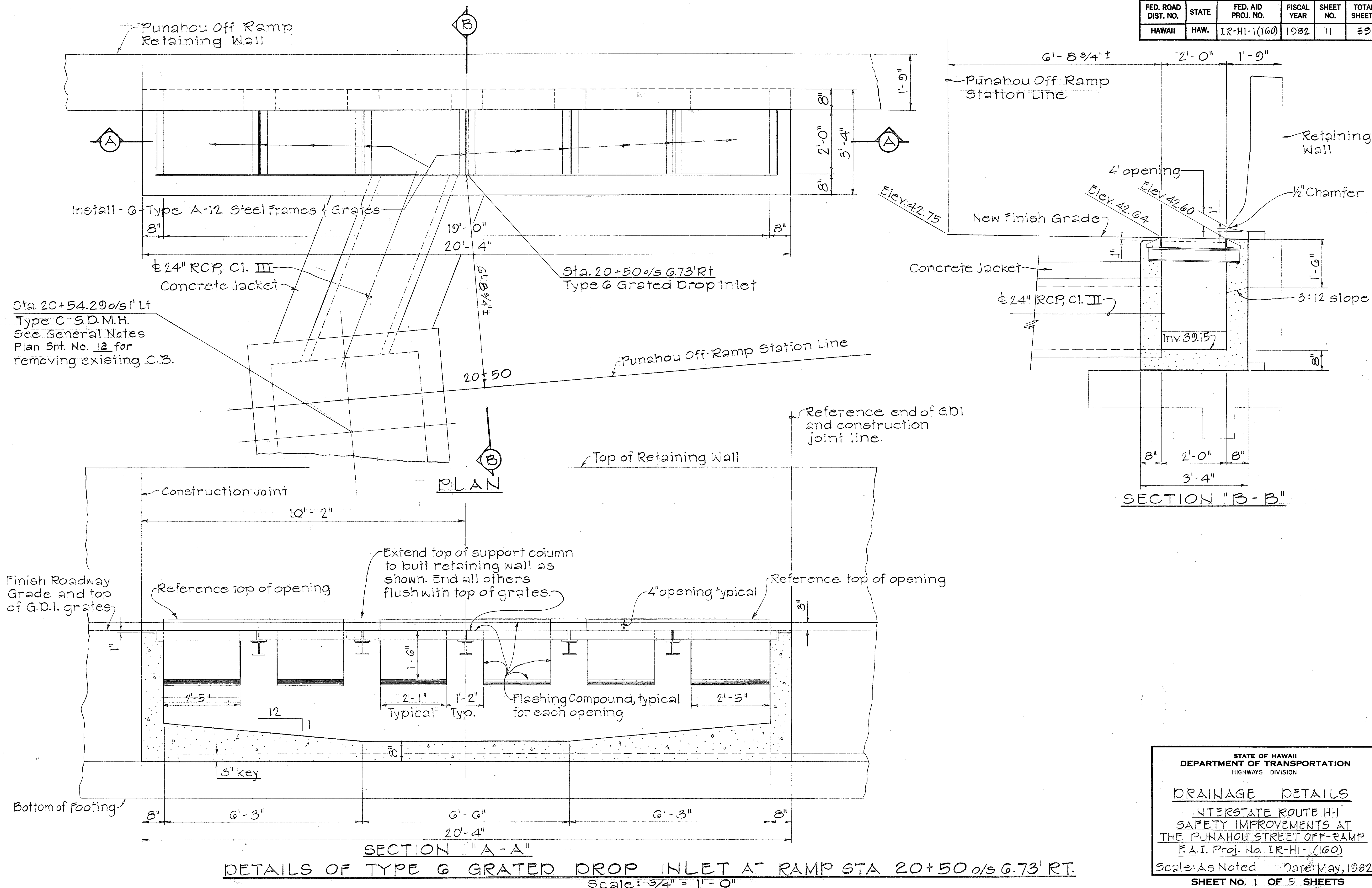


FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IR-HI-1(160)	1982	11	39



ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NO. 1	DRAWN BY	
	DESIGNED BY	
	CHECKED BY	

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

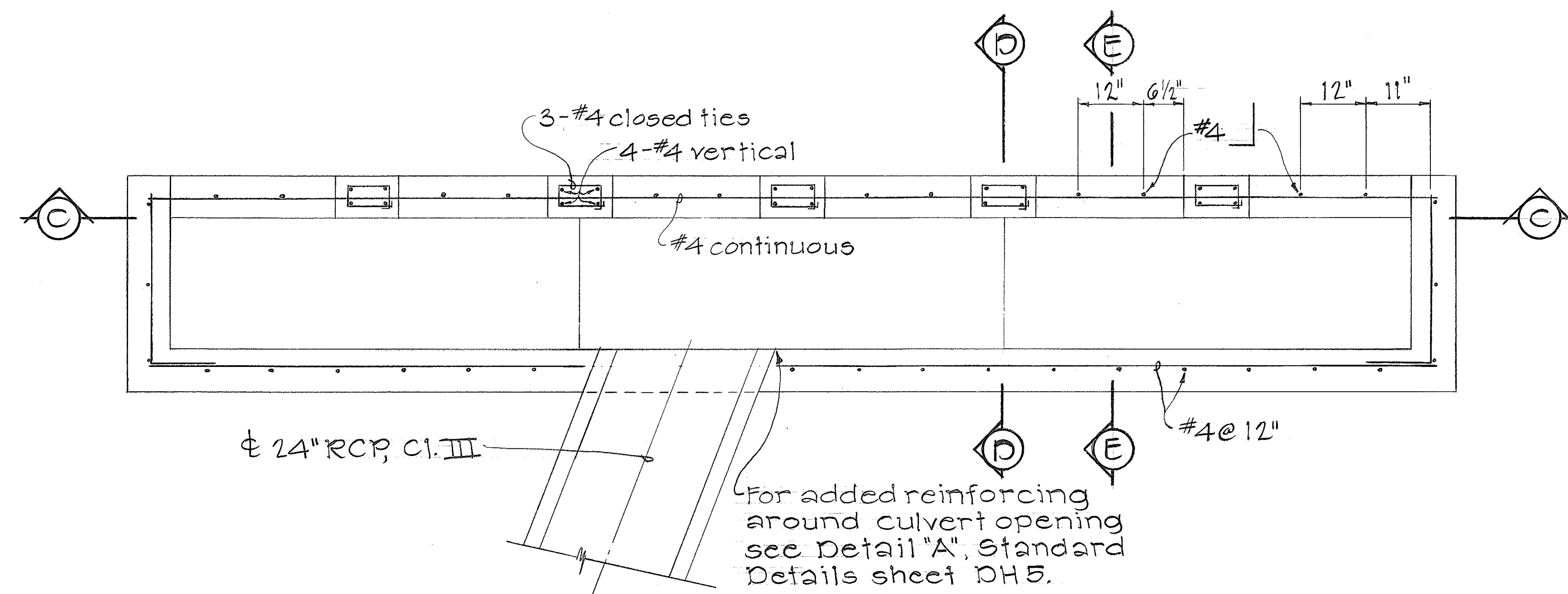
DRAINAGE DETAILS

INTERSTATE ROUTE H-1
SAFETY IMPROVEMENTS AT
THE PUNAHOU STREET OFF-RAMP
F.A.I. Proj. No. IR-HI-1(160)

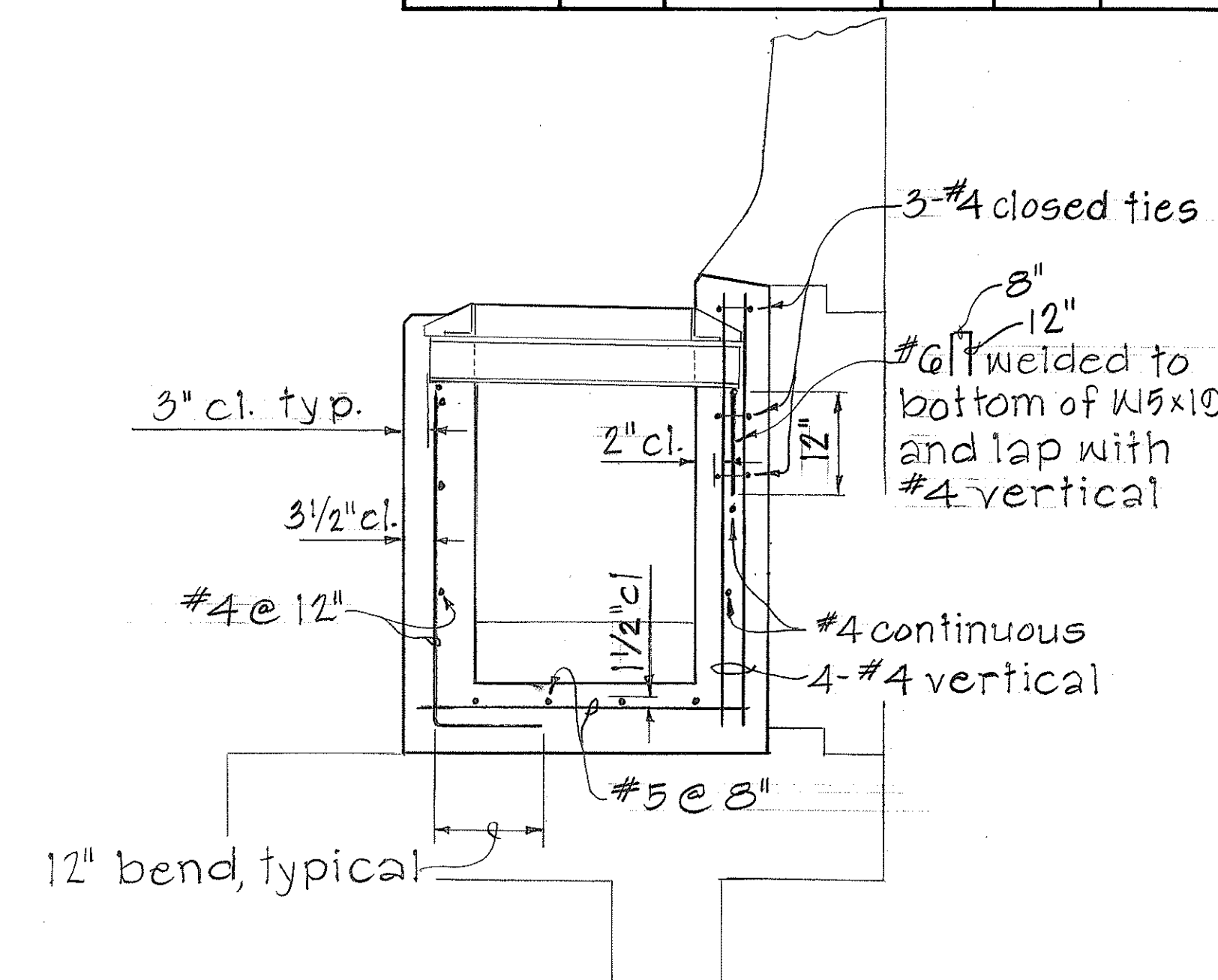
Scale: As Noted Date: May, 1982

SHEET NO. 1 OF 5 SHEETS

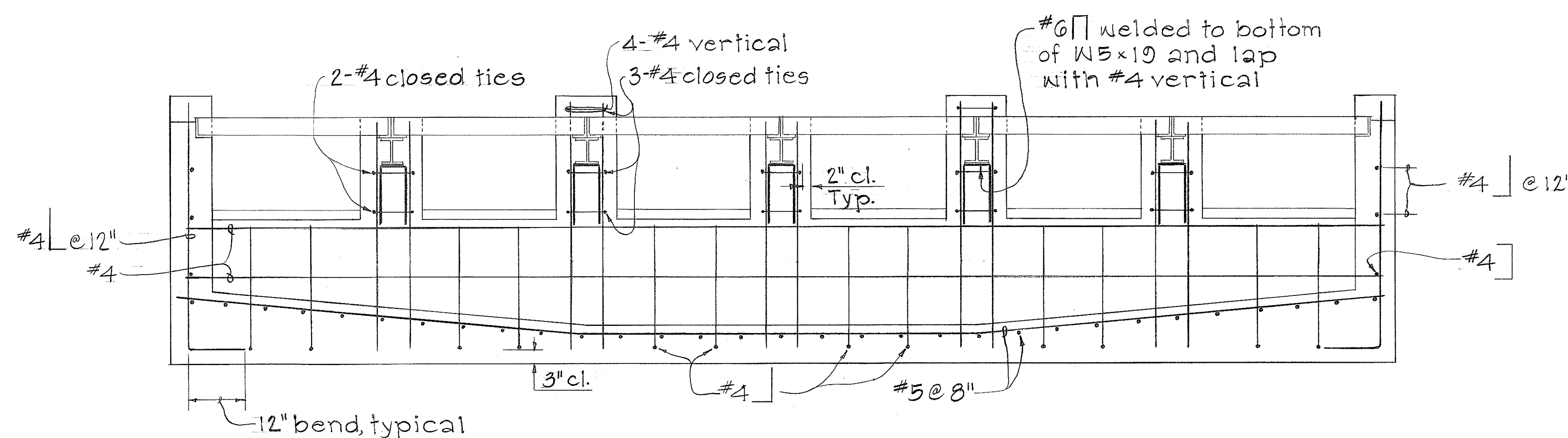
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IR-HI-1(160)	1982	12	39



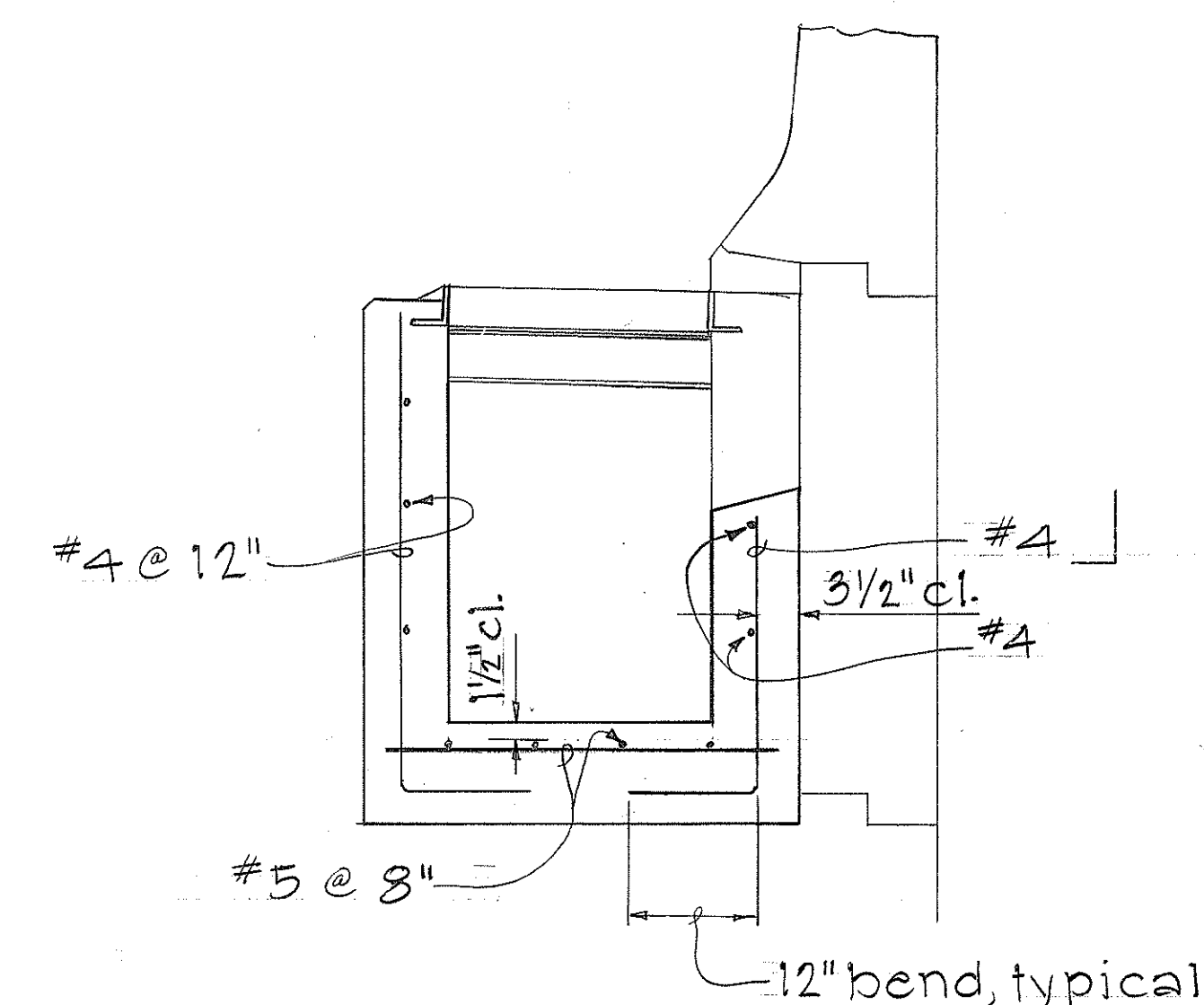
PLAN VIEW OF REINFORCING STEEL



SECTION "D-D"



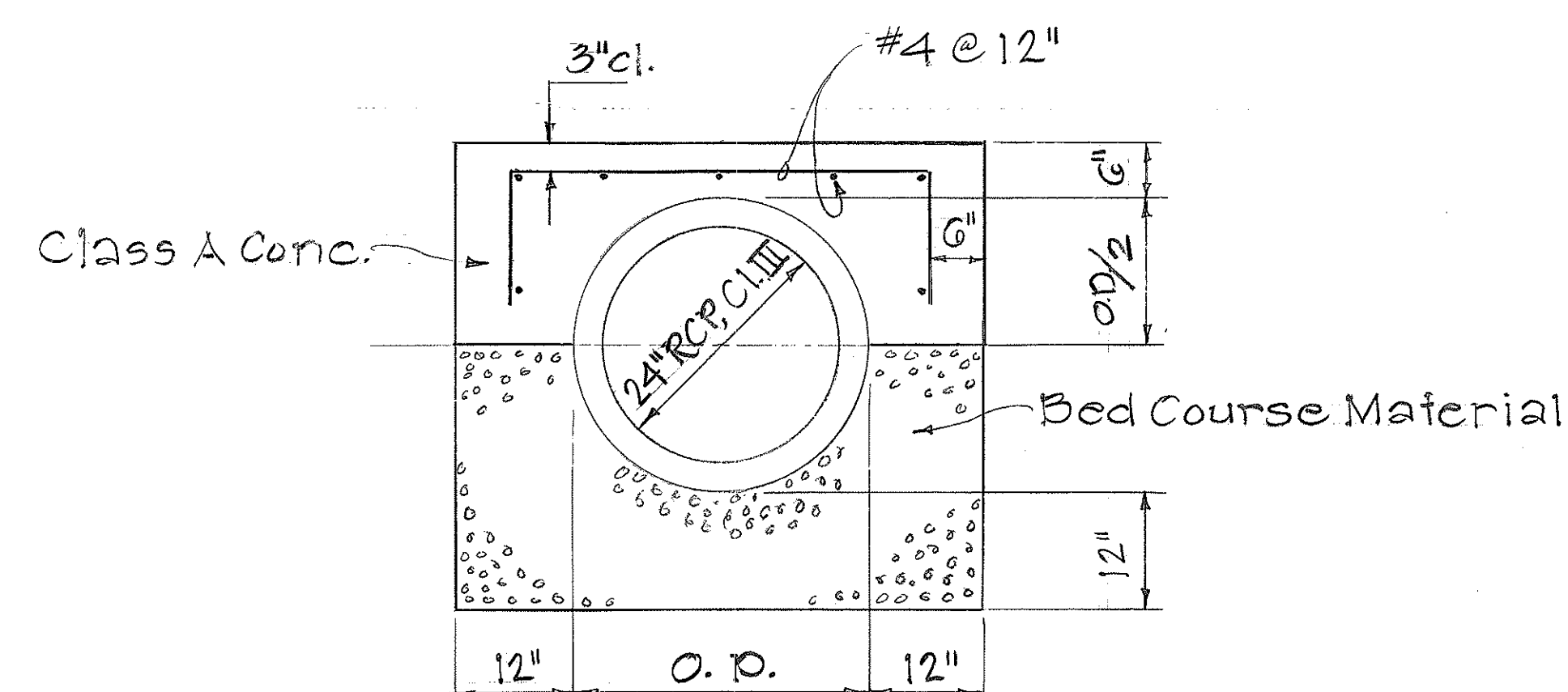
SECTION "C-C"



SECTION "E-E"

GENERAL NOTES:

1. Demolishing, removing and disposing the entire existing drainage structure shall not be paid for separately, but shall be considered incidental to the new drainage structure.
2. Salvaged C.I. Frame and Cover shall be cleaned and stockpiled.



CONCRETE JACKET DETAIL

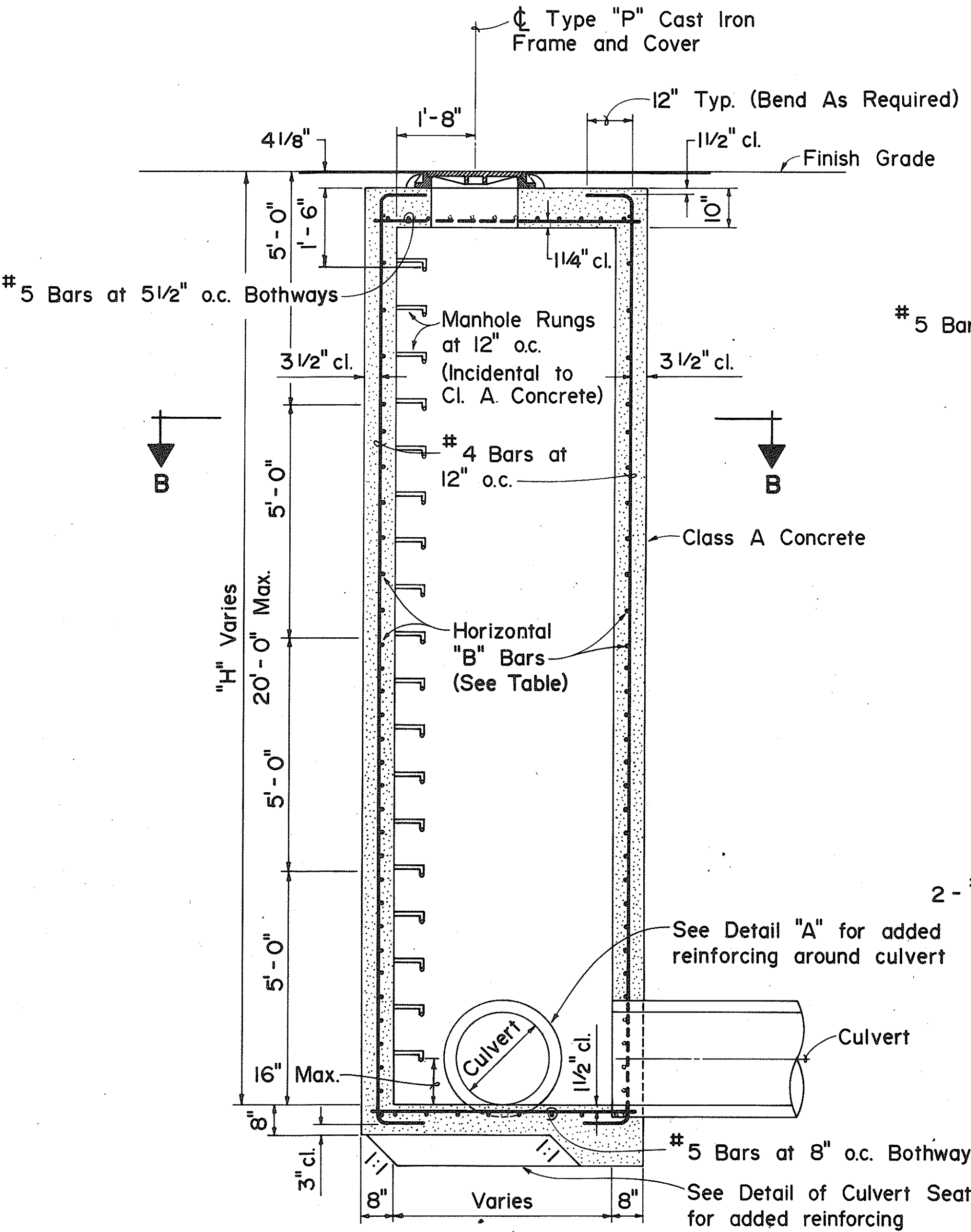
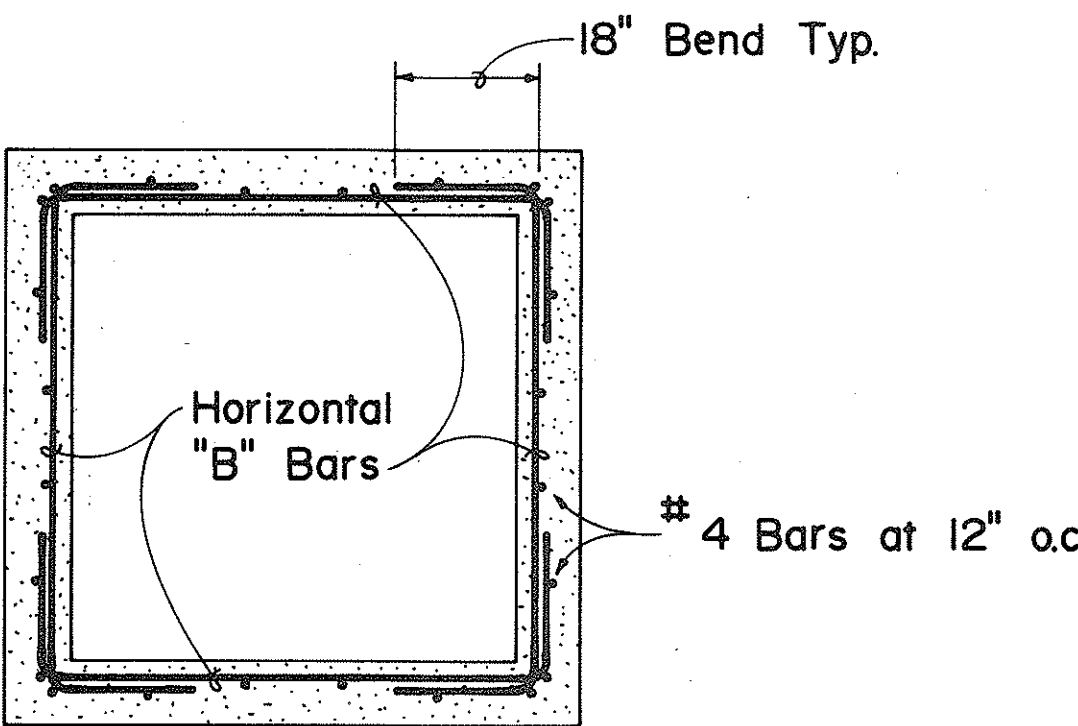
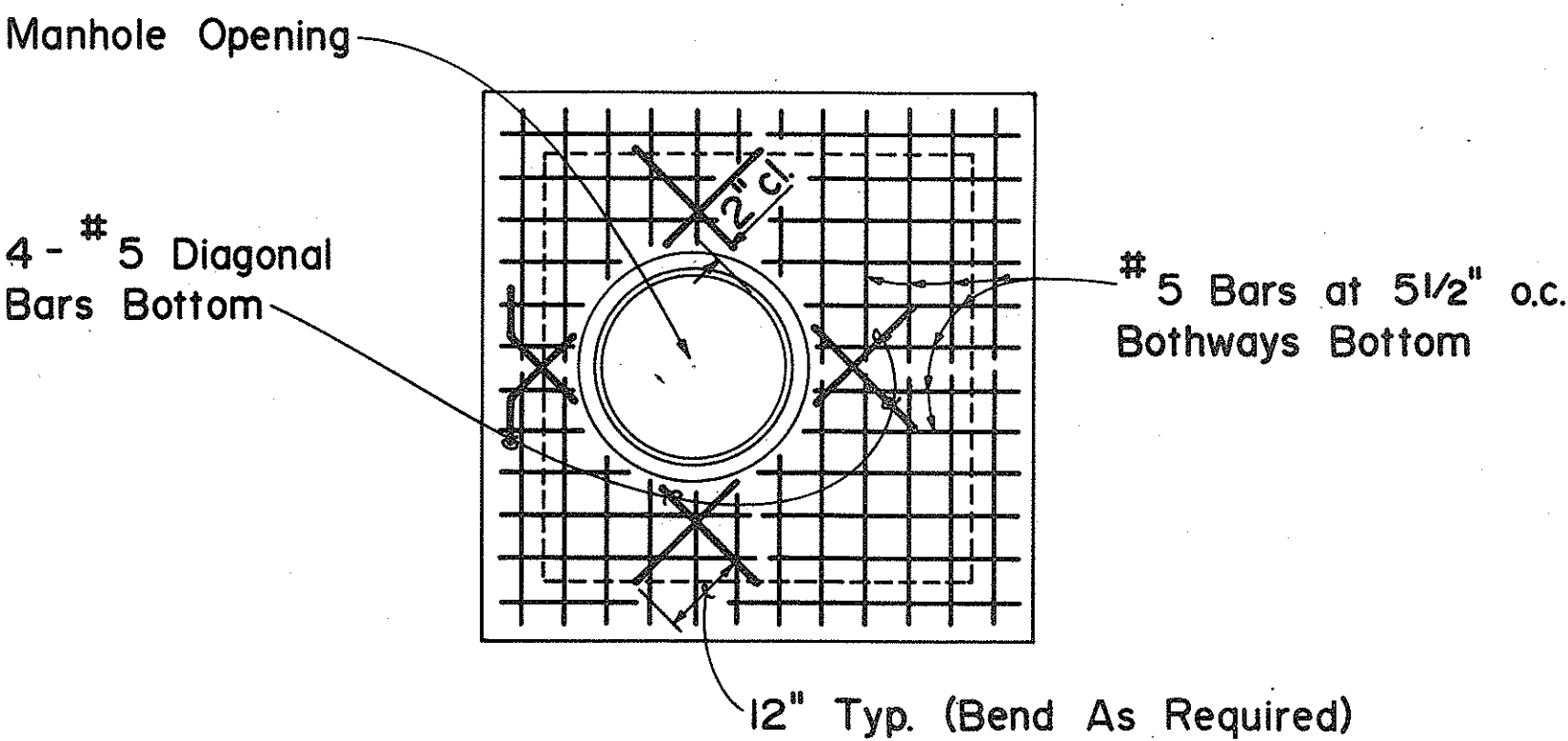
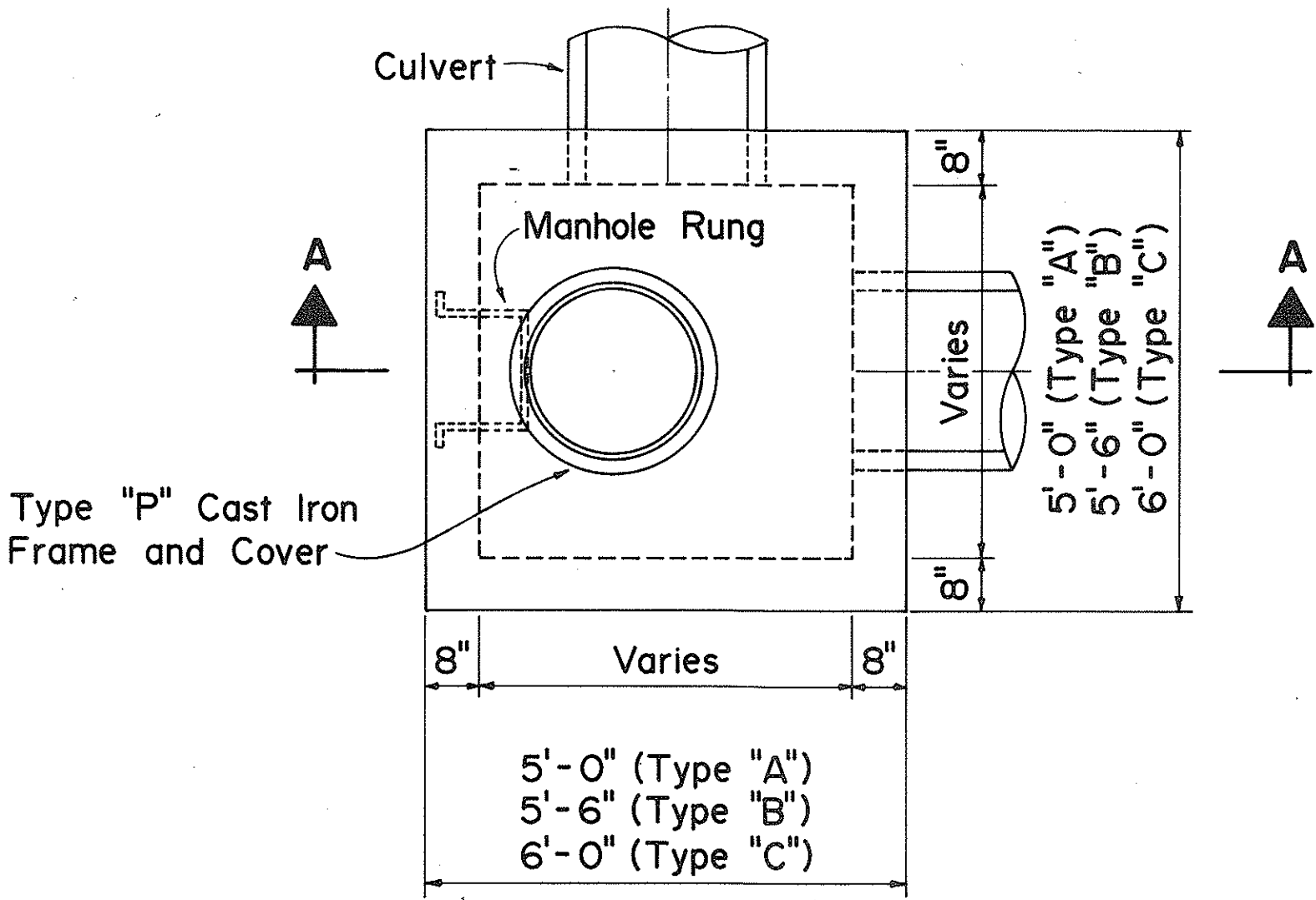
DETAILS OF TYPE G GRATED DROP INLET AT RAMP STA 20+50 o/s G-73' RT.
Scale: 3/4" = 1'-0"

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS

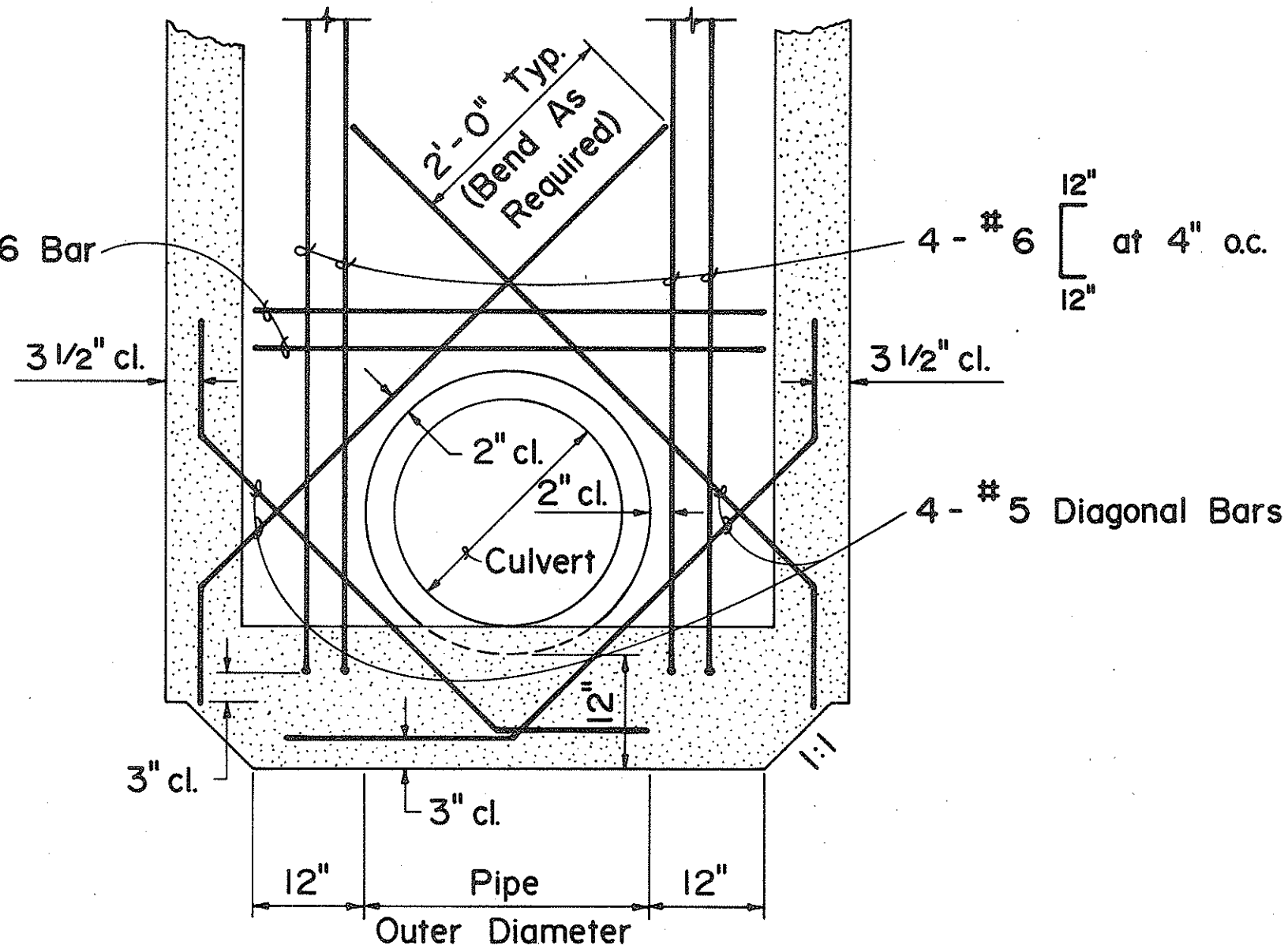
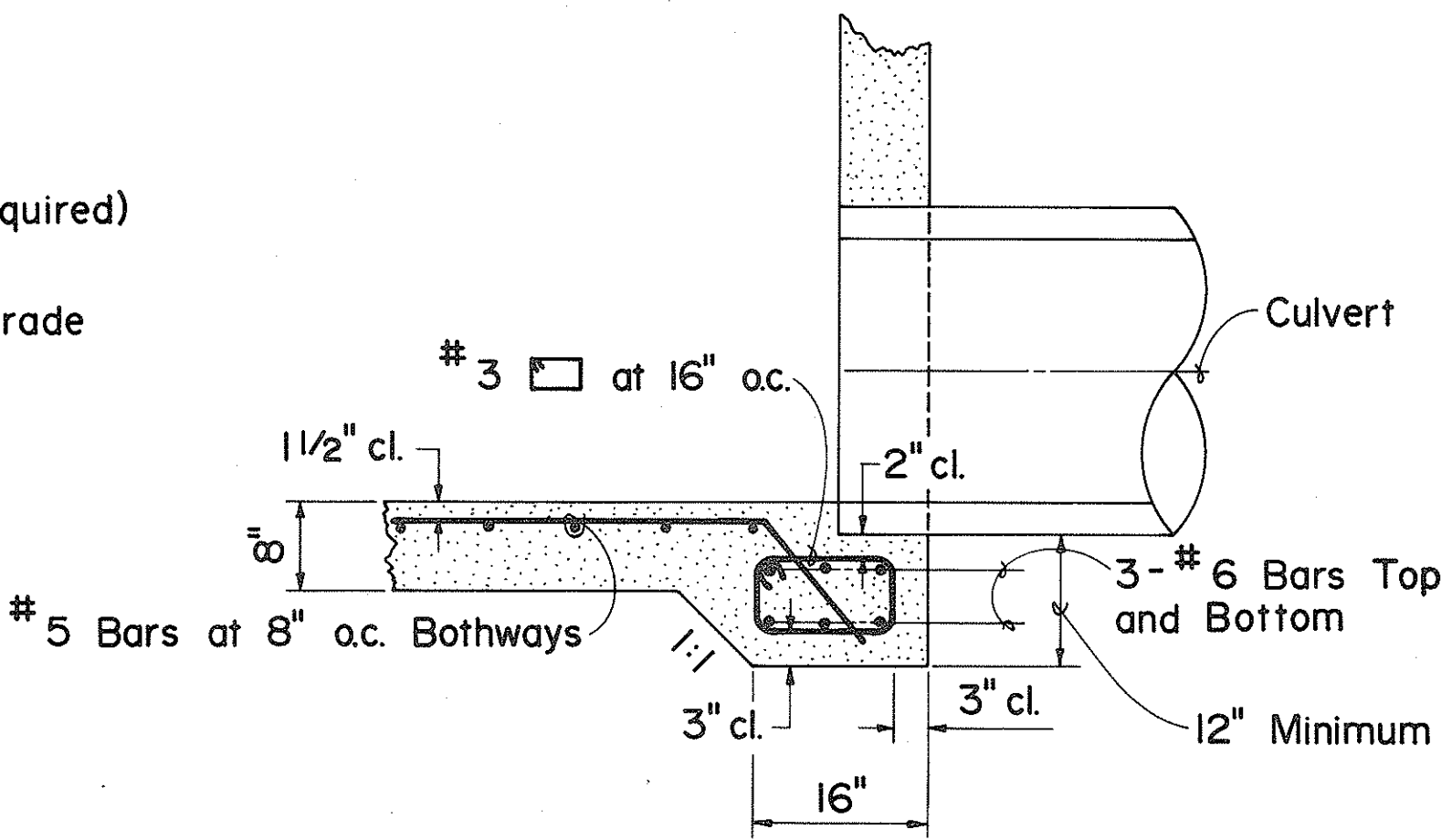
INTERSTATE ROUTE H-1
SAFETY IMPROVEMENTS AT
THE PUNAHOU STREET OFF-RAMP
F.A.I. Proj. No. IR-HI-1(160)
Scale: As Noted Date: May, 1982
SHEET NO. 2 OF 5 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	18-141-1(160)	1982	13	39



"H" MAX. (FT.)	HORIZONTAL "B" BARS
0'-0" to 5'-0"	# 4 at 12" o.c.
5'-1" to 10'-0"	# 4 at 9" o.c.
10'-1" to 15'-0"	# 4 at 6" o.c.
15'-1" to 20'-0"	# 5 at 6" o.c.

TYPE "A", "B", & "C" STORM DRAIN MANHOLE



APPROVAL RECOMMENDED:
P. J. J. J.
 HYDRAULIC DESIGN ENGINEER 8-20-80 DATE

APPROVED:
Robert R. R.
 ASSISTANT CHIEF, ENGINEERING 8-20-80 DATE

NO.	REVISION	APPROVED BY	DATE
1.	Supersedes Sht. DH 5 approved 12-17-69	H.T.	8/20/80
2.	Revise horizontal bar table and detail notes.	H.T.	4/21/82

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION

STANDARD DETAILS
 TYPE A, B, AND C
 STORM DRAIN MANHOLE

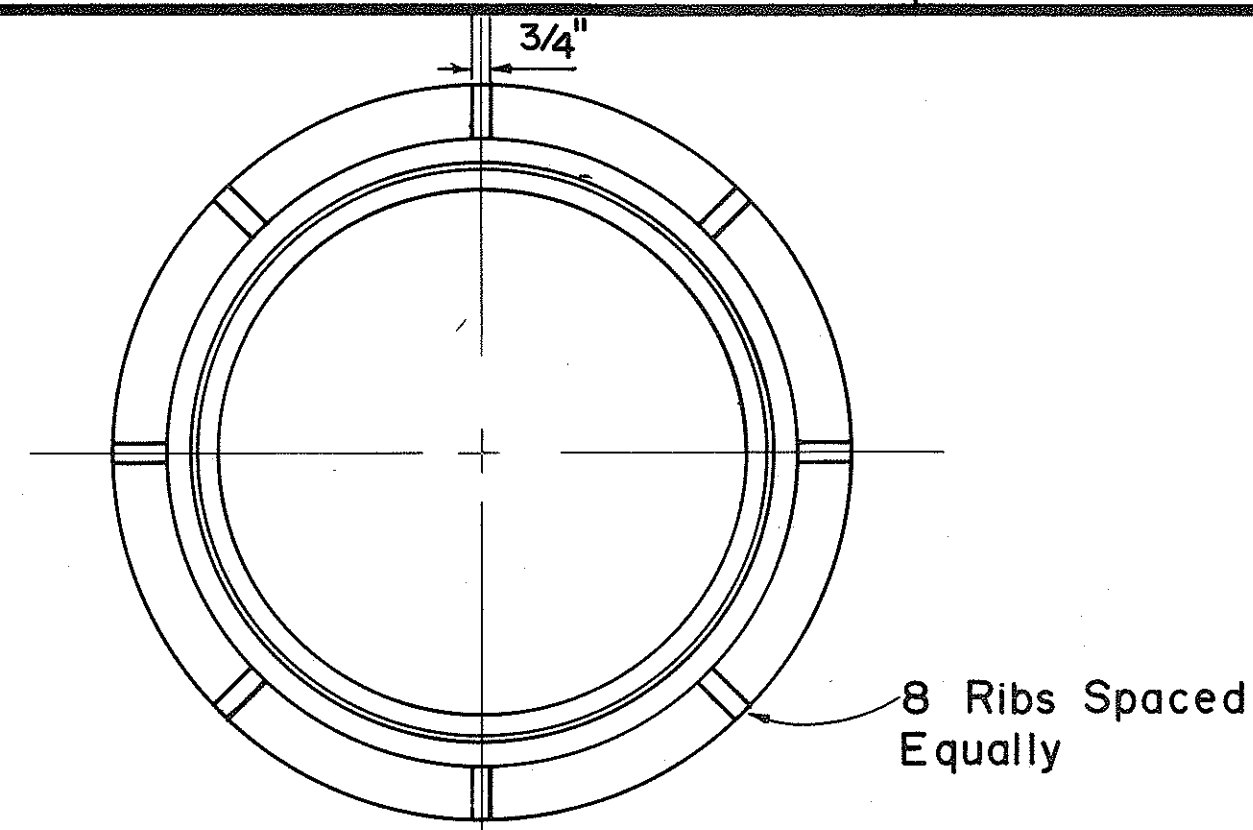
Not To Scale

Date: August 1980

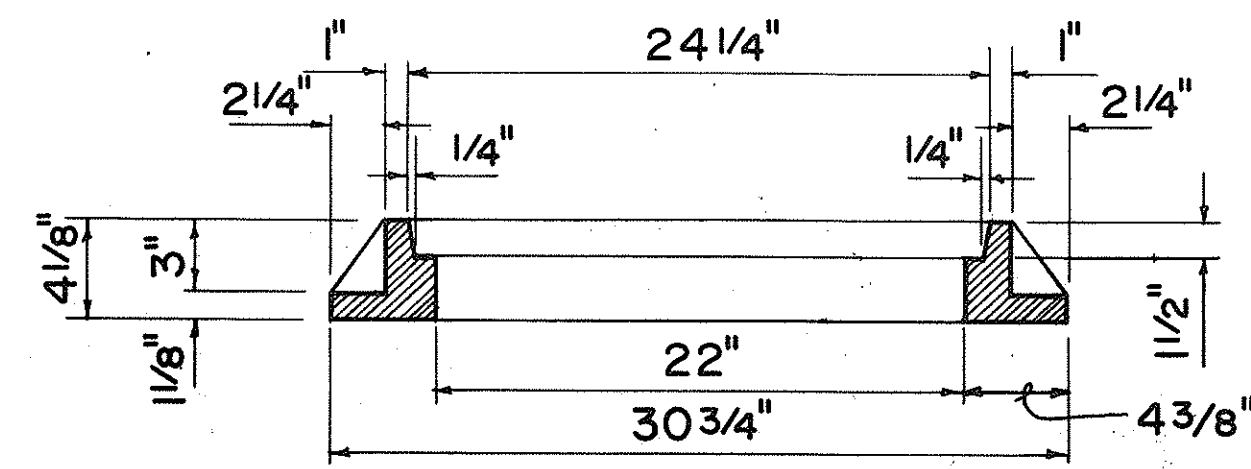
SHEET NO. 3 OF 5 SHEETS DH5

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

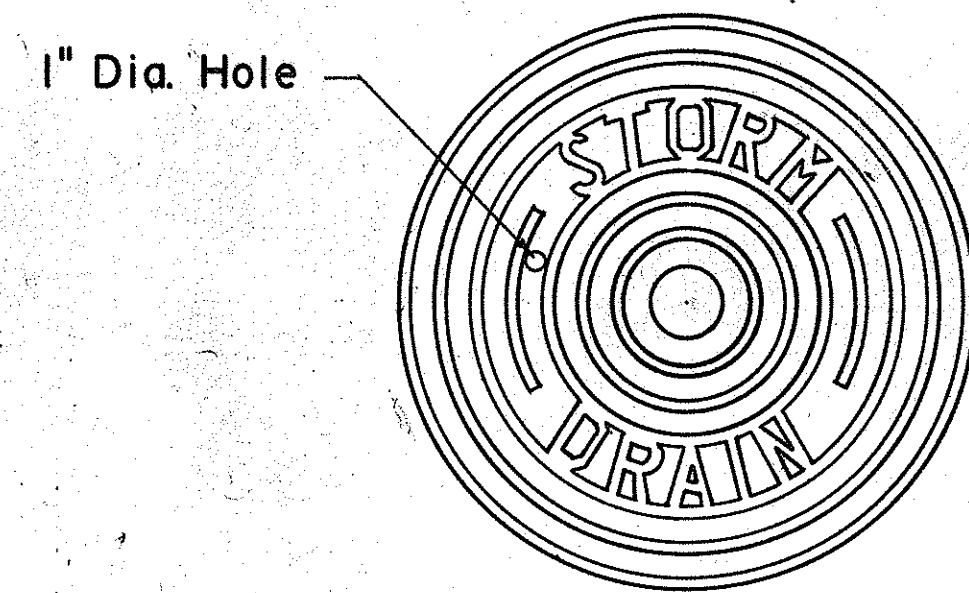
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IR-41-1(160)	1982	14	39



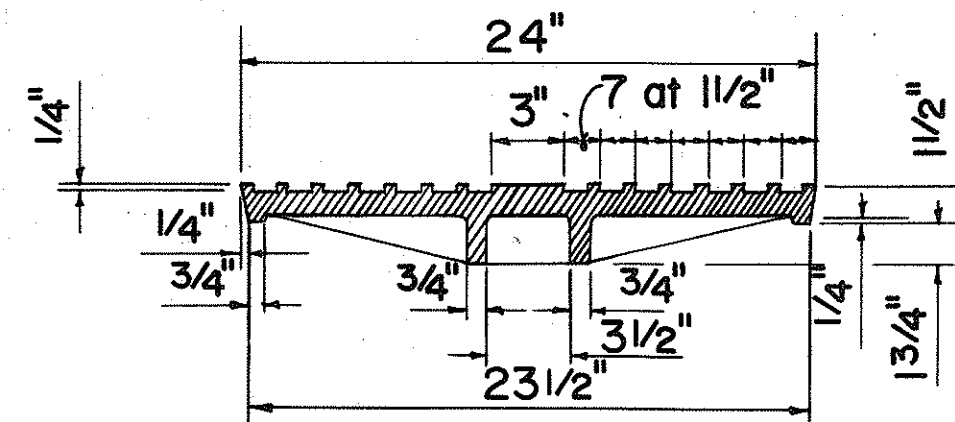
PLAN OF FRAME



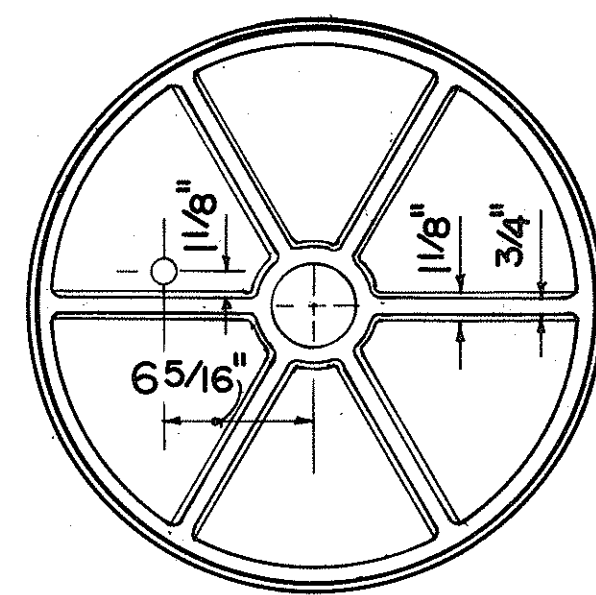
SECTION OF FRAME



TOP VIEW OF COVER

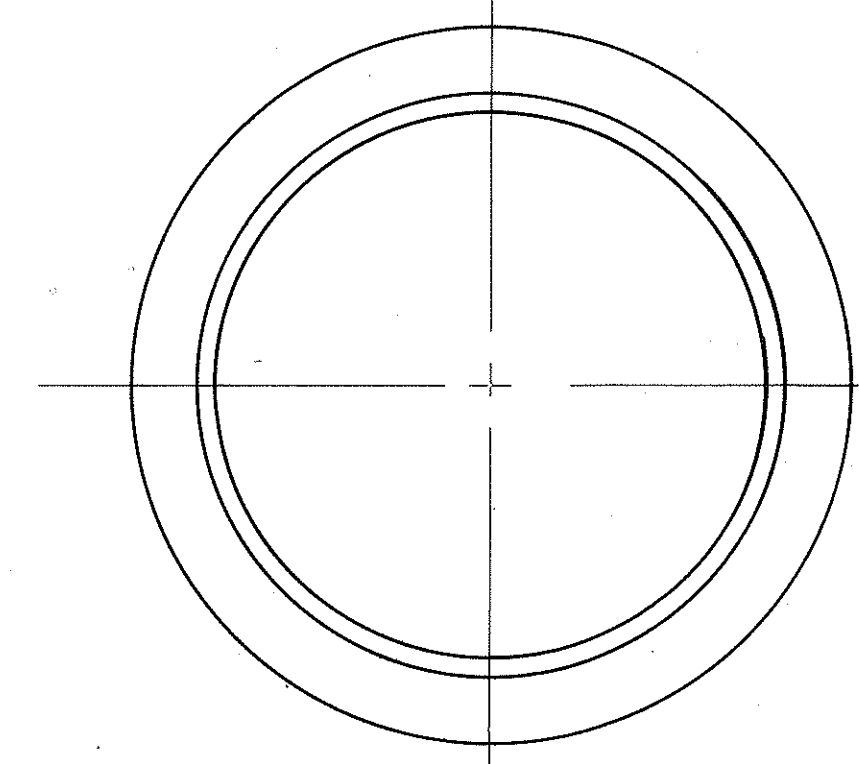


SECTION

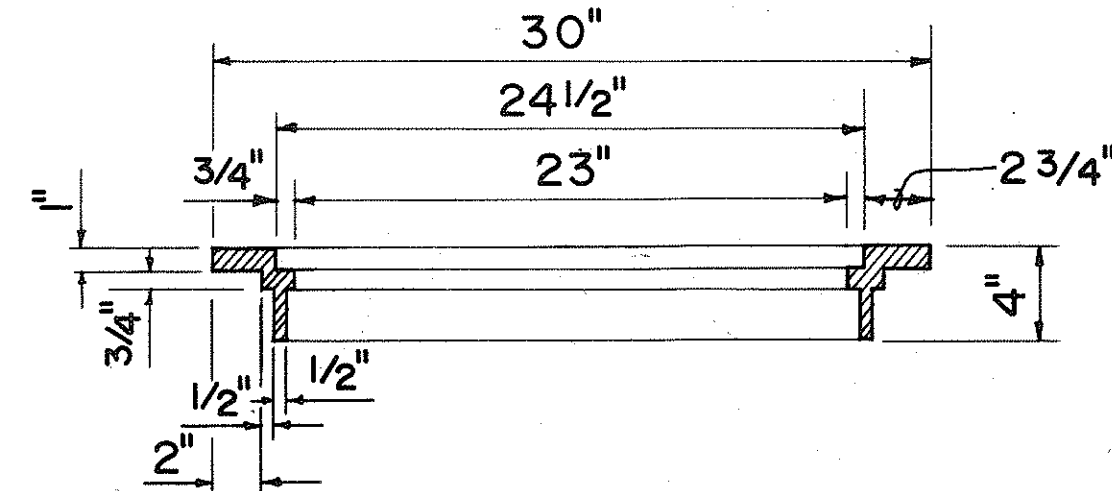


BOTTOM VIEW OF COVER

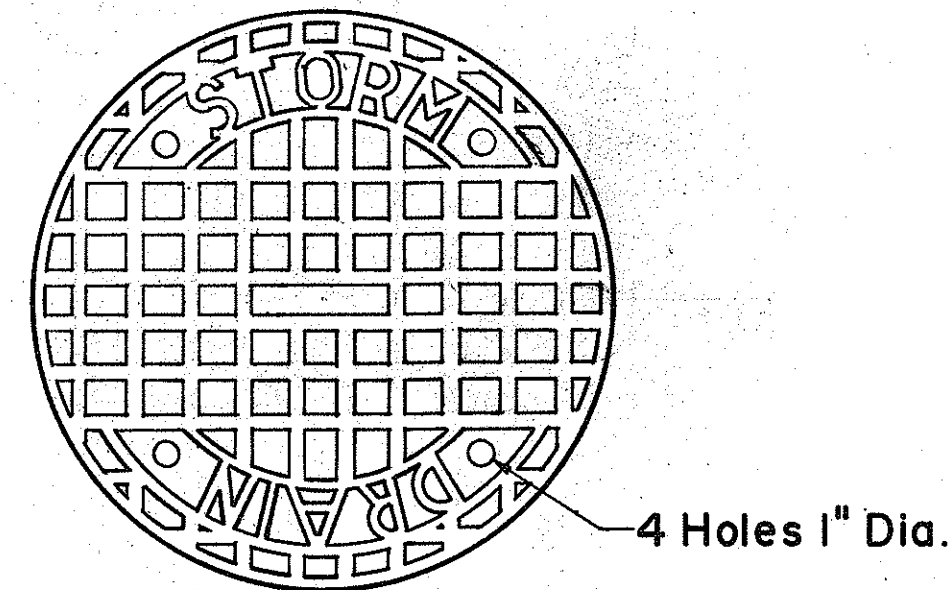
**TYPE "P" CAST IRON
FRAME AND COVER**



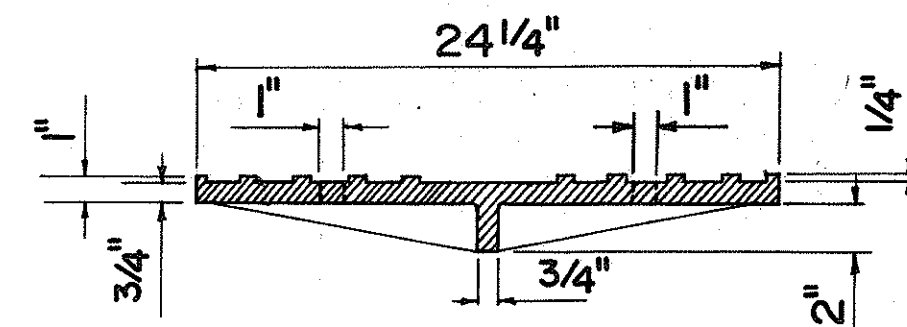
PLAN OF FRAME



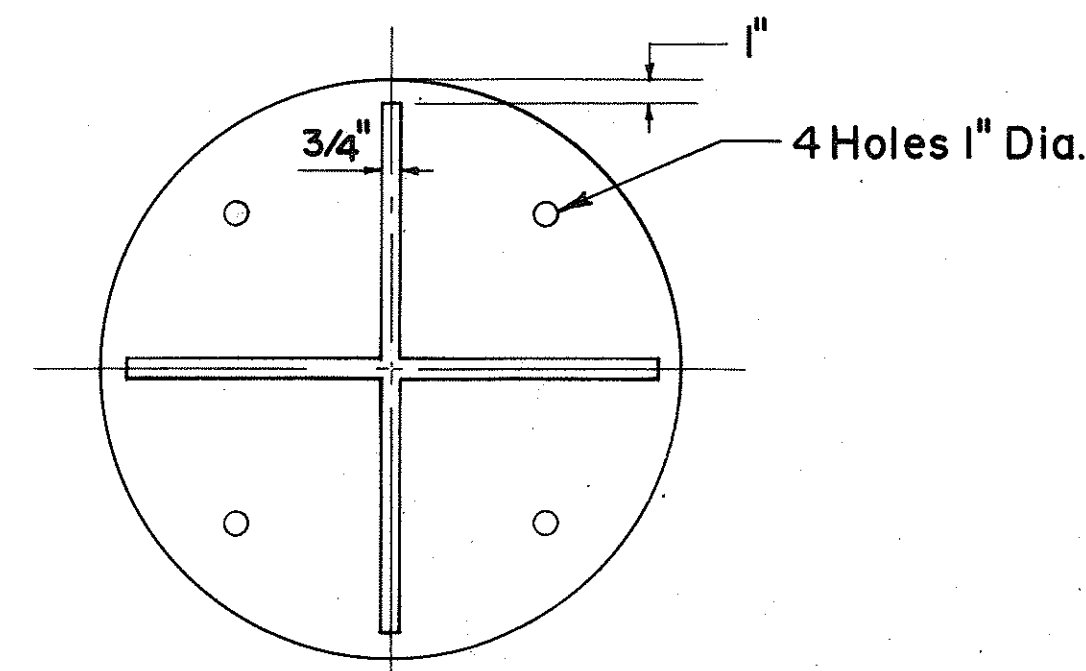
SECTION OF FRAME



TOP VIEW OF COVER

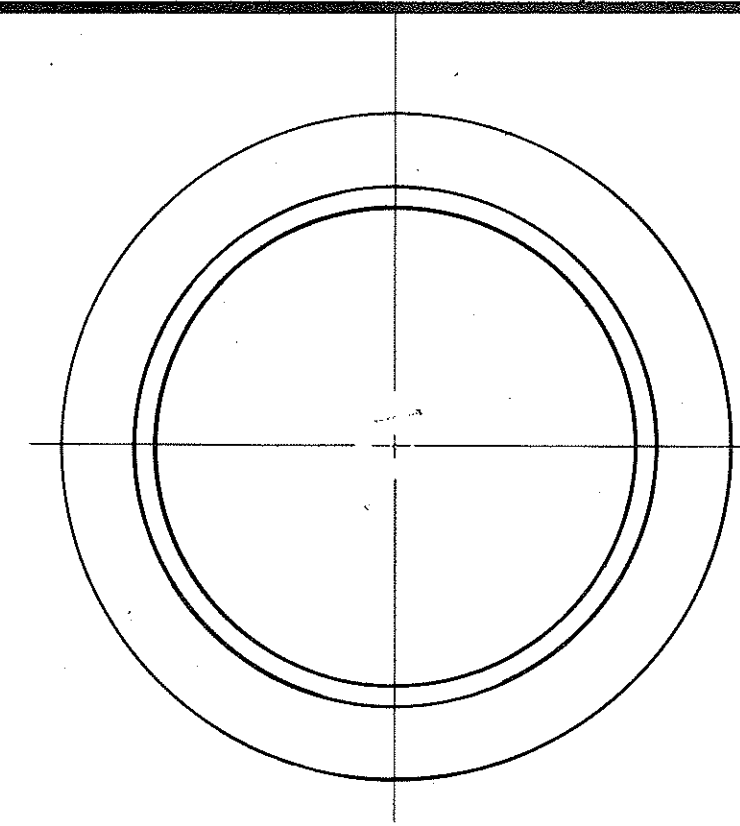


SECTION

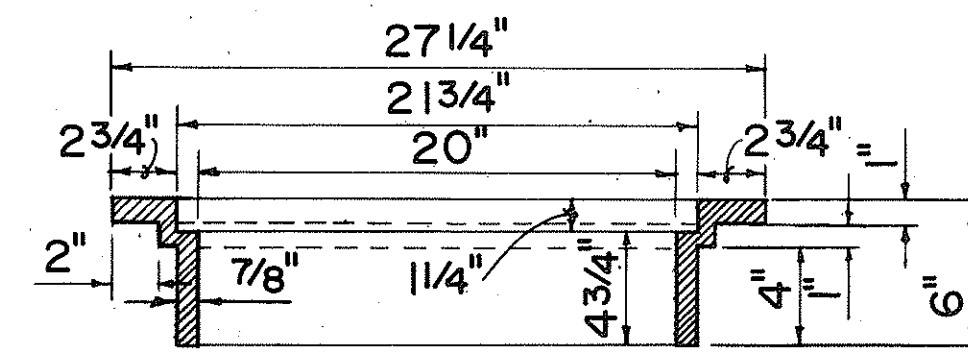


BOTTOM VIEW OF COVER

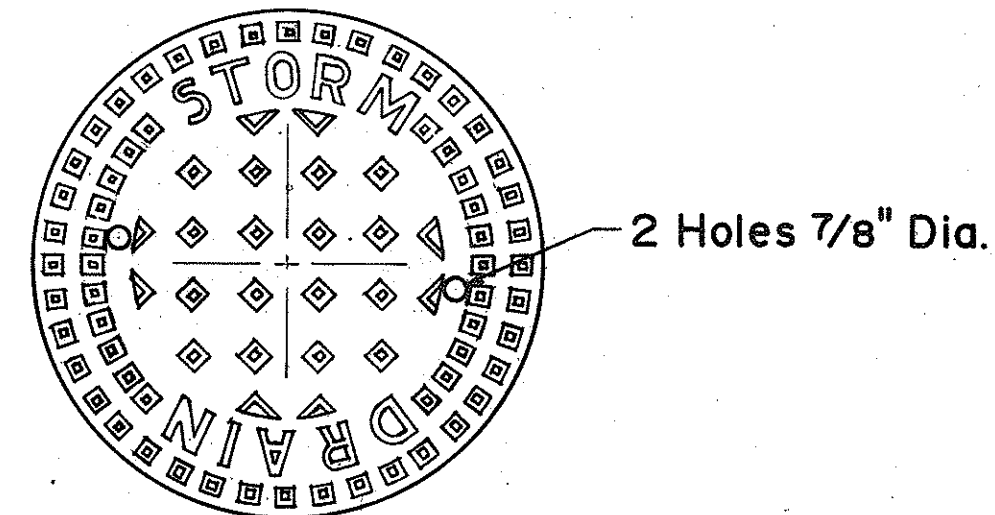
**TYPE "B" CAST IRON
FRAME AND COVER**



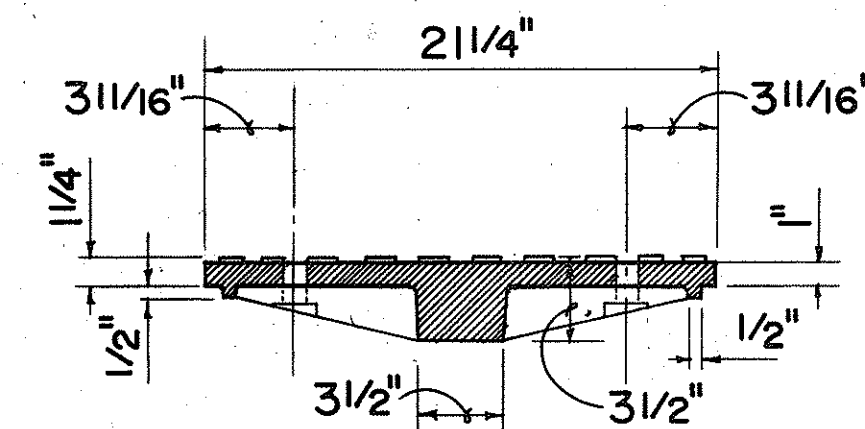
PLAN OF FRAME



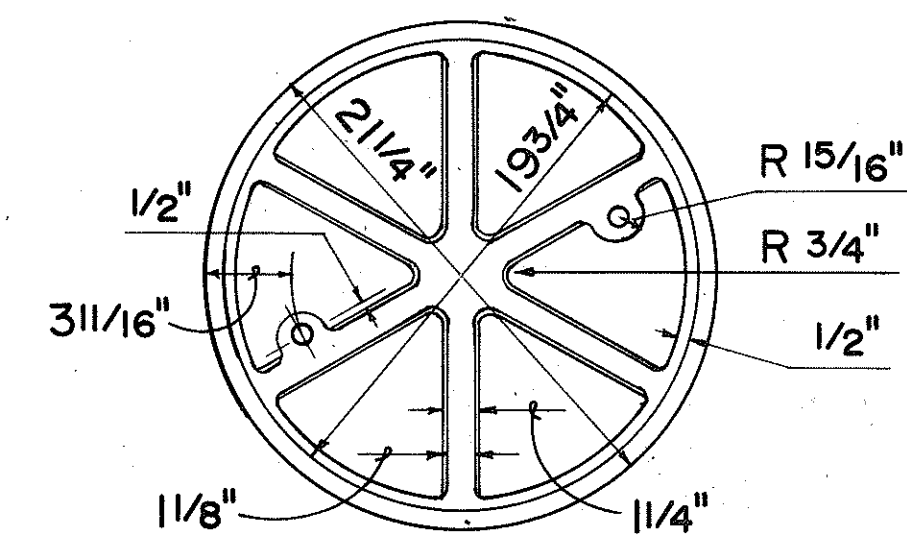
SECTION OF FRAME



TOP VIEW OF COVER

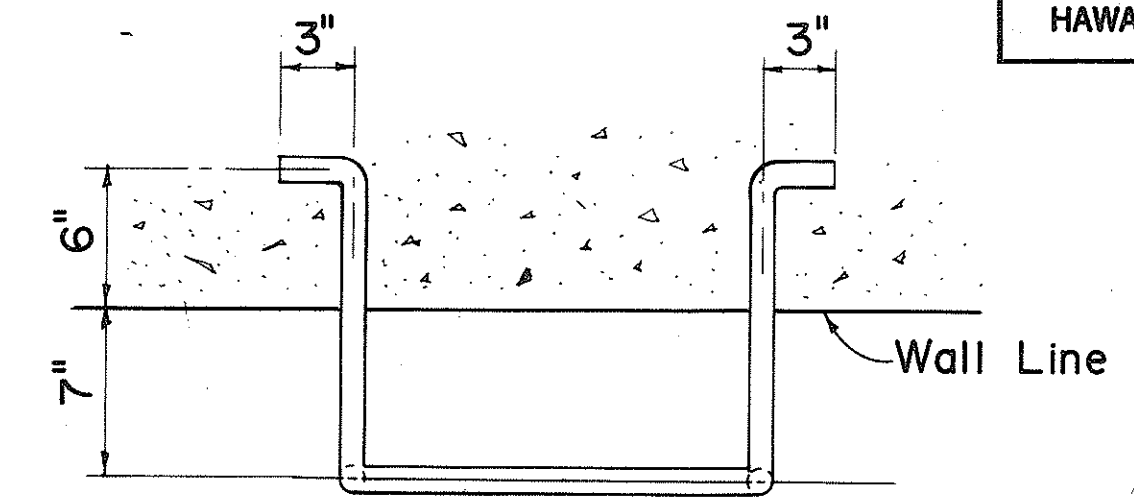


SECTION

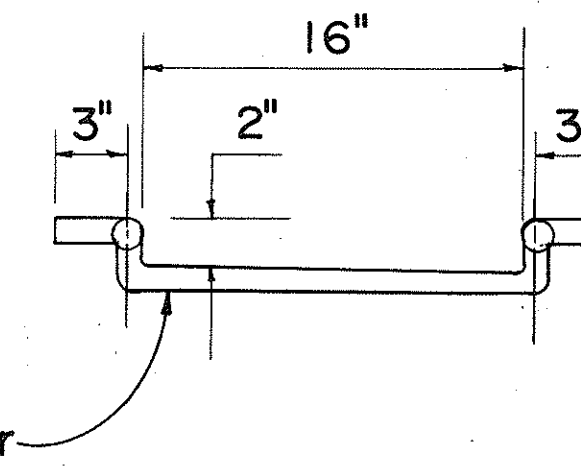


BOTTOM VIEW OF COVER

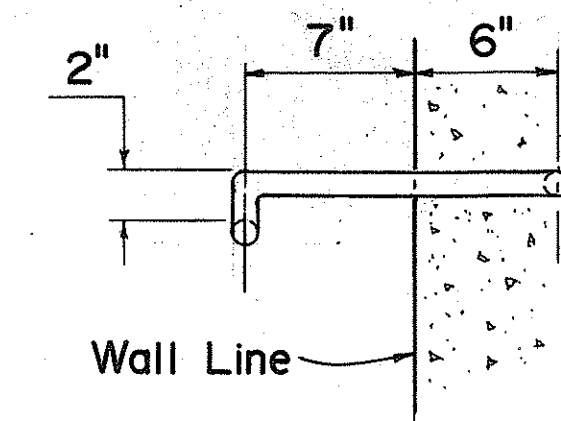
**TYPE "A" CAST IRON
FRAME AND COVER**



PLAN



FRONT VIEW



SIDE VIEW

MANHOLE RUNG

APPROVAL RECOMMENDED:
Takano
HYDRAULIC DESIGN ENGINEER 6-19-79 DATE

APPROVED:
Harold Zaleishi
ASSISTANT CHIEF, ENGINEERING 6-22-79 DATE

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

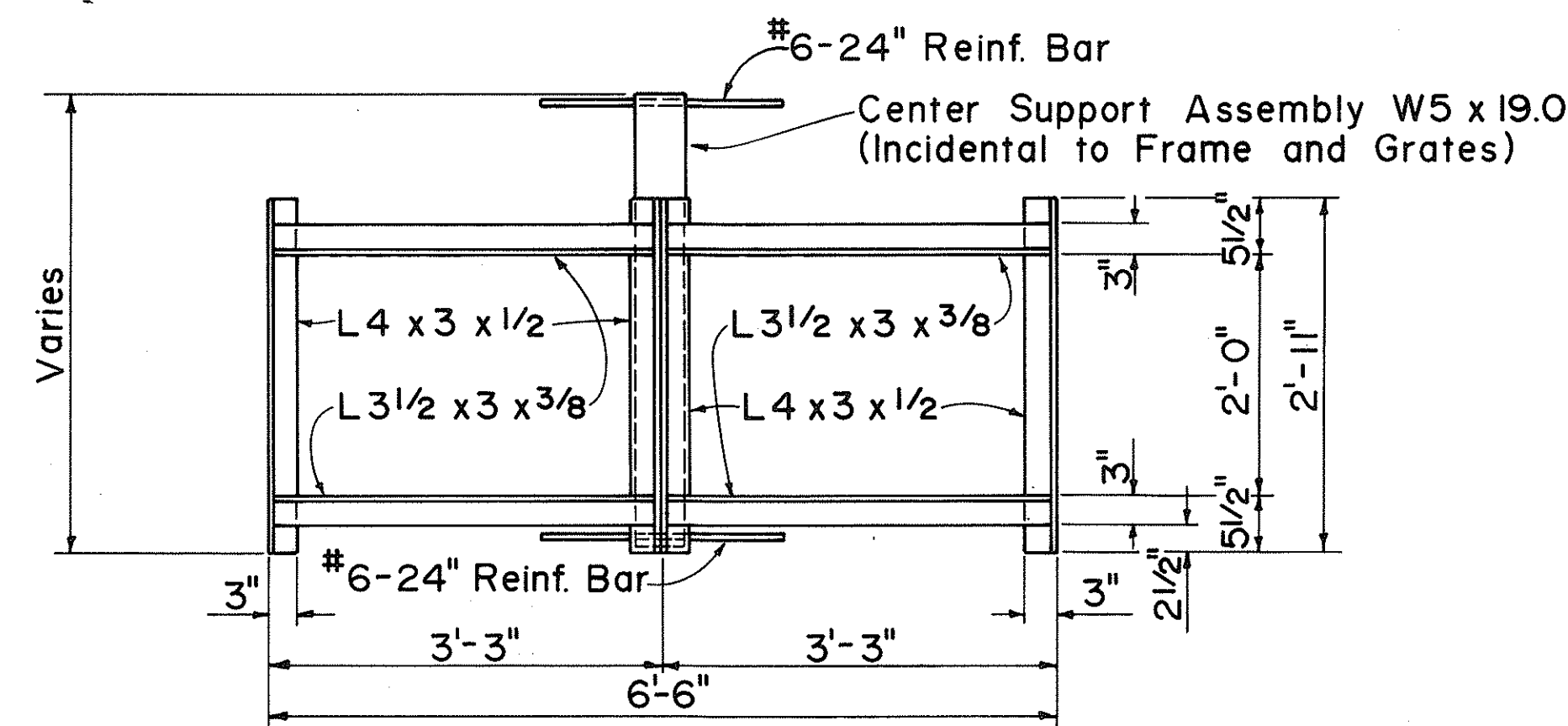
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION
STANDARD DETAILS CATCH BASIN AND MANHOLE CASTINGS
Not To Scale Date: Dec. 1977
SHEET NO. 4 OF 5 SHEETS DH 6

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTED BY	DRAWN BY	
QUANTITIES BY	DESIGNED BY	
CHECKED BY		

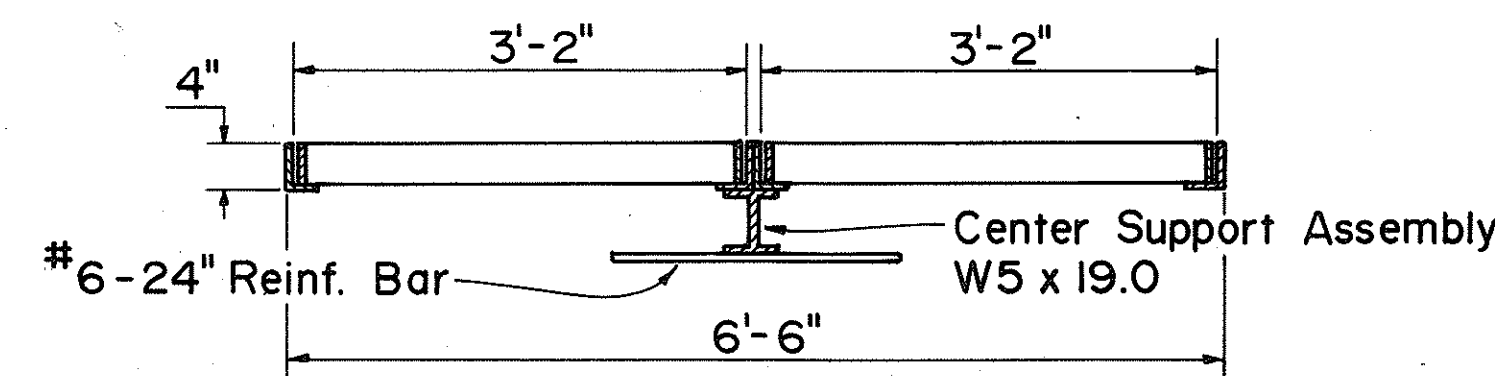
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IR-HI-1(60)	1982	15	39

GENERAL NOTES

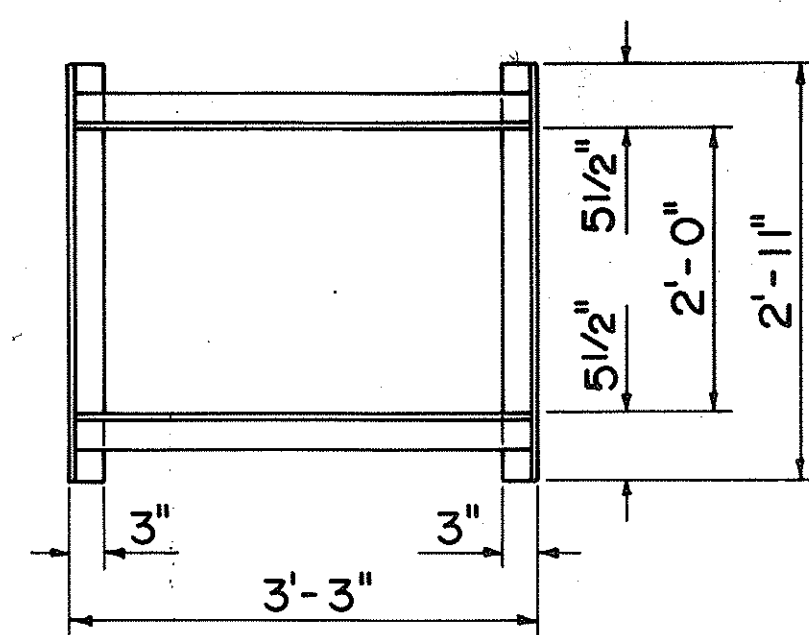
- Contractor has the option of using cast malleable iron, cast steel, welded, or bolted grate.
- All welds 3/8" unless otherwise noted.
- Type A-9 - Use in locations off the roadbed on all types of highways.
- Type A-12 - Use within the roadbed on all types of highways.



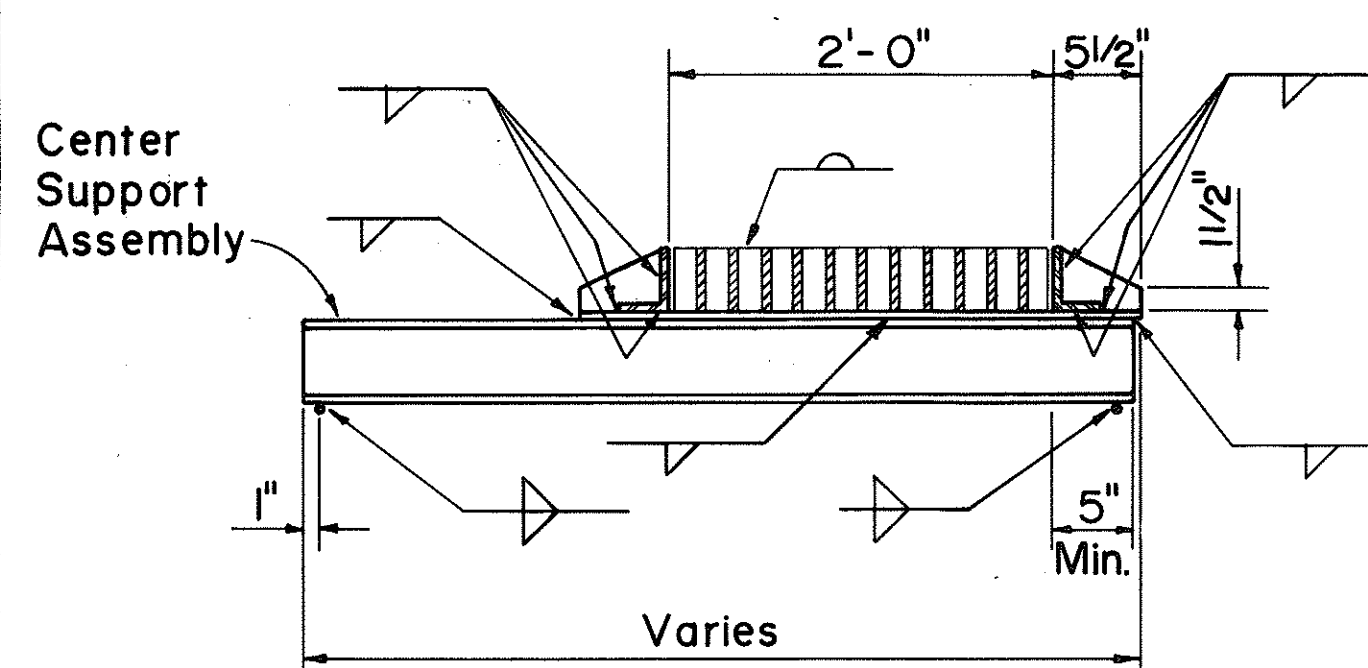
PLAN
(Two or More Grates)



LONGITUDINAL SECTION
(Thru Frame & Grate)

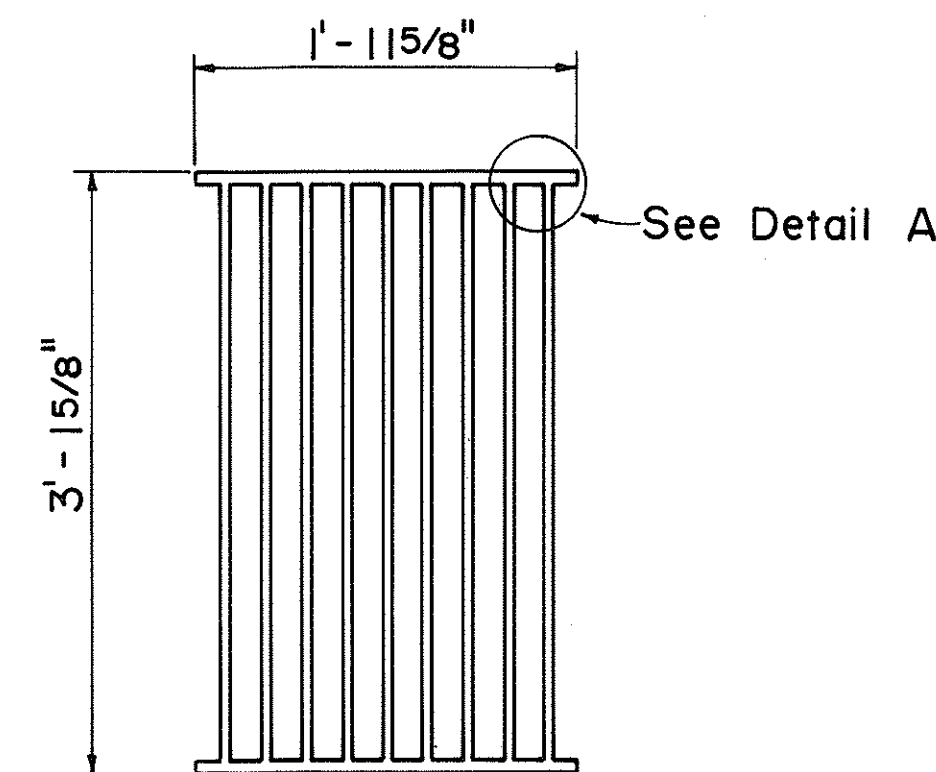


PLAN
(Single Grate)

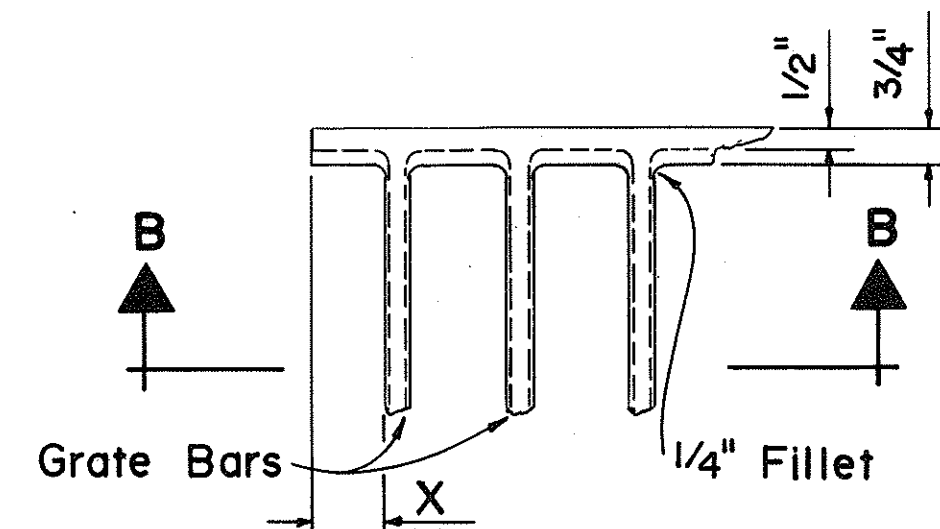


CROSS SECTION
(Thru Frame & Grate)

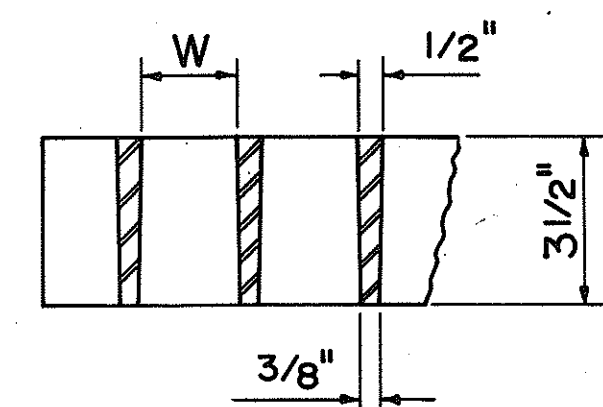
FRAME DETAILS



PLAN

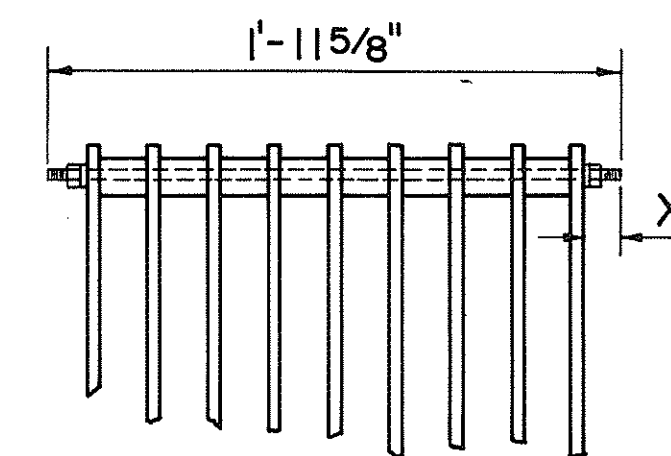


DETAIL A

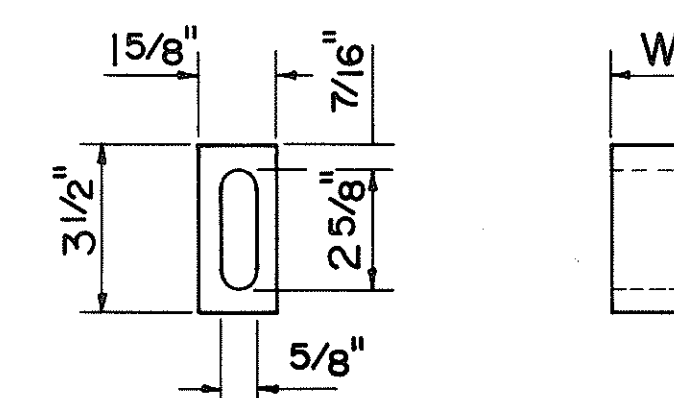


SECTION B-B

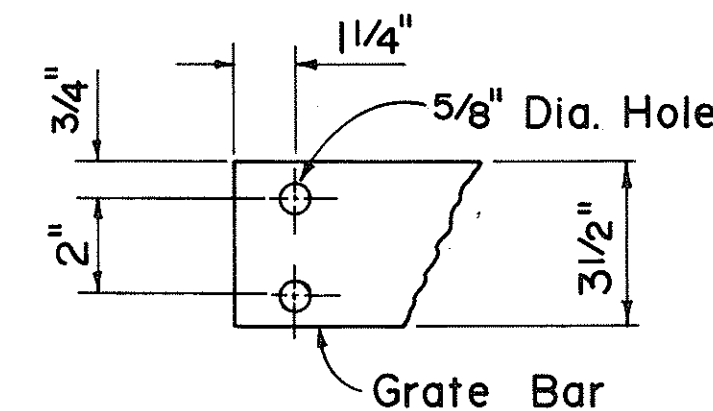
ALTERNATIVE CAST MALLEABLE IRON OR CAST STEEL GRATE



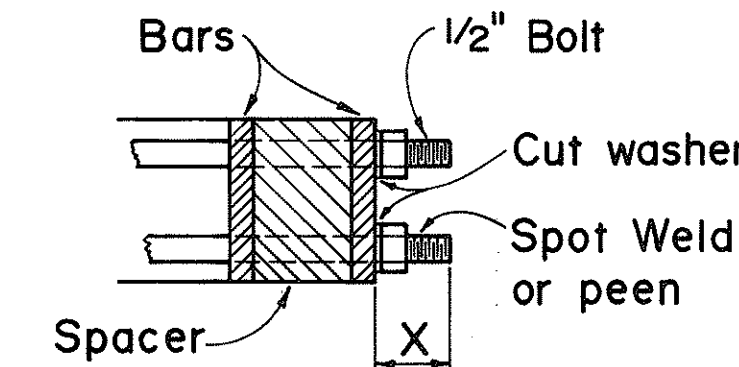
BOLTED END BLOCK



BAR SPACER

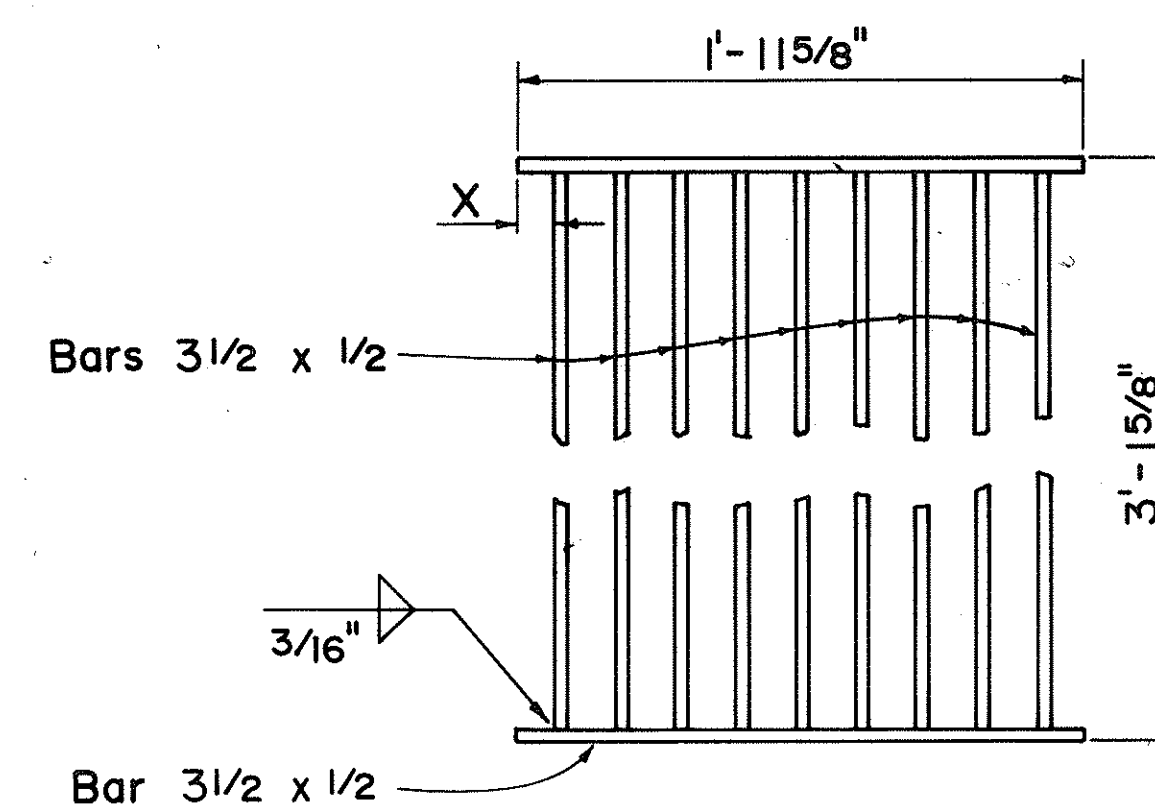


END OF BAR

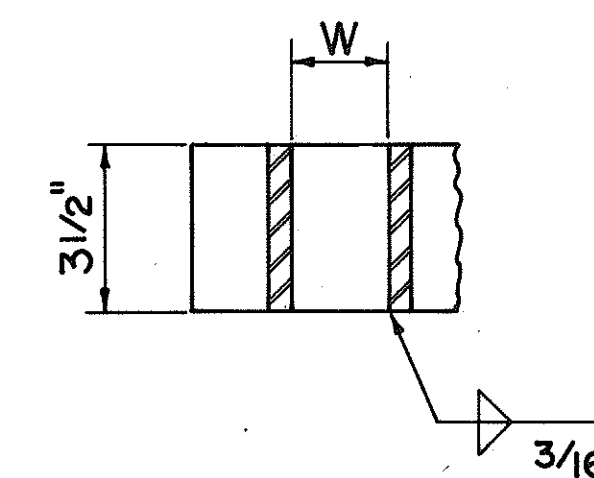


BOLTING DETAIL

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.T.	6/22/79
2.	Revise standard nomenclature for rolled steel shapes.	H.T.	4/21/82

APPROVAL RECOMMENDED:
G. J. Jarama
 HYDRAULIC DESIGN ENGINEER 6-19-79 DATE

APPROVED:
Herbert Zalewski
 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. 5 OF 5 SHEETS DH 7	

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