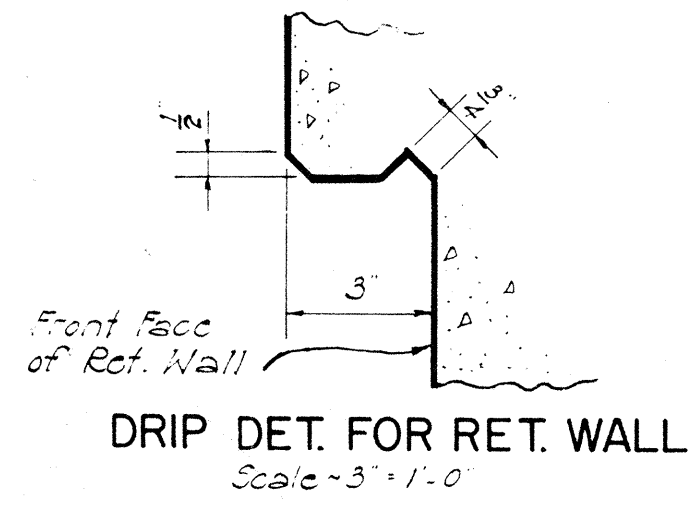


NAME DATE

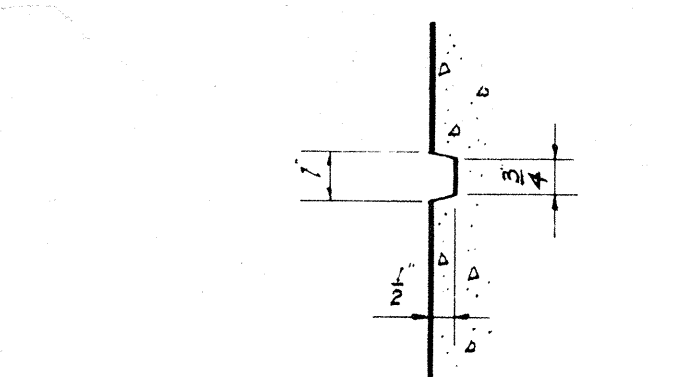
Use correct name of bridge
LEFT HAND SIDE
Date of year built
RIGHT HAND SIDE

DETAIL OF LETTERS AND FIGURES
AT BOTH APPROACHES

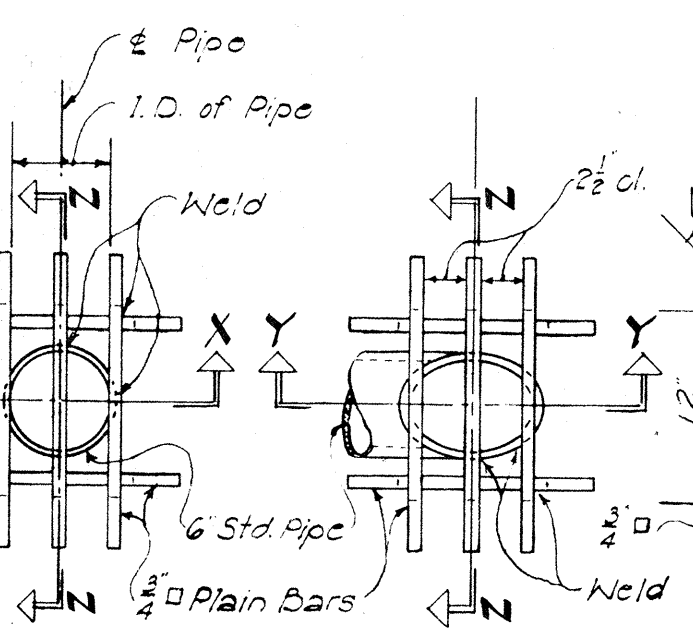
NOTE: Name of bridge to be placed in left end post panels and date in right post panels on entering bridge using modified block letters 3" in height. In case of stream crossings use name of stream for name of bridge. For all others use name as designated by the Engineer.



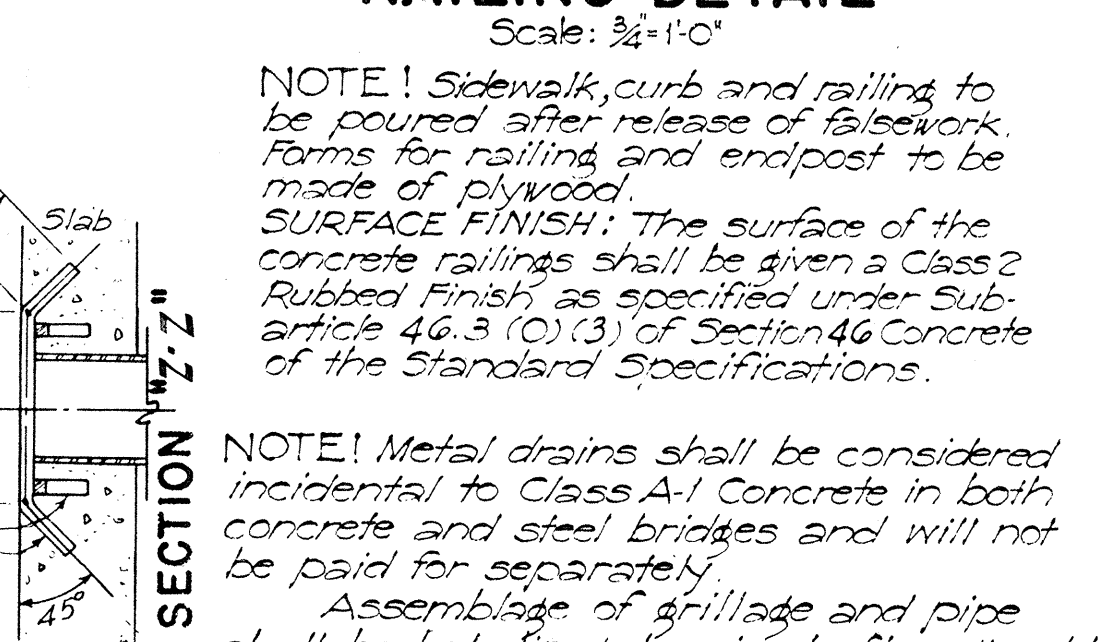
DRIP DET. FOR RET. WALL
Scale: 3/4"=1'-0"



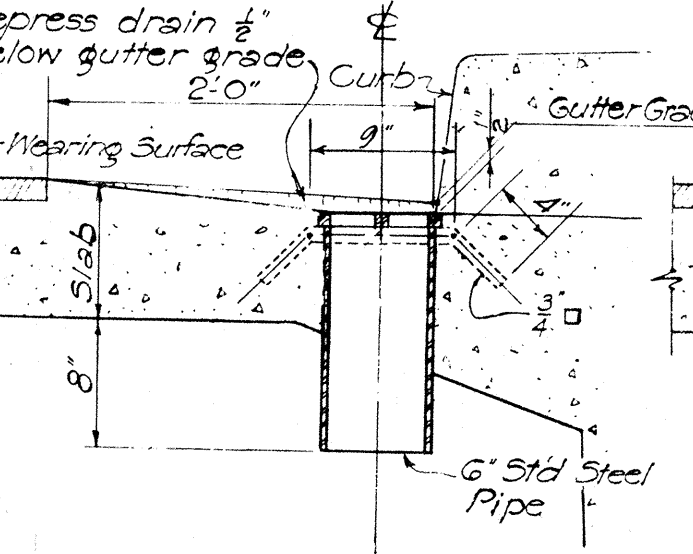
END POST GROOVE DET.
Scale: 3/4"=1'-0"



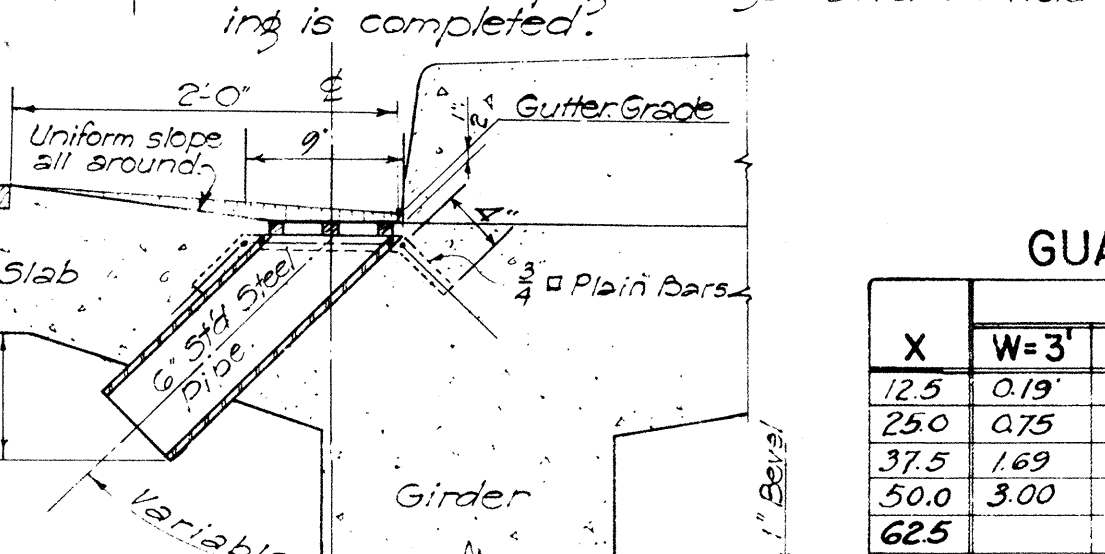
SECTION "X-X"
DRAINAGE DETAIL
Scale: 1"=1'-0"



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



SECTION "E-E"
Scale: 3/4"=1'-0"



SECTION "D-D"
Scale: 3/4"=1'-0"

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.

Minimum covering, measured from the surface of the concrete to the face of any reinforcing bar, shall be not less than 2 inches except in slabs where the minimum covering shall be 1 1/2 inches. In the footings of abutments and retaining walls and in piers the minimum covering shall be 3 inches. In work exposed to the action of sea water the minimum covering shall be 4 inches except in precast concrete piles where a minimum of 3" may be used.

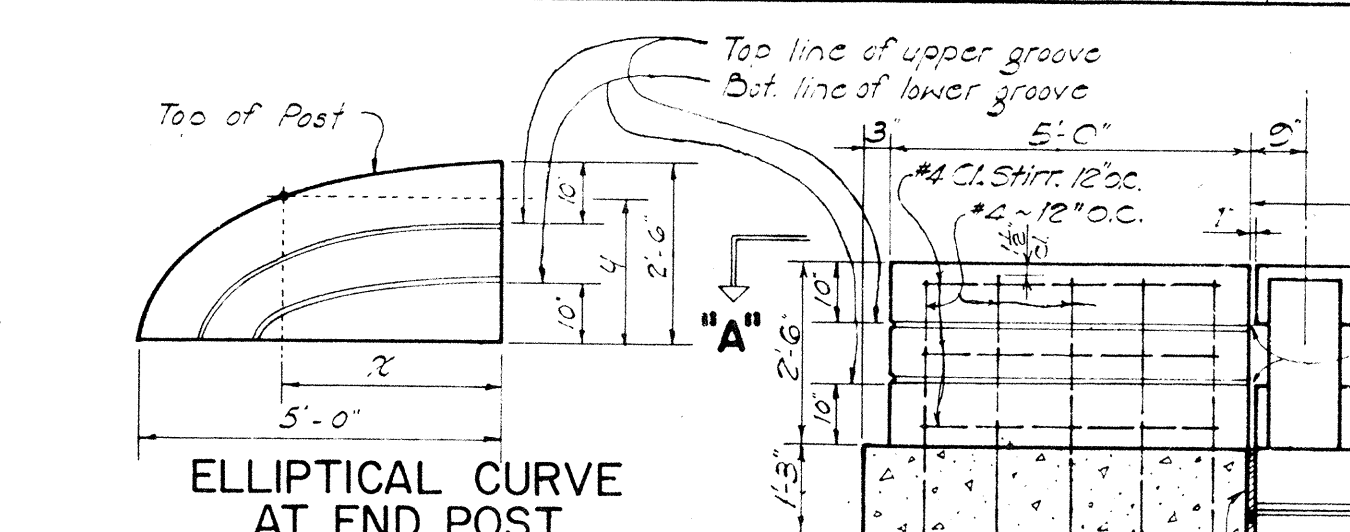
All dimensions relating to reinforcing are to centers of bars unless otherwise noted.

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

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

ELLIPSE COORDINATES

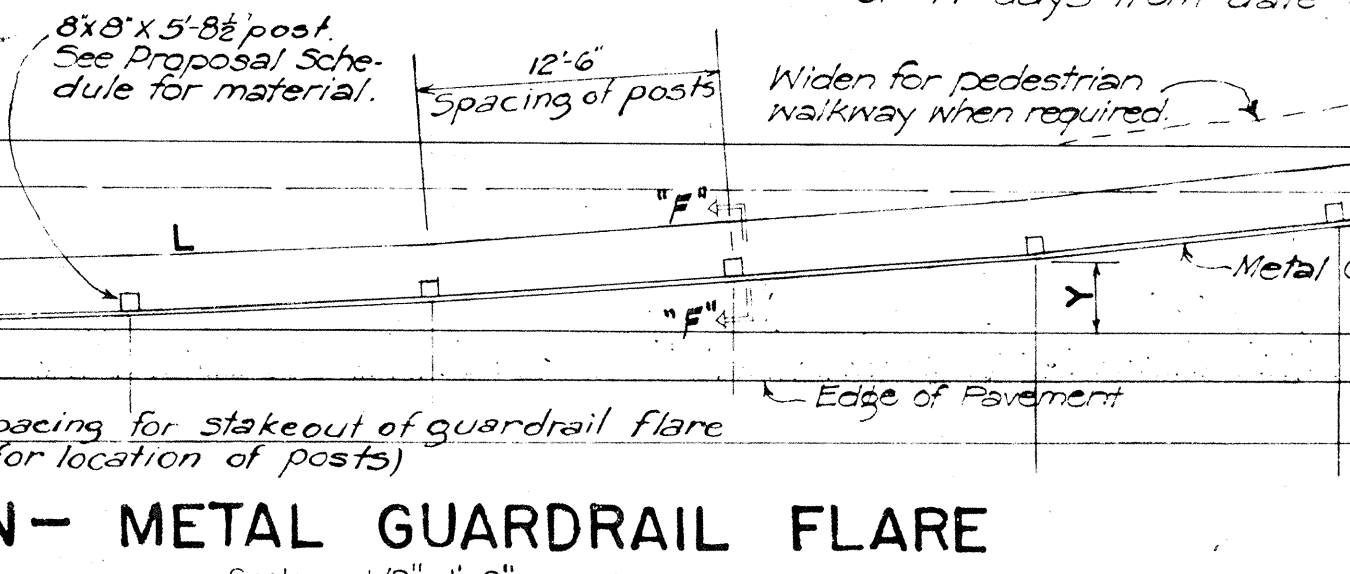
Top of Post	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
X	0	1.0	1.6	2.0	2.6	3.0	3.4	4.0	4.3	4.6	4.9	4.10 1/2	5.0							
Y	0	2.6	2.5 1/2	2.4 1/2	2.3 1/2	2.2	2.0	1.9 1/2	1.8	1.7 1/2	1.6 1/2	1.5 1/2	1.4 1/2	1.3 1/2	1.2 1/2	1.1 1/2	1.0 1/2	0.9 1/2	0.8 1/2	0.7 1/2
Bottom of Lower Groove	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
X	0	1.0	1.6	2.0	2.6	3.0	3.4	4.0	4.3	4.6	4.9	4.10 1/2	5.0							
Y	0	2.6	2.5 1/2	2.4 1/2	2.3 1/2	2.2	2.0	1.9 1/2	1.8	1.7 1/2	1.6 1/2	1.5 1/2	1.4 1/2	1.3 1/2	1.2 1/2	1.1 1/2	1.0 1/2	0.9 1/2	0.8 1/2	0.7 1/2



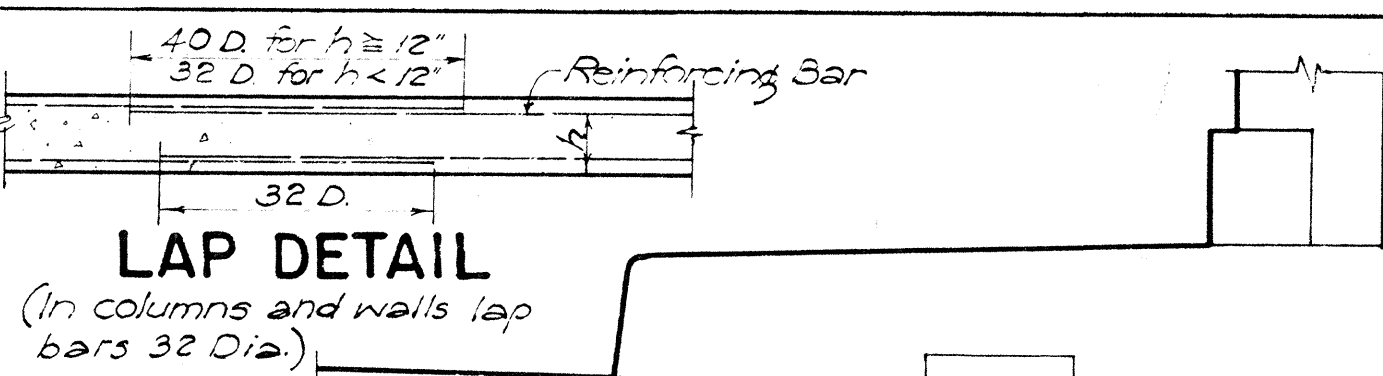
GUARDRAIL OFFSET

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	2.16	2.00
75.0			5.00	4.41	3.11	2.88
87.5				6.00	4.23	3.92
100.0					5.53	5.12
112.5						6.48
125.0						8.00

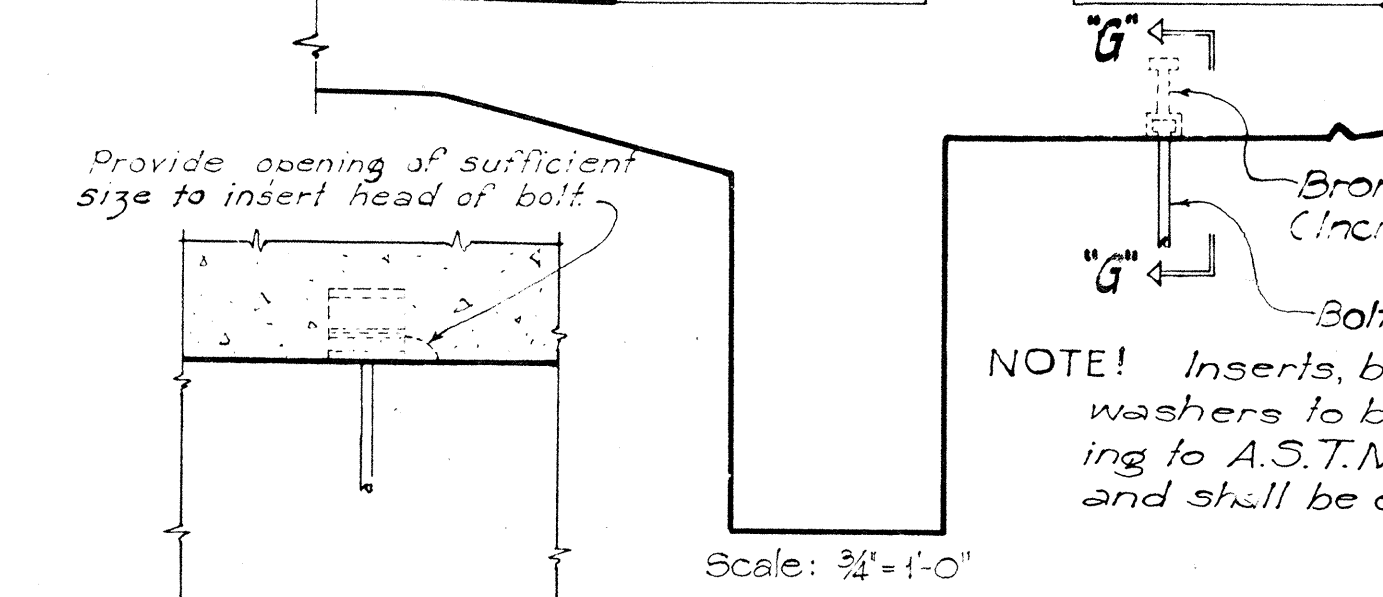
W = Guardrail flare
X = Distance from post at bridge to offset points.
Y = Guardrail flare offset



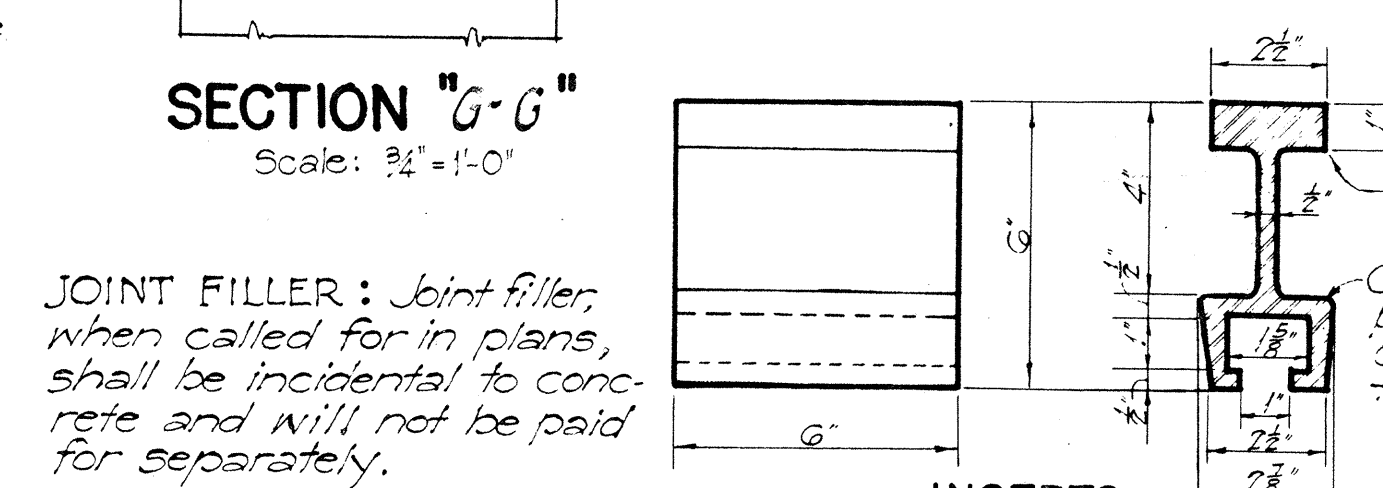
PLAN - METAL GUARDRAIL FLARE
Scale: 1/8"=1'-0"



LAP DETAIL
(In columns and walls lap bars 32 Dia.)



SECTION "G-G"
Scale: 3/4"=1'-0"

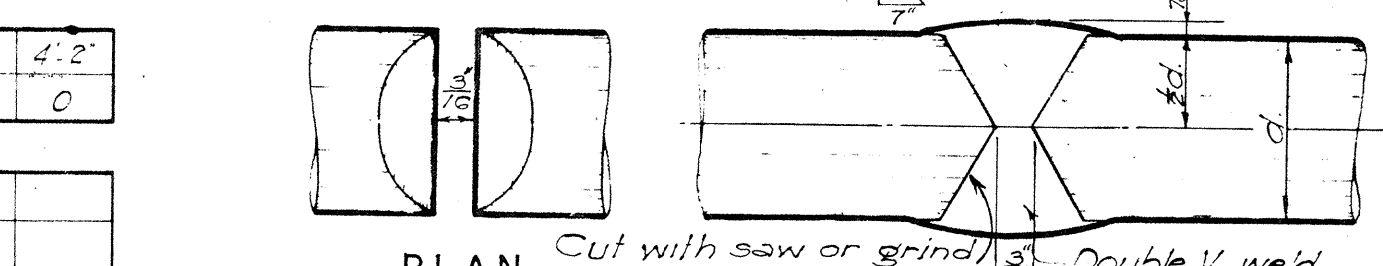


JOINT FILLER: Joint filler when called for in plans, shall be incidental to concrete and will not be paid for separately.

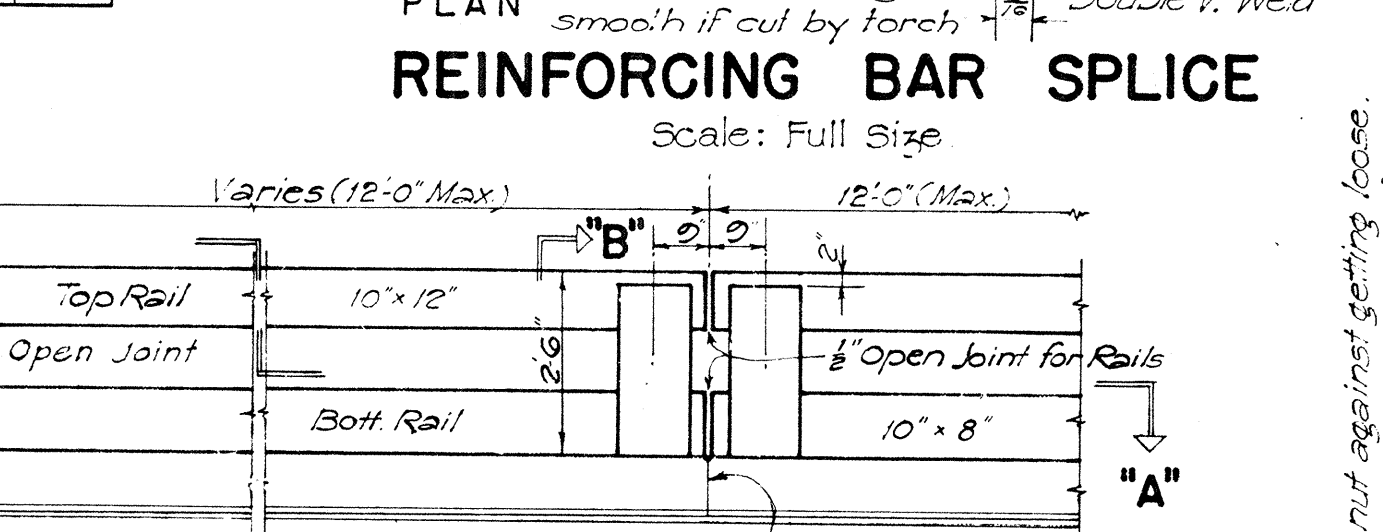
INSERTS
Scale: 3/4"=1'-0"

DETAIL OF PIPE HANGERS AND INSERTS

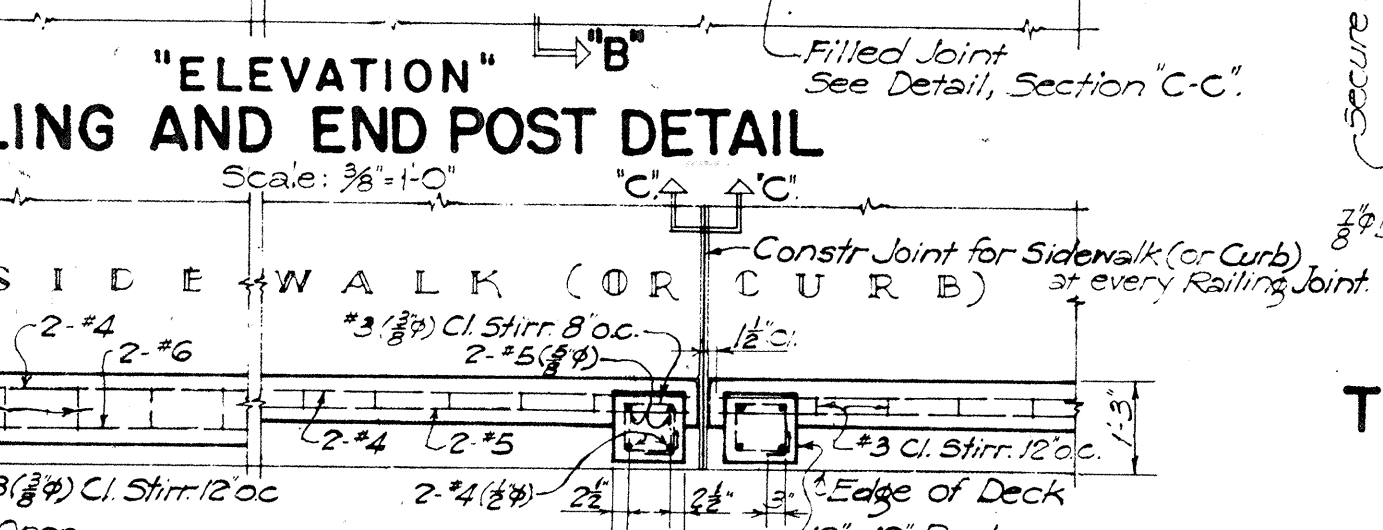
NOTE: Carbon content of reinforcing bars for welding shall not be over 0.40%. Low hydrogen electrodes E7015 or E7016 shall be used with preheat and interpass temperature not less than 200°F.



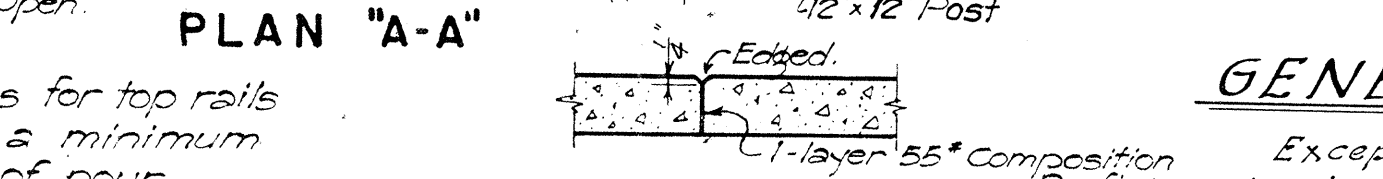
REINFORCING BAR SPLICE
Scale: Full Size



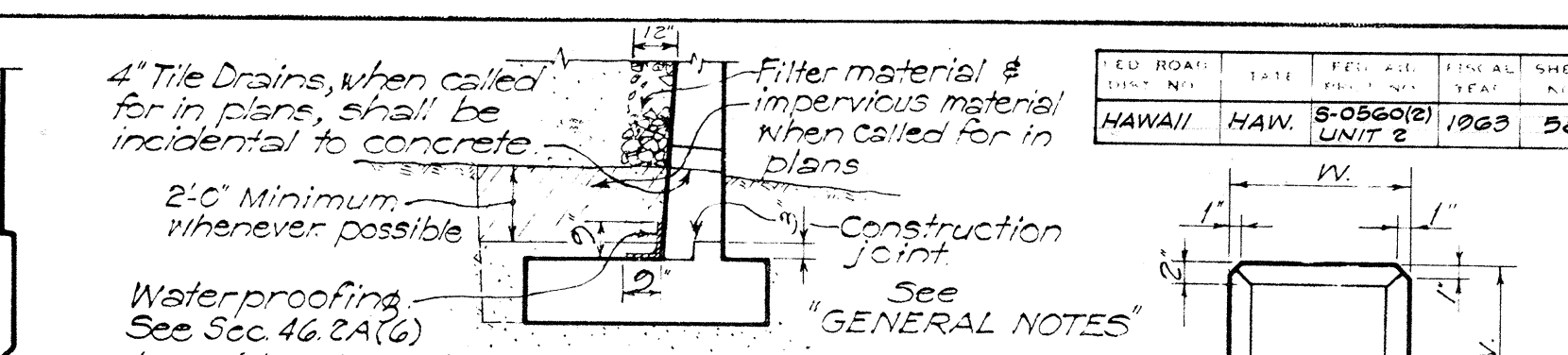
"ELEVATION"
RAILING AND END POST DETAIL
Scale: 3/8"=1'-0"



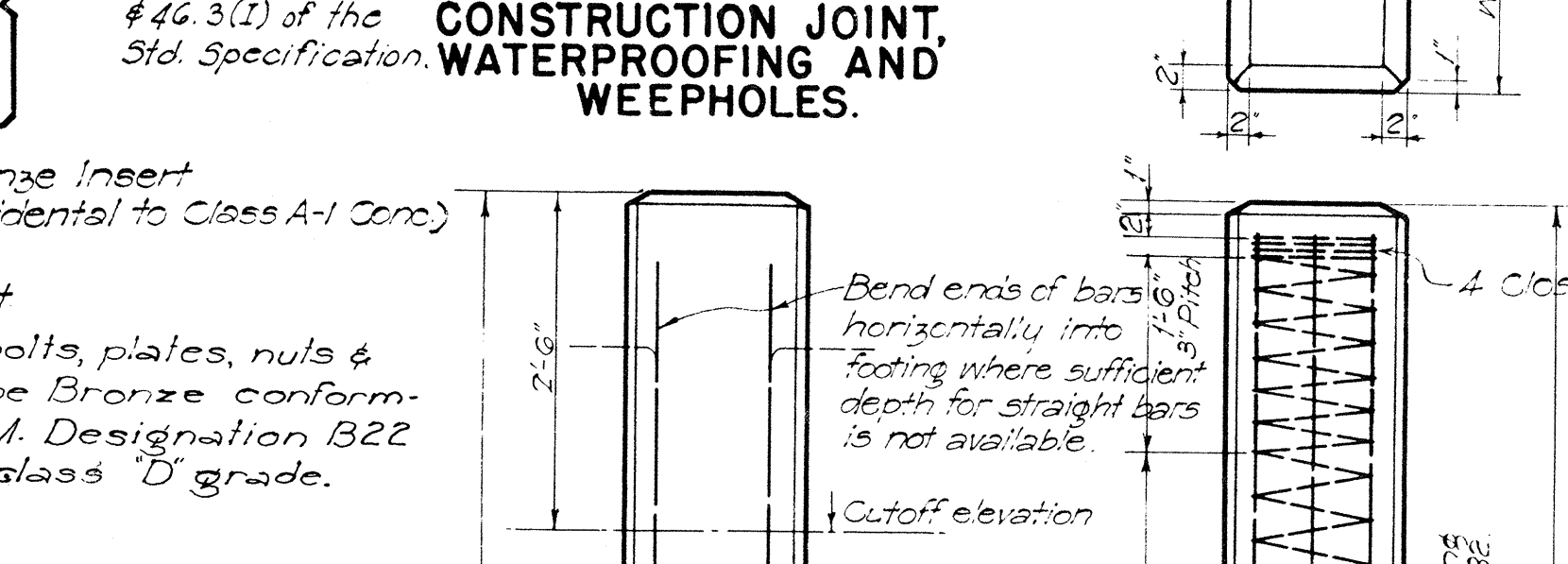
PLAN "A-A"



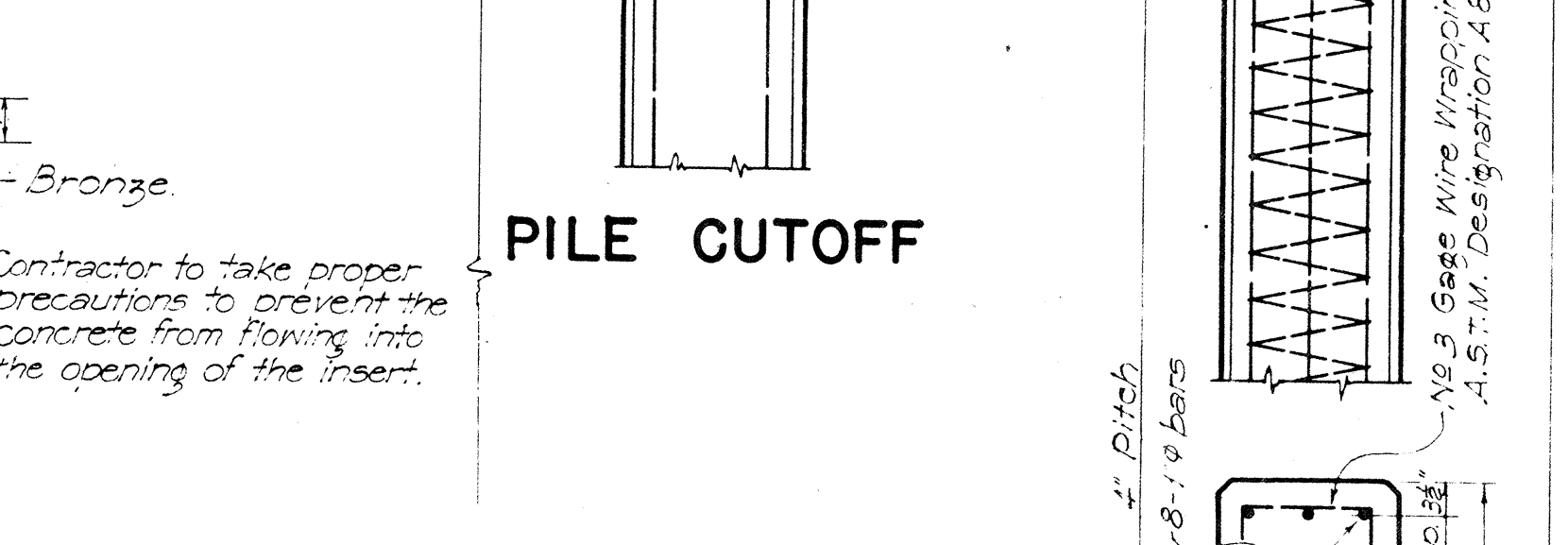
SECTION "C-C"



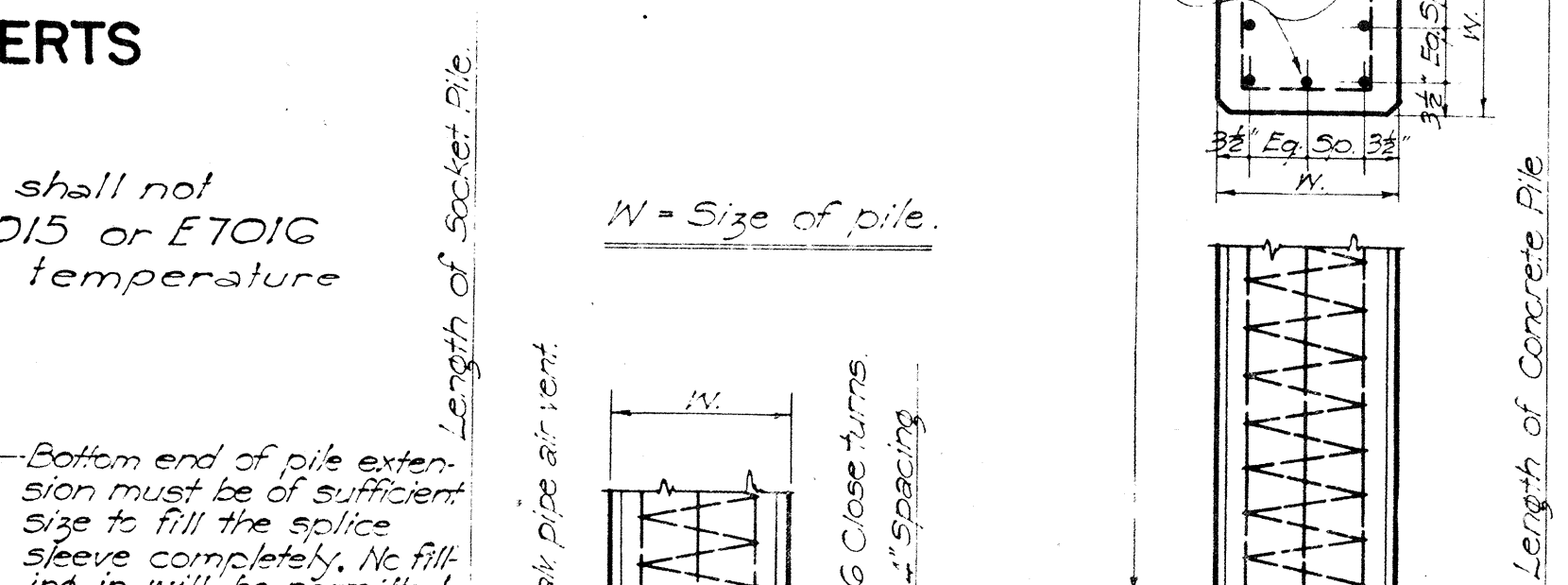
CONSTRUCTION JOINT, WATERPROOFING AND WEEPHOLES.



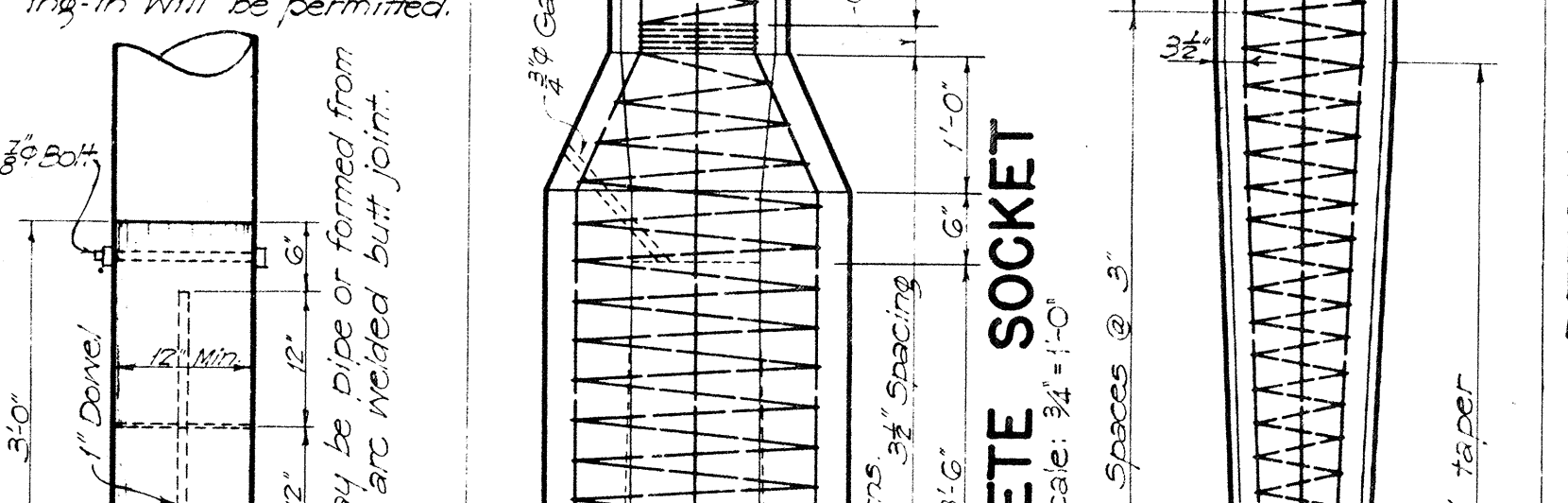
PILE CUTOFF



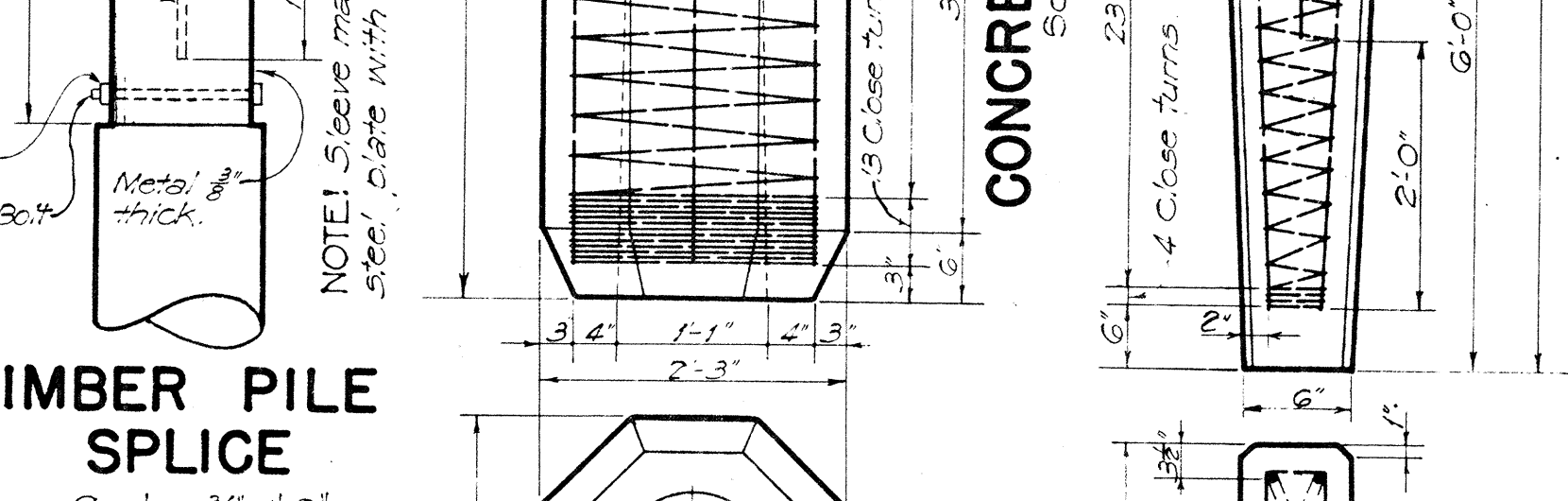
CONCRETE PILE
Scale: 3/4"=1'-0"



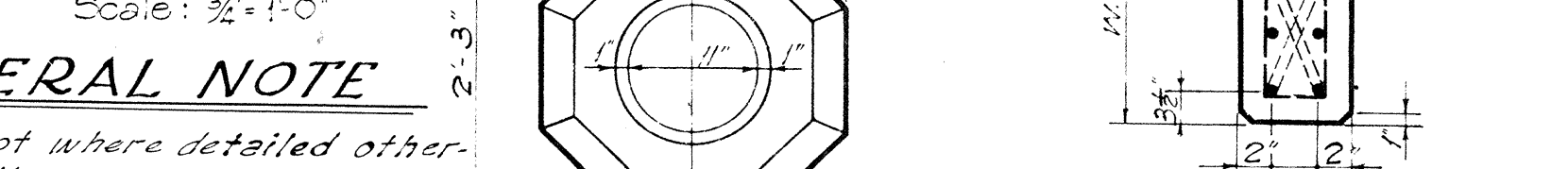
CONCRETE SOCKET
Scale: 3/4"=1'-0"



TIMBER PILE SPLICE
Scale: 3/4"=1'-0"



GENERAL NOTE



Unless otherwise noted all sharp corners and re-entrant angles in concrete work shall be chamfered. See Section 46.3(C) of the Standard Specifications. Chamfer to be 1/4"

DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
STATE OF HAWAII

STANDARD BRIDGE DETAILS

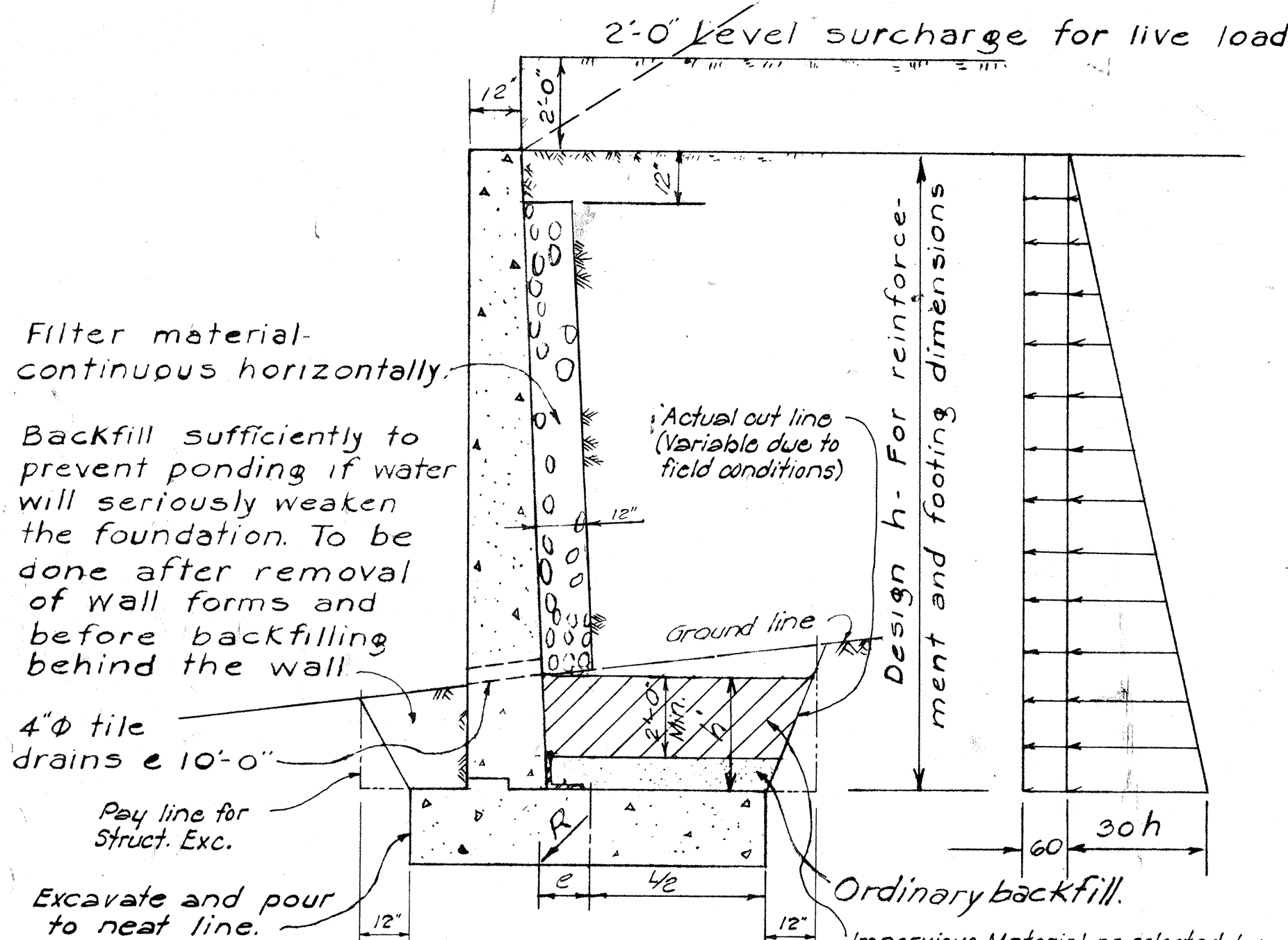
Scales as Noted

APPROVED BY: _____
STATE HIGHWAY ENGINEER

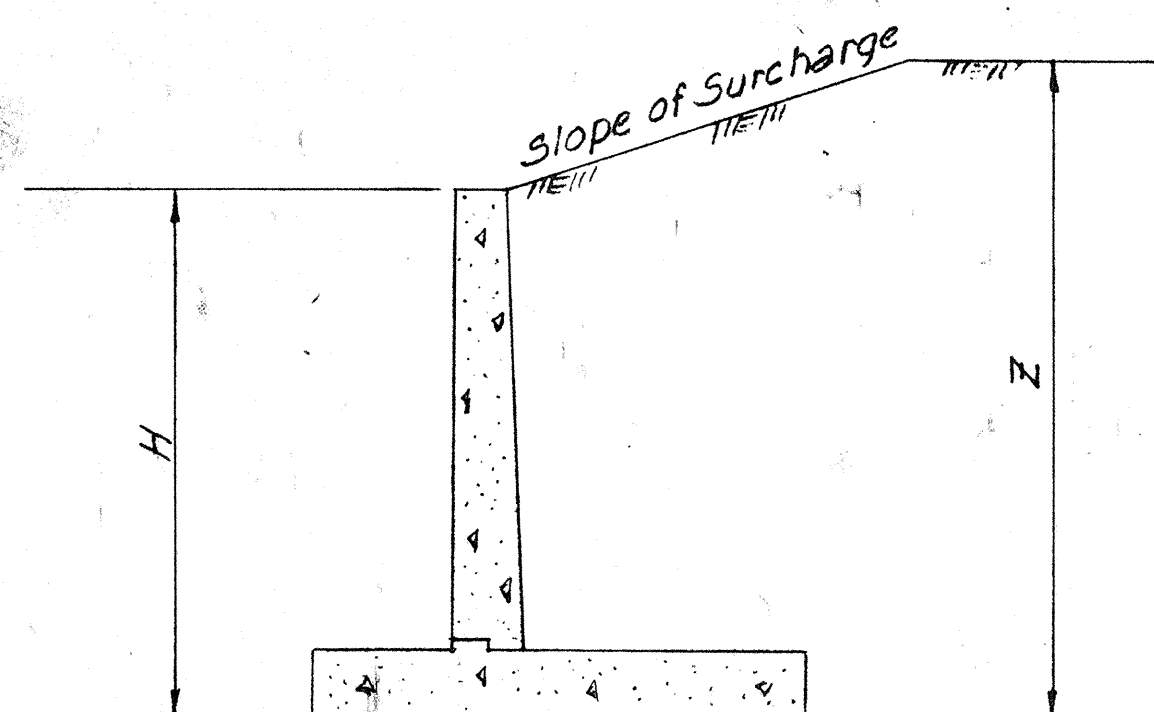
DATE: Aug. 26, 1959

SHEET NO. OF SHEETS

May 1959
July 1960
Sept 1960
Jan. 1962



DESIGN AND DRAINAGE



SPECIAL CASES:

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

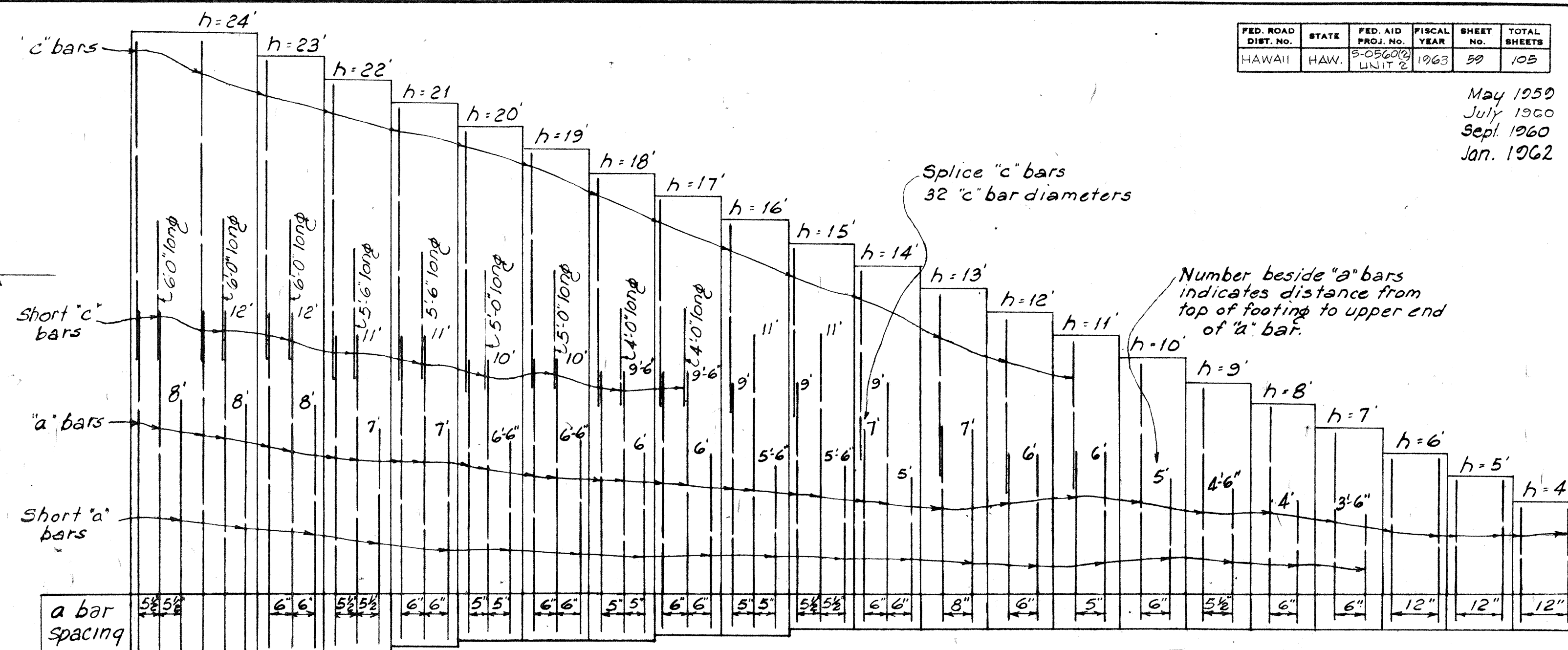
- For h = 4' to 7'
1.58:1 or less sloping surcharge unlimited.
1.5:1 sloping surcharge limited to $\frac{H}{H} = 2.3$
- For h of 8' and 9'
1.62:1 or less sloping surcharge unlimited.
1.5:1 sloping surcharge limited to $\frac{H}{H} = 1.8$
- For h of 10' and 11'
1.9:1 or less sloping surcharge unlimited.
1.5:1 sloping surcharge limited to $\frac{H}{H} = 1.4$
- For h = 13', 14', and 15'
2.2:1 or less sloping surcharge unlimited.
1.5:1 sloping surcharge limited to $\frac{H}{H} = 1.2$
- 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 $L_g = 0.4(h+t+2')$ to increase footing pressure. L_g shall be measured from the toe. Adjust footing design accordingly.

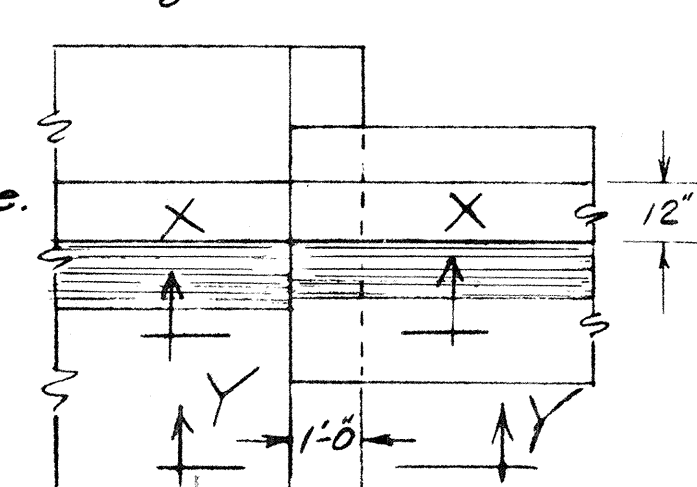
TABLE OF DIMENSIONS AND REINFORCING STEEL																									
h	4'	5'	6'	7'	8'	9'	10'	11'	12'	13'	14'	15'	16'	17'	18'	19'	20'	21'	22'	23'	24'				
a	6"	6"	6"	12"	12"	12"	12"	12"	12"	12"	15"	18"	21"	24"	24"	24"	27"	30"	33"	36"	39"				
*L	2.5'	3.0'	3.5'	4.0'	4.5'	5.0'	5.5'	6.0'	6.5'	7.0'	7.75'	8.25'	9.0'	9.75'	10.5'	11.5'	12.5'	13.5'	14.5'	15.25'	16.0'				
c	14"	14"	14"	14"	14"	14"	14"	18"	18"	18"	18"	18"	21"	21"	24"	24"	27"	30"	31"	33"					
"a" bars	#3 @ 12	#3 @ 12	#4 @ 12	#3 @ 6	#4 @ 6	#4 @ 5 1/2	#5 @ 6	#5 @ 5	#6 @ 6	#6 @ 6	#6 @ 6	#6 @ 5 1/2	#6 @ 5	#7 @ 6	#7 @ 5	#8 @ 6	#8 @ 5	#9 @ 6	#9 @ 5 1/2	#10 @ 6	#10 @ 5 1/2				
"b" bars	#3 @ 12	#3 @ 12	#3 @ 12	#3 @ 12	#3 @ 12	#4 @ 11	#5 @ 12	#5 @ 10	#5 @ 6	#6 @ 8	#6 @ 6	#6 @ 5 1/2	#6 @ 5	#7 @ 6	#7 @ 5	#8 @ 6	#8 @ 5	#9 @ 6	#9 @ 5 1/2	#10 @ 6	#10 @ 5 1/2				
"c" bars								#4	#4	#4	#4	#4	#4	#4	#4	#5	#5	#6	#6	#7	#7				
F.S. Sliding *	1.30	1.29	1.28	1.16	1.17	1.18	1.17	1.17	1.20	1.23	1.25	1.21	1.25	1.26	1.33	1.39	1.42	1.48	1.53	1.53	1.54				
F.S. Overturning	1.38	1.45	1.50	1.54	1.61	1.64	1.63	1.71	1.76	1.81	1.96	1.97	2.05	2.19	2.47	2.49	2.70	2.85	3.02	3.06	3.11				
Concr. c.y./ft	0.26	0.32	0.37	0.43	0.49	0.55	0.61	0.74	0.81	1.00	1.10	1.19	1.37	1.49	1.69	1.83	1.97	2.26	2.53	2.72	2.97				
Steel lbs./ft	11.1	13.3	17.7	20.0	27.3	32.8	43.8	51.0	67.7	59.6	76.2	87.8	103.7	125.8	145.4	178.3	222.7	249.2	278.4	339.0	376.6				
Eccentricity e	0.88'	1.01'	1.14	1.21	1.20	1.42	1.63	1.63	1.74	1.83	1.83	1.89	1.93	1.89	1.98	1.94	1.86	2.00	1.75	1.82	1.82				
Toe Pressure	2800	2600	3200	2800	2900	3200	3700	3600	3800	4100	3800	3900	3900	3800	4000	3900	4100	3900	4100	4100	4100				

* F.S. Against Sliding based on friction factor of 0.40



SECTION X-X

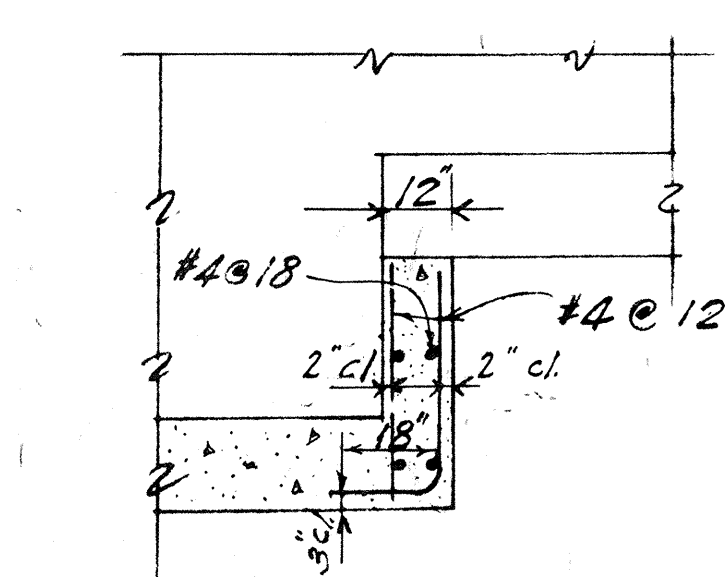
$\frac{3}{8}'' = 1'-0''$



PLAN

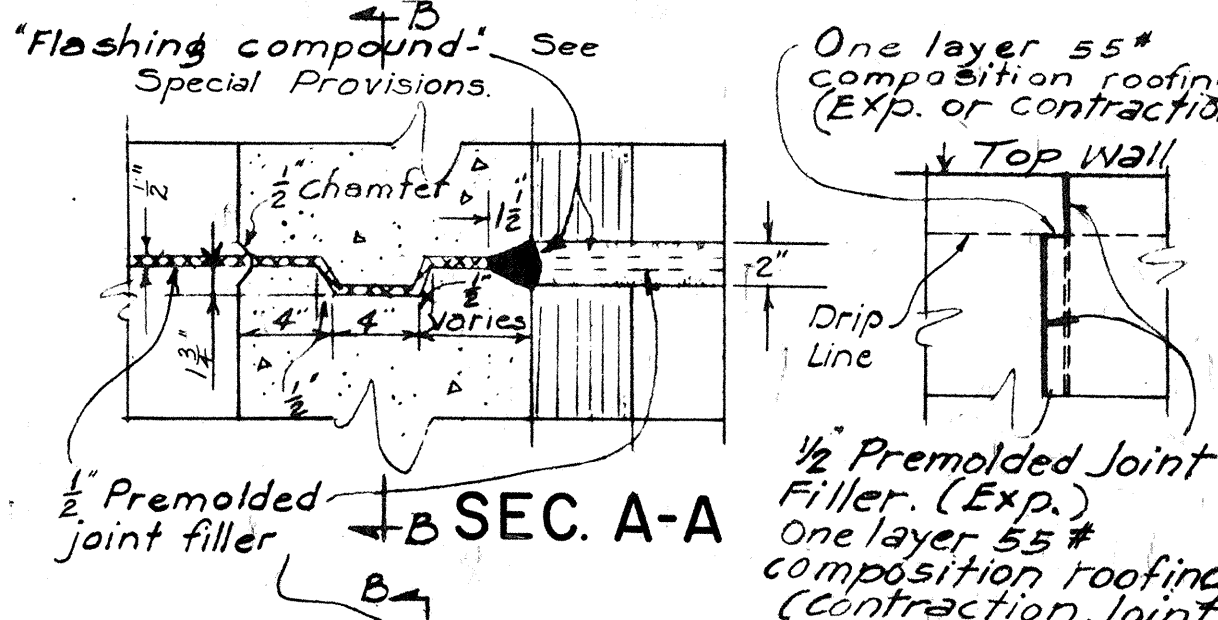
FOOTING STEP

TYPICAL ARRANGEMENT FOR SLOPING WALLS



SECTION Y-Y

$\frac{3}{8}'' = 1'-0''$



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.

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

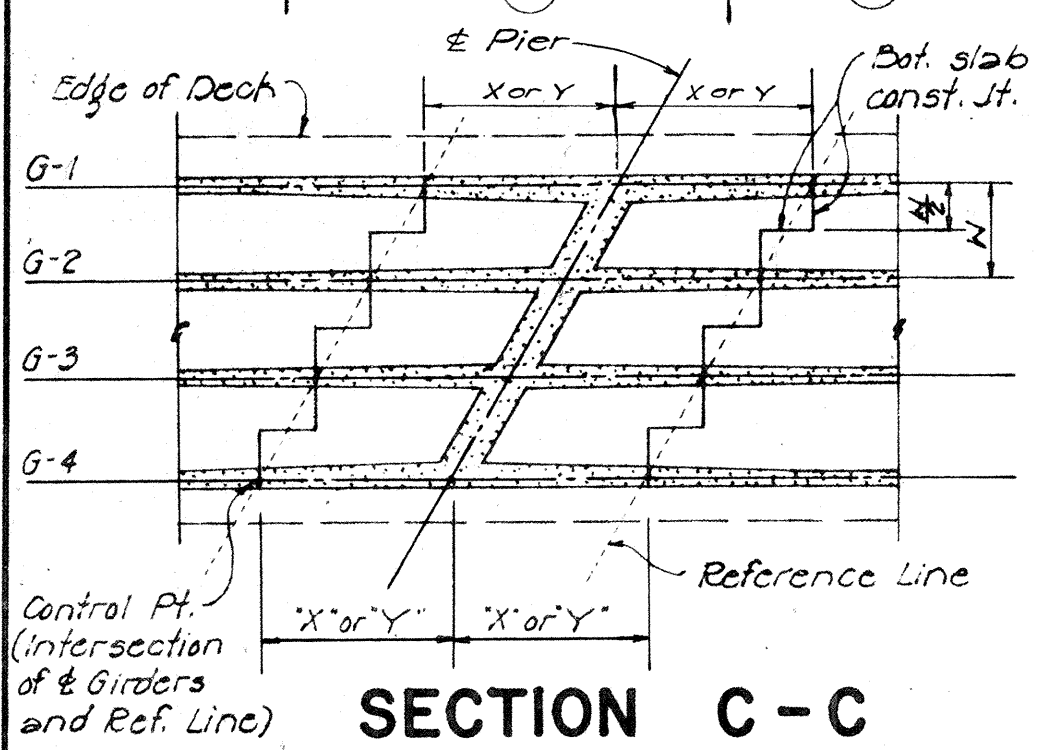
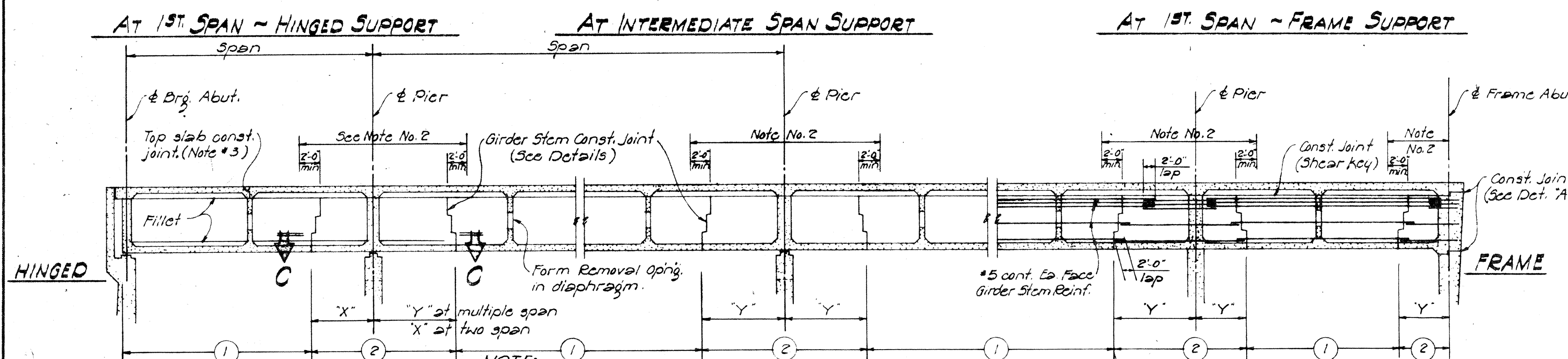
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
STATE OF HAWAII

RETAINING WALL STANDARDS

SCALES AS NOTED MAY 1956

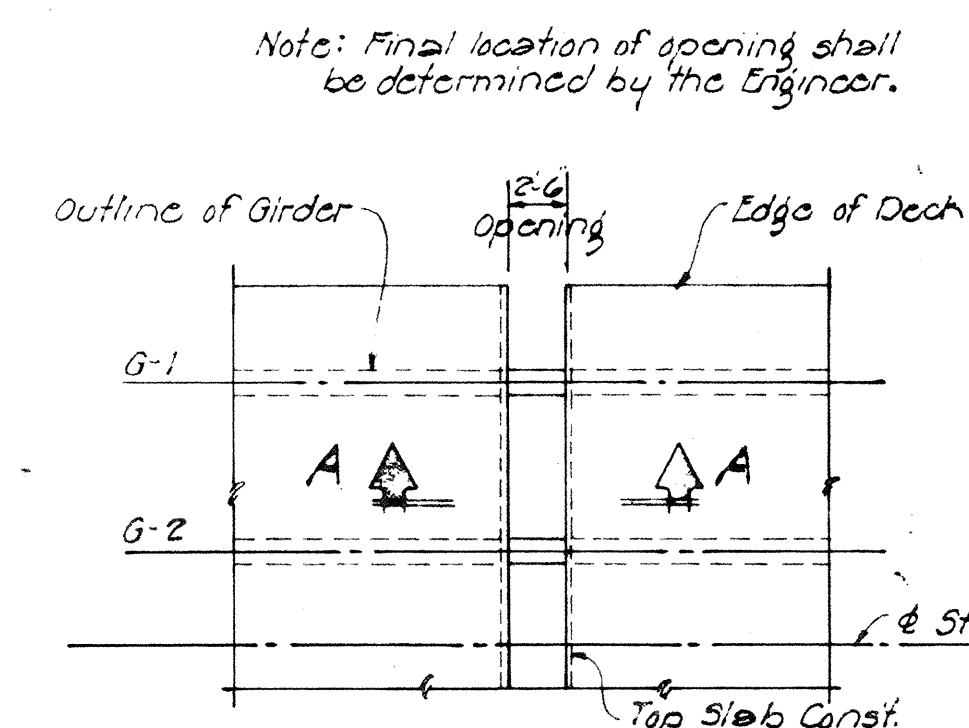
SHEET NO. OF SHEETS

May 59
Oct 60

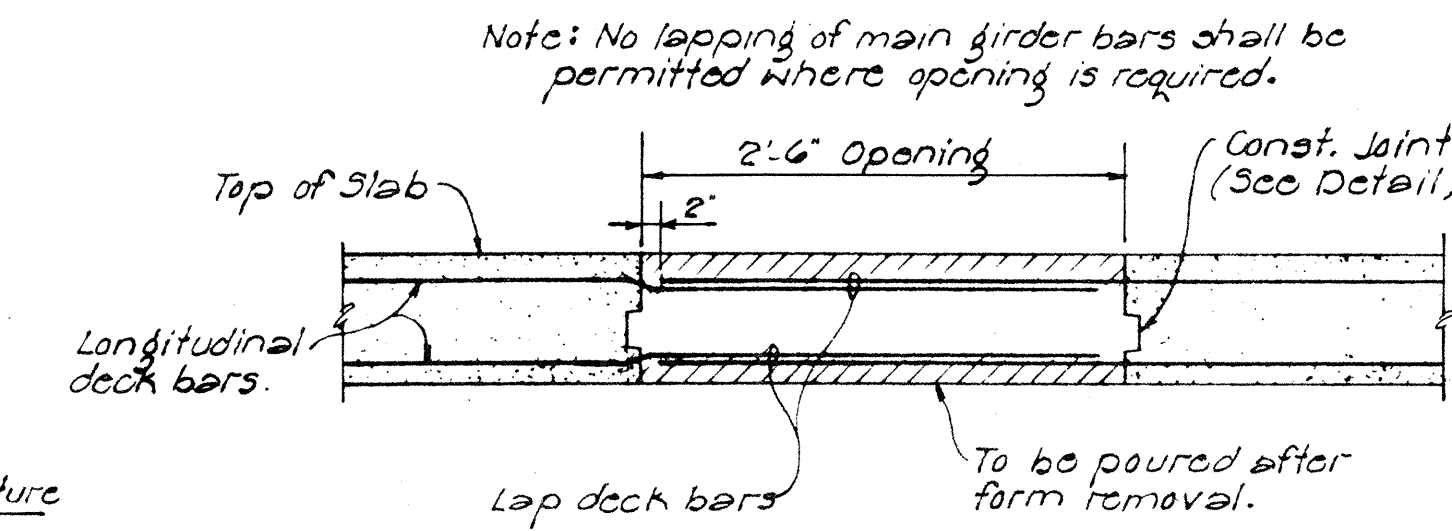


NOTE:
 No. 1 - Numbers (1) & (2) indicate sequence of placing bottom slab & girder stem concrete. (2) may be placed simultaneously with (1) when approved by the Engr., and provided that the (1) sections are placed in adjoining spans. For any deviation from the above the contractor shall submit a diagram to the Engineer for approval.
 No. 2 - No top slab construction joint or form removal opening shall be located in the region over the piers as noted.
 No. 3 - When top slab forms are not removed, const. joint in top slab shall be located over an intermediate diaphragm.
 No. 4 - Dimension "X" = 1/4 span "Y" = 1/5 span
 No. 5 - No lapping of main girder bars shall be permitted at construction joints.

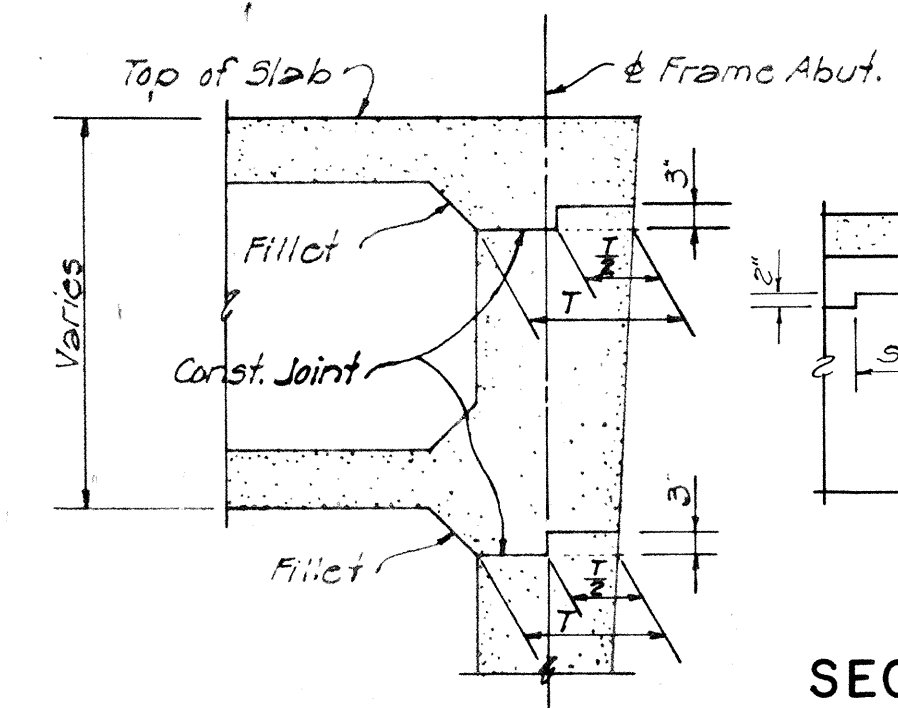
PLACING DIAGRAM FOR SUPERSTRUCTURE CONCRETE



PART PLAN - DECK
SHOWING FORM REMOVAL OPENING



SECTION A-A



DETAIL - A

SECTION - BEAM WIDTH LESS THAN 2'-0"

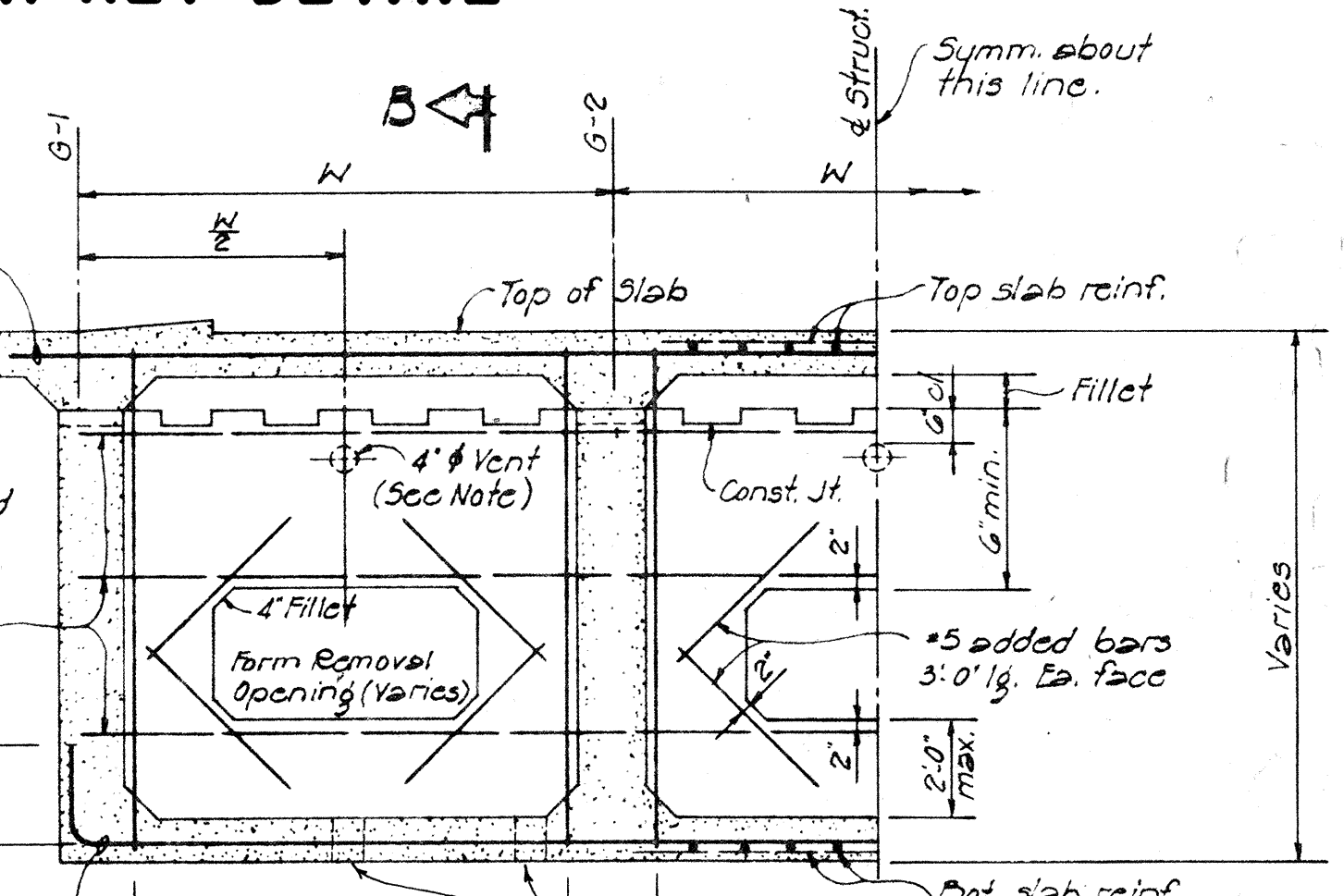
PLAN

SECTION - BEAM WIDTH MORE THAN 2'-0"

PLAN

SHEAR KEY DETAIL

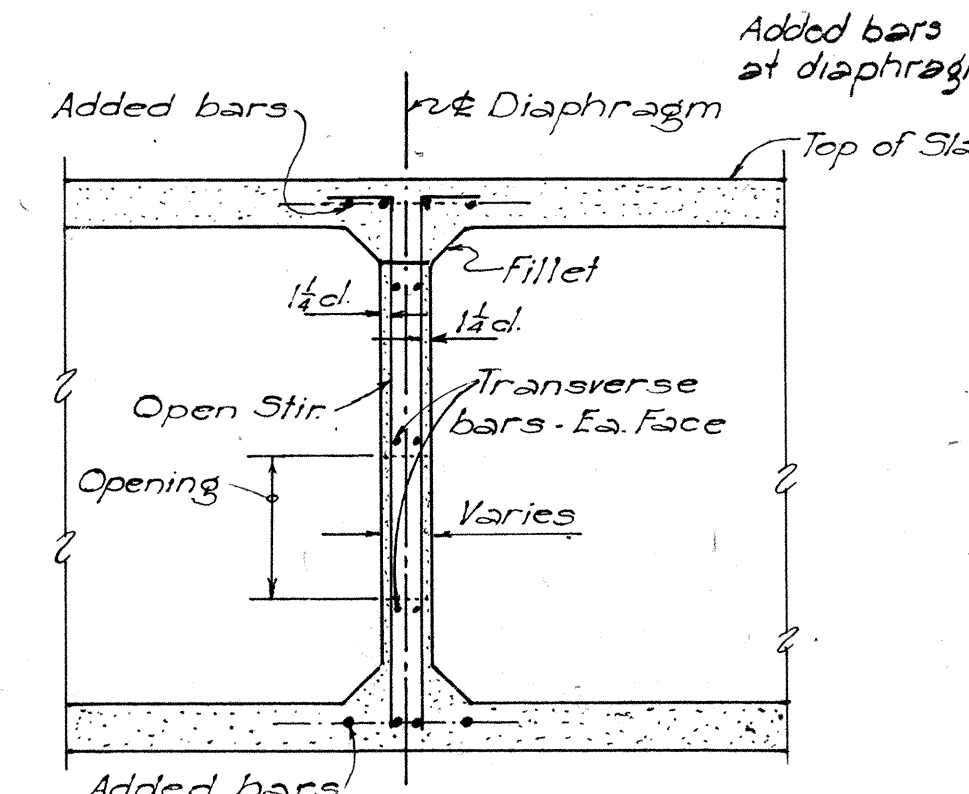
NOTE:
 If Contractor elects to leave top slab forms in place, form removal opening shall be omitted and replaced by 4" ϕ vent. (See Note)



FORM REMOVAL OPENING DETAIL IN DIAPHRAGM

GENERAL NOTE

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



SECTION B-B

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

HAWAII STATE HIGHWAY DEPARTMENT
STATE OF HAWAII

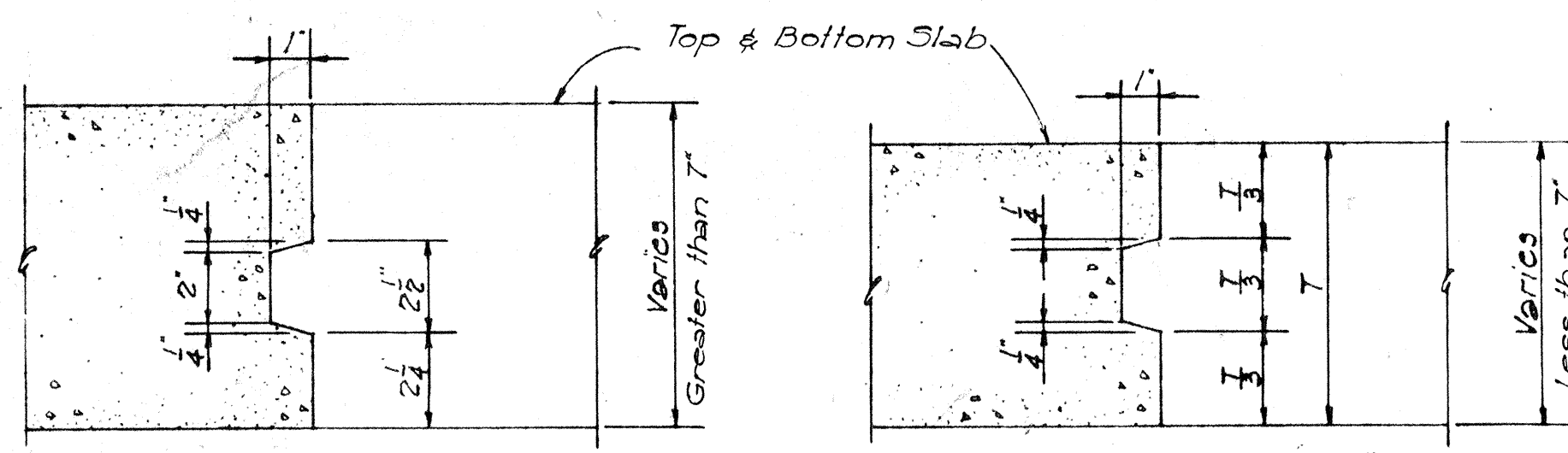
STANDARD DETAILS

BOX GIRDER

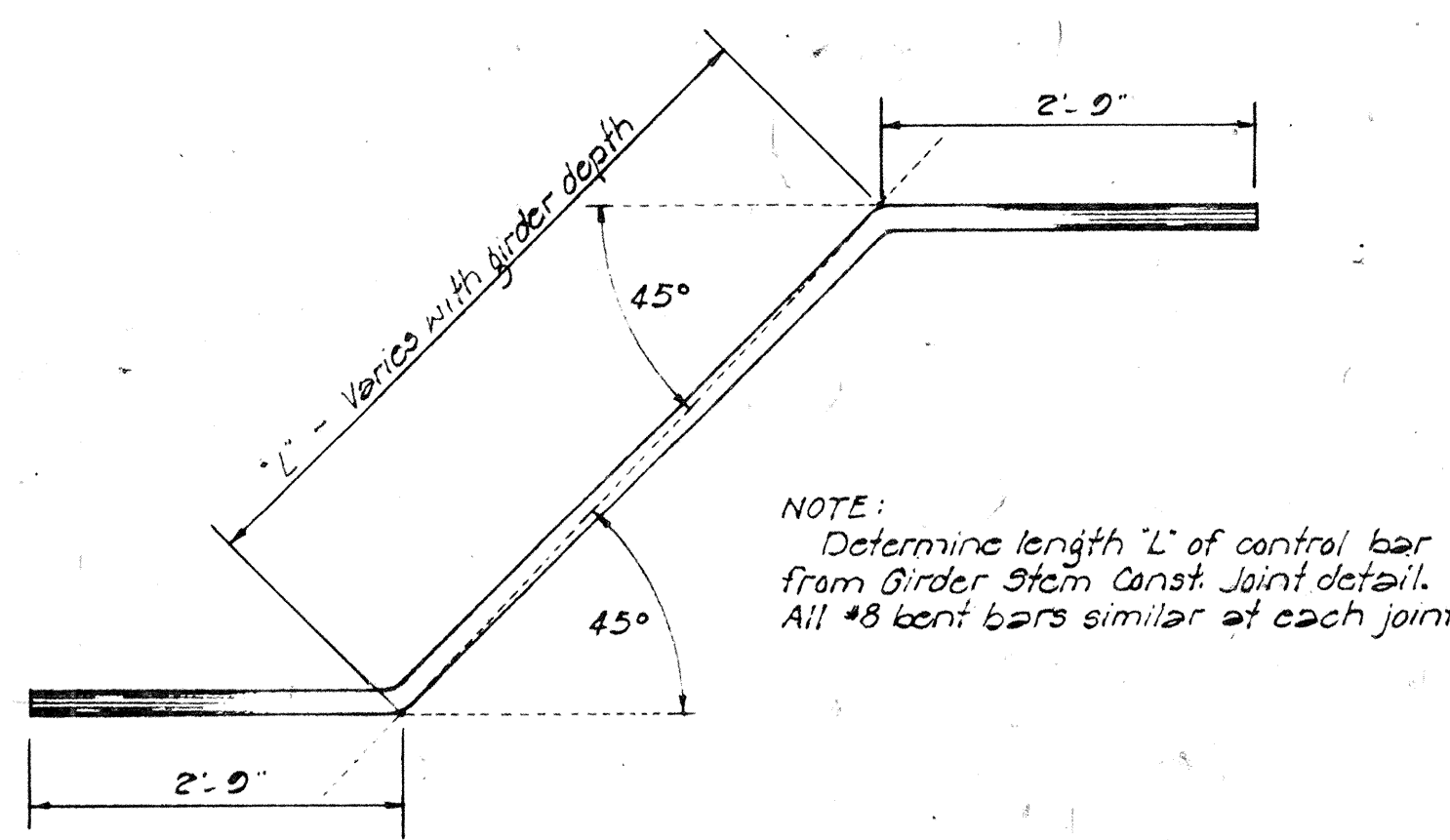
SCALES AS NOTED

SHEET NO. OF SHEETS

TOP AND BOTTOM SLAB CONST. JOINT

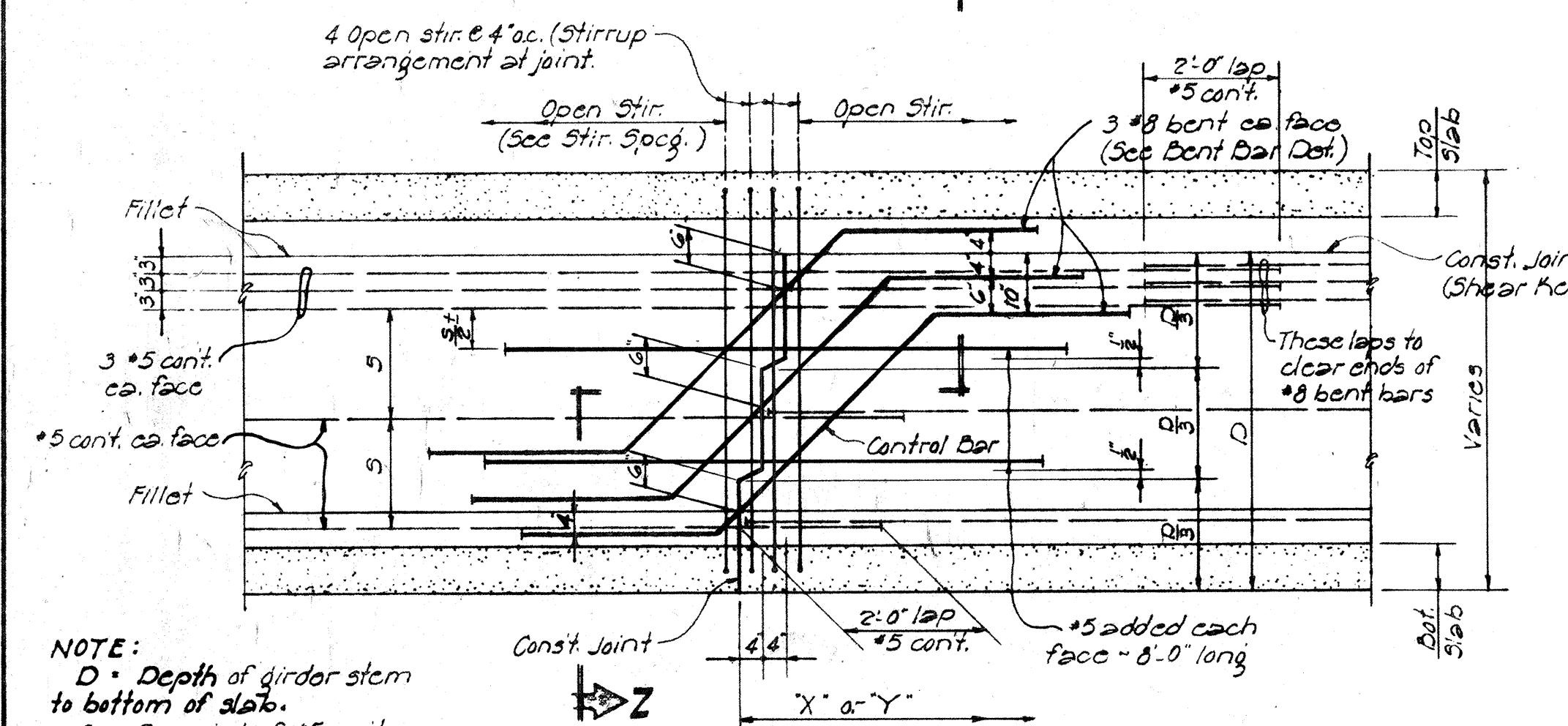


DETAIL - NO. 8 BENT BAR



NOTE:
 Determining length "L" of control bar from Girder Stem Const. Joint detail. All #8 bent bars similar at each joint.

GIRDER STEM CONST. JOINT



SECTION Z-Z

