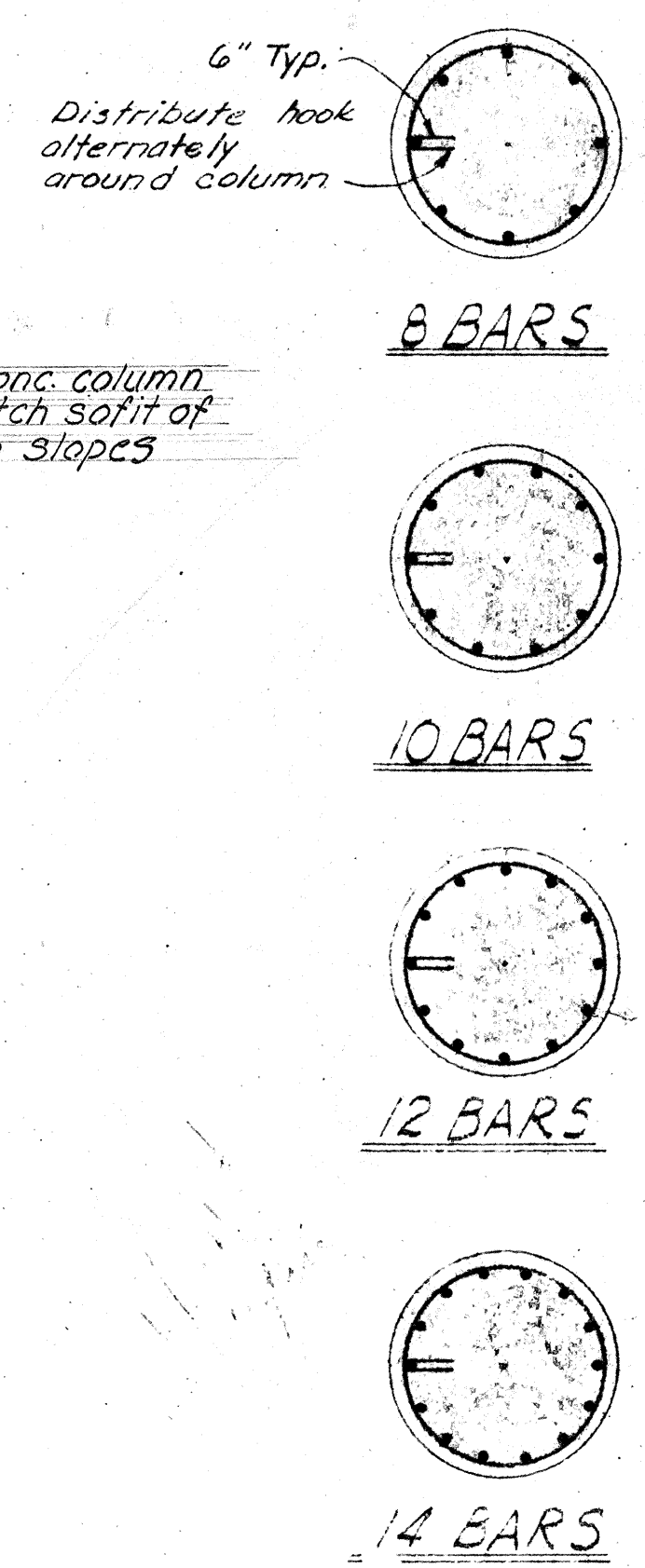
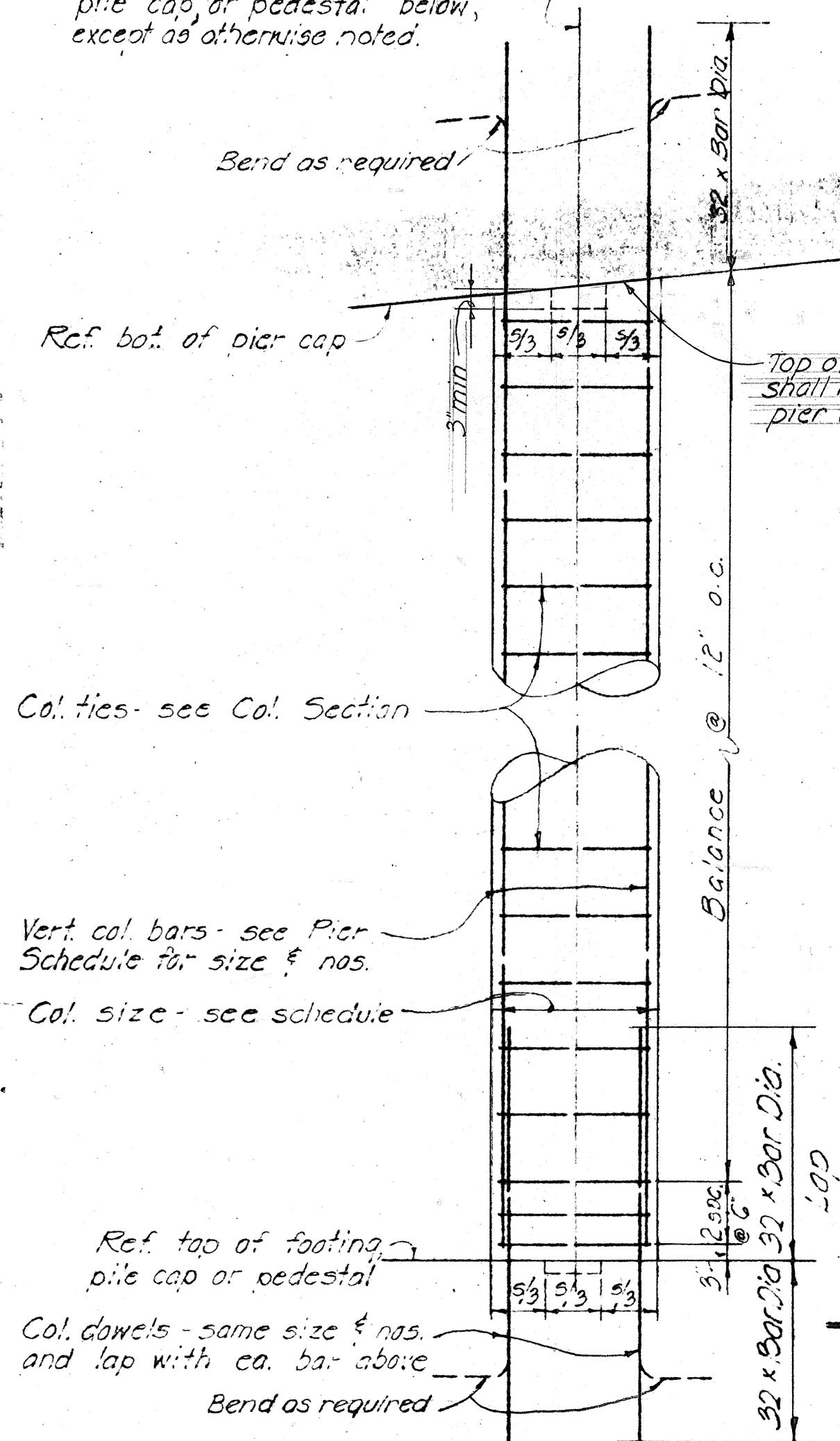
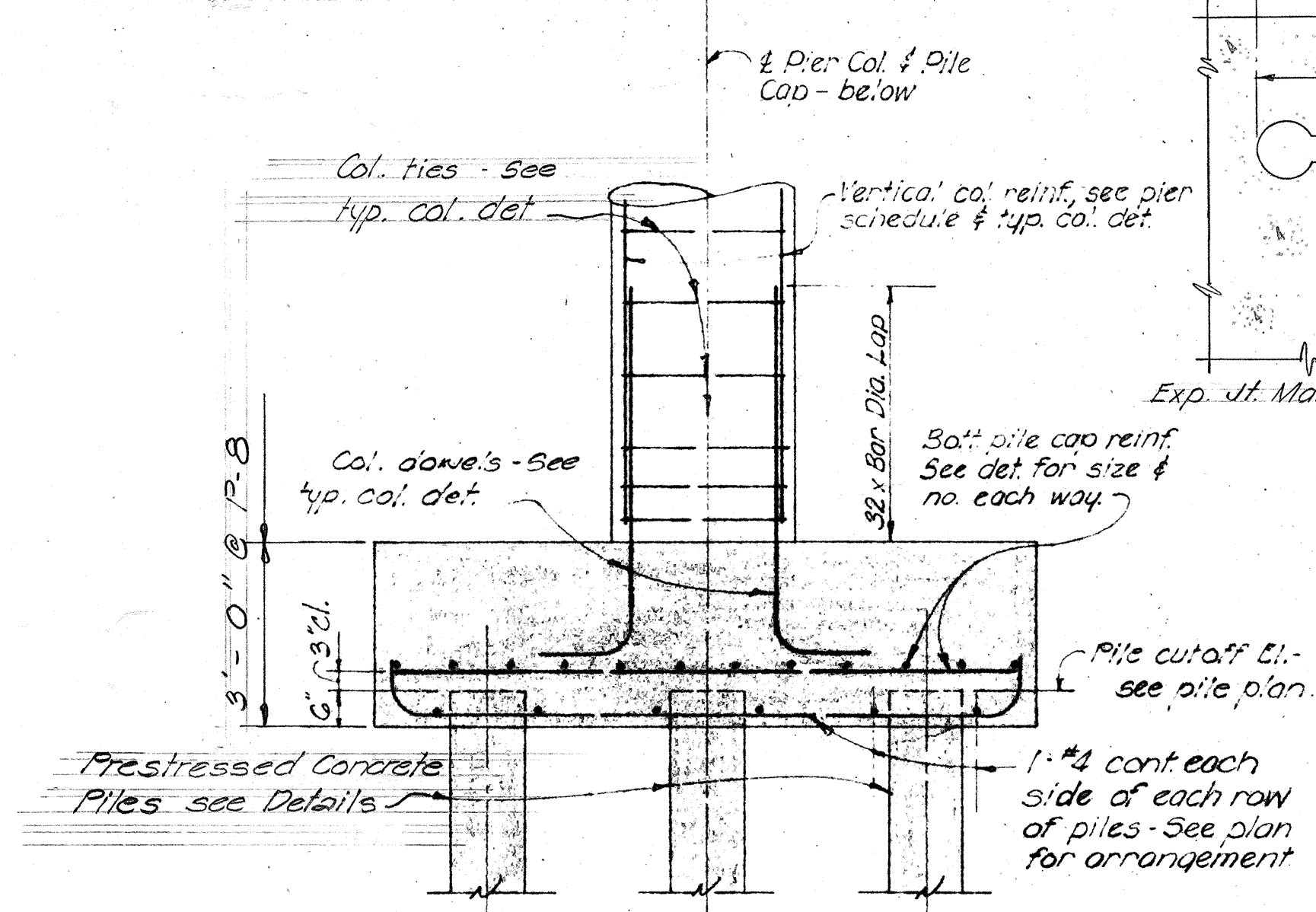


Ref. to pier col. & footing, pile cap, or pedestal below, except as otherwise noted.

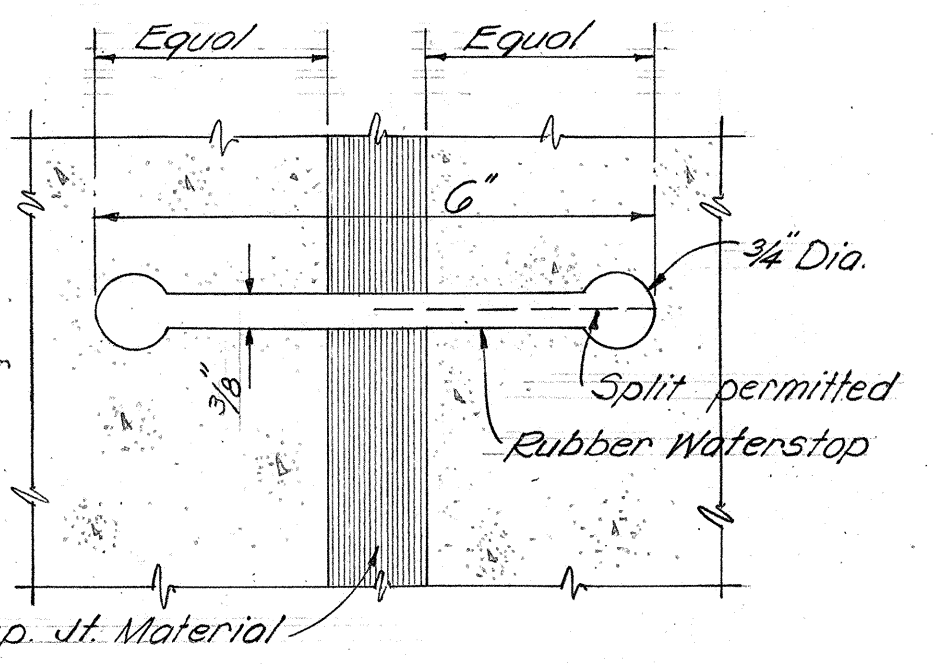


TYPICAL PIER COLUMN SECTIONS
All column ties to be #4 bars.

TYPICAL PIER COLUMN DETAIL



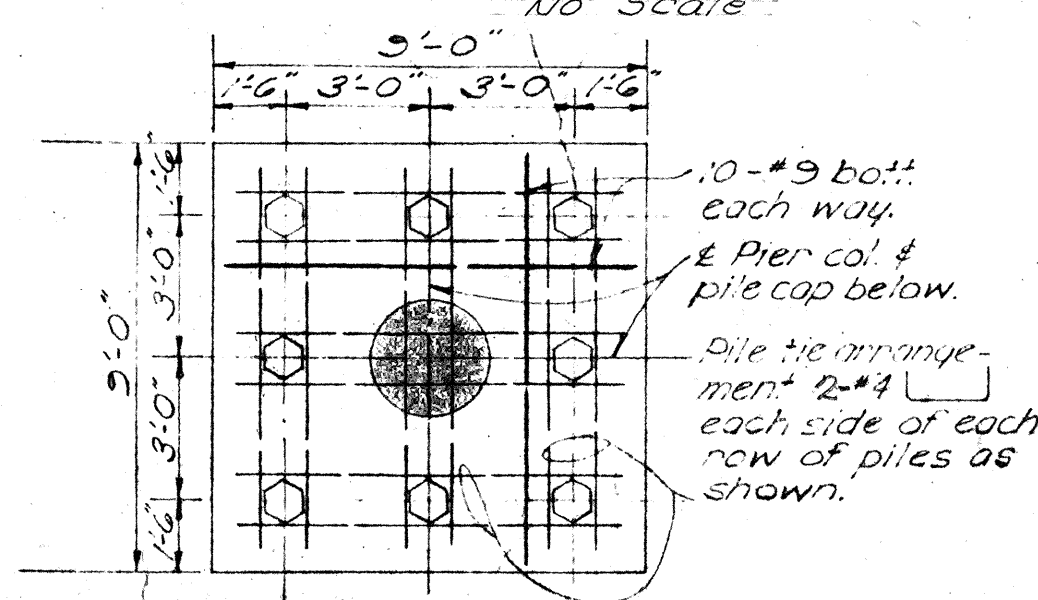
TYPICAL SECTION THRU PILE CAP
TYPE P-8



TYPE I

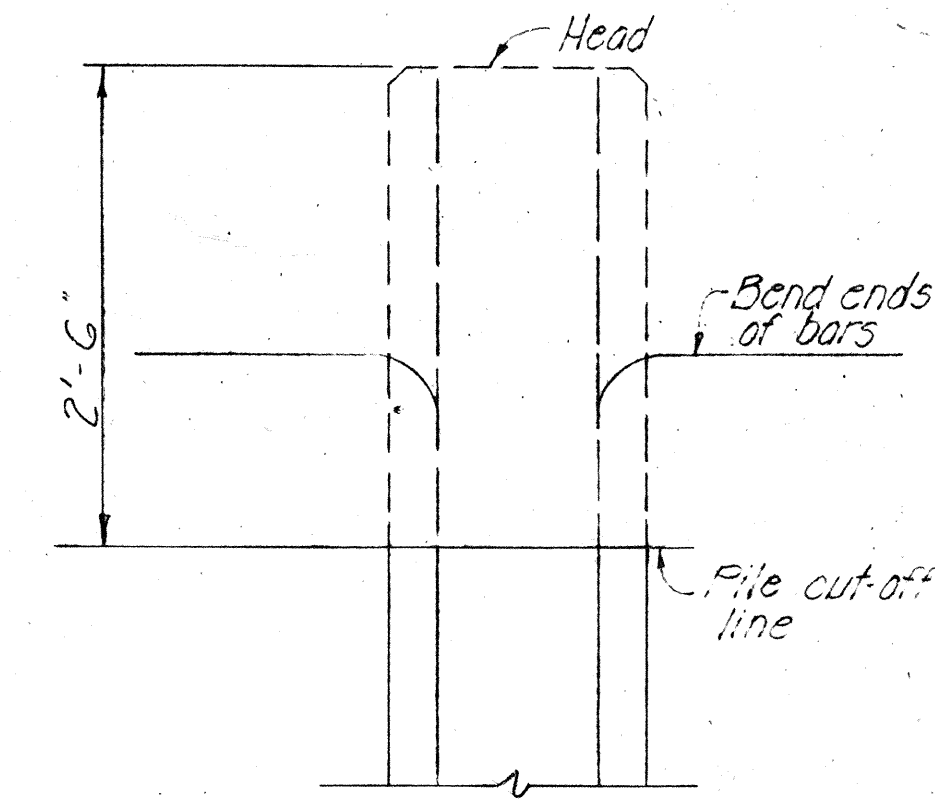
NOTE: For additional Waterstop information see Special Provisions. Waterstop shall be placed to within 6" of the edge of the structure and bent up 4".

WATERSTOP DETAILS
No Scale

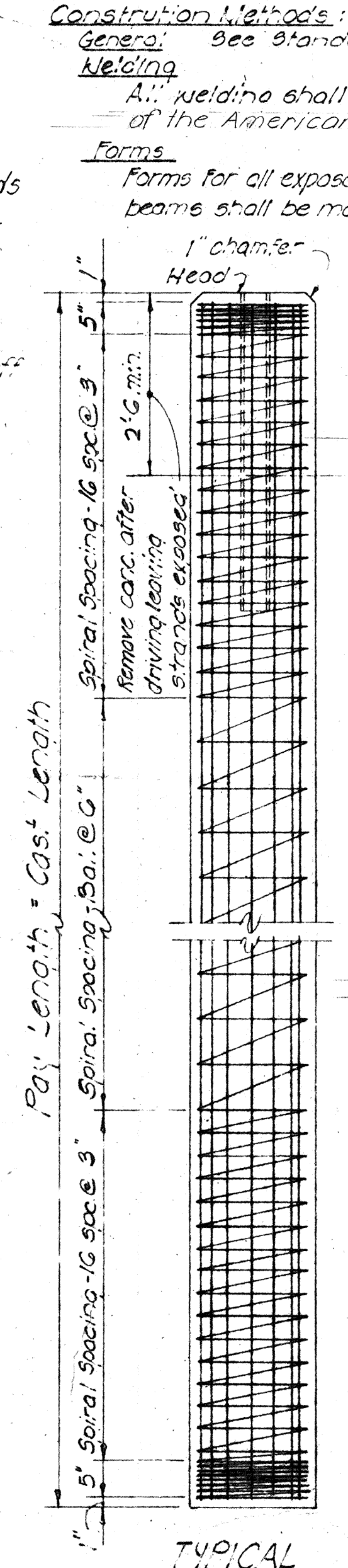


TYPICAL PILE CAP DETAILS
TYPE P-8

PIER COLUMN SCHEDULE					
PIER COLUMN LOCATION	STRUCTURE #1			STRUCTURE #4	
	(1)	(2)	(3)	(2)	(3)
Bot. Pier Cap	30" Dia. 8-#9	30" Dia. 12-#11	30" Dia. 12-#11	30" Dia. 12-#11	30" Dia. 12-#11
Top of Pedestal, Footing & Pile Cap	30" Dia. 8-#9	30" Dia. 12-#11	30" Dia. 12-#11	30" Dia. 12-#11	30" Dia. 12-#11
Dowels	8-#9	12-#11	12-#11	12-#11	12-#11
Footing Type	See Detail	See Det. Sht #43	See Det. Sht #43	See Det. Sht #43	See Det. Sht #43
Pile Cap Type	See Detail	See Det. Sht #43	See Det. Sht #43	P-8	P-8



TYPICAL DETAIL
PILE CUT-OFF
Scale: 1"=1'-0"



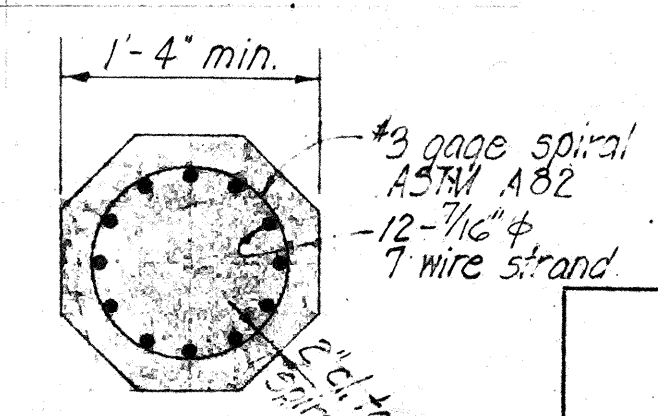
TYPICAL PRESTRESSED CONCRETE PILES

- Finish**
- For exposed concrete deck roadway finish - See Special Provisions. See Standard Specifications, Grade Separation Structures for all other finish.
 - Unless otherwise noted, all exposed corners shall be chamfered 94".
- Painting** - See Special Provisions.
- Symbols** - (1) Denotes pier column number.

All backfill behind abutments shall be complete in place before pouring concrete for the superstructure and before placing of the prestressed girders and steel girders.

The Contractor shall verify the location of all existing utility lines and notify the respective owners before commencing with the driving of the piles.

NOTE: Nine 1/2" dia. high tensile strength seven wire strands may be substituted for the twelve 1/4" diameter high-tensile strength seven wire strands shown. The 1/2" strands shall be spaced equally on a circle and inside of the spiral.



TYPICAL SECTION

GENERAL NOTES (For Struc. #1 & #4 and for all other Structures.)

Specifications: AASHTO
Standard specifications for Highway Bridges (8th Edition) with subsequent additions & modifications

Design Stresses:
See AASHTO Specification except otherwise noted.

Materials:
Neoprene pads are incidental to prestress girders or structural steel girders & will not be paid for separately.

- Concrete:**
- A mixture shall be added to all concrete. See Special Provisions.
 - All concrete shall be class A-1 except concrete for prestressed beams & as otherwise indicated on column schedule at left. Concrete for prestress beams - See Special Provisions.
 - Cover for reinforcing bars shall be as follows unless noted otherwise on plans.
1 1/2" for slabs, stirrups on sides of beams, & walls not exposed to ground.
2" for formed walls exposed to ground.
2 1/2" to main reinforcing of columns & beams.
3" for footings.
 - Reinforcing bars shall be detailed in accordance with ACI Manual of Standard Practice for Detailing Reinforced Concrete Highway Structures unless otherwise noted.
 - Reinforcing bars shall be securely tied at all intersections & splices & shall be held in place during pouring to maintain their proper location as shown on plans.
- Structural Steel** - See Sht. #47

Construction Methods:
General: See Standard Specifications.
Welding:

All welding shall conform to the latest Specifications for Welded Highway & Railway Bridges of the American Welding Society.

Forms:
Forms for all exposed surfaces of structures (except prestress beams) shall be plywood. Forms for prestress beams shall be made of material that results in a smooth finish & true dimensions as shown in the plans.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

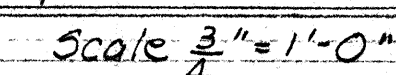
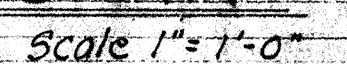
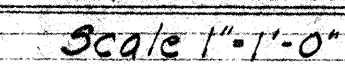
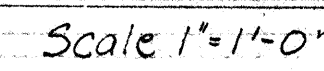
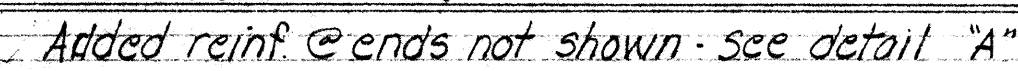
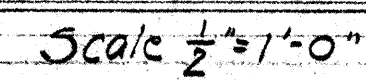
ALEA INTERCHANGE
STRUCTURES #1 & #4
TYPICAL DETAILS, GENERAL
NOTES & SCHEDULES

Maanalo Rd.
Kamehameha Hwy.
JUNE 1963

Proj. No. 30-0720(6)
Proj. No. F-090-1(4)

SHEET No. B200F 20 SHEETS

DATE
DESIGNED BY
CHECKED BY
NOTED BY
ORIGINAL
PLAN
NOTE BOOK
No.



DATE 11/18/64 BY EC.

Job No. 875

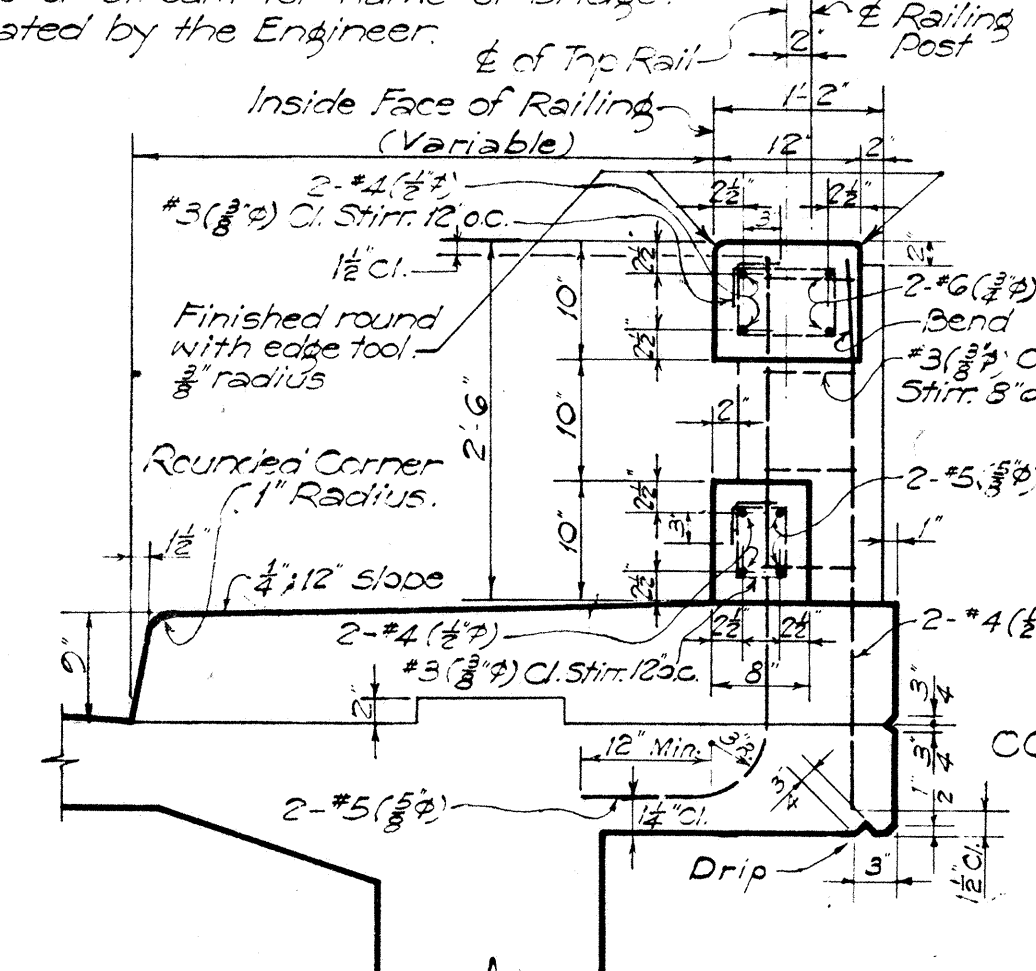
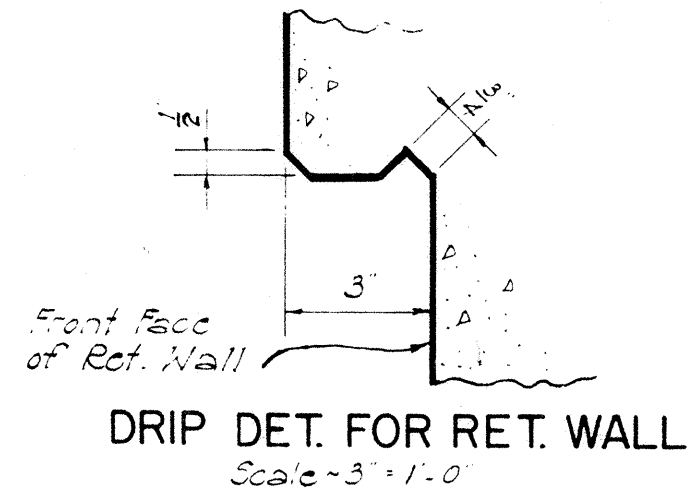
NAME DATE

Use correct name of bridge Date of year built

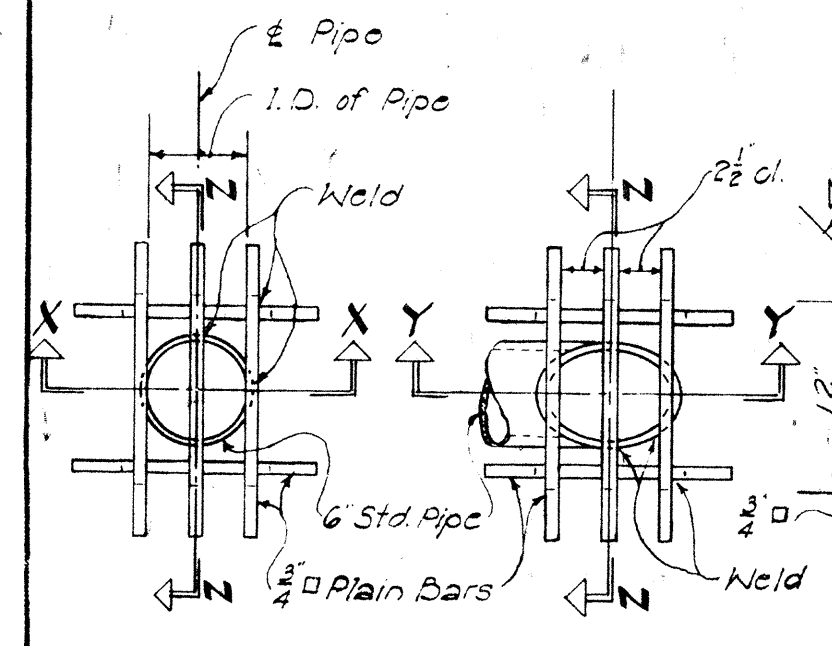
LEFT HAND SIDE RIGHT HAND SIDE

DETAIL OF LETTERS AND FIGURES AT BOTH APPROACHES

NOTE: Name of bridge to be placed in left end post panels and date in right post panels on entering bridge using modified block letters 2" in height. In case of stream crossings use name of stream for name of bridge. For all others use name as designated by the Engineer.

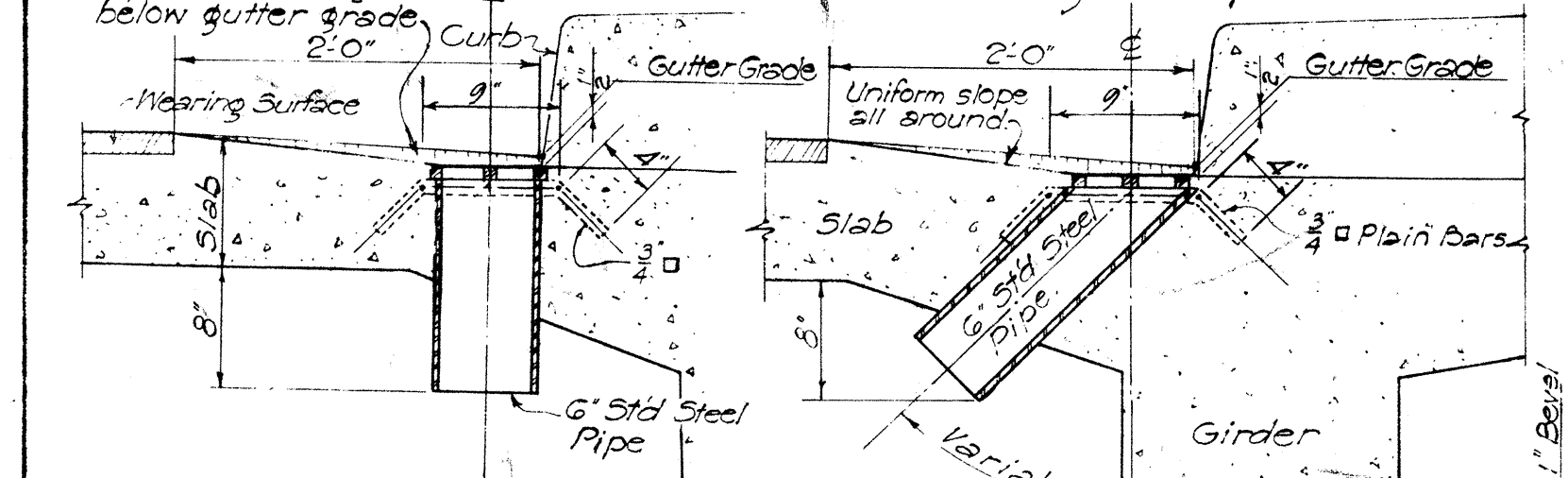


END POST GROOVE DET.
Scale: 5/8" = 1'-0"



NOTE: Sidewalk, curb and railing to be poured after release of falsework. Forms for railing and endpost to be made of plywood. SURFACE FINISH: The surface of the concrete railings shall be given a Class 2 Rubbed Finish as specified under Sub-article 46.3 (1) (3) of Section 46 Concrete of the Standard Specifications.

NOTE: Metal drains shall be considered incidental to Class A-1 Concrete in both concrete and steel bridges and will not be paid for separately. Assembly of grillage and pipe shall be hot-dip galvanized after all welding is completed.

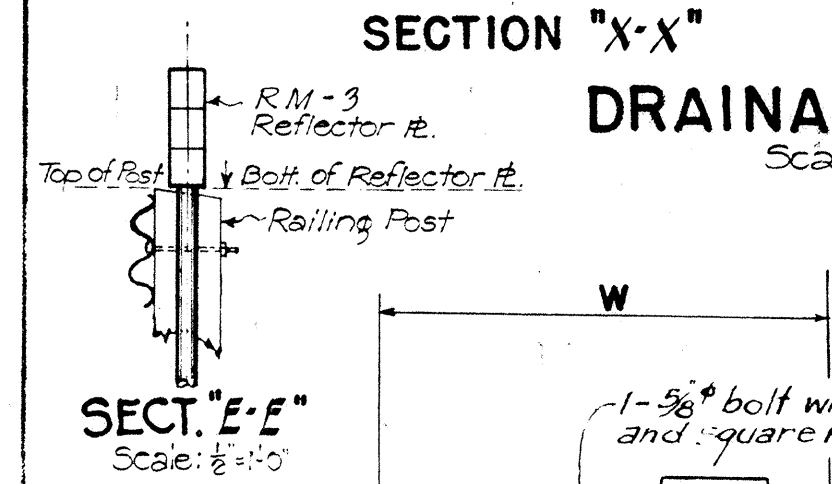


SECTION "Y-Y"
Scale: 1" = 1'-0"

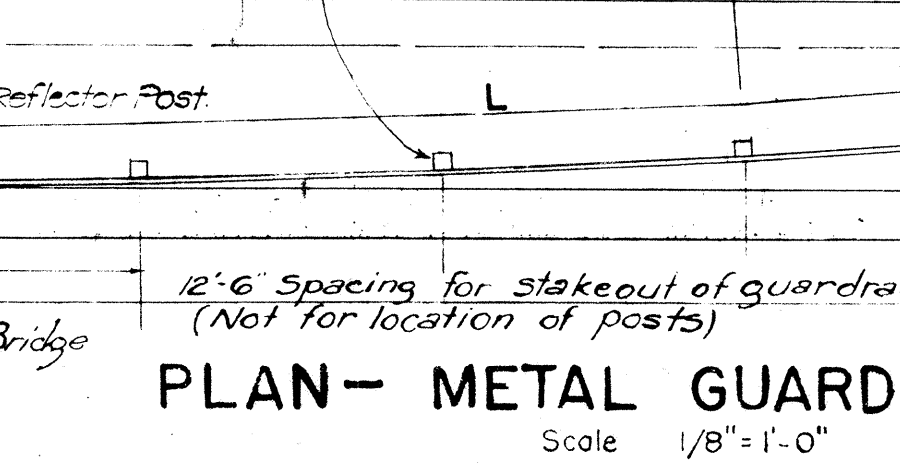
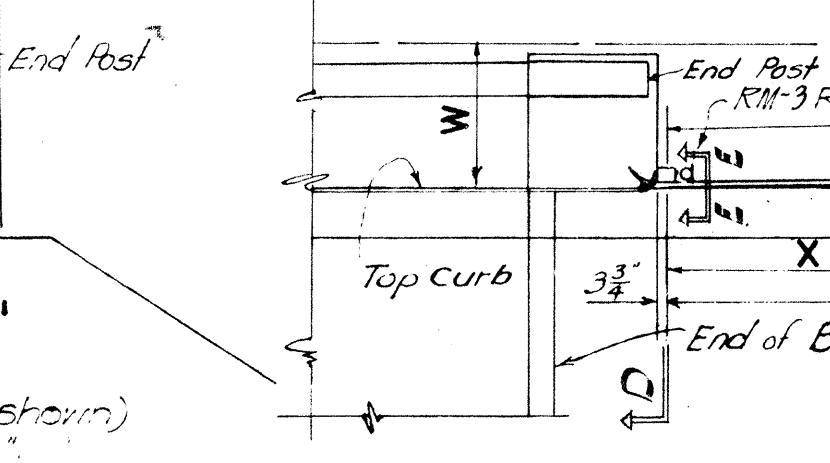
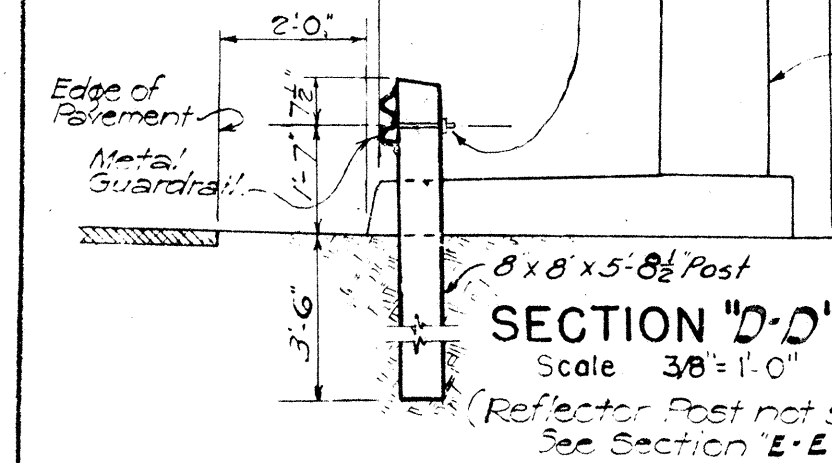
GUARDRAIL OFFSET

X	W=3'	W=4'	W=5'	W=6'	W=7'	W=8'
12.5	0.19	0.16	0.14	0.12	0.09	0.08
25.0	0.75	0.64	0.55	0.49	0.35	0.32
37.5	1.69	1.44	1.25	1.10	0.78	0.72
50.0	3.00	2.56	2.22	1.96	1.38	1.28
62.5	4.00	3.47	3.06	2.76	2.00	1.88
75.0	5.00	4.41	3.91	3.51	2.56	2.40
87.5	6.00	5.29	4.69	4.29	3.12	2.88
100.0	7.00	6.25	5.56	5.12	3.60	3.36
112.5	8.00	7.16	6.39	5.84	4.00	3.76
125.0	9.00	8.00	7.16	6.56	4.41	4.00

W = Guardrail flare
X = Distance from post at bridge to offset points.
Y = Guardrail flare offset



NOTE: See REGULATORY & WARNING Signs Sheet for details of RM-3, and railing posts. See Sign Details Sheet for reinforcement of concrete posts.



GENERAL NOTES

CONCRETE: Class of concrete to be used in different parts of the structure are as noted on plans. REINFORCING STEEL: All reinforcing steel shall be Billet Steel Bars A.S.T.M. A15 intermediate grade. Steel shall be made by the open-hearth or Electric Furnace Process. Mill certificate shall be required.

Deformations shall conform to A.S.T.M. A305. Splicing of reinforcing other than in main deck slab, girder and frame bars shall be done as shown in above sketch except where shown otherwise. Splices are to be staggered. Splices in main girder and frame bars are permitted only in bars exceeding 60'-0" in length at points to be indicated by the Engineer. These splices to be electrically welded according to detail and specifications. No allowance will be made in the quantities for extra weight of steel required for splices not shown on the plans. Minimum spacing between parallel bars shall be 2 1/2 times the diameter of bars, but in no case shall the clear distance between the bars be less than 1 1/2 times the maximum size of the coarse aggregate.

All dimensions relating to reinforcing are to centers of bars unless otherwise noted.

CONSTRUCTION JOINTS: All construction joints to have surface roughened and 1:2 cement grout applied immediately before the second pour. Construction joints to be located at places indicated in the plans. See Sec. 46.3 F (3) of the "Standard Specifications."

ELLIPSE COORDINATES

Top of Post

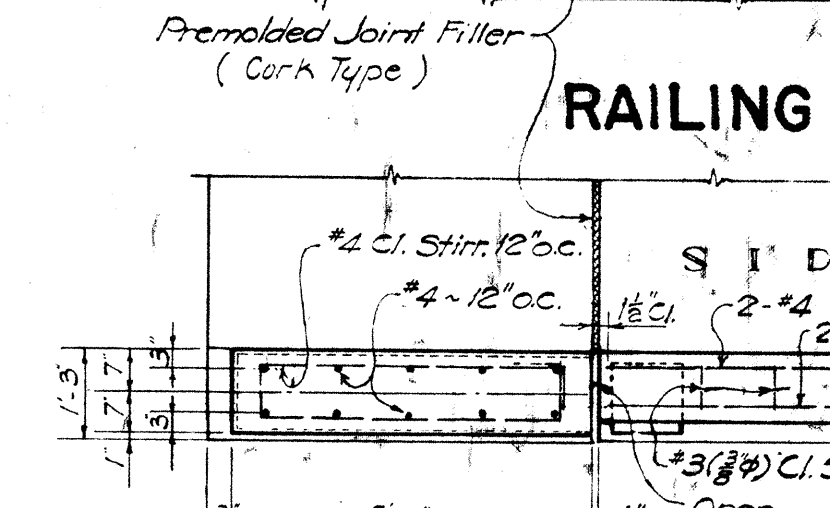
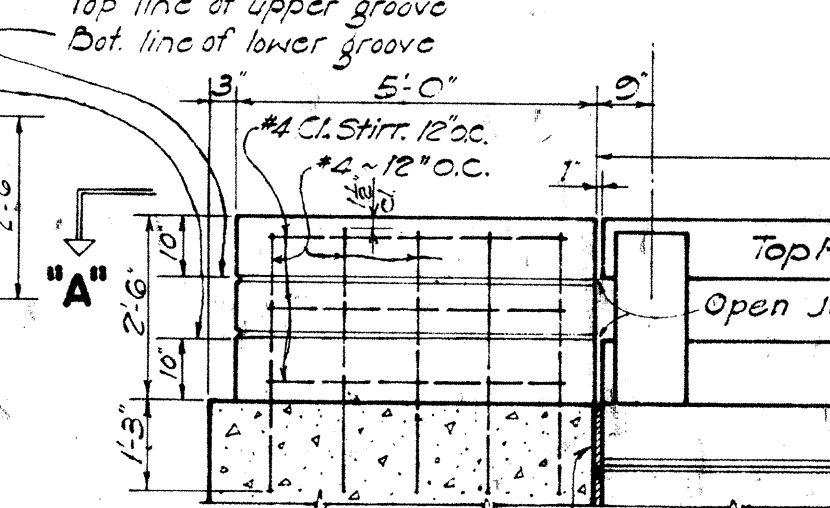
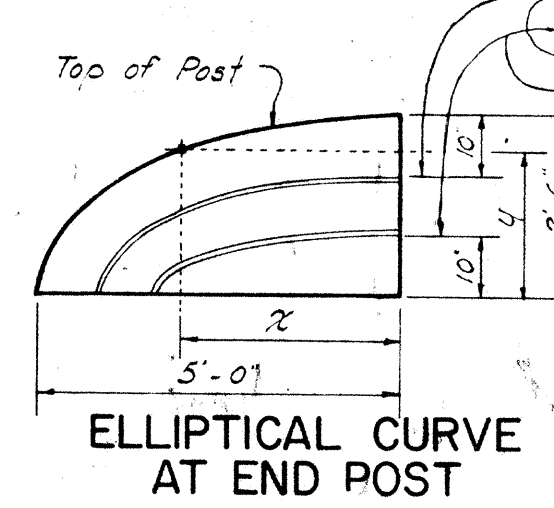
X	0	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	3'-6"	4'-0"	4'-6"	4'-10"	5'-0"
Y	0	2'-5 1/2"	2'-4 1/2"	2'-3 1/2"	2'-2"	1'-9 1/2"	1'-6"	1'-3 1/2"	1'-1 1/2"	9 1/8"	0

Top Line of Upper Groove

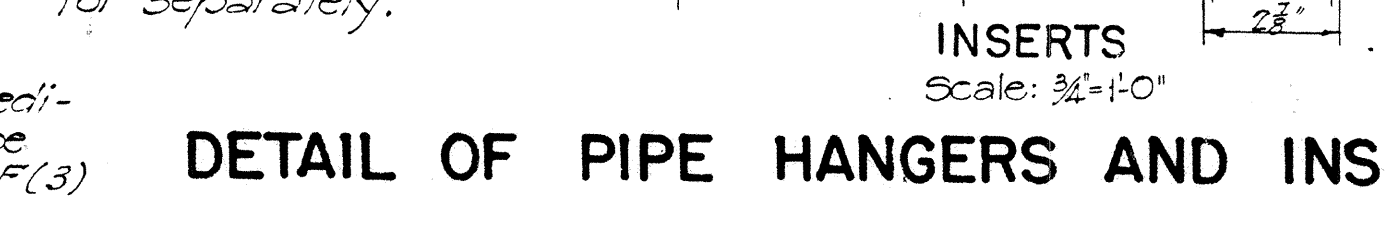
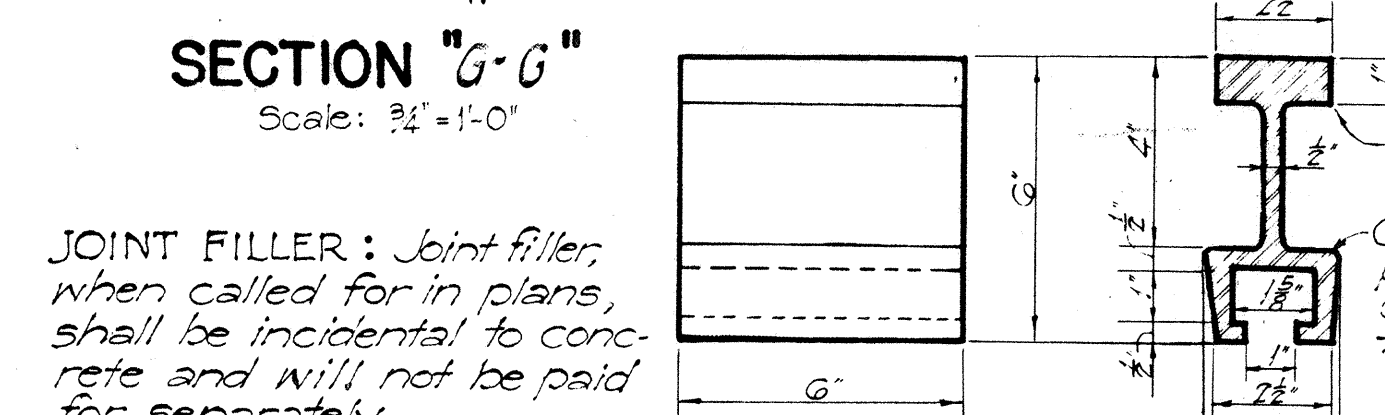
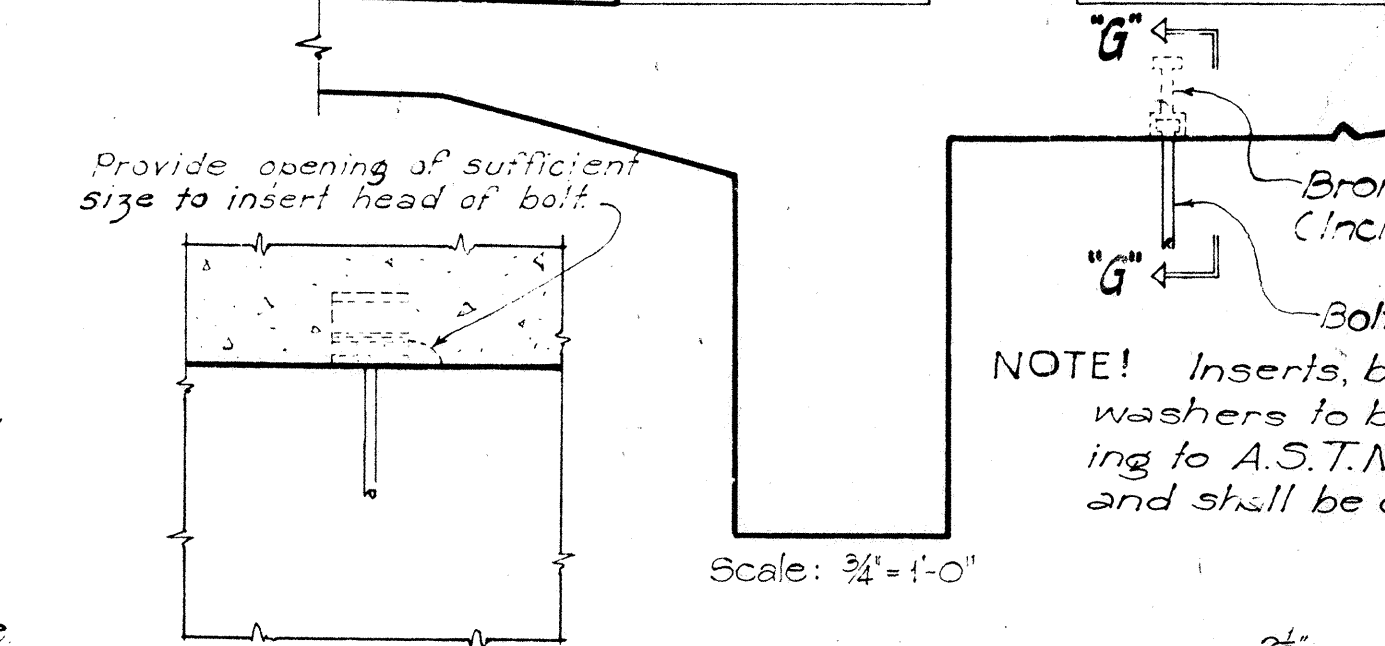
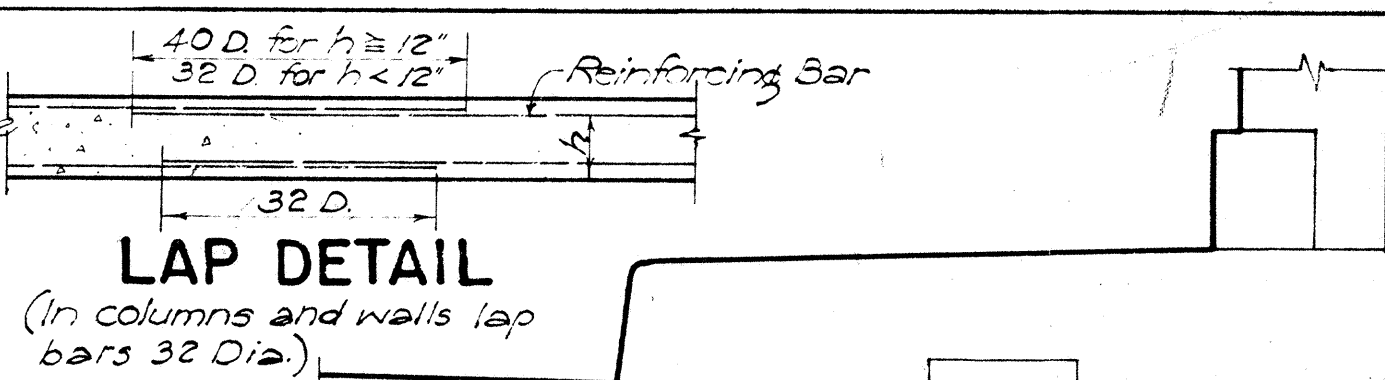
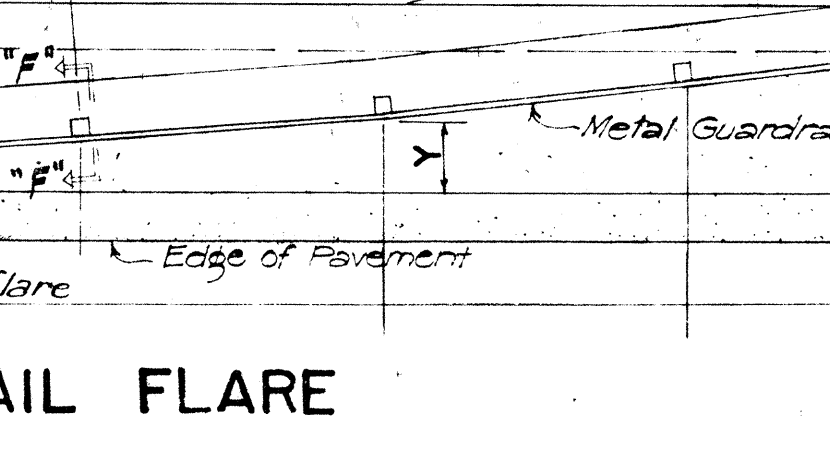
X	0	6"	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	3'-6"	4'-0"	4'-10"	5'-0"
Y	0	1'-8"	1'-7 1/2"	1'-7 1/2"	1'-6 1/2"	1'-5 1/2"	1'-4"	1'-1 1/2"	10 1/8"	9 1/8"	0

Bot. Line of Lower Groove

X	0	6"	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	3'-6"	4'-0"	4'-10"	5'-0"
Y	0	10"	9 1/8"	9 1/8"	8 1/8"	6 1/8"	5 1/8"	4 1/8"	3 1/8"	2 1/8"	0

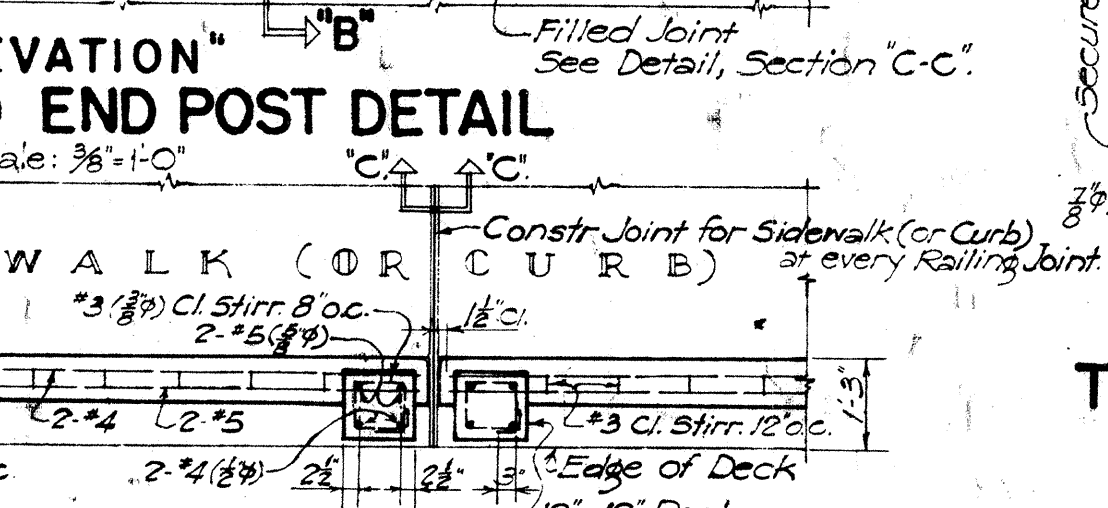
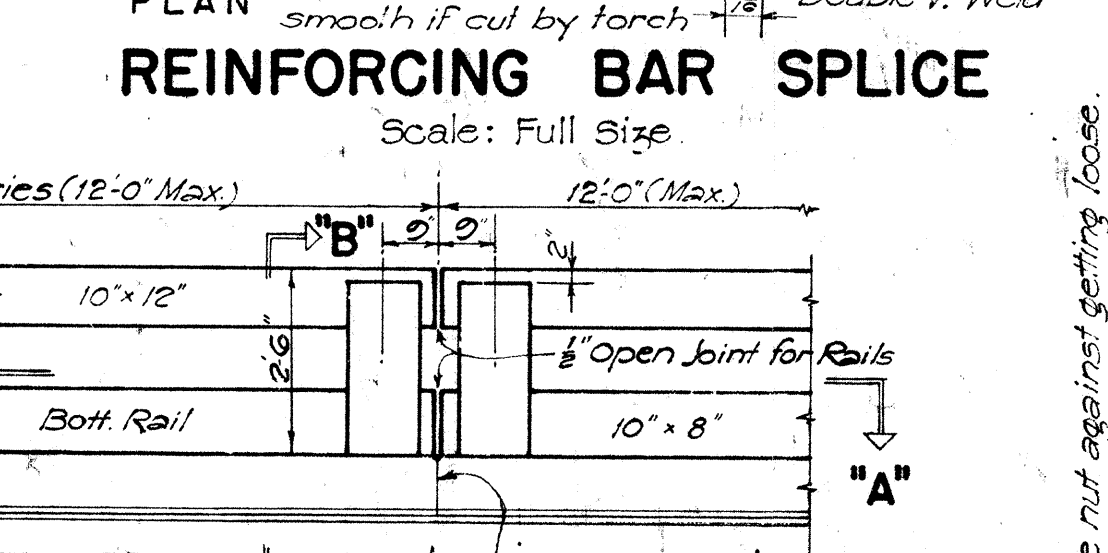
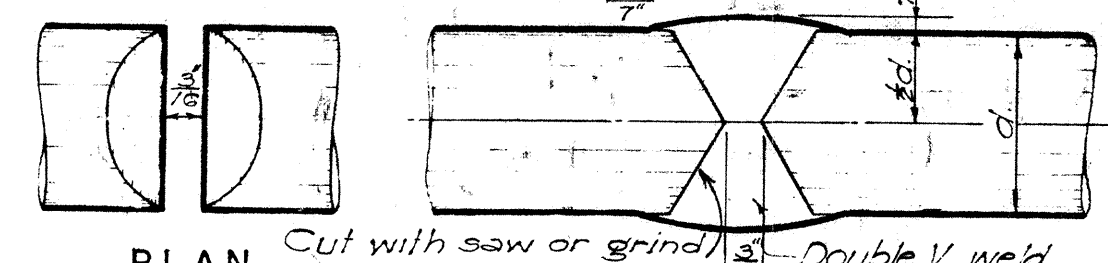


TOP RAIL - Bottom forms for top rails shall be kept in place a minimum of 14 days from date of pour.

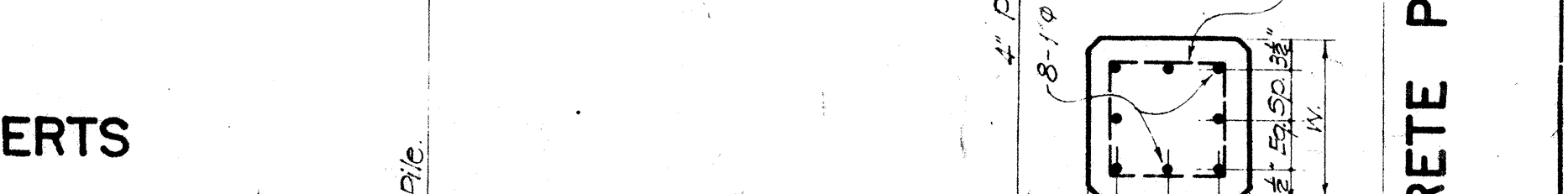
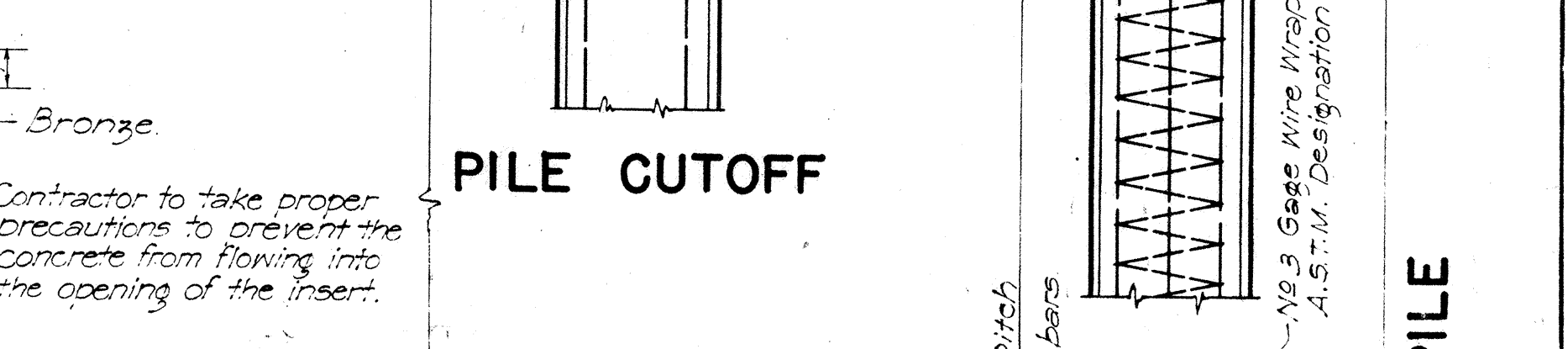
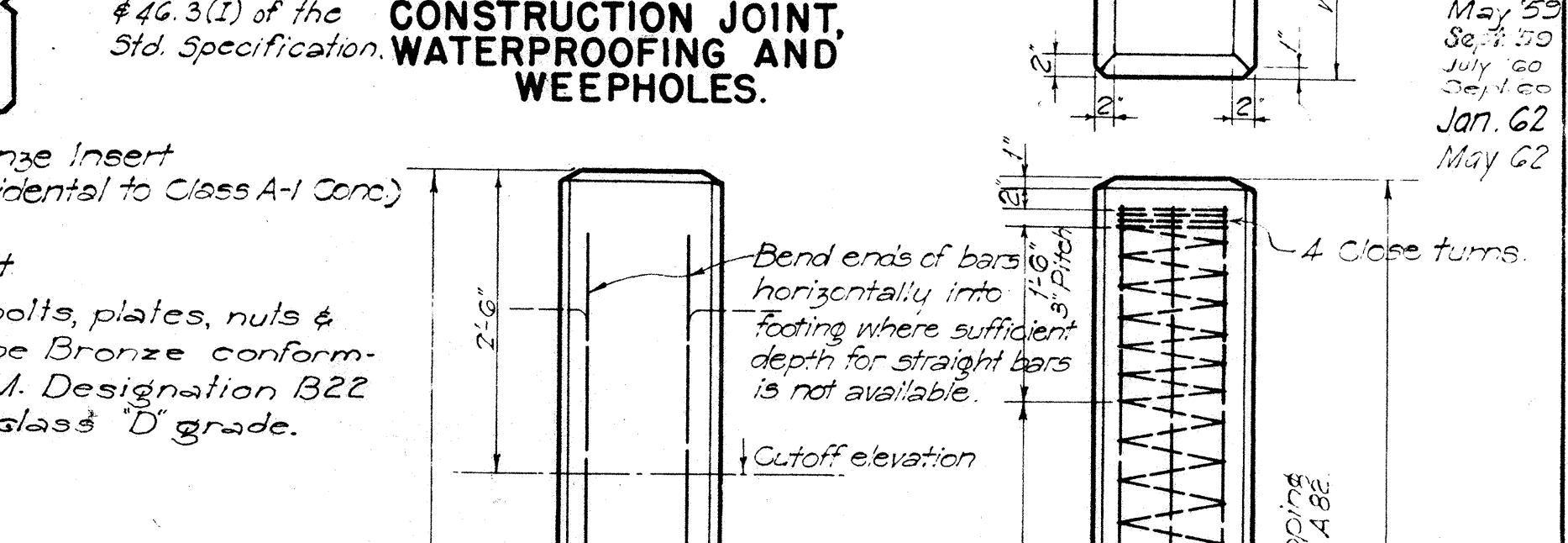
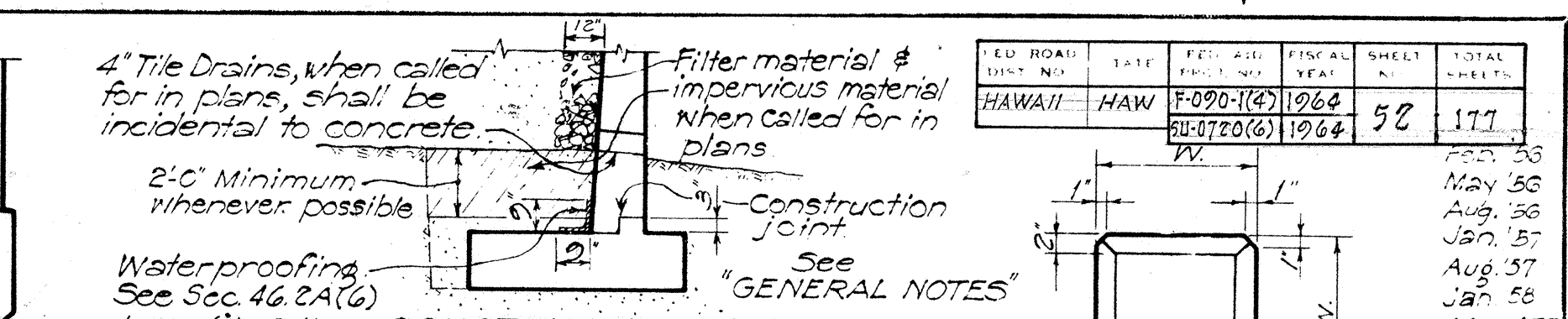
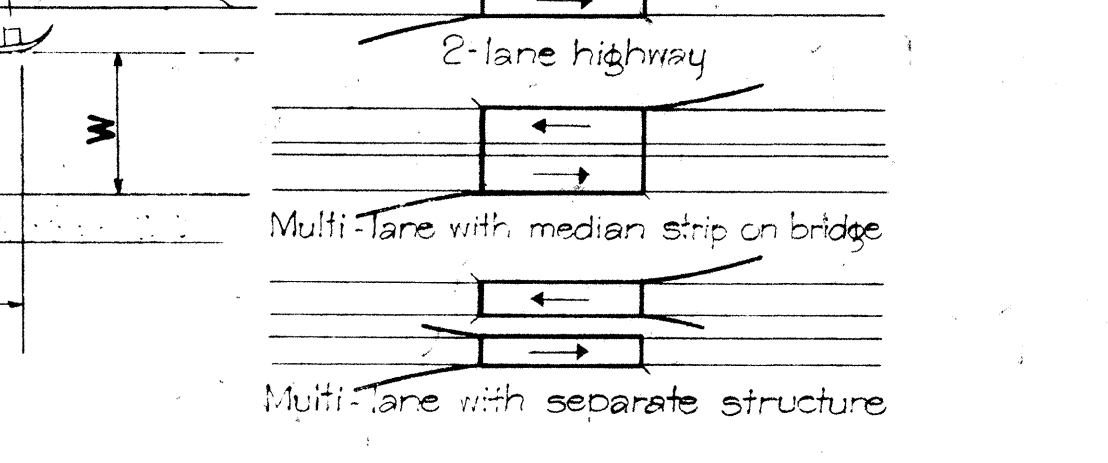


DETAIL OF PIPE HANGERS AND INSERTS

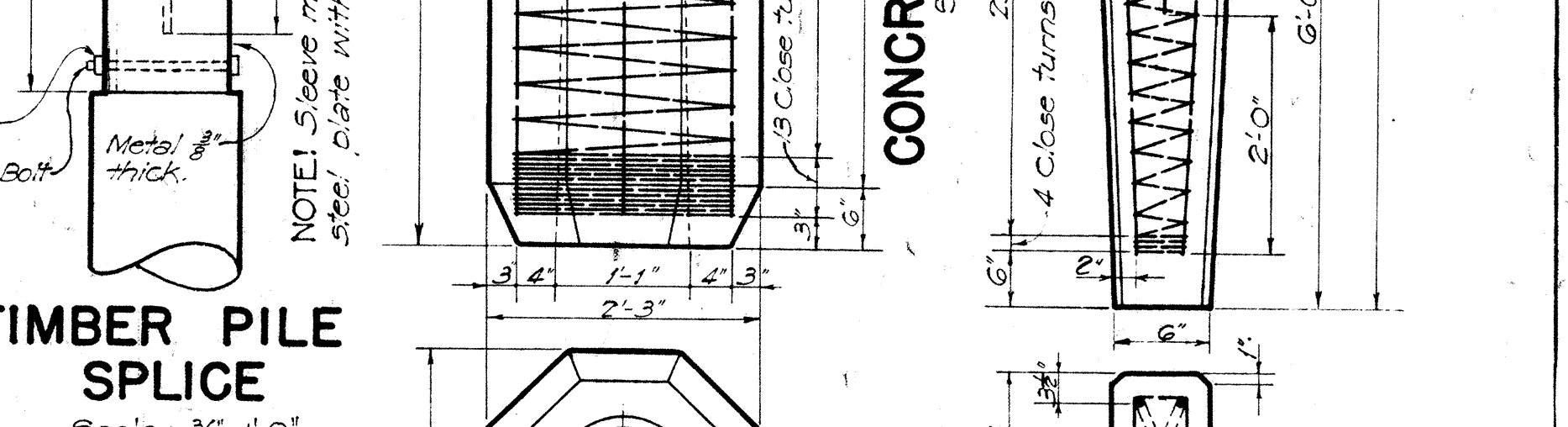
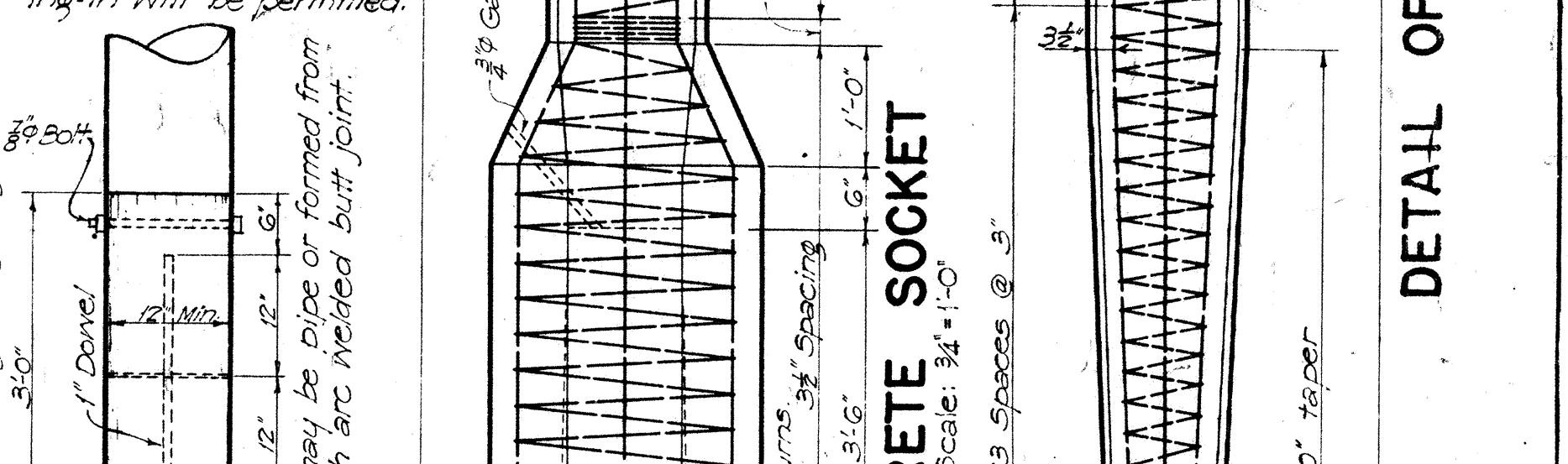
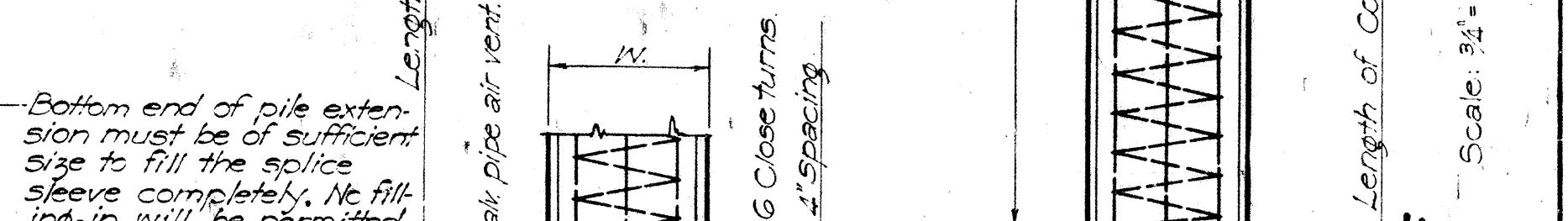
NOTE: Carbon content of reinforcing bars for welding shall not be over 0.40%. Low hydrogen electrodes E7015 or E7016 shall be used with preheat and interpass temperature not less than 200°F.



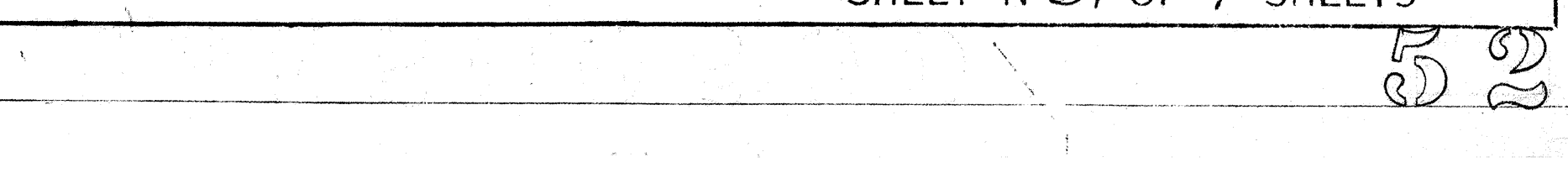
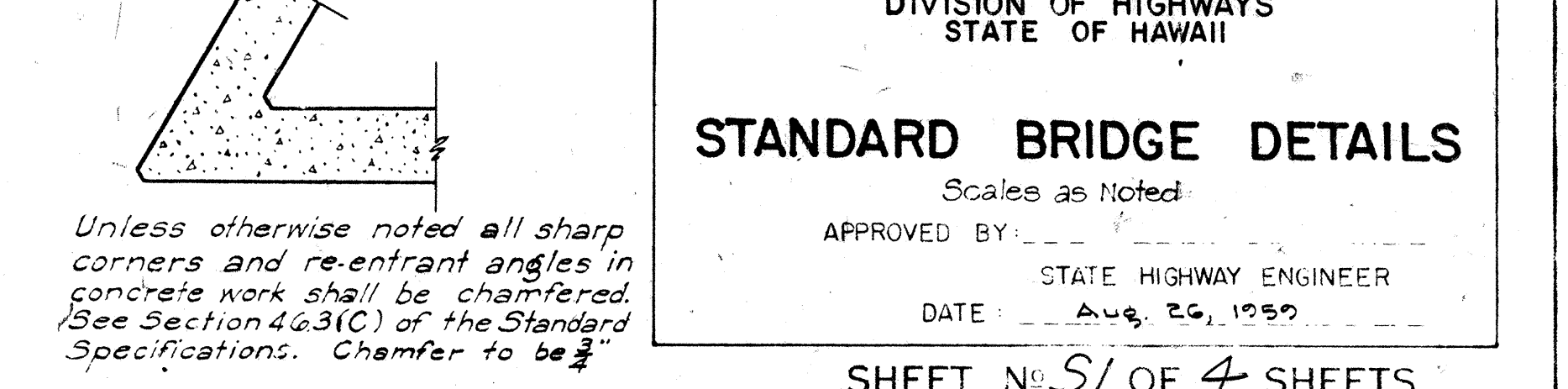
TOP RAIL - Bottom forms for top rails shall be kept in place a minimum of 14 days from date of pour.



NOTE: Carbon content of reinforcing bars for welding shall not be over 0.40%. Low hydrogen electrodes E7015 or E7016 shall be used with preheat and interpass temperature not less than 200°F.



TOP RAIL - Bottom forms for top rails shall be kept in place a minimum of 14 days from date of pour.



GENERAL NOTE: Except where detailed otherwise in the plans, all details on this sheet govern.

DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
STATE OF HAWAII

STANDARD BRIDGE DETAILS

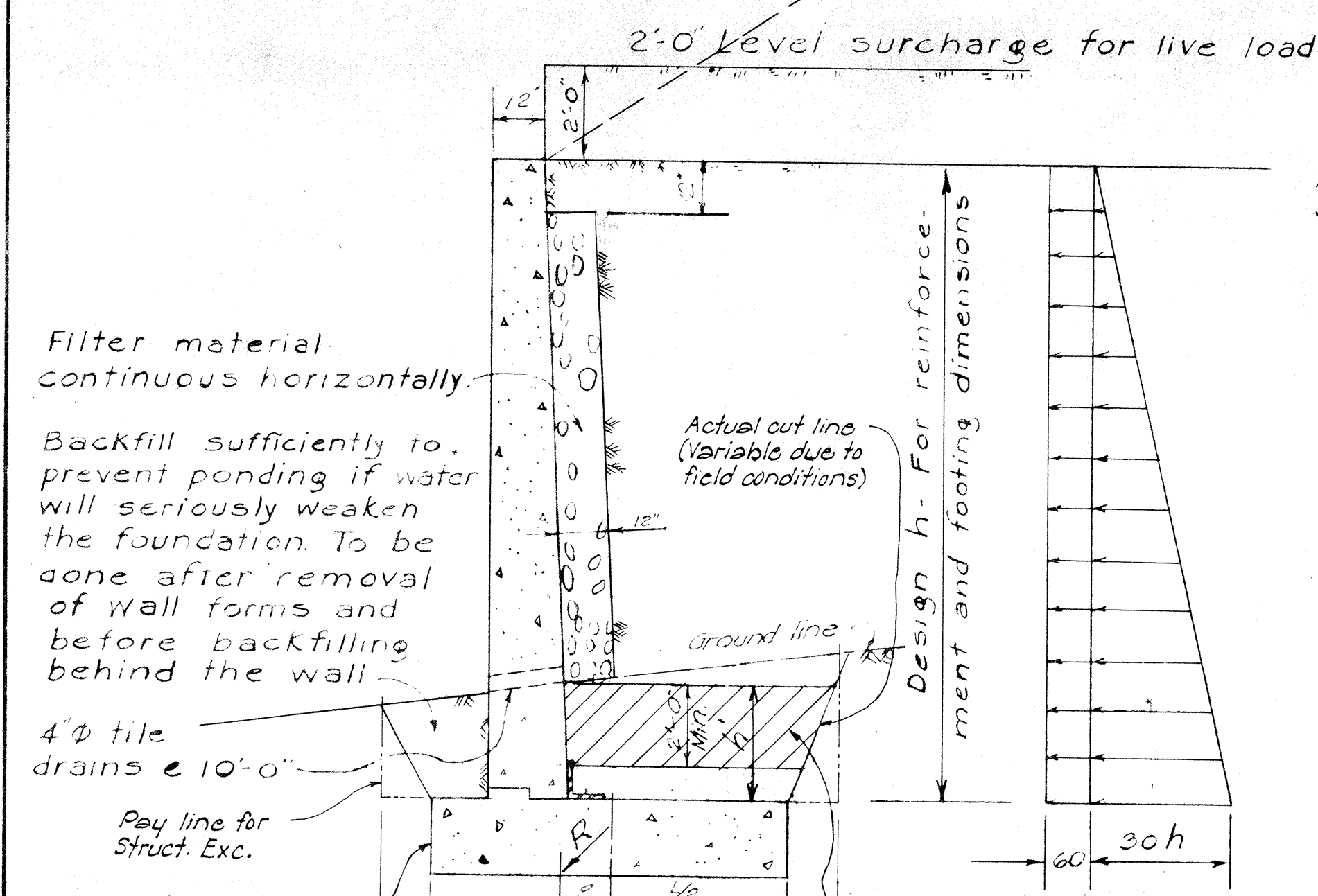
Scales as Noted

APPROVED BY: _____
STATE HIGHWAY ENGINEER

DATE: AUG. 20, 1959

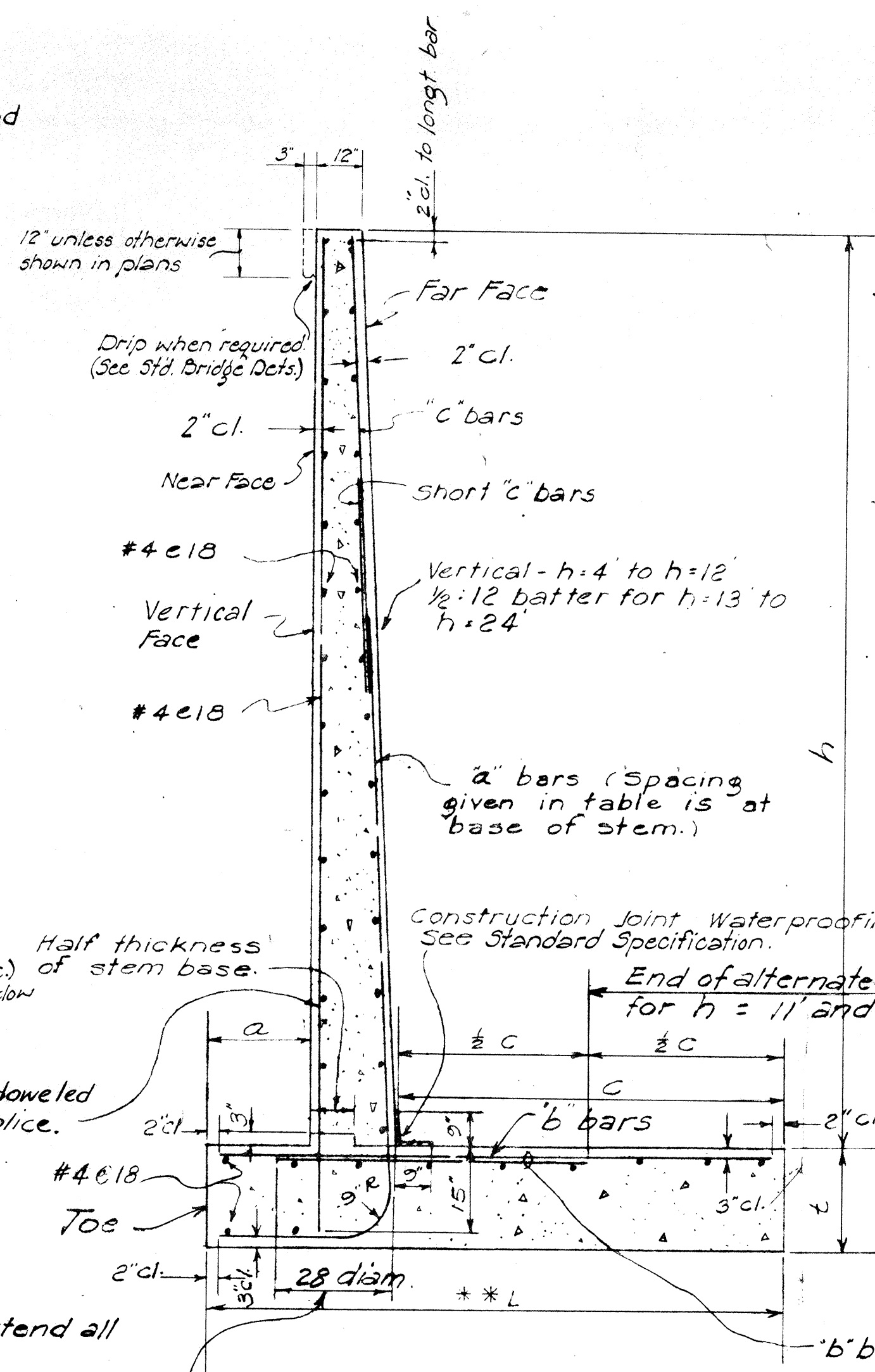
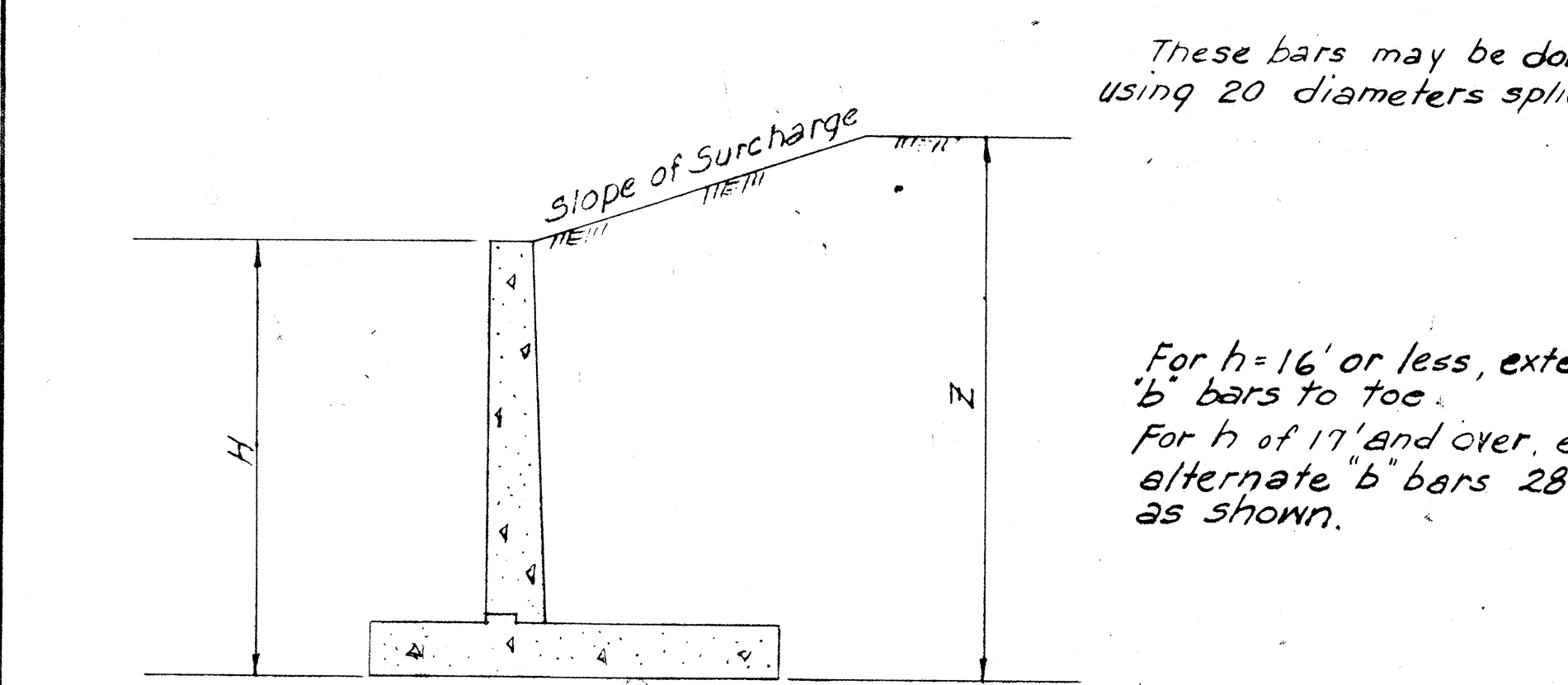
SHEET NO. 51 OF 4 SHEETS

May 1959
July 1960
Sept 1960
Jan. 1962



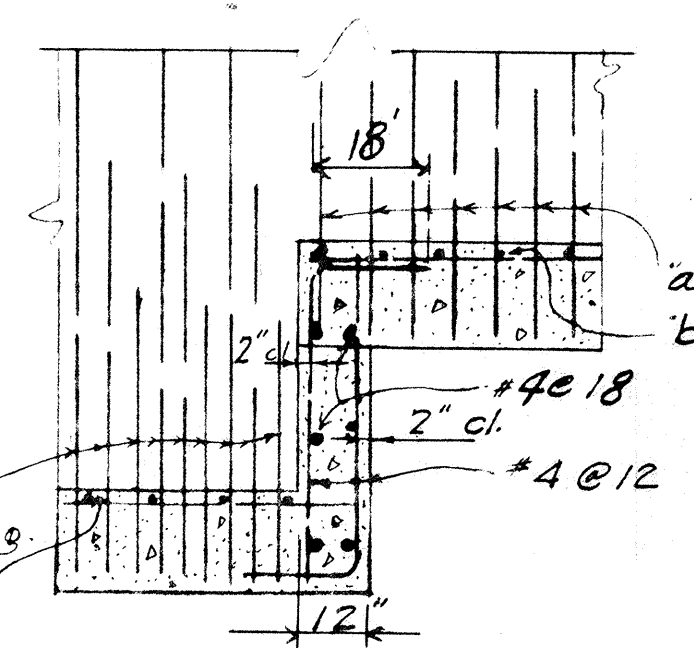
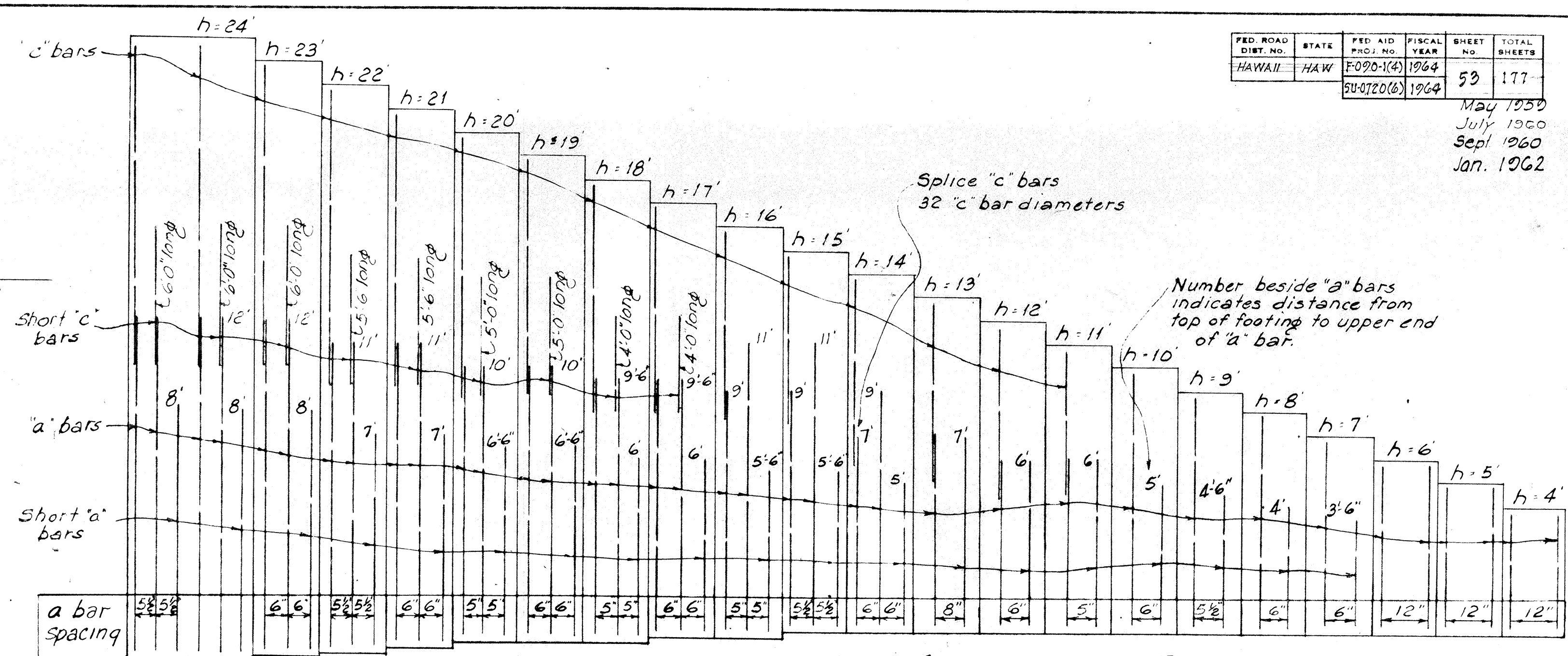
DESIGN AND DRAINAGE

Filter material continuous horizontally. Backfill sufficiently to prevent ponding if water will seriously weaken the foundation. To be done after removal of wall forms and before backfilling behind the wall. 4" tile drains @ 10'-0".

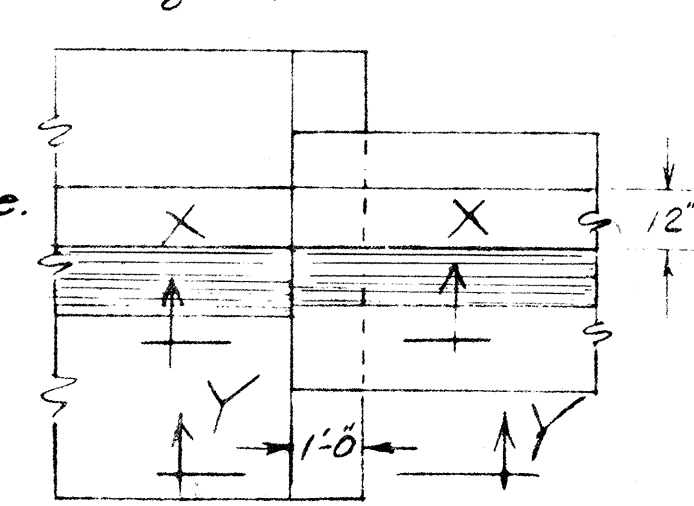


WALL SECTION

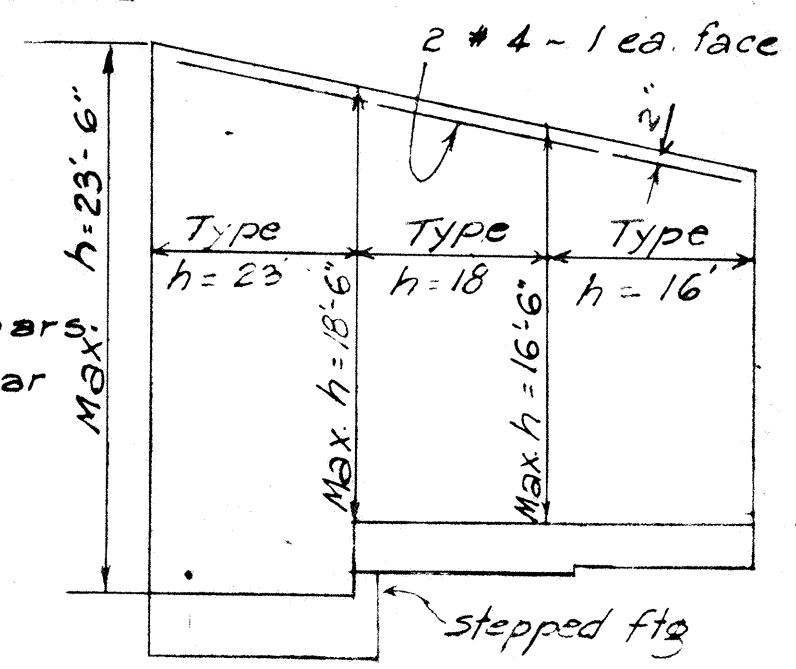
For h = 16' or less, extend all 'b' bars to toe.
For h of 17' and over, extend alternate 'b' bars 28 diameters as shown.



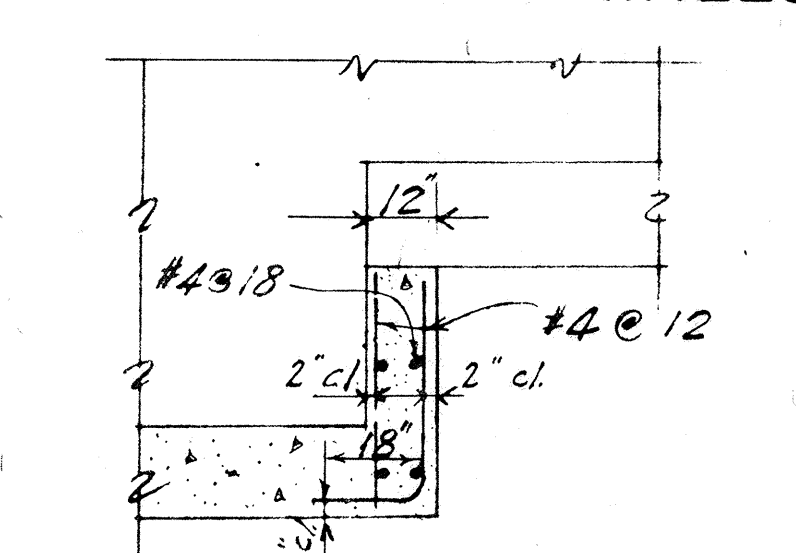
SECTION X-X



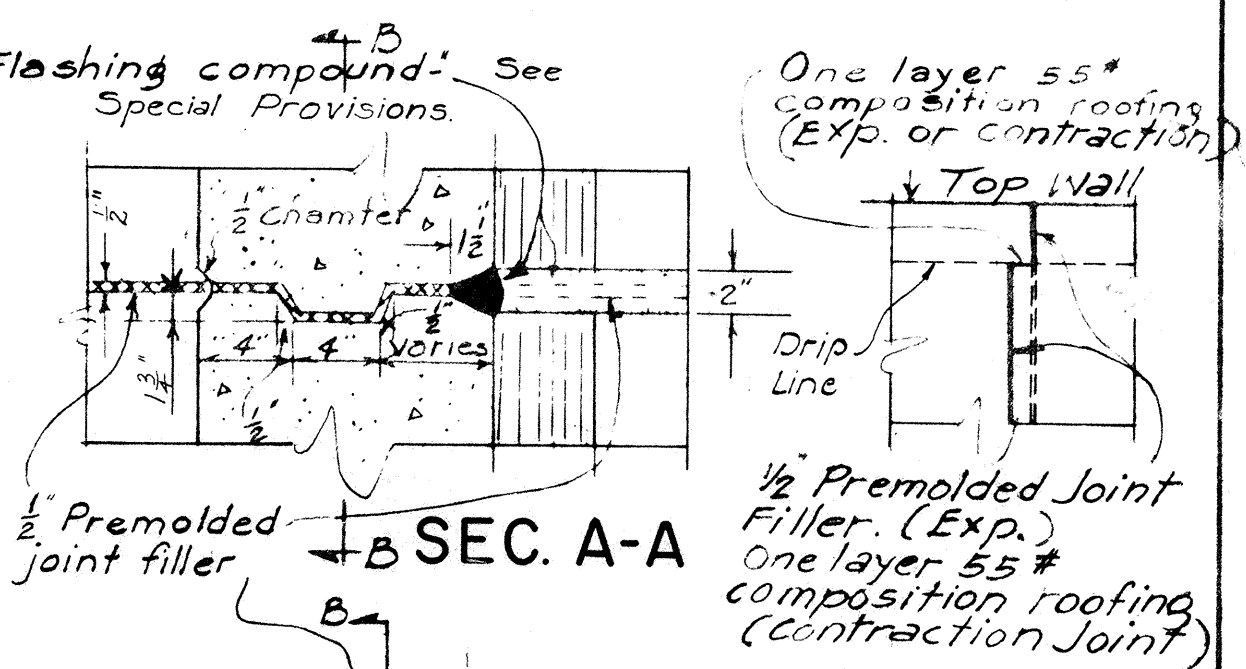
PLAN FOOTING STEP



TYPICAL ARRANGEMENT FOR SLOPING WALLS



SECTION Y-Y



JOINT DETAIL

(Spacing of Joints)
Contraction Joint - 30'-0" Max
Expansion Joint - 20'-0" Max

GENERAL NOTE

Except where detailed otherwise in the plans, all details on this sheet govern.

SPECIAL CASES:
Retaining walls shown are also applicable for the following conditions of loading:

- For h = 4' to 7' 1.5:1 or less sloping surcharge unlimited 1.5:1 sloping surcharge limited to $\frac{L}{H} = 2.3$
- For h of 8' and 9' 1.62:1 or less sloping surcharge unlimited 1.5:1 sloping surcharge limited to $\frac{L}{H} = 1.8$
- For h of 10' and 11' 1.9:1 or less sloping surcharge unlimited 1.5:1 sloping surcharge limited to $\frac{L}{H} = 1.4$
- For h = 13', 14', and 15' 2.2:1 or less sloping surcharge unlimited 1.5:1 sloping surcharge limited to $\frac{L}{H} = 1.2$
- For h = 18' to 21' 2.7:1 or less sloping surcharge unlimited.
- For h = 22' to 24' 3:1 sloping surcharge unlimited

* Special cases are not applicable if traffic can come within a distance from the top of the stem equal to one-half its height.

* When footing is on rock, L shall be reduced to $L_p = 0.4(h + t + 2')$ to increase footing pressure. L_p shall be measured from the toe. Adjust footing design accordingly.

TABLE OF DIMENSIONS AND REINFORCING STEEL																							
h	4'	5'	6'	7'	8'	9'	10'	11'	12'	13'	14'	15'	16'	17'	18'	19'	20'	21'	22'	23'	24'		
a	6"	6"	6"	12"	12"	12"	12"	12"	12"	12"	15"	18"	21"	24"	24"	24"	27"	30"	33"	36"	39"		
* * L	2.5'	3.0'	3.5'	4.0'	4.5'	5.0'	5.5'	6.0'	6.5'	7.0'	7.75'	8.25'	9.0'	9.75'	10.5'	11.5'	12.5'	13.5'	14.5'	15.25'	16.0'		
t	14'	14'	14'	14'	14'	14'	14'	18'	18'	18'	18'	21'	21'	24'	24'	24'	27'	30"	31"	33"			
'a' bars	#3 @ 12	#3 @ 12	#4 @ 12	#3 @ 6	#4 @ 6	#4 @ 5½	#5 @ 6	#5 @ 5	#6 @ 6	#6 @ 8	#6 @ 6	#6 @ 5½	#6 @ 5	#7 @ 6	#7 @ 5	#8 @ 6	#8 @ 5	#9 @ 6	#9 @ 5½	#10 @ 6	#10 @ 5½		
'b' bars	#3 @ 12	#3 @ 12	#3 @ 12	#3 @ 12	#3 @ 12	#4 @ 11	#5 @ 12	#5 @ 10	#5 @ 8	#6 @ 8	#6 @ 6	#6 @ 5½	#6 @ 5	#7 @ 6	#7 @ 5	#8 @ 6	#8 @ 5	#9 @ 6	#9 @ 5½	#10 @ 6	#10 @ 5½		
'c' bars	—	—	—	—	—	—	—	#4	#4	#4	#4	#4	#4	#4	#4	#5	#5	#6	#6	#7	#7		

APPROVED: DATE Aug. 25, 1959

STATE HIGHWAY ENGINEER

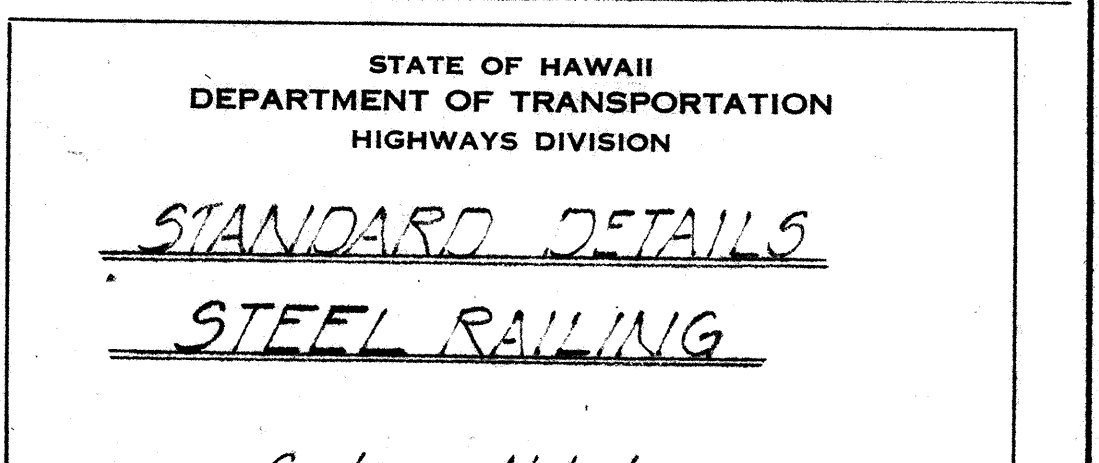
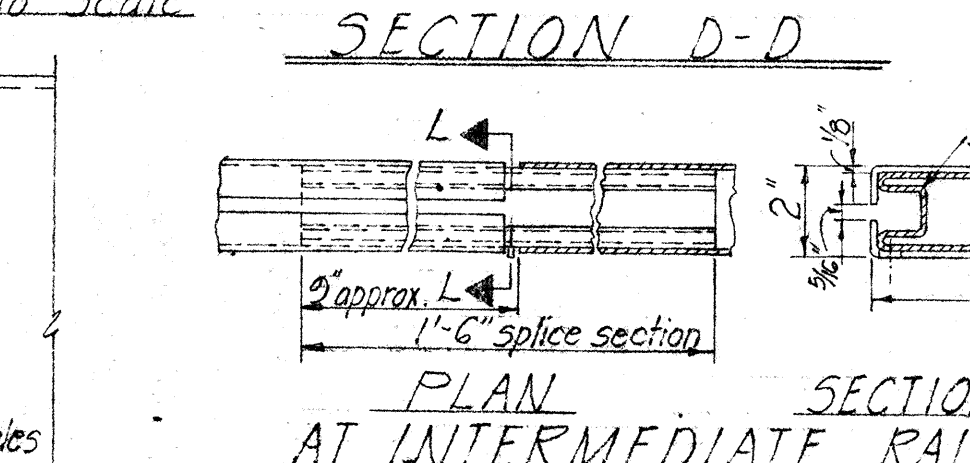
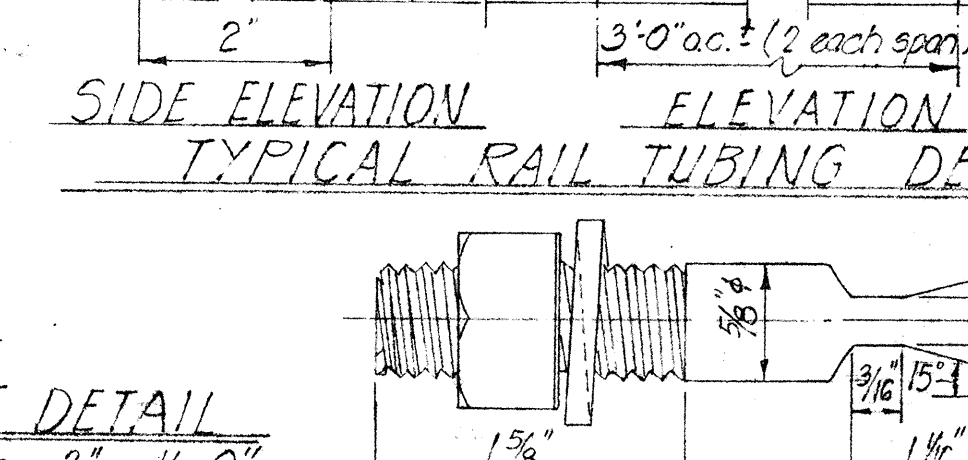
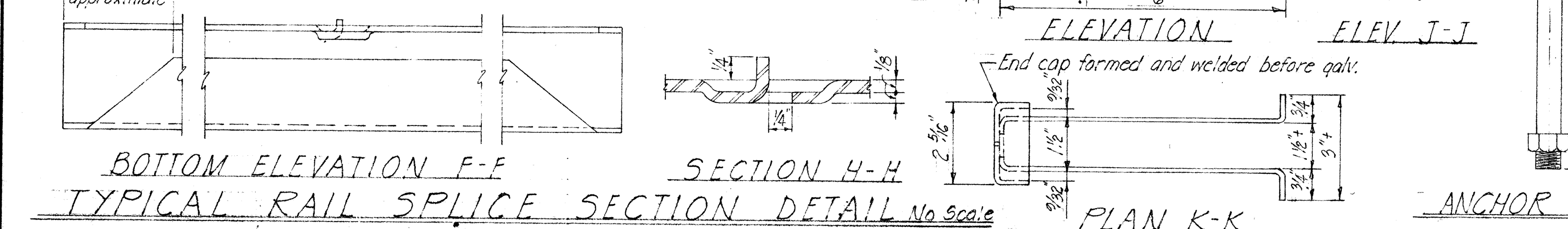
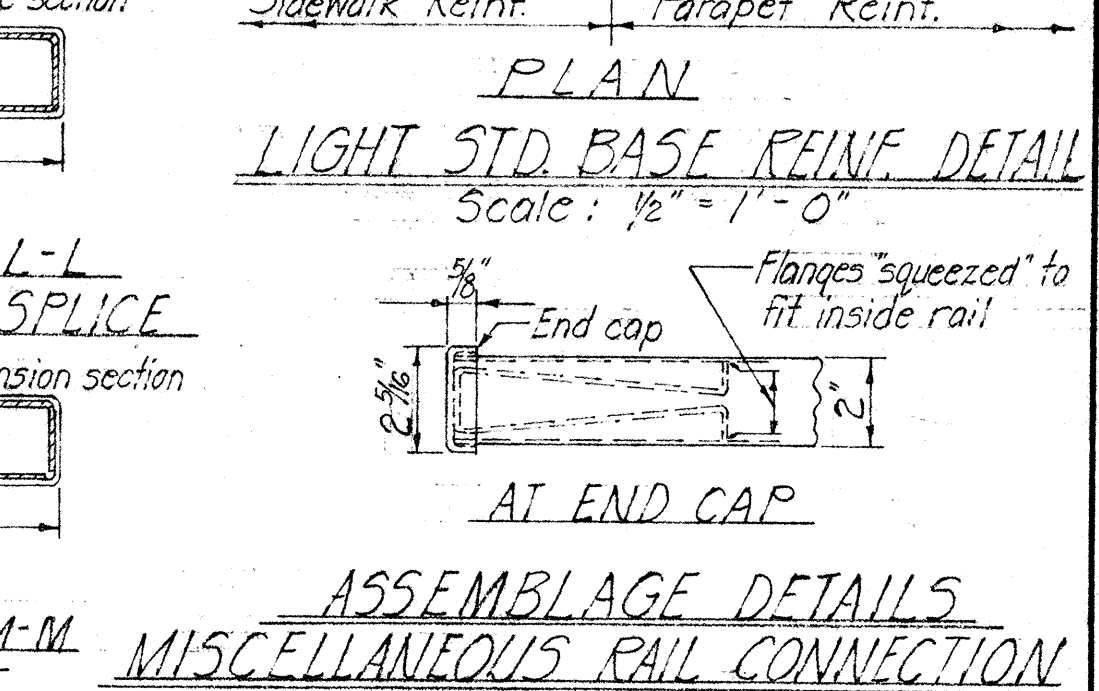
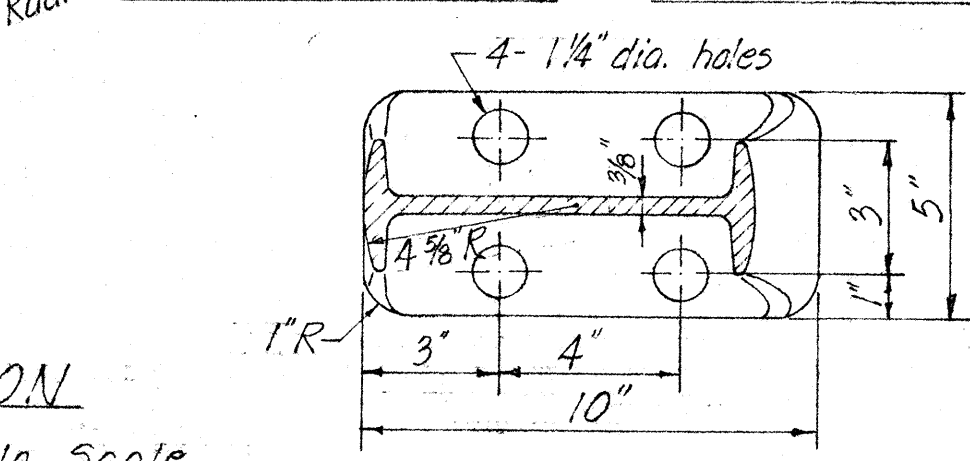
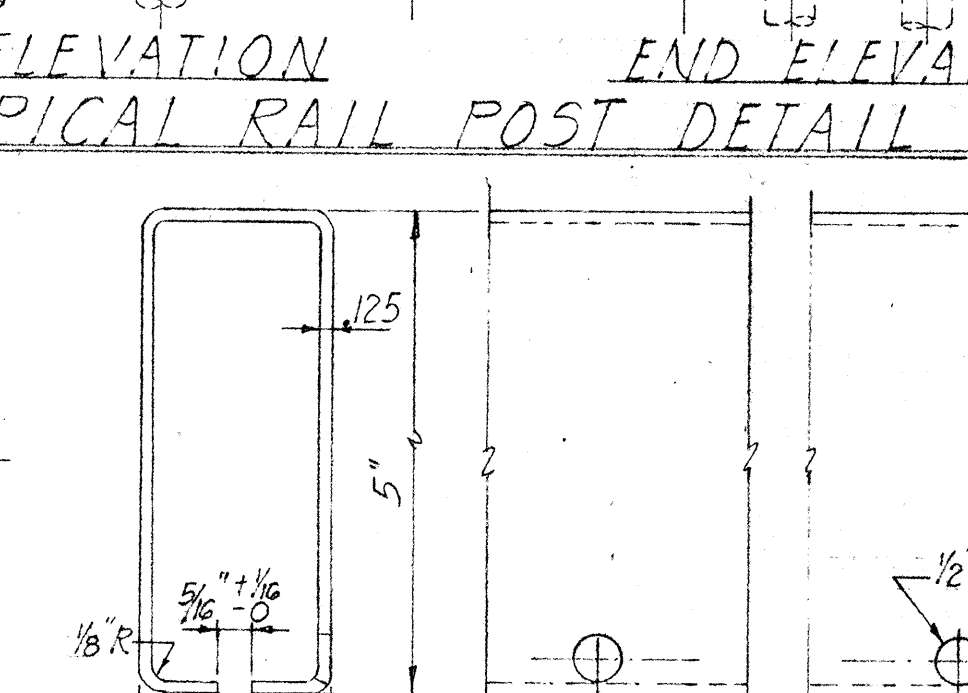
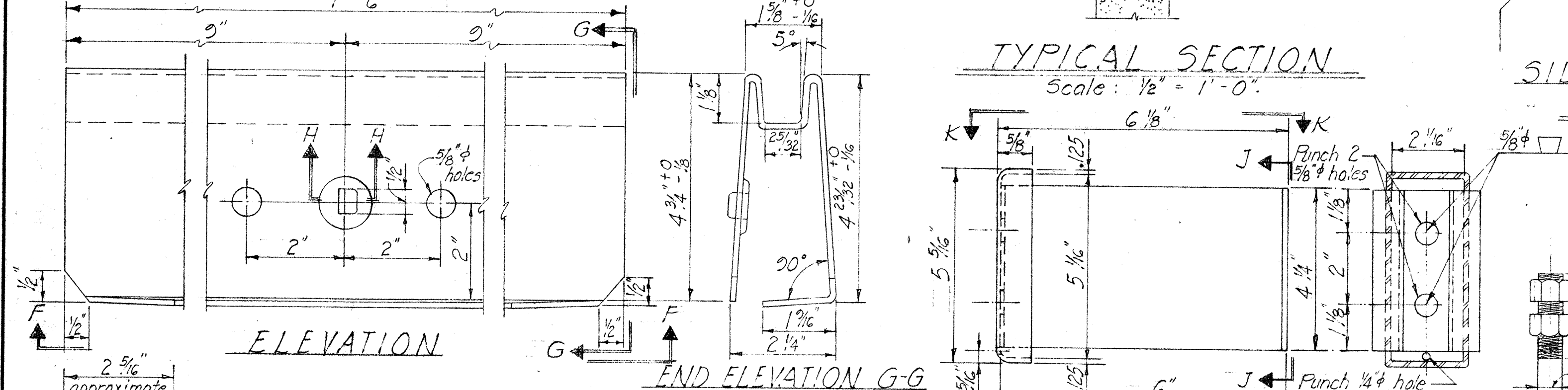
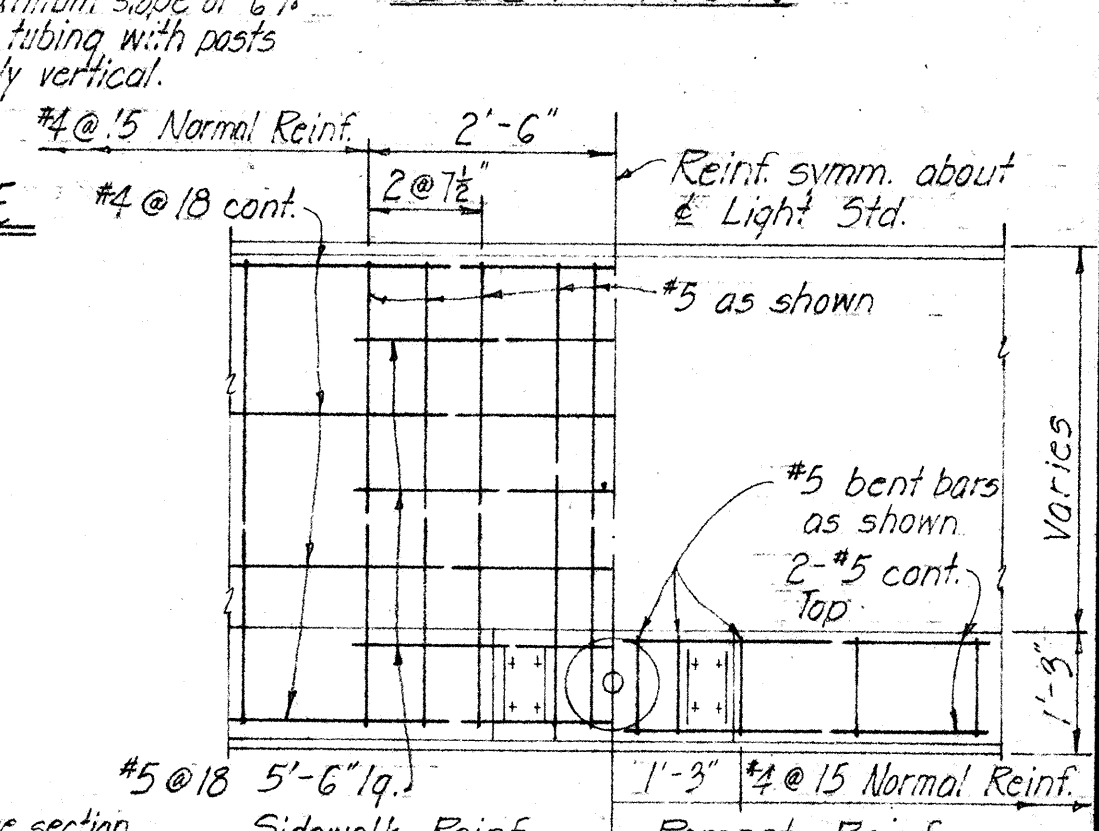
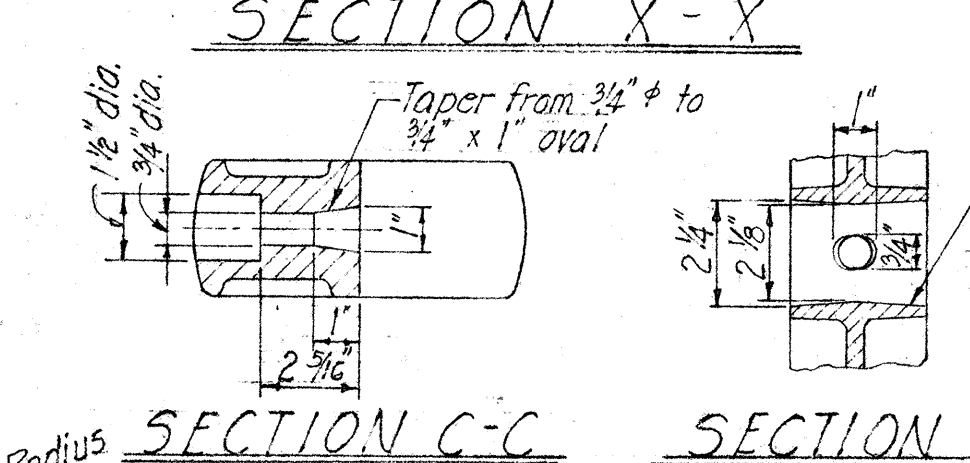
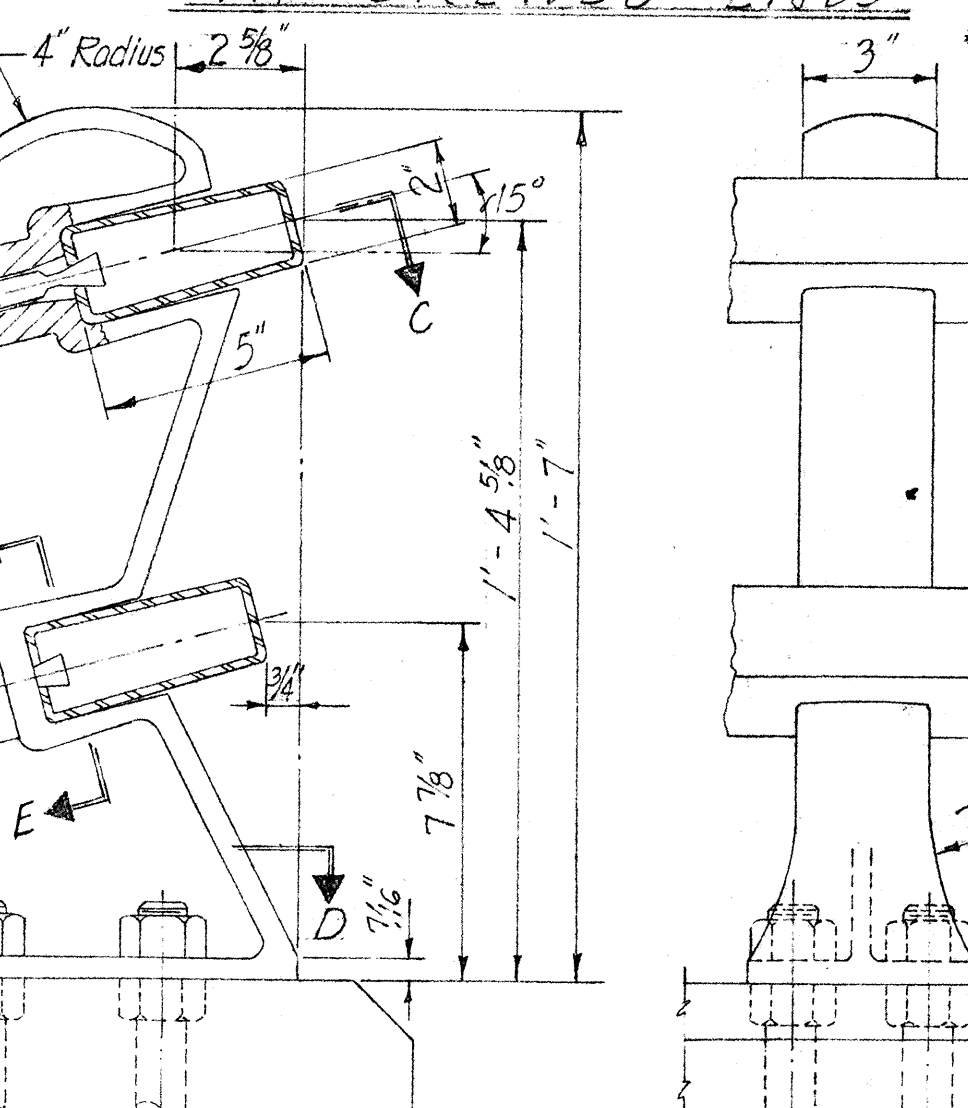
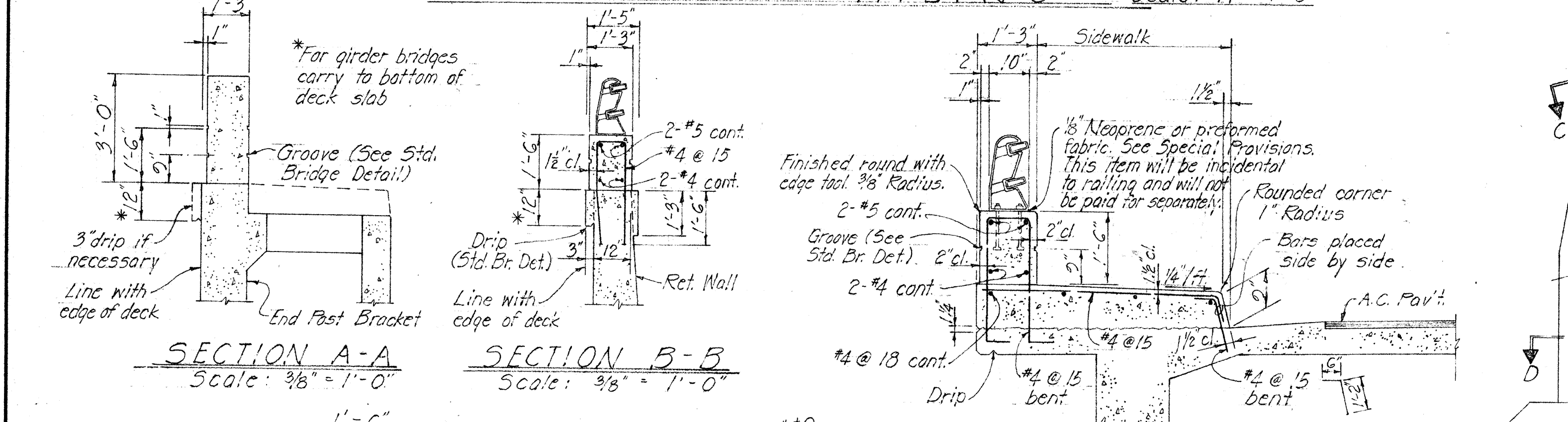
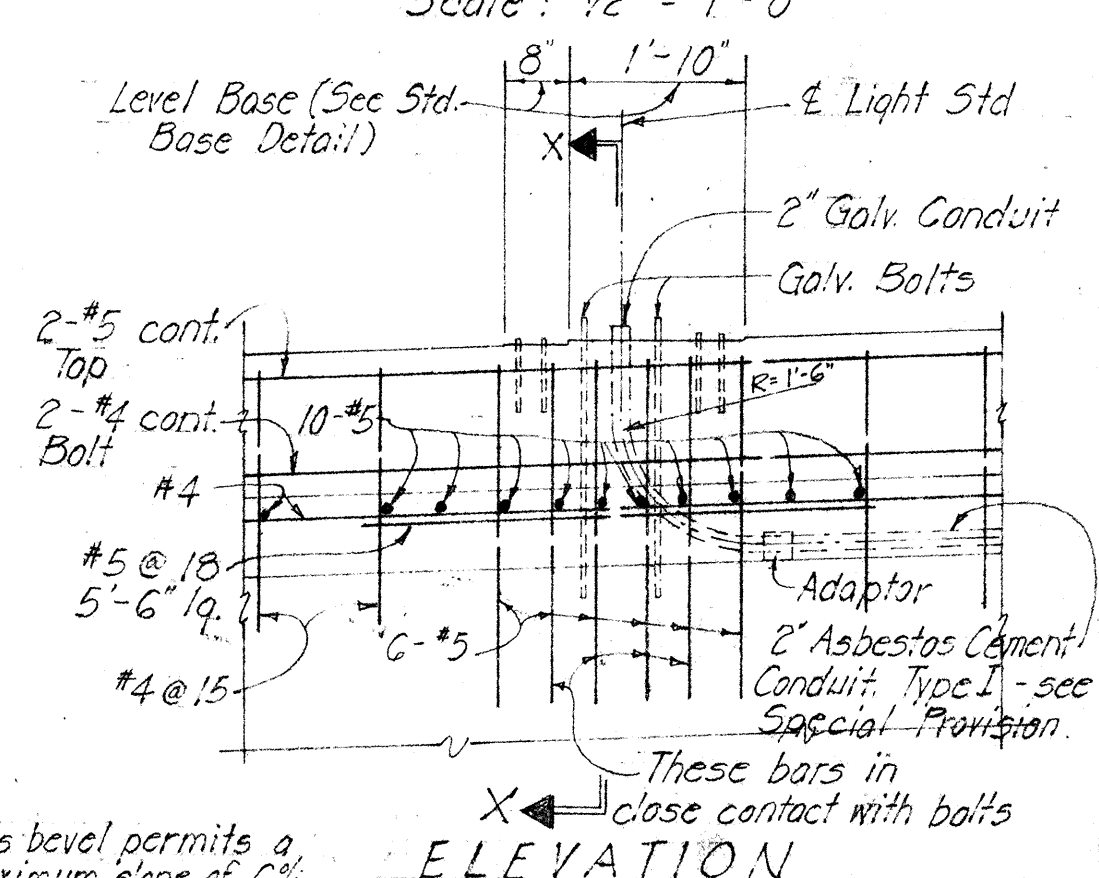
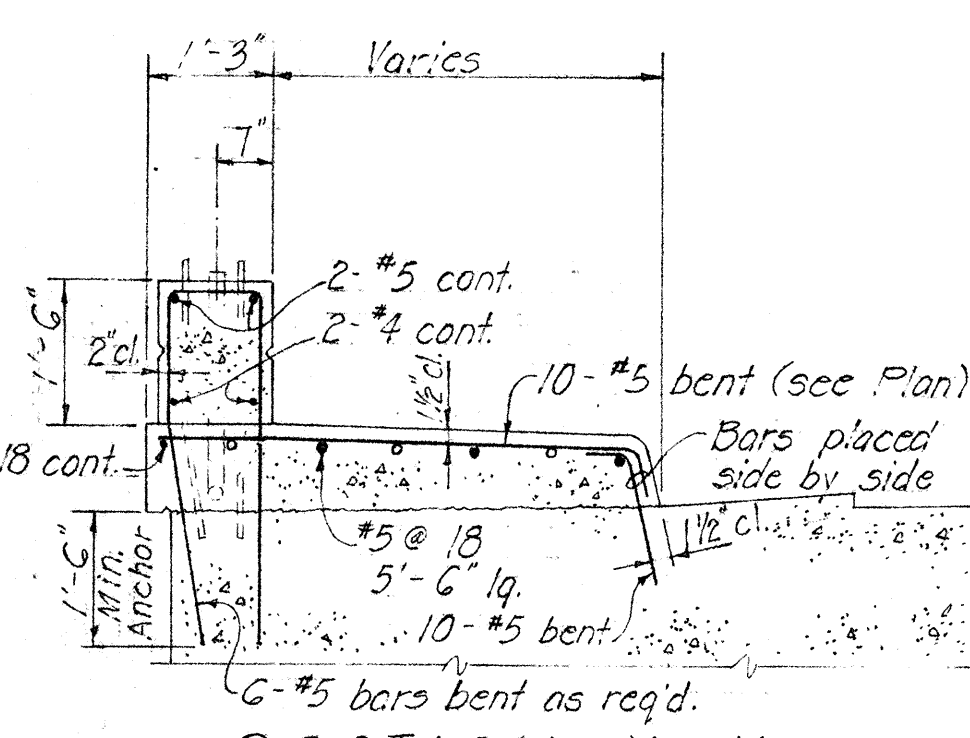
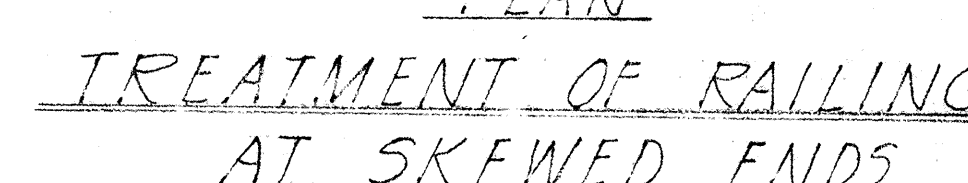
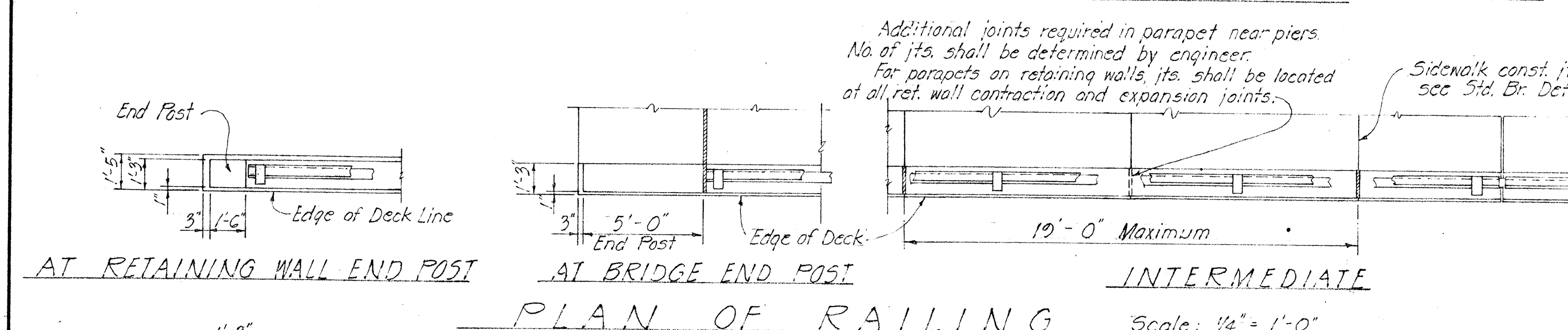
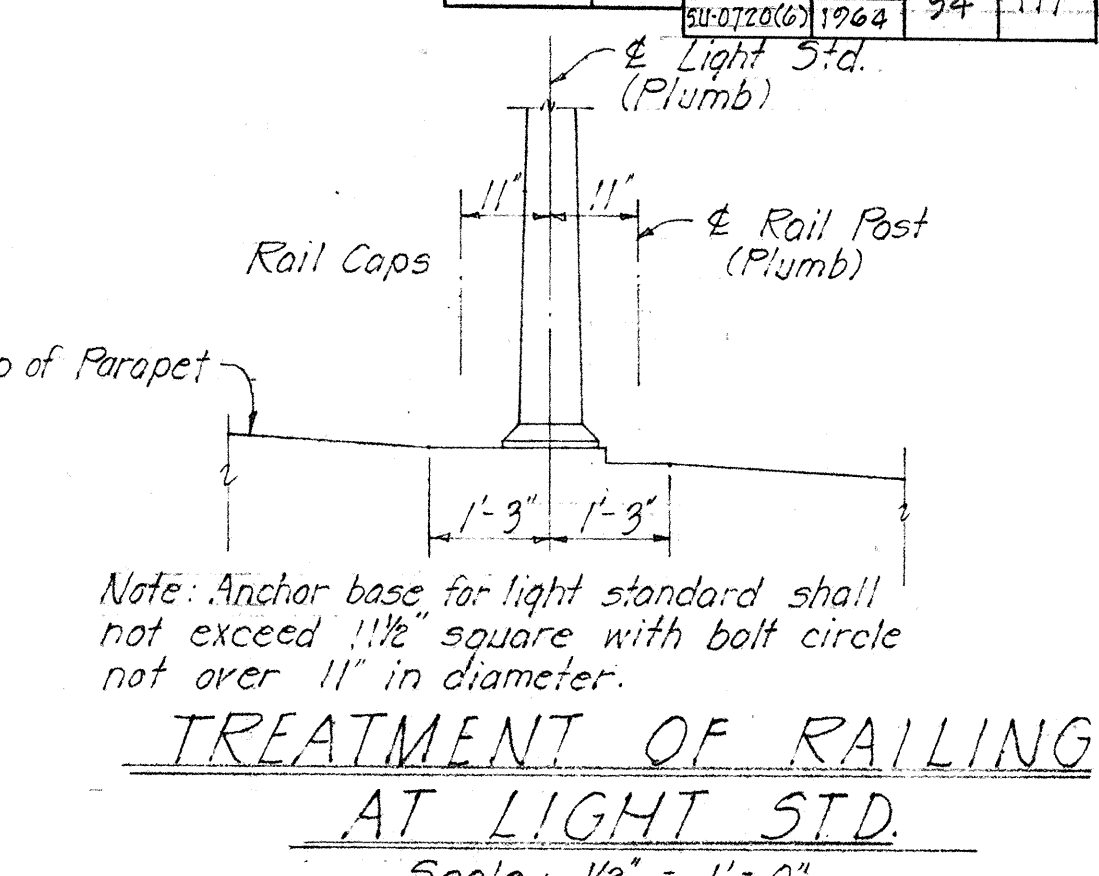
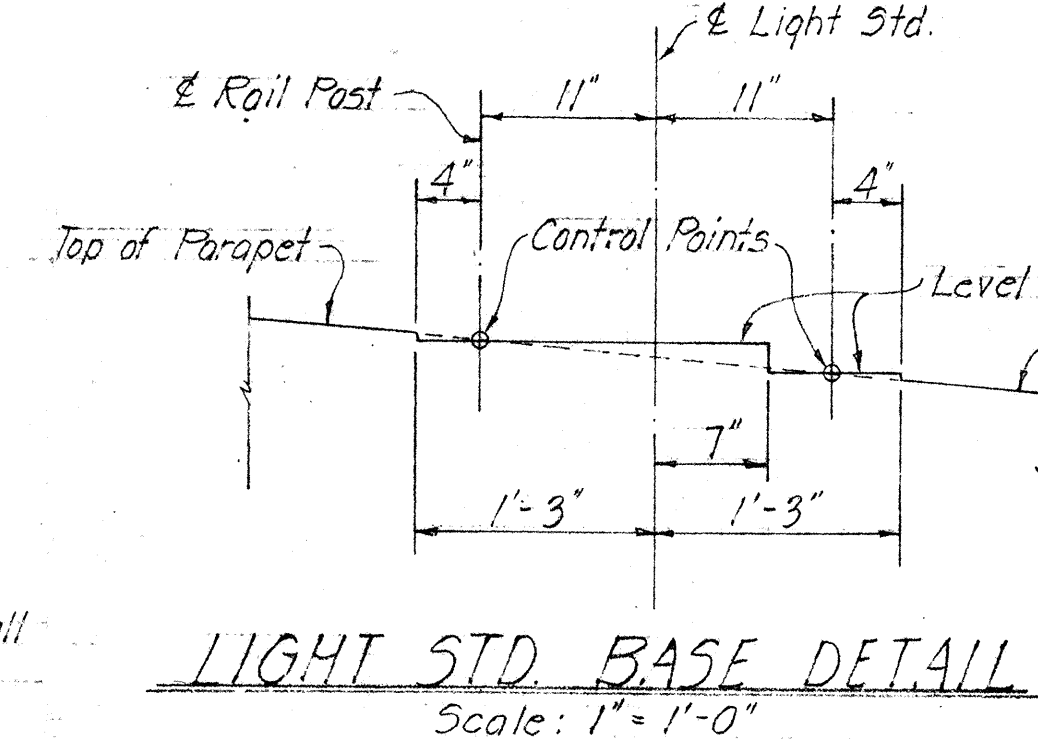
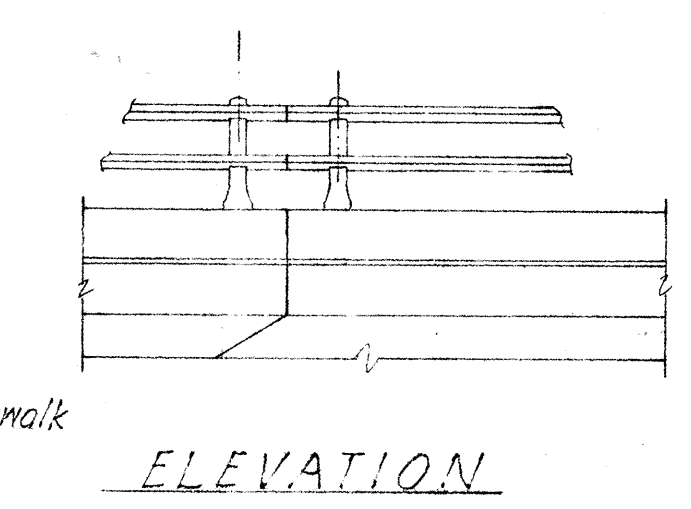
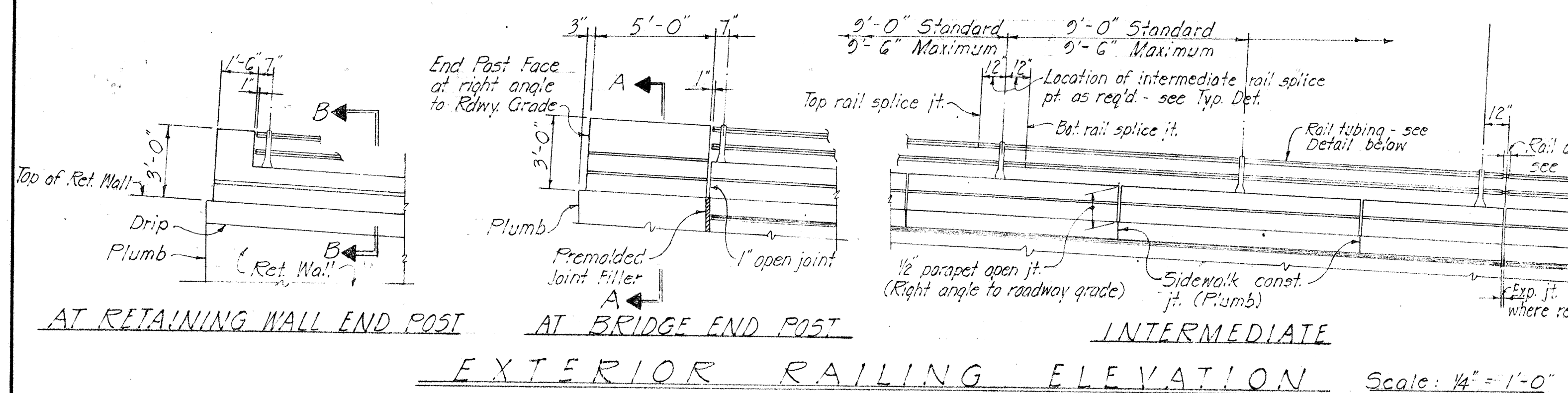
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
STATE OF HAWAII

RETAINING WALL STANDARDS

SCALES AS NOTED MAY, 1956

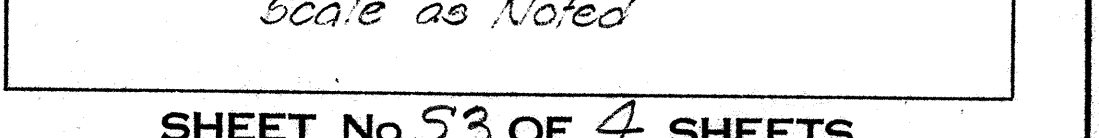
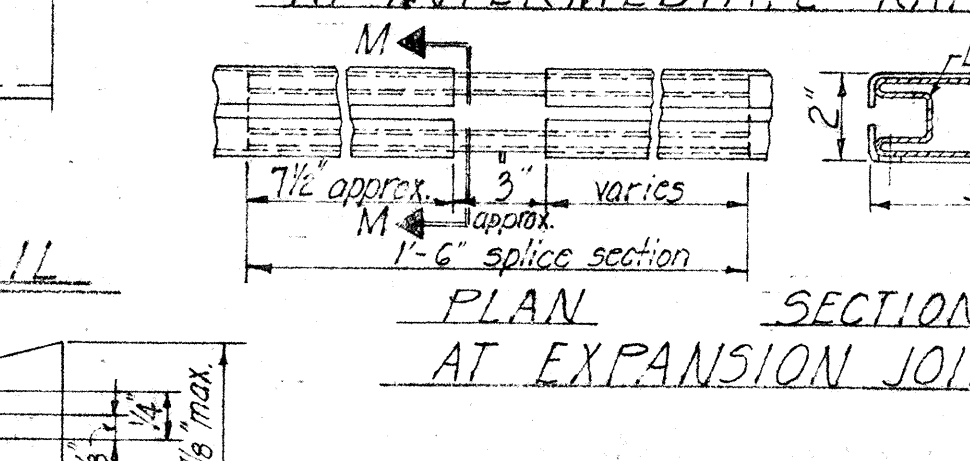
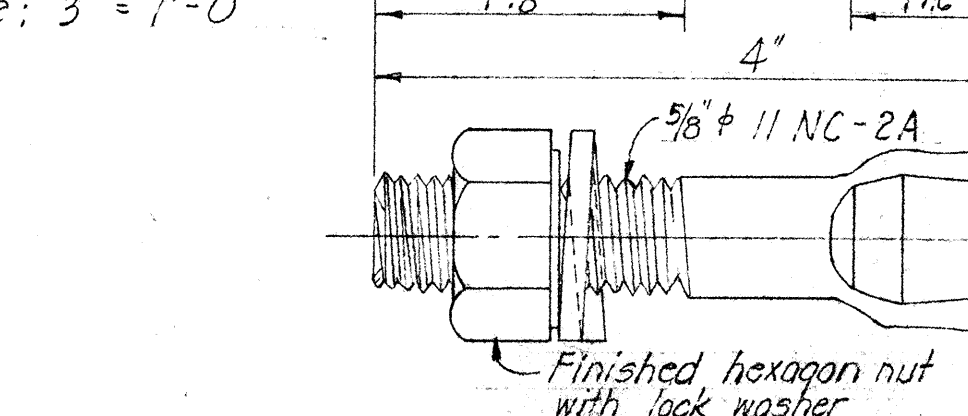
SHEET NO. 52 OF 4 SHEETS

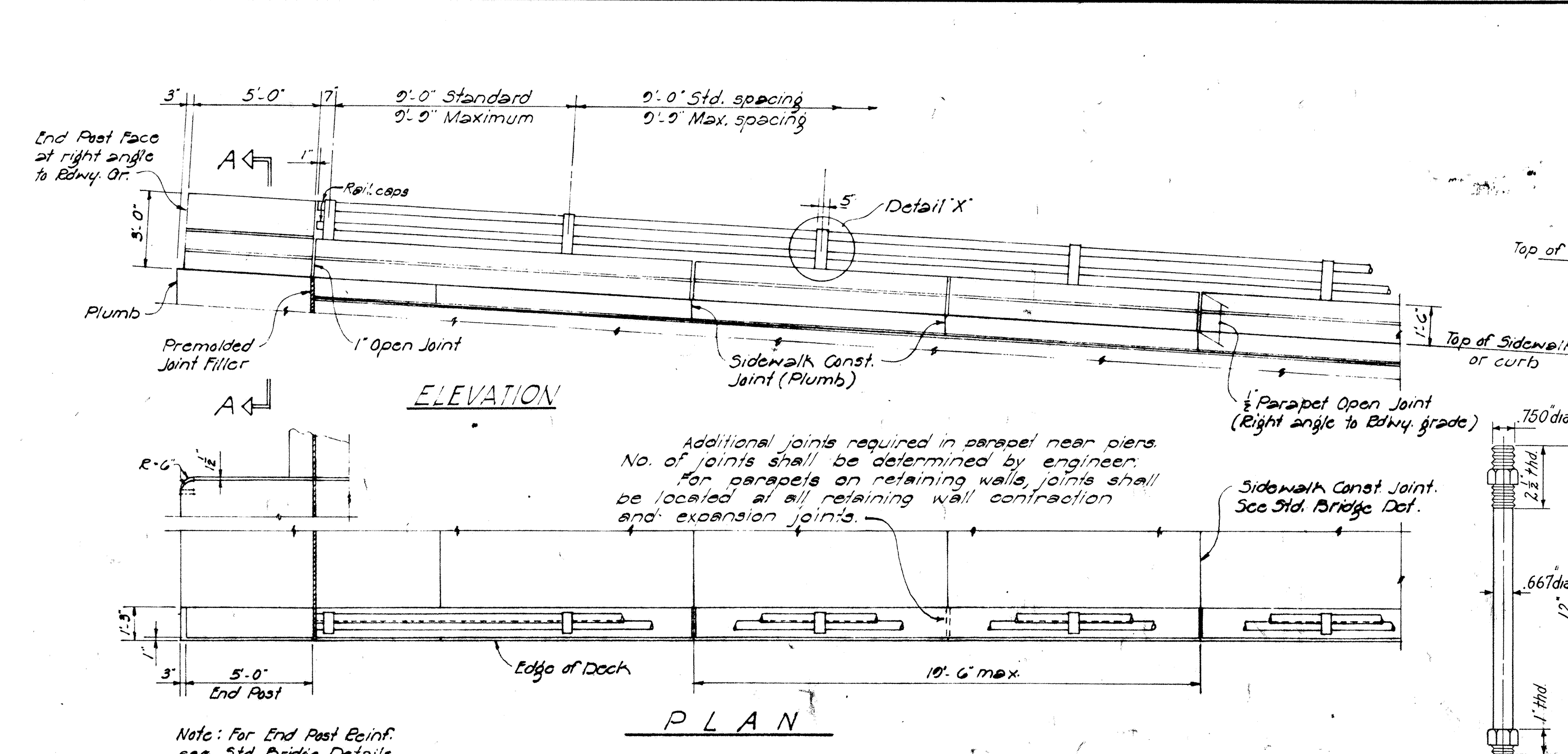
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F090-14(4)	1964	54	177



SPECIFICATIONS FOR STEEL RAILING

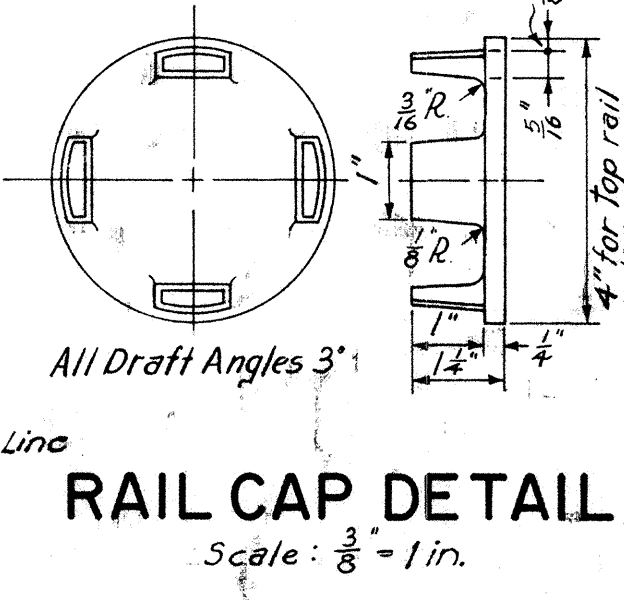
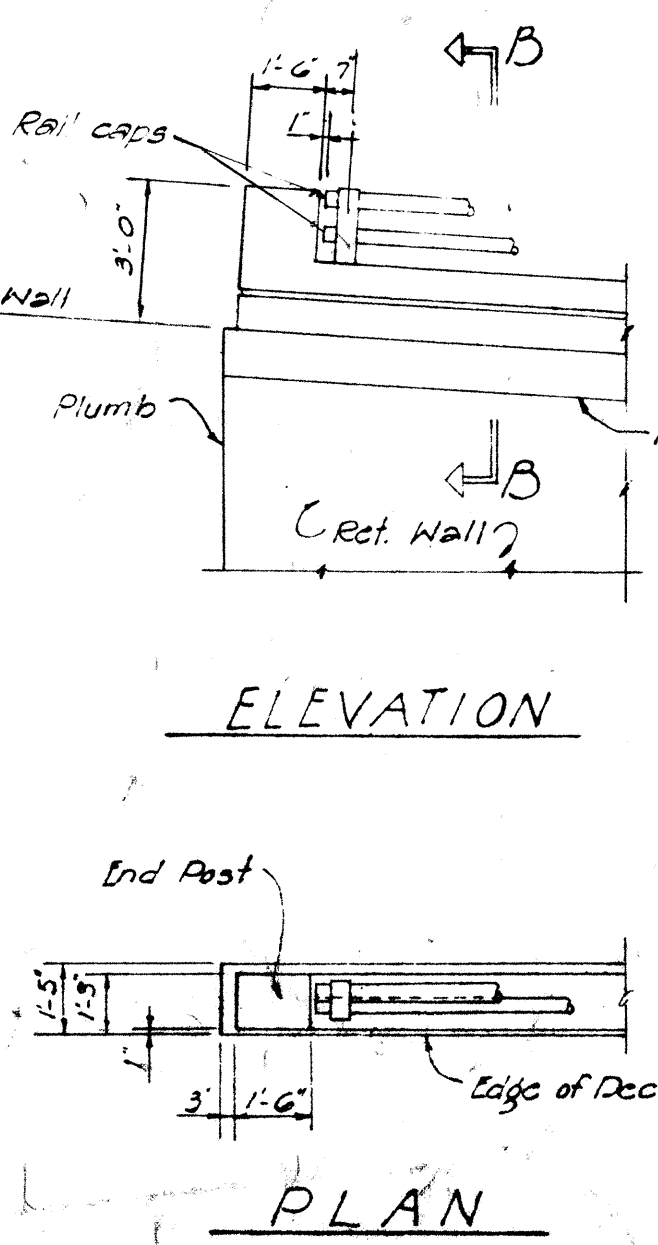
ITEM	DESCRIPTION	GALVANIZE
Post	Malleable Iron Castings ASTM A-47, Grade 350/B	ASTM A-153
Railing	Tubing 5" x 2" x 1/8" ASTM A-242, Grade C	ASTM A-123
Anchor Bolts & Nuts	ASTM A-307	ASTM A-153
Wedge Bolts	ASTM A-307	ASTM A-153



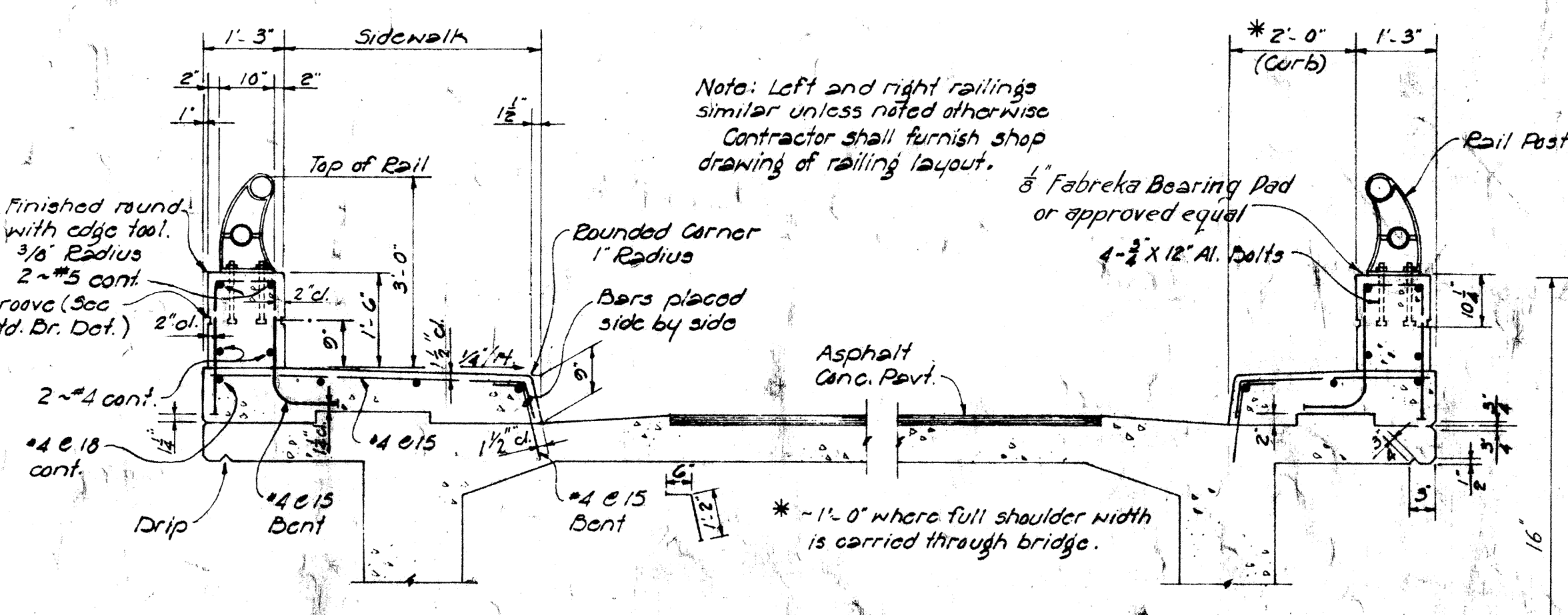
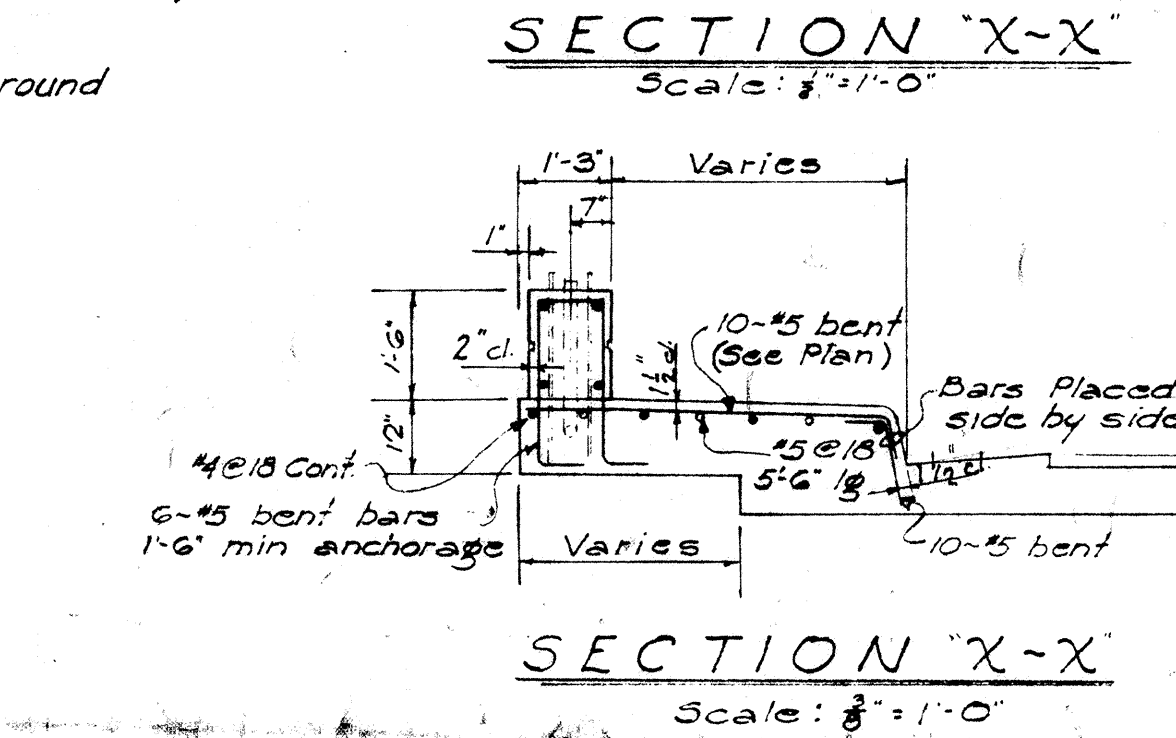
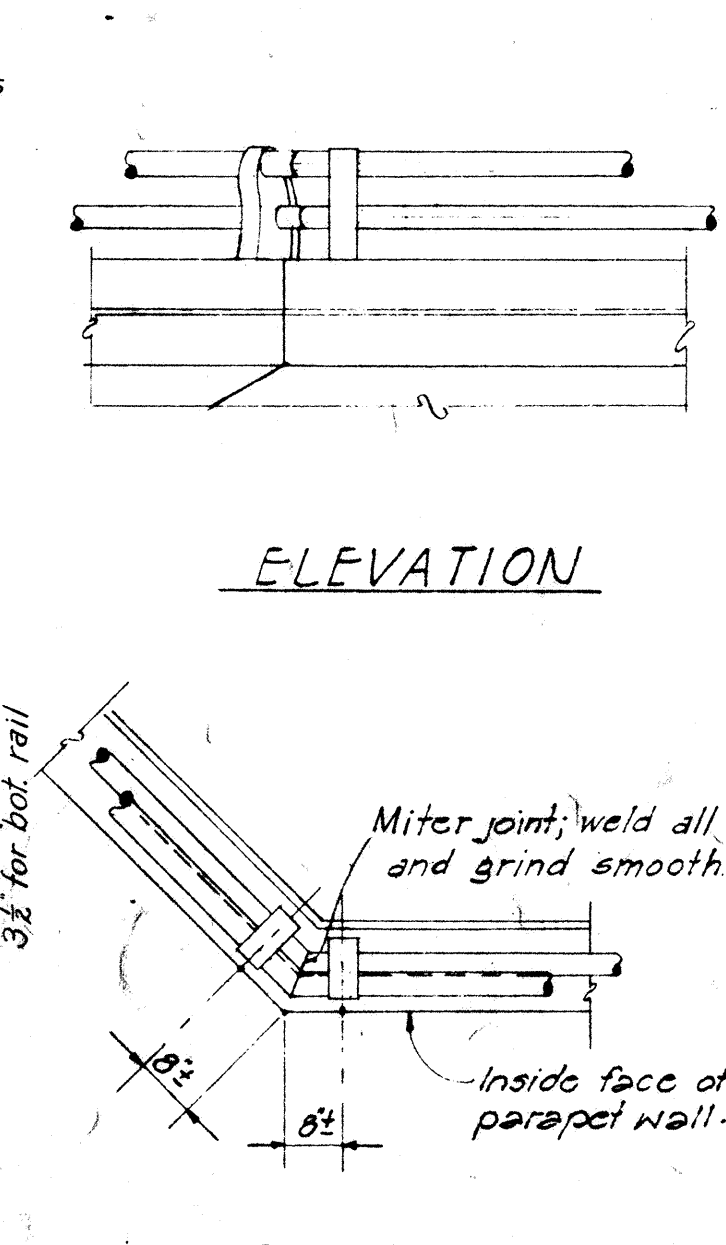


ALUMINUM RAILING DETAIL
Scale: 1/4" = 1'-0"

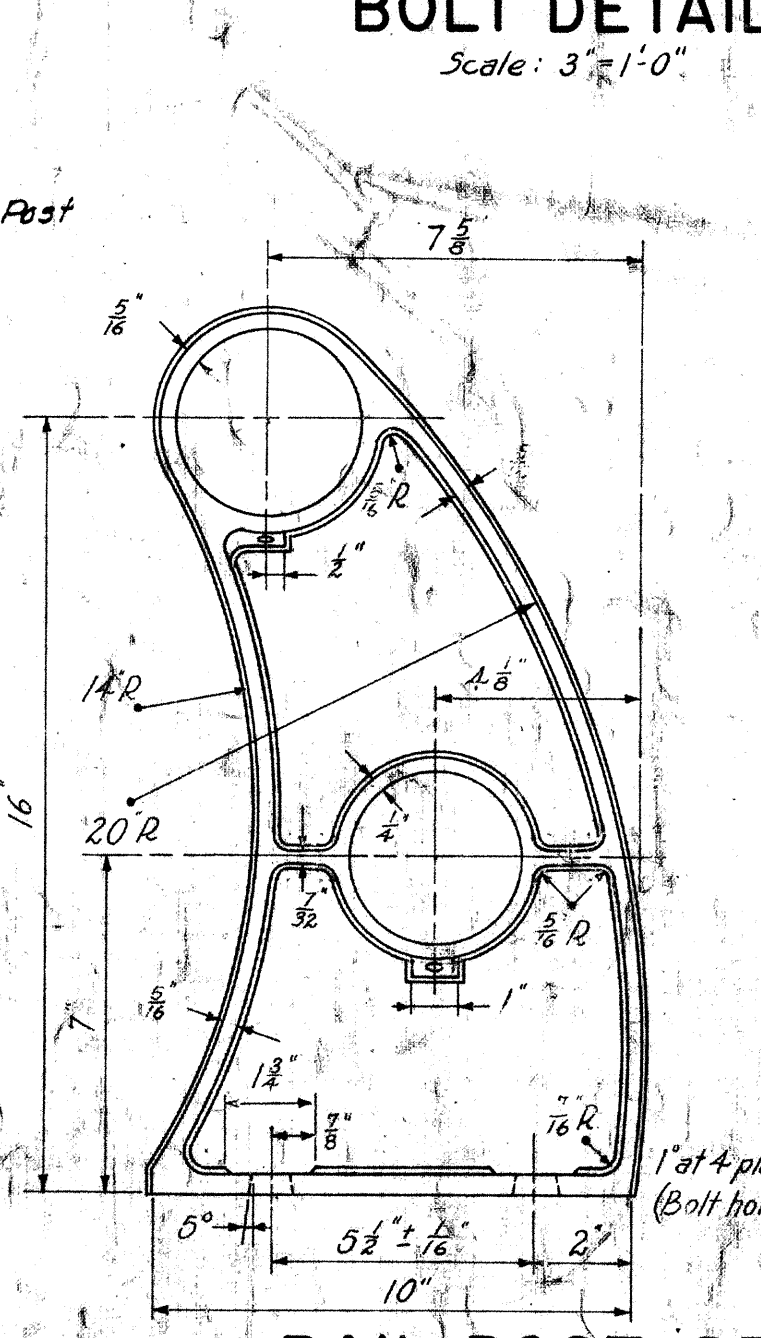
ANCHOR TREATMENT OF RAILING BOLT DETAIL ON RETAINING WALL
Scale: 3" = 1'-0"



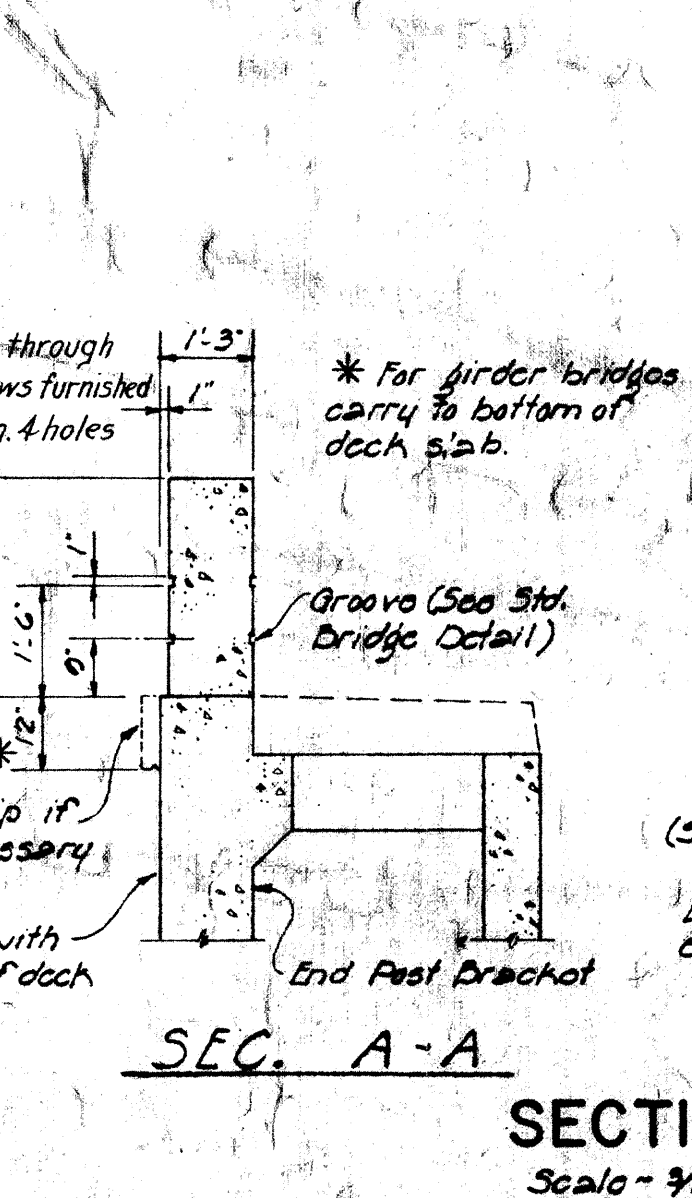
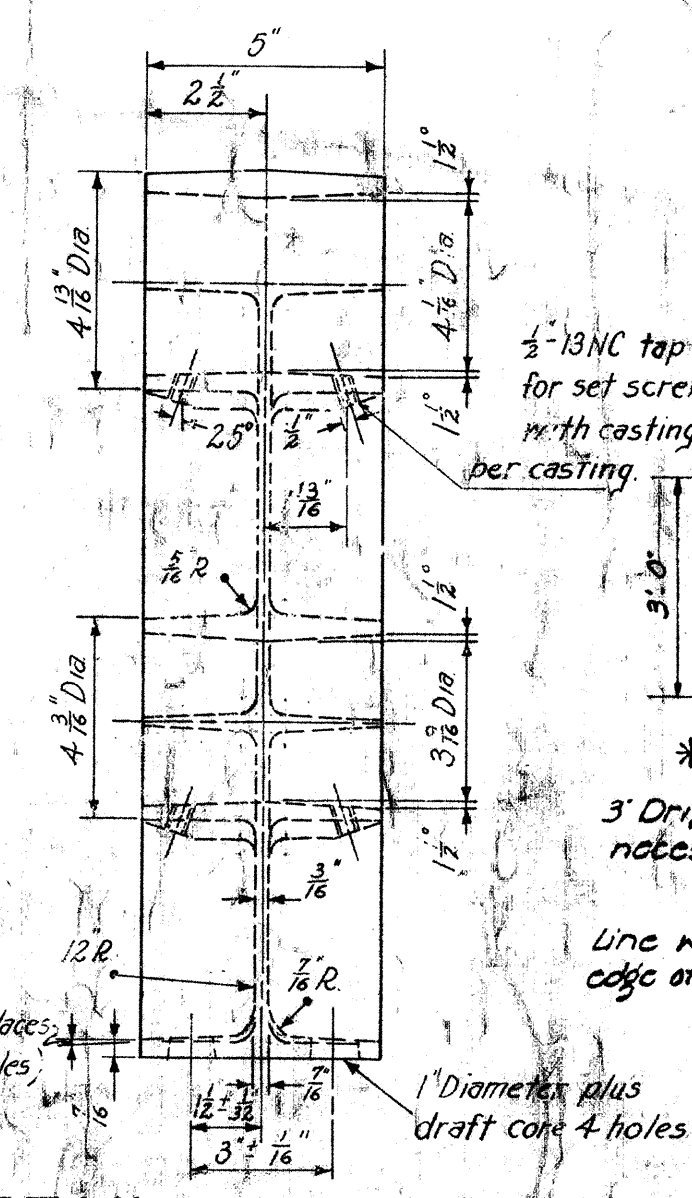
TREATMENT OF RAILING AT SKEWED JOINT
Scale: 3/8" = 1'-0"



TYPICAL SECTION
Scale: 1/2" = 1'-0"



RAIL POST DETAIL
Scale: 3" = 1'-0"



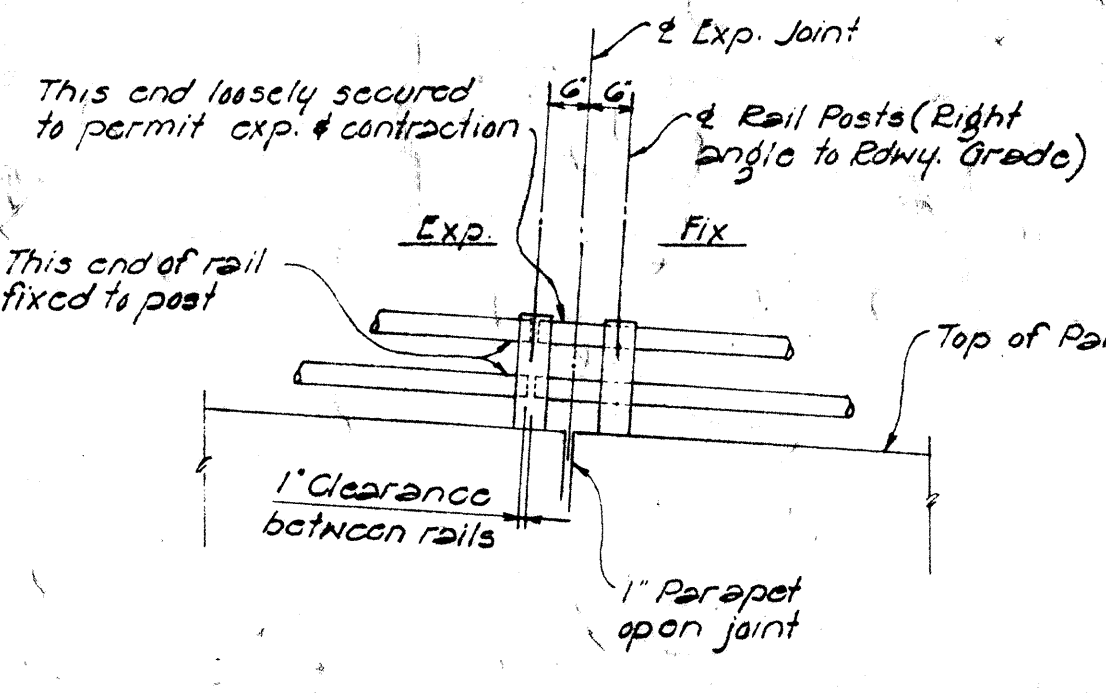
SECTIONS
Scale: 3/8" = 1'-0"

GENERAL NOTE
Except where detailed otherwise in the plans, all details on this sheet govern.
Aluminum railing, concrete parapet & end post to receive "Class 2 Surface Finish."

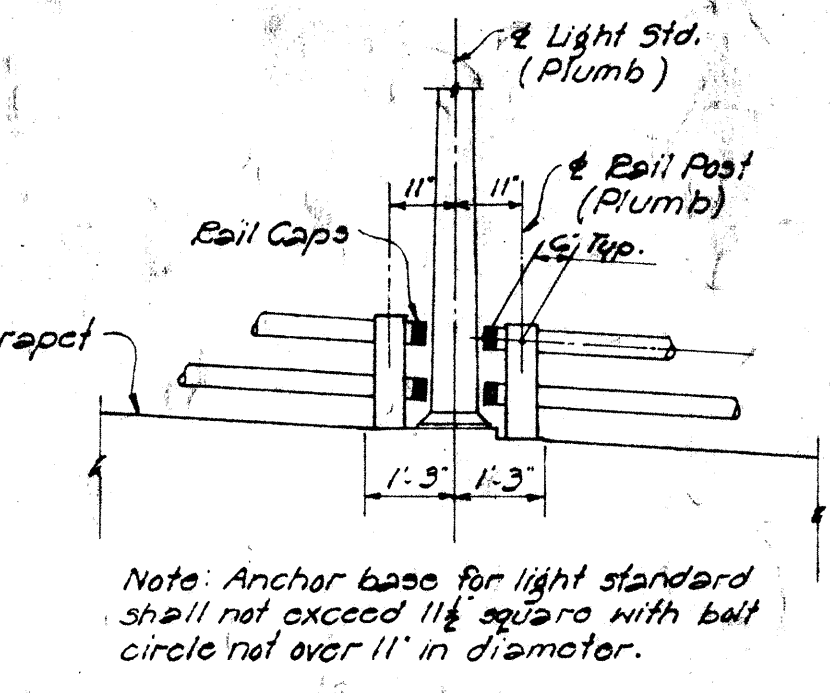
SPECIFICATION FOR ALUMINUM RAILING

ITEM	DESCRIPTION	ALLOY	UNIT WT.
Top Rail	Al Alloy Drawn Or Extruded Tube 4" o.d. x 1/8" thick wall.	6061-T6	1.70 #/ft.
Bot. Rail	Al Alloy Drawn Or Extruded Tube 3 1/2" o.d. x 1/8" thick wall.	6061-T6	1.56 #/ft.
* Rail Post	Permanent Mold Casting See Rail Post Detail	Post A356-T6 Ref. Sec. 2024-74	16.0 #/lb.
Rail Cap	See Rail Cap Detail	Cap A356-T6 Ref. Sec. 2024-74	Top - .415 #/sq. in. Bot. - .340 #/sq. in.
Bolts	See Anchor Bolt & Rail Post Detail	Bolt 2024-74 Nut 6061-T6 Wash. 2024-74	

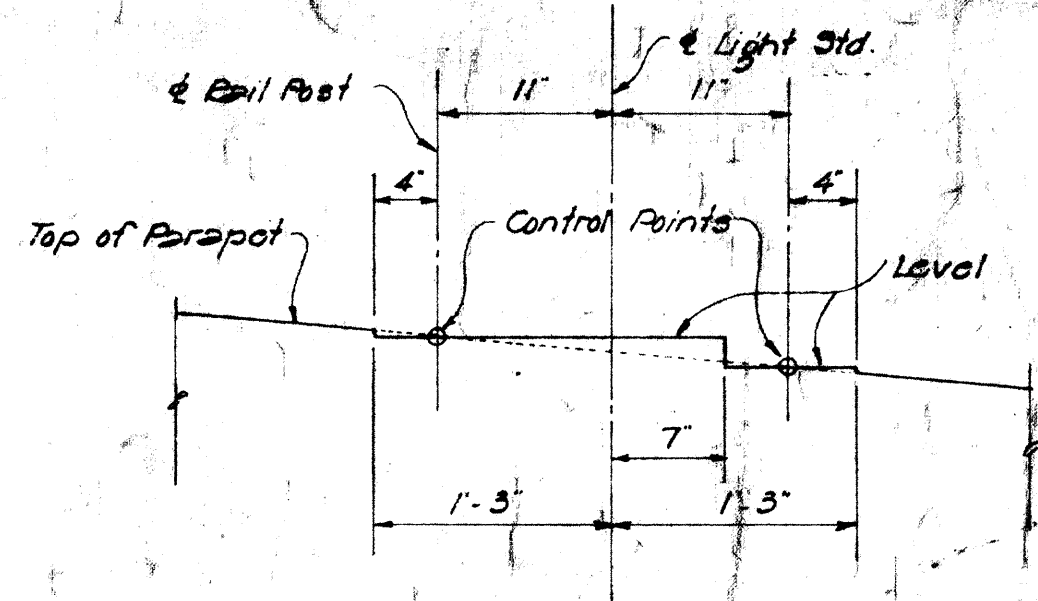
* Rail Post Finish: Front, top and rear faces of post shall receive a standard scratch brush finish, to be approved by the Engineer.



TREATMENT OF RAILING AT EXP. JOINT
Scale: 3/8" = 1'-0"

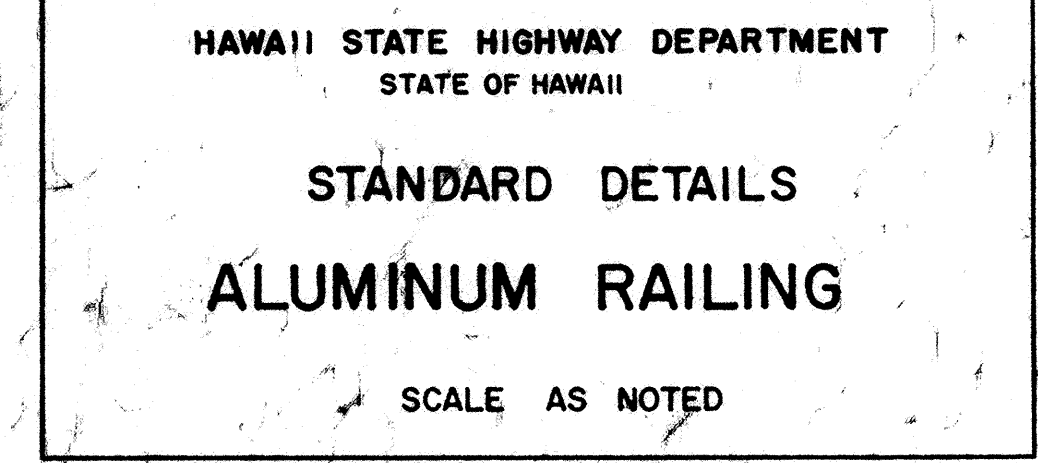


TREATMENT OF RAILING AT LIGHT STD.
Scale: 3/8" = 1'-0"



LIGHT STD. BASE DETAIL
Scale: 1" = 1'-0"

LIGHT STD. BASE REINF. DETAIL



HAWAII STATE HIGHWAY DEPARTMENT
STATE OF HAWAII
STANDARD DETAILS
ALUMINUM RAILING
SCALE AS NOTED

DESIGNED BY: J. L. B. / J. L. B.
CHECKED BY: J. L. B. / J. L. B.
DATE: 1-59

APPROVED: _____ DATE: Aug 26, 1959
STATE HIGHWAY ENGINEER