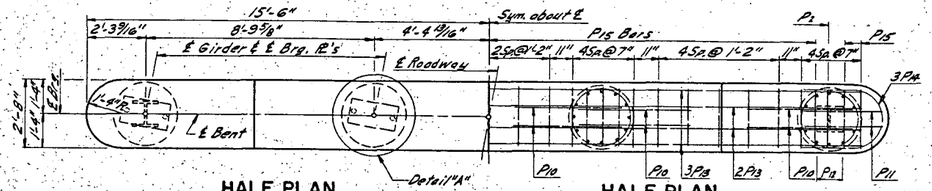
30'-0" ROADWAY

H20 LOADING

29-57-4

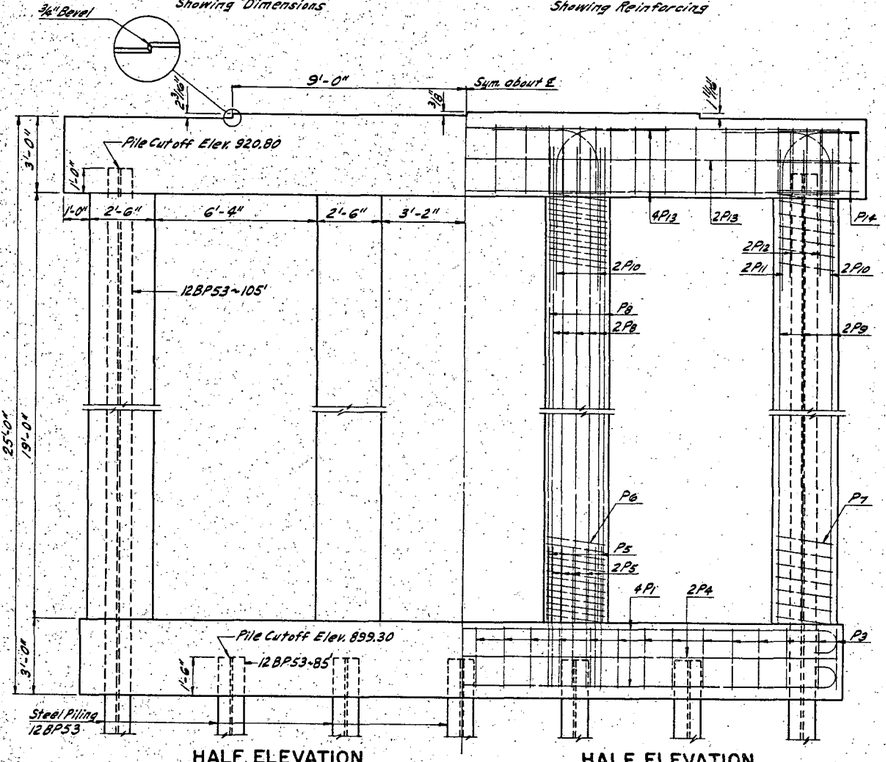
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	N. D.	I-29-2(26)		14	44

	MADE BY	CHECKED BY
DETAILS	E.H.H.	D.L.R.
TRACING	F.S.H.	D.L.R.
QUANTITIES	J.J.S.	D.L.R.



HALF PLAN
Showing Dimensions

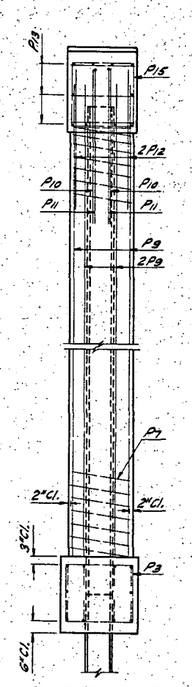
HALF PLAN
Showing Reinforcing



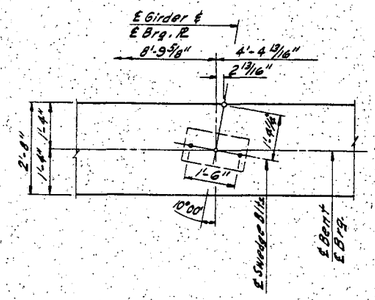
HALF ELEVATION
Showing Dimensions

HALF ELEVATION
Showing Reinforcing

Bent 3 ~ Looking West



END VIEW



DETAIL "A"

BAR LIST (ONE BENT)

MARK	NUMBER CAP	NUMBER COLUMN	NUMBER FOOTING	SIZE	LENGTH	SHAPE
P1			8	9	31'-2"	Bent
P2	2			5	7'-3"	"
P3			28	5	10'-4"	"
P4			2	5	29'-0"	Str.
P5			24	7	5'-6"	"
P6		2		4	581'-0"	Spiral
P7		2		3	278'-0"	"
P8		24		7	21'-0"	Str.
P9		12		5	21'-0"	"
P10		12		8	8'-9"	Bent
P11		4		8	7'-8"	"
P12		8		6	5'-6"	Str.
P13	10			6	28'-10"	"
P14	6			5	7'-6"	Bent
P15	33			5	10'-6"	"
SR4*		1		4	3'-8"	Str.
SR5*		1		5	4'-0"	"
SR6*		1		6	4'-6"	"
SR7*		1		7	5'-0"	"
SR8*		1		8	5'-4"	"

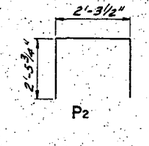
PROJECT I-29-2(26)
DRAWING 29-57-5

NOTE:

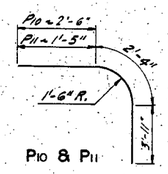
The concrete in the columns shall be allowed to set at least two (2) hours before the bent cap reinforcing is placed and concrete poured.

All exposed edges to be beveled with 3/4" triangular molding.

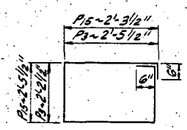
** Sample replacement bar to be spliced to bar from which 2'-0" sample has been cut. Furnish only one set for the entire bridge. This is not a pay item and shall be included in the unit price bid for reinforcing steel.*



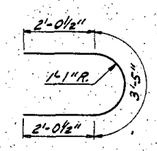
P2



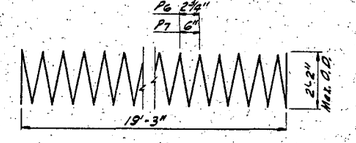
P10 & P11



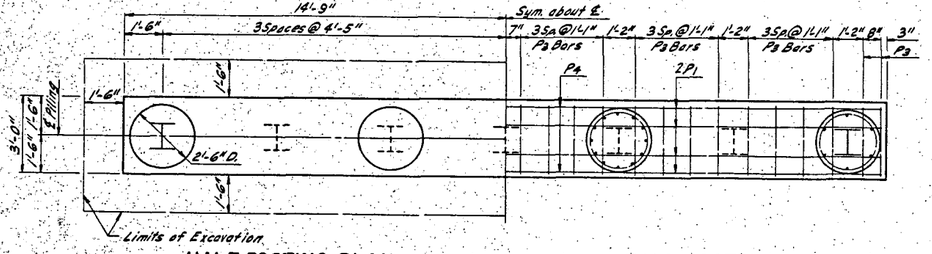
P3 & P15



P14

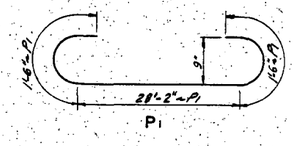


P6 & P7
(Plain)



HALF FOOTING PLAN
Showing Dimensions

HALF FOOTING PLAN
Showing Reinforcing



P1

BENT BAR DETAILS
Dimensions shown are center to center.

QUANTITIES (ONE BENT)

Class AE-1 Concrete	32.9 C.Y.
Reinforcing Steel	5043 Lbs.
Steel Piling (See Layout)	
Excavation (See Layout)	

TAFT SEPARATION

25'-0" BENT

30'-0" ROADWAY

H20 LOADING

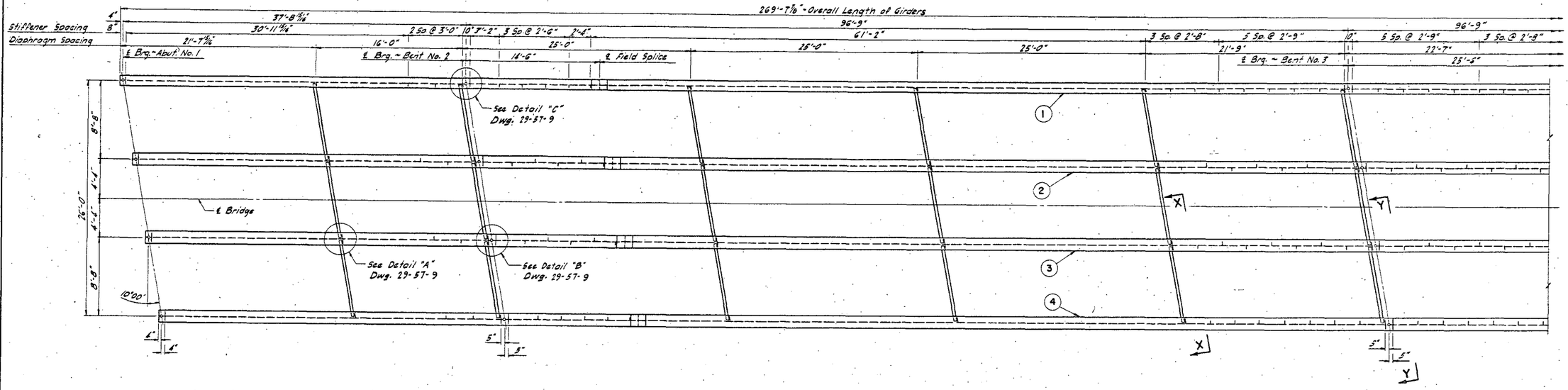
29-57-5

29-57-5

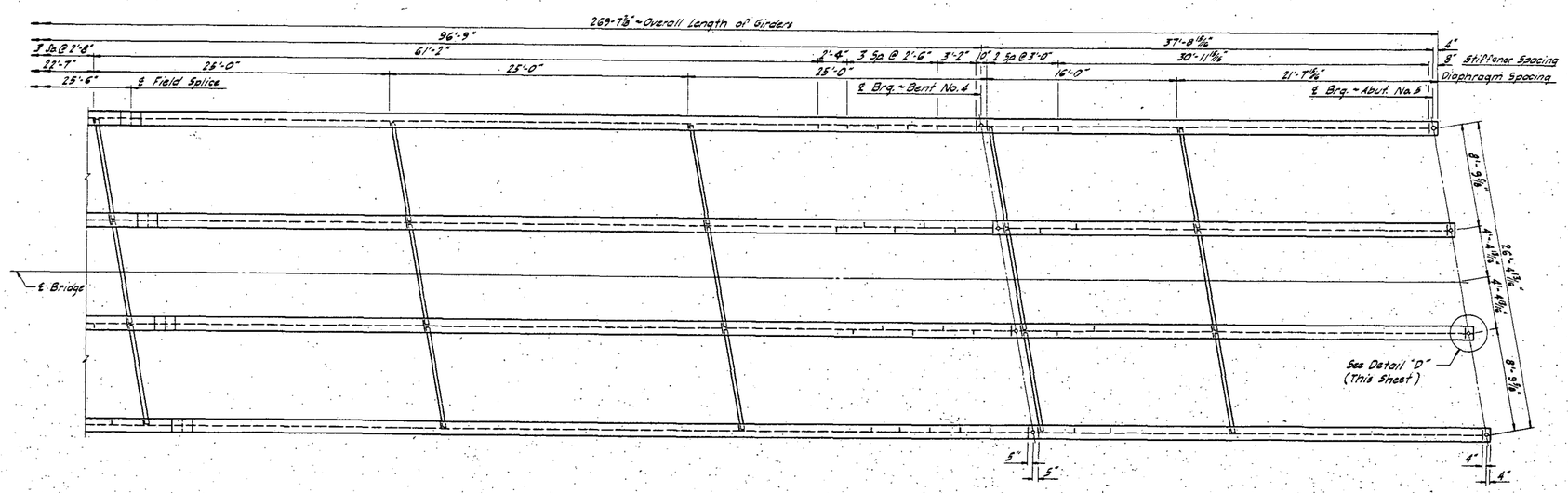
DESIGN	MADE BY	D.O.A.
	CHECKED BY	L.P.H.
DETAILS	MADE BY	L.E.G.
	CHECKED BY	G.A.L.
TRACING	MADE BY	G.A.L.
	CHECKED BY	L.E.G.
QUANTITIES	MADE BY	F.D.H.
	CHECKED BY	D.L.H.

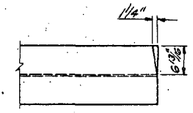
REVISIONS | MADE BY | CHK'D BY | DATE

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	N. D.	S-29-2126		15	44



STEEL LAYOUT





DETAIL "D"
Clip top flange only

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

QUANTITIES
See Drawing 29-57-9

TAFT SEPARATION

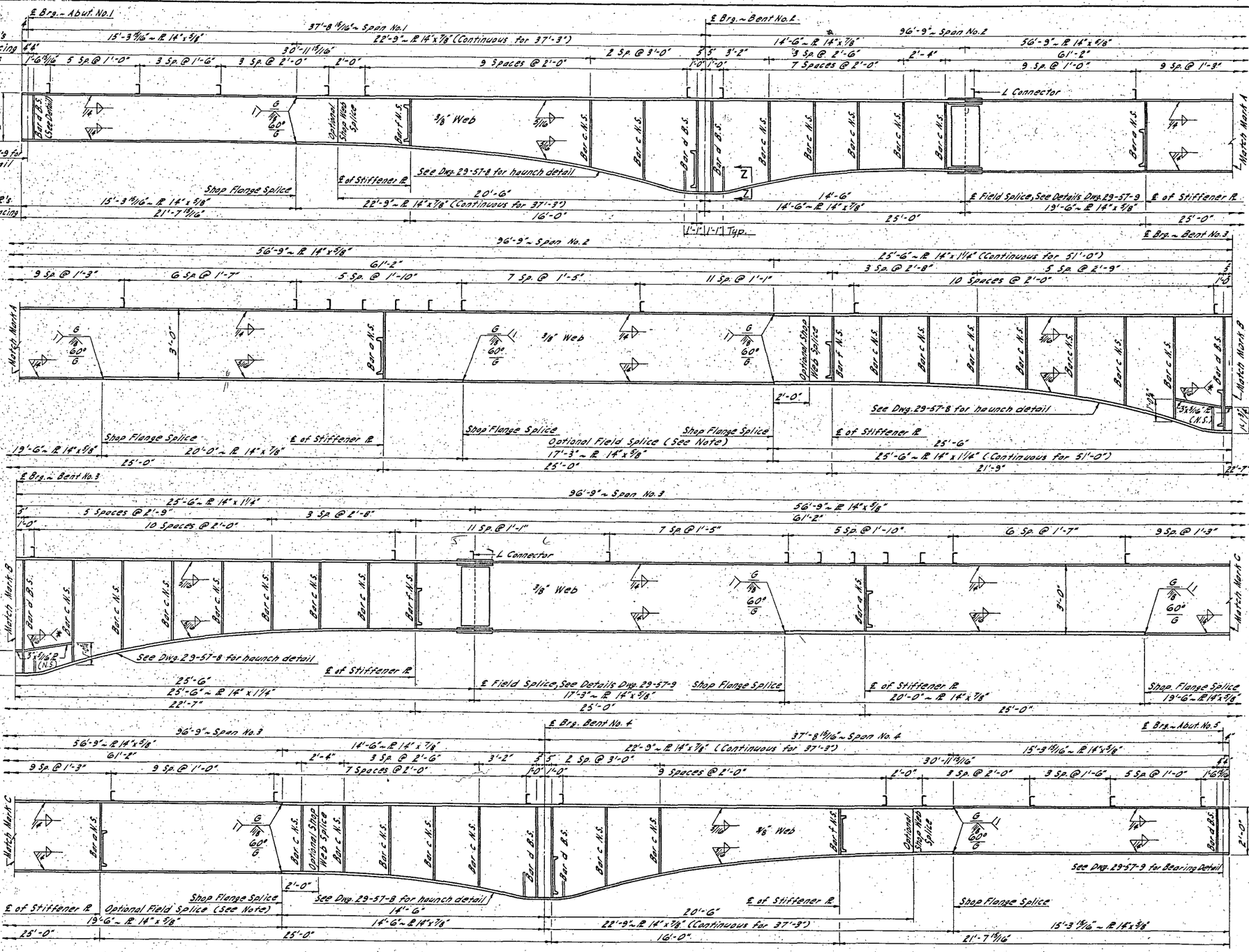
SUPERSTRUCTURE DETAILS

30'-0" ROADWAY
H20 LOADING

29-57-6

29-57-6

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	N. D.	I-29-2(26)		16	44



NOTES:

FIELD SPLICES:

TWO FIELD SPLICES ARE PROVIDED ON THIS DRAWING. FALSEWORK WITH PROVISIONS FOR JACKING MUST BE PROVIDED DURING ERECTION TO HOLD THE GIRDER IN ALIGNMENT WHILE SPLICES ARE BEING MADE.

OPTIONAL FIELD SPLICES:

IN ADDITION TO THE TWO FIELD SPLICES SHOWN ON THIS DRAWING 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 SHEET 29-57-9.
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.

SHOP FLANGE SPLICES:

SHOP FLANGE SPLICES ARE SHOWN AT THE SAME POINT AS THE OPTIONAL FIELD SPLICES. THESE SHOP FLANGE SPLICES CAN BE MADE IF THE OPTIONAL FIELD SPLICES ARE NOT USED.

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.

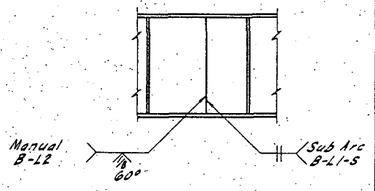
THE DETAILS SHOWN ARE FOR A FOUR SPAN CONTINUOUS WELDED GIRDER AND REPRESENT GIRDER NO. 1 IN A FOUR (4) GIRDER BRIDGE. GIRDERS NO. 2, NO. 3 AND NO. 4 ARE SIMILAR TO GIRDER NO. 1 AND SHALL BE FABRICATED IN ACCORDANCE WITH THESE DETAILS AND DRAWINGS 29-57-6 THRU 29-57-9.

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

OPTIONAL SHOP WEB SPLICES:

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

*Weld to web only



OPTIONAL SHOP WEB SPLICE

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

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

See Drawing 29-57-8 for Section Z-Z. Designed for 25 lb. F.W.S.

QUANTITIES

See Drawing 29-57-9

TAFT SEPARATION

WELDED GIRDER DETAIL

30'-0" ROADWAY

H20 LOADING

QUANTITIES MADE BY D.L.R. CHECKED BY F.D.H.

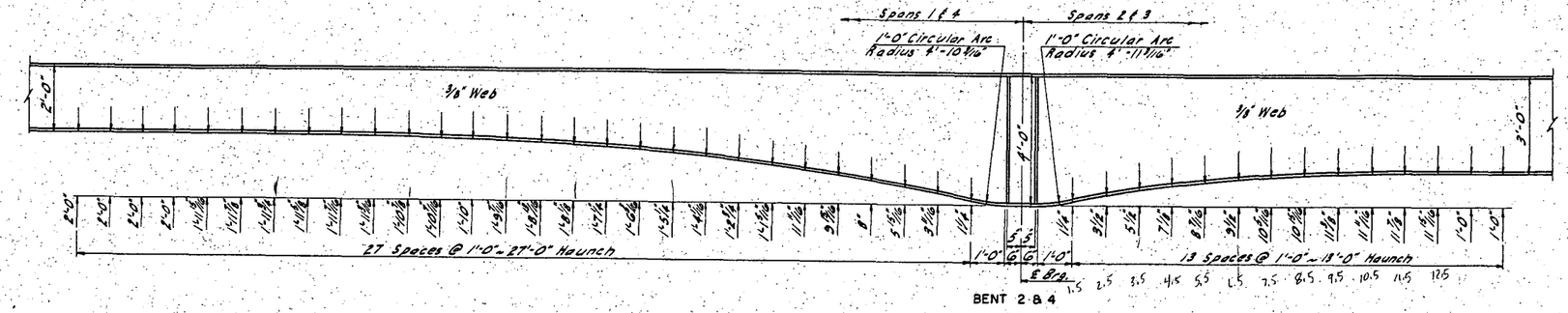
29-57-7

29-57-7

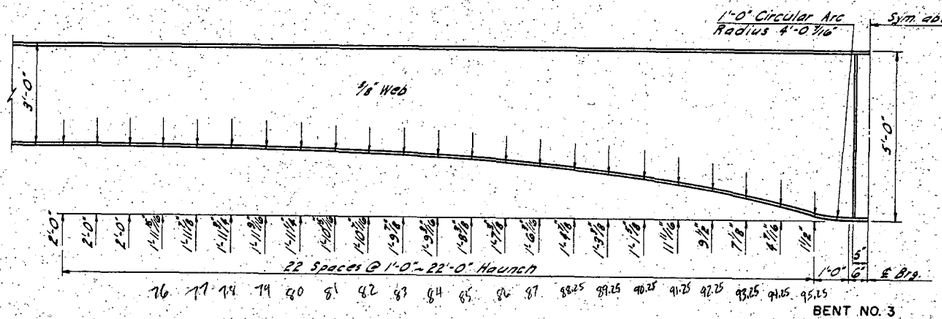
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	N. D.	I-29-2(26)		17	44

REVISIONS	MADE BY	CHK'D BY	DATE

DESIGN	MADE BY	D.O.L.
	CHECKED BY	L.E.G.
DETAILS	MADE BY	L.E.G.
	CHECKED BY	D.L.P.
TRACING	MADE BY	L.E.G.
	CHECKED BY	D.L.P.
QUANTITIES	MADE BY	L.E.G.
	CHECKED BY	F.D.H.

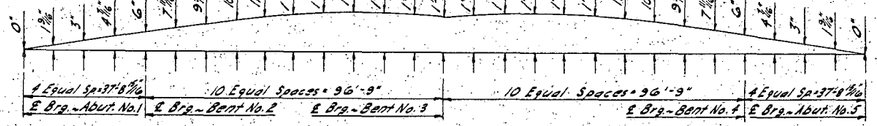


BENT 2 & 4



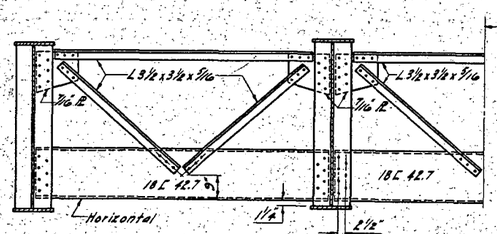
BENT NO. 3

GIRDER HAUNCH DETAILS



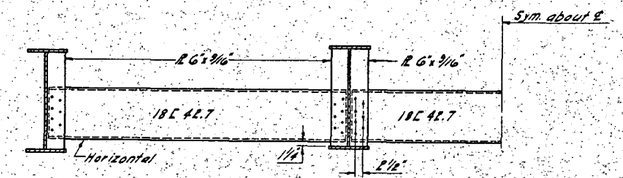
SHOP CAMBER DIAGRAM

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.



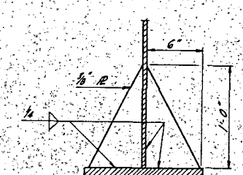
Y-Y

AT BENT NO. 3 ONLY



X-X

Typical for diaphragms at Bents 2 and 4 and all intermediate diaphragms.



Z-Z

Typical for bents 1, 3 & 4

Designed for 25 T.S.F. F.W.S.

QUANTITIES

See Drawing 29-57-9

TAFT SEPARATION

SUPERSTRUCTURE DETAILS

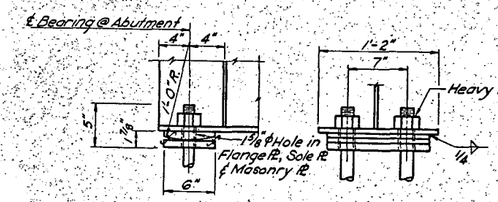
30'-0" ROADWAY

H20 LOADING

29-57-8

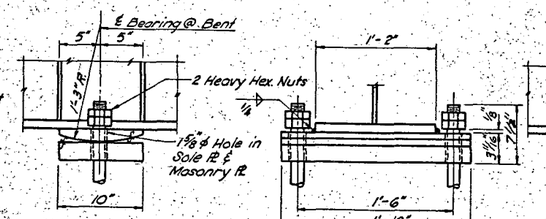
29-57-8

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	N. D.	I-29-2(26)		18	44



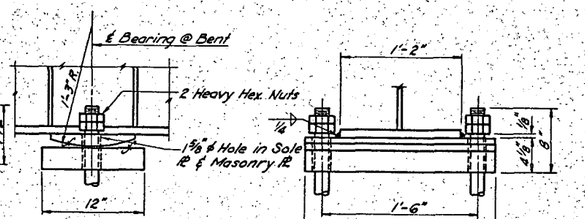
Sole Pl. ~ 6"x 1⅛" x 1'-0"
Masonry Pl. ~ 6"x ¾" x 1'-0"
Swedge Bolts ~ 1½" ϕ x 2'-0"
Note: Swedge bolts to be drilled in and anchored in quick setting anchor grout. See Special Provisions.

ABUTMENT BEARING DETAILS



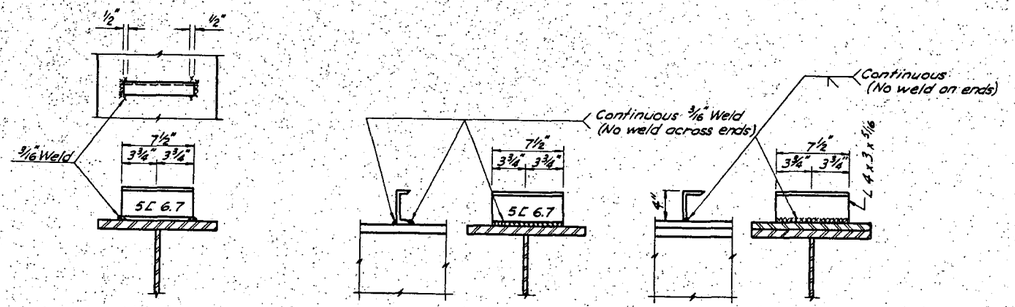
Sole Pl. ~ 10"x 1⅜"x 1'-10"
Masonry Pl. ~ 10"x 2⅛"x 1'-10"
Swedge Bolts ~ 1½" ϕ x 2'-0"

BENT BEARING DETAILS
BENTS 2 & 4



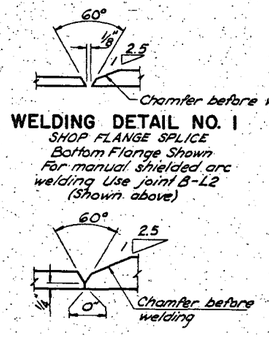
Sole Pl. ~ 10"x 1⅝"x 1'-10"
Masonry Pl. ~ 12"x 2½"x 1'-10"
Swedge Bolts ~ 1½" ϕ x 2'-0"

BENT BEARING DETAILS
BENT 3



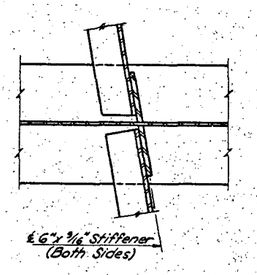
Use in Span 1 and in negative moment regions where spacing is 2'-0"
Use in positive moment region except over splice Pl's
Use over splice Pl's

SHEAR DEVICE DETAILS

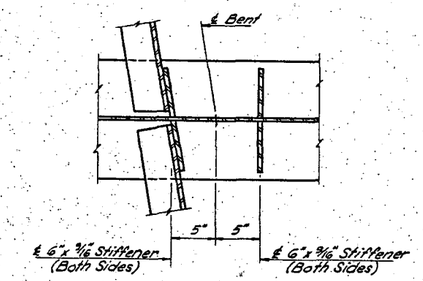


WELDING DETAIL NO. 1
SHOP FLANGE SPLICE
Bottom Flange Shown
For manual shielded arc welding Use joint B-L2 (Shown above)

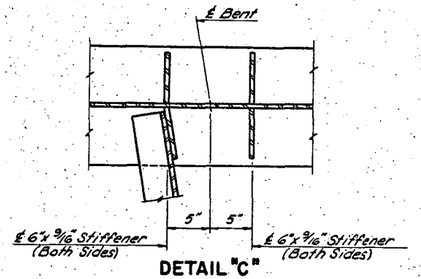
ALTERNATE DETAIL NO. 1
SHOP FLANGE SPLICE
Bottom Flange Shown
Submerged Arc AWS B-L2b-S
If submerged arc welding is used AWS B-L2b-S is an acceptable replacement for B-L2 (Manual)



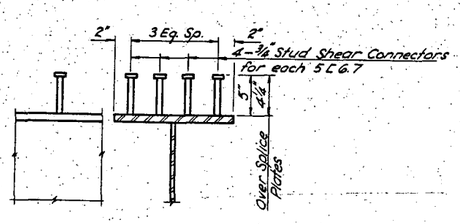
DETAIL "A"



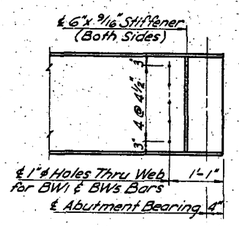
DETAIL "B"



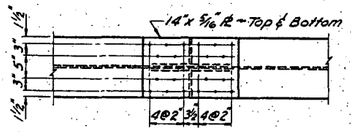
DETAIL "C"

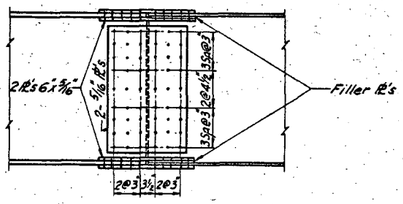


ALTERNATE SHEAR DEVICE

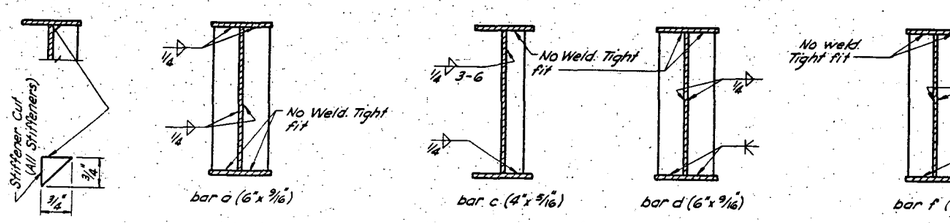


BEAM DETAILS





FIELD SPLICE PLATE



WEB STIFFENER DETAILS

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

QUANTITIES

Structural Steel (A-441)	142,700 Lbs.
Structural Steel (A-36)	25,700 Lbs.

TAFT SEPARATION

SUPERSTRUCTURE DETAILS

30'-0" ROADWAY

H20 LOADING

TRACING MADE BY: D.L.F.
TRACING CHECKED BY: E.D.H.
QUANTITIES MADE BY: D.L.F.
QUANTITIES CHECKED BY: E.D.H.

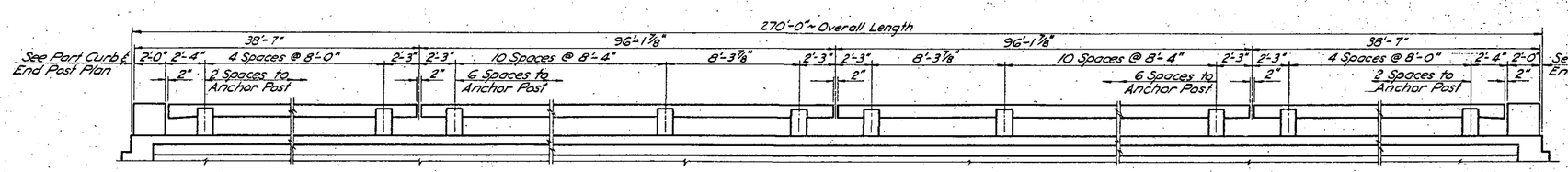
29-57-9

29-57-9

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	N. D.	I-29-2(26)		19	44

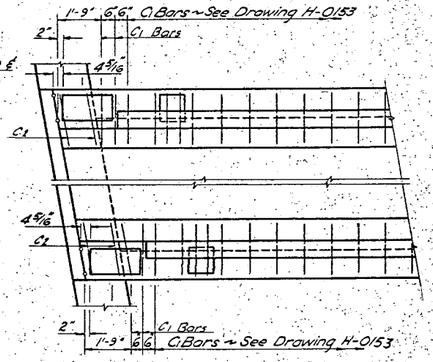
REVISIONS	MADE BY	CHK'D BY	DATE

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

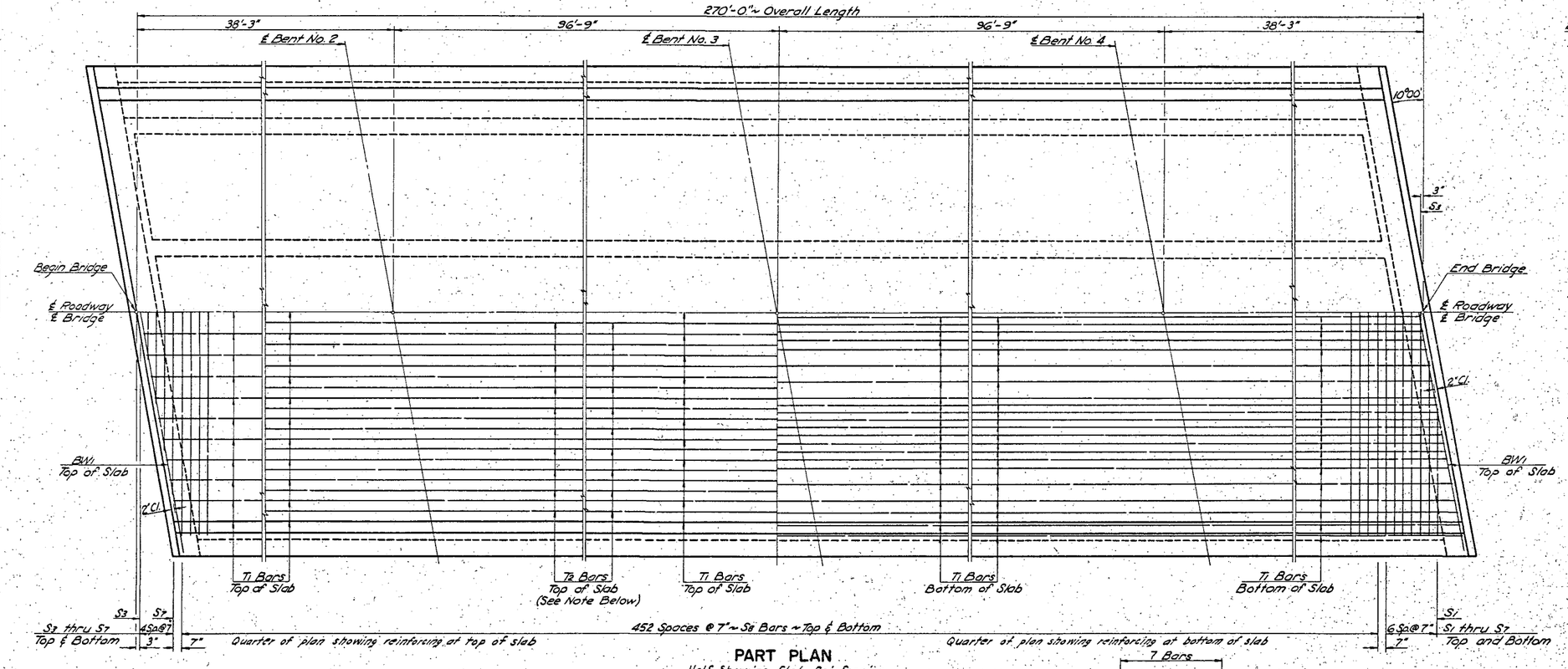


PART ELEVATION

See H-0153 for Railing Details

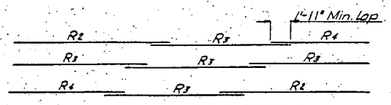


PART CURB & END POST PLAN



PART PLAN

Half Showing Slab Reinforcing
Typical Both Sides ~ by Rotation

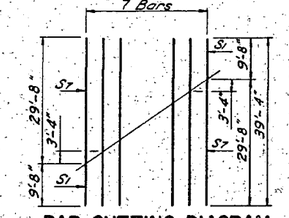


R BAR SPLICING DETAIL

(Spans #2 & #3)
Use R1 Bars in Spans #1 & #4

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



BAR CUTTING DIAGRAM

S1 thru S7 Bars ~ Two Sets ~ 275'-4"

Designed for 25# S.F. FWS.

QUANTITIES

See Drawing 29-57-11

TAFT SEPARATION

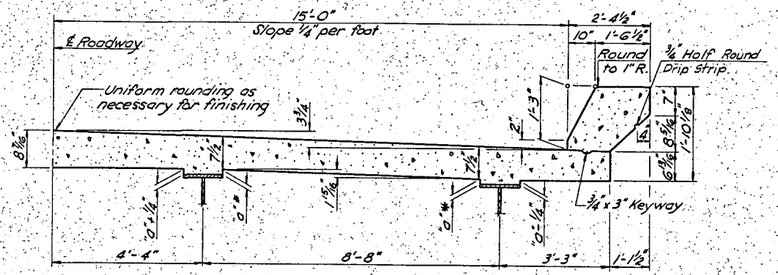
SLAB & RAILING DETAILS

30'-0" ROADWAY
H20 LOADING

29-57-10

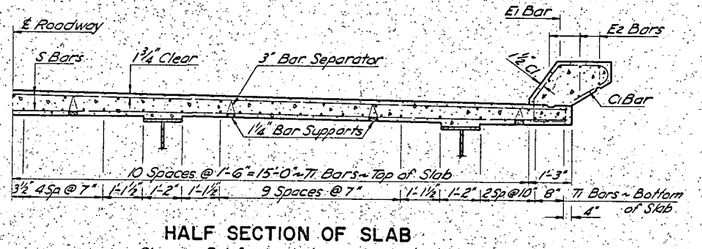
29-57-10

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	N. D.	I-29-2266		20	44

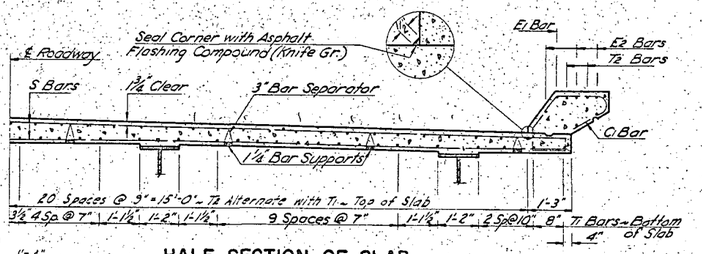


HALF SECTION OF SLAB
Showing Dimensions

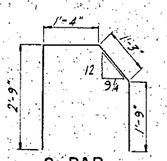
* "a" equals 1⅛" @ ℄ bearings of bents and abutments. At intermediate points "a" equals screed elevation at ℄ Roadway minus top of girder elevation minus (.884 outside girders)(.727 inside girders)



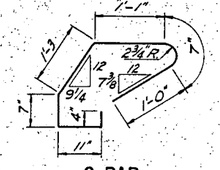
HALF SECTION OF SLAB
Showing Reinforcing between Bents & Abutments



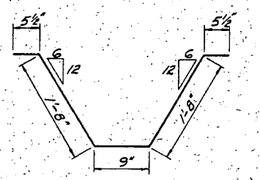
HALF SECTION OF SLAB
Showing Reinforcing over Bents



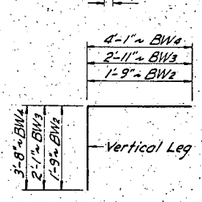
C2 BAR



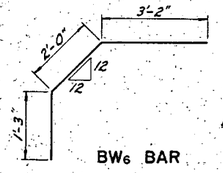
C1 BAR



BW5 BAR

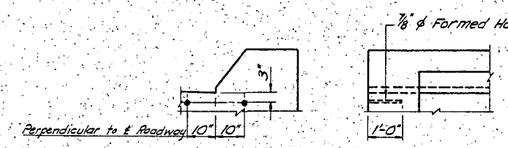


BW2, BW3 & BW4 BARS

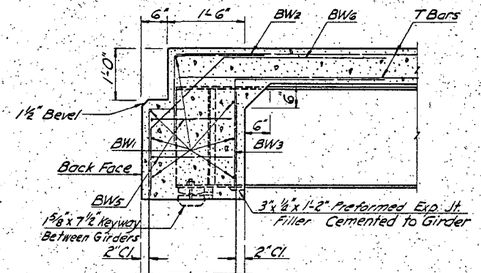


BW6 BAR

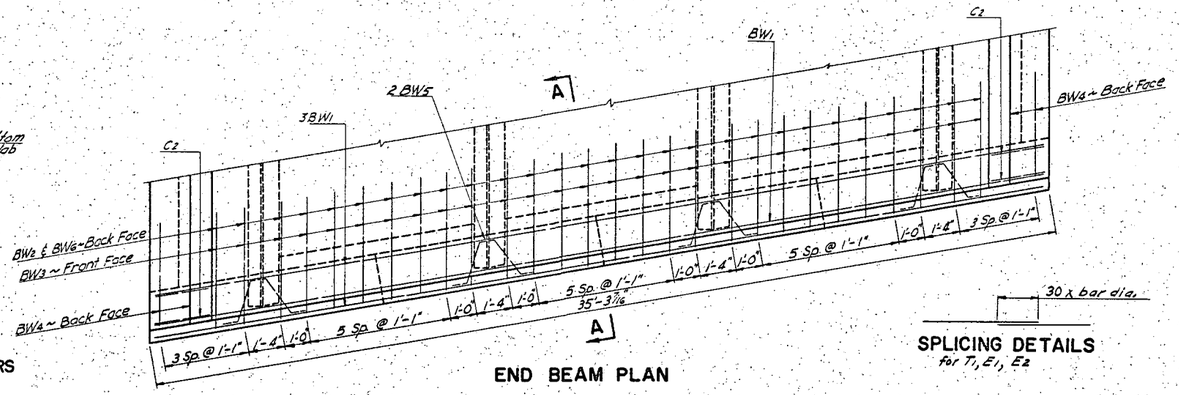
BENT BAR DETAILS
Dimensions shown are center to center



CURB SLEEVE DETAILS

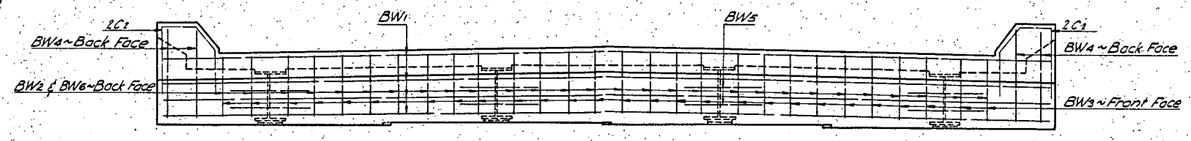


A-A



END BEAM PLAN

SPLICING DETAILS
for T1, E1, E2



END BEAM ELEVATION

SUPERSTRUCTURE

MARK	NUMBER SLAB	NUMBER RAILING & POSTS	NUMBER CURB	SIZE	LENGTH	SHAPE
BW1	14			6	35'-0"	Str.
BW2	56			6	3'-6"	Bent
BW3	56			6	5'-0"	"
BW4	8			6	7'-9"	"
BW5	16			5	5'-0"	"
BW6	56			6	6'-5"	"
C1	596			5	5'-9"	"
C2	8			5	7'-1"	"
E1			14	6	40'-2"	Str.
E2			70	5	39'-11"	"
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"	"
RC	468		3		2'-11"	Bent
R1	24		6		36'-0"	Str.
R2	16		6		33'-4"	"
R3	40		6		33'-2"	"
R4	16		6		31'-0"	"
S-57-45a			6		137'-8"	Str.
S8	906		6		32'-2"	"
T1	155		5		39'-11"	"
T2	60		12	6	40'-0"	"

PROJECT I-29-2266
DRAWING 29-57-11

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 29-57-6 thru 29-57-9 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.

* See Drawing 29-57-10 for bar cutting diagram.

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

QUANTITIES

Class AE-3 Concrete	263.9 C.Y.
Class AE-3 Concrete	17.36 C.Y.
Reinforcing Steel	85197 Lbs.
Railing and end post quantities included	

TAFT SEPARATION

SLAB, END BEAM & MISC. DETAILS

30'-0" ROADWAY
H20 LOADING

TRACING: DLP
QUANTITIES: MADE BY FDH, CHECKED BY DJK

29-57-11