

ND DEPARTMENT OF TRANSPORTATION

SHEET NO 1 OF 3

ABSTRACT OF BIDS RECEIVED

PROJECT NO. SS-9-999(163)

NO. 18

BIDDER
ENGINEERS ESTIMATEBIDDER
STRATA CORPORATION C
ONSTRUCTION DIVISIONBIDDER
WANZEK CONSTRUCTION
INCCOUNTY & DATE CAVALIER (019), GRAND FORK JUN 20, 2003 09:30AM
LENGTH & TYPE 0.000COMPLETION TIME 8 SITES IN DEVILS LAKE & GRAND FORKS DIS
10/04/03 STRUCTURAL MAINTENANCE REPAIR

c.c. CHECK RANK 00

GRAND FORKS, ND

FARGO, ND

c.c. BOND RANK 01

c.c. BOND RANK 02

SPEC. NO.	ITEM DESCRIPTION	UNIT	QUANTITY	BID PRICE	AMOUNT	BID PRICE	AMOUNT	BID PRICE	AMOUNT
103	CONTRACT BOND	L SUM	1000	1800000	1800000	500000	500000	1200000	1200000
702	MOBILIZATION	L SUM	1000	1500000	1500000	600000	600000	1000000	1000000
704	FLAGGING	MHR	50000	16000	800000	26000	130000	21200	106000
704	TRAFFIC CONTROL SIGNS	UNIT	280000	4000	112000	7000	196000	7000	196000
704	DELINEATOR DRUMS	EA	20000	50000	100000	25000	50000	25000	50000
708	RIPRAP-LOOSE ROCK	CY	55000	60000	330000	60000	330000	88000	484000
708	SLOPE PROTECTION CONCRETE-REMOVE & REPLACE	SY	90000	100000	900000	135000	1215000	195000	1755000
709	GEOTEXTILE FABRIC-TYPE RR	SY	82000	2000	164000	3000	246000	5000	41000
930	SPALL REPAIR	SF	135000	100000	1350000	150000	2025000	175000	2362500
930	WINGWALL MODIFICATION	L SUM	1000	2500000	2500000	3500000	3500000	5700000	5700000
930	BOX CULVERT JOINT REPAIR	EA	20000	2000000	40000000	800000	1600000	1050000	2100000
TOTAL					8818400		6570600		8784500
						NO LIMIT		NO LIMIT	

ACTION TAKEN BY DEPARTMENT OF TRANSPORTATION DIRECTOR:

AWARD TO: STRATA CORPORATION

38

DATE OF AWARD

June 26, 2003

WHEN PRELIMINARY ARRANGEMENTS ARE COMPLETED

DEPARTMENT OF TRANSPORTATION DIRECTOR

STATE	PROJECT NO.	PCN	SHEET NO.
ND	SS-9-999(163)	15411	1

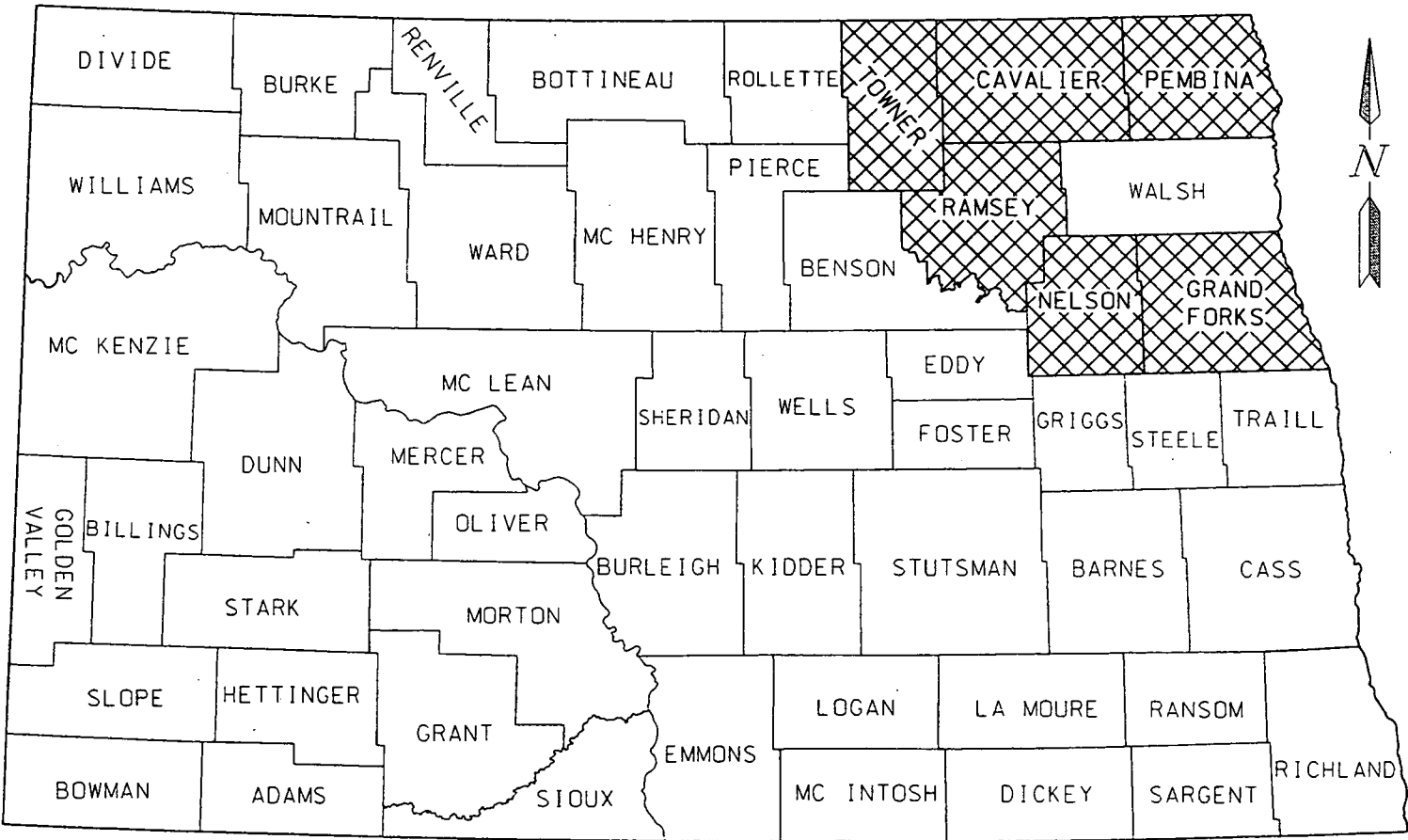
NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

STATEWIDE
SS-9-999(163)

GOVERNING SPECIFICATIONS:

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

MAINTENANCE REPAIR WORK ON EIGHT SITES
THROUGHOUT THE STATE



STATE COUNTY MAP

INDEX OF DRAWINGS

SHEET NO.	DESCRIPTION	SITE NUMBER
1	TITLE SHEET	ALL
2	SITE LOCATIONS	ALL
3	ESTIMATE OF QUANTITIES	ALL
4	TRAFFIC CONTROL	ALL
5-6	BOX CULVERT JOINT REPAIR & SPALL REPAIR	1
7	BOX CULVERT WINGWALL MODIFICATION	2
8	BOX CULVERT SPALL REPAIR	3
9	BOX CULVERT SPALL REPAIR	4
10	RIPRAP	5
11	CONCRETE SLOPE PROTECTION REPAIR	6
12	BOX CULVERT JOINT REPAIR	7
13-14	BOX CULVERT JOINT REPAIR & SPALL REPAIR	8
15-16	TRAFFIC CONTROL DEVICES LIST	ALL

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
D-704-22	CONSTRUCTION SIGN AND BARRICADE LOCATION DETAILS
D-704-24	CONSTRUCTION SIGN AND BARRICADE DETAILS
D-708-1	STANDARD SLOPE PROTECTION UNDER BRIDGES

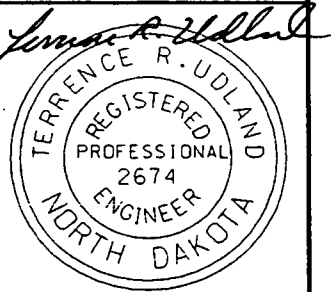
NOTE: STANDARD DRAWINGS ARE INCLUDED IN THE BACK OF THE PLANS

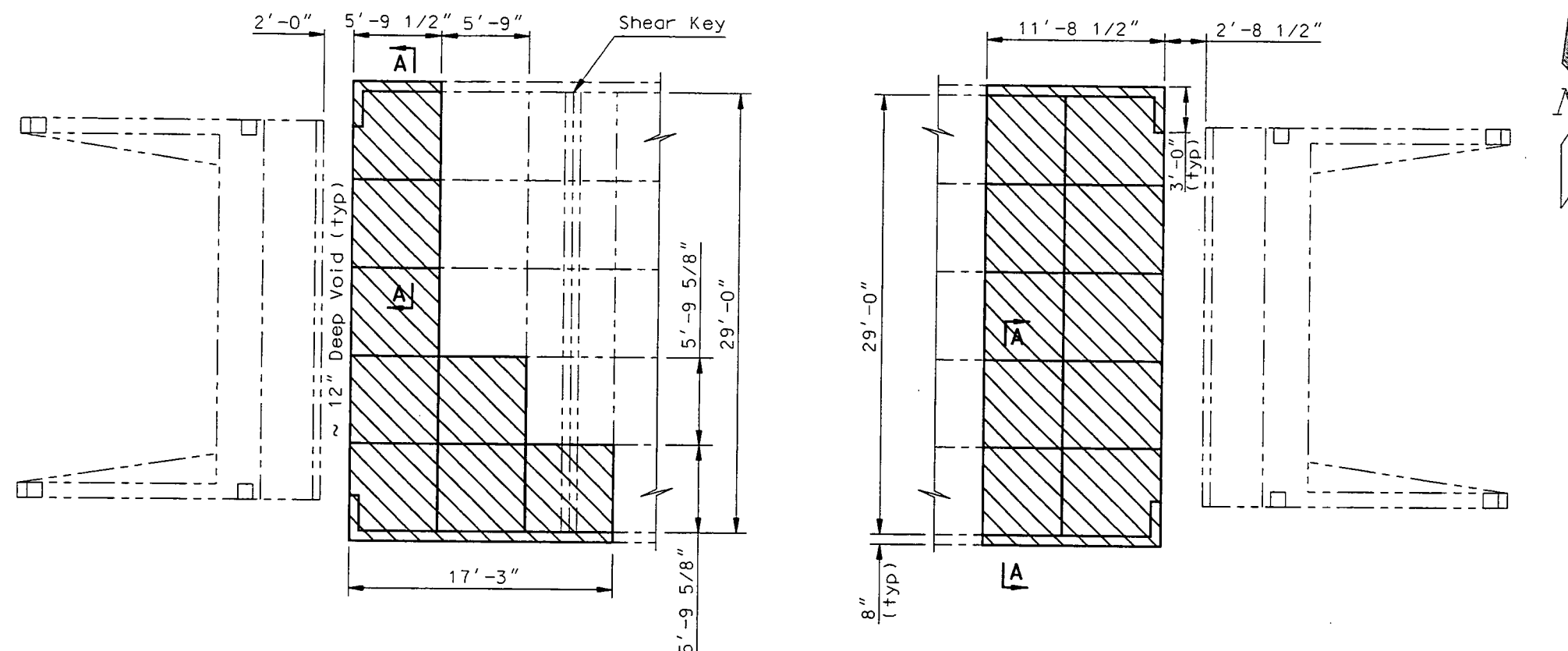
APPROVED DATE 5/5/03

Francis J. Ziegler
DIRECTOR,
OFFICE OF PROJECT DEVELOPMENT
ND DEPARTMENT OF TRANSPORTATION

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

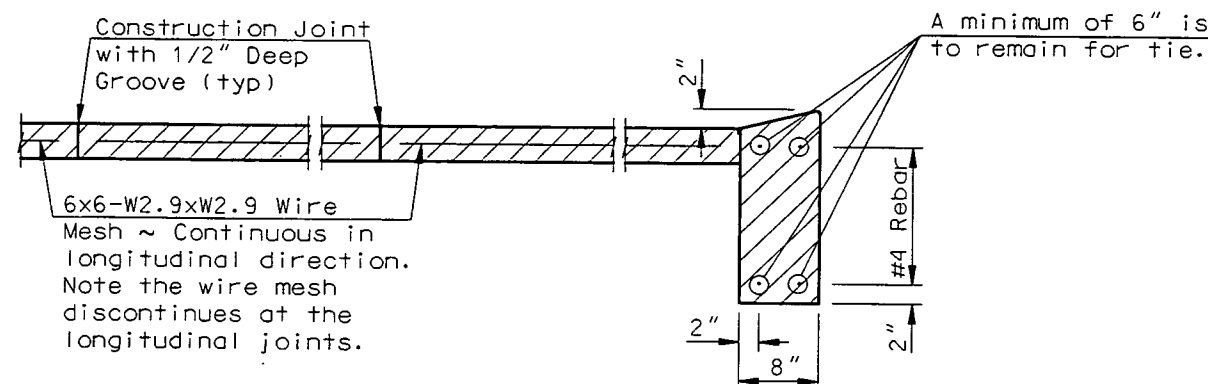
APPROVED DATE 5-5-03
Terrence R. Udland
BRIDGE ENGINEER
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION





SLOPE PROTECTION PLAN

 Indicates Slope Protection Panels To Be Removed



A-A

NOTES:

- 100 SCOPE OF WORK: Work at this site consists of replacing slope protection panels at both abutments.
- 708 SLOPE PROTECTION CONCRETE-REMOVE & REPLACE: The concrete slope protection has pulled away from the abutments leaving a gap of $\pm 2'-0"$ at the west abutment and $\pm 2'-8"$ at the east abutment. The embankment in these gaps has eroded and left void areas approximately 12" deep.

The concrete slope protection has damaged panels as shown in the plan view. The actual limits of the repair shall be determined by the engineer in the field. The designated panels shall be removed and replaced according to Standard Drawing D-708-1.

Care shall be taken to minimize damage to the wire mesh that is to remain in place for the replacement of the slope protection. A minimum of 6" of wire mesh is to remain beyond the removal line.

All concrete removed shall be properly disposed of off of the right-of-way. All labor, equipment and materials required to remove and replace the concrete slope protection, and backfill the void areas shall be included in the pay item "Slope Protection Concrete - Remove & Replace."

SPEC	CODE	ITEM DESCRIPTION	UNIT	QUANTITY
708	1105	SLOPE PROTECTION CONCRETE-REMOVE & REPLACE	SY	90

STANDARD DRAWINGS

D-708-1

BNRR OVERPASS
GRAND FORKS COUNTY

SLOPE PROTECTION
REMOVAL DETAILS

NOTES:

100 SCOPE OF WORK: Work at this site consists of filling voids, with expensive polyurethane foam insulation or flowable fill, caused by the untied construction joint separating on a reinforced concrete box culvert. All debris shall be removed from the box culvert.

930 BOX CULVERT JOINT REPAIR: Structure 5-305.341 is a triple 10' x 12' x 42' reinforced concrete box culvert with one untied construction joint. The joint has separated approximately 5 1/2" at bottom and 1/2" at top.

First an 18" wide, 15 gage galvanized steel plate shall be attached to both side wall joints. The voids along the box culvert floor and side walls shall then be filled with flowable fill from inside the box culvert. Install one 3' section of 15 gage steel plate to the roof, and then fill the voids above this 3' section by spraying expansive foam insulation from inside the box culvert. Attach another 3' section of steel plate and fill the voids above with the foam insulation.

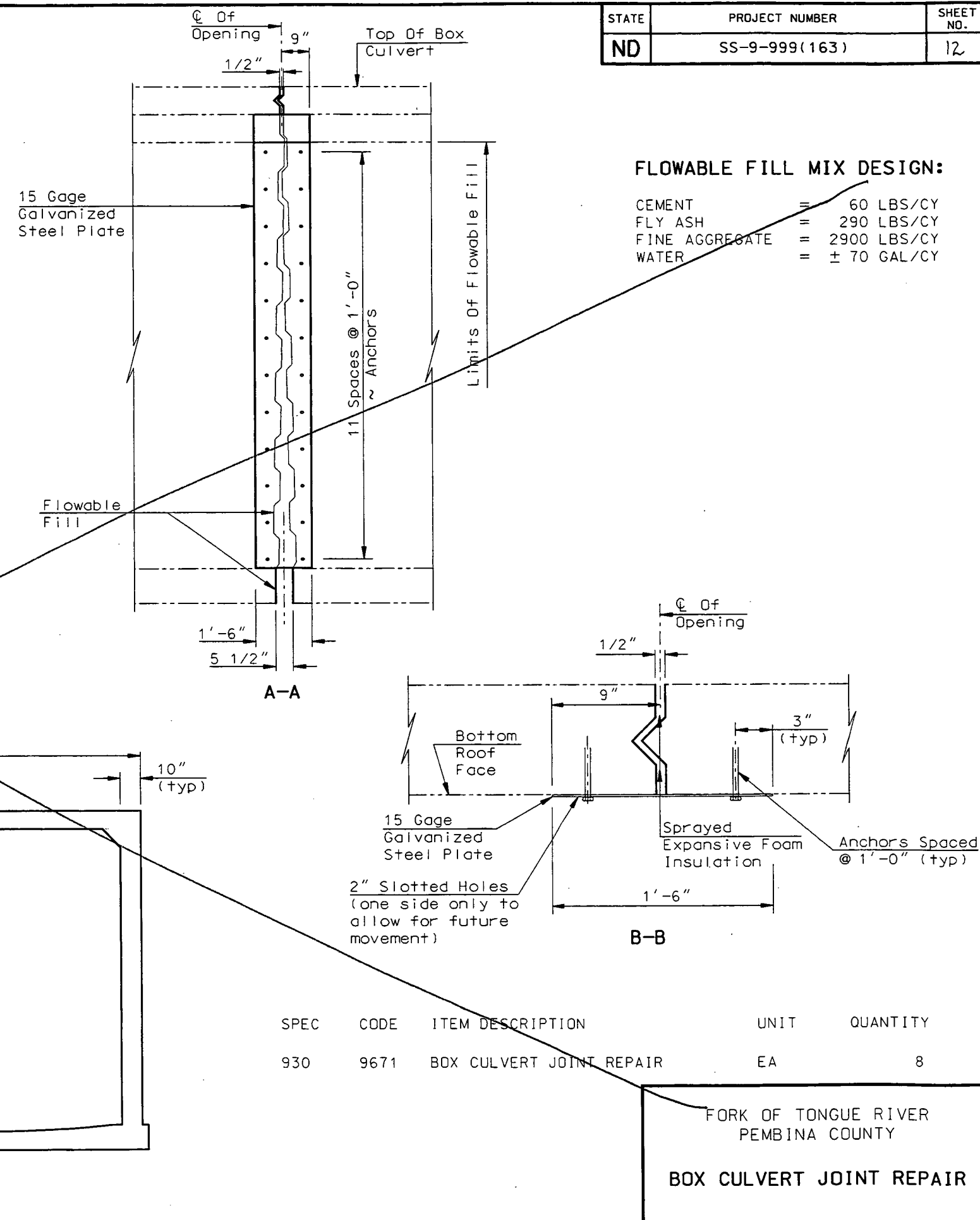
The anchorage system used on the plates shall be installed according to the manufacturer's recommendations, with a high strength adhesive specifically intended for concrete anchorage, in accordance with Section 806.02 of the NDDOT Standard Specifications.

The bid item "Box Culvert Joint Repair" shall apply to all different types of joint segments in a box culvert. At this site, a total of 8 joint segments will be paid for: 2 exterior wall, 3 floor, and 3 roof segments. The voids will not be filled on the interior walls. The unit price bid for each type of joint segment shall be the same.

The cost of all equipment, labor, and materials required to dewater, remove all debris from the box culvert, and fill the void areas shall be included in the price bid for "Box Culvert Joint Repair."

FLOWABLE FILL MIX DESIGN:

CEMENT	=	60 LBS/CY
FLY ASH	=	290 LBS/CY
FINE AGGREGATE	=	2900 LBS/CY
WATER	=	± 70 GAL/CY



NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

JOB # _____

STUTSMAN, BARNES, CASS GRAND FORKS AND WALSH COUNTY SAP-9-0999 (011) 000

THIS PROJECT CONSISTS OF PAINTING FACIA GIRDERS, STEEL
ENCASED COLUMNS AND MISCELLANEOUS SPOT COAT.

FHWA REGION	STATE	PROJECT NO.	SHEET NO.
8	N.D.	SAP-9-0999(011)000	1

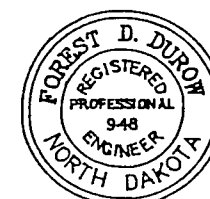
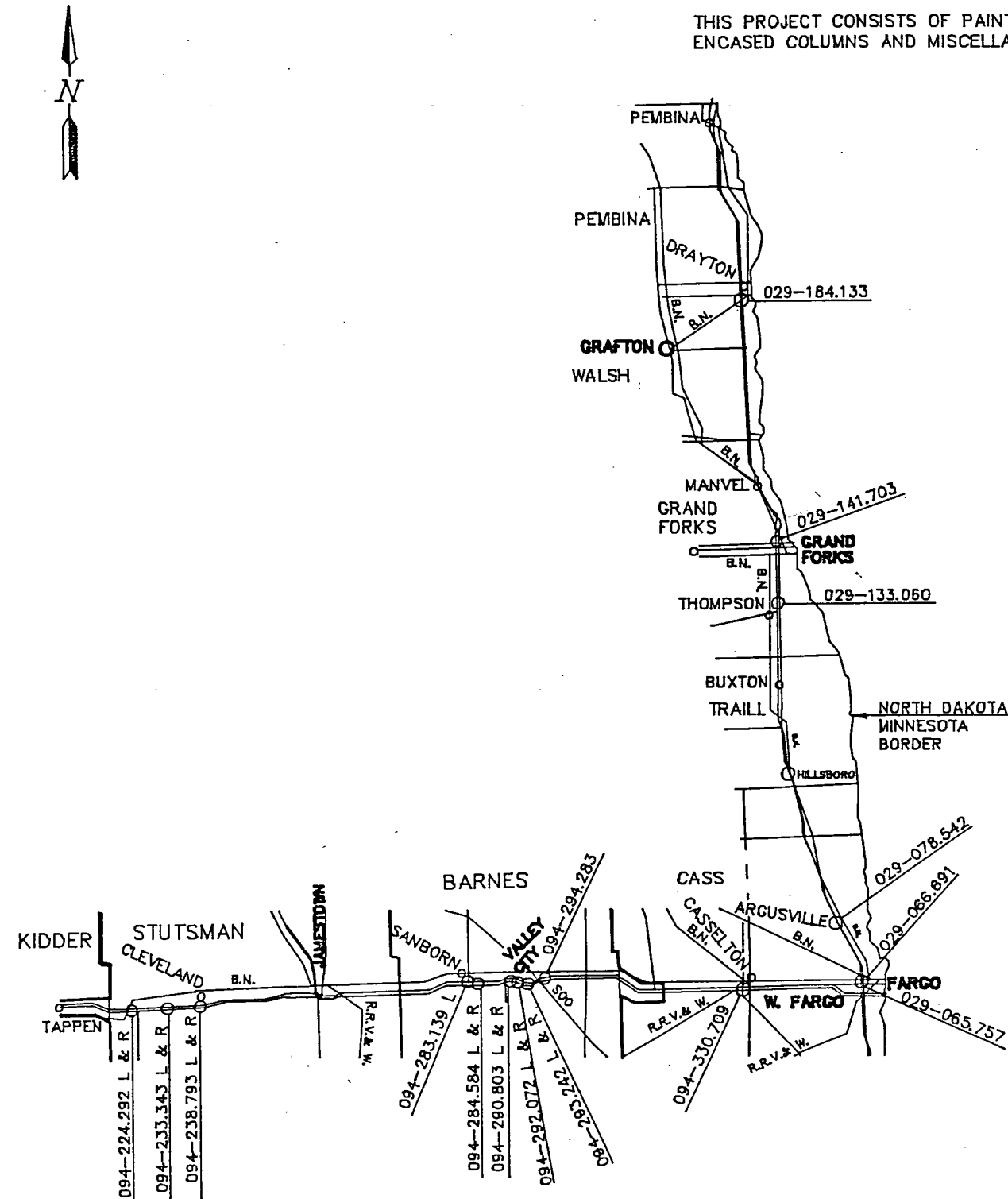
GOVERNING SPECIFICATIONS

STANDARD SPECIFICATIONS ADOPTED BY THE NORTH DAKOTA
STATE HIGHWAY DEPARTMENT NOVEMBER 1986, STANDARD
DRAWINGS CURRENTLY IN EFFECT, AND OTHER CONTRACT
PROVISIONS SUBMITTED HEREIN.

INDEX

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	NOTES & QUANTITIES

CONTRACT NO. 2



1-23-91 *Forest D. Durow*
DATE NAME

APPROVED

DATE 1-23-91

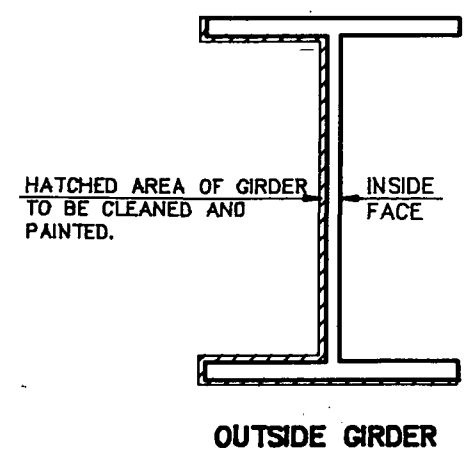
Ray Zink

CHIEF ENGINEER
NORTH DAKOTA
STATE HIGHWAY DEPARTMENT



BASIS OF ESTIMATE											
SITE NO.	BRIDGE NO.	LOCATION	BRIDGE LENGTH	GIRDER DEPTH	NO. OF GIRDERS	OUTSIDE GIRDER SQ.FT.	SPOT COAT SQ.FT.	SIZE & LENGTH SEC PILING	NO. SEC PILING	CLEAN & PAINT SQ.FT.	FINISH COAT COLOR
VALLEY CITY DISTRICT											
1	094-224.292 L & R	GRADE SEP. W HWY. 30	SEC PILING					12 3/4" X 16'	40	2,136.0	
2	094-233.343 L & R	HALFWAY LAKE INT.	SEC PILING					12 3/4" X 16'	40	2,136.0	
3	094-238.793 L & R	CLEVELAND INT.	SEC PILING					12 3/4" X 16'	40	2,136.0	
4	094-283.139 L	ROGERS INT.	SEC PILING					12 3/4" X 16'	24	1,282.0	
5	094-284.584 L & R	HOBART LAKE SEP.	SEC PILING					12 3/4" X 16'	52	2,777.0	
6	094-290.803 L & R	WEST VALLEY CITY INT.	SEC PILING					12 3/4" X 16'	52	2,777.0	
7	094-292.072 L & R	KATHRYN INT.	SEC PILING					12 3/4" X 16'	52	2,777.0	
8	094-293.242 L & R	GRADE SEP. E OF KATHRYN INT.	SEC PILING					12 3/4" X 16'	56	2,991.0	
9	094-294.283	EAST VALLEY CITY INT.	208.0'	3.0'	5	2636.0	330.0				BLUE
FARGO DISTRICT											
10	094-330.709	RRV & WR SEP.	232.33'	7.25'	2	5,820.0	2,850.0				RED
11	029-065.757	7TH AVE. N. SEP.	235.0'	2.5'	4	1,989.0	310.0				BLUE
12	029-066.691	BNRR SEP.	303.92'	8.125'	2	7,252.0	250.0				RED
13	029-078.542	ARGUSVILLE INT.	300.0	2.0' & 3.0'	4	3,378.0	250.0				RED
GRAND FORKS DISTRICT											
14	029-133.060	WALLE SEP.	265.0'	2.0' & 3.0"	3	2,863.0	500.0				BLUE
15	029-141.703	BNRR SEP.	300.0'	7.02'	2	6,333.0	295.0				BLUE
16	029-184.133	BNRR SEP.	246.83'	3.0' & 9.04'	4 & 2	3,487.0	215.0				BLUE
TOTAL						33,758.0	5,000.0	19,012.0			

FHWA REGION	STATE	FED. AID PROJ. NO.	SHEET NO.
8	N.D.	SAP-9-0999(011)000	



TRAFFIC CONTROL STANDARDS
D-754-1, 2, 3, 4, 5, 5A, 7 AND 11

ESTIMATE OF QUANTITIES		UNIT	QUANTITY
SPEC	CODE	ITEM DESCRIPTION	
103	0100	CONTRACT BOND	L.SUM 1.0
107	0100	RAILWAY PROTECTION INSURANCE	L.SUM 1.0
630	0100	SANDBLASTING AND PAINTING	L.SUM 1.0
630	0104	PREPARATION AND SPOT COATING	L.SUM 1.0
702	0100	MOBILIZATION	L.SUM 1.0
704	0100	FLAGGING	M.HR. 100.0
704	1100	TRAFFIC CONTROL	L.SUM 1.0

NOTES

SCOPE OF WORK: THIS PROJECT CONSISTS OF CLEANING AND PAINTING THE STEEL ENCASED CONCRETE (SEC) PILING AT EIGHT (8) SITES, THE FACIA SURFACES OF EXTERIOR GIRDERS AND MISCELLANEOUS SPOT COATING OF DETERIORATED AREAS OF ALL PAINTED SURFACES AS DESIGNATED BY THE ENGINEER AT EIGHT (8) BRIDGE SITES LISTED ABOVE.

PAINTING: THE FACIA SURFACES OF STRUCTURAL STEEL SHALL BE CLEANED AND PAINTED ACCORDING TO THE SUPPLEMENTAL SPECIFICATIONS, EXCEPT FOR SECTION 630.03 D.3. REHABILITATION PAINTING WHICH SHALL BE REVISED AS FOLLOWS: THE STEEL ENCASED CONCRETE PILING SHALL BE PREPARED BY BLAST CLEANING. THE LEVEL OF PREPARATION SHALL MEET THE REQUIREMENTS OF SSPC-SP 7 "BRUSH-OFF BLAST CLEANING". A PRIMER COAT OF ALUMINUM FILLED EPOXY MASTIC SHALL BE APPLIED TO THE PILING. A FINISH COAT IS NOT REQUIRED ON SEC PILING.

THE SURFACE OF THE EXTERIOR BEAMS SHALL BE PREPARED BY BLAST CLEANING. THE LEVEL OF PREPARATION SHALL MEET THE REQUIREMENTS OF SSPC-SP 7 "BRUSH-OFF BLAST CLEANING". FOR FIVE (5) STRUCTURES THE FINISH COAT SHALL BE BLUE COLOR NUMBER 25240 AND FOR THREE (3) STRUCTURES THE FINISH COAT SHALL BE RED COLOR NUMBER 21136 OF THE FEDERAL STANDARD 595B.

THE SPOT COAT AREAS SHALL MEET THE REQUIREMENTS OF SSPC-SP 3 "POWER TOOL CLEANING". CLEANING AND PAINTING OF THE STEEL SHALL BE INCLUDED IN THE LUMP SUM BID PRICE FOR "SAND BLASTING AND PAINTING" AND "PREPARATION AND SPOT COATING". THIS PAYMENT WILL BE FULL COMPENSATION FOR ALL LABOR, EQUIPMENT AND MATERIALS NECESSARY TO COMPLETE THE WORK AS SPECIFIED.

TRAFFIC CONTROL: TRAFFIC SHALL BE CONTROLLED AS SHOWN ON STANDARD D-754-7, TYPE F FOR STEEL ENCASED CONCRETE PILING SITES. TRAFFIC SHALL BE CONTROLLED AS SHOWN ON STANDARD D-754-11, TYPE P FOR NINE (9) BRIDGE SITES.

THE CONTRACTOR SHALL CONTACT THE ROADMASTER, MR. MARV BOSER AT (701) 280-7234 FOR BNRR SEPARATION AT MILE POINT 29-066.691. THE CONTRACTOR SHALL CONTACT THE ROADMASTER, MR. RON ROGEN AT (701)795-1236 FOR BNRR SEPARATION AT MILE POINT 29-141.703 AND 29-184.133. FOR THE RAIL-ROAD SEPARATION AT MILE POINT 94-330.709, THE CONTRACTOR SHALL CONTACT THE RED RIVER VALLEY & WESTERN RAILROAD AT (701)642-8257. A BID ITEM HAS BEEN INCLUDED FOR RAILROAD PROTECTION INSURANCE WHICH IS REQUIRED AT THESE FOUR (4) SITES.

WHEN THE CONTRACTOR IS NOT WORKING ON THE STRUCTURE ALL TRAFFIC CONTROL DEVICES, EXCEPT FOR POST MOUNTED SIGNS, SHALL BE REMOVED AND PLACED 80 FEET BEYOND THE EDGE OF THE DRIVING LANE. ANY POST MOUNTED SIGNS SHALL BE COVERED WHEN THE MESSAGE IS NOT APPLICABLE.

THE CONTRACTOR SHALL NOTIFY THE DISTRICT ENGINEER ONE WEEK PRIOR TO THE START OF THE WORK.

RESPONSIBILITY TO THE PUBLIC: THE CONTRACTOR SHALL SHROUD THE WORK AREA TO PROTECT THE MOTORING PUBLIC. THE COST OF MAINTAINING AND PROTECTING TRAFFIC WILL BE CONSIDERED INCIDENTAL TO THE PRICE BID FOR "TRAFFIC CONTROL".

SHROUDING SHALL BE CAPABLE OF PREVENTING DUST AND PAINT OVERSPRAY FROM REACHING PASSING TRAFFIC AND CAUSING VEHICLE DAMAGE OR IMPAIRING MOTORIST VISIBILITY.

North Dakota State Highway Department

SHEET NO. 1 OF 2

ABSTRACT OF BIDS RECEIVED

Project No.	10 29 4 6 140	CONTRACT NO.	1	
County & Date	GRAND FORKS NOVEMBER 18, 1966			
Length & Type	00.000 MILES STRUCTURAL & INCIDENTAL ITEMS			
Completion Time	BY JUNE 1, 1968			
SPEC. NO.	ITEM NO.	ITEM DESCRIPTION	UNIT	APPROXIMATE QUANTITY
203	1	COMMON EXCAVATION	CU YD	19,337.000
204	2	CLASS 1 EXCAVATION	CU YD	490.000
208	3	CLASS 2 EXCAVATION	CU YD	970.000
	4	COFFERDAM	L SUM	1.000
228	5	SELECT BACKFILL	CU YD	279.000
610	6	CONCRETE CLASS AE	CU YL	803.300
610	7	CONCRETE CLASS AAE	CU YD	153.700
612	8	REINFORCING STEEL INTER GRADE	LB	71,620.000
616	9	STRUCTURAL STEEL	LB	698,343.000
622	10	STEEL PILING 12BP53	L FT	13,620.000
622	11	STEEL TEST PILES 12BP53 130 FT.	NO	3.000
622	12	STEEL TEST PILES 12BP53 140 FT.	NO	2.000
624	13	ORNAMENTAL METAL RAILING 2 RAIL	L FT	598.670
624	14	ORNAMENTAL METAL RAILING 3 RAIL	L FT	70.330
736	15	DAMPPOOFING ONE COAT	SQ YD	111.000
736	16	THREE PLY FABRIC WATERPROOFING	SQ YD	15.000
	17	BRIDGE DRAINAGE SYSTEM	L SUM	1.000
	18	ASPHALT PLANK 1 IN	SQ FT	4,228.000
	19	ASPHALT PLANK 1/2 IN	SQ FT	590.000
	20	RUBBER MEMBRANE 1/16 IN	SQ YD	541.000
	21	BRIDGE BENCH MARKS	SET	1.000
	22	FIELD LABORATORY	NO	1.000

BIDDER	
ENGINEER'S ESTIMATE	
C. C.	
RANK	
BID PRICE	AMOUNT
1.2500	24,171.25
3.0000	1,470.00
15.0000	14,550.00
10,000.0000	10,000.00
6.0000	1,788.00
72.0000	57,837.60
77.0000	11,834.00
1.5000	10,743.00
2.2000	153,635.46
6.5000	88,530.60
1,200.0000	3,600.00
1,300.0000	2,600.00
16.0000	9,578.72
20.0000	1,406.62
3.0000	333.00
3.0000	75.00
8,000.0000	8,000.00
2.0000	8,456.00
1.0000	590.00
4.0000	2,164.00
150.0000	125.00
1,000.0000	1,000.00
412,513.53	

BIDDER	
James J. Igoe & Sons Constr. Inc. Bismarck, NDak.	
C. C. Bond	
RANK	
BID PRICE	AMOUNT
1.5500	10,635.35
2.0000	930.00
2.0000	1,940.00
16,000.0000	16,000.00
5.0000	1,490.00
56.0000	53,017.60
79.0000	13,216.30
1.1300	9,316.60
2.5600	174,585.75
5.0000	68,100.00
1,000.0000	3,000.00
1,200.0000	2,400.00
12.0000	7,184.04
14.0000	984.62
1.5000	166.50
100.0000	1,500.00
9,000.0000	8,000.00
4.0000	3,382.40
1.0000	590.00
3.5000	1,893.50
125.0000	125.00
1,000.0000	1,000.00
381,501.86	

BIDDER	
Sioux Falls Construction Co. Sioux Falls, S. Dak.	
C. C. Bond	
RANK	
BID PRICE	AMOUNT
4.0000	7,734.30
5.0000	2,450.00
12.0000	11,640.00
10,000.0000	10,000.00
7.8000	2,024.60
65.0000	52,214.50
75.0000	11,527.50
1.5000	10,743.00
2.7000	188,552.61
4.8000	65,375.00
800.0000	2,400.00
700.0000	1,800.00
14.0000	8,381.33
15.0000	1,054.35
2.0000	222.00
3.0000	75.00
12,000.0000	12,000.00
6000	2,336.40
5.0000	295.00
5.0000	2,705.00
250.0000	250.00
2,000.0000	2,000.00
376,644.54	

Project No.	1G 29 4 6 140	CONTRACT NO.	1	
County & Date	GRAND FORKS NOVEMBER 18, 1966			
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Completion Time	BY JUNE 1, 1968			
SPEC. NO.	ITEM NO.	ITEM DESCRIPTION	UNIT	APPROXIMATE QUANTITY
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208	2	CLASS 1 EXCAVATION	CU YD	490.000
208	3	CLASS 2 EXCAVATION	CU YD	970.000
	4	COFFERDAM	L SUM	1.000
228	5	SELECT BACKFILL	CU YD	279.000
610	6	CONCRETE CLASS AE	CU YD	803.300
610	7	CONCRETE CLASS AAE	CU YD	153.700
612	8	REINFORCING STEEL INTER GRADE	LB	71,620.000
616	9	STRUCTURAL STEEL	LB	698,343.000
622	10	STEEL PILING 12BP53	L FT	13,620.000
622	11	STEEL TEST PILES 12BP53 130 FT.	NO	3.000
622	12	STEEL TEST PILES 12BP53 140 FT.	NO	2.000
624	13	ORNAMENTAL METAL RAILING 2 RAIL	L FT	598.670
624	14	ORNAMENTAL METAL RAILING 3 RAIL	L FT	70.330
736	15	DAMPPROOFING ONE COAT	SQ YD	111.000
736	16	THREE PLY FABRIC WATERPROOFING	SQ YD	15.000
	17	BRIDGE DRAINAGE SYSTEM	L SUM	1.000
	18	ASPHALT PLANK 1 IN	SQ FT	4,228.000
	19	ASPHALT PLANK 1/2 IN	SQ FT	590.000
	20	RUBBER MEMBRANE 1/16 IN	SQ YD	541.000
	21	BRIDGE BENCH MARKS	SET	1.000
	22	FIELD LABORATORY	NO	1.000

BIDDER	
Northern Improvement Co. Fargo, NDak	
C. C. Bond	
RANK	
BID TIME	AMOUNT
1.0000	19,337.00
2.0000	980.00
4.3000	4,171.00
15,000.0000	15,000.00
4.5000	1,341.00
67.5000	38,156.75
100.0000	15,370.00
1.4000	10,026.80
2.7000	188,552.61
5.7000	77,634.00
1,000.0000	3,000.00
1,100.0000	2,200.00
12.0000	7,184.04
14.0000	984.62
1.0000	111.00
5.0000	75.00
7,000.0000	7,000.00
7.0000	2,952.60
6.0000	354.00
3.5000	1,893.50
130.0000	130.00
400.0000	400.00
396,860.92	

BIDDER	
Otto J. Eickhof & Son Inc. Crookston, Minnesota	
C. C. Bond	
RANK	
BID PRICE	AMOUNT
1.0000	19,337.00
3.0000	1,470.00
4.0000	3,880.00
16,400.0000	16,400.00
5.0000	1,490.00
60.0000	48,198.00
75.0000	11,527.50
1.4000	10,026.80
2.5000	174,585.75
6.1500	83,763.00
1,200.0000	3,600.00
1,400.0000	2,800.00
15.0000	8,280.05
15.0000	1,054.95
3.0000	333.00
10.0000	150.00
12,000.0000	12,000.00
7.5000	3,171.40
6.5000	383.30
7.5000	5,057.50
200.0000	200.00
900.0000	900.00
408,308.05	

BIDDER	
The Milton Rue Co. Bismarck, NDak.	
C. C. Bond	
RANK	
BID PRICE	AMOUNT
1.2500	24,171.25
3.0000	1,470.00
5.0000	4,850.00
15,000.0000	15,000.00
5.0000	1,490.00
60.0000	48,198.00
74.0000	11,373.80
1.7000	12,175.40
2.6000	181,569.18
3.5500	76,753.00
950.0000	2,850.00
1,050.0000	2,100.00
12.5000	7,483.37
17.0000	1,125.61
1.5000	166.50
6.5000	97.50
10,500.0000	10,500.00
7.0000	2,959.60
6.0000	354.00
6.0000	3,246.00
150.0000	150.00
600.0000	600.00
408,953.21	

ACTION TAKEN BY STATE HIGHWAY COMMISSIONER: -

AWARD TO

WHEN PRELIMINARY ARRANGEMENTS ARE COMPLETED

DATE OF AWARD

19

North Dakota State Highway Department

SHEET NO. 2 OF 2

ABSTRACT OF BIDS RECEIVED

Project No. IG 22 4 6 140 CONTRACT NO. 1
County & Date GRAND FORKS NOVEMBER 18, 1966
Length & Type 00.000 MILES STRUCTURAL & INCIDENTAL ITEMS

Completion Time BY JUNE 1, 1968

SPC. NO.	ITEM NO.	ITEM DESCRIPTION	UNIT	APPROXIMATE QUANTITY
203	1	COMMON EXCAVATION	CU YD	19,337.000
208	2	CLASS 1 EXCAVATION	CU YD	490.000
208	3	CLASS 2 EXCAVATION	CU YD	970.000
208	4	COFFERDAM	L SUM	1.000
228	5	SELECT BACKFILL	CU YD	298.000
610	6	CONCRETE CLASS AE	CU YD	803.300
610	7	CONCRETE CLASS AAF	CU YD	153.700
612	8	REINFORCING STEEL INTER GRADE	LB	71,620.000
616	9	STRUCTURAL STEEL	LB	698,343.000
622	10	STEEL PILING 12BP53	L FT	13,620.000
622	11	STEEL TEST PILES 12BP53 130 FT.	NO	3.000
622	12	STEEL TEST PILES 12BP53 140 FT.	NO	2.000
624	13	ORNAMENTAL METAL RAILING 2 RAIL	L FT	578.670
624	14	ORNAMENTAL METAL RAILING 3 RAIL	L FT	70.330
736	15	DAMPPOOFING ONE COAT	SQ YD	111.000
736	16	THREE PLY FABRIC WATERPROOFING	SQ YD	15.000
	17	BRIDGE DRAINAGE SYSTEM	L SUM	1.000
	18	ASPHALT PLANK 1 IN.	SQ FT	4,228.000
	19	ASPHALT PLANK 1/2 IN.	SQ FT	590.000
	20	RUBBER MEMBRANE 1/16 IN	SQ YD	541.000
	21	BRIDGE BENCH MARKS	SET	1.000
	22	FIELD LABORATORY	NO	1.000
		TOTAL		

BIDDER		
Schultz & Lindsey Constr. Co Fargo, NDak		
C. C. Bond		
RANK	BID PRICE	VENDOR NO.
6	15,469.60	
	735.00	
	5,820.00	
	35,000.0000	
	1,192.00	
	44,181.50	
	13,064.50	
	10,326.80	
	202,319.47	
	81,720.00	
	4,500.00	
	3,200.00	
	7,184.04	
	1,054.97	
	222.00	
	75.00	
	10,000.0000	
	4,228.00	
	472.00	
	2,700.00	
	150.0000	
	50.0000	
	443,569.86	

BIDDER		
Red River Construction Inc. Grand Forks, NDak		
C. C. Bond		
RANK	BID PRICE	VENDOR NO.
7	11,602.20	
	1,078.00	
	3,880.00	
	14,310.0000	
	1,192.00	
	49,804.60	
	10,759.00	
	11,459.20	
	195,536.04	
	102,156.00	
	10,920.00	
	7,840.00	
	8,980.00	
	1,190.61	
	183.15	
	105.00	
	11,550.0000	
	3,387.40	
	700.00	
	4,328.00	
	200.0000	
	2,000.0000	
	452,866.25	

BIDDER		
Sorasin Construction Co. Fargo, NDak.		
C. C. Bond		
RANK	BID PRICE	VENDOR NO.
8	10,635.35	
	3,500.00	
	5,000.00	
	24,506.0000	
	3,750.00	
	50,607.90	
	17,921.42	
	10,743.00	
	208,106.21	
	93,978.00	
	3,120.00	
	2,740.00	
	5,986.70	
	1,017.78	
	333.00	
	150.00	
	7,850.0000	
	5,707.80	
	703.00	
	1,406.60	
	150.0000	
	500.0000	
	453,357.26	

Limited to \$500,000.00 of work

Project No. IG 22 4 6 140 CONTRACT NO. 1
County & Date GRAND FORKS NOVEMBER 18, 1966
Length & Type 00.000 MILES STRUCTURAL & INCIDENTAL ITEMS

Completion Time BY JUNE 1, 1968

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208	4	COFFERDAM	L SUM	1.000
228	5	SELECT BACKFILL	CU YD	298.000
610	6	CONCRETE CLASS AE	CU YD	803.300
610	7	CONCRETE CLASS AAF	CU YD	153.700
612	8	REINFORCING STEEL INTER GRADE	LB	71,620.000
616	9	STRUCTURAL STEEL	LB	698,343.000
622	10	STEEL PILING 12BP53	L FT	13,620.000
622	11	STEEL TEST PILES 12BP53 130 FT.	NO	3.000
622	12	STEEL TEST PILES 12BP53 140 FT.	NO	2.000
624	13	ORNAMENTAL METAL RAILING 2 RAIL	L FT	578.670
624	14	ORNAMENTAL METAL RAILING 3 RAIL	L FT	70.330
736	15	DAMPPOOFING ONE COAT	SQ YD	111.000
736	16	THREE PLY FABRIC WATERPROOFING	SQ YD	15.000
	17	BRIDGE DRAINAGE SYSTEM	L SUM	1.000
	18	ASPHALT PLANK 1 IN.	SQ FT	4,228.000
	19	ASPHALT PLANK 1/2 IN.	SQ FT	590.000
	20	RUBBER MEMBRANE 1/16 IN	SQ YD	541.000
	21	BRIDGE BENCH MARKS	SET	1.000
	22	FIELD LABORATORY	NO	1.000
		TOTAL		

BIDDER		
Industrial Builders Inc. Fargo, NDak		
C. C.		
RANK	BID TIME	VENDOR NO.
9	24,171.25	
	661.50	
	4,947.00	
	16,000.0000	
	1,490.00	
	48,198.00	
	10,712.70	
	11,459.20	
	209,502.90	
	106,917.00	
	4,500.00	
	3,400.00	
	14,966.75	
	2,109.70	
	444.00	
	120.00	
	13,804.8000	
	7,510.40	
	485.00	
	4,369.00	
	300.0000	
	1,000.0000	
	488,269.40	

BIDDER		
Swingen Construction Co. Grand Forks, NDak.		
C. C.		
RANK	BID PRICE	VENDOR NO.
10	29,300.50	
	2,450.00	
	24,250.00	
	6,000.0000	
	1,192.00	
	62,657.42	
	19,212.50	
	12,891.60	
	202,319.47	
	115,776.00	
	3,900.00	
	2,800.00	
	10,776.00	
	1,547.26	
	1,110.00	
	222.00	
	4,100.0000	
	4,228.00	
	442.00	
	5,410.00	
	80.0000	
	2,200.0000	
	512,767.29	

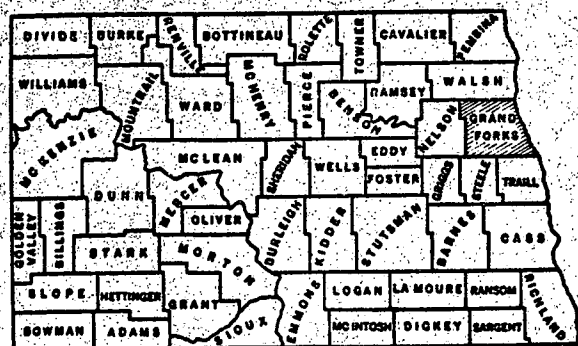
ACTION TAKEN BY STATE HIGHWAY COMMISSIONER: - AWARD TO

WHEN PRELIMINARY ARRANGEMENTS ARE COMPLETED

DATE OF AWARD

19

STATE HIGHWAY COMMISSIONER



SKETCH-MAP OF NORTH DAKOTA
SHOWING COUNTIES

DESIGN DATA

TRAFFIC	AVERAGE DAILY	EST. 30TH MAX. HR.
CURRENT TRAFFIC (1966)	2125 PASS 375 TRUCKS 2500 TOTAL	375
TRAFFIC FORECAST (1986)	5525 PASS 975 TRUCKS 6500 TOTAL	975
DESIGN SPEED	70 MPH	
TRAFFIC CLASSIFICATION	"M"	
MINIMUM SIGHT DISTANCE (NON PASSING)	800'	
FULL CONTROL OF ACCESS		
NO POINT OF ACCESS OTHER THAN BY RAMPS AT INTERCHANGES		

SCALES

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

SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS	
Name	No.
Rubber Membrane	SS-4
Metal Pipe	
Piling	
Aggregate for Portland Cement Conc.	SS-15
Structural and Paving Mortar Sand	
and Underdrain Granular Fill	
Bidding Requirements and Conditions	SS-9
Legal Relations and Responsibility To Public	SS-16 & SS-10
Painting	
Standard Provision For General Liability Policies	
Work on Railroad Right-of-Way	
Field Laboratory	SS-7

NORTH DAKOTA
STATE HIGHWAY DEPARTMENT
PLANS
FOR THE PROPOSED IMPROVEMENT OF A
STATE HIGHWAY
IN GRAND FORKS COUNTY
FEDERAL AID PROJECT NO. 1G-29-4(6) 140
STRUCTURAL

INDEX OF DRAWINGS

SHEET NO.	TITLE PAGE
SHEET NO. 1	SUMMARY OF QUANTITIES
SHEET NO. 2	TYPICAL SECTIONS
SHEET NO. 3	TO 6 INCL. PLAN AND PROFILE DRAWINGS
SHEET NO. 7	TO 20 INCL. STRUCTURAL DRAWINGS
SHEET NO. 21	TO 27 INCL. CROSS SECTIONS

LENGTH OF PROJECT	
PROJECT MILES-GROSS	MILES-NET
1G-29-4(6)	0.0
TOTALS	0.0

LIST OF STANDARDS

BRIDGE BENCH MARKS	STD. 7.6
STANDARD SIGNS	STD. 14.1A-1 & 2
FEDERAL AID NAME PLATE	STD. 14.9

LIST OF STRUCTURAL DRAWINGS

29-38-1	29-38-7
29-38-2	29-38-8
29-38-3	29-38-9
29-38-4	29-38-10
29-38-5	29-38-11
29-38-6	29-38-12
	H-0401
	H-0501

GOVERNING SPECIFICATIONS

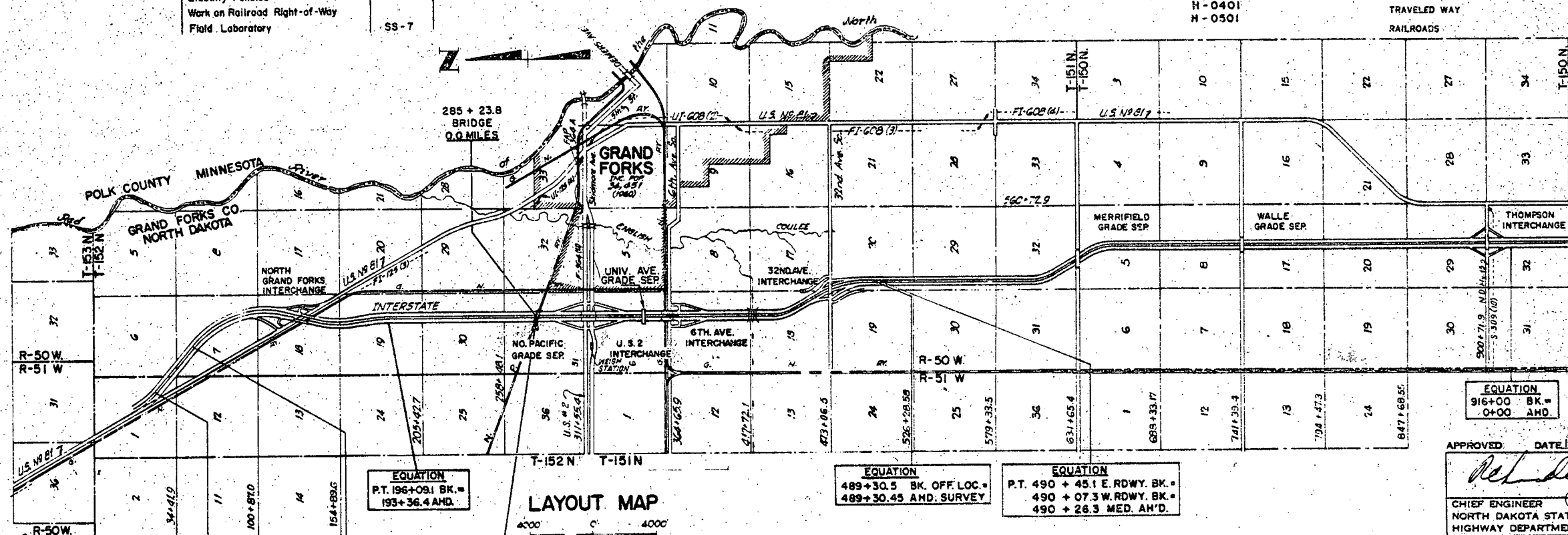
Standard Specifications adopted by the North Dakota State Highway Department January 1965 and approved as standard by the Bureau of Public Roads June 23, 1965. Required Contract Provision (Form PR-1273) dated December 1965 and others submitted herewith.

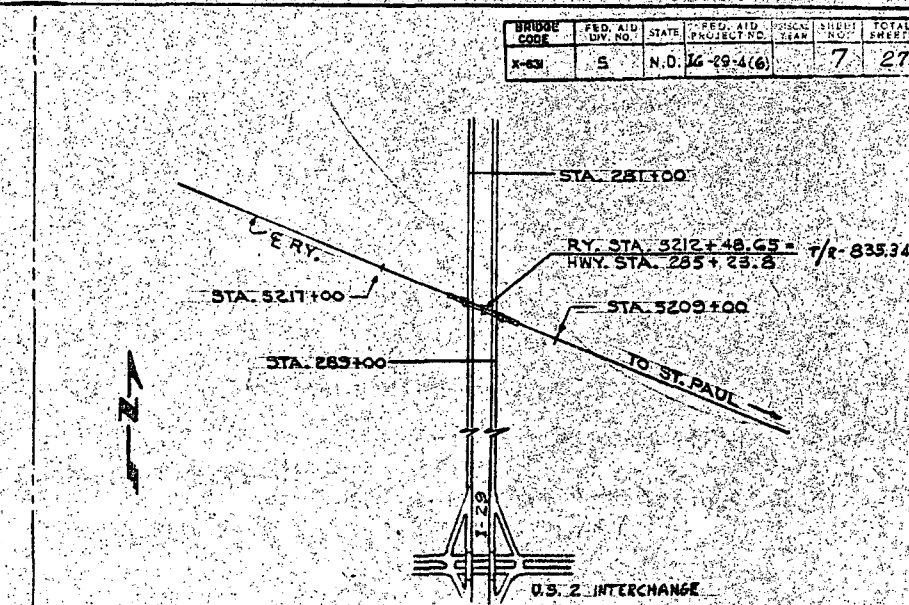
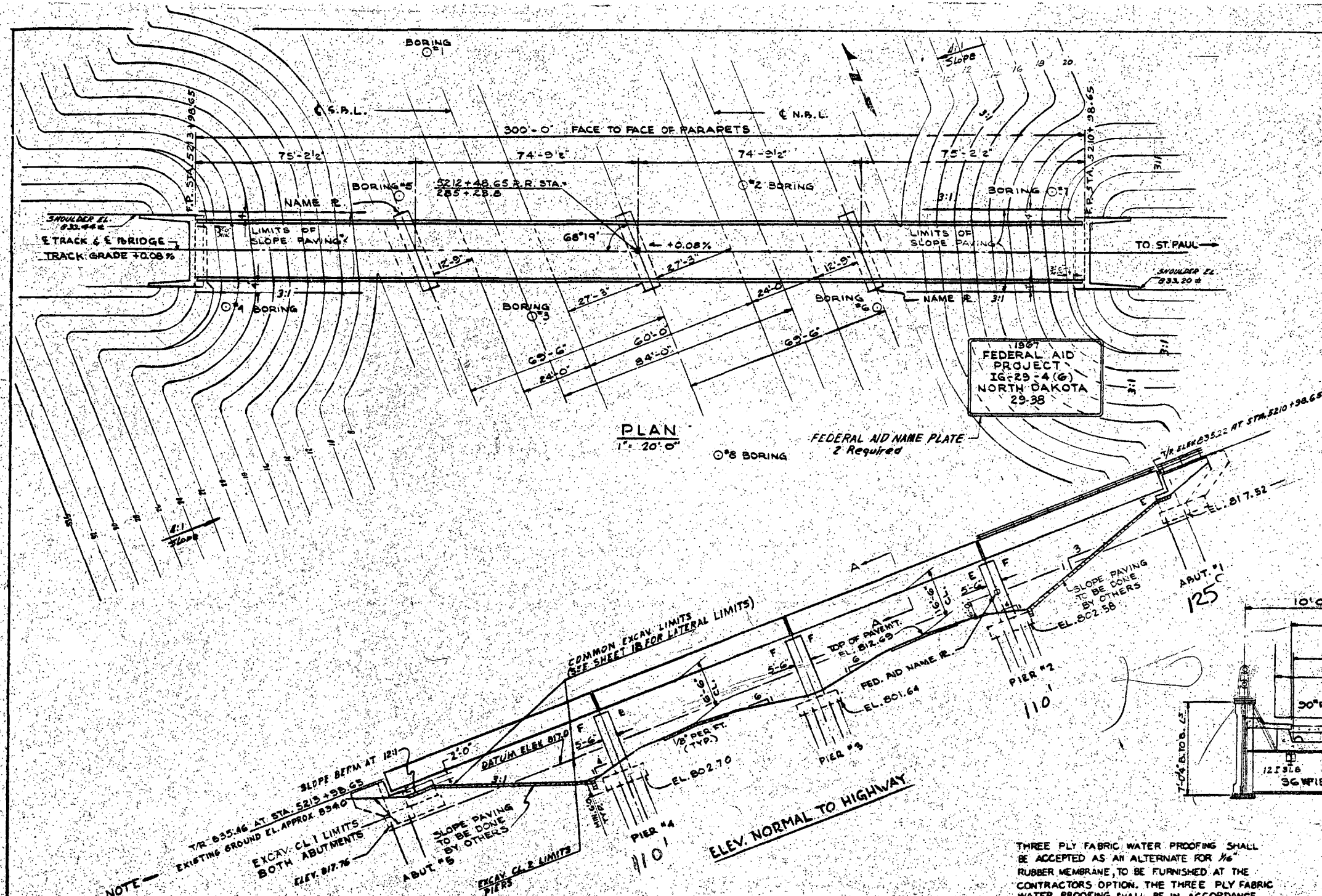
KEY TO CONVENTIONAL SIGNS

STATE & NATIONAL LINES	
COUNTY LINE	
TOWNSHIP & RANGE LINES	
GRADE LINE	
CENTERLINE OF CONSTRUCTION	
OLD RIGHT OF WAY LINE	
NEW RIGHT OF WAY LINE	
ABANDONED RIGHT OF WAY LINE	
PROPERTY LINE	
STONE WALL	
OTHER FENCES	
POLE LINES	
POWER LINES	
BRIDGE	
GROUND ELEVATION	
GRADE	
TRAVELED WAY	
RAILROADS	

NOTE: Common Excavation shall be measured in accordance with Sec. 203-3.2 of the Standard Specifications.

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





LOCATION SKETCH
SCALE: 1"=400'

DESIGN DATA:

SPECIFICATIONS	AREA 1964-1966
LIVE LOAD	COOPERS E-72
IMPACT	FOR STEAM LOCOMOTIVES
CONCRETE	NDHD CLASS AE-1
CONCRETE	NDHD CLASS AE-3
STRUCTURAL STEEL	ASTM DESIGNATION A36
REINFORCING STEEL	INTERMEDIATE GRADE-ASTM A-5-62T
FOUNDATION PILES	12 BP 53"
MAX PILE LOAD	60 TON PER PILE
EARTH	120 LBS PER CU. FT.

INDEX TO PLAN SHEETS	
TITLE	SHT.
GENERAL PLAN	7
PIERS	8
SOIL BORING (BY STATE)	9
SOIL BORING (BY STATE)	10
ABUTMENTS	11
STEEL FRAMING	12
STEEL FRAMING	13
BEARINGS	14
CONCRETE DECK	15
DECK DRAINAGE	16
HANDRAIL	17
SINGLE TRACK SHOULDER	18

SECTION A-A
SCALE: 1/4"=1'-0"

THREE PLY FABRIC WATER PROOFING SHALL BE ACCEPTED AS AN ALTERNATE FOR 1/8" RUBBER MEMBRANE, TO BE FURNISHED AT THE CONTRACTOR'S OPTION. THE THREE PLY FABRIC WATER PROOFING SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS, SECTION 736.
THE 540' CONSTRUCTION SPUR SHOWN ON SHEET #18 IS AVAILABLE TO THE STRUCTURAL CONTRACTOR.

* See Special Provisions
** See Supplemental Specifications 55-4

SPEC. NO.	203	208	736	*										228	624	624	*		736	208	**	
ITEM	COMMON EXCAVATION	CLASS 2 EXCAVATION	DAMP PROOFING ONE COAT	STEEL PILING 12BPS	STEEL TEST PILES 12BPS 120 FT.	STEEL TEST PILES 12BPS 140 FT.	CLASS AE-1 CONCRETE	CLASS AE-3 CONCRETE	REINFORCING STEEL (INTERMEDIATE)	STRUCTURAL STEEL	ASPHALT PLANK 1"	ASPHALT PLANK 1/2"	SELECT BACKFILL (CLASS 5)	2-LINE ORNAMENTAL METAL RAILING	3-LINE ORNAMENTAL METAL RAILING	1/8" RUBBER MEMBRANE	3 PLY FABRIC WATER PROOFING	BRIDGE BENCH MARKS	CLASS 1 EXCAVATION	CUTTER DAMS	BRIDGE DRAINAGE SYSTEM	
UNITS	CU. YDS.	CU. YDS.	SQ. YDS.	LIN. FT.	EACH	EACH	CU. YDS.	CU. YDS.	LBS.	LBS.	SQ. FT.	SQ. FT.	CU. YDS.	LIN. FT.	LIN. FT.	SQ. YDS.	SQ. YDS.	1 SET	CU. YDS.	LUMP SUM	LUMP SUM	
QUANTITIES	19,337	970	111	13,620	3	2	803.8	153.7	71,620	698,343	4,228	250	258	558.67	70.33	541	15.0	1 SET	490	1	1	

STRUCTURAL DRAWINGS	
GENERAL DRAWING	THIS SHEET 29-38-1, 29-38-2, 29-38-3, 29-38-4
SUBSTRUCTURE	29-38-2, 29-38-3, 29-38-4, H-2401, H-2501, 29-38-5, 29-38-6, 29-38-7, 29-38-8, 29-38-9, 29-38-10, 29-38-11, 29-38-12
SUPERSTRUCTURE	29-38-2, 29-38-3, 29-38-4, 29-38-5, 29-38-6, 29-38-7, 29-38-8, 29-38-9, 29-38-10, 29-38-11, 29-38-12
HITCHCOCK & ESTABROOK INC. ARCHITECTS - ENGINEERS MINNEAPOLIS, MINNESOTA	
NORTH DAKOTA STATE HIGHWAY DEPARTMENT HIGHWAY CROSSING UNDER NORTHERN PACIFIC RAILWAY BRIDGE-98.1 GENERAL PLAN INTERSTATE HIGHWAY 129, GRAND FORKS CO. PROJECT 1G-28-1(6) APPROVED: <i>Joseph P. Kirby</i> DATE: <i>2/10/66</i> BRIDGE ENGINEER, N.D.P. DATE: <i>2/10/66</i> <i>W. J. W. W.</i> DATE: <i>2/10/66</i> CHIEF ENGINEER, N.D.P.	



BILL OF REINFORCEMENT FOR 3 PIERS					
MARK	REQD.	SIZE	LENGTH	SHAPE	LOCATION
F1	45	6	29'-8"	—	FOOTING LONGIT.
F2	240	7	16'-4"	—	TRANSV.
D1	288	6	5'-0"	—	DOWELS
F1	96	6	21'-8"	—	SHAFT VERTS. PIER 3
P2	128	5	27'-6"	—	HORIZ. LONG.
P3	128	5	27'-6"	—	HORIZ. LONG.
P4	256	5	4'-0"	—	CORNERS
P5	84	5	6'-2"	—	TOP TRANSV.
P6	18	5	27'-8"	—	LONGIT.
P7	192	6	20'-8"	—	VERTS. PIER 2 & 4

SUMMARY OF QUANTITIES FOR 3 PIERS		
CLASS AE-1 CONCRETE	565.0	CYD.
COFFERDAMS	1	LUMP SUM
REINFORCEMENT BARS	27,918	LEBS.
TEST PILES - EST. LENGTH - 130 FT.	3	EACH
PILING - EST. LENGTH - 120 FT.	9720	LIN. FT.
CLASS 2 EXCAVATION	970	CYD.

GENERAL CONCRETE NOTES
MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH NORTH DAKOTA STATE HIGHWAY DEPARTMENT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION ADOPTED JANUARY 1965 WITH THE FOLLOWING ADDITIONS AND/OR MODIFICATIONS.

CONCRETE FOR PIERS, TOP AND ABUTMENTS SHALL BE CLASS AE-1 CONCRETE FOR SIDEWALKS AND DECK SHALL BE CLASS AAE-3. USE TYPE 2 LOW ALKALINE CEMENT FOR ALL CONCRETE. ALL CONCRETE TO BE COMPACTED BY VIBRATION.

REINFORCING BARS SHALL BE OF INTERMEDIATE GRADE BILLET STEEL CONFORMING TO A.S.T.M. SPEC. A-15. ALL BARS SHALL HAVE DEFORMATIONS AS PER A.S.T.M. SPEC. A-305.

PIER TOPS AND ABUTMENT BRIDGE SEATS SHALL BE FINISHED TO PLANE LEVEL SURFACE AT THE ELEVATIONS INDICATED. LOCATE AND DRILL HOLES FOR ANCHOR BOLTS IN THE CONCRETE PRIOR TO PLACING GIRDERS. BOLTS ARE TO BE GROUTED WITH STEEL IN PLACE USING NON-SHRINK TYPE GROUT. CONSTRUCTION JOINTS ON THE BACK FACE OF ABUTMENTS AND WING WALLS SHALL BE PROTECTED BY 3 PLY RUBBER MEMBRANE WATERPROOFING LAID IN 3 SWABINGS OF HOT ASPHALT. THE FIRST 2 PLYS TO BE 16 INCHES WIDE AND THE 3RD PLY 36 INCHES WIDE.

BACK FACE OF ABUTMENTS AND WING WALLS SHALL BE DAMP PROOFED IN ACCORDANCE WITH N.D.H.D. SPEC. SEC. 736.

CHAMFER ALL EXPOSED CORNERS 1/2 INCHES.

ALL EXPOSED FACES OF ABUTMENTS, WING WALLS AND PIERS SHALL BE GIVEN A "RUBBED SURFACE FINISH" IF SO DIRECTED BY THE ENGINEER WITHOUT ADDITIONAL COMPENSATION.

GENERAL PILE NOTES

PILES SHALL BE 12BP53 SECTION AND THEY SHALL BE DRIVEN TO OBTAIN A MINIMUM BEARING CAPACITY OF 60 TONS PER PILE IN THE HARD STRATUM LOCATED AT APPROXIMATE ELEVATION OF 687'. COST OF PILE CAPS SHALL BE INCLUDED IN THE COST OF PILE. TEST PILES SHALL BE DRIVEN AS SHOWN ON PILE PLANS TO DETERMINE REQUIRED PILE LENGTH.

SEE N.D.H.D. STD. PLAN H-0401 FOR PILE SPLICE DETAILS.

ALL PILES SHALL HAVE STEEL CAPS - SEE DETAIL ABOVE.

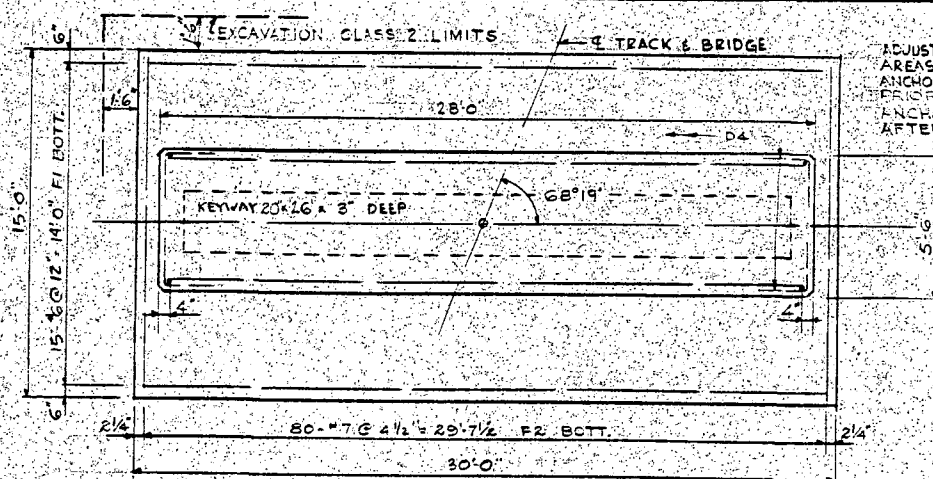
PILE LOADING (DESIGN)

D.L. + L.L. = 36 TONS PER PILE

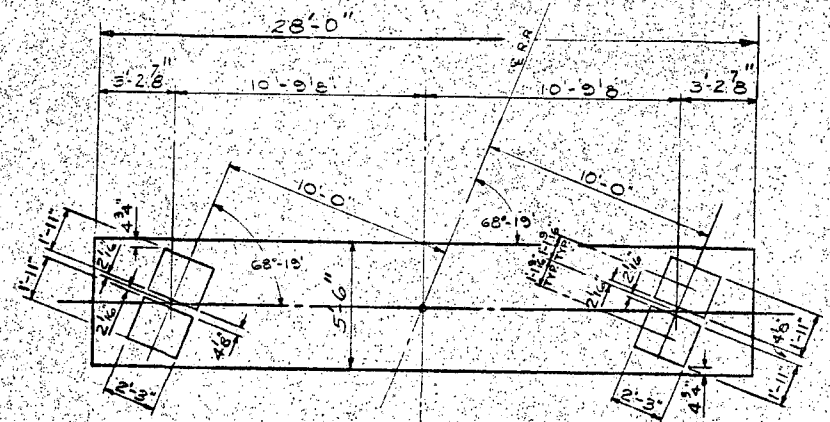
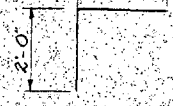
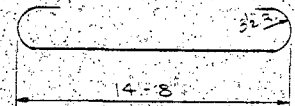
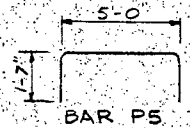
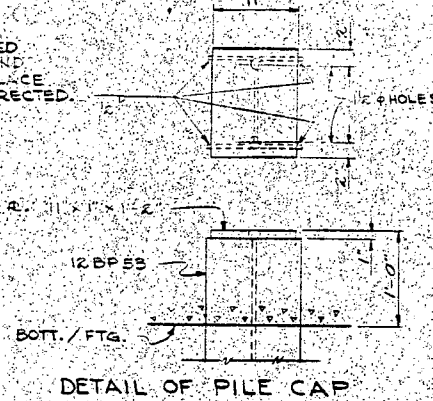
D.L. + L.L. + BR. F.W. = 55 TONS PER PILE

HITCHCOCK & ESTABROOK
ARCHITECTS - ENGINEERS
MINNEAPOLIS, MINNESOTA

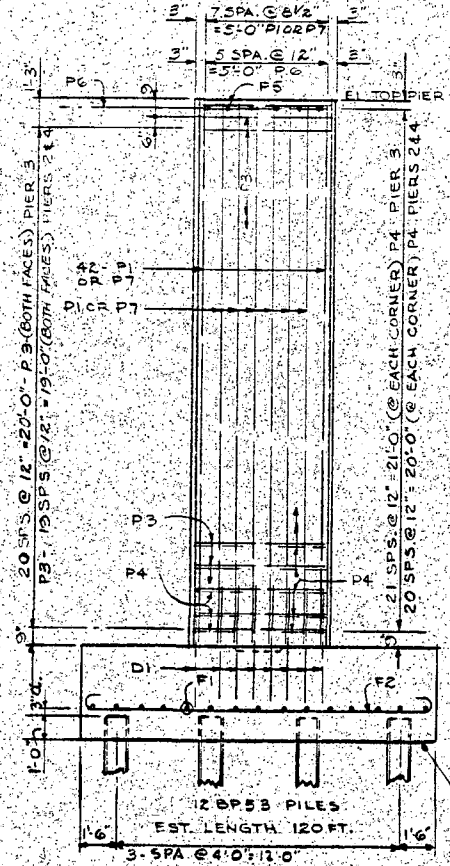
NORTH DAKOTA
STATE HIGHWAY DEPARTMENT
HIGHWAY CROSSING
UNDER
NORTHERN PACIFIC RAILWAY BRIDGE # 98.1
PIER DETAILS &
REINFORCEMENT
INTERSTATE HIGHWAY # 29 GRAND FORKS CO.
PROJECT 16-29-4(6)



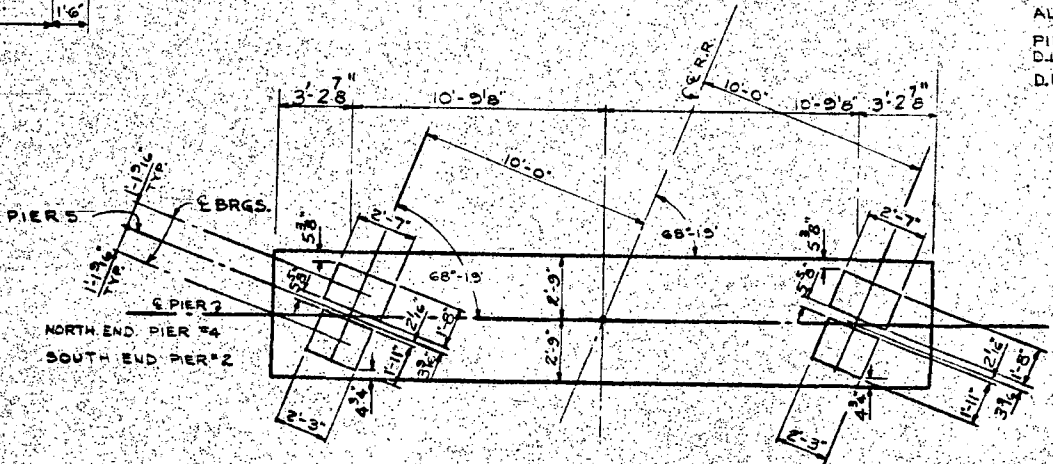
ADJUST STEEL SPACING IN BEARING AREAS TO CLEAR ANCHOR BOLTS. ANCHOR BOLT HOLES SHALL BE DRILLED PRIOR TO PLACING OF STEEL AND ANCHOR BOLTS GROUTED IN PLACE AFTER GIRDERS HAVE BEEN ERECTED.



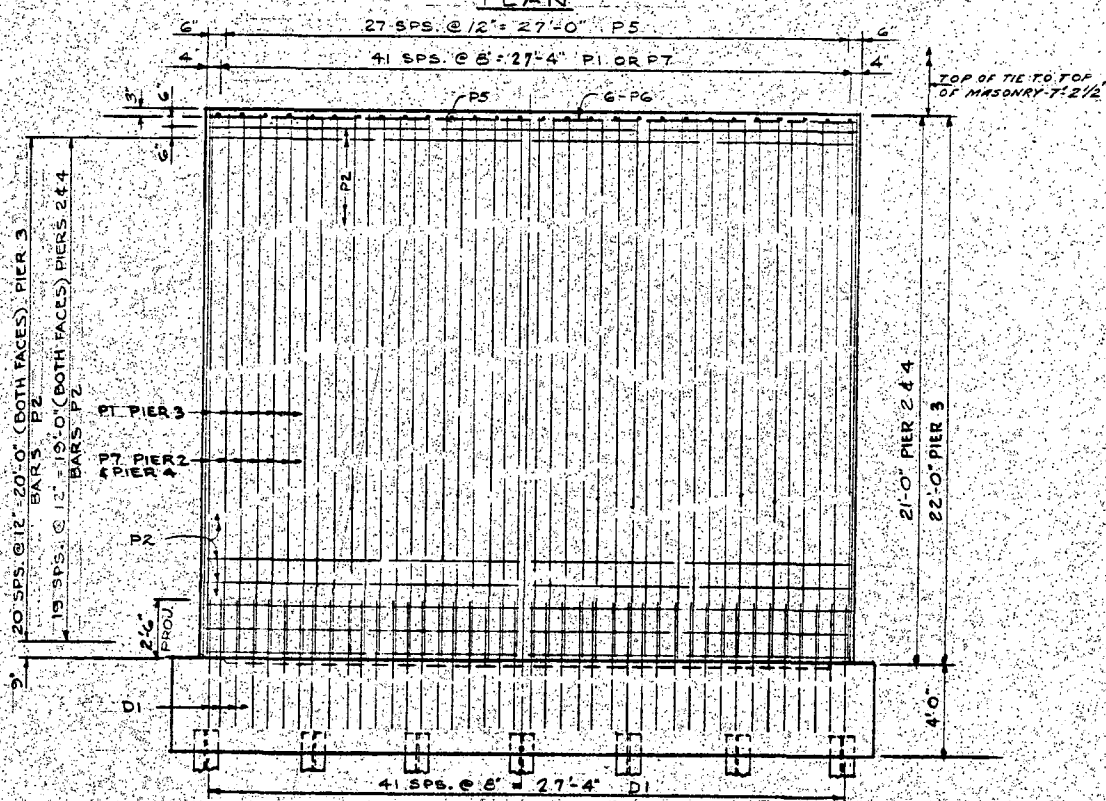
TOP VIEW PIER #3
1/4" = 1'-0"



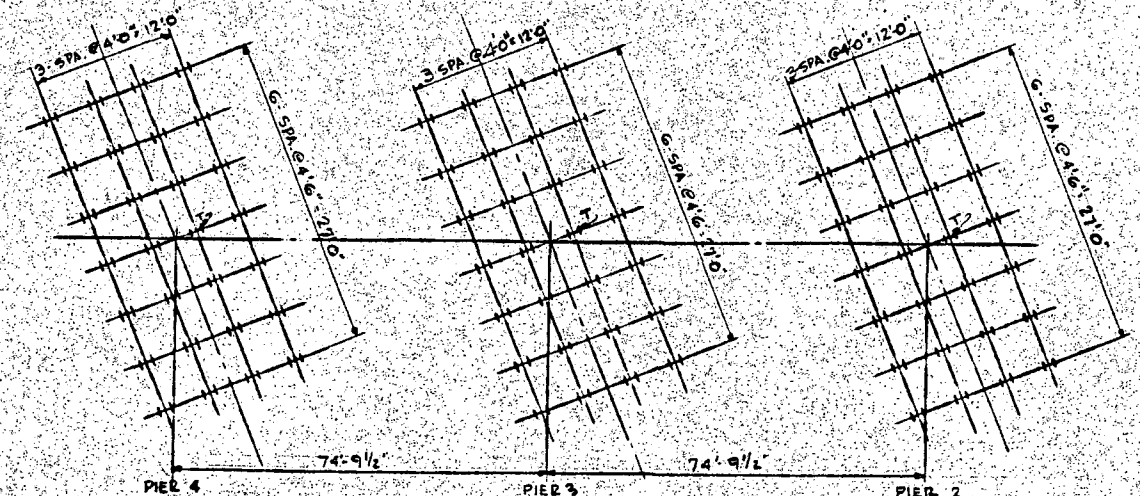
END VIEW



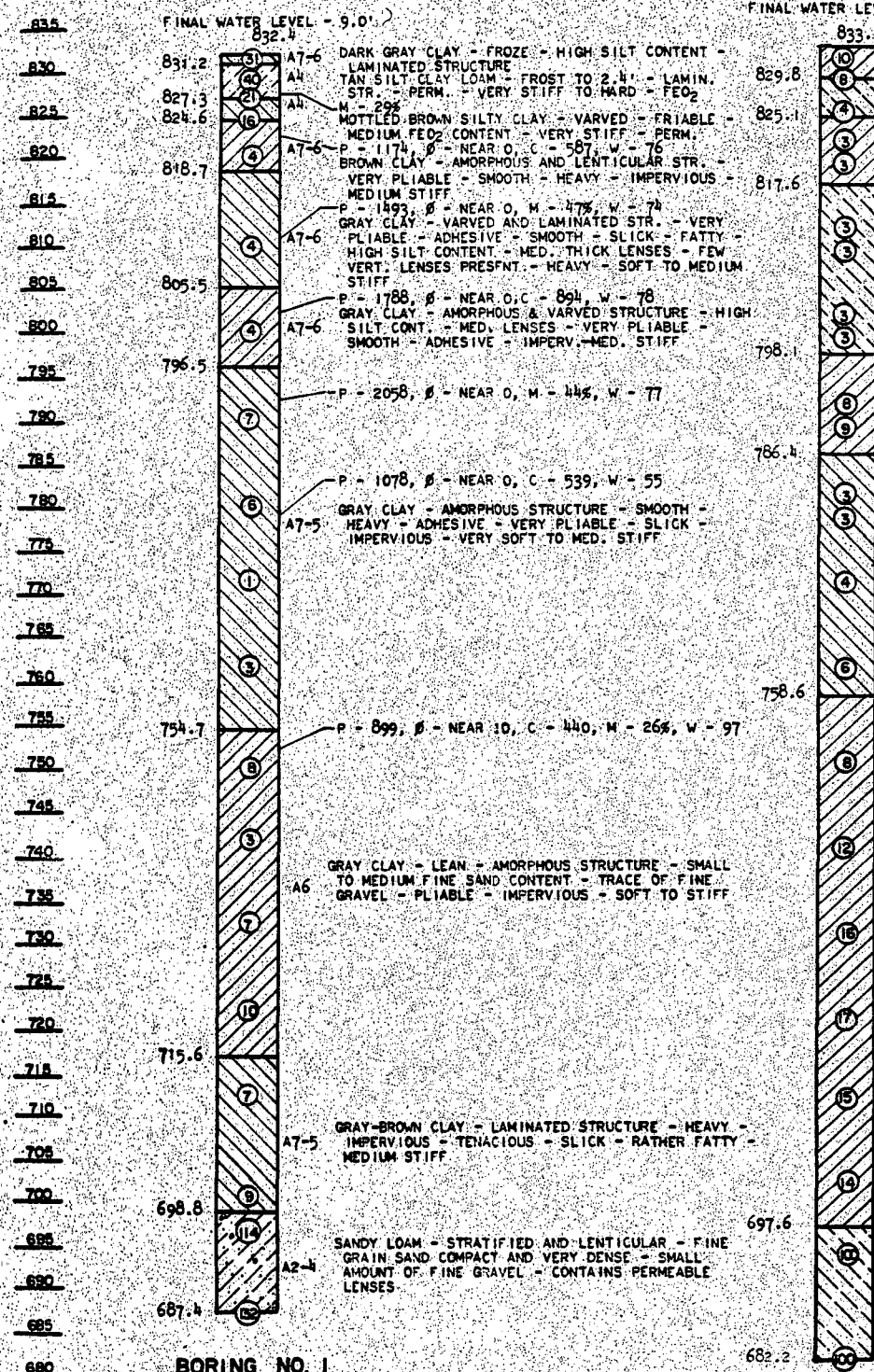
TOP VIEW OF PIERS #2 AND #4
1/4" = 1'-0"



ELEVATION



PILE LOCATION PLAN
T INDICATES TEST PILES - EST. LENGTH - 130 FT.

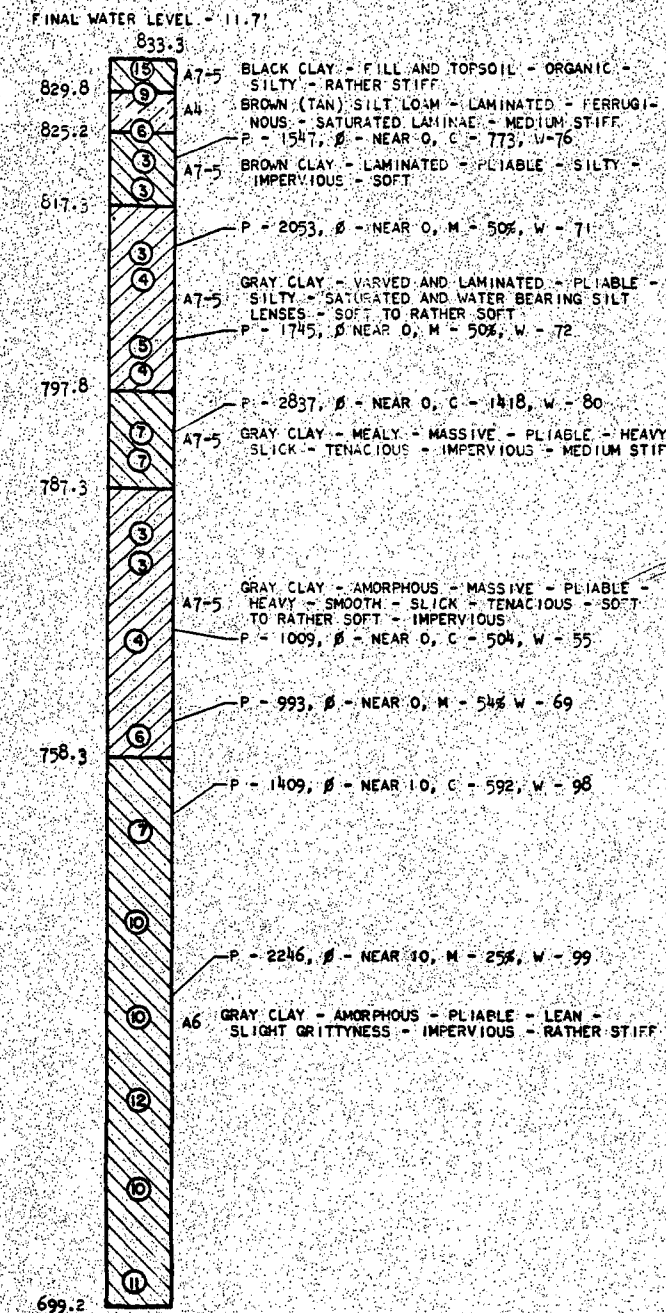


BORING NO. 1
STA. 284+32.1-42' RT.
E. Med.

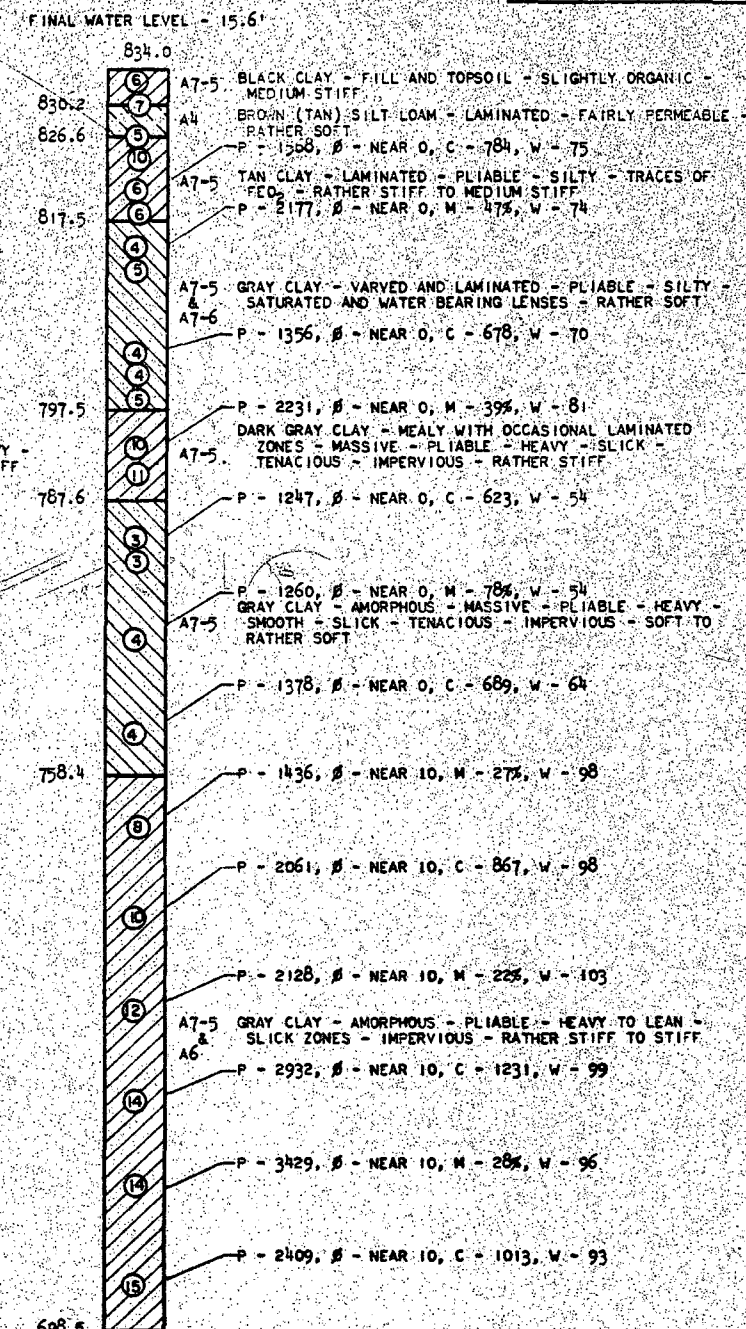
BORING NO. 2
STA. 285+15.67-42' LT
E. Med.

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

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



BORING NO. 3
STA. 285+32.0-42' RT.
E. Med.



BORING NO. 4
STA. 284+90.4-139.4' RT.
Surv. E.

BRIDGE NO. 29-38

BORING LOG

IG-29-4(6)

GRAND FORKS COUNTY

29-38-3



Surv. E

TABLES:

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



Surv. 6

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

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



Surv. E



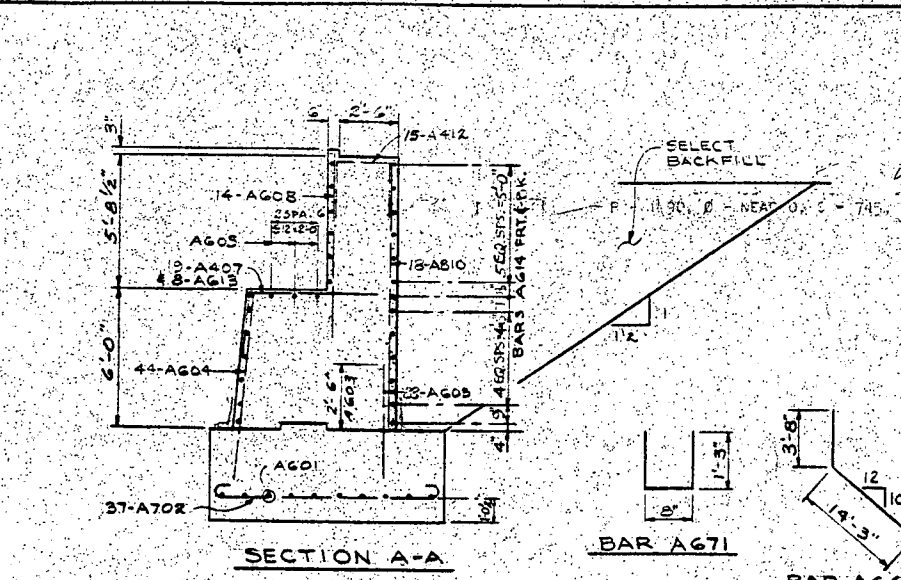
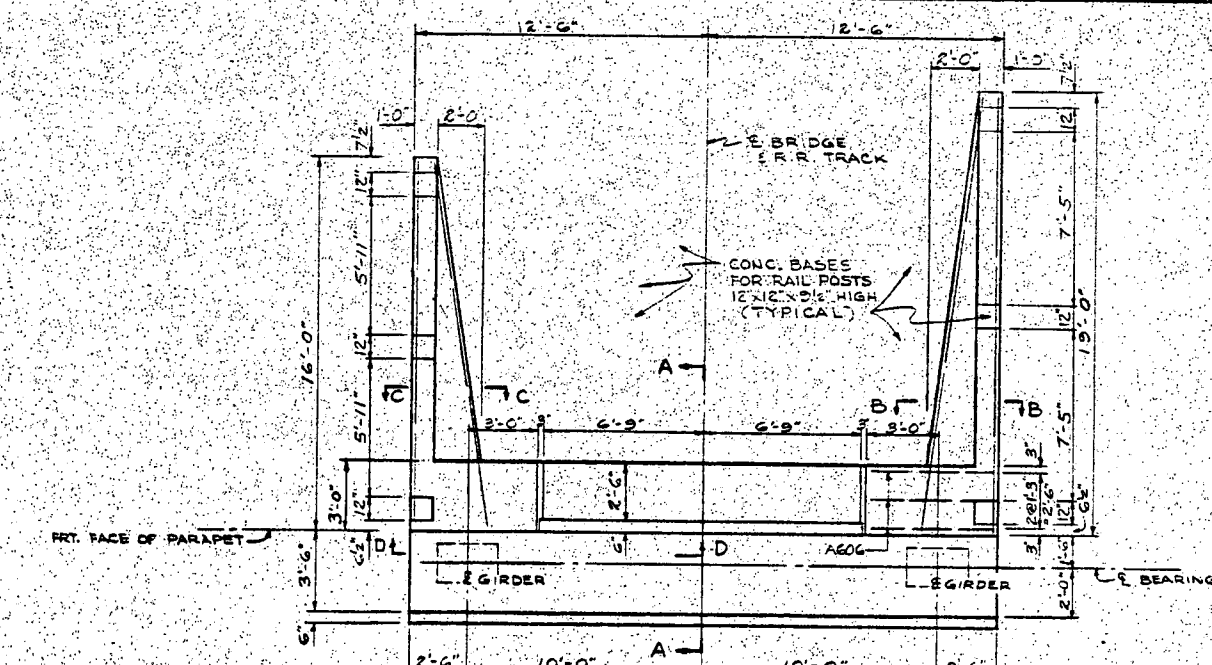
BRIDGE NO. 29-38

BORING LOG

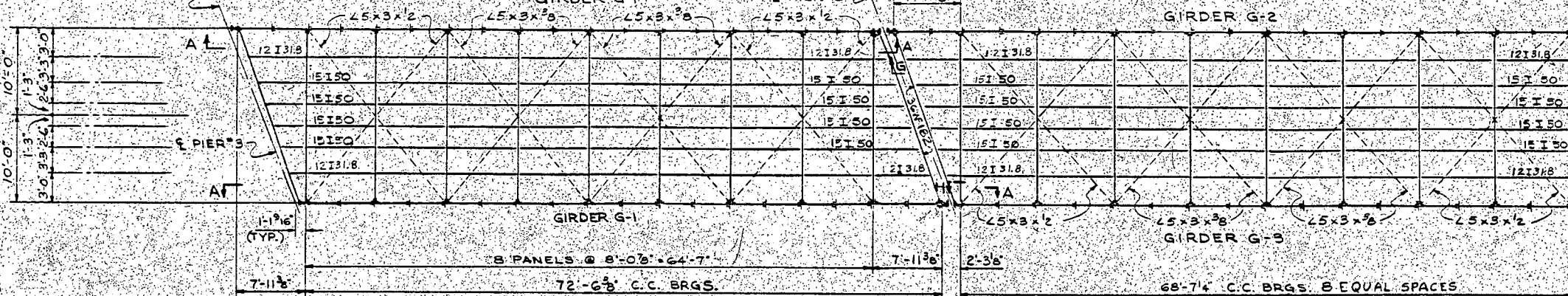
16-29-4(6)

GRAND FORKS COUNTY

SUMMARY OF QUANTITIES TWO ABUTS.				BILL OF REINFORCEMENT FOR TWO ABUTS.			
CLASS I EXCAVATION	490	CU.YDS.		MARK NO.	SIZE	LENGTH	SHAPE
CLASS AE-1 CONCRETE	228.3	CU.YDS.		AG01	20	14	27'-6"
REINF. STEEL	17,170	LEBS.		A702	74	14	11'-11"
2-TEST PILES 12" DIA. STEEL PILES	EA. 140 FT. LG.			AG03	28	2	5'-0"
12-TEST PILES 12" DIA. STEEL PILES (130')	2200	LN. FT.		AG04	108	2	8'-0"
SELECT BACKFILL	288	CU.YDS.		AG05	10	2	24'-0"
DAMP PROOFING (ONE COAT)	111.0	SQ.YDS.		AG06	12	2	8'-0"
THREE PLY FABRIC WATERPROOFING	15.0	SQ.YDS.		AG07	28	4	24'-0"
3-BAR ORNAMENTAL RAILING	7933	LN.FT.		AG08	28	12	8'-0"
				AG09	28	12	8'-0"
				AG10	28	12	8'-0"
				AG11	28	12	8'-0"
				AG12	28	12	8'-0"
				AG13	28	12	8'-0"
				AG14	28	12	8'-0"
				AG15	28	12	8'-0"
				AG16	28	12	8'-0"
				AG17	28	12	8'-0"
				AG18	28	12	8'-0"
				AG19	28	12	8'-0"
				AG20	28	12	8'-0"
				AG21	28	12	8'-0"
				AG22	28	12	8'-0"
				AG23	28	12	8'-0"
				AG24	28	12	8'-0"
				AG25	28	12	8'-0"
				AG26	28	12	8'-0"
				AG27	28	12	8'-0"
				AG28	28	12	8'-0"
				AG29	28	12	8'-0"
				AG30	28	12	8'-0"
				AG31	28	12	8'-0"
				AG32	28	12	8'-0"
				AG33	16	12	8'-0"
				AG34	4	12	8'-0"
				AG35	4	12	8'-0"
				AG36	4	12	8'-0"
				AG37	4	12	8'-0"
				AG38	4	12	8'-0"
				AG39	4	12	8'-0"
				AG40	4	12	8'-0"
				AG41	4	12	8'-0"
				AG42	4	12	8'-0"
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				AG45	4	12	8'-0"
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				AG49	4	12	8'-0"
				AG50	4	12	8'-0"
				AG51	4	12	8'-0"
				AG52	4	12	8'-0"
				AG53	4	12	8'-0"
				AG54	4	12	8'-0"
				AG55	4	12	8'-0"
				AG56	4	12	8'-0"
				AG57	16	12	8'-0"
				AG58	4	12	8'-0"
				AG59	4	12	8'-0"
				AG60	4	12	8'-0"
				AG61	4	12	8'-0"
				AG62	4	12	8'-0"
				AG63	4	12	8'-0"
				AG64	4	12	8'-0"
				AG65	4	12	8'-0"
				AG66	4	12	8'-0"
				AG67	4	12	8'-0"
				AG68	4	12	8'-0"
				AG69	4	12	8'-0"
				AG70	58	5	4'-2"
				AG71	24	6	3'-2"



BRIDGE SYMMETRICAL
BY ROTATION ABOUT E



NOTES (CONT.)

PAINTING OF STRUCTURAL STEEL SHALL COMPLY WITH SECTION 718 OF THE N.D.S.D. SPECIFICATIONS. ALL EXPOSED STEEL SURFACES SHALL BE GIVEN ONE SHOP COAT OF RED LEAD PAINT AFTER ERECTION AND CONCRETE WORK IS COMPLETED AND TWO FIELD COATS OF FOLIAGE GREEN PAINT (FIRST FIELD COAT TINTED WITH NOT MORE THAN ONE-FOURTH (1/4) LB. OF LAMP-BLACK PER GAL. OF OIL) FOLIAGE-GREEN PAINT SHALL CONFORM TO NASHO SPECIFICATION M67, TYPE II.

GENERAL STEEL NOTES

DESIGN, WORKMANSHIP AND FABRICATION SHALL CONFORM TO A.R.E.A. SPECIFICATIONS FOR STEEL RAILWAY BRIDGES, 1964 ISSUE. ERECTION SHALL CONFORM WITH THE LATEST EDITION OF NORTH DAKOTA STATE HIGHWAY DEPARTMENT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION.

FLOOR BEAMS, STRINGERS, GIRDERS, BRACING, AND BRACKETS SHALL BE ASSEMBLED IN THE SHOP AS COMPLETE UNITS AND MATCH MARKED ACCORDING TO PAR. 34 OF A.R.E.A. SPECS. SHOP AND FIELD CONNECTIONS SHALL BE 7/8 INCH DIAMETER HEAVY SEMI-FINISHED STRUCTURAL BOLTS WITH HEAVY HEX NUT AND ONE HARDENED WASHER PER BOLT. ALL BOLTS, NUTS AND WASHERS SHALL CONFORM TO A.S.T.M. A-325. 7/8 INCH DIAMETER RIVETS SHALL BE HARDENED. PRIVATE SHOP CONNECTIONS MINIMUM BOLT TENSION 36050 LBS. MAXIMUM 38000 LBS. +

HOLES FOR 7/8 INCH DIAMETER BOLTS AND RIVETS SHALL BE 1/16 INCH DIAMETER WITH HOLES SUB-DRILLED OR SUB-DRILLED 1/4\"/>

STRUCTURAL STEEL SHALL CONFORM TO CURRENT A.S.T.M. A-36 STEEL FOR EXPANSION COVER PLATES AND BARS SHALL BE A.S.T.M. A-242 CORROSION RESISTANT ALLOY TO BE APPROVED BY THE ENGINEER. WELDING SHALL CONFORM TO LATEST EDITION OF A.W.S. SPECS. FOR WELDED HIGHWAY AND RAILWAY BRIDGES. USE ONLY LOW HYDROGEN ELECTRODES SERIES E70 (MILD STEEL) FOR WELDING A.S.T.M. A-242 STEEL. ONLY CERTIFIED WELDERS QUALIFIED UNDER THE LATEST A.W.S. SPECS. MAY BE EMPLOYED IN THE SHOP FABRICATION OR FIELD ASSEMBLY OF THIS BRIDGE.

SHOP DRAWINGS SHALL COMPLY WITH SEC. 616 OF THE N.D.H.D. SPECS. AND SHALL BE SUBMITTED FOR APPROVAL OF THE N.D.H.D. BEFORE FABRICATION. THE FABRICATOR SHALL FURNISH THE SHOP DRAWING A COMPLETE SET OF APPROVED INK TRACINGS ON CLOTH OR EQUIVALENT REPRODUCIBLE TRACINGS ON A MATERIAL APPROVED BY N.D. RY. CO.

SHOP INSPECTION SHALL BE BY THE N.D. RY. CO. ENGINEER OF TESTS.

SEE SHEET #17 FOR LOCATION OF HANDRAIL POSTS-HOLES FOR ANCHOR SCREWS TO BE DRILLED IN TOP FLANGE 1/4\"/>

* A 1 3/4\"/>

+ IF HIGH STRENGTH BOLTS ARE USED IN THE WEB, FLANGES AND STIFFENERS, THE BOLTS SHALL BE PLACED SO THAT THE NUTS ARE ON THE UPPER SIDE OF THE BOTTOM FLANGES, THE LOWER SIDE OF THE TOP FLANGES AND ON THE INTERIOR SIDE (TRACK SIDE) OF THE WEB.

SEE SHEET #17 FOR TREATMENT OF TOP FLANGE AT HANDRAIL POST LOCATIONS

SUMMARY OF QUANTITIES FOR SUPERSTRUCTURE

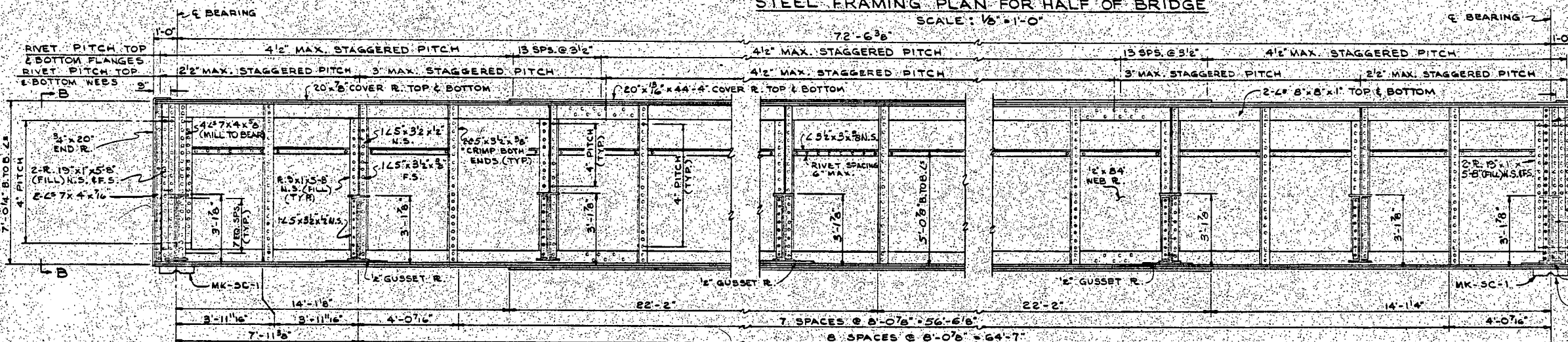
STRUCTURAL STEEL	698,343 LBS.
EXP. R. (A-242) INCL. IN STR. STEEL	
BEARINGS	
MAE-3 CONCRETE DECK	153.7 CU. YDS.
REINF. STEEL DECK	23,532 LBS.
DECK DRAINAGE SYSTEM	LUMP SUM
ASPHALT PLANK - 1"	4228 SQ. FT.
ASPHALT PLANK - 1 1/2"	550 SQ. FT.
WATERPROOFING MEMBRANE - 1/16"	541 SQ. YDS.
ORNAMENTAL METAL RAILING - 2 LINE	598.67 LIN. FT.

HITCHCOCK & ESTABROOK INC.
ARCHITECTS-ENGINEERS
MINNEAPOLIS, MINNESOTA

NORTH DAKOTA
STATE HIGHWAY DEPARTMENT
HIGHWAY CROSSING
UNDER
NORTHERN PACIFIC RAILWAY BRIDGE 98.1
STEEL FRAMING &
TYPICAL DETAILS
INTERSTATE HIGHWAY #29 GRAND FORKS CO.
PROJECT 1G-29-4(6)

STEEL FRAMING PLAN FOR HALF OF BRIDGE

SCALE: 1/8\"/>

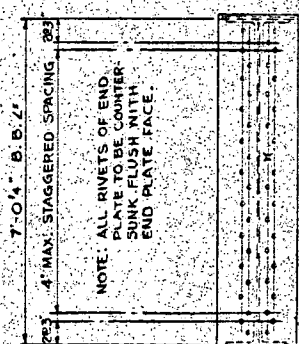


VIEW A-A

SCALE: 3/8\"/>

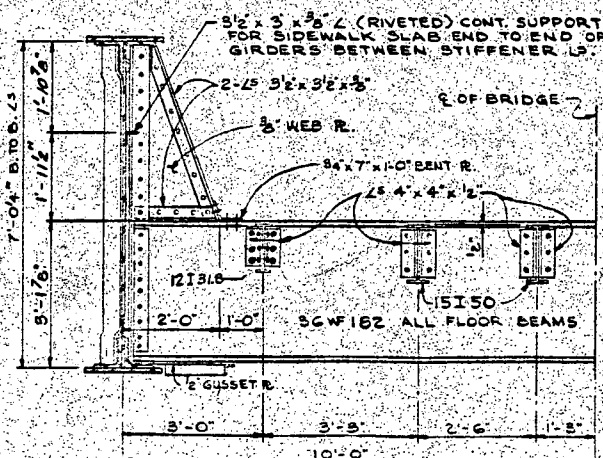
GIRDER G-1

CAMBER 3/8\"/>



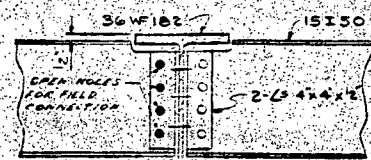
VIEW B-B

SCALE: 1/2\"/>



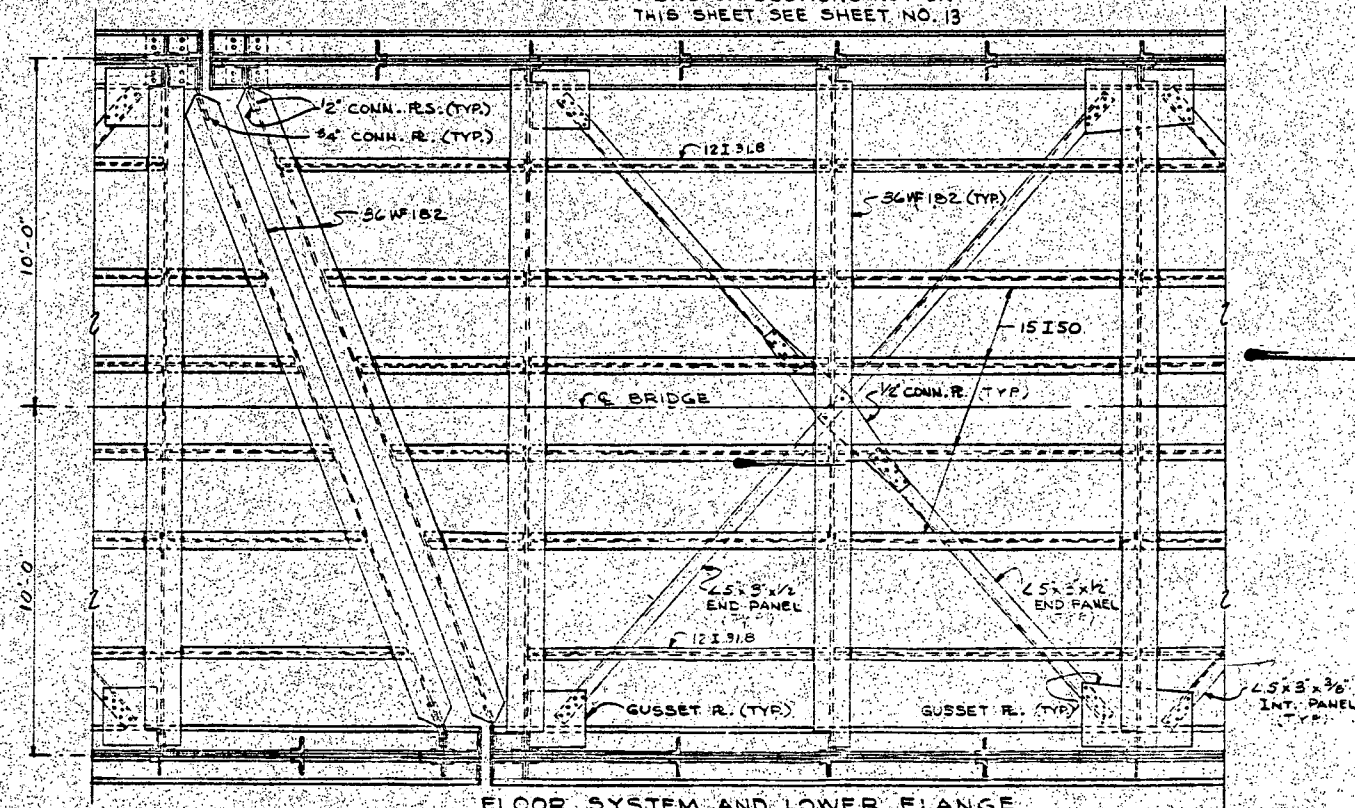
HALF TRANSVERSE SECTION

SCALE: 1/2\"/>



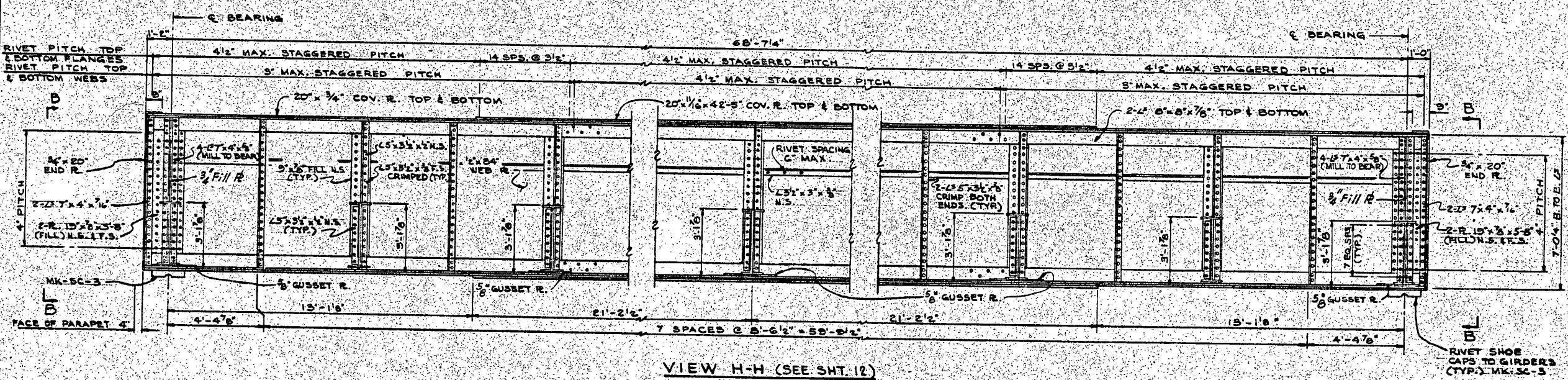
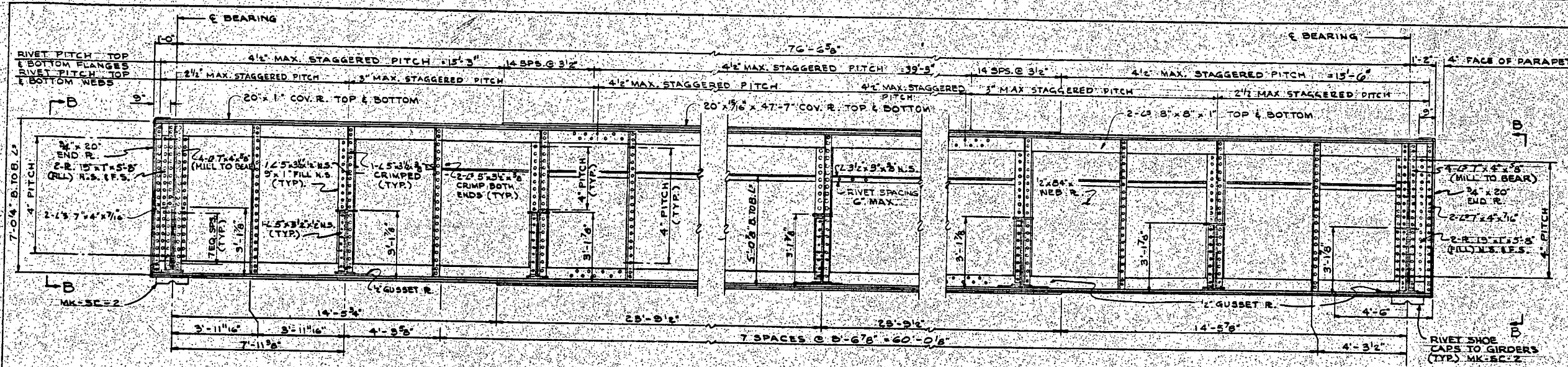
STRINGER CONN. DETAIL

NOTE: VIEWS OR SECTIONS NOT ON THIS SHEET SEE SHEET NO. 13



FLOOR SYSTEM AND LOWER FLANGE

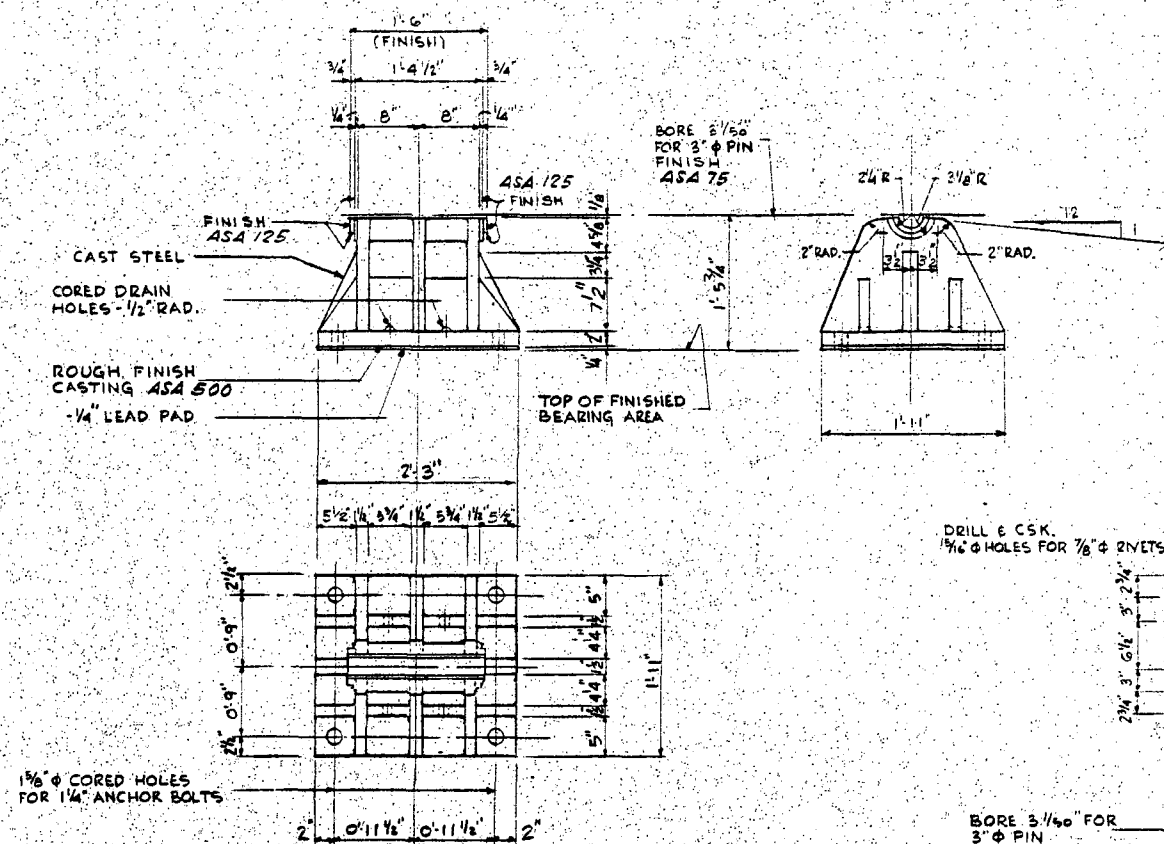
FED. AID DIST. NO.	STATE	PROJECT NO.	DATE	BY	CHKD.	APP'D.
5	N.D.	16-29-4(6)	13	27		



NOTE: VIEWS OR SECTIONS NOT ON THIS SHEET, SEE SHEET NO. 12

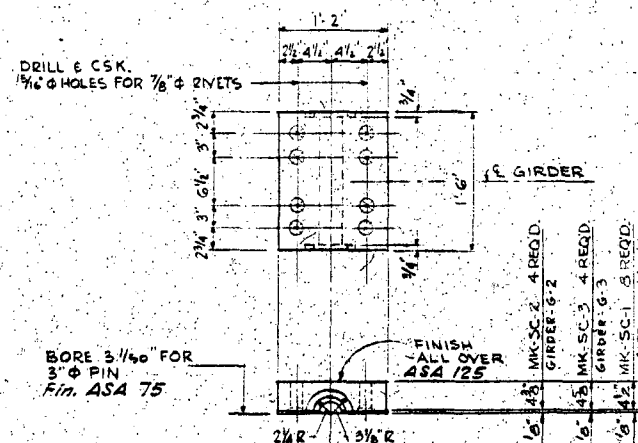
HITCHCOCK & ESTABROOK INC.
ARCHITECTS - ENGINEERS
MINNEAPOLIS, MINNESOTA

NORTH DAKOTA
STATE HIGHWAY DEPARTMENT
HIGHWAY CROSSING
UNDER
NORTHERN PACIFIC RAILWAY BRIDGE-38.1
STEEL FRAMING &
TYPICAL DETAILS
INTERSTATE HIGHWAY 29 GRAND FORKS CO.
PROJECT 16-29-4(6)

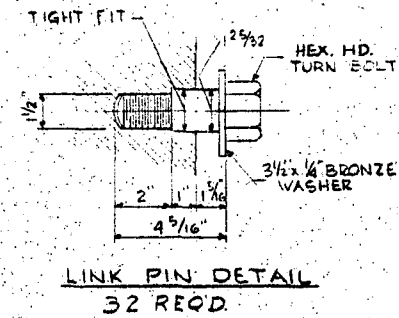
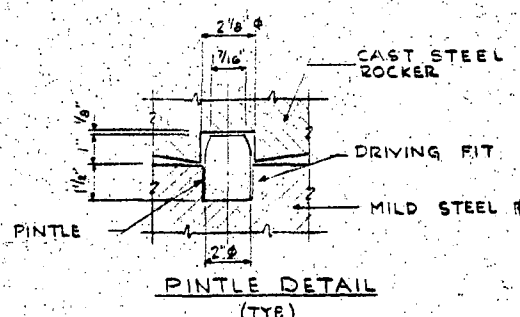


FIXED SHOES FOR PLATE GIRDER SPANS MK-FS-1

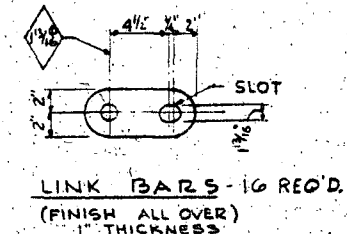
B-REQ'D - CAST STEEL
COMPLETE FIXED BEARING
EST. WT. 1325# EACH



SHOE CAPS FOR
PLATE GIRDER SPANS
1/16 REQ'D.

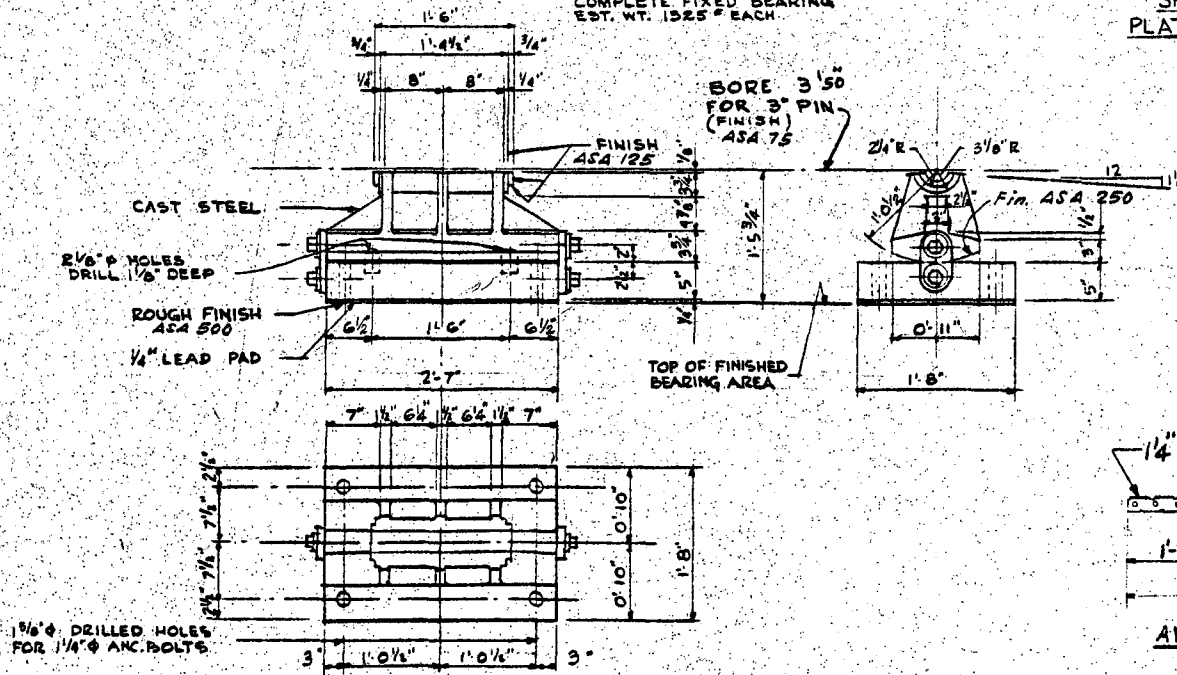


LINK PIN DETAIL
3/2 REQ'D

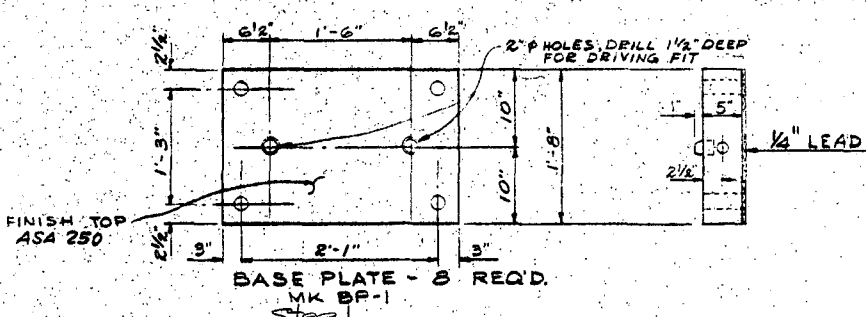


MATERIAL:
CAST STEEL: MILD TO MEDIUM STRENGTH
CARBON-STEEL CASTINGS FOR GENERAL
APPLICATION A.S.T.M. DESIGNATION A27
GRADE 65-35 FULLY ANNEALED
STRUCTURAL STEEL A.S.T.M. A36

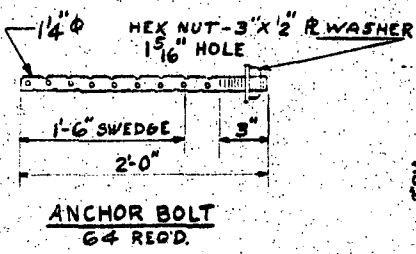
NOTE:
PAINT CONTACT SURFACES OF
PINS AND PINHOLES WHITE LEAD
AND TALLOW. PAINT ALL OTHER
SURFACES RED LEAD TTP-86a TYPE II
WT. OF ALL BEARINGS AND FITTINGS
WILL BE PAID FOR AT PRICE BID FOR
STRUCTURAL STEEL.



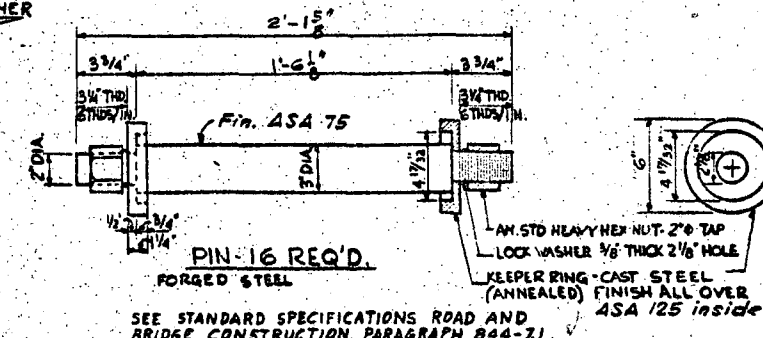
ROCKER SHOES FOR
PLATE GIRDER SPANS MK-RS-1
B REQ'D.
COMPLETE ROCKER BEARING EST. WT. 1700# EACH



BASE PLATE - B REQ'D.
MK BP-1
Steel 1.



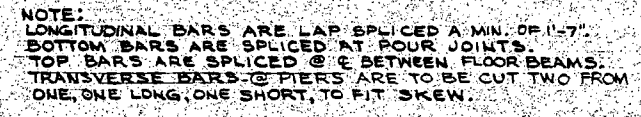
ANCHOR BOLT
6/4 REQ'D.



PIN - 1/6 REQ'D.
FORGED STEEL

SEE STANDARD SPECIFICATIONS ROAD AND
BRIDGE CONSTRUCTION, PARAGRAPH 844-21

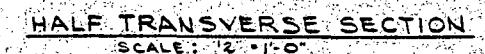
HITCHCOCK & ESTABROOK INC.
ARCHITECTS - ENGINEERS
MINNEAPOLIS, MINNESOTA
NORTH DAKOTA
STATE HIGHWAY DEPARTMENT
HIGHWAY CROSSING
UNDER
NORTHERN PACIFIC RAILWAY BRIDGE #981
BEARINGS & SHOES
INTERSTATE HIGHWAY 3-29 GRAND FORKS CO.
PROJECT 36-29-4(6)



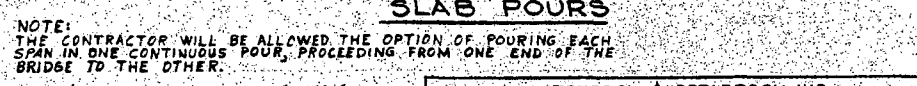
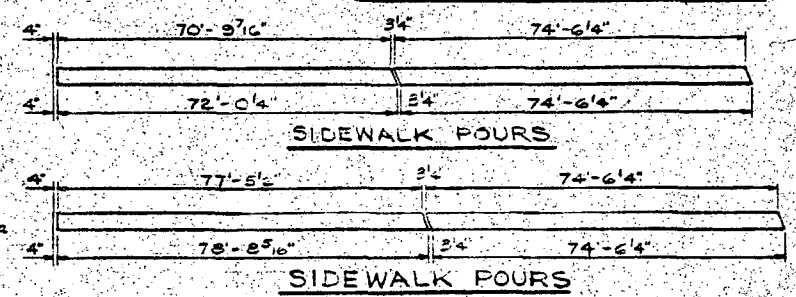
See sheet 16 for longitudinal section
along center line of bridge.



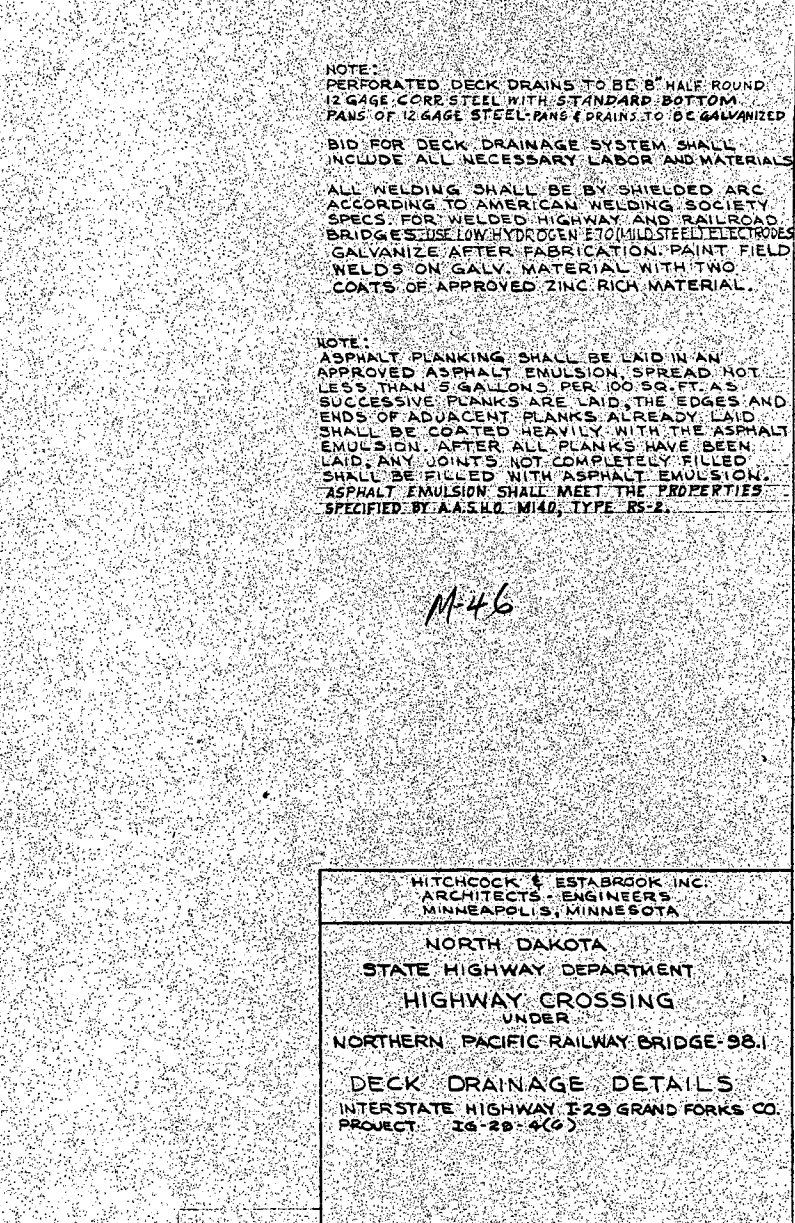
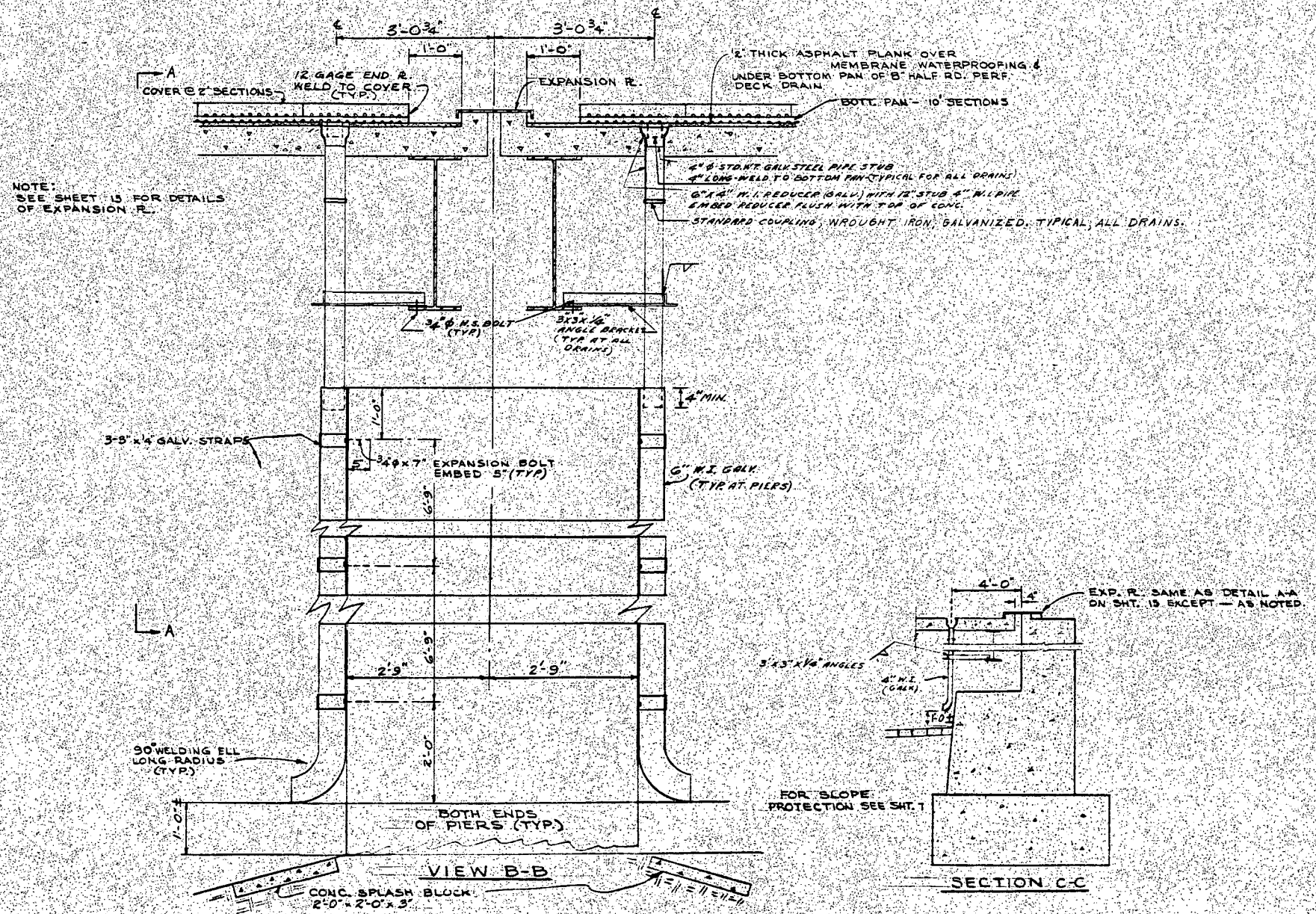
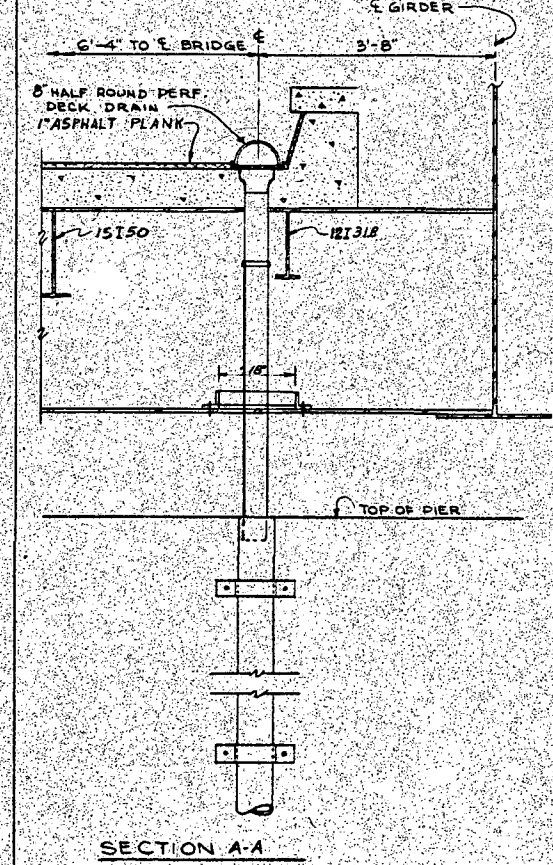
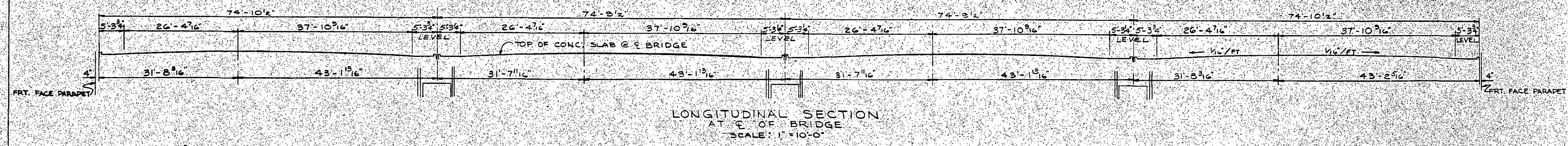
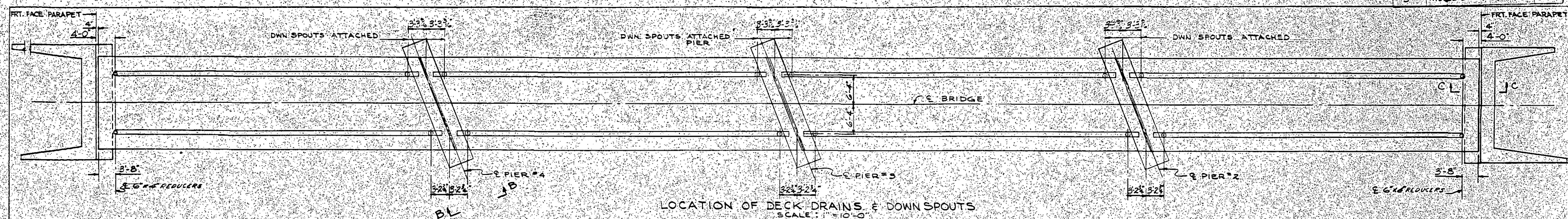
* BAP NUMBERS CHANGED ARE SAME SIZE & SAME NUMBER
REQUIRED AS PREVIOUS NUMBER BUT LENGTH OF EACH NO.
INCREASES BY 5" INCREMENTS.



KEYWAY DETAIL
SCALE: 1/2" = 1'-0"



29-38-9



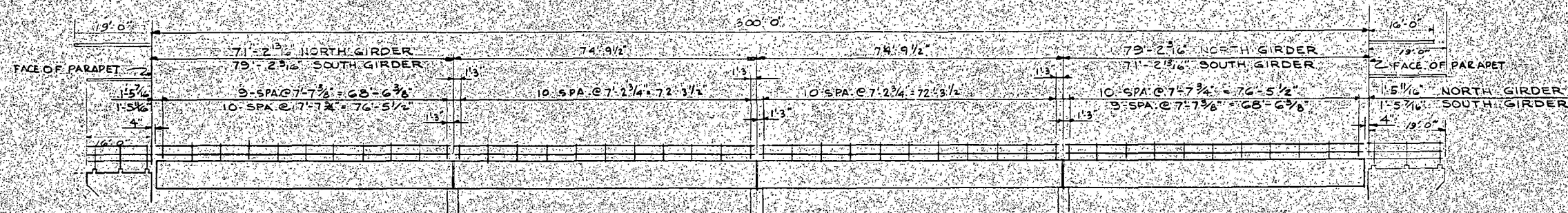
NOTE:
PERFORATED DECK DRAINS TO BE 8" HALF ROUND
12 GAGE CORR STEEL WITH STANDARD BOTTOM
PANS OF 12 GAGE STEEL PANS & DRAINS TO BE GALVANIZED
BID FOR DECK DRAINAGE SYSTEM SHALL
INCLUDE ALL NECESSARY LABOR AND MATERIALS
ALL WELDING SHALL BE BY SHIELDED ARC
ACCORDING TO AMERICAN WELDING SOCIETY
SPECS. FOR WELDED HIGHWAY AND RAILROAD
BRIDGES. USE LOW HYDROGEN E70 MILD STEEL ELECTRODES
GALVANIZE AFTER FABRICATION. PAINT FIELD
WELDS ON GALV. MATERIAL WITH TWO
COATS OF APPROVED ZINC RICH MATERIAL.

NOTE:
ASPHALT PLANKING SHALL BE LAID IN AN
APPROVED ASPHALT EMULSION, SPREAD NOT
LESS THAN 5 GALLONS PER 100 SQ. FT. AS
SUCCESSIVE PLANKS ARE LAID, THE EDGES AND
ENDS OF ADJACENT PLANKS ALREADY LAID
SHALL BE COATED HEAVILY WITH THE ASPHALT
EMULSION. AFTER ALL PLANKS HAVE BEEN
LAID, ANY JOINTS NOT COMPLETELY FILLED
SHALL BE FILLED WITH ASPHALT EMULSION.
ASPHALT EMULSION SHALL MEET THE PROPERTIES
SPECIFIED BY AASHTO M140, TYPE RS-2.

HITCHCOCK & ESTABROOK INC.
ARCHITECTS - ENGINEERS
MINNEAPOLIS, MINNESOTA

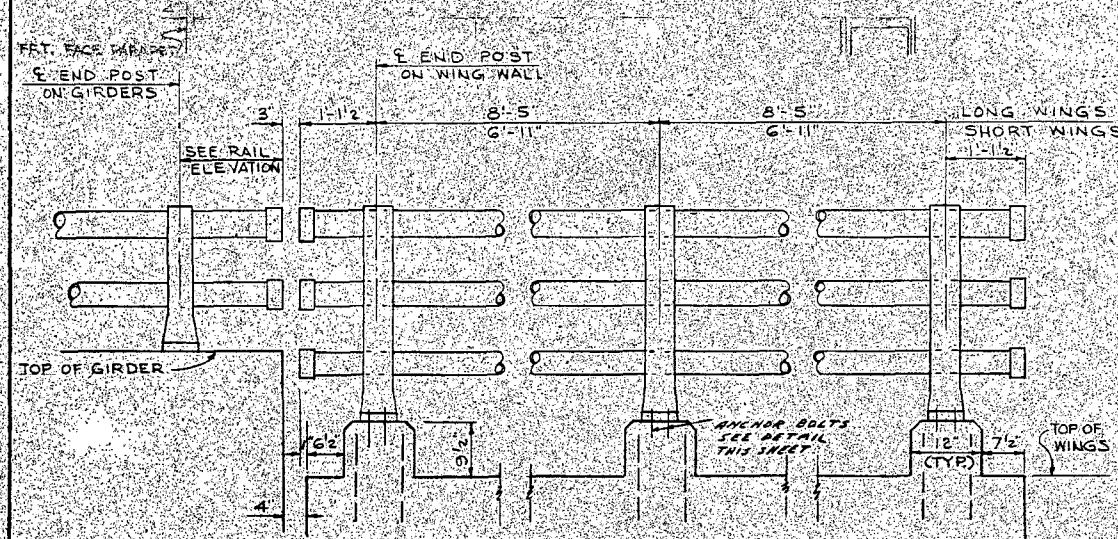
NORTH DAKOTA
STATE HIGHWAY DEPARTMENT
HIGHWAY CROSSING
UNDER
NORTHERN PACIFIC RAILWAY BRIDGE 98.1

DECK DRAINAGE DETAILS
INTERSTATE HIGHWAY 29 GRAND FORKS CO.
PROJECT IG-29-4(6)

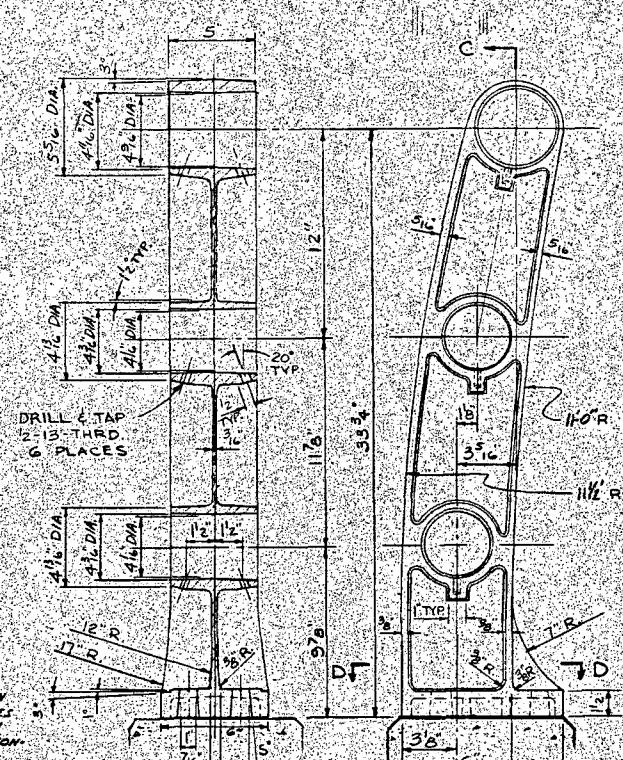


ABUT #5 PIER #4 PIER #3 PIER #2 ABUT #1

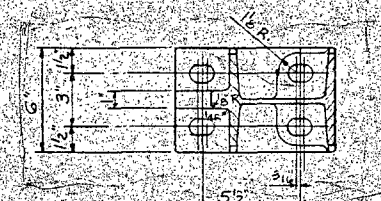
POST SPACING
NOT TO SCALE



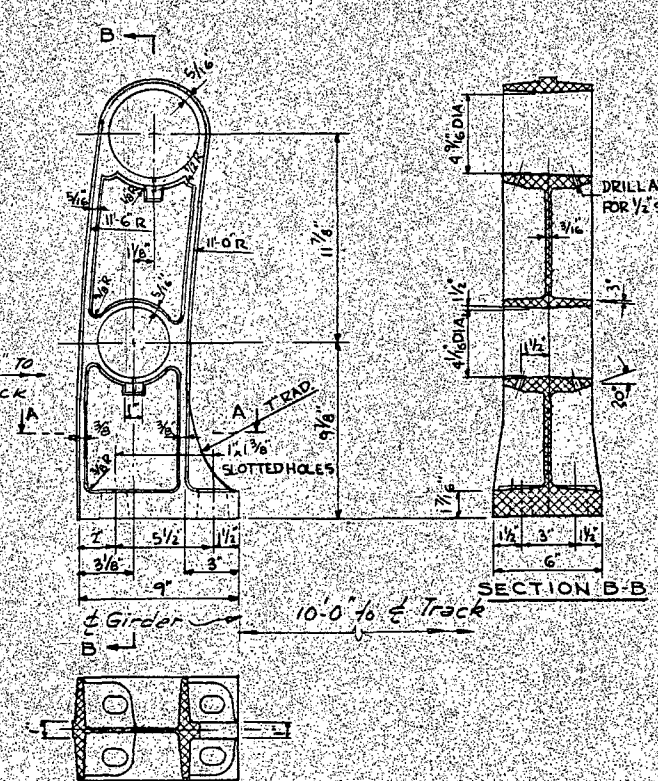
WING WALL ELEVATION



SECTION C-C
HANDRAIL POSTS ON WINGS
12 REQ'D

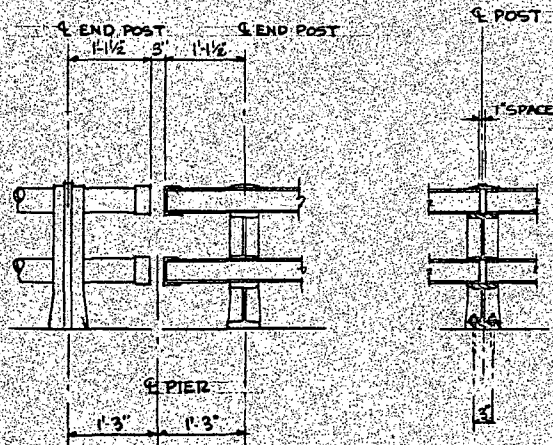


SECTION D-D

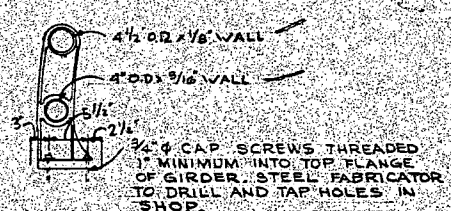


SECTION A-A

HANDRAIL POSTS ON GIRDERS
86 REQ'D



HANDRAIL DETAILS



HANDRAIL CAP



VIEW B-B

ORNAMENTAL METAL RAILING - ALTERNATE 'A'
RAIL POST SHALL BE PERMANENT MOLD TYPES OF CAST ALUMINUM ALLOY AND SHALL CONFORM TO A.S.T.M. B108, ALLOY A344-T4.
RAIL PIPE SHALL BE ALUMINUM ALLOY 6061-T6 AND SHALL BE DRAWN TO B.S.T.M. DES. B-210, OR EXTRUDED TUBE A.S.T.M. DES. B-210, OR EXTRUDED TUBE A.S.T.M. DES. B-221, OR ALLOY PIPE A.S.T.M. DES. B-241, MILL FINISH.

SET SCREWS SHALL BE ALUMINUM ALLOY 2024-T4 CONFORMING TO A.S.T.M. DES. B-211.

ANCHOR BOLTS SHALL BE AUSTINITE STAINLESS STEEL.

ALL ALUMINUM CASTINGS SHALL BE FINISHED BY GRINDING OFF THE GATES AND PARTING LINE FOLLOWED BY SAND BLASTING AND ONE COAT OF LACQUER.

ORNAMENTAL METAL RAILING - ALTERNATE 'S'
ALTERNATE 'S' SHALL HAVE THE SAME DIMENSIONS AS ALTERNATE 'A' WITH THE MATERIALS CONFORMING TO THE FOLLOWING:

RAIL SHALL BE HOT DIP GALVANIZED 3/2\"/>

POSTS AND RAIL CAPS SHALL BE HOT DIP GALVANIZED AND CONFORM TO SPECIFICATION A.A.S.H.O. M-192 CLASS TO 96.

CAP AND SET SCREWS SHALL BE GALVANIZED STEEL. ANCHOR BOLTS SHALL BE GALVANIZED STEEL.

ALL STEEL CASTINGS SHALL BE FINISHED BY GRINDING OFF THE GATES AND PARTING LINE FOLLOWED BY SAND BLASTING.

GENERAL NOTE
RIVETS IN GIRDERS UNDER RAIL POSTS SHALL BE COUNTERSUNK AND SURFACE OF GIRDER SHALL BE GROUND SMOOTH. ELASTOMERIC BEARING PADS, WITH A MINIMUM THICKNESS OF 1/4\"/>

IT WILL BE PERMISSIBLE TO USE STEEL SHIMS UNDER THE POSTS, HOWEVER, AN ELASTOMERIC SHIM OF A MINIMUM THICKNESS OF ONE-SIXTEENTH INCH MUST BE PLACED ABOVE AND BELOW THE STEEL SHIM.

ALL PIPE, RAIL POST, ANCHOR BOLT, ASSEMBLIES, BOLTS, SHIMS, SET SCREW, & END CAPS SHALL BE INCLUDED IN THE PRICE BID FOR ORNAMENTAL METAL RAILING ALTERNATE 'A' OR ALTERNATE 'S'.

FOR
ALCOA
TYPE 'A'

HITCHCOCK & ESTABROOK, INC.
ARCHITECTS - ENGINEERS
MINNEAPOLIS, MINNESOTA

NORTH DAKOTA
STATE HIGHWAY DEPARTMENT
HIGHWAY CROSSING
UNDER
NORTHERN PACIFIC RAILWAY BRIDGE #98.1
HANDRAIL DETAILS
INTERSTATE HIGHWAY #29 GRAND FORKS CO.
PROJECT IG-29-4(6)

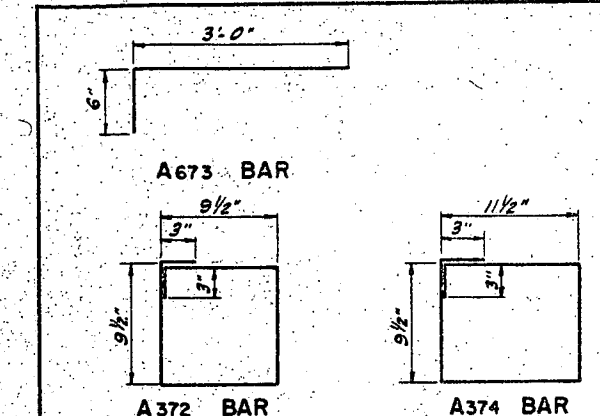
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	N.D.				

CORRECTED QUANTITIES-2 ABUT'S	
Class I Excavation	490.0 C.Y.
Class AE-1 Concrete	238.0 C.Y.
Reinforcing Steel	18,026 Lbs.
2 Test Piles 12 BP 53 Steel Piles Each 140 Ft. Lg.	
12 BP 53 Steel Piles (130')	3,900 L.F.
Select Backfill	298.0 C.Y.
Dampproofing (One Coat)	111.0 Sq. Y.
Three Ply Fabric Waterproofing	15.0 Sq. Y.
3 Line Ornamental Railing	70.33 L.F.
2 Line Ornamental Railing	70.33 L.F.
Class AE-4 Concrete	3.4 C.Y.

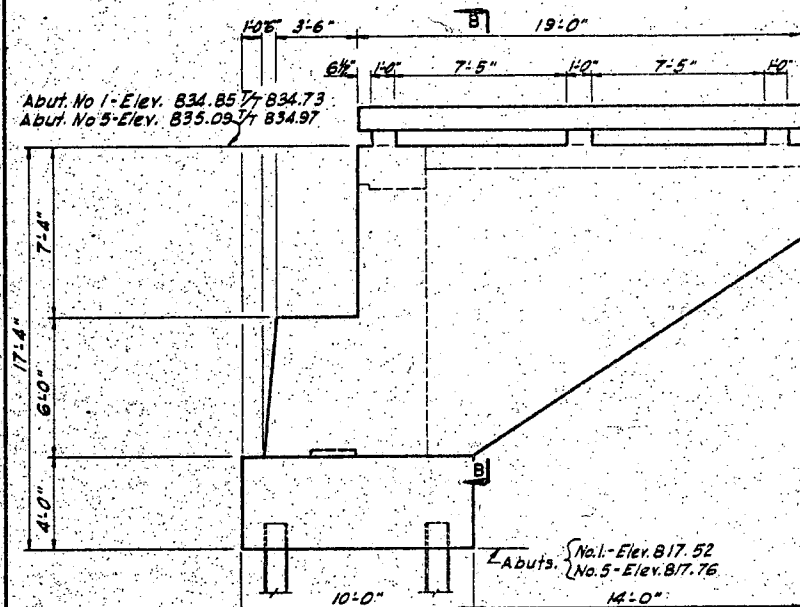
NOTES:
 The plans shown represent revisions in the top of the abutment wings. These alterations are necessary, because of the elimination of the three line railing originally specified and shown on drawings 29-38-5 and 29-38-11.
 The details shown call for a concrete post and parapet rail to be constructed monolithically with and on top of the abutment wing walls. A two line, aluminum railing will be placed on top of the parapets.
 The new rail will match the grade alignment of the two line railing presently called for on top of the girders.
 The quantity table shows corrected values in Class AE-1 concrete class AE-4 concrete, Reinforcing steel, 2 Line Ornamental Railing and 3 Line Ornamental Railing.
 The quantity table on the Title Sheet has not been revised in conformity to the corrected quantities shown on this drawing, 29-38-5A. Please refer to change order No. 1 dated March 21, 1967 for the corrected quantities.
 Also refer to Drawings 29-38-11 and 29-38-11A. Bevel top of abutment wings, concrete posts and concrete parapet rail with 3/4" triangular molding. All other corners chamfered according to Drawing 29-38-2.
 The detail plans, additional reinforcing bar table and the corrected quantity table shown on this drawing 29-38-5A represent revisions in drawing 29-38-5 and should be used in conjunction with drawing 29-38-5.

MARK	NO.	SIZE	LENGTH	SHAPE	LOCATION
A671	24	6	3'-2"		Rail Post on Wings
A372	24	3	3'-8"		Conc. Post on Wings
A673	48	6	3'-6"		From Wing into Ped.
A374	44	3	4'-0"		Concrete Pedestal
A675	12	6	15'-8"		Concrete Pedestal
A676	12	6	15'-8"		Concrete Pedestal

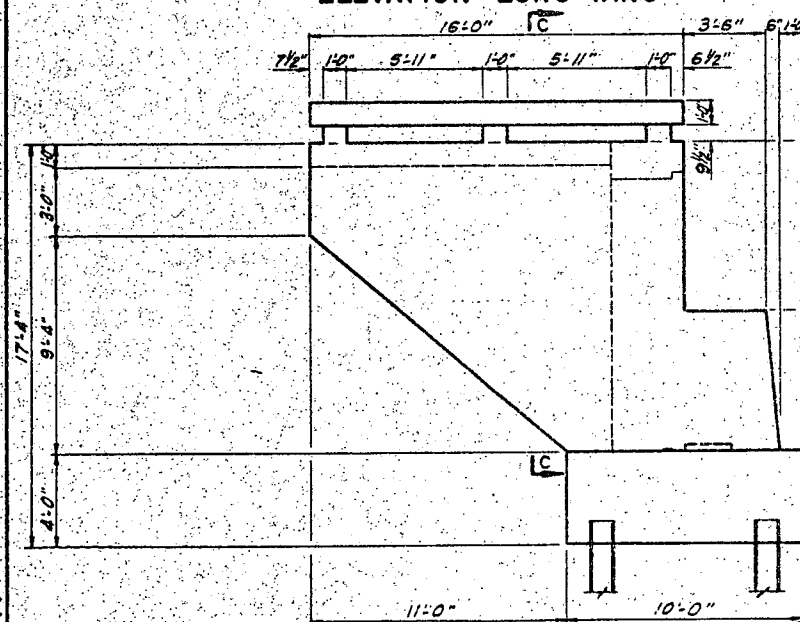
*Eliminate A671 Bars



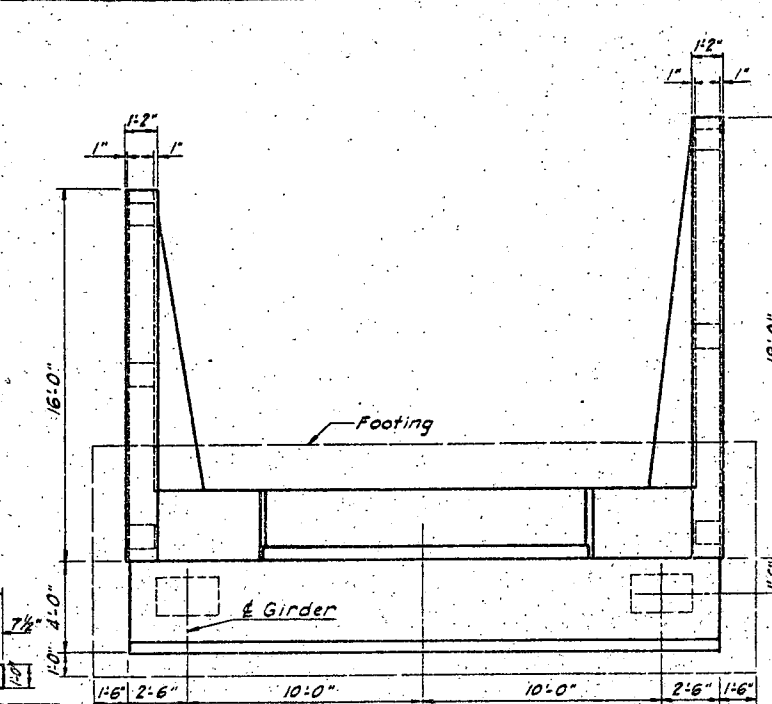
BENT BAR DETAILS



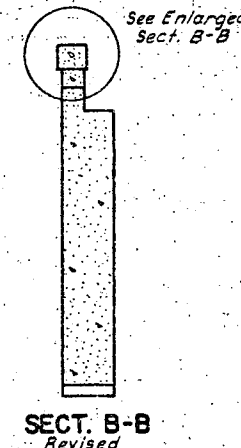
ELEVATION LONG WING



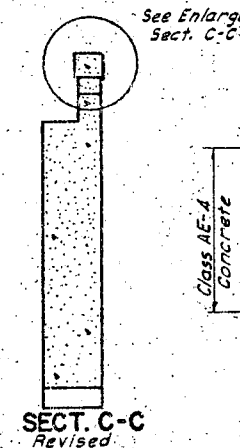
ELEVATION SHORT WING



PLAN
 Footing in Outline



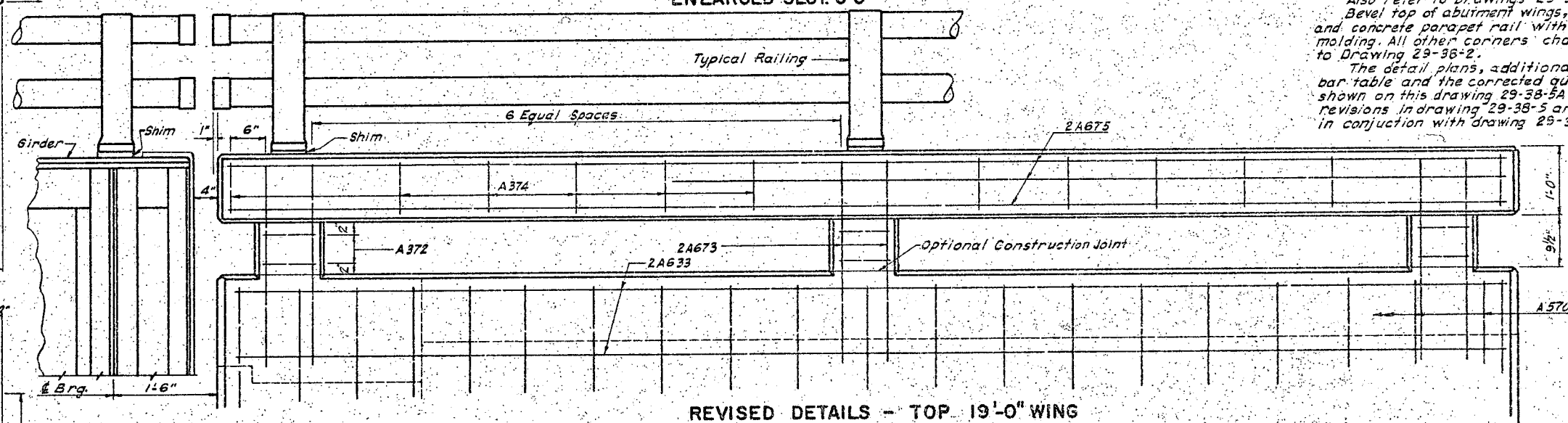
SECT. B-B
 Revised



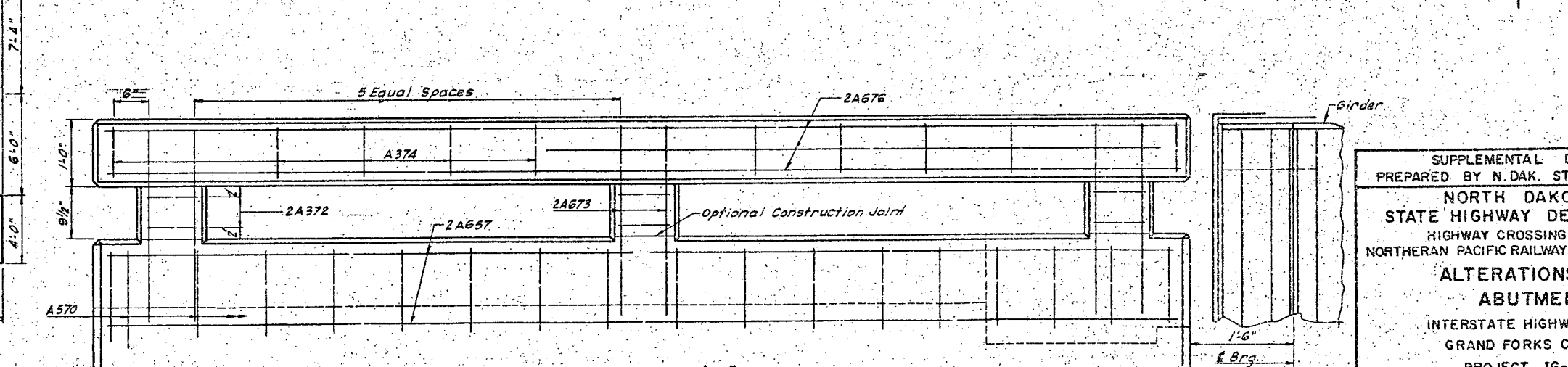
SECT. C-C
 Revised

ENLARGED SECT. B-B

ENLARGED SECT. C-C



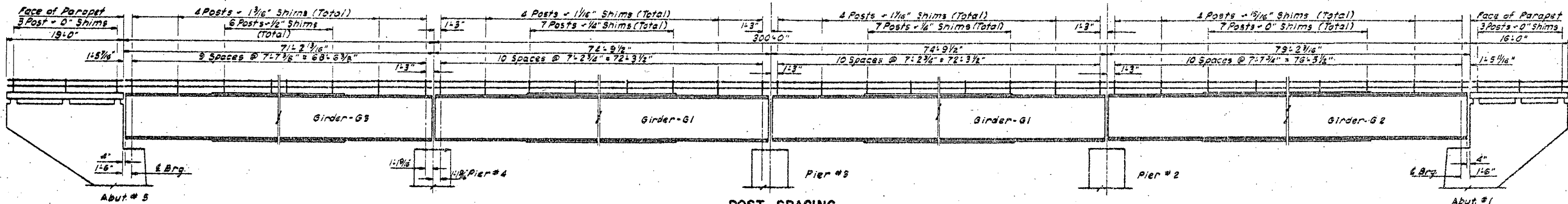
REVISED DETAILS - TOP 19'-0" WING



REVISED DETAILS - TOP 16'-0" WING
 Scale: 1" = 1'-0"

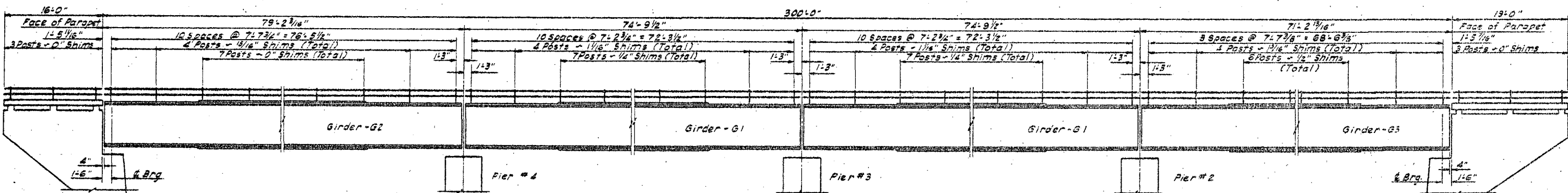
SUPPLEMENTAL DRAWING
 PREPARED BY N.DAK. STATE HIGH. DEPT.
 NORTH DAKOTA
 STATE HIGHWAY DEPARTMENT
 HIGHWAY CROSSING UNDER
 NORTHERN PACIFIC RAILWAY BRIDGE #98.1
 ALTERATIONS TO
 ABUTMENTS
 INTERSTATE HIGHWAY #29
 GRAND FORKS COUNTY
 PROJECT IG-29-4(16)

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
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POST SPACING
NORTH GIRDERS
1/8" = 1'-0"

NOTE: The computed depth of shim under each post is shown.



POST SPACING
SOUTH GIRDERS
1/8" = 1'-0"

GENERAL NOTES:

Rivets in girders under rail posts shall be counter sunk and surface of girder shall be ground smooth.

The computed thickness of shim under each post is shown. The shim or pad may be elastomeric, aluminum or steel. If elastomeric, 1/16" must be added to the shim thickness shown. This means at least a 1/16" elastomeric pad under each post. If the shim is aluminum, place a 1/16" elastomeric pad between the aluminum shim and girder, post and girder or post and parapet. If the shim is steel, place a 1/16" elastomeric pad above and below the steel shim. If the shims are steel at all places where a 0" shim is shown, a 1/16" elastomeric pad will be required to keep rails in line. In all cases, small elastomeric shims, as detailed on this drawing, will be required. These are to be used to bring individual posts into final adjustment.

All pipes, rail posts, anchor bolt assemblies, bolts, shims, set screw, & end caps shall be included in the price bid for ornamental metal railing alternate "A".

ORNAMENTAL METAL RAILING-ALTERNATE "A"
See the Special Provision, this project, governing post requirements, A344 (Modified).

Rail pipe shall be aluminum alloy 6061-T6 and shall be drawn tube A.S.T.M. Des. B-210, or extruded tube A.S.T.M. Des. B-221 or alloy pipe A.S.T.M. Des. B-241, mill finish.

Set screws shall have at least 0.002 inch anodic coating and chromate seal.

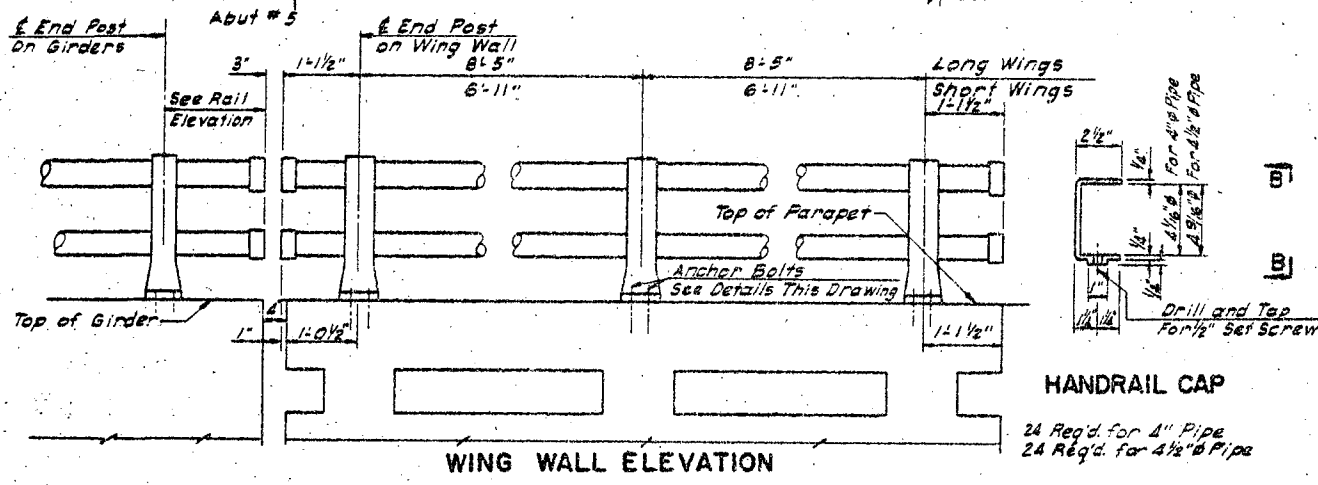
Cap screws shall be austenitic stainless steel.

Anchor bolts shall be austenitic stainless steel.

On drawing 29-38-6, the girder flanges are drilled 1/4" deep, with threaded holes to accommodate the post cap screws. Note that variable length cap screws are required to compensate for the variance in shim thickness.

All aluminum castings shall be finished by grinding off the gates and parting line followed by sand blasting and one coat of lacquer.

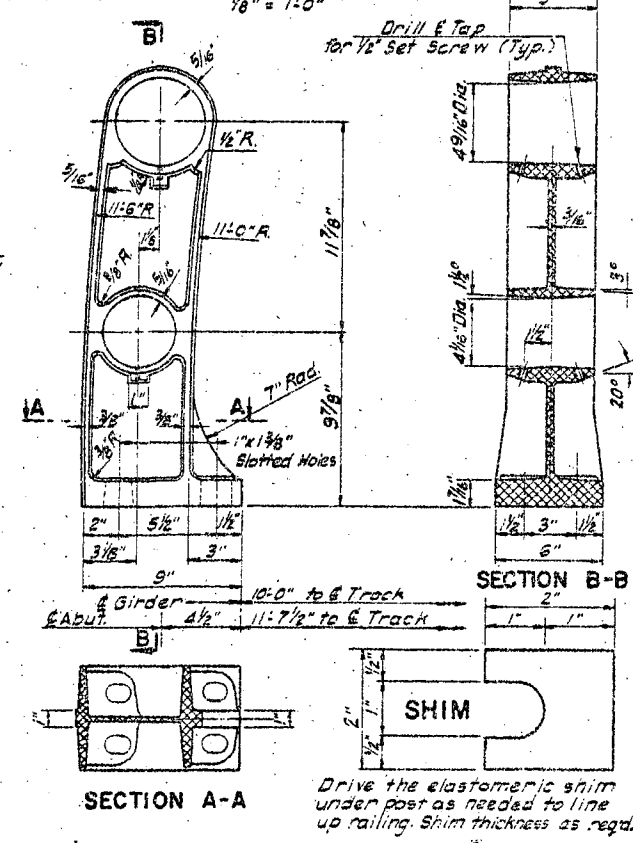
Set screws shall be aluminum alloy 2024-T4 conforming to A.S.T.M. Des. B-211.



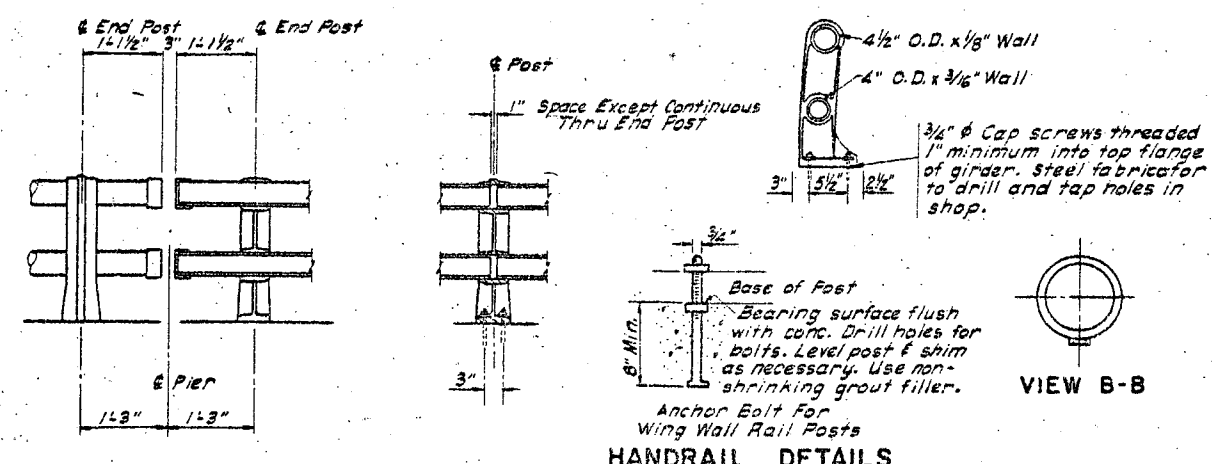
WING WALL ELEVATION

HANDRAIL CAP

24 Req'd. for 4" Pipe
24 Req'd. for 4 1/2" Pipe



HANDRAIL POSTS
98 Req'd.



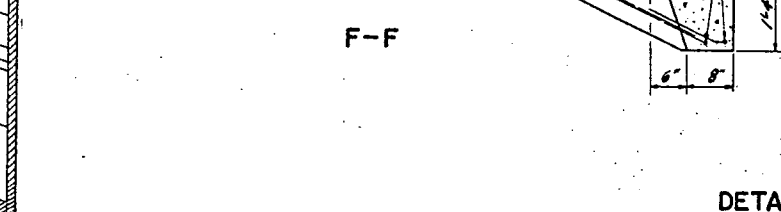
HANDRAIL DETAILS

SUPPLEMENTAL DRAWING
PREPARED BY N. DAK. STATE HIGH. DEPT.
NORTH DAKOTA
STATE HIGHWAY DEPARTMENT
HIGHWAY CROSSING UNDER
NORTHERN PACIFIC RAILWAY BRIDGE #98.1
ALTERATIONS TO
HANDRAIL DETAILS
INTERSTATE HIGHWAY #29
GRAND FORKS COUNTY
PROJECT IG-29-4 (G)

Checked By J.C.
Traced By J.C.
Detailed By J.C.



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



DETAILS OF PRECAST BLOCKS

DATE SIGNED: 10-19-63		NORTH DAKOTA STATE HIGHWAY DEPARTMENT Submitted: <i>Joseph B. Kirby</i> Bridge Engineer Recommended: Asst. Chief Engineer Pre-Construction Approved: <i>Edmund</i> Chief Engineer
REVISIONS		
DATE	CHANGE	