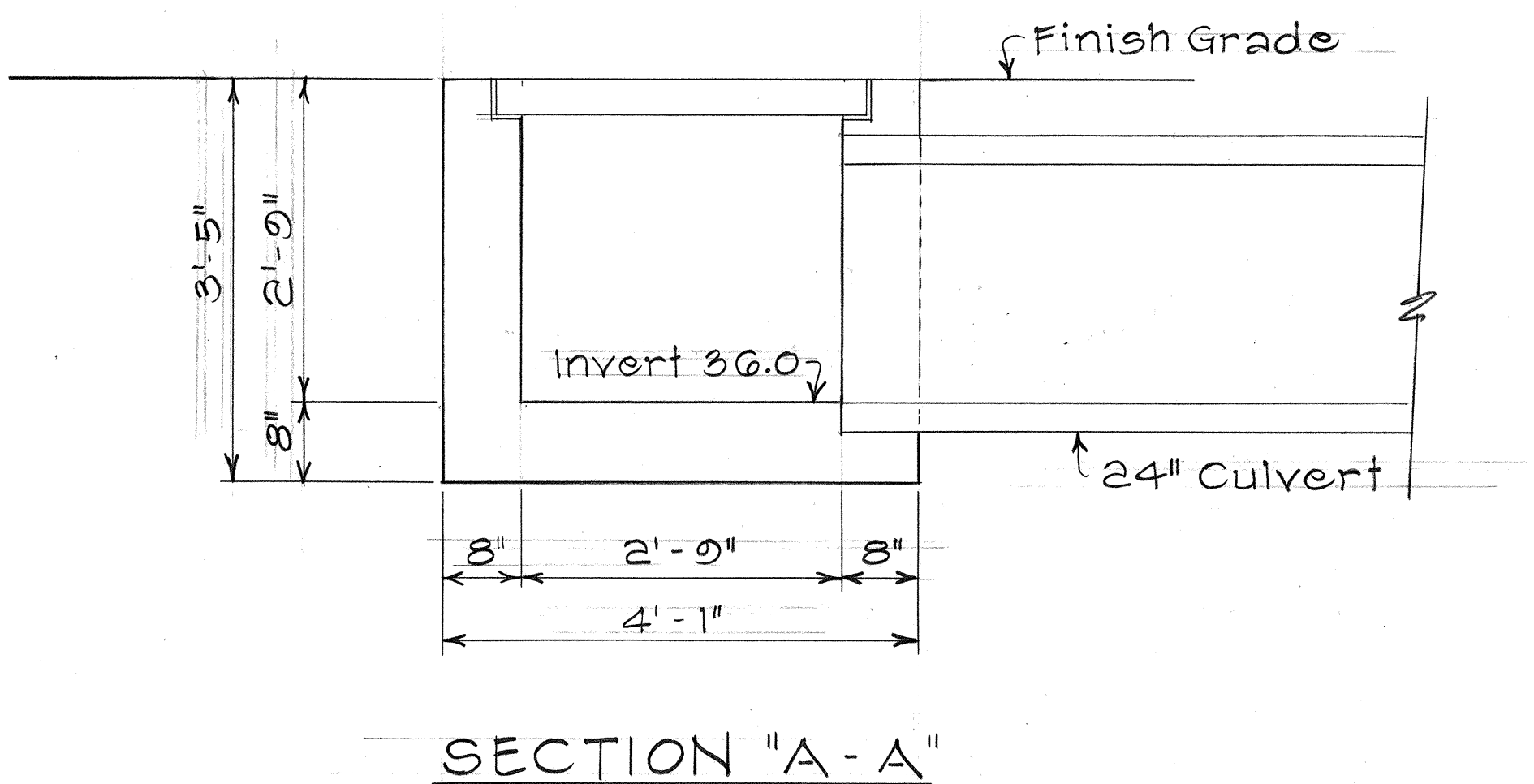
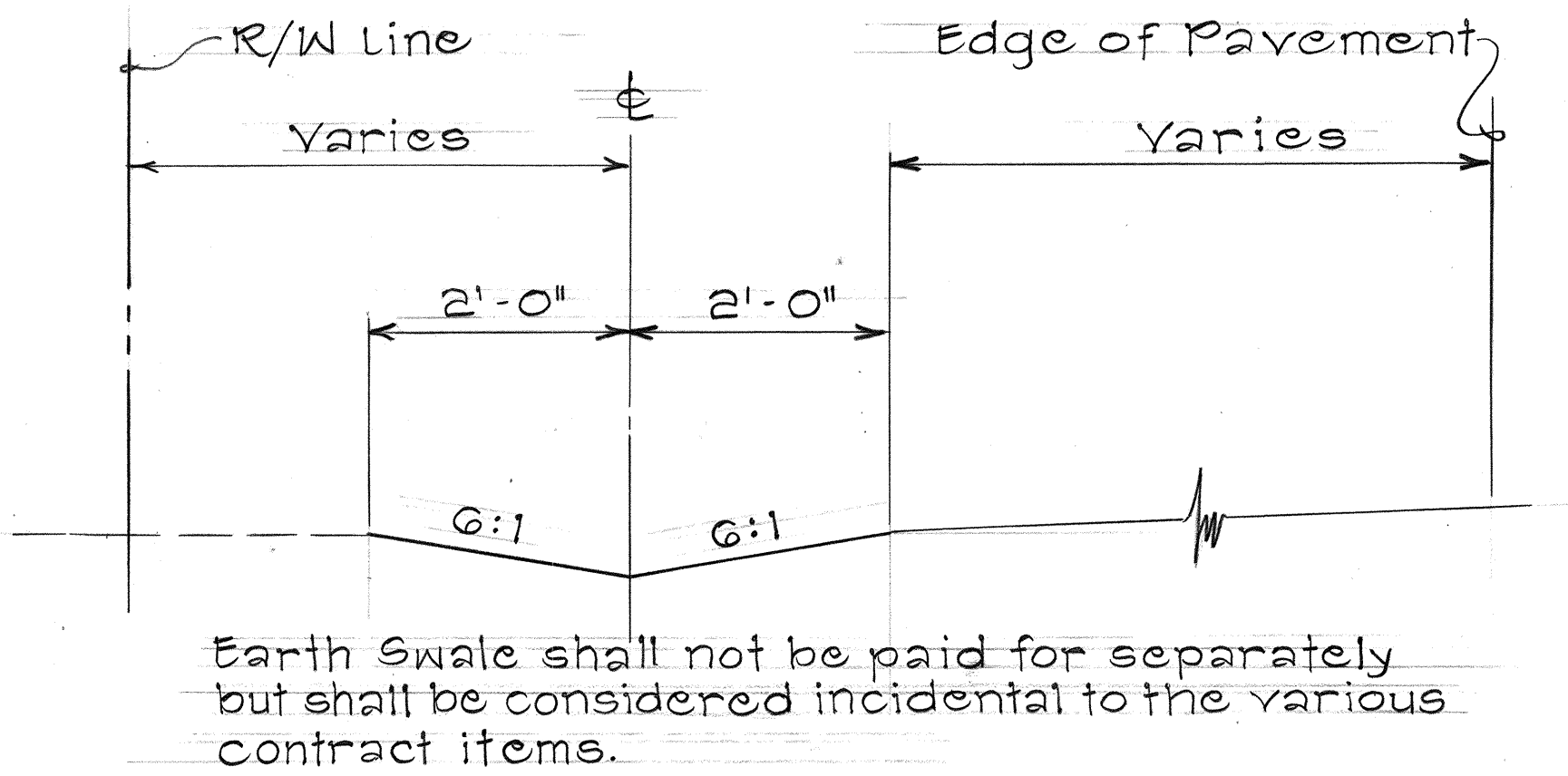
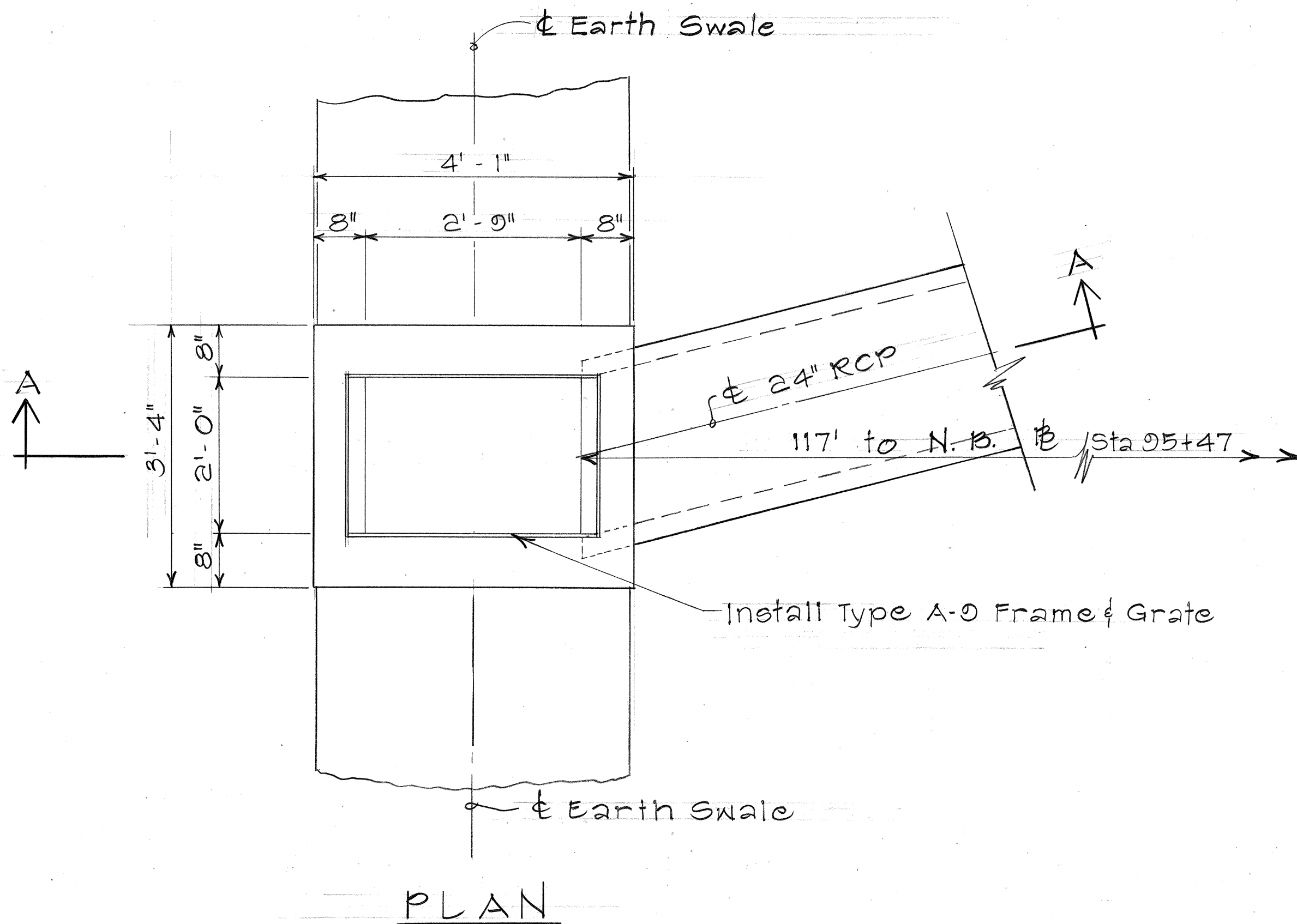
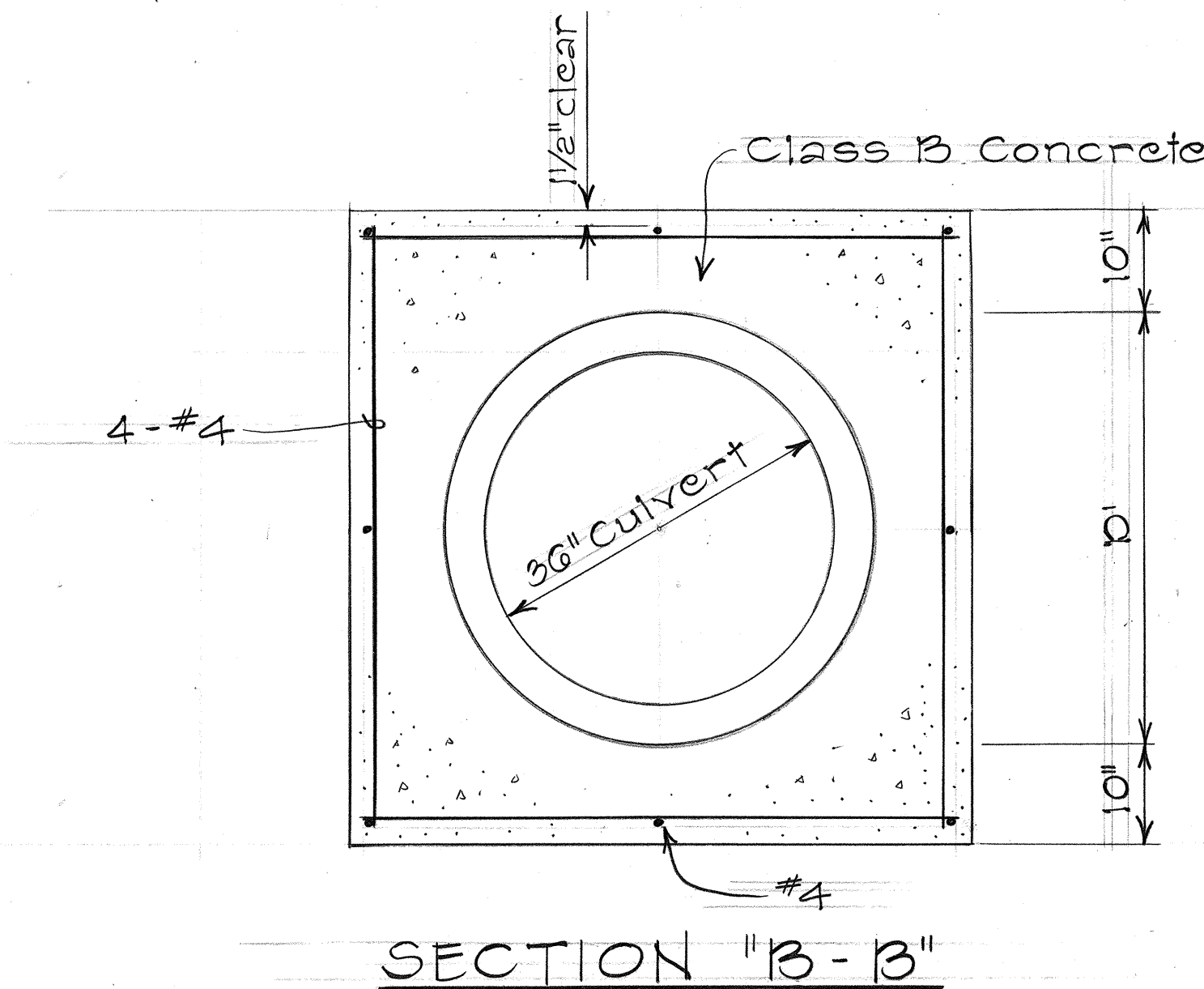
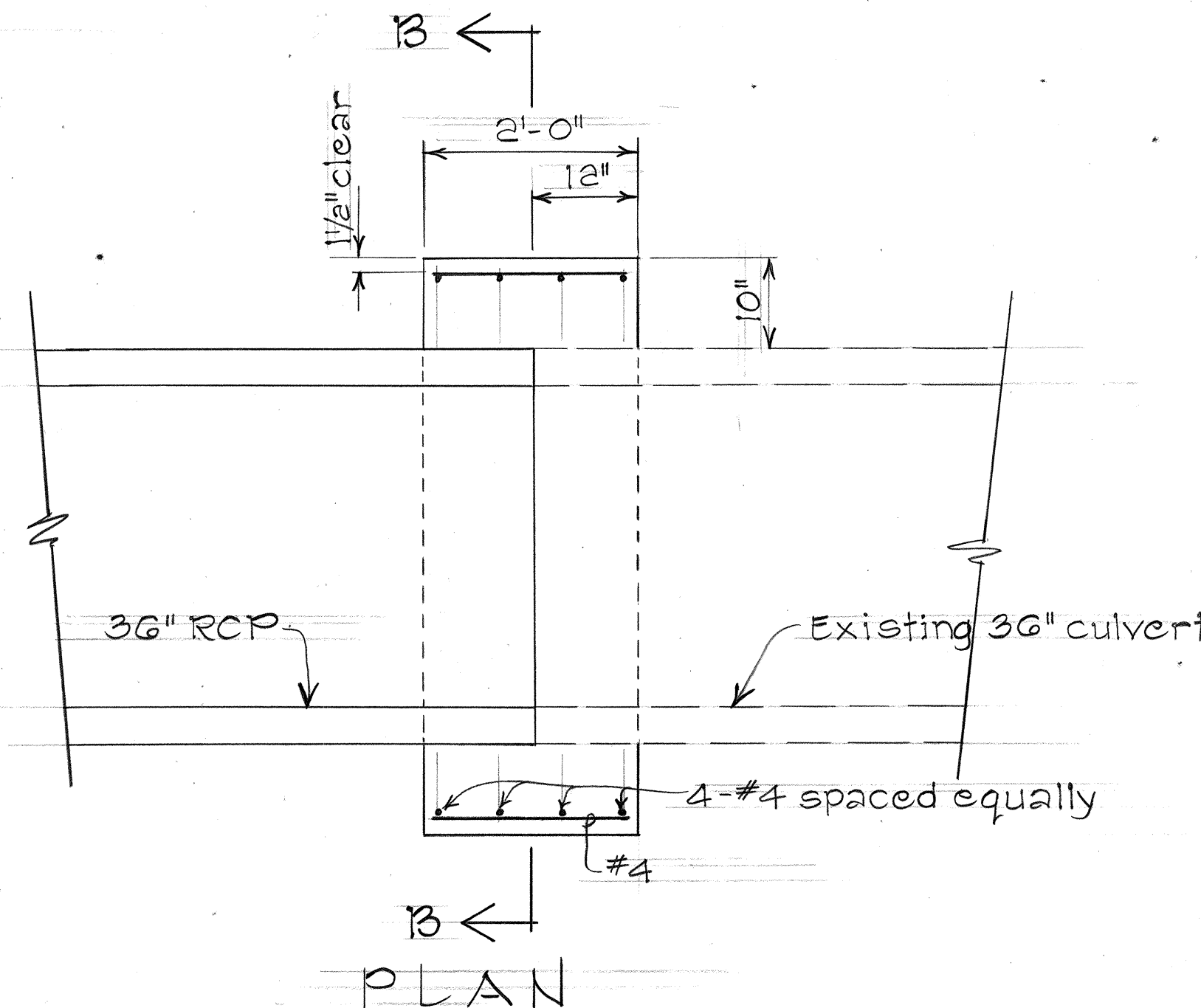


FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	M-3500(1)	1980	17	57



TYPE "G-1" GRATED DROP INTAKE

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



The Concrete Collar shall not be paid for separately but shall be considered incidental to the various contract items.

CONCRETE COLLAR DETAIL

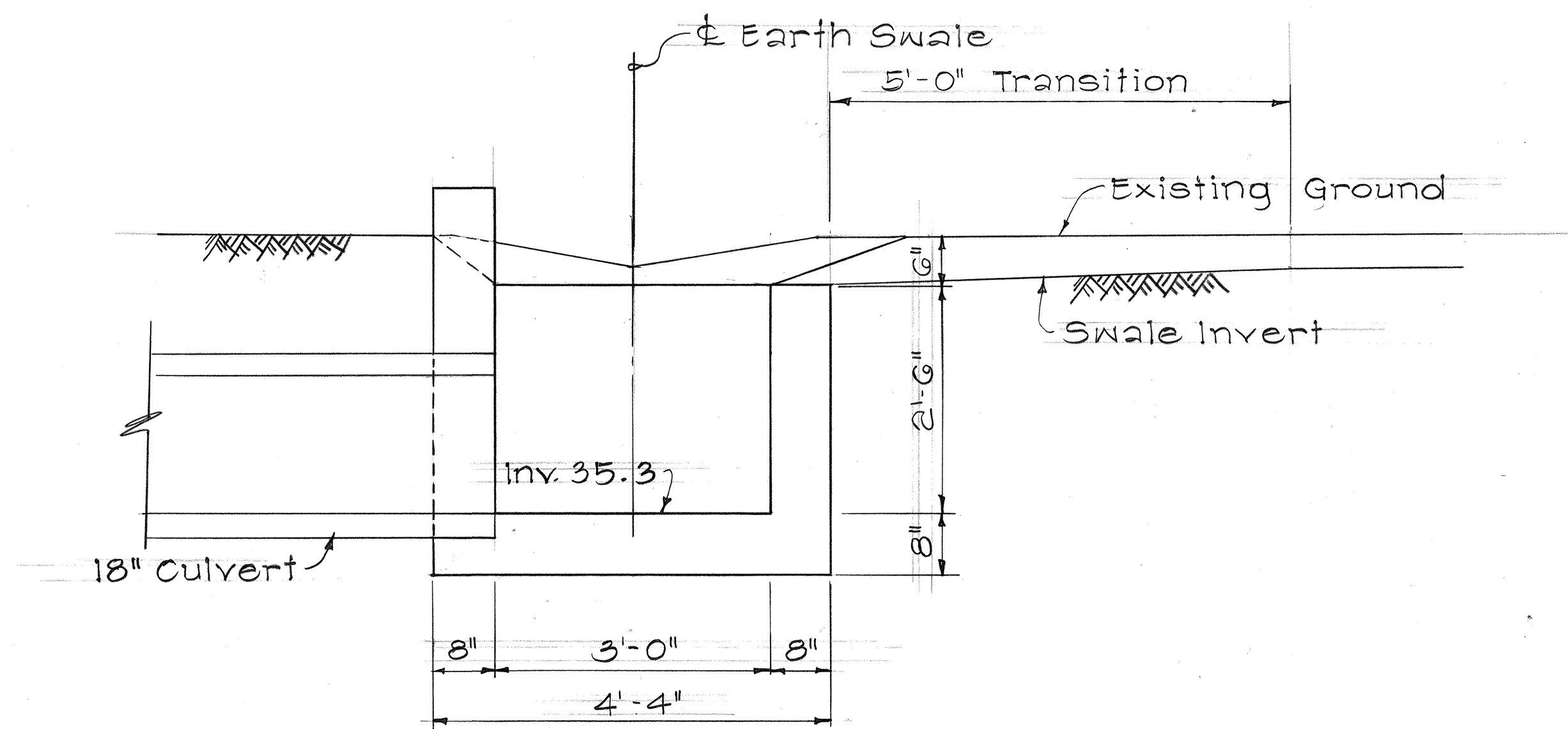
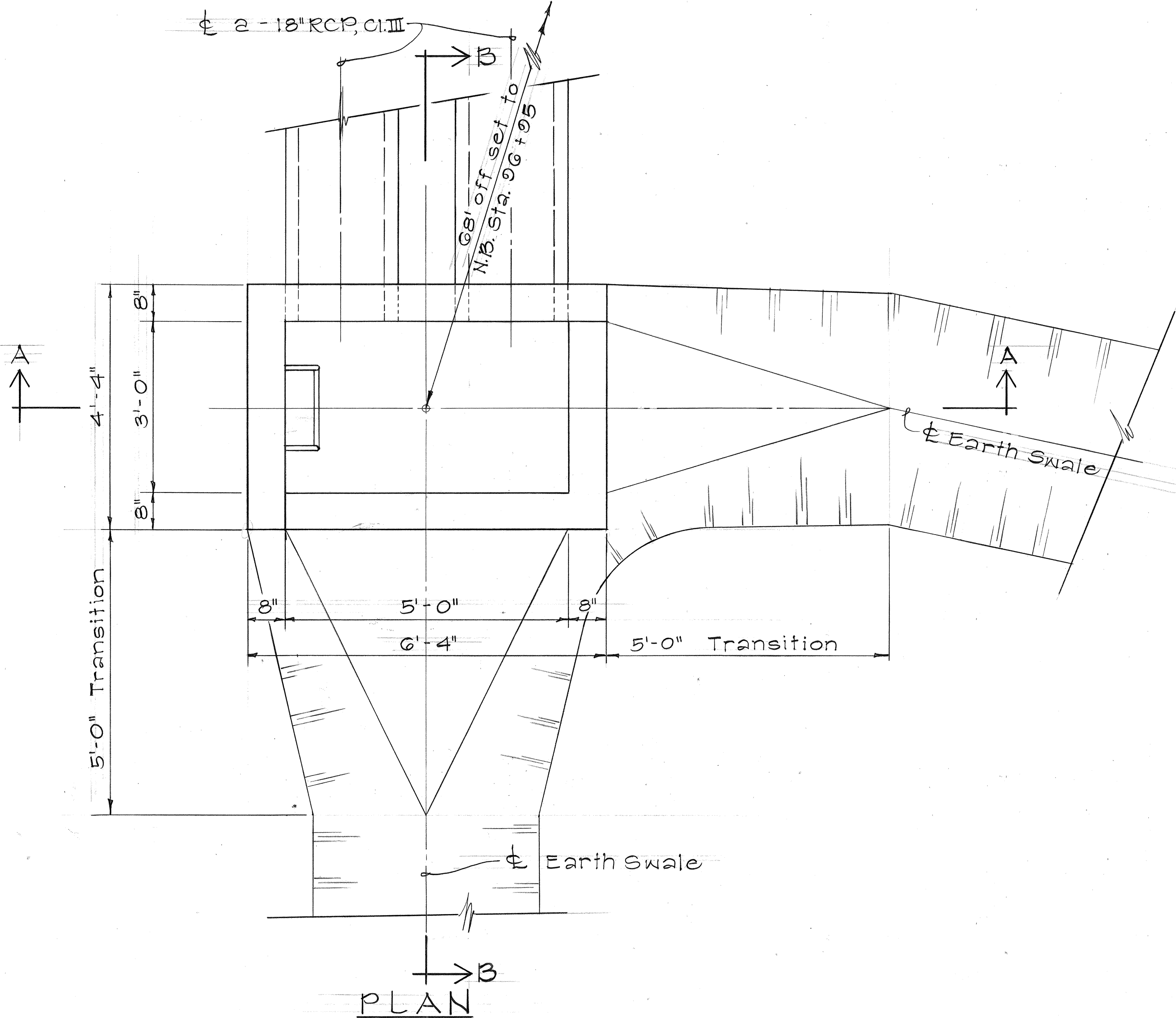
Scale: 3/4" = 1'-0"

ORIGINAL PLAN	DATE
DRAWN BY	
TRACED BY	
CHECKED BY	
NOTED BY	
NO.	

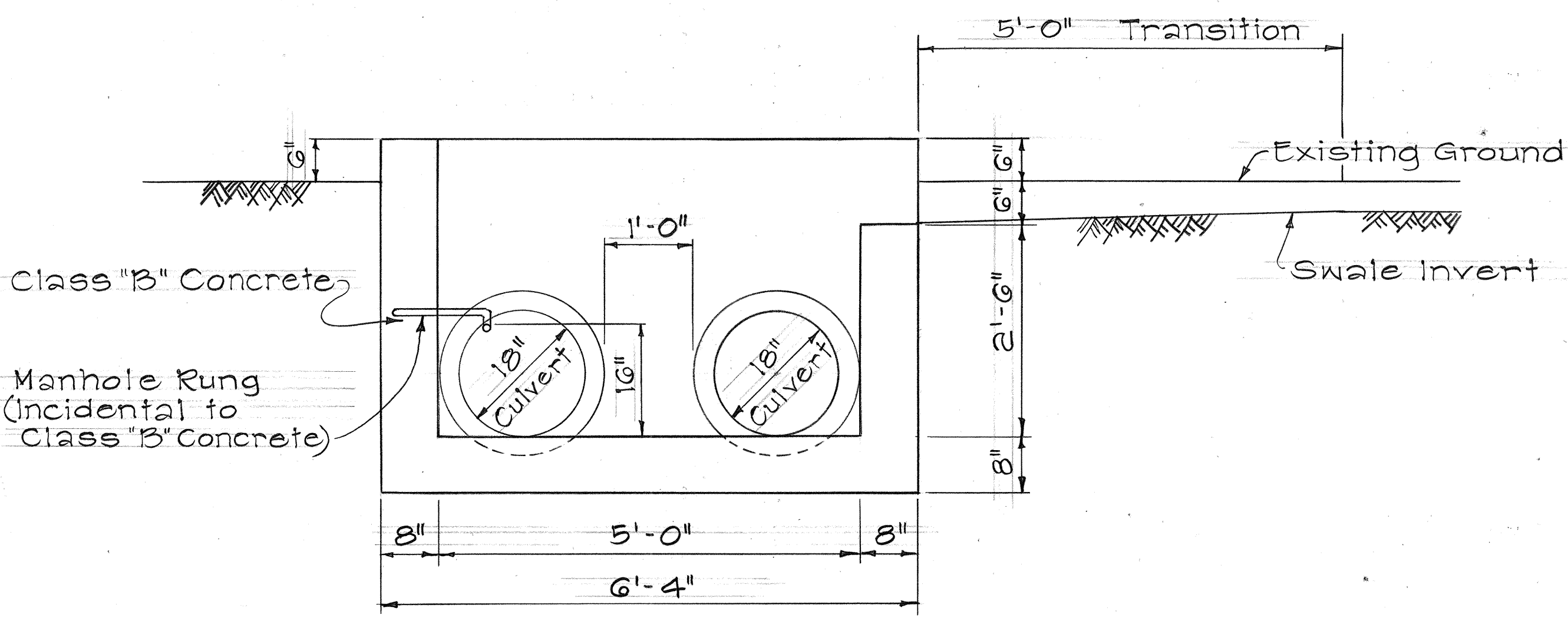
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION
DRAINAGE DETAILS

PUUNENE AVE. IMPROVEMENTS, PH. II
HAWAII ST. TO KUIHELANI HIGHWAY
F.A.M. PROJECT NO. M-3500(1)
Scale: 3/4" = 1'-0" Date: Apr. 1979
SHEET NO. 2 OF 7 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	M-3500(1)	1980	18	57



SECTION "B-B"



SECTION "A-A"

DETAIL TYPE "A" C/D AT N.B. STA. 96+95 o/s 68' RT.

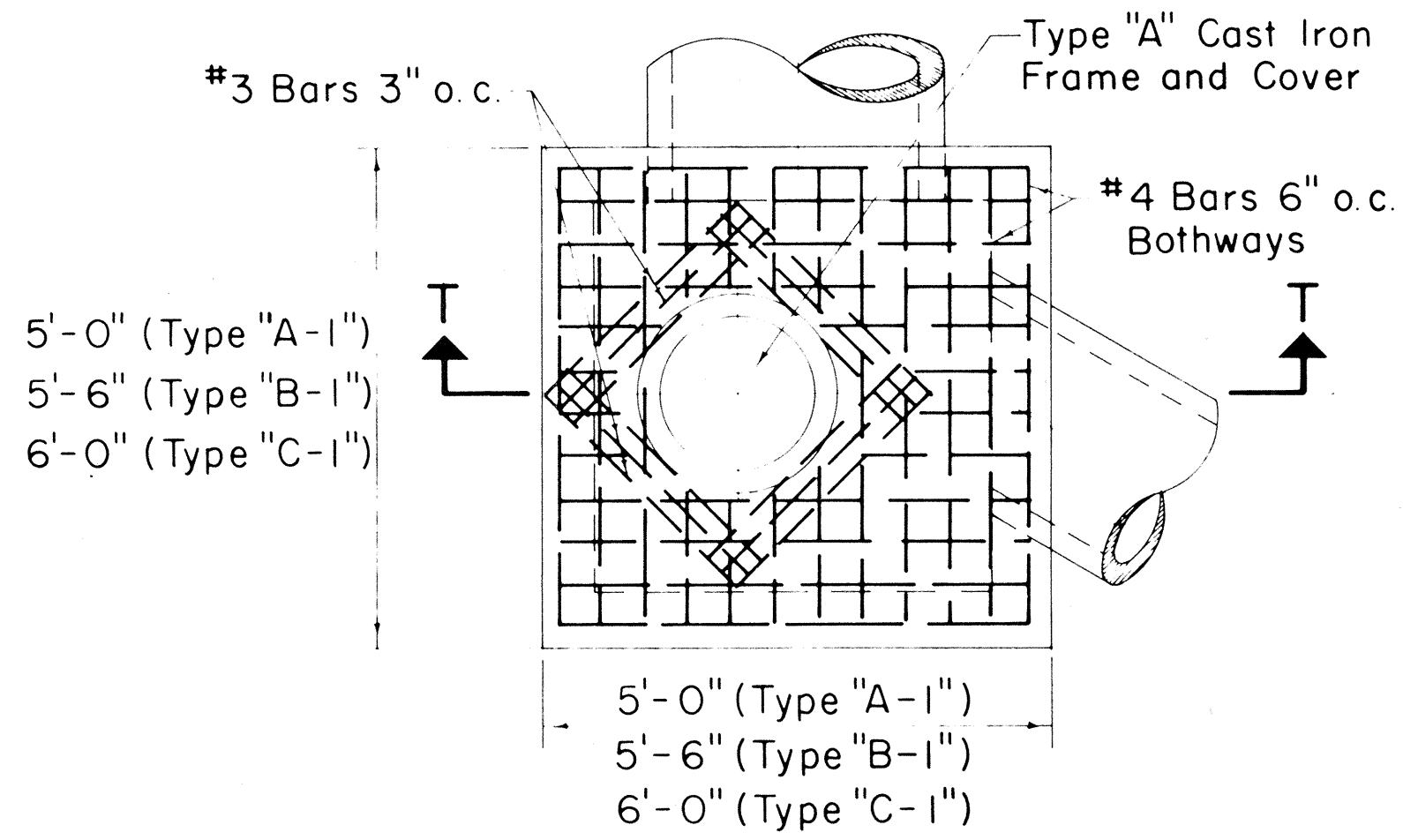
ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
TRACED BY	DRAWN BY	
NOTED BY	CHECKED BY	
No.		

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION
DRAINAGE DETAILS

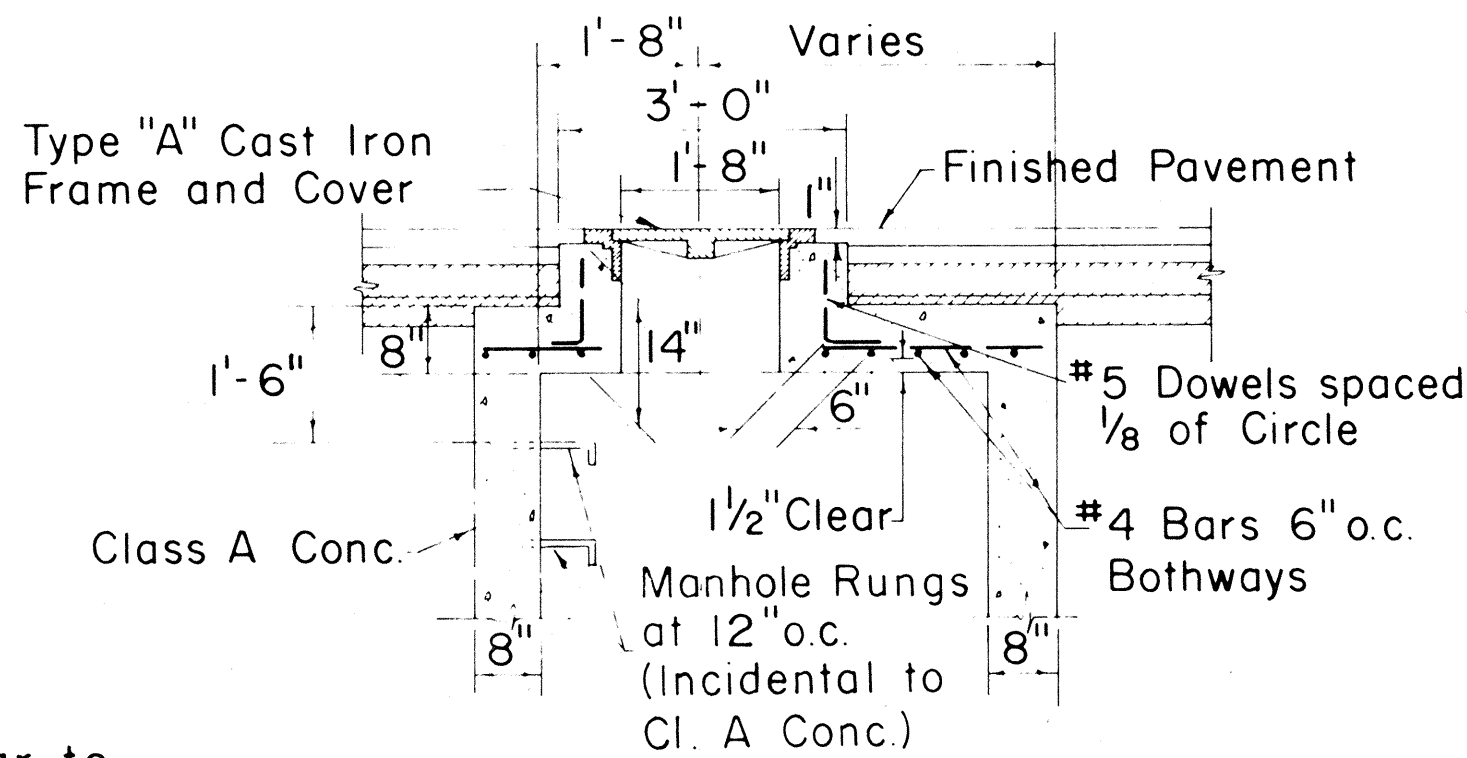
PUUNENE AVE. IMPROVEMENTS, PH. II
HAWAII ST. TO KUIHELANI HIGHWAY
F.A.M. PROJECT NO. M-3500(1)
Scale: 3/4" = 1'-0" Date:

SHEET NO. 3 OF 7 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJECT	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	M-3500(1)	1980	19	57



PLAN



SECTION T-T

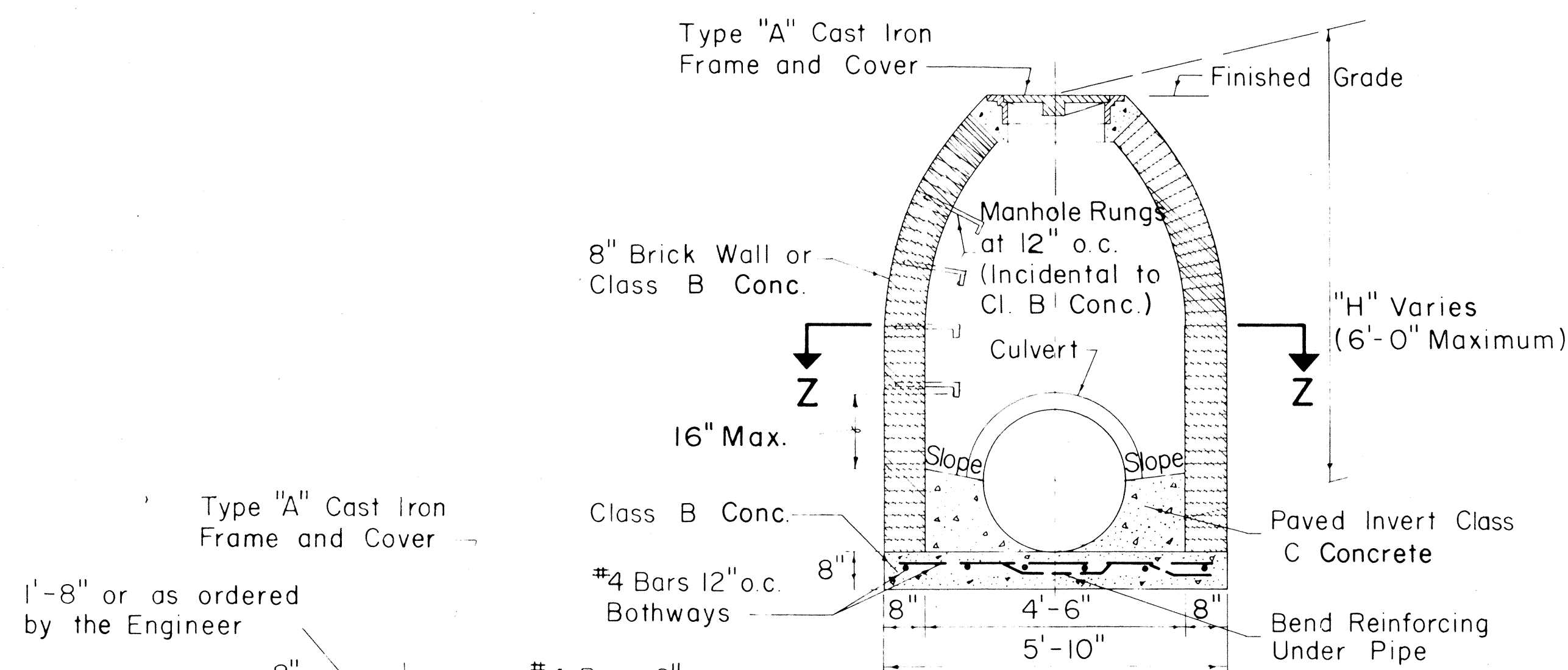
TYPE "A-I", "B-I", & "C-I"
STORM DRAIN MANHOLE
TOP DETAIL UNDER PAVEMENT

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

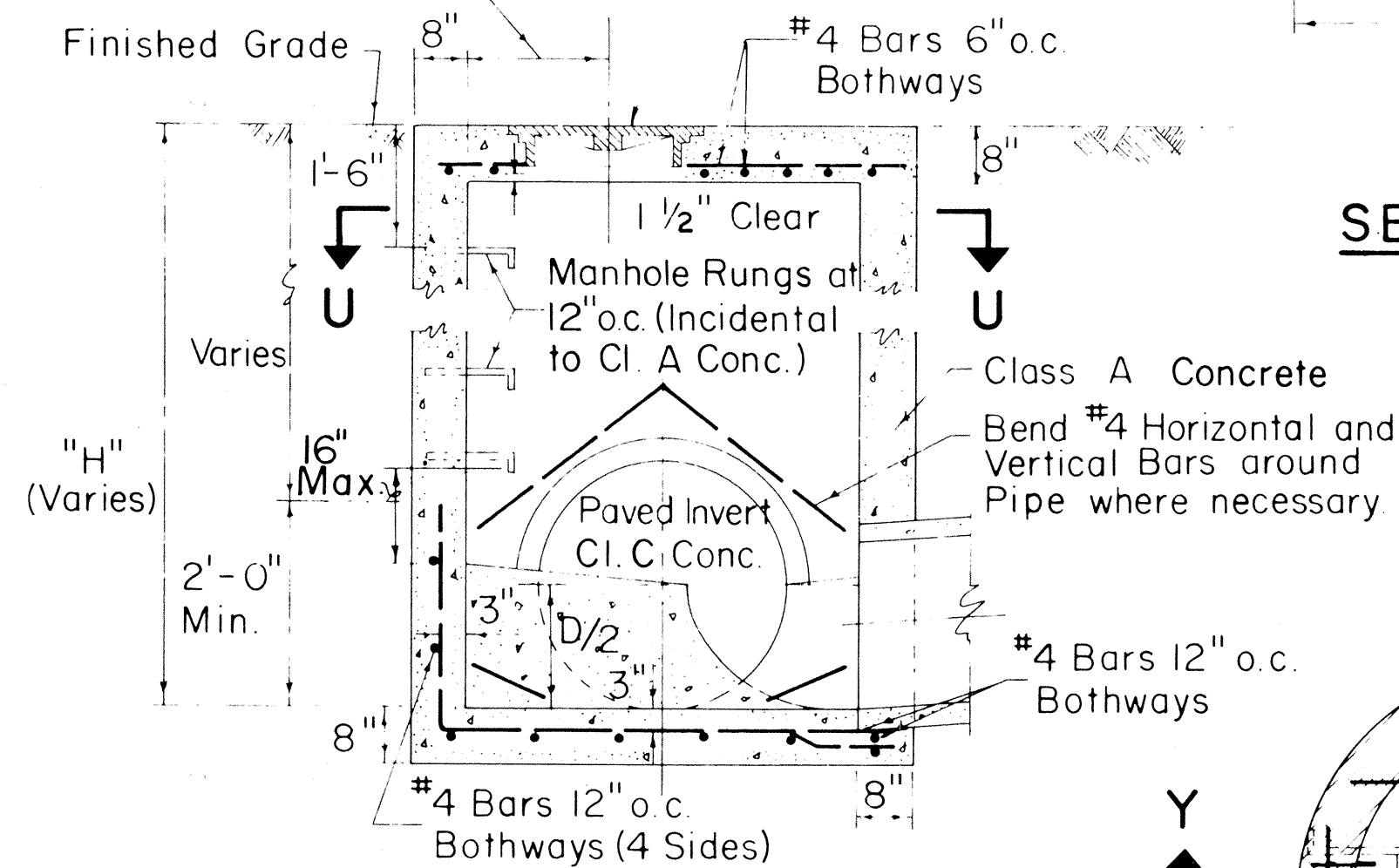
Note:
Bottom detail similar to Type "A", "B", & "C".

GENERAL NOTES

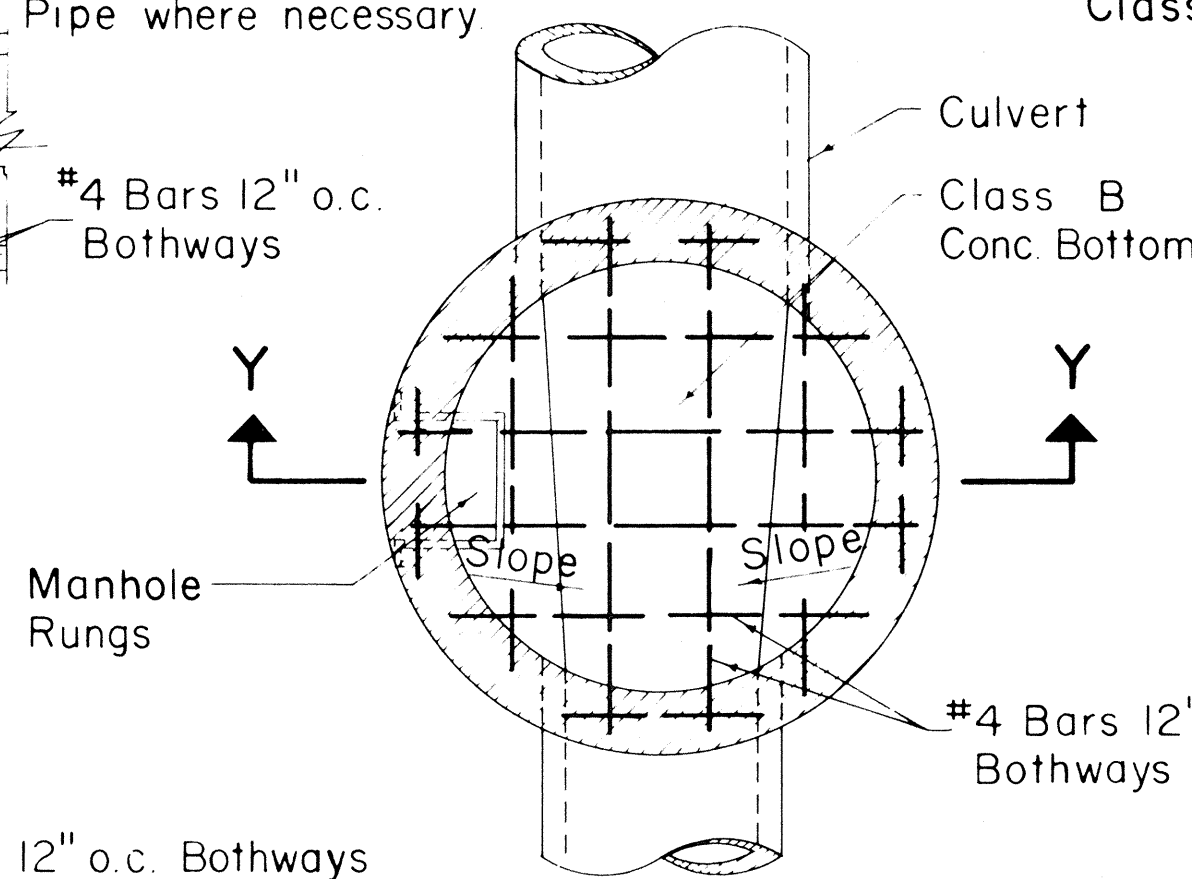
1. Culvert shall enter and leave S.D.M.H. from any position and in the direction indicated by the plans or ordered by the Engineer.
2. Manhole Rungs (12" o.c.) are required when "H" is greater than 4'-6". Only one rung (16" from the bottom) is required if "H" is 4'-6" or less. Type "A" C.I. Frame and Cover and Manhole Rungs may be placed at any location as ordered by the Engineer.



SECTION Y-Y



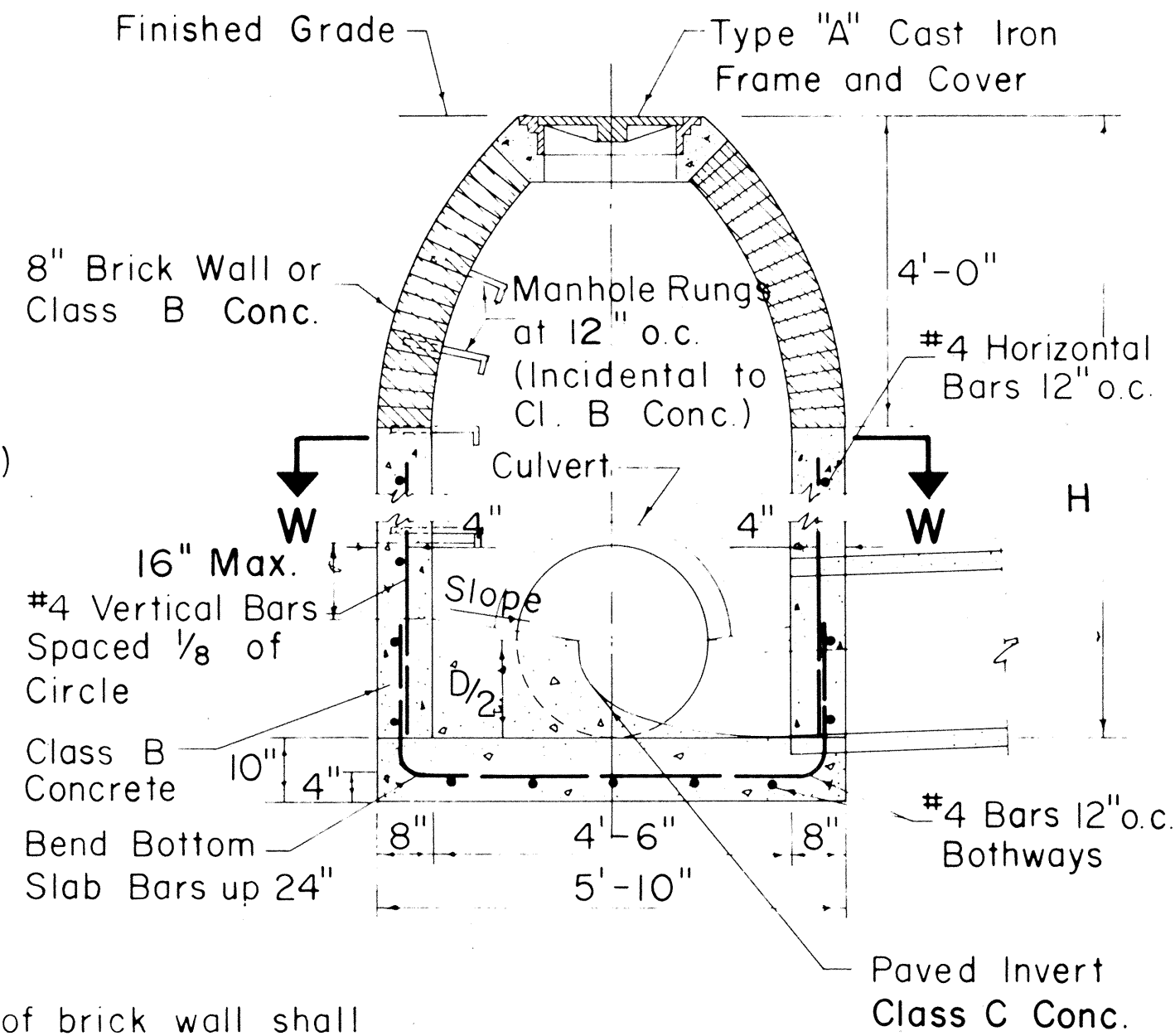
SECTION V-V



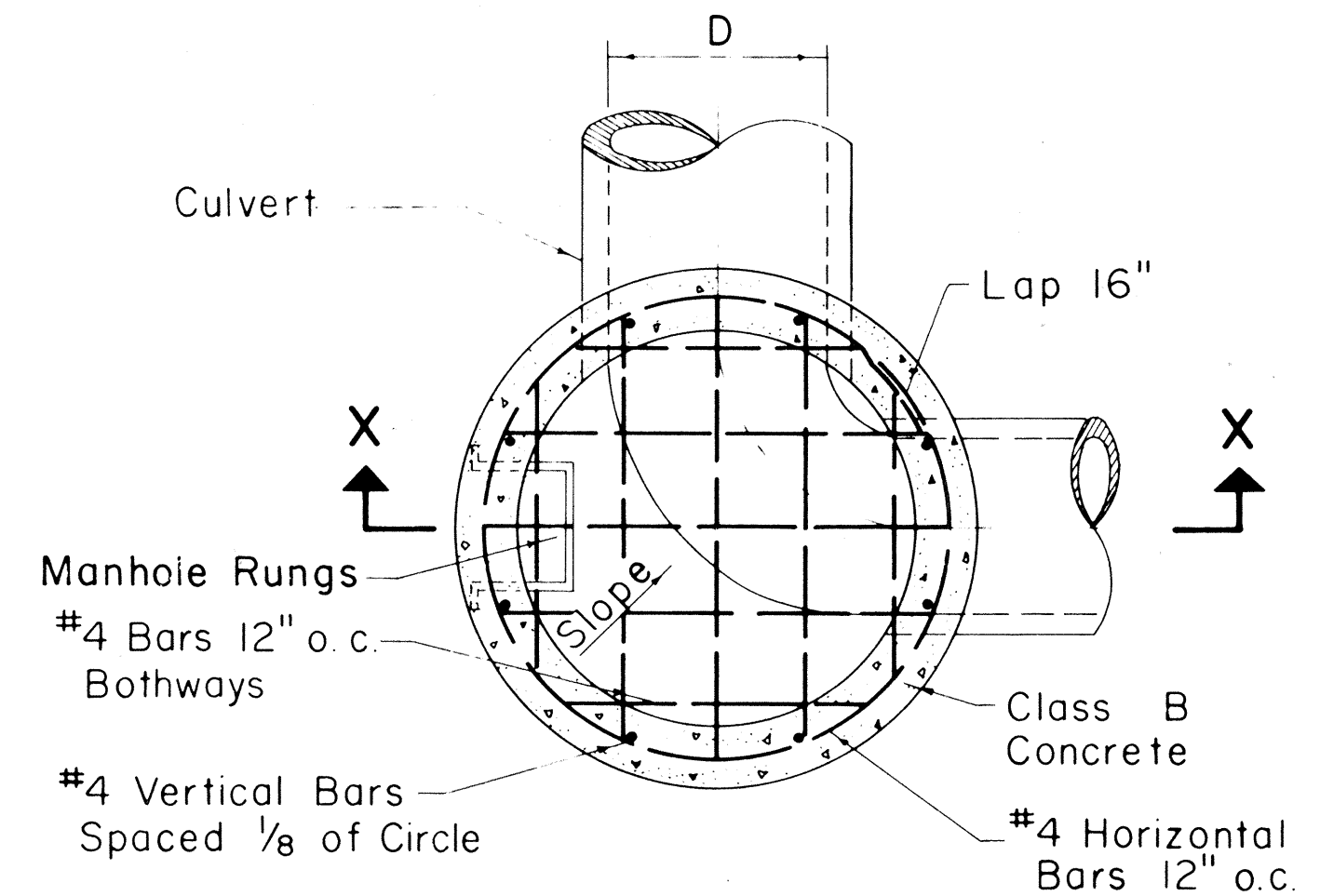
SECTION Z-Z

TYPE "D" STORM DRAIN MANHOLE

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



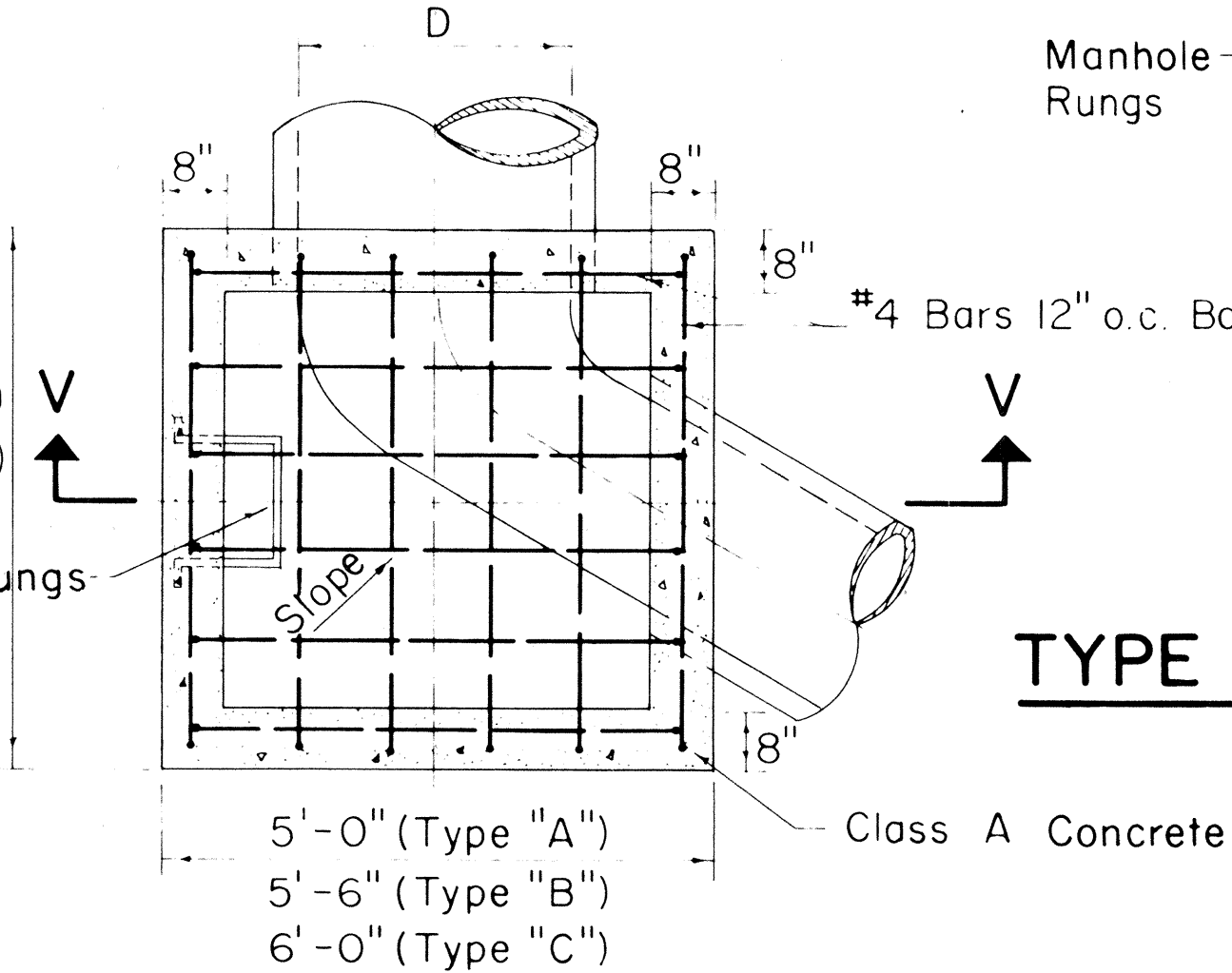
SECTION X-X



SECTION W-W

TYPE "E" STORM DRAIN MANHOLE

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



SECTION U-U

TYPE "A", "B", & "C"
S.D.M.H.

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

APPROVAL RECOMMENDED:

HYDRAULIC DESIGN ENGINEER

APPROVED:

ASST. CHIEF, ENGINEERING

12-17-69
DATE

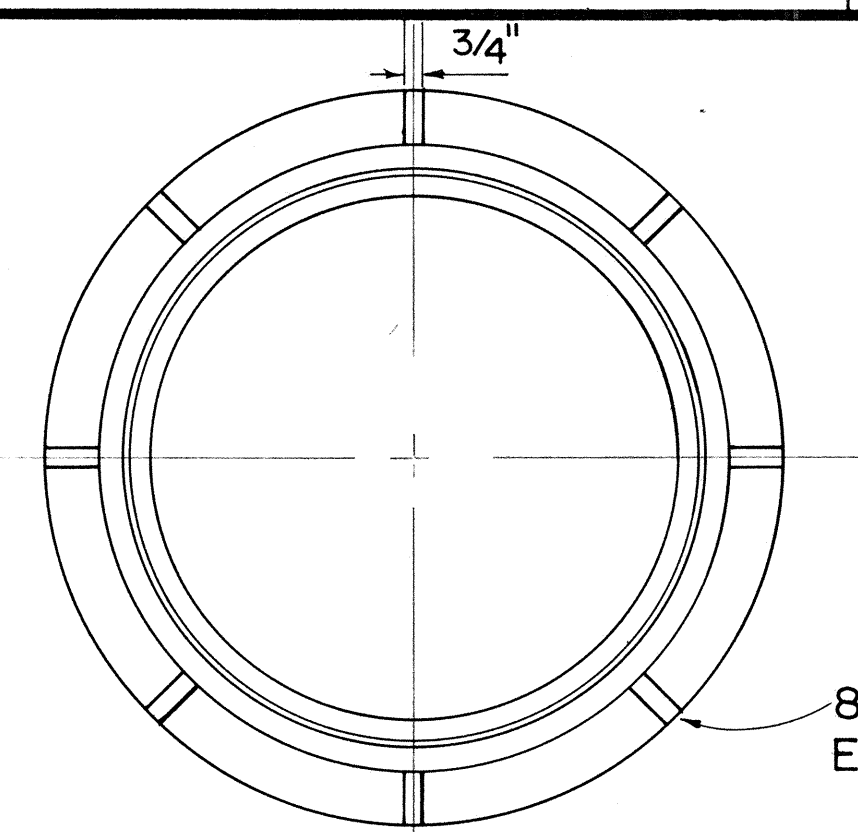
12-17-69
DATE

NO.	REVISION	APPROVED BY	DATE
1	Spacing on Manhole Rungs to conform to OSHA.	H. I.	1-21-75

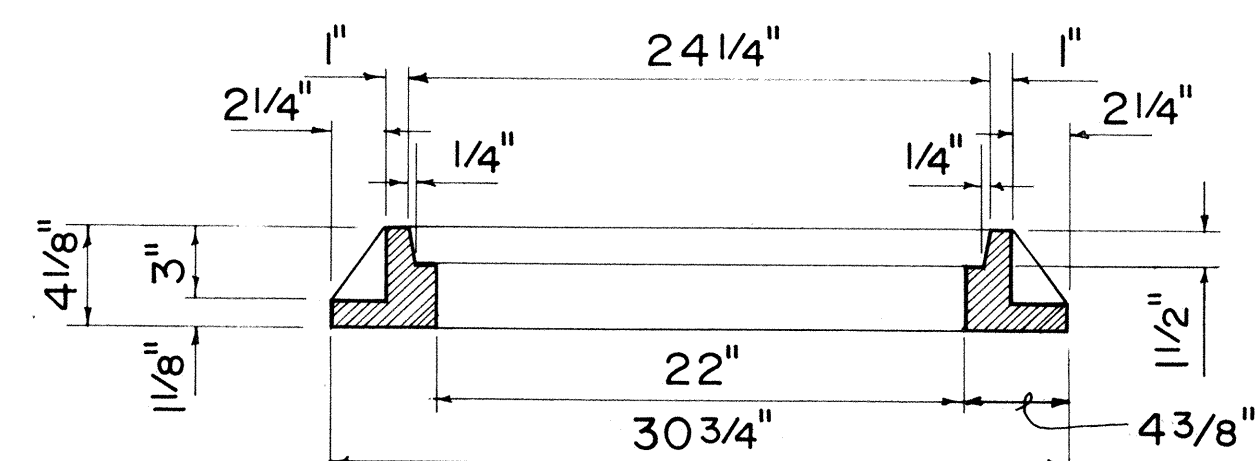
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION
STANDARD DETAILS STORM DRAIN MANHOLES
Scales: As Noted Date: July, 1969

SHEET NO. 4 OF 7 SHEETS DH 5

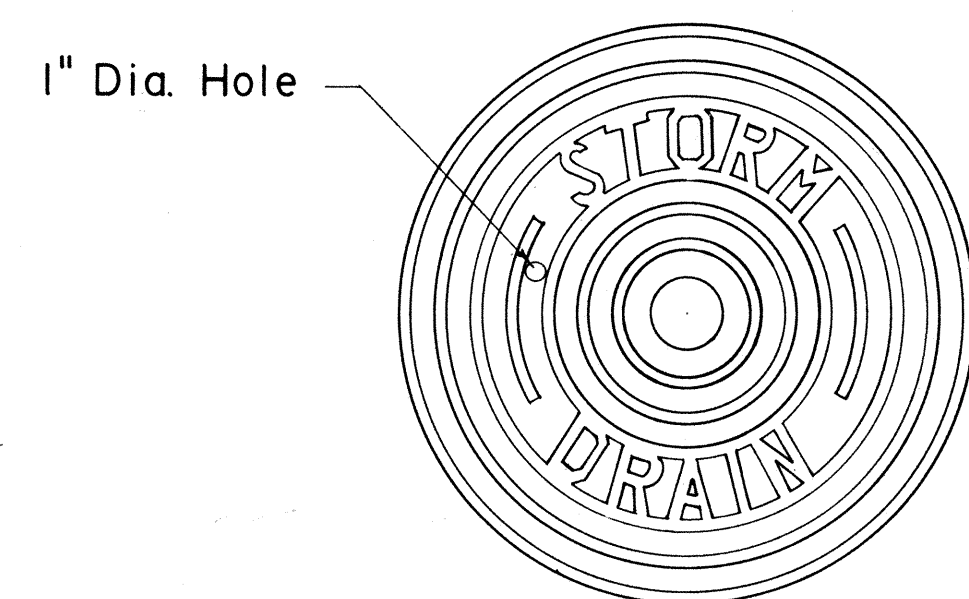
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	M-3500(1)	1980	20	57



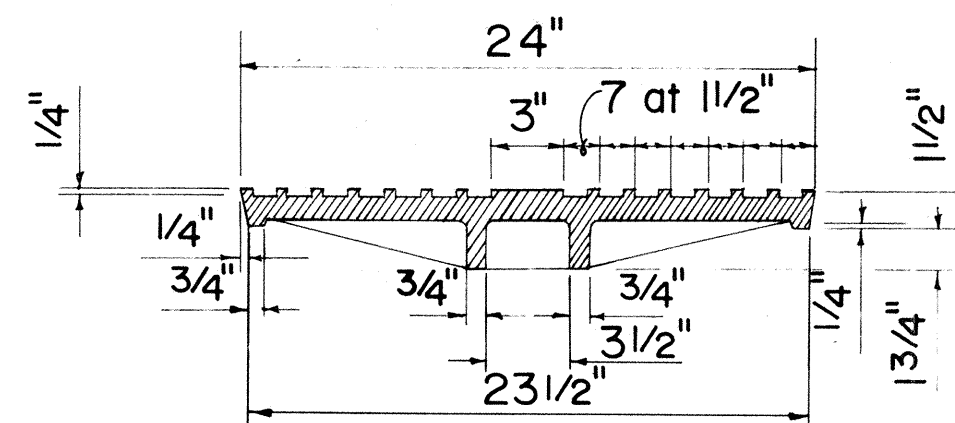
PLAN OF FRAME



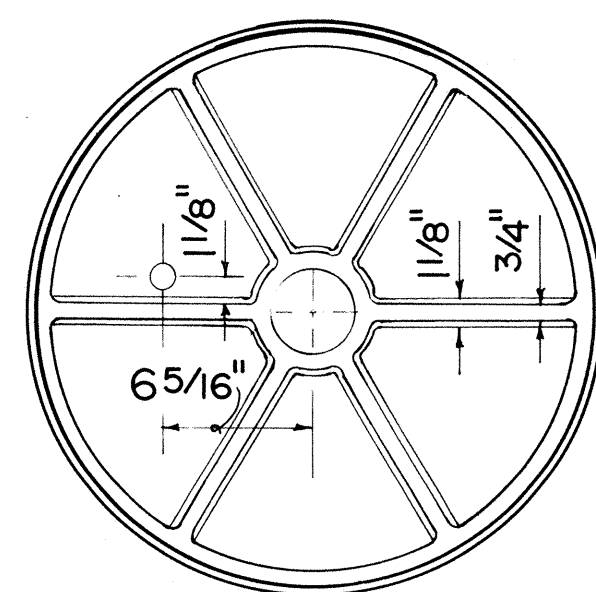
SECTION OF FRAME



TOP VIEW OF COVER

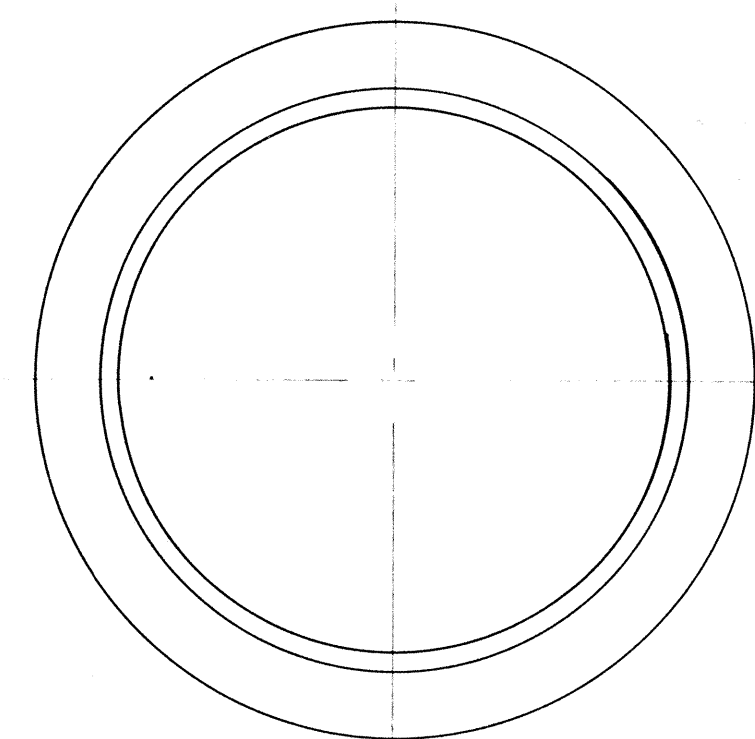


SECTION

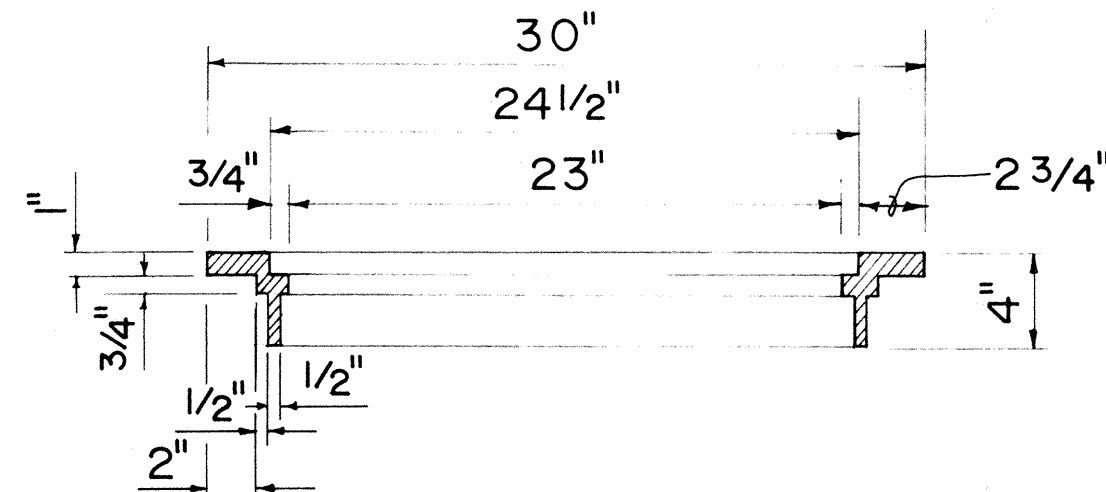


BOTTOM VIEW OF COVER

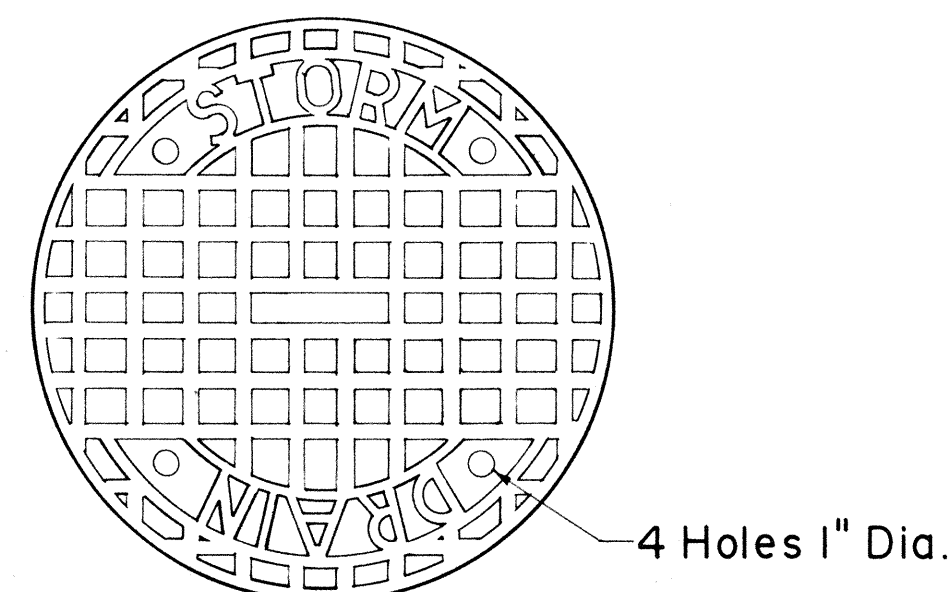
**TYPE "P" CAST IRON
FRAME AND COVER**



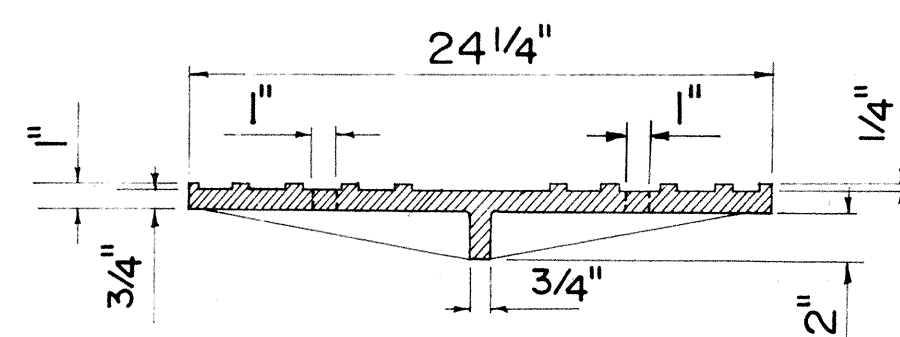
PLAN OF FRAME



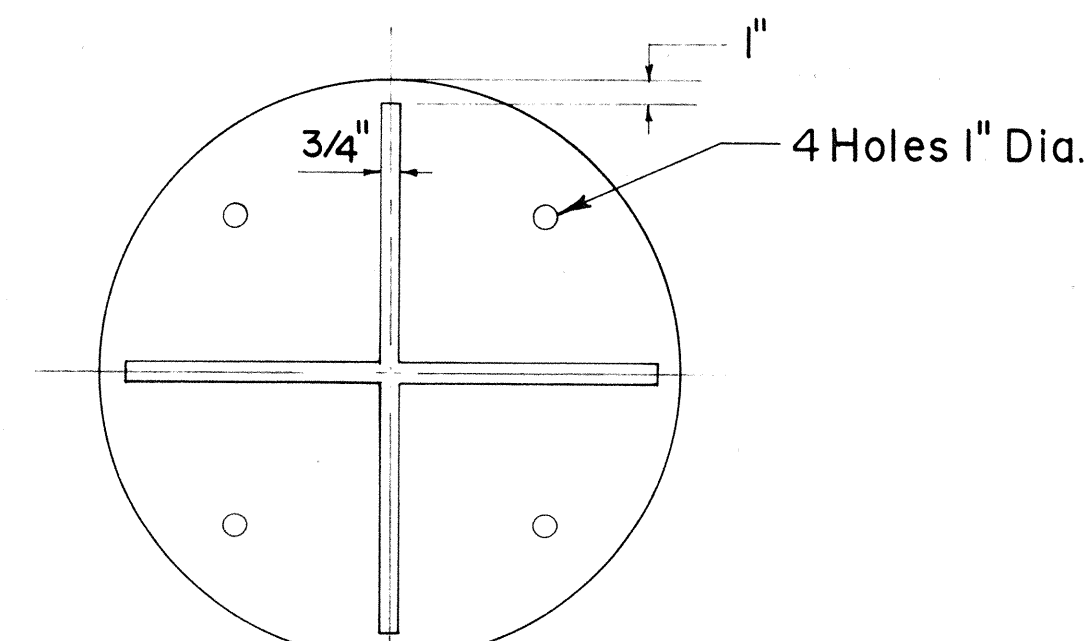
SECTION OF FRAME



TOP VIEW OF COVER

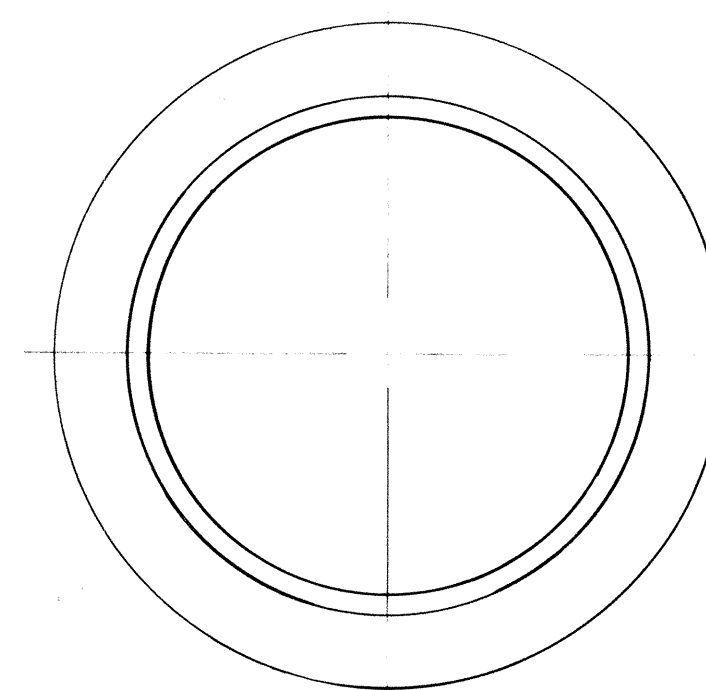


SECTION

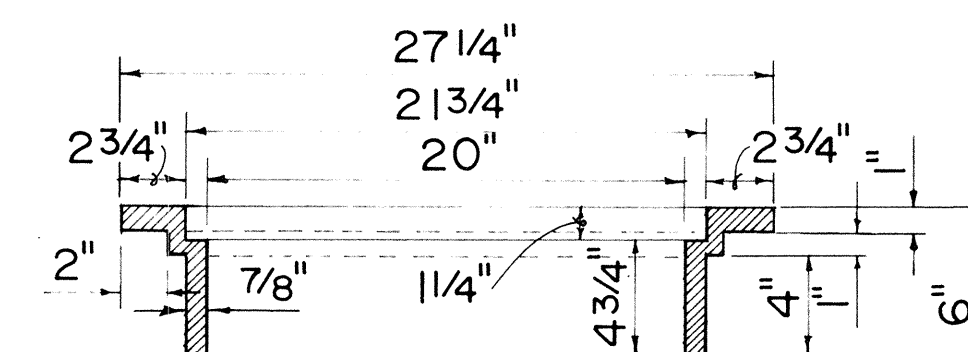


BOTTOM VIEW OF COVER

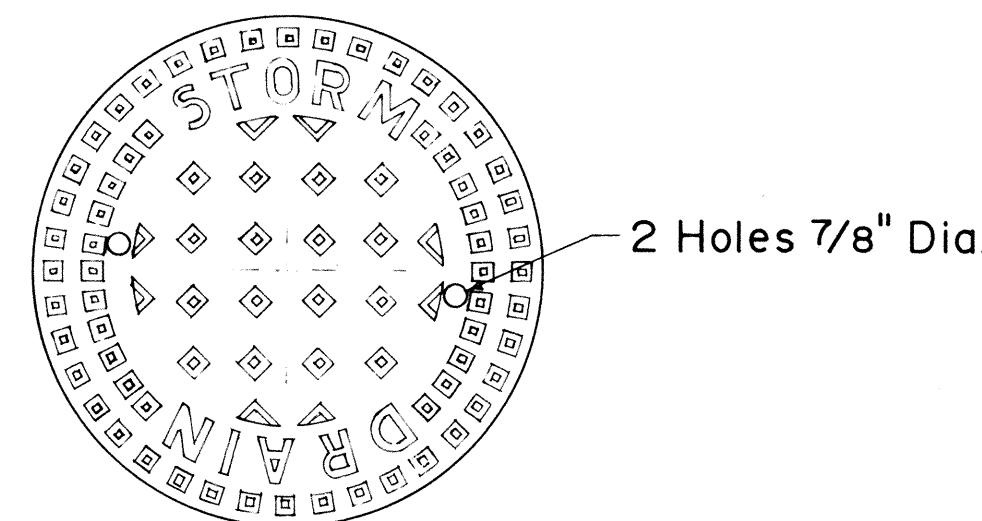
**TYPE "B" CAST IRON
FRAME AND COVER**



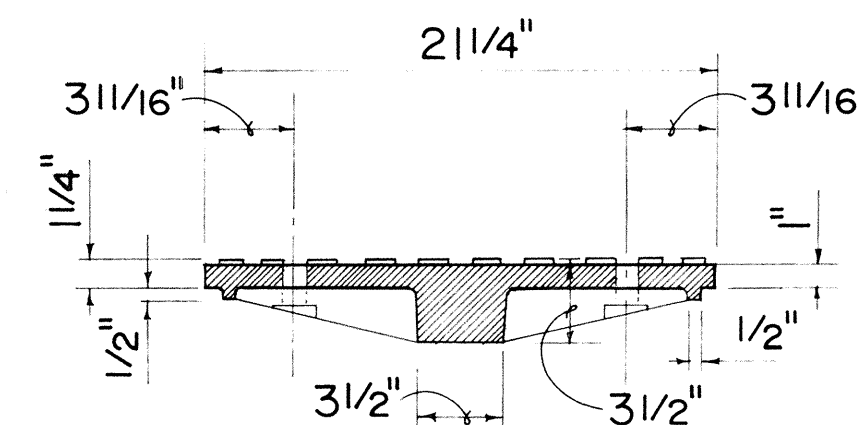
PLAN OF FRAME



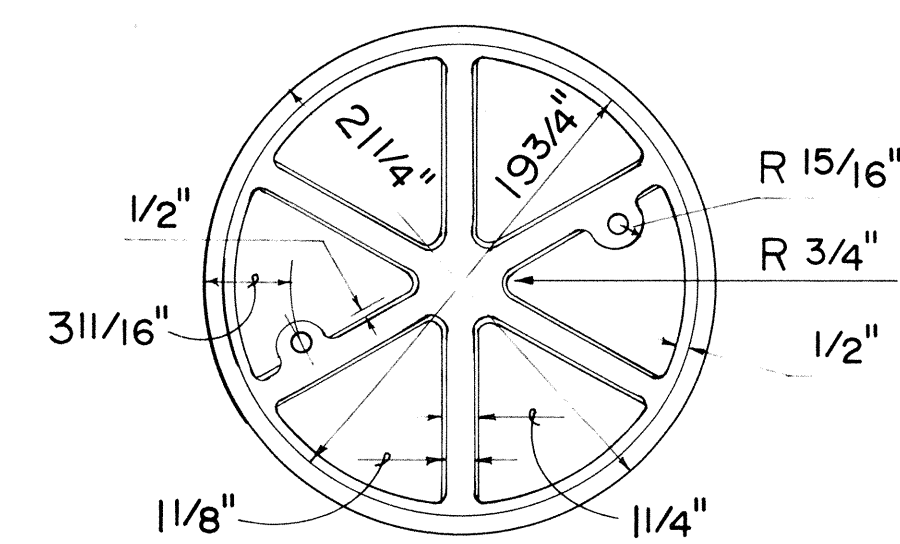
SECTION OF FRAME



TOP VIEW OF COVER

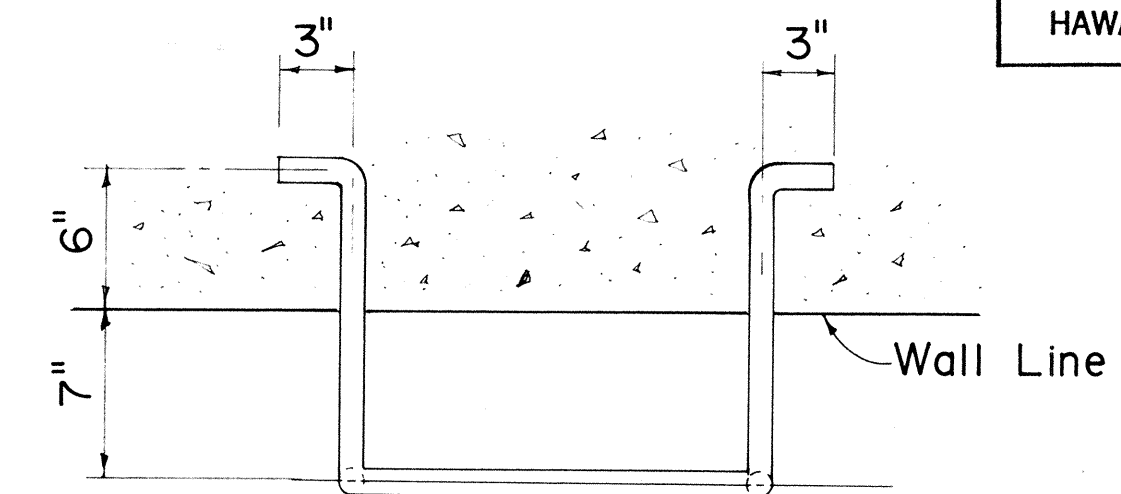


SECTION

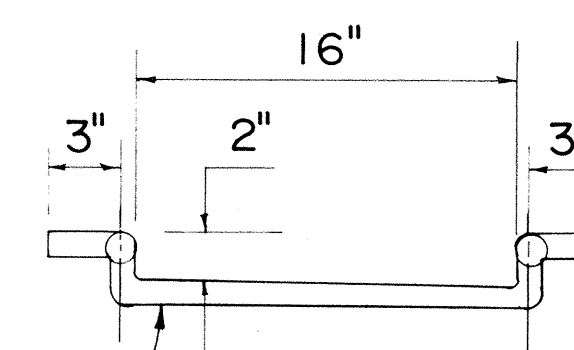


BOTTOM VIEW OF COVER

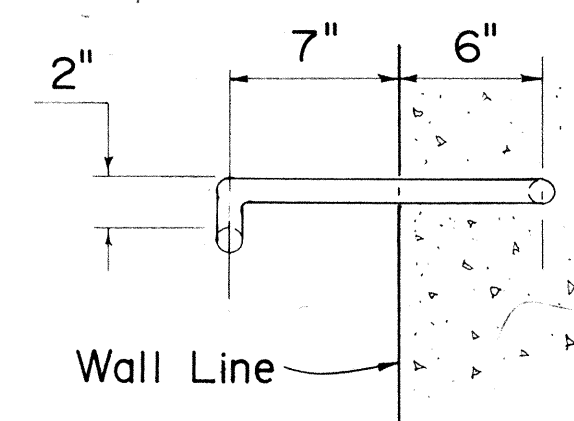
**TYPE "A" CAST IRON
FRAME AND COVER**



PLAN



FRONT VIEW



SIDE VIEW

MANHOLE RUNG

APPROVAL RECOMMENDED:
P. Takano
 HYDRAULIC DESIGN ENGINEER 6-19-79
 DATE
 APPROVED:
Harold Zakeishi
 ASSISTANT CHIEF, ENGINEERING 6-22-79
 DATE

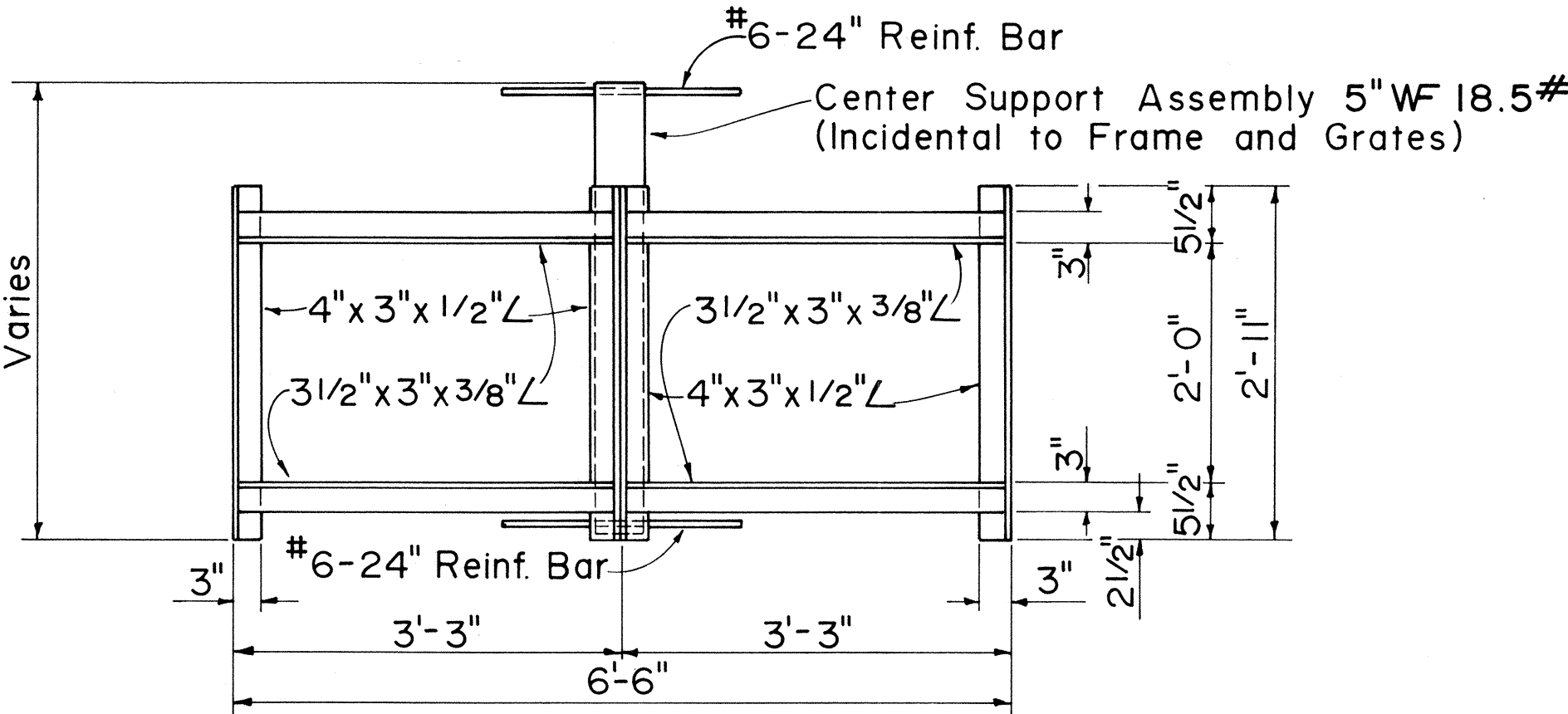
NO.	REVISION	APPROVED BY	DATE
1.	Supersedes Sht. DH 6 approved 12-17-69	H.P.	6/22/79

STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION
STANDARD DETAILS CATCH BASIN AND MANHOLE CASTINGS
Not To Scale Date: Dec. 1977
SHEET NO. 5 OF 7 SHEETS DH 6

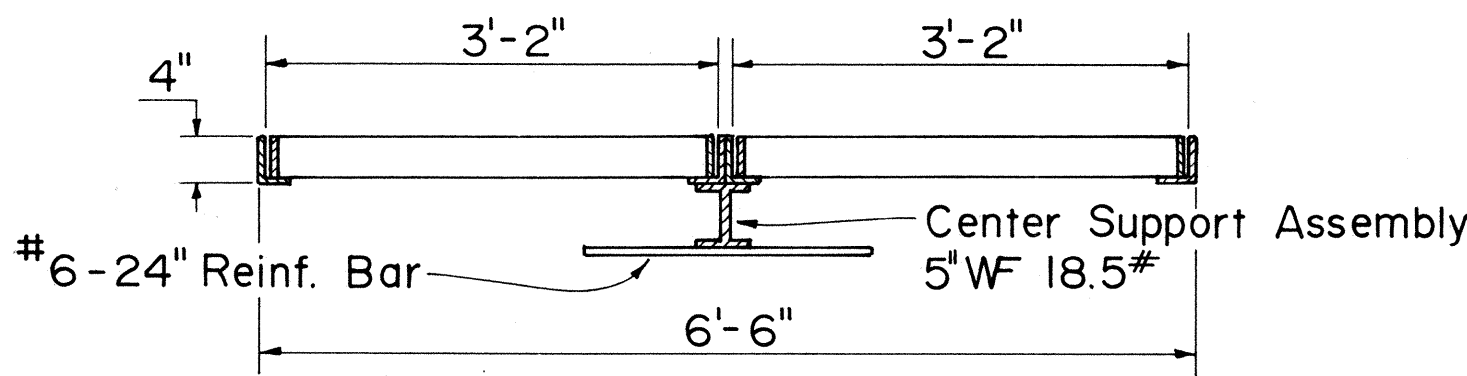
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	M-3500(1)	1980	21	57

GENERAL NOTES

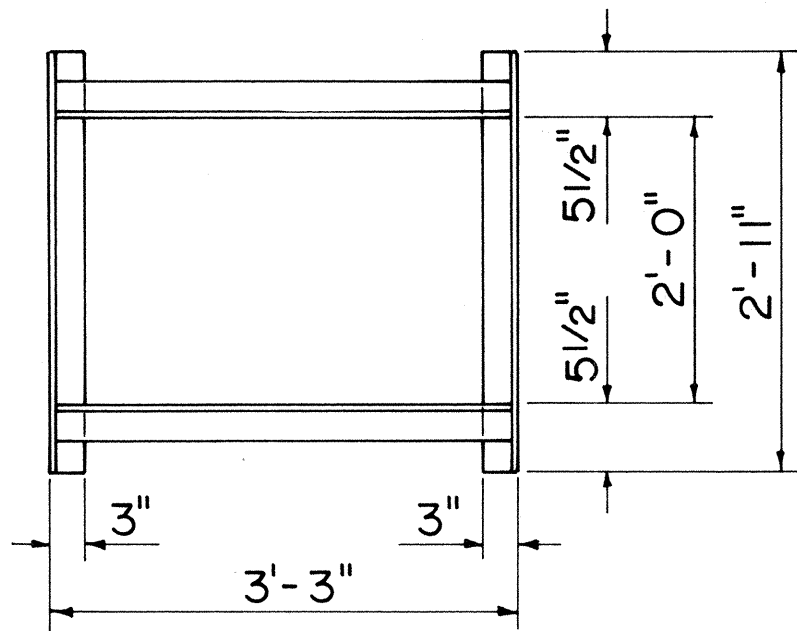
- Contractor has the option of using cast malleable iron, cast steel, welded, or bolted grate.
- All welds 3/8" unless otherwise noted.
- Type A-9 - Use in locations off the roadbed on all types of highways.
- Type A-12 - Use within the roadbed on all types of highways.



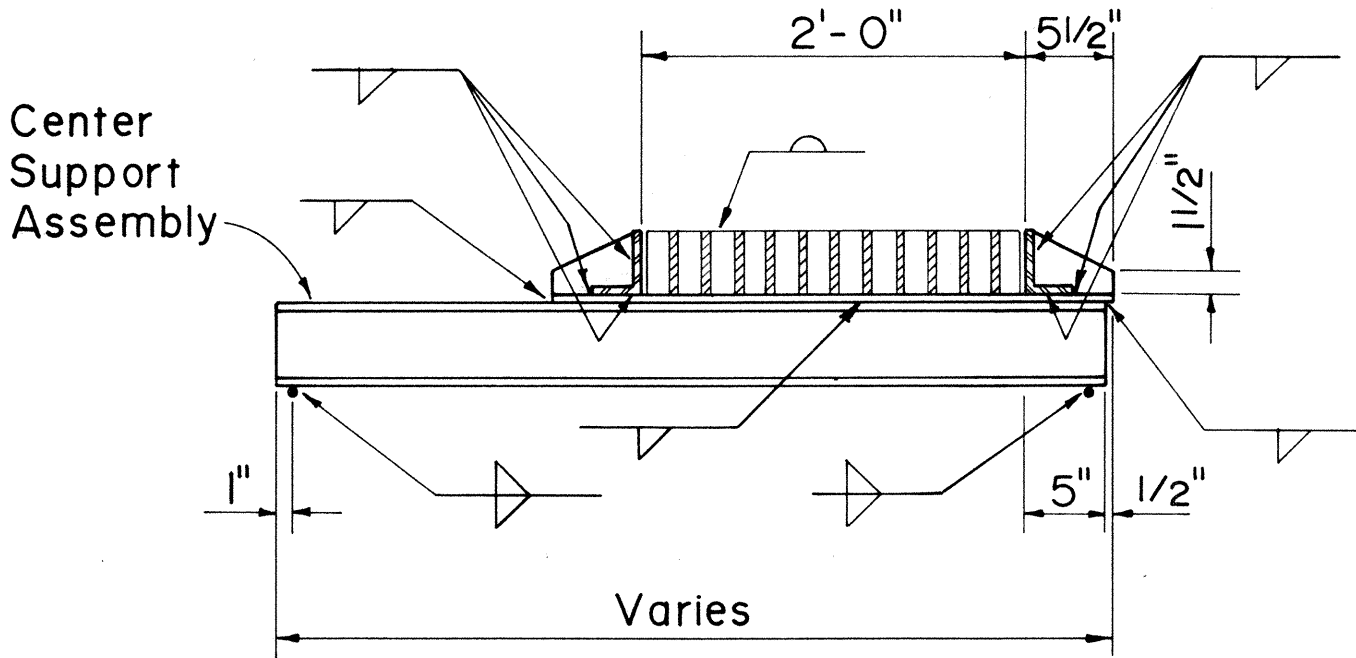
PLAN
(Two or More Grates)



LONGITUDINAL SECTION
(Thru Frame & Grate)

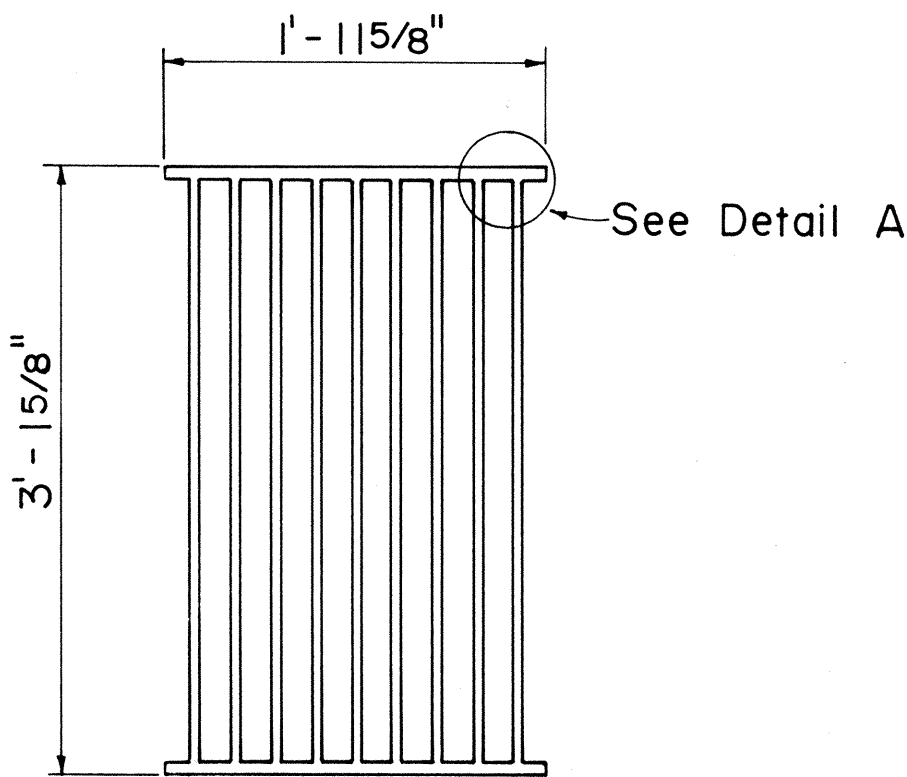


PLAN
(Single Grate)

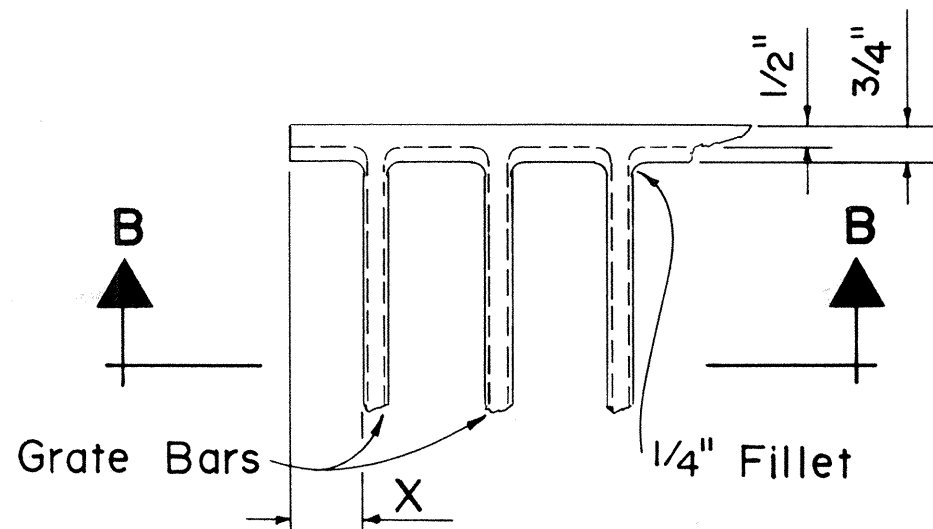


CROSS SECTION
(Thru Frame & Grate)

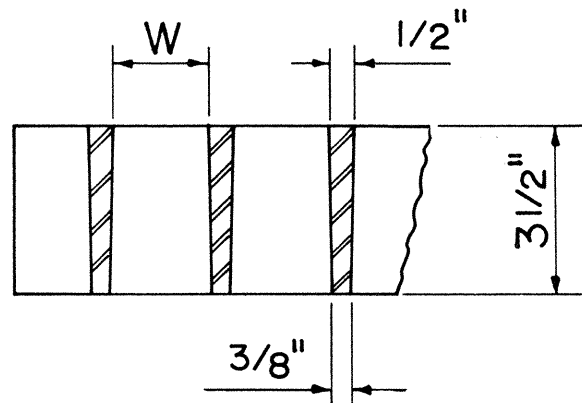
FRAME DETAILS



PLAN

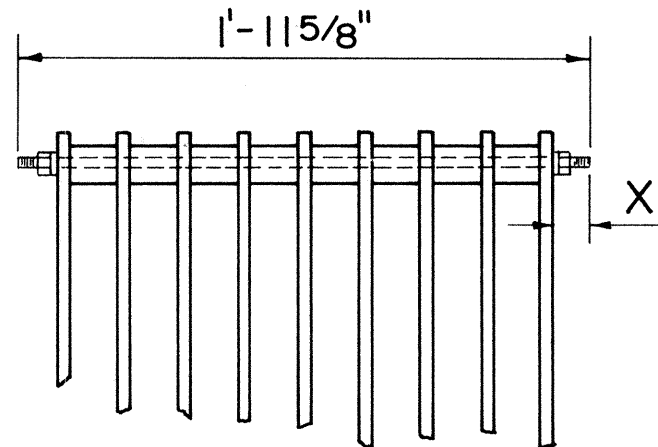


DETAIL A

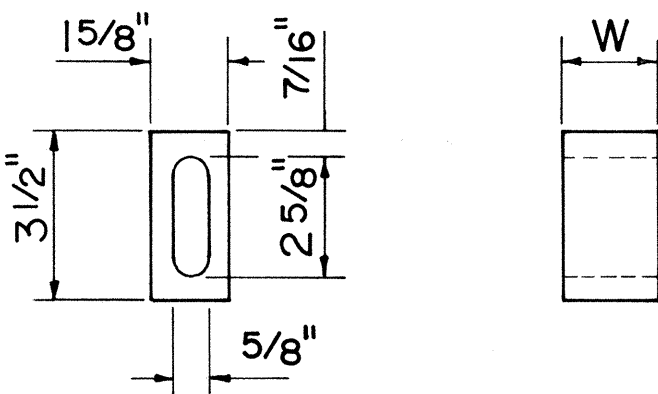


SECTION B-B

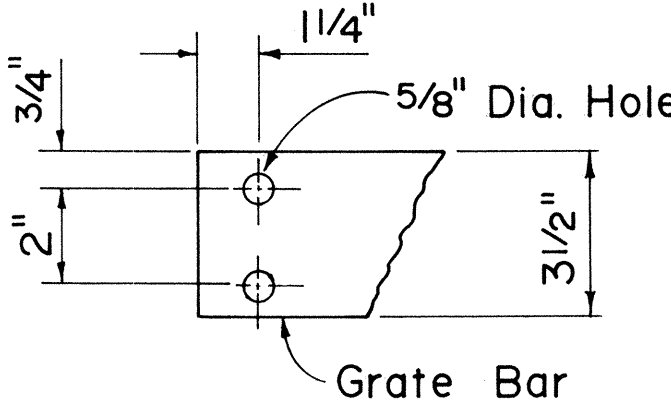
ALTERNATIVE CAST MALLEABLE IRON OR CAST STEEL GRATE



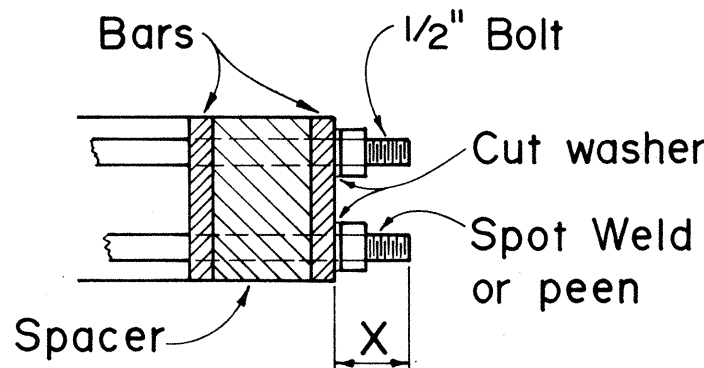
BOLTED END BLOCK



BAR SPACER

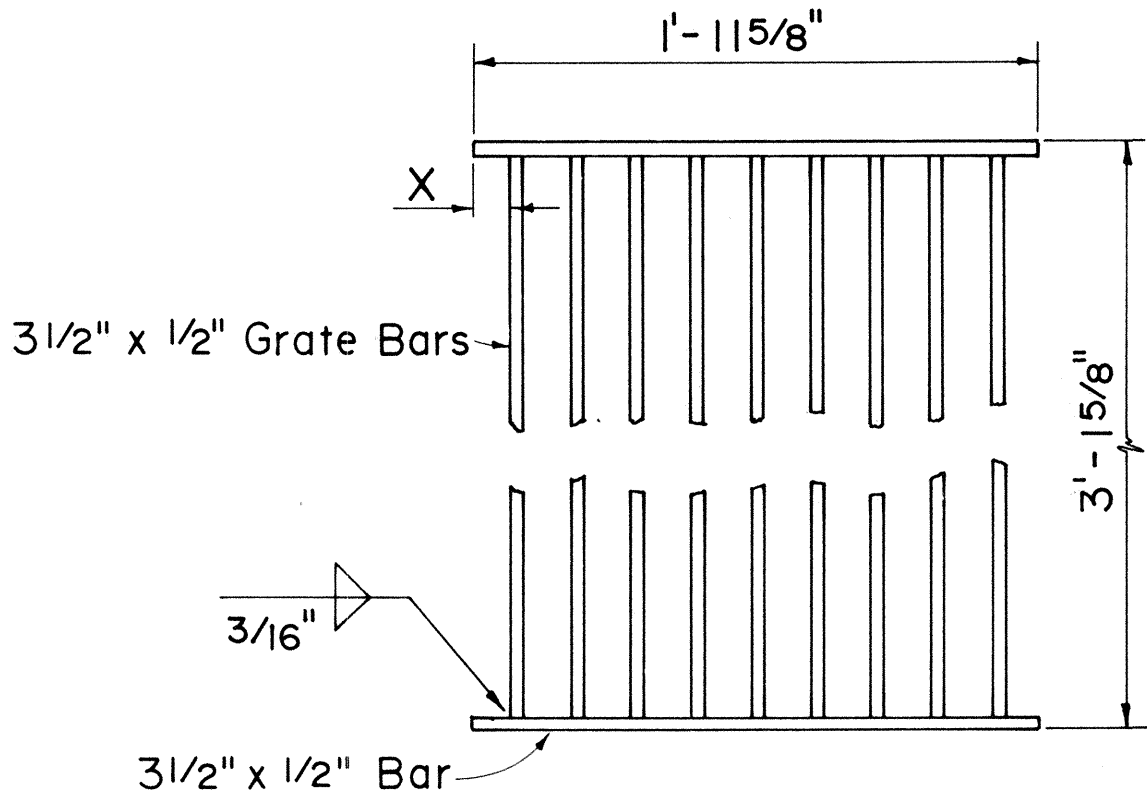


END OF BAR

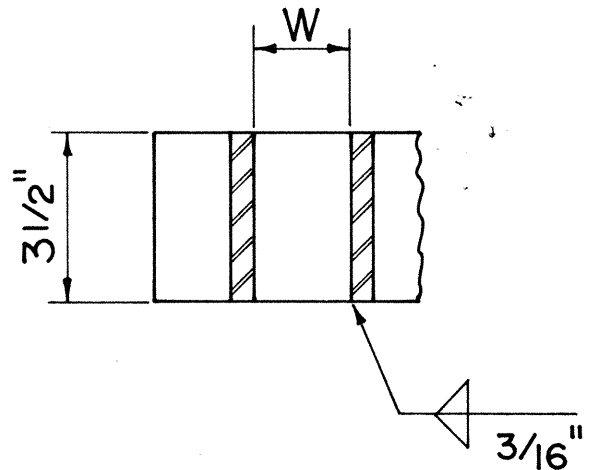


BOLTING DETAIL

ALTERNATIVE BOLTED GRATE



PLAN



SECTION

ALTERNATIVE WELDED GRATE

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"

NO.	REVISION	APPROVED BY	DATE
1.	Supersedes Sht. DH 7 approved 12-17-69	H.I.	6/22/79

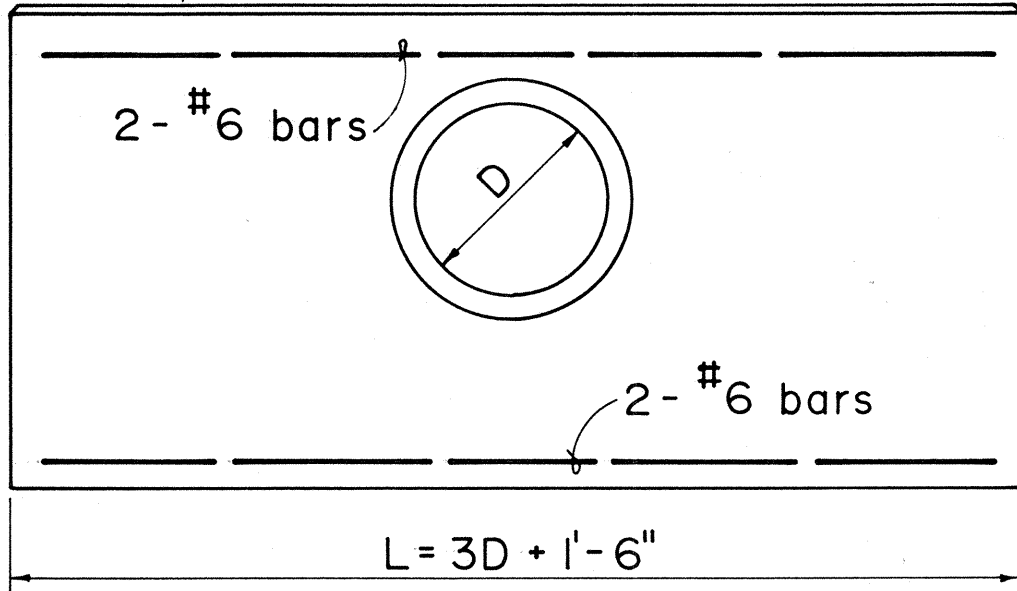
APPROVAL RECOMMENDED:
G. J. J. J.
 HYDRAULIC DESIGN ENGINEER 6-19-79
 DATE
 APPROVED:
Herbert Zaleski
 ASSISTANT CHIEF, ENGINEERING 6-22-79
 DATE

STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION			
STANDARD DETAILS			
TYPE A-9 AND A-12 FRAMES AND GRATES			
Not To Scale		Date: Dec. 1977	

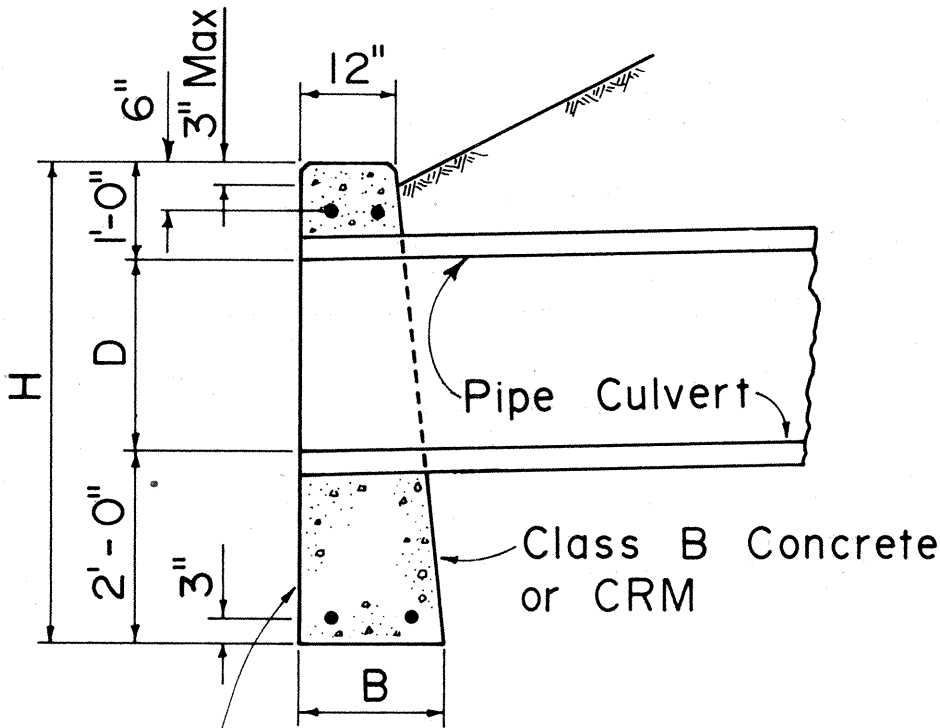
SHEET NO. 6 OF 7 SHEETS DH 7

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	M-3500(1)	1980	22	57

Chamfer all exposed edges one inch



ELEVATION



Culvert shall be neatly cut flush with this face.

SECTION

DATA FOR CONC. HDWL.			
D	B	L	H
18"	1'-6"	6'-0"	4'-6"
24"	1'-6"	7'-6"	5'-0"
30"	2'-0"	9'-0"	5'-6"
36"	2'-0"	10'-6"	6'-0"
42"	2'-6"	12'-0"	6'-6"
48"	2'-6"	13'-6"	7'-0"

DATA FOR CRM HDWL.			
D	B	L	H
18"	1'-9"	6'-0"	4'-6"
24"	2'-0"	7'-6"	5'-0"
30"	2'-3"	9'-0"	5'-6"
36"	2'-6"	10'-6"	6'-0"

CONCRETE OR CRM HEADWALL

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

APPROVAL RECOMMENDED:
P. Nakano
 HYDRAULIC DESIGN ENGINEER 6-19-79
 DATE
 APPROVED:
Harbert Zaleishi 6-22-79
 ASSISTANT CHIEF, ENGINEERING DATE

NO.	REVISION	APPROVED BY	DATE
I.	Supersedes Sht. DH 10 approved 12-17-69	H.T.	6/22/79

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION

STANDARD DETAIL
 CONCRETE OR CEMENT
 RUBBLE MASONRY HEADWALLS

Not To Scale

Date: June 1979