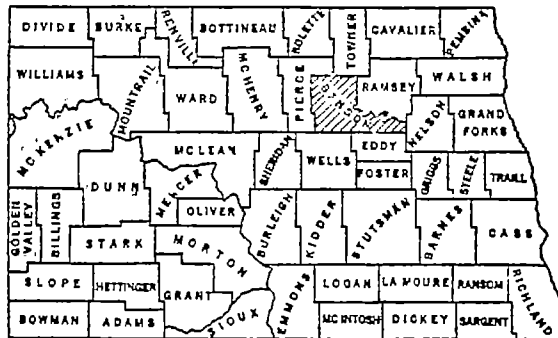
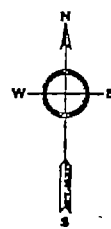




SKETCH-MAP OF NORTH DAKOTA
SHOWING COUNTIES



SCALES

LAYOUT SHEET	1 IN = 1000'
PLAN AND PROFILE DRAWINGS	1 IN = 100'
STRUCTURAL DRAWINGS	1 IN = 20'
CROSS SECTION SHEETS	1 IN = 10'

NORTH DAKOTA STATE HIGHWAY DEPARTMENT

PLANS

FOR THE PROPOSED IMPROVEMENT OF A

STATE HIGHWAY

IN BENSON COUNTY

FEDERAL AID SECONDARY PROJECT NO. S-291(7)
GRADE, GRAVEL AND STRUCTURE

INDEX OF DRAWINGS

SHEET NO	TITLE PAGE
1	TYPICAL SECTIONS & SUMMARY OF QUANTITIES
2	CULVERT AND BRIDGE LIST
3	TO 28 INCL. PLAN AND PROFILE DRAWINGS
4	TO 36 INCL. STRUCTURAL DRAWINGS
29	TO 36 INCL. SOIL PROFILE
37	TO 37 INCL. CROSS SECTIONS

LENGTH OF PROJECT

PROJECT MILES-GROSS	MILES-NET
S-291(7) 12.881	12.281
TOTALS	12.881 12.281

GOVERNING SPECIFICATIONS

Standard Specifications adopted by the North Dakota State Highway Department Jan 1936 and approved as standard by the Bureau of Public Roads May 7, 1936 Required Special Provisions dated June 13, 1939 and approved by the Bureau of Public Roads July 8, 1939 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.

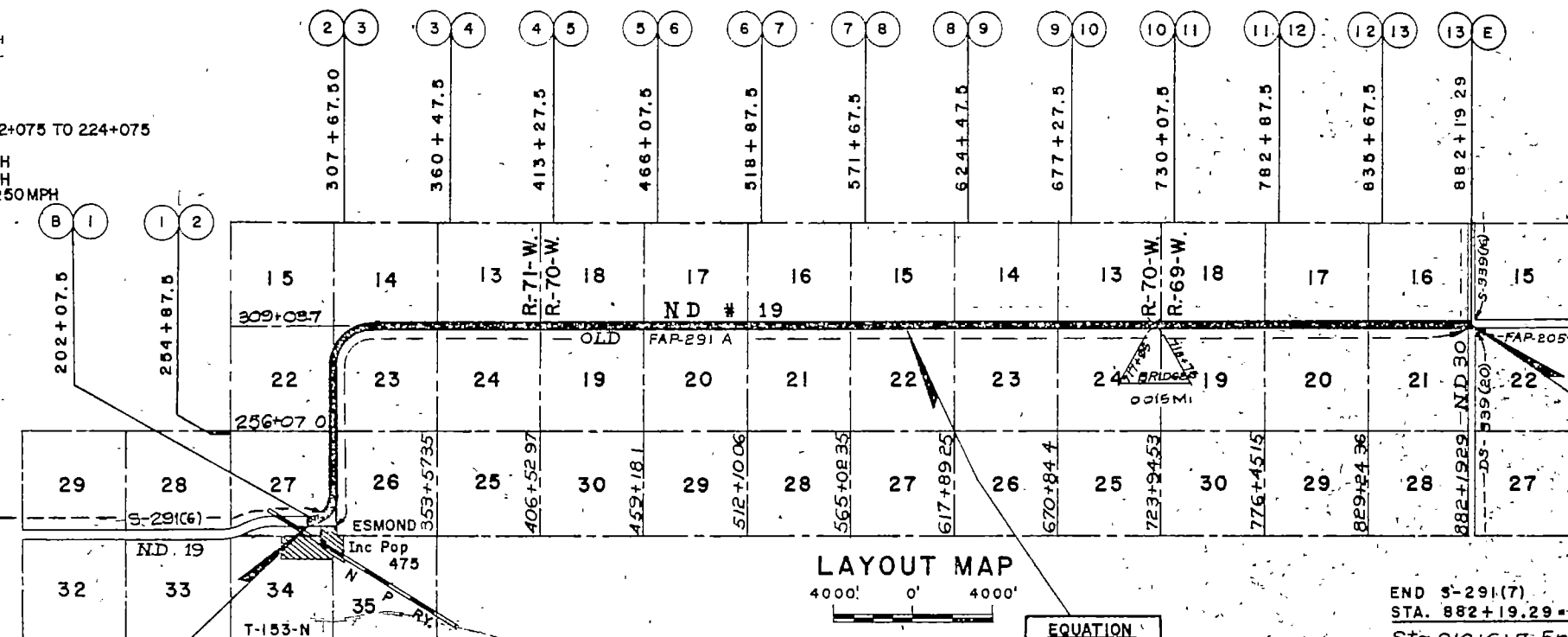
CURRENT TRAFFIC (1960) 225 PASS 75 TRUCKS 300 TOTAL 39
TRAFFIC FORECAST (1980) 450 PASS 150 TRUCKS 600 TOTAL 78

DESIGN SPEED 60 MPH (50 MPH) STA 202+07.5 TO 224+07.5

TRAFFIC CLASSIFICATION "M"

MINIMUM SIGHT DISTANCE (NON PASSING) 475' @ 60 MPH - 350' @ 50 MPH
MINIMUM SIGHT DISTANCE (SAFE PASSING) 2300' @ 60 MPH - 1600' @ 50 MPH
MINIMUM PASSING SIGHT DISTANCE FOR MARKING 1000' @ 60 MPH - 800' @ 50 MPH

BRIDGES Design loading H20S16 (57)
Min Width 30 Ft



LAYOUT MAP

4000' 0' 4000'

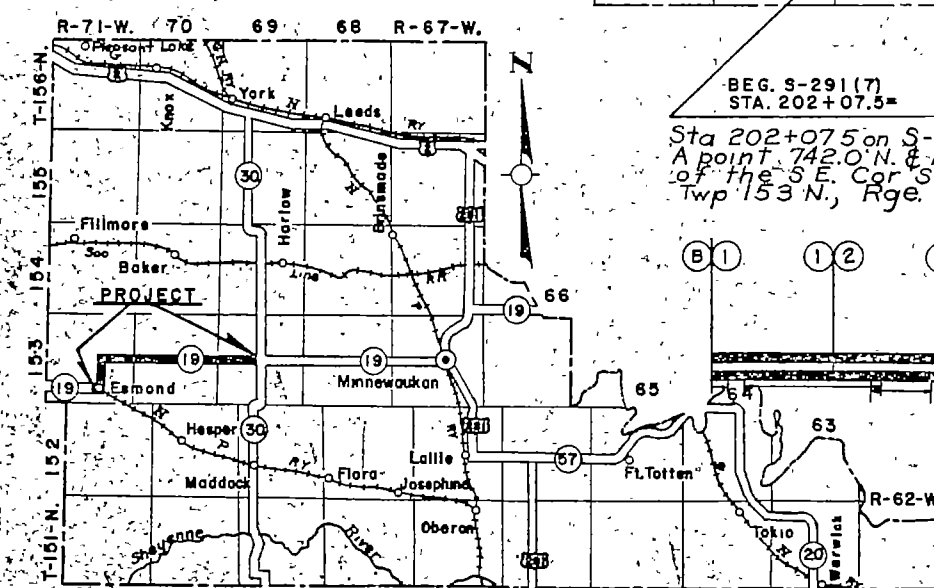
SCALE IN FEET

EQUATION
592+86.88 BK+
592+85.0 AHD

END S-291(7)
STA. 882+19.29

Sta 910+61.7 End old FAP 291
Sta 0+00 Beg. FAP 205
Sta 896+236 End DS 339(20)
Sta 896+236 Beg S-339(16)

A point at the N.E. Cor. of
Sec 21, Twp. 153 N., Rge. 69 W.



SKETCH MAP OF BENSON COUNTY

SIGHT DISTANCE DIAGRAM

LEGEND

PASSING ZONES	(1000' Min S.D.) 60MPH
NON PASSING ZONES	(800' " " " 60MPH
SAFE PASSING SECTIONS	(2300' Min S.D.) 60MPH
	(1600' " " " 60MPH

APPROVED DATE 1-4-60

R. H. Bradley

CHIEF ENGINEER
NORTH DAKOTA STATE
HIGHWAY DEPARTMENT



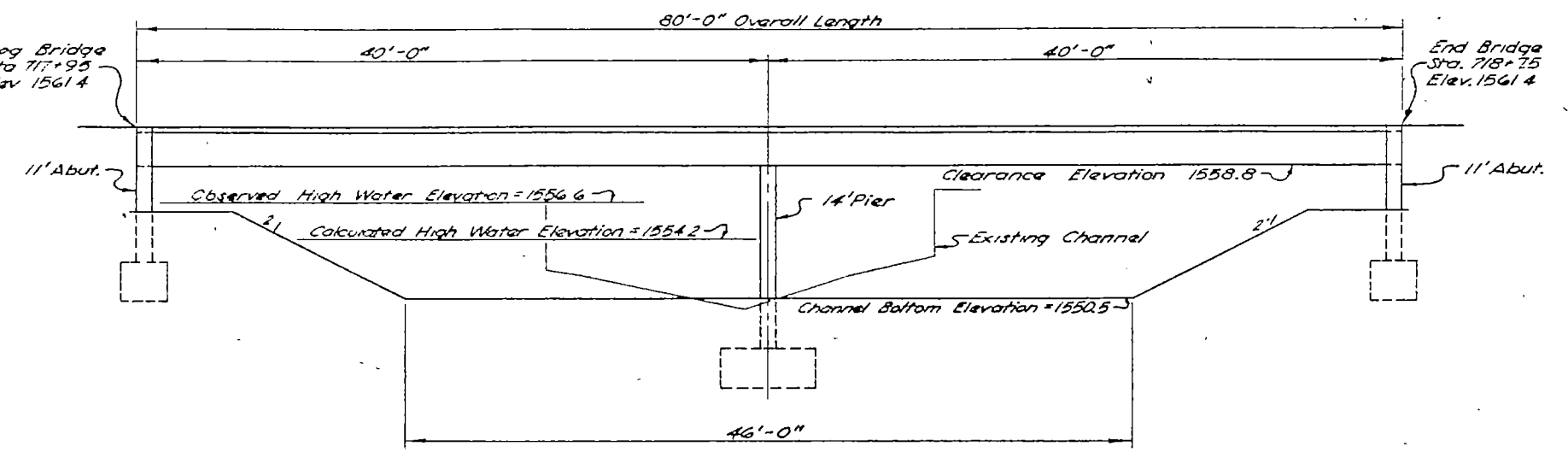
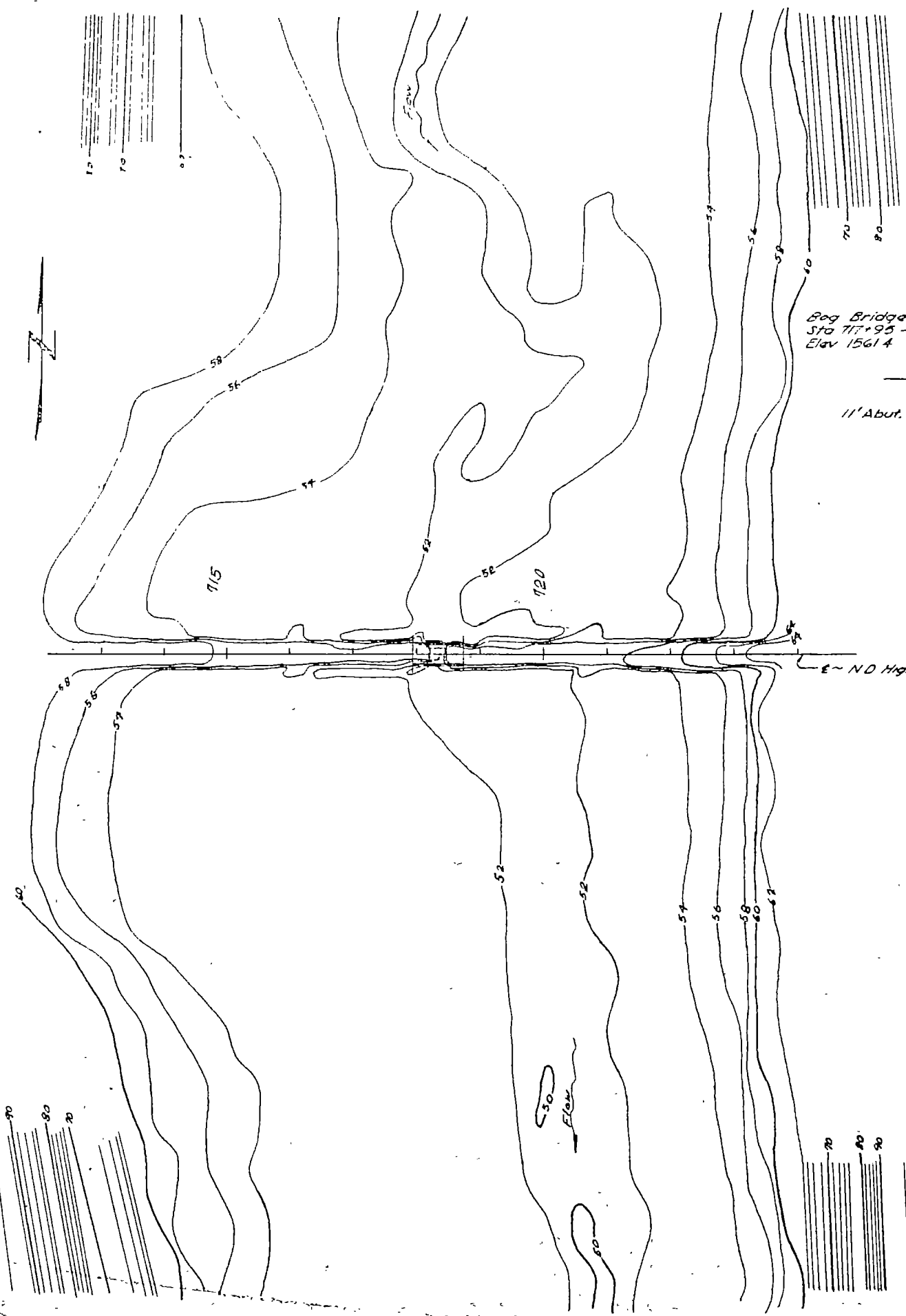
DEPARTMENT OF COMMERCE
BUREAU OF PUBLIC ROADS

APPROVED:

DIVISION ENGINEER DATE

S-291(7)

NO.	DESCRIPTION	DATE
1	DESIGN	10/1/51
2	CONSTRUCTION	10/1/51
3	REVISION	10/1/51
4	REVISION	10/1/51
5	REVISION	10/1/51
6	REVISION	10/1/51
7	REVISION	10/1/51
8	REVISION	10/1/51
9	REVISION	10/1/51
10	REVISION	10/1/51
11	REVISION	10/1/51
12	REVISION	10/1/51
13	REVISION	10/1/51
14	REVISION	10/1/51
15	REVISION	10/1/51
16	REVISION	10/1/51
17	REVISION	10/1/51
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21	REVISION	10/1/51
22	REVISION	10/1/51
23	REVISION	10/1/51
24	REVISION	10/1/51
25	REVISION	10/1/51
26	REVISION	10/1/51
27	REVISION	10/1/51
28	REVISION	10/1/51
29	REVISION	10/1/51
30	REVISION	10/1/51



ELEVATION OF PROPOSED BRIDGE
SCALE: 1"=5'

HYDRAULIC DESIGN DATA

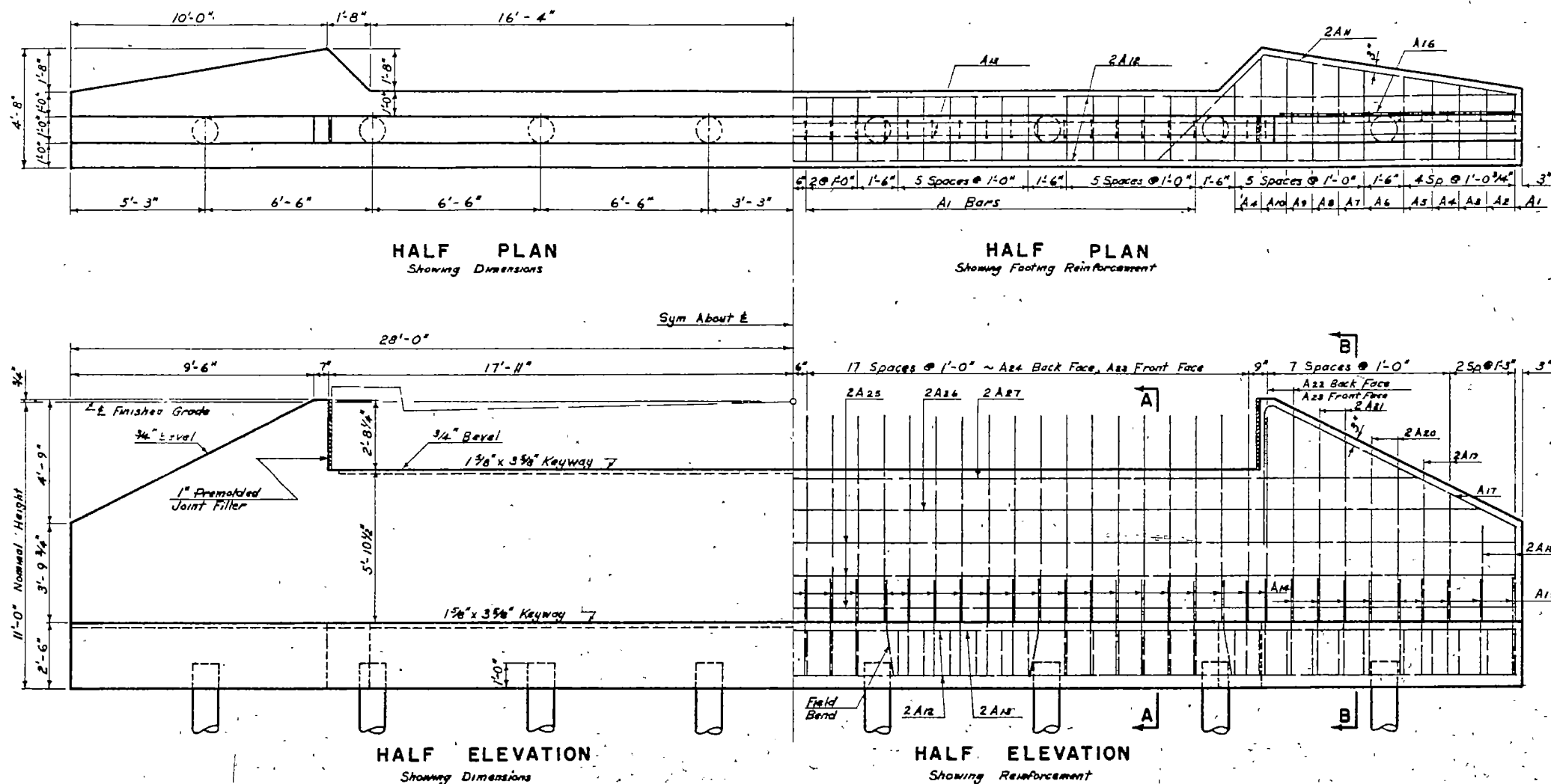
DRAINAGE AREA	45 SQ. MI.
DESIGN FREQUENCY	25 YR.
DESIGN DISCHARGE	955 C. F. S.
STREAM GRADIENT	0.000732 FT./FT.
STREAM VELOCITY	1.04 FT./SEC.
VELOCITY UNDER BRIDGE	4.92 FT./SEC.
DEPTH OF FLOW	3.7 FT.
WATERWAY REQUIRED (PROVIDED BELOW HIGH WATER)	194 SQ. FT.
WATERWAY PROVIDED BELOW CLEARANCE	524 SQ. FT.
FREEBOARD PROVIDED	4.6 FT.
LOW WATER ELEVATION	DRY INTERMITTENTLY

BRIDGE NO. 19-1
BIG COULEE BRIDGE
TOPOGRAPHIC LAYOUT
PROJ. S-291(7) STA. 718+35
BENSON COUNTY

SCALE: 1"=100'



DESIGN	MADE BY	CHECKED BY	DATE
DETAILS	CEG	GFE	
TRACING	CEG	GFE	
QUANTITIES	CEG	GFE	



PROJ. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	ND	5291(7)		32	75

BAR LIST - ONE ABUT.					
MARK	NO	SIZE	LENGTH	SHAPE	
A1	32	4	9'-6"	Bent	
A2	2	4	9'-10"	"	
A3	2	4	10'-2"	"	
A4	4	4	10'-6"	"	
A5	2	4	11'-0"	"	
A6	2	4	11'-4"	"	
A7	2	4	11'-8"	"	
A8	2	4	12'-0"	"	
A9	2	4	12'-4"	"	
A10	2	4	12'-2"	"	
A11	4	6	15'-6"	"	
A12	8	8	29'-9"	Str	
A13	4	4	29'-0"	"	
A14	38	4	8'-0"	Bent	
A15	18	5	4'-9"	"	
A16	2	4	9'-0"	Str	
A17	4	6	14'-9"	Bent	
A18	8	4	3'-9"	Str	
A19	8	4	3'-0"	"	
A20	8	4	6'-0"	"	
A21	8	4	7'-0"	"	
A22	4	5	8'-0"	"	
A23	40	4	8'-0"	"	
A24	36	4	5'-6"	"	
A25	12	4	28'-9"	"	
A26	4	4	27'-8"	"	
A27	4	6	25'-5"	"	

NOTES:
A12-13-25-26-27 Bars are spliced on E.

QUANTITIES	
Concrete Class A-1 1/2	296 CY
Reinforcing Steel	2501 LB
Piling (See Layout)	
Excavation (See Layout)	

11' ABUTMENT
FOR T-BEAM SPANS
30' ROADWAY

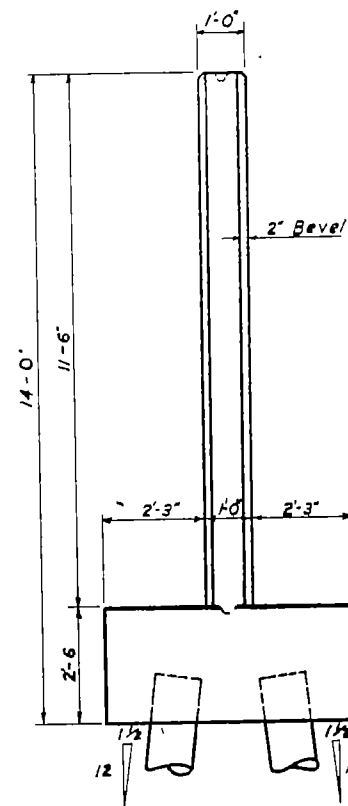
H-3229

H-3229

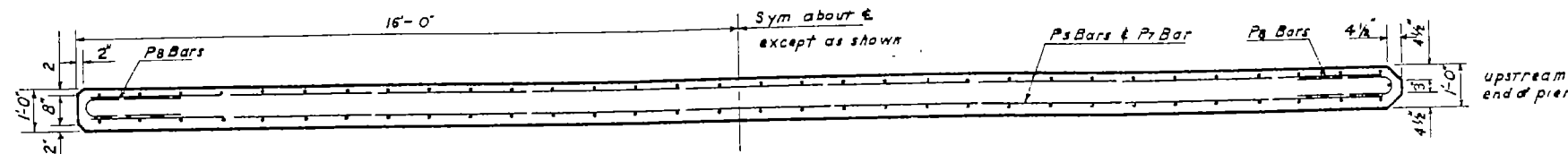
DESIGN	MADE BY	CHECKED BY	DATE
DETAILS	U/G	U/G	
TRACING	U/G	U/G	
QUANTITIES	U/G	U/G	

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	ND	529(7)		33	75

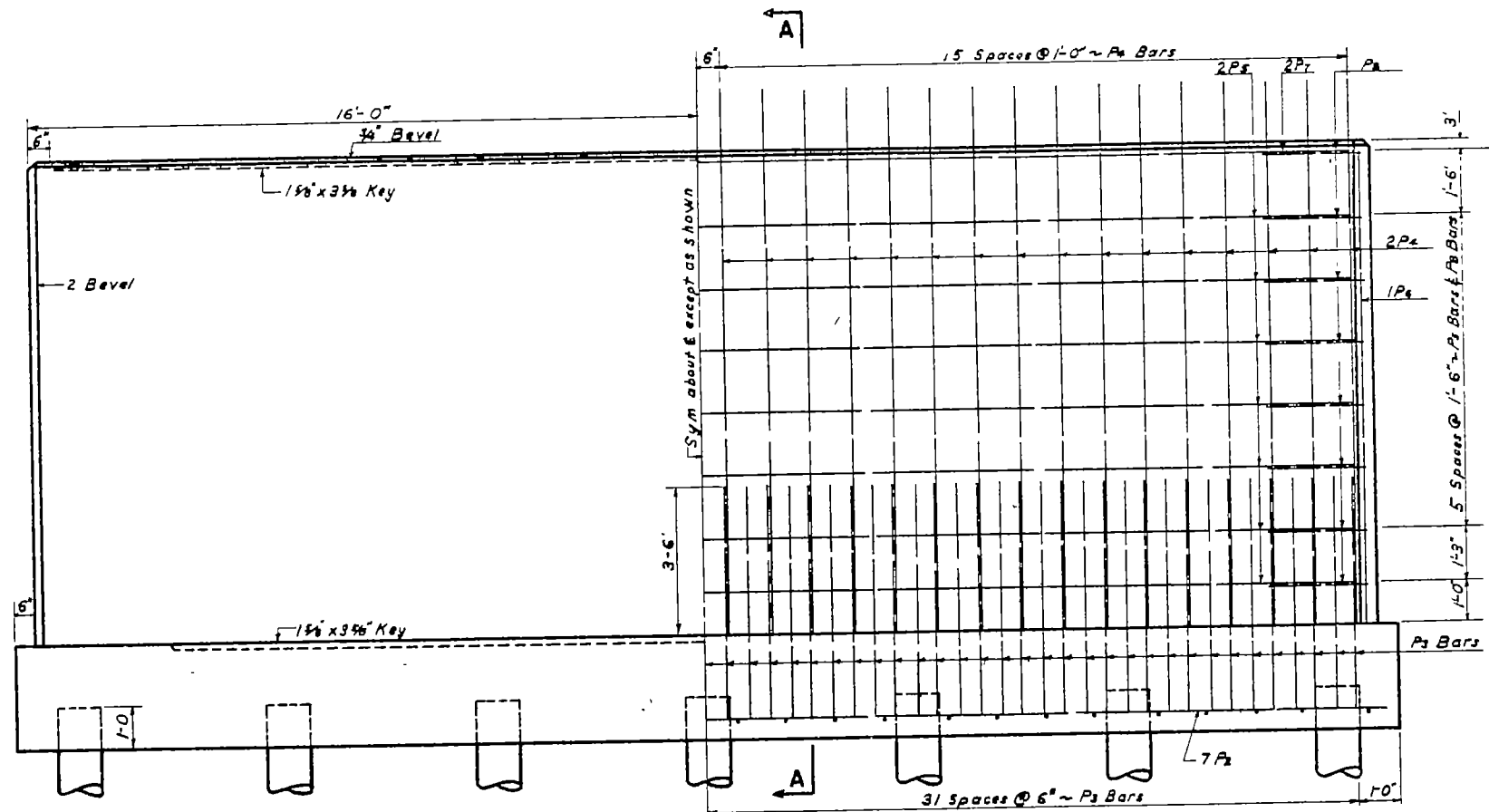
BAR LIST (ONE PIER)					
MARK	NO	SIZE	LENGTH	SHAPE	
P1	26	5	6'-3"	Bent	
P2	7	8	32'-6"	STP	
P3	53	7	11'-3"	Bent	
P4	54	8	13'-0"	STP	
P5	14	4	31'-9"	STP	
P6	1	8	11'-3"	STP	
P7	2	8	31'-3"	STP	
P8	18	4	4'-9"	Bent	



END VIEW



TOP VIEW

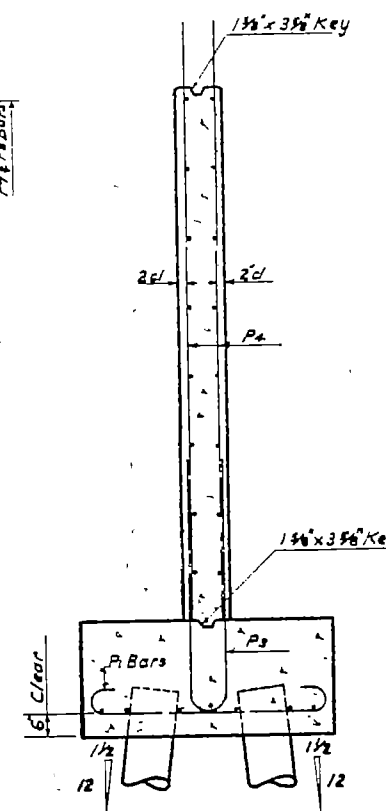


HALF ELEVATION

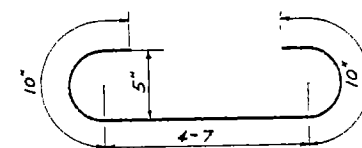
Showing Dimensions

HALF ELEVATION

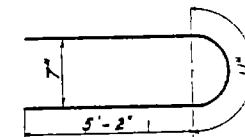
Showing Reinforcing



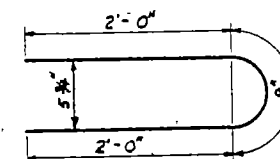
A-A



P1 BAR

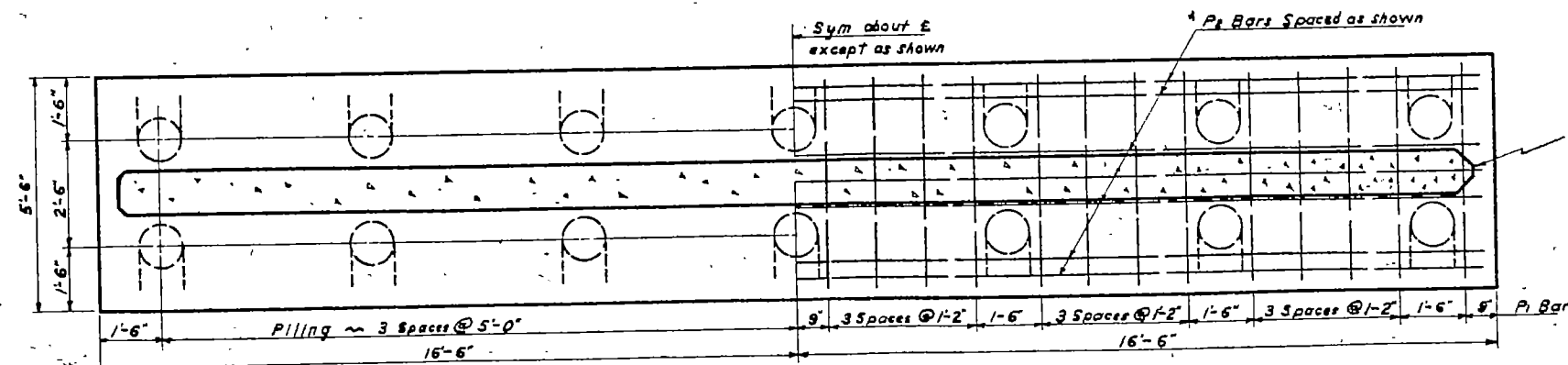


P3 BAR



P8 BAR

BENT BAR DETAILS



HALF FOOTING PLAN

Showing Dimensions

HALF FOOTING PLAN

Showing Reinforcing

QUANTITIES (ONE PIER)	
Concrete Class A-1/4	29.9 CY
Reinforcing Steel	3930 lb
Piling (See Layout)	
Excavation (See Layout)	

14'-0" PIER
FOR T-BEAM SPANS
30' ROADWAY

H-3329

H-3329

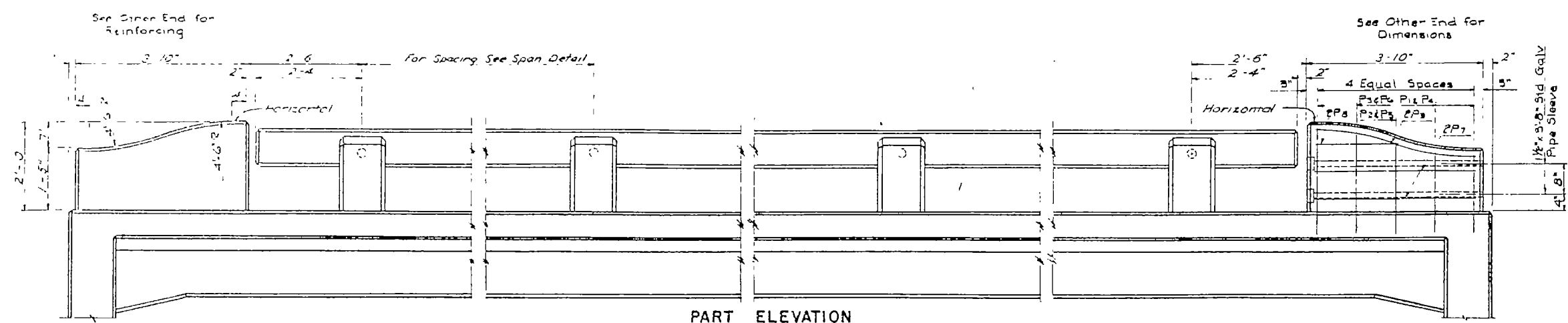
Has. S. Loading (1957)
Dec. 1959

FED. ROAD DIV. NO.	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS
5	N.D.	529(7)	34	75

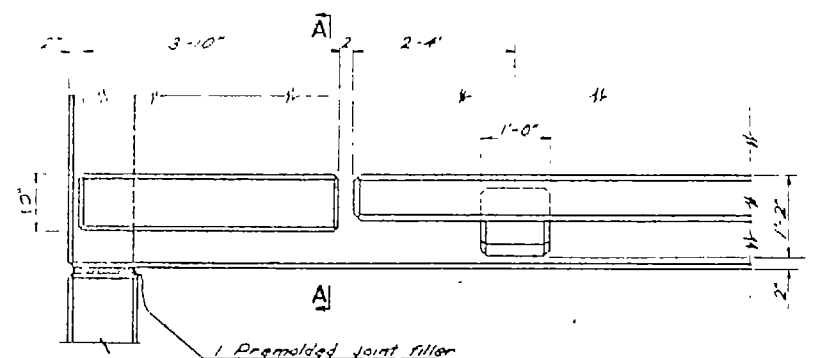
NOTES:

All concrete above top of curb shall be Class A-1 except concrete end posts.

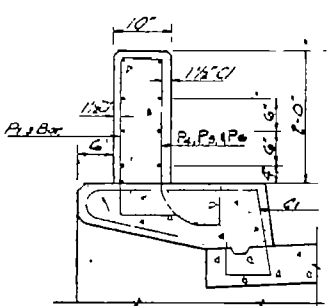
"Rubbed Surface Finish" will be required for the roadway faces of curbs, the outside vertical faces of curb and slab, and all faces of rails, intermediate and end posts. All other surfaces shall be given the "Ordinary Surface Finish"



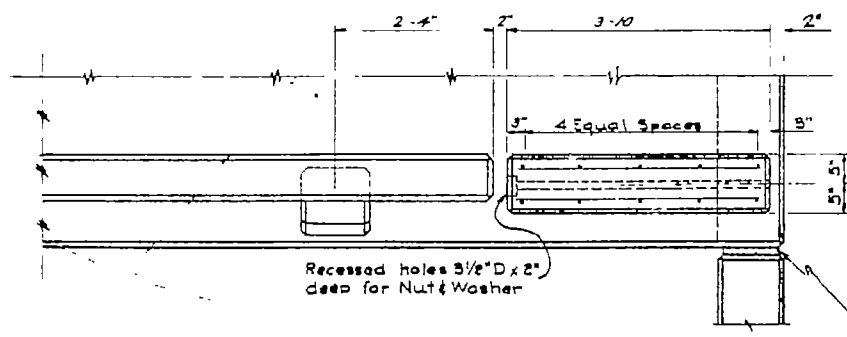
PART ELEVATION



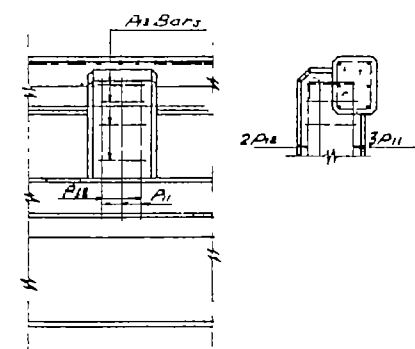
PART PLAN



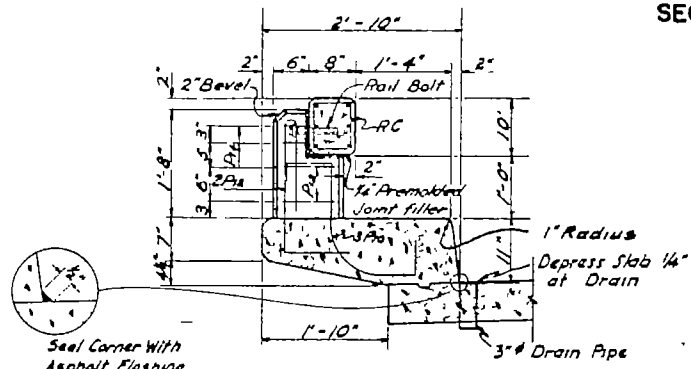
SEC. A-A



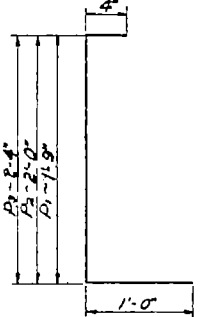
PART PLAN



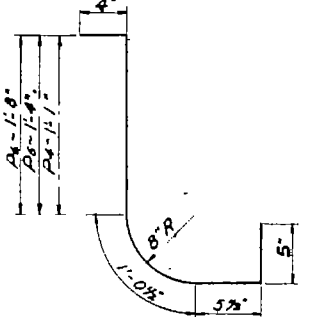
ANCHOR POST DETAIL
See Layout For Placement



TYPICAL SECTION



P1, P2 & P3 BARS



P4, P5 & P6 BARS

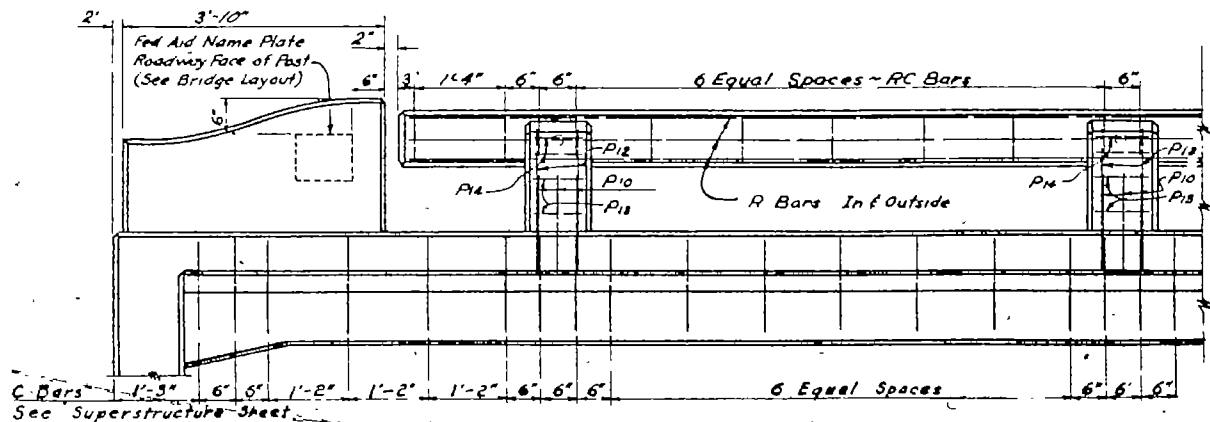
BAR LIST (BARS FOR RAILING AND POSTS)				
MARK	NO	SIZE	LENGTH	SHAPE
P1	*	5	4'-0"	Bent
P2	*	5	4'-6"	Bent
P3	*	5	4'-10"	Bent
P4	*	3	3'-8"	Bent
P5	*	3	2'-8"	Bent
RC	*	3	2'-8"	Bent
AS	*	5	*	Str.

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

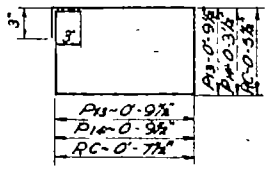
BAR LIST (4 END POSTS)				
MARK	NO	SIZE	LENGTH	SHAPE
P1	4	5	3'-1"	Bent
P2	4	5	3'-4"	"
P3	4	5	3'-8"	"
P4	4	5	3'-4"	"
P5	4	5	3'-7"	"
P6	4	5	3'-4"	"
P7	16	4	3'-6"	Str.
P8	4	1'-9"	Str.	
P9	8	5	3'-9"	Field Band

QUANTITIES ~ 4 END POSTS		
Concrete Class A-1 1/2	0.8	Cuylt
Reinforcing Steel	224	Lbs

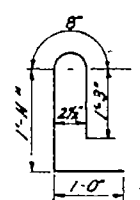
* Railing and end post quantities are included in slab quantities on Superstructure Sheet



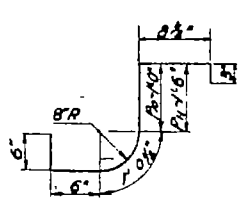
HAND RAIL DETAILS



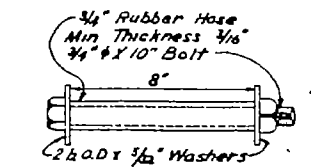
P7, P8 & RC BARS



P9 BARS



P10 & P11 BARS



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

STANDARD RAILING
DETAILS

