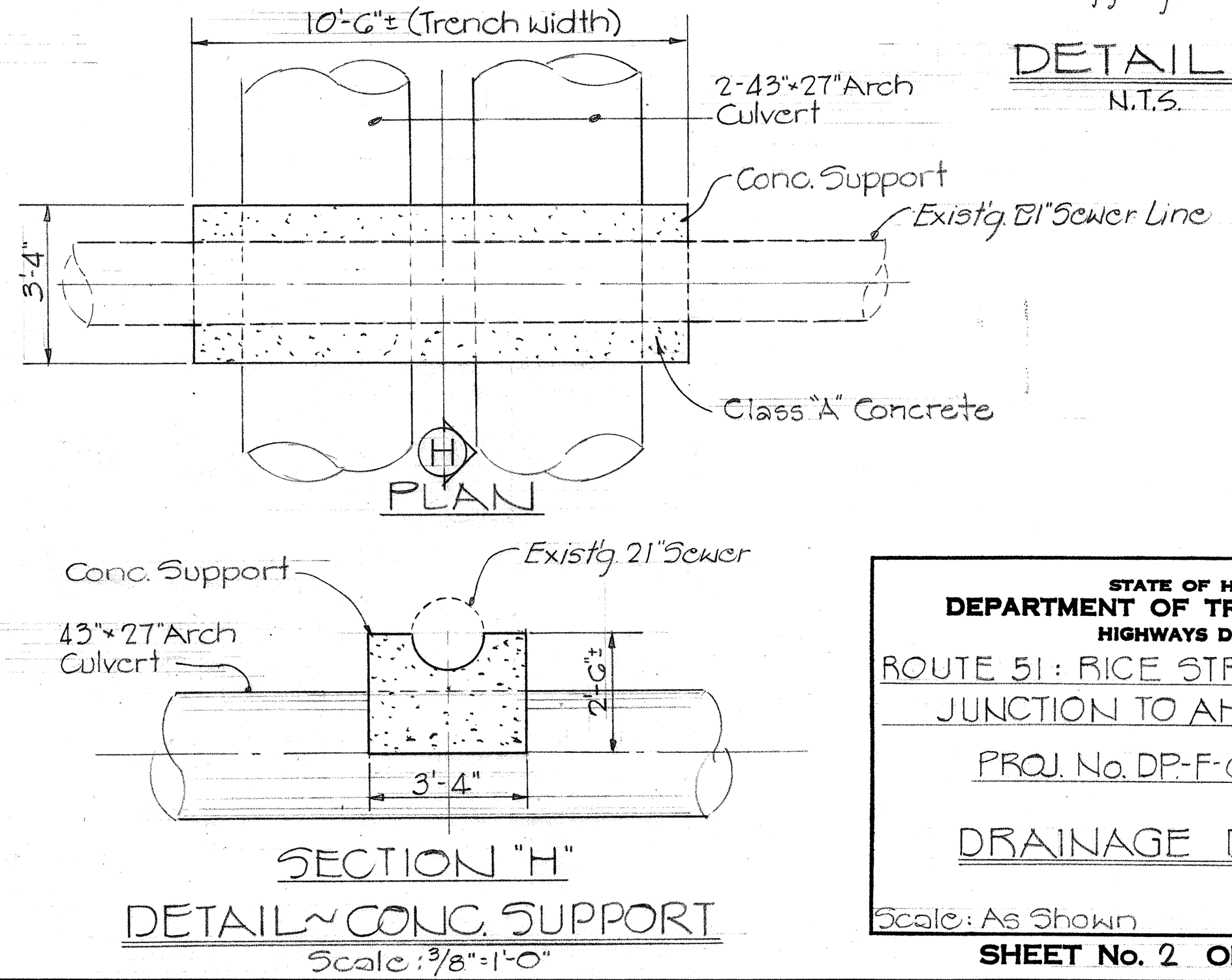
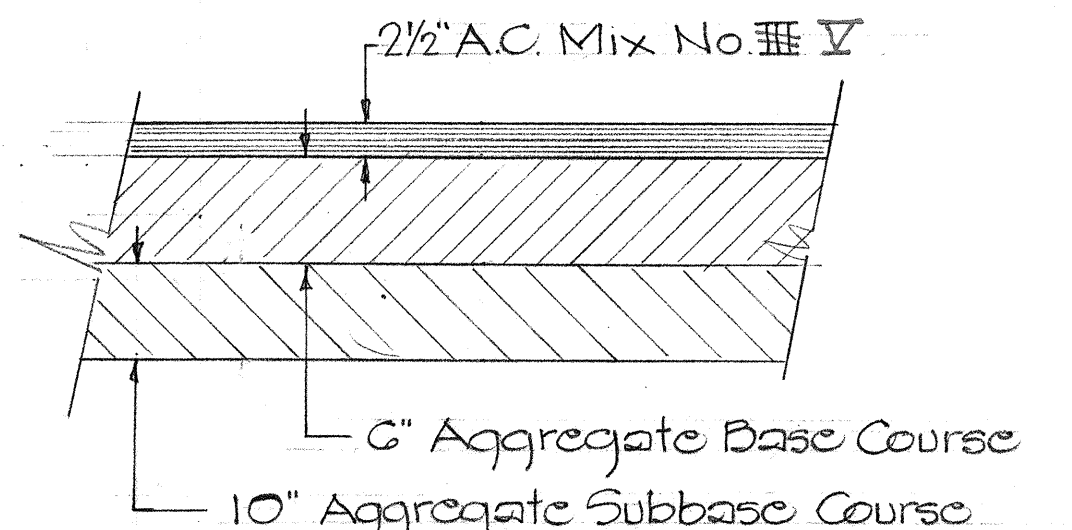
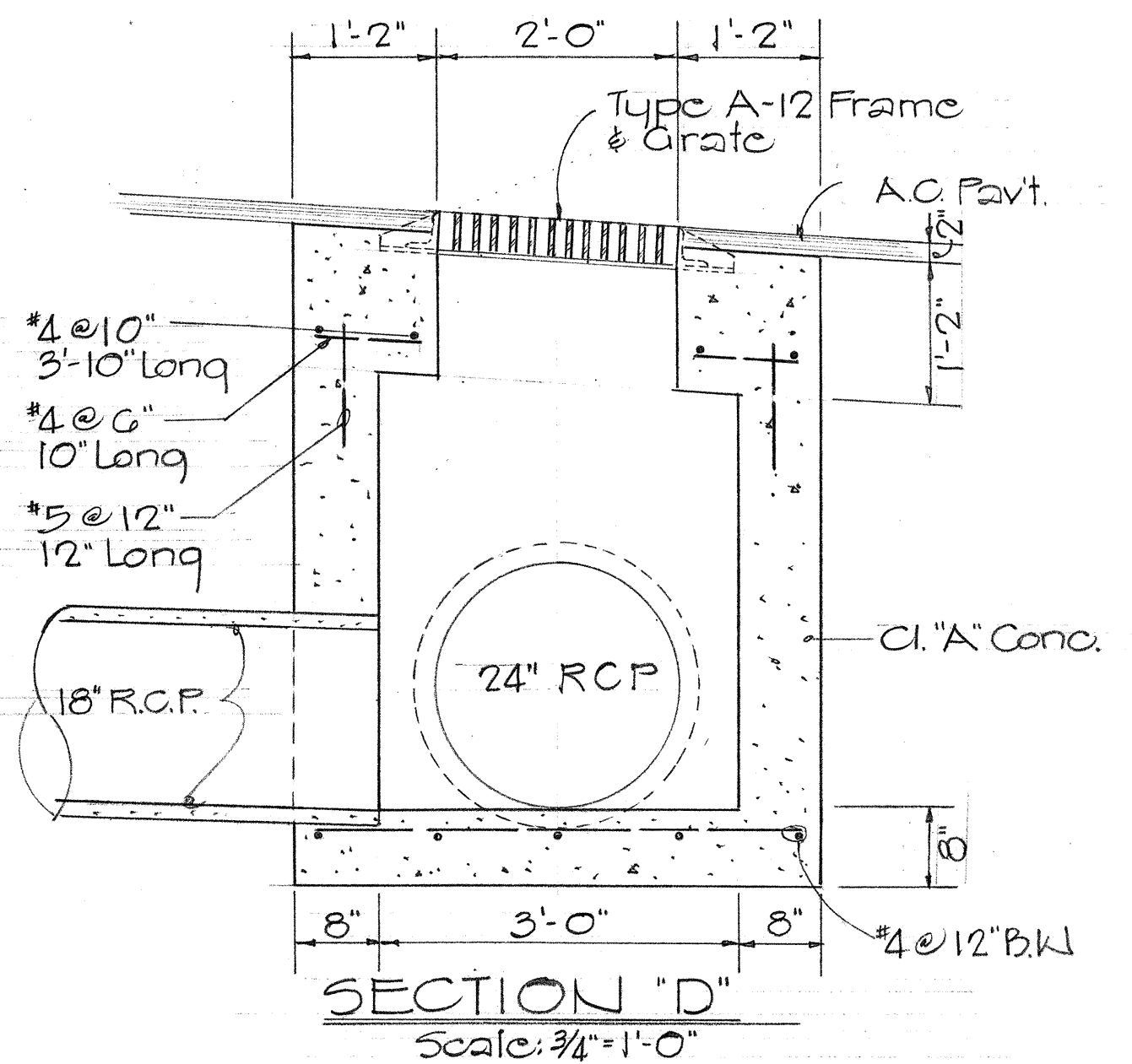
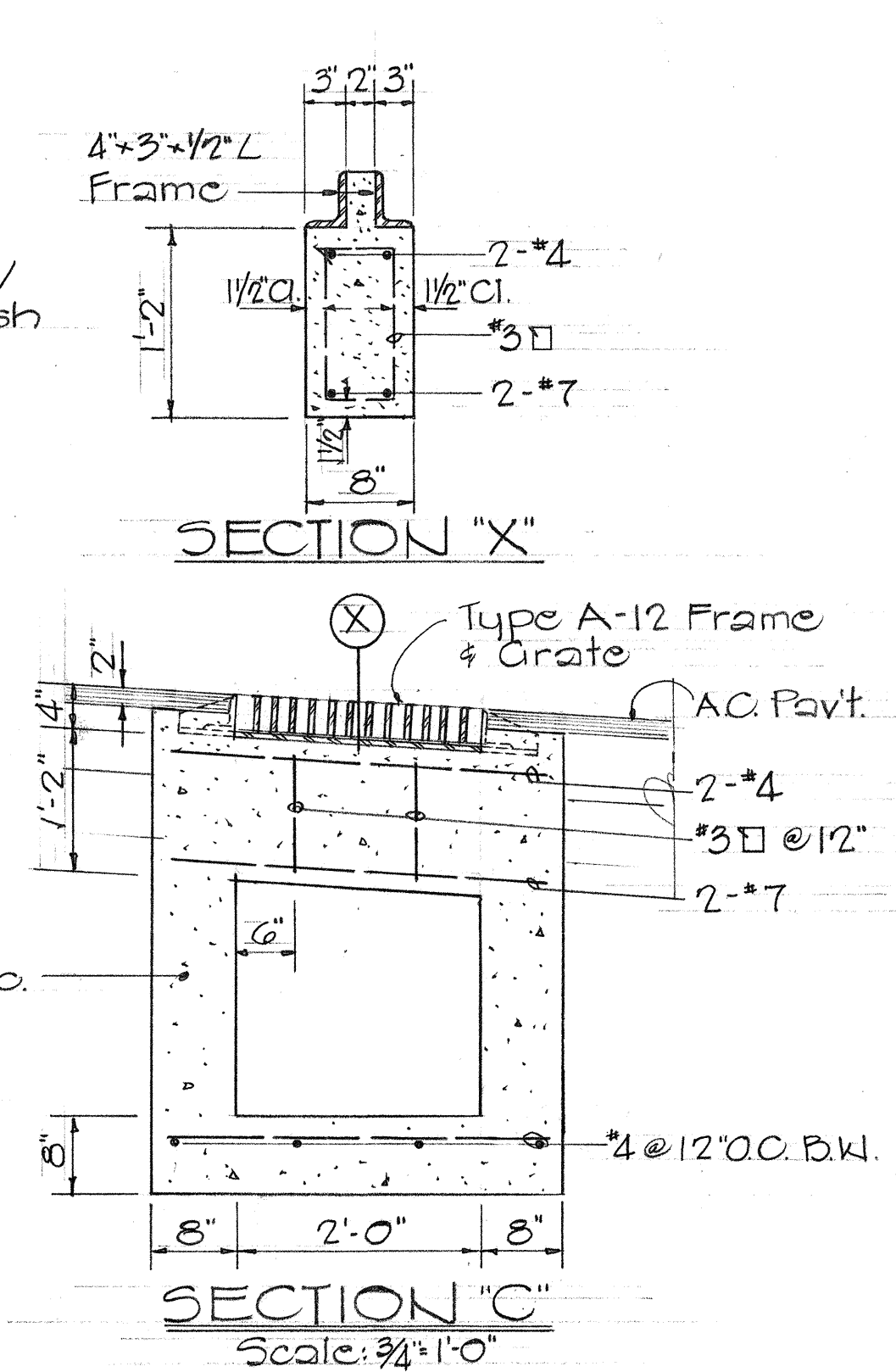
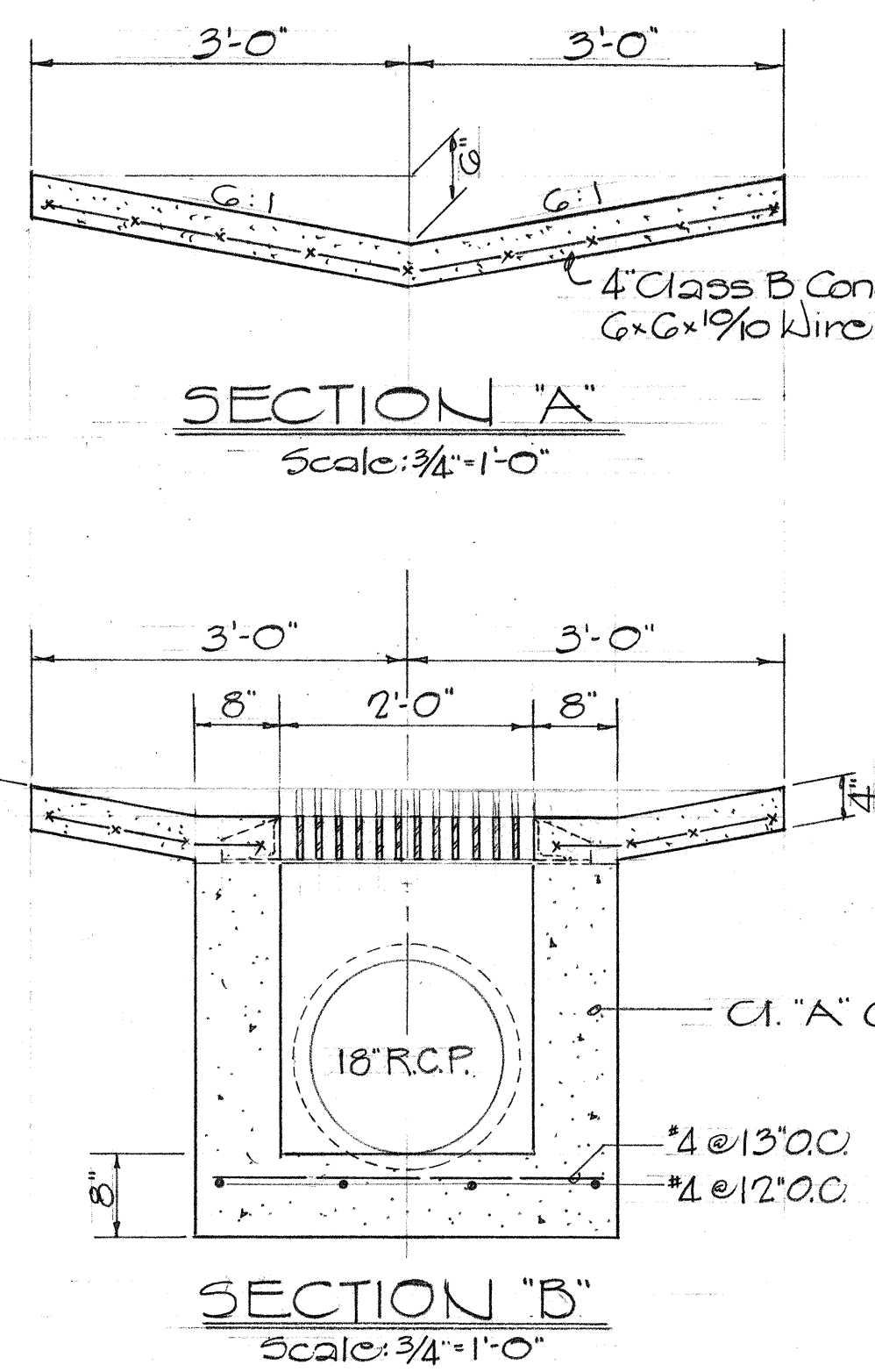
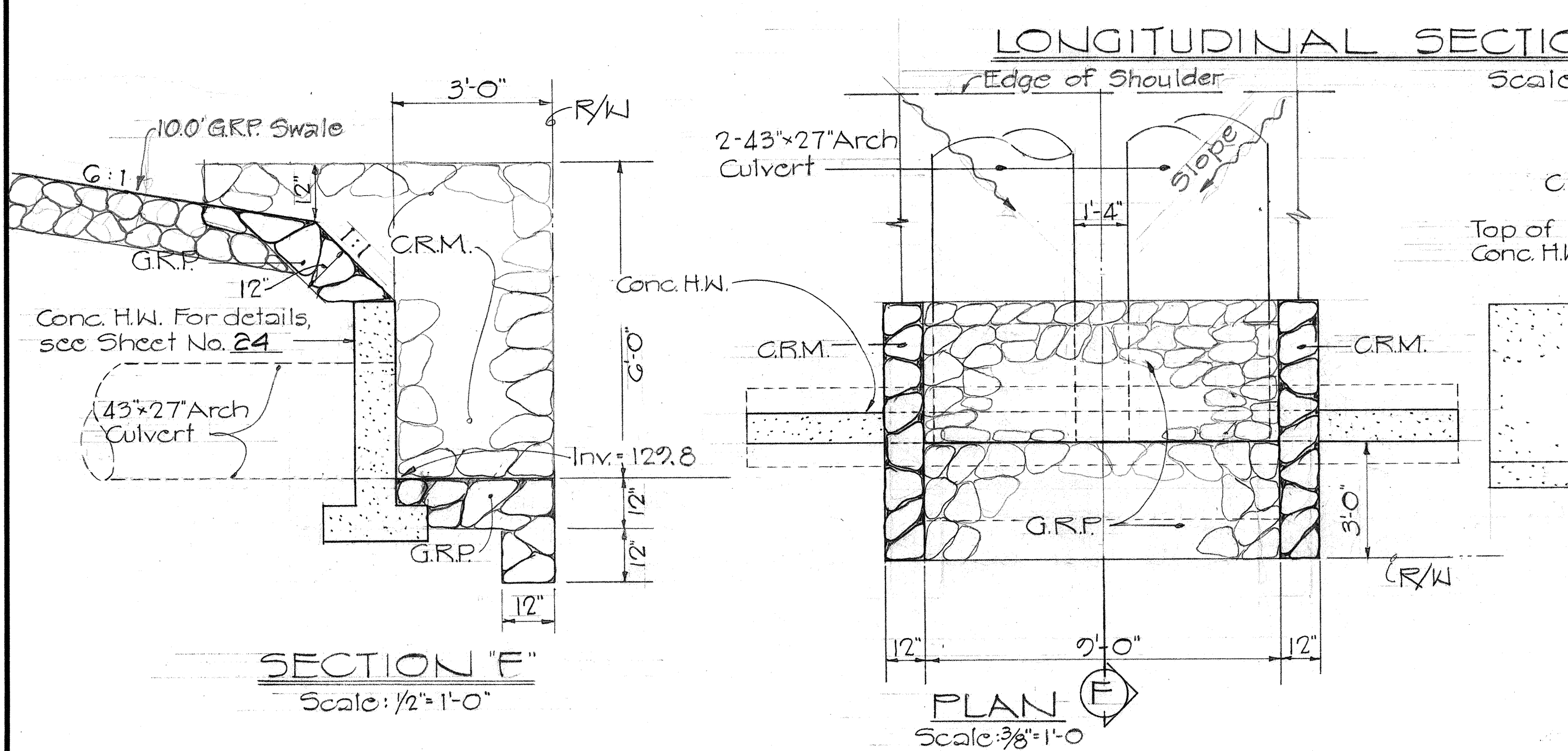
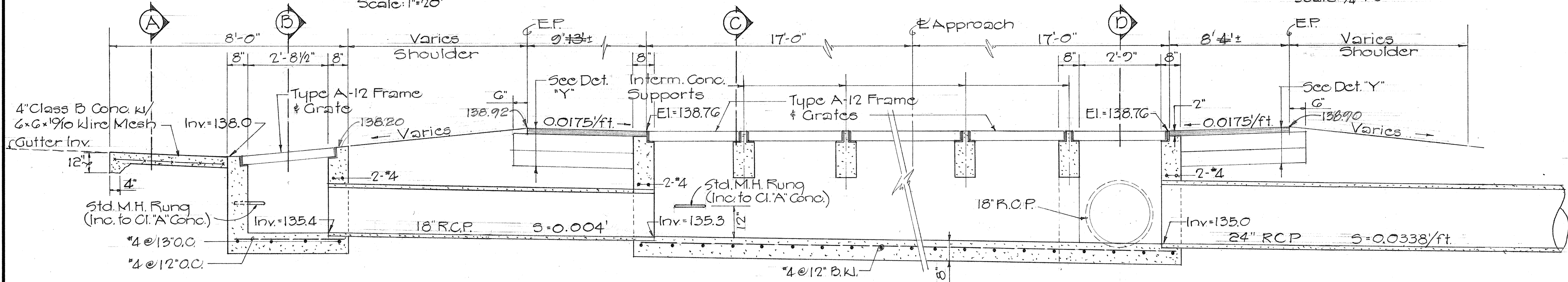
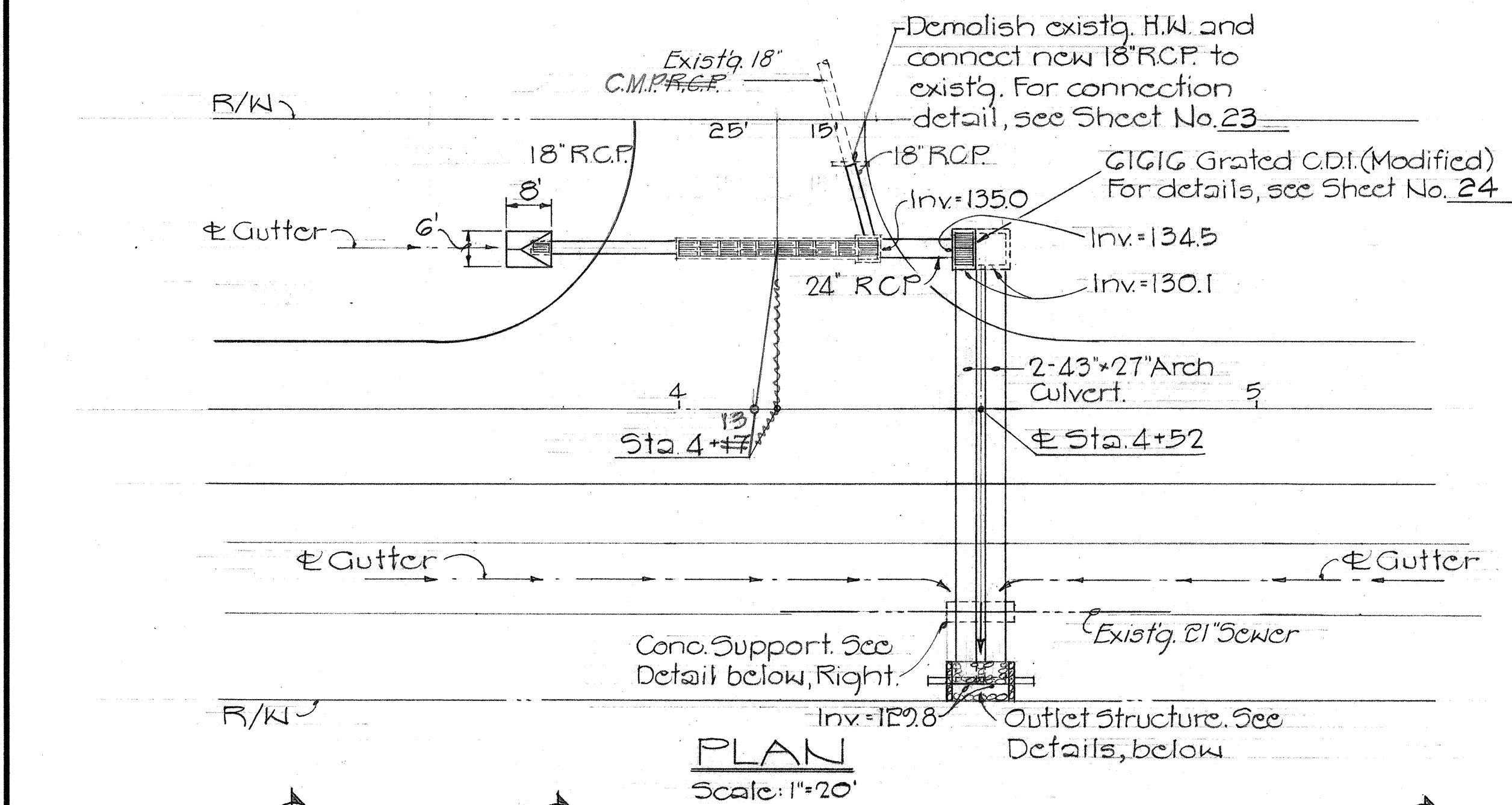


FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	DP-F-051-I(3)	1974	21	61

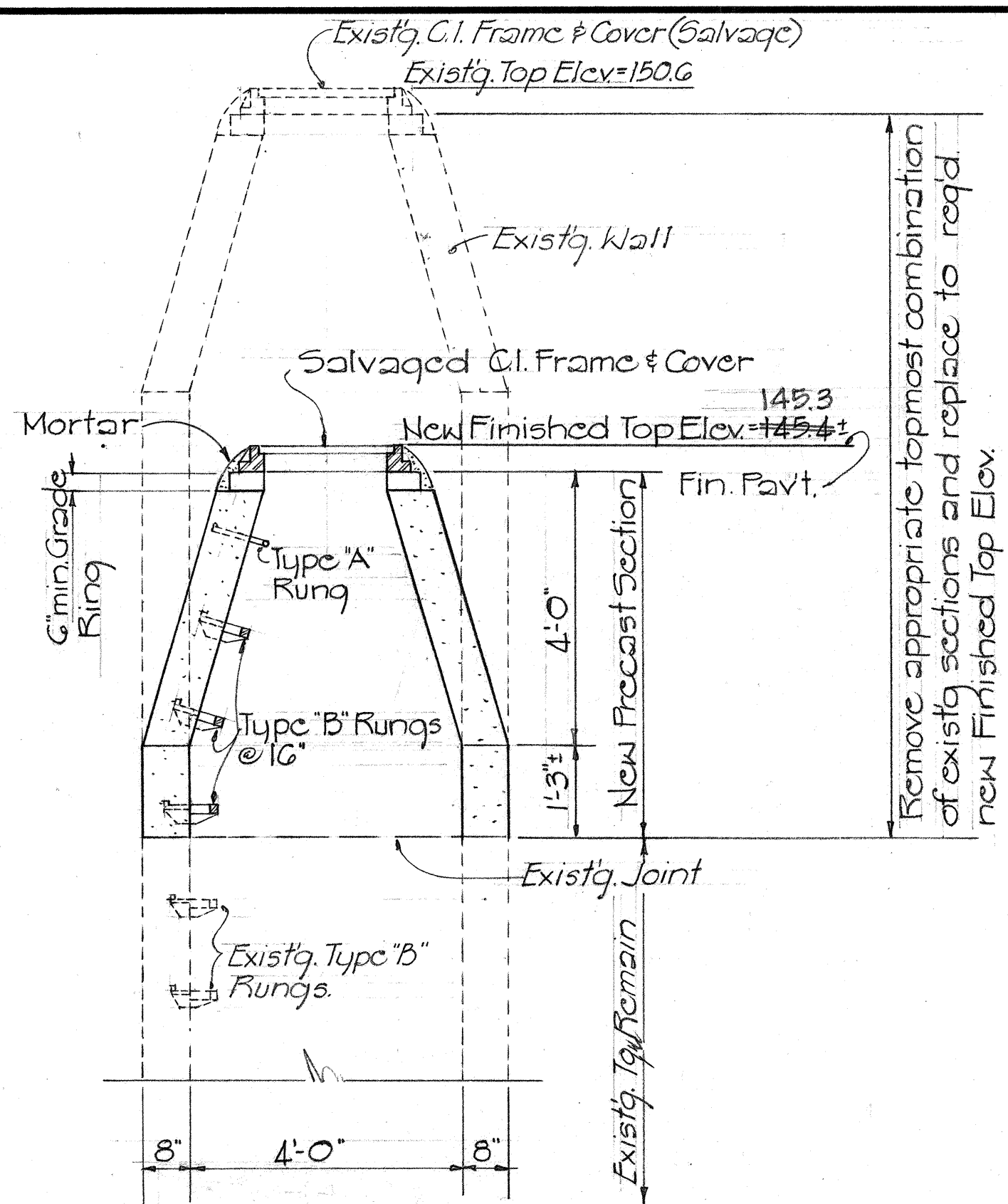
SHEET No. 1 OF 16 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	DP-F-051-1(3)	1974	22	61



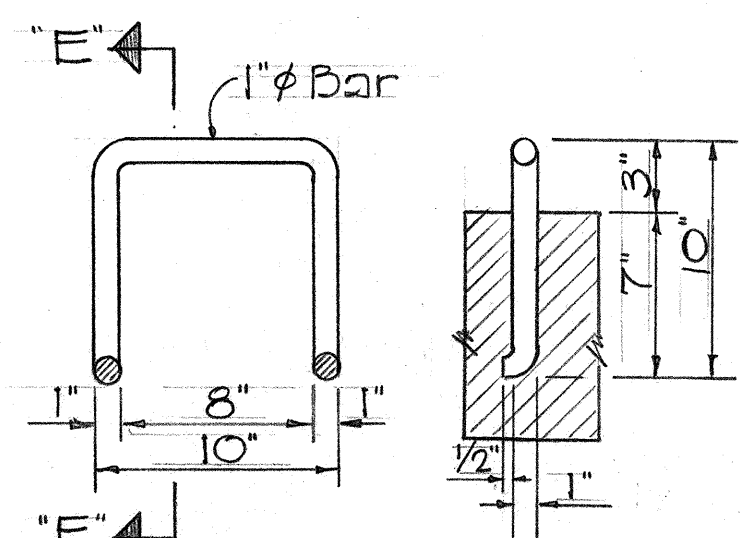
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
ROUTE 51: RICE STREET/ROUTE 51
JUNCTION TO AHUKINI ROAD
PROJ. No. DP-F-051-1(3)
DRAINAGE DETAILS
Scale: As Shown July 1973
SHEET No. 2 OF 16 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	DP-F-051-1(3)	1974	23	61



RECONSTRUCTED S.M.H. @ STA. 11+58 $\pm$ 48' LT.

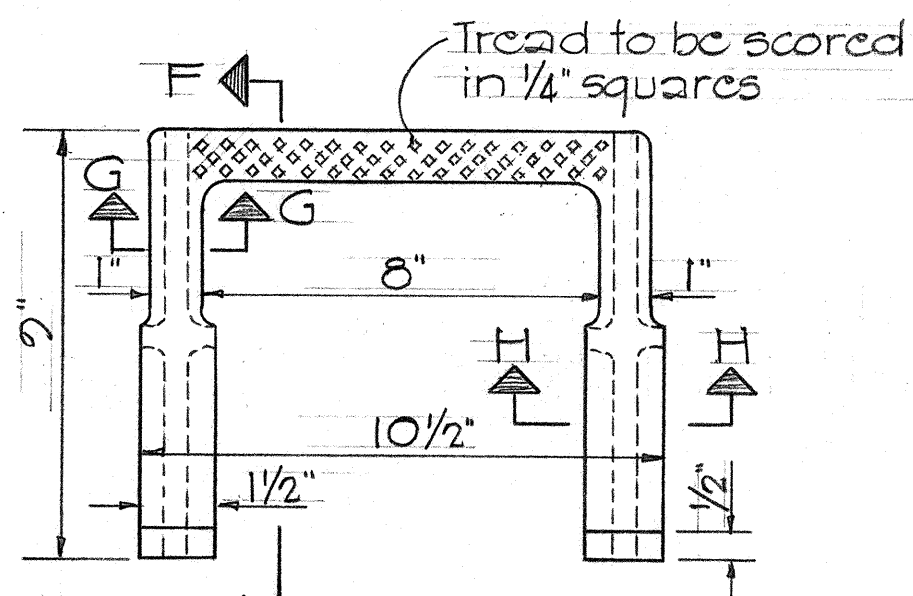
Scale: 1/2" = 1'-0"



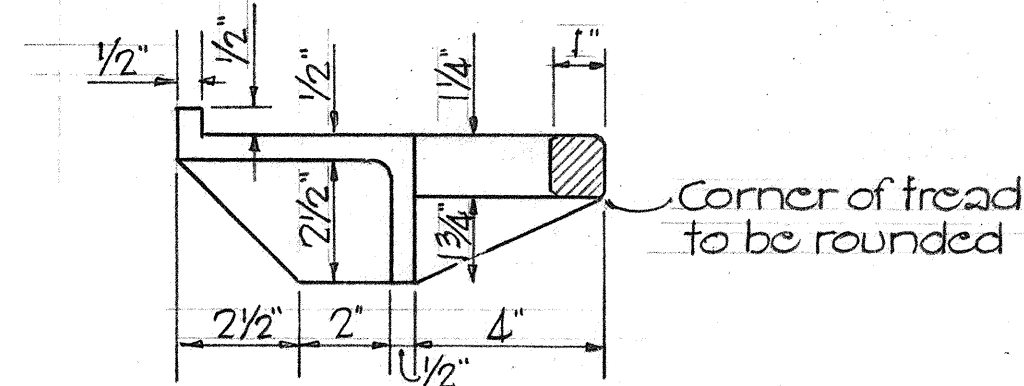
PLAN SECTION "E-E"

TYPE "A" MANHOLE RUNGS (WROUGHT IRON)

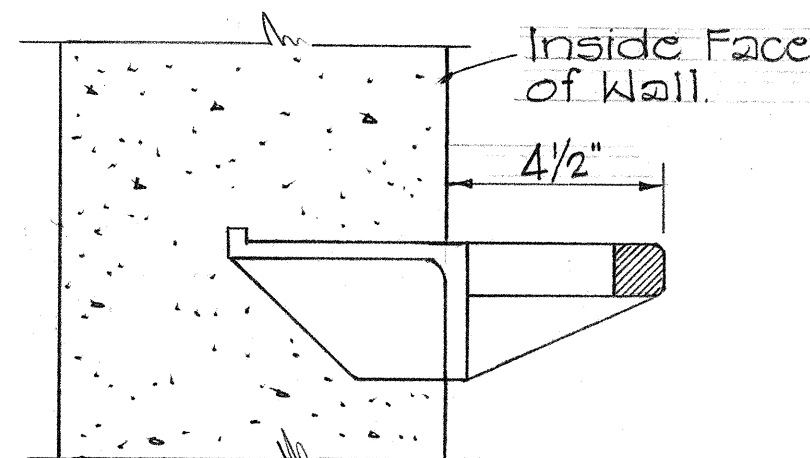
Scale: 1/2" = 1'-0"



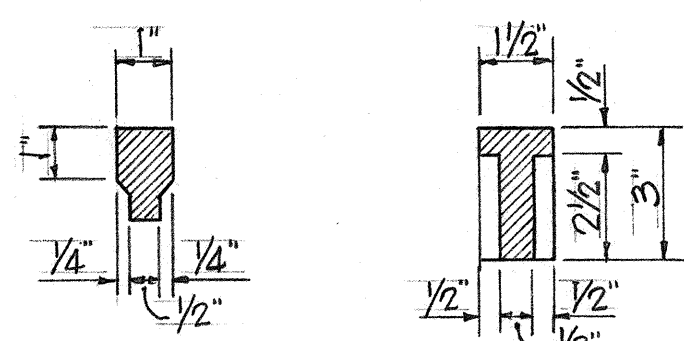
PLAN



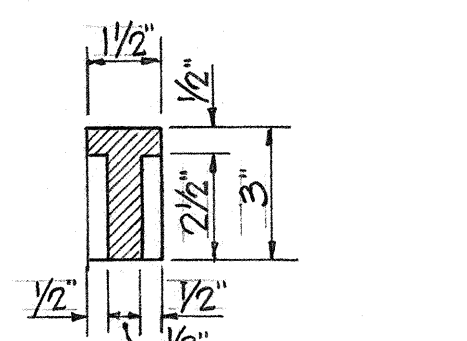
SECTION "F-F"



METHOD OF INSTALLATION



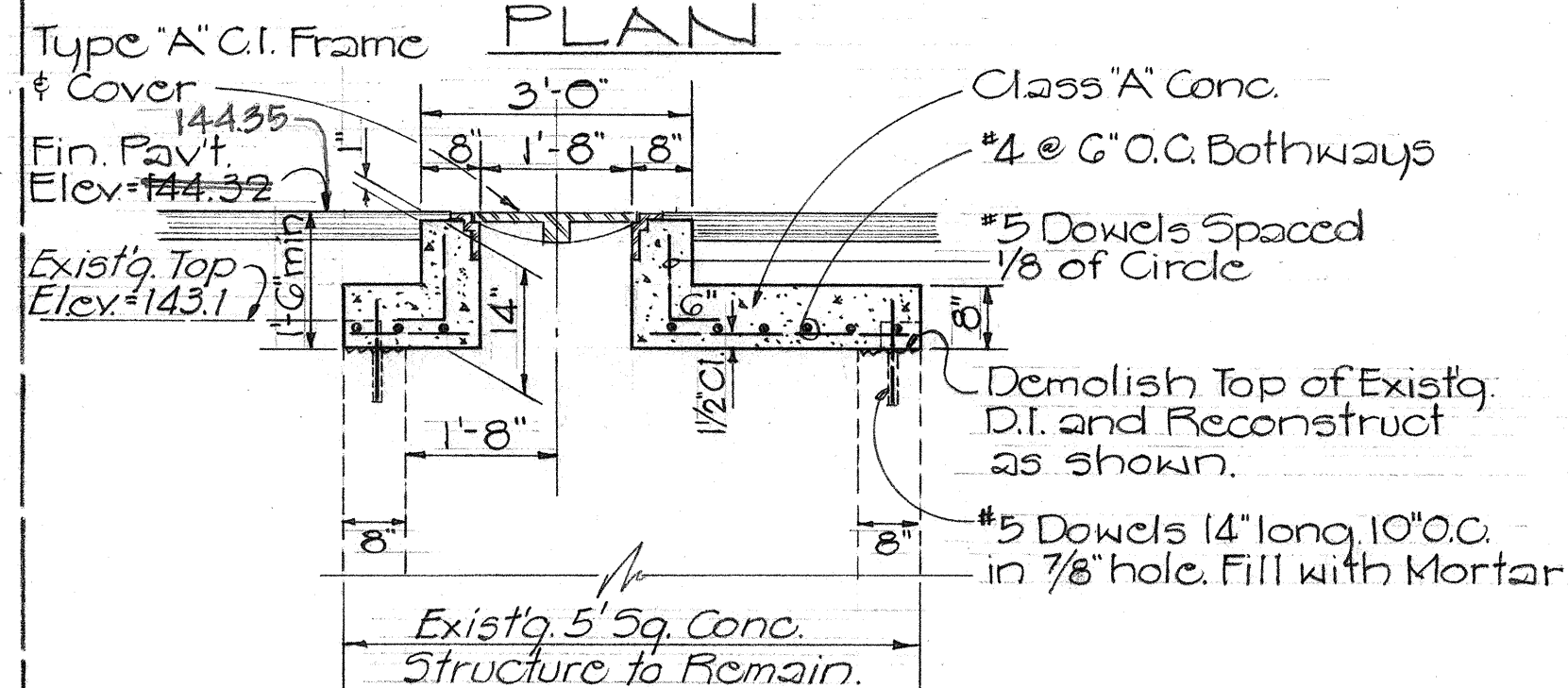
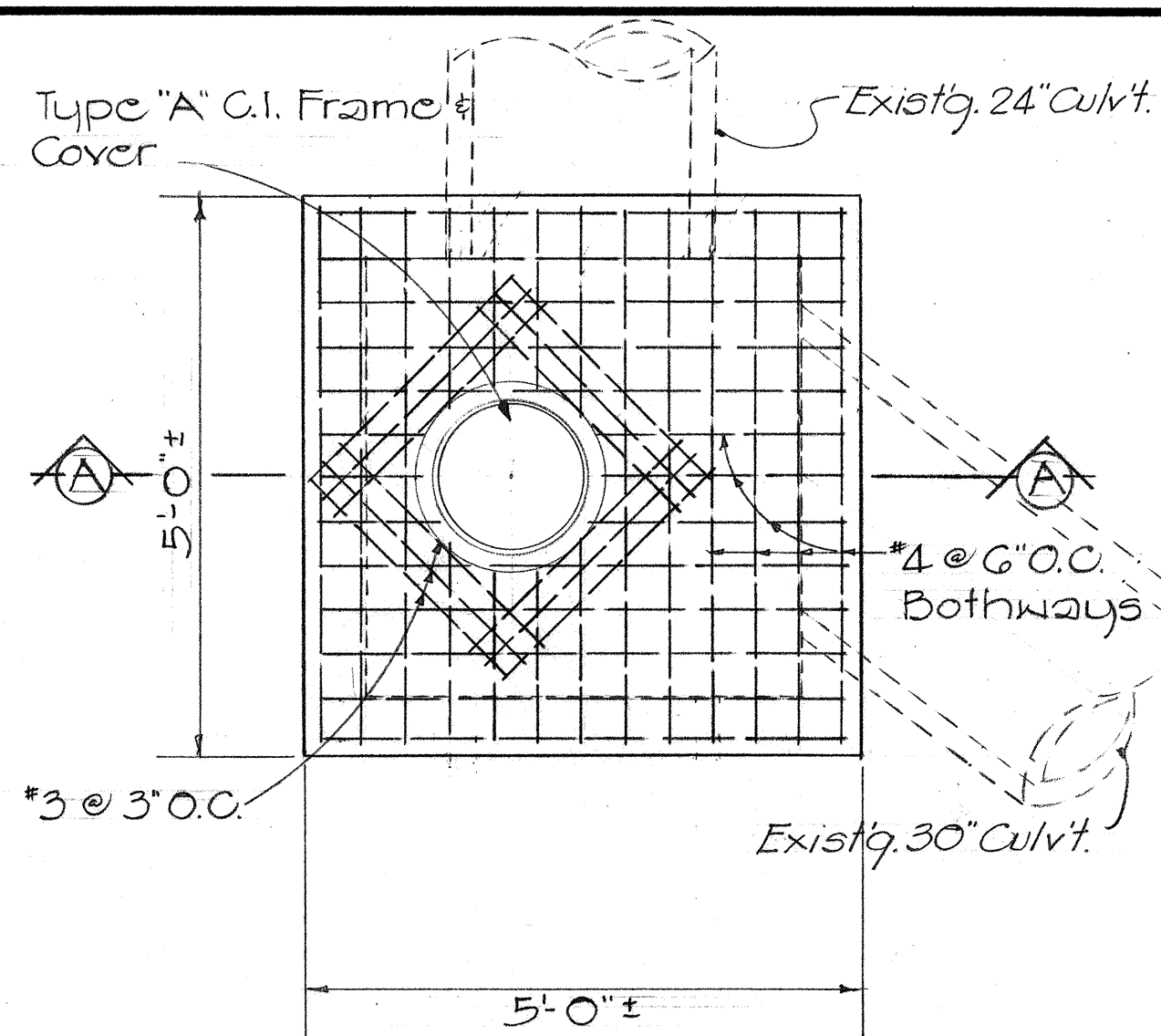
SECTION "G-G"



SECTION "H-H"

TYPE "B" MANHOLE RUNGS (CAST IRON) scale: 3" = 1'-0"

- Notes:
- 1- All joints to be grouted.
 - 2- Manhole Rungs to be placed at 16" O.C. (M.H. Rungs incidental to Conc. Wall)
 - 3- All mortar to be incidental to Conc. Wall.

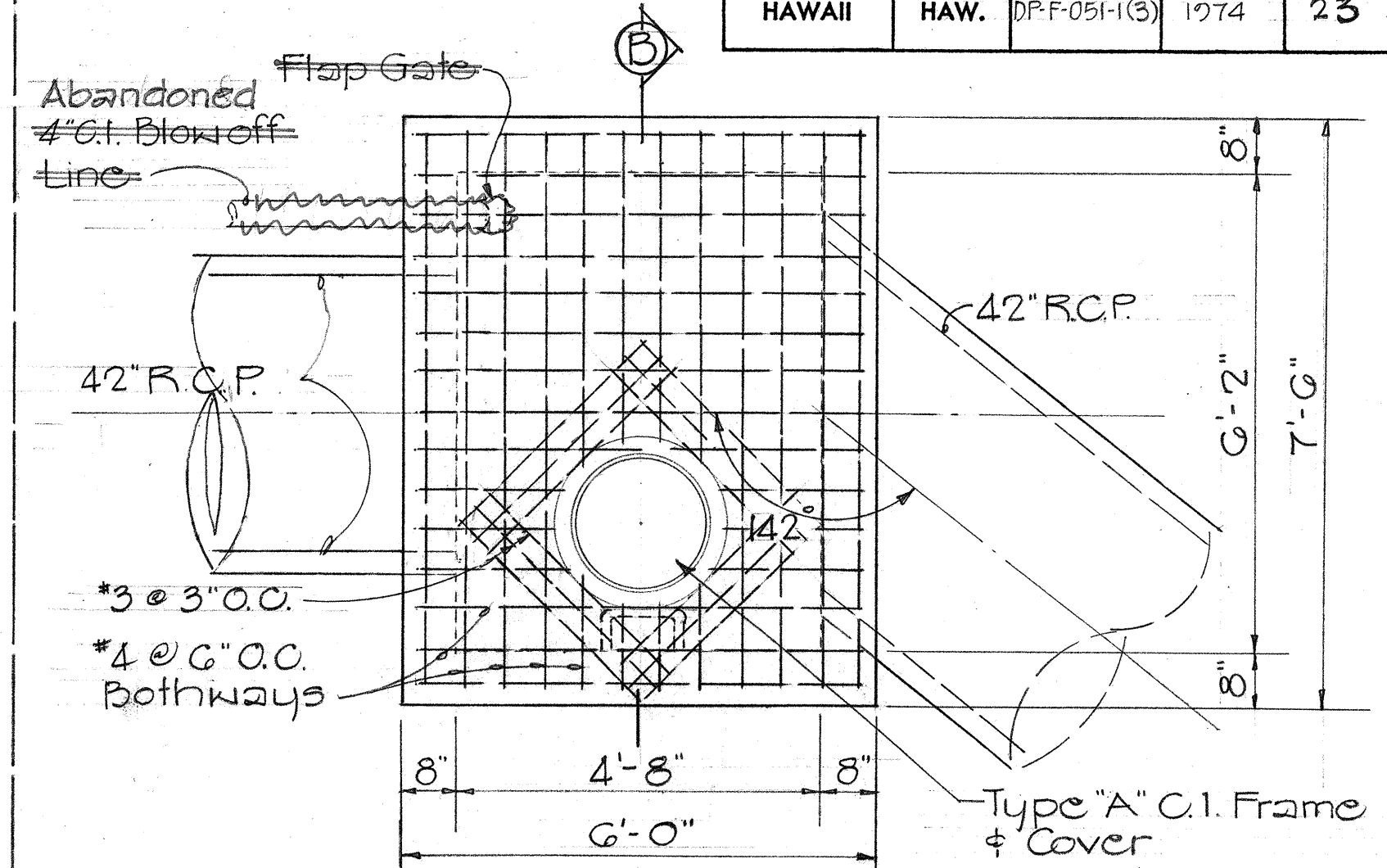


SECTION "A-A"

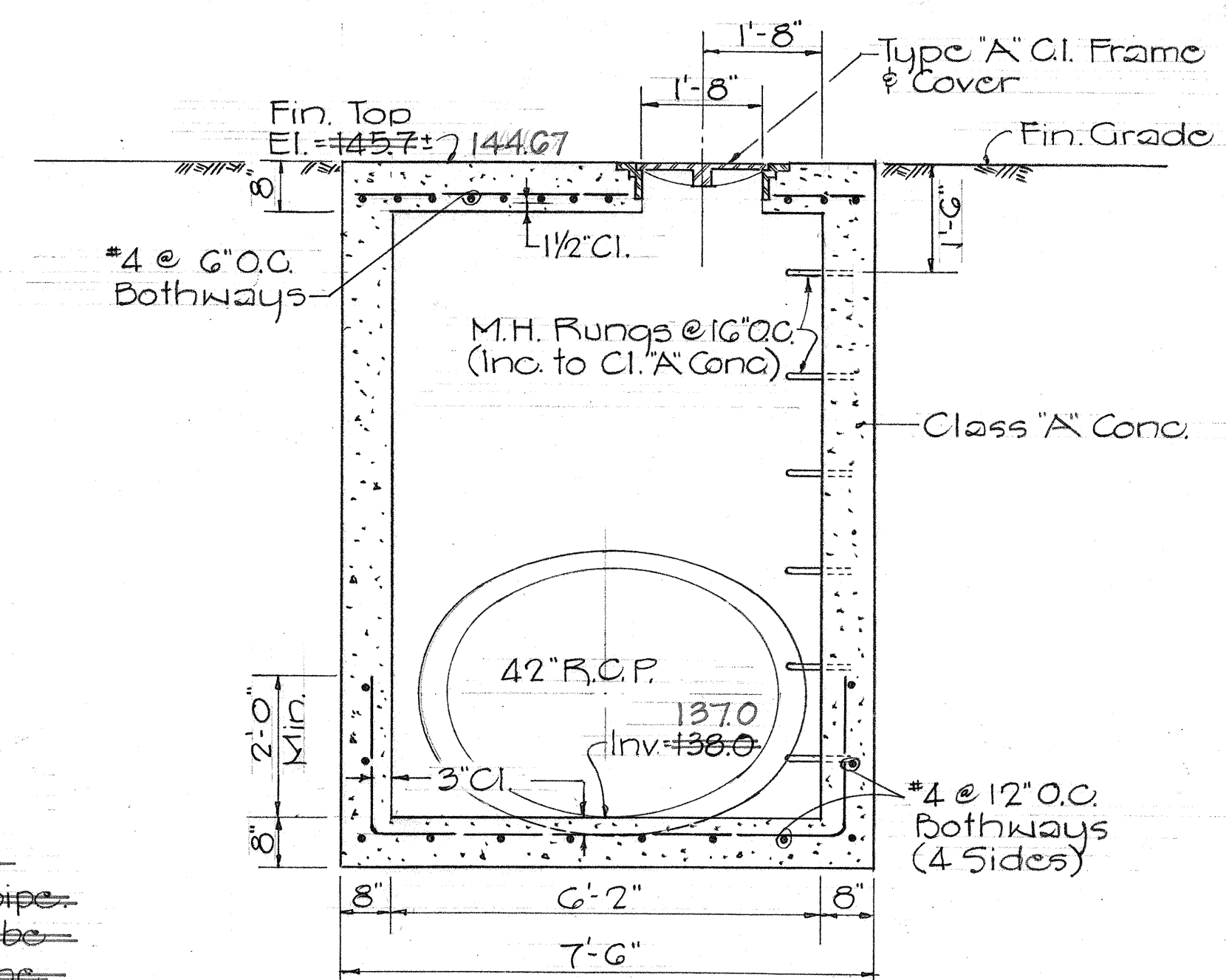
DETAIL ~ RECONSTRUCTED S.D.M.H. AT STA. 0+51 $\pm$ 80' LT.

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

- Note:
- 1- All fittings necessary to connect existing end of 4" C.I. pipe to new manhole shall be considered incidental to 4" C.I. pipe.
 - 2- The existing flap gate shall be salvaged and reinstalled in the manhole. This work shall be considered incidental to 4" C.I. pipe.



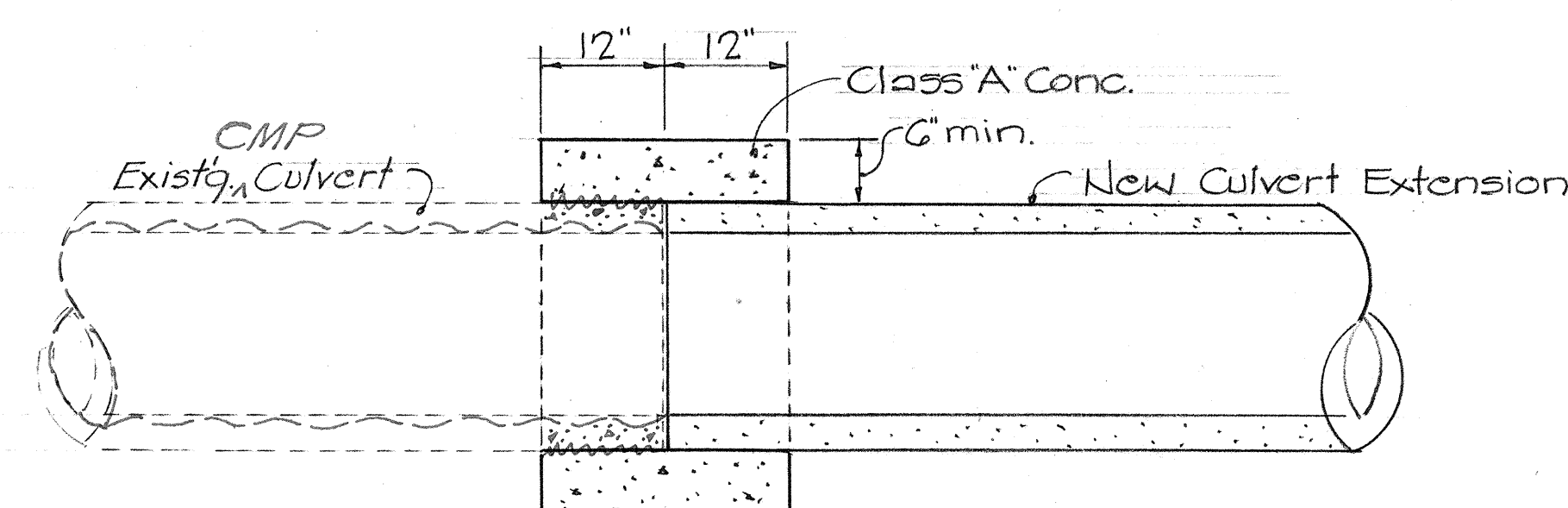
PLAN



SECTION "B-B"

DETAIL S.D.M.H. (MOD. TYPE C) AT STA. 0+35 $\pm$ 48' RT.

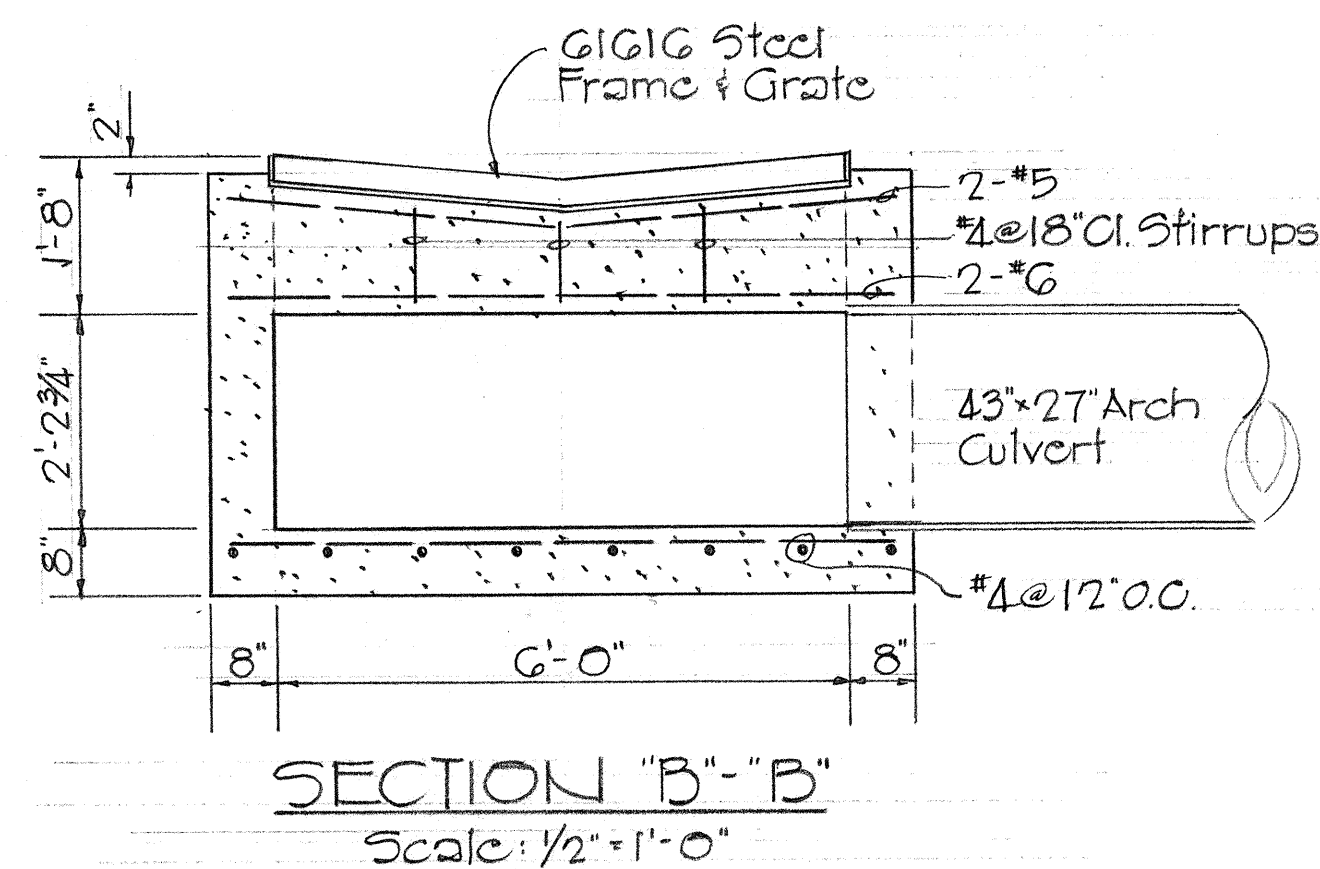
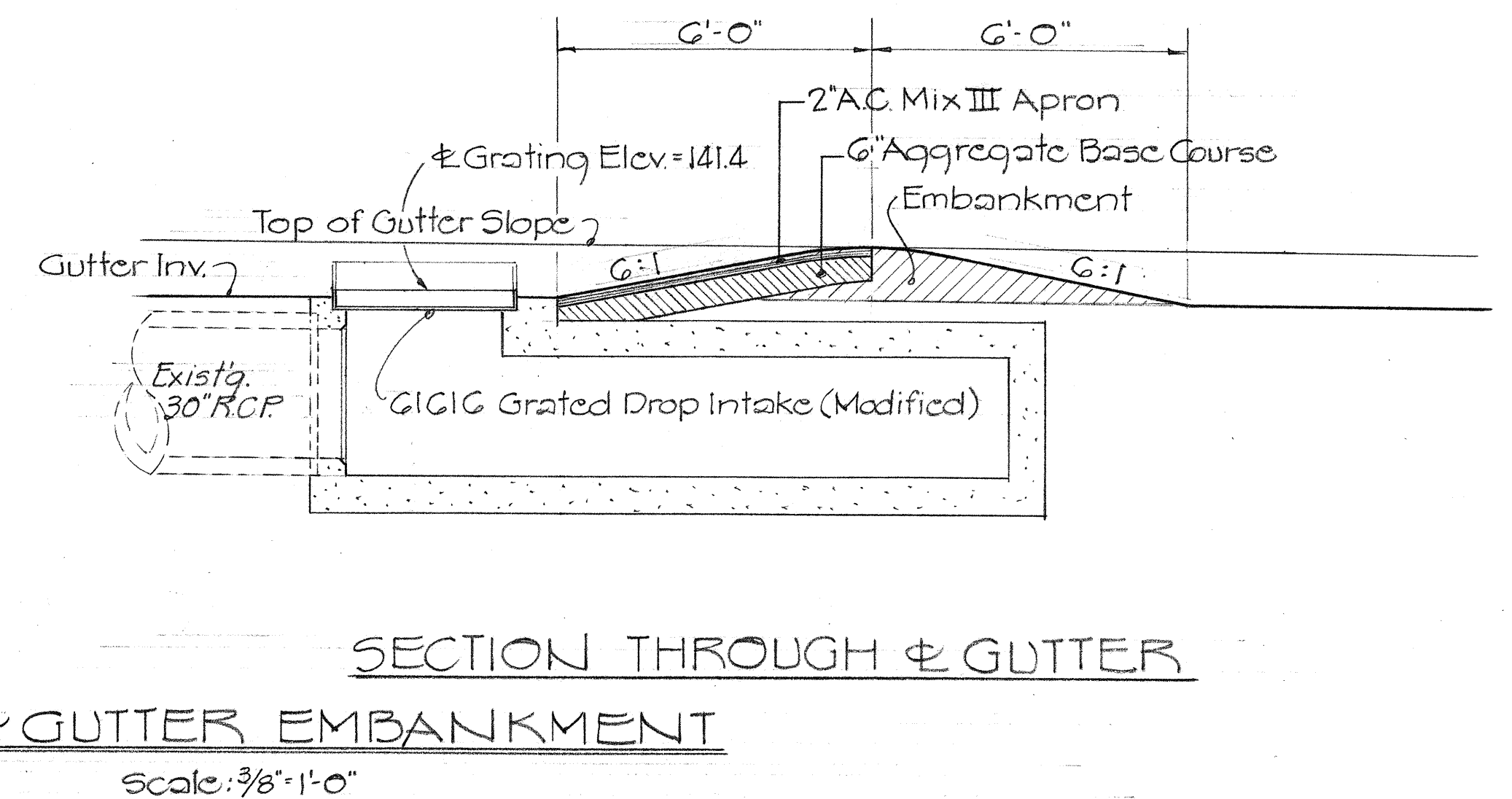
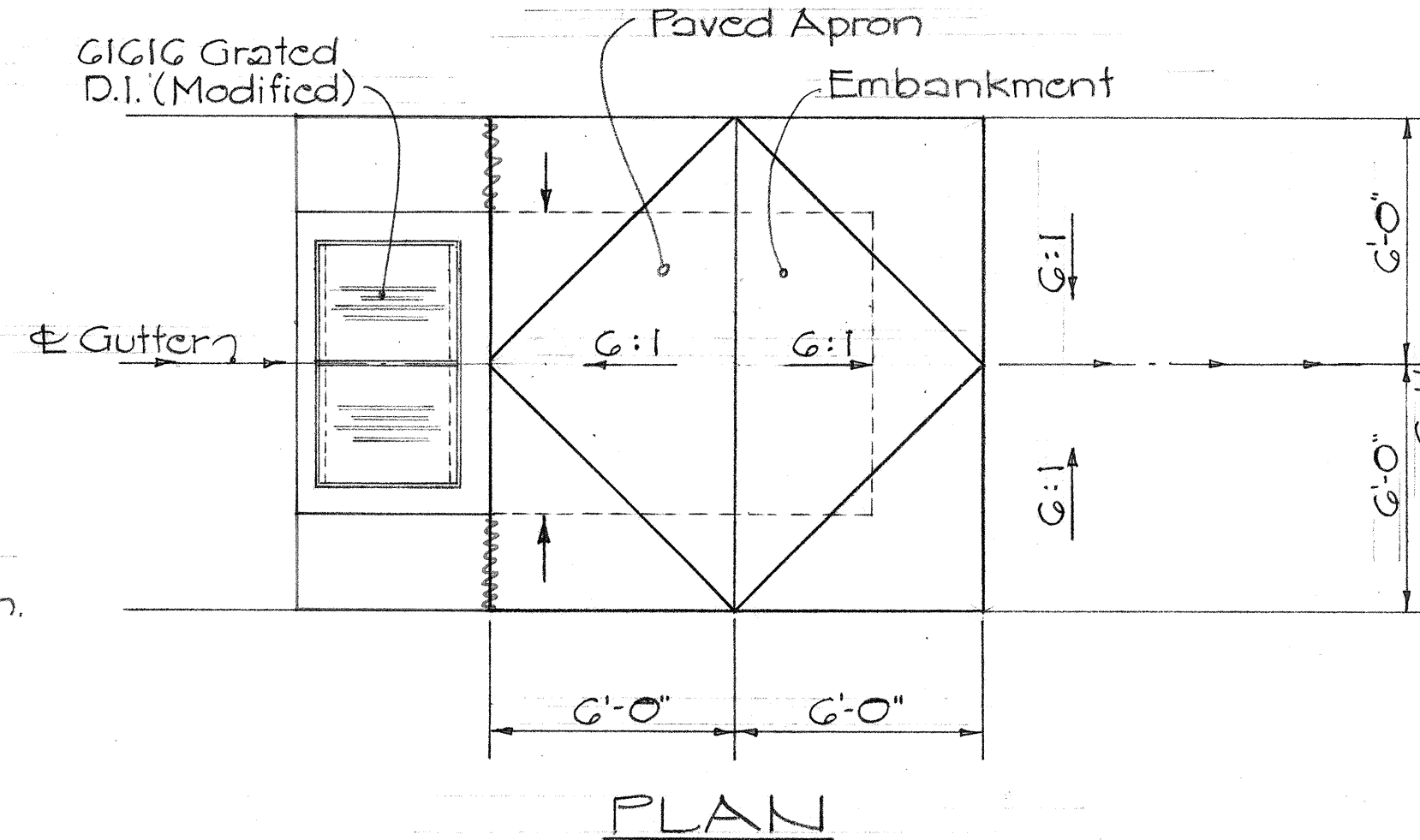
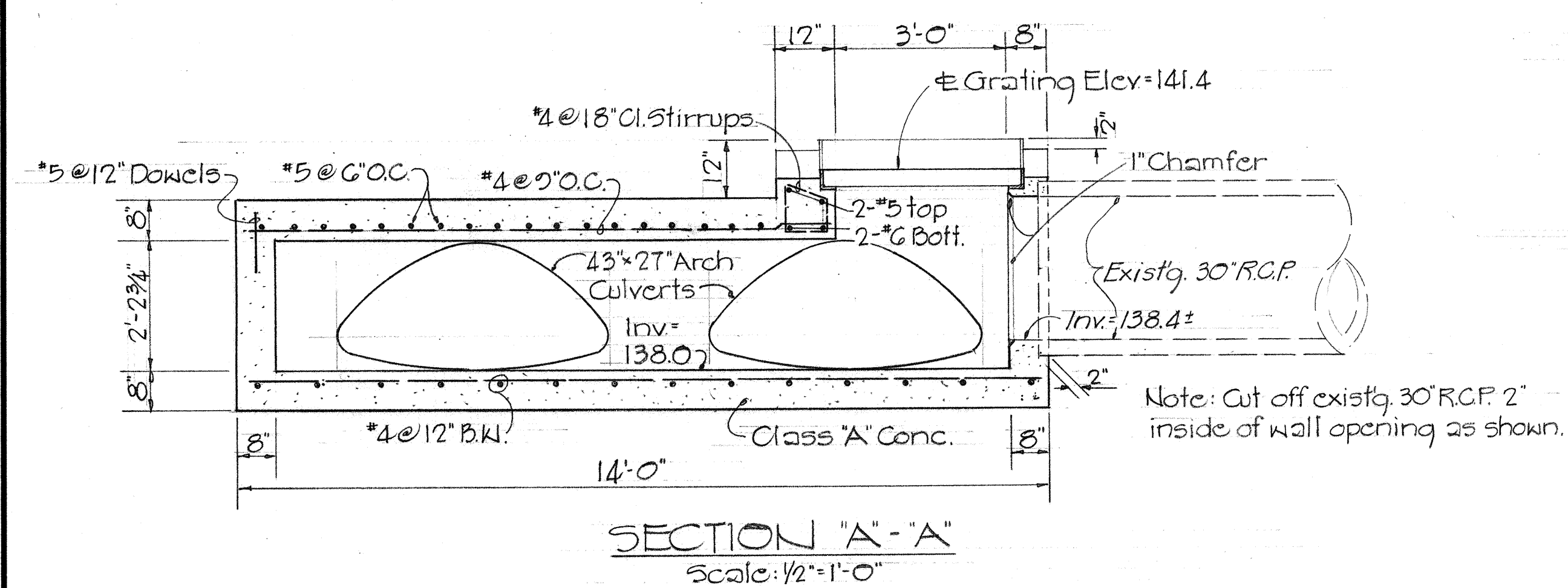
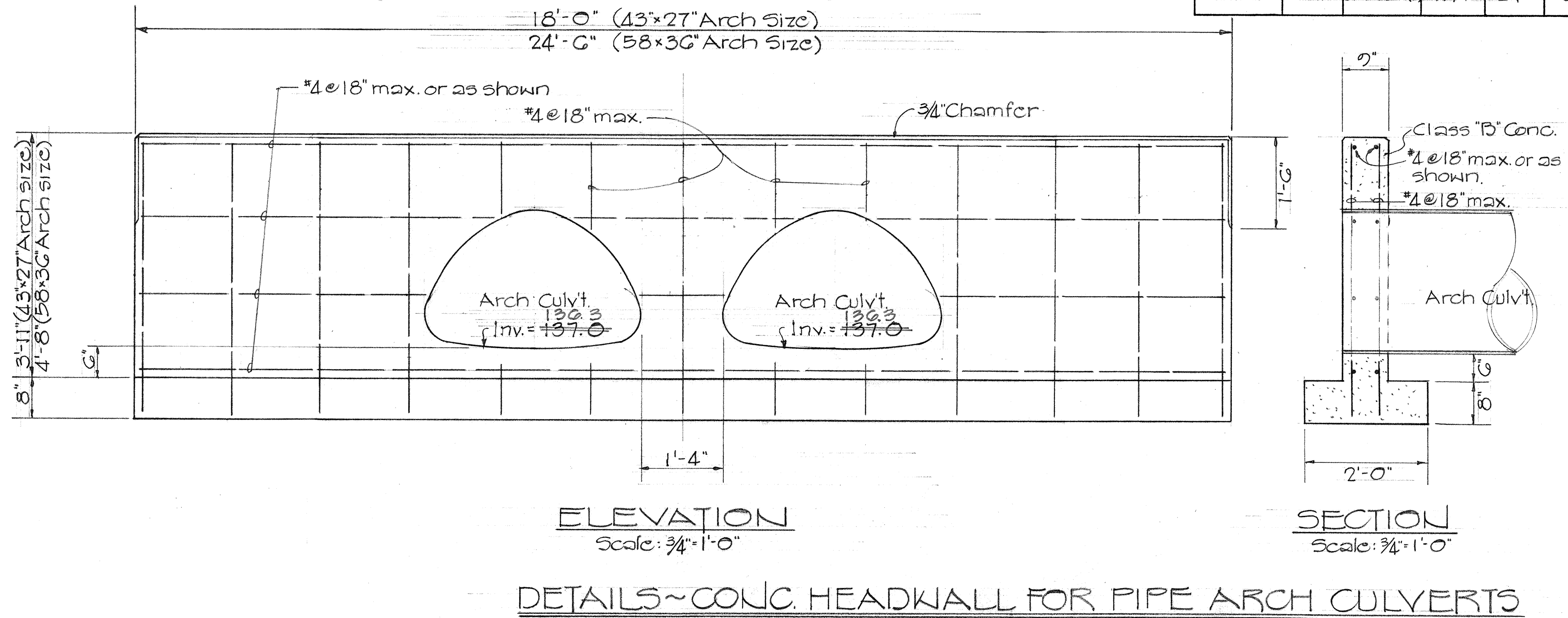
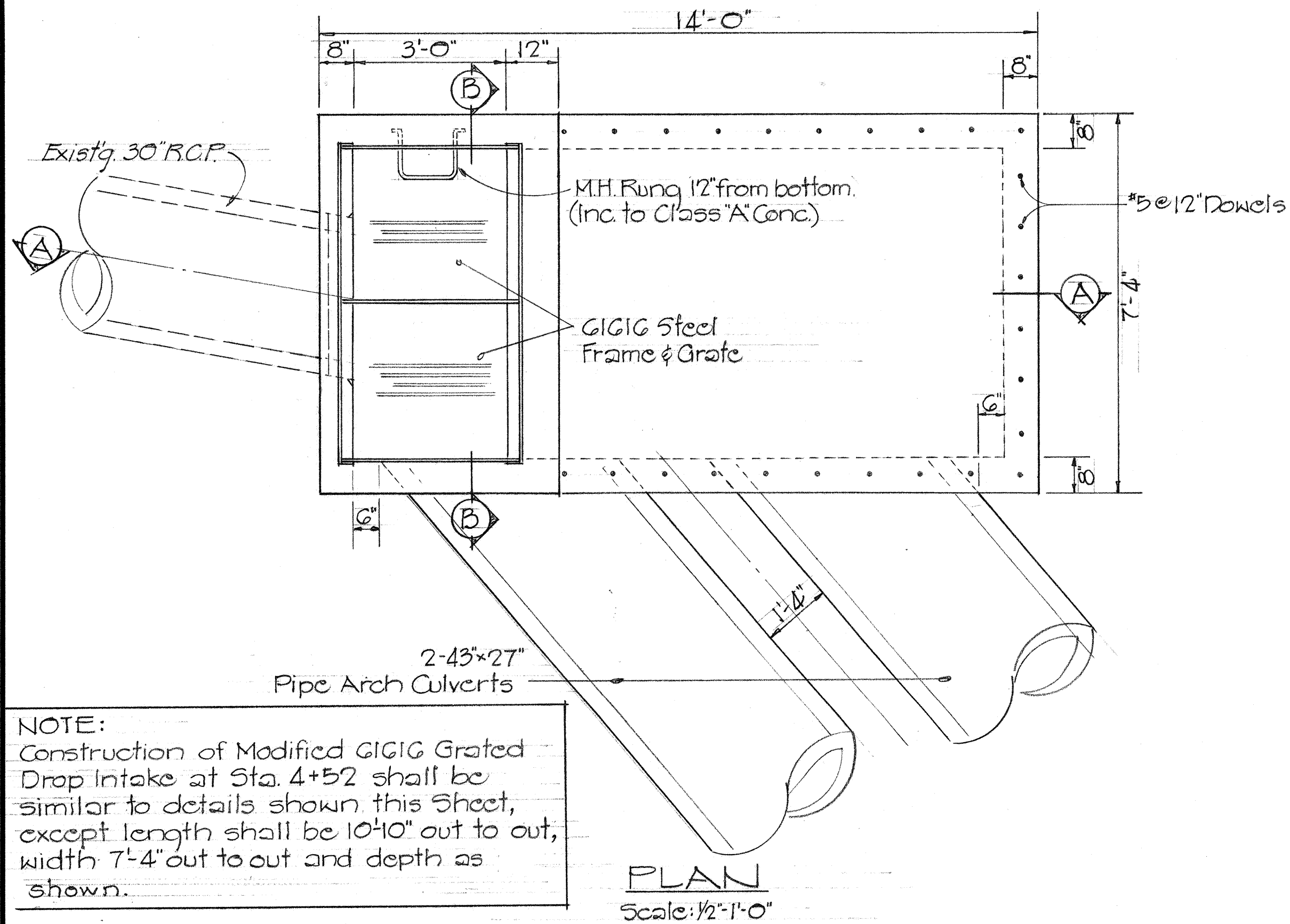
Scale: 1/2" = 1'-0"



CONNECTION DETAIL AT NEW CULVERT EXTENSION scale: Not to Scale

STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION
ROUTE 51: RICE STREET/ROUTE 51 JUNCTION TO AHUKINI ROAD
PROJ. No. DP-F-051-1(3) RECONSTRUCTED S.M.H. & MISC. DRAINAGE DETAILS
Scale: As Shown July 1973 SHEET No. 3 OF 16 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	DP-F-051-1(3)	1974	24	61

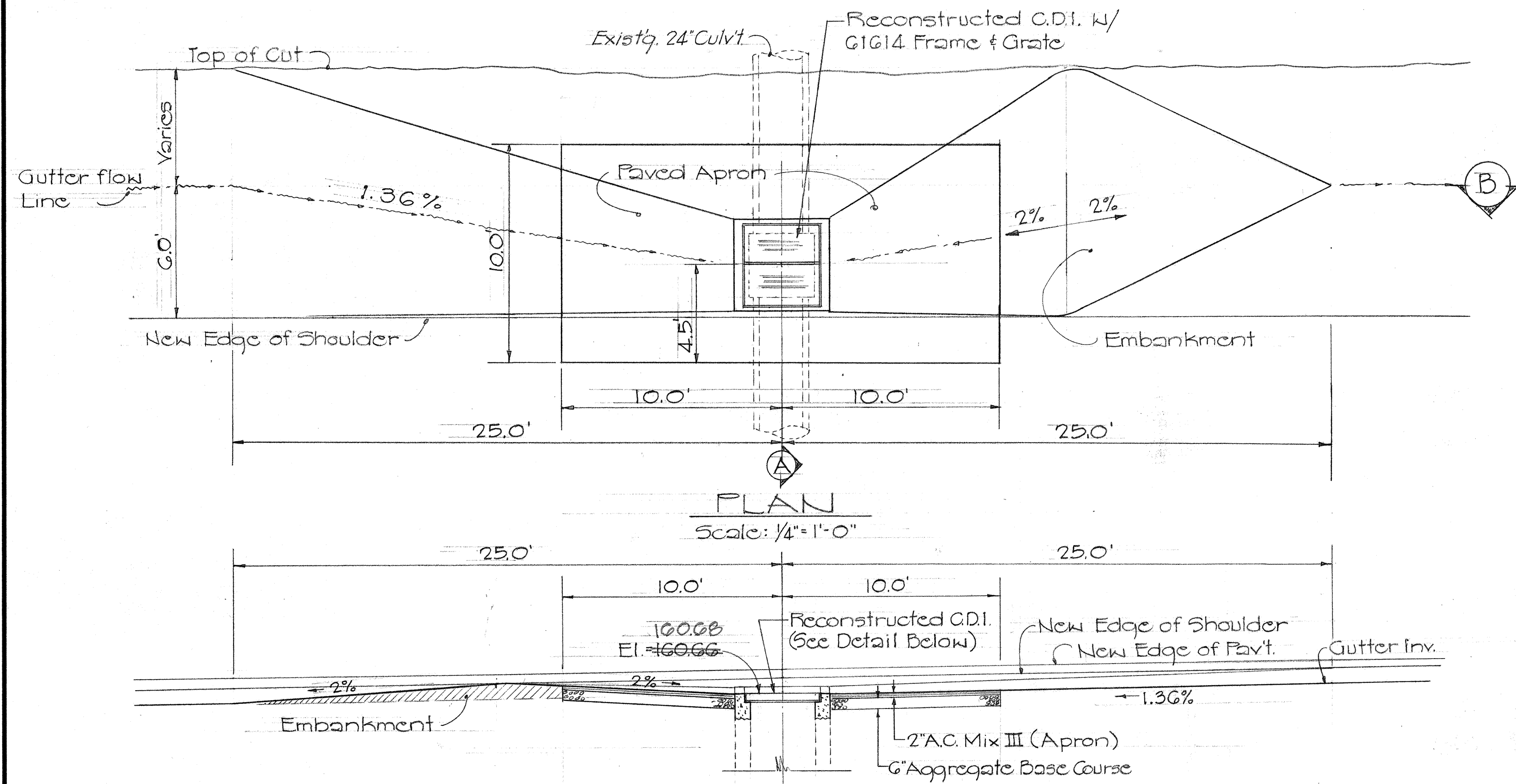


DETAILS~GIGIG GRATED DROP INTAKE (MODIFIED)
(STA. 1+18 3/4 44' LT.)

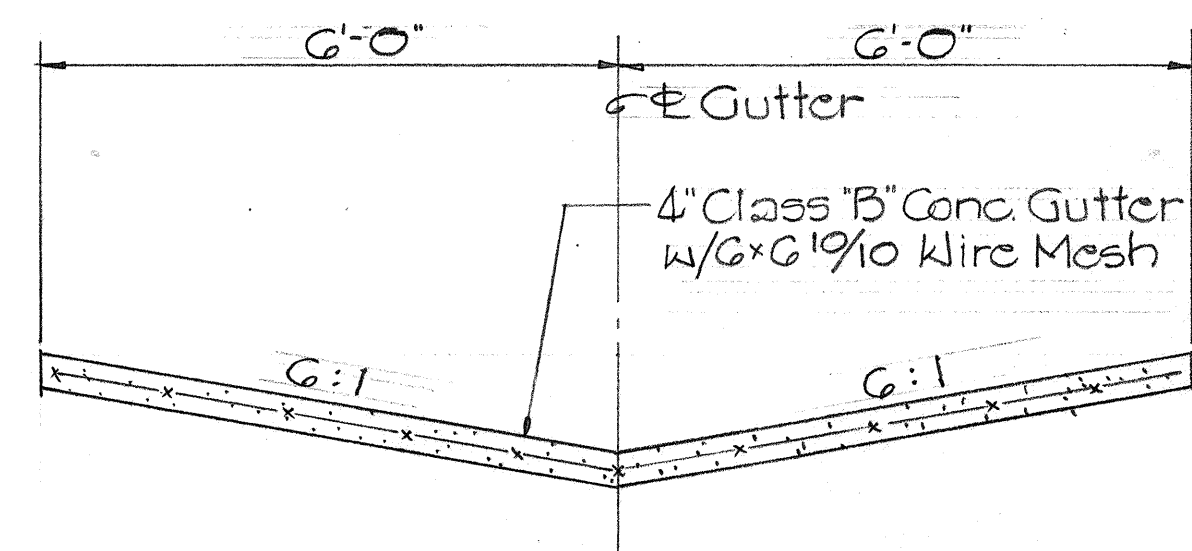
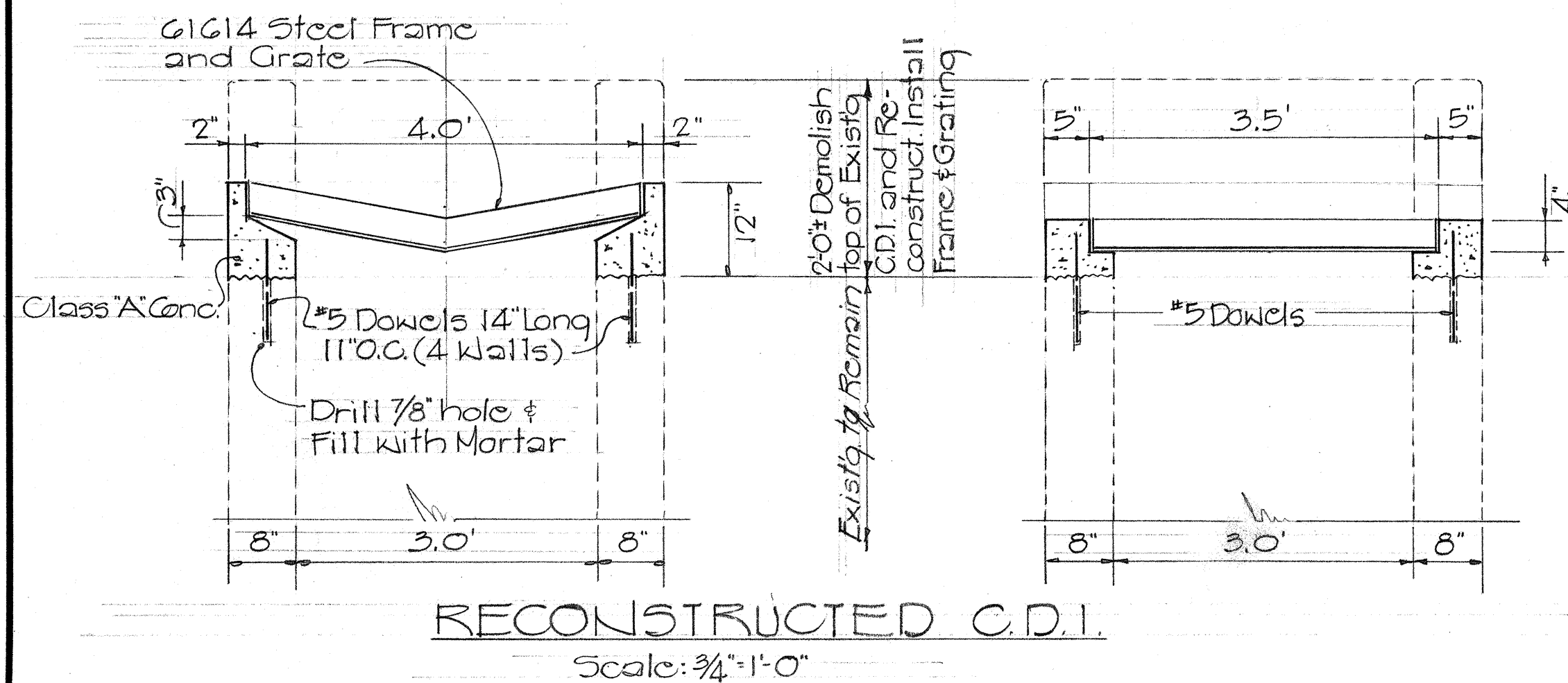
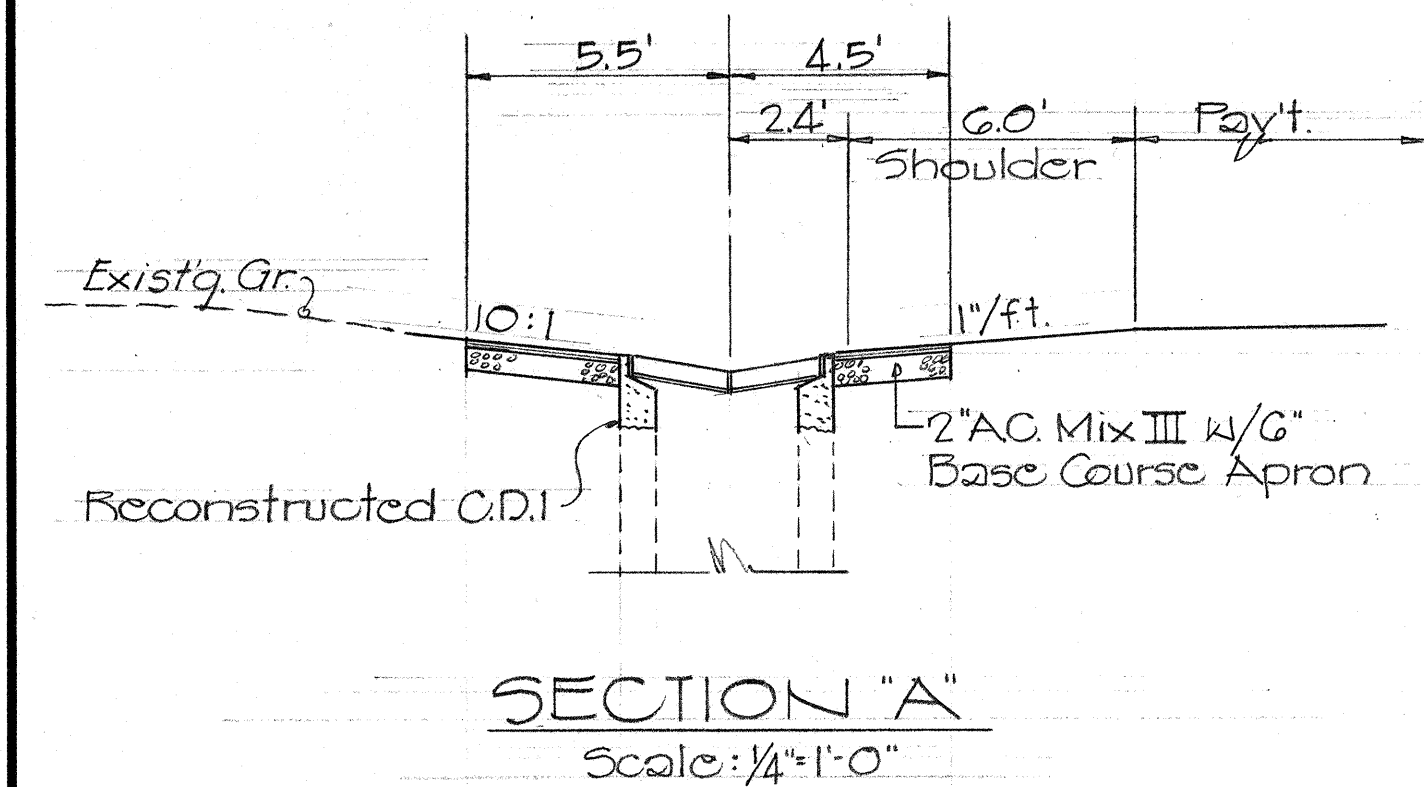
DESIGNED BY	DATE
DRAWN BY	
CHECKED BY	
NOTED BY	
ORIGINAL	
PLAN	
NOTE BOOK	
NO.	

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
ROUTE 51: RICE STREET/ROUTE 51
JUNCTION TO AHUKINI ROAD
PROJ. No. DP-F-051-1(3)
MISC. DRAINAGE DETAILS
Scale: As Shown
July 1973
SHEET No. 4 OF 16 SHEETS

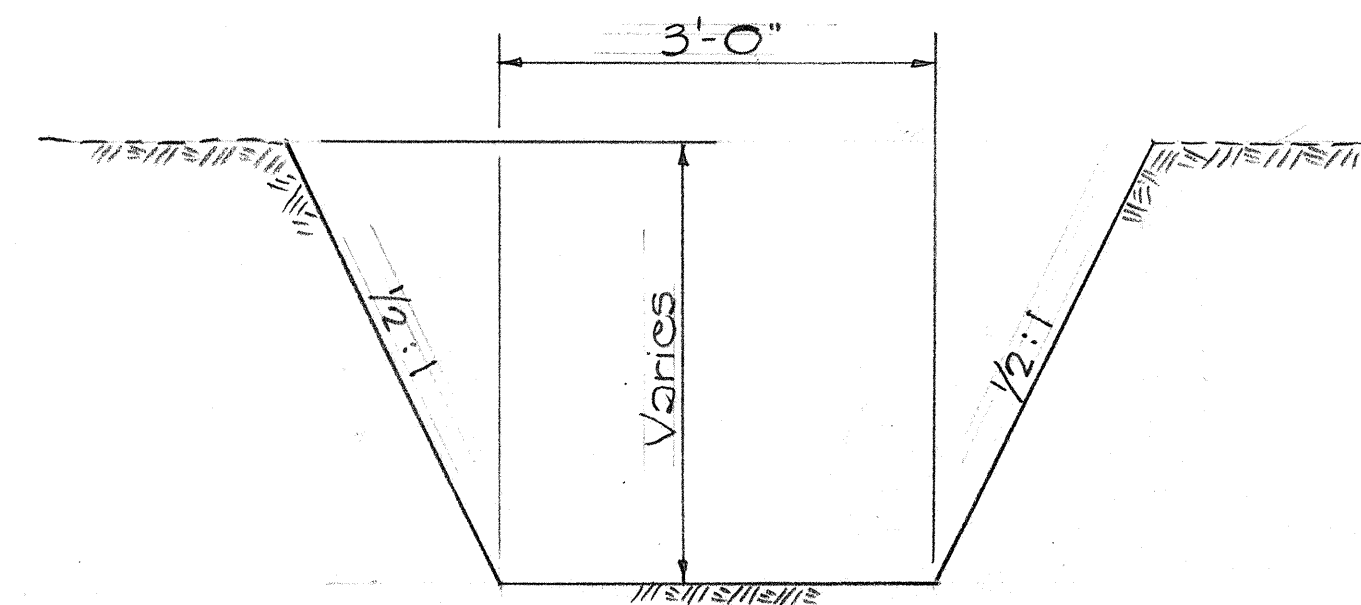
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	DPF-051-1(3)	1974	25	61



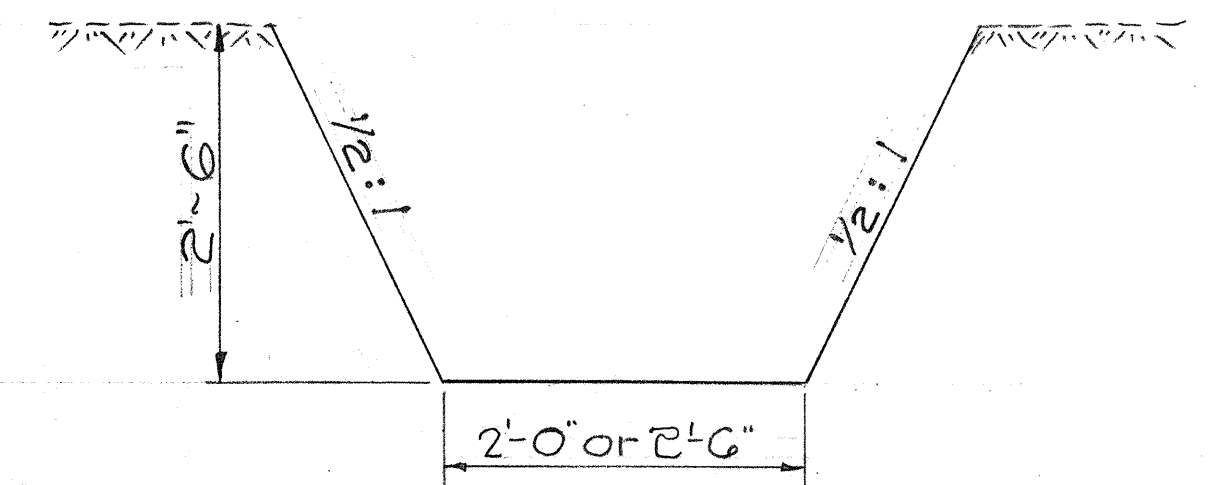
LONGITUDINAL SECTION "B" @ GUTTER FLOW LINE
(STA. 60+00 ~ AHUKINI ROAD)
Scale: 1/4" = 1'-0"



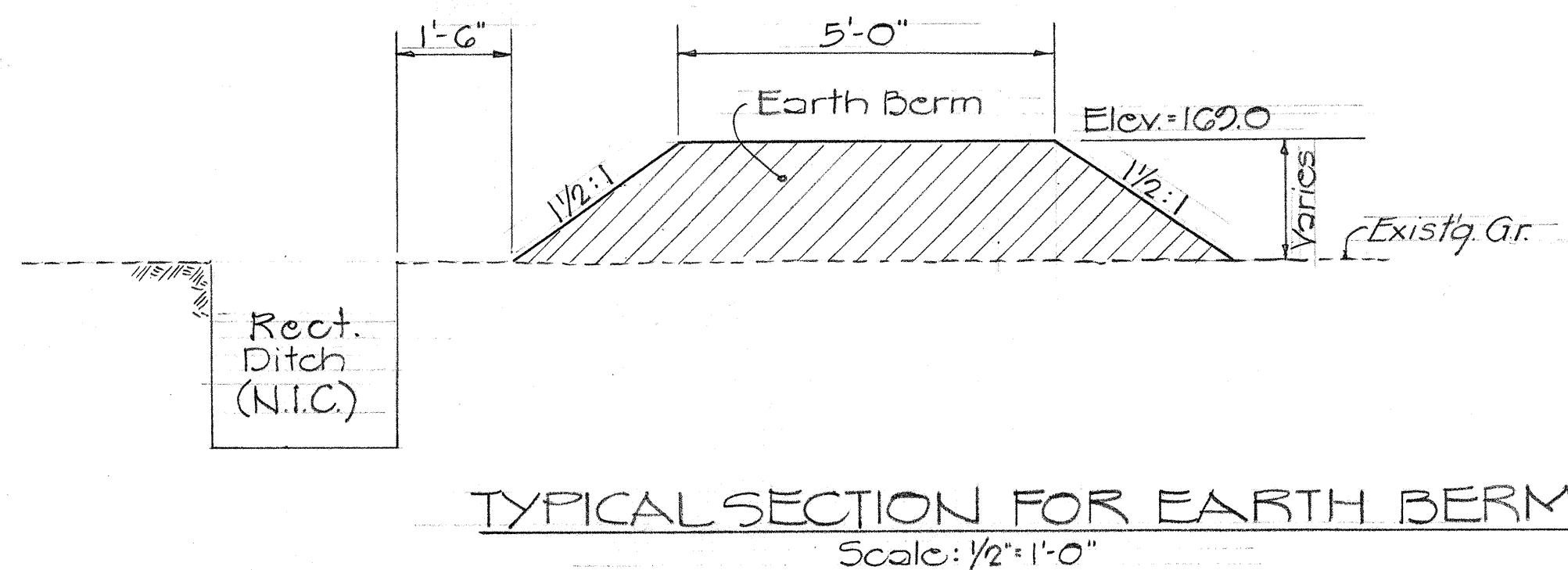
DETAILS ~ GUTTER, TYPE 2 (G1G1-12)
Scale: 1/2" = 1'-0"



TYPICAL SECTION ~ MAIN DITCH
Scale: 3/4" = 1'-0"



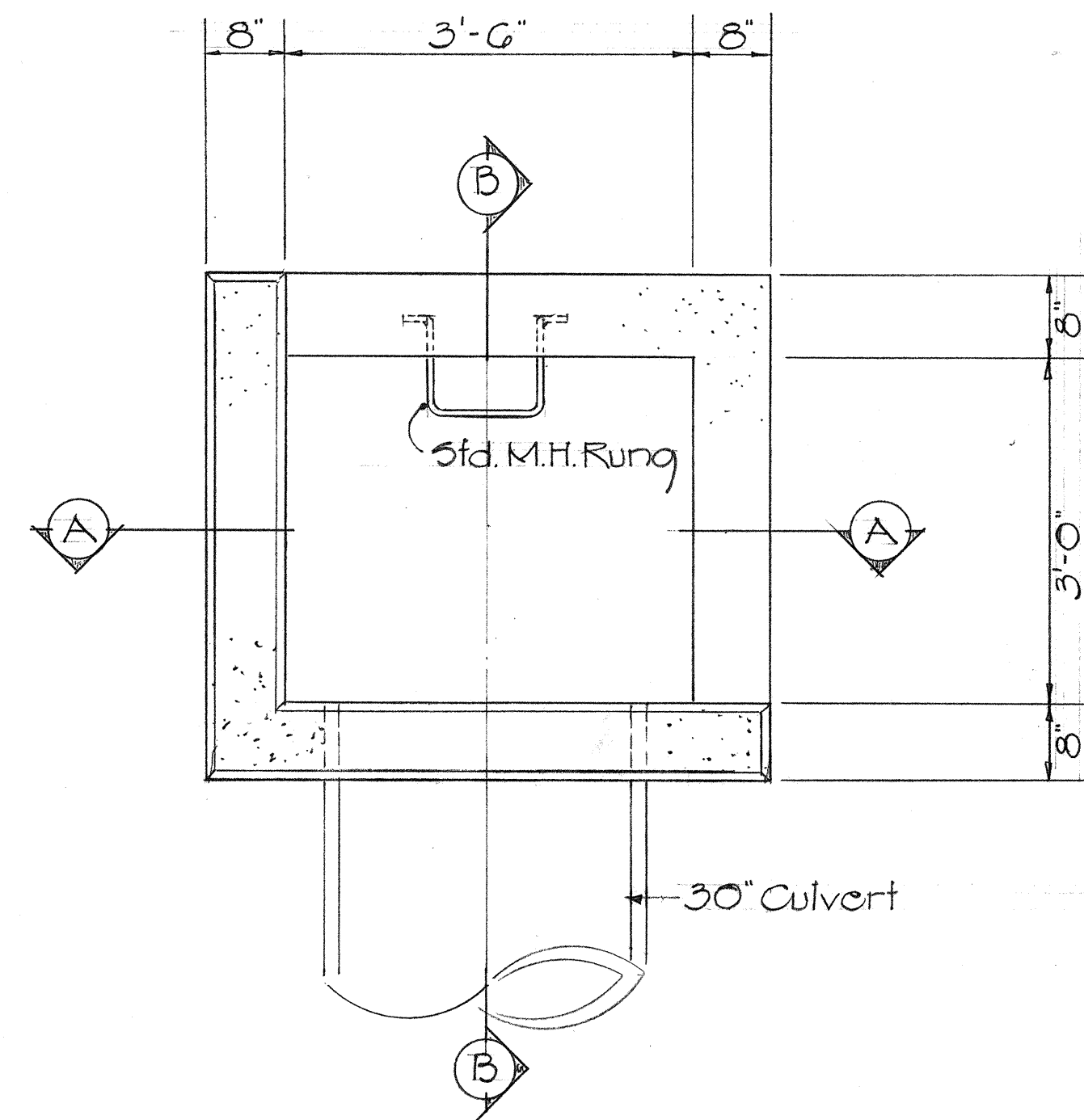
DETAILS ~ TRAP DITCH (N.I.C.)
Scale: 3/4" = 1'-0"



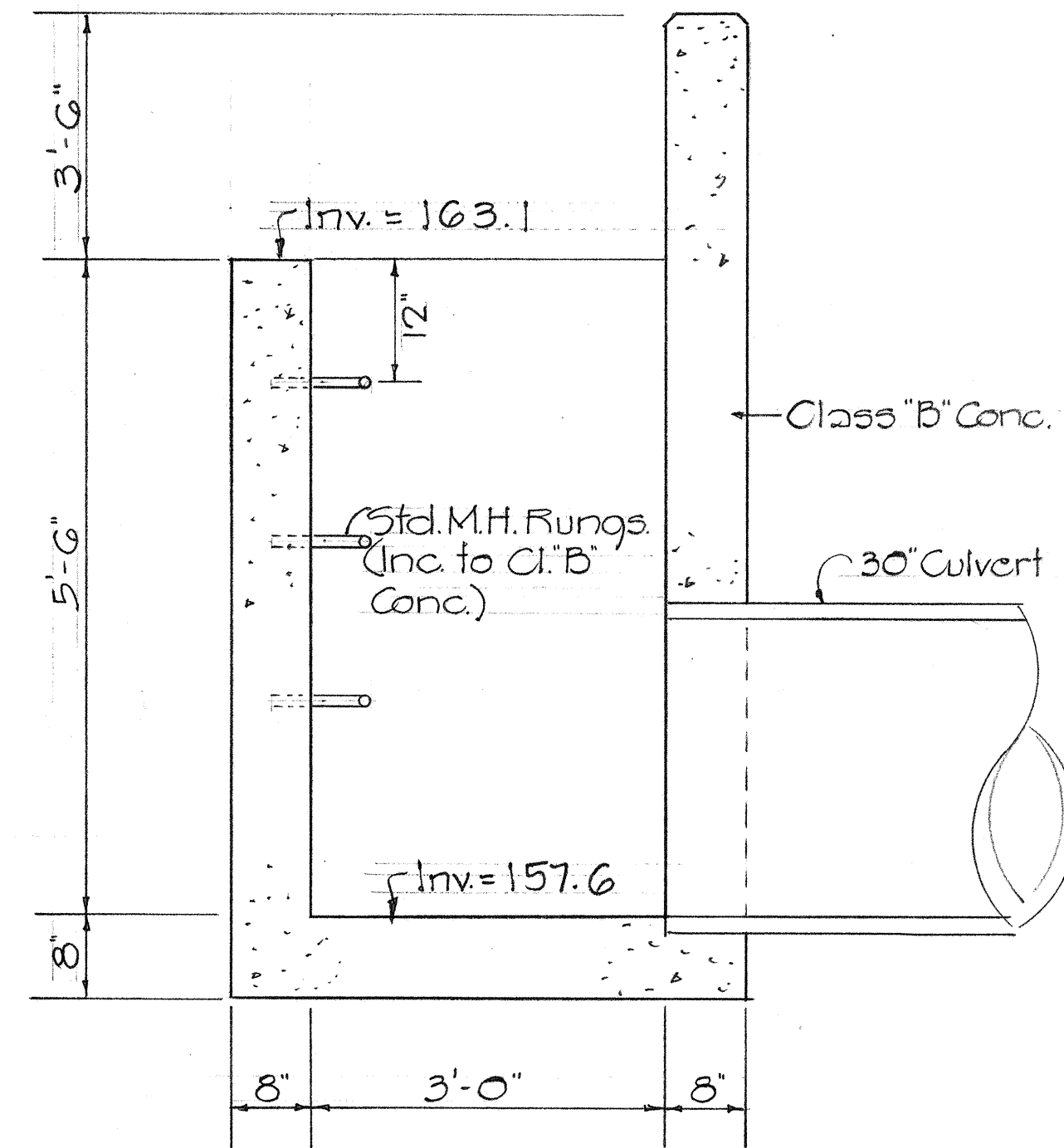
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION ROUTE 51: RICE STREET/ROUTE 51 JUNCTION TO AHUKINI ROAD PROJ. No. DPF-051-1(3) MISC. DRAINAGE DETAILS Scale: As Shown SHEET No. 5 OF 16 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	DP-F-051-1(3)	1974	26	61

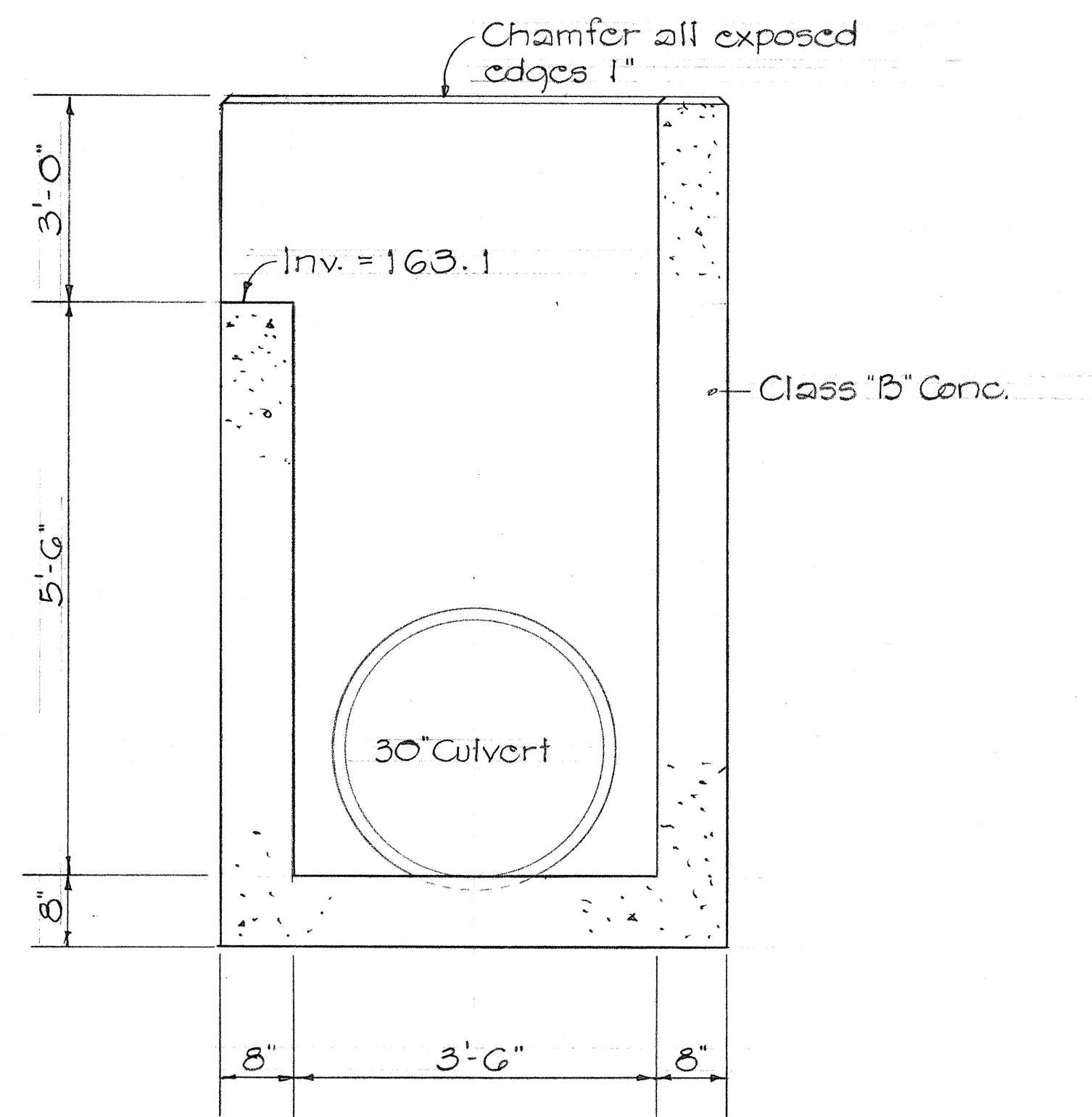
*Dotted lines indicate Cut-off Walls, 2 feet deep and 12 inches thick.



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

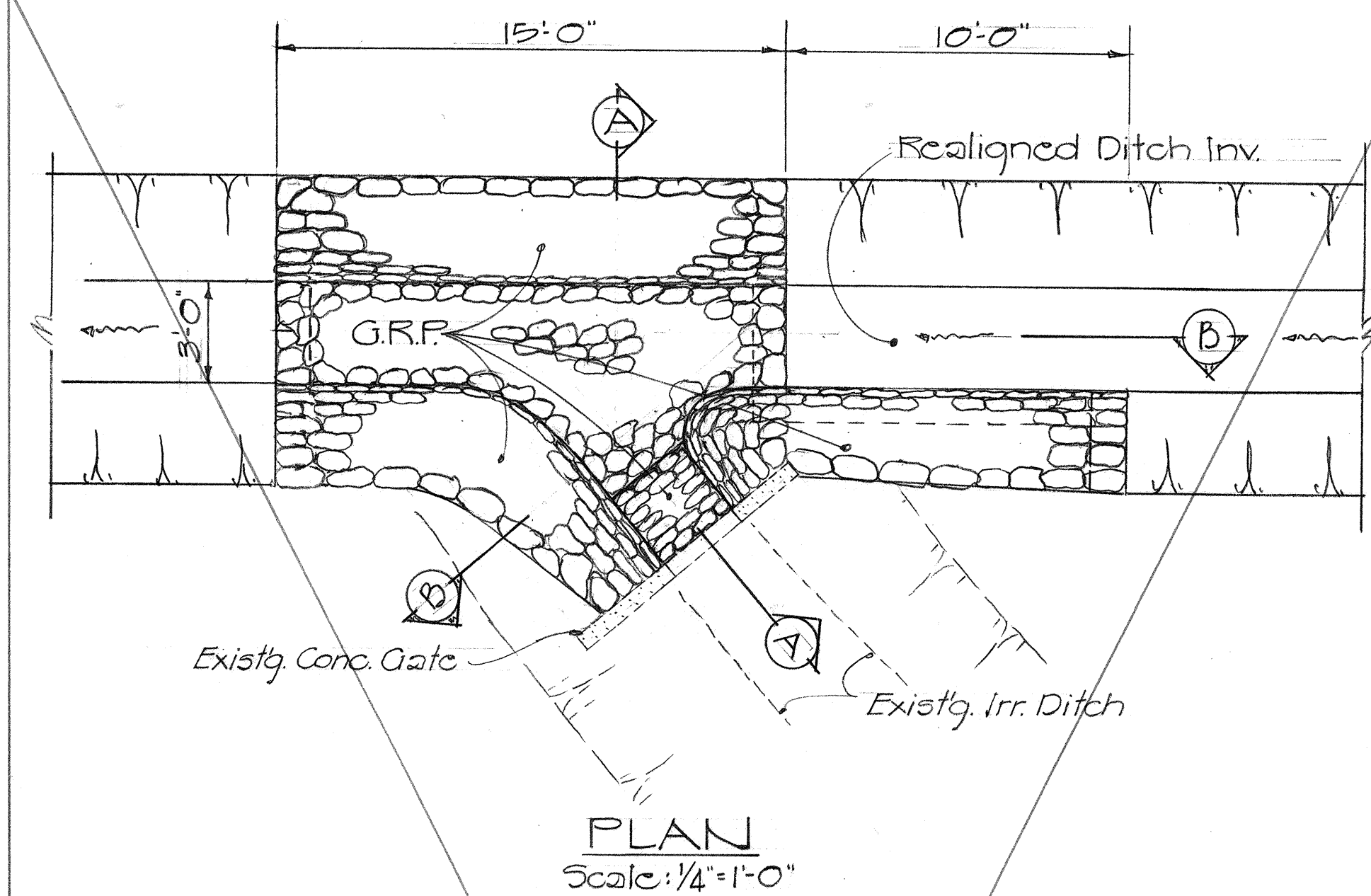


SECTION "B"-B
Scale: 3/4" = 1'-0"

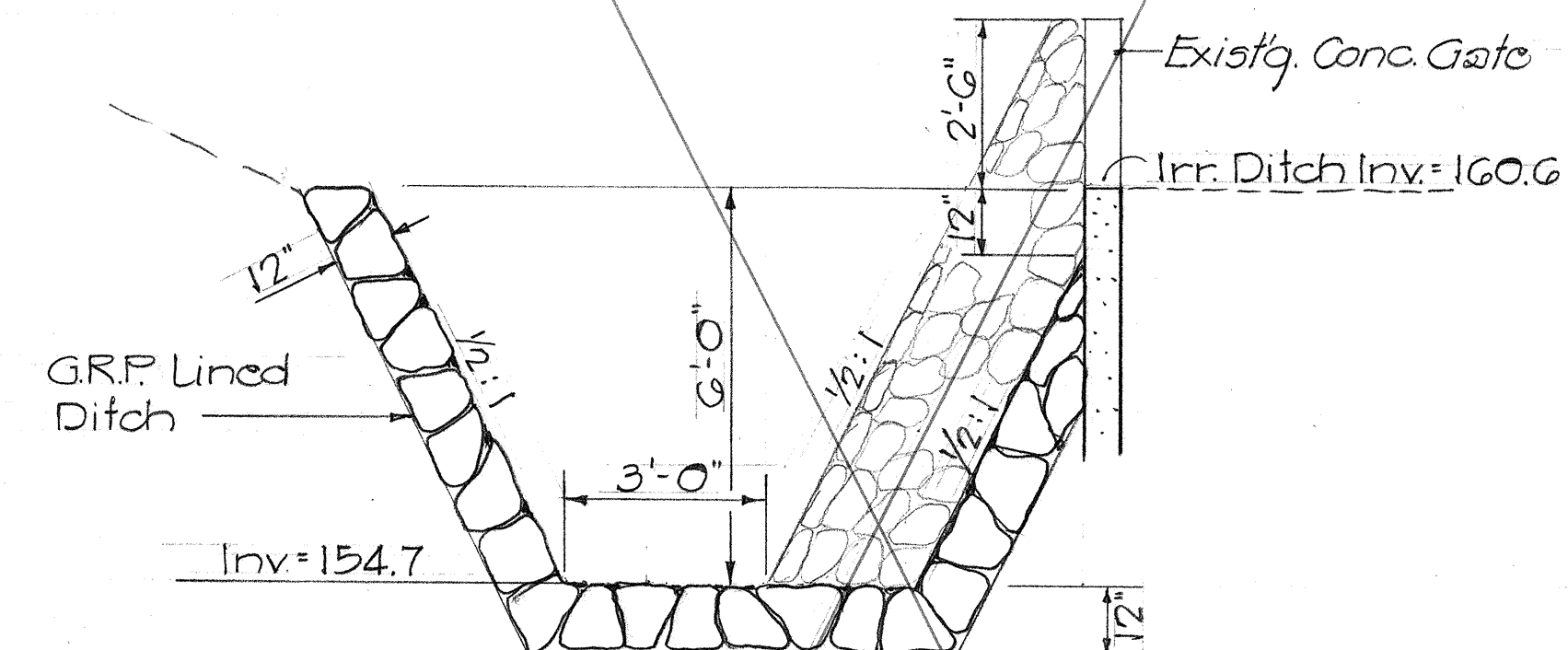


SECTION "A"-A
Scale: 3/4" = 1'-0"

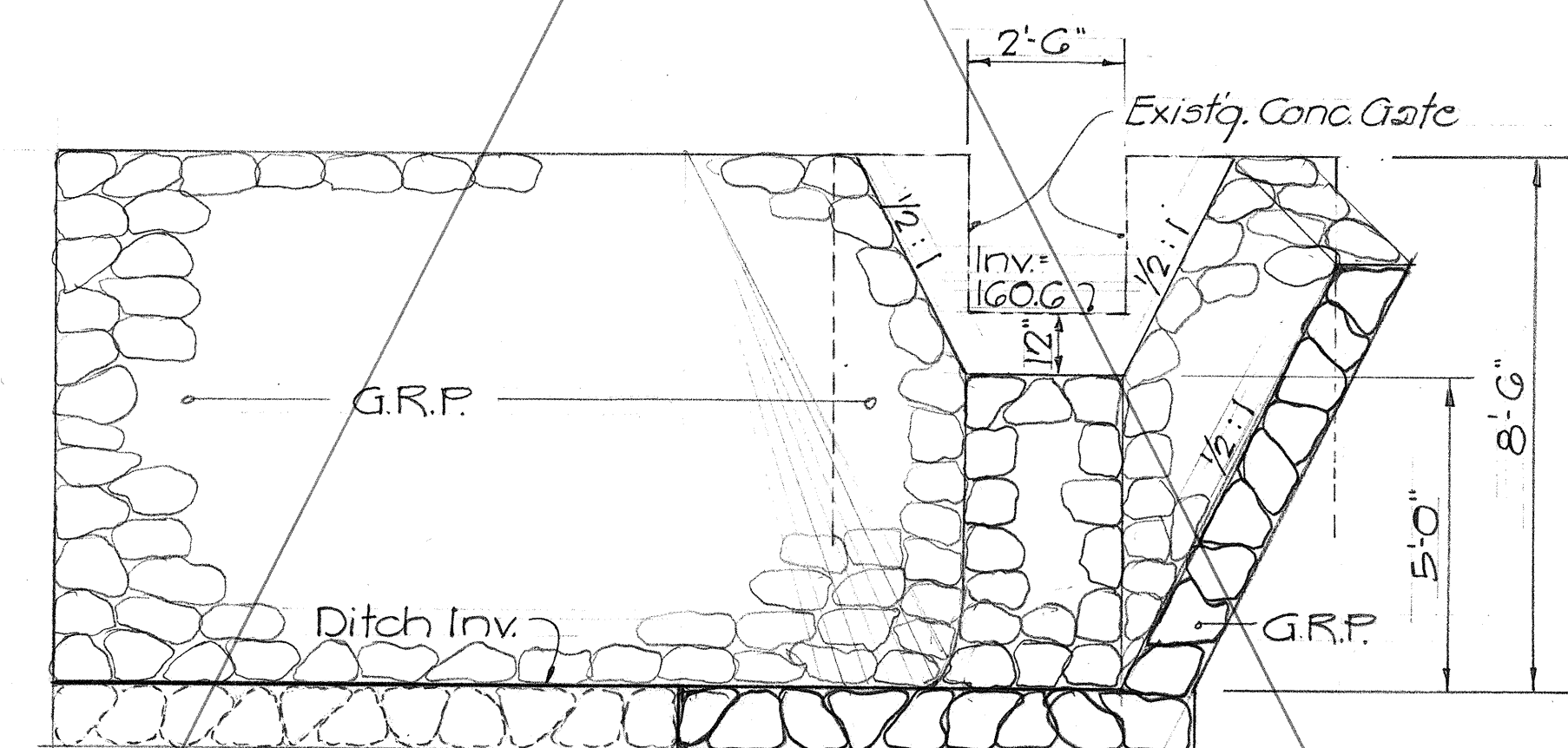
DETAILS ~ 2 WAY INLET CDI @ STA. 25+85 (LT)



PLAN
Scale: 1/4" = 1'-0"



SECTION "A"-A
Scale: 3/8" = 1'-0"

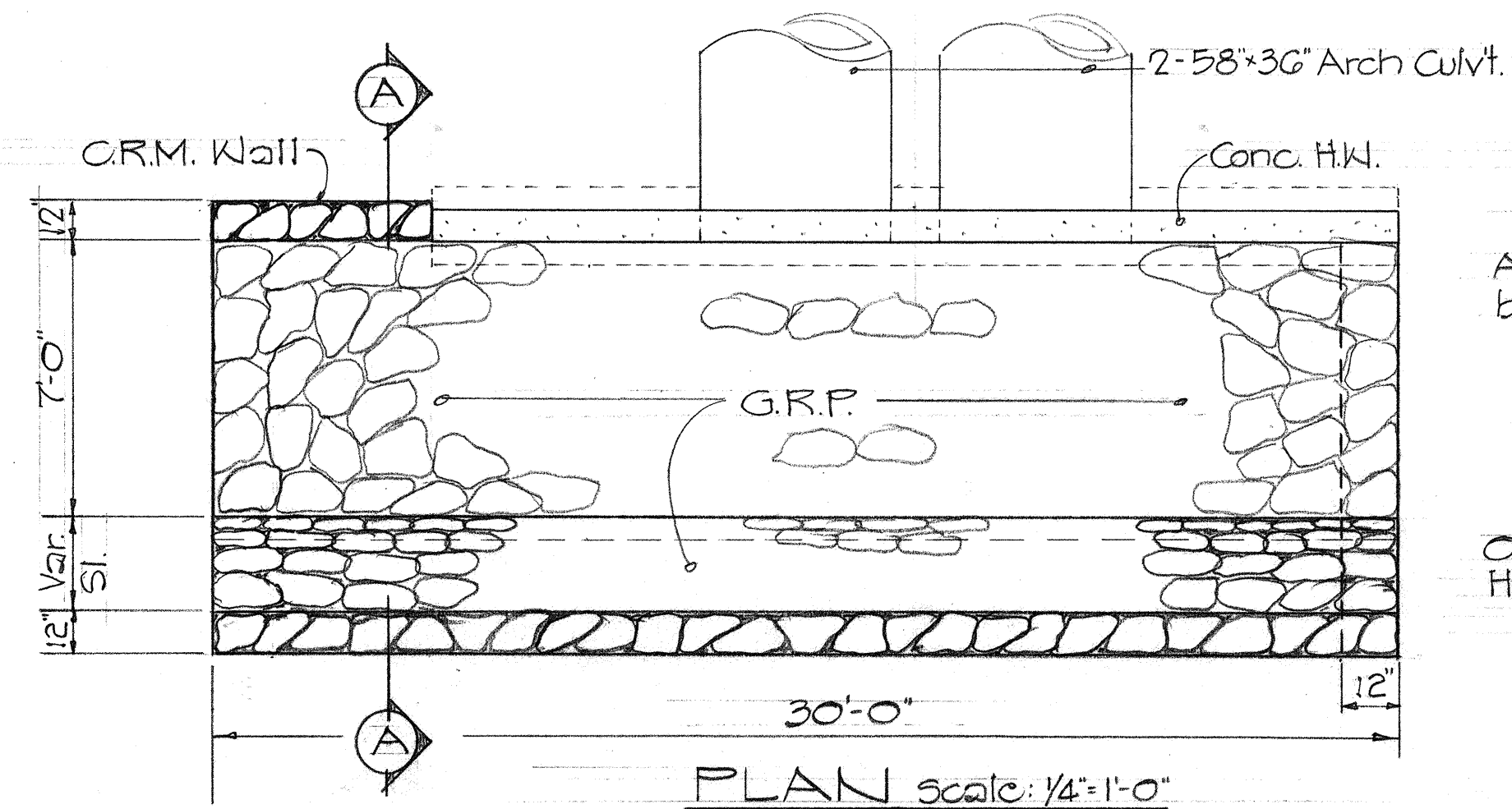


SECTION "B"-B
Scale: 3/8" = 1'-0"

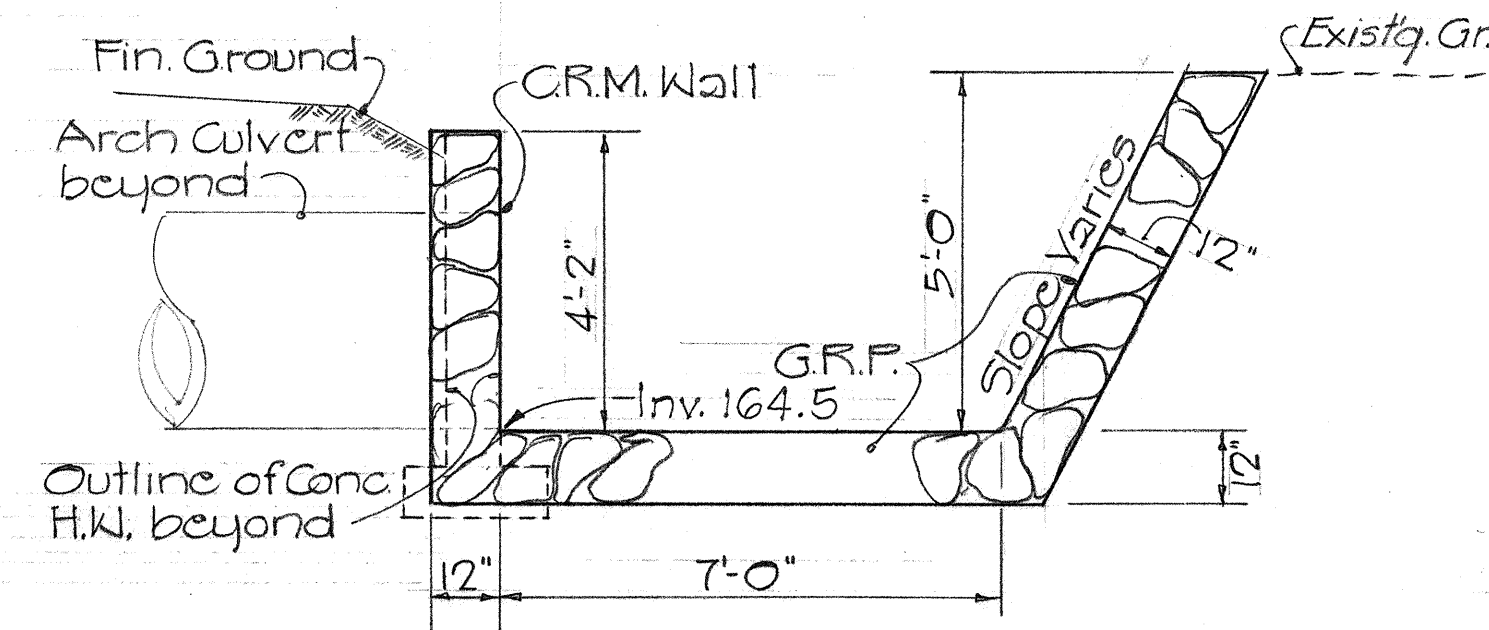
DETAILS ~ G.R.P. LINED DITCH FOR
CONCRETE GATE PROTECTION ~
STA. 23+35 1/2 TO 20' RT.

STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION
ROUTE 51: RICE STREET/ROUTE 51 JUNCTION TO AHUKINI ROAD
PROJ. No. DP-F-051-1(3)
MISC. DRAINAGE DETAILS
Scale: As Shown July 1973
SHEET No. 6 OF 16 SHEETS

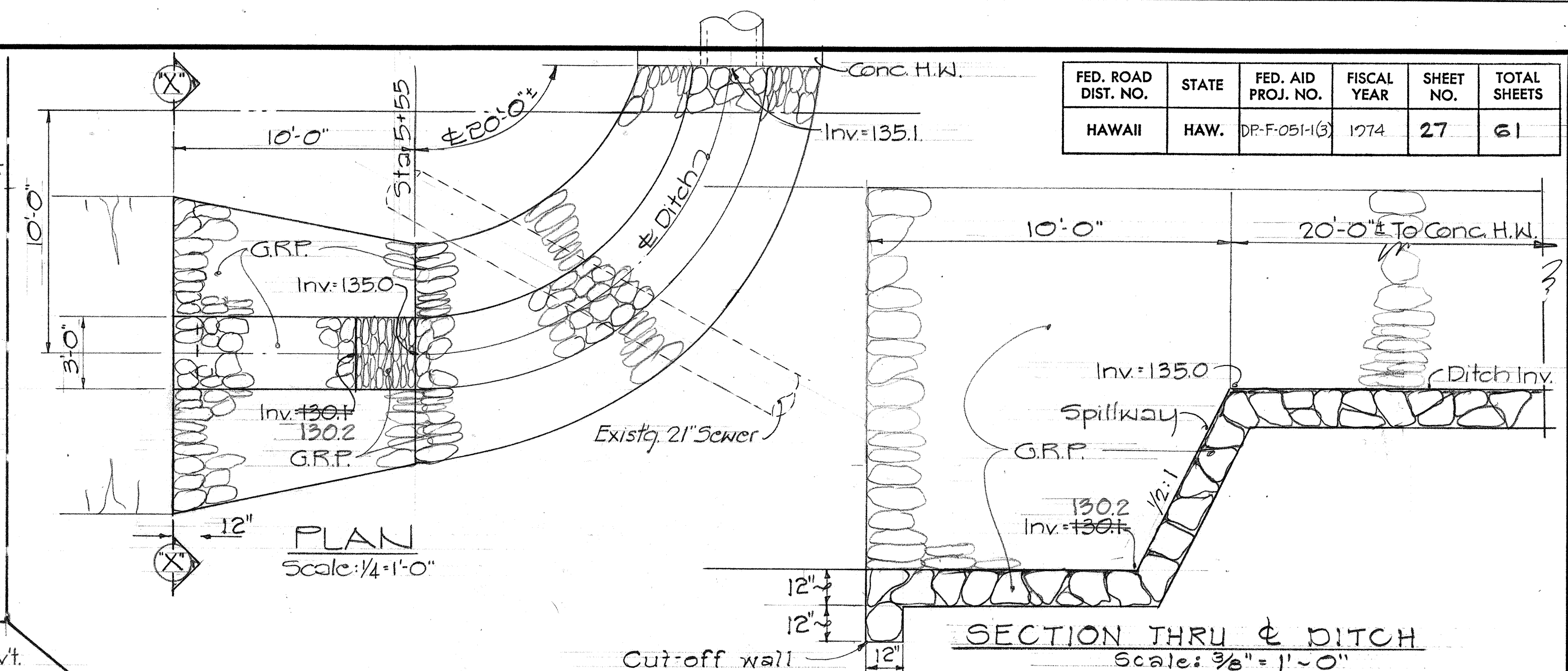
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	DP-F-051-(3)	1974	27	61



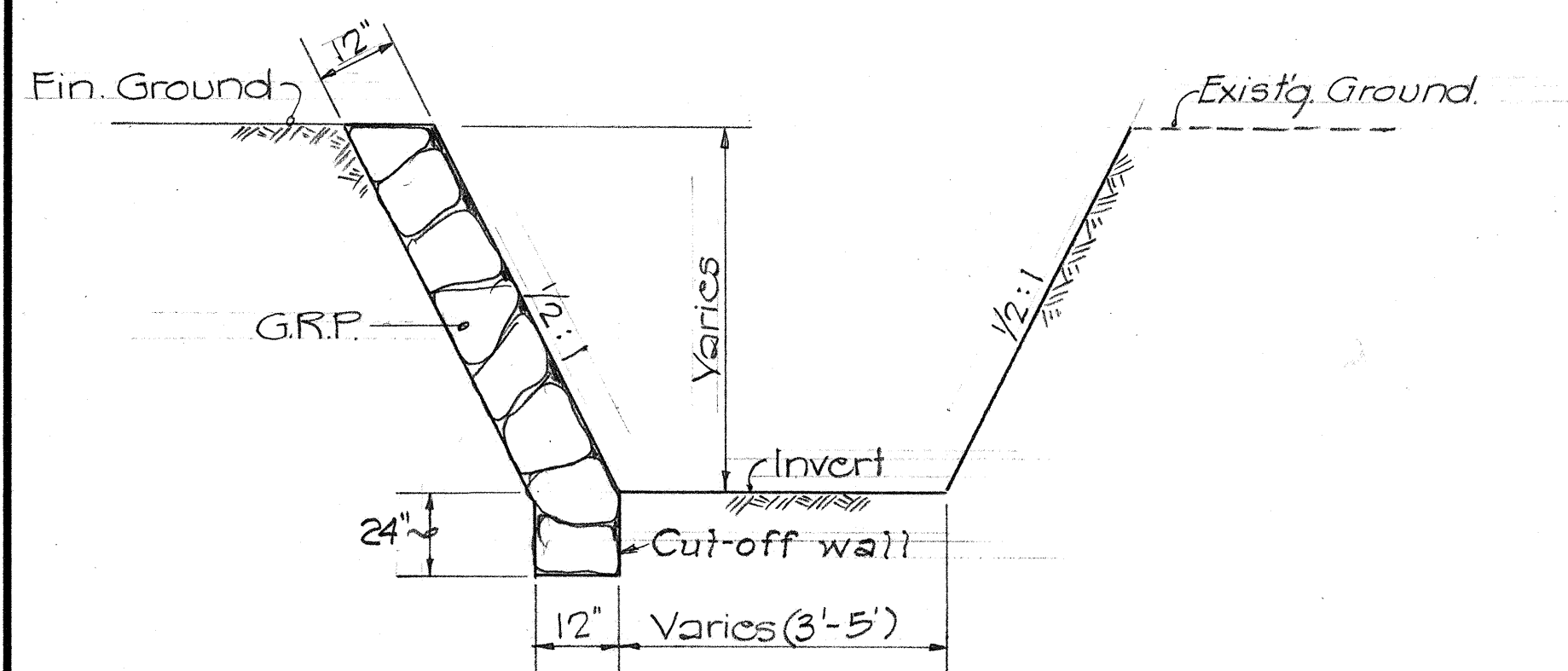
DETAILS ~ C.R.M. WALL & G.R.P. DITCH PROTECTION AT STA. 38+00 RT.



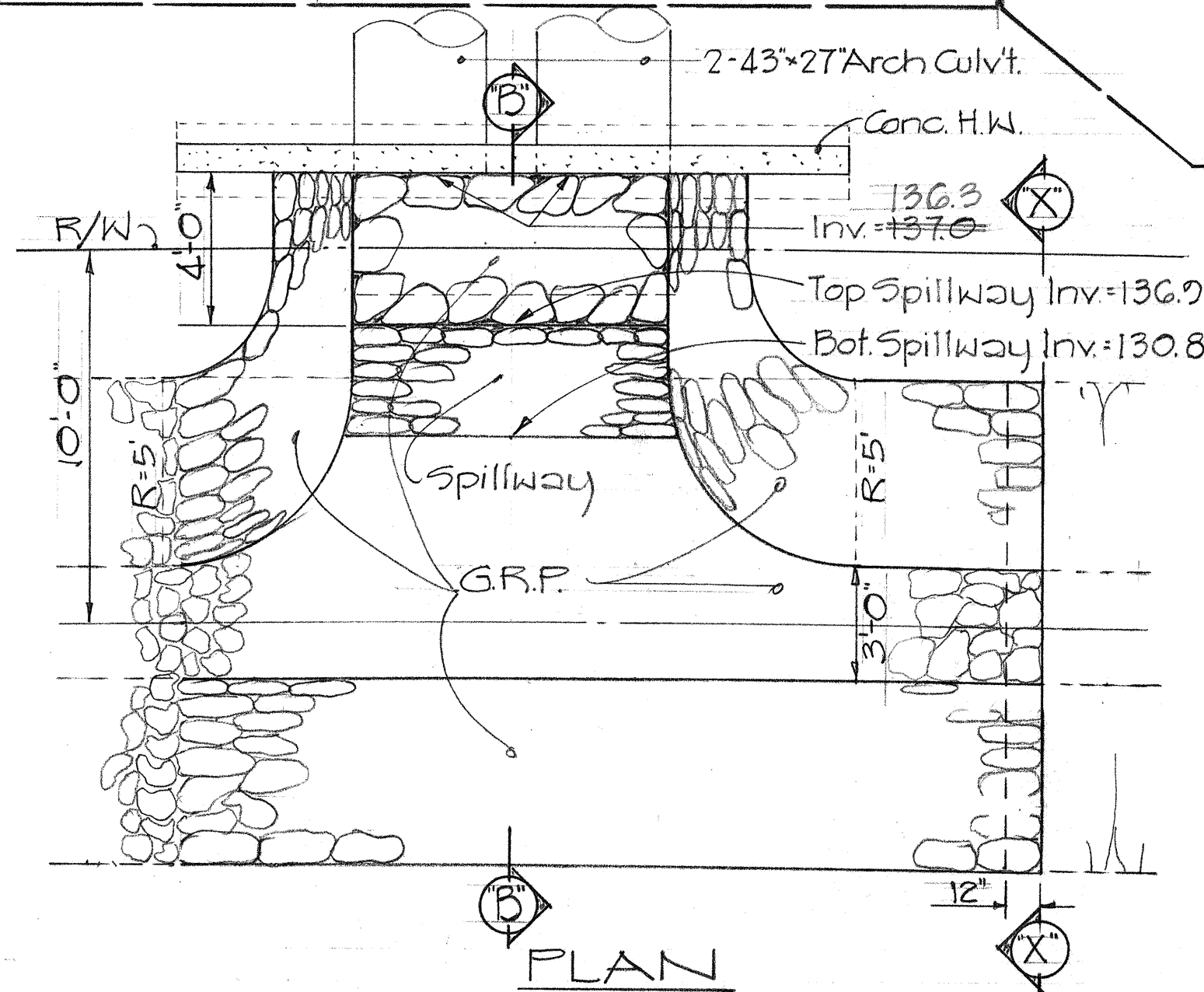
SECTION "A"- "A" scale: 3/8"=1'-0"



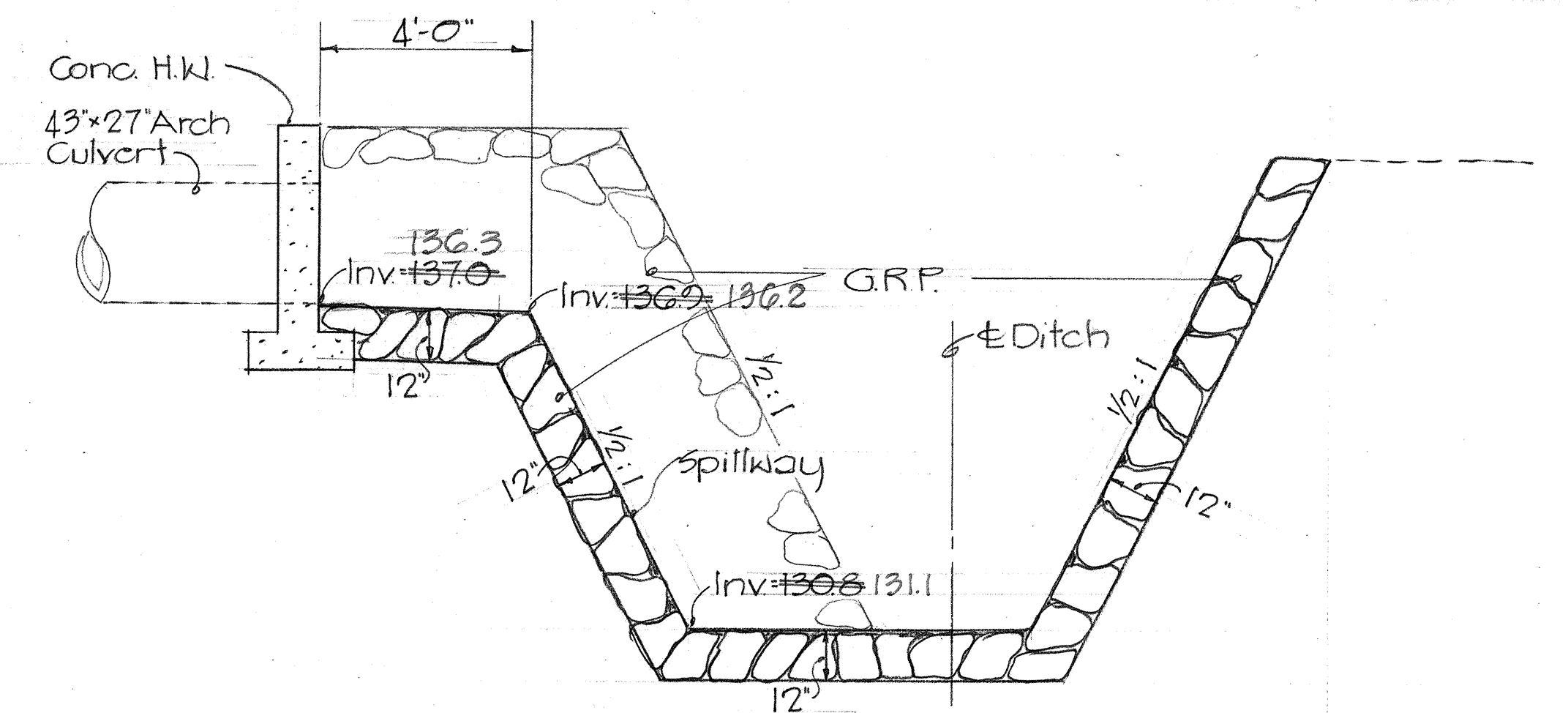
DETAILS ~ G.R.P. SPILLWAY ~ STA. 5+68 % 48 RT.



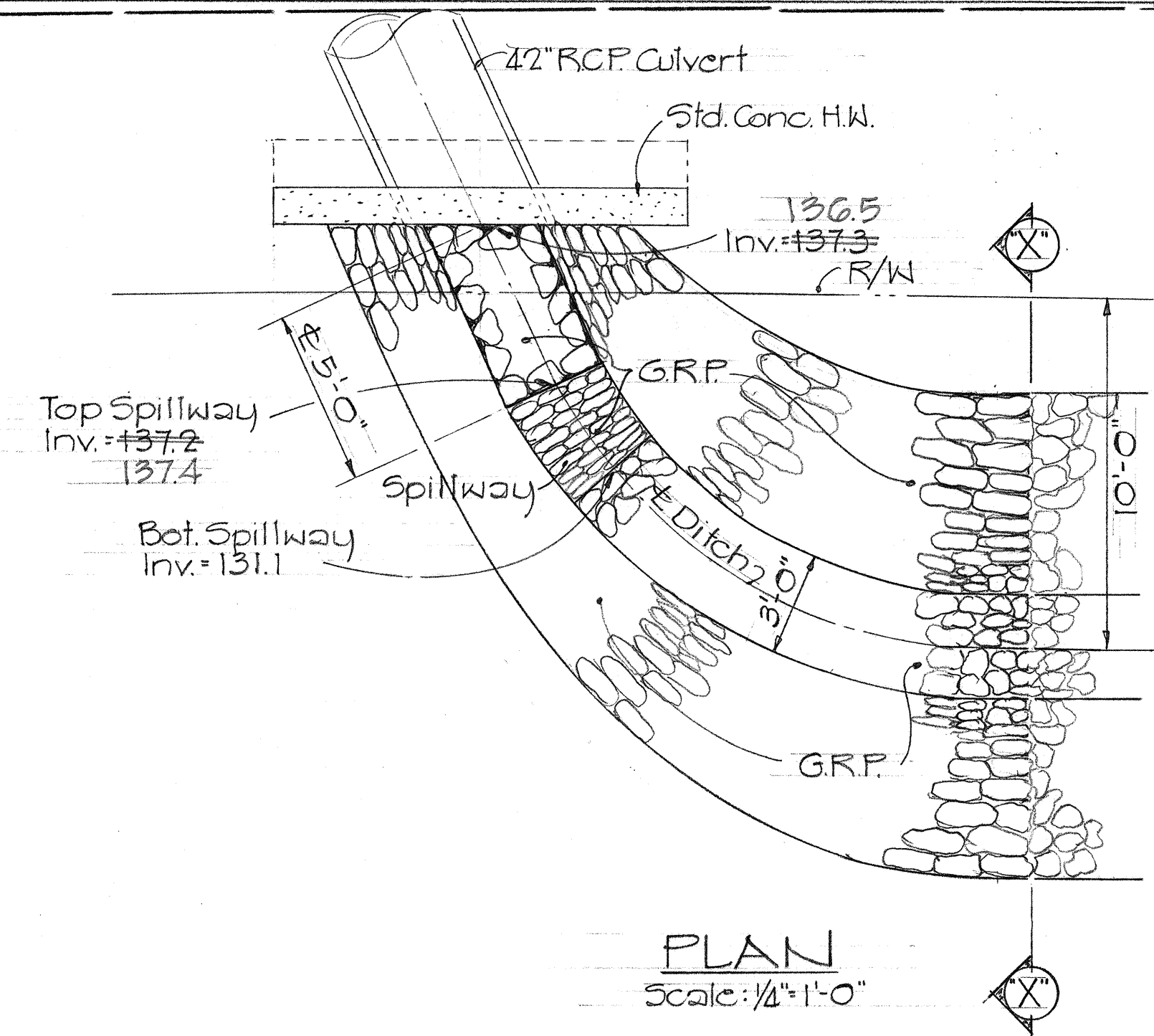
TYPICAL SECTION ~ CURVED DITCH SIDE
(OUTER) PROTECTION AT STA. 37+22 LT. Scale: 1/2" = 1'-0"



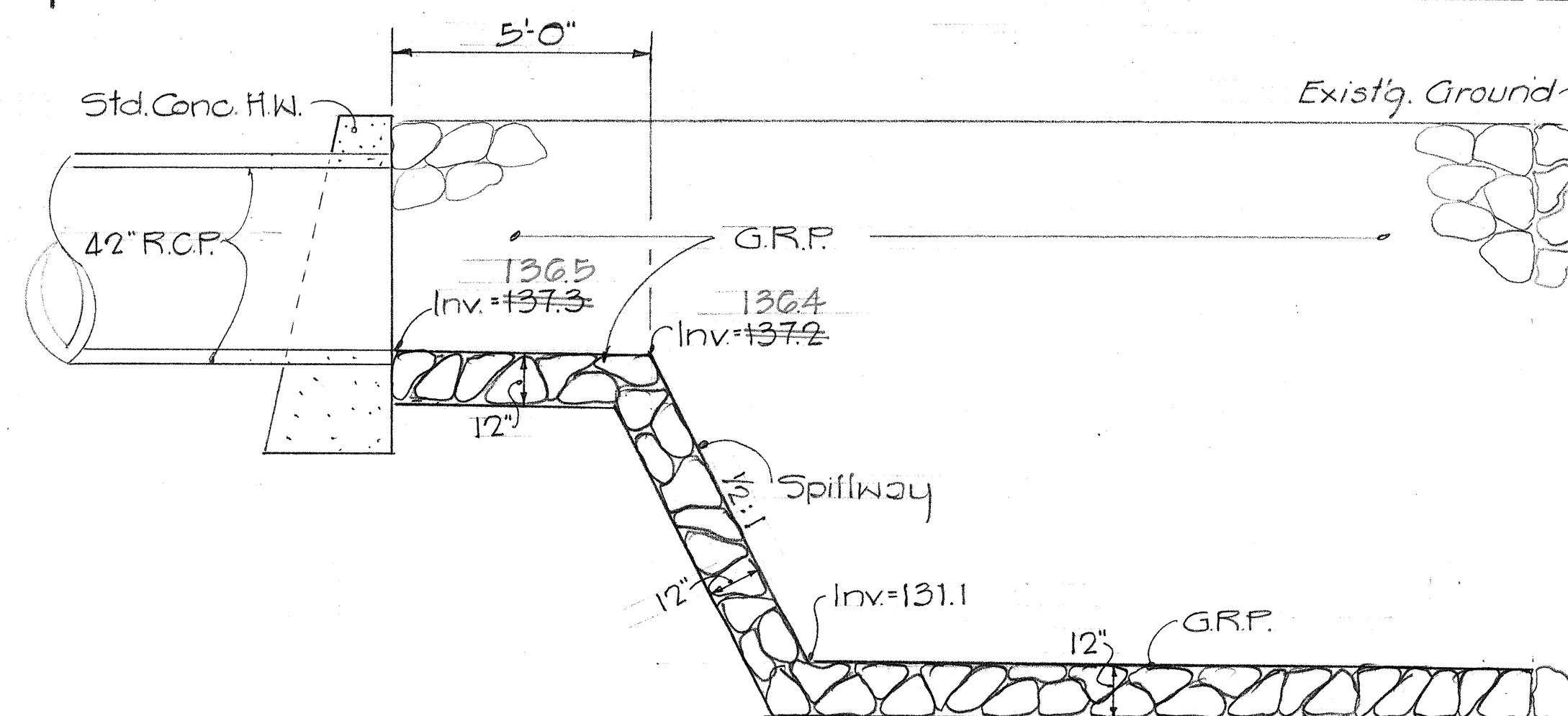
DETAILS ~ 2'-43" x 27" ARCH CULVERT OUTLET G.R.P. EROSION PROTECTION ~ STA. 1+52 % 58' RT.



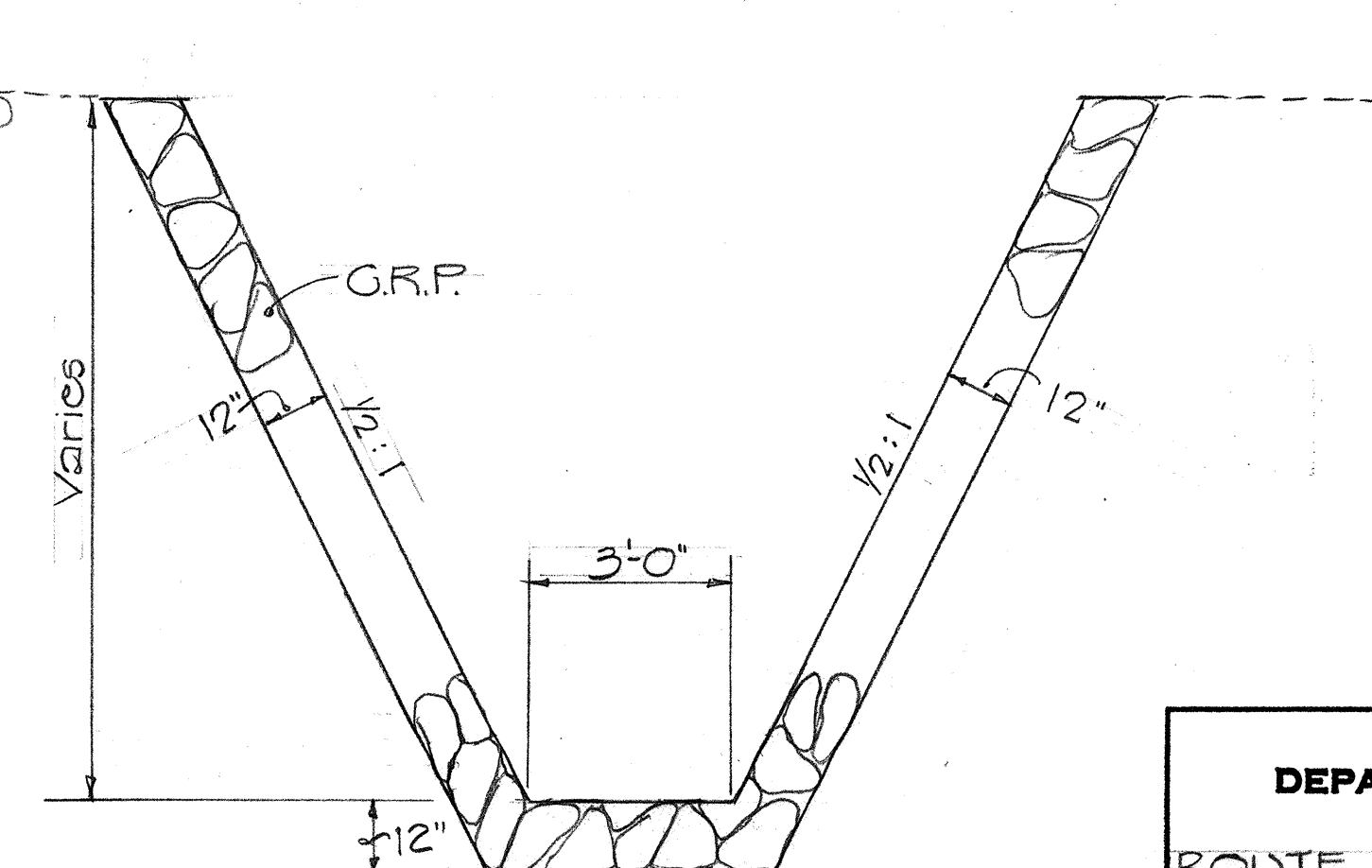
SECTION "B"- "B"
Scale: $\frac{3}{8} = 1'-0"$



DETAILS ~ 42" CULVERT OUTLET GR.P EROSION PROTECTION ~ STA. 0+99 %S 84' RT.



LONGITUDINAL SECTION THRU Φ DITCH
Scale: $\frac{3}{8}'' = 1'-0''$



SECTION "X"- "X"
Scale: $\frac{3}{8}" = 1'-0"$

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ROUTE 51: RICE STREET/ROUTE 51
JUNCTION TO AHUKINI ROAD

PROJ. No. DP-F-051-1(3)

MISC. DRAINAGE DETAILS

Scale: As Shown July 1973

SHEET No. 7 OF 16 SHEETS

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

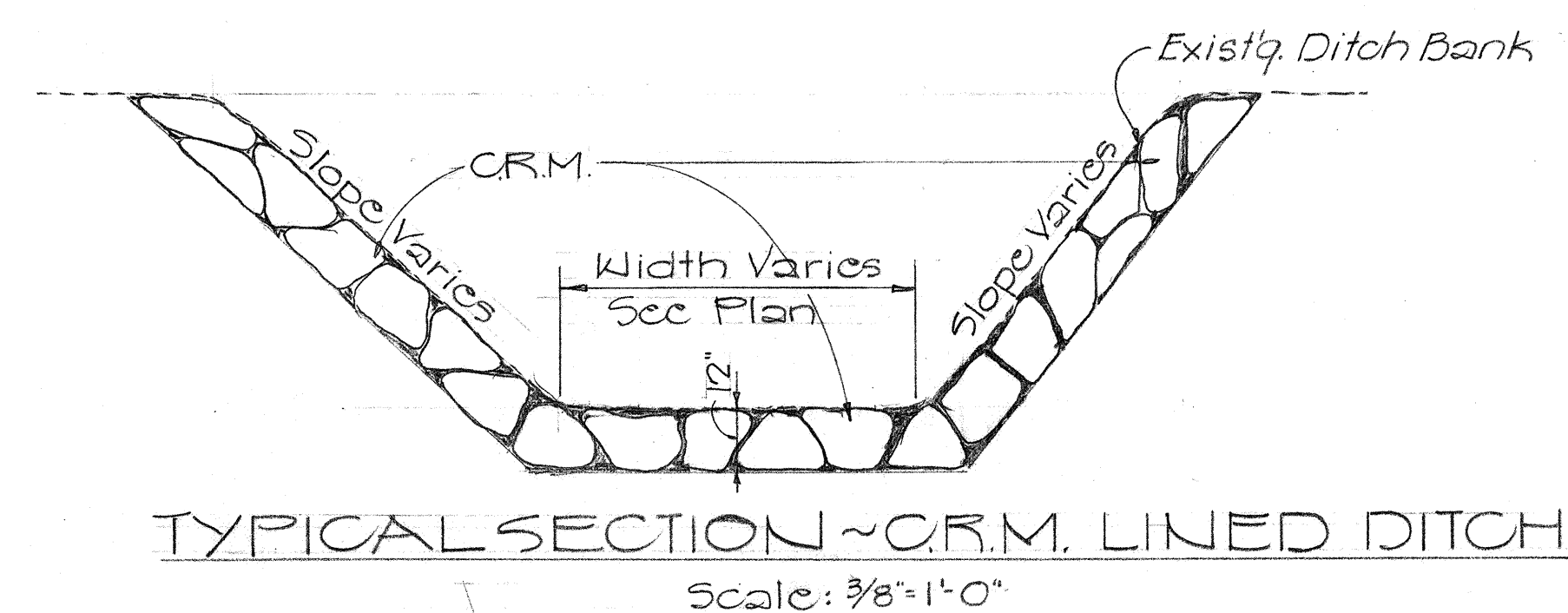
ROUTE 51: RICE STREET/ROUTE 51
JUNCTION TO AHUKINI ROAD

PROJ. No. DP-F-051-1(3)

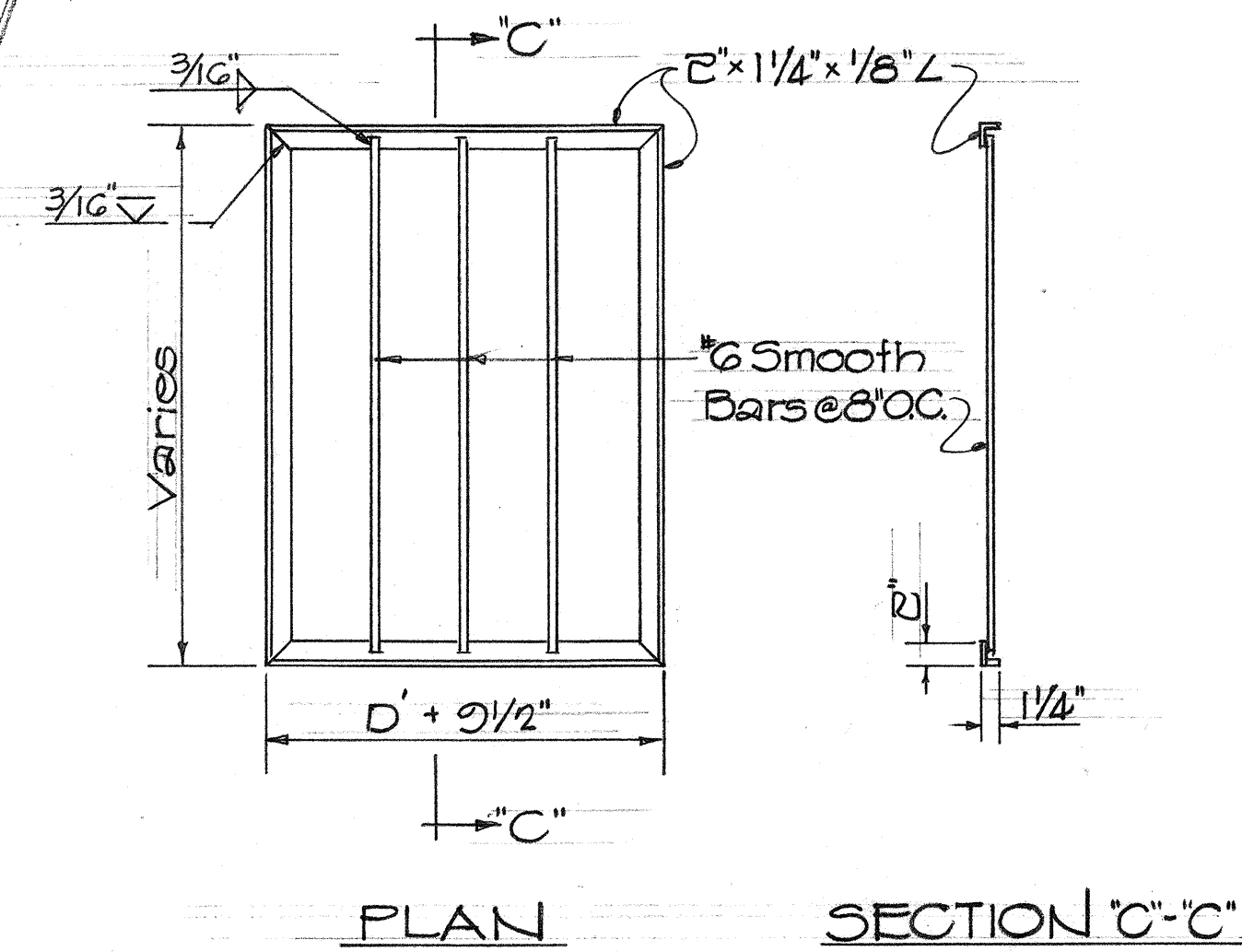
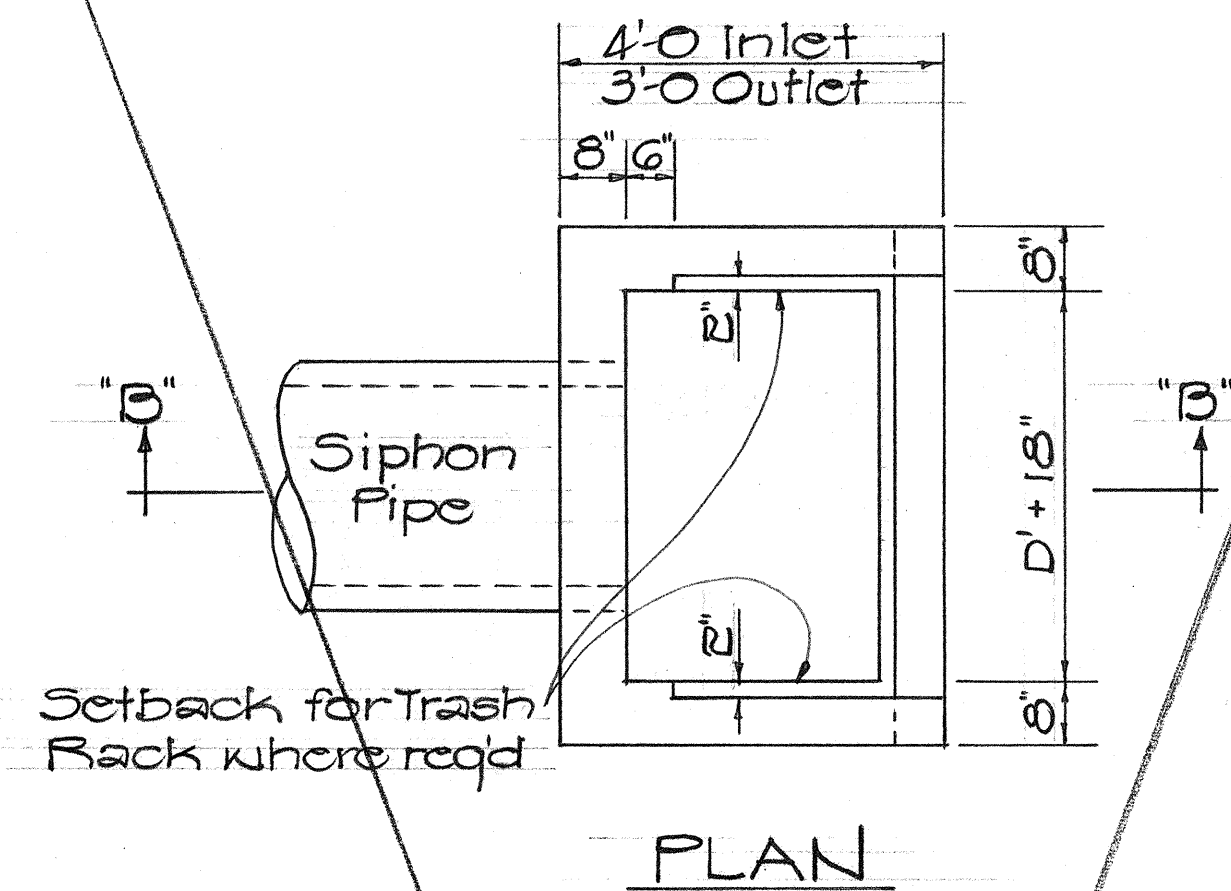
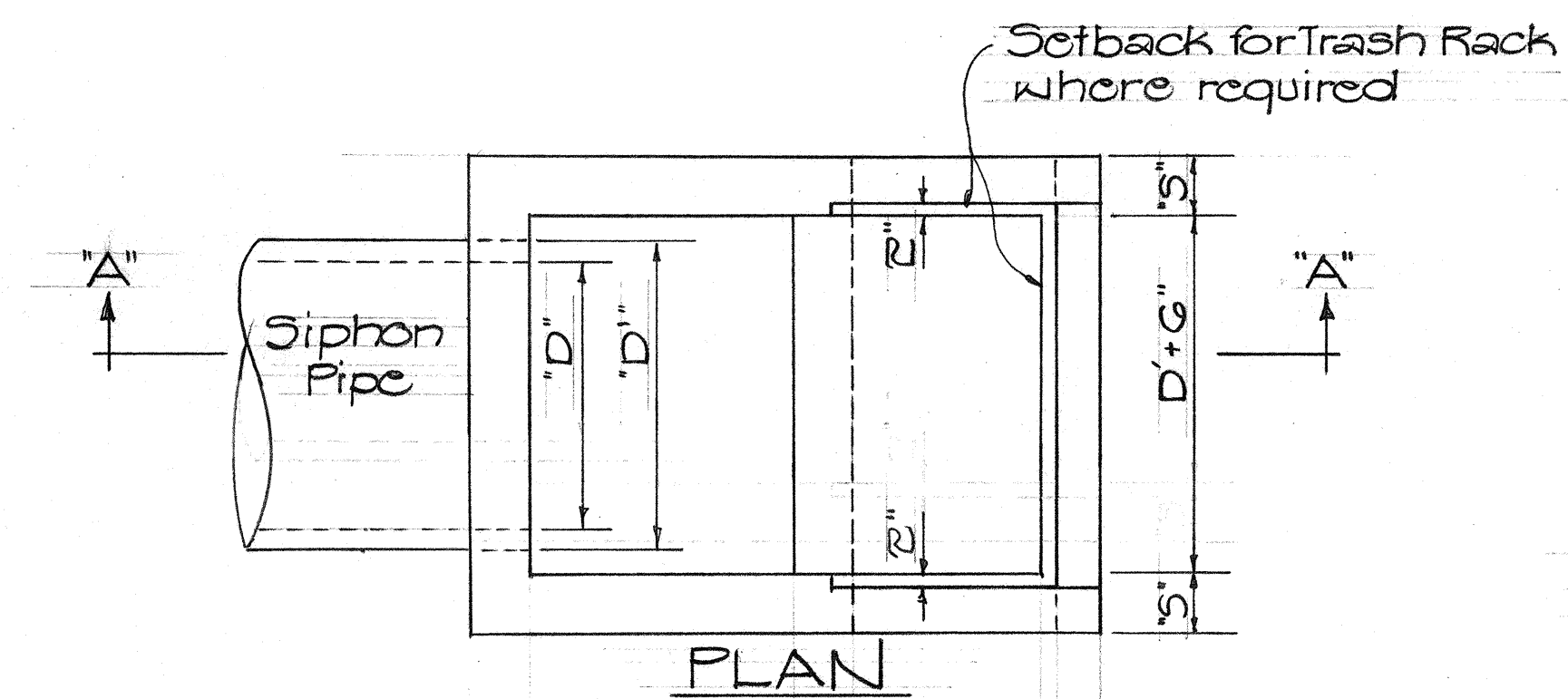
42 INCH SIPHON AT STA. 46+77.5

Scale: As Shown July 1973

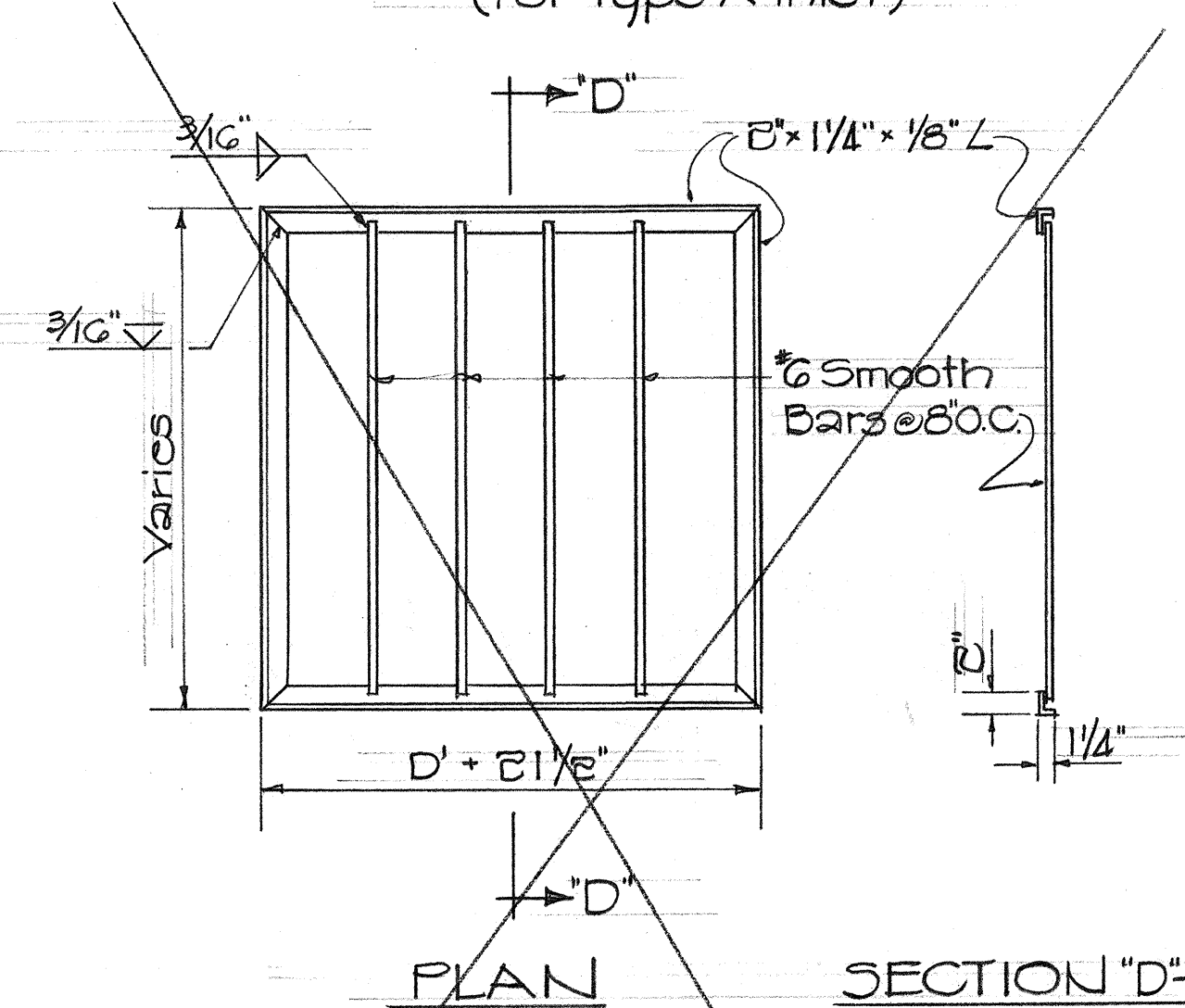
SHEET No. 8 OF 16 SHEETS



FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	DP-F-051-1(3)	1974	29	61

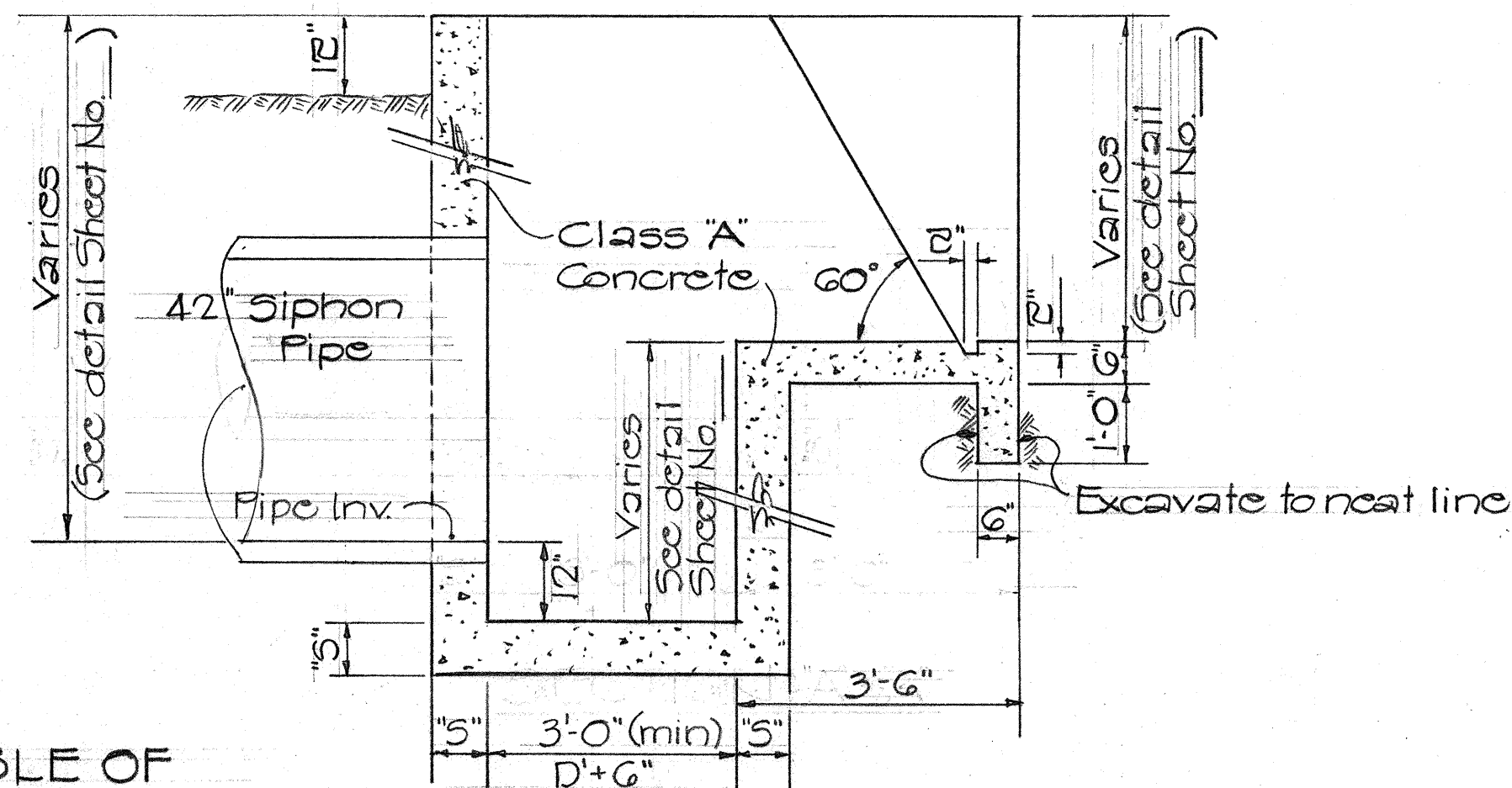


TYPE A TRASH RACK
(For Type 'A' Inlet)

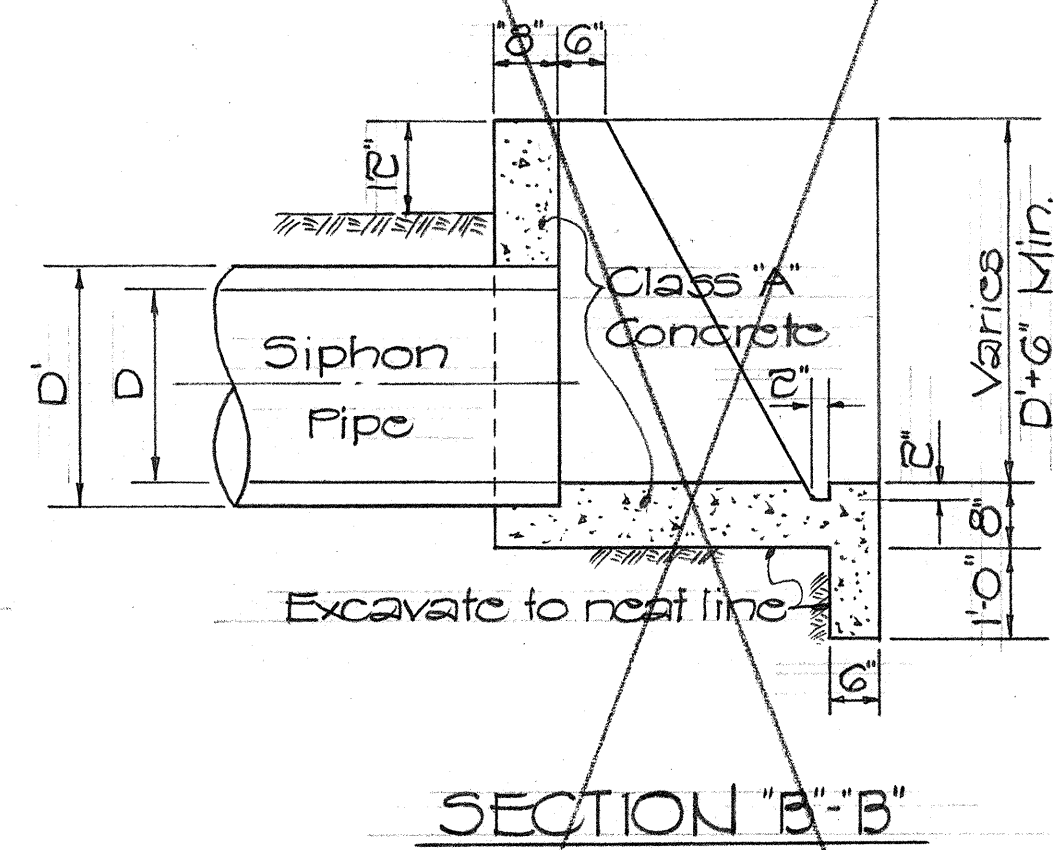


TYPE B TRASH RACK
(For Type 'B' Inlet)

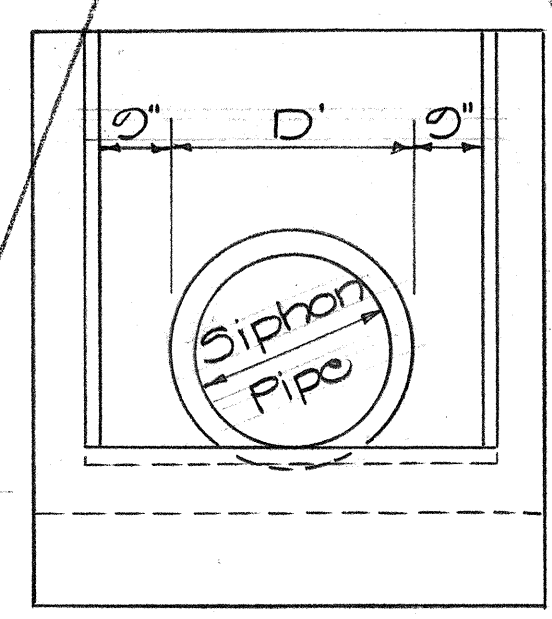
TRASH RACK DETAIL FOR SIPHON INLET
Scale: 3/4" = 1'-0"



SECTION "A-A"



SECTION "B-B"



ELEVATION

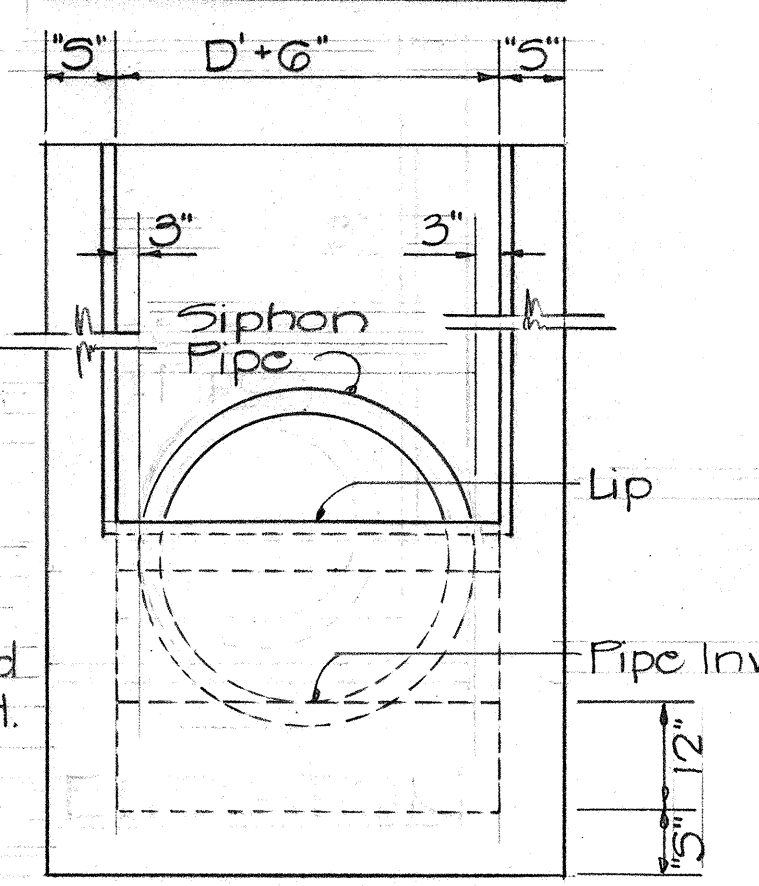
Note:
Siphon outlet
similar except no
Trash Rack required

DETAILS OF TYPE "B" SIPHON INLET & OUTLET
Scale: 1/2" = 1'-0"

TABLE OF
WALL THICKNESS

"D"	"S"	D'
in.	in.	in.
24"	8"	30"
30"	9"	37"
36"	9"	44"
42"	9"	51"

Notes:
1. Siphon Outlet similar except no Trash Rack are required
2. M.H. rungs (16" OC) are required when depth of siphon box is greater than 4'-6". Only one rung (12" from bottom) is required if depth is 4'-6" or less. The M.H. rungs may be placed at any location as ordered by the Engineer.

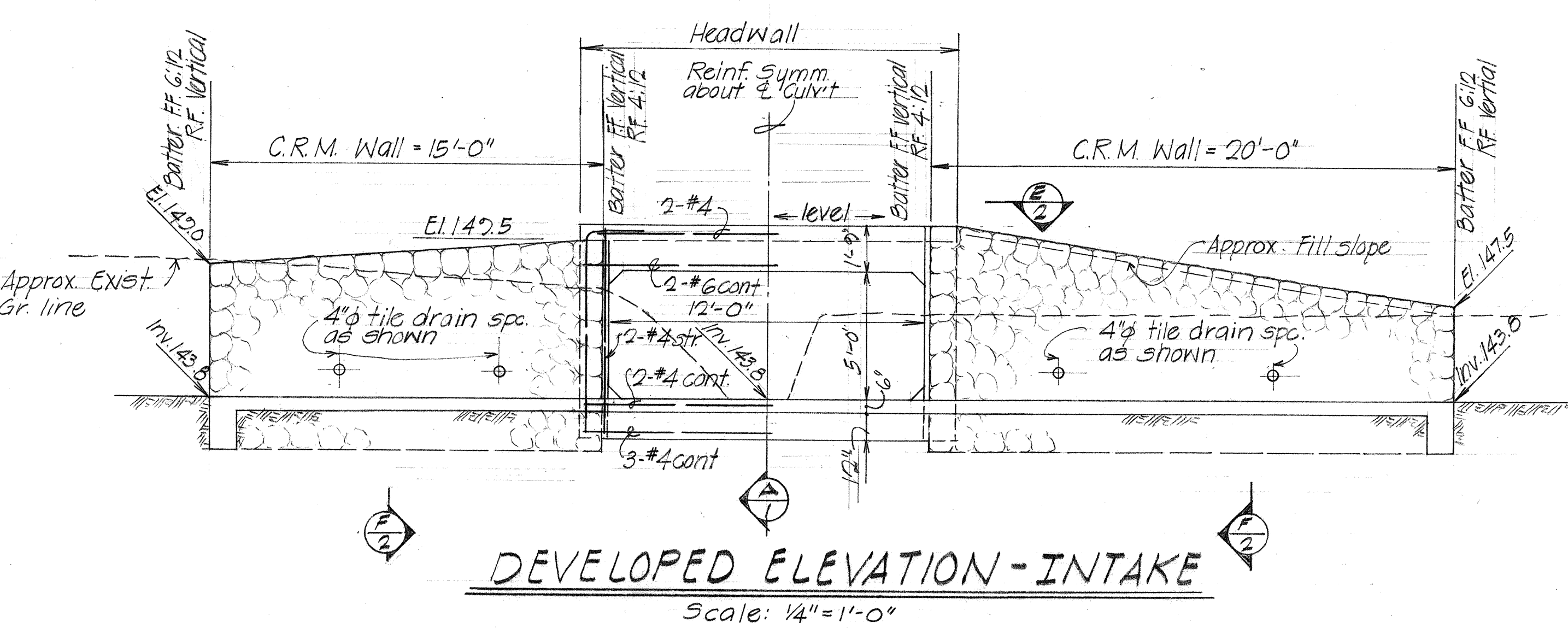
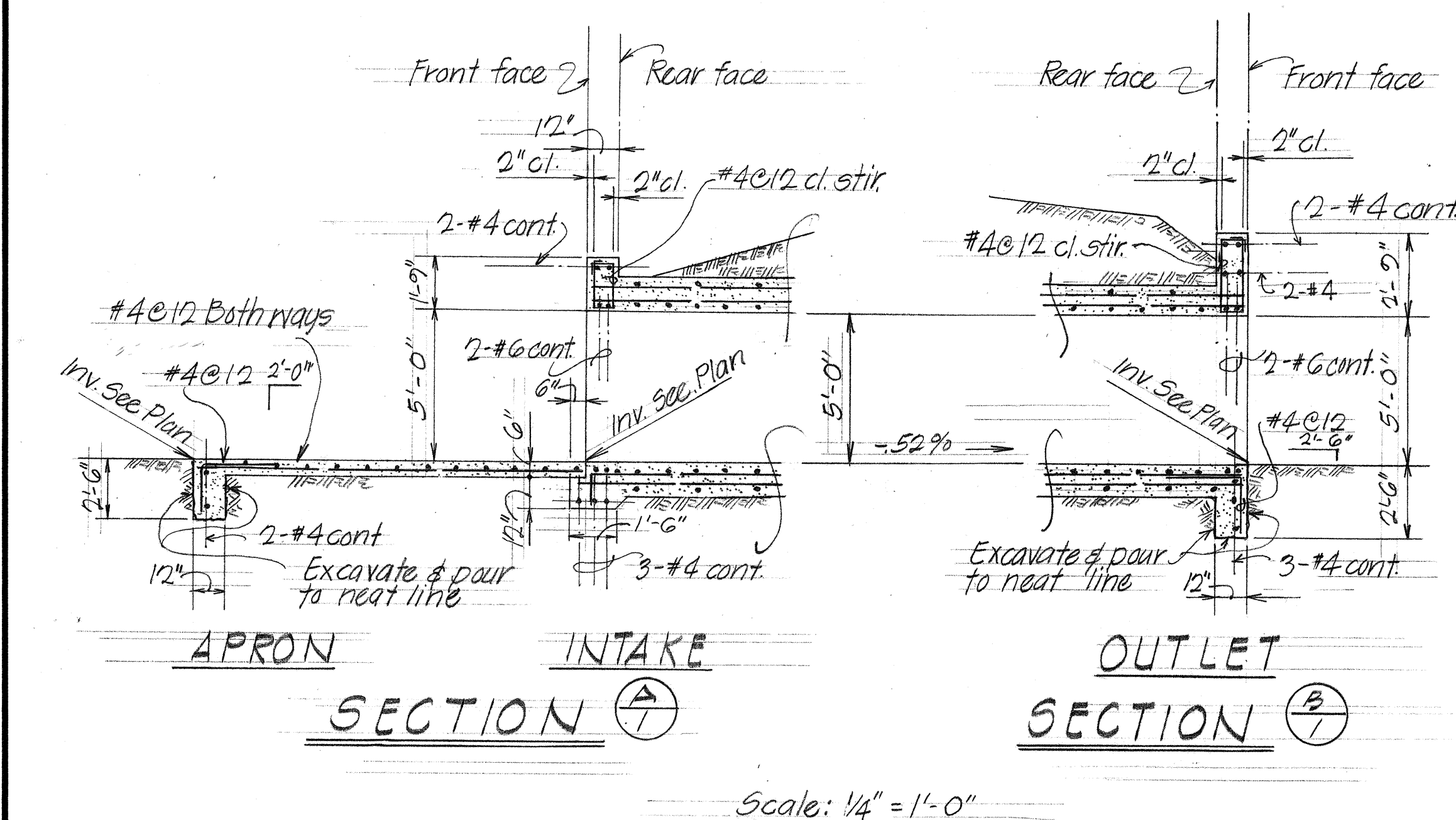
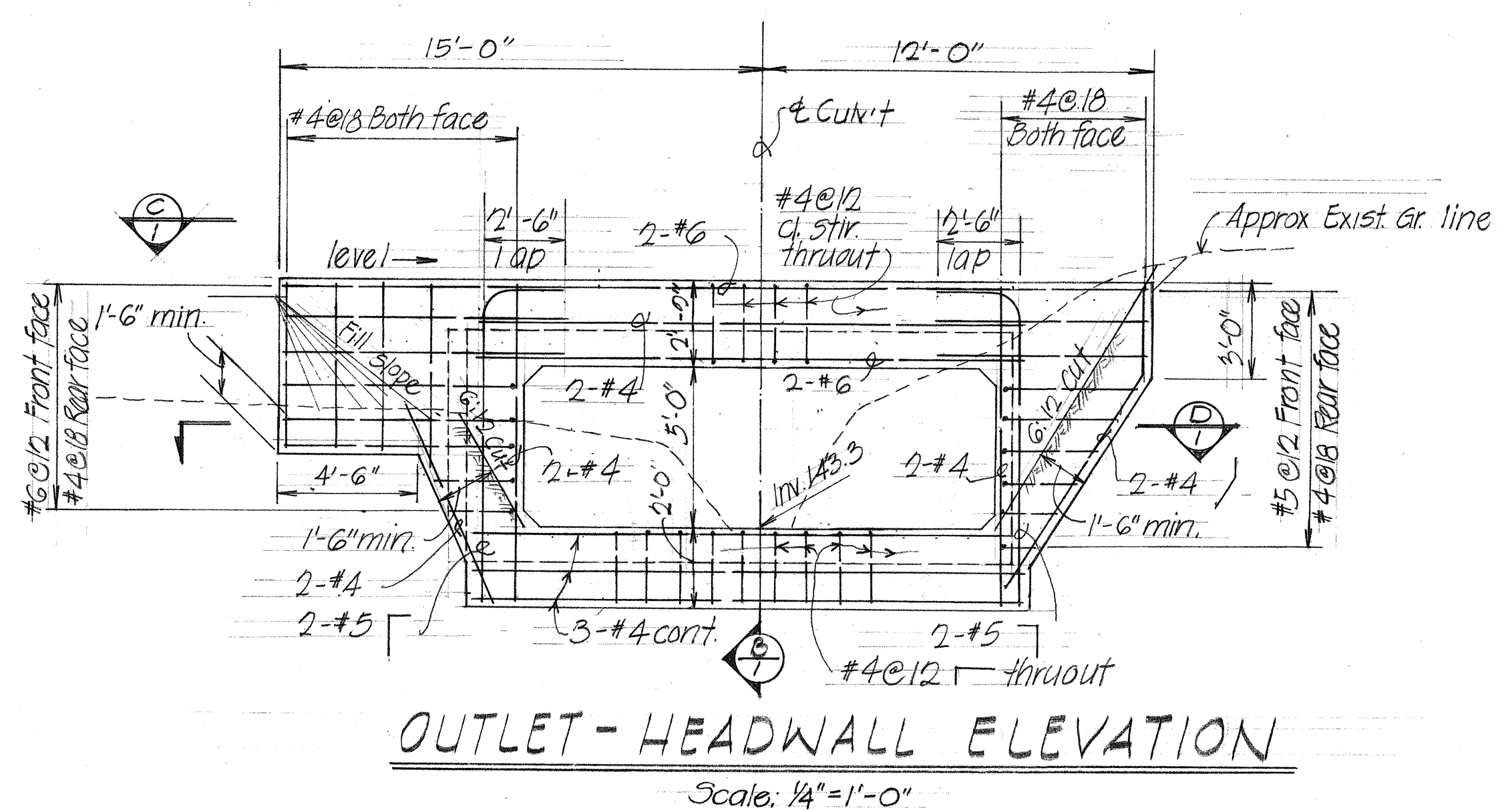
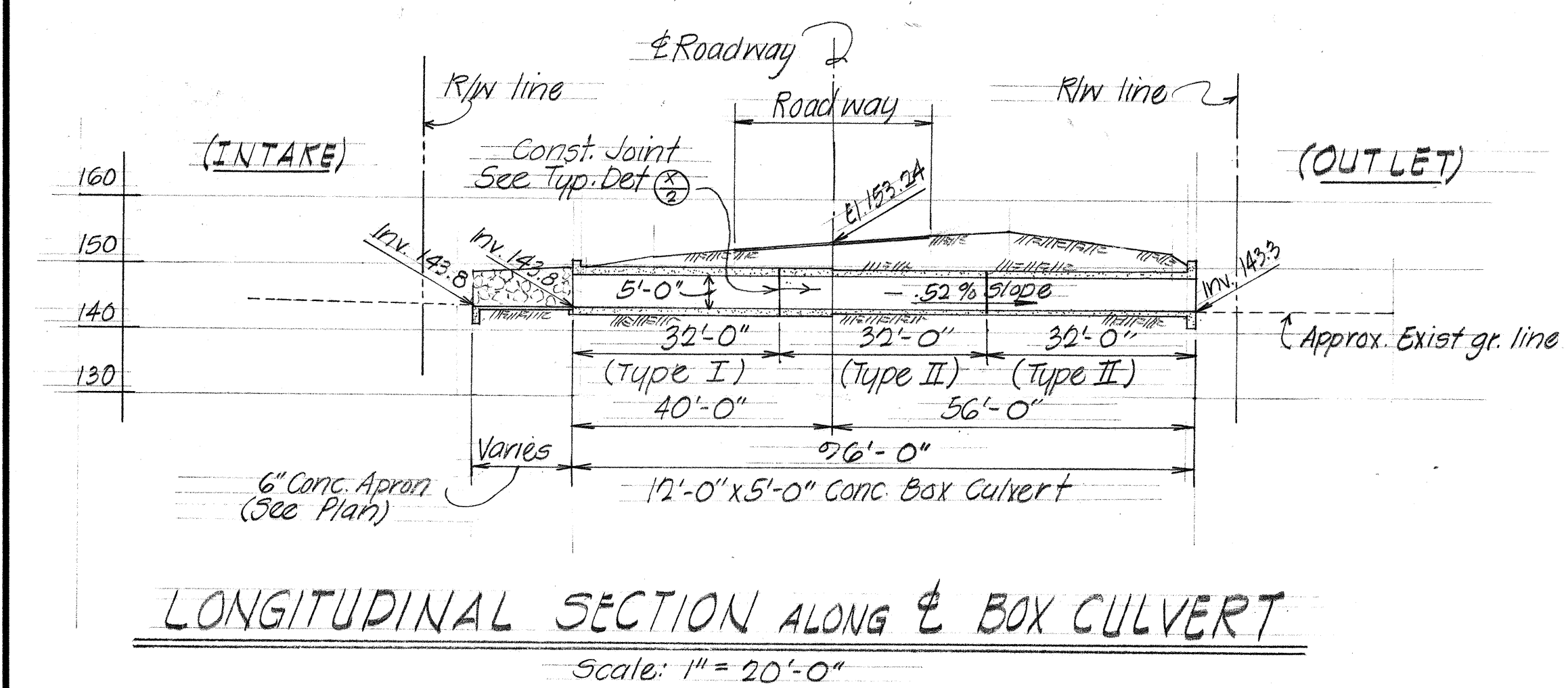
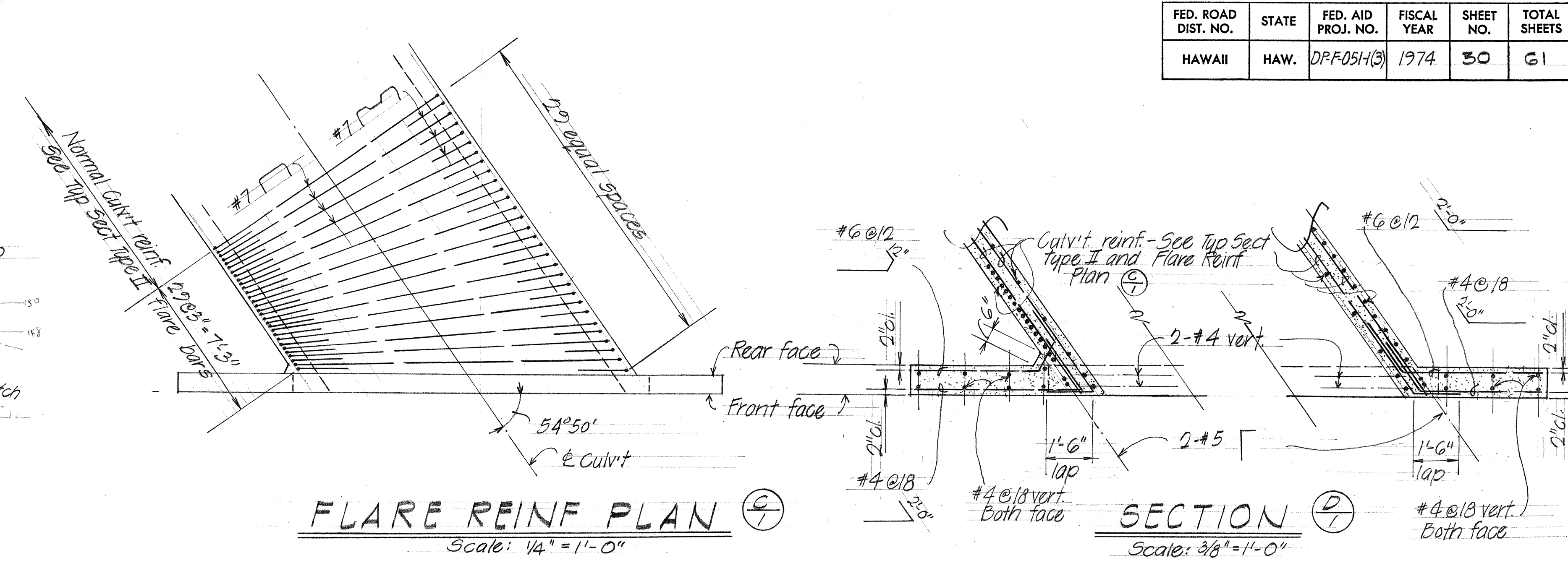
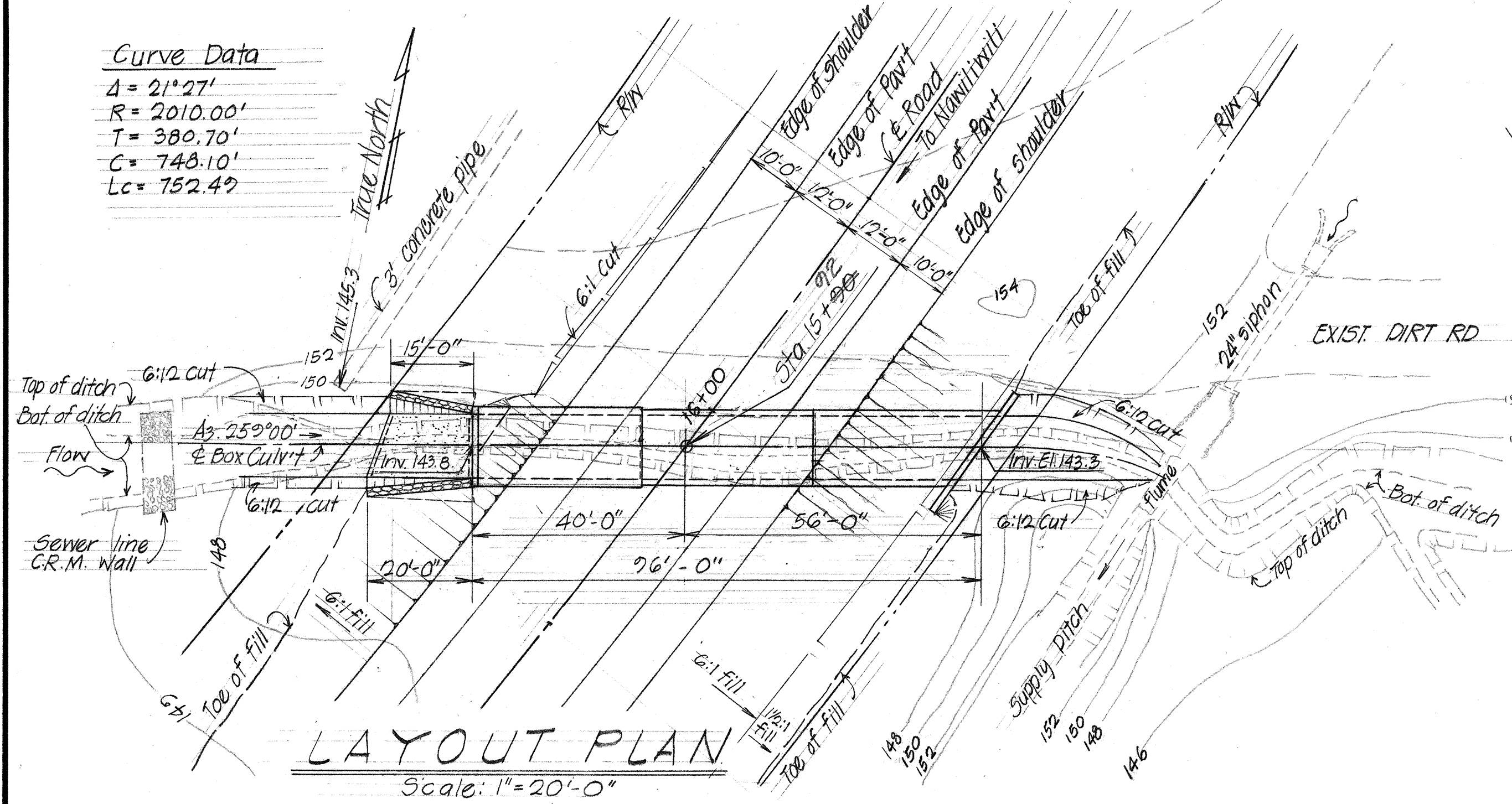


ELEVATION

DETAILS OF TYPE "A" SIPHON INLET & OUTLET
Scale: 1/2" = 1'-0"

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
ROUTE 51: RICE STREET/ROUTE 51
JUNCTION TO AHUKINI ROAD
PROJ. No. DP-F-051-1(3)
SIPHON DETAILS
Scale: As Shown July 1973
SHEET No. 29 OF 16 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	DPF-051(3)	1974	30	61

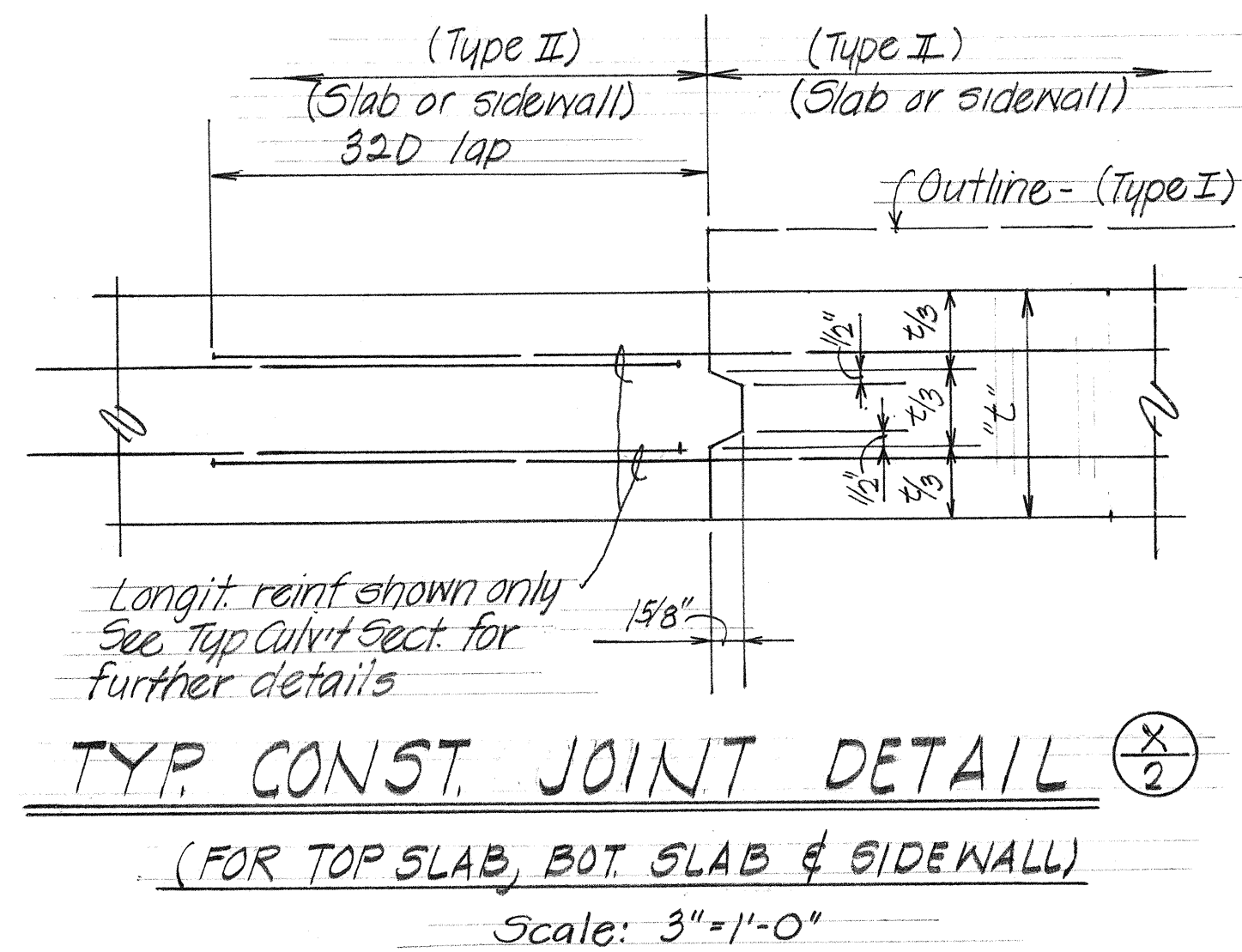
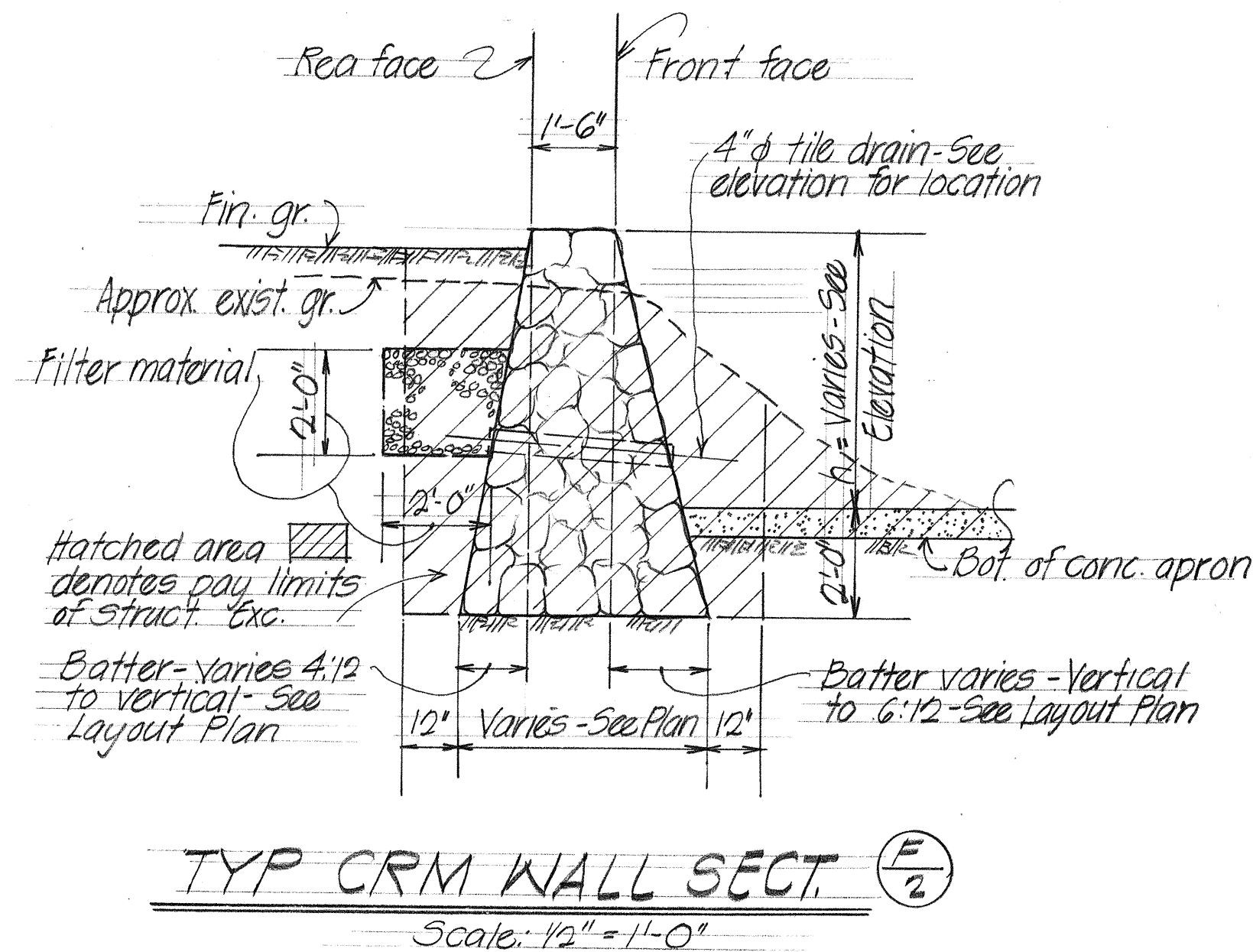
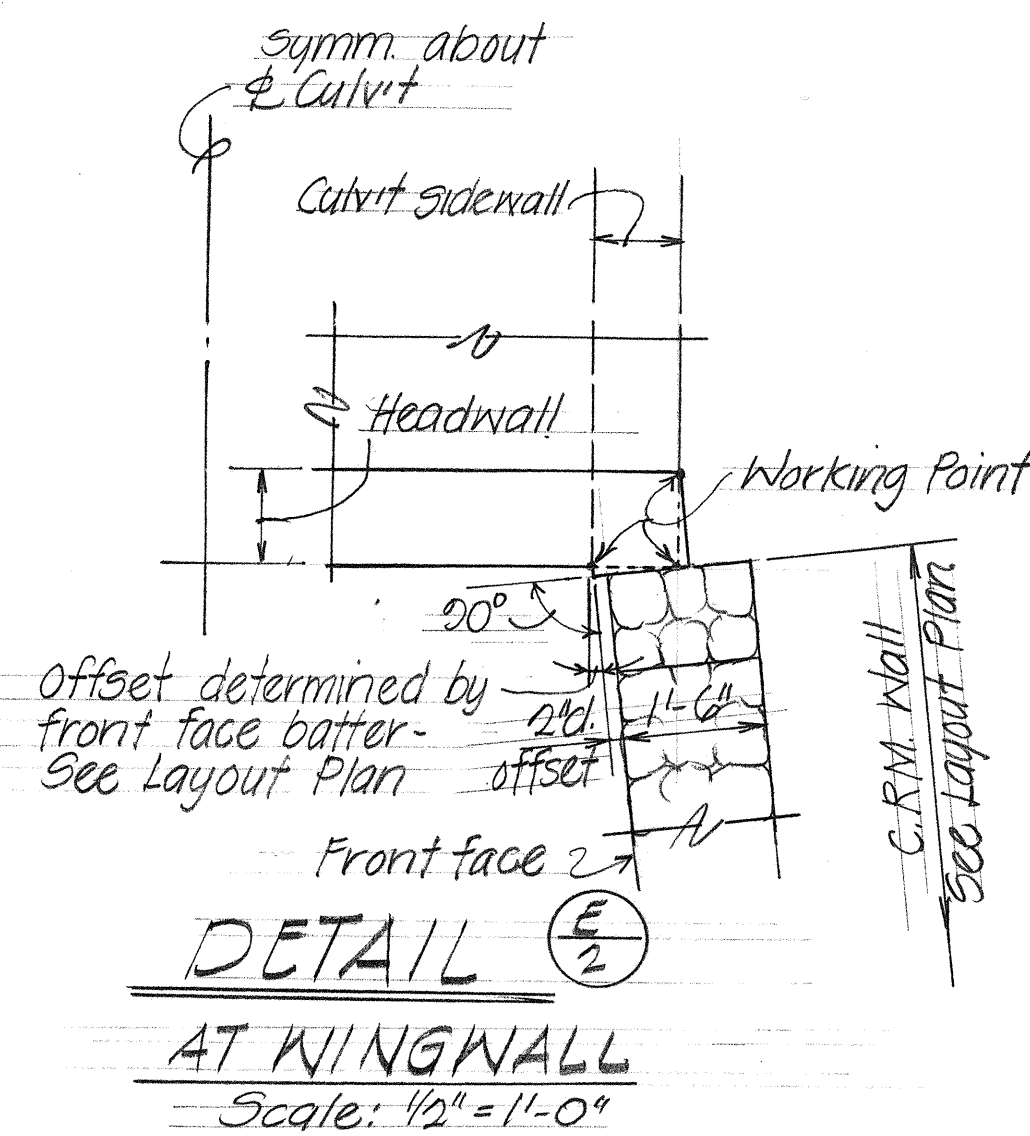
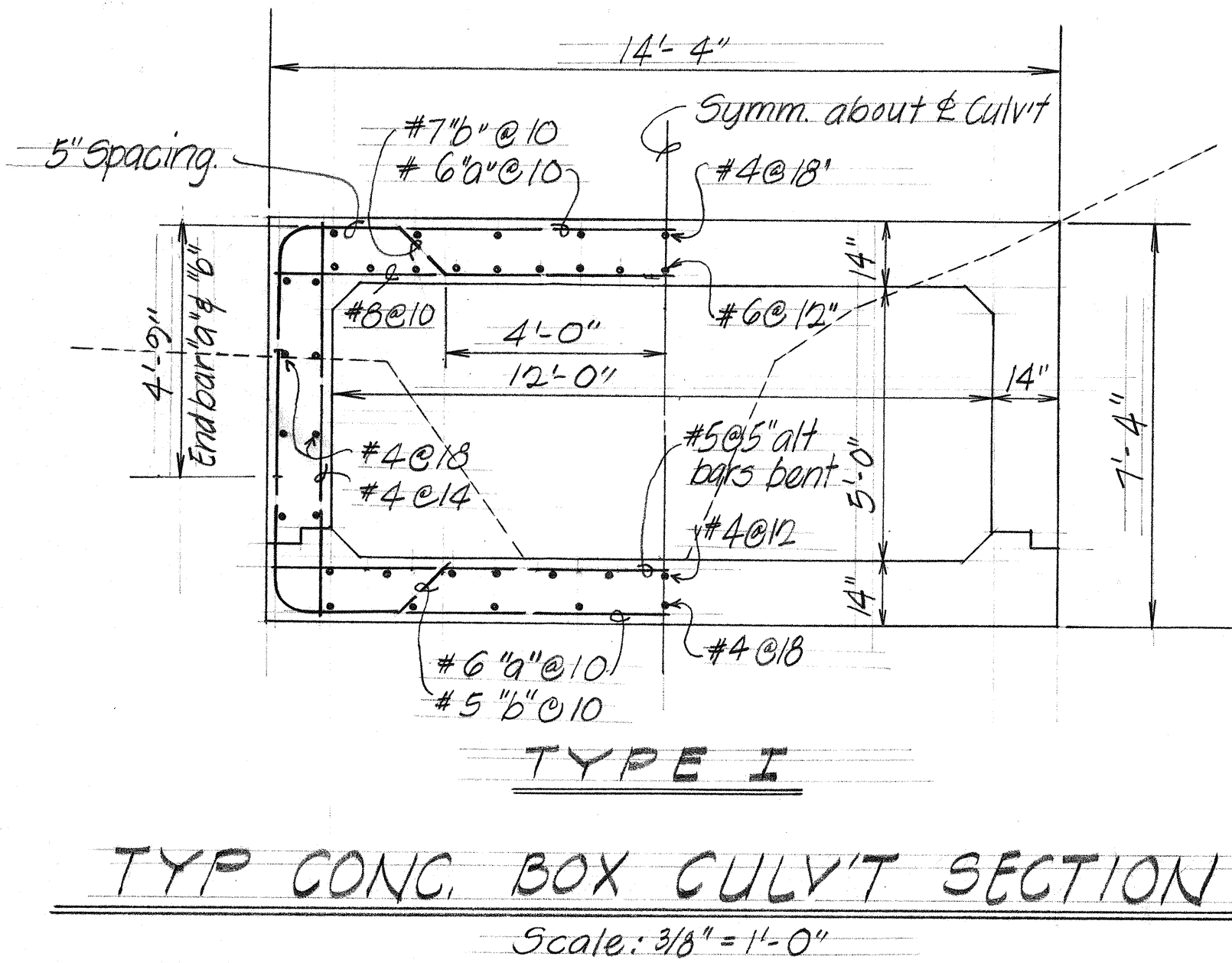
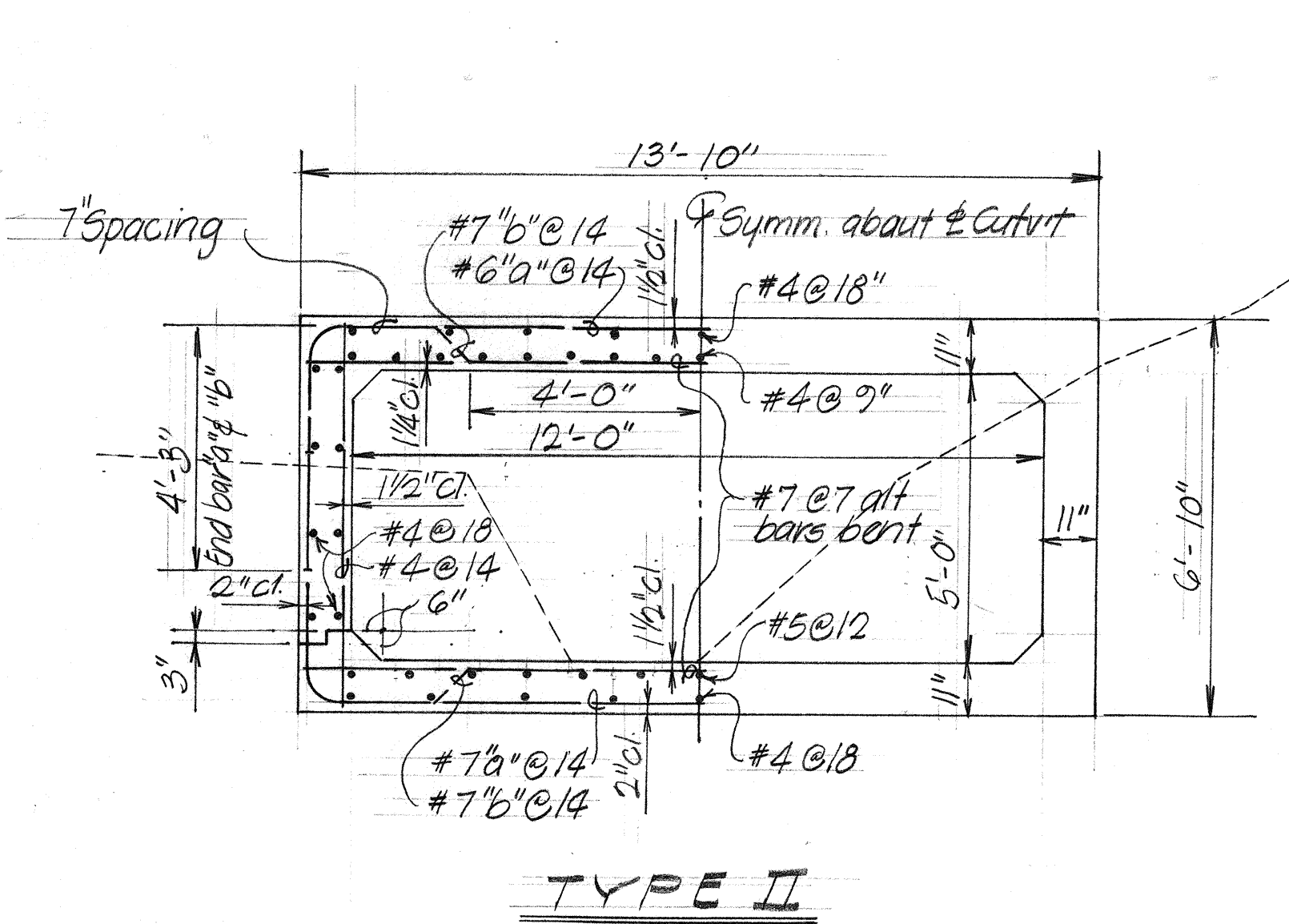


STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

12'-0" x 5'-0" BOX CULVERT
STA. 15+72
Proj N^o DPF-051-(3)
DEC. 1973
SHEET No. 10 OF 16 SHEETS

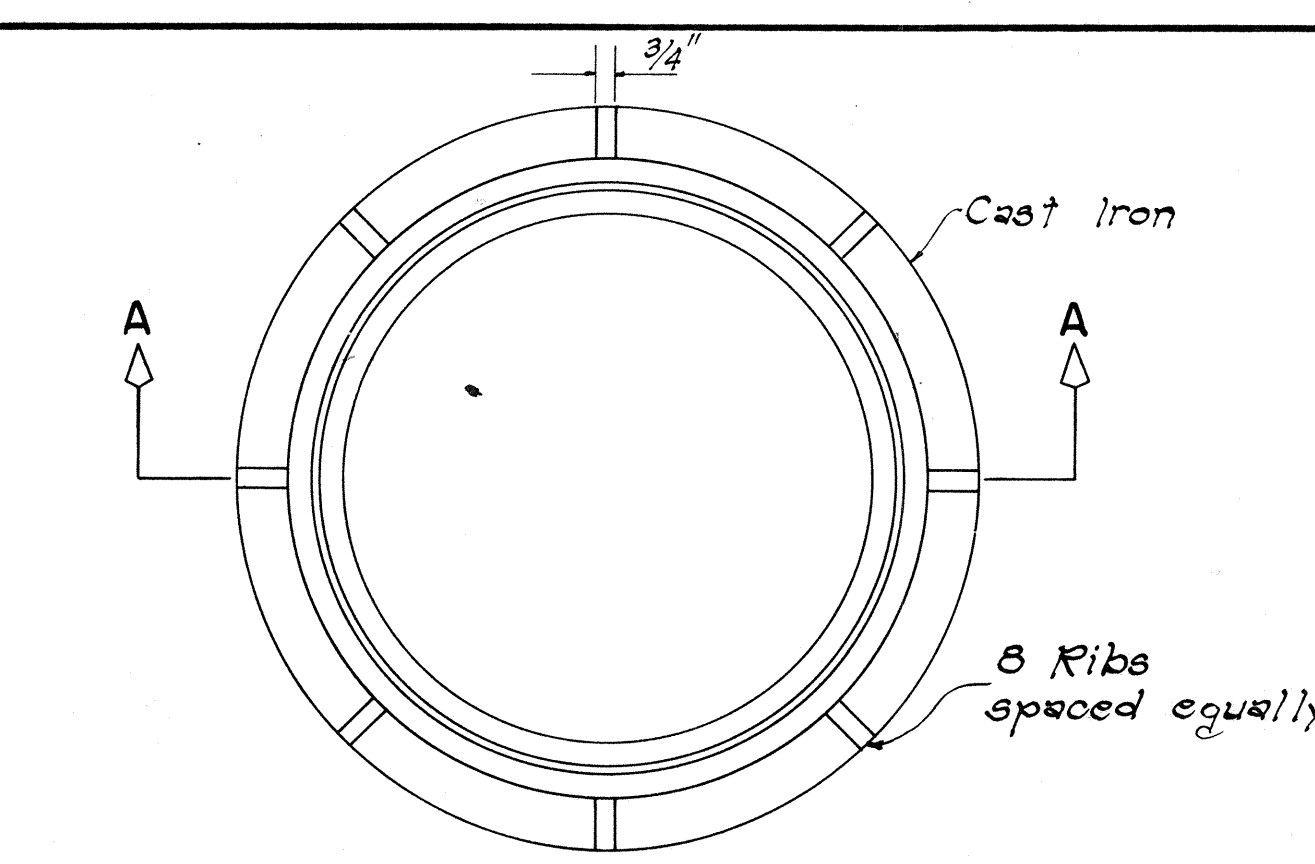
DATE	
SURVEY PLANNED BY	
DRAWN BY	
DESIGNED BY	
CHECKED BY	
NOTE BOOK	
No.	

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	DP-F-051-13	1974	31	61

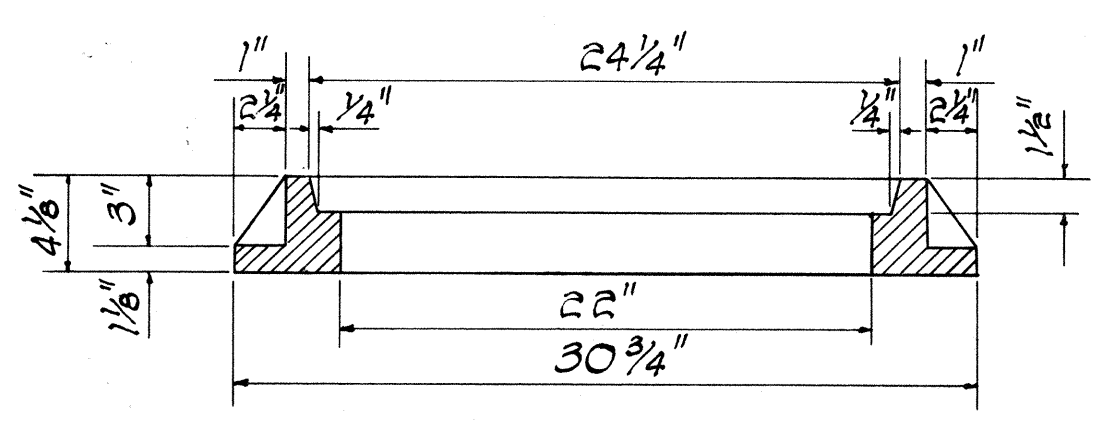


ESTIMATED QUANTITIES		STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION	
ITEM	QUANTITY	12'-0" x 5'-0" BOX CULVERT	
Concrete	147 c.y.	STA. 15+02	
Reinf. Steel	25,000 lbs	Proj No DP-F-051-(3)	
Struct. Exc.	320 c.y.	DEC. 1973	
Channel Exc.	65 c.y.	SHEET NO. 11 OF 16 SHEETS	
C.R.M.	43 c.y.	31	

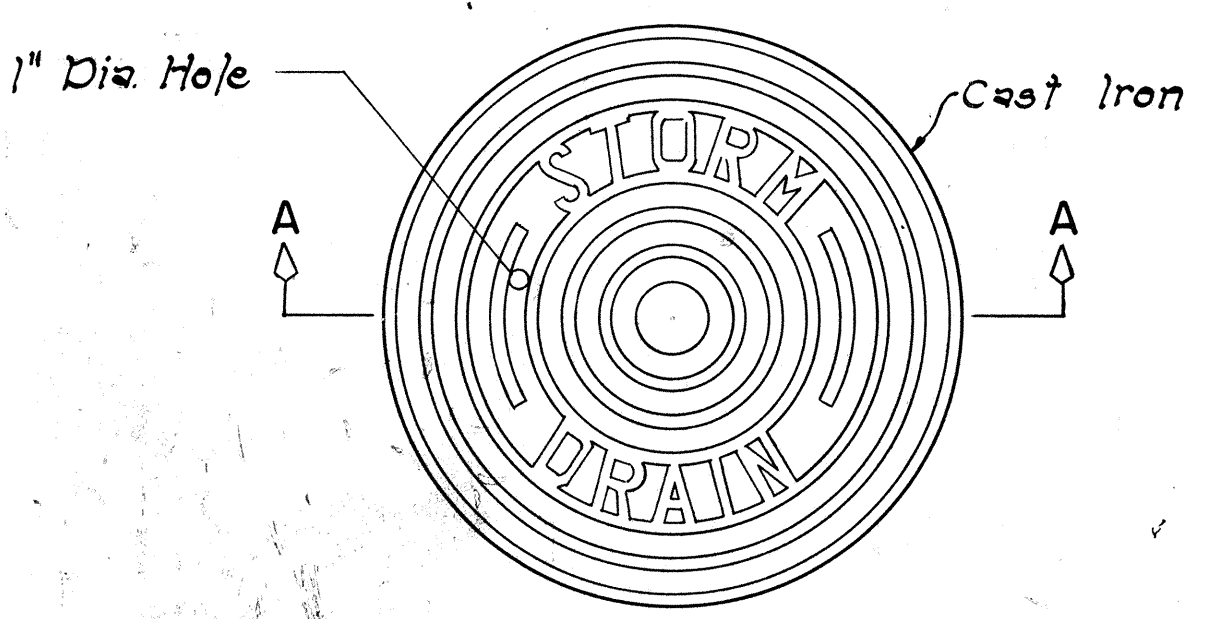
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	DPF0514(3)	1974	32	61



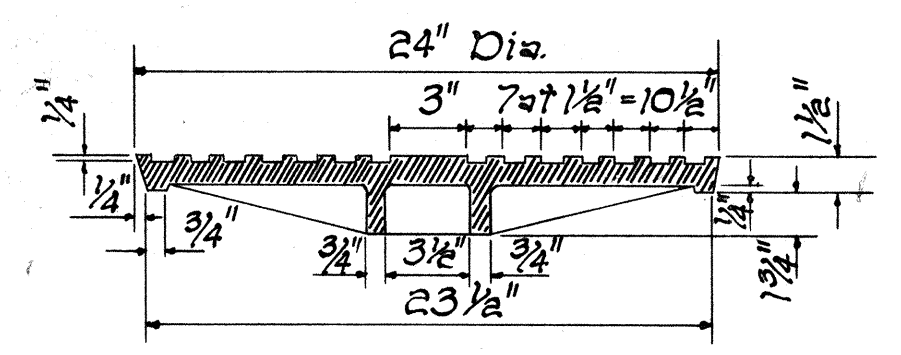
PLAN



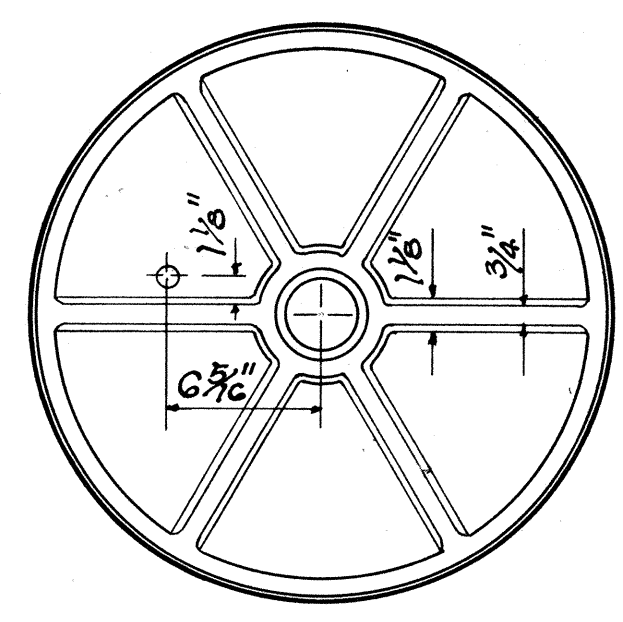
SECTION A-A



PLAN

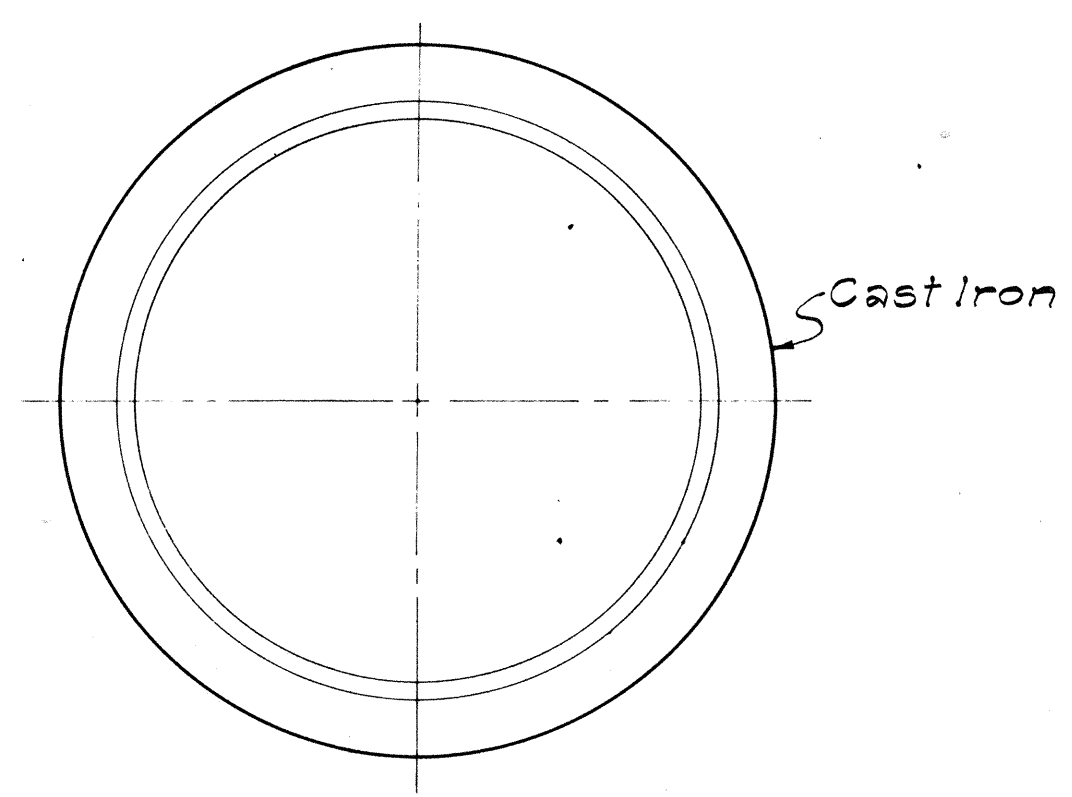


SECTION A-A

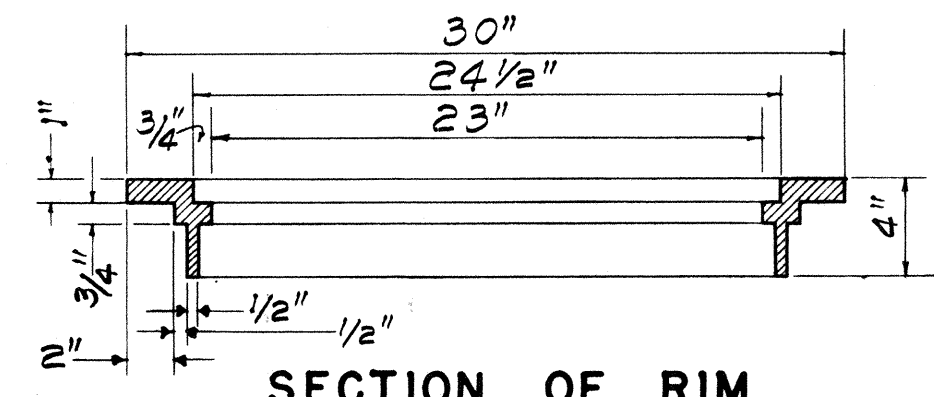


BOTTOM VIEW OF COVER

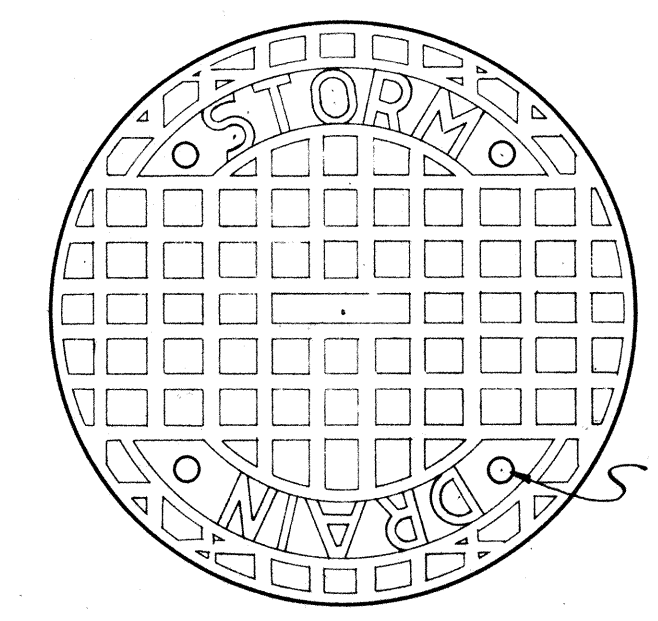
DETAILS OF TYPE "P"
CAST IRON FRAME AND COVER
SCALE: 1-1/2" = 1'-0"



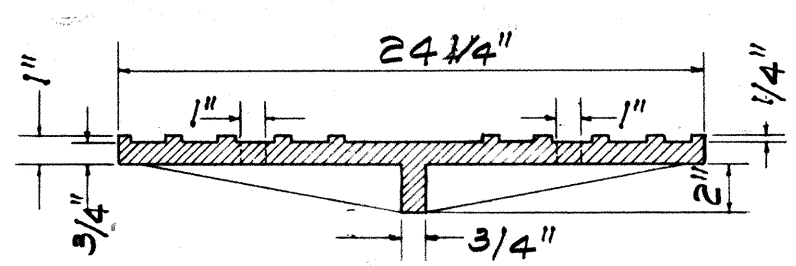
PLAN OF RIM



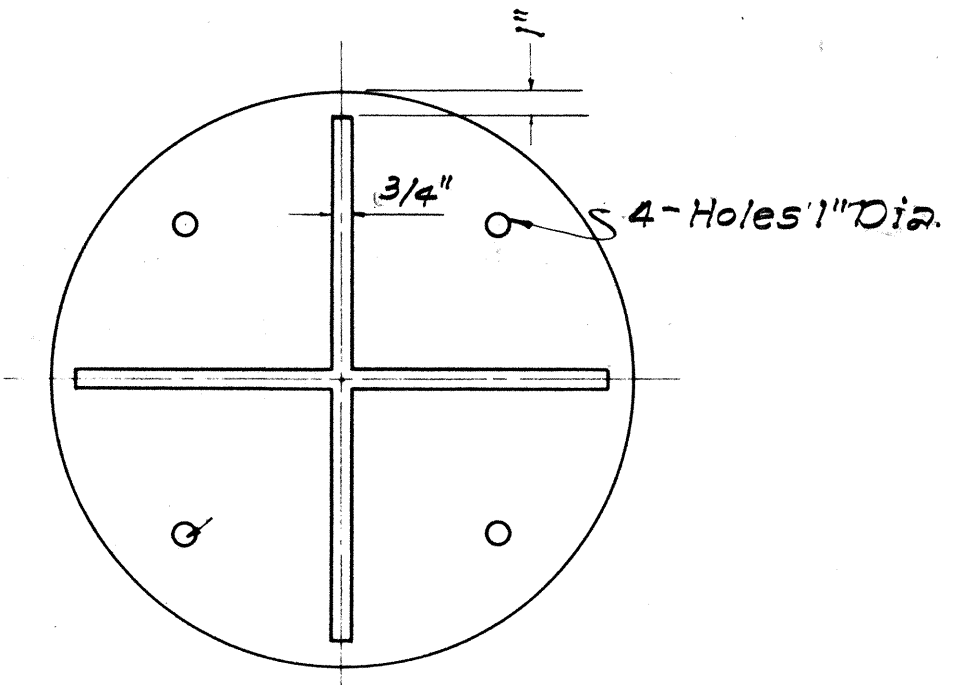
SECTION OF RIM



TOP VIEW OF COVER

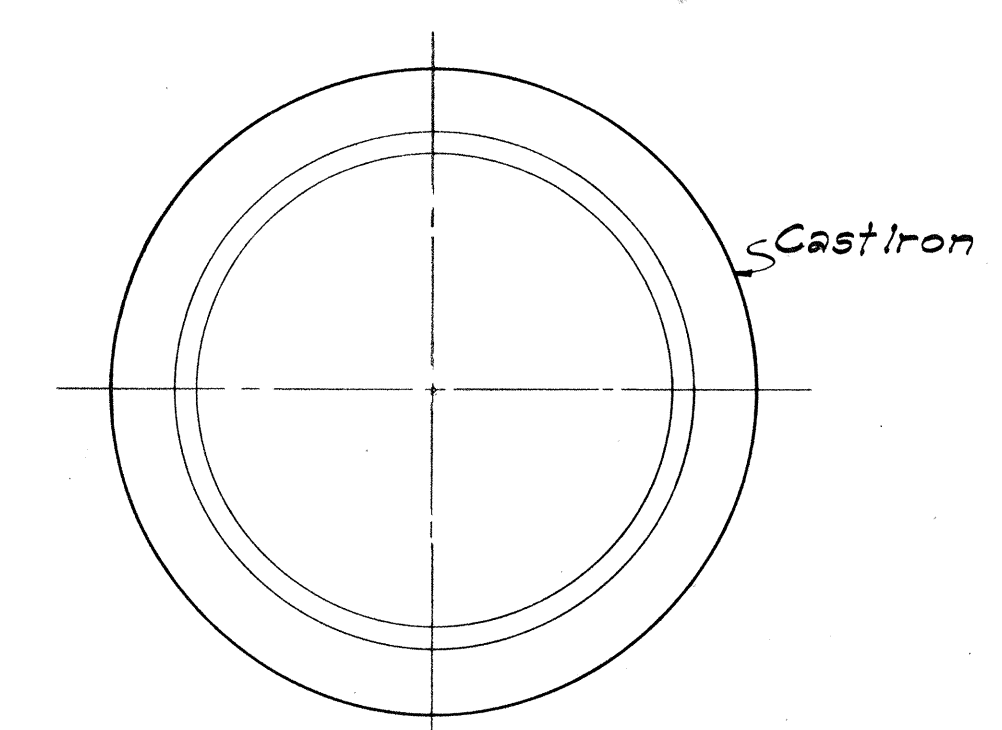


SECTION

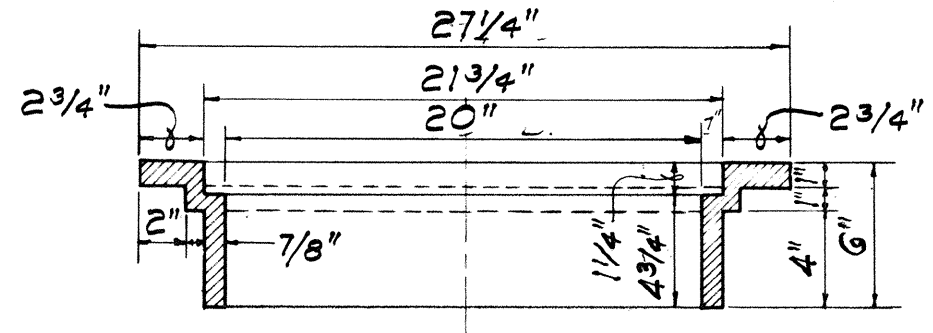


BOTTOM VIEW OF COVER

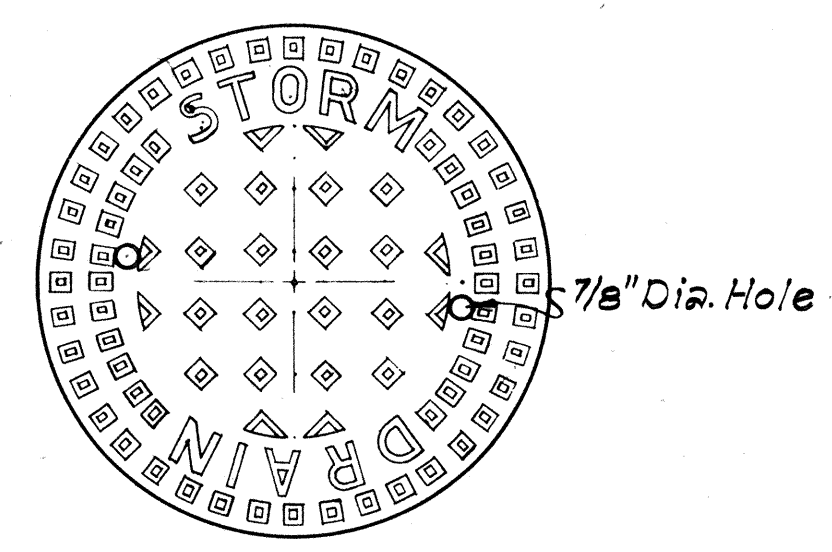
DETAILS OF TYPE "B"
CAST IRON FRAME AND COVER
SCALE: 1-1/2" = 1'-0"



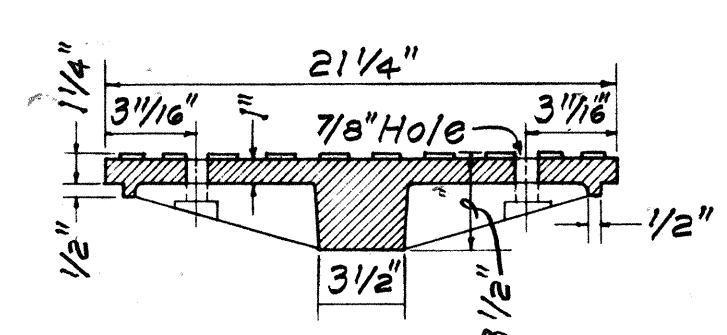
PLAN OF RIM



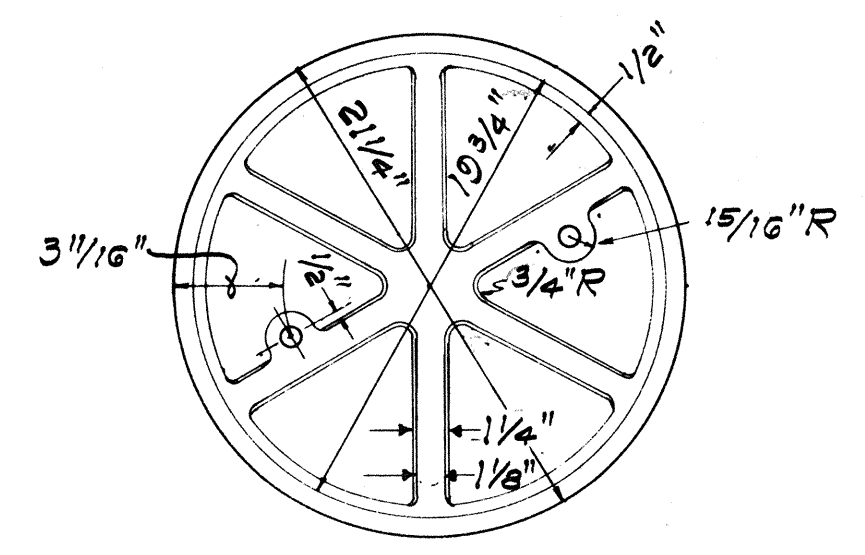
SECTION OF RIM



TOP VIEW OF COVER

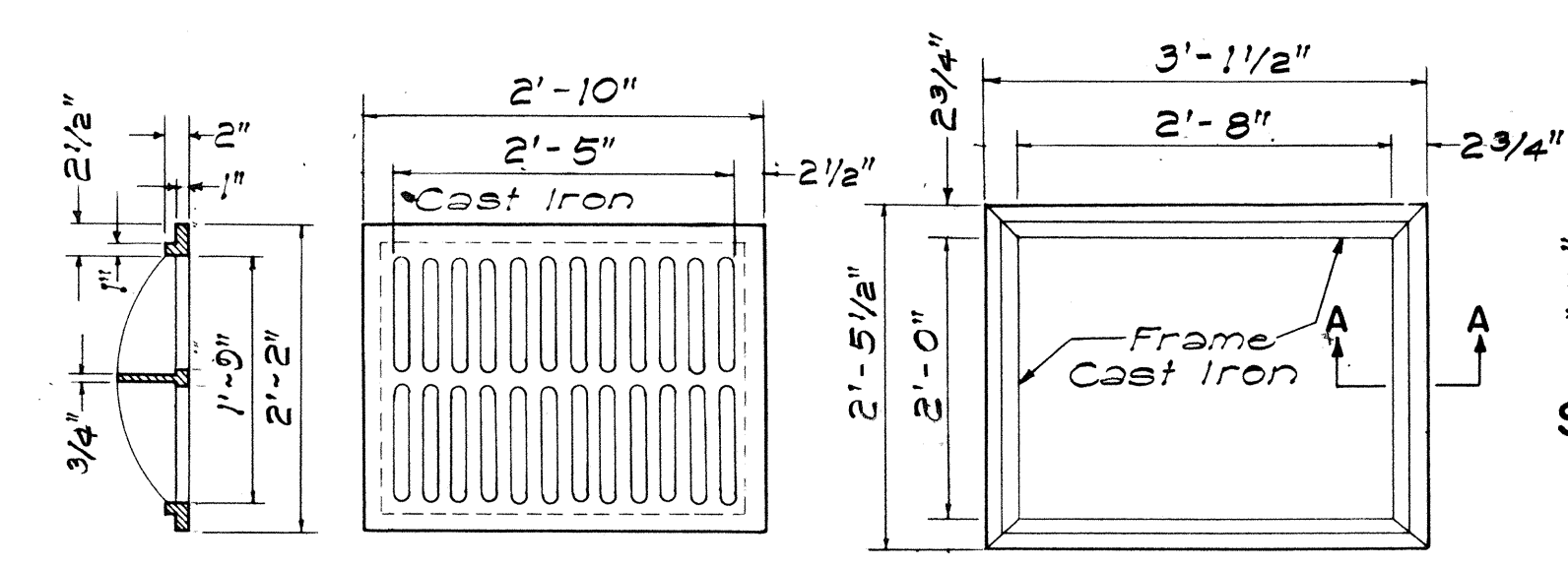


SECTION

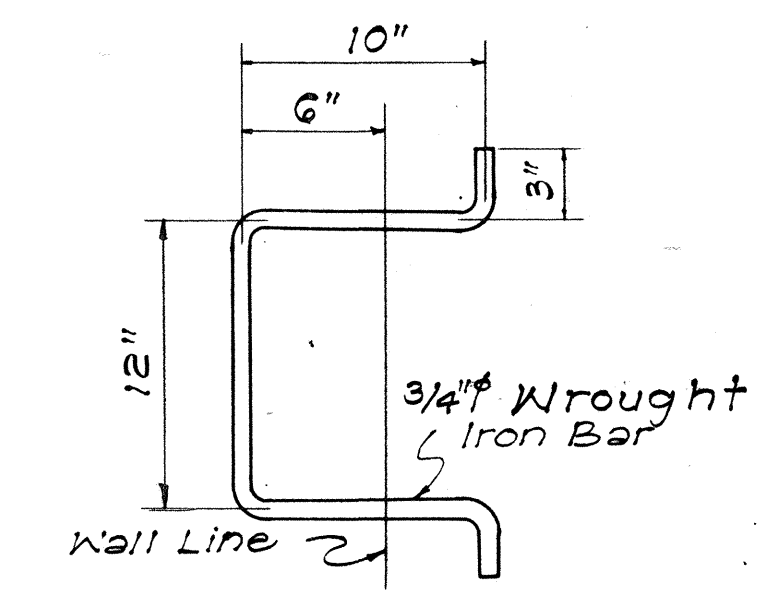


BOTTOM VIEW OF COVER

DETAILS OF TYPE "A"
CAST IRON FRAME AND COVER
SCALE: 1-1/2" = 1'-0"



SECTION TOP VIEW TOP VIEW
TYPE C C.I. FRAME AND GRATE
SCALE: 3/4" = 1'-0"



MANHOLE RUNG
SCALE: 1-1/2" = 1'-0"

APPROVAL RECOMMENDED:
G. P. P. P. 12-17-67
HYDRAULIC DESIGN ENGINEER DATE

APPROVED:
G. P. P. P. 12-17-67
ASSISTANT CHIEF, ENGINEERING DATE

NO.	REVISION	APPROVED BY	DATE
1.	Detail of Type "P" Cast Iron Frame and Cover	H.T.	1-6-71

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS
CATCH BASIN AND
MANHOLE CASTINGS

Scale: As Noted Date: July, 1969
SHEET NO. 12 OF 16 SHEETS DH 6

DATE: 12-17-67
DESIGNED BY: G. P. P. P.
DRAWN BY: G. P. P. P.
CHECKED BY: G. P. P. P.
NOTE BOOK: 12-17-67

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	DR.F0514(3)	1974	33	61

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"	$1\frac{9}{16}$ "
A-12	12	$1\frac{3}{8}$ "	$1\frac{1}{4}$ "

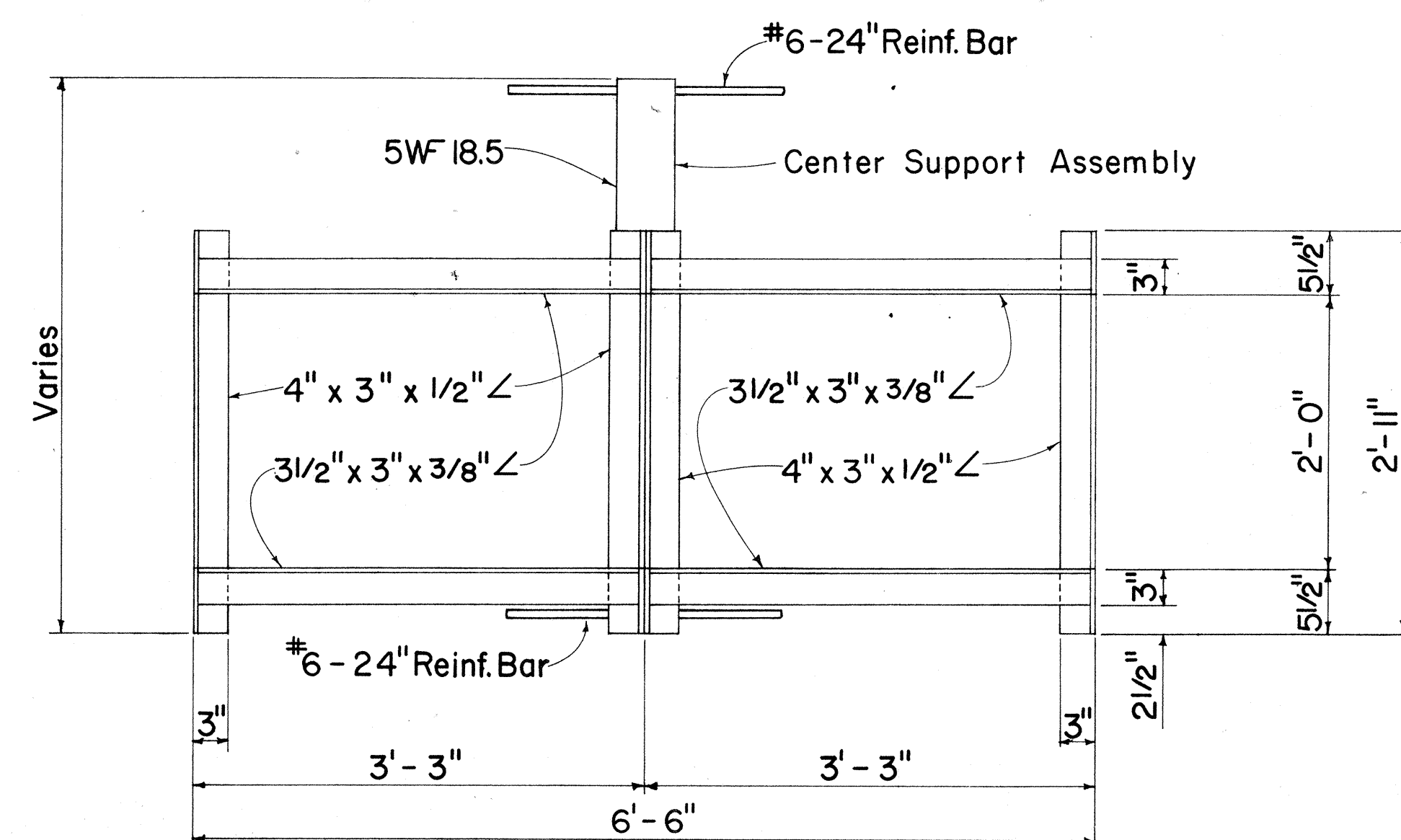
NOTE:

- 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.

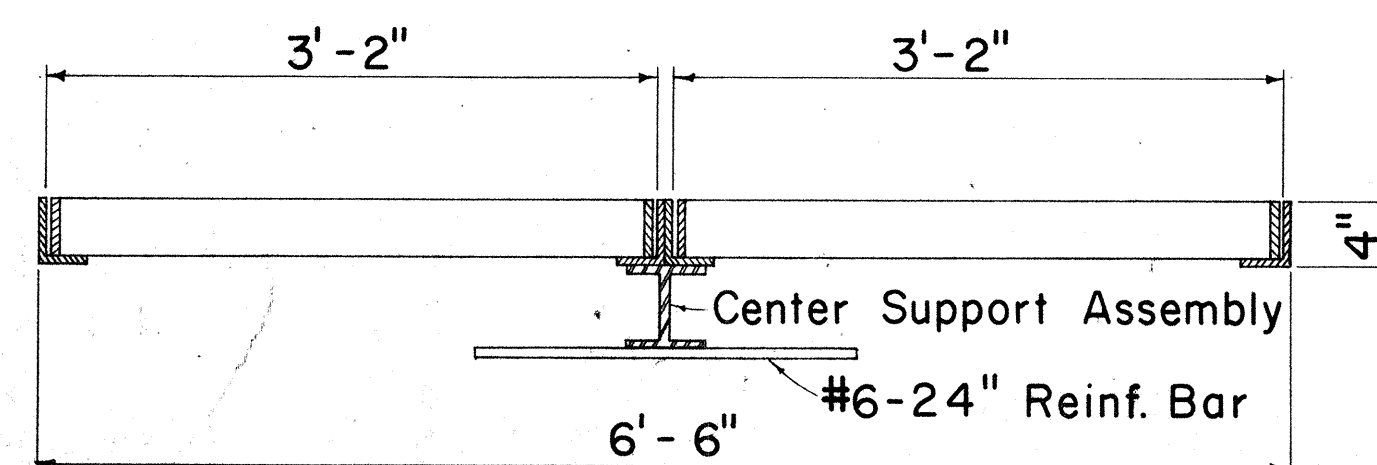
APPROVAL RECOMMENDED:		12-17-69
HYDRAULIC DESIGN ENGINEER		DATE
APPROVED:		12-11-69
ASSISTANT CHIEF, ENGINEERING		DATE

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. 13 OF 16 SHEETS DH 7



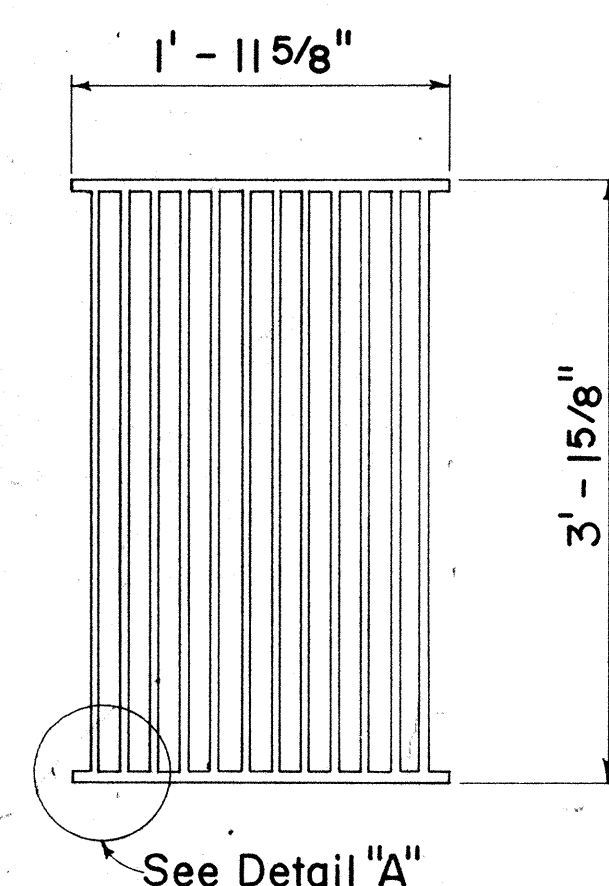
PLAN
(Two or More Grates)



LONGITUDINAL SECTION
(Thru Frame & Grate)

FRAME DETAILS

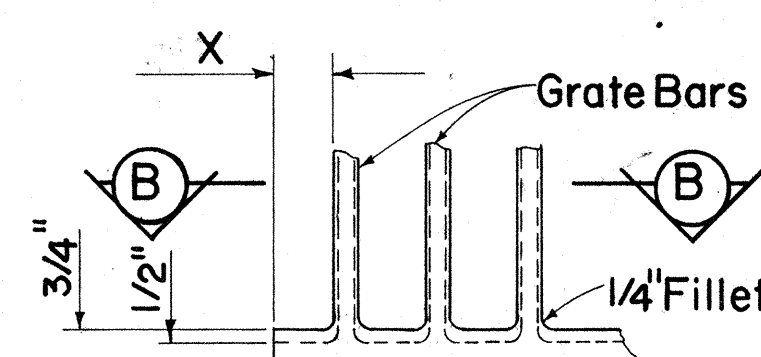
Scale: 1" = 1' - 0"



PLAN

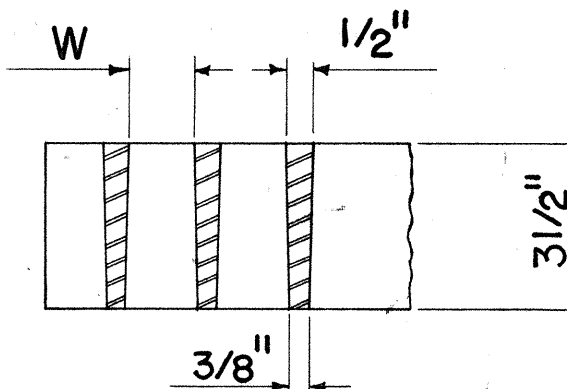
Scale: 1" = 1' - 0"

ALTERNATIVE CAST MALLEABLE IRON OR CAST STEEL GRATE



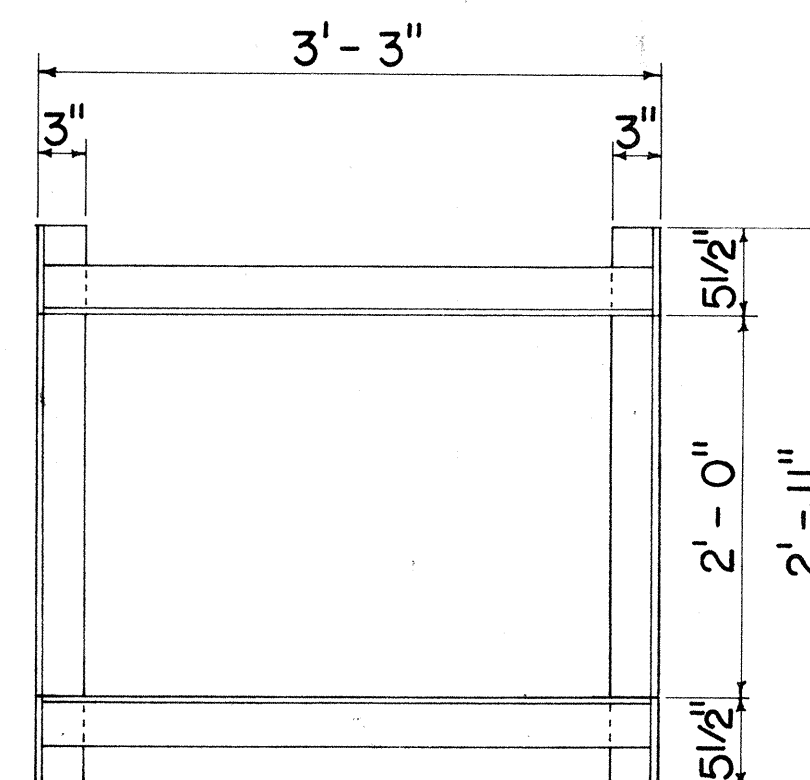
DETAIL "A"

Scale: 3" = 1' - 0"

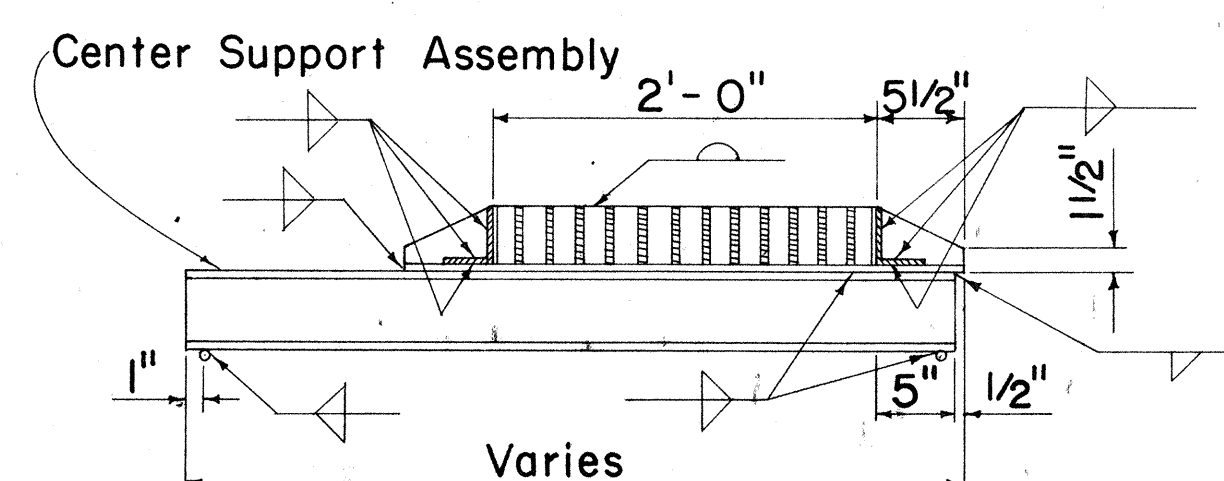


SECTION "B-B"

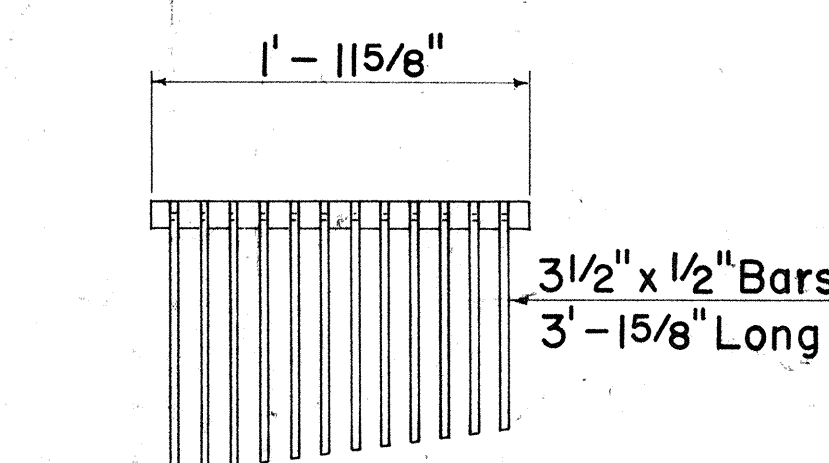
Scale: 3" = 1' - 0"



PLAN
(Single Grate)

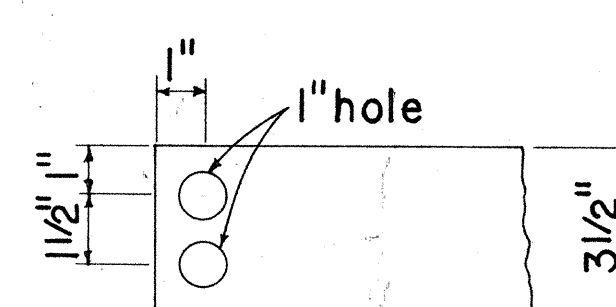


CROSS SECTION
(Thru Frame & Grate)



CAST END BLOCK

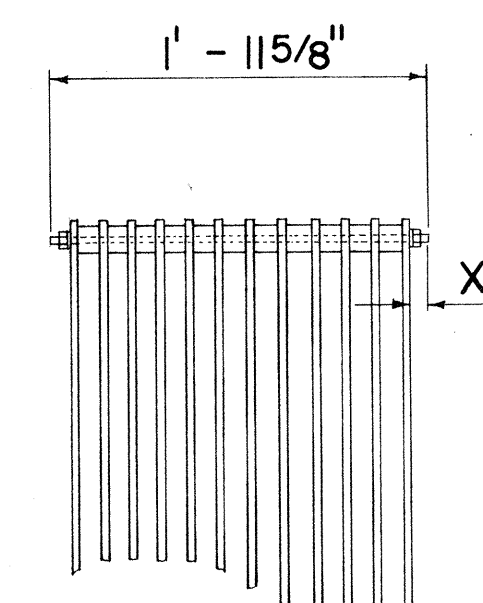
Scale: 1" = 1' - 0"



END OF BAR

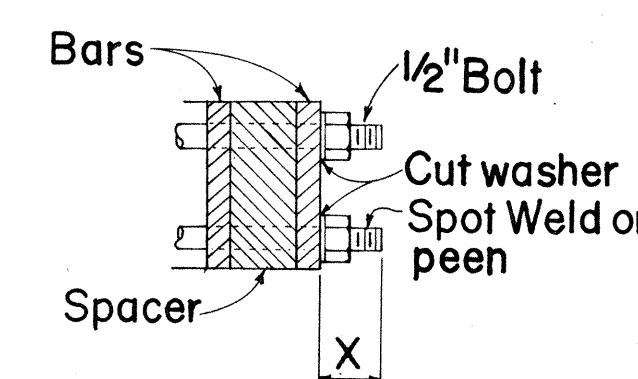
Scale: 3" = 1' - 0"

ALTERNATIVE CAST MALLEABLE IRON OR CAST STEEL END BLOCK GRATE



BOLTED END BLOCK

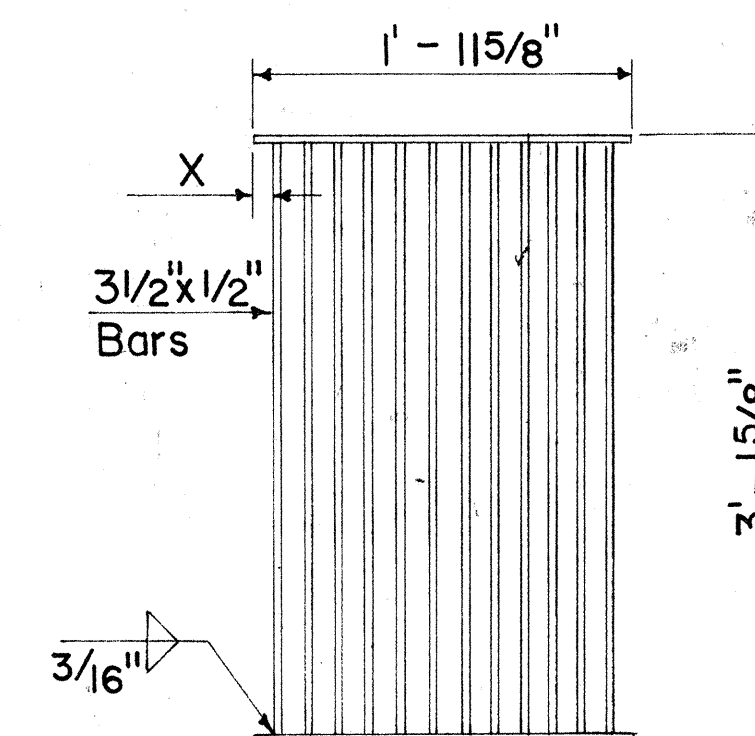
Scale: 1" = 1' - 0"



BOLTING DETAIL

Scale: 3" = 1' - 0"

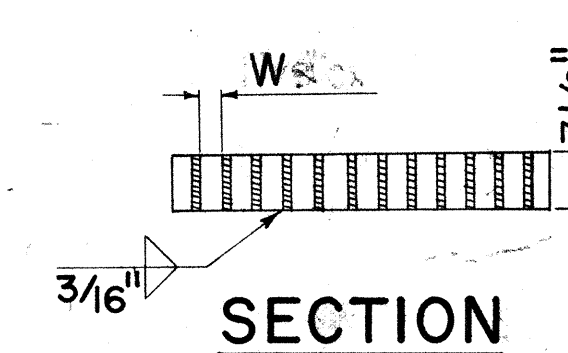
ALTERNATIVE BOLTED GRATE



PLAN

ALTERNATIVE WELDED GRATE

Scale: 1" = 1' - 0"



SECTION

NO.	REVISION	APPROVED BY	DATE

Scale: 1" = 1' - 0"

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

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	DPF05H(3)	1974	34	61

GENERAL NOTES

- Grates and Frames shall be hot dip galvanized after fabrication, see specifications.
- All welds $\frac{3}{8}$ " unless otherwise noted.
- Refer to "Spacing Table" for Types 61614 & 61616 Drop Intake and Frame & Grates dimensions.
- The Frame & Grate materials shall conform to the specifications of ASTM Designation Structural Steel A283, Grade D and the Standard Specifications.
- Culvert shall leave Drop Intake from any position and any direction indicated by plans or ordered by the Engineer. Culverts may both enter and leave Drop Intake so that Drop Intake will act as manhole.
- Manhole Rungs (16" o.c.) are required when "H" is greater than 4 feet 6 inches. Only one rung (12 inches from the bottom) is required if "H" is 4 feet 6 inches or less. Manhole Rungs may be placed at any location as ordered by the Engineer.

SPACING TABLE

TYPE	NO. BARS	A	B	C	D
61614	11	2'-0"	1'-11½"	1¼"	1'-6"
61616	17	3'-0"	2'-11¾"	1⅝"	2'-0"

NO.	REVISION	APPROVED BY	DATE
1	Curb for Top of Fill Gutters	H. J.	6-5-11

APPROVAL RECOMMENDED:

HYDRAULIC DESIGN ENGINEER

52-17-69
DATE

APPROVED:

ASSISTANT CHIEF, ENGINEERING

12-11-69
DATE

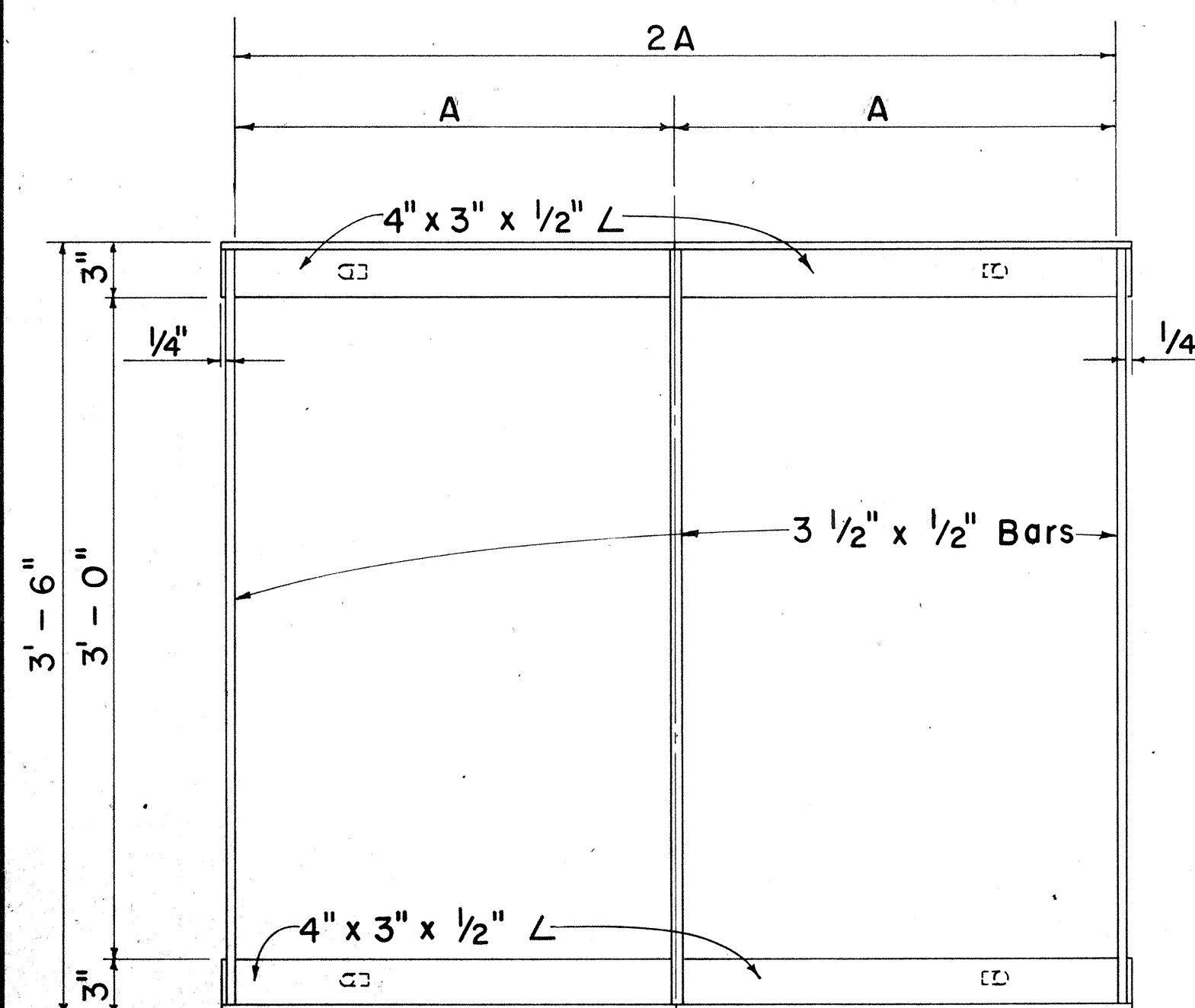
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS
TYPE 61614 & 61616
GRADED DROP INTAKES

Scales: As Noted

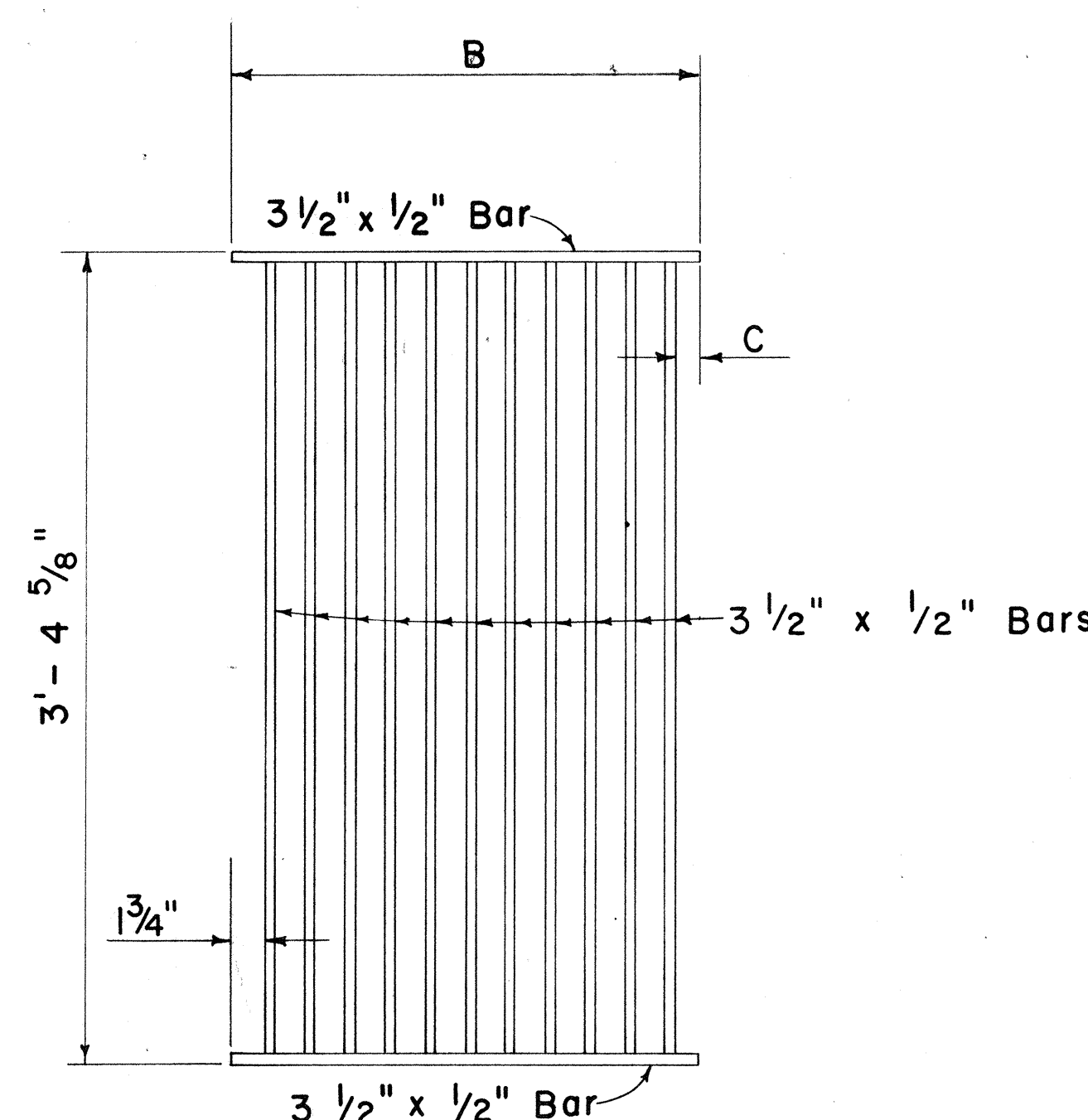
Date: Feb. 1969

SHEET No. 14 OF 16 SHEETS DH 8



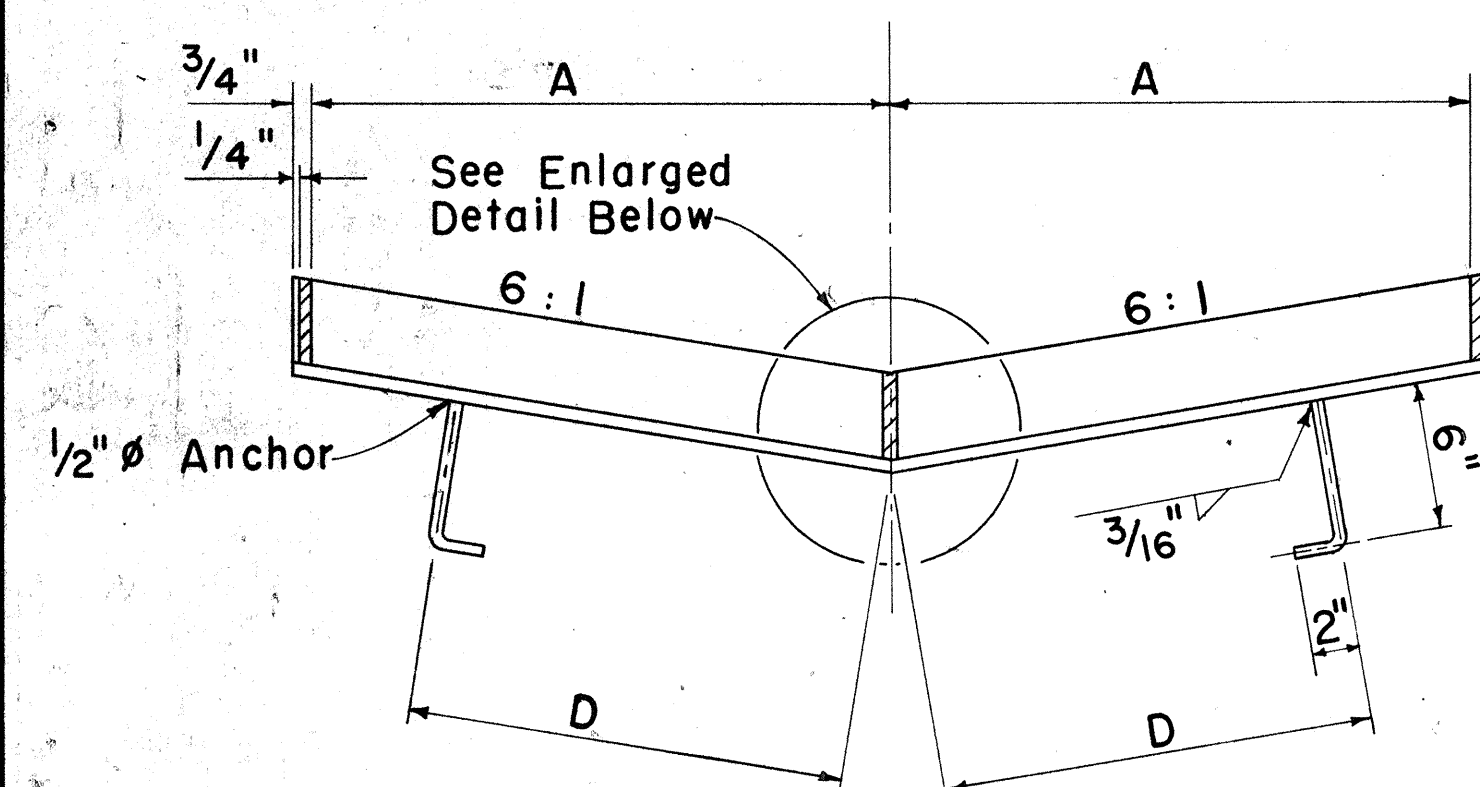
PLAN

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



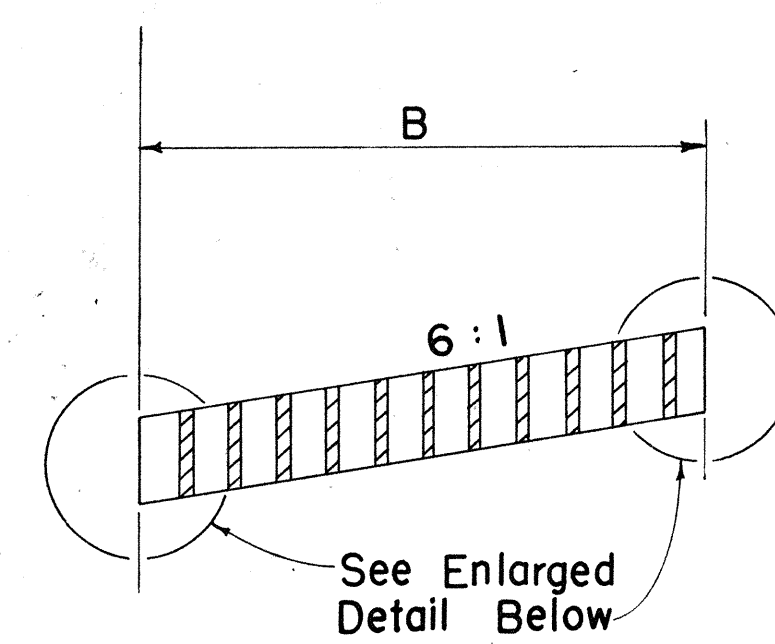
PLAN

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



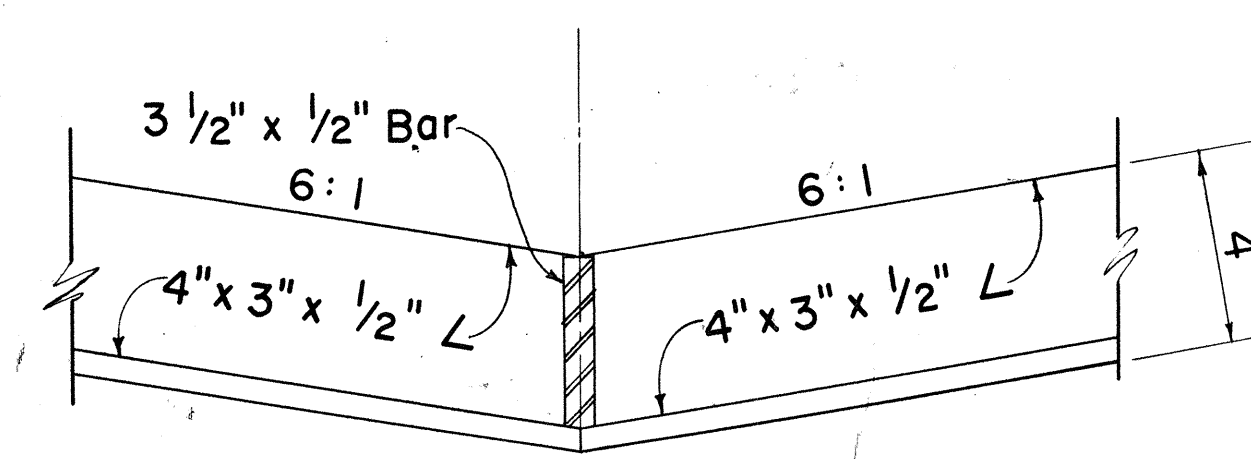
SECTION

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



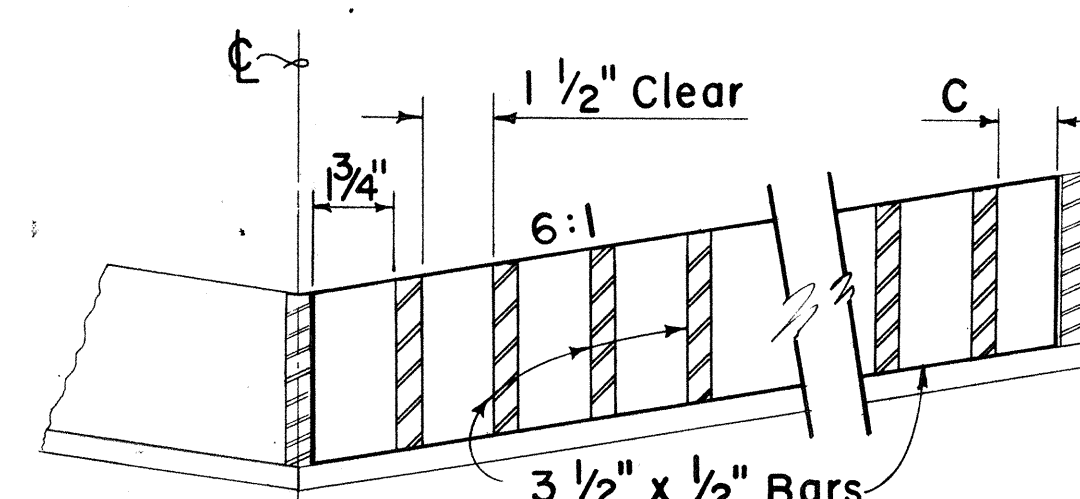
SECTION

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



FRAME

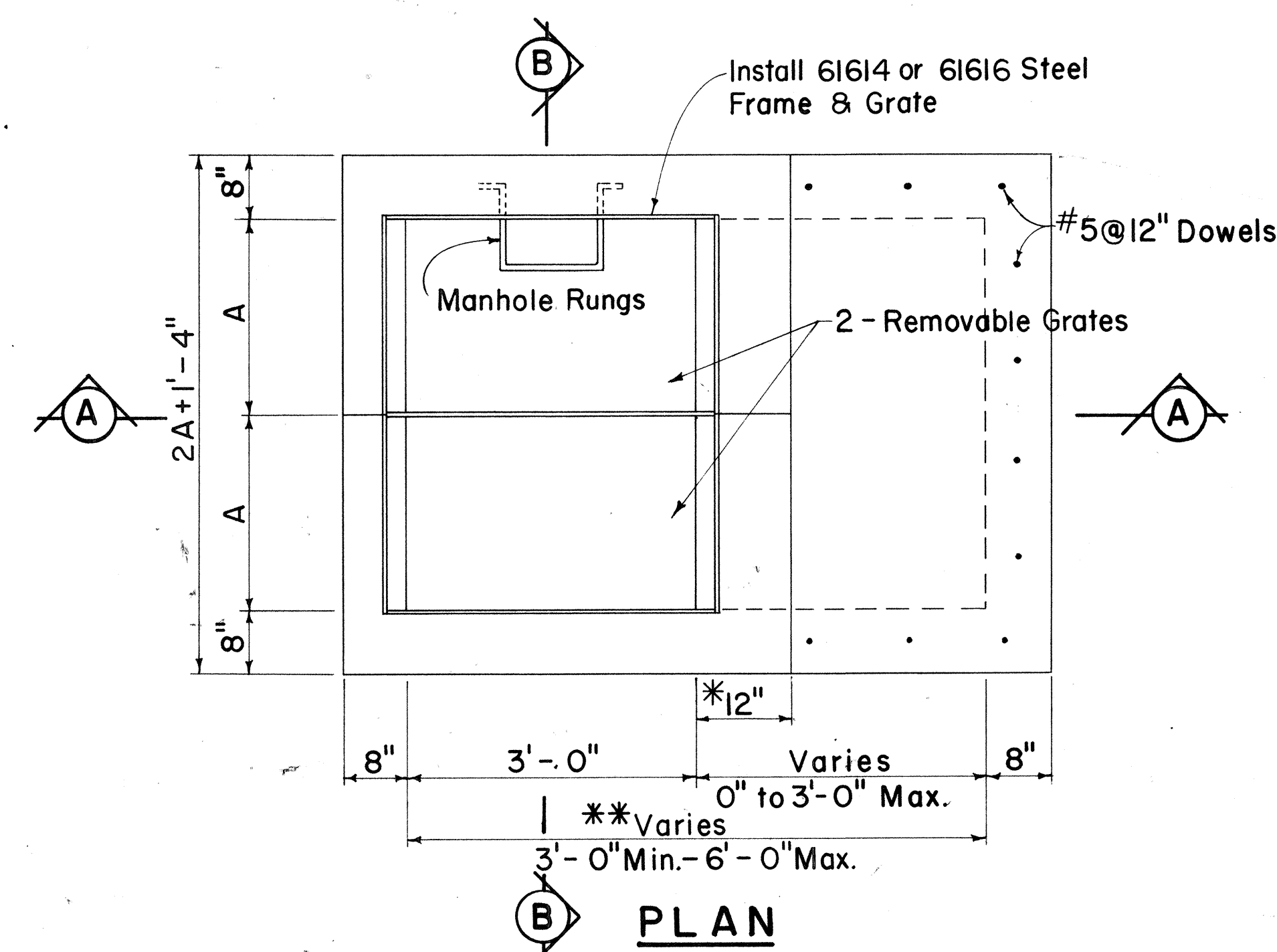
Scale: 3" = 1'-0"



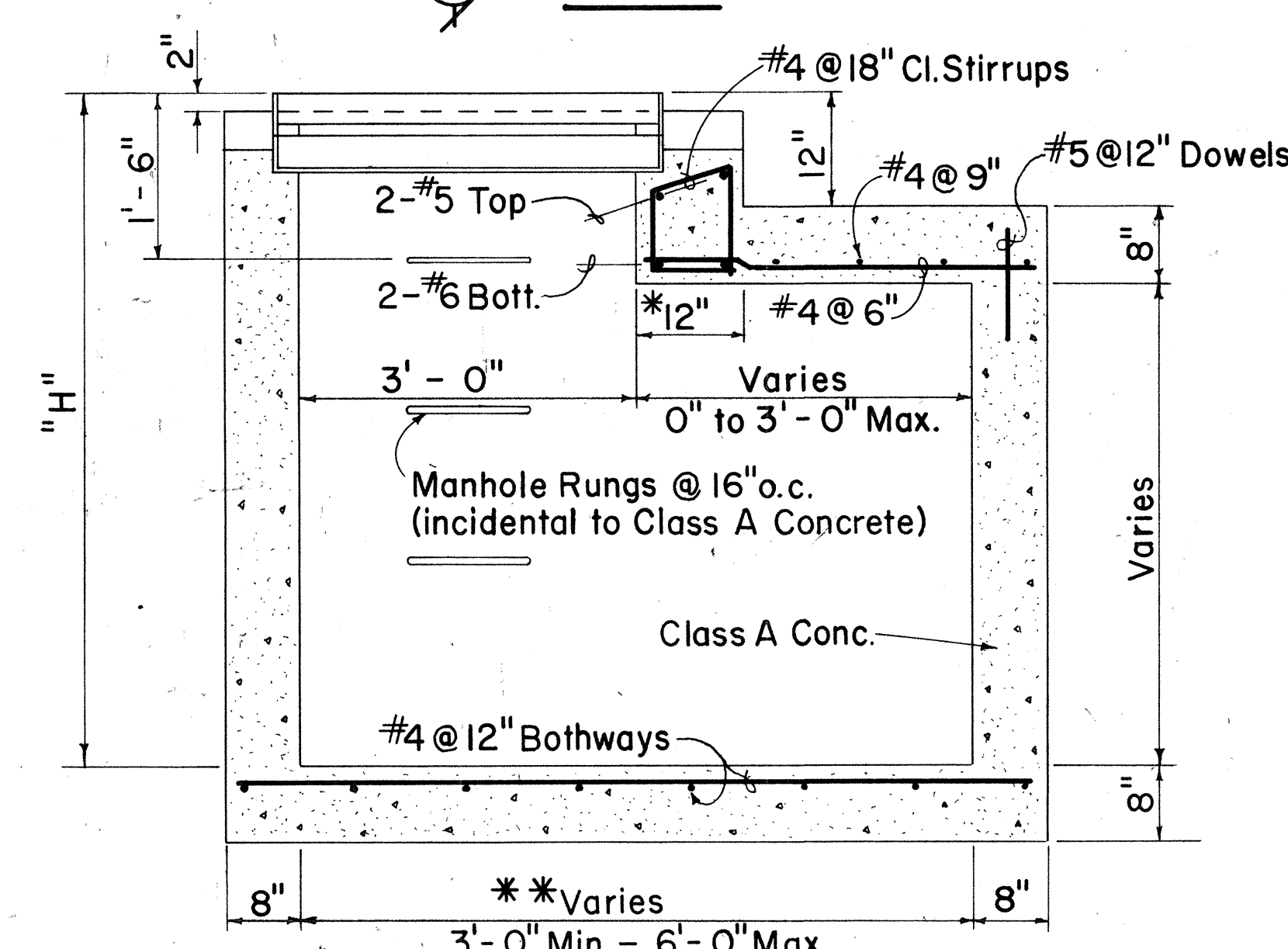
GRATE

Scale: 3" = 1'-0"

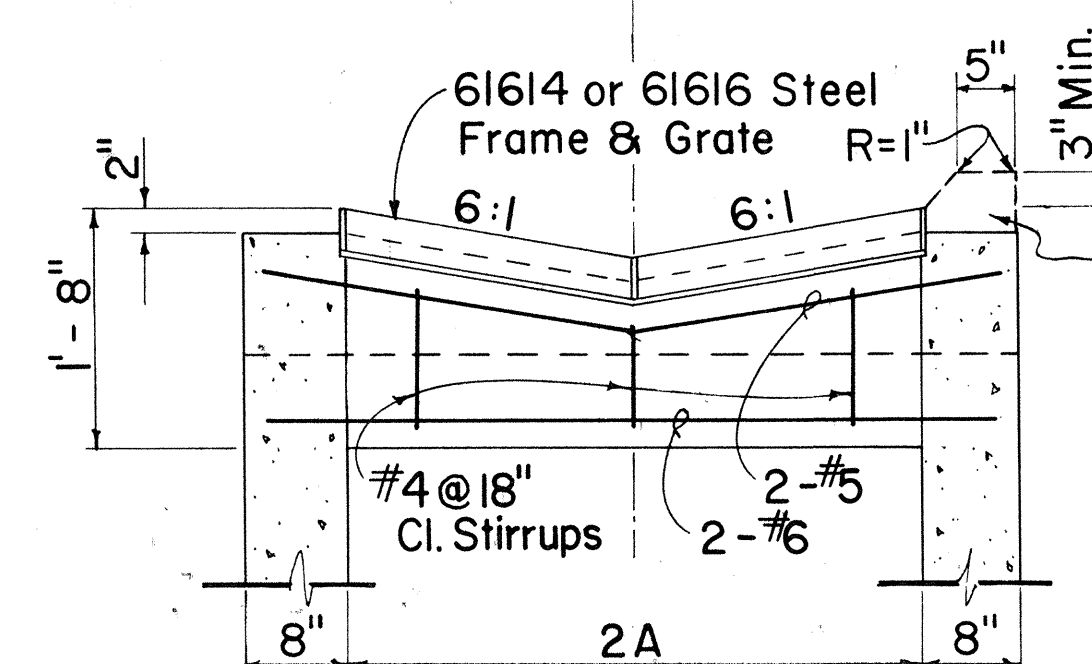
DETAILS OF TYPE 61614 OR 61616 STEEL FRAME AND GRATE



PLAN



SECTION A-A



SECTION B-B

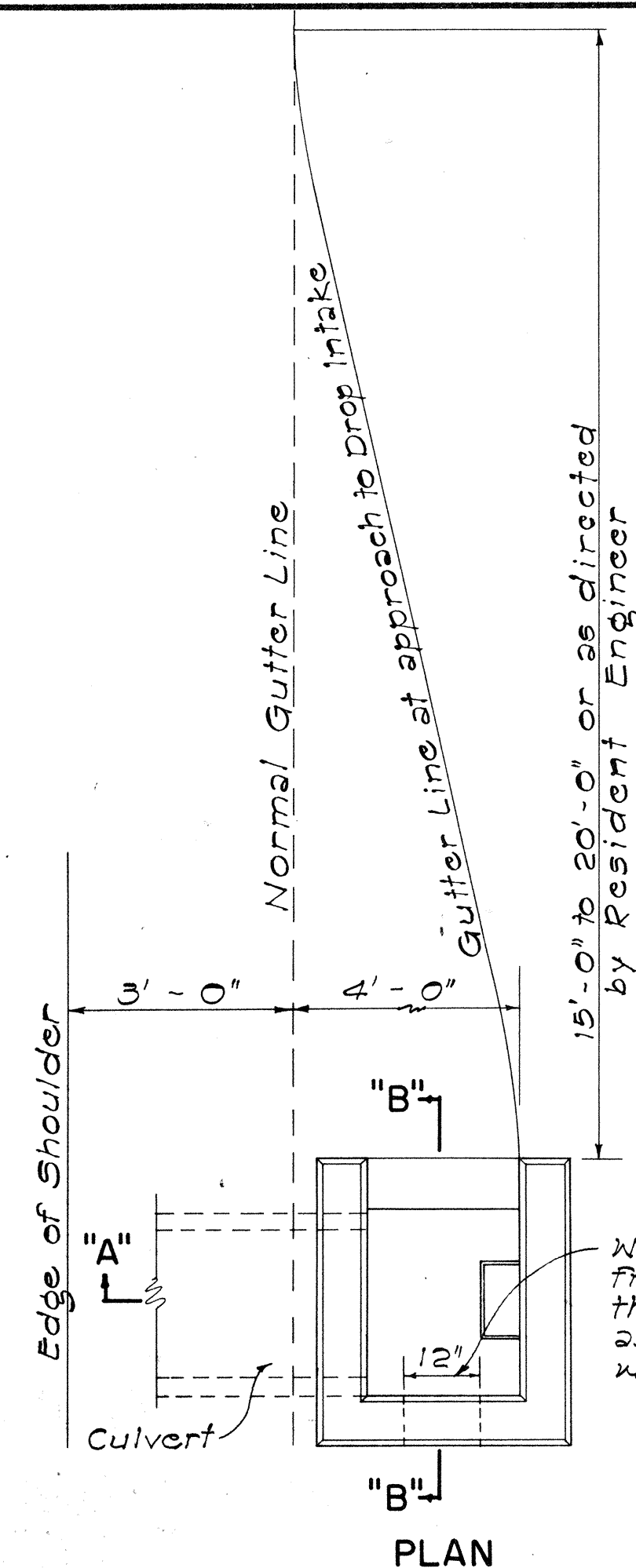
DETAILS OF 61614 OR 61616 DROP INTAKE

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

- * For Minimum size box of 3'-0", use 8" and eliminate reinforcing steel shown in the top portion.
- ** For Culverts larger than 30", the minimum dimension shall be D.

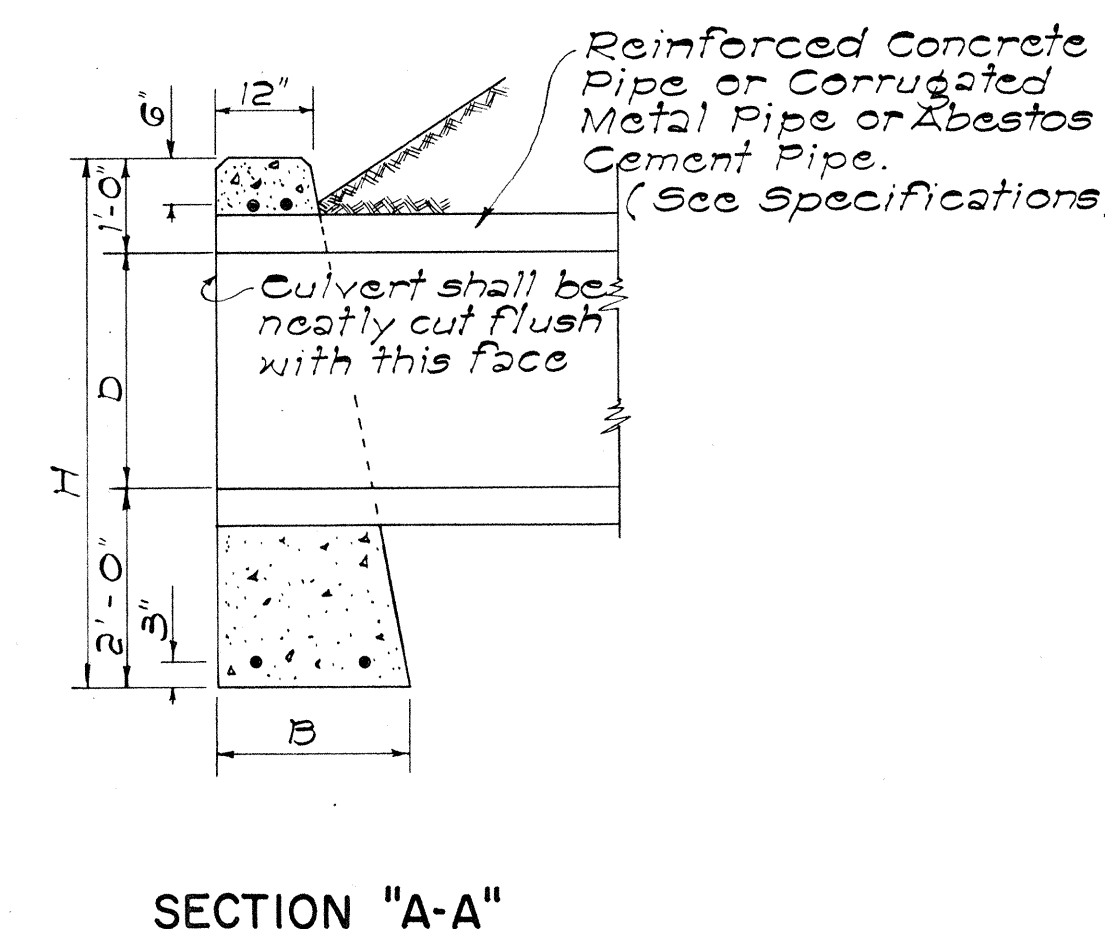
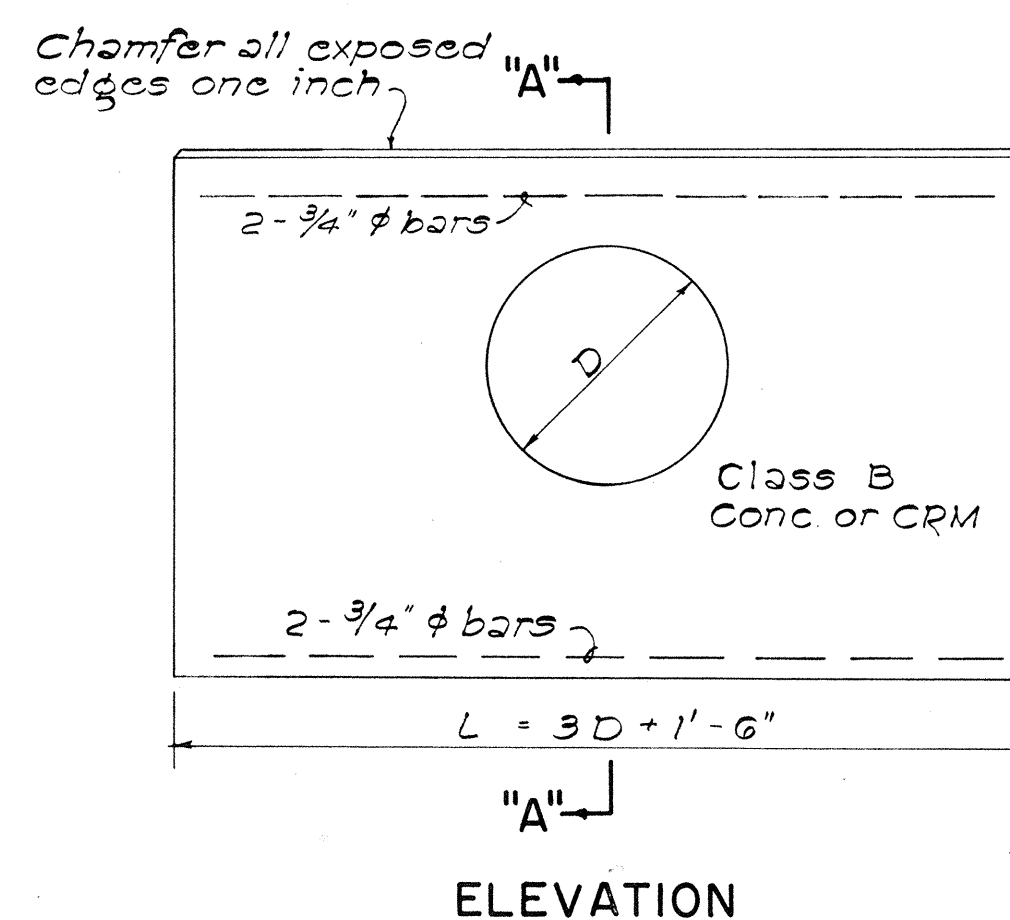
Install curb when Drop Intake is used to drain Top of Fill Gutters. Provide Gutter Transitions of 25 ft. (entering and leaving D.I.)

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	DRF051-1(3)	1974	35	61



DATA - CONG. DROP INTAKE	Where Variable Equals
D' D L' D' + G' S Cu. Yds.	
23' 18' 2'-5" 8' 1.41 4'-6"	
30' 24' 3'-0" 8' 1.72 5'-0"	
37' 30' 3'-7" 9' 2.32 5'-6"	
44' 36' 4'-2" 9' 2.73 6'-0"	
51' 42' 4'-9" 10' 3.54 6'-6"	
58' 48' 5'-4" 10' 4.01 7'-0"	

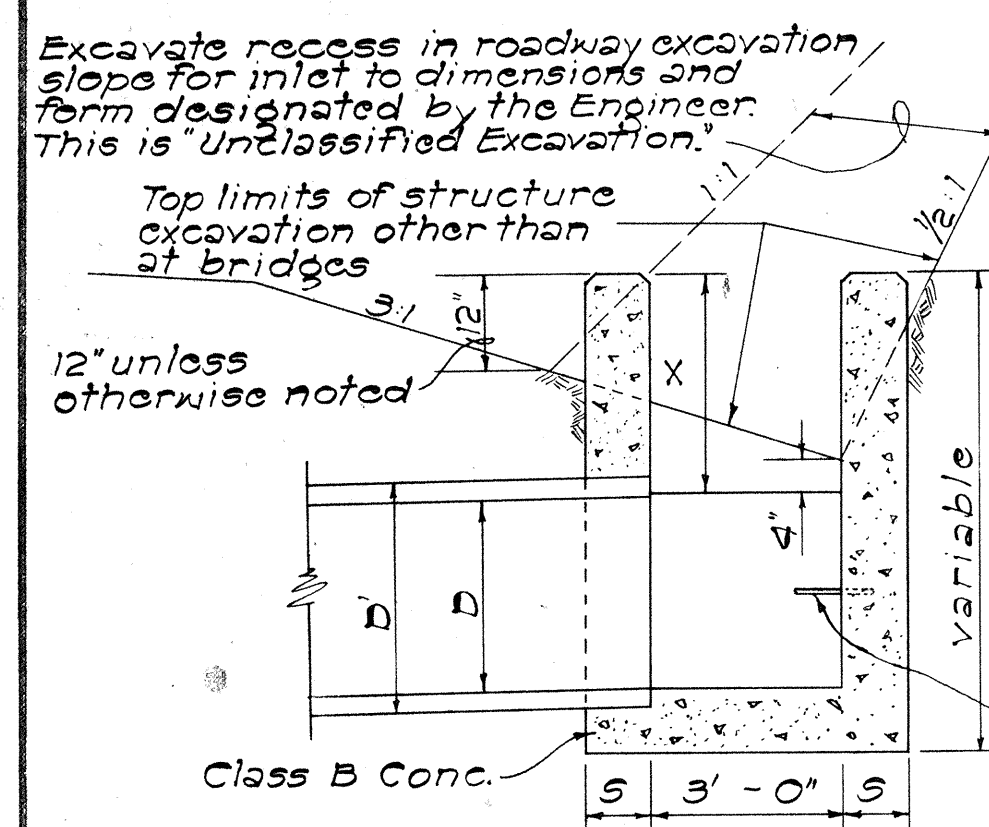
Note: Dimension "X" is assumed as 2'-4" in figuring the above quantities.



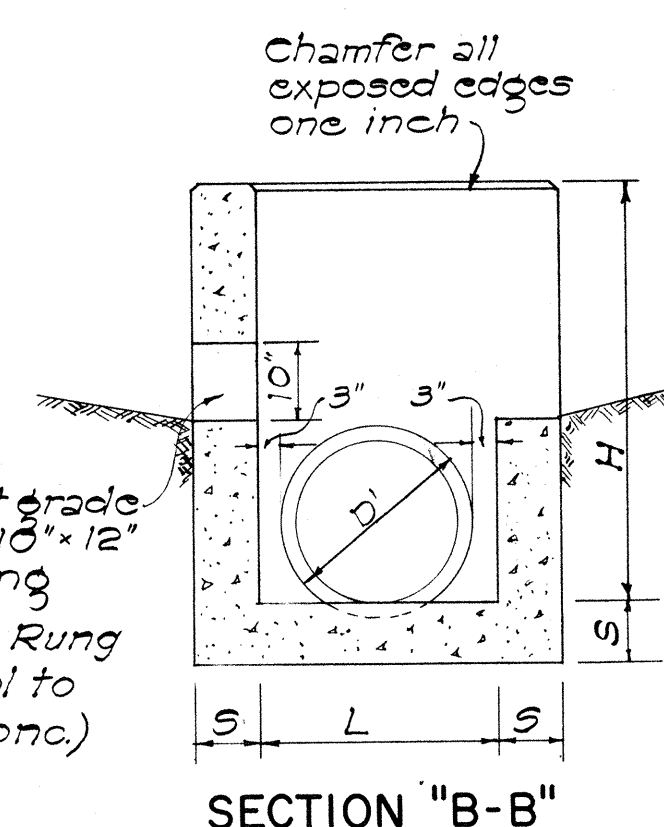
DATA FOR CONG. HEADWALL	CL. B CONG. FOR S.C.P.	CL. B CONG. FOR C.M.P.	Steel For One Headwall
D B L H Cu. Yd.	Cu. Yd.	Cu. Yd.	No. of Bars Size Length Lbs.
18' 1'-6" 6'-0" 4'-6" 1.12	1.17	4	3/4" 5'-0" 33
24' 1'-6" 7'-6" 5'-0" 1.52	1.60	4	3/4" 7'-0" 42
30' 2'-0" 9'-0" 5'-6" 2.36	2.49	4	3/4" 8'-0" 51
36' 2'-0" 10'-6" 6'-0" 2.94	3.13	4	3/4" 10'-0" 60
42' 2'-6" 12'-0" 6'-6" 4.19	4.47	4	3/4" 11'-6" 69
48' 2'-6" 13'-6" 7'-0" 5.01	5.36	4	3/4" 13'-0" 78

DATA - MASONRY HEADWALL	CRM FOR R.C.P.	CRM FOR C.M.P.
D B L H Cu. Yd.	Cu. Yd.	Cu. Yd.
18' 1'-9" 6'-0" 4'-6" 1.24	1.29	
24' 2'-0" 7'-6" 5'-0" 1.83	1.92	
30' 2'-3" 9'-0" 5'-6" 2.56	2.70	
36' 2'-6" 10'-6" 6'-0" 3.43	3.66	

DETAIL OF HEADWALL
Scale: 1/2" = 1'-0"



SECTION "A-A"

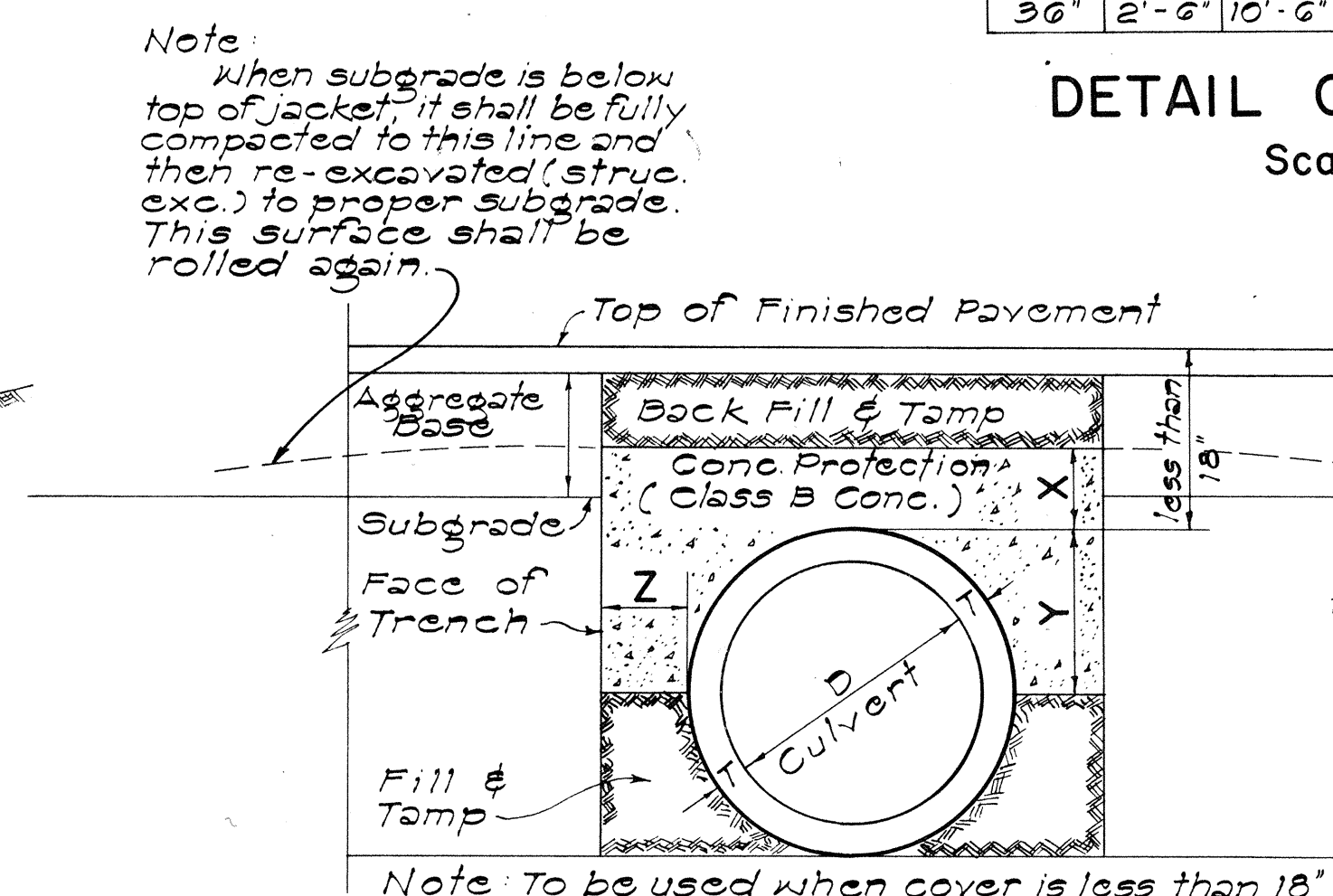


SECTION "B-B"

DETAIL OF CONCRETE DROP INTAKE
Scale: 1/2" = 1'-0"

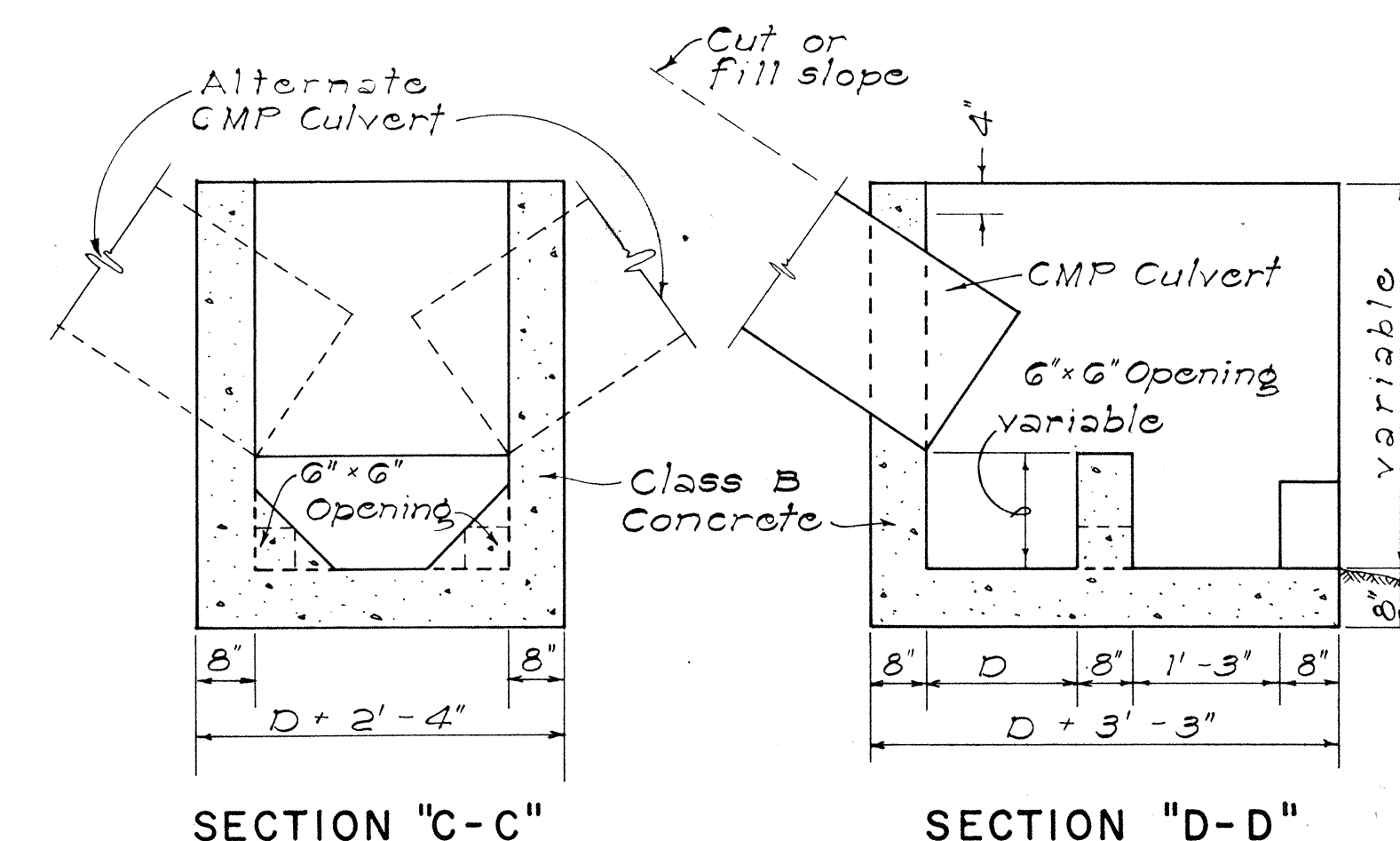
GENERAL NOTES

- Culvert shall enter and leave Drop Intake from any position and in the direction indicated by the plans or ordered by the Engineer.
- D' shall be the maximum outside dimension of the culvert at the Drop Intake wall.
- Manhole Rungs (16" o.c.) are required when "H" is greater than 4 feet 6 inches. Only one rung (12 inches from the bottom) is required if "H" is 4 feet 6 inches or less. Manhole Rungs may be placed at any location as ordered by the Engineer.



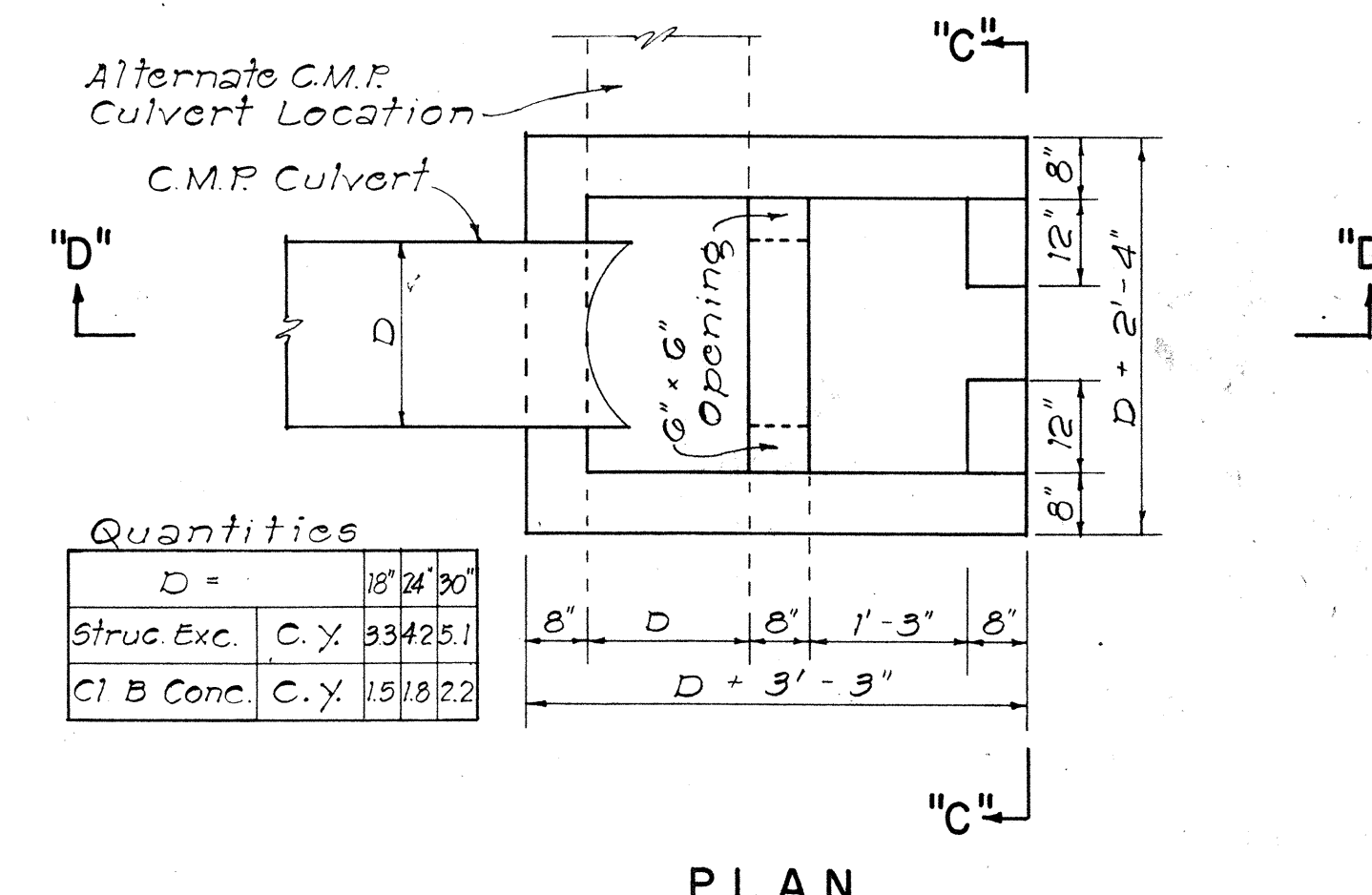
DATA FOR CONCRETE PROTECTION OVER CULVERTS	X	Y	Z
	6" for 18" D	$\frac{D}{2} + T$	Z must be from pipe to face of trench Minimum = X Maximum pay quantity will be Z = 12"
	7" for 24" D		
	8" for 30" D		
	9" for 36" D		
	10" for 42" D		
	11" for 48" D		
	12 for 54" D		

SECT. OF CULVERT WITH CONG. PROTECTION
Scale: 1" = 1'-0"



SECTION "C-C"

SECTION "D-D"



DETAILS OF CONG. DROP BOX AT
OUTLET OF CULVERT PIPE
NOT TO SCALE

APPROVAL RECOMMENDED:
[Signature] 12-17-69
HYDRAULIC DESIGN ENGINEER DATE

APPROVED:
[Signature] 12-17-69
ASSISTANT CHIEF, ENGINEERING DATE

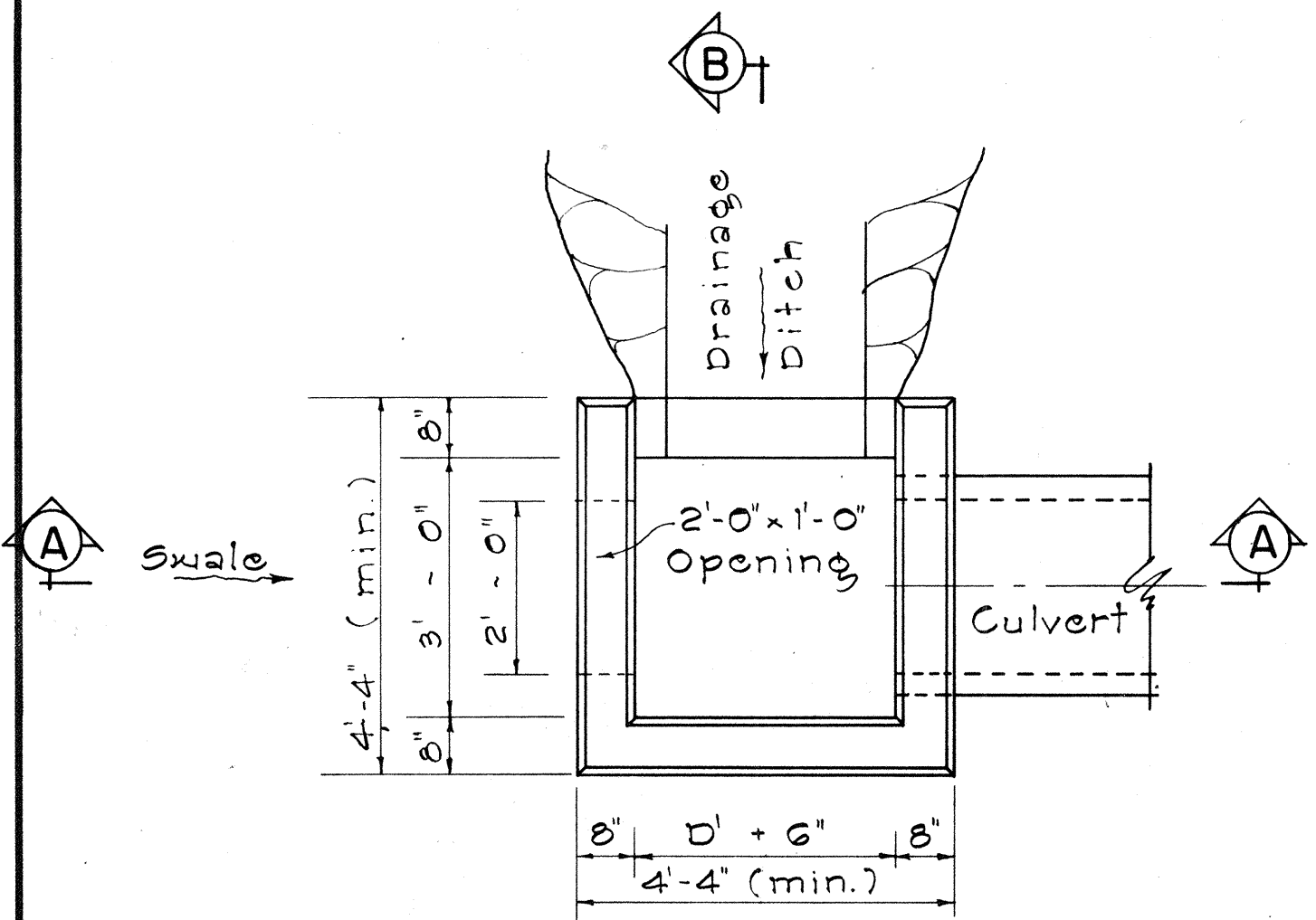
NO.	REVISION	APPROVED BY	DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
STANDARD DETAILS
DROP INTAKE, HEADWALL &
CONCRETE PROTECTION
Scale: As Noted Date: Aug. 1967
SHEET No. 15 OF 16 SHEETS DH 10

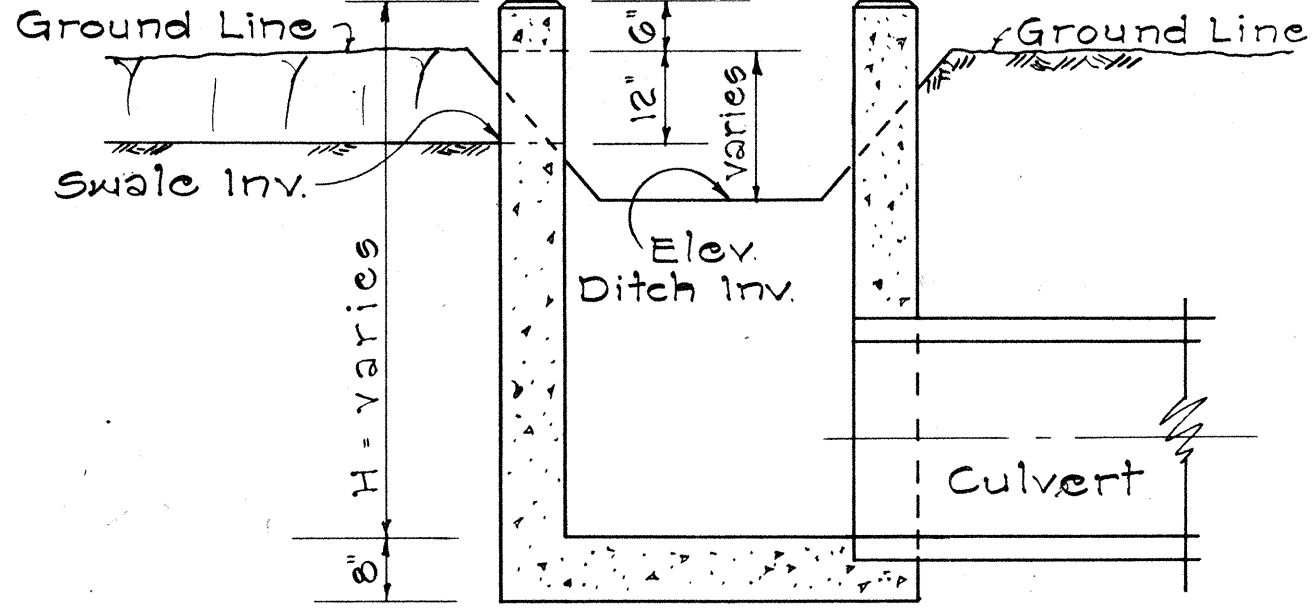
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	DRF05H(3)	1974	36	61

GENERAL NOTES

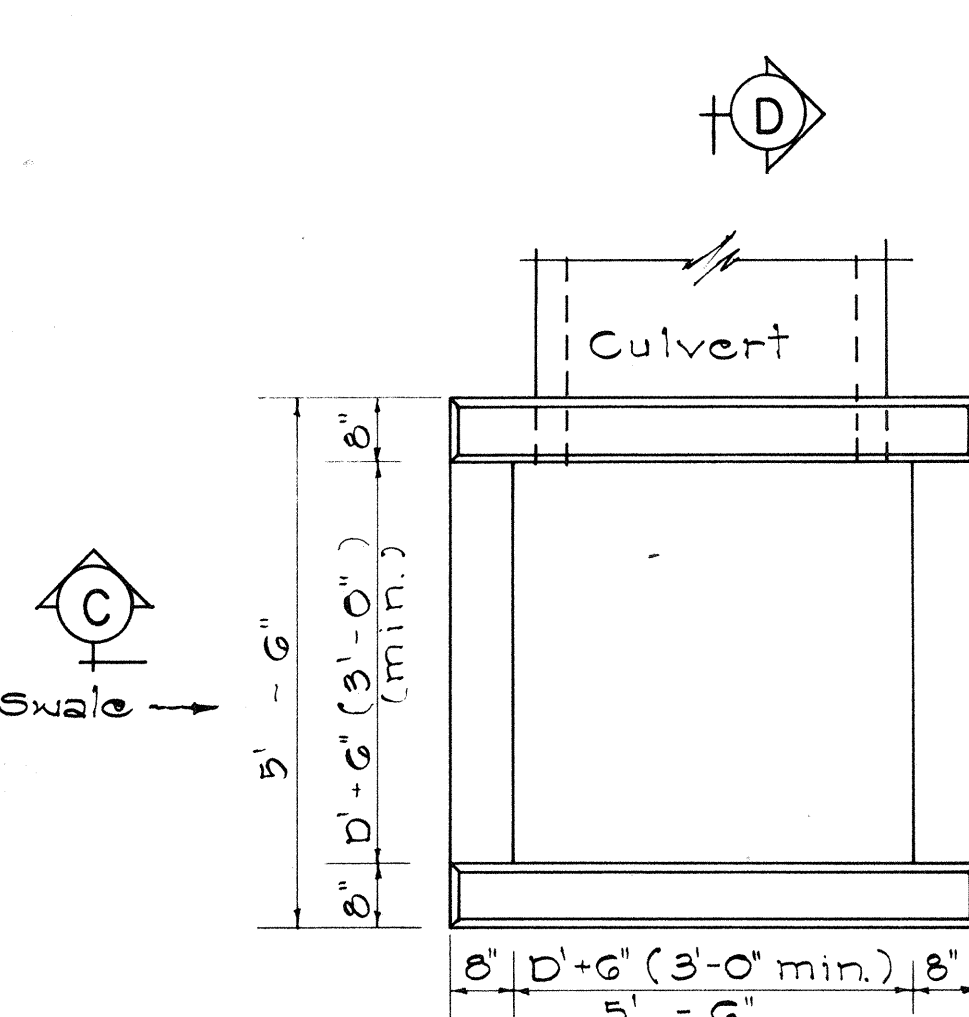
1. All concrete shall be Class "B" unless otherwise noted.
2. Exposed edges of all drainage structures shall be chamfered one inch.
3. Culvert shall enter and leave Drop Intake from any position and in the direction indicated by the plans or ordered by the Engineer.
4. Manhole Rungs (16" o.c.) are req'd. when "H" is greater than 4'-6". Only one rung (12 inches from the bottom) is required if "H" is 4'-6" or less. Manhole Rungs may be placed at any location as ordered by the Engineer.



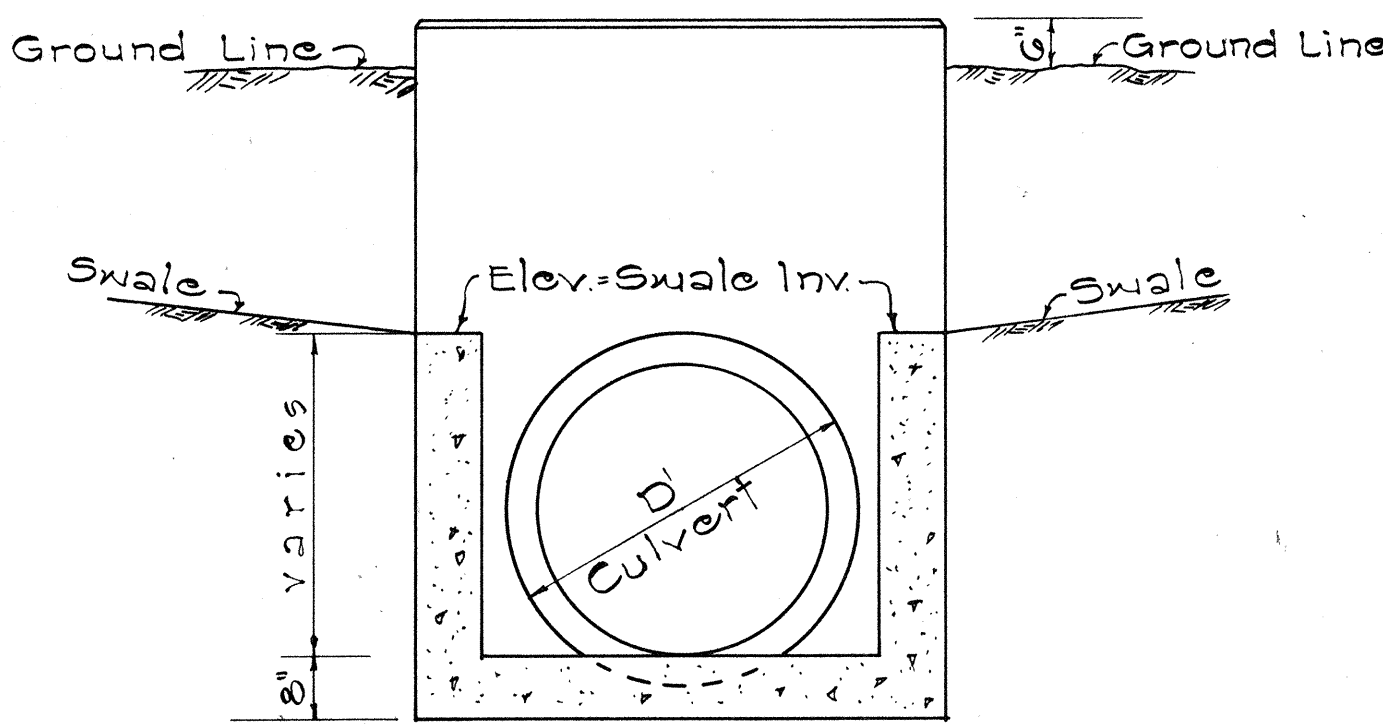
PLAN



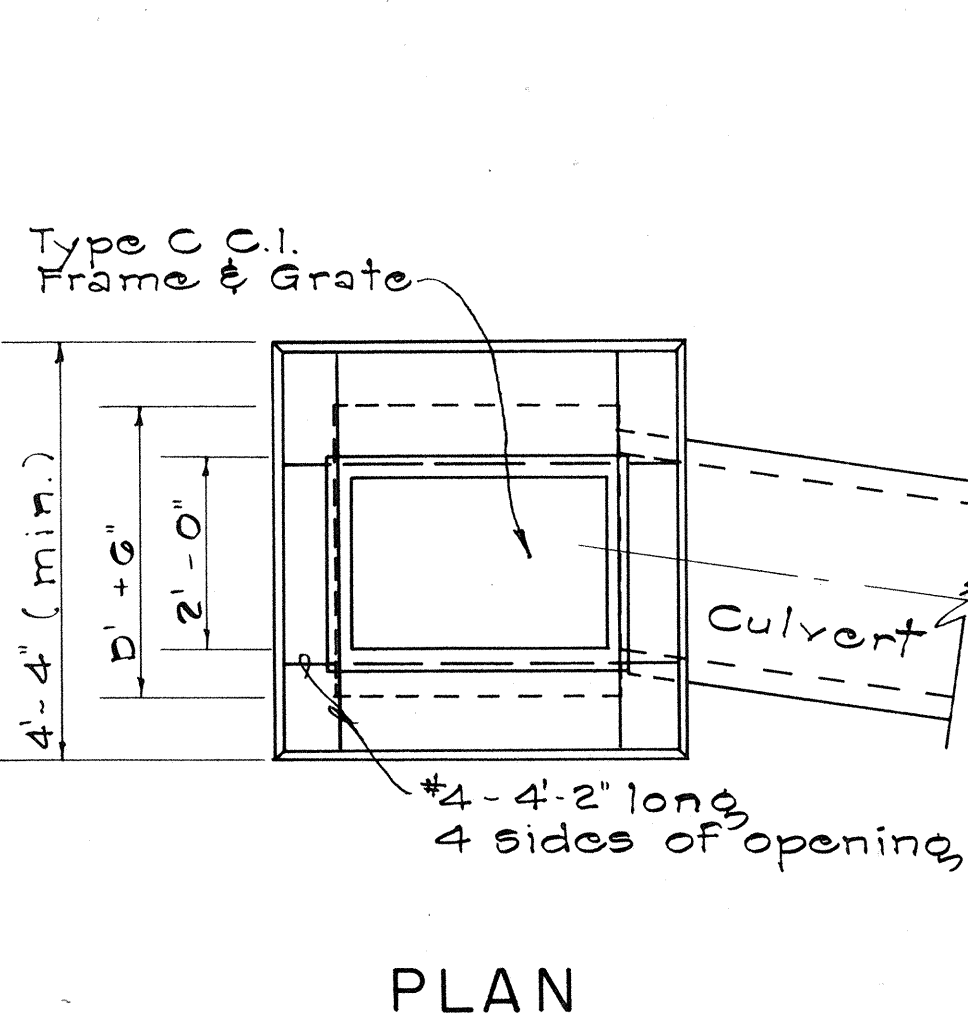
SECTION "A-A"



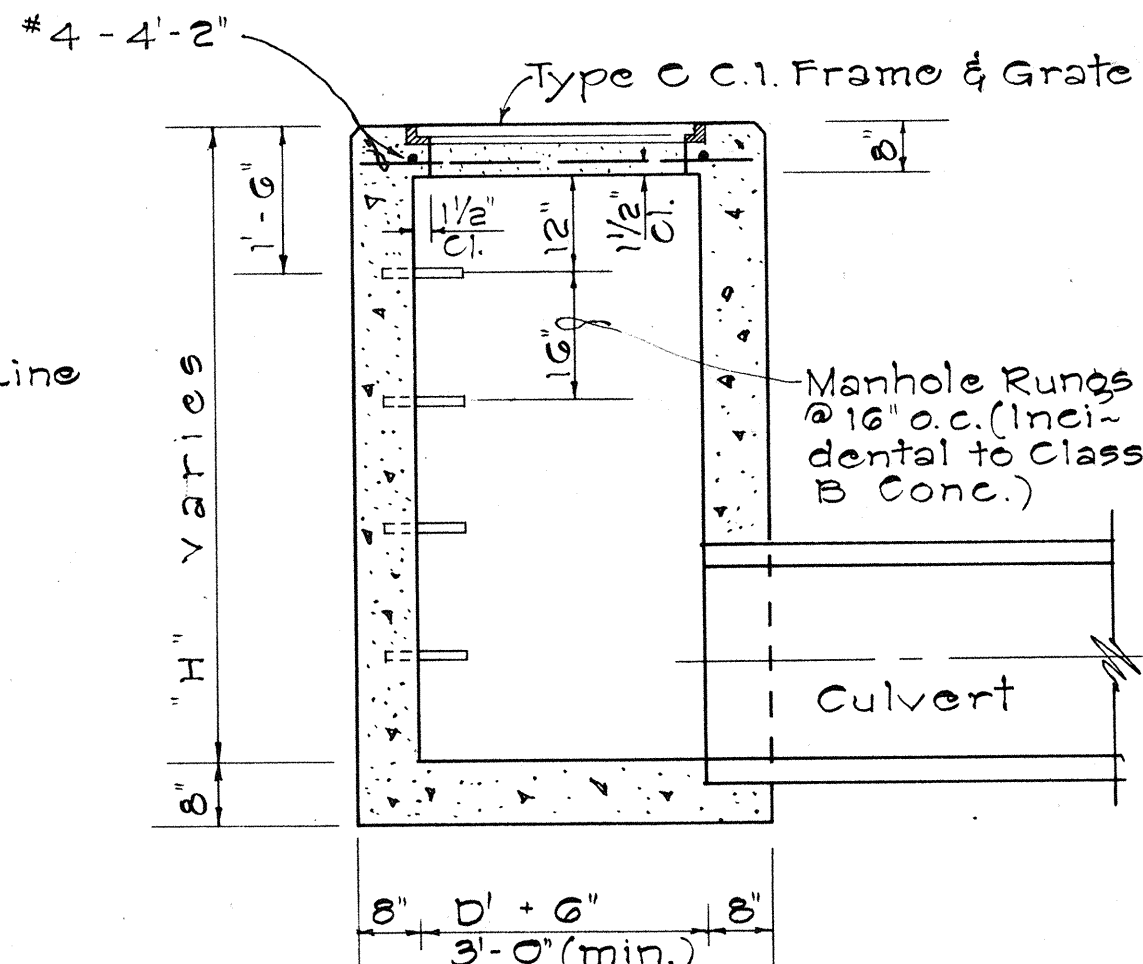
PLAN



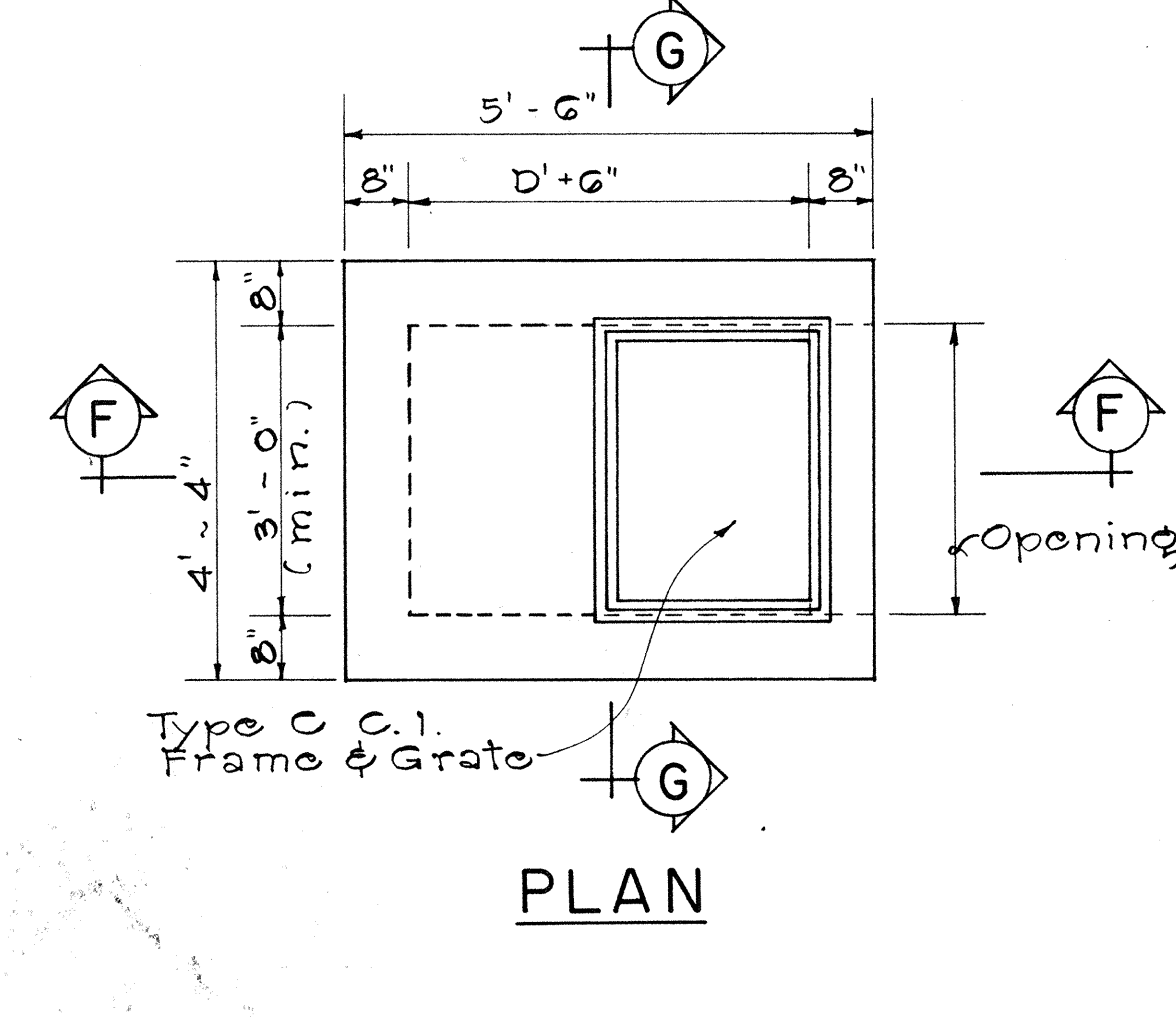
SECTION "C-C"



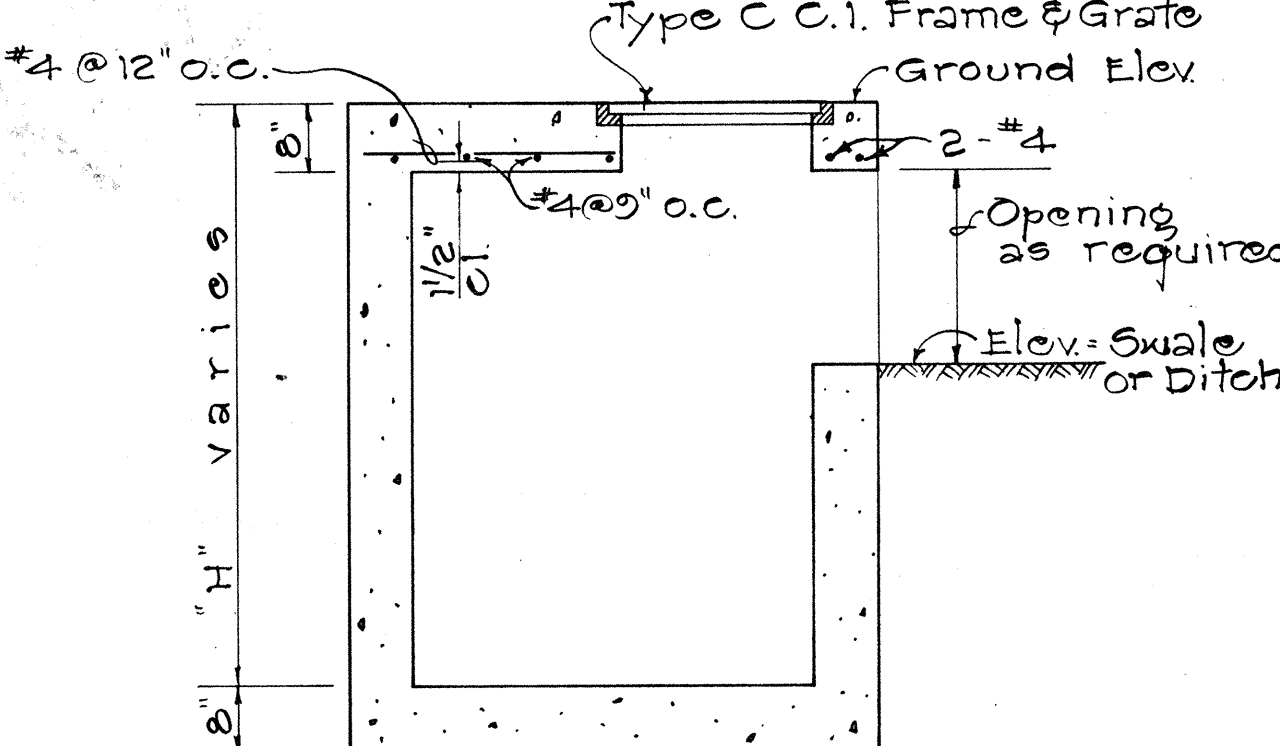
PLAN



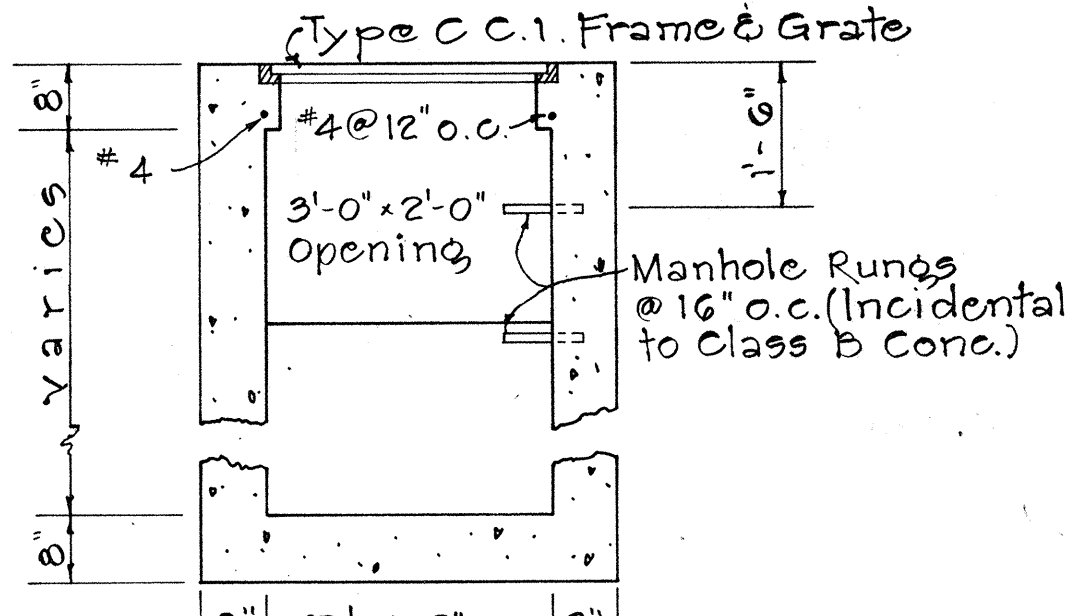
SECTION "E-E"



PLAN



SECTION "F-F"



SECTION "G-G"

TYPE "C" GRATED CONCRETE DROP INTAKE

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

TYPE "D" GRATED CONCRETE DROP INTAKE

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

APPROVAL RECOMMENDED:
 HYDRAULIC DESIGN ENGINEER
 DATE: 12-17-69

APPROVED:
 ASSISTANT CHIEF, ENGINEERING
 DATE: 12-17-69

NO.	REVISION	APPROVED BY	DATE

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION
 STANDARD DETAILS
 TYPE "A", "B", "C", AND "D"
 CONCRETE DROP INTAKE
 Scale: As Noted
 Date: July, 1969
 SHEET No. 16 OF 16 SHEETS DH19

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

TYPE "A" CONCRETE DROP INTAKE

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

TYPE "B" CONCRETE DROP INTAKE

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