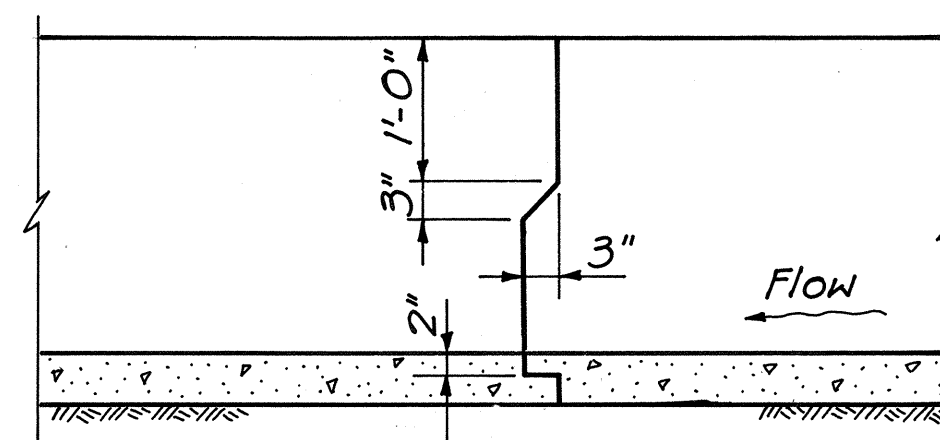


SCHEDULE OF ROADWAY LINED SWALES & DITCHES

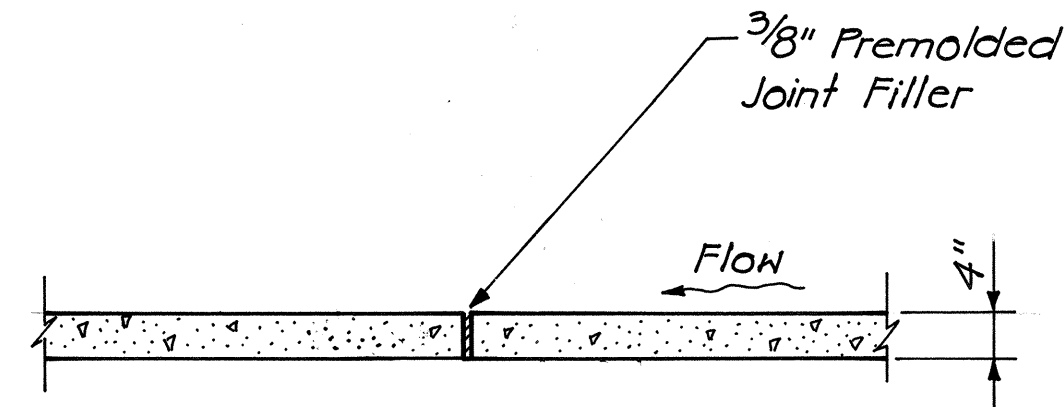
CL.B CONCRETE
OR SHOTCRETE

2070100	—	REINFORCING STEEL
Cu.Yd.	Lbs	DITCH & CHANNEL EXCAVATION

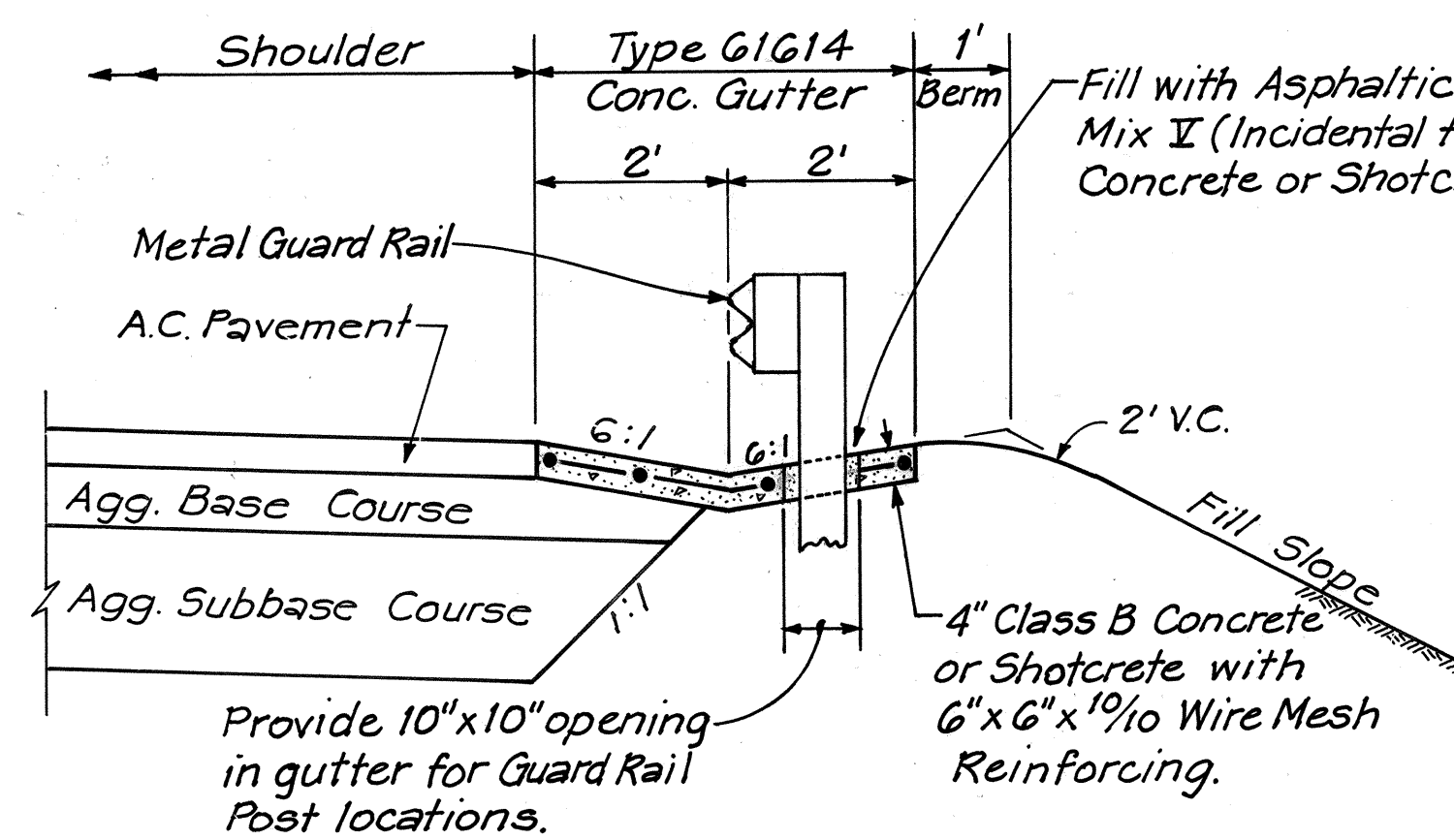
	ITEM	—	609.2218		640.0100			2070100	—
	UNIT	—	Lin. Ft.		Lin. Ft.			Cu. Yd.	Lbs
FWR Sta. 166+25 to FWR Sta. 170+30, Lt.		61218	405						1053
FWR Sta. 167+25 to FWR Sta. 172+55, Rt.		61218	530						1378
FWR Sta. 178+25 to FWR Sta. 182+50, Rt.		61218	425						1105
FWR Sta. 178+60 to FWR Sta. 187+00, Lt.		61218	840						2184
FWR Sta. 182+50 to FWR Sta. 185+74, Rt.		1			324			26	309



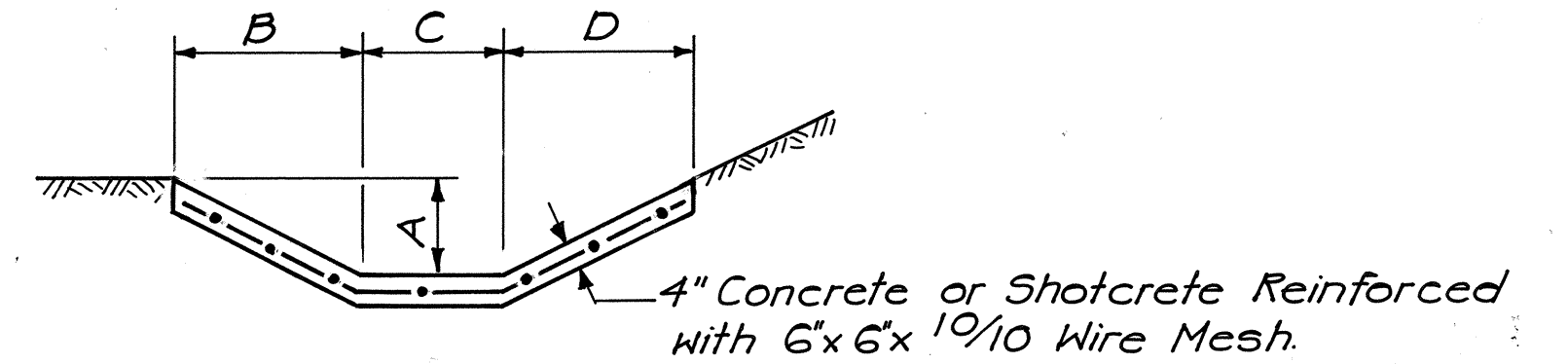
$\frac{3}{8}$ " Premolded
Joint Filler



1' $\overleftarrow{\text{Berm}}$ Fill with Asphaltic Concrete, Mix I (Incidental to Class "B" Concrete or Shotcrete)

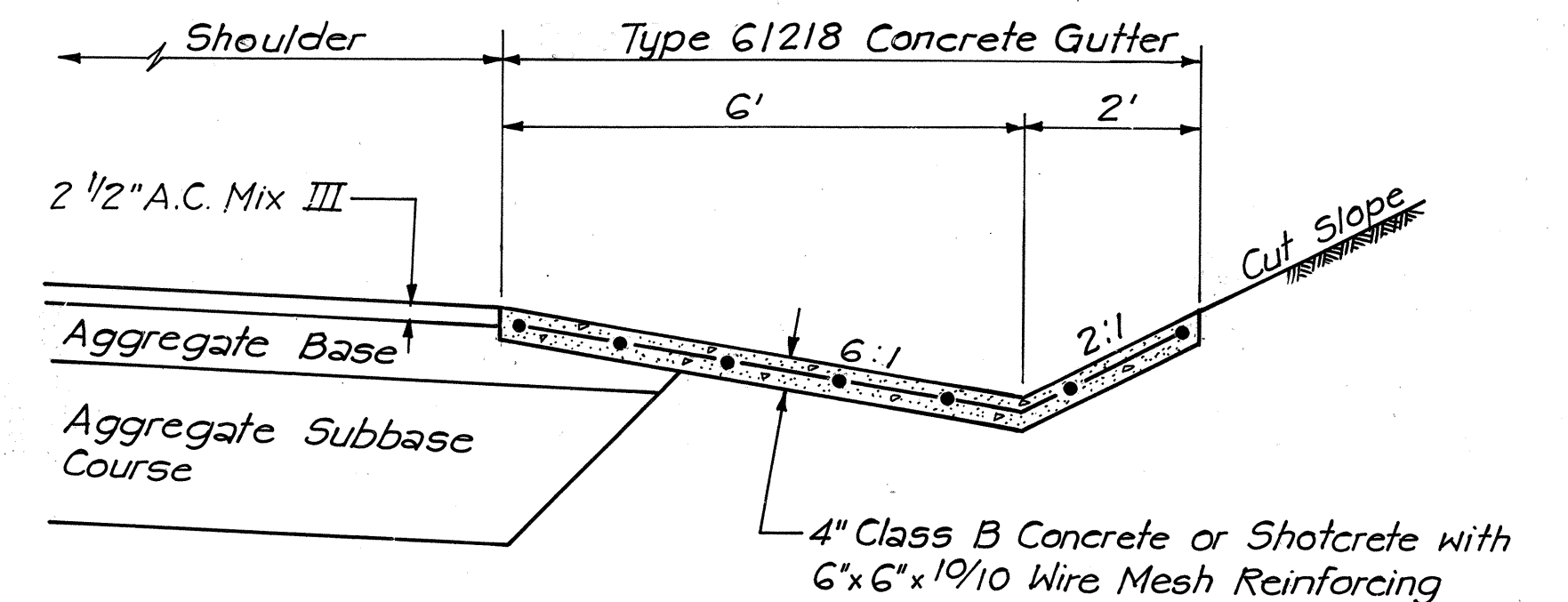


LINED DRAINAGE DITCH



TYPE	A	B	C	D	CONCRETE	REINFORCING	EXCAVATION
1	1	2	0	2	0.0605 C.Y./L.F.	0.9534 LB./L.F.	0.080 C.Y./L.F.

1. Contractor may substitute Lined Ditches of other Shapes and of equal or greater Capacity if approved by the Engineer. Payment will be on the original Ditch as shown on the Plans.
2. Ditch Transitions shall be paid under the adjacent downstream Ditch Type.



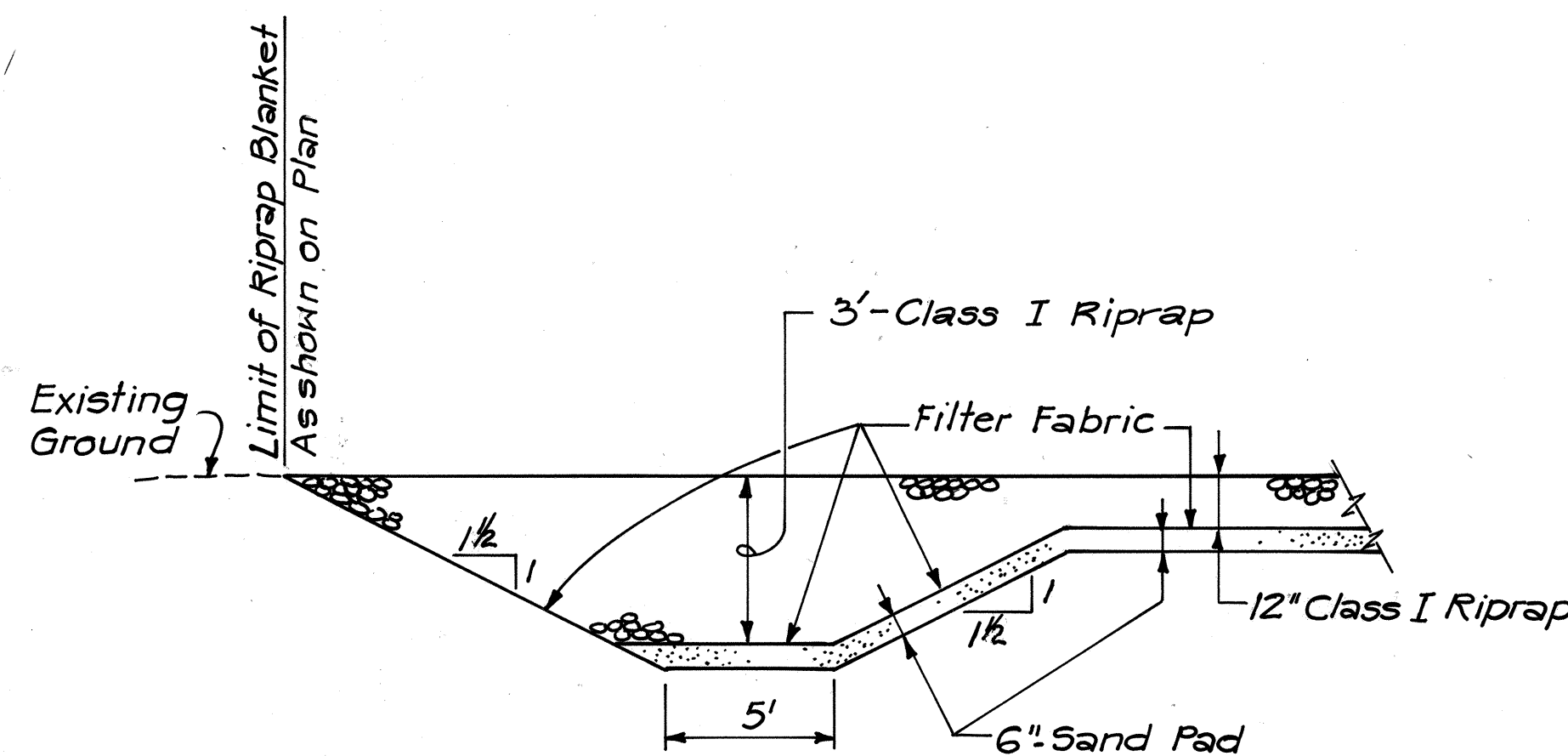
THIS WORK WAS PREPARED BY
ME OR UNDER MY SUPERVISION
R. D. Olson

DRAINAGE DETAILS

SCALE: AS SHOWN DATE: APRIL 1982

SHEET No. 1 OF 4 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	76008-0182 S-RS-0760(2)	1982	25	163

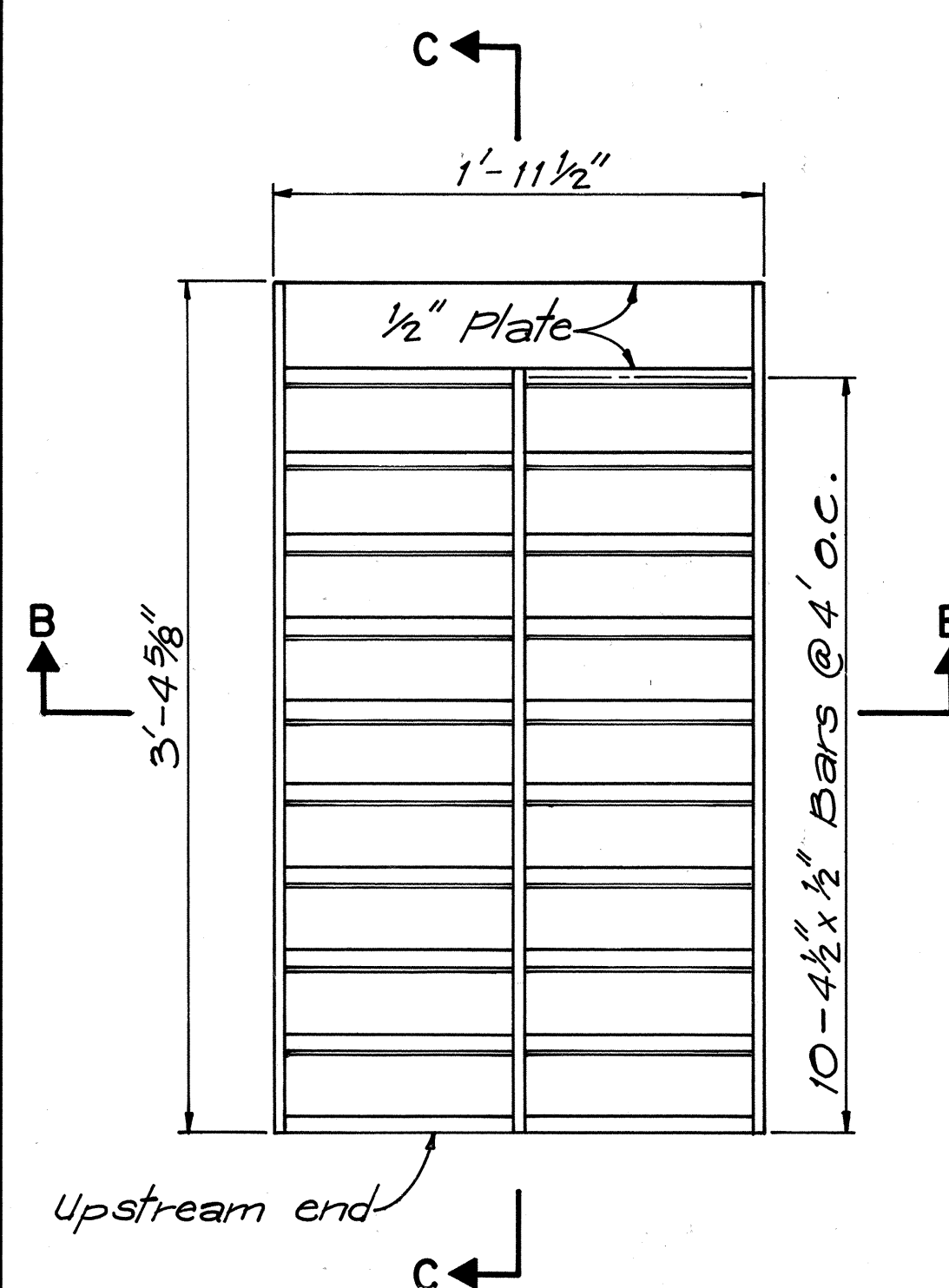


NOTE: Shown excavation slopes may be flattened as required by Soil conditions.

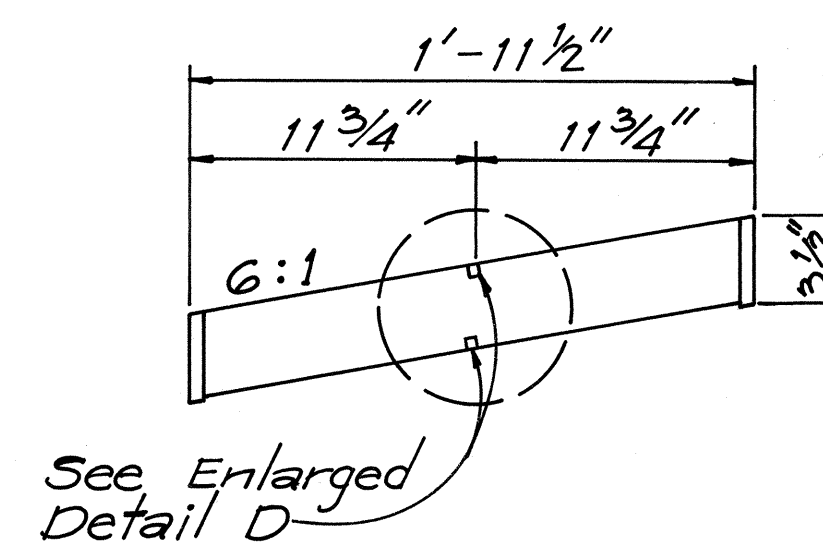
**RIPRAP CUTOFF DETAIL AT
DOWNSTREAM LIMITS OF RIPRAP PROTECTION**
N.T.S.

RIPRAP NOTES:

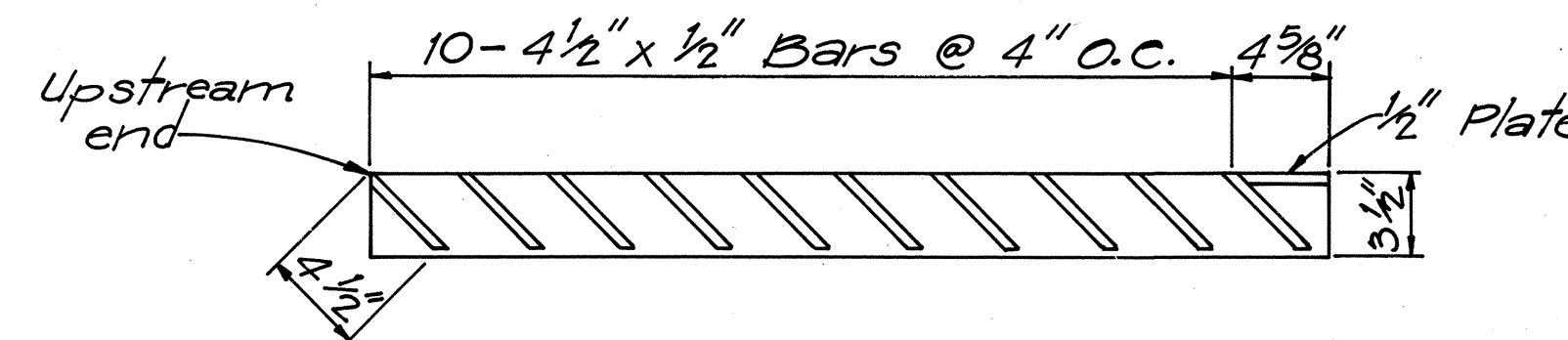
1. Sand Pad shall not be required where subsoil consists of Coral/ Sand material, as directed by the Engineer.



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

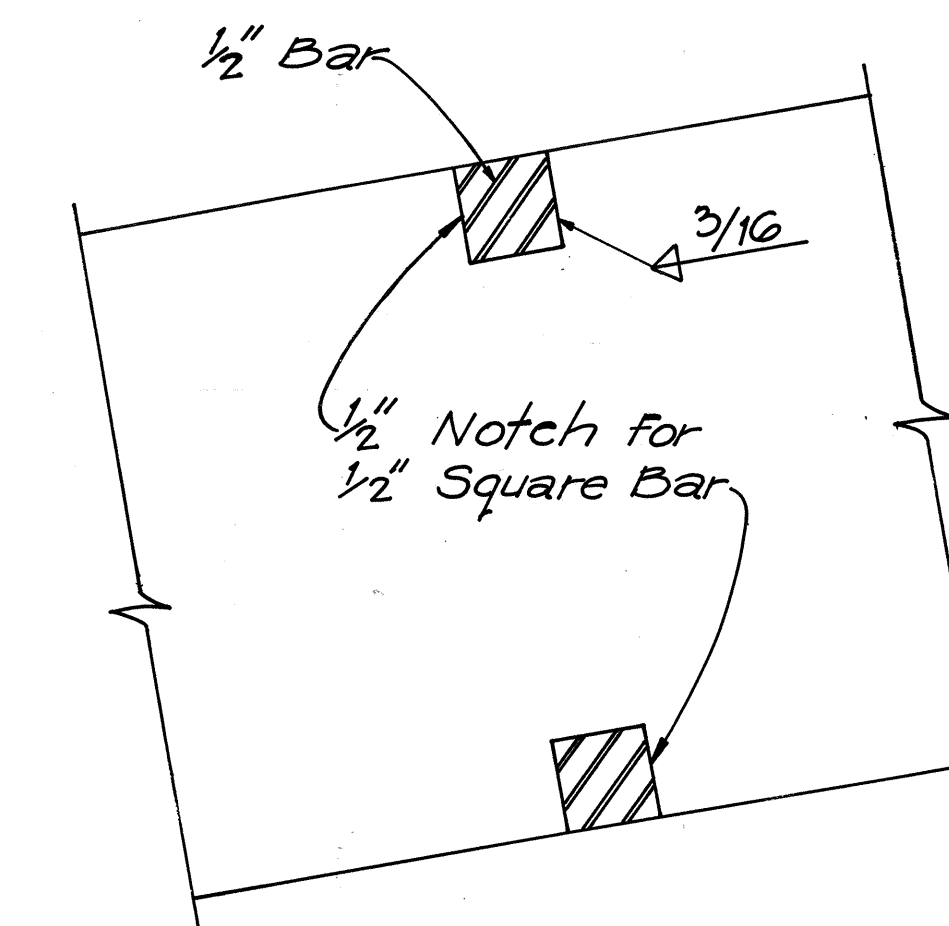


SECTION B-B
Scale: 1 1/2" = 1'-0"



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

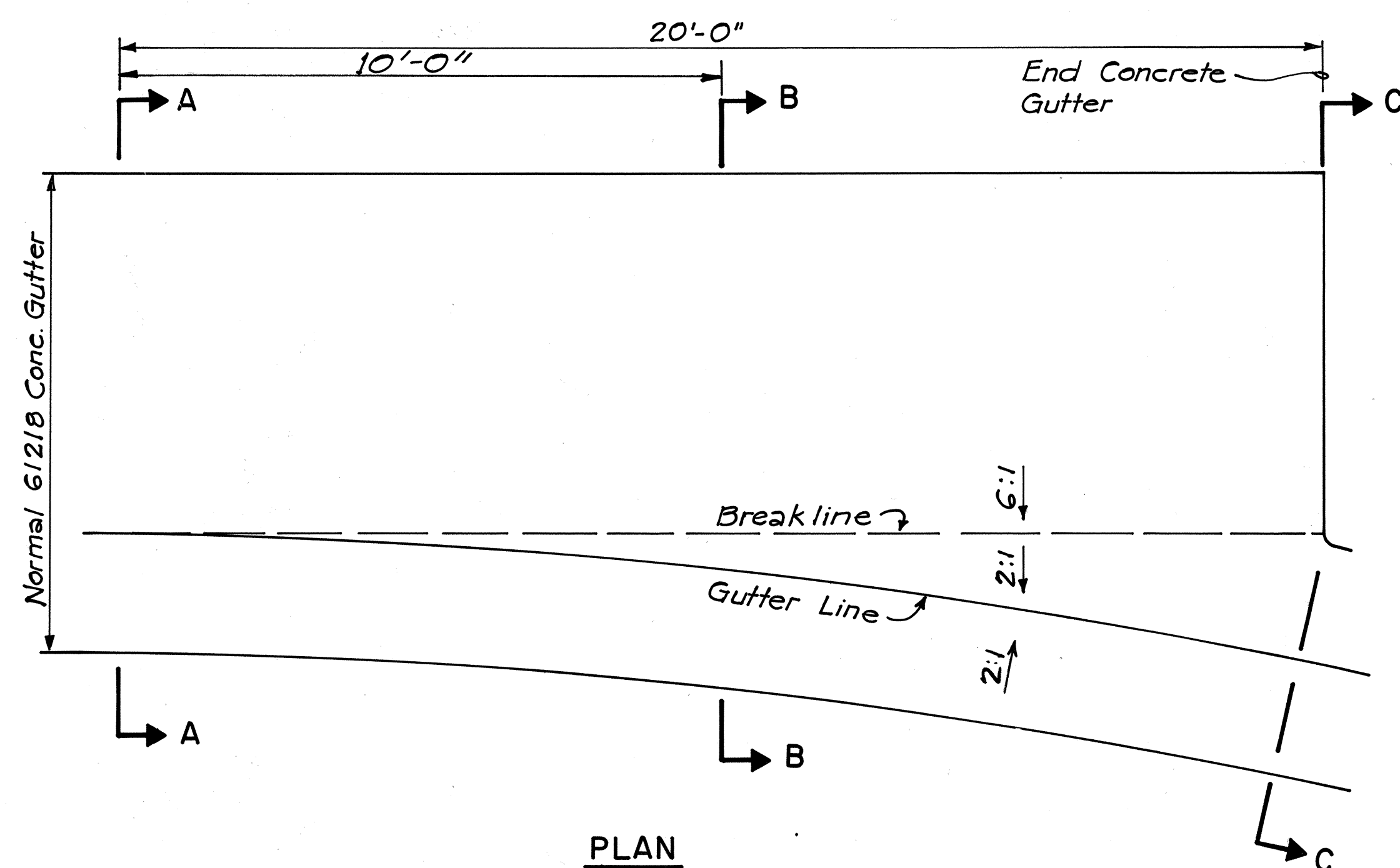
DETAILS OF TYPE 61614-45° GRATE
Scale: As Shown



DETAIL D (GRATE)
Scale: Full Size

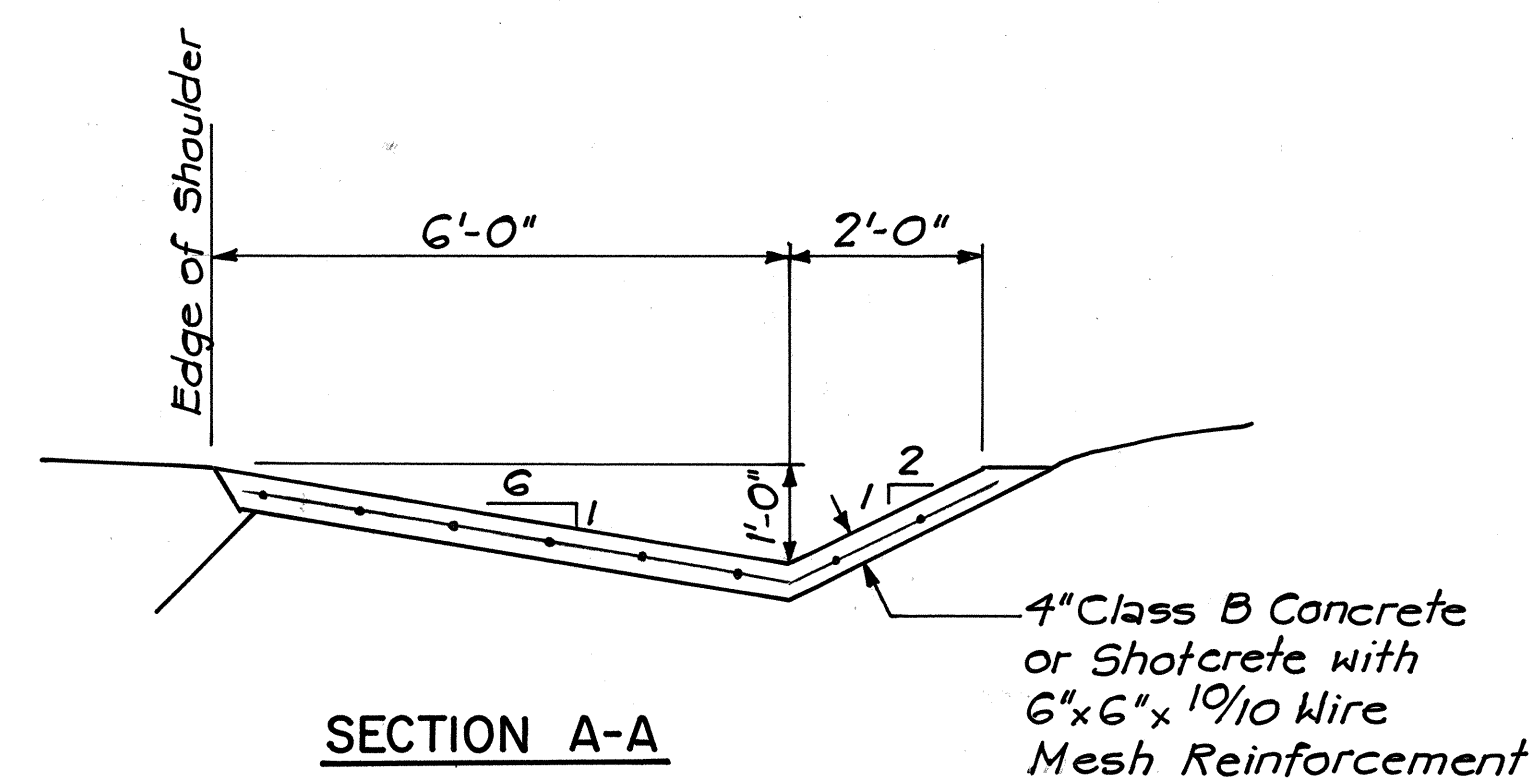
GENERAL NOTES:

1. Grates shall be hot dip galvanized after fabrication, see specification.
2. All welds 3/8" unless otherwise noted.
3. The grate materials shall conform to the specifications of ASTM Designation Structural Steel A283, Grade D and the Standard Specifications.
4. Existing Grate shall be salvaged and stockpiled on job site and incidental to new grate.

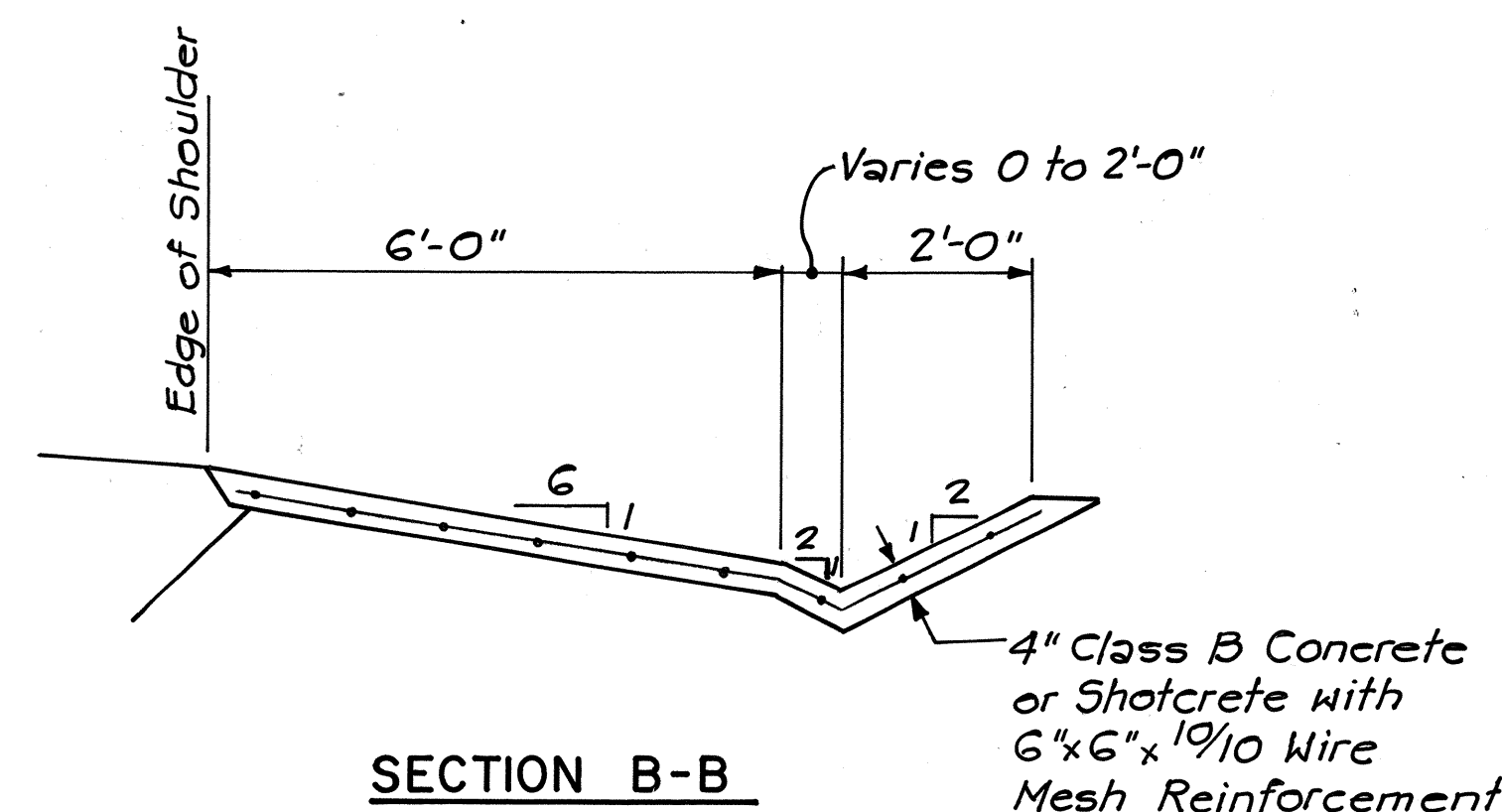


PLAN

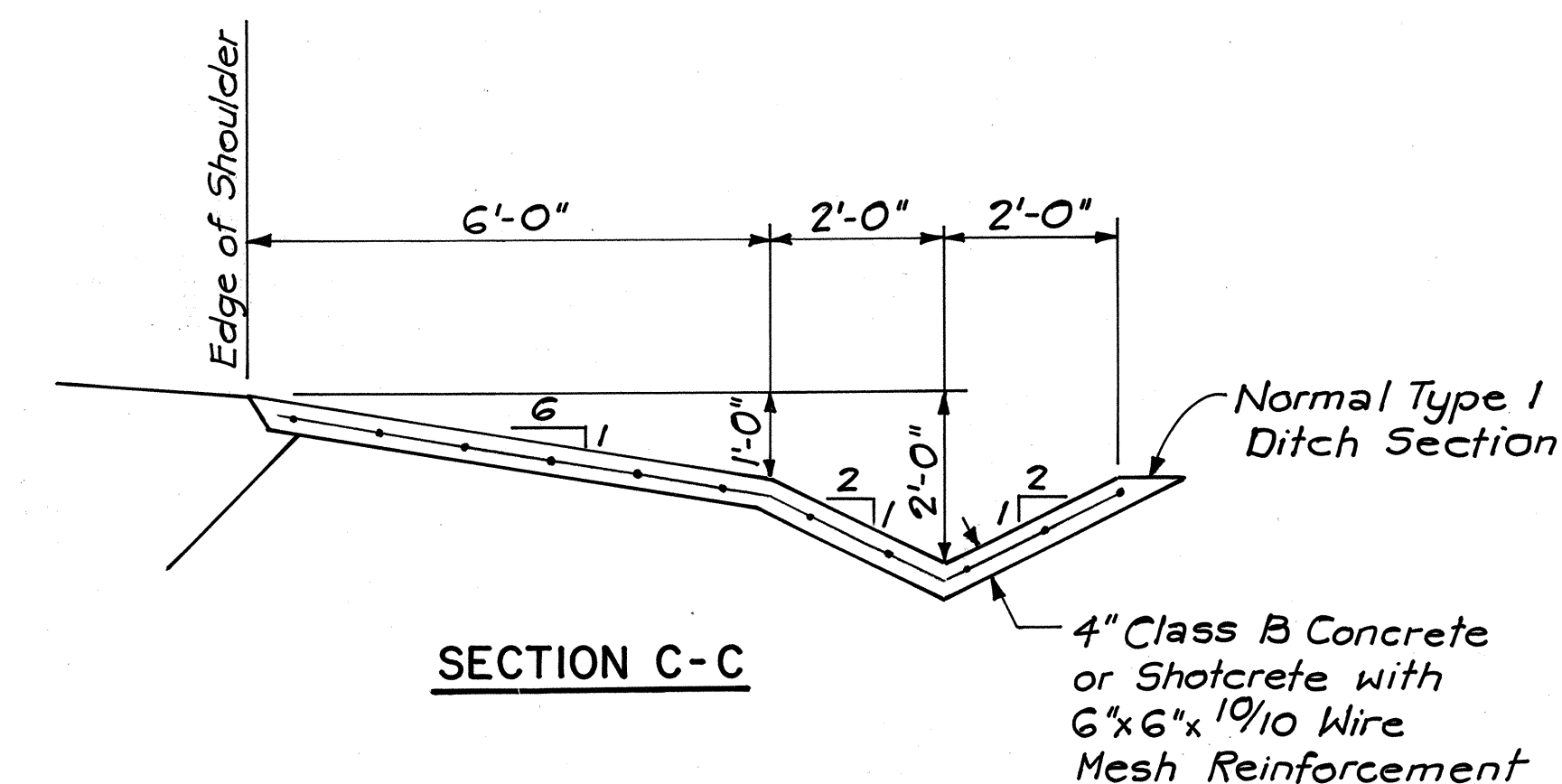
TRANSITION DETAIL
FROM TYPE 61218 GUTTER TO TYPE I LINED DITCH
Scale: 1/2" = 1'-0"



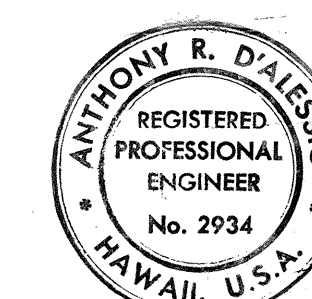
SECTION A-A



SECTION B-B



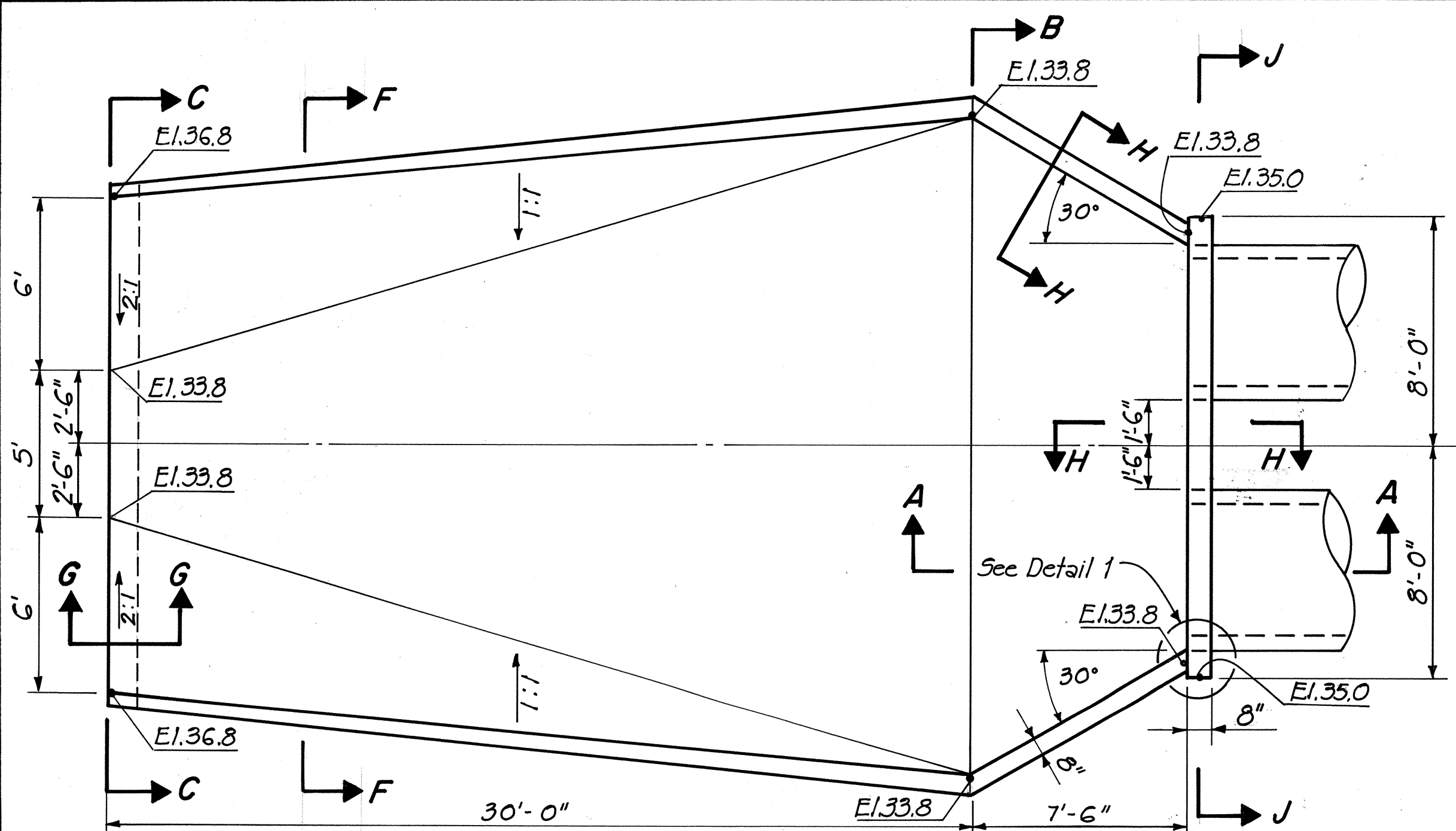
SECTION C-C



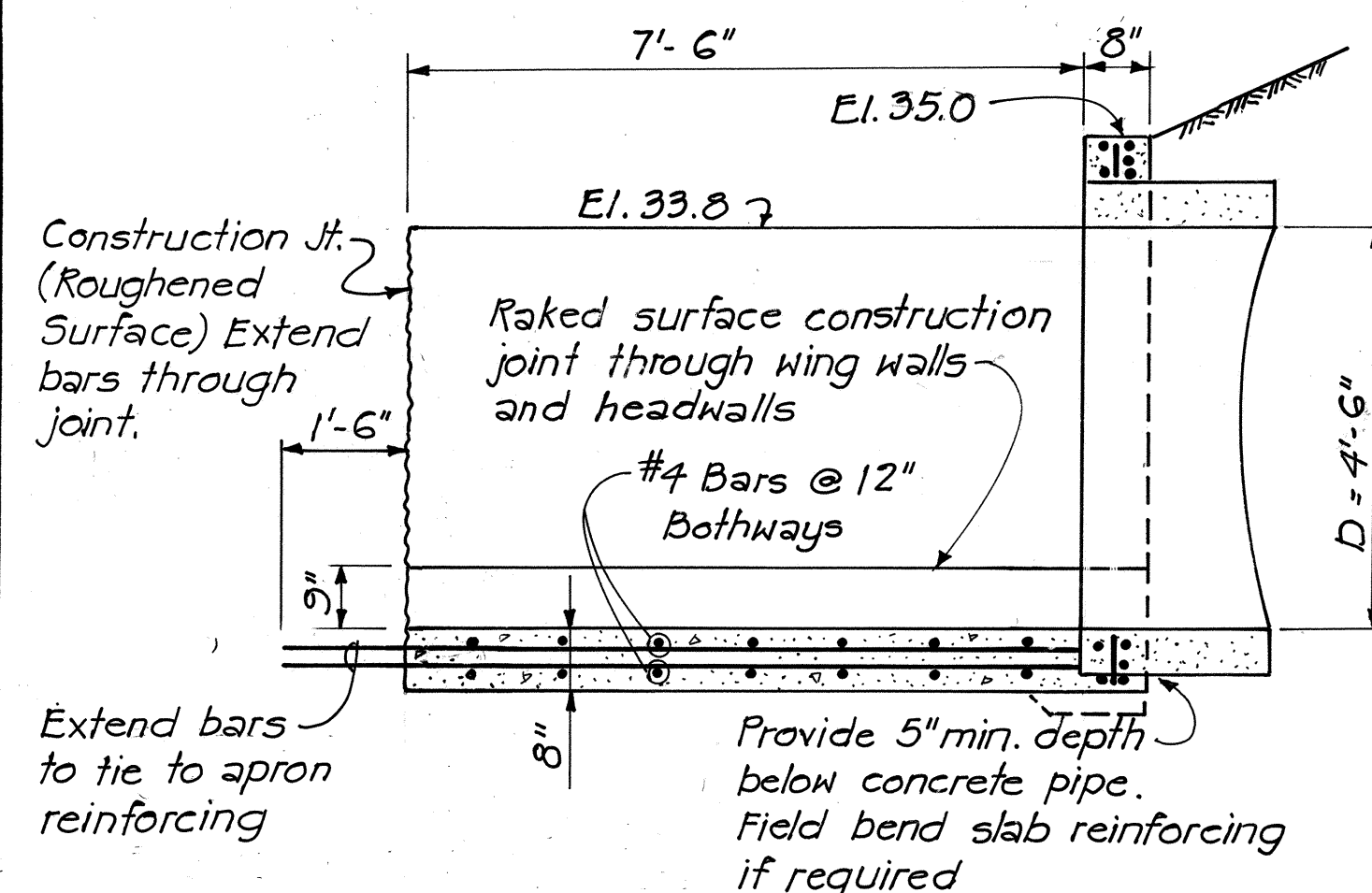
THIS WORK WAS PREPARED BY
ME OR UNDER MY SUPERVISION.
[Signature]

DATE	REVISION
	STATE OF HAWAII DEPARTMENT OF TRANSPORTATION LAND TRANSPORTATION FACILITIES DIVISION
	DRAINAGE DETAILS
	FORT WEAVER ROAD VICINITY OF MANGO TREE ROAD TO THE VICINITY OF RENTON ROAD
	SCALE: AS SHOWN DATE: APRIL 1982
	SHEET NO. 2 OF 4 SHEETS

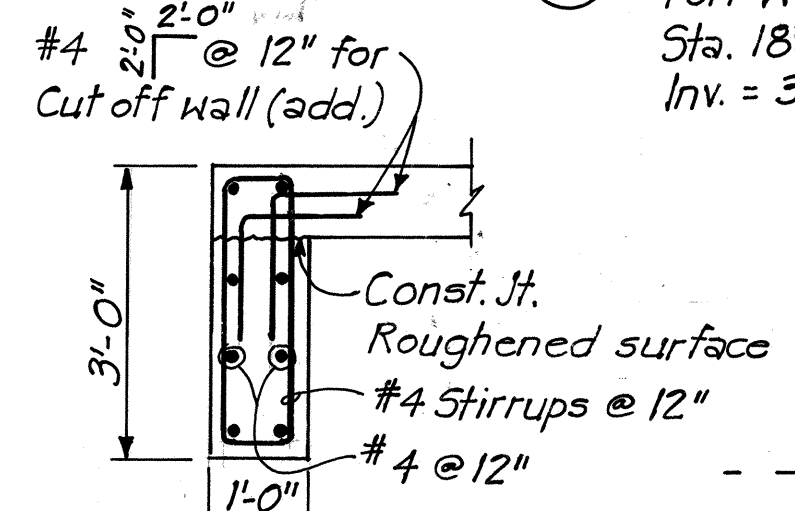
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	7600B-01-82 S-RS-0760(2)	1982	26	163



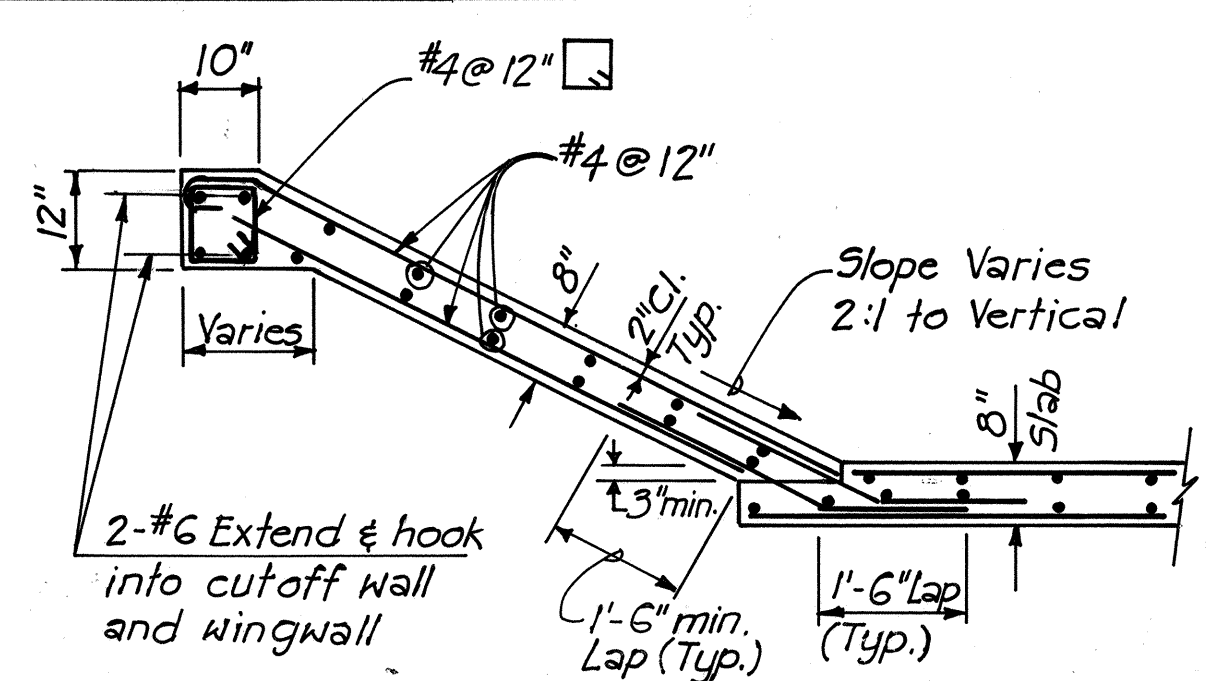
**PLAN
INLET STRUCTURE**
Scale: 1/4" = 1'-0"



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

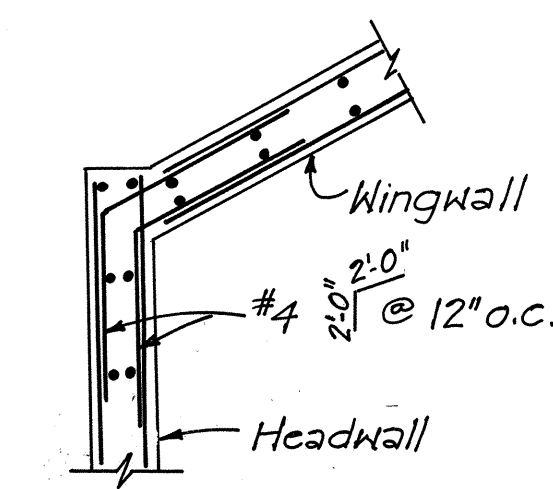


**SECTION G-G
CUT OFF WALL
REINFORCING**

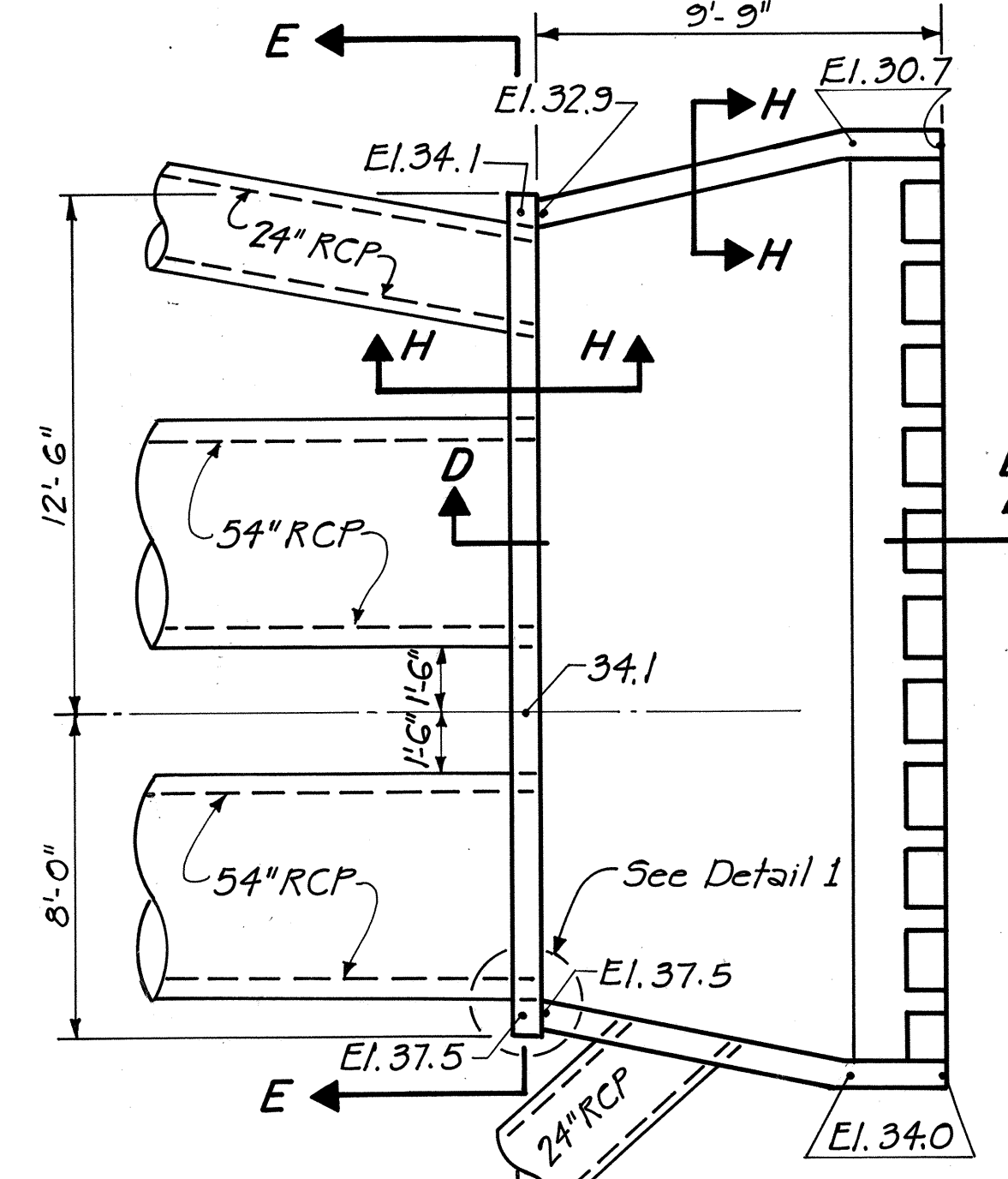


**SECTION F-F
APRON REINFORCING**
Scale: 1/2" = 1'-0"

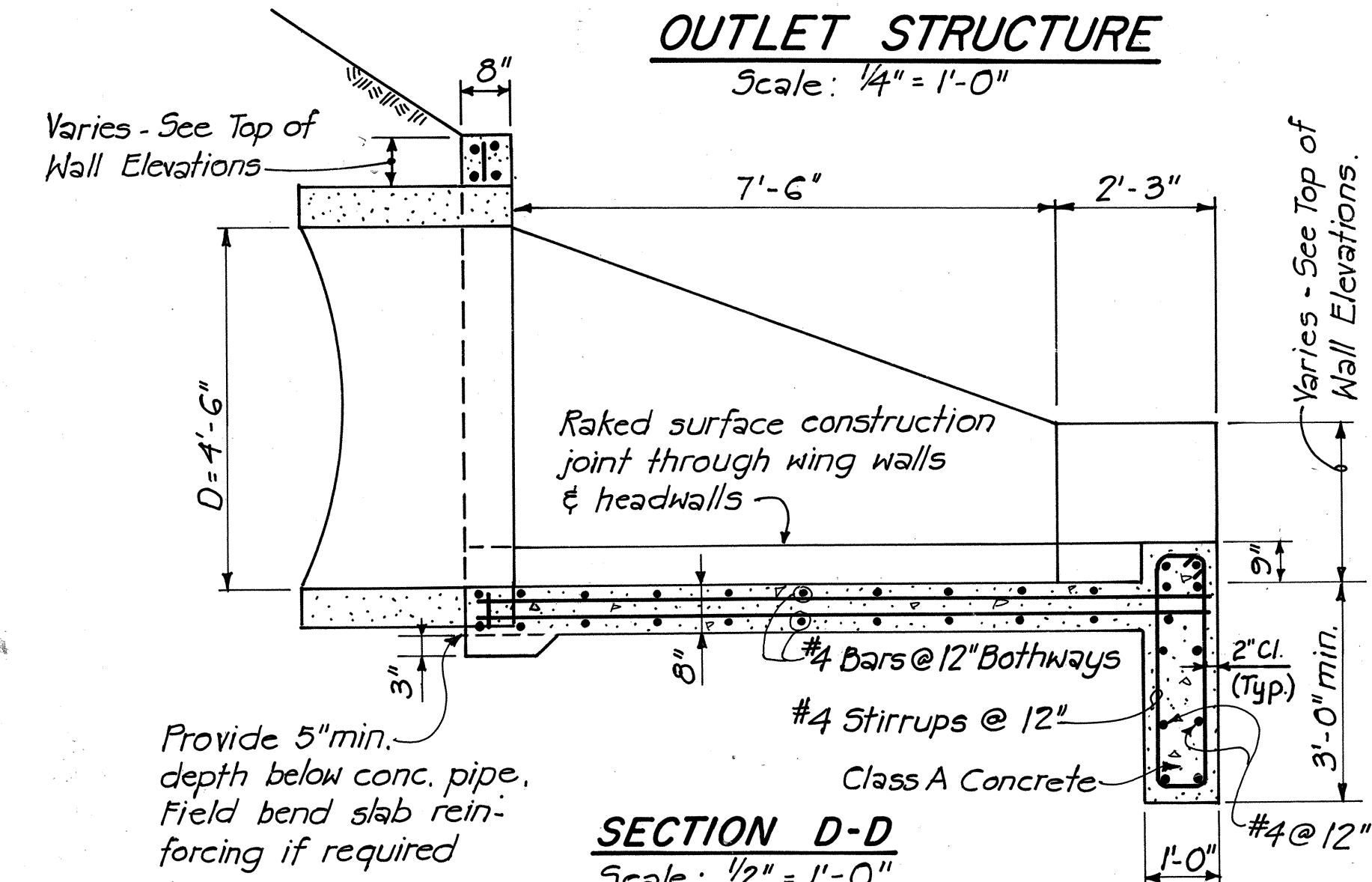
NOTE
For Sections B-B, C-C, J-J & K-K
See Sheet No. 27



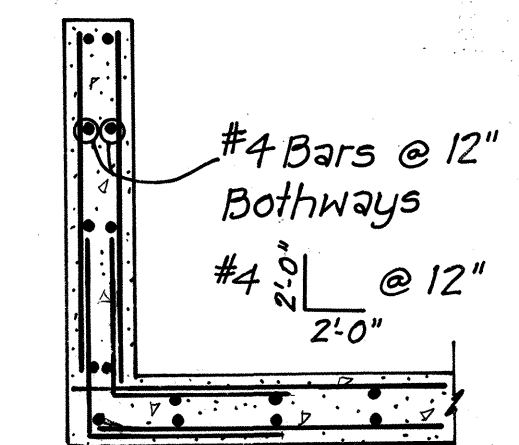
DETAIL 1
Scale: 1/2" = 1'-0"



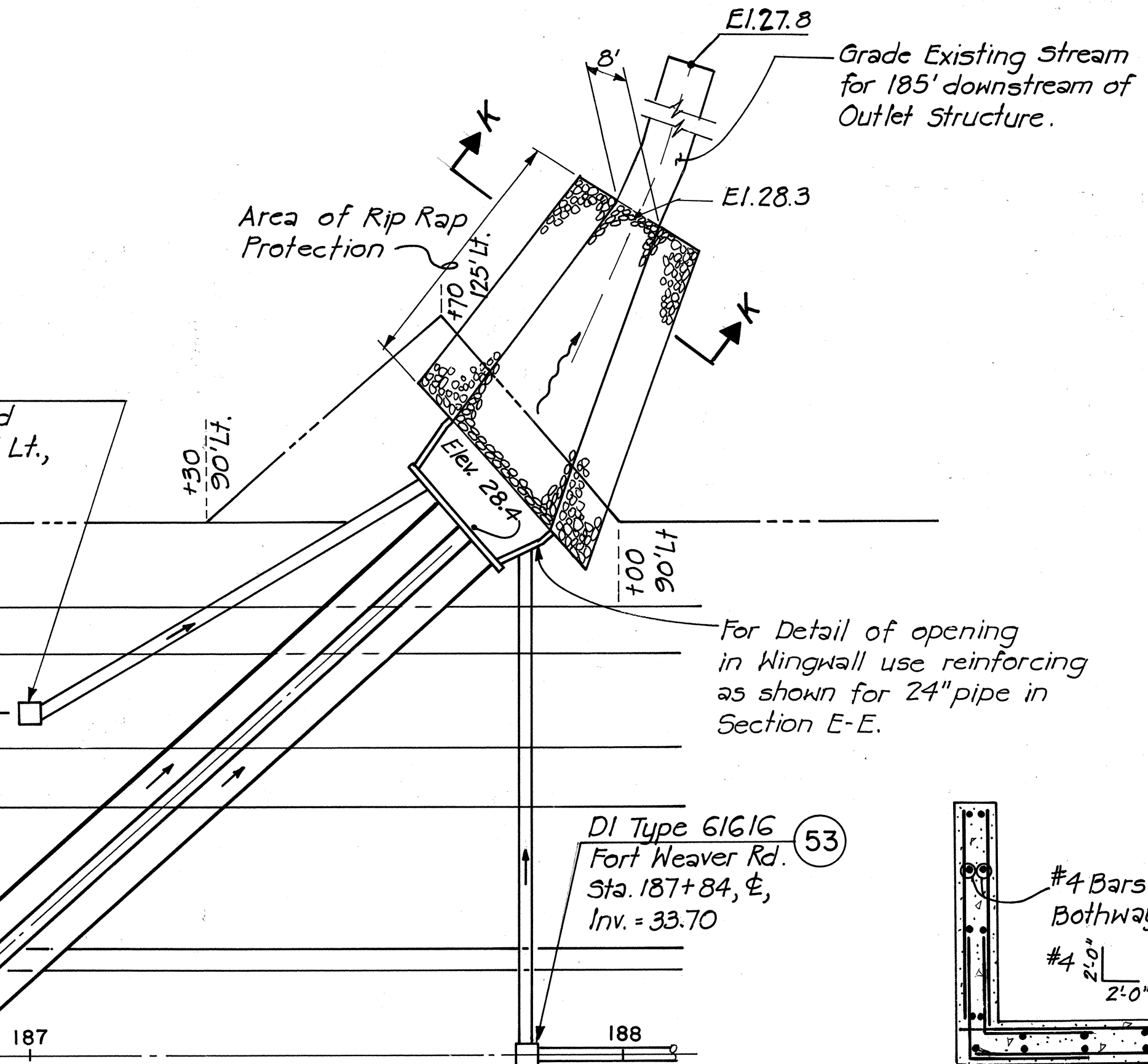
**PLAN
OUTLET STRUCTURE**
Scale: 1/4" = 1'-0"



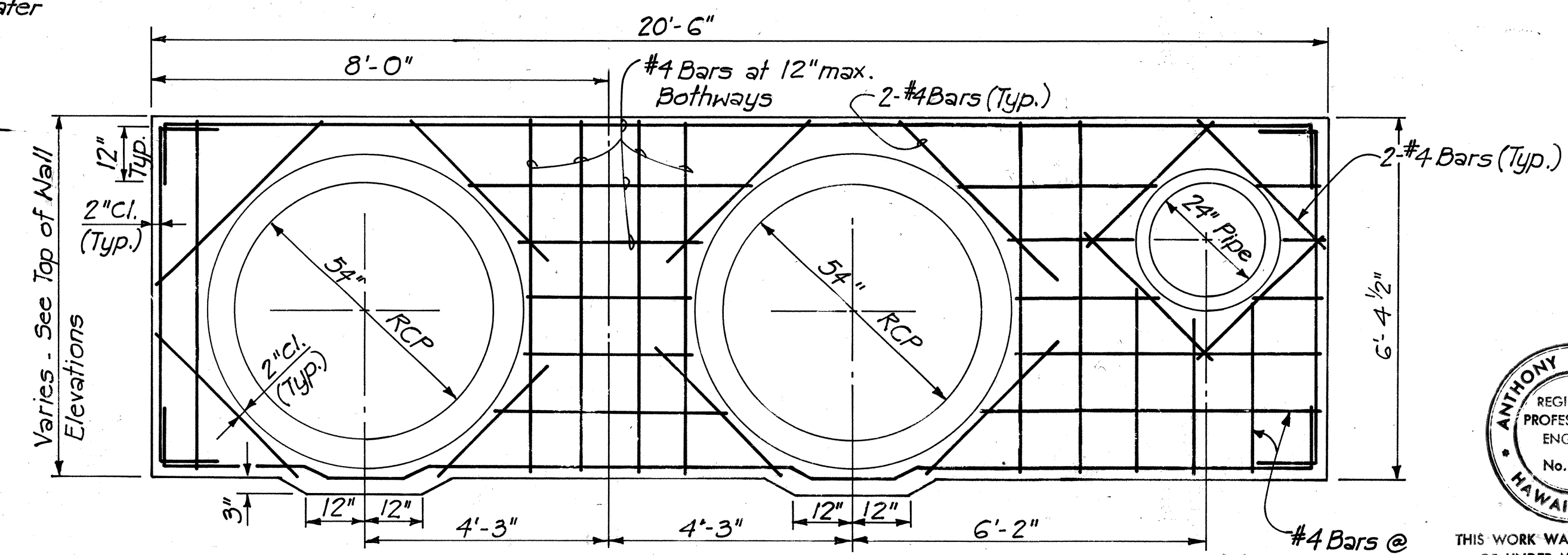
SECTION D-D
Scale: 1/2" = 1'-0"



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



PLAN
Scale: 1" = 20'-0"

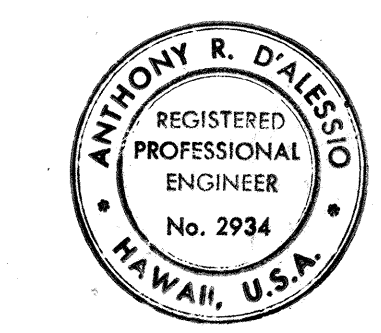


SECTION E-E
Scale: 1/2" = 1'-0"

NOTE: For outlet structure provide continuous horizontal reinforcement.

Grade Stream to meet concrete apron and existing stream.

ORIGINAL PLAN	DATE
DRAWN BY: GBT/ENM	
DESIGNED BY: PMS	
CHECKED BY: AED	
NO.	



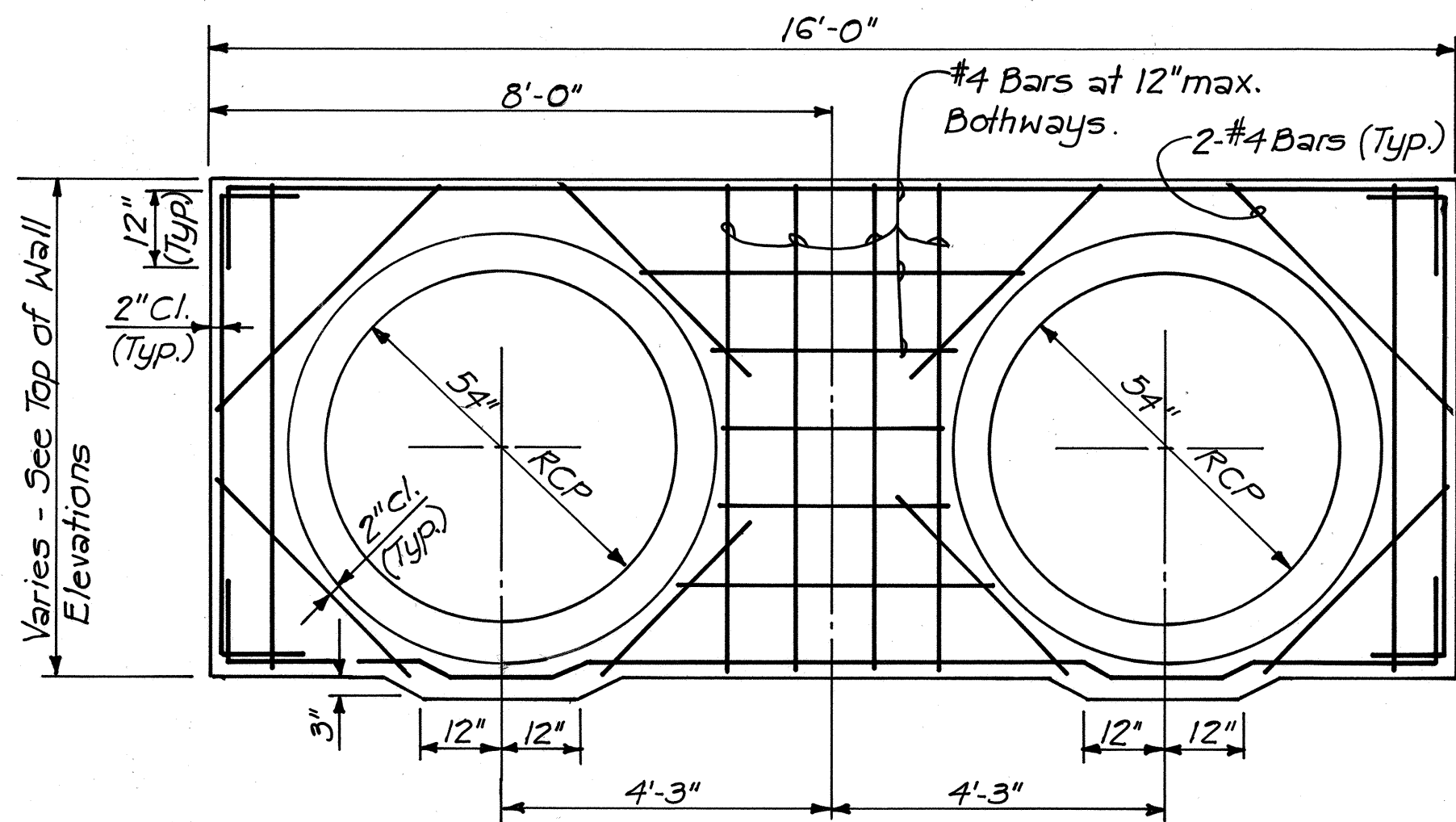
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS

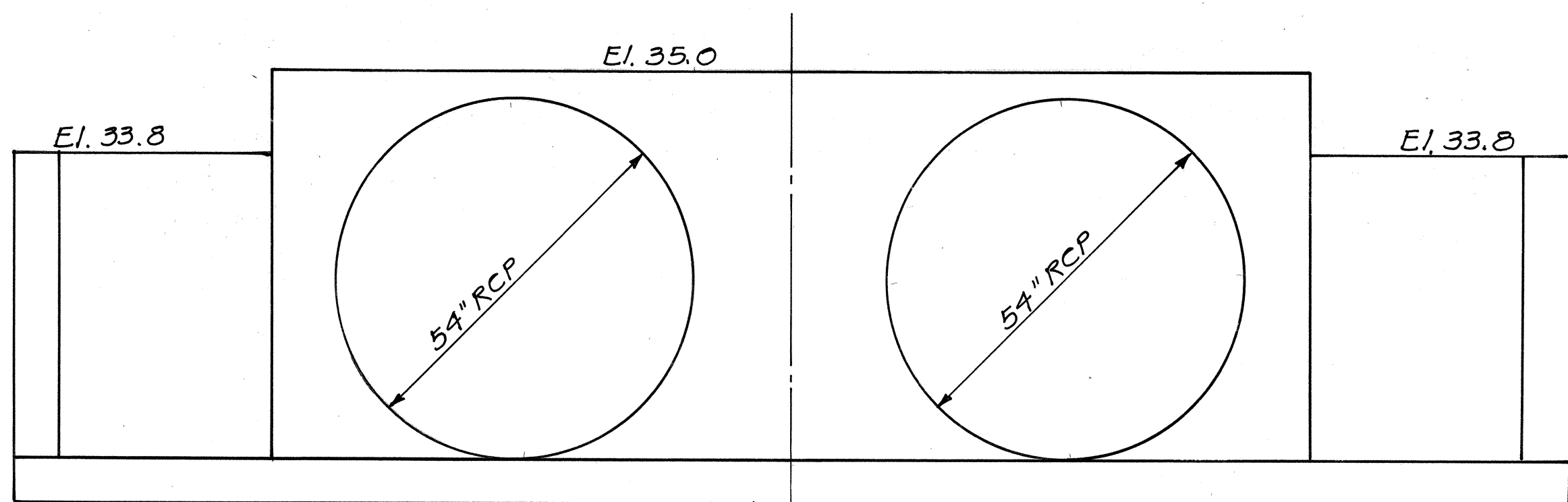
FORT WEAVER ROAD
VICINITY OF MANGO TREE ROAD
TO THE VICINITY OF RENTON ROAD

SCALE: AS SHOWN DATE: APRIL 1982
SHEET NO. 3 OF 4 SHEETS

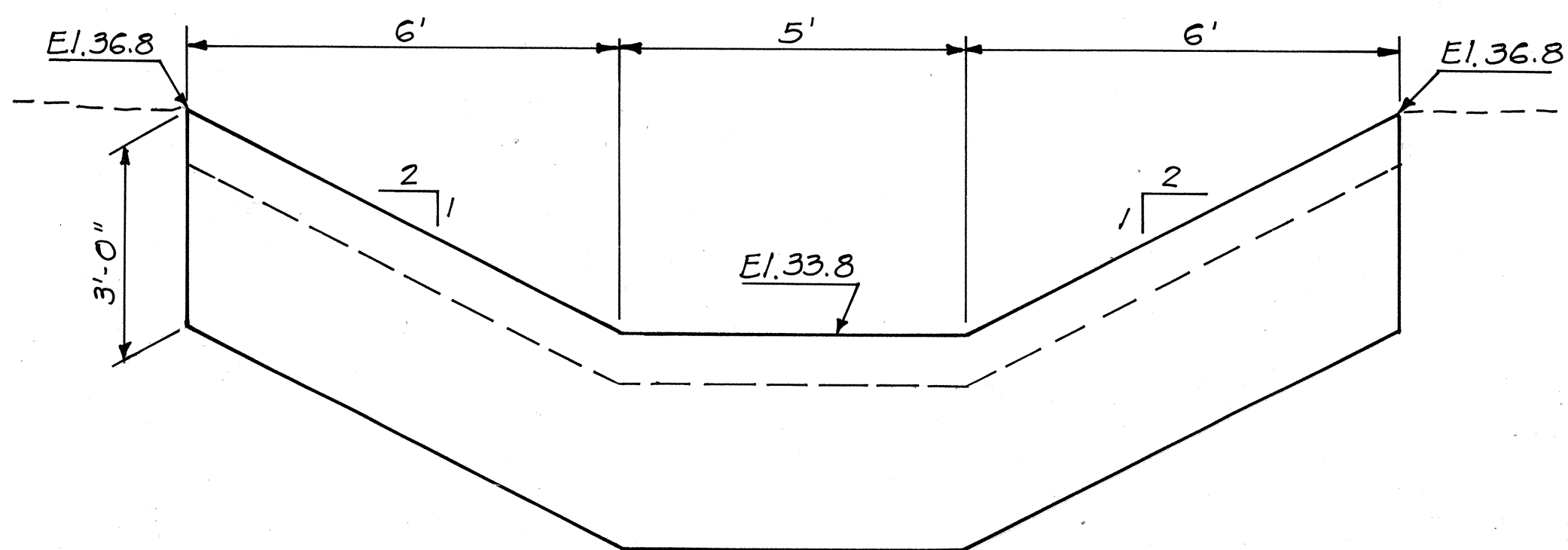
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	7600B-01-82 S-RS-0760(2)	1982	27	163



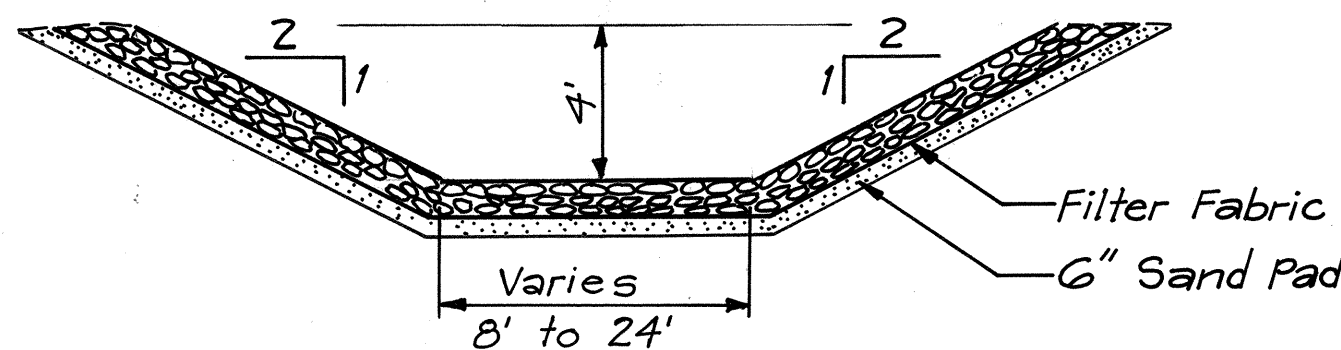
SECTION J-J
Scale: 1/2" = 1'-0"



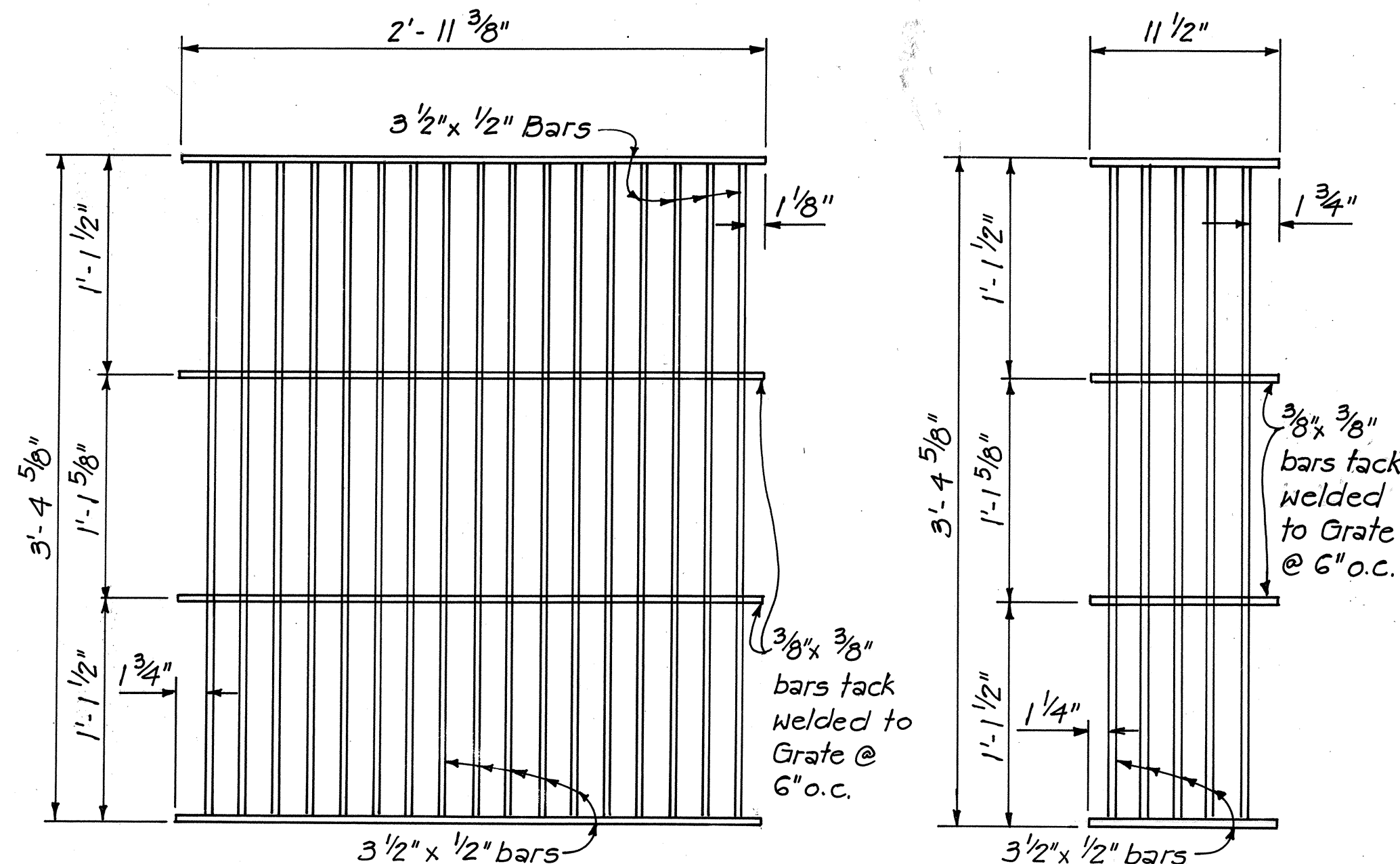
SECTION B-B
Scale: 1/2" = 1'-0"



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

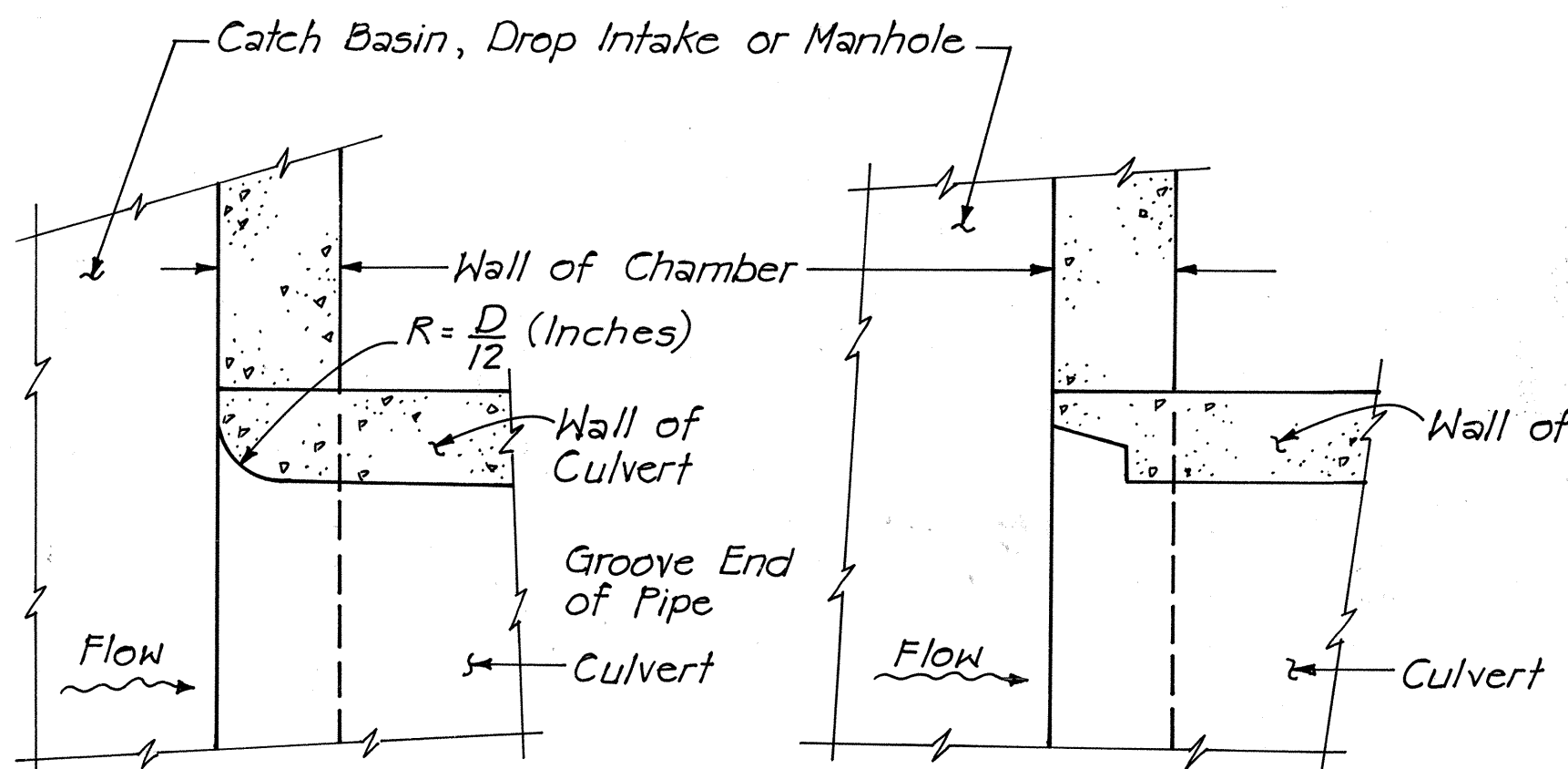


SECTION K-K
12" RIP RAP BLANKET
CLASS 1
(See additional Rip Rap details on Sheet No. 25.)
N.T.S.

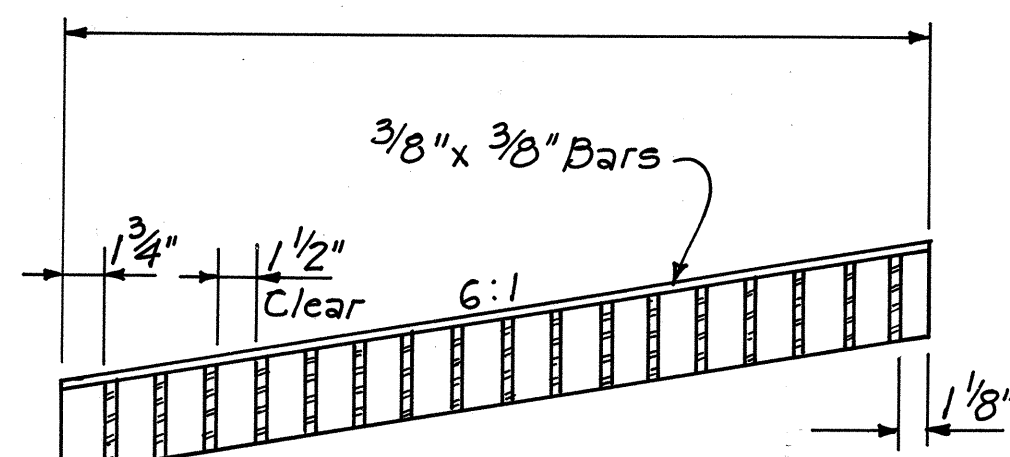


PLAN

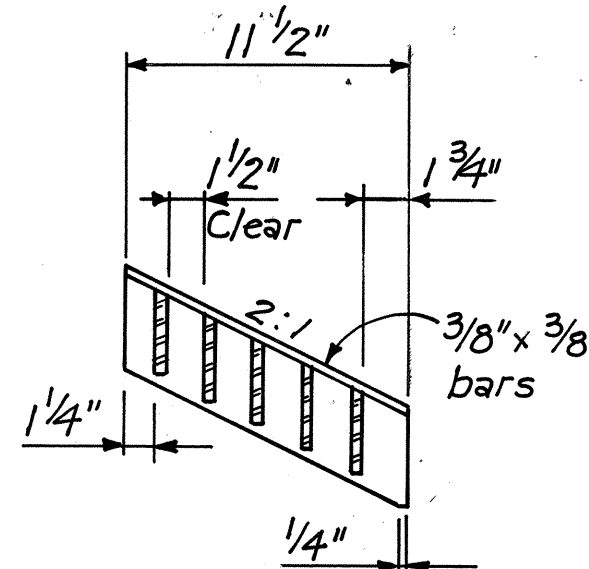
PLAN



TYPICAL DETAILS FOR CULVERTS EXITING
A CATCH BASIN, DROP INTAKE OR MANHOLE
N.T.S.



SECTION

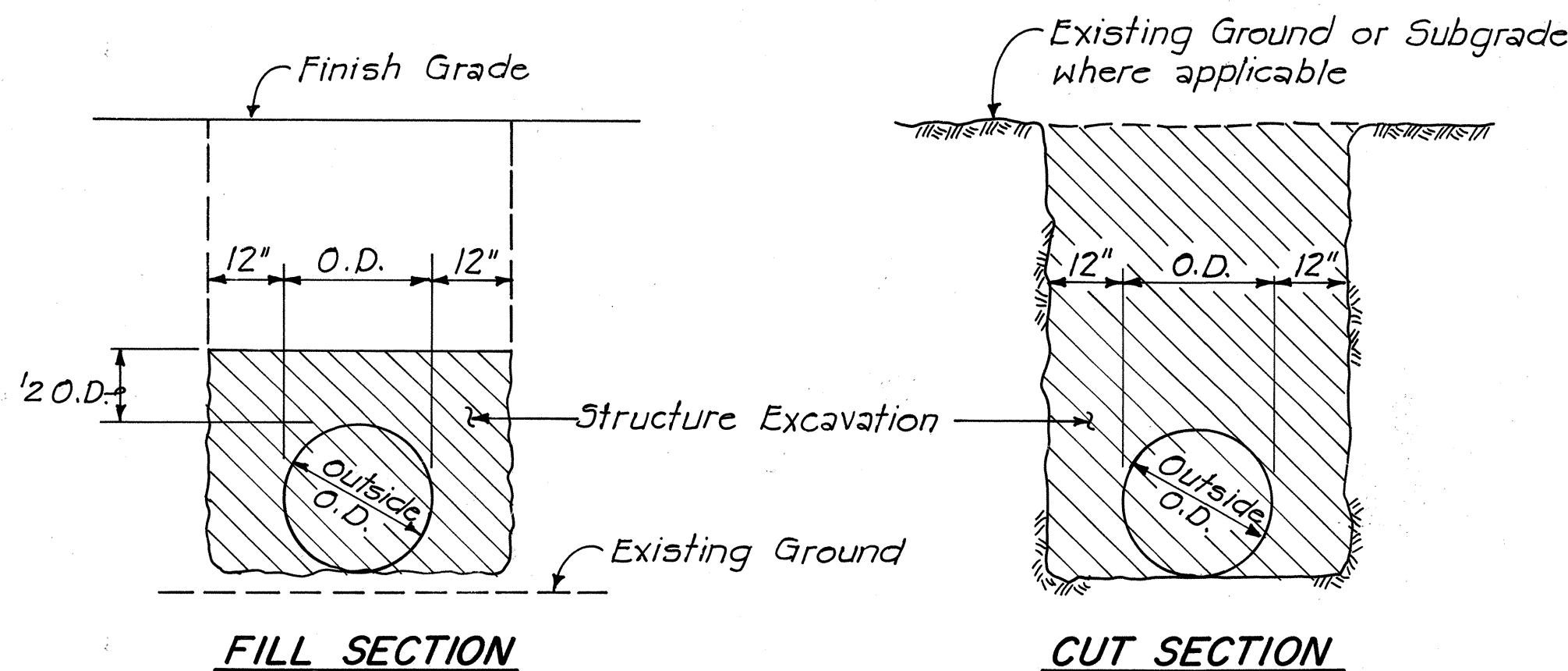


SECTION

DETAILS OF TYPE 61214-S GRATE
Scale: 1/2" = 1'-0"

GENERAL NOTES:

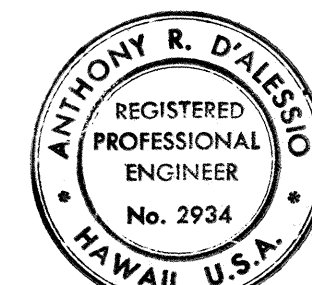
- Grates shall be hot dip galvanized after fabrication, See Specifications.
- All welds 3/8" unless otherwise noted.
- The Grate materials shall conform to the Specifications of ASTM Designation Structural Steel A 283, Grade D and the Standard Specifications.
- Existing Grate shall be salvaged and stockpiled on job site. This work shall be incidental to new grates.



FILL SECTION

CUT SECTION

TRENCH EXCAVATION PAY LIMIT
N.T.S.



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OR UNDER MY SUPERVISION.

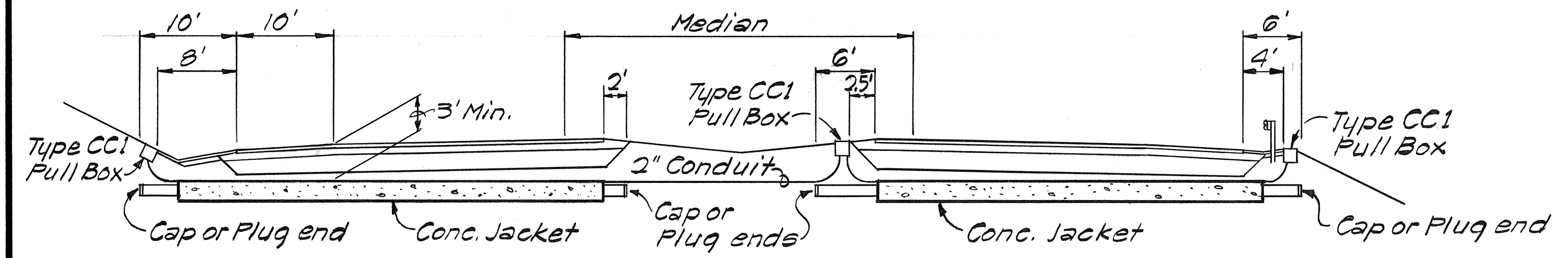
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS

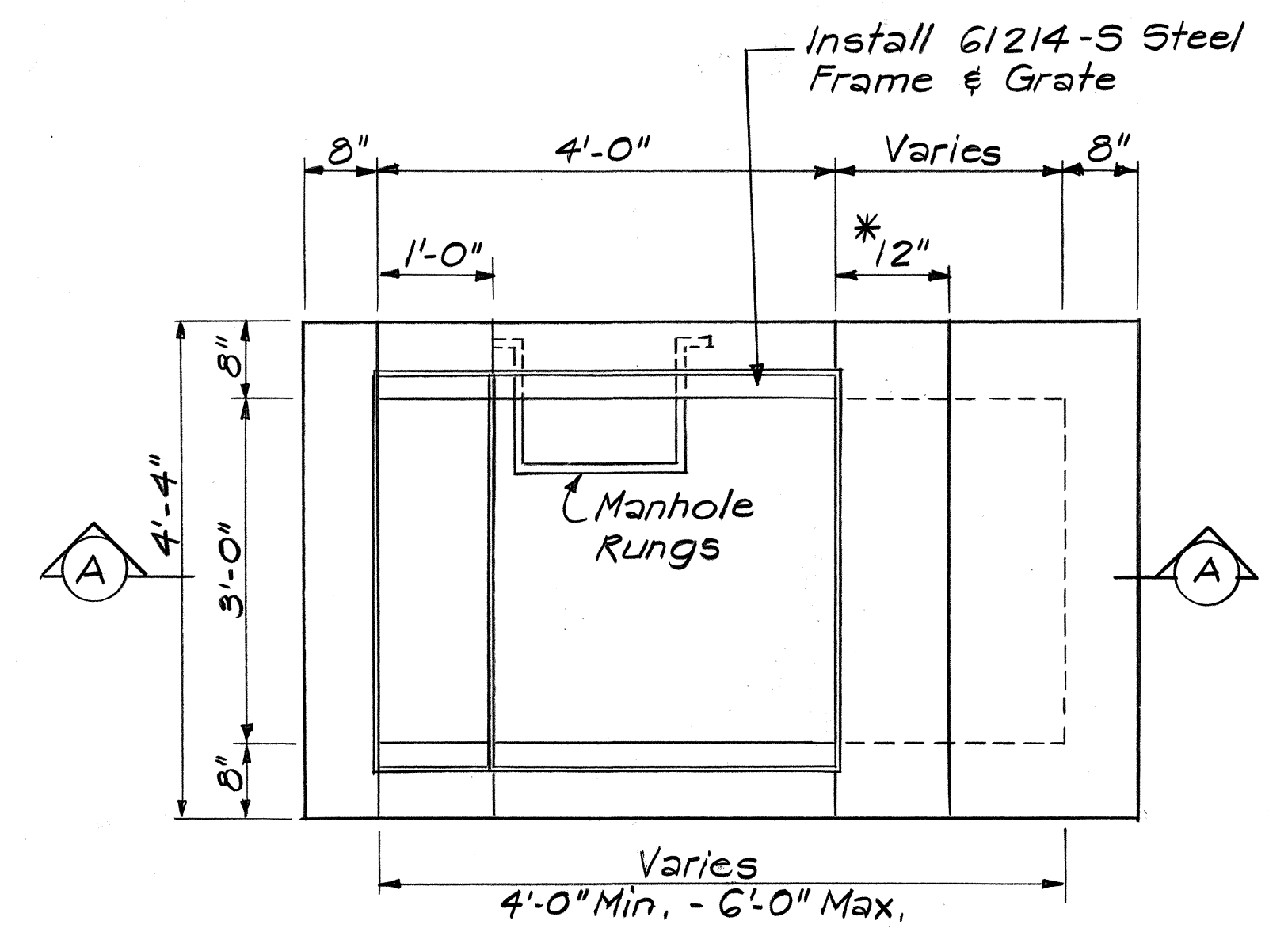
FORT WEAVER ROAD
VICINITY OF MANGO TREE ROAD
TO THE VICINITY OF RENTON ROAD

SCALE: AS SHOWN DATE: APRIL 1982
SHEET NO. 4 OF 4 SHEETS

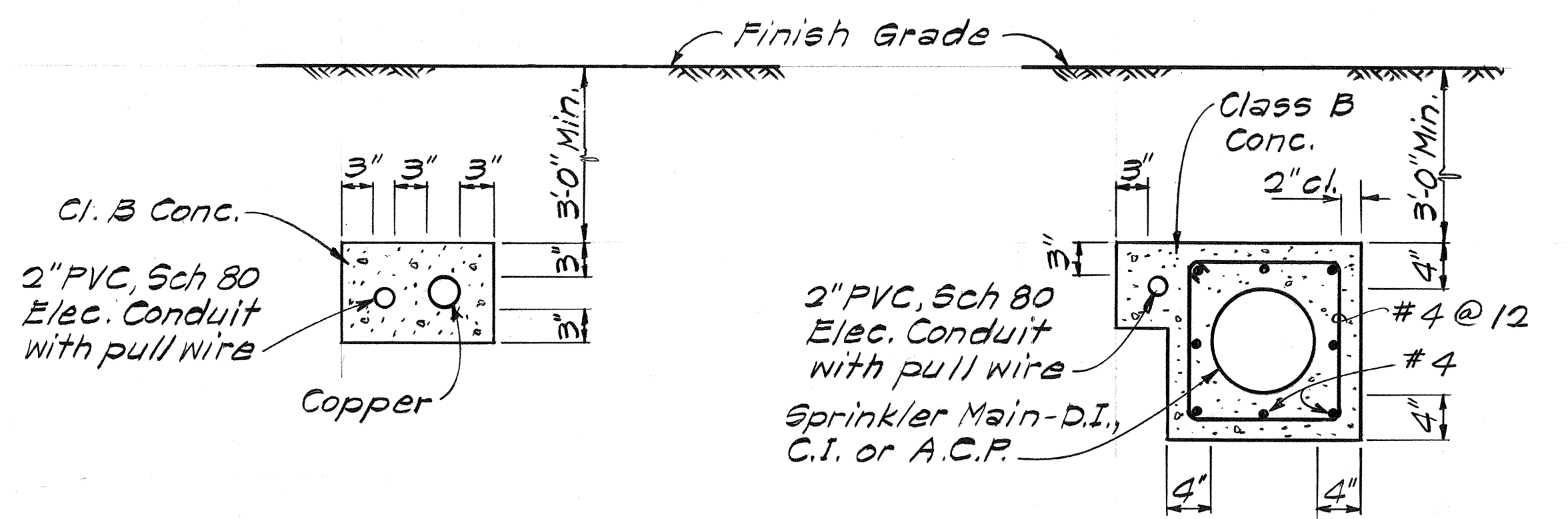
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	7600B-01-82 S-RS-0760 (2)	1982	28	163



TYPICAL SPRINKLER MAIN & ELECTRICAL CONDUIT ROADWAY CROSSING
Scale: 1"=10'



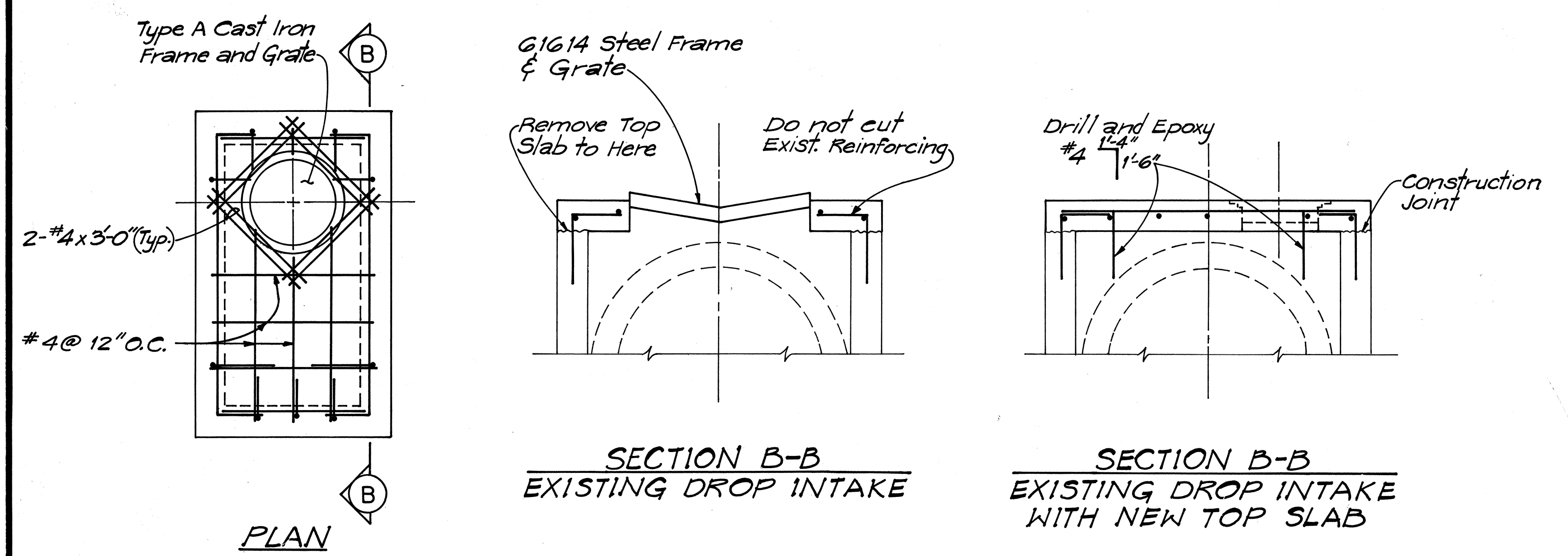
PLAN



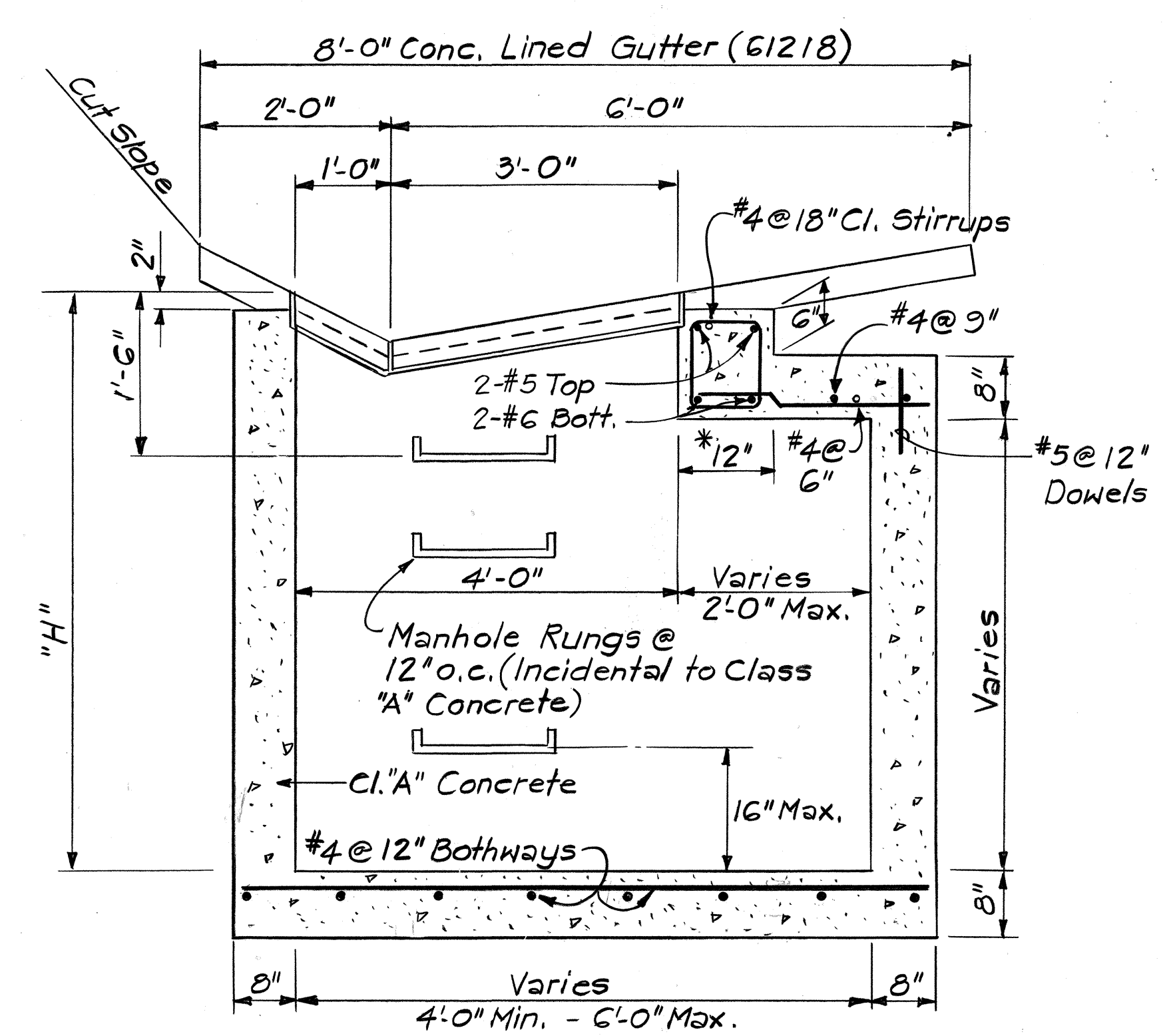
3" AND SMALLER SIZES 4" AND LARGER SIZES

TYPICAL SECTION OF CONCRETE JACKET
Scale: 1"=1'-0"

Note: Pressure test sprinkler main for leaks prior to jacketing.

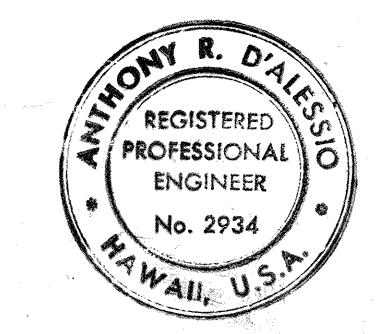


DETAIL OF 61614 DROP INTAKE
FT. WEAVER RD. STA. 66+20, 71.25' LT.
Scale: 1/2"=1'-0"



SECTION A-A
DETAIL OF 61614 DROP INTAKE
Scale: 3/4"=1'-0"

*For minimum size box of 4'-0" only, use 8" & eliminate reinforcing steel shown in top portion.



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[Signature]

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
**DRAINAGE DETAILS AND
SPRINKLER SYSTEM DETAILS**

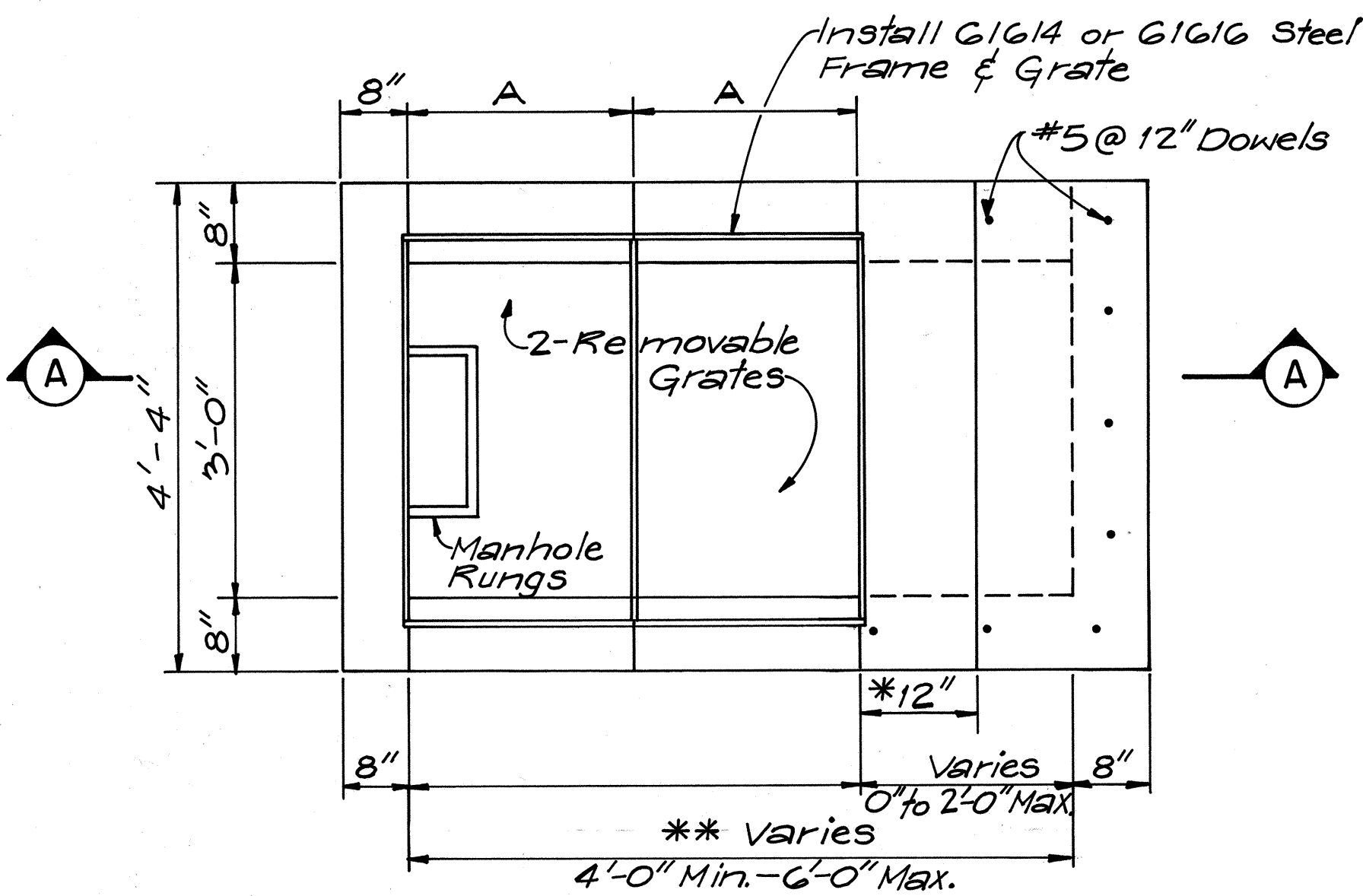
FORT WEAVER ROAD
VICINITY OF MANGO TREE ROAD
TO THE VICINITY OF RENTON ROAD
SCALE: AS SHOWN DATE: APRIL 1982
SHEET NO. 1 OF 1 SHEETS

28

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	7600B-01-82 S-RS-076012	1982	CO28S-1	163

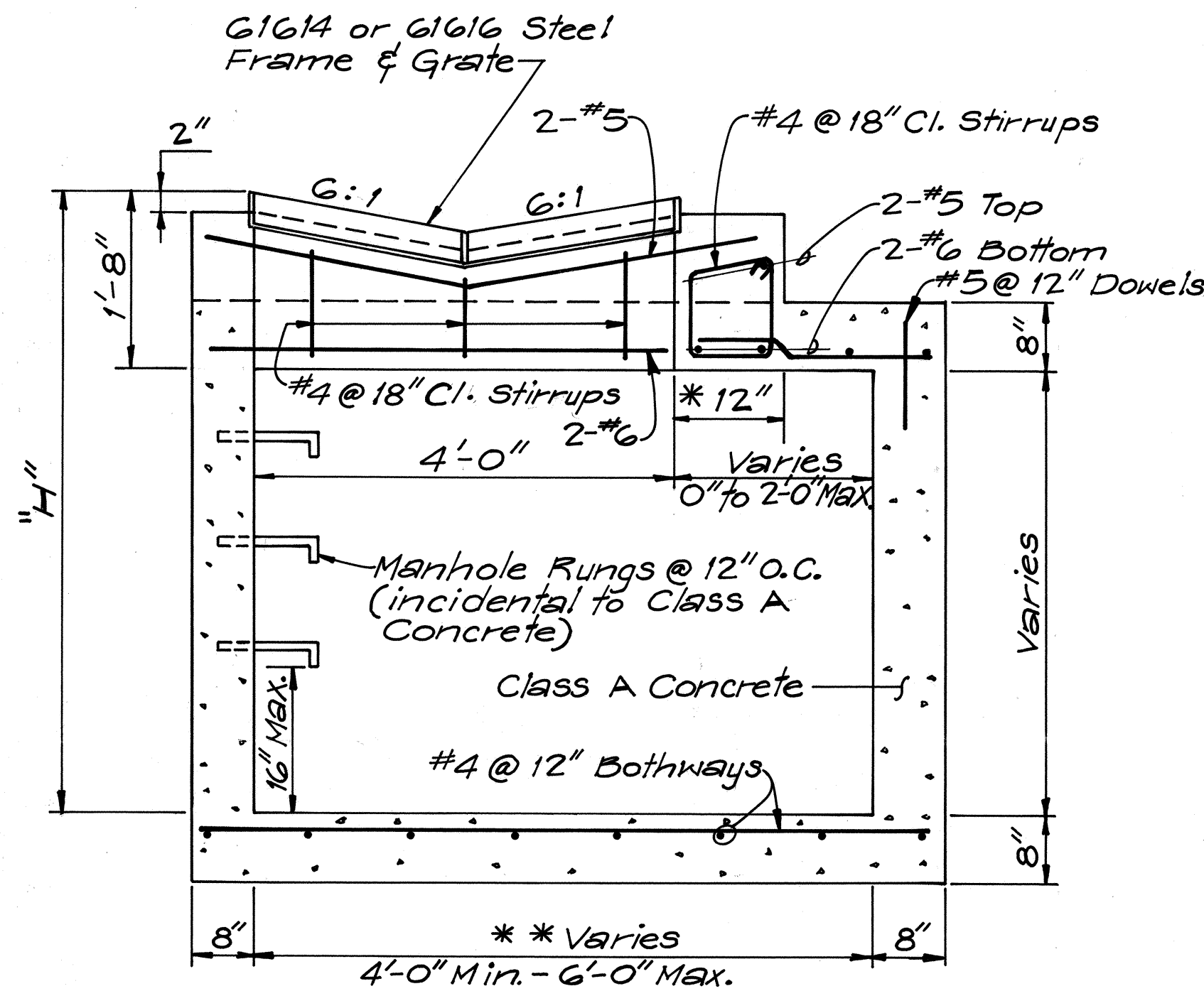
GENERAL NOTES:

- Grates and Frames shall be hot dip galvanized after fabrication, see specifications.
- All welds 3/8" unless otherwise noted.
- Refer to "Spacing Table" for Types G1614 & G1616 Drop Intake and Frame & Grates dimensions.
- The Frame & Grate materials shall conform to the specifications of ASTM Designation Structural Steel A283, Grade D and the Standard Specifications.
- Culvert shall leave Drop Intake from any position and any direction indicated by plans or ordered by the Engineer. Culverts may both enter and leave Drop Intake so that Drop Intake will act as manhole.
- Manhole Rungs (12" O.C. are required when "H" is greater than 4 feet 6 inches. Only one rung (16 inches from the bottom) is required if "H" is 4 feet 6 inches or less. Manhole Rungs may be placed at any location as ordered by the Engineer.



PLAN

SPACING TABLE					
TYPE	NO. BARS	A	B	C	D
G1614	11	2'-0"	1'-11 1/2"	1 1/4"	1'-6"
G1616	17	3'-0"	2'-11 3/8"	1 1/8"	2'-0"

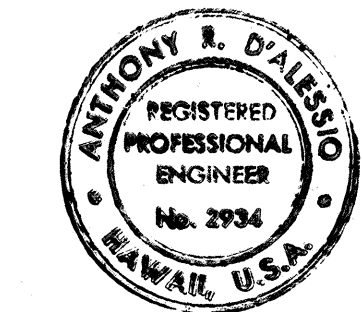


SECTION A-A

DETAILS OF 61614 OR 61616 DROP INTAKE
SCALE: 3/4"=1'-0"

- * For Minimum size box of 3'-0", use 8" and eliminate reinforcing steel shown in the top portion.
- ** For Culverts larger than 30", the minimum dimension shall be D+1'.

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



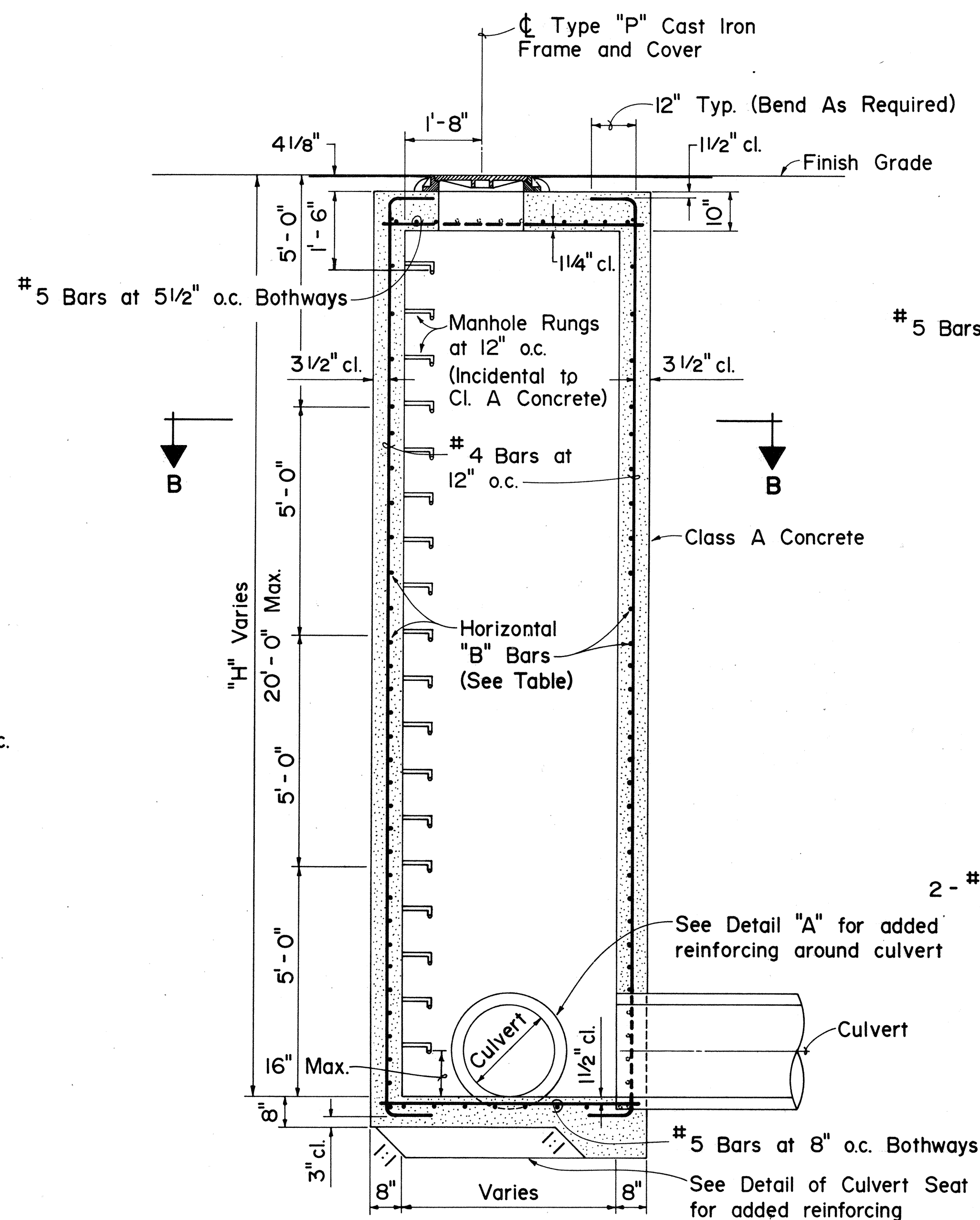
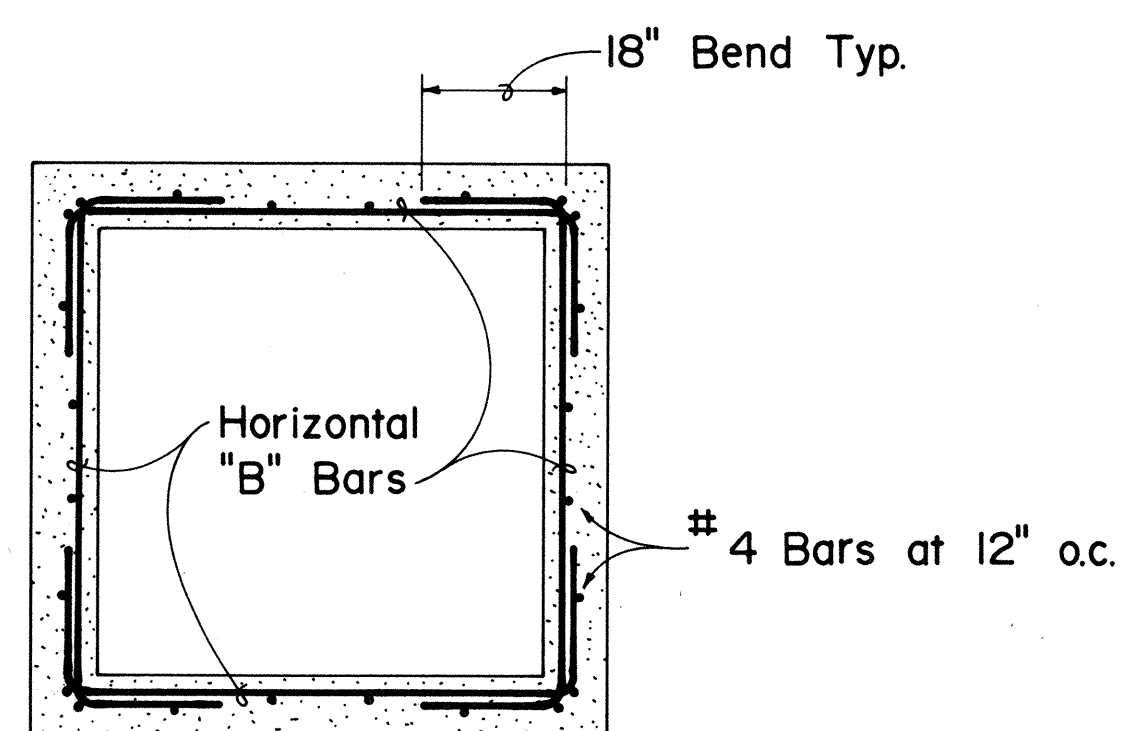
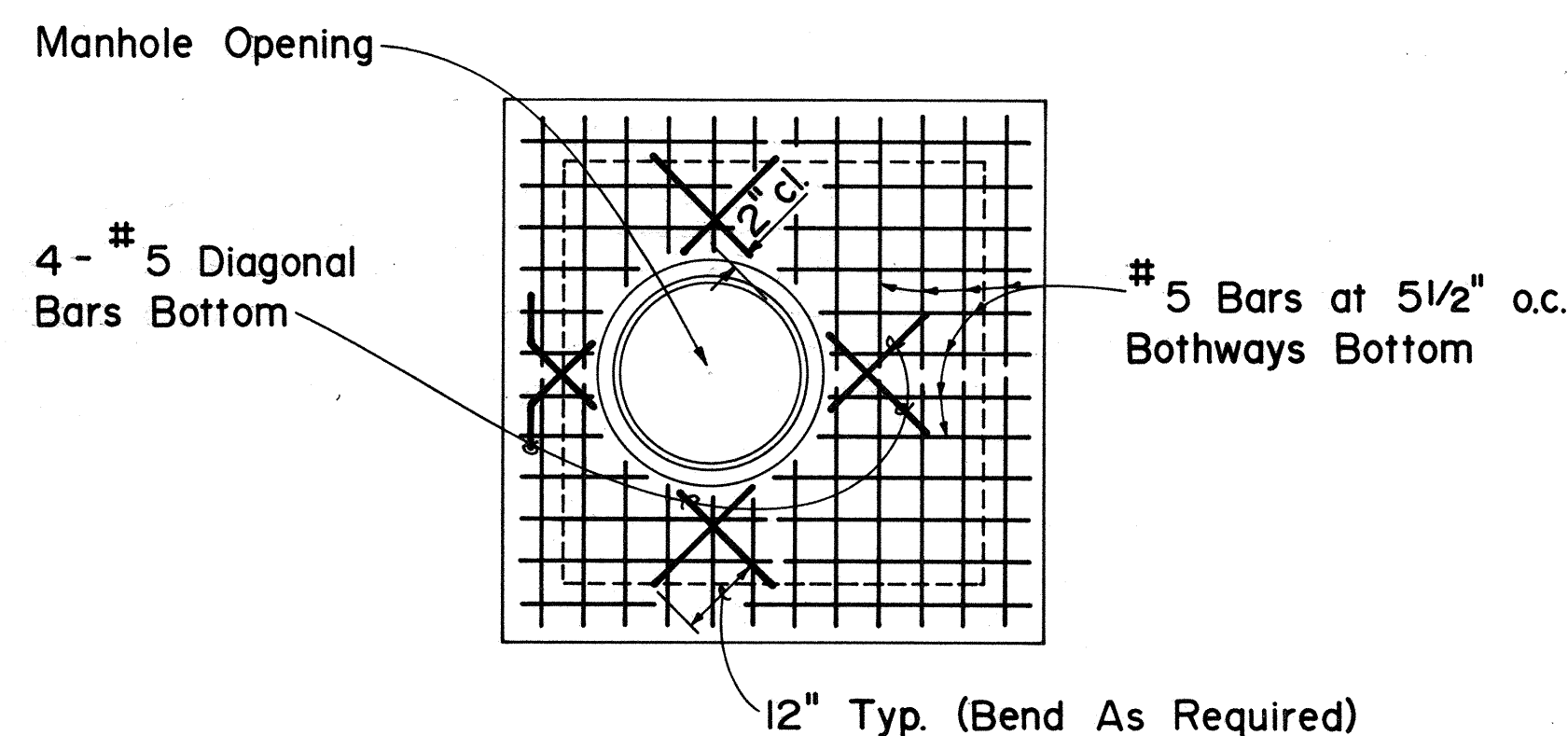
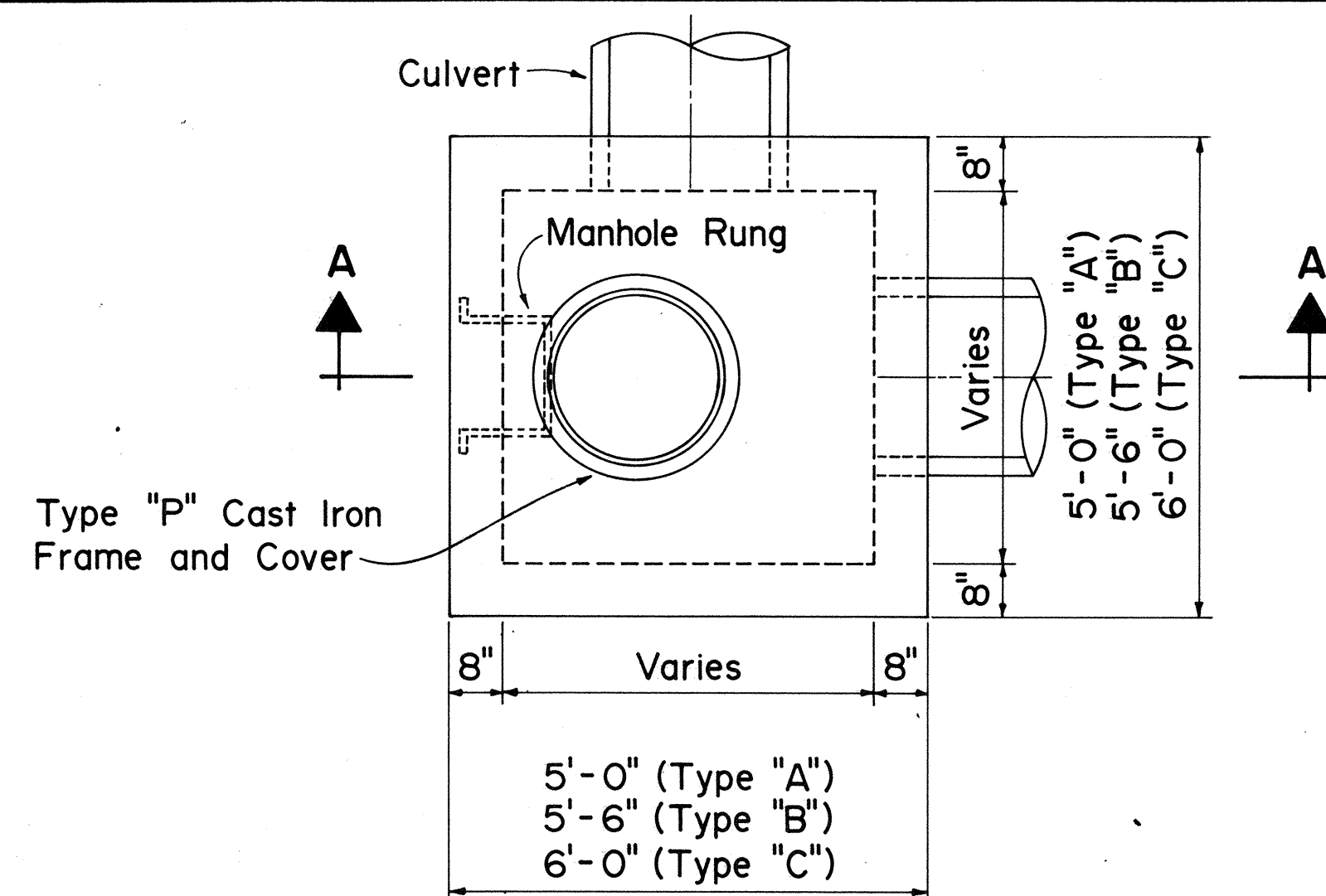
THIS WORK WAS PREPARED BY ME
OR UNDER MY SUPERVISION
[Signature]

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

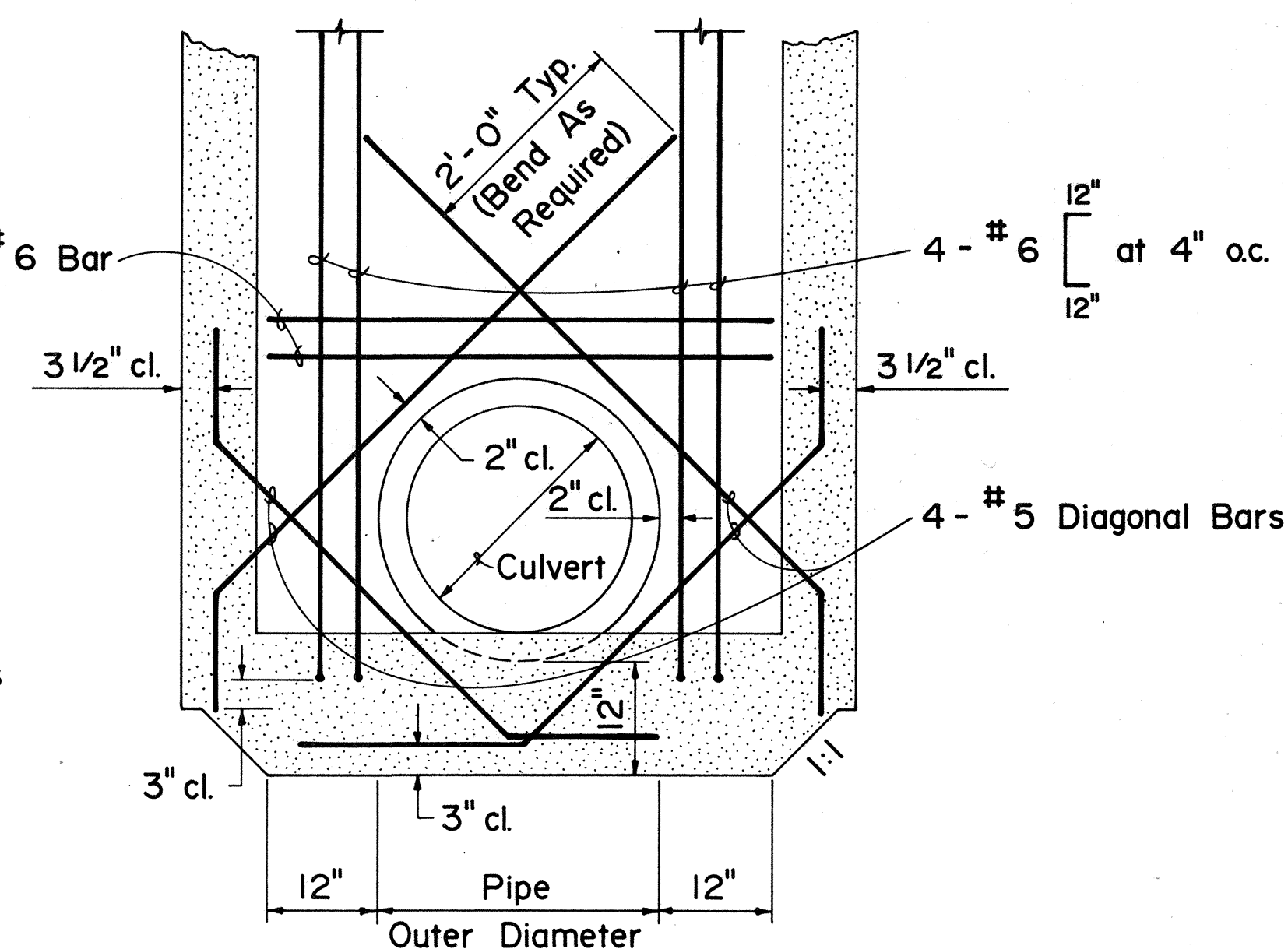
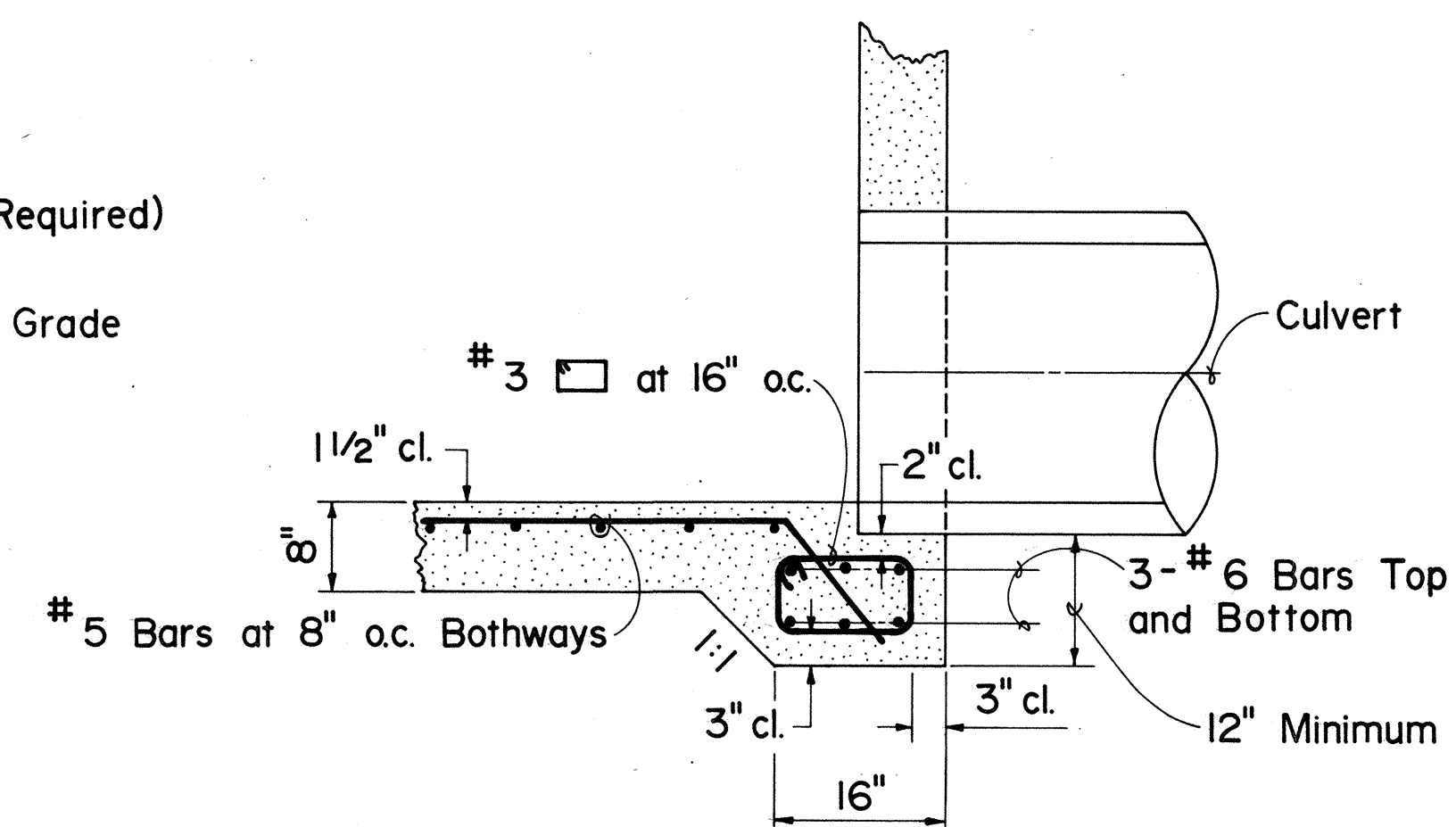
DRAINAGE DETAILS

FORT WEAVER ROAD
VICINITY OF MANGO TREE ROAD
TO THE VICINITY OF RENTON ROAD
SCALE: 3/4"=1'-0" DATE: JUNE 1982
SHEET NO. 1 OF 1 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	7600B-01-82 S-RS-076014	1982	29	163



"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.



APPROVAL RECOMMENDED:
T. Takano
 HYDRAULIC DESIGN ENGINEER 8-20-80 DATE

APPROVED:
Shunpei Sakaiishi
 ASSISTANT CHIEF, ENGINEERING 8-20-80 DATE

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

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION

STANDARD DETAILS

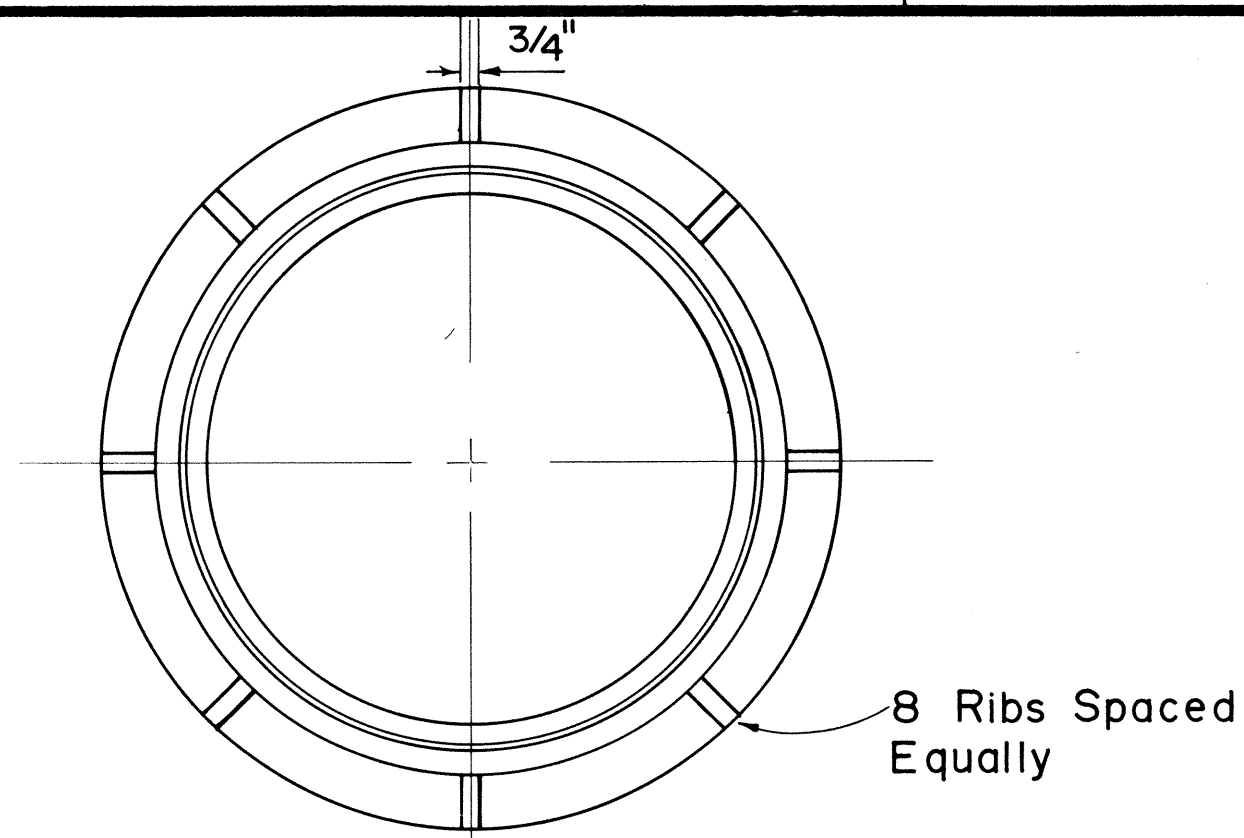
TYPE A, B, AND C
 STORM DRAIN MANHOLE

Not To Scale Date: August 1980

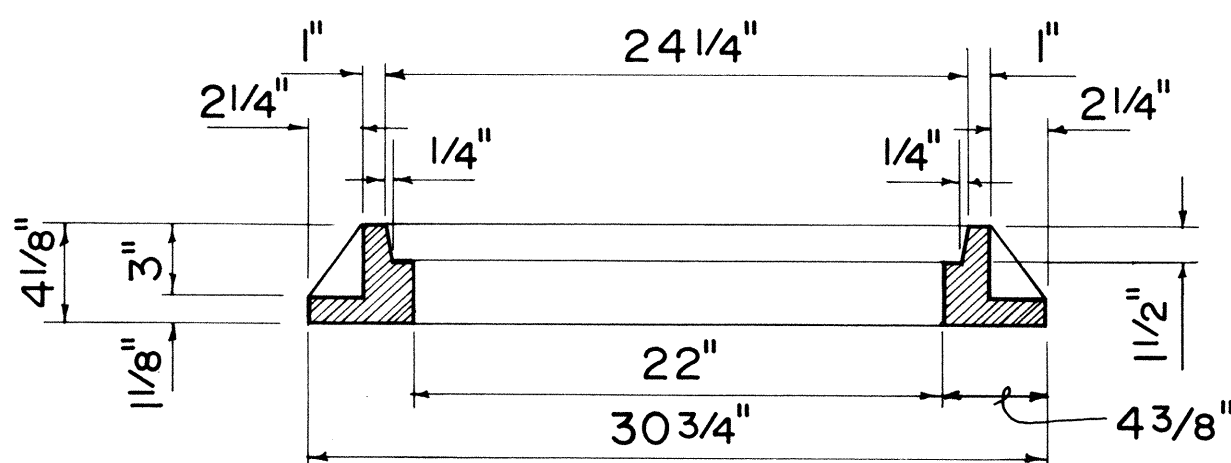
SHEET No. OF SHEETS DH5

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

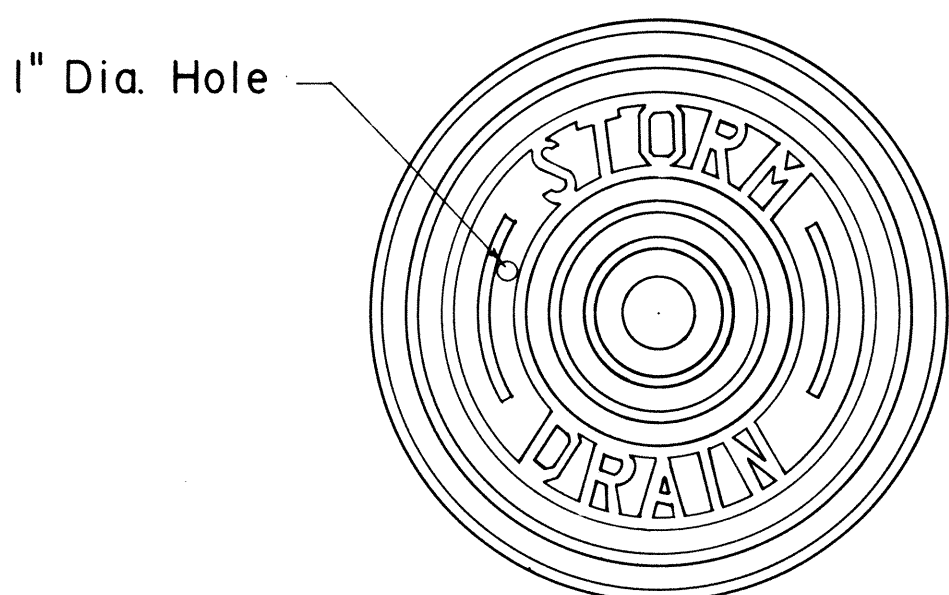
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	7600B-01-82 S-RS-0760(2)	1982	30	163



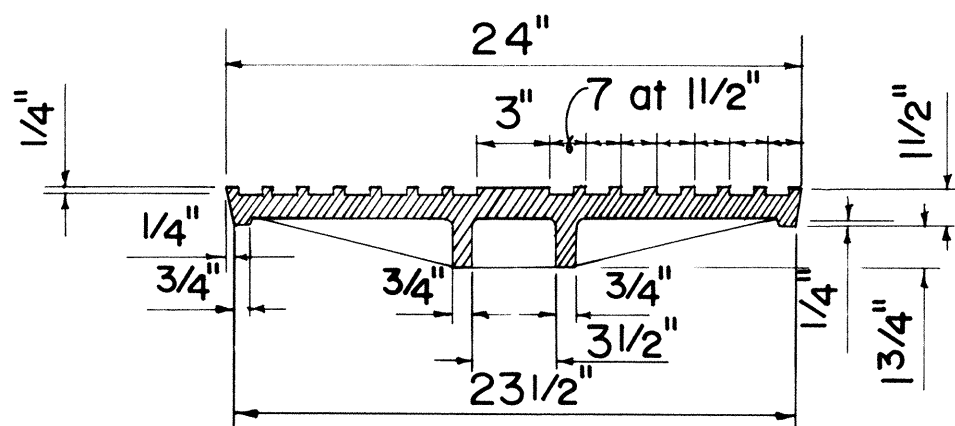
PLAN OF FRAME



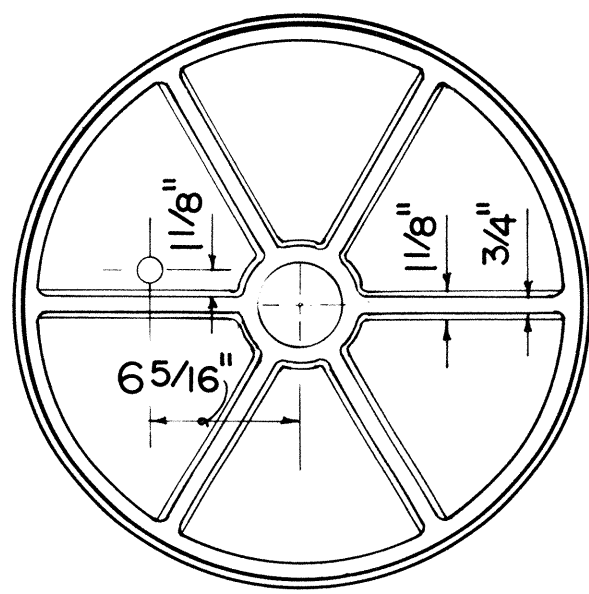
SECTION OF FRAME



TOP VIEW OF COVER

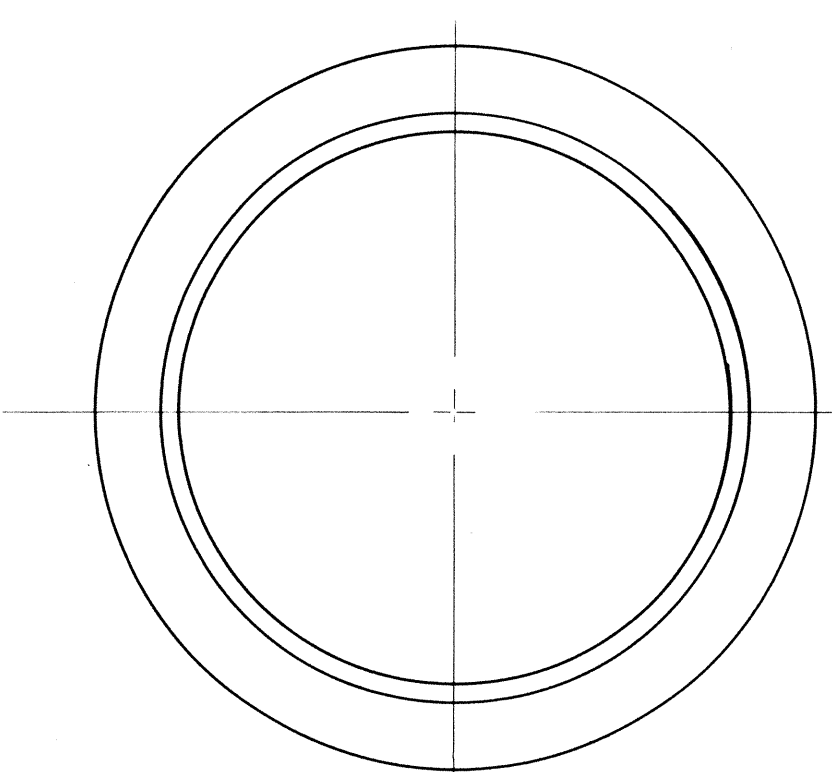


SECTION

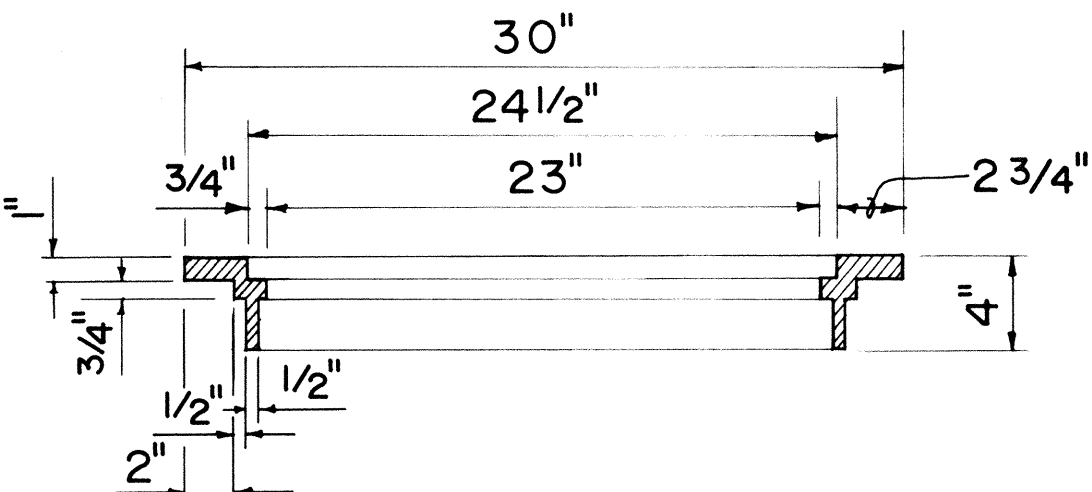


BOTTOM VIEW OF COVER

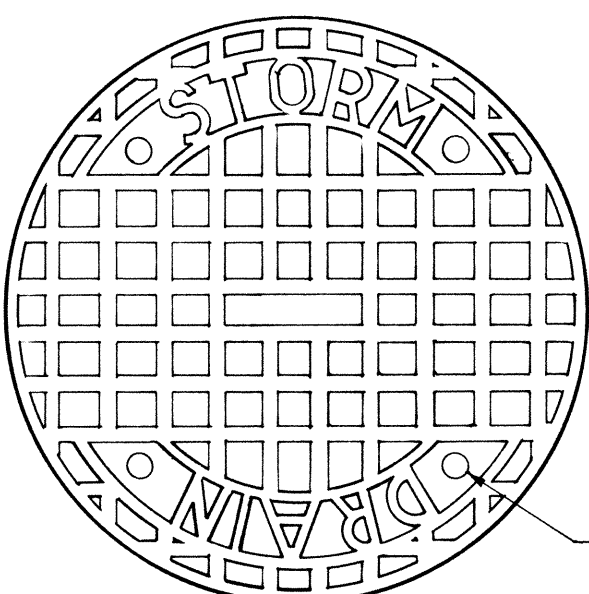
TYPE "P" CAST IRON
FRAME AND COVER



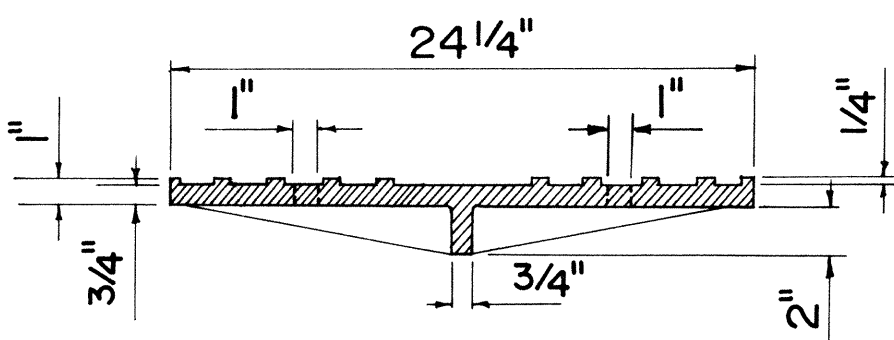
PLAN OF FRAME



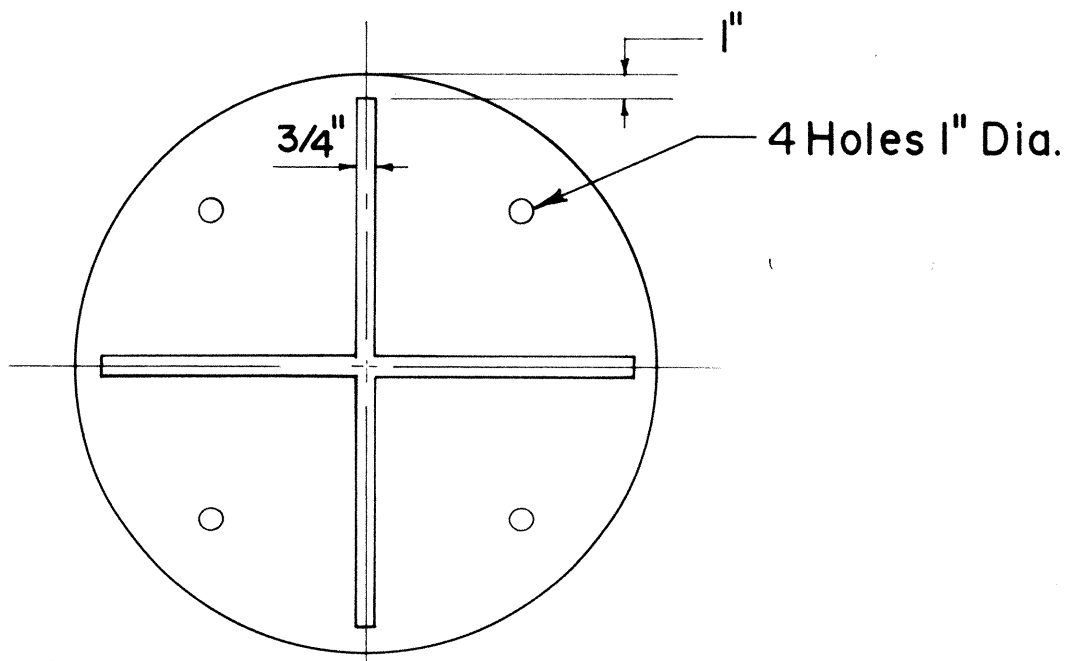
SECTION OF FRAME



TOP VIEW OF COVER

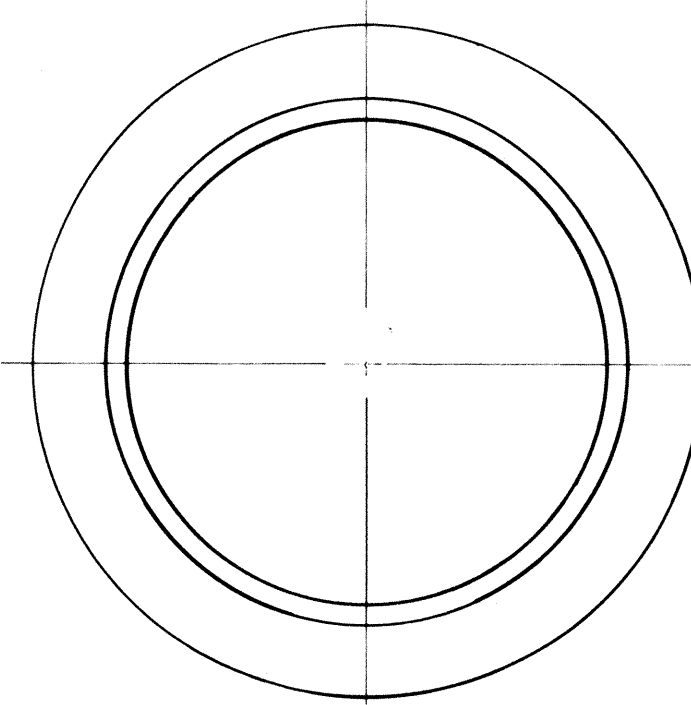


SECTION

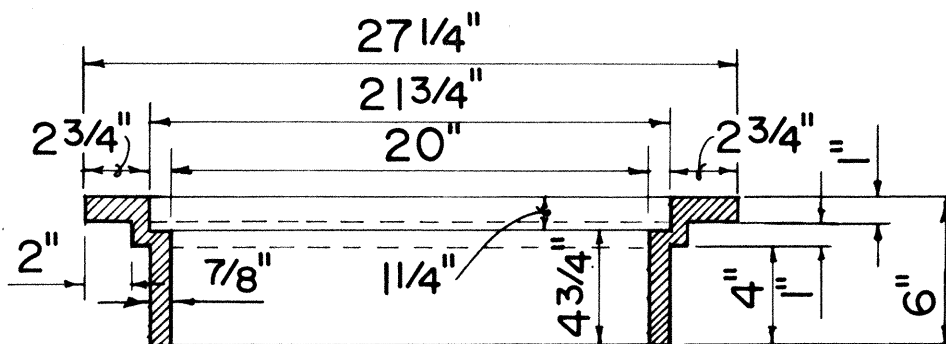


BOTTOM VIEW OF COVER

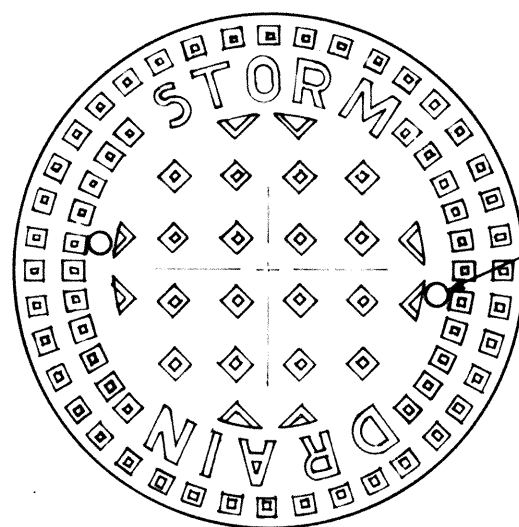
TYPE "B" CAST IRON
FRAME AND COVER



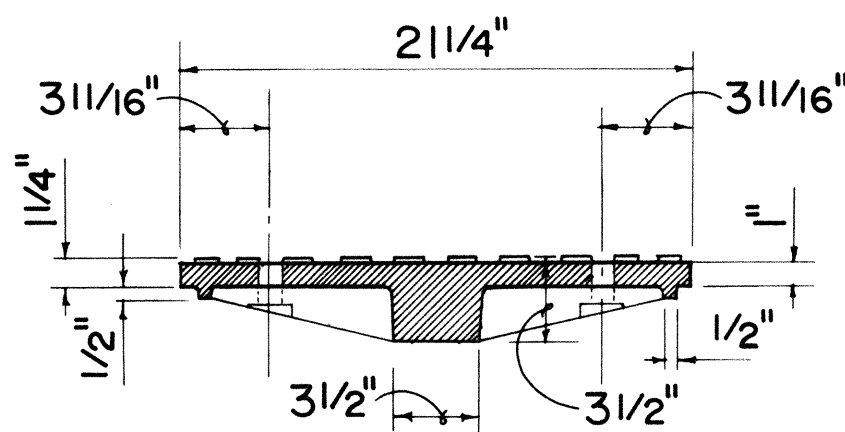
PLAN OF FRAME



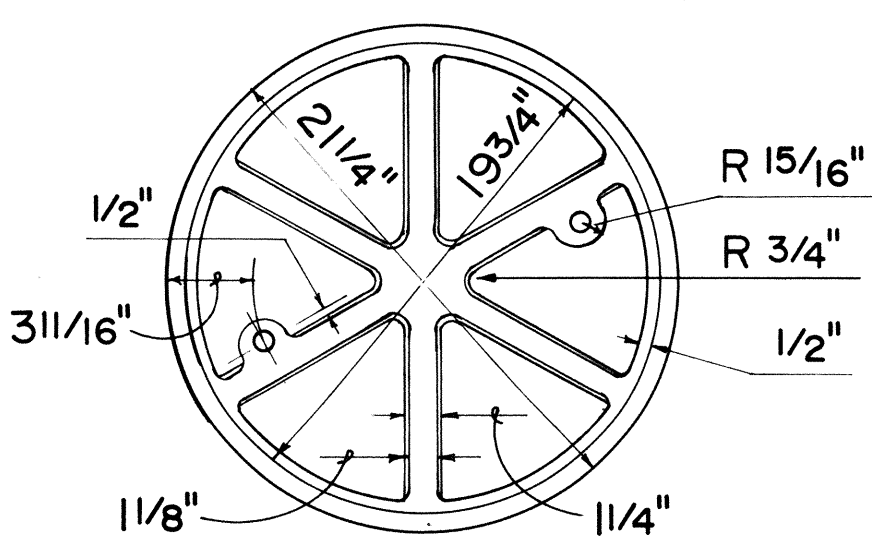
SECTION OF FRAME



TOP VIEW OF COVER

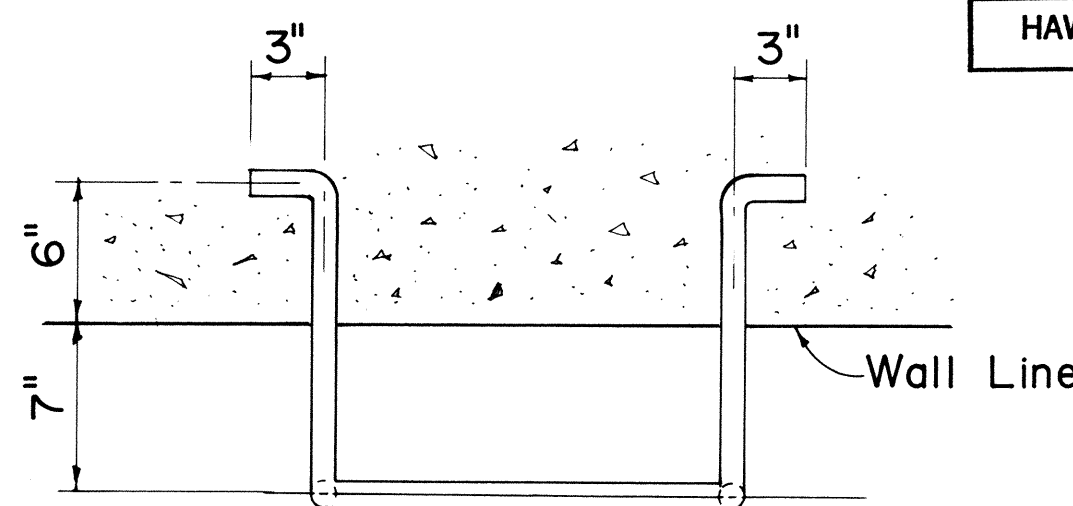


SECTION

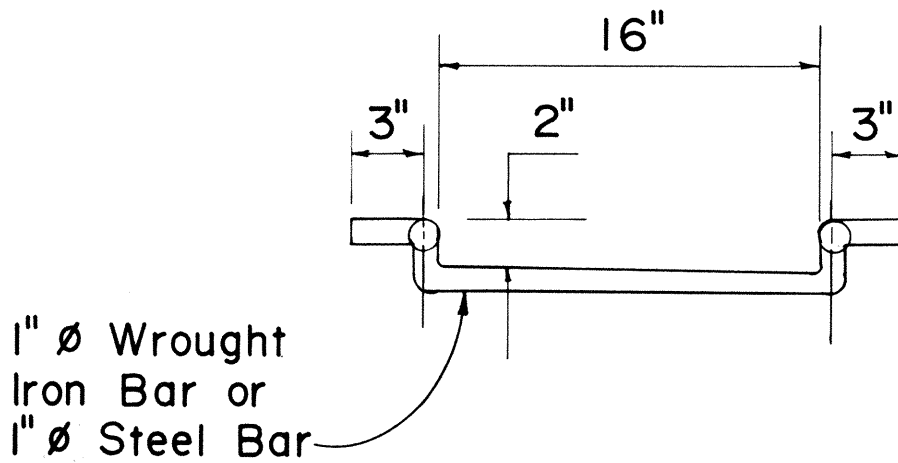


BOTTOM VIEW OF COVER

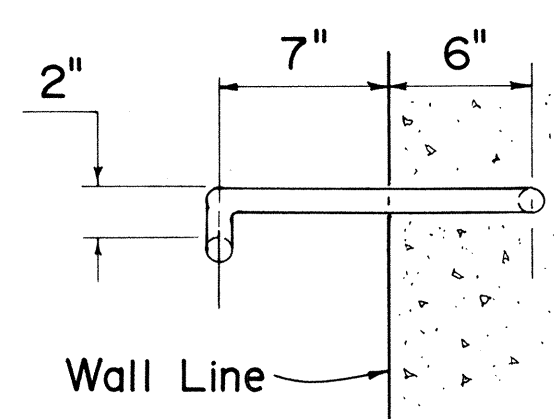
TYPE "A" CAST IRON
FRAME AND COVER



PLAN



FRONT VIEW



SIDE VIEW

MANHOLE RUNG

APPROVAL RECOMMENDED:
T. Takano 6-19-79
 HYDRAULIC DESIGN ENGINEER DATE
 APPROVED:
Harbor Zaleishi 6-22-79
 ASSISTANT CHIEF, ENGINEERING DATE

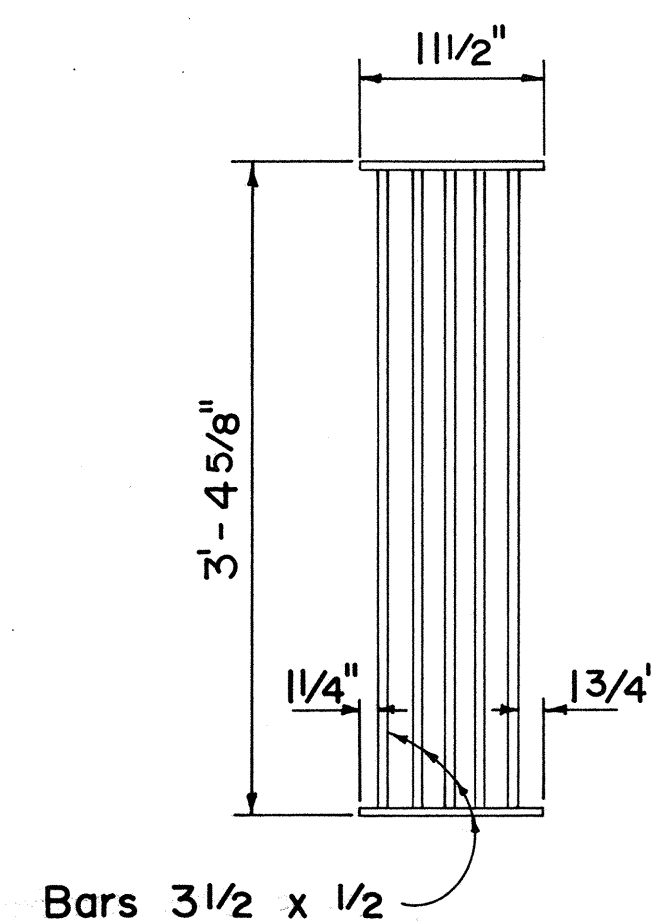
NO.	REVISION	APPROVED BY	DATE
1.	Supersedes Sht. DH 6 approved 12-17-69	H.P.	6/22/79

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

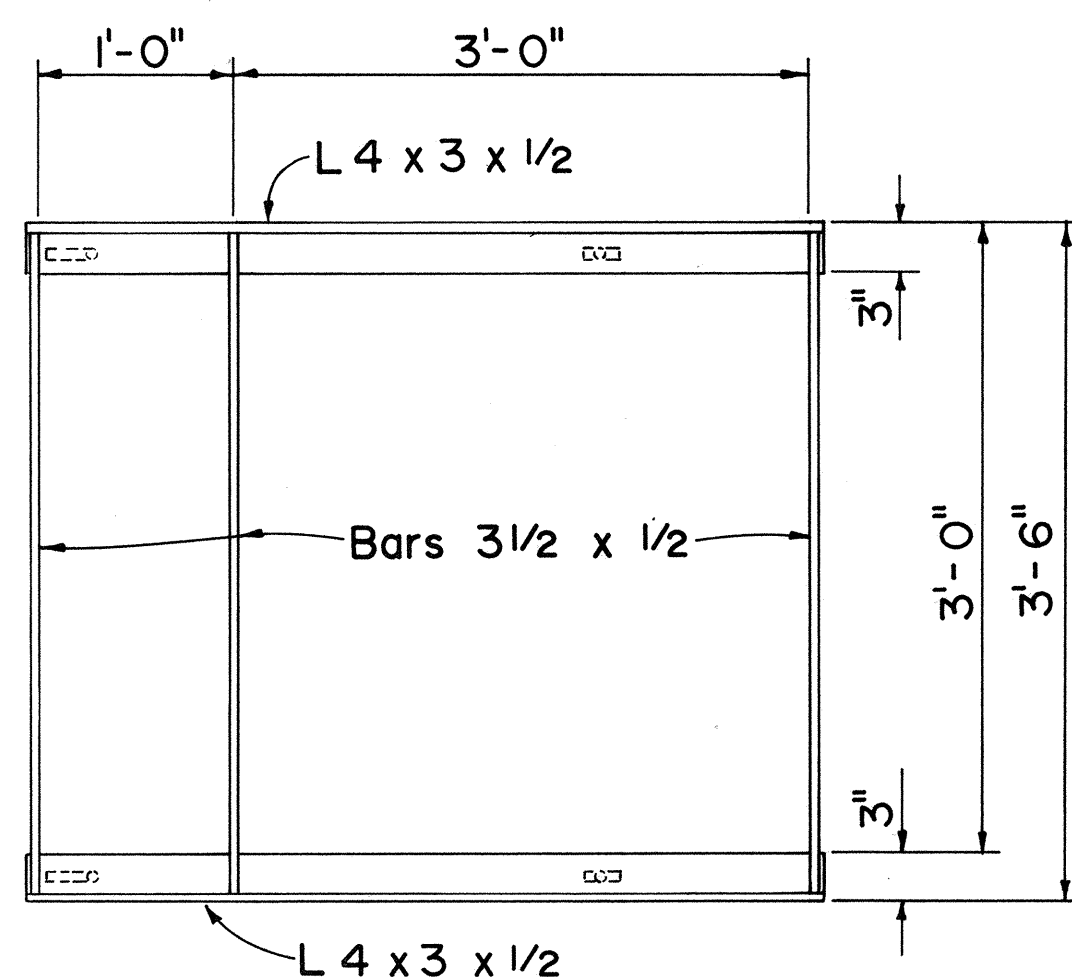
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	7600B-01-82 (S-RS-0760B)	1982	31	163

GENERAL NOTE

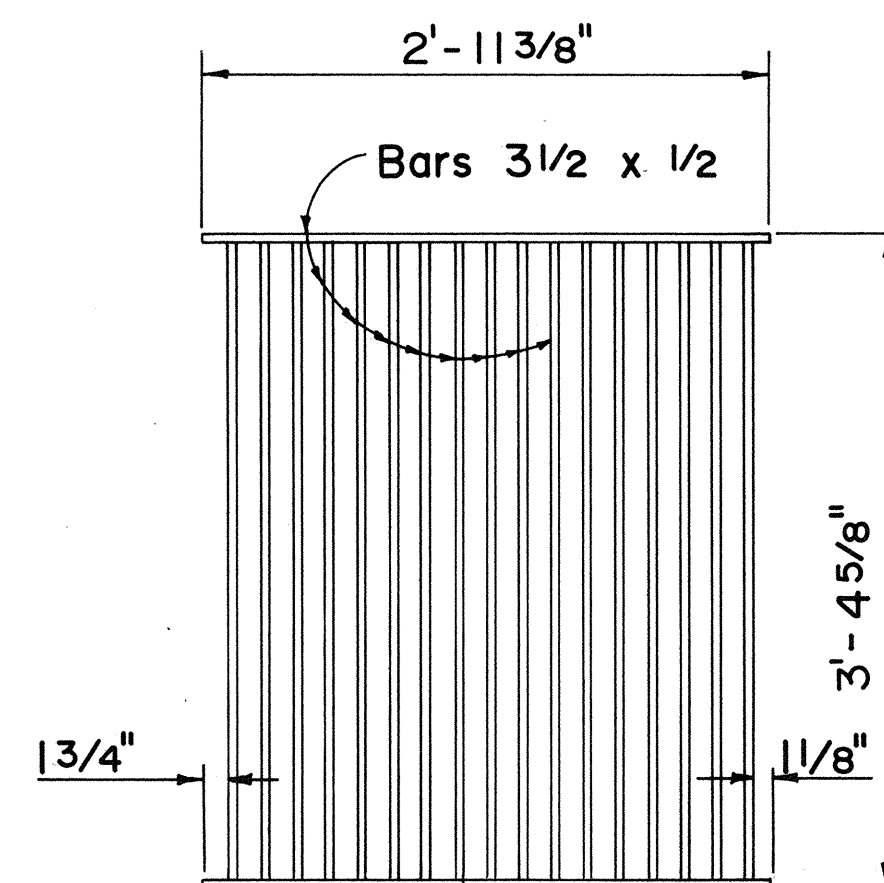
1. All welds 3/8" unless otherwise noted.



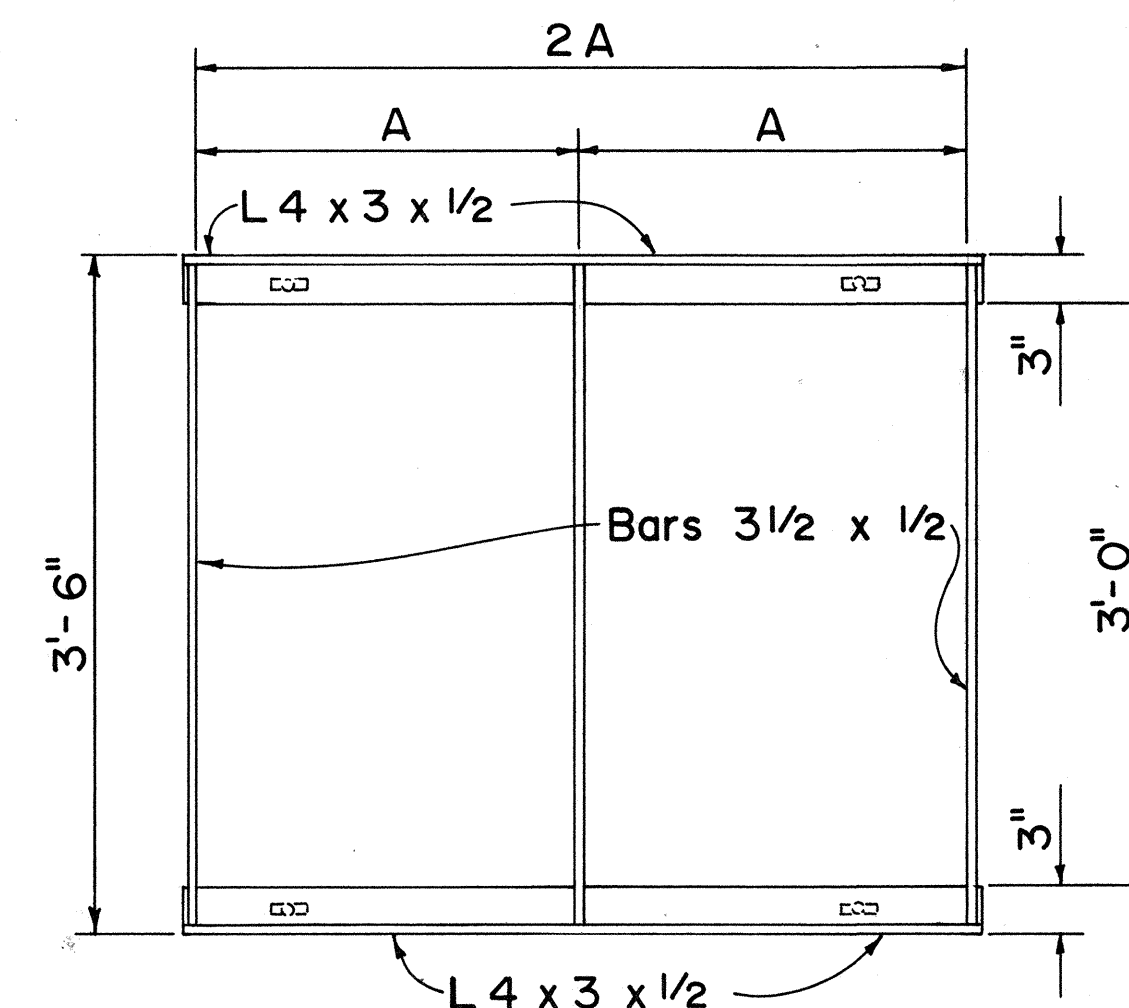
PLAN



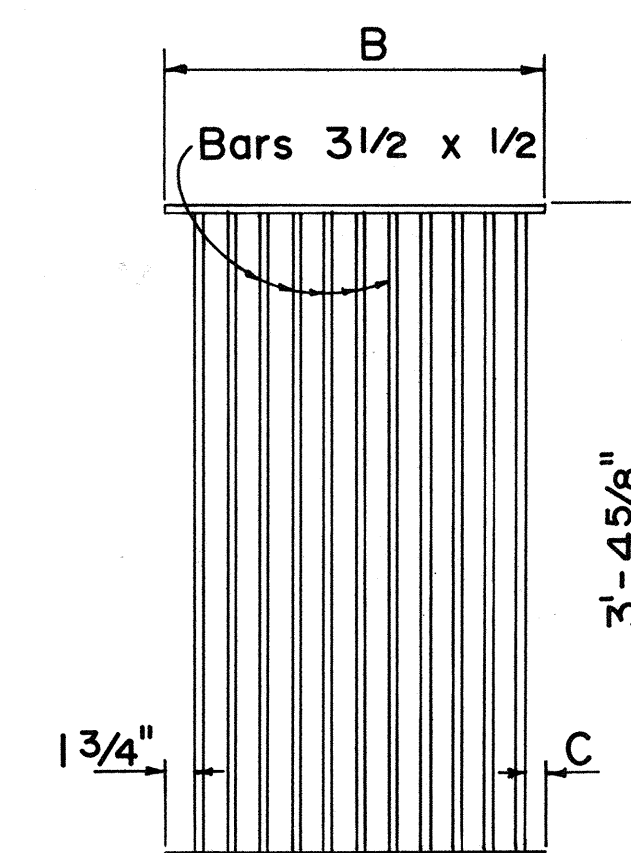
PLAN



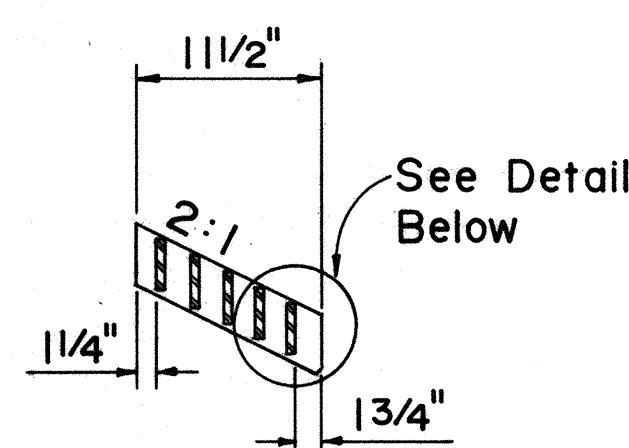
PLAN



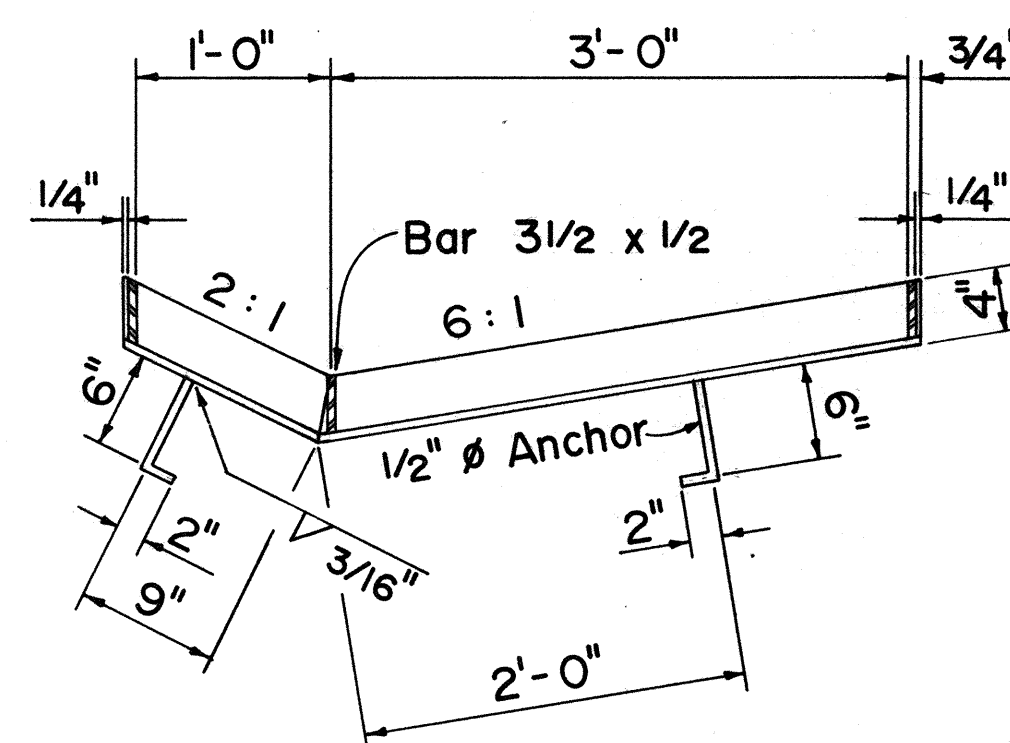
PLAN



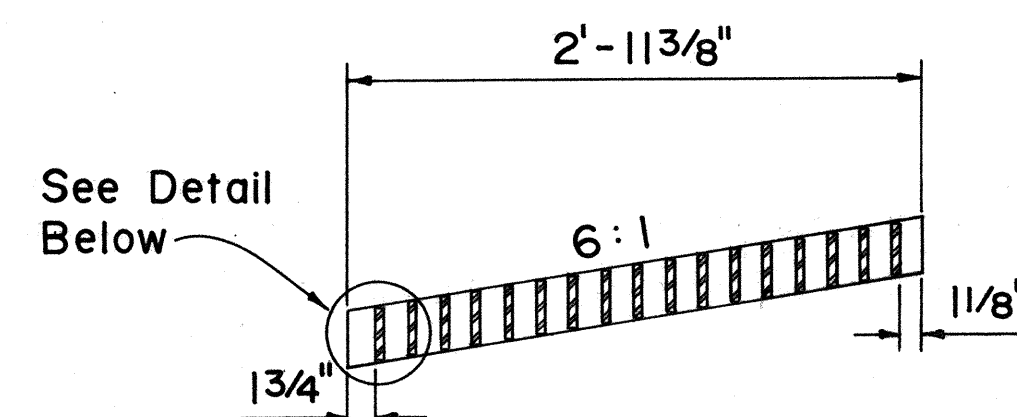
PLAN



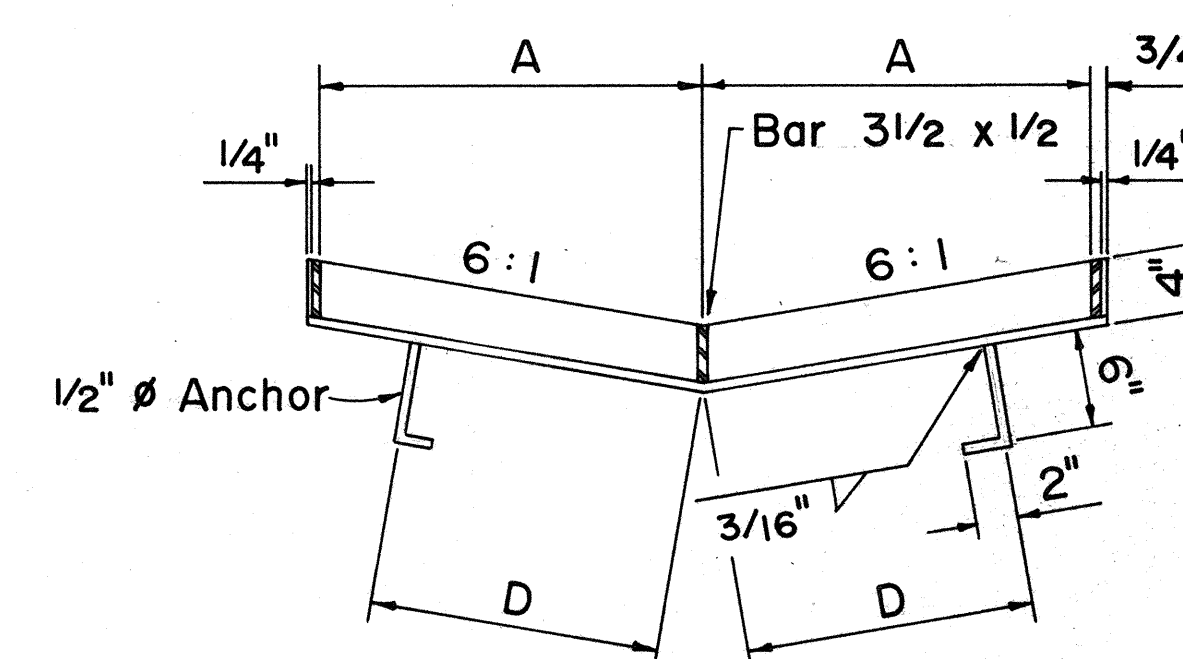
SECTION



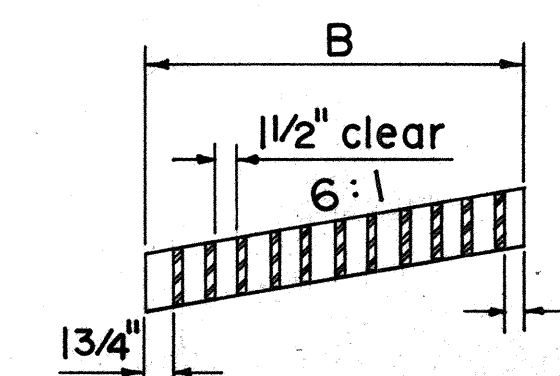
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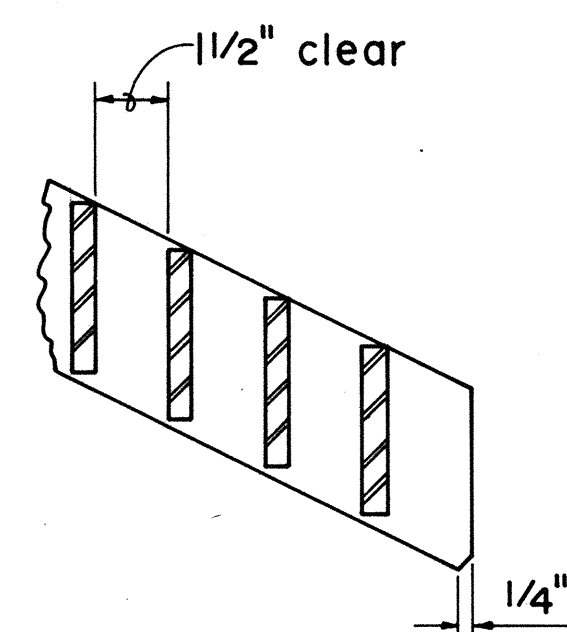
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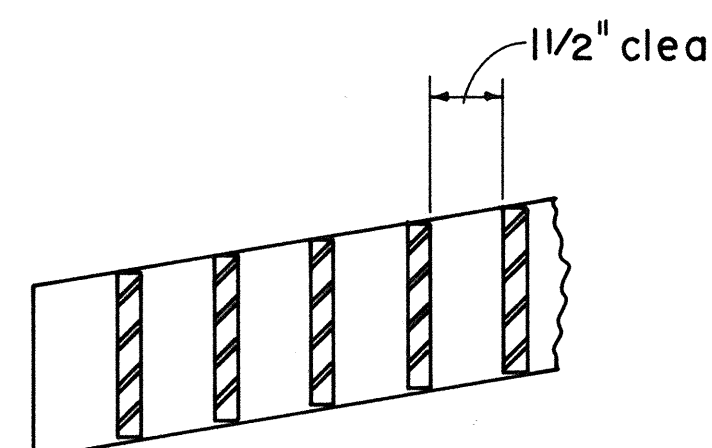
SECTION



SECTION



GRATE



GRATE

61614 OR 61616 STEEL FRAME AND GRATE

DIMENSIONS					
TYPE	NO. BARS	A	B	C	D
61614	11	2'-0"	1'-11 1/2"	1 1/4"	1'-6"
61616	17	3'-0"	2'-11 3/8"	1 1/8"	2'-0"

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

NO.	REVISION	APPROVED BY	DATE
1.	Supersedes Sht. DH 8 & DH 9 approved 12-17-69	H.T.	6/22/79
2.	Revise standard nomenclature for rolled steel shapes.	H.T.	4/21/82

STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION	
STANDARD DETAILS	
61214, 61614 & 61616 STEEL FRAMES AND GRATES	
Not To Scale	Date: Dec. 1977
SHEET No.	OF SHEETS DH 8

61214 STEEL FRAME AND GRATES

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