

DESIGN DATA

Traffic
 Current Traffic (1980) 3350 Pass. 650 Trucks 4000 Total 600
 Traffic Forecast (2000) 6800 Pass. 1200 Trucks 8000 Total 880
 Design Speed 70 MPH
 Traffic Classification "M"
 Minimum Sight Distance (Stopping) 850'

Est. 30th
 Max. Hr.

**NORTH DAKOTA
 STATE HIGHWAY DEPARTMENT**

GRADING
 IN WARD COUNTY
 FEDERAL AID PROJECT F-FG-4-002(10)147
 Grading And Structural

FHWA REGION	STATE	PROJECT	SHEET NO.
8	N.D.	F-FG-4-002(10)147	1

GOVERNING SPECIFICATIONS:

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

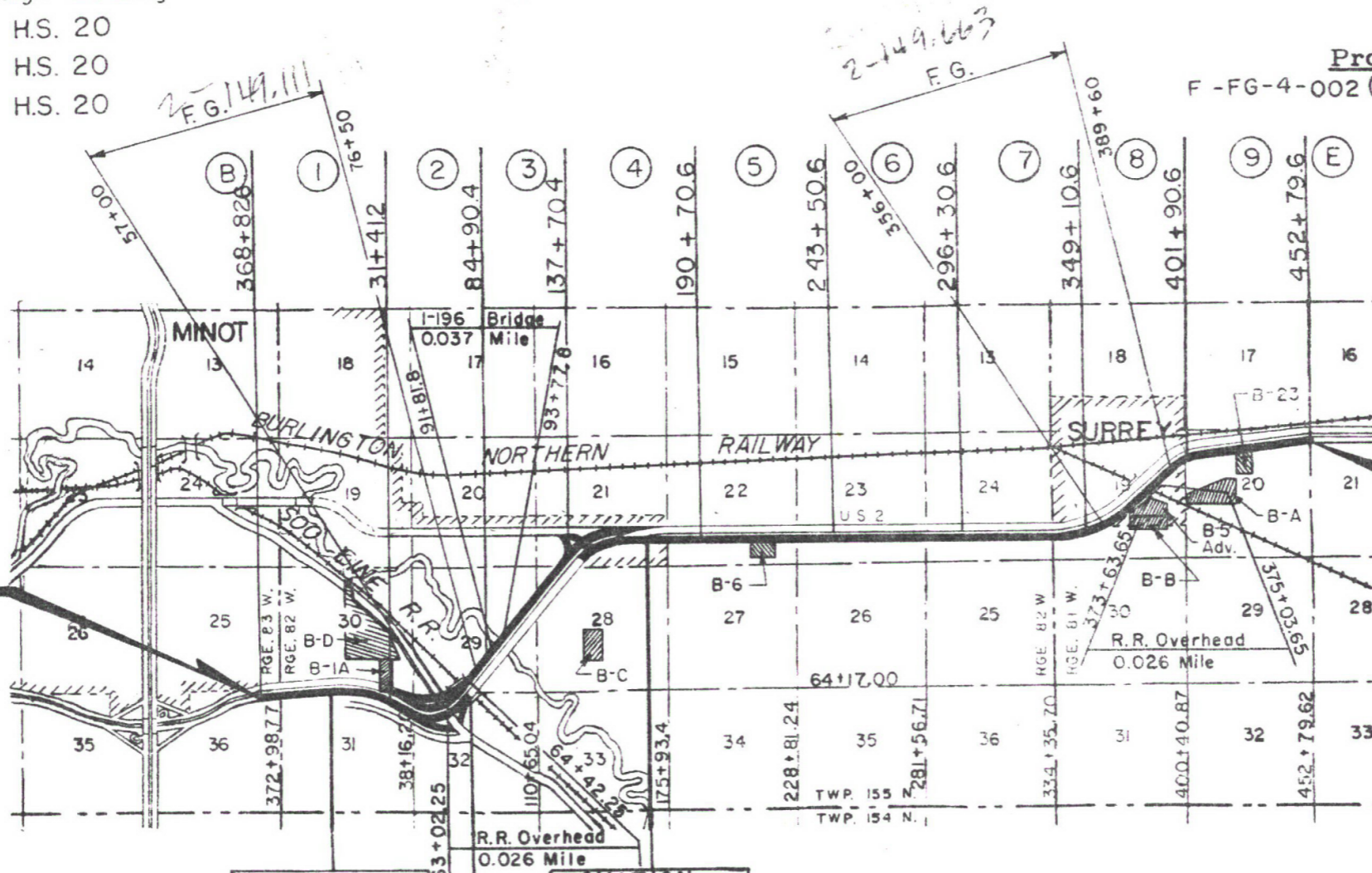
LENGTH OF PROJECT

Project	Miles-Gross	Miles-Net
F-FG-4-002(10)147	8.963	8.963

Bridges

Sta.	Clear Rdwy. Width	Design Loading
63+69.6	45'	H.S. 20
92+79.8	40'	H.S. 20
374+33.65	40'	H.S. 20

Mile Point	Stationing
147.00	368+82.6
148.00	4+05.24
149.00	56+85.24
150.00	110+34.44
151.00	163+14.44
152.00	216+14.64
153.00	268+94.64
154.00	321+74.64
155.00	374+54.64
156.00	427+34.64
156.482	452+79.6 Bk.



BORROW AREAS

- B-5 Adv.
- B-6
- B-23
- B-A
- B-B
- B-C
- B-D
- B-1A

BEG. PROJ. F-FG-4-002(10)147
 STA. 368+82.6
 SEC 36, Twp. 155 N., Rge. 82 W.

END PROJ. F-FG-4-002(10)
 STA. 452+79.62
 SEC 20, Twp. 155 N., Rge. 81 W.

LIMITED CONTROL ACCESS

Access Limited to Point Designated Thus.
 No access except those shown on plans. Access Points as shown may be shifted slightly during construction if necessary to better serve property owners and traffic.

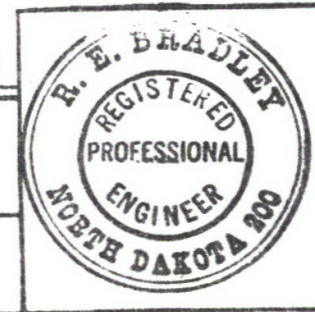
EQUATION:
 390+21.39 Bk. =
 0+00 Ahd.

EQUATION:
 164+56.23 Bk. =
 164+76.43 Ahd.

EQUATION:
 62+02.3 Bk. =
 62+71.5 Ahd.

APPROVED DATE 3-14-80

R. E. Bradley
 CHIEF ENGINEER
 NORTH DAKOTA
 STATE HIGHWAY DEPARTMENT



U.S. DEPARTMENT OF TRANSPORTATION
 FEDERAL HIGHWAY ADMINISTRATION

APPROVED

DIVISION ENGINEER

DATE

SUPPLEMENTAL SPECIFICATIONS
&
SPECIAL PROVISIONS

B A S I S O F E S T I M A T E

Grading

<u>No.</u>	<u>Name</u>
SP-103-3	Award & Execution of Contract
SP-107-6 & 7	Legal Relations & Responsibility to Public
SP-108-9 & 19	Prosecution & Progress
SP-109-3	Measurement & Payment
SP-193	Railway Protection Insurance
SP-203-2	Excavation & Embankment (Borrow)
SP-272	Fuel Cost Adjustment
SP-273	Haul Road Maintenance
SP-302-1 & 3	Aggregate Surface Course
SP-406-7 & 8	Hot Bituminous Pavement
SP-726-23	Seeding
SP-743-10	Pavement Marking
SP-746-1	Flagging
SP-762-6	Maintenance & Protection of Traffic
SP-776-2	Temporary Striping
SP	Trainee
SP-870-4	Paints, Oils & Thinners
SP-871-4	Pavement Marking Material

Structural

<u>No.</u>	<u>Name</u>
SP-103-3	Award & Execution of Contract
SP-108-9 & 19	Prosecution & Progress
SP-193	Railway Protection Insurance
SP-208-1	Excavation for Box Culverts & Bridges
SP-299	Repair and Overlay of PCC Bridge Decks
SP-254	Epoxy Coated Reinforcing Steel
SP-610-3	Portland Cement Concrete
SP-616-1	Structural Steel
SP-622-3	Piling
SP-762-6	Maintenance & Protection of Traffic
SP-806-1	Aggregates for Portland Cement Concrete
SP-806-3	Aggregate for Portland Cement Concrete
SP-844-1	Structural Steel
SP-272	Fuel Cost Adjustment
SP-273	Haul Road Maintenance
SP-	Trainee

Water for Compaction:

10 Gal./C.Y. of Embankment Quantity
20 Gal./Ton of Aggregate Base Course
(Includes amount for use as a dust palliative.)

Topsoil:

Topsoil shall be removed from the entire construction area 6" deep, excepting roadway where alignment follows existing road or as directed by the Engineer.

Seeding:

Entire right-of-way and construction area in easements except roadbed, undisturbed areas and sodded areas.

Temporary Cover Crop:

75% of Above Areas

Aggregate Base Course-2" Depth:

Cl. 5-1.5 Ton/C.Y. + 25%
Private Drive
Section Line
Median X-ing

Mulching:

M.L. inslopes and ditches
Sta. 40+00 to 97+65

MAXIMUM SIZE OF AGGREGATE

<u>Description</u>	<u>Type of Aggregate</u>	<u>Max. Size</u>
Aggregate Base Crse., Cl. 5	Crushed	3/4"

all

FHWA REGION	STATE	FED AID PROJ NO	SHEET NO
8	ND	F-FG-4-002 (10) 147	11

SUMMARY OF QUANTITIES (STRUCTURAL)

SPEC. NO.	CODE NO.	ITEM DESCRIPTION	UNIT	(F.G. Portion) STA. 63+72.3	(F. Portion) STA. 92+79.8	(F.G. Portion) STA. 374+33.65	GRAND TOTAL
103	0100	Contract Bond	L.Sum				1
*202	0105	Removal of Structure	L.Sum	1			1
202	0290	Removal of Slope Protection	S.Y.	45			45
208	0100	Class I Excavation	C.Y.	200	107	200	507
208	0110	Class II Excavation	C.Y.		167		167
208	0201	Foundation Preparation	Ea.	1	1	1	3
228	0100	Select Backfill	C.Y.	325	213	160	698
602	0130	Class AAE-3 Concrete	C.Y.	282.7	256.6		539
602	1110	Class AE-1 Concrete	C.Y.	188.4	300	180.2	669
602	1130	Class AE-3 Concrete	C.Y.			171.1	171
604	9610	*Prestressed Box Beam-27"	L.F.	822		684	1506
604	9620	Prestressed Box Beam-33" (15@ 64'-4")	L.F.		965		965
612	0115	Reinforcing Steel-Grade 60	LB.	55,085	57,177	32,956	145,218
612	0116	Reinforcing Steel-Grade 60 (Epoxy Coated)	LB	31,292	31,878	21,224	84,394
616	5890	**Structural Steel-A36	L.Sum				1
622	0020	Steel Piling HP 10 x 42	L.F.	4720	900	750	6370
622	0040	Steel P-ling HP 12 x 53	L.F.		1,495	780	2,275
622	*0393	Steel Test Piling HP 10 x 42	L.F.	210	170	170	550
622	1200	Steel Test Piling HP 12 x 53	L.F.		135	150	285
630	0040	15" CSP .064"	L.F.	168		288	456
630	0440	15" CSES .064"	Ea.	2		4	6
630	2375	24" RCP, Cl.II	L.F.		11		11
630	2464	24" RCP Cl. III (60° Elbow)	L.F.	8			8
630	2380	24" RCP Cl.III	L.F.	64			64
630	2470	30" RCP Cl. IV	L.F.	130	130		260
762	3798	Traffic Control	L.S.	1			1
746	0100	Flagging	M. Hrs.	100			100

*(12 @ 42'-1", 6 @ 52'-10")-STA. 63+69.6
 (10 @ 41'-9 1/8", 5 @ 53'-3 1/2")-STA. 374+33.65

** (45241 Lbs.)-STA. 63+72.3
 (2156 Lbs.)-STA. 92+79.8

all

SUMMARY OF QUANTITIES CONT'D (STRUCTURAL)

FHWA REGION	STATE	FED AID PROJ NO	SHEET NO
8	ND	F-FG-4-002(10)147	12

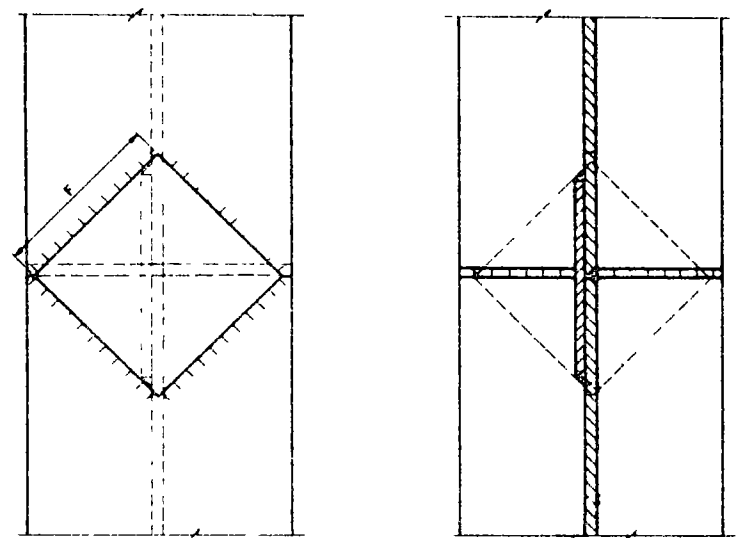
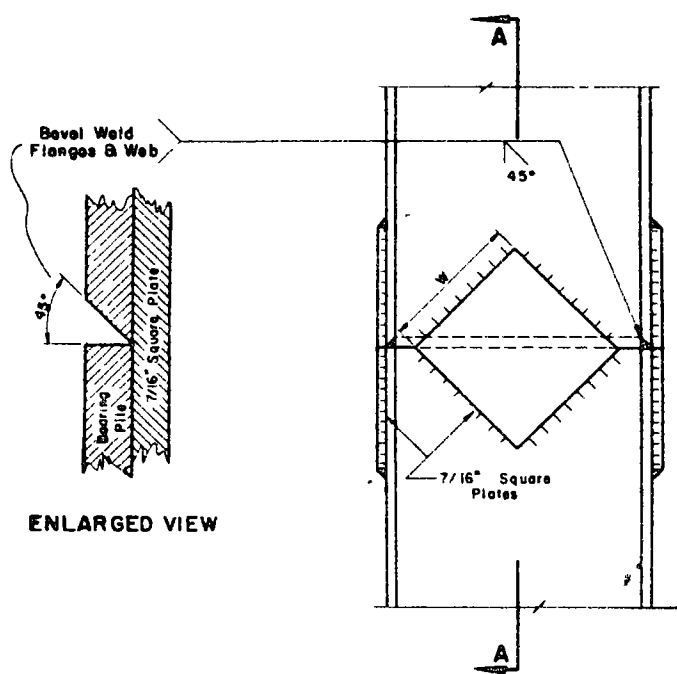
SPEC. NO.	CODE NO.	ITEM DESCRIPTION	UNIT	(F.G. Portion) STA. 63+72.2	(F. Portion) STA. 92+79.8	(F.G. Portion) STA. 374+33.65	GRAND TOTAL
630	3285	30" RCES	Ea.		1		1
702	0130	Loose Rock Riprap	C.Y.		850.2		850
703	0100	Aggregate Cushion	C.Y.		283.4		283
704	0100	Concrete Slope Protection	S.Y.	934		620	1554
705	0100	Mobilization	L.Sum				1
750	0100	Linseed Oil Treatment	Gal.	39	35	25	99
752	0100	Bridge Approach Drains	Ea.	2		4	6
756	0100	Field Laboratory-Type A	L.Sum				1
900	3000	Bridge Bench Marks	Set	1	1	1	3
900	9700	Class I Overlay	S.Y.	700			700
900	9701	Class II Overlay	S.Y.	50			50
900	9702	Class III Overlay	S.Y.	25			25
900	8505	Trainee	M.Hrs.	700	600	700	2,000
203	0101	Common Excavation, Type A	C.Y.	2638	20,120	35,783	58,541
203	0108	Topsoil - Borrow Area	C.Y.	11,700	2,300	12,000	26,000
203	0130	Muck Excavation	C.Y.	2,680	0	0	2,680
203	0140	Borrow	C.Y.	65,800	10,765	24,000	100,565
204		Avg. Haul (Not a Pay Item) (Exc.)	C.Y. Sta.		15,335 7.30	30,050 4.0	45,385 5.12
204		Avg. Haul (Not a Pay Item) (Borrow)	C.Y. Sta.	55,800 20.80	10,765 1.25	24,000 5.00	100,565 14.94
216	0100	Water	M. Gal.	684	309	598	1,591

2-149111
2-149663

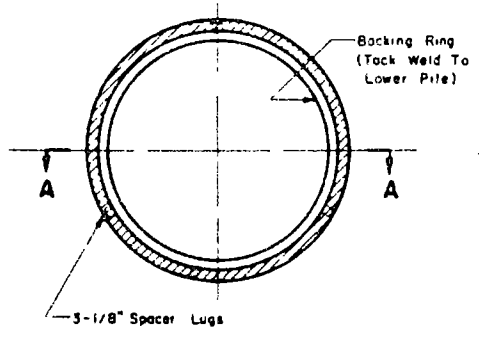
REV. NO.	DATE	BY	CHKD.
1			
2			

2-151-789

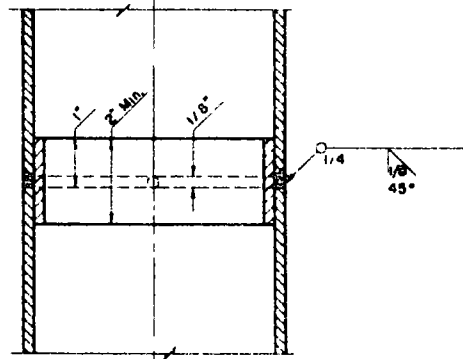
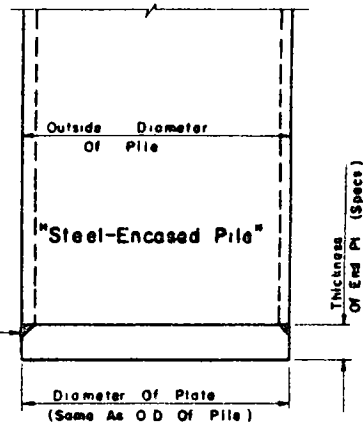
DESIGN	DATE
REVISIONS	MADE BY
1	RELINQUISHED
2	REDESIGNED
3	REDESIGNED
4	REDESIGNED
5	REDESIGNED
6	REDESIGNED
7	REDESIGNED
8	REDESIGNED
9	REDESIGNED
10	REDESIGNED
11	REDESIGNED
12	REDESIGNED
13	REDESIGNED
14	REDESIGNED
15	REDESIGNED
16	REDESIGNED
17	REDESIGNED
18	REDESIGNED
19	REDESIGNED
20	REDESIGNED



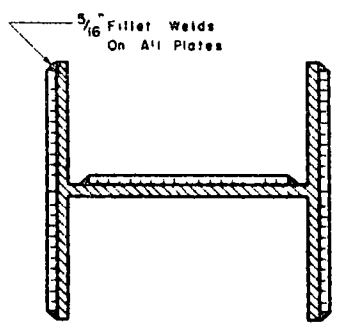
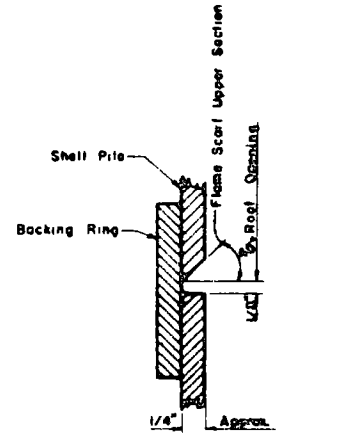
Flame Scarf Inside Of Both Flanges And One Side Of Web Of Upper Section



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



SHELL PILE SPLICE DETAIL



PILE	8"	10	12	14"
F FLANGE	5	6 1/2	8"	10"
W WEB	4"	5 1/2	6 1/2	8"

ALTERNATE H-PILE SPLICE DETAIL

Steel H-Pile may be spliced with complete penetration groove welds in both flanges and web in lieu of using the 7/16" reinforcing plates

AWS classification E70XX low hydrogen electrodes shall be used

*Welds made without the use of backing material shall have the root gouged to sound metal and welded from the second side

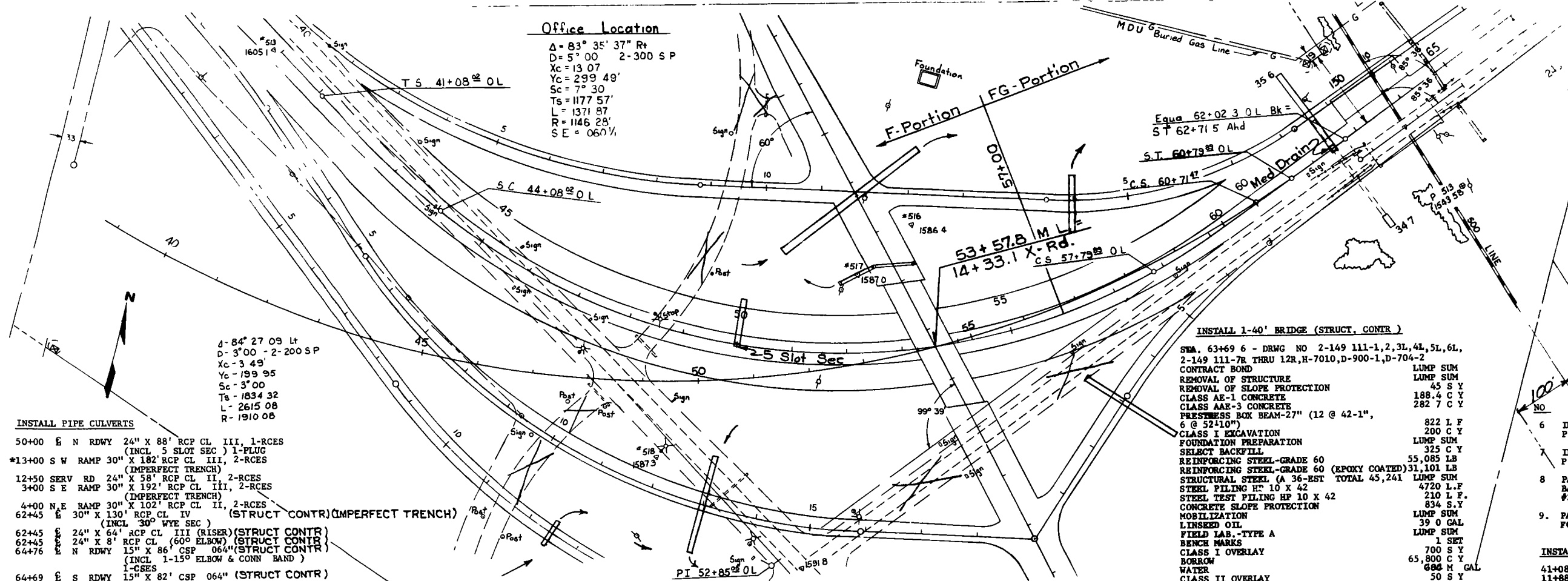
All welding shall conform to the current specification for "Welded Highway and Railway Bridges of the American Welding Society"

PILE SPLICE DETAILS

REVISED 6-1-78
REVISED 12-12-66

H-0401

H-0401



Office Location
 Δ = 83° 35' 37" Rt
 D = 5' 00" 2-300 S P
 Xc = 13.07
 Yc = 299.49
 Sc = 7° 30'
 Ts = 1177.57'
 L = 1371.87
 R = 1146.28'
 SE = 0.60 1/2

- INSTALL PIPE CULVERTS**
- 50+00 E N RDWY 24" X 88" RCP CL III, 1-RCES (INCL 5 SLOT SEC) 1-PLUG
 - *13+00 S W RAMP 30" X 182" RCP CL III, 2-RCES (IMPERFECT TRENCH)
 - 12+50 SERV RD 24" X 58" RCP CL II, 2-RCES
 - 3+00 S E RAMP 30" X 192" RCP CL III, 2-RCES (IMPERFECT TRENCH)
 - 4+00 N.E RAMP 30" X 102" RCP CL II, 2-RCES
 - 62+45 E 30" X 130" RCP CL IV (STRUCT CONTR) (IMPERFECT TRENCH) (INCL 30" WYE SEC)
 - 62+45 E 24" X 64" RCP CL III (RISER) (STRUCT CONTR)
 - 62+45 E 24" X 8" RCP CL (60" ELBOW) (STRUCT CONTR)
 - 64+76 E N RDWY 15" X 86" CSP 064" (STRUCT CONTR) (INCL 1-15" ELBOW & CONN BAND) 1-CSES
 - 64+69 E S RDWY 15" X 82" CSP 064" (STRUCT CONTR) (INCL 1-15" ELBOW & CONN BAND) 1-CSES
 - *INSTALL 30" X 88" RCP, 1-RCES GRADING CONTRACT
 - 30" X 94" RCP, 1-RCES, SURFACING CONTRACT

- INSTALL 1-40' BRIDGE (STRUCT. CONTR)**
- STA. 63+69.6 - DRWG NO 2-149 111-1, 2, 3L, 4L, 5L, 6L, 2-149 111-7R THRU 12R, H-7010, D-900-1, D-704-2
- CONTRACT BOND LUMP SUM
- REMOVAL OF STRUCTURE LUMP SUM
- REMOVAL OF SLOPE PROTECTION 45 S.Y.
- CLASS AE-1 CONCRETE 188.4 C.Y.
- CLASS AAE-3 CONCRETE 282.7 C.Y.
- PRESTRESS BOX BEAM-27" (12 @ 42-1", 6 @ 52-10") 822 L.F.
- CLASS I EXCAVATION 200 C.Y.
- FOUNDATION PREPARATION LUMP SUM
- SELECT BACKFILL 325 C.Y.
- REINFORCING STEEL-GRADE 60 55,085 LB
- REINFORCING STEEL-GRADE 60 (EPOXY COATED) 31,101 LB
- STRUCTURAL STEEL (A 36-EST TOTAL 45,241 LUMP SUM
- STEEL PILING HP 10 X 42 4720 L.F.
- STEEL TEST PILING HP 10 X 42 210 L.F.
- CONCRETE SLOPE PROTECTION 834 S.Y.
- MOBILIZATION LUMP SUM
- LINSEED OIL 39.0 GAL
- FIELD LAB.-TYPE A LUMP SUM
- BENCH MARKS 7 SET
- CLASS I OVERLAY 700 C.Y.
- BORROW 65,800 C.Y.
- WATER 684 M GAL
- CLASS II OVERLAY 50 S.Y.
- CLASS III OVERLAY 25 S.Y.
- Borrow 65800 C.Y.
- Common Exc Type A 22' X 216' RCP 2283 C.Y.

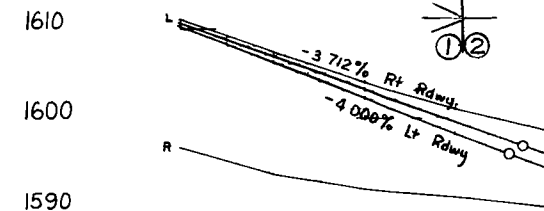
- REMOVAL OF FOUNDATION**
- 55+00 LT 1 EA
- INSTALL CONC MED DRAIN**
- 62+45 MED 1 EA
- RELAY PIPE CULVERTS**
- 62+45 E 2-30" RCES

BENCH MARKS

NO	DESCRIPTION	LOCATION	ELEV
6	IRON MONU. LX2 GRD BY P.P.	44+13-368' LT	1612.86
7	IRON MONU LX2 GRD. BY P.P.	DESTROYED	1591.06
8	PAINT SPOT S.W. COR. CONC BASE FOR LIGHT POLE HWY. #2	52+52-270' RT.	1588.91
9	PAINT SPOT N.W. ABUTMENT FOR R R BRIDGE	64+52-26' RT	1575.28

INSTALL R/W MARKERS

- 41+08 LT & RT. 2
- 11+88+ S RDWY RT. 1
- 17+44+ S RDWY RT. 1
- 47+2+ (N.E.R.) LT. 1
- 62+66 LT. 1
- 63+39 LT. 1
- 64+33 RT. 1
- 64+69 RT. 1
- 64+70 LT. 1
- 20+58+ (S. RD.) RT. 1



Rt Rdwy
 PI 48+75
 Elev. 1585.6
 V.C. 600'

Lt. Rdwy
 PI 46+80
 Elev. 1585.9
 V.C. 600'

Excavation Summary

Topsoil Exc. (Borrow)	19700 C.Y.
Topsoil Exc	10239 C.Y.
Subcut Exc	4839 C.Y.
Exc	106239 C.Y.
* Borrow	131737 C.Y. (Area B-D)
Emb	245495 C.Y.
Ave. Haul (Borrow)	= 13.65 Sta - 131737 C.Y.

Rt Rdwy
 PI 58+59
 Elev. 1585.6
 V.C. 600'

Lt. Rdwy
 PI 61+22
 Elev. 1585.8
 V.C. 600'

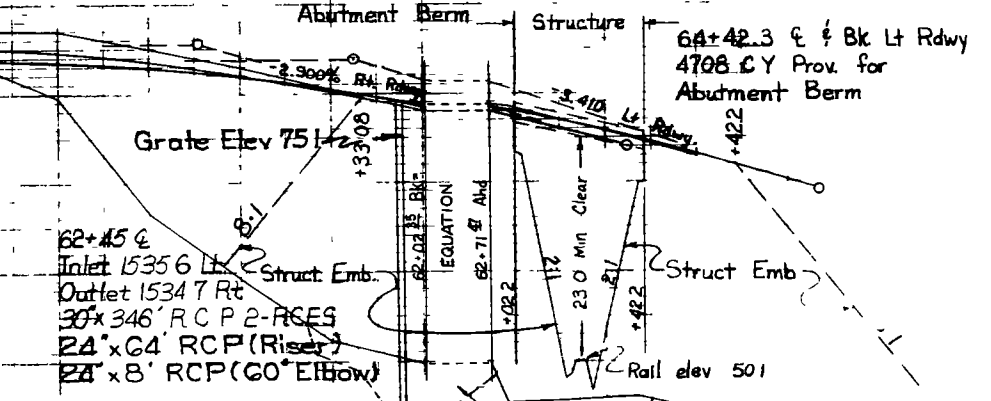
Structural
 Sta 43+50 to 63+50

Topsoil Exc. (Borrow)	5300 C.Y.
Topsoil Exc	1476 C.Y.
Muck Exc	2680 C.Y.
Borrow	34773 C.Y. (Area B-D)
Emb	37453 C.Y.
Ave. Haul (Borrow)	= 17.5 Sta - 34773 C.Y.

43+05 To 62+93
 Clearing & Grubbing
 Approx. 10239 C.Y.

Inlet 1580.3 Rt.
 Outlet 1577.7 Lt.
 50+00 E N. Rdwy.
 24" X 88" RCP (Incl. 5 Slot & Plug)
 1-RCES Lt.

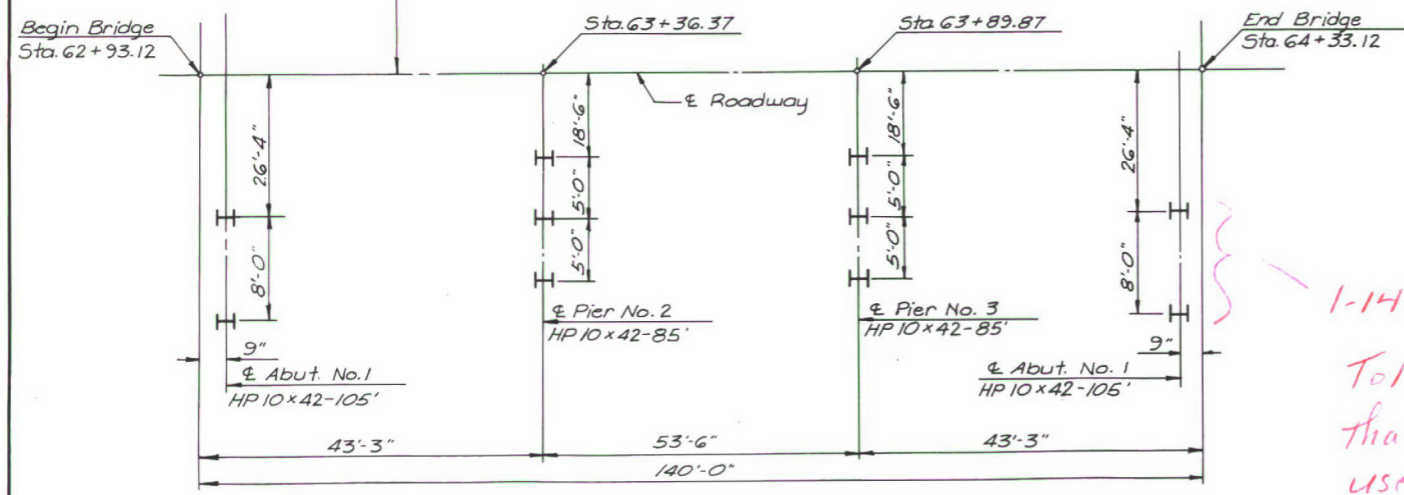
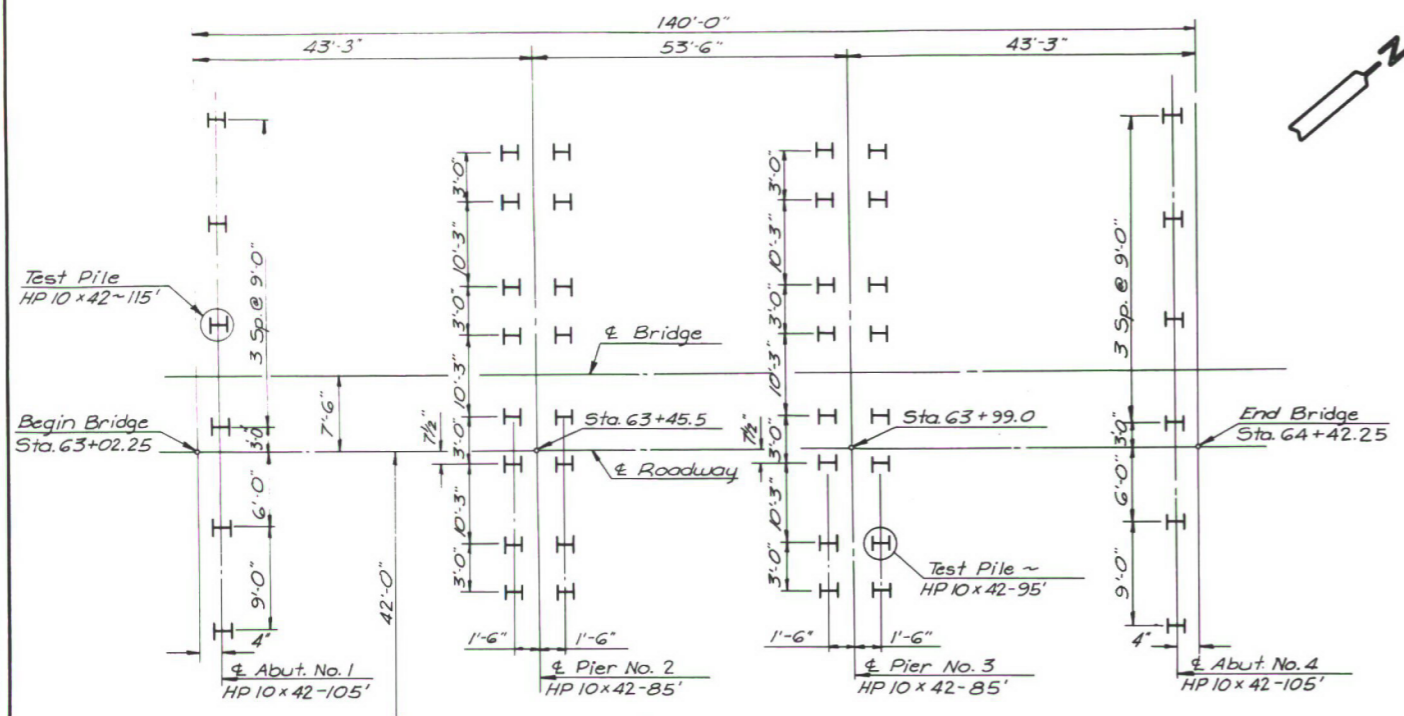
* Entered into Mass at
 Sta. 43+50



Station	Right Roadway Elevation	Left Roadway Elevation
40	1586.8	1611.0
41	1610.7	1610.2
42	1593.8	1607.3
43	1606.9	1606.2
44	1592.0	1604.0
45	1591.0	1602.2
46	1599.5	1601.0
47	1590.0	1599.2
48	1585.8	1598.3
49	1585.6	1595.3
50	1586.7	1593.3
51	1586.9	1591.3
52	1585.6	1589.3
53	1585.7	1587.3
54	1586.5	1585.3
55	1587.7	1583.3
56	1587.4	1581.3
57	1587.6	1579.3
58	1587.9	1577.3
59	1588.0	1575.3
60	1588.1	1573.3
61	1588.2	1571.3
62	1588.3	1569.3
63	1588.4	1567.3
64	1588.5	1565.3
65	1588.6	1563.3
66	1588.7	1561.3
67	1588.8	1559.3
68	1588.9	1557.3
69	1589.0	1555.3
70	1589.1	1553.3
71	1589.2	1551.3
72	1589.3	1549.3
73	1589.4	1547.3
74	1589.5	1545.3
75	1589.6	1543.3
76	1589.7	1541.3
77	1589.8	1539.3
78	1589.9	1537.3
79	1590.0	1535.3
80	1590.1	1533.3
81	1590.2	1531.3
82	1590.3	1529.3
83	1590.4	1527.3
84	1590.5	1525.3
85	1590.6	1523.3
86	1590.7	1521.3
87	1590.8	1519.3
88	1590.9	1517.3
89	1591.0	1515.3
90	1591.1	1513.3
91	1591.2	1511.3
92	1591.3	1509.3
93	1591.4	1507.3
94	1591.5	1505.3
95	1591.6	1503.3
96	1591.7	1501.3
97	1591.8	1499.3
98	1591.9	1497.3
99	1592.0	1495.3
100	1592.1	1493.3

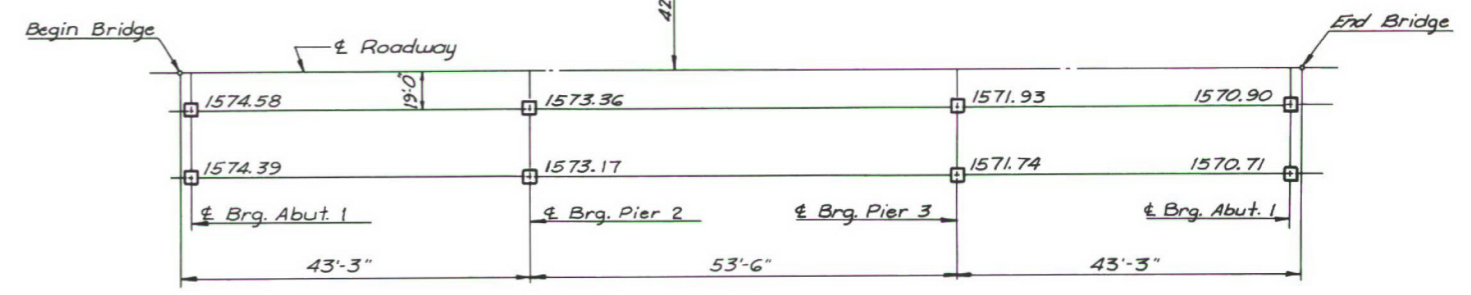
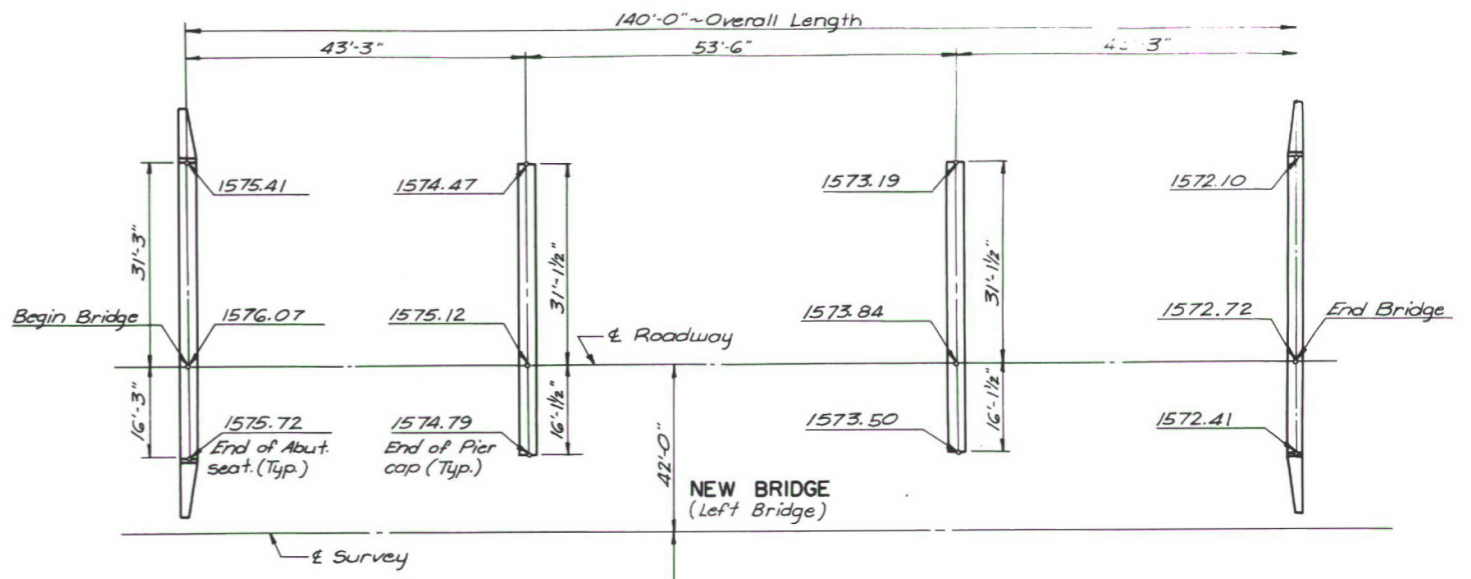
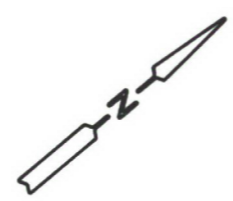
FED. ROAD DIST. NO.	STATE	PROJ. NO.	SHEET NO.	TOTAL SHEETS
8	N. D.	F-FG-4-002(10)	67	

CHECKED BY	DATE
MADE BY	
CHECKED BY	
MADE BY	
CHECKED BY	
MADE BY	
CHECKED BY	
MADE BY	
CHECKED BY	
MADE BY	



EXISTING BRIDGE
(Right Bridge)

PILING LAYOUT
(Not to scale)



NEW BRIDGE
(Left Bridge)

EXISTING BRIDGE
(Right Bridge)

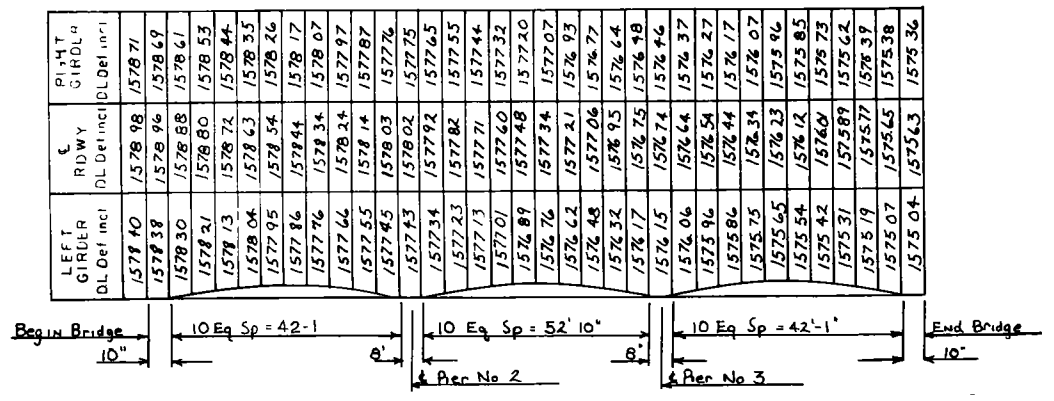
BEARING PLATE LAYOUT
Elevations are to top of finished concrete
(Not to scale)

1-14-81
Told Barry Ingeason
that contractor could
use 12" pile in abut.
at no additional cost
to the state.
JWD

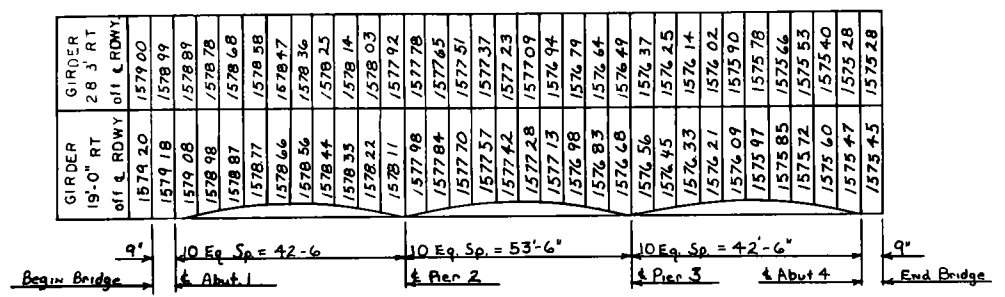
500 LINE SEPARATION
PILING LAYOUT
BEARING PLATE LAYOUT

2-149.111

FED. ROAD DIST. NO.	STATE	PROJ. NO.	SHEET NO.	TOTAL SHEETS
8	N D	F-PG 4 002(10)	68	



SCREED ELEVATION-LEFT BRIDGE
Elevations are to top of finished concrete



SCREED ELEVATION-RIGHT BRIDGE
Elevations are to top of finished concrete

500 LINE SEPARATION
SCREED ELEVATIONS
GENERAL NOTES

FHWA REGION	STATE	FED AID PROJ NO	SHEET NO
8	ND.	F-FG-A-002(10)	69

GENERAL NOTES:

GENERAL: The cost of furnishing and placing asphalt curb seal, premolded joint filler, bar spacers, bar supports, screed chairs, threaded inserts and other miscellaneous items shall be included in the price bid for class AE-1 and AAE-3 concrete.

Dead load deflections have been accounted for in the screed elevations.

EMBANKMENT: The embankment at the abutments shall be in place for a minimum of 60 days before piling are driven. The contractor will be required to drill pilot holes 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.

The contractor may construct the structural embankment prior to the proposed starting date shown in the progress schedule. If this is done, no working days will be charged for the grading work done before the schedule starting date.

EXCAVATION: Excavation Class 1 at the abutments shall extend from the bottom of the footing to the upper limits as shown on the bridge layout drawing. Excavation Class 1 at the pier shall extend from the bottom of the footing to the bottom of the slope protection.

BACKFILL: All backfilling shall be done according to section 228 and 203.2.3.2 of the Standard Specifications. 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.

The top layer of transverse deck slab reinforcement shall be tied down with wire

ties to the protruding shear reinforcement of the beams. The ties shall be at intervals of 5 to 6 feet along the full length of all beams to prevent the slab reinforcement from rising when the concrete is placed. The tie wires connecting the reinforcing mat to the protruding shear reinforcement shall be wrapped at least twice with 14 gage epoxy coated wire (minimum).

CONCRETE: All superstructure concrete shall be class AAE-3 Concrete for abutments and piers shall be class AE-1. The contractor may substitute class AE-3 concrete for class AE-1 concrete, but not AE-1 for AE-3. Any substitutions, however, will be at the contractor's expense, and the class of concrete paid for will be that class shown on the plans.

The "Special Surface Finish" (Section 602-3.10.5) will be required for all faces of the barrier wall and other surfaces that are visible to the motor-ing public. This finish shall be made with a spray application. The rate of application shall be as recommended by the manufacturer. All other surfaces shall be given the "Ordinary Surface Finish". All "Ordinary Surface Finish" shall be completed within 24 hours after removal of forms.

If the depth of the concrete risers between the tops of the girders and the bottom of the deck slab exceed the theoretical dimensions, the additional concrete required shall be furnished at no expense to the State. Type I or Type II cement may be used. In an area where class 3 aggregate is difficult to obtain, the contractor may substitute class 4 aggregate for class 3.

DIAPHRAGMS: The requirement of paragraphs 602-3.6.2.1 of the Standard Specifications may be waived.

CURING AAE-3 CONCRETE: The method of curing the deck concrete shall be in accordance with section 602-3.7.2.2. The intent is to place the covering

as soon as possible without causing a significant amount of blemish to the surface. Once the covering operation has started, it shall be a continuous operation to keep pace with the finisher. All unprotected concrete shall be kept moist by a fog spray until covered and once covered kept continuously moist for 5 days.

Linseed Oil Treatment: Linseed oil treatment shall not be started until all concrete work is completed. Only one uniform application of .015 gallons per square yard shall be applied to the deck of the right bridge. Both applications shall be applied to the left bridge. A protective covering shall be used so that linseed oil is not applied to the area within 3 inches of the gutter line until after the asphalt curb seal is in place.

TEST PILE: The test piles shall be driven to a bearing not less than 125 percent of the design load as determined by the dynamic formula.

PILING: A steam, air or diesel hammer for driving piling for this structure shall have a rated energy and ram weight not less than 32,095 foot-pounds-tons as computed by the formula $W(E-8,663) + 0.741E$ 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 more ~~less~~ than 4,800 pounds.

BARRIERS: The concrete barrier shall be formed for three contiguous sections. Concrete shall be placed in alternate sections and shall have a curing period of three days between placement of adjacent sections.

If the forms for the barrier railing are held in place by concrete inserts in the deck slab, the inserts shall be removed when the form removal has been completed and the cavities in the deck slab cleaned and filled flush with a non-shrink epoxy mortar approved by the engineer.

* changed by note in proposal

File forms of paid for with State funds

2-149.111

GENERAL NOTES:

FHWA REGION	STATE	FED AID PROJ NO	SHEET NO
8	ND	F-FG-4-002(10)	70

SHOP DRAWINGS: The contractor shall submit the following shop drawings for approval by the bridge engineer before fabrication:

1. Prestressed Concrete Girder
2. Structural Steel

These items will not be incorporated into the substructure until the shop drawings have been approved.

INSURANCE: The contractor, while working on the structure, will be required to furnish railway protection insurance for the amount specified in the Special Provision.

DESIGN STRENGTH:

- F'C 3,000 PSI CL. AE-1 CONCRETE
- F'C 4,000 PSI CL. AAE-3 CONCRETE
- FY 56,000 PSI STRUCTURAL STEEL
- FY 60,000 PSI GR.60 REINF. STEEL
- F'C 5,000 PSI PRESTRESSED GIRDER CONCRETE

STRUCTURAL STEEL: The proper alignment shall be maintained between sections while reaming the holes.

Wire rope slings shall not be used to handle the girders. They shall be handled with beam clamps designed for that purpose.

All structural steel shall be A-36, shear connectors on splice plates shall be moved to clear bolt holes.

Temporary or permanent attachments or devices that are not shown on the plans as part of the structure, shall not be welded to the structural steel members during the fabrication and construction process.

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, section 870-1.1 and 870-1.5.

All exposed steel surfaces shall be given one shop coat of red lead paint. One spot coat of red lead paint after erection and concrete work is completed and two finish coats of aluminum.

REMOVAL OF STRUCTURE: Includes all portions of the slab, abutments and piers required for the widening.

REMOVAL OF SLOPE PROTECTION: Includes the top panel on both ends of the existing bridge. Embankment will be added and the slope protection replaced to the proper elevation.

SEQUENCE OF CONSTRUCTION: The left bridge (new) will be completed first. Traffic will be routed over the new bridge and the existing bridge will be widened.

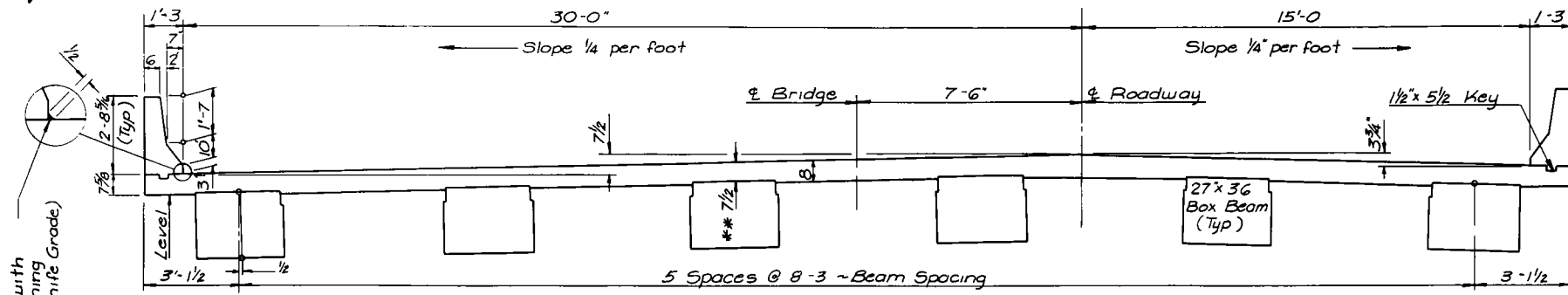
CONCRETE: A retarding admixture shall be required to be used in the concrete for bridge decks. The admixture to be used shall be submitted to the Engineer for approval before use by the Contractor.

OVERLAY: The entire deck shall be overlaid with a maximum of 2 passes of the finishing machine. Newly placed concrete shall not be overlaid until it has cured for a minimum of 7 days.

This form is sold for with 5.11 . . .

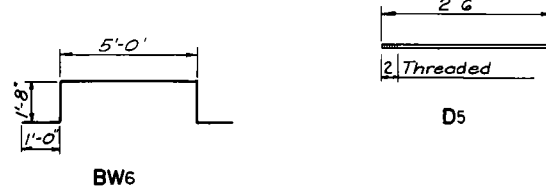
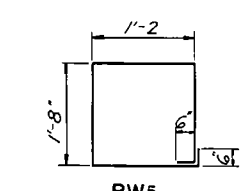
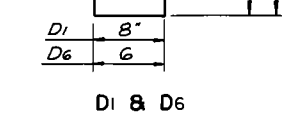
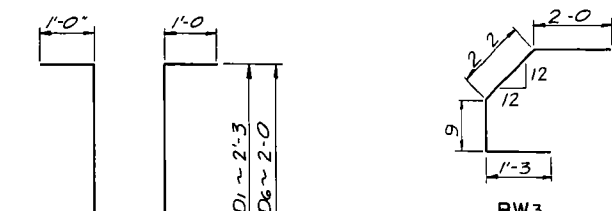
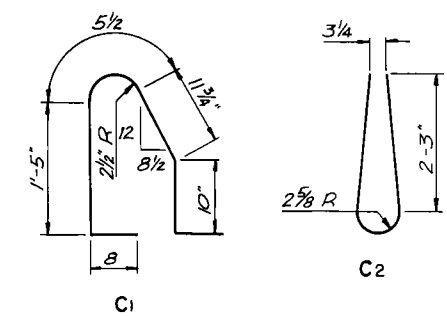
2-149.111

FED. ROAD DIST. NO.	STATE	PROJ. NO.	SHEET NO.	TOTAL SHEETS
8	N D	F-FG-4-002(1D)	74	



SECTION OF SLAB
Showing Dimensions

Bottom forms must be adjusted to proper elevation to assure the 8' design thickness of concrete

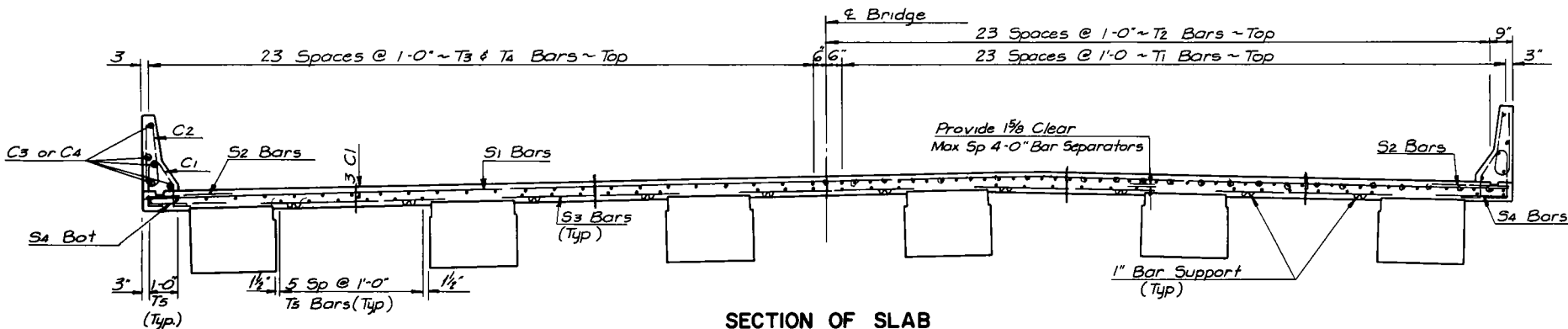


BENT BAR DETAILS

Dimensions shown are out to out

Seal corner with Asphalt Flashing Compound (Knife Grade)

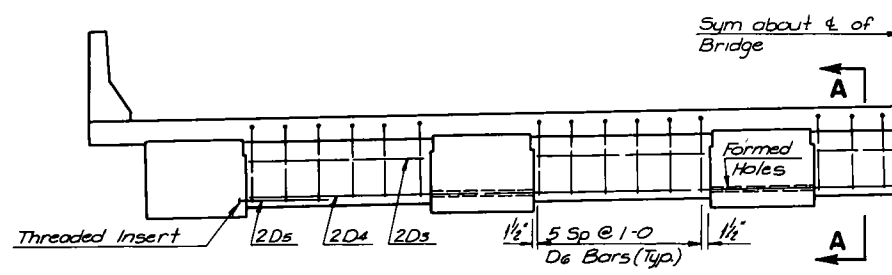
** This dimension will vary due to the variable camber of the prestressed box girder



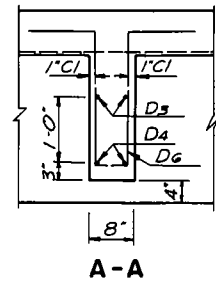
SECTION OF SLAB

Showing Reinforcing Bars between supports

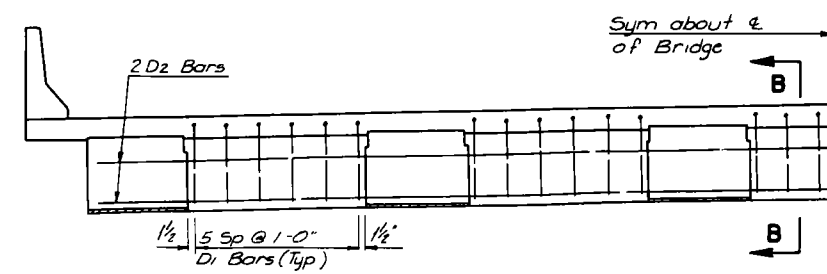
Showing Reinforcing Steel over Piers



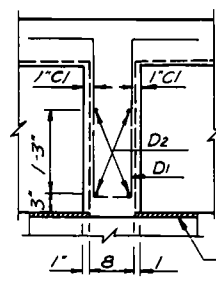
INTERMEDIATE DIAPHRAGM



A-A



PIER DIAPHRAGM



B-B

1/2 x 11 x 3 0 Preformed Jt Filler (Assumed to Compress to 3/8)

BAR LIST				
MARK	NO	SIZE	LENGTH	SHAPE
BW1	12	6	47'-0"	Str
BW2	164	5	4'-9"	Bent
BW3	96	6	6'-2"	
BW4	94	5	2'-3"	
BW5	8	6	6'-8"	
BW6	20	6	10'-4"	
* C1	284	5	5'-0"	Bent
C2	284	5	5'-2"	"
C3	40	4	21'-3"	Str
C4	20	4	26'-5"	"
D1	60	4	7'-2"	Bent
D2	8	6	43'-11"	Str
D3	30	4	5'-0"	"
D4	6	6	37'-11"	
D5	12	3/4"Ø	2'-6"	
D6	90	4	6'-6"	Bent
* S1	206	5	47'-0"	Str
* S2	4K	4	2'-10"	
* S3	1030	5	6'-4"	
S4	412	4	2'-4"	
* T1	96	5	24'-9"	Str
* T2	94	6	24'-9"	
* T3	96	4	36'-2"	
* T4	96	4	25'-2"	
* T5	102	4	47'-9"	"

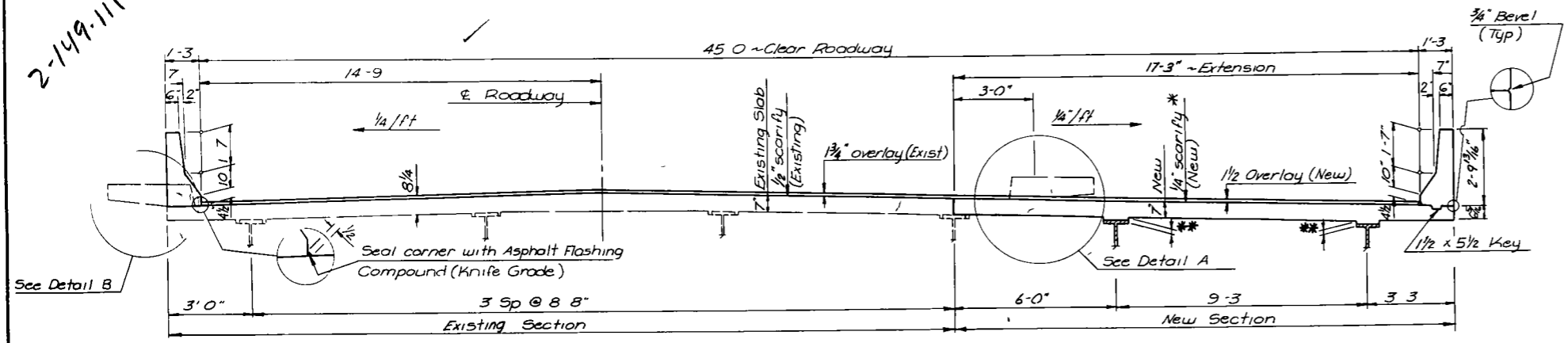
* Reinforcing Bar shall be Epoxy coated (See Special Provisions)

QUANTITIES	
Class AAE-3 Concrete	204 4 C.Y.
Reinforcing Steel	1800 Lbs
Reinforcing Steel (Epoxy)	22,260 Lbs

SOO LINE SEPARATION
SUPERSTRUCTURE
LEFT BRIDGE

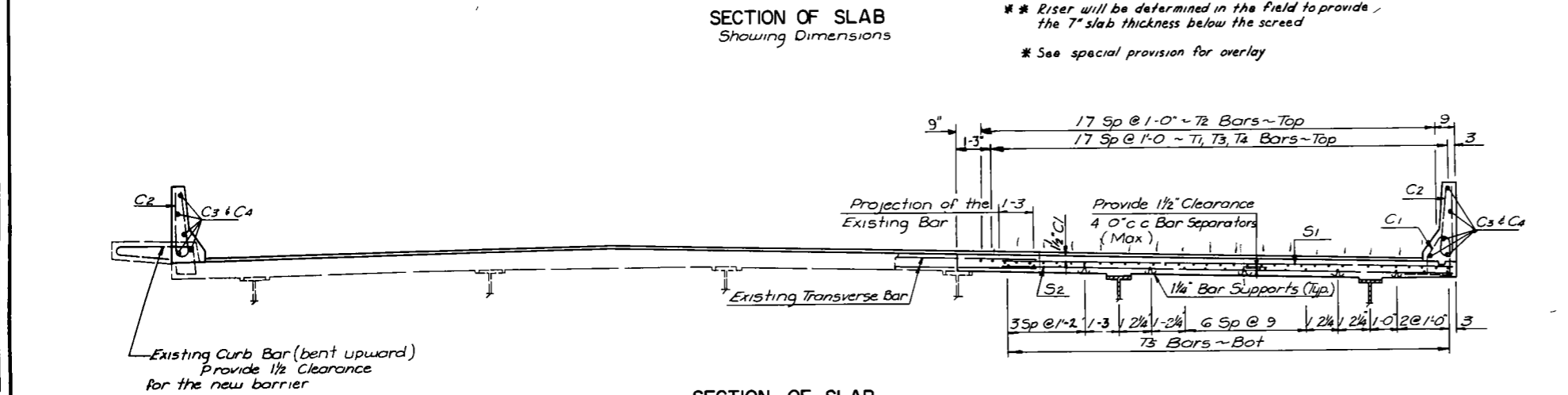
2-149-111

FED. ROAD DIST. NO.	STATE	PROJ. NO.	SHEET NO.	TOTAL SHEETS
8	N D	F-FG-4-002(14)	80	

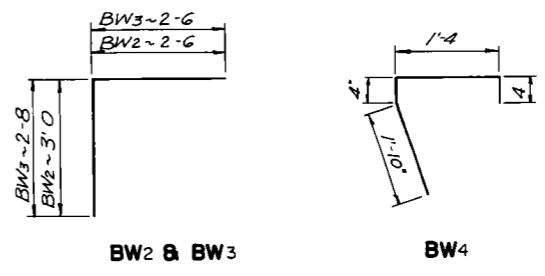
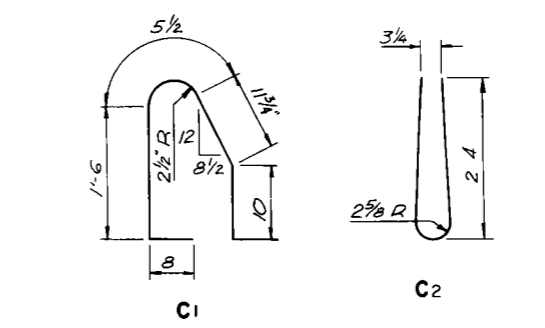


SECTION OF SLAB
Showing Dimensions

** Riser will be determined in the field to provide the 7" slab thickness below the screed
* See special provision for overlay



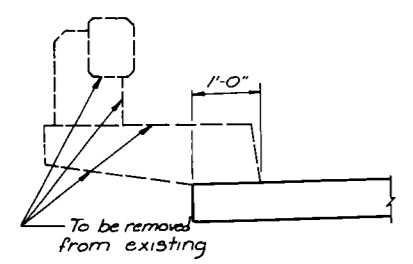
SECTION OF SLAB
Showing Reinforcing steel for New Slab
Extension and New Barriers



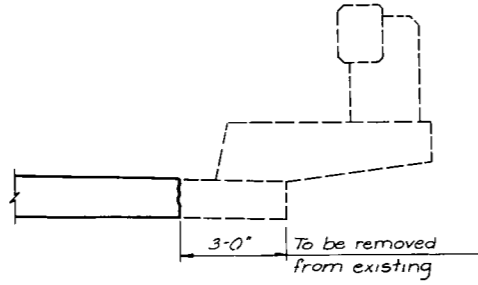
BENT BAR DETAILS
Dimensions shown are out to out

BAR LIST				
MARK	NO	SIZE	LENGTH	SHAPE
BW1	20	5	16'-9"	Str
BW2	24	4	5'-6"	Bent
BW3	24	4	5'-2"	
BW4	24	4	3'-10"	
* C1	142	5	5'-1"	Bent
C2	291	5	5'-5"	"
C3	40	4	21'-3"	Str
CA	20	4	26'-5"	"
* S1	277	5	16'-9"	Str
S2	277	5	16'-9"	"
* T1	36	5	24'-9"	Str
* T2	36	6	24'-9"	"
* T3	36	4	36'-2"	"
* T4	18	4	25'-2"	"
* T5	48	4	47'-9"	"

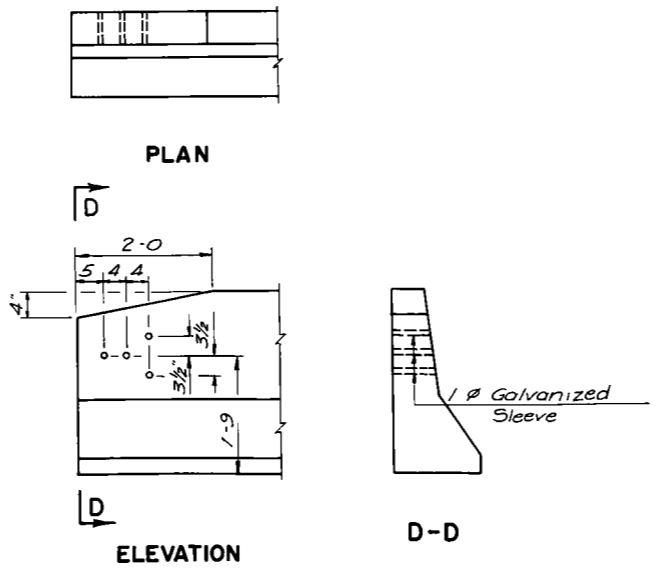
* Reinforcing Bar shall be Epoxy coated (See Special Provisions)



DETAIL "B"



DETAIL "A"



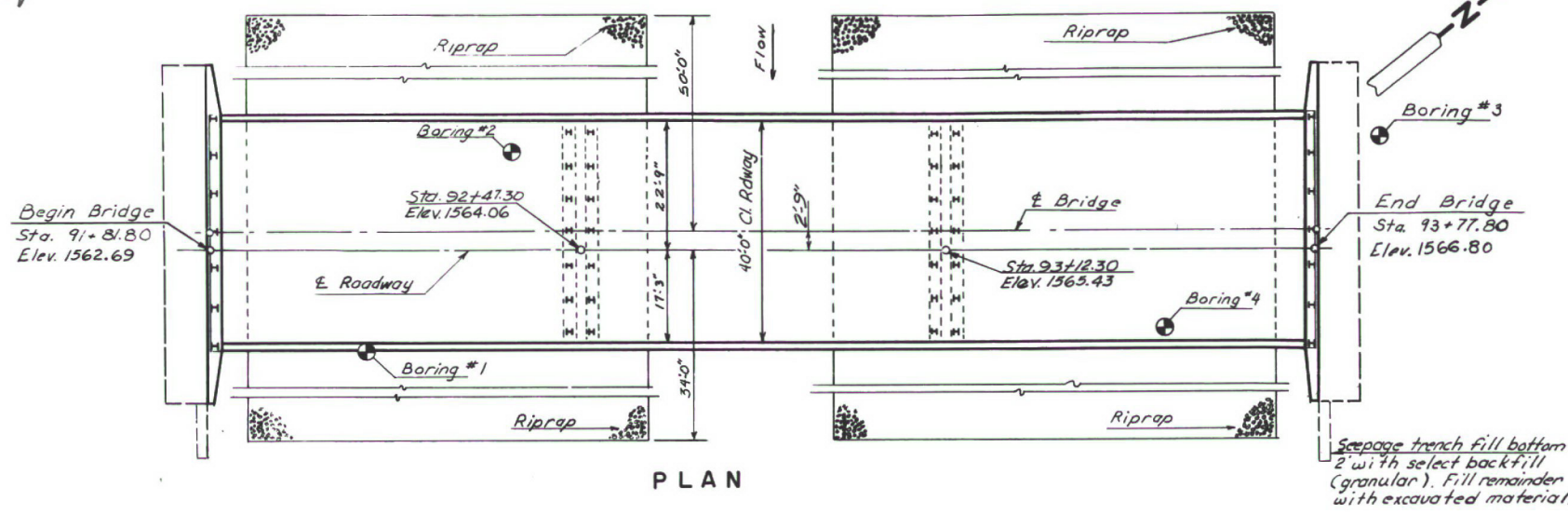
BARRIER END DETAILS

QUANTITIES	
Class AAF-3 Concrete	78 3 C.Y.
Reinforcing Steel	9516 Lbs.
Reinforcing Steel (Epoxy C)	9032 Lbs.

500 LINE SEPARATION
SUPERSTRUCTURE
DETAILS
RIGHT BRIDGE

2-14 9.6.63

BRIDGE CODE	FED. ROAD DIST. NO.	STATE	PROJ. NO.	SHEET NO.	TOTAL SHEETS
X-081	5	N. D.	F-FG-4-002(1)147	82	



HYDRAULIC DESIGN DATA

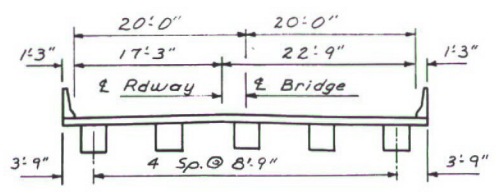
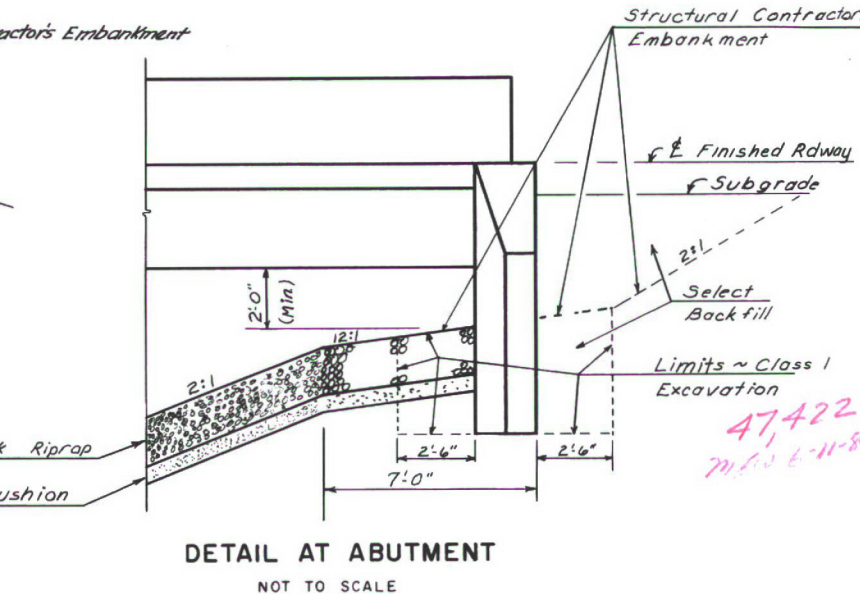
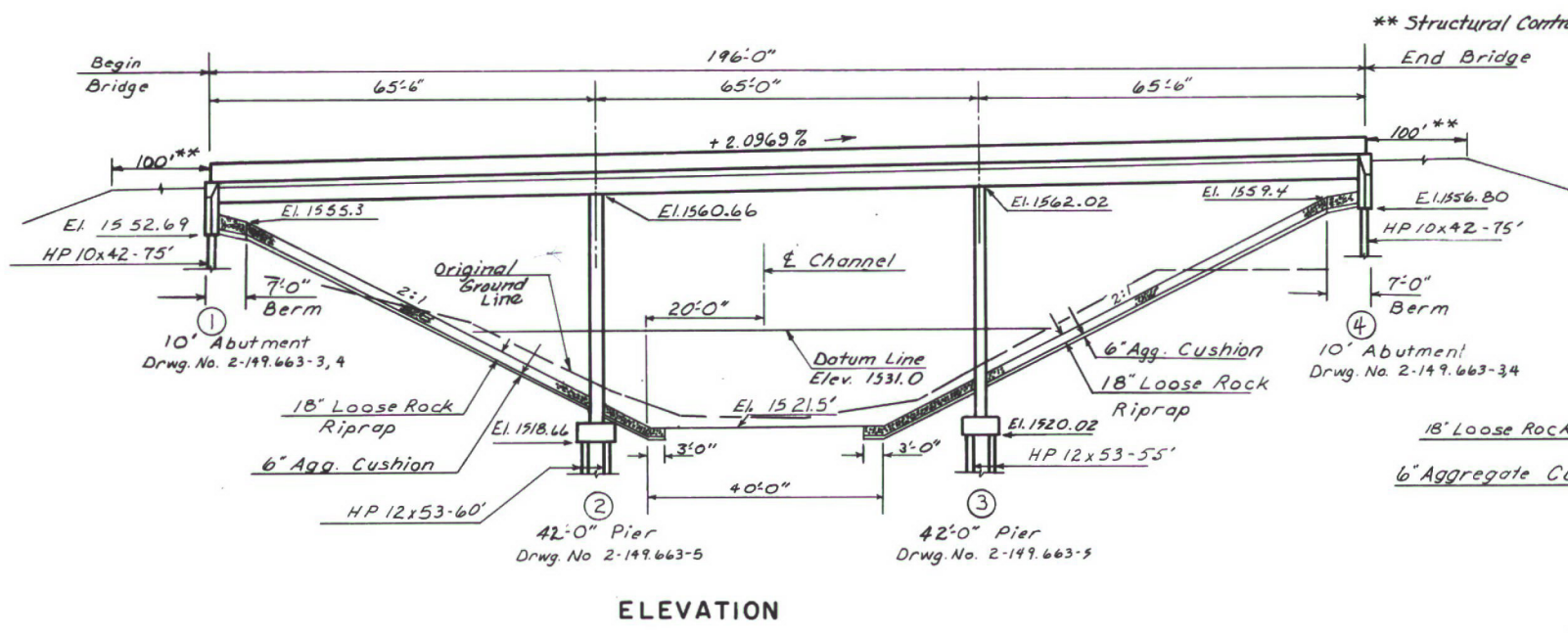
DRAINAGE AREA	4025 SQ. MI.
DESIGN FREQUENCY	50 YRS.
DESIGN DISCHARGE	9260 CFS.
DESIGN STAGE	1546.9
STREAM GRADIENT	0.0001
WATERWAY PROVIDED BELOW DESIGN STAGE	2230 SQ. FT.
WATERWAY PROVIDED BELOW CLEARANCE	4550 SQ. FT.
AVERAGE VELOCITY OF FLOW IN NATURAL CHANNEL	3.3±
DEPTH OF FLOW	25.4 FT.
VELOCITY OF FLOW UNDER BRIDGE	4.2 FT./SEC.
FREEBOARD PROVIDED	11.9 FT.±
100-YEAR FREQUENCY DISCHARGE	4460 CFS
100-YEAR FREQUENCY STAGE	1549.7
MAXIMUM RECORDED STAGE (1969)	1548.0
MAXIMUM RECORDED DISCHARGE (1904)	12000 CFS

SPECIAL PROVISIONS

NO.	NAME
254	EPOXY COATED REINFORCING STEEL
208-1	EXCAVATION FOR BOX CULVERTS & BRIDGES
610-3	PORTLAND CEMENT CONCRETE
622-3	PILING
806-1	AGGREGATES FOR PORTLAND CEMENT CONCRETE
806-3	AGGREGATE FOR PORTLAND CEMENT CONCRETE, STRUCTURAL & PAVING MOTAR SAND & UNDER-DRAIN GRANULAR FILL

ESTIMATE OF QUANTITIES

SPEC. NO.	CODE NO.	BID ITEM	QTY.	UNIT
103	0100	CONTRACT BOND	1	L.S.
203	0140	BORROW	10,765	C.Y.
208	0100	CLASS I EXCAVATION	107	C.Y.
208	0110	CLASS II EXCAVATION	167	C.Y.
208	0201	FOUNDATION PREPARATION	1	E.A.
216	0100	WATER	309	M GAL.
228	0100	SELECT BACKFILL	213	C.Y.
604	9620	PRESTRESSED BOX BEAM-33"(15@64"4")	965.0	L.F.T.
602	0130	CLASS AAE-3 CONCRETE	256.6	C.Y.
602	1110	CLASS AE-1 CONCRETE	300	C.Y.
612	0115	REINFORCING STEEL- GRADE 60	57,177	LBS.
612	0116	REINFORCING STEEL-(GR.60) EPOXY COATED	31,878	LBS.
622	0020	STEEL PILING- HP10X42	900	L.F.
622	0040	STEEL PILING- HP12X53	1,495	L.F.
622	0393	STEEL TEST PILING- HP10X42	170	L.F.
622	1200	STEEL TEST PILING- HP12X53	135	L.F.
702	0130	LOOSE ROCK RIPRAP	850.2	C.Y.
703	0100	AGGREGATE CUSHION	283.4	C.Y.
616	5890	STRUCTURAL STEEL A36(APPROX. 2156 LBS.)	1	L.S.
750	0100	LINSEED OIL TREATMENT	35	GAL.
900	3000	BRIDGE BENCH MARKS	1	SET



SCREED ELEVATIONS

Order No.	Scree Elev.	Scree Elev. & Roadway	Order No.	Scree Elev.	Scree Elev. & Roadway
1	62.266	62.266	1	62.266	62.266
2	62.266	62.266	2	62.266	62.266
3	62.266	62.266	3	62.266	62.266
4	62.266	62.266	4	62.266	62.266
5	62.266	62.266	5	62.266	62.266
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95	62.266	62.266	95	62.266	62.266
96	62.266	62.266	96	62.266	62.266
97	62.266	62.266	97	62.266	62.266
98	62.266	62.266	98	62.266	62.266
99	62.266	62.266	99	62.266	62.266
100	62.266	62.266	100	62.266	62.266

BENCH MARKS				PILE LOADING							
NO.	DESCRIPTION	LOCATION	ELEV.	LOCATION	DEAD LOAD + EARTH	LIVE LOAD	EARTH O.T.M.	WIND	DESIGN LOAD	MAX. REQD. BEARING	* MINIMUM PENETRATION
11	Point Spot on N. end of CSP	80+18 102' RT	1538.71					50 LB.			
12	Point Spot on SW Corner of wing wall for Bridge	92+06 24' RT	1542.41	Abut. 1 & 4	34.1 T	11.4 T		15 LB.	45.5 T	55 T	40'
13	Point Spot on SW Corner of water wall	101+87 274' Rt	1588.24	Pier 2 & 3	39.3 T	11.6 T		100 LB. LL	50.9 T	70 T	20'

STRUCTURAL DRAWINGS

GENERAL DRAWING 2-149.663-1,2
 SUBSTRUCTURE 2-149.663-3,4,5
 SUPERSTRUCTURE 2-149.663-6 & 7 H-0401 D-900-1 H-7008

DESIGN LOADING HS 20 SCALE 1 INCH = 15 FEET

NORTH DAKOTA STATE HIGHWAY DEPARTMENT
SOURIS RIVER BRIDGE LAYOUT
 PROJECT F-FG-4-002(1)147 STA. 92+79.80
 WARD COUNTY

APPROVED
 3-14-80 *Shady Nees*
 DATE BRIDGE ENGINEER

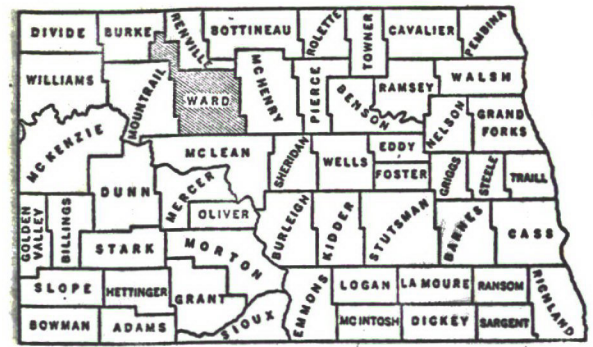
2-149.111

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	N. D.	FG-701(2)		1	5

NORTH DAKOTA STATE HIGHWAY DEPARTMENT

PLANS FOR THE PROPOSED IMPROVEMENT OF A

STATE HIGHWAY IN WARD COUNTY FEDERAL AID PROJECT NO. FG-701(2)



SKETCH-MAP OF NORTH DAKOTA SHOWING COUNTIES



SCALES
 LAYOUT SHEET: 1 IN. = 3000'
 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.

INDEX OF DRAWINGS

SHEET NO.	TITLE PAGE
1	TITLE PAGE
2	INCL. PLAN AND PROFILE DRAWING
3	TO & INCL. STRUCTURAL DRAWINGS

LENGTH OF PROJECT	
PROJECT MILES-GROSS	MILES-NET
FG-701(2) 0.026	0.026
TOTALS	0.026

GOVERNING SPECIFICATIONS:
 Standard Specifications adopted by the North Dakota State Highway Department Jan. 1956 and approved as standard by the Bureau of Public Roads, May 7, 1956. Required Special Provisions dated June 15, 1959 and approved by the Bureau of Public Roads July 5, 1959 and others submitted herewith.

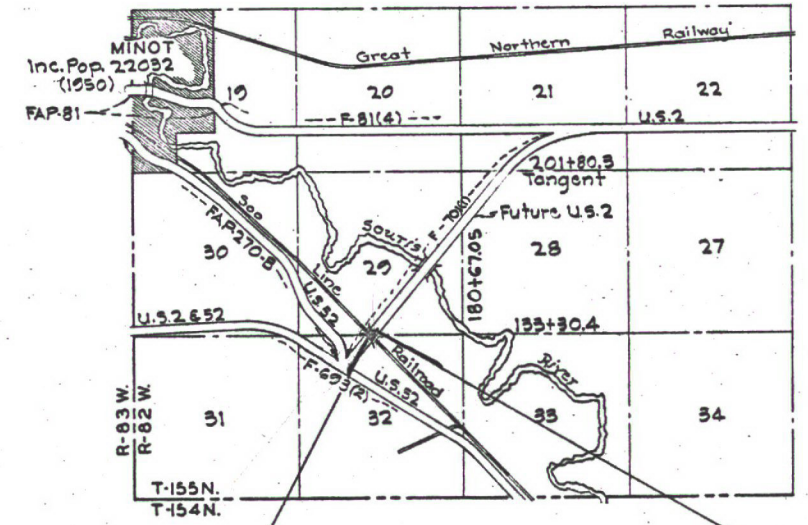
KEY TO CONVENTIONAL SIGNS

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

DESIGN DATA

TRAFFIC AVERAGE DAILY EST. 30TH MAX. HR.
 CURRENT TRAFFIC (1959) 788 PASS. 262 TRUCKS 1050 TOTAL 137
 TRAFFIC FORECAST (1970) 2400 PASS. 800 TRUCKS 3200 TOTAL 416
 DESIGN SPEED 70 MPH
 TRAFFIC CLASSIFICATION 'M'
 MINIMUM SIGHT DISTANCE (NON PASSING) 600'
 MINIMUM SIGHT DISTANCE (SAFE PASSING) 3200'
 MINIMUM PASSING SIGHT DISTANCE FOR MARKING 1200'
 BRIDGES 120' 516 (1957) DESIGN LOADING
 MINIMUM WIDTH 30'

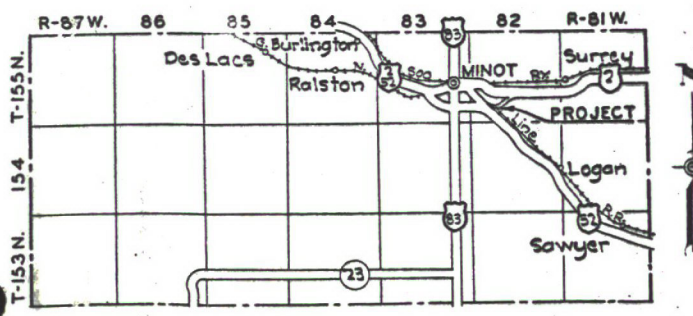
STRUCTURAL DRAWINGS	STANDARD DRAWINGS
2-12.5-1	7.5
2-12.5-2	7.6
H-1173-1	14.9
H-1173-2	H-0112
H-1278	H-0401
H-1347	H-0501



LAYOUT MAP

BEG. FG-701(2) STA. 132+40.52 =
 Sta. 132+40.52 on F-701(1)
 A point 2234.08' East &
 69.47' South of the N.W.
 Cor. of Sec. 32, Twp. 155,
 Rge. 82 W.

END FG-701(2) STA. 133+80.52 =
 Sta. 133+80.52 on F-701(1)
 A point 2322.86' East &
 38.79' North of the N.W.
 Cor. of Sec. 32, Twp. 155,
 Rge. 82 W.



SKETCH MAP OF PART OF WARD COUNTY

LOCATION	QUANTITIES ^① See Special Provisions								
	15B EXCAVATION CLASS 2	60A CONCRETE CLASS A1	60A CONCRETE CLASS A1 1/2	62A REINFORCING STEEL	63A STRUCTURAL STEEL	65G STEEL REINFORCED PILING	SLOPE PROTECTION	22B SELECT BACKFILL	BRIDGE BENCH MARKS
	CU. YD.	CU. YD.	CU. YD.	LB.	LB.	Lin. Ft.	SQ. FT.	CU. YD.	SET
Sta. 133+14.77	261	6.9	255.9	49,204	93,585	1980	5373	75	1
Grand Totals	261	6.9	255.9	49,204	93,585	1980	5373	75	1

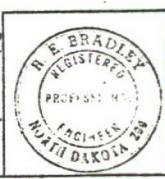
Add 1240.15 to datum of proj. plans to get C & G. datum.

See Per. Survey Aug. 26, 1958

APPROVED DATE 9-24-62

Alkneley

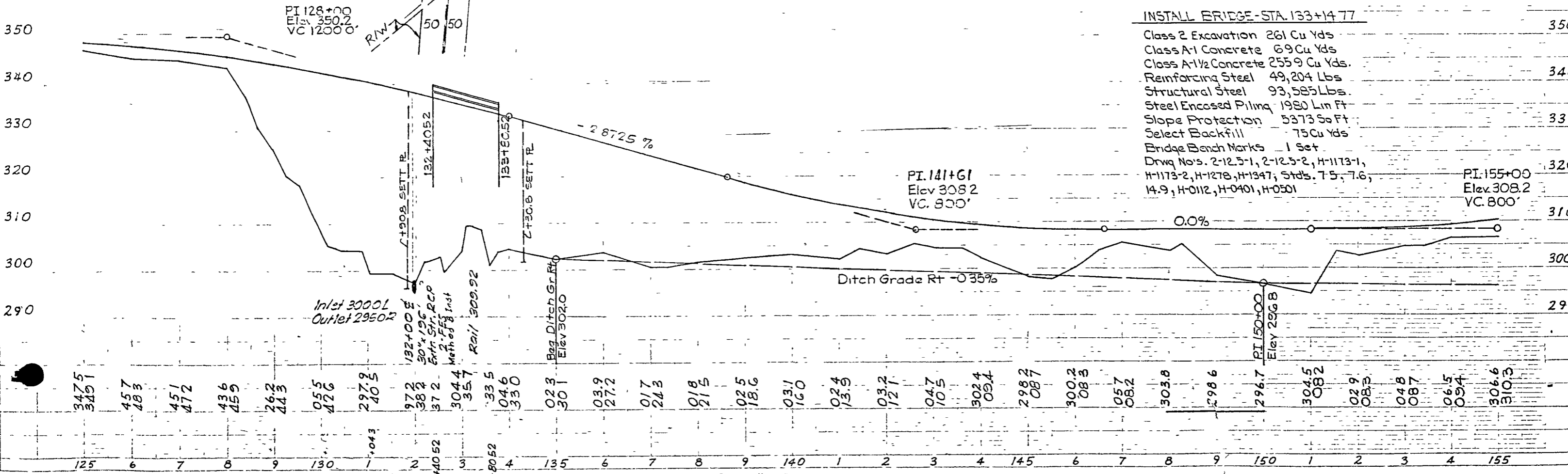
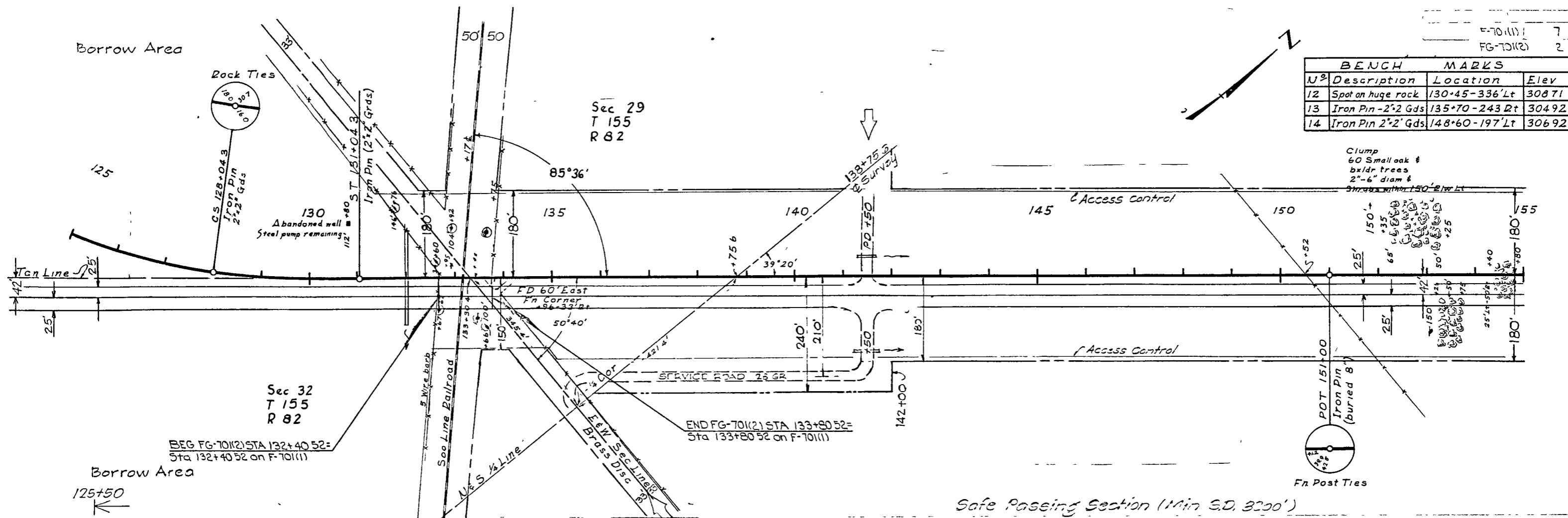
CHIEF ENGINEER
 NORTH DAKOTA STATE
 HIGHWAY DEPARTMENT



DEPARTMENT OF COMMERCE
 BUREAU OF PUBLIC ROADS

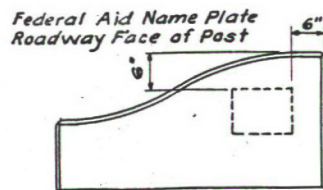
APPROVED
 DIVISION ENGINEER DATE

BENCH MARKS			
N ^o	Description	Location	Elev
12	Spot on huge rock	130+45-336' Lt	308.71
13	Iron Pin - 2" x 2" Gds	135+70-243' Rt	304.92
14	Iron Pin 2" x 2" Gds	148+60-197' Lt	306.92



1960
FEDERAL AID
PROJECT
F-701(2)
NORTH DAKOTA
2-12.5

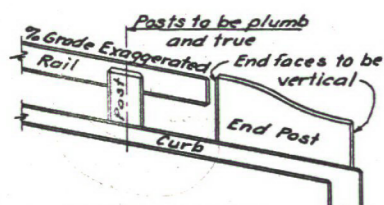
FEDERAL AID NAME PLATE
2 Required



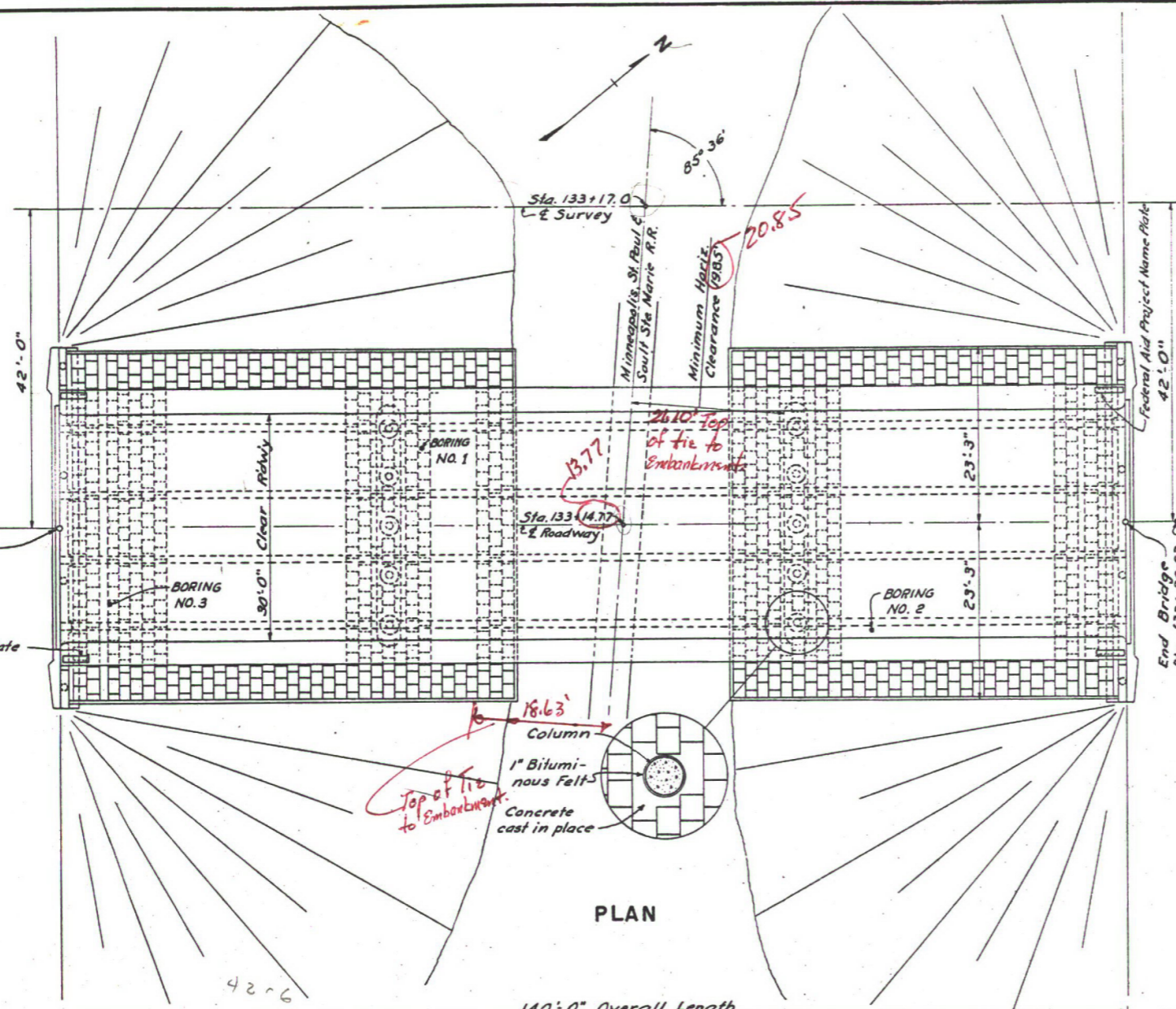
NAME PLATE LOCATION ON
END POST
Also see plan (This drawing)
Railing Details Drawing H-0112,
H-1173 & Standard Drawing 14.9.

Begin. Bridge
Sta. 132+40.52
Elev. 338.41

Federal Aid
Project Name Plate



DETAIL OF POSTS & RAIL
Showing Supplemental Drawing for
Railing Details, Sheet H-0112
(Outside View)



PLAN

GENERAL:
A vibrating strike-off template shall be used when finishing the deck slab concrete. Care shall be taken that the vibrator is shut off when the forward movement of the template is stopped. The final strike-off shall be made on a fairly long surface without continual starting and stopping. The cost of furnishing and placing joint filler, asphalt curb seal, name plates, end post pipe sleeves, and other miscellaneous items shall be included in the price bid for Class A-1 1/2 Concrete. For painting, welding, and deflection notes see drawing H-1173-1. For rail post spacing and slab pouring sequence notes see drawing H-1173-2.

EXCAVATION:
All structural excavation shall be Excavation Class 2

EMBANKMENT:
The roadway embankment has been previously placed under separate contract, but additional shaping and placement will be required in order to conform to the exact limits as defined on this sheet and as directed by the Engineer; any cost accruing due to these operations shall be included in the unit price bid for precast block.

Earth consolidation shall be in accordance with Section 17.3(a)4 of the Standard Specifications using "Extra Compaction".

Embankment material, if required shall be obtained from Highway Right-of-Way as staked by the Engineer.

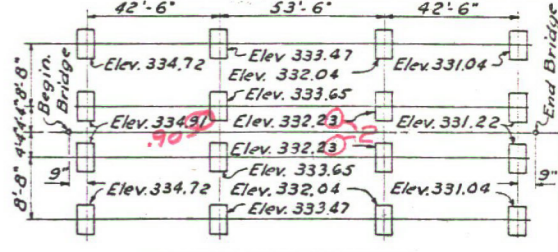
PRECAST BLOCK:
The precast block panels shall be placed in accordance with the standard drawing 7.5, the details as shown on this sheet, and as specifically directed by the Engineer.

REINFORCING STEEL: (Intermediate Grade)
Bent bar details are given center to center unless noted. The Bar fabricator shall add a prefix to all bar designations to differentiate between the several parts of the structure or structures.

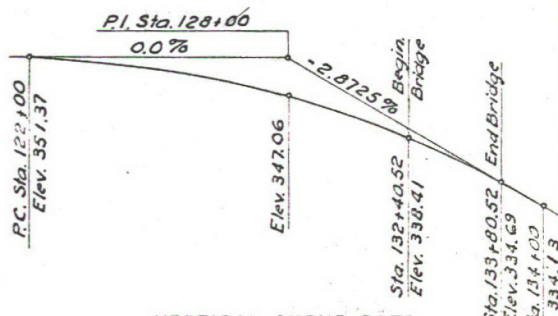
CONCRETE:
All exposed edges of concrete shall be beveled with 3/4" triangular molding except as shown on the plans. The "Rubbed Surface Finish" shall be given to the railing end posts, to the outside and roadway vertical faces of curbs, and to the exposed faces of the abutment wing walls. All other surfaces shall be given the "Ordinary Surface Finish". All concrete shall be Class A-1 1/2 except railings which are Class A-1 and shall be compacted by vibration. Air-entrained portland cement shall be used in the bridge slab and curb concrete. Concrete made from both regular and air-entrained cement shall be considered Class A-1 1/2 as a pay item. The Deck Slab may be placed in one continuous pour provided the Contractor can supply concrete at a rate not less than 25 Cu. Yd. per hour.

NOTES

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	N.D.	FG-701(2)		3	8

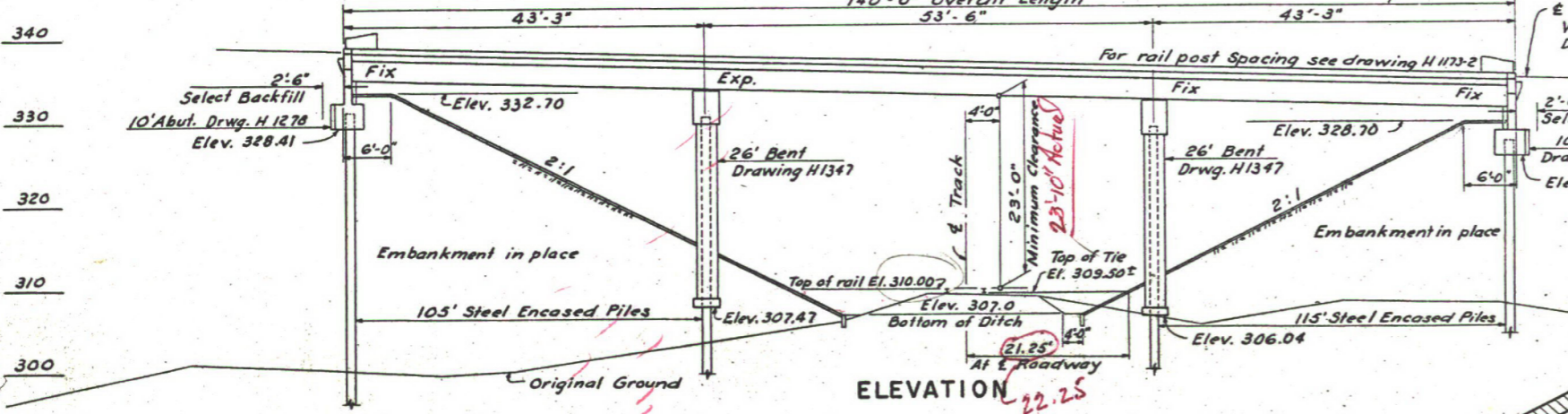


BEARING PLATE LAYOUT
Elevations are to top of finished Concrete

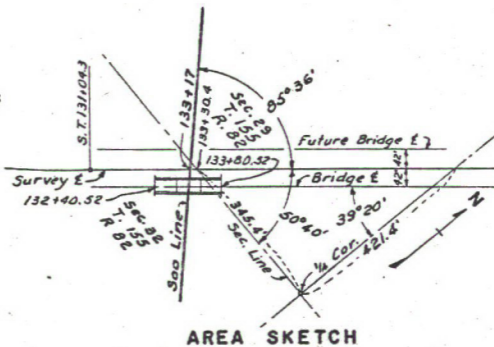


VERTICAL CURVE DATA
Elevations are to top of finished Roadway

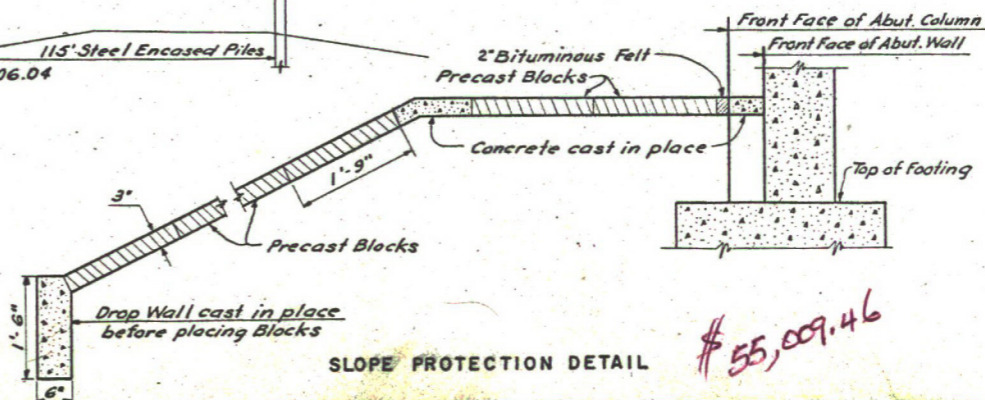
ESTIMATE OF QUANTITIES		BID ITEM	
SPL. PROV.	SPEC. NO.	QUANTITY	UNIT
12	REMOVING EXISTING STRUCT. AT STA.		CU. YD.
15 B	EXCAVATION CLASS 2	261	CU. YD.
	CLASS 3		CU. YD.
60 A	CONCRETE CLASS A-1	6.9	CU. YD.
	CLASS A-1 1/2	255.9	CU. YD.
62 A	REINFORCING STEEL	49,204	LB.
63 A	STRUCTURAL STEEL	93,585	LB.
64 A	UNTREATED TIMBER		M.S.M.
64 B	TREATED TIMBER		M.S.M.
65 A	UNTREATED TIMBER PILING		FT.
15 I	650 STEEL ENCASED PILING	9 @ 105 FT. / 9 @ 115 FT.	1980 LIN. FT.
65 E	UNTREATED TIMBER TEST PILES		EACH
15 I	655 STEEL ENCASED TEST PILES		EACH
	SLOPE PROTECTION	5373	SQ. FT.
22 B	TEMPORARY CROSSING AND DETOUR		
	SELECT BACKFILL	75	CU. YD.
	BRIDGE BENCH MARKS		1 SET



ELEVATION



AREA SKETCH



SLOPE PROTECTION DETAIL

BENCH MARKS				PILE LOADING								
NO.	DESCRIPTION	LOCATION	ELEV.	LOCATION	DEAD LOAD + EARTH	LIVE LOAD	EARTH O. T. M.	WIND 50 LB. 15 LB. 100 LB. LL.	LONG. FORCE	DESIGN LOAD	MINIMUM REQUIRED BEARING	MINIMUM PENETRATION
1	2"x2" Hub by P.P.	Sta. 121+35-225' R/L	348.27									
2	Foot on huge rock	Sta. 130+45-336' L/R	308.71	Abutment	31.4 T.	13.3 T.				44.7 T.	65 T.	60
3	Iron Pin - 2"x2" Gds.	Sta. 135+70-243' R/L	304.92									
14	Iron Pin - 2"x2" Gds.	Sta. 148+60-197' L/L	306.92	Pier	47.6 T.	23.7 T.				71.3 T.	73 T.	50

STRUCTURAL DRAWINGS

GENERAL DRAWING 2-12.5-1 (THIS SHEET), 2-12.5-2, 7.6, M-0501
 SUBSTRUCTURE H-1278, M-1347, M-0401, 7.5
 SUPERSTRUCTURE M-1173-1, M-1173-2, M-0112, 14.9

DESIGN LOADING H20 S16 (1957) SCALE 1 INCH = 10 FEET

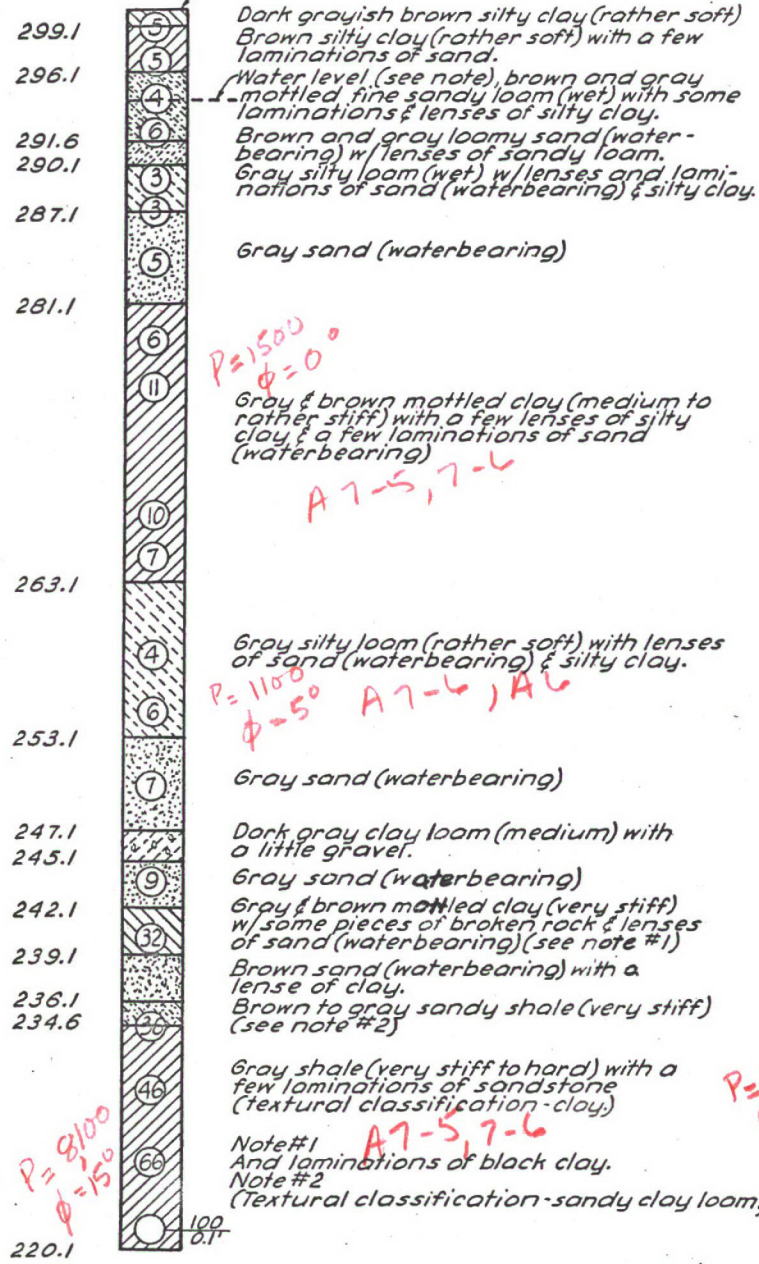
NORTH DAKOTA
STATE HIGHWAY DEPARTMENT
OVERHEAD
MINNEAPOLIS, ST. PAUL & SAULT STE. MARIE R.R.
BRIDGE LAYOUT

PROJECT FG-701(2) STA 132+40.52
WARD COUNTY

APPROVED 9-18-59 DATE
Joseph O. Kirby
BRIDGE ENGINEER

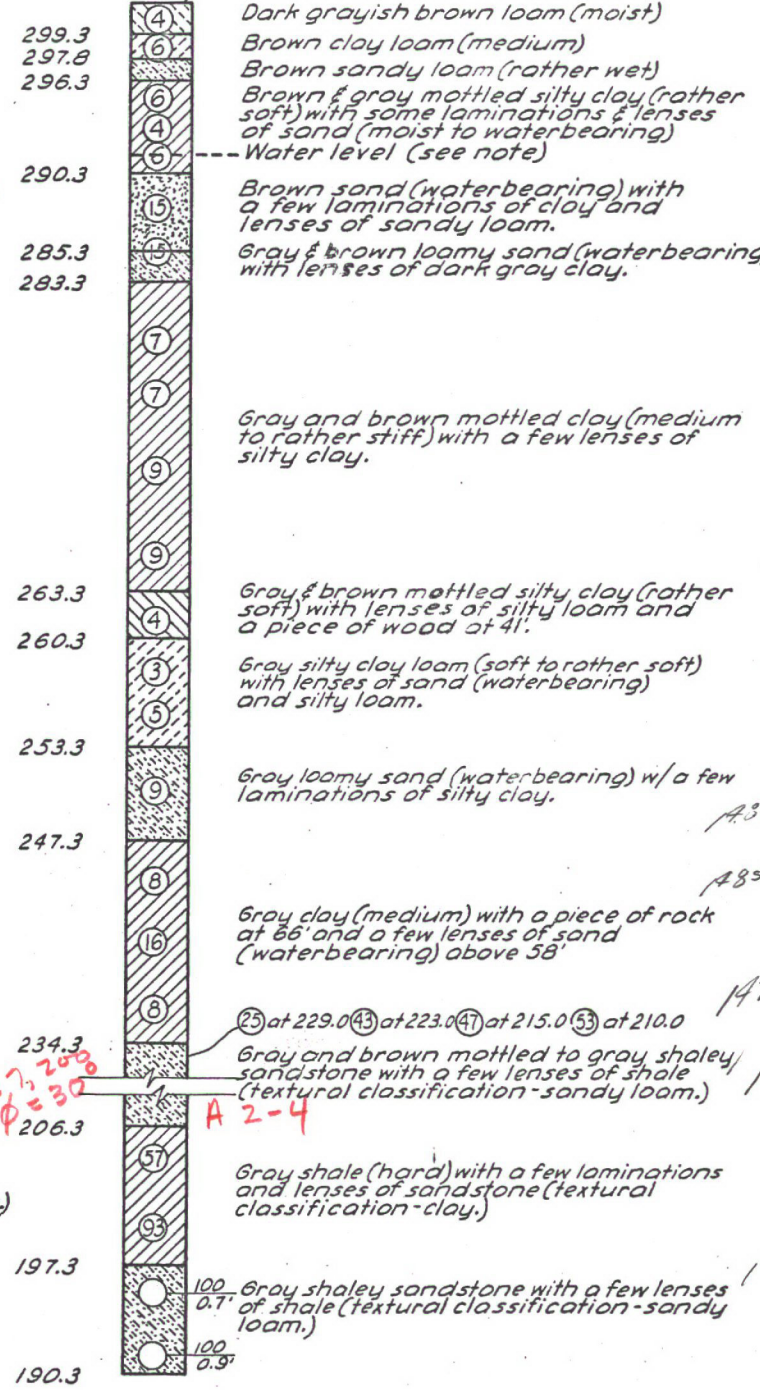
Model

Sta. 132+87-10' Lt. of south roadway E.
Elev. 300.1



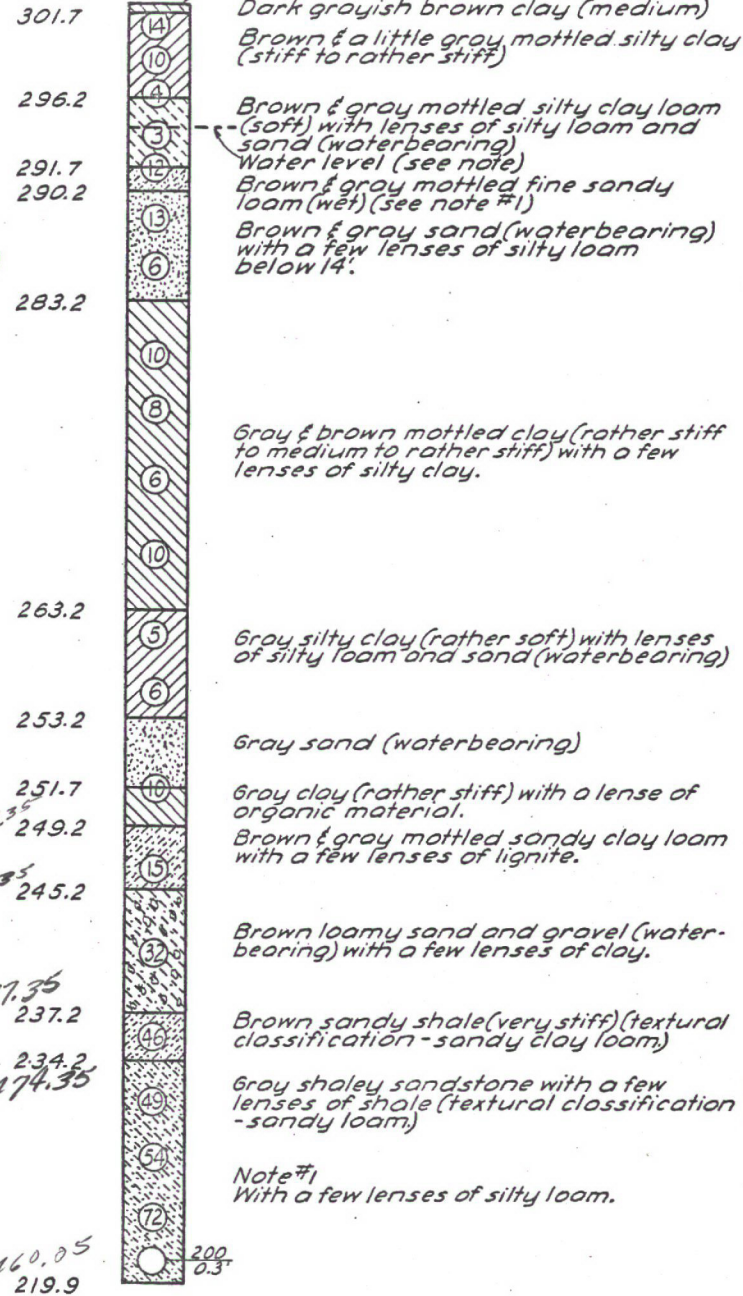
Note: Water level at 6 1/2' when checked with boring sampled to 9 1/2'.
Water level at 7 1/2' when checked immediately after the casing was removed.
Water level at 6' when checked 11 days later.

Sta. 133+47-14' Rt. of south roadway E.
Elev. 301.3



Note: Water level at 9 1/2' when checked immediately after the casing was removed and also when rechecked 6 days later.

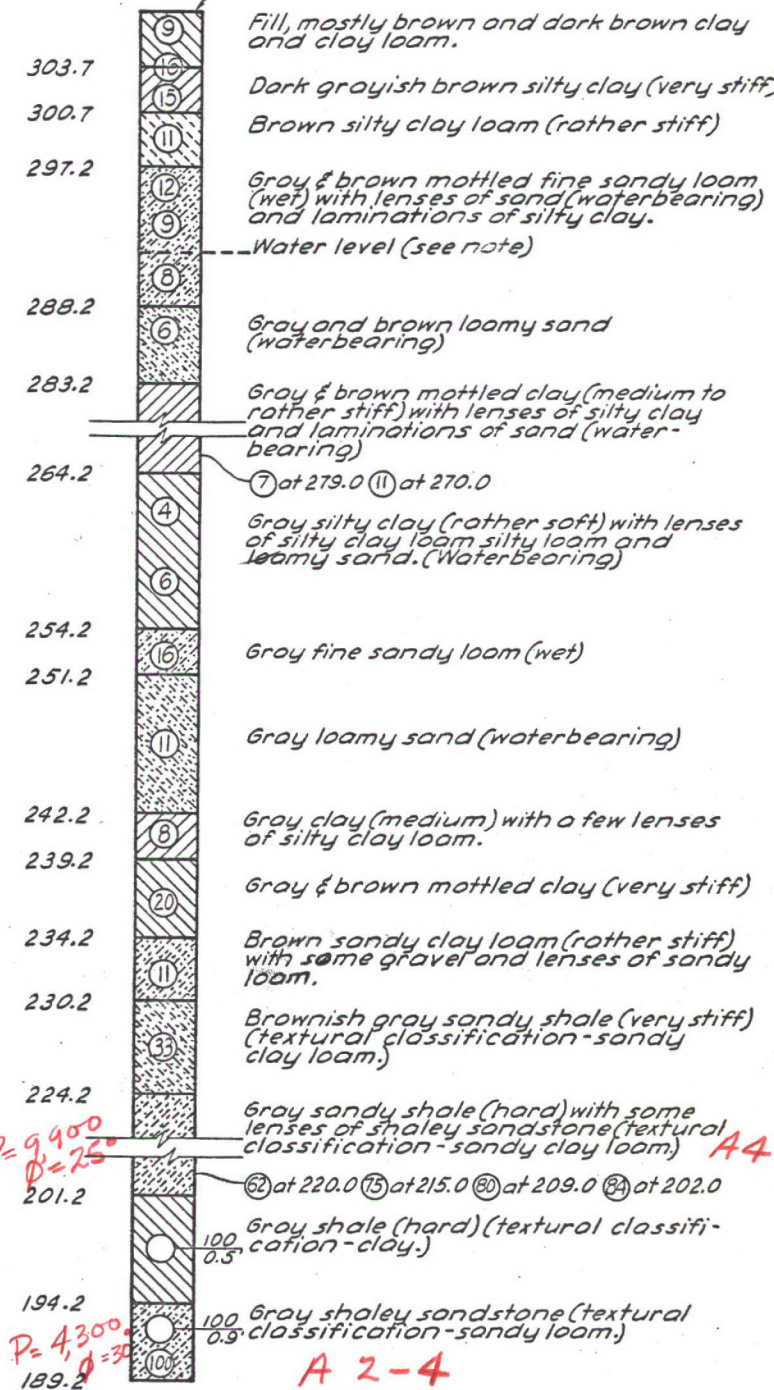
Sta. 132+47-10' Rt. of south roadway E.
Elev. 302.2



Note: Water level at 8' when checked with boring sampled to 14 1/2'.
Water level at 10' when checked immediately after the casing was removed.
Water level at 8' when rechecked 4 days later.

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 these shown.

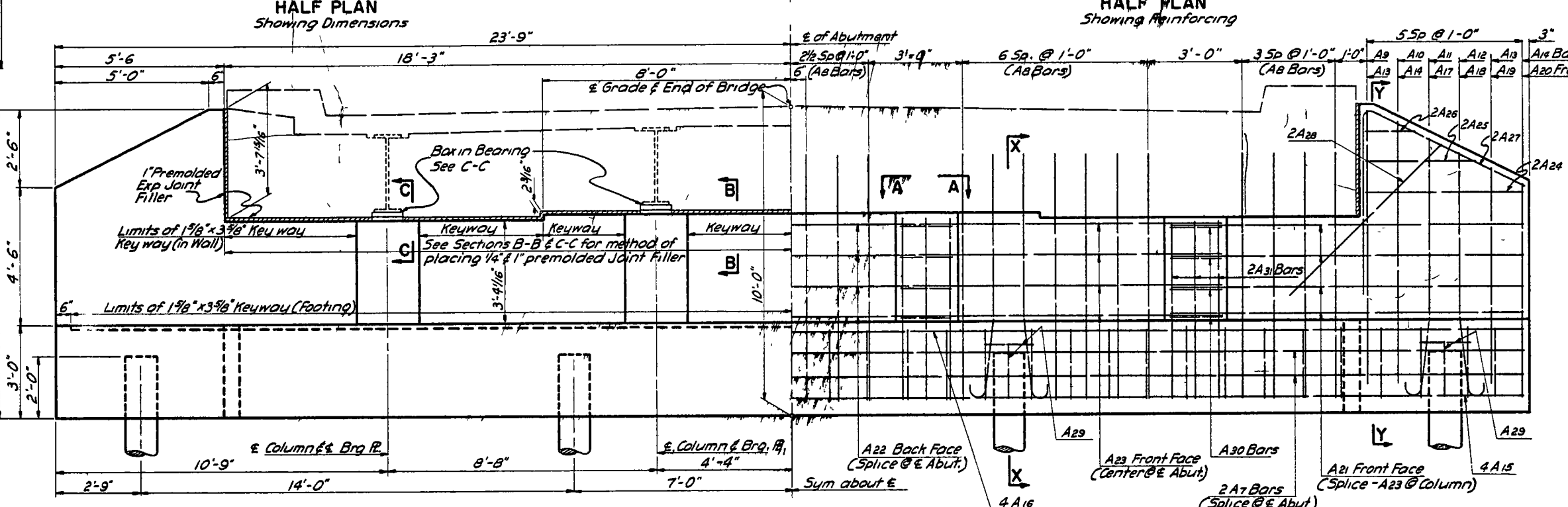
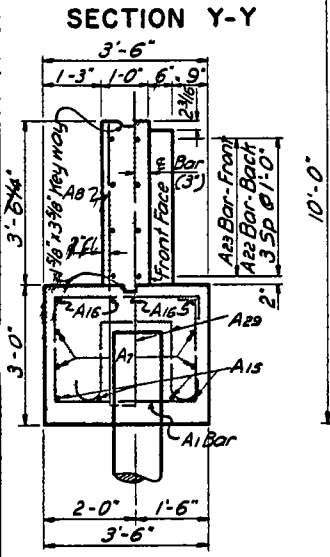
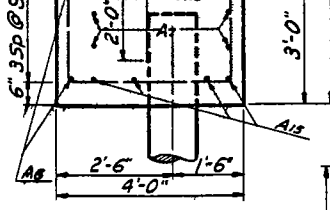
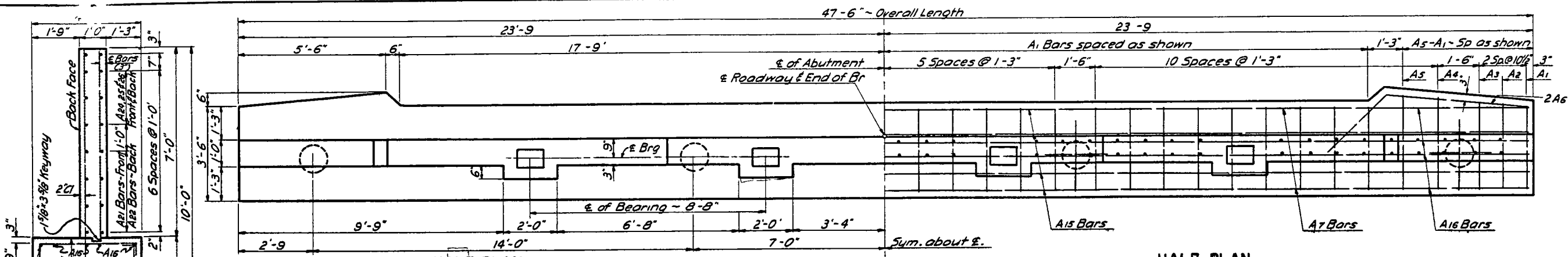
Sta. 133+87 - on south roadway E.
Elev. 307.2



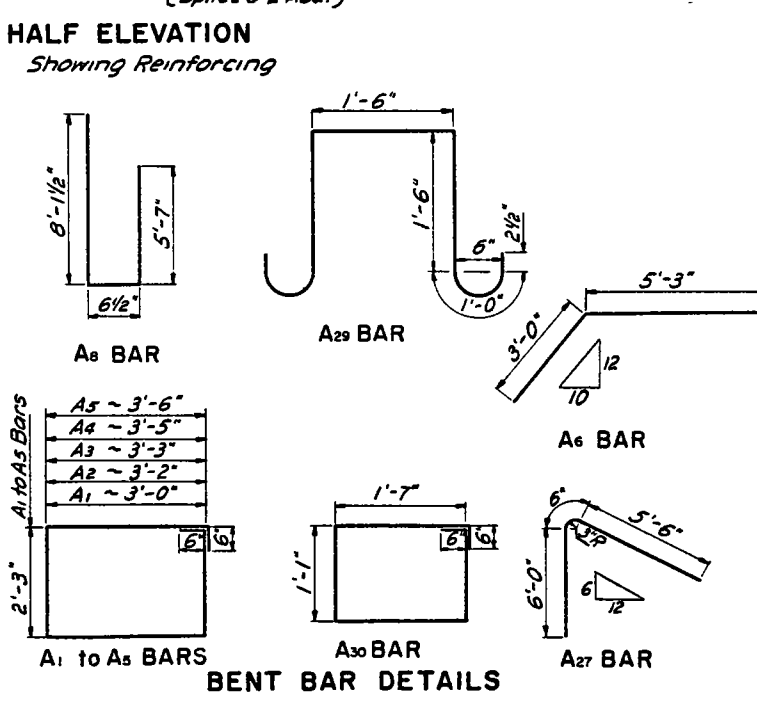
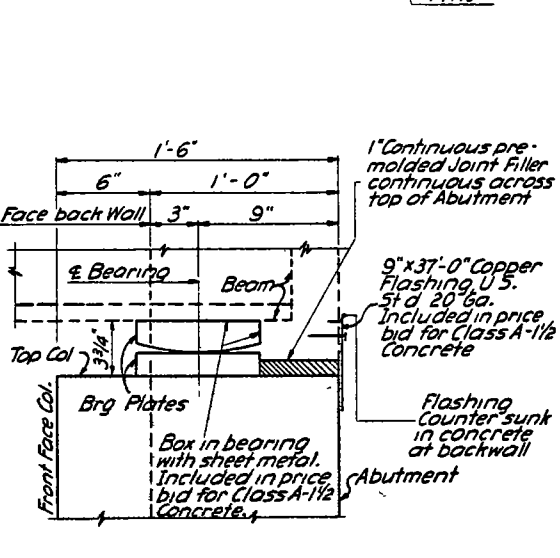
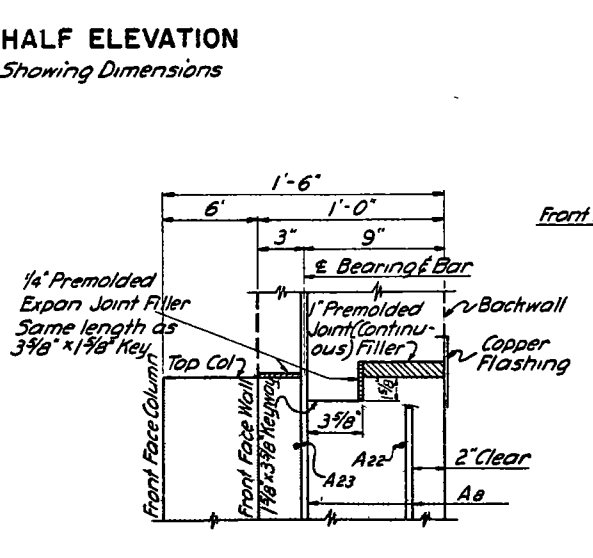
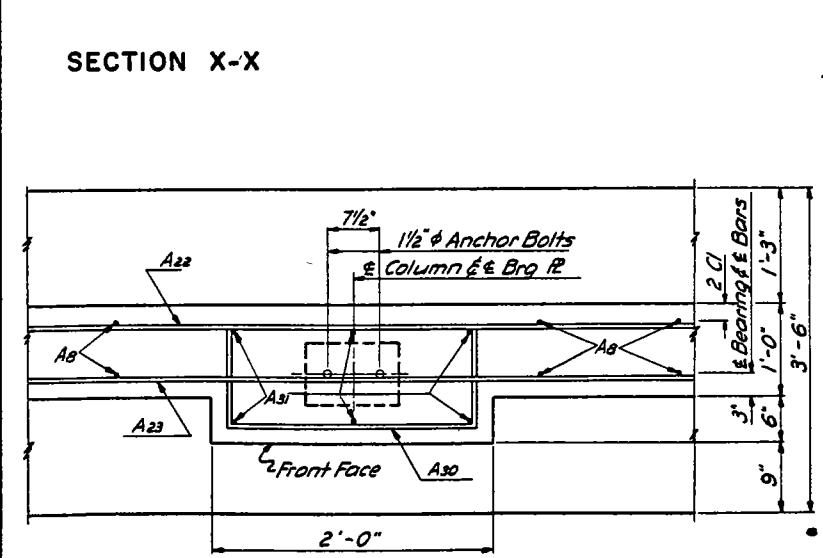
Note: Water level at 15 1/2' when checked with boring sampled to 22'.
Water level at 15 1/2' when checked immediately after the casing was removed. Water level at 15' when rechecked 45 minutes later.

BRIDGE NO. 2-12.5

BORING LOG
FG-701(2)
WARD COUNTY

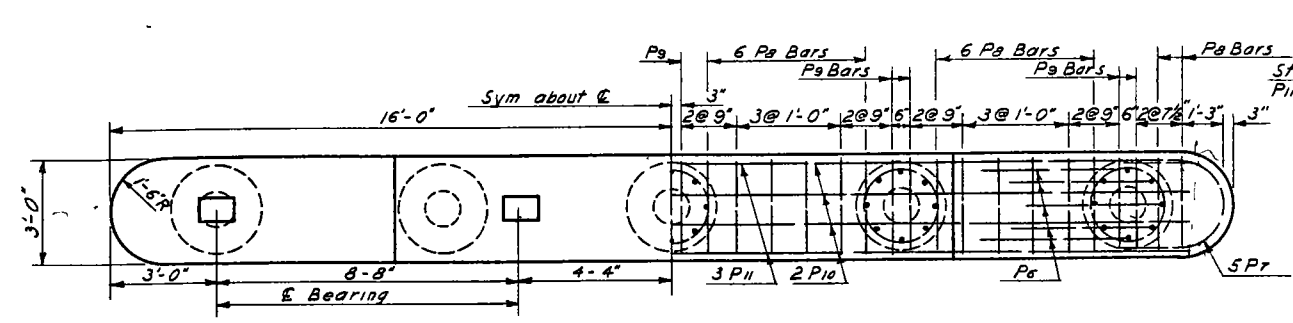


BAR LIST (ONE ABUT.)				
MARK	NO	SIZE	LENGTH	SHAPE
A1	31	4	11'-4"	Bent
A2	2	4	11'-10"	"
A3	2	4	12'-0"	"
A4	2	4	12'-4"	"
A5	2	4	12'-6"	"
A6	4	6	8'-3"	"
A7	8	6	24'-9"	Str.
A8	28	4	14'-3"	Bent
A9	2	4	8'-0"	Str.
A10	2	4	8'-3"	"
A11	2	4	7'-9"	"
A12	2	4	7'-3"	"
A13	4	4	6'-9"	"
A14	4	4	6'-3"	"
A15	8	10	25'-8"	"
A16	8	11	26'-0"	"
A17	2	4	5'-9"	"
A18	2	4	5'-3"	"
A19	2	4	4'-9"	"
A20	2	4	4'-3"	"
A21	8	4	11'-6"	"
A22	8	4	24'-4"	"
A23	4	4	27'-8"	"
A24	4	4	5'-0"	"
A25	4	4	3'-6"	"
A26	4	4	1'-6"	"
A27	4	6	12'-0"	Bent
A28	4	6	7'-0"	Str.
A29	8	6	6'-11"	Bent
A30	16	5	6'-4"	"
A31	24	6	5'-8"	Str.

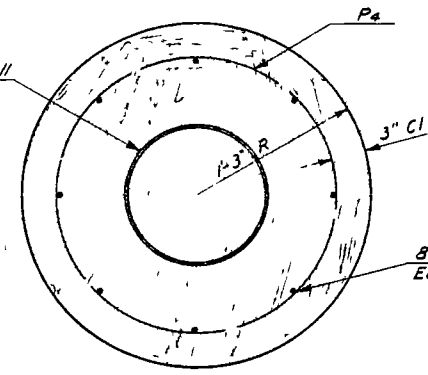


QUANTITIES (ONE ABUT.)	
Concrete Class A-1 1/2	26 1/2 cu yd
Reinforcing Steel	3 805 lb
Flashing (See Layout)	
Excavation (See Layout)	

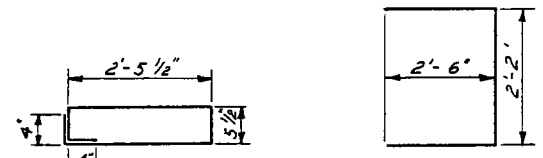
10 FT. ABUTMENT
FOR I BEAM SPANS
FIXED END
30 FT ROADWAY



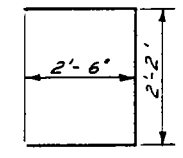
TOP PLAN



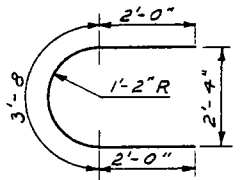
C-C



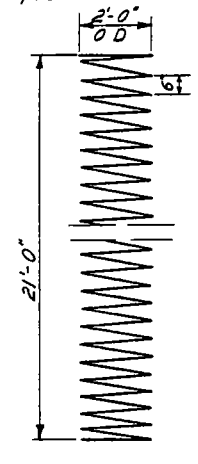
P1 BAR



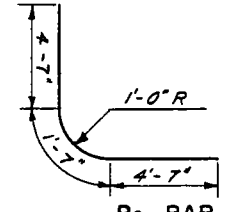
P3 BAR



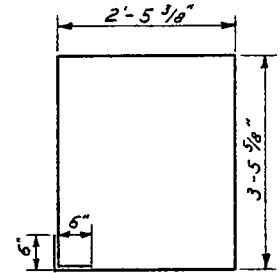
P7 BAR



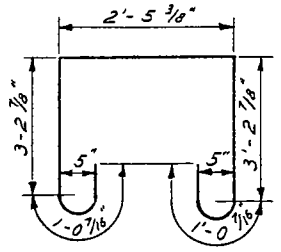
P4 BAR



P6 BAR



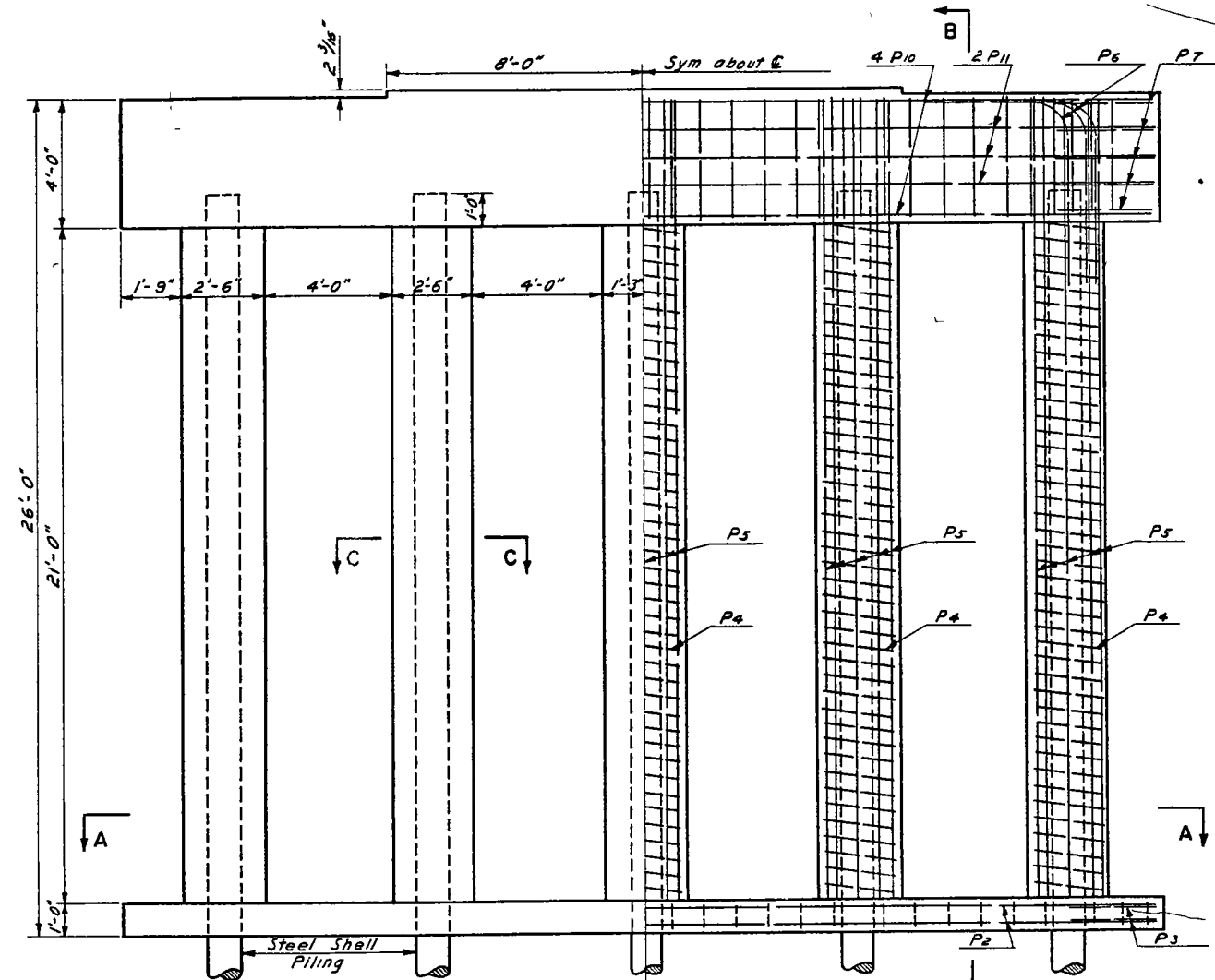
P8 BAR



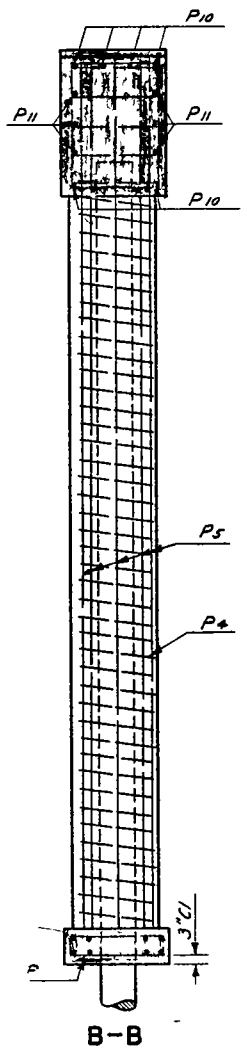
P9 BAR

BENT BAR DETAILS

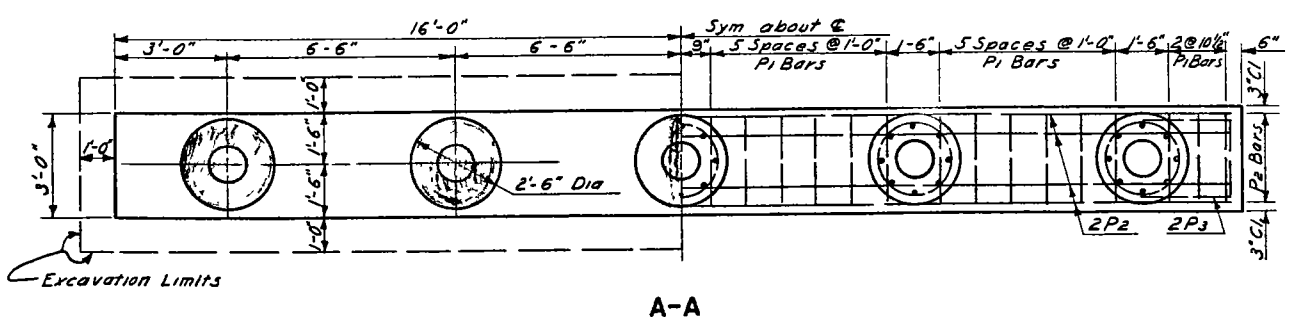
NOTE
Column concrete shall be allowed to set a minimum of two hours before pier cap reinforcing is placed or concrete poured



ELEVATION



B-B

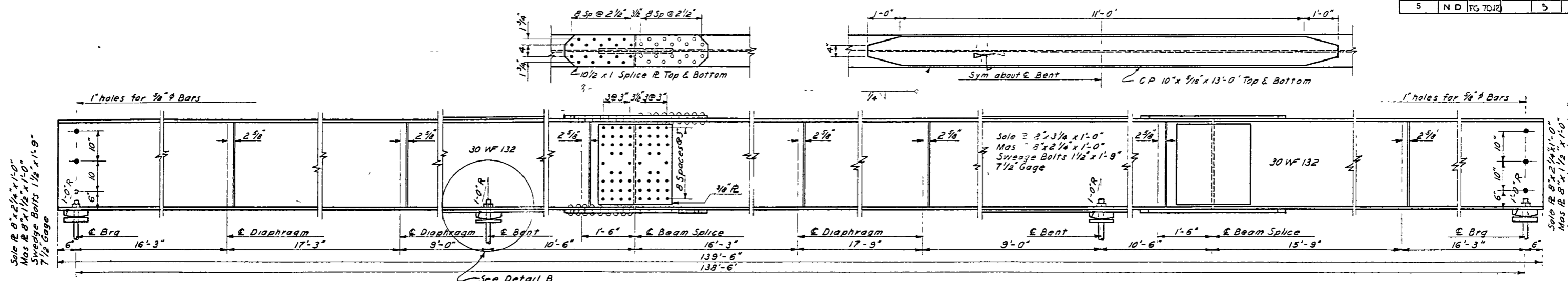


A-A

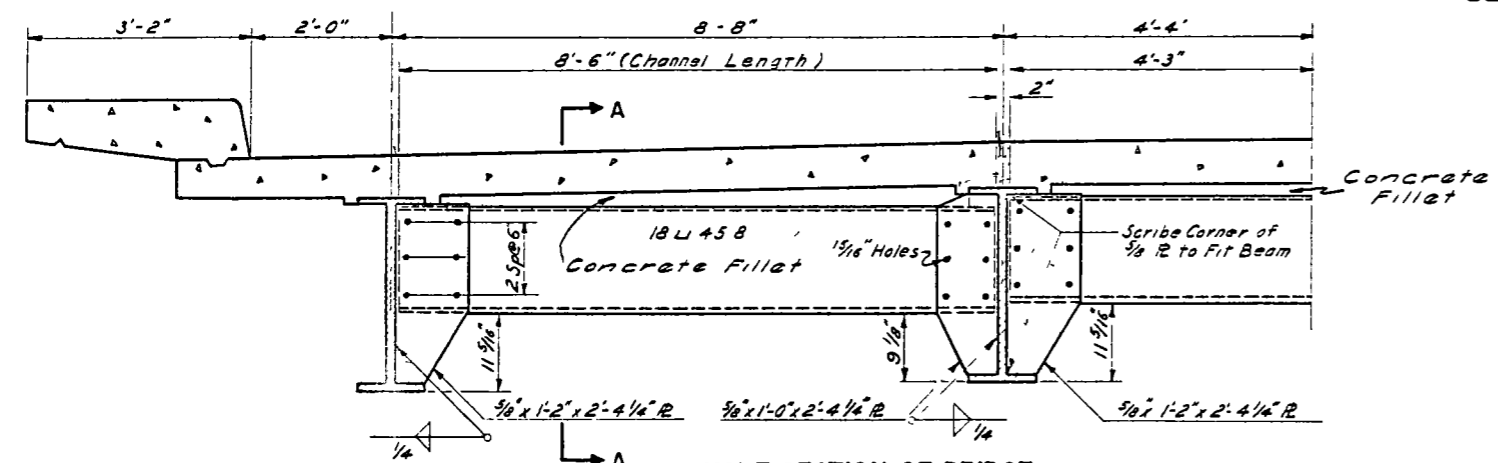
BAR LIST (One Bent)				
MARK	NO	SIZE	LENGTH	SHAPE
P1	30	4	6'-6"	Bent
P2	8	8	31'-0"	Str
P3	4	6	7'-2"	Bent
P4	5	3	278'-6"	"
P5	40	5	24'-9"	Str
P6	10	7	10'-9"	Bent
P7	10	5	7'-8"	"
P8	28	5	12'-10"	"
P9	10	5	11'-0"	"
P10	8	3	29'-0"	Str
P11	5	6	29'-0"	"

QUANTITIES (One Bent)	
Concrete Class A-1/2	331 CY
Reinforcing Steel	4231 Lb
Piling (See Layout)	
Excavation (See Layout)	

26' BENT
DETAIL
FOR I- BEAM
SPANS
30' ROADWAY

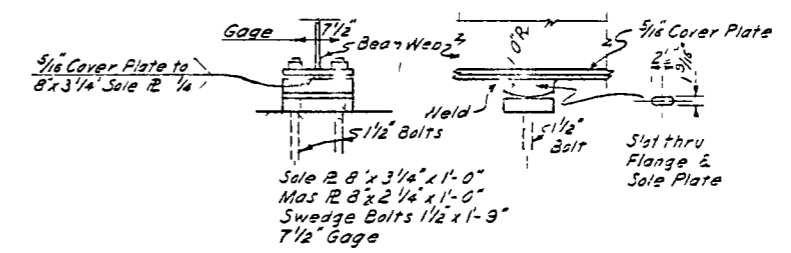


BEAM ELEVATION



HALF SECTION OF BRIDGE

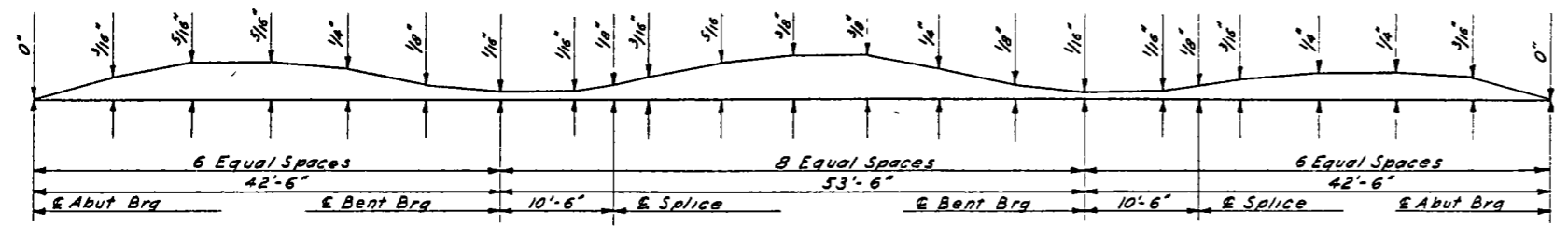
Showing Steel Diaphragm & Connectors
See Sheet H 1173 - (Sheet 2) for A-A



DETAIL B

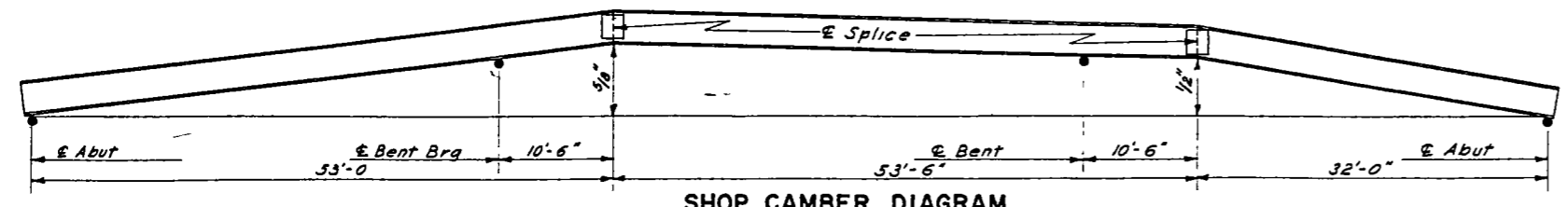
Showing Expansion Bearing

STRUCTURAL STEEL
All Structural Carbon Steel shall conform to the latest ASTM A-7 Specifications
GENERAL
All rivets are to be 7/8"
Open holes are to be 1/8" except as noted
Field connections shall be made with 7/8" tensile strength bolts or shall be riveted
The placement of pier swedge bolts shall be in accordance with the approved shop drawings
Bearing areas are to be finished true to plan & elevation by grinding if necessary, before bearing plates are set
The Field Riser Diagram shows dimensions from an assumed chord drawn between supports. Additions or subtractions must be made to the riser dimensions to compensate for the tolerances in the beam and deflection due to weight of the beam
PAINT
Paint and painting shall conform to the North Dakota Standard Specifications for Road and Bridge Construction, Sections 80 & 132.17. All exposed steel surfaces shall be given one shop coat of red lead paint, one spot coat of red lead paint after erection and concrete work is completed and two field coats of aluminum paint (first field coat tinted with Prussian Blue) No paint, shop or field, on top of beams
WELDING
The metal arc process shall be used for all shop and field fabrication. All welding shall conform to the current Standard Specifications for Welding Highway & Railway Bridges, Design, Construction and Repair, of the American Welding Society
Welding will not be paid for directly, but shall be included in the unit price bid for structural steel



FIELD RISER DIAGRAM

Showing Dimension "a"

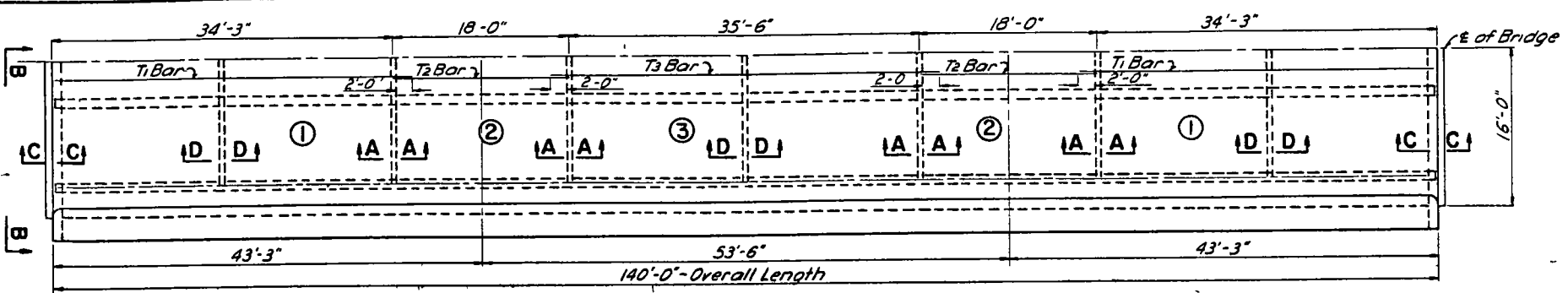


SHOP CAMBER DIAGRAM

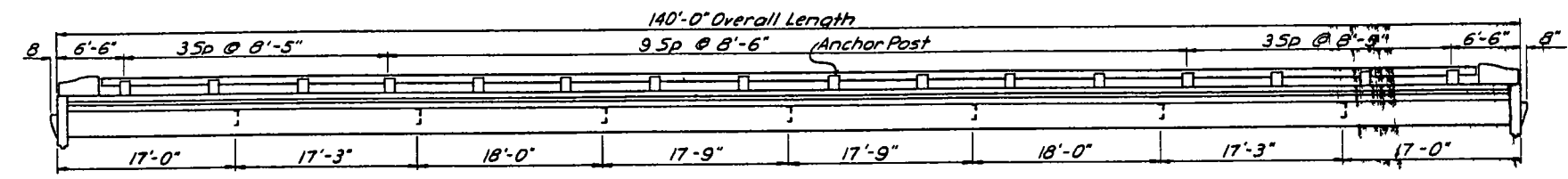
QUANTITIES	
Structural Steel	93,385 lb

SUPERSTRUCTURE
THREE SPAN CONTINUOUS
I-BEAM
140'-0" OVERALL LENGTH
30' ROADWAY
SHEET 1 OF 2

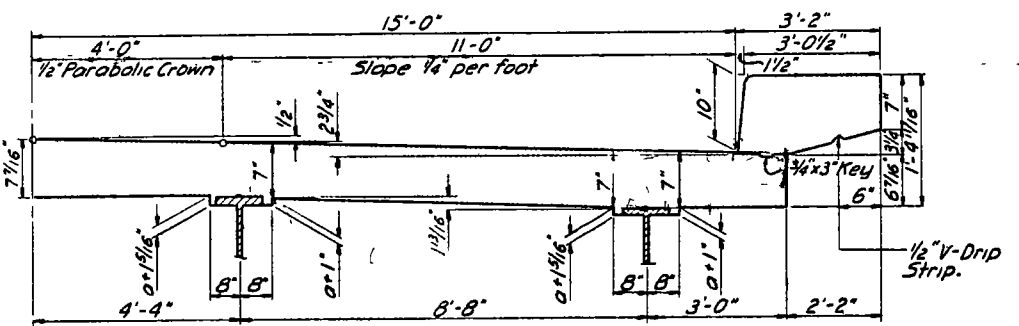
CHECKED BY: J. E. H. R.
 TRACING
 QUANTITIES
 MADE BY: J. E. H. R.
 CHECKED BY: J. E. H. R.
 MADE BY: J. E. H. R.
 CHECKED BY: J. E. H. R.
 H 1173



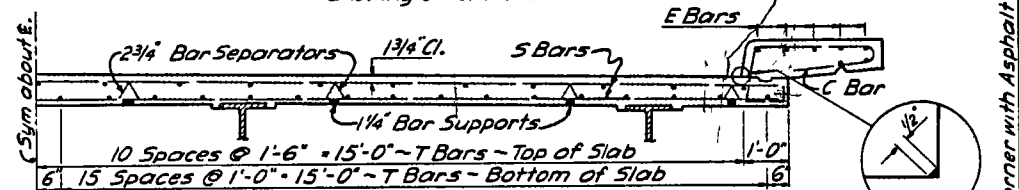
HALF PLAN



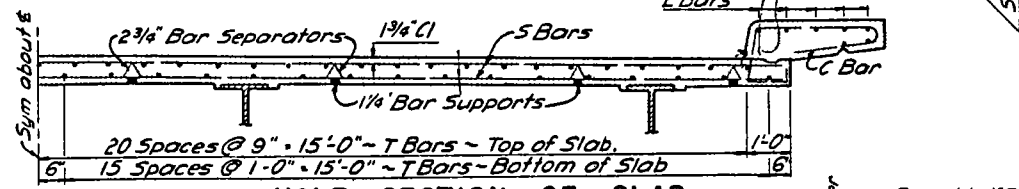
ELEVATION



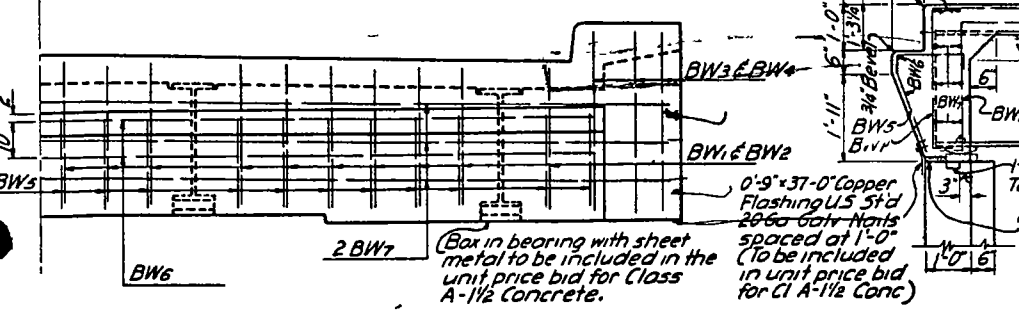
HALF SECTION OF SLAB
Showing Dimensions



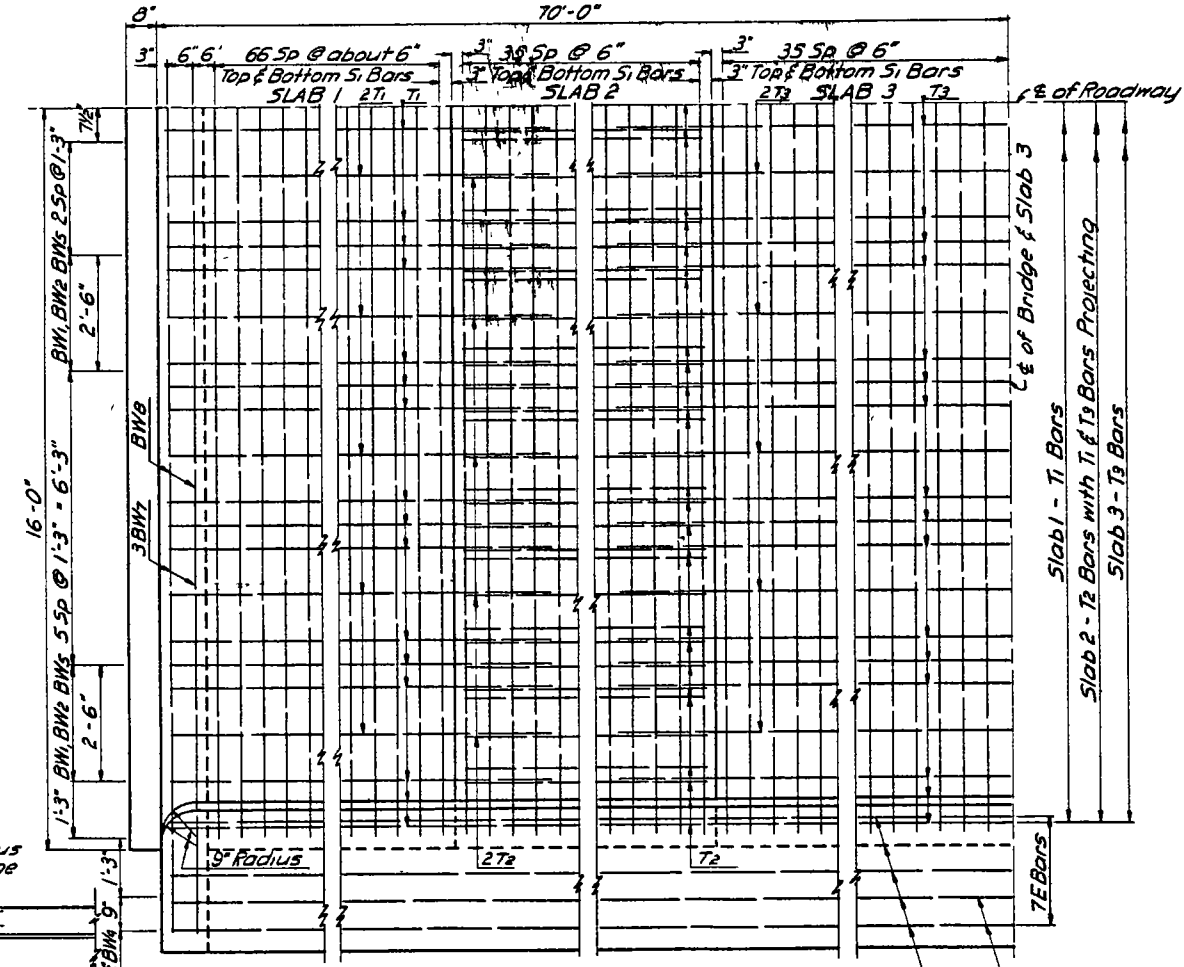
HALF SECTION OF SLAB
Showing Reinforcement for Slab Number 1



HALF SECTION OF SLAB
Showing Reinforcement for Slab Number 2

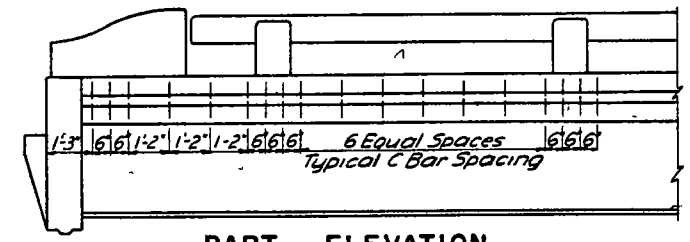


SECTION B-B

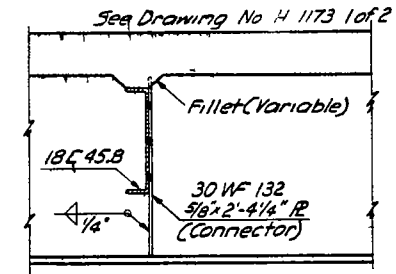


SLAB REINFORCEMENT DETAILS

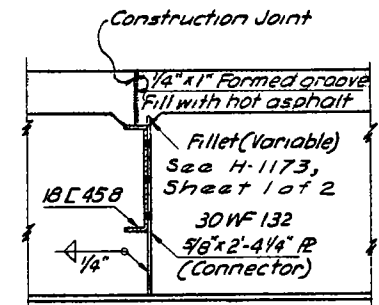
T1 & T3 Bar Projections shown in half plan above
E Bars ~ Field splicing details in curb
R Bars ~ Field splicing details in rail



PART ELEVATION
Showing C Bar Spacing



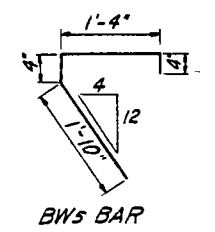
SECTION D-D



SECTION A-A

BAR LIST				
MARK	NO	SIZE	LENGTH	SHAPE
BW1	40	4	6'-1"	Bent
BW2	40	4	5'-4"	"
BW3	12	4	6'-11"	"
BW4	12	4	6'-2"	"
BW5	44	4	3'-10"	"
BW6	4	5	31'-6"	Str
BW7	12	5	36'-0"	"
BW8	4	5	36'-0"	"
C	298	5	6'-11"	Bent
E	36	5	36'-6"	Str
S1	554	5	31'-6"	Str
T1	106	4	36'-0"	Str
T2	146	5	17'-6"	"
T3	53	4	39'-6"	"
P10	60	5	3'-4"	Bent
P11	4	5	4'-0"	"
P12	64	5	3'-6"	"
P13	68	3	3'-8"	"
P14	60	3	2'-8"	"
RC	222	3	2'-8"	Bent
R	48	5	34'-6"	Str

NOTES
The slab shall be poured in the following sequence:
1 Slab sections 1
2 Slab section 3
3 Slab sections 2 over piers
Each curb shall be placed in one continuous operation. Bevel all exposed edges with 3/4 triangular molding except as shown.
Quantities shown below include handrail end posts.
See Drawing H-0112
For railing details see Drawing H-0112
Designed for 25 #/ft future wearing surface



BENT BAR DETAILS

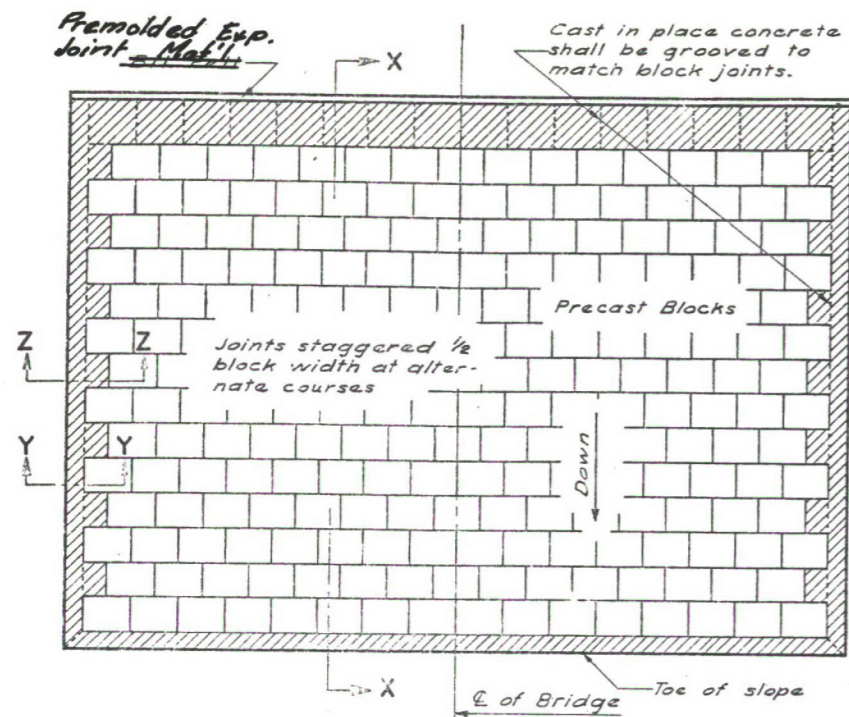
QUANTITIES	
Concrete Class A-1	6.9 Cu Yd
Concrete Class A-1/2	137.5 Cu Yd
Reinforcing Steel	33,132 lb

Includes End Post & Railing Quant
SUPERSTRUCTURE
THREE SPAN
I - BEAM
OVERALL LENGTH 140 FT
H20 S16 LOADING
SHEET 2 OF 2

TRACING CHECKED BY J.C.
 QUANTITIES CHECKED BY M.M.

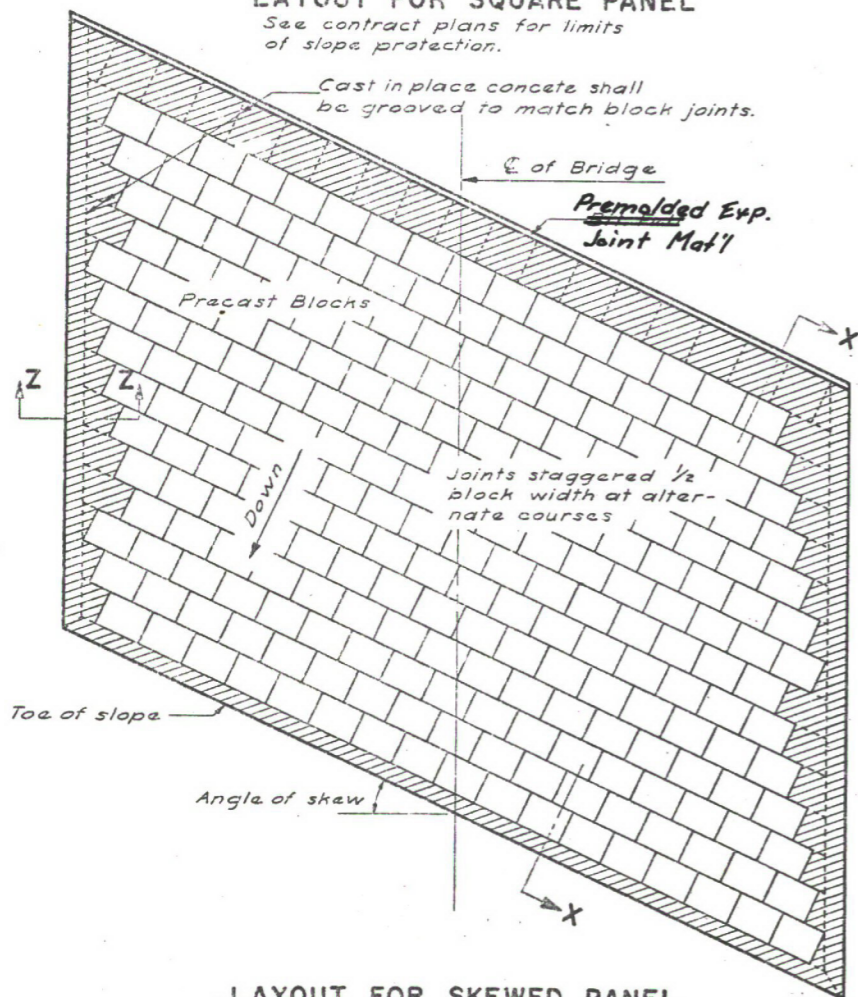
H - 1173 - 2

STANDARD SLOPE PROTECTION UNDER BRIDGES
GROUTED PRECAST CONCRETE BLOCKS



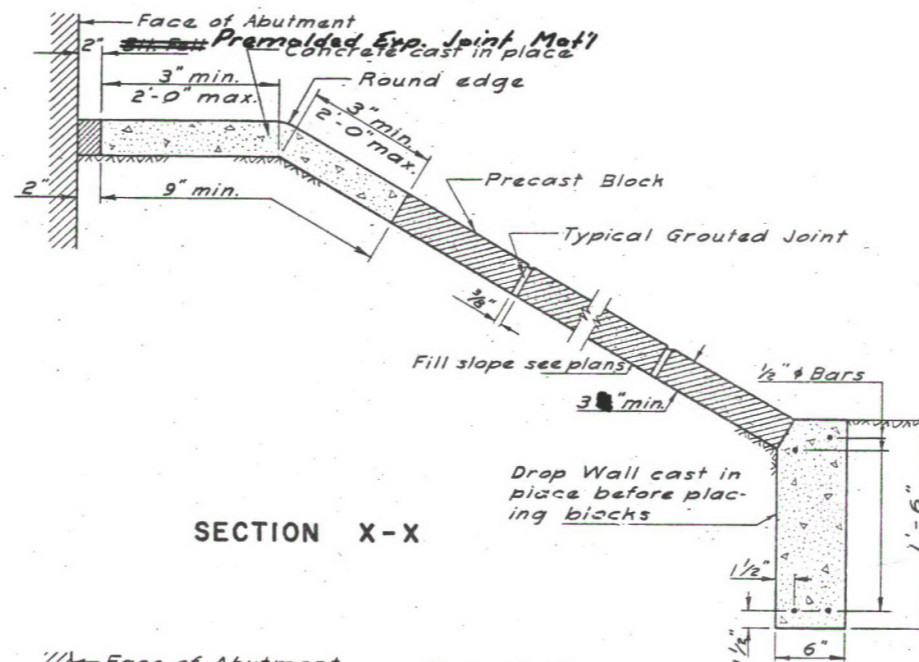
LAYOUT FOR SQUARE PANEL

See contract plans for limits of slope protection.

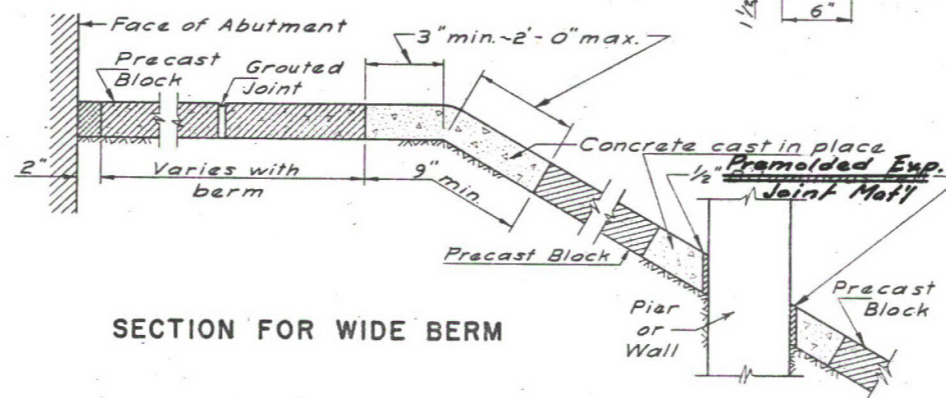


LAYOUT FOR SKEWED PANEL

See contract plans for limits of slope protection & angle of skew.



SECTION X-X



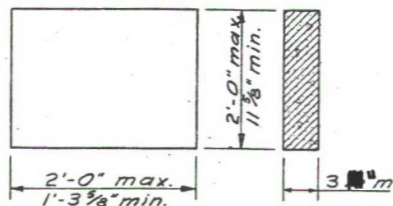
SECTION FOR WIDE BERM

NOTE:

Wherever parts of bridge, such as pier columns or walls, are contacted by the Slope Protection material, 1/2" thick Bituminous Felt Joint Filler shall be provided between contact areas.

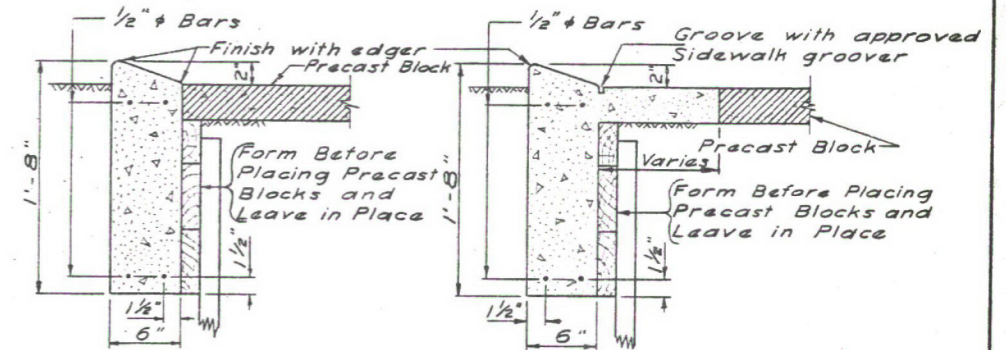
The areas around such piers or walls, where the regular block pattern is interrupted, shall be constructed with cast in place concrete and shall be marked into sections with an approved Sidewalk groover.

Bituminous Felt Joint Filler shall be in accordance with the Standard Specifications for Premolded Expansion Joint Filler For Concrete, AASHTO Designation: M-35.



DETAILS OF PRECAST BLOCKS

1/2" depth grooves to be provided.



SECTION Y-Y

SECTION Z-Z

METHOD OF MEASUREMENT

Slope protection shall be measured by the square foot and the area to be paid for shall include all that area within the outside limits of the concrete edges and bituminous ~~filler~~ without deducting for pier columns or pier walls.

BASIS OF PAYMENT

Slope protection shall be paid for at the contract unit price bid per square foot for Slope Protection. The payment of this price shall be full compensation for furnishing, delivering, and placing all material, for all reinforcing steel, excavations, backfill, preparation of slope surface, form lumber, tools, labor, and all incidentals necessary to complete this item in accordance with the plan and these specifications.

CONSTRUCTION NOTES (cont.)

Test cylinders for determining Compressive strength of the concrete shall be cured along with and under the same curing conditions as for the poured in place concrete or precast concrete blocks. Precast Concrete block joints shall be grout filled, using grout consisting of one part of Portland Cement and two parts of clean sharp sand by volume corrected for moisture.

CONSTRUCTION NOTES

Where applicable, Construction methods shall conform to Section 60 of the N.D.H.D. Standard Specifications.

The contractor will be allowed to cast the slope protection in place, however, when he does this he will be required to groove the finished surface to give the same appearance which would be obtained with the precast blocks. Poured in place concrete slope protection will be required to develop a minimum compressive strength of 3000 ^{psi}/sq.in. in 28 days. The gradation of coarse aggregate shall be optional with the contractor.

Precast Concrete Blocks for slope protection shall develop a minimum compressive strength of 3000 ^{psi}/sq.in. in 28 days. The gradation of coarse aggregate shall be optional with the contractor. All joints between precast blocks shall be grouted and the joints grooved as shown on this sheet. All precast blocks shall be sound and free from cracks or other defects that would interfere with the proper placing of the unit, or impair the strength or permanence of the construction. Only one size of precast block shall be used at a structure location.

The embankment slope to be protected shall conform to the plan cross-section, be free of rubbish, and have all loose material thoroughly compacted.

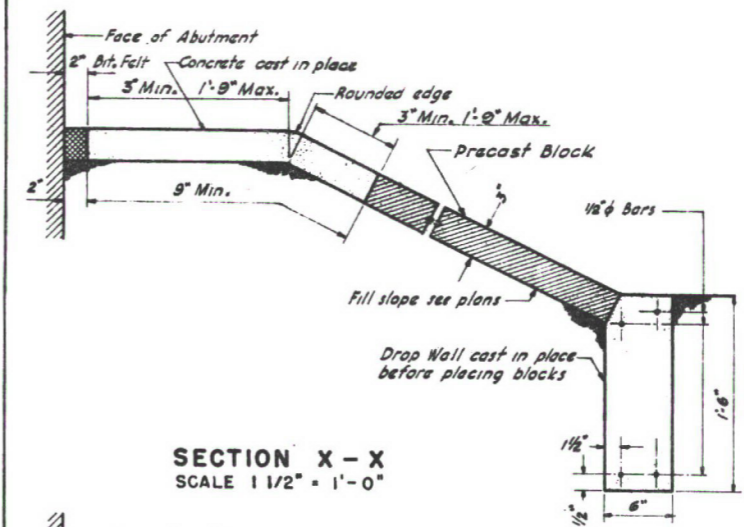
The cast-in-place concrete shown at all edges and around pier columns or walls of the slope protection as detailed on this sheet, shall be provided regardless of which type of slope protection is used. Rectangular shaped blocks shall be placed with the long dimension horizontal.

The adjacent slope areas shall be left in a smooth, uniform condition.

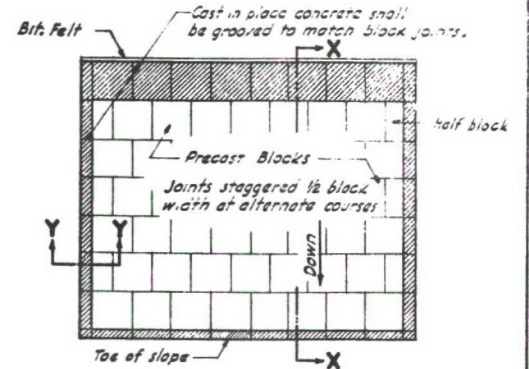
1-20-58
REVISIONS
12-11-59

NORTH DAKOTA
STATE HIGHWAY DEPARTMENT
Submitted: *Joseph R. Kirby*
Bridge Engineer
Recommended: *M. B. Johnson*
Director Staff Division
Approved: *R. Kirby*
Chief Engineer

SLOPE PROTECTION DETAIL

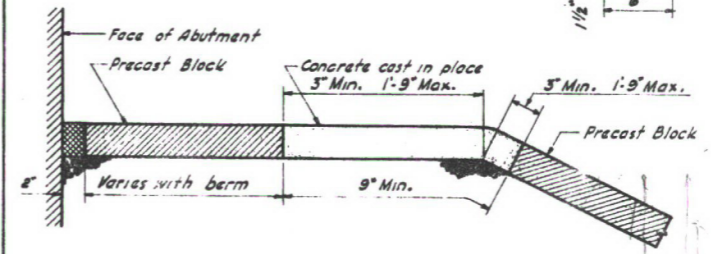


SECTION X - X
SCALE 1 1/2" = 1'-0"

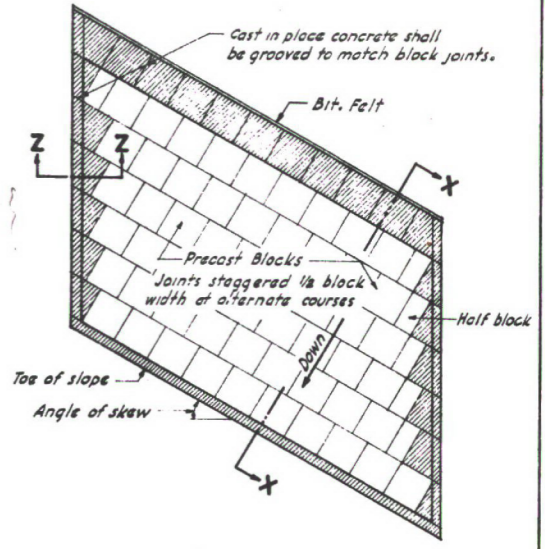


LAYOUT FOR SQUARE PANEL

See contract plans for limits of slope protection.

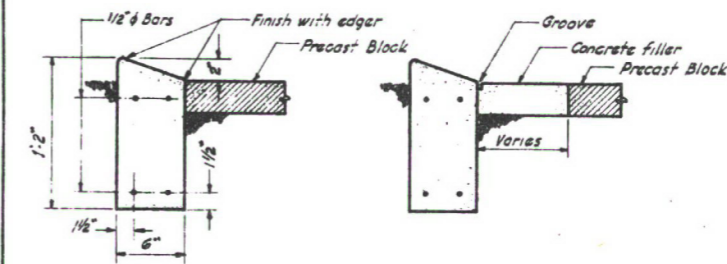


SECTION FOR WIDE BERM
SCALE 1 1/2" = 1'-0"



LAYOUT FOR SKEWED PANEL

See contract plans for limits of slope protection & angle of skew.



SECTION Y-Y
SCALE 1 1/2" = 1'-0"

SECTION Z-Z

METHOD OF MEASUREMENT

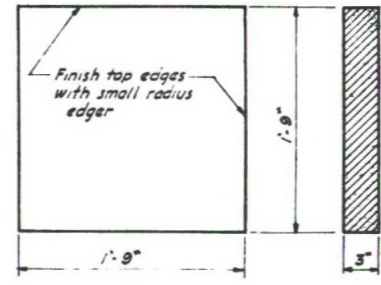
Slope protection block shall be measured by the square foot and shall include all that area within the outside limits of the concrete edges and bituminous felt.

BASIS OF PAYMENT

Slope protection block shall be paid for at the contract price per square foot and shall include all precast block, concrete, reinforcing steel, excavation, bituminous felt and all other materials, equipment, tools, labor and work incidental to construction.

CONSTRUCTION NOTES

Construction methods & materials shall conform to N.D.H.D. specifications Sect. 60. Rounded concrete shall be class A-1 1/2. Precast conc. block shall conform to A.S.T.M specification C 145-52 for group A block. Blocks shall be laid up with dry joints tight & true to line and level with a full bed resulting in a smooth even surface over the entire panel. All joints shall be kept free of earth. Blocks shall be sound & free of chips, cracks, and other blemishes. The slope receiving the panel shall conform to the designated cross section, free of rubbish with all loose material thoroughly compacted.

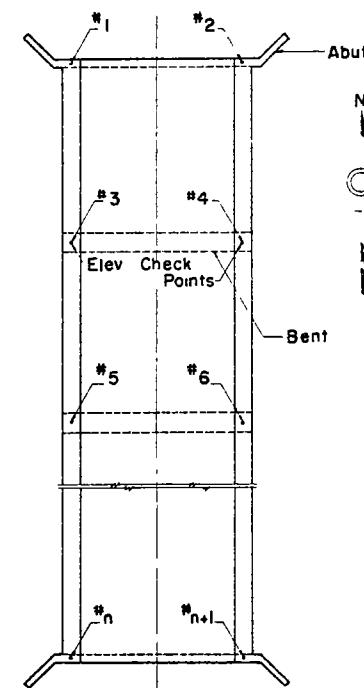
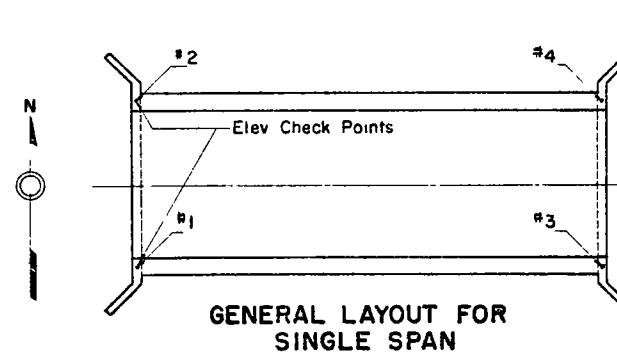


DETAILS OF PRECAST BLOCK
SCALE 1 1/2" = 1'-0"

VOID

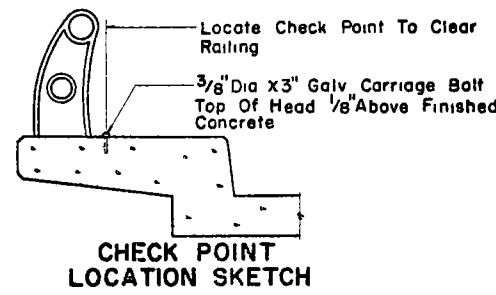
NORTH DAKOTA
STATE HIGHWAY DEPARTMENT
Submitted: *Joseph P. Kirby*
Bridge Engineer
Recommended: *M. J. ...*
Director Staff Division
Approved: *R. ...*
1-20-58 Chief Engineer

BRIDGE BENCH MARKS

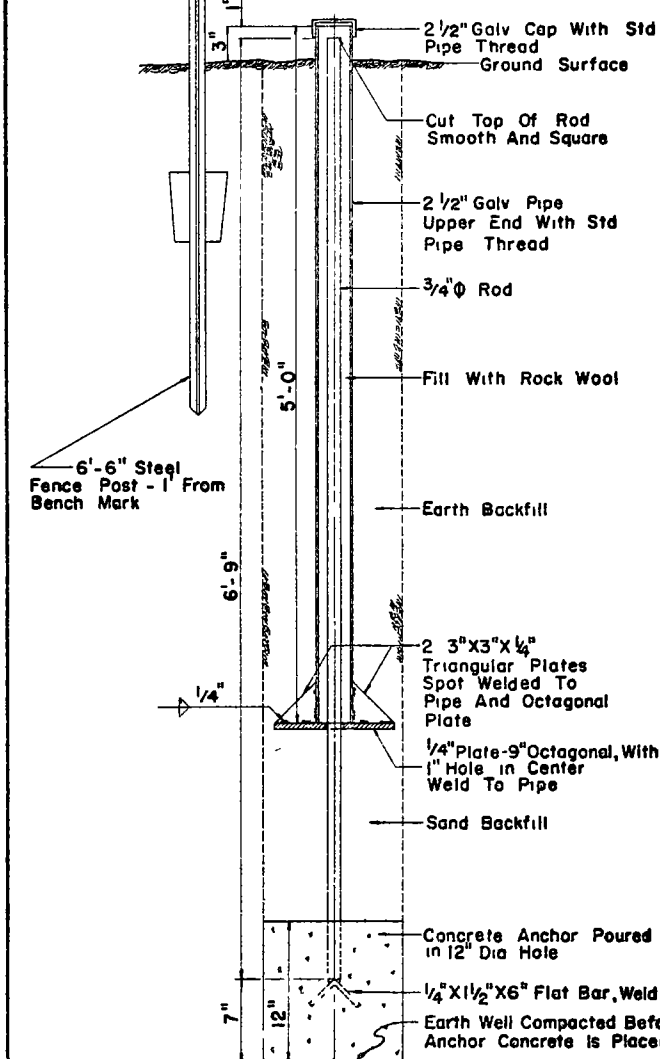


GENERAL LAYOUT FOR SINGLE SPAN

GENERAL LAYOUT FOR MULTIPLE SPAN



CHECK POINT LOCATION SKETCH



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.

NORTH DAKOTA
STATE HIGHWAY DEPARTMENT
Submitted *Joseph R. Turley*
Bridge Engineer
Recommended *[Signature]*
Director Staff Division
Approved *[Signature]*
Chief Engineer
Date 3-3-58 Revised 6-9-58

A B C D E F G H I J K L M N O
 P Q R S T U V W X Y Z
 1 2 3 4 5 6 7 8 9 0
 1 2 3 4 5 6 7 8 9 0 ^{5/8}

Note All dimensions for 3/4 inch letters and numbers shall be in direct proportion to those shown above for the 1 inch high letters and numbers

LETTERS FOR BRIDGE NAME PLATES

NOTES

Federal Aid Project name plates shall be installed in the locations designated on the Structure layout sheet

The Federal Aid Project number, Bridge number, and date to be shown on the name plate shall be as indicated on the structure layout sheet

Name plates shall be cast of bronze composed of the following materials

- Copper - 84-8C%
- Tin - 4-6%
- Lead - 4-6%
- Zinc - 4-6%

Lettering shall be approximately 3/16" above the surface of the plate and shall conform to the type and spacing shown 'Name Plate Condensed' pattern letters as manufactured by Mellin Co. or approved equal may be used if desired. Vertical and horizontal spacing shall be kept in proportion to the spacing shown

The top surface of the letters and frame shall be burnished. The background of the plate shall have a deep brown oxidized finish

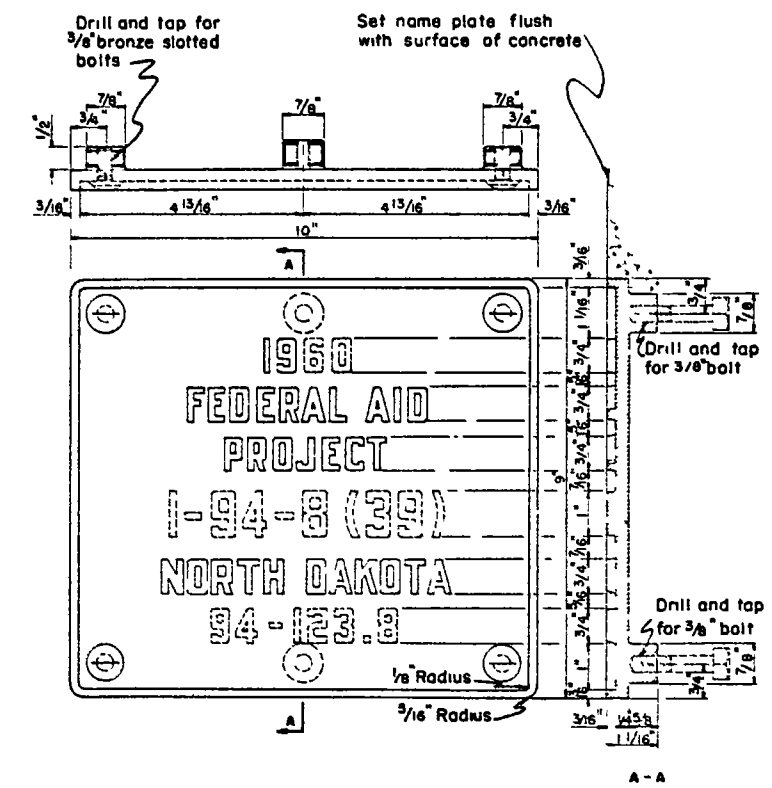
The draft on the letters shall be not more than 3° in 12"

Letters and numbers shall conform to those shown. Furnish two steel bolts 3/8" x 3" long and four bronze bolts 3/8" x 3/4" long with each plate. The bronze bolts shall have slotted heads. The four corner bolt holes are to be used to fasten the plate to the forms during construction. After the forms have been removed the four bronze bolts shall be used to fill the four bolt holes

A rubbed proof of the patterns shall be submitted to the North Dakota State Highway Department for approval before the name plates are cast

Unless otherwise noted on the structure layout sheet two (2) Federal Aid Name Plates will be required at each structure location

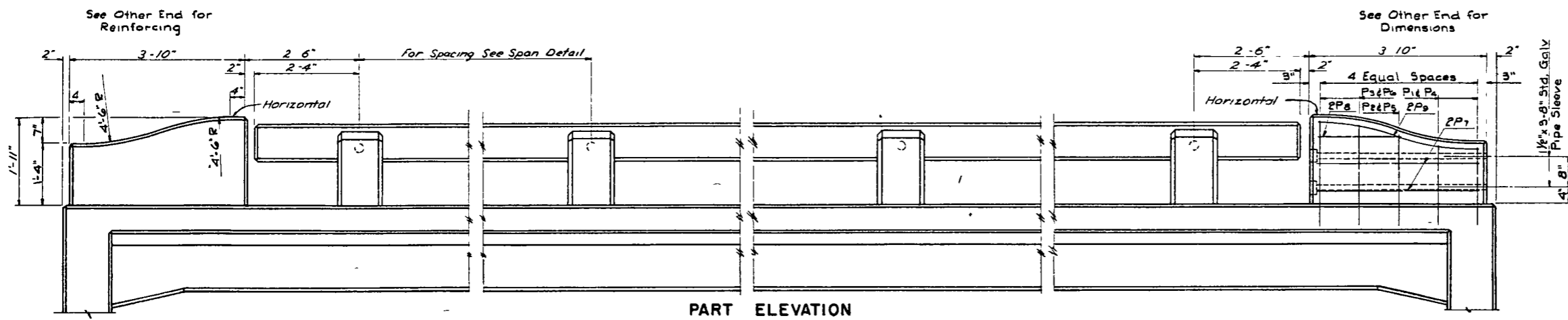
The cost of furnishing and installing name plates, steel and bronze bolts, as described on this sheet, shall be included in the unit price bid for the several pay items



FEDERAL AID NAME PLATE

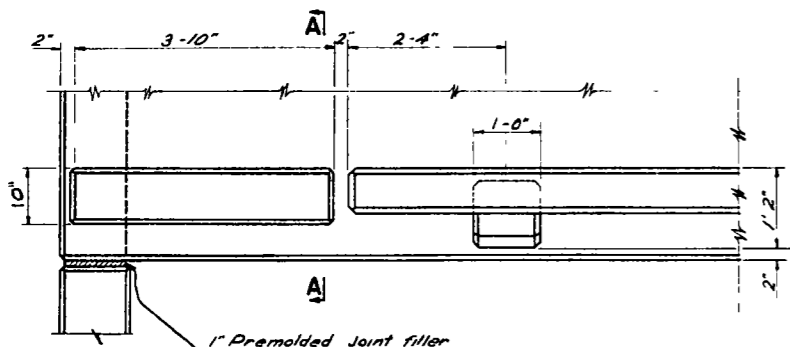
NORTH DAKOTA
 STATE HIGHWAY DEPARTMENT
 Submitted *Joyce O. Kirby*
 Bridge Engineer
 Recommended *W. J. Weese*
 Director Staff Division
 Approved *W. J. Weese*
 Acting Chief Engineer
 Date 3-24-58

Revised 7-10-59
 Revised 4-30-59
 Revised 4-7-58

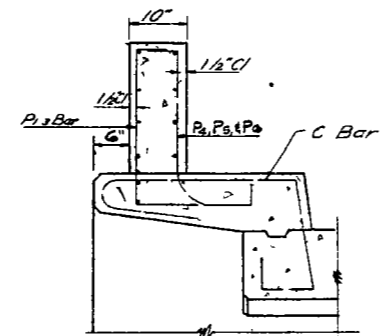


PART ELEVATION

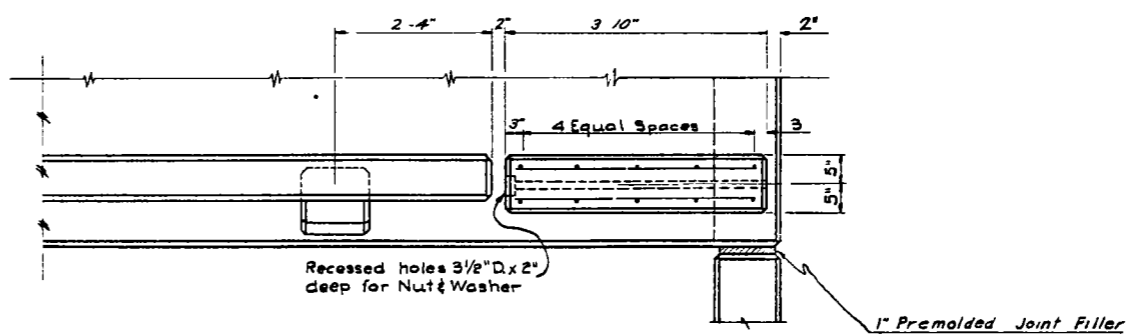
NOTES:
 All concrete above top of curb shall be Class A-1 except concrete end posts.
 "Rubbed Surface Finish" will be required for the roadway faces of curbs, the outside vertical faces of curb and slab, and all faces of rails, intermediate and end posts. All other surfaces shall be given the "Ordinary Surface Finish"



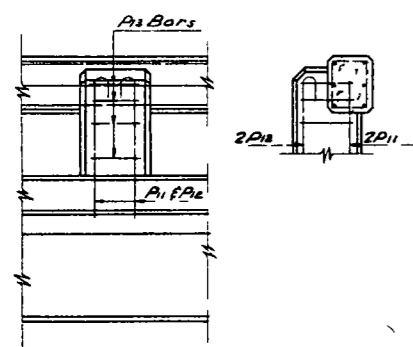
PART PLAN



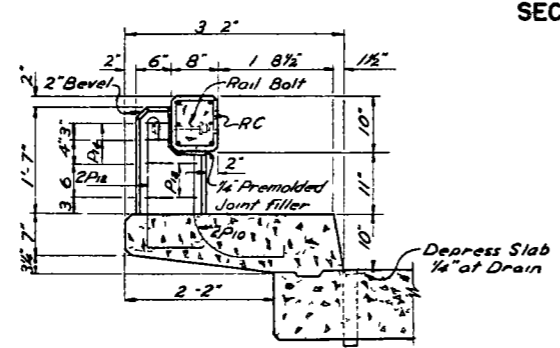
SEC. A-A



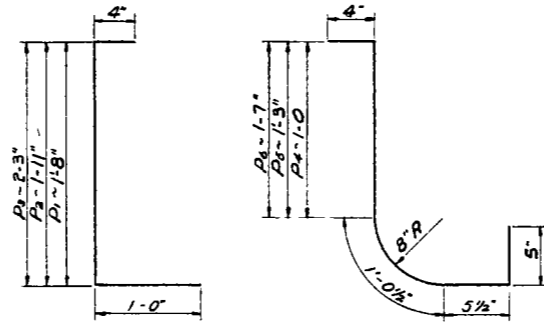
PART PLAN



ANCHOR POST DETAIL
See Layout For Placement



TYPICAL SECTION



BENT BAR DETAILS FOR END POSTS

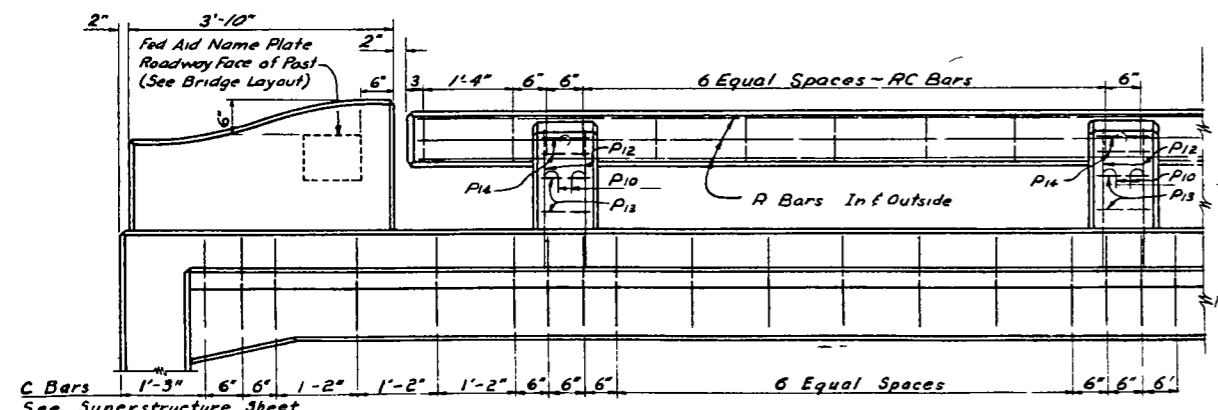
BAR LIST (BARS FOR RAILING AND POSTS)				
MARK	NO	SIZE	LENGTH	SHAPE
P10	*	5	3'-4"	Bent
P11	*	5	4'-0"	Bent
P12	*	5	3'-6"	Bent
P13	*	3	3'-8"	Bent
P14	*	3	2'-8"	Bent
RC	*	3	2'-8"	Bent
PX**	**	5	*	Str

* Number of bars shown on Superstructure Sheet
 ** Number Length & Splicing information of R bars shown on Superstructure Sheet

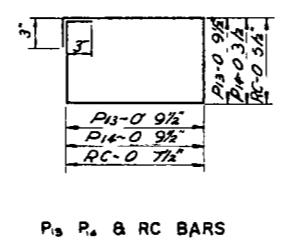
BAR LIST (4 END POSTS)				
MARK	NO	SIZE	LENGTH	SHAPE
P1	8	5	3'-0"	Bent
P2	4	5	3'-3"	-
P3	8	5	3'-7"	-
P4	8	5	3'-3"	-
P5	4	5	3'-6"	-
P6	8	5	3'-10"	-
P7	16	4	3'-6"	Str
P8	8	4	1'-9"	Str
P9	8	5	3'-9"	Field Bend

QUANTITIES - 4 END POSTS
 Concrete Class A-1 1/2 0.8 Cu Yd
 Reinforcing Steel 221 Lbs

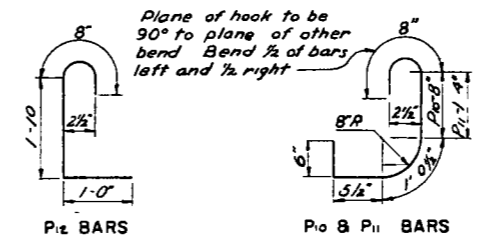
* Railing and end post quantities are included in slab quantities on Superstructure Sheet



HAND RAIL DETAILS



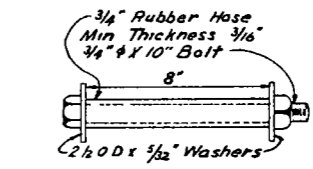
P3, P4 & RC BARS



P12 BARS

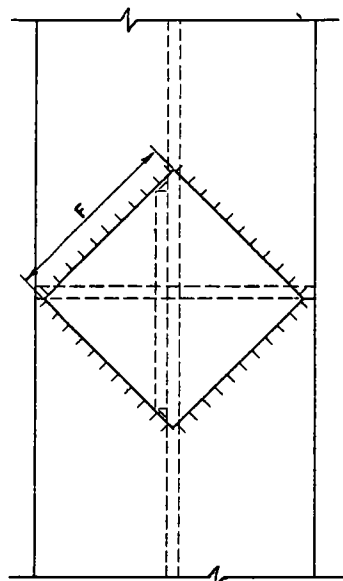
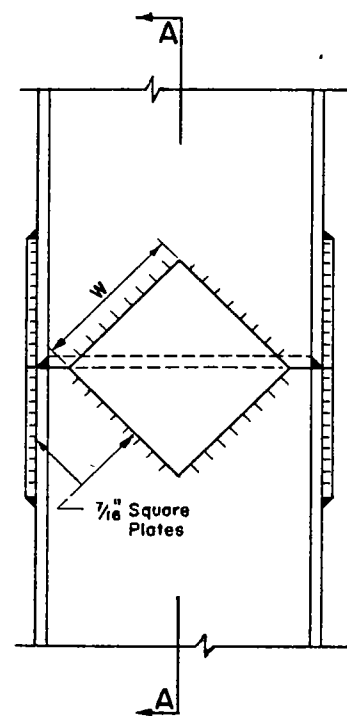
P10 & P11 BARS

BENT BAR DETAILS FOR RAILING POSTS & RAILING

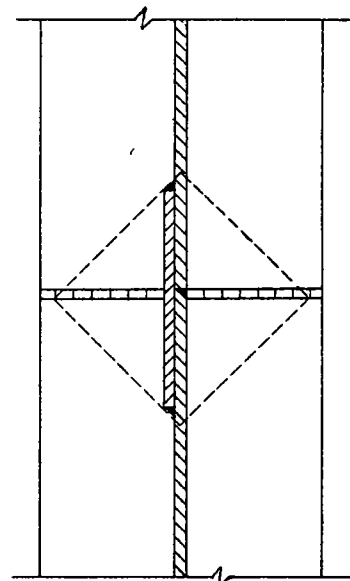


RAIL BOLT
(Galvanized)
(To be included in the unit price bid for Class A 1/2 Concrete)

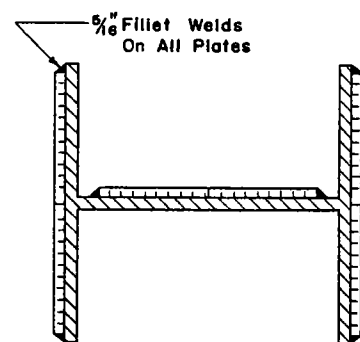
**STANDARD RAILING
DETAILS**



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

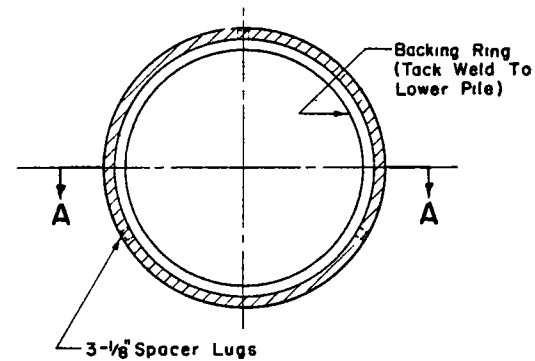


A-A

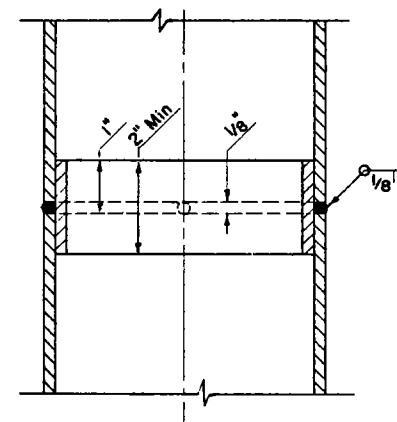


H-PILE SPLICE DETAIL

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

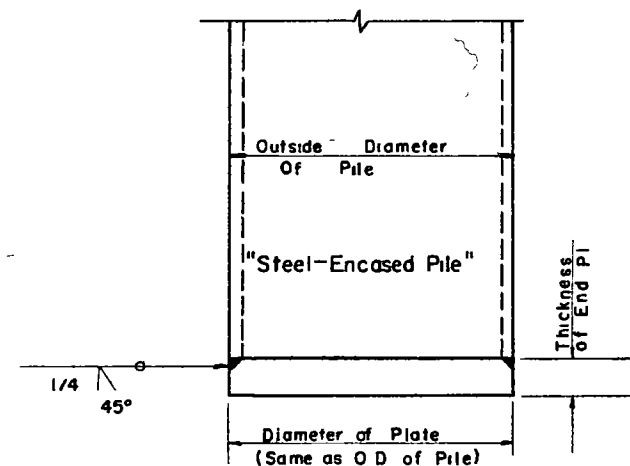


Backing Ring may be made from pile cut-offs or other material of a like quality.



A-A

SHELL PILE SPLICE DETAIL

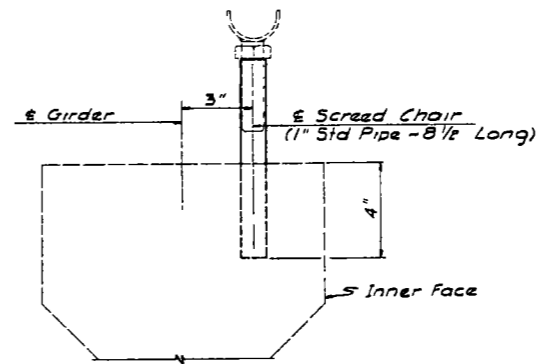


END PLATE DETAIL

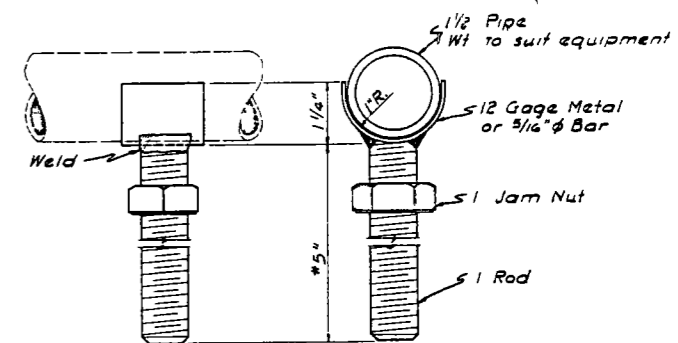
All welding shall conform to the current specification for "Welded Highway and Railway Bridges of the American Welding Society". Backing rings and welding will not be paid for directly, but shall be included in the unit price bid for steel piles.

MADE BY
CHECKED BY
QUANTITIES

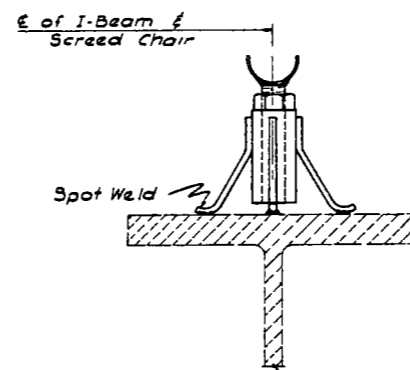
H-0401



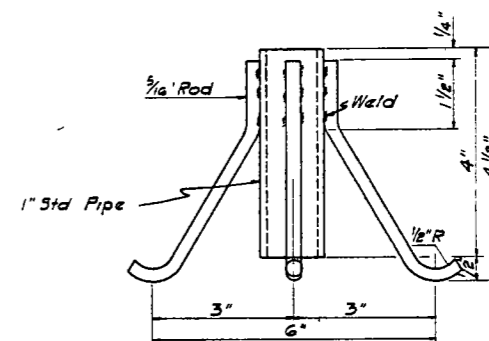
SCREED CHAIR IN PRESTRESSED GIRDER
(Outside Girders Only)



ADJUSTABLE SCREED HOLDER
**Useable with slab thickness of 7" or less for greater slab thickness adjust length accordingly.*



I-BEAM WITH SCREED CHAIR



SCREED CHAIR*

NOTES

The spacing of screed chairs shall be such that no noticeable deflection occurs in the screed when the vibrating strike-off is in operation. Chairs shall be similarly placed for all screeds on the same bridge span with a maximum spacing of three feet when using 1 1/2" extra strong pipe for a screed. Screeds shall be set on outer beams and also on intermediate beams if necessary to maintain the required template.

The cost of the screed chairs and holders shall be included in the unit price bid for the various pay items. Upon completion of the project the screed and screed holders shall remain the property of the Contractor.

The design shown for the screed chairs and seat may be varied slightly to suit manufacturers products if approved by the Engineer.

NORTH DAKOTA
STATE HIGHWAY DEPARTMENT
**SCREED CHAIR
AND
ADJUSTABLE SCREED
HOLDER**
APPROVED
1-6-59
DATE
Joseph P. Kahan
BRIDGE ENGINEER