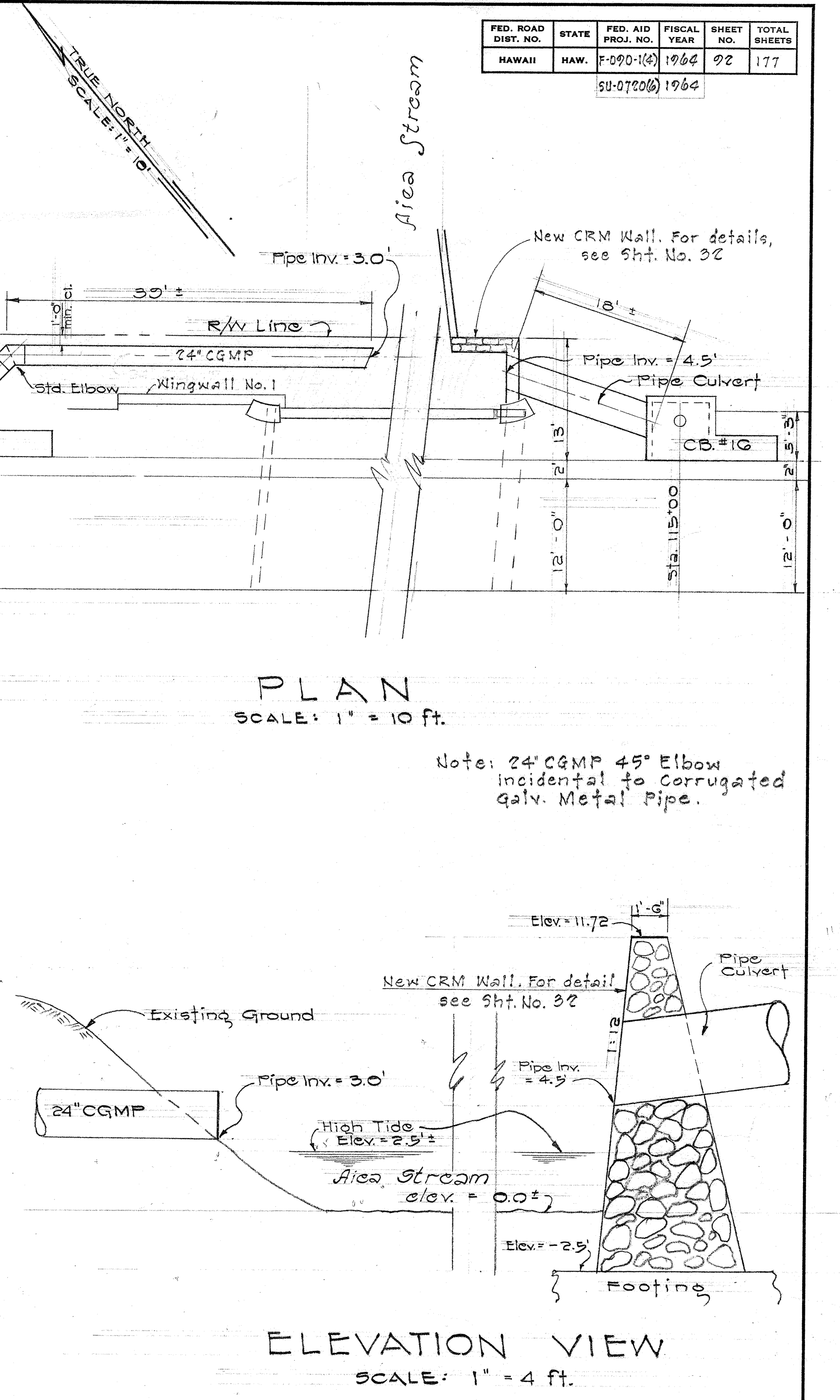
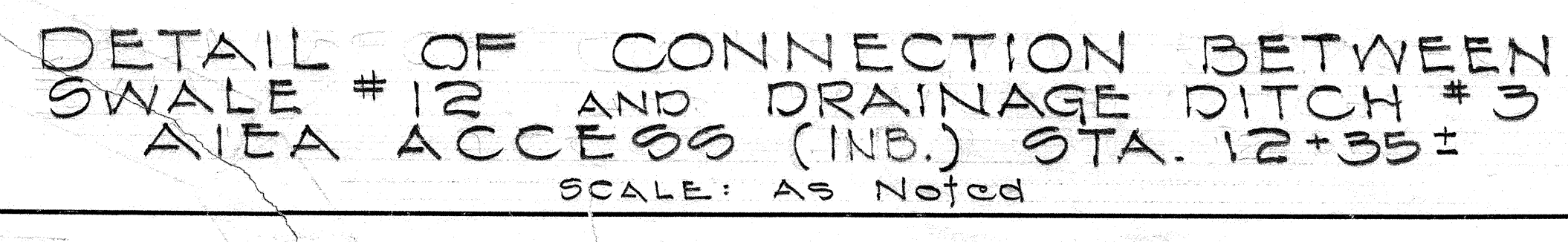
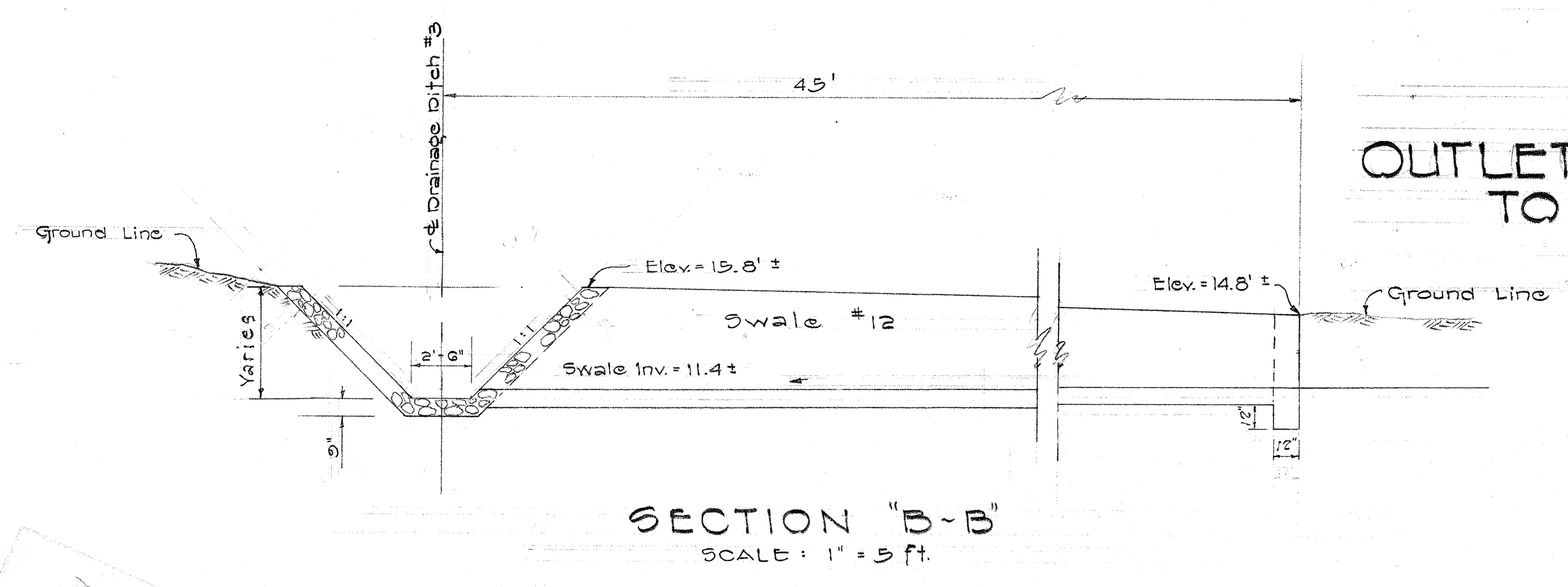
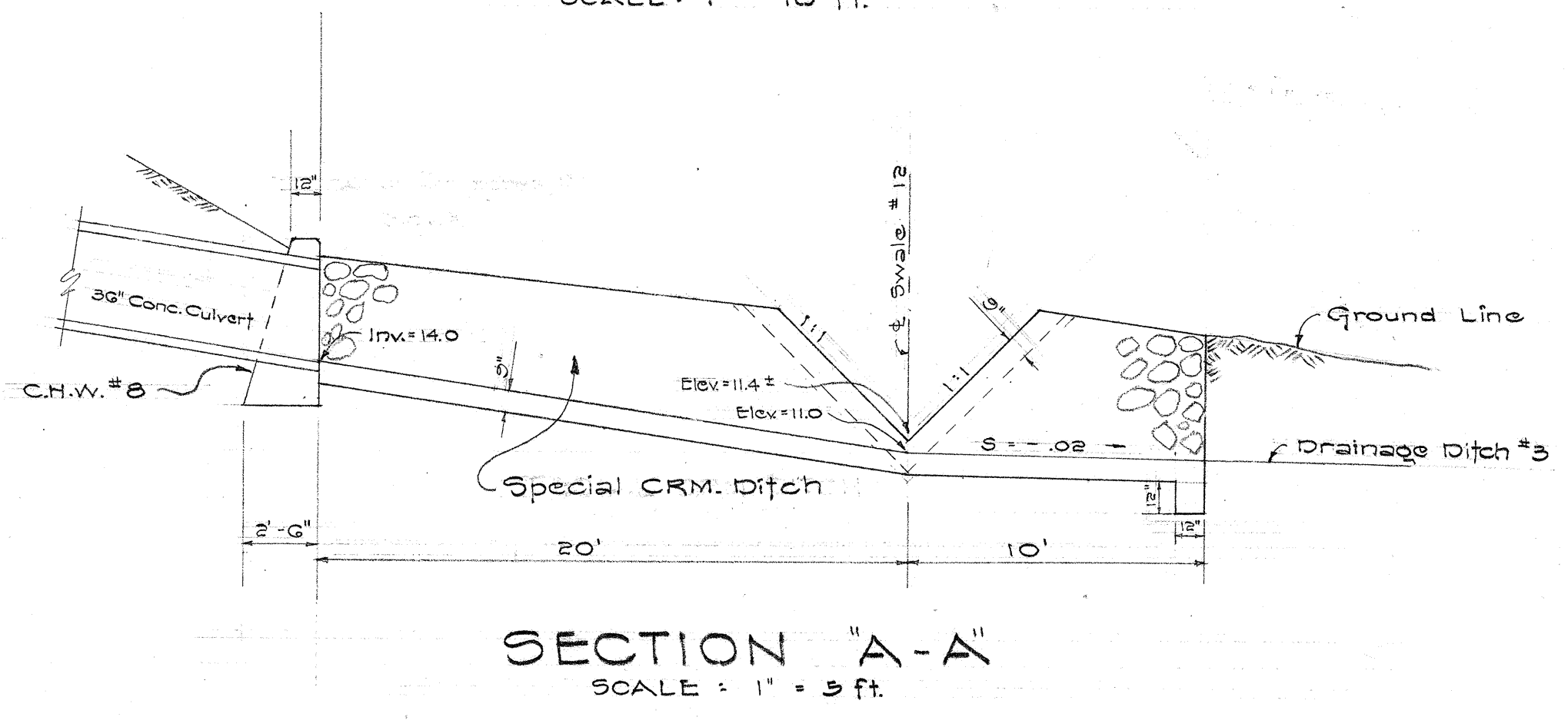
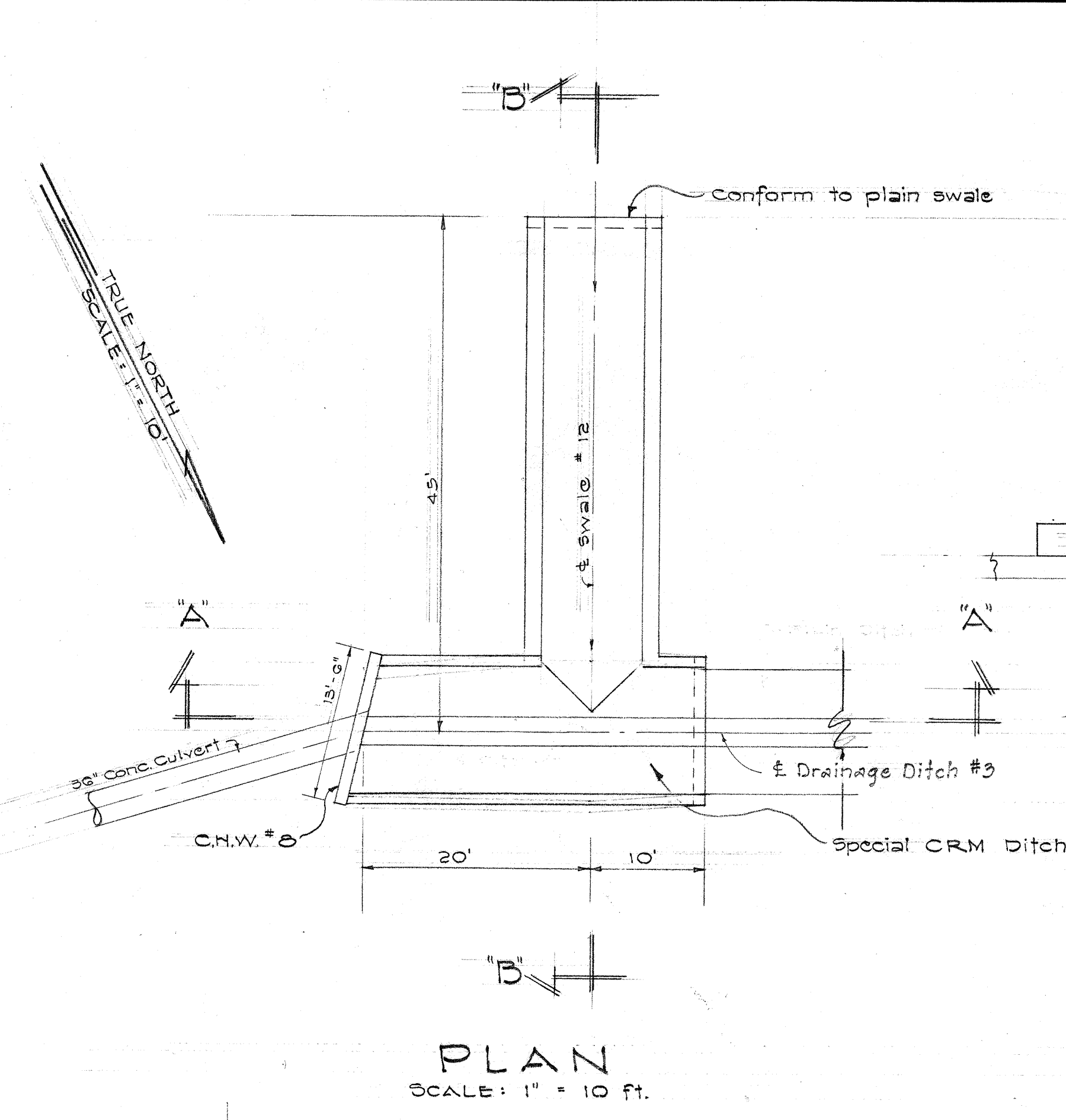
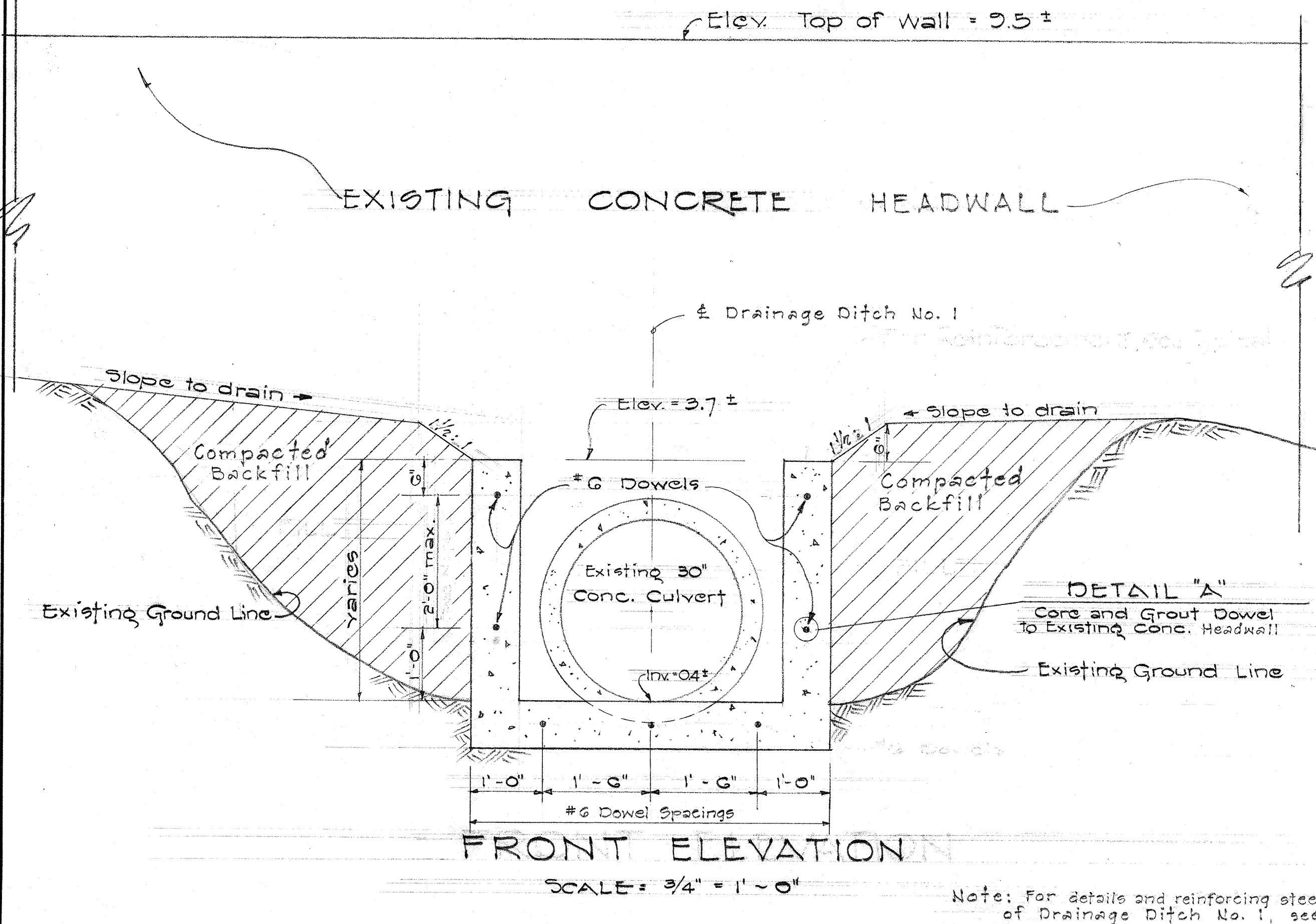
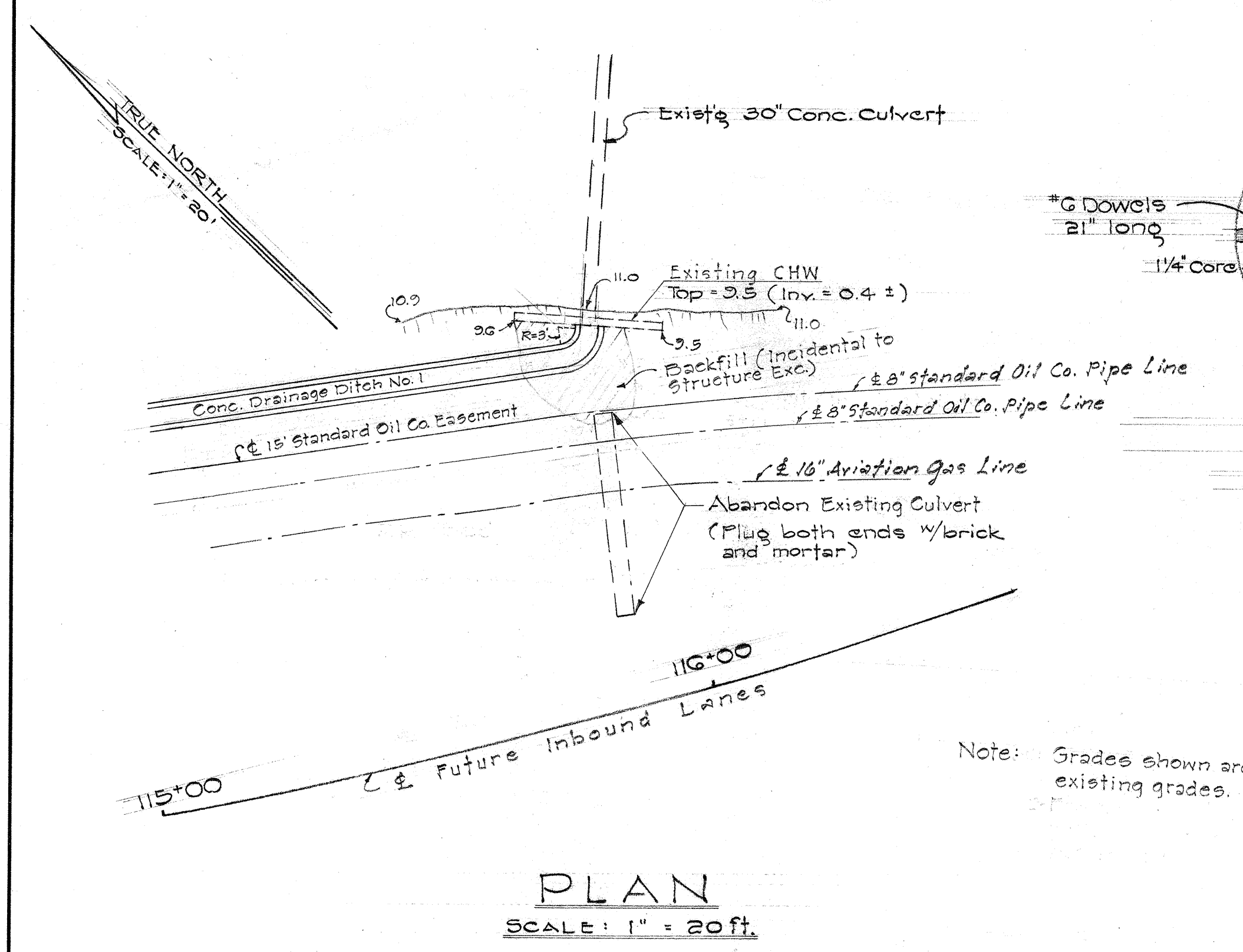


FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-090-1(4)	1964	92	177
SU-0720(6) 1964					



STATE OF HAWAII

DEPARTMENT OF TRANSPORTATION

HIGHWAYS DIVISION

DRAINAGE DETAILS

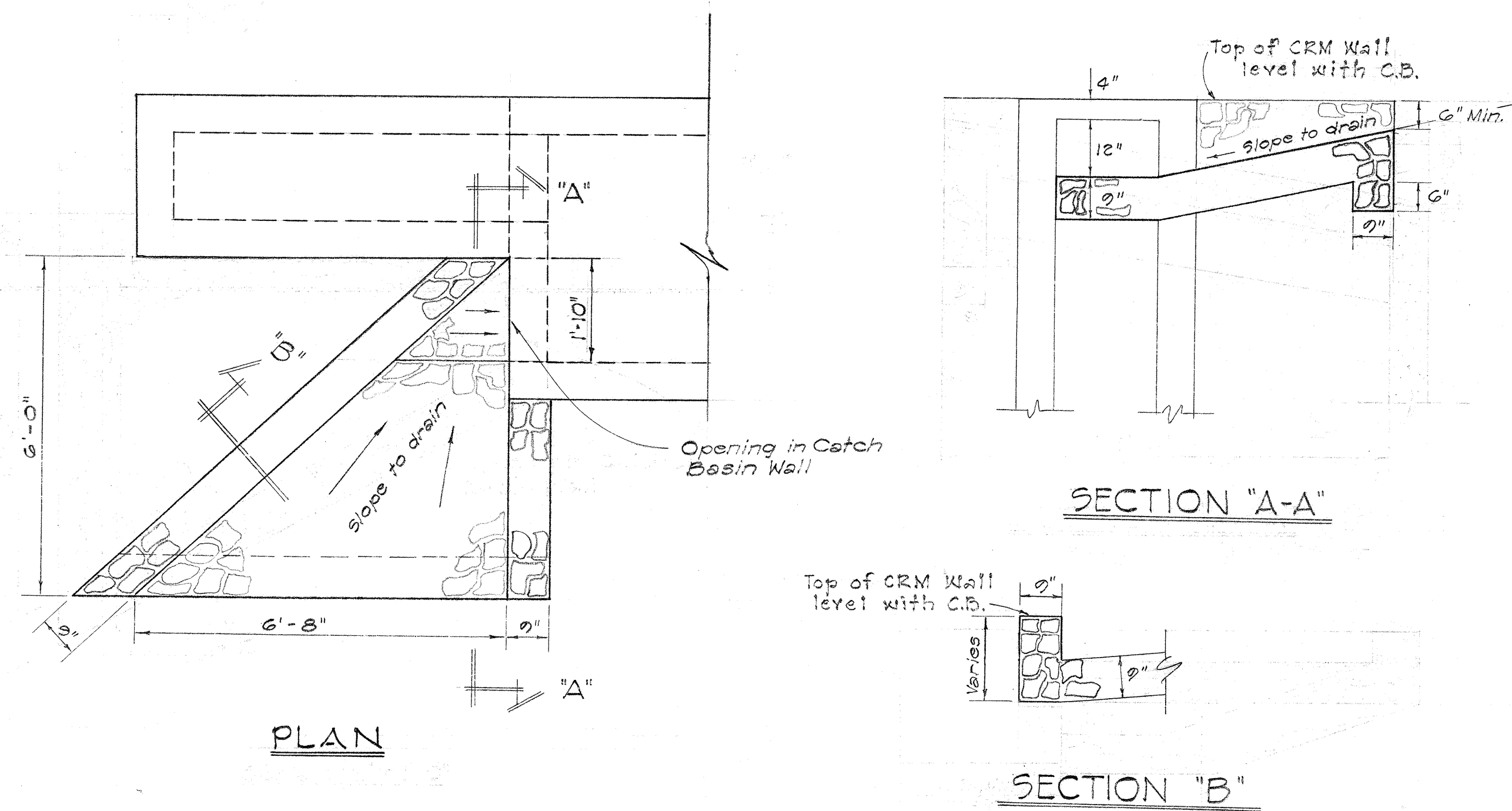
Kamehameha Hwy
Moanalua Rd.
Scale: As Noted

F-090-1(4)
SU-0720(6)
Feb. 1964

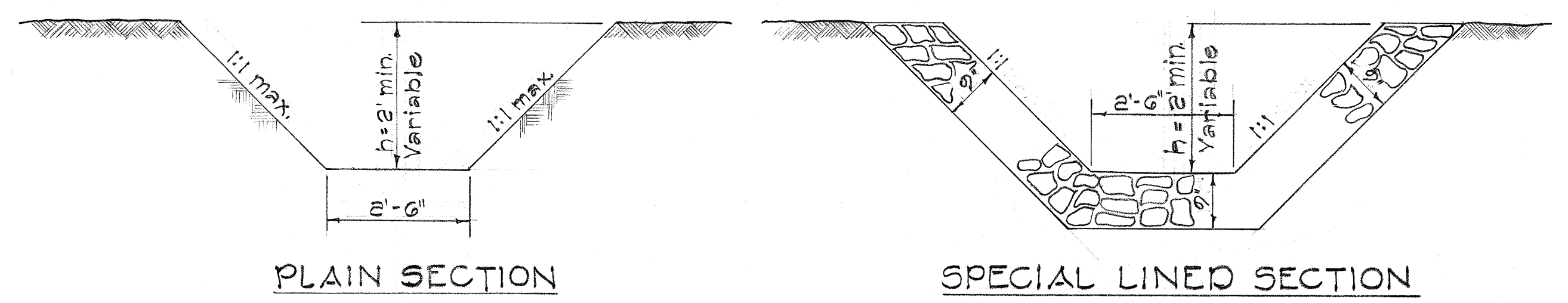
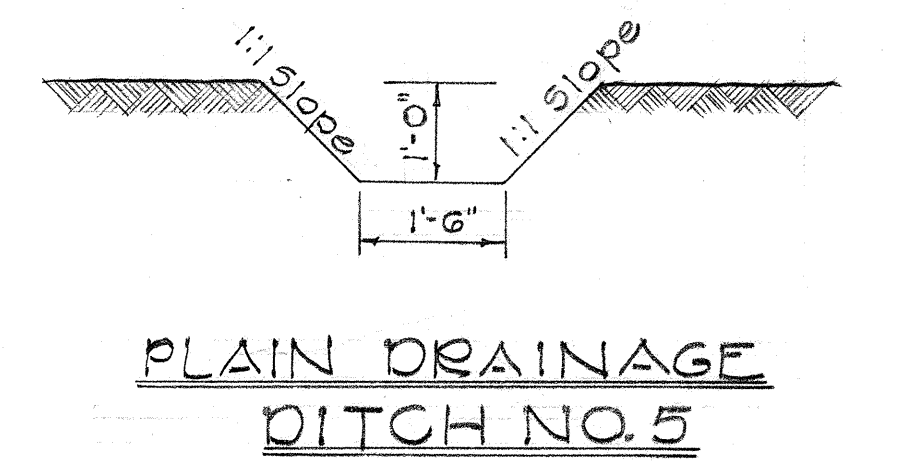
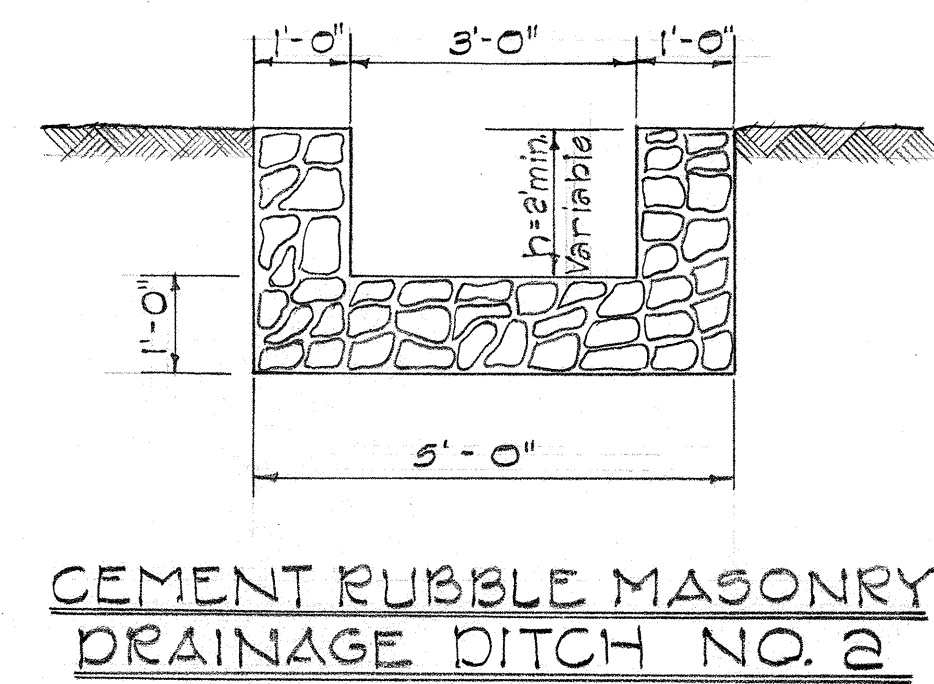
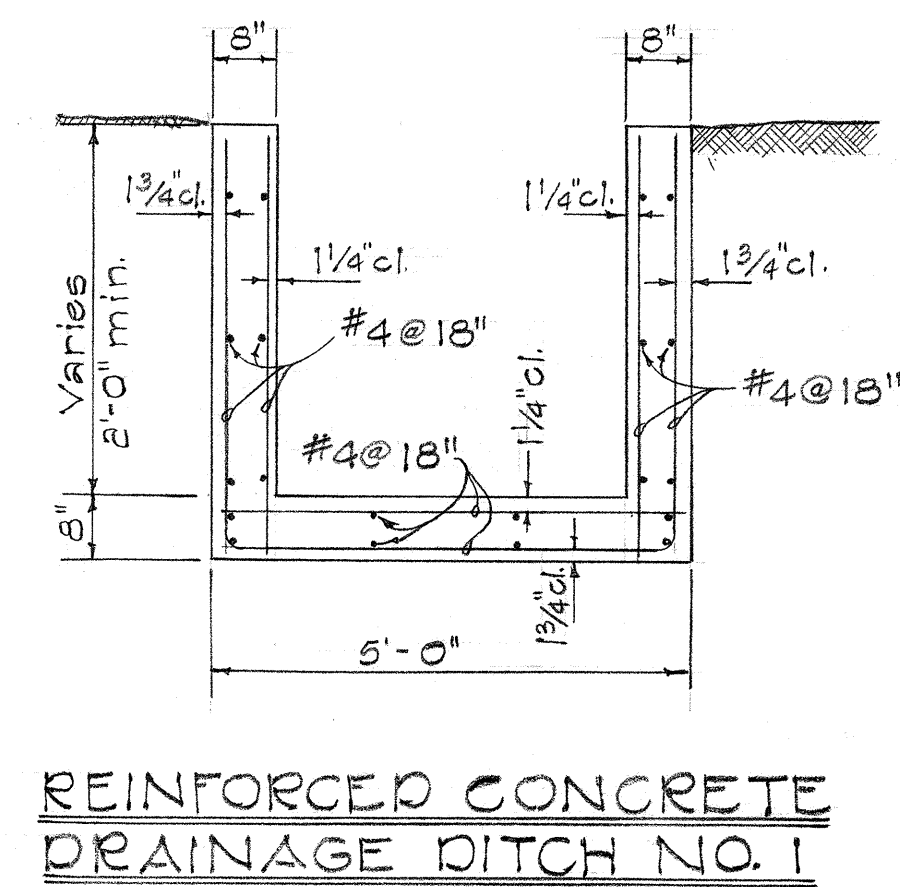
SHEET No. 1 OF 13 SHEETS

92

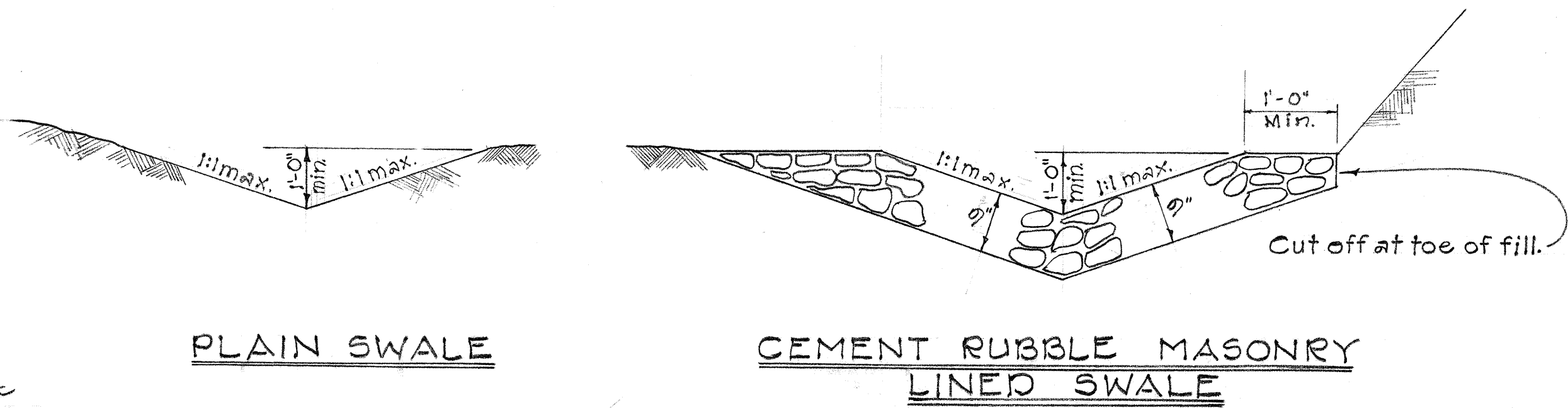
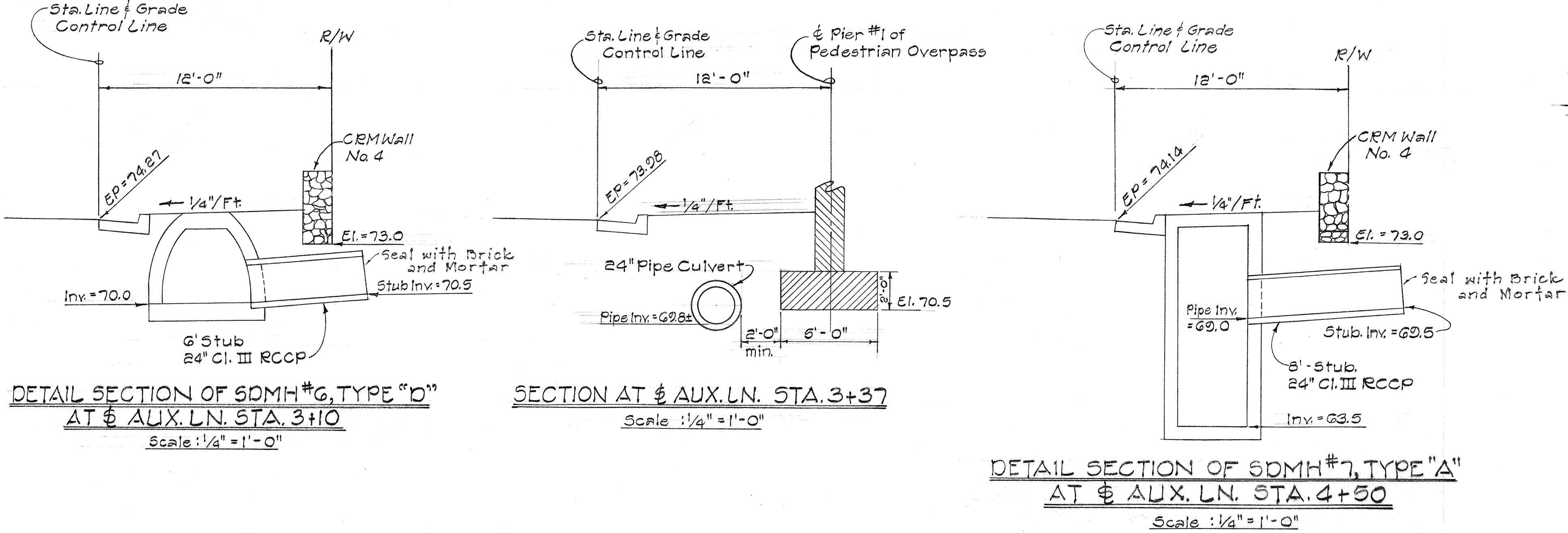
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-090-1(4)	1964	93	177
		54-0720(6)	1964		



GRP REAR INTAKE AT CATCH BASINS #6 & 29
Scale: 1/2" = 1'-0"



TYPICAL SECTIONS OF DITCHES
Scale: 1/2" = 1'-0"



TYPICAL SECTIONS - SWALE
Scale: 1/2" = 1'-0"

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS

KAMEHAMEHA HWY. PROJ. NO. F-090-1(4)
MOANALUA RD. PROJ. NO. 54-0720(6)

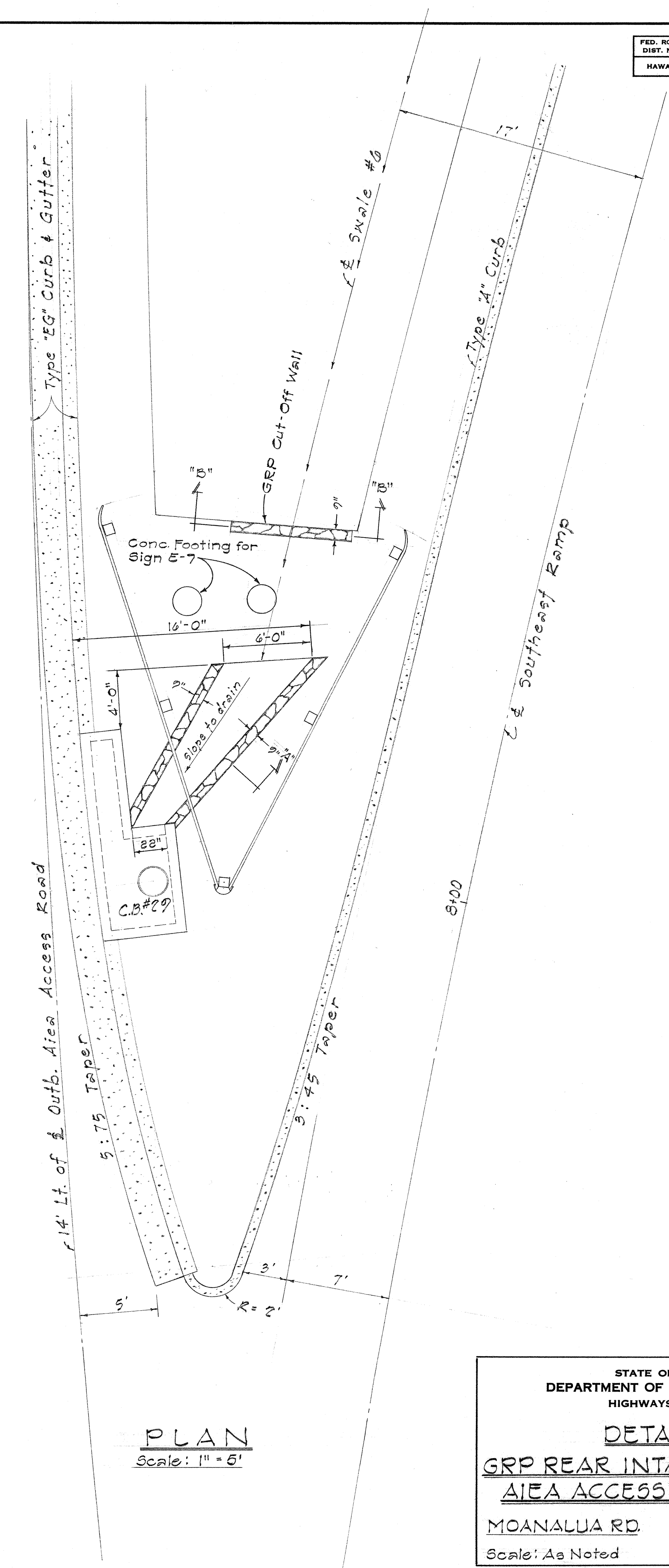
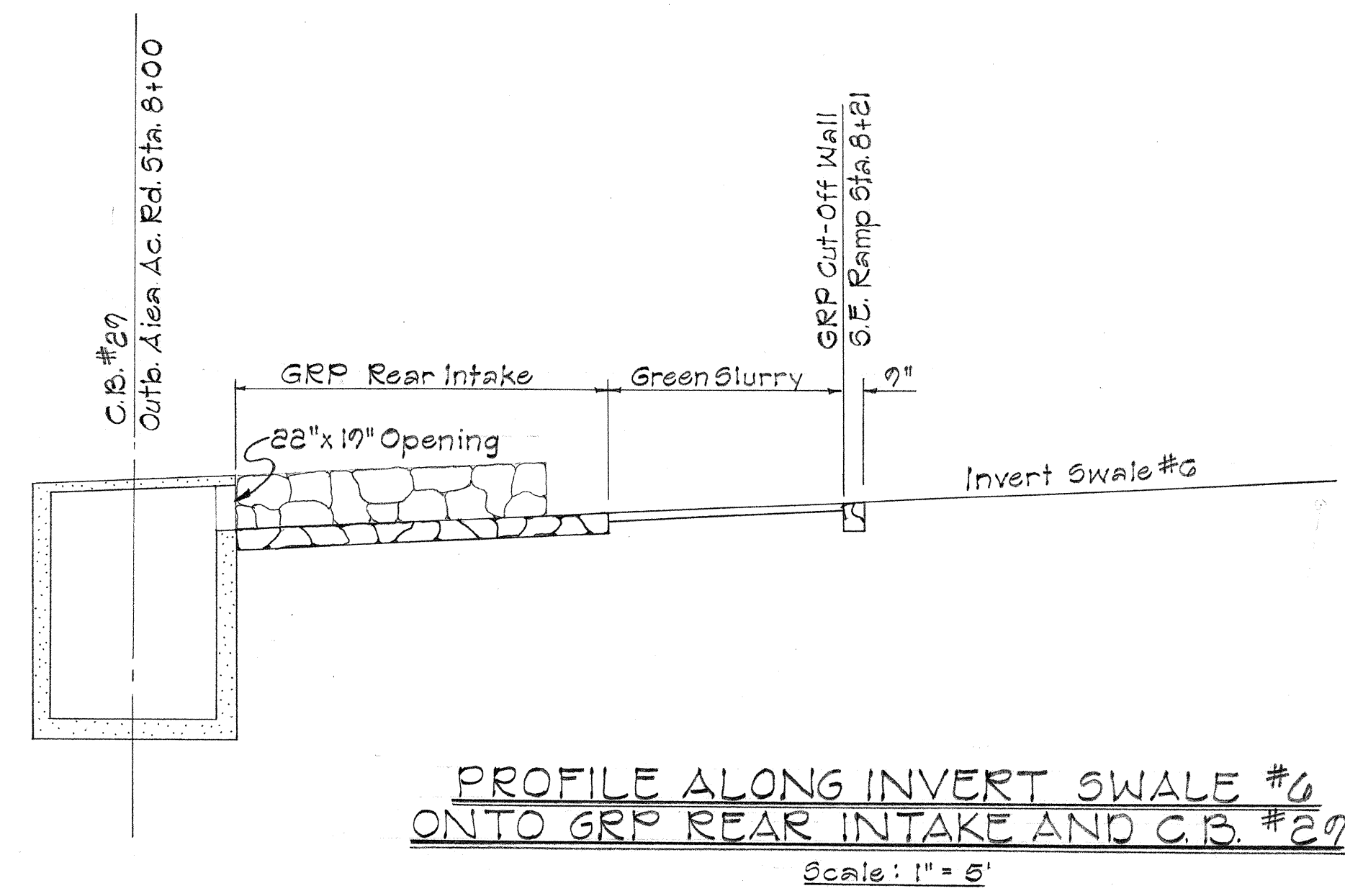
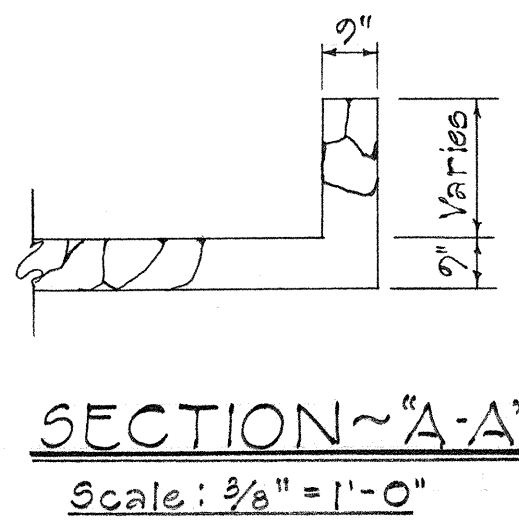
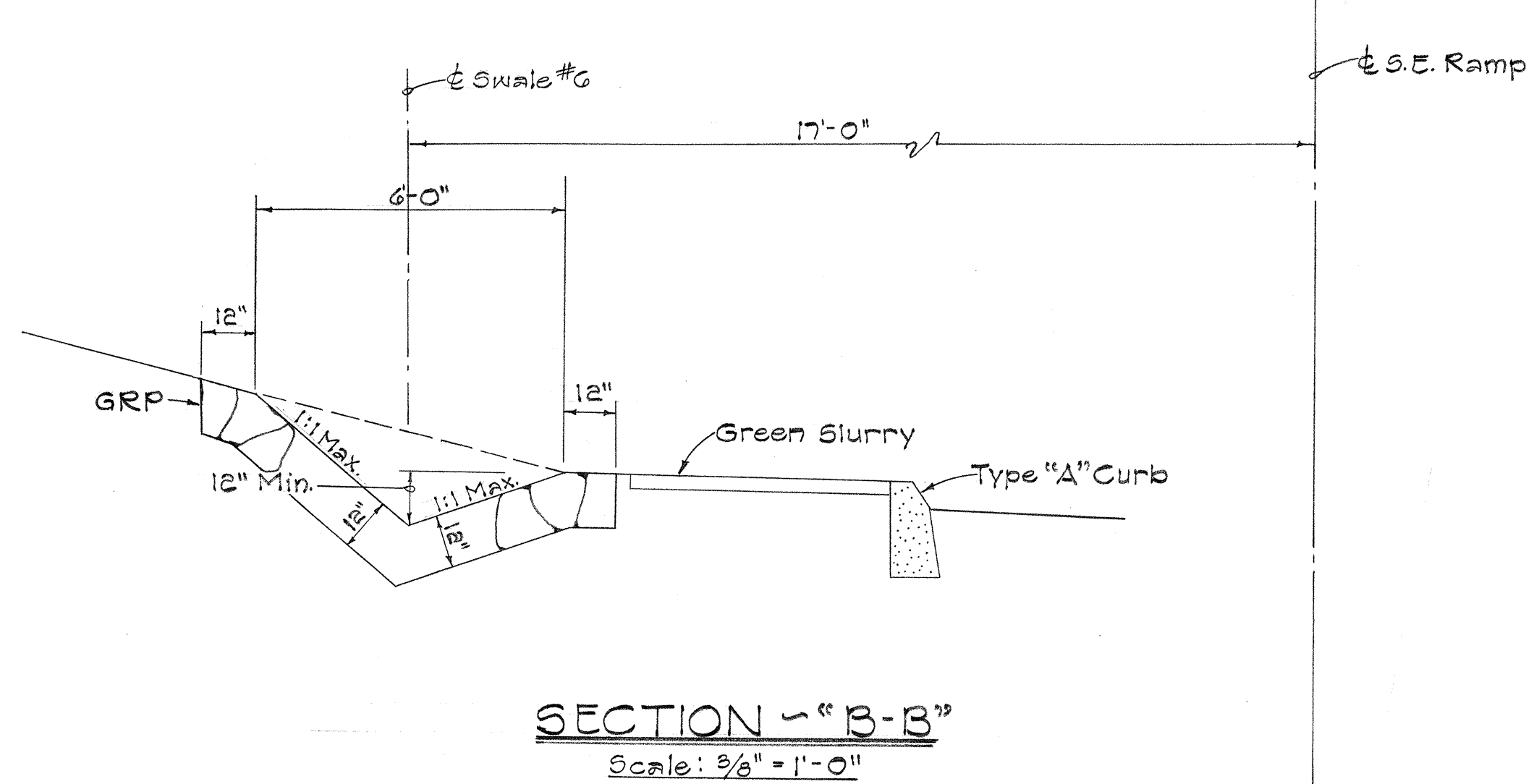
Scale: As Noted Feb. 1964

SHEET No. 2 OF 13 SHEETS

DESIGNED BY	DATE
DRAWN BY	
CHECKED BY	
NOTED BY	
NO.	

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	SU-0720(6)	1964	93A-1	177

True North
Scale: 1" = 5'



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DETAIL OF
GRP REAR INTAKE AT C.B. #27
AIEA ACCESS RD. STA. 8+00

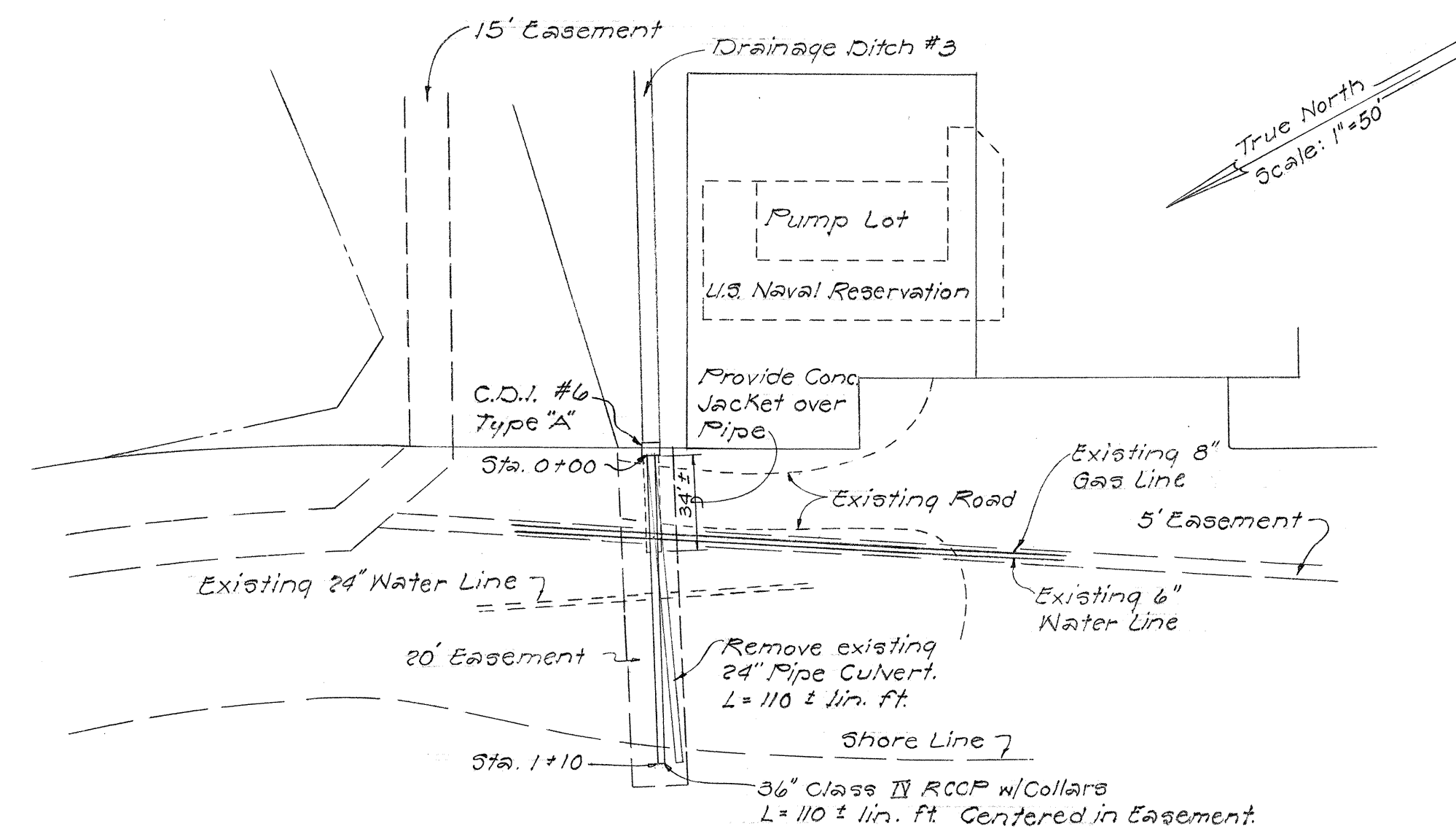
MOANALUA RD. Proj. No. SU-0720(6)
Scale: As Noted March 1964

SHEET No. OF SHEETS

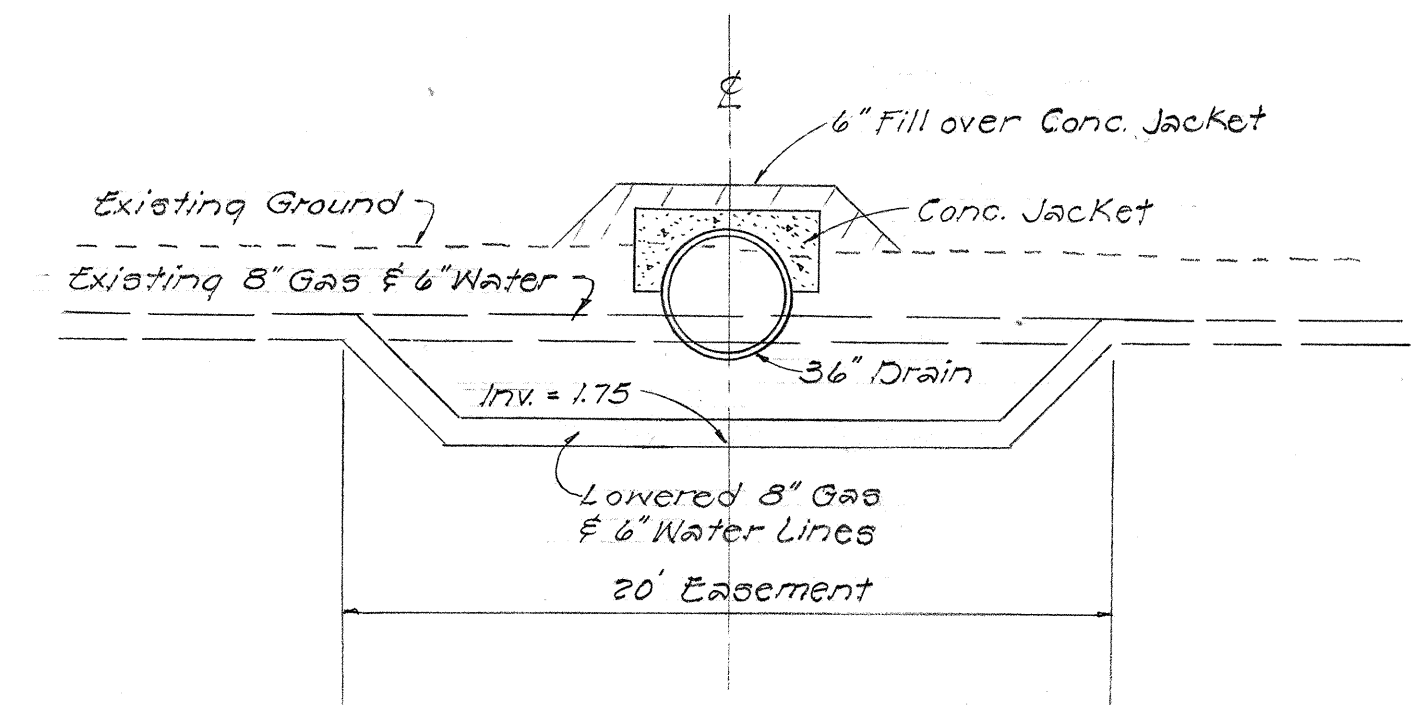
93A-1

ORIGINAL PLAN	DATE
SURVEY PLOTTED BY	
DRAWN BY	
DESIGNED BY	
NOTED BY	
CHECKED BY	
No.	

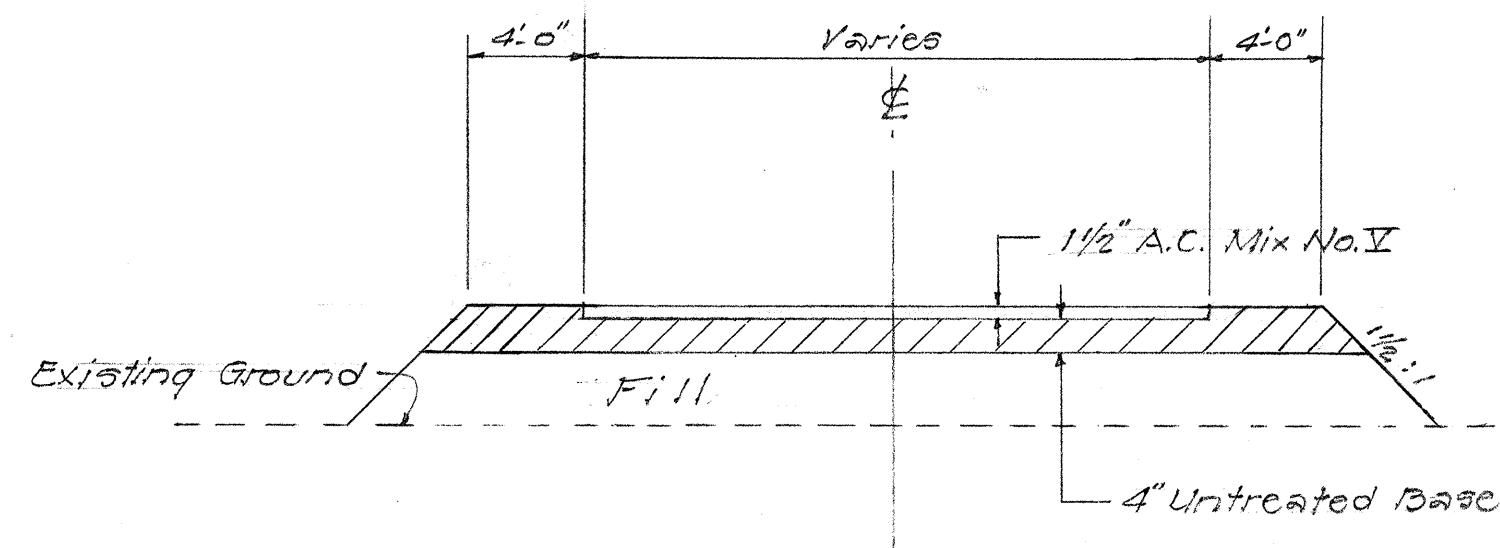
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HAWAII	HAW.				



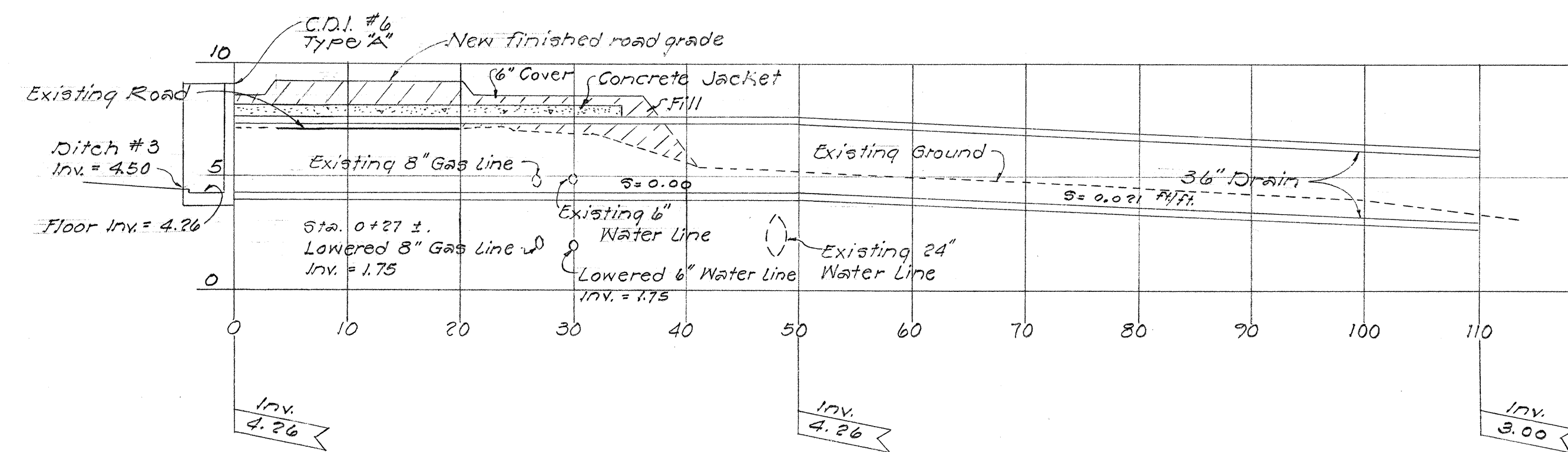
PLAN



DETAIL FOR
LOWERING 8" GAS & 6" WATER LINES
Scale: 1" = 5'

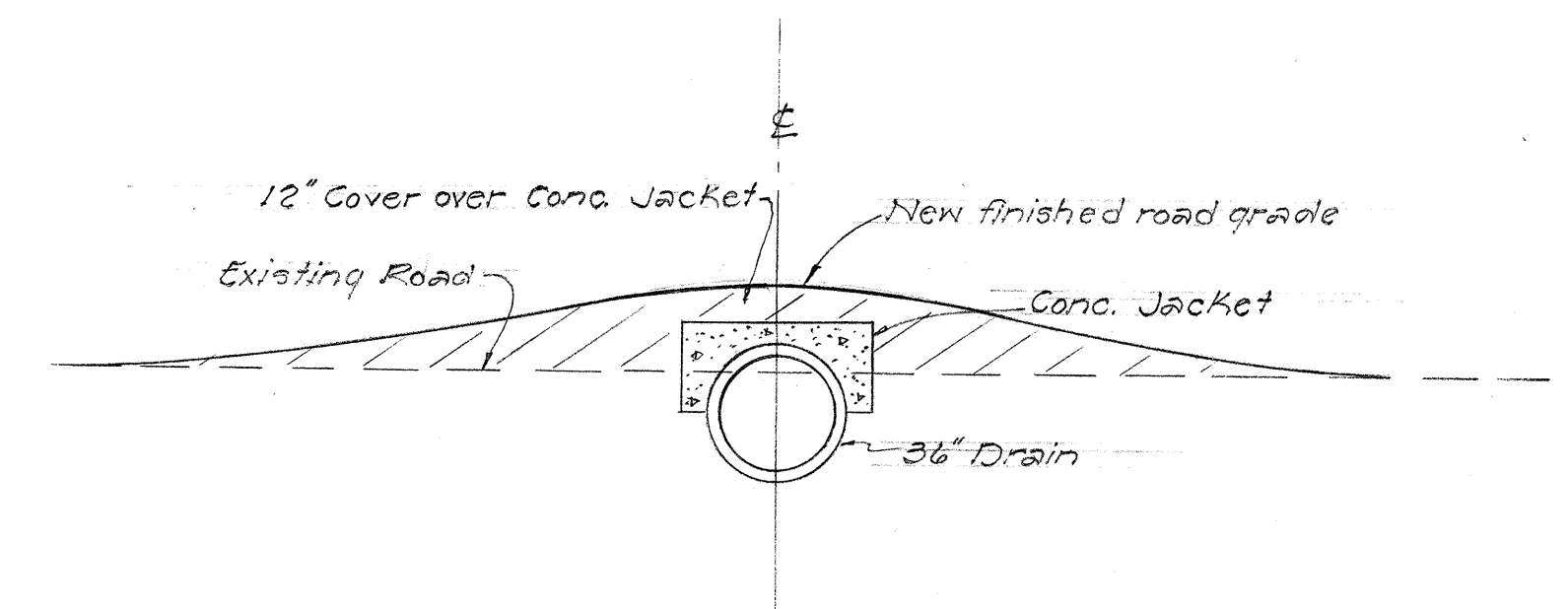


TYPICAL SECTION FOR ROAD
Not to Scale



PROFILE OF 36" DRAIN

Scale: Horiz. 1" = 10'
Vert. 1" = 5'



SECTION OF ROAD
OVER 36" DRAIN
Not to Scale

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

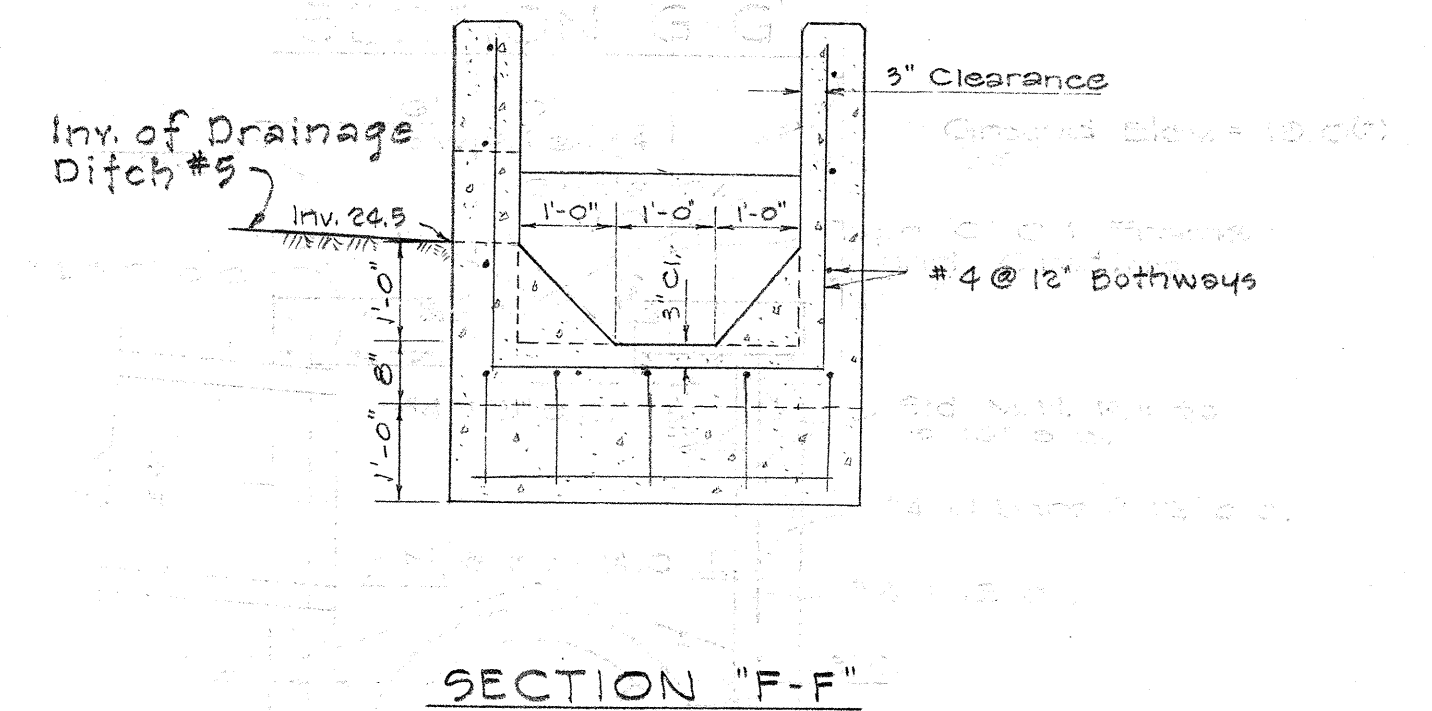
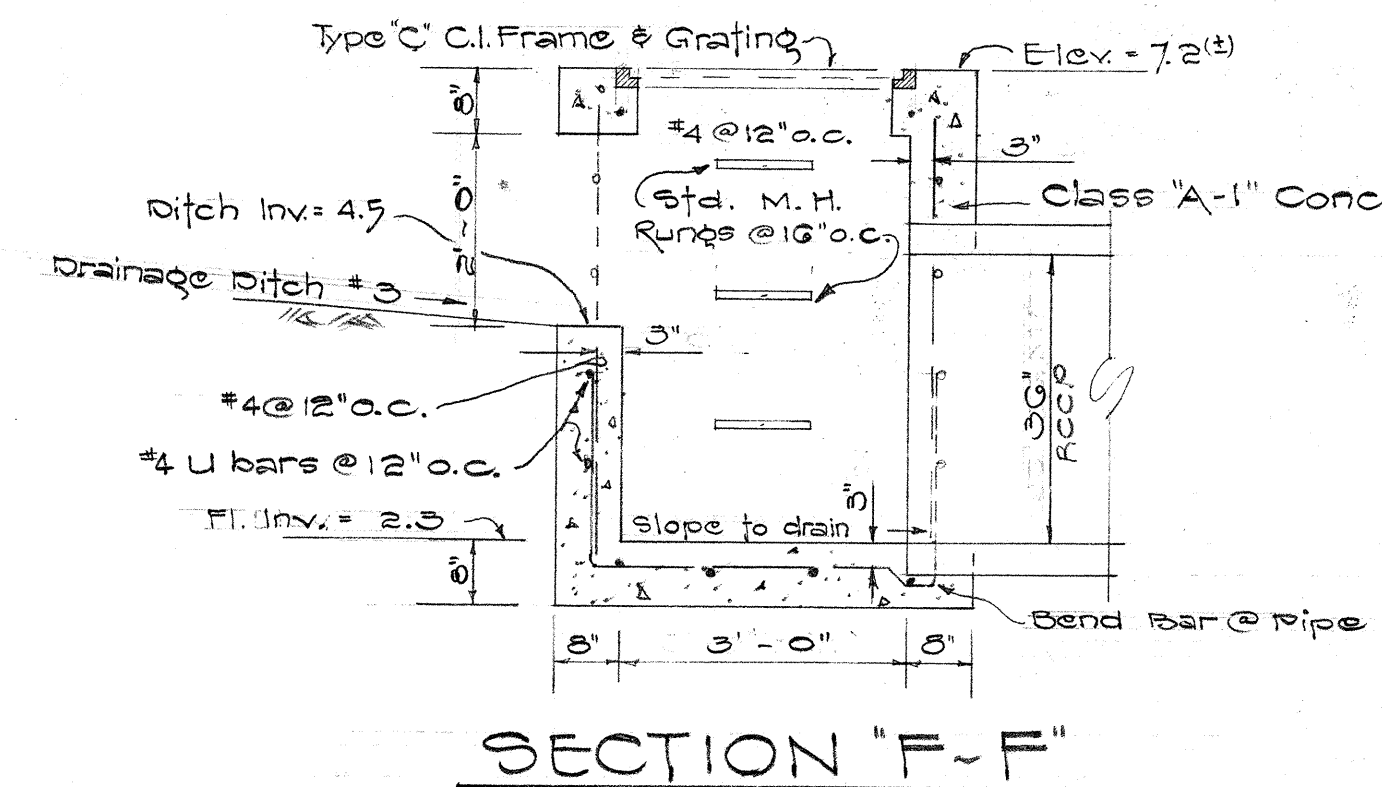
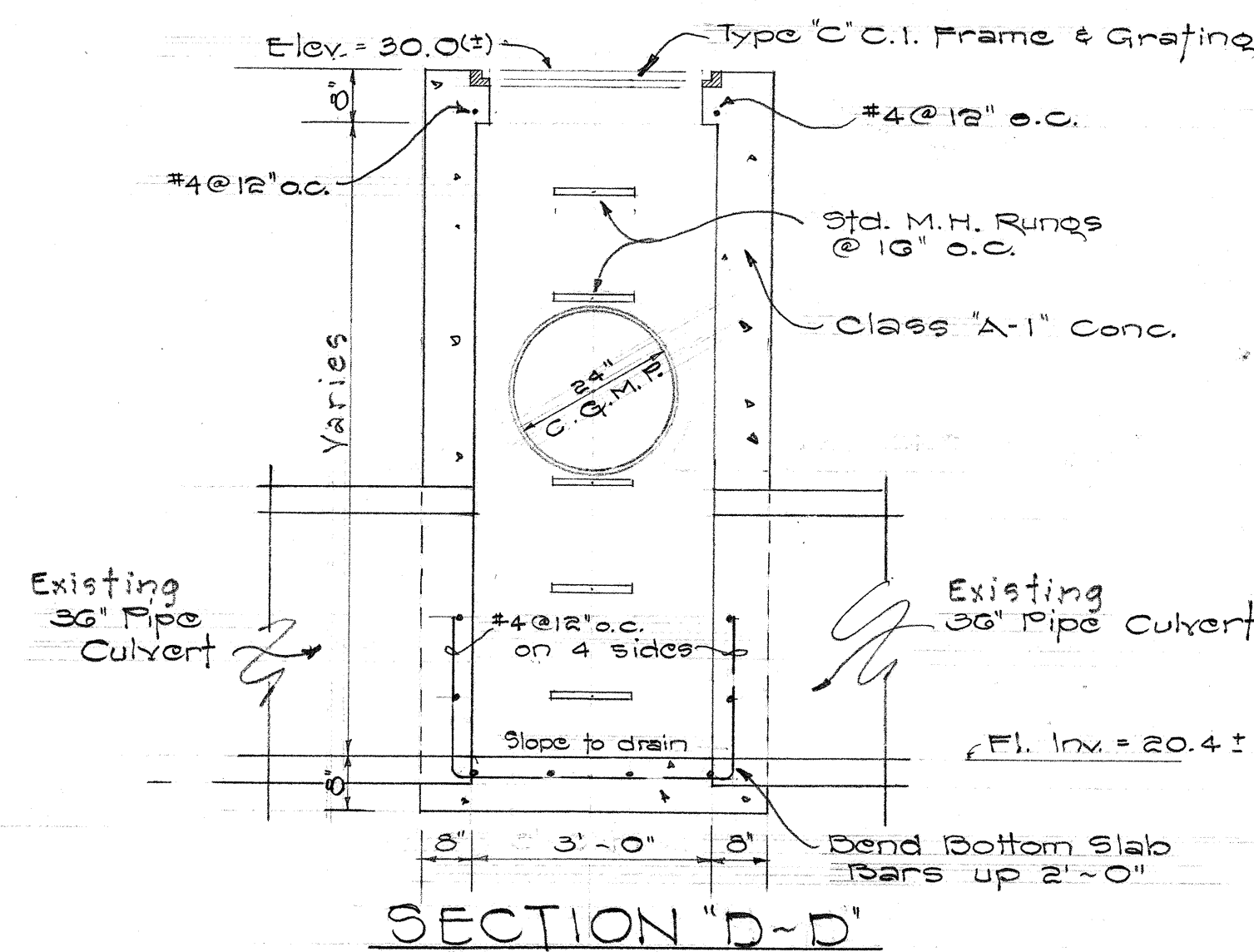
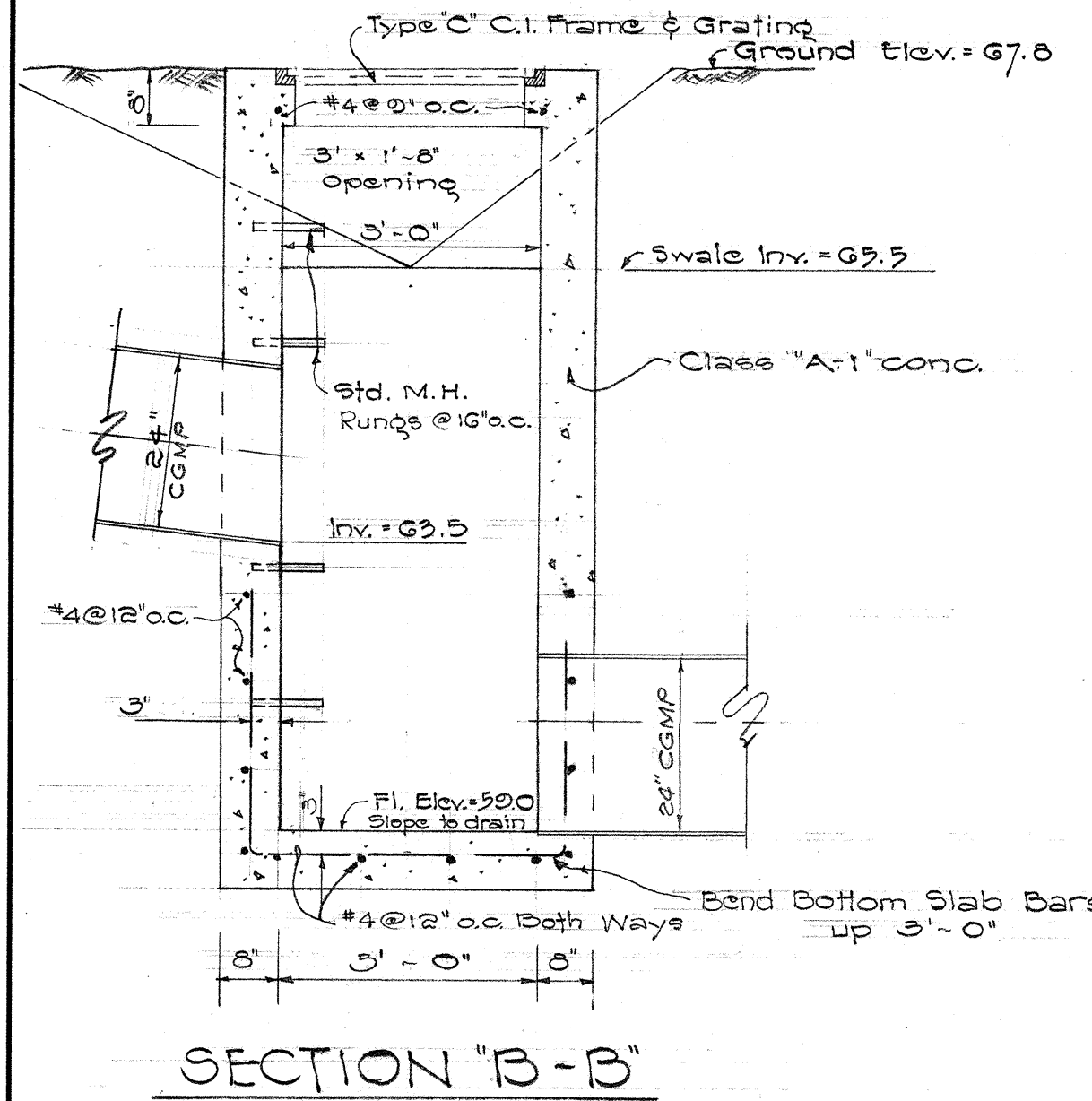
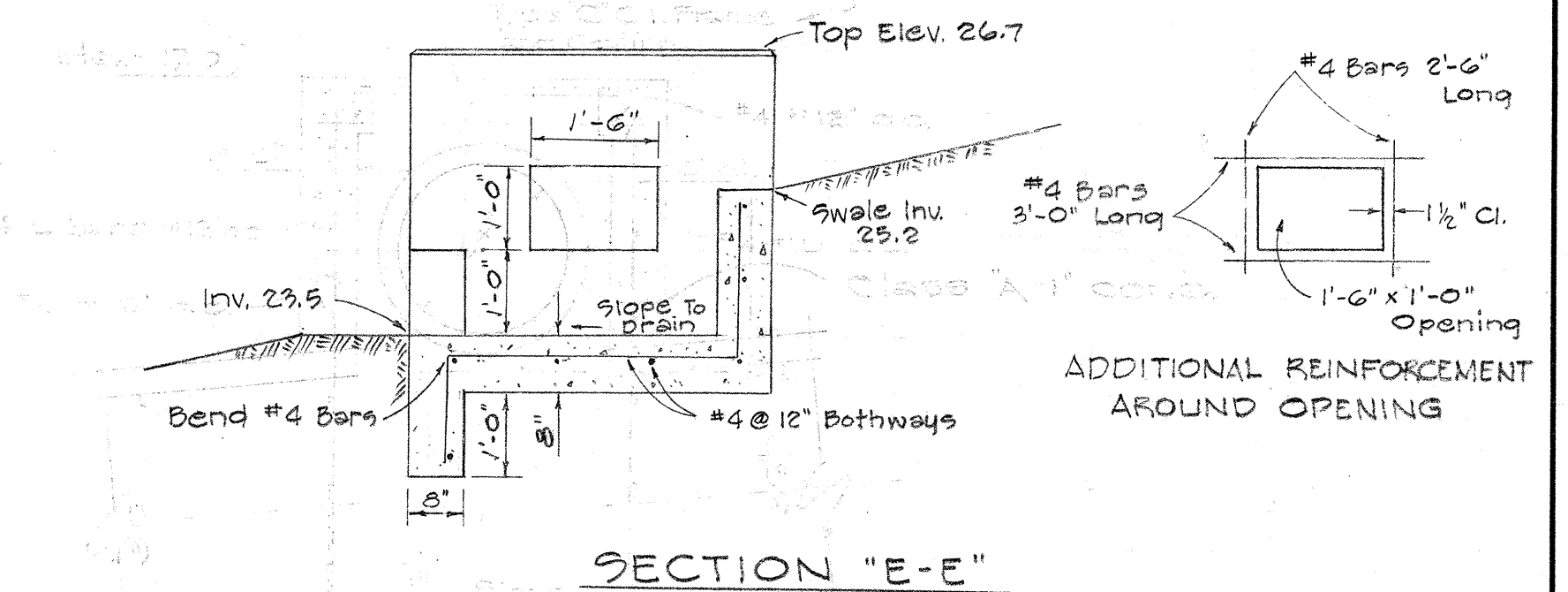
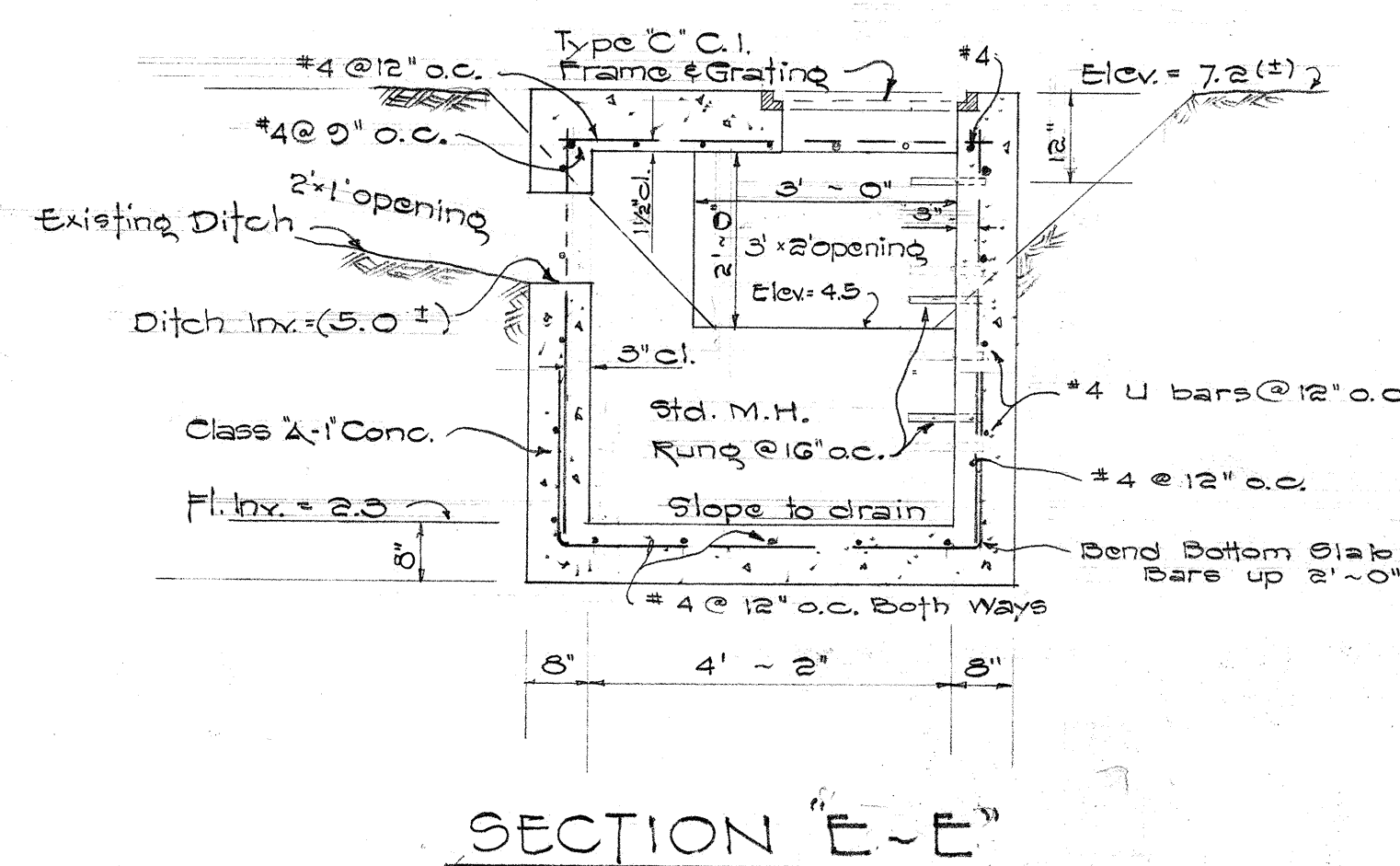
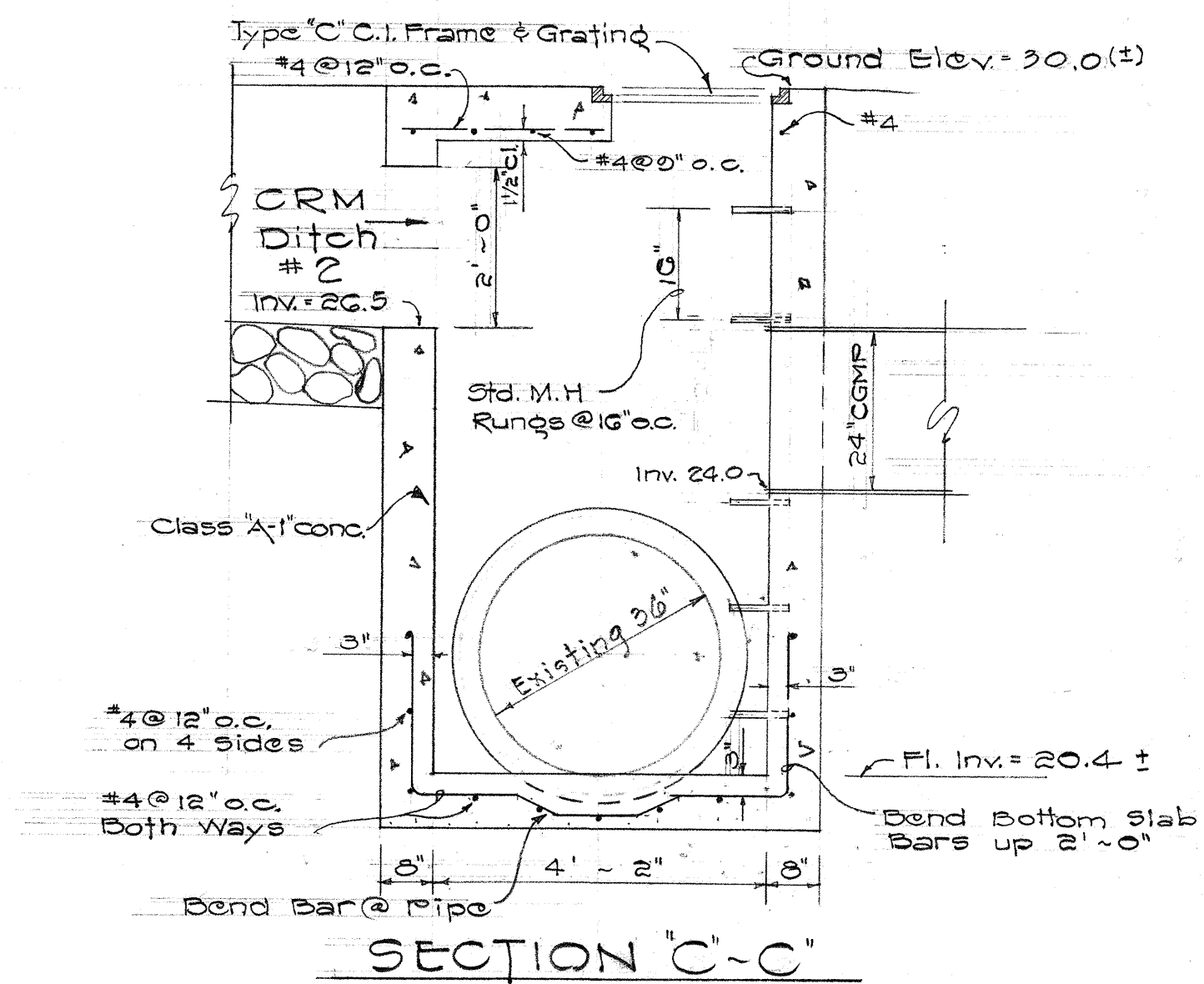
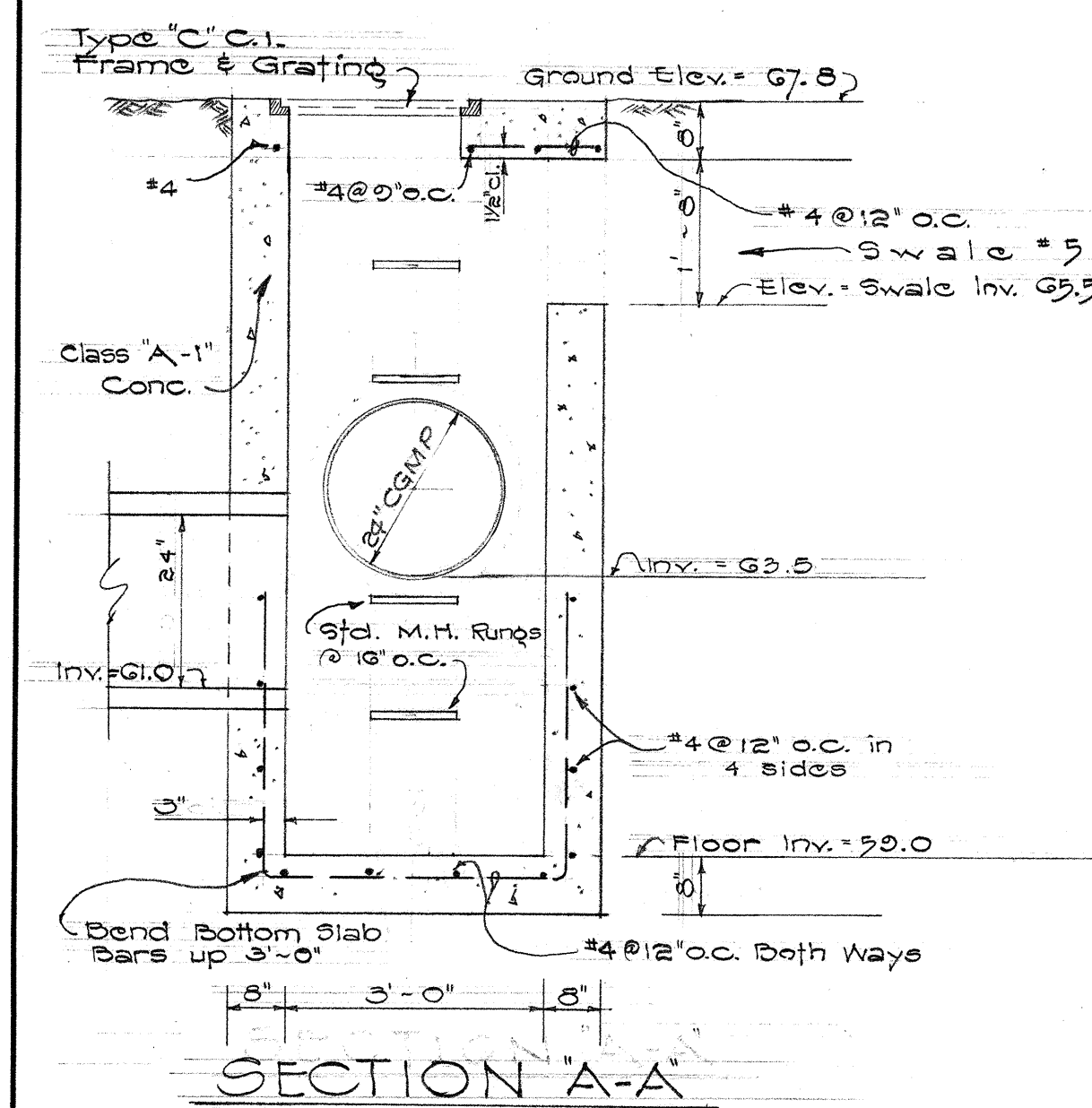
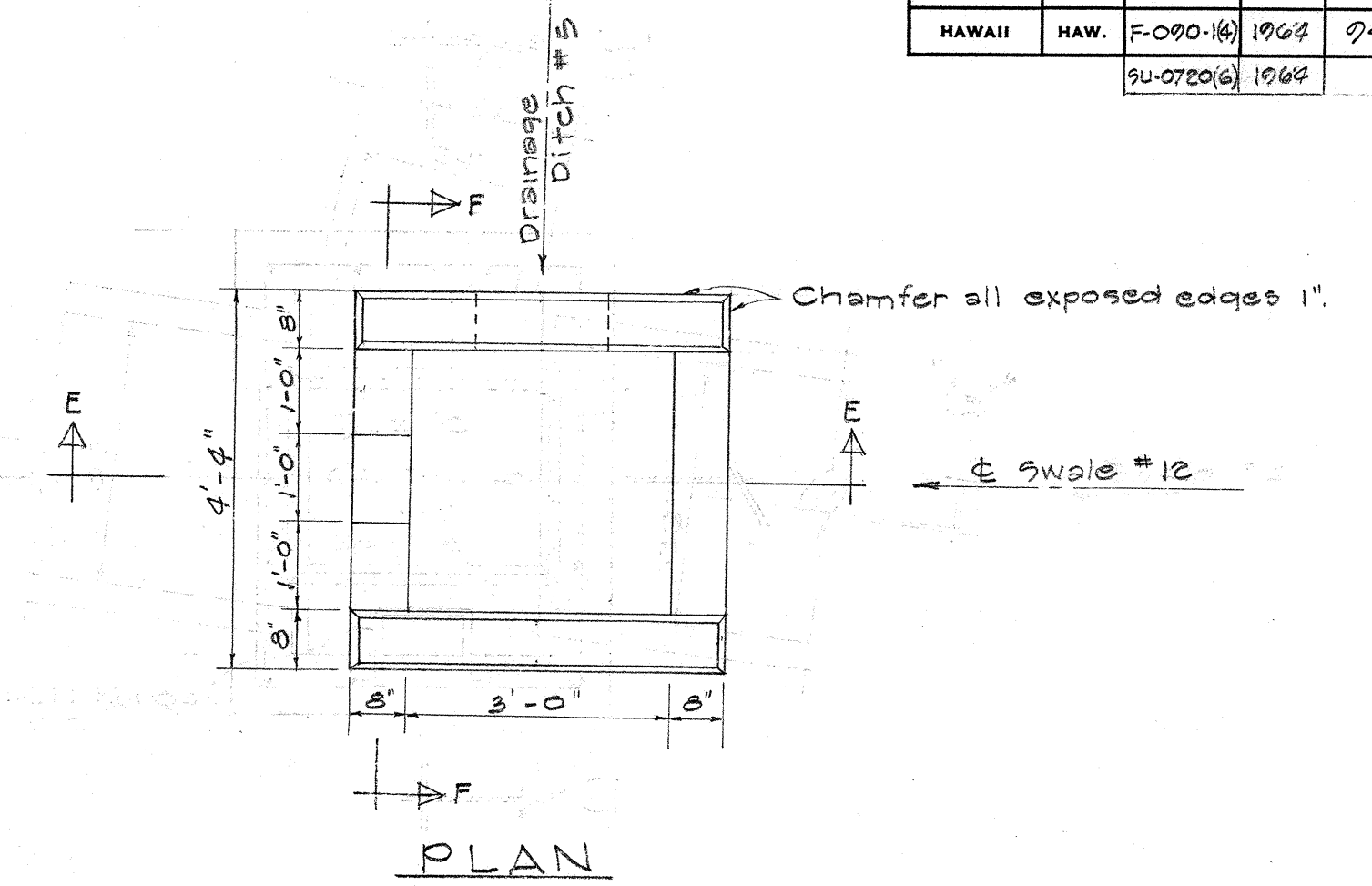
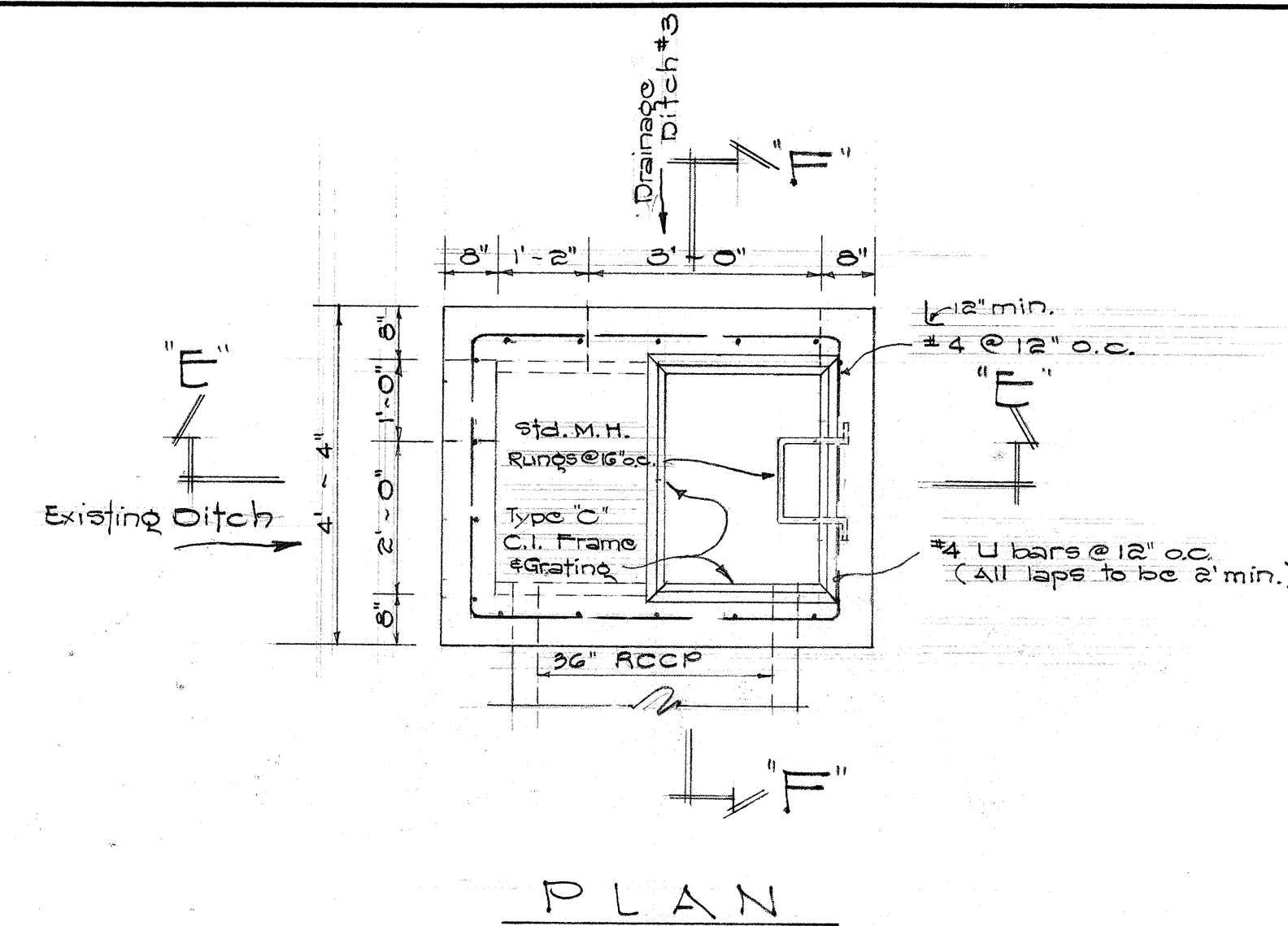
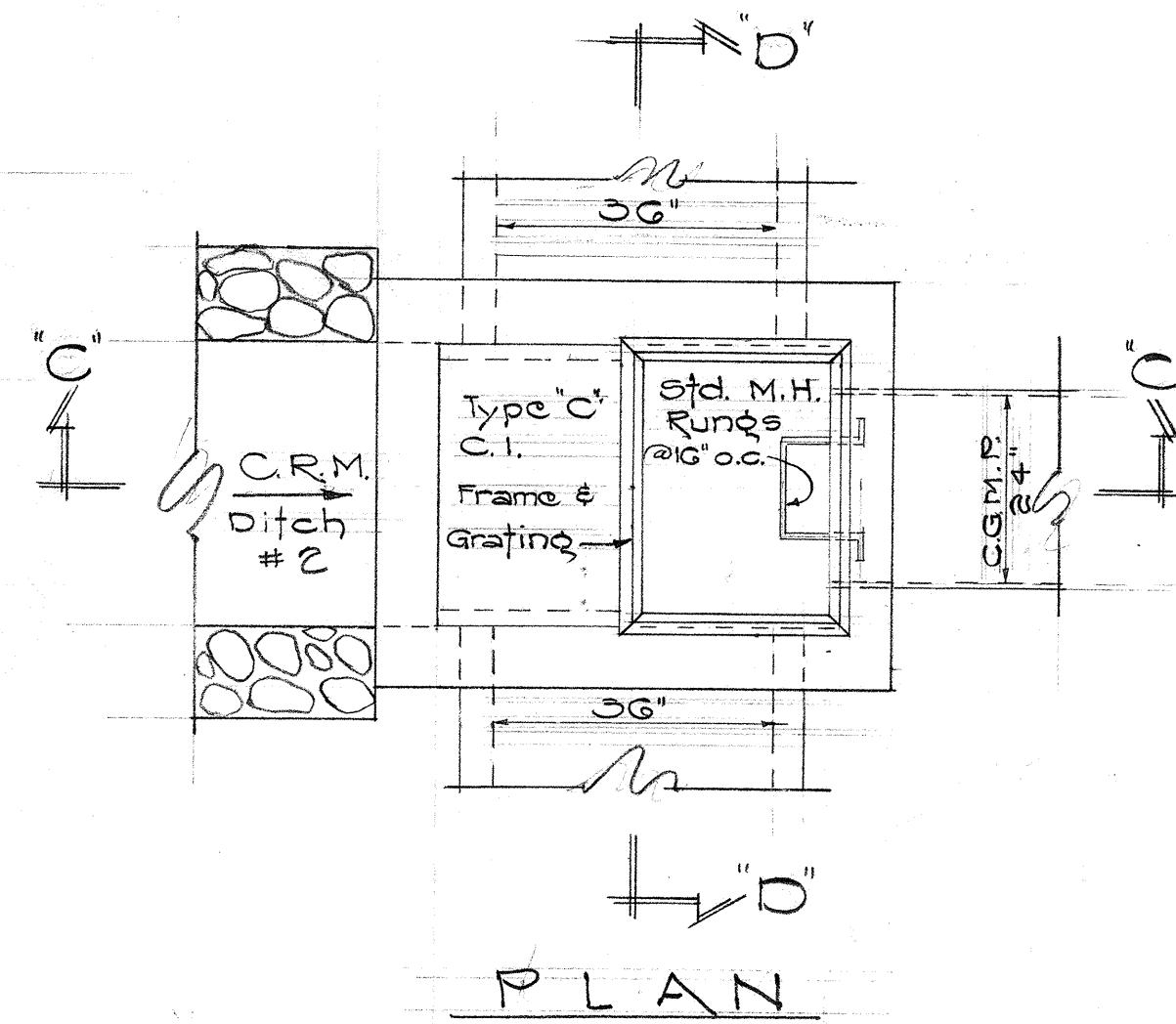
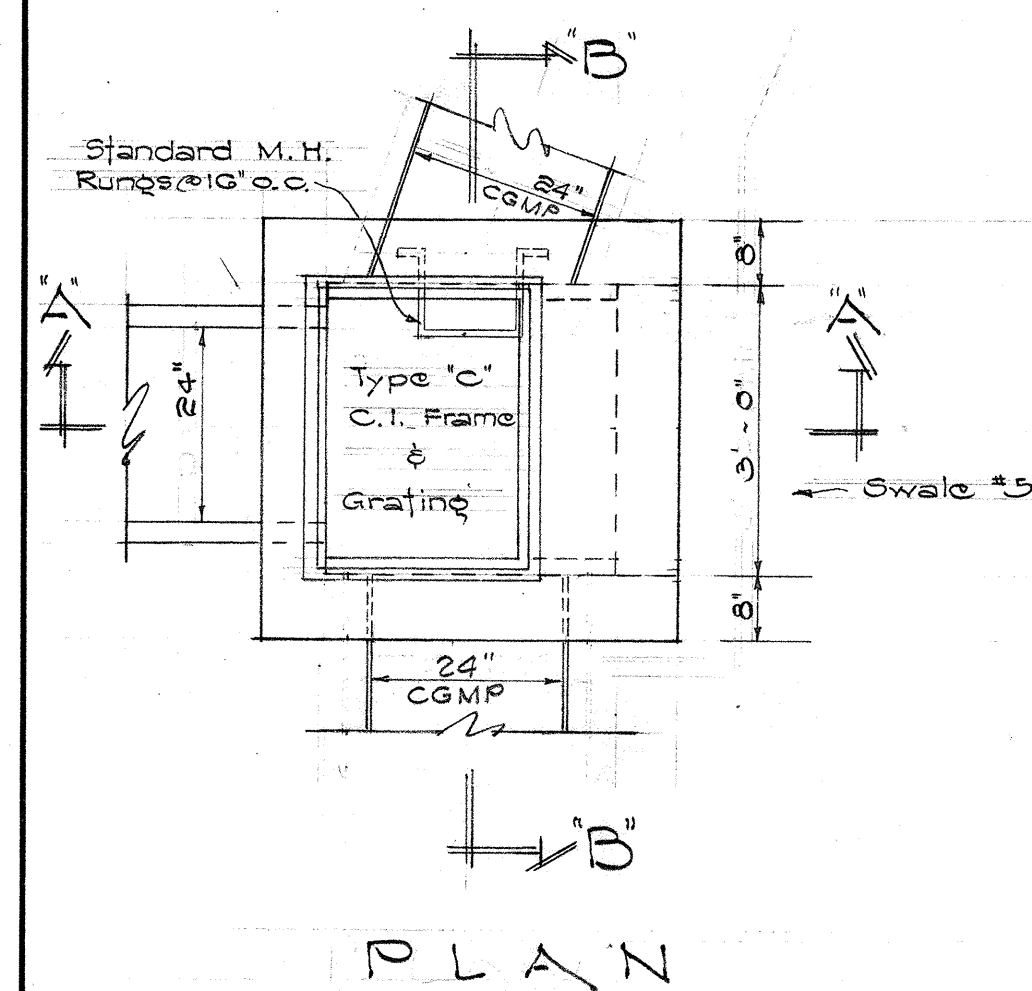
36" DRAIN AT C.D.I. #6

KAMEHAMEHA HWY PROJ. No. F-090-1(4)
SCALES: AS NOTED NOV. 1964

SHEET No. OF SHEETS

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

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-090-16	1964	94	177
SU-0720(6) 1964					



**SPECIAL ~ CONCRETE
DROP INTAKE #6
EASEMENT B**
SCALE: 1/2" = 1'-0"

**SPECIAL ~ CONCRETE
DROP INTAKE #12**
SCALE: 1/2" = 1'-0"

**SPECIAL ~ CONCRETE
DROP INTAKE #1**
STA. 127+45 (OUTB)
SCALE: 1/2" = 1'-0"

**SPECIAL ~ CONCRETE
DROP INTAKE #2**
STA. 4+10 (S.E. RAMP)
SCALE: 1/2" = 1'-0"

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS

Kamehameha Hwy.
Moanalua Road

Proj. No. F-090-16
Proj. No. SU-0720(6)

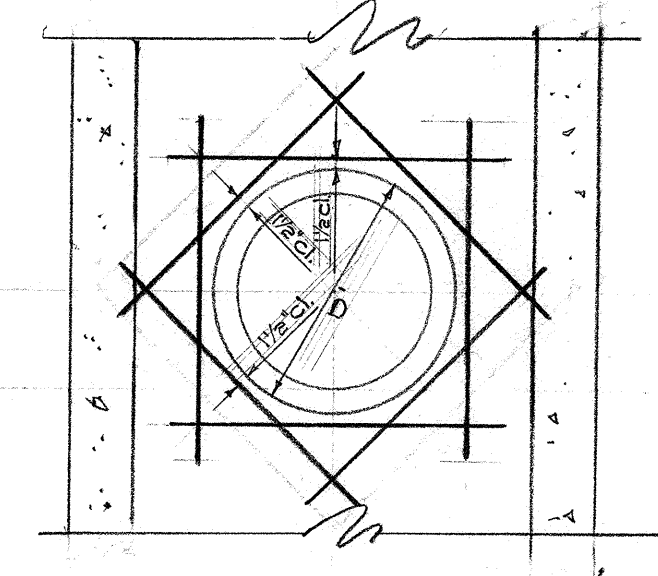
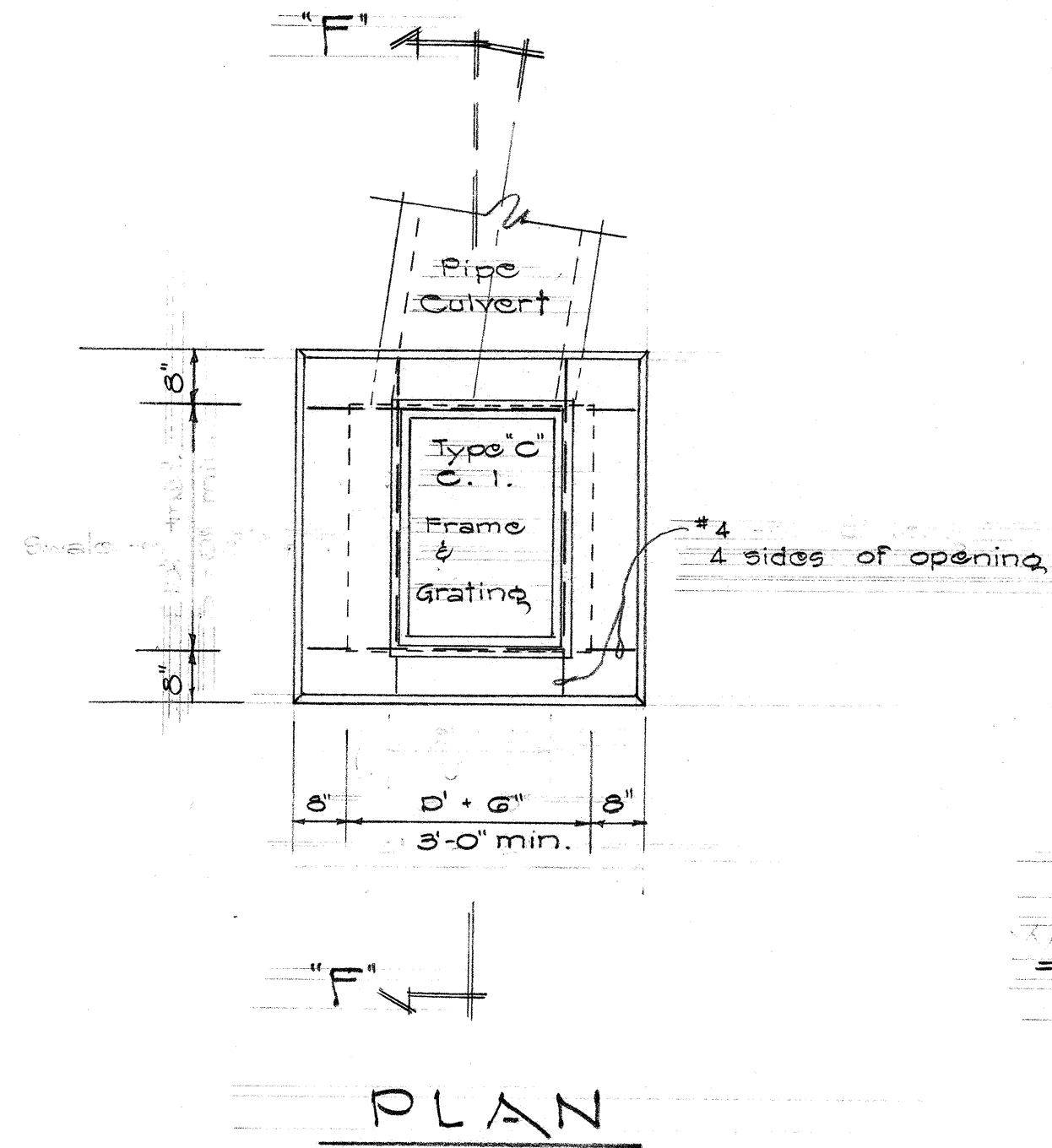
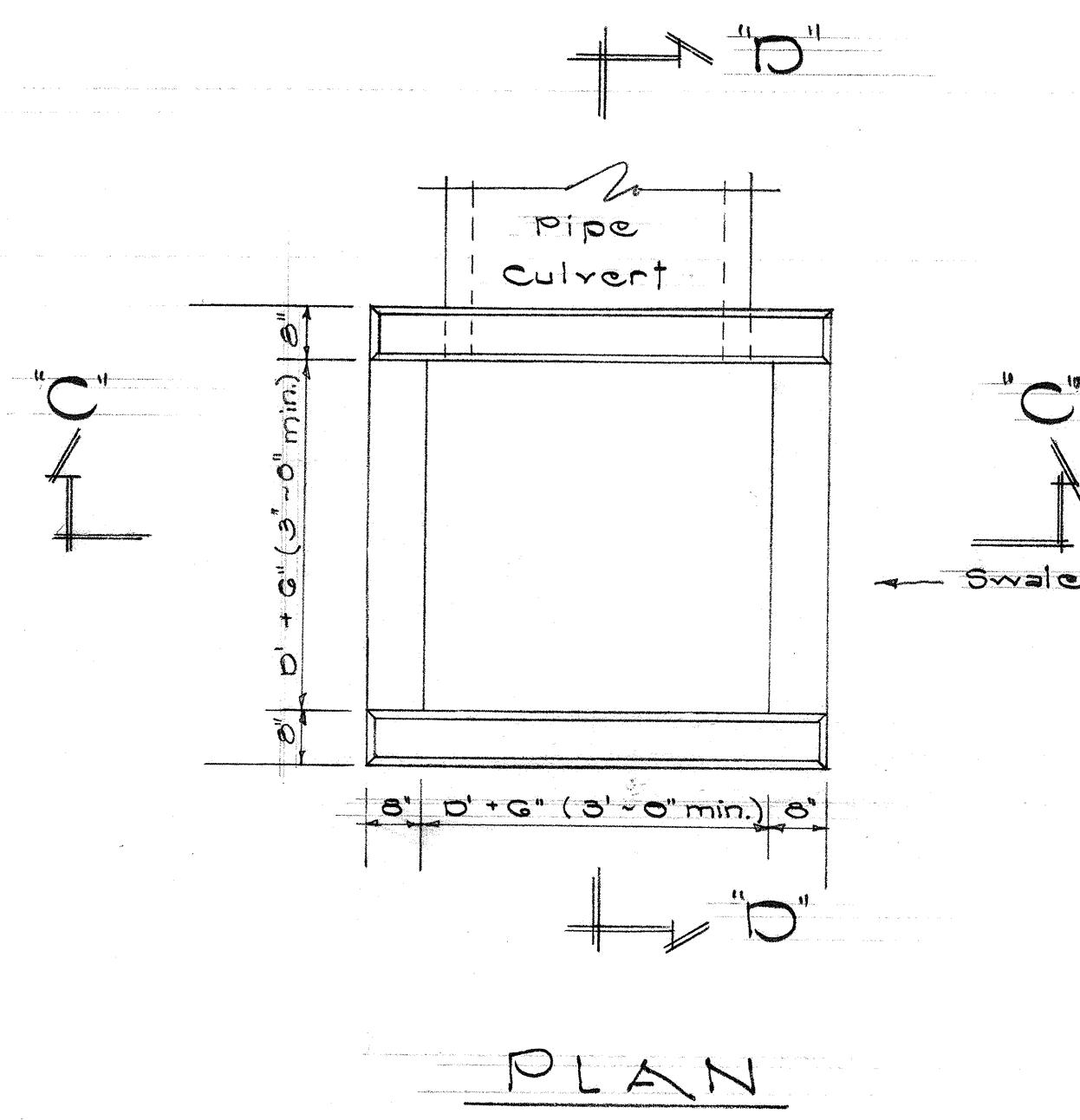
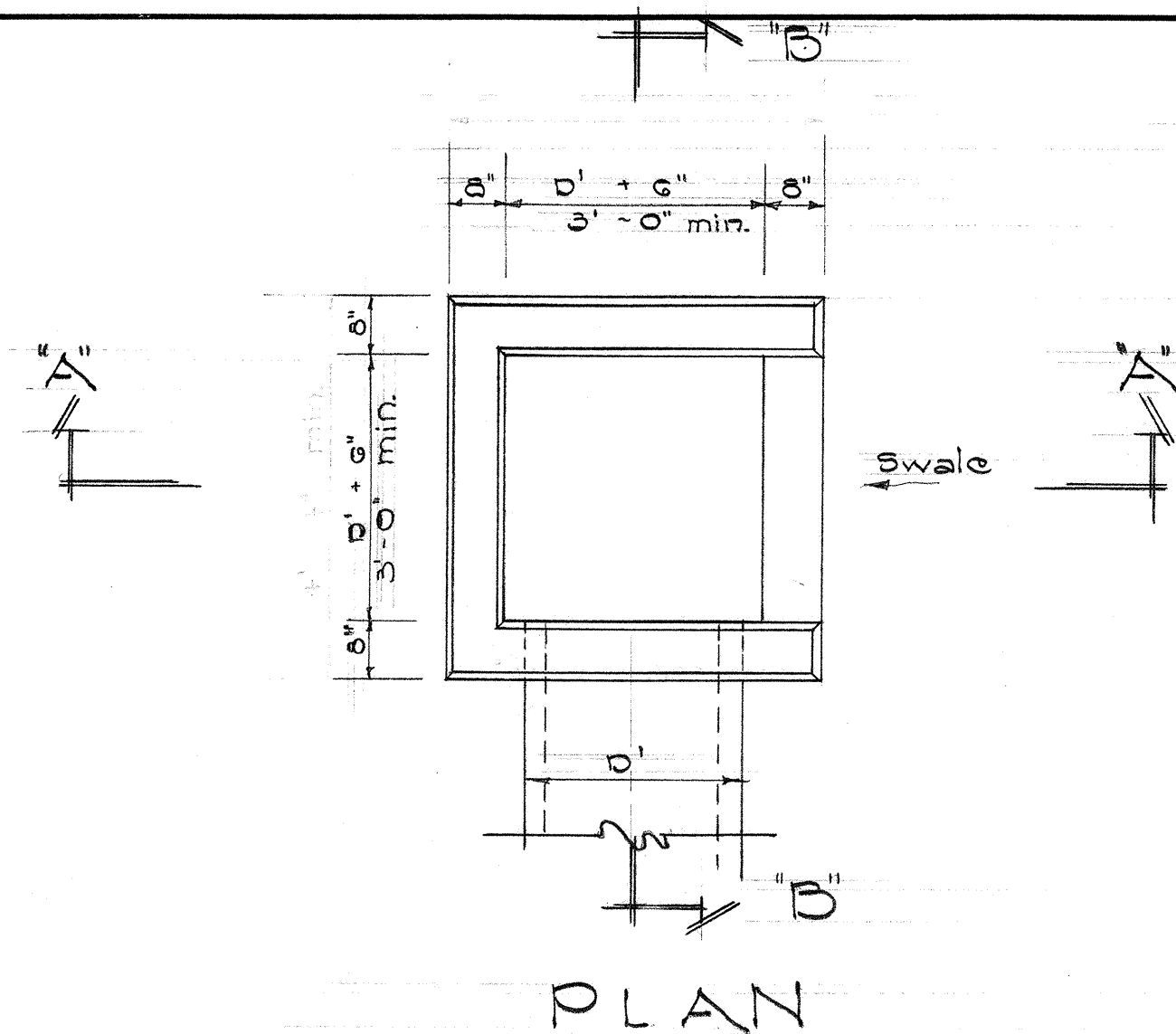
Scale: 1/2" = 1'-0"

February, 1964

SHEET No. 3 OF 13 SHEETS

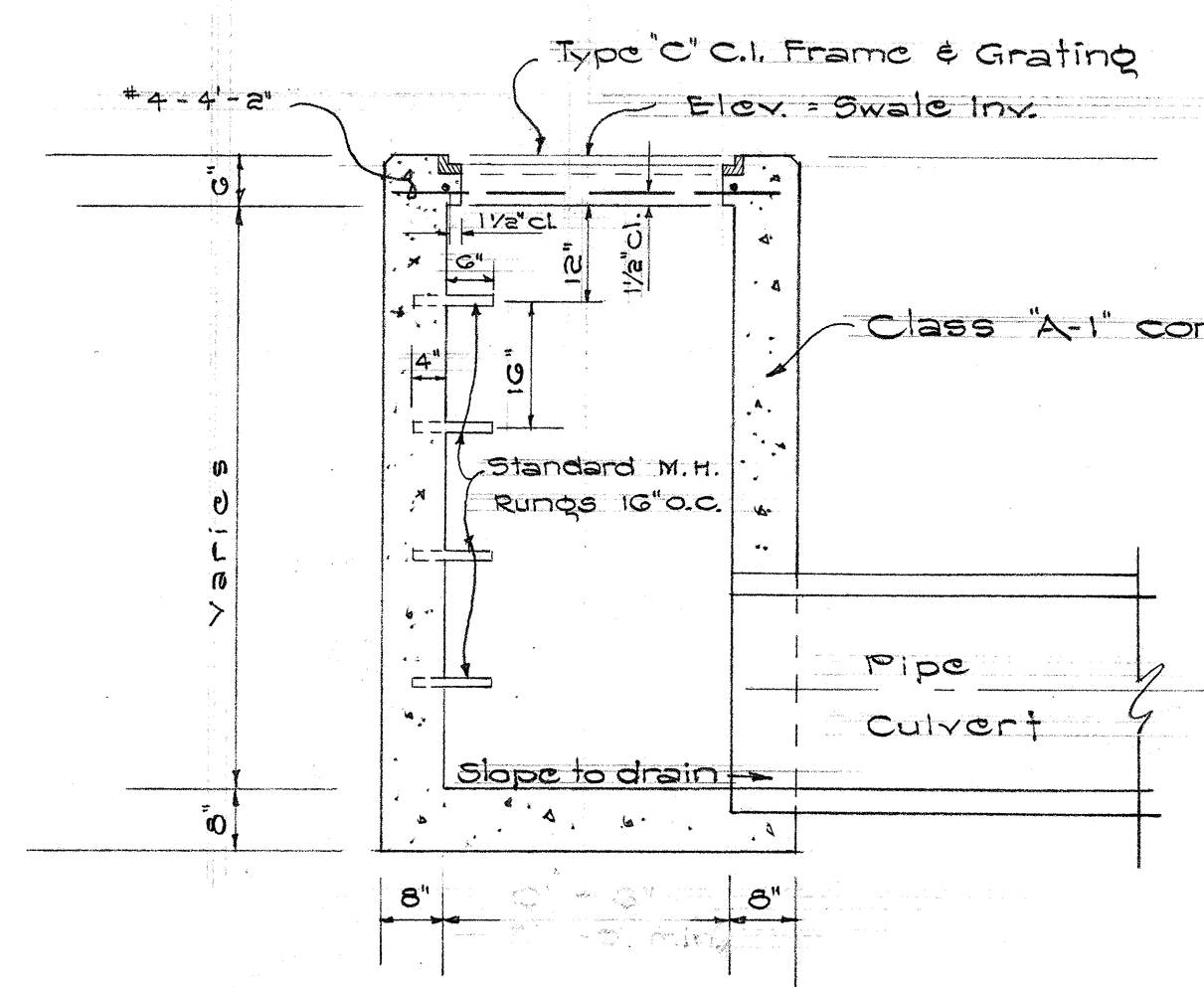
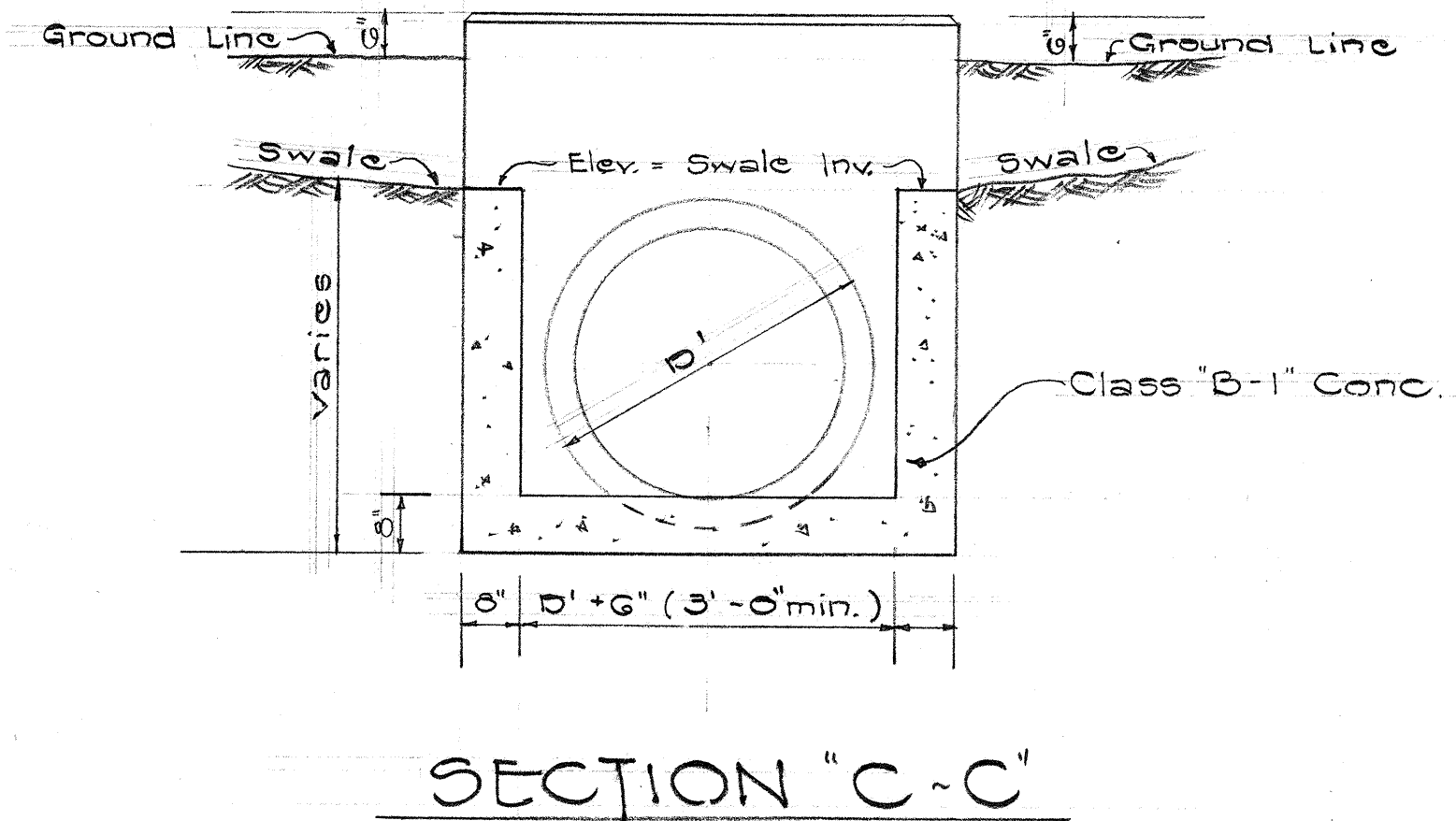
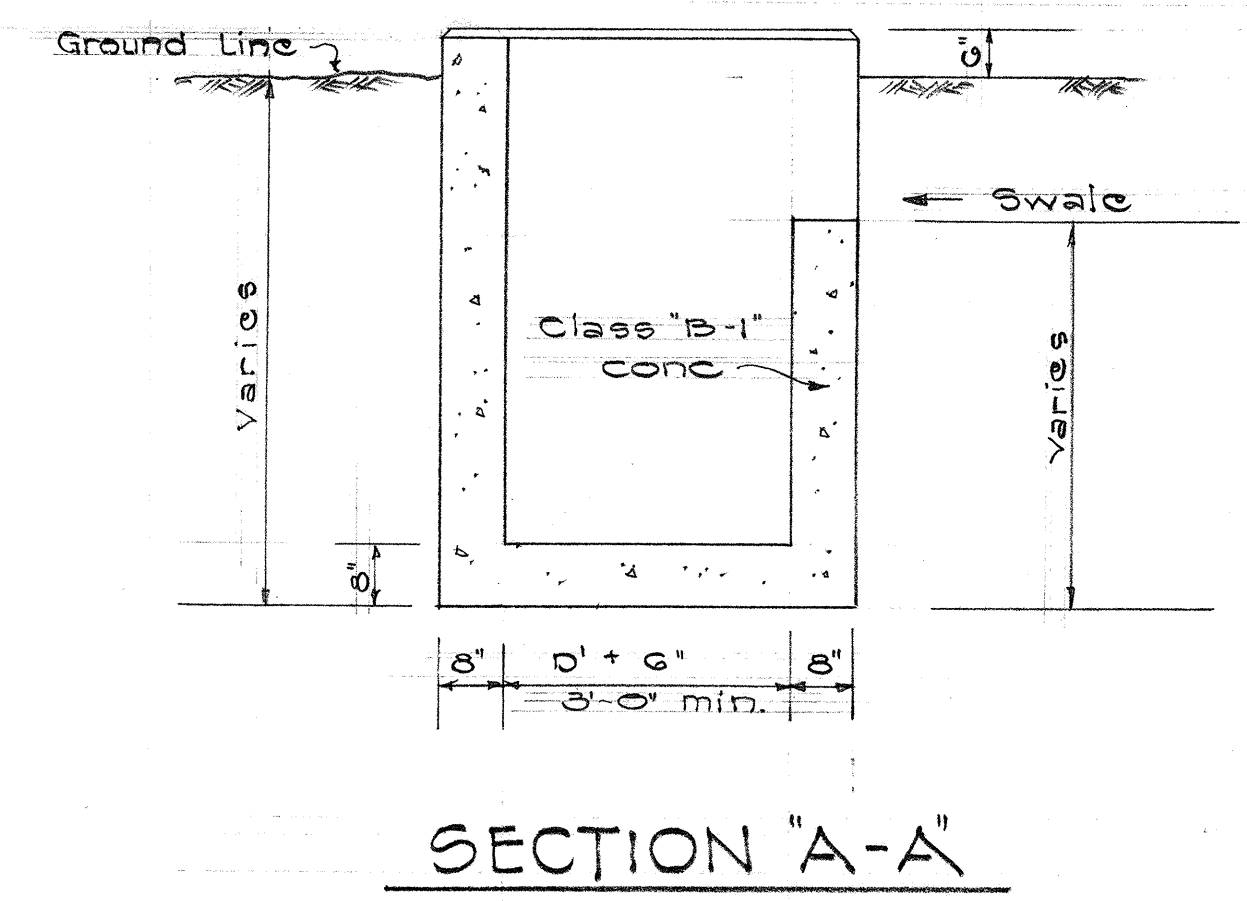
DATE	BY
PLAN	BY
NOTE BOOK	BY
CHECKED BY	BY
NO.	NO.

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	5U-0720	1964	95	177



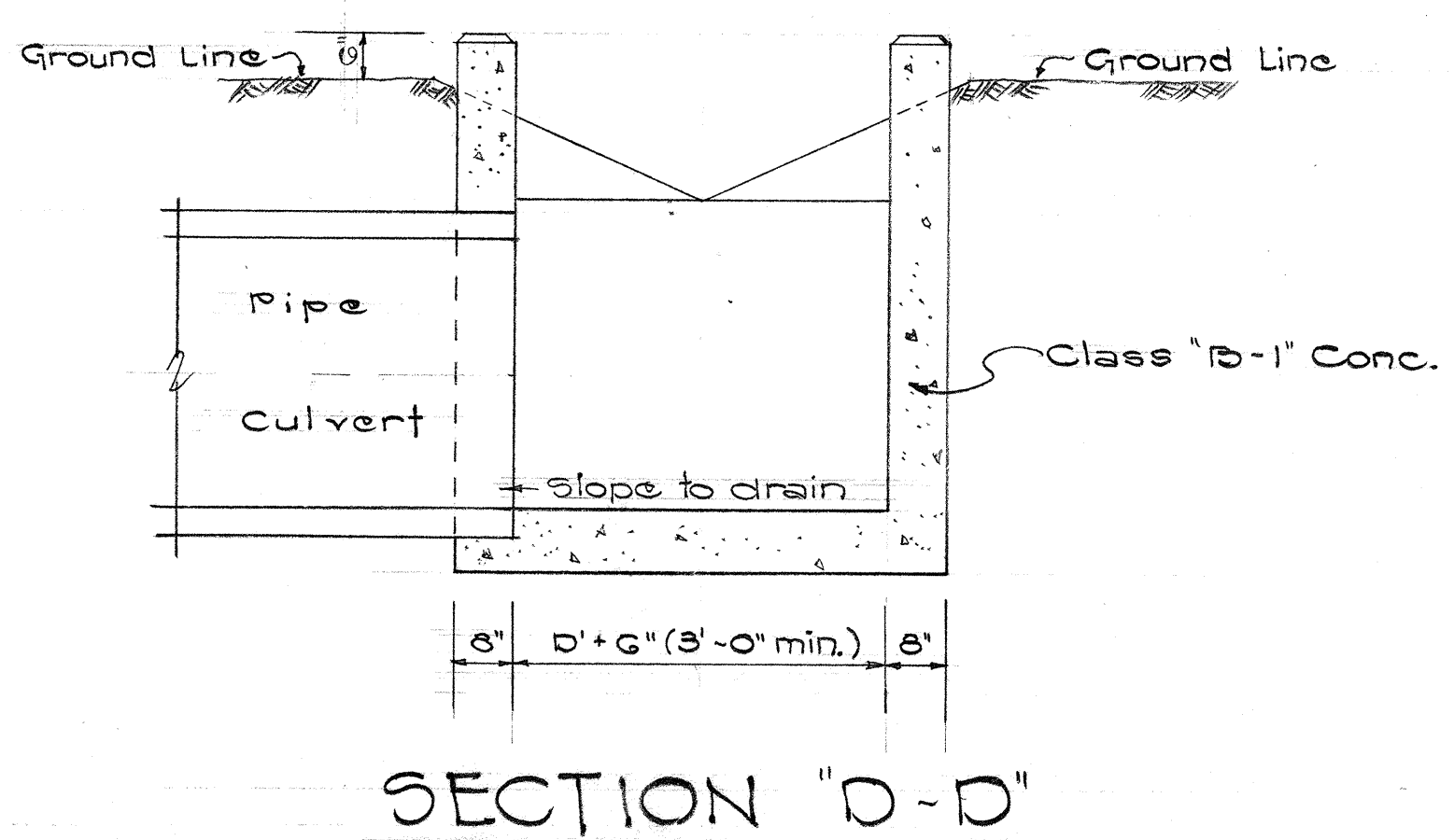
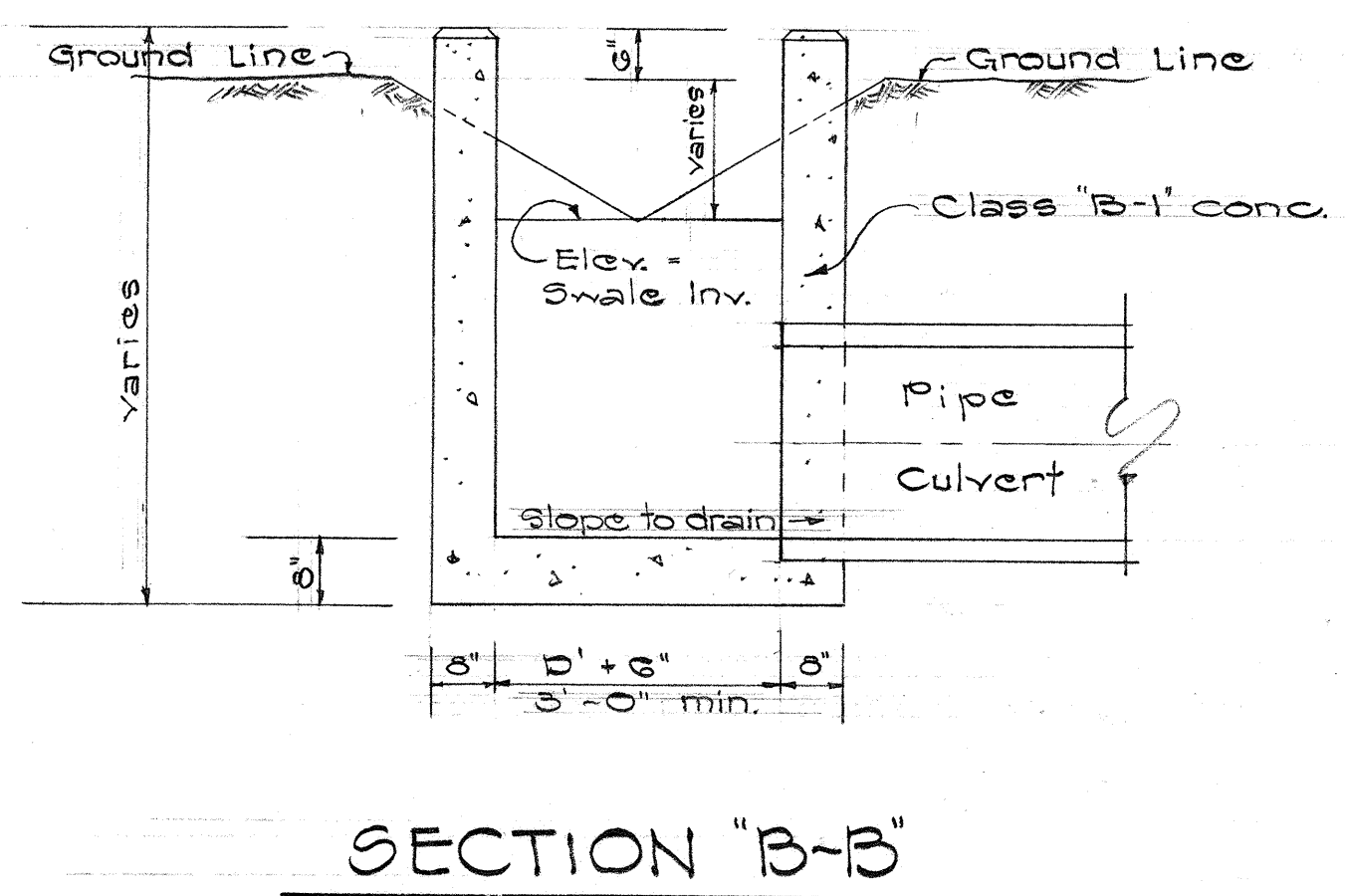
TYPICAL REINFORCEMENT WHERE PIPE ENTERS WALL OF DRAINAGE STRUCTURES WHERE NOTED

SCALE: 1/2" = 1' ~ 0"



GENERAL NOTE:

1. See Plans for alignment & inverts of all culverts, ditches, and swales entering C.O.I.
2. Exposed edges above the ground line of all drainage structures shall be chamfered one (1) inch.
3. Swales and ditches shall have a ten (10) foot transition into C.O.I.
4. Standard Manhole Rungs shall be incidental to Class 'A-1' Concrete.
5. Location of Standard Manhole Rungs to be determined by the Engineer.



TYPE "C" GRATED CONCRETE DROP INTAKE

SCALE: 1/2" = 1' ~ 0"

TYPE "A" CONCRETE DROP INTAKE

SCALE: 1/2" = 1' ~ 0"

TYPE "B" CONCRETE DROP INTAKE

SCALE: 1/2" = 1' ~ 0"

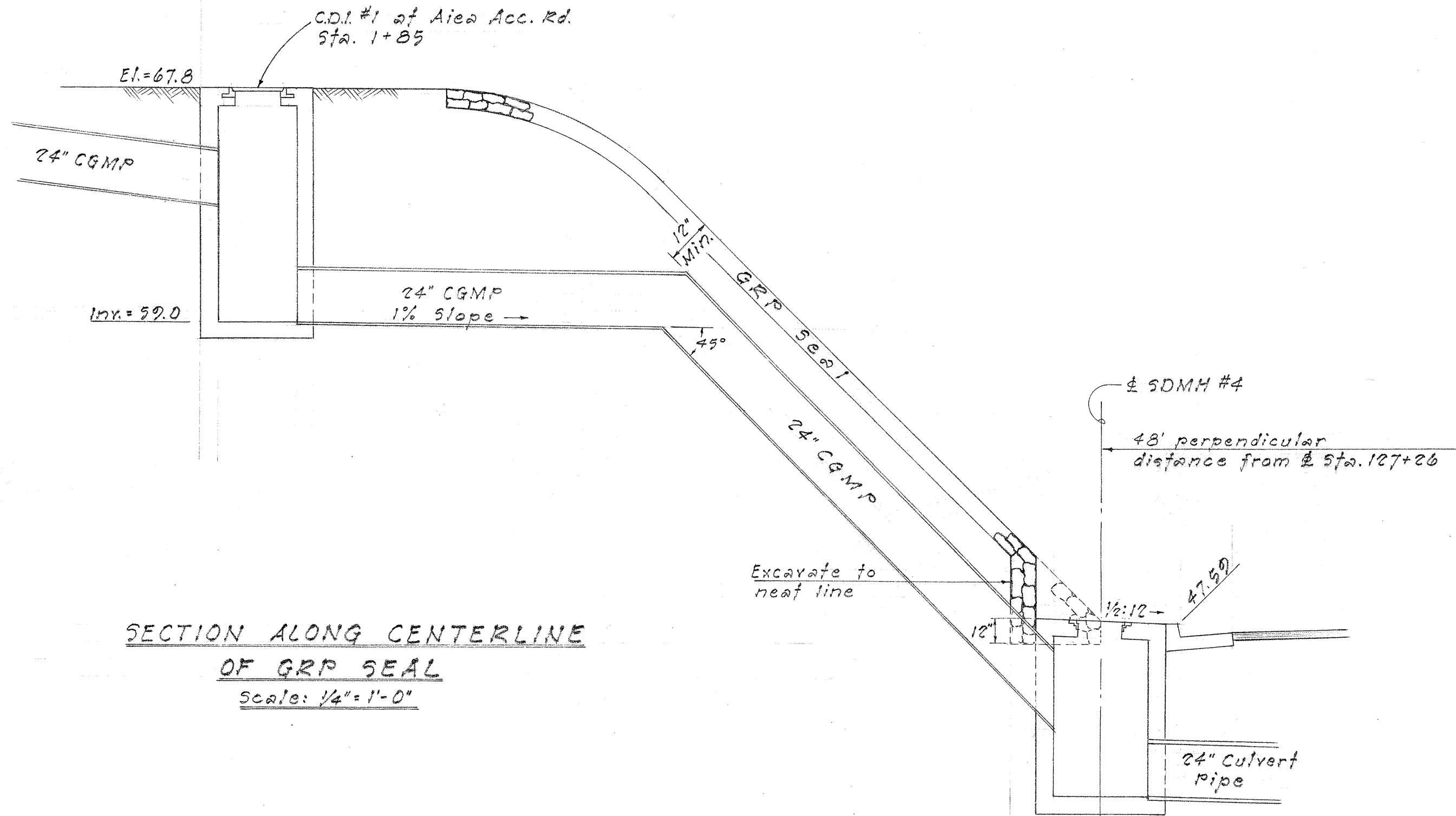
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS

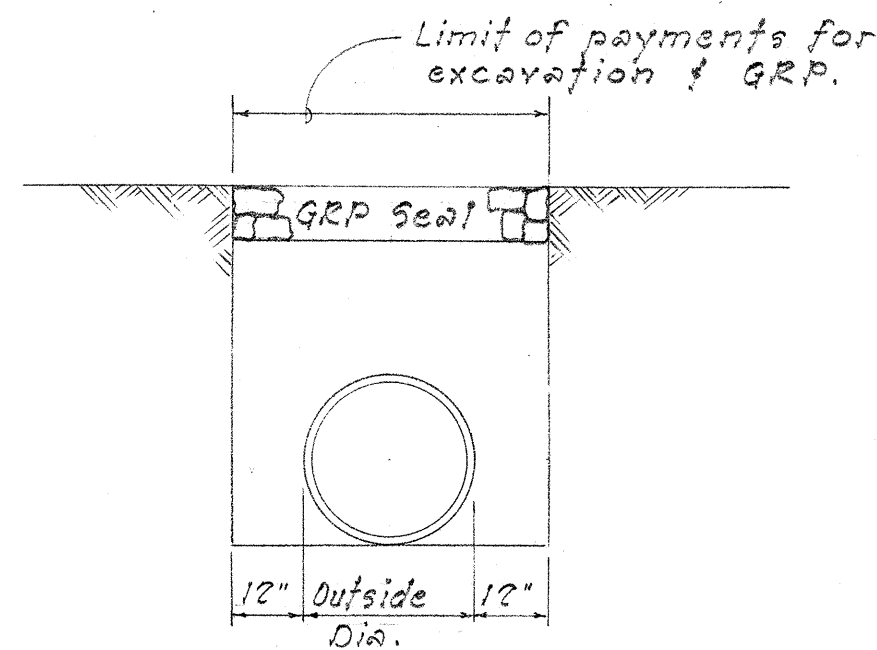
MOANALUA ROAD
SCALE: AS NOTED

PROJ. No. 5U-0720(G)
FEB. 1964

SHEET No. 4 OF 13 SHEETS

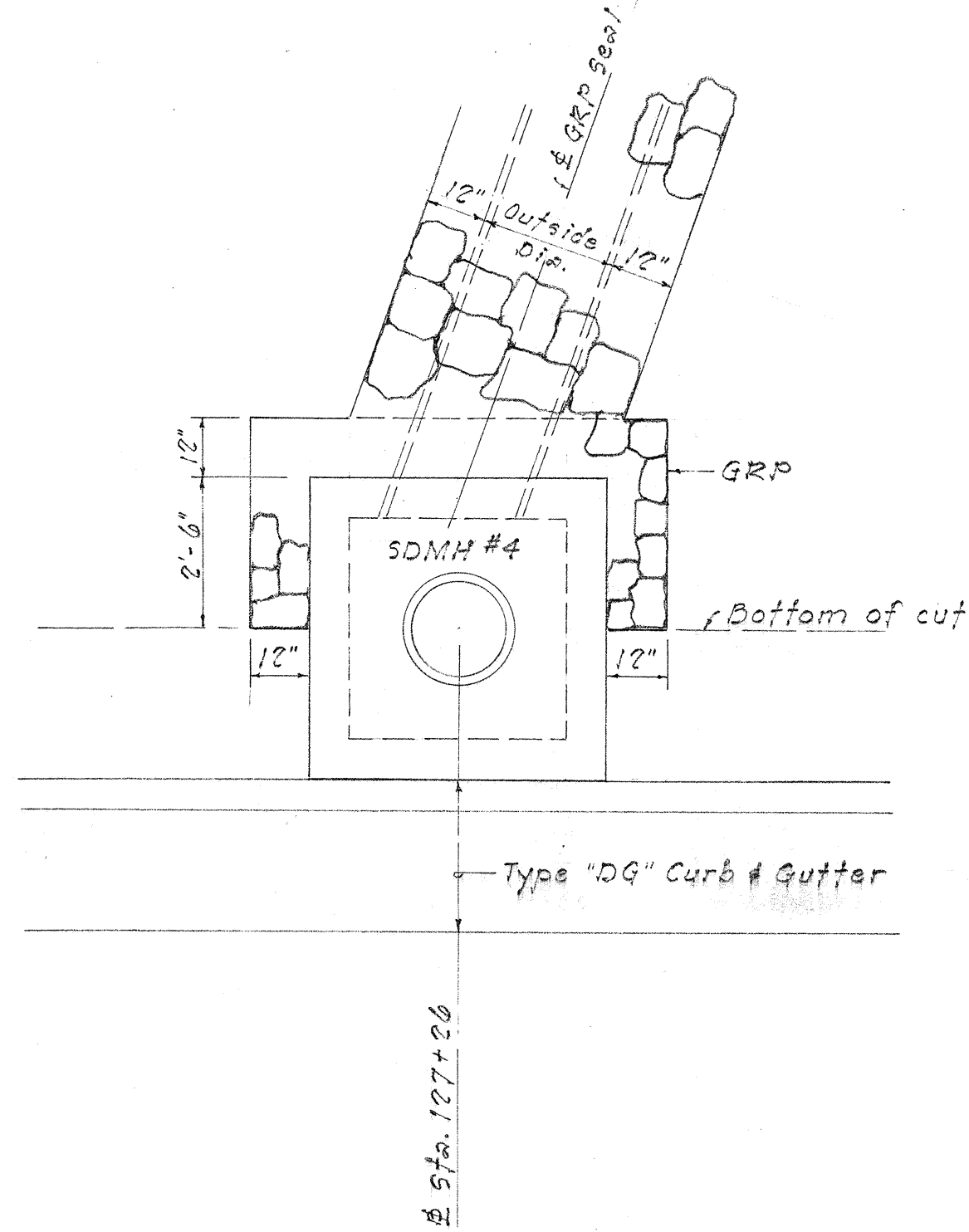


SECTION ALONG CENTERLINE
OF GRP SEAL
Scale: 1/4" = 1'-0"



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

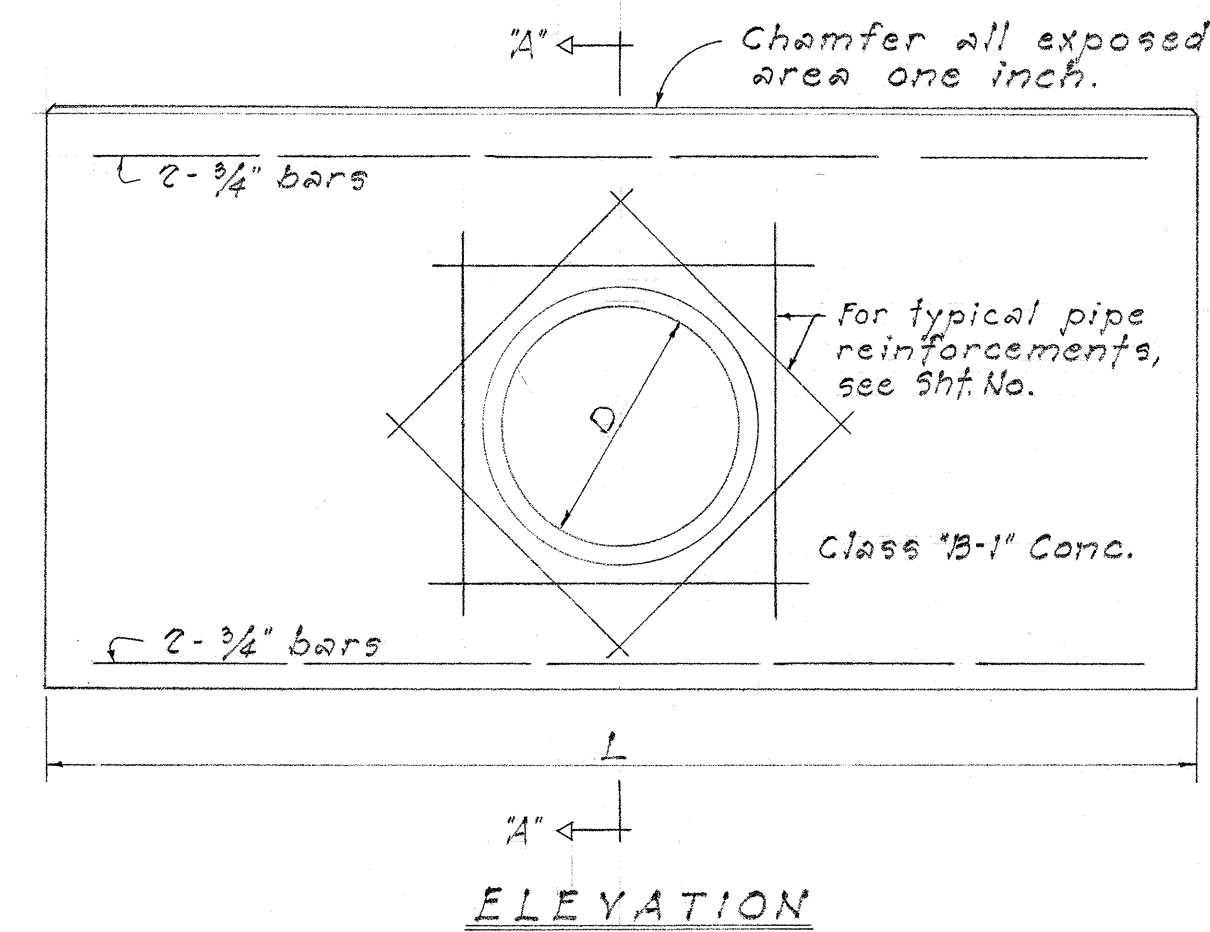
- Notes:
1. Excavation and GRP required beyond the limit of payments shall be done at the Contractor's expense.
 2. 24" CGMP 45° elbow incidental to Corrugated Galv. Metal Pipe.



PLAN VIEW AT SDMH #4
Scale: 3/8" = 1'-0"

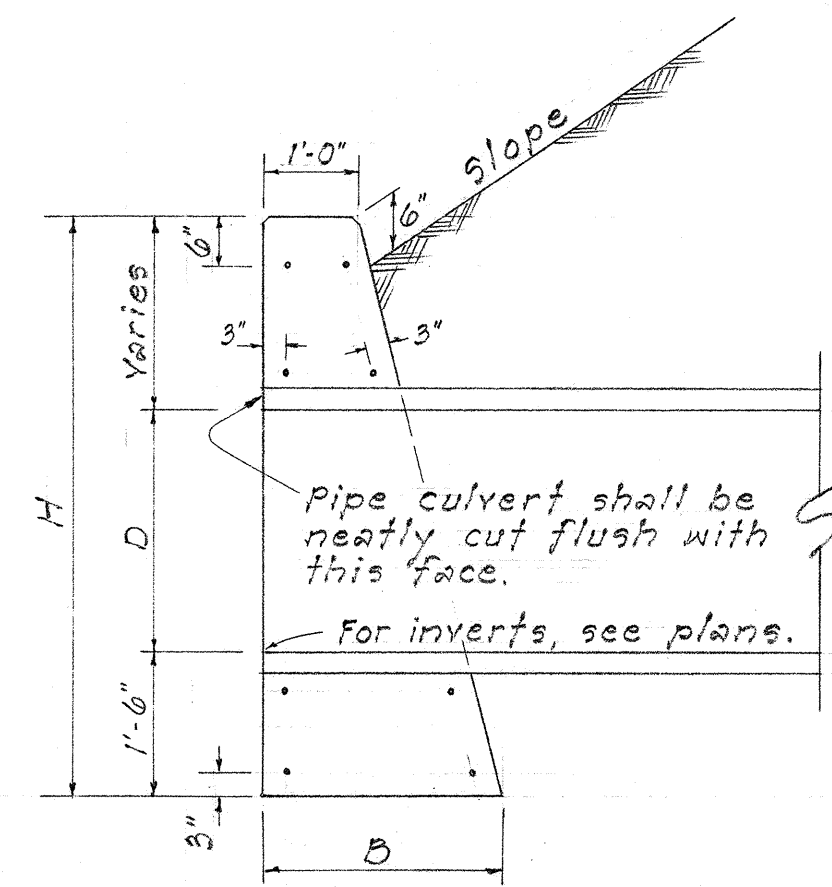
DETAIL OF GROUTED RUBBLE PAVING SEAL OVER CULVERT

Scale: As Noted



DATA FOR CONC. HEADWALL					
	D	B	L	H	
CHW #6	24"	2'-0"	10'-6"	5'-6"	±
CHW #8	36"	2'-6"	13'-6"	6'-6"	±
CHW #9	24"	2'-0"	10'-6"	5'-6"	±

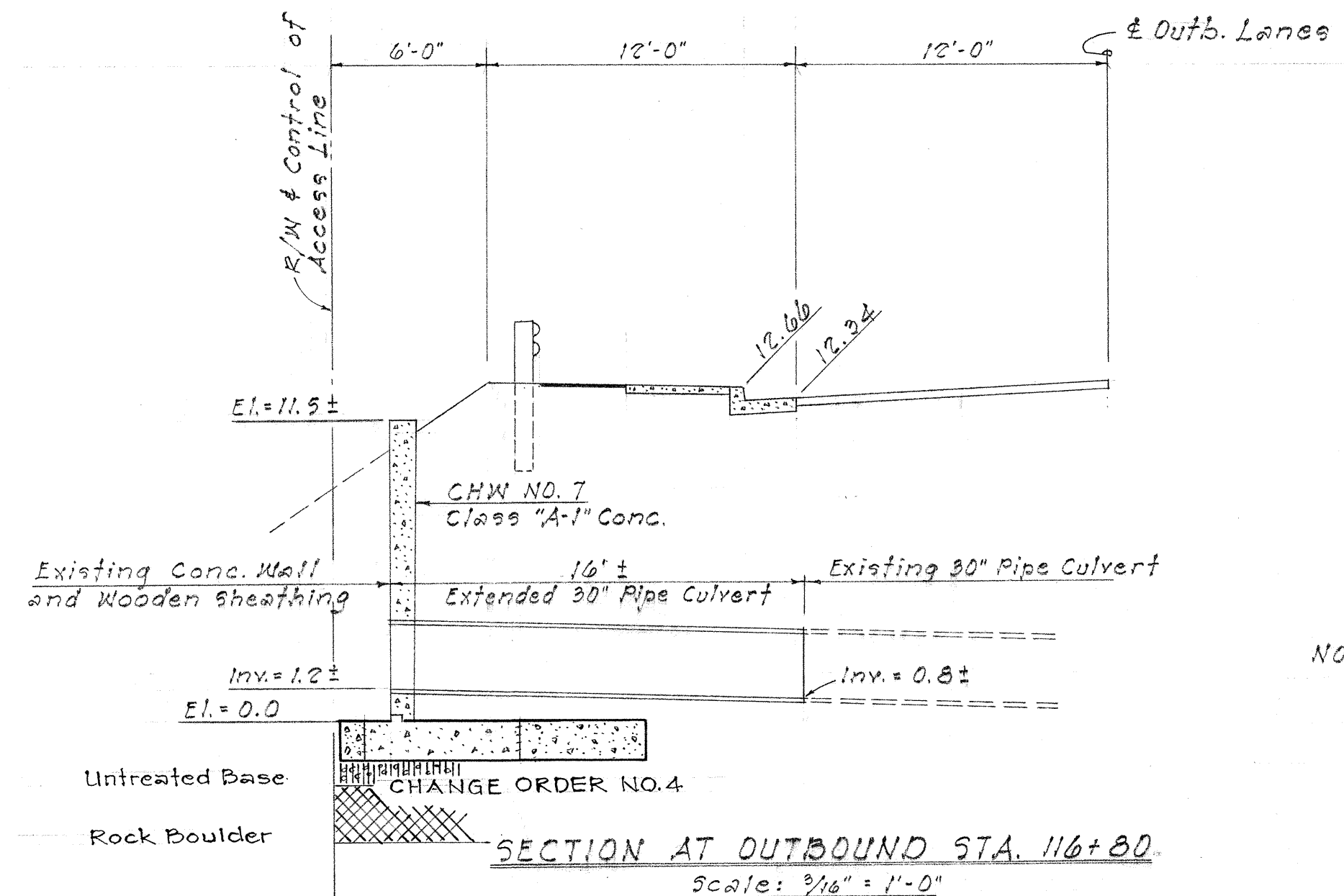
Top Elev.
41.32



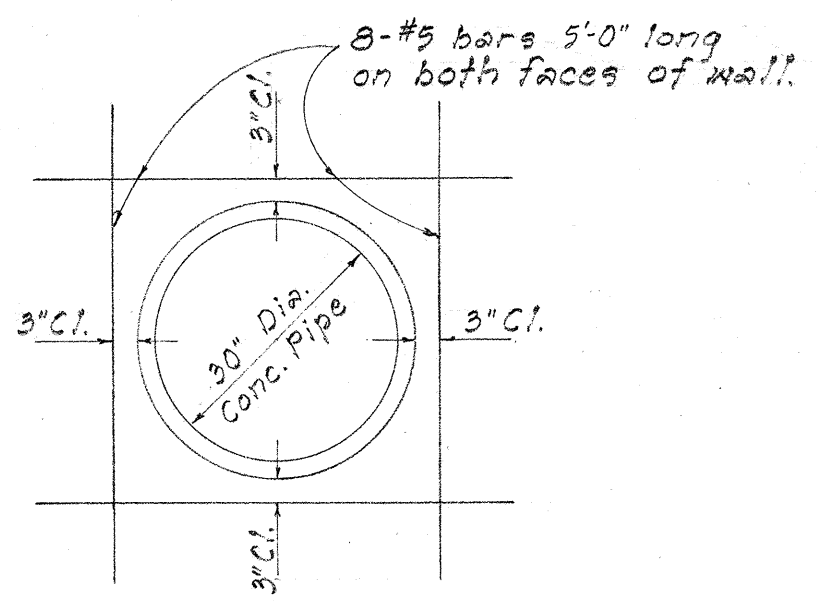
SECTION "A-A"

DETAIL OF CONCRETE HEADWALL NOS. 6, 8, & 9

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



SECTION AT OUTBOUND STA. 116+80
Scale: 3/8" = 1'-0"



ADDITIONAL REINFORCEMENT AROUND PIPE CULVERT

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

- NOTE:
1. For dimensions and reinforcements of Concrete Headwall No. 7, see "Retaining Wall Standards" Sht. No. 53.
 2. Length of CHW No. 7 shall be 15'-0"
 3. Any damages to existing structures shall be repaired by the Contractor at his own expense.
 4. One layer of 55# Composition Roofing shall be inserted between the existing structures and CHW No. 7.

DETAIL OF CONCRETE HEADWALL NO. 7

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

STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION	
DRAINAGE DETAILS	
Mogana Rd.	Proj. No. 5U-0720(6)
Scale: As Noted	Feb. 1964
SHEET No. 5 OF 13 SHEETS	

DATE	
STUDY PLOTTED BY	
DRAWN BY	
TRACED BY	
REVIEWED BY	
NOTED 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.	F-090-1(4)	1964	98	177
SU-0720(6) 1964					

* Kamehameha Highway Proj. No. F-090-1(4)

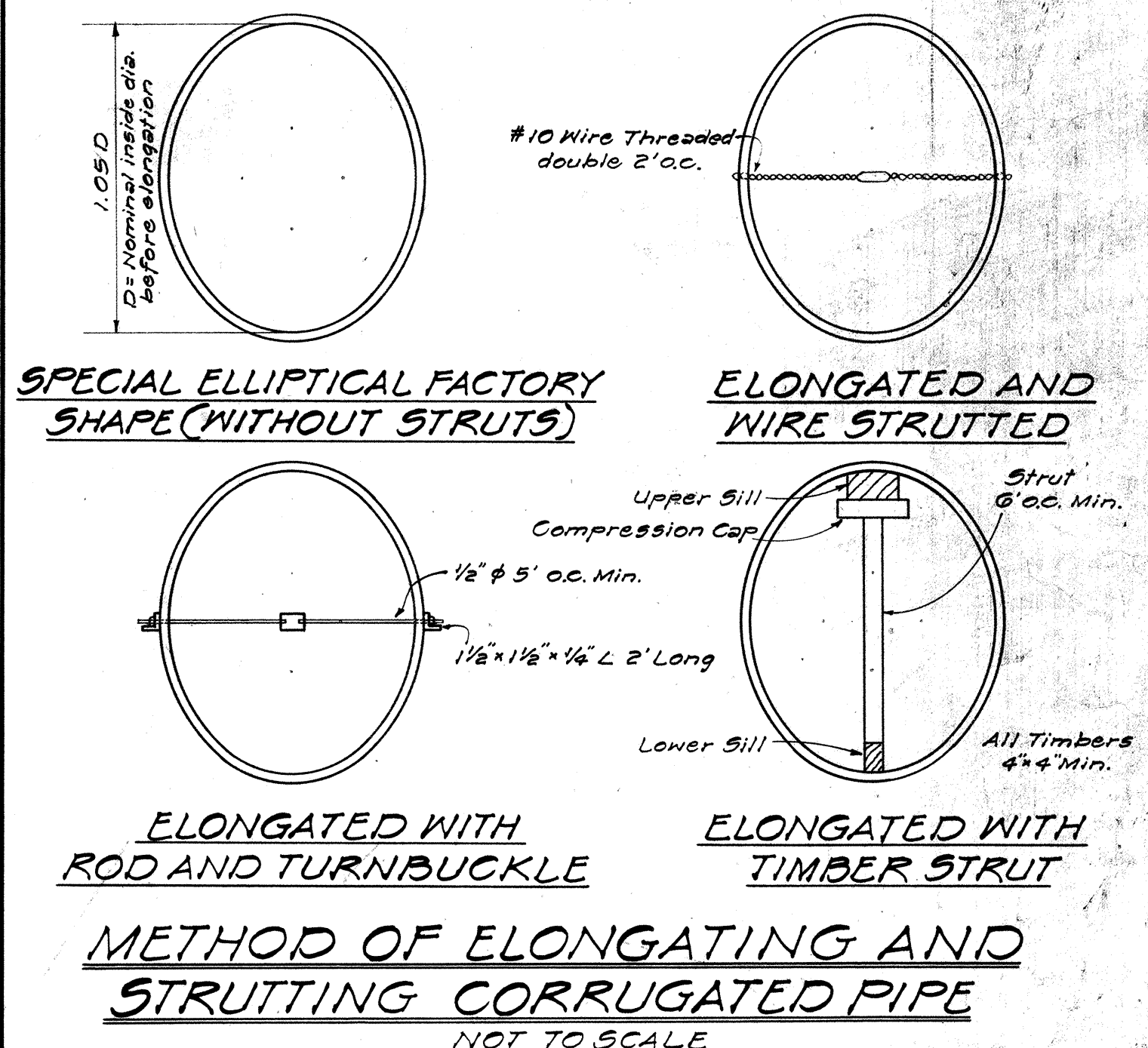
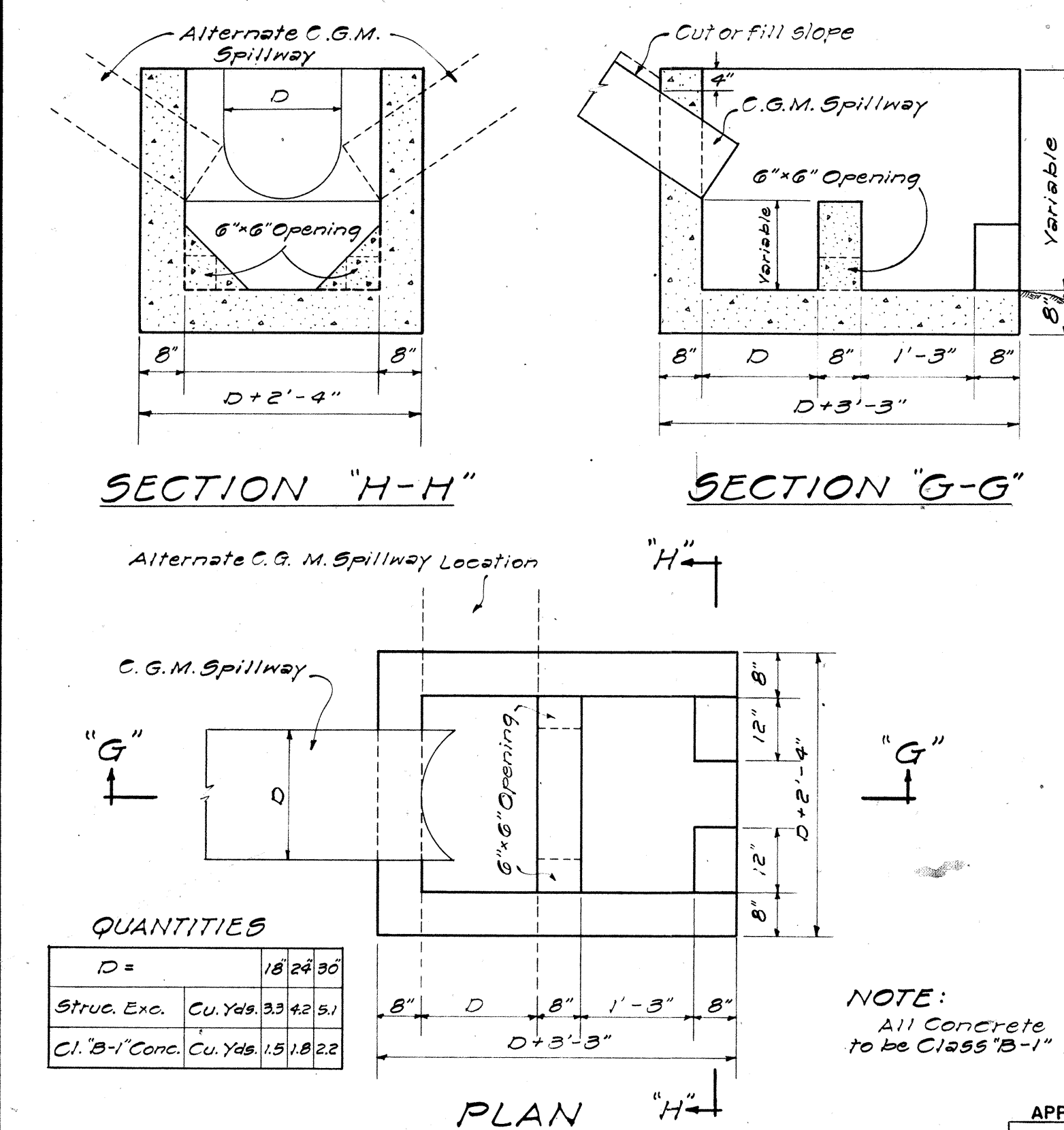
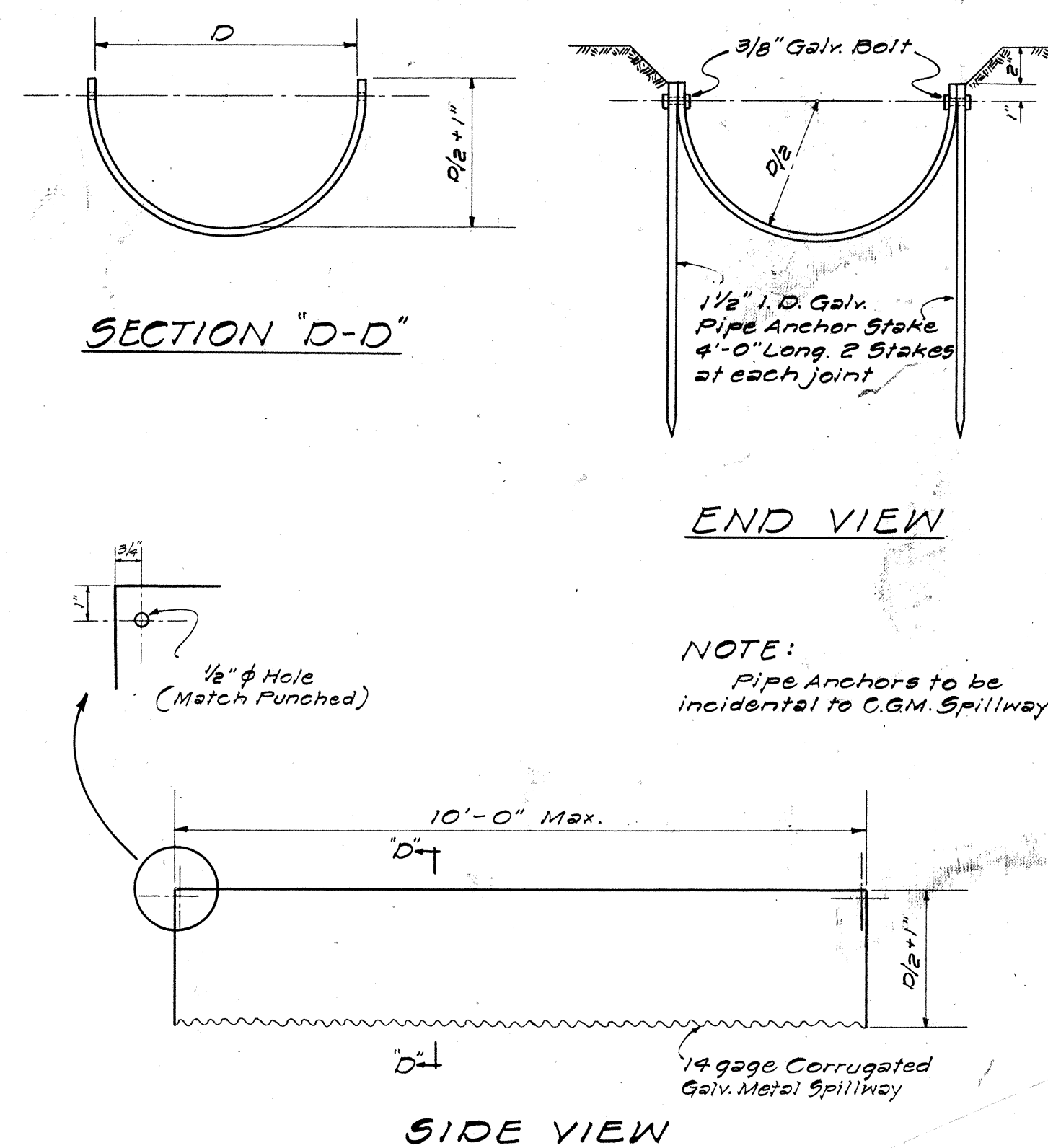
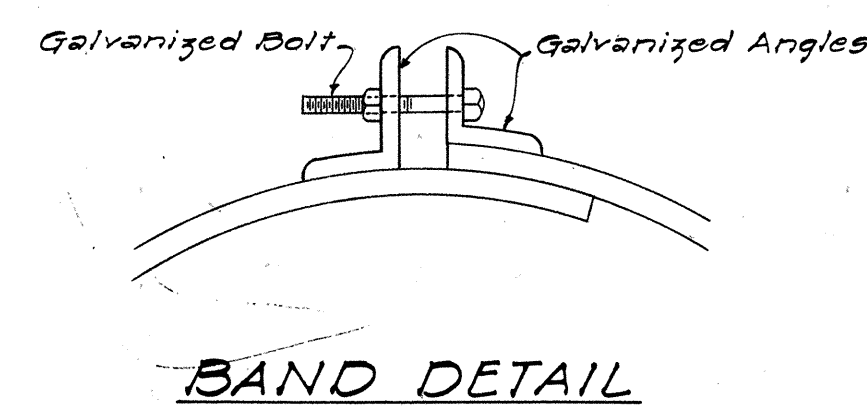
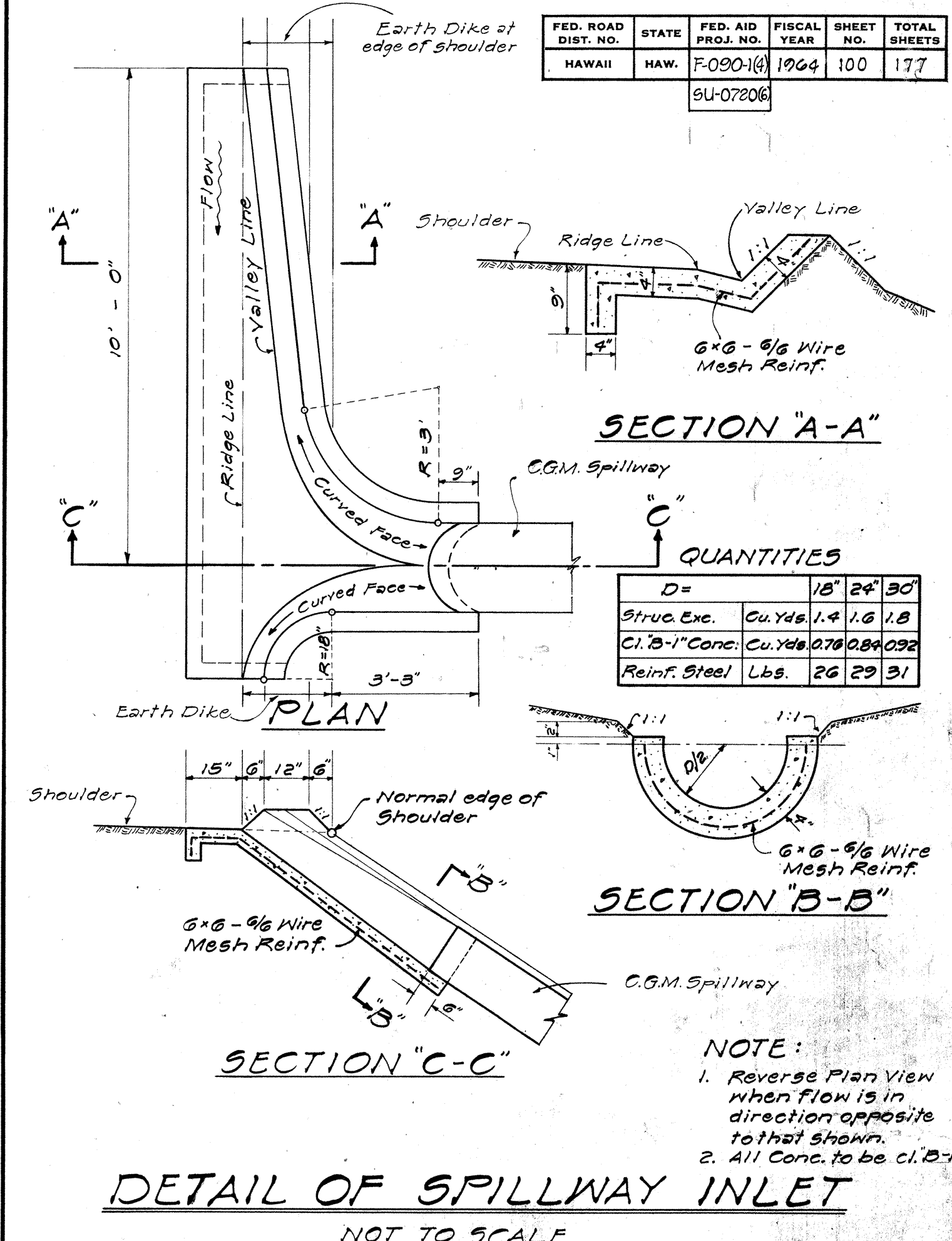
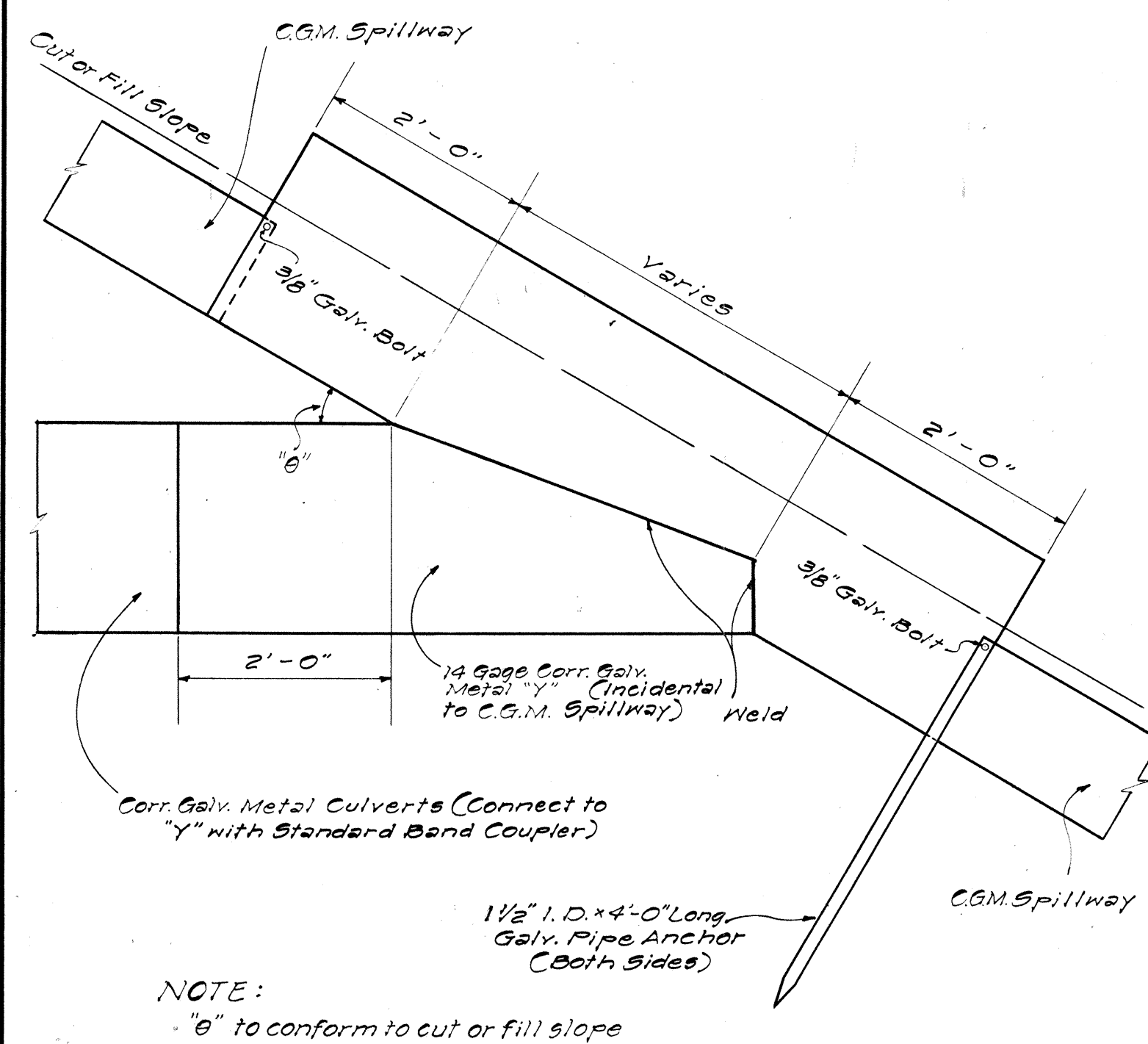
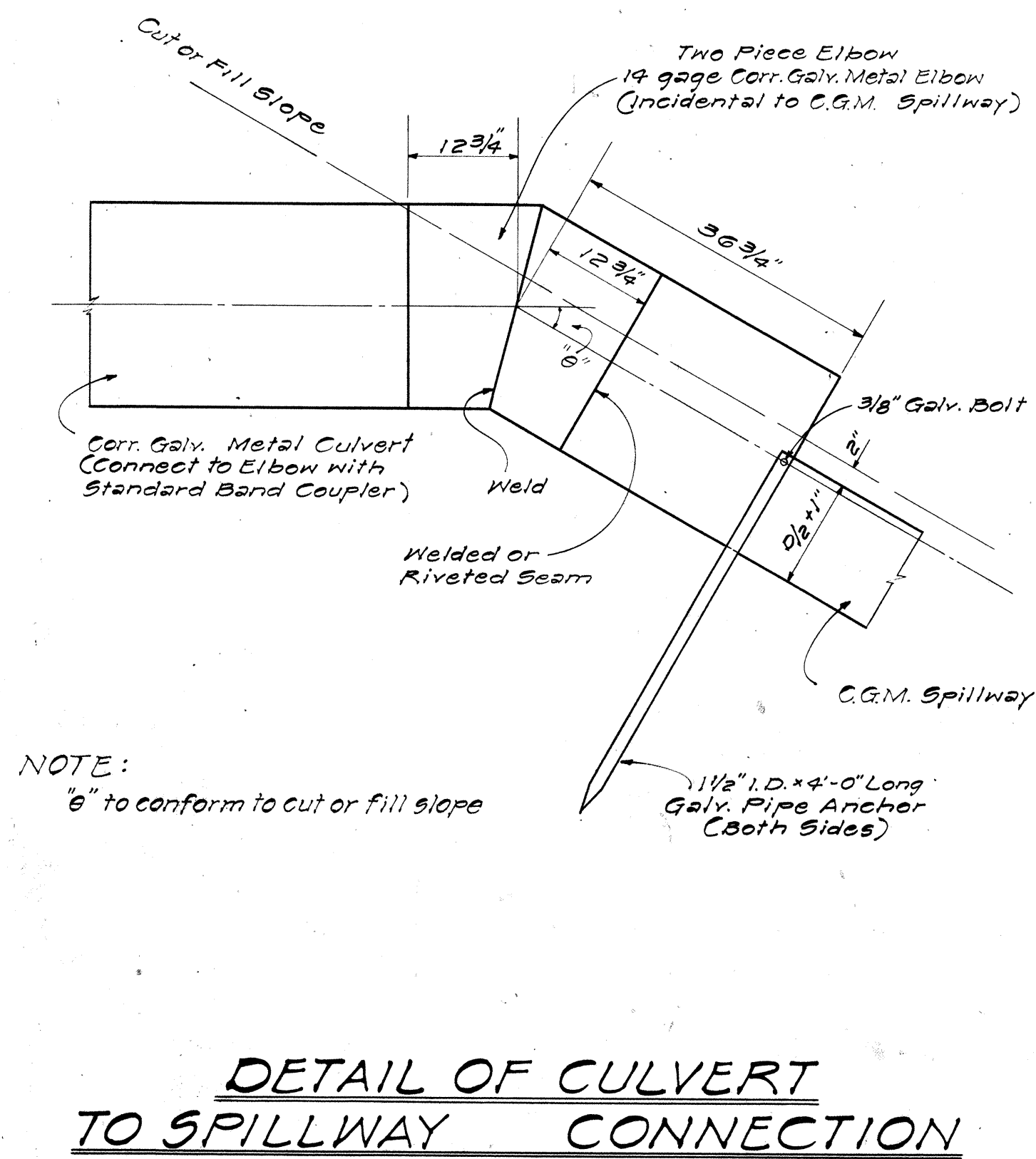
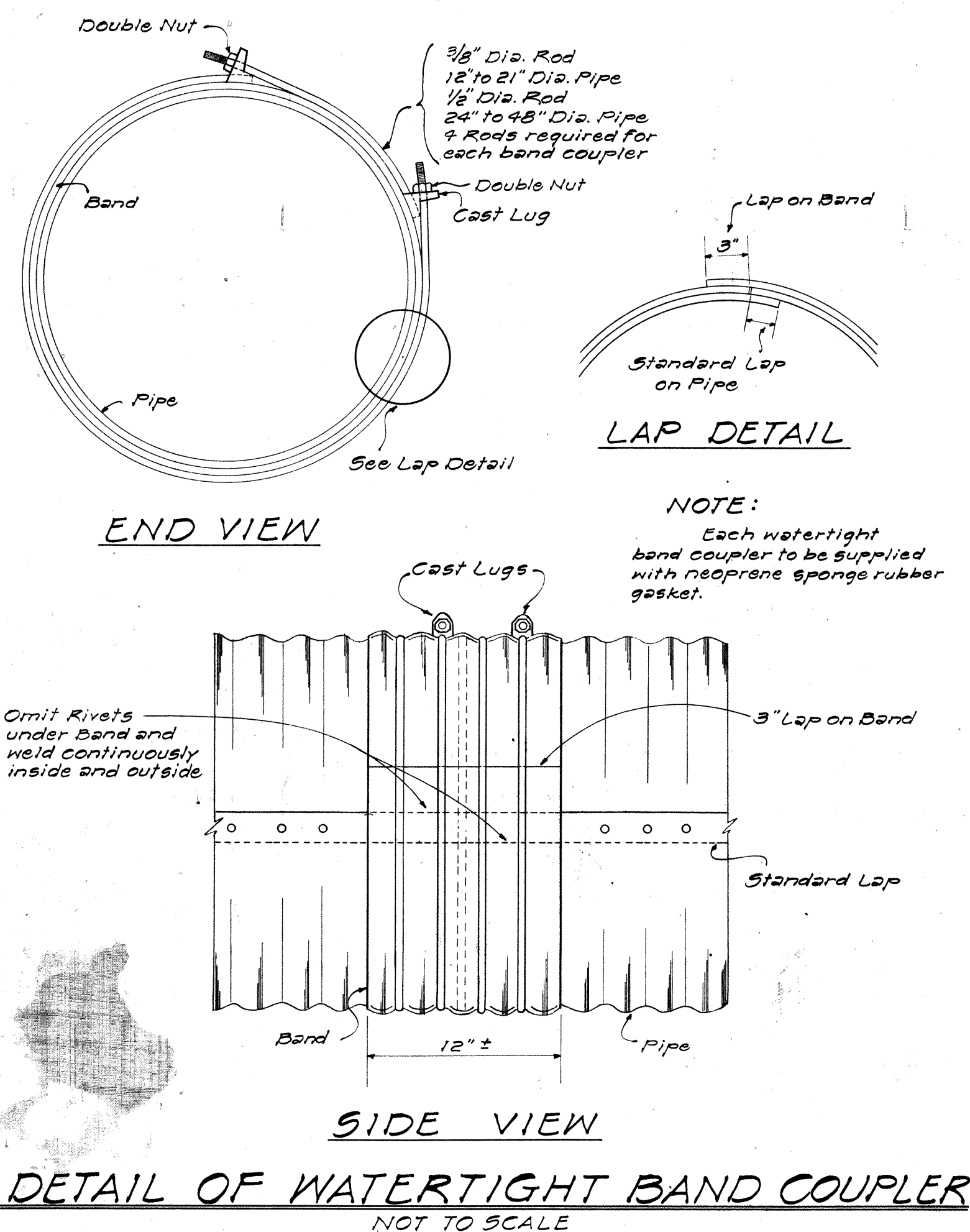
SUMMARY OF DRAINAGE STRUCTURES

STRUCTURE		LOCATION			DETAIL SHEET NUMBER	FLOOR INVERT	ITEMS													REMARKS
TYPE	NUMBER	ROAD	STATION	OFFSET			Struc. Exc.	Ditch & Chan. Exc.	Class "A-1" Conc.	Class "B-1" Conc.	Reinf. Steel	C.R.M.	G.R.P.	C.I. Frame & Cover		Type "C" C.I. Frame & Grating	Type "X" Steel Frame & Grating	Salvage/Reuse C.I. Frame & Cover	Brick Wall for S.D.M.H.	
														Type "A"	Type "B"					
B5	C.B.#4	to Inb.	121+40	14' Lt.		31.5	30		2.3		305			1						
A	C.B.#5	to Inb.	122+35	14' Rt.		33.0	25		7.0		170				1					
A	C.B.#6	to Loop	8+60			35.0	21		6.1		181		1.0		1					
B	C.B.#7	to Loop	11+25			40.1	16		5.1		129				1					
B	C.B.#8	to Loop	14+20			50.25	17		5.3		150				1					
B5	C.B.#9	to S.E. Ramp	17+95			62.7	19		6.4		317			1						
B5	C.B.#10	to S.E. Ramp	14+69	14' Rt.		51.0	19		6.3		317			1						
B	C.B.#11	to	133+25	10' Lt.		59.0	32		8.7		210				1					
B	C.B.#12	to	130+00	10' Lt.		49.0	29		7.5		210				1					
B	C.B.#13	to	127+00	10' Lt.		36.0	32		8.0		231				1					
C5	C.B.#14	to	124+35	45' Lt.		30.64	18		6.0		317			1						
C	C.B.#15	to Outb.	119+50	14' Lt.		12.0	26		7.0		150				1					
C	C.B.#16	to Outb.	115+00			5.0	23		7.2		140				1					
A	C.B.#17	to Outb.	114+00			4.4	17		7.0		170				1					
C	C.B.#18	to Outb.	118+63	16' Lt.		10.7	30		6.2		180				1					
B	C.B.#19	to Aux. Ln.	8+80	58' Lt.		67.7	15		4.2		129				1					
A	C.B.#20	to Aux. Ln.	3+75	2' Rt.		62.0	34		9.0		191				1					
A	C.B.#21	to Aiea Access Rd.	7+75			38.3	36		10.7		191				1					
B	C.B.#22	to Aiea Access Rd.	15+30	2' Lt.		32.0	34		8.3		160				1					
A	C.B.#23	to Aiea Access Rd.	16+75	18' Rt.		34.0	22		6.8		170				1					
C	C.B.#24	to Aiea Access Rd.	2+00	26' Rt.		62.5	17		5.0		129				1					
B	C.B.#25	to Aiea Access Rd.	1+85	14' Lt.		62.0	19		5.4		150				1					
C	C.B.#26	to Loop	5+50			45.5	20		7.3		129				1					
D6	C.B.#27	to S.E. Ramp	4+00	14' Rt.		30.0	14		4.5		46					1				
B5	C.B.#28	to S.E. Ramp	8+00	14' Rt.		40.0	20		6.8		305			1						
B	C.B.#29	to Outb. Aiea Access Rd.	8+00	2' Rt.		39.0	23		6.5		150		1.0		1					
B	C.B.#30	to Kam. Hwy (DA-NR 13-2)	305+00			8.2	16		4.8		130				1					
B5	C.B.#31	to S.E. Ramp	11+50	14' Rt.		47.0	20		6.8		374			1						
B	C.B.#33	to	140+90	50' Lt.		68.9	15		4.3		129						1			
	C.B.#34	to	141+00	50' Rt.		68.35	0		0		0								Existing C.B.	
A	C.B.#35	to Aux. Ln.	5+40	6' Rt.		64.5	28		7.6		191				1					
B	C.B.#36	to Kam. Hwy (DA-NR 13-2)	295+45	40' Rt.		18.0	27		10.5		192				1					
TOTALS		MOANALUA ROAD																		
		KAMEHAMEHA HIGHWAY																		
GRAND TOTALS						1,203	1,026	251.8	98.9	14,545	243	3.8	12	23	7	1	1	0		

SHEET No. 7 OF 13 SHEETS

DATE: _____
SURVEY PLOTTED BY: _____
PLAN: _____
DESIGNED BY: _____
NOTE BOOK: _____
QUANTITIES BY: _____
CHECKED BY: _____

SHEET No 8 OF 13 SHEETS

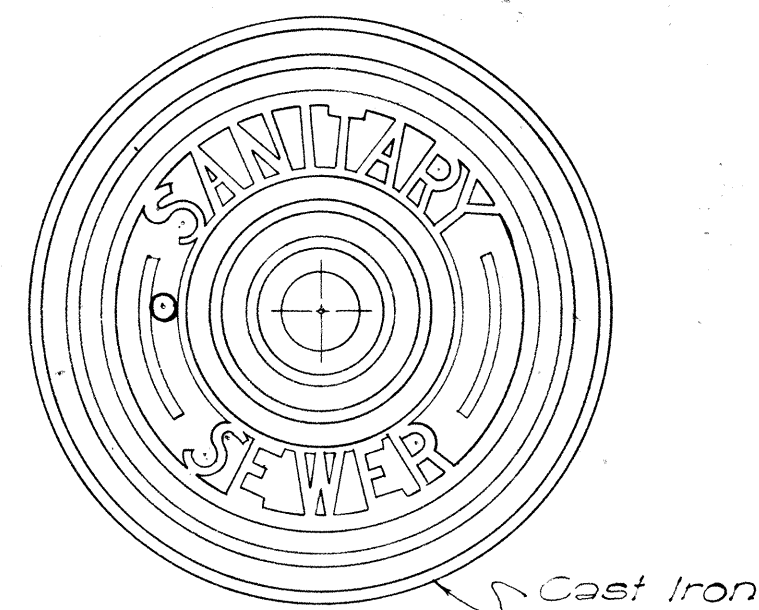


STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
STANDARD DETAILS
CORRUGATED GALVANIZED METAL
CULVERTS, SPILLWAYS, AND
SPECIAL DETAILS
SCALES AS NOTED
SHEET NO. 2 OF 13 SHEETS

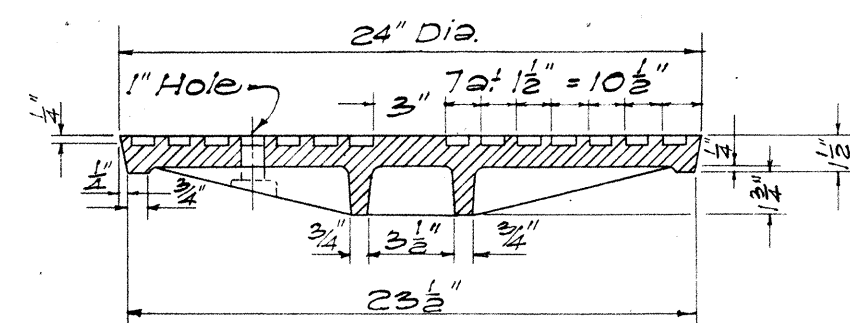
DATE: 5-22-64
DRAWN BY: R. Y.
CHECKED BY: G. M.
NOTE BOOK
No.

2/17/57
8/14/50

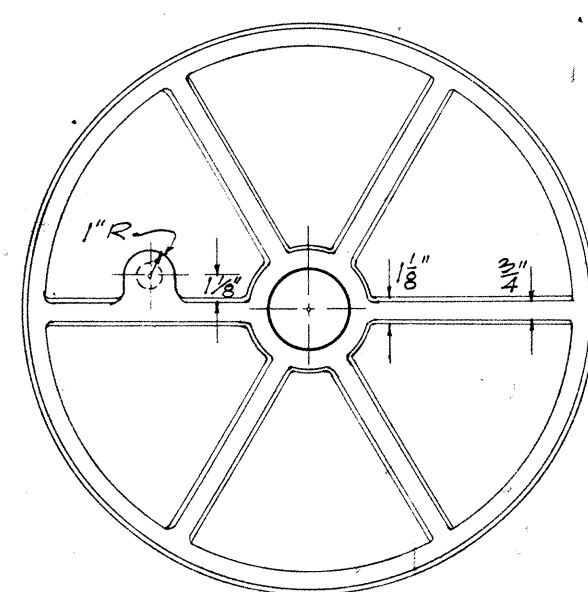
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-090-1(4)	1964	101	177
August 1957					50-0720(6) 1964



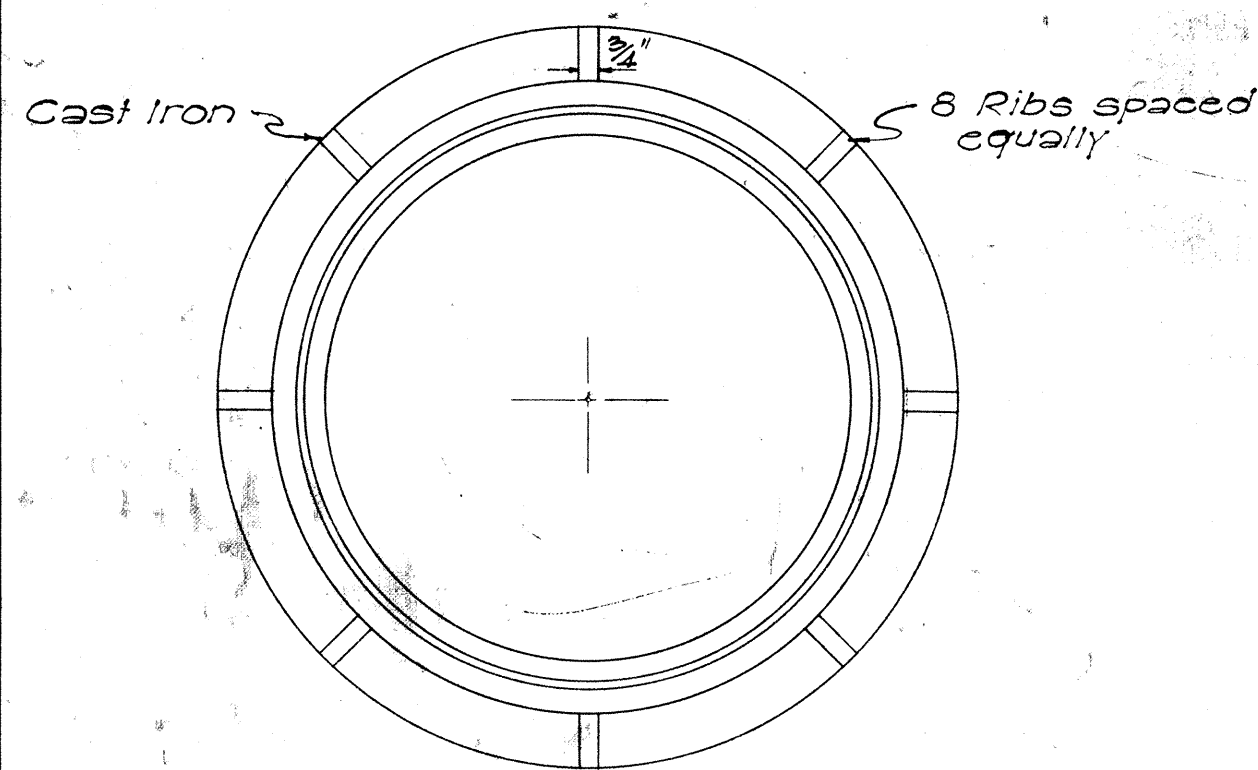
TOP VIEW OF COVER



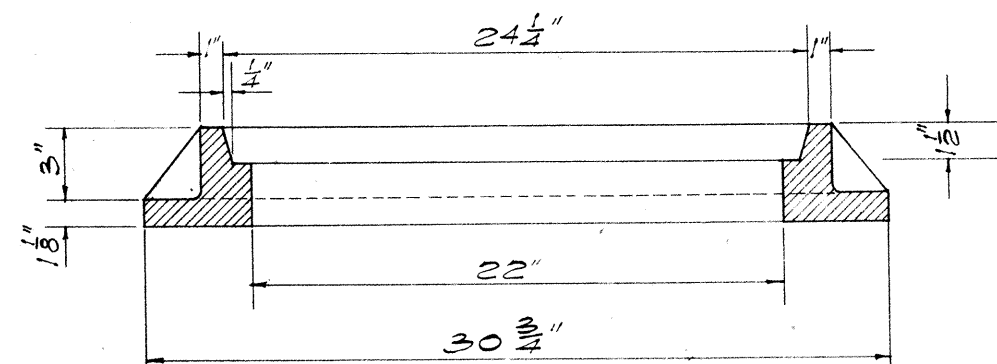
SECTION



BOTTOM VIEW OF COVER

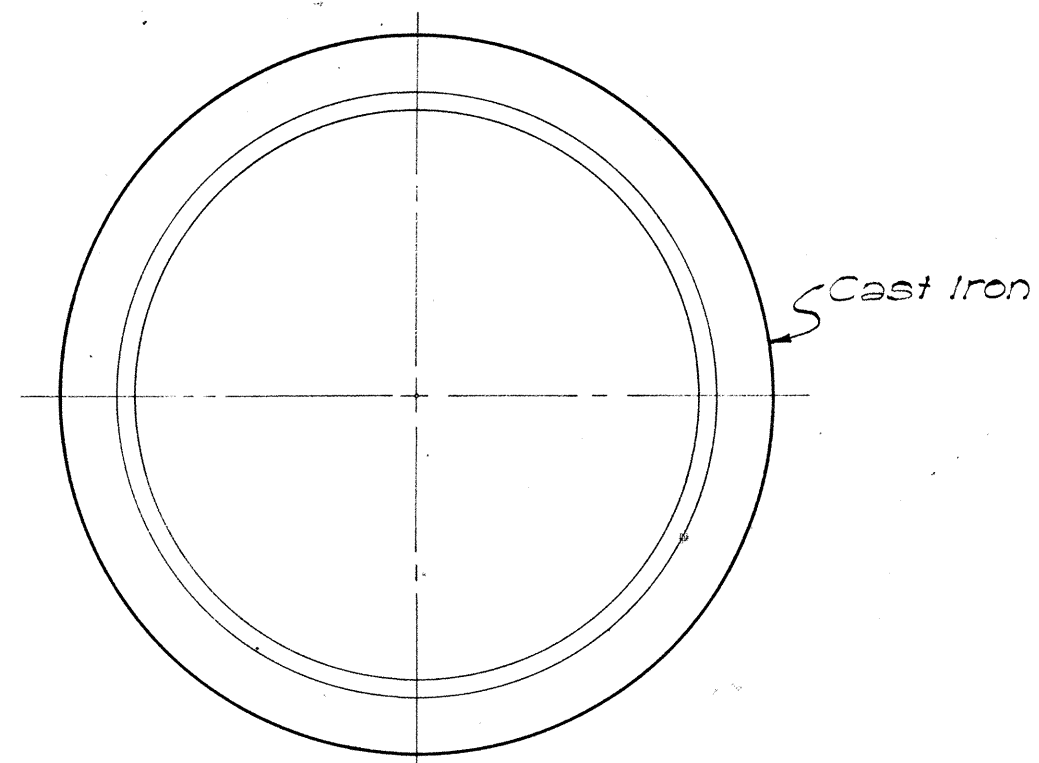


PLAN OF RIM

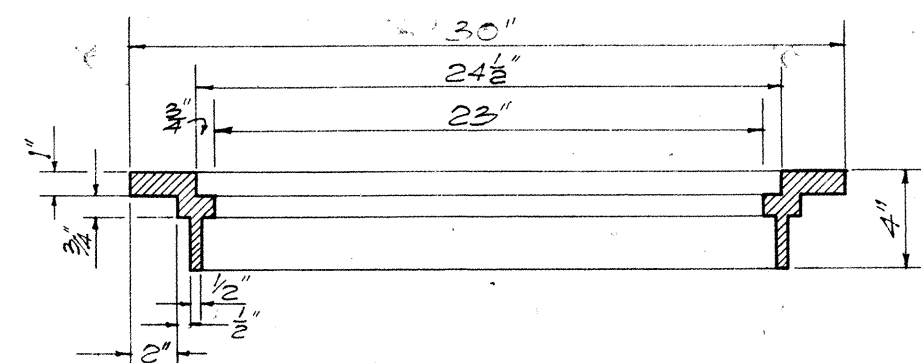


SECTION OF RIM
DETAILS OF TYPE "C"
MANHOLE CASTINGS

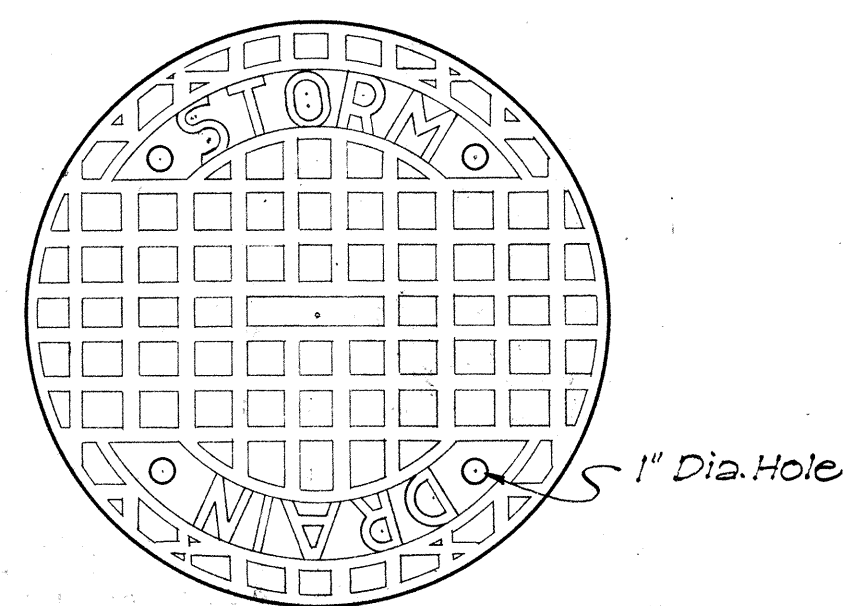
SCALE: 1-1/2" = 1'-0"



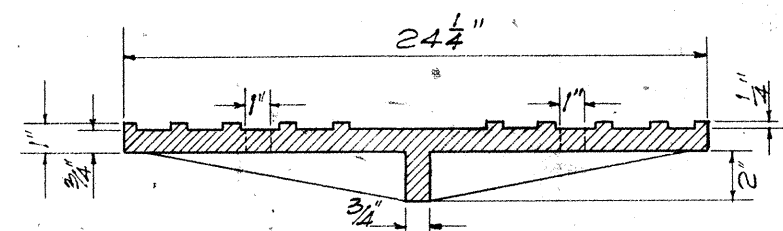
PLAN OF RIM



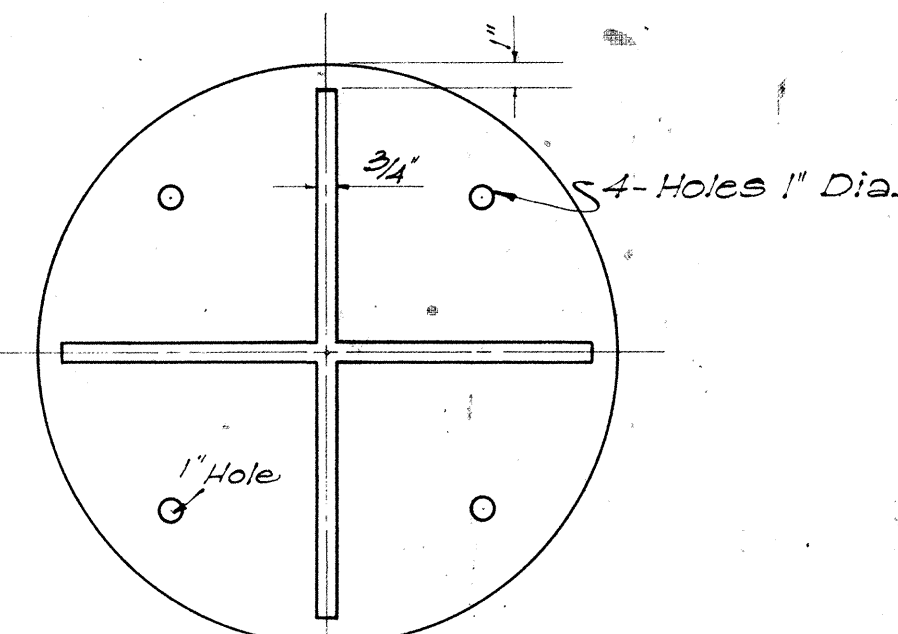
SECTION OF RIM



TOP VIEW OF COVER



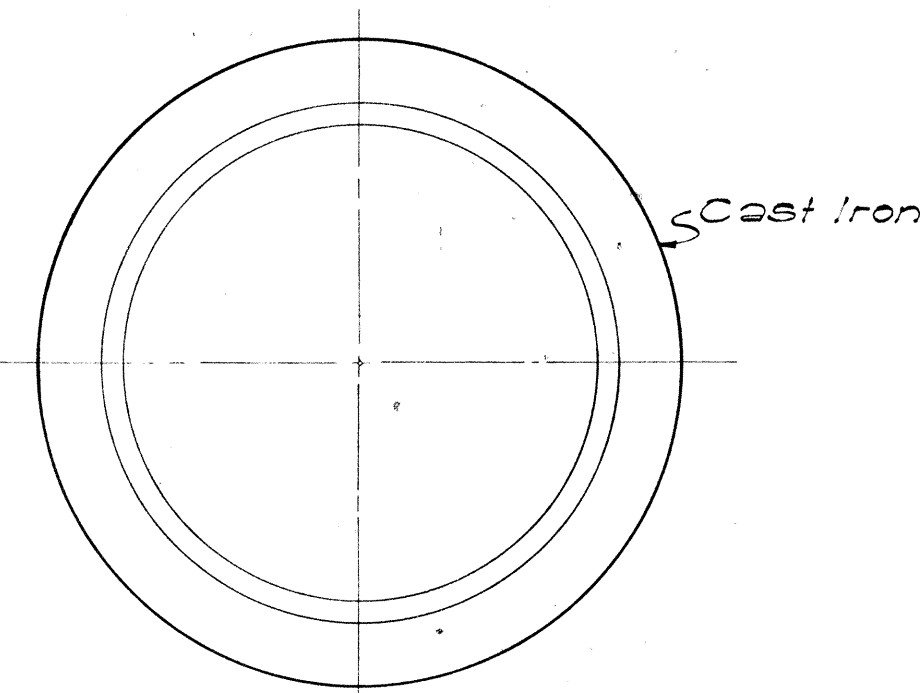
SECTION



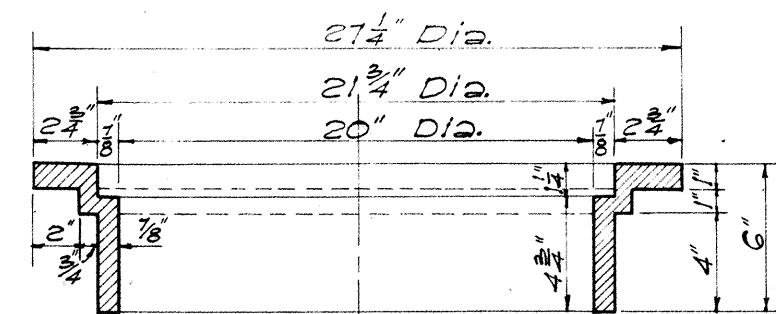
BOTTOM VIEW OF COVER

DETAILS OF TYPE "B"
CATCH BASIN CASTINGS

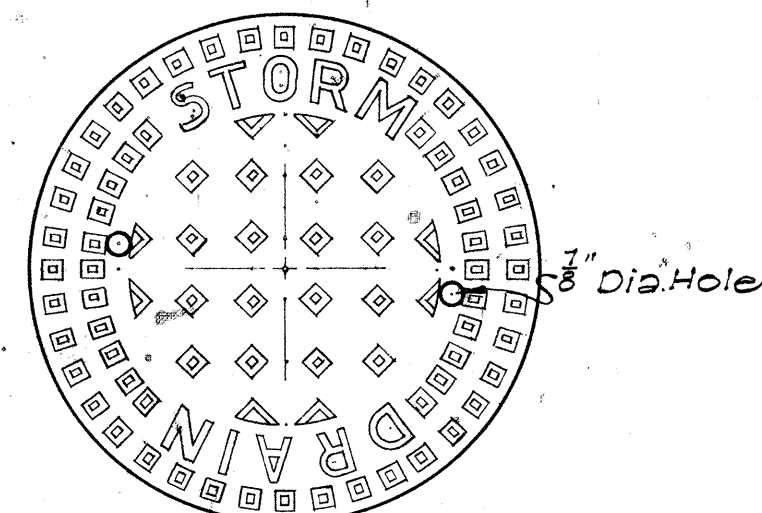
SCALE: 1-1/2" = 1'-0"



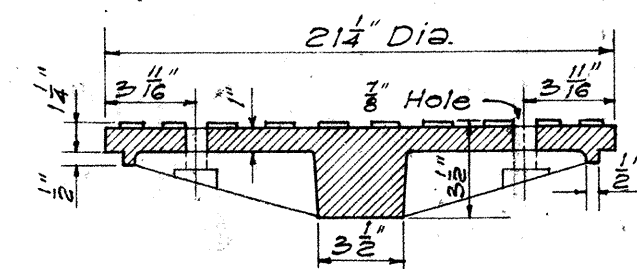
PLAN OF RIM



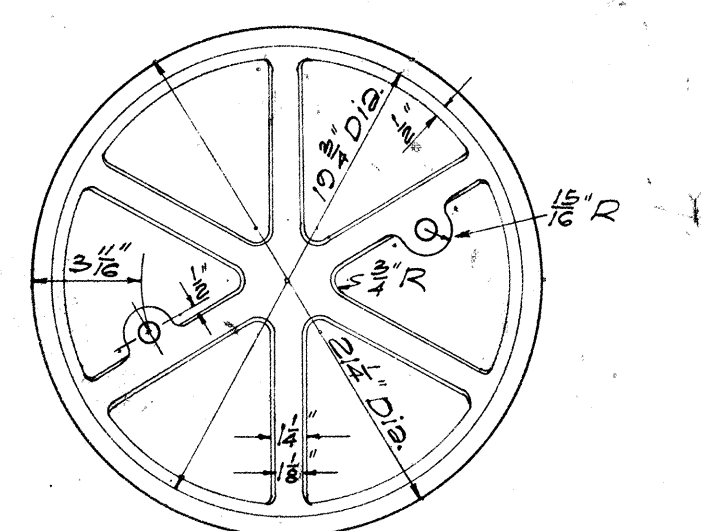
SECTION OF RIM



TOP VIEW OF COVER



SECTION

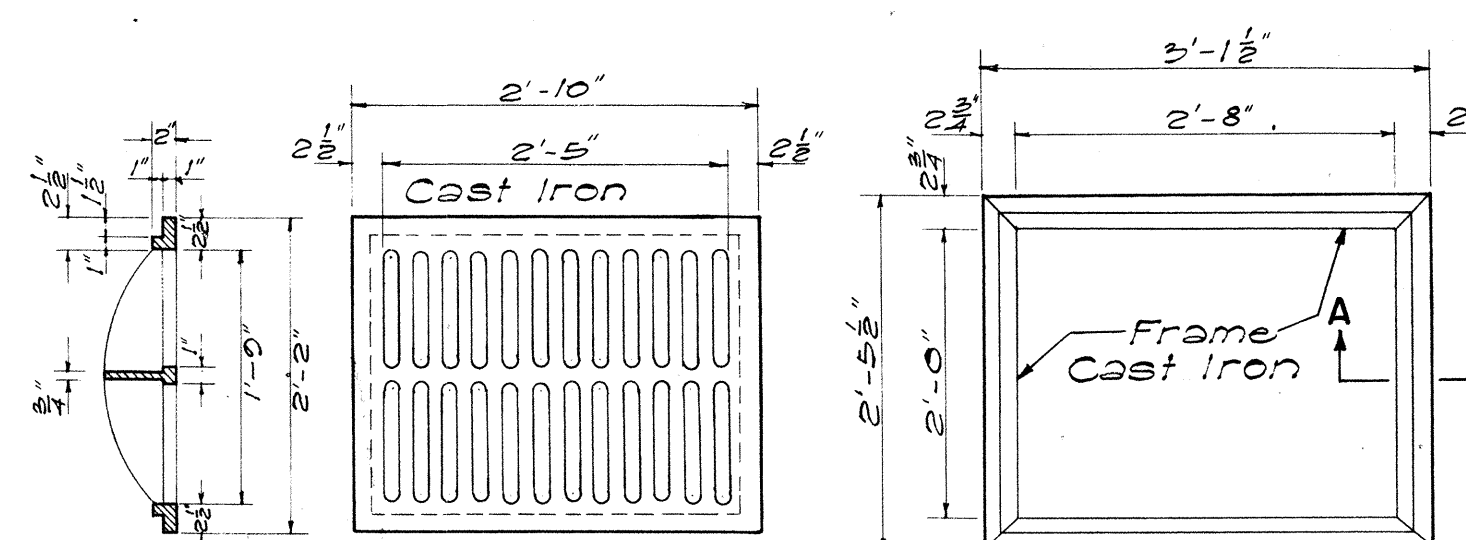


BOTTOM VIEW OF COVER

DETAILS OF TYPE "A"
MANHOLE CASTINGS

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

NOTE: Stock Pattern From Novelty Foundry ~ Honolulu



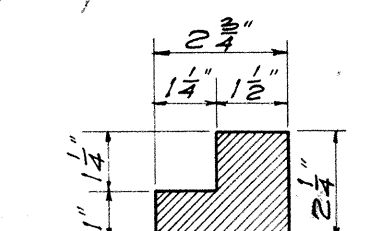
SECTION

TOP VIEW

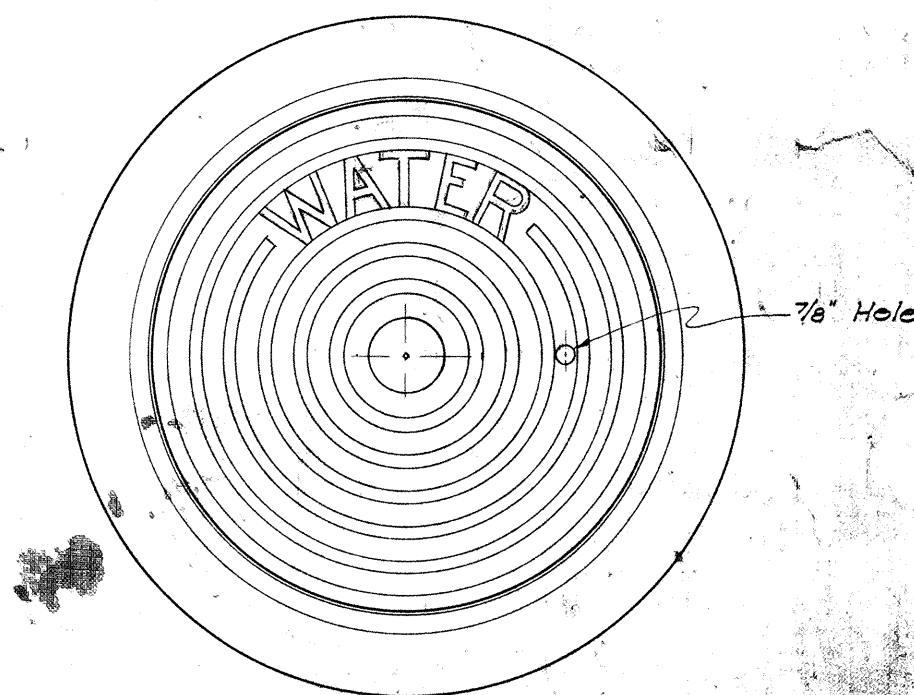
TOP VIEW

TYPE C C.I. FRAME AND GRATING

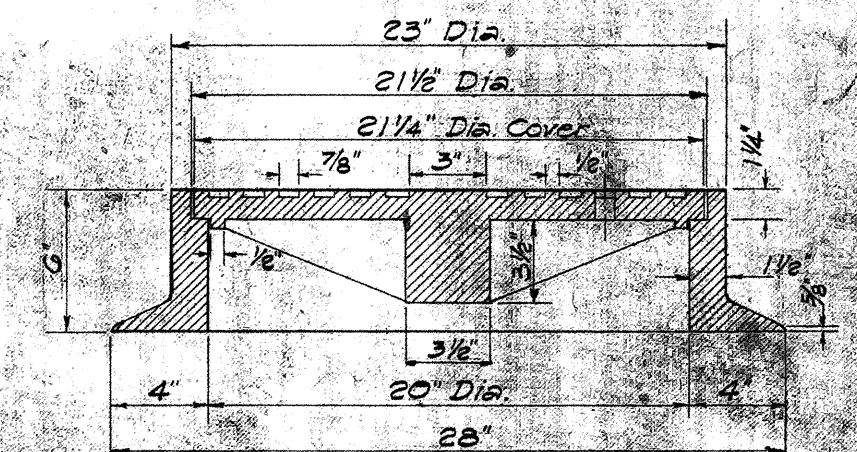
SCALE: 3/4" = 1'-0"



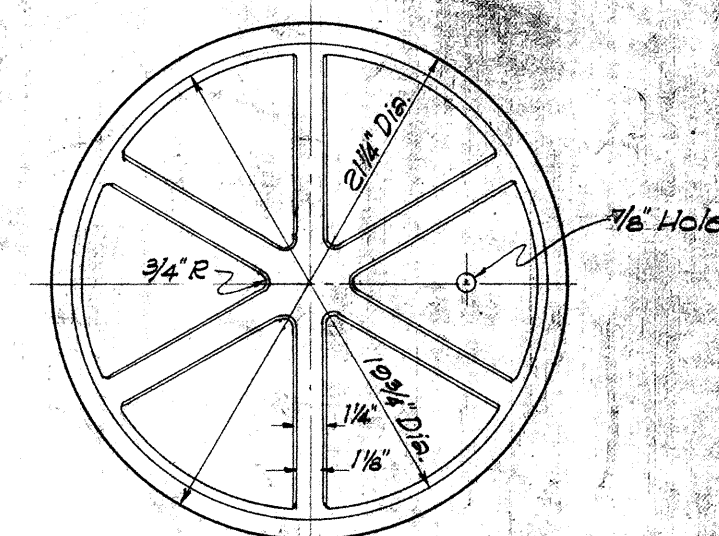
SECTION "A-A"
SCALE 3" = 1'-0"



PLAN OF FRAME AND COVER



SECTION OF FRAME AND COVER



BOTTOM VIEW OF COVER

DETAILS OF 20" CAST IRON
FRAME AND COVER FOR
WATER MANHOLE

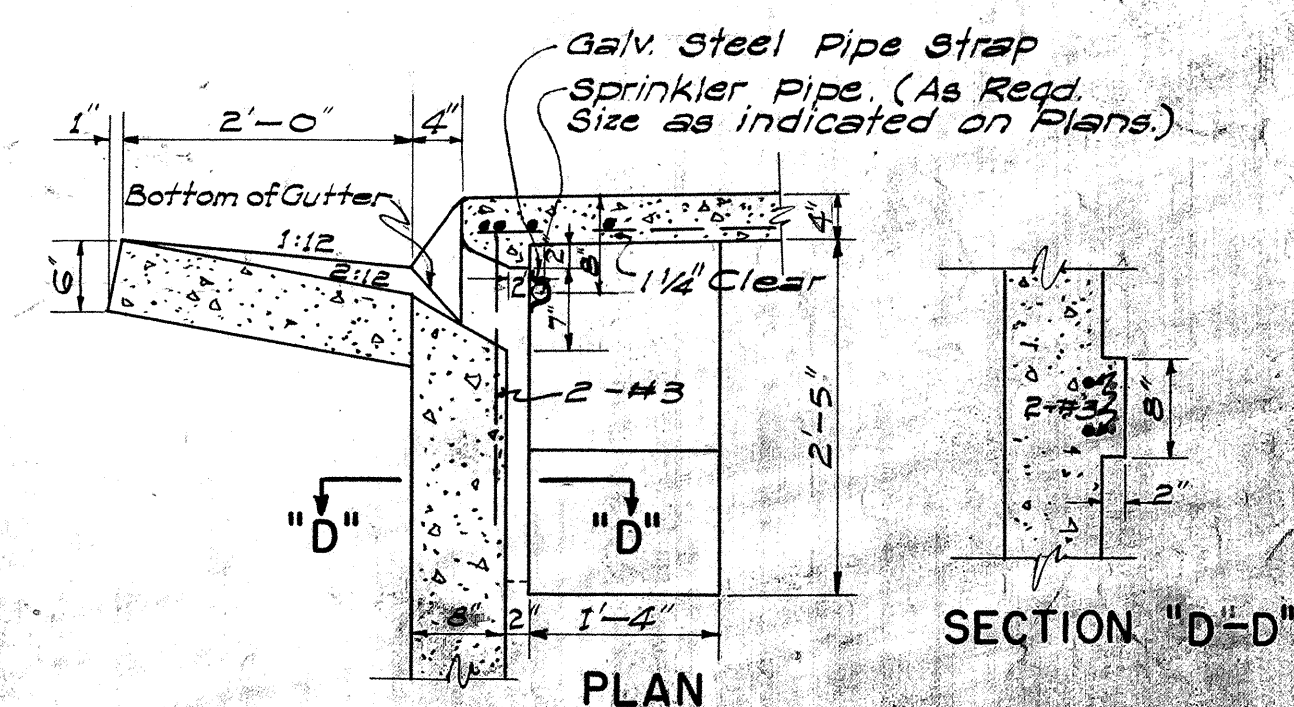
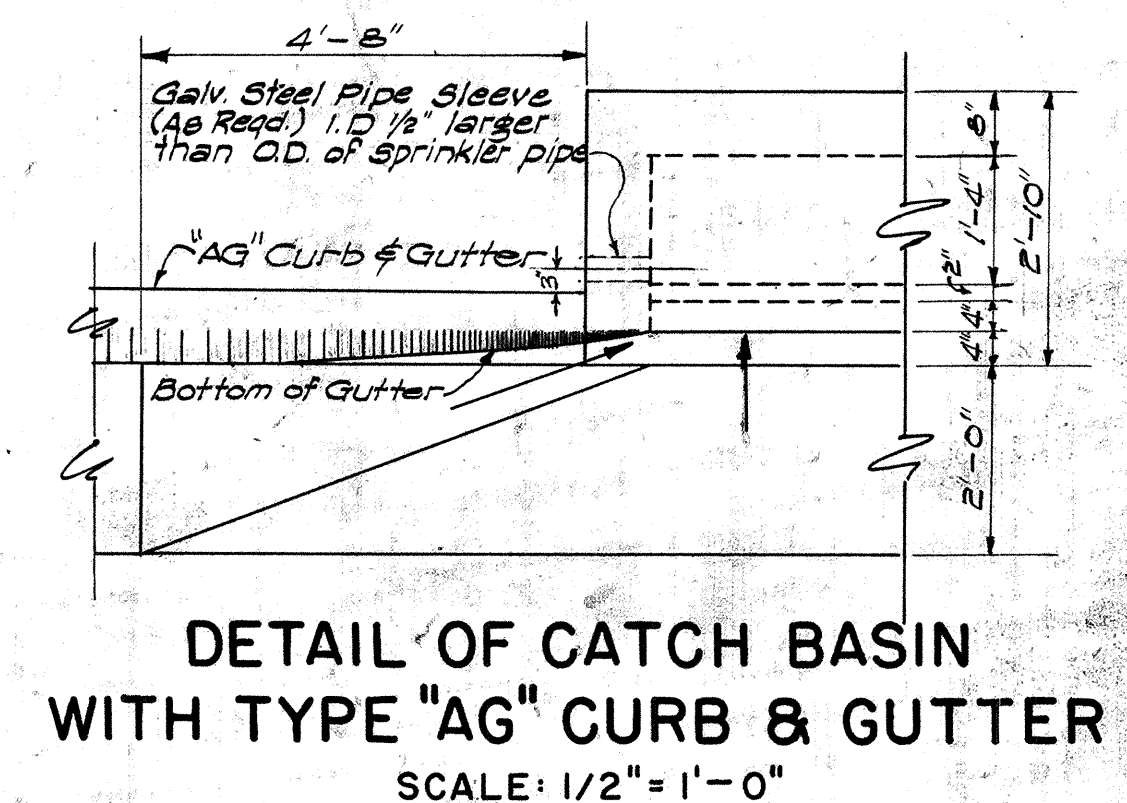
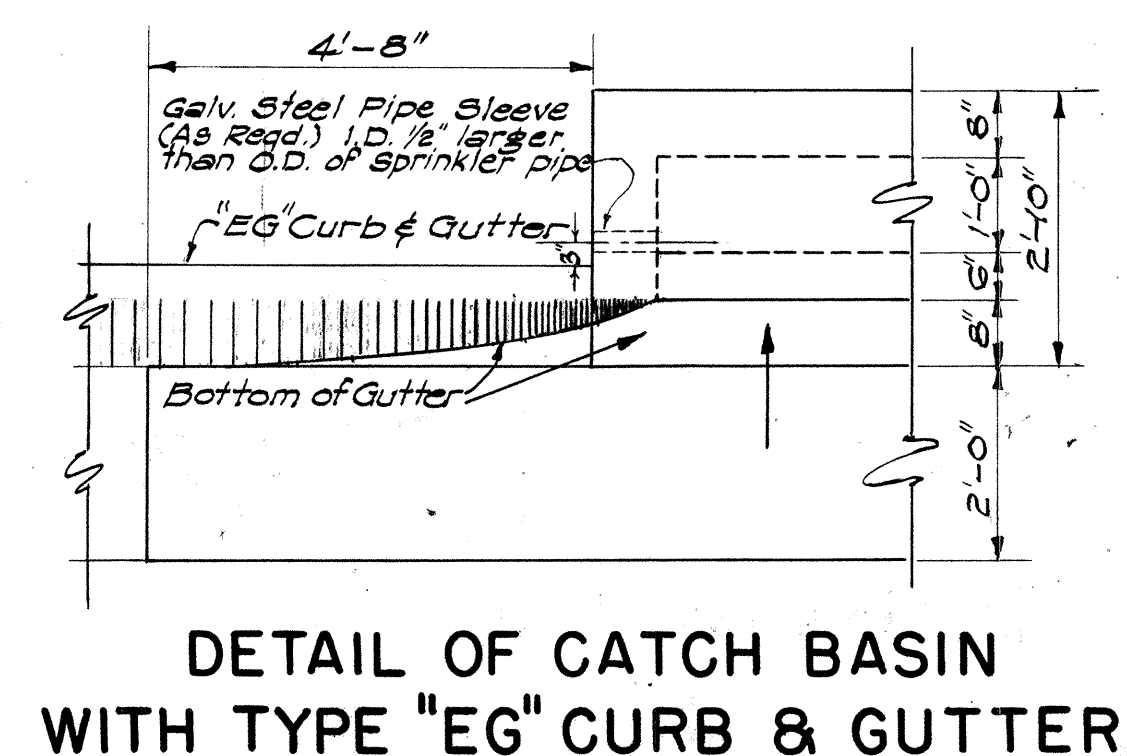
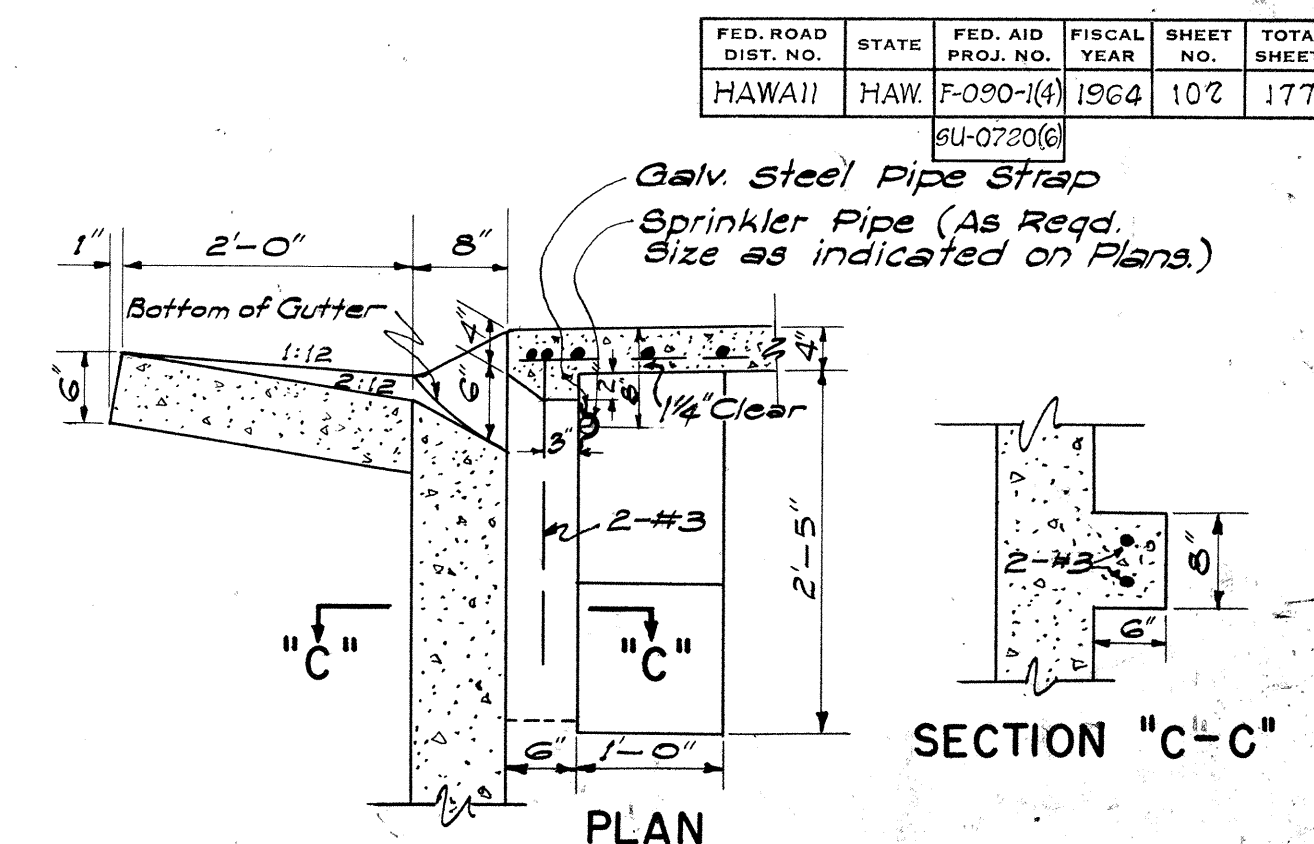
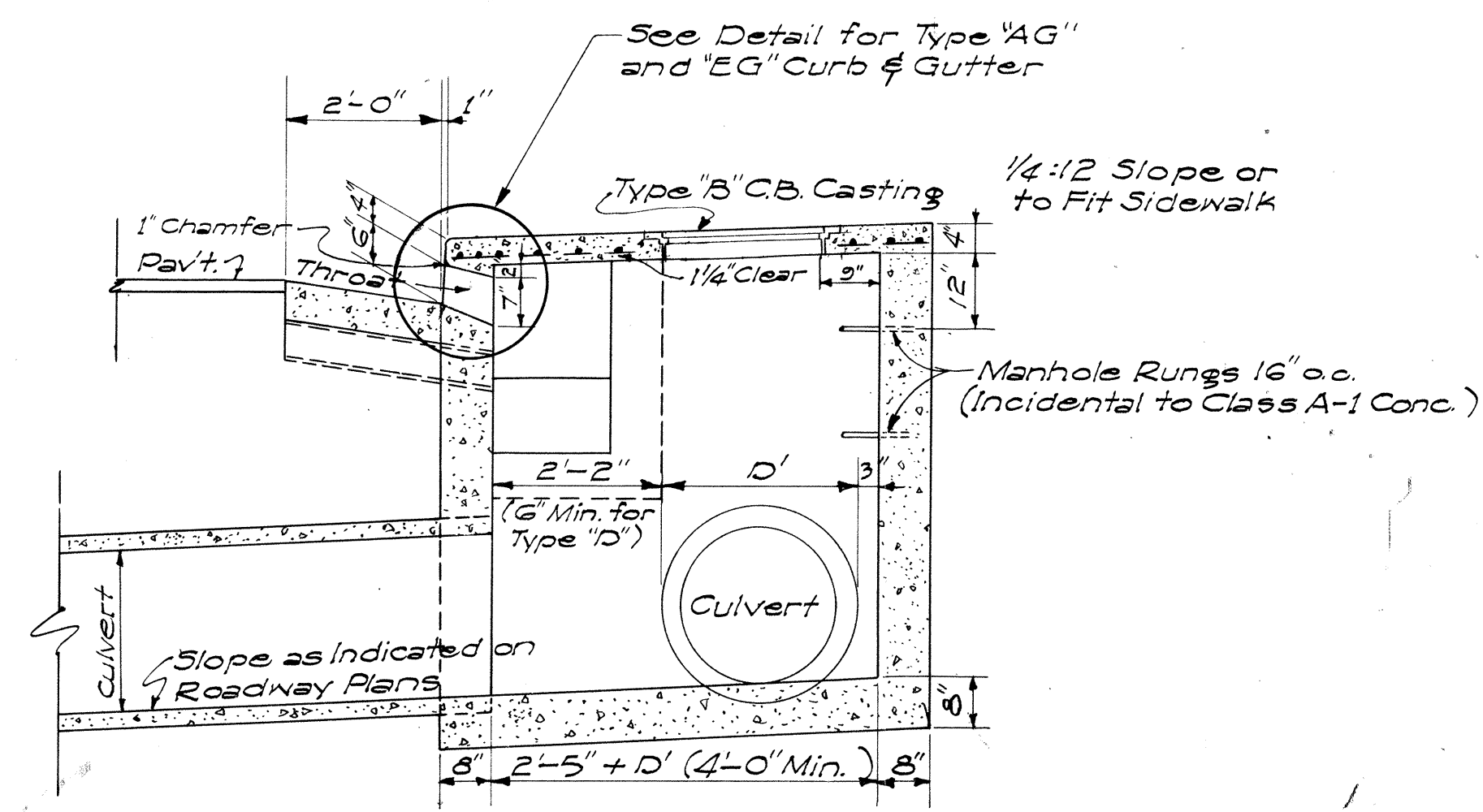
SCALE: 1 1/2" = 1'-0"

DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
STATE OF HAWAII
STANDARD DETAILS
CATCH BASIN AND
MANHOLE CASTINGS

SCALES AS NOTED

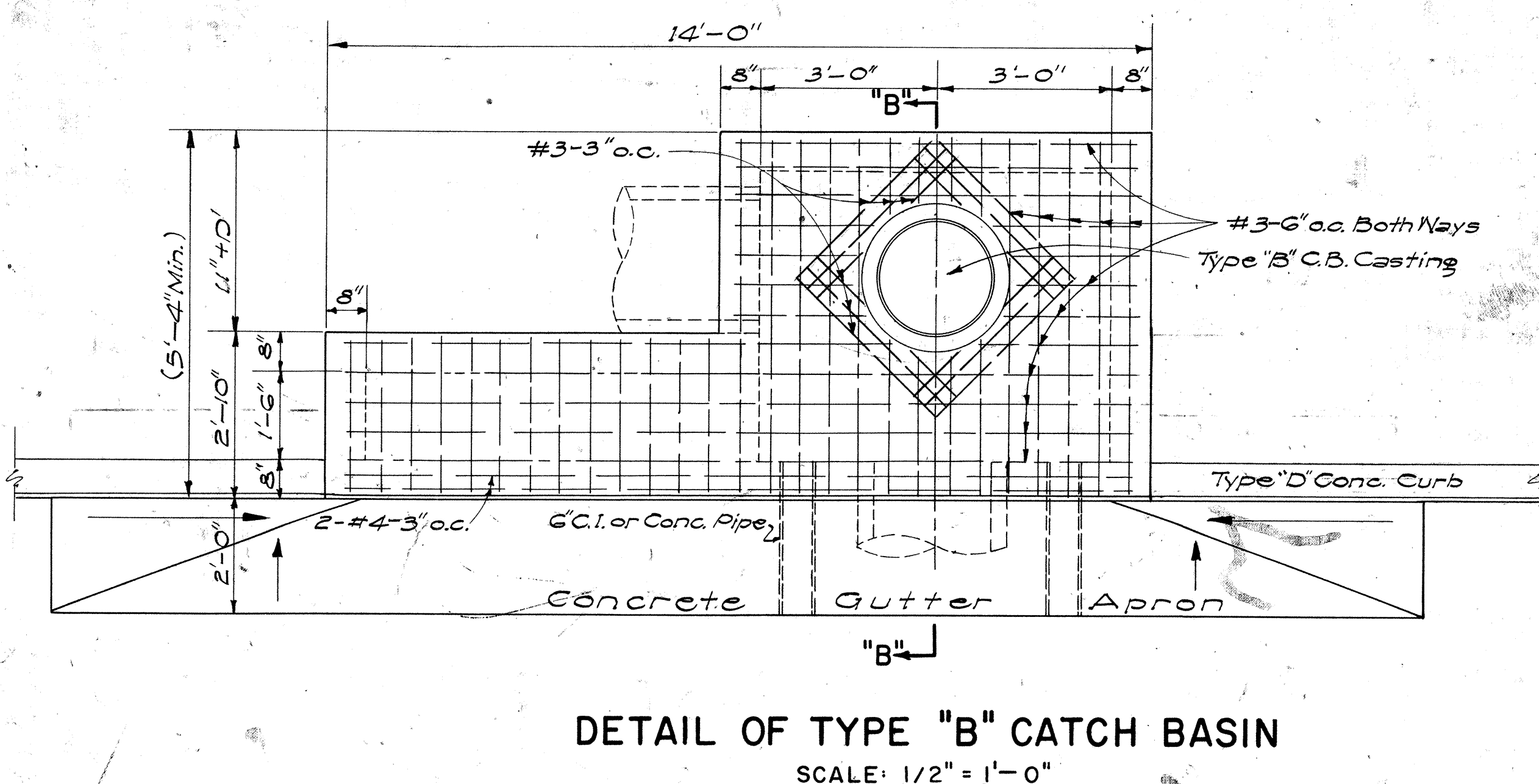
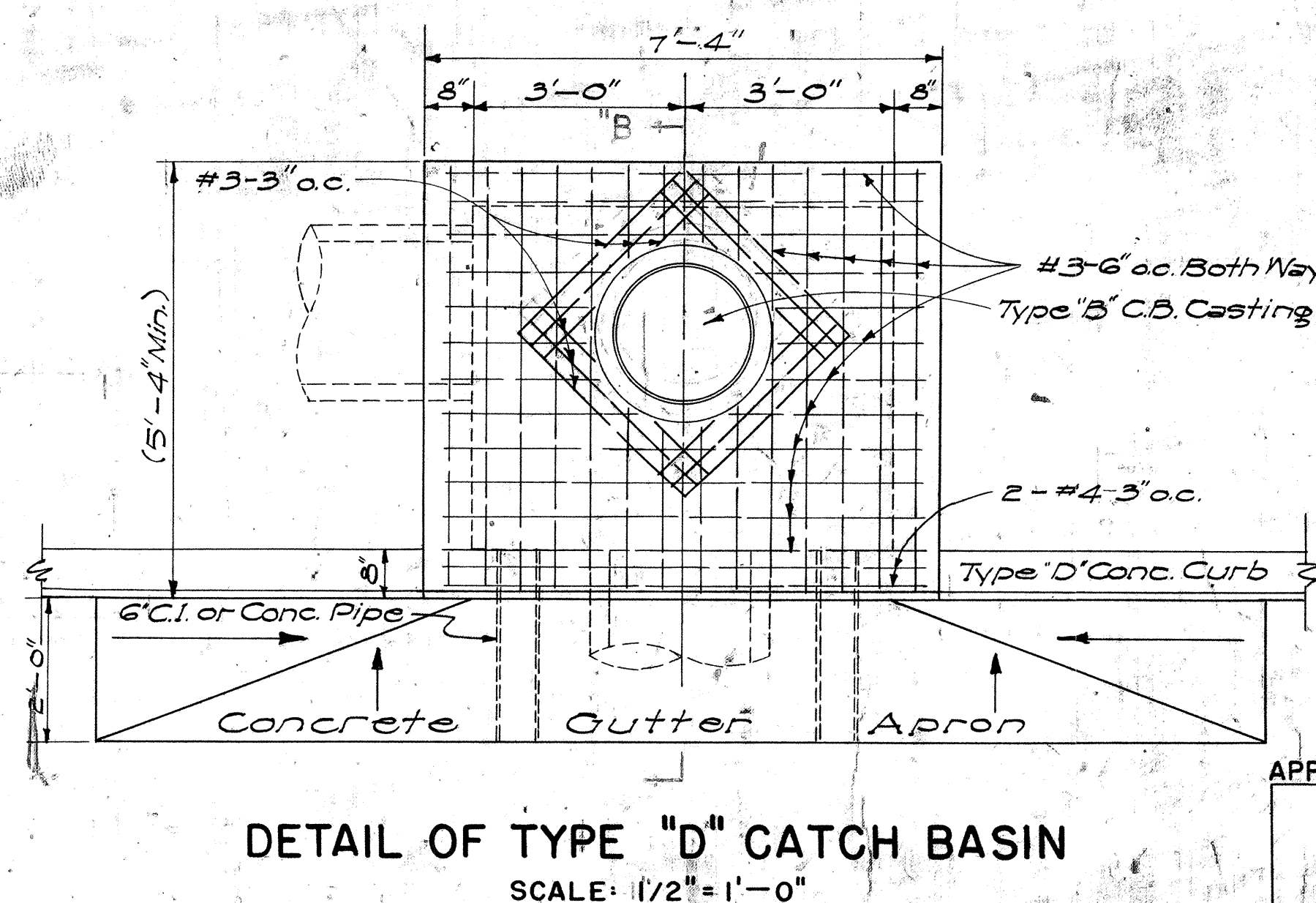
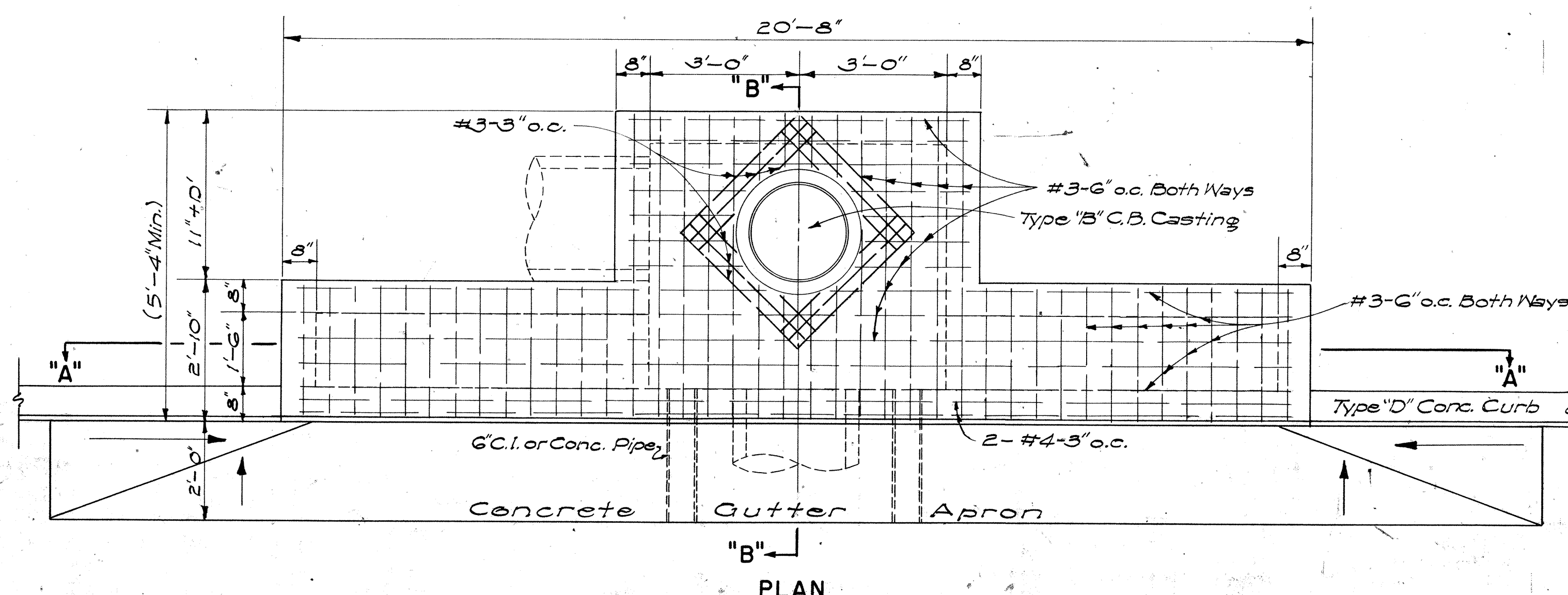
SHEET NO. 10 OF 15 SHEETS

APPROVED: DATE: Aug. 23, 1959
STATE HIGHWAY ENGINEER



ESTIMATED QUANTITIES

Type	Class A Conc.	Struct. Exc.	Reinf. Steel	Gutter Length
"A" 	7.5 cy	24.7 cy	145 lb	30'-0"
"B" 	6.0 cy	21.5 cy	108 lb	23'-4"
"C" 	6.0 cy	21.5 cy	108 lb	23'-4"
"D" 	4.9 cy	16.5 cy	77 lb	16'-8"

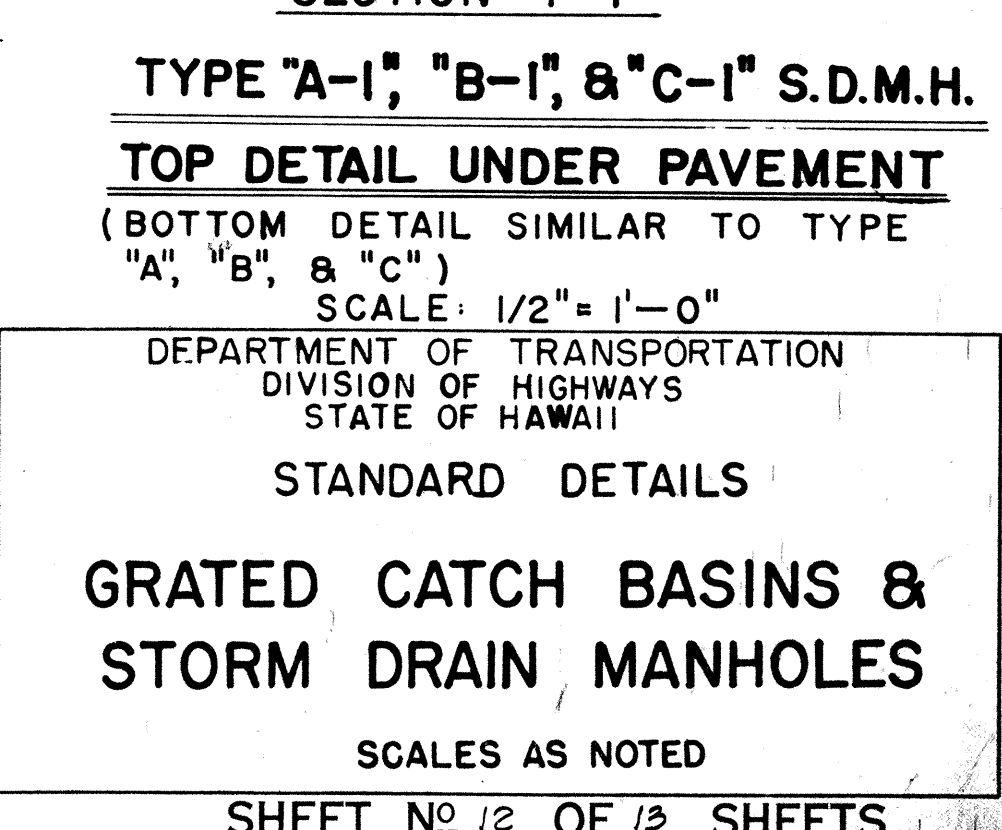


NOTE: TYPE "C" C.B. SIMILAR BUT OPPOSITE HAND

DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
STATE OF HAWAII
STANDARD DETAILS
CONCRETE CATCH BASINS

SCALES AS NOTED

SHEET NO 11 OF 13 SHEETS

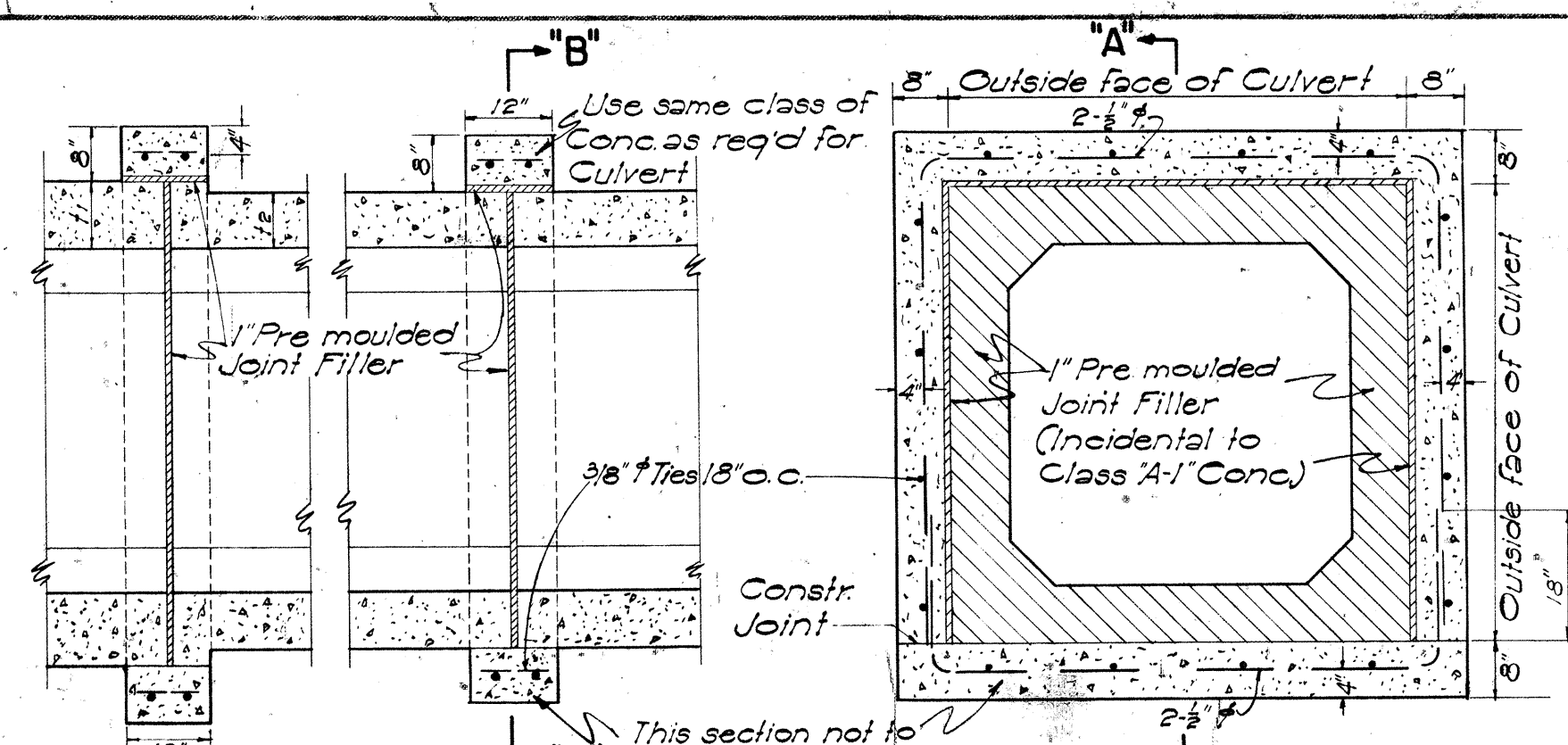
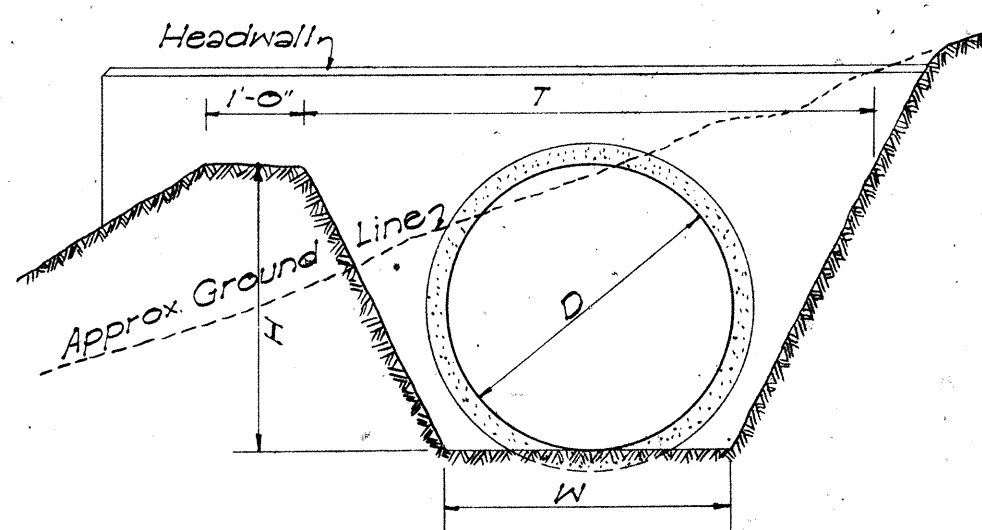


2/17/57

DATA FOR OUTLET DITCH			
D	W	H	T=H+H
18"	24"	2'-0"	4'-0"
24"	30"	2'-0"	4'-6"
30"	30"	2'-6"	5'-0"
36"	36"	3'-0"	6'-0"

DETAIL OF OUTLET DITCH

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



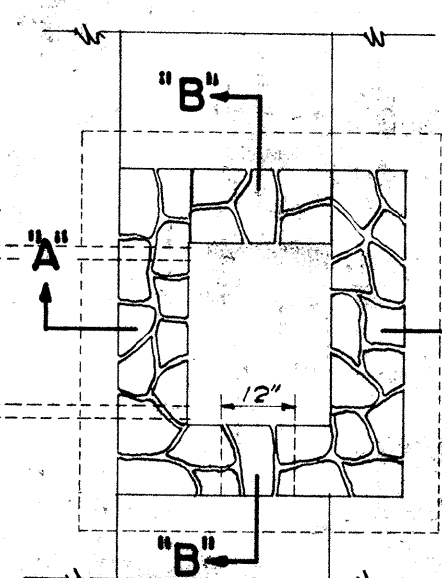
SECTION "A-A" SECTION "B-B"

CONC. COLLAR FOR CONC. BOX CULVERT

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

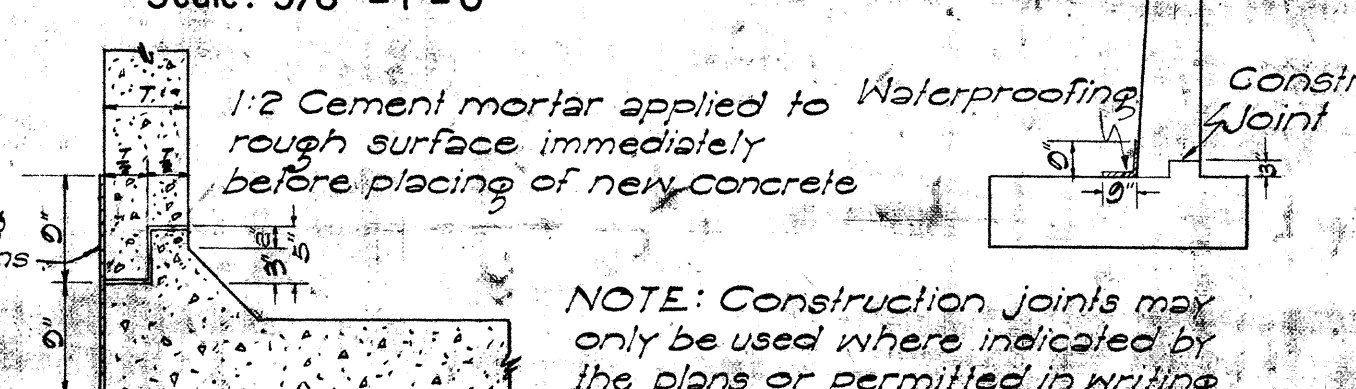
DATA FOR MASONRY DROP INTAKE			
D	D	L	Cu. Yds.
23"	18"	2'-5"	3.02
30"	24"	3'-0"	3.61
37"	30"	3'-7"	4.21
44"	36"	4'-2"	4.85

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



DETAIL OF MASONRY DROP INTAKE

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

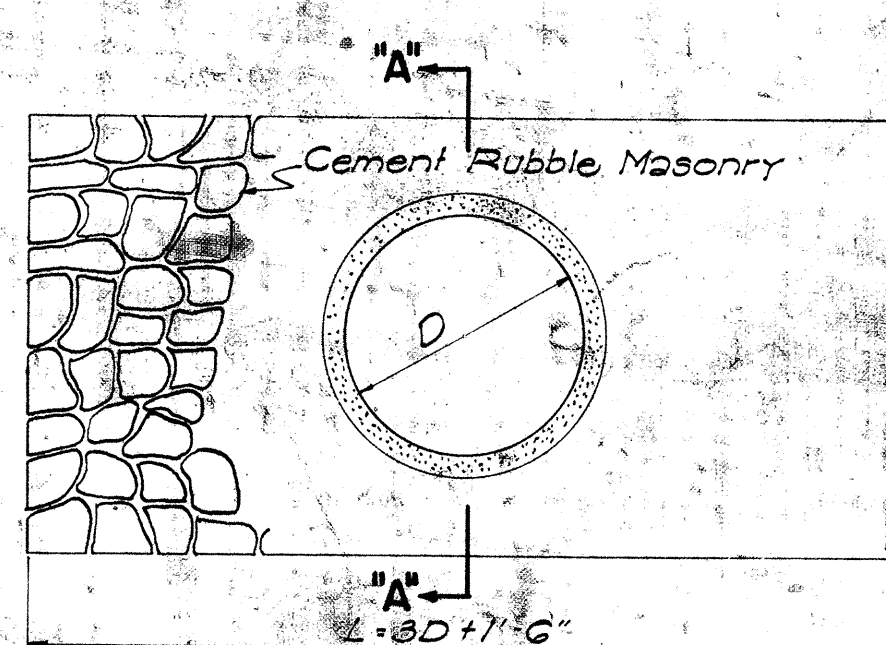


CONSTR. JOINT DETAILS

NOTE: Construction joints may only be used where indicated by the plans or permitted in writing by the Engineer.

NOTE: When subgrade is below top of jacket, it shall be fully compacted to this line and then re-excavated (struck) to proper subgrade. This surface shall be rolled again.

DATA - MASONRY HEADWALL			
D	H	B	Cu. Yds.
18"	3'-6"	1'-0"	0.85
24"	4'-0"	1'-0"	1.28
30"	4'-6"	1'-0"	1.83
36"	5'-0"	1'-0"	2.40



DETAIL OF MASONRY HEADWALL

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



SECTION

CONC. PIPE CULVERT

NOTE: Thickness of reinforcing and concrete used, are to conform with the approved design as provided by the Specifications.

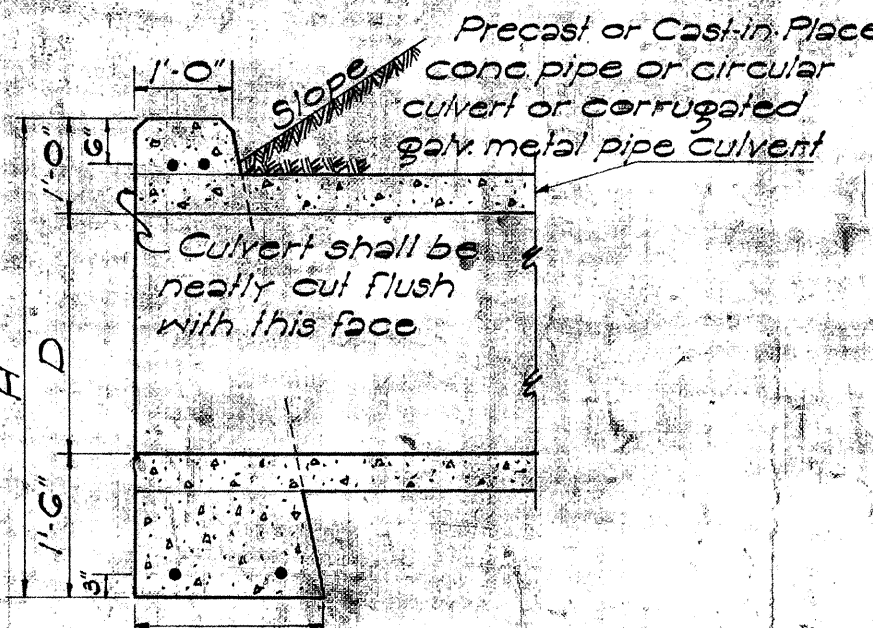
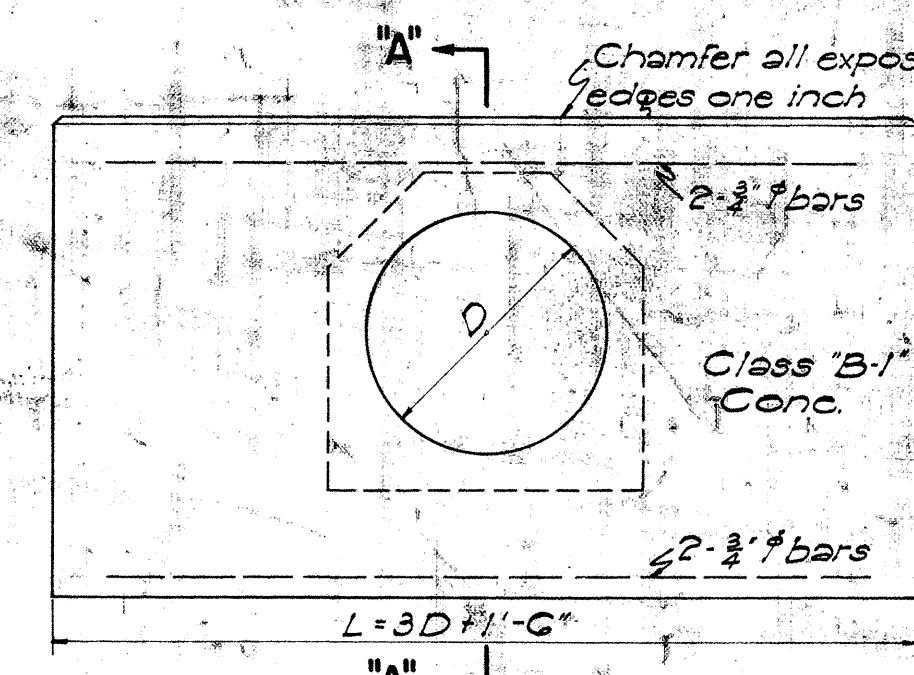
DATA - CAST-IN-PLACE CONC. CULVERT			
D	d	W	Cu. Yds. per ft.
18"	4"	2'-2"	0.11
24"	4 1/2"	2'-0"	0.14
30"	5"	3'-4"	0.19
36"	5 1/2"	3'-11"	0.26

CAST-IN-PLACE CONC. CULVERT

DATA FOR CONC. HEADWALL			
D	B	L	Cu. Yds.
18"	1'-6"	6'-0"	0.22
24"	1'-6"	7'-6"	1.25
30"	2'-0"	10'-0"	1.05
36"	2'-0"	10'-0"	2.45
42"	2'-6"	12'-0"	3.87
48"	2'-6"	13'-6"	4.66

DETAIL OF CONCRETE HEADWALL

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



SECT. OF CULVERT WITH CONC. PROTECTION

Scale: 1" = 1'-0"

DATA FOR CONCRETE PROTECTION OVER CULVERTS			
X	Y	Z	
6" for 18" D			
7" "	24" D		
8" "	30" D		
9" "	36" D		
10" "	42" D		
11" "	48" D		
12" "	54" D		

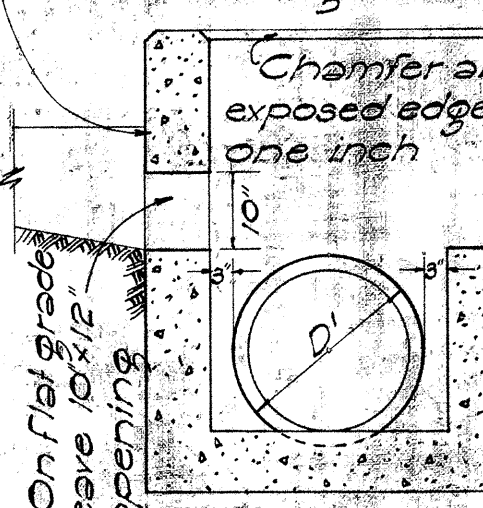
APPROVED: DATE: Aug. 25, 1959
STATE HIGHWAY ENGINEER

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
STANDARD DETAILS
DROP INTAKES, RETAINING WALLS,
HEADWALLS, CONSTRUCTION JOINTS
SCALES AS NOTED
SHEET NO. 13 OF 13 SHEETS

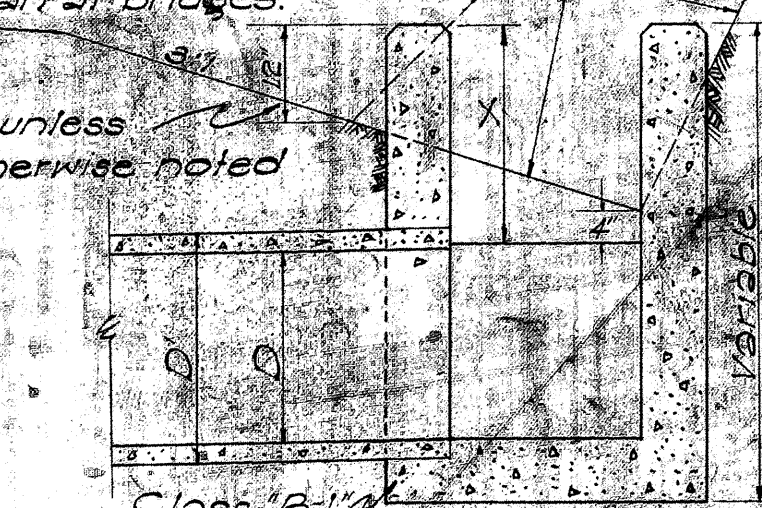
DATA - CONC. DROP INTAKE			
D	D	L	Cu. Yds.
23"	18"	2'-5"	1.41
30"	24"	3'-0"	1.72
37"	30"	3'-7"	2.32
44"	36"	4'-2"	2.73
51"	42"	4'-9"	3.54
58"	48"	5'-4"	4.01

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

NOTE: This type of structure shall also be used for the Drop Intakes of Syphons connected with Irrigation Ditches or Flumes with appropriate changes to dimensions. In this case all joints must be made water tight.



SECTION "B-B"

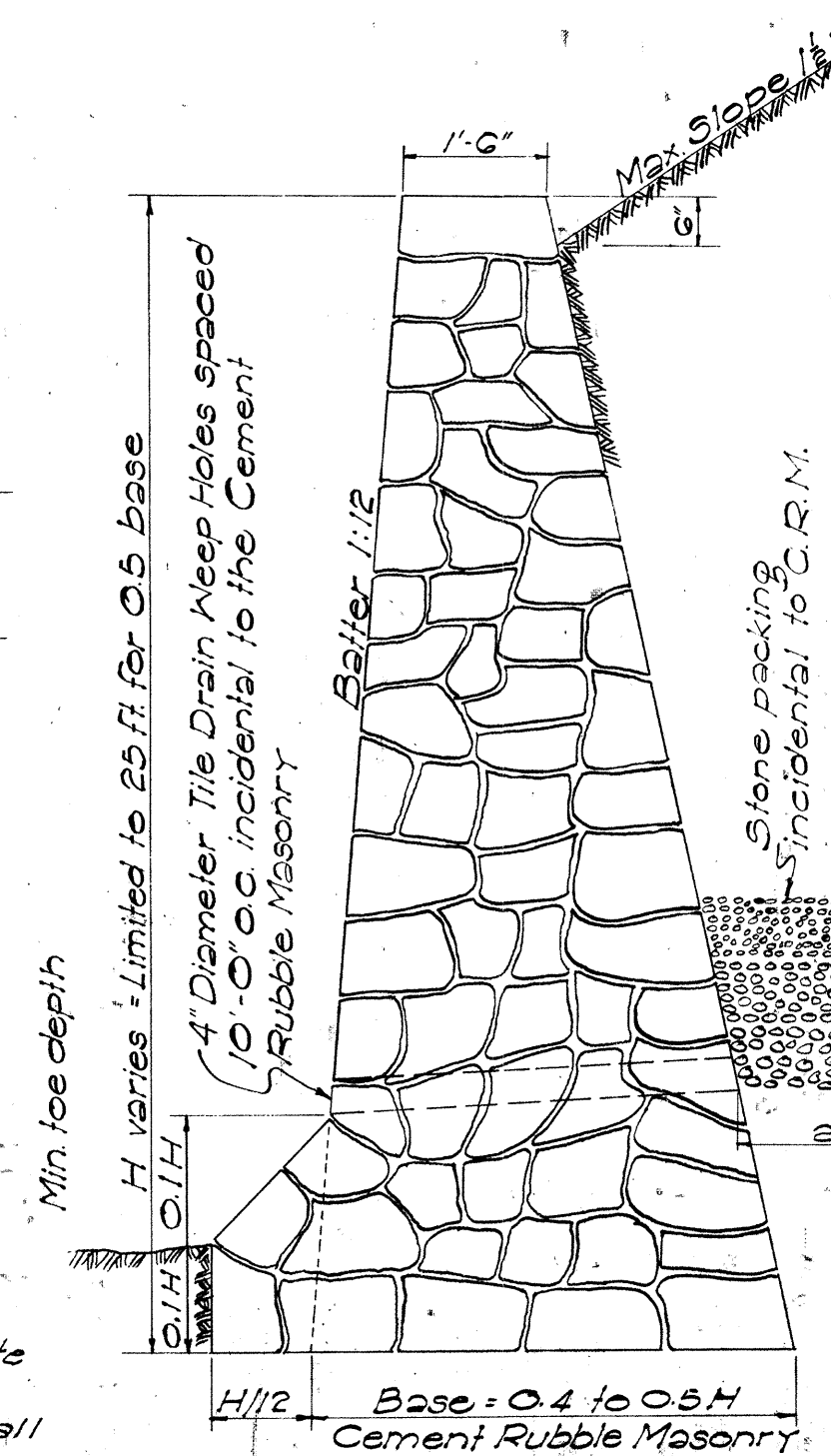


SECTION "A-A"

DETAIL OF CONCRETE DROP INTAKE

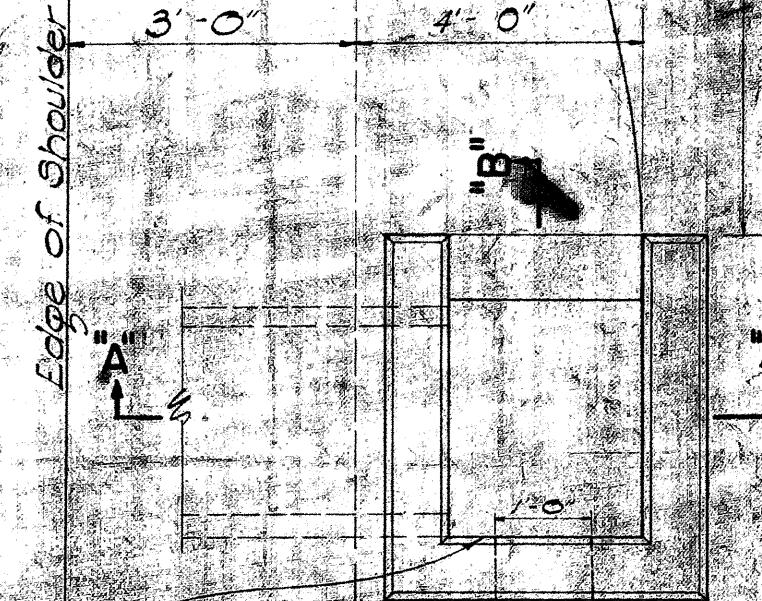
Scale: 1/2" = 1'-0"

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
STANDARD DETAILS
DROP INTAKES, RETAINING WALLS,
HEADWALLS, CONSTRUCTION JOINTS
SCALES AS NOTED
SHEET NO. 13 OF 13 SHEETS



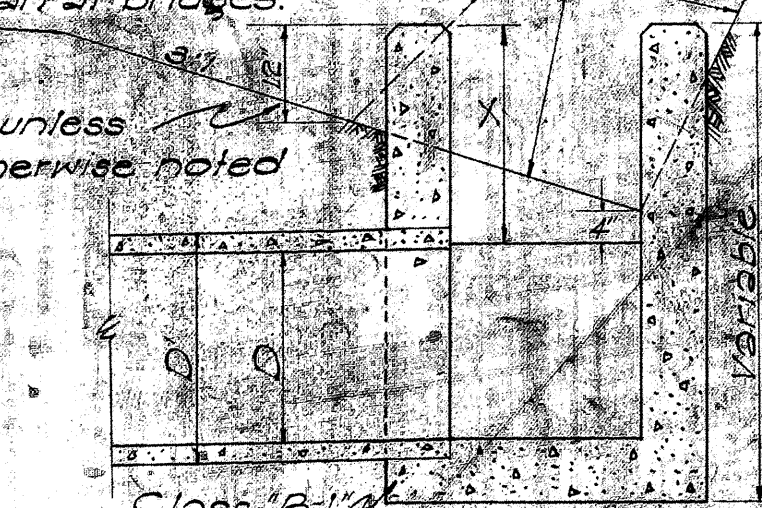
SECTION OF HIGH CEMENT RUBBLE MASONRY RETAINING WALL OR SEAWALL

SECTION OF LOW MASONRY RETAINING WALL OR SEAWALL



PLAN

NOTE: Where drainage comes from both sides, the structure shall be excavated to the level of the drainage as shown for opposite wall.



SECTION "A-A"