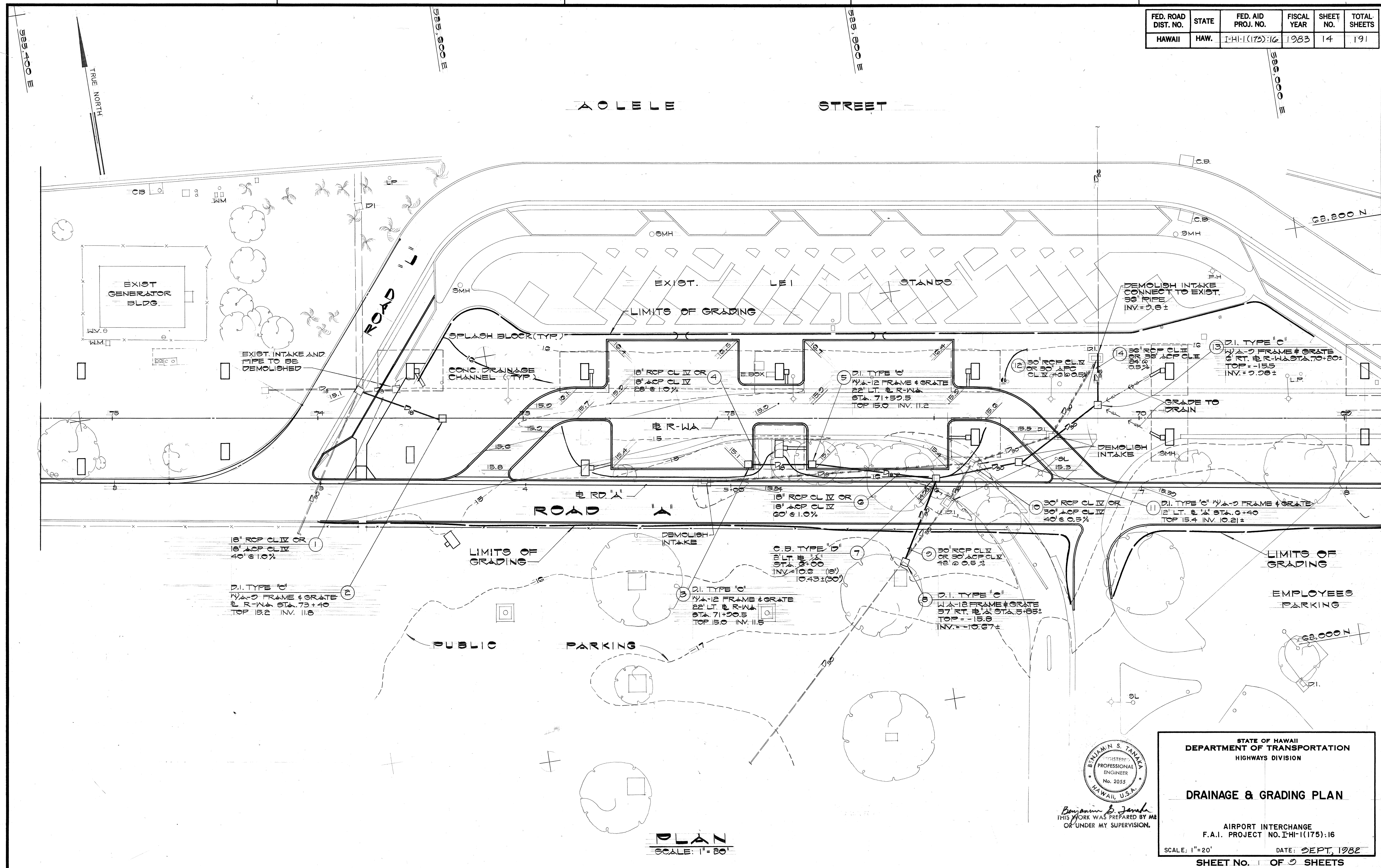


FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H-1(175):16	1983	14	191

ORIGINAL PLAN	DATE
DESIGNED BY	
NOTED BY	
CHECKED BY	



BENJAMIN S. TANKA
 PROFESSIONAL ENGINEER
 No. 2055
 HAWAII, U.S.A.
 THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

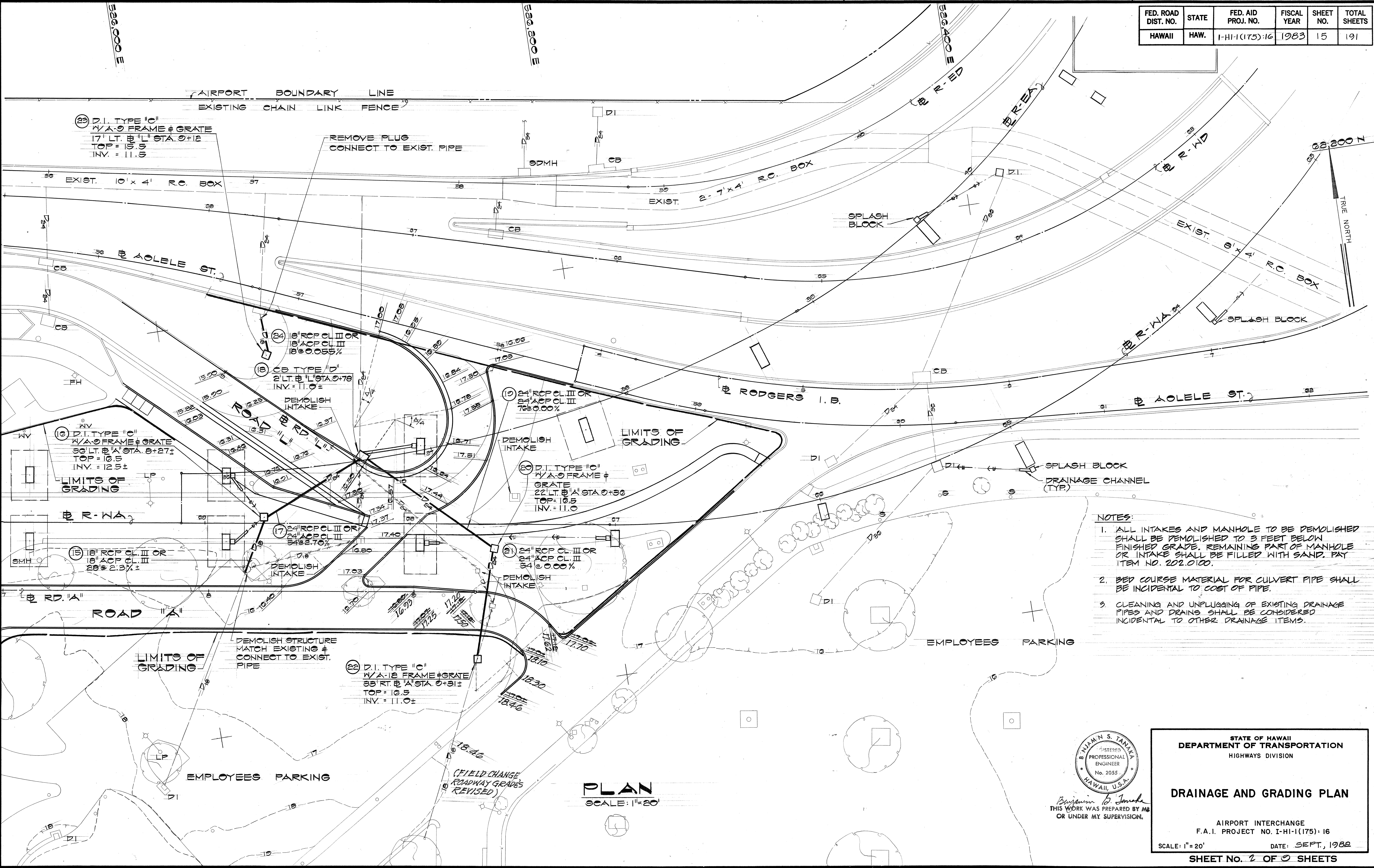
STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION

DRAINAGE & GRADING PLAN

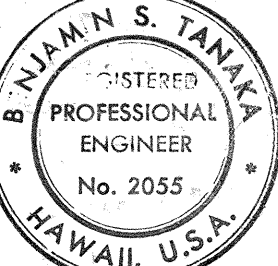
 AIRPORT INTERCHANGE
 F.A.I. PROJECT NO. I-H-1(175):16
 SCALE: 1"=20' DATE: SEPT, 1982
 SHEET NO. 14 OF 20 SHEETS

PLAN
 SCALE: 1"=20'

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(175)-16	1983	15	191



ORIGINAL PLAN	DATE
DESIGNED BY	
TRACED BY	
NOTED BY	
CHECKED BY	



THIS WORK WAS PREPARED BY ME
 OR UNDER MY SUPERVISION.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

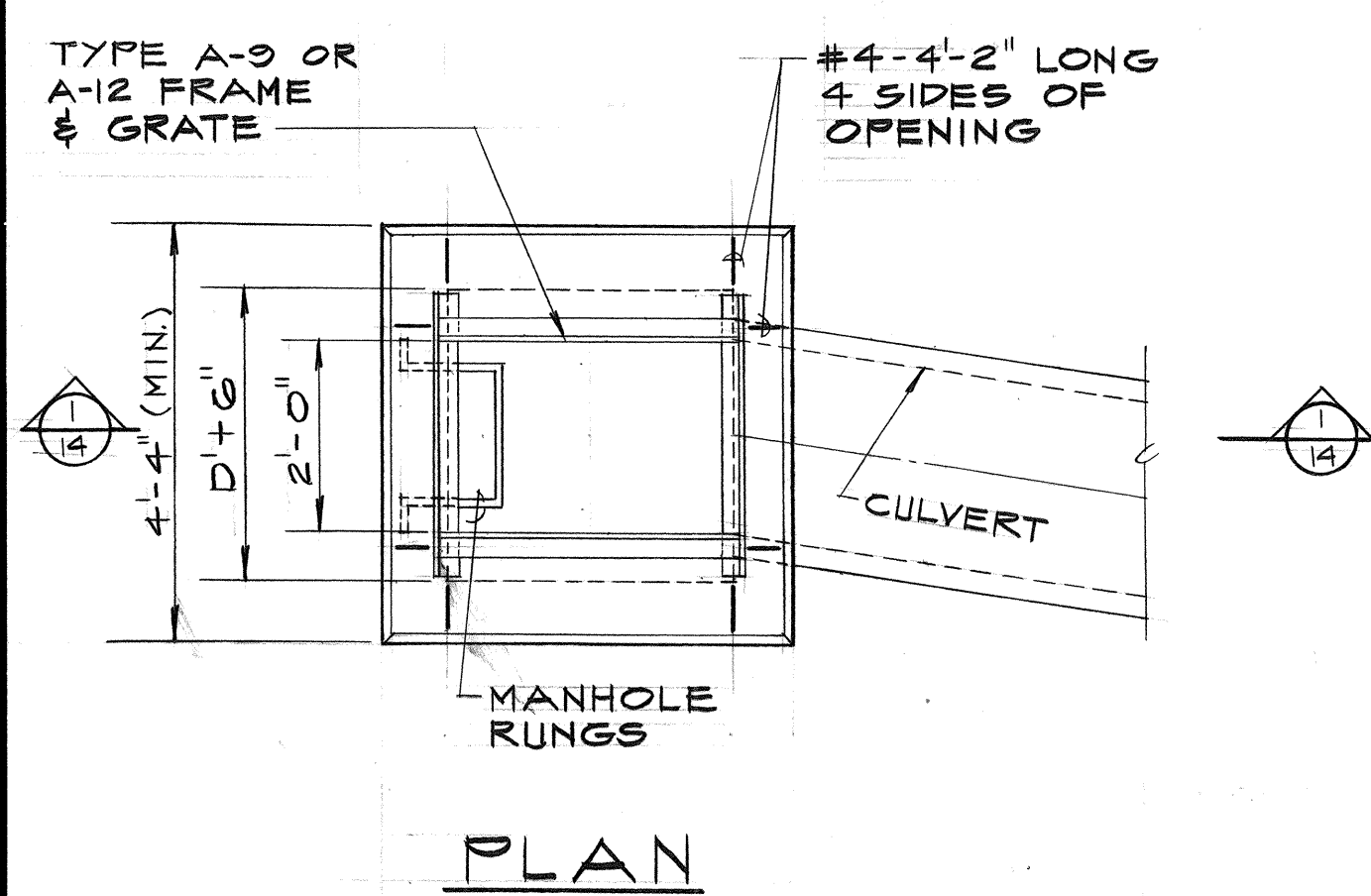
DRAINAGE AND GRADING PLAN

AIRPORT INTERCHANGE
F.A.I. PROJECT NO. I-HI-1(175)-16

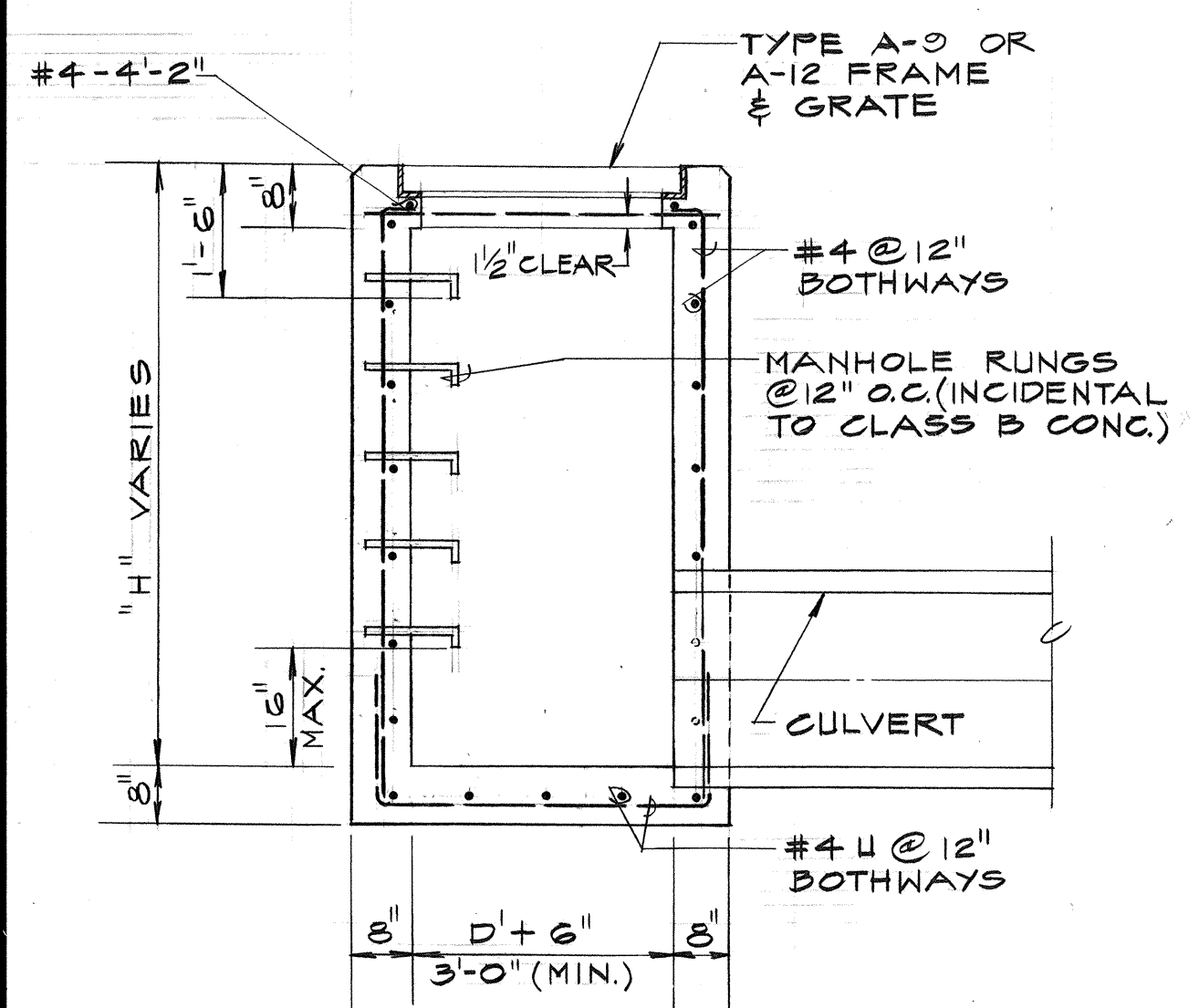
SCALE: 1"=20' DATE: SEPT., 1982

SHEET NO. 1 OF 0 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(175):16	1983	16	191



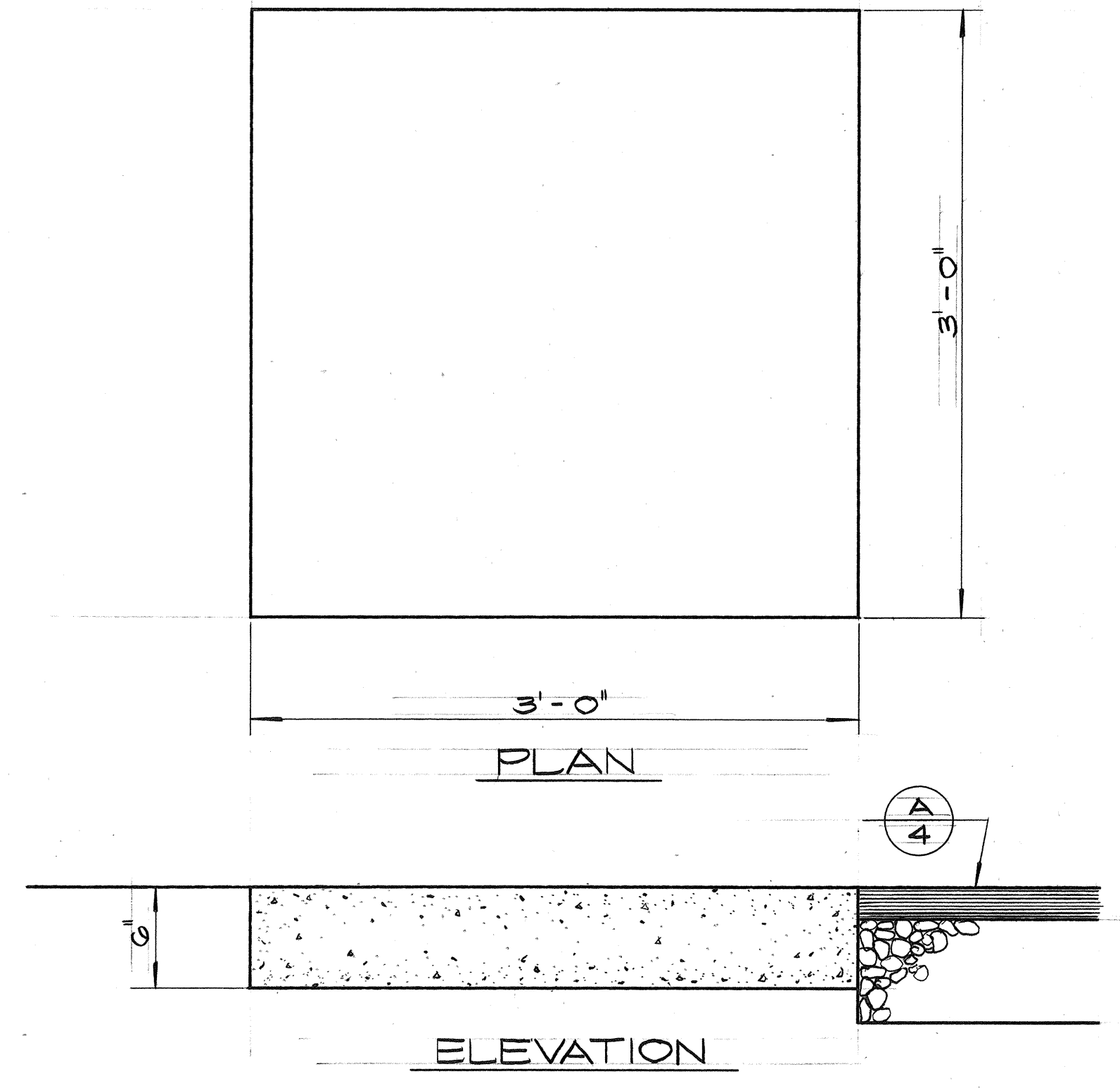
- ### GENERAL NOTES
1. ALL CONCRETE SHALL BE CLASS "B" UNLESS OTHERWISE NOTE.
 2. EXPOSED EDGES OF ALL DRAINAGE STRUCTURES SHALL BE CHAMFERED ONE INCH.
 3. CULVERT SHALL ENTER AND LEAVE DROP INTAKE FROM ANY POSITION AND IN THE DIRECTION INDICATED BY THE PLANS OR ORDERED BY THE ENGINEER.
 4. MANHOLE RUNGS (12" O.C.) ARE REQUIRED WHEN "H" IS GREATER THAN 4'-0". ONLY ONE RUNG (16 INCHES FROM THE BOTTOM) IS REQUIRED IF "H" IS 4'-6" OR LESS. MANHOLE RUNGS MAYBE PLACED AT ANY LOCATION AS ORDERED BY THE ENGINEER.



SECTION 14

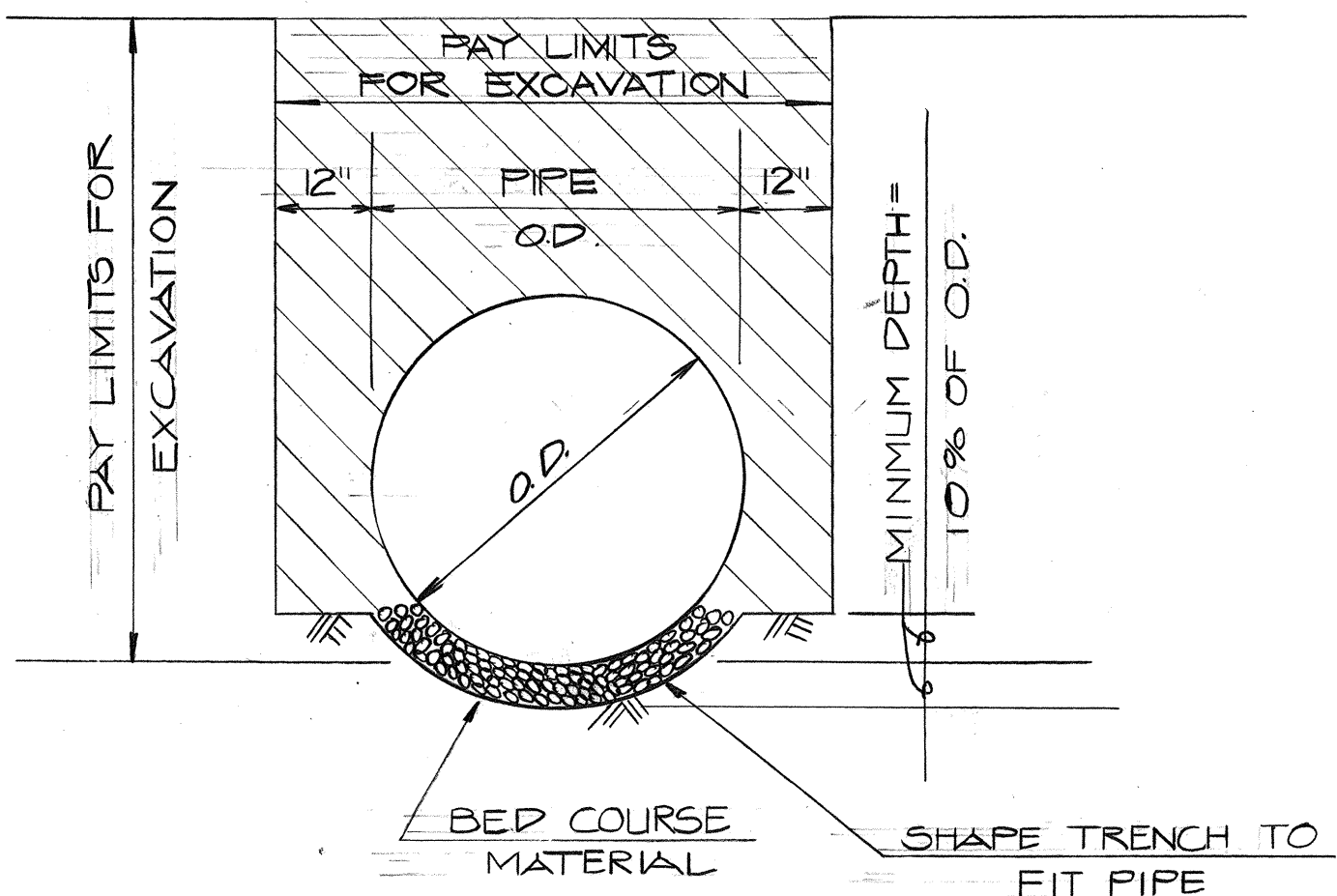
TYPE "C" GRATED CONCRETE DROP INTAKE

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



SPLASH PAD

AT: EA STA. 02+00 &
WA STA. 41+71.80
SCALE: 1 1/2" = 1'-0"



BEDDING & PAY LIMITS FOR CULVERTS

NO SCALE

ORIGINAL PLAN	DATE
DESIGNED BY	
CHECKED BY	
NOTED BY	
QUANTITIES BY	
NO.	

BENJAMIN S. TANAKA
REGISTERED PROFESSIONAL ENGINEER
No. 2055
HAWAII, U.S.A.

Benjamin S. Tanaka
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

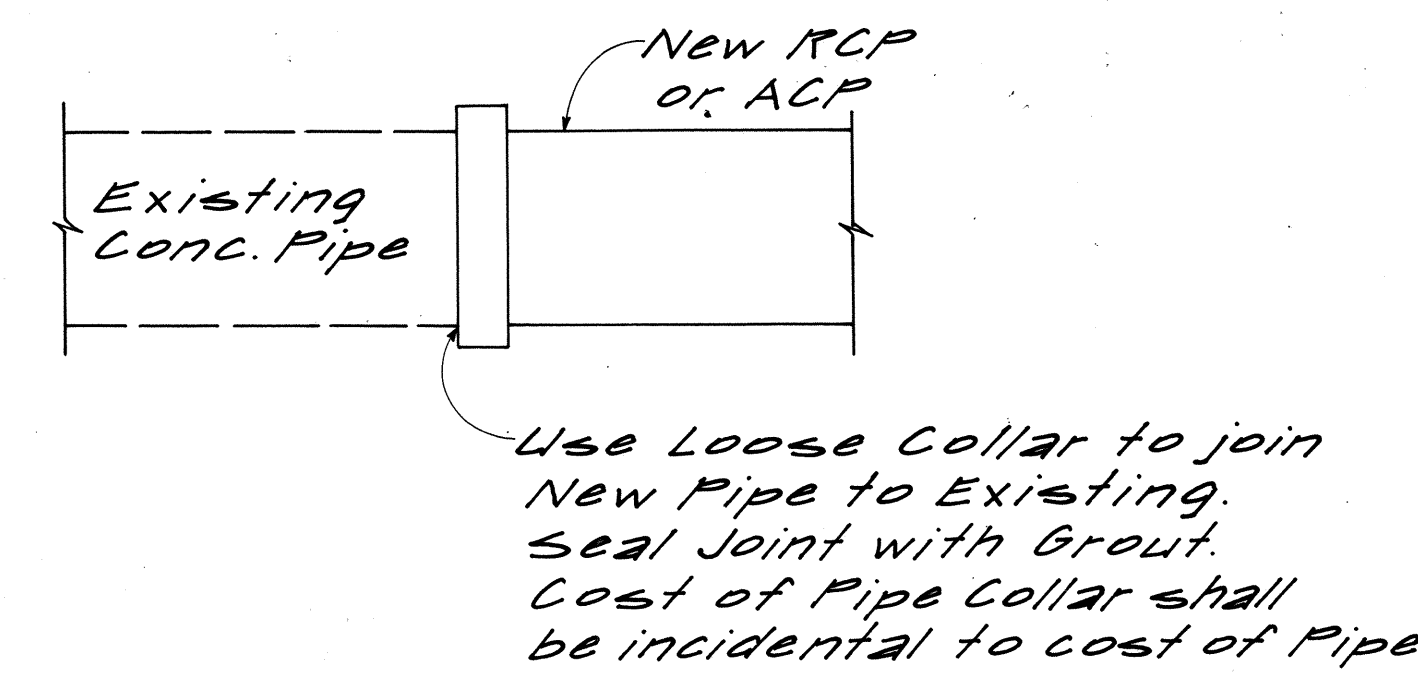
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS

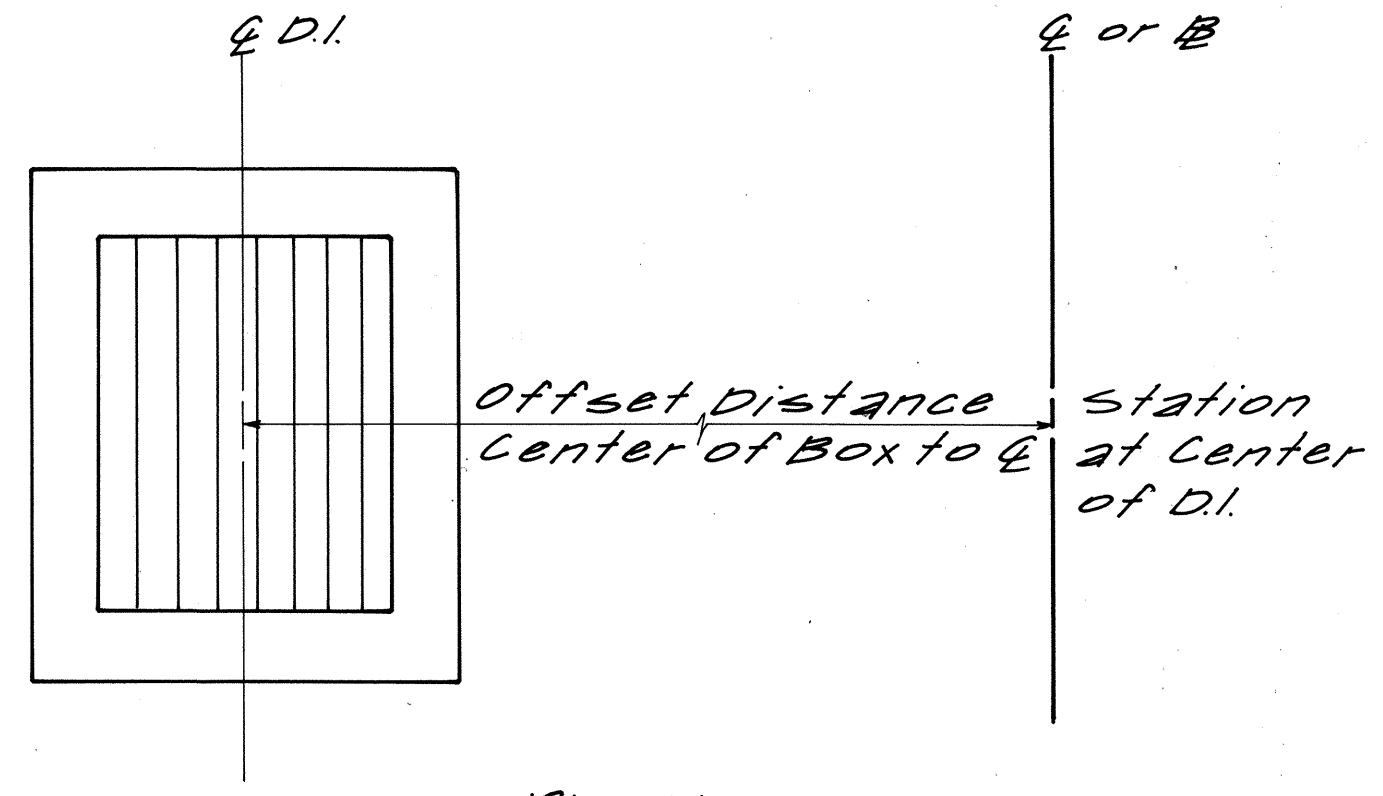
AIRPORT INTERCHANGE
F.A.I. PROJECT NO. I-HI-1(175):16
SCALE: AS SHOWN DATE: SEPT., 1983

SHEET NO. 3 OF 3 SHEETS

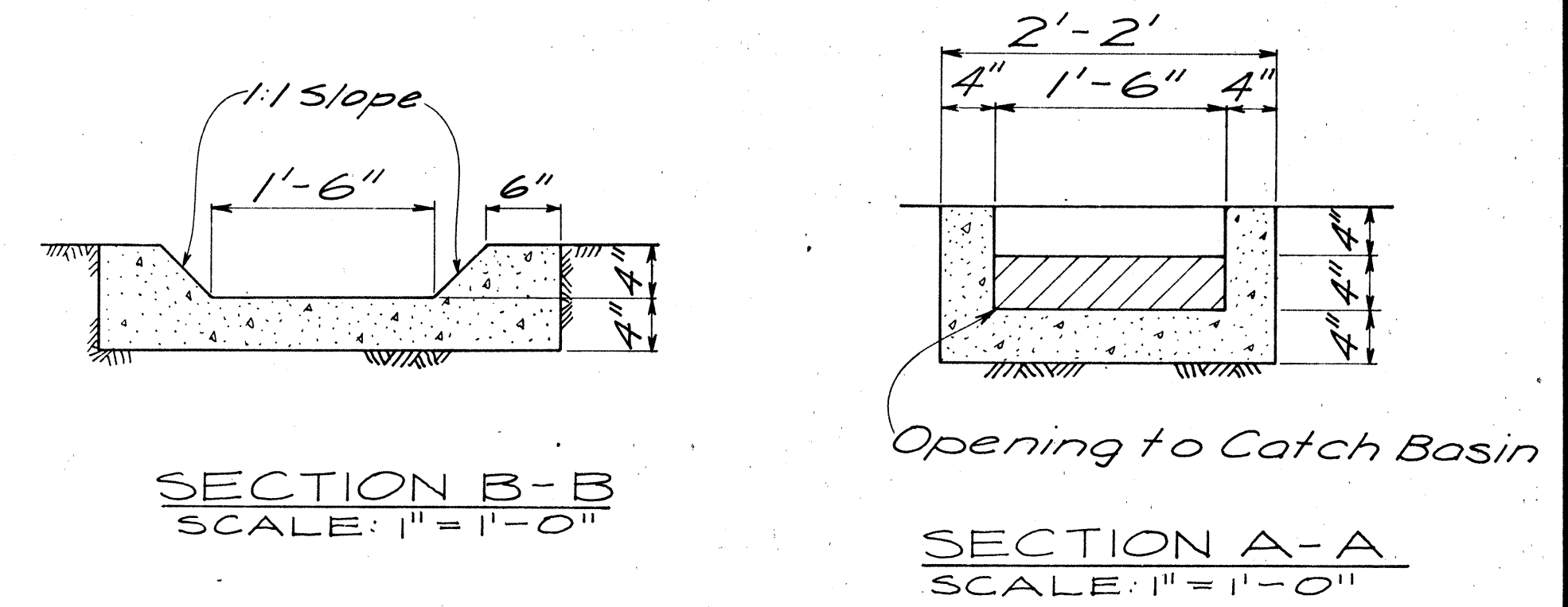
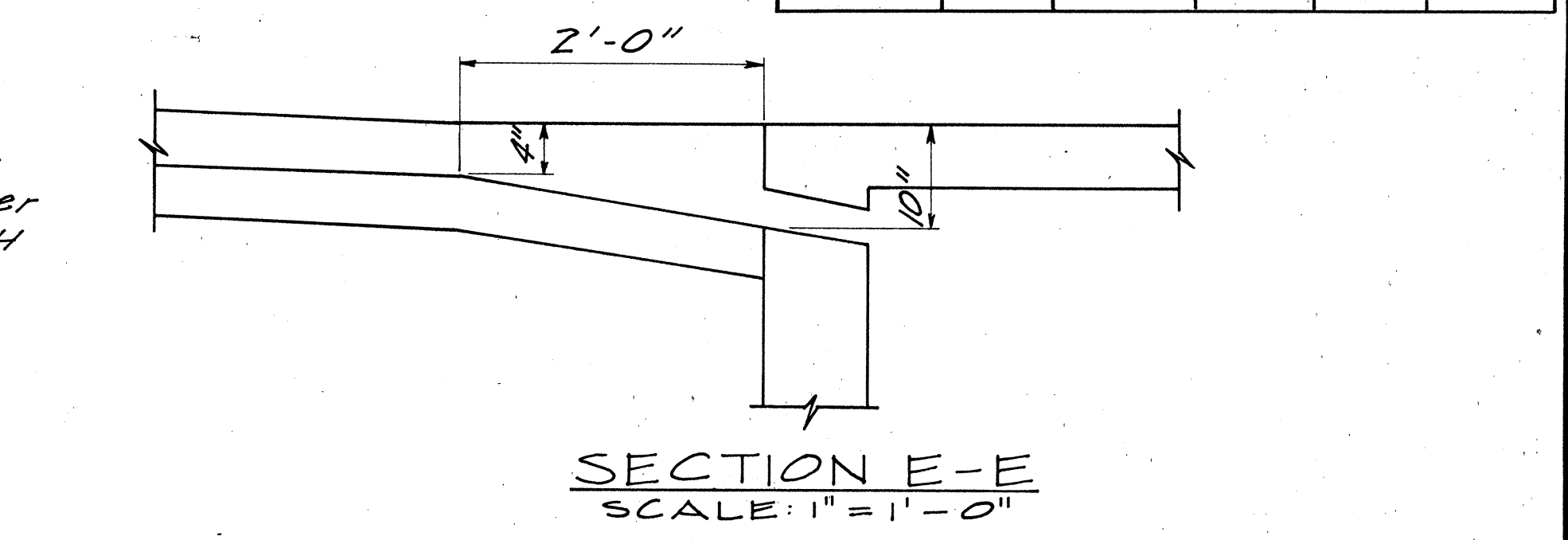
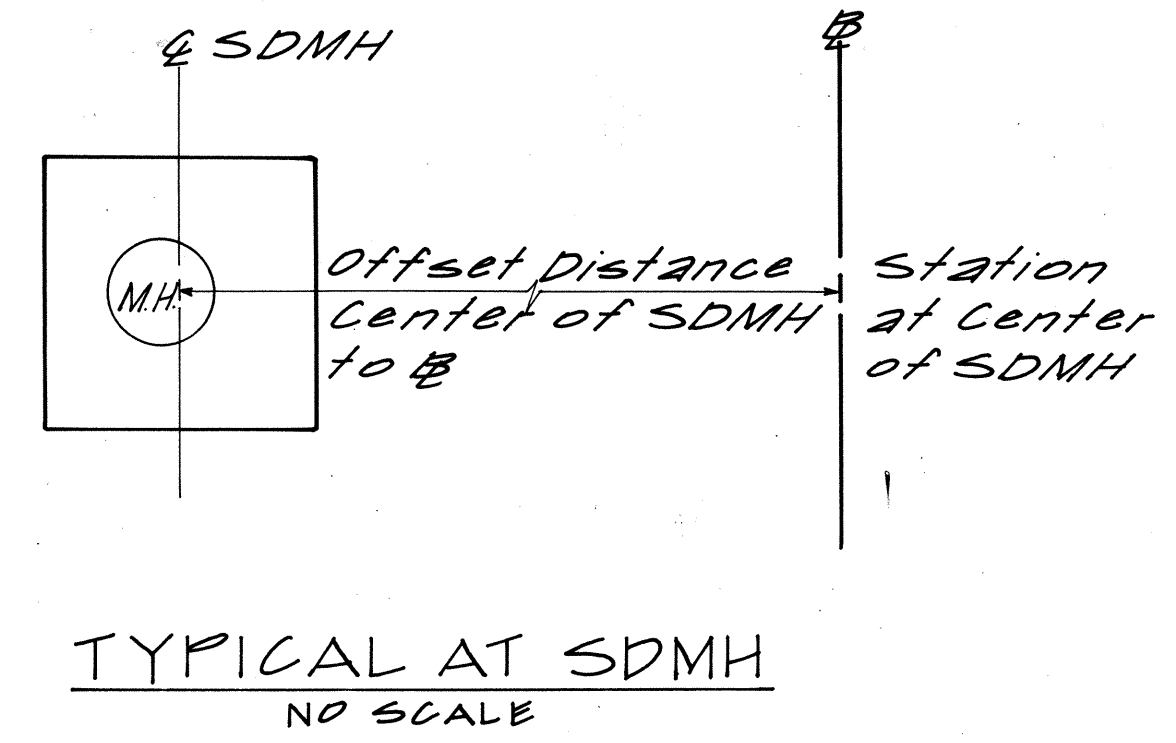
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	1-1(175):16	1983	17	191



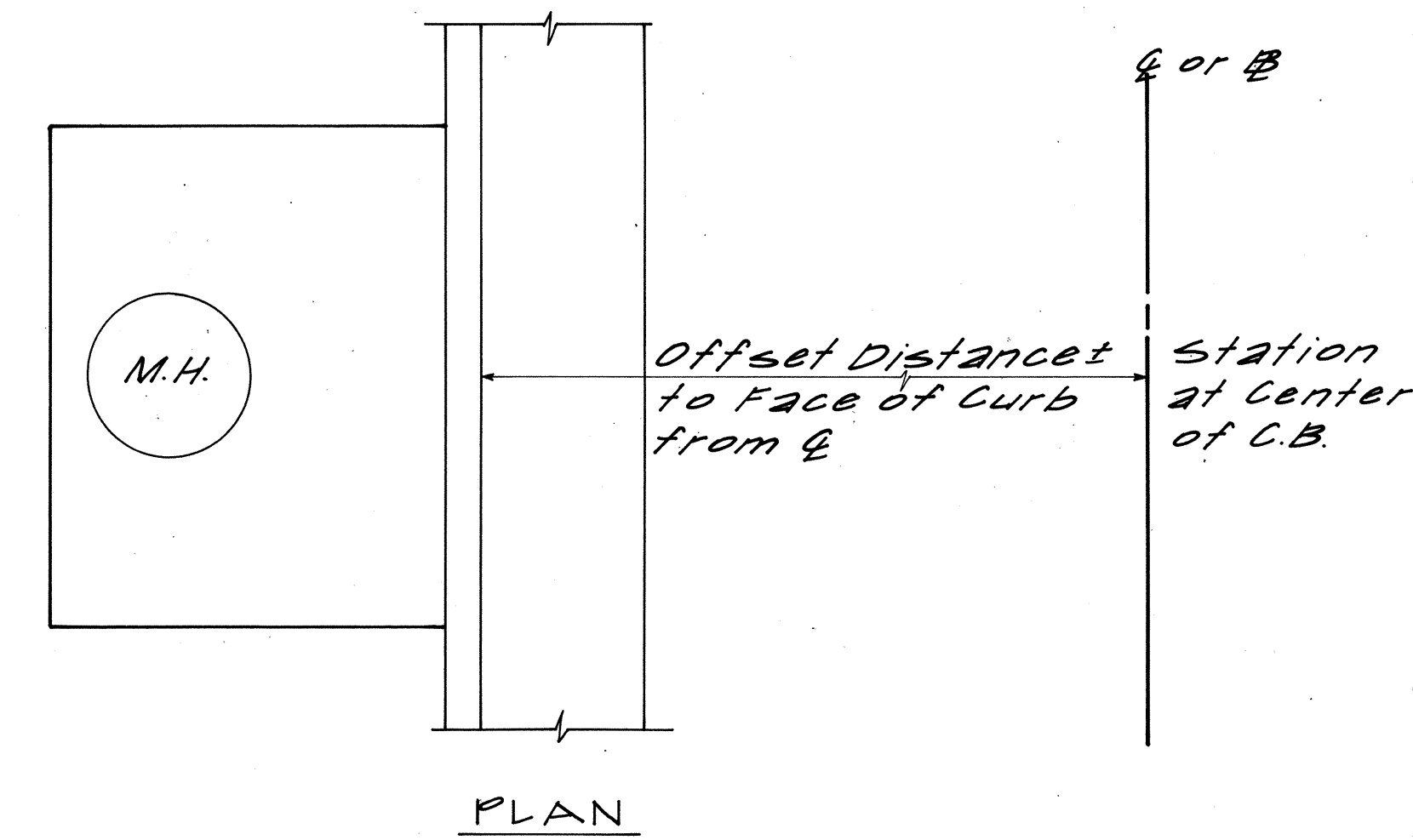
PIPE CONNECTION TO EXISTING PIPE
NO SCALE



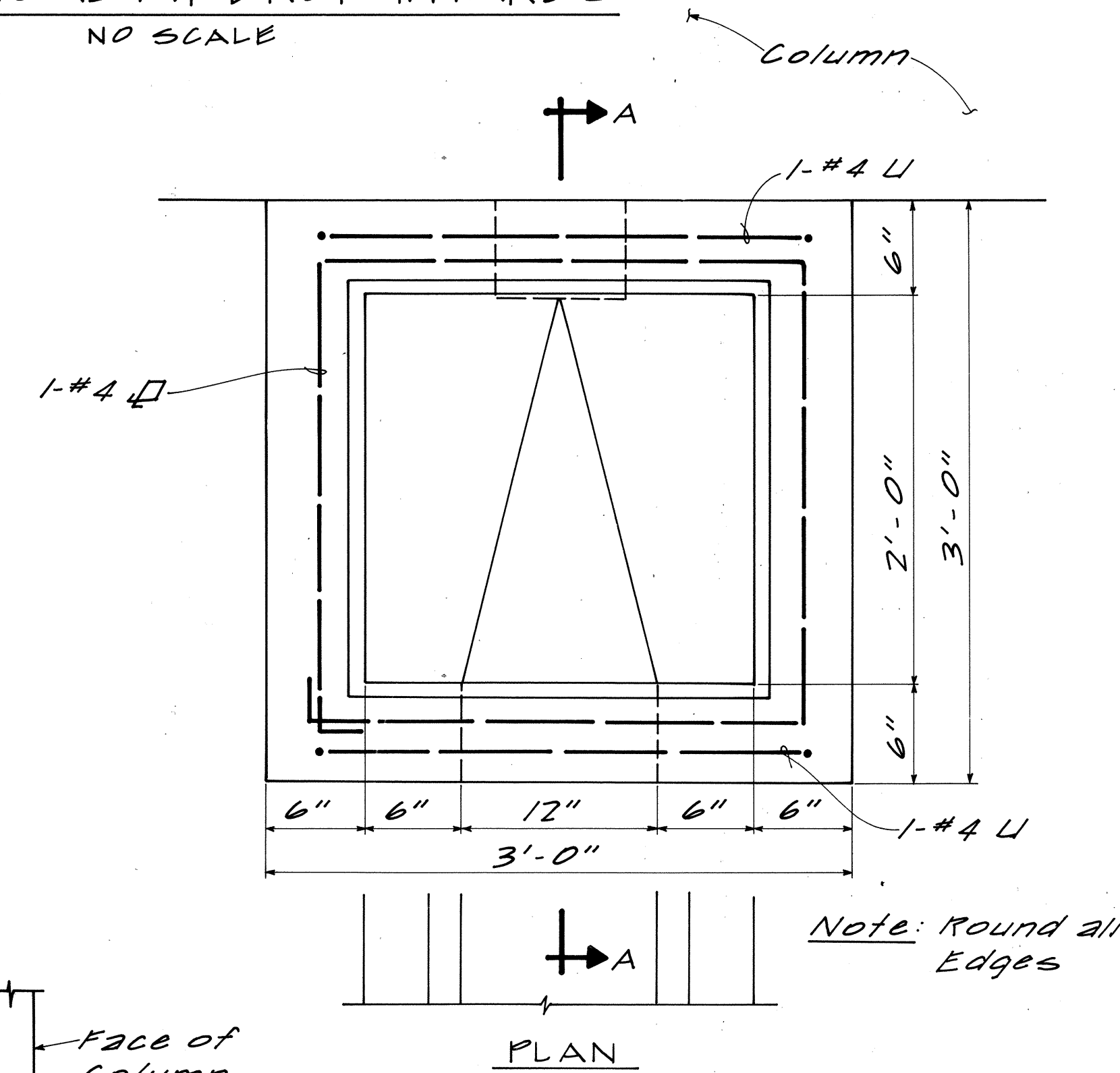
PLAN
TYPICAL AT DROP INTAKES
NO SCALE



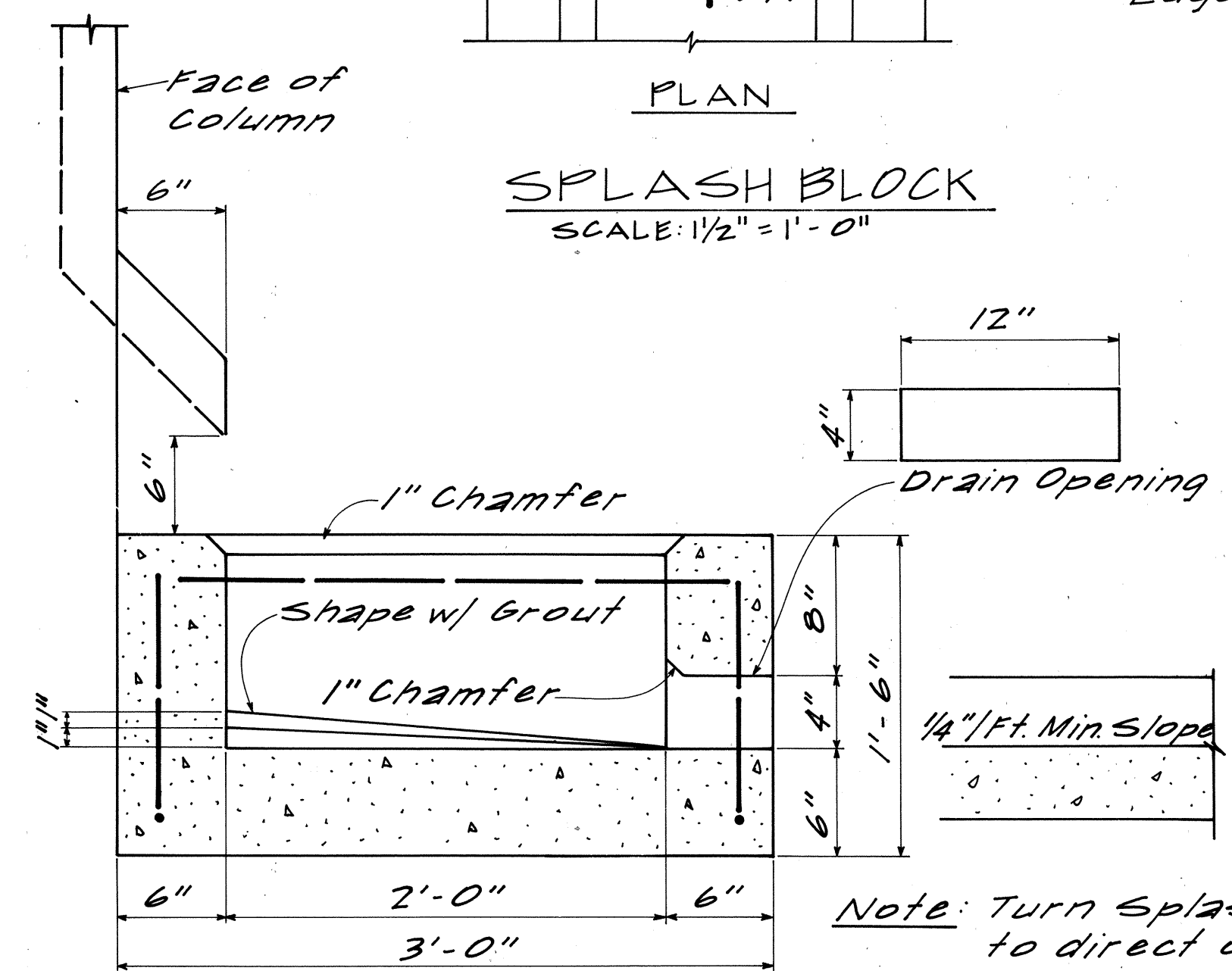
Location of openings in Type D & ID Catch Basins to be determined by the Engineer



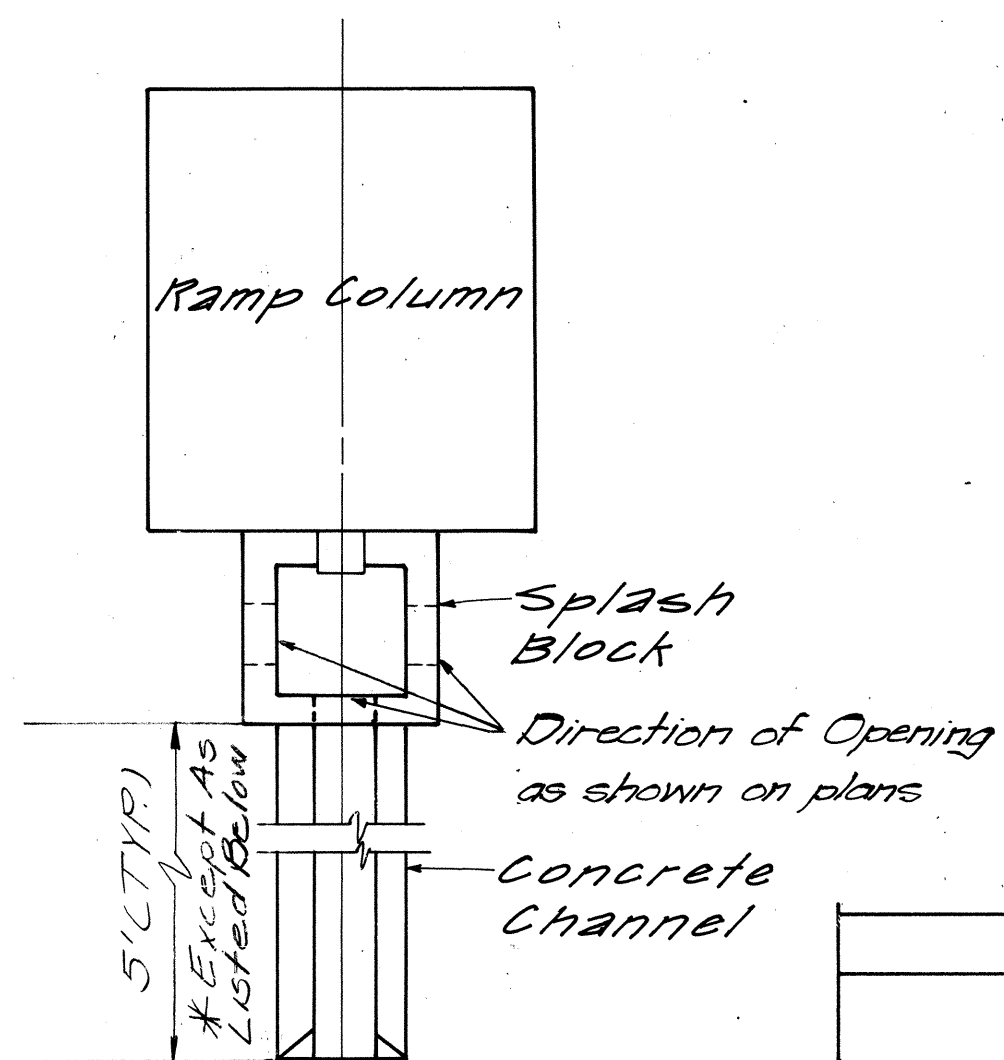
PLAN
TYPICAL AT CATCH BASINS
NO SCALE



PLAN
SPLASH BLOCK
SCALE: 1/2" = 1'-0"

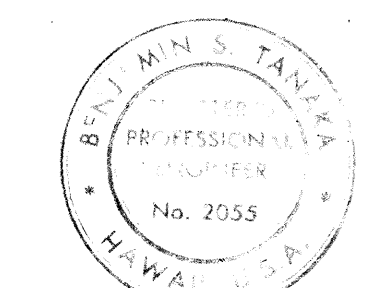
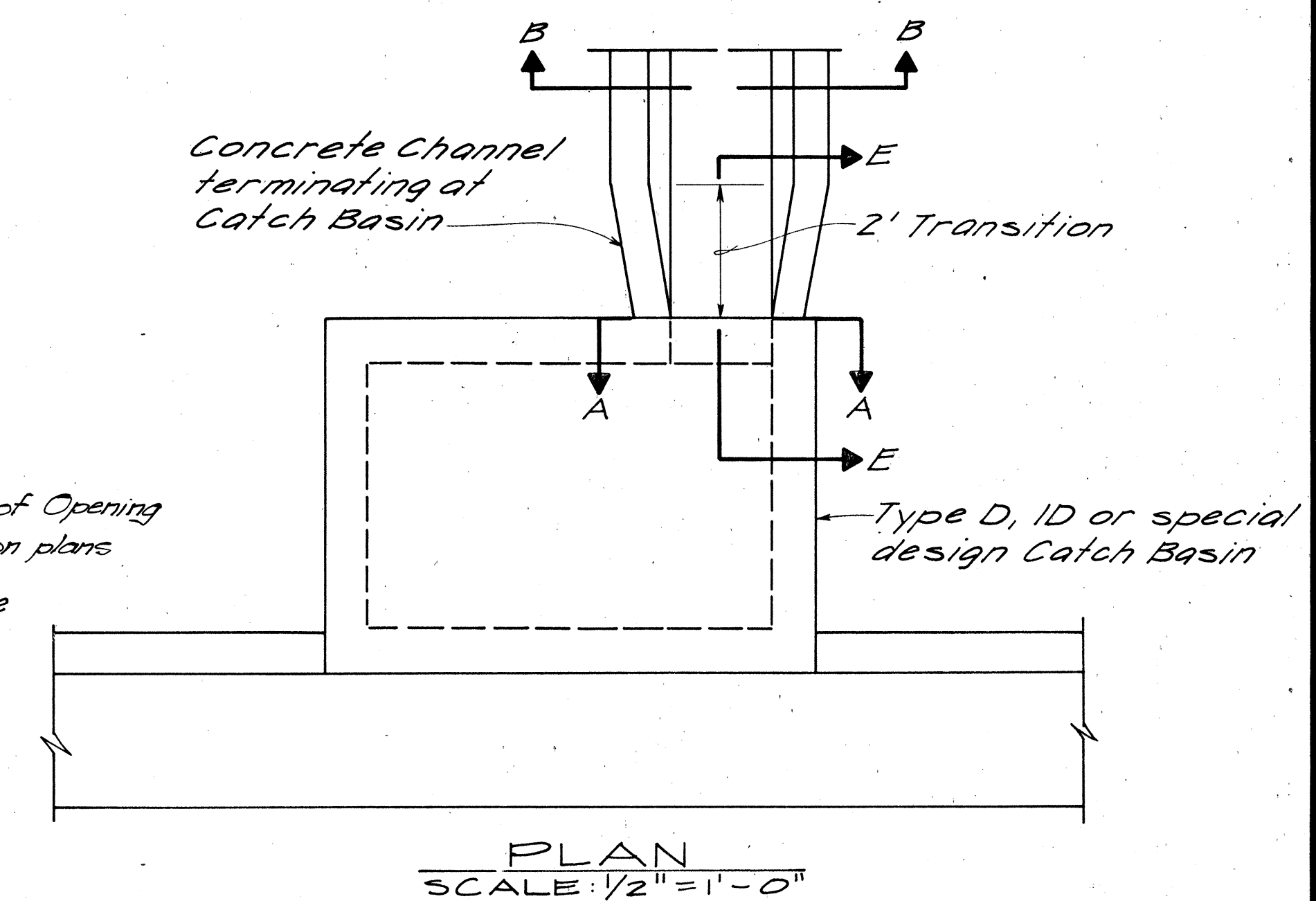


SECTION A-A
SCALE: 1/2" = 1'-0"



DETAIL A
NO SCALE

*PIER STATION B R-WA	CHANNEL LENGTH
67+95-RT	22'
70+80-LT	8.5'
70+80-RT	8.0
71+75-LT	8.5
71+75-RT	5.5
72+70-LT	8.5
72+70-RT	8.0



Benjamin S. Tanaka
WORK WAS PREPARED BY ME
UNDER MY SUPERVISION.

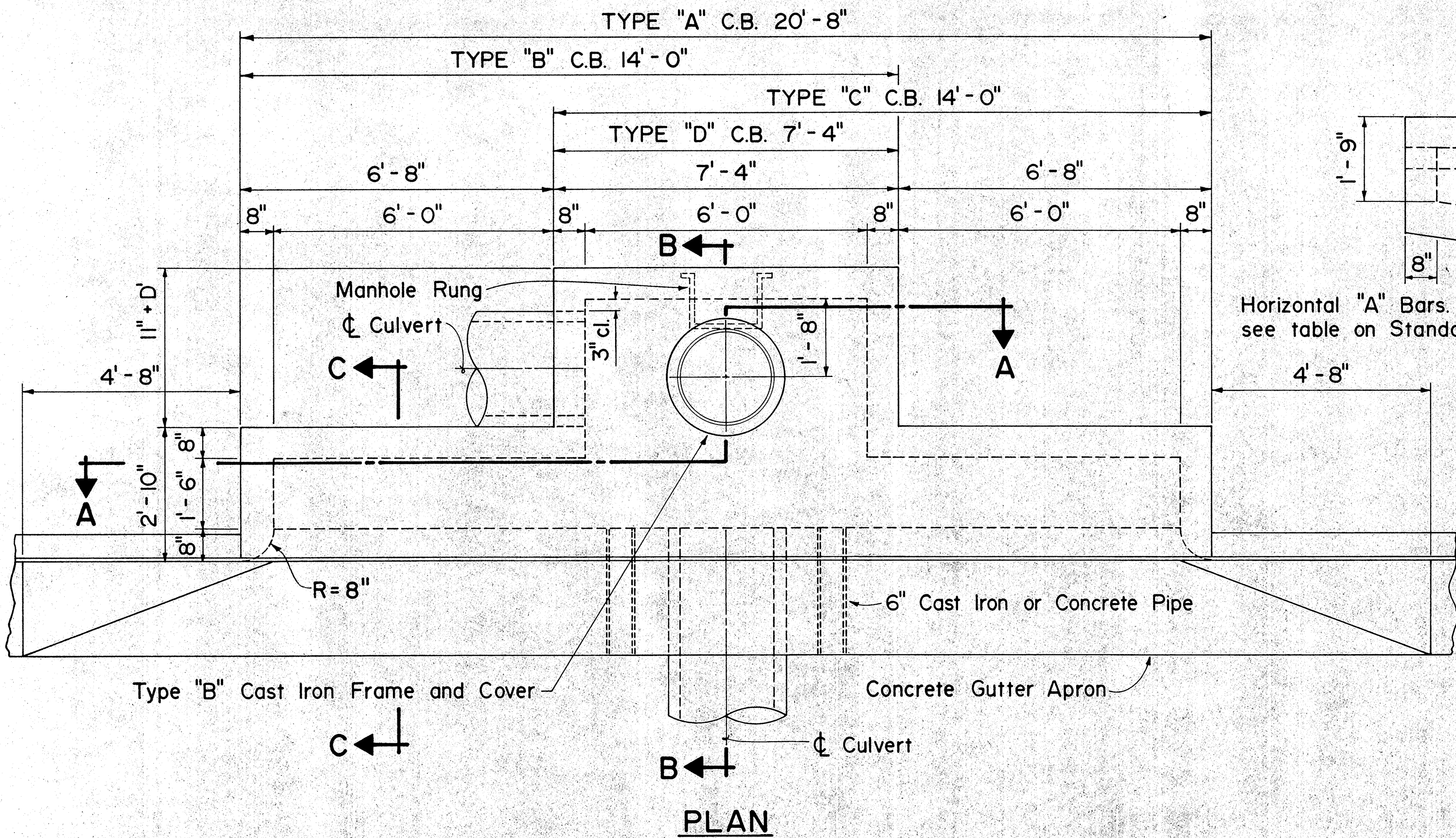
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS

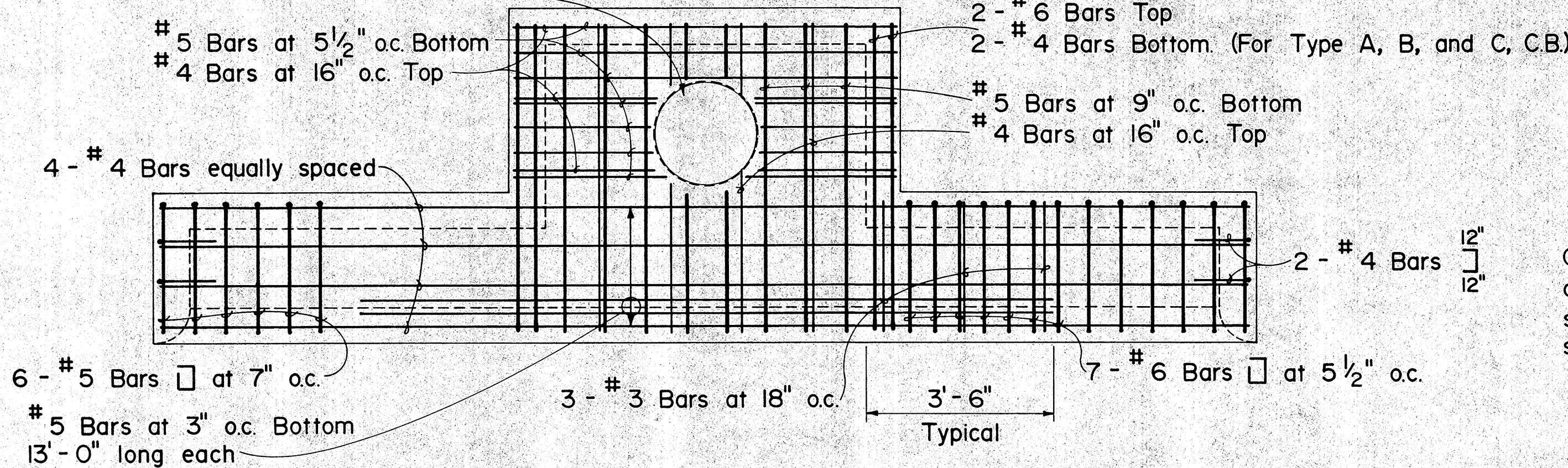
AIRPORT INTERCHANGE
F.A.I. PROJECT NO. 1-1(175):16
SCALE: AS SHOWN DATE: SEPT., 1982
SHEET No. 4 OF 0 SHEETS

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

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	111-1(175)16	1983	18	191

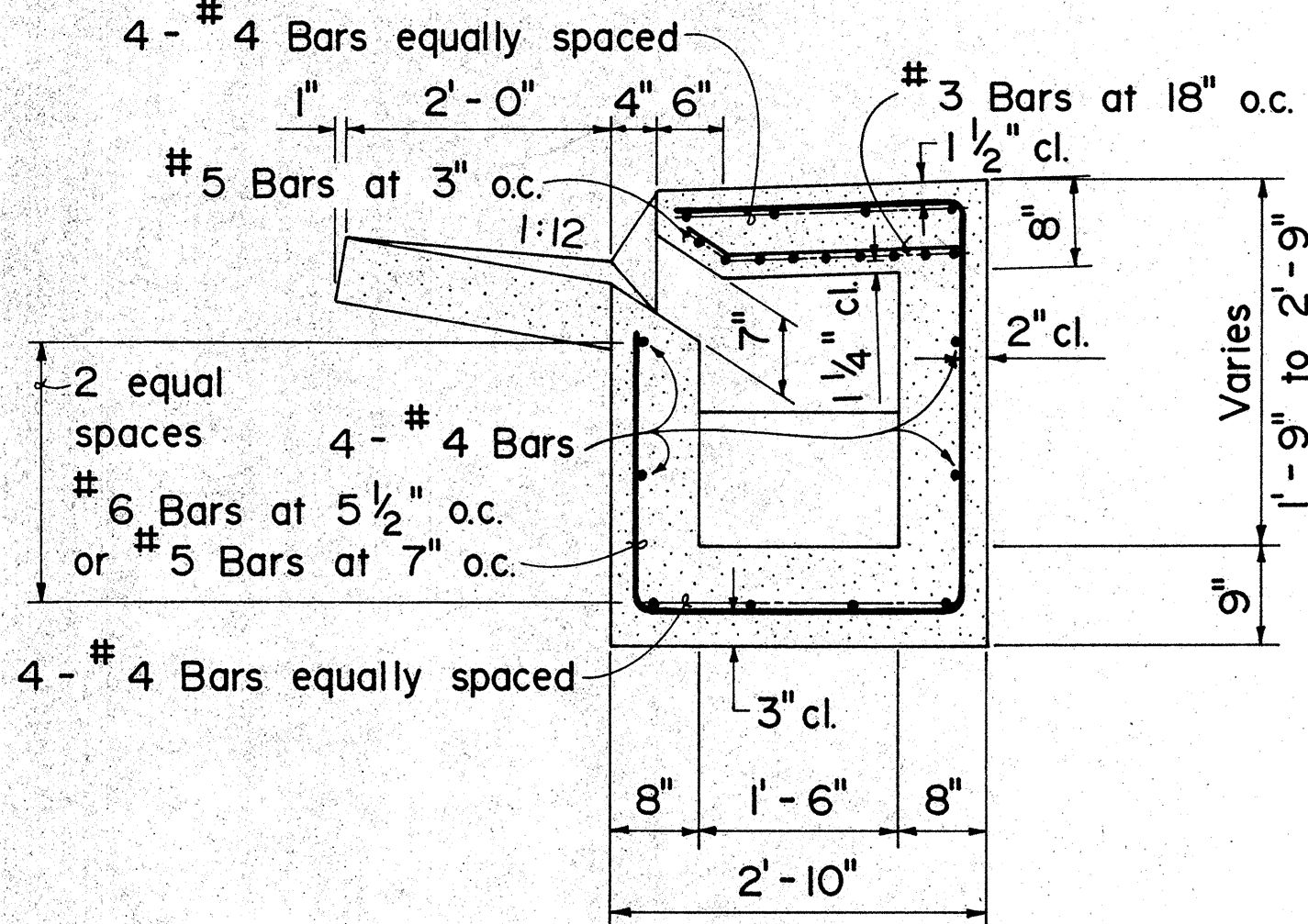
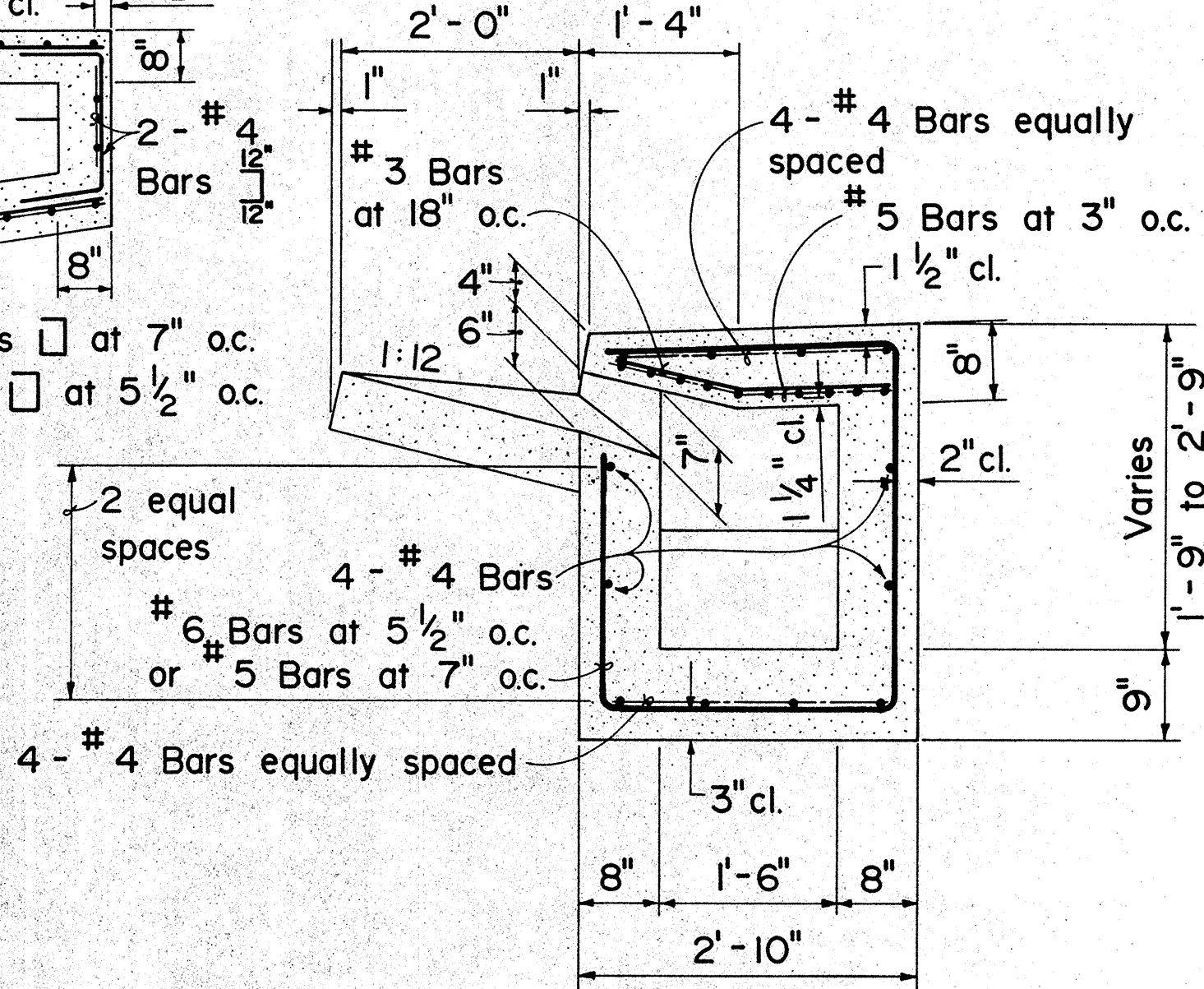
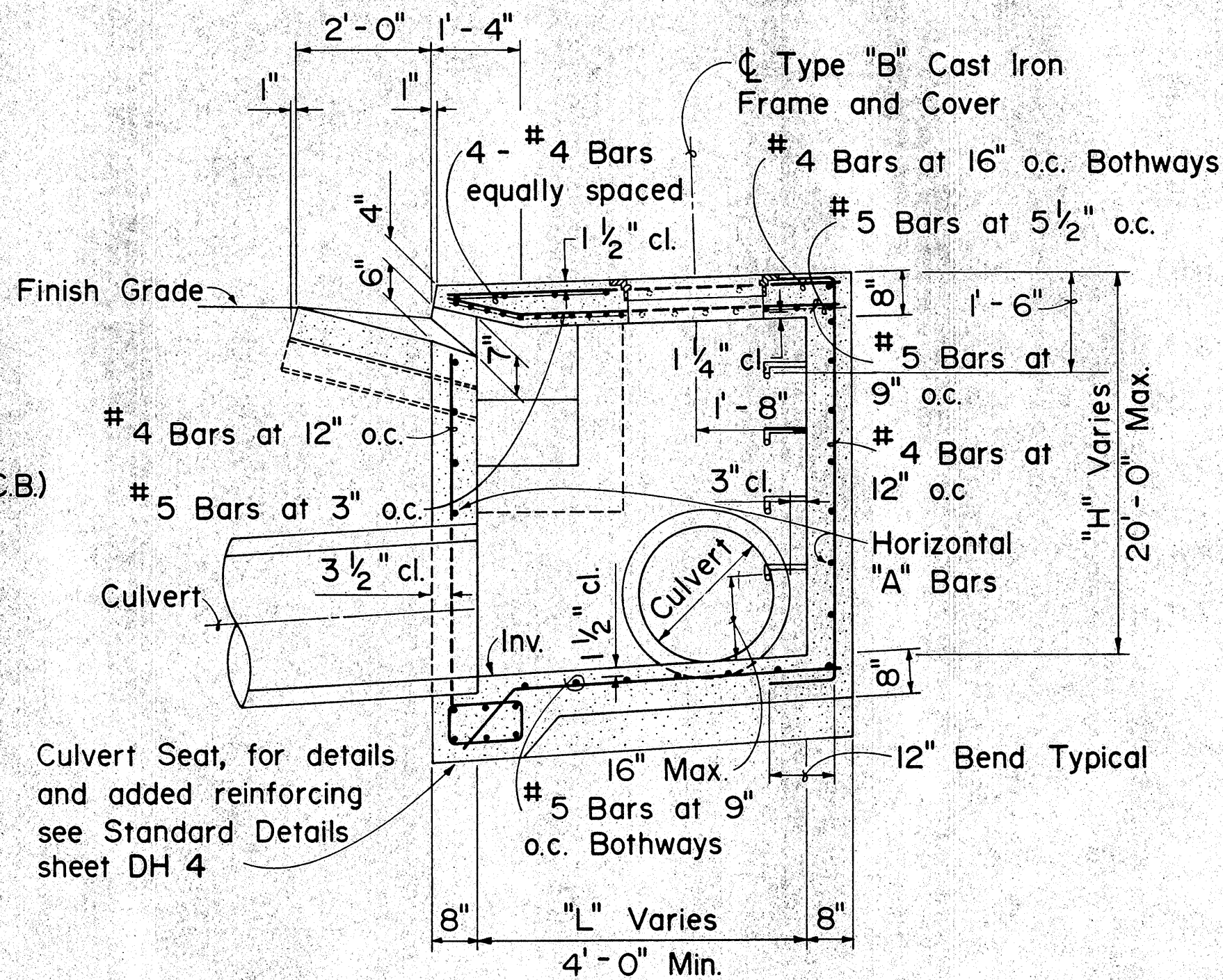
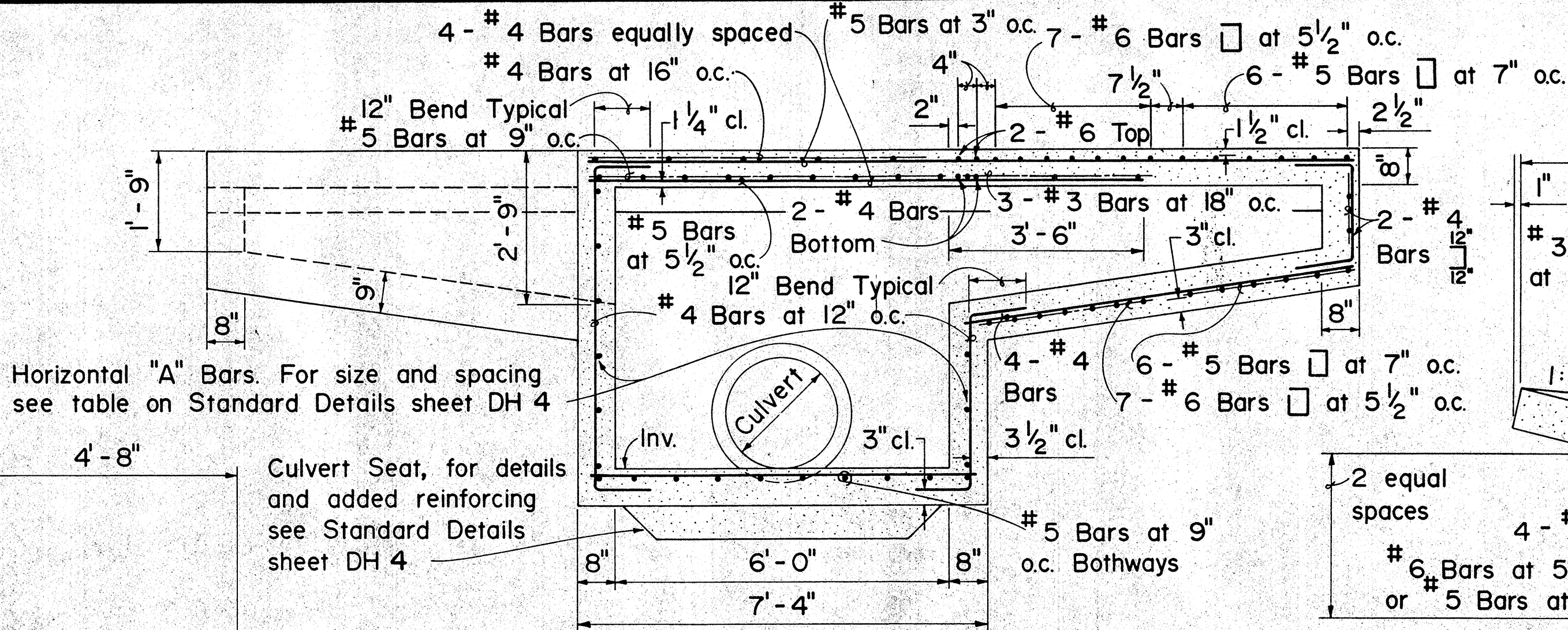


Opening for Type "B" Cast Iron Frame and Cover. For added reinforcing around hole see Standard Details sheet DH 4



PLAN VIEW OF REINFORCING STEEL

TYPE "A", "B", "C" & "D" CATCH BASIN



APPROVAL RECOMMENDED:

HYDRAULIC DESIGN ENGINEER

12/3/80
DATE

APPROVED:

ASSISTANT CHIEF, ENGINEERING

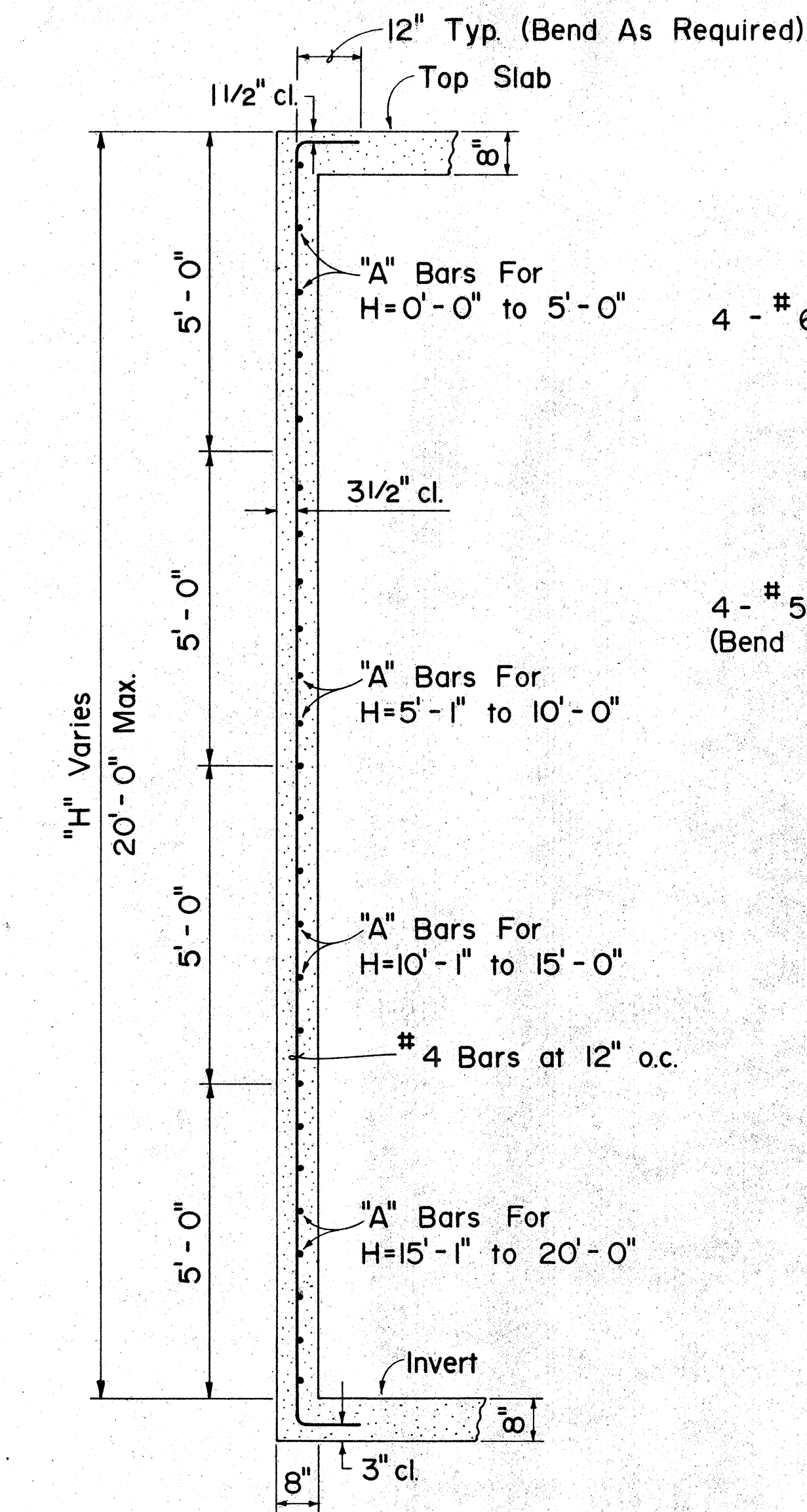
12/4/80
DATE

NO.	REVISION	APPROVED BY	DATE
1.	Supersedes Sht. DH 1 approved 12/17/69	H.F.	12/4/80

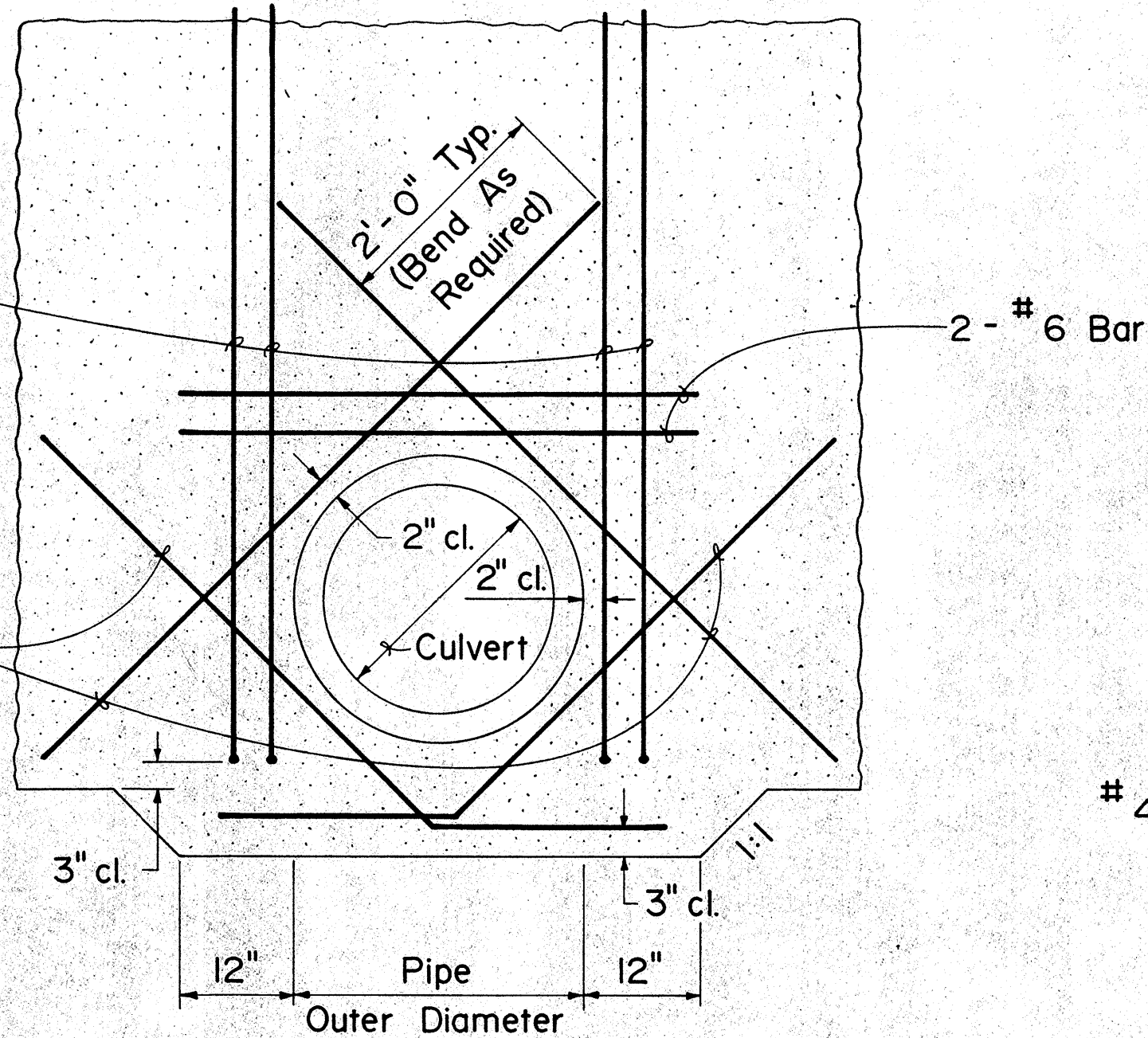
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION
STANDARD DETAILS TYPE A, B, C, & D CATCH BASIN
Not To Scale Date: 198
SHEET NO. 5 OF 9 SHEETS DH 1

ORIGINAL PLAN	DATE
DRAWN BY	
CHECKED BY	
NOTED BY	
QUANTITIES BY	
CHECKED BY	
No.	

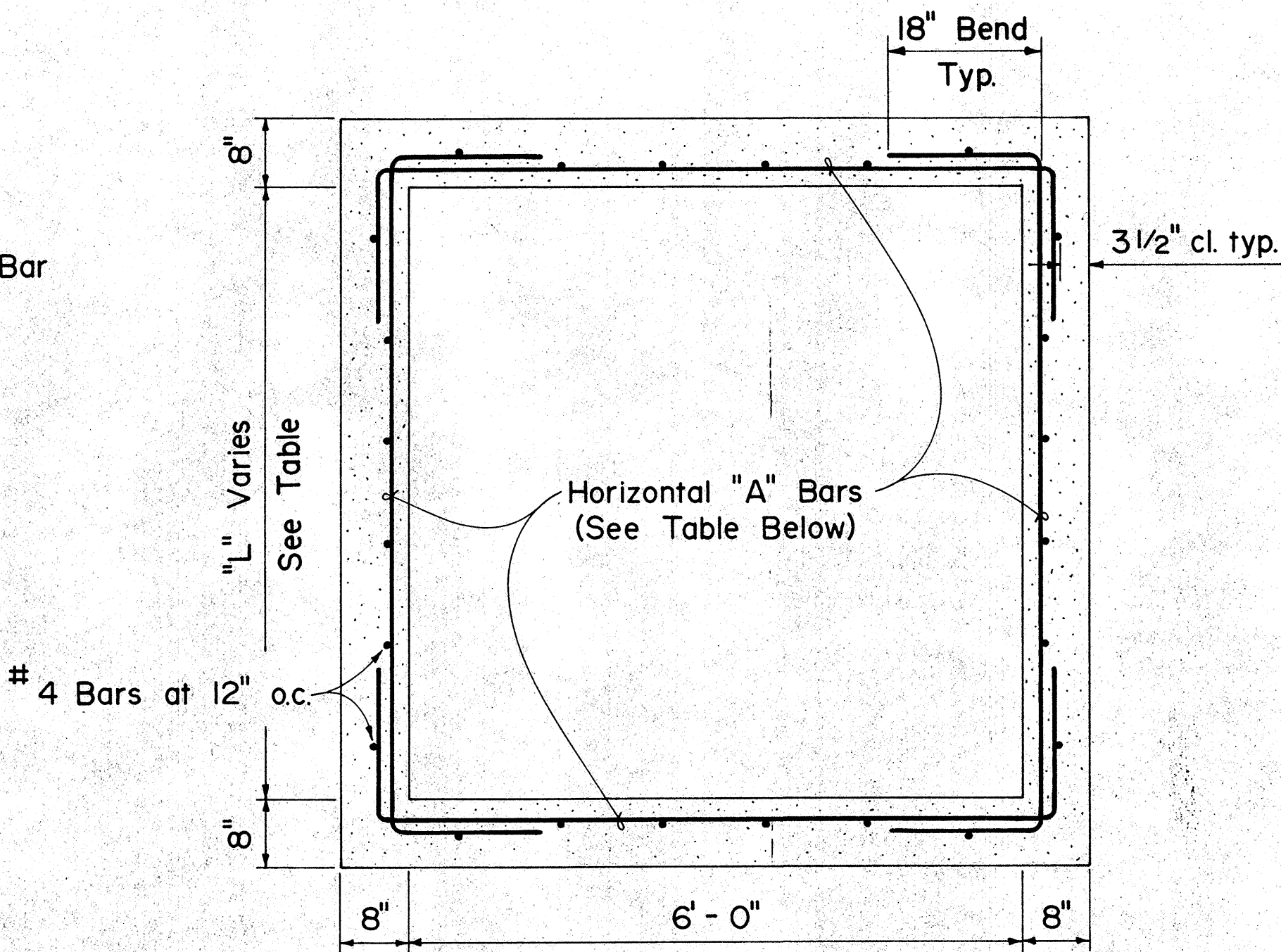
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	1-HH(175)-16	1983	19	191



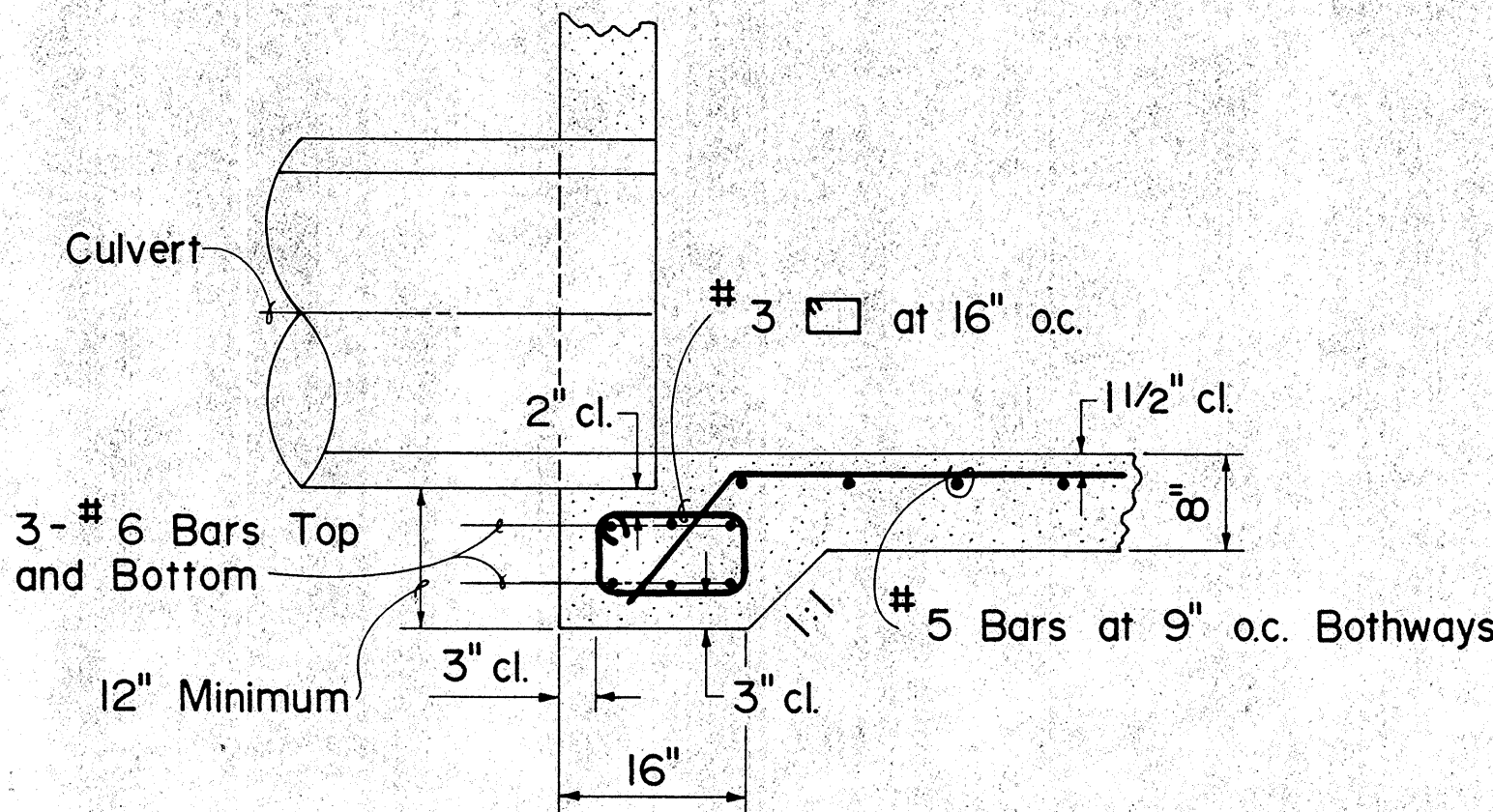
ELEVATION VIEW OF WALL SECTION



ADDED REINFORCING FOR CULVERT OPENINGS

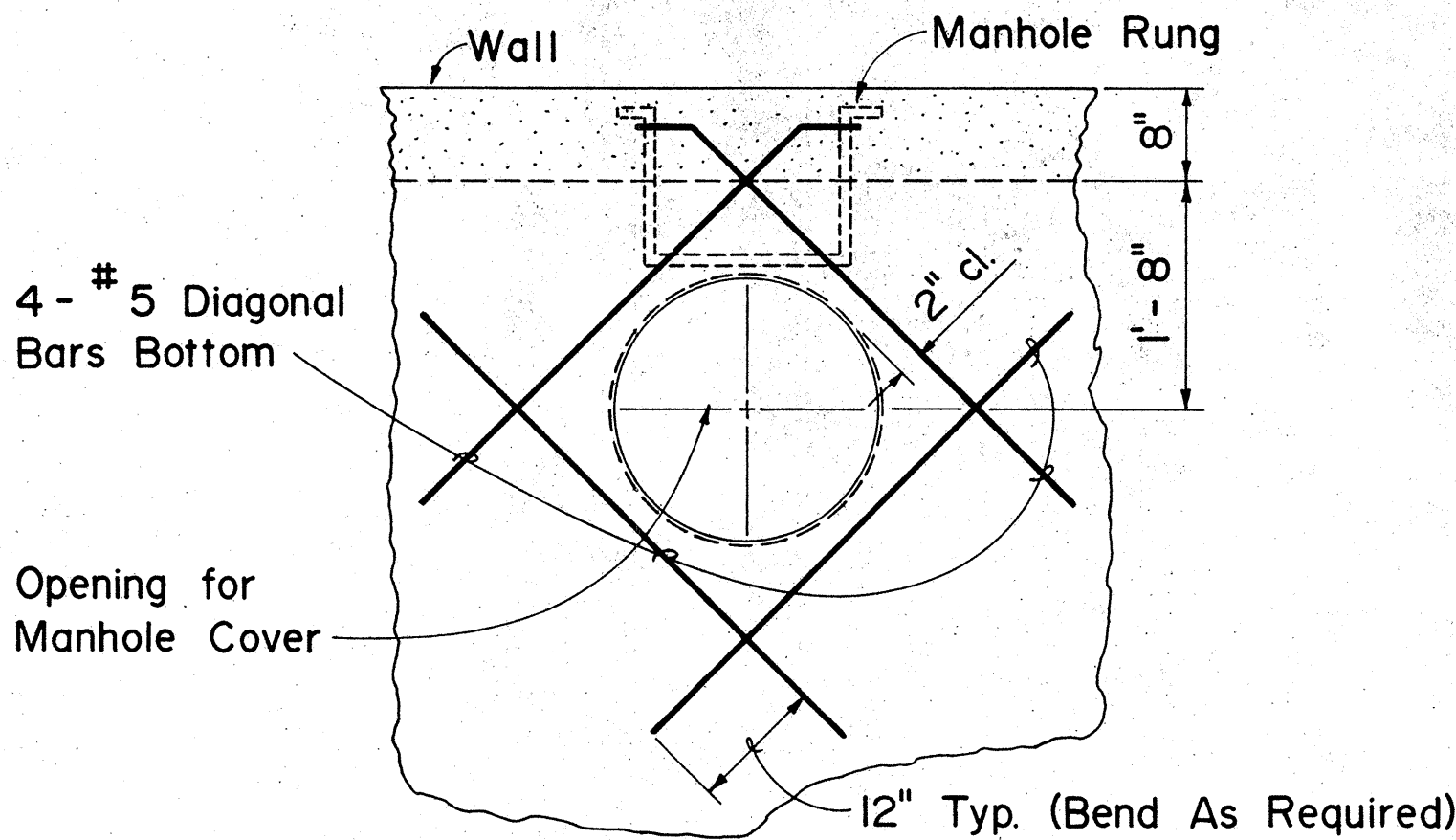


PLAN VIEW OF WALL SECTION



DETAIL OF CULVERT SEAT

"H" MAX. (FT.)	HORIZONTAL "A" BARS				
	4'-0"	6'-0"	7'-4"	8'-4"	9'-4"
0'-0" to 5'-0"	# 4 at 12" o.c.	# 4 at 10" o.c.	# 5 at 10" o.c.	# 5 at 8" o.c.	# 5 at 7" o.c.
5'-1" to 10'-0"	# 4 at 9" o.c.	# 5 at 9" o.c.	# 5 at 6" o.c.	N.A.	N.A.
10'-1" to 15'-0"	# 5 at 10" o.c.	# 5 at 6" o.c.	N.A.	N.A.	N.A.
15'-1" to 20'-0"	# 5 at 8" o.c.	N.A.	N.A.	N.A.	N.A.



ADDED REINFORCING FOR MANHOLE OPENING

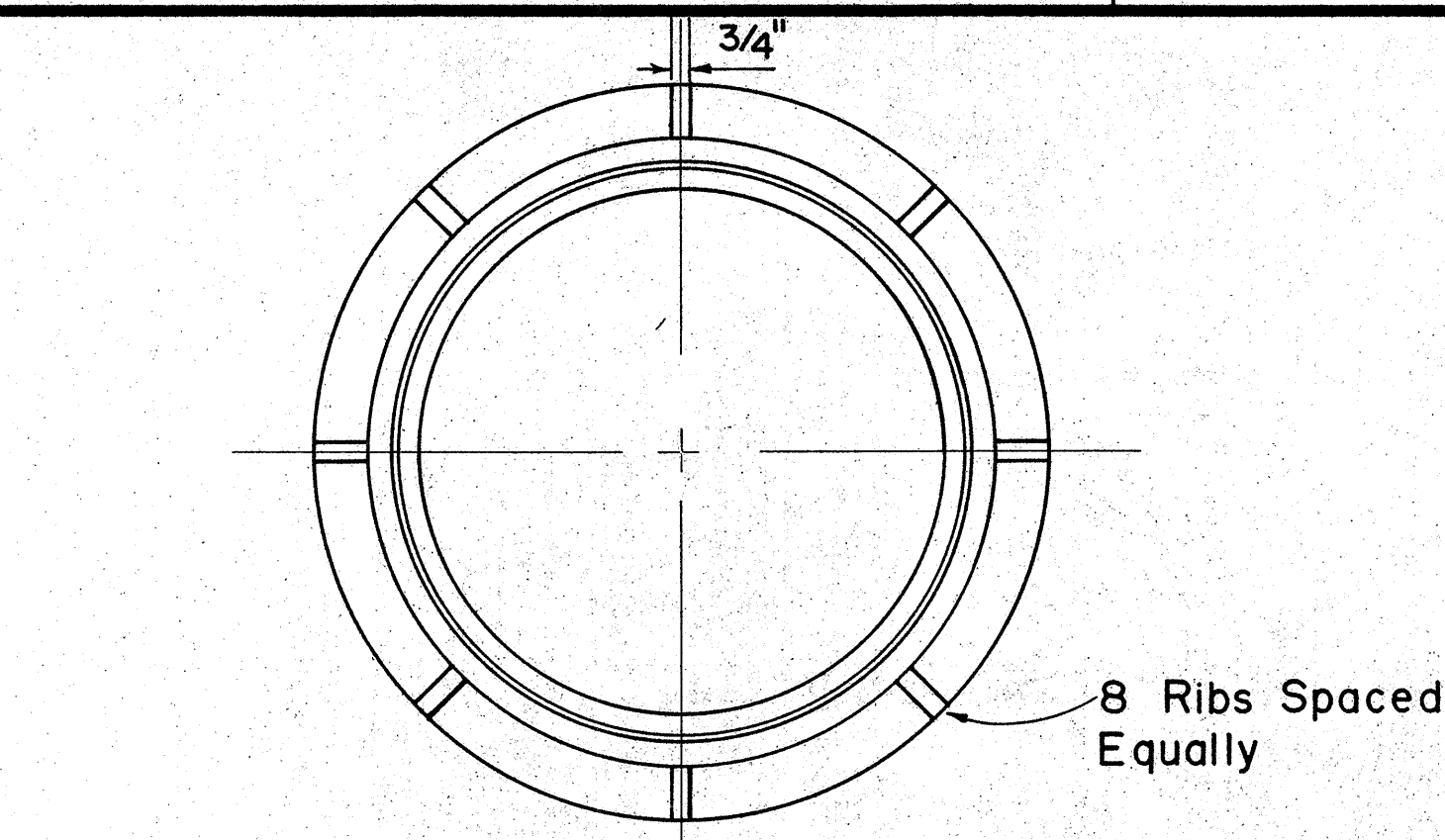
APPROVAL RECOMMENDED: 12/3/80
 HYDRAULIC DESIGN ENGINEER DATE
 APPROVED: 12/4/80
 ASSISTANT CHIEF, ENGINEERING DATE

NO.	REVISION	APPROVED BY	DATE
1.	Replaces Sht. DH 4 approved 12-17-69	H.T.	12/4/80

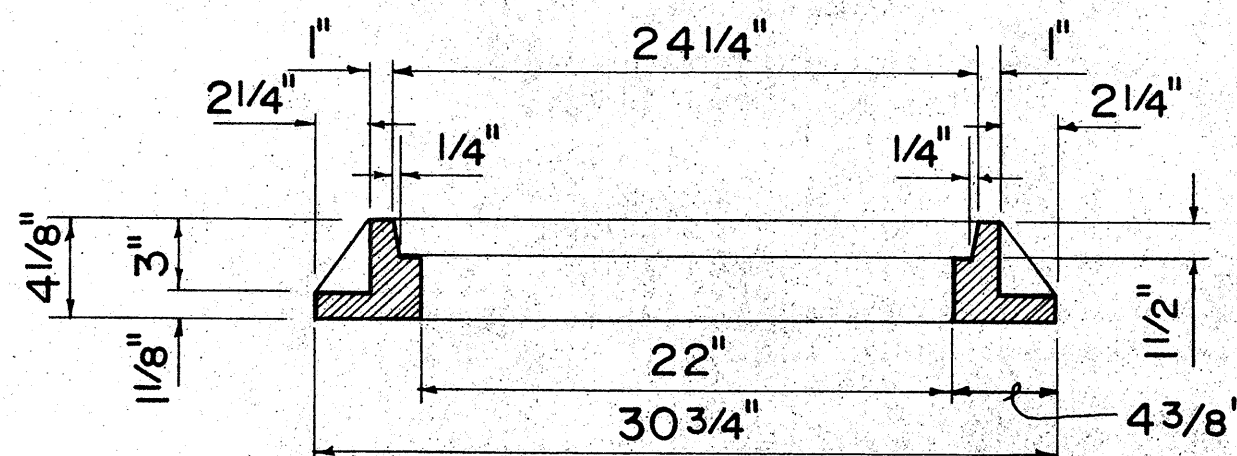
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION
STANDARD DETAILS TYPICAL REINFORCING DETAILS FOR CATCH BASINS
Not To Scale Date: 198
SHEET NO. 0 OF 0 SHEETS DH 4

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

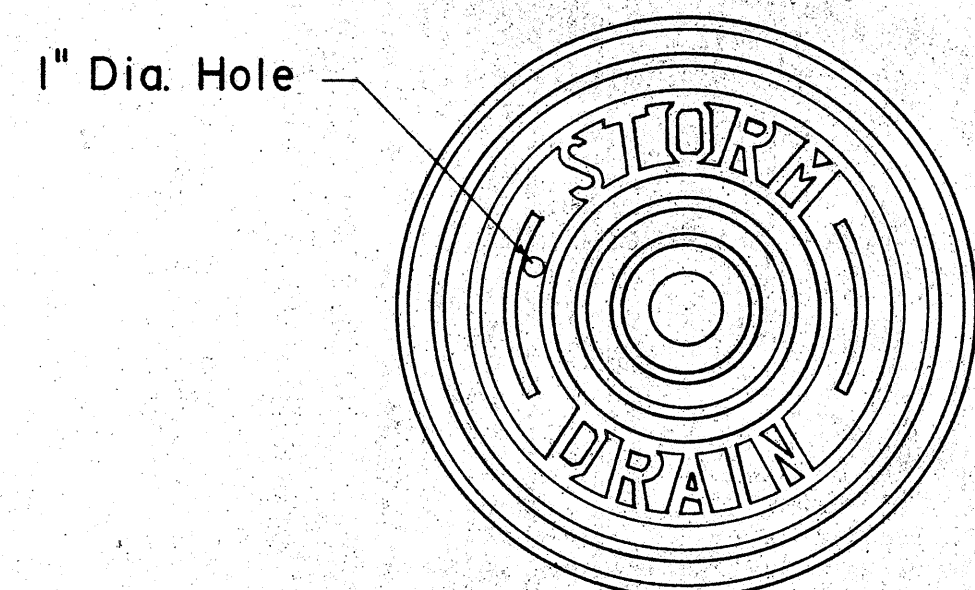
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	1-HI-10734	1983	20	191



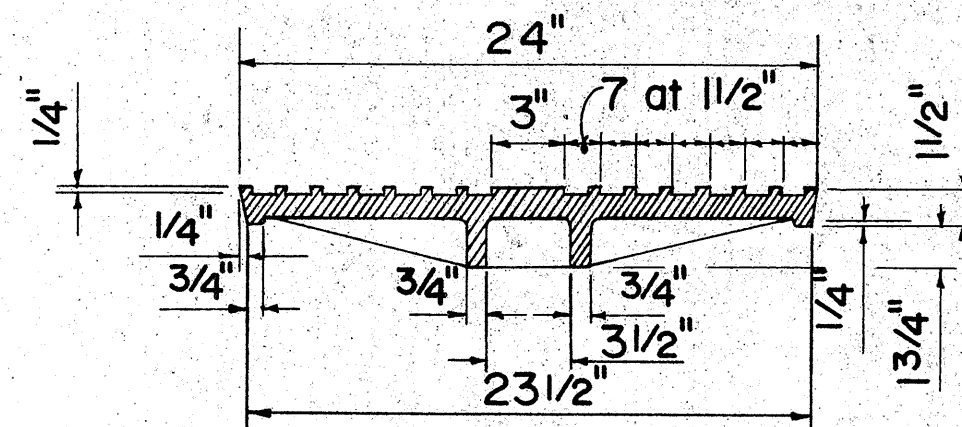
PLAN OF FRAME



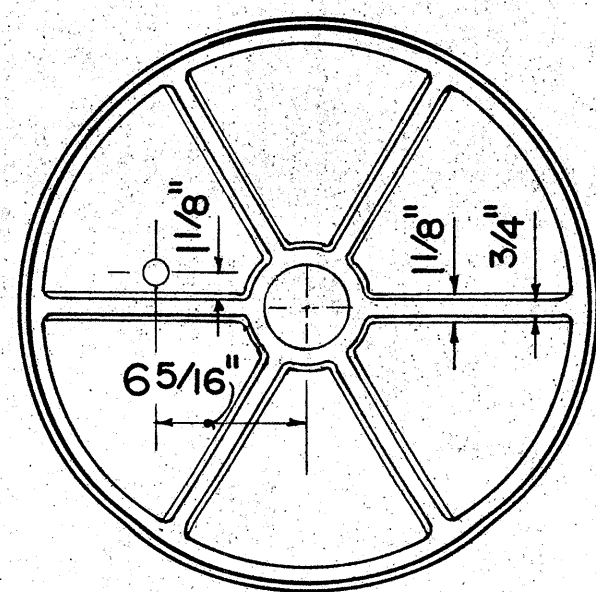
SECTION OF FRAME



TOP VIEW OF COVER

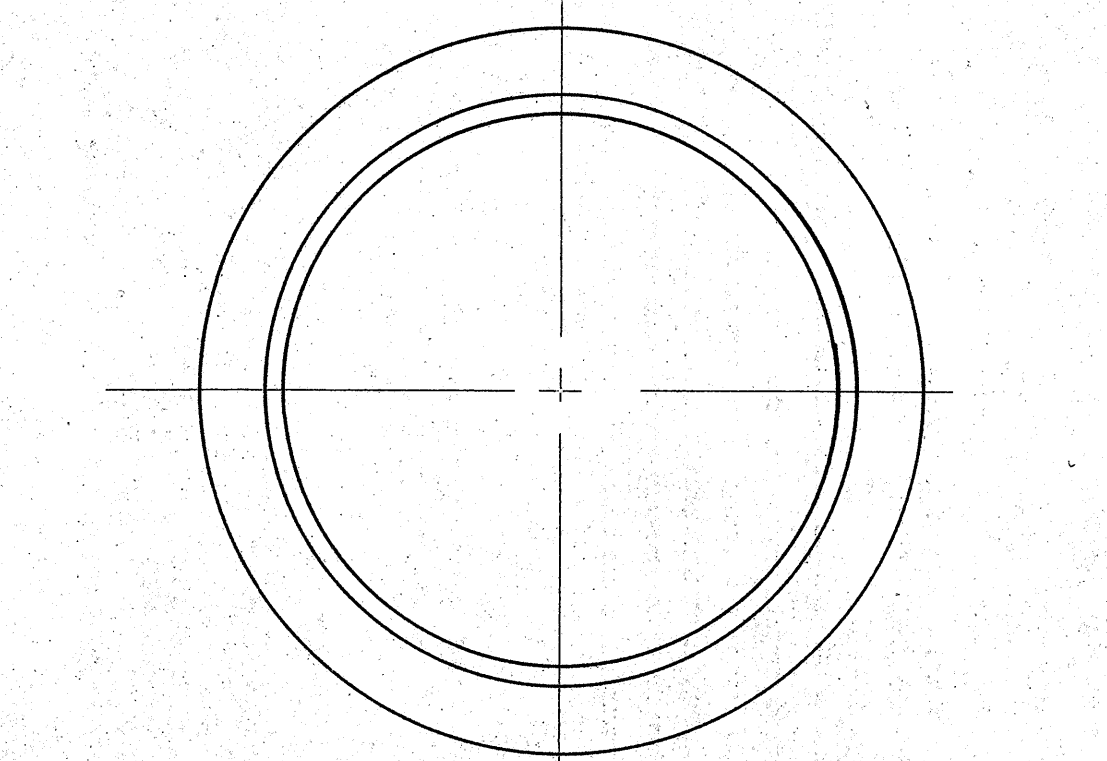


SECTION

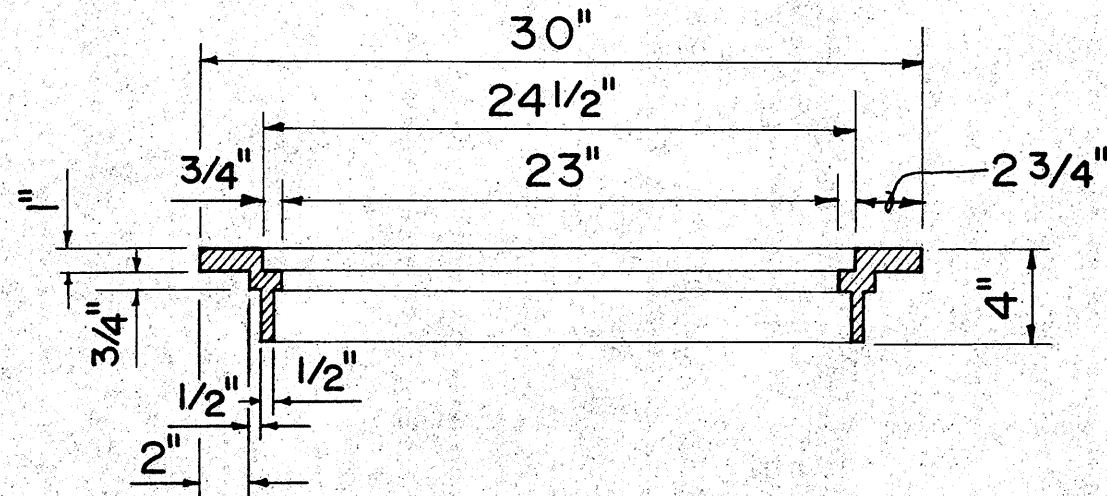


BOTTOM VIEW OF COVER

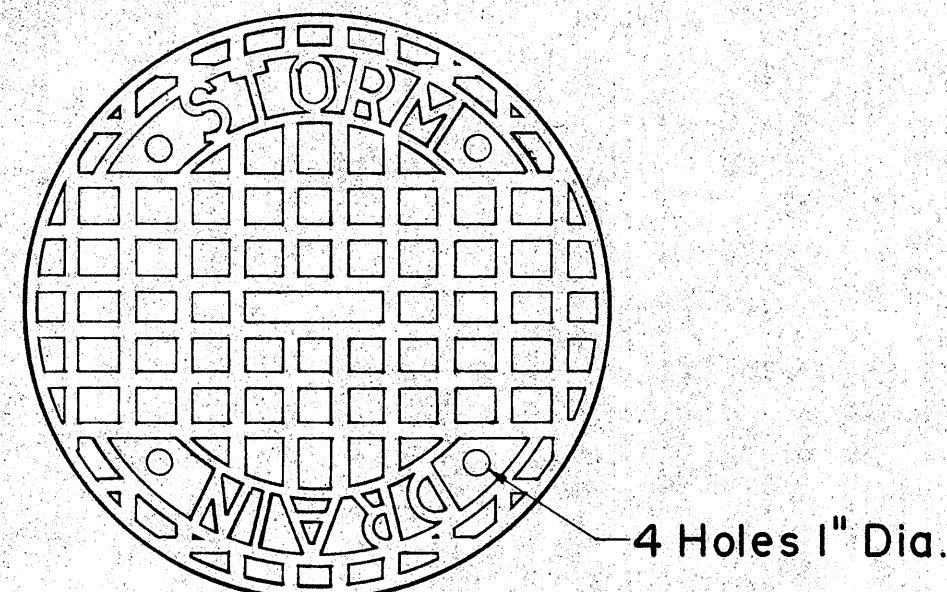
TYPE "P" CAST IRON
FRAME AND COVER



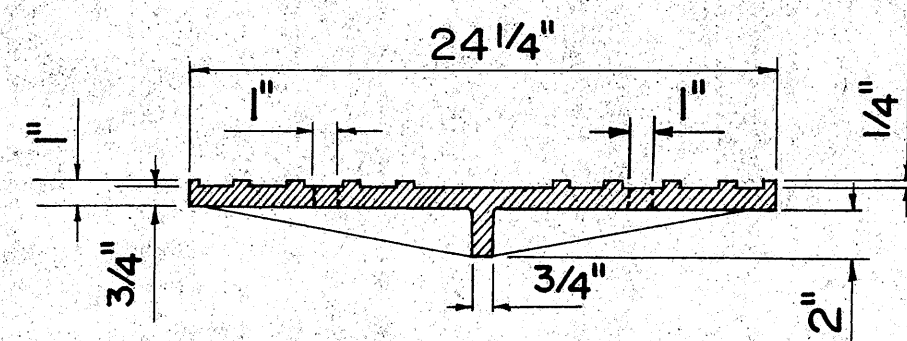
PLAN OF FRAME



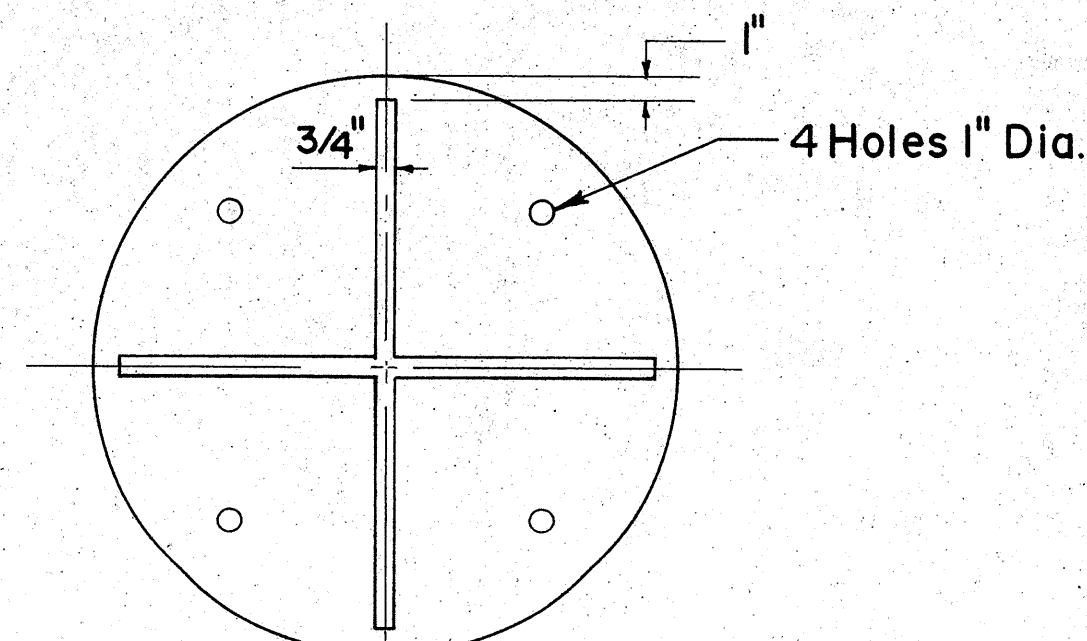
SECTION OF FRAME



TOP VIEW OF COVER

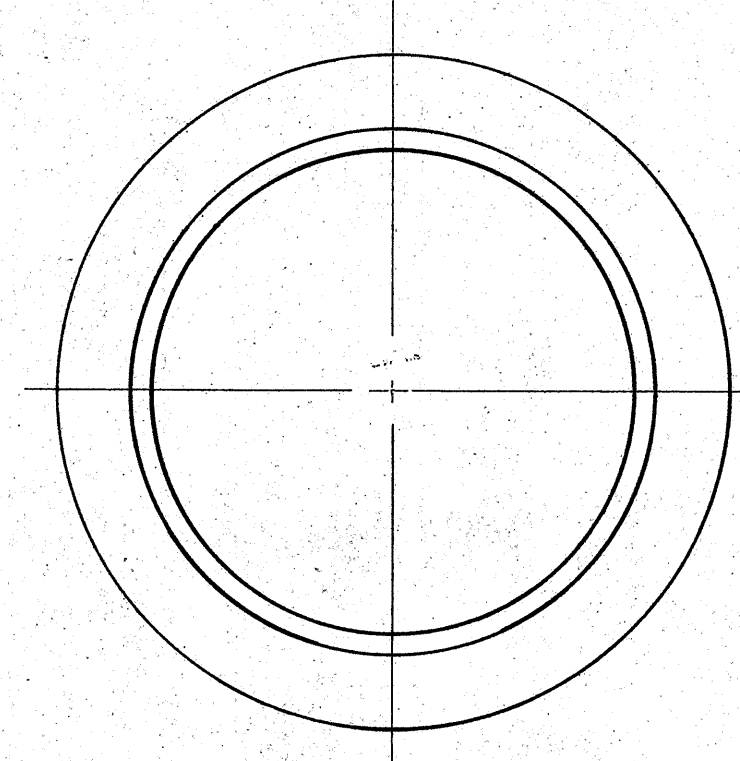


SECTION

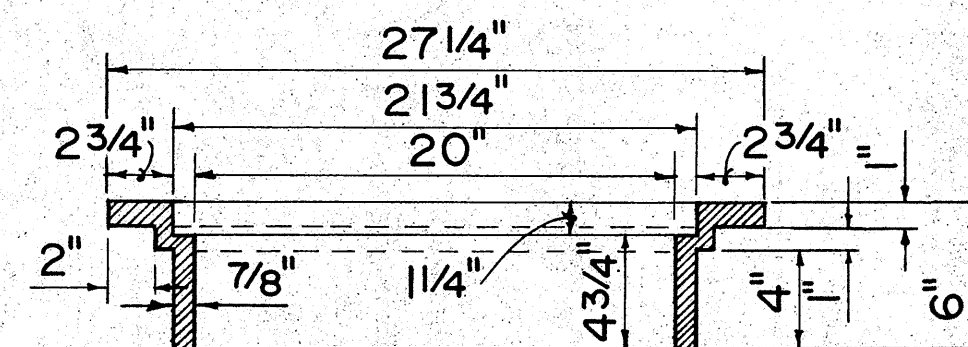


BOTTOM VIEW OF COVER

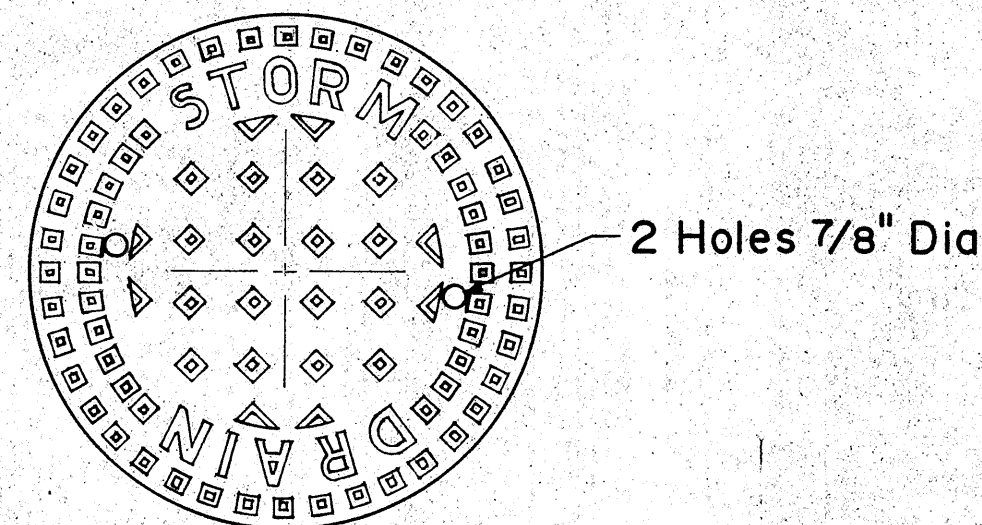
TYPE "B" CAST IRON
FRAME AND COVER



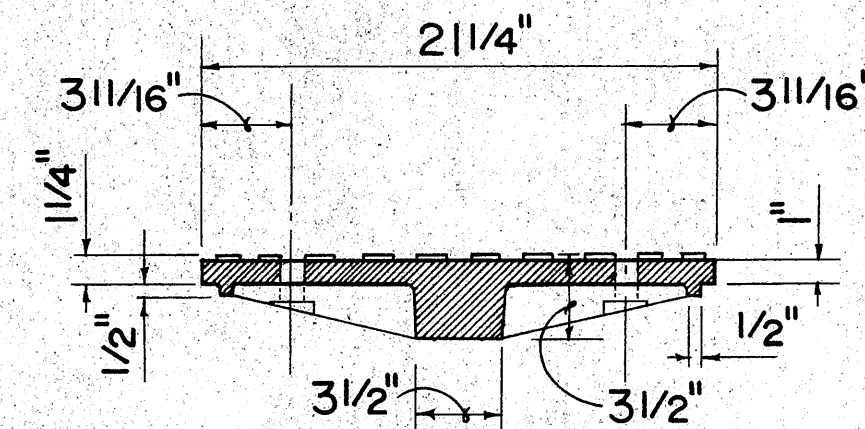
PLAN OF FRAME



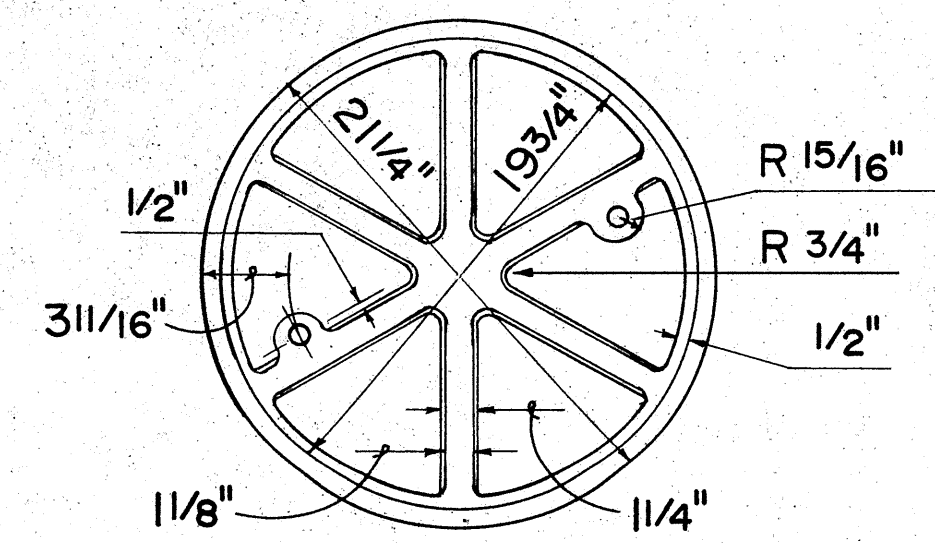
SECTION OF FRAME



TOP VIEW OF COVER

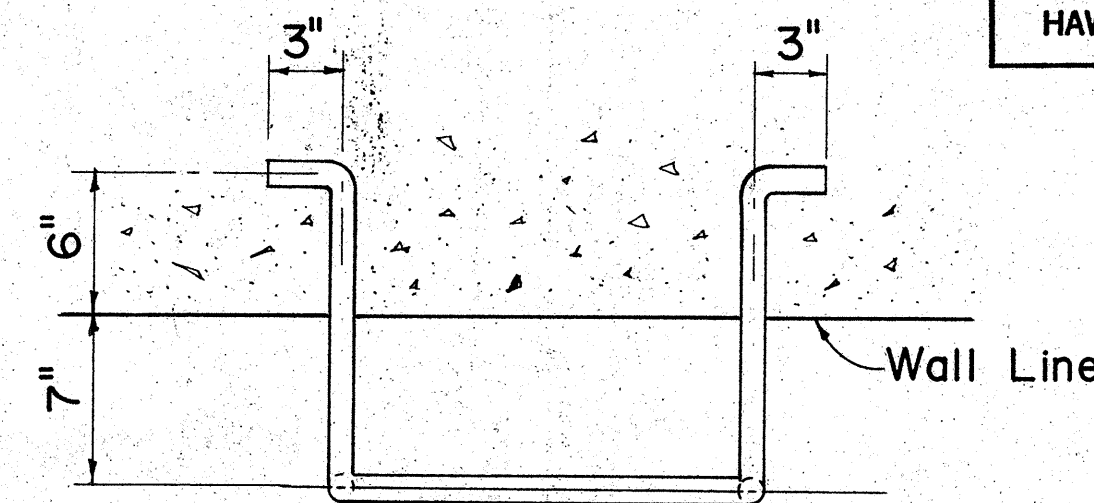


SECTION



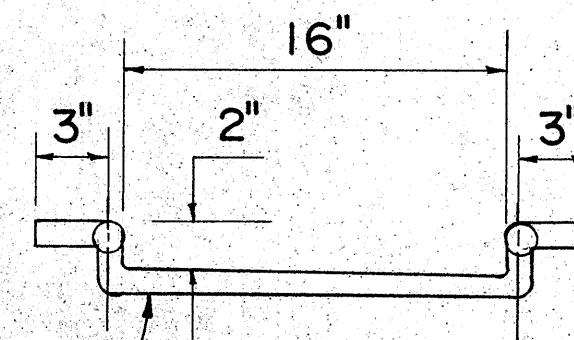
BOTTOM VIEW OF COVER

TYPE "A" CAST IRON
FRAME AND COVER

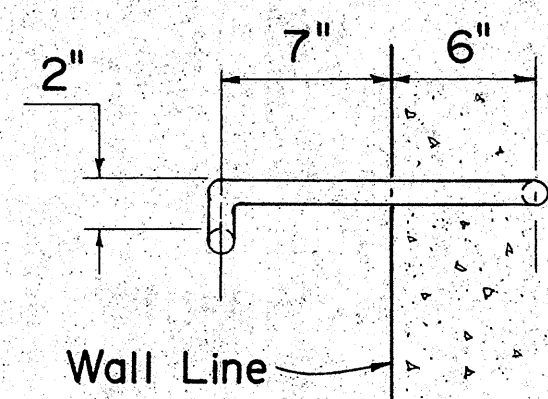


PLAN

1" Ø Wrought
Iron Bar or
1" Ø Steel Bar



FRONT VIEW



SIDE VIEW

MANHOLE RUNG

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

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

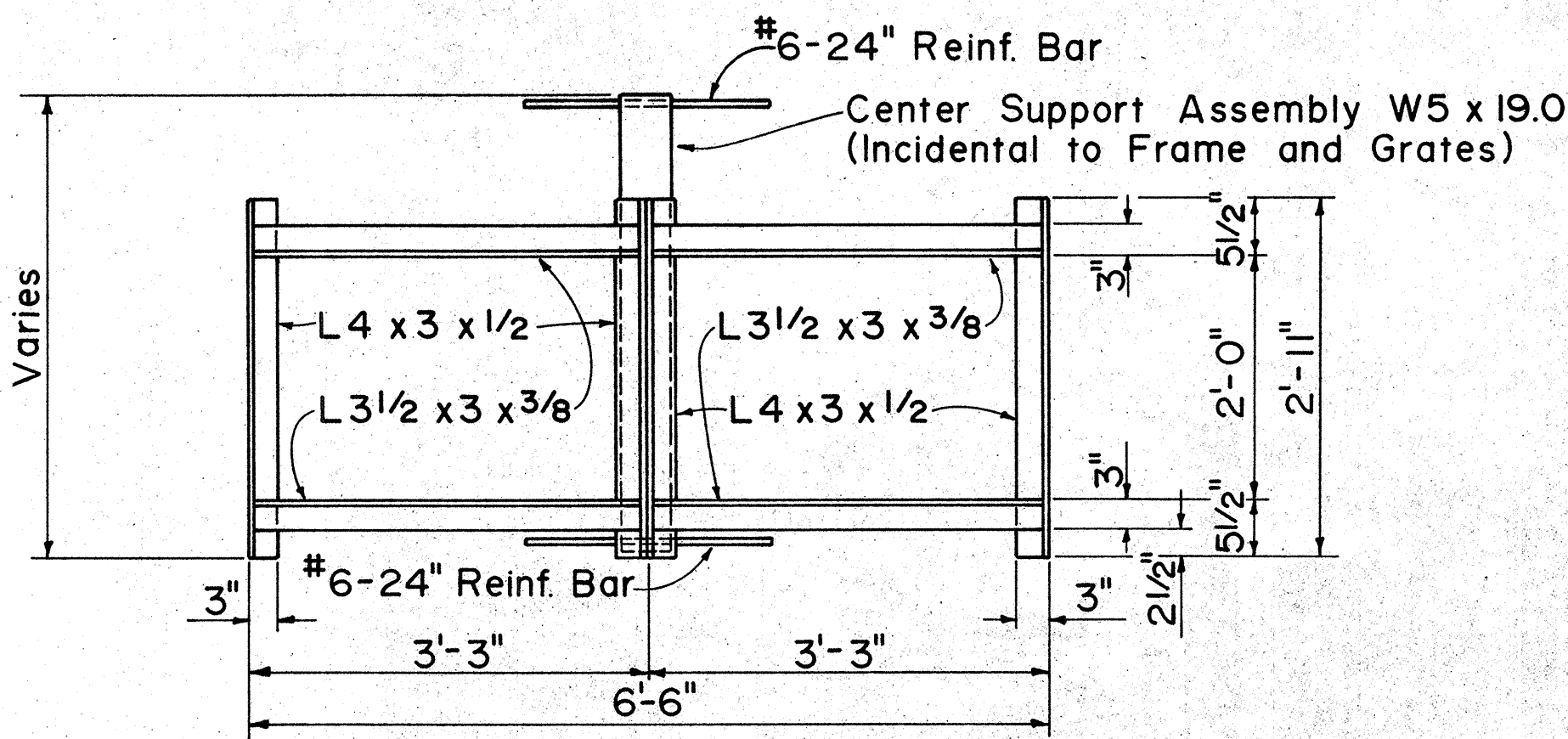
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION
STANDARD DETAILS CATCH BASIN AND MANHOLE CASTINGS
Not To Scale Date: Dec. 1977

SHEET NO. 7 OF 8 SHEETS DH 6

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	1-HI-1075(16)	1983	21	191

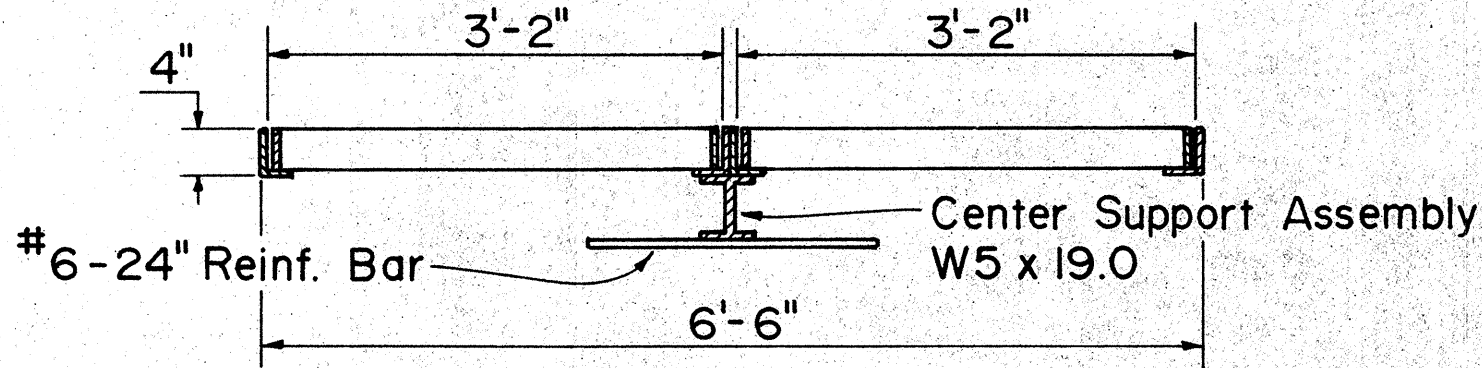
GENERAL NOTES

- 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.



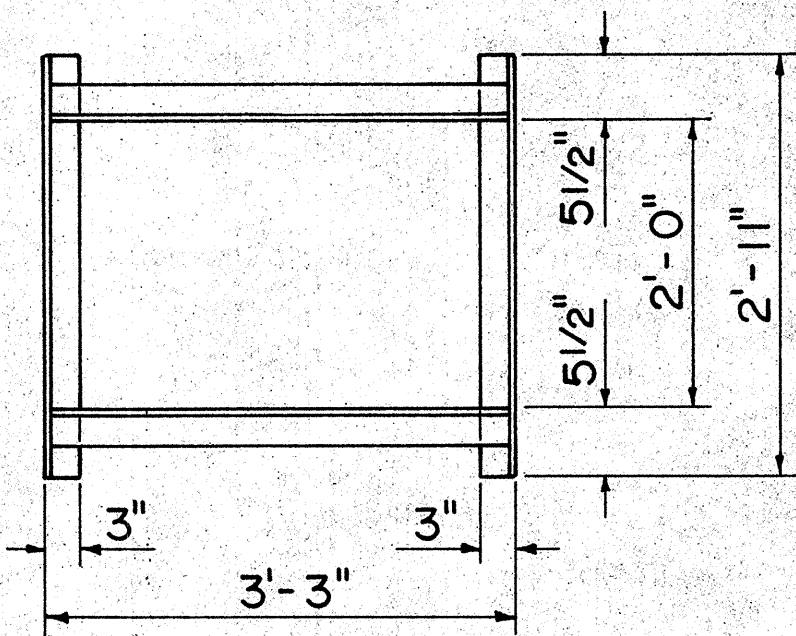
PLAN

(Two or More Grates)



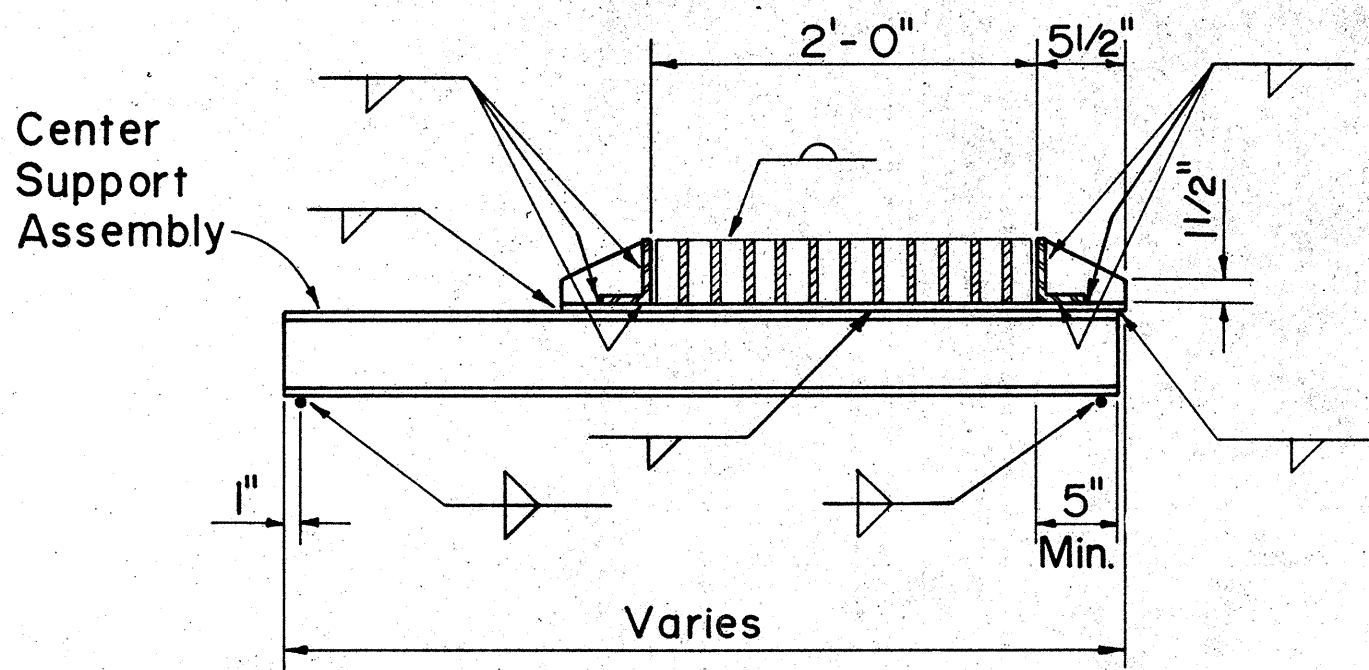
LONGITUDINAL SECTION

(Thru Frame & Grate)



PLAN

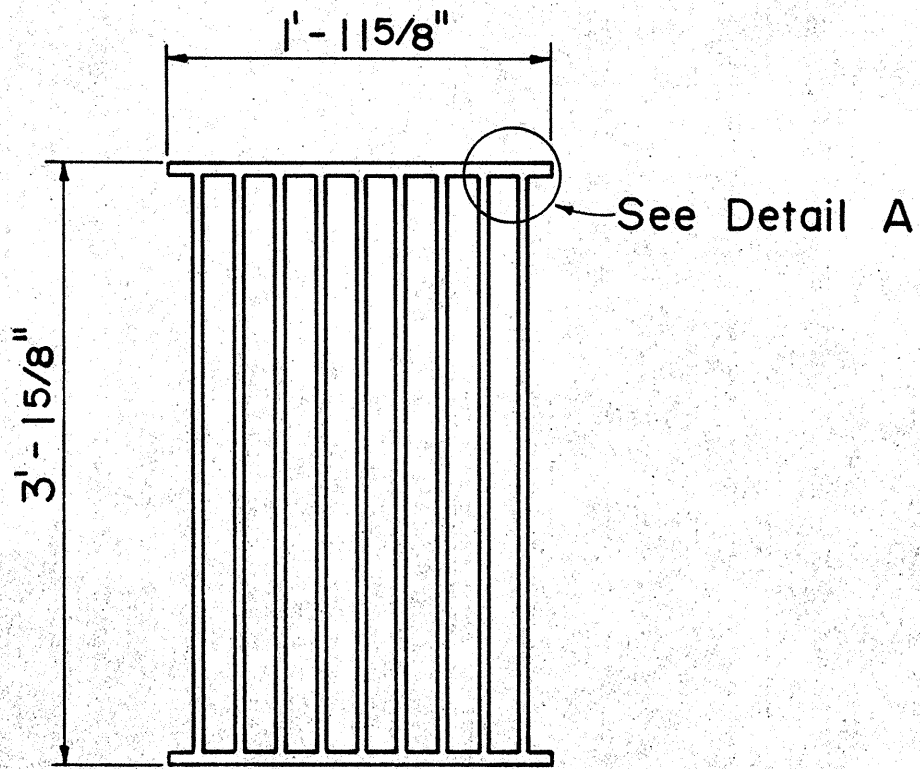
(Single Grate)



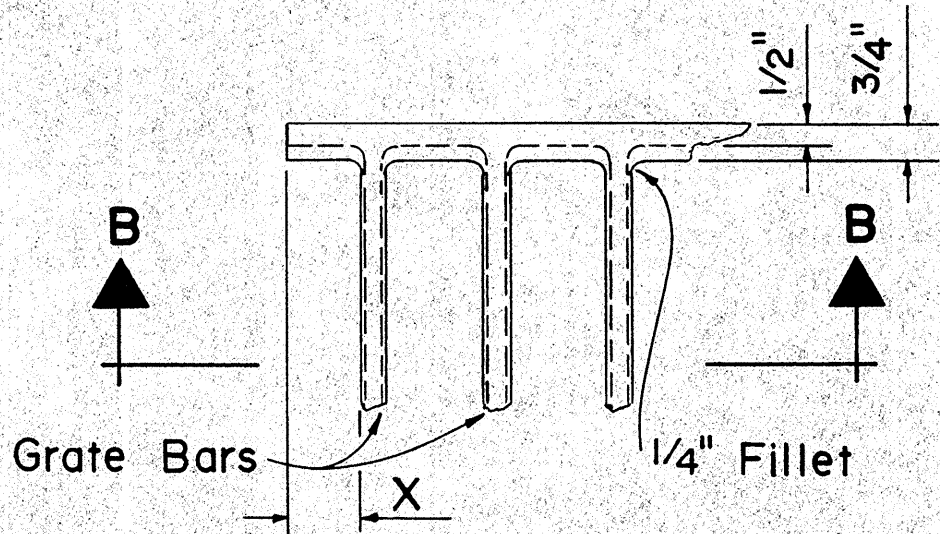
CROSS SECTION

(Thru Frame & Grate)

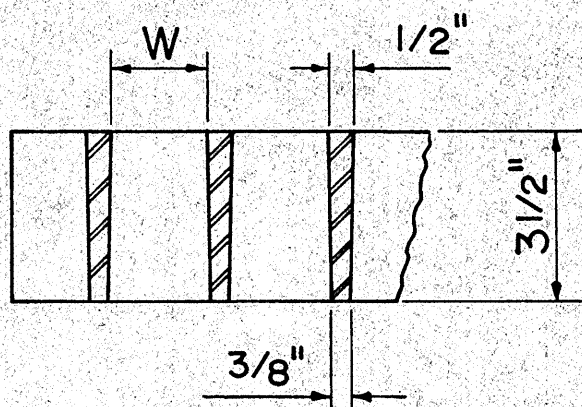
FRAME DETAILS



PLAN

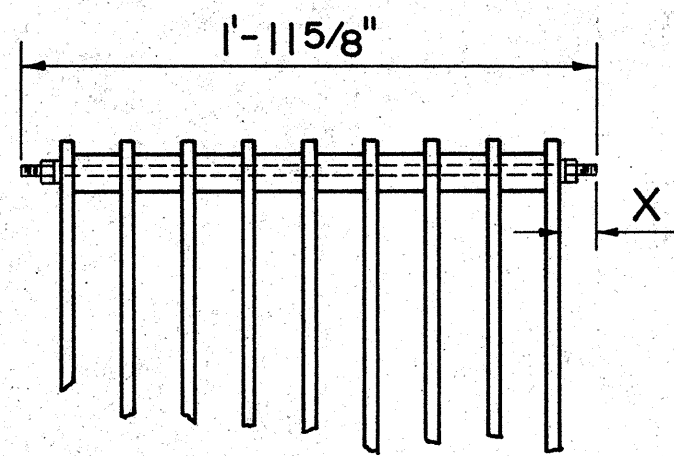


DETAIL A

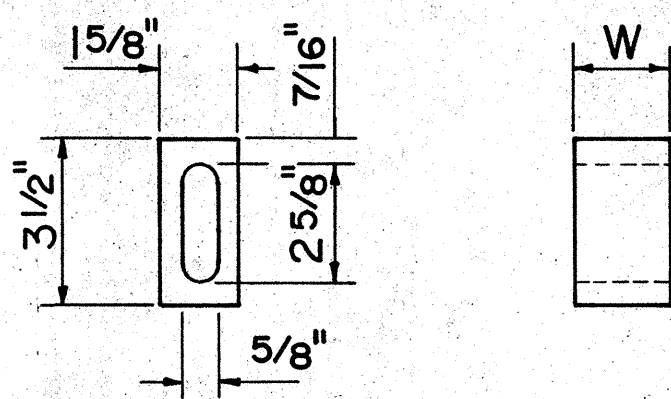


SECTION B-B

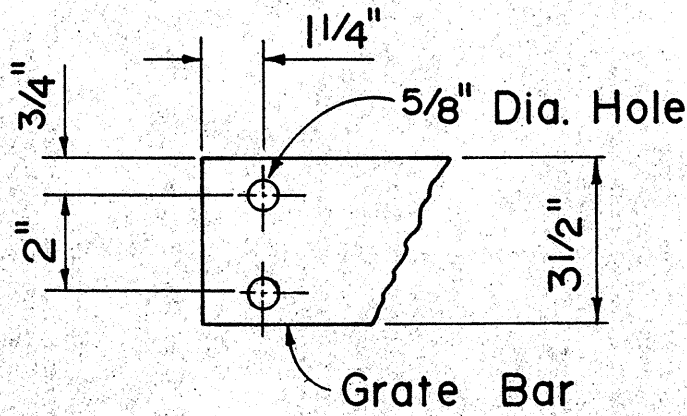
ALTERNATIVE CAST MALLEABLE IRON OR CAST STEEL GRATE



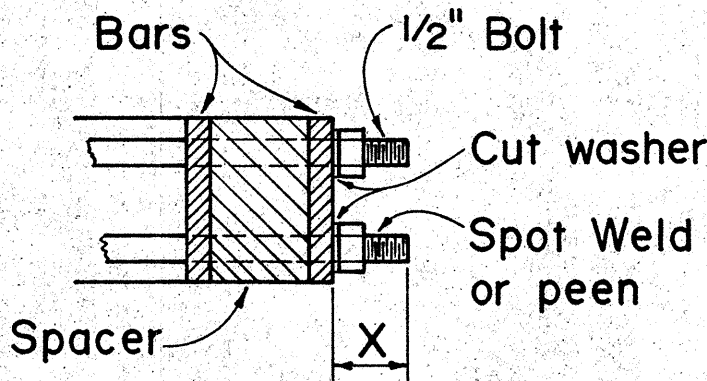
BOLTED END BLOCK



BAR SPACER

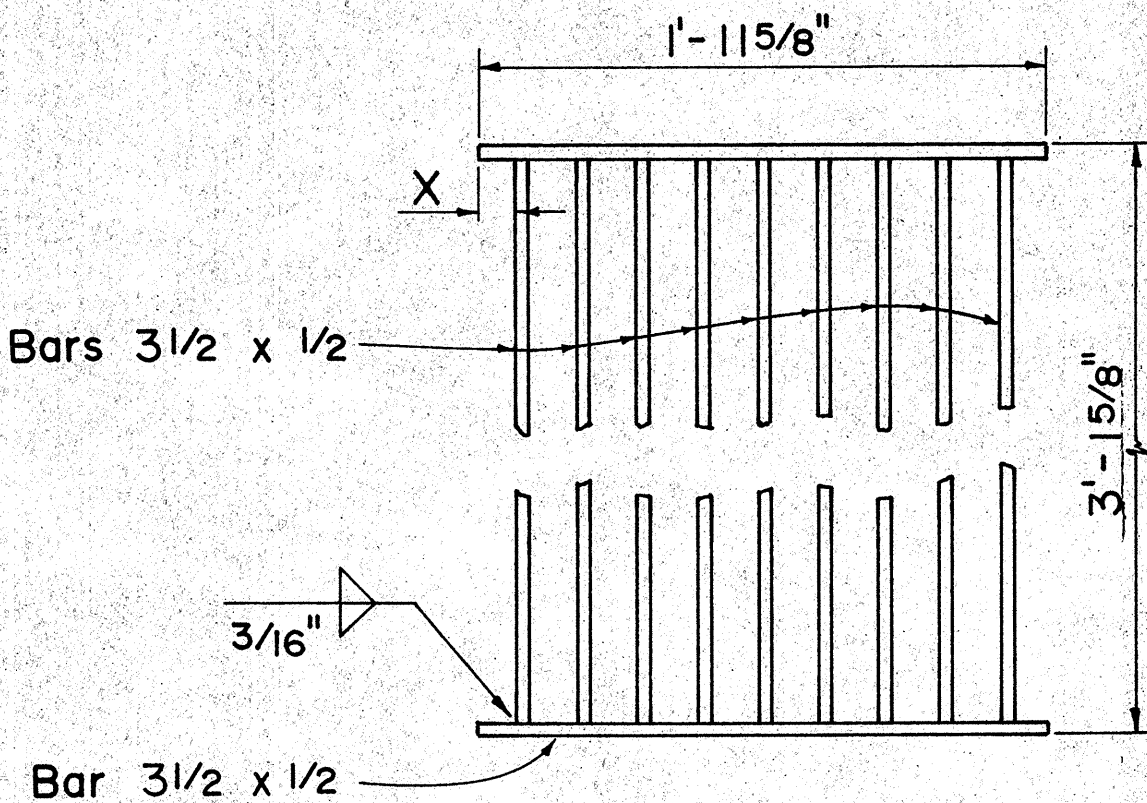


END OF BAR

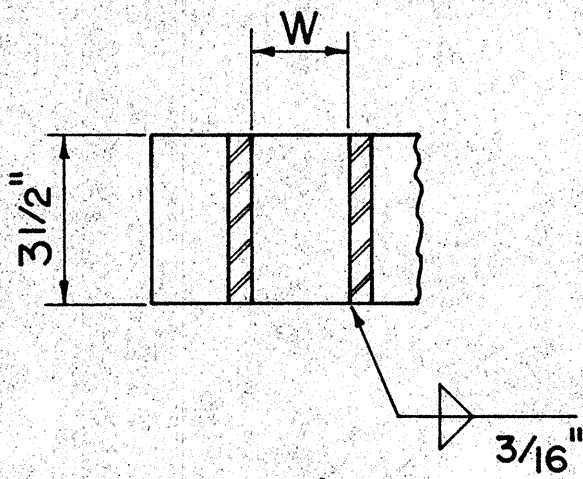


BOLTING DETAIL

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. Jakano 6-19-79
 HYDRAULIC DESIGN ENGINEER DATE

APPROVED:
Robert Zaleski 6-22-79
 ASSISTANT CHIEF, ENGINEERING DATE

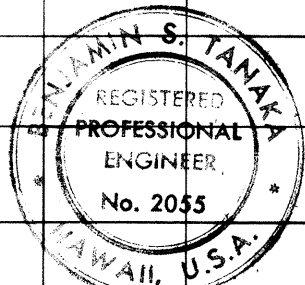
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION	
STANDARD DETAILS TYPE A-9 AND A-12 FRAMES AND GRATES	
Not To Scale	Date:
SHEET NO. 21 OF 21 SHEETS DH 7	

ORIGINAL PLAN	DATE
DESIGNED BY	
CHECKED BY	
NOTED BY	
QUANTITIES BY	
NO.	

DRAINAGE SUMMARY

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	H-11-1(75)46	1983	22	191

STRUCTURES			E S T I M A T E D																				Q U A N T I T I E S																				ITEM	NUMBER	SHEET																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
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THIS WORK WAS PREPARED BY ME
OR UNDER MY SUPERVISION