

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(77):13	1969	34	155 ⁴

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	
	TRACED BY	
NOTE BOOK	DESIGNED BY	
	QUANTITIES BY	
No. _____	CHECKED BY	1-20-69

THIS WORK WAS PREPARED BY
ME OR UNDER MY SUPERVISION.

J. Andrew Schuchardt

SHEET No. 1 OF 17 SHEETS

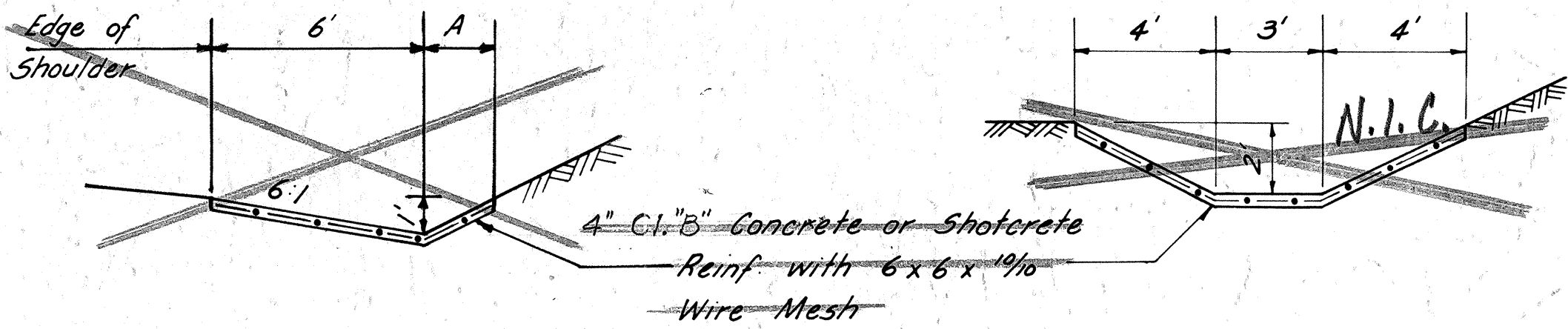
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(77):13	1969	35	155

SCHEDULE OF ROADWAY LINED SWALES & DITCHES

LOCATION	TYPE	DITCH EXCAVATION C. Y.	SHOTCRETE C. Y.	REINF. STEEL LB.	REMARKS
± H-1 202+35 Lt. to H-1 201+45 Lt.	4	128	3.0	26.3	90'
± H-1 201+45 Lt. to H-1 201+35 Lt.	4-5	6	.4	4.4	10' *
± H-1 201+35 Lt. to H-1 197+54 Lt.	5	203 252 249	7.6 17.0 5.4	101 224.6 163.6	175 383 210
± H-1 197+54 Lt. to H-1 197+44 Lt.	5-7	1	6	7.3	10' *
± H-1 197+44 Lt. to H-1 195+00 Lt.	7	110 145 29	13.1 16.4 3.3	171.4 214.4 43	195 245 25
± H-1 195+00 Lt. to H-1 194+57 Lt.	7-5	18	2.3	30.6	42' *
± H-1 202+63 Lt. to H-1 203+50 Lt.	5	47	3.7	49.6	85'
± H-1 203+85 Lt. to H-1 203+50 Lt.	4-5	27	1.4	15.3	35' *
± H-1 204+95 Lt. to H-1 205+78 Lt.	4-5	21	3.2	36.3	83' *
± H-1 195+00 Lt. to D 40+20 Rt.	6	0	31.9 54.1 26.2	418.4 709.2 290.8	640 1081 441
± H-1 195+00 Rt. to WE 205+30 Rt.	6	0	17 51.8 34.8	883.4 677.1 452.7	341 1032 601
± WE 205+30 Rt. to WE 205+80 Rt.	2	0	4.6	72.9	50'
± WE 205+40 Rt. to WE 210+00 Rt.	2		42.6	670.7	460'
± D 38+92 Rt. to ± D 18+94 Rt.	1		197.3	3108.9	1998'
± H-1 209+00 Rt. to ± MF 144+00 Lt.	1		105.9	1668.0	1072'
± H-1 211+50 Rt. to ± H-1 216+00 Rt.	1		44.4	700.2	450'
± H-1 216+00 Rt. to ± H-1 216+25 Rt.	1-6	N.I.C.	1.9	29.1	25' *
± H-1 216+25 Rt. to ± H-1 216+95 Rt.	6		3.9	54.5	70'
± H-1 217+55 Rt. to ± B 11+30 Rt.	1		49.4	778.0	500'
± H-1 213+50 Lt. to ± H-1 219+00 Lt.	1		54.3	855.8	550'
± H-1 219+00 Lt. to ± H-1 219+50 Lt.	1-6		3.8	58.3	50' *
± H-1 219+50 Lt. to ± H-1 219+92 Lt.	6		2.3	38.7	42'
± MF 144+50 Rt. to ± B 14+00 Lt.	1		83.9	1322.6	850'
± B 14+00 Lt. to ± B 13+50 Lt.	1-6		4.6	70.0	60'
± H-1 203+85 Lt. to H-1 203+50 Lt.	4-5	27	1.4	15.3	35' *

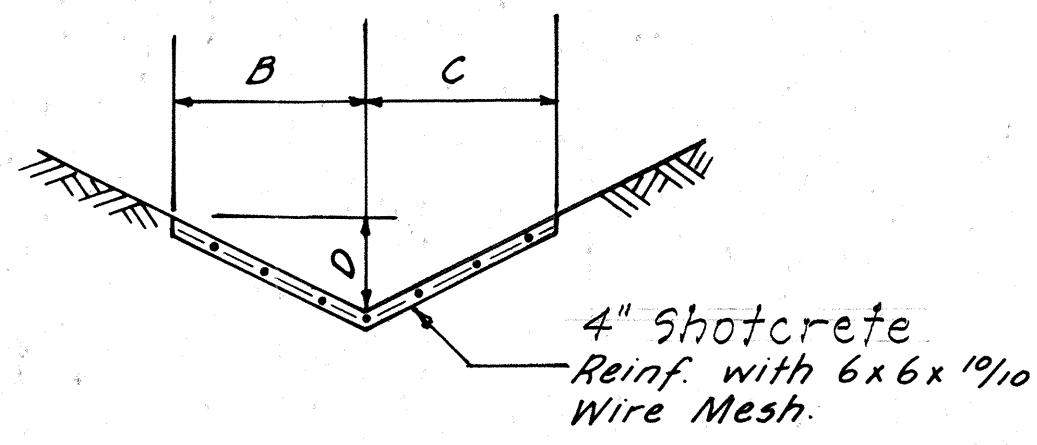
SCHEDULE OF ROADWAY LINED SWALES & DITCHES

LOCATION	TYPE	DITCH EXCAVATION C. Y.	CL. B' CONC. OR SHOTCRETE C. Y.	REINF. STEEL LB.	REMARKS
± B 13+50 Lt. to ± B 13+22 Lt.	6		2.6	36.6	47'
± B 22+05 Rt. to ± B 14+50 Rt.	1		74.6	1174.8	755'
± B 14+50 Rt. to ± B 13+50 Rt.	1-6		6.9	105.0	90' *
± B 13+50 Rt. to ± B 13+00 Rt.	6		2.2	31.1	40'
± B 13+00	12		1.1	16.0	
± B 12+92 Rt. to ± B 11+30 Rt.	8-1		24.8	364.6	250' *
± E 29+72 Rt. to ± E 17+50 Rt.	1		110.8	745.8	1122'
± E 17+50 Rt. to ± E 17+00 Rt.	1-6		3.5	52.5	45' *
± E 17+00	11		6	7.9	
± E 16+94 Rt. to ± E 16+50 Rt.	6		1.9	27.2	35'
± E 21+97 Lt. to ± E 18+00 Lt.	1	N.I.C.	39.2	617.7	397'
± E 18+00 Lt. to ± E 17+50 Lt.	1-6		3.8	58.3	50' *
± E 17+50 Lt. to ± E 17+00 Lt.	6		2.8	38.9	50'
± EW 126+55 Rt. to ± EW 127+00 Rt.	1		4.4	70.0	45'
± EW 127+00 Rt. to ± EW 127+50 Rt.	1-6		3.8	58.3	50' *
± EW 127+50 Rt. to ± EW 129+50 Rt.	6		12.7	178.9	230'
± EW 120+95 Lt. to ± EW 124+00 Lt.	1		30.1	474.6	305'
± EW 124+00 Lt. to ± EW 124+50 Lt.	1-6		3.8	58.3	50' *
± MF 156+24 Lt. to ± MF 159+35 Lt.	1		30.7	483.9	311'
± UE 38+81 Rt. to ± UE 41+75 Rt.	5	70	14.8	193.4	335'
± H-1 225+13 Rt. to ± H-1 231+68 Rt.	10	3780	445.5	3509.1	658'
± UE 38+67 Rt. to ± DA 14+60 Lt.	2		62.0	976.9	670'
± UE 38+30 Lt. to ± DA 10+50 Rt.	5		4.6	61.3	105'
± DA 10+50 Rt. to ± DA 10+70 Rt.	5-2		1.4	20.4	20' *
± DA 10+70 Rt. to ± DA 14+65 Rt.	5		17.4	230.4	395'



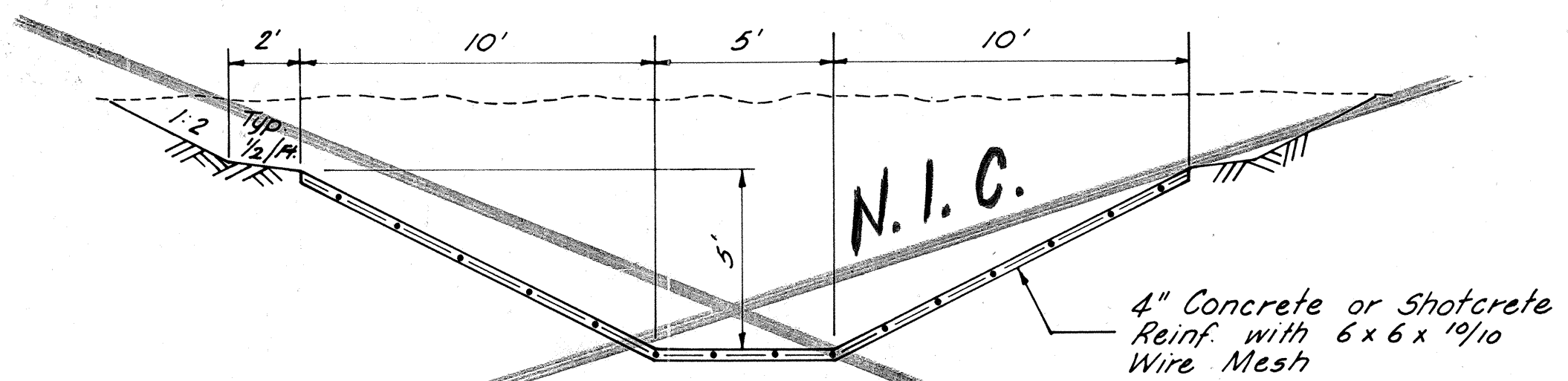
TYPE	A	CONCRETE	REINF.
1	2'	.09876 c/LF	1.556 #/LF
2	1.5'	.09259 c/LF	1.458 #/LF

~~TYPE 3 N.I.C.~~
Concrete 14.75 c/LF
Reinf. 2.139 #/LF

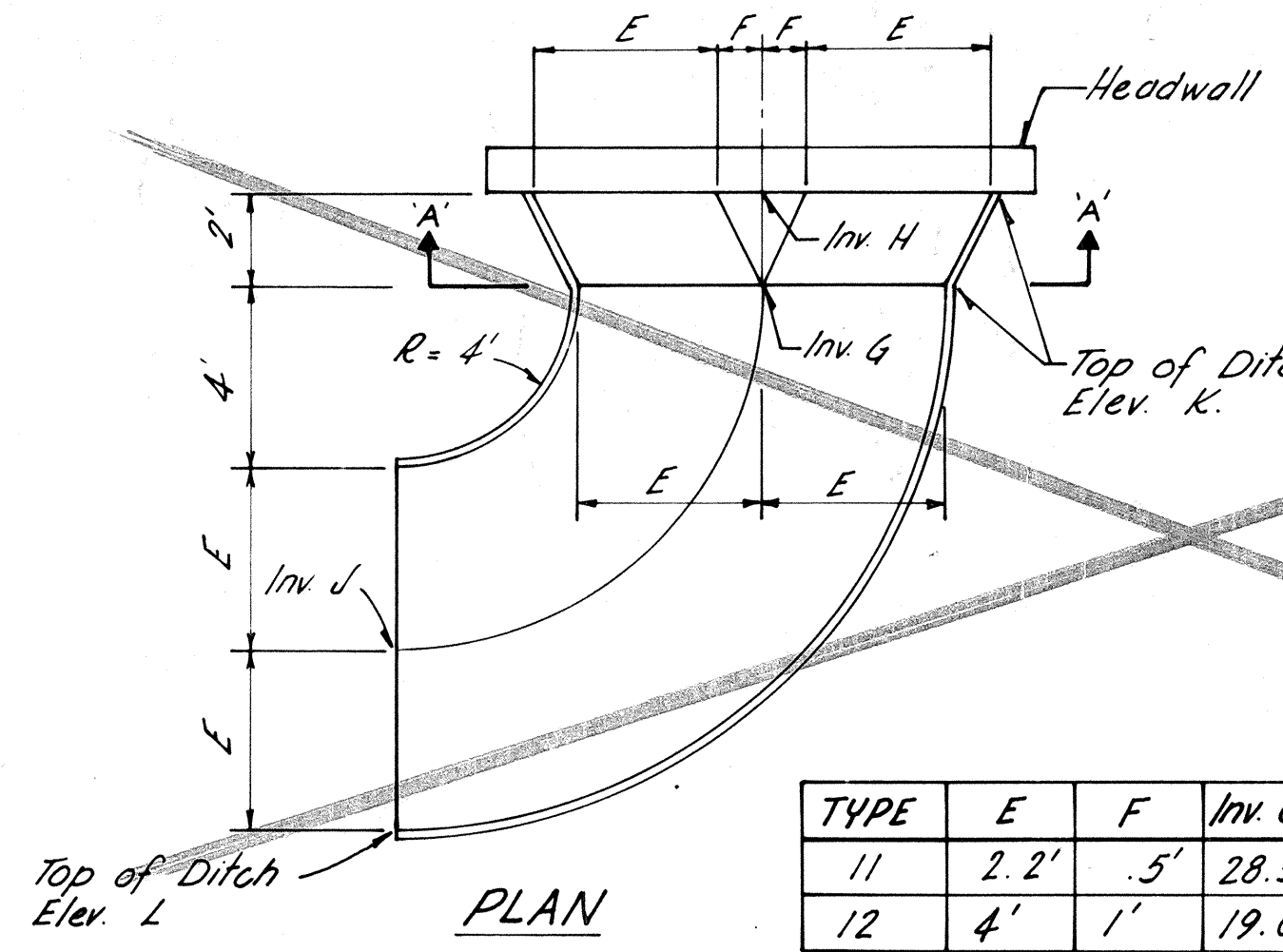


TYPE	B	C	D	CONCRETE	REINF.
4	.75'	.75'	.5'	.0333 c/LF	.2917 #/LF
5	1.5'	1.5'	1'	.0441 c/LF	.5834 #/LF
6	2'	2'	1.5'	.0500 c/LF	.6561 #/LF
7	2.25'	2.25'	1.5'	.0668 c/LF	.8750 #/LF
8	4'	3'	2'	.0997 c/LF	1.3611 #/LF
9	4'	4'	2'	.1104 c/LF	1.5556 #/LF

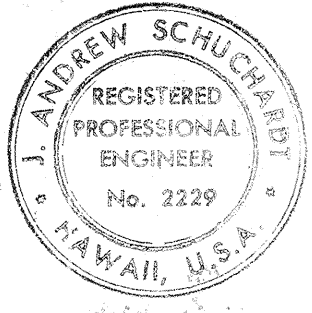
VEE DITCH



TYPE 10
Concrete .677 c/LF
Reinf. 5.333 #/LF



TYPE	E	F	Inv. G	Inv. H	Inv. J	El. K	El. L	SHEET No.
11	2.2'	.5'	28.5	28.0	30.9	31.0	32.0	10
12	4'	1'	19.0	18.5	20.5	22.5	22.5	15



THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
J. Andrew Schuchardt

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE ESTIMATED QUANTITIES

HALAWA INTERCHANGE
PROJECT No I-HI-1(77):13

SCALE: 1"=50'

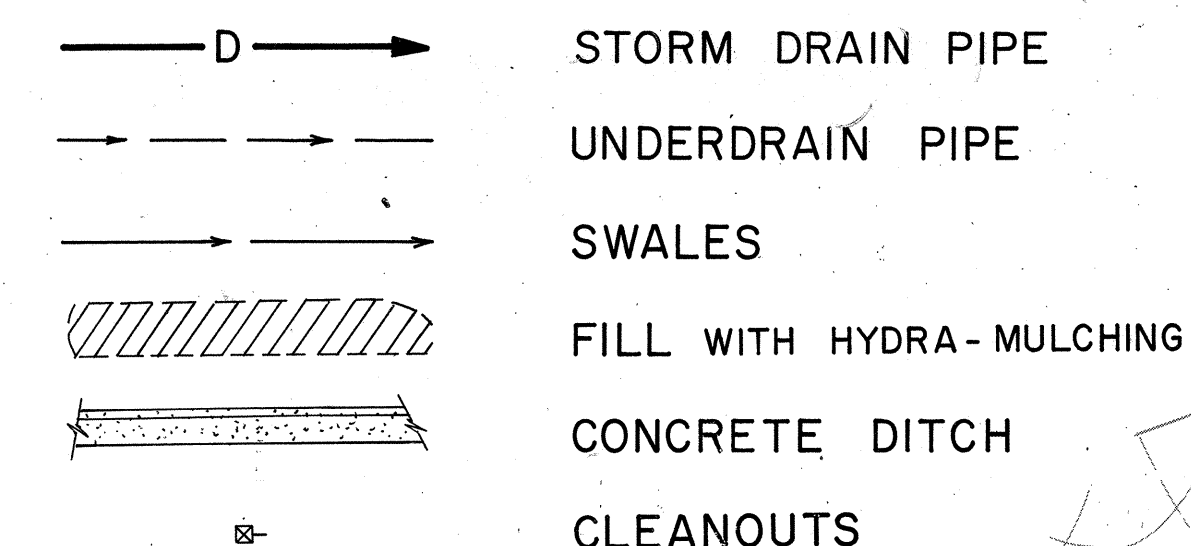
DATE: Nov. 28, 1969

ORIGINAL PLAN
DRAWN BY J. ANDREW SCHUCHARDT
DESIGNED BY J. ANDREW SCHUCHARDT
CHECKED BY J. ANDREW SCHUCHARDT
DATE 11-28-69

* Transition Section

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(77)13	1969	36	155

GRADING AND DRAINAGE LEGEND



GENERAL NOTES:

1. Unless otherwise noted, all concrete for drainage improvement shall be "Concrete For Structures Other Than In Bridges".
2. Unless otherwise noted, all reinforcing steel for drainage improvements shall be "Reinforcing Steel Other Than In Bridges".
3. Unless otherwise noted, all structure excavation for drainage improvements shall be "Structure Excavation Other Than At Bridges".
4. The final location of manhole rungs shall be determined by the engineer in the field.
5. Manhole rungs and wire mesh reinforcing shall be incidental to "Concrete For Structures Other Than In Bridges".
6. Openings to Drainage Structures shall be plugged temporarily or unless otherwise directed by the Engineer. Payment incidental to Drainage Contract items.
7. Hydra-mulching of Fill Slope is to be paid for as "Slope Control Planting".

End 6" Perforated
Underdrain Pipe
H-191a 199+50 O.B.W



**STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION**

GRADING AND
DRAINAGE PLANS
HALAWA INTERCHANGE
PROJECT No. I-HI-1 (77) : 13

SCALE: 1" = 50' DATE Nov. 28, 1969

SHEET No. 3 OF 17 SHEETS

33 (5)

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
TRACED BY	DRAWN BY	
DESIGNED BY	L. TEMPLE	
QUANTITIES BY	J. O'HARE	
CHECKED BY	J. O'HARE	
No.		1-20-61

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

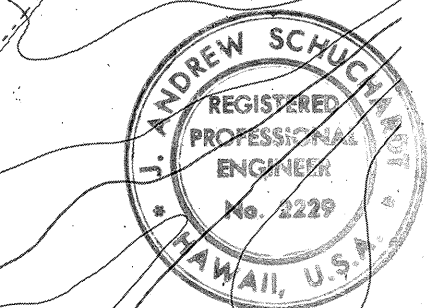
SHEET No. 4 OF 17 SHEETS

NOTE:
Drainage for Kaimakani Street
is shown on Utility Drawings
No. 80 & 81.

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(77):13	1969	38	1554

CURVE DATA TABLE				
NO.	N. COORDINATE	E. COORDINATE	DATA	
PC	75489.95	526412.20	Δ	67°58'37.8"
PT	74582.07	525759.66	R	1000.00'
CC	75517.93	525412.65	L	1186.43'
PI	74816.03	526371.98	T	674.22'

NOTE:
FILL AREA I is to be completed first then work should proceed to FILL AREA II & finally FILL AREA III.



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J. Andrew Schuchman

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

GRADING AND
DRAINAGE PLANS

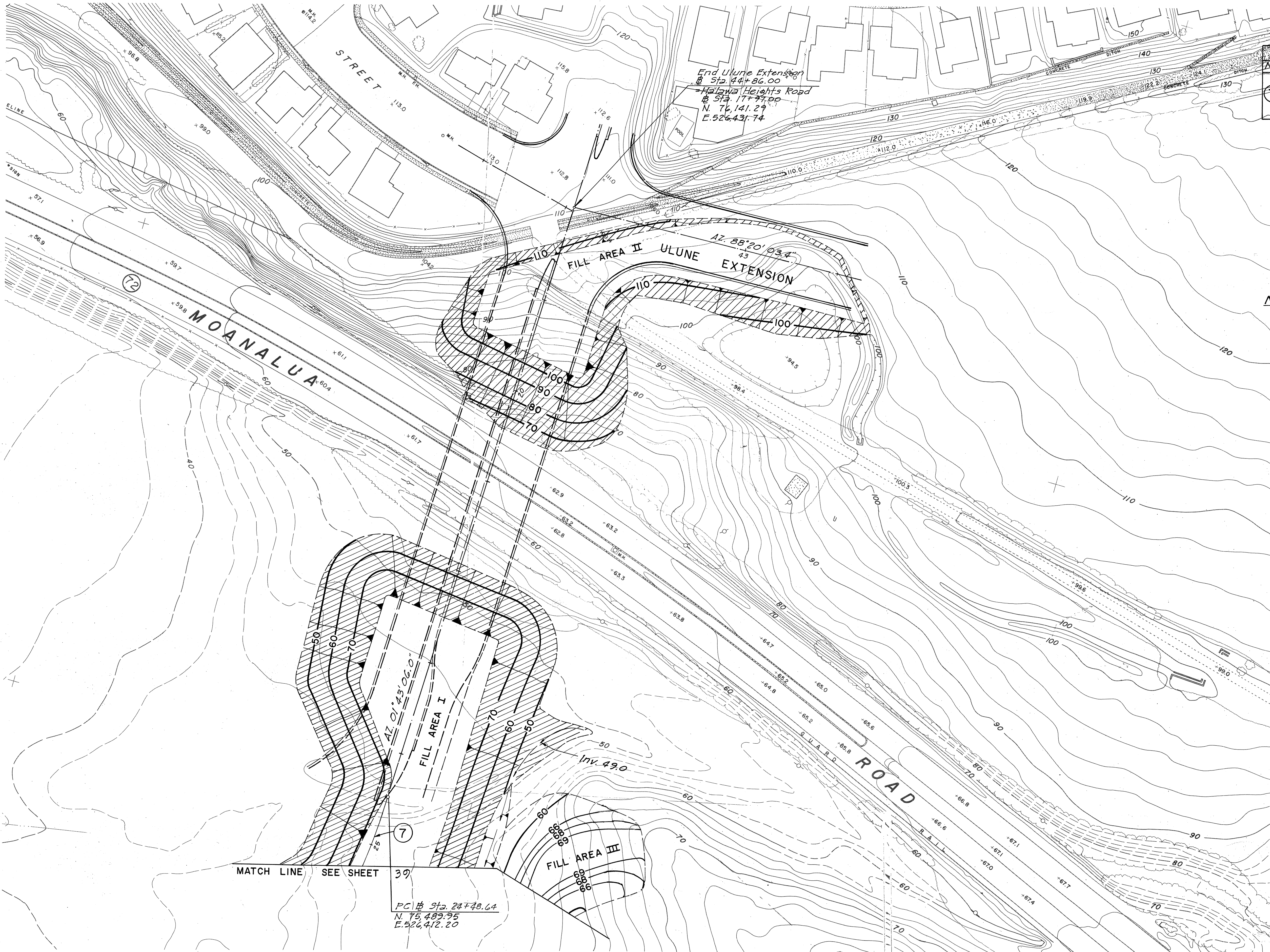
HALAWA INTERCHANGE
PROJECT No I-HI-1(77):13

SCALE: 1"=50' DATE: Nov. 28, 1969

SHEET No. 5 OF 17 SHEETS

33

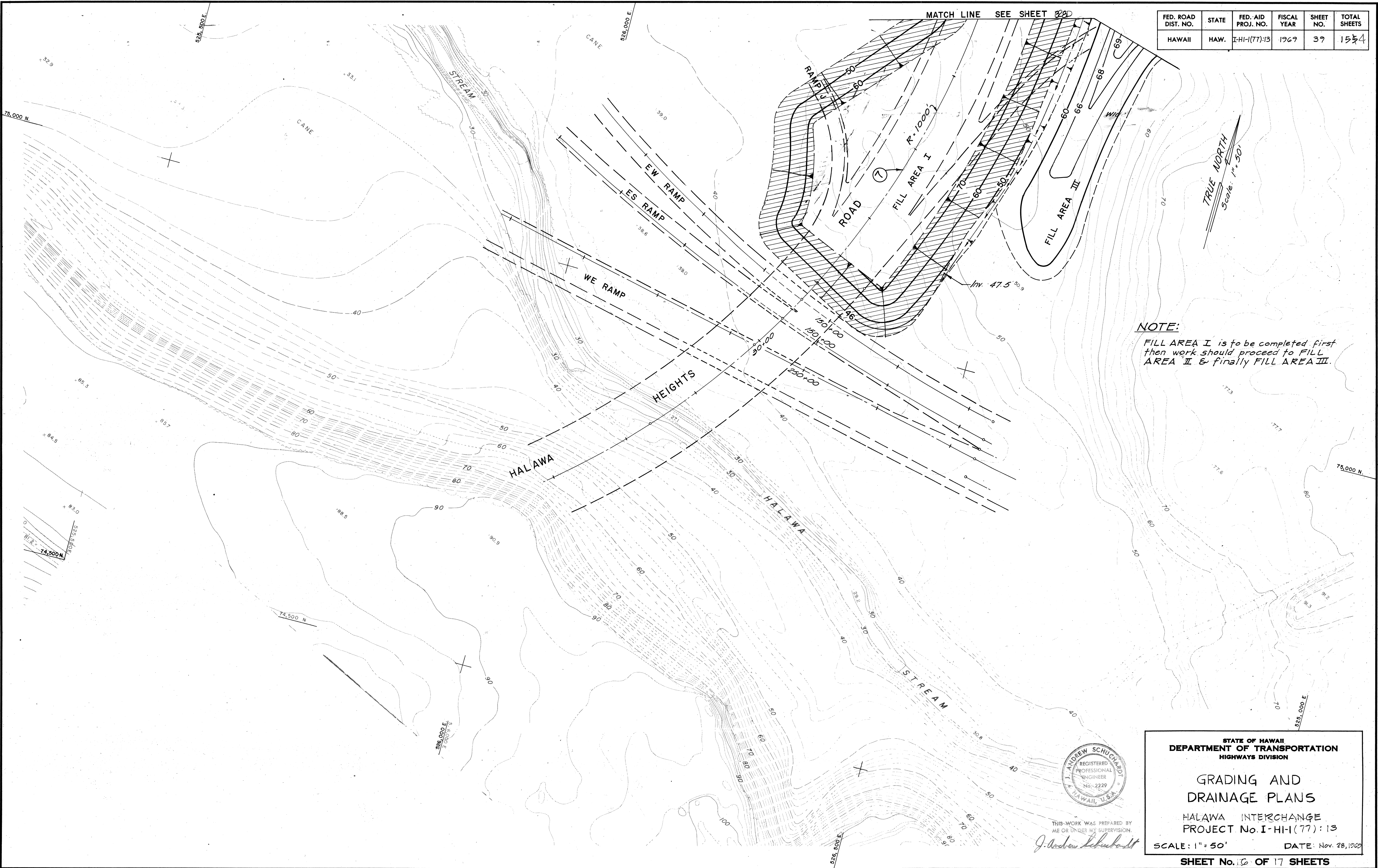
ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	
	DESIGNED BY	
	QUANTITIES BY	
	CHECKED BY	



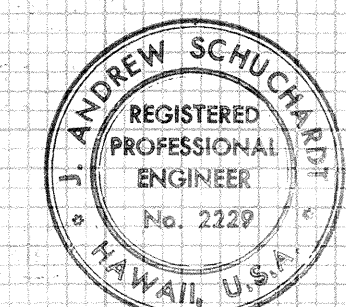
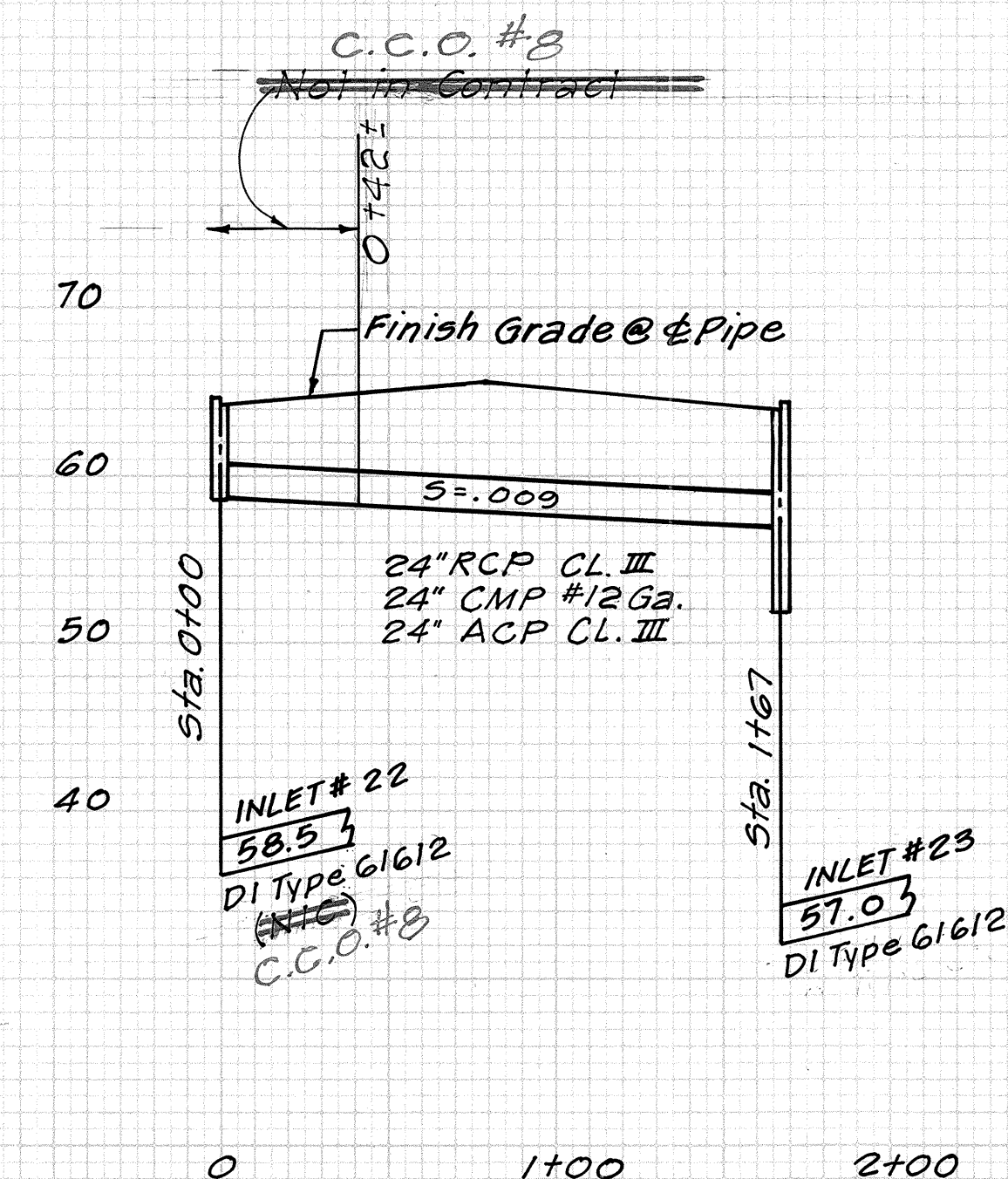
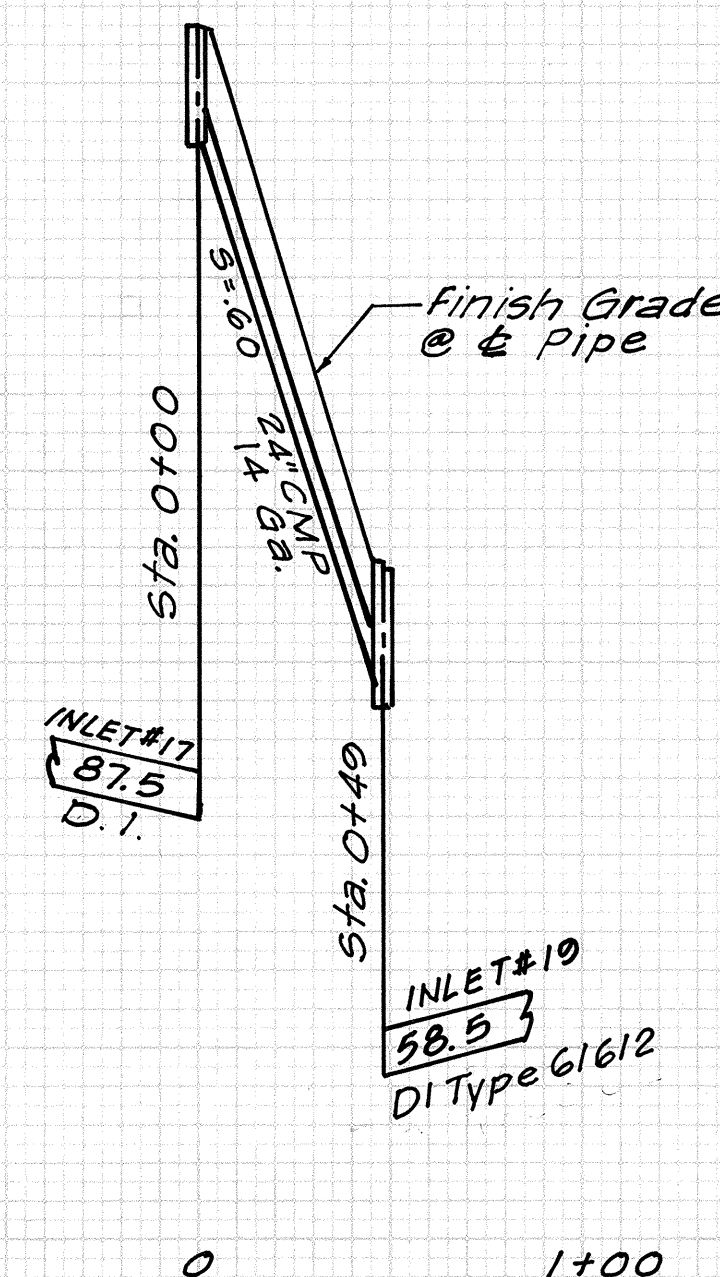
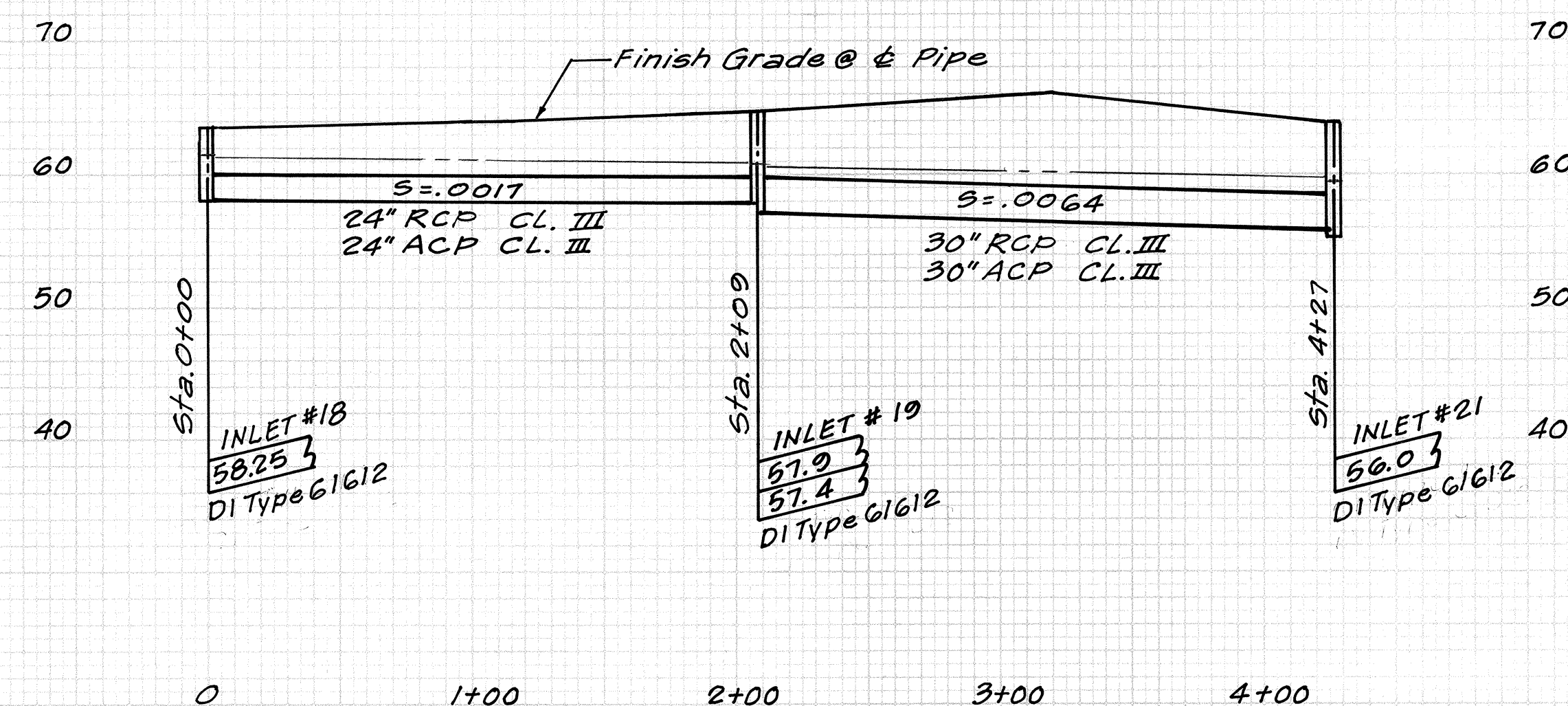
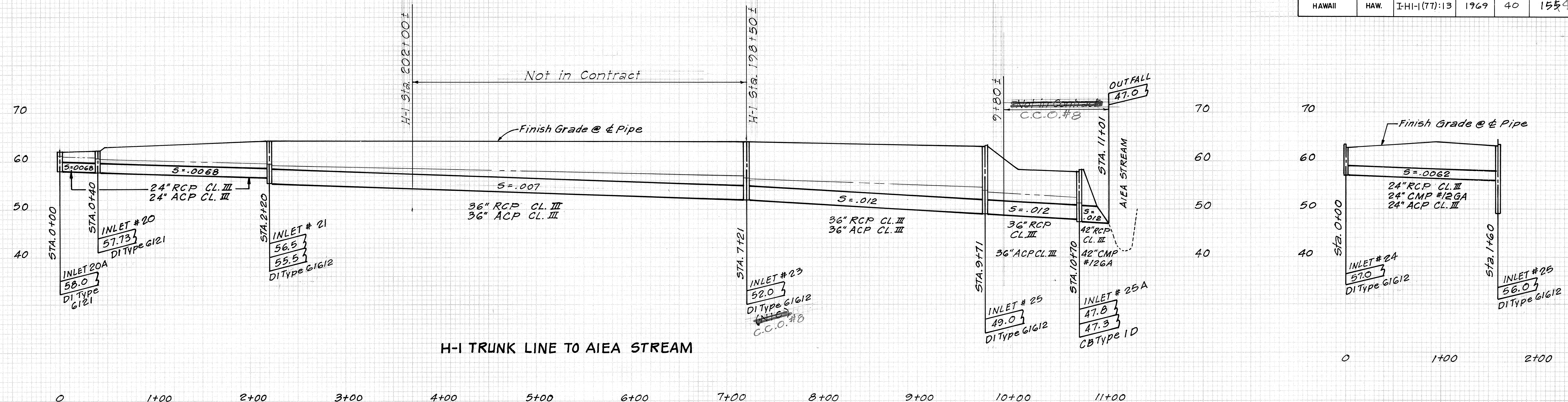
End Ulune Extension
Sta. 44+86.00
Halawa Heights Road
Sta. 17+97.00
N. 76.141.29
E. 526.431.74

PC 1# Sta. 24748.64
N. 75.489.95
E. 526.412.20

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(77):13	1969	39	154



FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(77):13	1969	40	154



DRAINAGE PROFILES

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VERTICAL SCALE: 1"=10'
HORIZONTAL SCALE: 1"=50'

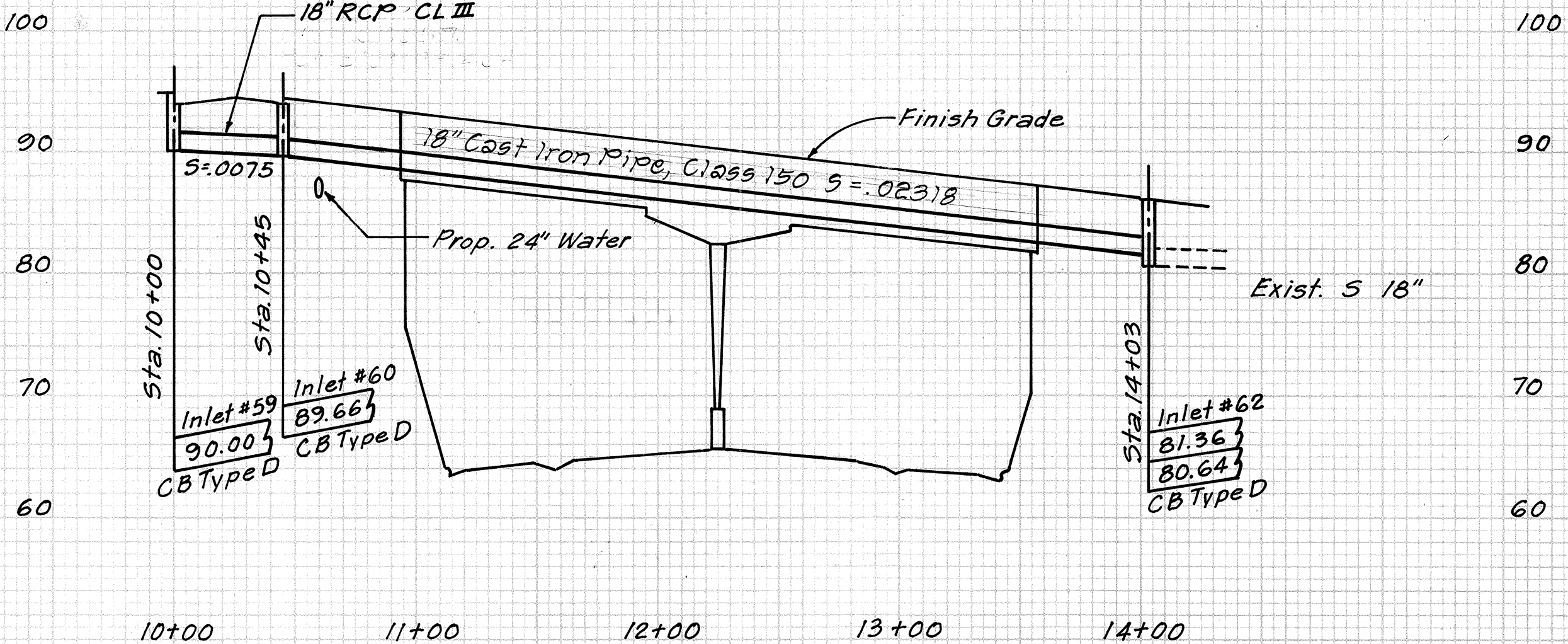
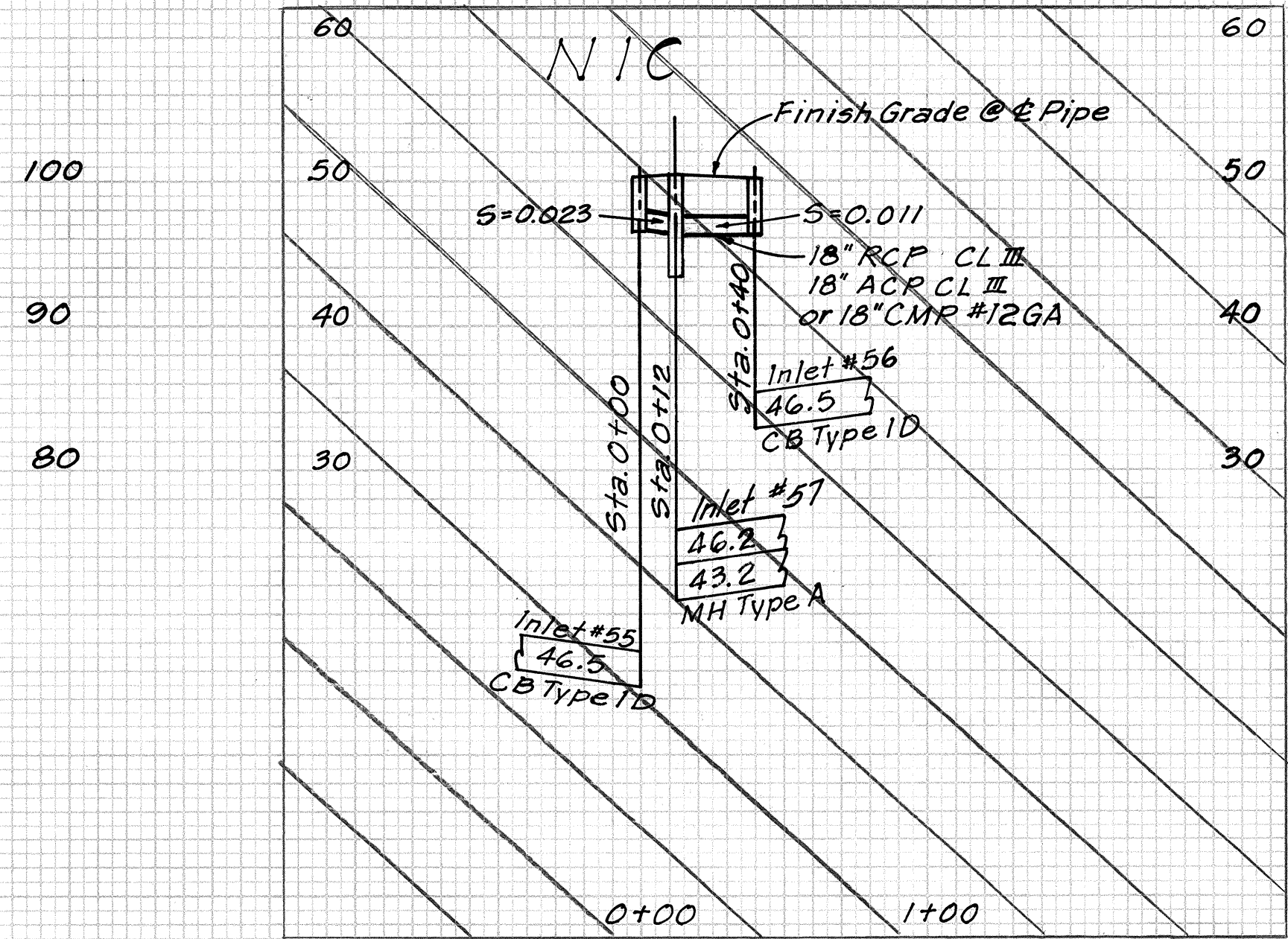
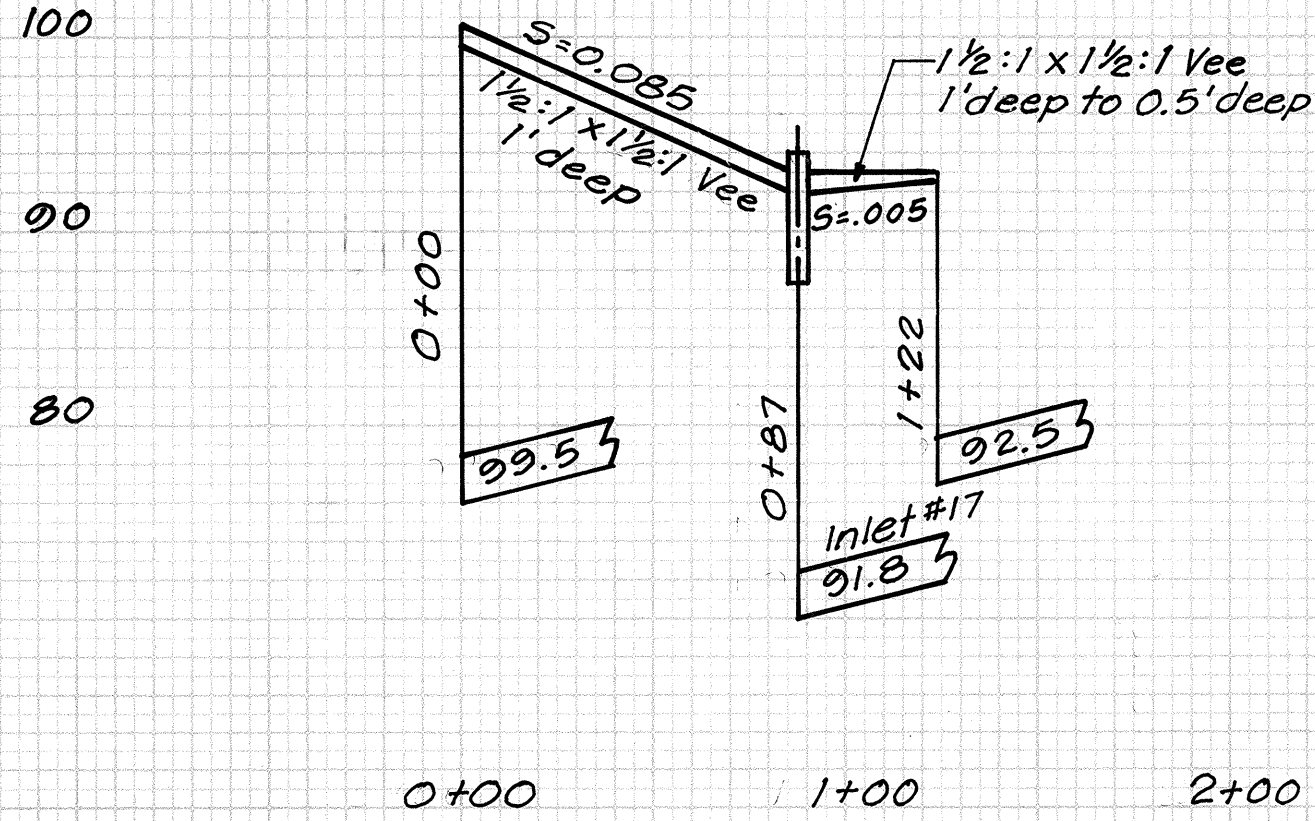
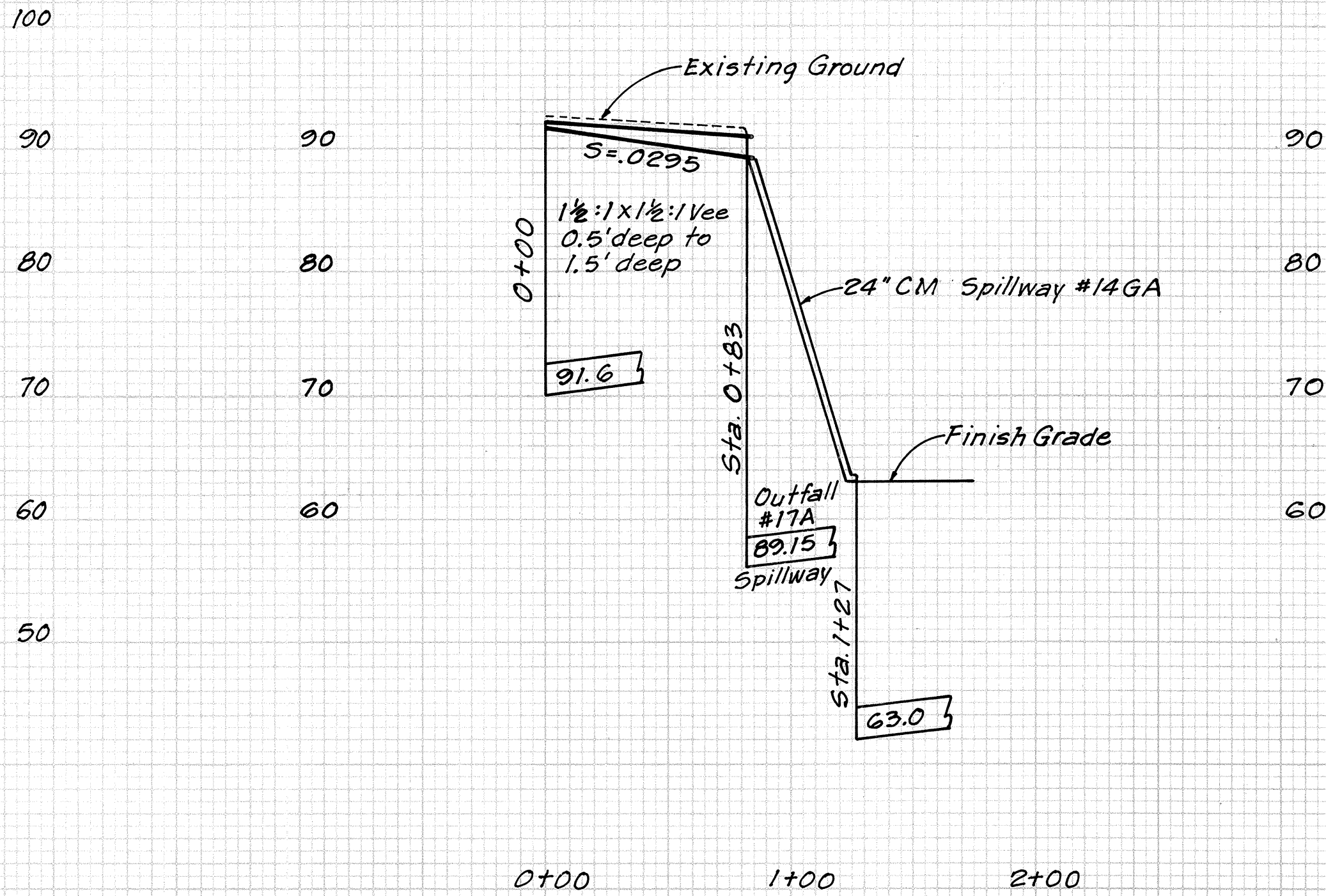
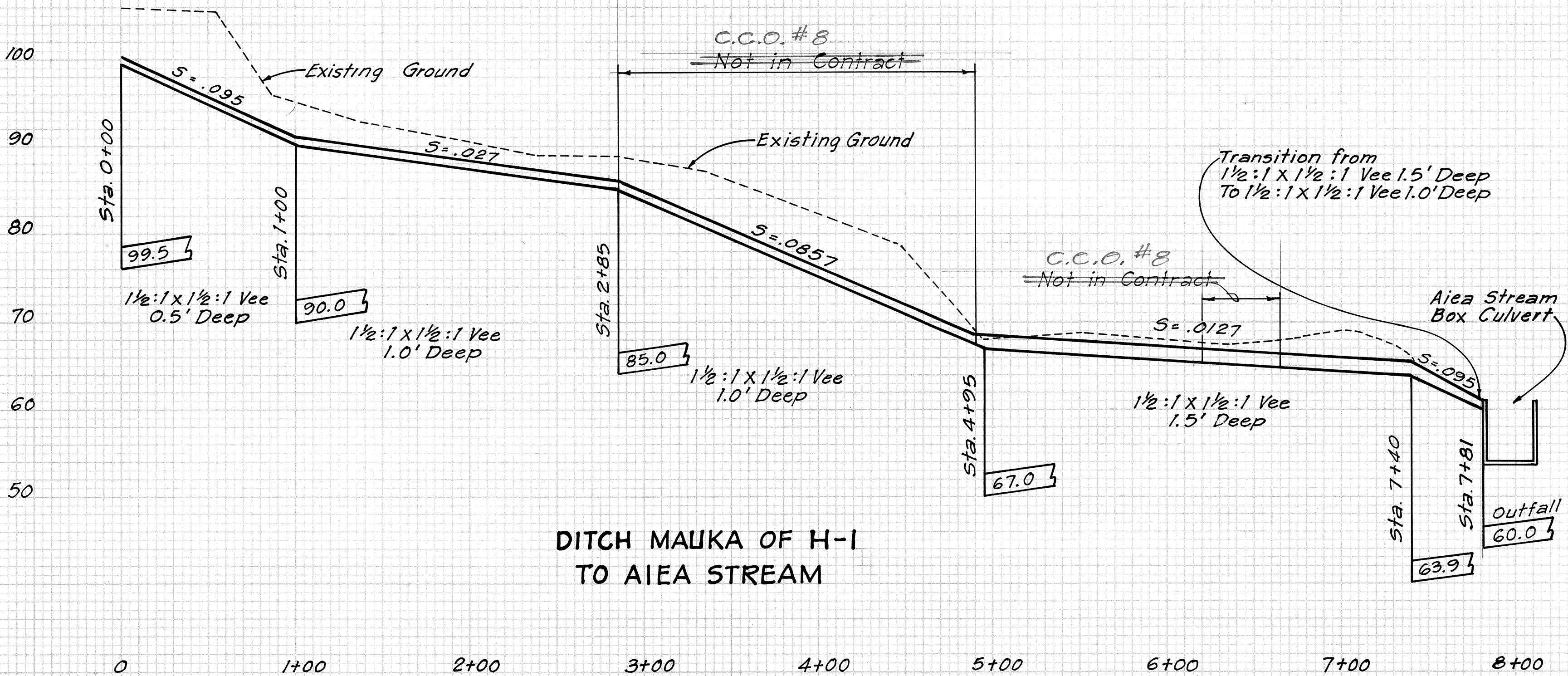
SHEET 7 OF 17 SHEETS

4111

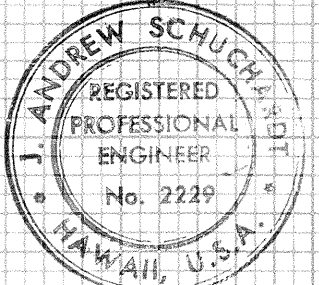
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H-1(77):13	1969	41	154

DATE	BY	DATE	BY
FINAL SURVEY	NOTED	NOTED	NOTED
NO. 1	NO. 2	NO. 3	NO. 4

DATE	BY	DATE	BY
11-20-53	P. HIRATA		J. OHARE
ORIGINAL SURVEY	NOTED	NOTED	NOTED
NO. 1	NO. 2	NO. 3	NO. 4



KAIMAKANI STREET DRAINAGE LINE



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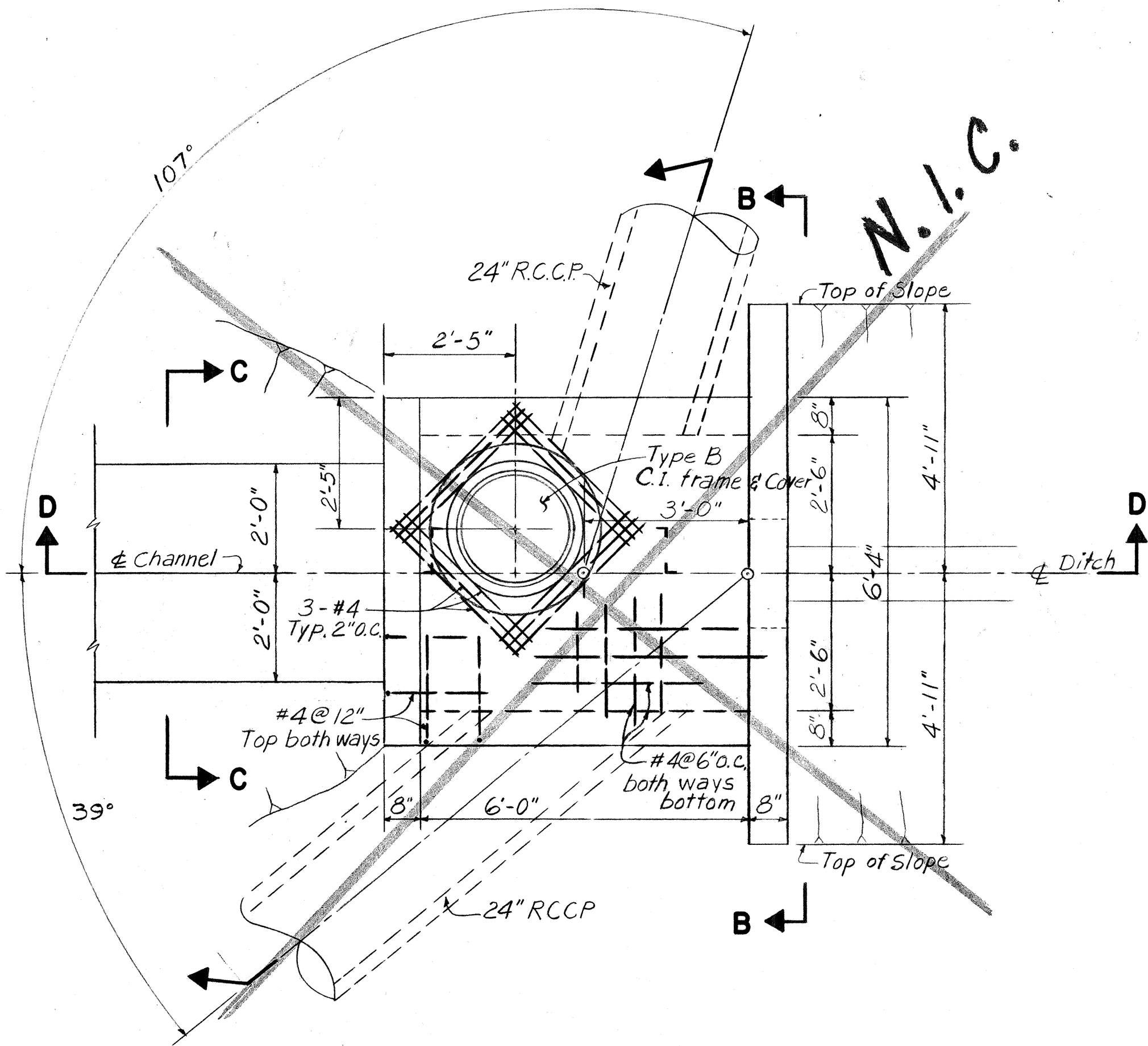
DRAINAGE PROFILES

VERTICAL SCALE: 1"=10'

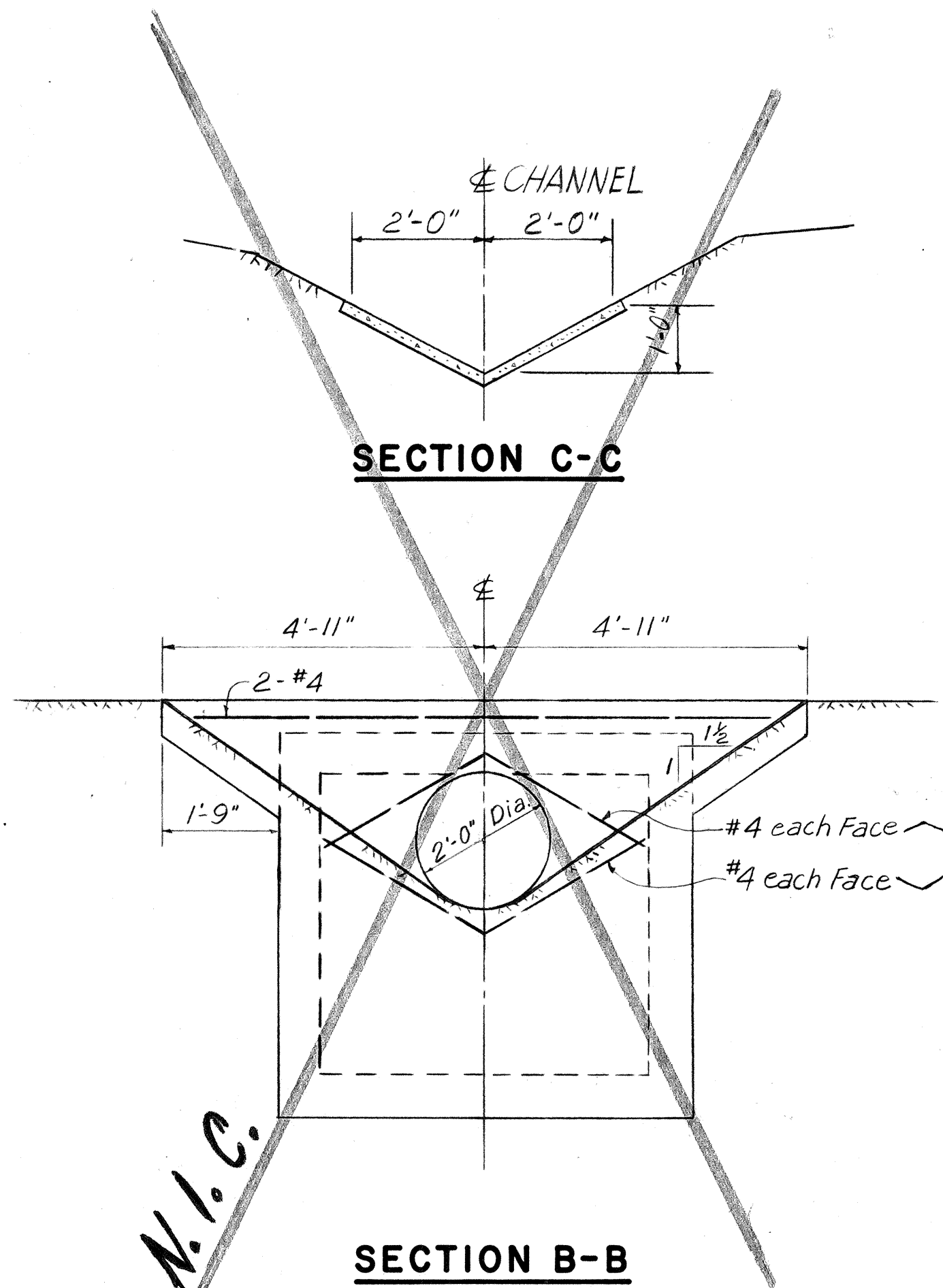
HORIZONTAL SCALE: 1"=50'

SHEET 8 OF 17 SHEETS

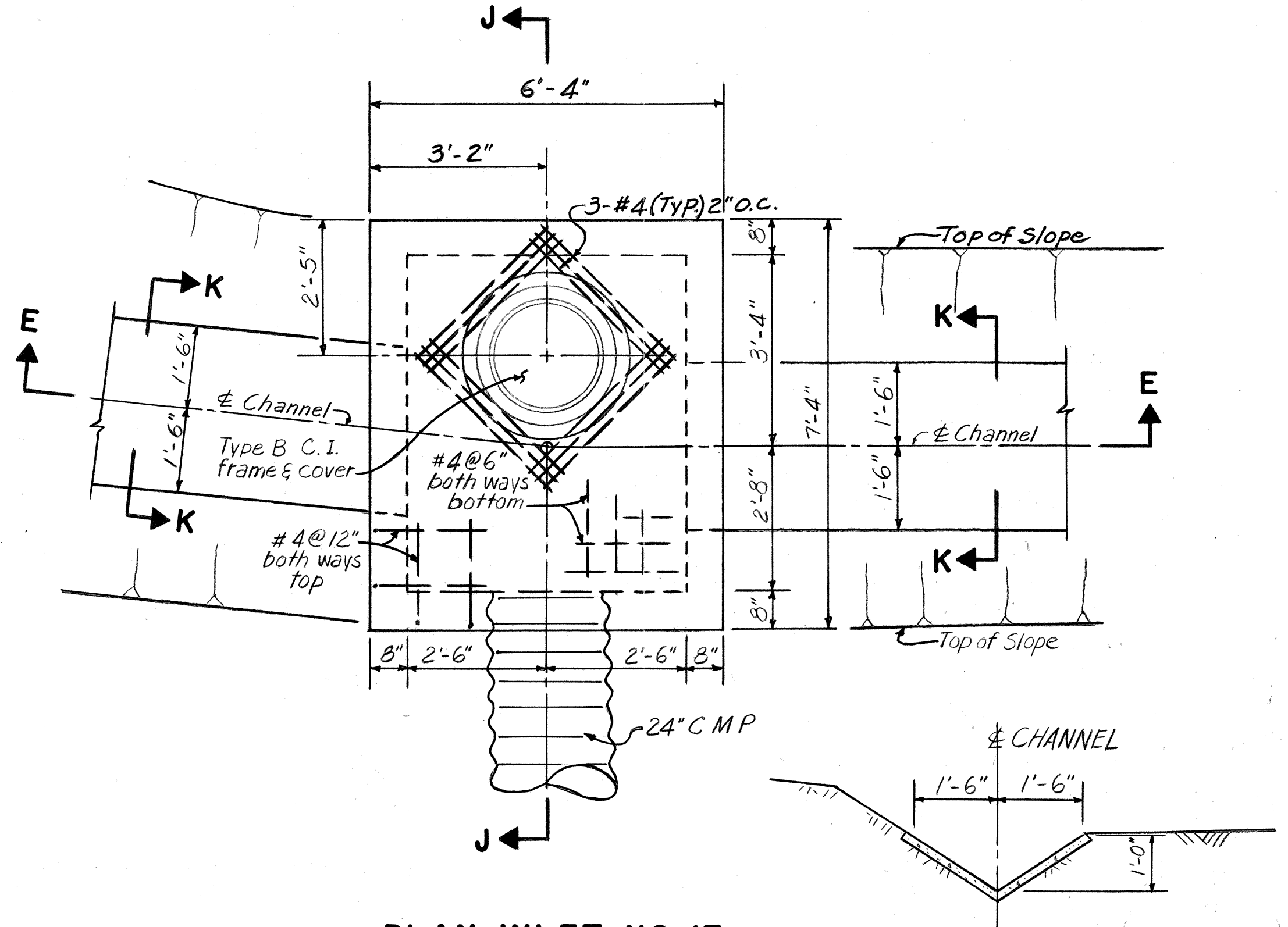
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H-1(77):13	1969	42	1554



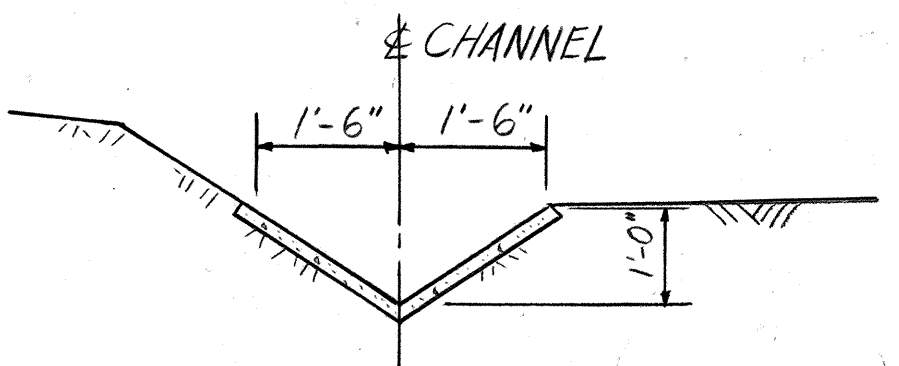
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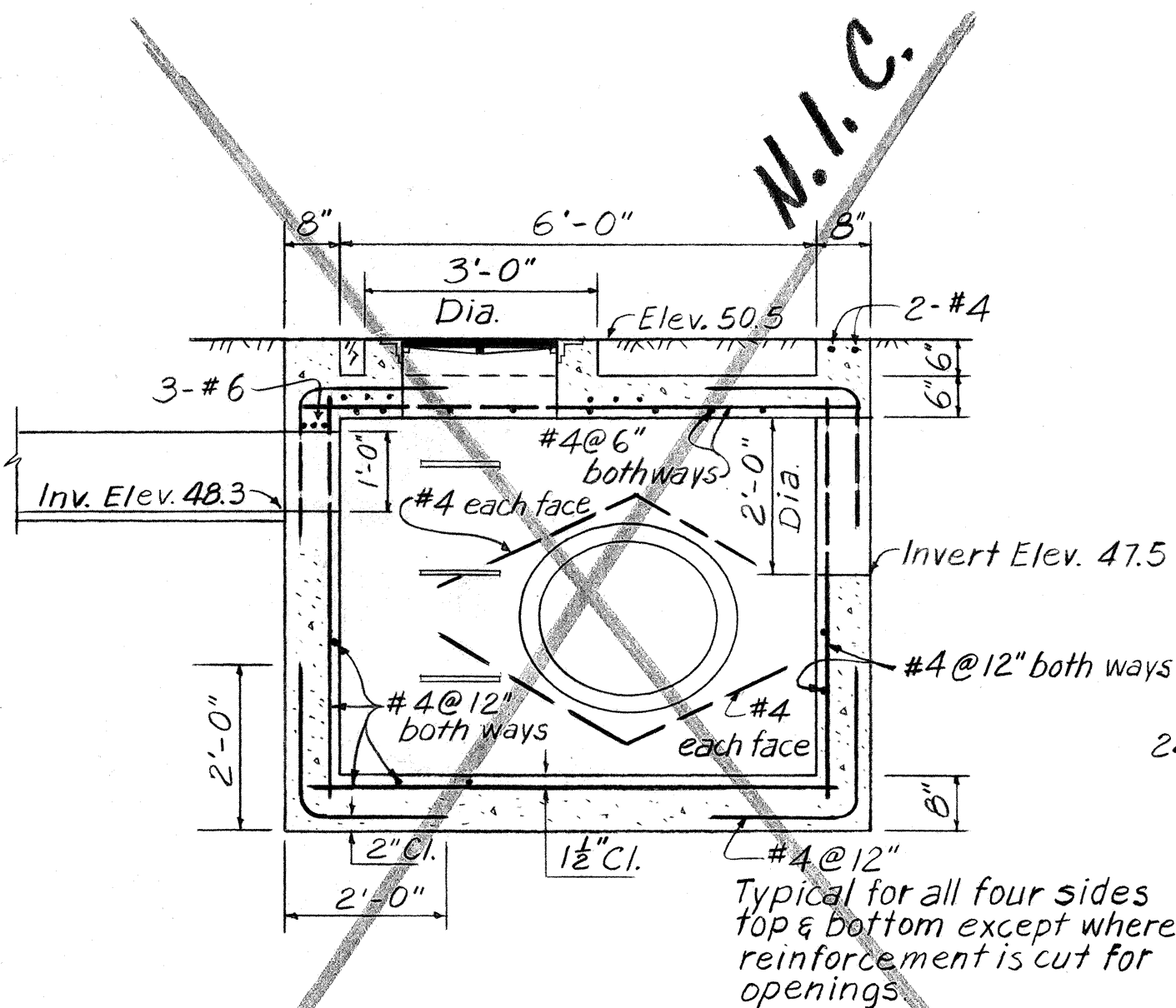
SECTION B-B



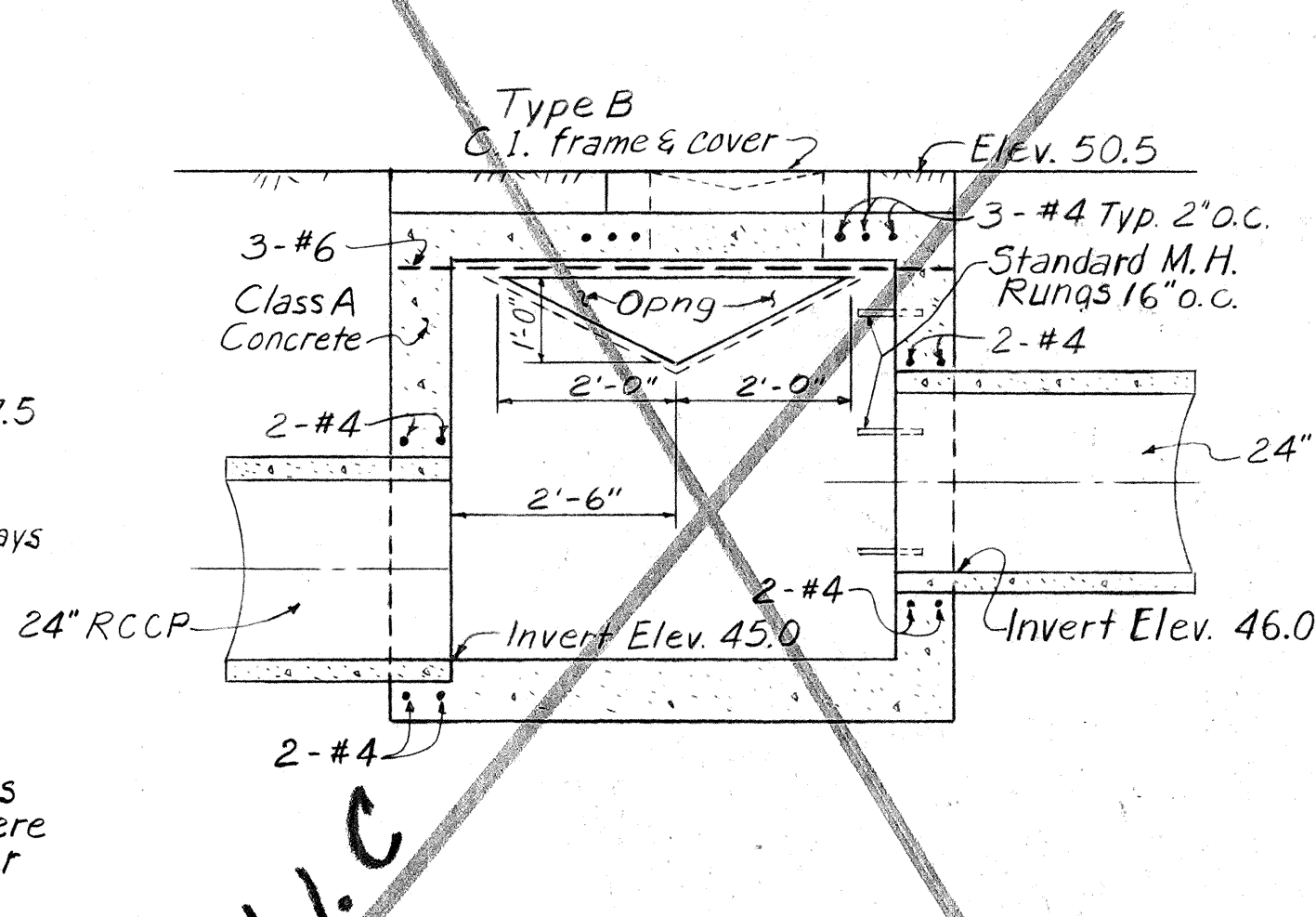
PLAN INLET NO. 17



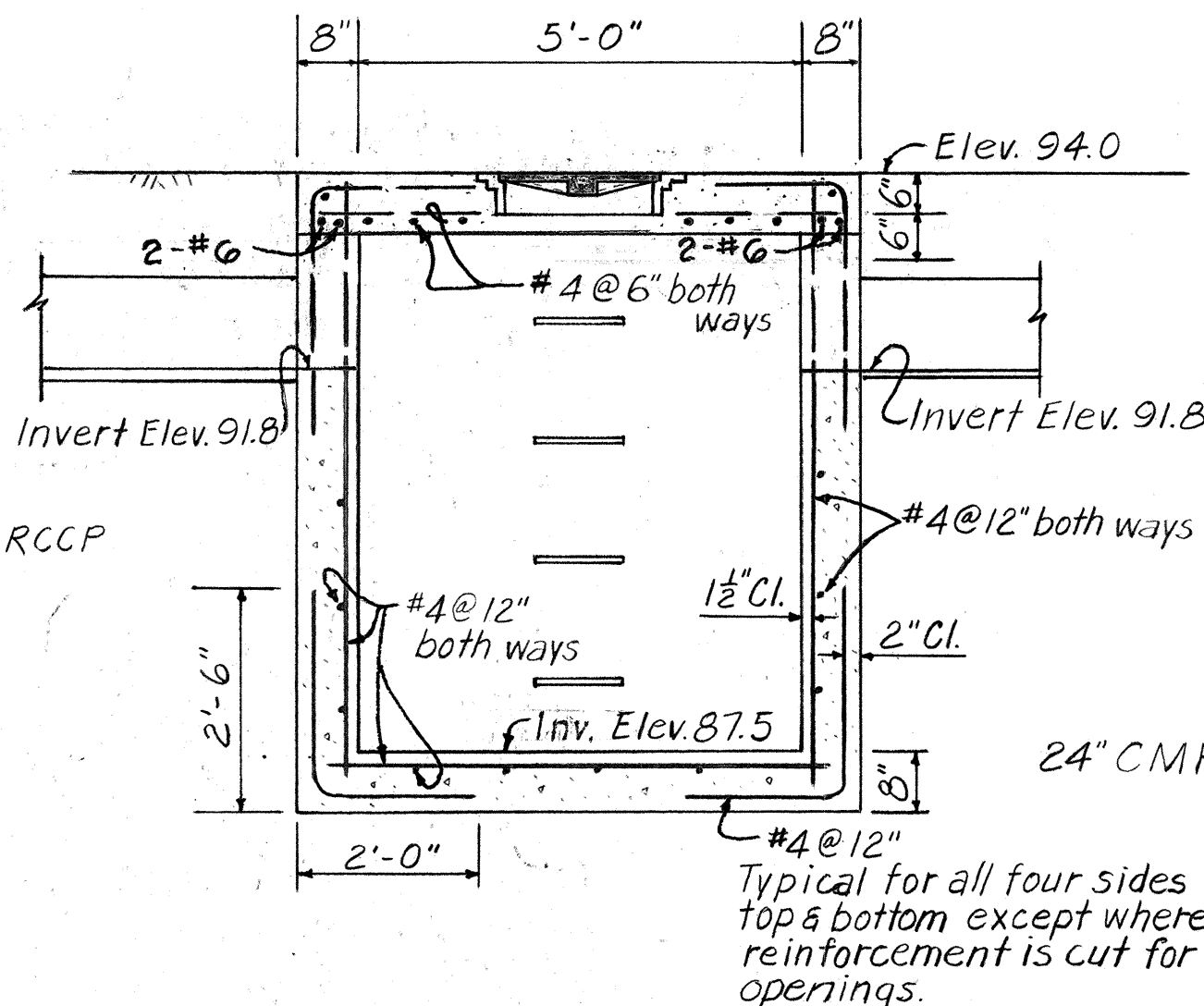
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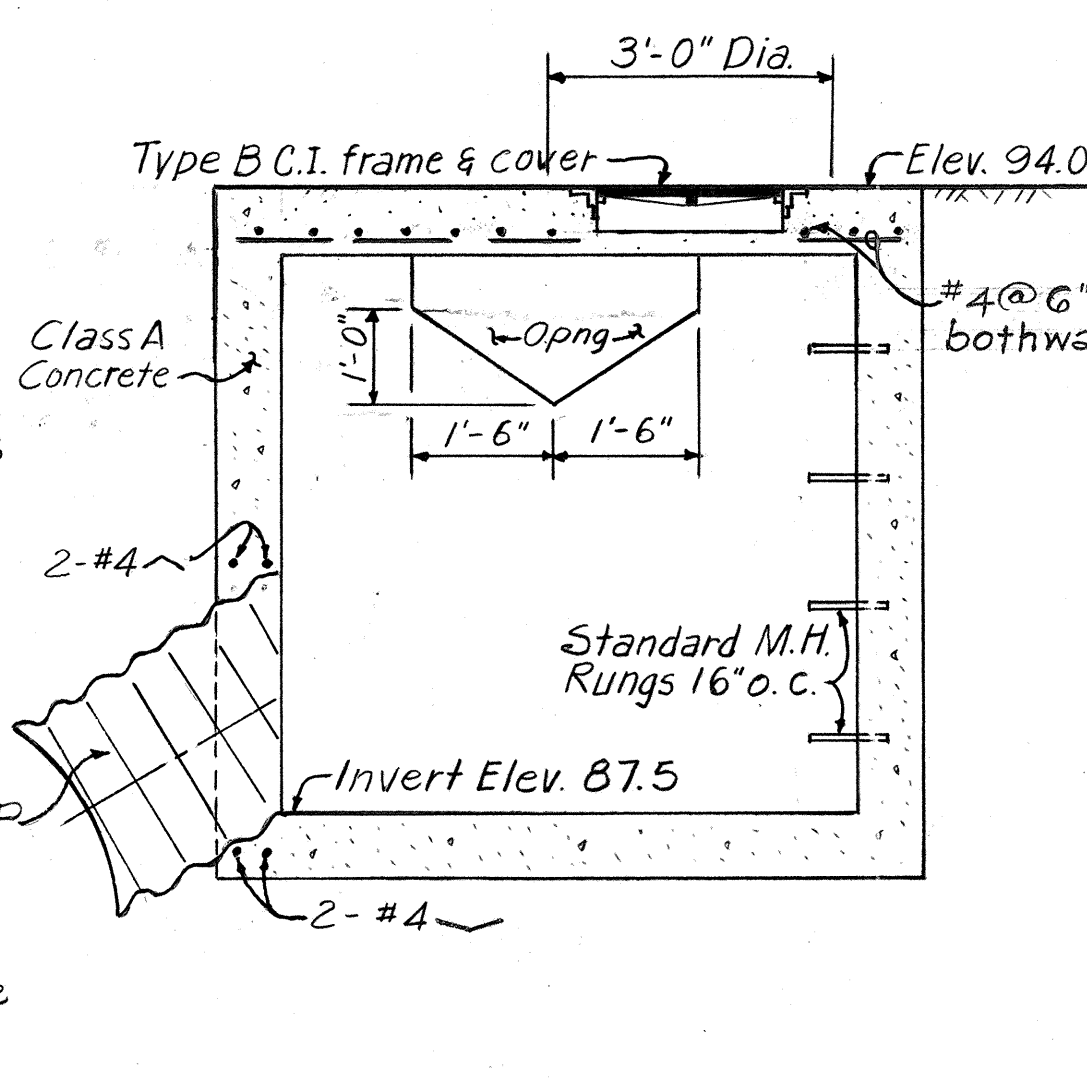
SECTION D-D



SECTION A-A



SECTION E-E



SECTION J-J

GENERAL NOTES

1. Provide 2-#4 bars top and bottom around culvert pipes.
2. The lateral limits for payment of structural excavation for drainage structures shall be the vertical surface one foot outside the exterior face of walls.
3. Standard M.H. rungs to be incidental to class A concrete. See sheet for details.
4. For details of Type B C.I. frame and cover see sheet 46

DATE	10/28/69
DESIGNED BY	J. BALDELLI
CHECKED BY	M. DEJANTZ
NO.	42



THIS WORK WAS PREPARED BY
ME OR UNDER MY SUPERVISION.
J. Andrew Schuchardt

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

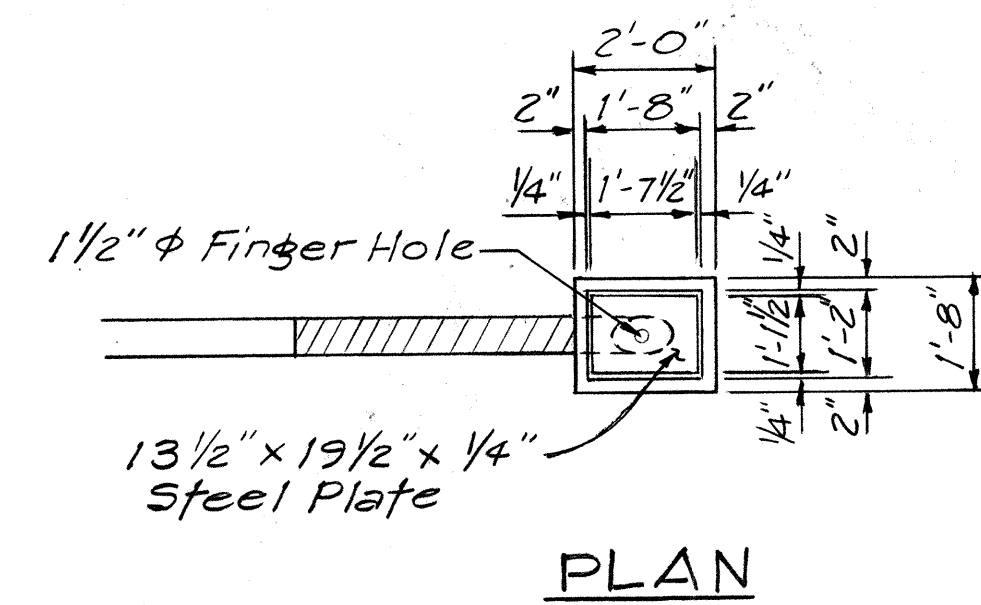
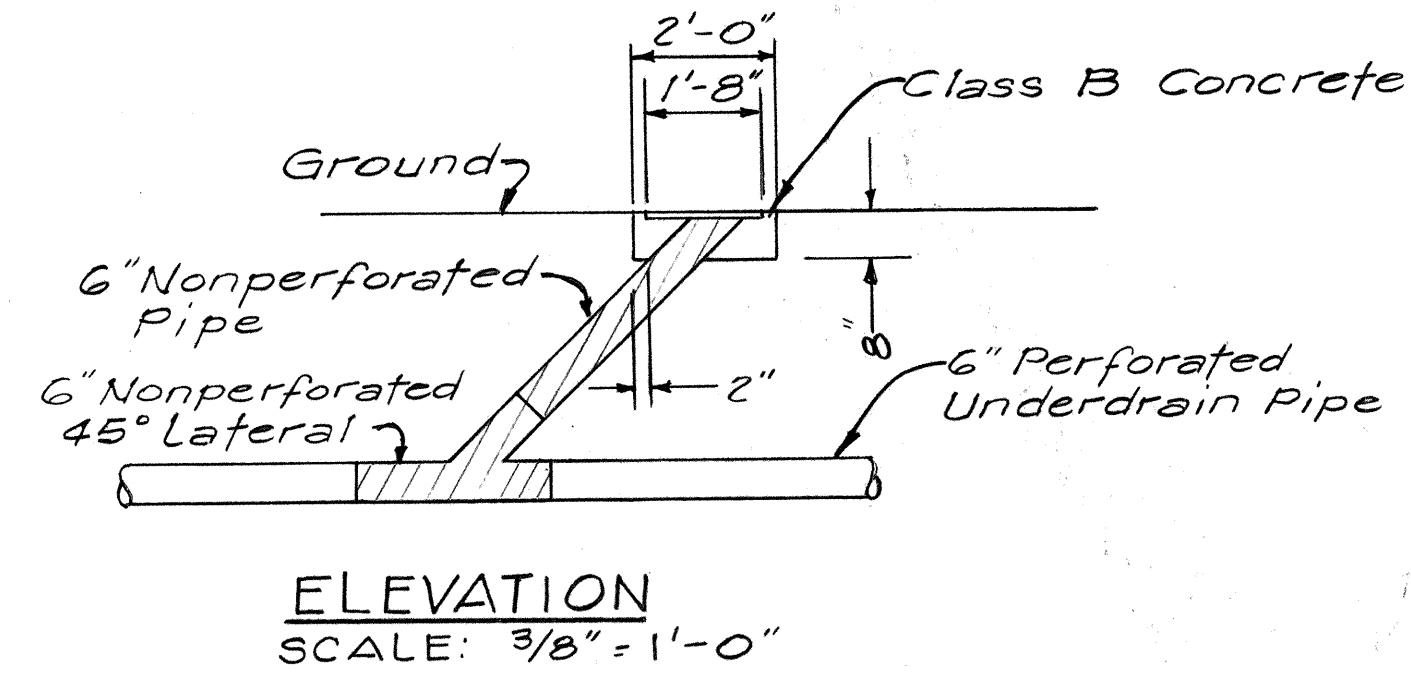
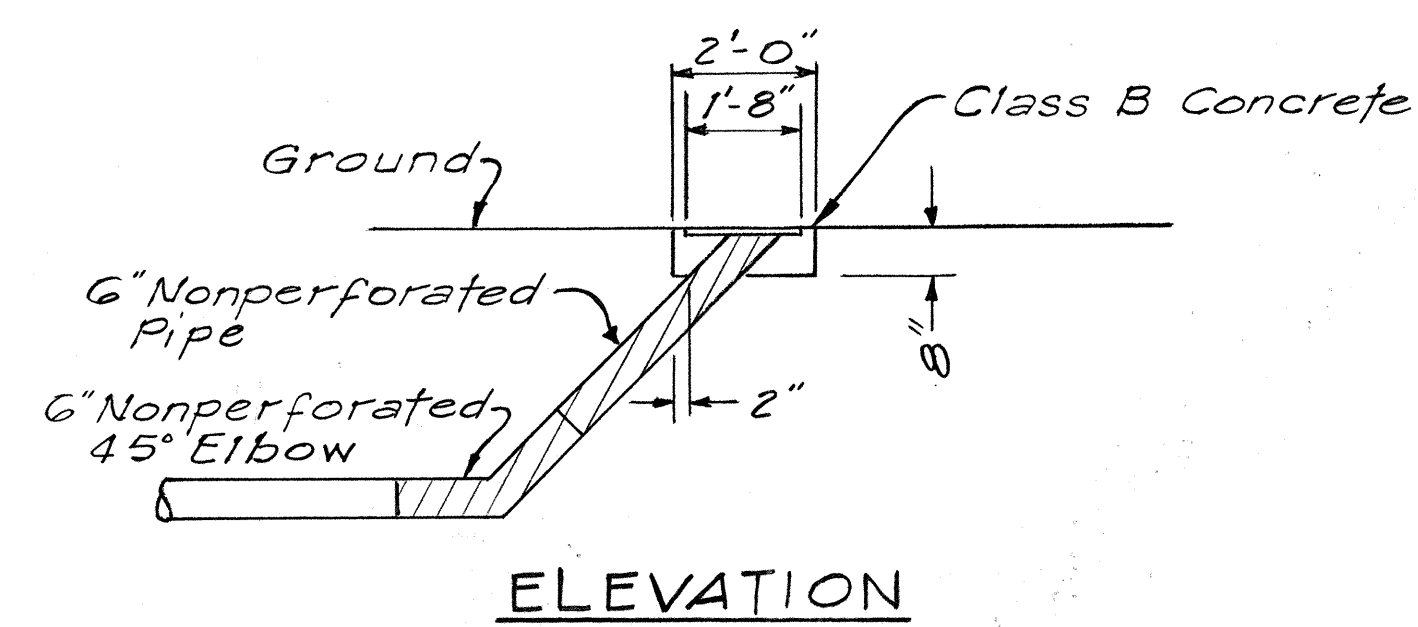
DRAINAGE DETAILS

HALAWA INTERCHANGE
PROJECT No. I-H-1(77):13

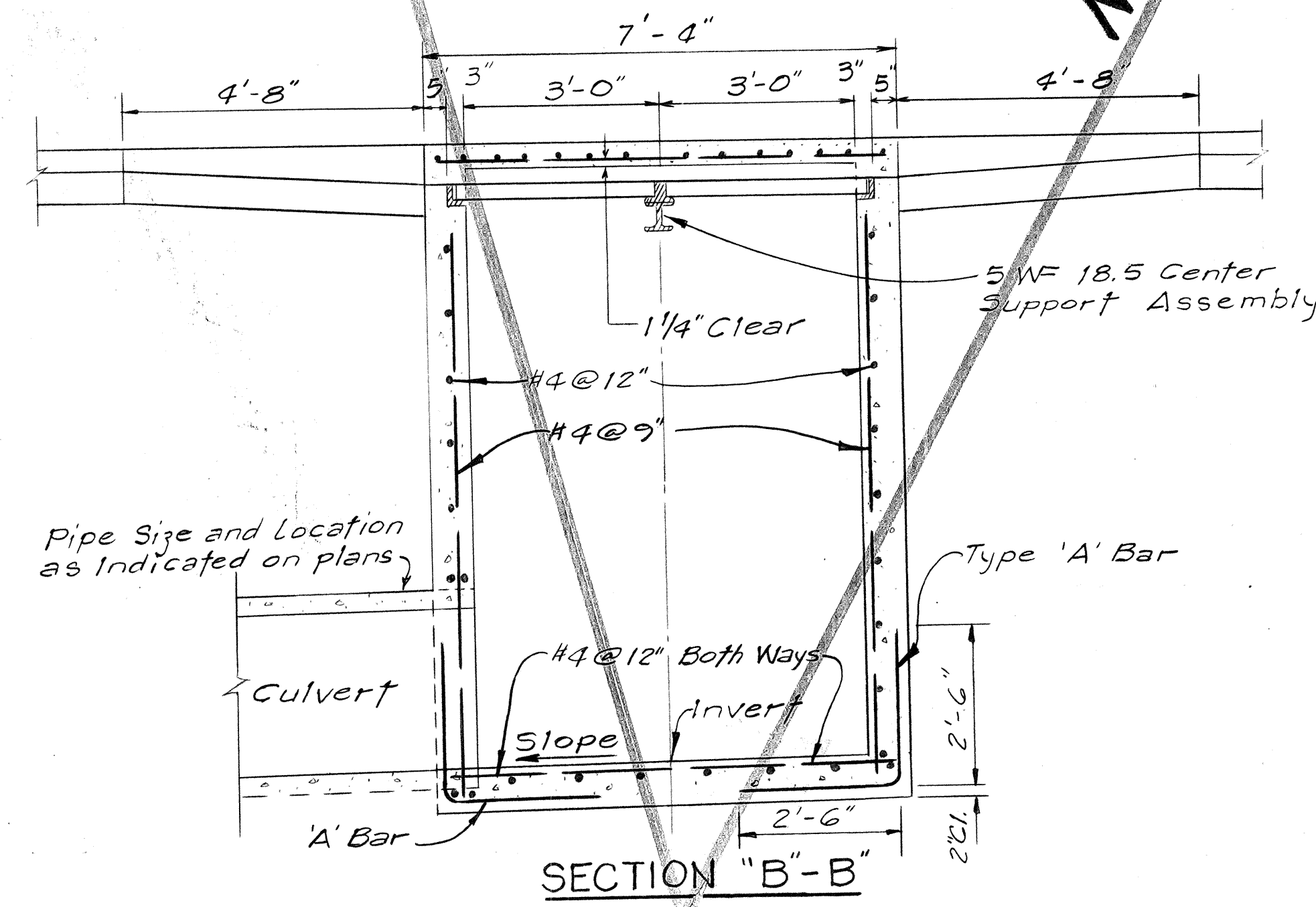
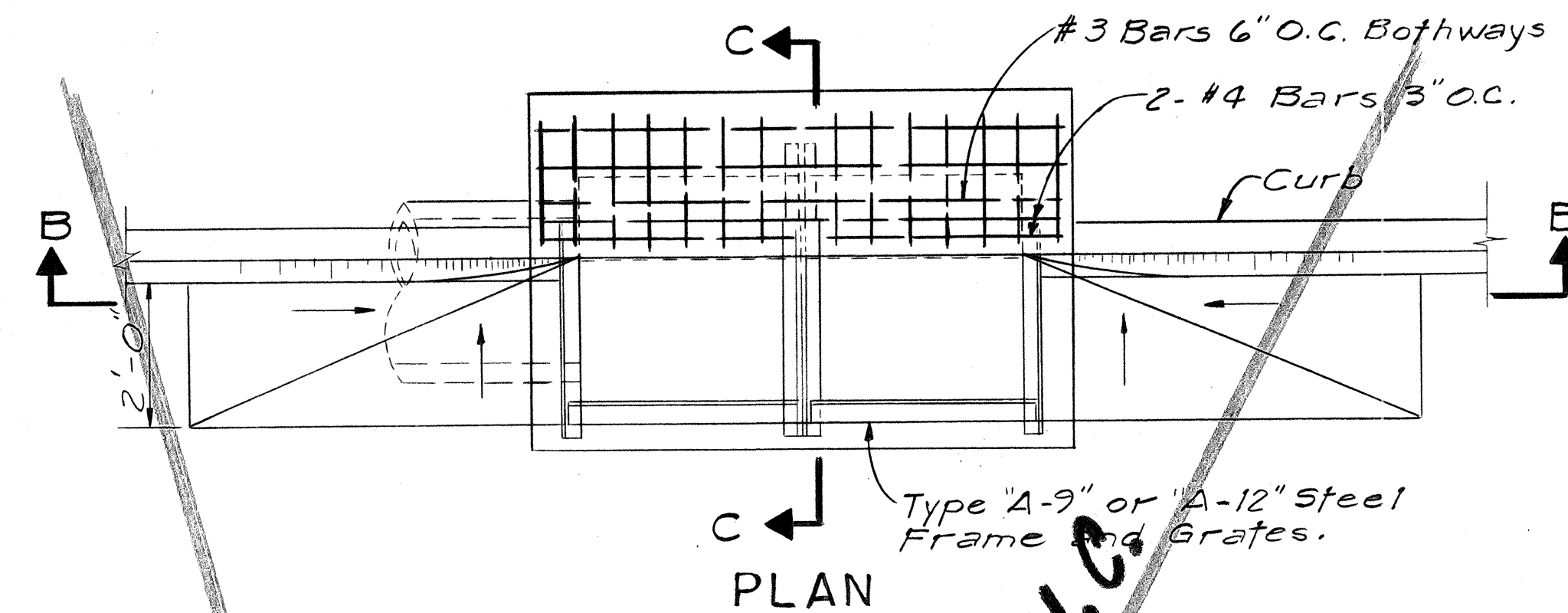
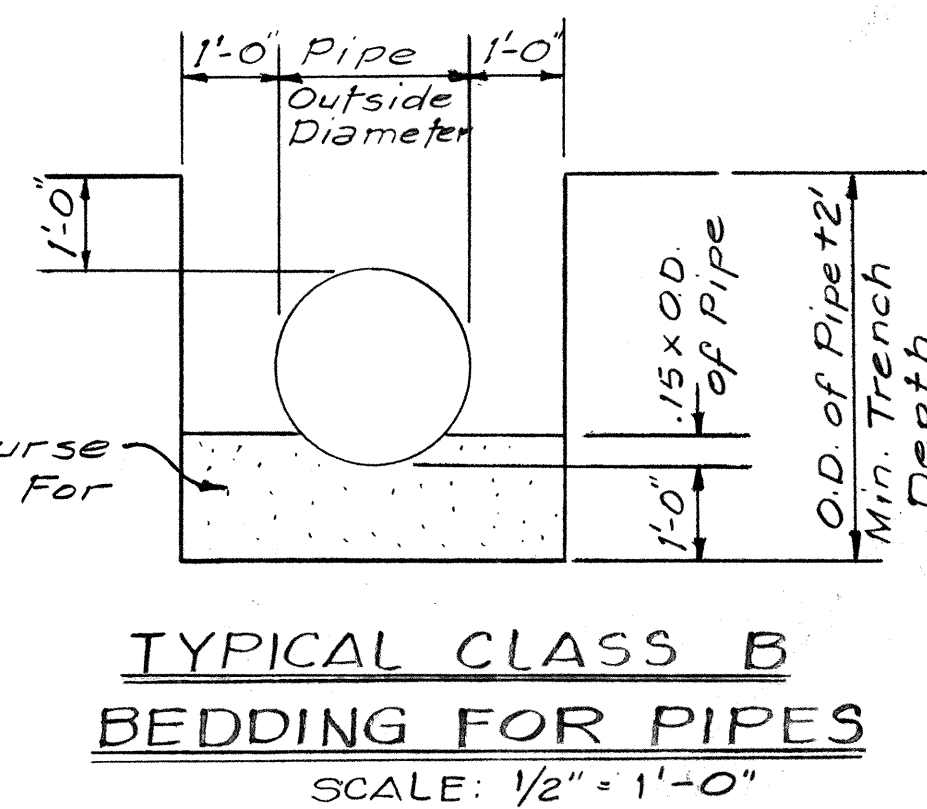
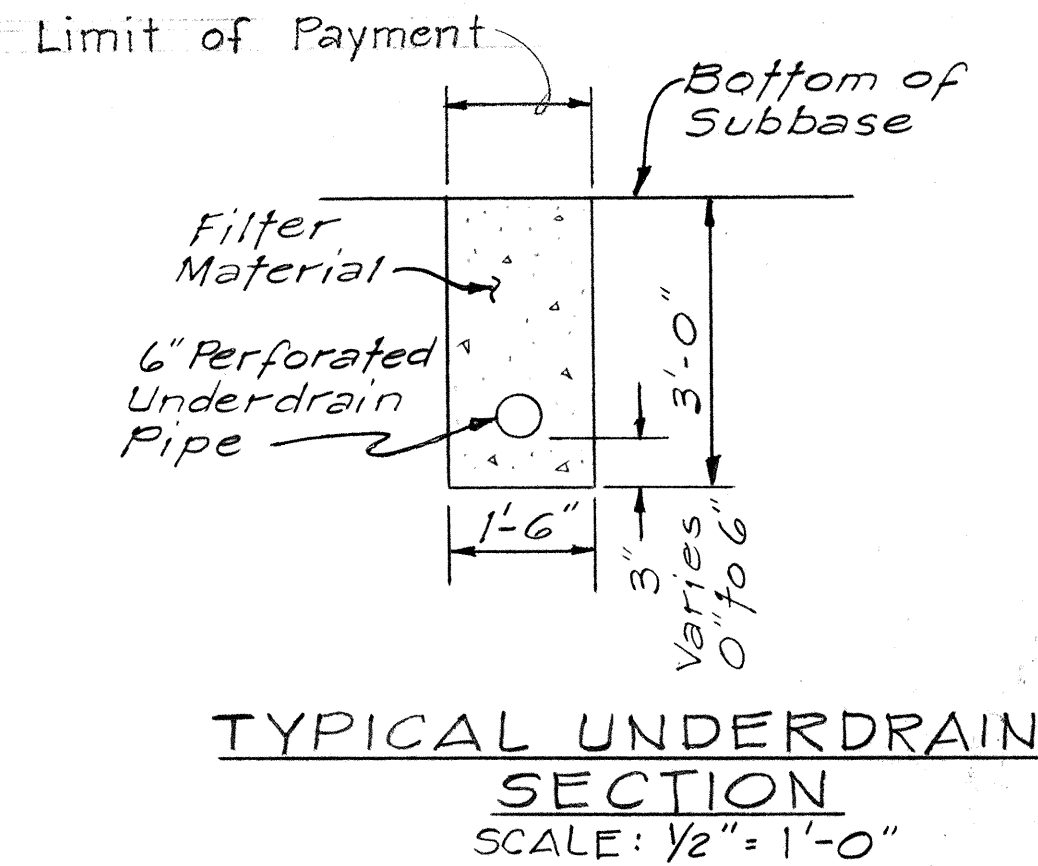
SCALE: 1/2" = 1'-0" DATE Nov. 28, 1969

SHEET No. 42 OF 17 SHEETS

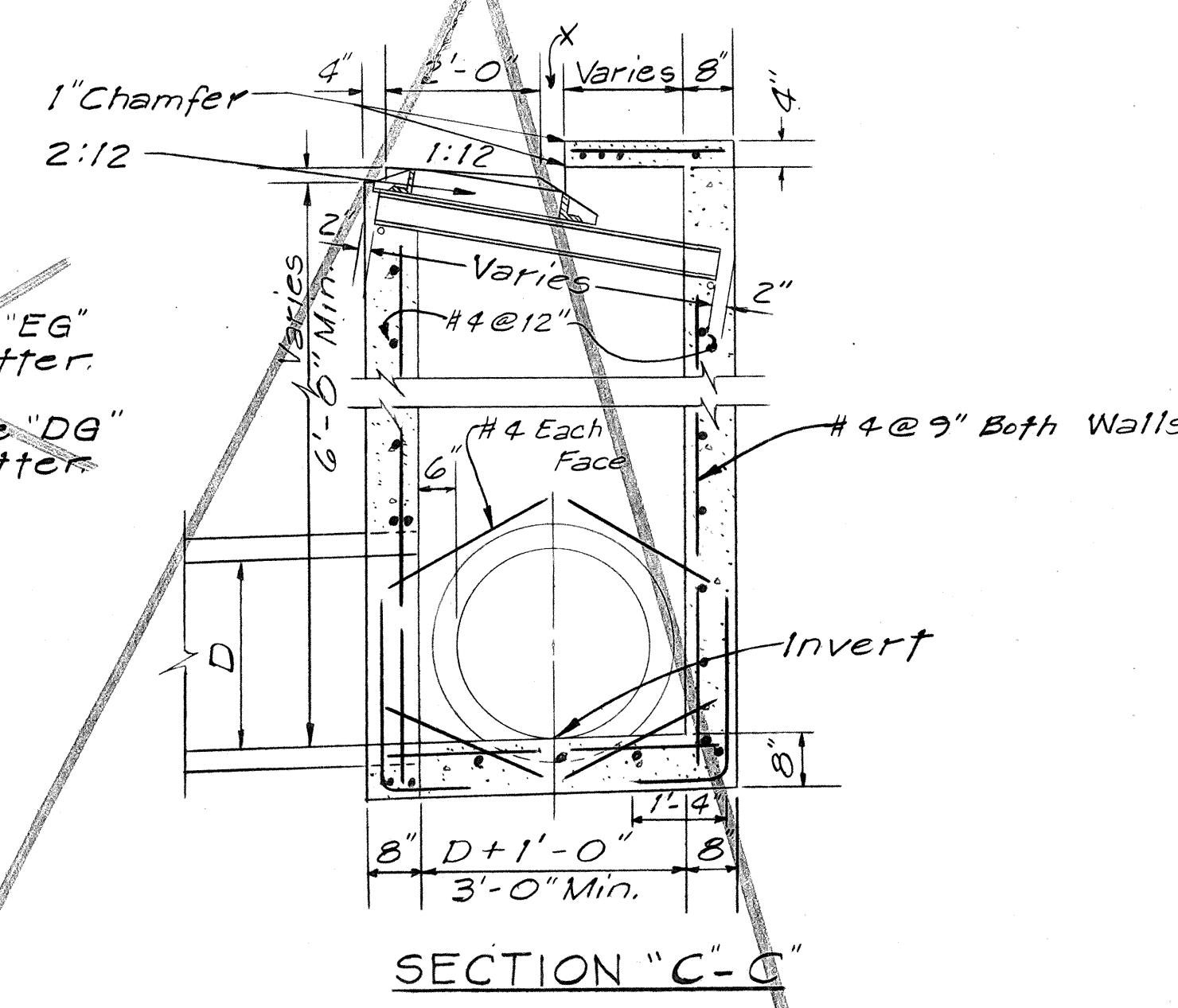
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HI-1(77):13	1969	43	1554



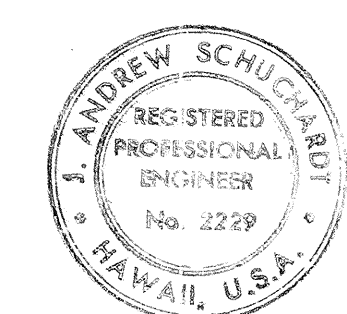
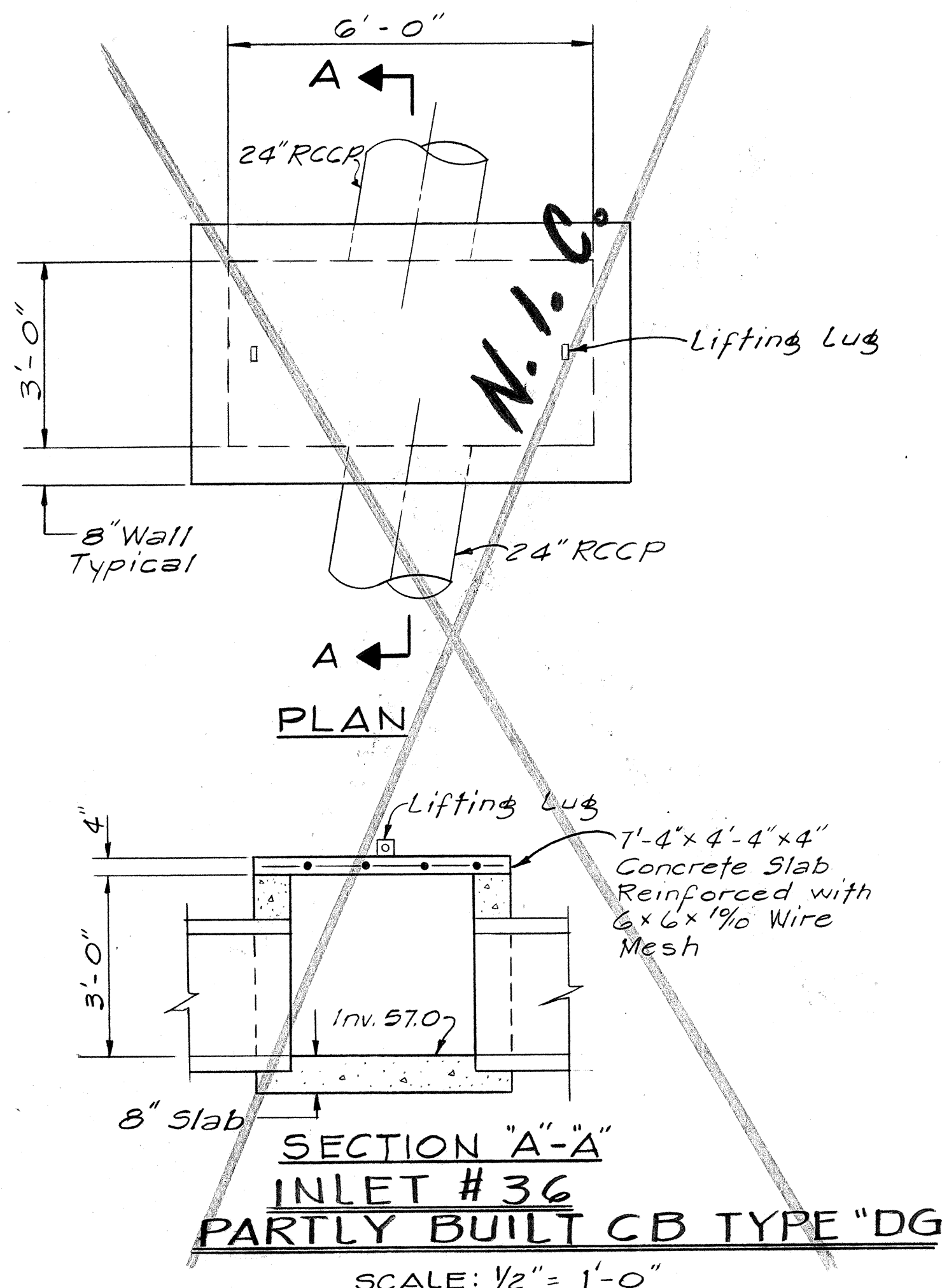
UNDERDRAIN CLEANOUT DETAIL
SCALE: 3/8" = 1'-0"



NOTE:
X=9" For Type "EG" Curb & Gutter.
X=1" For Type "DG" Curb & Gutter.



DETAIL OF TYPE "DG" CATCH BASIN
SCALE: 1/2" = 1'-0"



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J. Andrew Schubert

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

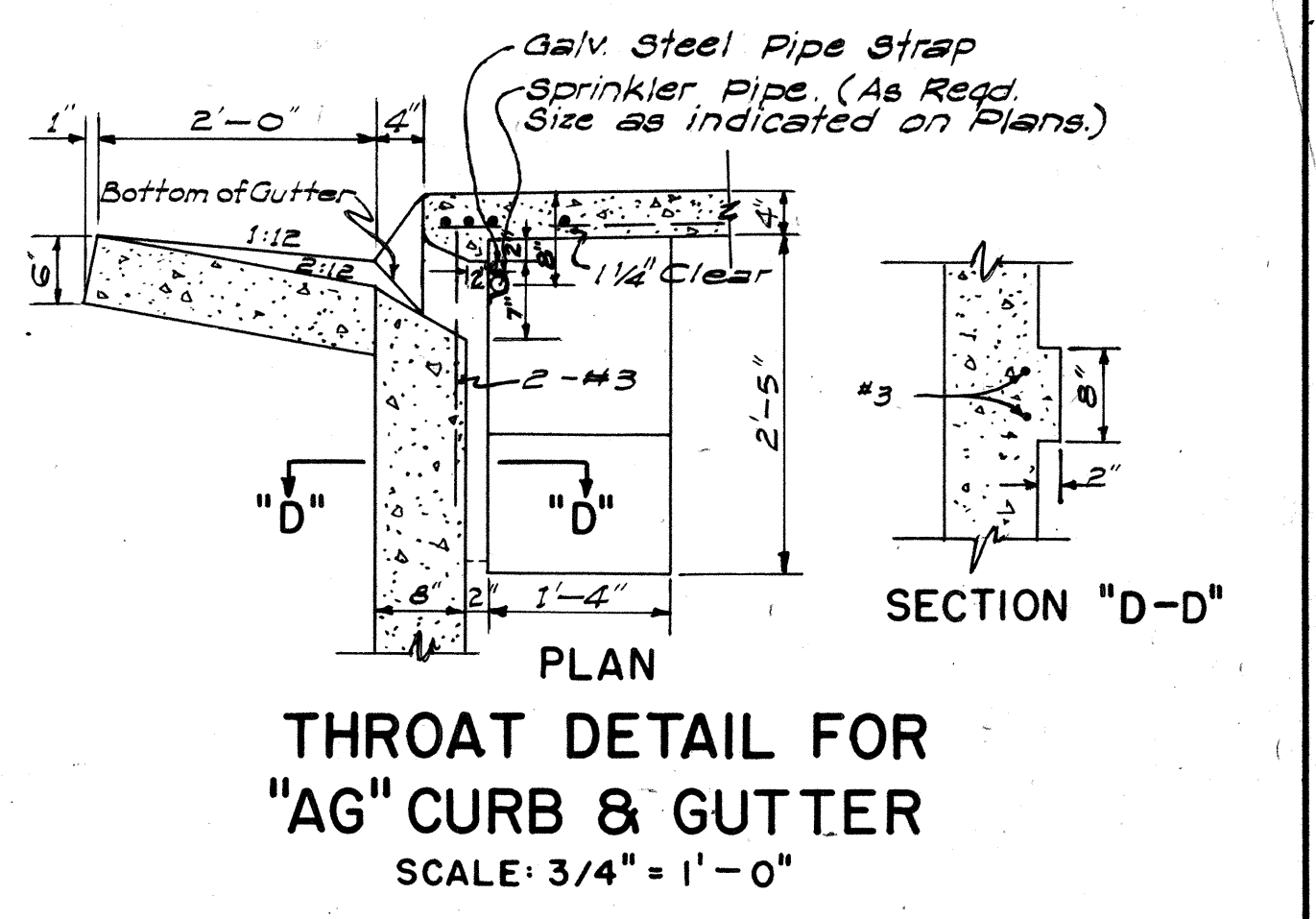
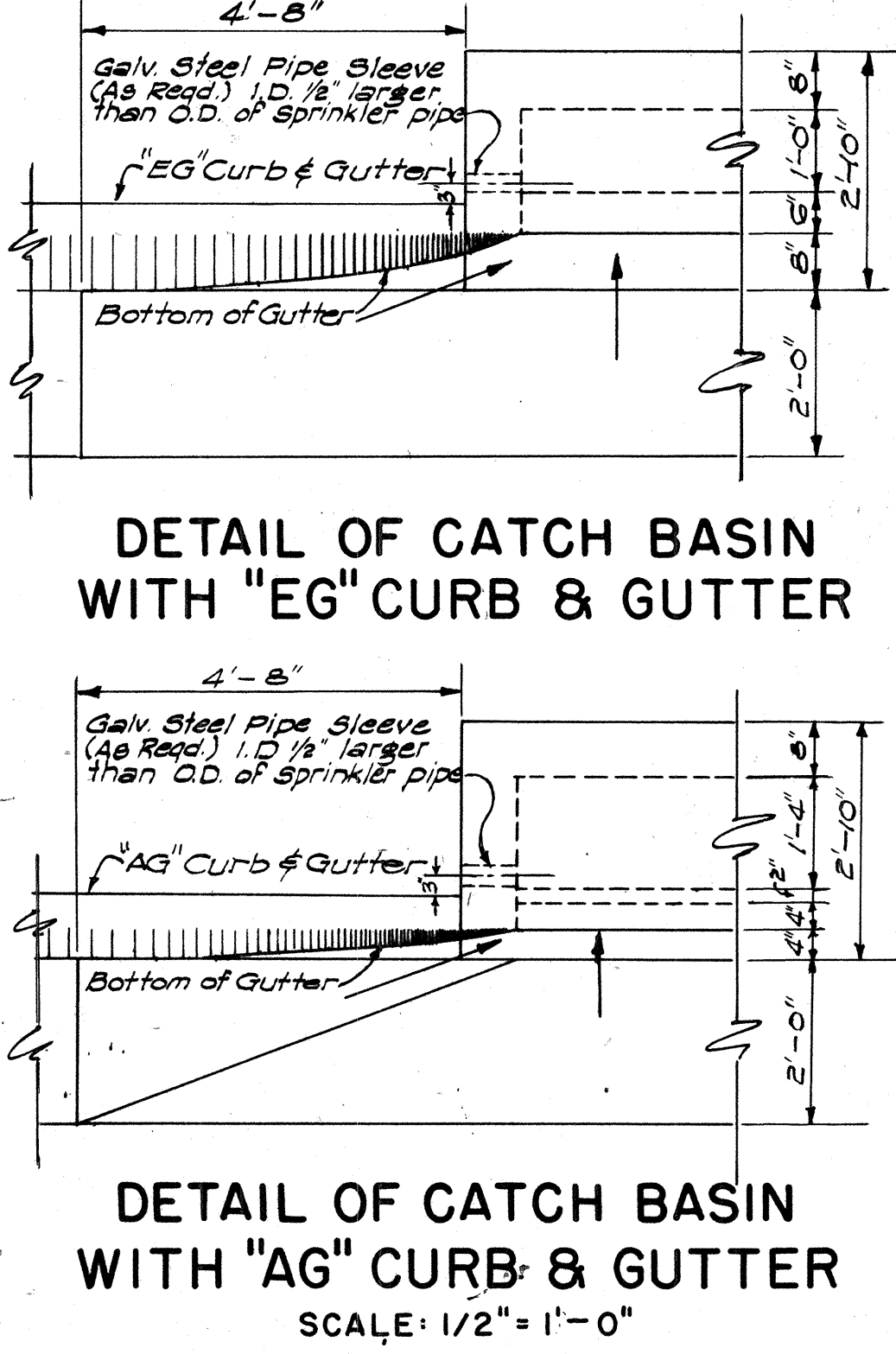
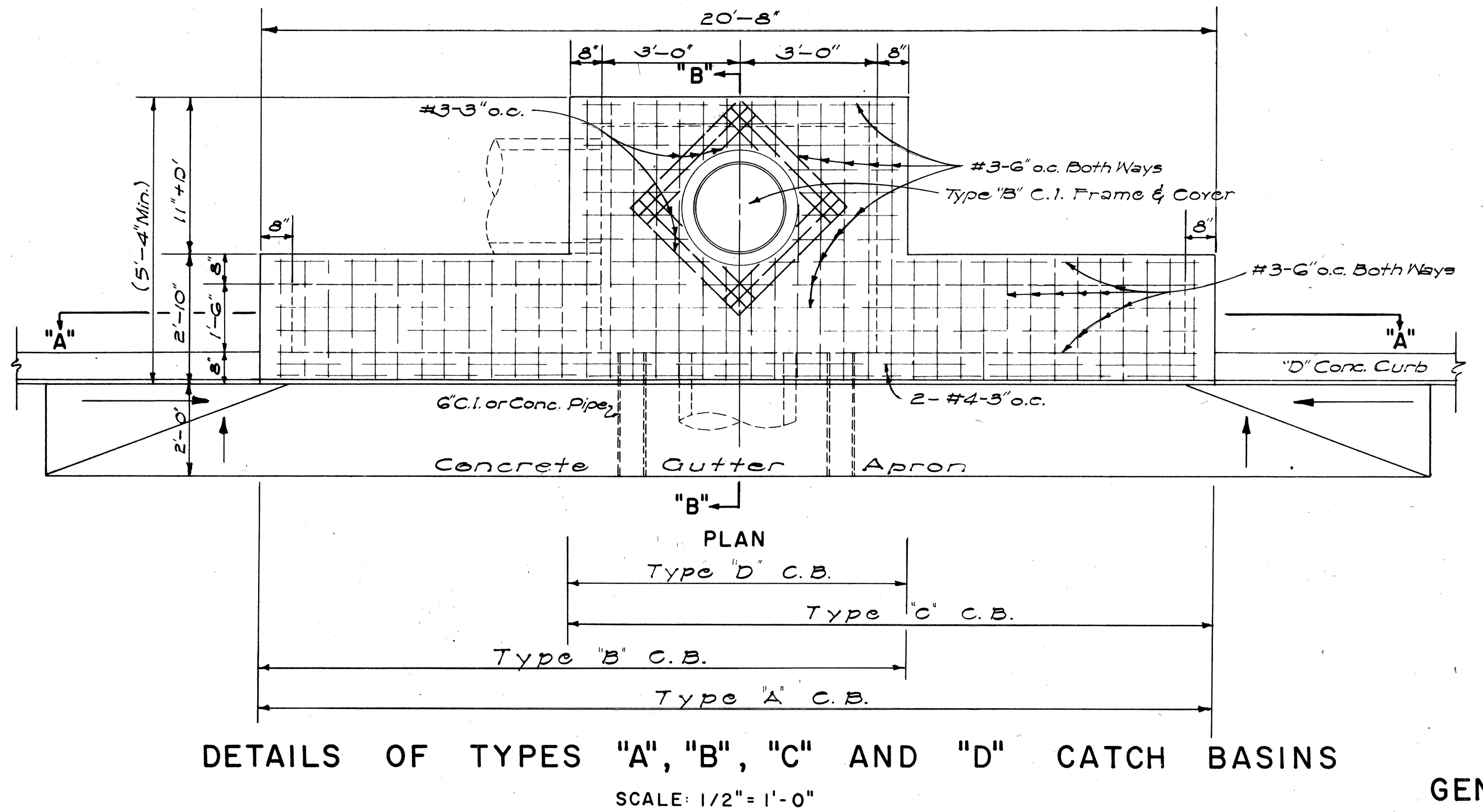
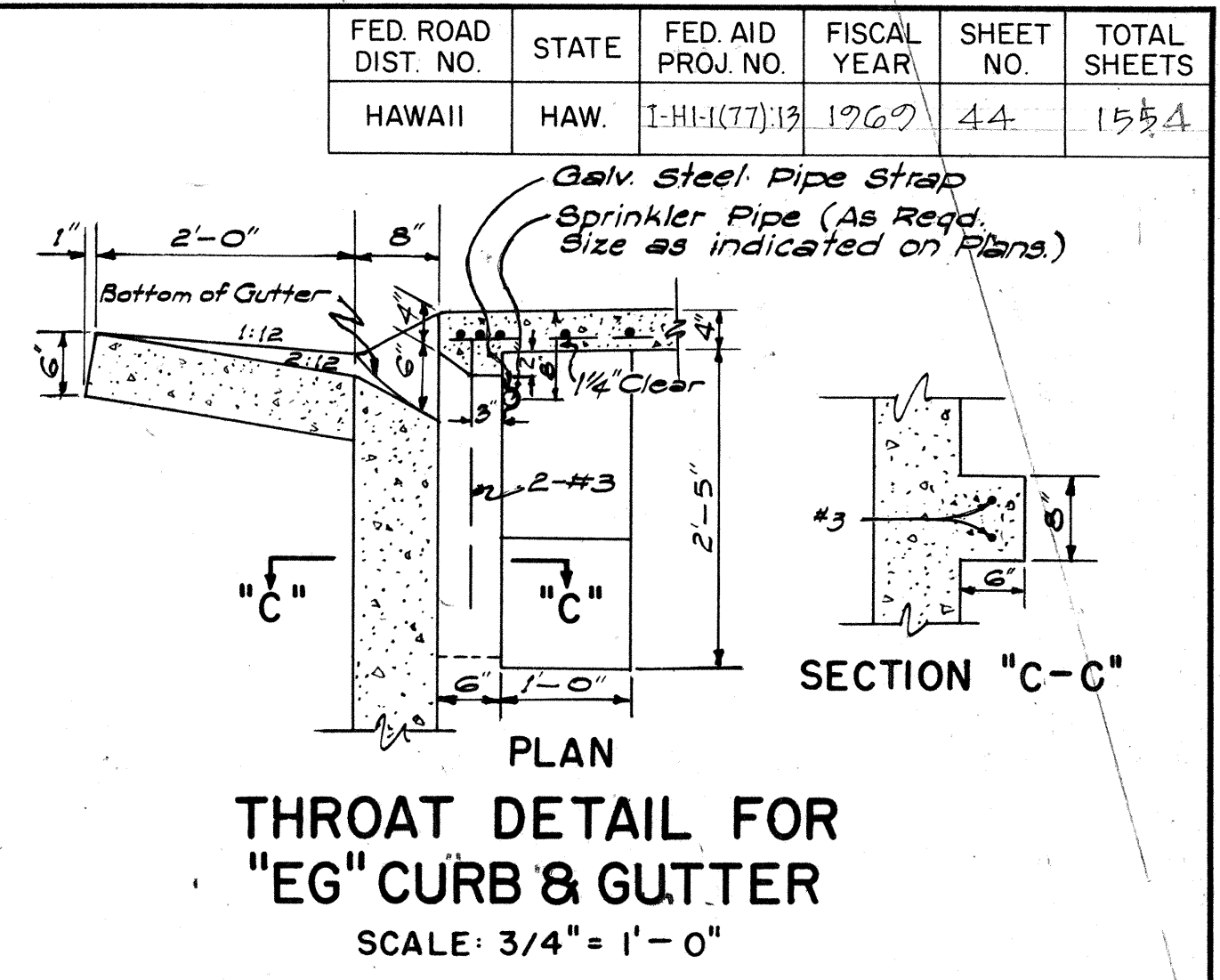
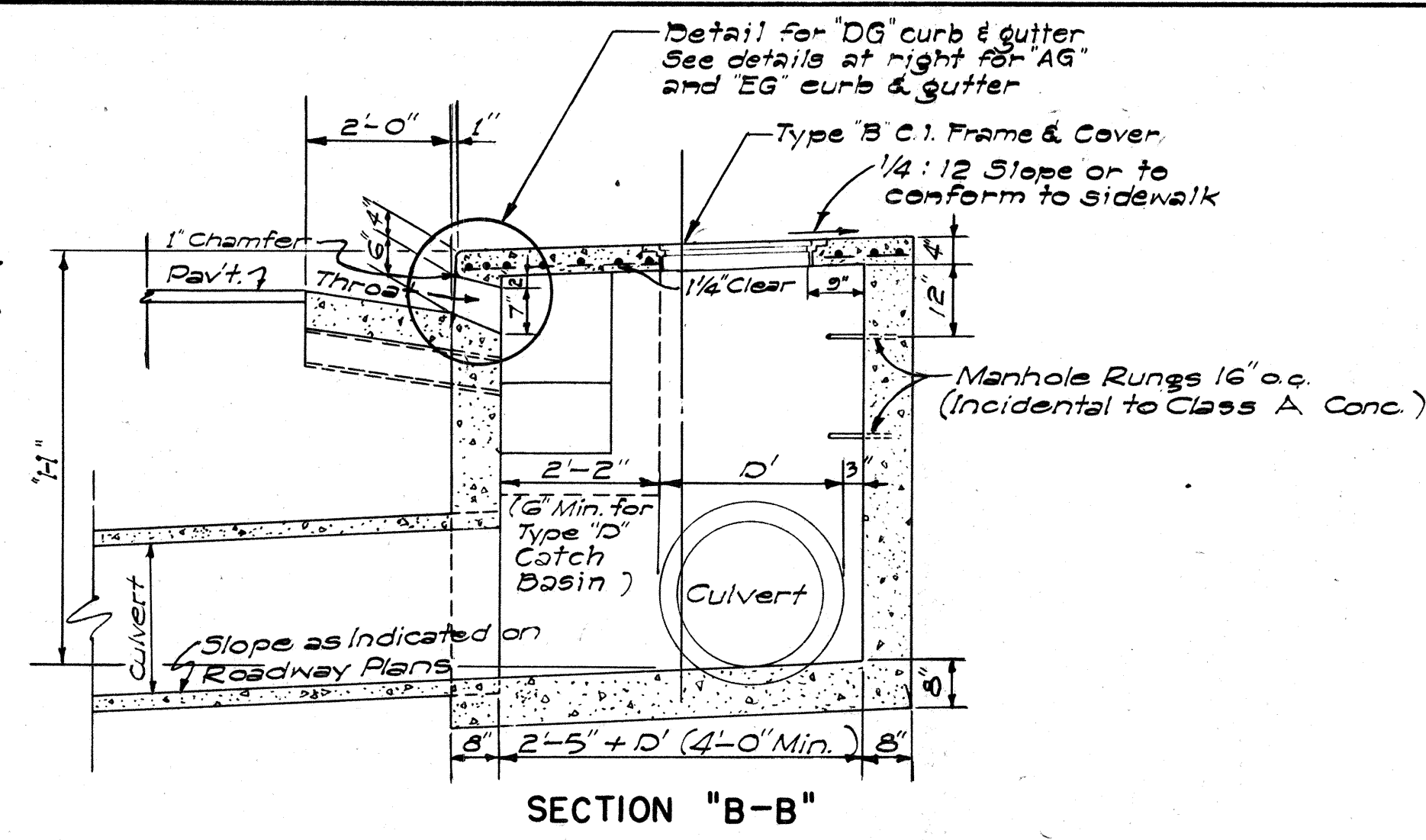
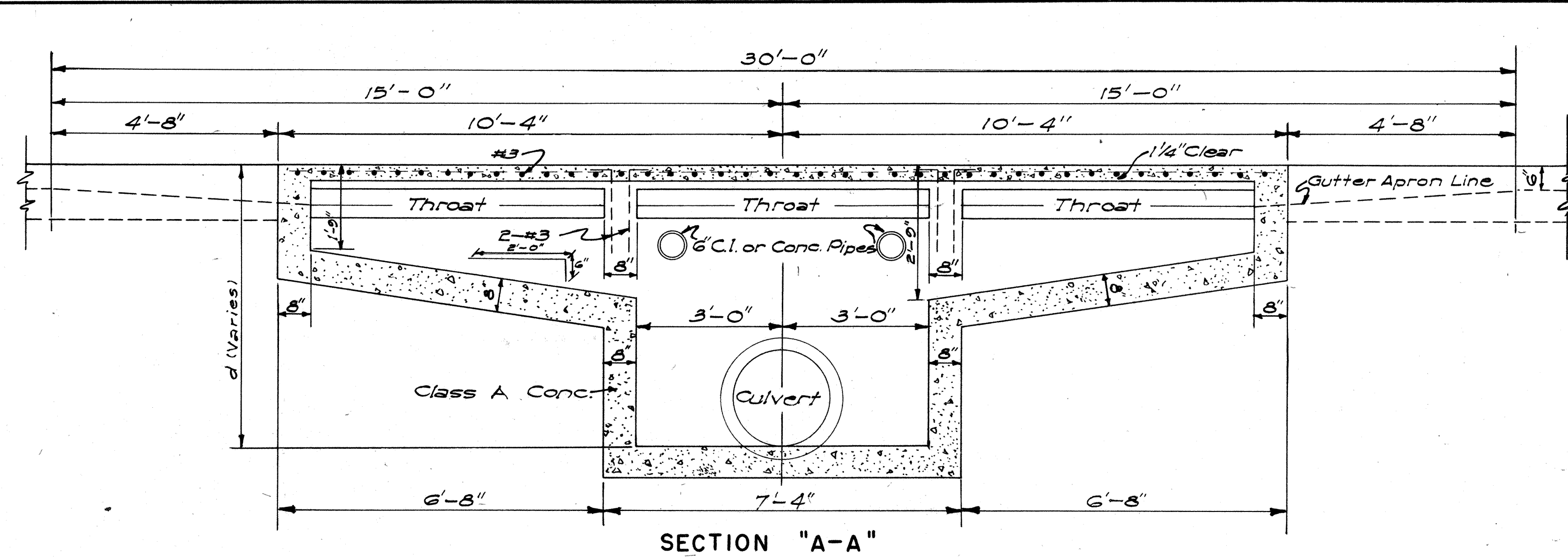
DRAINAGE DETAILS

HALAWA INTERCHANGE
PROJECT No. I-HI-1 (77):13

SCALE: AS SHOWN DATE Nov. 28, 1969

SHEET No 10 OF 17 SHEETS

2/17/59



- GENERAL NOTES**
- Quantities based on $d = 5.75'$ and $D' = 30'$.
 - Quantities do not include concrete for Gutter Apron.
 - The Contractor shall install two 6" Cast Iron or Concrete Pipes as incidental to Class A Concrete for Construction Drainage. The Engineer shall determine the exact location in the field.
 - Culvert shall leave C.B. from any position and any direction indicated by plans or ordered by the Engineer. Culvert may both enter and leave C.B. so that C.B. will also act as Manhole.
 - The Contractor shall install Galvanized Steel Pipe Sleeves and Straps as incidental to Sprinkler System.
 - The type of curb and/or gutter (Type 1, 2, 3, etc.) shall conform to the type specified on the Roadway plans.
 - Manhole Rungs (16" o.c.) are required when "H" is greater than 4 feet 6 inches. Only one rung (12 inches from the bottom) is required if "H" is 4 feet 6 inches or less. Type "B" Cast Iron Frame and Cover and Manhole Rungs may be placed at any location as ordered by the Engineer.

ESTIMATED QUANTITIES

Type	Class A Conc. Struct. Exc.	Reinf. Steel	Gutter Length
"A"	7.5 c.y.	24.7 c.y.	145 lb.
"B"	6.0 c.y.	21.5 c.y.	108 lb.
"C"	6.0 c.y.	21.5 c.y.	108 lb.
"D"	4.0 c.y.	16.5 c.y.	77 lb.

APPROVAL RECOMMENDED:
HYDRAULIC DESIGN ENGINEER
DATE: 12-17-69

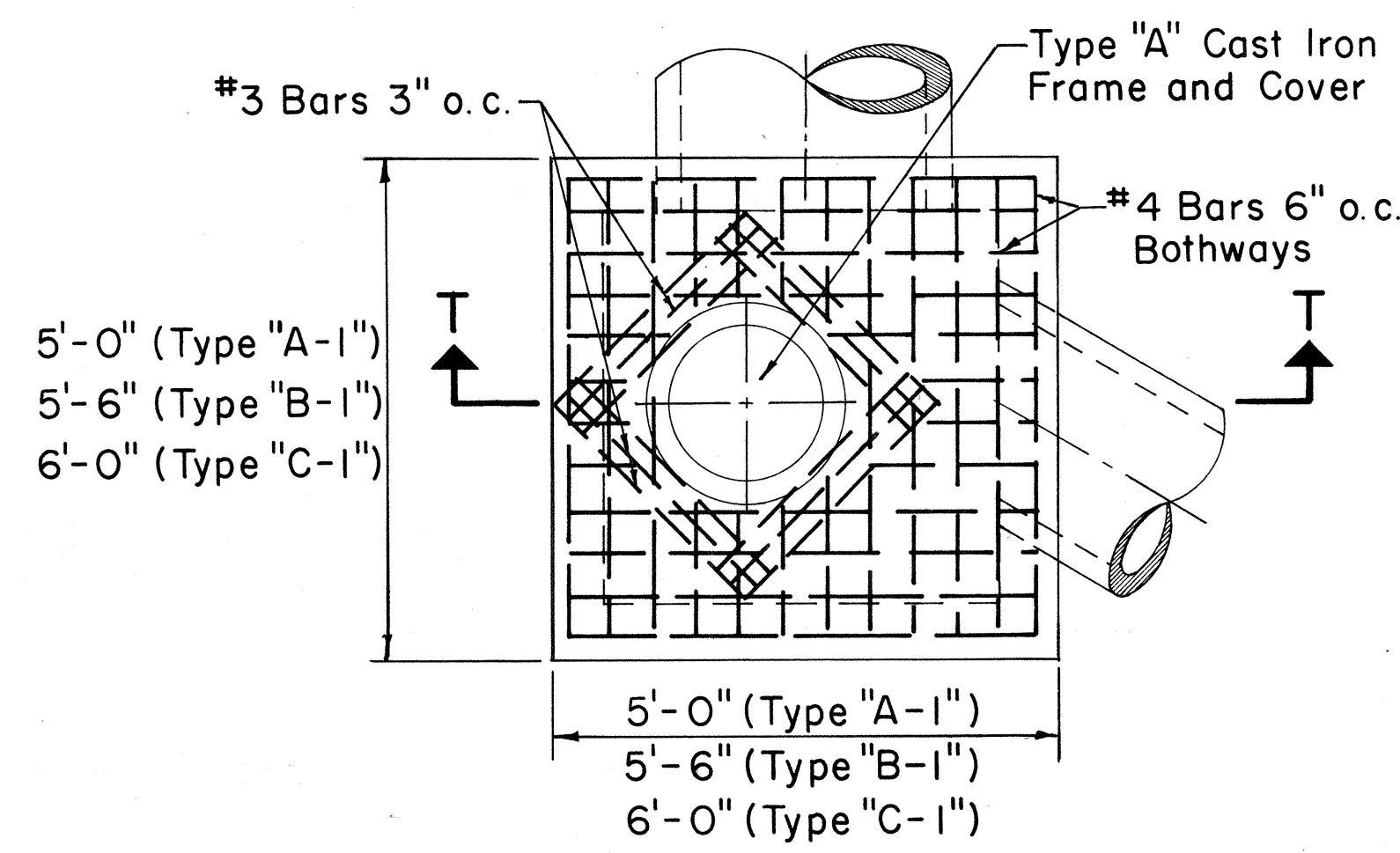
APPROVED:
ASSISTANT CHIEF, ENGINEERING
DATE: 12-17-69

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
STANDARD DETAILS
CATCH BASINS

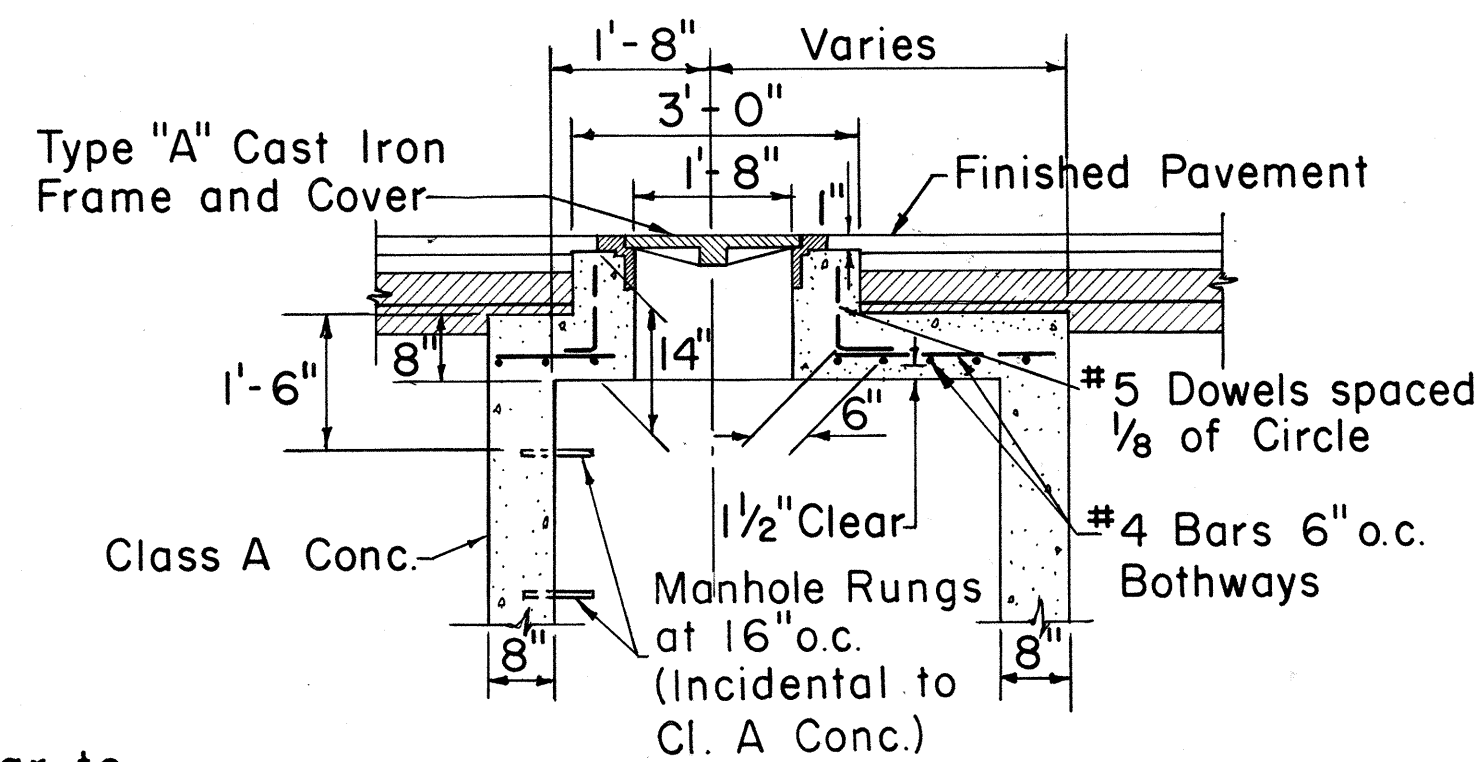
Scale: As Noted
Date: July, 1969
SHEET NO. 11 OF 17 SHEETS

DESIGNED BY: J. N. ...
DRAWN BY: ...
CHECKED BY: ...
DATE: ...

FED. ROAD DIST. NO.	STATE	FED. AID PROJECT	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	111(77)13	1969	45	155



PLAN



Note:
Bottom detail similar to Type "A", "B", & "C".

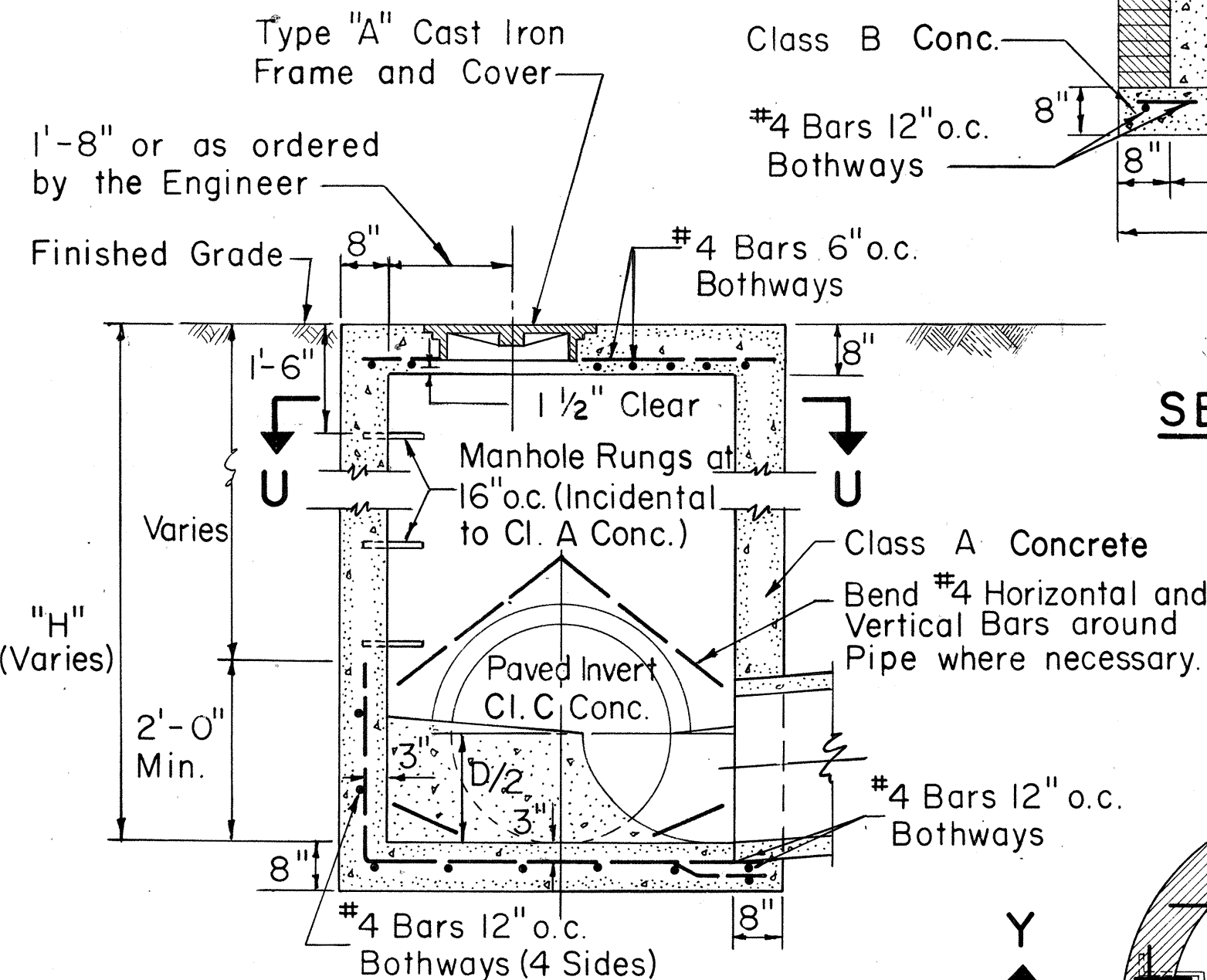
SECTION T-T

TYPE "A-I", "B-I", & "C-I" STORM DRAIN MANHOLE TOP DETAIL UNDER PAVEMENT

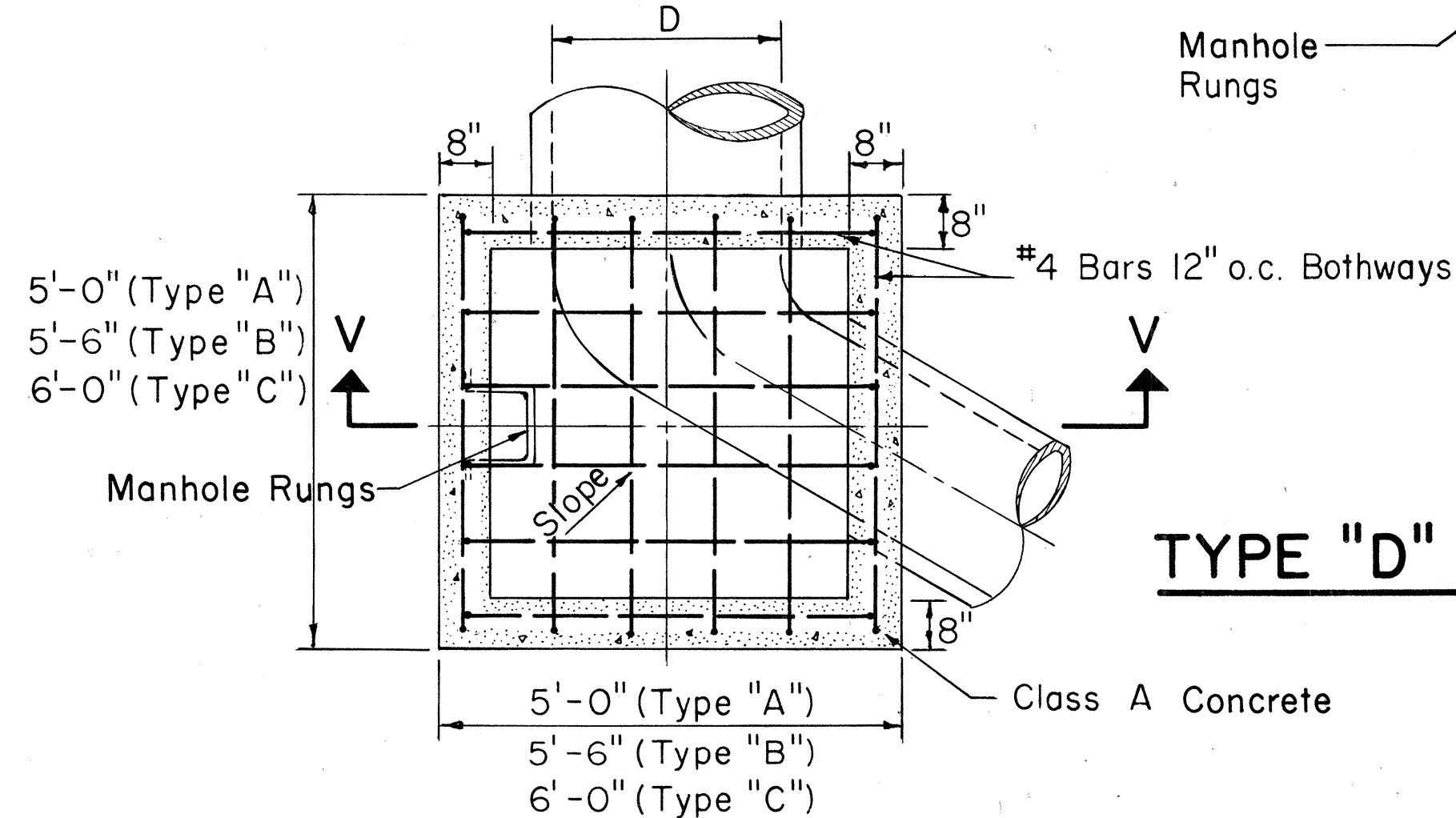
Scale: 1/2" = 1'-0"

GENERAL NOTES

- Culvert shall enter and leave S.D.M.H. from any position and in the direction indicated by the plans or ordered by the Engineer.
- Manhole Rungs (16" o.c.) are required when "H" is greater than 4'-6". Only one rung (12" from the bottom) is required if "H" is 4'-6" or less. Type "A" C.I. Frame and Cover and Manhole Rungs may be placed at any location as ordered by the Engineer.



SECTION V-V

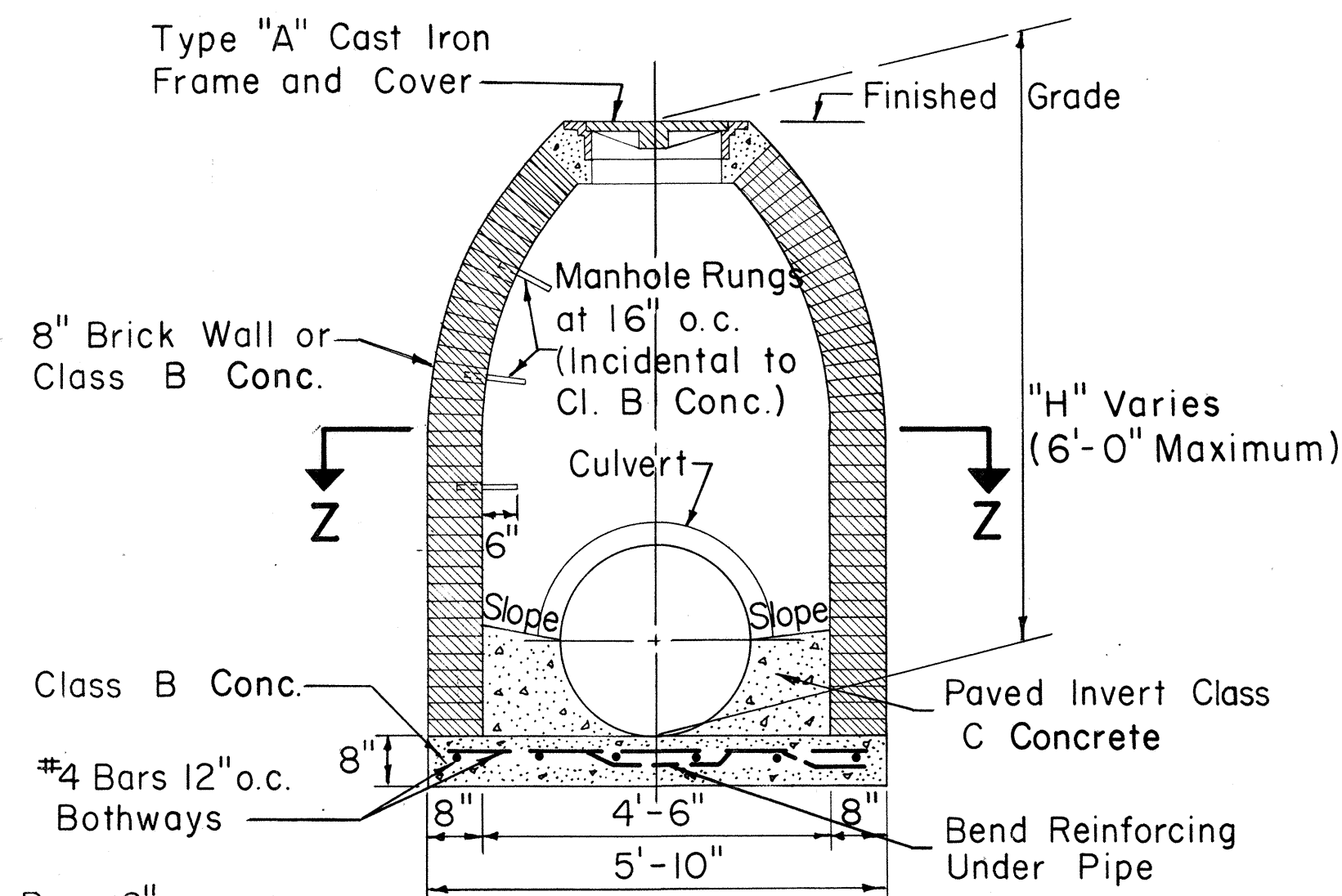


SECTION U-U

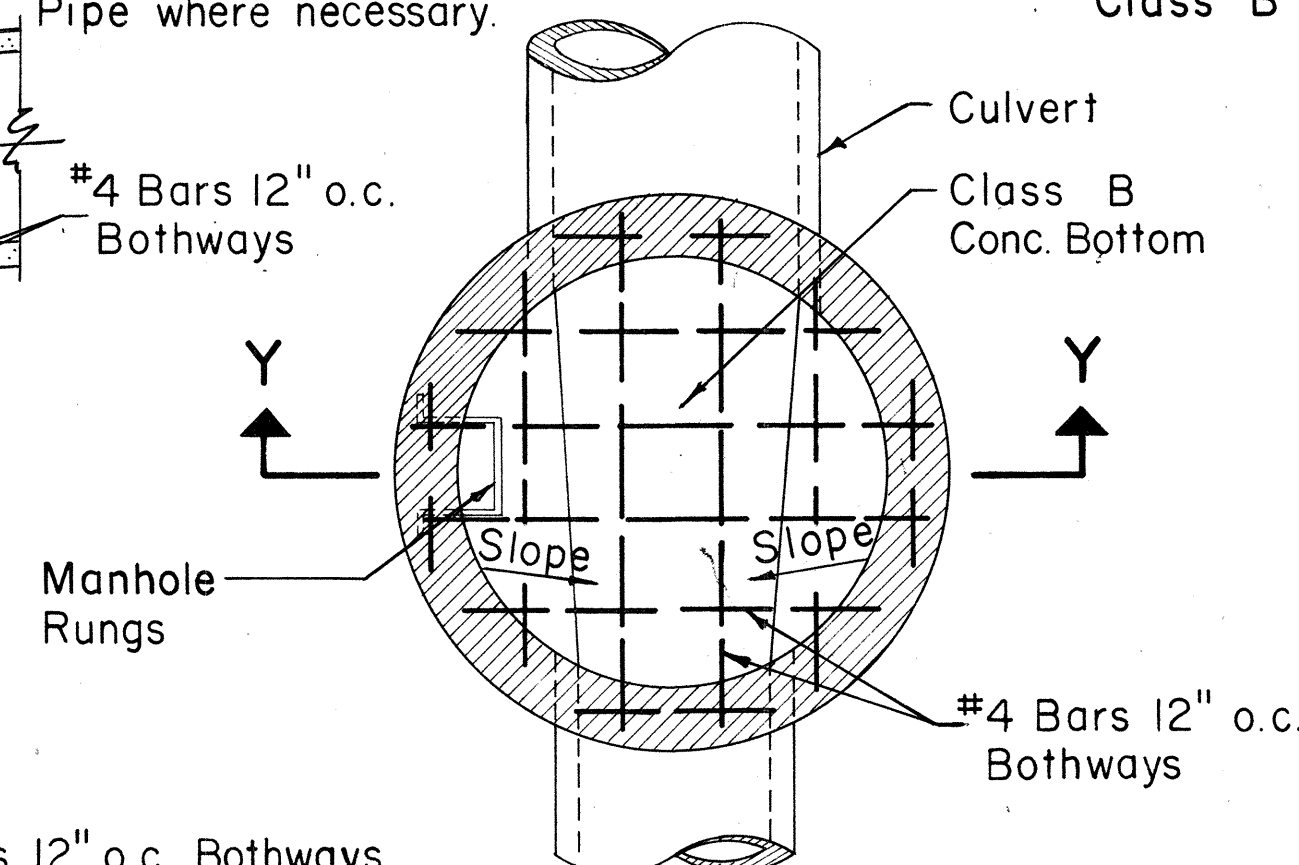
TYPE "A", "B", & "C"

S.D.M.H.

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



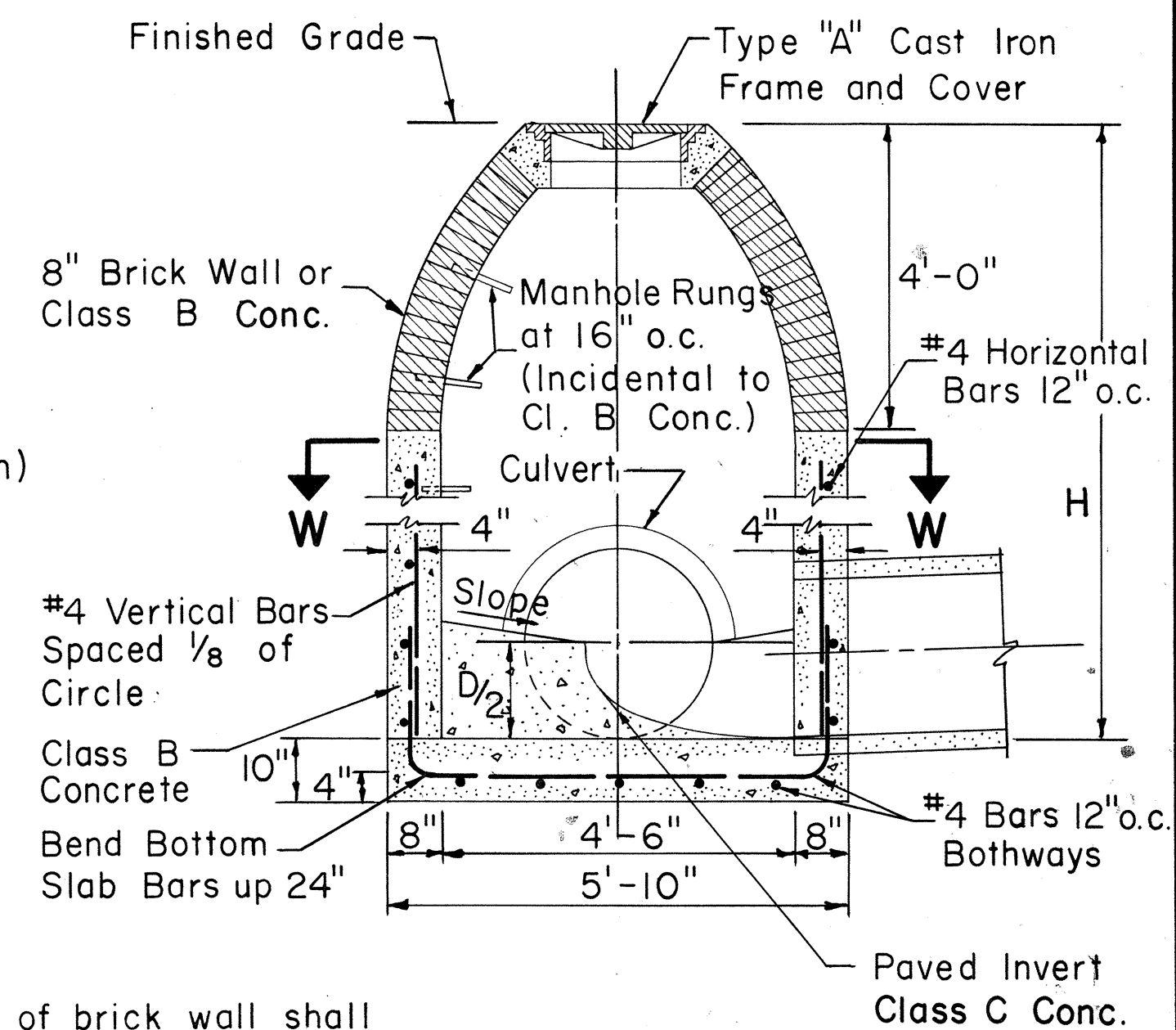
SECTION Y-Y



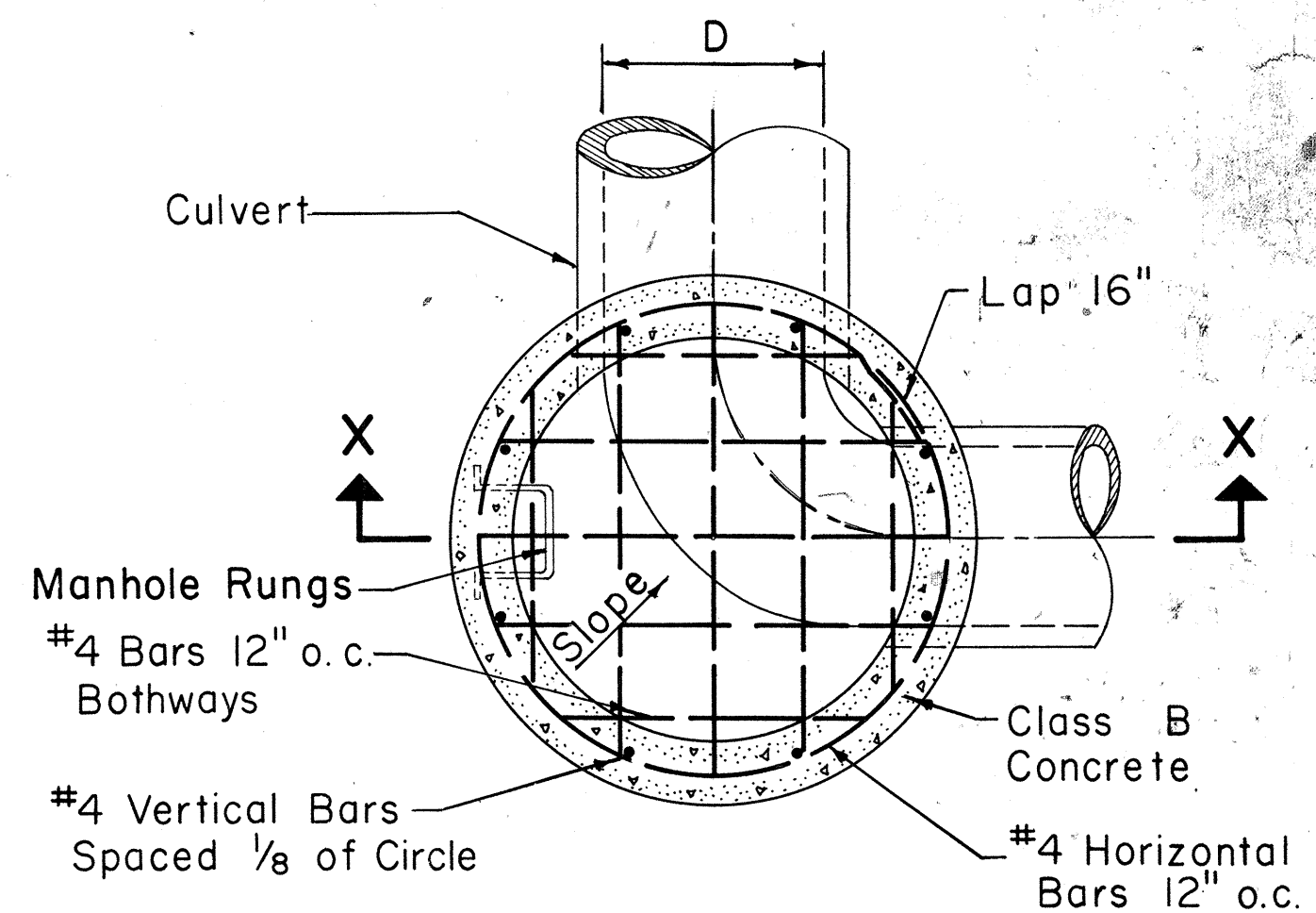
SECTION Z-Z

TYPE "D" STORM DRAIN MANHOLE

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



SECTION X-X



SECTION W-W

TYPE "E" STORM DRAIN MANHOLE

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

NO.	REVISION	APPROVED BY	DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

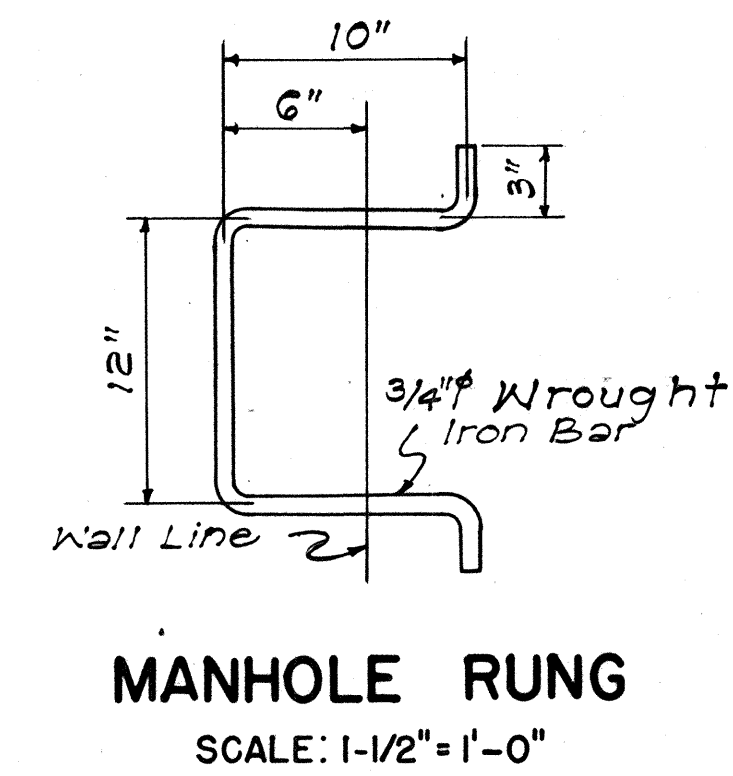
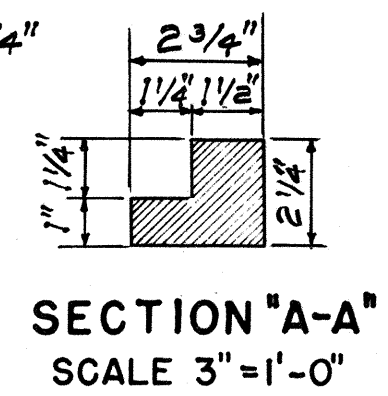
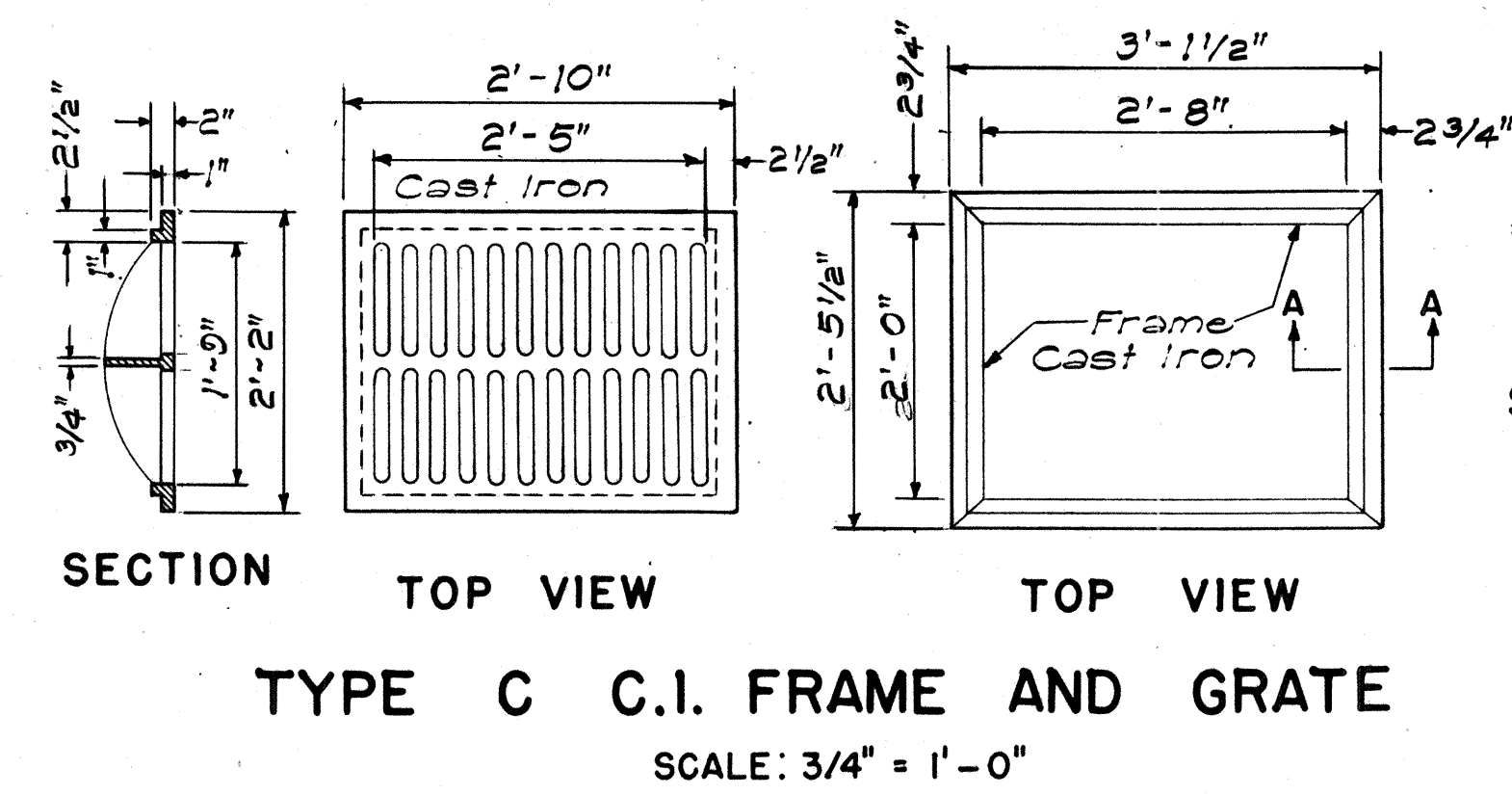
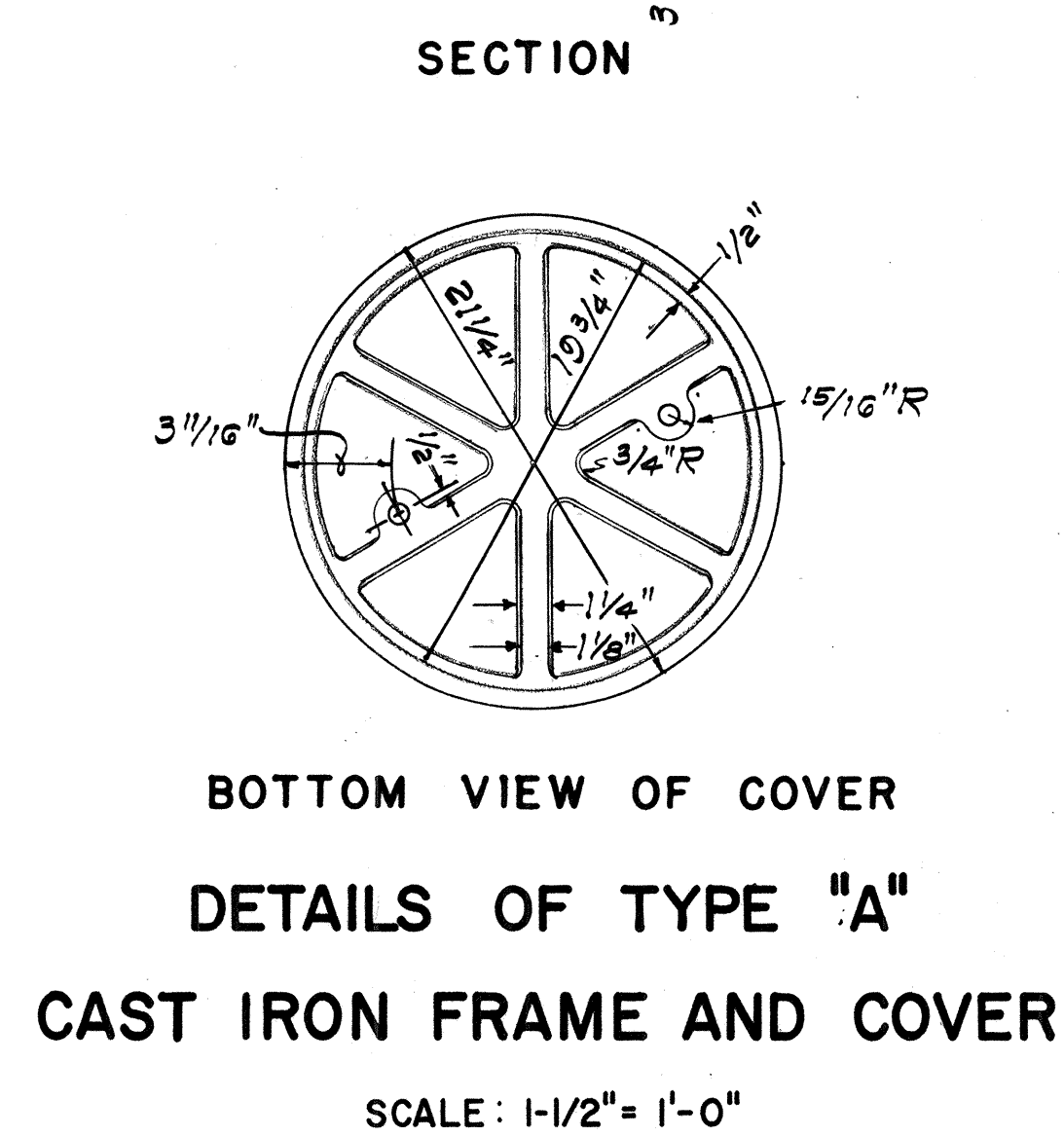
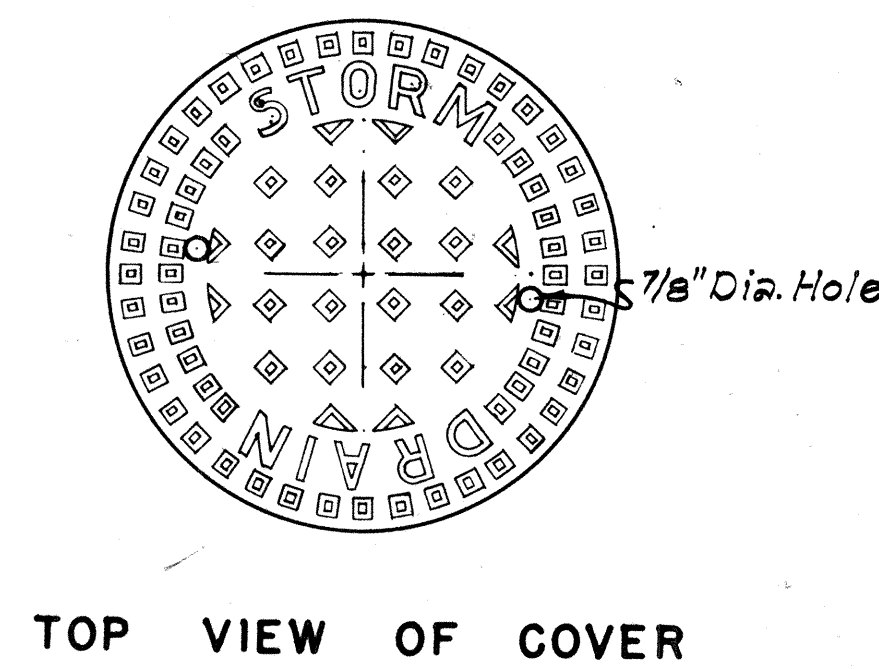
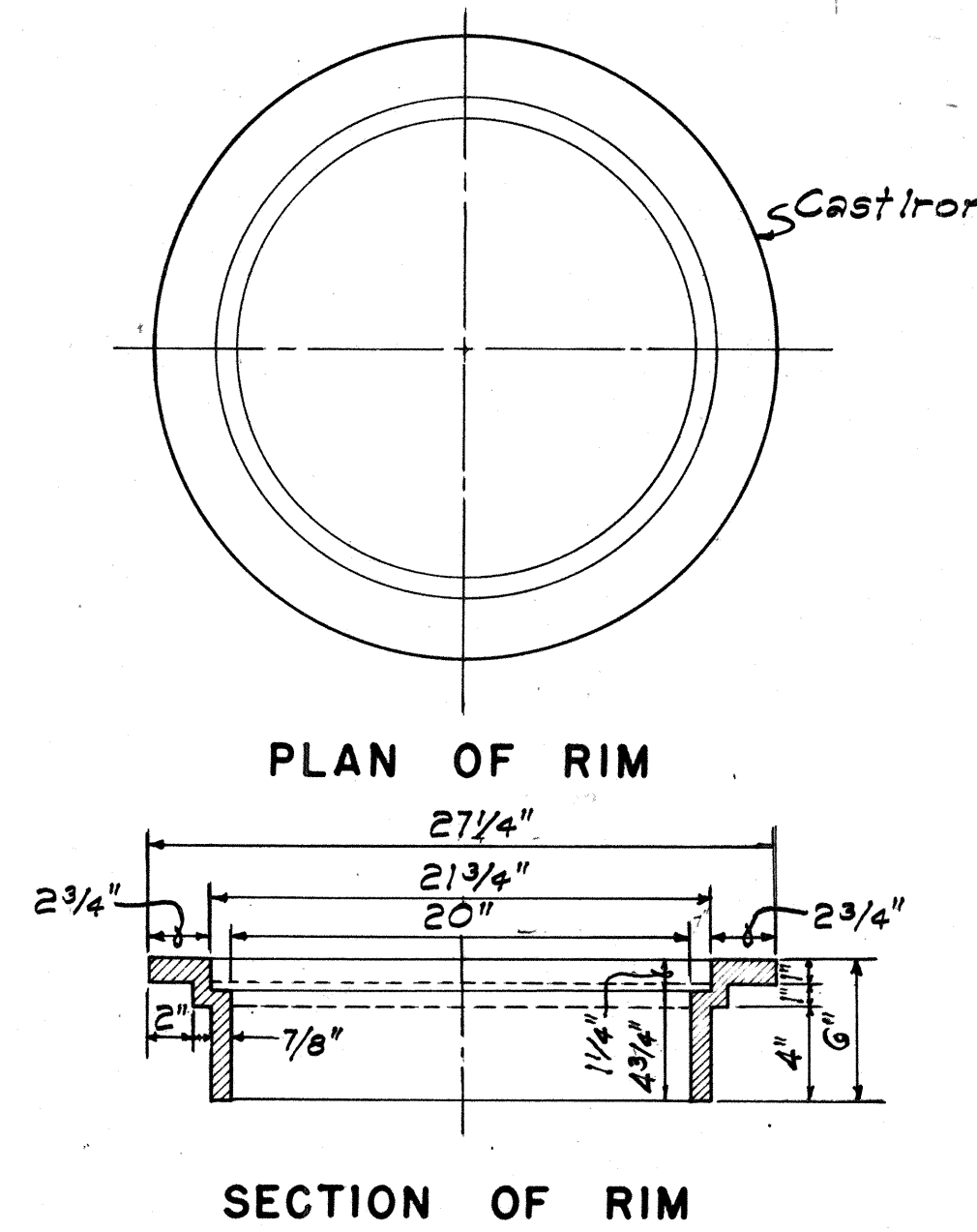
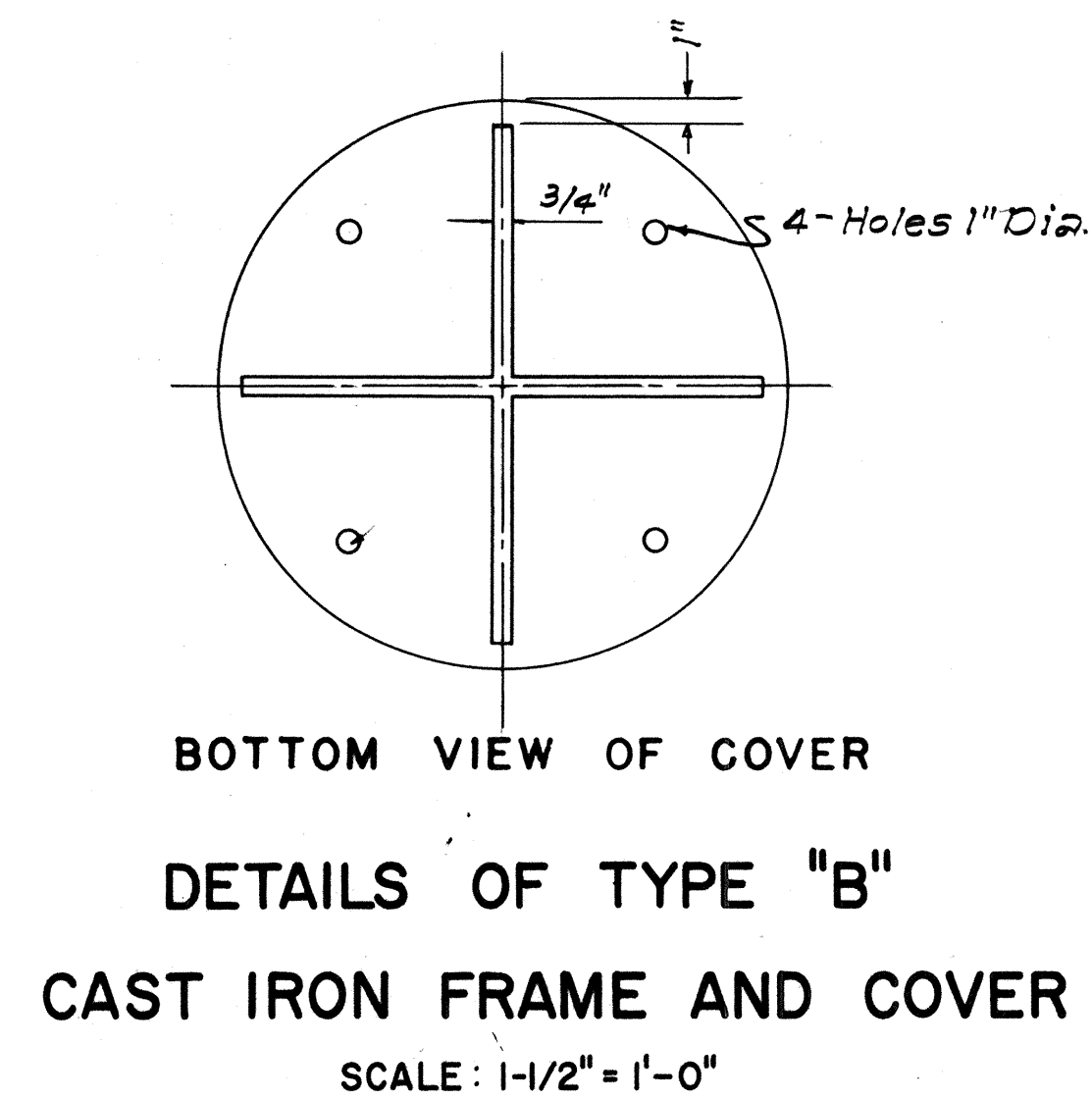
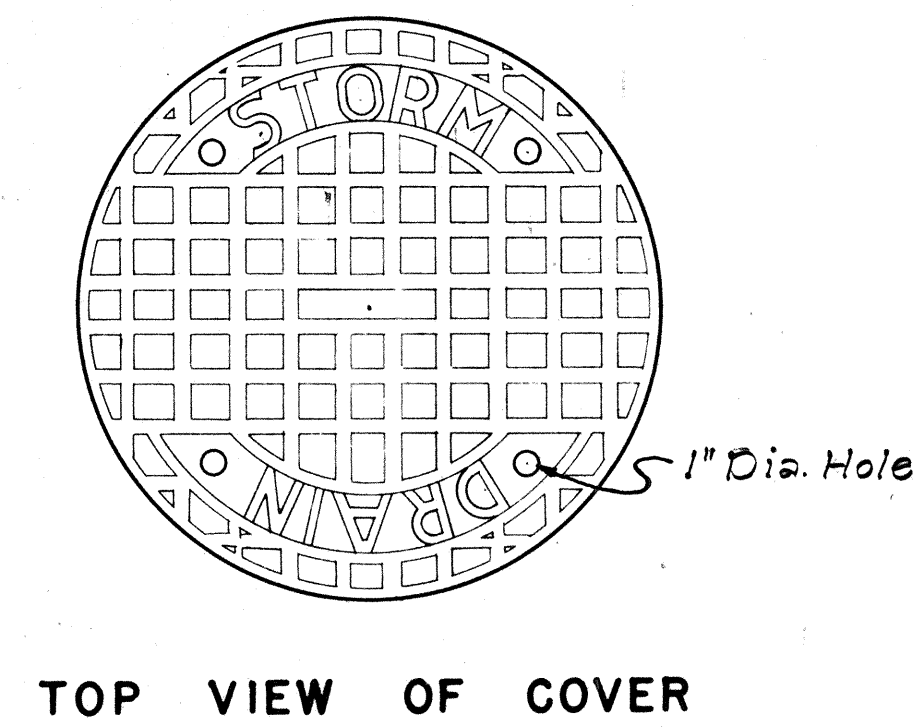
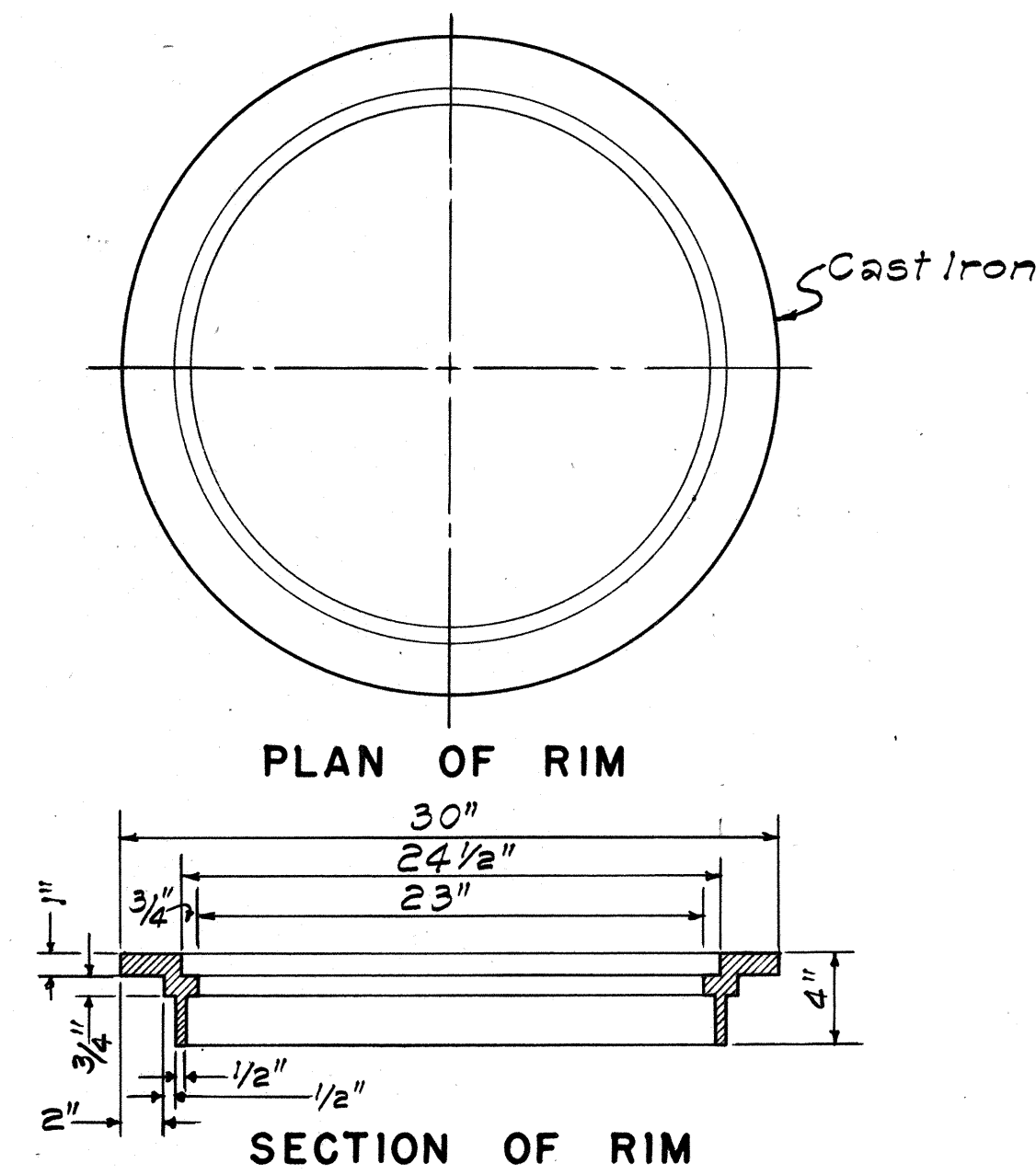
STANDARD DETAILS
STORM DRAIN MANHOLES

Scales: As Noted
Date: July, 1969

APPROVAL RECOMMENDED:
HYDRAULIC DESIGN ENGINEER
DATE: 12-17-69

APPROVED:
ASST. CHIEF, ENGINEERING
DATE: 12-17-69

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HH-1(77)13	1967	46	154



APPROVAL RECOMMENDED:
 HYDRAULIC DESIGN ENGINEER
 DATE 12-17-69

APPROVED:
 ASSISTANT CHIEF, ENGINEERING
 DATE 12-17-69

NO.	REVISION	APPROVED BY	DATE

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION

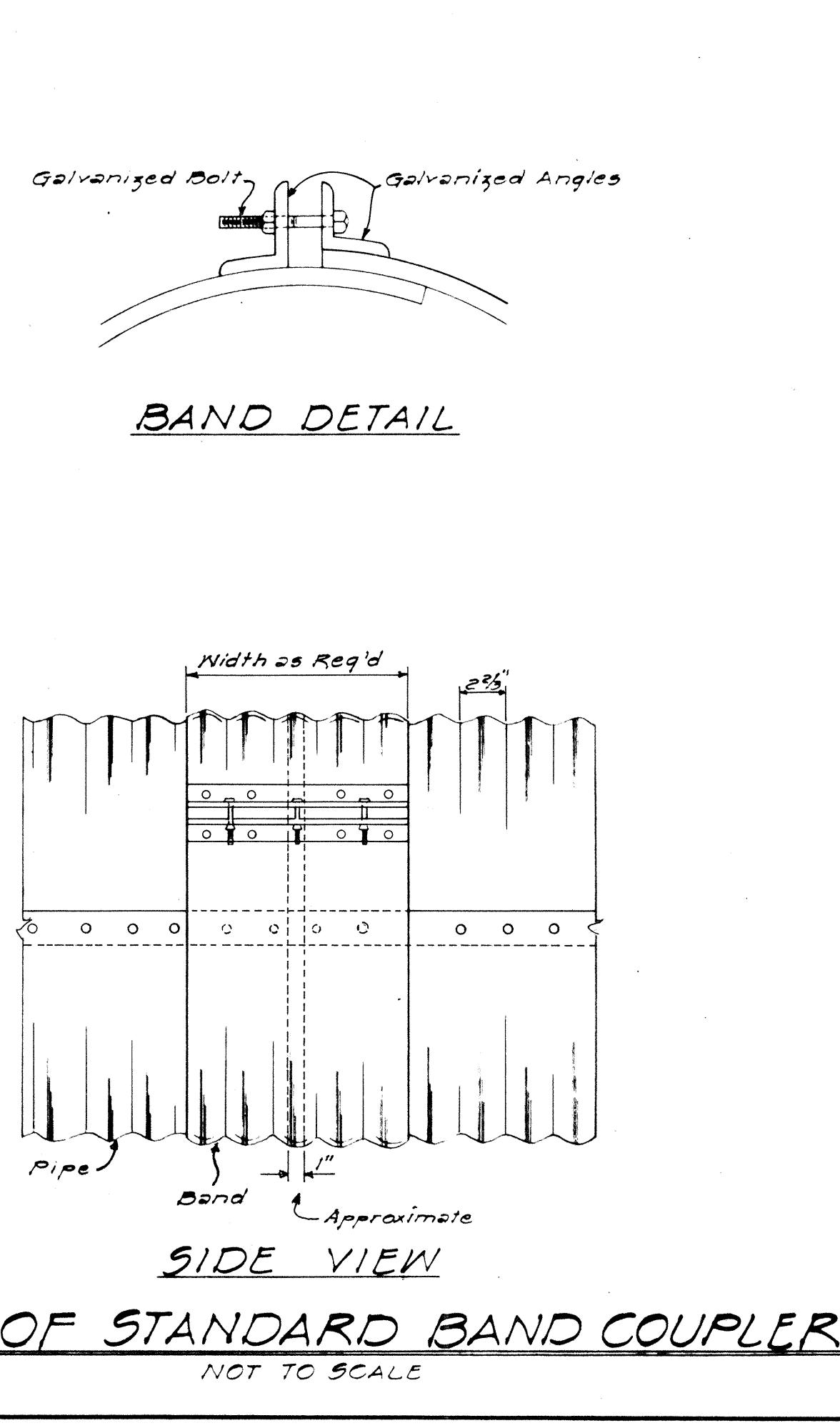
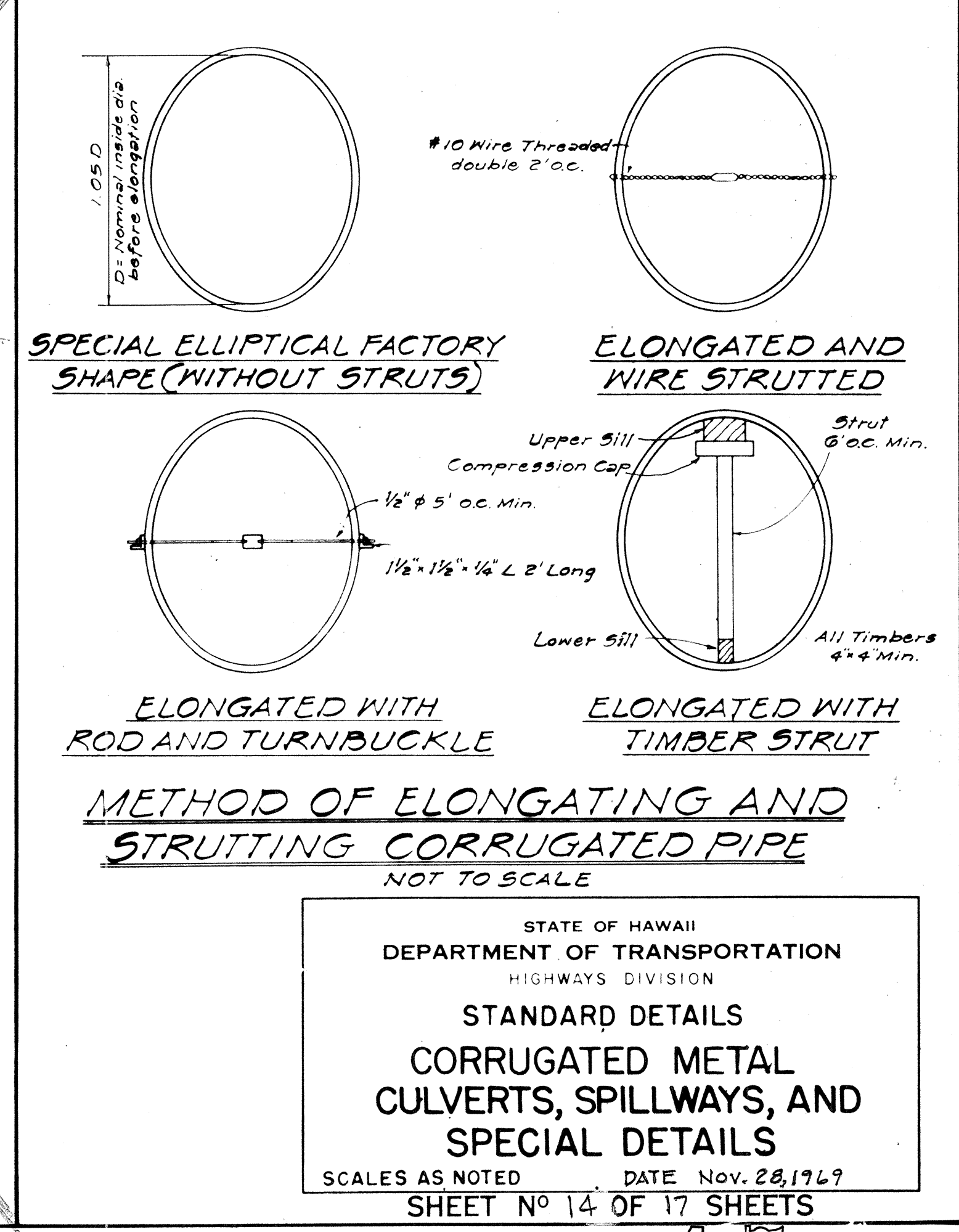
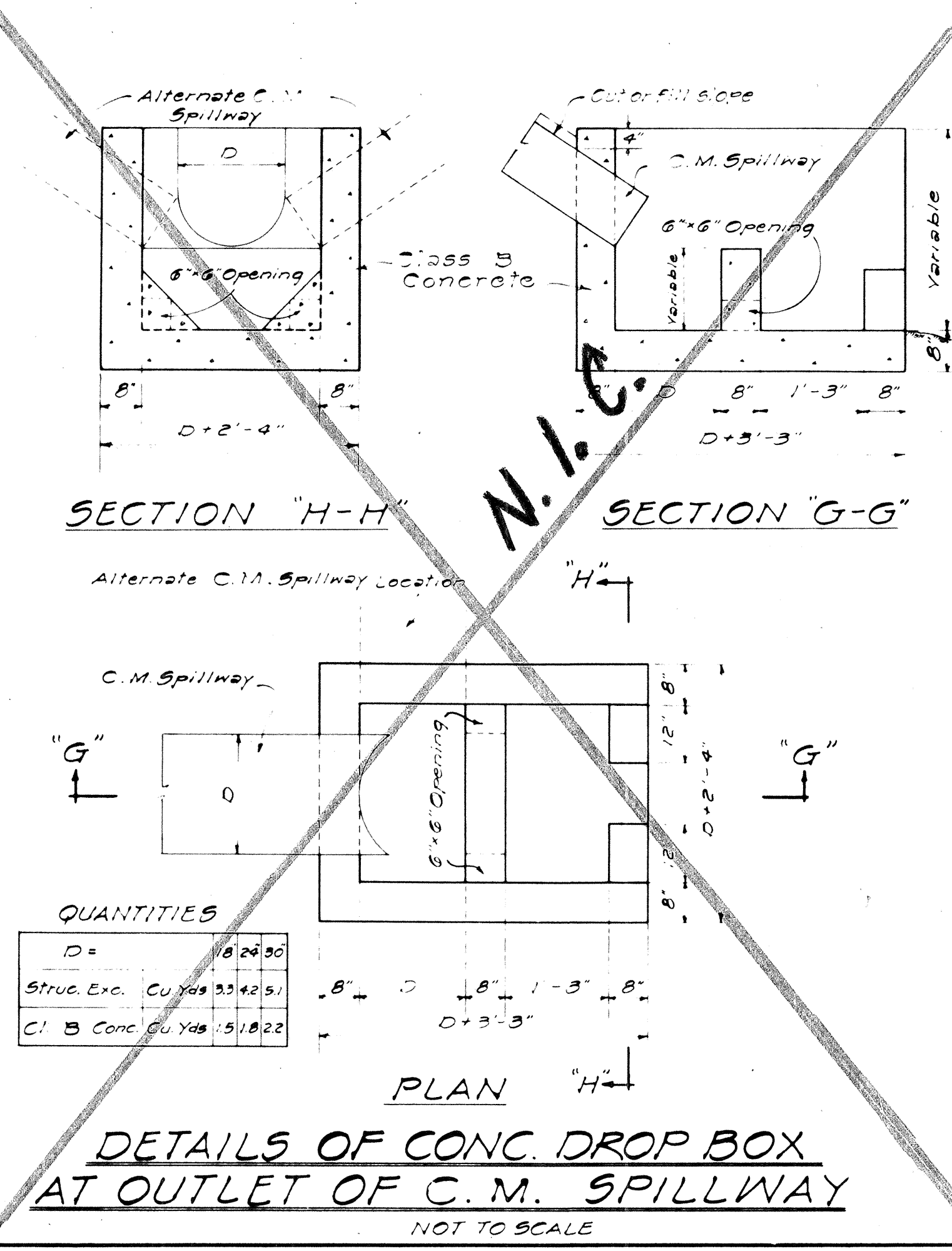
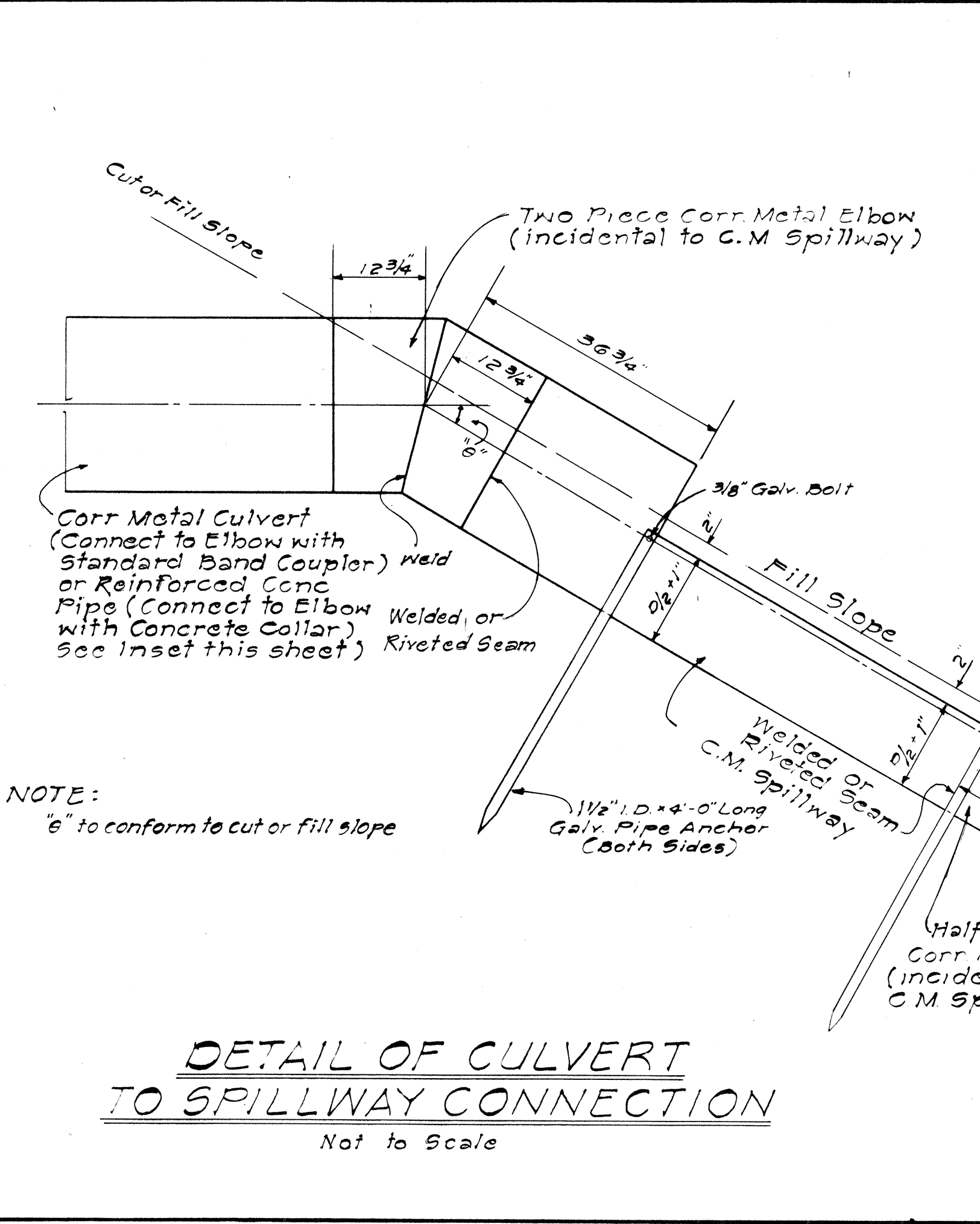
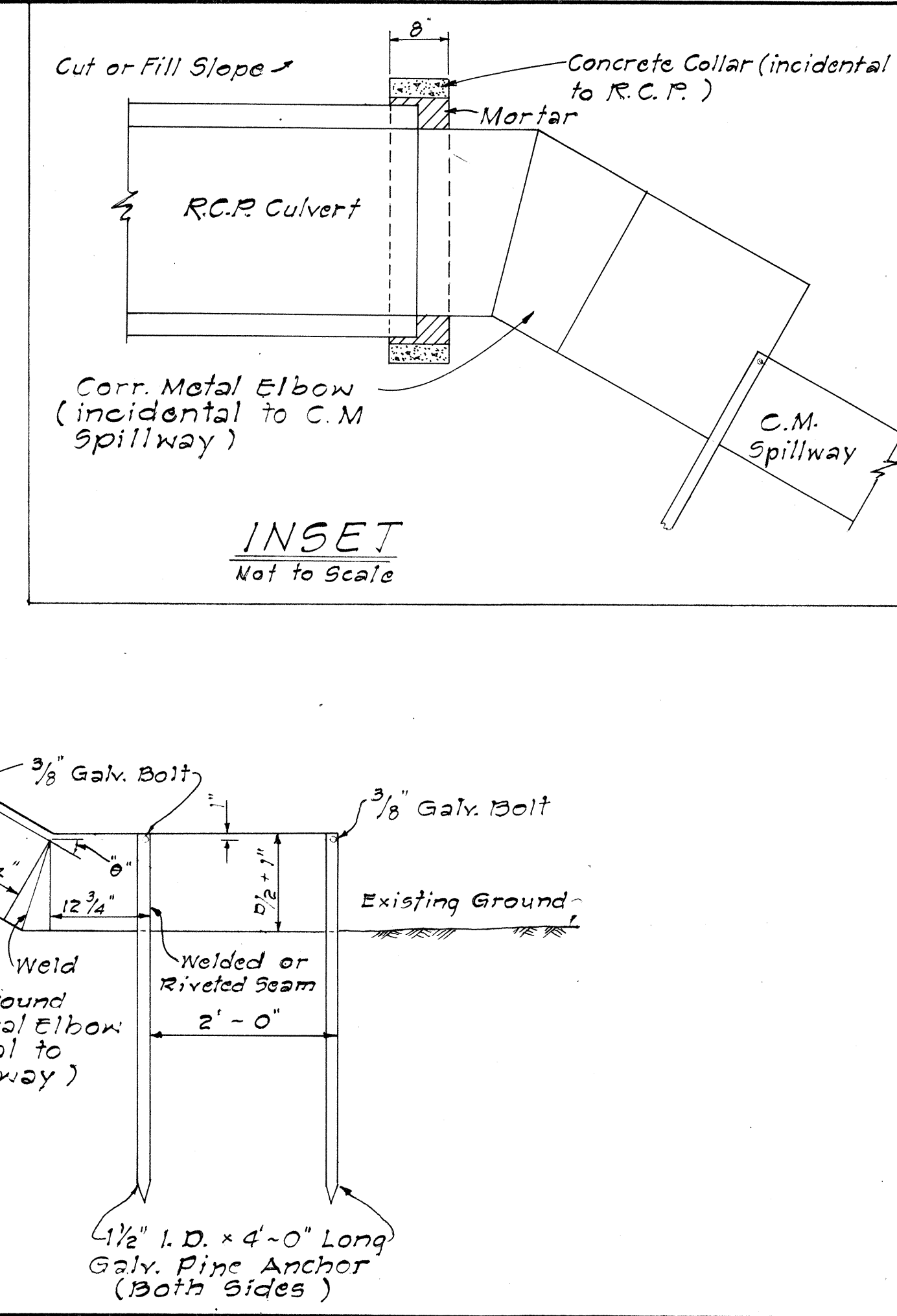
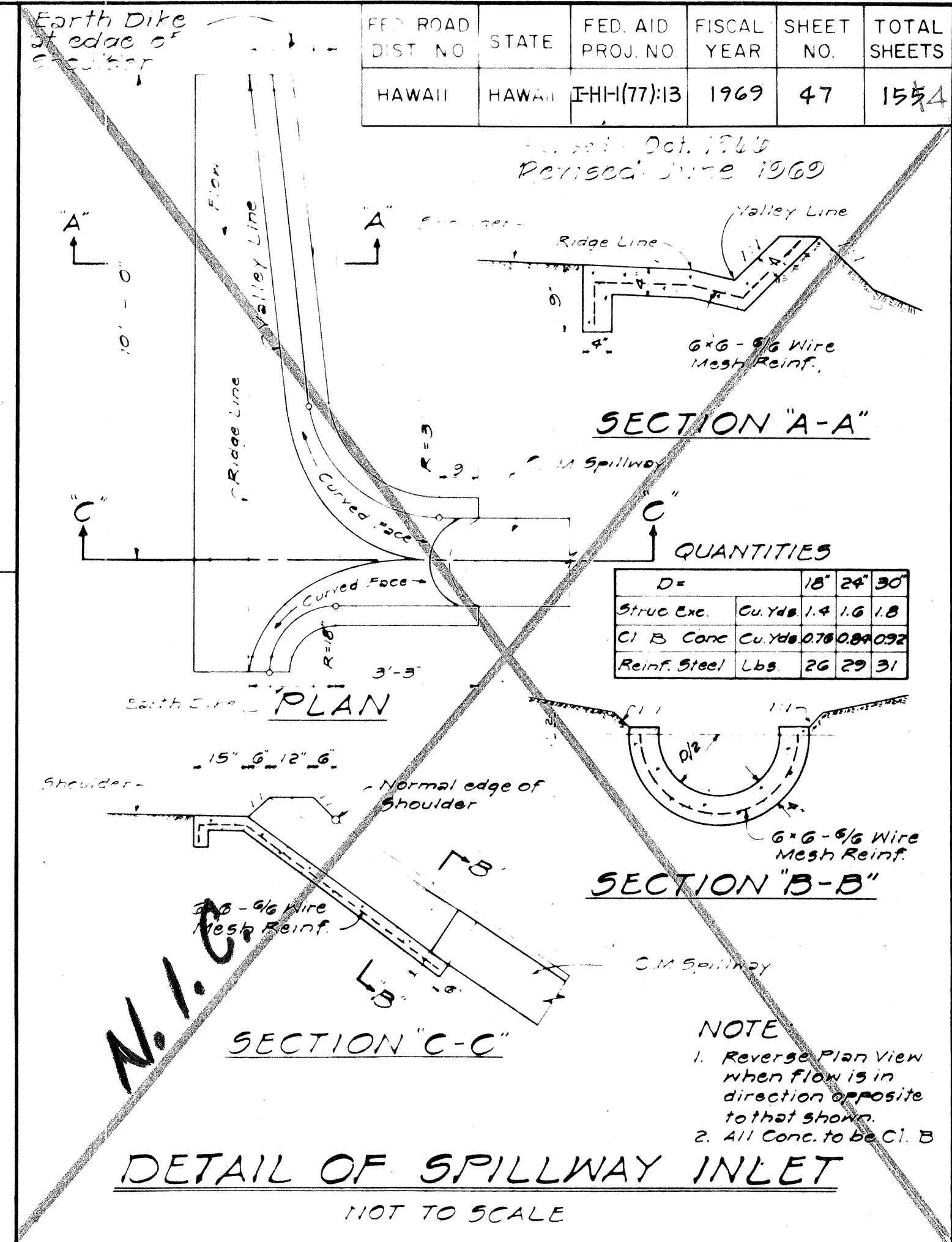
STANDARD DETAILS
 CATCH BASIN AND
 MANHOLE CASTINGS

Scale: As Noted Date: July, 1969
 SHEET NO 13 OF 17 SHEETS DH 6

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	
	TRACED BY	
	QUANTITIES BY	
	CHECKED BY	

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	FHH-177-13	1969	47	154

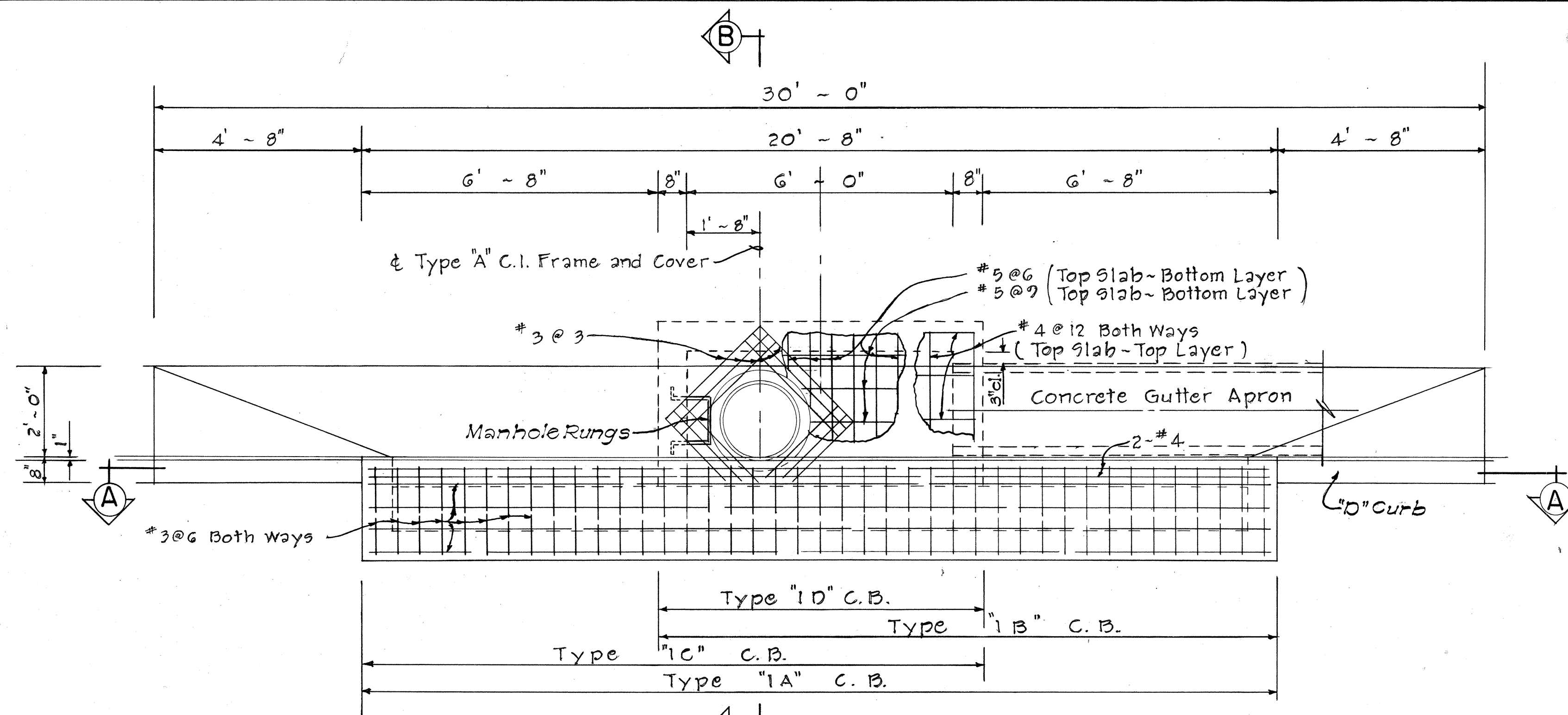
Revised: Oct. 1969
Revised: June 1969



SURVEY PLOTTED BY	DATE
DESIGNED BY	5-24-69
QUANTITIES BY	5-24-69
CHECKED BY	
ORIGINAL PLAN	
NOTE BOOK	
No.	

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
STANDARD DETAILS
CORRUGATED METAL
CULVERTS, SPILLWAYS, AND
SPECIAL DETAILS
SCALES AS NOTED
DATE Nov. 28, 1969
SHEET NO. 47 OF 17 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	1-HI-1(77)-13	1969	48	154

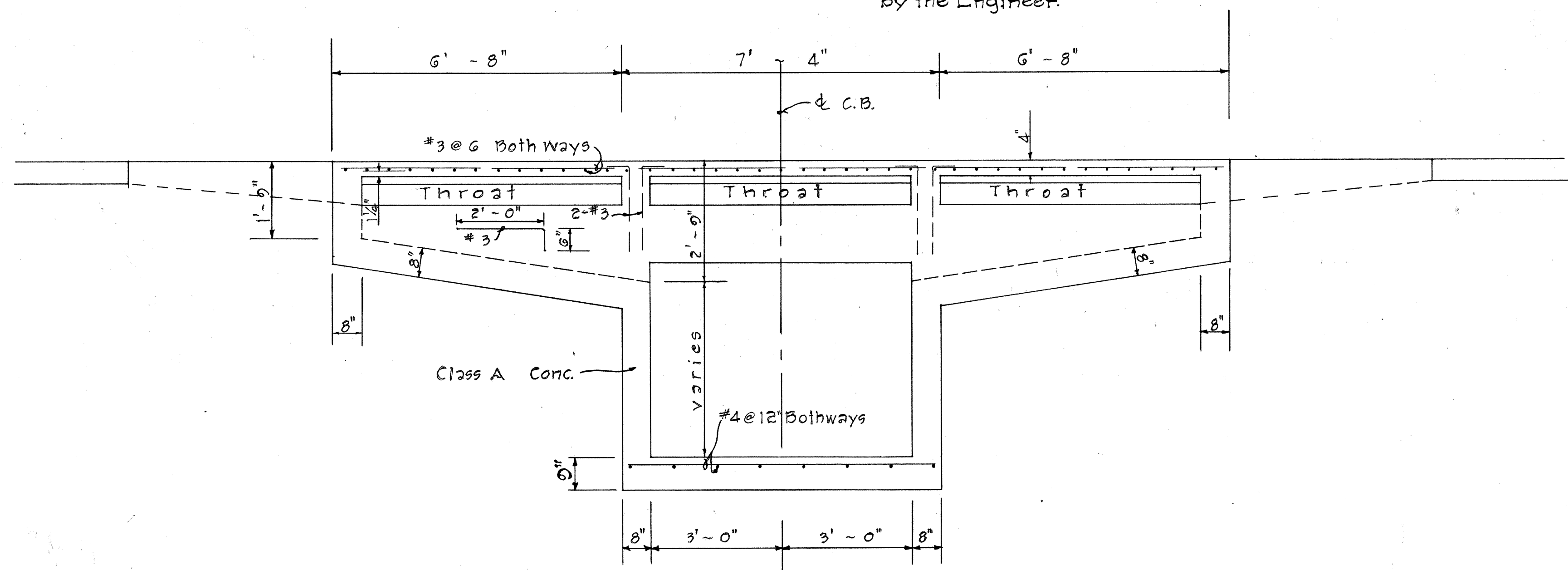


GENERAL NOTES

- Culvert shall enter and leave C.B. from any position and in the direction indicated by the plans or ordered by the Engineer.
- D' shall be the maximum outside dimension of the culvert at the C.B. wall.
- The type of curb and/or gutter (Type 1, 2, 3, etc.) shall conform to the type specified on the roadway plans.
- Manhole Rungs (16" o.c.) are required when "H" is greater than 4 feet 6 inches. Only one rung (12 inches from the bottom) is required if "H" is 4 feet 6 inches or less. Type "A" C.I. Frame & Cover and Manhole Rungs may be placed at any location as ordered by the Engineer.

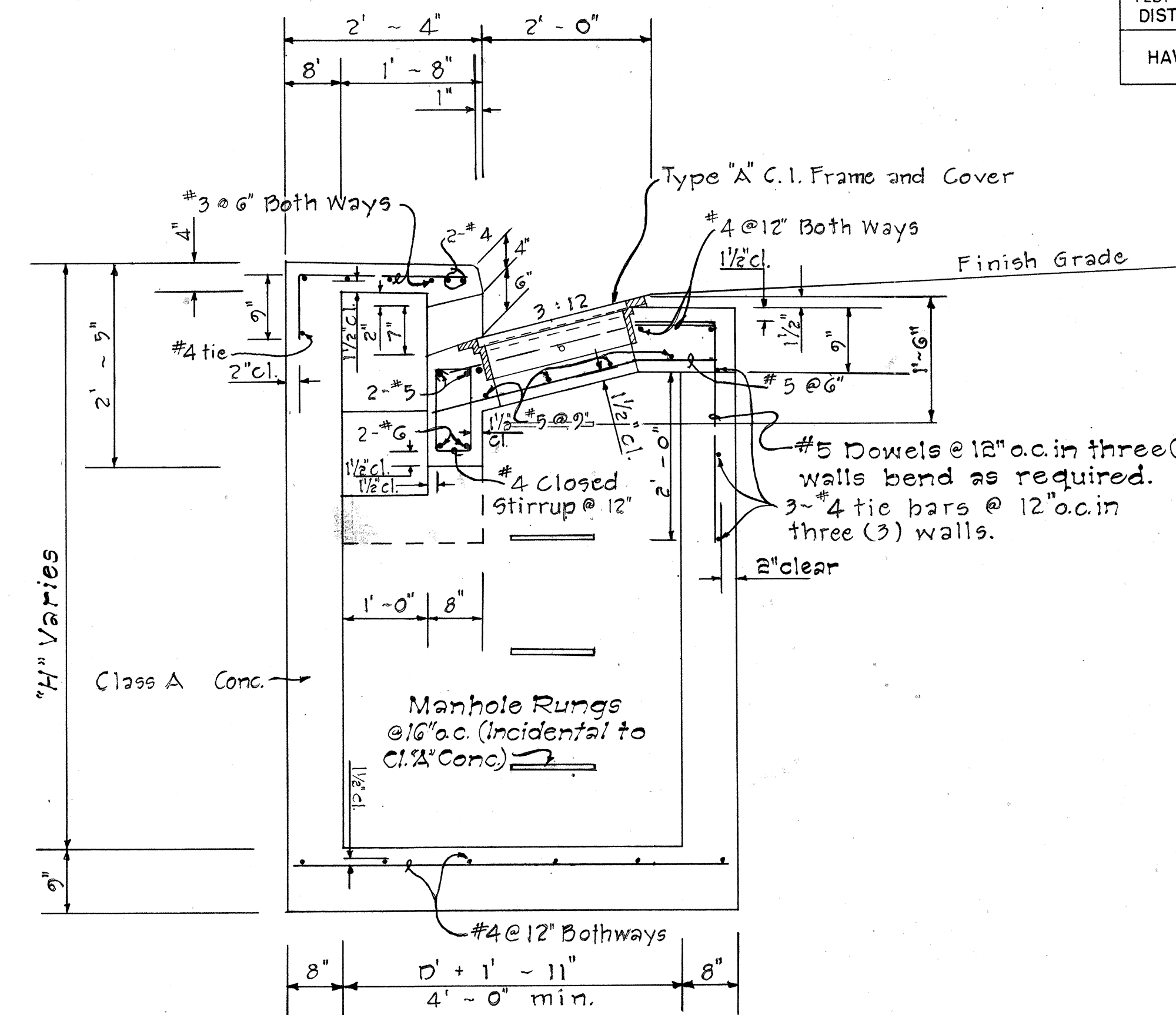
PLAN

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



SECTION "A-A"

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



SECTION "B-B"

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

APPROVAL RECOMMENDED:
P. Nakano
 HYDRAULIC DESIGN ENGINEER - 12-17-69
 DATE

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

NO.	REVISION	APPROVED BY	DATE

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION
 STANDARD DETAILS
 TYPE "IA", "IB", "IC", AND "ID"
 CATCH BASINS

Scale: As Noted Date: July, 1969

SHEET, No. 15 OF 17 SHEETS DH 3

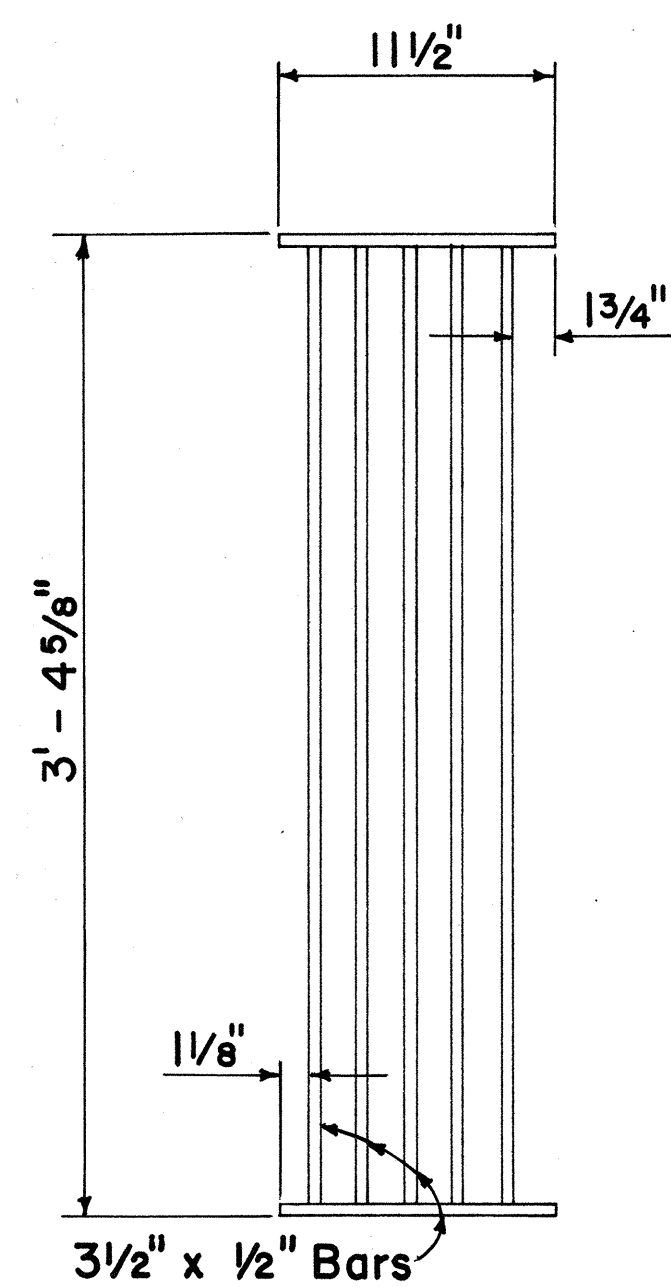
DETAILS OF TYPE "IA", "IB", "IC" AND "ID" CATCH BASIN

ORIGINAL PLAN	DATE
DRAWN BY	
DESIGNED BY	
QUANTITIES BY	
CHECKED BY	

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H-1(77)33	1967	47	154

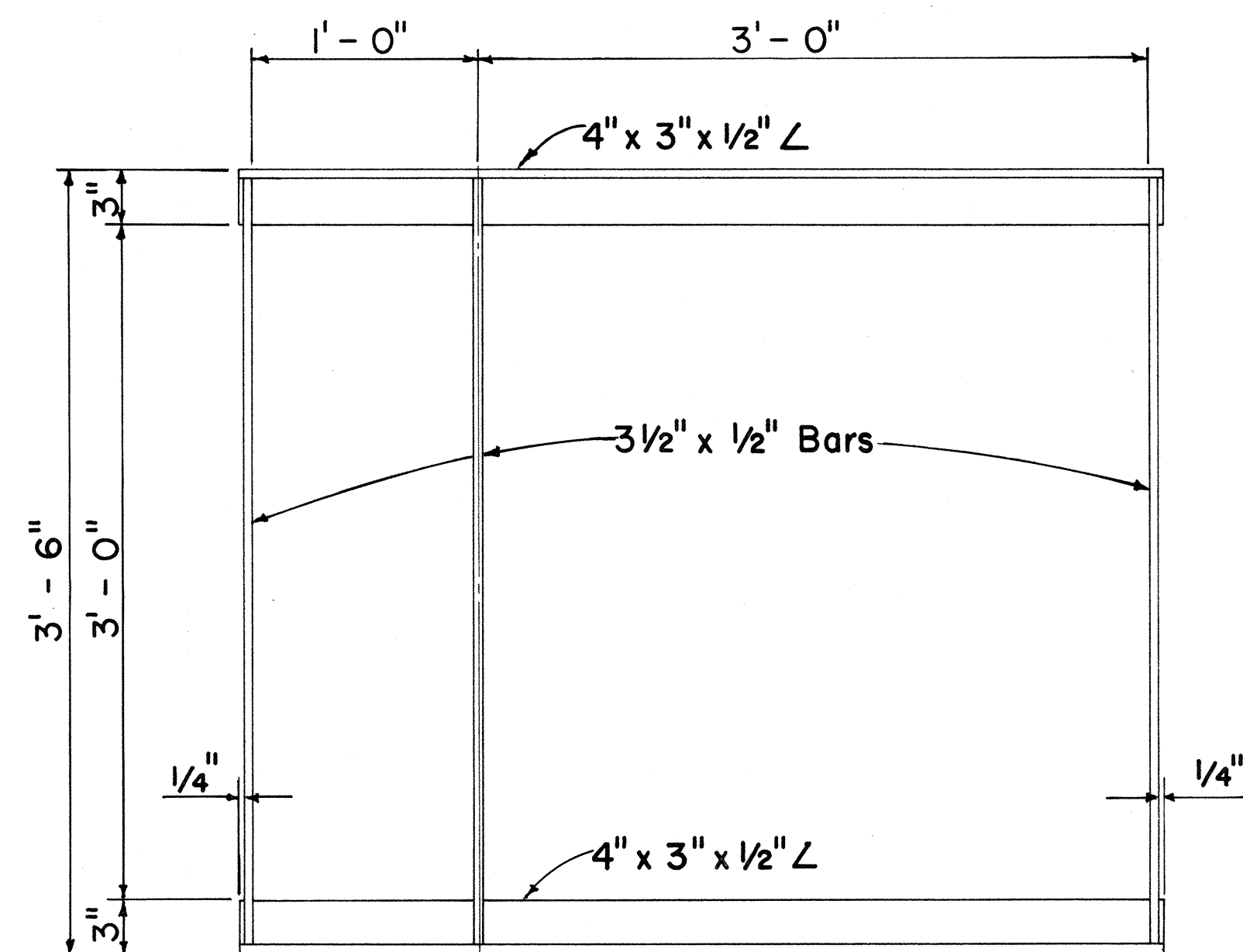
GENERAL NOTES

- Grates and Frames shall be hot dip galvanized after fabrication, see specifications.
- All welds $\frac{3}{8}$ " 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 (16" o.c.) are required when "H" is greater than 4 feet 6 inches. Only one rung (12 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.



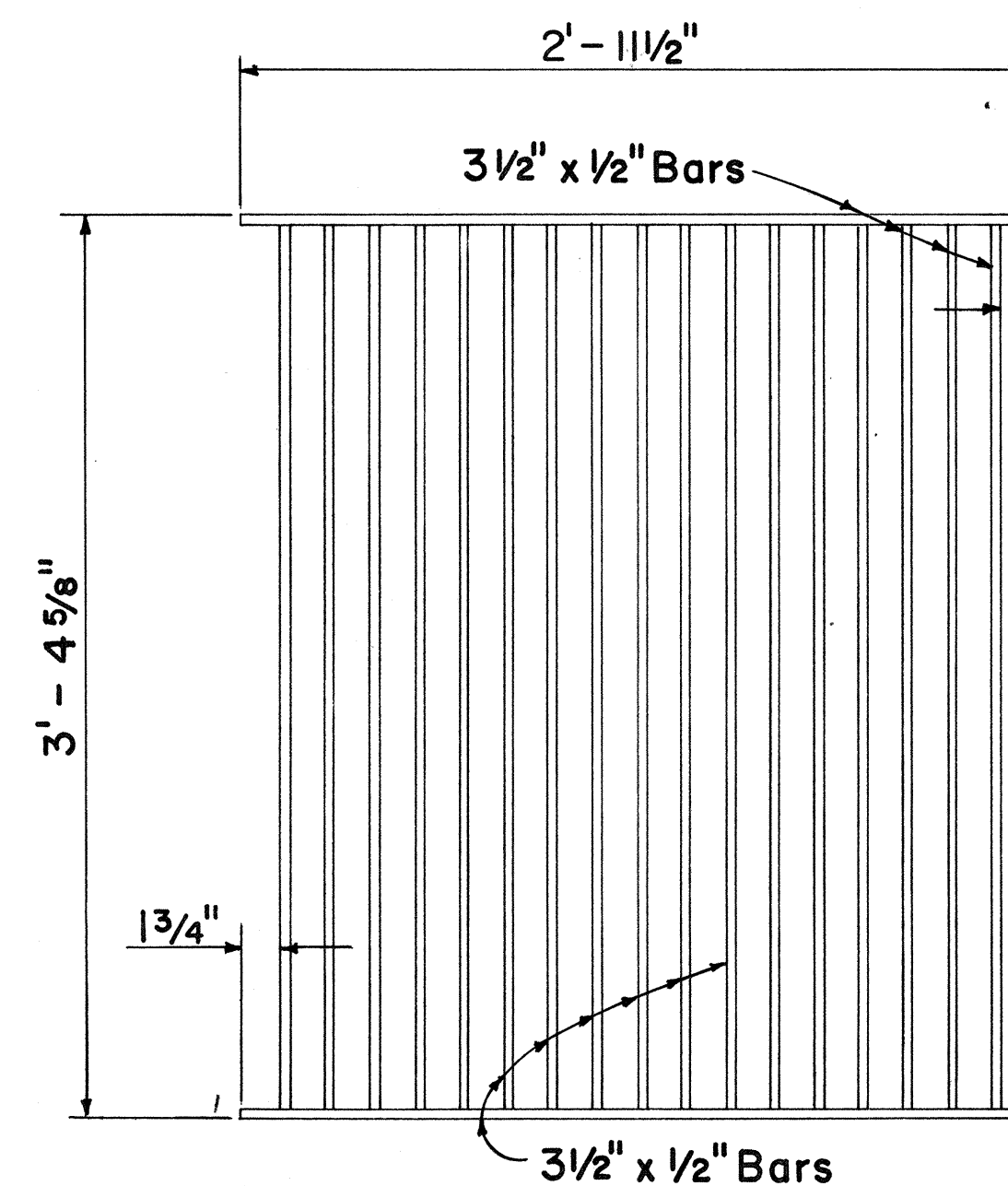
PLAN

Scale: $1\frac{1}{2}" = 1' - 0"$



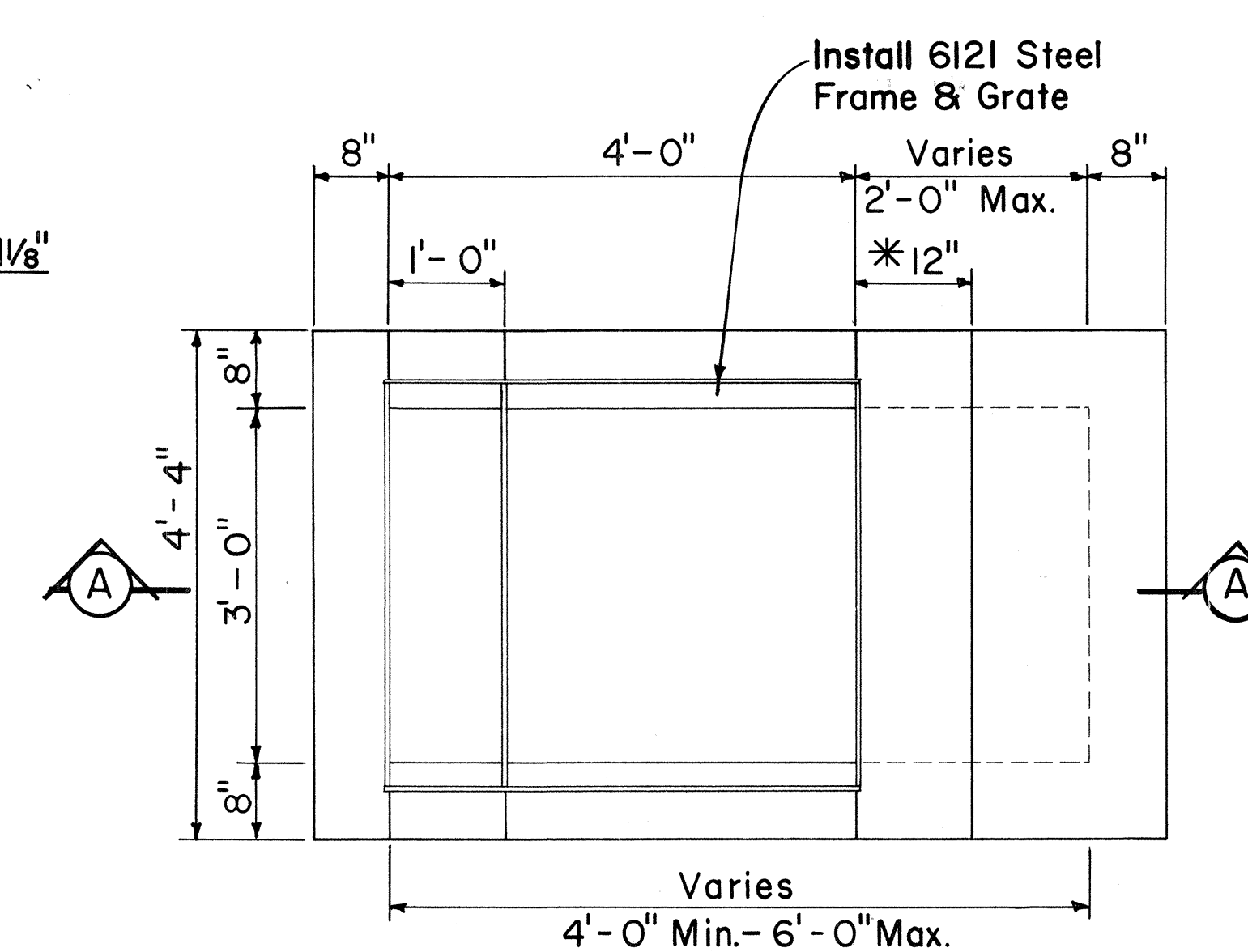
PLAN

Scale: $1\frac{1}{2}" = 1' - 0"$

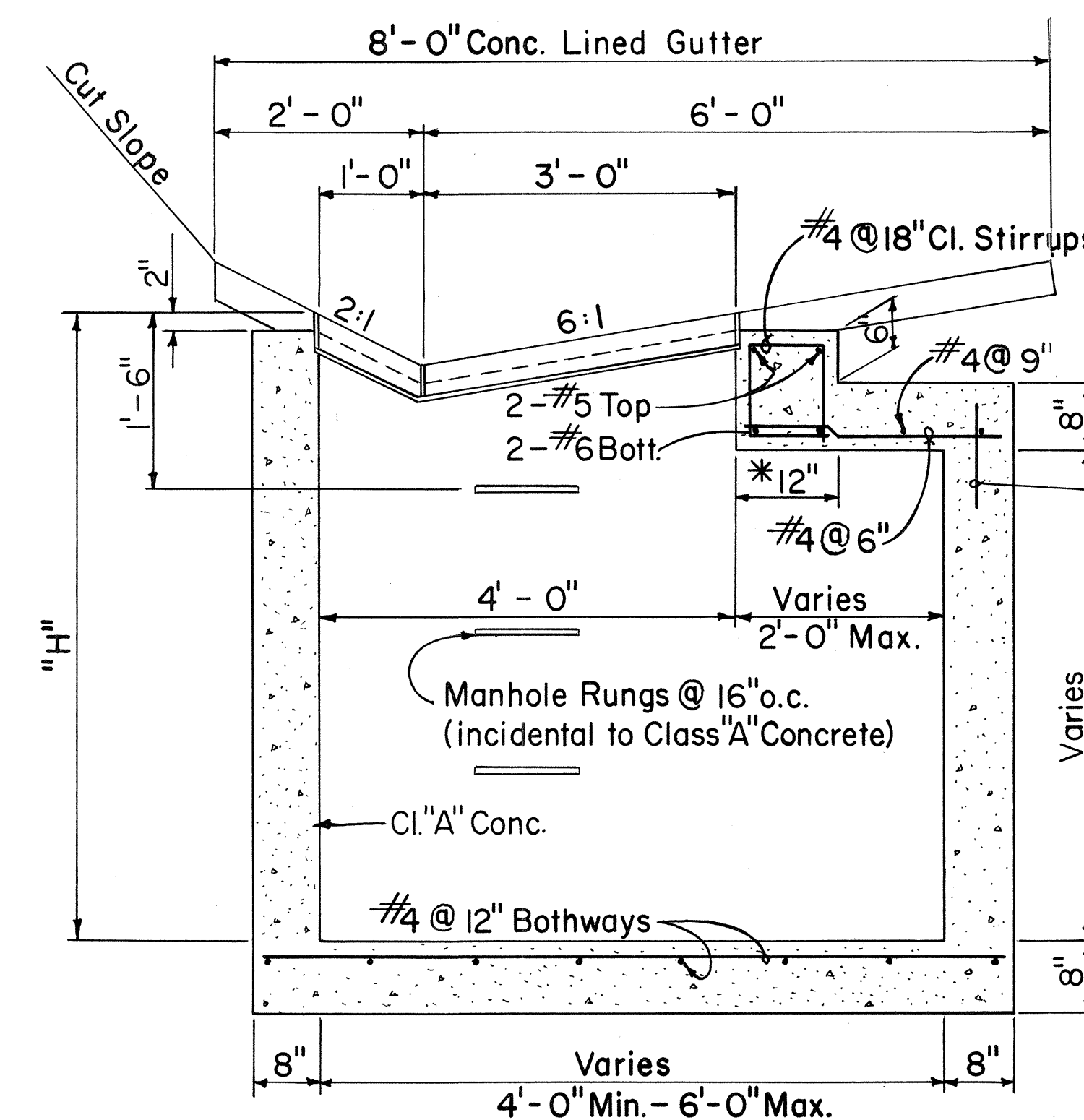


PLAN

Scale: $1\frac{1}{2}" = 1' - 0"$



PLAN



SECTION A - A

DETAIL OF 6121 DROP INTAKE

Scale: $\frac{3}{4}" = 1' - 0"$

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

NO.	REVISION	APPROVED BY	DATE

APPROVAL RECOMMENDED:

HYDRAULIC DESIGN ENGINEER

DATE

APPROVED:

ASSISTANT CHIEF, ENGINEERING

DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS

TYPE 6121
GRADED DROP INTAKE

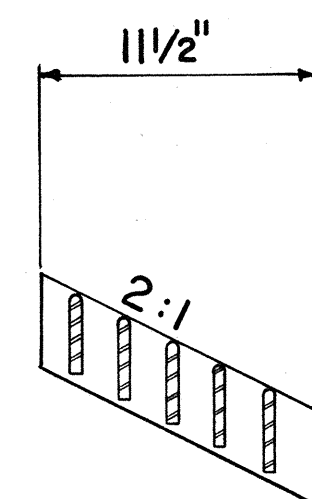
Scales: As Noted

Date: July 1969

SHEET No. 16 OF 17 SHEETS

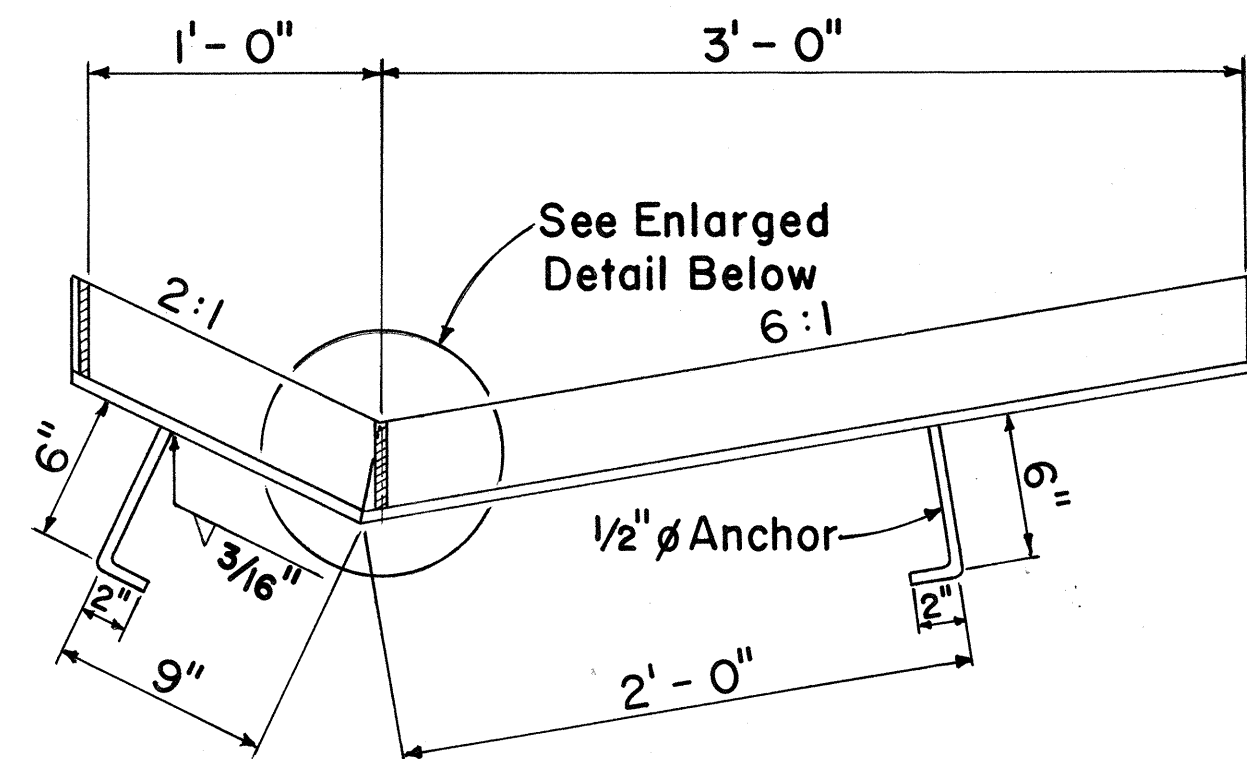
HD 9

DETAILS OF TYPE 6121 STEEL FRAME AND GRATES



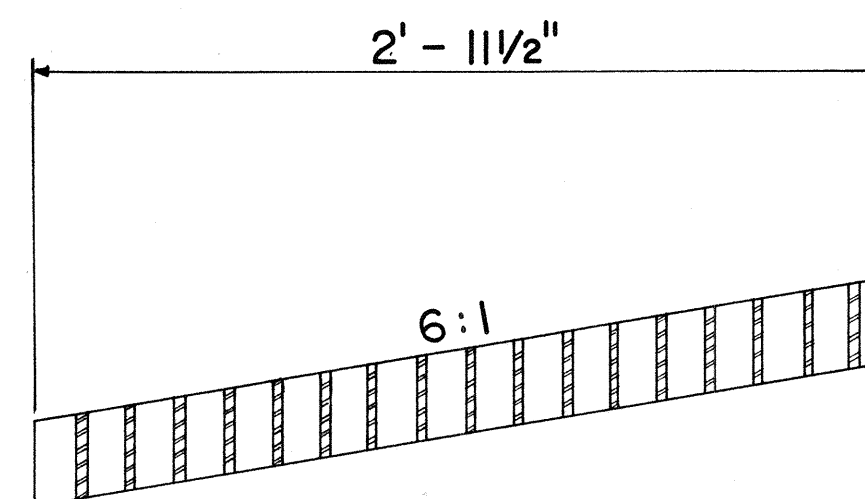
SECTION

Scale: $1\frac{1}{2}" = 1' - 0"$



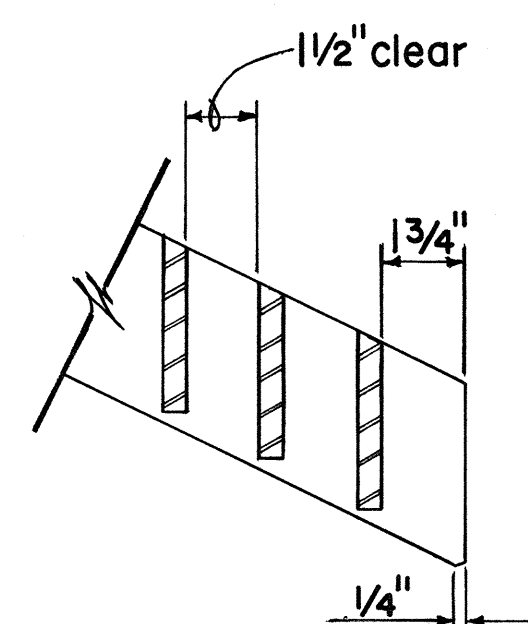
SECTION

Scale: $1\frac{1}{2}" = 1' - 0"$



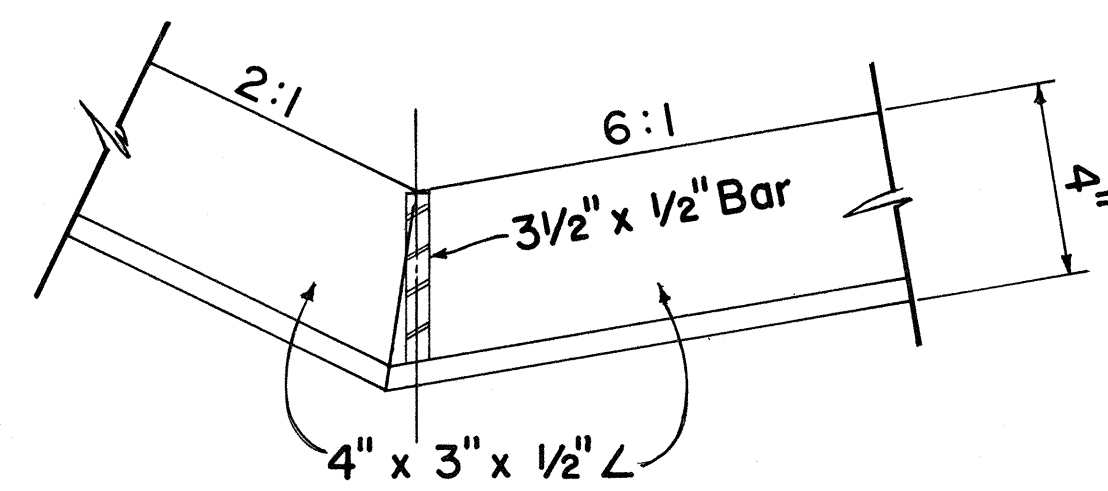
SECTION

Scale: $1\frac{1}{2}" = 1' - 0"$



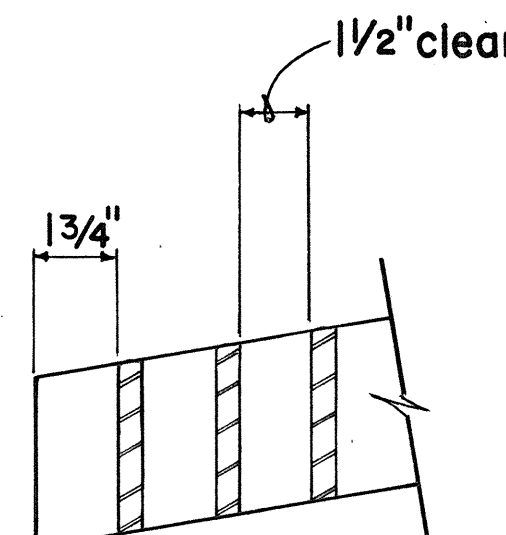
GRATE

Scale: $3" = 1' - 0"$



FRAME

Scale: $3" = 1' - 0"$



GRATE

Scale: $3" = 1' - 0"$

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(77)13	1969	50	154

GENERAL NOTES

- Grates and Frames shall be hot dip galvanized after fabrication, see specifications.
- All welds $\frac{3}{8}$ " unless otherwise noted.
- Refer to "Spacing Table" for Types 61612 & 61613 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 (16" o.c.) are required when "H" is greater than 4 feet 6 inches. Only one rung (12 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.

SPACING TABLE					
TYPE	NO. BARS	A	B	C	D
61612	11	2'-0"	1'-11½"	1¼"	1'-6"
61613	17	3'-0"	2'-11½"	1⅛"	2'-0"

APPROVAL RECOMMENDED:

HYDRAULIC DESIGN ENGINEER _____ DATE _____

APPROVED:

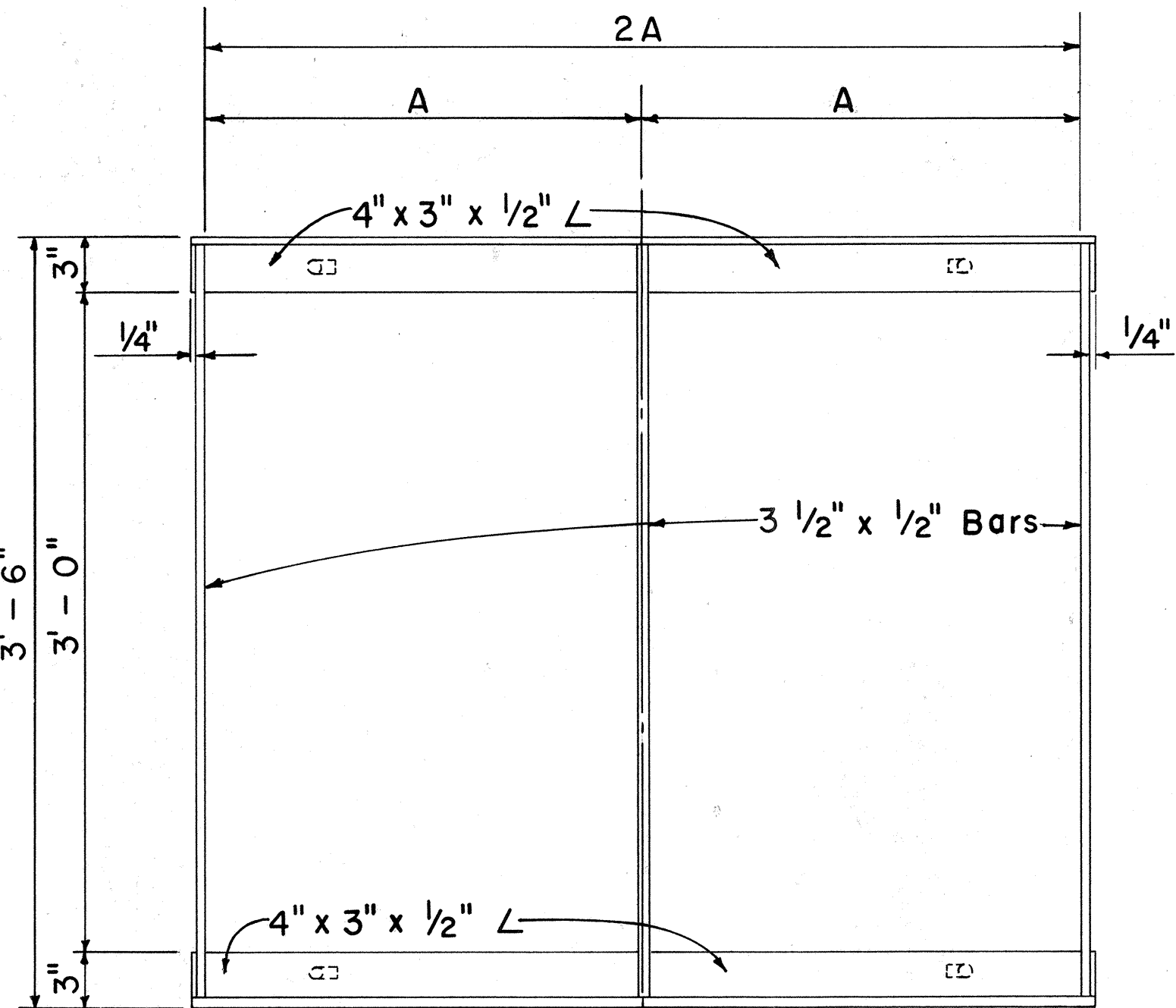
ASSISTANT CHIEF, ENGINEERING _____ DATE _____

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TYPE 61612 & 61613
GRADED DROP INTAKES
HALAWA INTERCHANGE
PROJECT No. I-HI-1(77):13

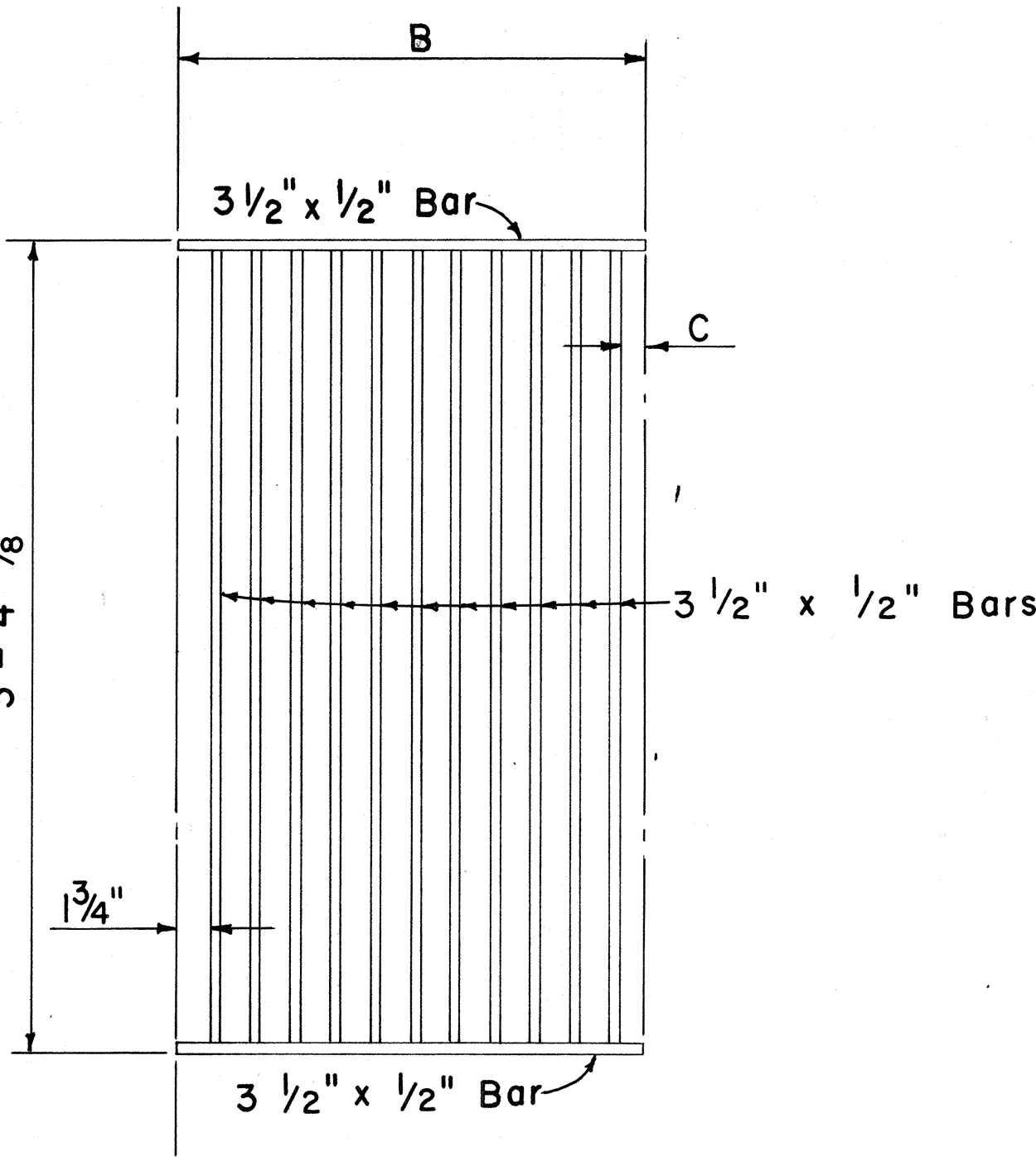
Scales: As Noted Date: Feb. 1969

SHEET No. 17 OF 17 SHEETS



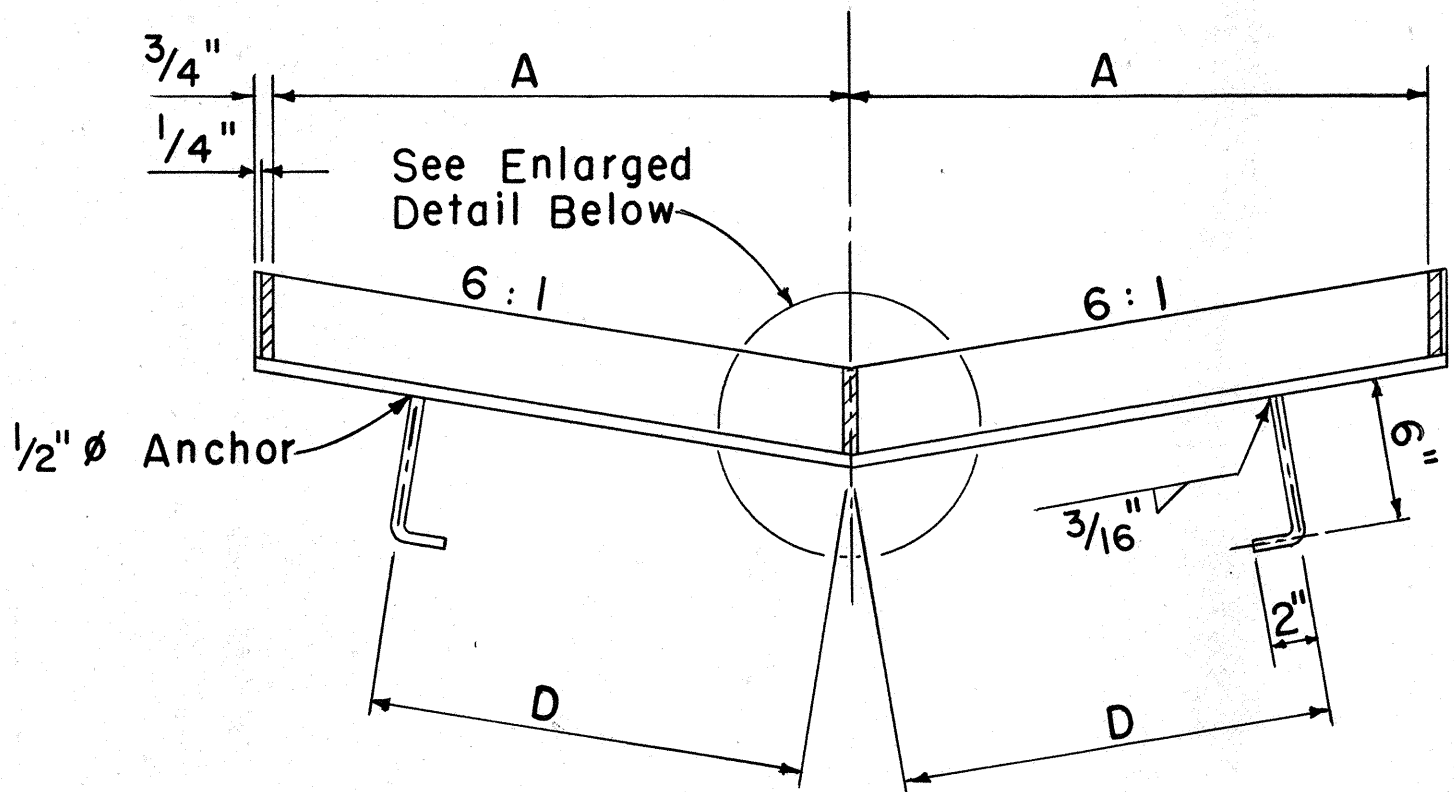
PLAN

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



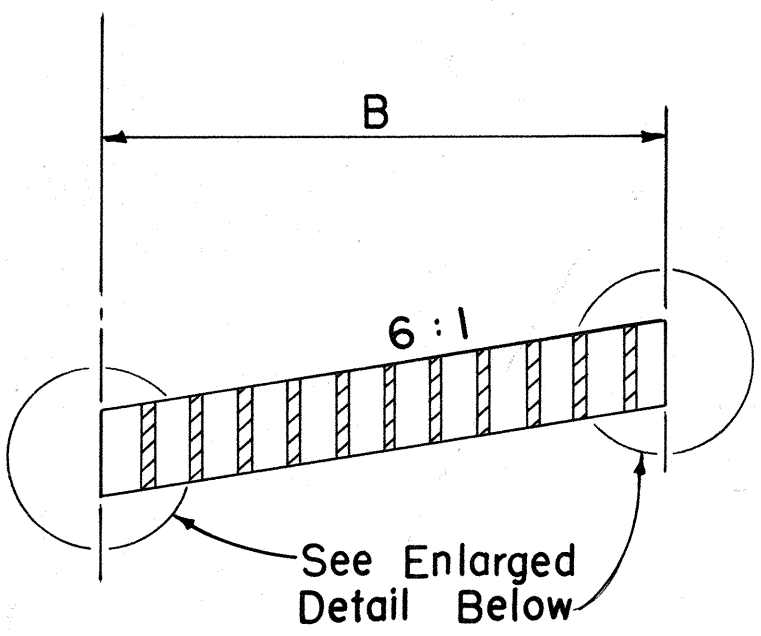
PLAN

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



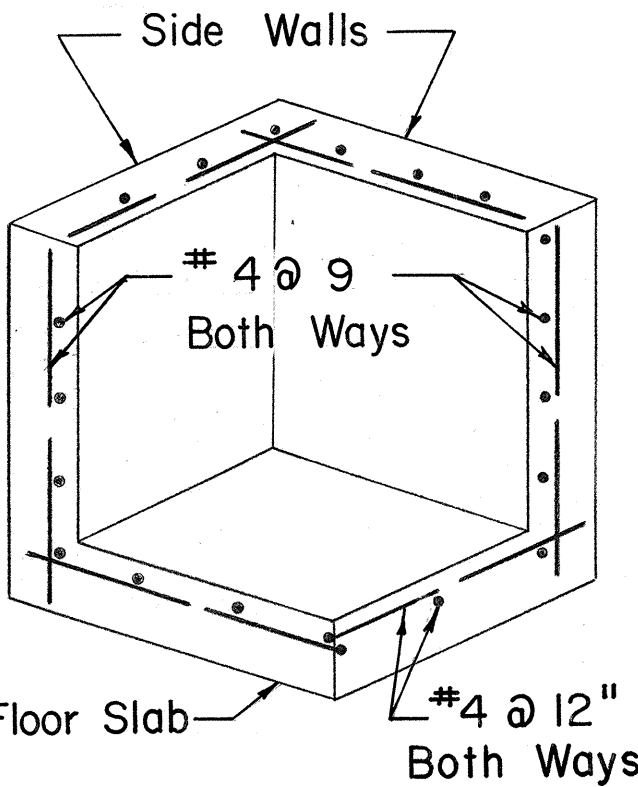
SECTION

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



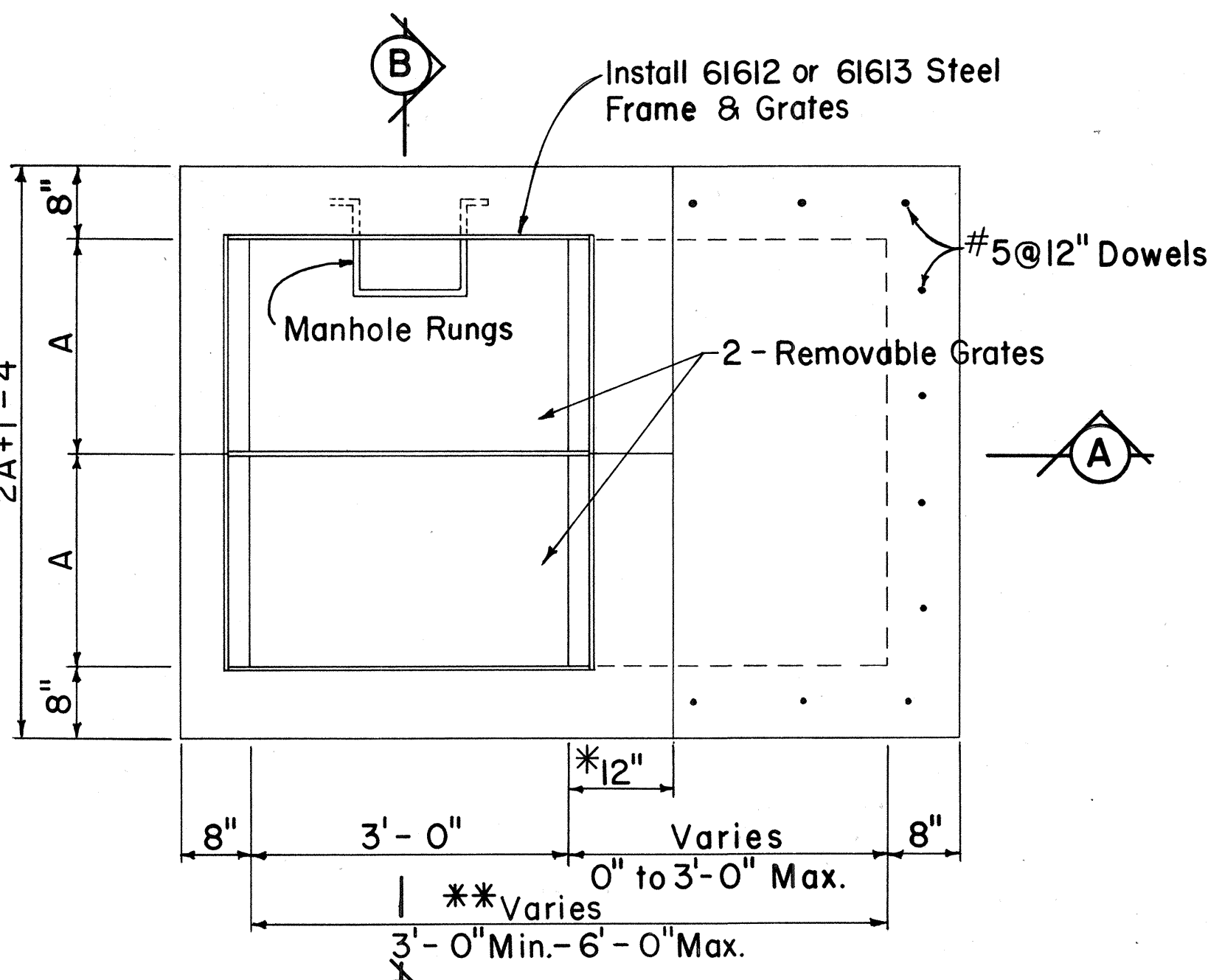
SECTION

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

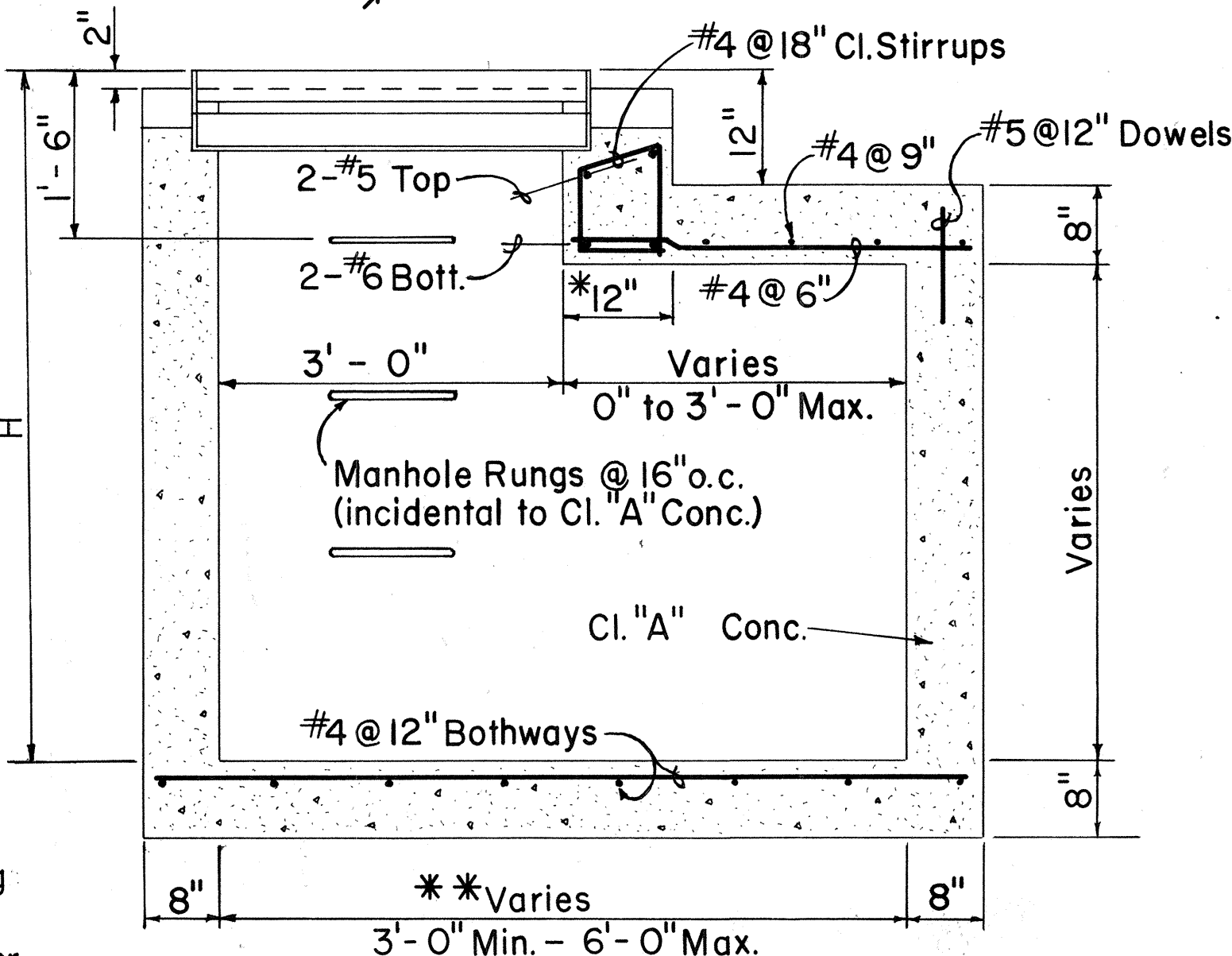


Reinforcing Steel for DI Type 61612 when depth exceeds 6'-0".

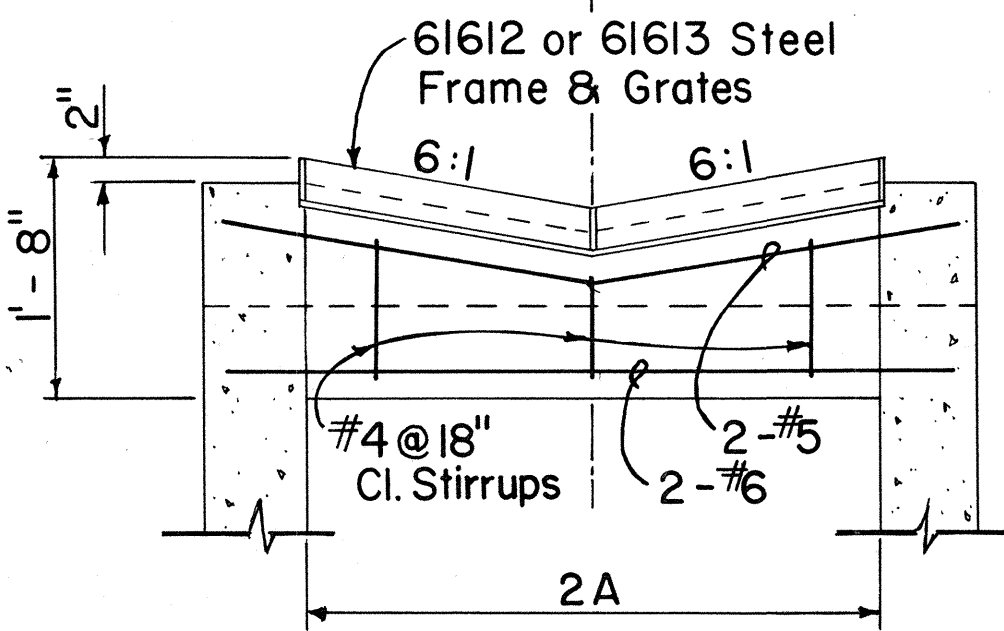
All RCP & ACP entering or exiting drop intakes shall be rounded. The Radius of the rounding shall be determined by the following equation
$$R \text{ (inches)} = \frac{\text{Pipe Diameter (feet)}}{12}$$



PLAN



SECTION A - A



SECTION B - B

DETAILS OF 61612 OR 61613 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'.



THIS WORK WAS PREPARED BY
ME OR UNDER MY SUPERVISION.
J. Andrew Schulhardt

DETAILS OF TYPE 61612 OR 61613
STEEL FRAME AND GRATES

SURVEY PLOTTED BY	DATE
DRAWN BY	
CHECKED BY	
NOTED BY	
NO.	