STATE	PROJECT NO.	PCN	SHEET NO.
ND	SS-9-999(157)	15102	1

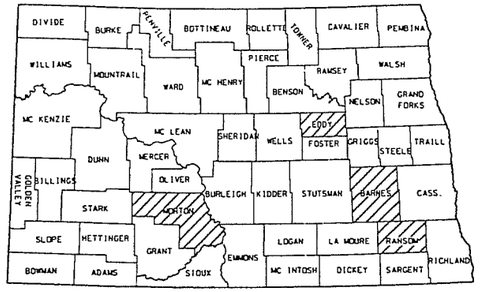
JOB# 13

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

BARNES, EDDY, MORTON & RANSOM COUNTIES

SS-9-999(157)

PAINTING BRIDGE STRUCTURAL STEEL



STATE COUNTY MAP

GOVERNING SPECIFICATIONS:

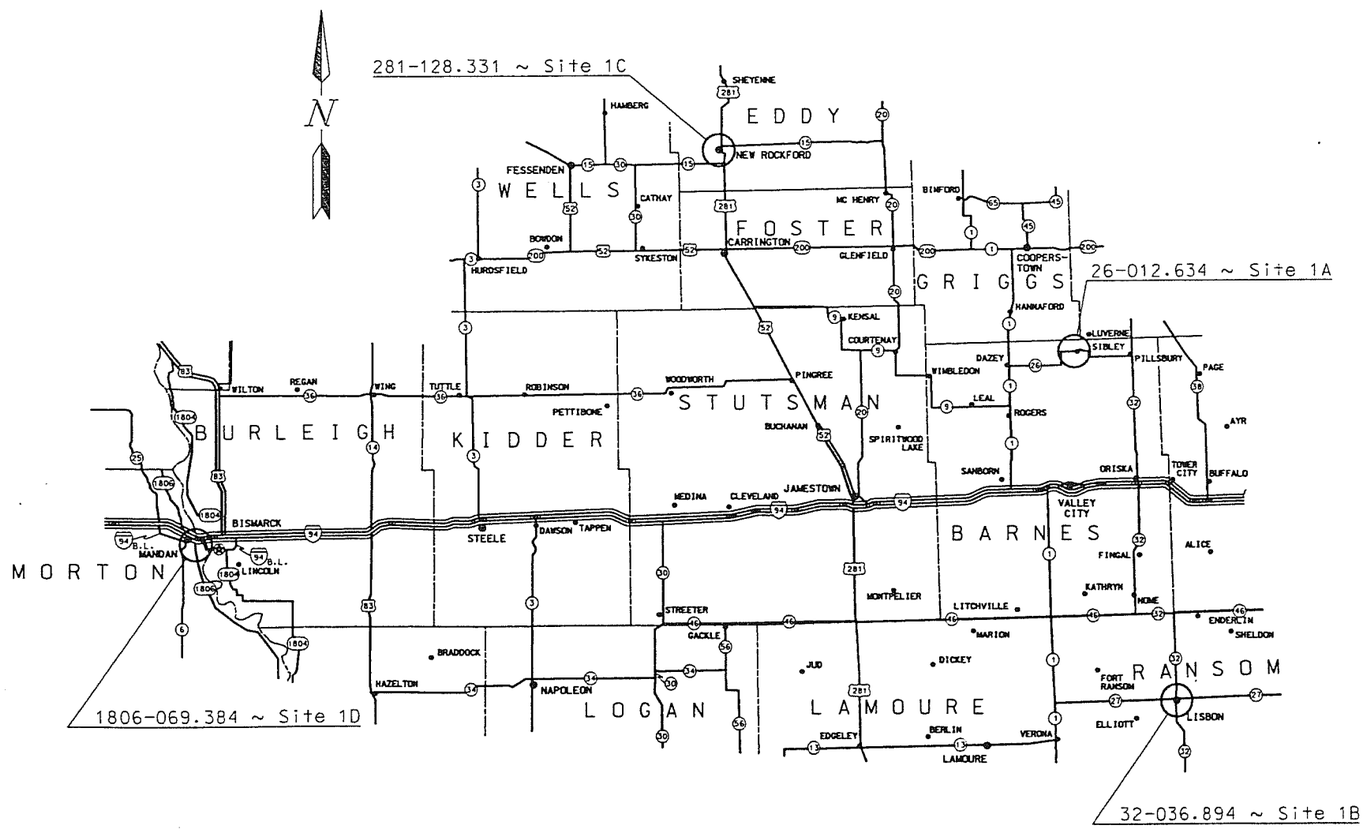
Standard Specifications adopted by the North Dakota Department of Transportation October 1997; Standard Drawings currently in effect; and other Contract Provisions submitted herein.

INDEX OF DRAWINGS

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	ESTIMATE OF QUANTITIES
3	BASIS OF ESTIMATE AND NOTES
4-9	STRUCTURAL STEEL PAINTING DETAILS
10-11	TRAFFIC CONTROL DEVICES LIST

SPECIAL PROVISIONS

SP 500(97) BRIDGE PAINTING



SITE LOCATIONS

LIST OF STANDARD DRAWINGS

D-704-8	BREAKAWAY SYSTEMS FOR CONSTRUCTION ZONE SIGNS
D-704-9, 10, 11, 12	CONSTRUCTION SIGN DETAILS
D-704-13	BARRICADE DETAILS
D-704-14	CONSTRUCTION SIGN AND BARRICADE ASSEMBLY DETAILS
D-704-19	CONSTRUCTION SIGN AND BARRICADE LOCATION DETAILS

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 4-24-02

Terrence R. Udland

BRIDGE ENGINEER
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

TERRENCE R. UDLAND REGISTERED PROFESSIONAL 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 4/24/2002

Francis G. Ziegler

OFFICE OF INFRASTRUCTURE SUPPORT
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

FRANCIS G. ZIEGLER REGISTERED PROFESSIONAL P.E. 1679 ENGINEER NORTH DAKOTA

STRUCTURAL STEEL PAINTING ~ BASIS OF ESTIMATE

SITE	BRIDGE NO.	DISTRICT	LOCATION	AREAS TO BE PAINTED	TRAFFIC CONTROL STANDARD DRAWING	GIRDER LENGTH	FINISH COLOR	COLOR NO.	AREA (SF)
1A	26-012.634	Valley City	Lake Ashtubula Bridge	All Exposed Structural Steel	D-704-19, Type F	126'-0"	Blue	25240	3800
1B	32-036.894	Fargo	Sheyenne River Bridge	All Exposed Structural Steel	D-704-19, Type F	164'-3"	Brown	20095	7700
1C	281-128.331	Devils Lake	James River Bridge	All Exposed Structural Steel	D-704-19, Type F	72'-6"	Blue-Gray	25184	4600
1D	1806-069.384	Bismarck	Heart River Bridge	All Exposed Structural Steel	D-704-19, Type F	249'-0"	Red	31302	34,400
								TOTAL	50,500

NOTES:

100 SCOPE OF WORK: This project consists of cleaning and painting all exposed structural steel for the four sites listed above.

630 CLEANING AND PAINTING: All exposed structural steel surfaces shall be cleaned and painted according to Special Provision 500(97). The finish coats at each site shall be the color shown in the above table and shall meet Federal Standard No. 595B colors. Sites 1A, 1B, 1C and 1D are paid for under the lump sum bid item "Cleaning & Painting - Site 1."

Drawings 9-999.157-1 thru 9-999.157-6 show the approximate surface area of exposed structural steel to be painted at each site. A complete set of plans for each structure can be viewed at the NDDOT Bridge Division.

704 TRAFFIC CONTROL: The traffic control at each site shall be according to the Standard Drawing listed in the above table. The traffic control shall be set up only while work is going on at the sites during daylight hours. The traffic control shall be removed and normal traffic operations restored at the end of each workday.

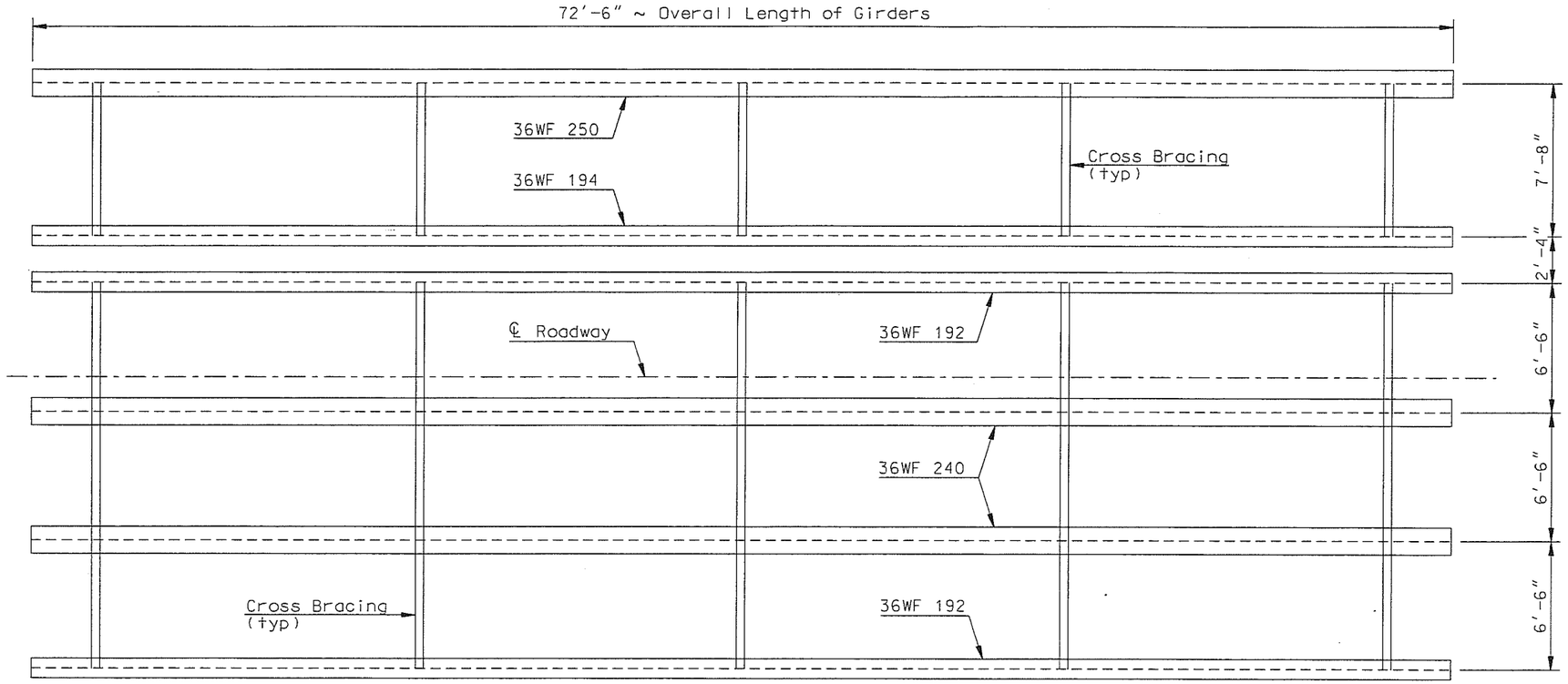
704 TRAFFIC CONTROL DEVICES LIST: The traffic control quantities include devices for traffic control to be set up at two sites simultaneously. The contractor will only be paid for the signs and devices used at two sites and shall move the traffic control from one completed site to the next.

SPEC	CODE	ITEM DESCRIPTION	UNIT	QUANTITY
630	0121	CLEANING & PAINTING - SITE 1	L SUM	1

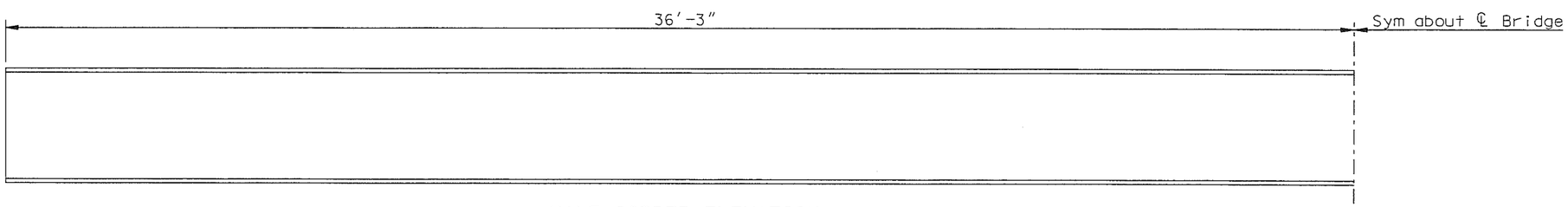
STATEWIDE
(FOUR SITES)

STRUCTURAL STEEL PAINTING
BASIS OF ESTIMATE & NOTES

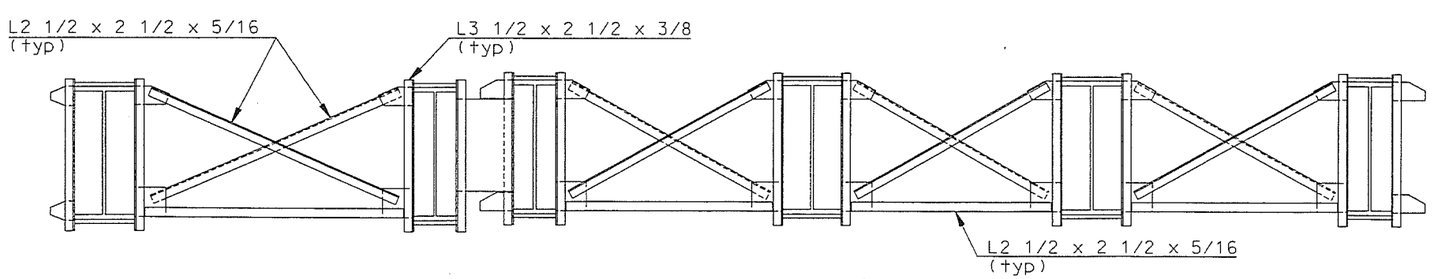
STATE	PROJECT NUMBER	SHEET NO.
ND	SS-9-999(157)	7



GIRDER LAYOUT



HALF GIRDER ELEVATION



CROSS BRACING ELEVATION

JAMES RIVER BRIDGE
281-128.331

STRUCTURAL STEEL
PAINTING DETAILS

DESIGN DATA				
Traffic	Average Daily			Est.Max.Hr.
Current (1997)	Pass: 2060	Trucks 180	Total 2240	230
Forecast (2017)	Pass: 2270	Trucks 200	Total 2470	250
Minimum Sight Dist. for:		Design Speed 65 MPH		
Stopping		Bridges		
Safe Passing				
Passing for Marking				

JOB# 24

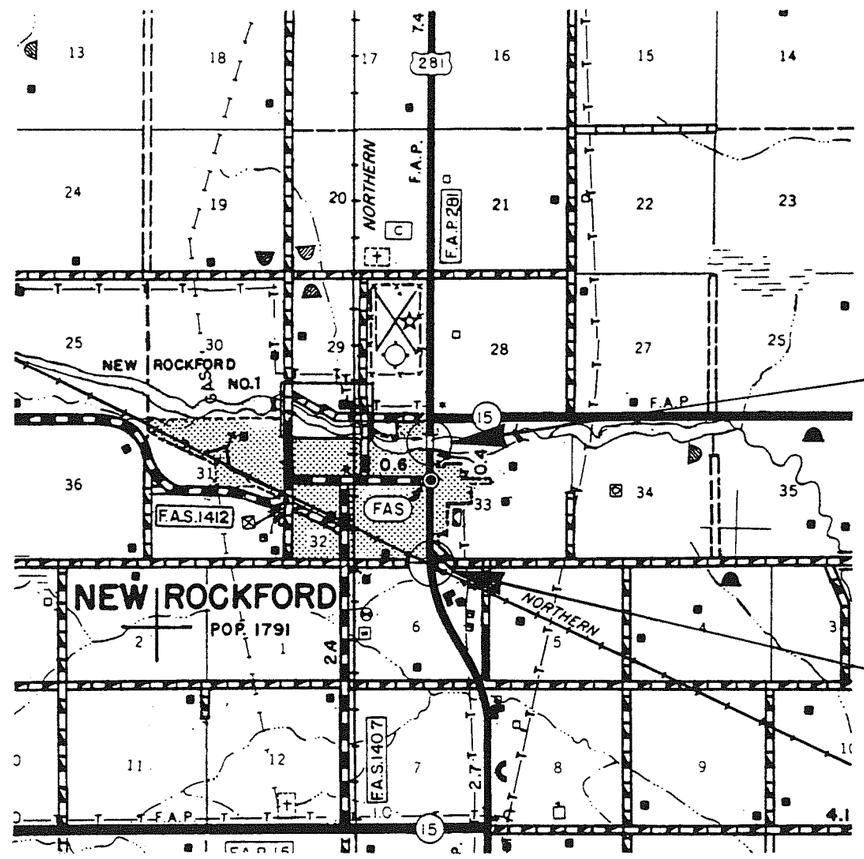
FHWA REGION	STATE	PROJECT NO.	SHEET NO.
8	ND	SHE-3-281(054)127 SHE-3-281(055)128	1

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

EDDY COUNTY
SHE-3-281(054)127
SHE-3-281(055)128
Guardrail, Bridge Rail Retrofit and Incidentals

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.



SHE-3-281(055)128
James River Bridge
RP 128.331 US 281

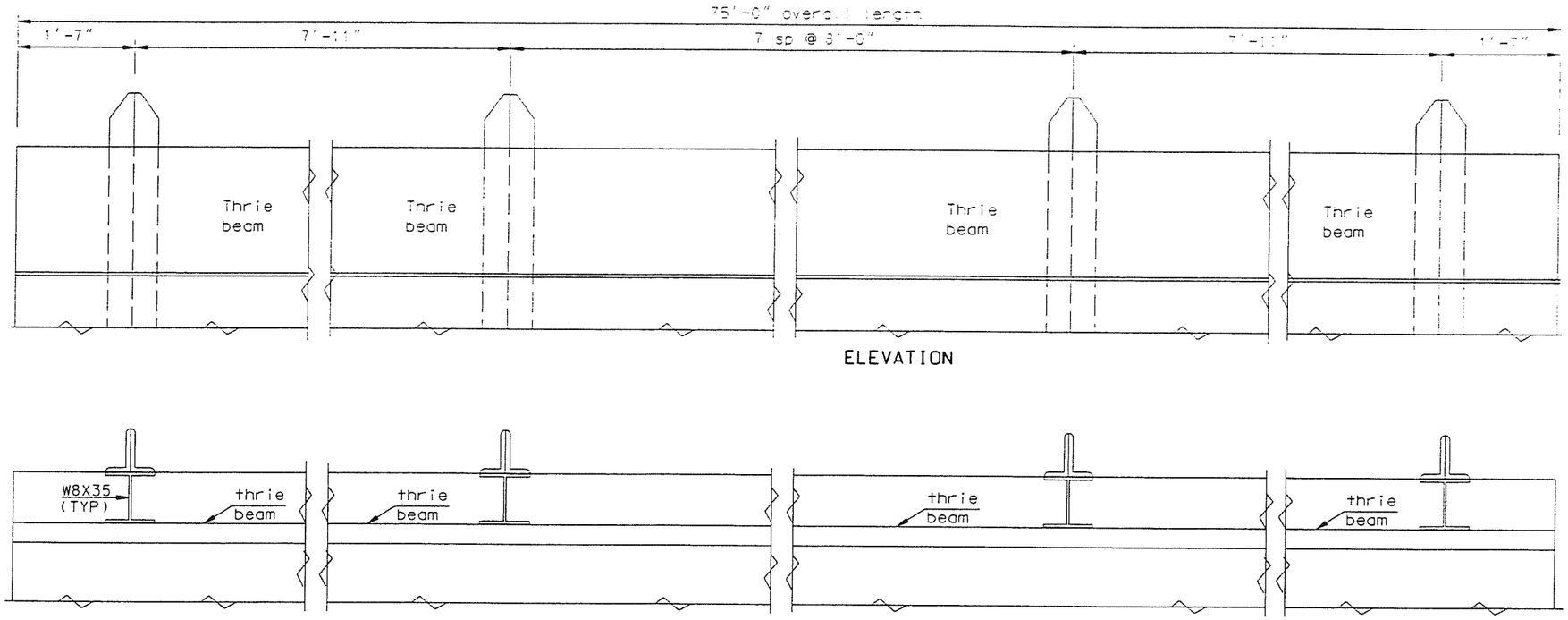
SHE-3-281(054)127
BNRR Separation
RP 127.480 US 281

DESIGNER Brad Pfeifer
DESIGNER
DESIGNER
RECOMMEND APPROVAL 3-11, 1998
DESIGN ENGINEER

APPROVED DATE 3-20-98
David K. Olson
P.E. 1199
DIRECTOR OF HIGHWAYS AND ENGINEERING

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

...\d_traffi\title.dgn Feb. 23, 1998 10:04:13

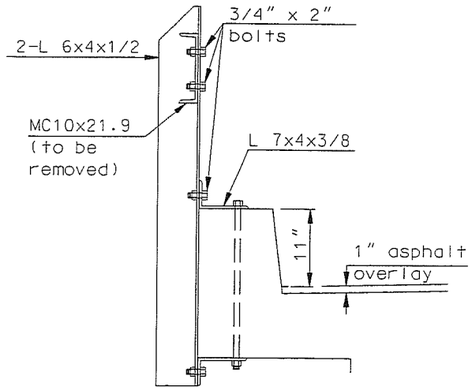


SPEC	CODE	ITEM DESCRIPTION	UNIT	QUANTITY
616	0362	STRUCTURAL STEEL	LBS	1434
764	0135	THRIE BEAM GUARDRAIL	LF	150

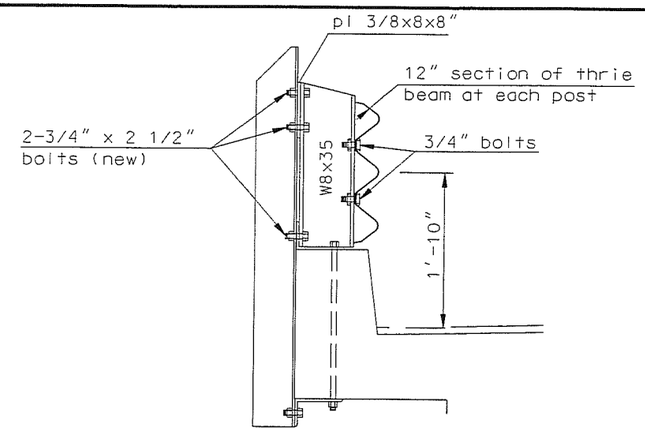
JAMES RIVER

THRIE BEAM RAIL RETROFIT

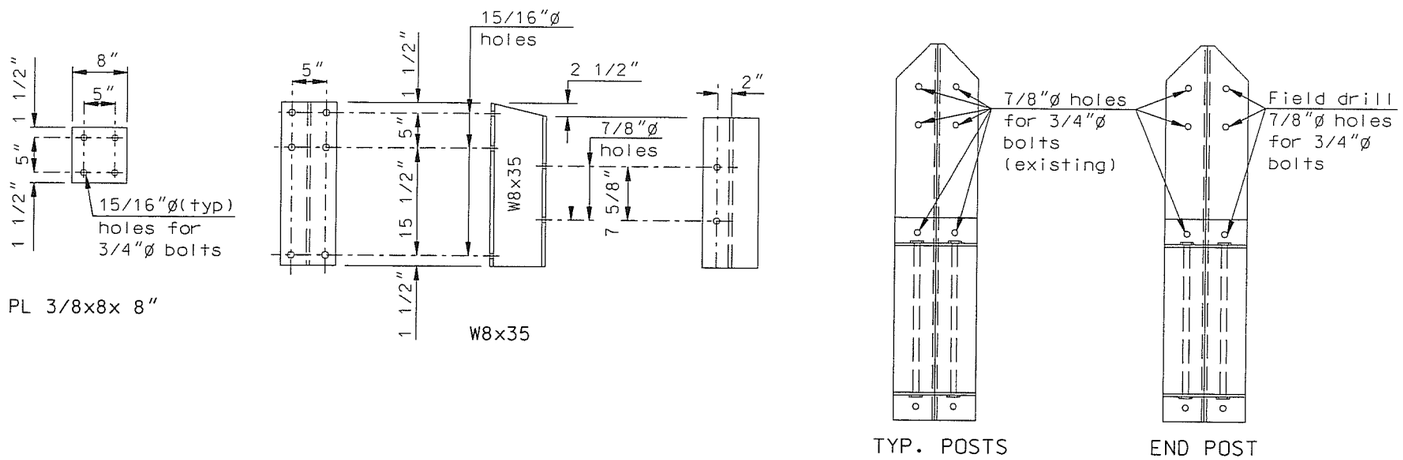
FHWA REGION	STATE	FEDERAL AID PROJECT NUMBER	SHEET NO.
8	ND	SHE-3-281(055)128	17



SHOWING EXISTING CURB AND GUARDRAIL



SHOWING CURB WITH THRIE BEAM RETROFIT



SHOWING LOCATION OF BOLT HOLES

NOTES:

The bid items shall be "Thrie Beam Guardrail" and "Structural Steel". Thrie Beam Guardrail shall be paid for by linear feet and Structural Steel shall be paid for by th pound.

The structural steel shall conform to AASHTO M-183 unless otherwise noted.

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

The contractor shall submit the shop drawings for the thrie beam guard raill for approval by the bridge engineer before fabrication.

The existing channel rail shall be removed and become the property of the contractor.

The cost of removal shall be included in the price bid for "Thrie Beam Guardrail".

JAMES RIVER

THRIE BEAM RAIL RETROFIT

RRETRO2 98LCS011 LLS

281-128.331-2

STABILIZED GRAVEL BASE

BITUMINOUS SURFACING QUANTITIES

EDDY COUNTY

FEDERAL AID PROJECT NO. 296.A (8)

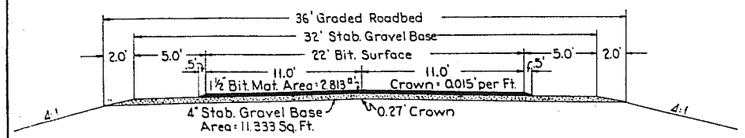
FINAL 281-128.331

REVISED 2-29-40

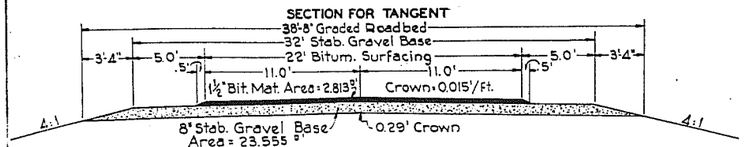
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
4	N. D.	296.A		2-A	

GOVERNING SPECIFICATIONS:
Standard Specifications adopted by the North Dakota State Highway Department September 1939 and approved as standard by the Pubic Roads Administration January 18, 1940.
Standard Special Provisions for labor as approved by the Public Roads Administration March 28, 1939 and these provisions submitted herewith.

TYPICAL SECTION
32' STABILIZED GRAVEL BASE
22' BITUMINOUS SURFACING



SECTION FOR TANGENT



USE:- Sta. 125+00 to Sta. 135+00
Sta. 235+00 to Sta. 240+00

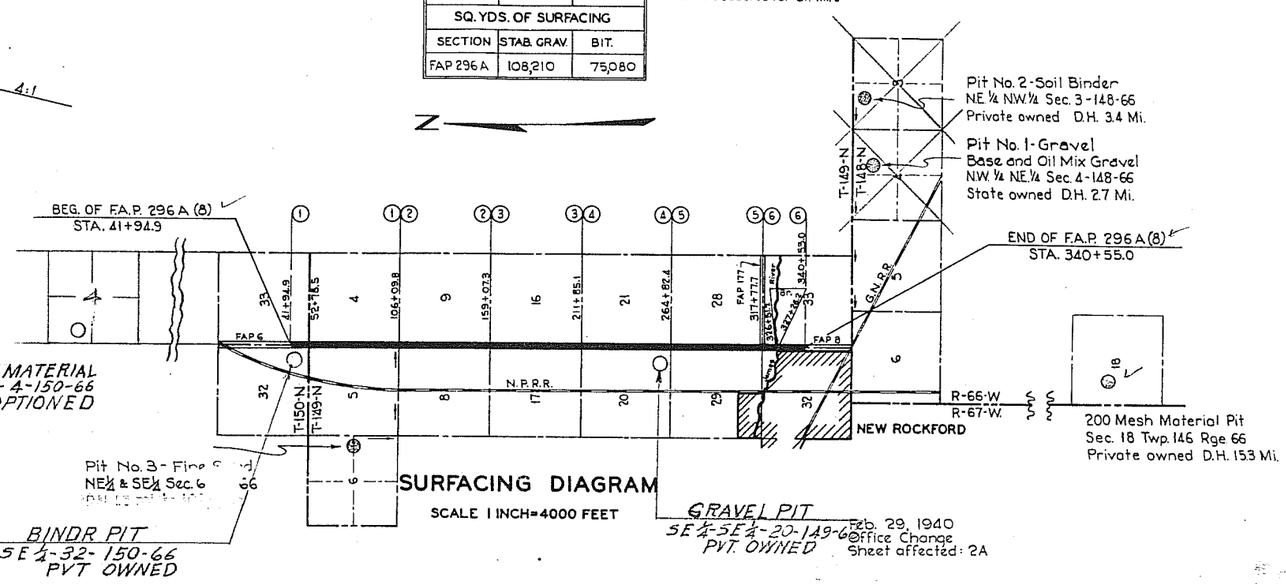
BASIS OF ESTIMATE FOR STABILIZED GRAVEL BASE									
PITS	PIT NO.	LAB. WEIGHTS	PERCENT BY WEIGHT	GRAVEL PER MILE	SOIL BINDER PER MILE	FINE SAND PER MILE	TOTAL DRY MIXED MATERIAL 140# Per Cu. Ft.	WATER PER MILE 10% of Wt. of Dry Mixed Mat'l	STABILIZED GRAVEL BASE PER MILE
		LBS.	%	TONS	TONS	TONS	TONS	TONS	TONS
GRAVEL	1	100	70.4	2949	356	884	4189	419	4608
SOIL BINDER	2	12	8.5						
FINE SAND	3	30	21.1	6129	740	1837	8706	870	9576

LENGTH OF PROJECT		
SECTION	GROSS	NET
FAP 296A	5.655	5.641
SQ. YDS. OF SURFACING		
SECTION	STAB. GRAV.	BIT.
FAP 296A	108,210	75,080

0.014 Mi. deducted for Br. Mi. 6

BASIS OF ESTIMATE			
4"	8"		32' STABILIZED GRAVEL BASE
4608	9576	Tons	Stabilized Gravel Base per mile.
7392	7392	Gals.	Bit. SC-2 per mile (Prime Coat) 0.35 Gals. per Sq. Yd. 36' Width

1½"		22' BITUMINOUS SURFACING
1100	Tons	Comb. Aggregates per Mi. (2.0 Tons per Cu. Yd.)
10	Gals.	Bit. SC-4 per ton Comb. Aggregates
3872	Gals.	Bit. RC-4 per Mi. (Sealcoat) 0.30 Gals. per Sq. Yd. 22' W.
136	Tons	Seal Aggr. per Mi. (Sealcoat) 21# per Sq. Yd. 22' W.



Milepoint	Station
129	291 + 55.92
130	238 + 75.92
131	185 + 95.92
132	133 + 15.92
133	80 + 35.92

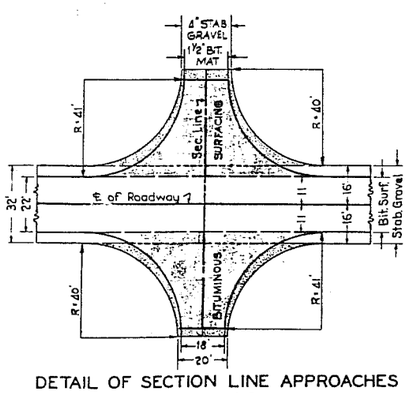
Hwy. # 281

L MIX MATERIAL
¼ NW¼ - 4-150-66
TATE OPTIONED

Feb. 29, 1940
Office Change
Sheet affected: 2A

-NOTES-

1. Subgrade Preparation Type A, as specified in Sec. 23 of the Standard Specifications, shall be included in the price bid for Item 34 A-1, Stabilized Gravel Base.
2. 10% added to estimated quantity to be used when and where directed by the Engineer.
3. See Special Provisions referring to this item.



DETAIL OF SECTION LINE APPROACHES
80 Tons Stabilized Gravel Base
120 Gals. Bit. SC-2 (Prime) 0.35 Gal. per Sq. Yd.
28 Tons Combined Aggregates
10 Gals. Bit. SC-4 per ton Combined Aggregate
100 Gals. Bit. RC-4 (Seal) 0.30 Gal. per Sq. Yd.
4 Tons Seal Aggregate (21# per Sq. Yd.)

SEC. LINE APPROACHES	
52+78.5	Rt.
106+09.8	Rt.-Lt. ✓
159+07.3	Rt.-Lt. ✓
264+82.4	Rt.-Lt. ✓
317+77.7	Rt.-Lt. (Dbl.) ✓
333+15	Rt. (Street) ✓
~~340+55~~	~~Rt. (Street)~~
Total No. of Approaches	6

STABILIZED GRAVEL BASE ITEMS				BITUMINOUS SURFACING CLASS "B"							
STABILIZED GRAVEL BASE ITEMS				BITUMINOUS SURFACING "CLASS B"							
MACHINE MIX METHODS				TRAVELING PLANT OR STATIONARY PLANT MIX METHODS							
		34 A-1	42 K-39	ASBIA ASBP	42 M	421-A5A	45 X				
		STABILIZED GRAVEL BASE	FURNISH AND APPLY BIT. SC-2 PRIMECOAT	COMBINED AGGREGATE	FURNISH BIT. SC-4 MIX	FURNISH AND APPLY BIT. RC-4 SEALCOAT	SEAL AGGREGATE				
		TONS	GALS.	TONS	GALS.	GALS.	TONS				
SUBTOTAL 4" BASE		258322	34461	5892	58789	20316	7089				
SUBTOTAL 8" BASE		2856	2100	312	3120	1100	38.0				
SUBTOTAL		286882	36561	6204	61909	21416	7489				
+10% add'l for Base Mat'l											
SEC. LINE APPR'S		505.6	729	196	1709	2065	551				
PVT. Drives		3900									
TOTAL		295838	37290	6400	63618	23481	8040				

APPROVED: DATE: 1-10-1939

STATE HIGHWAY ENGINEER
NORTH DAKOTA STATE HIGHWAY DEPARTMENT

RECOMMENDED FOR APPROVAL:

DISTRICT ENGINEER
PUBLIC ROADS ADMINISTRATION
FEDERAL WORKS AGENCY

APPROVED:

COMMISSIONER
PUBLIC ROADS ADMINISTRATION
FEDERAL WORKS AGENCY

FAP 296A (8)

FAP 296A (8)

COMPUTED BY: Cliff Altmon 8-26-38
CHECKED BY: J. Berg 9-14-38

Sh. 2-A

FED. ROAD DIST. NO.	STATE	FAP	FISCAL YEAR
4	N.D.	296A	

RELAY PIPE CULVERTS

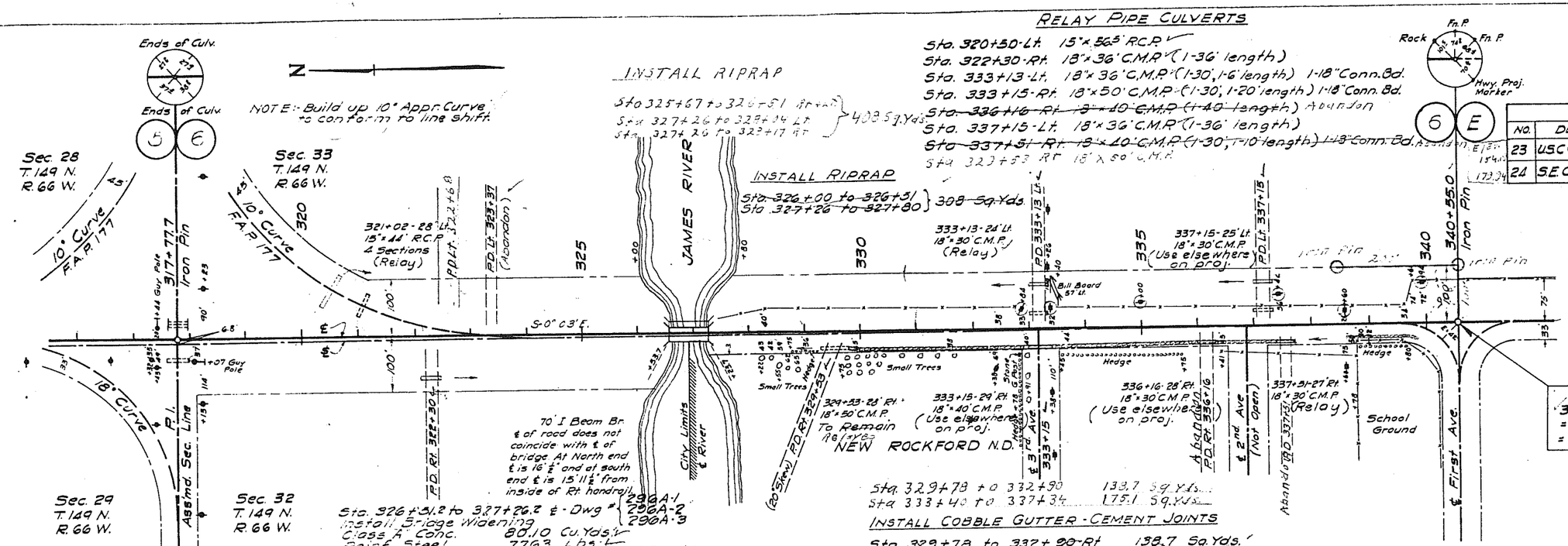
Sta. 320+50-Lt. 15"x 56.5' R.C.P.
Sta. 322+30-Rt. 18"x 36' C.M.P. (1-36' length)
Sta. 333+13-Lt. 18"x 36' C.M.P. (1-30', 1-6' length) 1-18" Conn. Bd.
Sta. 333+15-Rt. 18"x 50' C.M.P. (1-30', 1-20' length) 1-18" Conn. Bd.
~~Sta. 336+16-Rt. 18"x 40' C.M.P. (1-40' length)~~ Abandon
Sta. 337+15-Lt. 18"x 36' C.M.P. (1-36' length)
~~Sta. 337+51-Rt. 18"x 40' C.M.P. (1-30', 1-10' length) 1-18" Conn. Bd.~~ Abandon
Sta. 339+53-Rt. 18"x 50' C.M.P.

INSTALL RIPRAP

Sta. 325+67 to 329+51 Rt. and
Sta. 327+26 to 329+34 Lt.
Sta. 327+26 to 329+17 Rt.
} 408 Sq. Yds.

INSTALL RIPRAP

~~Sta. 326+00 to 326+31~~
~~Sta. 327+26 to 327+80~~ } ~~308 Sq. Yds.~~



BENCH MARKS			
NO.	DESCRIPTION	LOCATION	E
23	U.S.C.&G. Top N.W. Br.W.	326+52 - Rt.	1
24	S.E. Cor. Cistern Top	339+91 - 215' Rt.	

EQUATION
340+55.0 End of FAP 296A
= 0+74.93 of WPGH 8
= 287+70 of NRM 296 A.

Sta. 326+51.2 to 327+26.2 ℄ - Dwg. # 296A-1, 296A-2, 296A-3

Install Bridge Widening		
Class "A" Conc.	80.10 Cu. Yds.	
Reinf. Steel	7763 Lbs.	
Struct. Steel	32,900 Lbs.	34,950 Lbs.
Untr. Tim. Piling	466 Lin. Ft.	446.5 Lin. Ft.
Wet Str. Exc. Removing portions of old structure	62 Cu. Yds.	105
	Lump Sum	

Sta. 329+78 to 332+90 — 133.7 Sq. Yds.
Sta. 333+40 to 337+34 — 175.1 Sq. Yds.

INSTALL COBBLE GUTTER - CEMENT JOINTS

Sta. 329+78 to 332+90-Rt.	138.7 Sq. Yds.
Sta. 333+40 to 335+96-Rt.	113.8 Sq. Yds.
Sta. 336+36 to 337+31-Rt.	42.2 Sq. Yds.
Sta. 338+60 to 339+86-Rt.	56.0 Sq. Yds.

Sta. 329+78 to 337+25-Rt. Special 3.5' "V" ditch

Sta. 338+60 to 339+86-Rt. Special 2.0' "V" ditch

Uncl. Exc.	7878 Cu. Yds.	3717
Emb.	7878 Cu. Yds.	3717
Uncl. Exc.	3043 Cu. Yds.	
Emb.	3043 Cu. Yds.	
O.H.	242 Cu. Yd. Stas.	

Uncl. Exc. 281 Cu. Yds.
Emb. 281 Cu. Yds.

Sta. 322+30-Rt. 200 Cu. Yds. Provided 300 Cu. Yds. used For P.D. Approach

Sta. 322+66 Lt. 228 Cu. Yds. used For P.D. Approach

Sta. 333+13-Lt. 15 Cu. Yds. Provided 33 Cu. Yds. used For P.D. Approach

Sta. 337+15-Lt. 15 Cu. Yds. Provided 38 Cu. Yds. used For P.D. Approach

Sta. 329+53-Rt. 20 Cu. Yds. Provided For P.D. Approach No Emb. used

Sta. 333+15-Rt. Street Approach No Emb. used

Sta. 337+51-Rt. 80 Cu. Yds. Provided For P.D. Approach Abandon

Sta. 336+16-Rt. 50 Cu. Yds. Provided For P.D. Approach Abandon

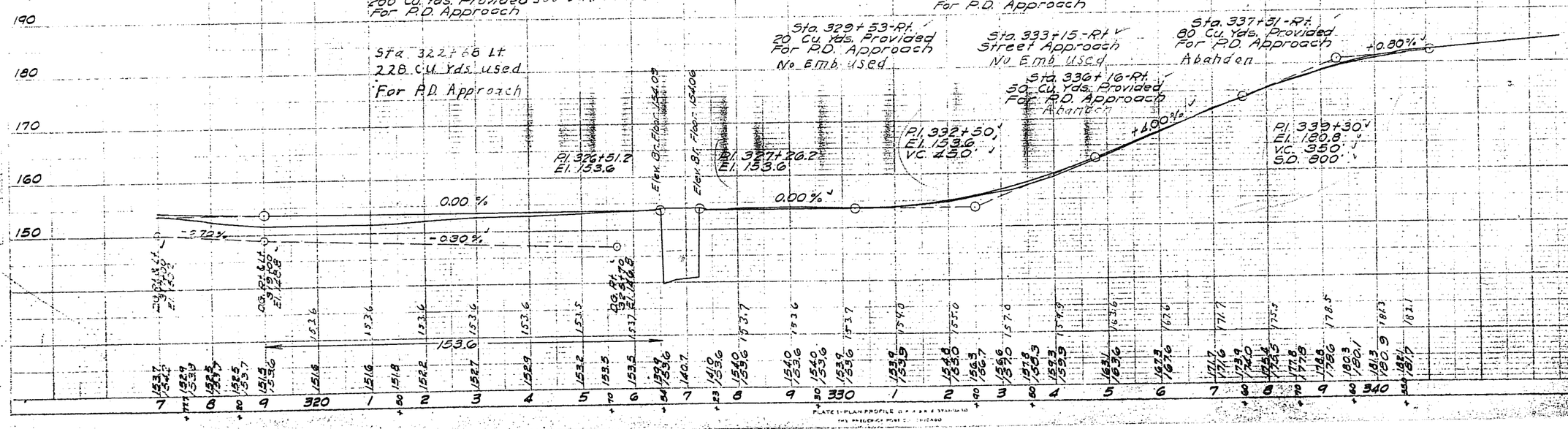
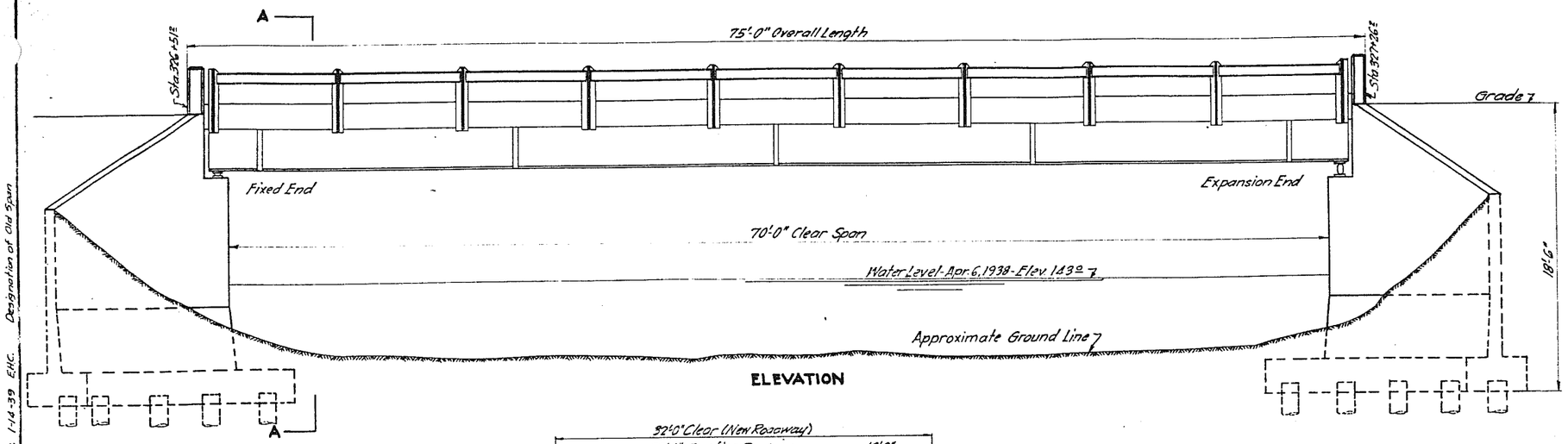
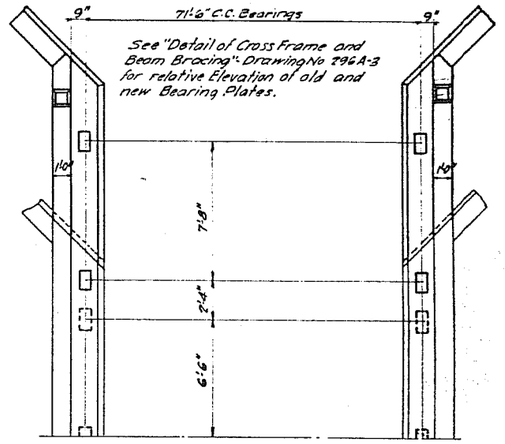


PLATE 1-PLAN PROFILE

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
4	N.D.	296-A		16	37

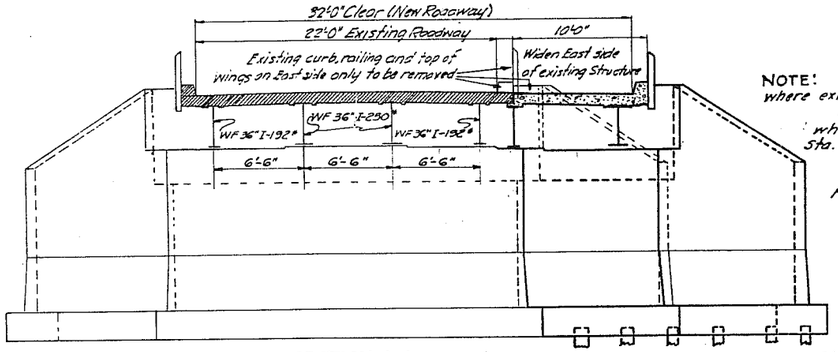


ELEVATION



PART PLAN OF BRIDGE SEATS

Showing Layout of Bearing Plates



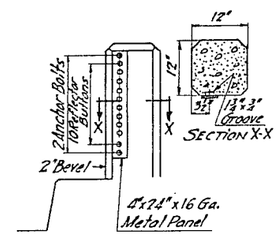
SECTION A-A

NOTE: Riprap slopes at all 4 corners of the bridge where existing riprap is disturbed or covered.
Place riprap from each abutment back to point where slope is 3:1 = Sta. 326+00 at North end and Sta. 327+80 at South end of Bridge.
Top of riprap @ Elev. 148.00.

Note: Present span is Highway Standard 70' I Beam, drawing No. I-70
Built on Project No. NRH-M 296A

Legend.
Old Structure
New Construction

NOTES:
All excavation for abutments shall be classified as Wet Structural Excavation.
The contract price for Structural Steel shall include all field drilling.



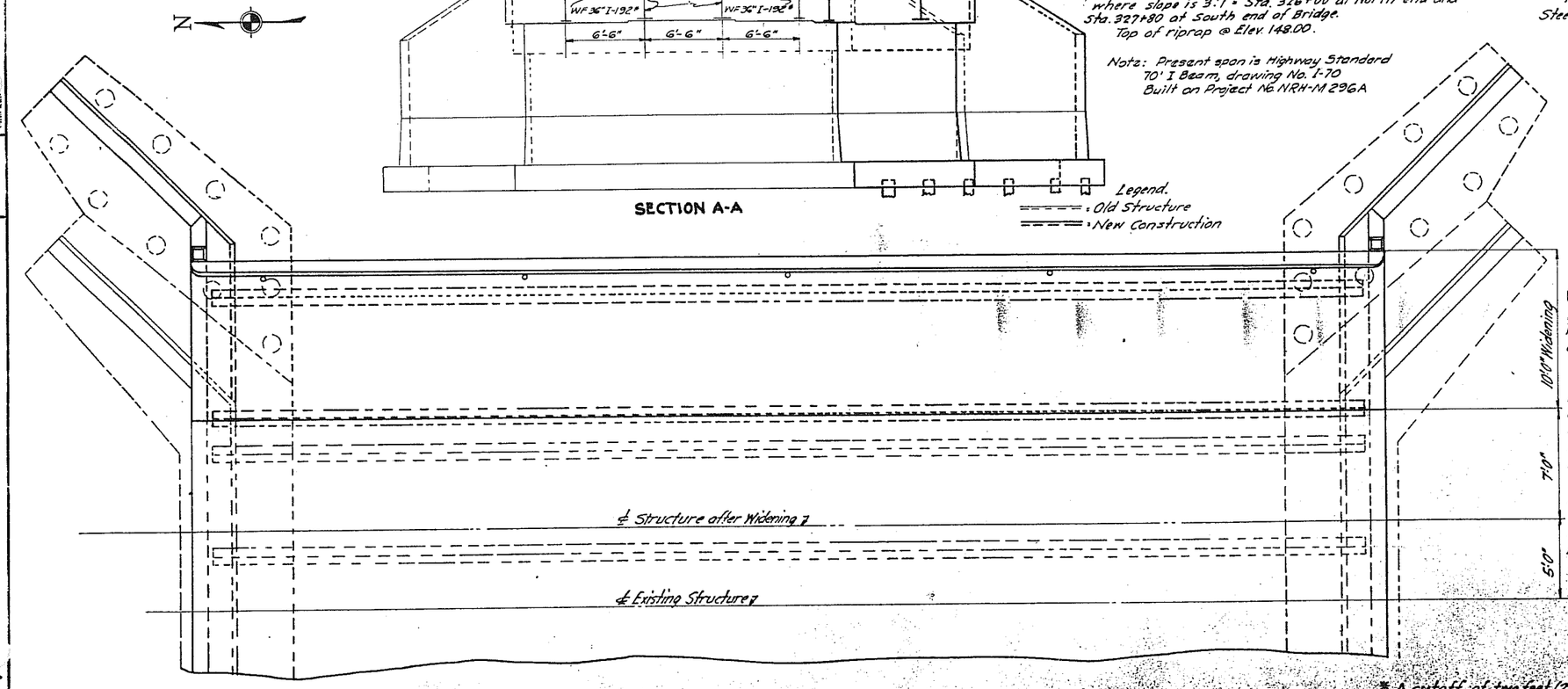
BRIDGE MARKER

BRIDGE MARKER:
North Dakota Highway Dep't. Std. Reflector Bridge Marker to be installed on all posts at ends of bridge.

Marker to consist of 4"x24"x16 ga. metal panel with a row of ten No. 2 uncolored reflector buttons at 2" center to center. Panel to be white enameled with a black bead along all edges and fastened to post with a ⅝"x3" button head cinch anchor bolt near each end.

Bridge Marker, complete with reflector units in place, to be included in contract price for Class "A" Concrete.

NOTE:
Old riprap to be removed and replaced or new riprap to be placed on new embankment at contractor's option. (Grading Item)



PART PLAN

Scale ¼"=1'-0"

* A cutoff of two feet (2') has been assumed in estimating the driven length (below cutoff) of piling as compared with the ordered length.

ESTIMATE OF QUANTITIES

TEMPORARY CROSSING AND DETOUR	NONE	
REMOVING OLD STRUCTURE	NONE	
STRUCTURAL EXCAVATION		
UNCLASSIFIED		CU. YD.
DRY		CU. YD.
WET	612	CU. YD.
UNTREATED TIMBER PILING 20 to 25 FT.		
Piling in place *	460	LIN. FT.
TREATED TIMBER PILING to FT.		
FURNISHING AND DELIVERING		LIN. FT.
DRIVING		LIN. FT.
UNTREATED TIMBER		M. B. M.
TREATED TIMBER		M. B. M.
CONCRETE CLASS "A"	801	CU. YD.
" " " "		CU. YD.
REINFORCING STEEL	7763	LB.
STRUCTURAL STEEL	94900	LB.
RIPRAP, PLAIN JOINT (GRADING ITEM)	308	SQ. YD.
GRAVEL WEARING SURFACE (Not Pay Item)		CU. YD.
Removing Portions of old Structure	LUMP SUM	

STRUCTURAL DRAWINGS

GENERAL DRAWING	296 A-1 (This sheet)
SUBSTRUCTURE	296A-2
SUPERSTRUCTURE	296A-3

NORTH DAKOTA
STATE HIGHWAY DEPARTMENT

BRIDGE LAYOUT

F. A. P. No. 296 A STA. 326+51 to Sta. 327+26

EDDY COUNTY

Approved 9-10 Clifford Johnson
Chief Engineer

296A-1

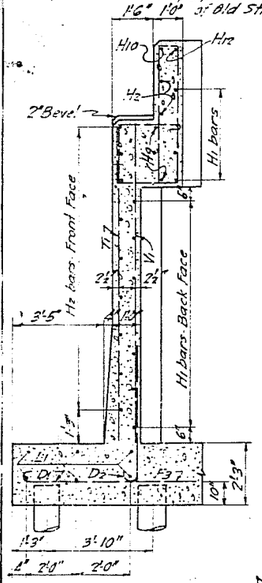
Rev. 1-14-39 EHC. Designation of Old Span

DRAWN BY W. C. Johnson
TRACED I.C.R.
CHECKED T.C.J.

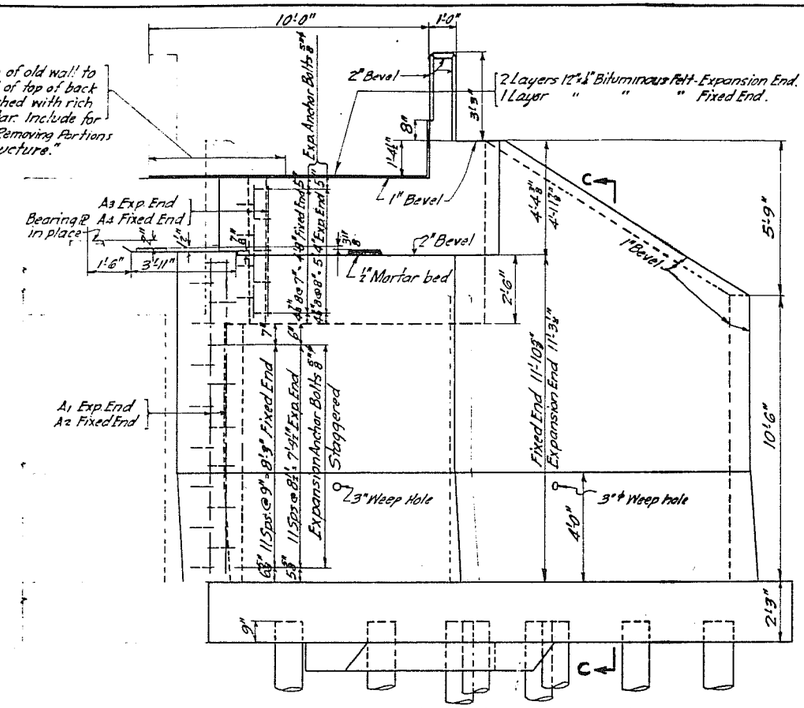
STRUCTURE
QUANTITIES

296A-

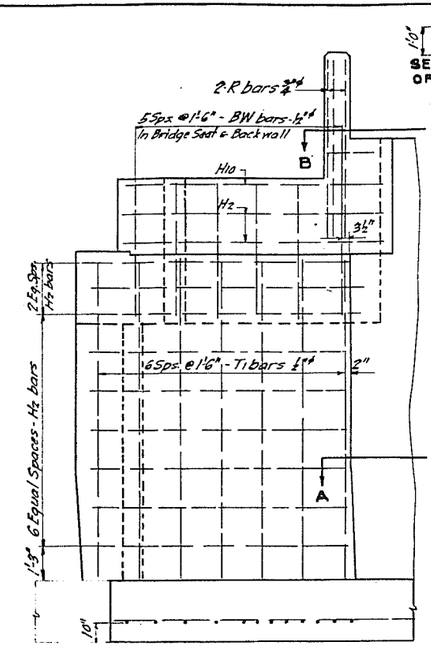
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
4	N.D.	296-A		17	37



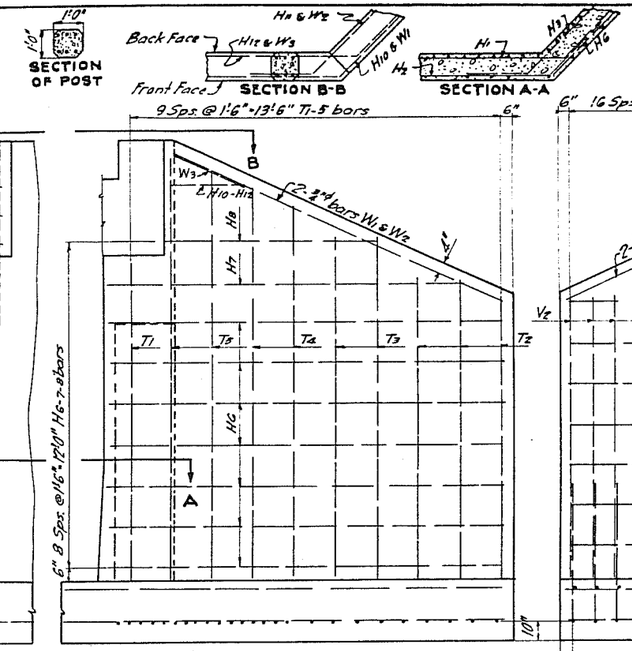
SECTION OF WALL



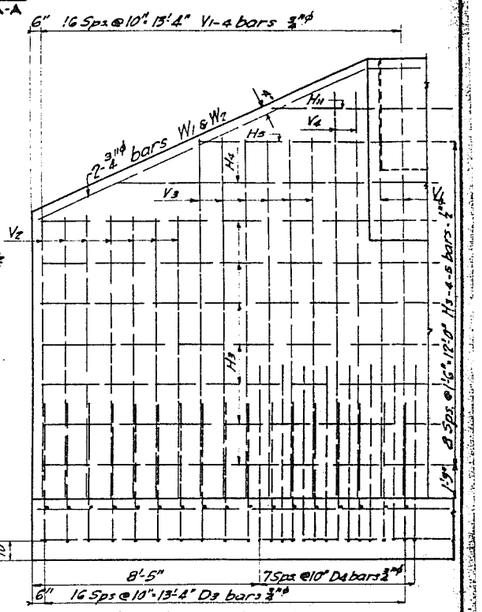
ELEVATION
Showing Dimensions



ELEVATION OF WALL
Showing Reinforcement in front face.



ELEVATION OF WING
Showing Reinforcement in front face.



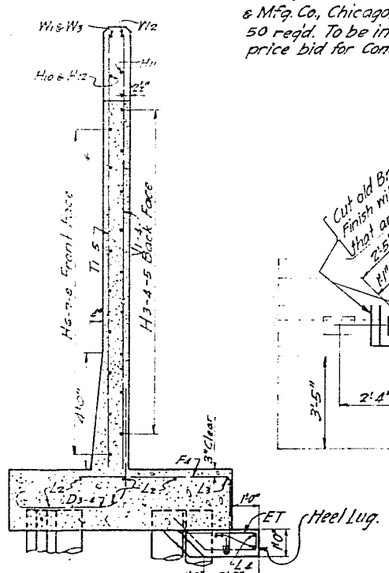
ELEVATION OF WING
Showing Reinforcement in back face.

NOTE: *Expansion Anchor Bolts to be Hook Bolts, ¾"ϕ x 11"; Manufactured by American Expansion Bolt & Mfg. Co., Chicago, Ill., or equal. 50 reqd. To be included in the price bid for Conc. Class "A"*

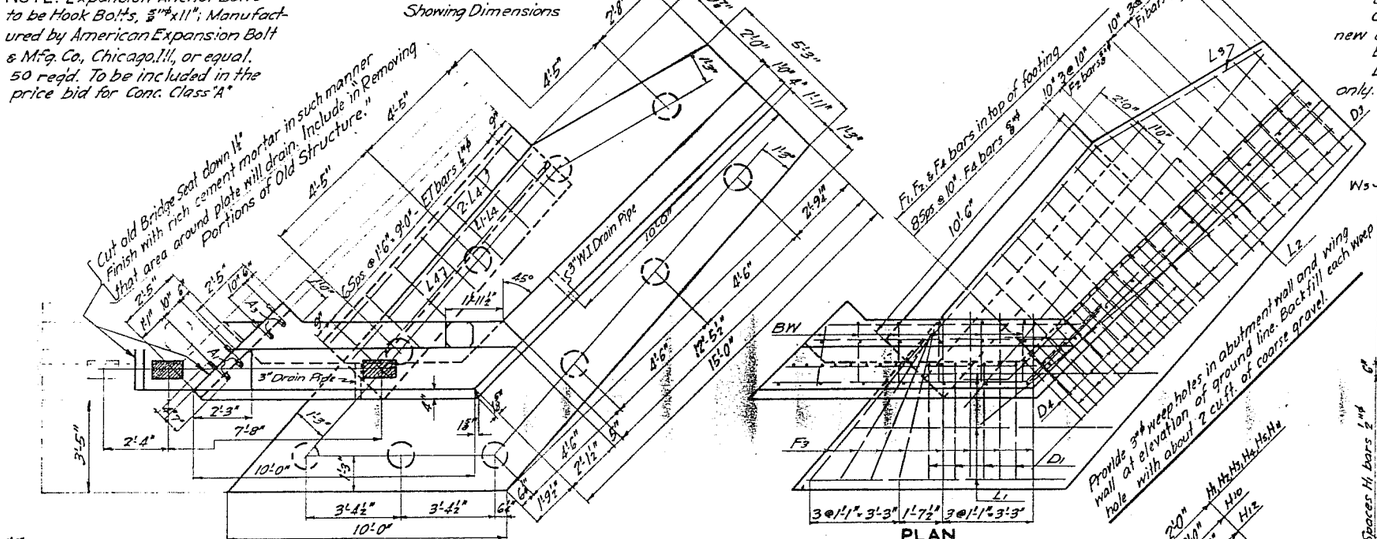
CONSTRUCTION NOTES:
Bend L3 Bars in field as shown.
Contact surfaces between old and new concrete to be carefully cleaned.
Bevel all exposed edges 1" except as shown.
Extend both abutments on East end only.

BAR LIST (*For Two Abutments*)

MARK	SIZE	NO.	LENGTH	SHAPE	MARK	SIZE	NO.	LENGTH	SHAPE
A1	¾"ϕ	2	11'-0"	Straight	H9	½"ϕ	4	9'-9"	Straight
A2	"	2	11'-9"	"	H10	"	2	12'-6"	Bent
A3	"	2	5'-9"	"	H11	"	2	5'-0"	"
A4	"	2	5'-3"	"	H12	"	2	11'-10"	"
BW1	½"ϕ	6	18'-6"	Bent	L1	"	12	9'-9"	Straight
BW2	"	6	17'-3"	"	L2	"	10	17'-0"	"
D1	½"ϕ	8	8'-9"	"	L3	"	2	17'-3"	"
D2	"	8	6'-4"	"	L4	"	8	10'-3"	"
D3	"	34	7'-6"	"	R	¾"ϕ	12	7'-3"	"
D4	"	16	10'-6"	"	T1	½"ϕ	16	11'-2"	"
ET	½"ϕ	14	6'-10"	"	T5	"	6	10'-3"	"
F1	"	8	5'-0"	Straight	T3	"	4	12'-6"	"
F2	½"ϕ	8	6'-3"	"	T4	"	4	14'-0"	"
F3	½"ϕ	16	8'-10"	Bent	T5	"	4	15'-3"	"
F4	½"ϕ	18	10'-8"	"	V1	¾"ϕ	20	11'-2"	"
H1	½"ϕ	22	11'-6"	"	V2	"	14	10'-6"	"
H2	"	22	11'-6"	"	V3	"	12	13'-3"	"
H3	"	14	17'-3"	"	V4	"	4	15'-6"	"
H4	"	2	14'-0"	"	V5	"	8	7'-0"	"
H5	"	2	9'-0"	"	W1	"	2	15'-7"	Bent
H6	"	14	14'-9"	Straight	W2	"	2	15'-7"	"
H7	"	2	12'-6"	"	W3	"	2	5'-0"	"
H8	"	2	7'-6"	"					

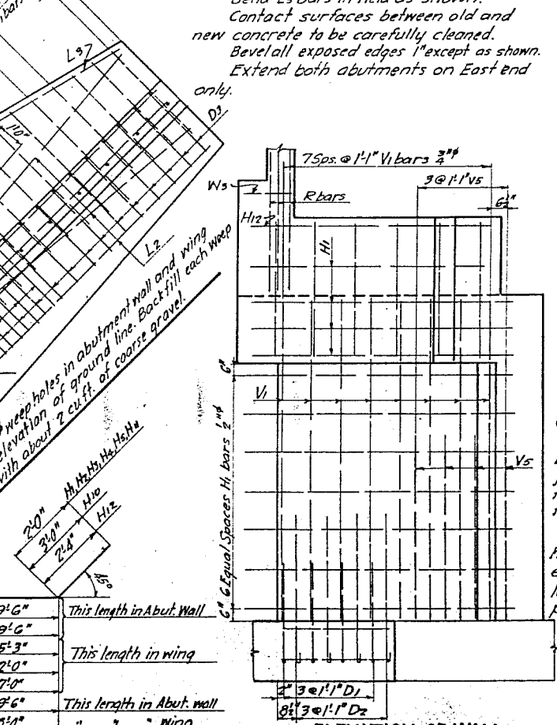


SECTION C-C



PLAN
Showing Dimensions; and Reinforcement in heel lug.

PLAN
Showing Reinforcement.



ELEVATION OF WALL
Showing Reinforcement in back face

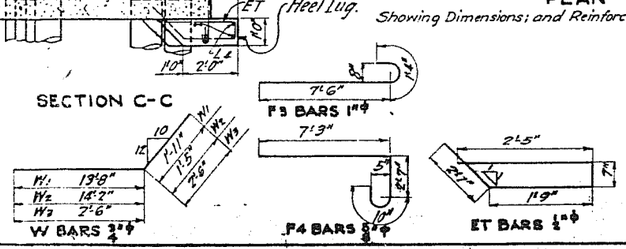
H1	9'-6"	This length in Abut. Wall
H2	9'-6"	
H3	15'-3"	This length in wing
H4	12'-0"	
H5	7'-0"	
H10	9'-6"	This length in Abut. wall
H11	3'-0"	" " " Wing
H12	9'-6"	" " " Abut. Wall

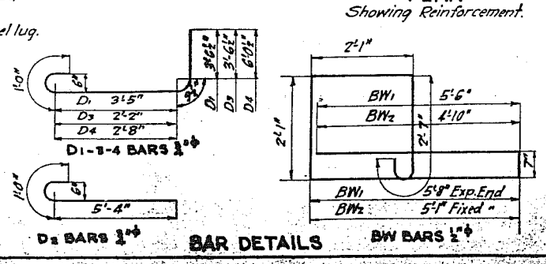
H1-2-3-4-5-10-11-12 BARS ½"ϕ

GENERAL NOTE:
Expansion Anchor Bolts, Bituminous Felt, paving joint filler and weep hole pipes to be included in price bid for Class "A" concrete.

**A cutoff of two feet (2') has been assumed in estimating the driven length (below cutoff) of piling as compared with the ordered length.*

QUANTITIES FOR ABUT. EXTENSIONS		
ITEMS	Exp End	Fixed End
Concrete Class "A"	278 Cu.Yd.	278 Cu.Yd.
Reinforcing Steel	2144 Lbs.	2140 Lbs.
Untreated Timber Piles	10 @ 25'	10 @ 25'
Piling in place*	230 L.F.	230 L.F.
Str. Excavation, Dry	Cu.Yd.	Cu.Yd.
" " Wet	372 Cu.Yd.	372 Cu.Yd.





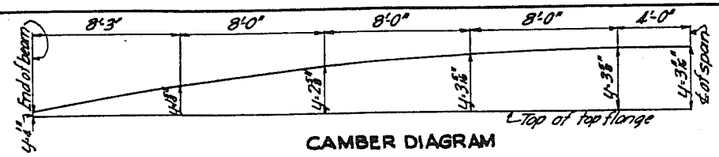
BAR DETAILS

BRIDGE WIDENING
STA. 326+51± TO STA. 327+26±
NORTH DAKOTA F.A.P. 296A
EDDY COUNTY
ABUTMENT DETAILS

296A-17

296A-17

FED. ROAD DIST. NO.	STATE	FEDERAL NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
4	N.D.	2961		18	37



CAMBER DIAGRAM

GENERAL NOTES:

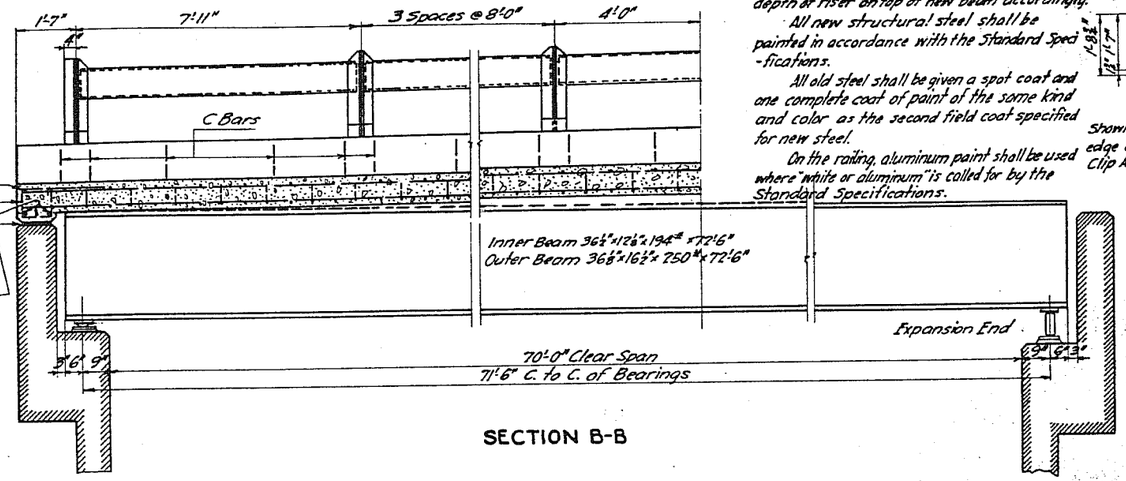
Old Handrail to be carefully removed and placed on new curb as shown. Old drain pipes to remain in place.

Top of curb and gutter line to conform to Camber Diagram as shown. Top of new slab to match old slab of joint, varying depth of riser on top of new beam accordingly.

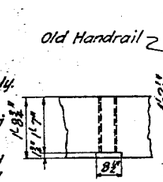
All new structural steel shall be painted in accordance with the Standard Specifications.

All old steel shall be given a spot coat and one complete coat of paint of the same kind and color as the second field coat specified for new steel.

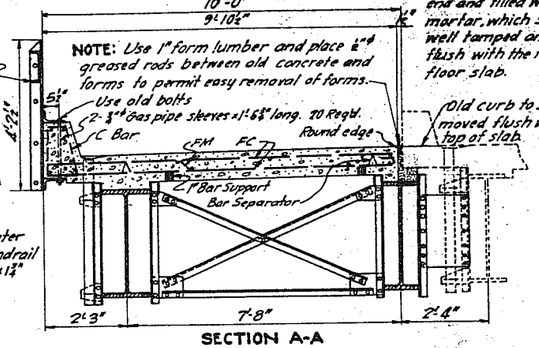
On the railing, aluminum paint shall be used where "white or aluminum" is called for by the Standard Specifications.



SECTION B-B



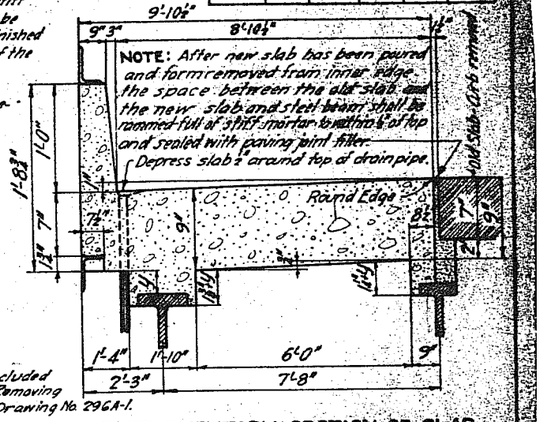
DETAIL
Showing notch in outer edge of slab for Handrail Clip Angles. - 8½"x 7½"x 1⅞"



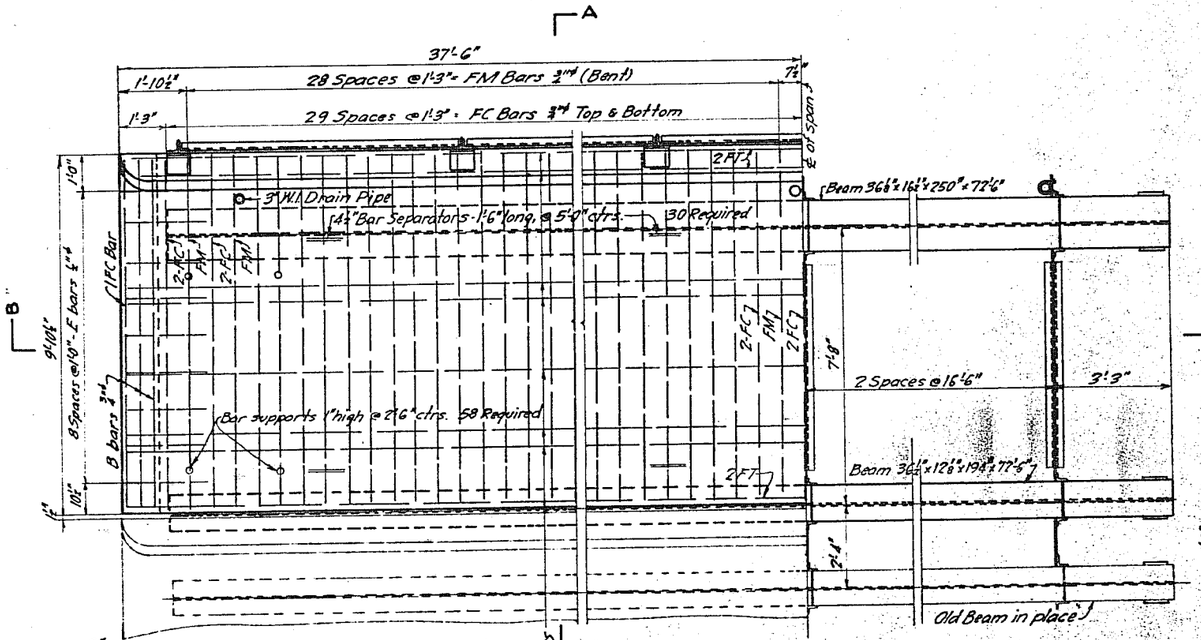
SECTION A-A
Showing reinforcing & Cross Framing.

The old drains shall be plugged at the bottom end and filled with stiff mortar, which shall be well tamped and finished flush with the top of the floor slab.

NOTE: Removal of curb to be included for payment in lump sum for "Removing Portions of Old Structure." See Drawing No. 296A-1.

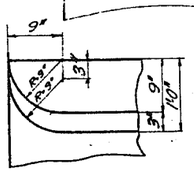


SUPPLEMENTARY SECTION OF SLAB
SCALES:- Vert: 1½"=1'-0" Horizontal: ½"=1'-0"

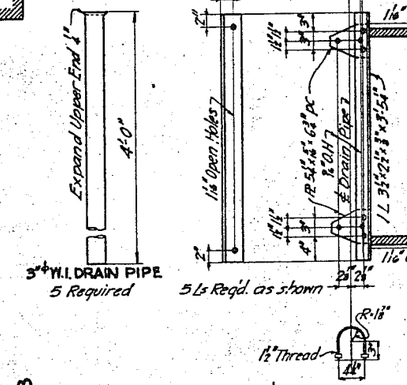


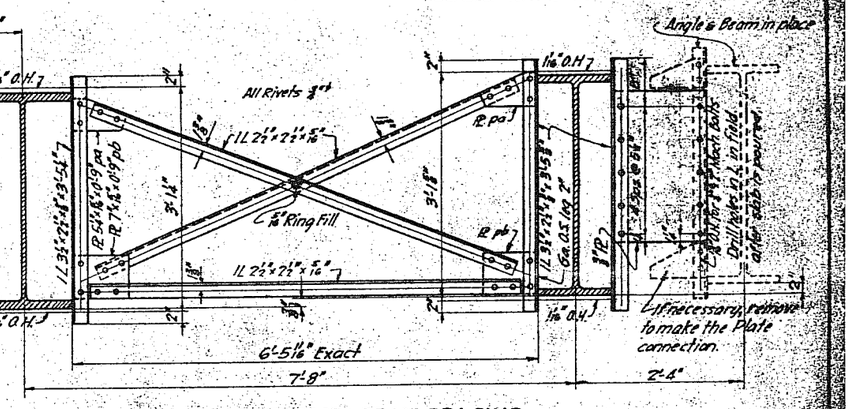
HALF PLAN
Showing Slab Reinforcement

HALF PLAN
Showing Beams & Cross Frames

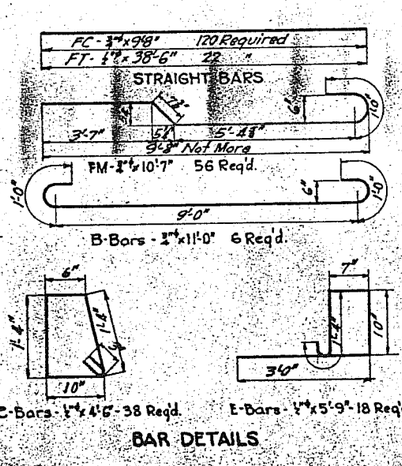


END DETAIL OF CURB

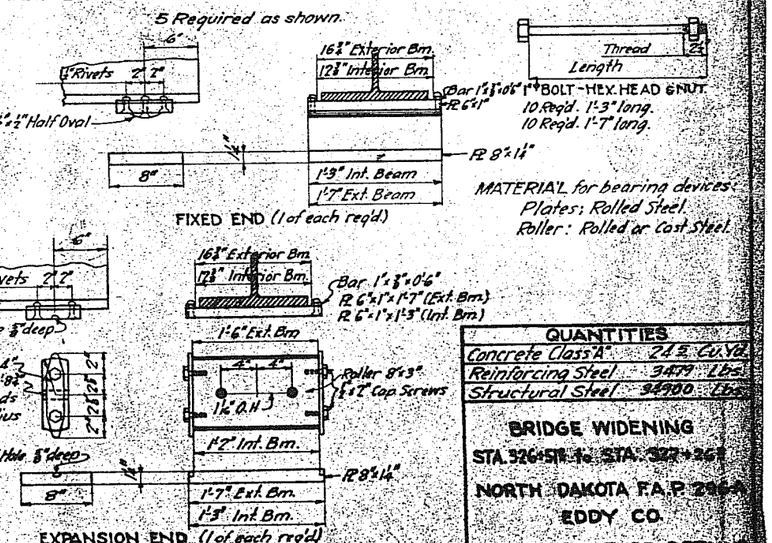




DETAIL OF CROSS FRAME & BEAM BRACING



BAR DETAILS



FIXED END (1 of each req'd)

EXPANSION END (1 of each req'd)
BEARING DEVICES

QUANTITIES		
Concrete Class "A"	21.5	Cu. Yd.
Reinforcing Steel	3477	Lbs.
Structural Steel	34900	Lbs.

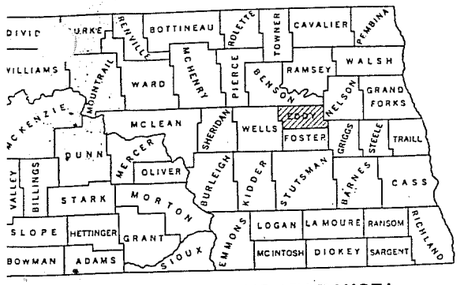
BRIDGE WIDENING
STA. 326+51.1 to STA. 327+26.1
NORTH DAKOTA F.A.P. 296-A
EDDY CO.
SUPERSTRUCTURE DETAILS

296A-2

CHECKED BY I.C.F. MADE BY E.C. Jacobsen CHECKED BY I.C.F.

281-123.331

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
4	N. D.	296.A. Re.		1	21



SKETCH-MAP OF NORTH DAKOTA
SHOWING COUNTIES

N
W E
S

SCALES
LAYOUT SHEET: 1 IN. = 350 FT.
PLAN AND PROFILE DRAWINGS HOR. 1 IN. = 100 FT. VERT 1 IN. = 10 FT.
STRUCTURAL DRAWINGS:— AS SHOWN
CROSS SECTION SHEETS:— 1 IN. = 5 FT.

NORTH DAKOTA

STATE HIGHWAY COMMISSION

PLANS

FOR THE PROPOSED IMPROVEMENT OF A

STATE HIGHWAY

IN EDDY COUNTY

FEDERAL AID PROJECT NO. 296·A·Re

DESCRIPTION· *Beg. at Sta. 261+90 I -a point 303.6 ft. North of the S.E. Cor. of Sec. 29 -T.149 N.-R.66 W. -thence South along Sec. Line to Sta. 292+23.3 P.C. thence Southwesterly to Sta. 296+73.1 -thence West along the center line of First Ave. S. in the City of New Rockford, to Sta. 316+72.3 = Sta. 317+26.8 on F.A.P. #296.A. the Center line of First St. E. - the End of F.A.P. # 296.A.Re.*

INDEX OF DRAWINGS

SHEET NO. 1 TITLE PAGE
SHEET NO. 2 TYPICAL SECTIONS & SUMMARY OF QUANTITIES
SHEET NO. 3 CULVERT & BRIDGE LIST
SHEETS NOS. 4 TO 5 INCL. PLAN AND PROFILE DRAWINGS
SHEETS NOS. 6 TO 10 INCL. STRUCTURAL DRAWINGS
SHEETS NOS. 11 TO 21 INCL. CROSS SECTIONS

SPECIFICATIONS TO GOVERN. *As Submitted for Approval Mar. 26, 1932-*

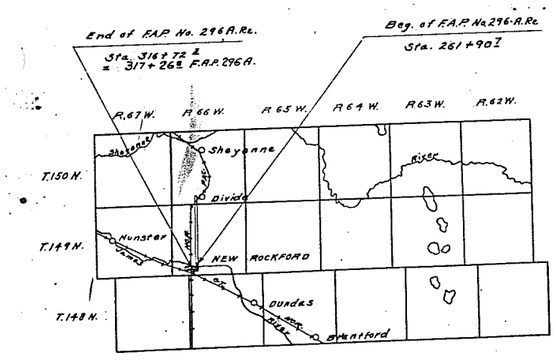
LENGTH OF PROJECT		
SEC.	MILES-GROSS	MILES-NET
A	7.524	7.558
A-Re		1.038
D		
TOTALS	7.560 Mi.	7.560

Grade A *New Const.*

NOTE- [illegible] F.A.P. 296.A Re.
7.560 Mi. Gross - Net.
Project [illegible] by [illegible] M.
[illegible] Rockford.

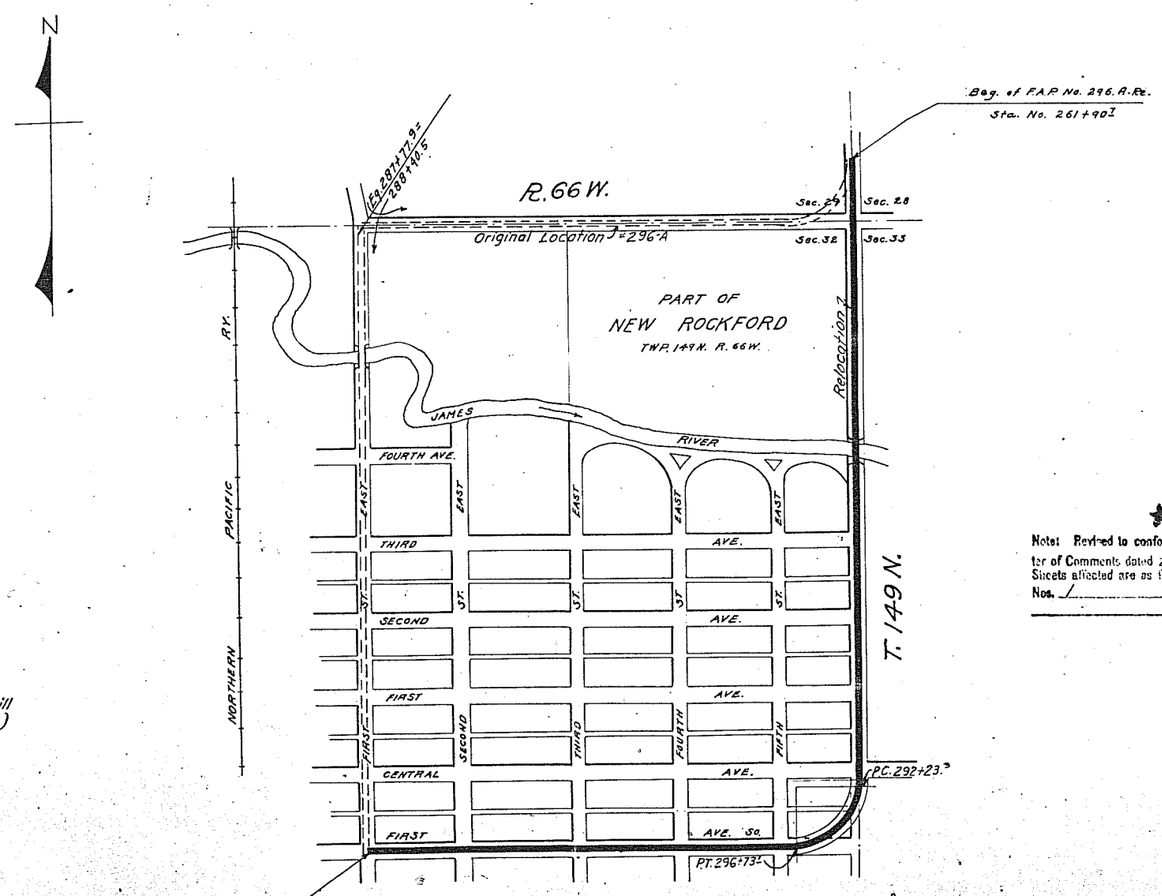
KEY TO CONVENTIONAL SIGNS

STATE & NATIONAL LINES
COUNTY LINE
TOWNSHIP & RANGE LINES
GRADE LINE
CENTERLINE OF CONSTRUCTION (500)
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 / GRADE ELEVATION (643.0 / 641.0 / 245)
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 (B M)
WATERS EDGE
MARSH
WIRE ROPE GUARD RAIL
SNOW FENCE
RIPRAP
GUARDS POSTS
COBBLE GUTTERS
CONCRETE GUTTERS (CONCRETE GUTTER)



SKETCH MAP of EDDY CO.

NOTE: *Ample Guard Rail Protection will be Provided for (without Fed. Aid) Contract will be let later*



LAYOUT MAP
SCALE = 1 inch = 350 ft.

APR 7

Note: Revised to conform to B. P. R. Letter of Comments dated Apr. 6, 1932
Sheets affected are as follows:—
Nos. 1

STATE OF NORTH DAKOTA
DEPARTMENT OF STATE HIGHWAYS
APPROVED AND SUBMITTED TO BUREAU OF PUBLIC ROADS
DATE May 31 1932 [redacted]
CHIEF ENGINEER

U. S. DEPARTMENT OF AGRICULTURE
BUREAU OF PUBLIC ROADS
EXAMINED BY [redacted]
RECOMMENDED FOR APPROVAL. [redacted]
DISTRICT ENGINEER
RECOMMENDED FOR APPROVAL: [redacted]
CHIEF ENGINEER
APPROVED: [redacted]
CHIEF OF BUREAU
APPROVED BY THE SECRETARY OF AGRICULTURE [redacted]

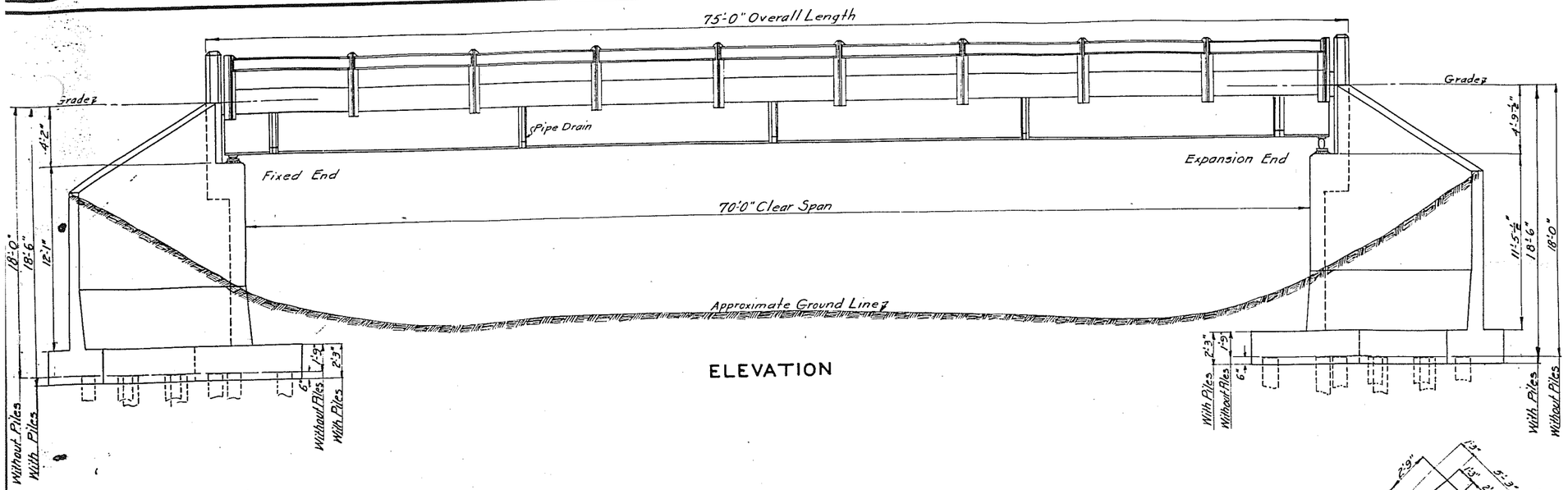
EDDY, CO.

TE: [illegible]ers will be erected by the State [illegible]out [illegible]eral Aid Showing: "Beginning of [illegible]ject" and "End of Project."

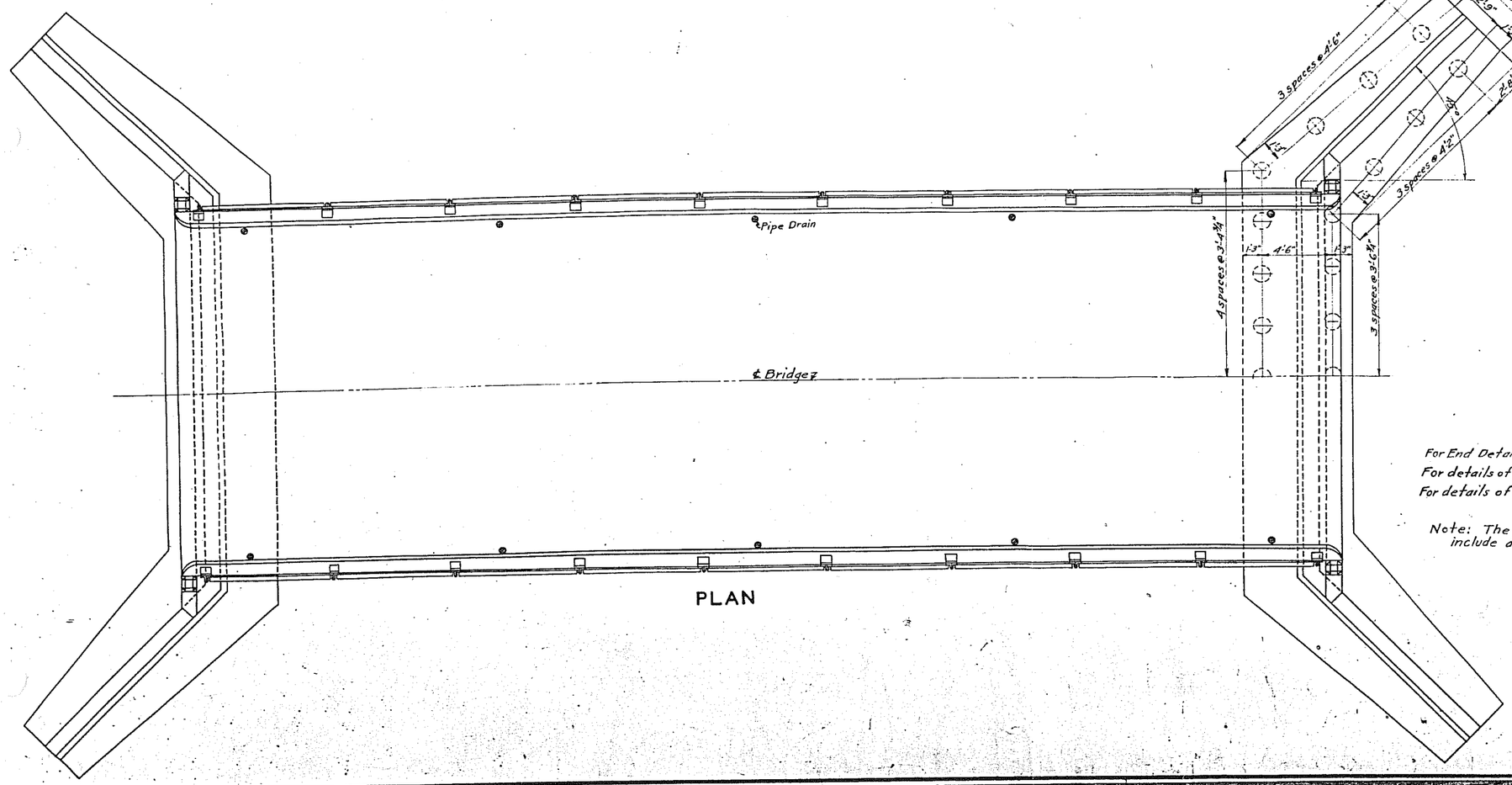
TE: Right-of-Way necessary to construct project according to the approved plans [illegible] be acquired.

Signed: [redacted]
Chief Engineer and Sec'y

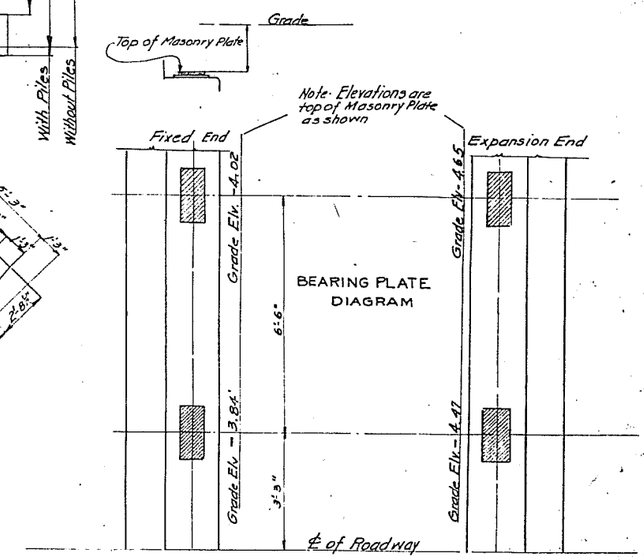
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
4	N. D.	[illegible]		6	14



ELEVATION



PLAN



BEARING PLATE DIAGRAM

For End Details see Sheet # I-00.
For details of Superstructure see Sheet # I-70
For details of Substructure see Sheet # 18-I-A

Note: The price bid for concrete shall include all Bituminous felt, etc.

WITH PILING		WITHOUT PILING	
F.A.P.	Station	F.A.P.	Station
368-C	637+62.5		
296-B	274+00.0		

QUANTITIES FOR ENTIRE BRIDGE	
WITHOUT PILING	
Concrete Class "A"	172.4 Cu. Yds.
Reinforcing Steel	17090 Lbs.
Structural Steel	73217 Lbs.
WITH PILING	
Untreated Timber Piles	56 Required
(See Layout Sheet for Lengths of Piles)	
Concrete Class "A"	186.4 Cu. Yds.
Reinforcing Steel	17842 Lbs.
Structural Steel	73217 Lbs.

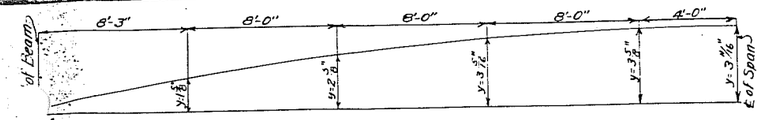
NORTH DAKOTA
STATE HIGHWAY DEPARTMENT
STANDARD
I-BEAM BRIDGE
CLEAR SPAN 70'-0"
CLEAR ROADWAY 22'-0"
NOMINAL ABUTMENT HEIGHT 18'-0"

APPROVED 3-14 1931 Clifford Johnson
BRIDGE ENGINEER

APPROVED Mar 17 1931 [illegible]
CHIEF ENGINEER

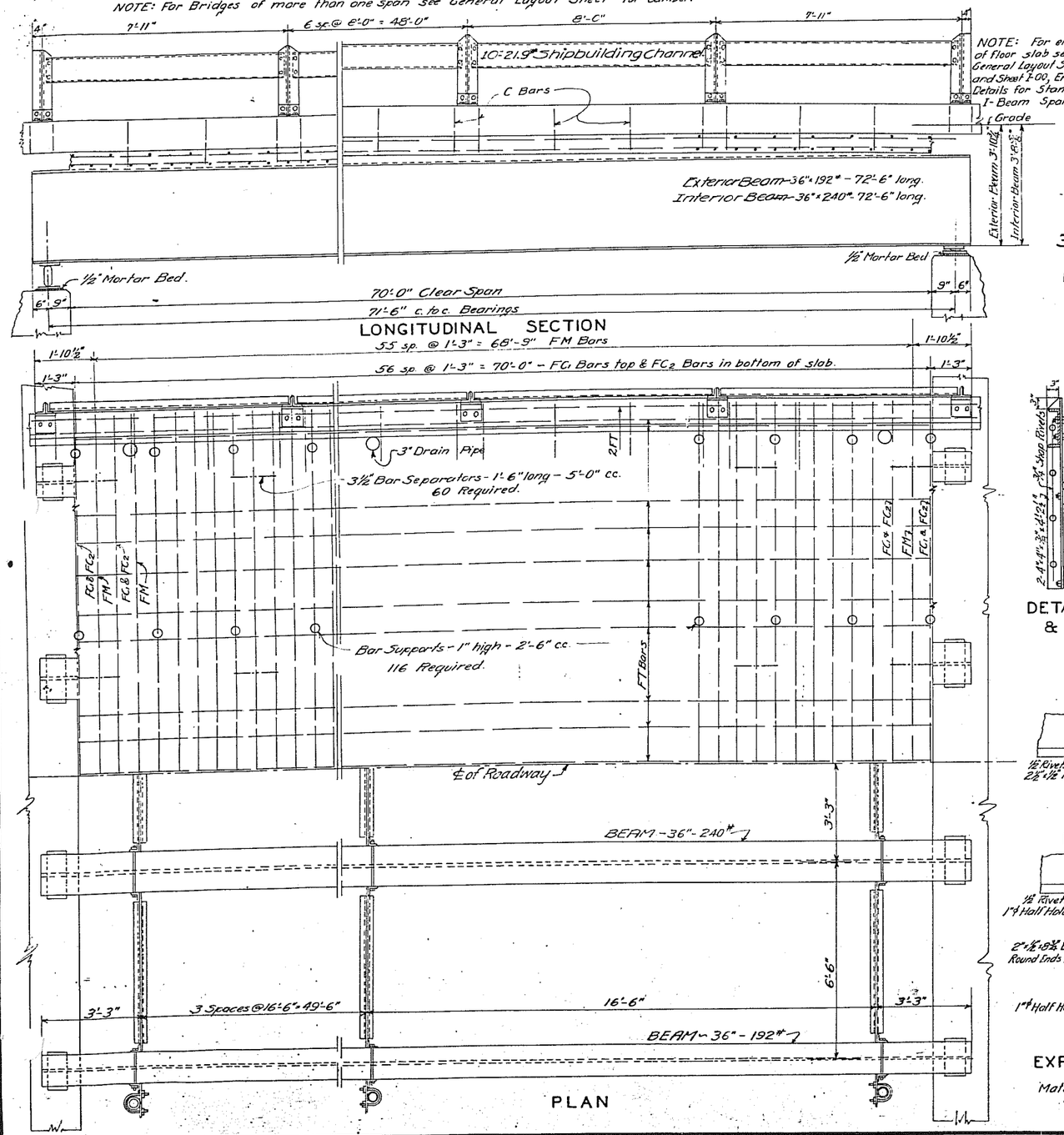
81-81-T

FED. ROAD DIST. No.	STATE	FED. AID PROJ. No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
4	N. D.				



CAMBER DIAGRAM

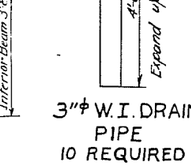
NOTE: For Bridges of more than one span see General Layout Sheet for Camber.



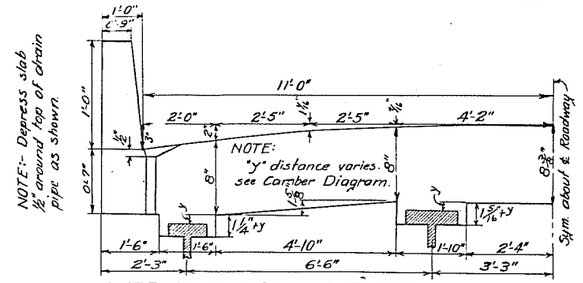
LONGITUDINAL SECTION

PLAN

NOTE: For end details of floor slab see General Layout Sheet and Sheet I-00, End Details for Standard I-Beam Spans.

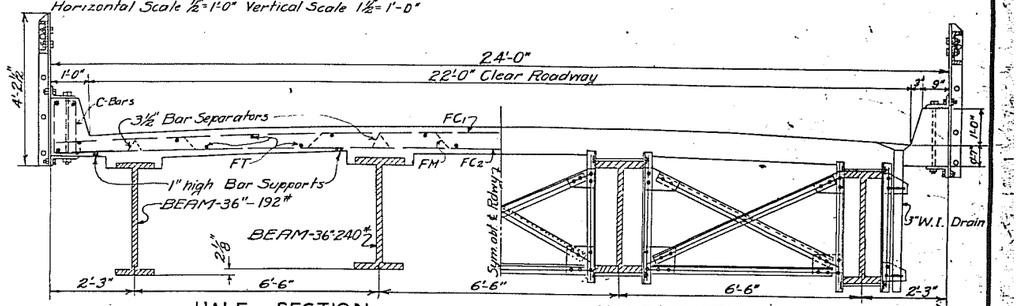


3"ϕ W.I. DRAIN PIPE
10 REQUIRED



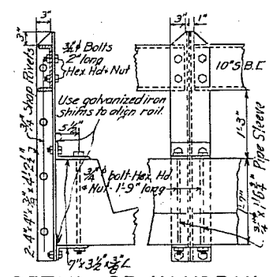
SUPPLEMENTARY HALF-SECTION OF SLAB

Horizontal Scale ½" = 1'-0" Vertical Scale 1½" = 1'-0"

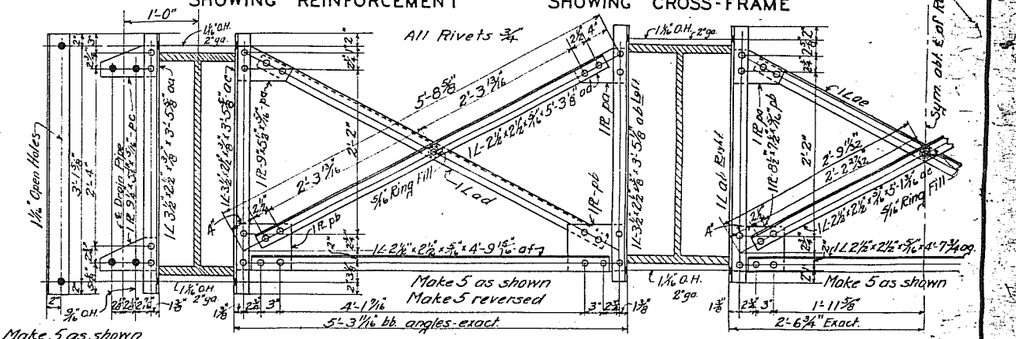


HALF SECTION SHOWING REINFORCEMENT

HALF SECTION SHOWING CROSS-FRAME



DETAIL OF HANDRAIL & CONNECTION

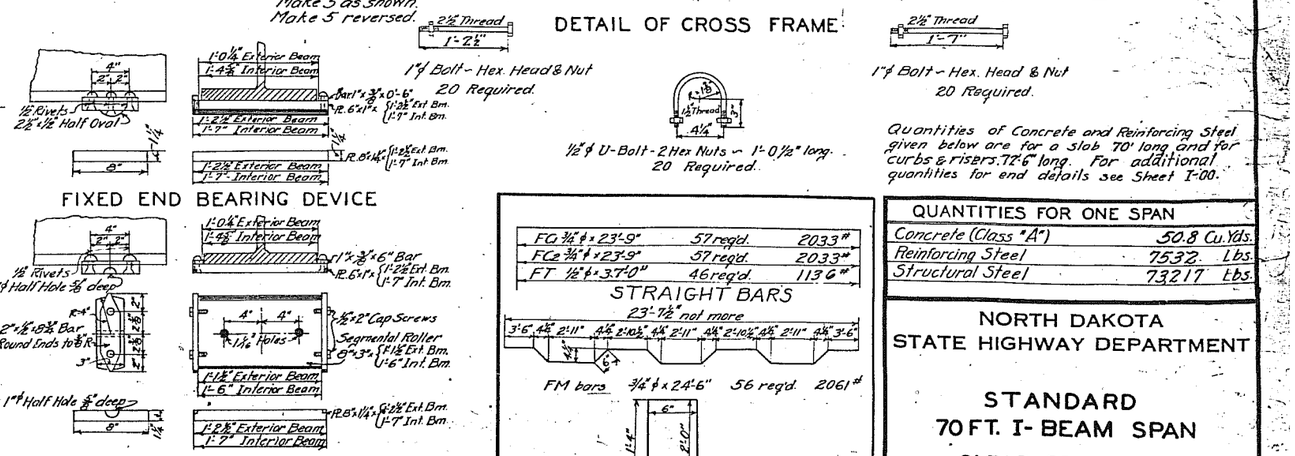


DETAIL OF CROSS FRAME

FIXED END BEARING DEVICE

EXPANSION END BEARING DEVICE

Material: Plates, Rolled Steel.
Roller, Rolled or Cast Steel.



Quantities of Concrete and Reinforcing Steel given below are for a slab 70' long and for curbs & risers 72'-6" long. For additional quantities for end details see Sheet I-00.

FC1 ¾" ϕ x 23'-9"	57 req'd.	2033#
FC2 ¾" ϕ x 23'-9"	57 req'd.	2033#
FT ½" ϕ x 37'-0"	46 req'd.	1136#

STRAIGHT BARS

23'-7½" not more

FM bars ¾" ϕ x 24'-6" 56 req'd. 2061#

C bars 1½" ϕ x 5'-3" 76 req'd 267#

BAR DETAILS

All dimensions c. to c. of bars.

QUANTITIES FOR ONE SPAN		
Concrete (Class "A")	50.8	Cu. Yds.
Reinforcing Steel	7532.	Lbs.
Structural Steel	73217	Lbs.

NORTH DAKOTA
STATE HIGHWAY DEPARTMENT

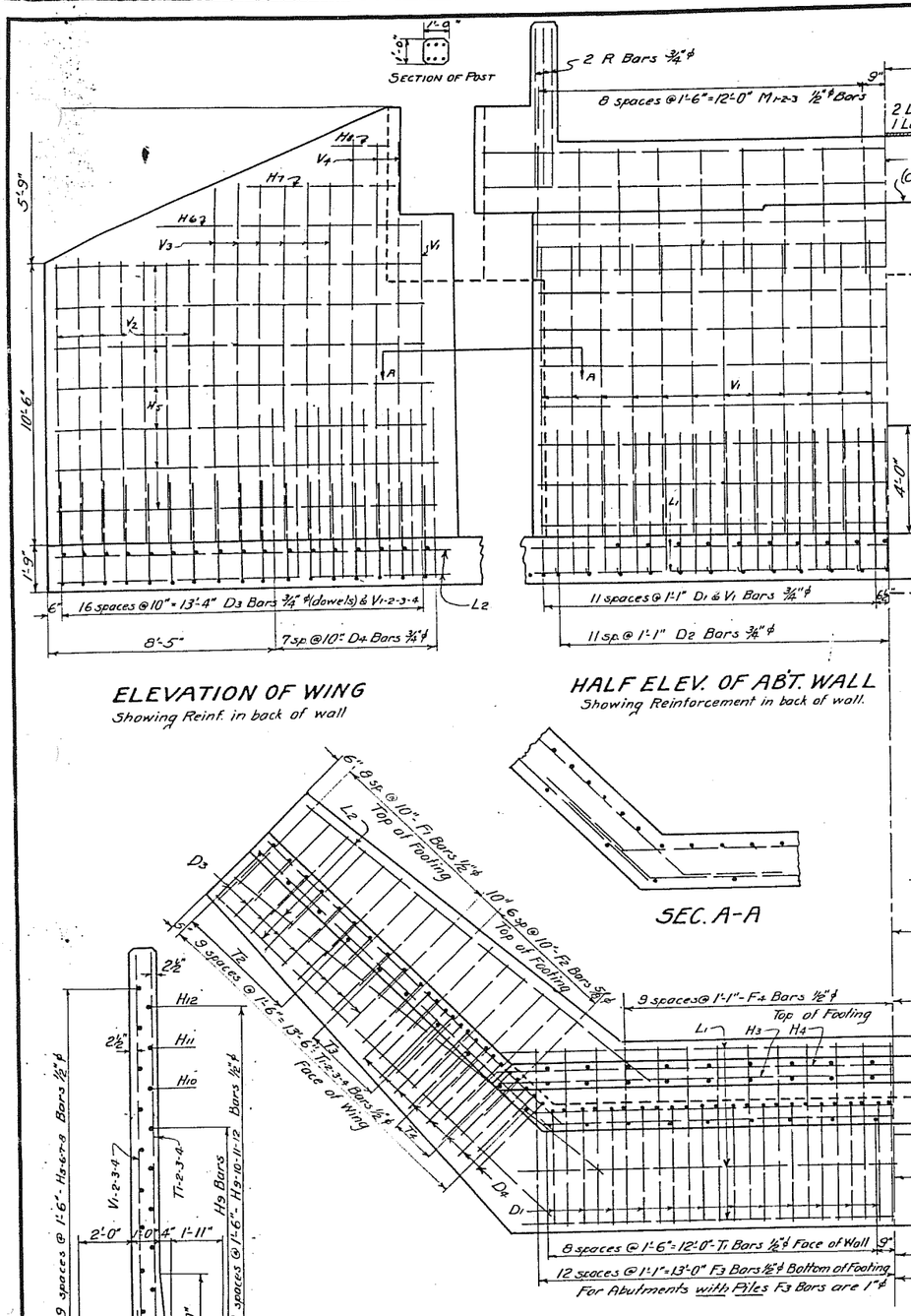
STANDARD
70 FT. I-BEAM SPAN

CLEAR ROADWAY 22'-0"

APPROVED Sept 2 1931 Frank E. Cass
ASST. BRIDGE ENGINEER

APPROVED 9-2 1931 L. C. Frahm
CHIEF ENGINEER

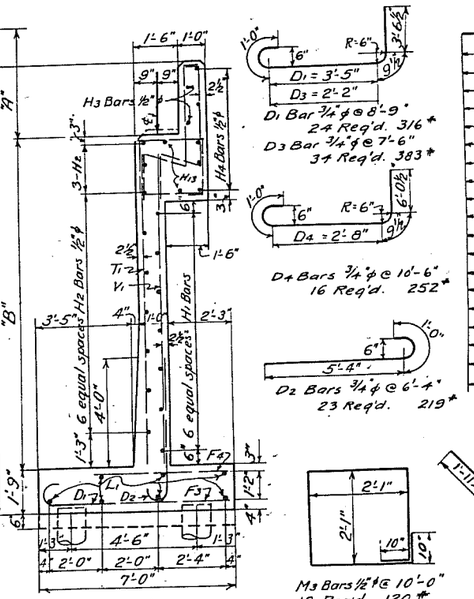
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
4	N.D.				



ELEVATION OF WING
Showing Reinf. in back of wall

HALF ELEV. OF AB'T. WALL
Showing Reinforcement in back of wall.

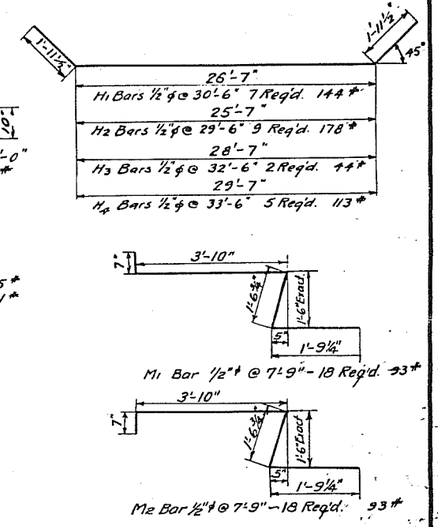
HALF ELEVATION
Showing Outlines



SEC. OF AB'T. WALL

V1	Bars	¾"ϕ @ 11'-3"	26	Req'd.	439#
T1	"	½"ϕ @ 11'-3"	20	"	150#
F4	"	½"ϕ @ 4'-6"	19	"	57#
V2	"	¾"ϕ @ 10'-6"	14	"	221#
V3	"	¾"ϕ @ 13'-3"	12	"	239#
V4	"	¾"ϕ @ 15'-6"	6	"	139#
T2	"	½"ϕ @ 10'-6"	8	"	56#
T3	"	½"ϕ @ 13'-3"	6	"	53#
T4	"	½"ϕ @ 15'-6"	4	"	41#
F1	"	½"ϕ @ 4'-3"	18	"	51#
F2	"	⅝"ϕ @ 5'-0"	14	"	73#
H9	"	½"ϕ @ 14'-9"	14	"	138#
H10	"	½"ϕ @ 12'-6"	2	"	17#
H11	"	½"ϕ @ 7'-6"	2	"	10#
H12	"	½"ϕ @ 4'-6"	2	"	6#
H13	"	½"ϕ @ 25'-9"	2	"	34#
L1	"	½"ϕ @ 28'-0"	7	"	131#
L2	"	½"ϕ @ 17'-0"	10	"	113#
R	"	¾"ϕ @ 7'-3"	12	"	131#

STRAIGHT BARS



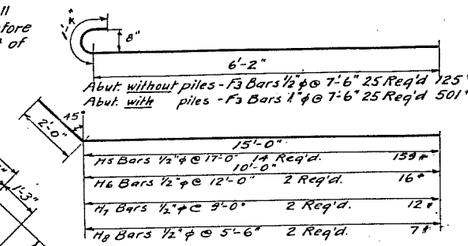
SEC. A-A

HALF PLAN
Showing Reinforcement.

HALF PLAN
Showing Outlines.

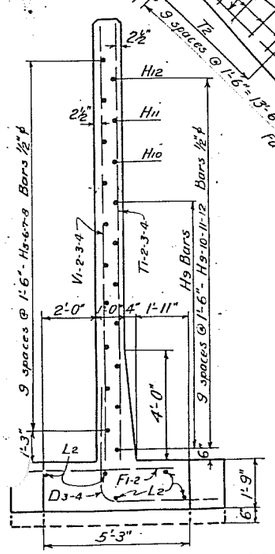
TABLE OF DIMENSIONS					
CLEAR SPAN	Expansion End A	Expansion End B	"C"	Fixed End A	Fixed End B
20'	3'-1⅜"	13'-1⅝"	1⅝"	3'-1⅜"	13'-1⅝"
25'	3'-1⅜"	13'-1⅝"	1¾"	3'-1⅜"	13'-1⅝"
30'	3'-1⅜"	13'-1⅝"	1¾"	3'-1⅜"	13'-1⅝"
35'	3'-7⅞"	12'-7⅜"	1½"	3'-7⅞"	12'-7⅜"
40'	3'-7⅞"	12'-7⅜"	1¼"	3'-7⅞"	12'-7⅜"
45'	3'-10½"	12'-4½"	1⅞"	3'-10½"	12'-4½"
50'	4'-6"	11'-9"	1⅞"	3'-10½"	12'-4½"
55'	4'-8⅞"	11'-6⅛"	1½"	4'-1⅜"	12'-1⅝"
60'	4'-8⅞"	11'-6⅛"	1"	4'-1⅜"	12'-1⅝"
65'	4'-9½"	11'-5⅝"	1⅞"	4'-1⅜"	12'-1⅝"
70'	4'-9½"	11'-5½"	2⅛"	4'-2"	12'-1"
75'	4'-8⅞"	11'-6⅛"	1"	4'-1⅜"	12'-1⅝"
80'	4'-8⅞"	11'-6⅛"	¾"	4'-1⅜"	12'-1⅝"

NOTE: Where the foundation material under the footing with piles is soft or wet, the lower six inches of the footing shall be poured first and allowed to harden before the reinforcing steel is placed and the rest of the footing poured.

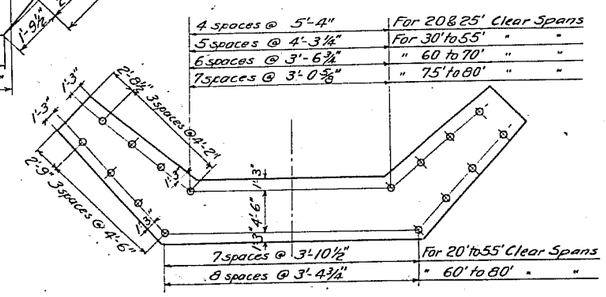


BAR DETAILS

NOTE: All dimensions are c. to c. of bars.



END VIEW OF WING



QUANTITIES FOR ONE ABUTMENT.		
	WITH PILES	WITHOUT PILES
Concrete (Class A)	65.7 Cu.Yd.	58.7 Cu.Yd.
Reinforcing Steel	4749 Lbs.	4373 Lbs.
Piling	See Layout	
Allowable Excavation Area	500 Sq. Ft.	

NORTH DAKOTA
STATE HIGHWAY DEPARTMENT

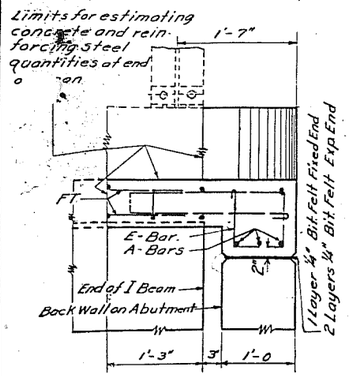
STANDARD 18' ABUTMENT
FOR
I-BEAM SPANS

APPROVED 3-2 1932 Clifford Johnson BRIDGE ENGINEER

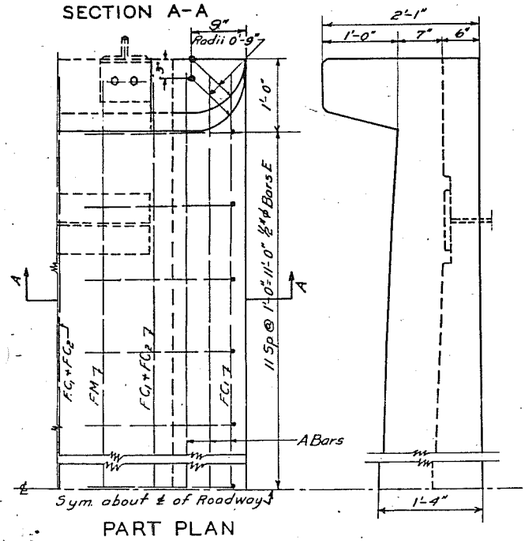
APPROVED Mar. 7 1932 H. C. Frahm CHIEF ENGINEER

SUPERSEDES DRAWING 18-1A, APPROVED FEB. 4, 1931

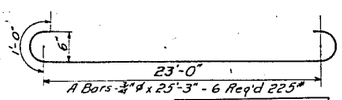
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
4	N.D.				

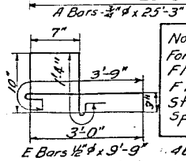


SECTION A-A



PART PLAN



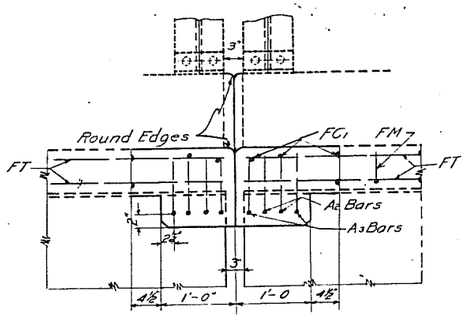


Note:
For details of Bars FM, FC1, FC2 and FT, see plan for Standard I Beam Span.

E Bars ½"ϕ x 9'-9"	46 Req'd.	300#
FM Bars ¾"ϕ x 24'-6"	2 Req'd.	73#
FC1 Bars ¾"ϕ x 23'-9"	4 Req'd.	143#
FC2 Bars ¾"ϕ x 23'-9"	2 Req'd.	71#

QUANTITIES FOR DETAIL "A" (TWO ENDS)	
Concrete Class "A"	4.2 Cu. Yds.
Reinforcing Steel	812 Lbs.

END DETAIL "A"
FOR ABUTMENT ENDS

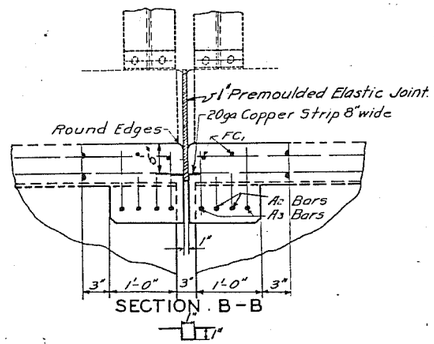


SECTION B-B

FC1 Bars ¾" x 23'-9" 4 Req'd. 143# Straight
A2 Bars ¾" x 25'-1" 4 Req'd. 151# Bent
A3 Bars ¾" x 9'-4" 12 Req'd. 168# Bent

QUANTITIES FOR DETAIL "B" (Both Halves)	
Concrete Class "A"	2.3 Cu. Yds.
Reinforcing Steel	462 Lbs.

END DETAIL "B"
FOR FIXED ENDS



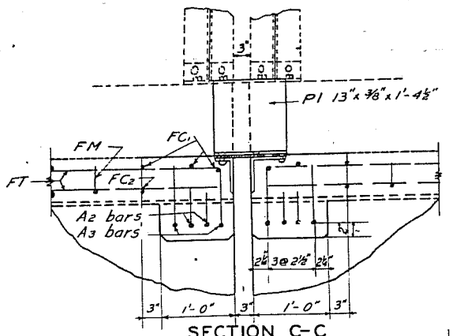
SECTION B-B

DETAIL OF COPPER STRIP

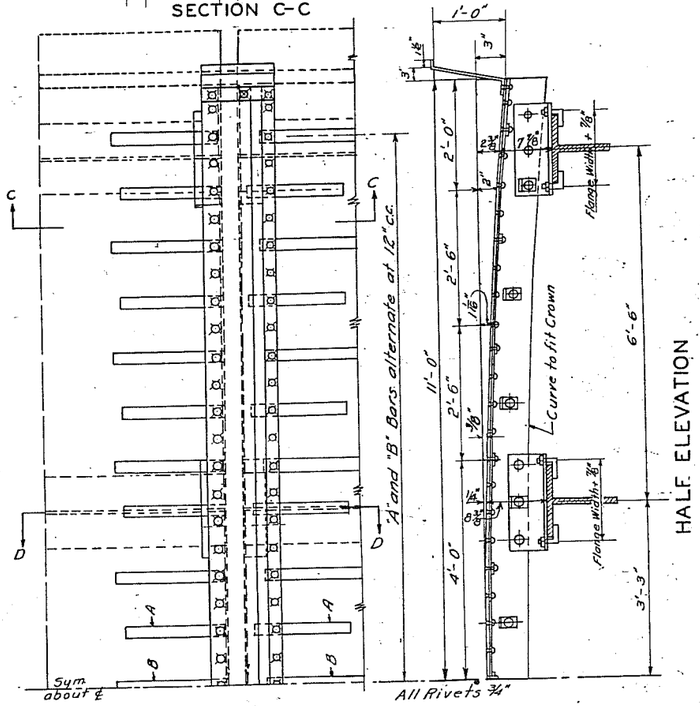
FC1 Bars ¾" x 23'-9" 4 Req'd. 143# Straight
A2 Bars ¾" x 25'-1" 4 Req'd. 151# Bent
A3 Bars ¾" x 9'-4" 12 Req'd. 168# Bent

QUANTITIES FOR DETAIL "C" (Both Halves)	
Concrete Class "A"	2.3 Cu. Yds.
Reinforcing Steel	462 Lbs.
24 Lin. Ft. 20 gage Copper - 8" wide.	
24 Lin. Ft. 1" x 6" - Premoulded Elastic Joint.	
2 Lin. Ft. 1" x 12" " "	
Copper strip and elastic joint to be included in contract price for Concrete.	

END DETAIL "C"
FOR EXPANSION ENDS WITH ELASTIC JOINT

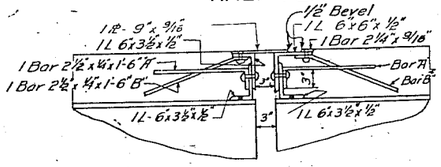


SECTION C-C

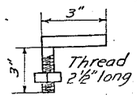


HALF PLAN

HALF ELEVATION



SECTION D-D

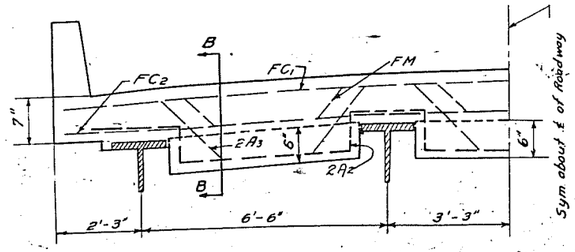


¾"ϕ Hook Bolts
Hexagon Nuts
16 Required

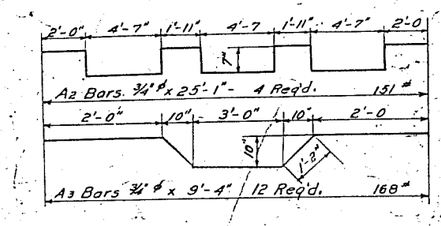
FC1 Bars ¾" x 23'-9" 4 Req'd. 143# Straight
A2 Bars ¾" x 25'-1" 4 Req'd. 151# Bent
A3 Bars ¾" x 9'-4" 12 Req'd. 168# Bent

QUANTITIES FOR DETAIL "D" (Both Halves)	
Concrete Class "A"	2.2 Cu. Yds.
Reinforcing Steel	462 Lbs.
Structural Steel	1618 Lbs.

END DETAIL "D"
FOR EXPANSION ENDS WITH SLIDING PLATE JOINT

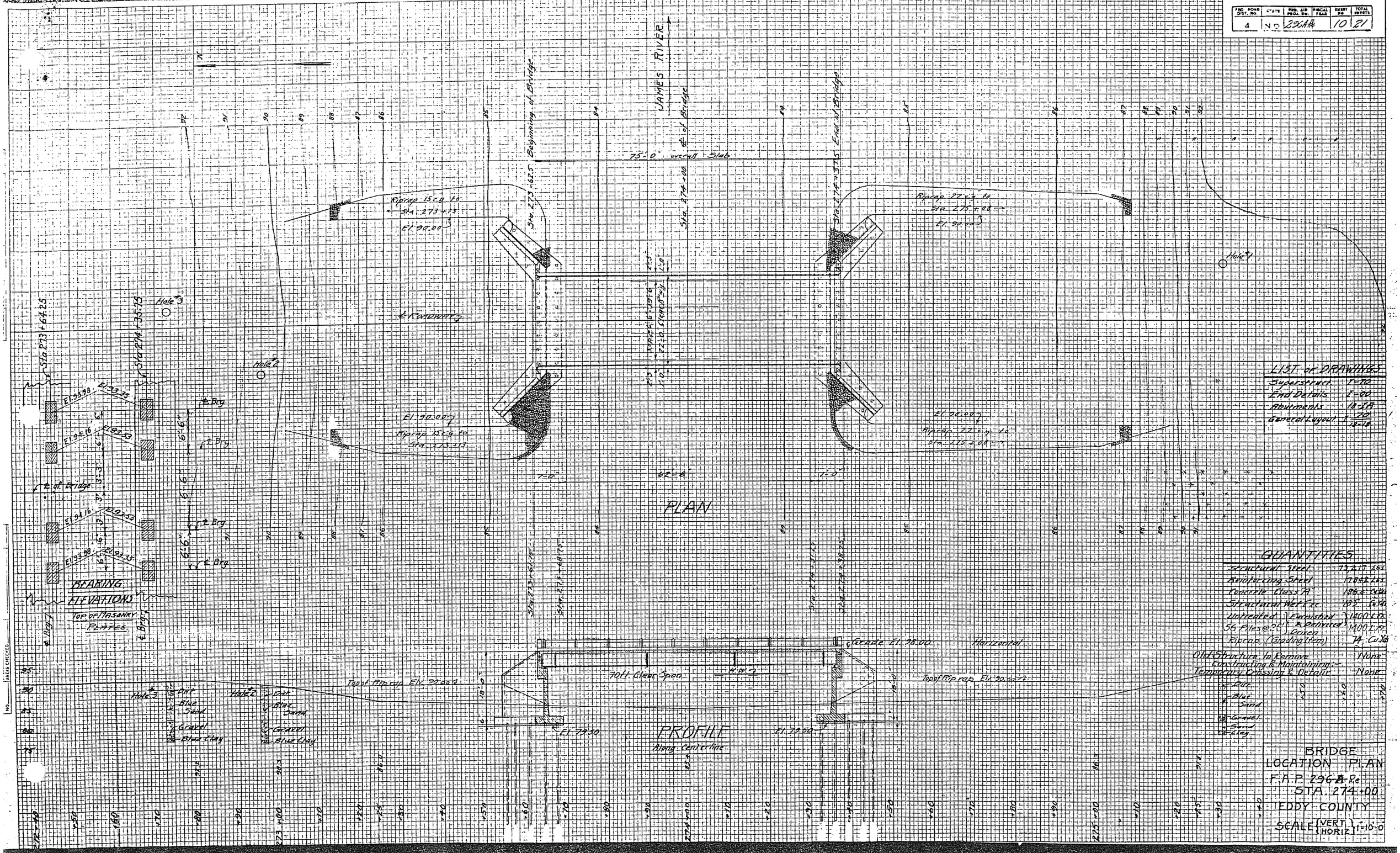


END VIEW
For End Details B, C, & D.



BAR DETAILS
For End Details B, C, & D.

NORTH DAKOTA
STATE HIGHWAY DEPARTMENT
END DETAILS
FOR
STANDARD I BEAM SPANS
CLEAR ROADWAY 22'-0"

APPROVED 4-7 1931 Clifford Johnson BRIDGE ENGINEER
APPROVED 4-7 1931 N. G. Spaeth CHIEF ENGINEER

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
4	ND	296(A)A		10	21