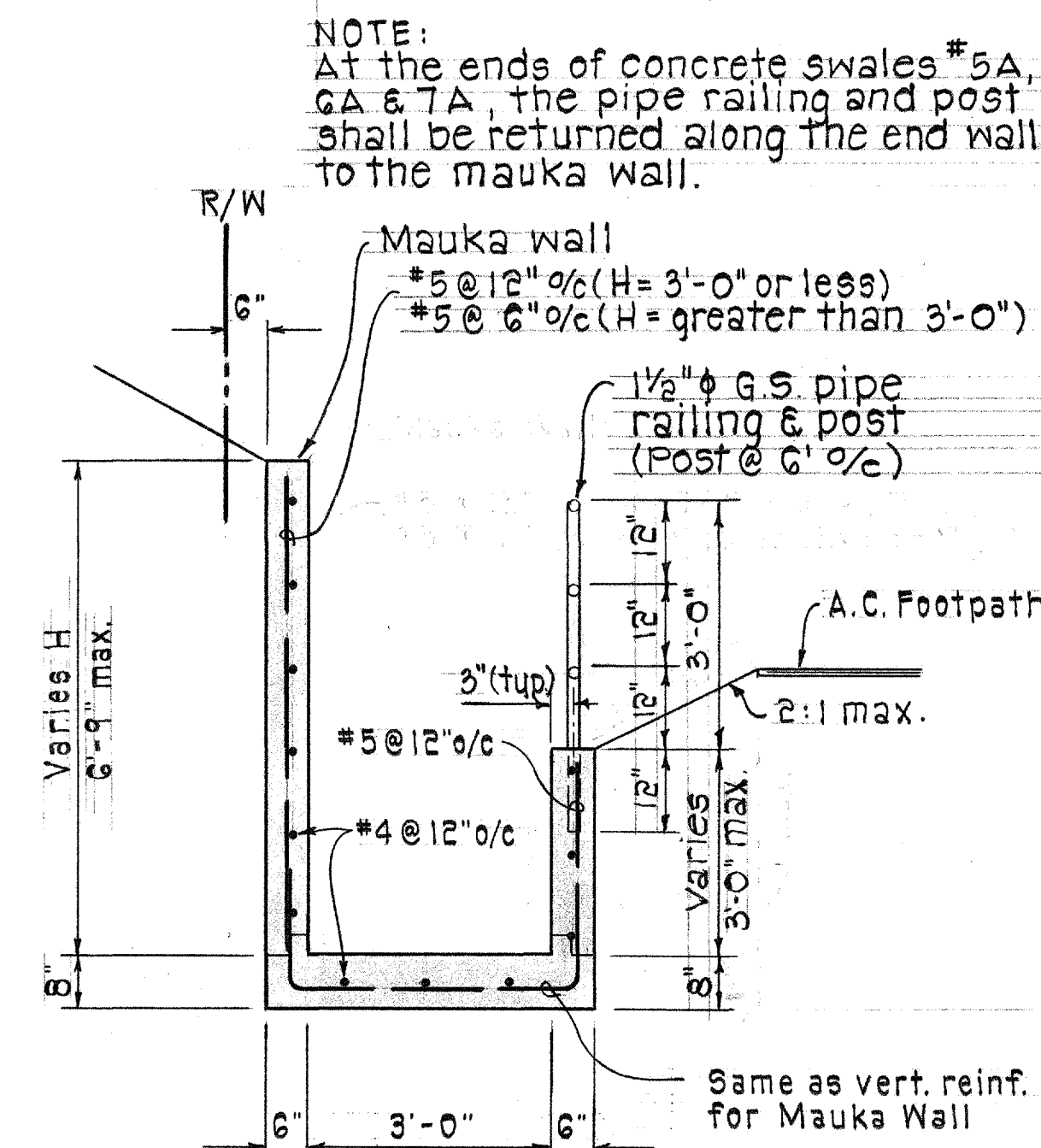


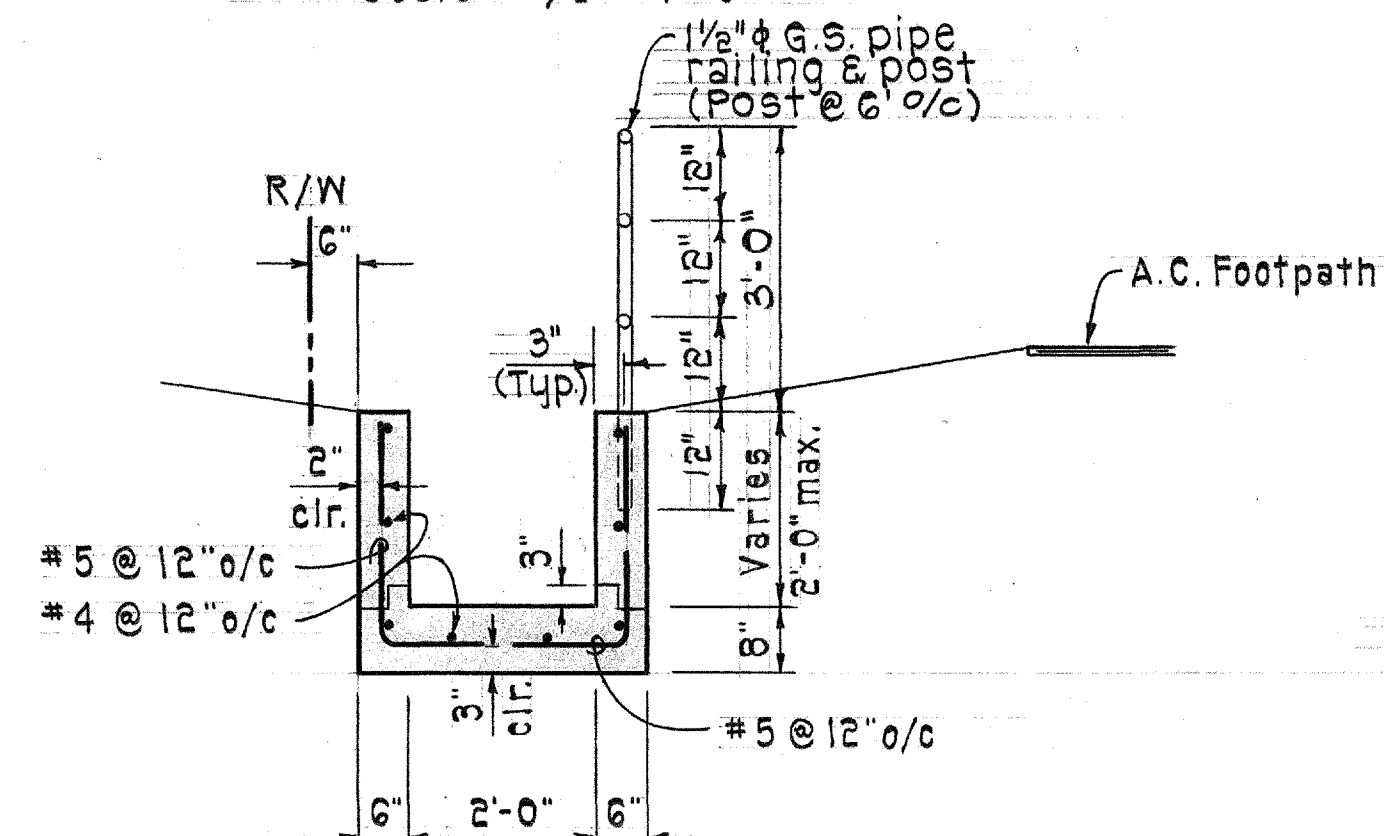
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.		1969	52	104

PROJECT NO. 900 B-02-68 UNIT 2



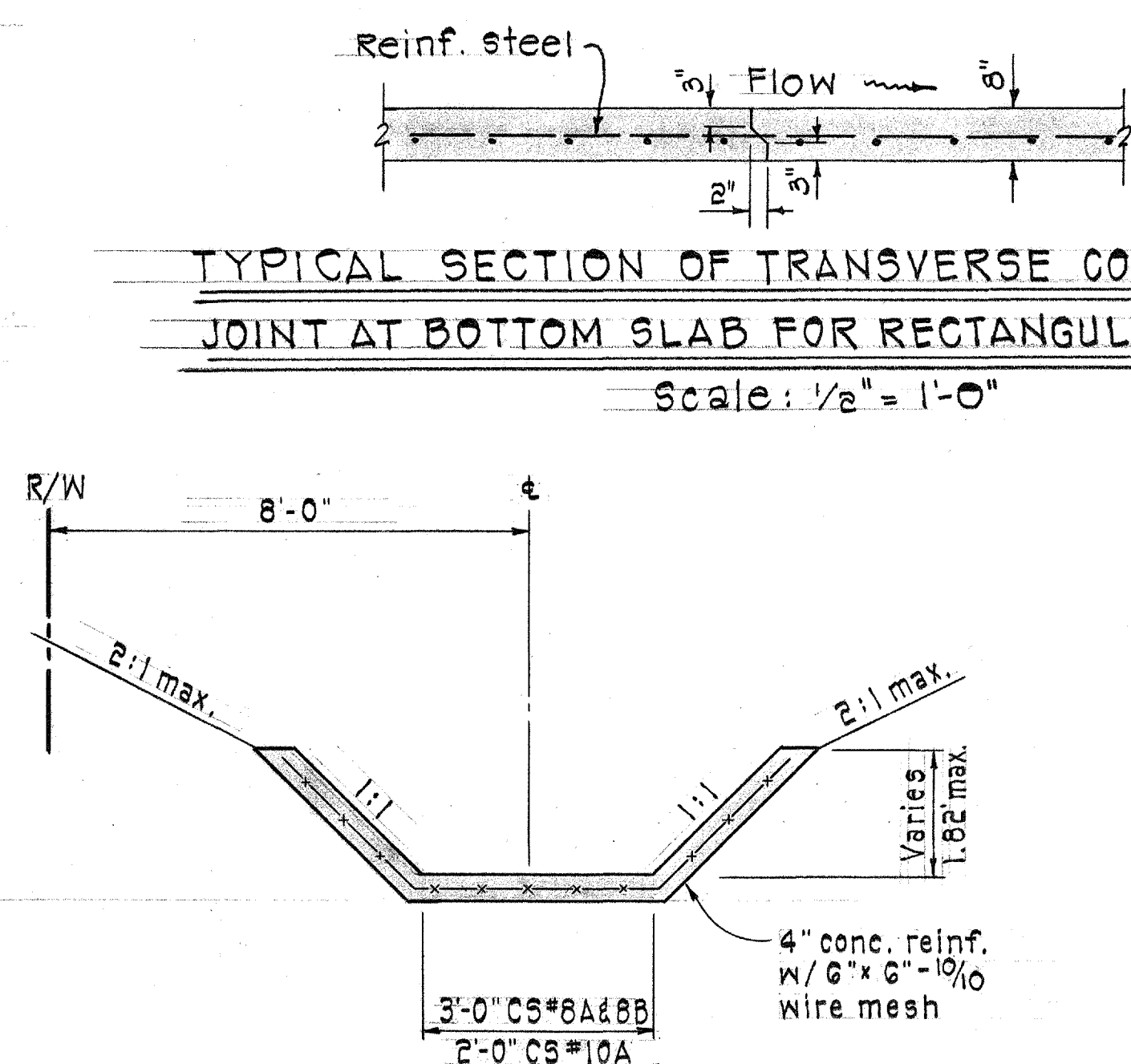
TYPICAL SECTION
CONC. SWALE #4A, #5A
AND #10A (STA. 0+00 TO STA. -1+90)

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



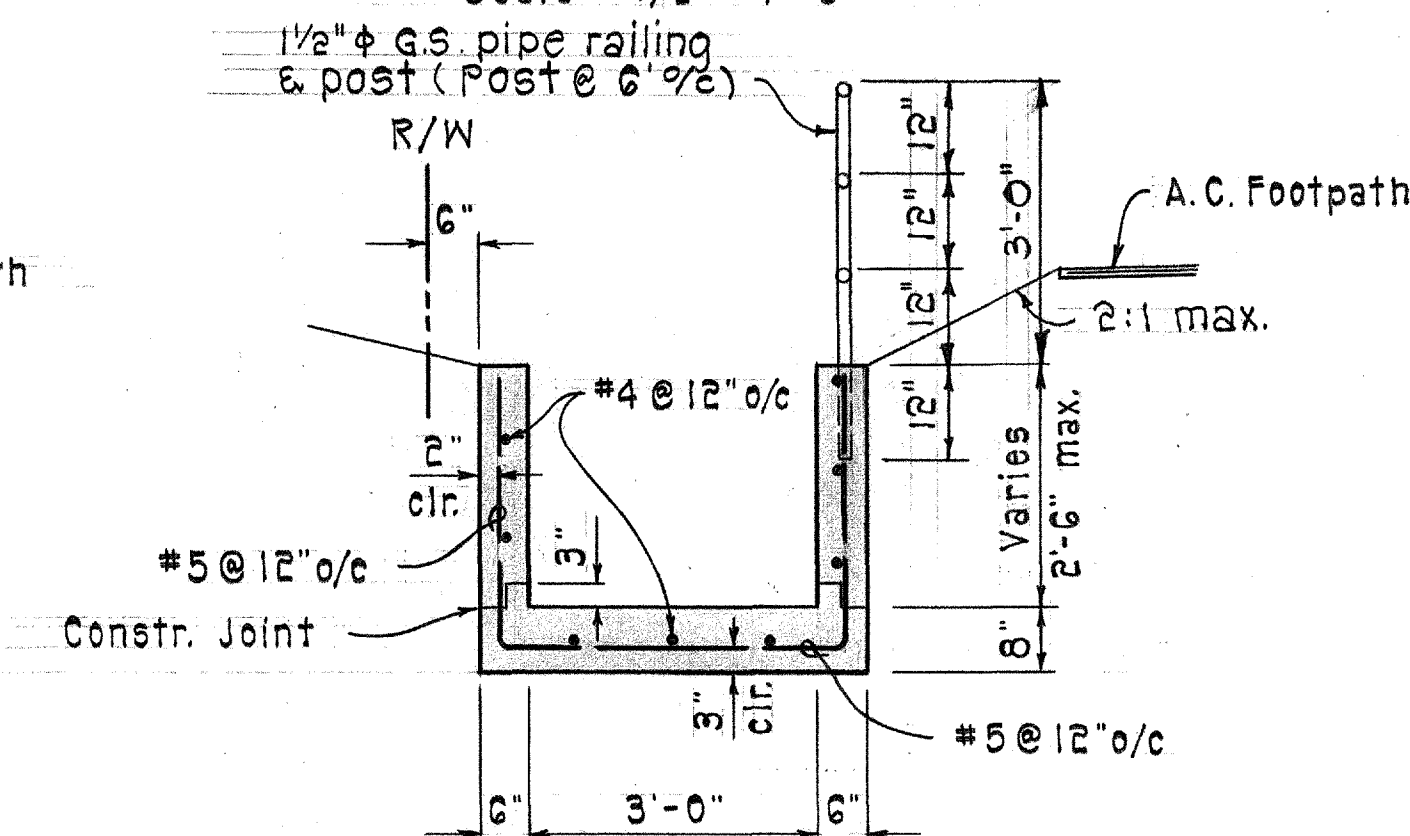
TYPICAL SECTION
CONC. SWALE #6A

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



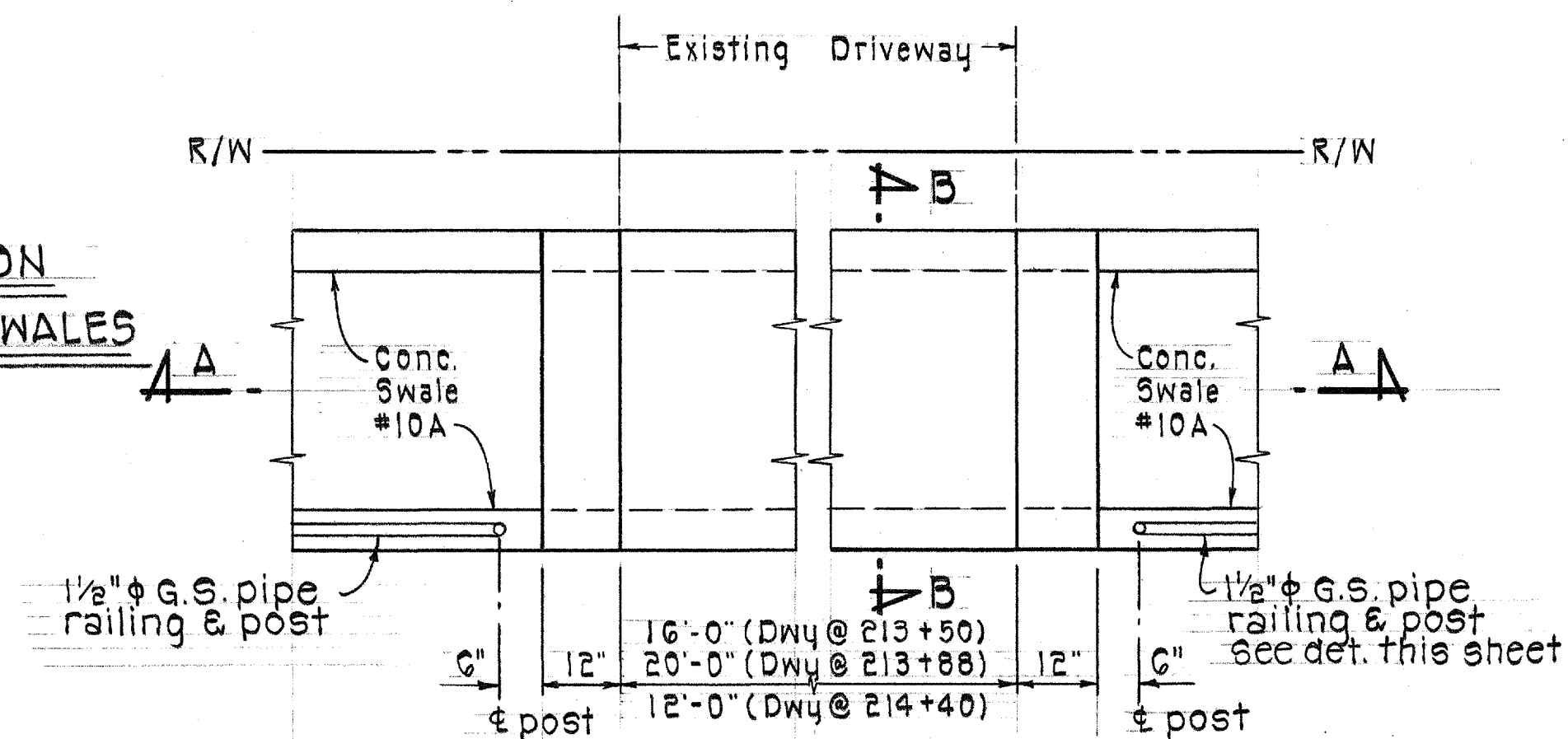
TYPICAL SECTION
CONC. SWALE #8A, #8B
AND #10A (STA. -1+99 TO STA. -3+20)

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

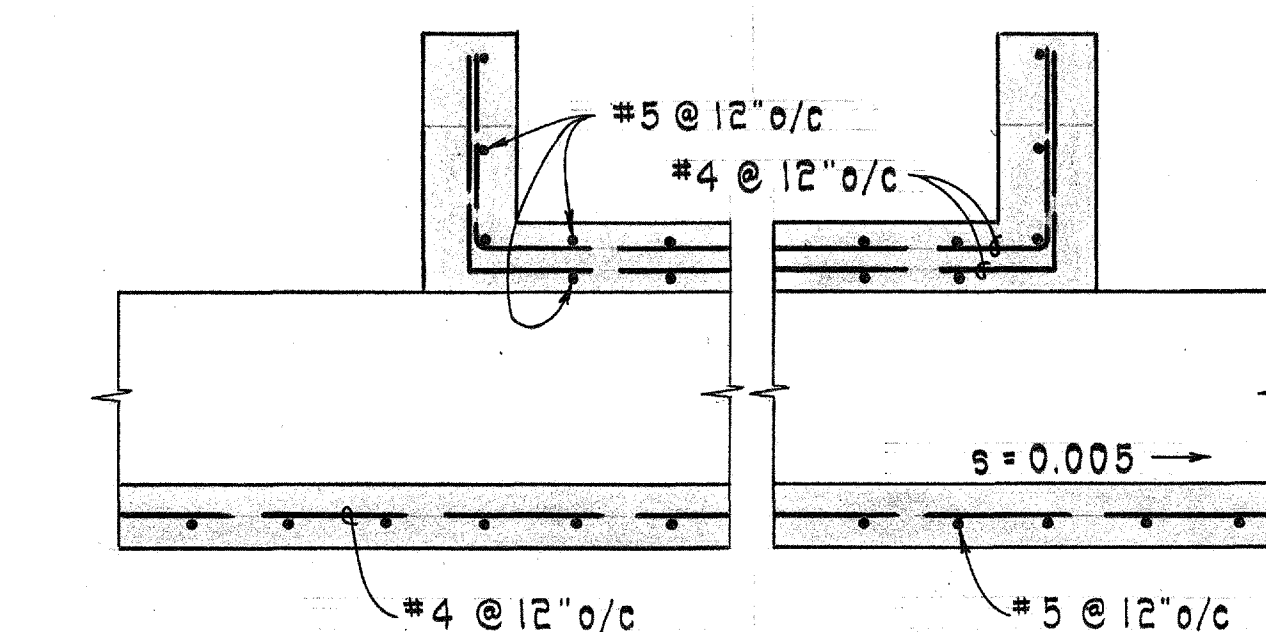


TYPICAL SECTION
CONC. SWALE #6B, #7A, #7B

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



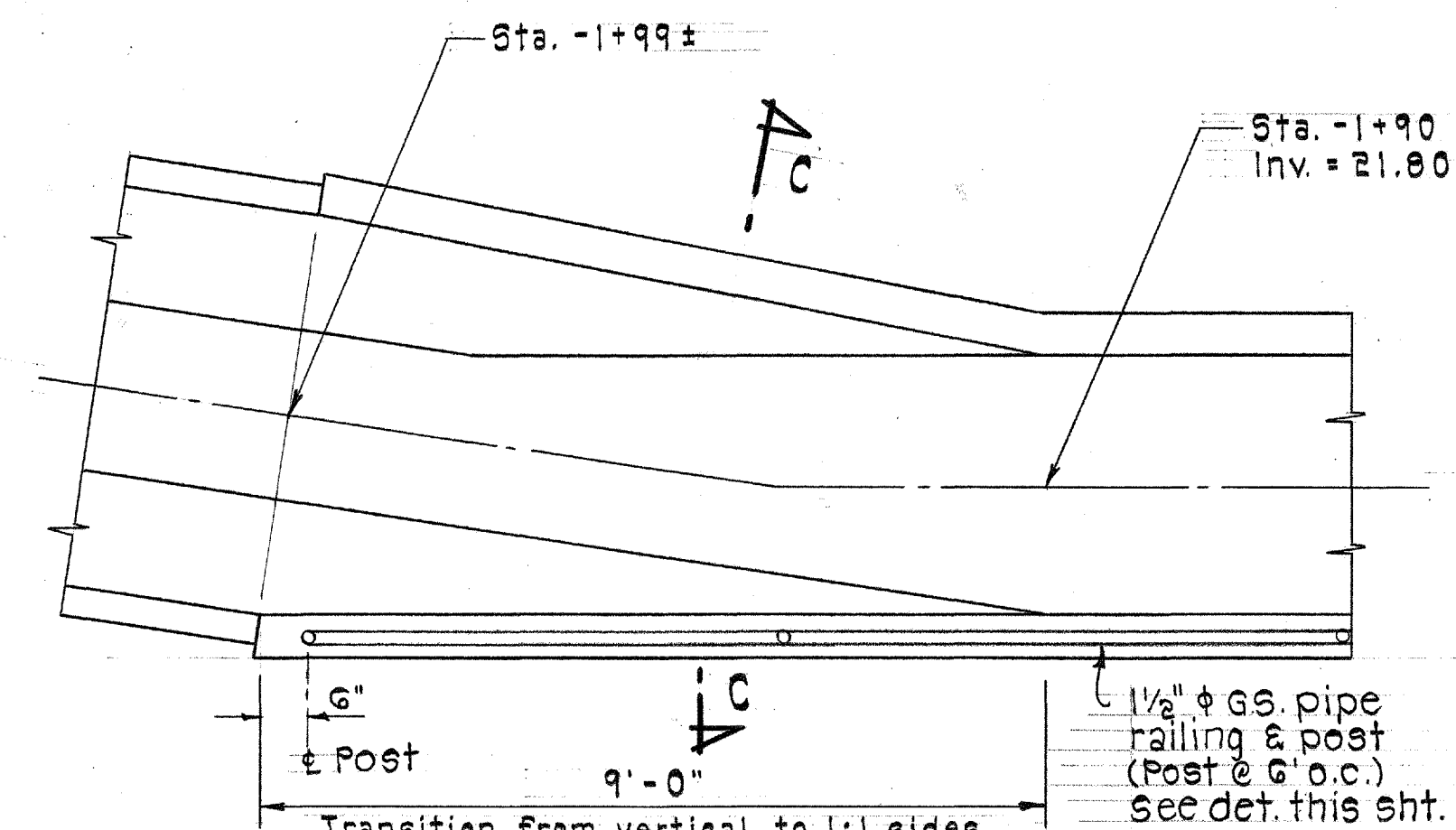
PLAN



SECTION "A-A"

DETAIL OF CONC. SLAB DRIVEWAY
OVER CONC. SWALE #10A
AT STA. 213+50, STA. 213+88 AND STA. 214+40

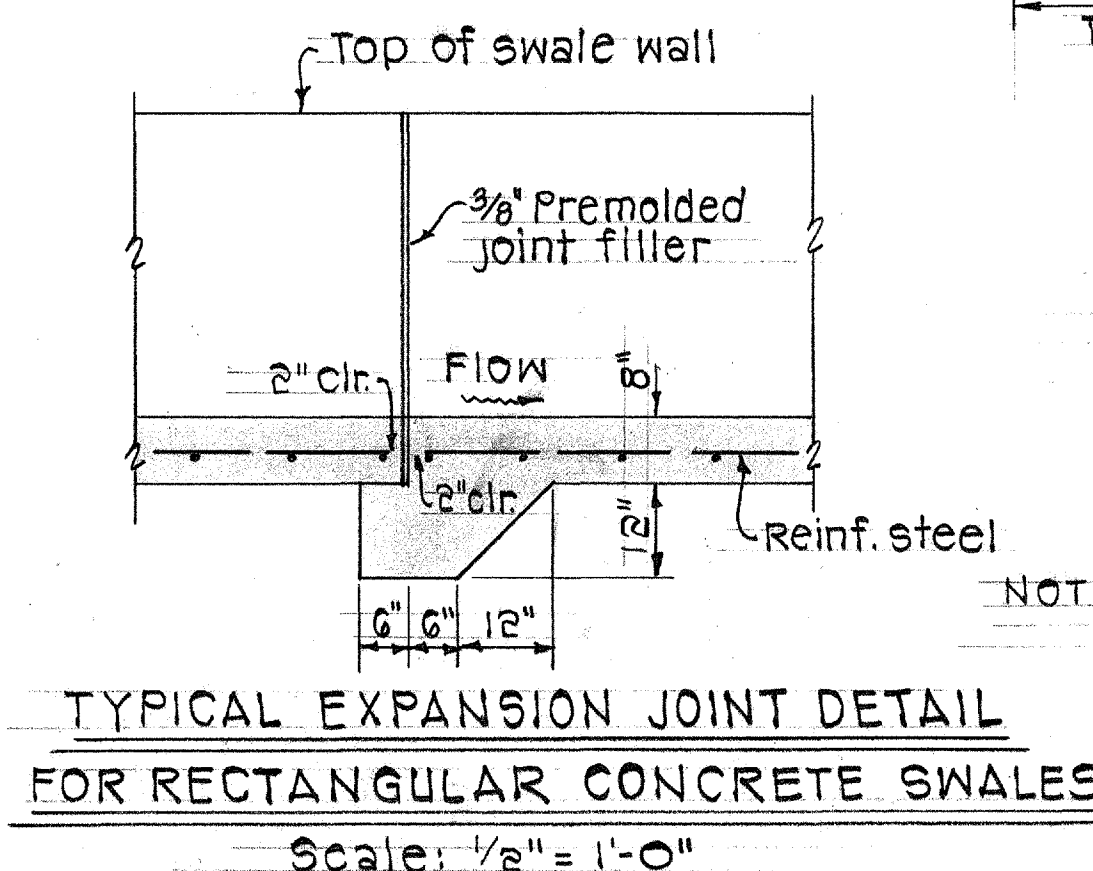
Scale: 1/2" = 1'-0"



PLAN

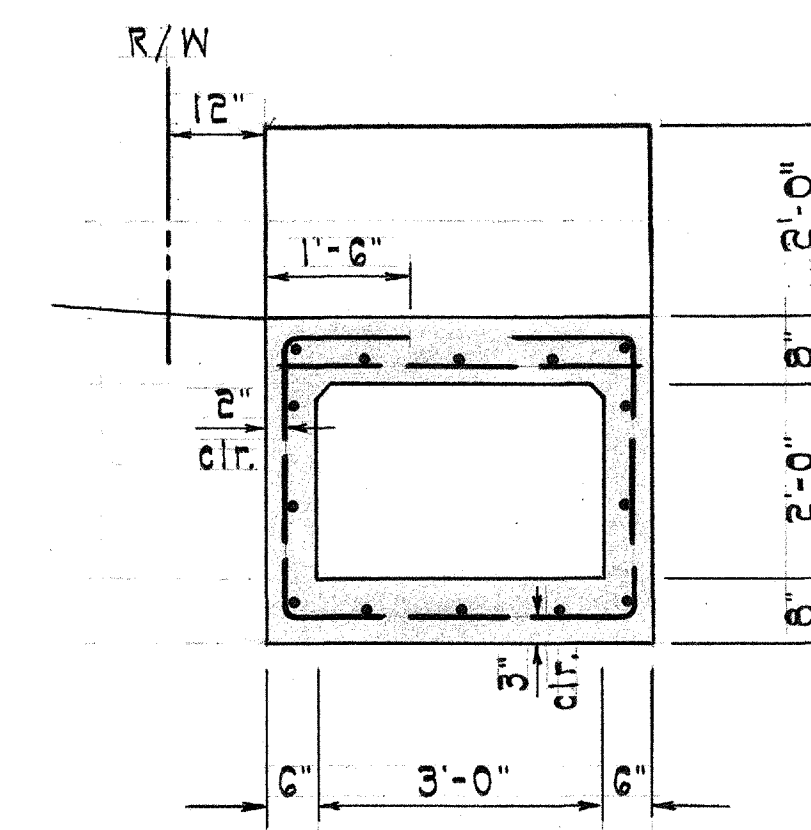
DETAIL OF TRANSITION
CONC. SWALE #10A

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

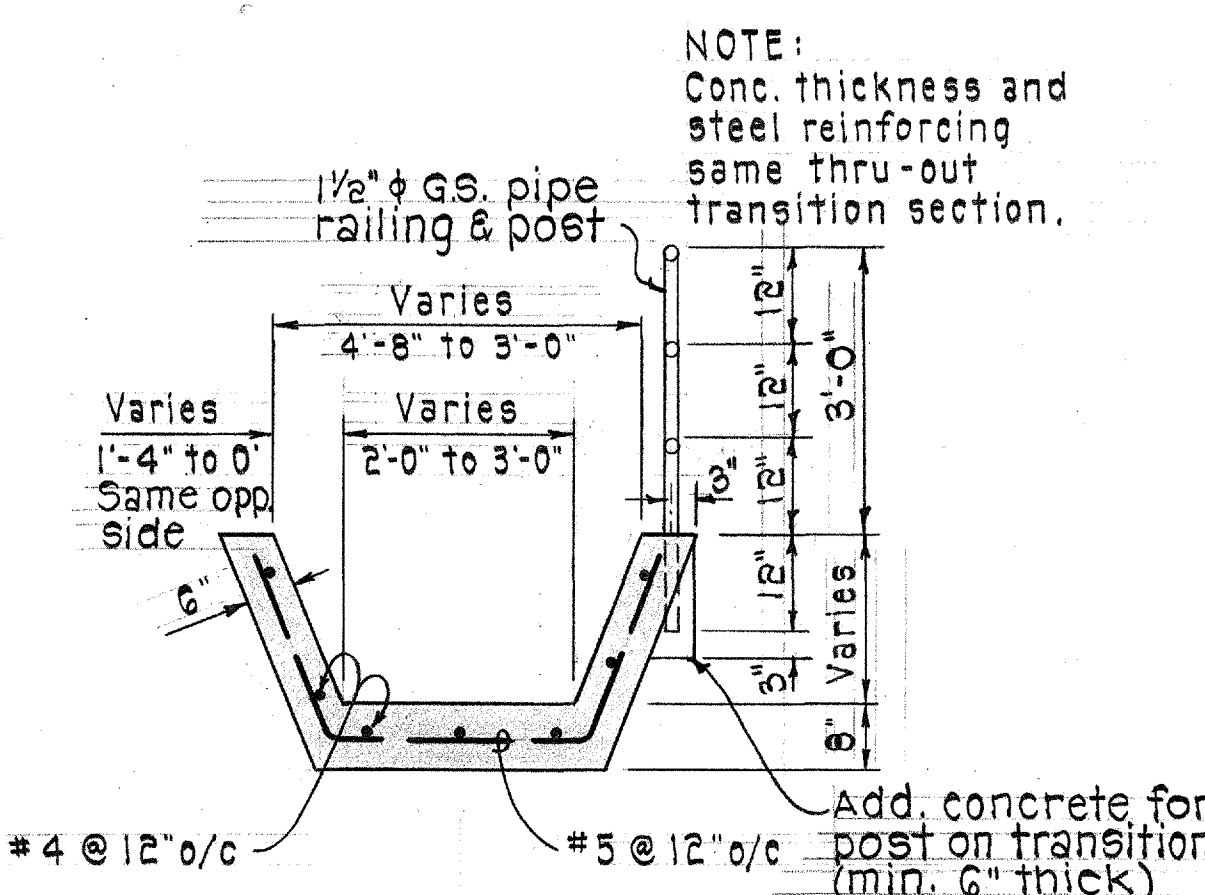


TYPICAL EXPANSION JOINT DETAIL
FOR RECTANGULAR CONCRETE SWALES

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

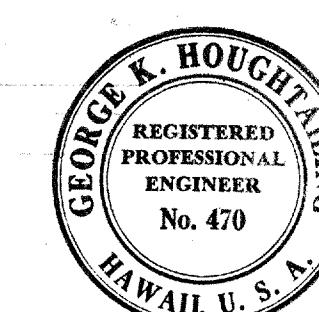


SECTION "B-B"



SECTION "C-C"

CONCRETE SWALE	STR. EXC. C.Y.	CL. A-1 CONC. C.Y.	REINF. STEEL #	6" x 6" - 10/10 WIRE MESH #	RAILING & POST LIN. FT.
# 4A	277.8	75.6	8,838	—	379
# 5A	423.5	93.5	11,949	—	456
# 6A	38.8	11.6	1,054	—	82
# 6B	282	76.3	6,528	—	400
# 7A	135	38.2	3,152	—	205
# 7B	78	17.3	1,460	—	104
# 8A	325	39	—	670	—
# 8B	57.5	8	—	53	—
# 10A	124.5	44.1	2,178	169	177
DWY. @ 213+50	—	2.2	185	—	—
DWY. @ 213+88	—	2.6	220	—	—
DWY. @ 214+40	—	1.8	155	—	—



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OR UNDER MY SUPERVISION.

George K. Houghaling
Signature

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
DRAINAGE DETAILS
CONCRETE SWALE

FARRINGTON HIGHWAY WIDENING
PROJECT 900B-02-68

UNIT 2

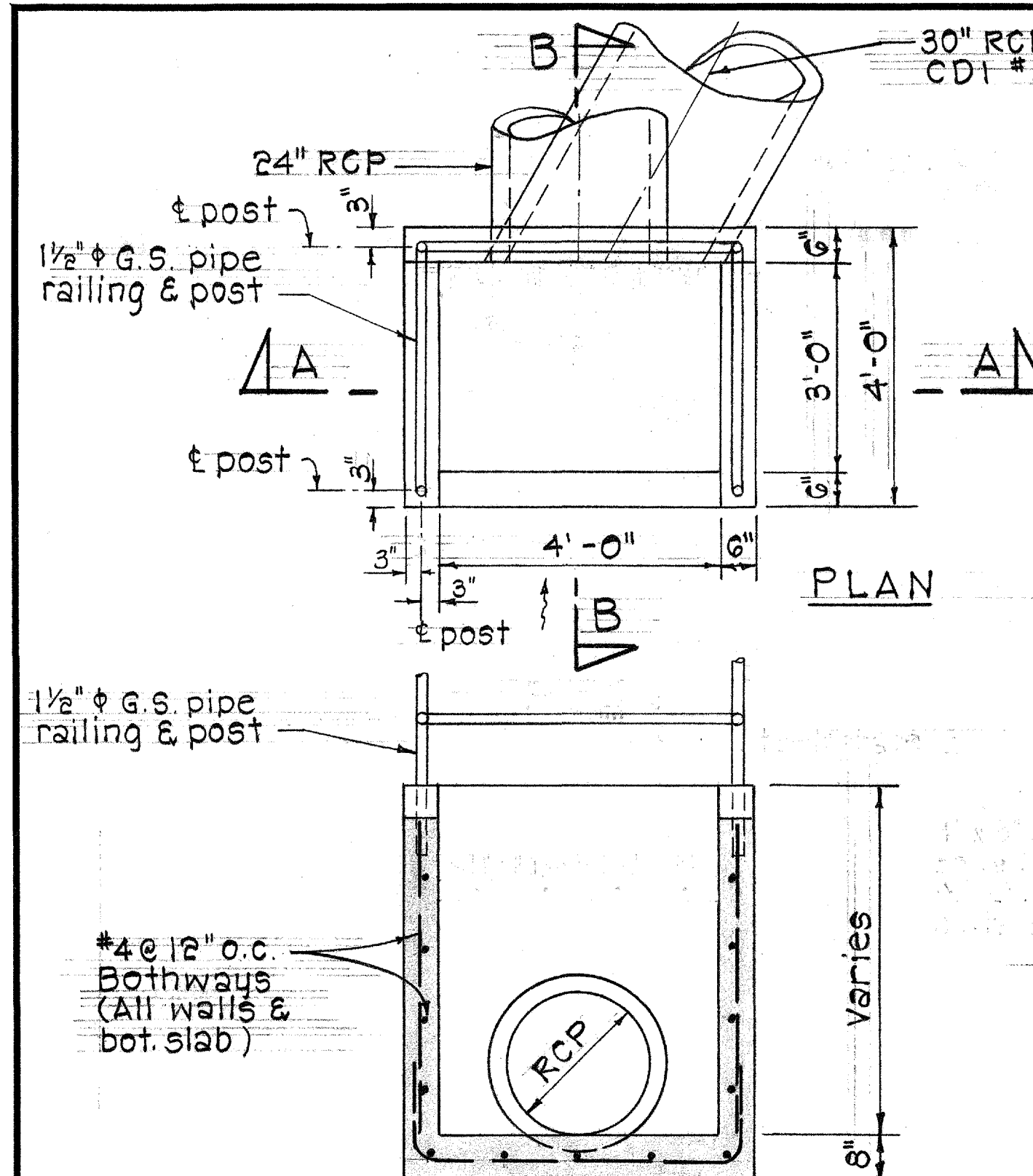
SCALE: AS NOTED

SHEET No. 1 OF 3 SHEETS

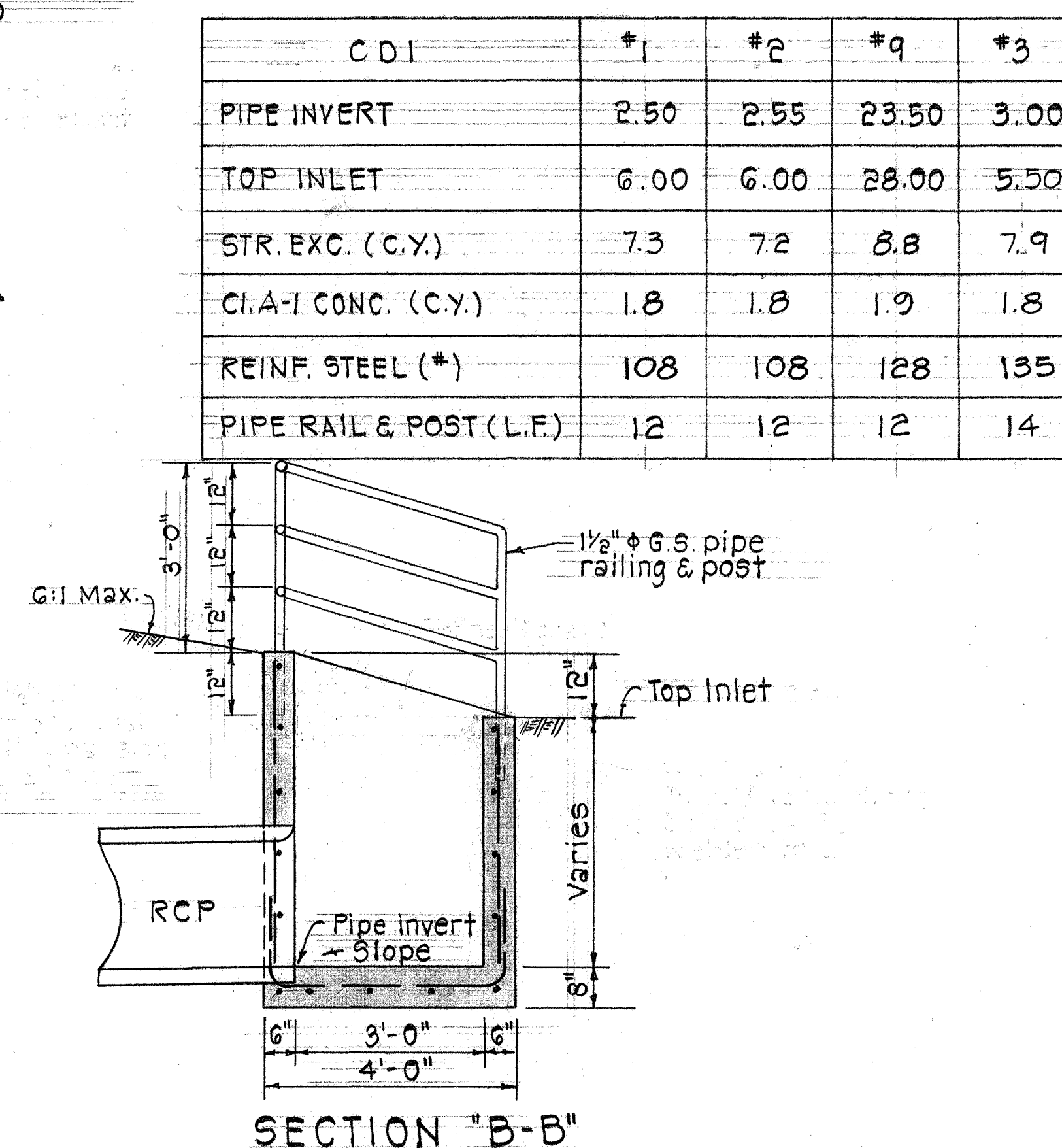
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.		1969	53	104

PROJECT NO. 900 B-02-68 UNIT 2

CDI	#4	#5	#6	#7
PIPE INVERT	9.40	15.50	20.30	20.70
SWALE INVERT	11.40	15.80	22.00	23.00
MAUKA WALL	12.90	21.80	24.50	25.25
MAKAI WALL	14.00	18.30	24.50	25.25
STR. EXC. (C.Y.)	9.0	11.6	7.6	8.0
CL. B-I CONC. (C.Y.)	1.5	1.3	1.4	1.6
REINF. STEEL (#)	144	117	184	192



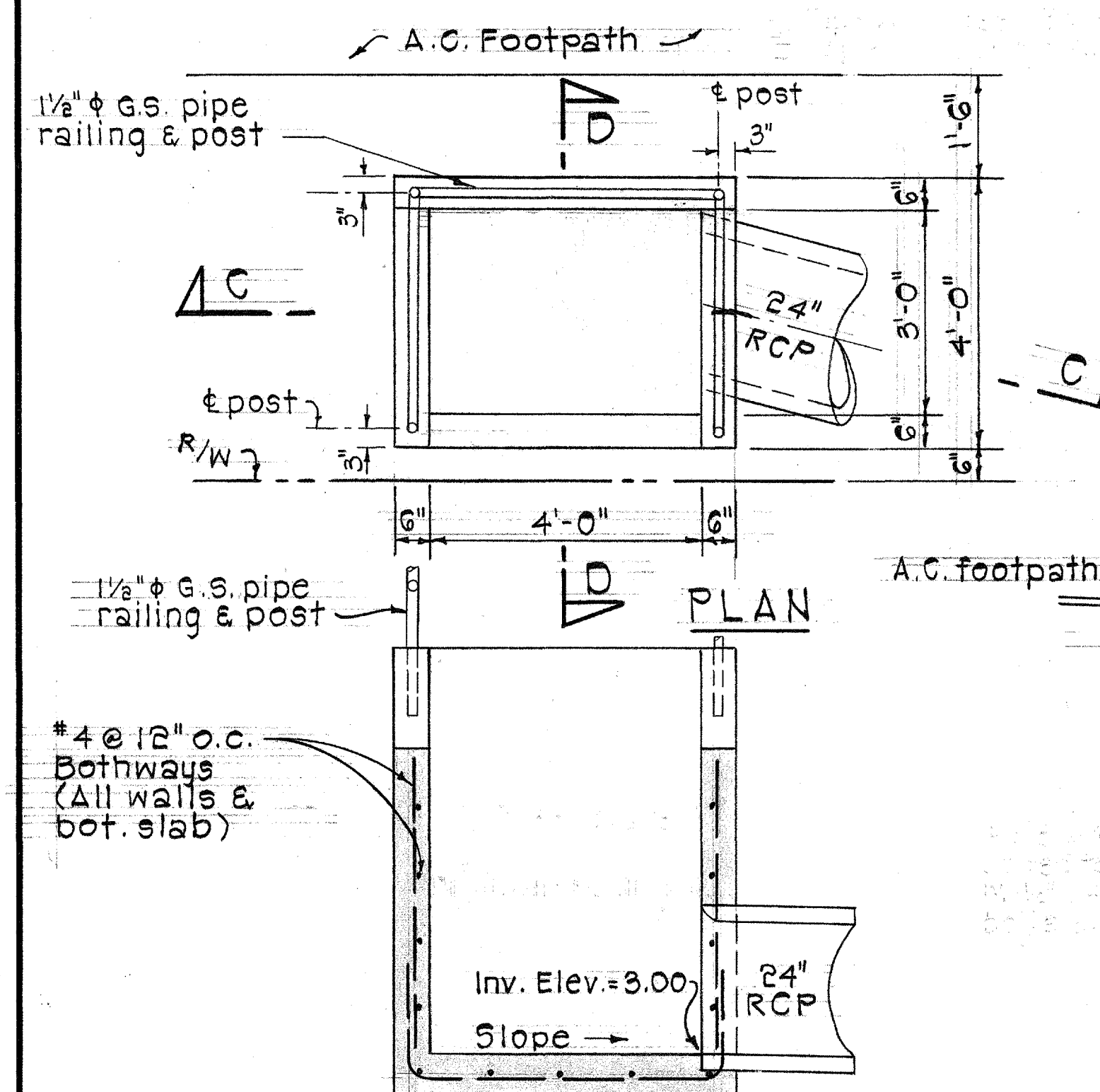
SECTION "A-A"



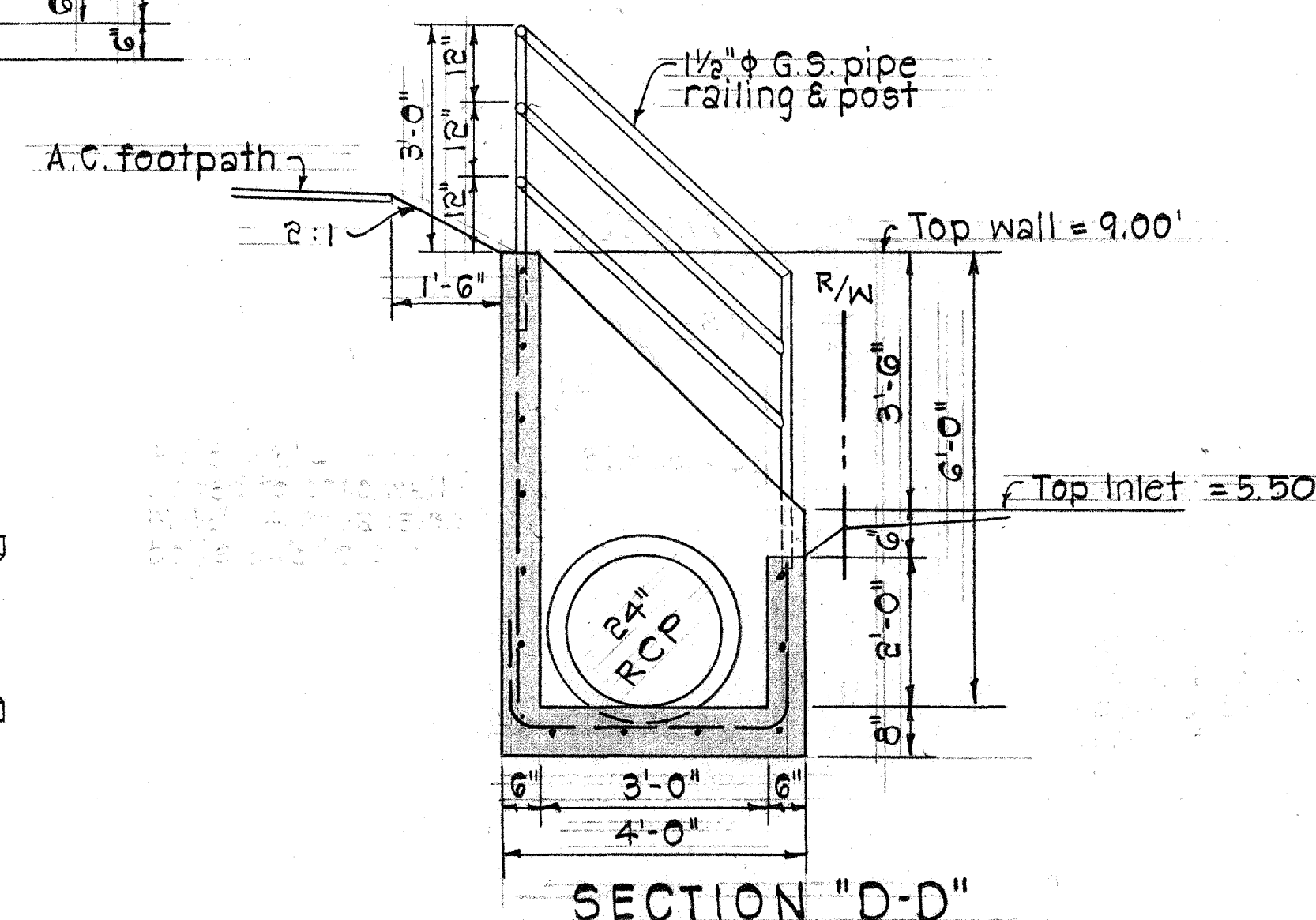
SECTION "B-B"

DETAILS OF CDI #1, #2 & #9

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



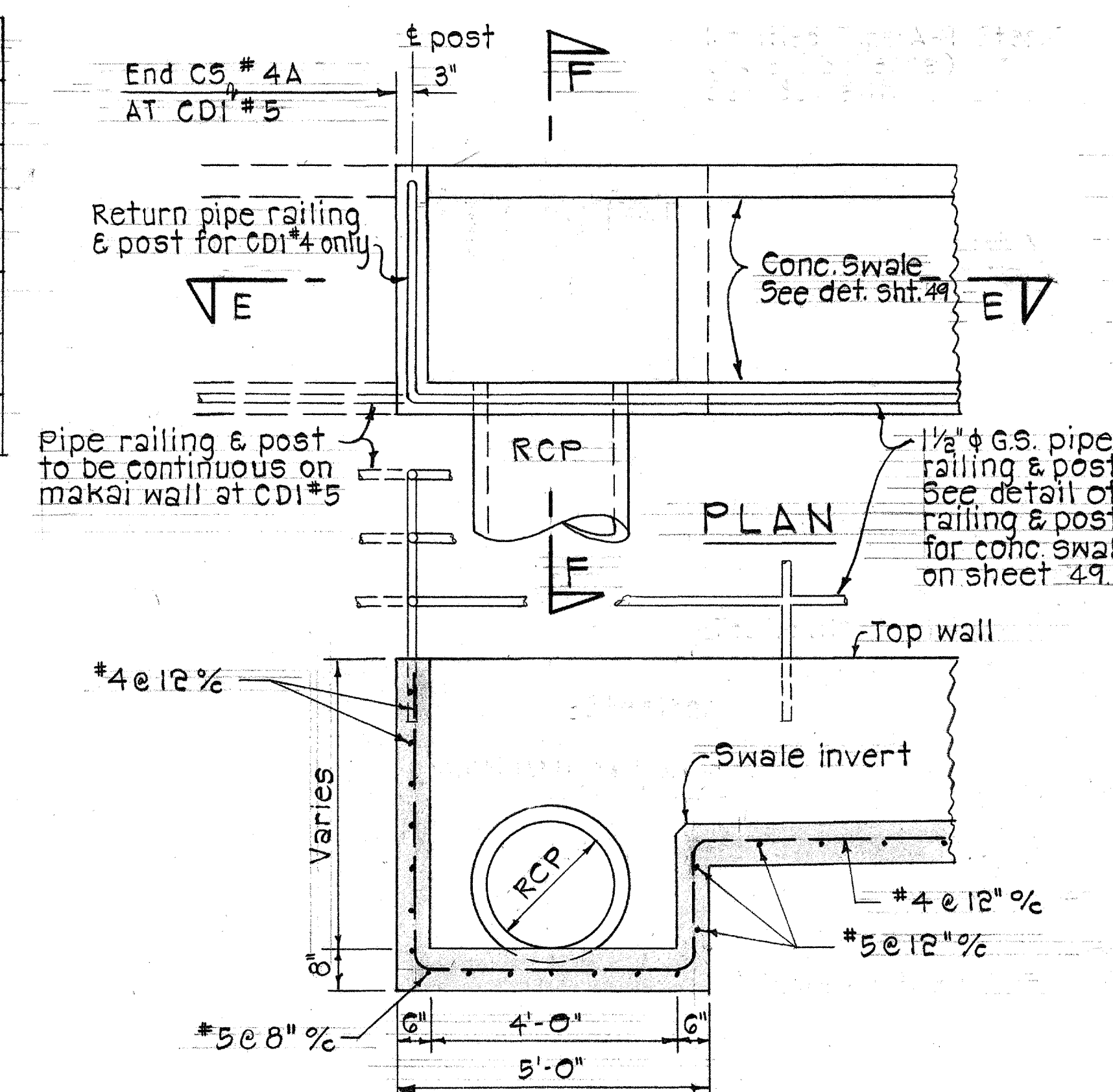
SECTION "C-C"



SECTION "D-D"

DETAILS OF CDI #3

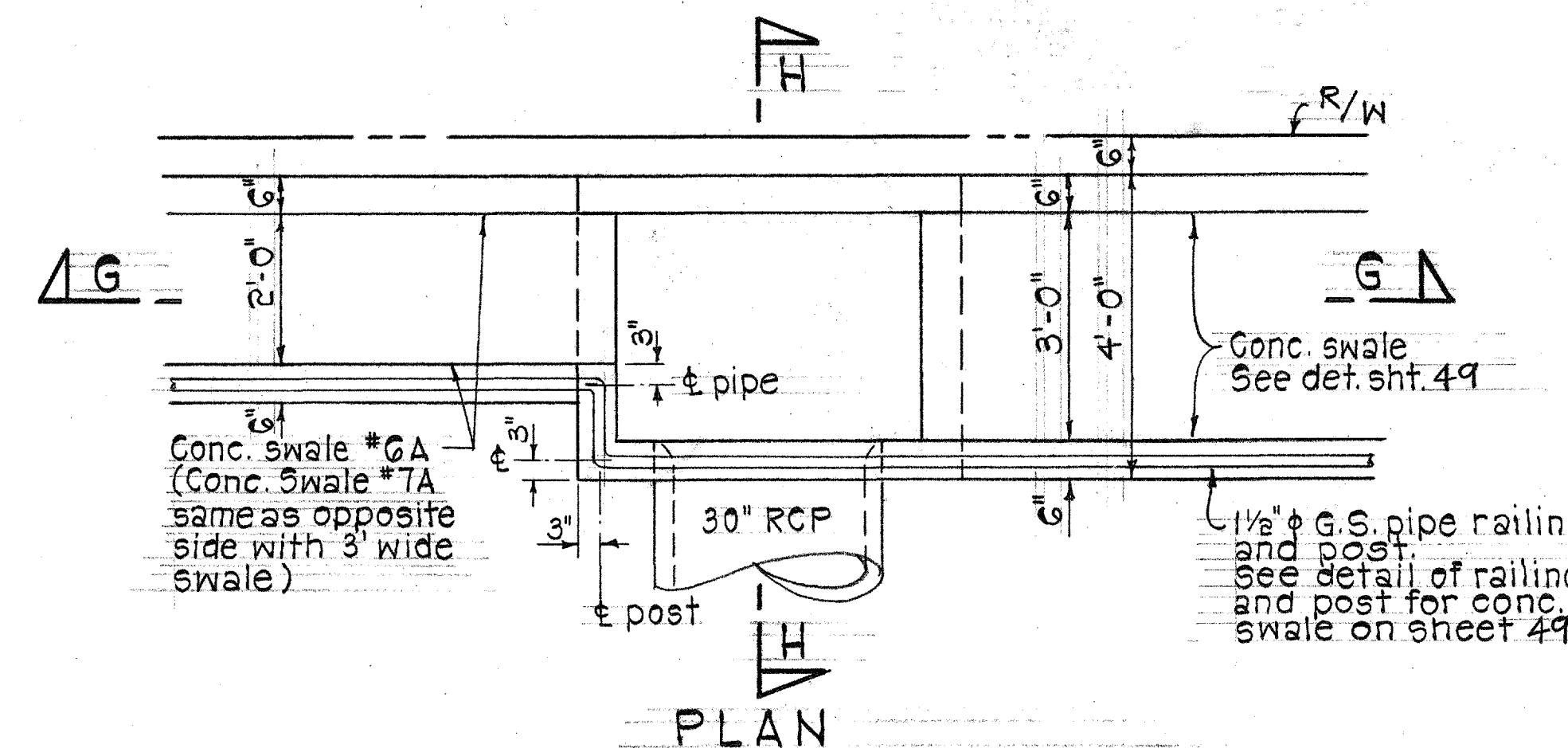
Scale: 1/2" = 1'-0"



REFLECTED SECTION "E-E"

DETAILS OF CDI #4 & #5

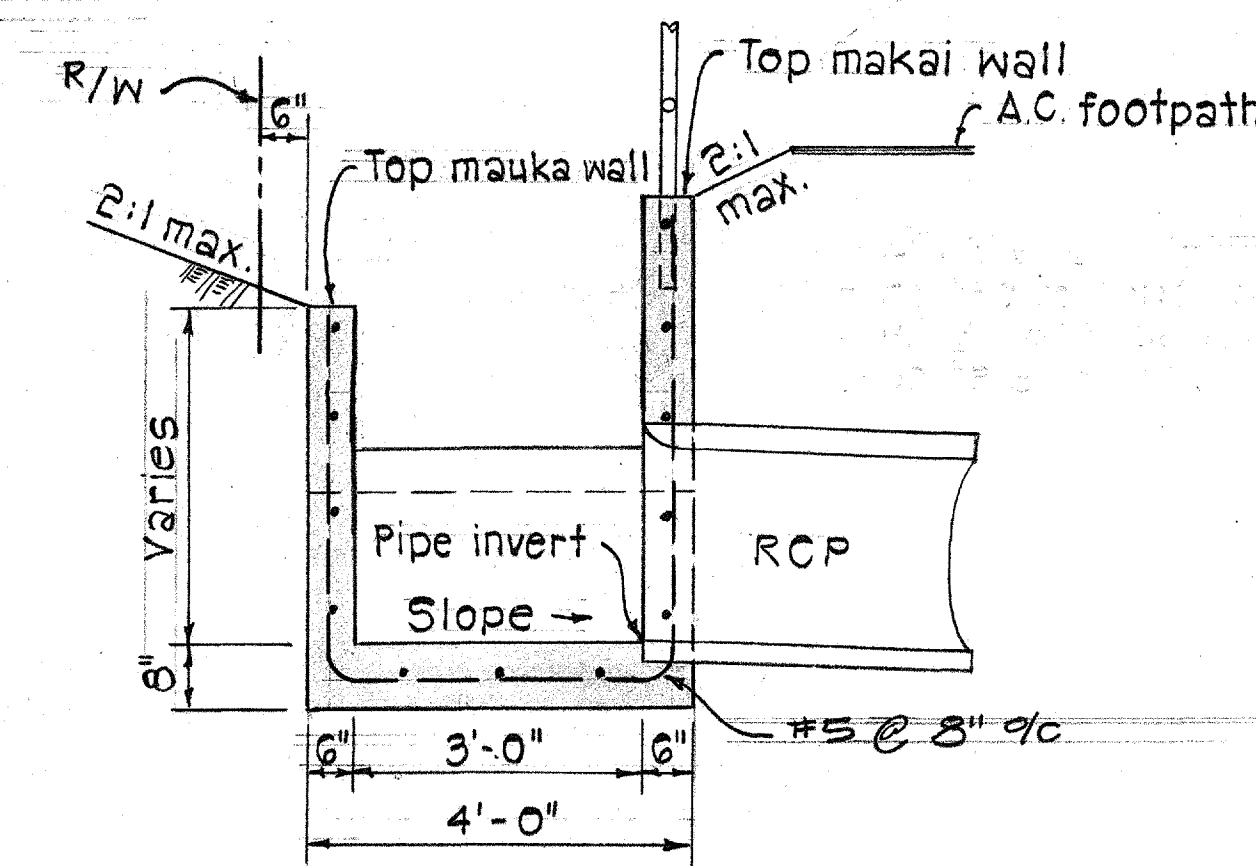
Scale: 1/2" = 1'-0"



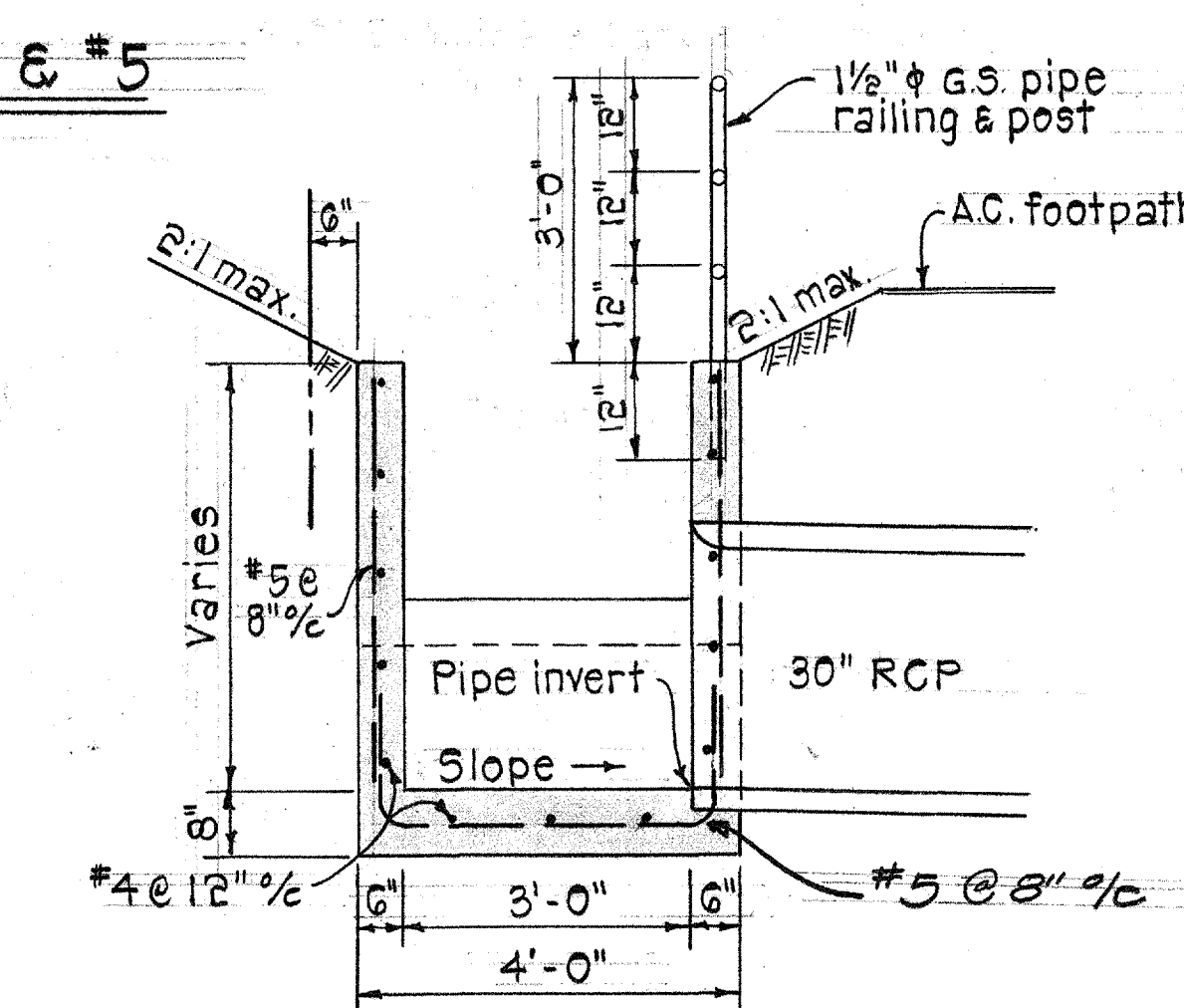
SECTION "G-G"

DETAILS OF CDI #6 & #7

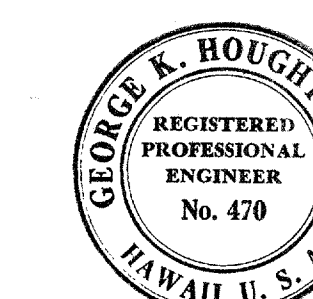
Scale: 1/2" = 1'-0"



SECTION "F-F"



SECTION "H-H"



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George K. Houghtaling
Signature

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS
CONCRETE DROP INTAKE

FARRINGTON HIGHWAY WIDENING
PROJECT 900 B-02-68

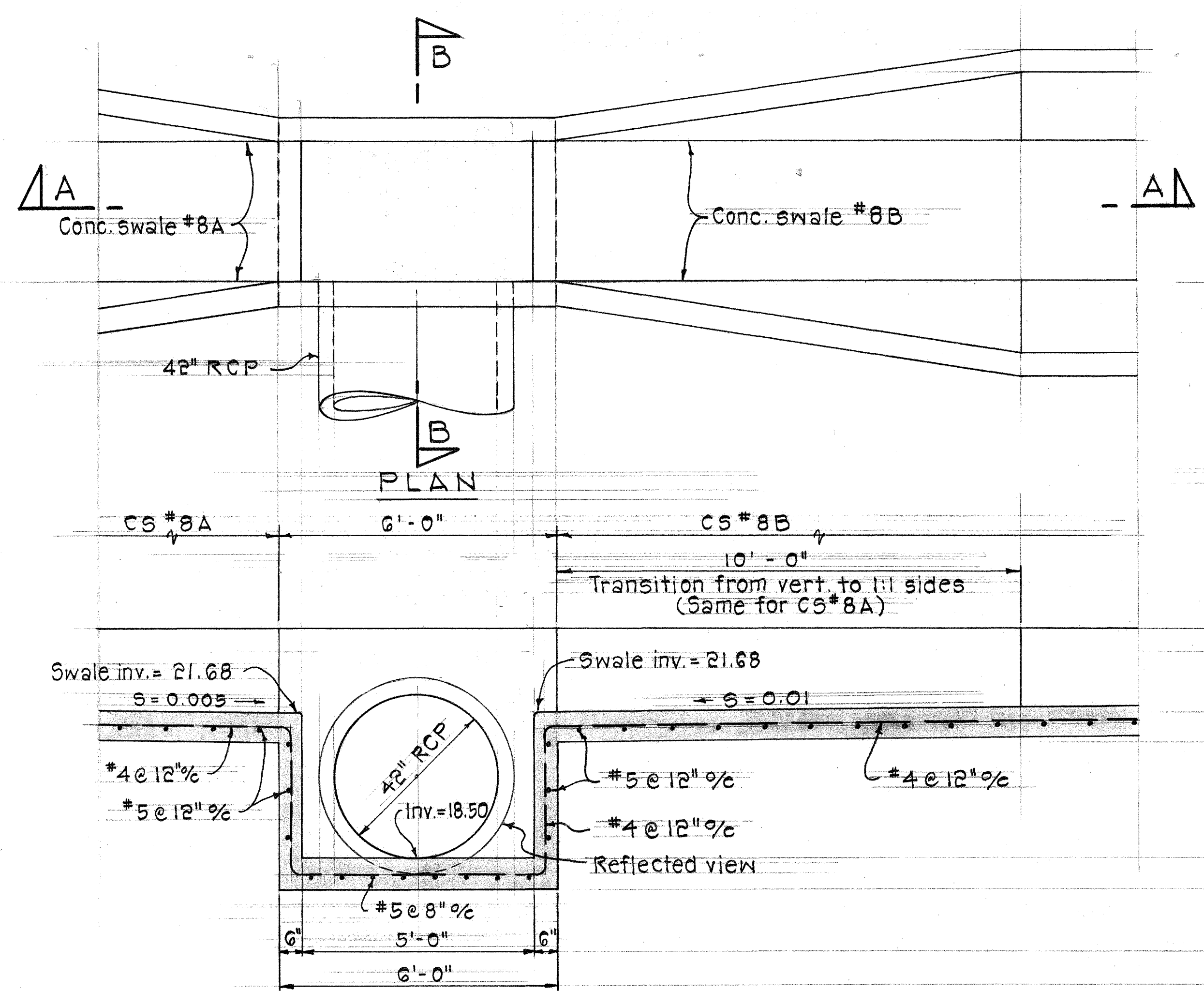
UNIT 2

SCALE: AS NOTED

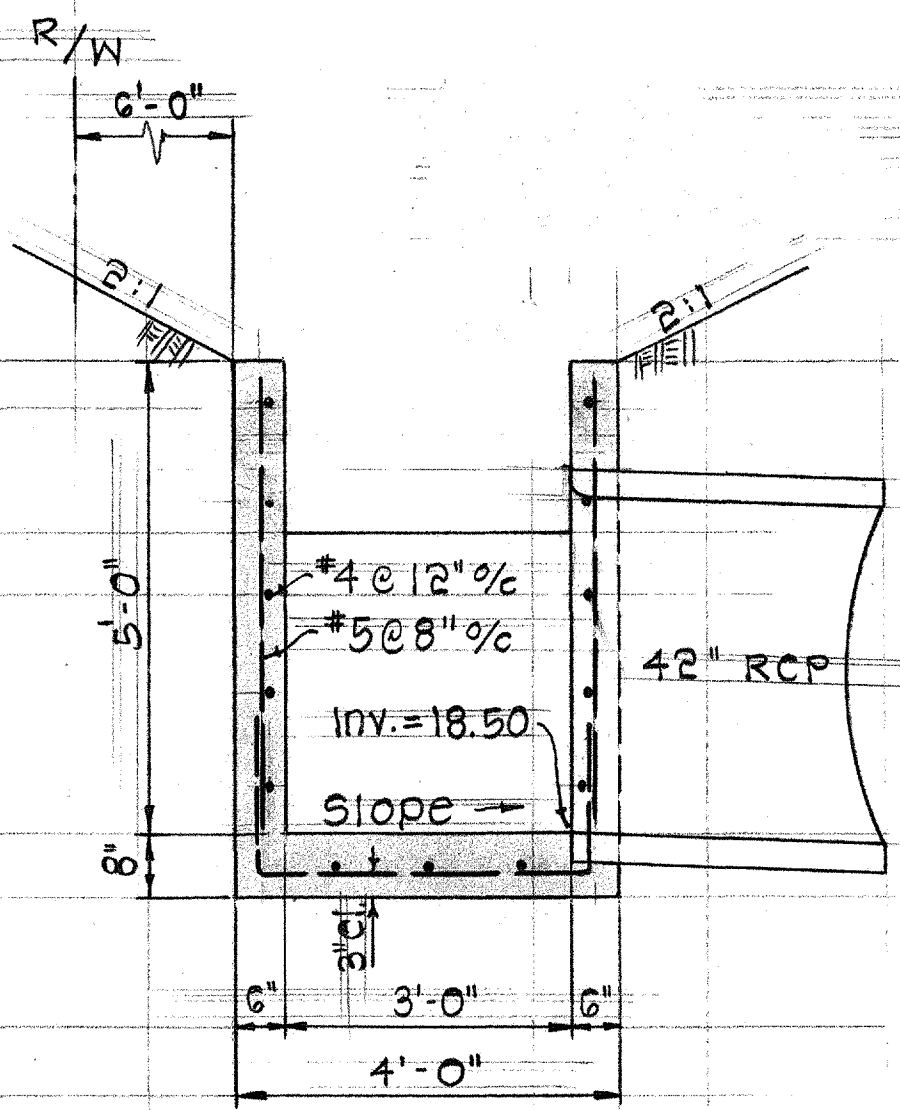
SHEET No. 2 OF 3 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.		1969	54	104

PROJECT NO. 900 B-02-G8 UNIT 2



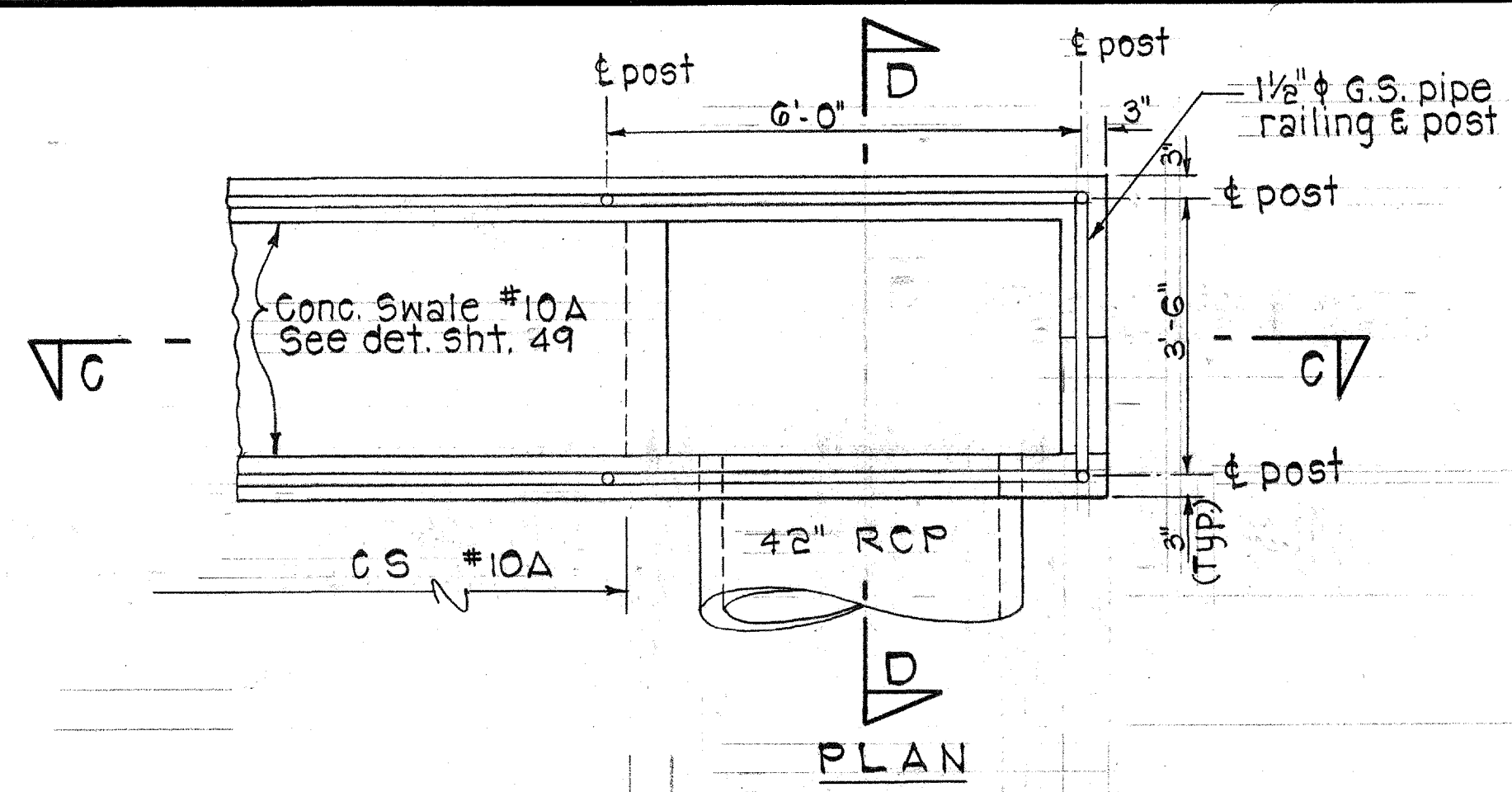
SECTION "A-A"



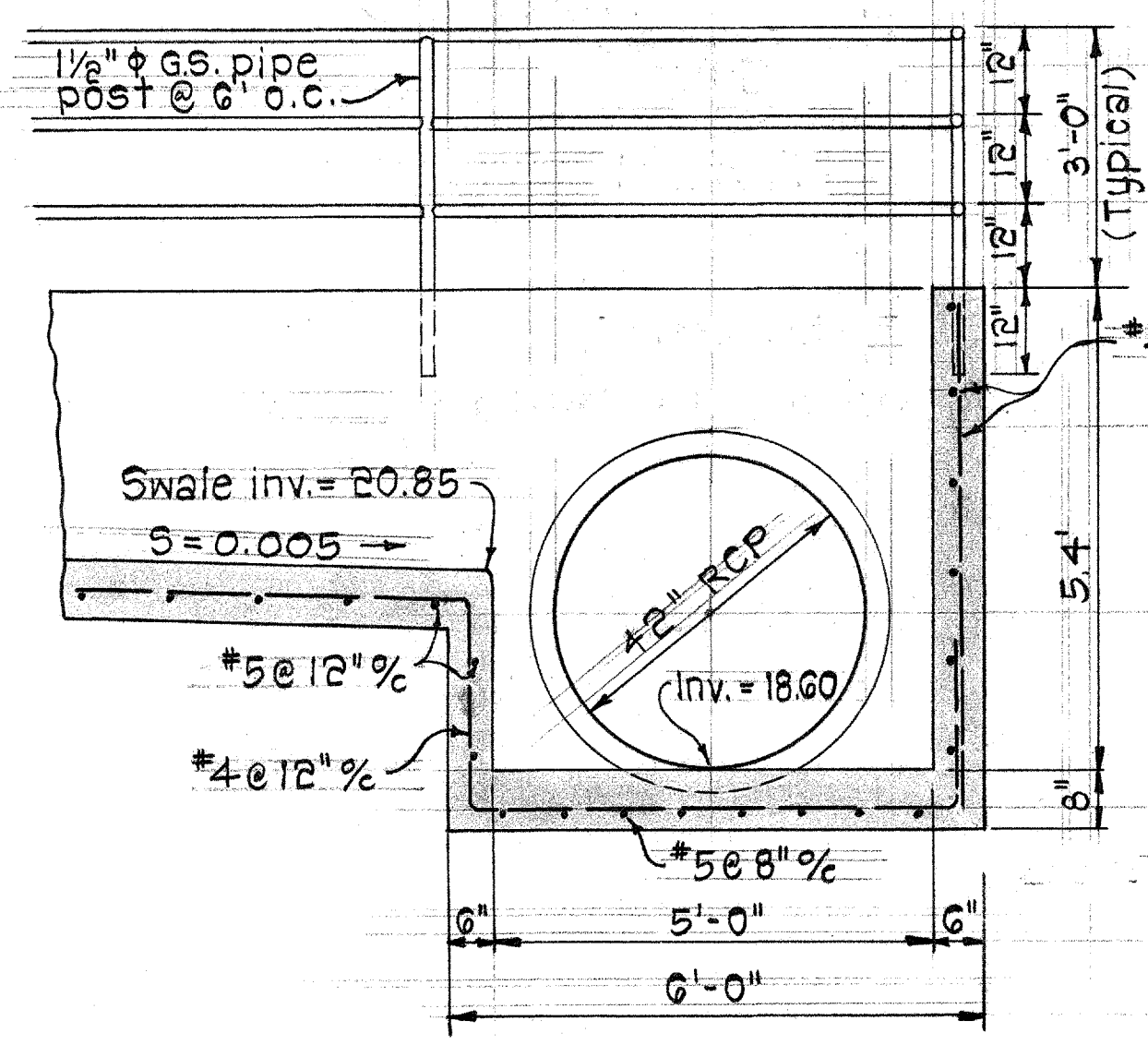
SECTION "B-B"

DETAILS OF CDI #8

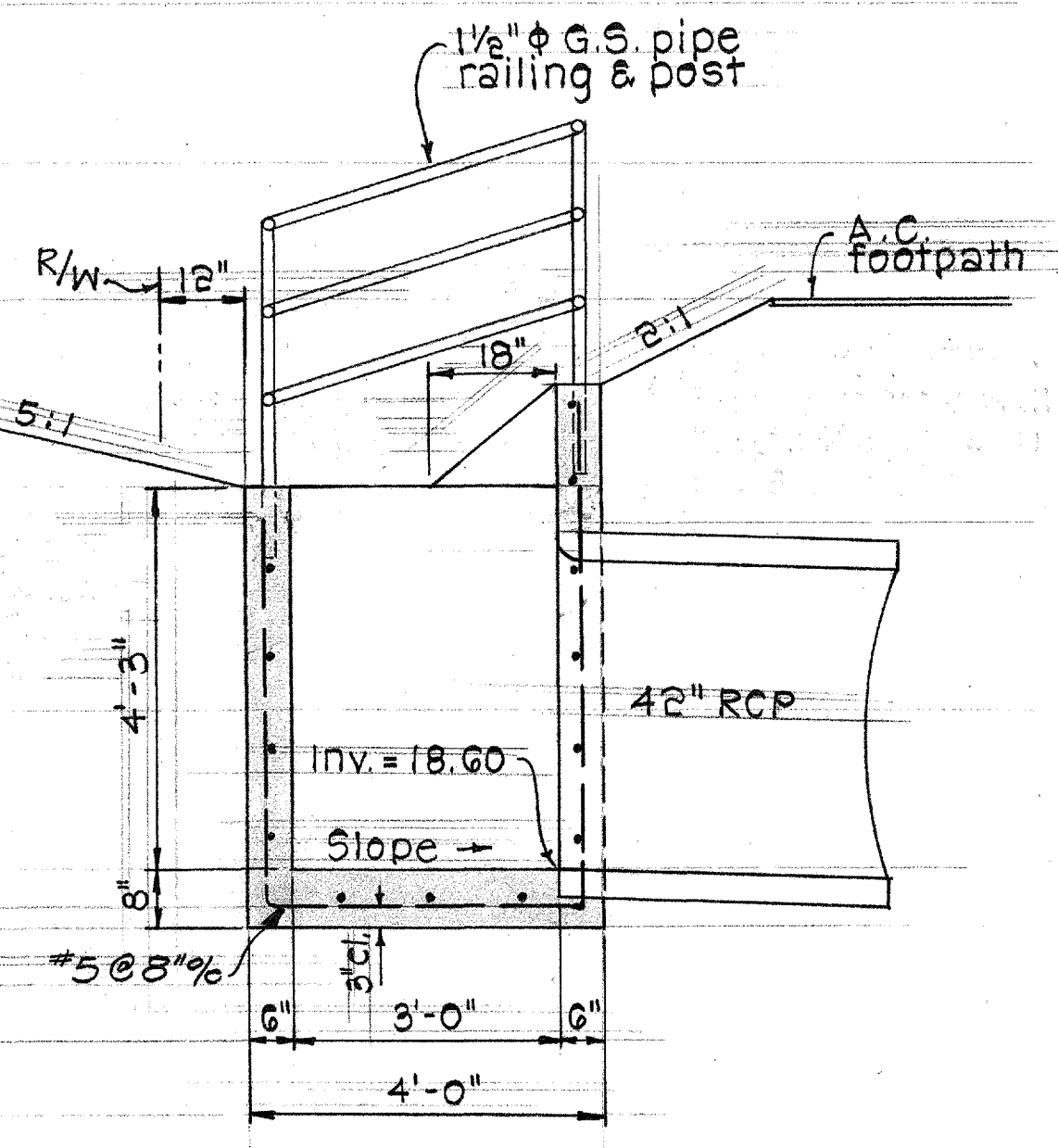
Scale: 1/2" = 1'-0"



PLAN



REFLECTED SECTION "C-C"



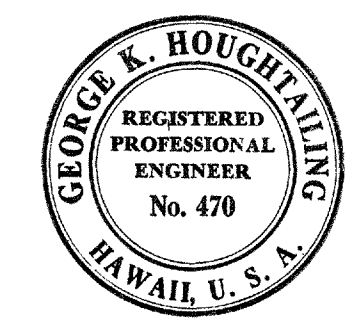
SECTION "D-D"

DETAILS OF CDI #10

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

CDI	#8	#10
PIPE INVERT	18.50	18.60
SWALE INVERT	21.68	20.85
MAUKA WALL	23.50	22.85
MAKAI WALL	23.50	24.00
STR. EXC. C.Y.	10.0	9.8
CL. A-T CONC. C.Y.	1.9	1.7
REINF. STEEL #	252	150

SURVEY PLOTTED BY	DATE
DRAWN BY	
DESIGNED BY	
CHECKED BY	
NOTE BOOK	
No.	



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George K. Houghtaling
 Signature

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION
 DRAINAGE DETAILS
 CONCRETE DROP INTAKE
 FARRINGTON HIGHWAY WIDENING
 PROJECT 900 B-02-G8
 UNIT 2
 SCALE: AS NOTED
 SHEET No. 3 OF 3 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.		1969	C05452	104

PROJECT NO. 900 B-02-68 UNIT 2

GENERAL NOTES

- Contractor has the option of using cast malleable iron, cast steel, welded, bolted, cast malleable iron end block or cast steel end block grate.
- Grates and Frames shall be hot dip galvanized after fabrication, see specifications.
- All welds $\frac{3}{8}$ " unless otherwise noted.
- Center support assembly shall be used when two or more grates are specified. Incidental to Types A-9 or A-12 Frame and Grates.
- Refer to "Grate Bar Spacing Table" for Types A-9 and A-12 Grate dimensions.
- The various materials shall conform to the specifications of ASTM as listed in the following tabulation and the Std. Specifications.

Material	ASTM Designation
Structural Steel.....	A283, Grade D
Cast Steel.....	A27, Grade 65-35
Malleable Iron Casting....	A47, Gr. No. 35018

GRATE BAR SPACING TABLE			
TYPE	NO. BARS	CLEAR BAR SPACING-W.	X
A-9	9	2"	1 9/16"
A-12	12	1 3/8"	1 1/4"

NOTE:

- Type A-9 - Use in locations off the roadbed on all types of highways.
- Type A-12 - Use within the roadbed on all types of highways.

APPROVAL RECOMMENDED:

P. Palacios 12-17-69
HYDRAULIC DESIGN ENGINEER DATE

APPROVED:

John J. John 12-17-69
ASSISTANT CHIEF, ENGINEERING DATE

THIS SHEET IS A SUPPLEMENT TO THE CONTRACT PLANS

NO.	REVISION	APPROVED BY	DATE

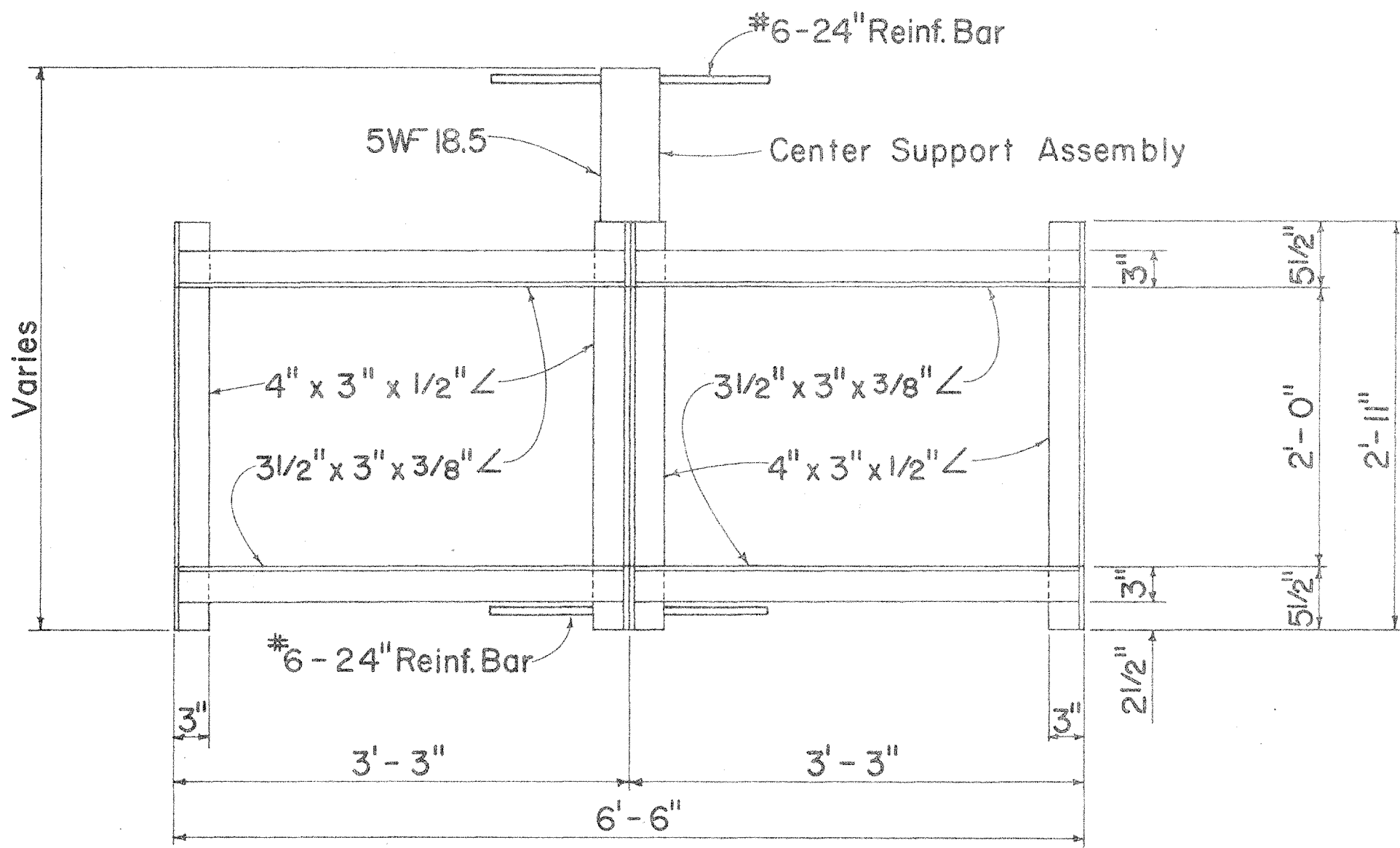
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS

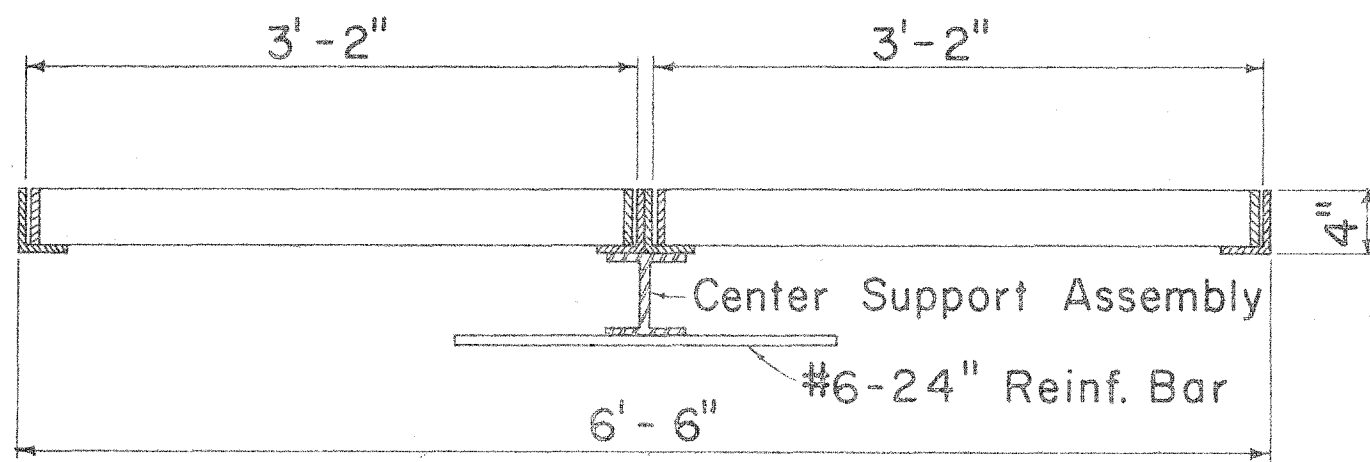
TYPE A-9 AND A-12
FRAMES AND GRATES

Scales: As Noted Date: Aug. 1968

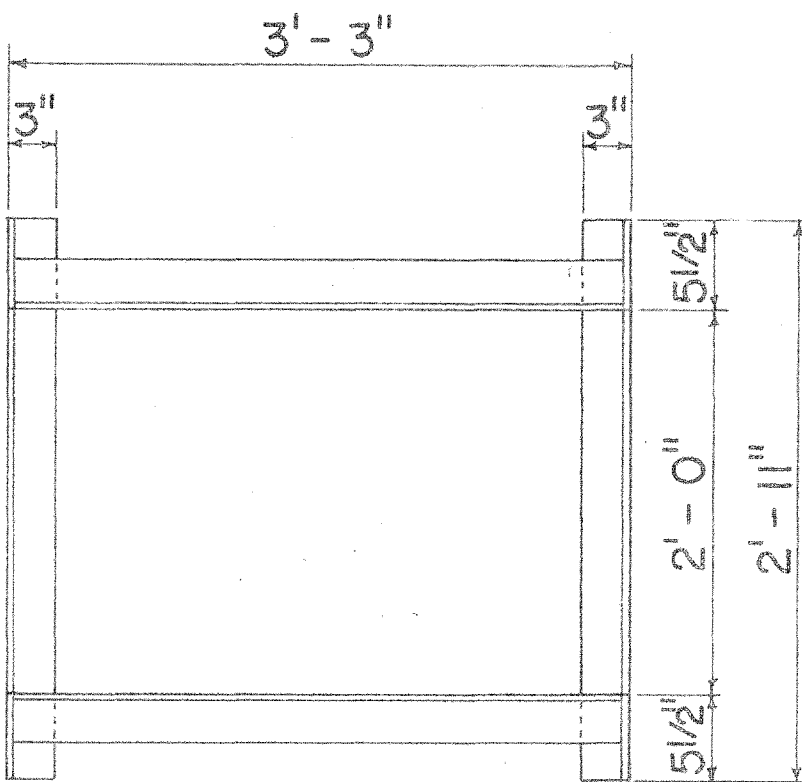
SHEET No. 1A OF 4 SHEETS DH 7



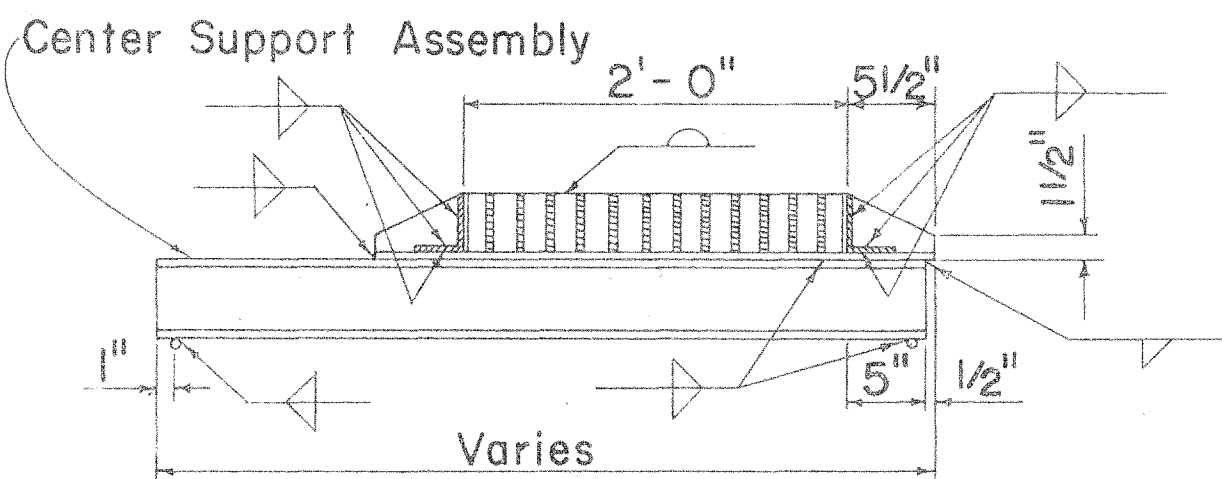
PLAN
(Two or More Grates)



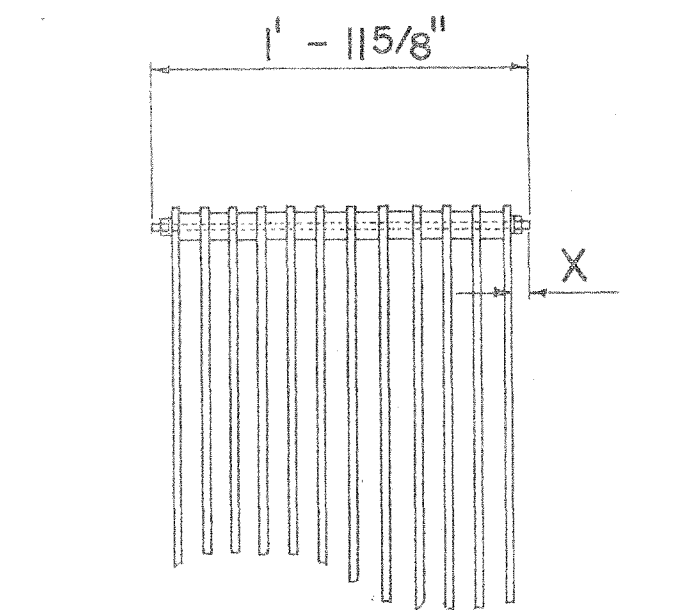
LONGITUDINAL SECTION
(Thru Frame & Grate)



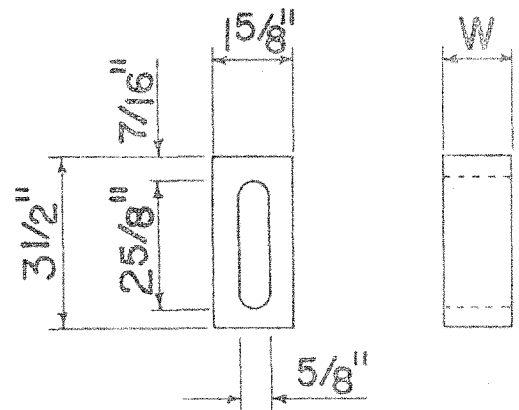
PLAN
(Single Grate)



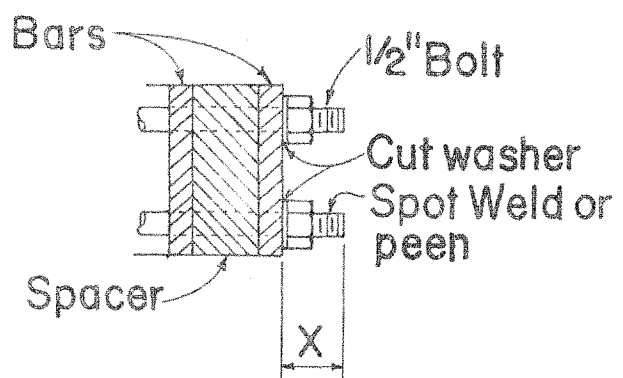
CROSS SECTION
(Thru Frame & Grate)



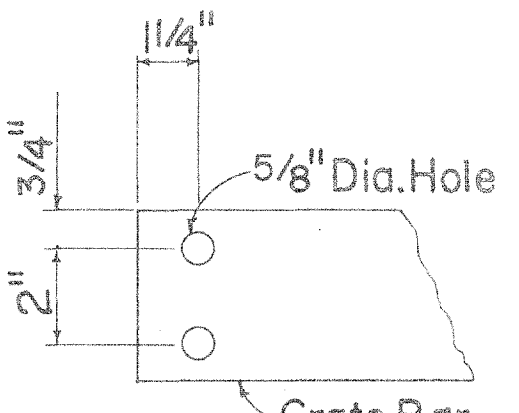
BOLTED END BLOCK
Scale: 1" = 1' - 0"



BAR SPACER
Scale: 3" = 1' - 0"

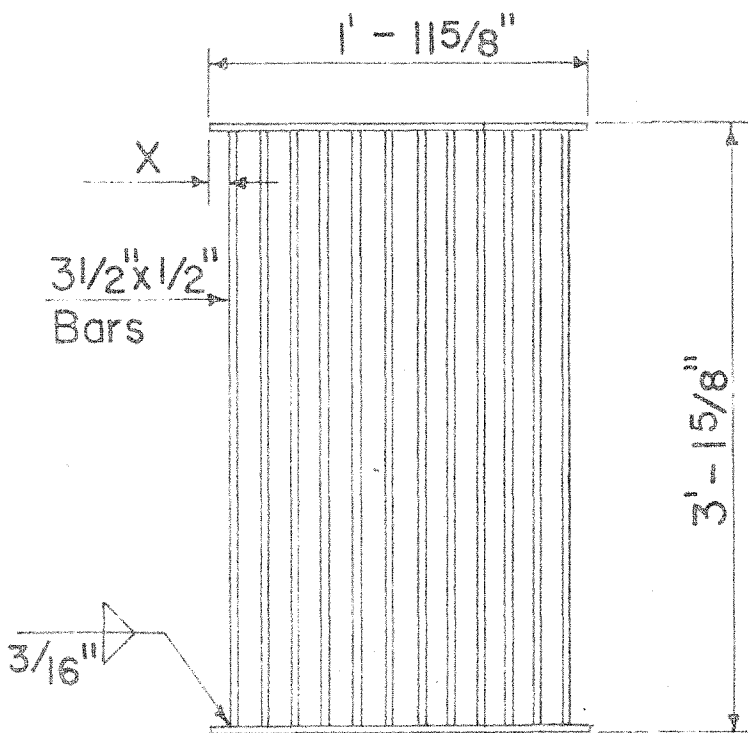


BOLTING DETAIL
Scale: 3" = 1' - 0"



END OF BAR
Scale: 3" = 1' - 0"

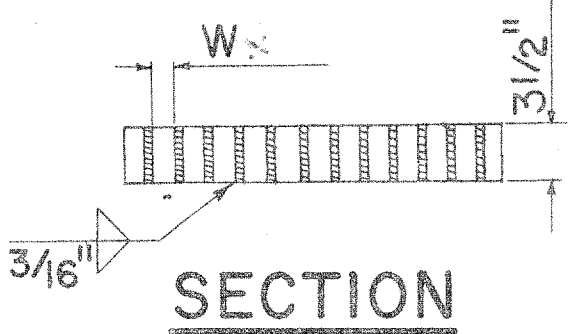
ALTERNATIVE BOLTED GRATE



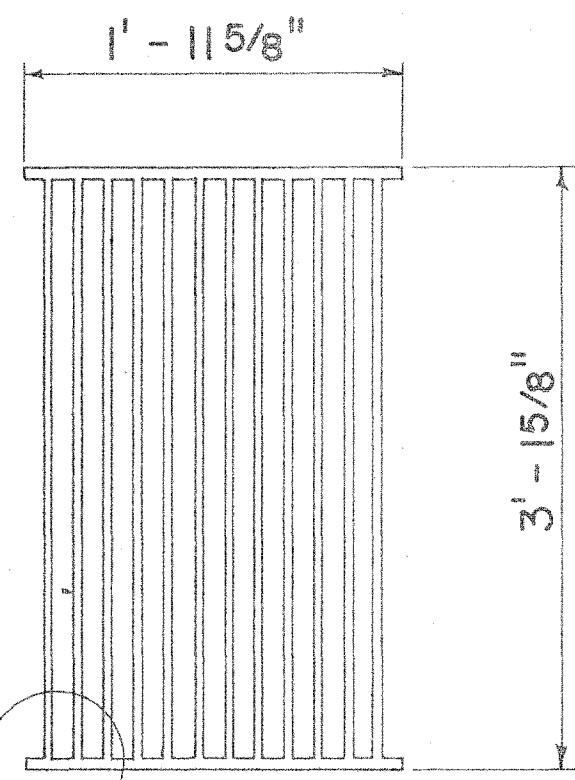
PLAN

ALTERNATIVE WELDED GRATE

Scale: 1" = 1' - 0"



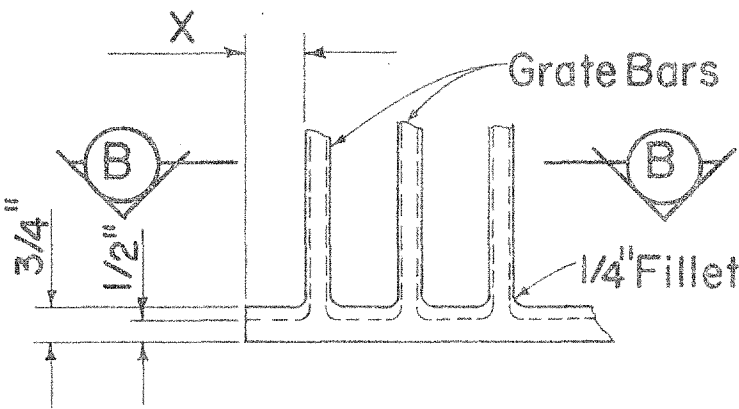
SECTION



PLAN

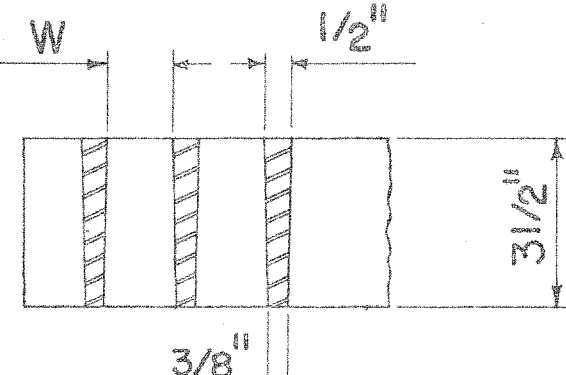
Scale: 1" = 1' - 0"

ALTERNATIVE CAST MALLEABLE IRON
OR CAST STEEL GRATE



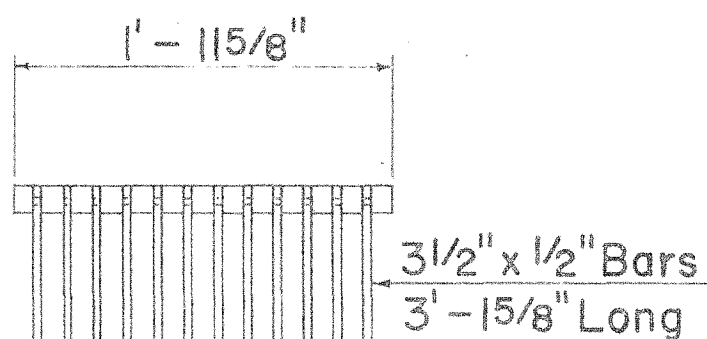
DETAIL "A"

Scale: 3" = 1' - 0"



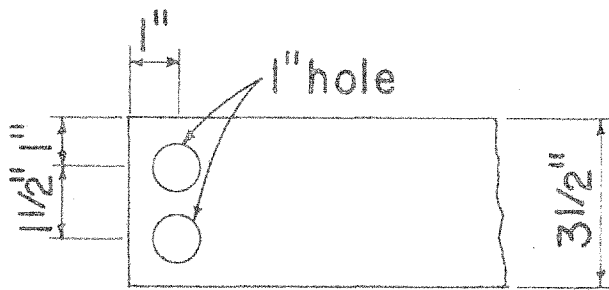
SECTION "B-B"

Scale: 3" = 1' - 0"



CAST END BLOCK

Scale: 1" = 1' - 0"

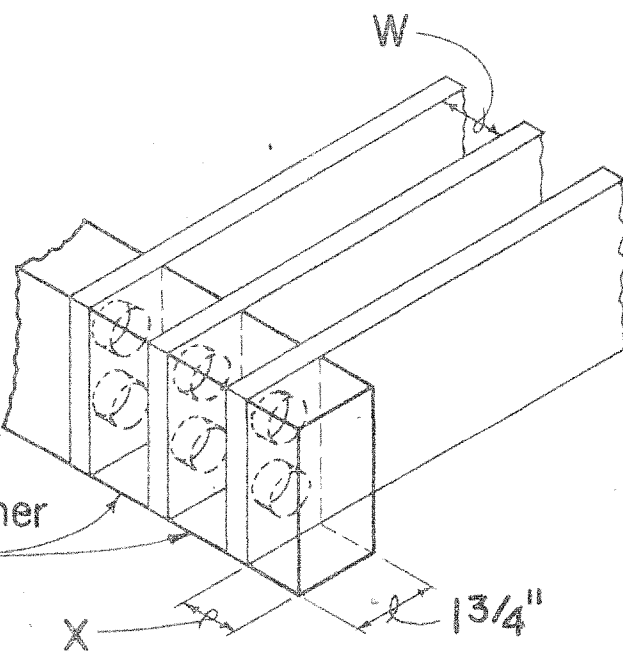


END OF BAR

Scale: 3" = 1' - 0"

ALTERNATIVE CAST MALLEABLE IRON
OR CAST STEEL END BLOCK GRATE

Both ends held together
by solid casting



SURVEY PLOTTED BY	DATE
PLAN	7/68
DESIGNED BY	7/68
TRACED BY	7/68
NOTE BOOK	7/68
QUANTITIES BY	7/68
CHECKED BY	7/68
NO.	