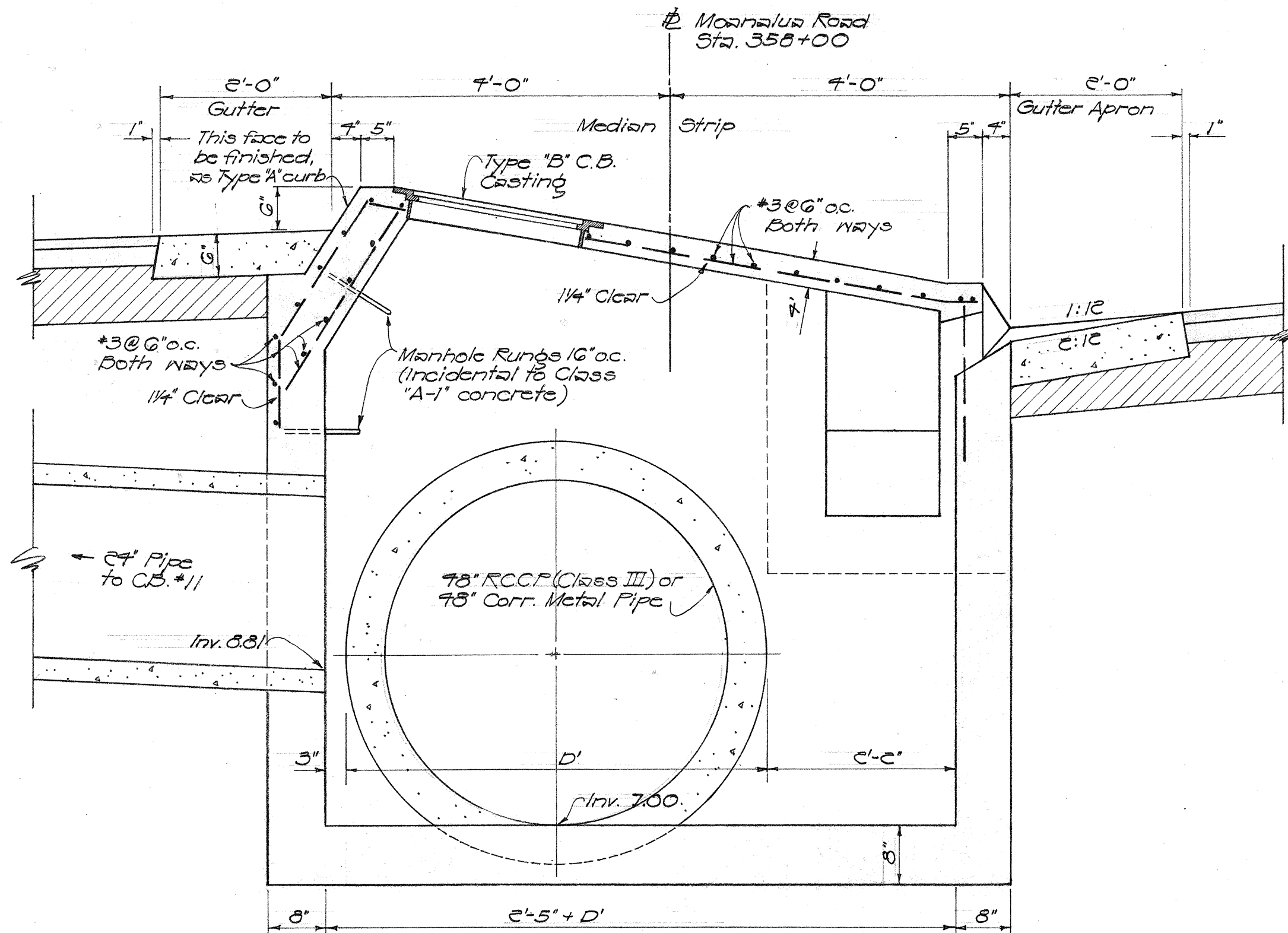




SPECIAL DETAIL SECTION
OF C.B. #12
Scale: 3/4" = 1'-0"

Note: Unless shown or noted otherwise on this detail, C.B. #12 shall be constructed as a standard catch basin, type "C". See Standard Details for plan view and other details. Gutter and Gutter Apron shall not be part of catch basin, but shall be paid for under the item of Type "AG" curb and gutter.

NOTE:
See Cost Control Sheet
for Quantities

SUMMARY OF DRAINAGE PIPE ALTERNATE

FROM	TO	PIPE LENGTH	ALT. 'A' CONC. PIPE	ALT. 'B' CORR. PIPE
CB 3-A	Exist. CB.	80	C4'-IV	C4'-14ga.
CB 7-A	SDMH 1-A	188	3G'-III	7C'-1Cga.
CB 5-A	CB 6-A	70	C4'-IV	C4'-14ga.
CB 6-A	5x3' C.B.C.	78	C4'-IV	C4'-14ga.
CB 1	SDMH 1-A	226	3G'-III	3G'-1Cga.
CB 2	SDMH 1	32	C4'-IV	C4'-14ga.
CB 3	SDMH 1	30	C4'-IV	C4'-14ga.
CB 4	CB 1-A	140	C4'-III	C4'-14ga.
CB 5	CB 1	170	3G'-III	3G'-1Cga.
CB 6	SDMH 3	32	C4'-IV	C4'-14ga.
CB 7	SDMH 3	30	C4'-IV	C4'-14ga.
CB 8	SDMH 2	176	C4'-III	C4'-14ga.
CB 9	CB 5	174	3G'-III	3G'-1Cga.
CB 10	CB 9	122	3G'-III	3G'-1Cga.
CB 10-A	CB 10	20	3G'-III	3G'-14ga.
CB 11	CB 12	32	C4'-IV	C4'-14ga.
CB 12	SDMH 3	270	4B'-VII	54'-1Cga.
CB 14	CB 13	70	C4'-IV	C4'-14ga.
CB 15	SDMH 7	25	C4'-III	NONE
CB 16	SDMH 4	92	C4'-IV	30'-14ga.
"	"	80	C4'-III	"
CB 17	SDMH 5	170	4B'-IV	48'-1Cga.
CB 18	CB 17	32	C4'-IV	C4'-14ga.
CB 19	SDMH 8	24	C4'-IV	C4'-14ga.
CB 20	CB 19	20	C4'-IV	C4'-14ga.
CB 21	SDMH 10	80	C4'-IV	C4'-14ga.
CB 22	SDMH 8	60	C4'-IV	C4'-14ga.
"	"	12	C4'-III	"
CB 23	CB 22	134	C4'-III	C4'-14ga.
CB 24	SDMH 11	28	C4'-IV	C4'-14ga.
CB 25	CB 26	32	C4'-IV	C4'-14ga.
CB 26	SDMH 9	170	3G'-III	3G'-1Cga.
CB 27	SDMH 12	8	1B'-III	1B'-1Cga.
CB 28	SDMH 13	16	1B'-III	1B'-1Cga.
CB 29	CB 28	28	1B'-III	1B'-1Cga.
CB 30	SDMH 14	37	C4'-IV	C4'-14ga.
CB 31	SDMH 15	148	C4'-IV	C4'-14ga.
CB 32	SDMH 14A	114	3G'-III	30'-14ga.
CB 33	CB 32	32	C4'-IV	C4'-14ga.
CB 34	SDMH 17	18	C4'-IV	C4'-14ga.
CB 35	SDMH 15	28	C4'-IV	C4'-14ga.
CB 36	SDMH 19	70	C4'-IV	C4'-14ga.
CB 37	SDMH 19	160	C4'-III	C4'-14ga.
CB 38	SDMH 20	40	C4'-IV	C4'-14ga.
CB 39	SDMH 20	50	C4'-IV	C4'-14ga.
CB 40	SDMH 20	160	C4'-III	C4'-14ga.
CB 41	Outlet	6	C4'-IV	C4'-14ga.
CB 42	SDMH 35	58	C4'-II	C4'-14ga.
CB 80	SDMH 37	30	C4'-III	24'-14ga.
CB 81	SDMH 6	100	24'-III	NONE
SDMH 1	CB 1-A	70	4B'-IV	54'-1Cga.
"	"	125	4B'-III	"
SDMH 2	CB 4	110	C4'-IV	C4'-14ga.
SDMH 3	SDMH 1	220	4B'-III	54'-1Cga.
SDMH 4	CB 10	112	3G'-IV	3G'-1Cga.
"	"	52	3G'-III	"
SDMH 5	CB 12	145	4B'-III	48'-1Cga.
SDMH 6	CB 15	26	C4'-III	NONE
SDMH 7	CB 21	120	C4'-III	NONE
SDMH 8	CB 16	20	C4'-IV	C4'-14ga.
"	"	54	C4'-III	"
SDMH 9	CB 17	170	3G'-IV	4C'-1Cga.
SDMH 10	SDMH 9	33	C4'-IV	C4'-14ga.
SDMH 11	CB 25	17	C4'-III	C4'-14ga.
SDMH 13	CB 23	20	C4'-IV	C4'-14ga.
"	"	130	C4'-III	"
SDMH 14	CB 26	240	3G'-IV	30'-14ga.
SDMH 14A	SDMH 14	120	3G'-IV	30'-14ga.
SDMH 15	SDMH 16	20	C4'-IV	C4'-14ga.
SDMH 16	CB 32	36	C4'-IV	C4'-14ga.

SUMMARY OF C.B. QUANTITIES

C.B. No.	TYPE	D. BOT. OF TOP SLAB TO INV. FT.	ESTIMATED QUANTITIES	CL. A-1 CONC. CY.	REINF. STEEL LB.	STR. EXC. CY.
1-A	D	16.35	12.7	88	54.1	
3-A	B	11.72	8.2	28	34.7	
4-A	C	4.31	5.2	112	20.3	
5-A	C	5.28	5.4	28	12.2	
6-A	B	7.58	5	28	17.5	
1	C	7.31	7.2	112	30.1	
2	C	5.04	5.3	28	18.6	
3	B	5.17	5.4	28	18.2	
4	D	7.58	4.8	67	15.4	
5	C	7.06	7.7	112	22.3	
6	C	4.67	5.1	28	17.7	
7	B	4.83	5.2	28	18.1	
8	D	5.38	4.4	67	13.4	
9	C	6.86	7.6	112	28.6	
10	D	7.44	6.7	67	24.7	
11	C	4.31	6.5	28	24	
12	C	6.11	7.7	128	28.2	
13	C	7.15	6.3	28	17.4	
14	C	5.41	5.3	28	18.8	
15	D	3.60	3.4	67	10	
16	D	10.86	7.5	67	12.2	
17	C	6.57	7.4	112	27.7	
18	C	4.74	5.1	28	17.8	
19	C	6.88	6.3	28	23.3	
20	B	6.61	6.2	28	22.8	
21	D	5.88	7.6	67	15.3	
22	D	8.82	6.3	67	17.0	
23	D	7.21	6.5	67	16.5	
24	D	5.10	4.2	67	13.8	
25	C	4.74	5.2	28	17.2	
26	C	6.58	7.0	28	26.3	
27	D	6.26	5.3	67	18.5	
28	D	2.03	6.4	67	23.2	
29	D	8.71	6.3	67	22.2	
30	D	5.10	7.2	67	13.8	
31	D	6.18	5.4	77	18.7	
32	C	5.80	6.5	113.5	23.2	
33	C	6.12	6.4	108	23.5	
34	D	6.38	5	67	17.0	
35	C	5.04	5.8	108	20.4	
36	D	5.87	4.5	67	15.7	
37	B	5.21	6.3	108	22.2	
38	D	6.02	4.8	67	16.3	
39	B	4.23	5.2	28	18.3	
40	B	4.31	5.3	108	18.3	
41	B	3.02	4.0	28	12.7	
42	B	5.50	5.6	28	12.8	
80	B	4.75	5.2	28	17.2	
81	D	5.78	4.6	67	15.5	
10-A	D	10.0	7.5	77	28.6	

SDMH 18	SDMH 19	108	C4'-IV	C4'-14ga.
SDMH 19	CB 33	210	C4'-III	C4'-14ga.
SDMH 20	CB 37	28	C4'-III	C4'-14ga.
SDMH 35	SDMH 36	158	C4'-III	C4'-14ga.
SDMH 36	SDMH 37	140	C4'-IV	C4'-14ga.
"	"	34	C4'-III	"
SDMH 37	CB 81	24	C4'-IV	C4'-14ga.
Conc. Channel	SDMH 3A	128	C4'-III	C4'-14ga.
CDI 1	CB 16	14	1B'-VII	1B'-1Cga.
CDI 2	CB 22	10	1B'-VII	1B'-1Cga.
CDI 3	CB 31	16	1B'-VII	1B'-1Cga.
CDI 4	SDMH 18	70	C4'-III	C4'-14ga.
CDI 5	CDI 6 (Sp.)	70	C4'-IV	C4'-14ga.
CDI 6	Outlet	38	C4'-IV	30'-14ga.
CDI 7	CB 70	38	C4'-IV	C4'-14ga.

HAWAII STATE HIGHWAY DEPARTMENT

C.B. QUANTITIES, ALTERNATE PIPE
SCHEDULE & C.B. No. 12 SPECIAL DETAIL

MOANALUA ROAD US-S-0720(3) UNIT 3
LUNALILO FREEWAY BU-072-1(2) UNIT 4
MIDDLE STREET BU-065-1(1) UNIT 3

Scale: As Noted

March 1959

SHEET No. 1 OF 5 SHEETS

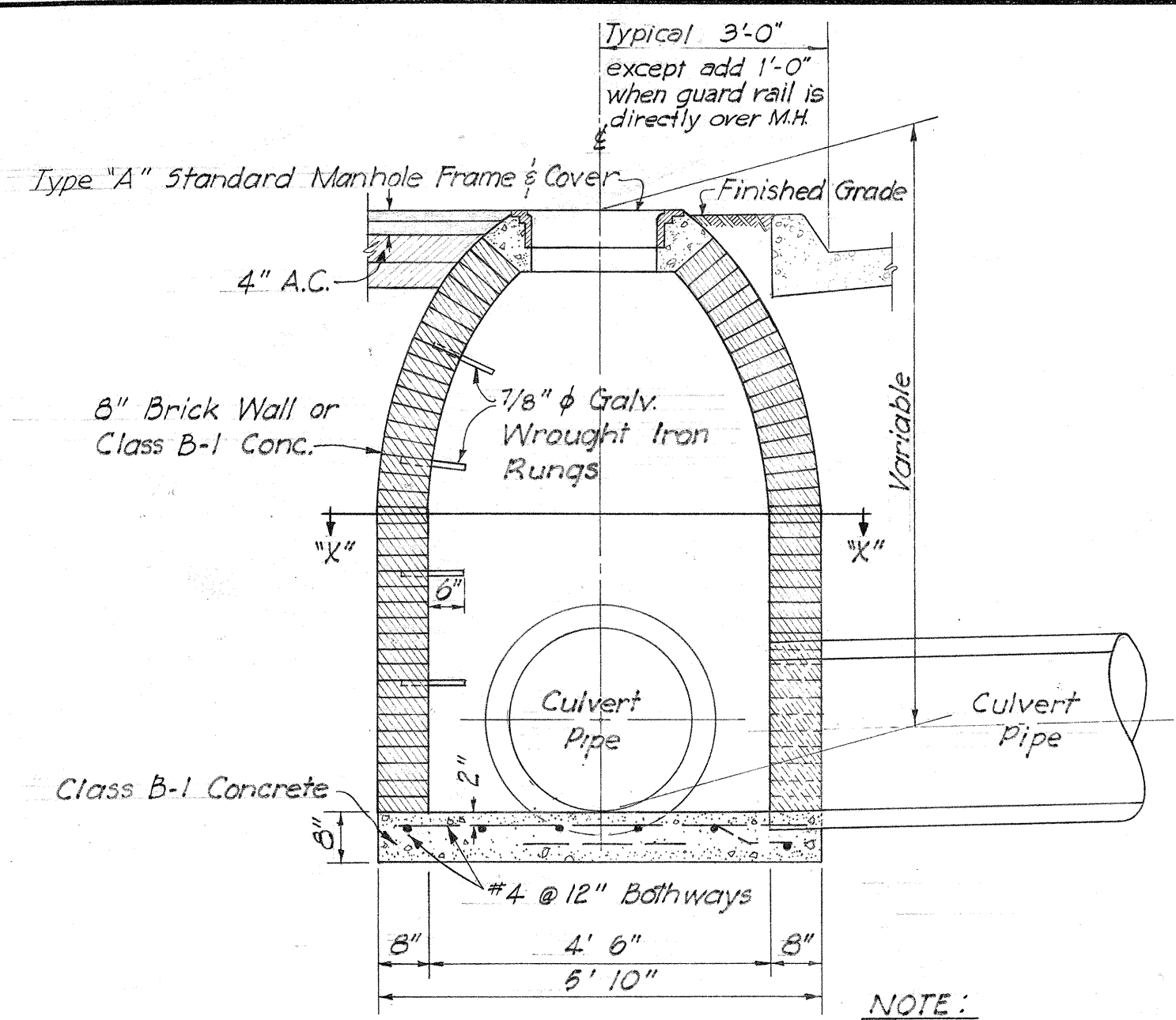
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\$174.26

\$161.25

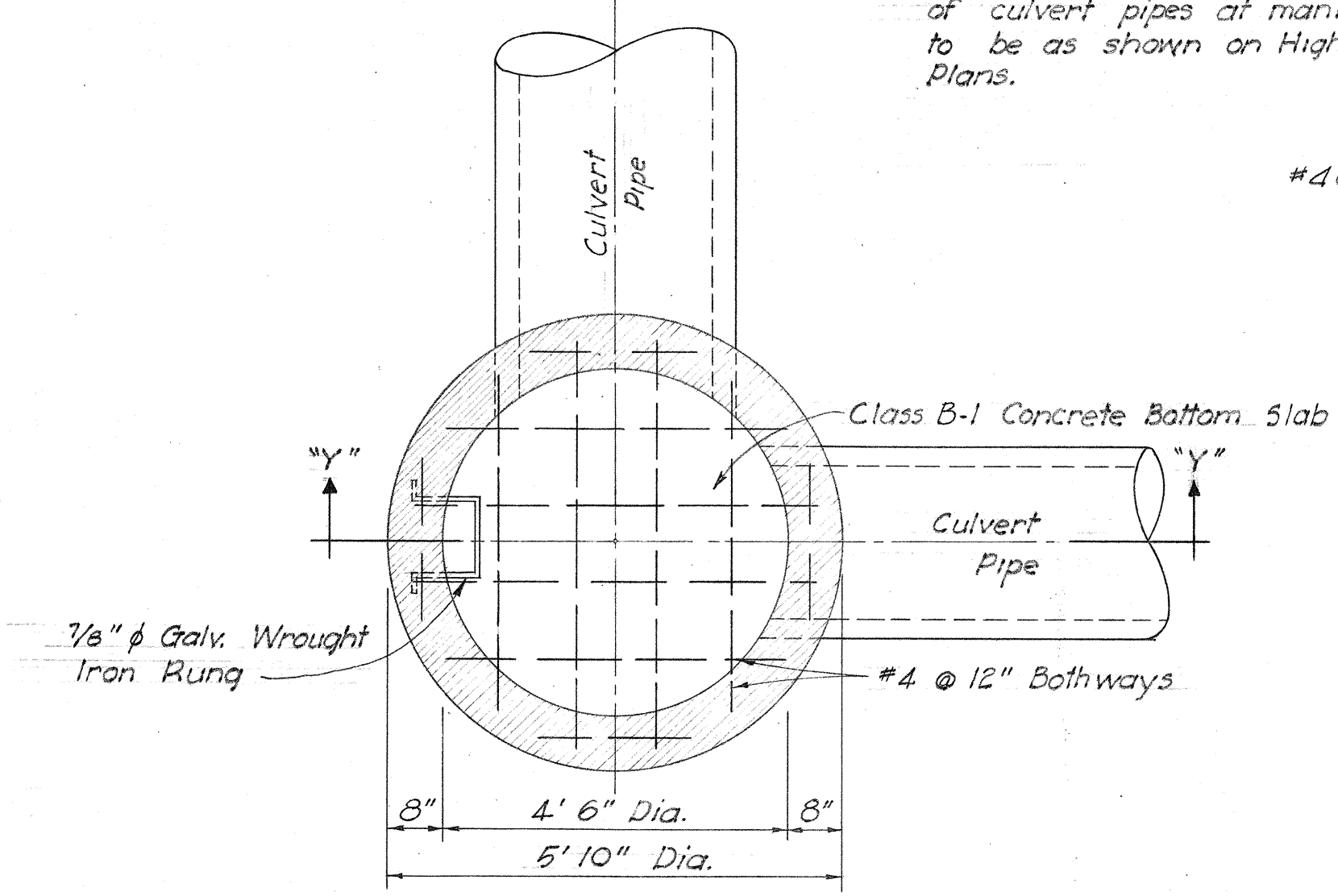
34

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	US-0720(3)	1960	17	79
		BU-072-1(2)	1960	27	118
		BU-065-1(1)	1960	26	118



SECTION "Y-Y"

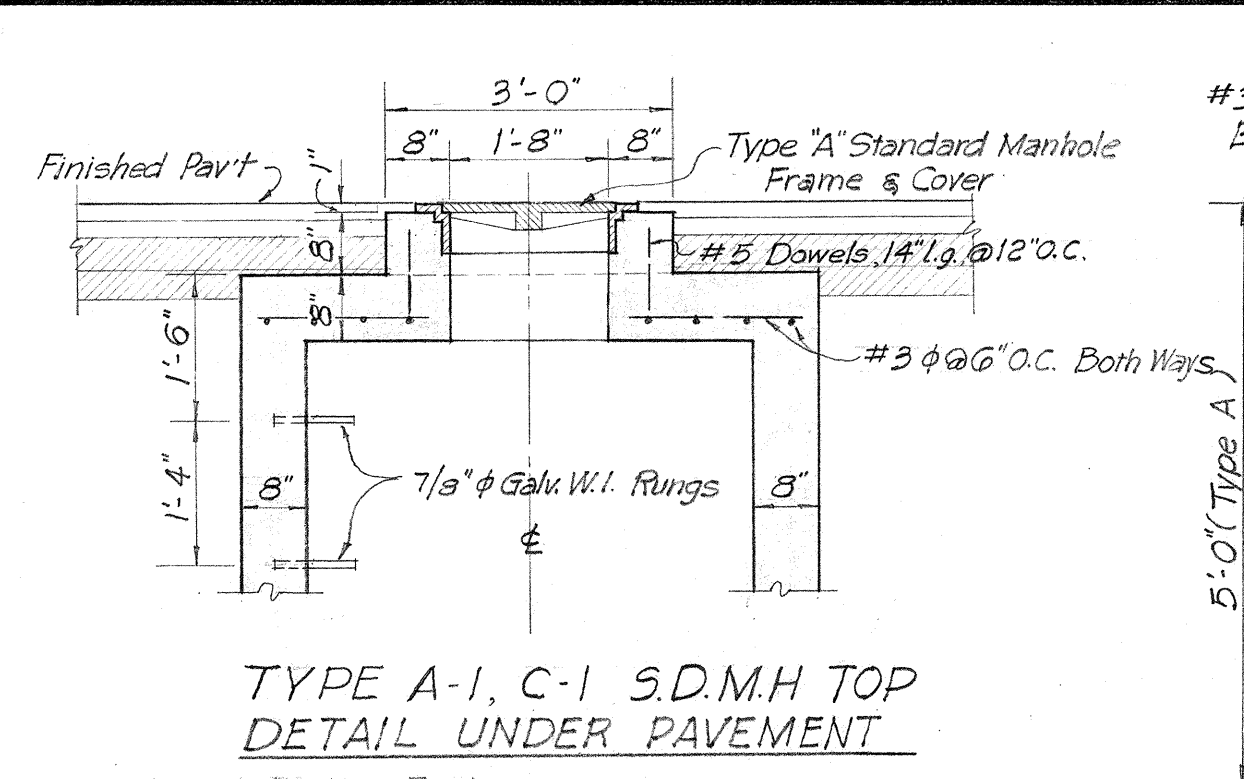
NOTE:
If Brick is used, exterior surface of wall shall be plastered with 1" thickness of 1:2 Cement Mortar.
Number, Size and direction of culvert pipes at manhole to be as shown on Highway Plans.



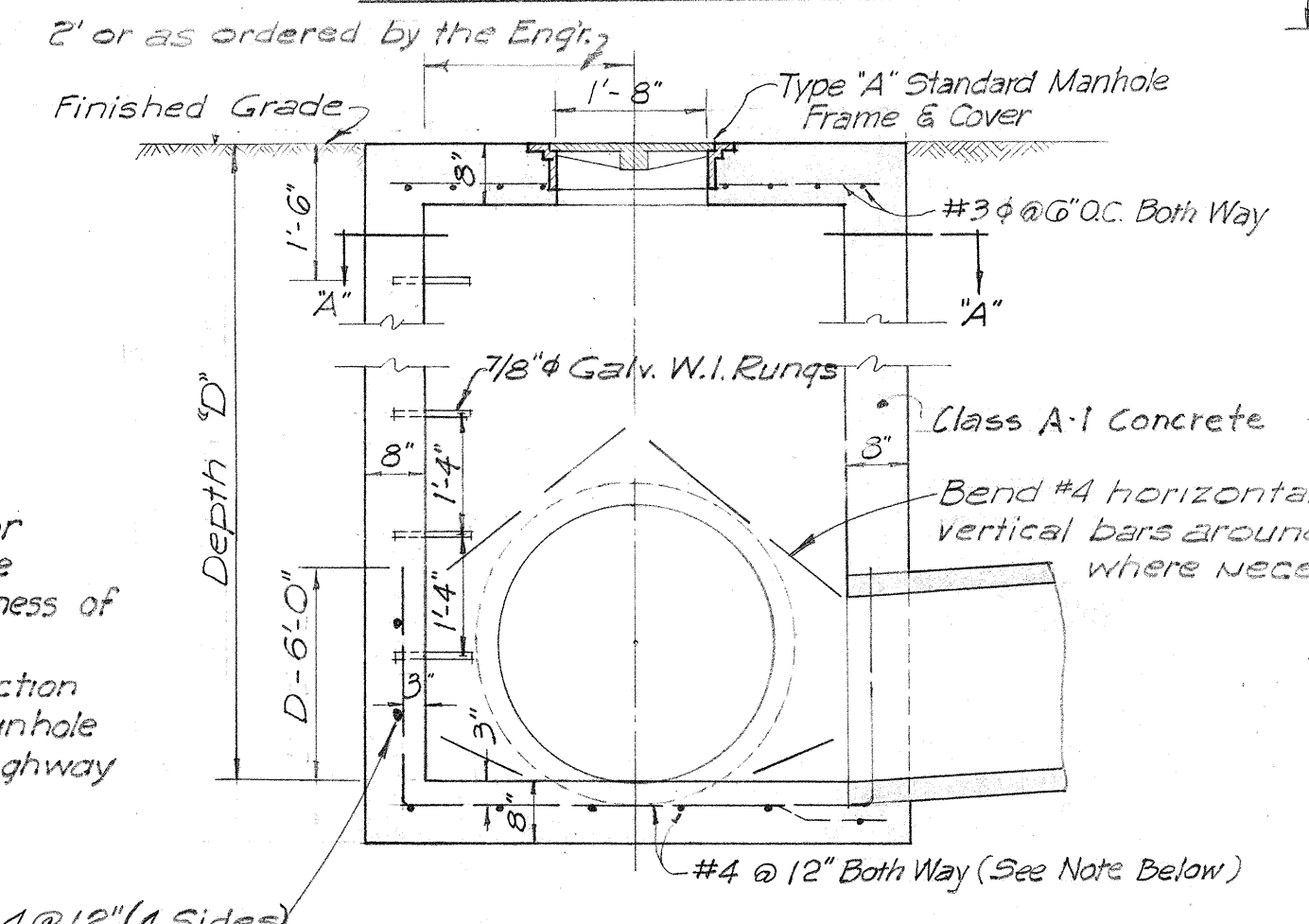
SECTION "X-X"

TYPE "D" STORM DRAIN MANHOLE

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

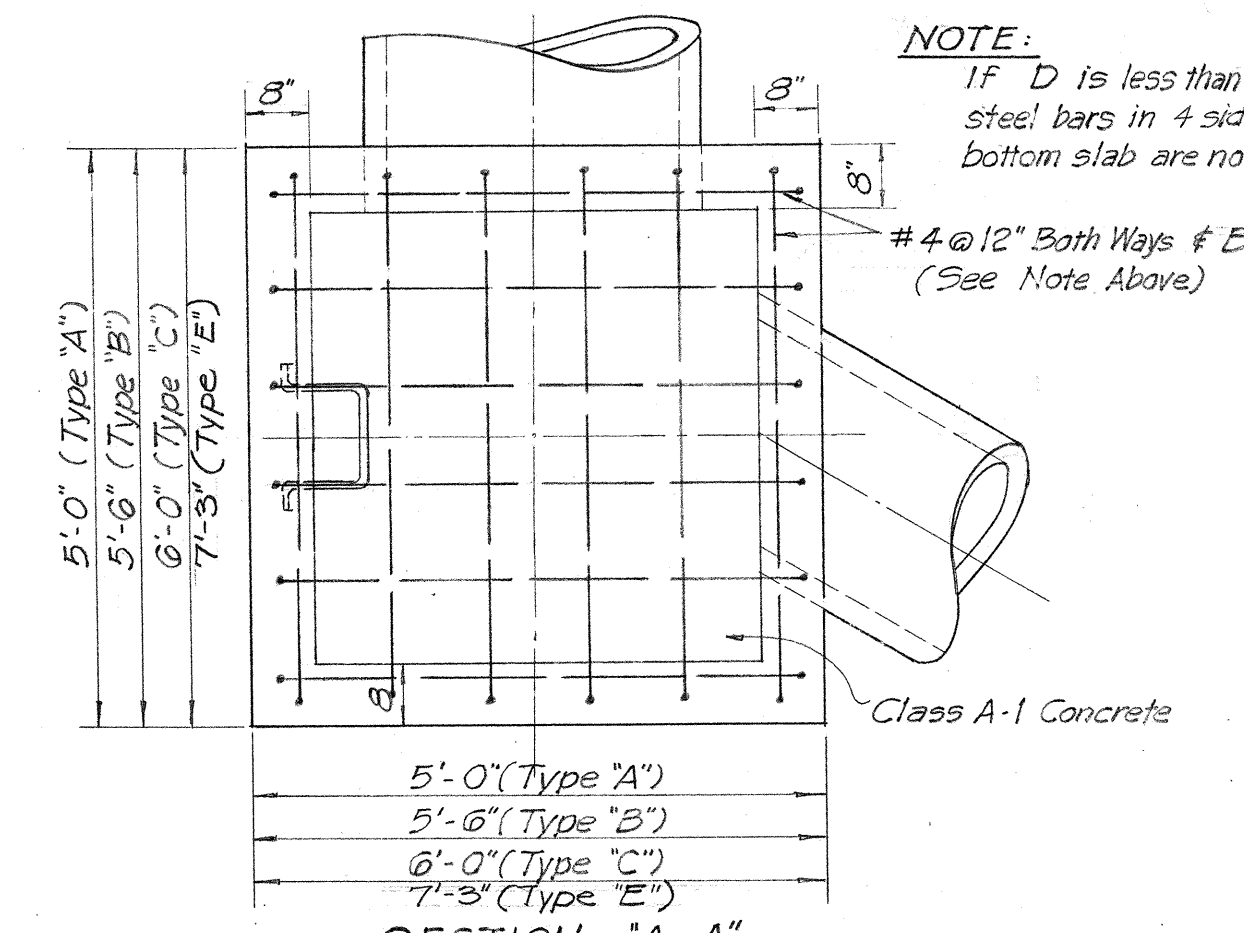


TYPE A-1, C-1 S.D.M.H. TOP
DETAIL UNDER PAVEMENT



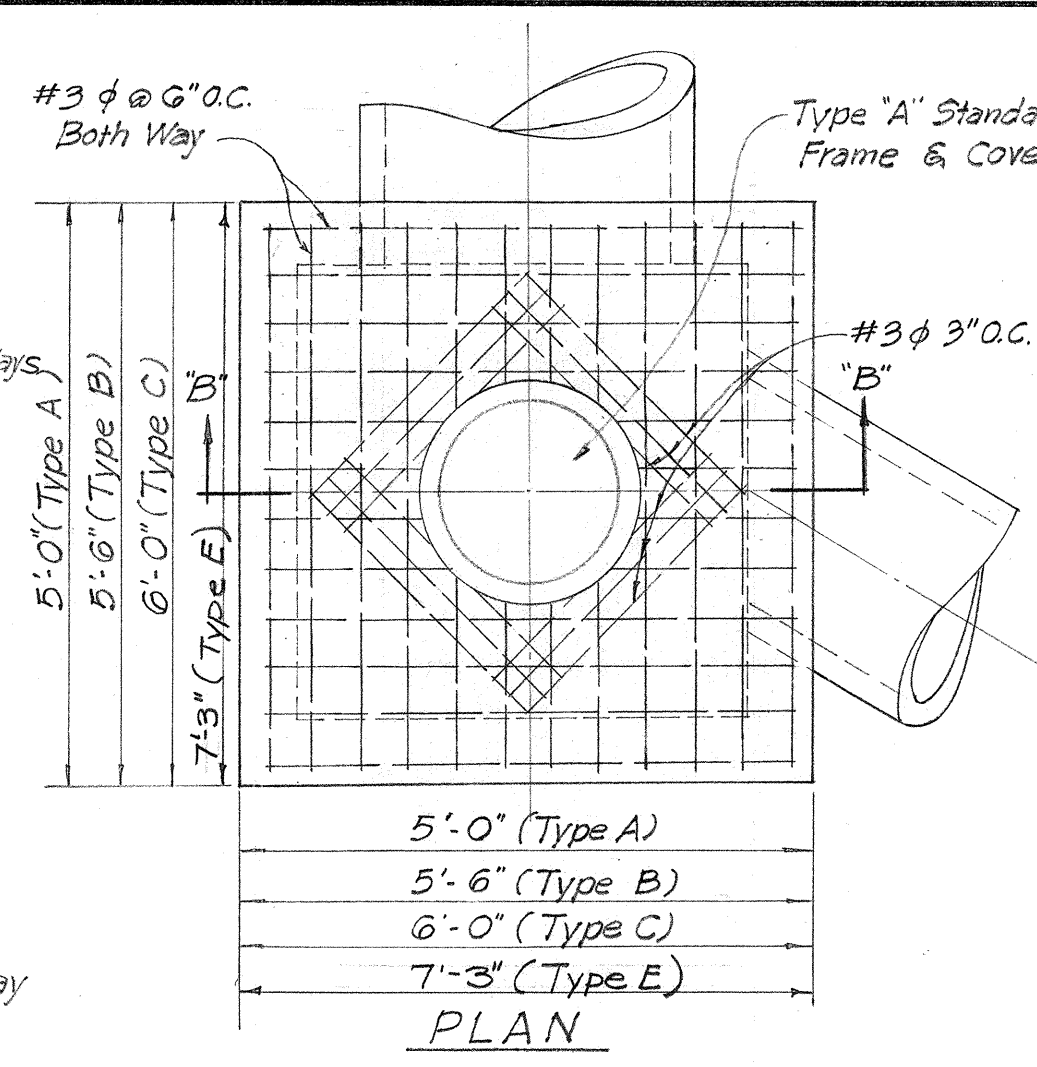
SECTION "B-B"
TYPE "A", "B" & "C" S.D.M.H.
UNDER UNPAVED AREAS

NOTE:
If "D" is less than 8', reinf. steel bars in 4 sides and bottom slab are not required (See Note Above)



SECTION "A-A"
TYPE "A", "B", "C" & "E" S.D. MANHOLE

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



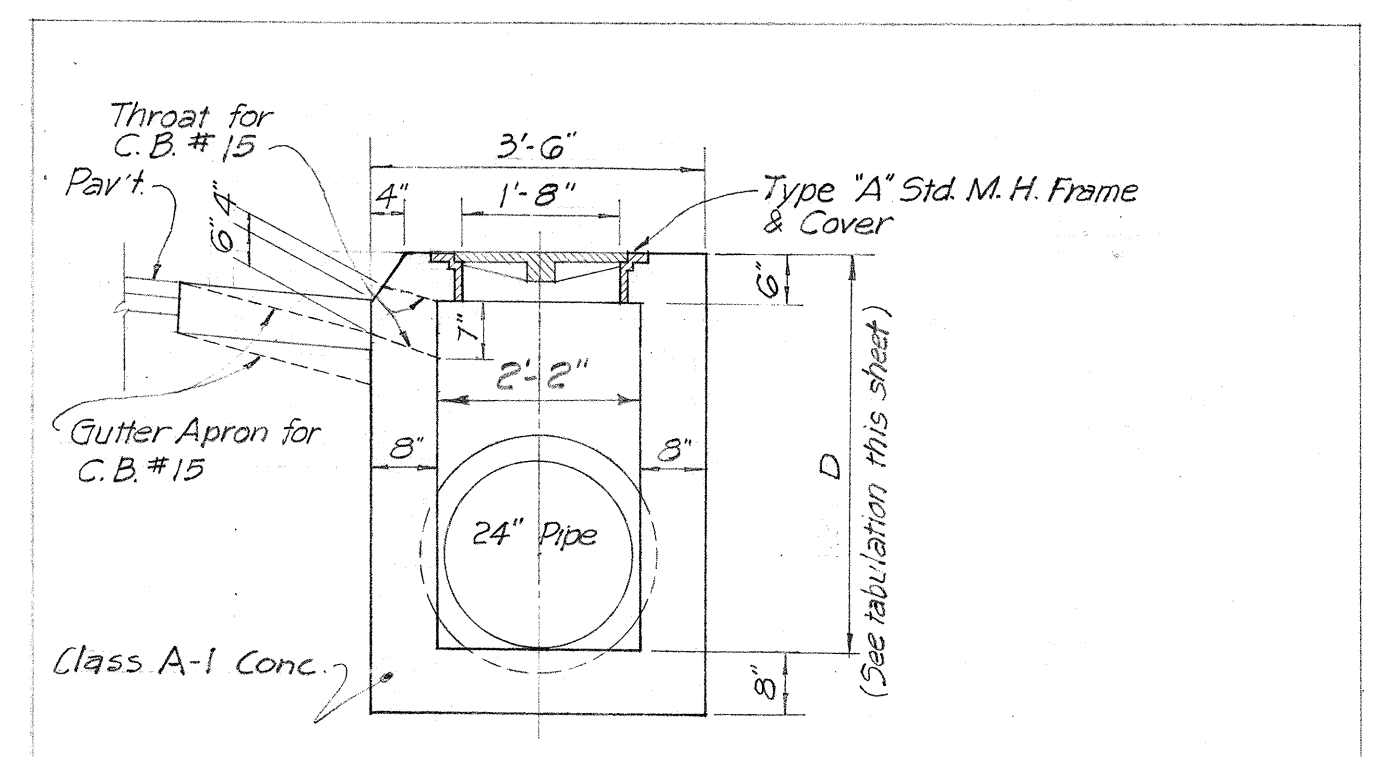
TYPE "E" S.D.M.H. TOP
IN MEDIAN STRIP
(Walls and Bottom Slab similar to Types A, B & C)
SCALE: 1/2" = 1'-0"

See Cost Control Sheets for Quantities

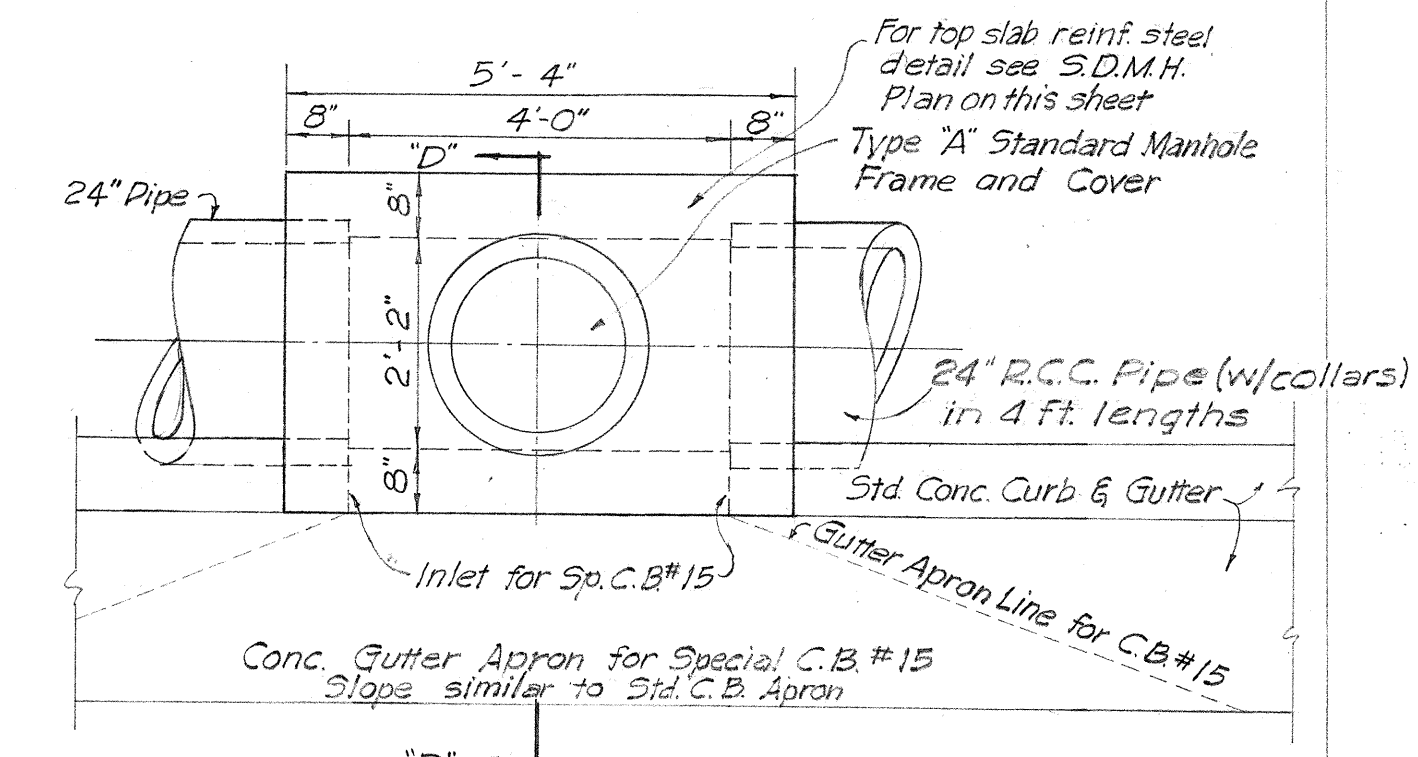
TABULATION OF S.D.M.H.

SDMH No.	TYPE	D ft.	ESTIMATED QUANTITIES			
			CL A-1 CONC. c.y.	CL B-1 CONC. c.y.	REINF. STEEL lbs.	STR. EXC. c.y.
1	E	6.11	4.7		77	80.6
2	D	6.85		0.7	32	13.4
3	E	6.7	3.5		77	81.2
4	C-1	12.61	7.3		278	82.0
5	E	6.91	4.4		61	16.6
6	SP	5.83	2.3		32	8.5
7	SP	4.44	2.1		32	6.6
8	A-1	8.25	4.3		151	12.7
9	C	8.1	5.4		175	80.8
10	D	7.20		0.7	32	14.1
11	D	6.88		0.7	32	13.5
12	D	7.00		0.7	32	13.7
13	A-1	9.36	4.4		157	18.0
14	D	6.55		0.7	32	12.5
14-A	D	6.04		0.7	32	14.5
15	D	7.49		0.7	32	14.5
16	D	5.20		0.7	32	10.5
17	D	7.68		0.7	32	16
18	D	6.41		0.7	32	16
19	A	7.20	3.6		37	14.4
20	A	6.73	3.3		37	13.7
35	D	7.68		0.7	32	14.7
36	A	8.25	4.7		191	17.4
37	A	8.61	7.1		137	16.8
1-A	D	6.14		0.7	32	12.14
E-A	D	6.0		0.7	32	10.7

NOTE: Provide Type "A" Standard Manhole Frames and Covers for all manholes in above tabulation.



SECTION "D-D"

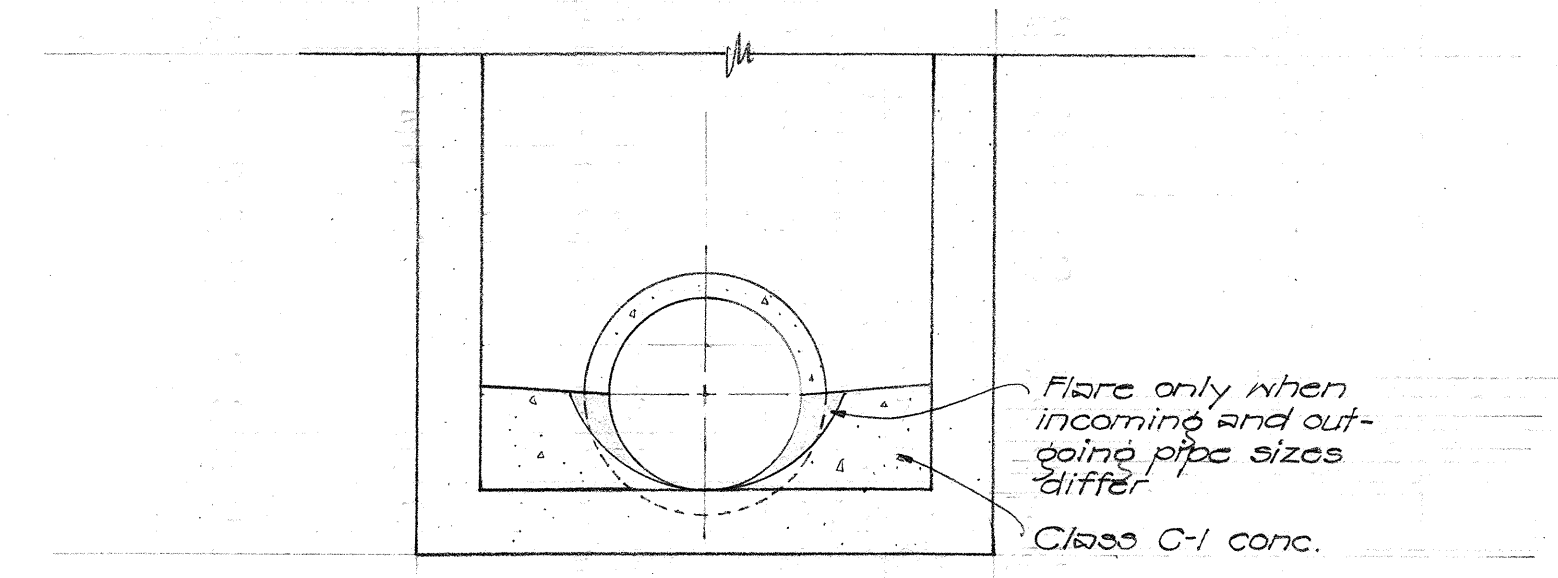


PLAN

S.D. MANHOLE NO. 6, 7 & C.B. NO. 15

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

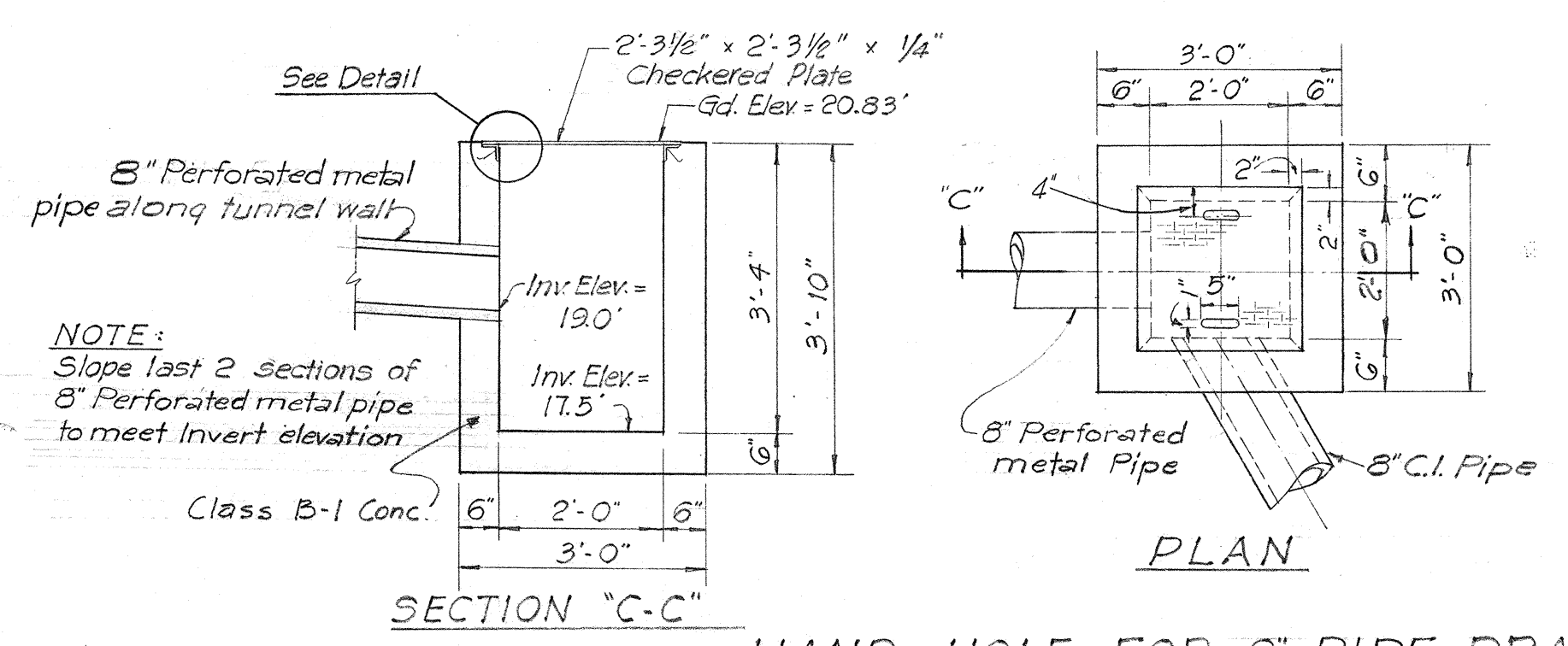
NOTE:
C.B. #15 details are similar to that of S.D.M.H. #6 & 7 except as shown on Plan & Section above



DETAIL OF PAVED
INVERT FOR S.D.M.H.

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

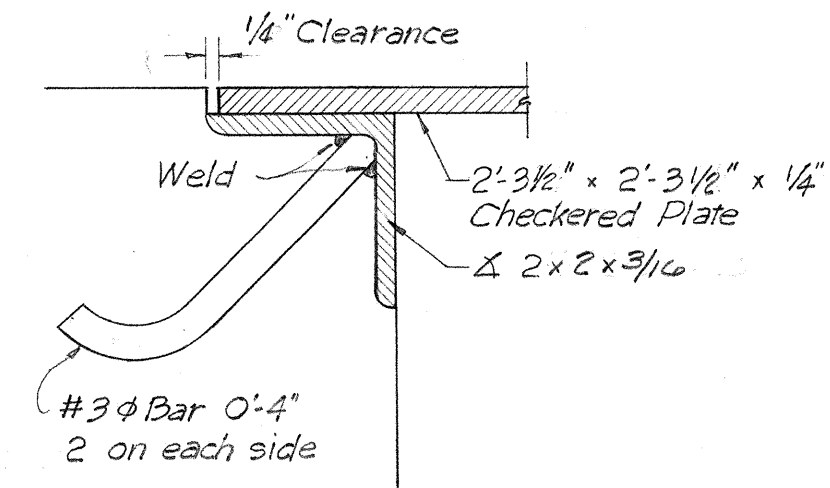
NOTE: Paved invert required only where there is a continuous flow at the invert without drop.



SECTION "C-C"

HAND HOLE FOR 8" PIPE DRAIN
AT EAST PORTAL OF TUNNEL (STRUCTURE "C-D")

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

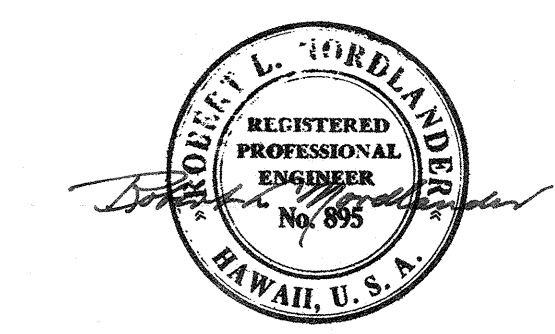


DETAIL

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

HAND HOLE ESTIMATED QUANTITIES	
Class B-1 Conc.	0.8 c.y.
Structure Exc.	11.5 c.y.

DATE	12-59
DESIGNED BY	W.L.G.
DRAWN BY	W.L.G.
CHECKED BY	W.L.G.
NOTED BY	W.L.G.
QUANTITIES CHECKED BY	W.L.G.
NO.	1



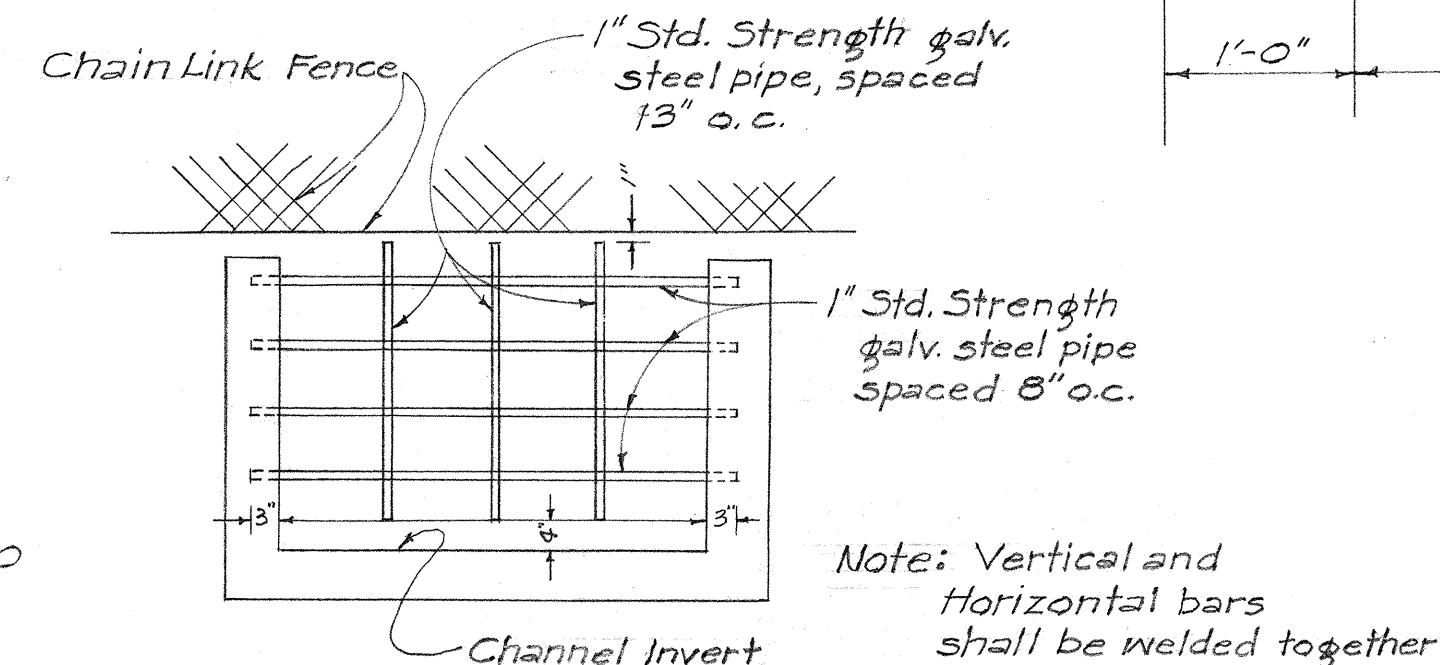
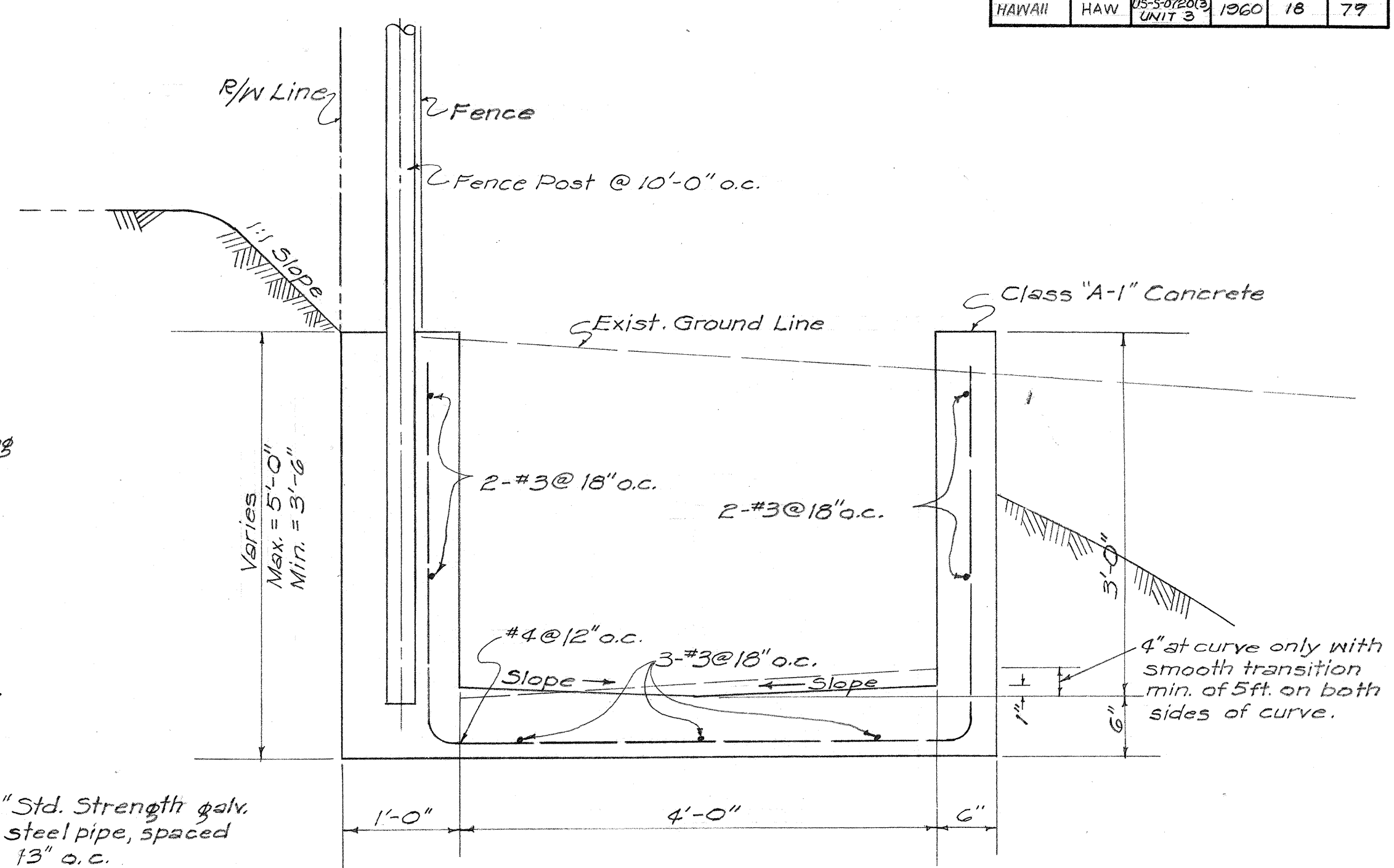
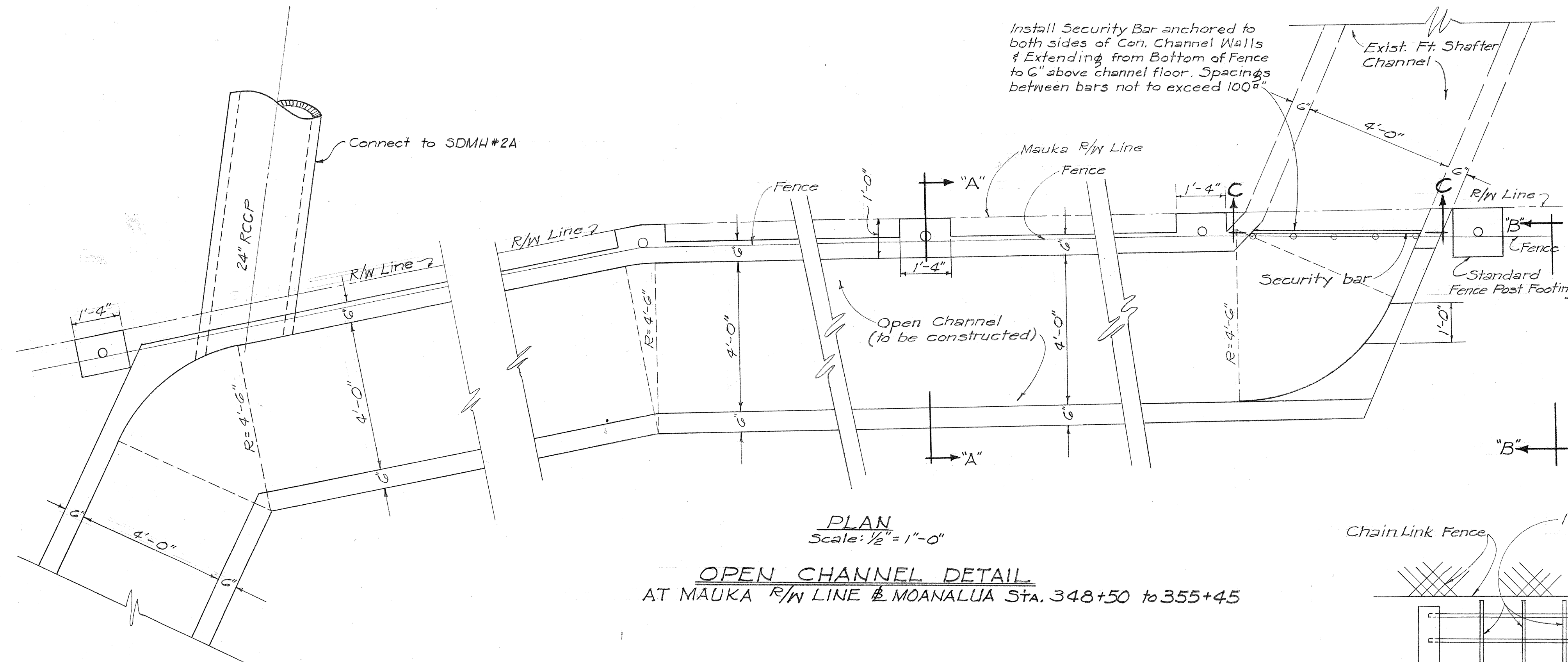
BELT, COLLINS & ASSOC., LTD.
Civil and Structural Engineers

HAWAII STATE HIGHWAY DEPARTMENT
STATE OF HAWAII

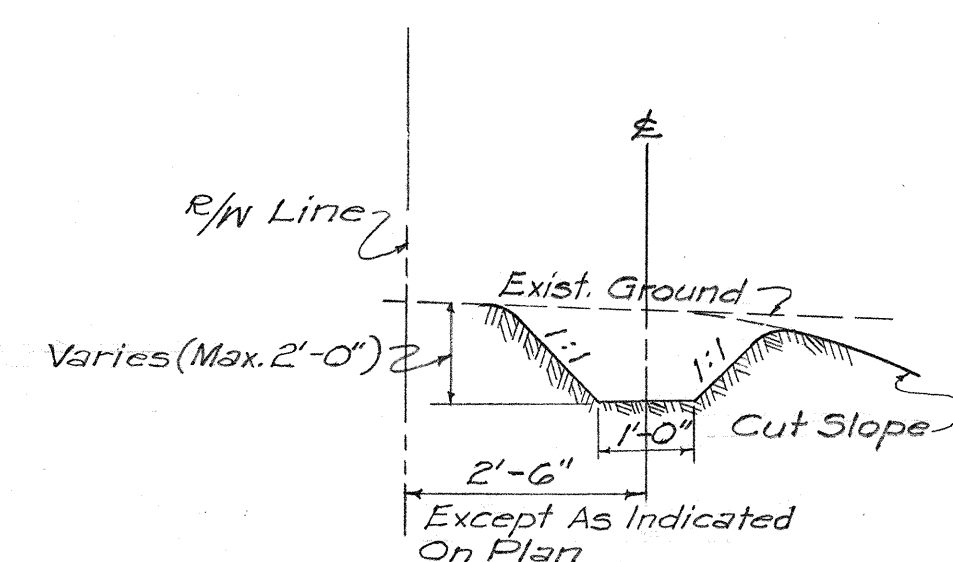
STORM DRAIN MANHOLE DETAILS

MOANALUA ROAD	US-S-0720(3) UNIT 3
LUNALILO FREEWAY	BU-072-1(2) UNIT 4
MIDDLE STREET	BU-065-1(1) UNIT 3

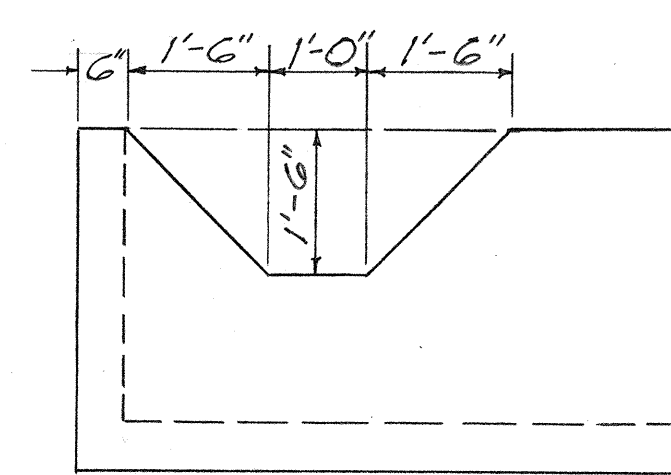
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW	US-5720(3) UNIT 3	1960	18	79



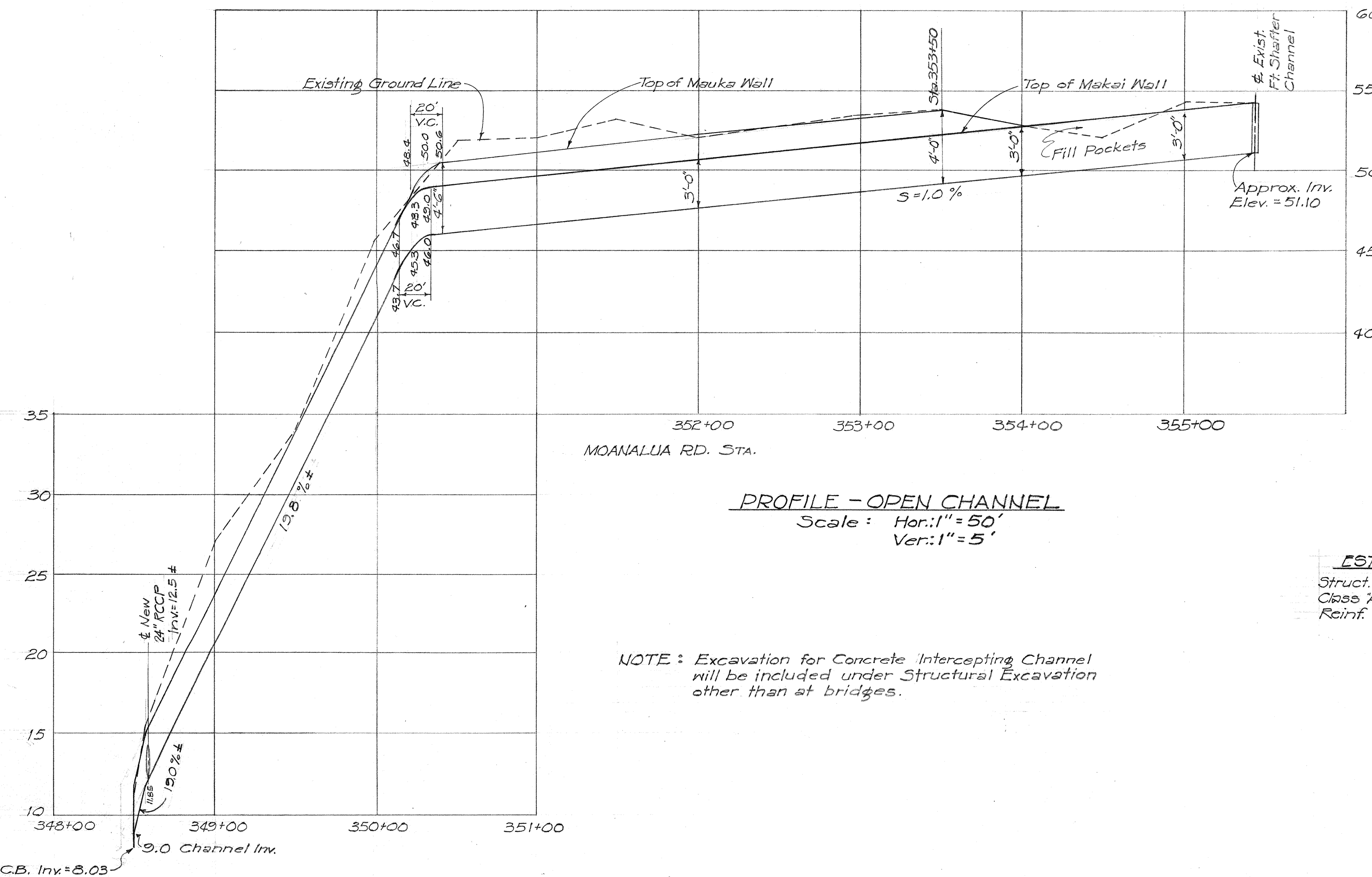
SECTION C-C
SHOWING SECURITY BAR
Scale: 1/2" = 1'-0"



TYPICAL DITCH SECTION
Scale: 1/2" = 1'-0"



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



PROFILE - OPEN CHANNEL
Scale: Hor: 1" = 50'
Ver: 1" = 5'

ESTIMATED QUANTITIES

Struct. Exc.	800 cu. yds.
Class 'A-1' Conc.	1064 cu. yds.
Reinf. Steel	7540 lbs.

NOTE: Excavation for Concrete Intercepting Channel will be included under Structural Excavation other than at bridges.

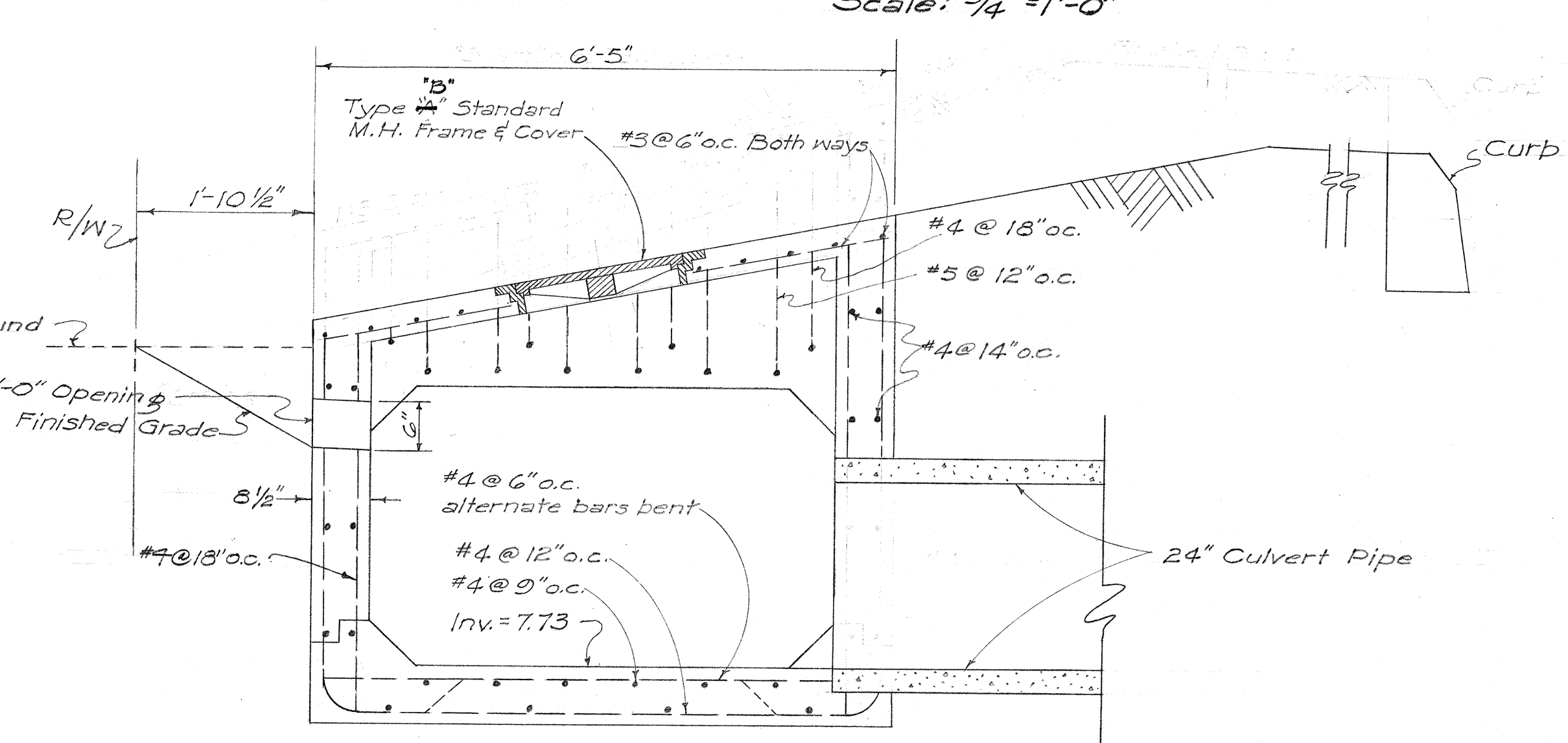
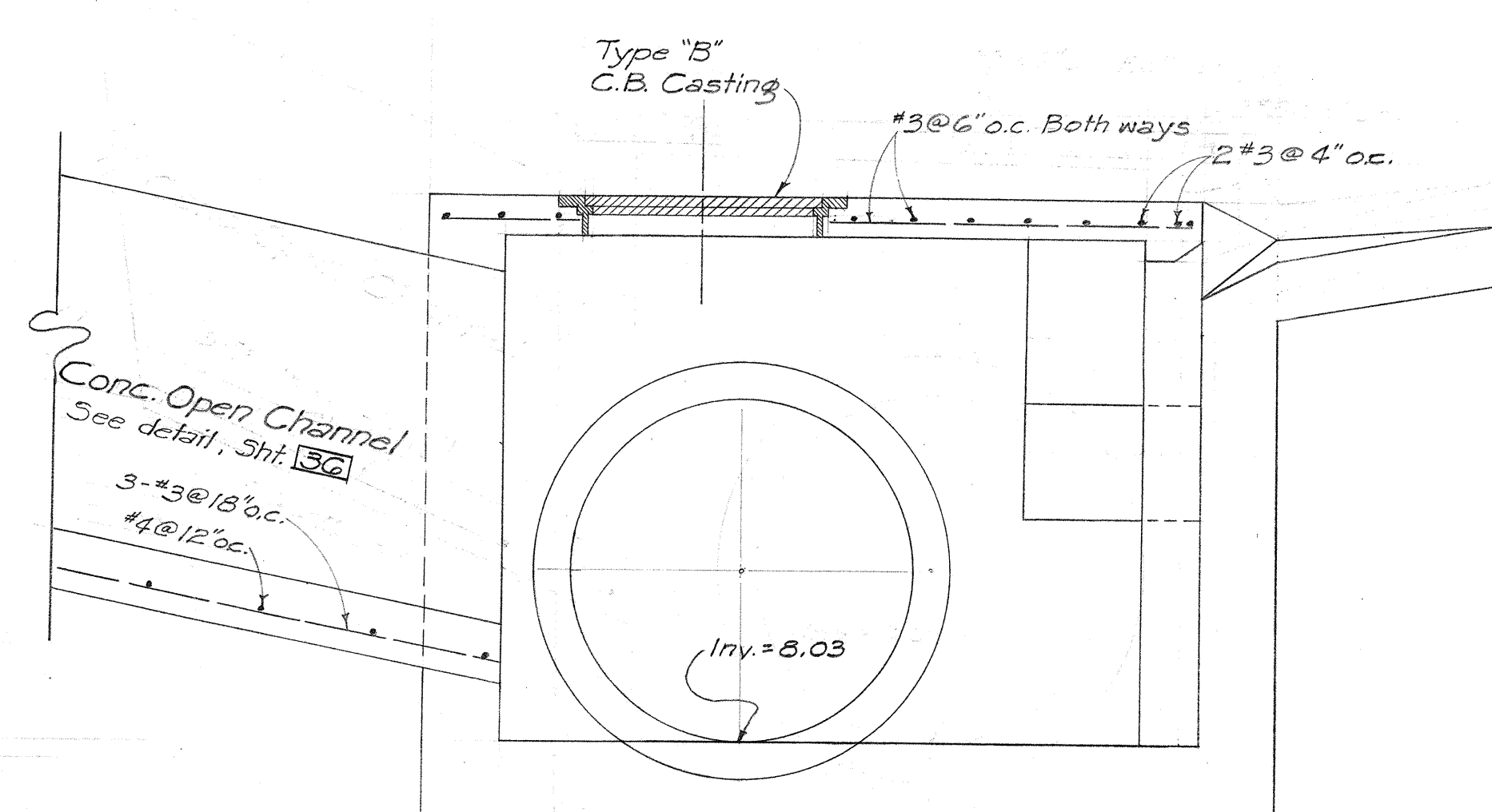
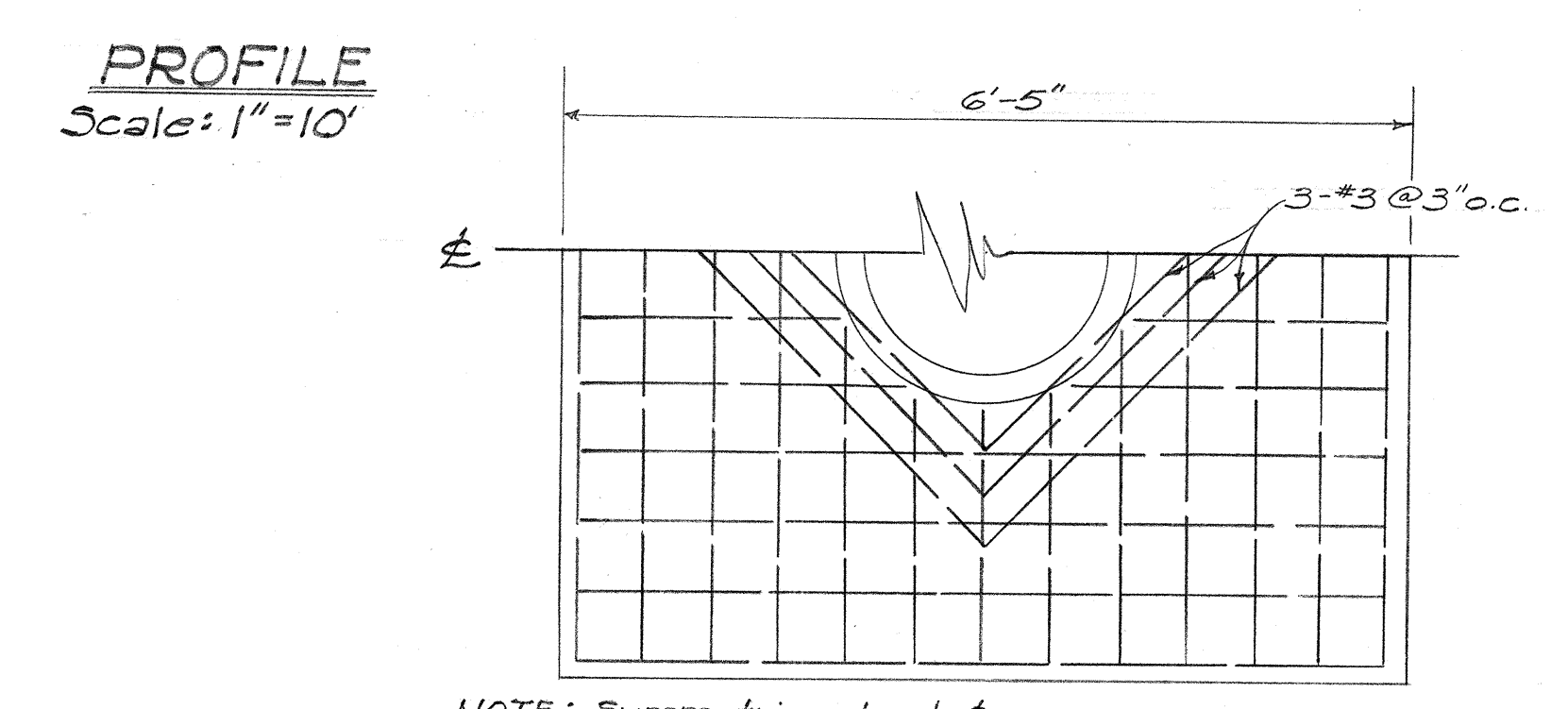
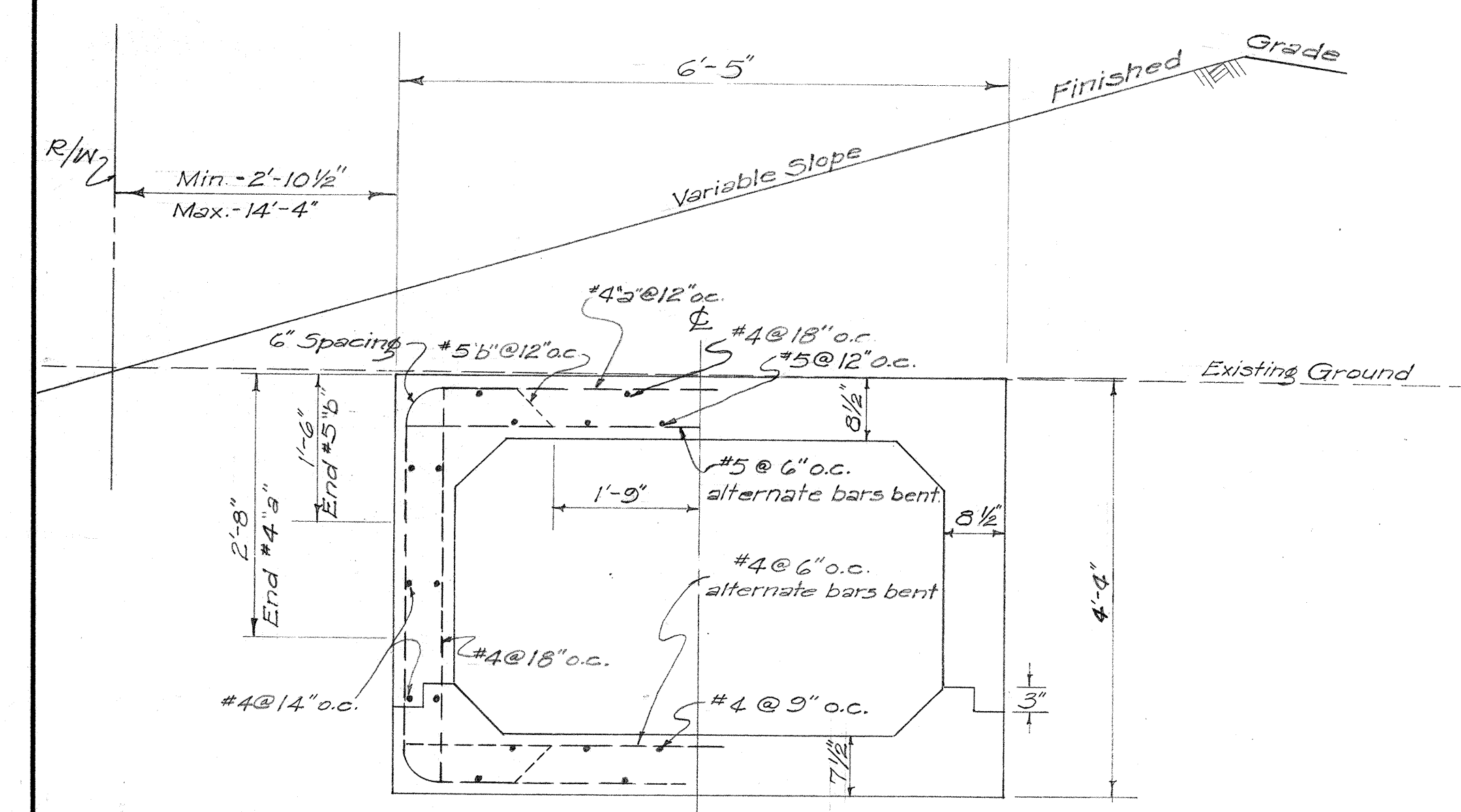
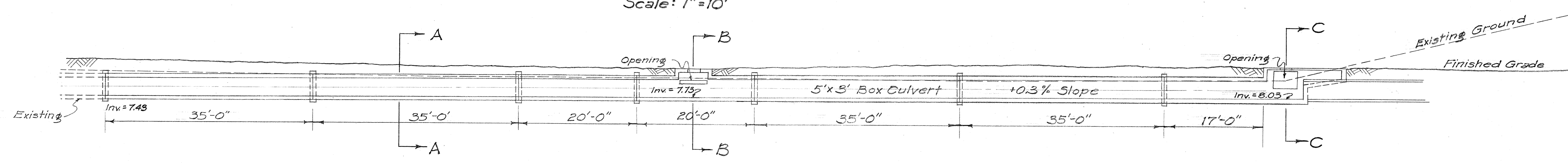
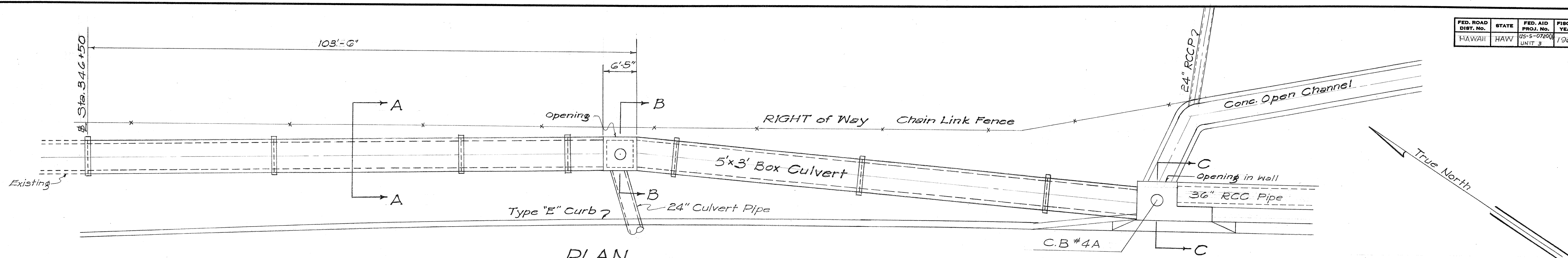
SURVEY PLOTTED BY	DATE
DESIGNED BY	
TRACED BY	
QUANTITIES BY	
CHECKED BY	
NOTE BOOK No.	

HAWAII STATE HIGHWAY DEPARTMENT
STATE OF HAWAII

DRAINAGE CHANNEL DETAILS

MOANALUA ROAD US-5-0720(3) UNIT 3

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW	US-5-0720	1960	19	77



Note:
Culvert details symmetrical about vertical & horizontal $\bar{x}$ unless otherwise shown. For concrete collar detail see Standard Details.

ESTIMATED QUANTITIES

Struct. Exc. = 305.3
Class "A-1" Conc. = 10+ c.y.
Reinf. Steel = 13,120 lbs.

Note:
Quantities for C.B. #4A and Conc. open channel are not included.

HAWAII STATE HIGHWAY DEPARTMENT
STATE OF HAWAII

5' x 3' BOX CULVERT

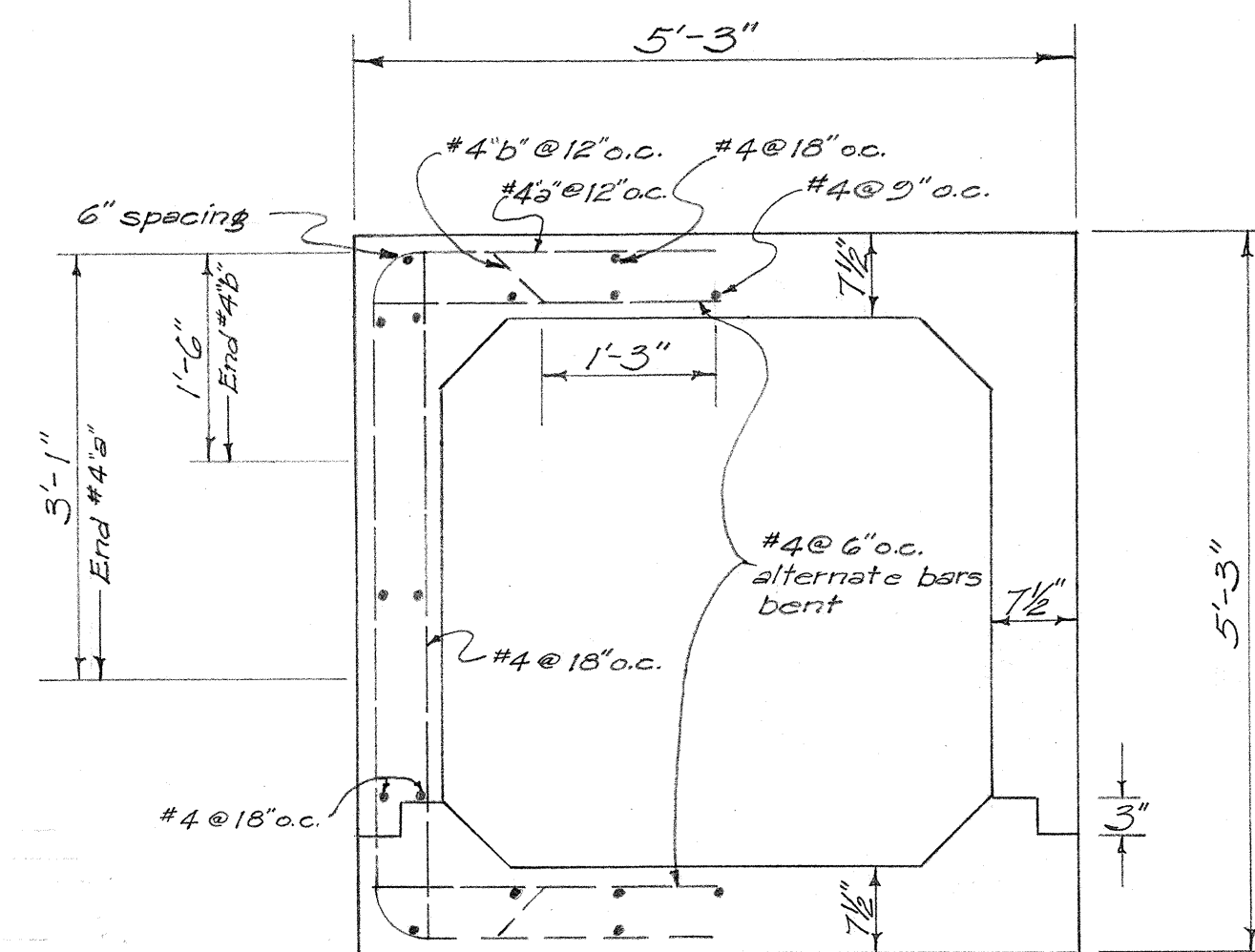
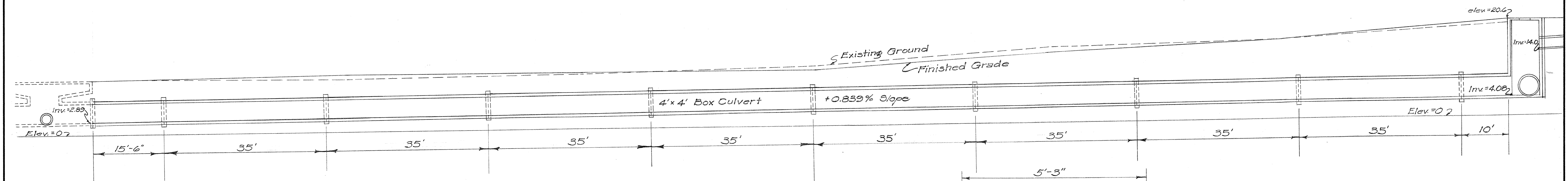
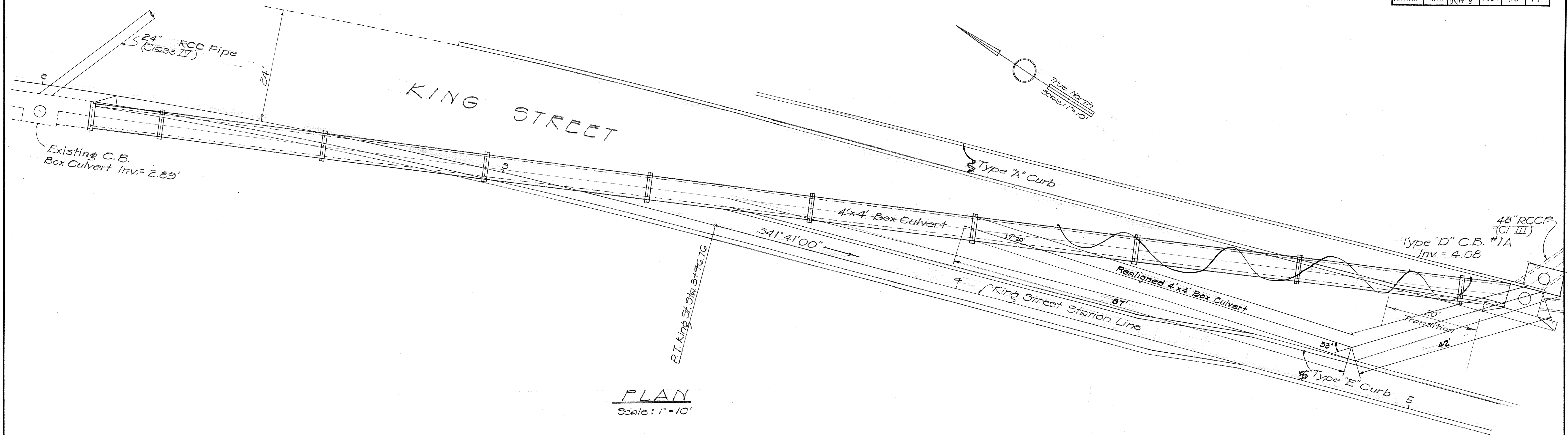
MOANALUA ROAD US-5-0720(3) UNIT 3

SCALE: 1" = 10 FT.

SHEET NO. 4 OF 5 SHEETS

8526.19

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW	US-5-0720(3)	1960	20	79



ESTIMATED QUANTITIES

Struct. Exc.	-	363	C.Y.
Class "A-1" Conc.	-	143	C.Y.
Reinf. Steel	-	17,450	lb.

Note: Quantities for C.B.#1 are not included.

NOTE:
Culvert details symmetrical about vertical and horizontal center line unless otherwise shown.
For concrete collar details see standard details.

HAWAII STATE HIGHWAY DEPARTMENT

STATE OF HAWAII

4' x 4' BOX CULVERT

MOANALUA ROAD US-5-0720(3) UNIT 3

SCALE: 1" = 10 FT.

SHEET NO. 5 OF 5 SHEETS

SURVEY PLOTTED BY	DATE
DESIGNED BY	
TRACED BY	
QUANTITIES BY	
CHECKED BY	
NOTE BOOK No.	