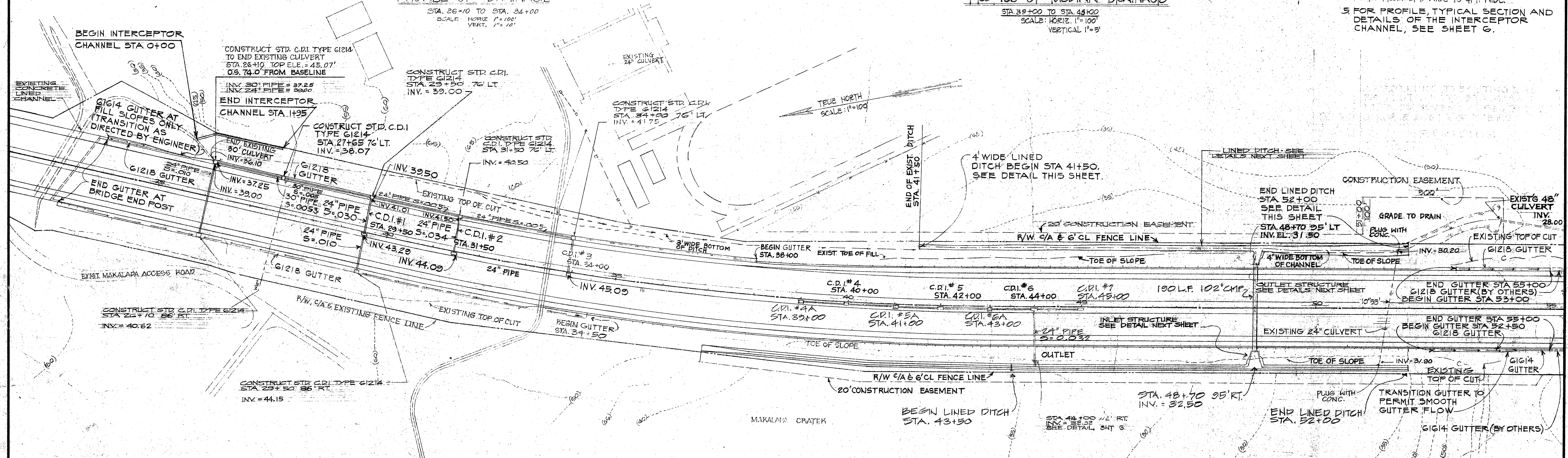
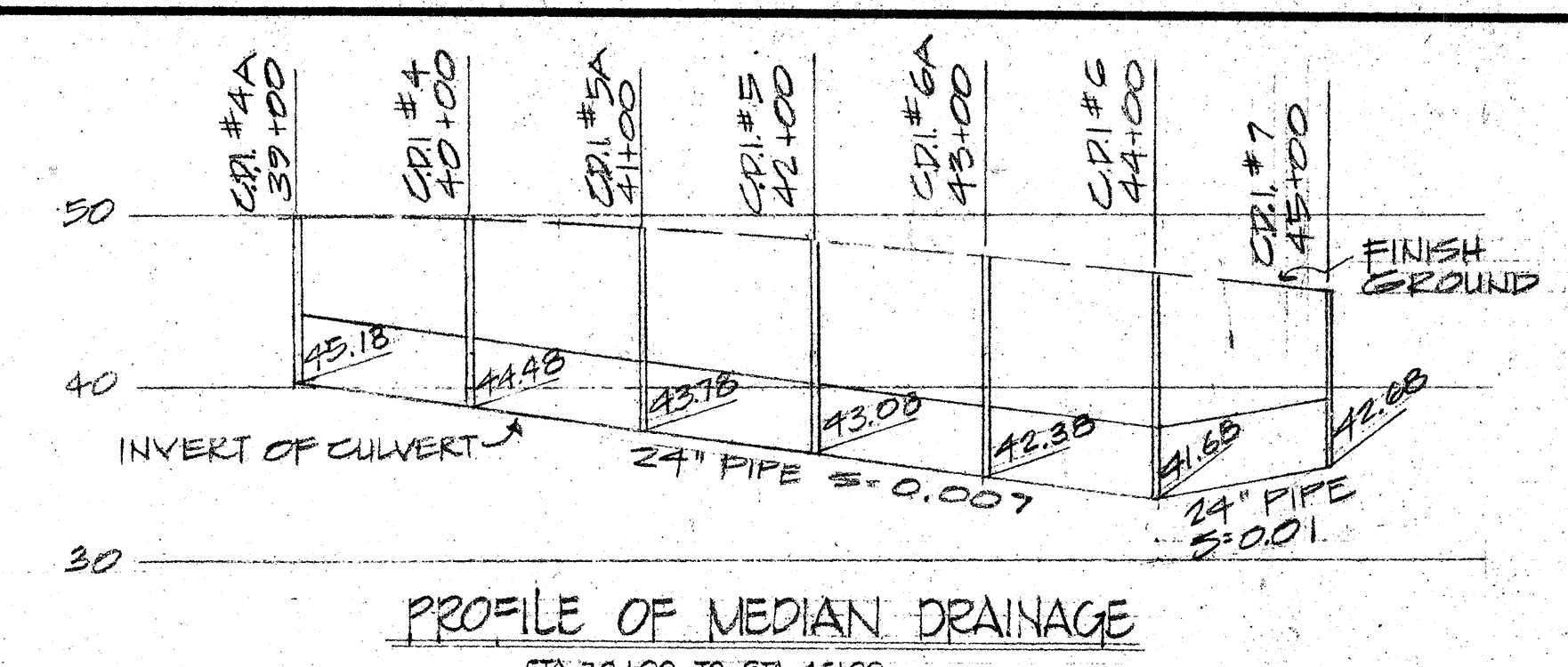
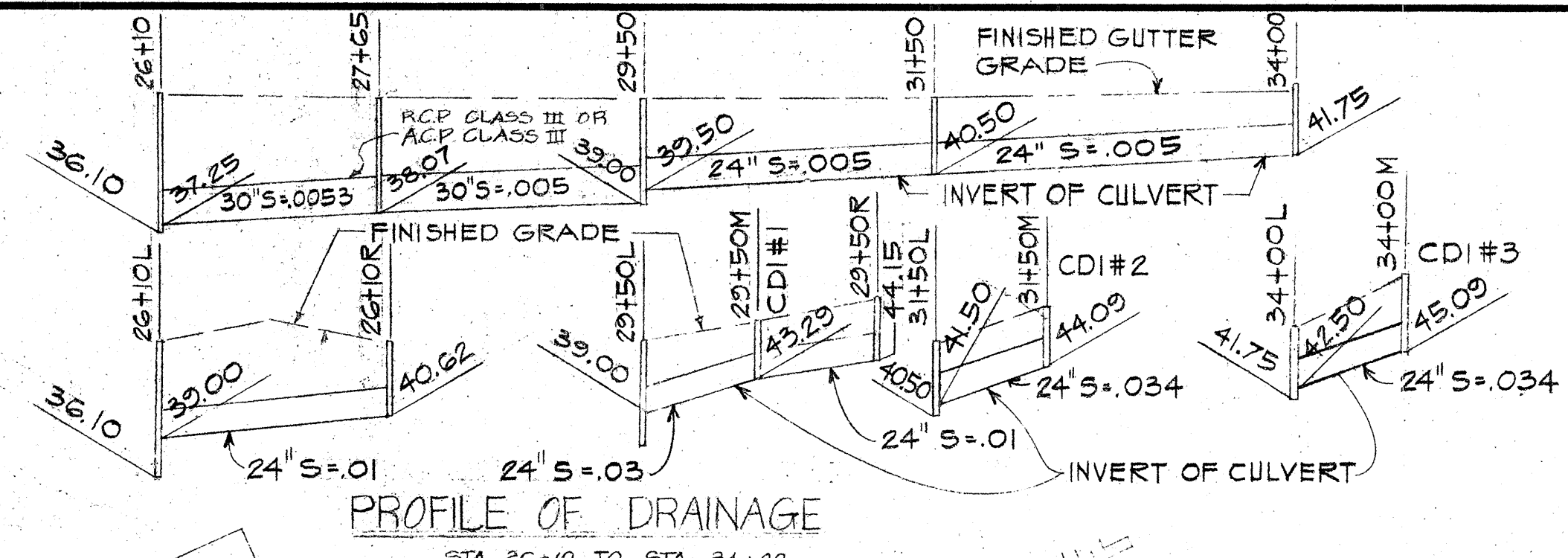
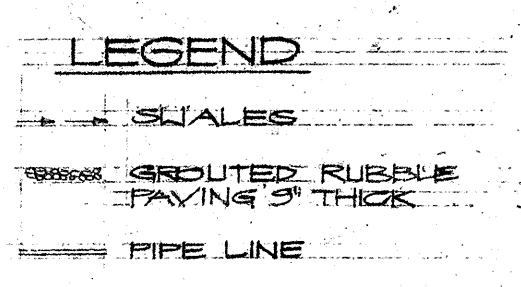


FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	1-11-1 (7)-14	1974	4	61

- NOTES
- SEE DETAIL SHEET 6 FOR TYPE MD-2
  - PLACE TYPE MD-2 FOR C.D.I. #1, #2, #3, #4A, #4, #5A, #5, #6A, #6 AND #7.
  - UNLESS OTHERWISE NOTED USE C.M.P. 14 GAGE, R.C.P. CLASS III, OR A.C.P. CLASS III FOR ALL 24" PIPE AND 30" PIPE
  - STA. 41+00 TO STA. 41+50 UNLINED DITCH TRANSITION SHALL BE WIDEN ALONG RIGHT BANK OF EXISTING UNLINED DITCH TO OBTAIN TRANSITION OF BOTTOM WIDTH FROM 3 FT. WIDE TO 4 FT. WIDE.
  - FOR PROFILE, TYPICAL SECTION AND DETAILS OF THE INTERCEPTOR CHANNEL, SEE SHEET 6.



DATE: \_\_\_\_\_

ORIGINAL PLAN

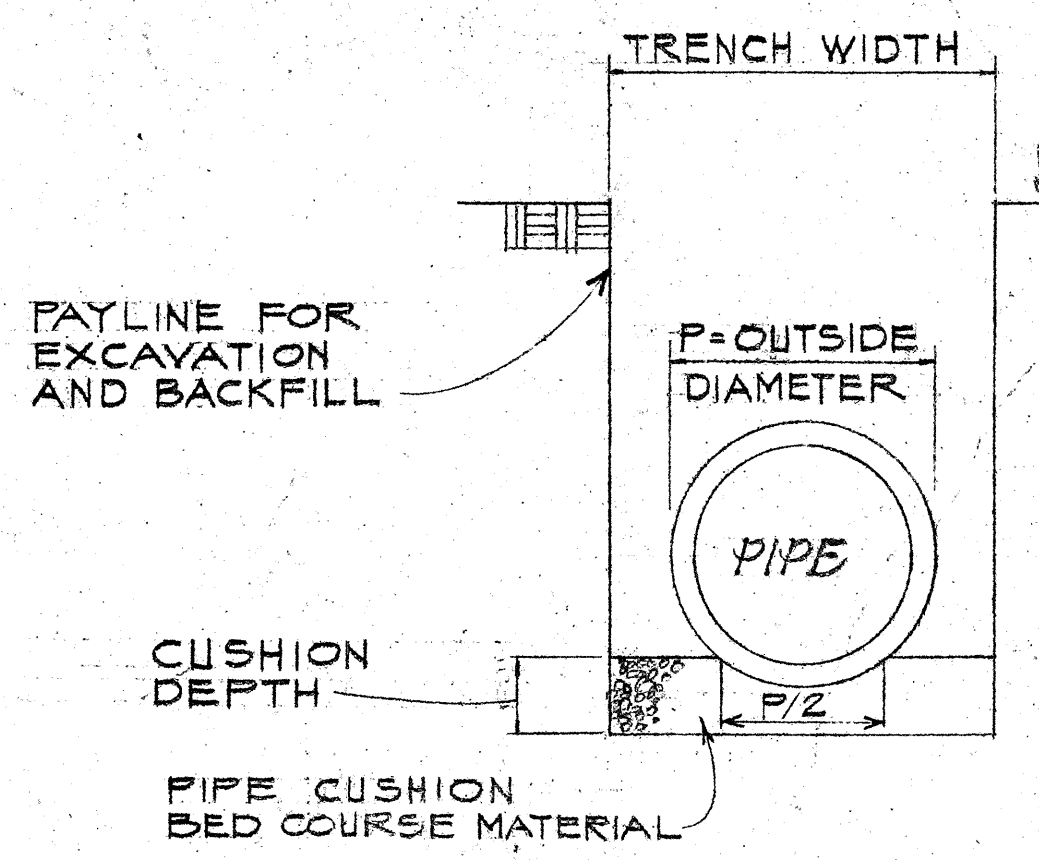
DRAWN BY: \_\_\_\_\_

TRACED BY: \_\_\_\_\_

QUANTITIES BY: \_\_\_\_\_

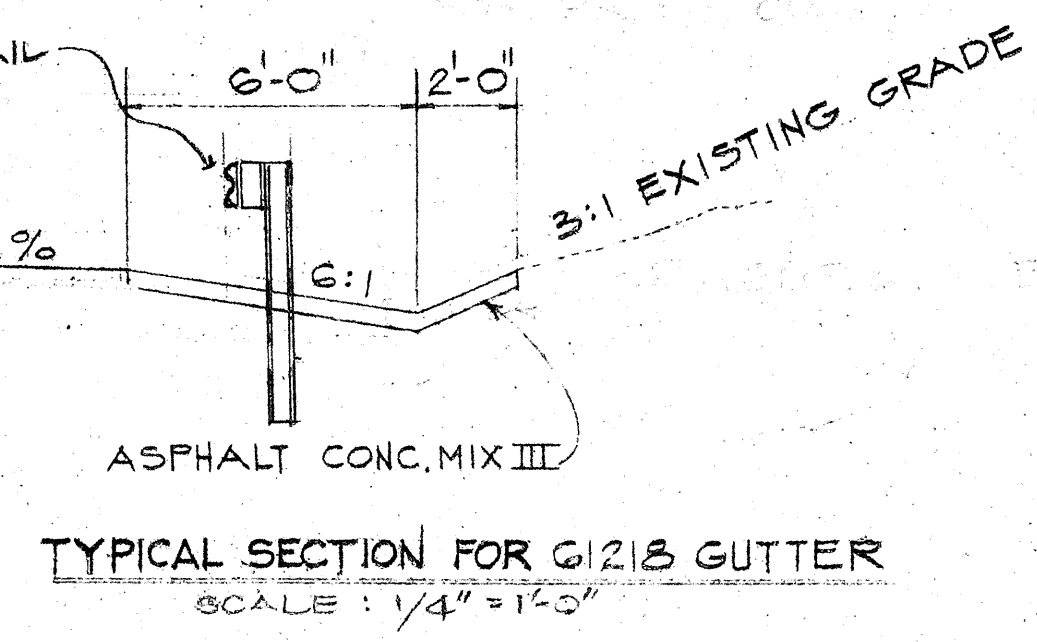
CHECKED BY: \_\_\_\_\_

No. \_\_\_\_\_



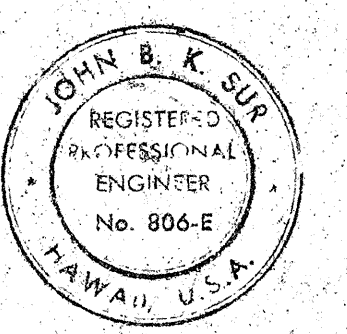
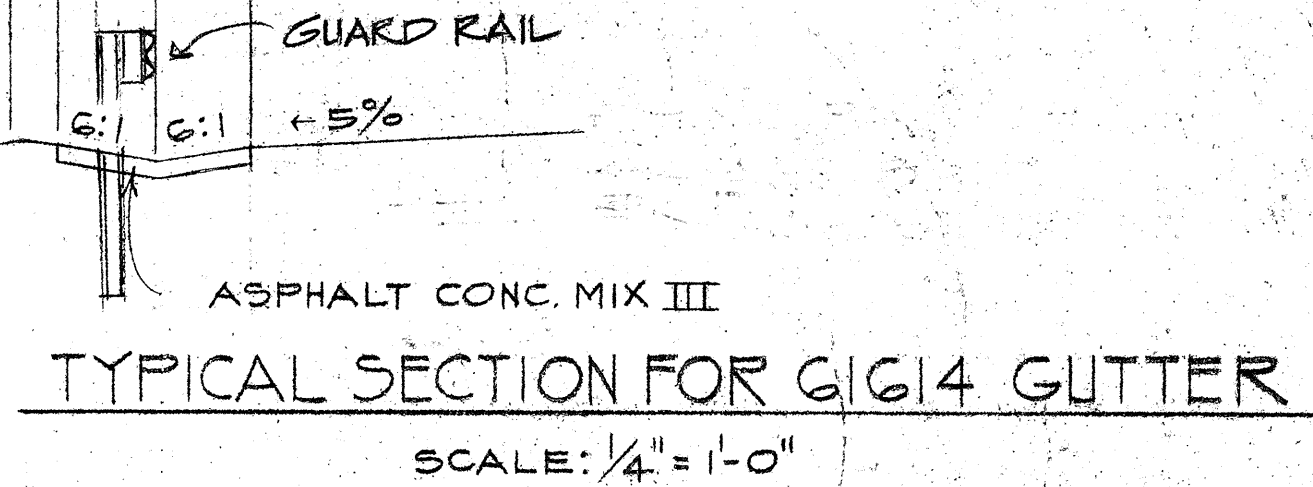
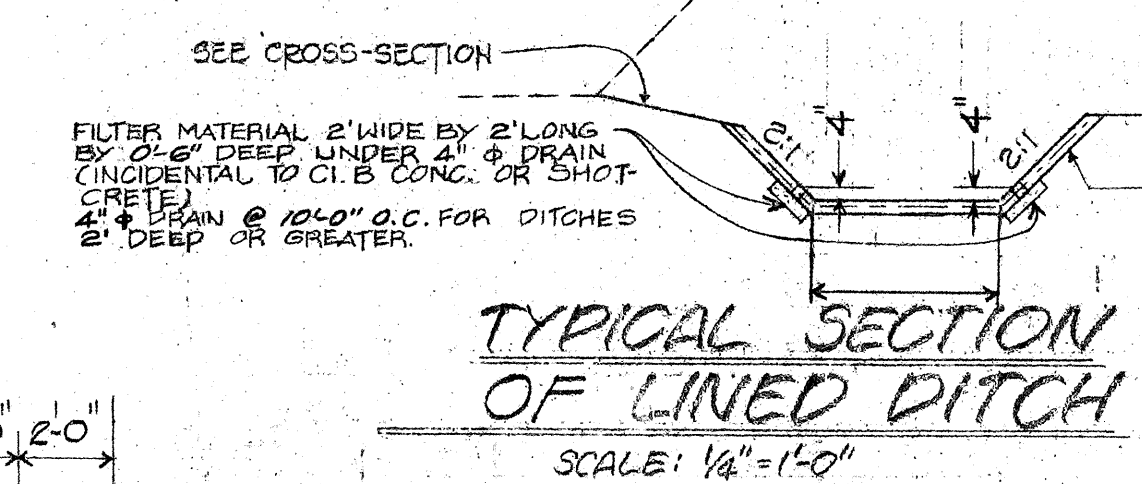
PAYMENT TRENCH EXCAVATION AND BACKFILL FOR CULVERT NOT TO SCALE

CULVERT SIZE	TRENCH WIDTH	CUSHION MATERIAL DEPTH	TYPE CUSHION
24"	50"	10"	BED COURSE MATERIAL
30"	57"	12"	BED COURSE MATERIAL
36"	72"	20"	BED COURSE MATERIAL
48"	150"	30"	BED COURSE MATERIAL



NOTE FOR TRENCH BACKFILL MATERIAL SEE STANDARD SPECIFICATION FOR ROAD AND BRIDGE CONSTRUCTION SECTION 703.21

**PLAN**  
SCALE: 1"=100'



THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

**DETAIL DRAINAGE PLAN**

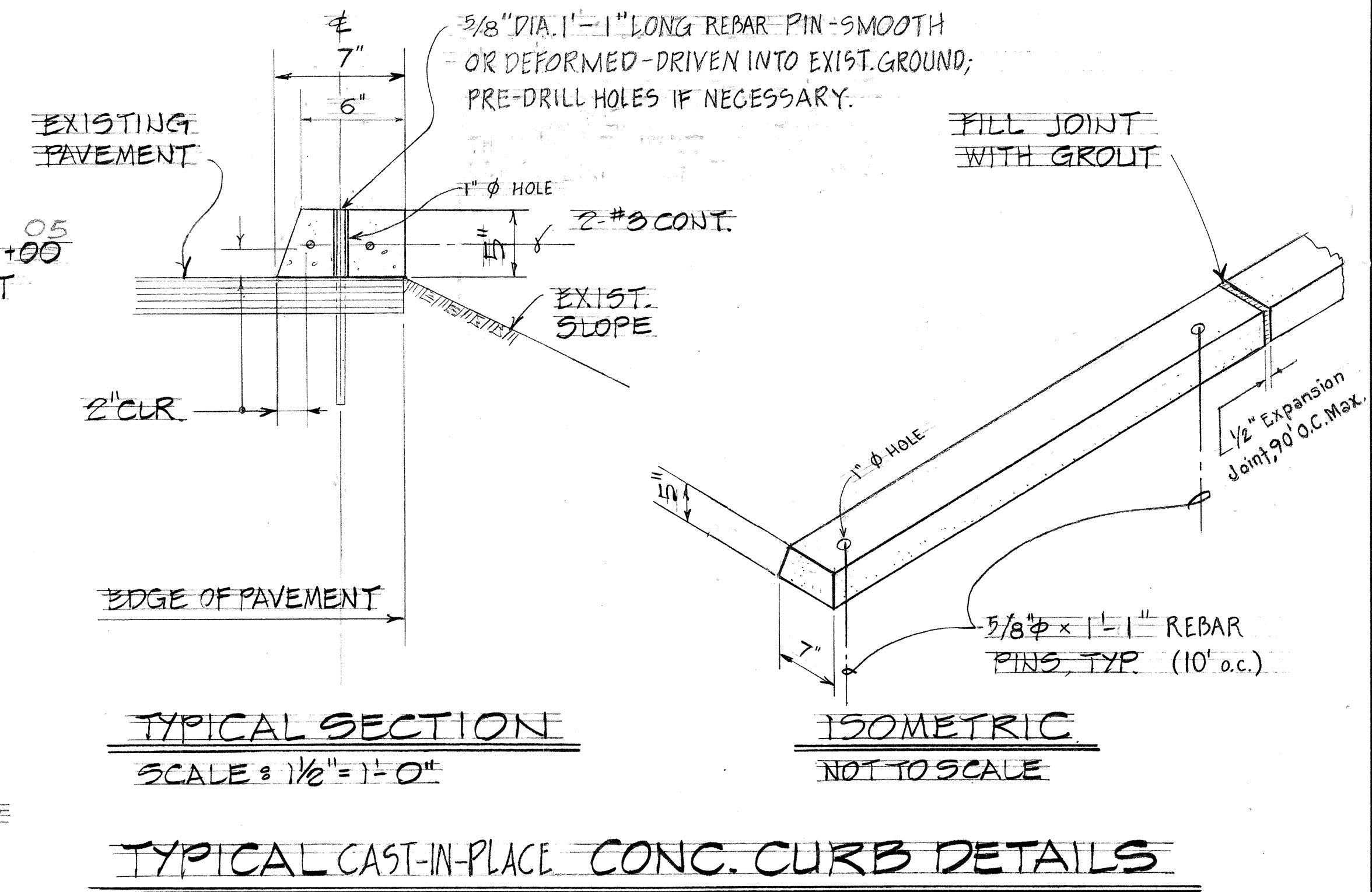
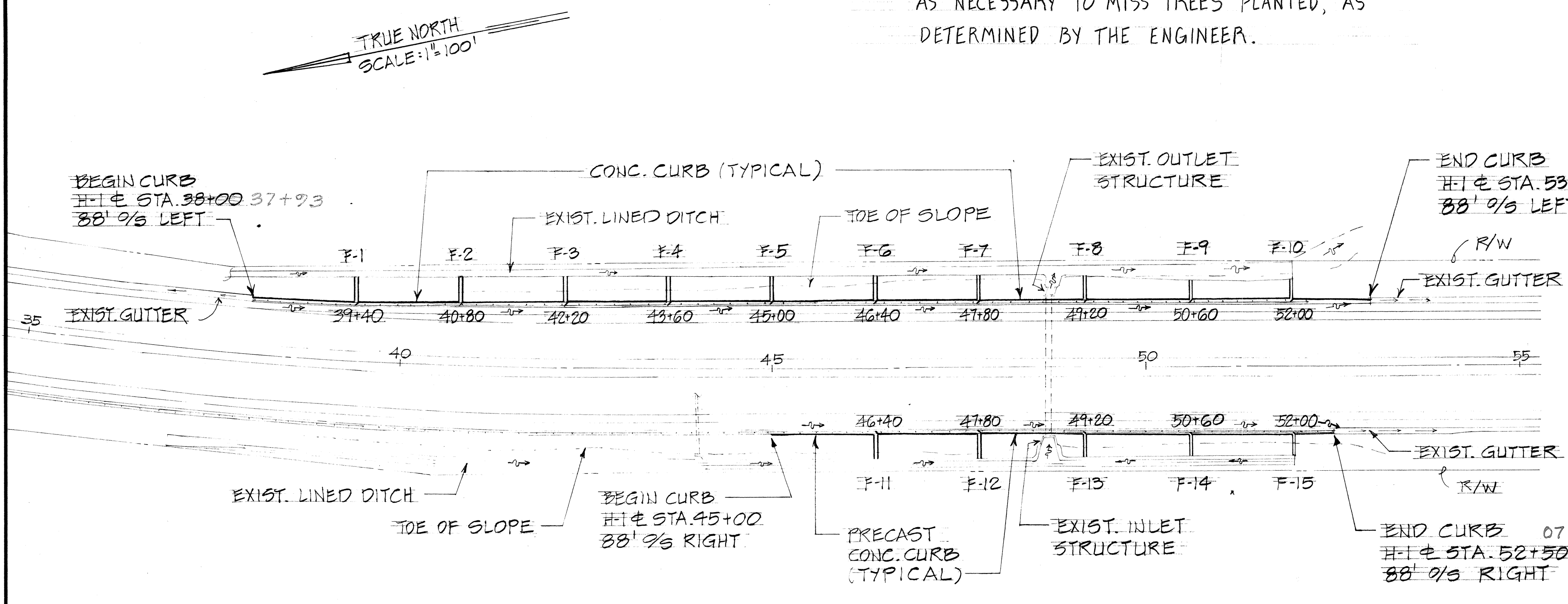
INTERSTATE ROUTE H-1  
PAV. PROJECT NO. I-111(7)-14

SCALE AS SHOWN DATE: JUNE 5, 1974

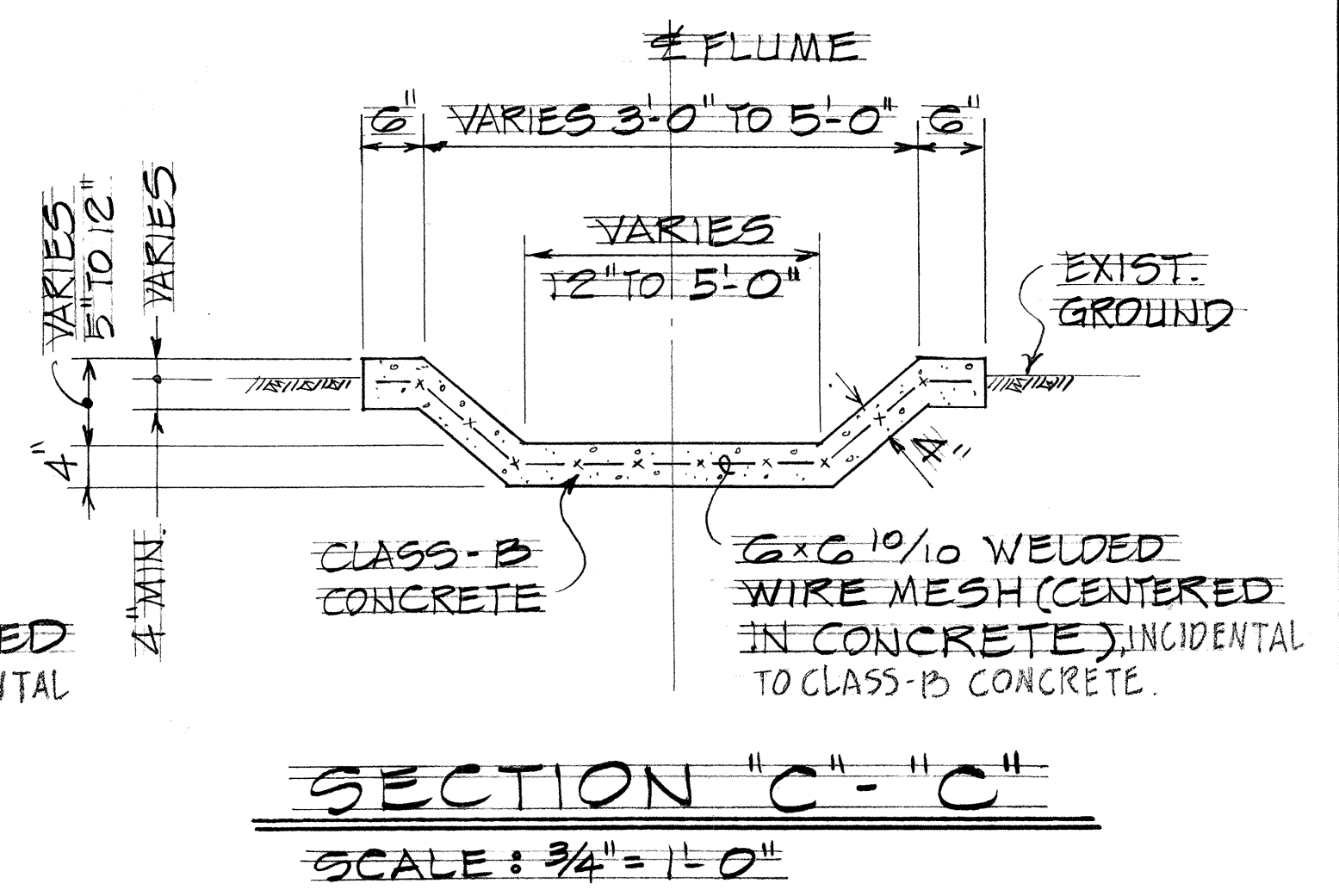
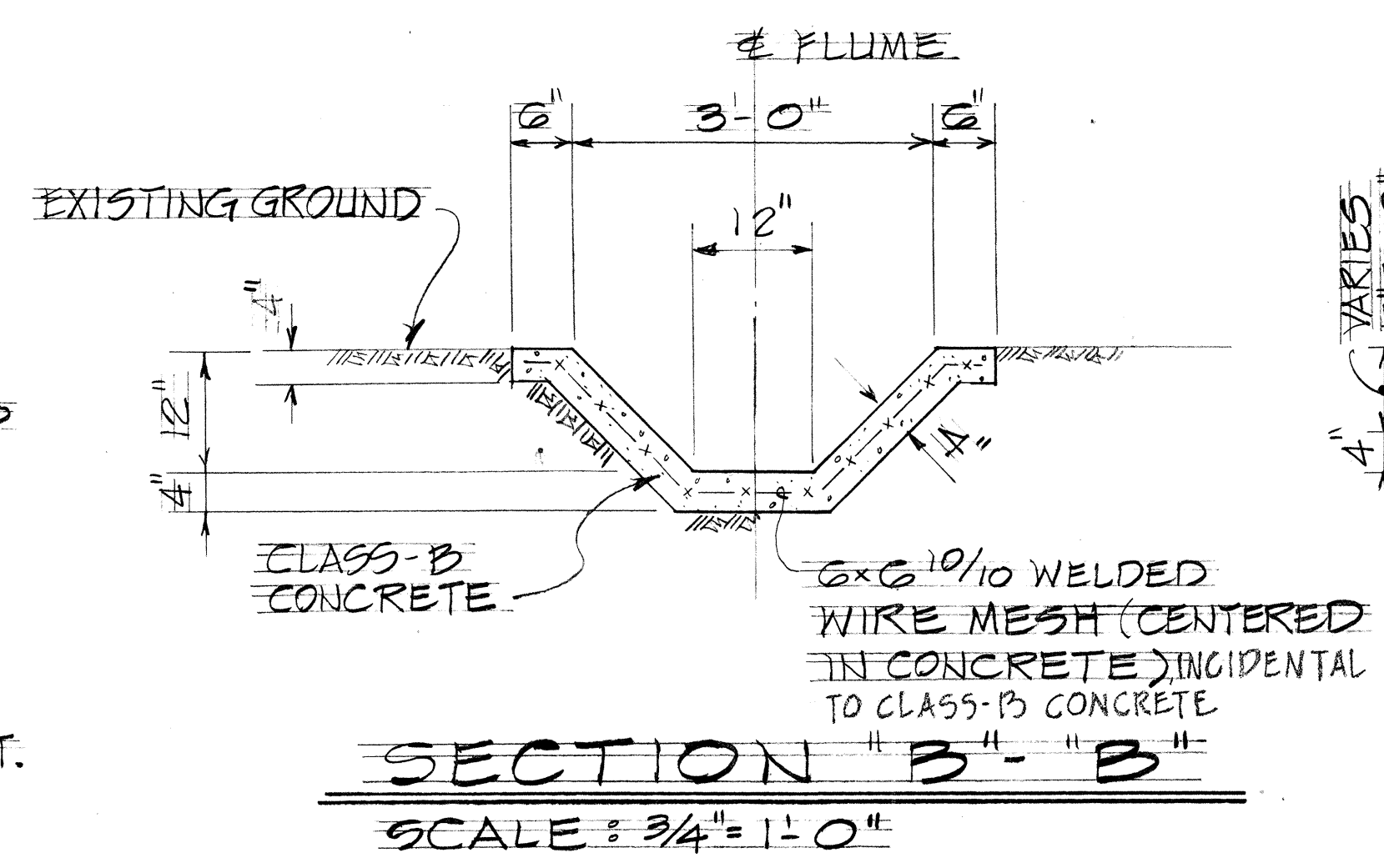
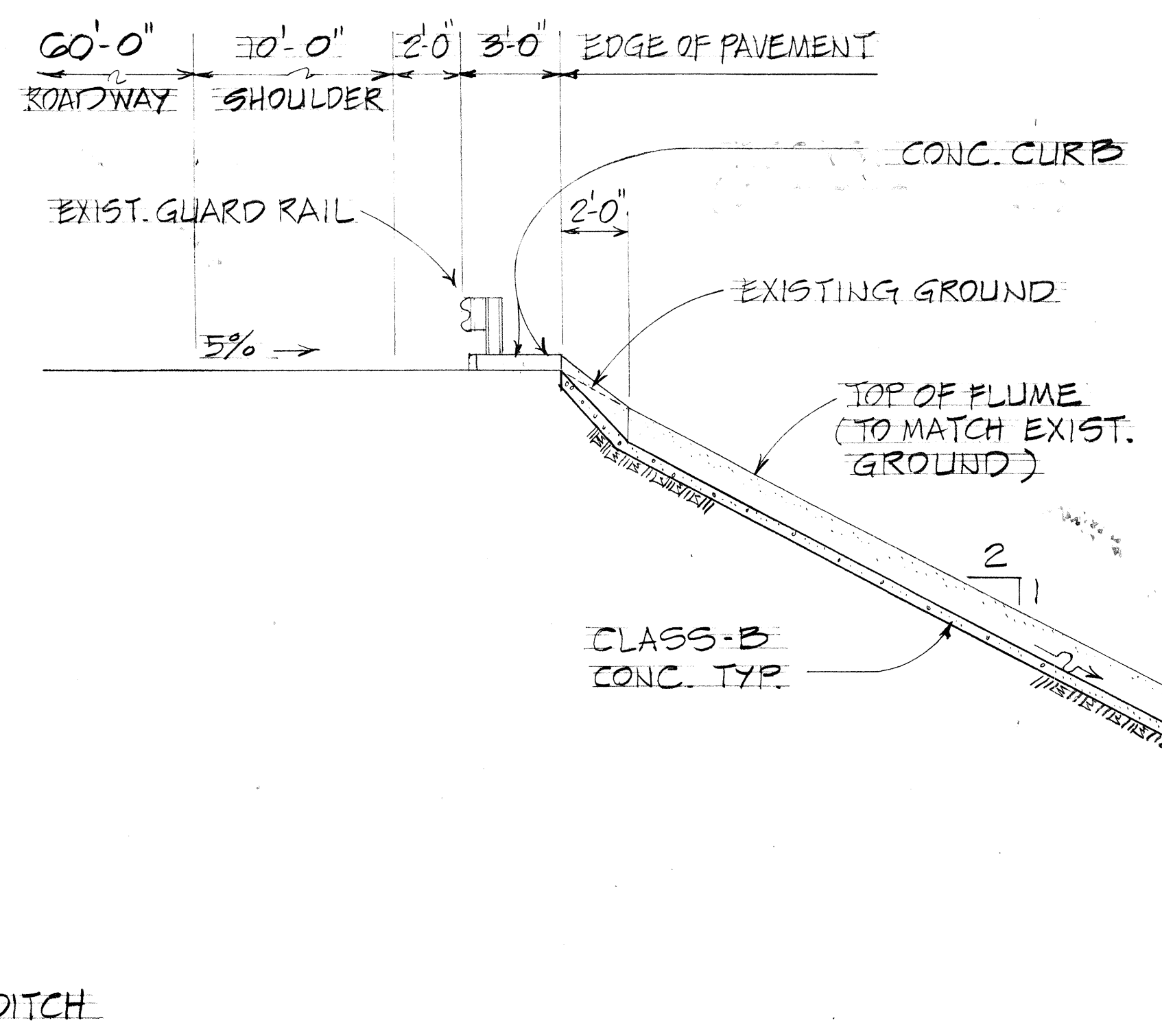
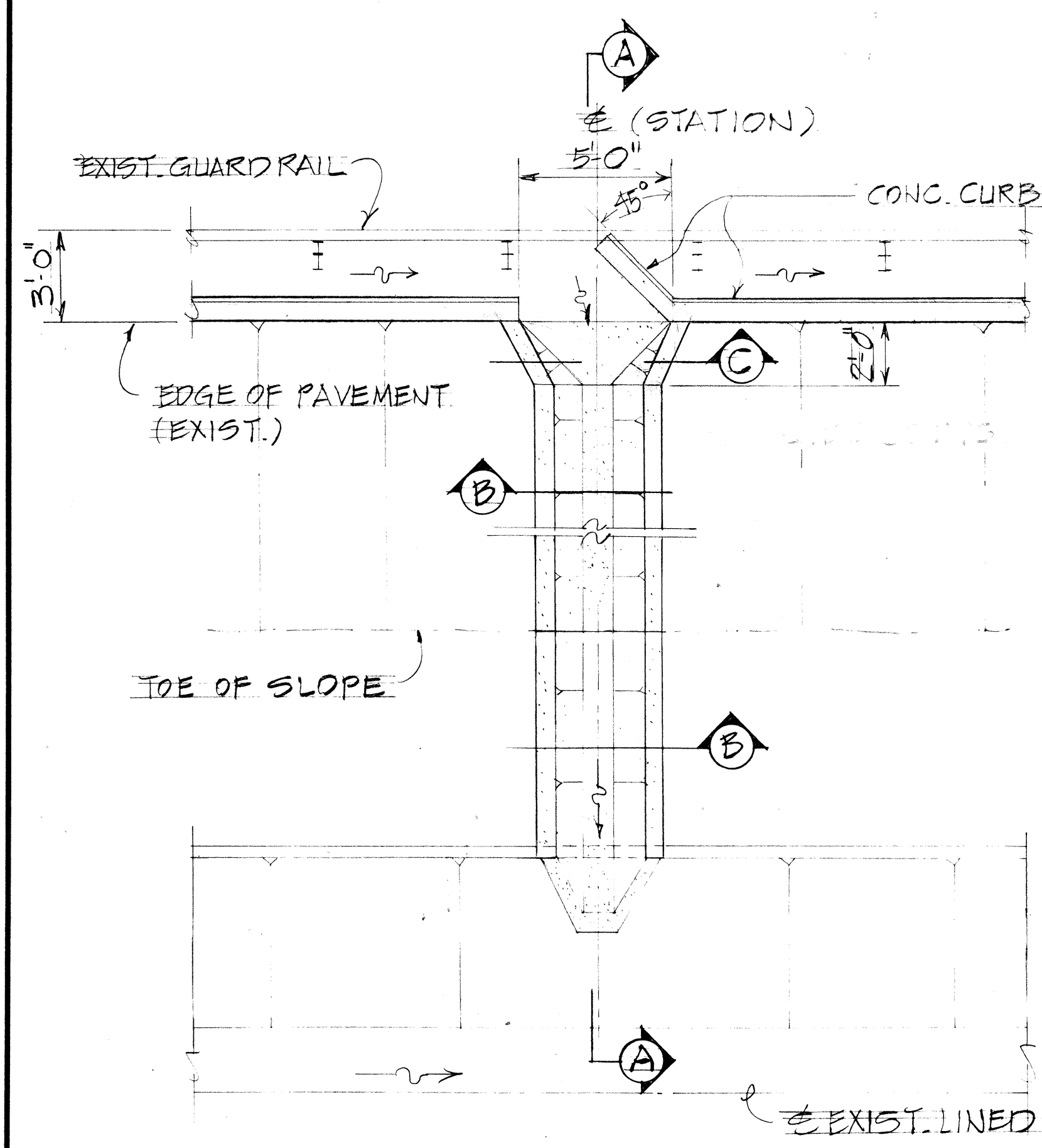
SHEET No. 1 OF 6 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1 (71):14	1974	GA-5	61

NOTE: LOCATIONS OF CONCRETE FLUMES SHALL BE ADJUSTED AS NECESSARY TO MISS TREES PLANTED, AS DETERMINED BY THE ENGINEER.



**PLAN**  
SCALE: 1" = 100'



**PLAN**  
SCALE: 1/4" = 1'-0"  
F-1 THRU F-10 - REVERSED  
F-11 THRU F-15 - SHOWN

**SECTION "A" - "A"**  
SCALE: 1/4" = 1'-0"

**SECTION "B" - "B"**  
SCALE: 3/4" = 1'-0"

**SECTION "C" - "C"**  
SCALE: 3/4" = 1'-0"

**TYPICAL FLUME DETAILS - F-1 THRU F-15**

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

**CURB AND FLUME CONSTRUCTION PLAN**

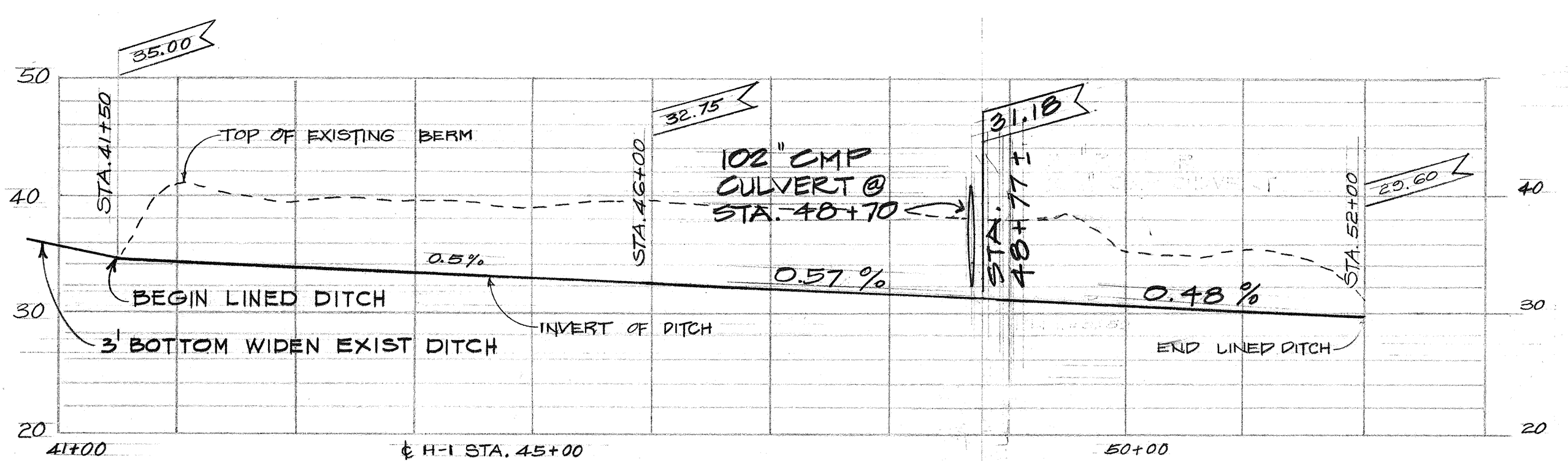
INTERSTATE ROUTE H-1  
F.A. I. PROJECT No. I-HI-(71):14

SCALE: AS SHOWN      DATE: MAY 21, 1976  
SHEET NO. 1 OF 1 SHEETS

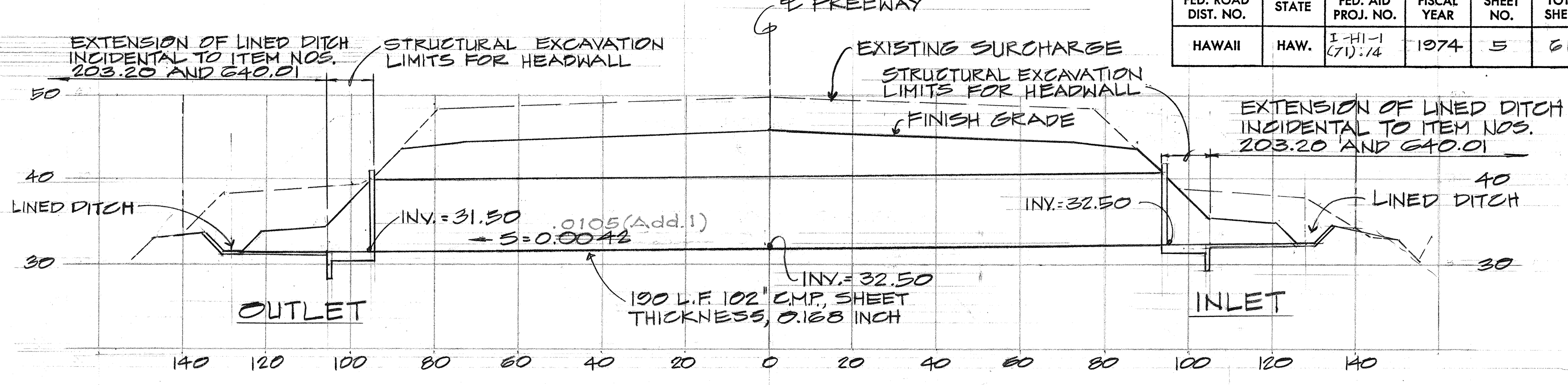
SURVEY PLOTTED BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
 DRAWN BY: \_\_\_\_\_  
 TRACED BY: \_\_\_\_\_  
 DESIGNED BY: \_\_\_\_\_  
 CHECKED BY: \_\_\_\_\_  
 NO. \_\_\_\_\_

GAOS

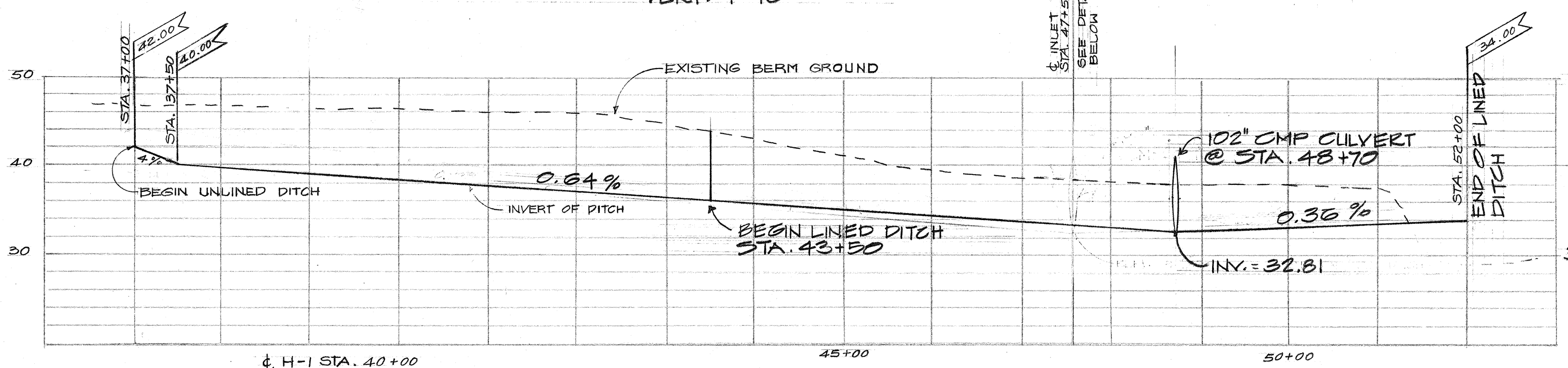
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H-1 (71)-14	1974	5	61



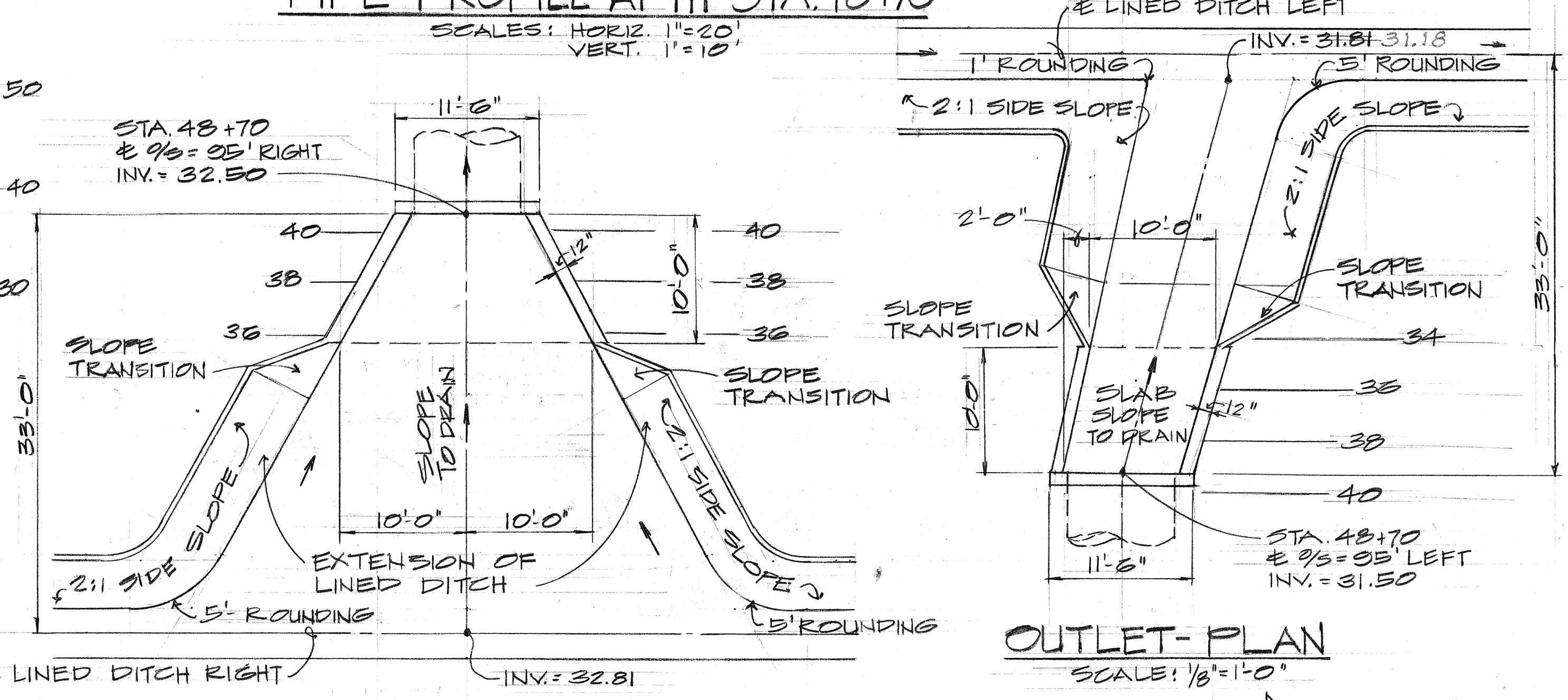
**LINED DITCH PROFILE - LEFT**  
 SCALES: HORIZ. 1"=100'  
 VERT. 1"=10'



**PIPE PROFILE AT HI STA. 48+70**  
 SCALES: HORIZ. 1"=20'  
 VERT. 1"=10'

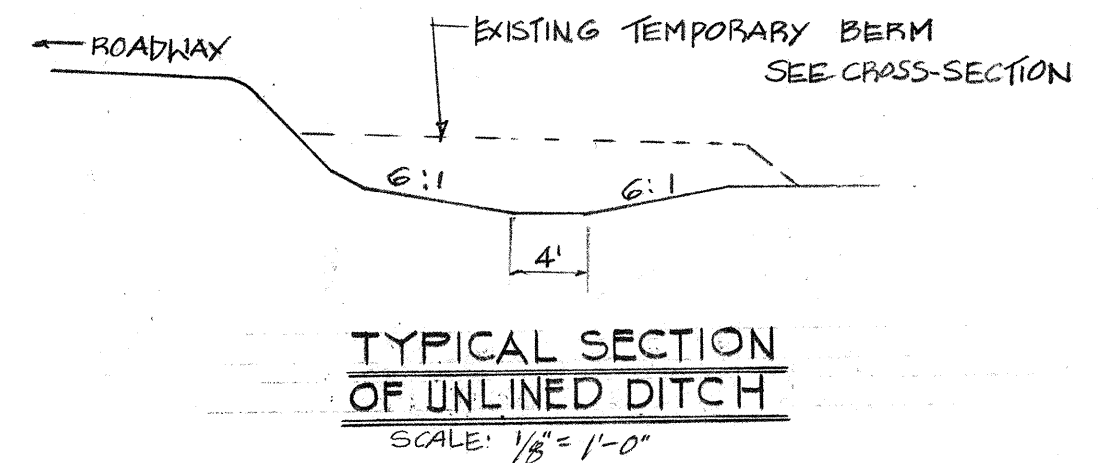


**UNLINED AND LINED DITCH PROFILE - RIGHT**  
 SCALES: HORIZ. 1"=100'  
 VERT. 1"=10'



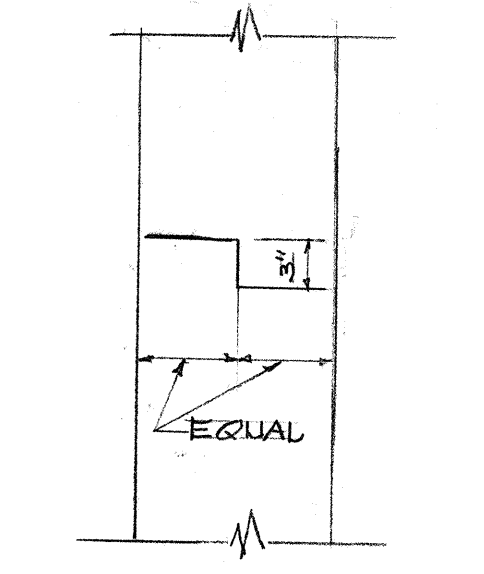
**INLET-PLAN**  
 SCALE: 1/8"=1'-0"

**OUTLET-PLAN**  
 SCALE: 1/8"=1'-0"

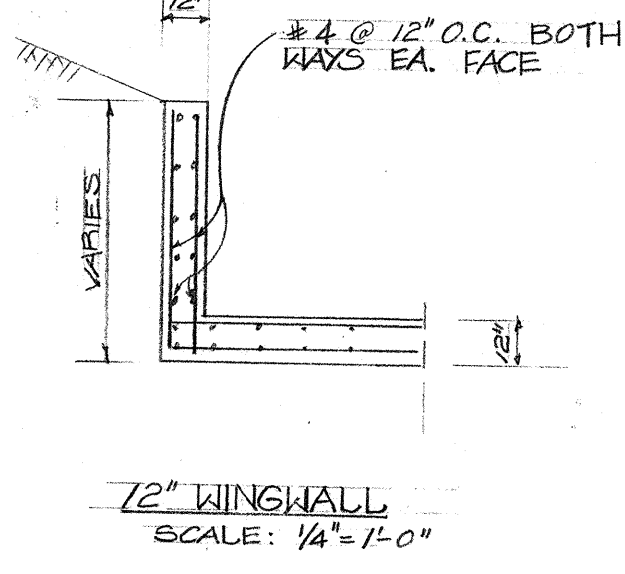


**TYPICAL SECTION OF UNLINED DITCH**  
 SCALE: 1/8"=1'-0"

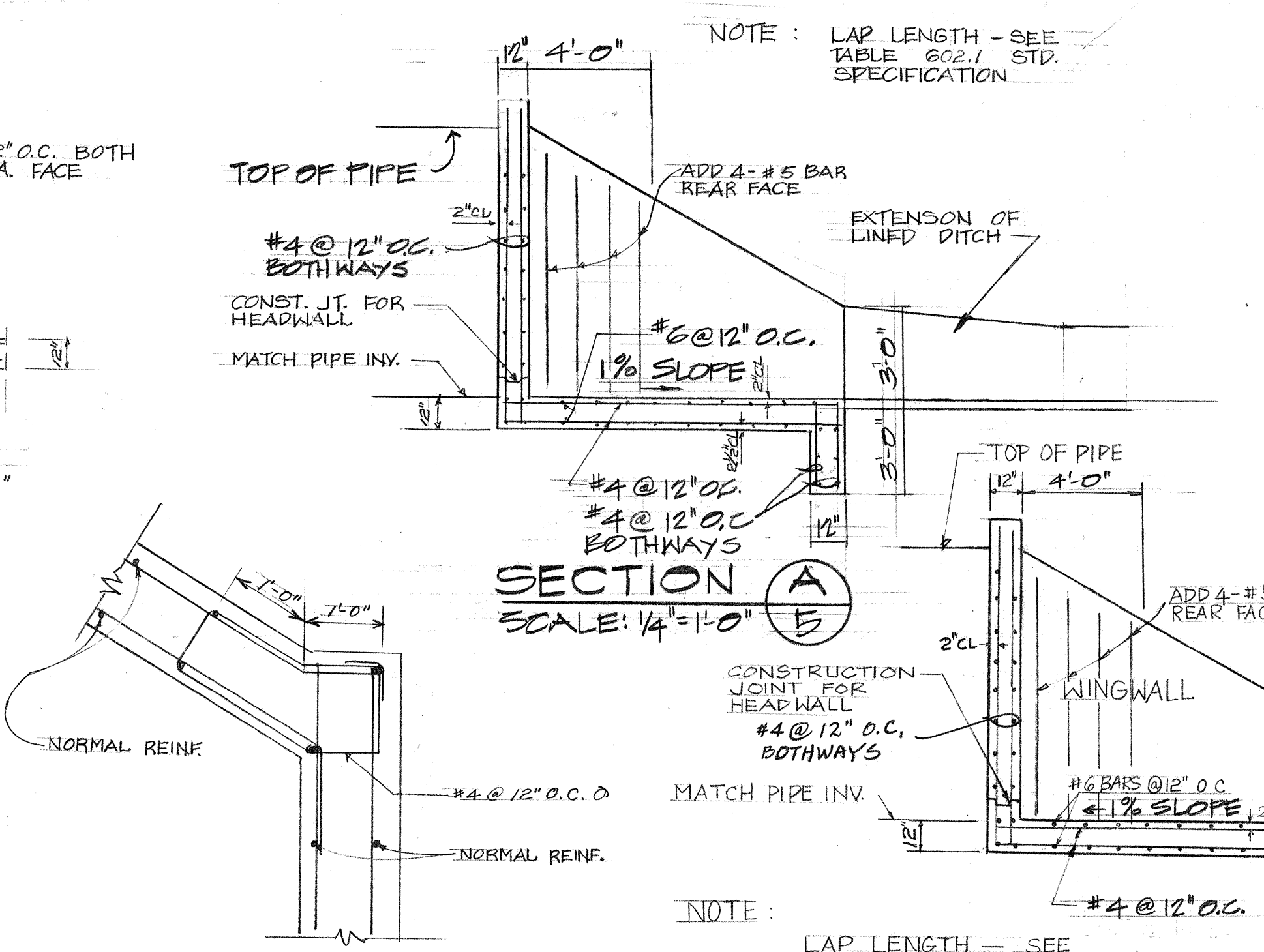
DATE	.....
SURVEY PLOTTED BY	.....
DRAWN BY	.....
CHECKED BY	.....
NOTE BOOK	.....
No.	.....



**CONSTRUCTION JOINT**



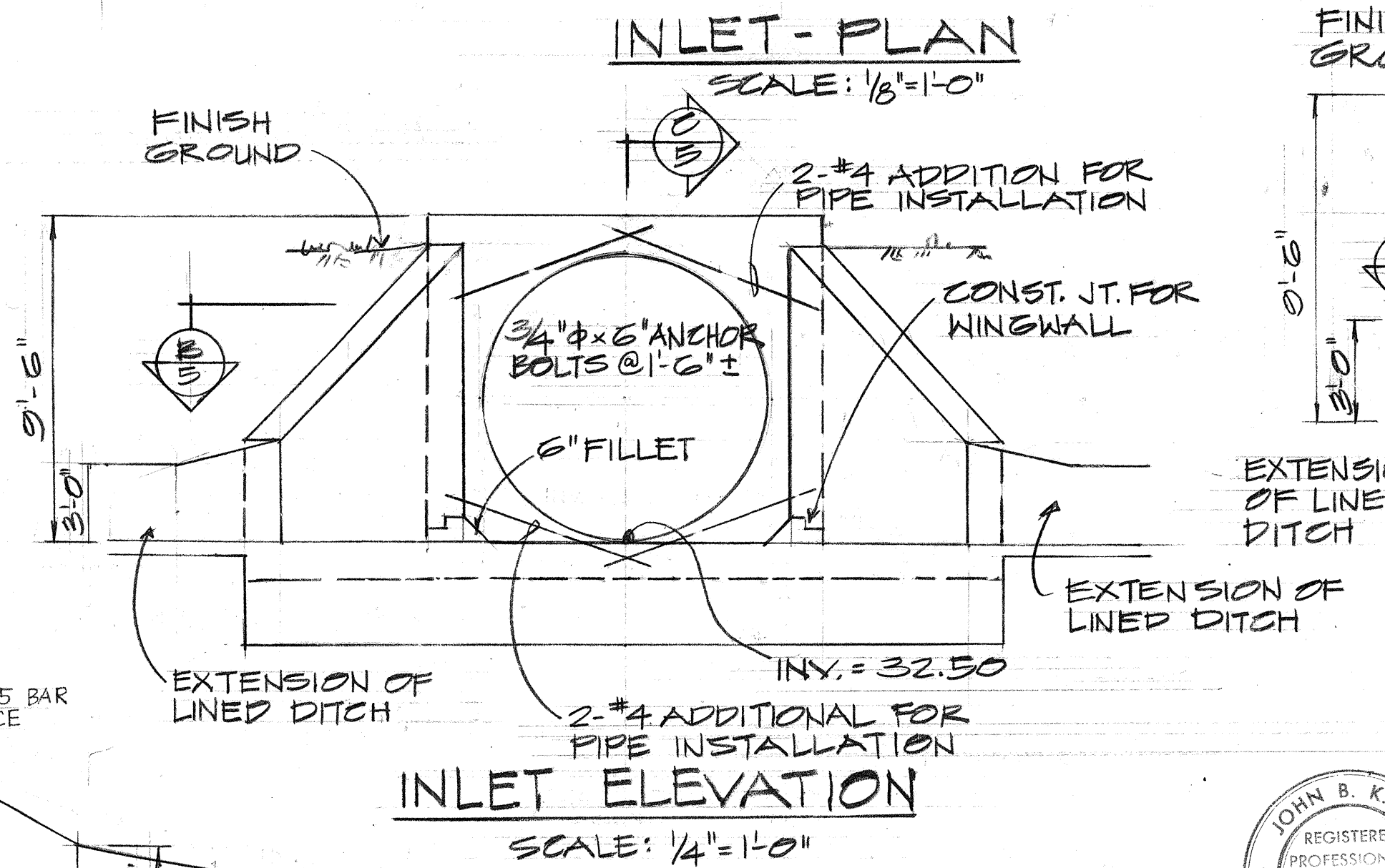
**12" WINGWALL**  
 SCALE: 1/4"=1'-0"



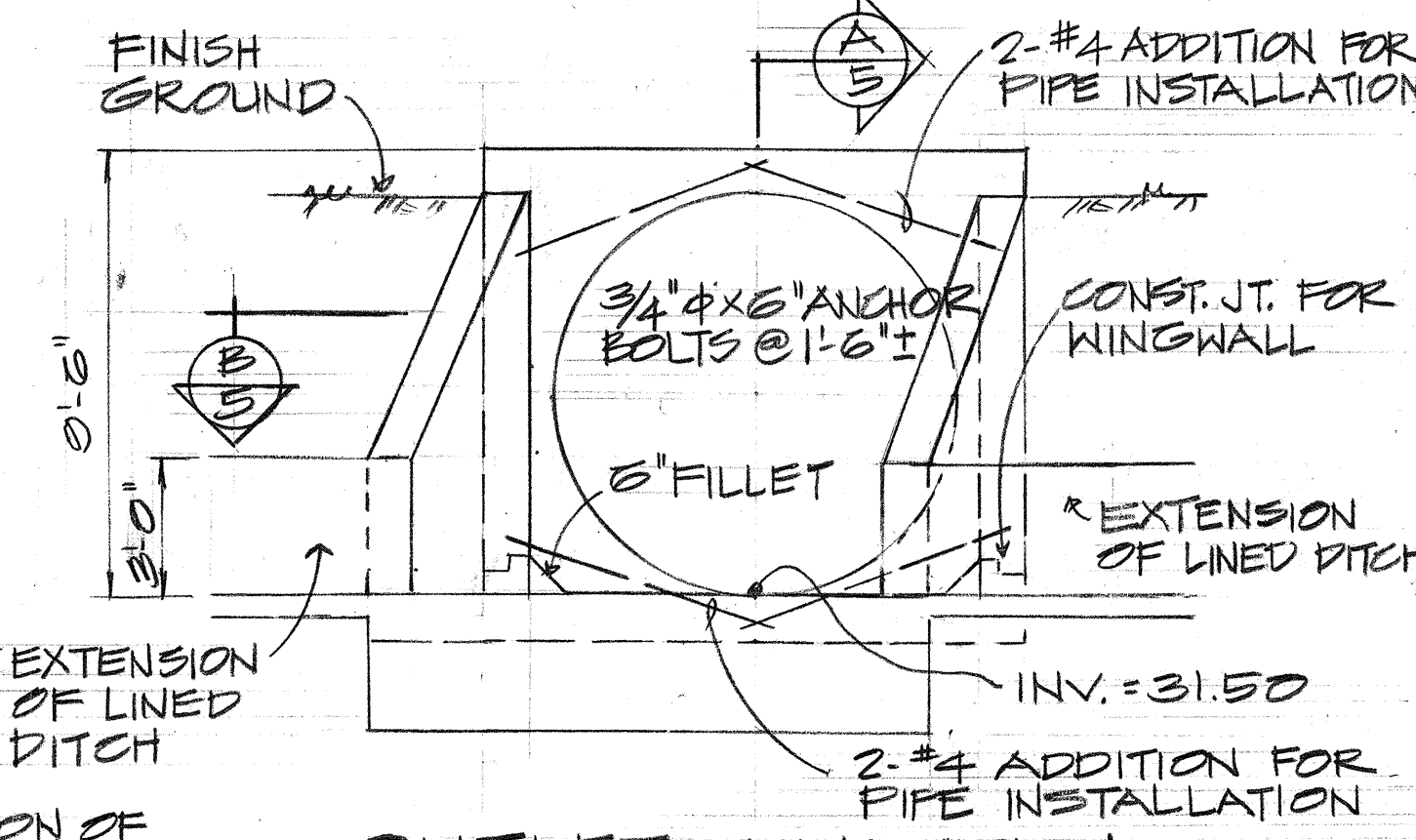
**SECTION A**  
 SCALE: 1/4"=1'-0"

**SECTION B**  
 NOT TO SCALE

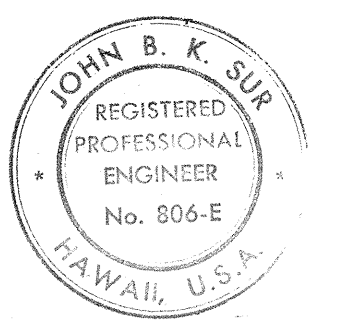
**SECTION C**  
 SCALE: 1/4"=1'-0"



**INLET ELEVATION**  
 SCALE: 1/4"=1'-0"



**OUTLET ELEVATION**  
 SCALE: 1/4"=1'-0"



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STATE OF HAWAII  
 DEPARTMENT OF TRANSPORTATION  
 HIGHWAYS DIVISION

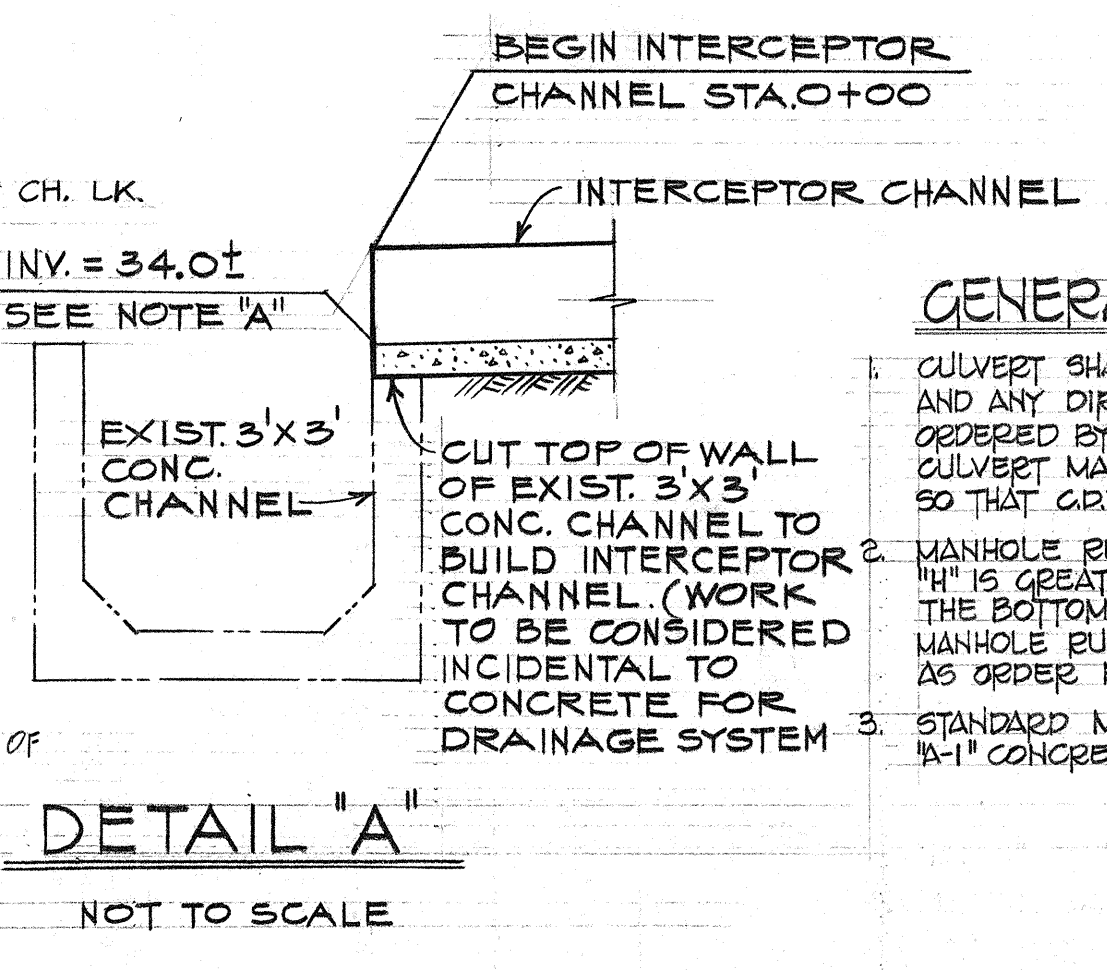
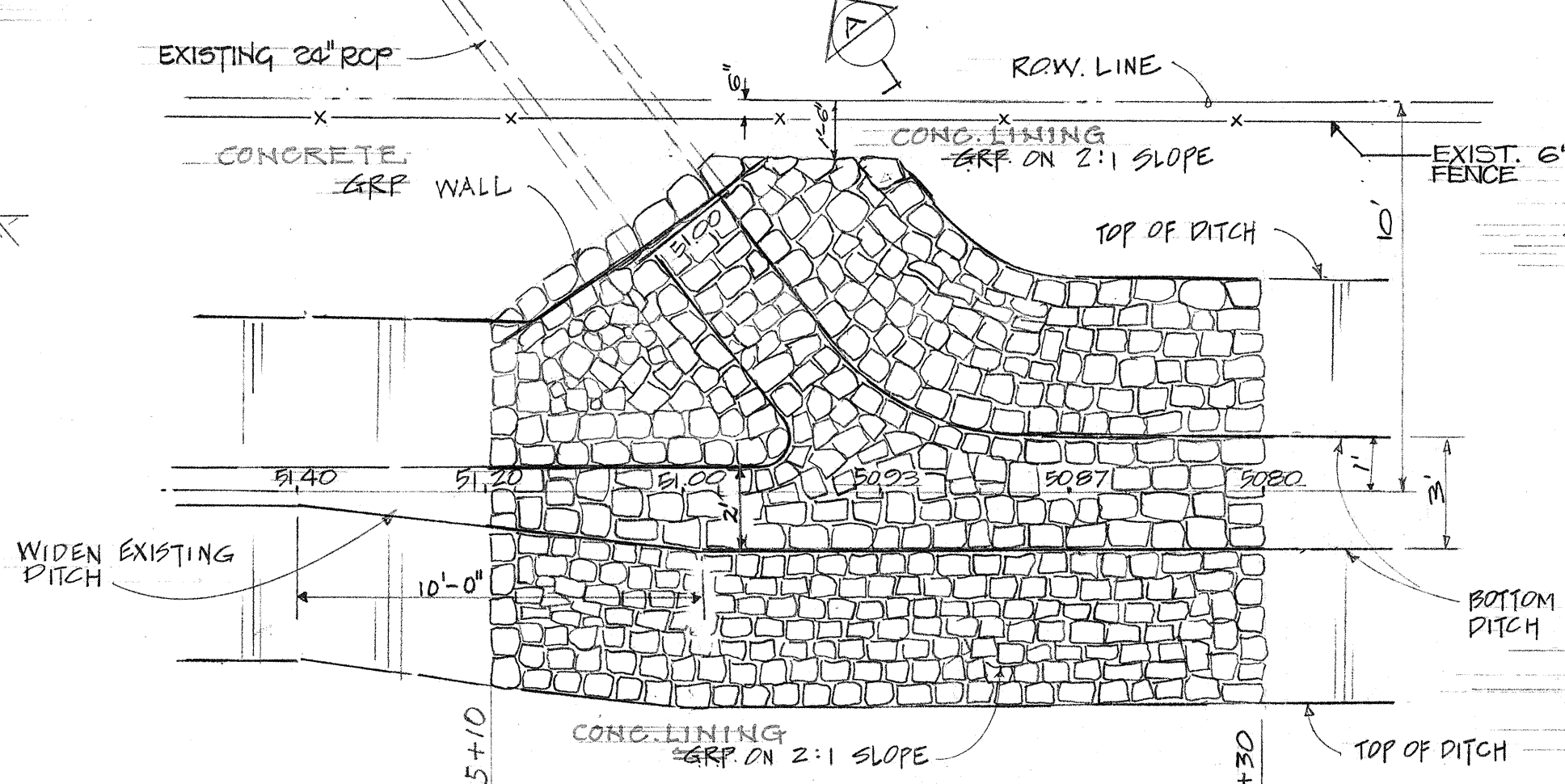
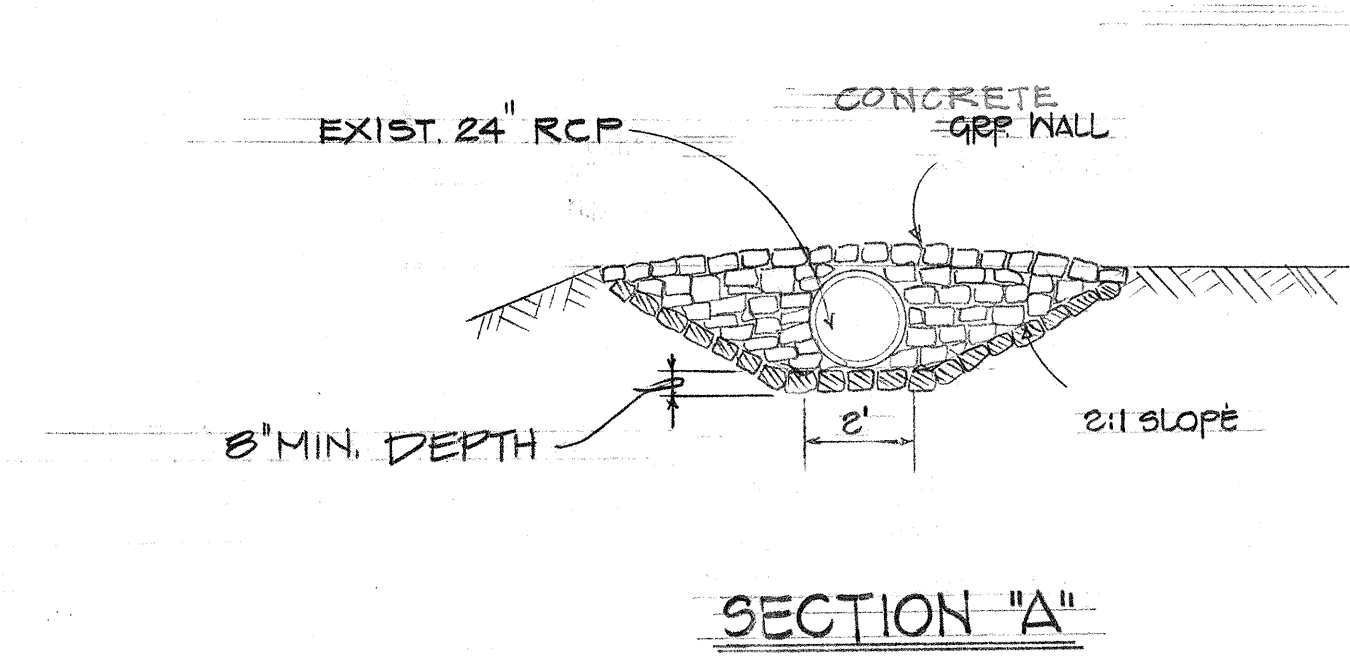
**DRAINAGE DETAILS**

INTERSTATE ROUTE H-1  
 F.A.I. PROJECT NO. I-H-1 (71) : 14

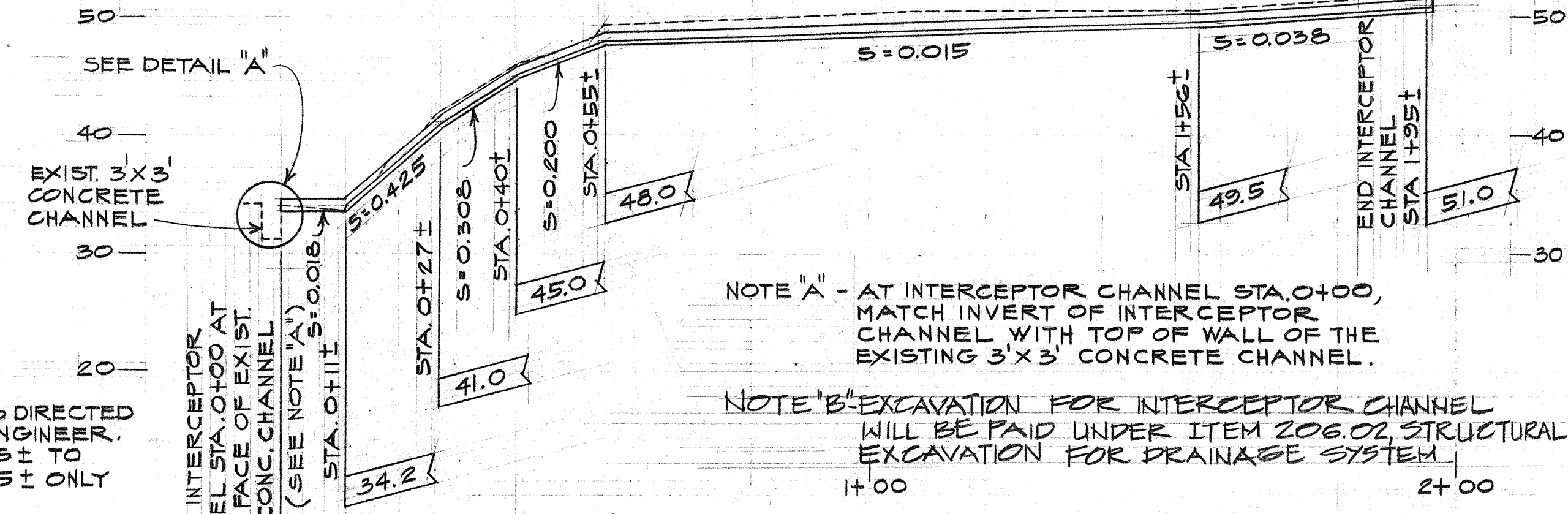
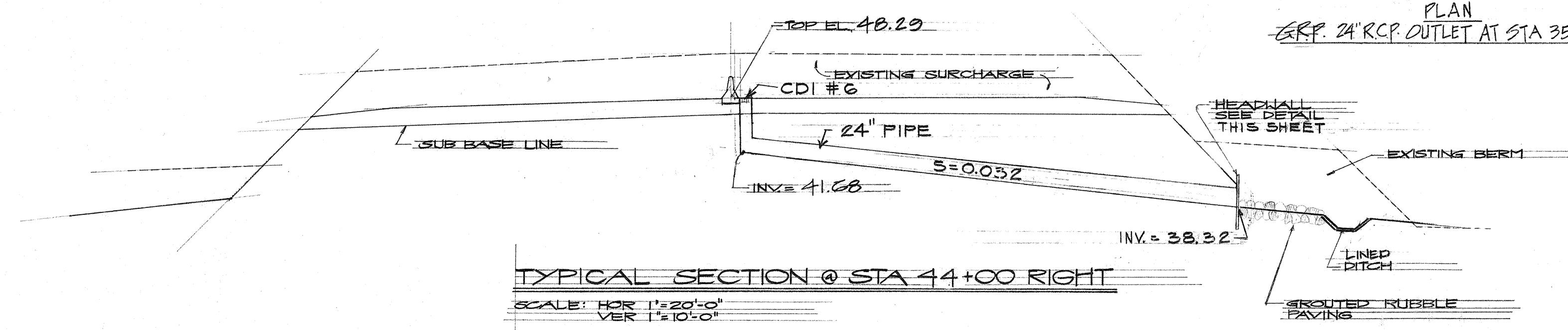
SCALE AS SHOWN      DATE: JUNE 5, 1974

**SHEET No. 2 OF 6 SHEETS**

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-11-1 (7)14	1974	6	6



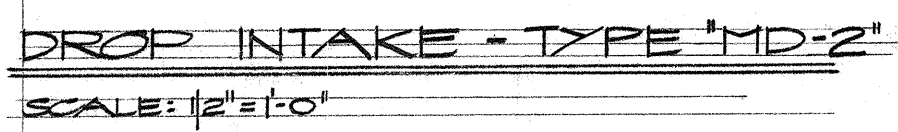
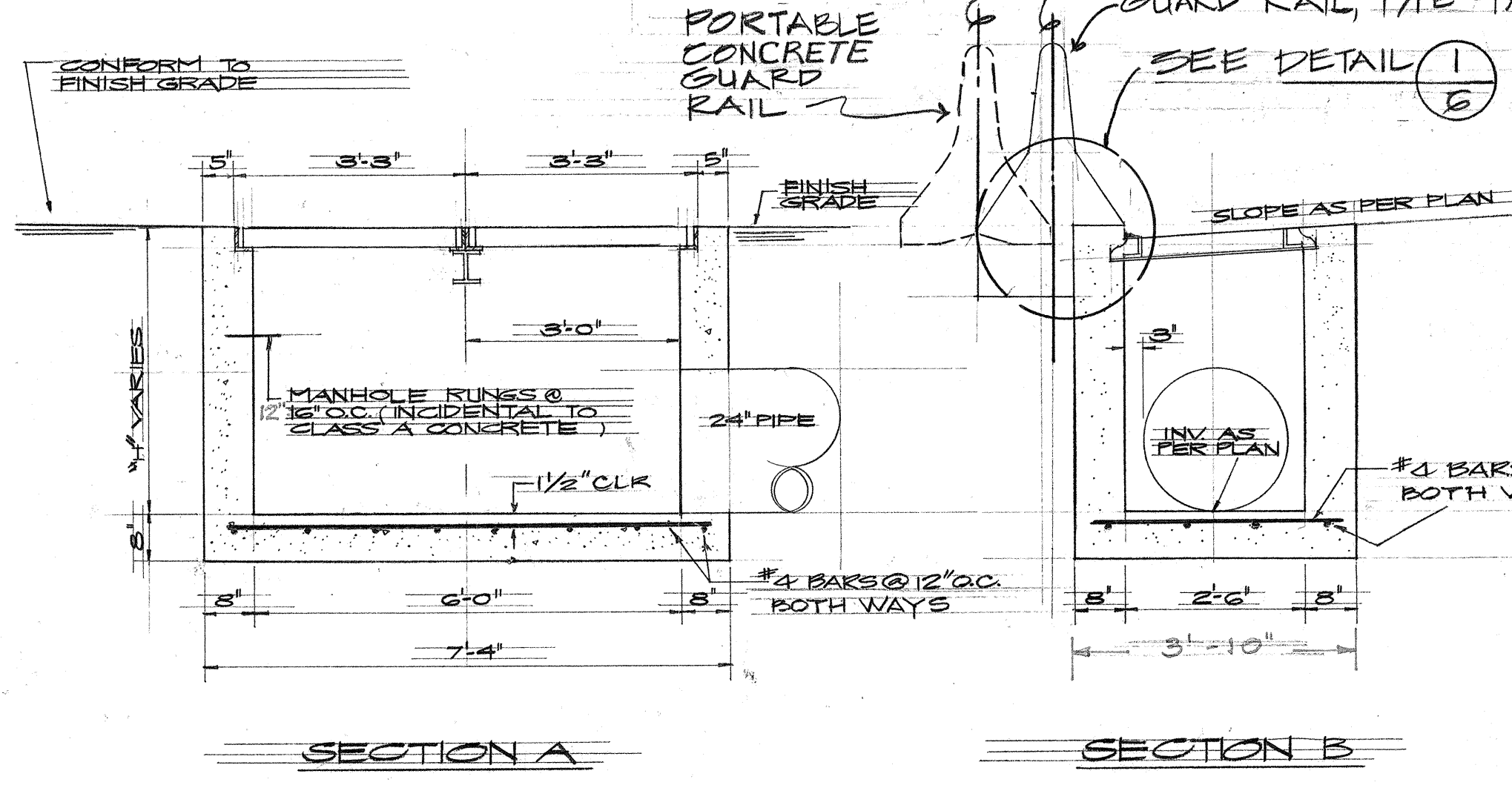
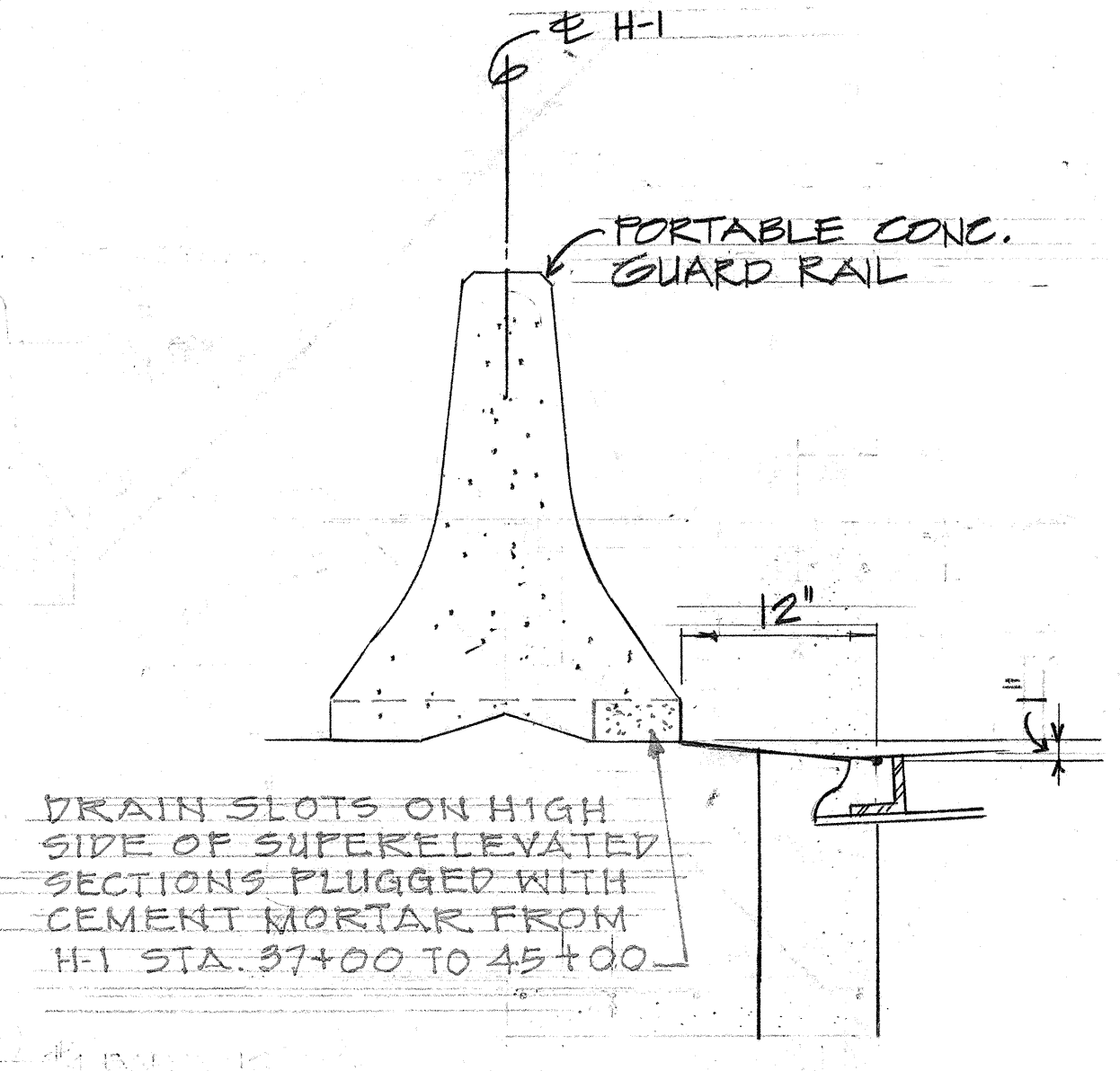
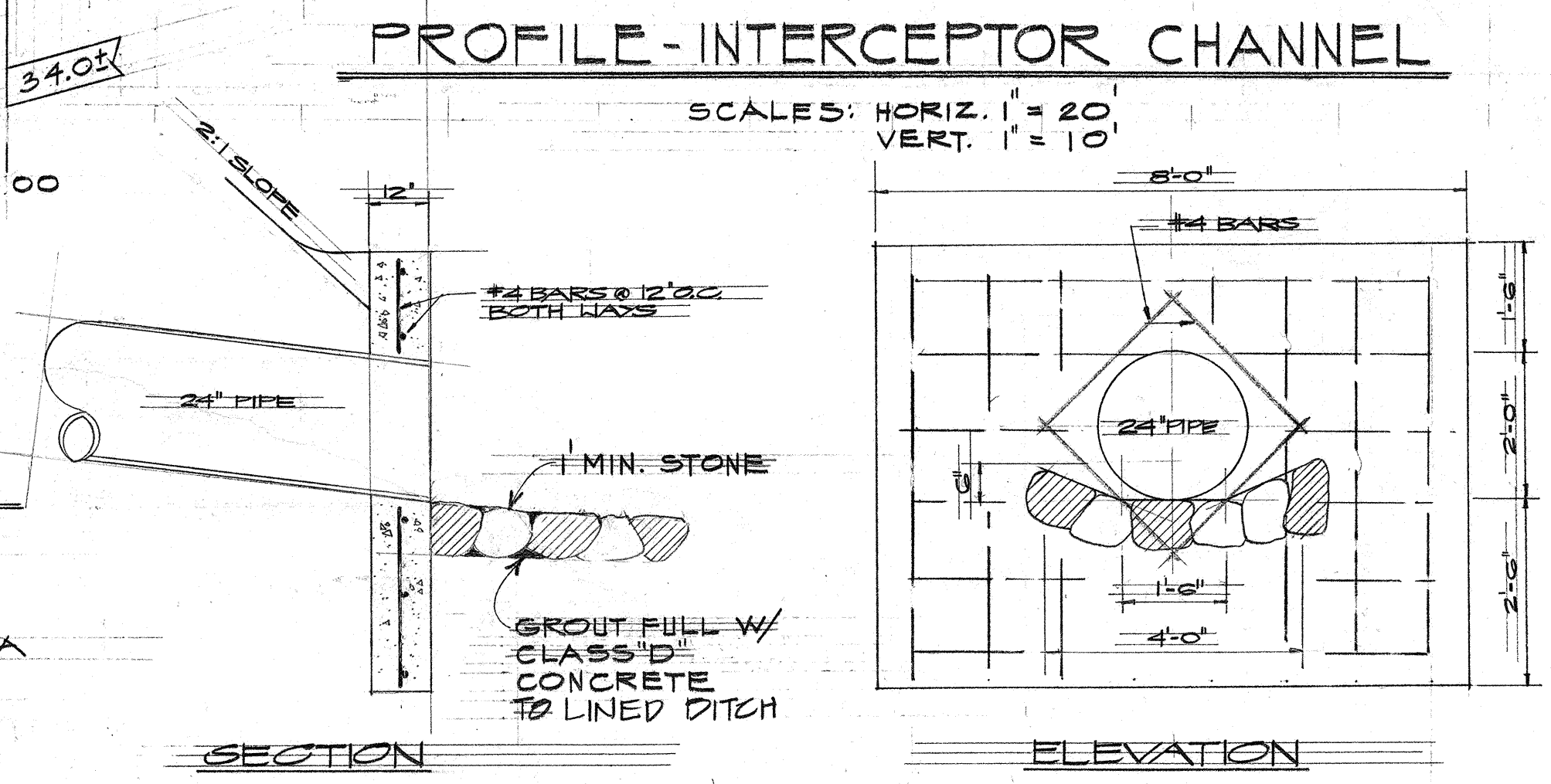
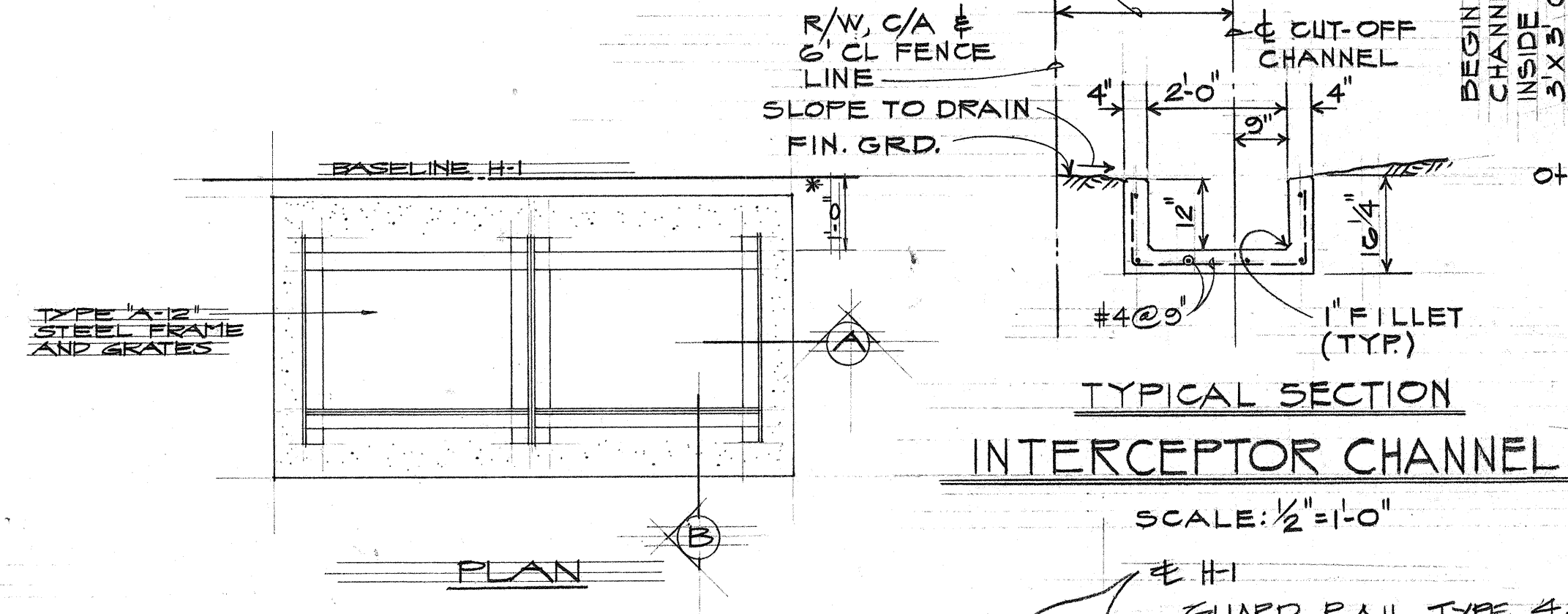
- GENERAL NOTES:**
- CULVERT SHALL LEAVE C.D.I. FROM ANY POSITION AND ANY DIRECTION INDICATED BY PLANS OR ORDERED BY THE ENGINEER. CULVERT MAY BOTH ENTER AND LEAVE C.D.I. SO THAT C.D.I. WILL ACT AS MANHOLES.
  - MANHOLE RINGS (6" O.C.) ARE REQUIRED WHEN 16" H" IS GREATER THAN 4'-6" ONLY ONE RING (6" FROM THE BOTTOM) IS REQUIRED IF "H" IS 4'-6" OR LESS. MANHOLE RINGS MAY BE PLACED AT ANY LOCATION AS ORDERED BY THE ENGINEER.
  - STANDARD M.H. RINGS TO BE INCIDENTAL TO CLASS "A-1" CONCRETE, SEE SHEET 9 FOR DETAILS.



2'-6" OR AS DIRECTED BY THE ENGINEER, STA 0+55± TO 1+95± ONLY

NOTE "A" - AT INTERCEPTOR CHANNEL STA. 0+00, MATCH INVERT OF INTERCEPTOR CHANNEL WITH TOP OF WALL OF THE EXISTING 3'X3' CONCRETE CHANNEL.

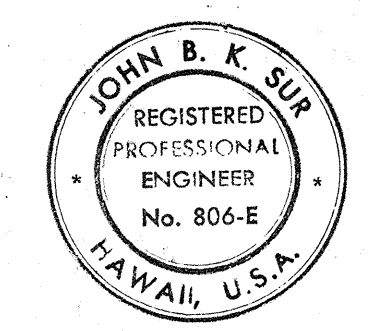
NOTE "B" - EXCAVATION FOR INTERCEPTOR CHANNEL WILL BE PAID UNDER ITEM 206.02 STRUCTURAL EXCAVATION FOR DRAINAGE SYSTEM.



DRAIN SLOTS ON HIGH SIDE OF SUPERELEVATED SECTIONS PLUGGED WITH CEMENT MORTAR FROM H-1 STA. 37+00 TO 45+00

\* 2'-0" FOR AREAS WHERE PORTABLE CONCRETE GUARD RAILS ARE USED.

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



STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

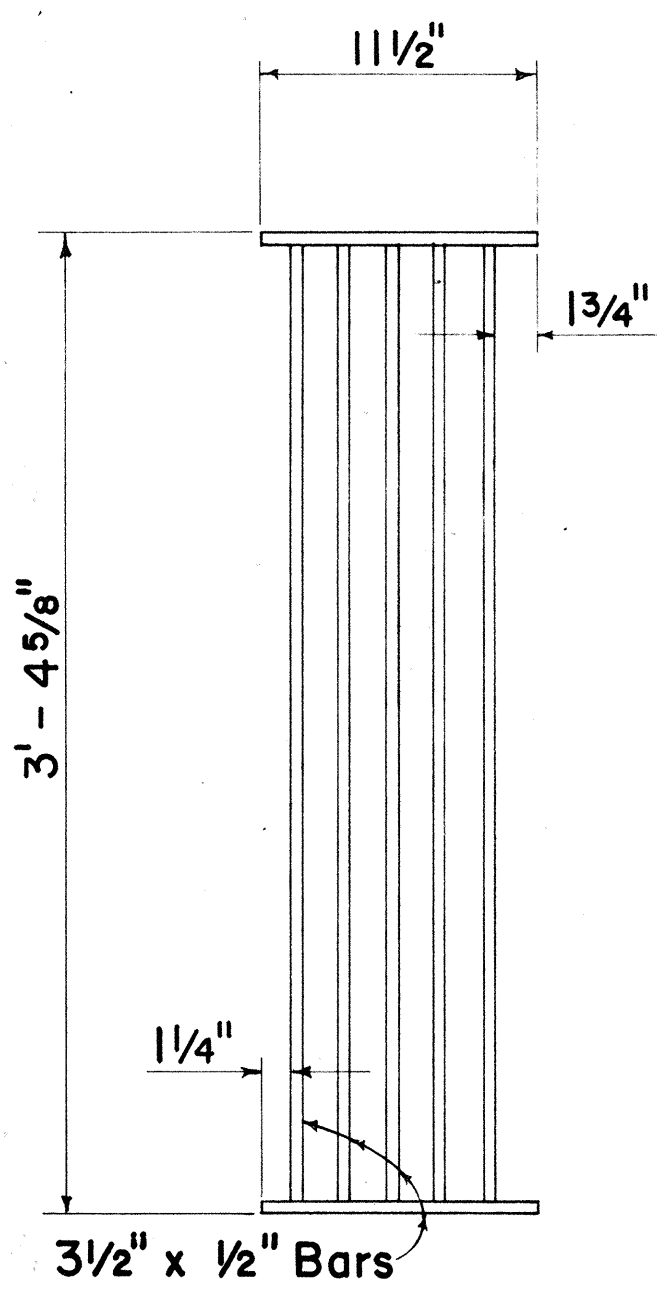
**DRAINAGE DETAILS**

INTERSTATE ROUTE H-1  
F.A.I. PROJECT NO. I-11-1(7)14

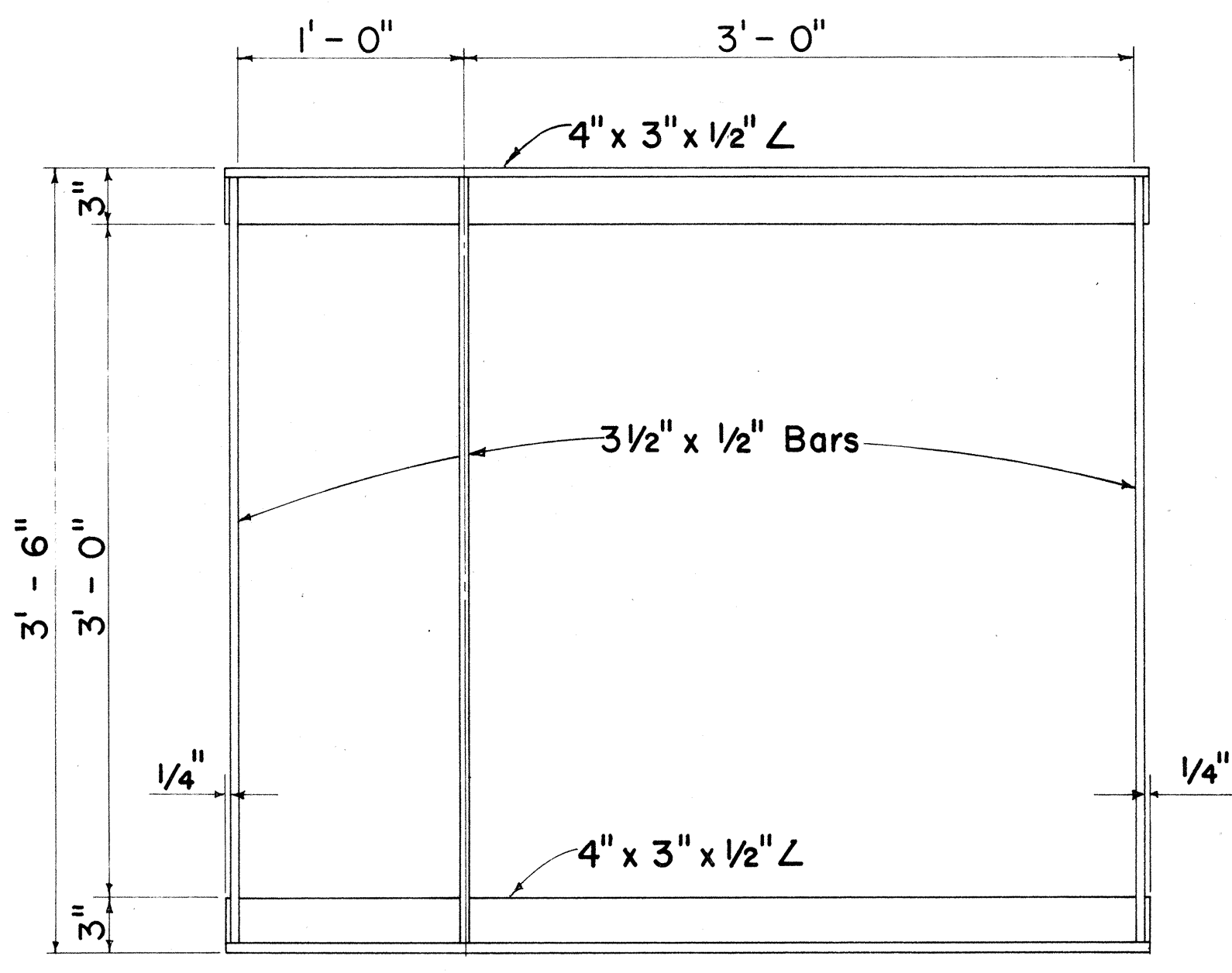
SCALE AS SHOWN DATE: JUNE 5, 1974

SHEET No. 3 OF 6 SHEETS

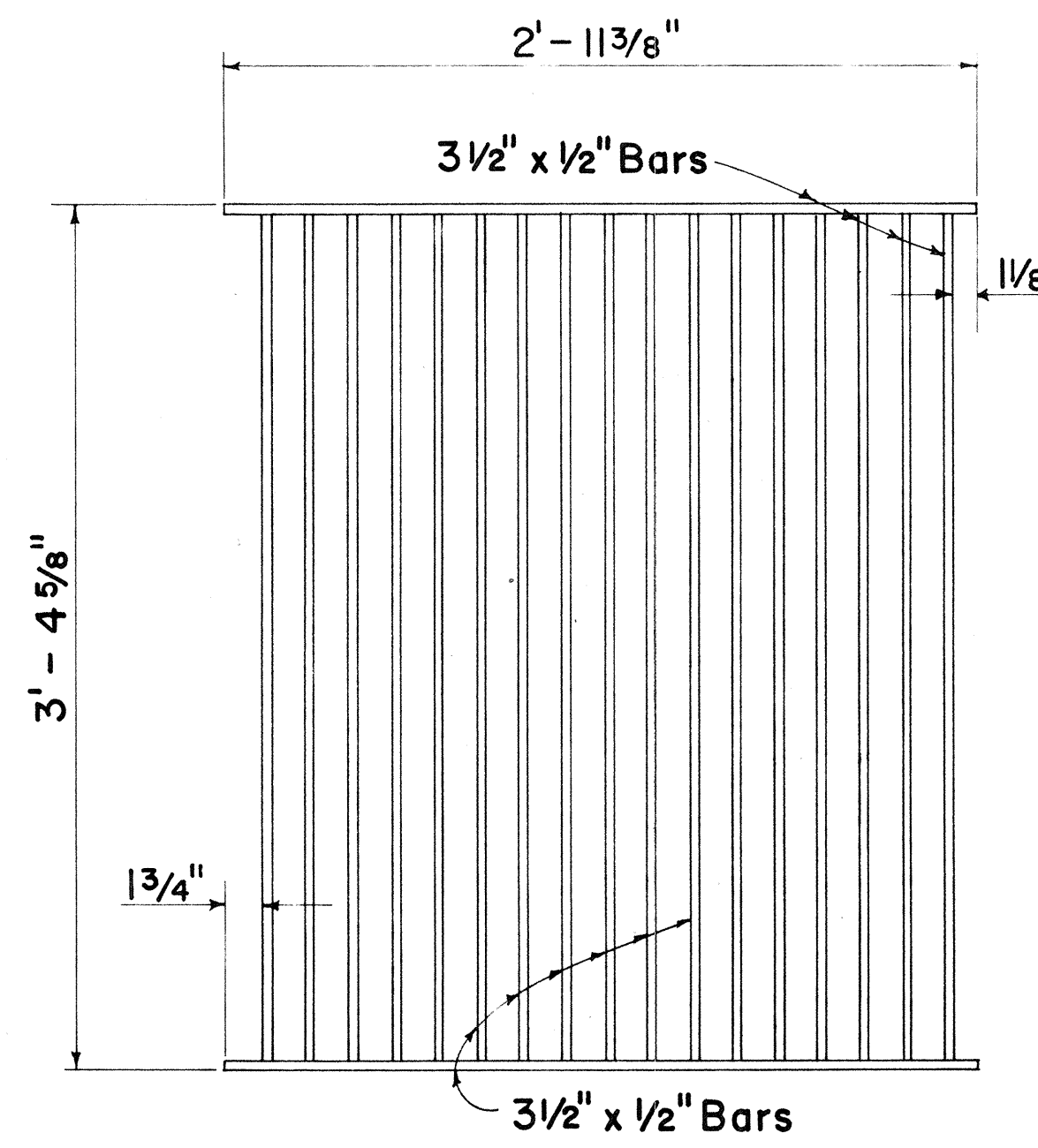
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-(71)-14	1974	7	61



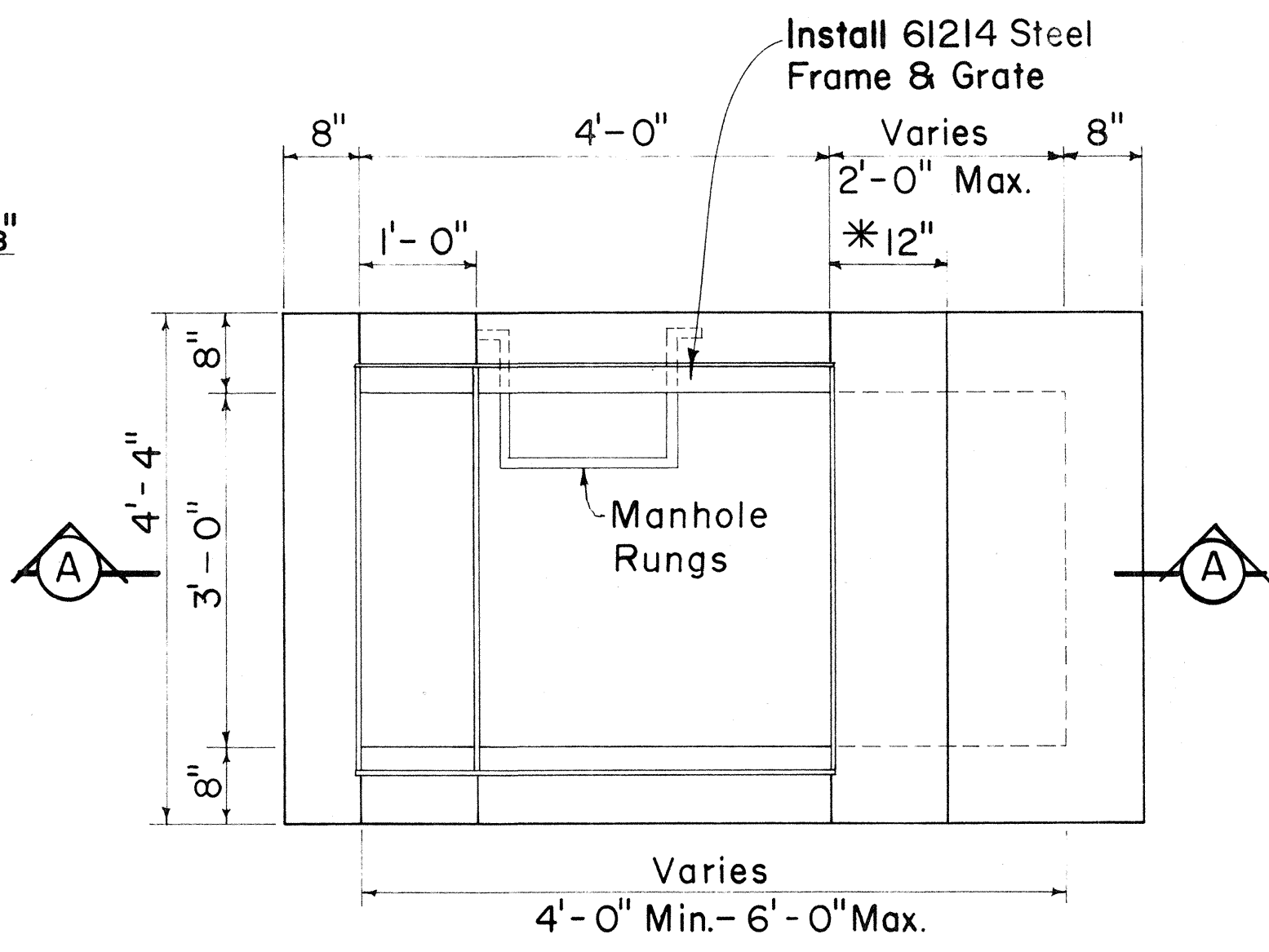
**PLAN**  
Scale: 1/2" = 1' - 0"



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



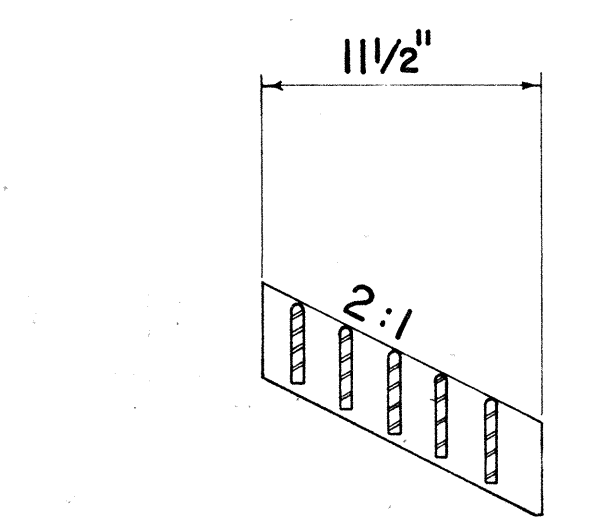
**PLAN**  
Scale: 1/2" = 1' - 0"



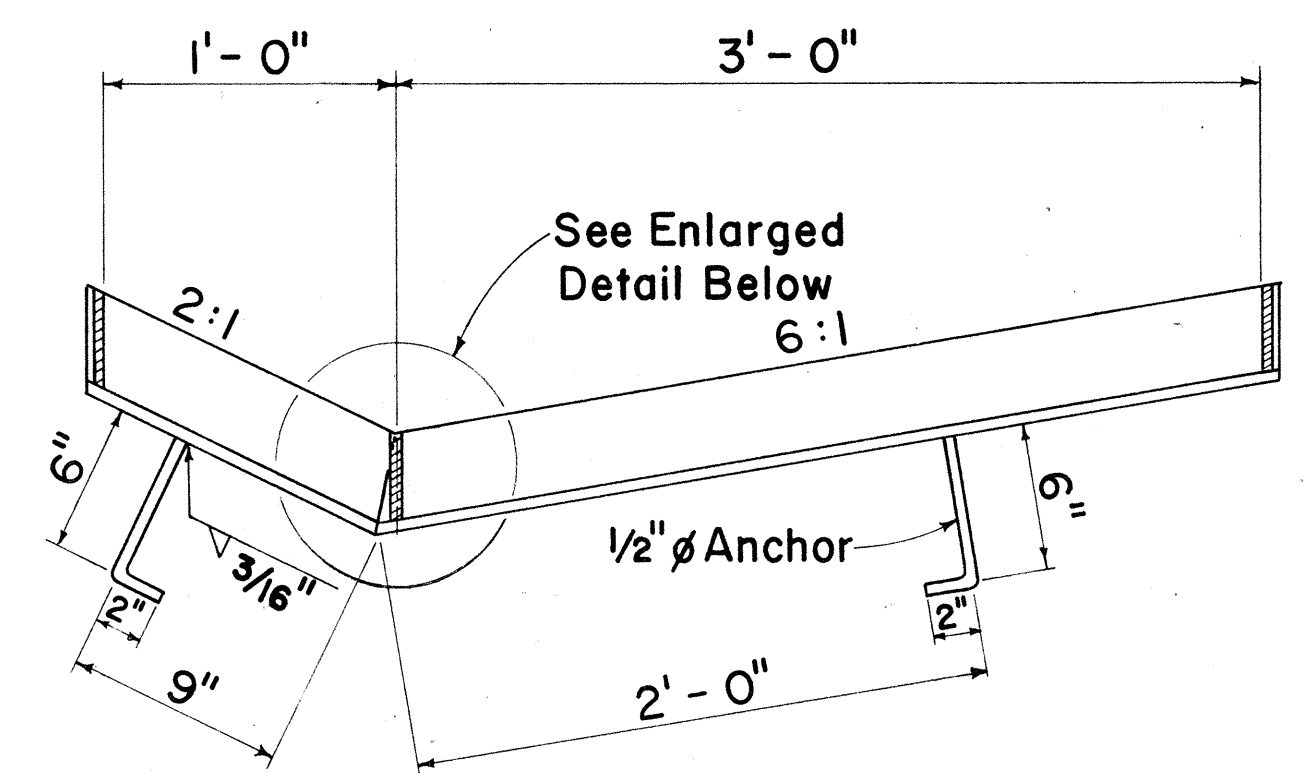
**PLAN**

**GENERAL NOTES**

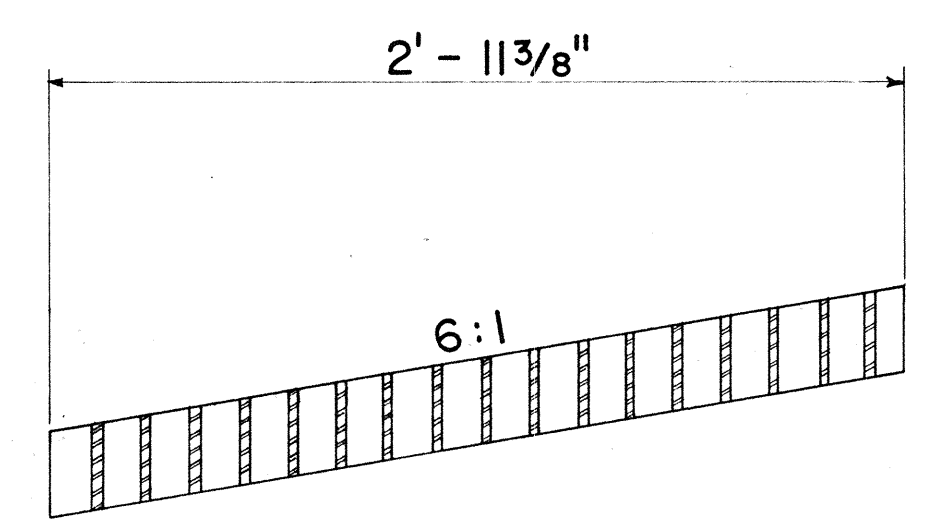
- Grates and Frames shall be hot dip galvanized after fabrication, see specifications.
- All welds 3/8" unless otherwise noted.
- The Frame & Grate materials shall conform to the specifications of ASTM Designation Structural Steel A283, Grade D and the Standard Specifications.
- Culvert shall leave Drop 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. The Manhole Rungs may be placed at any location as ordered by the Engineer.



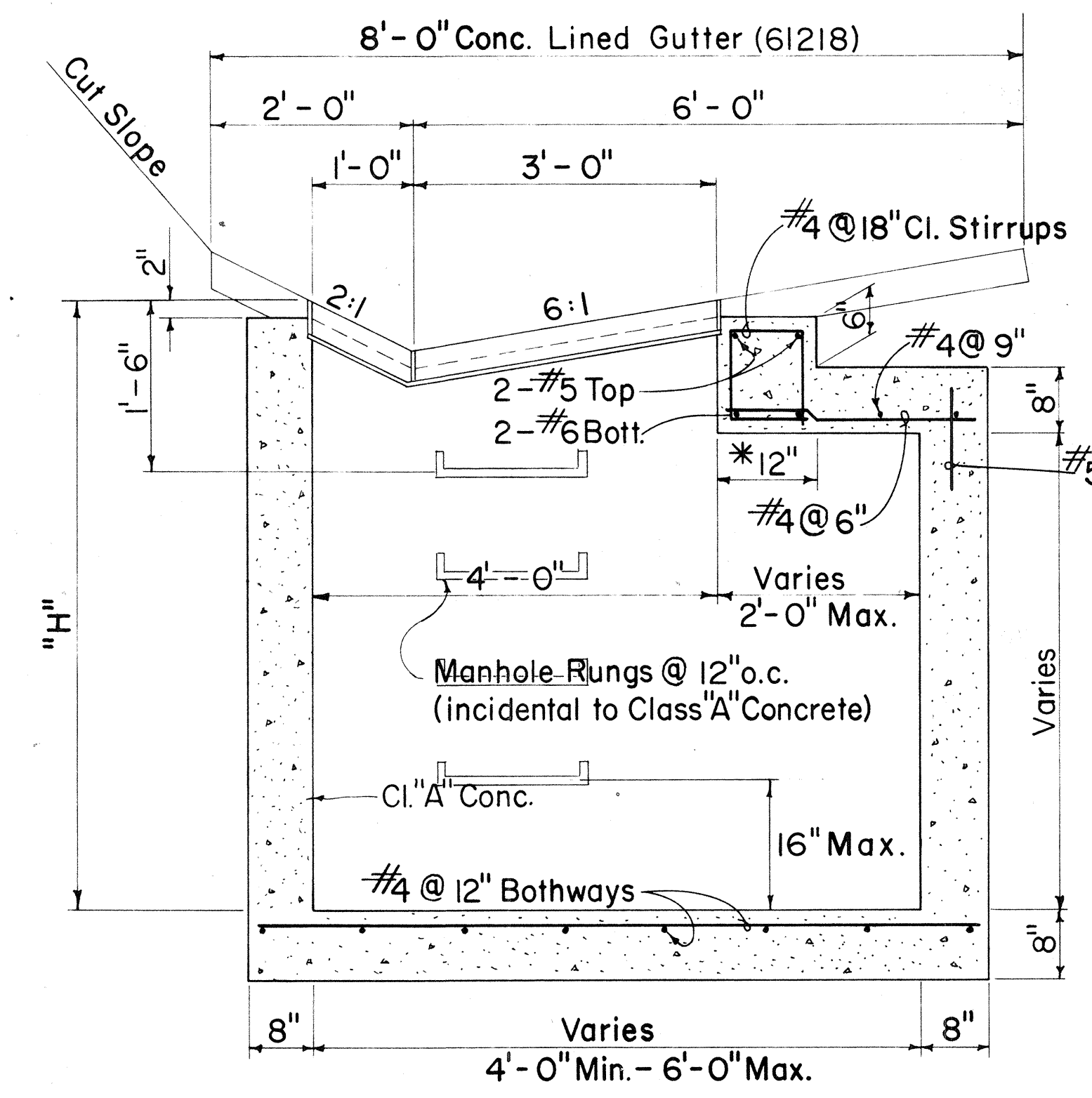
**SECTION**  
Scale: 1/2" = 1' - 0"



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



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



**SECTION A - A**

**DETAIL OF 61214 DROP INTAKE**

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

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

NO.	REVISION	APPROVED BY	DATE
1.	Spacing on Manhole Rungs to conform to OSHA.	H.T.	1-21-15

APPROVAL RECOMMENDED:  
*G. Takano*  
HYDRAULIC DESIGN ENGINEER  
DATE: 12-17-69

APPROVED:  
*[Signature]*  
ASSISTANT CHIEF, ENGINEERING  
DATE: 12-17-69

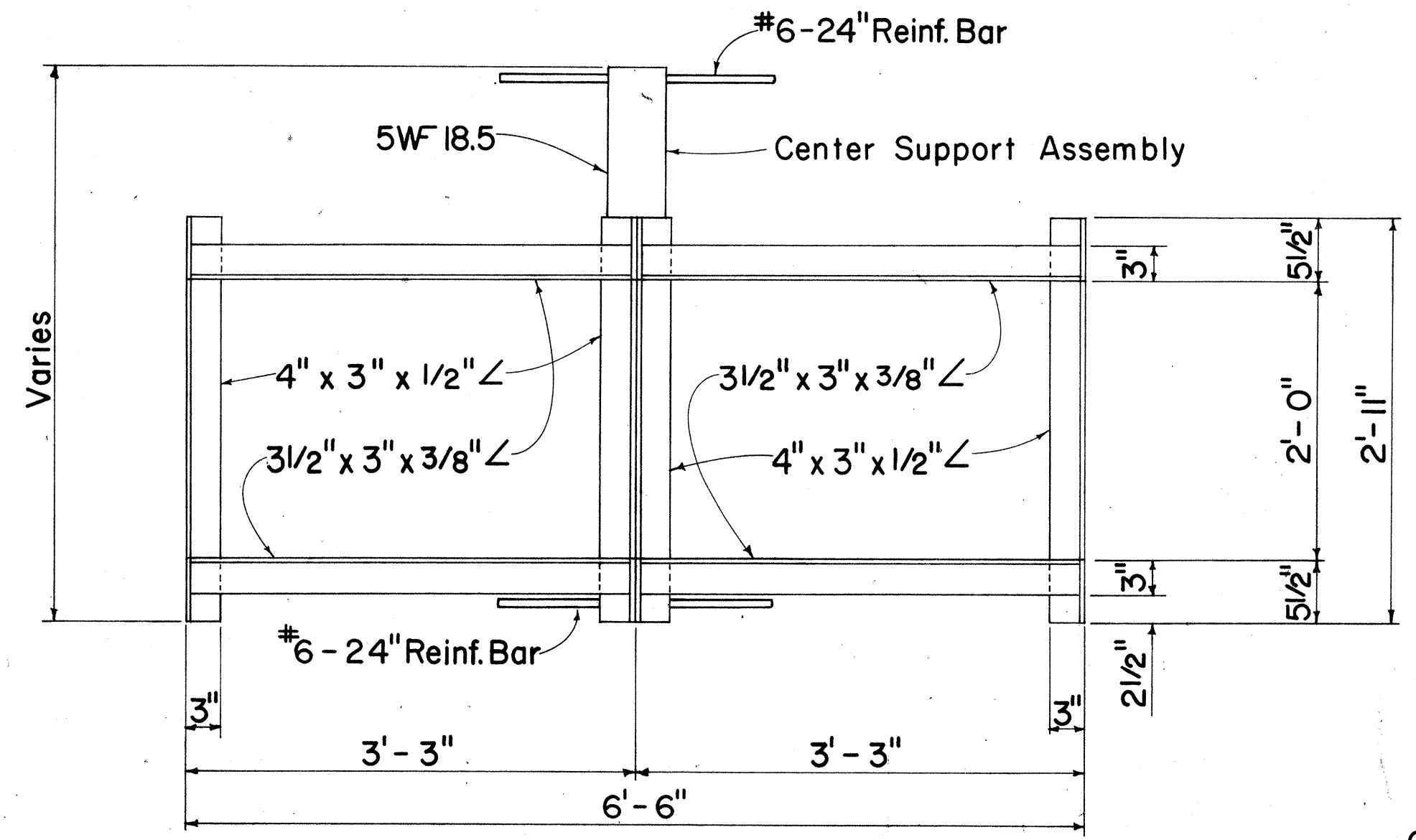
STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION  
STANDARD DETAILS  
TYPE 61214  
GRATED DROP INTAKE

Scales: As Noted Date: July 1969  
SHEET No. 4 OF 6 SHEETS DH 9

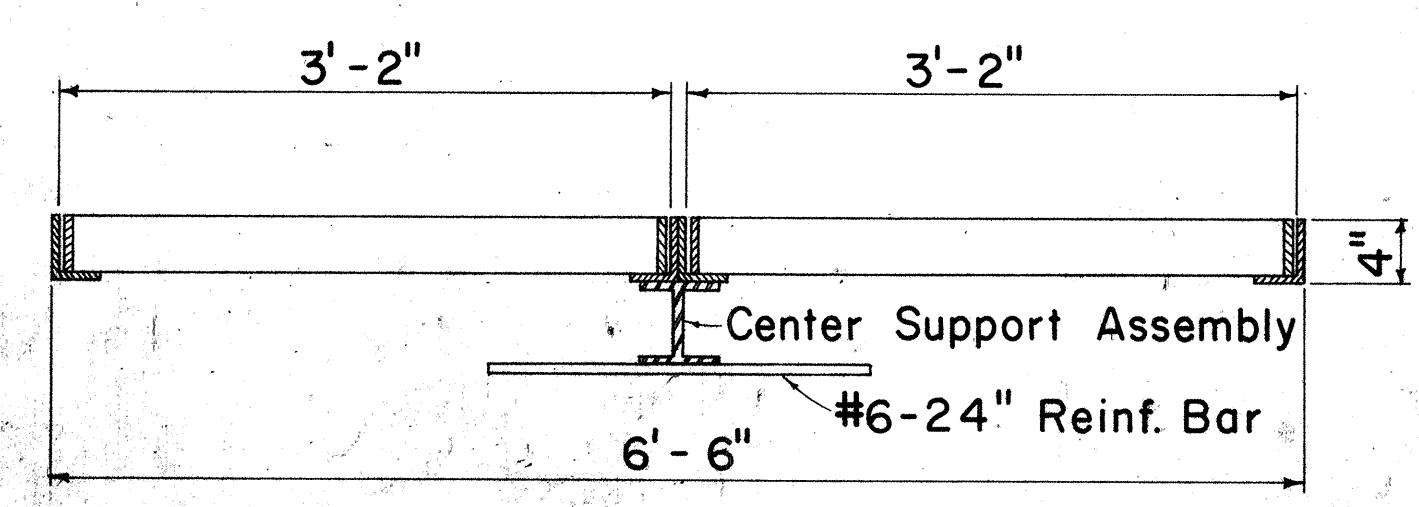
**DETAILS OF TYPE 61214 STEEL FRAME AND GRATES**

DATE: \_\_\_\_\_  
DRAWN BY: \_\_\_\_\_  
CHECKED BY: \_\_\_\_\_  
DESIGNED BY: \_\_\_\_\_  
QUANTITIES BY: \_\_\_\_\_  
ORIGINAL PLAN: \_\_\_\_\_  
NOTE BOOK: \_\_\_\_\_  
No. \_\_\_\_\_

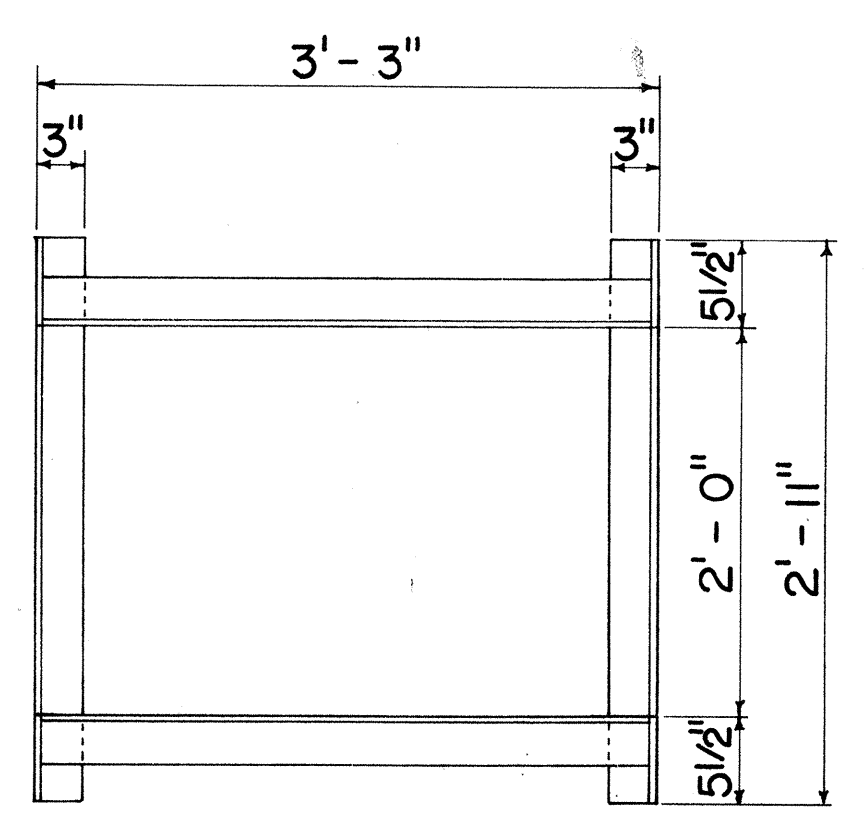
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	1-11-1 (71): 14	1974	8	61



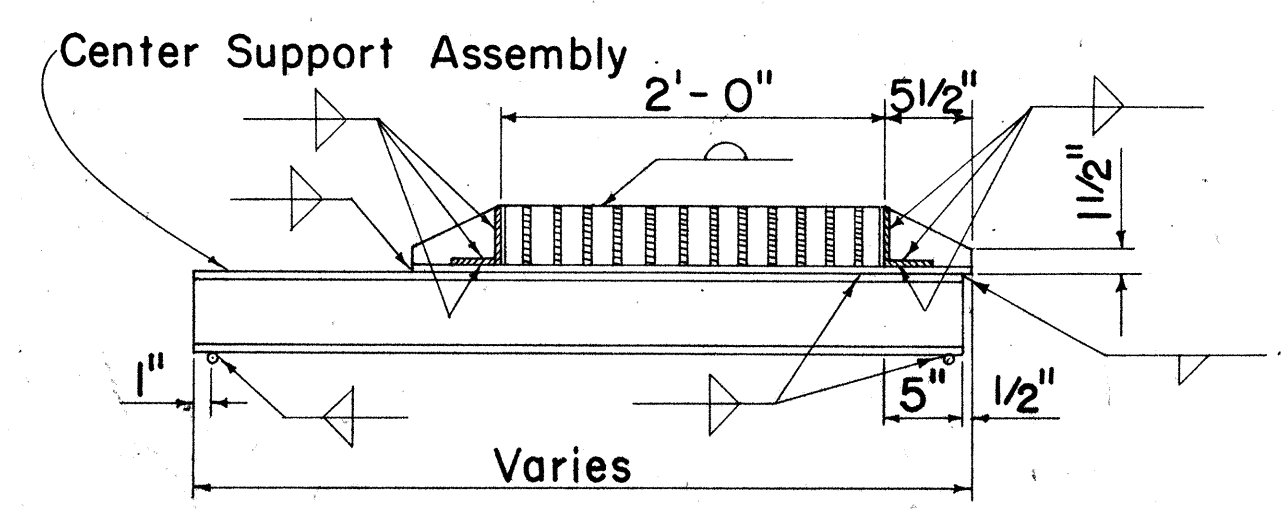
**PLAN**  
(Two or More Grates)



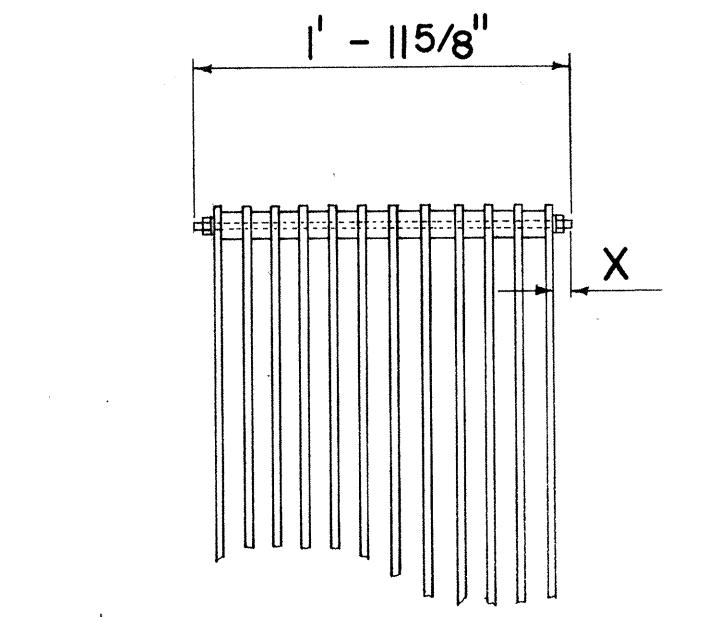
**LONGITUDINAL SECTION**  
(Thru Frame & Grate)



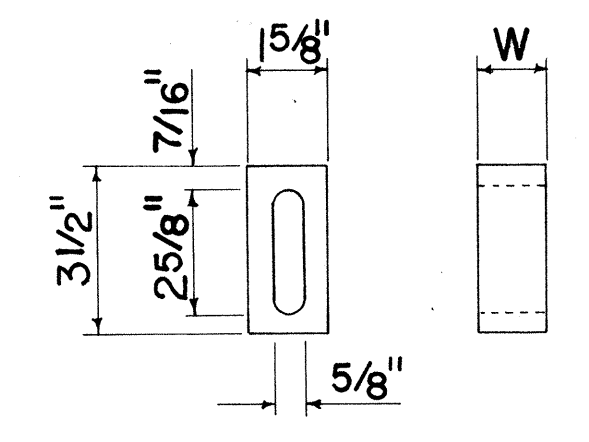
**PLAN**  
(Single Grate)



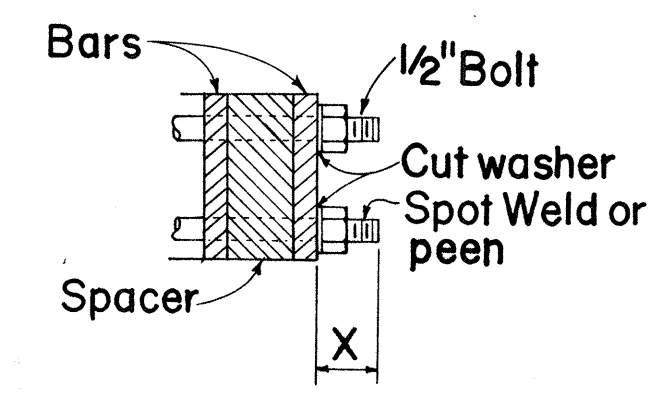
**CROSS SECTION**  
(Thru Frame & Grate)



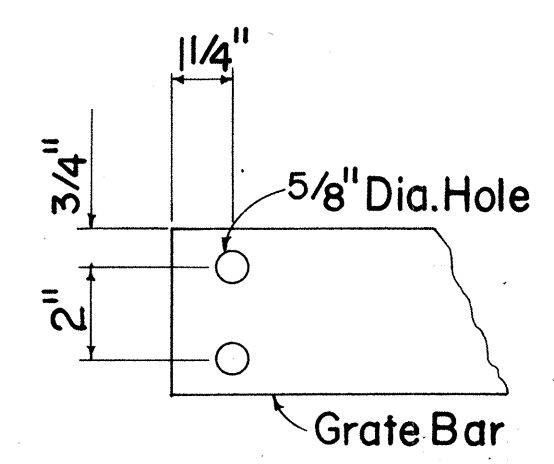
**BOLTED END BLOCK**  
Scale: 1" = 1'-0"



**BAR SPACER**  
Scale: 3" = 1'-0"

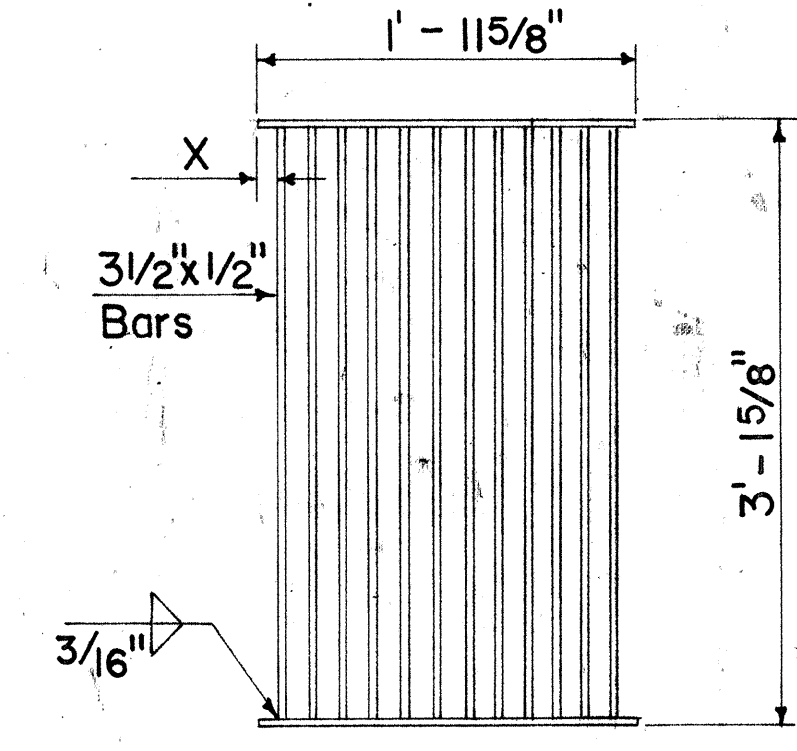


**BOLTING DETAIL**  
Scale: 3" = 1'-0"

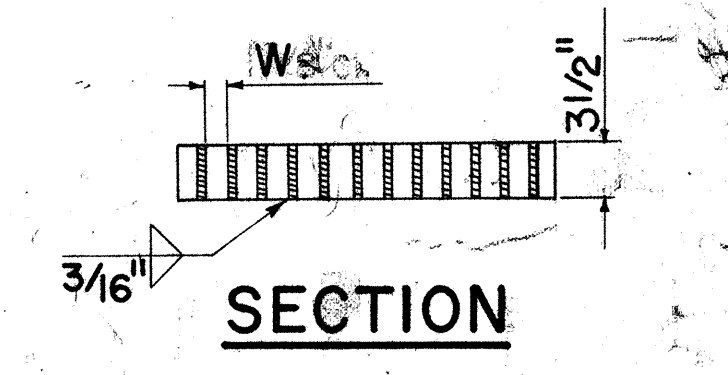


**END OF BAR**  
Scale: 3" = 1'-0"

**ALTERNATIVE BOLTED GRATE**



**PLAN**  
**ALTERNATIVE BOLTED GRATE**  
Scale: 1" = 1'-0"

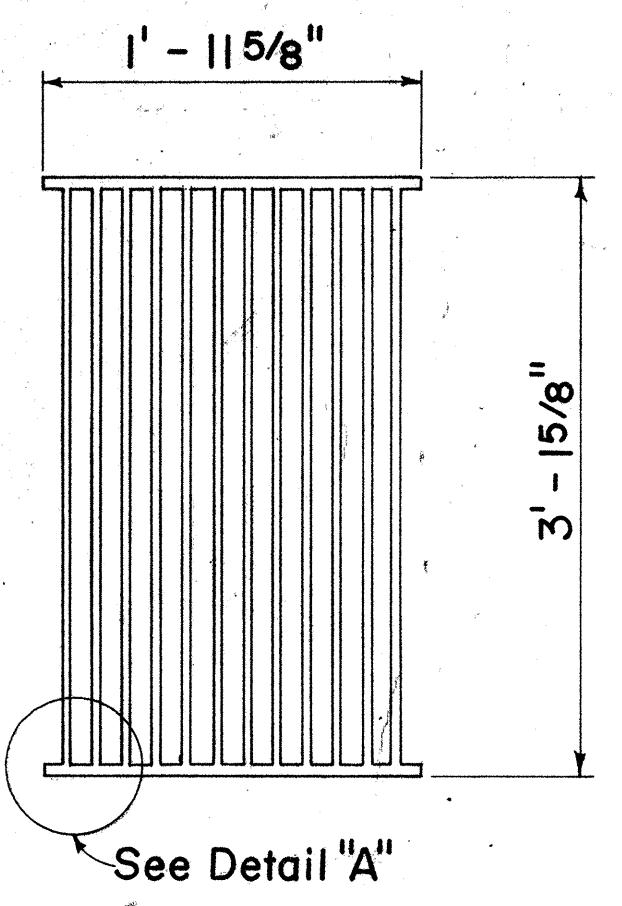


**SECTION**

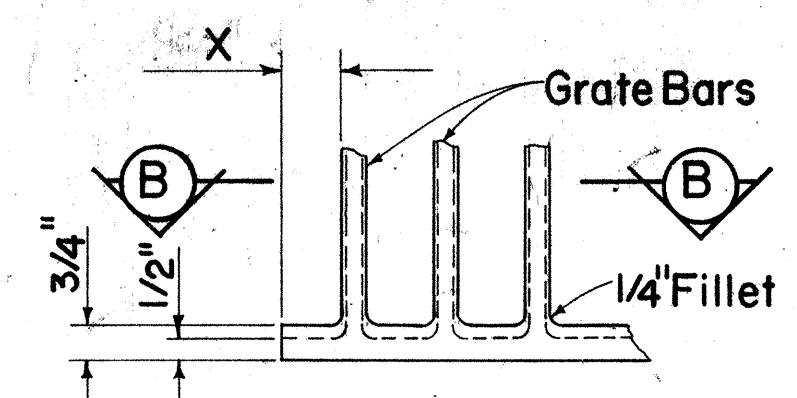
**ALTERNATIVE WELDED GRATE**

Scale: 1" = 1'-0"

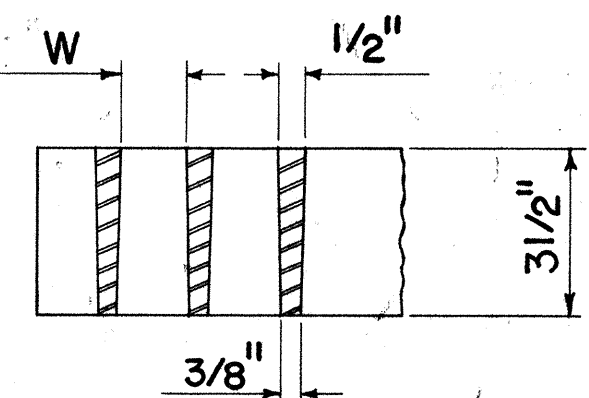
**FRAME DETAILS**  
Scale: 1" = 1'-0"



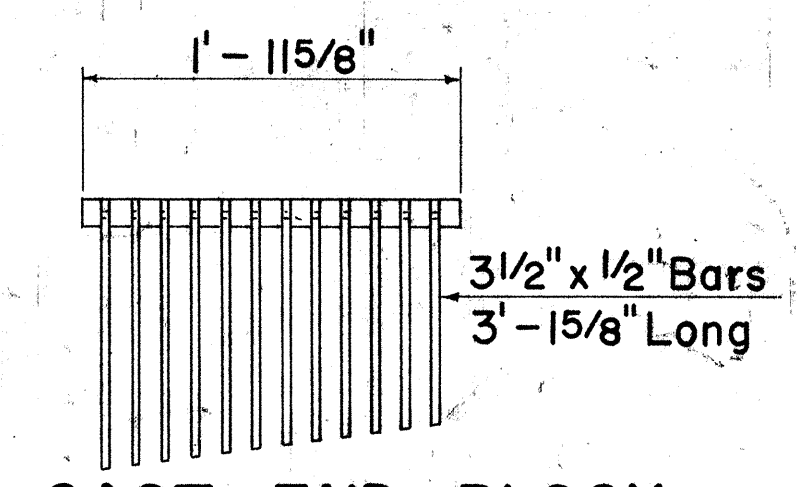
**PLAN**  
Scale: 1" = 1'-0"



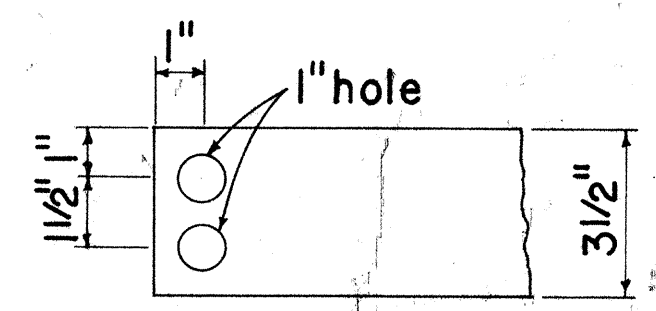
**DETAIL "A"**  
Scale: 3" = 1'-0"



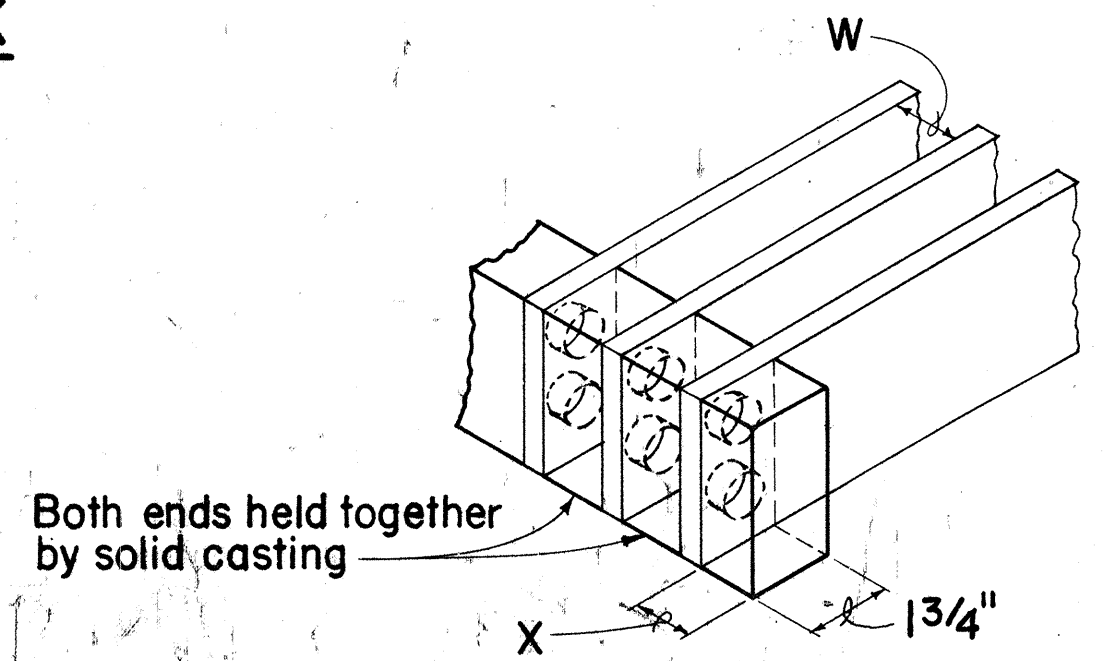
**SECTION "B-B"**  
Scale: 3" = 1'-0"



**CAST END BLOCK**  
Scale: 1" = 1'-0"



**END OF BAR**  
Scale: 3" = 1'-0"



**ALTERNATIVE CAST MALLEABLE IRON OR CAST STEEL END BLOCK GRATE**

**GENERAL NOTES**

- Contractor has the option of using cast malleable iron, cast steel, welded, bolted, cast malleable iron end block or cast steel end block grate.
- Grates and Frames shall be hot dip galvanized after fabrication, see specifications.
- All welds 3/8" unless otherwise noted.
- Center support assembly shall be used when two or more grates are specified. Incidental to Types A-9 or A-12 Frame and Grates.
- Refer to "Grate Bar Spacing Table" for Types A-9 and A-12 Grate dimensions.
- The various materials shall conform to the specifications of ASTM as listed in the following tabulation and the Std. Specifications

Material	ASTM Designation
Structural Steel	A283, Grade D
Cast Steel	A27, Grade 65-35
Malleable Iron Casting	A47, Gr. No. 35018

TYPE	NO. BARS	CLEAR BAR SPACING - W	X
A-9	9	2"	1 9/16"
A-12	12	1 3/8"	1 1/4"

- NOTE:**
- 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.

APPROVAL RECOMMENDED:  
 [Signature] 12-17-69  
 HYDRAULIC DESIGN ENGINEER DATE

APPROVED:  
 [Signature] 12-17-69  
 ASSISTANT CHIEF, ENGINEERING DATE

NO.	REVISION	APPROVED BY	DATE

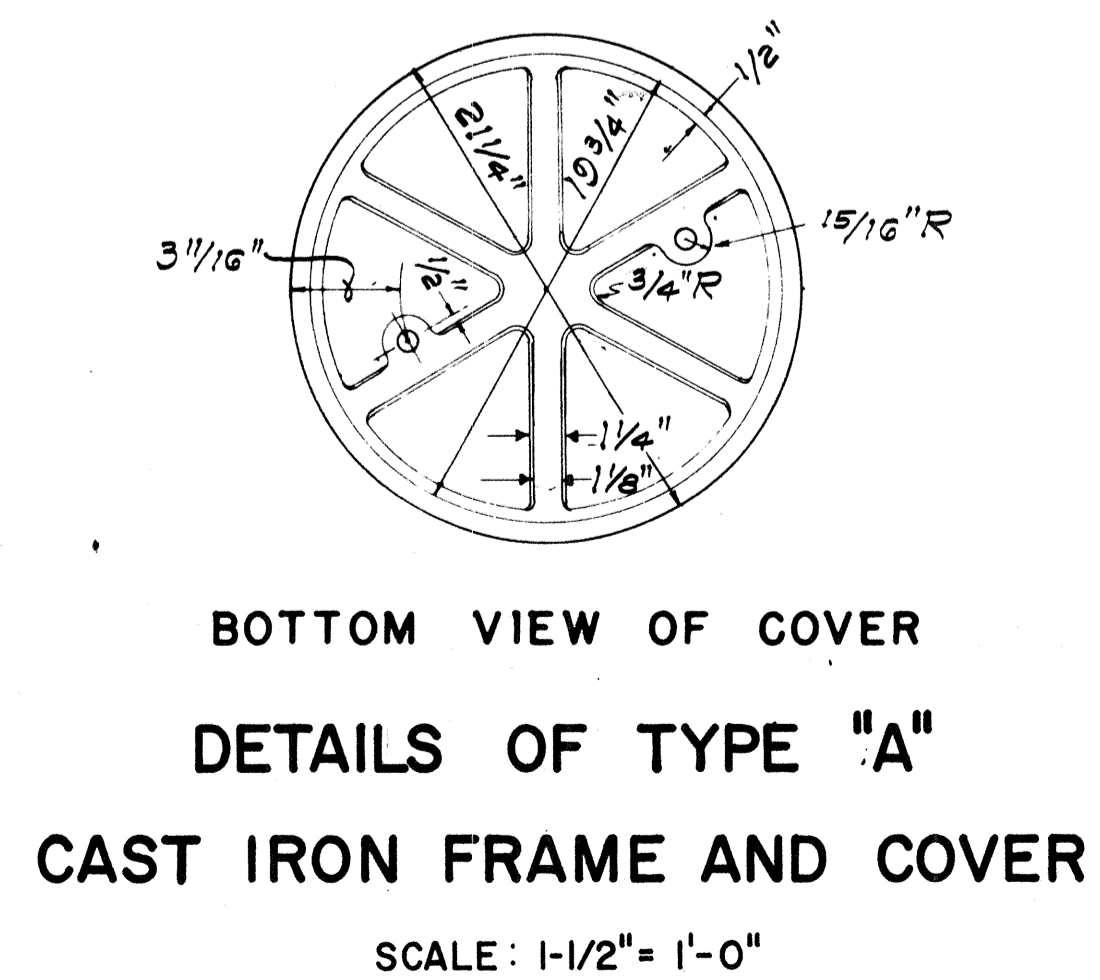
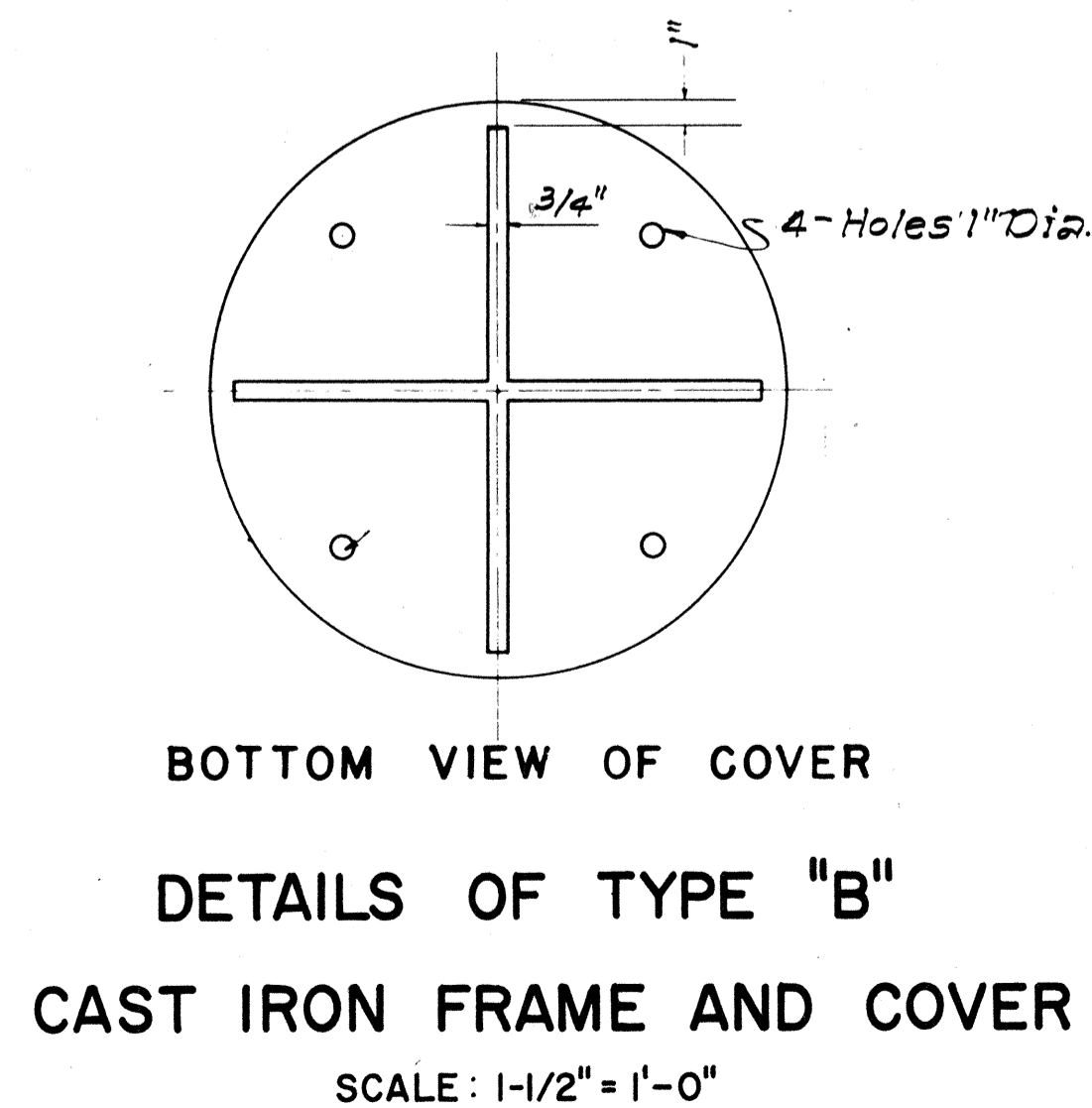
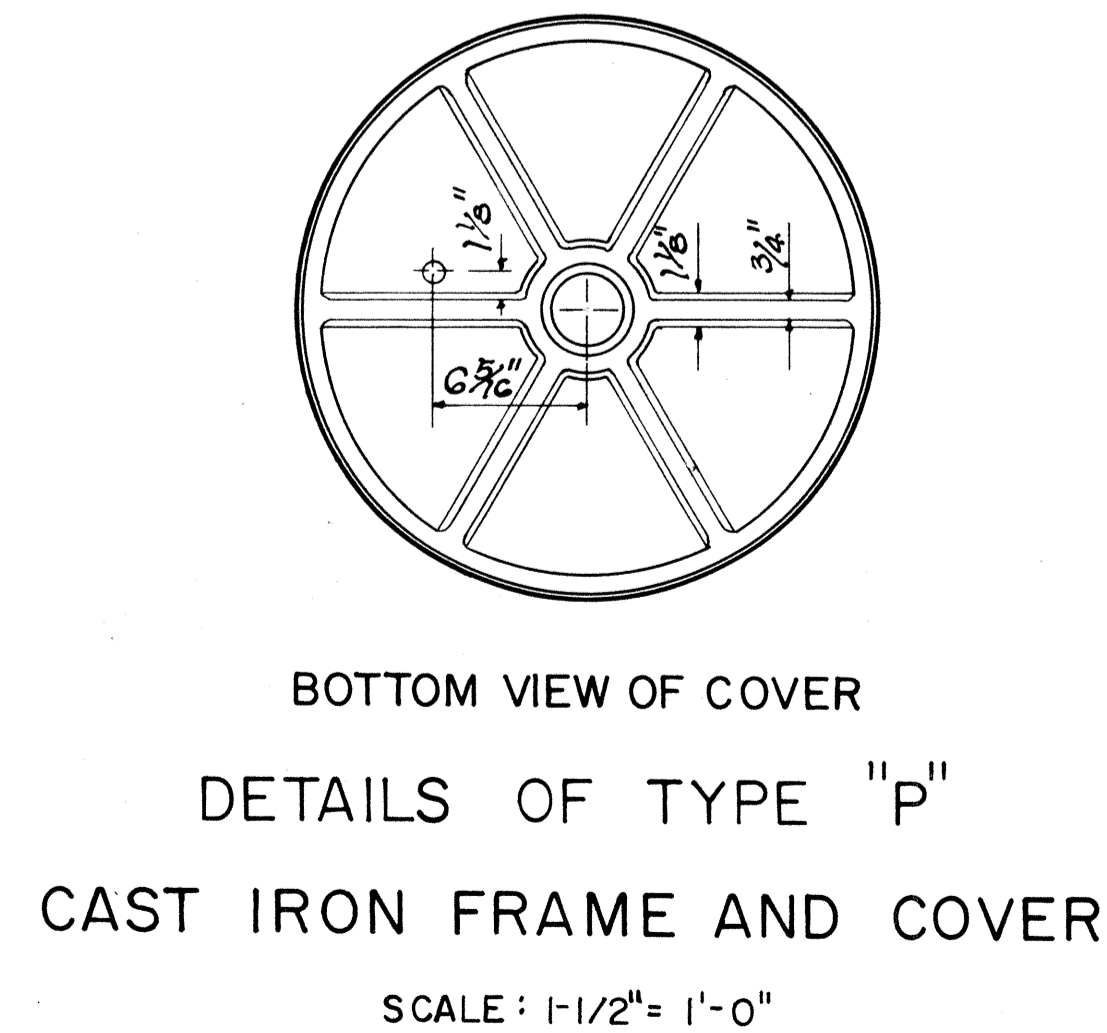
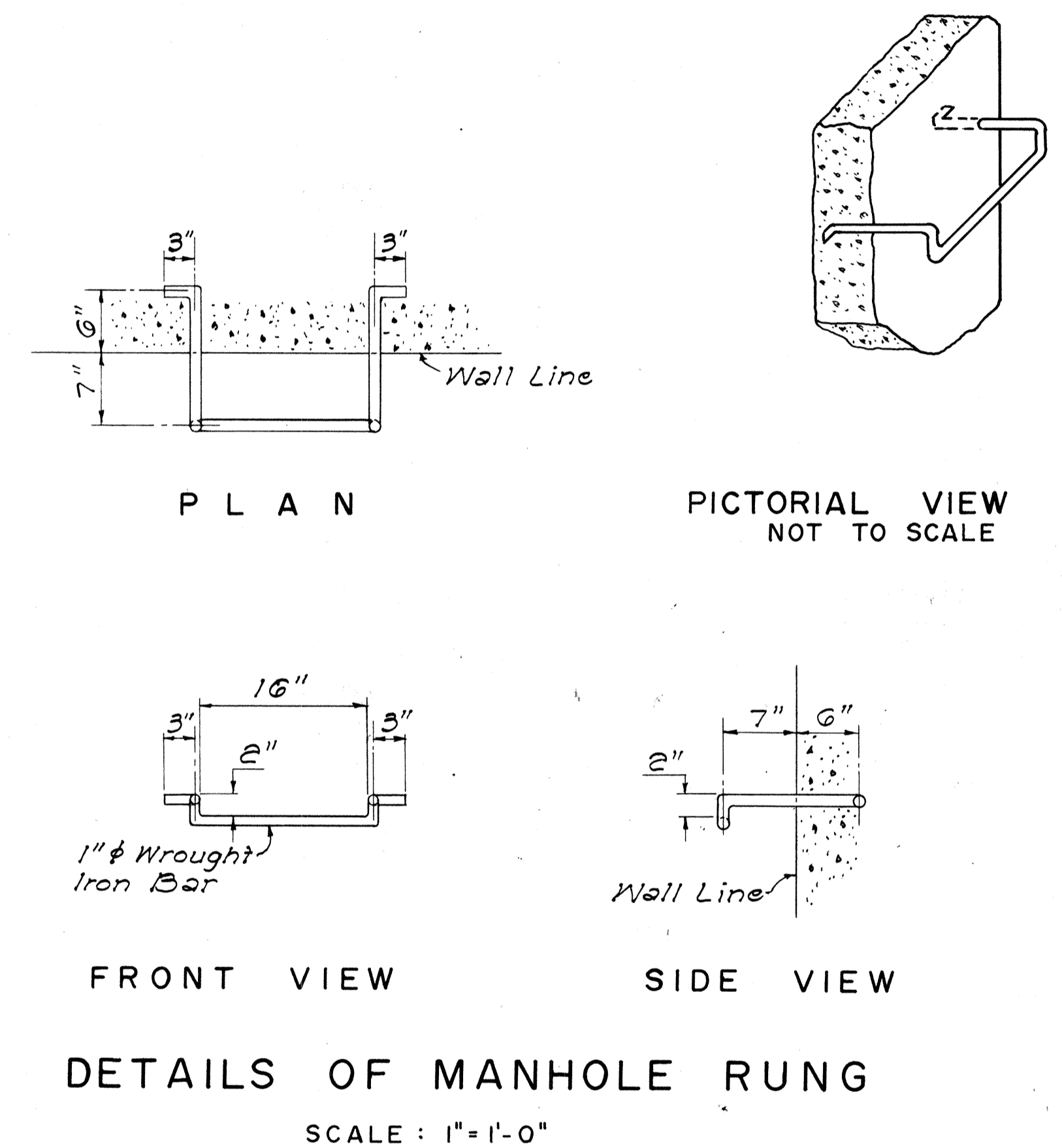
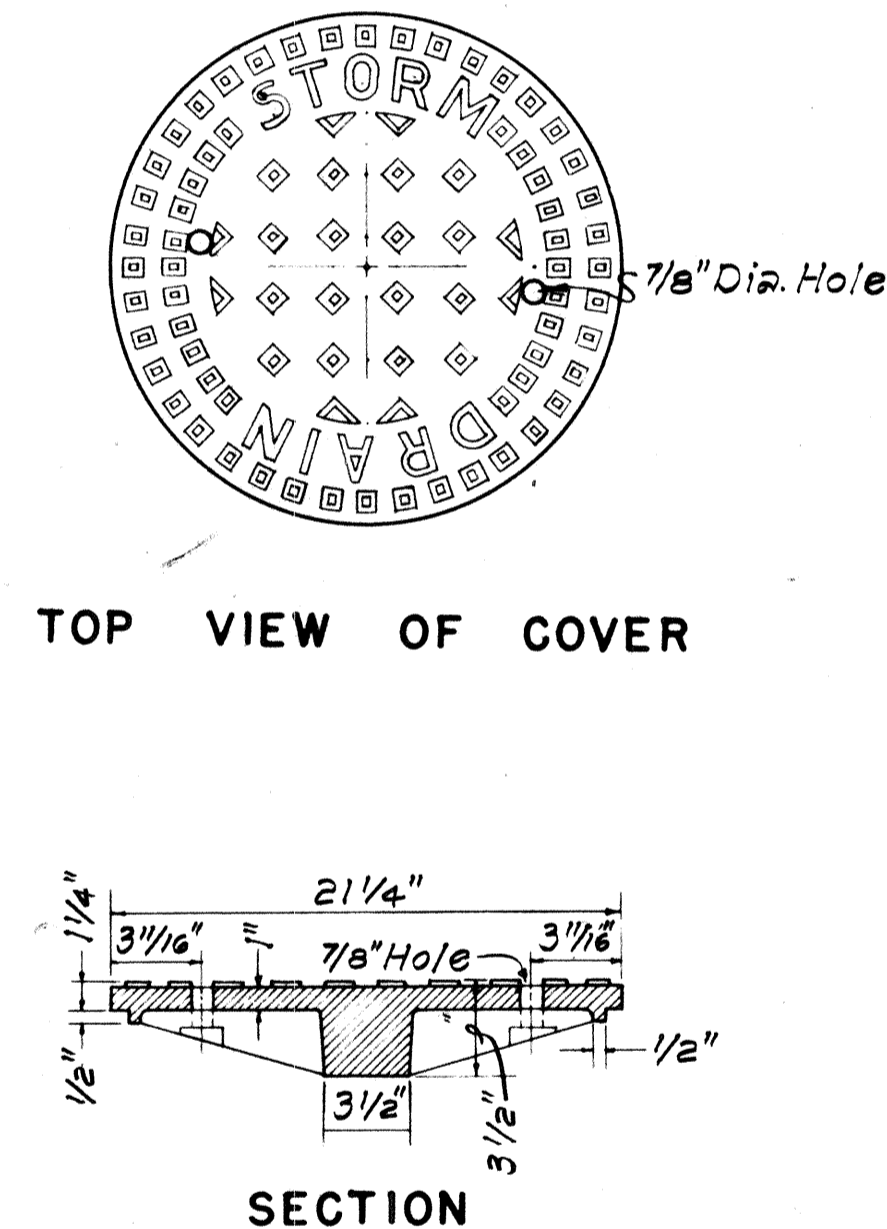
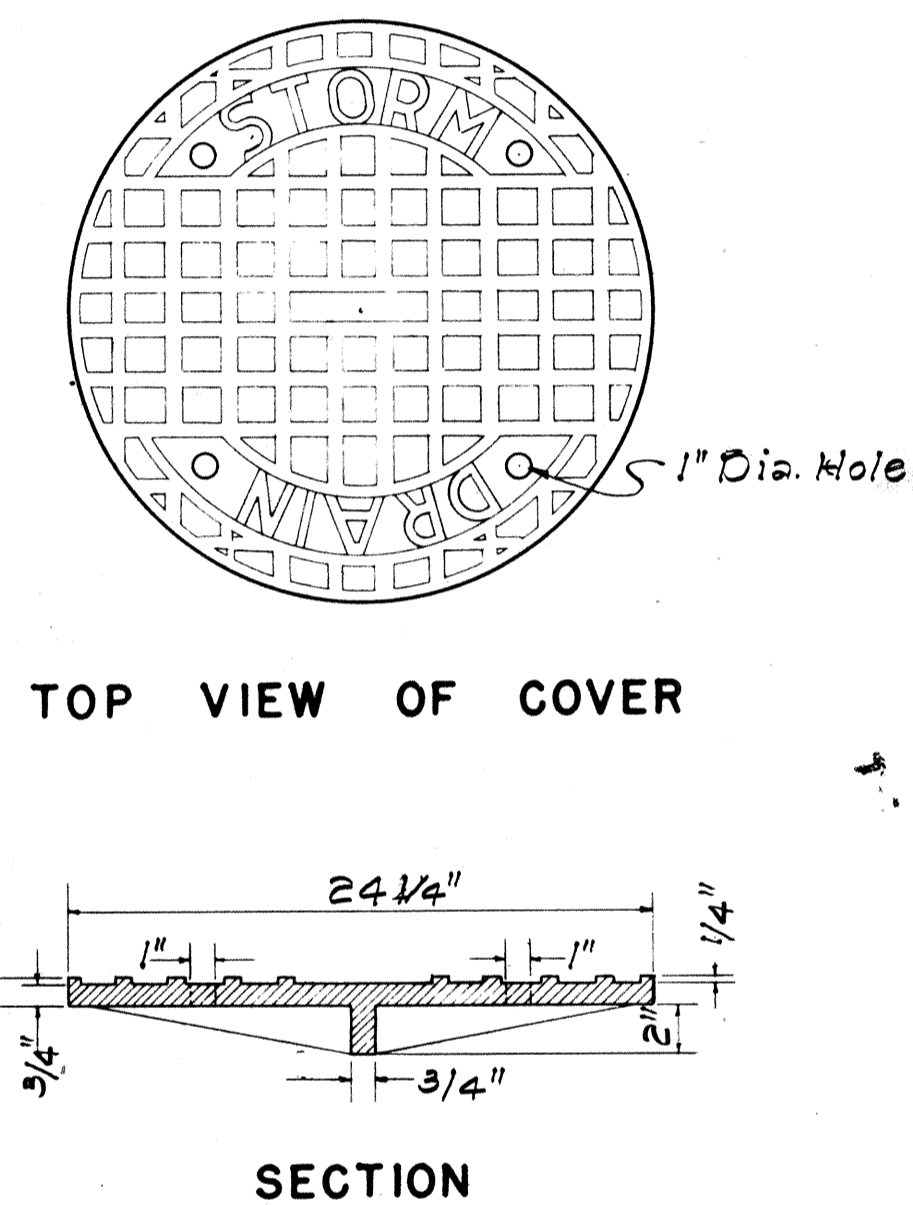
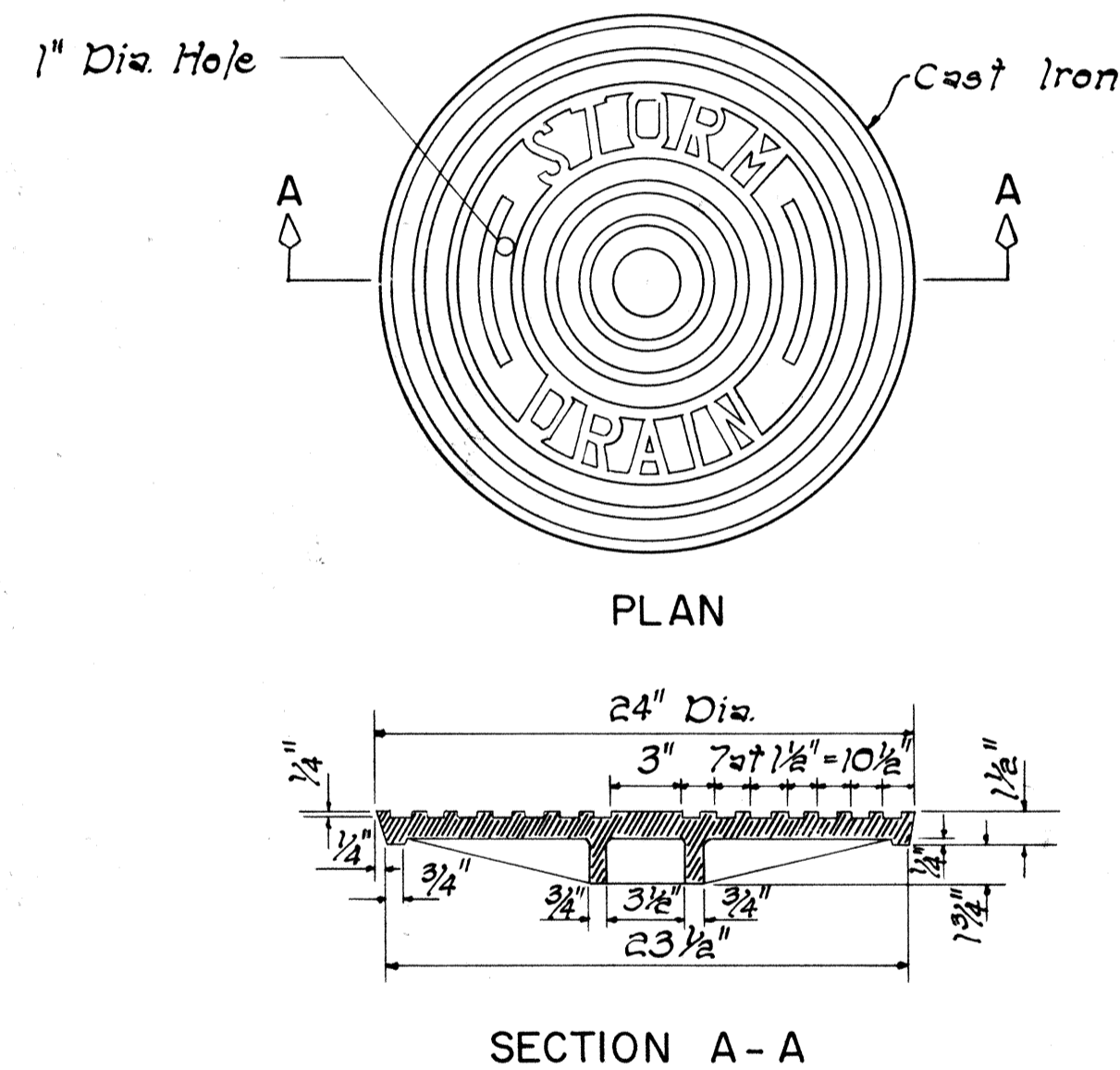
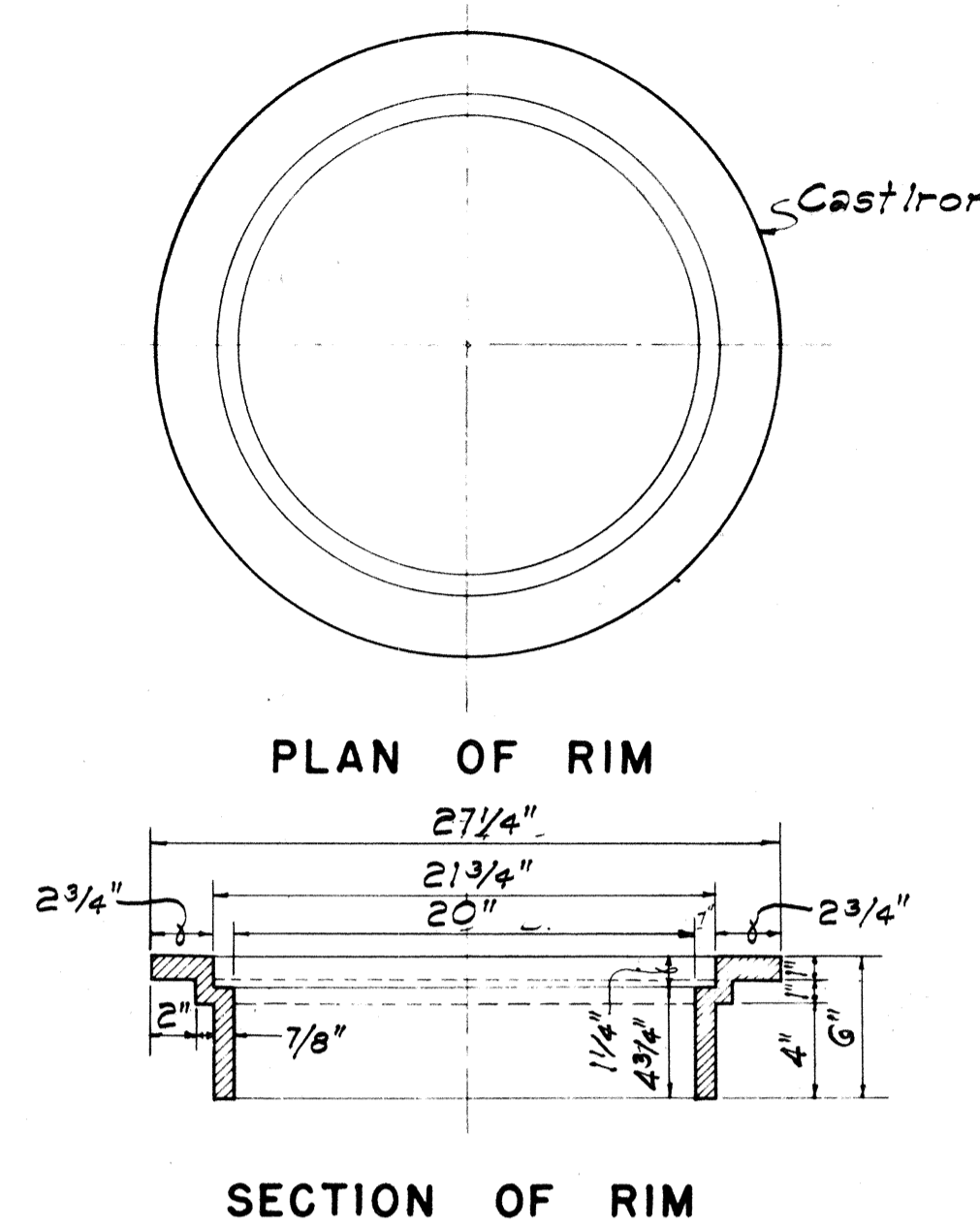
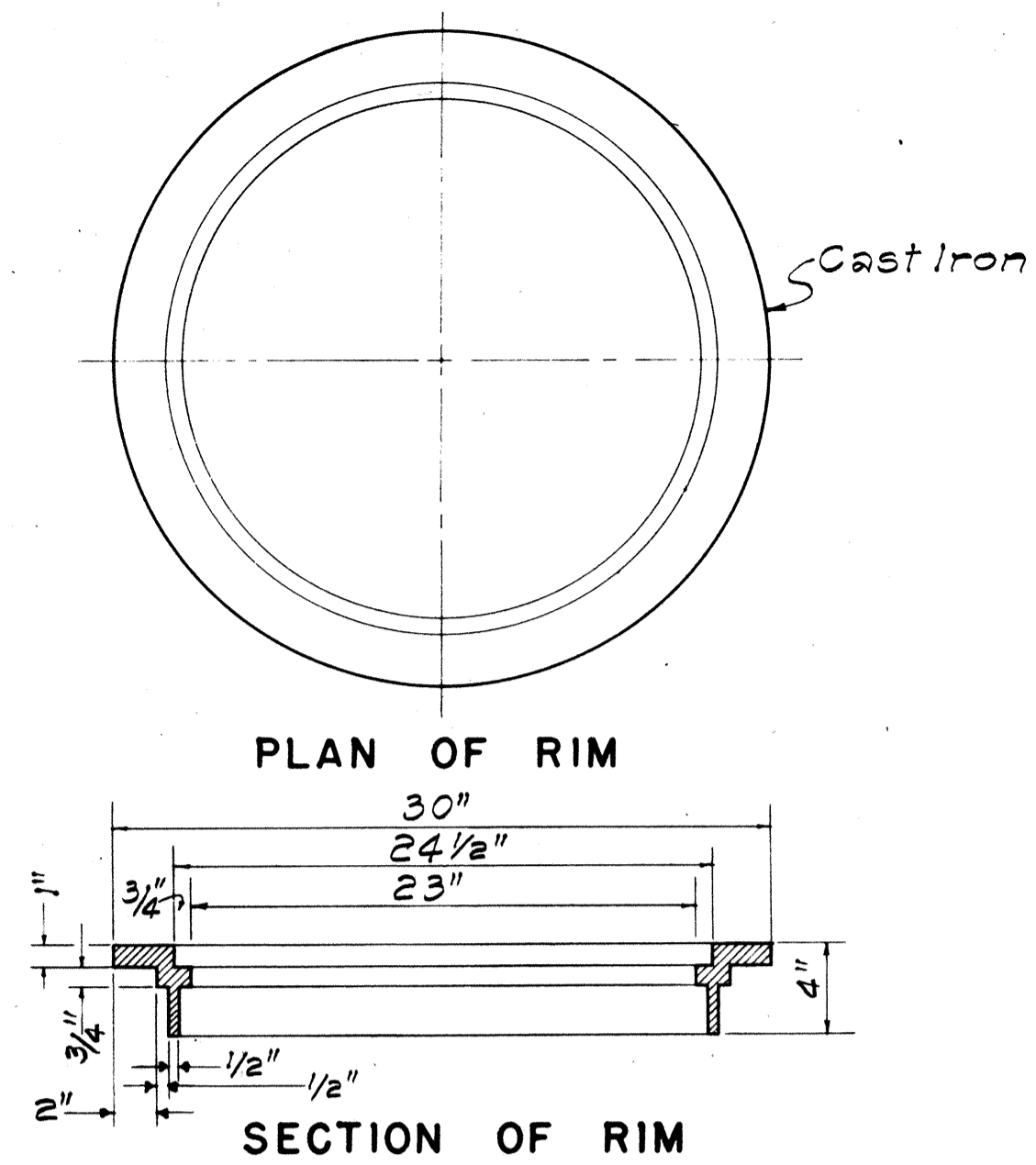
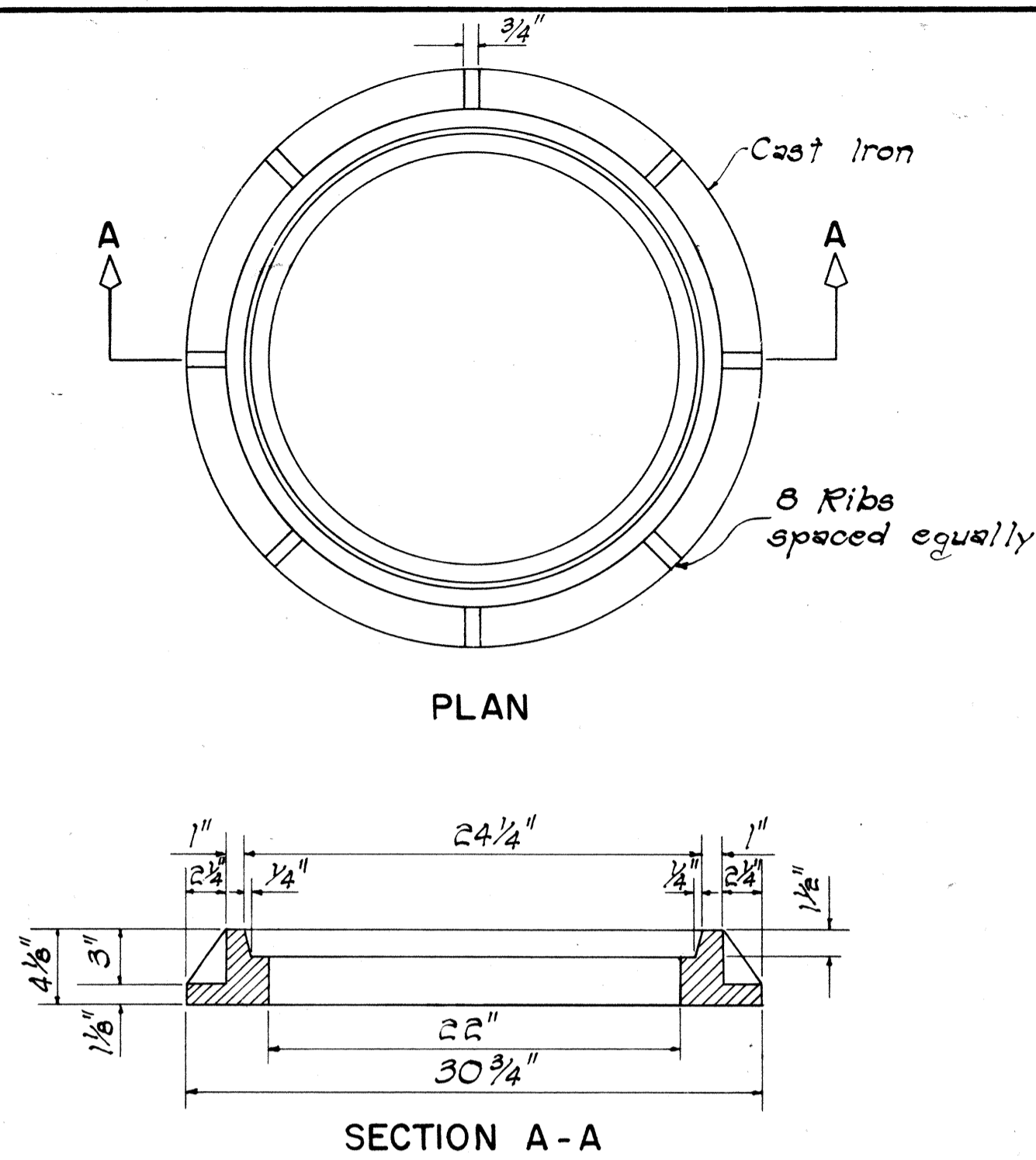
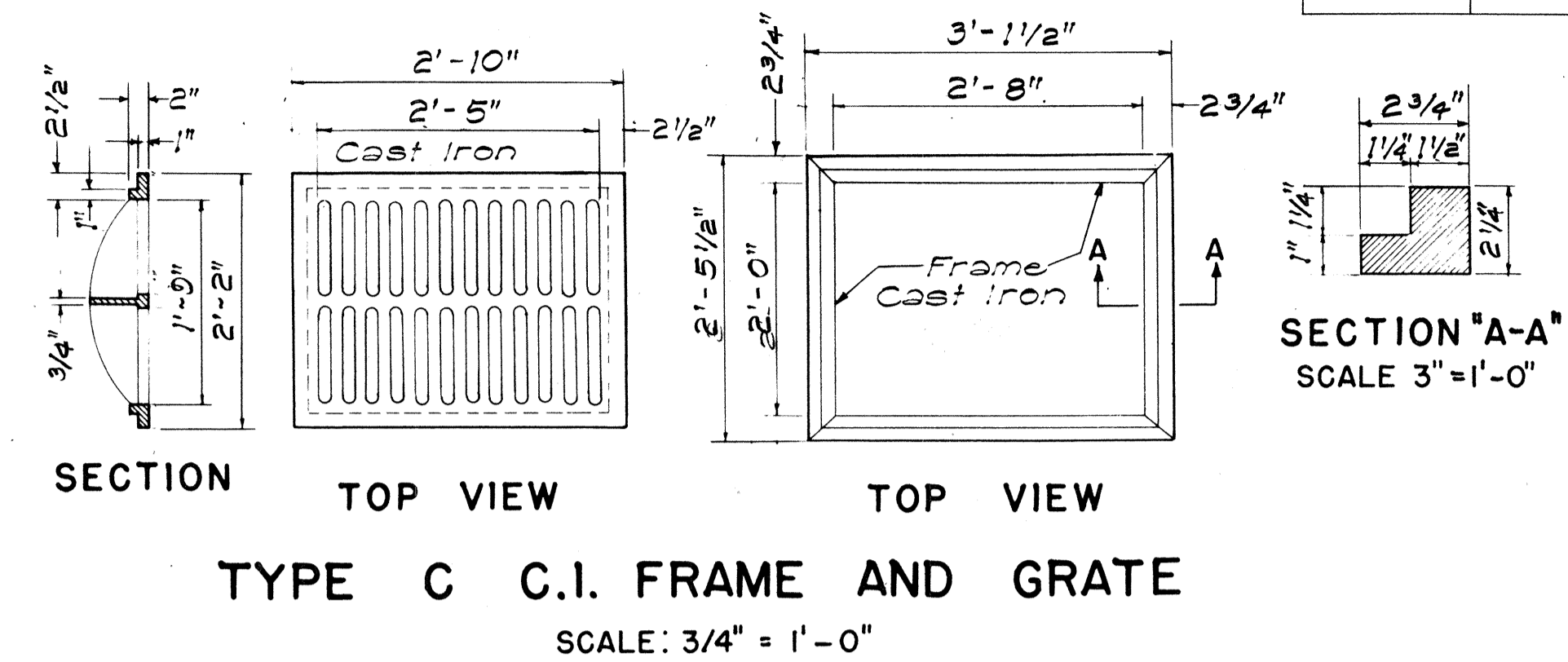
STATE OF HAWAII  
 DEPARTMENT OF TRANSPORTATION  
 HIGHWAYS DIVISION

STANDARD DETAILS  
 TYPE A-9 AND A-12  
 FRAMES AND GRATES

Scales: As Noted Date: Aug. 1968

SURVEY PLOTTED BY: [Name] DATE: 7/68  
 TRACED BY: [Name] DATE: 8/68  
 DESIGNED BY: [Name] DATE: 7/68  
 QUANTITIES BY: [Name] DATE: 8/68  
 CHECKED BY: [Name] DATE: 8/68  
 ORIGINAL PLAN NO. [Number]  
 NOTE BOOK NO. [Number]

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW	1-11-171	1974	6	61



APPROVAL RECOMMENDED:  
P. Takano 12-17-67  
HYDRAULIC DESIGN ENGINEER DATE

APPROVED:  
John S. S. S. 12-17-67  
ASSISTANT CHIEF, ENGINEERING DATE

NO.	REVISION	APPROVED BY	DATE
1.	Detail of Type "P" Cast Iron Frame and Cover	H.T.	1-6-11
2.	Details of Manhole Rungs to conform to O.S.H.A.	H.T.	1-21-15

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

STANDARD DETAILS  
CATCH BASIN AND  
MANHOLE CASTINGS

Scale: As Noted Date: July, 1969  
SHEET NO 6 OF 6 SHEETS DH 6

DATE: \_\_\_\_\_  
SURVEY PLOTTED BY: \_\_\_\_\_  
DRAWN BY: A. Calisto  
CHECKED BY: \_\_\_\_\_  
ORIGINAL PLAN NOTE BOOK NO. \_\_\_\_\_