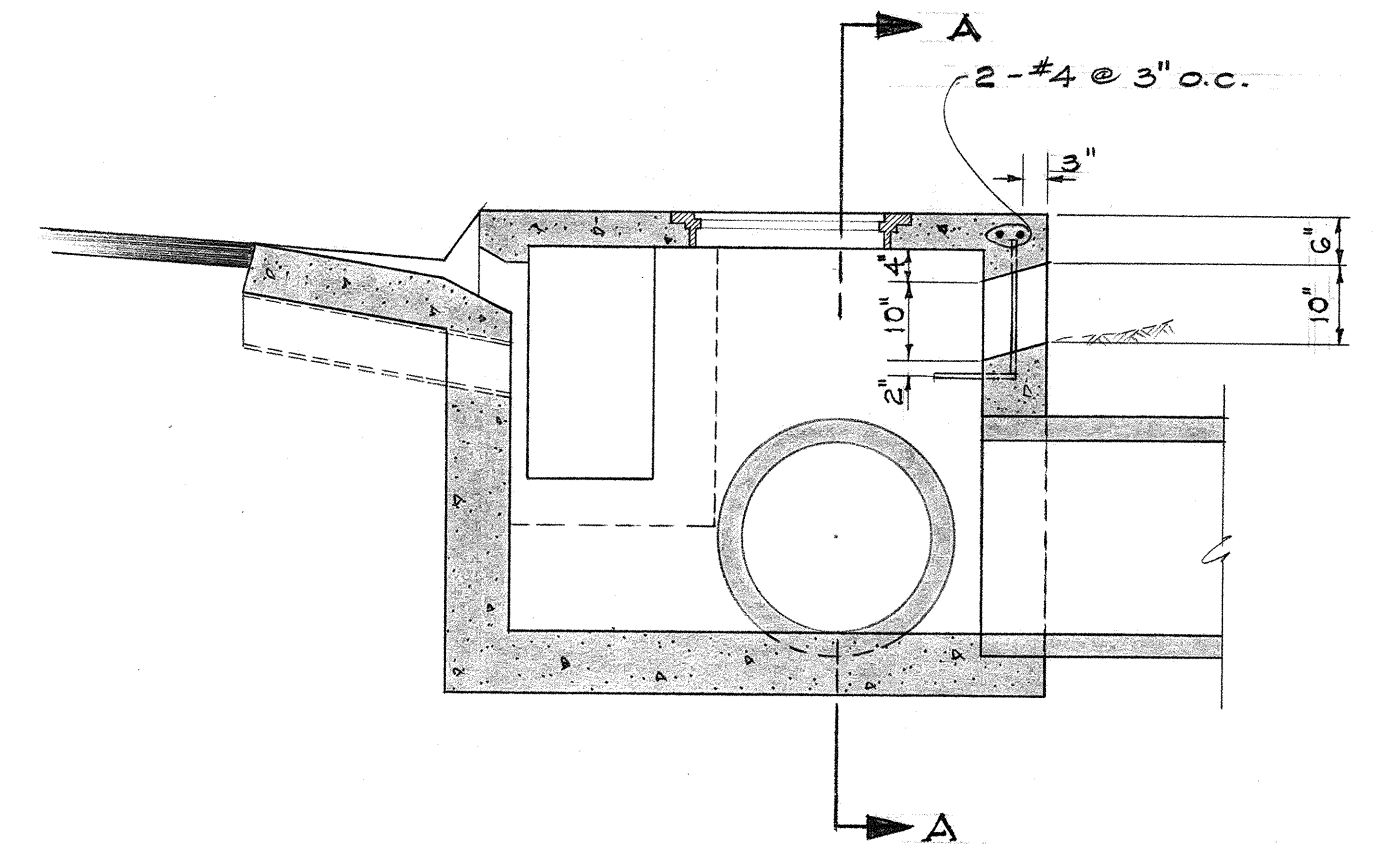
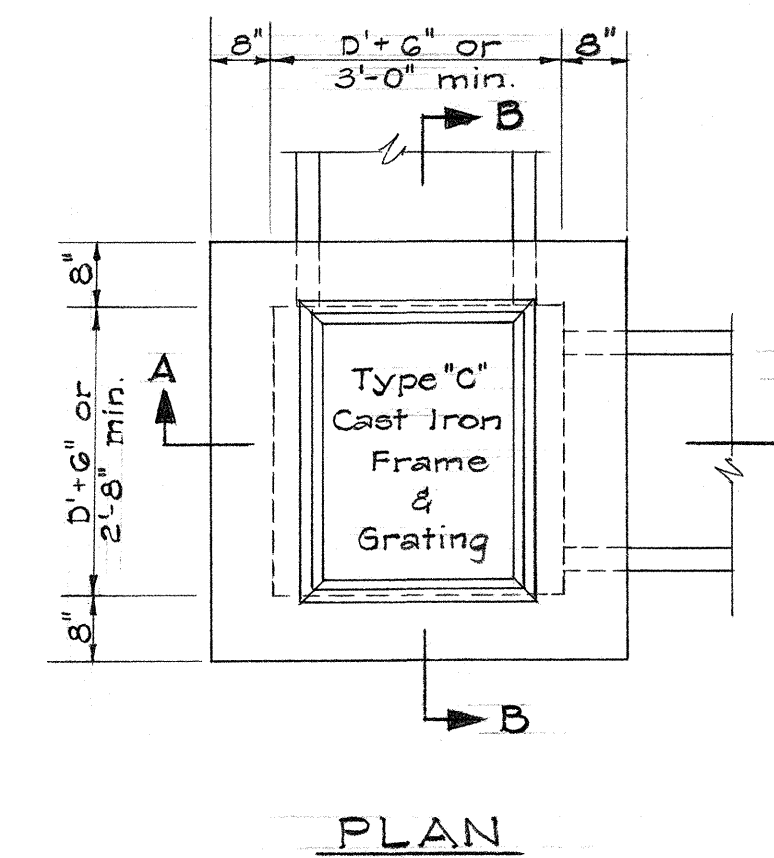
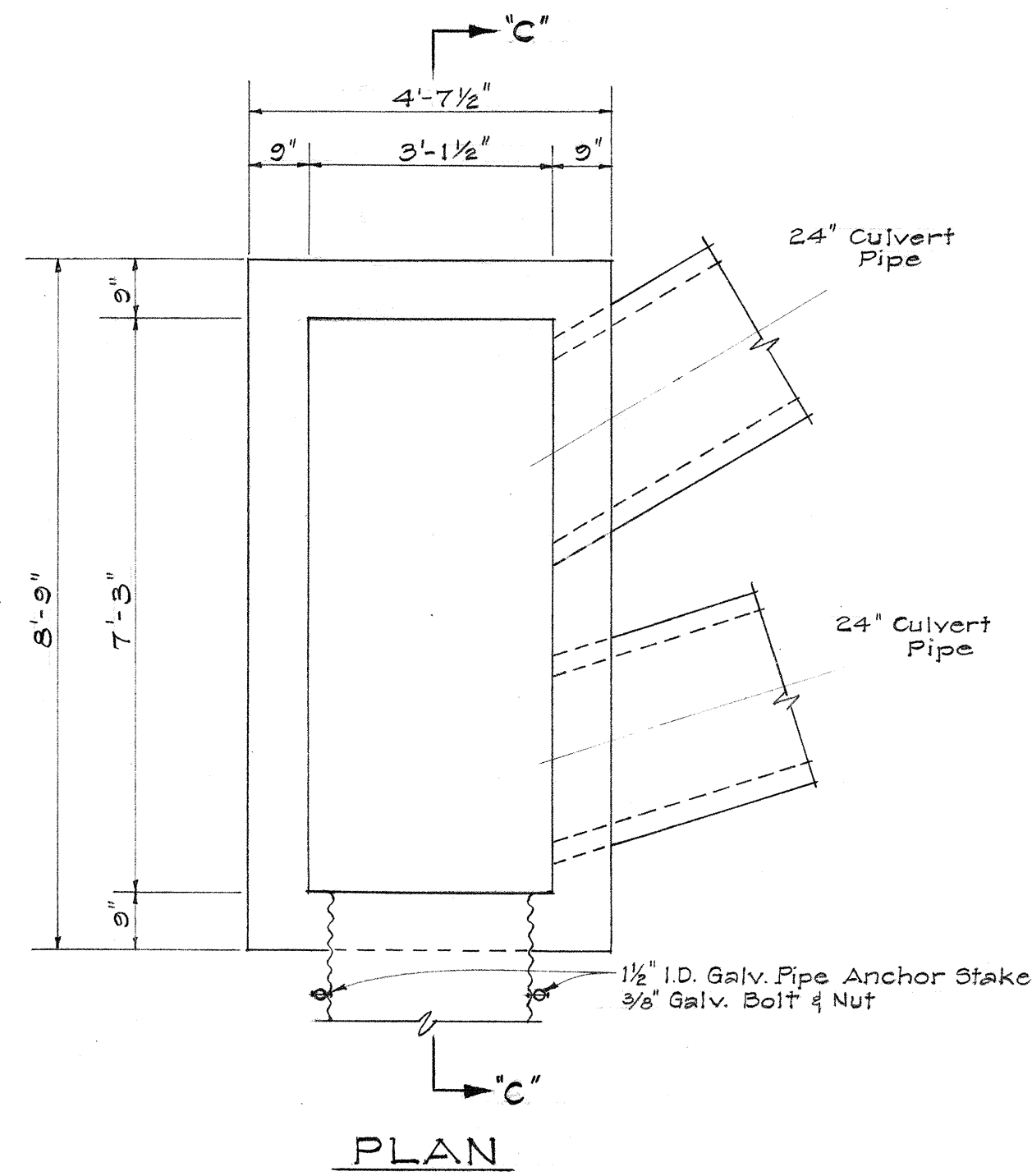
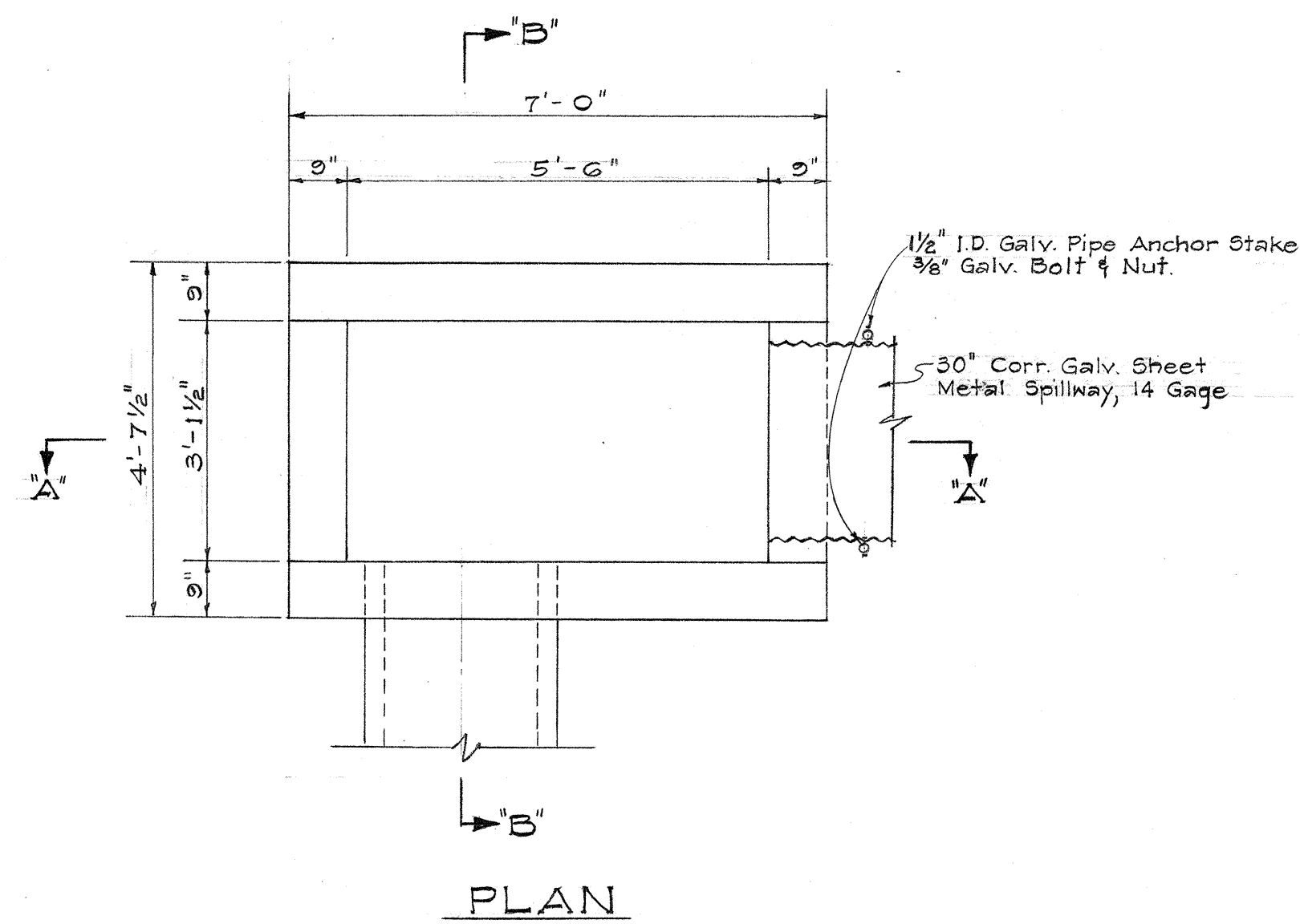
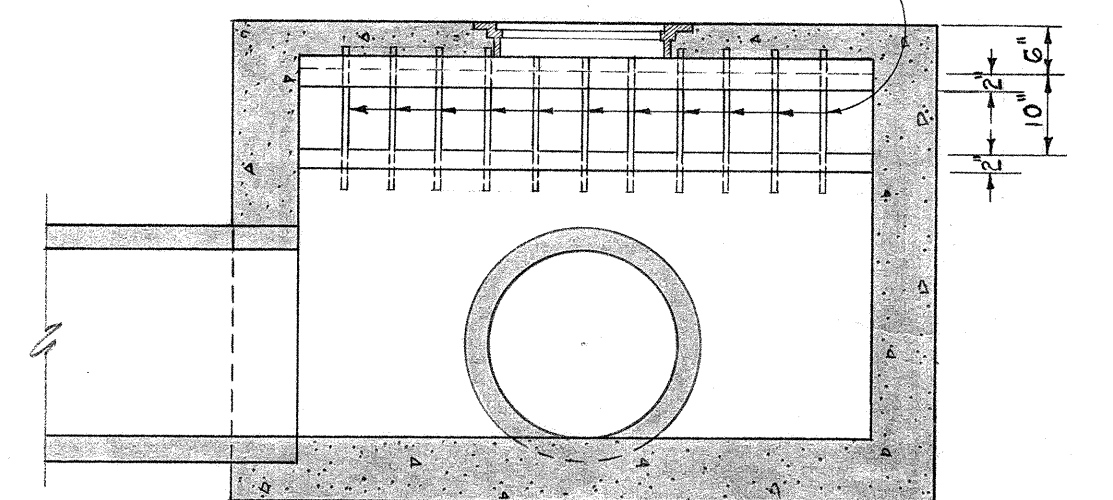


FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-080-1(8)	1963	14	53



NOTE:
Details not noted or shown here shall be the same as required for Standard Type "B" Catch Basin.

11-3/4" w.l. bars, 6" o.c., 1'-6" long, 4" embedment each end, incidental to Class "A-1" concrete.

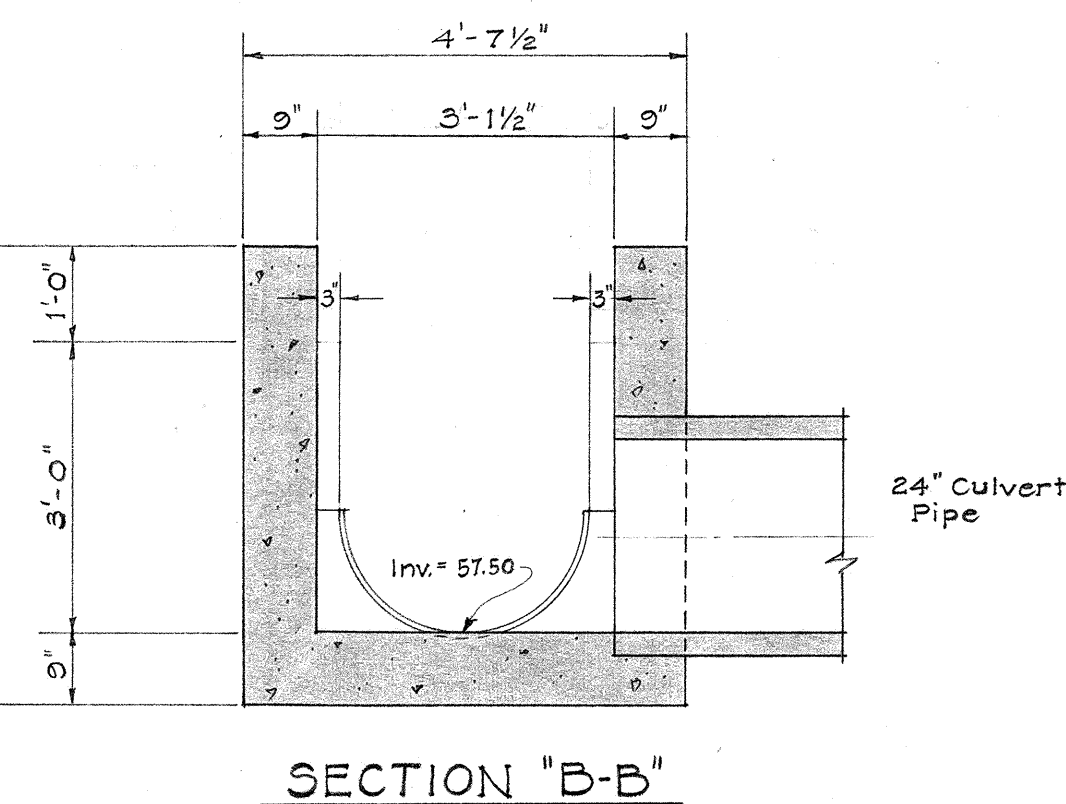
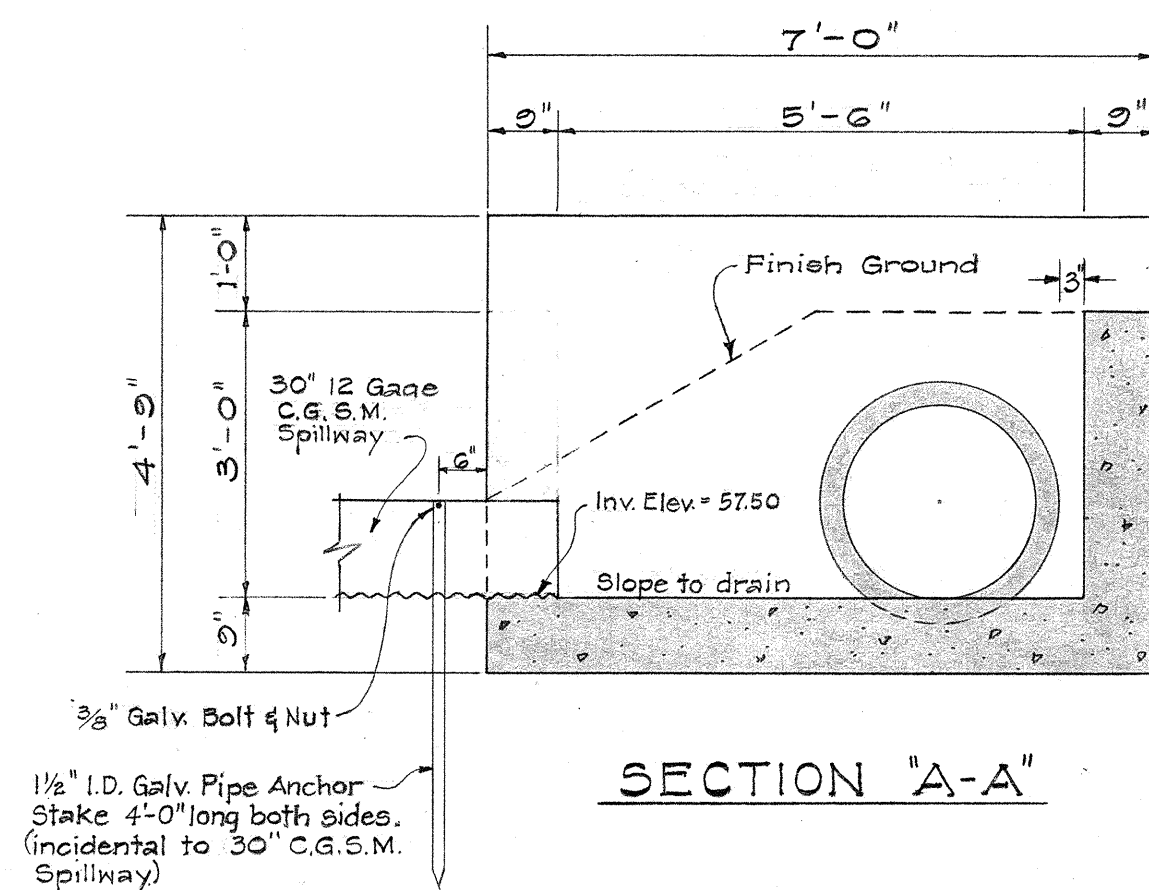


SPECIAL TYPE "B" CATCH BASIN

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

NOTES

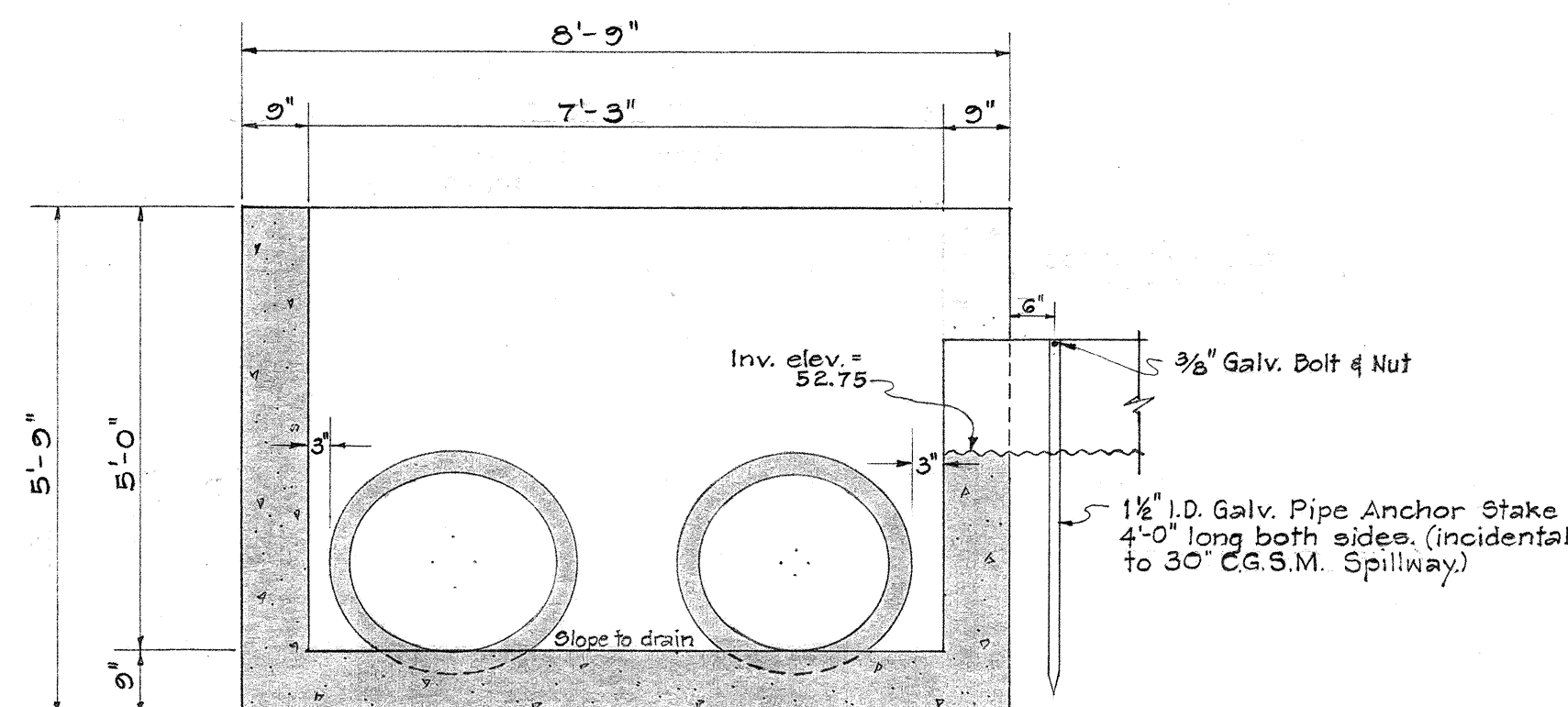
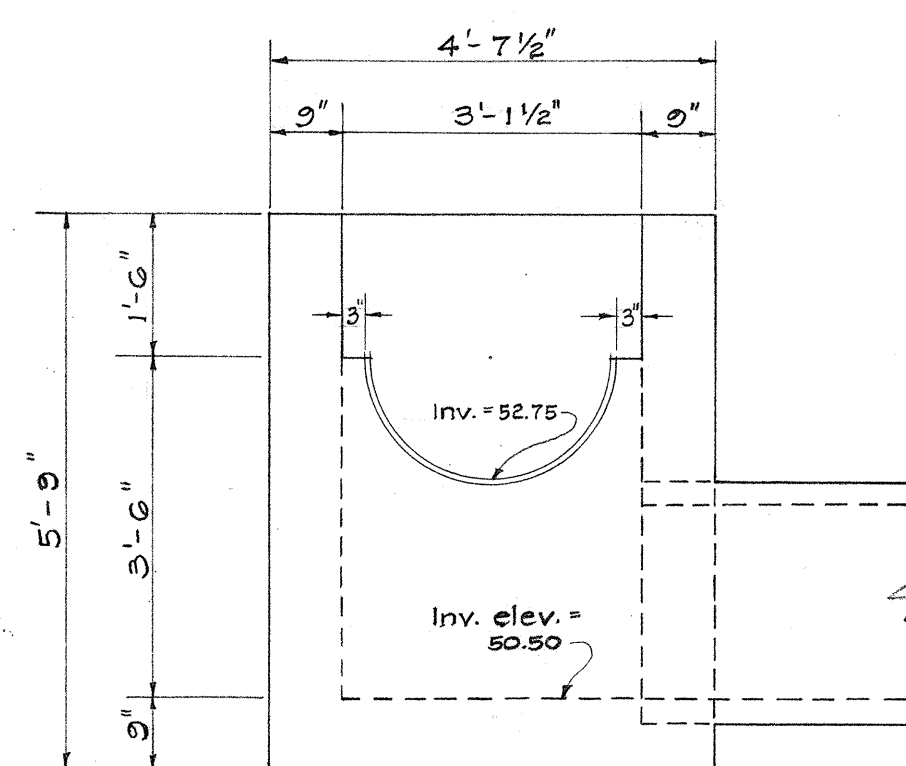
- Details not noted or shown here shall be the same as the G.C.M. Spillway of the Standard Details Sheet No. 20.
- Chamfer all exposed concrete edges one inch.



SPECIAL CONC. DROP INTAKE

STA. 44+65

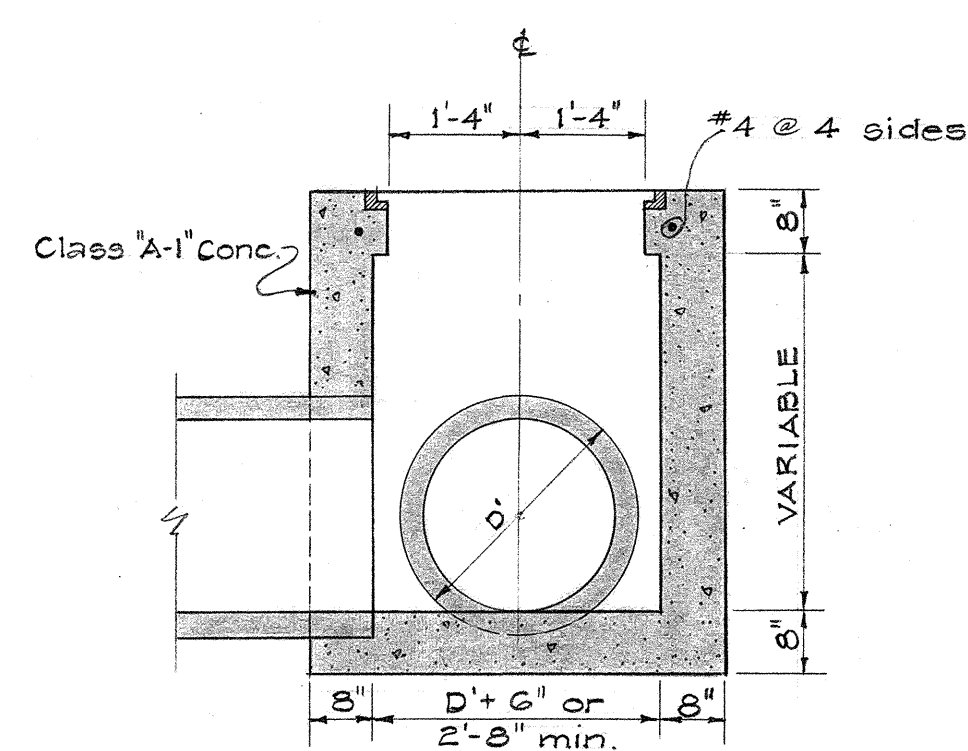
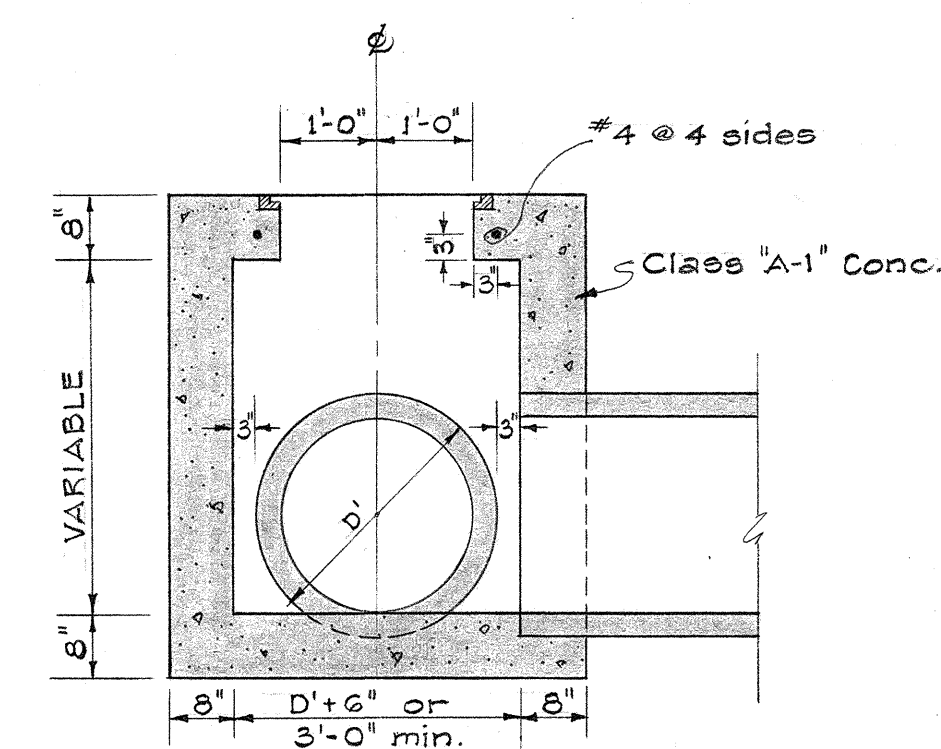
SCALE: 1/2" = 1'-0"



SPECIAL CONC. DROP INTAKE

KUNIA LINE "B" STA. 3+30±

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



TYPICAL GRATED CONC. DROP-INTAKE

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

SPECIAL DRAINAGE DETAILS

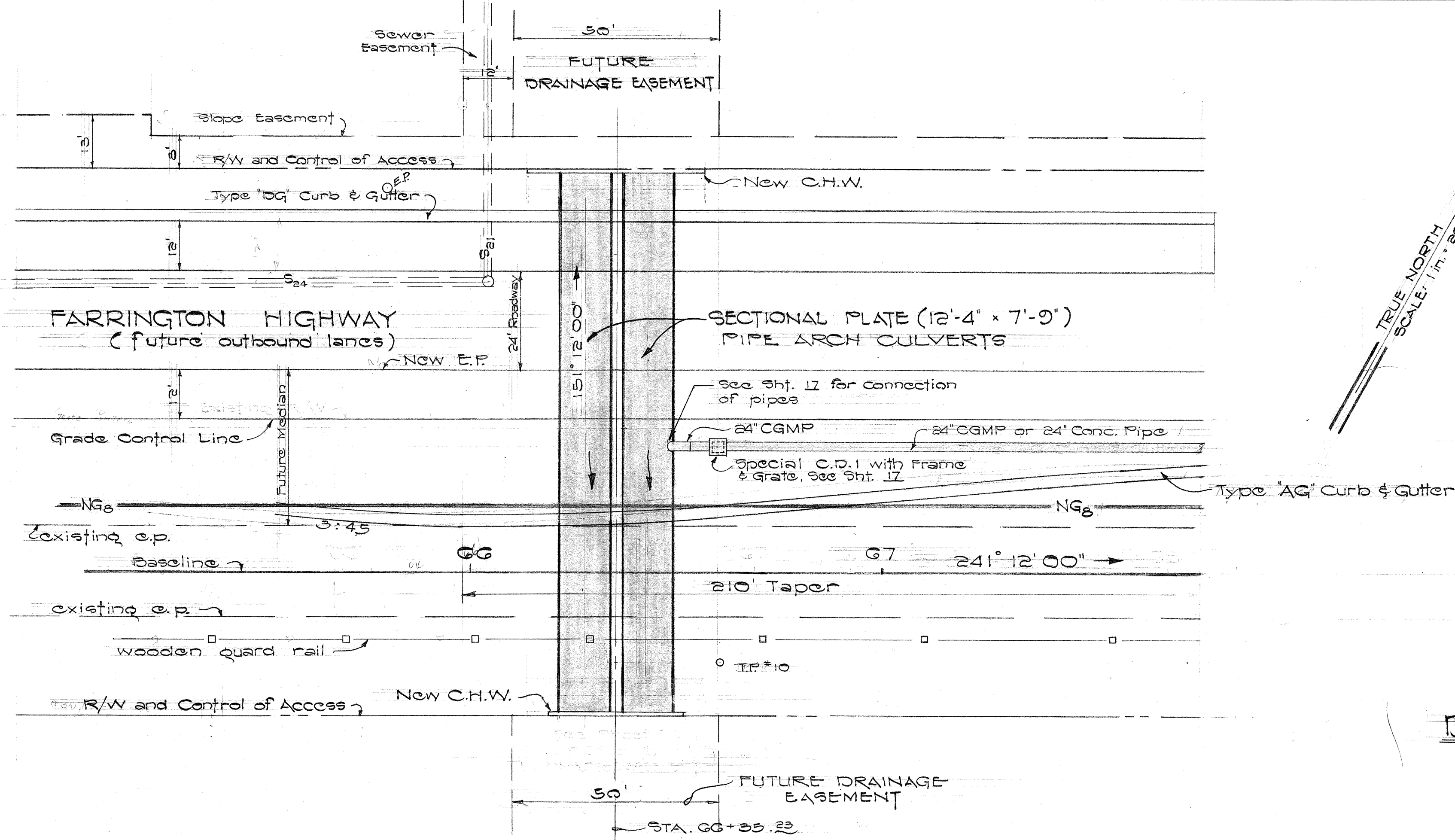
PROJECT No. F-080-1(8)

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

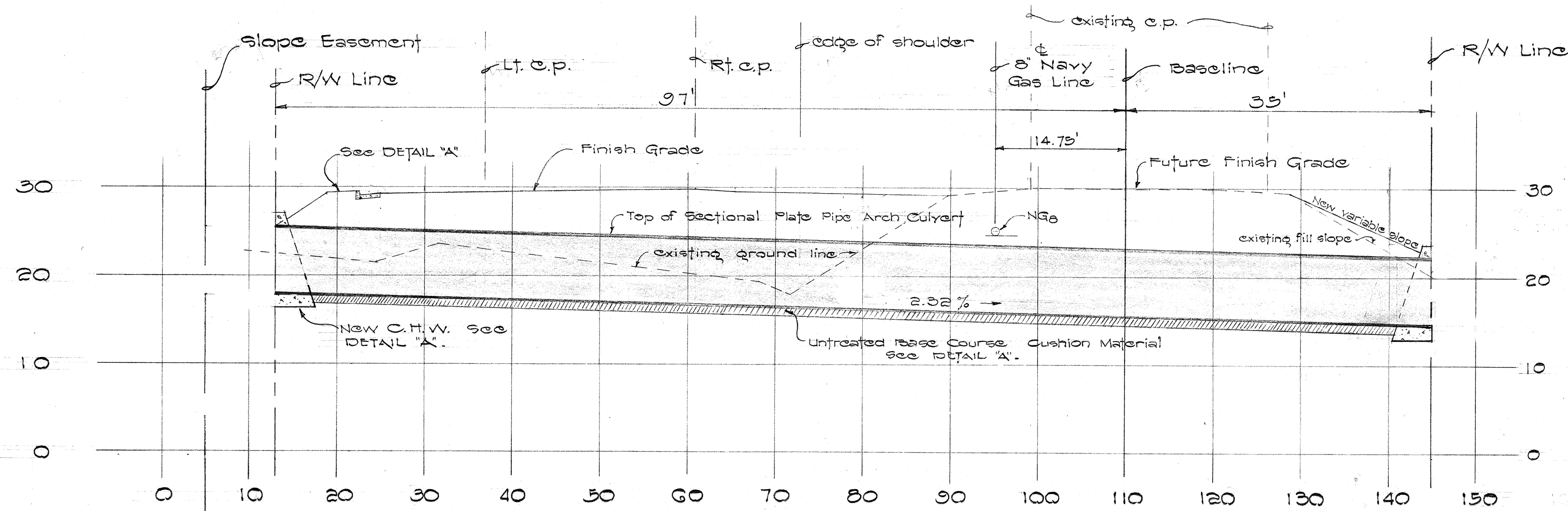
Oct. 1963

SHEET No. 1 OF 2 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-080-1(8)	1963	16	53

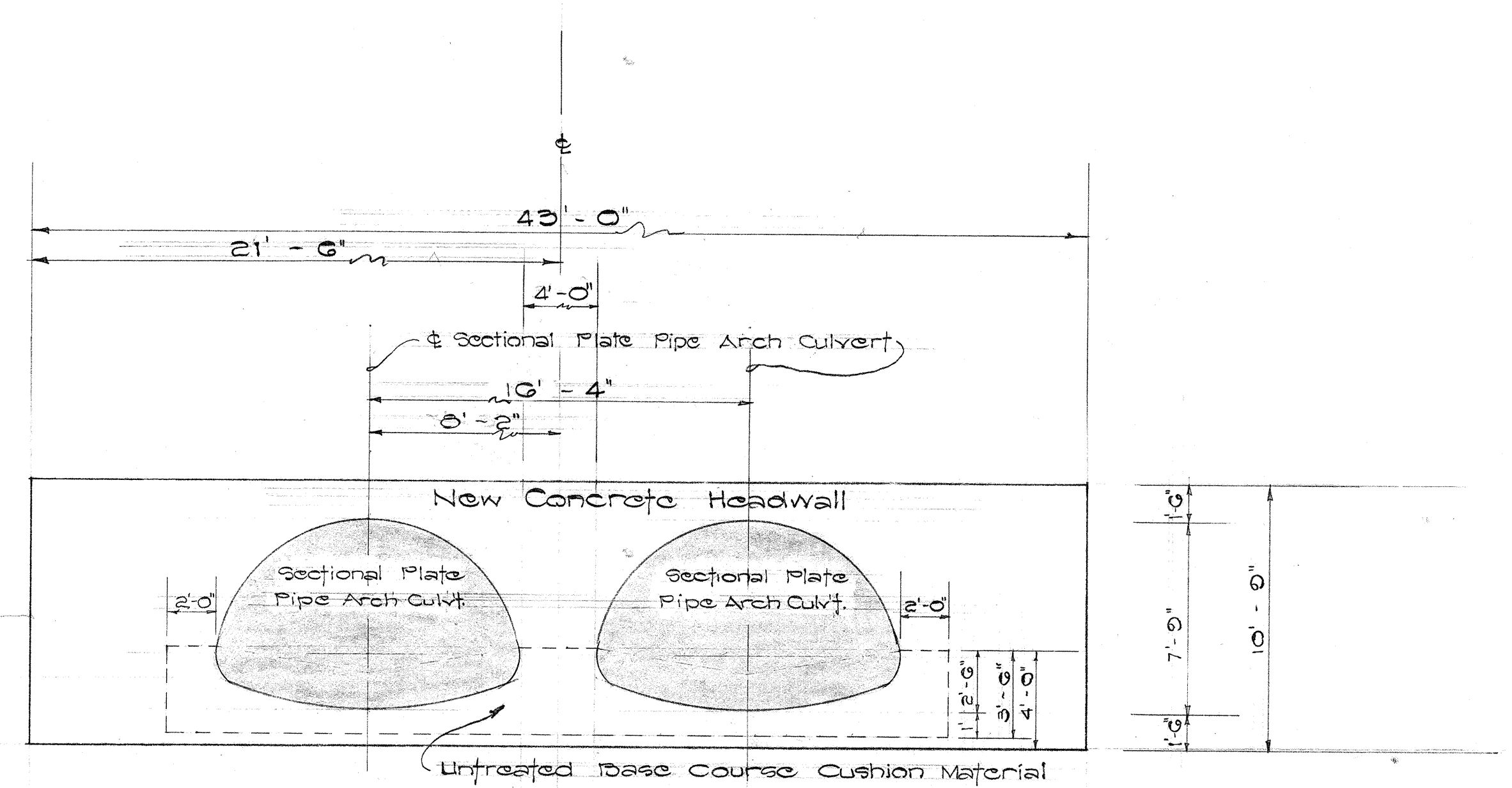


PLAN ~ Scale: 1 in. = 20 ft.



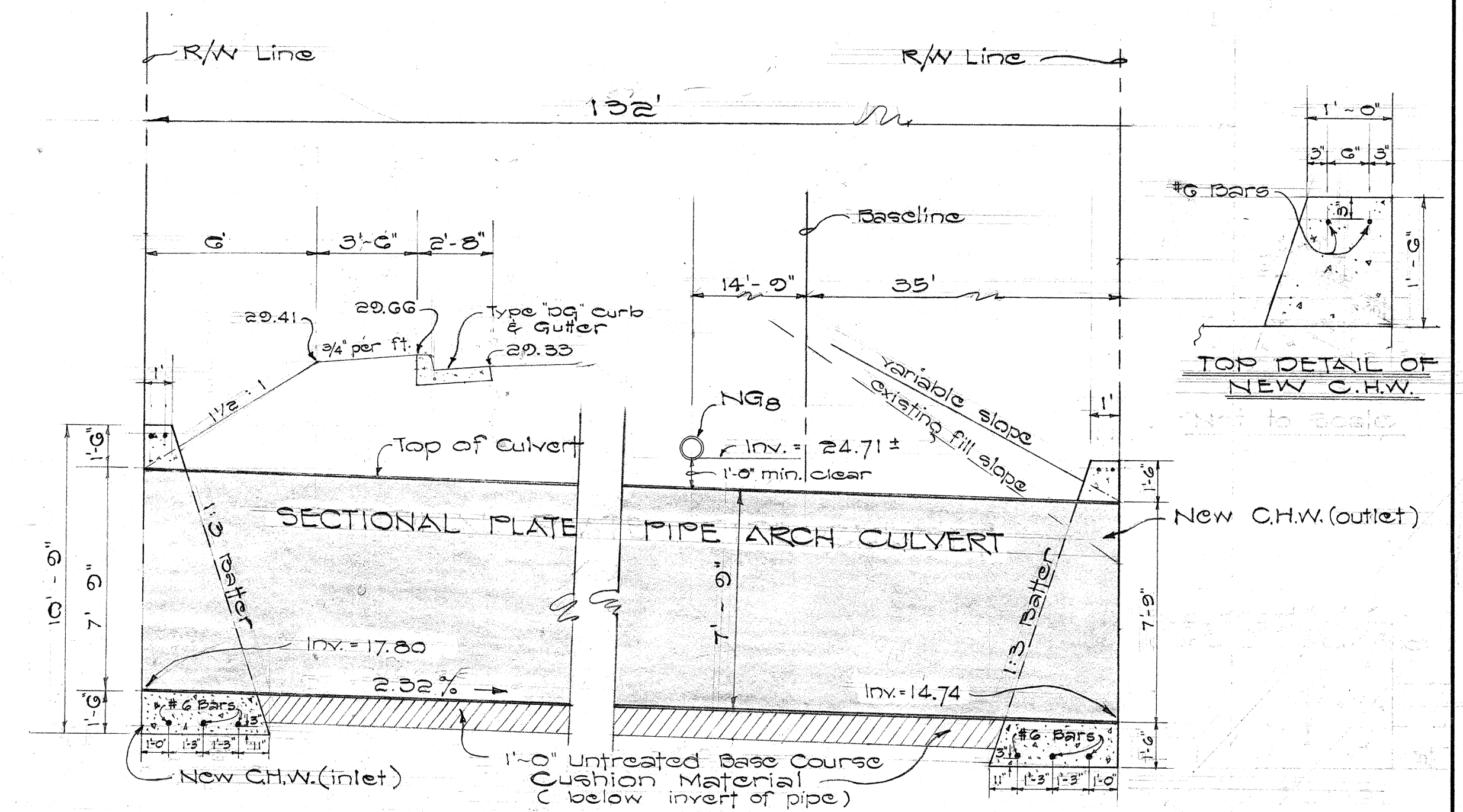
PROFILE OF 12'-4" x 7'-9" SECTIONAL PLATE PIPE ARCH CULVERT & CONCRETE LINED CHANNEL @ STA. GG+35.23

Scale: 1" = 10'-0"



DETAIL OF INLET HEADWALL FOR DOUBLE 12'-4" x 7'-9" SECTIONAL PLATE PIPE ARCH CULVT.

Scale: 1 in. = 5 ft.



DETAIL 'A' ~ Scale: 1/4 in. = 1 ft.

ESTIMATED QUANTITIES

Struc. Exc. for Sect. Plate Pipe Arch Culvt.	1454
Ditch and Channel Exc.	125.5 + 126 c.y.
Untreated Base Course Cushion Material	776.692 Ton
Class 'A-1' Conc. for Headwalls	55 c.y.
12'-4" x 7'-9" Sect. Plate Pipe Arch Culvt.	264 L.F.

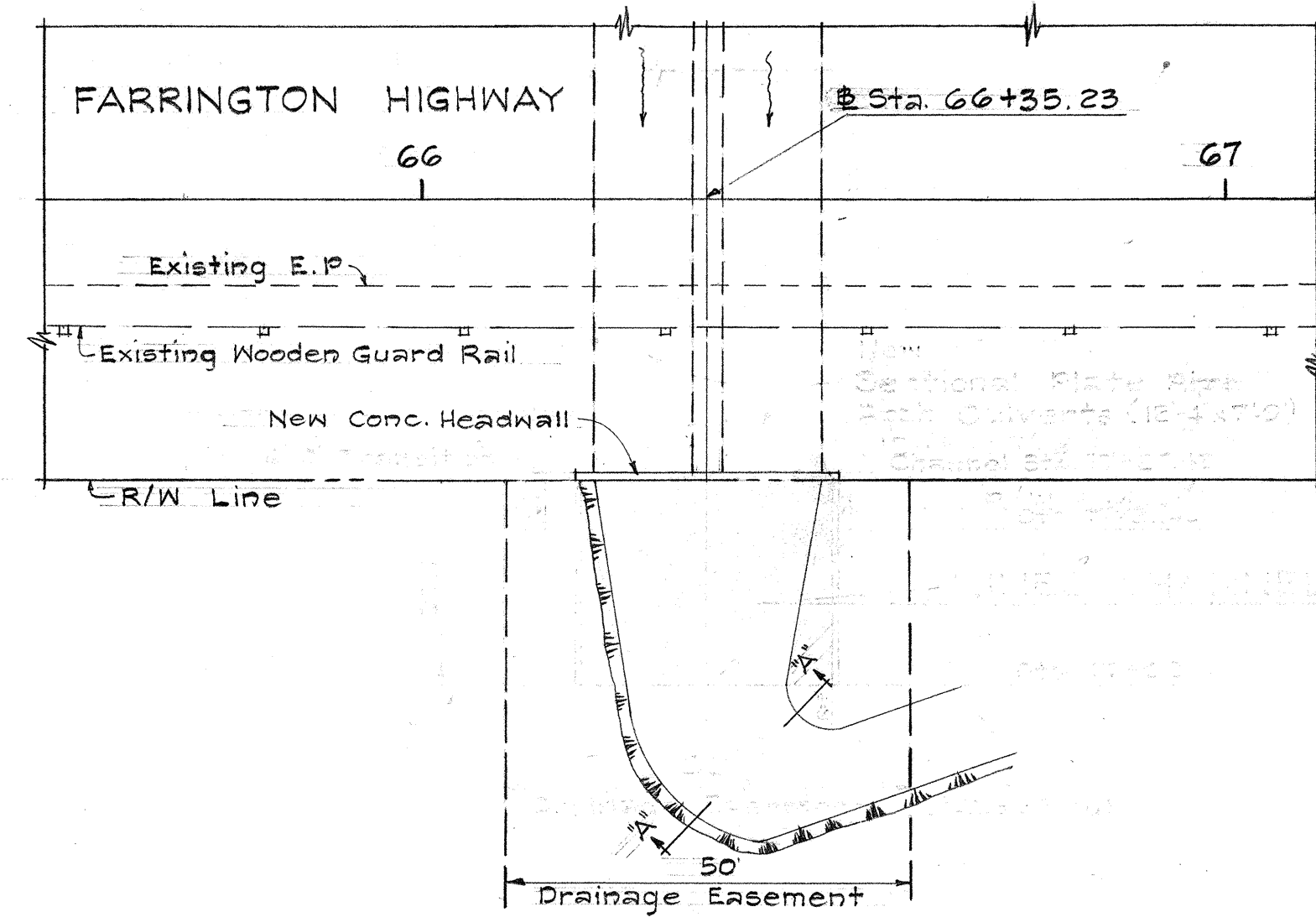
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DETAILS OF DOUBLE 12'-4" x 7'-9"
SECTIONAL PLATE PIPE ARCH
CULVERT & INLET HEADWALL
@ STA. GG+35.23

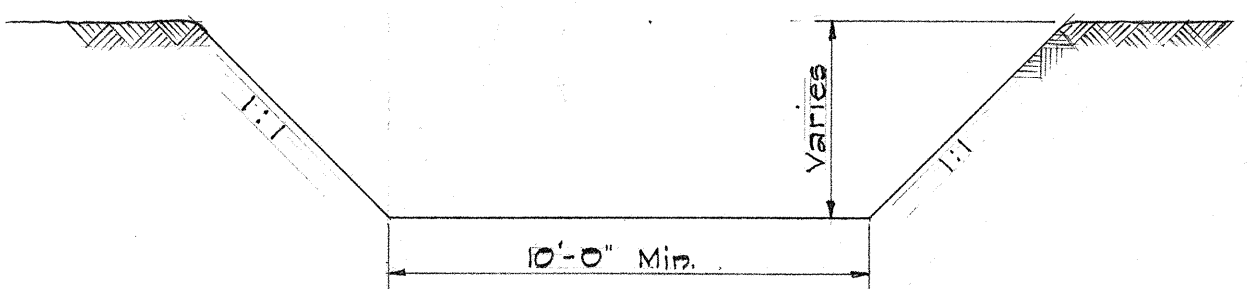
FARRINGTON HWY. F-080-1(8)
Scale: As Noted Nov. 1963

SHEET No. 3 OF 2 SHEETS

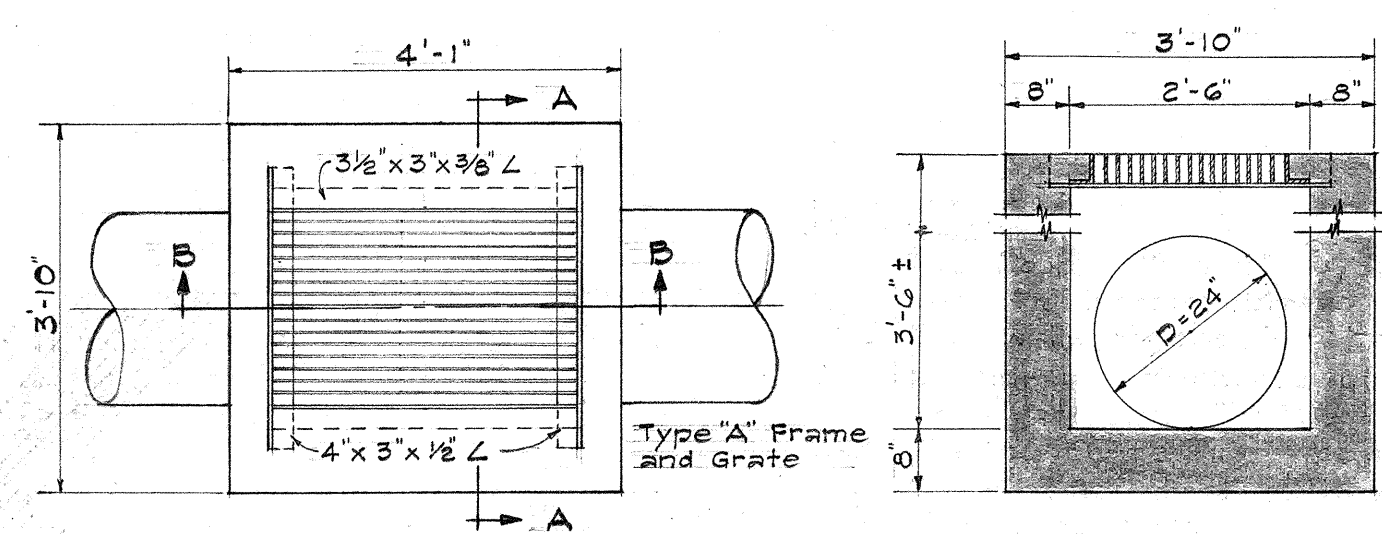
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-090-1(8)	1963	17	53



PLAN
Scale: 1" = 20'

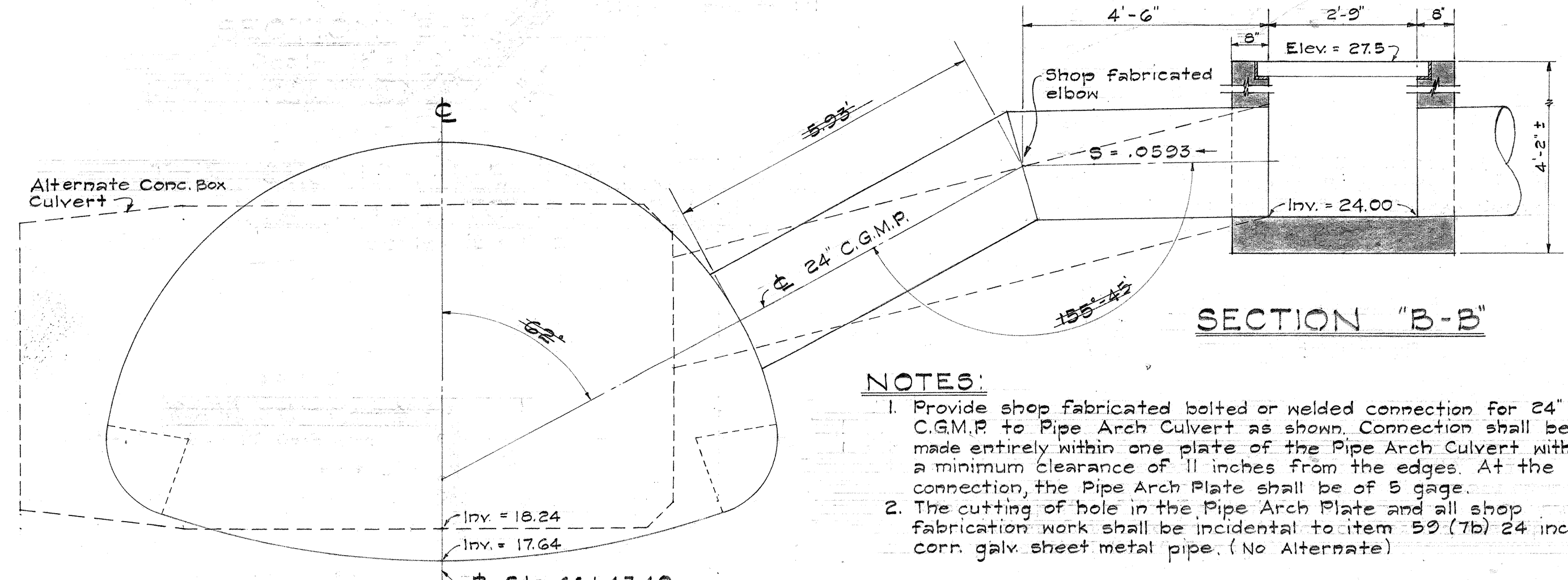


TYPICAL SECTION "A-A"
PLAIN DITCH
Scale: 1/4" = 1'-0"



PLAN
SECTION "A-A"
SPECIAL C.D.I. #9 AT STA. 66+60
Scale: 1" = 20'-0"
Scale: 1/2" = 1'-0"

- NOTES:**
1. The Double 12'-4" x 7'-9" Sectional Plate Pipe Arch Culvert shall be of 7 gage with the bottom plates at a minimum thickness of 5 gage.
 2. Reinforcing steel in headwalls shall be incidental to construction of the headwalls.
 3. Drainage structure of Special C.D.I. #9 (with Type "A" Frame & Grate) shall be Class "A-1" Concrete.
 4. Reinforcing steel in headwalls shall be incidental to construction of the headwalls.
 5. Drainage structure of Special C.D.I. #9 (with Type "A" Frame & Grate) shall be Class "A-1" Concrete.



- NOTES:**
1. Provide shop fabricated bolted or welded connection for 24" C.G.M.P. to Pipe Arch Culvert as shown. Connection shall be made entirely within one plate of the Pipe Arch Culvert with a minimum clearance of 11 inches from the edges. At the connection, the Pipe Arch Plate shall be of 5 gage.
 2. The cutting of hole in the Pipe Arch Plate and all shop fabrication work shall be incidental to item 50 (7b) 24 inch corr. galv. sheet metal pipe. (No Alternate)

C.D.I. CONNECTION TO SECTIONAL PLATE PIPE ARCH CULVERT
Scale: 1/2" = 1'-0"

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS

STA. 66+35.23

FARRINGTON HWY. F-090-1(8)
Scale As Noted Nov. 1963

SHEET No. 4 OF 2 SHEETS

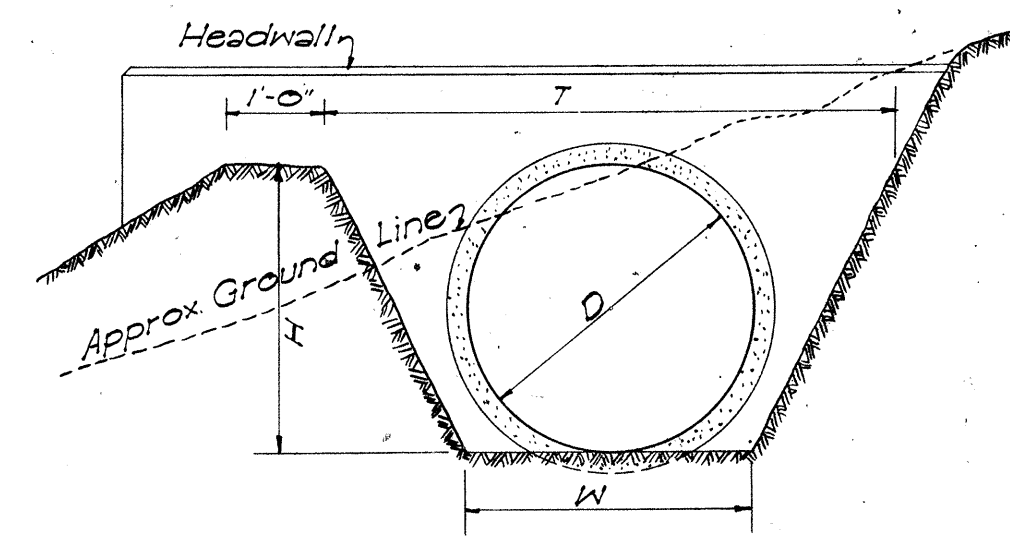
SURVEY PLOTTED BY	DATE
DESIGNED BY	"
CHECKED BY	"
NOTE BOOK	"
QUANTITIES BY	"
CHECKED BY	"

2/17/57

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW	F-090-1(6)	1953	18	53

AUG. 1957

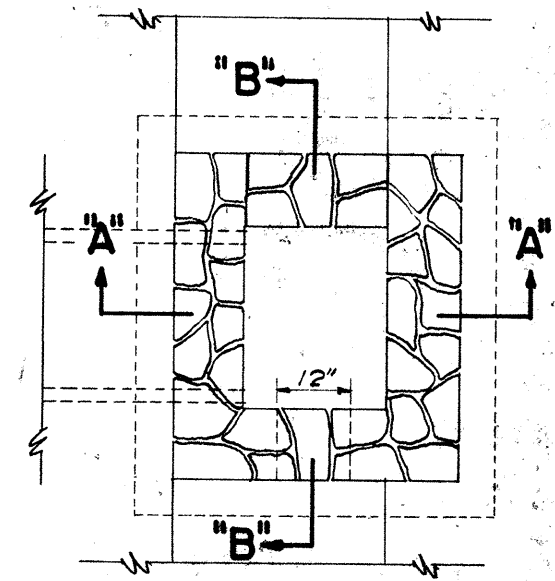
D	W	H	T-W+H
18"	24"	2'-0"	4'-0"
24"	30"	2'-0"	4'-6"
30"	30"	2'-6"	5'-0"
36"	36"	3'-0"	6'-0"



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

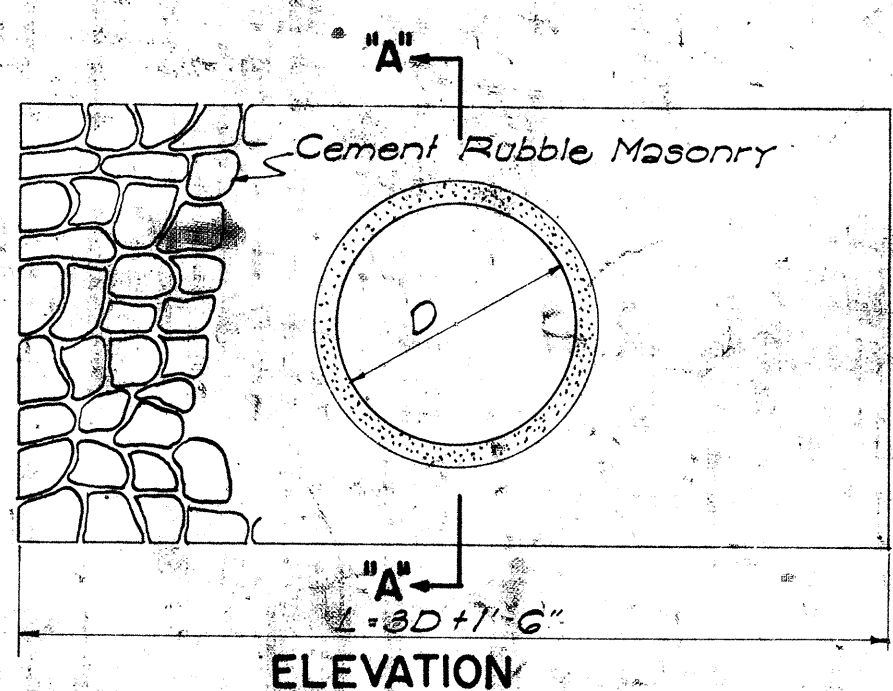
D	D	L-D+G	Cu Yds	Where Variables Equal
23"	18"	2'-5"	3.02	4'-6"
30"	24"	3'-0"	3.61	5'-0"
37"	30"	3'-7"	4.21	5'-6"
44"	36"	4'-2"	4.85	6'-0"

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

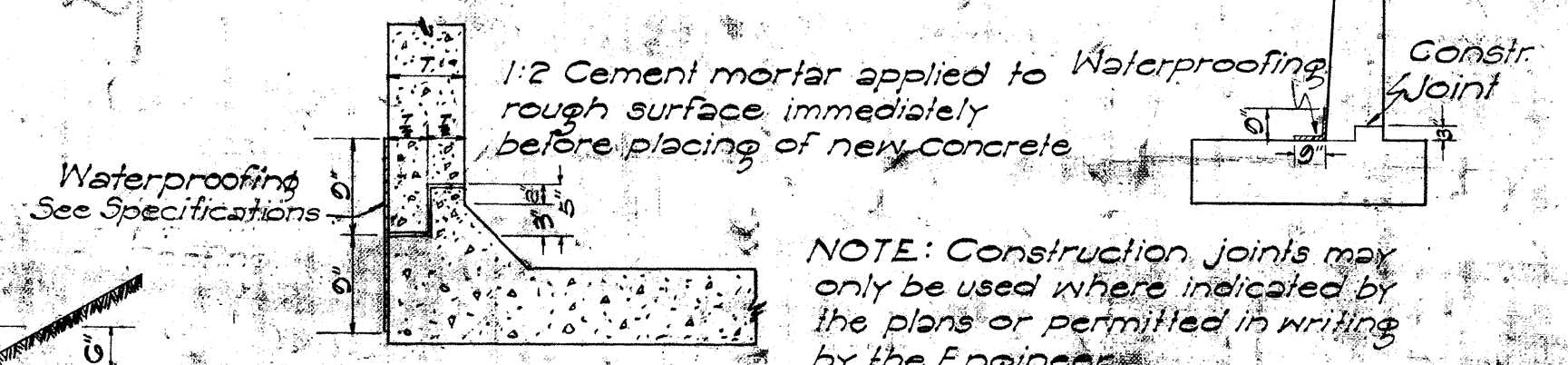


DETAIL OF MASONRY DROP INTAKE
Scale: 3/8" = 1'-0"

D	H	B	L	Cast-in-Place Conc. Culvert Cu. Yds.	Conc. Pipe Culvert Cu. Yds.	Corrugated Pipe Culvert Cu. Yds.
18"	3'-6"	1'-0"	6'-0"	0.85	0.05	0.03
24"	4'-0"	2'-0"	7'-6"	1.28	1.42	1.41
30"	4'-6"	2'-3"	9'-0"	1.83	2.06	2.00
36"	5'-0"	2'-6"	10'-6"	2.40	2.84	2.72

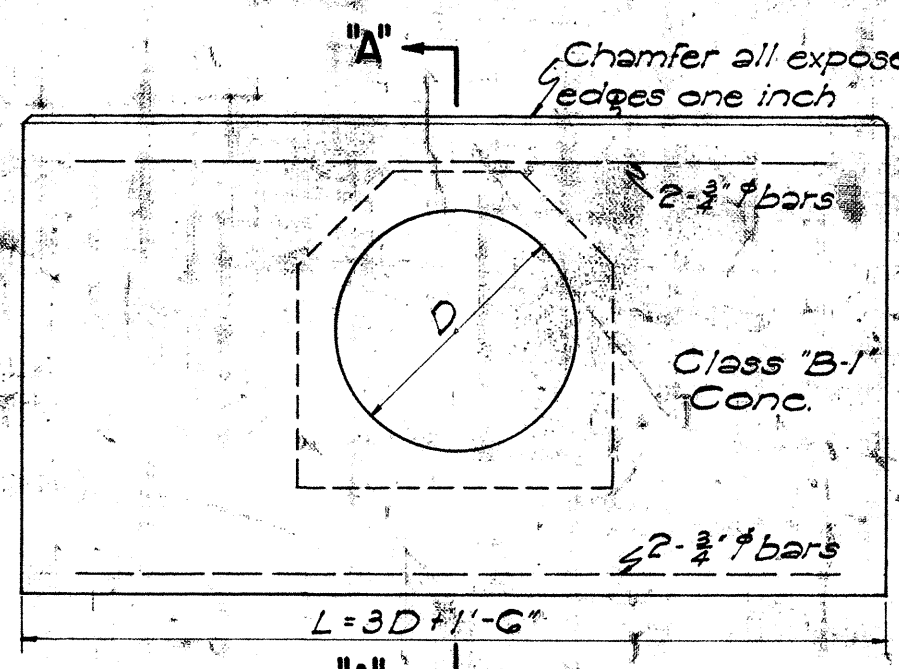


DETAIL OF MASONRY HEADWALL
Scale: 1/2" = 1'-0"



CONSTR. JOINT DETAILS

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



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

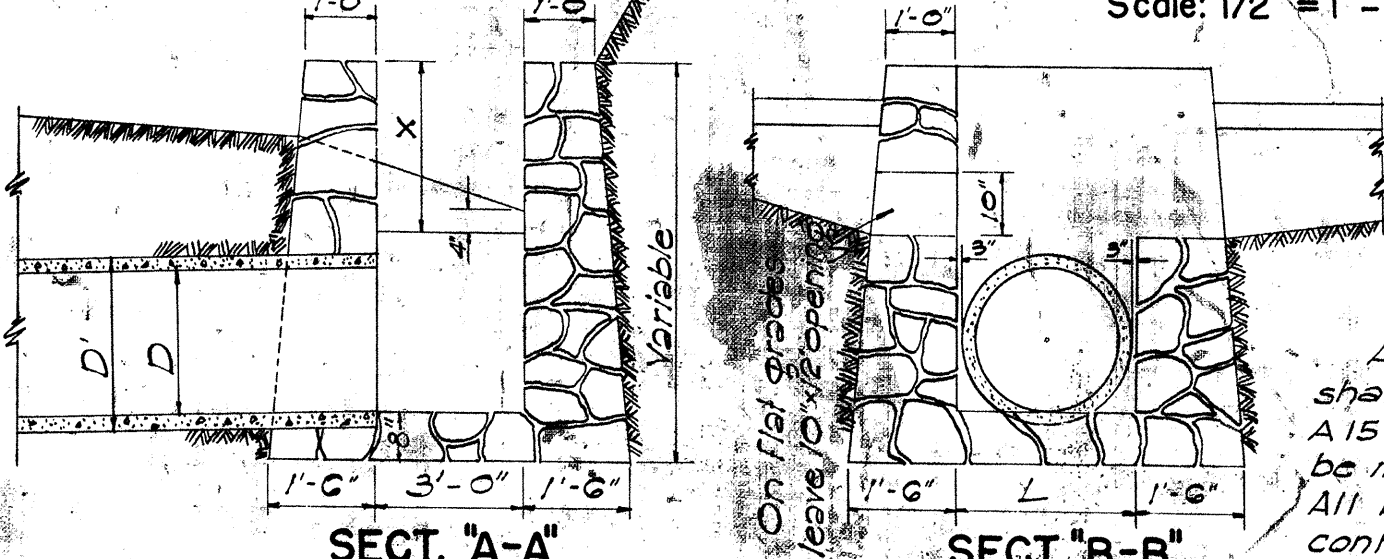
D	d	W	Cu Yds per Ft.
18"	4"	2'-2"	0.11
24"	4 1/2"	2'-0"	0.14
30"	5"	3'-4"	0.19
36"	5 1/2"	3'-11"	0.26

CAST-IN-PLACE CONC. CULVERT

D	B	L	H	Cast-in-Place Conc. Culvert Cu. Yds.	Conc. Pipe Culvert Cu. Yds.	Steel For One Headwall
18"	1'-6"	6'-0"	4'-0"	0.02	1.00	4
24"	1'-6"	7'-6"	4'-0"	1.23	1.33	4
30"	2'-0"	10'-0"	5'-0"	1.05	2.17	4
36"	2'-0"	12'-0"	5'-0"	2.43	2.74	4
42"	2'-6"	12'-0"	6'-0"		3.87	4
48"	2'-6"	13'-6"	6'-0"		4.66	4

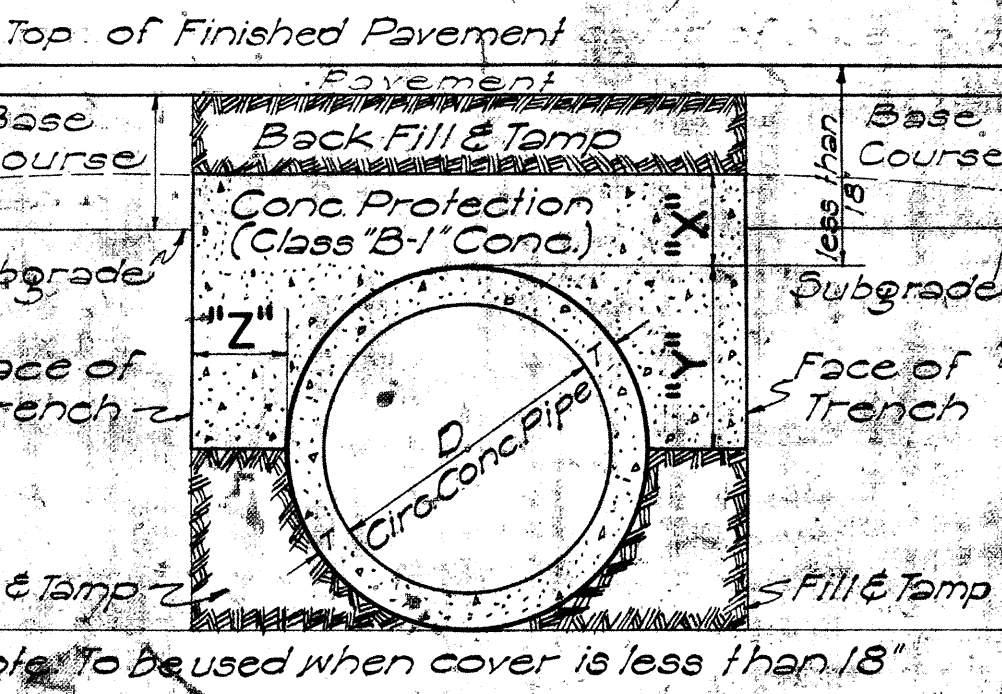
DETAIL OF CONCRETE HEADWALL
Scale: 1/2" = 1'-0"

SECTION "A-A" CONC. COLLAR FOR CONC. BOX CULVERT
Scale: 1/2" = 1'-0"



REINFORCING BARS
All reinforcing bars for concrete shall be Billet Steel bars, ASTM A15, intermediate grade. Steel shall be made by the open-hearth process. All bars shall be deformed type conforming to ASTM A-305.

SECTION OF HIGH CEMENT RUBBLE MASONRY RETAINING WALL OR SEAWALL



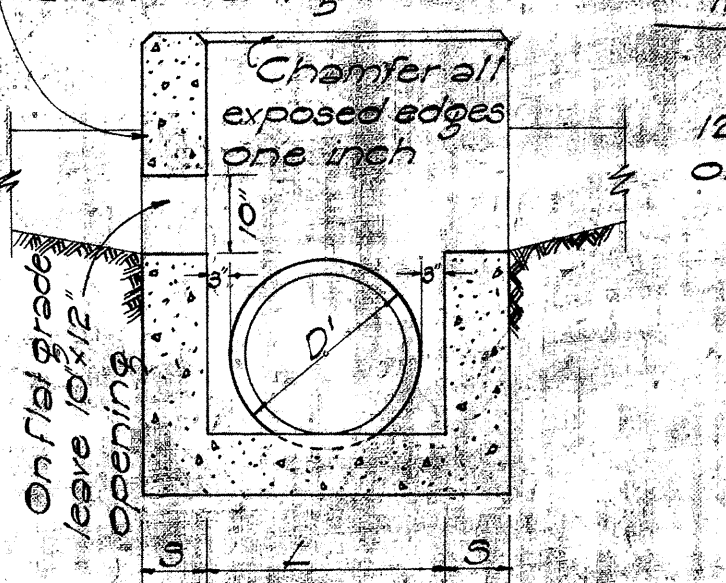
X	Y	Z
6" for 18" D		Z must be from pipe to face of trench
7" " 24" D		
8" " 30" D		
9" " 36" D		
10" " 42" D		
11" " 48" D		
12" " 54" D		

SECT. OF CULVERT WITH CONC. PROTECTION
Scale: 1/2" = 1'-0"

SECTION OF LOW MASONRY RETAINING WALL OR SEAWALL

D	D	L-D+G	Cu Yds	Where Variables Equal
23"	18"	2'-5"	1.41	4'-6"
30"	24"	3'-0"	1.72	5'-0"
37"	30"	3'-7"	2.32	5'-6"
44"	36"	4'-2"	2.73	6'-0"
51"	42"	4'-9"	3.54	6'-6"
58"	48"	5'-4"	4.01	7'-0"

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

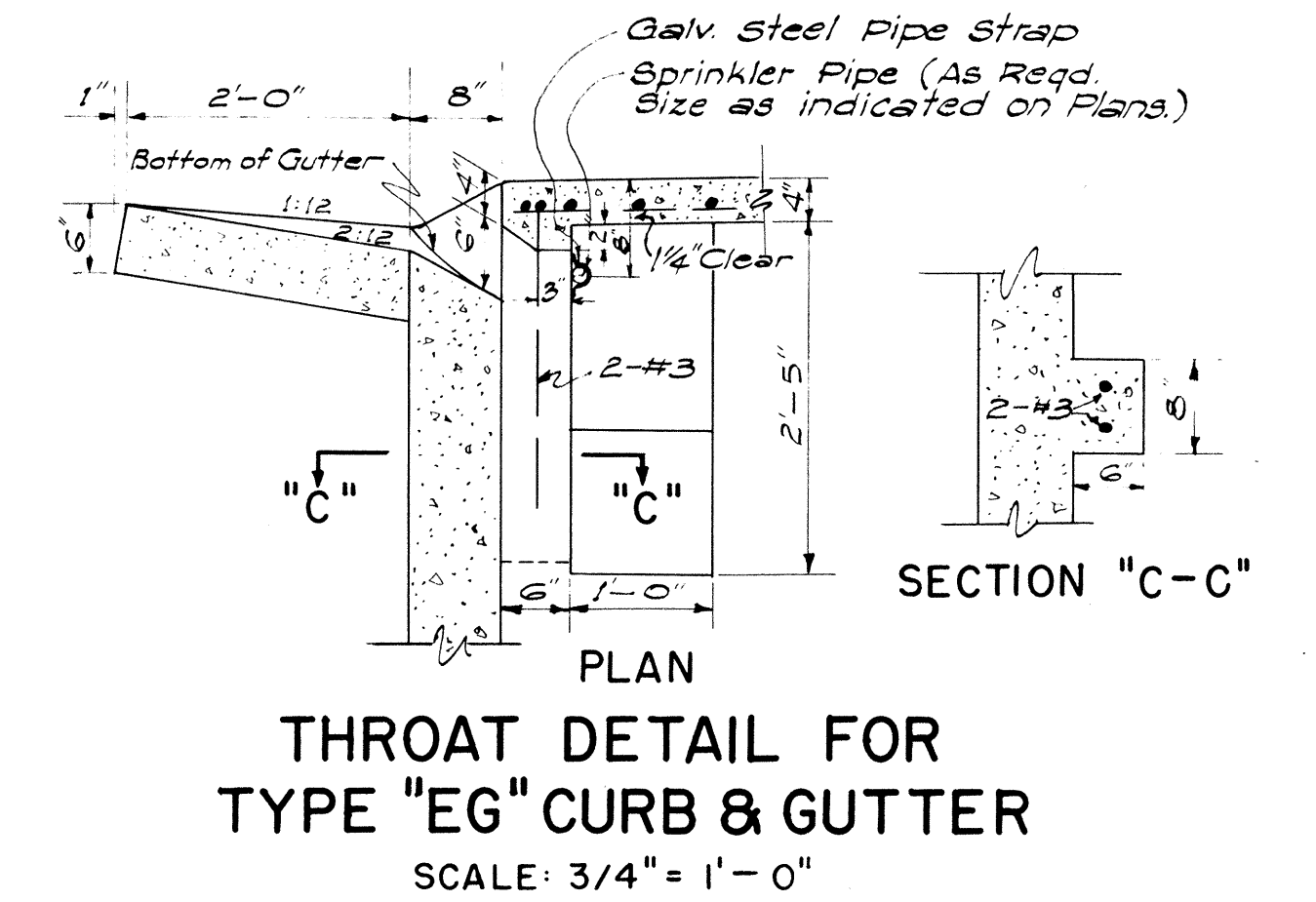
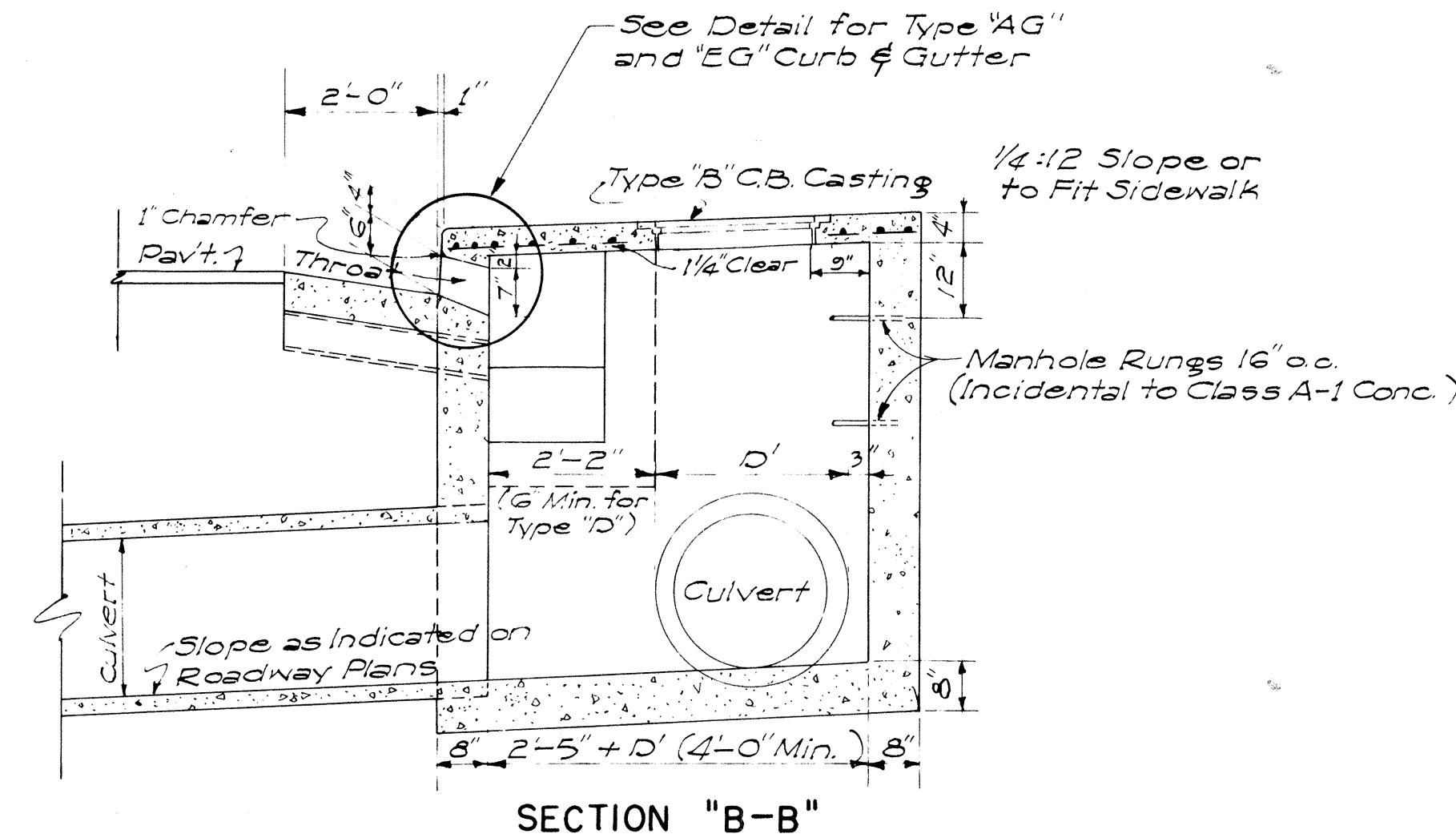
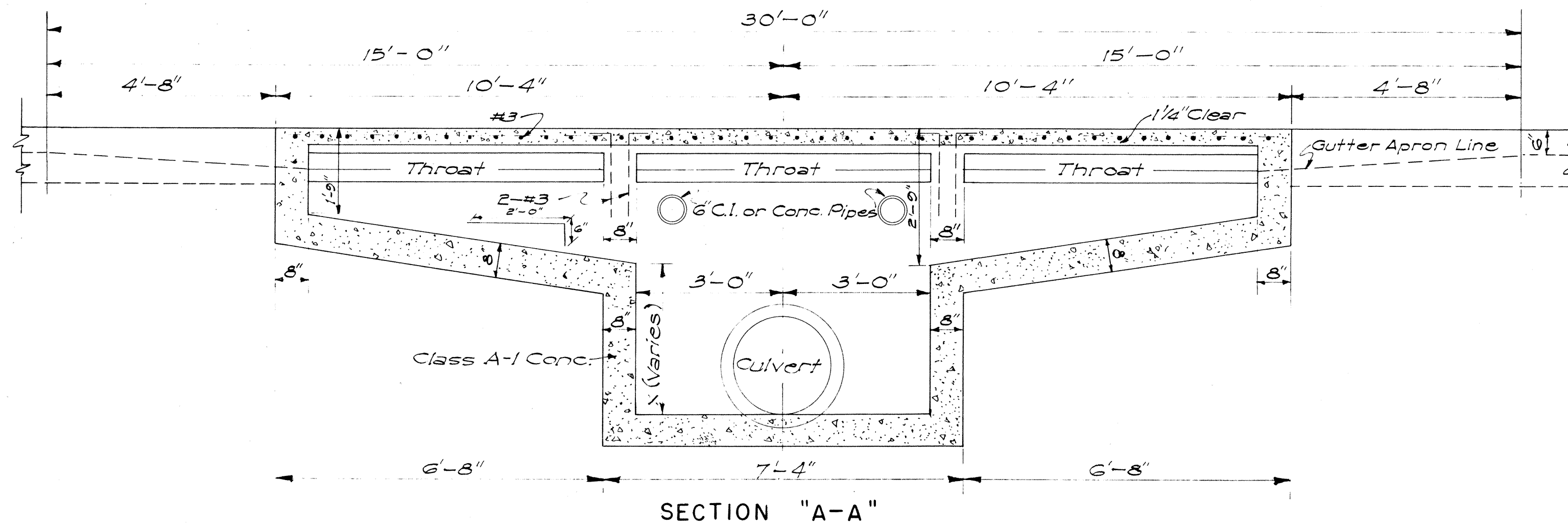


DETAIL OF CONCRETE DROP INTAKE
Scale: 1/2" = 1'-0"

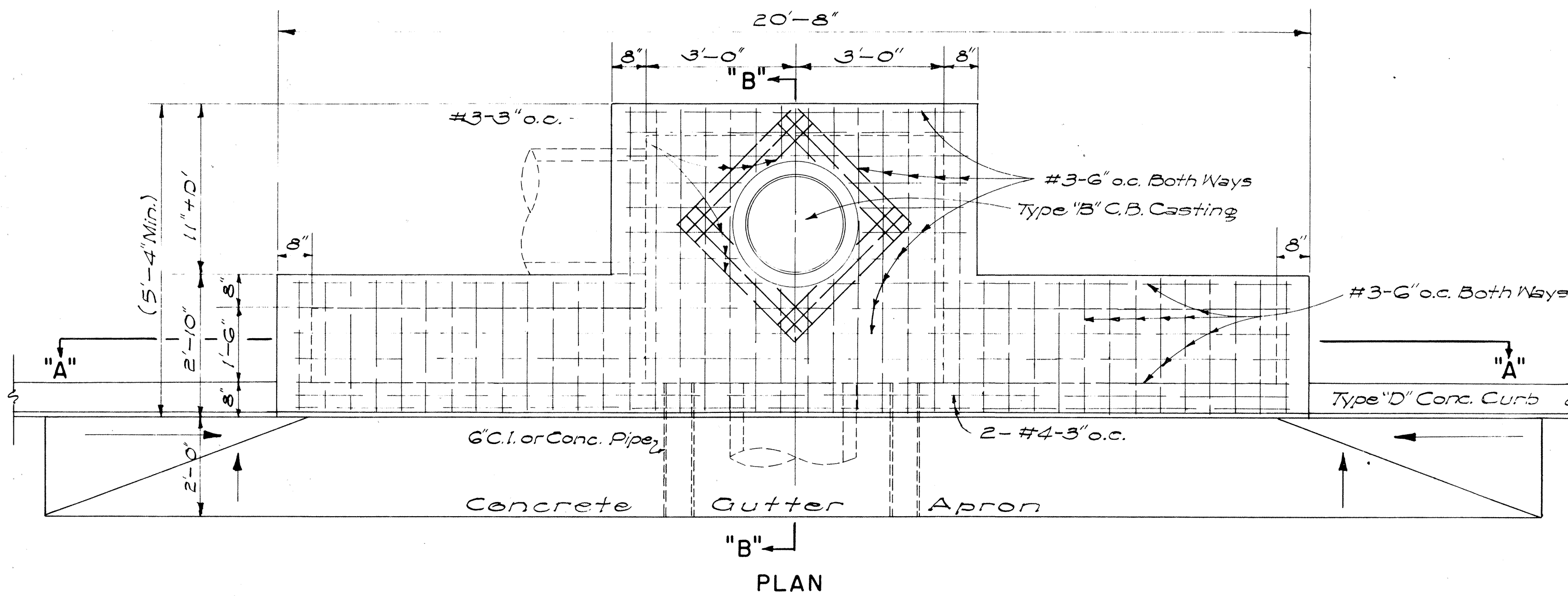
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
STATE OF HAWAII
STANDARD DETAILS
DROP INTAKES, RETAINING WALLS,
HEADWALLS, CONSTRUCTION JOINTS
SCALES AS NOTED

2/17/59

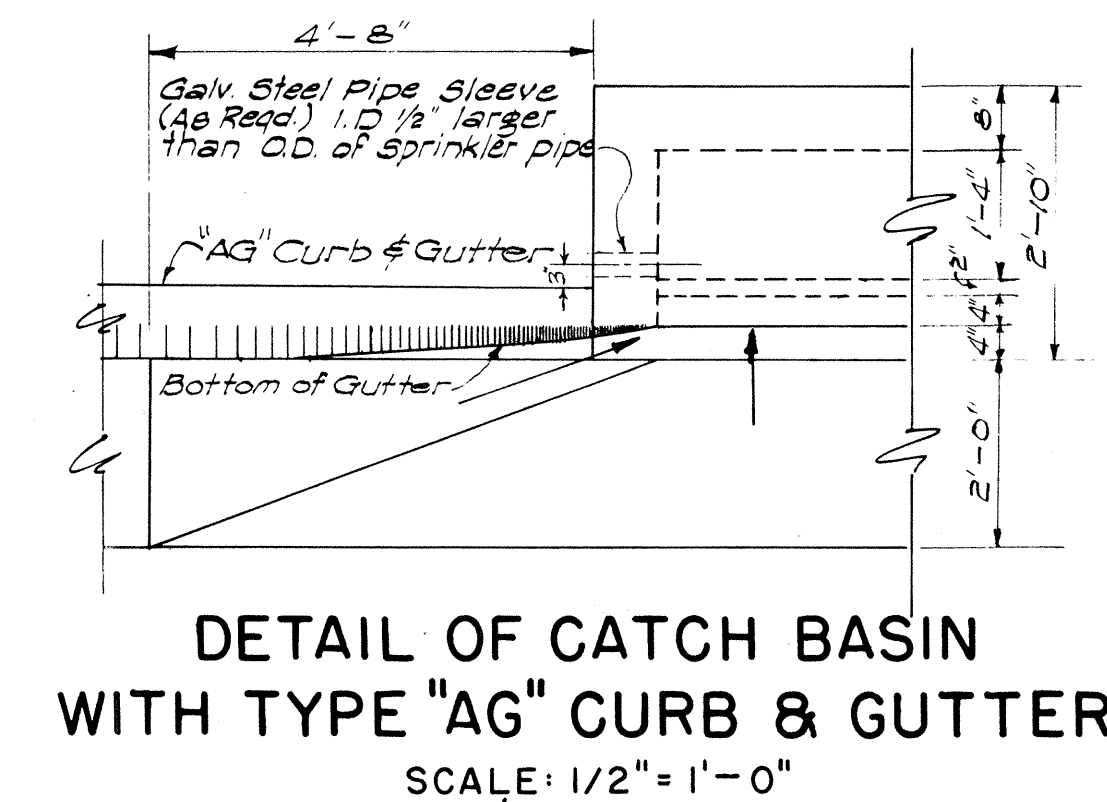
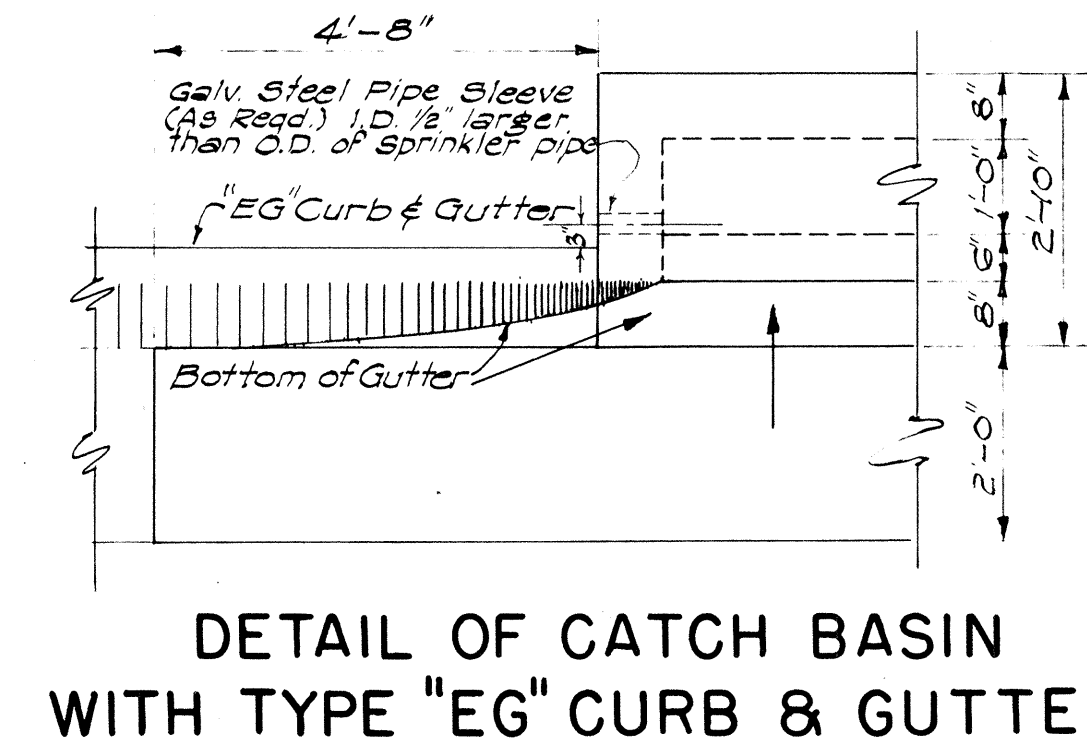
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW	F-090-1(8)	1959	19	53



THROAT DETAIL FOR
TYPE "EG" CURB & GUTTER
SCALE: 3/4" = 1'-0"



DETAIL OF TYPE "A" CATCH BASIN
SCALE: 1/2" = 1'-0"



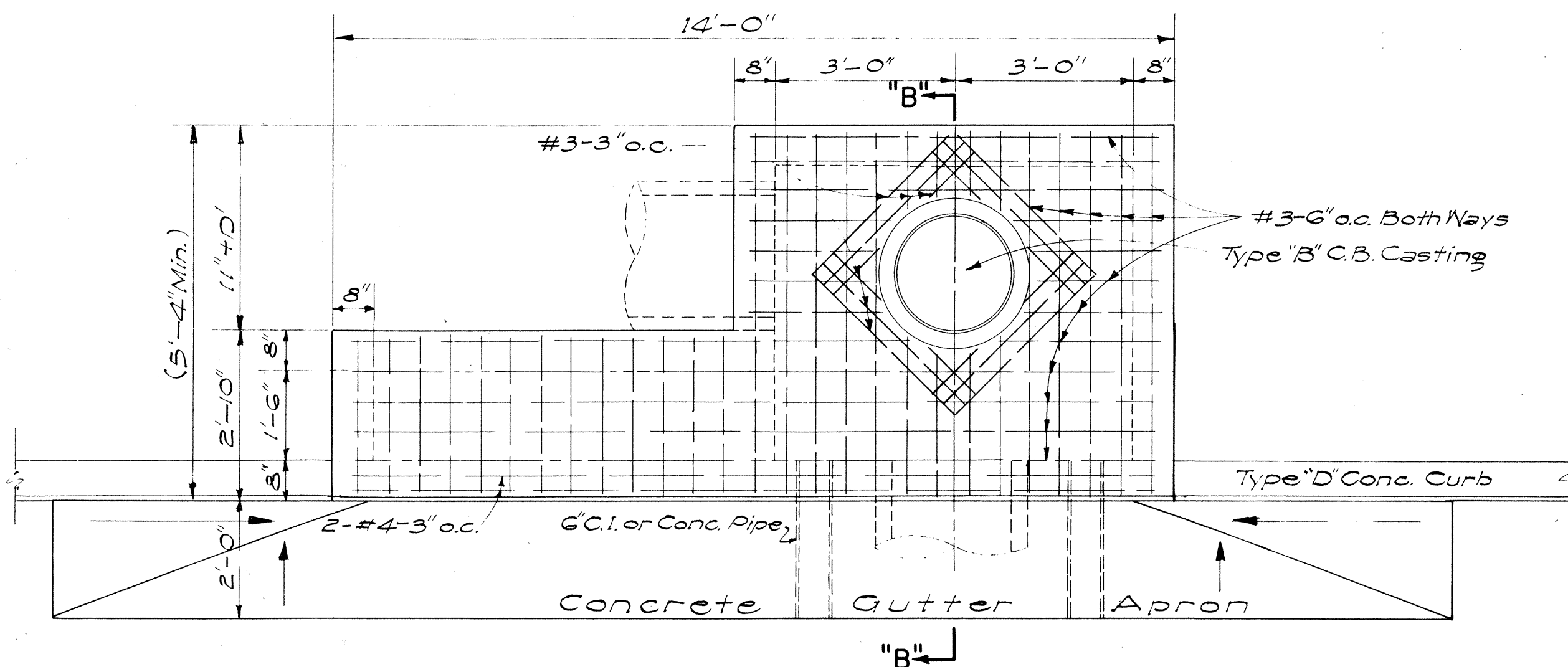
DETAIL OF CATCH BASIN
WITH TYPE "AG" CURB & GUTTER
SCALE: 1/2" = 1'-0"

ESTIMATED QUANTITIES

Type	Class A-1 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"

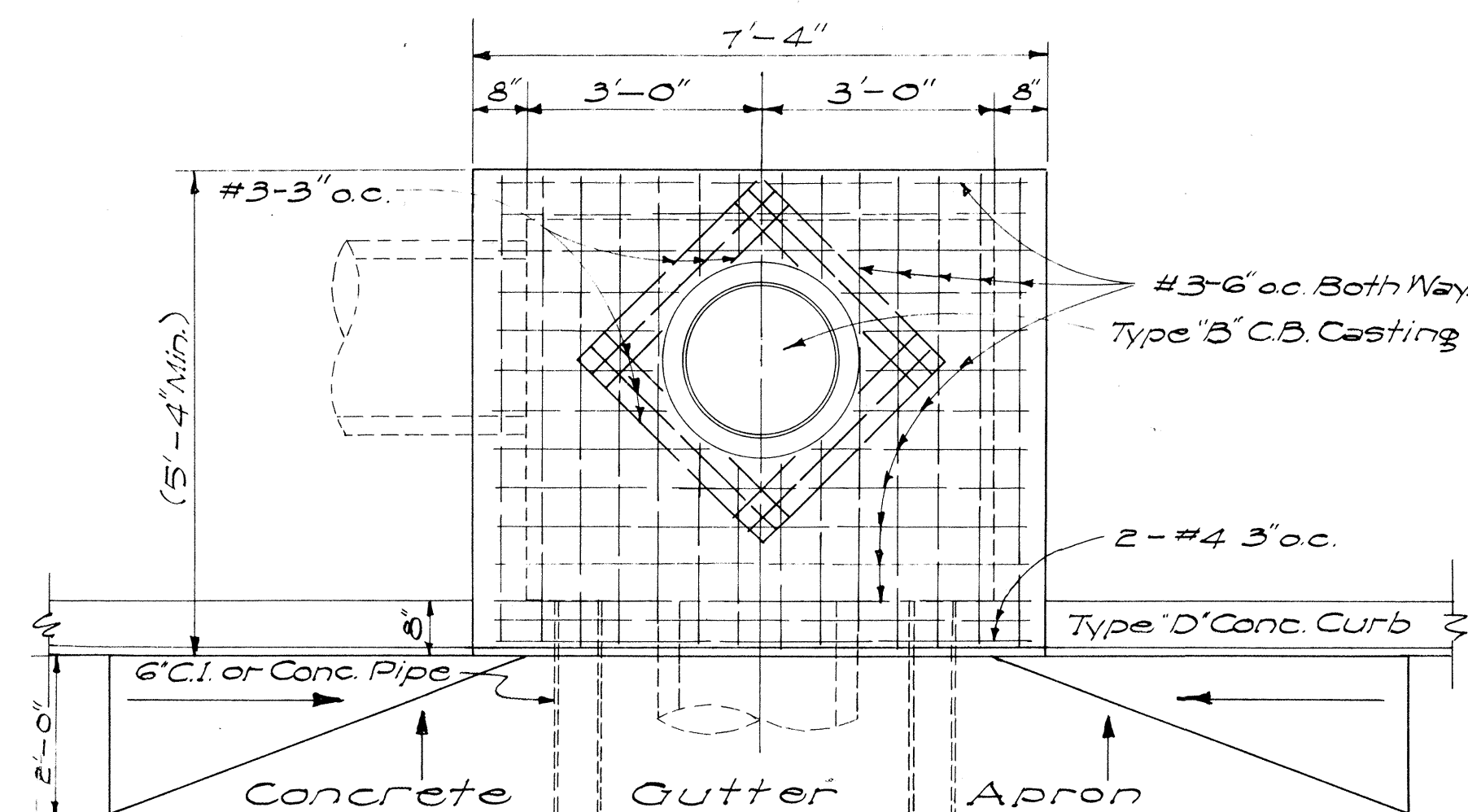
NOTES:

- Quantities based on X=3'-0" and D'=30'.
- Quantities do not include concrete for Gutter Apron.
- The Contractor shall install 2'-6" Cast Iron or Concrete Pipes as incidental to Class A-1 Concrete for Construction Drainage.
- Culvert shall leave C.B. from any position and any direction indicated by plans or ordered by the Engineer. Culvert may both enter and leave C.B. so that C.B. will also act as Manhole.
- The Contractor shall install Galvanized Steel Pipe Sleeves and Straps as incidental to Sprinkler System.

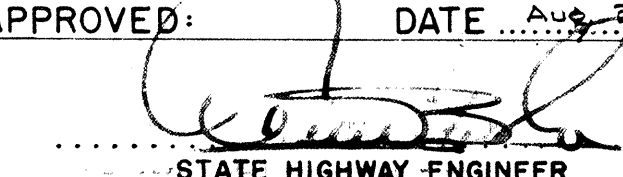


DETAIL OF TYPE "B" CATCH BASIN
SCALE: 1/2" = 1'-0"

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



DETAIL OF TYPE "D" CATCH BASIN
SCALE: 1/2" = 1'-0"

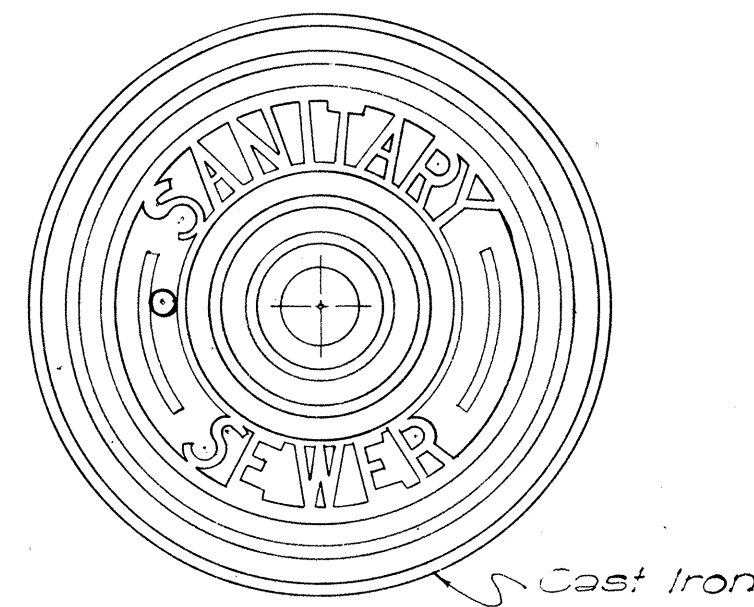
APPROVED:  DATE: Aug. 25, 1959
STATE HIGHWAY ENGINEER

DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
STATE OF HAWAII
STANDARD DETAILS
CONCRETE CATCH BASINS
SCALES AS NOTED
SHEET NO. 6 OF 7 SHEETS

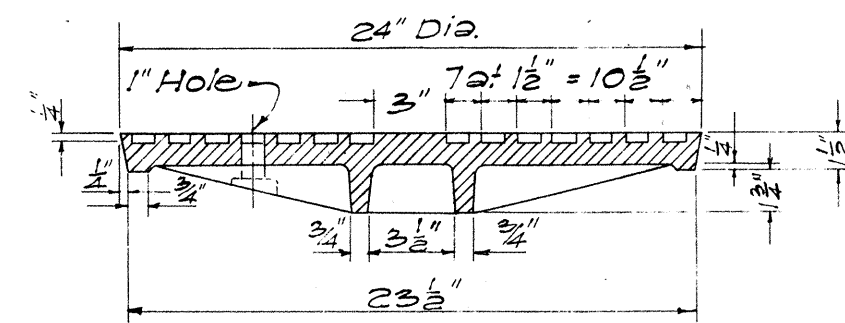
2/17/50
8/14/50

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW	F090-1(8)	1953	21	53

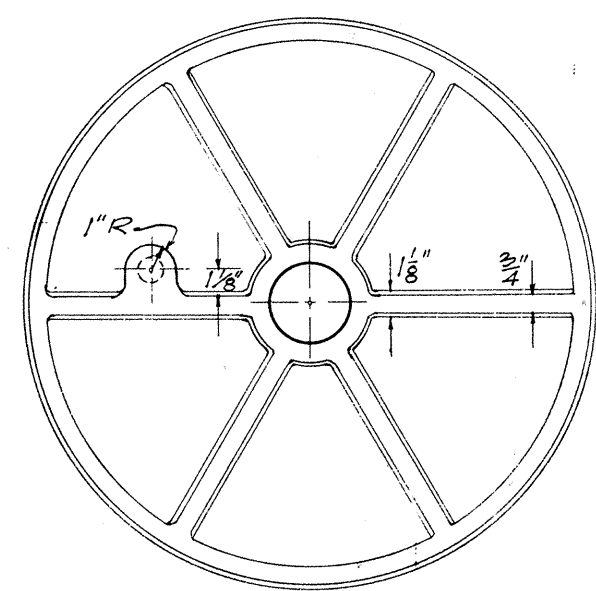
August 1957



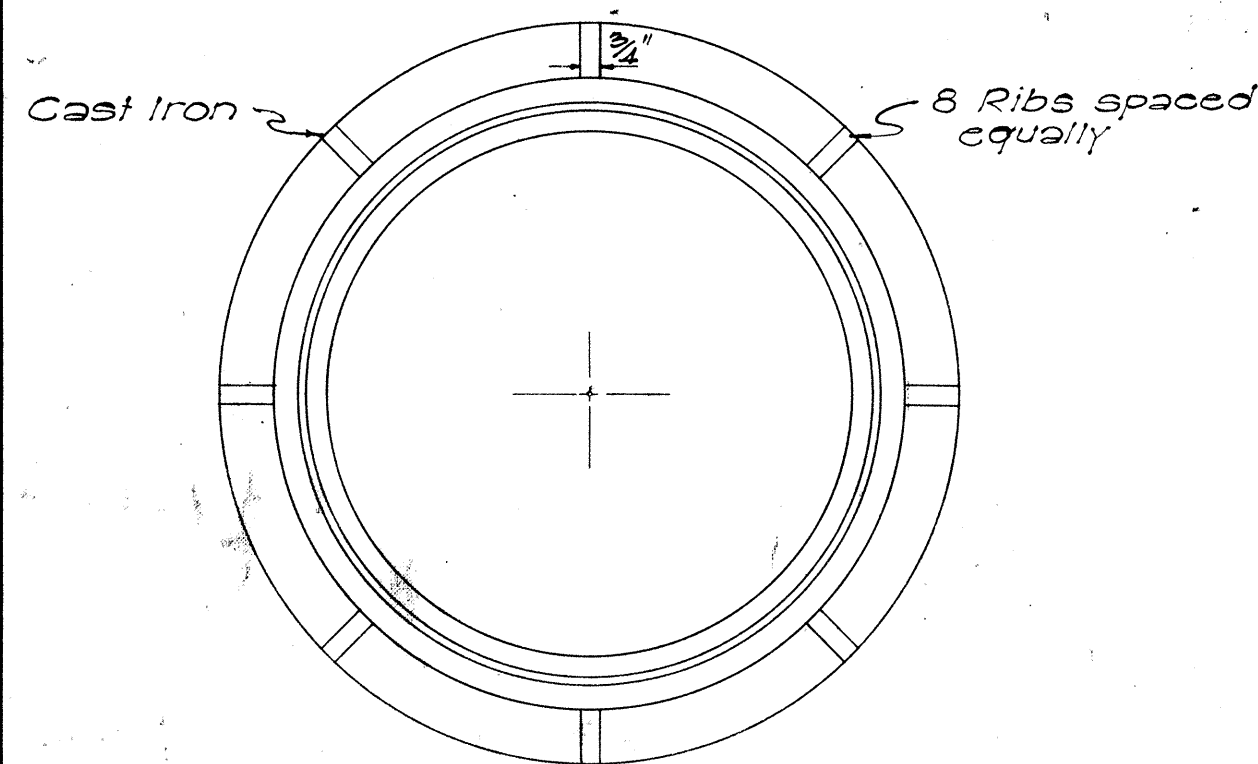
TOP VIEW OF COVER



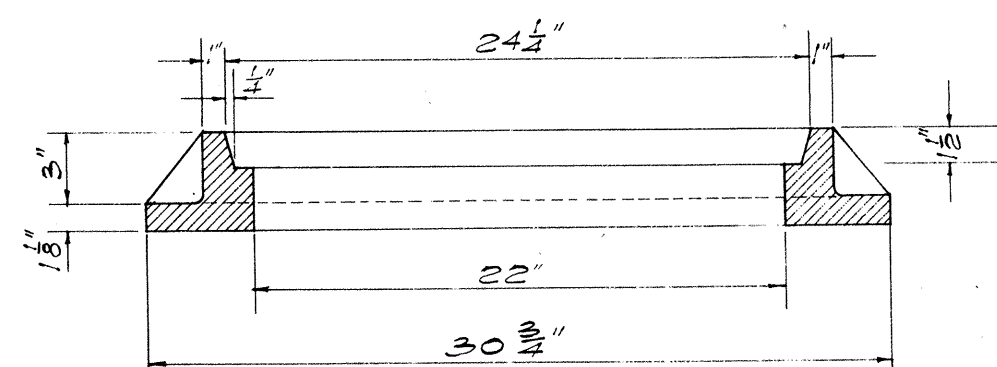
SECTION



BOTTOM VIEW OF COVER

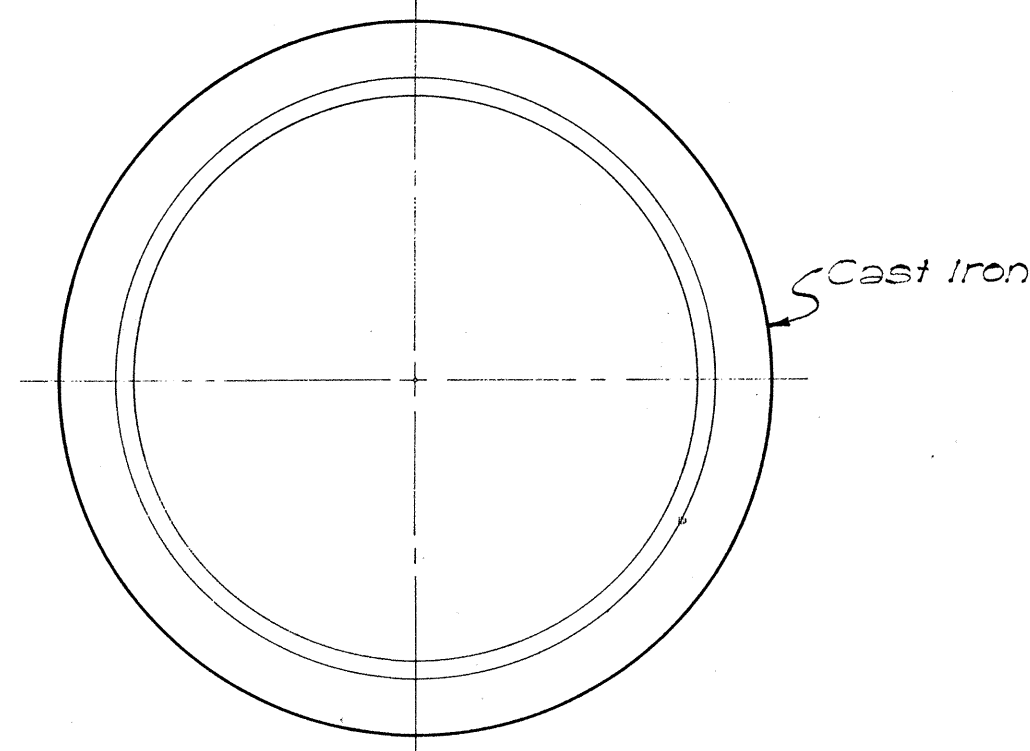


PLAN OF RIM

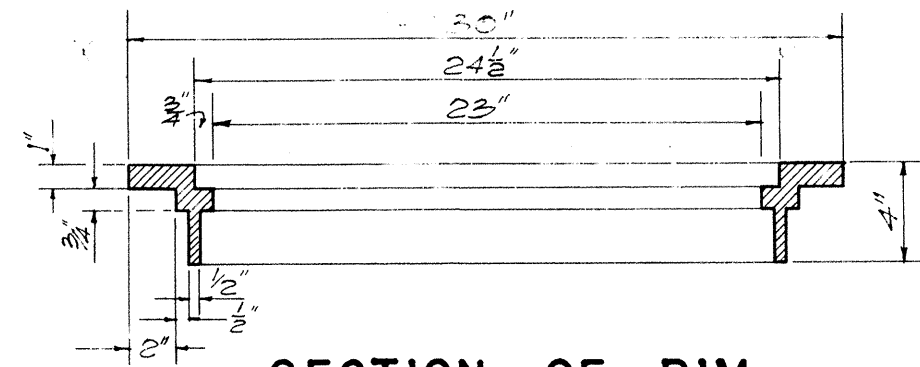


SECTION OF RIM
DETAILS OF TYPE "C"
MANHOLE CASTINGS

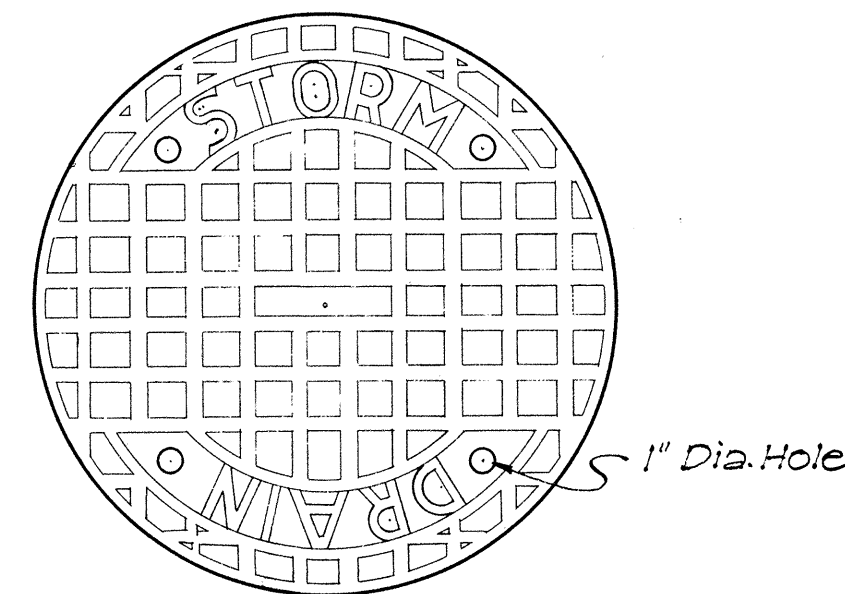
SCALE: 1-1/2" = 1'-0"



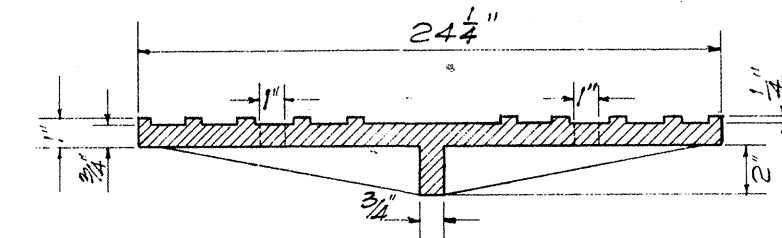
PLAN OF RIM



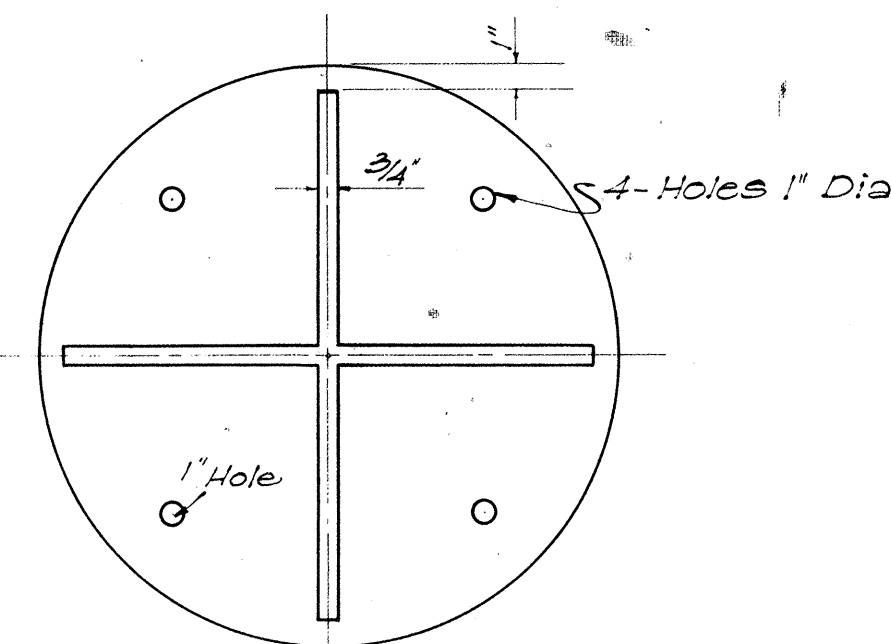
SECTION OF RIM



TOP VIEW OF COVER



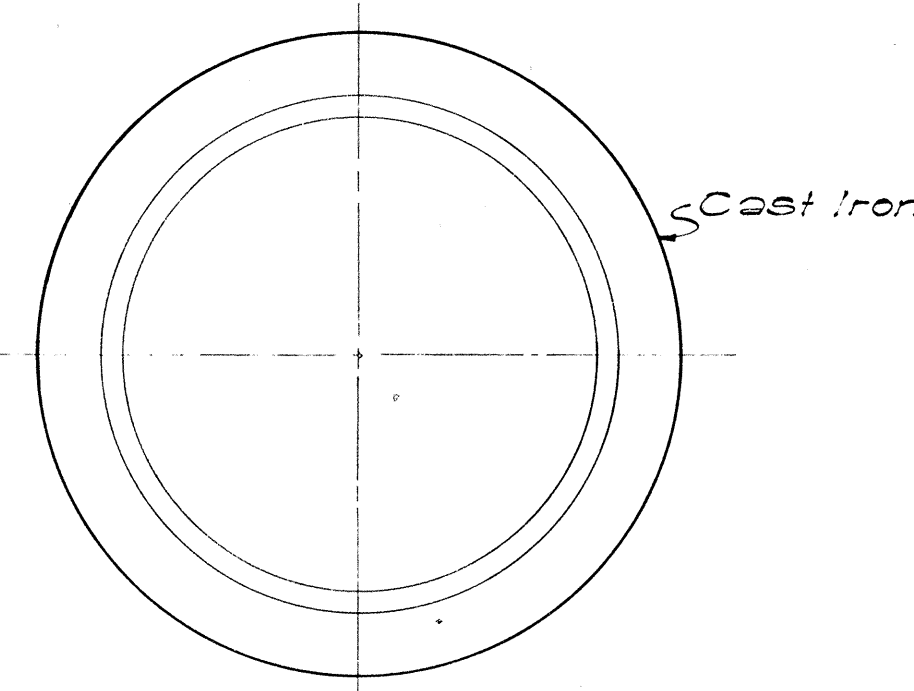
SECTION



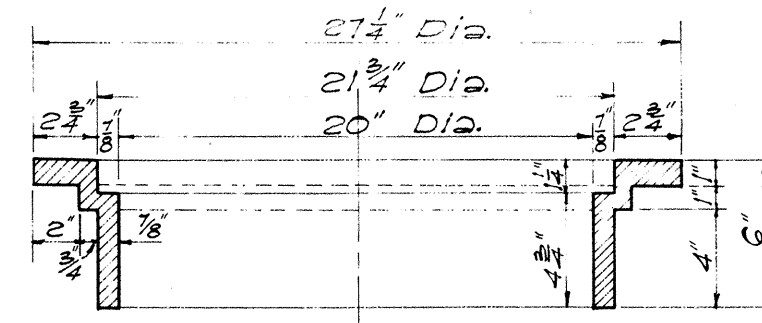
BOTTOM VIEW OF COVER

DETAILS OF TYPE "B"
CATCH BASIN CASTINGS

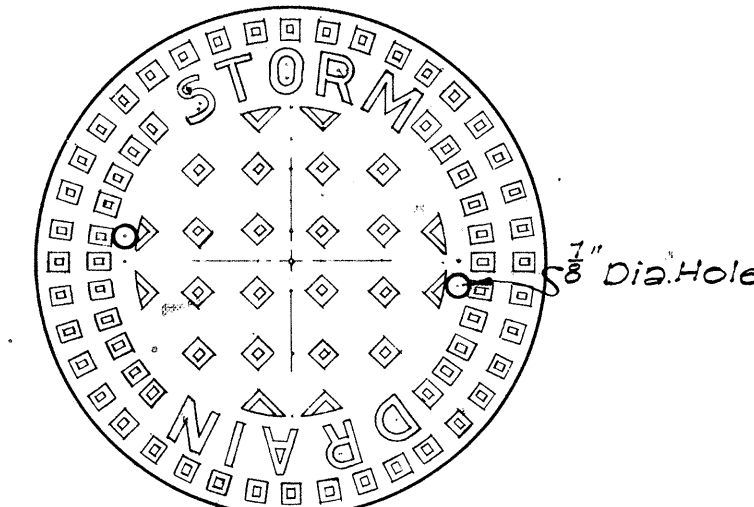
SCALE: 1-1/2" = 1'-0"



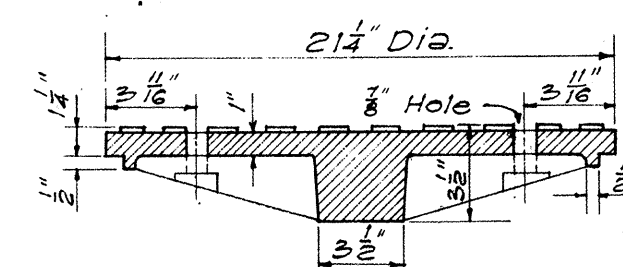
PLAN OF RIM



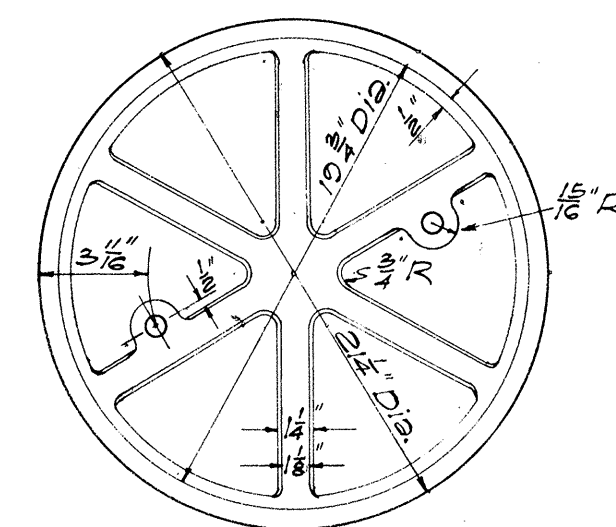
SECTION OF RIM



TOP VIEW OF COVER



SECTION

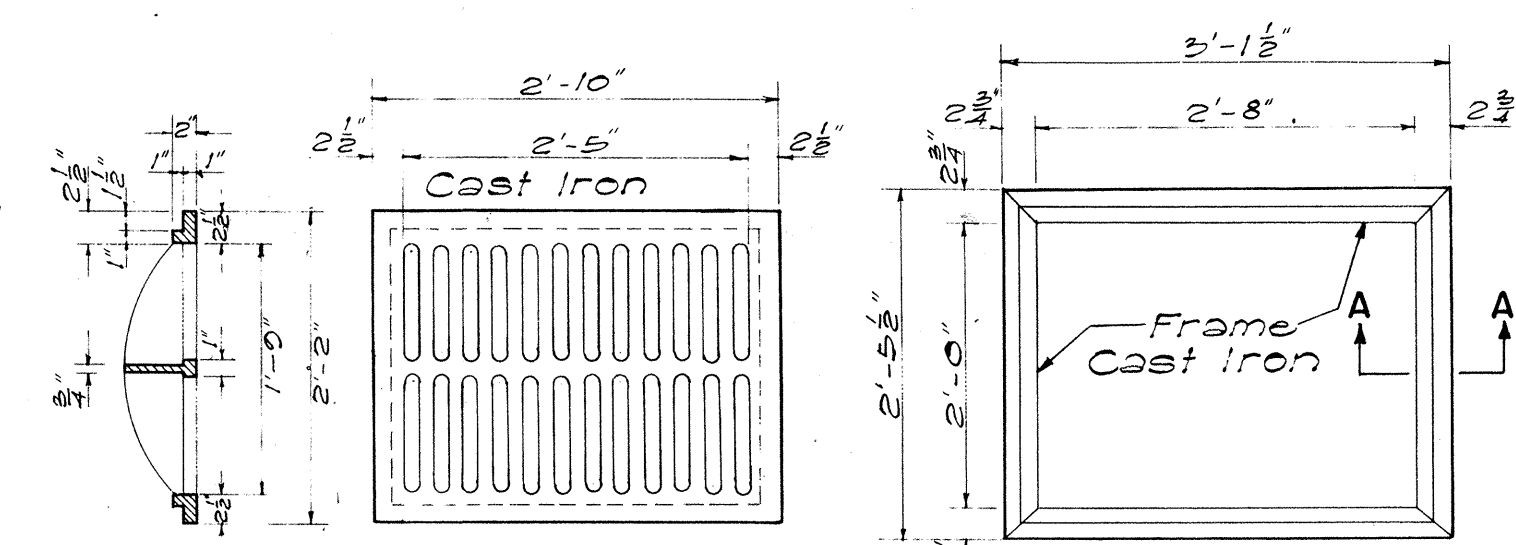


BOTTOM VIEW OF COVER

DETAILS OF TYPE "A"
MANHOLE CASTINGS

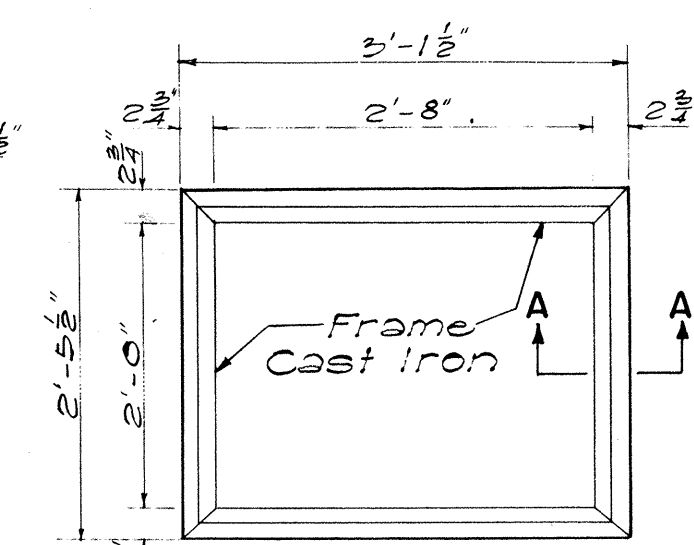
SCALE: 1-1/2" = 1'-0"

NOTE: Stock Pattern From Novelty Foundry ~ Honolulu



SECTION

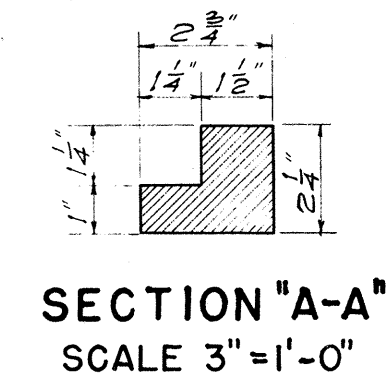
TOP VIEW



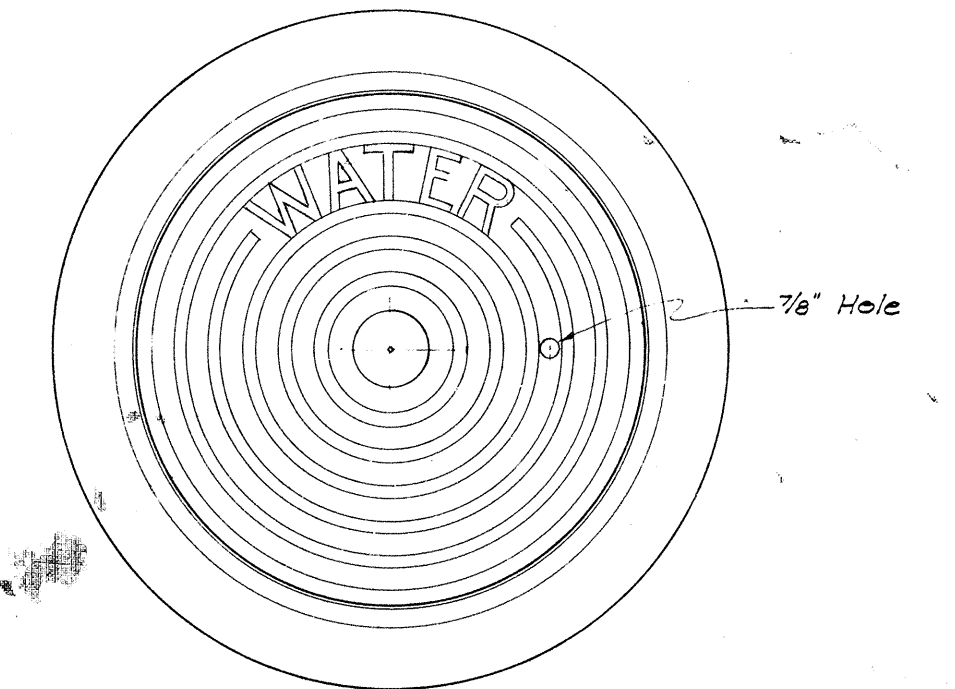
TOP VIEW

TYPE C C.I. FRAME AND GRATING

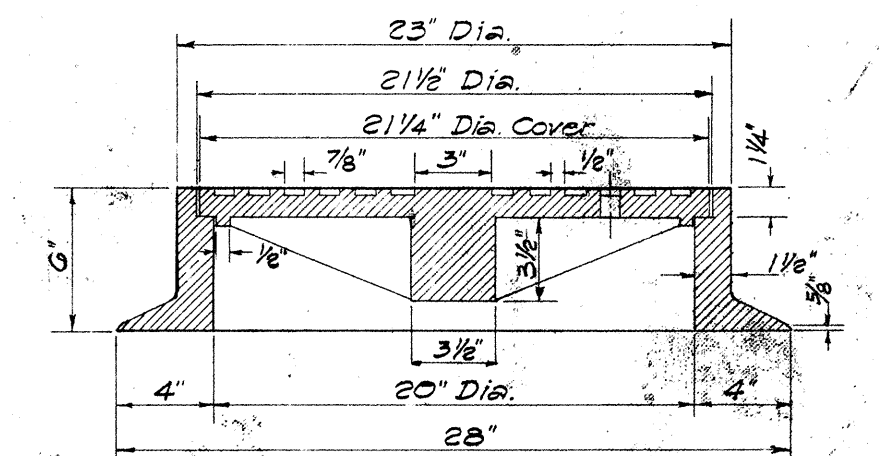
SCALE: 3/4" = 1'-0"



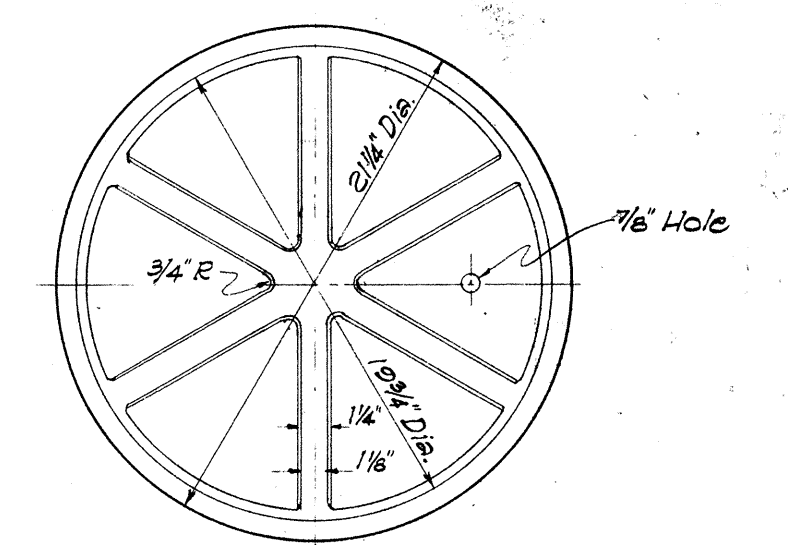
SECTION "A-A"
SCALE 3" = 1'-0"



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"

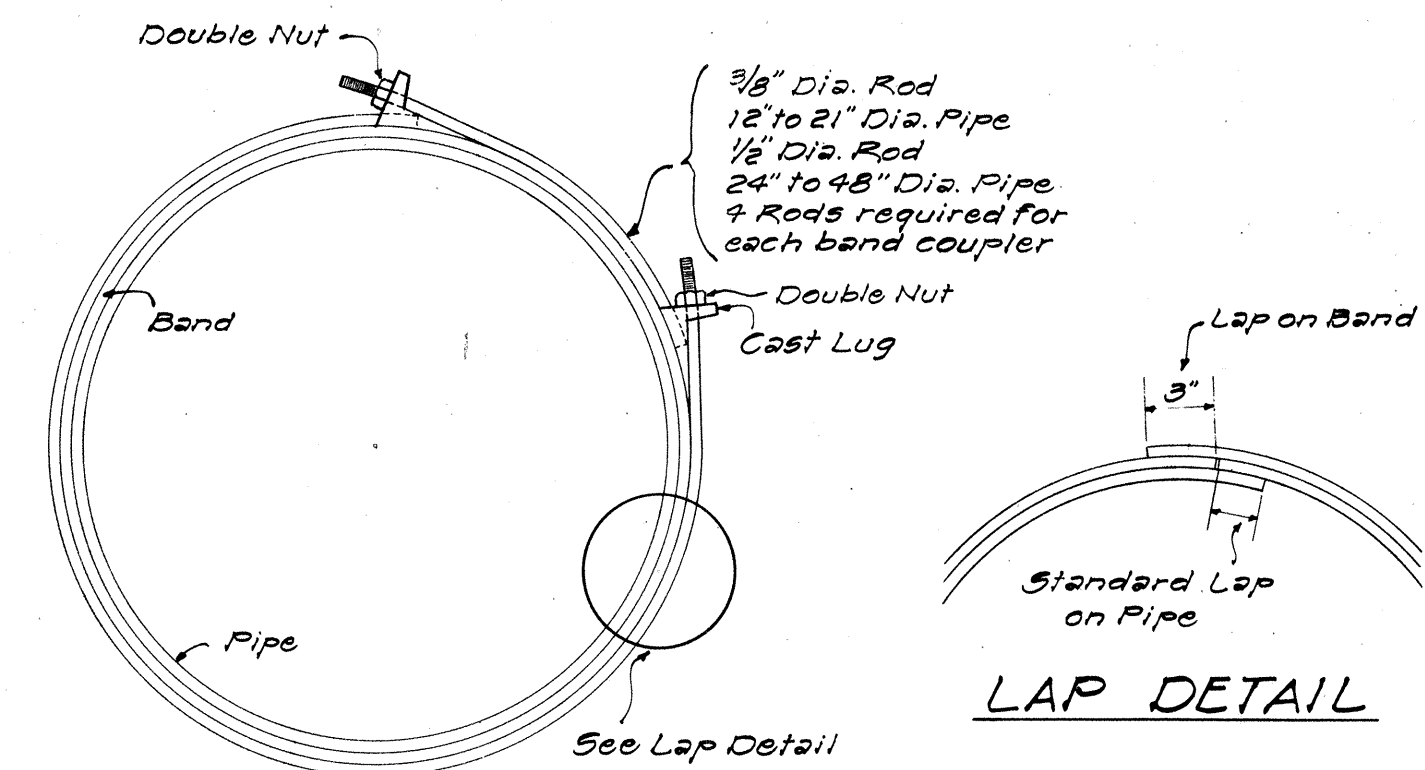
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
STATE OF HAWAII
STANDARD DETAILS
CATCH BASIN AND
MANHOLE CASTINGS

SCALES AS NOTED

SHEET NO 8 OF 2 SHEETS

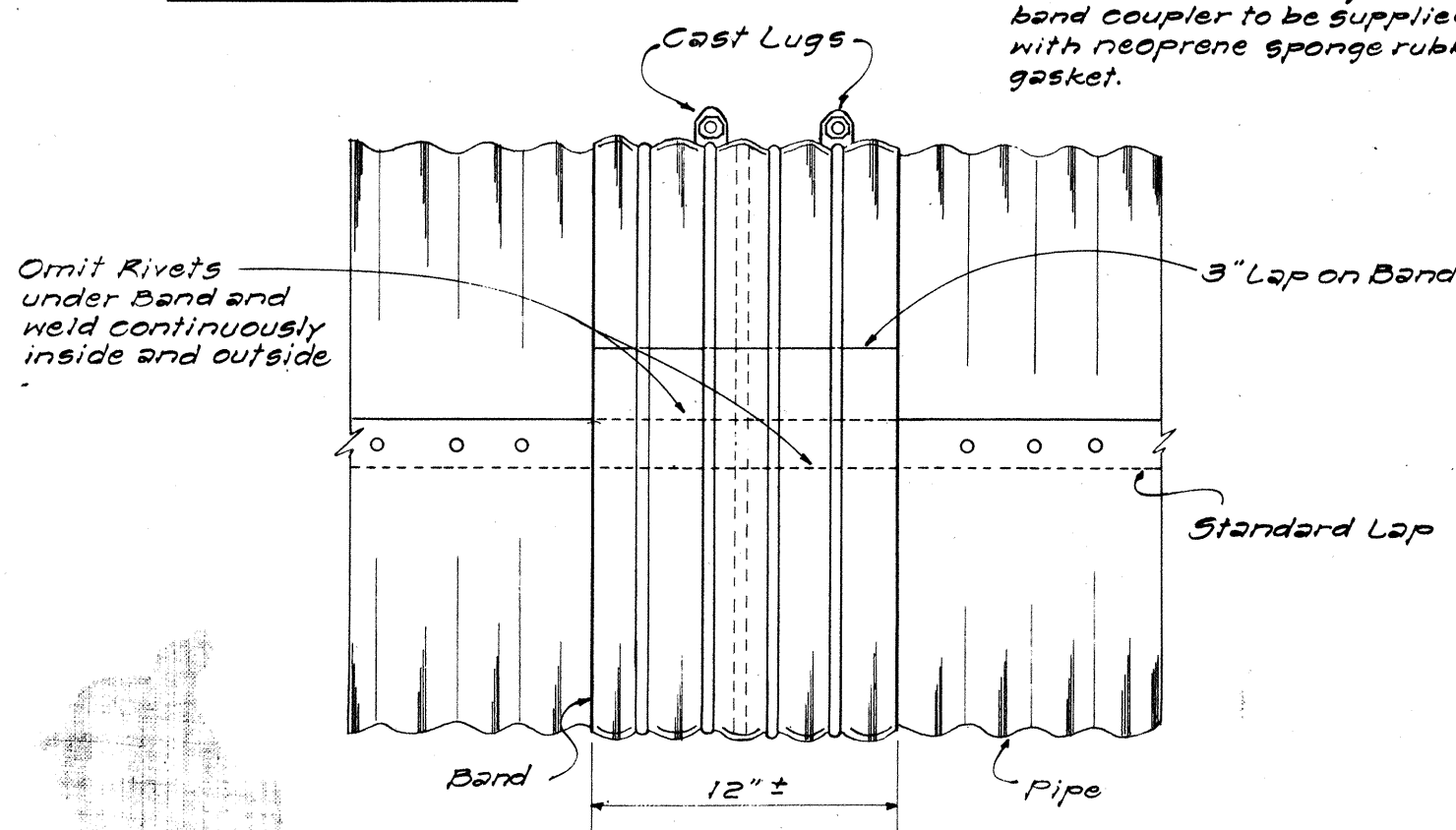
APPROVED: DATE: Aug. 29, 1957
STATE HIGHWAY ENGINEER

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



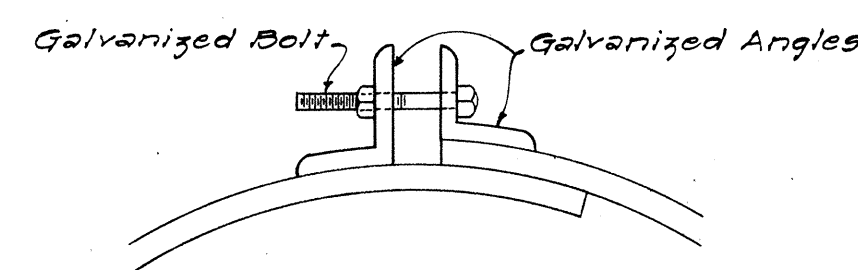
END VIEW

NOTE:
Each watertight
band coupler to be supplied
with neoprene sponge rubber
gasket.

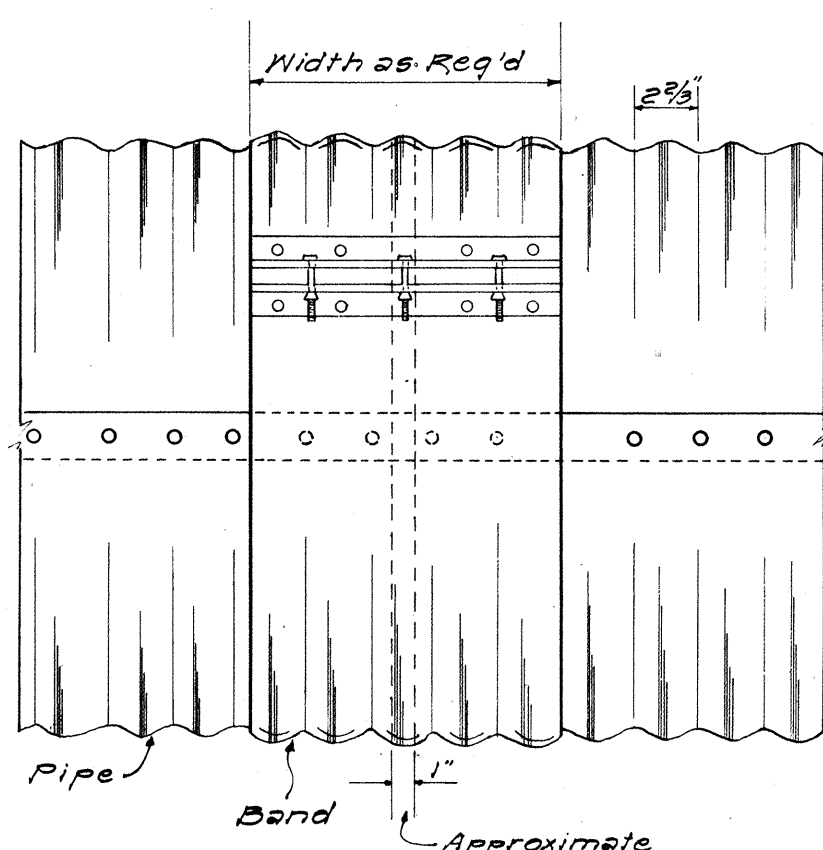


SIDE VIEW

DETAIL OF WATERTIGHT BAND COUPLER
NOT TO SCALE

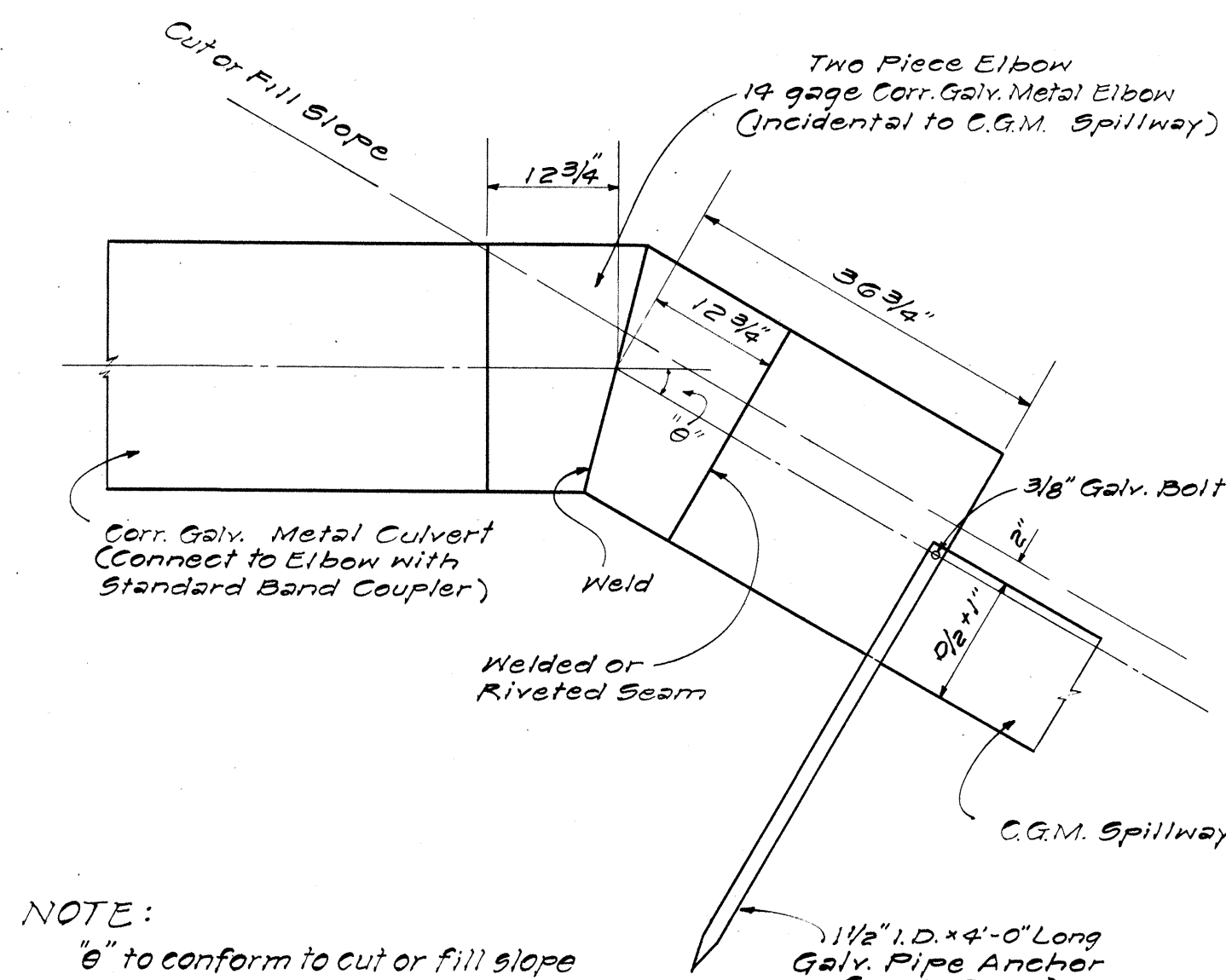


BAND DETAIL



SIDE VIEW

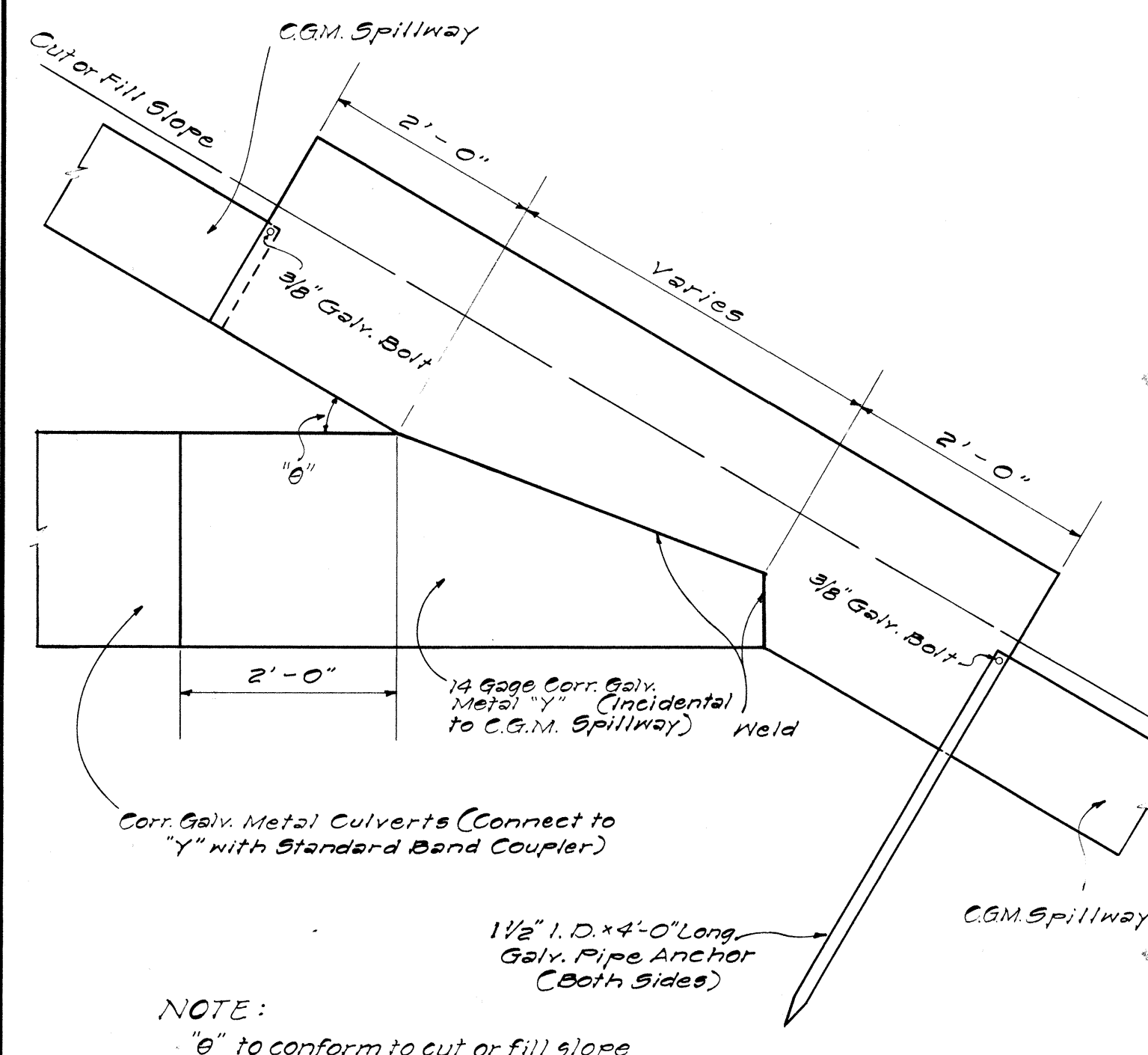
DETAIL OF STANDARD BAND COUPLER
NOT TO SCALE



NOTE:
"6" to conform to cut or fill slope

DETAIL OF CULVERT
TO SPILLWAY CONNECTION

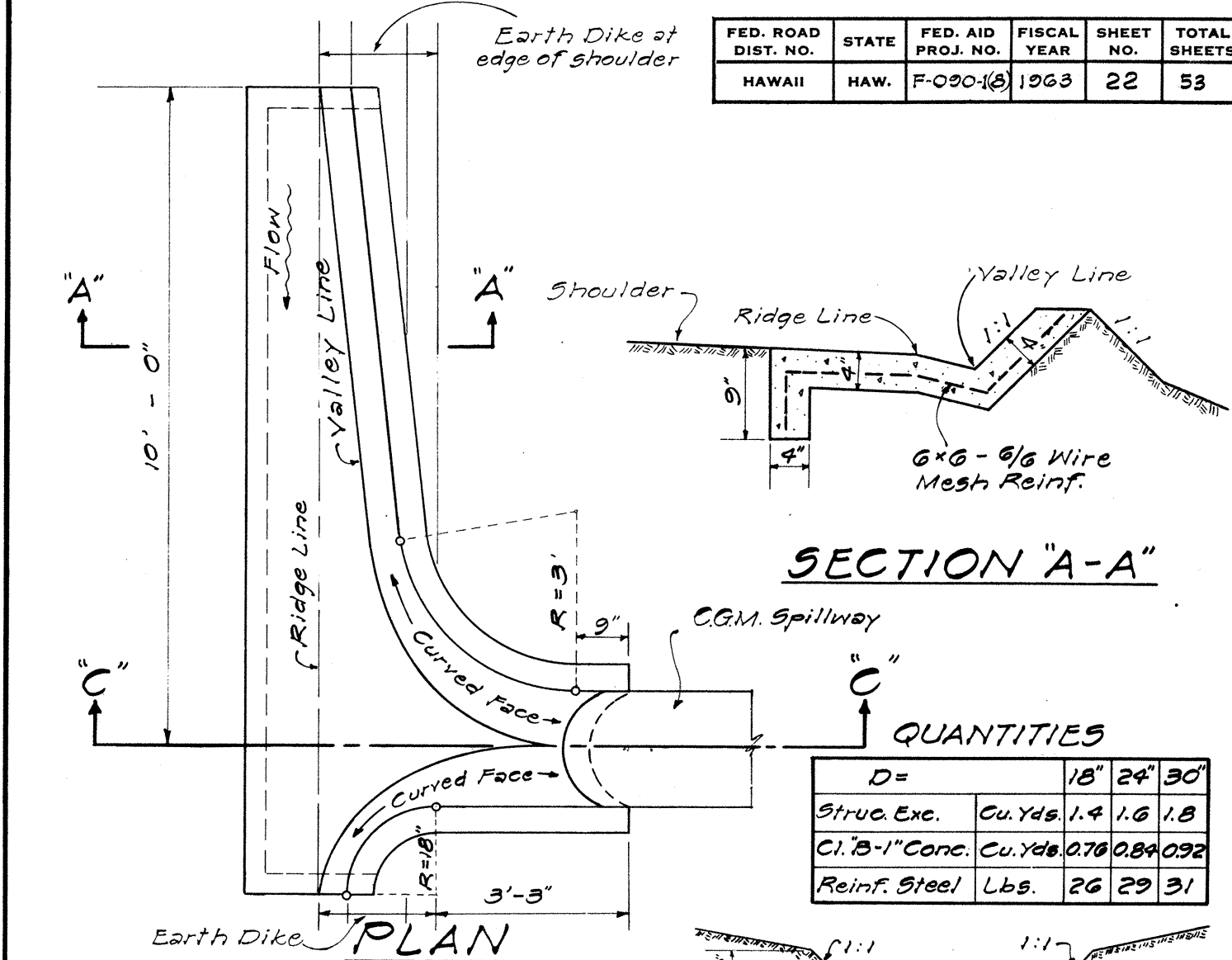
NOT TO SCALE



NOTE:
"6" to conform to cut or fill slope

DETAIL OF CULVERT
TO SPILLWAY "Y" CONNECTION

NOT TO SCALE



SECTION "A-A"

QUANTITIES

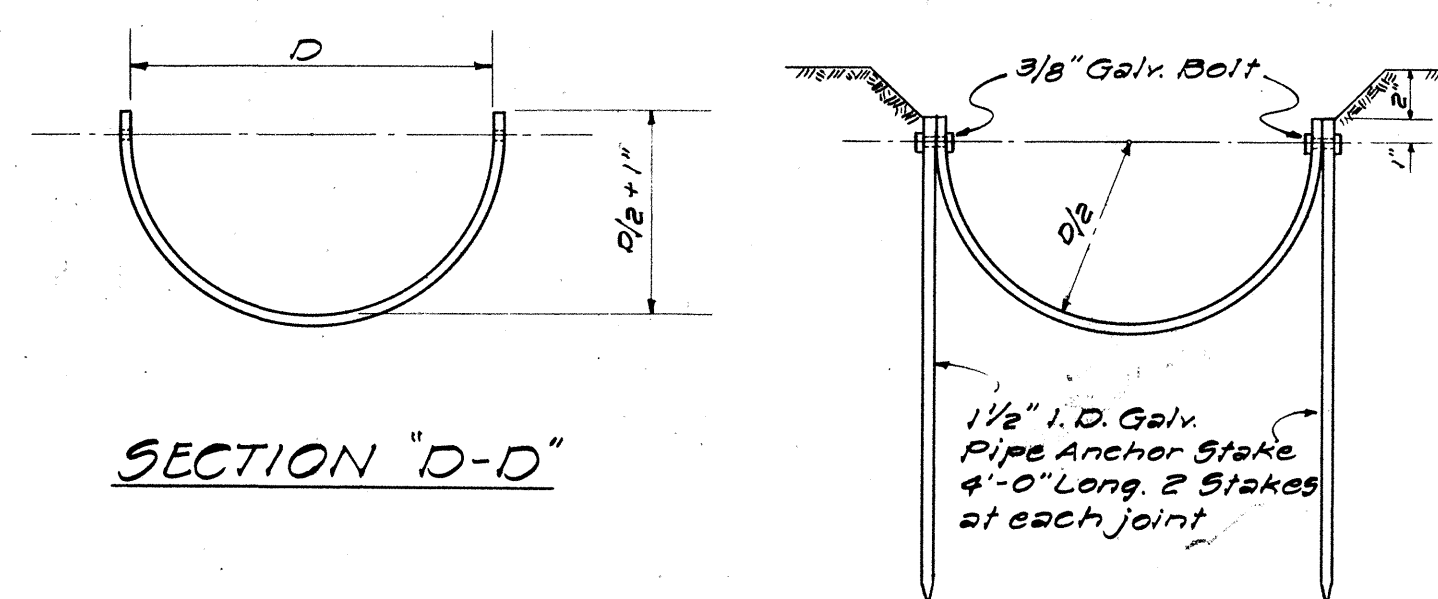
D=	18"	24"	30"
Struc. Exc.	1.4	1.6	1.8
Cl. B-1 Conc.	0.70	0.84	0.92
Reinf. Steel Lbs.	26	29	31

SECTION "B-B"

NOTE:
1. Reverse Plan View
when flow is in
direction opposite
to that shown.
2. All Conc. to be Cl. B-1

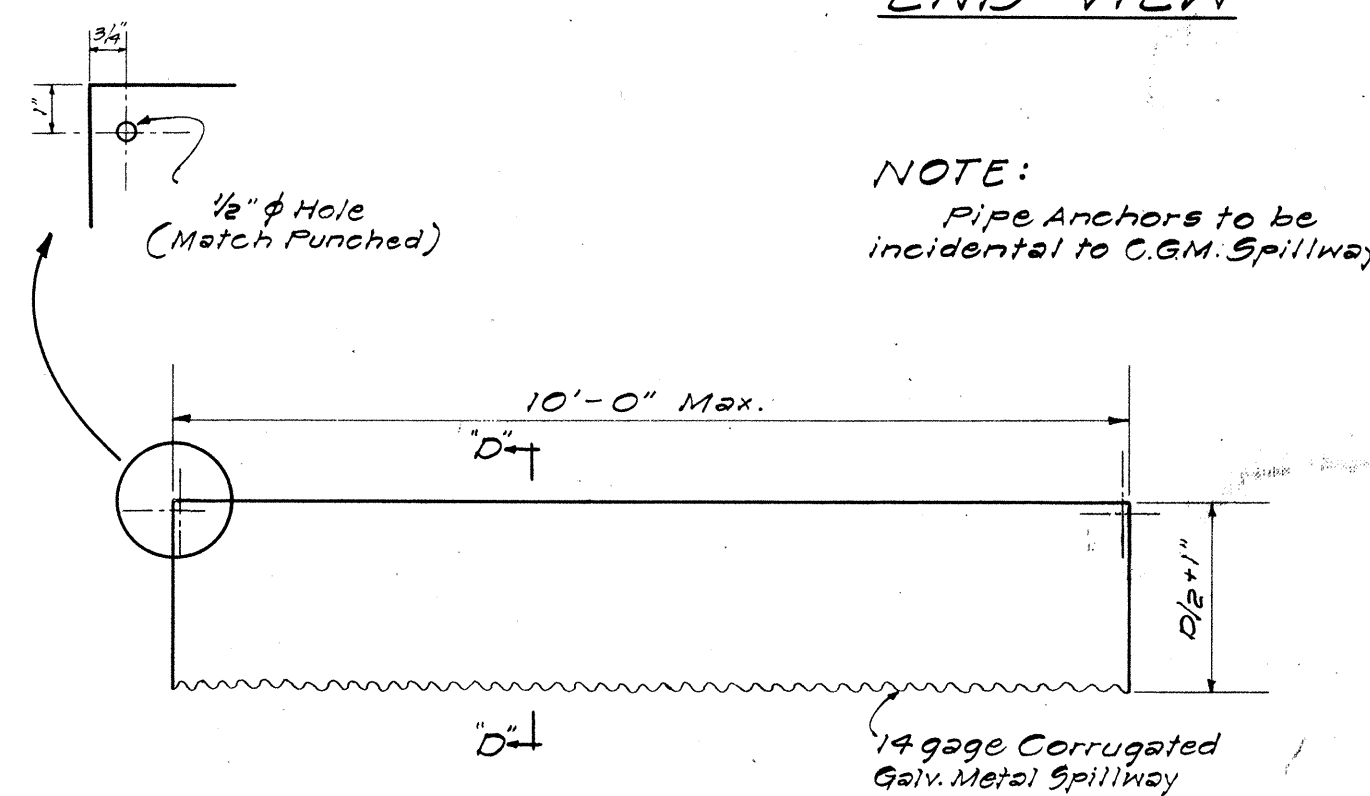
DETAIL OF SPILLWAY INLET

NOT TO SCALE



SECTION "D-D"

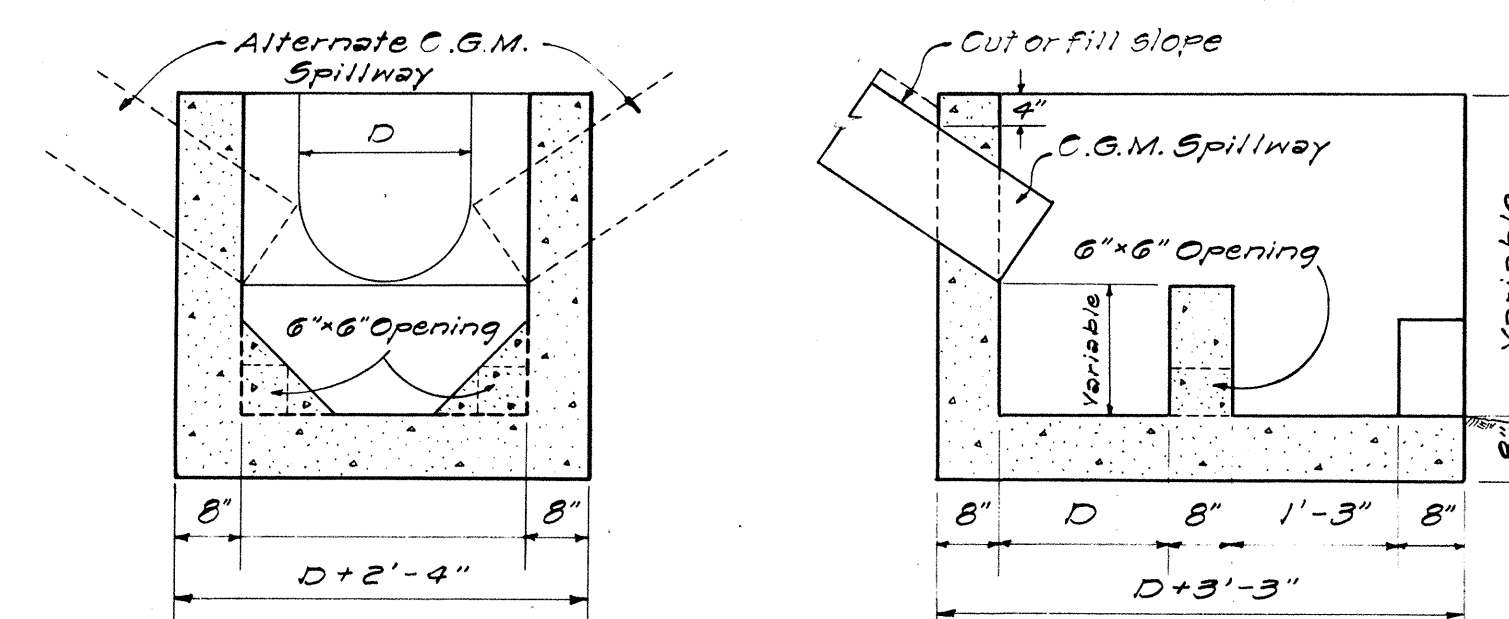
END VIEW



SIDE VIEW

C G.M. SPILLWAY

NOT TO SCALE



SECTION "H-H"

SECTION "G-G"

QUANTITIES

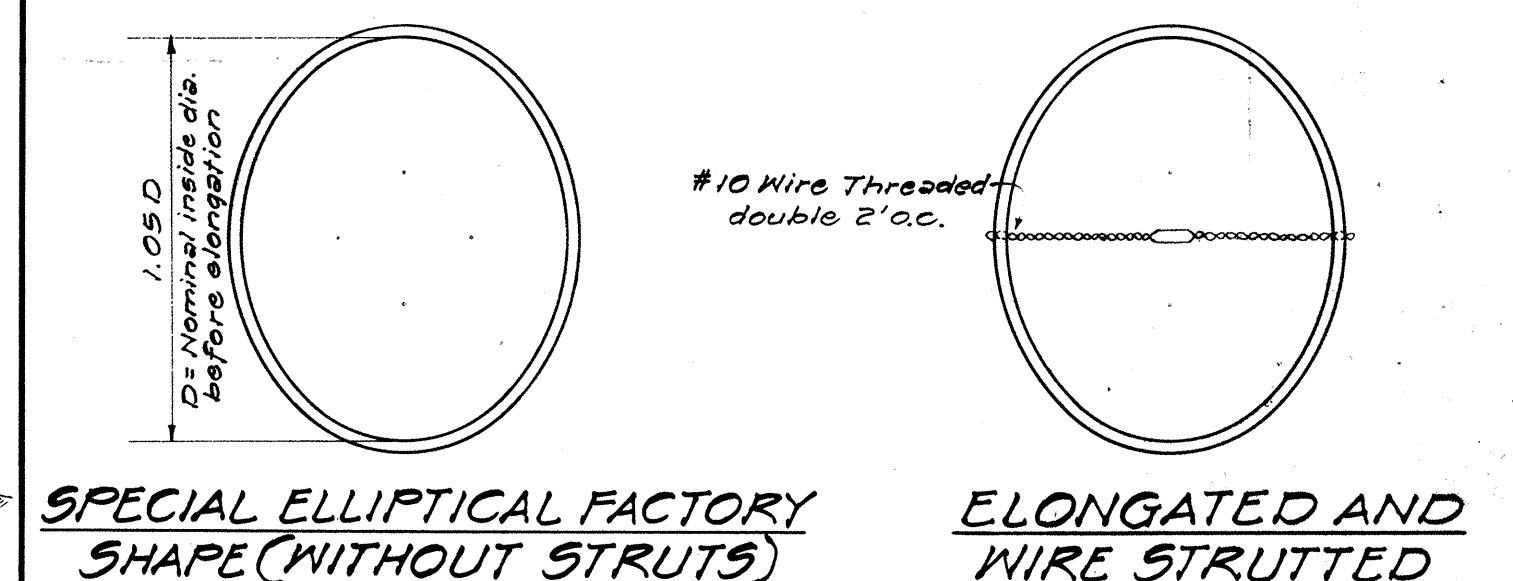
D=	18"	24"	30"
Struc. Exc.	3.3	4.2	5.1
Cl. B-1 Conc.	1.5	1.8	2.2

NOTE:
All Concrete
to be Class B-1

PLAN "H-H"

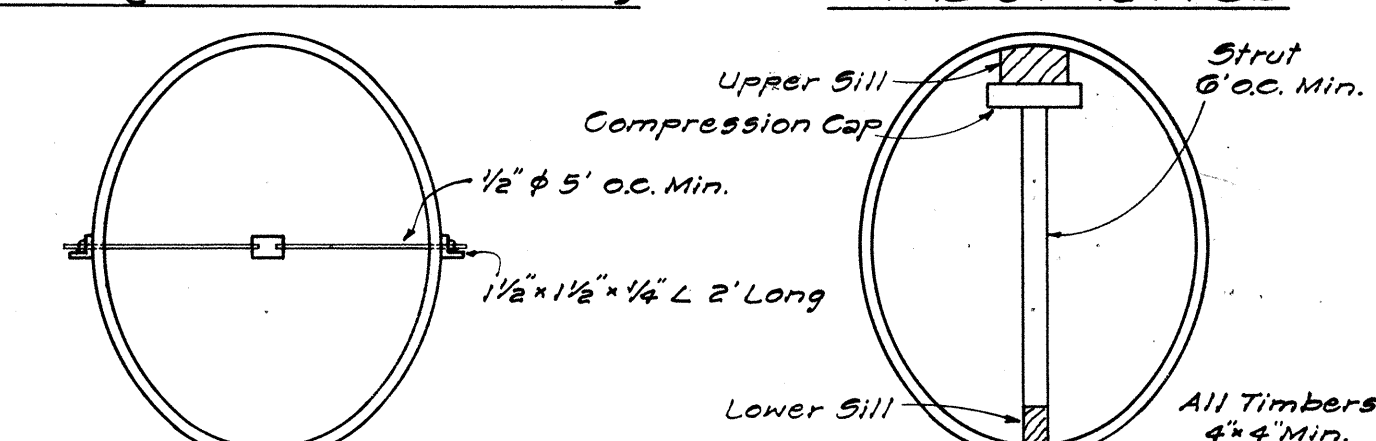
DETAILS OF CONC. DROP BOX
AT OUTLET OF C.G.M. SPILLWAY

NOT TO SCALE



SPECIAL ELLIPTICAL FACTORY
SHAPE (WITHOUT STRUTS)

ELONGATED AND
WIRE STRUTTED



ELONGATED WITH
ROD AND TURNBUCKLE

ELONGATED WITH
TIMBER STRUT

METHOD OF ELONGATING AND
STRUTTING CORRUGATED PIPE

NOT TO SCALE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
STANDARD DETAILS
CORRUGATED GALVANIZED METAL
CULVERTS, SPILLWAYS, AND
SPECIAL DETAILS
SCALES AS NOTED
SHEET NO 9 OF 9 SHEETS

APPROVED: [Signature] DATE: 5-14-51
DIRECTOR OF TRANSPORTATION

ORIGINAL PLAN
DATE: 5-24-51
DESIGNED BY: G.M.
CHECKED BY: [Signature]
NO.