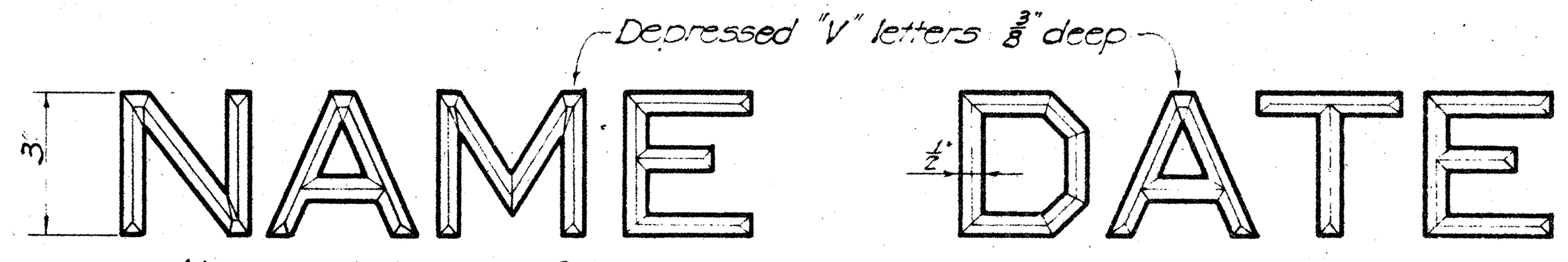
STANDARD BRIDGE DETAILS

FED. ROAD DIST. No.	STATE	FED. AID PROJ. No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
HAWAII	HAW	[illegible]	1960	68 A	70
		[illegible]	1960	47 A	118
		[illegible]	1960	45 A	115

Feb. '53
May '56
Aug. '56
Jan. '57
Aug. '57
Jan. '58
May '59
Jun. '60

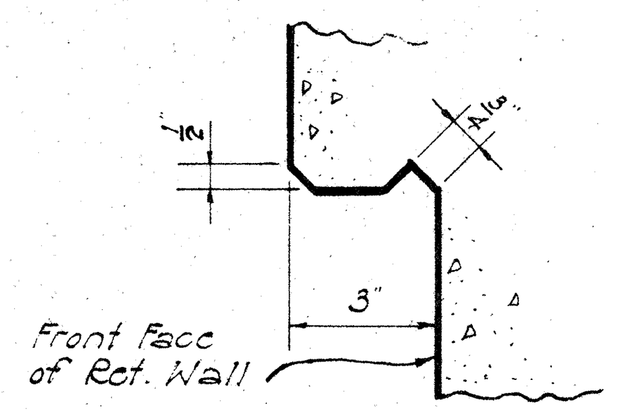


Use correct name of bridge
LEFT HAND SIDE

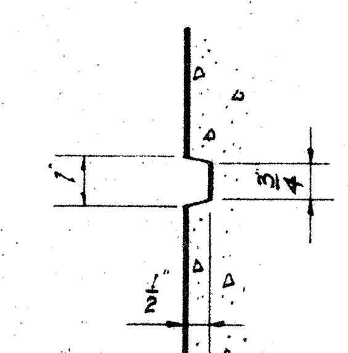
Date of year built
RIGHT HAND SIDE

DETAIL OF LETTERS AND FIGURES AT BOTH APPROACHES

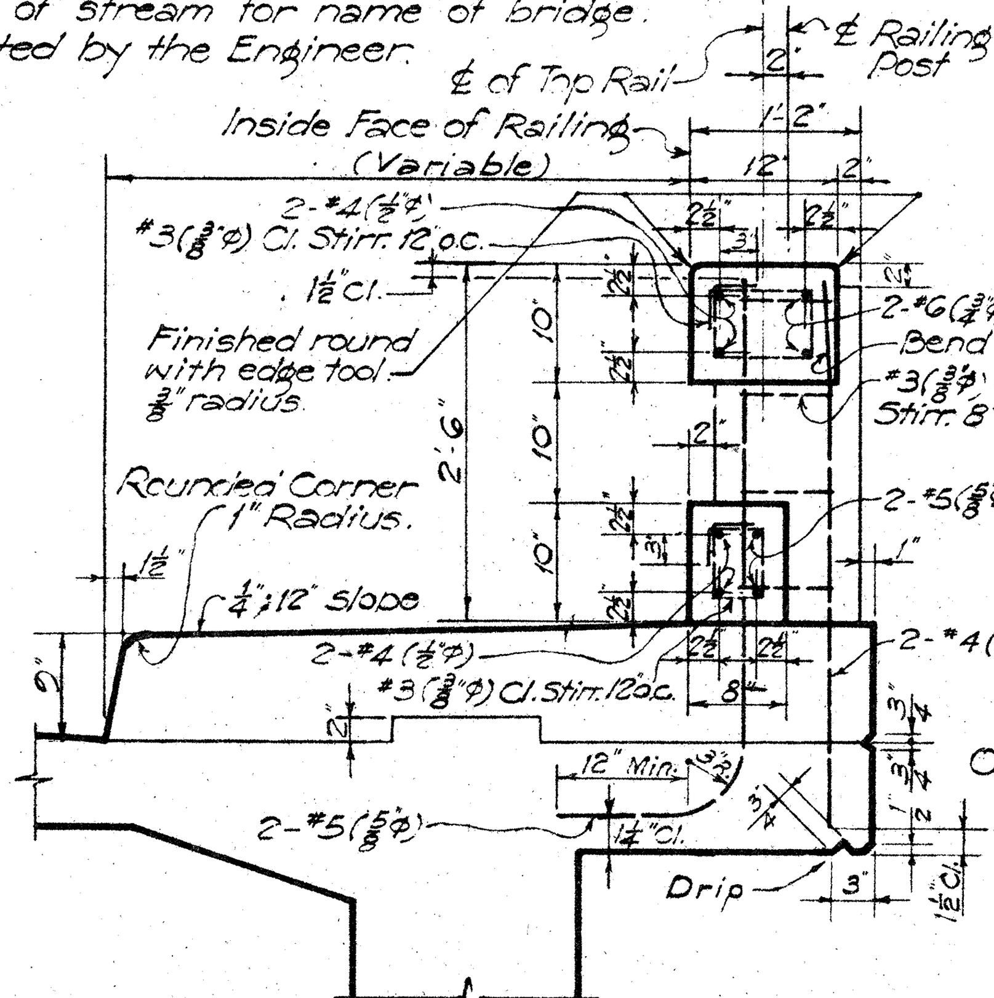
NOTE: Name of bridge to be placed in left end post panels and date in right post panels on entering bridge using modified block letters 3" in height. In case of stream crossings use name of stream for name of bridge. For all others use name as designated by the Engineer.



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



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



SECTION "B-B"
RAILING DETAIL
Scale: ¾" = 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 Subarticle 46.3 (O) (3) of Section 46 Concrete of the Standard Specifications.

GENERAL NOTES

CONCRETE: Class of concrete to be used in different parts of the structure are as noted on the plans.

REINFORCING STEEL: All reinforcing steel shall be Billet Steel Bars A.S.T.M. A 15 intermediate grade.

Steel shall be made by the open-hearth process. Deformations shall conform to A.S.T.M.-A 305

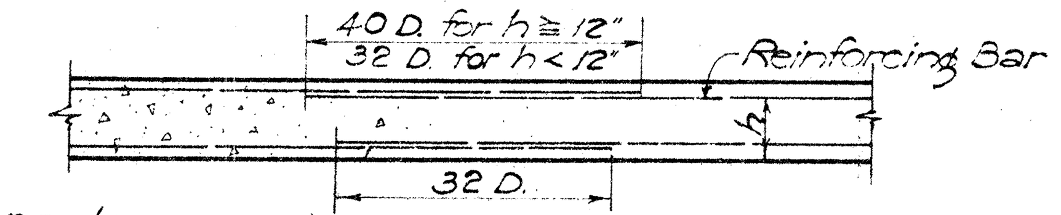
Splicing of reinforcing other than in main deck slab, girder and frame bars shall be done as shown in above sketch except where shown otherwise. Splices are to be staggered. Splices in main girder and frame bars are permitted only in bars exceeding 60'-0" in length at points to be indicated by the Engineer. These splices to be electrically are 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 2½ times the diameter of bars, but in no case shall the clear distance between the bars be less than 1½ times the maximum size of the coarse aggregate.

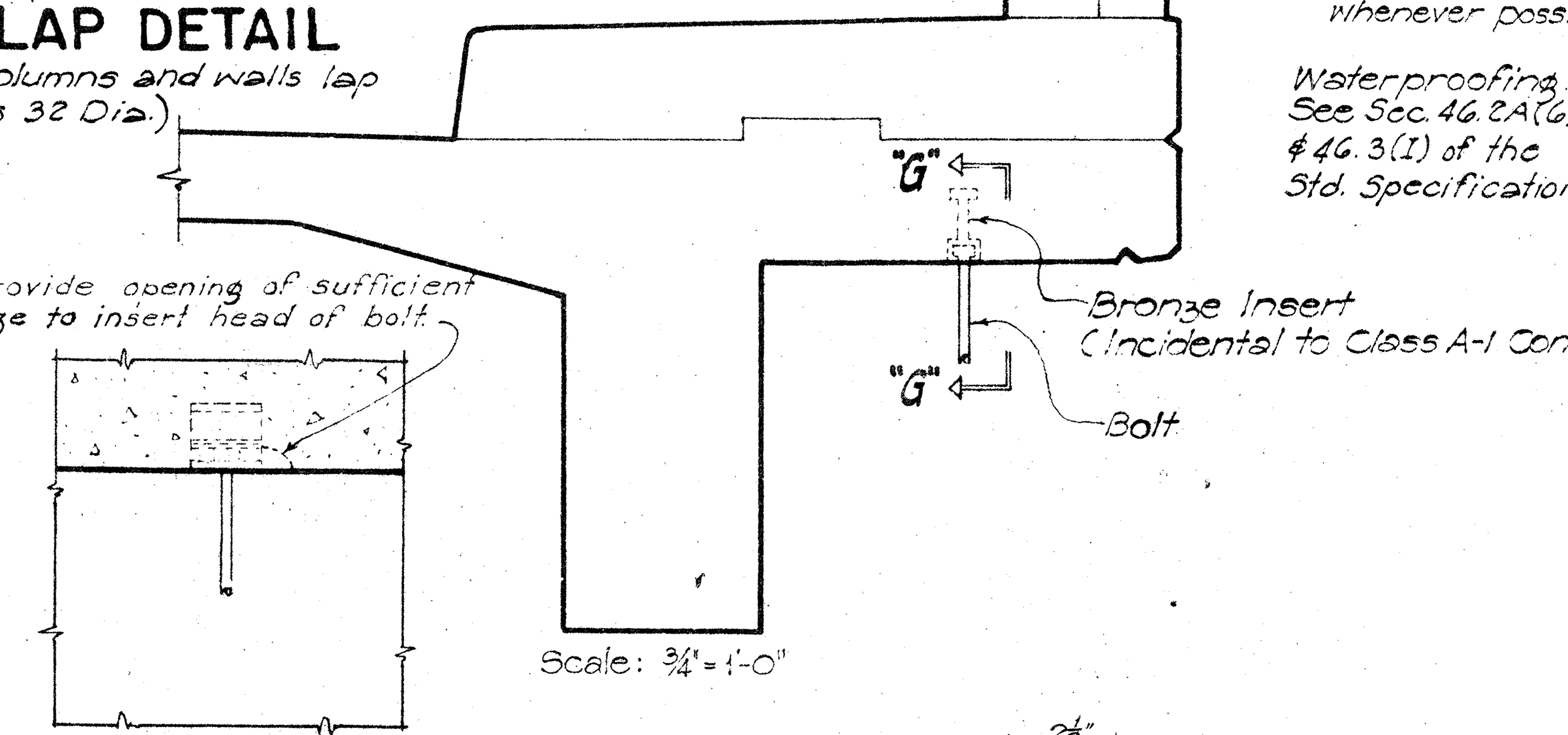
Minimum covering, measured from the surface of the concrete to the face of any reinforcing bar, shall be not less than 2 inches except in slabs where the minimum covering shall be 1¼ inch. In the footings of abutments and retaining walls and in piers the minimum covering shall be 3 inches. In work exposed 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 grout 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."

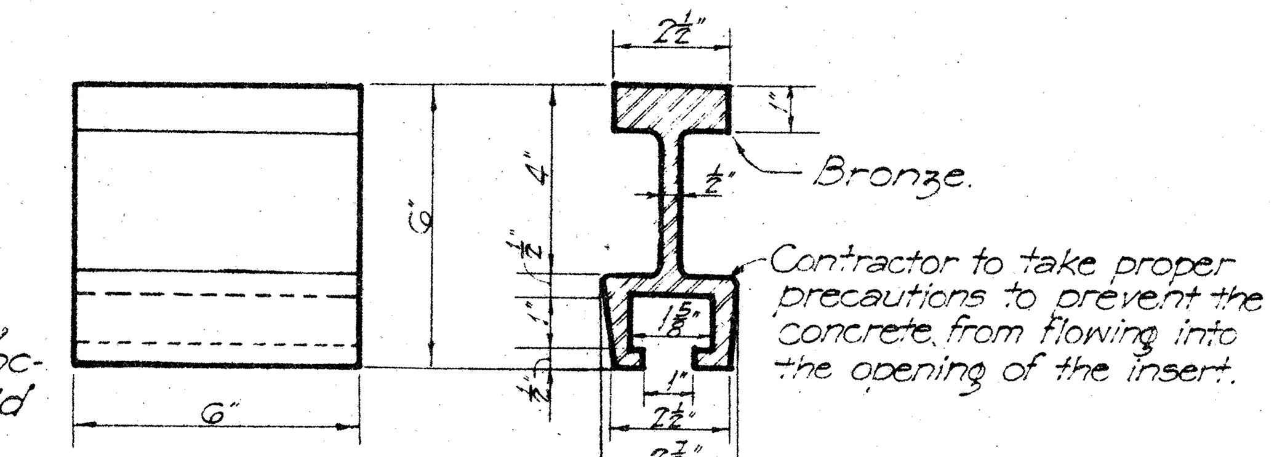


LAP DETAIL
(In columns and walls lap bars 32 Dia.)



SECTION "G-G"
Scale: ¾" = 1'-0"

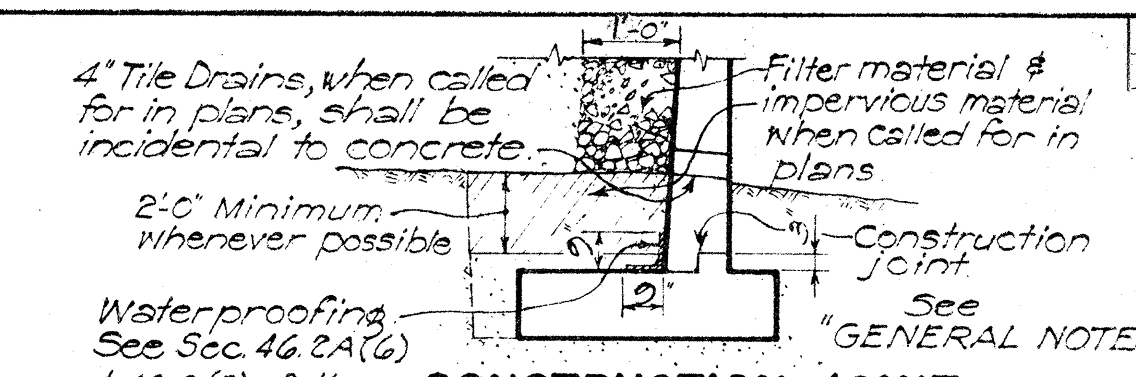
JOINT FILLER: Joint filler, when called for in plans, shall be incidental to concrete and will not be paid for separately.



INSERTS
Scale: ¾" = 1'-0"

DETAIL OF PIPE HANGERS AND INSERTS

NOTE: Inserts, bolts, plates, nuts & washers to be Bronze conforming to A.S.T.M. Designation B 22 and shall be Class "D" grade.



CONSTRUCTION JOINT, WATERPROOFING AND WEEPHOLES.

ELLIPSE COORDINATES

Top of Post

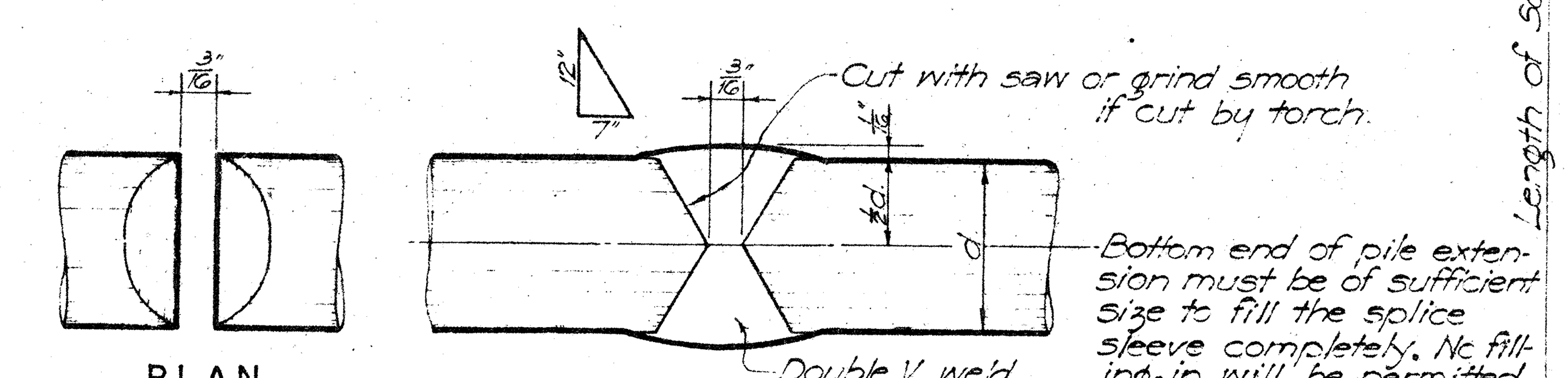
x	0	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	3'-6	4'-0"	4'-3"	4'-6"	4'-9"	4'-10½	5'-0"
y	2'-6"	2'-5⅜	2'-4⅝	2'-3½	2'-2"	2'-0"	1'-9 7/16"	1'-6	1'-3 13/16	1'-1 1/16	9⅜"	6 11/16	0

Top Line of Upper Groove

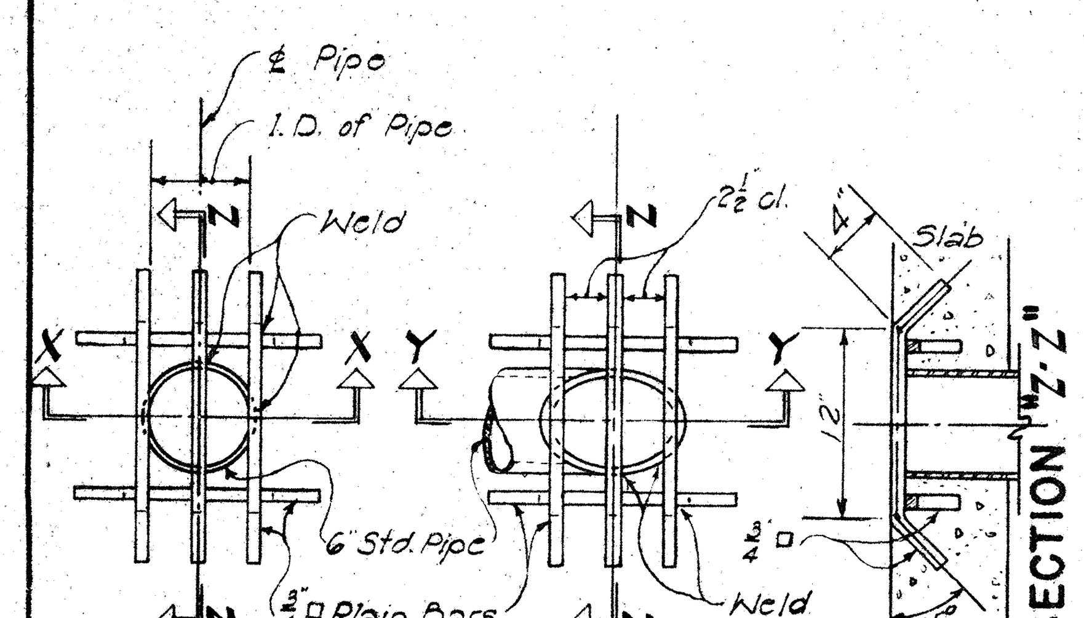
x	0	6"	1'-0"	1'-6"	2'-0"	2'-6	3'-0"	3'-3"	3'-6"	3'-9"	4'-0"	4'-1"	4'-2"
y	1'-8"	1'-7⅞"	1'-7 7/16"	1'-6 11/16	1'-5 9/16"	1'-4"	1'-1⅞"	1'-0½"	10⅞"	8 11/16"	5⅝"	4"	0

Bot. Line of Lower Groove

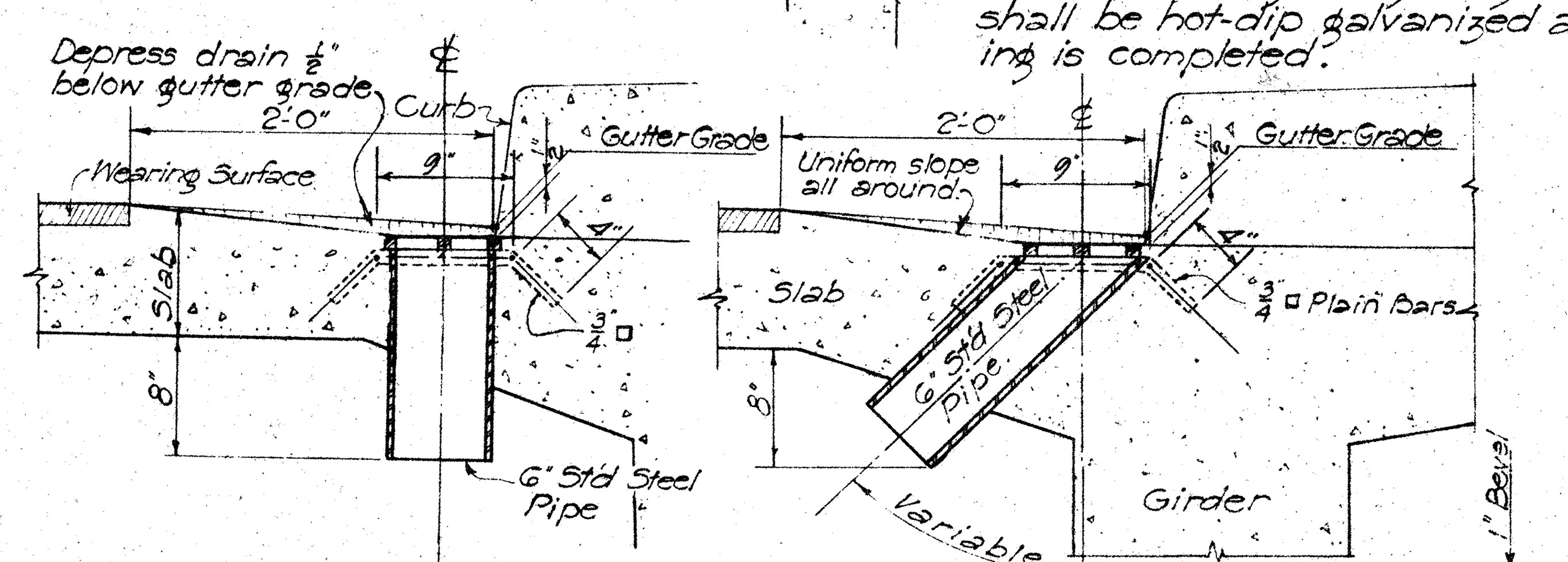
x	0	6"	1'-0"	1'-6"	2'-0"	2'-6	2'-9"	3'-0"	3'-2"	3'-3"	3'-4"		
y	10"	9⅞"	9 9/16	8 15/16"	8"	6⅝"	5⅝"	4⅜	3⅛"	2¼	0		



REINFORCING BAR SPLICE
Scale: Full Size

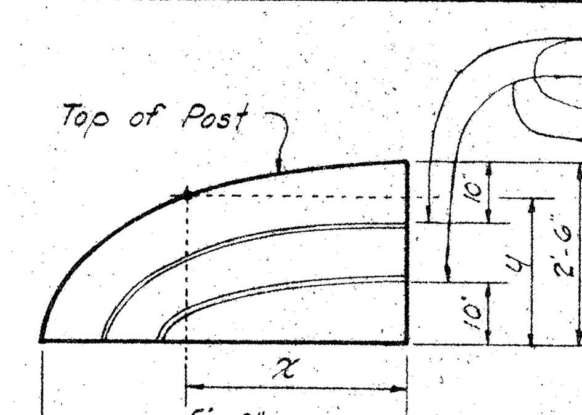


NOTE: Metal drains shall be considered incidental to Class A-1 Concrete in both concrete and steel bridges and will not be paid for separately.
Assemblage of grillage and pipe shall be hot-dip galvanized after all welding is completed.



SECTION "X-X"
SECTION "Y-Y"

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

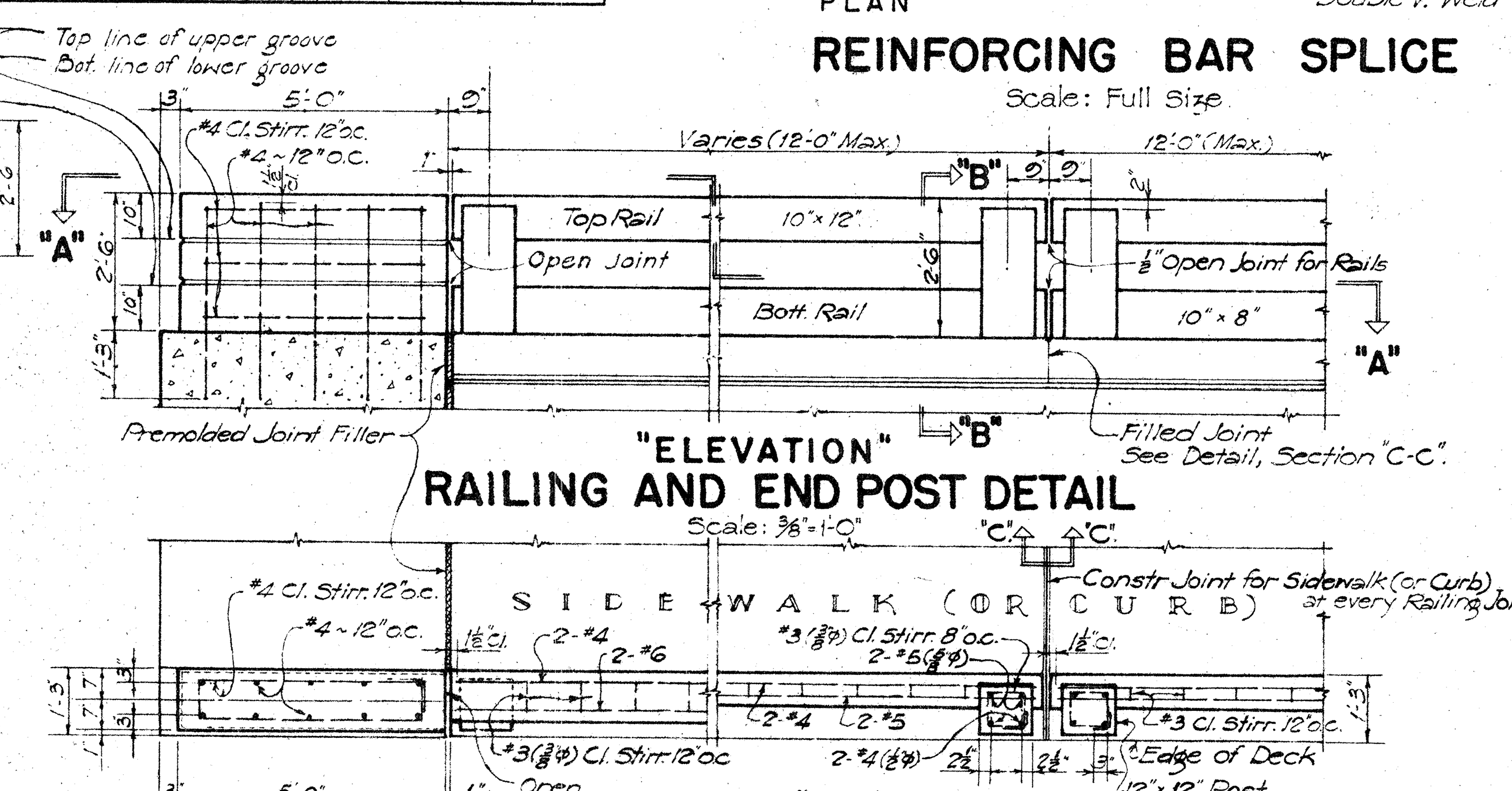


ELLIPTICAL CURVE AT END POST

GUARDRAIL OFFSET

X	Y 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					7.00	6.48
125.0						8.00

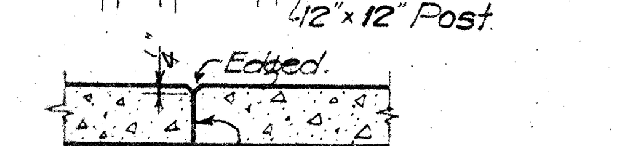
W = Guardrail flare
X = Distance from post at bridge to offset points.
Y = Guardrail flare offset



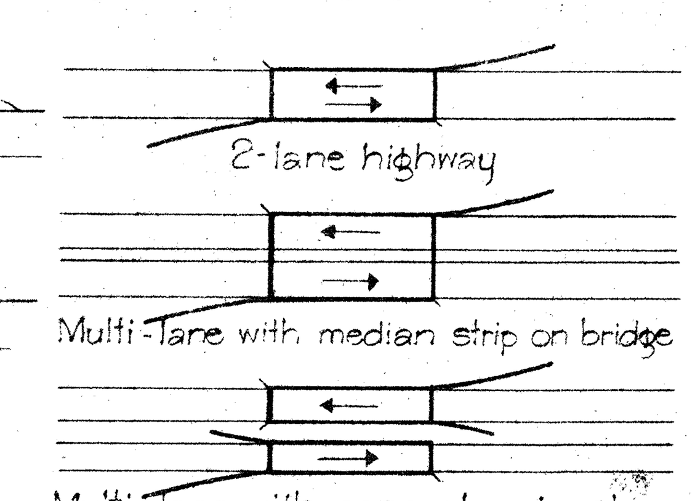
"ELEVATION"
RAILING AND END POST DETAIL
Scale: ⅜" = 1'-0"

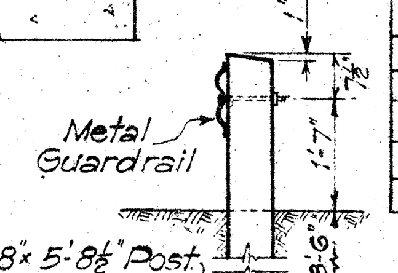
PLAN "A-A"

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

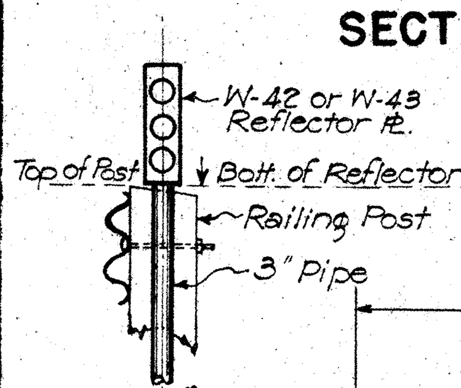


SECTION "C-C"



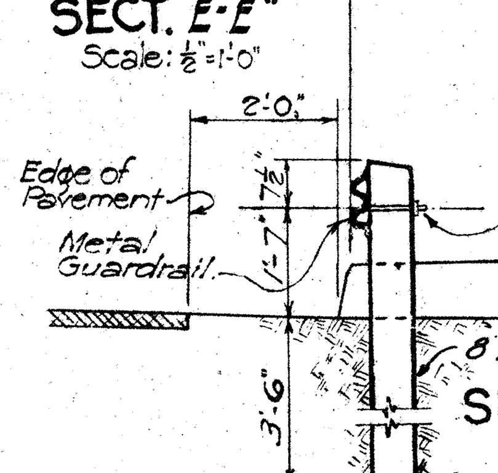


SECT. "F-F"

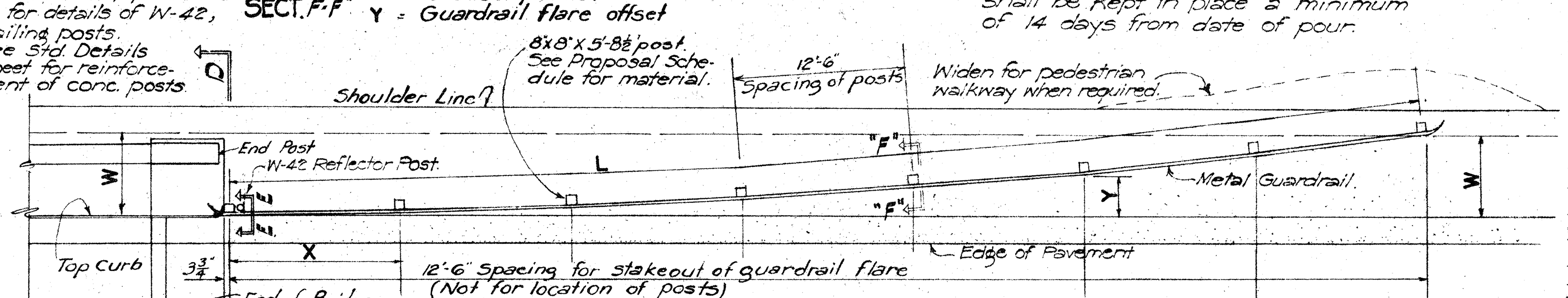


SECT. "E-E"
Scale: ½" = 1'-0"

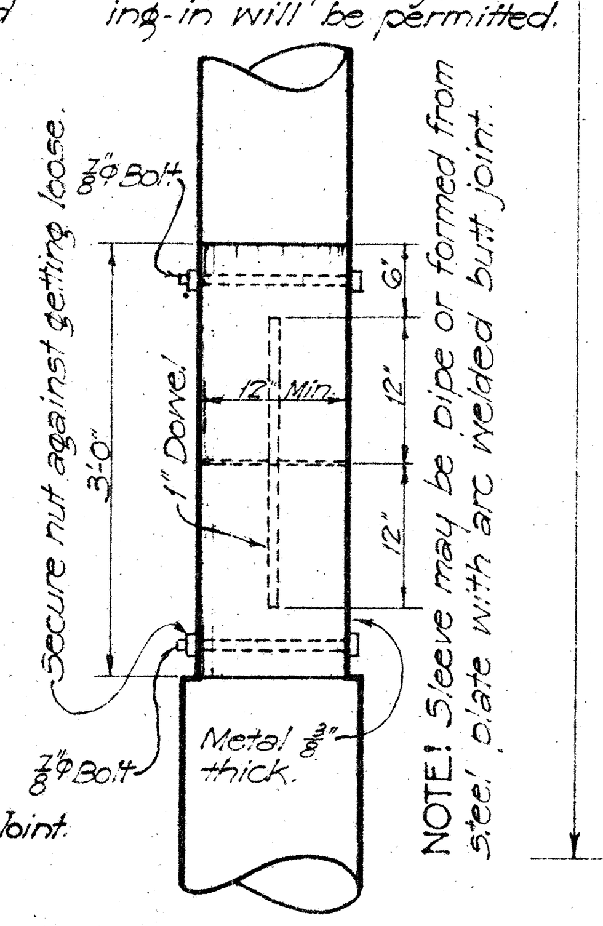
NOTE!! See REGULATORY & WARNING SIGNS Sheet for details of W-42, W-43, and railing posts.
See Std. Details Sheet for reinforcement of conc. posts.



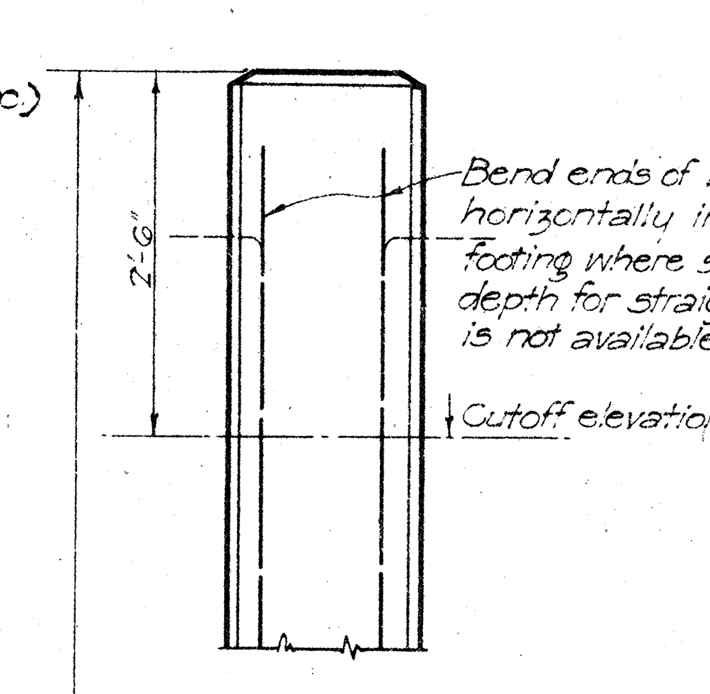
SECTION "D-D"
Scale ⅜" = 1'-0"
(Reflector Post not shown)
See Section "E-E".



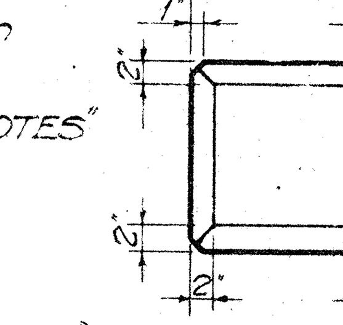
PLAN - METAL GUARDRAIL FLARE
Scale 1/8" = 1'-0"



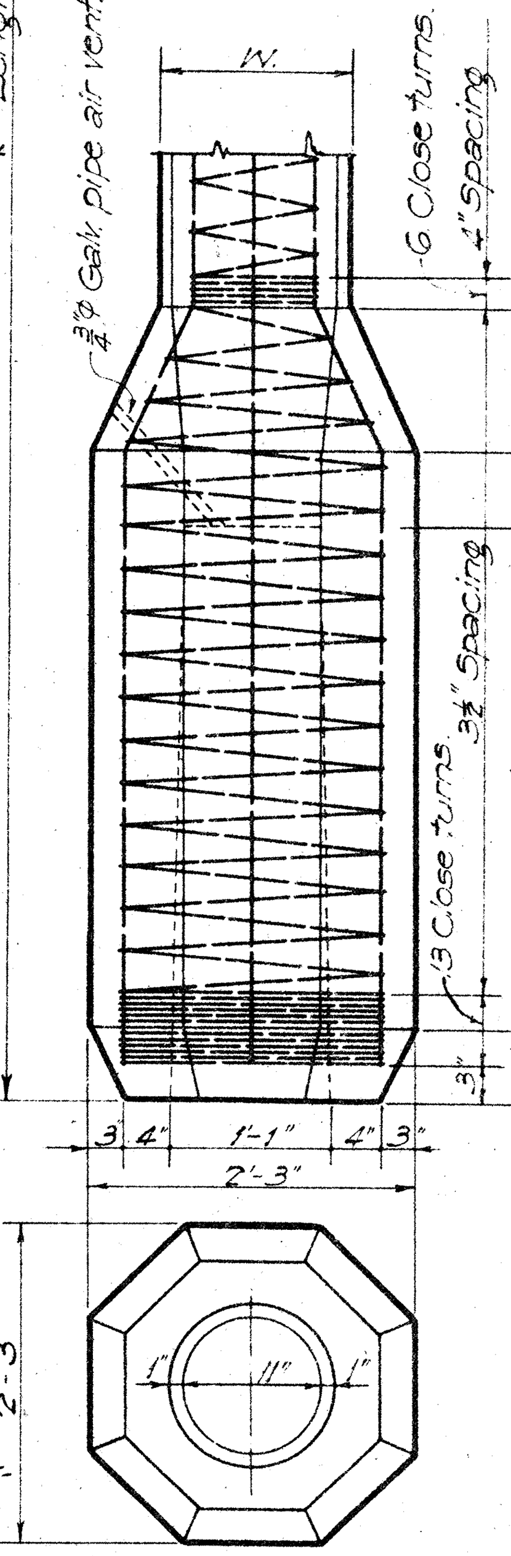
TIMBER PILE SPLICE
Scale: ¾" = 1'-0"



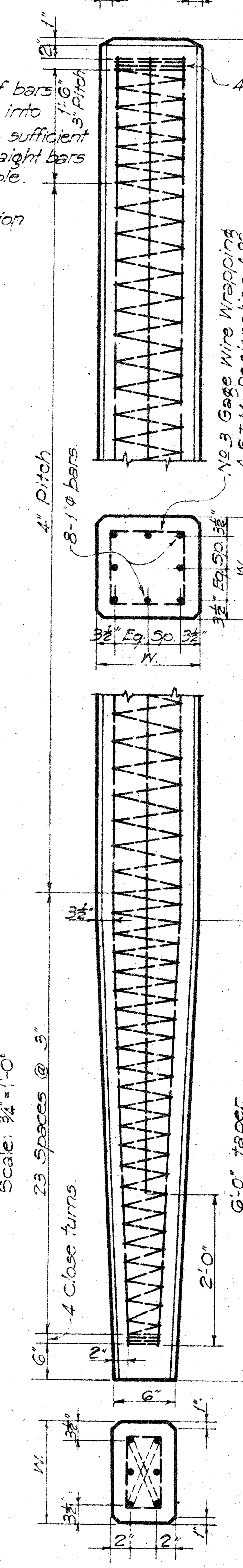
PILE CUTOFF



W = Size of pile.



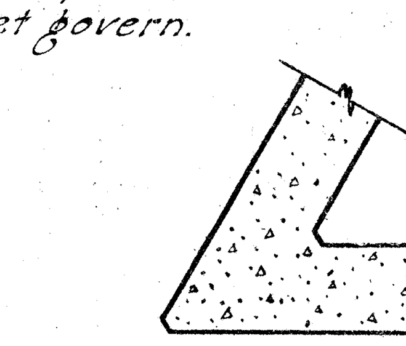
CONCRETE SOCKET
Scale: ¾" = 1'-0"



DETAIL OF CONCRETE PILE
Scale: ¾" = 1'-0"

GENERAL NOTE

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



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 ¾".

HAWAII STATE HIGHWAY DEPARTMENT
STATE OF HAWAII

STANDARD BRIDGE DETAILS
Scales as Noted

APPROVED BY: [signature]
STATE HIGHWAY ENGINEER
DATE Aug. 26, 1959

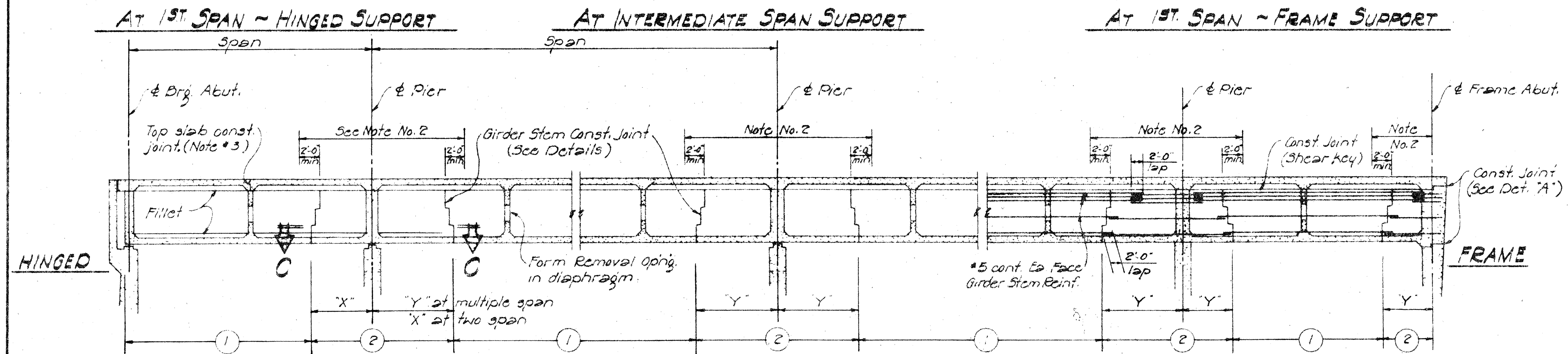
SHEET No. OF SHEETS

S526.28A S174.47A S161.45A

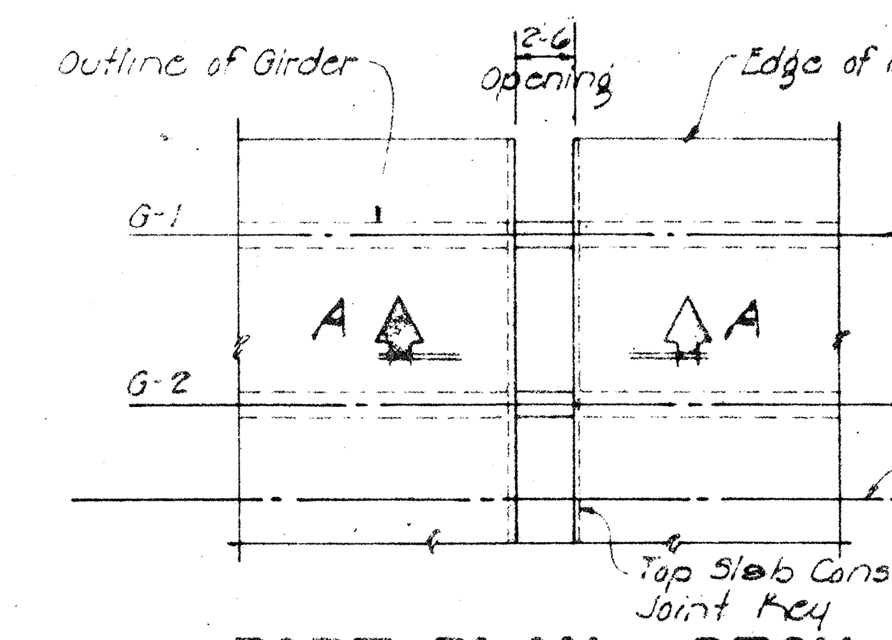
77A

ORIGINAL PLAN | NOTE BOOK No.
SURVEY PLOTTED BY
DESIGNED BY W.R. Bartels
DRAWN BY
TRACED BY R. Kanemura
QUANTITIES BY
QUANTITIES CHECKED BY
CHECKED BY
DATE Mar. 1952

FED. ROAD DIST. No.	STATE	FED. AID PROJ. No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
HAWAII	HAW	US-S-0720(3) UNIT 3	1960	28 B	79
		BU-072-1(2) UNIT 4	1960	47 B	118
		BU-065-1(1) UNIT 3	1960	45 B	115



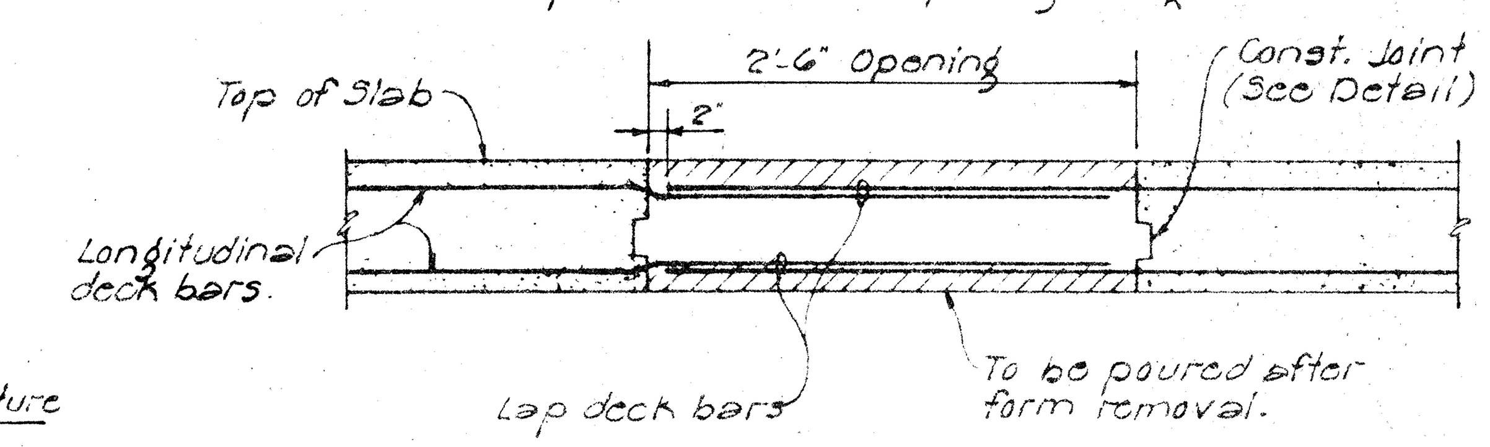
Note: Final location of opening shall be determined by the Engineer.



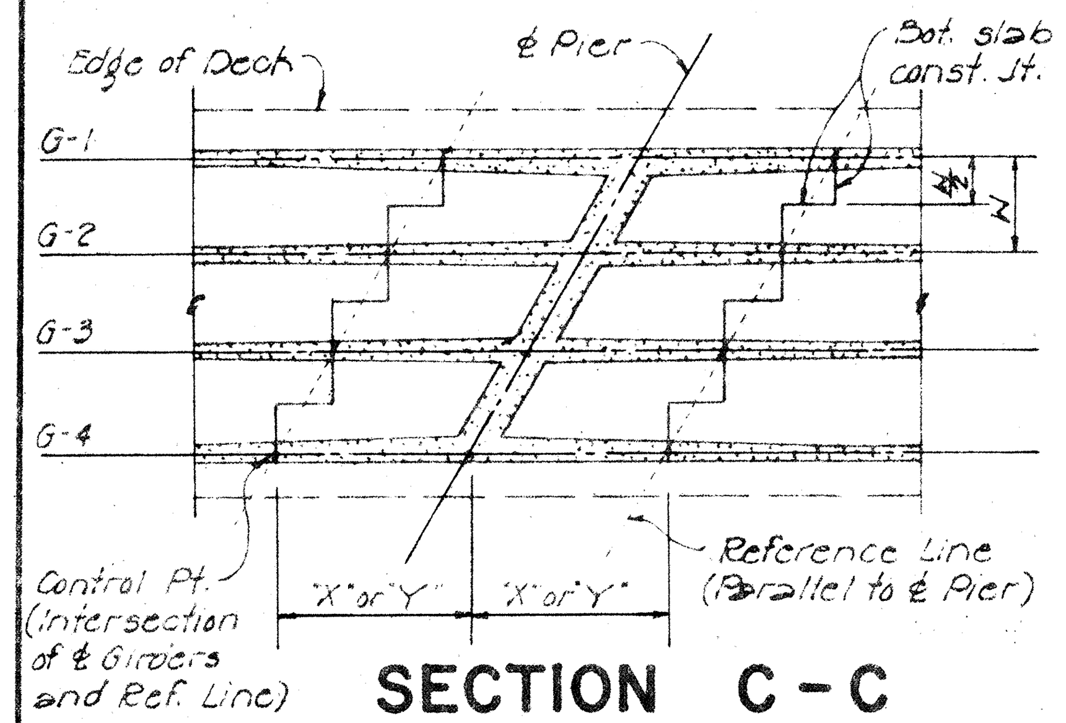
PART PLAN - DECK

SHOWING FORM REMOVAL OPENING

Note: No lapping of main girder bars shall be permitted where opening is required.



SECTION A-A

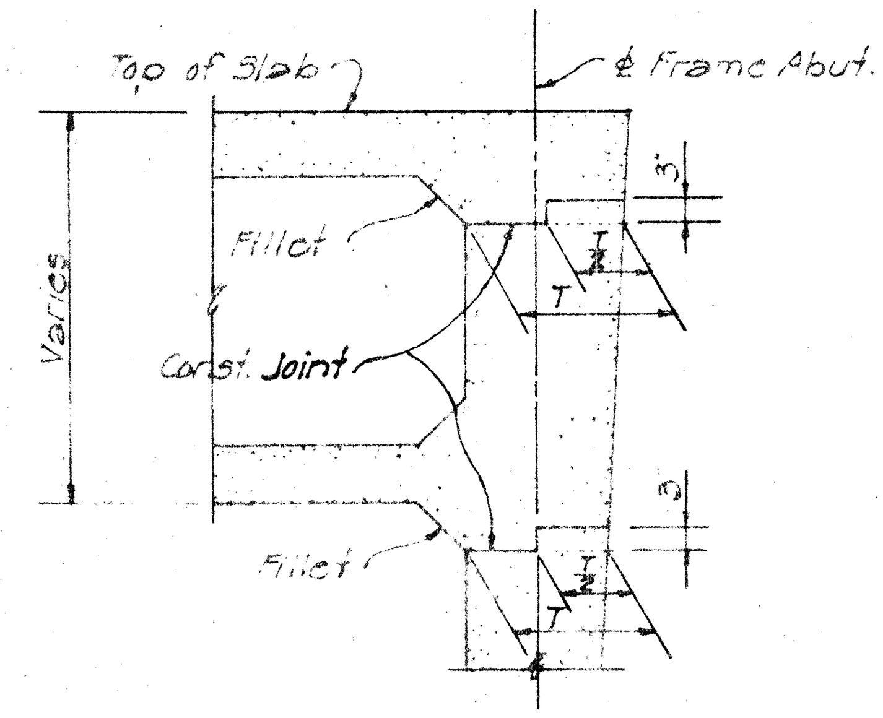


SECTION C-C

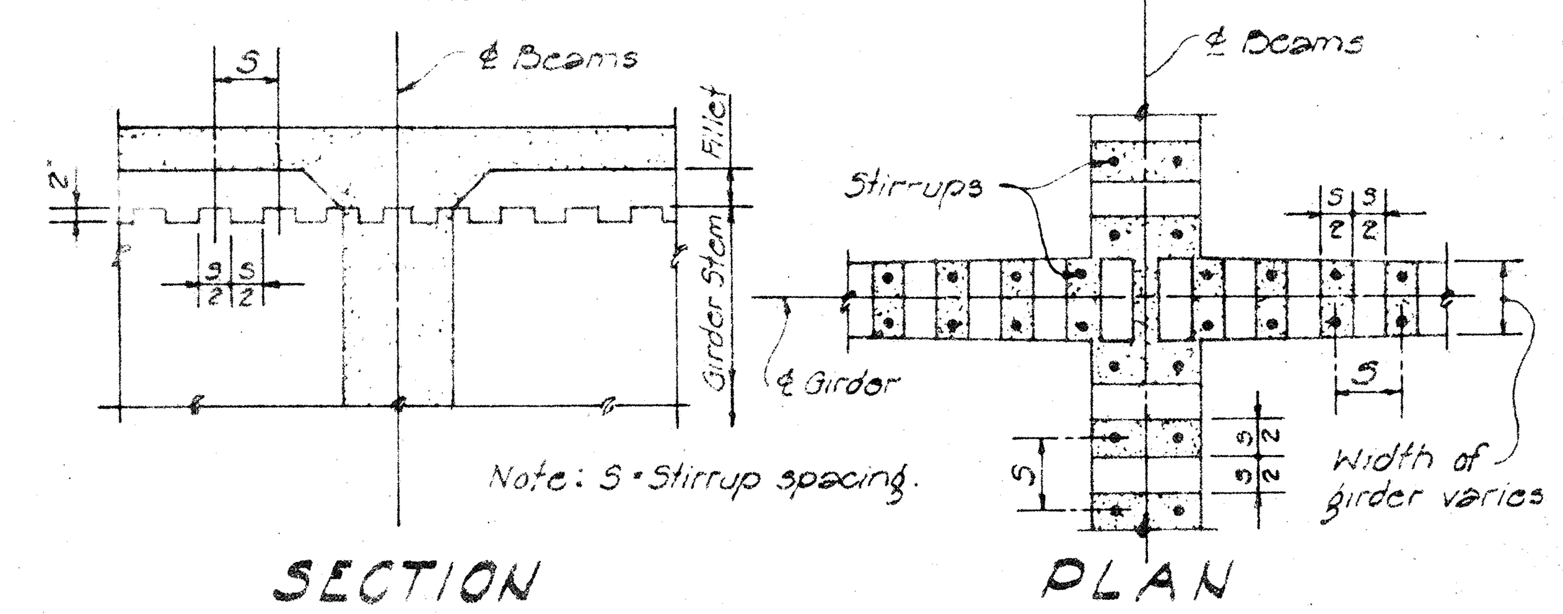
SHOWING TREATMENT OF CONST. JOINT FOR BRIDGES ON SKEW

NOTE:
No. 1 - Numbers ① and ② indicate sequence of placing bottom slab and girder stems.
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.

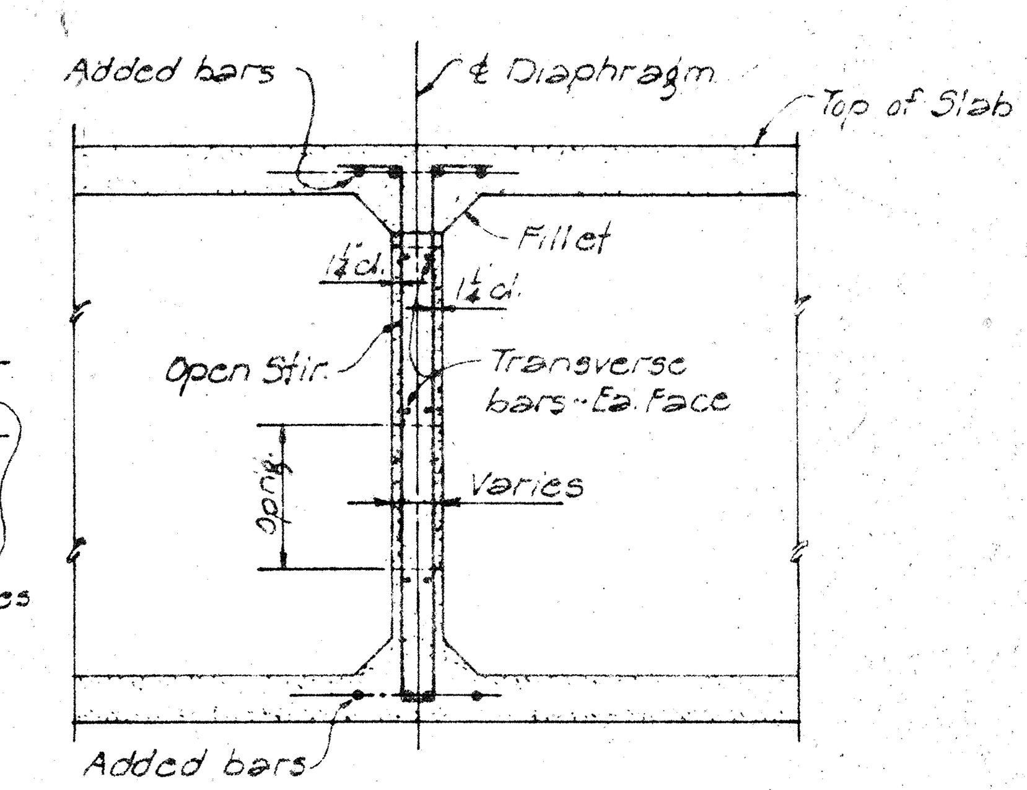
PLACING DIAGRAM FOR SUPERSTRUCTURE CONCRETE



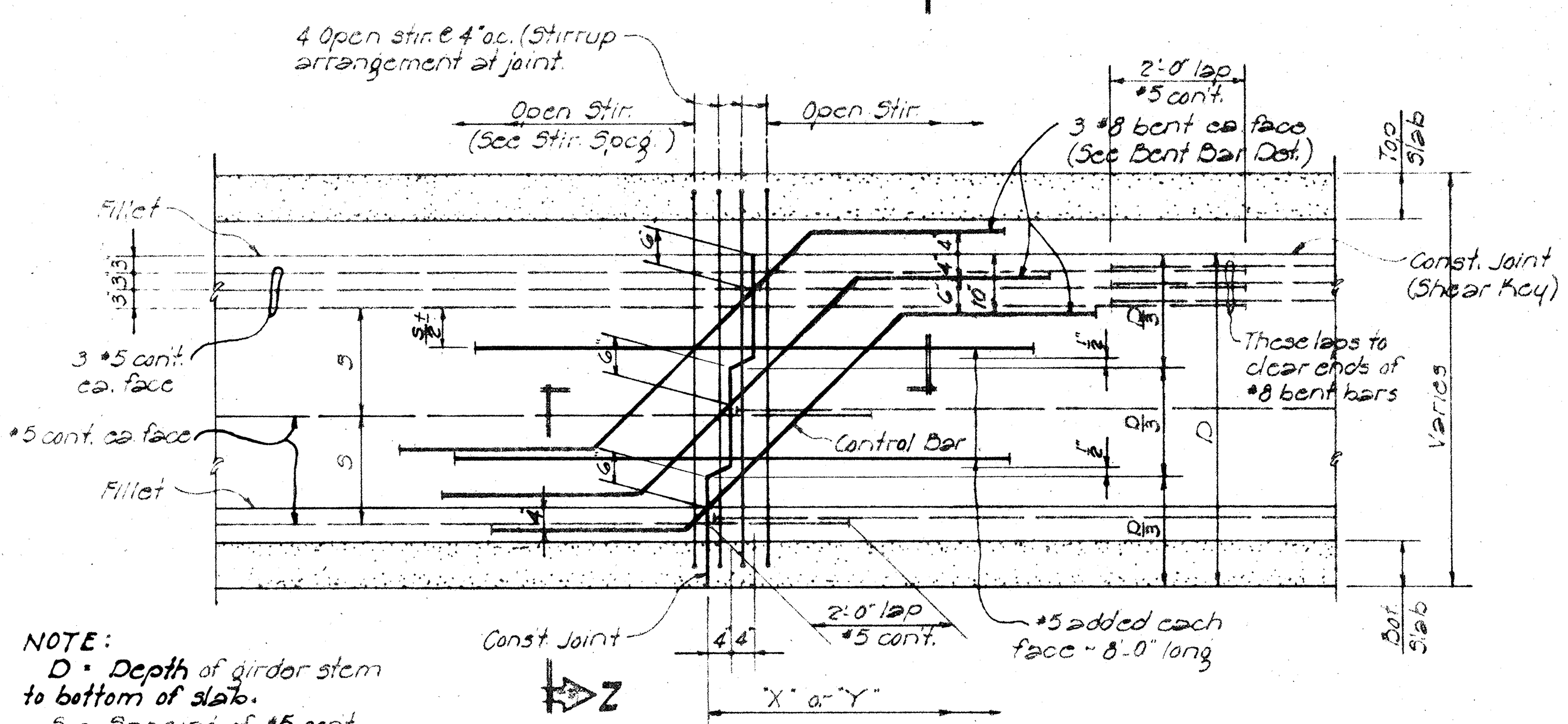
DETAIL - A



SHEAR KEY DETAIL

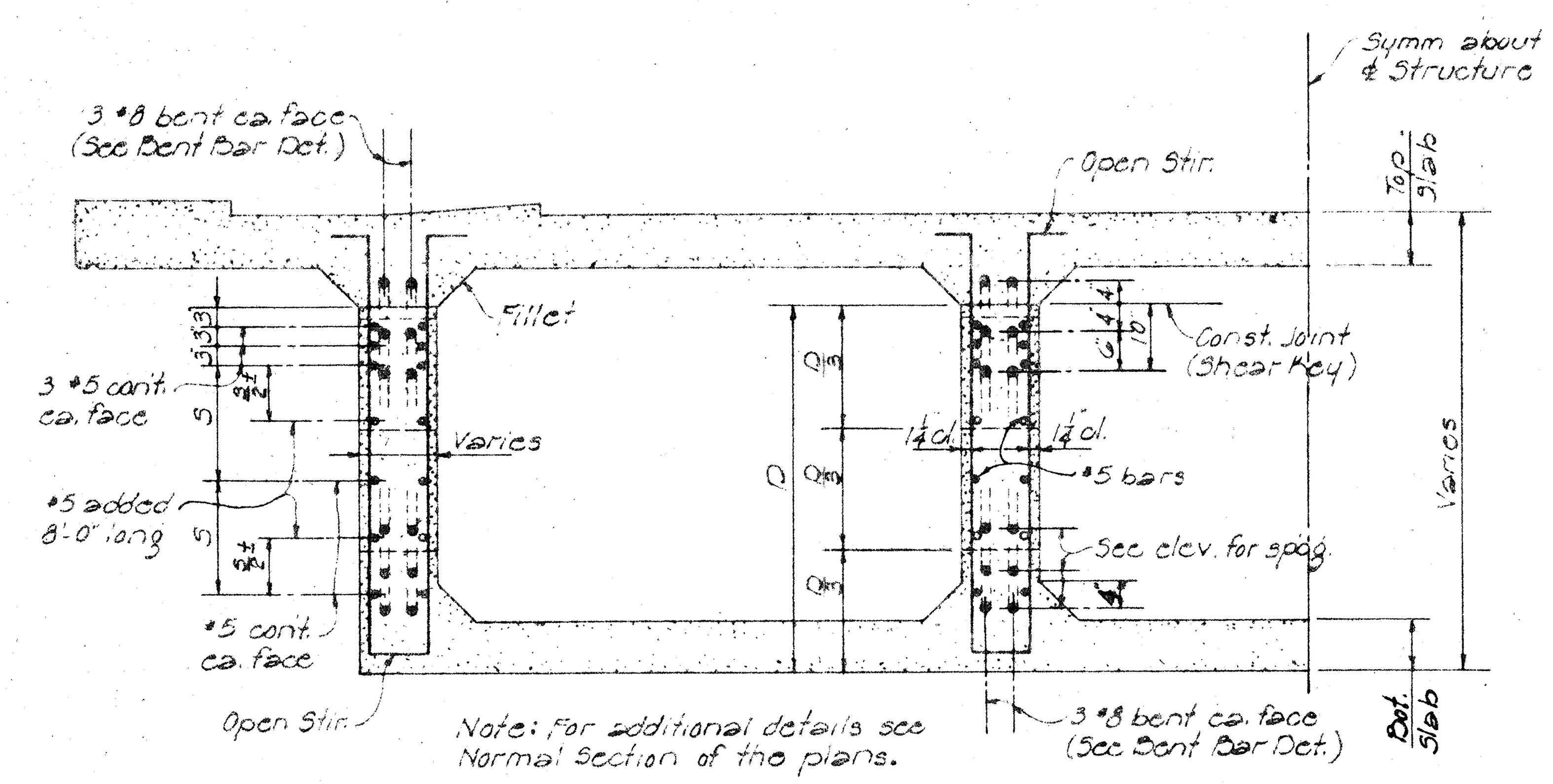


SECTION B-B



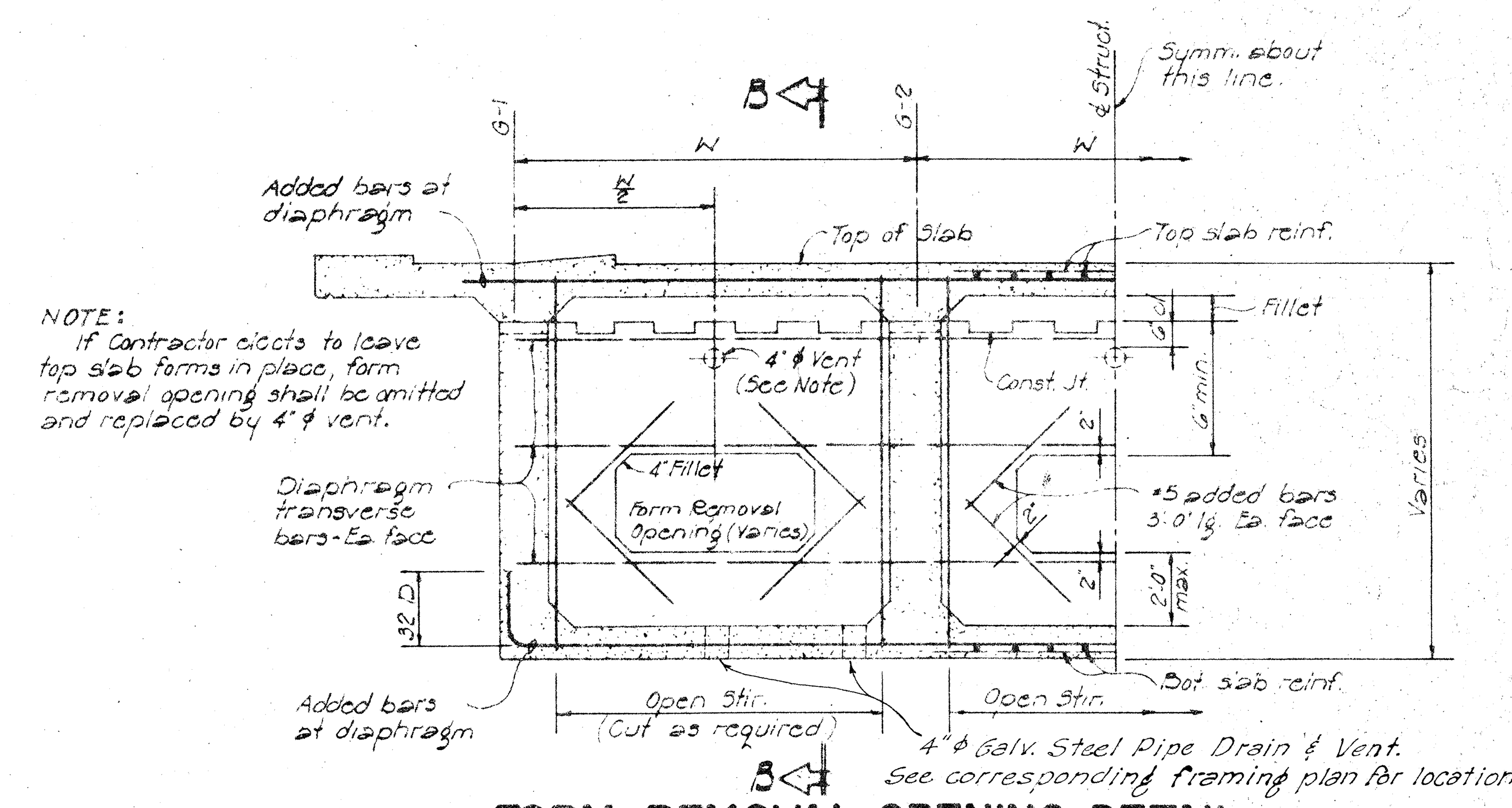
NOTE:
D = Depth of girder stem to bottom of slab.
S = Spacing of #5 cont. girder stem long. bars.

GIRDER STEM CONST. JOINT



SECTION Z-Z

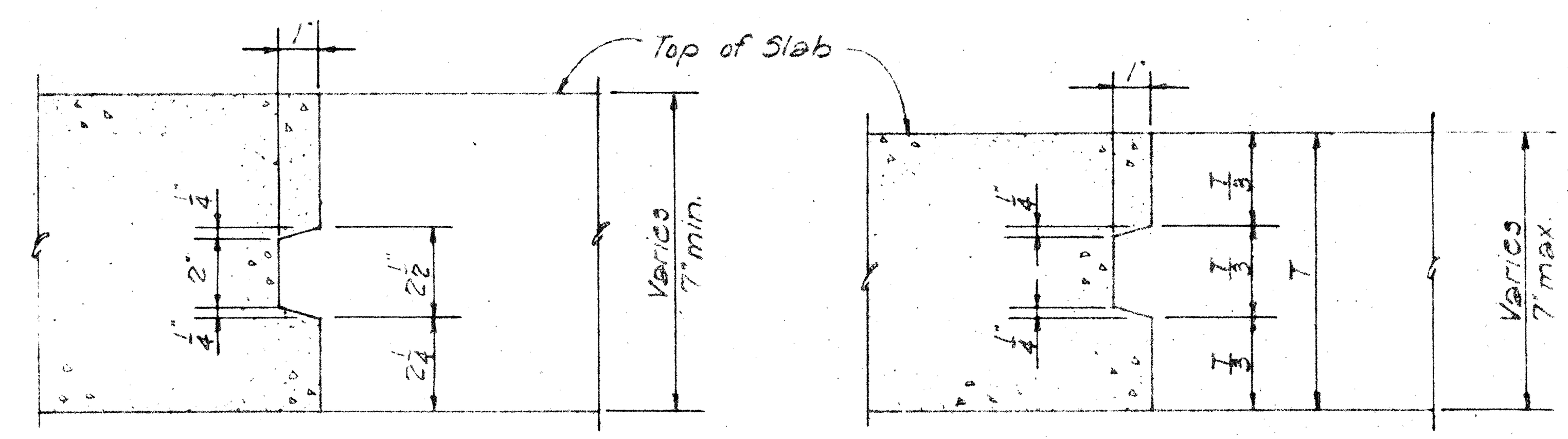
NOTE:
If Contractor elects to leave top slab forms in place, form removal opening shall be omitted and replaced by 4" ϕ vent.



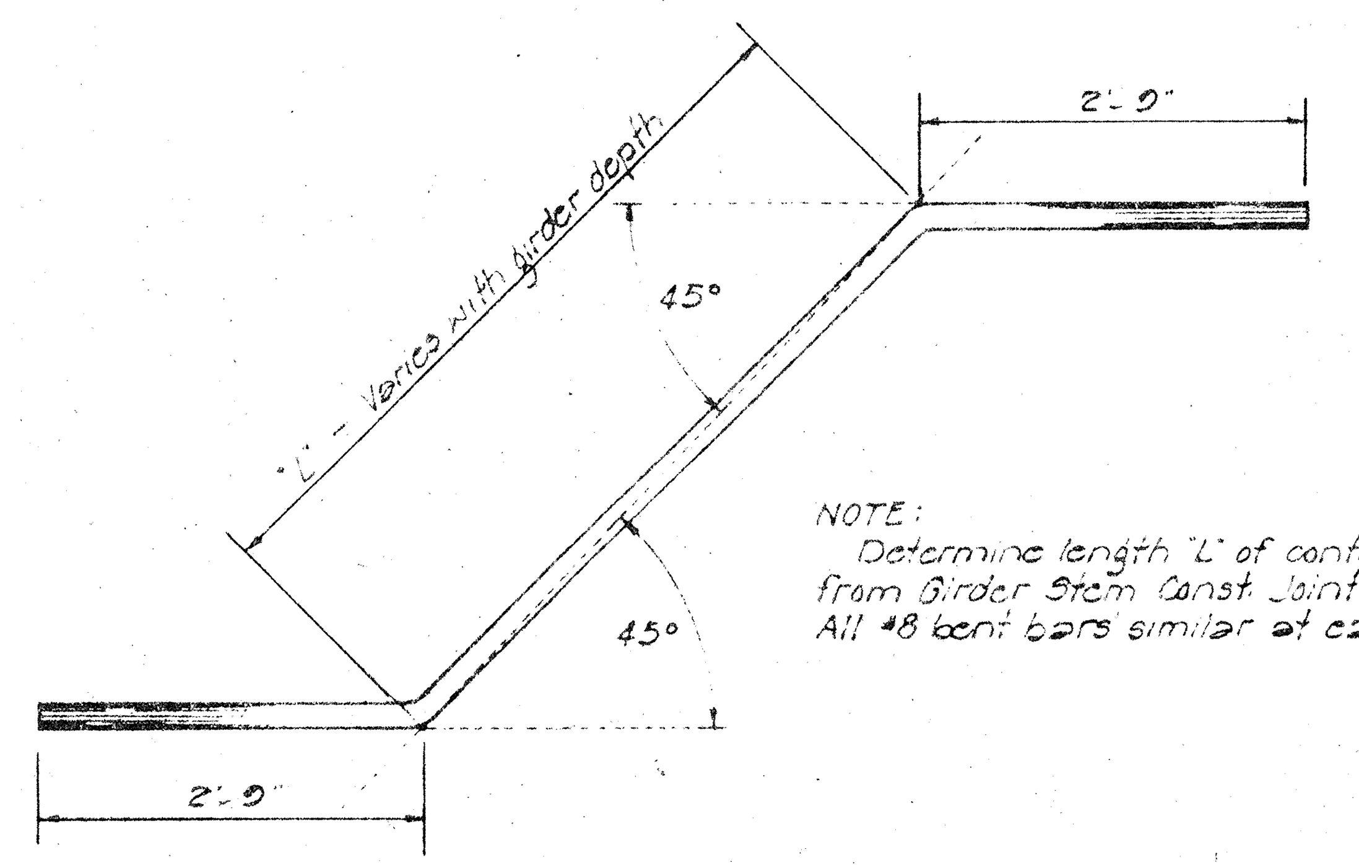
FORM REMOVAL OPENING DETAIL IN DIAPHRAGM

GENERAL NOTE

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



TOP SLAB CONST. JOINT



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

DETAIL - NO. 8 BENT BAR

APPROVED: [signature] STATE HIGHWAY ENGINEER

DATE: Aug. 26, 1959

HAWAII STATE HIGHWAY DEPARTMENT

STATE OF HAWAII

STANDARD DETAILS

BOX GIRDER

SCALES AS NOTED

SHEET No. OF SHEETS

S526.28B S174.47B S161.45B

778

ORIGINAL PLAN / NOTE BOOK No. — SURVEY PLOTTED BY / DESIGNED BY / DRAWN BY / TRACED BY / QUANTITIES BY / QUANTITIES CHECKED BY / CHECKED BY — DATE