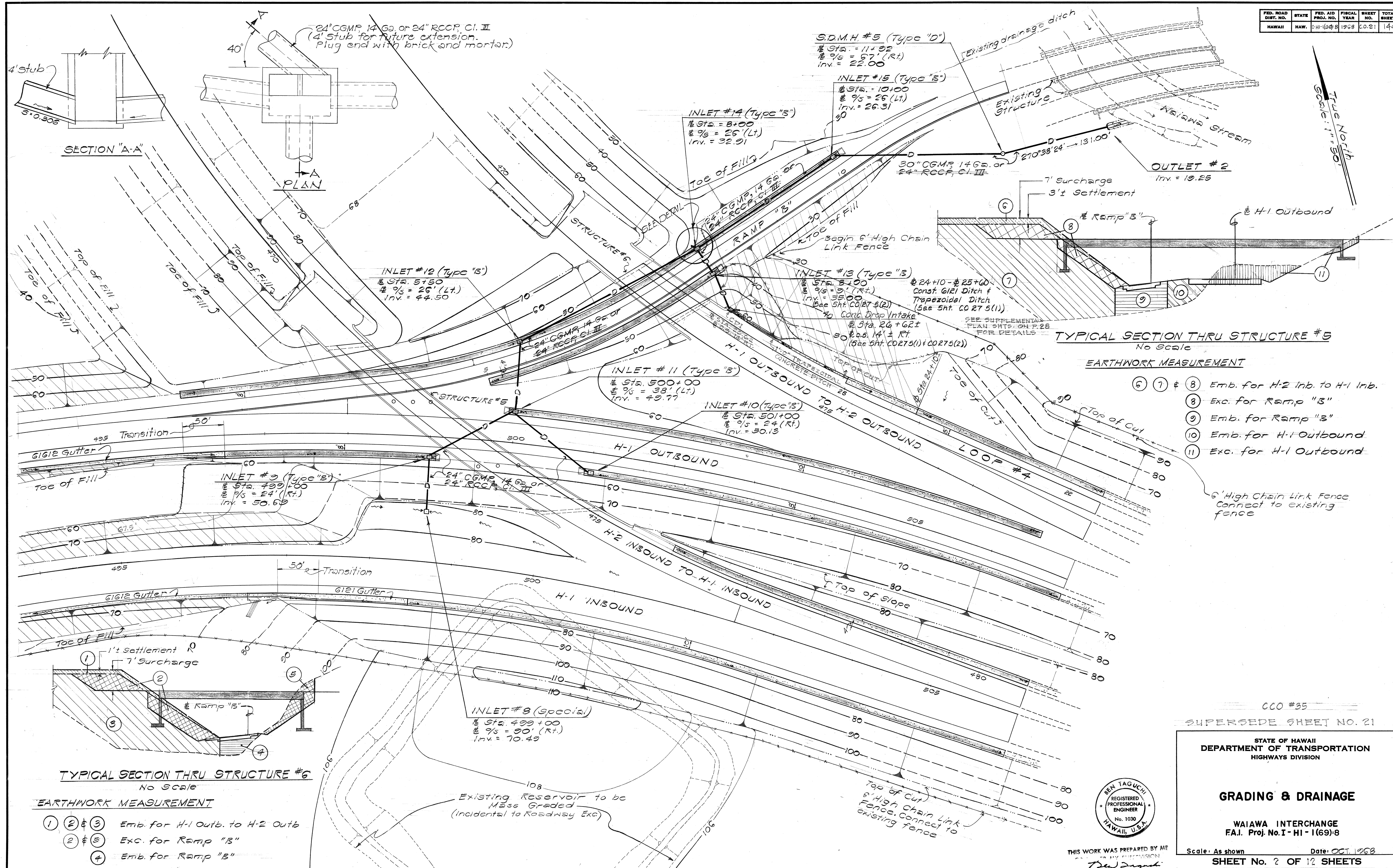


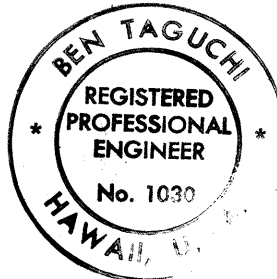


FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(69)8	1968	C.O. 22	144

DRAINAGE ESTIMATED QUANTITIES

ITEM NO.	14.01	15.01	20A.01	46.101	46.201	48.01	54A.06	54A.07	59A.152	59A.210	59A.498	59A.500	59A.782	59A.724	62.01	97.10	98.01
ITEM	Structure Excavation other than at bridges	Ditch and Channel Excavation	Unretained Base for Pipe Foundation	Class A-1 Concrete other than in Bridges	Class B-1 Concrete other than in Bridges	Reinforcing Steel other than in Bridges	Modified Type A-12 Steel Frame and Grates	Type B Steel Grate	24 Inch. CGMP 14 Ga. or 24 Inch. RCP, Class III	30 Inch. CGMP 14 Ga. or 24 Inch. RCP, Class III	48 Inch. CGMP 12 Ga. or 42 Inch. RCP, Class III	48 Inch. CGMP 12 Ga. or 42 Inch. RCP, Class III	60 Inch. CGMP 10 Ga. or 60 Inch. RCP, Class III	60 Inch. CGMP 10 Ga. or 60 Inch. RCP, Class III	Cement Rubble Masonry	Brick Wall for Storm Drain Manholes	Type A Cast Iron Frame and Cover
UNIT USED	Cu. Yd.	Cu. Yd.	Cu. Yd.	Cu. Yd.	Cu. Yd.	Lb.	Each	Each	Lin. Ft.	Lin. Ft.	Lin. Ft.	Lin. Ft.	Lin. Ft.	Lin. Ft.	Cu. Yd.	Lin. Ft.	Each
CHANNEL		259		53													
INLET #1	165.55 198		0 42	4.87 4		278.64 278		1			72 77						
S.D.M.H. #1	214.79 169		0 8		2.20 4	121 138					50 53					4.0	1
INLET #2	218		16	6		639	1				25.5 100						
INLET #3	57.98 71		5	6		704	1				20.2 29						
INLET #4	23.65 37		4	4		223	1		28 35								
S.D.M.H. #2	402.89 564		0 41	23.60 23		2934.11 2500							191.0 204				1
INLET #5	271.31 271		0 24	4.22 3		20197 252					150.3 150						
INLET #6	347.01 558		0 48	4.61 5		33724 387	1				297.5 303						
S.D.M.H. #3	238.94 188		0 13	14.80 15		164502 1317							60 63				1
INLET #7	367.18 302		11.57 15	10		1210.74 1008	1						72 76				
S.D.M.H. #4	248.49 217		6.24 10	22.24 21		20777 1790							38.5 49				1
OUTLET #1	60.82 20	2.22 2													20.66 25		
INLET #8	113		7	5		330		1	66								
INLET #9	145		13	5		246	1		115								
INLET #10	144		13	5		223	1		119								
INLET #11	92		10	7		726	1		85								
INLET #12	215		27	5		246	1		242								
INLET #13	42		4	5		223	1		35								
INLET #14	102.08 160		22	5		577	1		125.6 264								
INLET #15	177.01 183		0 23	5		633	1			207.6 205							
S.D.M.H. #5	101.85 129		0 15		0.66 +	32				131						5	1
OUTLET #2	102.9 5	17.33 22													707 5		
24" CONC. SPILLWAY W/ CONC. DROP BOX	20				13												
TOTAL	4084	283	330	193	2.66 15	12,472	11	3	901	338.6 336	23770 259	4478 453	1705 188	1910 204	2773 30	11.0 9	5

CLASS A-1 CONCRETE (46.113 A1) OR SHOTCRETE DITCH (119.01 A2)			
ROAD	STATION		Cu. Yd.
	FROM	TO	
H-1 Inbound	487+58	490+00 (Lt.)	25
H-1 Inbound	498+50	506+12.08 (Rt.)	78
H-1 Outbound	496+50	489+92 (Rt.)	25
H-1 Outbound	501+08	506+97.22 (Rt.)	60
H-1 Outbound	500+08	506+50 (Lt.)	67
H-1 Inb. to H-2 Outb.	485+50	487+17 (Rt.)	17
H-1 Inb. to H-2 Outb.	489+88	493+90 (Lt.)	29
H-2 Inb. to H-1 Inb.	476+00	480+60.31 (Lt.)	47
Ramp "B"	1+25	5+42 (Lt.)	42
Ramp "B"	5+58	7+92 (Lt.)	24
Ramp "B"	5+00	7+92 (Rt.)	30
Ramp "B"	8+08	9+92 (Lt.)	19
Loop #5	1+10	3+22 (Rt.)	22
Loop #5	3+38	10+00 (Rt.)	67
Loop #4	21+60.09	24+10 (Rt.)	25
Loop #5	10+00	16+50 (Rt.)	33
H-1 Inbound	491+60	496+90 (Rt.)	27
H-1 Inbound	496+90	498+50 (Rt.)	16
H-1 Outbound	488+96.25	496+50 (Rt.)	38
		Total	692



THIS WORK WAS PREPARED BY ME
OR UNDER MY SUPERVISION.

Ben Taguchi

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE ESTIMATED
QUANTITIES

WAI'AWA INTERCHANGE
F.A.I. Proj. No. I-HI-1(69)8

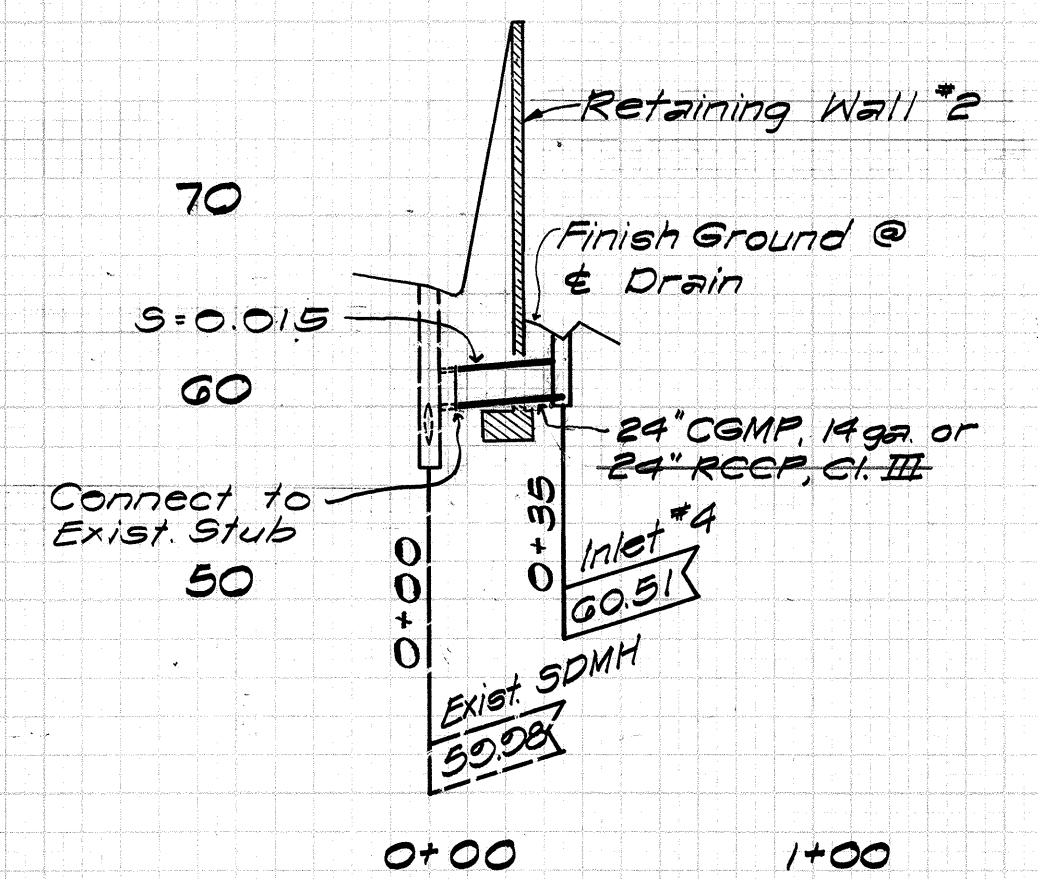
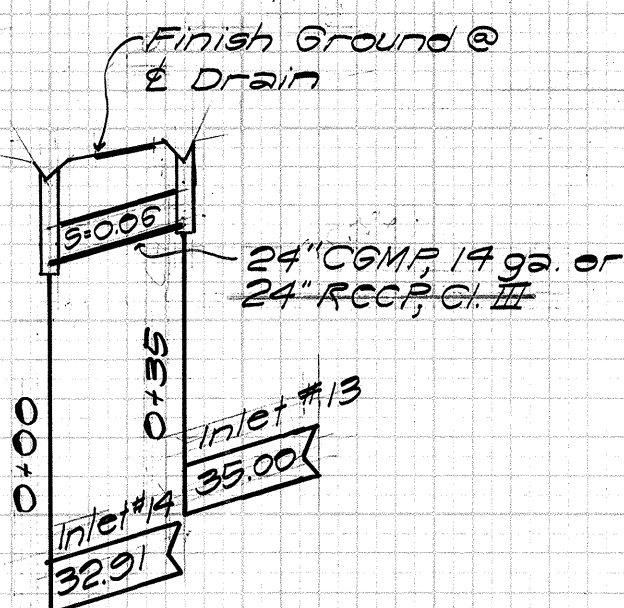
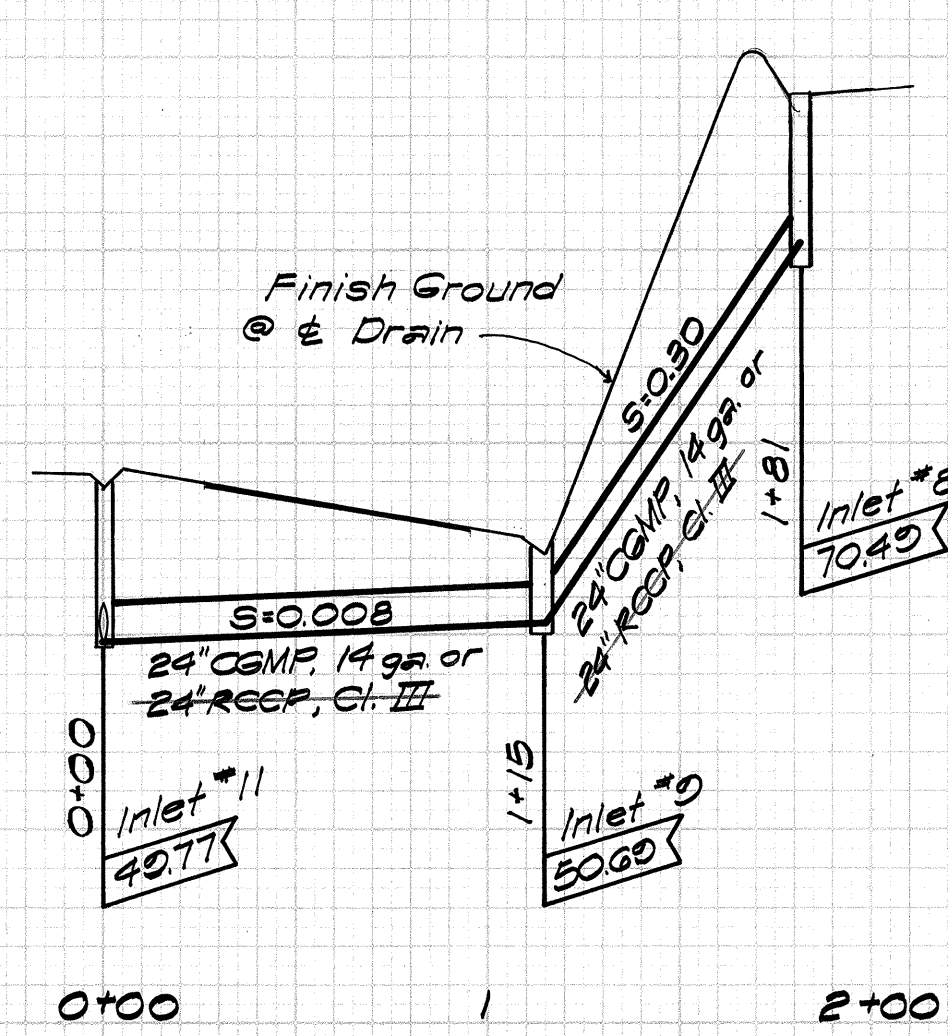
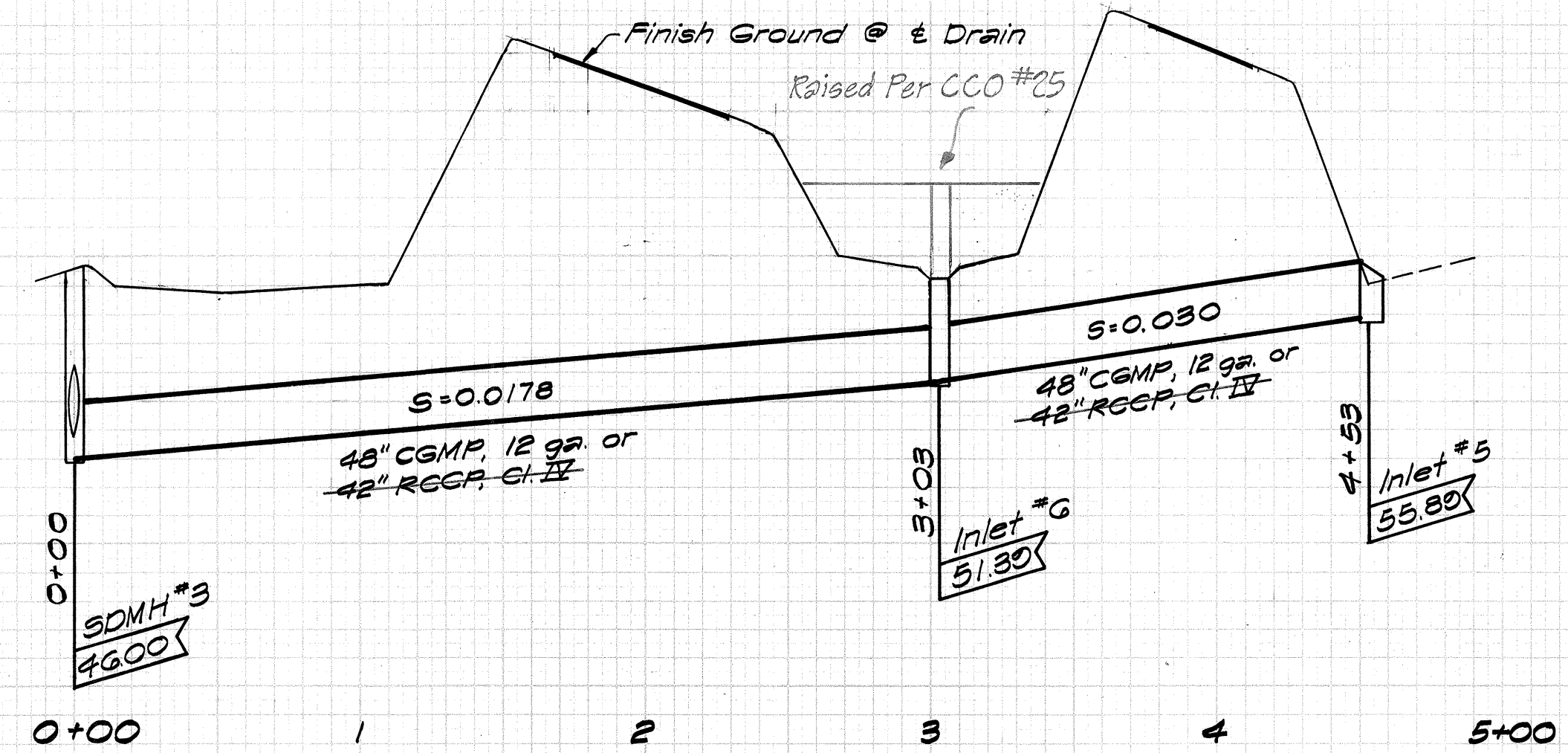
Scale: As Shown Date: OCT. 1968

SHEET No. 3 OF 12 SHEETS

JUNE 19, 1969

C O 22

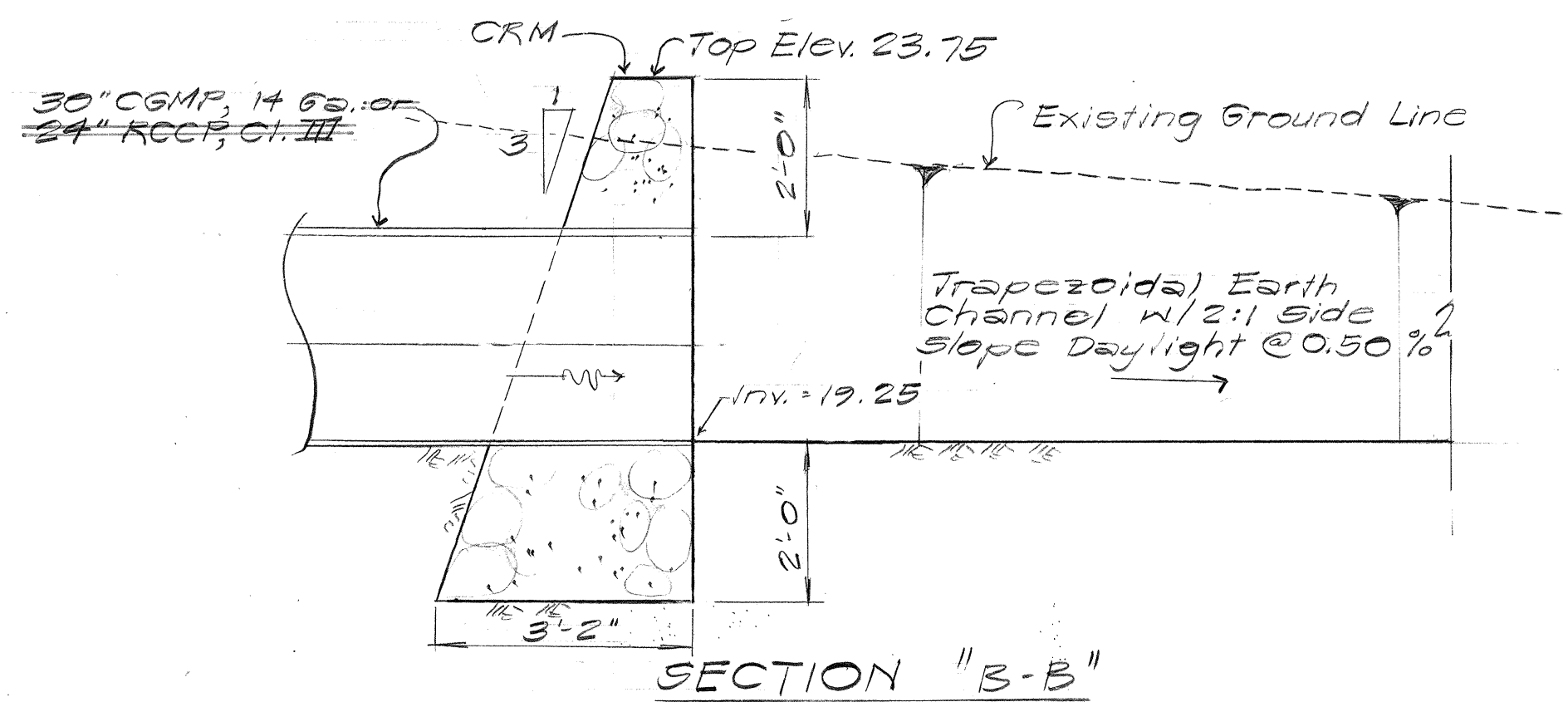
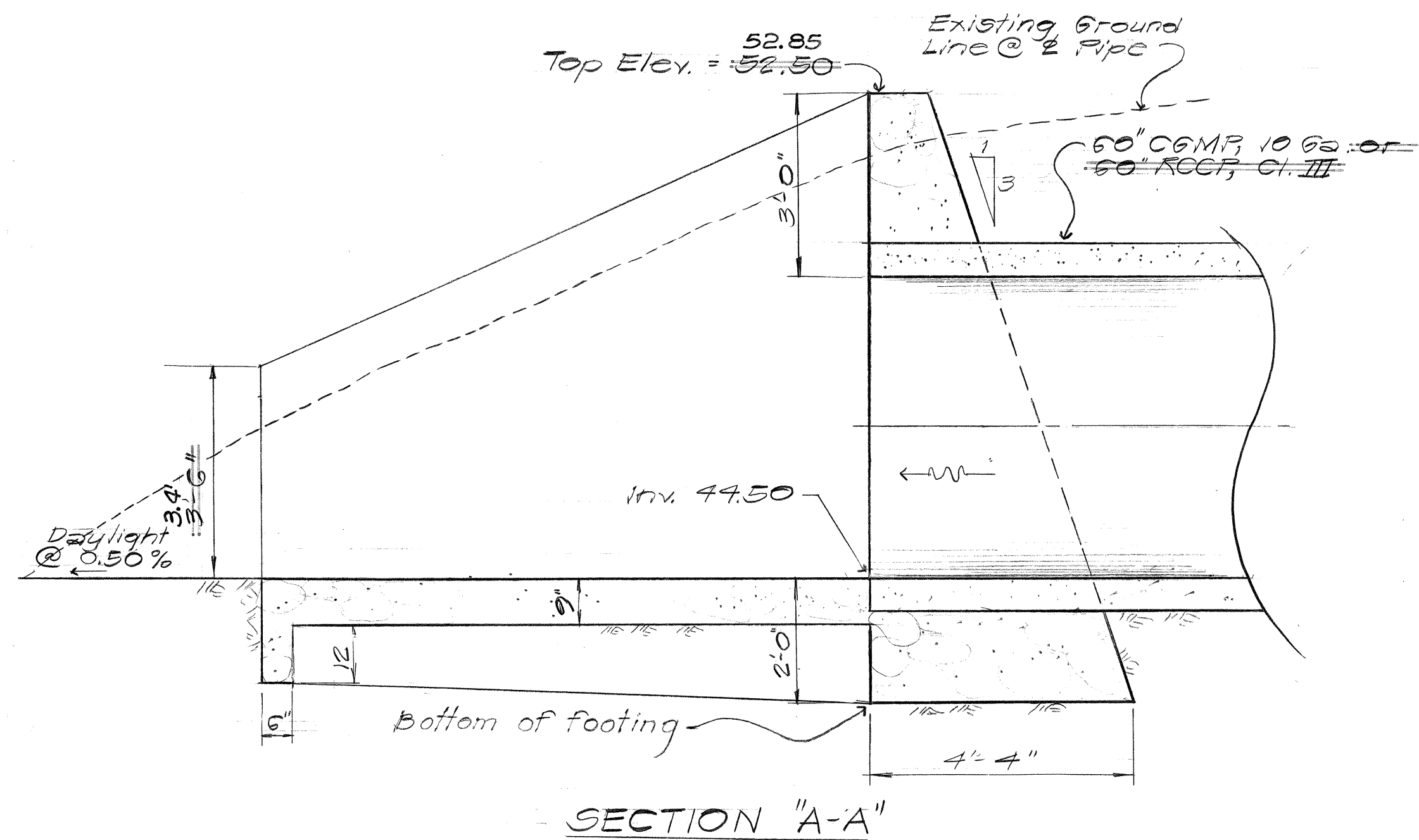
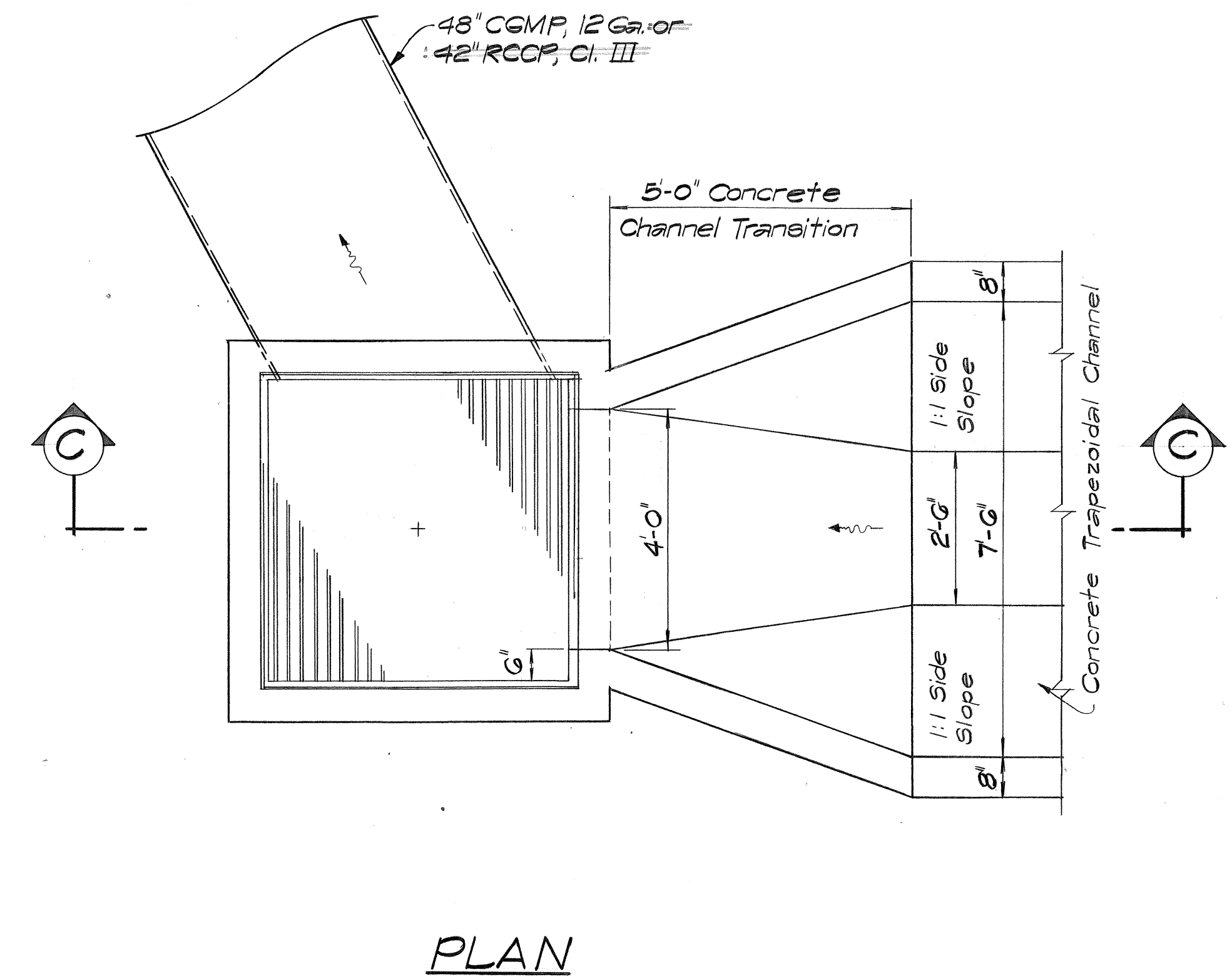
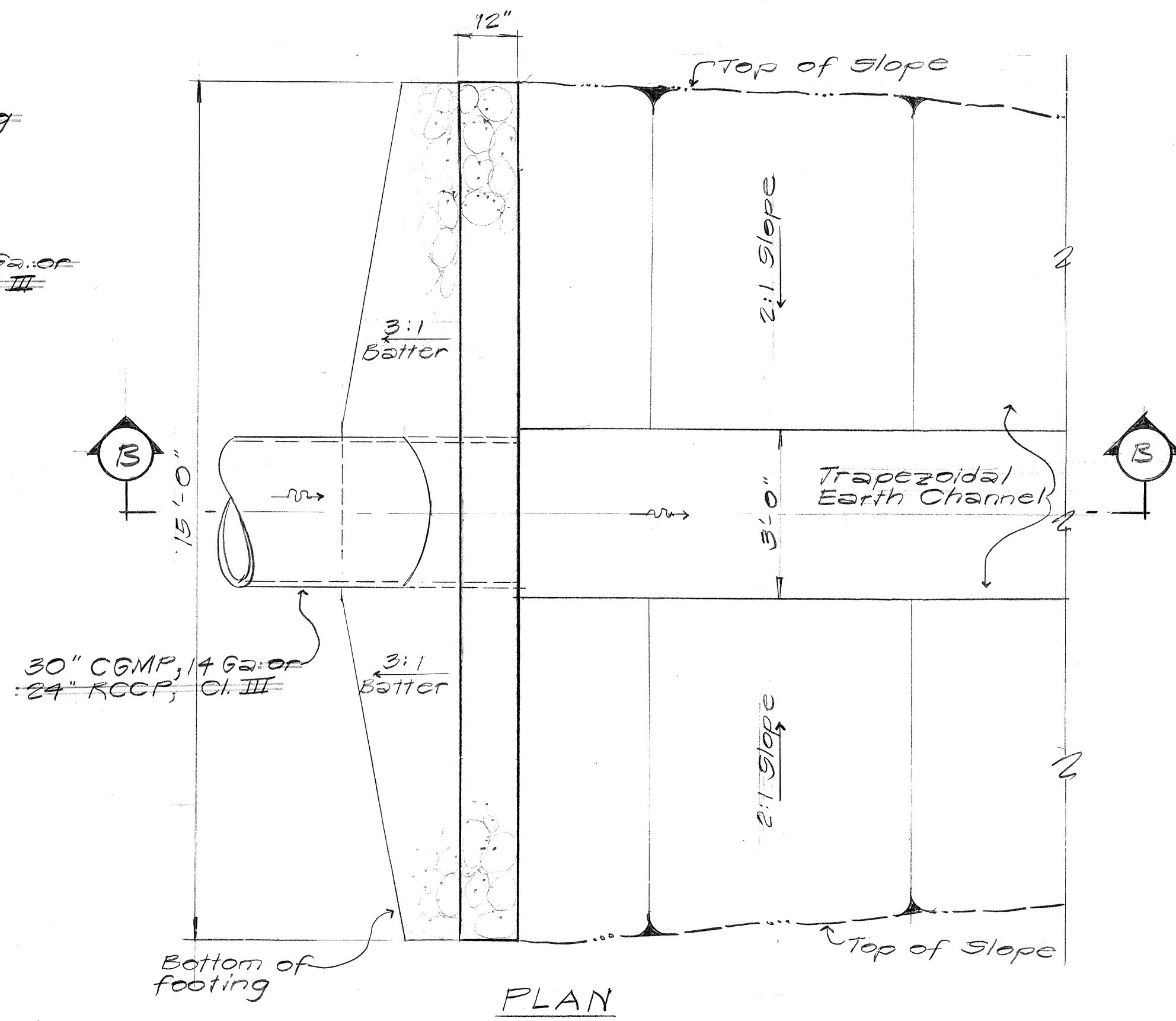
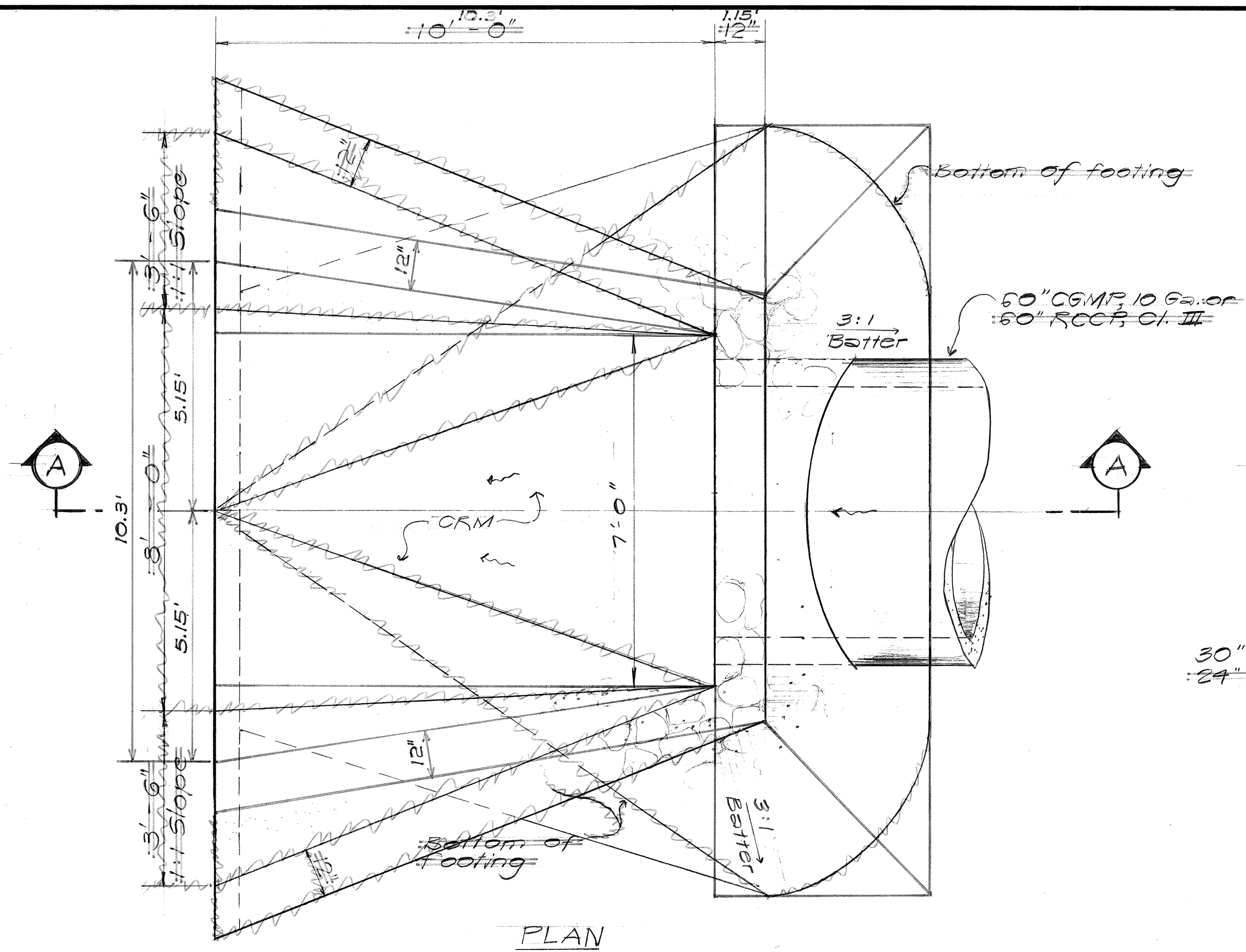
ORIGINAL PLAN	DATE
DESIGNED BY	
NOTED BY	
QUANTITIES BY	
CHECKED BY	

A circular professional engineer seal for Ben Taguchi. The outer ring contains the name "BEN TAGUCHI" at the top and "HAWAII, U.S.A." at the bottom. The inner circle contains the text "REGISTERED PROFESSIONAL ENGINEER" and the number "No. 1030". There are small stars on either side of the inner text.

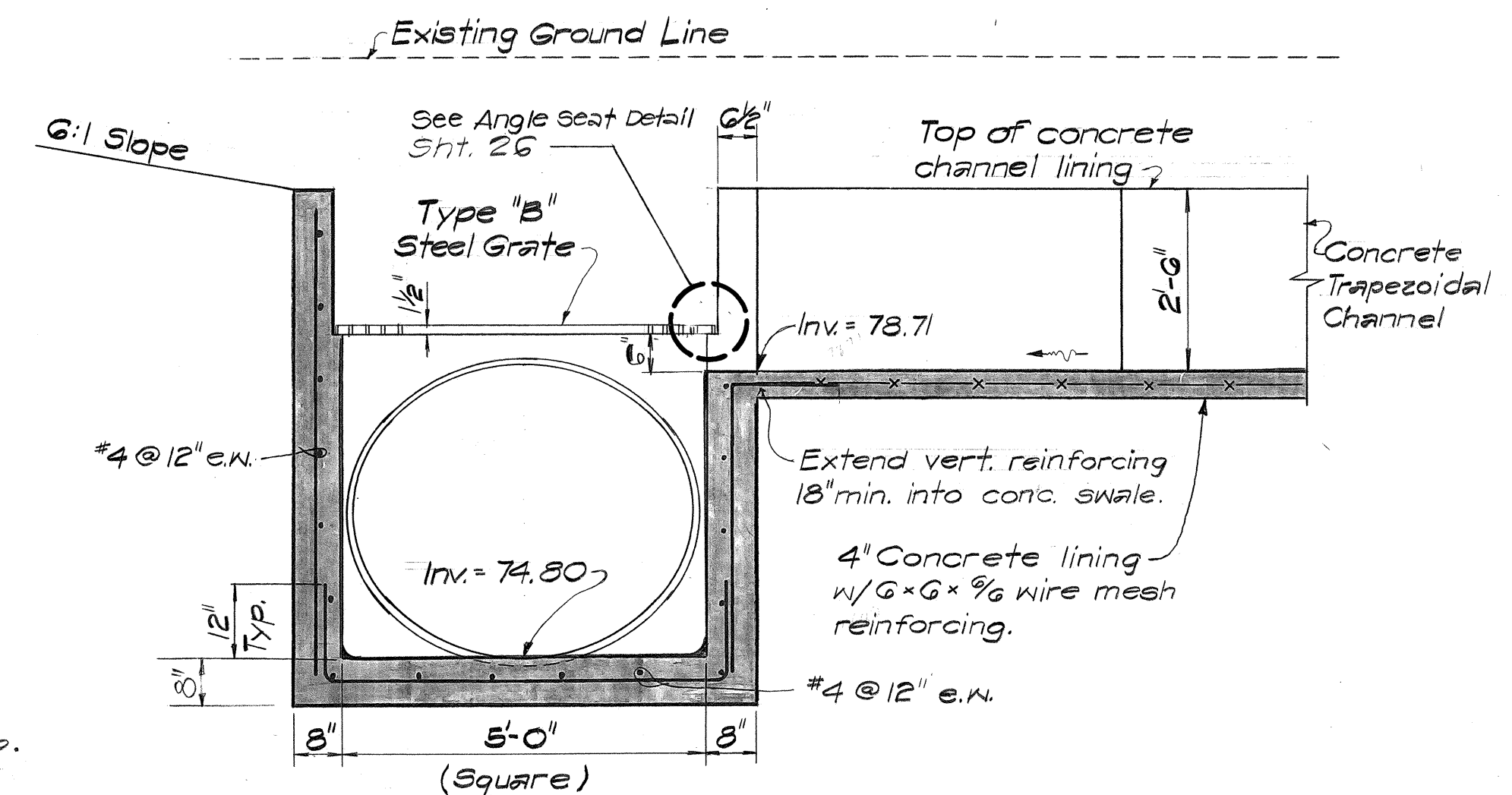
Ben Ingwersen

Scale: As shown Date: OCT. 1968
SHEET NO. 4 OF 12 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(69)8	1968	60.25	144

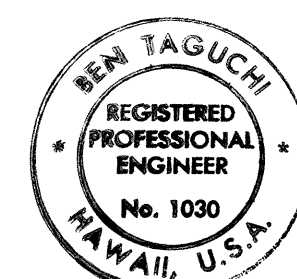
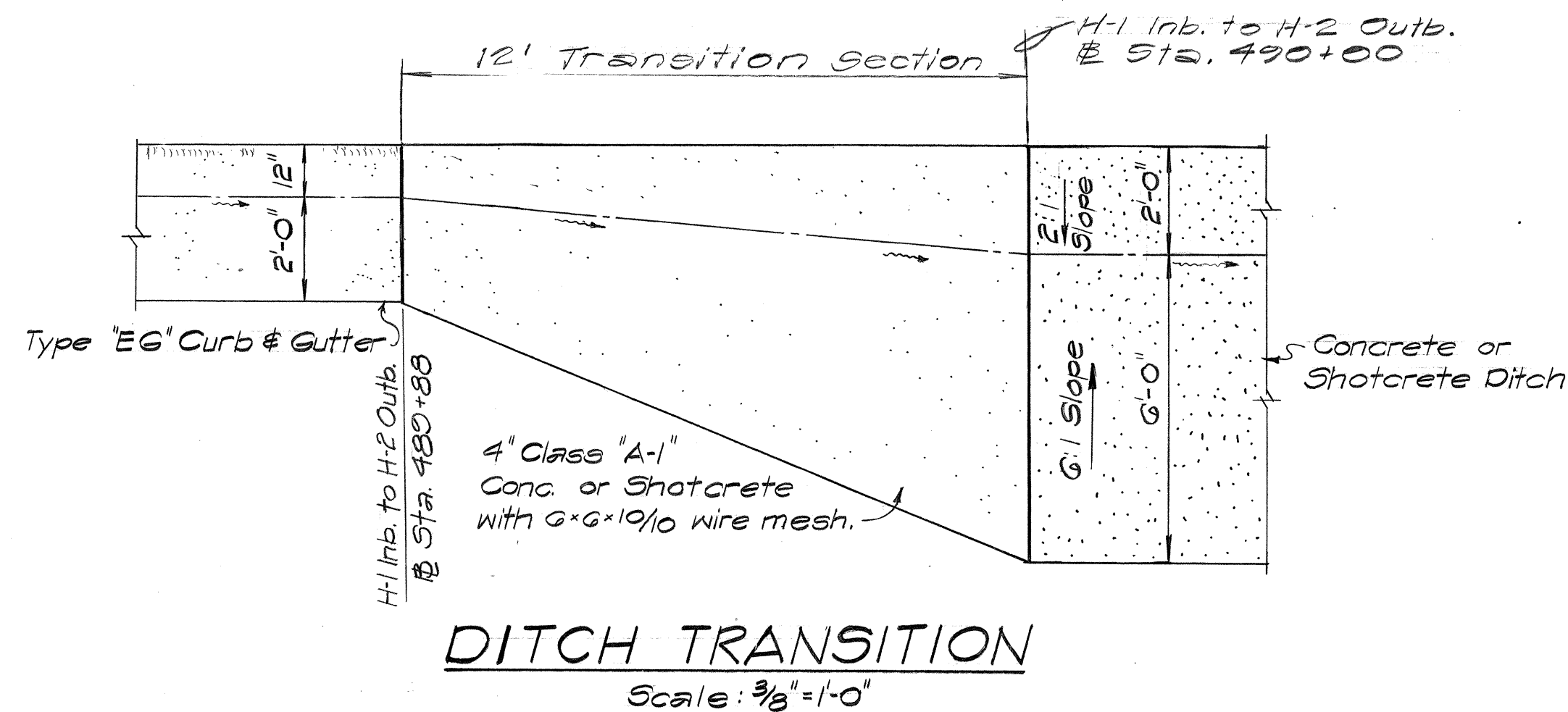


DETAIL OUTLET #2
Scale: 1/2" = 1'-0"



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

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



THIS WORK WAS PREPARED BY ME
OR UNDER MY SUPERVISION
Ken Taguchi

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS

WAIAWA INTERCHANGE
F.A.I. Proj. No. I-HI-1(69)8

Scale: As Shown Date: OCT. 1968
SHEET NO. 6 OF 12 SHEETS

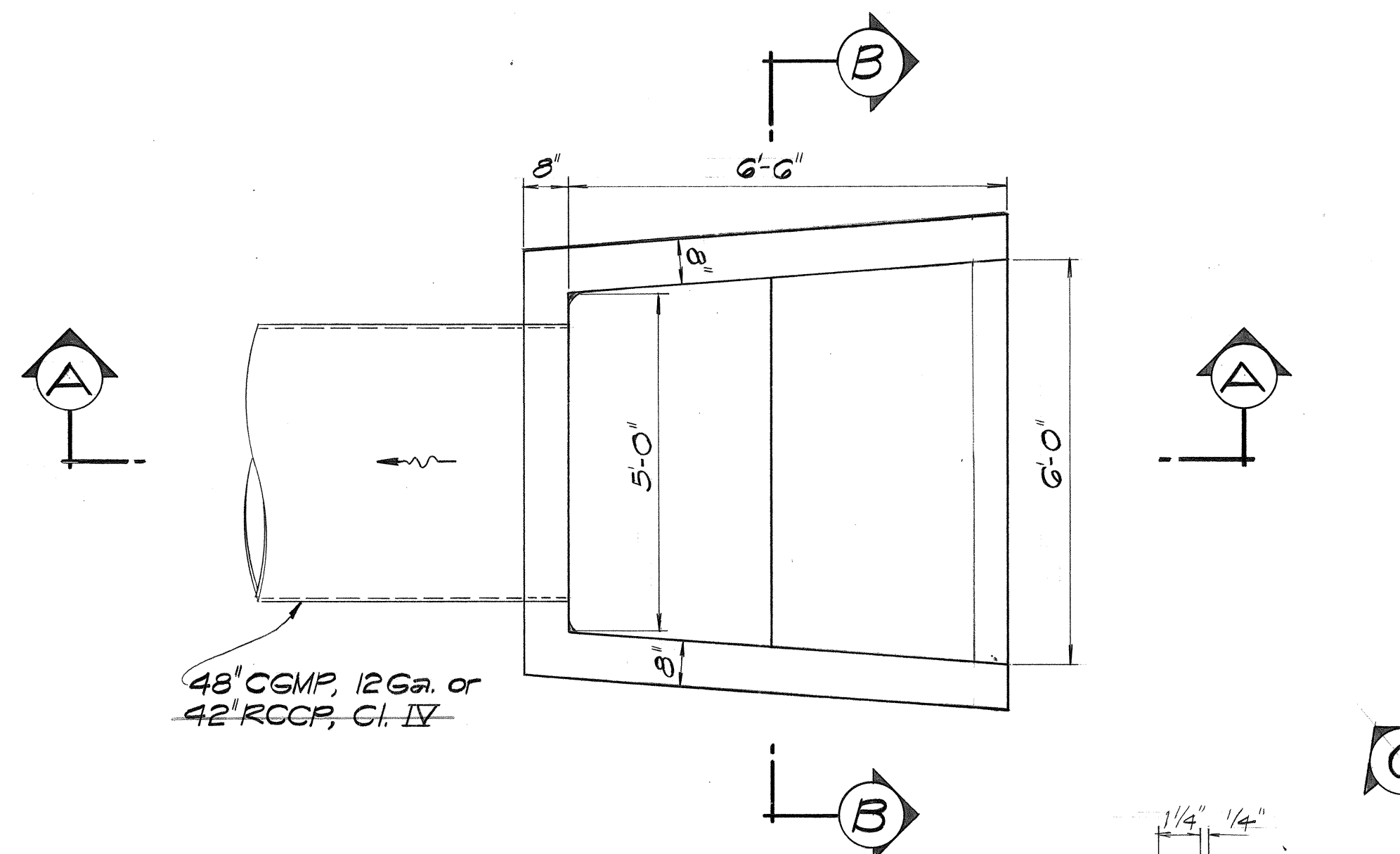
"AS-BUILT"

JUNE 19, 1969

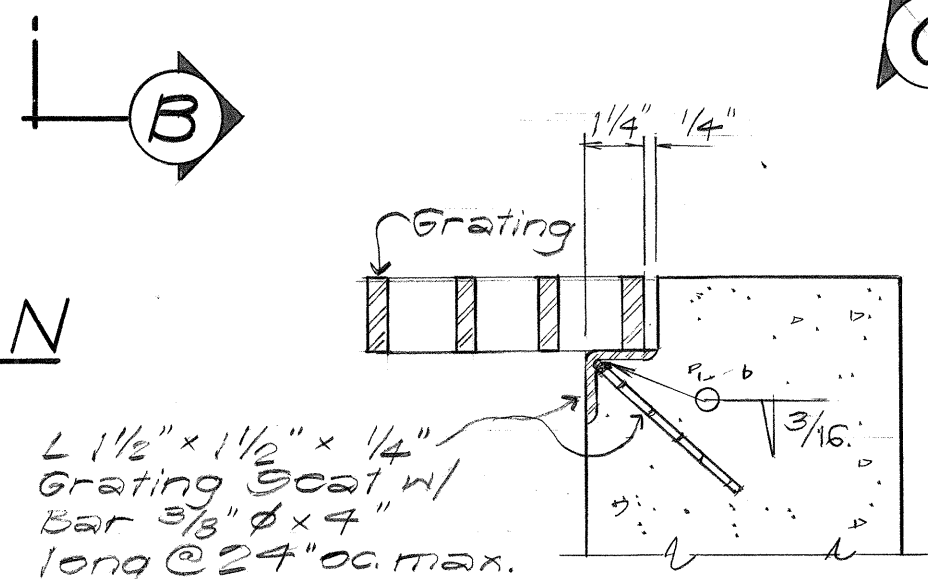
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DATE	
DESIGNED BY	
CHECKED BY	
NOTED BY	
ORIGINAL PLAN	
NOTE BOOK	
NO.	

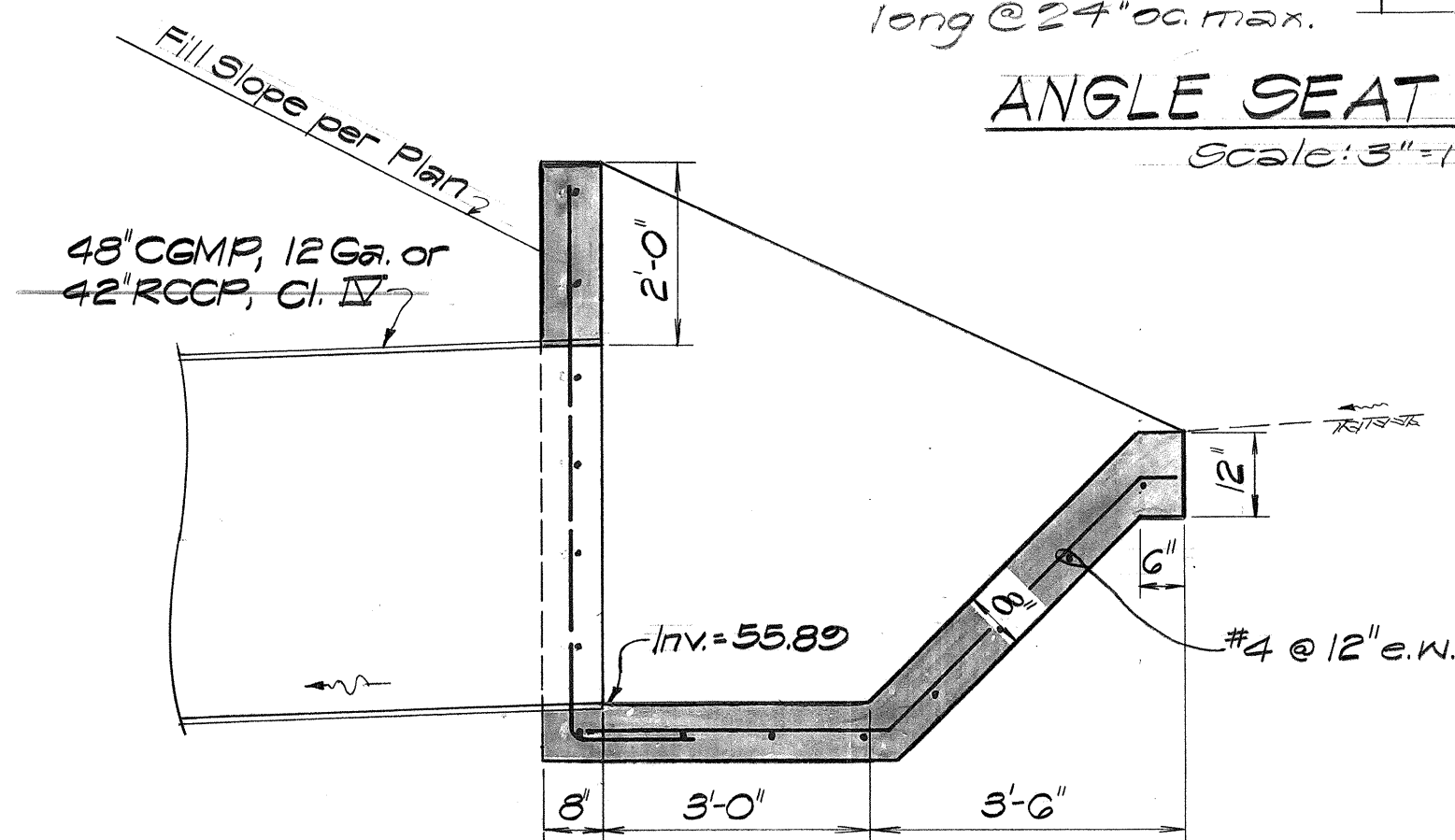
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(69)8	1968	26	144



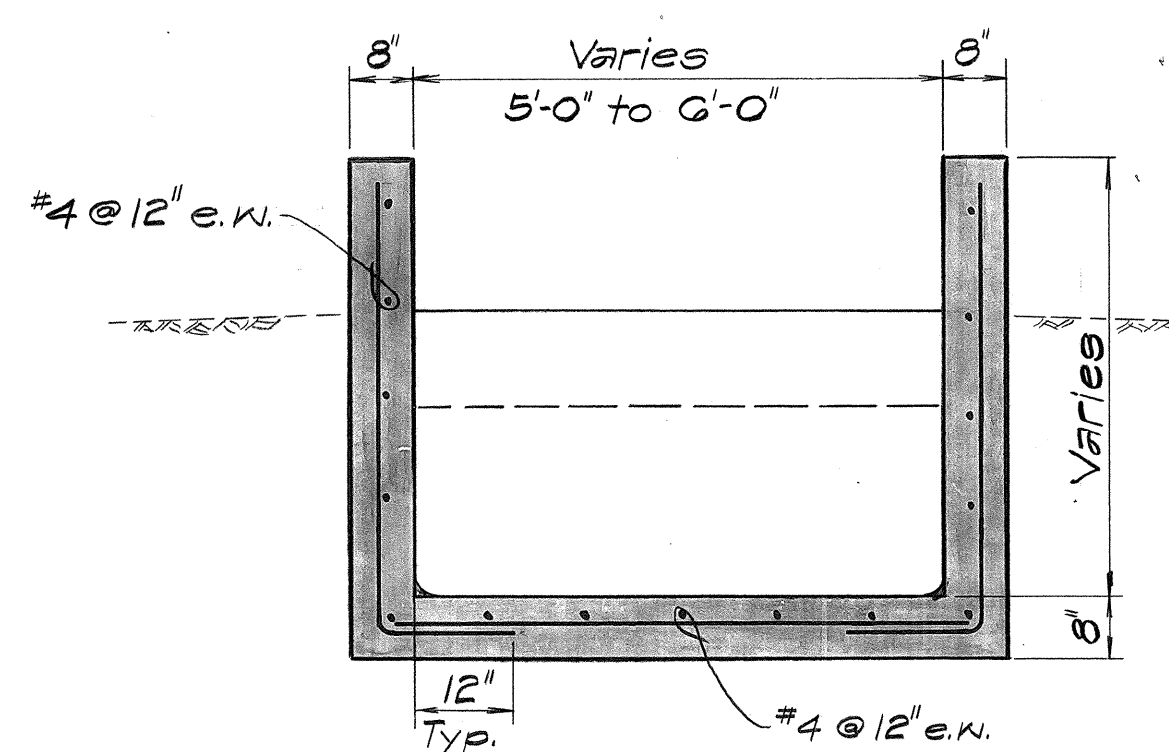
PLAN



ANGLE SEAT DETAIL



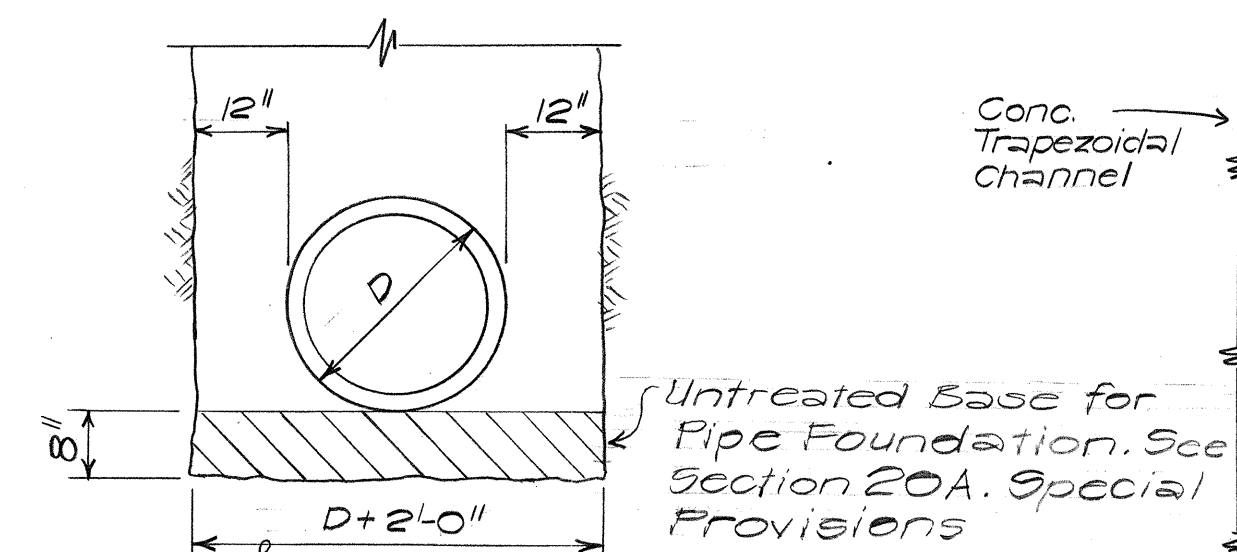
SECTION "A-A"



SECTION "B-B"

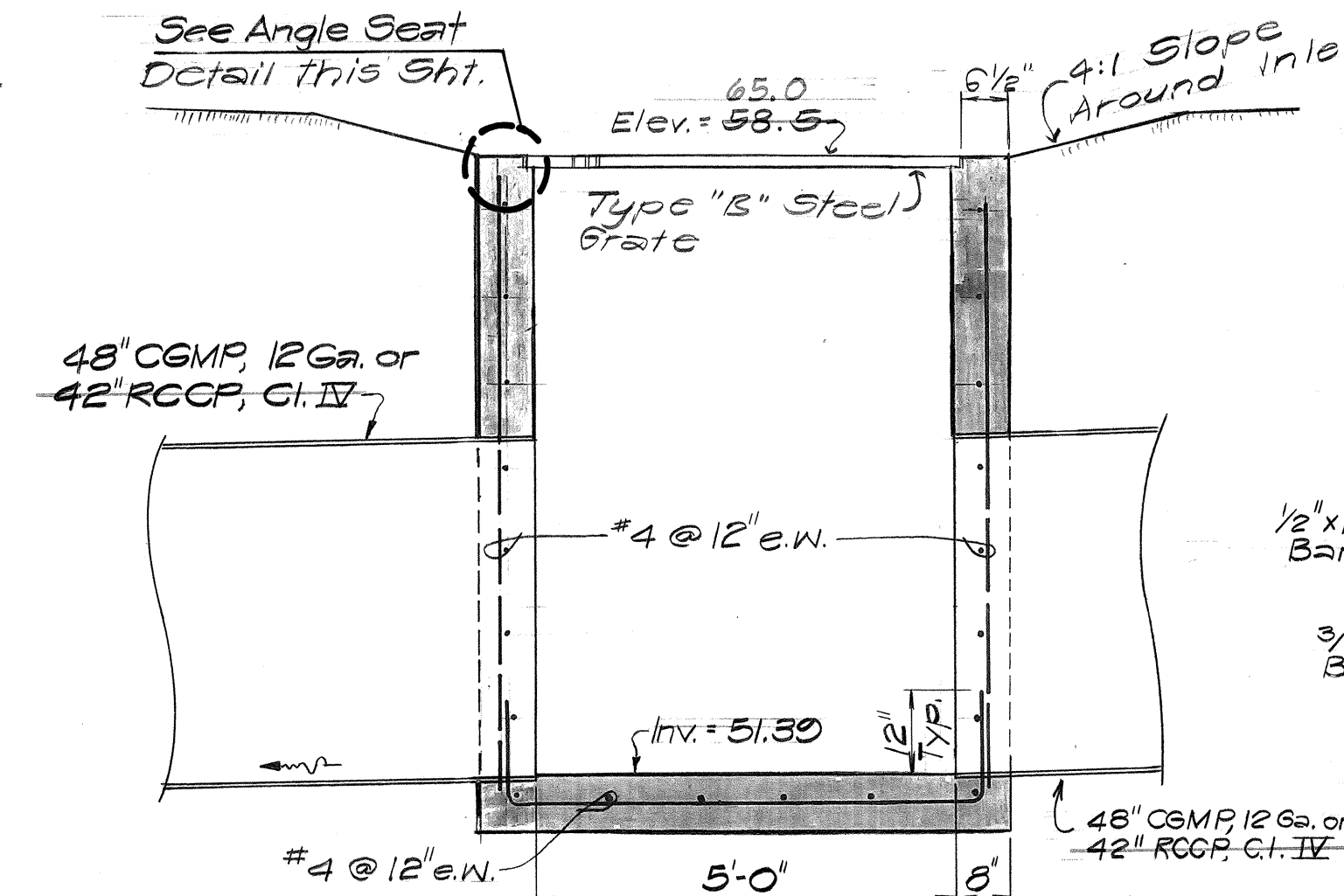
DETAIL INLET #5

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



TYPICAL TRENCH BEDDING

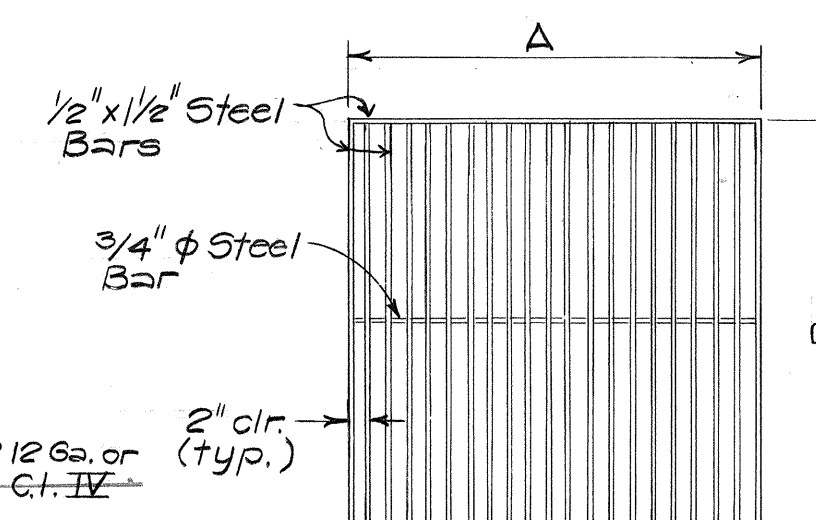
Scale: 1/2"=1'-0"



SECTION "C-C"
DETAIL INLET #6

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

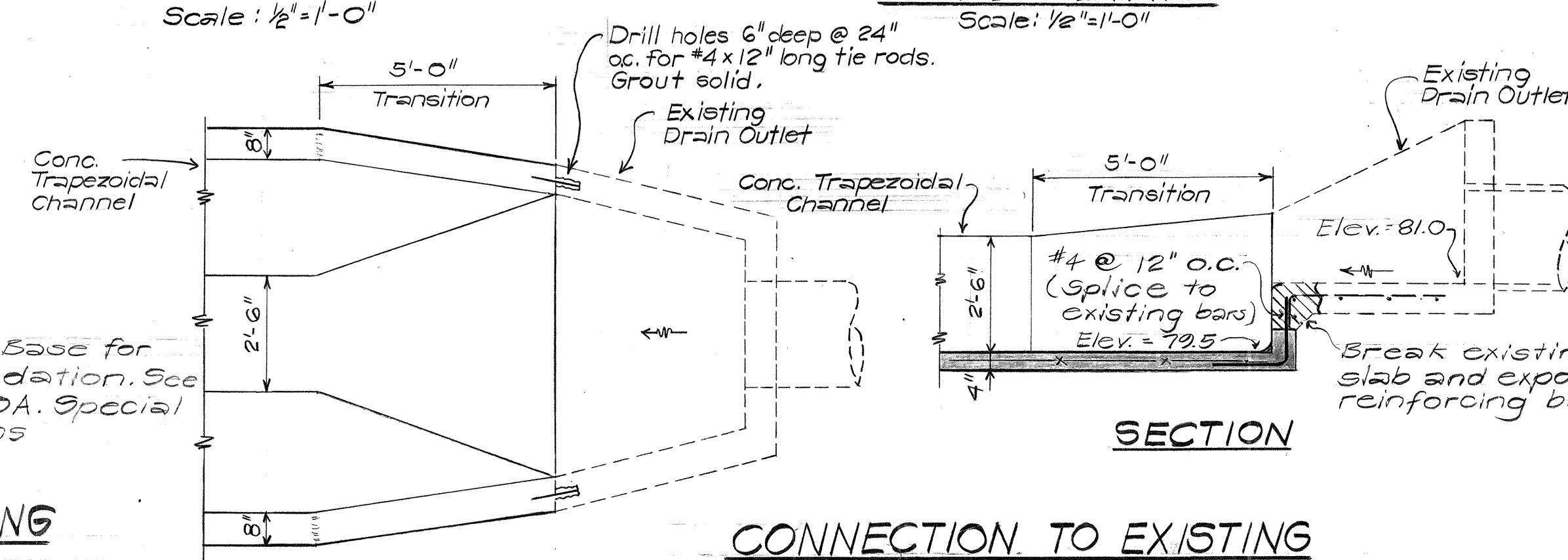
ITEM	A	B
Inlet #1	5'-2 1/2"	5'-2 1/2"
Inlet #6	5'-5 1/2"	5'-2 1/2"
Inlet #8	4'-2 1/2"	4'-2 1/2"



TYPE "B" STEEL
GRATE DETAIL

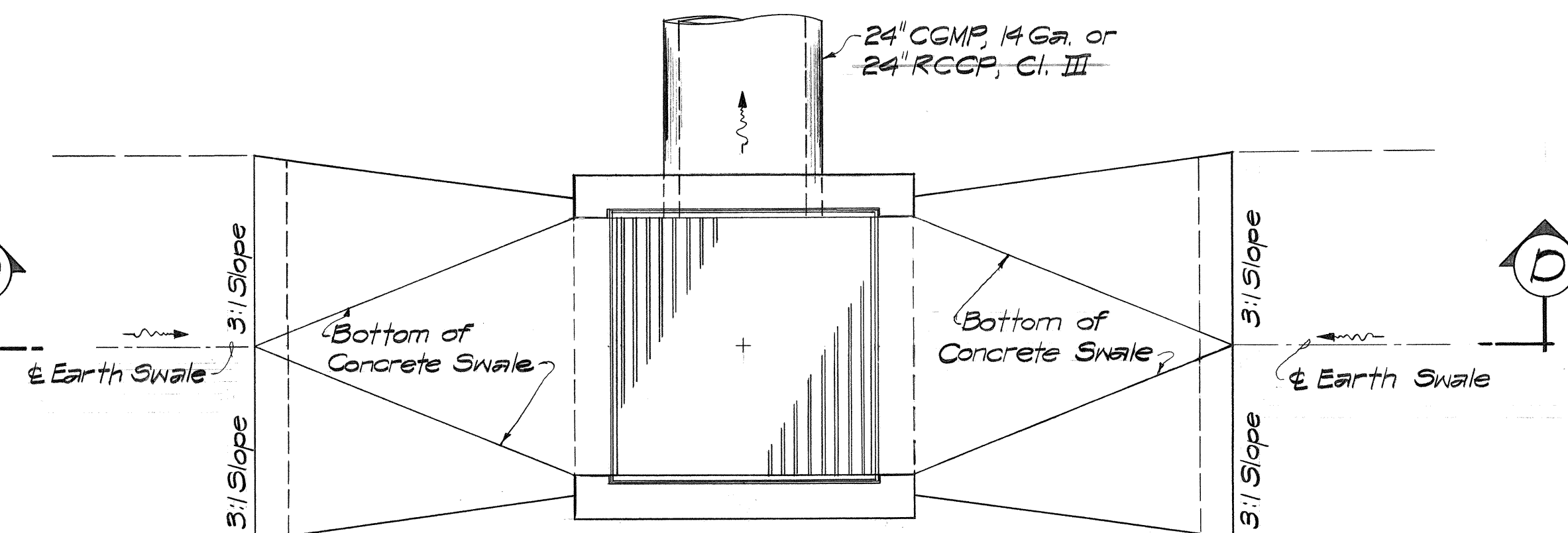
Scale: 1/2"=1'-0"

- NOTES:
1. All bar connections shall be arc-welded.
 2. Entire gate shall be galvanized

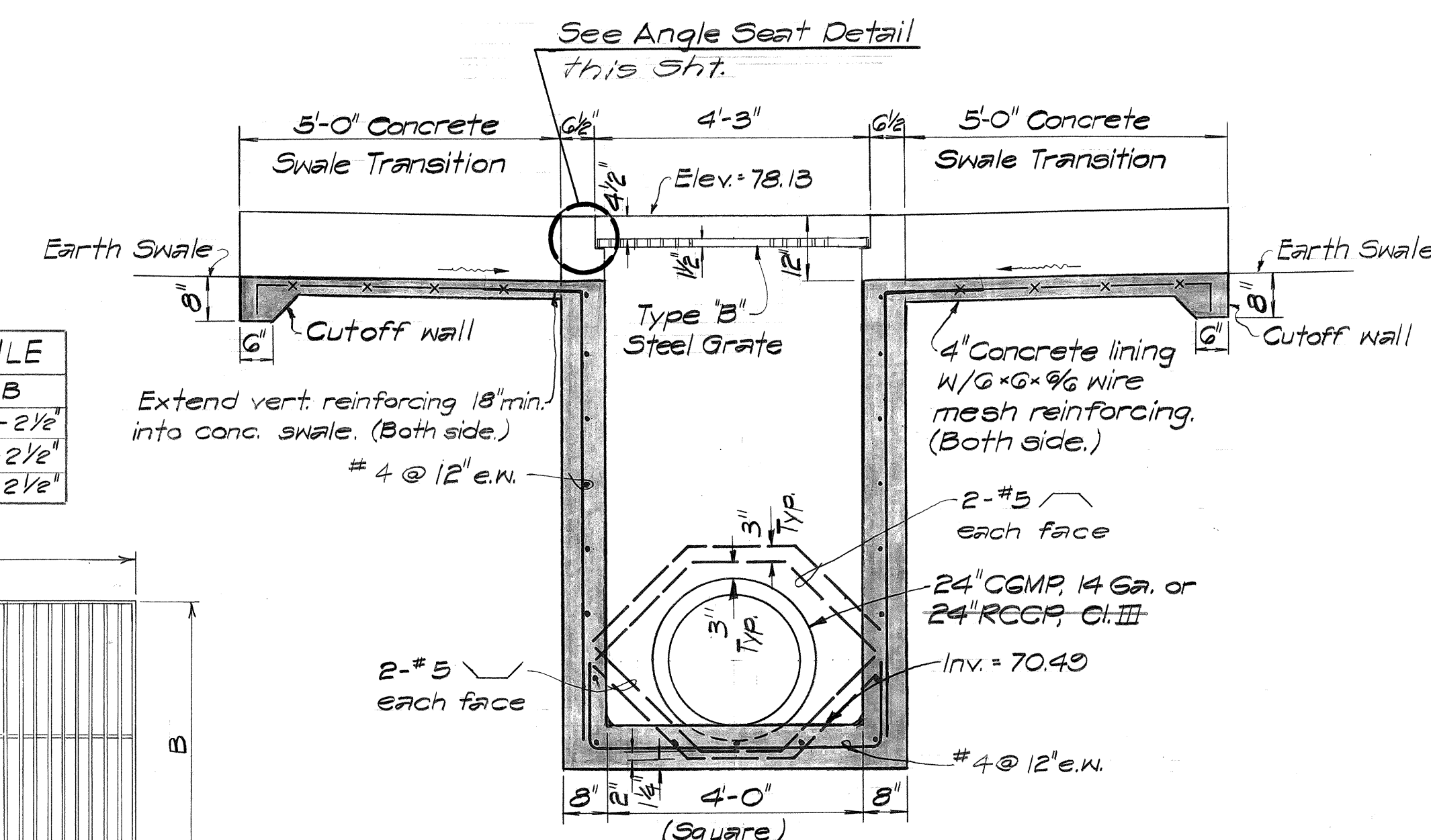


CONNECTION TO EXISTING
DRAIN OUTLET

Scale: 3/8"=1'-0"



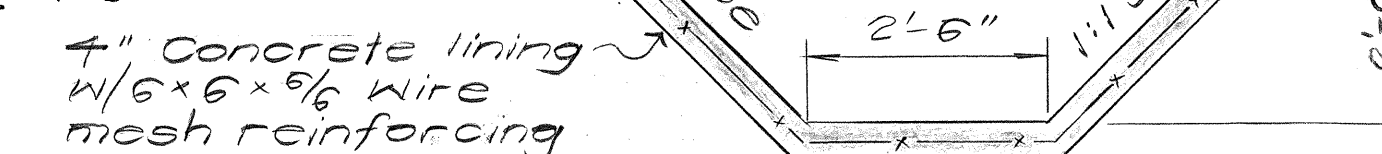
PLAN



SECTION "D-D"

DETAIL INLET #8

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



TYPICAL CONCRETE
TRAPEZOIDAL CHANNEL

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

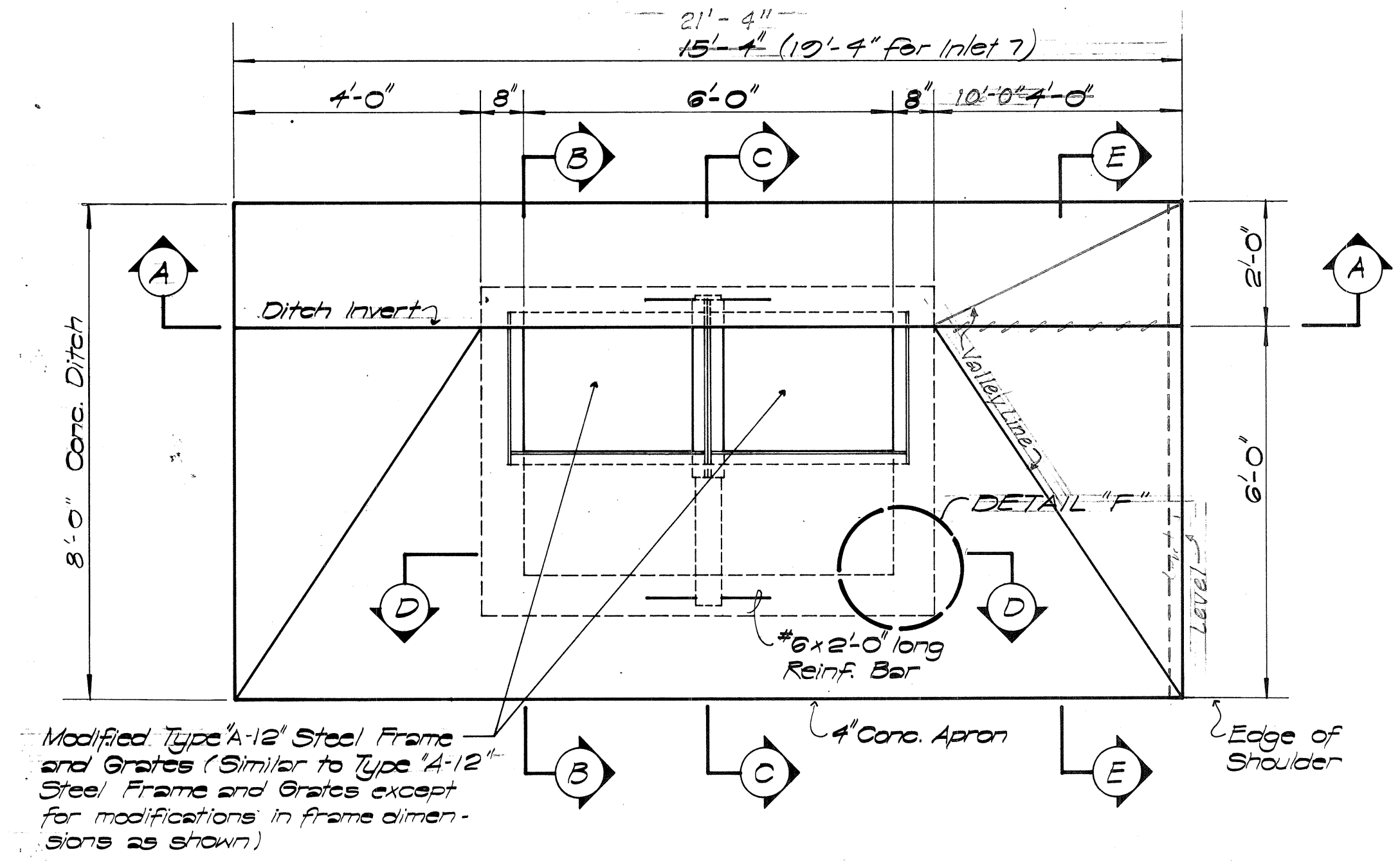
DRAINAGE DETAILS

WAIWA INTERCHANGE
F.A.I. Proj. No. I-HI-1(69)8

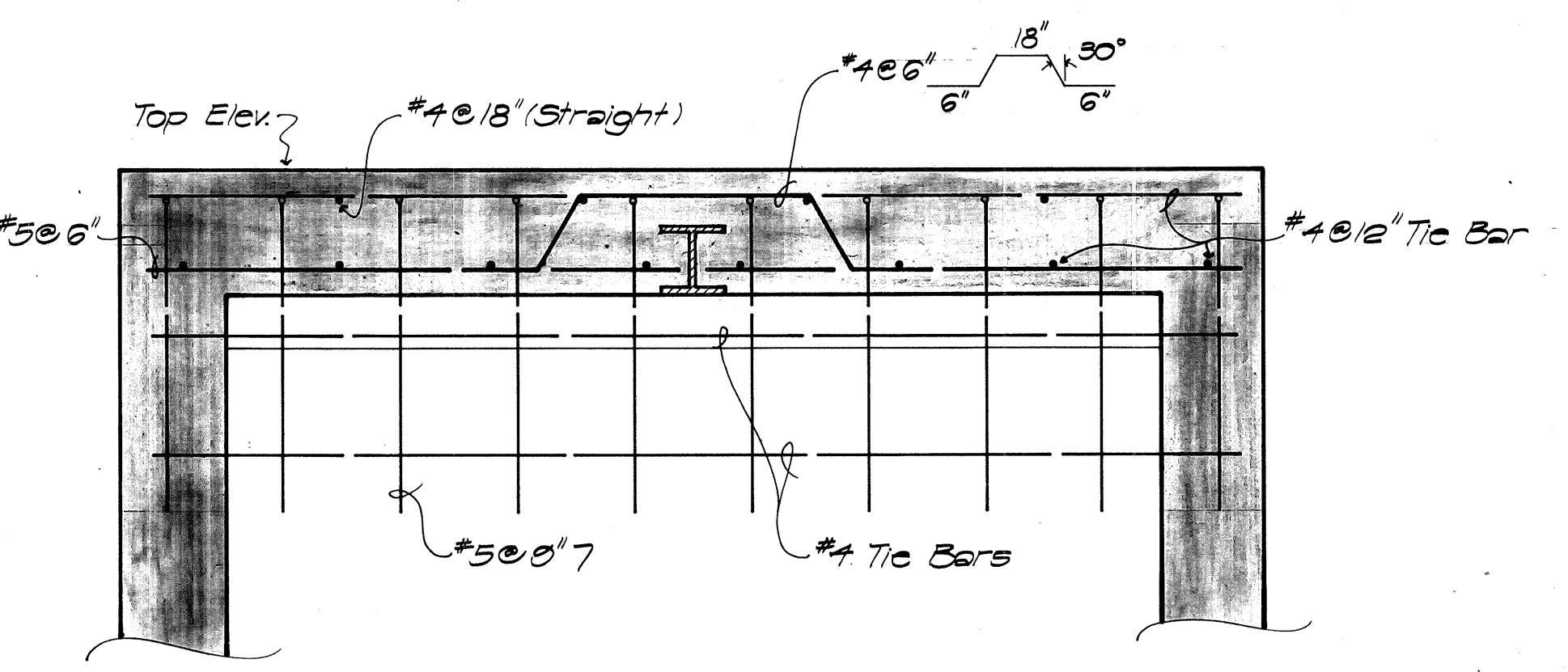
Scale: As Shown Date: OCT. 1968
SHEET No. 7 OF 12 SHEETS

THIS WORK WAS PREPARED BY ME
OR UNDER MY SUPERVISION,
Ben Taguchi
REGISTERED PROFESSIONAL ENGINEER
No. 1030
HAWAII, U.S.A.

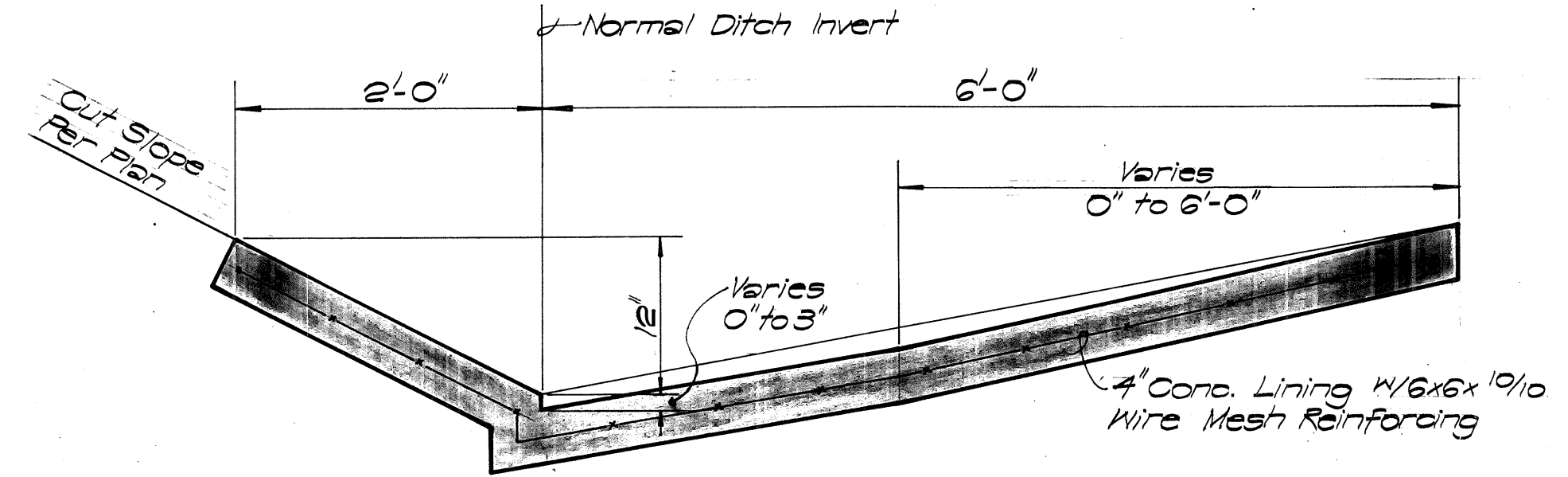
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(69)8	1968	27	144



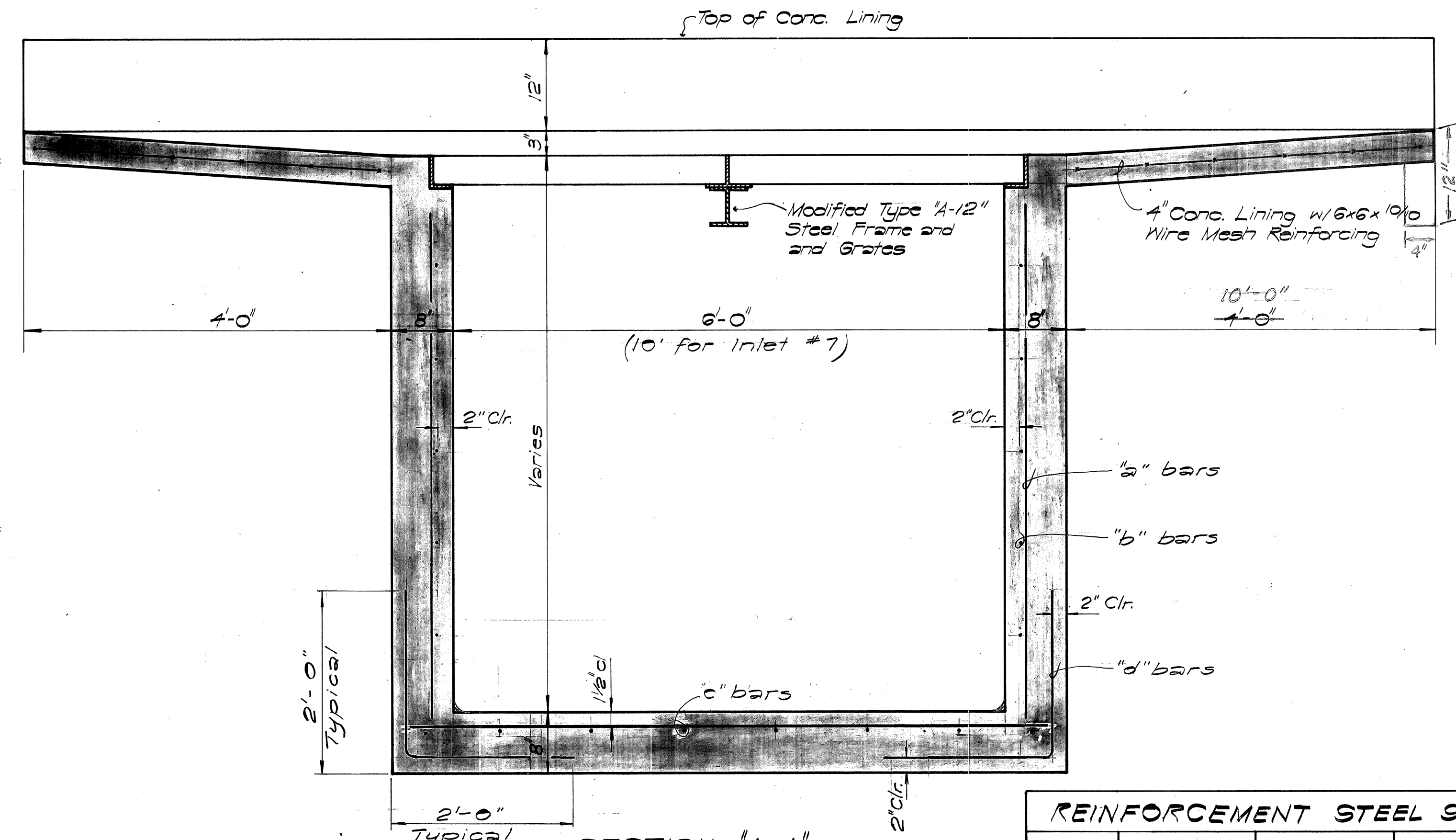
PLAN
Scale: 1/2" = 1'-0"
Not to scale



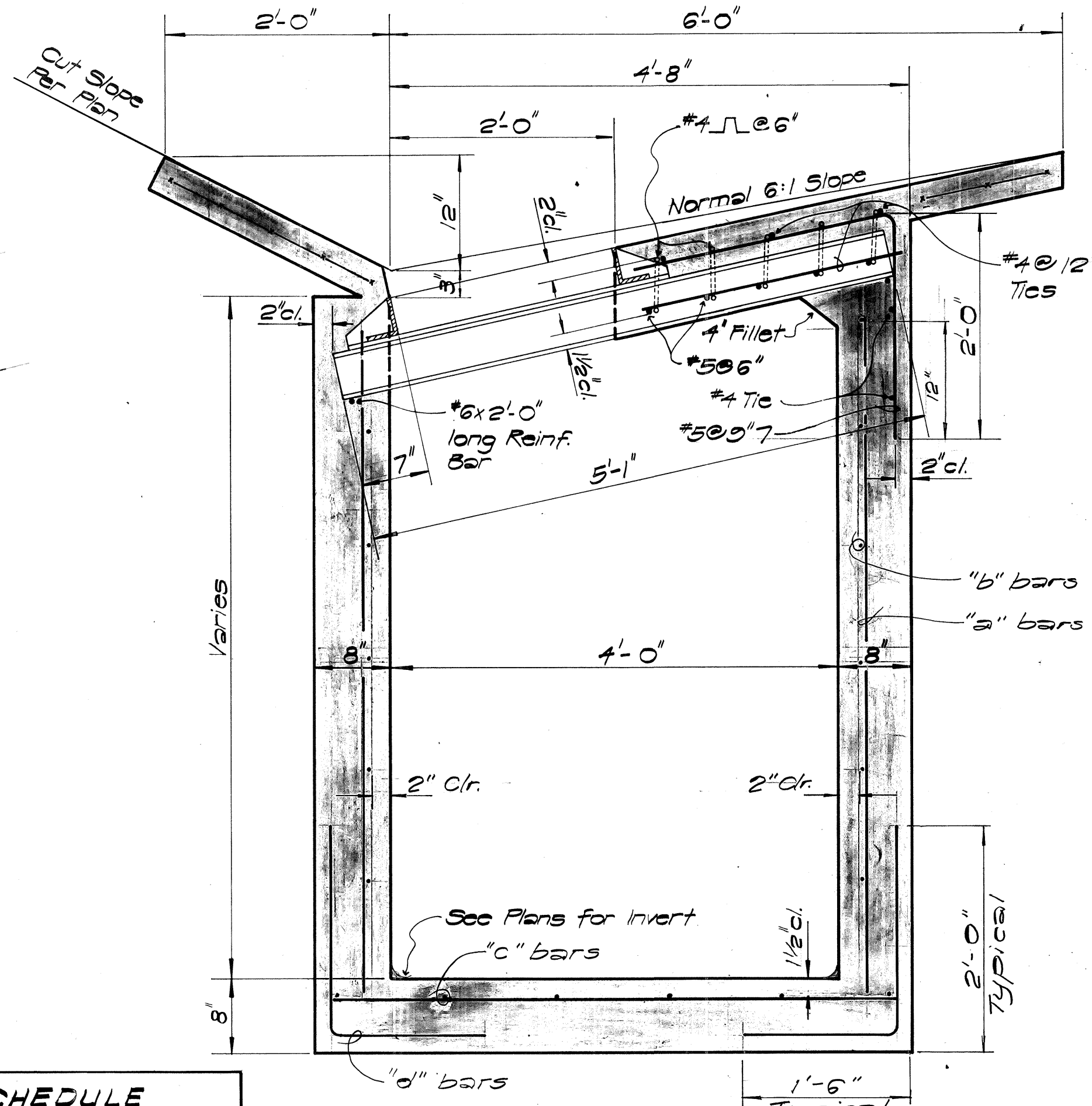
SECTION "D-D"
Scale: 1" = 1'-0"



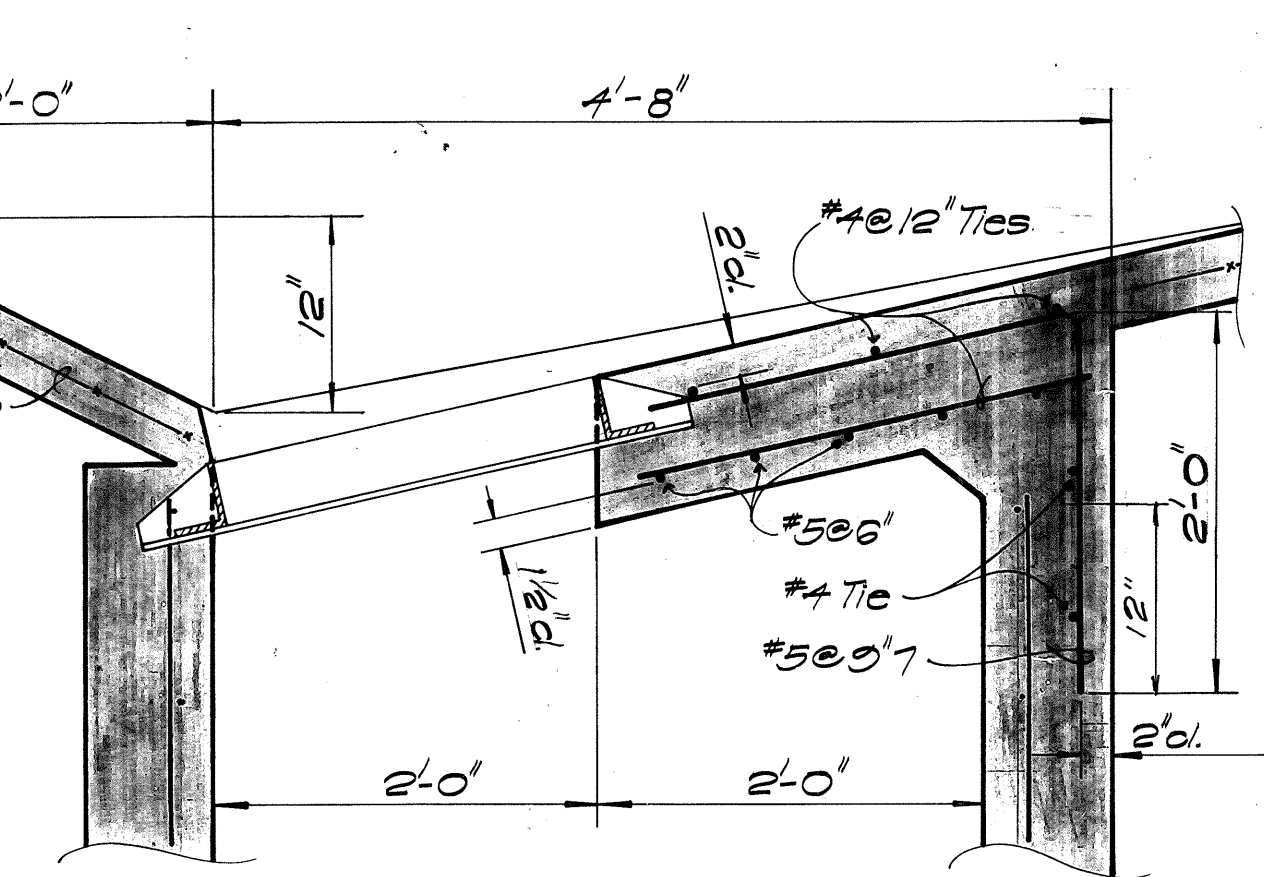
SECTION "E-E"
Scale: 1" = 1'-0"



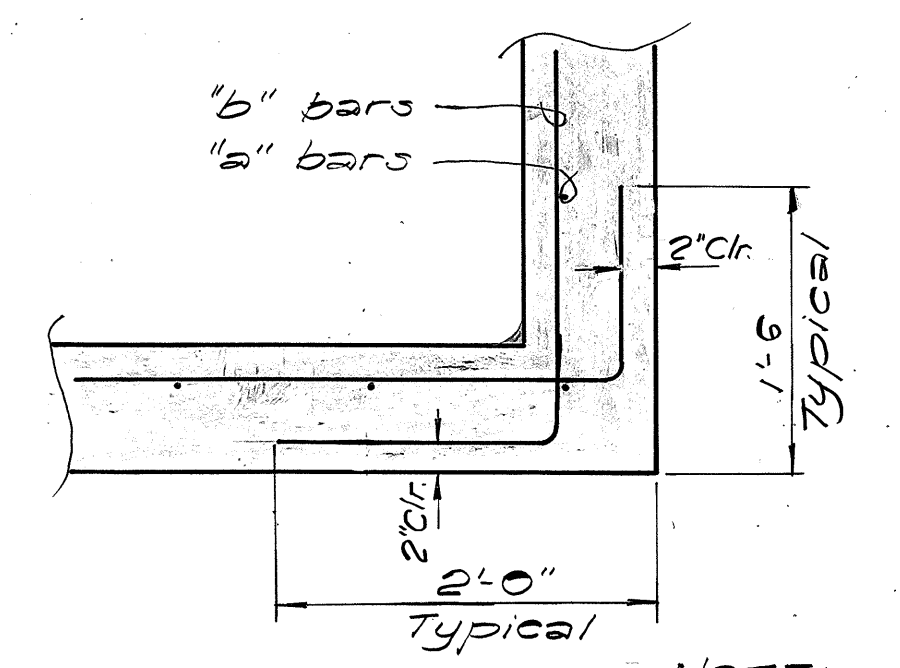
SECTION "A-A"
Scale: 1" = 1'-0"
Not to scale



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



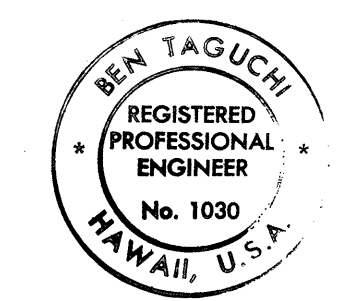
SECTION "C-C"
Scale: 1" = 1'-0"



DETAIL "F"
Scale: 1" = 1'-0"
NOTE: Typical at all corners.

REINFORCEMENT STEEL SCHEDULE				
INLET	"a" bars	"b" bars	"c" bars	"d" bars
2, 3, 11, 14 & 15	#5 @ 12"	#5 @ 12"	#4 @ 12" Bothways	#5 @ 12"
7	#5 @ 12"	#5 @ 12"	#4 @ 6" Bothways	#5 @ 12"
4, 9, 10, 12 & 13	—	—	#4 @ 12" Bothways	—

NOTE:
1. Provide 2-#5 bars around culvert pipes.
2. Fillet (grout) all bottom corners and edges.



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

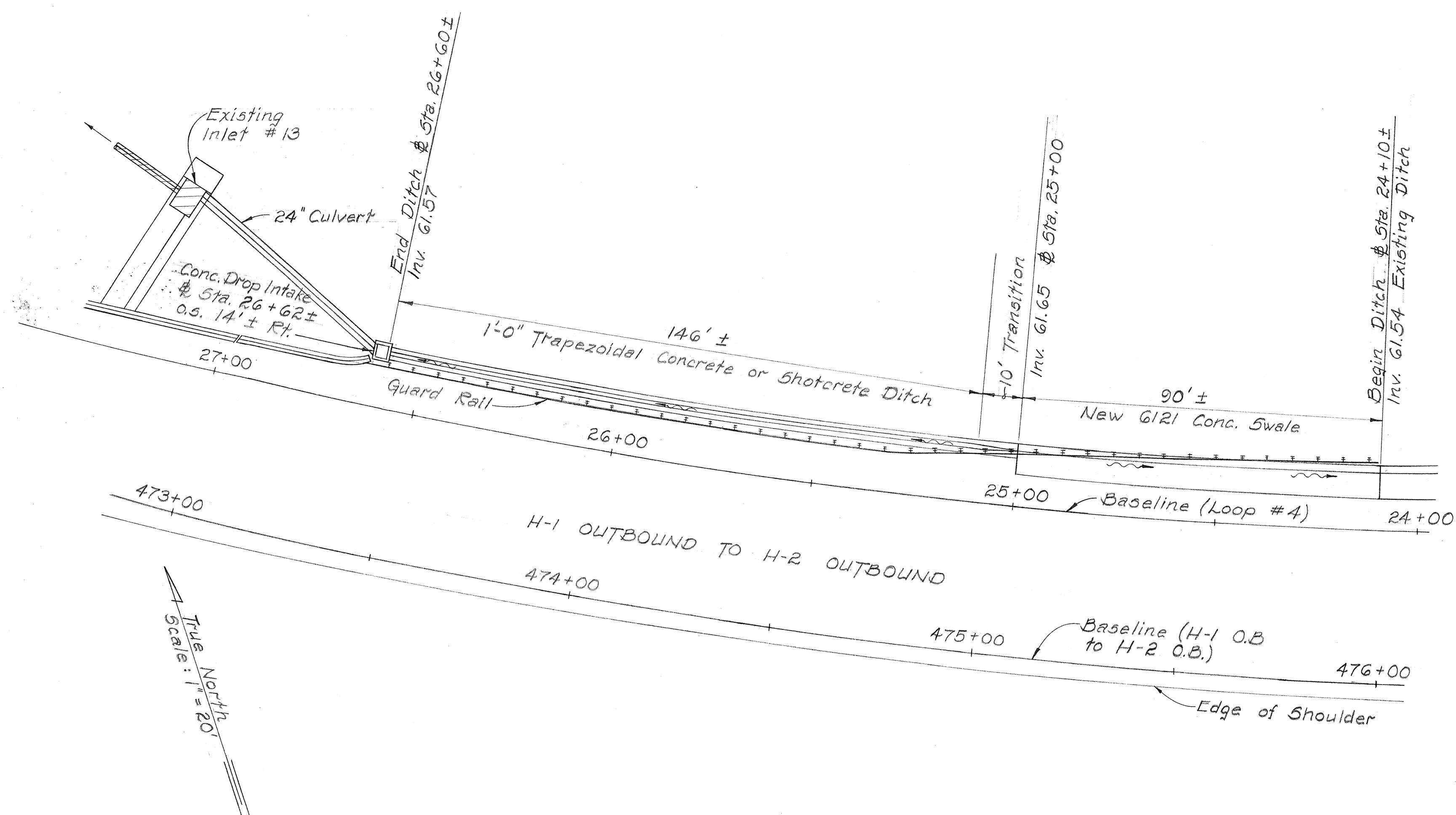
**DRAINAGE DETAILS
(TYPE "B" INLET)**

WAIAWA INTERCHANGE
F.A.I. Proj. No. I-HI-1(69)8

Scale: As Shown Date: OCT. 1968

SHEET No. 8 OF 12 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(69):8	1968		



PLAN

\$ 8+00 (Ramp 8)

Tap Existing Inlet #13 For 24" Culvert	
Excavation	2 C.Y.
Concrete	0.2 C.Y.
Steel	30 Lb.

\$ 26+60± - \$ 25+00 (Loop #4)

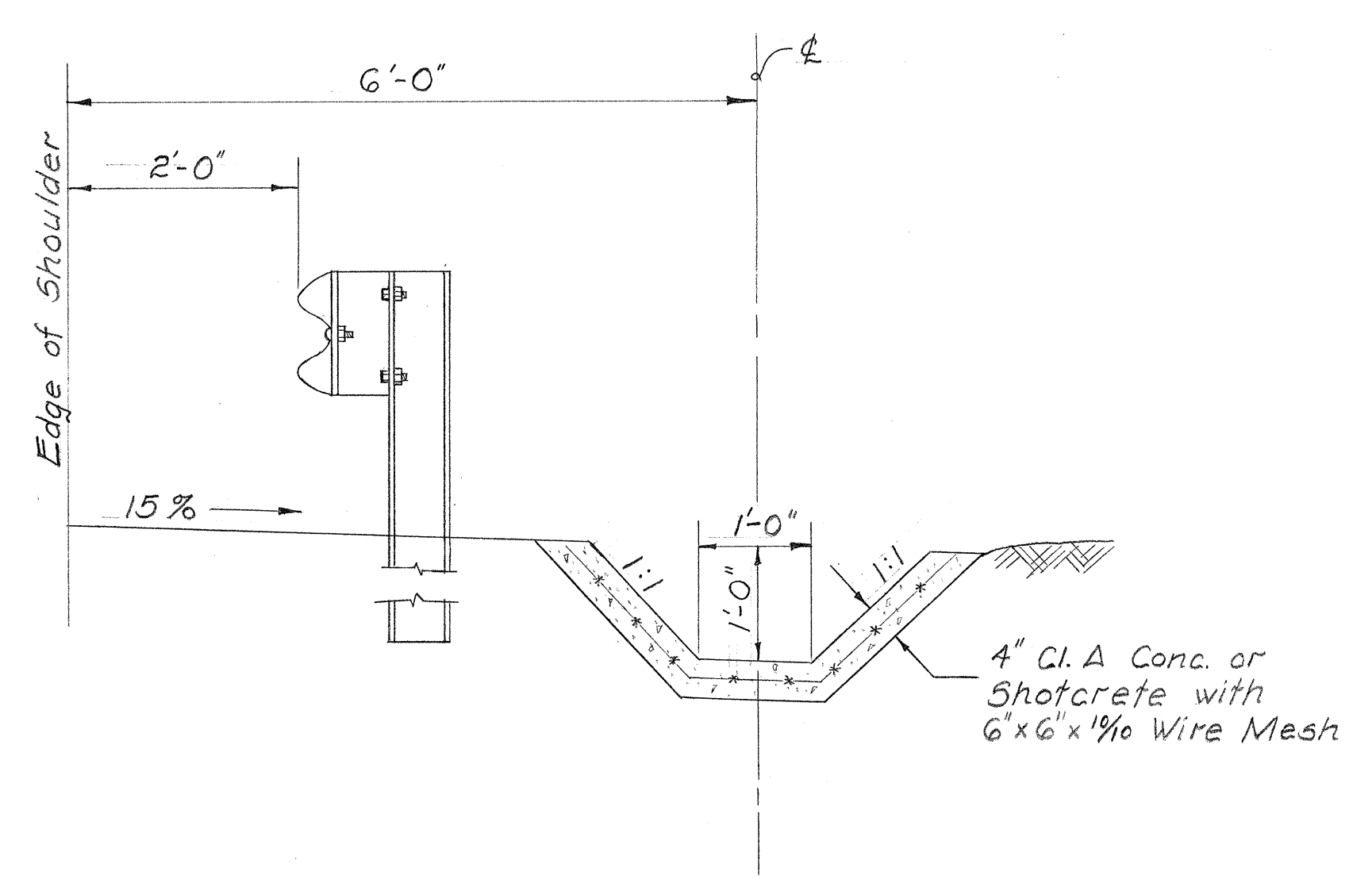
Construct 1'-0" Trapezoidal Ditch	19 C.Y.
Ditch & Channel Excavation	73 C.Y.
Concrete	

\$ 26+62 (Loop #4) o.s. 14' R.H.

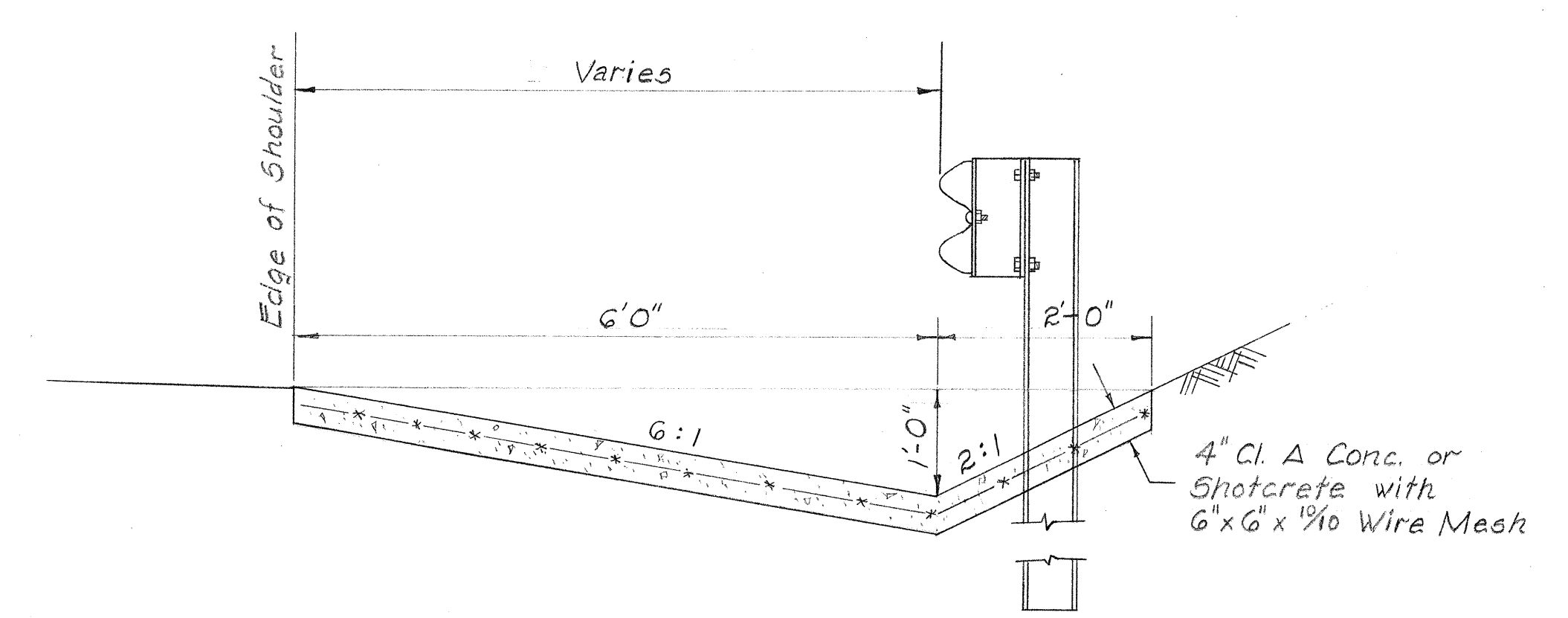
Construct CDI	42 C.Y.
Excavation	1.6 C.Y.
Concrete	64 L.F.
24" Culvert	

\$ 25+00 - \$ 24+10± (Loop #4)

Construct G121 Ditch	18 C.Y.
Ditch & Channel Excavation	9.2 C.Y.
Concrete	



TYPICAL SECTION AT TRAPEZOIDAL CONCRETE OR SHOTCRETE DITCH
Scale: 3/4" = 1'-0"



TYPICAL SECTION AT G121 CONCRETE OR SHOTCRETE DITCH
Scale: 3/4" = 1'-0"

CCO #35
THIS SHEET IS A SUPPLEMENT TO THE CONTRACT PLANS

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

PLAN & DRAINAGE DETAILS
ALONG LOOP #4
AT STRUCTURE NO. 6

WAIAWA INTERCHANGE
PROJ. NO. I-HI-1(69):8

Scale: As Shown Date: April, 1971

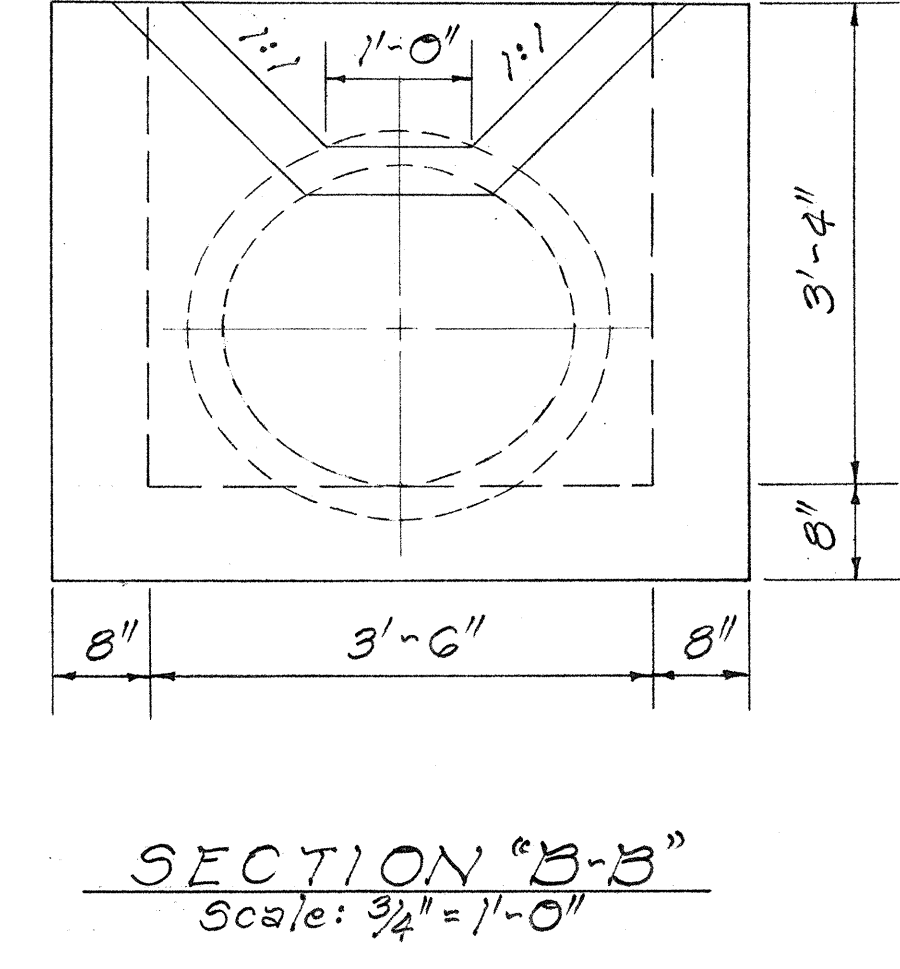
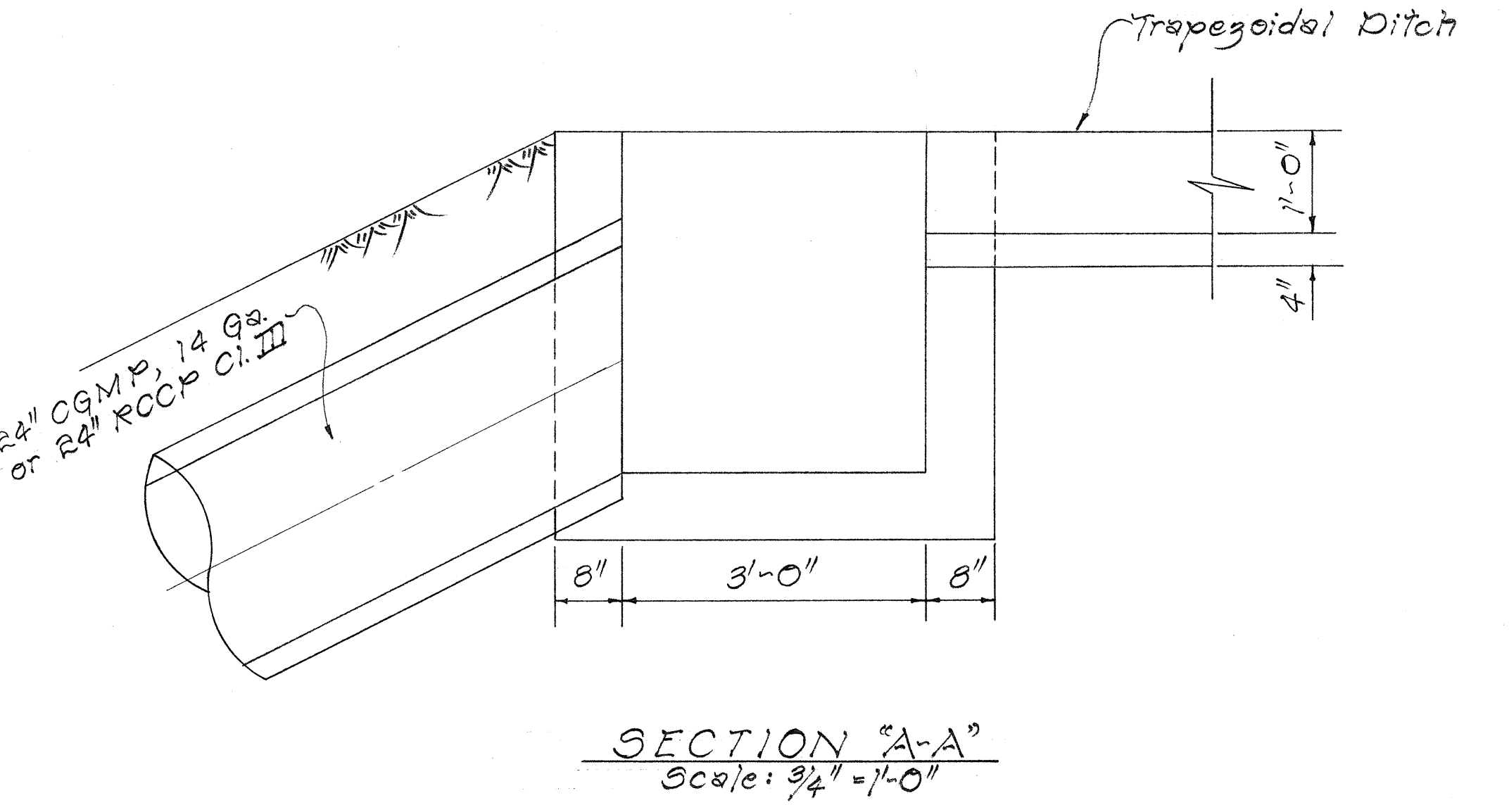
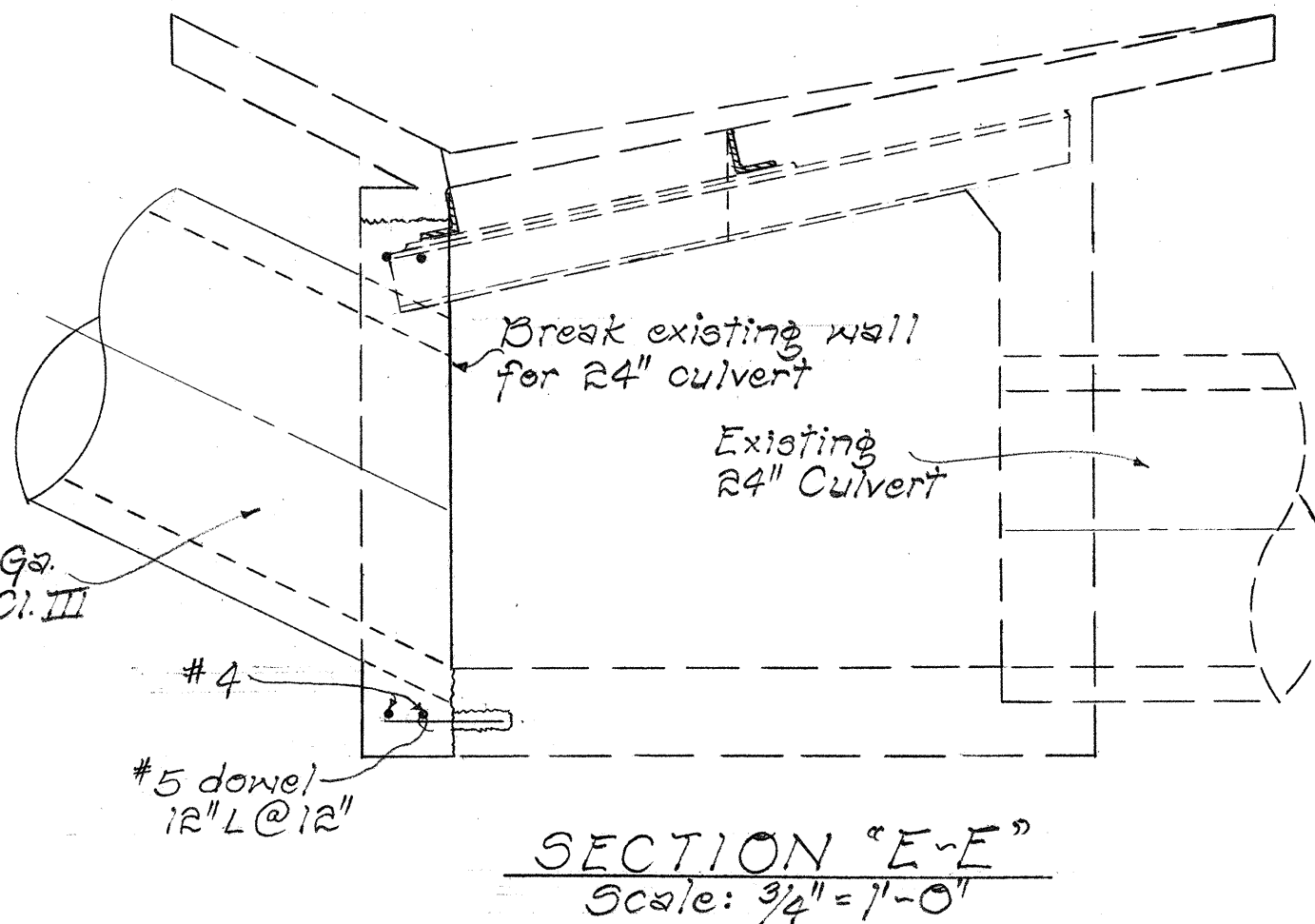
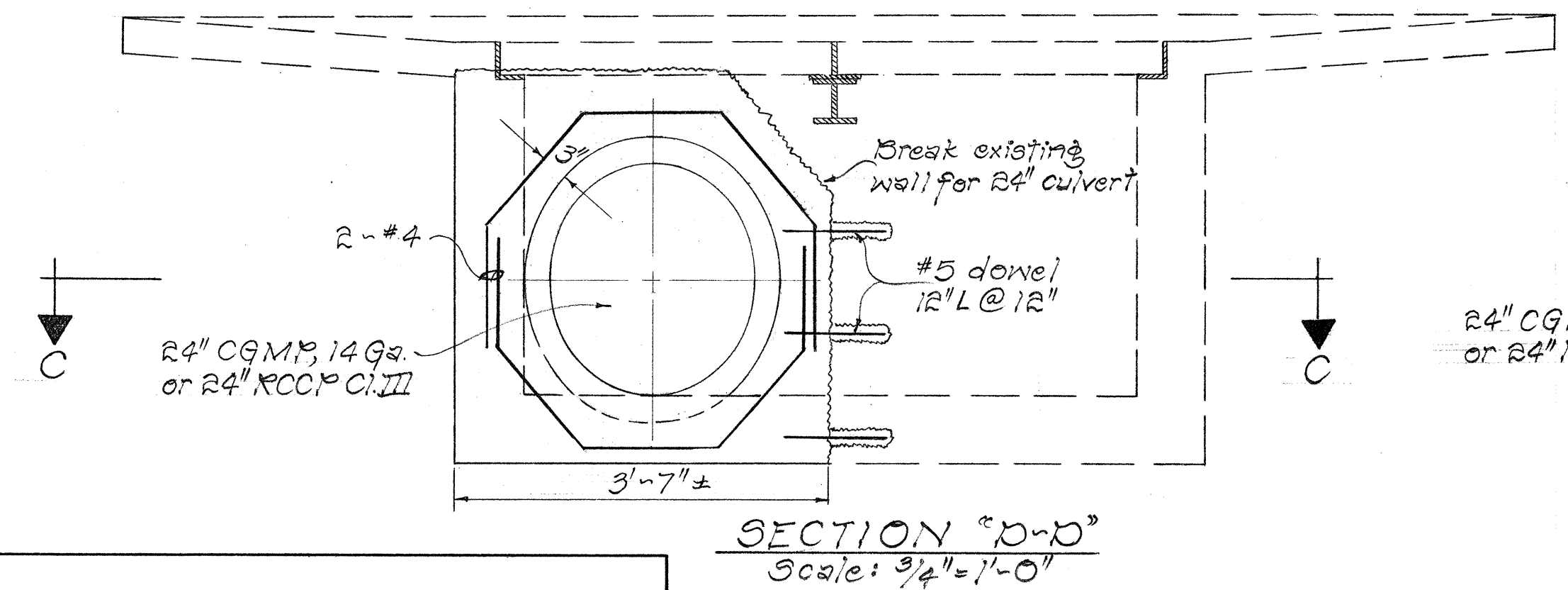
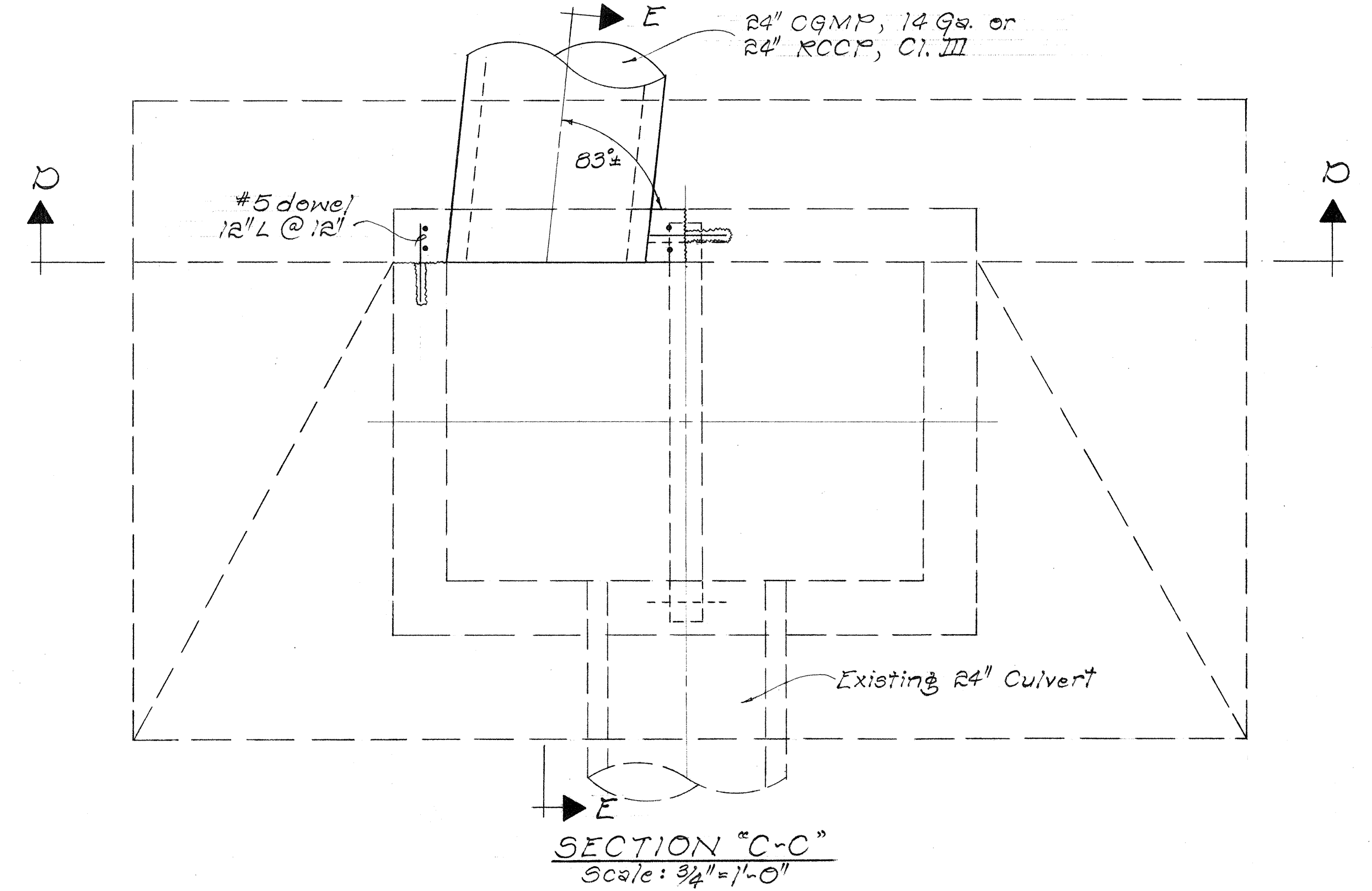
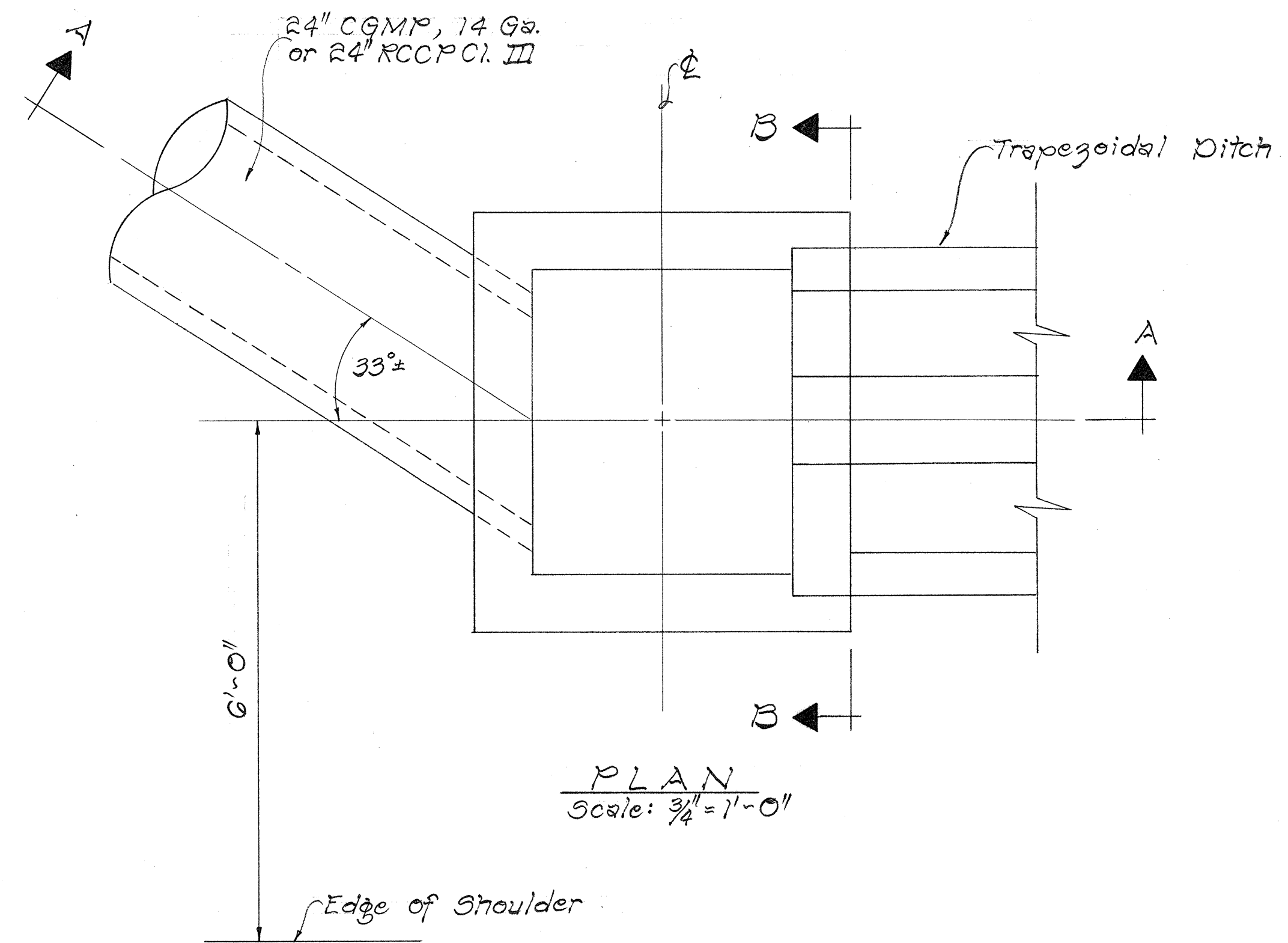
CHANGE ORDER NO. 35
29

SHEET NO. OF SHEETS

CO 27 S(1)

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

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(69)18	1968		



DETAILS AT EXISTING INLET #13

DETAIL OF CONCRETE DROP INTAKE AT STA. 26+62, O.S. 14'± RT.

CCO #35
THIS SHEET IS A SUPPLEMENT TO THE CONTRACT PLANS.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DETAILS OF CONCRETE DROP INTAKE AT STA. 26+62, O.S. 14' RT. & EXISTING INLET #13

Waiana Interchange
Proj. No. I-HI-1(69)18

Scale: As Shown Date: April 1971

CHANGE ORDER NO. 29

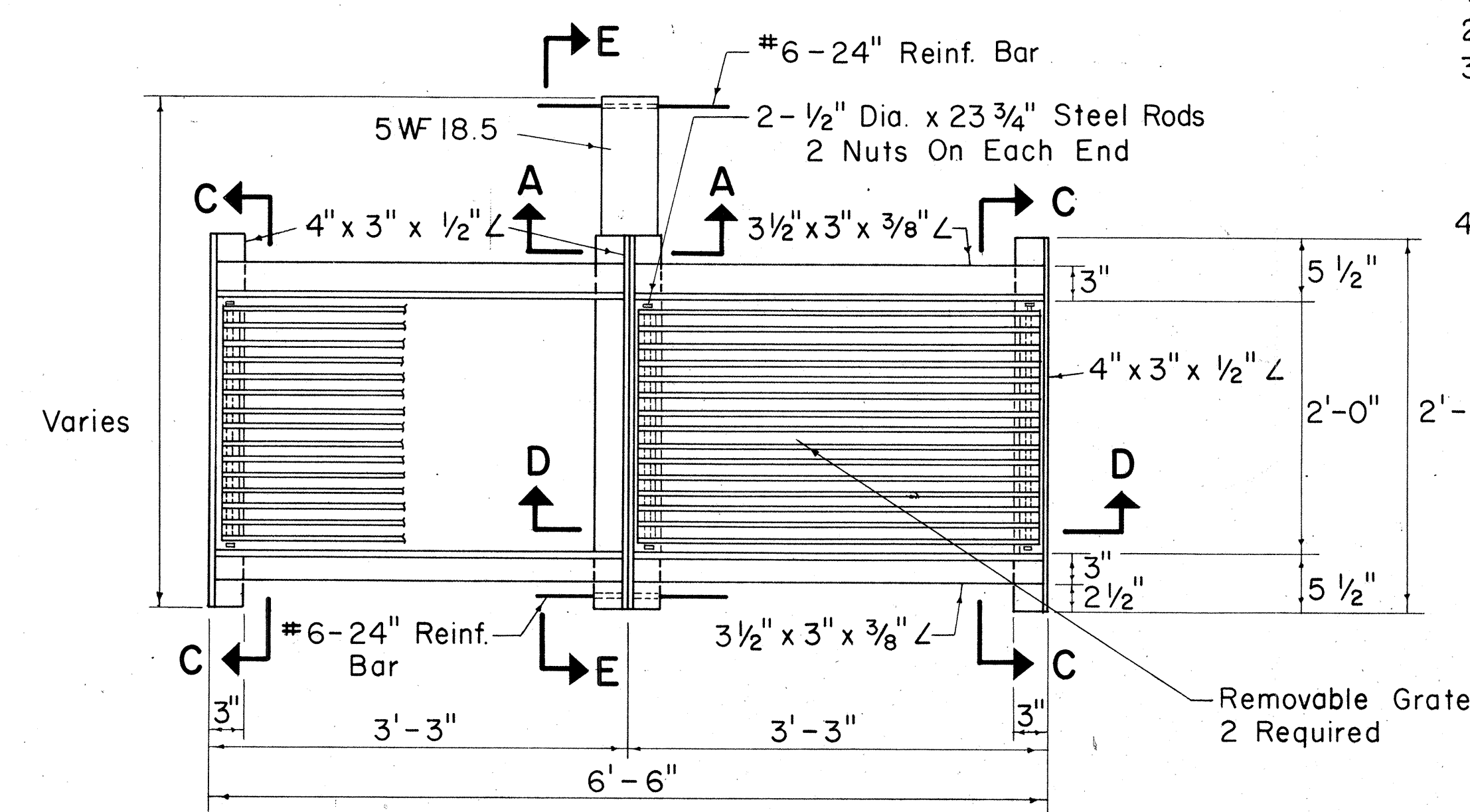
SHEET No. OF SHEETS

DATE	_____
DESIGNED BY	_____
TRACED BY	_____
NOTED BY	_____
CHECKED BY	_____
ORIGINAL PLAN	_____
NOTE BOOK	_____
No.	_____

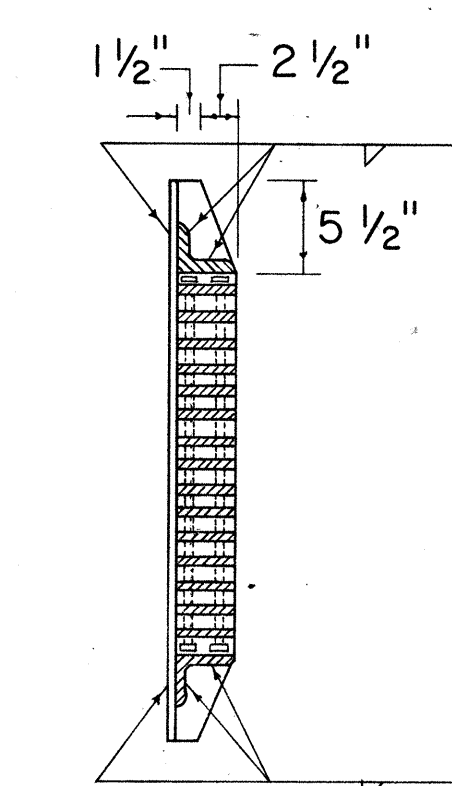
Revised: Jan. 25, 1967

NOTE:

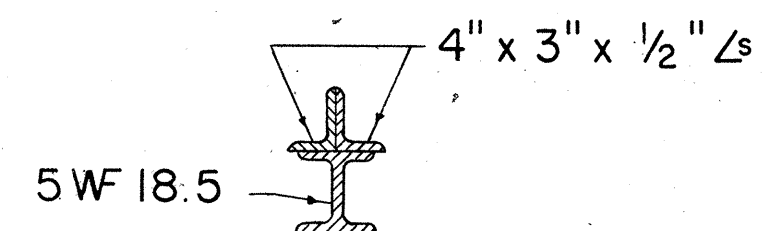
1. All welds $\frac{3}{8}$ " unless otherwise noted.
2. All steel shall be structural grade.
3. Grates and Frame shall be hot dip galvanized after fabrication in accordance with Section 44(H) of the Standard Specifications.
4. Detail of Types "A-1" and "A-2" Steel Frame and Grates are identical except for the thickness of end spacers and number of grate bars. See Table of End Spacer Thickness.



PLAN



SECTION C-C

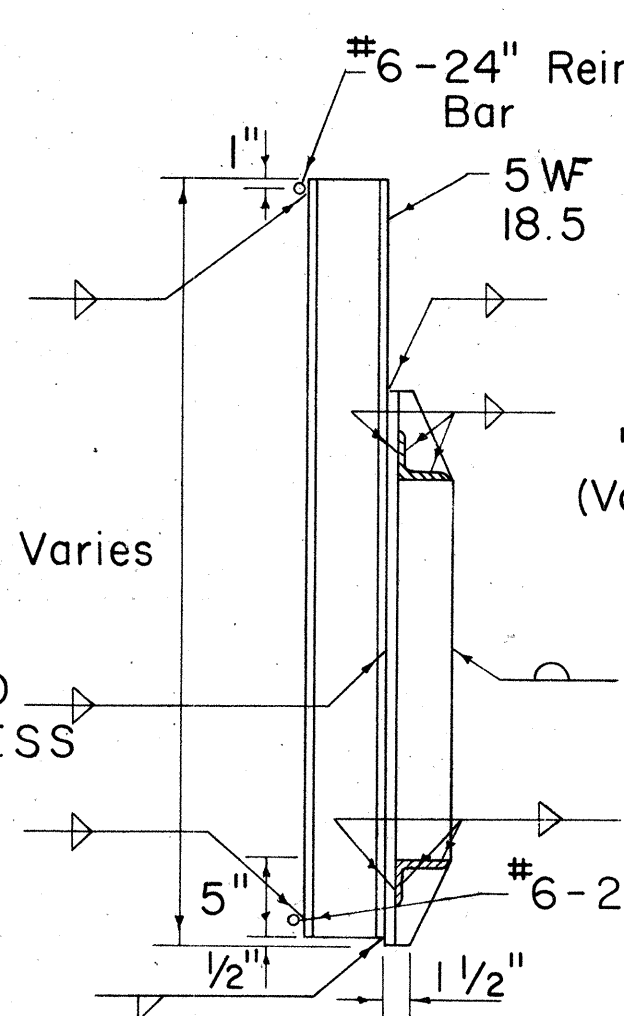


SECTION A-A

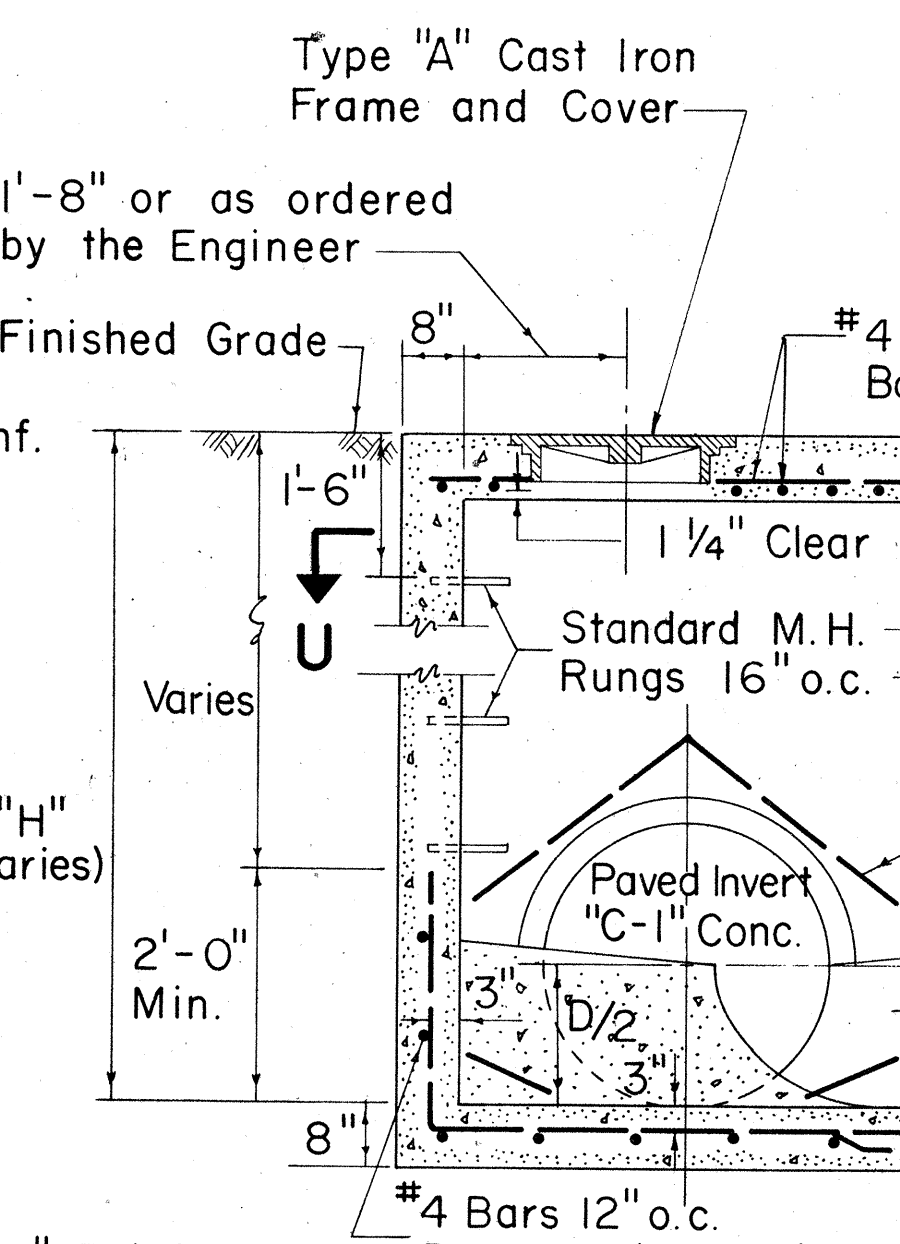
TABLE OF END SPACER THICKNESS

TYPE FRAME & GRATES	"I" (in.)
A-1	1
A-2	1 3/8

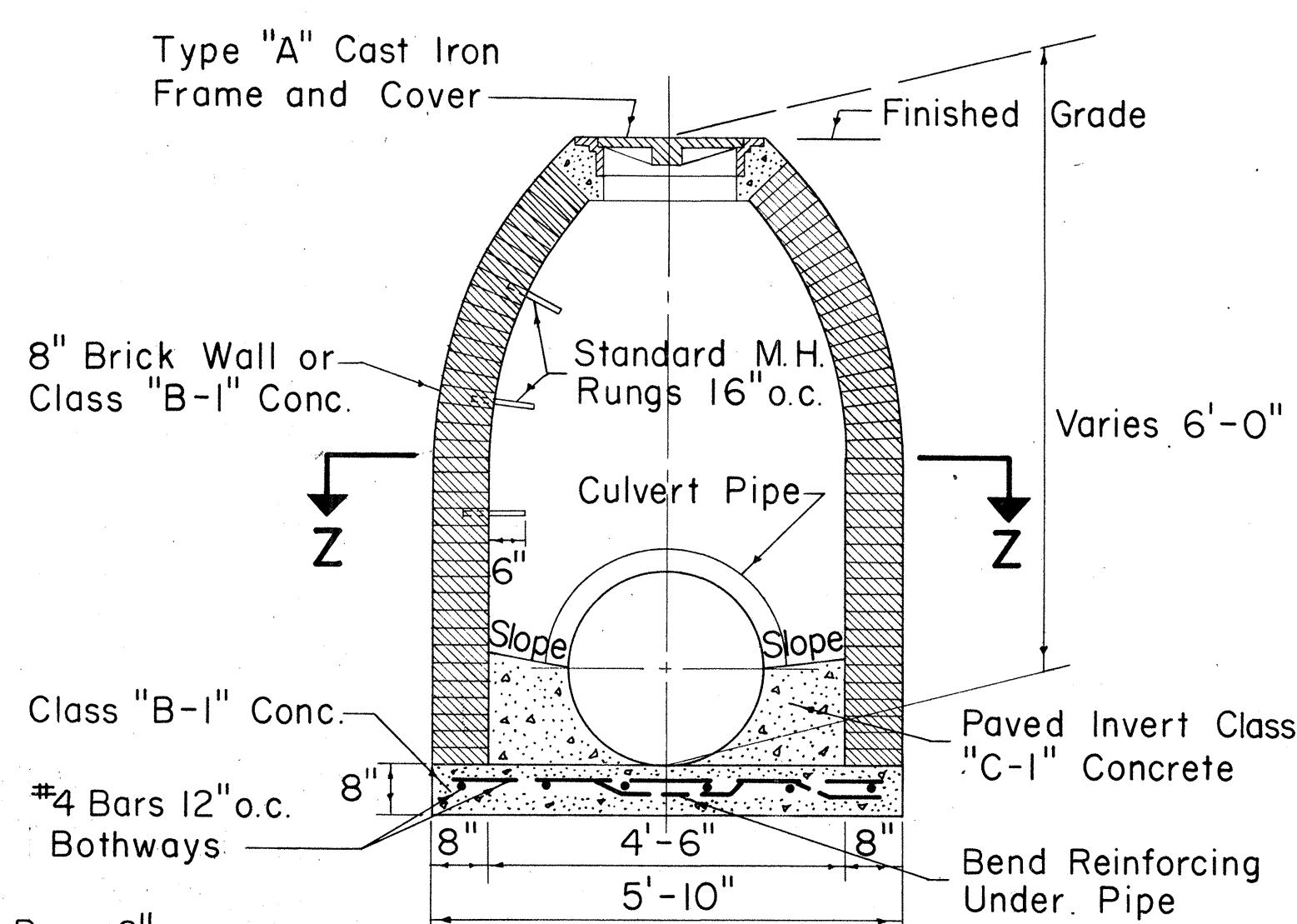
END SPACER



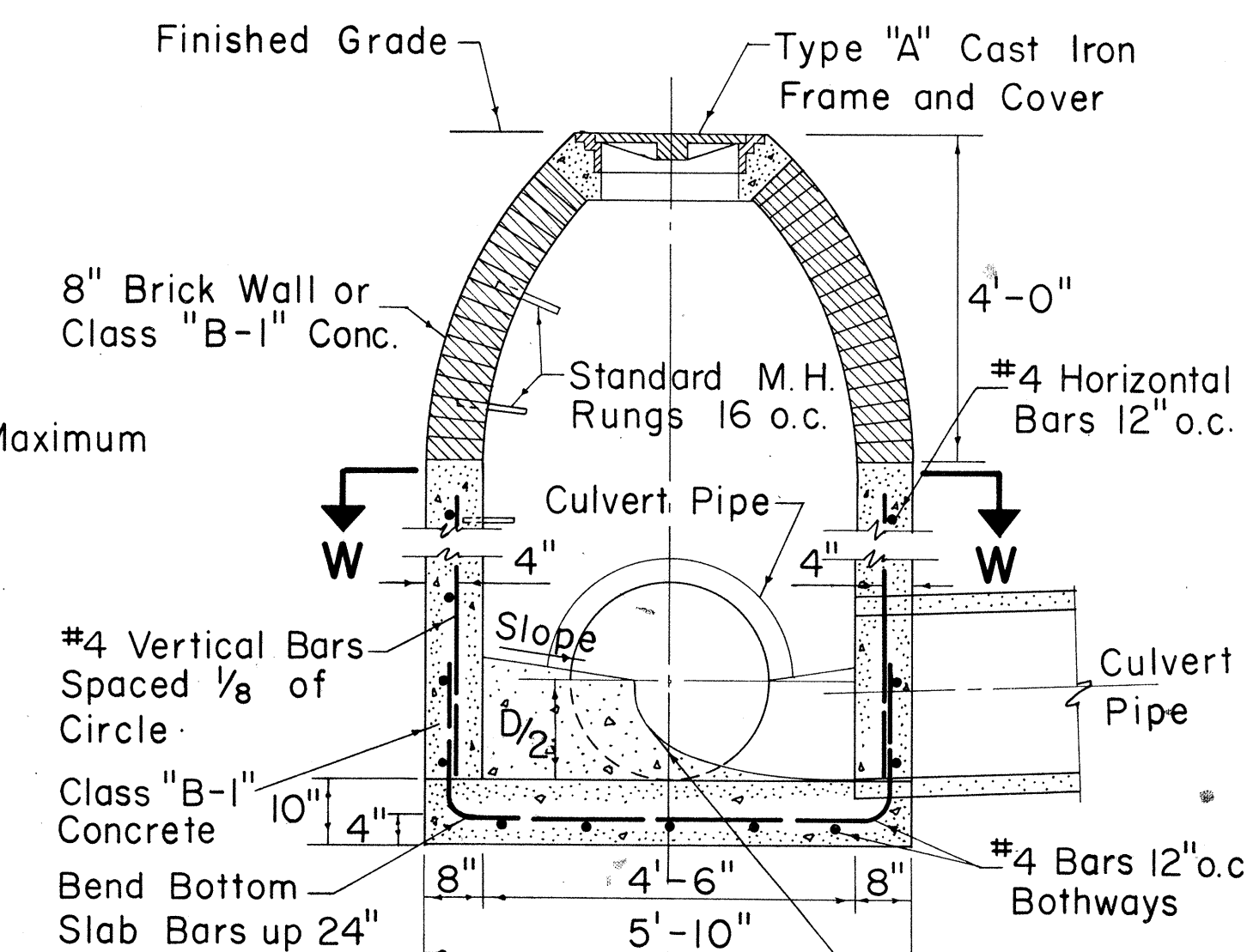
SECTION E-E



SECTION V-V



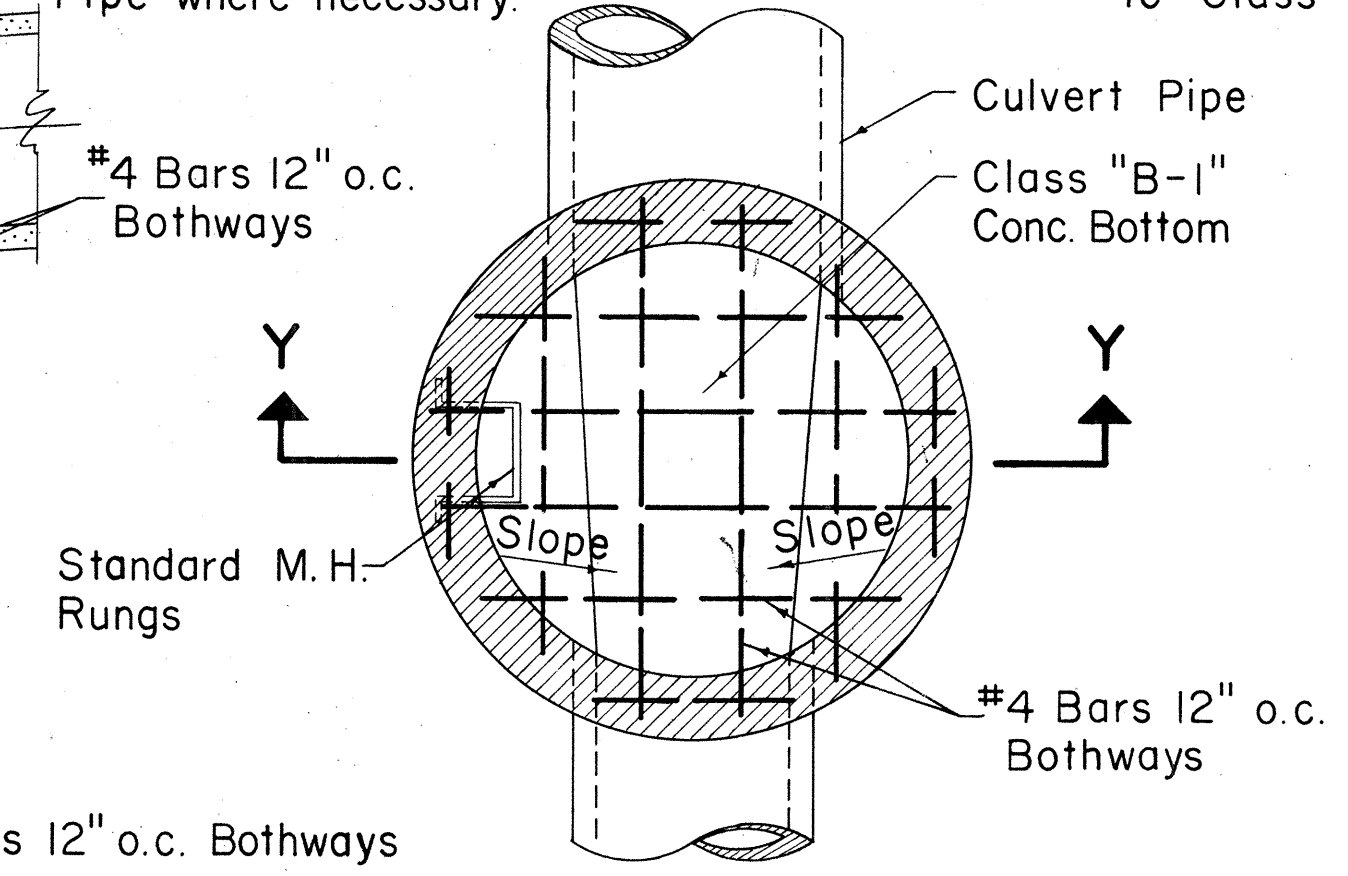
SECTION Y-Y



SECTION X-X

NOTE:

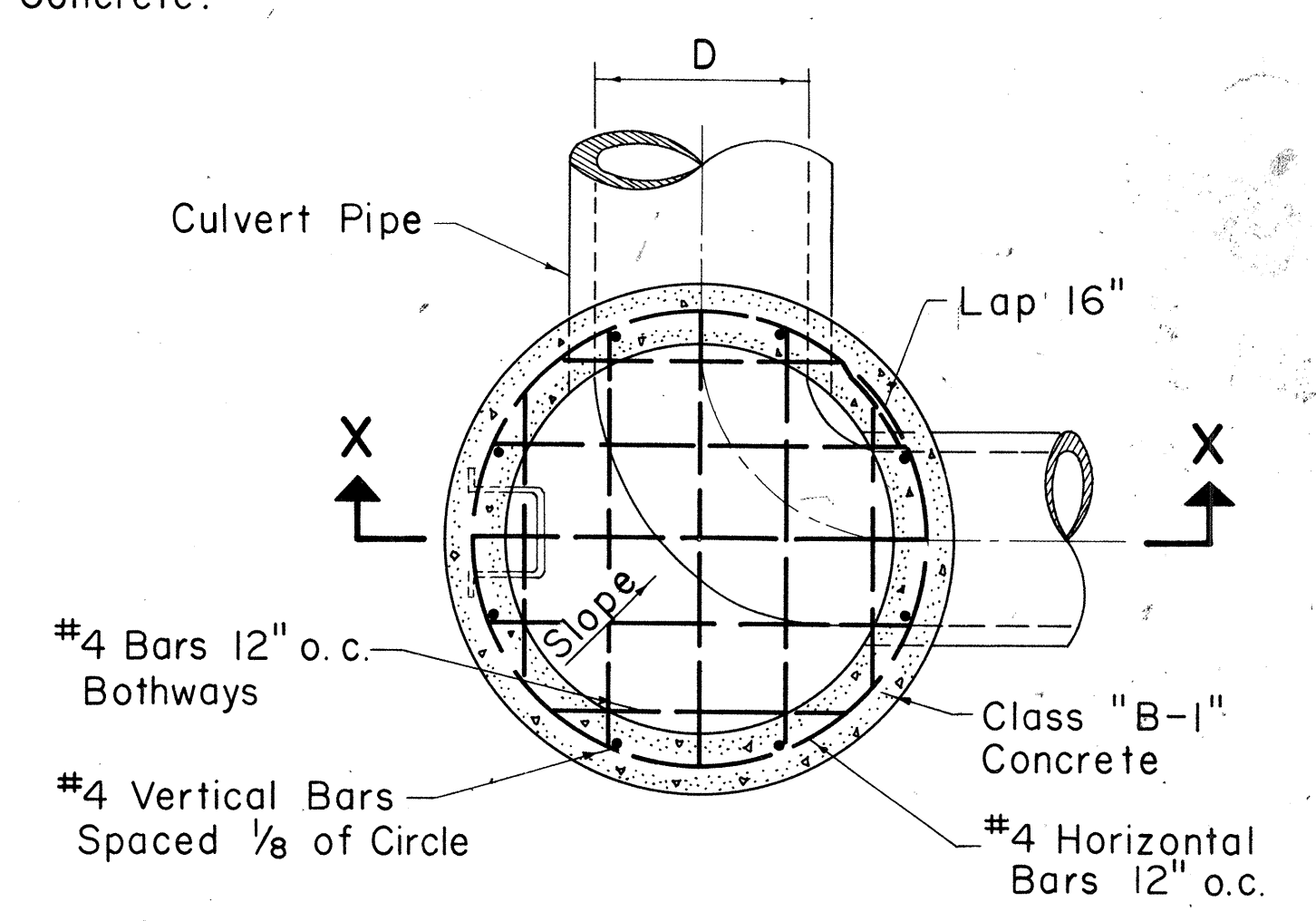
1. Exterior surface of brick wall shall be plastered with 1" thickness of 1:2 Cement Mortar.
2. Number size and direction of culvert pipes at manhole to be as shown on plans.
3. Paved invert not required at drop manholes.
4. All Class "C-1" Concrete to be incidental to Class "B-1" Concrete.



SECTION Z-Z

TYPE "D" STORM DRAIN MANHOLE

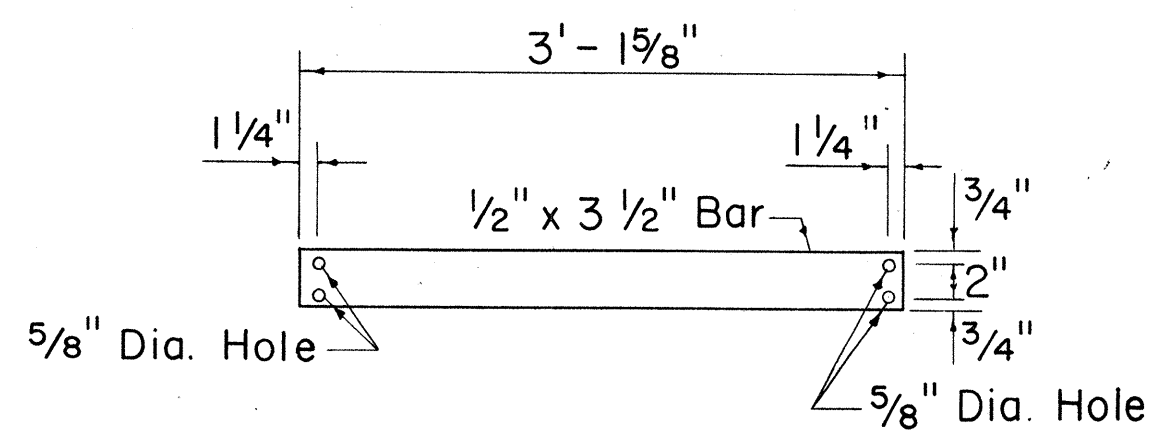
Scale: 1/2" = 1'-0"



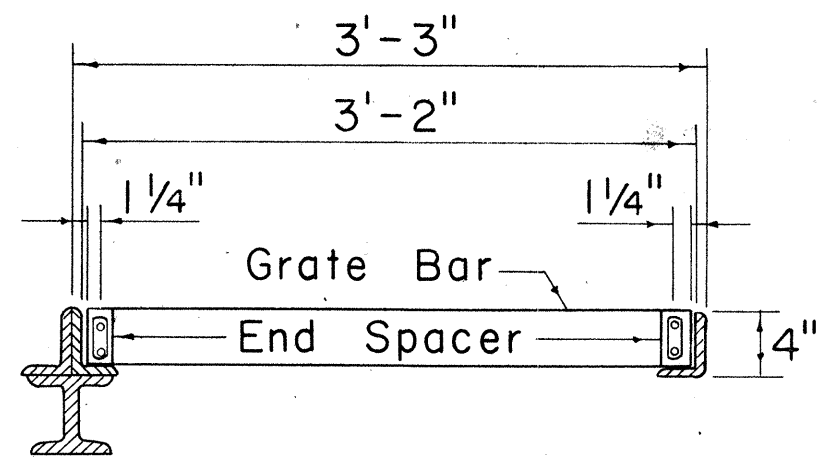
SECTION W-W

TYPE "E" STORM DRAIN MANHOLE

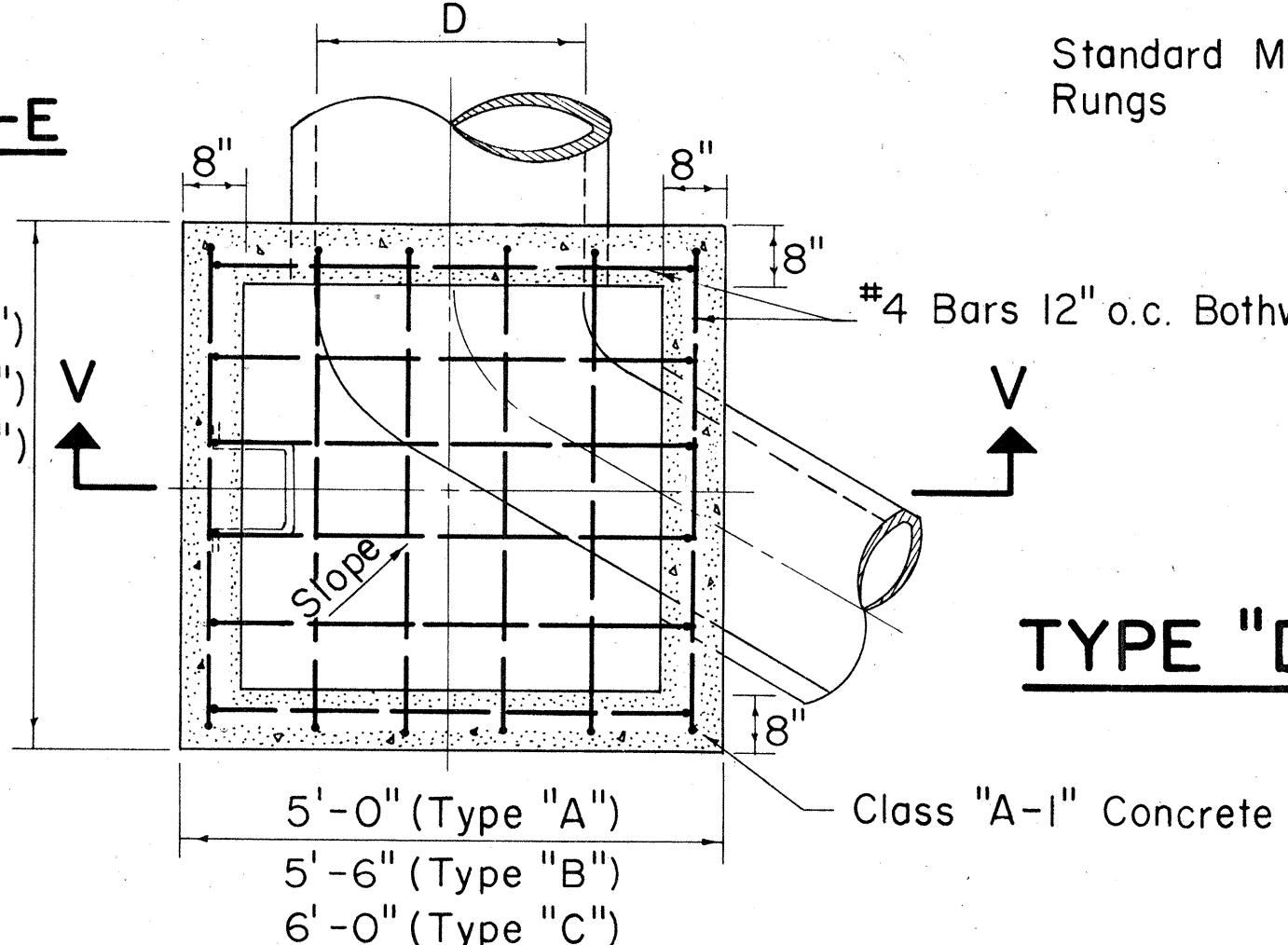
Scale: 1/2" = 1'-0"



GRATE BARS



SECTION D-D



SECTION U-U

TYPE "A", "B", & "C"

S.D.M.H.

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

DETAIL OF TYPE "A-1" & "A-2" STEEL FRAME AND GRATES

Scale: 1" = 1'-0"

APPROVED:

DIRECTOR OF TRANSPORTATION DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS

STEEL FRAME AND GRATES
AND STORM DRAIN MANHOLES

Scales: As Noted Date OCT, 1968

SHEET NO. 28 OF 144 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(62)B	1968	29	144

GENERAL NOTES

- Contractor has the option of using cast malleable iron, cast steel, welded, bolted 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

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"

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.

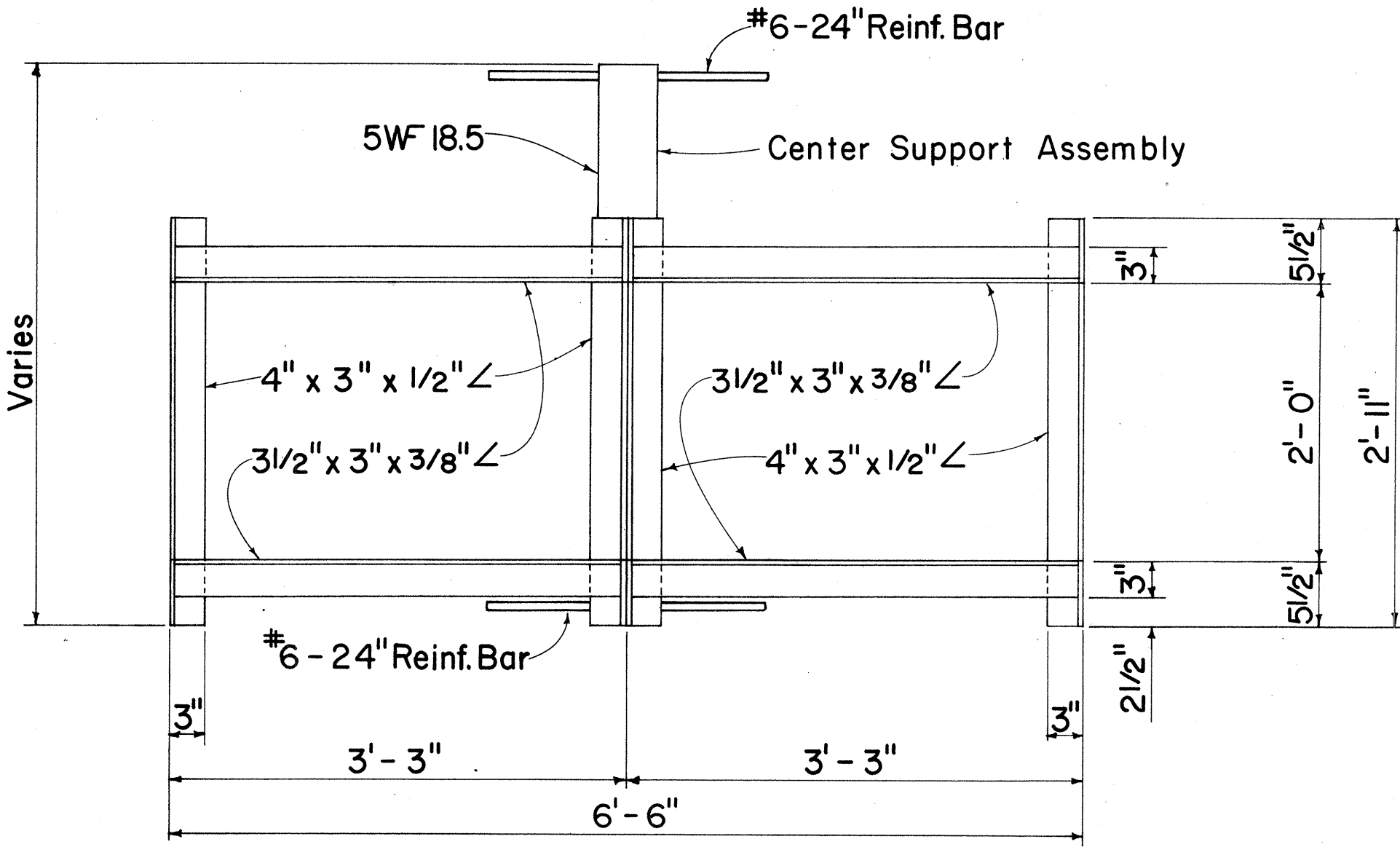
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS

TYPES A-9 AND A-12
FRAMES AND GRATES

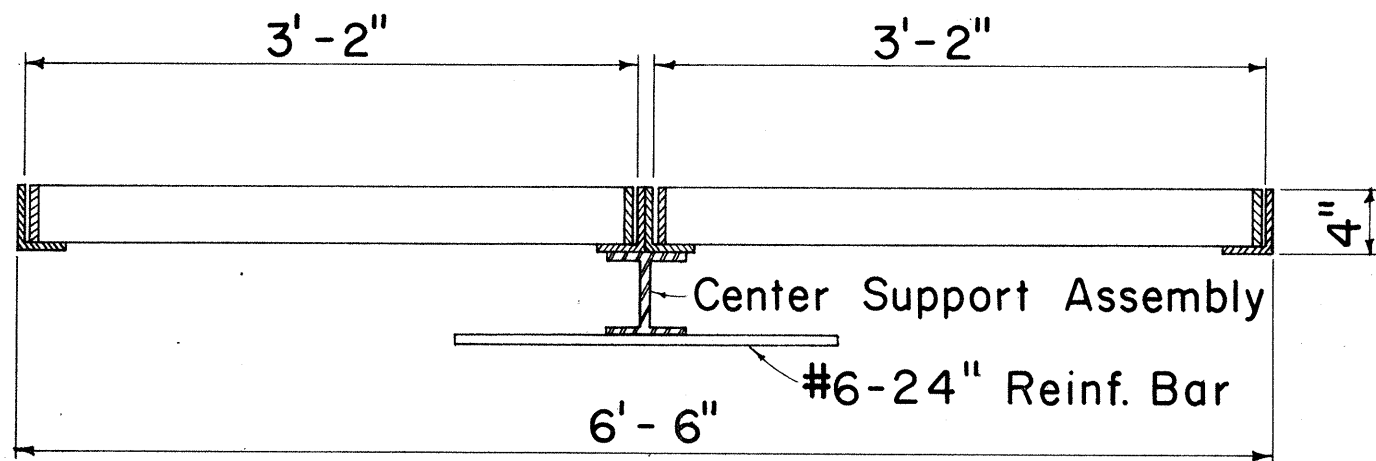
Scales: As Noted Date: Aug. 1968

SHEET No. 10 OF 12 SHEETS



PLAN

(Two or More Grates)

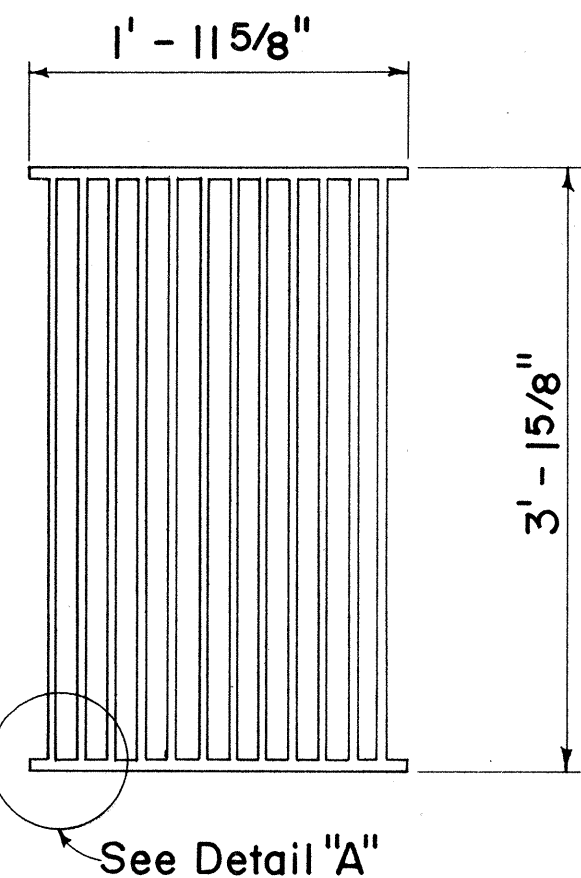


LONGITUDINAL SECTION

(Thru Frame & Grate)

FRAME DETAILS

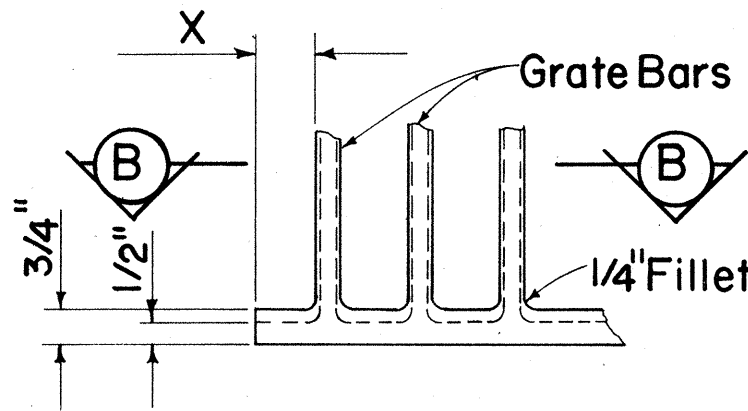
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PLAN

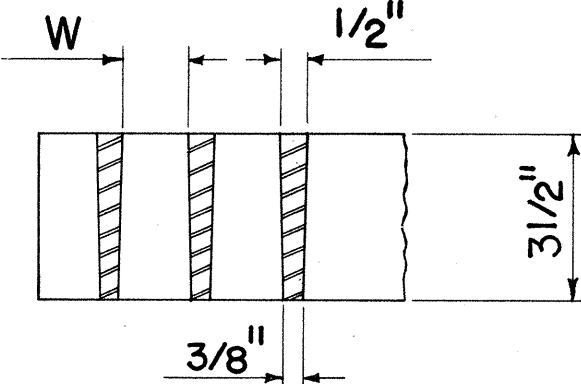
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ALTERNATIVE CAST MALLEABLE IRON
OR CAST STEEL GRATE



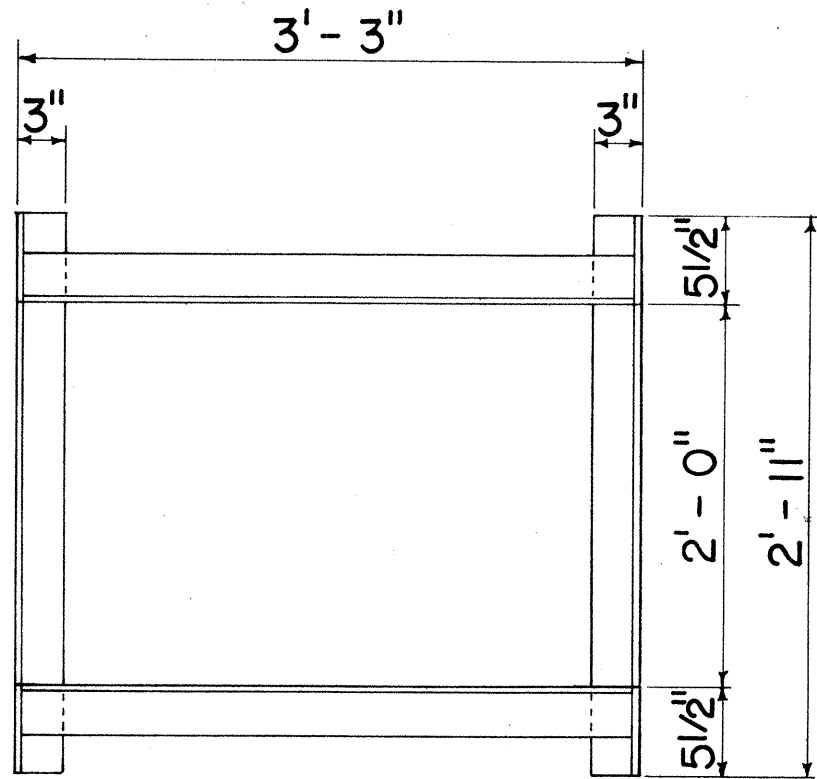
DETAIL "A"

Scale: 3"= 1'- 0"



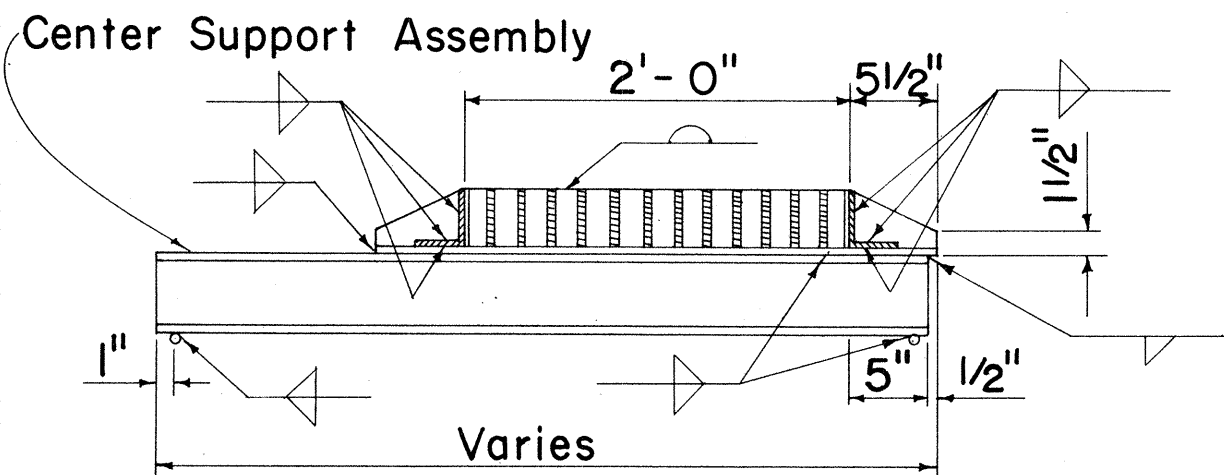
SECTION "B-B"

Scale: 3"= 1'- 0"



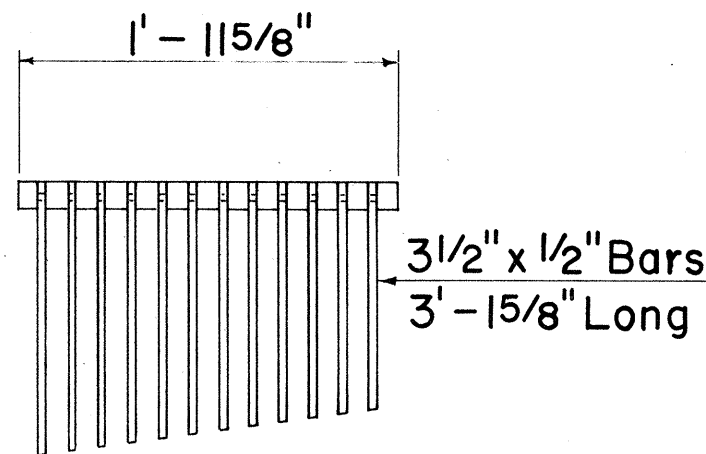
PLAN

(Single Grate)



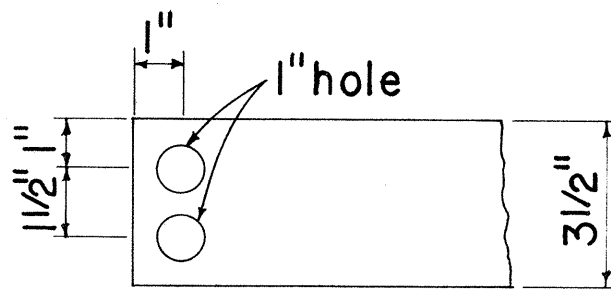
CROSS SECTION

(Thru Frame & Grate)



CAST END BLOCK

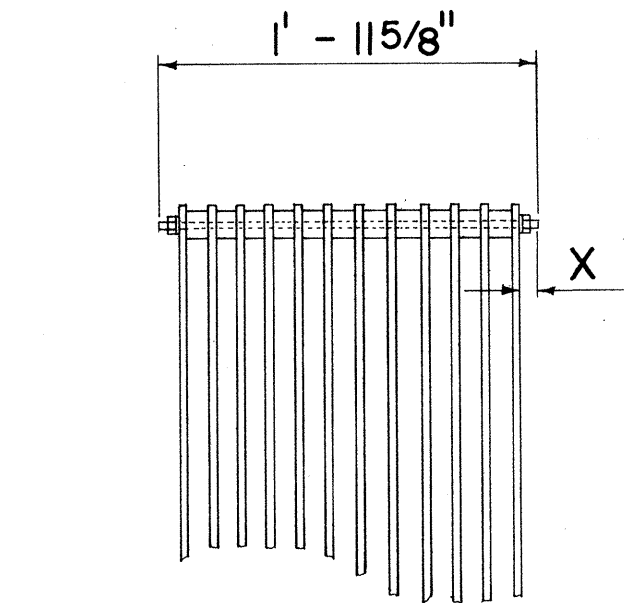
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END OF BAR

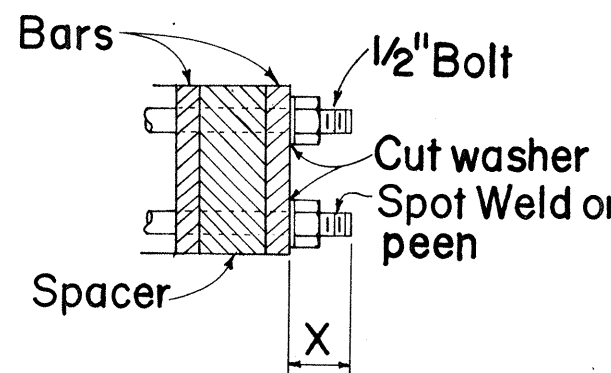
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ALTERNATIVE CAST MALLEABLE IRON
OR CAST STEEL END BLOCK GRATE



BOLTED END BLOCK

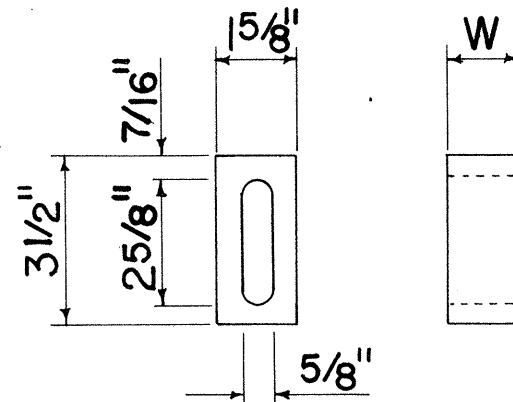
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BOLTING DETAIL

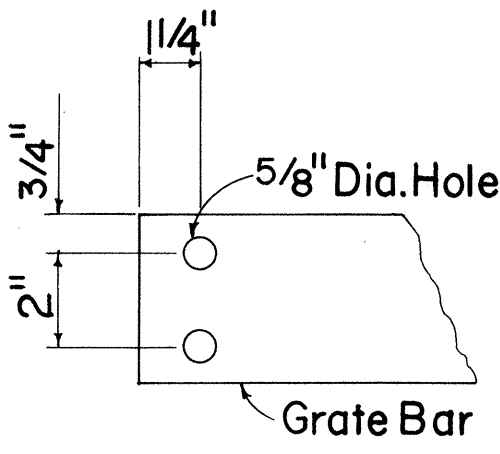
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ALTERNATIVE BOLTED GRATE



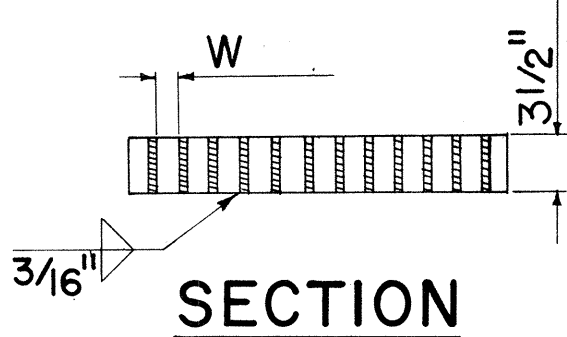
BAR SPACER

Scale: 3"= 1'- 0"

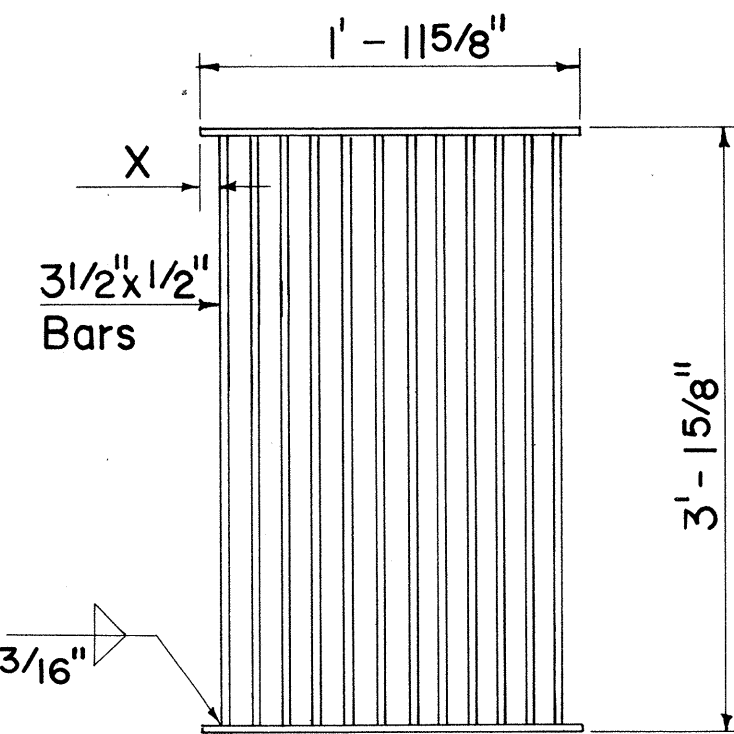


END OF BAR

Scale: 3"= 1'- 0"



SECTION



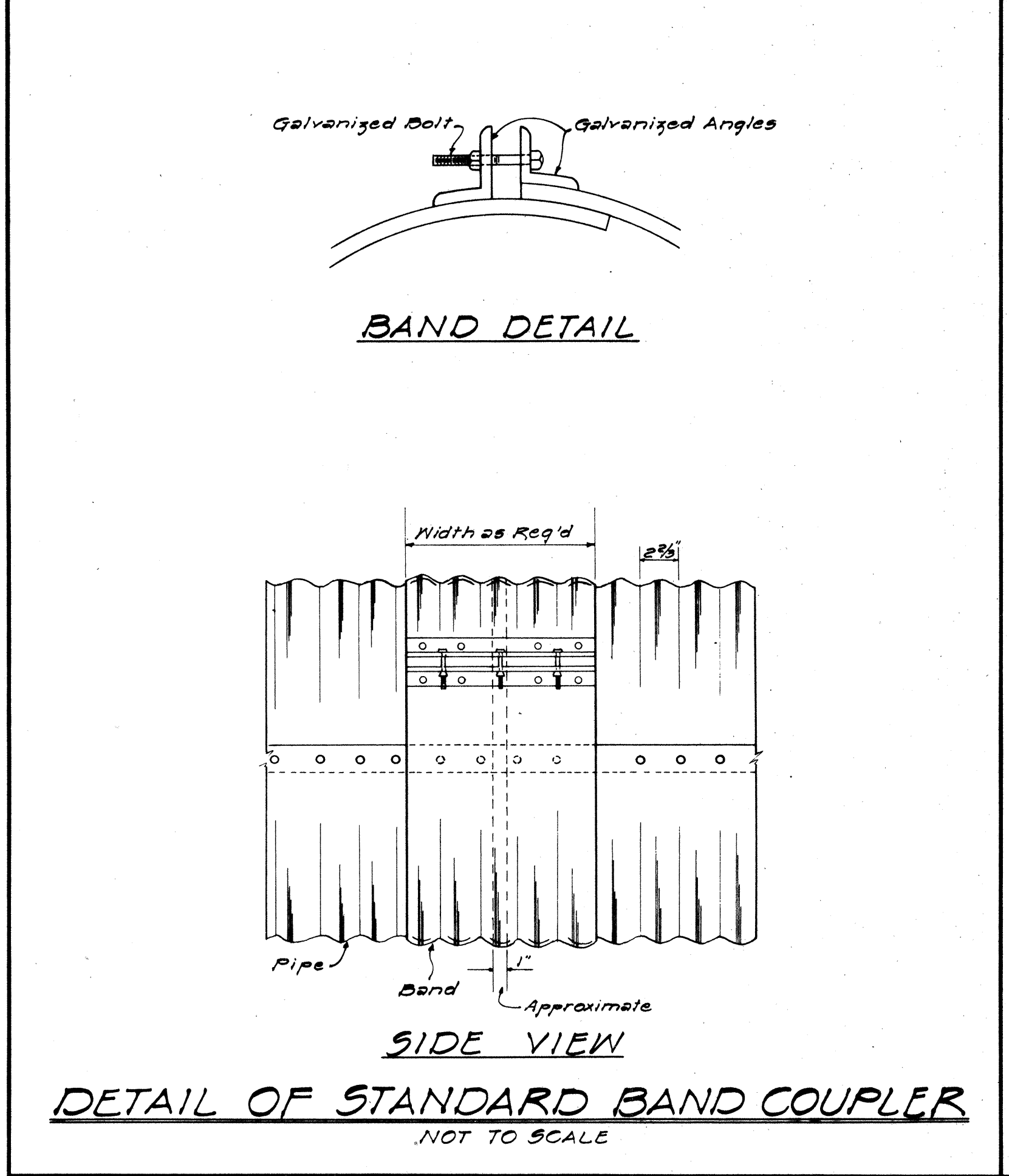
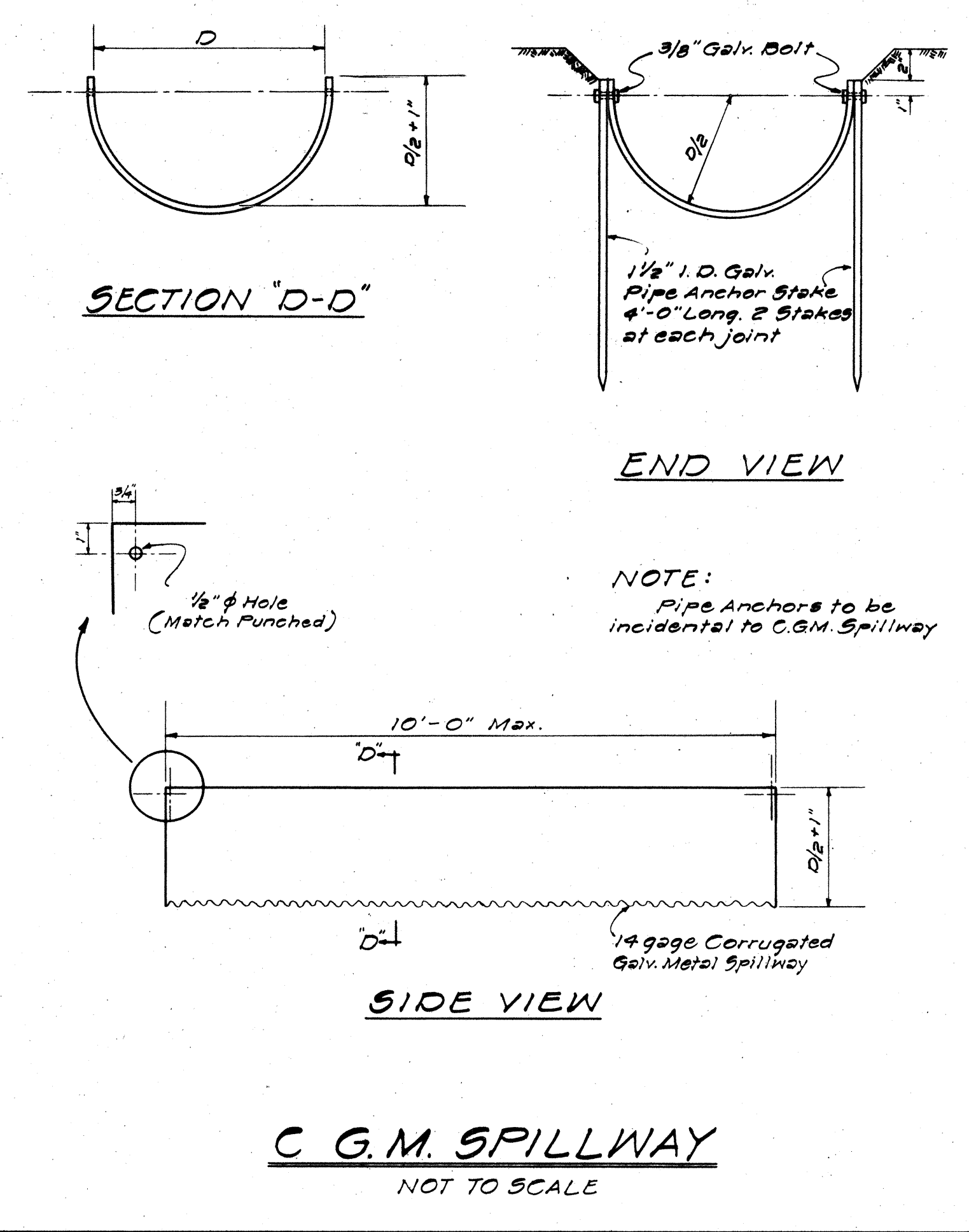
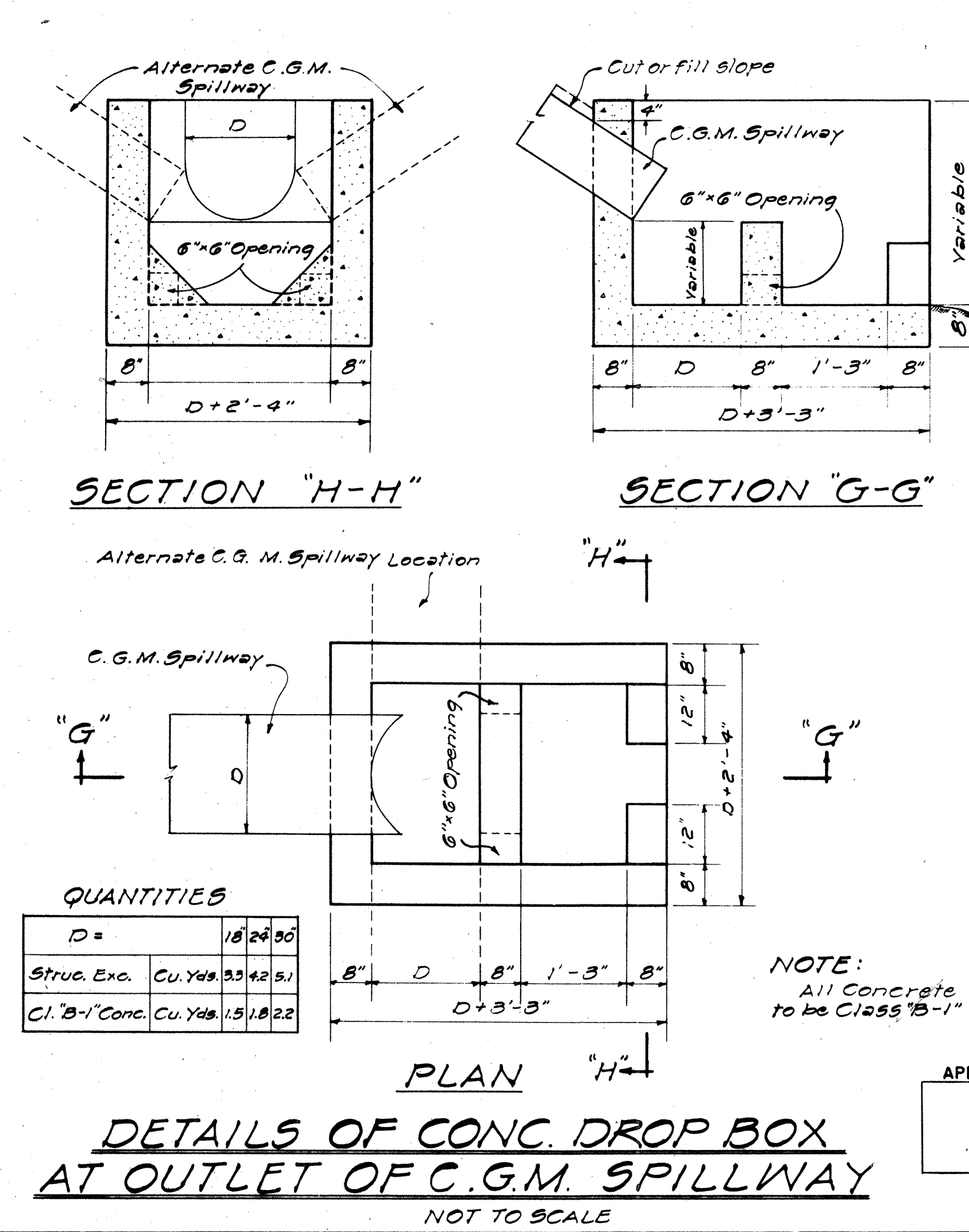
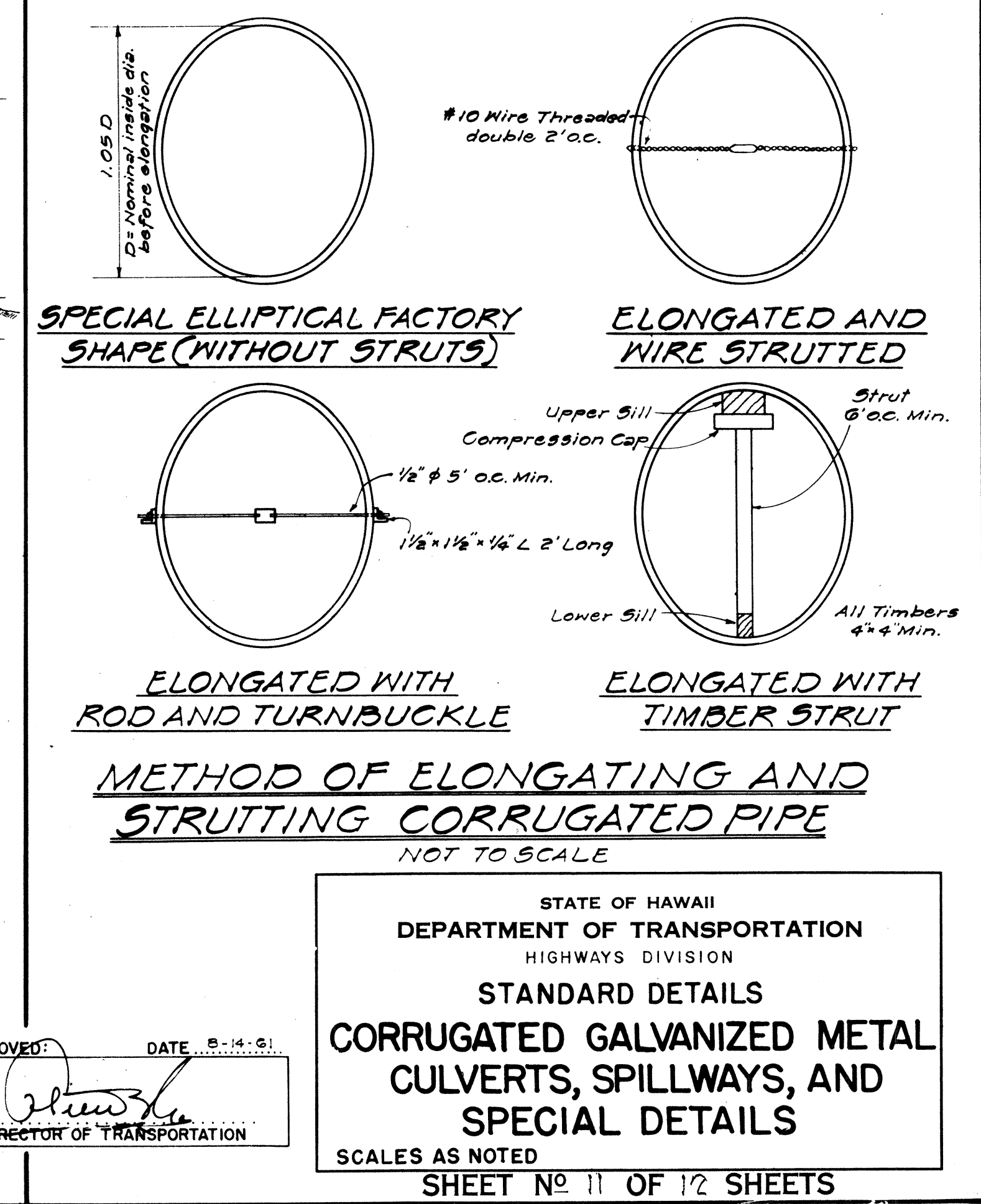
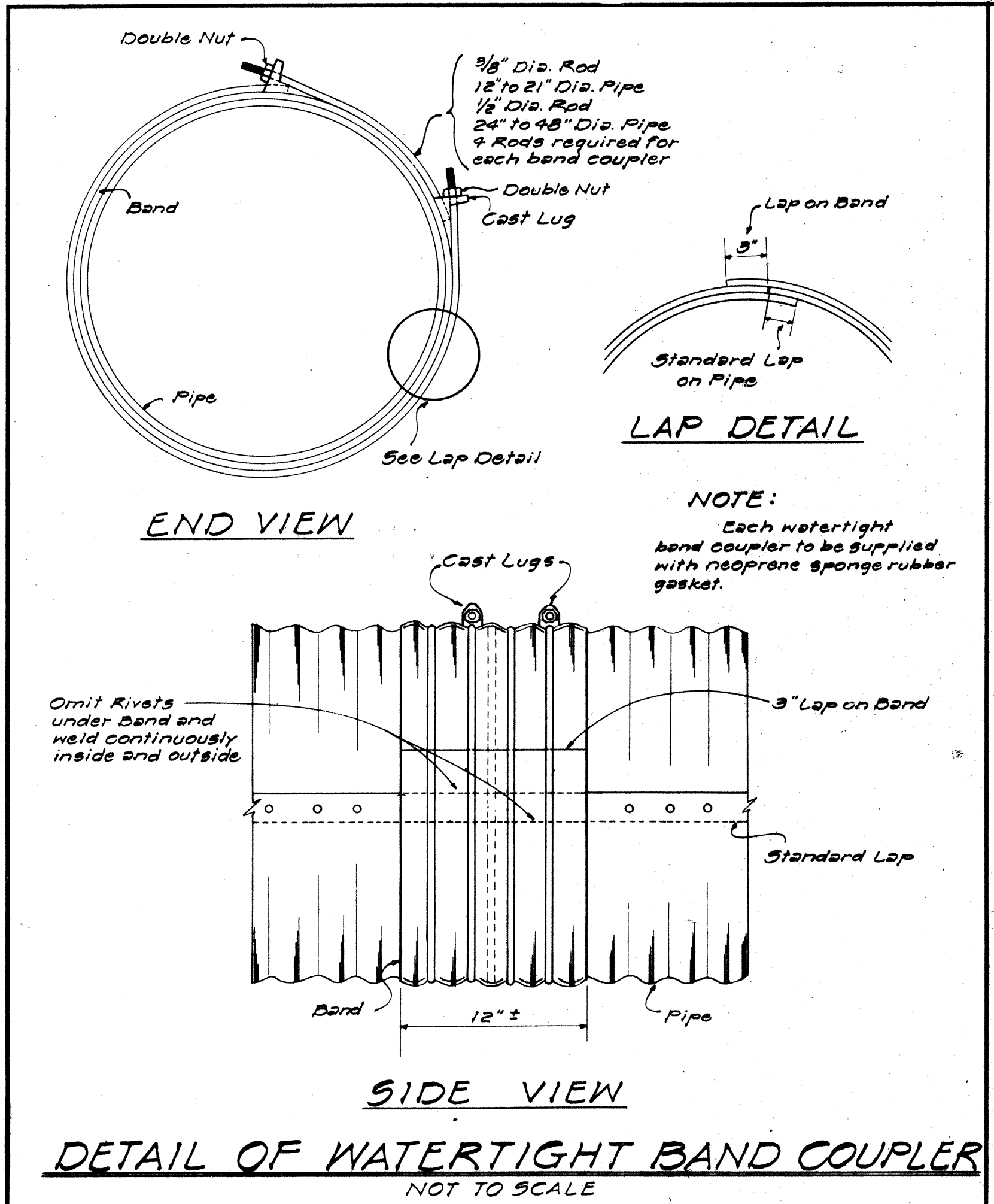
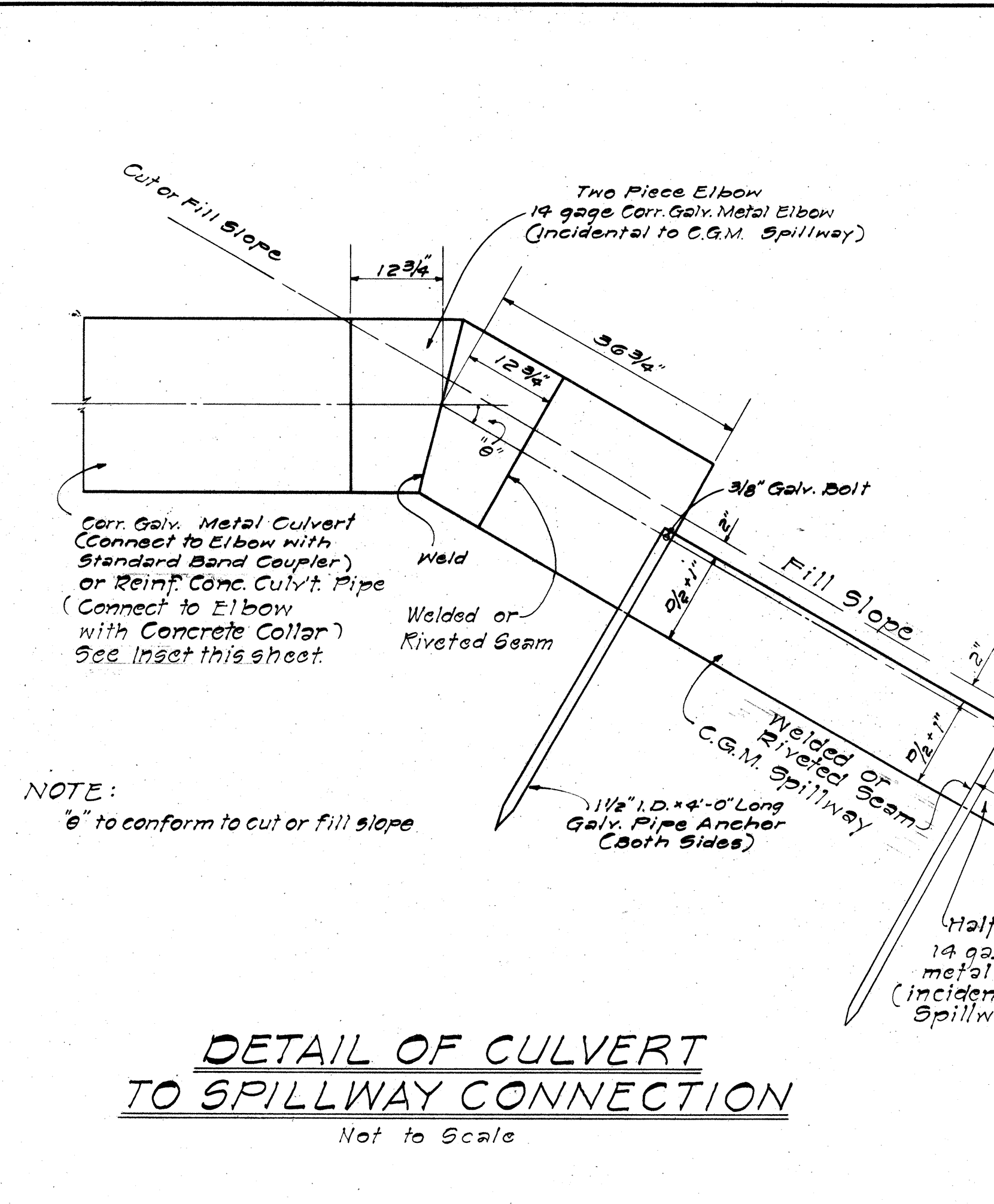
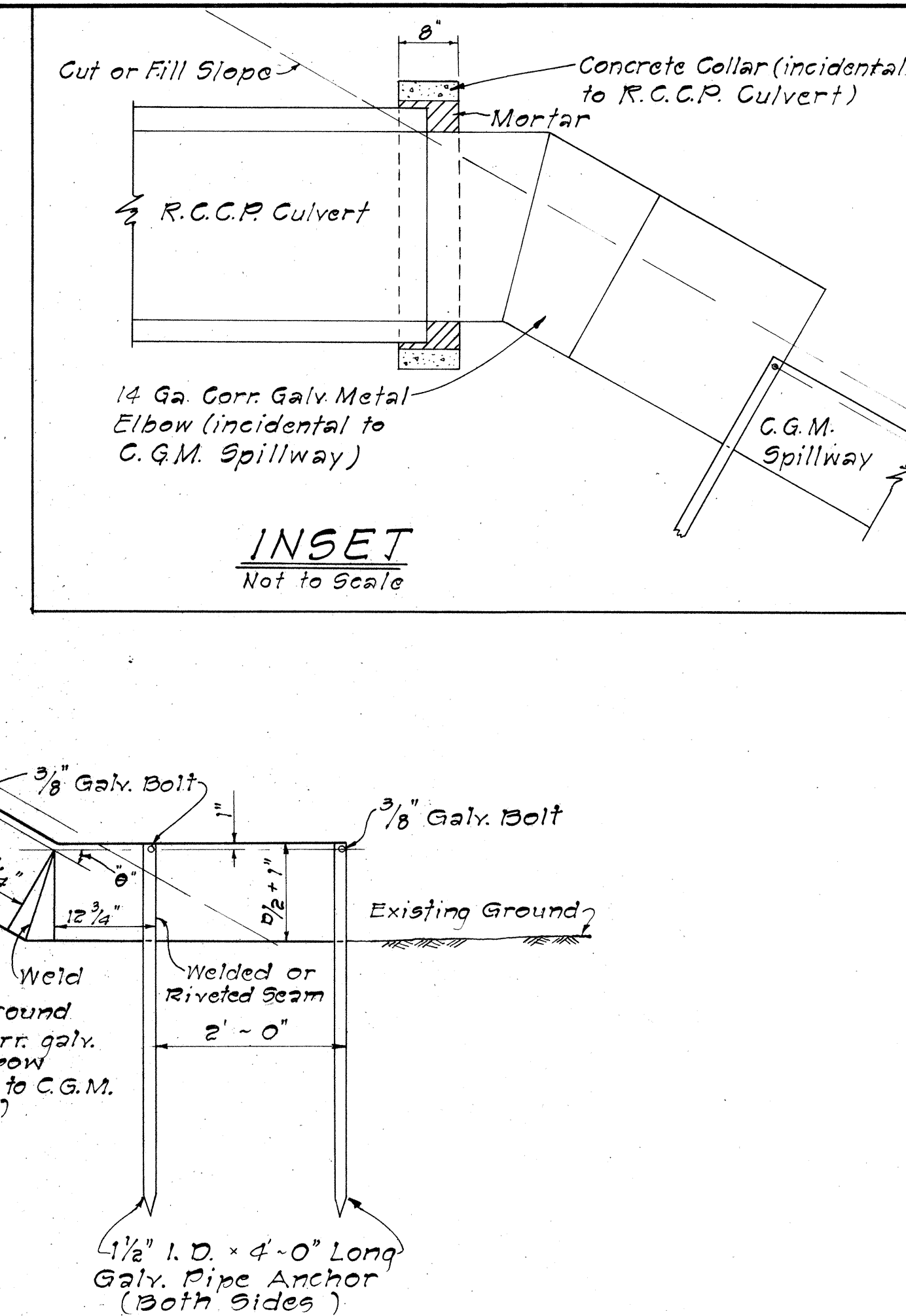
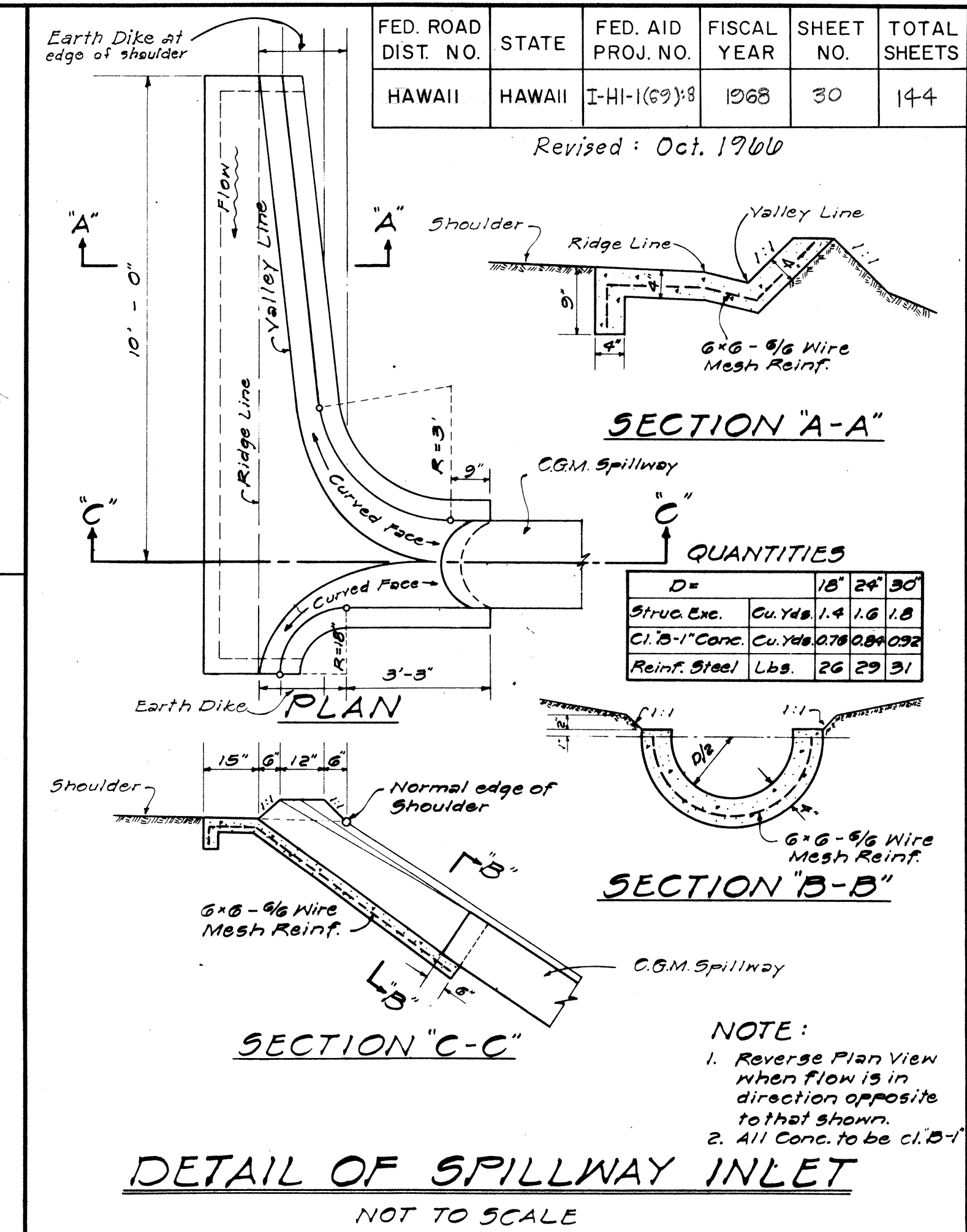
PLAN

Scale: 1"= 1'- 0"

ALTERNATIVE
WELDED GRATE

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	I-HI-1(69)18	1968	30	144

Revised: Oct. 1960



DATE	5-22-64
SURVEYED BY	Y
DRAWN BY	Y
DESIGNED BY	Y
CHECKED BY	Y
ORIGINAL FILED	Y
NOTE BOOK	Y
NO.	Y

