DESIGN DATA				
Traffic	Average Daily			Est.Max.Hr.
Current 1996	Pass. 1575	Trucks 635	Total 2210	220
Forecast 2016	Pass. 2360	Trucks 950	Total 3310	330
Minimum Sight Dist. for:		Design Speed 70 MPH		
Stopping 600'		Bridges		
Full Control of Access				
No Point of Access other than at Interchange Ramps				

JOB# 5

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

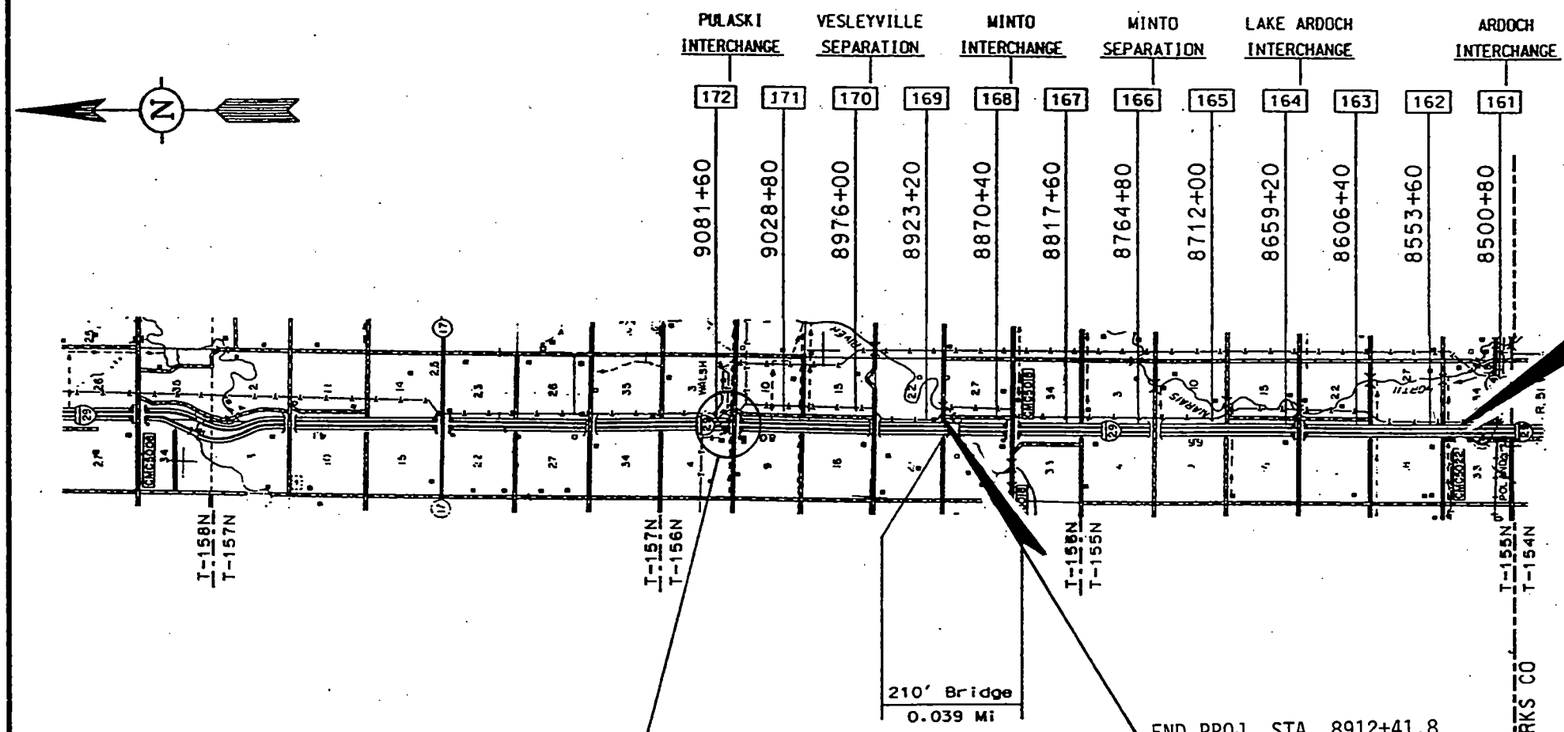
FEDERAL AID PROJECT AC-IM-6-029(013)161
IN WALSH COUNTY
CONCRETE PAVEMENT REPAIR
HOT BITUMINOUS PAVEMENT OVERLAY
(NORTHBOUND ROADWAY)
MILLING & OVERLAY OF X-ROADS
LAKE ARDOCH, MINTO, & PULASKI INTERCHANGES

FHWA REGION	STATE	PROJECT NO.	SHEET NO.
8	ND	AC-IM-6-029(013)161	1

GOVERNING SPECIFICATIONS:

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

LENGTH OF PROJECT
7.089 MILES



BEG. PROJECT STA. 8538+14.1
SEC. 34, T-155 N., R-51 W.
R.P. 161.7

PROJECT AC-IM 6-029(013)161 STA. 9081+60
PULASKI INTERCHANGE

END PROJ. STA. 8912+41.8
SEC. 22, T-156 N., Rge 51 W.
R.P. 168.8

88' North of End of Bridge

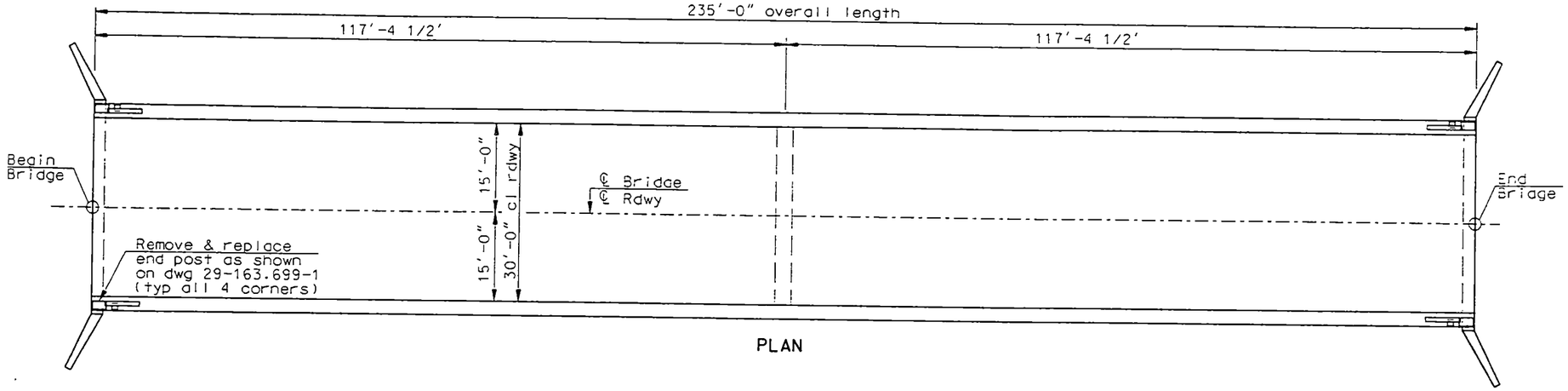
PAVING SECTION _____
URBAN SECTION _____
TRAFFIC SECTION _____
RURAL SECTION Jerry F. Johnson
RECOMMEND APPROVAL 2-17, 1998
DESIGN ENGINEER _____

APPROVED DATE 2-17-98
David K.O. Leer
P.E. 1199
DIRECTOR OF HIGHWAYS AND ENGINEERING
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

TITLE98.PSF

Orig.

FHWA REGION	FHWA REGION	STATE	FEDERAL AID PROJECT NUMBER	SHEET NO.
X-771	8	ND	IM-6-029(013)161	34



PLAN

SCOPE OF WORK: The work on this site consists of removing and replacing the end posts on the ends of the bridge and overlaying the bridge deck with low slump concrete.

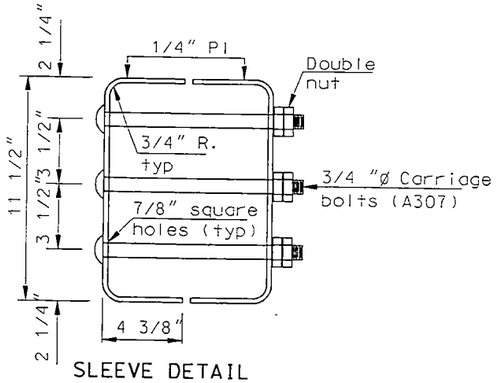
BRIDGE DECK OVERLAY: The deck overlay shall be done in two stages to allow at least one lane of traffic at all times. All concrete removed from the deck shall be disposed of properly, off of the right of way, by the contractor. The overlay shall meet the requirements of low-slump concrete as listed in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

SPEC	CODE	ITEM DESCRIPTION	UNIT	QUANTITY
602	1210	BRIDGE END POST MODIFICATION	EA	4
650	0700	CLASS 1 OVERLAY	SY	783
650	0701	CLASS 2 OVERLAY	SY	157
650	0702	CLASS 3 OVERLAY	SY	39
650	0703	CLASS 2A OVERLAY	LF	283

LAKE ARDOCH INTERCHANGE

BRIDGE LAYOUT

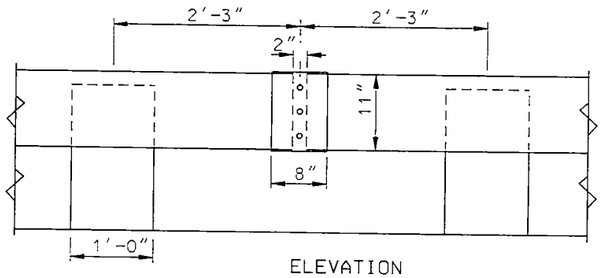
FHWA REGION	STATE	FEDERAL AID PROJECT NUMBER	SHEET NO.
8	ND	IM-6-029(013)161	35



SLEEVE DETAIL

NOTE:

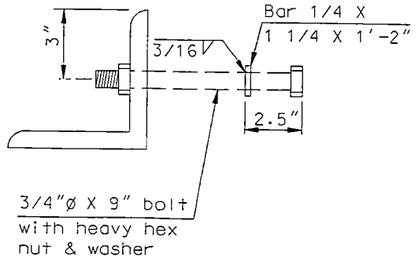
The steel plates shall be M183 steel. Plates, bolts and nuts shall be galvanized in accordance with AASHTO M111. Materials and labor to install the rail sleeves shall be incidental to "BRIDGE END POST MODIFICATION".



ELEVATION

SLEEVE AT RAIL JOINT

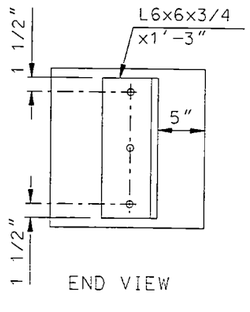
(2 required)



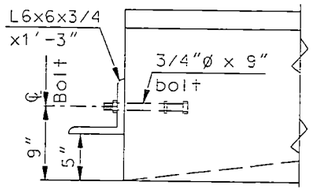
ANCHOR BOLT ASSEMBLY

NOTE:

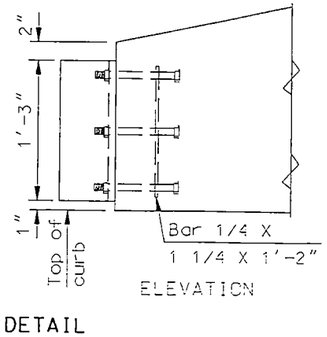
The 6 x 6 x 3/4 angle shall be used in lieu of the MC8x20 shown on Standard D-764-3.



END VIEW

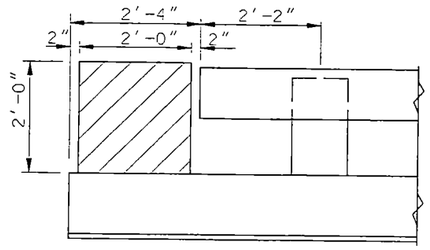


PLAN

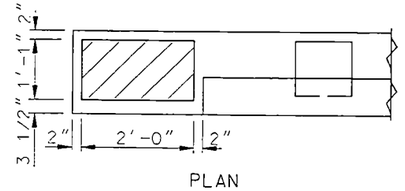


ELEVATION

END POST DETAIL

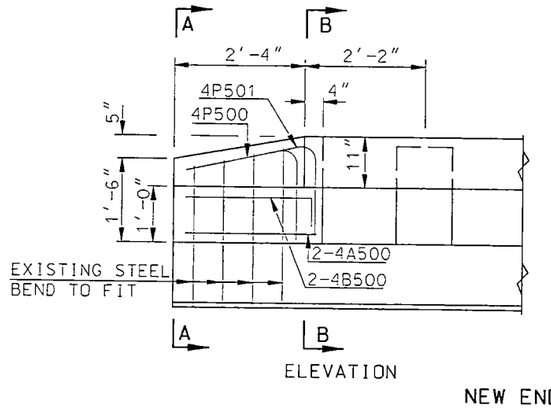


ELEVATION



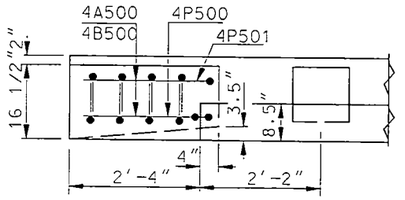
PLAN

SHOWING END POST REMOVAL LIMITS

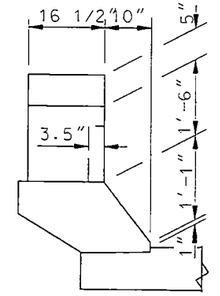


ELEVATION

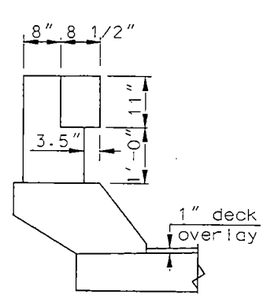
NEW END POST



PLAN



A-A

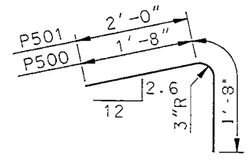


B-B

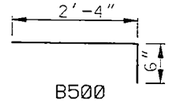
BAR LIST (ONE POST)				
SIZE	MARK	NO.	LENGTH	SHAPE
4	A500	2	2'-4"	STR.
4	B500	2	2'-10"	BENT
4	P500	1	3'-4"	BENT
4	P501	1	3'-8"	BENT

ESTIMATE OF QUANTITIES

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



P500 & P501



BENT BAR DETAILS

NOTE:

Modify bridge end posts at both ends of the bridge.

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

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

QUANTITIES		
BRIDGE END POST MODIFICATION	4	EA

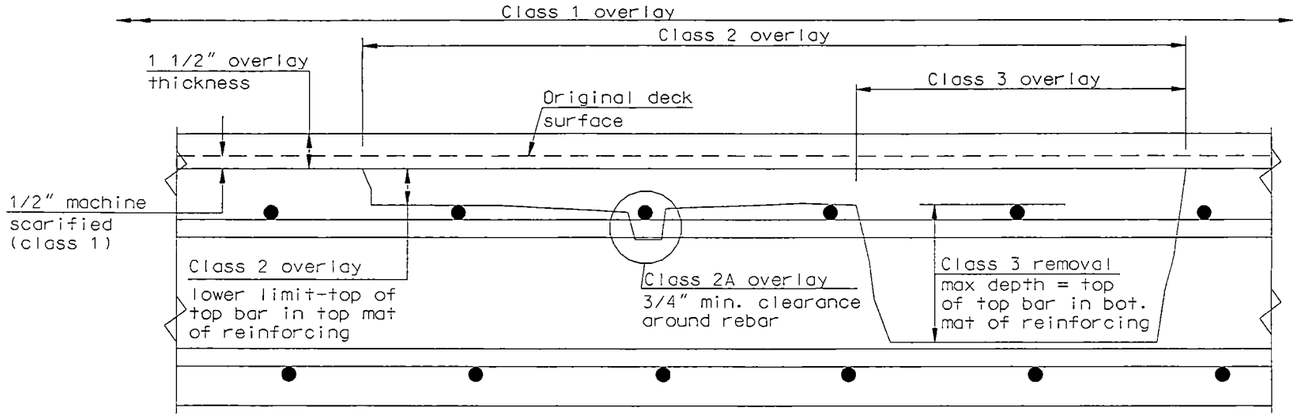
LAKE ARDOCH INTERCHANGE

RAIL SLEEVES & END POST DETAILS

ENDPOST 97LCS074 LLS

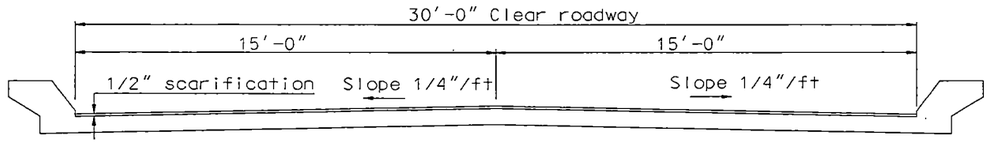
29-163.699-1

FHWA REGION	STATE	FEDERAL AID PROJECT NUMBER	SHEET NO.
8	ND	IM-6-029(013)161	36

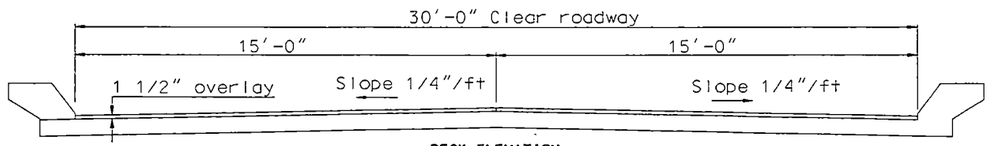


Class 4 removal shall be below limit of class 3 removal to full depth.

BRIDGE DECK
(Overlay classifications)



DECK ELEVATION
Showing removal



DECK ELEVATION
Showing overlay

QUANTITIES		
CLASS 1 OVERLAY	783	SY
CLASS 2 OVERLAY	157	SY
CLASS 3 OVERLAY	39	SY
CLASS 2A OVERLAY	283	LF

LAKE ARDOCH INTERCHANGE

OVERLAY DETAILS

DESIGN DATA				
Traffic	Average Daily			Est.Max.Hr.
Current 1996	Pass: 1650	Trucks 330	Total 1980	200
Forecast 2016	Pass: 2475	Trucks 495	Total 2970	300
Minimum Sight Dist. for:		Design Speed 70 MPH		
Stopping 720'		Bridges HS20		
Full Control of Access				
No Point of Access Other Than at Interchange Ramps				

JOB# 26

FHWA REGION	STATE	PROJECT NO.	SHEET NO.
8	ND	IM-6-029(027)161	1

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

IN WALSH COUNTY

FEDERAL AID PROJECT NO. IM-6-029(027)161

RECYCLE PCC PAVEMENT (SOUTHBOUND)

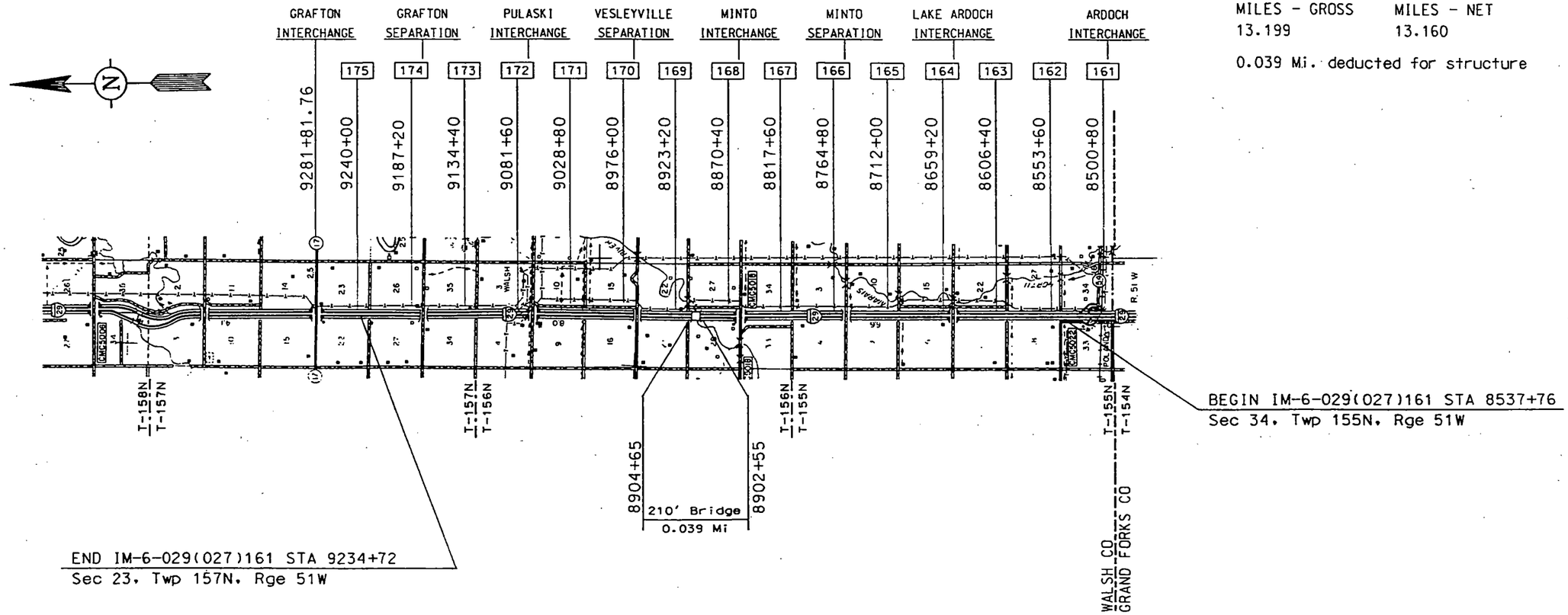
GOVERNING SPECIFICATIONS:

Standard Specifications adopted by the North Dakota Department of Transportation September 1992; Standard Drawings currently in effect; and other Contract Provisions submitted herein.

LENGTH OF PROJECT

MILES - GROSS	MILES - NET
13.199	13.160

0.039 Mi. deducted for structure



PAVING SECTION _____

URBAN SECTION Andrew Stimpfl

TRAFFIC SECTION Dave Ellefson

RURAL SECTION _____

RECOMMEND APPROVAL 2-11-1997

DESIGN ENGINEER David K. O'Leer

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED

_____ _____
DIVISION ADMINISTRATOR DATE

APPROVED DATE 2/11/97

Francis G. Ziegler

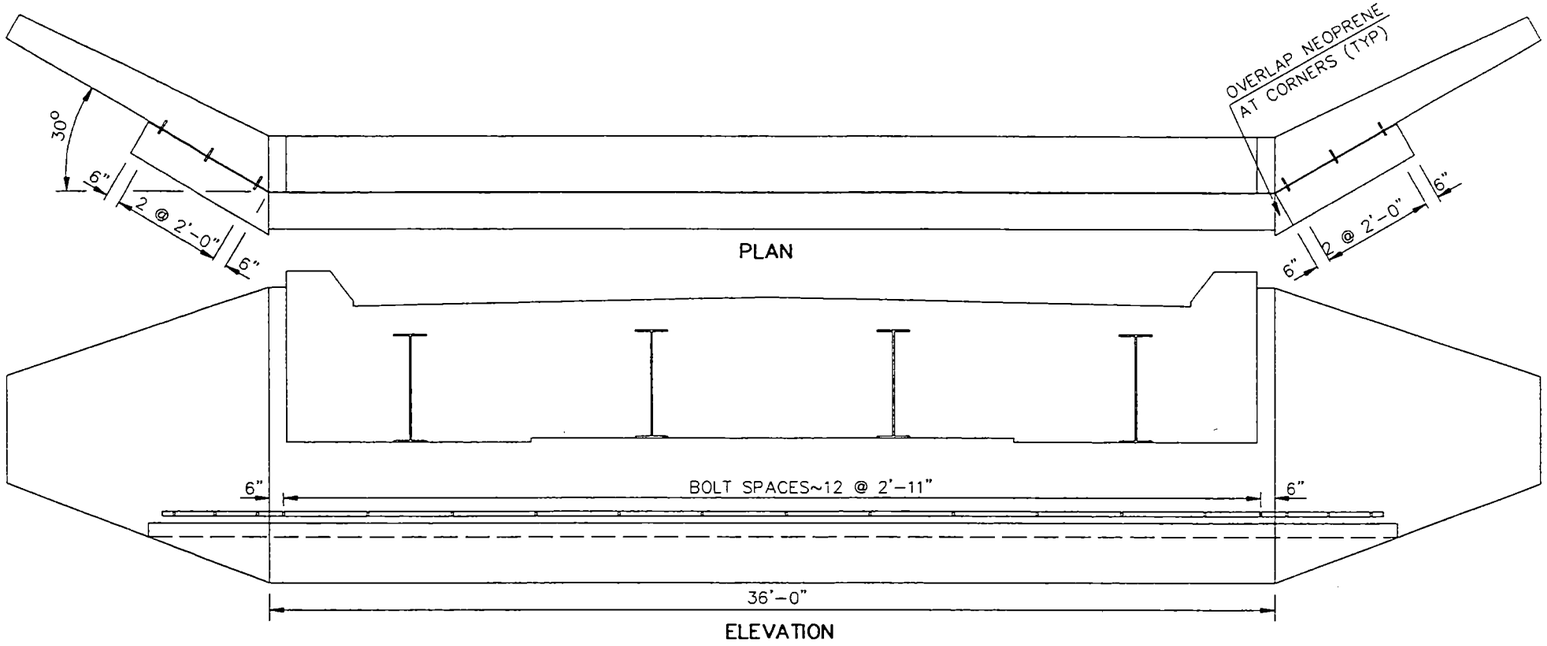
DIRECTOR OF HIGHWAYS AND ENGINEERING

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

FRANCIS G. ZIEGLER REGISTERED PROFESSIONAL P.E. 1579 ENGINEER NORTH DAKOTA

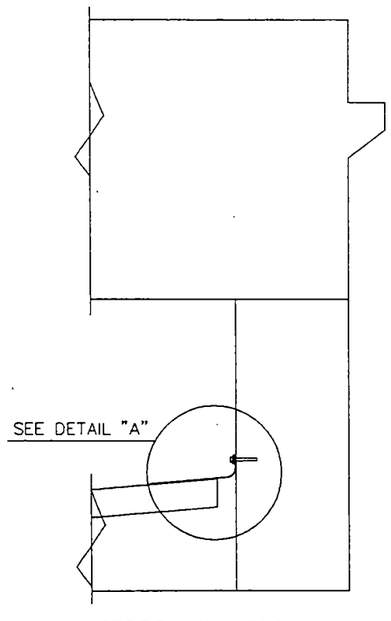
r:\project\60029161.027\d_urban\ti Dec. 19, 1996 10:54:11

FHWA REGION	STATE	FEDERAL AID PROJECT NUMBER	SHEET NO.
8	ND	IM-6-029(027)161	64

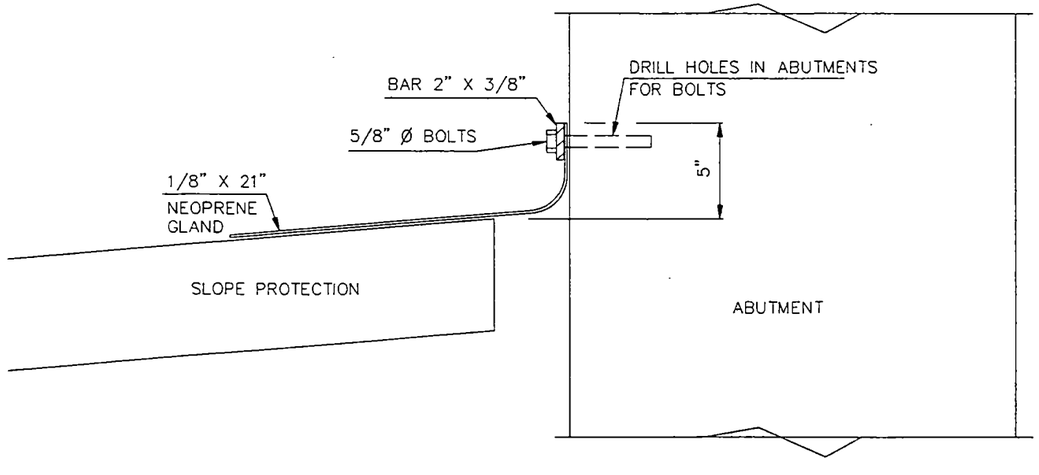


PLAN

ELEVATION



SECTION @ ABUTMENT



DETAIL "A"

NOTES:

THE 2" X 3/8" BARS ON THE WING WALLS SHALL BE SPEPARATE FROM THE BAR ON THE FRONT FACE OF THE ABUTMENT. THE BAR ON THE FRONT FACE OF THE ABUTMENT SHALL BE ONE LONG PIECE OR MADE UP OF SEVERAL SHORTER PIECES. THE SPACE FROM THE ENDS OF THE BARS TO THE FIRST HOLE SHALL NOT BE GREATER THAN 6 INCHES.

THE NEOPRENE GLAND SHALL BE MADE IN THREE PIECES: ONE FOR THE FRONT FACE OF THE ABUTMENT AND ONE FOR EACH WING WALL. THE GLANDS SHALL BE CUT SO THAT THEY OVERLAP AT THE CORNERS.

THE BOLTS TO HOLD THE NEOPRENE GLAND IN PLACE SHOULD BE INSTALLED INTO THE ABUTMENT BY A MECHANICAL OR CHEMICALLY BONDED METHOD.

ALL EQUIPMENT, MATERIALS AND LABOR REQUIRED TO INSTALL THE GLAND AS SHOWN SHALL BE INCLUDED IN THE BID ITEM "JOINT TREATMENT".

QUANTITIES	(TWO ABUTMENTS)	
JOINT TREATMENT	92.0	LF

LAKE ARDOCH INTERCHANGE

JOINT TREATMENT DETAILS

NORTH DAKOTA STATE HIGHWAY DEPARTMENT

SHEET NO. 1 OF 3

ABSTRACT OF BIDS RECEIVED

PROJECT NO. I 29 4 22 163
COUNTY & DATE WALSH FEBRUARY 19 1971
LENGTH & TYPE 00 000 MILES STRUCTURAL & INCID.
COMPLETION TIME BY MAY 15 1972

NO. 3

SPEC. NO.	ITEM DESCRIPTION	UNIT	QUANTITY	BIDDER: ENGINEER'S ESTIMATE C.C. BID PRICE	ENGINEER'S ESTIMATE AMOUNT	BIDDER: James J. Igoe & Sons Construction, Inc. Bismarck, North Dakota C.C. Bond RAnk 1 BID PRICE	AMOUNT	BIDDER: Industrial Builders, Inc. Fargo, North Dakota C.C. Bond RAnk 2 BID PRICE	AMOUNT
208	CLASS 1 EXCAVATION	CU YD	355	200	71000	200	71000	300	106500
228	SELECT BACKFILL	CU YD	870	500	435000	600	522000	450	391500
610	CLASS AE-1 CONCRETE SUB-STRUCTURES	CU YD	265	8000	2120000	8000	2120000	8500	2252500
610	CLASS AE-3 CONCRETE I-BEAM SUPERSTRUCTURE	CU YD	761	8500	6468500	8000	6088000	8000	6088000
610	CLASS AAE-3 CONCRETE RAILING & POSTS	CU YD	48	20000	960000	12500	600000	17500	840000
612	REINFORCING STEEL-GRADE 40	LB	264926	17	4503742	14	3708964	15	3973890
616	STRUCTURAL STEEL A-572 WELDED GIRDER-GRADE 50	LB	244576	32	7826432	30	7337280	29	7092704
616	STRUCTURAL STEEL A-36 WELDED GIRDER	LB	276470	32	8847040	29	8017630	29	8017630
622	STEEL PILING HP10X42	L FT	4190	650	2723500	600	2514000	650	2723500
622	STEEL PILING HP12X53	L FT	5250	750	3937500	700	3675000	760	3990000
622	STEEL TEST PILES HP10X42 140 FT.	EA	1	145000	145000	100000	100000	140000	140000
622	STEEL TEST PILES HP12X53 145 FT.	EA	1	170000	170000	120000	120000	150000	150000
622	STEEL TEST PILES HP10X42 150 FT.	EA	1	150000	150000	110000	110000	150000	150000
750	LINSEED OIL TREATMENT	GAL	118	500	59000	500	59000	500	59000
900	BRIDGE BENCH MARKS	SET	3	20000	60000	15000	45000	20000	60000
704	CONCRETE SLOPE PROTECTION	SQ YD	1220	1000	1220000	1100	1342000	1200	1464000
900	MOBILIZATION	L SUM	1	500000	500000	500000	500000	300000	300000
900	MTCE. & PROTECTION OF TRAFFIC-THREE STRUCTURES	L SUM	1	300000	300000	500000	500000	150000	150000
728	SODDING	SQ YD	1890	60	113400	100	189000	70	132300
216	WATER	M GAL	24	250	6000	1000	24000	500	12000
746	FLAGGING	M HR	300	210	63000	210	63000	210	63000
900	ROADWAY CANOPY	L SUM	1	150000	150000	200000	200000	200000	200000
900	ROADWAY CANOPY	L SUM	1	150000	150000	200000	200000	200000	200000
900	ROADWAY CANOPY	L SUM	1	150000	150000	200000	200000	200000	200000
756	FIELD LABORATORY	EA	1	100000	100000	150000	150000	100000	100000
203	PIER MOUNDING PROTECTION	CU YD	2250	100	225000	100	225000	400	900000
	TOTAL SUM BID				41454114		38680874		39756524

ACTION TAKEN BY STATE HIGHWAY COMMISSION: AWARD TO: WHEN PRELIMINARY ARRANGEMENTS ARE COMPLETED.

FORM NO. 14-2-1 (8) "BUY NORTH DAKOTA PRODUCTS" DATE OF AWARD 19 STATE HIGHWAY COMMISSIONER

ORTH DAKOTA STATE HIGHWAY DEPARTMENT

SHEET NO. 2 OF 3

ABSTRACT OF BIDS RECEIVED

PROJECT NO. I 29 4 22 163
COUNTY & DATE WALSH FEBRUARY 19 1971
LENGTH & TYPE 00 000 MILES STRUCTURAL & INCID.
COMPLETION TIME BY MAY 15 1972

NO. 3

SPEC. NO.	ITEM DESCRIPTION	UNIT	QUANTITY	BIDDER 1: Swingen Construction Co. Grand Forks, North Dak. C.C. Bond Rank 3 BID PRICE	BIDDER 1 AMOUNT	BIDDER 2: Otto J. Eickhof & Sons Crookston, Minnesota C.C. Bond Rank 4 BID PRICE	BIDDER 2 AMOUNT	BIDDER 3: Schultz & Lindsay Construction Company Fargo, North Dakota C.C. Bond Rank 5 BID PRICE	BIDDER 3 AMOUNT
208	CLASS 1 EXCAVATION	CU YD	355	340	120700	400	142000	250	88750
228	SELECT BACKFILL	CU YD	870	475	413250	450	391500	500	435000
610	CLASS AE-1 CONCRETE SUB-STRUCTURES	CU YD	265	7300	1934500	8000	2120000	9500	2517500
610	CLASS AE-3 CONCRETE I-BEAM SUPERSTRUCTURE	CU YD	761	7300	5555300	7800	5935800	10000	7610000
610	CLASS AAE-3 CONCRETE RAILING & POSTS	CU YD	48	15000	720000	18000	864000	15000	720000
612	REINFORCING STEEL-GRADE 40	LB	264926	17	4503742	15	3973890	16	4238816
616	STRUCTURAL STEEL A-572 WELDED GIRDER-GRADE 50	LB	244576	31	7581856	32	7826432	35	8560160
616	STRUCTURAL STEEL A-36 WELDED GIRDER	LB	276470	31	8570570	32	8847040	35	9676450
622	STEEL PILING HP10X42	L FT	4190	775	3247250	680	2849200	700	2933000
622	STEEL PILING HP12X53	L FT	5250	880	4620000	780	4095000	800	4200000
622	STEEL TEST PILES HP10X42 140 FT.	EA	1	150000	150000	126000	126000	140000	140000
622	STEEL TEST PILES HP12X53 145 FT.	EA	1	175000	175000	145000	145000	160000	160000
622	STEEL TEST PILES HP10X42 150 FT.	EA	1	165000	165000	135000	135000	150000	150000
750	LINSEED OIL TREATMENT	GAL	118	450	53100	600	70800	400	47200
900	BRIDGE BENCH MARKS	SET	3	22500	67500	17500	52500	15000	45000
704	CONCRETE SLOPE PROTECTION	SQ YD	1220	950	1159000	900	1098000	1000	1220000
900	MOBILIZATION	L SUM	1	500000	500000	650000	650000	1000000	1000000
900	MTCE.& PROTECTION OF TRAFFIC-THREE STRUCTURES	L SUM	1	900000	900000	1260000	1260000	3000000	3000000
728	SODDING	SQ YD	1890	75	141750	60	113400	100	189000
216	WATER	M GAL	24	250	6000	1000	24000	500	12000
746	FLAGGING	M HR	300	210	63000	210	63000	210	63000
900	ROADWAY CANOPY	L SUM	1	150000	150000	120000	120000	300000	300000
900	ROADWAY CANOPY	L SUM	1	150000	150000	120000	120000	300000	300000
900	ROADWAY CANOPY	L SUM	1	150000	150000	120000	120000	300000	300000
756	FIELD LABORATORY	EA	1	60000	60000	100000	100000	100000	100000
203	PIER MOUNDING PROTECTION	CU YD	2250	210	472500	350	787500	200	450000
	TOTAL SUM BID				41630018		42030062		45755876

ACTION TAKEN BY STATE HIGHWAY COMMISSION: AWARD TO: _____ WHEN PRELIMINARY ARRANGEMENTS ARE COMPLETED.

FORM NO. 14-2-1 (9) "BUY NORTH DAKOTA PRODUCTS" DATE OF AWARD _____ 19 _____ STATE HIGHWAY COMMISSIONER

RTH DAKOTA STATE HIGHWAY DEPARTMENT

SHEET NO. 3 OF 3

ABSTRACT OF BIDS RECEIVED

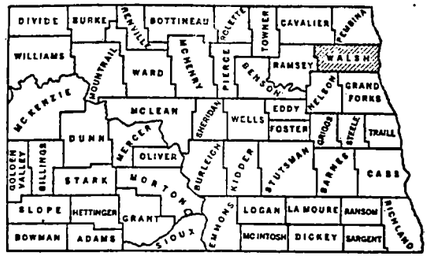
PROJECT NO. I 29 4 22 163
COUNTY & DATE WALSH FEBRUARY 19 1971
LENGTH & TYPE 00 000 MILES STRUCTURAL & INCID,
COMPLETION TIME BY MAY 15 1972

SPEC. NO.	ITEM DESCRIPTION	UNIT	QUANTITY	NO. 3 BIDDER Northern Improvement Co. Fargo, North Dakota C.C. Bond Rank 6 BID PRICE	AMOUNT	BIDDER C.C. BID PRICE	AMOUNT	BIDDER C.C. BID PRICE	AMOUNT
208	CLASS 1 EXCAVATION	CU YD	355	350	124250				
228	SELECT BACKFILL	CU YD	870	750	652500				
610	CLASS AE-1 CONCRETE SUB-STRUCTURES	CU YD	265	9500	2517500				
610	CLASS AE-3 CONCRETE I-BEAM SUPERSTRUCTURE	CU YD	761	10000	7610000				
610	CLASS AAE-3 CONCRETE RAILING & POSTS	CU YD	48	18000	864000				
612	REINFORCING STEEL-GRADE 40	LB	264926	18	4768668				
616	STRUCTURAL STEEL A-572 WELDED GIRDER-GRADE 50	LB	244576	33	8071008				
616	STRUCTURAL STEEL A-36 WELDED GIRDER	LB	276470	33	9123510				
622	STEEL PILING HP10X42	L FT	4190	680	2849200				
622	STEEL PILING HP12X53	L FT	5250	800	4200000				
622	STEEL TEST PILES HP10X42 140 FT,	EA	1	150000	150000				
622	STEEL TEST PILES HP12X53 145 FT,	EA	1	180000	180000				
622	STEEL TEST PILES HP10X42 150 FT,	EA	1	170000	170000				
750	LINSEED OIL TREATMENT	GAL	118	500	59000				
900	BRIDGE BENCH MARKS	SET	3	15000	45000				
704	CONCRETE SLOPE PROTECTION	SQ YD	1220	1400	1708000				
900	MOBILIZATION	L SUM	1	1500000	1500000				
900	MTCE,& PRUTECTION OF TRAFFIC-THREE STRUCTURES	L SUM	1	1400000	1400000				
728	SODDING	SQ YD	1890	60	113400				
216	WATER	M GAL	24	100	2400				
746	FLAGGING	M HR	300	210	63000				
900	ROADWAY CANOPY	L SUM	1	200000	200000				
900	ROADWAY CANOPY	L SUM	1	200000	200000				
900	ROADWAY CANOPY	L SUM	1	200000	200000				
756	FIELD LABURATORY	EA	1	100000	100000				
203	PIER MOUNDING PROTECTION	CU YD	2250	175	393750				
	TOTAL SUM BID				47265186				

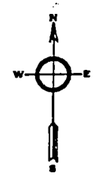
ACTION TAKEN BY STATE HIGHWAY COMMISSION: **AWARD TO:** WHEN PRELIMINARY ARRANGEMENTS ARE COMPLETED.

FORM NO. 14-2-1 (10) "BUY NORTH DAKOTA PRODUCTS" DATE OF AWARD _____ 19 _____ STATE HIGHWAY COMMISSIONER

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	
5	N. D.	I-29-4 (22)	1	



SKETCH-MAP OF NORTH DAKOTA
SHOWING COUNTIES



SCALES
- LAYOUT SHEET: 1 IN. = 5000'
- PLAN AND PROFILE DRAWINGS (HOR. 1 IN. = 100 FT. VERT. 1 IN. = 10 FT.
- STRUCTURAL DRAWINGS:- AS SHOWN
- CROSS SECTION SHEETS:- 1 IN. = 10 FT.

NORTH DAKOTA
STATE HIGHWAY DEPARTMENT

PLANS

FOR THE PROPOSED IMPROVEMENT OF A

STATE HIGHWAY

IN WALSH COUNTY

FEDERAL AID PROJECT NO. I-29-4 (22) 163

STRUCTURAL

LENGTH OF PROJECT		
PROJECT	MILES-GROSS	MILES-NET
I-29-4(22)	4.023	0.0
TOTALS	4.023	0.0

GOVERNING SPECIFICATIONS:

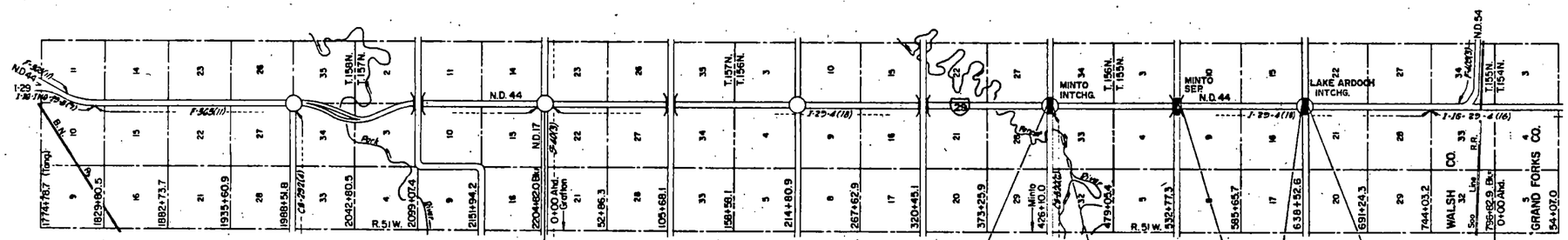
Standard Specifications adopted by the North Dakota State Highway department Jan. 1965 and approved as standard by the Federal Highway Administration June 23,1965. Required Contract Provision (Form PR-1273) dated October 1969 and others submitted herewith.

DESIGN DATA

TRAFFIC	AVERAGE DAILY	EST. 30TH. MAX. HR.
CURRENT TRAFFIC (1970)	1925 PASS. 325 TRUCKS 2250 TOTAL	330
TRAFFIC FORECAST (1990)	4900 PASS. 800 TRUCKS 5700 TOTAL	850

DESIGN SPEED 60 MPH
TRAFFIC CLASSIFICATION "M"
MINIMUM SIGHT DISTANCE (STOPPING) 750

STA.	CLEAR RDWY. WIDTH	DESIGN LOADING
426+10.0	30'	H20 (1944)
532+77.3	30'	H15 (1944)
638+52.6	30'	H20 (1944)



LAYOUT MAP
5000 0 5000
SCALE IN FEET

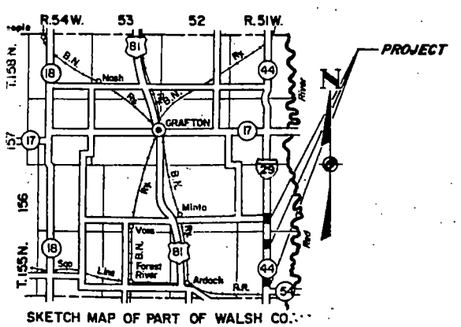
Sta. 426+10.0
I-235 Bridge
0.0Miles

Sta. 532+77.3
I-265 Bridge
0.0Miles

Sta. 638+52.6
I-235 Bridge.
0.0Miles

Begin Project No. I-29-4 (22)
Station 426+10.0 Main Line =
15+00 Cross Road
Station 426+10.0 on Project No.
I-29-4 (18)
A point 52' East of the North West
Corner of Sec.34, Twp.156N, Rge.51W.

End Project No. I-29-4 (22)
Station 638+52.6 Main Line =
15+00 Cross Road
Station 638+52.6 on Project No.
I-29-4 (18)
A point 52' East of the North West
Corner of Sec.22, Twp.155N., Rge.51W.



SKETCH MAP OF PART OF WALSH CO.

APPROVED DATE 12-16-70

W. A. Wise
Acting Chief Engineer

CHIEF ENGINEER
NORTH DAKOTA STATE
HIGHWAY DEPARTMENT

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED

DIVISION ENGINEER DATE

FED. ROAD DIST. NO.	STATE	PROJ. NO.		SHEET NO.	
5	N.D.	I-29-4(62)		3	

NOTES

Total quantities have been rounded off to the nearest whole unit for bidding purposes.

UTILITIES: Separate plans, if any, showing relocation or adjustment work to be performed by utility companies to accomodate highway construction will be made available to the contractor upon request to the Engineer.

The Structural and grading contractors shall conduct their individual operations to the mutual benefit of each other. See section 105.7 of the standard specifications.

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 (3 structures).

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 75% of the time computed by multiplying the number of working days allowed for the performance of the work shown in the contract as awarded, by 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.

Construction Identification Signs shall be installed at stations 7+50 Rt. Minto Interchange crossroad, 8+00 Rt. Minto Separation crossroad, and 7+50 Rt. Lake Ardoch Interchange.

The structural contractor shall install temporary curbs as shown on sheet No. 9 at all bridge approach drain locations. Cost to be incidental to other items.

Aggregate Surface Course for the Crossroads has been provided on the Grading Contract. In the event that structural work has not progressed to a point to allow the grading contractor to place the Aggregate Surface Course at the Structure ends, the material shall be furnished at the site by the Grading Contractor. The Structural Contractor shall then place the Aggregate Surface Course in accordance with the plans. Cost of placing the Aggregate Surface Course shall be incidential to other items.

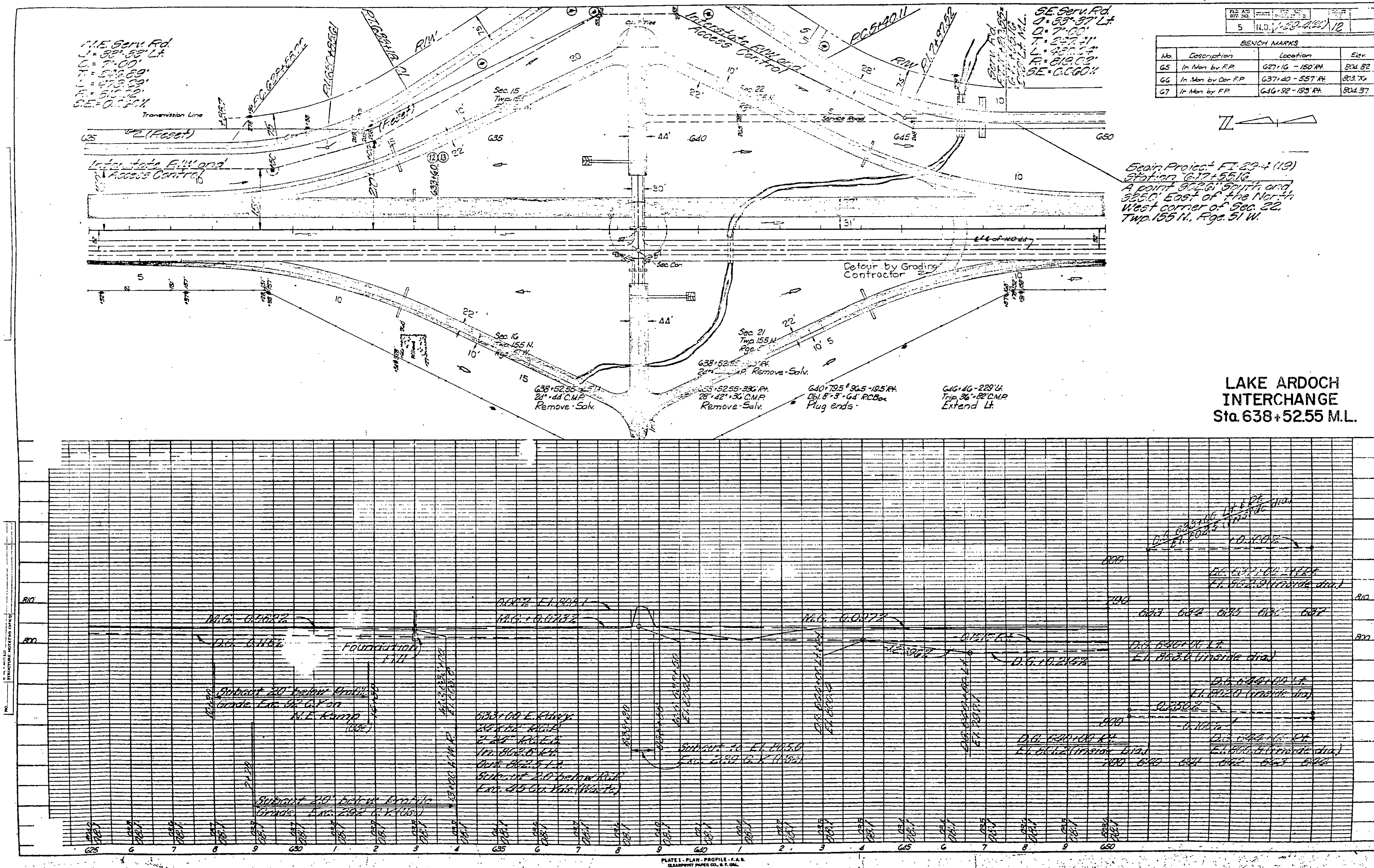
Pier Mounding Protection - The area covered by the pier mounding shall have the Topsoil removed and stockpiled in an approved manner. Soil for Construction of the Pier mound shall be furnished by the Contractor from Sources outside the highway right-of-way. The Pier mound embankment shall be placed in layers and consolidated until stable under passage of the grading equipment. After the mound has been completed to the required section, the topsoil shall be replaced and the disturbed area sodded. Pier Mounding Protection shall be measured by the Cubic Yards of embankment in place. Removal and replacing of topsoil shall be included in price bid for "Pier Mounding Protection."

LIST OF SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS	
NAME	NO.
Field Laboratory	SS-7
Bidding Requirements & Conditions	SS-9
Legal Relations and Responsibility to Public	SS-10 & SS-16
General Statement	SS-24 & SP-41
Piling	SS-21
Scope of Work	SS-25 & SP-59
Prosecution & Progress	SP-9
Mobilization	SP-10
Value Incentive Engineering	SP-11A
Maintenance and Protection of Traffic	SP-16D
Backfill	SP-27
Concrete Structures	SP-29
Reinforcement	SP-32A
Painting	SP-33
Quick Setting Anchor Grout	SP-34
Structural Steel	SP-35A
Concrete Slope Protection	SP-45A
Measurement and Payment	SP-54
Temporary Water Pollution Control	SP-55
Roadway Canopy	SP-61

INCIDENTAL ITEMS	
Item	Sheet No.
Temporary Curbs	9
Aggregate Surface Course	3

QUANTITIES

Spec. No.	208	228	610			612	616		622					750		704				728	216	746		756	203
Code No.	0100	0100	1112	1134	0138	0110	5722	0562	0020	0040	0600	1480	0620	0100	8000	0100	7520	3322		0100	0100	0100	7012	0100	0160
Location	Class 1 Excavation	Select Backfill	Class AE-1 Concrete (Sub-Structure)	Class AE-3 Concrete (I-Beam Super Structure)	Class AAE-3 Concrete (Railings & Posts)	Reinforcing Steel (Grade 40)	Structural Steel (A-572) Welded Girder Grade 50	Structural Steel (A-36) Welded Girder	Steel Piling		Steel Test Piles			Linseed Oil Treatment	Bridge Bench Marks	Concrete Slope Protection	Mobilization	Maintenance and Protection of Traffic 3 Structures		Sodding	Water	Flagging	Roadway Canopy	Field Laboratory	Pier Mounding Protection
											140 Ft.	145 Ft.	150 Ft.												
									HP10 x 42	HP12 x 53	HP10 x 42	HP12 x 53	HP10 x 42												
	Cu. Yd.	Cu. Yd.	Cu. Yd.	Cu. Yd.	Cu. Yd.	LB.	LB.	LB.	Lin. Ft.	Lin. Ft.	Ea.	Ea.	Ea.	Gal.	Set	Sq. Yd.	Lump Sum	Lump Sum		S.Y.	M Gal.	Man Hrs.	Lump	Ea.	Cu. Yd.
426+10.0	85	360	75.2	250.9	15.23	86,352	97,758	92,575	1450	1430	1			38	1	370				630	8	100	1		750
532+77.3	120	150	114.1	259.2	17.13	92,222	49,060	91,320	1200	2220		1		42	1	480				630	8	100	1		750
638+52.6	150	360	75.2	250.9	15.23	86,352	97,758	92,575	1540	1600			1	38	1	370				630	8	100	1		750
Total	355	870	265	761	48	264,928	244,576	276,470	4190	5250	1	1	1	118	3	1220	1	1		1890	24	300	3	1	2250



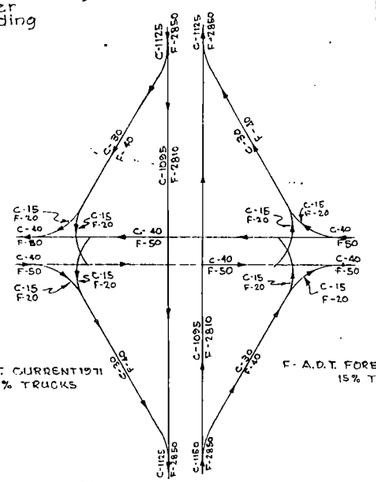
BENCH MARKS

No.	Description	Location	Elev.
65	Ir. Mon. by F.P.	627+16 - 150' Rt.	804.82
66	Ir. Mon. by Cor F.P.	637+40 - 557' Rt.	803.76
67	Ir. Mon. by F.P.	646+92 - 195' Rt.	804.37

FED. AID INV. NO	STATE	
5	N.D.	I-29-4(6)/13

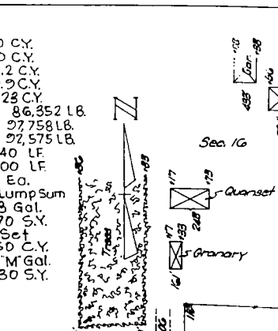
INSTALL OVERHEAD (1-235' Bridge)

Class 1 Excavation	150 C.Y.
Select Backfill	360 C.Y.
Class AE-1 Concrete Substructure	75.2 C.Y.
Class AE-3 Concrete I Beam Superstructure	250.9 C.Y.
Class AAE-3 Concrete Railing & Posts	15.28 C.Y.
Reinforcing Steel (Grade 40)	86,352 LB.
Structural Steel A572 Welded Girder (Grade 50)	27,758 LB.
Structural Steel A 36 Welded Girder	27,575 LB.
Steel Piling (HP 10 x 42)	1540 LF.
Steel Piling (HP 12 x 53)	1600 LF.
Steel Test Piles (HP 10 x 42) 150 Ft	1 Ea.
Roadway Canopy	1 Lump Sum
Linseed Oil Treatment	38 Gal.
Concrete Slope Protection	370 S.Y.
Bridge Bench Marks	1 Set
Pier Mounding Protection	750 C.Y.
Water	8 M Gal.
Sodding	630 S.Y.



C-A.D.T. CURRENT 1971
15% TRUCKS

F-A.D.T. FORECAST 1991
15% TRUCKS



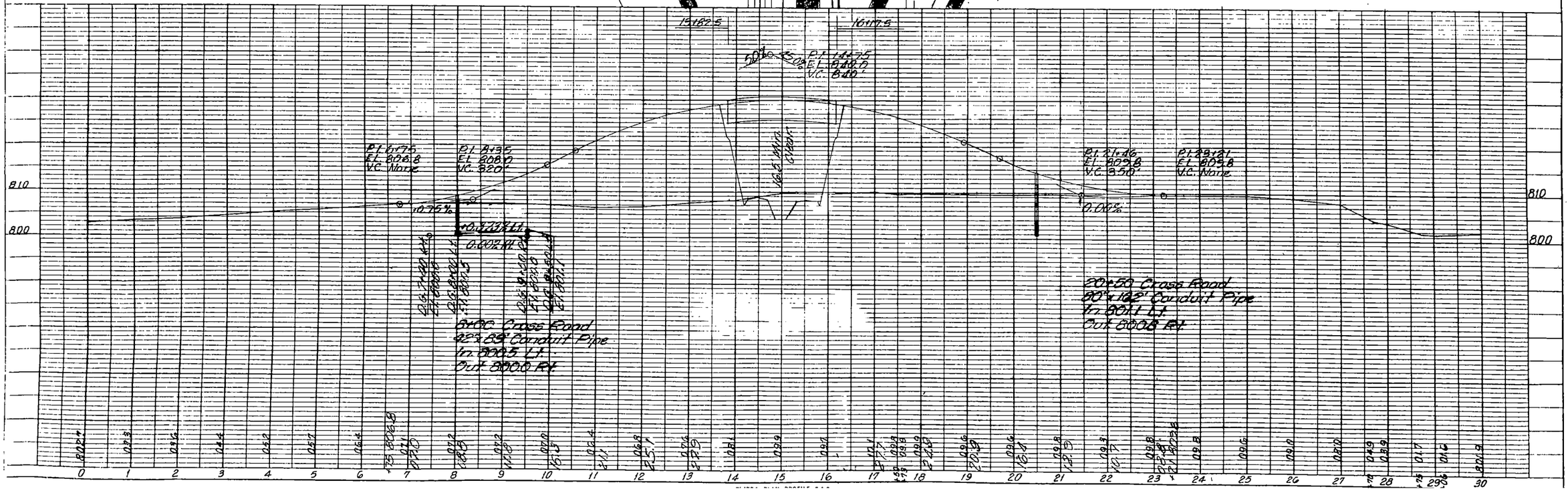
STRUCTURAL DRAWING NO.
29-163.75, 29-163.75-1&2, D-704-1
H-1403, H-1380, H-0401, D-900-6
H-5130-1,2, H-5131-1,2, H-0501
H-0158, D-900-1

Sec. 21
Twp. 155 N.
Rge. 51 W.

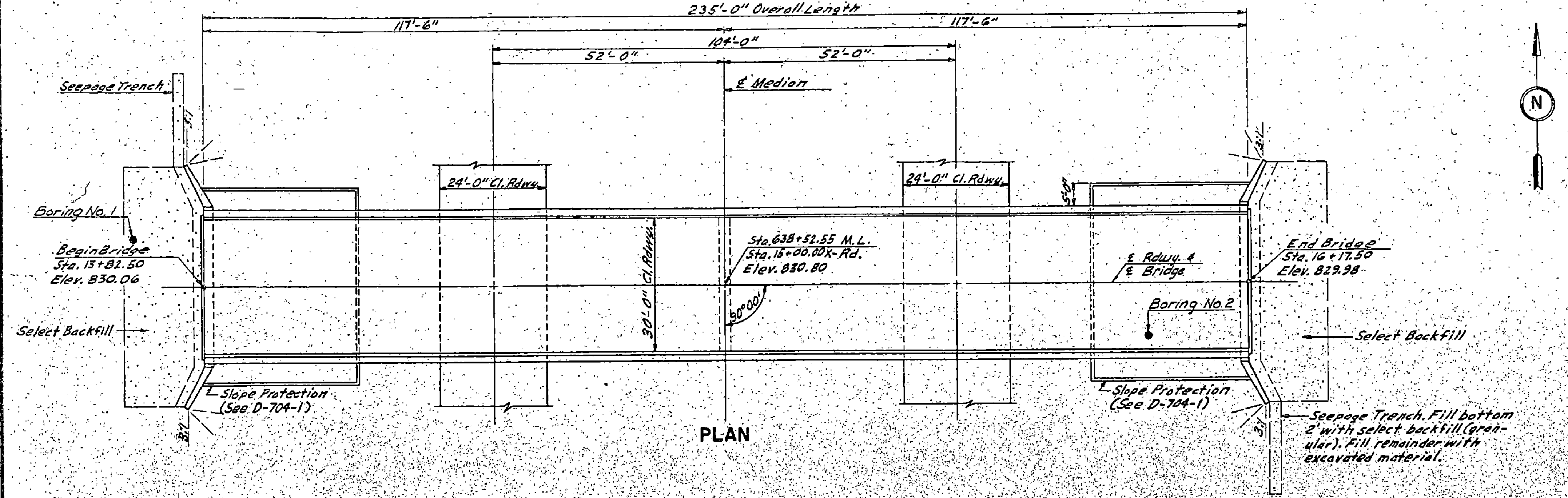
7:06-54' Lt.
21"x24" R.C.P.
To Remain

7:06-23' Rt.
60"x28" C.M.P.
To Remain

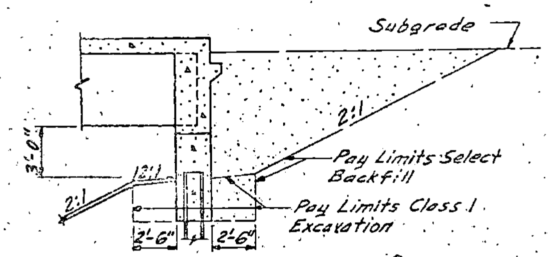
LAKE ARDOCH INTERCHANGE



BRIDGE CODE	FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
X-771	5	N. D.	I-29-4(22)		37	



PLAN



DETAIL AT ABUTMENT ON ℄

See SP-34 for Quick Setting Anchor Grout.
See SP-29 for Optional Concrete Surface Finish.
① See SP-33 for Painting.
② See Sp-35A for Structural Steel.
③ See SS-21 for Piling.
④ See SP-45A for Concrete Slope Protection.
⑤ See SP-32A for Reinforcement.
⑥ See SP-27 for Backfill.
⑥ See SP-61 for Roadway Canopy.

General Notes for this project are shown on Dwg. 29-163.75-1.

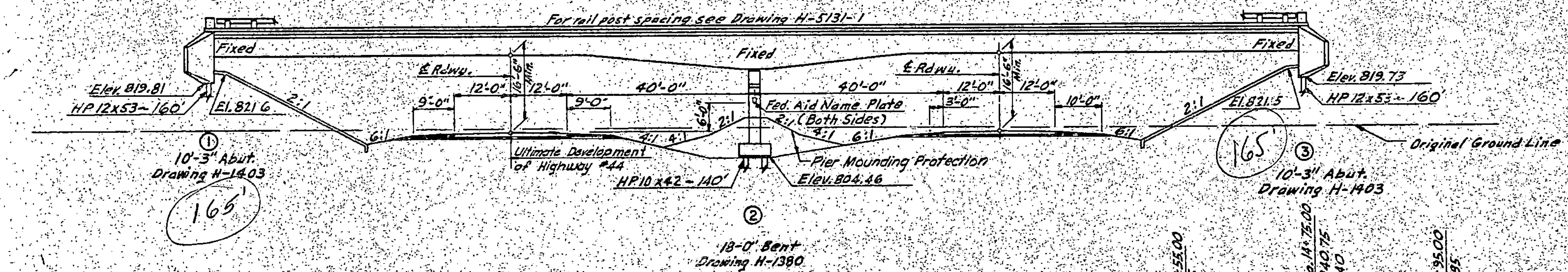
ESTIMATE OF QUANTITIES

SPEC. NO.	CODE NO.	BID ITEM	
203	0180	PIER MOUNDING PROTECTION	750 CU. YD.
208	0100	CLASS I EXCAVATION	150 CU. YD.
216	0100	WATER	8 "M" GAL.
228	0100	SELECT BACKFILL ⑤	360 CU. YD.
610	1112	CLASS AE-1 CONCRETE SUBSTRUCTURES	75.2 CU. YD.
610	1134	CLASS AE-3 CONCRETE I BEAM SUPERSTRUCTURE	250.9 CU. YD.
610	0138	CLASS AAE-3 CONCRETE RAILING & POSTS	15.23 CU. YD.
612	0110	REINFORCING STEEL ④ (GRADE 40)	86,352 LB.
616	5722	STRUCTURAL STEEL A 572 WELDED GIRDER (GRADE 50)	97,758 LB.
616	0362	STRUCTURAL STEEL A36 ① WELDED GIRDER	92,575 LB.
622	0020	STEEL PILING (HP 10X42) ②	1540 LIN. FT.
622	0040	STEEL PILING (HP 12X53) ②	1600 LIN. FT.
622	0620	STEEL TEST PILES (HP 10X42) ② 150 FT.	1 EACH
	7012	ROADWAY CANOPY ⑥	1 LUMP SUM
728	0100	SODDING	630 SQ. YD.
750	0100	LINSEED OIL TREATMENT	38 GAL.
704	0100	CONCRETE SLOPE PROTECTION ③	370 SQ. YD.
	3000	BRIDGE BENCH MARKS	1 SET

STRUCTURAL DRAWINGS

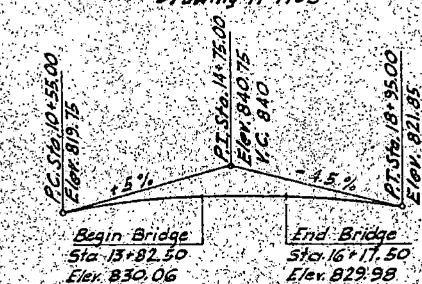
GENERAL DRAWING 29-163.75 (THIS SHEET), 29-163.75-1 & 2, D-704-1
SUBSTRUCTURE H-1403, H-1380, H-0401, D-900-6
SUPERSTRUCTURE H-5130-1,2, H-5131-1,2, H-0158, H-0501, D-900-1,

DESIGN LOADING H20 (1944) | SCALE 1 INCH = 15 FEET



ELEVATION

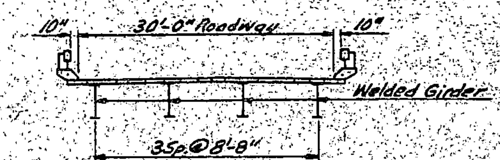
145'



VERTICAL CURVE DATA

1971
FEDERAL AID
PROJECT
I-29-4(22)
NORTH DAKOTA
29-163.75

FEDERAL AID NAME PLATE
2 REQUIRED



DECK SECTION

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=27,000 psi ~ Structural Steel A 572 (Grade 50)
fs=20,000 psi ~ Structural Steel A36

℄ OUTSIDE GIRDERS	829.79	829.80	830.02	830.20	830.35	830.45	830.51	830.54	830.54	830.54	830.54	830.53	830.53	830.53	830.52	830.50	830.47	830.40	830.29	830.14	829.95	829.73	829.71
℄ ROADWAY	830.06	830.07	830.29	830.47	830.62	830.72	830.78	830.81	830.81	830.81	830.81	830.80	830.80	830.80	830.79	830.78	830.74	830.67	830.56	830.41	830.22	830.00	829.98

1'-0" | 10 Eq. Sp. = 116'-6" | 10 Eq. Sp. = 116'-6" | 1'-0"
Begin Bridge | ℄ Brg. Abut. 1 | ℄ Bent 2 | ℄ Brg. Abut. 3 | End Bridge

SCREED ELEVATION

Elevations are to top of finished concrete

BENCH MARKS

NO.	DESCRIPTION	LOCATION	ELEV.
65	Iron Mon. by F.P.	627 + 16 ~ 150' Rt.	804.82
66	Iron Mon. by Cor. F.P.	637 + 40 ~ 557' Rt.	803.76
67	Iron Mon. by F.P.	646 + 92 ~ 193' Rt.	804.37

PILE LOADING

LOCATION	DEAD LOAD	LIVE LOAD	EARTH LOAD	WIND 50 LB.	WIND 15 LB.	WIND 100 LB. L.L.	EMBANKMENT SETTLEMENT	DESIGN LOAD	MAXIMUM REQUIRED BEARING
Abutments	39.5T.	11.5T.					19.0T.	70.0T.	70.0T.
Bent No. 2	41.9T.	13.6T.	2.1T.					57.6T.	57.6T.

NORTH DAKOTA
STATE HIGHWAY DEPARTMENT

LAKE ARDOCH INTERCHANGE

BRIDGE LAYOUT

PROJECT I-29-4(22) STA. 638+52.55

WALSH COUNTY

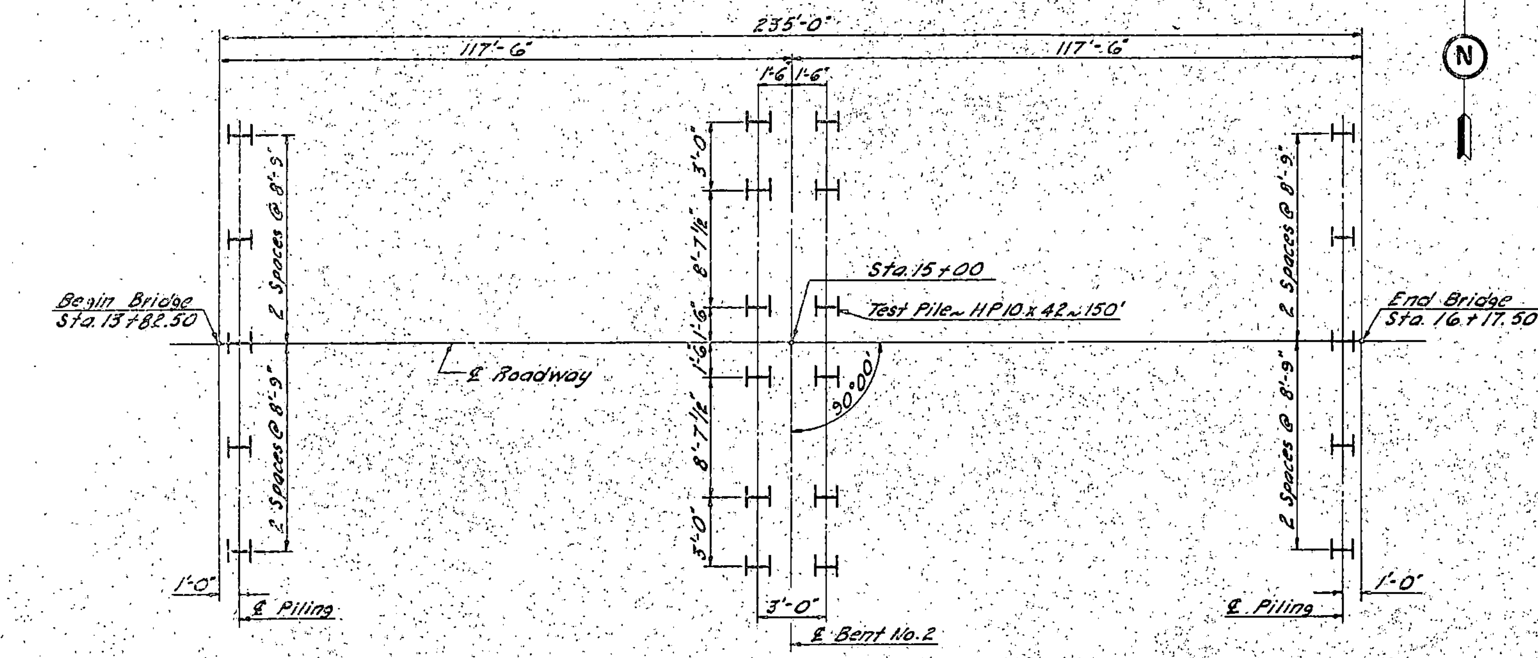
APPROVED
Nov. 17, 1970 Allen J. Anderson
DATE BRIDGE ENGINEER

ALLEN J. ANDERSON REGISTERED PROFESSIONAL ENGINEER NORTH DAKOTA

TOPOGRAPHY — CHECKED BY F.O.H. | DETAILS — MADE BY F.O.H., CHECKED BY F.O.H. | SPACING — MADE BY L.E.G., CHECKED BY G.A.L. | QUANTITIES — CHECKED BY D.L.R.

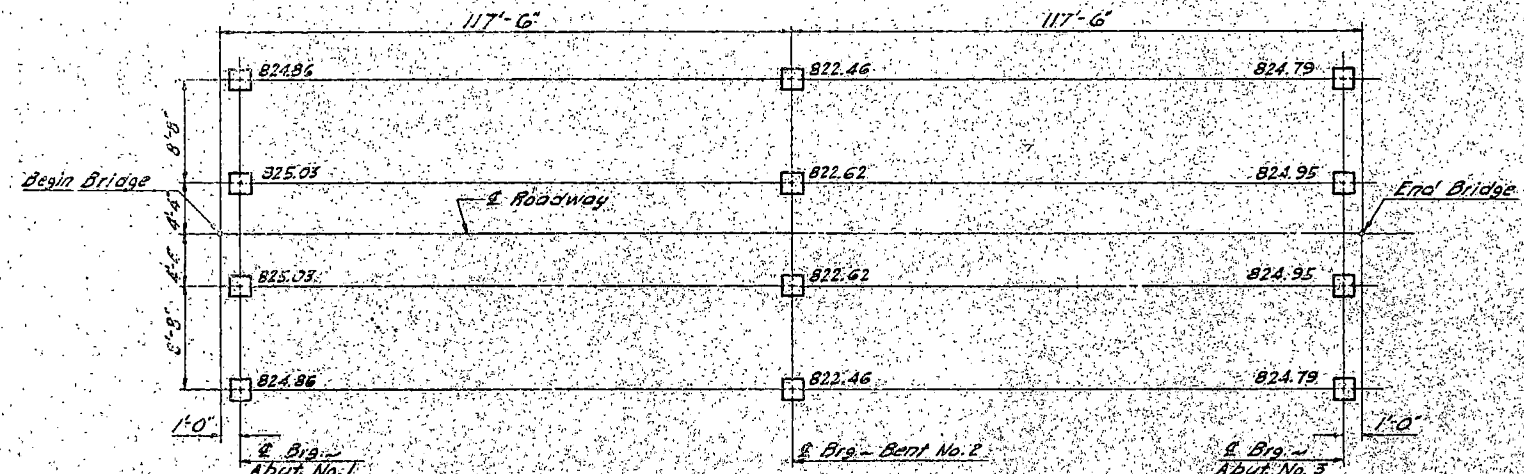
29-163.707 old 29-26

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	N.D.	I-29-4(22)		38	



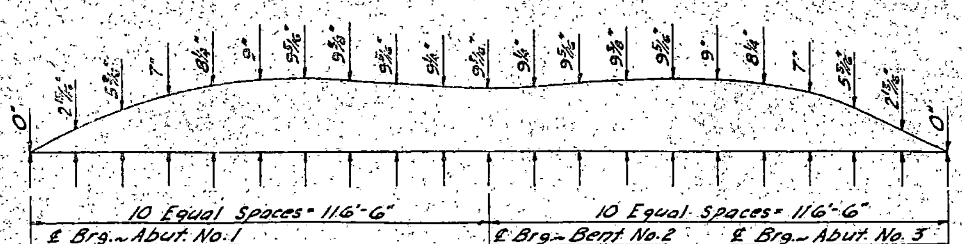
PILING LAYOUT

(Not to Scale)



BEARING PLATE LAYOUT

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



SHOP CAMBER DIAGRAM

NOTES:

GENERAL:

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

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

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

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

ALL RIVETS OR HIGH STRENGTH BOLTS ARE TO BE 7/8". 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 SUBSTRUCTURE IS PLACED.

EXCAVATION:

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

BACKFILL:

ALL BACKFILL SHALL BE COMPACTED ACCORDING TO SECTION 203-2.3 OF THE STANDARD SPECIFICATIONS, EXCEPT THAT THE COMPACTED DENSITY SHALL BE AT LEAST 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 4 PERCENTAGE POINTS BELOW THE OPTIMUM NOR MORE THAN THAT WHICH WILL PERMIT COMPACTION TO THE REQUIRED DENSITY.

SELECT BACKFILL SHALL NOT BE PLACED ABOVE THE ELEVATION OF THE BERM UNTIL THE SUPERSTRUCTURE HAS CURED.

REINFORCING STEEL:

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

CONCRETE:

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

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

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

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

STRUCTURAL STEEL:

OXYGEN CUTTING SHALL BE IN ACCORDANCE WITH THE LATEST STANDARD SPECIFICATIONS FOR WELDED HIGHWAY AND RAILWAY BRIDGES OF THE AMERICAN WELDING SOCIETY (AWS D2.0). THE STEEL SHALL BE PRE-HEATED TO THE MINIMUM PREHEAT AND INTERPASS TEMPERATURE FOR WELDING WITH LOW HYDROGEN ELECTRODES. OXYGEN CUT SURFACES OF MEMBERS CARRYING CALCULATED STRESS SHALL HAVE THEIR EDGES ROUNDED TO A 1/16" INCH RADIUS BY GRINDING AFTER CUTTING.

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

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

STRUCTURAL STEEL CONT.

SHEAR CONNECTOR STUDS SHALL CONFORM TO THE STUD WELDING REQUIREMENTS OF THE LATEST STANDARD SPECIFICATIONS FOR WELDED HIGHWAY AND RAILWAY BRIDGES OF THE AMERICAN WELDING SOCIETY (AWS D2.0). THE CONTRACTOR WILL BE REQUIRED TO OBTAIN A PRODUCT CERTIFICATION IN ACCORDANCE WITH SECTION 802 OF THE NORTH DAKOTA STANDARD SPECIFICATIONS.

STEEL ERECTION:

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

MATERIALS: (STRUCTURAL STEEL)

GIRDER FLANGES: A 572 (GRADE 50)

GIRDER WEB, WEB AND FLANGE SPLICE PLATES, STIFFENERS, DIAPHRAGMS, CHANNEL SHEAR CONNECTORS, BEARING PLATES, AND ANCHOR BOLTS: A 36

BLAST CLEANING:

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

PAINT:

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

ALL EXPOSED STEEL SURFACES SHALL BE GIVEN ONE SHOP COAT OF RED LEAD PAINT (INCLUDING TOP OF UPPER FLANGES BUT NOT SHEAR CONNECTORS), ONE SPOT COAT OF RED LEAD PAINT AFTER ERECTION AND CONCRETE WORK IS COMPLETED, AND TWO FIELD COATS OF ENAMEL. THE FIRST FIELD COAT SHALL CONFORM TO REDDISH-BROWN COLOR NO. 20109 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.

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 35,381 FOOT-POUND-TONS AS COMPUTED BY THE FORMULA W(E-9072)+0.78E WHERE W IS THE WEIGHT OF THE RAM IN TONS AND E IS THE RATED HAMMER ENERGY AS ALLOWED IN SECTION 622. IN NO CASE SHALL THE RAM WEIGHT BE LESS THAN 4,800 POUNDS.

TEST PILES:

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

LINSEED OIL TREATMENT:

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

STATIONING:

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

CONCRETE SLOPE PROTECTION:

THE USE OF PRECAST BLOCK FOR CONCRETE SLOPE PROTECTION WILL NOT BE ALLOWED ON THIS PROJECT.

QUANTITIES

LAKE ARDOCH INTERCHANGE

BEARING PLATE LAYOUT

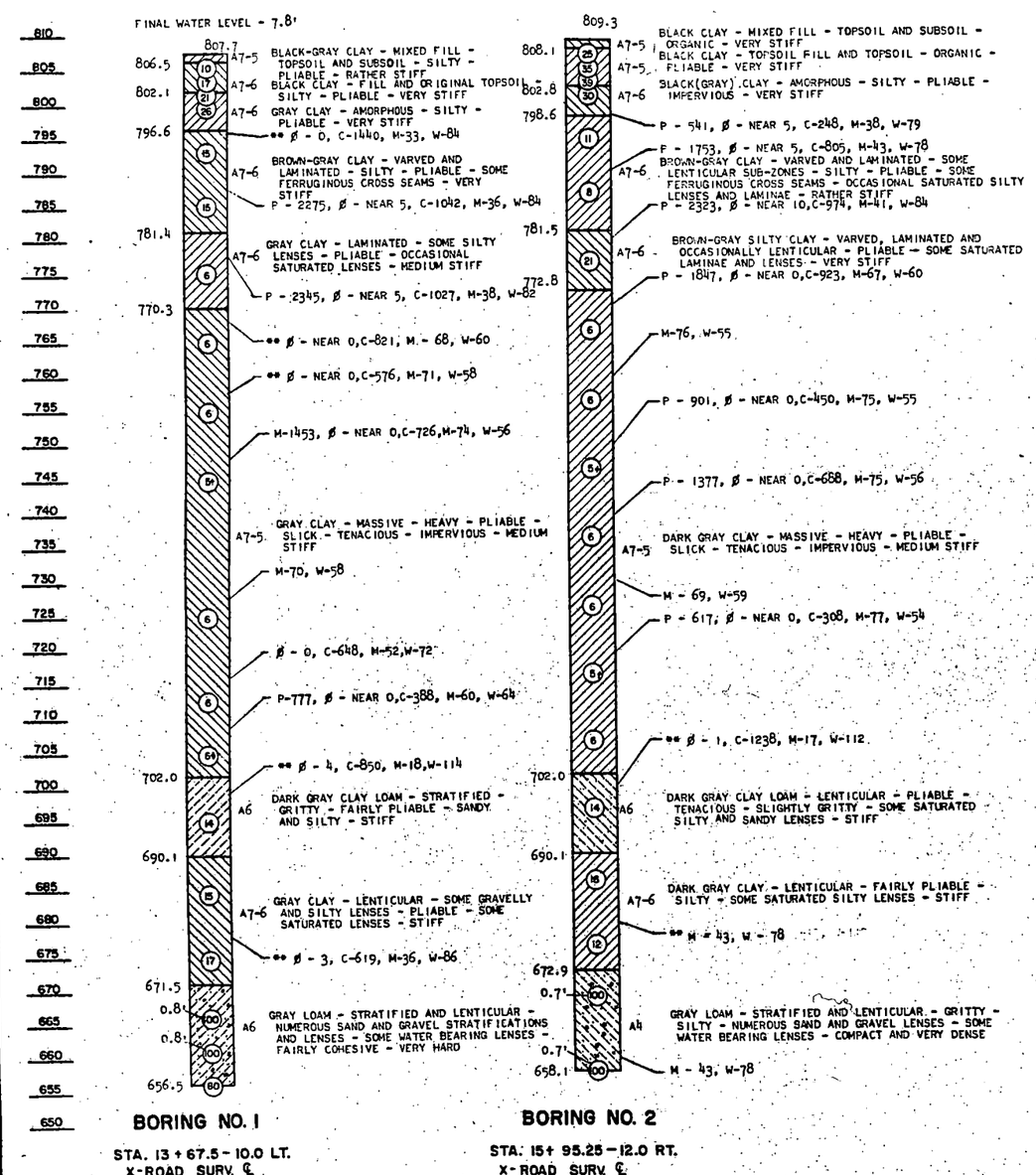
PILING LAYOUT

GENERAL NOTES

FED. ROAD DIST. NO.	STATE	PROJ. NO.	SHEET NO.	
5	N. D.	I-29-4(22)	39	

Btm. of Footing Abut. No. 1
Elev. 819.81

Btm. of Footing Abut. No. 3
Elev. 819.73



BORING NO. 1

STA. 13 + 67.5 - 10.0 LT.
X-ROAD SURV. ℄

BORING NO. 2

STA. 15+ 95.25 - 12.0 RT.
X-ROAD SURV. ℄

NOTES:

ENCIRCLED NUMBERS INDICATE THE NUMBER OF BLOWS DELIVERED BY A 140 LB. HAMMER FROM A HEIGHT OF 30" TO DRIVE CORE TUBE 1.0'.
THE BORING LOG DATA SHOWN IS FOR DESIGN PURPOSES ONLY. THE STATE ASSUMES NO RESPONSIBILITY IF SOIL CONDITIONS ENCOUNTERED DURING CONSTRUCTION DIFFER FROM THOSE SHOWN.

SYMBOLS:

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

SCALE 1" = 10'

BRIDGE NO. 29-163.75

LAKE ARDOCH INTERCHANGE

BORING LOG

WALSH COUNTY

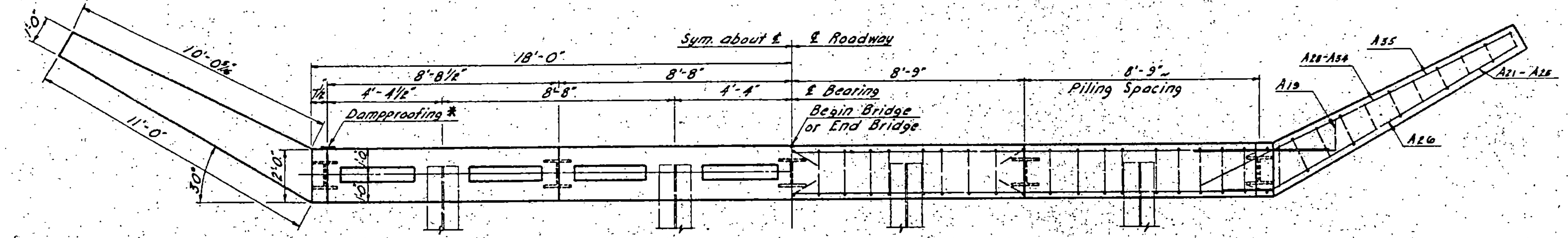
29-163.75-2

29-163.75-2

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	N.D.	I-29-4(21)		21	

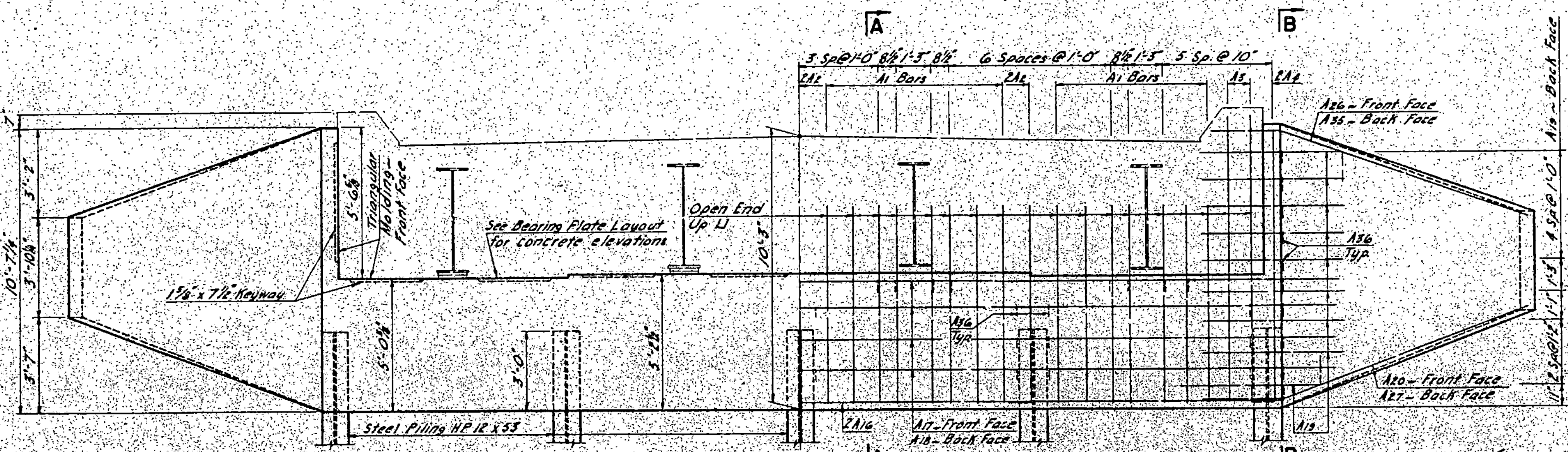
REVISIONS	MADE BY	CH'D BY	DATE

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



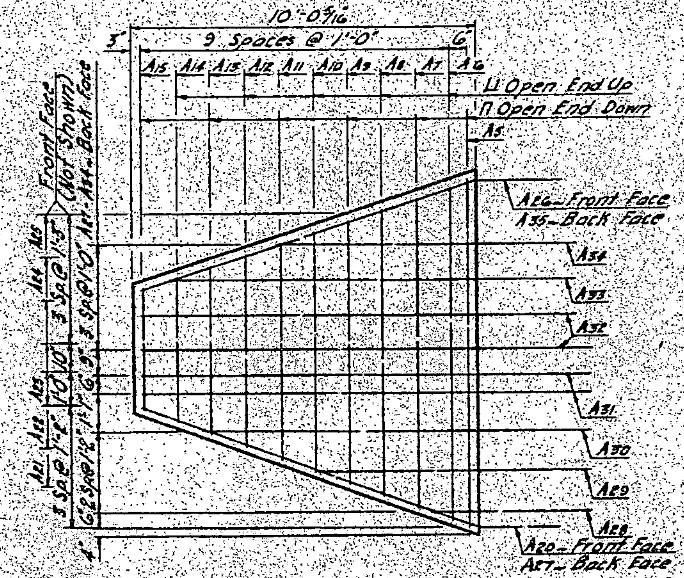
HALF PLAN
Showing Dimensions

HALF PLAN
Showing Reinforcing

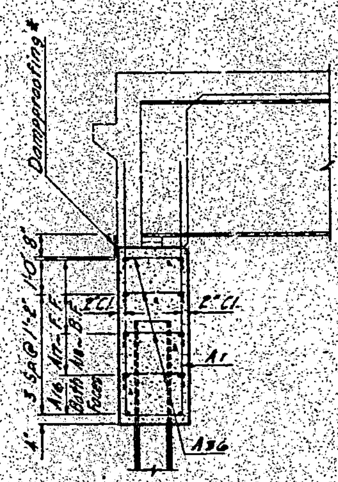


HALF ELEVATION
Showing Dimensions

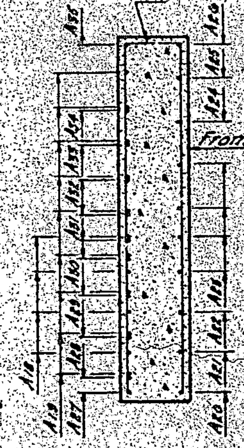
HALF ELEVATION
Showing Reinforcing



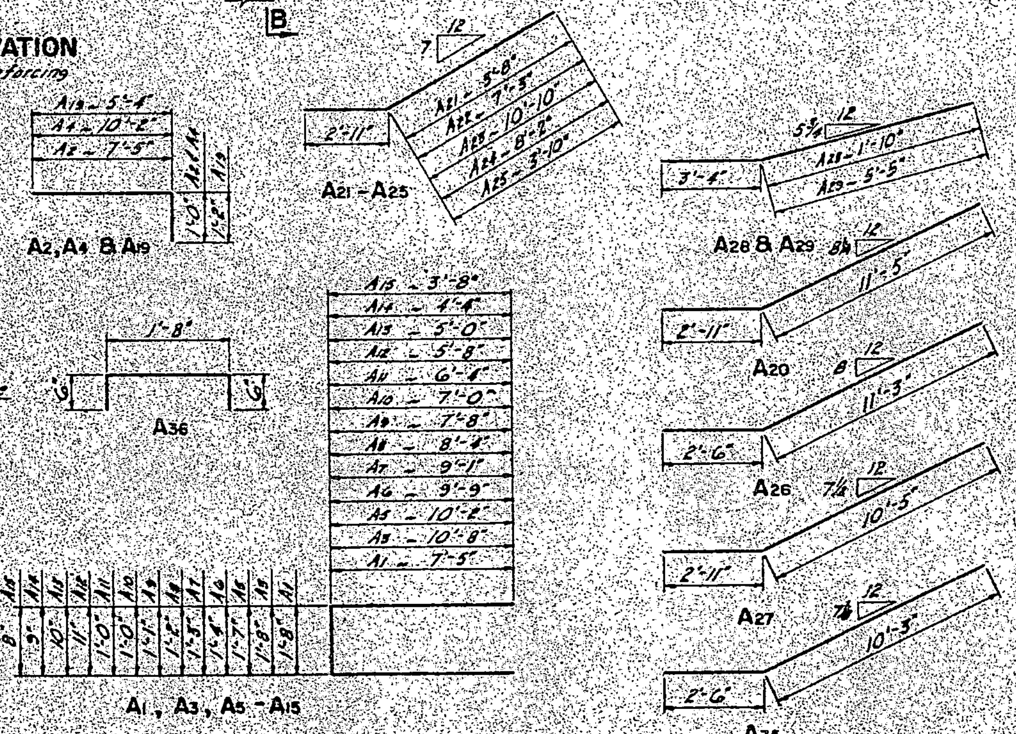
WING ELEVATION
Back Face Shown



A-A



B-B



BENT BAR DETAILS
Dimensions shown are out to out

BAR LIST (ONE ABUT.)

MARK	NUMBER	WALL		SIZE	LENGTH	SHAPE	UNIT WT.
A1		30		6	16'-6"	Bent	24.78
A2		6		6	8'-5"	"	12.64
A3		4		6	23'-0"	"	34.55
A4		4		6	11'-2"	"	16.77
A5		2		5	21'-11"	"	22.86
A6		2		5	20'-10"	"	21.73
A7		2		5	19'-5"	"	20.25
A8		2		5	17'-10"	"	18.60
A9		2		5	16'-5"	"	17.12
A10		2		5	15'-0"	"	15.65
A11		2		5	13'-8"	"	14.26
A12		2		5	12'-3"	"	12.78
A13		2		5	10'-10"	"	11.30
A14		2		5	9'-5"	"	9.82
A15		2		5	8'-0"	"	8.34
A16		2		6	36'-0"	Str.	54.08
A17		4		5	36'-0"	"	37.55
A18		4		5	40'-0"	"	41.72
A19		18		7	6'-6"	Bent	13.29
A20		2		7	14'-4"	"	29.30
A21		2		7	6'-7"	"	13.46
A22		2		7	10'-2"	"	20.79
A23		8		7	13'-9"	"	28.11
A24		2		7	11'-1"	"	22.66
A25		2		7	6'-9"	"	13.80
A26		2		6	13'-9"	"	20.65
A27		2		7	13'-4"	"	27.26
A28		2		8	5'-2"	"	13.80
A29		2		8	8'-9"	"	23.37
A30		2		8	11'-10"	Str.	31.60
A31		4		8	13'-2"	"	35.16
A32		4		7	12'-9"	"	26.07
A33		2		7	11'-8"	"	23.85
A34		2		7	8'-6"	"	17.38
A35		2		6	12'-9"	Bent	19.15
A36		60		4	2'-8"	"	1.78

NOTES:

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

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

QUANTITIES (ONE ABUT.)		
Class AE-1 Concrete	22.2	C.Y.
Reinforcing Steel	3165	Lbs.
Excavation (See Layout)		
Piling (See Layout)		

10'-3" ABUTMENT

WELDED GIRDER SPANS

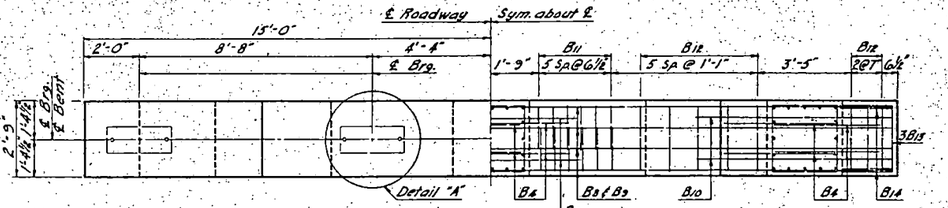
30'-0" ROADWAY

H20 LOADING

H-1403

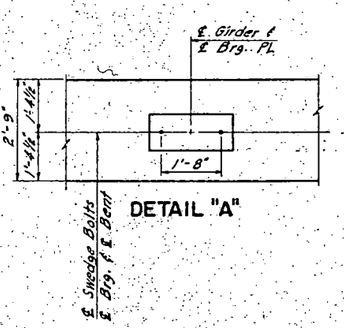
H-1403

FED. ROAD DIST. NO.	STATE	PROJ. NO.	SHEET NO.	TOTAL SHEETS
5	N.D.	I-29-4(21)	22	

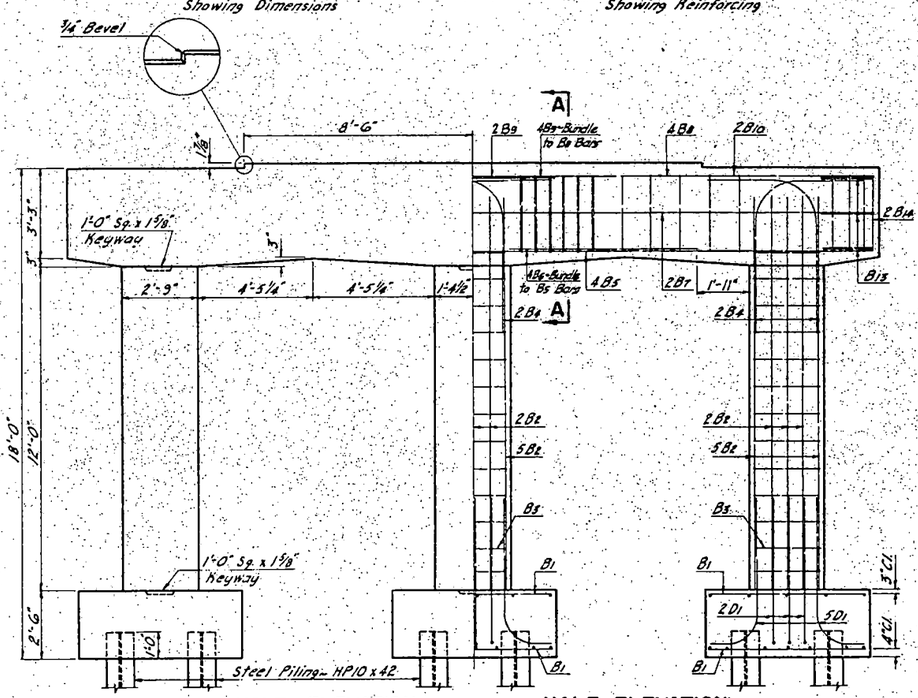


HALF PLAN
Showing Dimensions

HALF PLAN
Showing Reinforcing



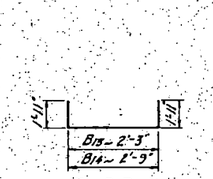
DETAIL "A"



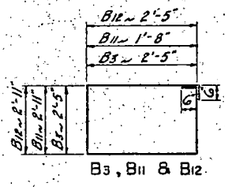
HALF ELEVATION
Showing Dimensions

HALF ELEVATION
Showing Reinforcing

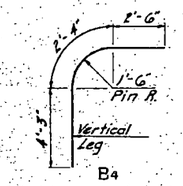
END VIEW



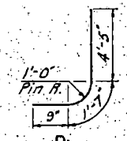
B13 & B14



B3, B11 & B12



B4



D1

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

BAR LIST

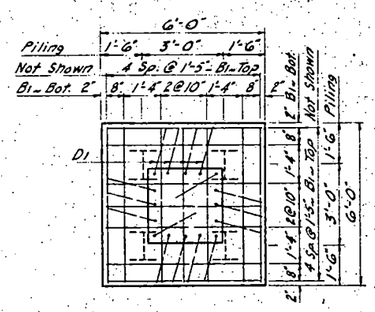
MARK	NUMBER CAP	NUMBER COLUMN	NUMBER FOOTING	SIZE	LENGTH	SHAPE	UNIT WT.
B1			72	5	5'-8"	Str.	5.91
B2		48		8	14'-6"	"	38.72
B3	3	36		3	10'-8"	Bent	4.01
B4		12		8	9'-1"	"	24.26
B5	4			9	29'-8"	Str.	100.87
B6	8			10	7'-0"	"	30.12
B7	2			6	29'-8"	"	44.56
B8	4			8	29'-8"	"	79.22
B9	6			6	6'-0"	"	9.01
B10	4			7	7'-2"	"	14.65
B11	24			5	10'-2"	Bent	10.60
B12	16			5	11'-8"	"	12.17
B13	6			6	6'-1"	"	9.14
B14	4			6	6'-7"	"	9.89
D1			48	8	6'-9"	"	18.02
S#4*	1			4	3'-8"	Str.	
S#5*	1			5	4'-0"	"	
S#6*	1			6	4'-6"	"	
S#7*	1			7	5'-0"	"	
S#8*	1			8	5'-4"	"	

NOTE:

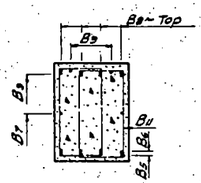
The concrete in the columns shall be allowed to set at least two (2) hours before the bent cap reinforcing is placed and concrete poured.

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

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



FOOTING PLAN - TYPICAL



A-A

QUANTITIES	
Class AE-1 Concrete	30.8 C.Y.
Reinforcing Steel	5305 Lbs.
Steel Piling (See Layout)	
Excavation (See Layout)	

18'-0" BENT DETAIL

WELDED GIRDER SPANS

30'-0" ROADWAY

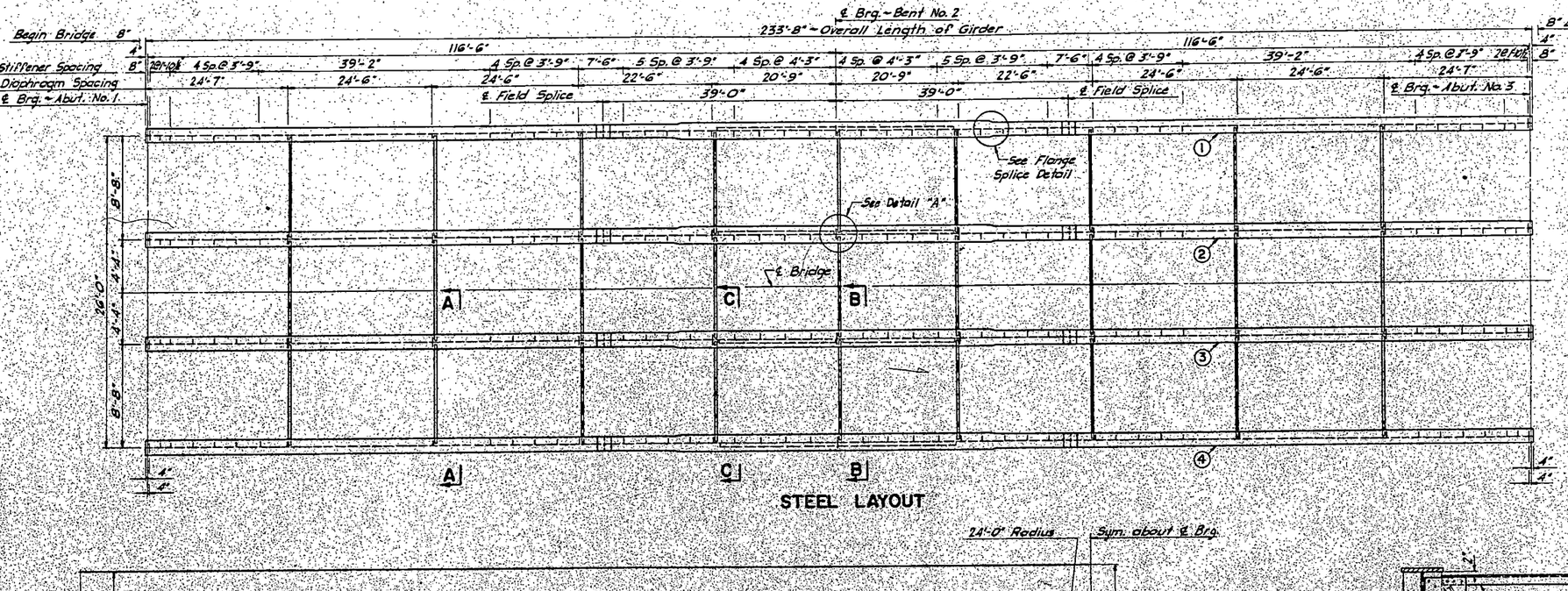
H15 or H20 LOADING

H-1380

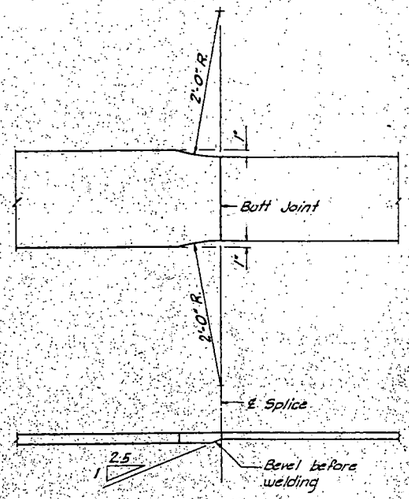
DESIGN	MADE BY	L.P.H.
	CHECKED BY	C.A.E.
DETAILS	MADE BY	C.A.E.
	CHECKED BY	L.E.G.
TRACING	MADE BY	C.A.E.
	MADE BY	D.L.B.
QUANTITIES	MADE BY	D.L.B.
	CHECKED BY	D.E.B.

REVISIONS

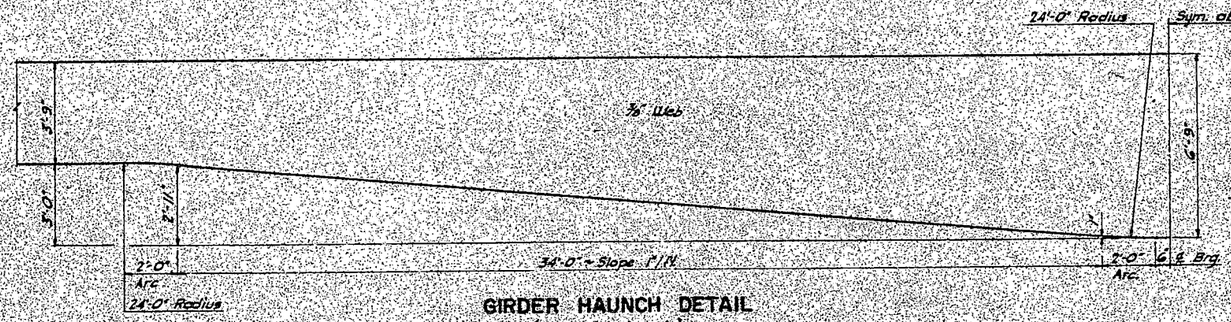
BY	CH'D BY	DATE



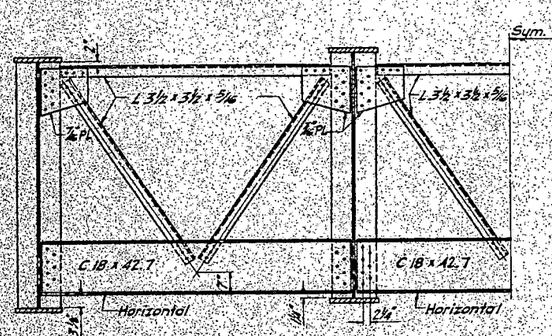
STEEL LAYOUT



FLANGE SPLICE DETAIL

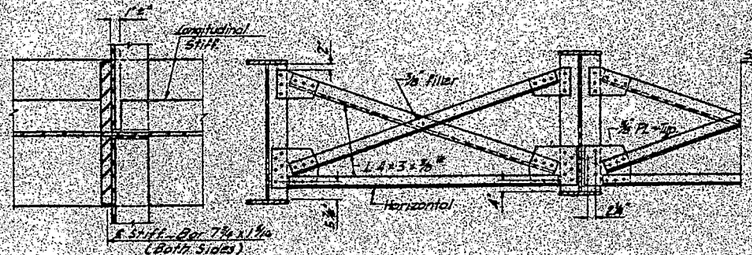


GIRDER HAUNCH DETAIL
(Showing Web only)



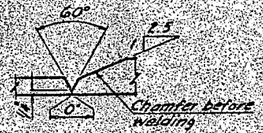
B-B

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

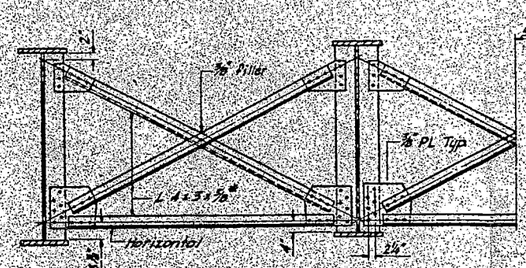


DETAIL "A"

A-A
Typical for diaphragms at positive moment regions.



ALTERNATE DETAIL NO. 1
SHOP FLANGE SPLICE
Top 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).



C-C
Typical for diaphragms adjacent to support
4 Leg Vertical

* Allow approximately 1" clearance as shown between longitudinal & vertical stiffeners for installation of diaphragms.

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

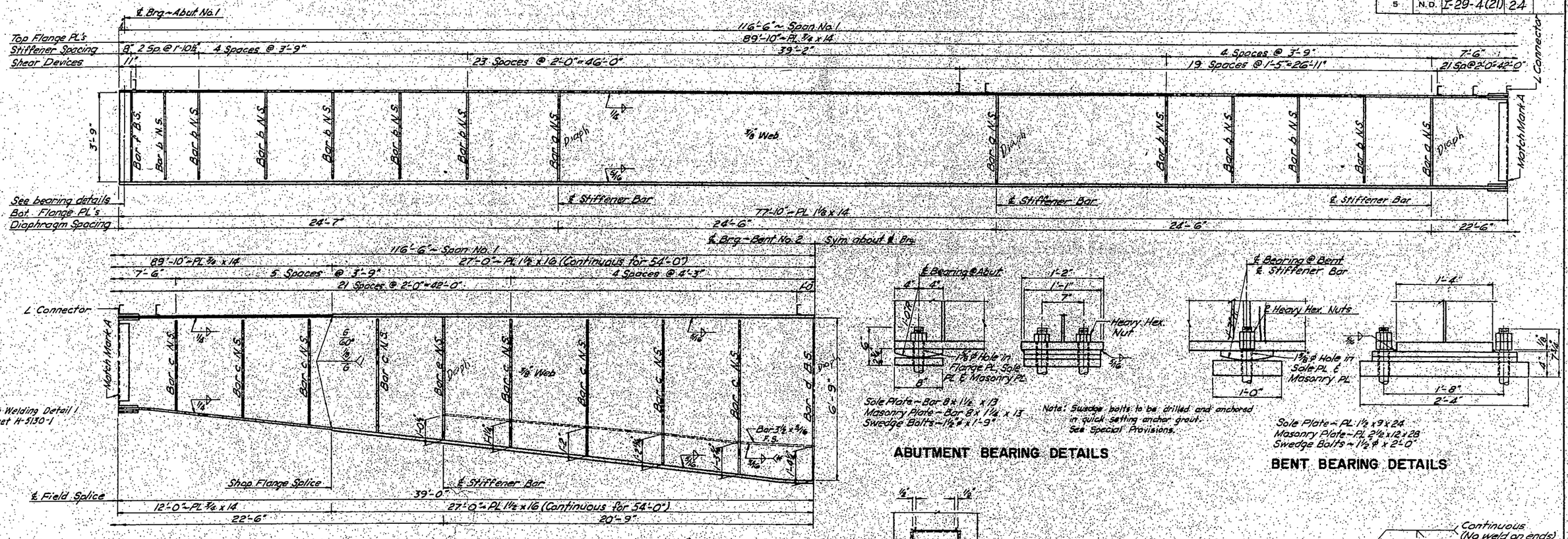
QUANTITIES
See Drawing H-5130-2

GIRDER & DIAPHRAGM DETAILS
WELDED GIRDER SPANS
30'-0" ROADWAY
H_{20} LOADING

H-5130-1

H-5130

FED. ROAD DIST. NO.	STATE	PROJ. NO.		SHEET NO.	TOTAL SHEETS
5	N.D.	I-29-4(21)	24		



HALF GIRDER ELEVATION

*Weld to web only.

Sole Plate~Bar 8 x 1½ x 13
Masonry Plate~Bar 9 x 1¼ x 13
Swedge Bolts~1½ ø x 1'-9"

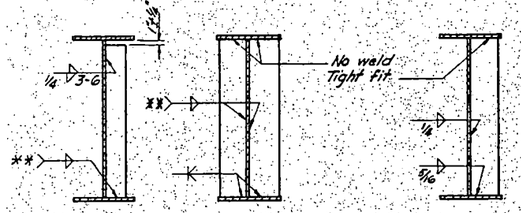
Note: Swedge bolts to be drilled and anchored in quick setting anchor grout. See Special Provisions.

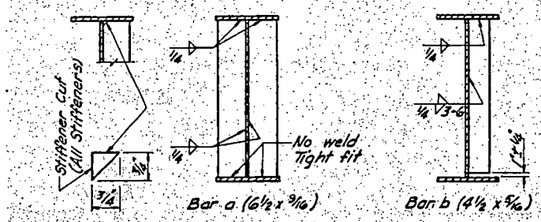
ABUTMENT BEARING DETAILS

Sole Plate~PL 1½ x 9 x 24
Masonry Plate~PL 2½ x 12 x 28
Swedge Bolts~1½ ø x 2'-0"

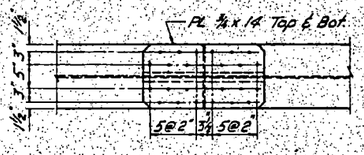
BENT BEARING DETAILS

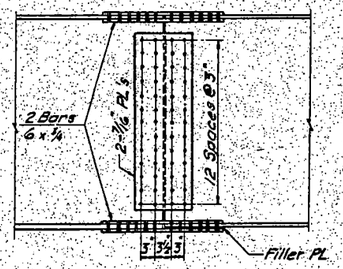
**Weld size to be ⅛" for flange or stiffener thickness of over ½" to ¾" and 5/16" for flange or stiffener thickness of over ¾" to 1½".





WEB STIFFENER DETAILS

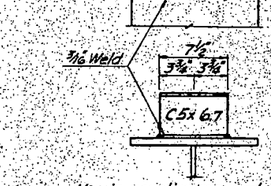




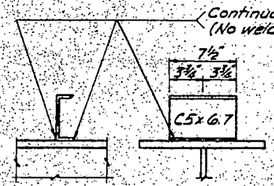
FIELD SPLICE DETAILS

GIRDER DETAIL

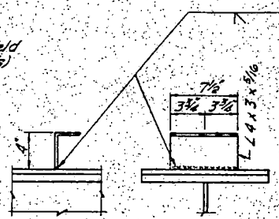
Nomenclature:
N.S. = Near Side
B.S. = Both Sides
F.S. = Far Side



Use in negative moment regions between field splices.

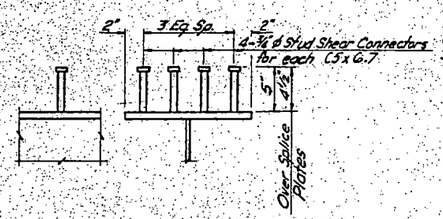


Use in positive moment regions except over splice ℄'s



Use over splice ℄'s

SHEAR DEVICE DETAILS



ALTERNATE SHEAR DEVICE

NOTE:
The details shown on this drawing represents Girder No.1 in a four 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, drawing H-5130-1 and the shop camber diagram.

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

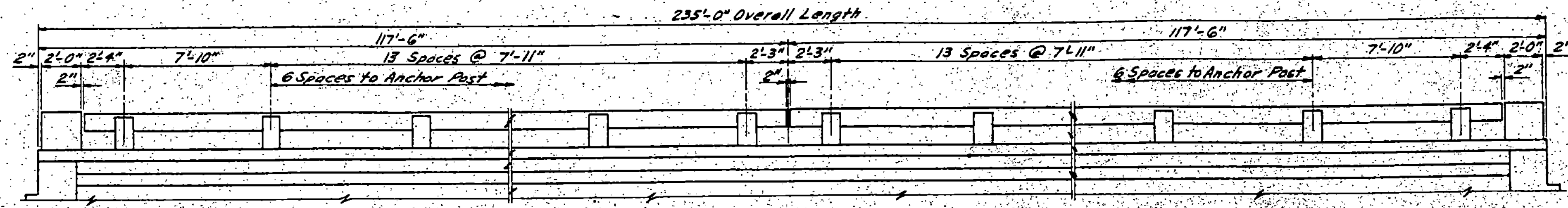
QUANTITIES

Structural Steel A572	37,758	Lb
Structural Steel A36	92,575	Lb

GIRDER & BRG. DETAILS
WELDED GIRDER SPANS
30'-0" ROADWAY
H20 LOADING

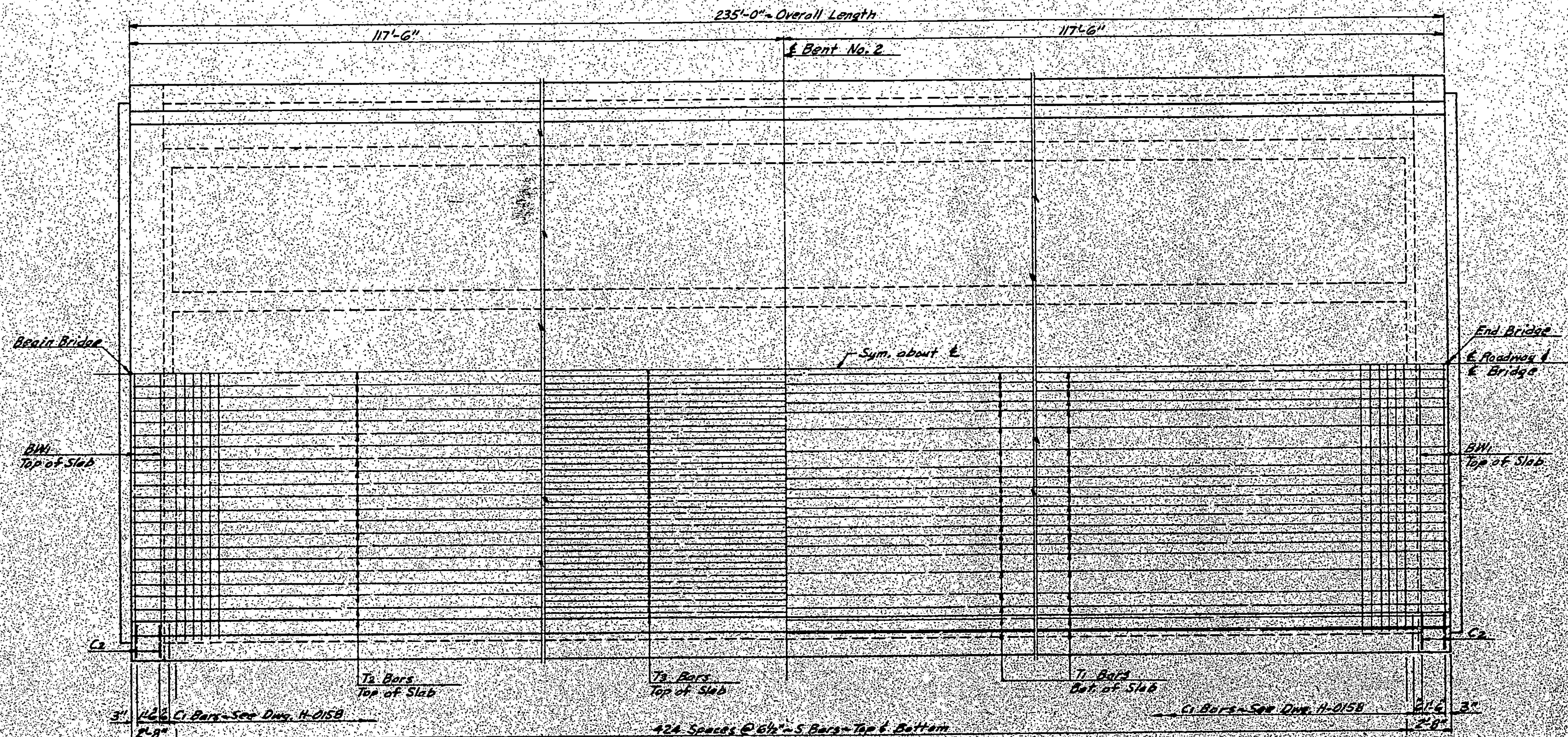
H-5130-2

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



PART ELEVATION

See H-015B for Railing Details

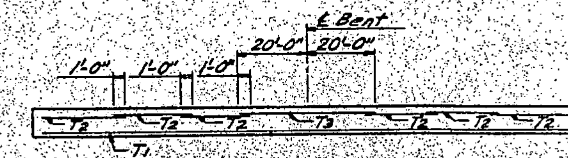


PART PLAN

Quarter showing reinforcing in top of slab

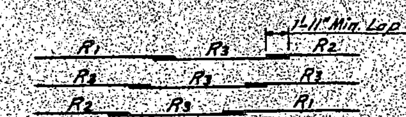
Half showing slab reinforcing
Typical both sides ~ by Rotation

Quarter showing reinforcing in bottom of slab



BAR LAYOUT

T2 & T3



R BAR SPLICING DETAIL

(Spans 1 & 2 Railing)

SPLICING DETAIL

T1, C3, C4

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

QUANTITIES
See Dwg. H-5131-2

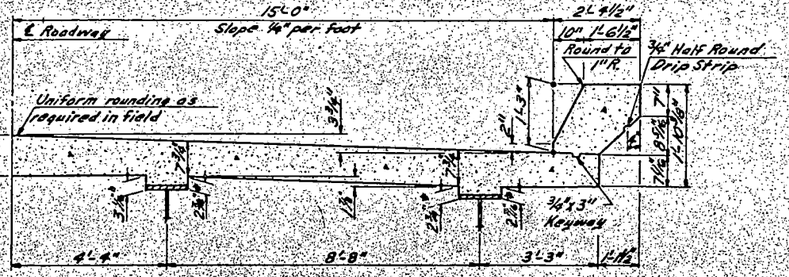
SLAB & RAILING DETAI

WELDED GIRDER SPAN

30'-0" ROADWAY

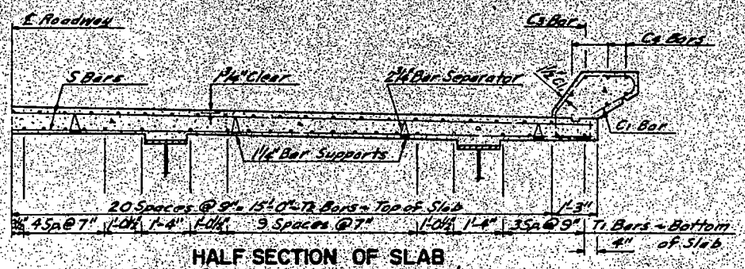
H20 LOADING

FED. ROAD DIST. NO.	STATE	PROJ. NO.	...	SHEET NO.	TOTAL SHEETS
5	N.D.	I-29-4(21	26		

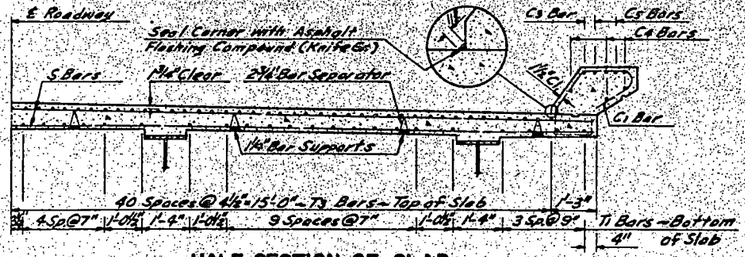


HALF SECTION OF SLAB
Showing Dimensions

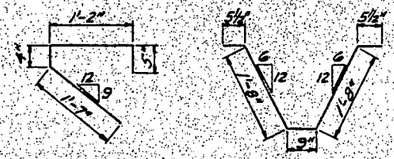
* Allow for variation in girder elevation by adjusting the riser dimension to maintain required slab thickness.



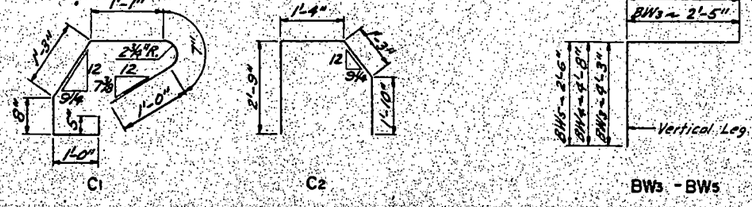
HALF SECTION OF SLAB
Showing Reinforcing between Bent & Abutments



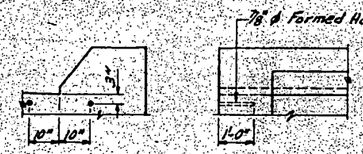
HALF SECTION OF SLAB
Showing Reinforcing over Bent



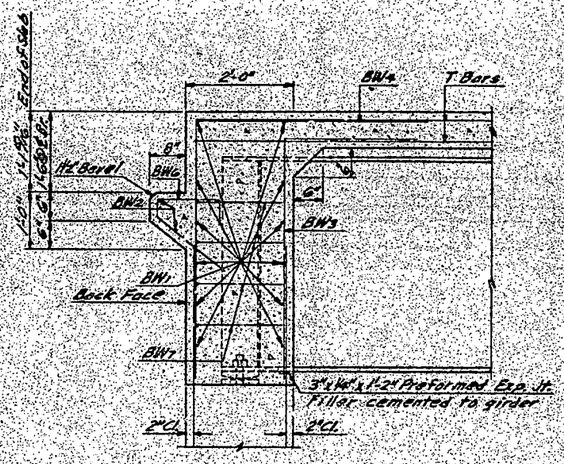
BW6 BW7



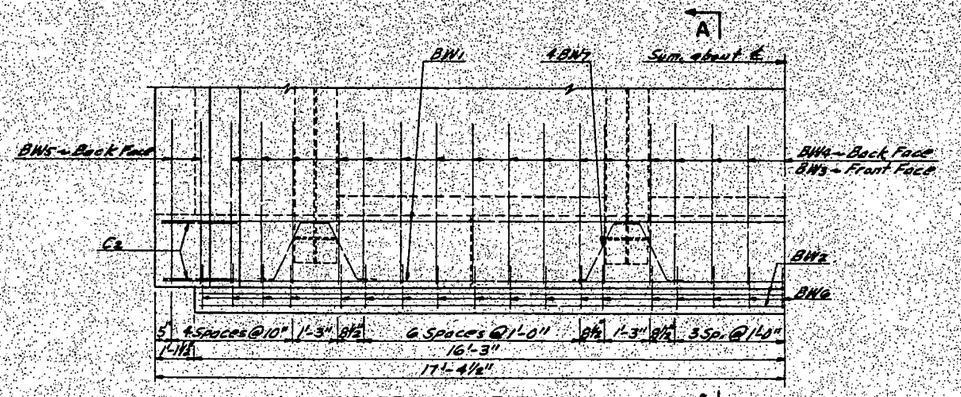
BENT BAR DETAILS
Dimensions shown are out to out



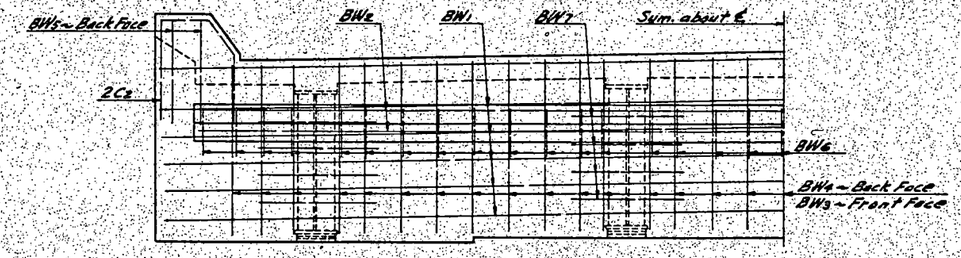
CURB SLEEVE DETAILS



A-A



END BEAM HALF PLAN



END BEAM HALF ELEVATION

BAR LIST (SUPERSTRUCTURE)

MARK	NUMBER: SLAB	NUMBER: RAILING POSTS	NUMBER: CURB	SIZE	LENGTH	SHAPE	UNIT WT.
BW1	24		6	34'-5"	Str.	51.70
BW2	4		5	32'-2"	"	33.55
BW3	66		6	6'-8"	Bent	10.01
BW4	66		6	8'-11"	"	13.39
BW5	8		6	6'-9"	"	10.14
BW6	70		4	3'-6"	"	2.34
BW7	32		5	5'-0"	"	5.22
C1	532		5	6'-0"	Bent	6.26
C2	9		5	7'-2"	"	7.48
C3		14	6	35'-2"	Str.	52.82
C4		70	5	34'-11"	"	36.42
C5		4	4	40'-0"	"	26.70
P1		168	6	4'-8"	Bent	6.51
P2		12	6	5'-1"	"	7.64
P3		120	5	41.9"	"	4.95
P4	120		3	4'-2"	"	1.56
P5	112		3	3'-2"	"	1.19
P6	8		3	4'-8"	"	1.75
RC	416		3	3'-3"	Bent	1.22
R1	16		6	42'-6"	Str.	63.84
R2	16		6	32'-6"	"	54.83
R3	40		6	39'-6"	"	59.33
S	850		6	32'-2"	Str.	48.32
T1	308		5	34'-11"	Str.	36.42
T2	296		3	33'-6"	"	12.50
T3	81		4	40'-0"	"	26.70

NOTES:

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

Each curb shall be poured in one continuous operation.

See Std Drawing H-0158 for railing details.

See Drawings H-5130-1 and H-5130-2 for structural steel details.

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

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

QUANTITIES

Class AE-3 Concrete	250.9	C.Y.
Class AAE-3 Concrete	15.23	C.Y.
Reinforcing Steel	14,719	Lbs.

Railing and end post quantities included.

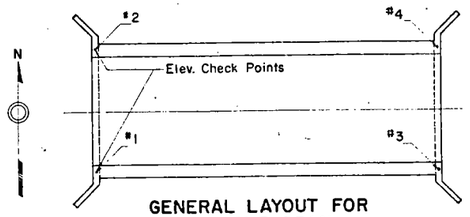
SLAB, END BEAM & MISC. DETAILS
WELDED GIRDER SPANS
30'-0" ROADWAY
H20 LOADING

H-5131-2

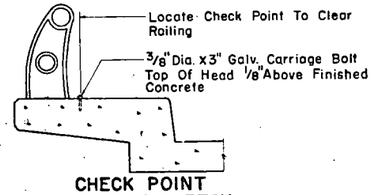
NO. ROAD SYS. NO.	COUNTY	NO. AND TYPE NO.	SHEET NO.
	N.D.	1-29-4(22)	41

D-900-1

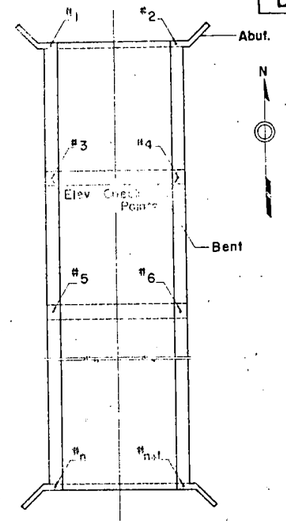
BRIDGE BENCH MARKS



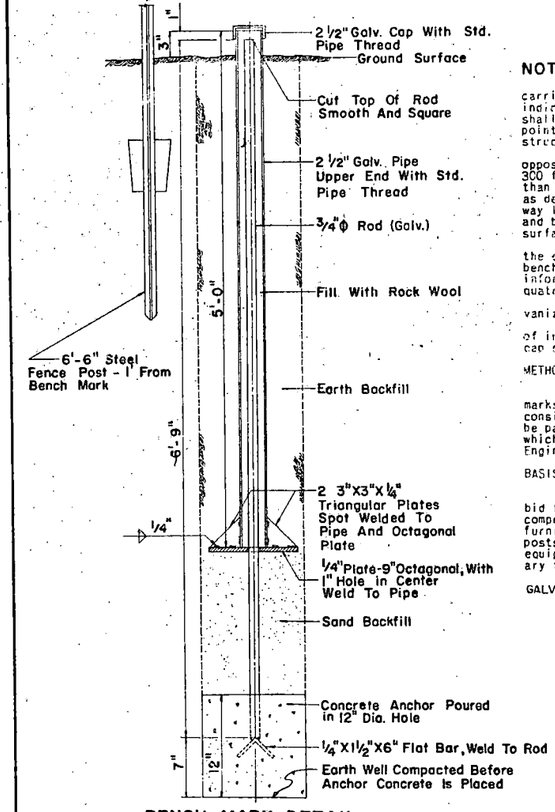
GENERAL LAYOUT FOR SINGLE SPAN



CHECK POINT LOCATION SKETCH



GENERAL LAYOUT FOR MULTIPLE SPAN



BENCH MARK DETAIL

NOTES:

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

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

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

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

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

METHOD OF MEASUREMENT:

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

BASIS OF PAYMENT:

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

GALVANIZING:

After fabrication the complete assembly shall be Hot Dip Galvanized

Revised 10-20-52
Revised 6-9-59

NORTH DAKOTA
STATE HIGHWAY DEPARTMENT

Submitted: Joseph R. Kirby
Bridge Engineer

Recommended:
Director Staff Division

Approved:
Chief Engineer

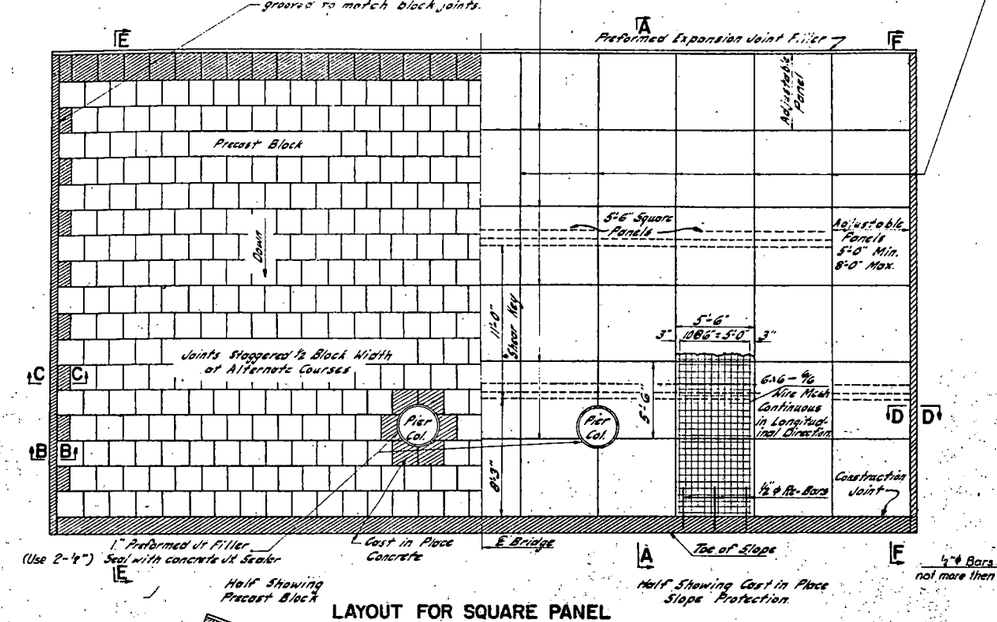
Date: 3-3-58

7.6

DIV. NO.			NO.
5	N.D.	1-29-4(22)	40

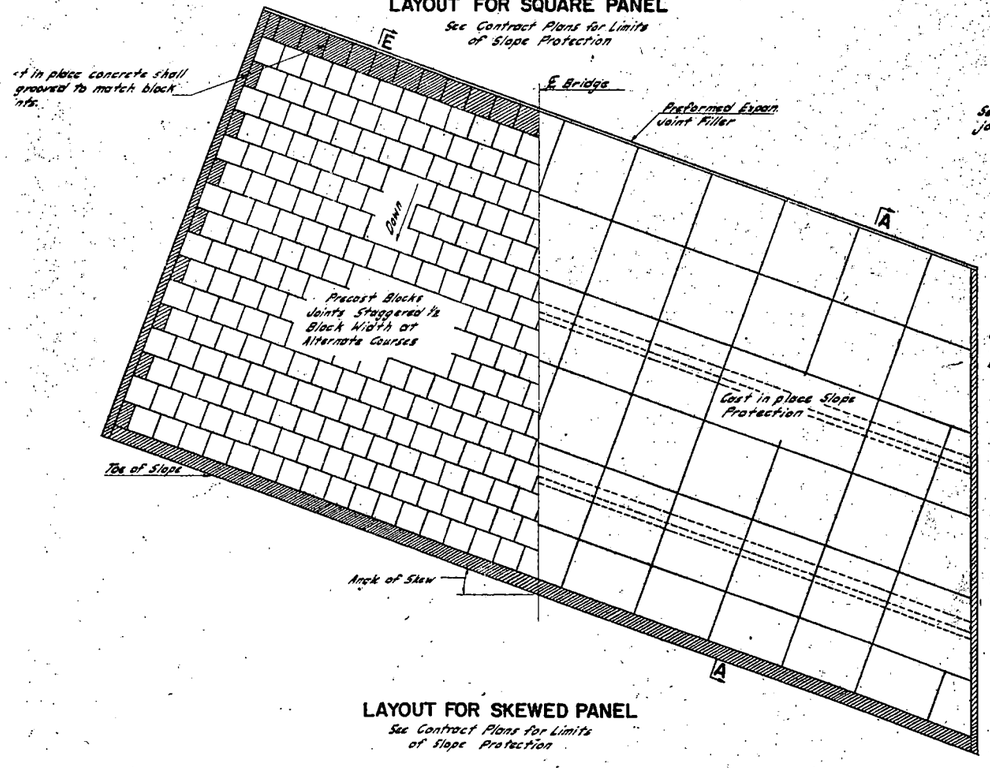
D-704-1

STANDARD SLOPE PROTECTION UNDER BRIDGES



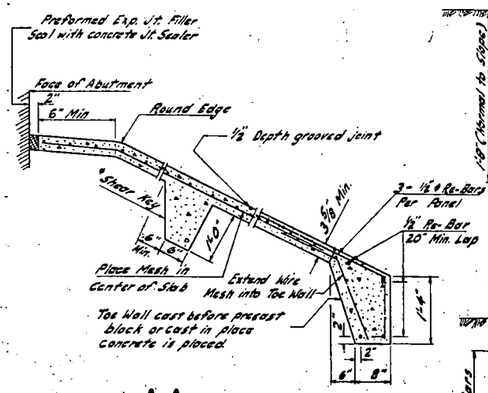
LAYOUT FOR SQUARE PANEL

See Contract Plans for Limits of Slope Protection

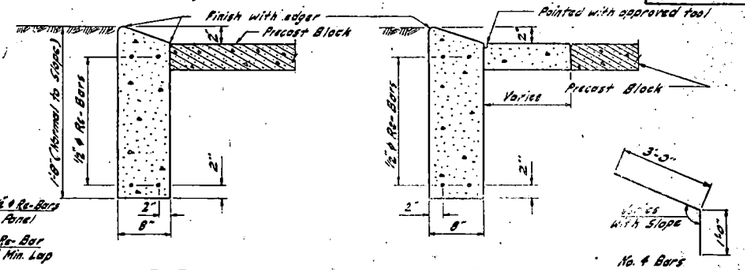


LAYOUT FOR SKEWED PANEL

See Contract Plans for Limits of Slope Protection



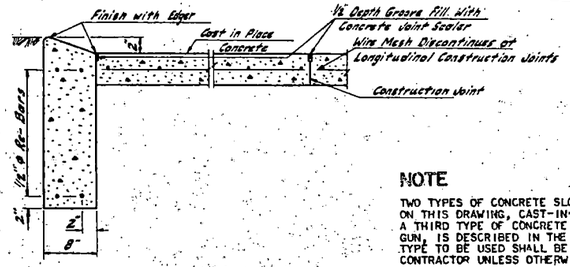
A-A



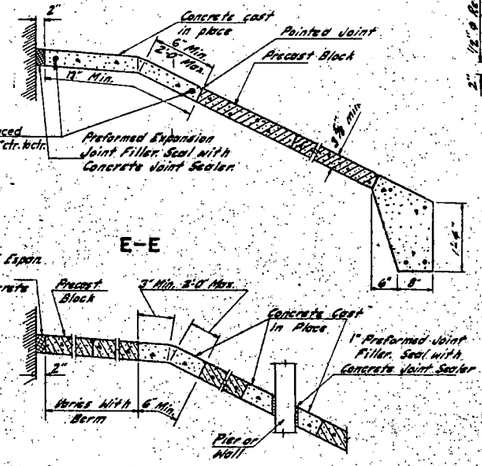
B-B

C-C

BENT BAR DETAIL



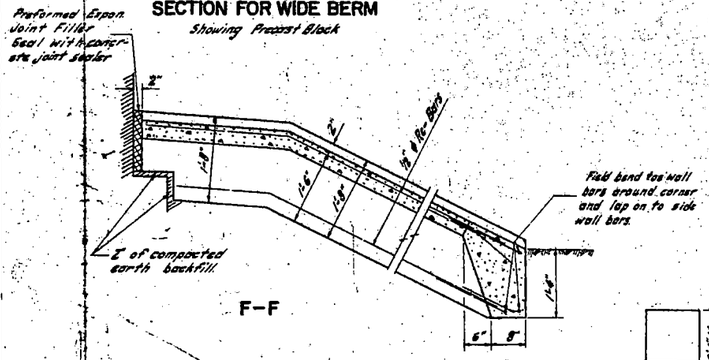
D-D



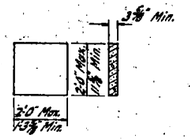
E-E

SECTION FOR WIDE BERM

Showing Precast Block



F-F



DETAILS OF PRECAST BLOCKS

NOTE

TWO TYPES OF CONCRETE SLOPE PROTECTION ARE SHOWN ON THIS DRAWING, CAST-IN-PLACE AND PRECAST BLOCK. A THIRD TYPE OF CONCRETE SLOPE PROTECTION, CEMENT-GUN, IS DESCRIBED IN THE SPECIAL PROVISIONS. THE TYPE TO BE USED SHALL BE OPTIONAL WITH THE CONTRACTOR UNLESS OTHERWISE SPECIFIED ON THE PLANS.

WHEN CEMENT-GUN SLOPE PROTECTION IS USED, THE DETAILS SHOWN FOR CAST-IN-PLACE SLOPE PROTECTION SHALL GOVERN THE INSTALLATION EXCEPT AS FOLLOWS.

1. WELDED STEEL WIRE FABRIC SHALL BE CONTINUOUS OVER THE ENTIRE AREA TO BE PROTECTED. FABRIC SHALL BE STYLE 6X6 - 6/6 AND LAPS SHALL BE A MINIMUM OF 6".

2. LONGITUDINAL AND TRANSVERSE CONSTRUCTION JOINTS SHALL BE ELIMINATED.

3. SIDE & TOE WALLS MAY BE EITHER CAST-IN-PLACE OR CEMENT GUN CONCRETE

WHEREVER PARTS OF A STRUCTURE, SUCH AS PIER COLUMNS, WALLS, ETC. ARE CONTACTED BY THE SLOPE PROTECTION, PREFORMED EXPANSION JOINT FILLER SHALL BE INSTALLED BETWEEN CONTACT AREAS AS SHOWN.

THE AREAS AROUND PIERS, ABUTMENTS, TOP OF SLOPES AND SIDEWALLS WHERE THE REGULAR PRECAST BLOCK PATTERN IS INTERRUPTED, SHALL BE CONSTRUCTED WITH CAST IN PLACE CONCRETE AND SHALL BE MARKED INTO SECTIONS WITH AN APPROVED GROOVING TOOL.

RECTANGULAR SHAPED PRECAST BLOCKS SHALL BE PLACED WITH THE LONG DIMENSION TRANSVERSE.

*SHEAR KEYS SHALL BE PLACED IN EVERY OTHER PANEL ON THE SLOPE, AS SHOWN. DO NOT INSTALL SHEAR KEY ON BERM.

(ALSO SEE SPECIAL PROVISIONS)

ALL CONSTRUCTION JOINTS SHALL BE SEALED WITH CONCRETE JOINT SEALER AS WELL AS ALL CRACKS THAT DEVELOP BEFORE THE PROJECT HAS BEEN ACCEPTED.

DATE SIGNED:
10-19-65

REVISIONS	
DATE	CHANGE

NORTH DAKOTA
STATE HIGHWAY DEPARTMENT

Submitted: Joseph B. Kirby
Bridge Engineer

Recommended:
Asst. Chief Engineer
Pre-Construction

Approved:
Chief Engineer