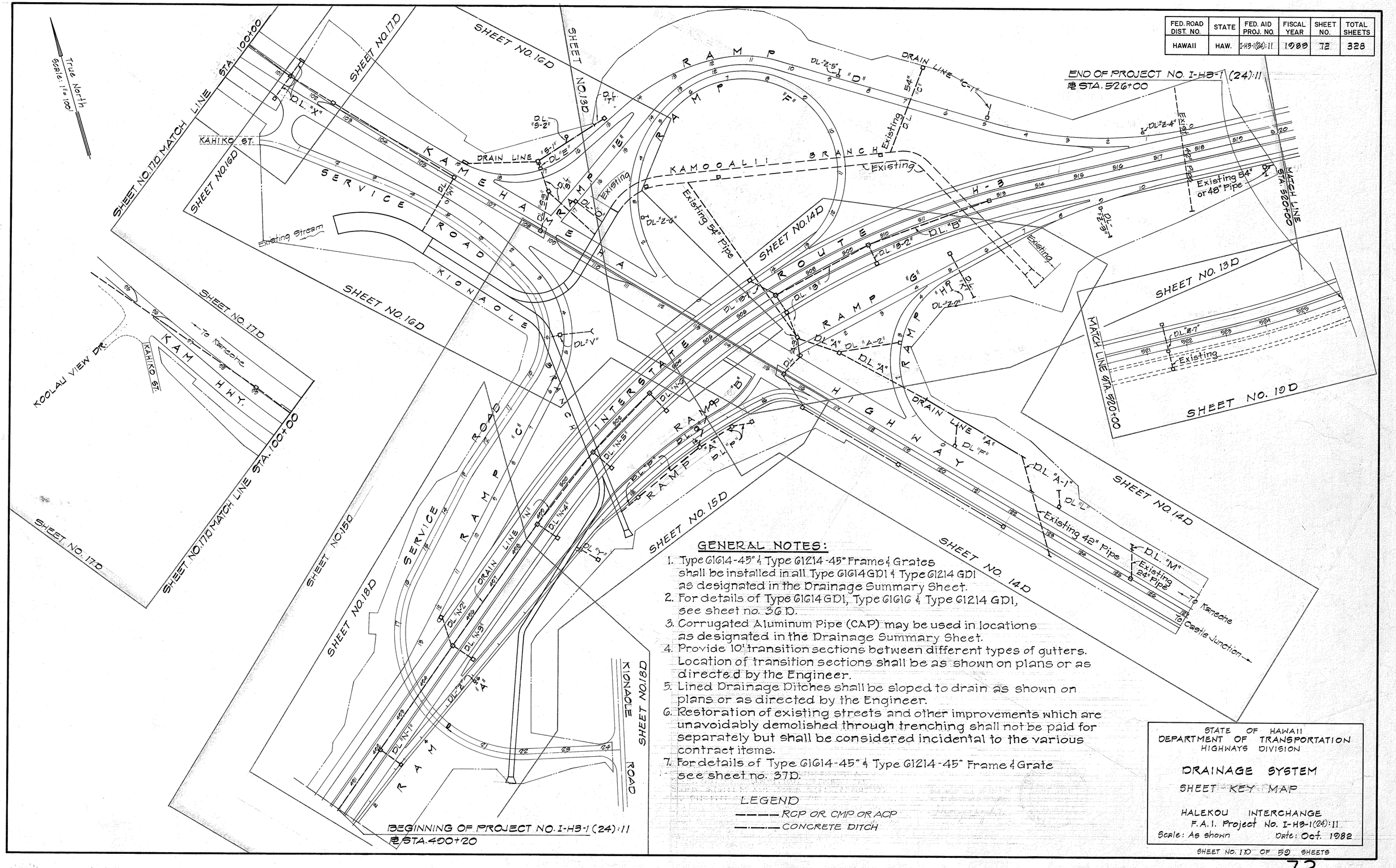
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HB-1(24):11	1988	72	328



GENERAL NOTES:

1. Type G1614-45° & Type G1214-45° Frame & Grates shall be installed in all Type G1614 GD1 & Type G1214 GD1 as designated in the Drainage Summary Sheet.
2. For details of Type G1614 GD1, Type G1616 & Type G1214 GD1, see sheet no. 36 D.
3. Corrugated Aluminum Pipe (CAP) may be used in locations as designated in the Drainage Summary Sheet.
4. Provide 10' transition sections between different types of gutters. Location of transition sections shall be as shown on plans or as directed by the Engineer.
5. Lined Drainage Ditches shall be sloped to drain as shown on plans or as directed by the Engineer.
6. Restoration of existing streets and other improvements which are unavoidably demolished through trenching shall not be paid for separately but shall be considered incidental to the various contract items.
7. For details of Type G1614-45° & Type G1214-45° Frame & Grate see sheet no. 37D.

LEGEND

——— RCP OR CMP OR ACP

—·—·— CONCRETE DITCH

END OF PROJECT NO. I-HB-1(24):11
℄ STA. 526+00

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE SYSTEM

SHEET KEY MAP

HALEKOU INTERCHANGE
F.A.I. Project No. I-HB-1(24):11
Scale: As shown Date: Oct. 1982

SHEET NO. 1D OF 50 SHEETS

DRAINAGE SUMMARY

PROJECT: HALEKOU INTERCHANGE

PROJECT NO: I-H3-1(24):11

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(24):11	1983	73	328

LINE NUMBER	TYPE OF STRUCTURE	STATION (FROM – TO)	206. 1000 CY Structure Excavation Other Than At Bridges	206. 7100 CY Structure Backfill for Structural Plate Culverts	207. 0100 CY Ditch & Channel Excavation	303. 0000 CY Class 'A' Concrete Other Than In Bridges	602. 1000 LB Reinforcing Steel Other Than In Bridges	603. 0011 CY Rock Cushion Under Concrete Channel	603. 1010 LF 24-Inch RCP, Class III	603. 1012 LF 30-Inch RCP, Class III	603. 1018 LF 48-Inch RCP, Class III	603. 2066 LF 24-Inch CMP, Sht."t", 0.079 Inch	603. 2084 LF 24-Inch CMP, Sht."t", 0.109 Inch	603. 2088 LF 36-Inch CMP, Sht."t", 0.109 Inch	603. 2090 LF 42-Inch CMP, Sht."t", 0.109 Inch	603. 2092 LF 48-Inch CMP, Sht."t", 0.109 Inch	603. 3070 LF 120-Inch Structural Plate Pipe No. 10 Gage	603. 3074 LF 132-Inch Structural Plate Pipe No. 10 Gage	603. 3130 LF 120-Inch Structural Plate Pipe No. 8 Gage	603. 7220 LF 24-Inch CMP, Sht."t", 0.109 Inch or 24-Inch RCP, Class III or 24-Inch ACP, Class III	603. 7280 LF 30-Inch CMP, Sht."t", 0.109 Inch or 24-Inch RCP, Class III or 24-Inch ACP, Class III	603. 7380 LF 36-Inch CMP, Sht."t", 0.109 Inch or 30-Inch RCP, Class III or 30-Inch ACP, Class III	603. 7600 LF 24-Inch CMP, Sht."t", 0.079 Inch or 24-Inch CAP, Sht."t", 0.075 Inch or 24-Inch RCP, Class III or 24-Inch ACP, Class III	603. 7601 LF 24-Inch CMP, Sht."t", 0.109 Inch or 24-Inch CAP, Sht."t", 0.075 Inch or 24-Inch RCP, Class III or 24-Inch ACP, Class III	603. 7602 LF 30-Inch CMP, Sht."t", 0.109 Inch or 30-Inch CAP, Sht."t", 0.075 Inch or 24-Inch RCP, Class III or 24-Inch ACP, Class III	603. 7603 LF 30-Inch CMP, Sht."t", 0.109 Inch or 30-Inch CAP, Sht."t", 0.075 Inch or 30-Inch RCP, Class III or 30-Inch ACP, Class III	603. 2200 LF 24-Inch Corrugated Steel End Section, Sht."t", 0.079 Inch	603. 7610 LF 60-Inch CMP, Sht."t", 0.138 Inch or 60-Inch CAP, Sht."t", 0.135 Inch or 60-Inch RCP, Class III	603. 9000 LF 3-Inch ϕ Galvanized Iron Pipe Filled With Concrete	604. 2150 EA Type A Cast Iron Frame & Cover	604. 2160 EA Type B Cast Iron Frame & Cover	604. 2170 EA Type P Cast Iron Frame & Cover	604. 2310 EA Type A-9 Steel Frame & Grate	604. 2330 EA Type G1614 Steel Frame & Grate	604. 2340 EA Type G1616 Steel Frame & Grate	LINE NUMBER
1	Modified Type B CD1	℄ Sta. 506+74.50 Rt (113'o/s) H-3	31			8.5	1550																									1				1
2	Modified Type B CD1	℄ Sta. 116+64 Lt (118'o/s) Kam	209			6.5	1000									140																				2
3	Concrete Headwall	℄ Sta. 118+82 Lt (124'o/s) Kam	335			5.0	80									214																				3
4	42-Inch CMP	℄ Sta. 123+40 Rt (61'o/s) Kam	10												8																					4
5	Modified Outlet Structure	℄ Sta. 121+64 Lt (116'o/s) Kam	121			13.0	310								54																					5
6	Type G1214 GD1	℄ Sta. 2+80 Rt Ramp H	141			2.2	200																				135									6
7	Modified G1614 GD1	℄ Sta. 0+84.87 Rt Ramp G	45			4.8	750																					50							1		7
8	Type G1614 GD1	℄ Sta. 115+50 Kam	57			2.2	210																					67							1		8
9	Type G1614 GD1	℄ Sta. 506+95 Rt (58'o/s) H-3	60			3.0	300																							46					1		9
10	Type G1616 GD1	℄ Sta. 506+95 H-3	73			3.3	520																							54						1	10
11	Type G1616 GD1	℄ Sta. 509+50 H-3	253			3.3	520																						250							1	11
12	Type G1616 GD1	℄ Sta. 512+75 H-3	279			2.8	300																					322								1	12
13	Type G1614 GD1	℄ Sta. 506+60 Lt (73'o/s) H-3	70			2.2	210																					78							1		13
14	Type G1614 GD1	℄ Sta. 509+50 Rt (58'o/s) H-3	54			2.5	230																					54							1		14
15	CD1 #C-2	℄ Sta. 6+80 Rt (82'o/s) Ramp D	16			3.5	440																														15
16	Type G1614 GD1	℄ Sta. 16+75 Lt Ramp E	55			2.2	210																				72								1		16
17	Type G1614 GD1	℄ Sta. 17+00 Rt Ramp D	23			2.2	210																				26								1		17
18	Type G1614 GD1	℄ Sta. 120+00 Lt (72'o/s) Kam	39			2.2	210																				57										18
19	Type B CD1	℄ Sta. 511+30 Rt (87'o/s) H-3	171			5.0	45																					134										19
20	Type G1614 GD1	℄ Sta. 123+00 Lt (65'o/s) Kam	35			2.2	210					43																			1							20
21	Standard Concrete Headwall	℄ Sta. 124+88 Lt (75'o/s) Kam	17			1.6	45						27																									21
22	Type G1214 GD1	℄ Sta. 119+00 Rt Kam	240			2.4	260																					276										22
23	Type G1616 GD1	℄ Sta. 492+00 H-3	298			3.0	500																	248													1	23
24	Type G1616 GD1	℄ Sta. 495+12 H-3	318			3.0	575																	308													1	24
25	Type G1616 GD1	℄ Sta. 498+75 H-3	376			3.7	540																359														1	25
26	Type G1616 GD1	℄ Sta. 501+00 H-3	250			3.5	515															221															1	26
27	Type G1616 GD1	℄ Sta. 503+00 H-3	215			3.7	360															196															1	27

DATE	REVISION
	Revised Quantities on line 23

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

DRAINAGE SUMMARY

PROJECT: HALEKOU INTERCHANGE

PROJECT NO.: I - H3 - 1(24):11

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(24):11	1983	74	328

LINE NUMBER	Type G1214 Steel Frame & Grate	Type G1614-45° Steel Frame & Grate	Type G1214-45° Steel Frame & Grate	Hand Laid Rip Rap	Concrete Spillway	Filter Material	LINE NUMBER
	604.	604.	604.	611.	640.	206.	
	2350	2360	2361	0100	0170	8500	
	EA	EA	EA	CY	EA	CY	
1							1
2							2
3							3
4							4
5							5
6	1						6
7		1					7
8							8
9							9
10							10
11							11
12							12
13							13
14							14
15							15
16							16
17							17
18		1					18
19							19
20			1				20
21							21
22			1				22
23							23
24							24
25							25
26							26
27							27

SHEET No. 30 OF 50 SHEETS

ORIGINAL PLAN
NOTE BOOK
No.

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DATE

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DRAINAGE SUMMARY

PROJECT: HALEKOU INTERCHANGE

PROJECT NO: I-H3-1(24):11

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(24):11	1983	75	238

LINE NUMBER	TYPE OF STRUCTURE	STATION (FROM – TO)	206. 1000 CY Structure Excavation Other Than At Bridges	206. 7100 CY Structure Backfill for Structural Plate Culverts	207. 0100 CY Ditch & Channel Excavation	503. 0000 CY Class "A" Concrete Other Than in Bridges	602. 1000 LB Reinforcing Steel Other Than in Bridges	603. 0011 CY Rock Cushion Under Concrete Channel	603. 1010 LF 24-Inch RCP, Class III	603. 1012 LF 30-Inch RCP, Class III	603. 1018 LF 48-Inch RCP, Class III	603. 2066 LF 24-Inch CMP, Sht. "ψ", 0.079 Inch	603. 2084 LF 24-Inch CMP, Sht. "ψ", 0.109 Inch	603. 2088 LF 36-Inch CMP, Sht. "ψ", 0.109 Inch	603. 2090 LF 42-Inch CMP, Sht. "ψ", 0.109 Inch	603. 2092 LF 48-Inch CMP, Sht. "ψ", 0.109 Inch	603. 3070 LF 120-Inch Structural Plate Pipe No. 10 Gage	603. 3074 LF 132-Inch Structural Plate Pipe No. 10 Gage	603. 3130 LF 120-Inch Structural Plate Pipe No. 8 Gage	603. 7220 LF 24-Inch CMP Sht. "ψ", 0.109 Inch or 24-Inch RCP, Class III or 24-Inch ACP, Class III	603. 7280 LF 30-Inch CMP, Sht. "ψ", 0.109 Inch or 24-Inch RCP, Class III or 24-Inch ACP, Class III	603. 7380 LF 36-Inch CMP, Sht. "ψ", 0.109 Inch or 30-Inch RCP, Class III or 30-Inch ACP, Class III	603. 7600 LF 24-Inch CMP, Sht. "ψ", 0.079 Inch or 24-Inch CAP, Sht. "ψ", 0.075 Inch or 24-Inch RCP, Class III or 24-Inch ACP, Class III	603. 7601 LF 24-Inch CMP, Sht. "ψ", 0.109 Inch or 24-Inch CAP, Sht. "ψ", 0.075 Inch or 24-Inch RCP, Class III or 24-Inch ACP, Class III	603. 7602 LF 30-Inch CMP, Sht. "ψ", 0.109 Inch or 30-Inch CAP, Sht. "ψ", 0.075 Inch or 24-Inch RCP, Class III or 24-Inch ACP, Class III	603. 7603 LF 30-Inch CMP, Sht. "ψ", 0.109 Inch or 30-Inch CAP, Sht. "ψ", 0.075 Inch or 30-Inch RCP, Class III or 30-Inch ACP, Class III	603. 2200 LF 24-Inch Corrugated Steel End Section, Sht. "ψ", 0.079 Inch	603. 7610 LF 60-Inch CMP, Sht. "ψ", 0.138 Inch or 60-Inch CAP, Sht. "ψ", 0.135 Inch or 60-Inch RCP, Class III	603. 9000 LF 3-Inch Galvanized Iron Pipe Filled with Concrete	604. 2150 EA Type A Cast Iron Frame & Cover	604. 2160 EA Type B Cast Iron Frame & Cover	604. 2170 EA Type P Cast Iron Frame & Cover	604. 2310 EA Type A-D Steel Frame & Grate	604. 2330 EA Type G1614 Steel Frame & Grate	604. 2340 EA Type G1616 Steel Frame & Grate	LINE NUMBER
28	Type G1214 GD1	℄ Sta. 3+26 Rt Ramp A	05			2.2	235													66														28
29	Type G1614 GD1	℄ Sta. 495+55 Lt H-3	61			2.2	210													70													1		29
30	Type G1614 GD1	℄ Sta. 495+12 Rt H-3	50			2.2	210													54													1		30
31	Type G1614 GD1	℄ Sta. 498+75 Rt H-3	55			2.3	220													54													1		31
32	Type G1614 GD1	℄ Sta. 501+00 Rt H-3	60			2.8	250													54													1		32
33	Type G1614 GD1	℄ Sta. 503+00 Rt H-3	61			2.8	250													54													1		33
34	Type G1614 GD1	℄ Sta. 5+85 Rt Ramp A	21			2.2	210																20										1		34
35	Type B CD1	℄ Sta. 10+09 Rt (70'%) Ramp A	25			1.5							46																						35
36	Type G1614 GD1	℄ Sta. 12+00 Rt Ramp A	131			6.1	750						46																				1		36
37	Type G1214 GD1	℄ Sta. 14+00 Rt Ramp A	361			3.1	425						196																				1		37
38	Type A SDMH	℄ Sta. 15+00 Rt Ramp A	136			4.5	730						96																			1			38
39	Type B CD1	℄ Sta. 15+50 Rt (40'%) Ramp A	55			2.0	250						50																						39
40	Type B CD1	℄ Sta. 504+00 Rt (120'%) H-3	137			1.6	225						118																						40
41	Type Y CD1	℄ Sta. 17+00 Rt (37'%) Ramp D	445			5.7	1000																							102					41
42	Type H SDMH	℄ Sta. 17+08 Rt (65'%) Ramp E	550			10.3	1600																							142					42
43	Type G1214 GD1	℄ Sta. 106+00 Lt Kam	223			3.6	307																180												43
44	Type E SDMH	℄ Sta. 16+00 Rt Ramp D	31			2.6	415			14																						1				44
45	Type G1614 GD1	℄ Sta. 108+50 Kam	82			2.2	210																	70									1		45
46	Type G1214 GD1	℄ Sta. 15+00 Rt Ramp D	21			2.2	200																	22											46
47	Standard Headwall	℄ Sta. 8+92 Lt Service Road	40			1.6	42																78												47
48	Type G1214 GD1	℄ Sta. 8+85 Lt Service Road	18			2.2	235																15												48
49	Type G1614 GD1	℄ Sta. 106+00 Kam	187			6.9	955				58																						1		49
50	Type G1214 GD1	℄ Sta. 106+00 Rt (62'%) Kam	337			6.1	980				82																								50
51	Modified Type Z SDMH	℄ Sta. 99+00 Kam	3			2.0	190																									1			51
52	Type G1614 GD1	℄ Sta. 101+45 Kam	19			3.7	600																										1		52
53	Type G1214 GD1	℄ Sta. 101+45 Lt Kam	58			2.8	245	45																											53
54	Type G1214 GD1	℄ Sta. 101+45 Rt (66'0/s) Kam	91			3.7	355	65																											54

SURVEY PLOTTED BY ____ DATE ____
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ORIGINAL PLAN
NOTE BOOK
No. ____

DRAINAGE SUMMARY

PROJECT: HALEKOU INTERCHANGE

PROJECT NO.: I-H3-1(24):11

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(24):11	1983	76	328

LINE NUMBER	Type G1214 Steel Frame & Grate	Type G1614-45° Steel Frame & Grate	Type G1214-45° Steel Frame & Grate	Hand Laid Rip Rap	Concrete Spillway	Filter Material	LINE NUMBER
	604. 2350 EA	604. 2360 EA	604. 2361 EA	611. 0100 CY	640. 0170 EA	206. 8500 CY	
28	1						28
29							29
30							30
31							31
32							32
33							33
34							34
35							35
36							36
37							37
38							38
39							39
40							40
41							41
42							42
43			1				43
44							44
45							45
46	1						46
47							47
48	1						48
49							49
50	1						50
51							51
52							52
53			1				53
54			1				54

ORIGINAL PLAN

NOTE BOOK No.

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TRACED BY: " " " "
DESIGNED BY: " " " "
QUANTITIES BY: " " " "
CHECKED BY: " " " "

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DRAINAGE SUMMARY

PROJECT: HALEKOU INTERCHANGE

PROJECT NO: I-H3-1(24):11

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(24):11	1983	77	328

LINE NUMBER	TYPE OF STRUCTURE	STATION (FROM – TO)	206. 1000 CY Structure Excavation Other Than At Bridges	206. 7100 CY Structure Backfill for Structural Plate Culverts	207. 0100 CY Ditch & Channel Excavation	503. 0000 CY Class "A" Concrete Other Than in Bridges	602. 1000 LB Reinforcing Steel Other Than in Bridges	603. 0011 CY Rock Cushion Under Concrete Channel	603. 1010 LF 24-Inch RCP, Class III	603. 1012 LF 30-Inch RCP, Class III	603. 1018 LF 48-Inch RCP, Class III	603. 2066 LF 24-Inch CMP, Sht. ¼", 0.079 Inch	603. 2084 LF 24-Inch CMP, Sht. ¼", 0.109 Inch	603. 2088 LF 36-Inch CMP, Sht. ¼", 0.109 Inch	603. 2090 LF 42-Inch CMP, Sht. ¼", 0.109 Inch	603. 2092 LF 48-Inch CMP, Sht. ¼", 0.109 Inch	603. 3070 LF 120-Inch Structural Plate Pipe No. 10 Gage	603. 3074 LF 132-Inch Structural Plate Pipe No. 10 Gage	603. 3130 LF 120-Inch Structural Plate Pipe No. 8 Gage	603. 7220 LF 24-Inch CMP, Sht. ¼", 0.109 Inch or 24-Inch RCP, Class III or 24-Inch ACP, Class III	603. 7280 LF 30-Inch CMP, Sht. ¼", 0.109 Inch or 24-Inch RCP, Class III or 24-Inch ACP, Class III	603. 7380 LF 36-Inch CMP, Sht. ¼" 0.109 Inch or 30-Inch RCP, Class III or 30-Inch ACP, Class III	603. 7600 LF 24-Inch CMP, Sht. ¼", 0.079 Inch or 24-Inch CAP, Sht. ¼", 0.075 Inch or 24-Inch RCP, Class III or 24-Inch ACP, Class III	603. 7601 LF 24-Inch CMP, Sht. ¼", 0.109 Inch or 24-Inch CAP, Sht. ¼", 0.075 Inch or 24-Inch RCP, Class III or 24-Inch ACP, Class III	603. 7602 LF 30-Inch CMP, Sht. ¼", 0.109 Inch or 30-Inch CAP, Sht. ¼", 0.075 Inch or 24-Inch RCP, Class III or 24-Inch ACP, Class III	603. 7603 LF 30-Inch CMP, Sht. ¼", 0.109 Inch or 30-Inch CAP, Sht. ¼", 0.075 Inch or 30-Inch RCP, Class III or 30-Inch ACP, Class III	603. 2200 LF 24-Inch Corrugated Steel End Section, Sht. ¼", 0.079 Inch	603. 7610 LF 60-Inch CMP, Sht. ¼", 0.138 Inch or 60-Inch CAP, Sht. ¼", 0.135 Inch or 60-Inch RCP, Class III	603. 9000 LF 3-Inch ϕ Galvanized Iron Pipe Filled with Concrete	604. 2150 EA Type A Cast Iron Frame & Cover	604. 2160 EA Type B Cast Iron Frame & Cover	604. 2170 EA Type P Cast Iron Frame & Cover	604. 2310 EA Type A-9 Steel Frame & Grate	604. 2330 EA Type 61614 Steel Frame & Grate	604. 2340 EA Type 61616 Steel Frame & Grate	LINE NUMBER
55	Modified Type A SDMH	℄ Sta. 102+50 Kam	2			1	80																													55
56	Type 61614 GD1	℄ Sta. 4+75 Rt Ramp H	19			2.2	210																		18									1		56
57	Type 61614 GD1	℄ Sta. 9+00 Rt Ramp G	60			2.2	210																		75									1		57
58	Type 61614 GD1	℄ Sta. 1+15 Rt Ramp D	16			2.2	210																		14									1		58
59	Type 61614 GD1	℄ Sta. 5+00 Rt Ramp D	30			2.2	210																		30									1		59
60	Type 61614 GD1	℄ Sta. 8+80 Rt Ramp D	14			2.2	210																		10									1		60
61	Type 61614 GD1	℄ Sta. 2+57 Rt Ramp F	15			2.2	210																		12									1		61
62	Type 61214 GD1	℄ Sta. 521+50 Lt H-3	100			3.6	375															61														62
63	Type 61614 GD1	℄ Sta. 521+30 H-3	17			3.9	410																											1		63
64	Type 61614 GD1	℄ Sta. 116+25 Rt Kam	76			2.4	270																			90										64
65	Type 61614 GD1	℄ Sta. 122+00 Rt Kam	288			2.1	205																			296										65
66	Type 61614 GD1	℄ Sta. 125+30 Kam	9			2.2	210																											1		66
67	Inlet Structure	℄ Right Pipe Sta. 15+30.78 Kionaole Branch	169			62	2250																													67
68	Inlet Structure	℄ Left Pipe Sta. 9+05 Kionaole Branch	169			62	2250																													68
69	120" Structural Plate Pipe	Kionaole Branch	14,660	17,425													2010		426																	69
70	192" Structural Plate Pipe	Kamooalii Branch	5,330	4,975														780																		70
71	Channel	℄ Sta. 3+89.92 to ℄ Sta. 5+87.74 Kamooalii Br.			1775	420	36,370	105																												71
72	Outlet & Channel	Channel Sta. 0+00 to Channel Sta. 3+45	20		2412	558	47,700	230																												72
73	CMP Drop Inlet	℄ Sta. 7+20 Kamooalii Branch	5			1.2	10							7																			1		73
74	CMP Drop Inlet	℄ Sta. 8+07 Kamooalii Branch	5			1.2	10							7																			1		74
75	CMP Drop Inlet	℄ Sta. 8+75 Kamooalii Branch	5			1.2	10							7																			1		75
76	CMP Drop Inlet	℄ Sta. 12+95 Kamooalii Branch				1.2	10																										1		76
77	CMP Drop Inlet	℄ Sta. 13+05 Kamooalii Branch				1.2	10																										1		77
78	Concrete Spillway	℄ Sta. 409+90 Lt H-3			11																															78
79	Concrete Spillway	℄ Sta. 518+78 Lt H-3			11																															79
80	Concrete Spillway	℄ Sta. 6+38 Rt Ramp F			11																															80
81	Concrete Spillway	℄ Sta. 8+70 Rt Ramp F			11																															81

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

SHEET No. 60 OF 59 SHEETS

DRAINAGE SUMMARY

PROJECT: HALEKOU INTERCHANGE

PROJECT NO.: I-H3-1(24):11

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(24):11	1983	78	328

LINE NUMBER	604. 2350 EA Type G12-14 Steel Frame & Grate	604. 2360 EA Type G1614-45° Steel Frame & Grate	604. 2361 EA Type G1214-45° Steel Frame & Grate	611. 0100 CY Hand Laid Rip Rap	640. 0170 EA Concrete Spillway	206. B500 CY Filter Material	LINE NUMBER
55							55
56							56
57							57
58							58
59							59
60							60
61							61
62	1						62
63							63
64		1					64
65		1					65
66							66
67							67
68							68
69							69
70							70
71						15	71
72				90		20	72
73							73
74							74
75							75
76							76
77							77
78					1		78
79					1		79
80					1		80
81					1		81

ORIGINAL PLAN
NOTE BOOK No.
SURVEY PLOTTED BY DATE
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DRAINAGE SUMMARY

PROJECT: HALEKOU INTERCHANGE

PROJECT NO: I-H3-1(24):11

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H9-1(24):11	1989	79	328

LINE NUMBER	TYPE OF STRUCTURE	STATION (FROM – TO)	ITEM NO.	206. 1000	206. 7100	207. 0100	503. 0000	602. 1000	603. 0011	603. 1010	603. 1012	603. 1018	603. 2066	603. 2084	603. 2088	603. 2090	603. 2092	603. 3070	603. 3074	603. 3130	603. 7220	603. 7280	603. 7380	603. 7600	603. 7601	603. 7602	603. 7603	603. 2200	603. 7610	603. 9000	604. 2150	604. 2160	604. 2170	604. 2310	604. 2330	604. 2340	LINE NUMBER
			UNIT USED	CY	CY	CY	CY	LB	CY	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	EA	EA	EA	EA	EA	EA	
				Structure Excavation Other Than At Bridges	Structure Backfill for Structural Plate Culverts	Ditch & Channel Excavation	Class "A" Concrete Other Than in Bridges	Reinforcing Steel Other Than in Bridges	Rock Cushion Under Concrete Channel	24-Inch RCP, Class III	30-Inch RCP, Class III	48-Inch RCP, Class III	24-Inch CMP, Sht. "ψ", 0.079 Inch	24-Inch CMP, Sht. "ψ", 0.109 Inch	36-Inch CMP, Sht. "ψ", 0.109 Inch	42-Inch CMP, Sht. "ψ", 0.109 Inch	48-Inch CMP, Sht. "ψ", 0.109 Inch	120-Inch Structural Plate Pipe No. 10 Gage	132-Inch Structural Plate Pipe No. 10 Gage	120-Inch Structural Plate Pipe No. 8 Gage	24-Inch CMP, Sht. "ψ", 0.109 Inch or 24-Inch RCP, Class III or 24-Inch ACP, Class III	30-Inch CMP, Sht. "ψ", 0.109 Inch or 24-Inch RCP, Class III or 24-Inch ACP, Class III	36-Inch CMP, Sht. "ψ", 0.109 Inch or 30-Inch RCP, Class III or 30-Inch ACP, Class III	24-Inch CMP, Sht. "ψ", 0.079 Inch or 24-Inch CAP, Sht. "ψ", 0.075 Inch or 24-Inch RCP, Class III or 24-Inch ACP, Class III	24-Inch CMP, Sht. "ψ", 0.109 Inch or 24-Inch CAP, Sht. "ψ", 0.075 Inch or 24-Inch RCP, Class III or 24-Inch ACP, Class III	30-Inch CMP, Sht. "ψ", 0.109 Inch or 30-Inch CAP, Sht. "ψ", 0.075 Inch or 24-Inch RCP, Class III or 24-Inch ACP, Class III	30-Inch CMP, Sht. "ψ", 0.109 Inch or 30-Inch CAP, Sht. "ψ", 0.075 Inch or 30-Inch RCP, Class III or 30-Inch ACP, Class III	24-Inch Corrugated Steel End Section, Sht. "ψ", 0.079 Inch	60-Inch CMP, Sht. "ψ", 0.138 Inch or 60-Inch CAP, Sht. "ψ", 0.135 Inch or 60-Inch RCP, Class III	3-Inch Galvanized Iron Pipe Filled with Concrete	Type A Cast Iron Frame & Cover	Type B Cast Iron Frame & Cover	Type P Cast Iron Frame & Cover	Type A-D Steel Frame & Grate	Type G1G14 Steel Frame & Grate	Type G1G1G Steel Frame & Grate	
82	Concrete Spillway	℄ Sta. 2+75 Lt Ramp G				11																														82
83	Concrete Spillway	℄ Sta. 12+75 Rt Serv. Rd				11																														83
84	Concrete Spillway	℄ Sta. 21+27 Rt Serv. Rd				11																														84
85	Type G1G14 GD1	℄ Sta. 489+50 H-3	146			5	700														4		56											1		85
86	Type "N-1A" GD1	℄ Sta. 489+50 Lt. (60.58' %) H-3	119			8	900														4		50										3			86
87	Type "N-1A" Concrete Headwall	℄ Sta. 489+50 Lt. (112' %) H-3	5			5	200																													87

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ORIGINAL PLAN
NOTE BOOK
No.

DATE	REVISION
	Added Quantities, Line 85-87

DRAINAGE SUMMARY

PROJECT: HALEKOU INTERCHANGE

PROJECT NO.: I - H3 - 1(24) : 11

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(24):11	1983	80	328

LINE NUMBER	604. 2350 EA Type G1214 Steel Frame & Grate	604. 2360 EA Type G1614-45° Steel Frame & Grate	604. 2361 EA Type G1214-45° Steel Frame & Grate	611. 0100 CY Hand Laid Rip Rap	640. 0170 EA Concrete Spillway	206. 8500 CY Filter Material	LINE NUMBER
82					1		82
83					1		83
84					1		84
85							85
86							86
87							87

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

DATE	REVISION
	Added Quantities for Line 85-86, Added Item No. 603.1014

SHEET No. 90 OF 59 SHEETS

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DRAINAGE SUMMARY

PROJECT : HALEKOU INTERCHANGE

PROJECT NO : I-H3-1(24):11

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(24):11	1983	81	328

LINE NUMBER	TYPE OF STRUCTURE	STATION (FROM – TO)	ITEM NO.	207. 0100	609. 2218	609. 2614	609. 2616	609. 2618	609. 2620	640. 0100	640. 0110	640. 0120	640. 0130	640. 0140	640. 0150	640. 0160	LINE NUMBER
			UNIT USED	CY	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	
				Ditch & Channel Excavation	Gutter, Type 2 (61218)	Gutter, Type 2 (61614)	Gutter, Type 2 (61616)	Gutter, Type 2 (61215)	Gutter, Type 2 (61216)	Lined Drainage Ditch, Type A	Lined Drainage Ditch, Type B	Lined Drainage Ditch, Type C	Lined Drainage Ditch, Type D	Lined Drainage Ditch, Type E	Lined Drainage Ditch, Type F	Lined Drainage Ditch, Type G	
	GUTTERS																
	℄ Sta. 490+20 H-3 to ℄ Sta. 504+25 H-3						1380										
	℄ Sta. 495+12 Rt H-3 to ℄ Sta. 504+44 Rt H-3					923											
	℄ Sta. 495+55 Lt H-3 to ℄ Sta. 497+35 Lt H-3					180											
	℄ Sta. 490+20 Lt H-3 to ℄ Sta. 490+90 Lt H-3					70											
	℄ Sta. 1+45 Rt Ramp A to ℄ Sta. 5+85 Rt Ramp A				440												
	℄ Sta. 5+85 Rt Ramp A to ℄ Sta. 13+20 Rt Ramp A					735											
	℄ Sta. 13+20 Rt Ramp A to ℄ Sta. 15+00 Rt Ramp A				180												
	℄ Sta. 15+00 Rt Ramp A to ℄ Sta. 117+25 Rt Kam					225											
	℄ Sta. 117+25 Rt Kam to ℄ Sta. 121+75 Rt Kam				450												
	℄ Sta. 121+75 Rt Kam to ℄ Sta 126+50 Rt Kam					475											
	℄ Sta. 490+90 Lt H-3 to ℄ Sta. 8+25 Rt Ramp C				860												
	℄ Sta. 8+25 Rt Ramp C to ℄ Sta. 4+60 Lt Serv. Rd.							815									
	℄ Sta. 6+20 Lt Ramp C to ℄ Sta. 12+15 Lt Ramp C				595												
	℄ Sta. 126+50 Rt Kam to ℄ Sta. 127+00 Rt Kam				50												
	℄ Sta. 506+95 H-3 to ℄ Sta. 526+00 H-3						1905										
	℄ Sta. 506+95 Rt H-3 to ℄ Sta. 515+60 Rt H-3					865											
	℄ Sta. 516+80 Lt H-3 to ℄ Sta. 518+78 Lt H-3					198											
	℄ Sta. 518+78 Lt H-3 to ℄ Sta. 526+00 Lt H-3				722												
	℄ Sta. 1+15 Rt Ramp D to ℄ Sta. 4+50 Rt Ramp D				335												
	℄ Sta. 4+50 Rt Ramp D to ℄ Sta. 8+80 Rt Ramp D					430											
	℄ Sta. 8+80 Rt Ramp D to ℄ Sta. 15+00 Rt Ramp D				620												
	℄ Sta. 15+00 Rt Ramp D to ℄ Sta. 18+30 Rt Ramp D					325											
	℄ Sta. 18+30 Rt Ramp D to ℄ Sta. 106+00 Lt Kam				66												
	℄ Sta. 13+50 Lt Ramp E to ℄ Sta. 17+35 Lt Ramp E					382											
	℄ Sta. 115+25 Lt Kam to ℄ Sta. 6+30 Rt Ramp F					878											
	℄ Sta. 6+30 Rt Ramp F to ℄ Sta. 8+50 Rt Ramp F				220												

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

DRAINAGE SUMMARY

PROJECT : HALEKOU INTERCHANGE

PROJECT NO : I-H3-1(24):11

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(24):11	1983	82	328

LINE NUMBER	TYPE OF STRUCTURE	STATION (FROM – TO)	ITEM NO.	207. 0100	609. 2218	609. 2614	609. 2616	609. 2618	609. 2620	640. 0100	640. 0110	640. 0120	640. 0130	640. 0140	640. 0150	640. 0160	LINE NUMBER
			UNIT USED	CY	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	
				Ditch & Channel Excavation	Gutter, Type 2 (G1218)	Gutter, Type 2 (G1614)	Gutter, Type 2 (G1616)	Gutter, Type 2 (G1218)	Gutter, Type 2 (G1216)	Lined Drainage Ditch, Type A	Lined Drainage Ditch, Type B	Lined Drainage Ditch, Type C	Lined Drainage Ditch, Type D	Lined Drainage Ditch, Type E	Lined Drainage Ditch, Type F	Lined Drainage Ditch, Type G	
	℄ Sta. 8+50 Rt Ramp F to ℄ Sta. 506+60 Lt H-3					598											
	℄ Sta. 2+85 Lt Ramp G to ℄ Sta. 5+00 Lt Ramp G				225												
	℄ Sta. 0+85 Rt Ramp G to ℄ Sta. 3+05 Rt Ramp G					215											
	℄ Sta. 3+05 Rt Ramp G to ℄ Sta. 3+70 Rt Ramp G				70												
	℄ Sta. 2+80 Rt Ramp H to ℄ Sta. 4+75 Rt Ramp H				195												
	℄ Sta. 4+75 Rt Ramp H to ℄ Sta. 519+50 Rt H-3					866											
	℄ Sta. 101+28 Kam to ℄ Sta. 101+43 Kam					15											
	℄ Sta. 96+20 Rt Kam to ℄ Sta. 101+45 Rt Kam				525												
	℄ Sta. 99+83 Lt Kam to ℄ Sta. 106+00 Lt Kam								617								
	℄ Sta. 115+69 Lt Kam to ℄ Sta. 118+40 Lt Kam					271											
	℄ Sta. 2+80 Rt Ramp H to ℄ Sta. 127+00 Lt Kam					1010											
	℄ Sta. 17+00 Rt Ramp A to ℄ Sta. 121+75 Rt Kam				475												
	℄ Sta. 121+75 Rt Kam to ℄ Sta. 125+00 Rt Kam					325											
	℄ Sta. 126+50 Rt Kam to ℄ Sta. 127+00 Rt Kam				50												
	℄ Sta. 12+75 Rt Serv. Rd to ℄ Sta. 16+50 Rt Serv. Rd							375									
	℄ Sta. 20+20 Rt Serv. Rd to ℄ Sta. 21+27 Rt Serv. Rd							107									
	LINED DRAINAGE DITCH																
	℄ Sta. 517+82 Lt H3 to ℄ Sta. 518+67 Lt H3		40							103							
	℄ Sta. 0+23 Rt Ramp D to ℄ Sta. 14+94 Rt Ramp D		710							1720							
	℄ Sta. 4+75 Rt Ramp H to ℄ Sta. 6+70 Rt Ramp H		114							220							
	℄ Sta. 519+74 Rt H3 to ℄ Sta. 7+07 Rt Ramp H		240							635							
	℄ Sta. 2+66 Lt Ramp G to ℄ Sta. 5+13 Lt Ramp G		47									247					
	℄ Sta. 7+22 Kamoolii Br. to ℄ Sta. 8+66 Kamoolii Br.		27									144					
	℄ Sta. 1+20 Lt Serv. Rd. to ℄ Sta. 4+60 Lt Serv. Rd.		52									346					
	℄ Sta. 15+28 Rt Ramp D to ℄ Sta. 15+52 Rt Ramp D		12								29						
	℄ Sta. 15+52 Rt Ramp D to ℄ Sta. 16+12 Rt Ramp D		155											60			
	℄ Sta. 16+12 Rt Ramp D to ℄ Sta 17+00 Rt Ramp D		200										88				

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DRAINAGE SUMMARY

PROJECT : HALEKOU INTERCHANGE

PROJECT NO : I-H3-1(24):11

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(24):11	1983	83	328

LINE NUMBER	TYPE OF STRUCTURE	STATION (FROM – TO)	ITEM NO.	207. 0100 Ditch & Channel Excavation	609. 2218 Gutter, Type 2 (G1218)	609. 2614 Gutter, Type 2 (G1614)	609. 2616 Gutter, Type 2 (G1616)	609. 2618 Gutter, Type 2 (G1218)	609. 2620 Gutter, Type 2 (G1216)	640. 0100 Lined Drainage Ditch, Type A	640. 0110 Lined Drainage Ditch, Type B	640. 0120 Lined Drainage Ditch, Type C	640. 0130 Lined Drainage Ditch, Type D	640. 0140 Lined Drainage Ditch, Type E	640. 0150 Lined Drainage Ditch, Type F	640. 0160 Lined Drainage Ditch, Type G	LINE NUMBER
			UNIT USED	CY	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	
		℄ Sta. 118+82 Lt Kam to ℄ Sta. 121+42 Lt Kam		850											260		
		℄ Sta. 121+42 Lt Kam to ℄ Sta. 121+83 Lt Kam		250												41	
		℄ Sta. 22+16 Lt Serv. Rd to ℄ Sta. 10+09 Rt Ramp A		101						475							

Deleted Quantities from ℄ Sta. 488+75 H-3 to ℄ Sta. 490+20 H-3

DATE	REVISION

SURVEY PLOTTED BY ____ DATE
DRAWN BY ____
TRACED BY ____
DESIGNED BY ____
QUANTITIES BY ____
CHECKED BY ____

ORIGINAL PLAN
NOTE BOOK ____ No. ____

C.O. 83

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(24):II	1983	84	325

NOTE:
1- For Gutter Transition, see sht. 18D

True North
Scale: 1in.=50ft.

DRAIN LINE "A"
℄ STA. 506+74.50 Rt. (113°0'6" Rt.) H-3
CONSTRUCT:
Modified Type "B" GD1 # A-1
(See sht. 28D for Details)

DRAIN LINE "B"
℄ STA. 512+75 H-3
CONSTRUCT:
Type G1616 GD1 #B-4

INSTALL:
24" RCP, Cl. III, 24" CMP, Sht "t"=0.109" or
24" ACP, Cl. III (See sht. D for Profile)
℄ STA. 8+80 Rt. TO 15+00 Rt. RAMP "D"
CONSTRUCT:
Gutter, Type 2 (G1218)
(See Typ. Rdway Sect. for Det.)

℄ STA. 4+50 Rt. TO 8+80 Rt. RAMP "D"
CONSTRUCT:
Gutter, Type 2 (G1614)
(See Typ. Rdway Sect. for Detail)

℄ STA. 8+85 Rt. TO 15+00 Rt. RAMP "D"
CONSTRUCT:
3-Underdrain Cleanouts
INSTALL:
6" Perforated Underdrain Pipe
(See Detail sheet 25D)

℄ STA. 1+15 Rt. TO 4+50 Rt. RAMP "D"
CONSTRUCT:
Gutter, Type 2 (G1218)
(See Typ. Rdway Sect. for Det.)

GD1 #C-2 (special)
℄ Sta. 6+80 (82°0'6" Rt.) Ramp "D"
Inv. = 226.00
Ditch Inv. = 228.05

℄ STA. 1+25 Rt. TO 4+50 Rt. RAMP "D"
CONSTRUCT:
2-Underdrain Cleanouts
INSTALL:
6" Perforated Underdrain Pipe
(For Det. See sht. 25D)

℄ STA. 2+66 Lt. TO ℄ STA. 5+13 Lt. RAMP "G" AND ℄ STA. 7+22 TO ℄ STA. 8+66 KAMOOALII BRANCH
CONSTRUCT:
Lined Drainage Ditch, Type C
(See sht. 26D for Detail)

Type G1614 GD1 # "C-1"
℄ Sta. 5+00 Rt. RAMP "D"
Connect Pipe to Lined Drainage Ditch (See Detail of Pipe Outlet, Sht. 27D)

DRAIN LINE "Z-4"
℄ STA. 1+15 Rt. RAMP "D"
CONSTRUCT:
Type G1614 GD1 # Z-5
Standard Conc. Headwall # Z-5
INSTALL:
24" RCP, Cl. III, 24" CMP
Sht "t" = 0.075" or 24" ACP, Cl. III

℄ STA. 5+80 Lt. TO 518+78 Lt. H-3
CONSTRUCT:
Gutter, Type 2 (G1614)
(See Typ. Rdway Sect. for Det.)

℄ STA. 518+78 Lt. TO 520+00 Lt. H-3
CONSTRUCT:
Gutter, Type 2 (G1218)
(See Typ. Rdway Sect. for Det.)

℄ STA. 505+05 TO 520+00 H-3 (Median)
CONSTRUCT:
Gutter, Type 2 (G1616)
(See Typ. Rdway Sect. for Det.)

DRAIN LINE "Z-5"
℄ STA. 8+80 Rt. RAMP "D"
CONSTRUCT:
Type G1614 GD1 # Z-6
Std. Conc. Headwall # Z-6
INSTALL:
24" RCP Cl III, 24" CMP
Sht "t" = 0.075" or 24" ACP, Cl. III

℄ STA. 505+05 Rt. TO ℄ STA. 515+60 Rt. H-3
CONSTRUCT:
Gutter, Type 2 (G1614)
(See Typ. Rdway Sect. for Det.)

℄ STA. 518+78 Lt. H-3
CONSTRUCT:
Conc. Spillway (See sht. 29D for Detail)

℄ STA. 6+38 Rt. RAMP "F"
CONSTRUCT:
Conc. Spillway
(See sht. 29D for Detail)

℄ STA. 8+70 Rt. RAMP "F"
CONSTRUCT:
Conc. Spillway
(See sht. 29D for Detail)

Type G1614 GD1 # Z-5
Sta. 1+15 Rt. Ramp "D"
Inv. = 282.00

Type G1614 GD1 # Z-4
℄ Sta. 8+80 Rt. Ramp "D"
Inv. = 276.00

Type G1614 GD1 # B-4
℄ Sta. 512+75
Inv. = 267.00

Type G1614 GD1 # B-3
Inv. = 260.00

Type G1614 GD1 # B-2
Inv. = 257.45

Type G1614 GD1 # B-1
Inv. = 256.07

Type G1614 GD1 # B-5
Inv. = 263.10

Type G1614 GD1 # B-6
Inv. = 261.00

Type G1614 GD1 # Z-3
Inv. = 250.00

Type G1614 GD1 # Z-4
℄ 0+00 Ramp "G"
Inv. = 270.00

Type G1614 GD1 # A-3
Inv. = 250.93

Modified Type "B" GD1 # A-1
℄ Sta. 506+74.50 (113°0'6" Rt.) H-3
Inv. = 233.50 (30")
Inv. = 234.00 (24")
Inv. = 227.00 (54" & 48")
Swale Inv. = 238.00

Type G1614 GD1 # A-4
Inv. = 241.00

Type G1614 GD1 # A-5
Inv. = 240.66

Type G1614 GD1 # A-2
Inv. = 234 (24")
Inv. = 230 (48")

Std. Conc. Headwall # K-1
Inv. = 230.90

Std. Conc. Headwall # Z-3
Inv. = 252.00

Lined Drainage Ditch, Type A
Lined Drainage Ditch, Type C
Daylight to existing ground
Gutter, Type 2 (G1218)
Gutter, Type 2 (G1614)
Gutter, Type 2 (G1616)
14" CP Perforated Underdrain
Cleanout
Top of Cut
Toe of Fill
Limit of Fill
Sta. 6+38 Ramp "F" Conc. Spillway
Sta. 8+70 Conc. Spillway
℄ Pipe Sta. 7+20 CMP Drop Inlet
℄ Pipe Sta. 8+07 CMP Drop Inlet
℄ Pipe Sta. 8+75 CMP Drop Inlet
Grade to Inlet Opening @ G:1 Slope
Grade to Drain
Sta. 8+80 Ramp "D" Type G1614 GD1 # Z-6 H/ Culvert & Headwall # Z-6
Sta. 2+75 Ramp "G" Conc. Spillway
Existing 54" CMP
Existing 54" or 48" Pipe
Existing Type "C-1" SDMH Sta. 519+50
Sta. 519+85 Exist. Conc. Spillway
Std. Conc. Headwall
Type G1614 GD1 # Z-4
Std. Concrete Headwall # Z-4
Gutter, Type 2 (G1614) 6" Perforated Underdrain
Gutter, Type 2 (G1218)
Gutter, Type 2 (G1614)
Gutter, Type 2 (G1616)
Gutter, Type 2 (G1614) Modified
Type "B" GD1 # A-2
Gutter, Type 2 (G1614) Type "B" GD1 # A-5
Gutter, Type 2 (G1614) Type "B" GD1 # A-4
Lined Drainage Ditch, Type A
Lined Drainage Ditch, Type A
Lined Drainage Ditch, Type A

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(24):11	1983	85	328

DRAIN LINE "B-2"
℄STA. 500+50 Rt.(58'0/s Rt) H-3
CONSTRUCT:
Type G1G14 GD1 # B-6

INSTALL:
24" RCP, CL III, 24" ACP CL III or 24" CMP, Sht. "t"=0.100" (See Sht. 20D for Profile)

DRAIN LINE "B-1"
℄STA. 500+60 (73'0/s Lt) H-3
CONSTRUCT:
Type G1G14 GD1 # B-5
INSTALL:
24" RCP, CL III, 24" ACP CL III or 24" CMP, Sht. "t"=0.100" (See Sht. 20D for Profile)

Type "B" CD1 # K-1
℄Sta. 511+30 (87'0/s Rt) H-3
Ditch Inv. = 252.00
Inv. = 248.00

Type G1G16 GD1 # B-3
℄Sta. 500+50 H3
Inv. = 260.00

Type G1G14 GD1 # B-6
℄Sta. 500+50 (58'0/s Rt.) H-3
Inv. = 261.00

Type G1G14 GD1 # B-5
℄Sta. 500+60 (73'0/s Lt) H-3
Inv. = 269.10

Type G1G14 GD1 # B-1
Sta. 500+95 (58'0/s Rt) H-3
Inv. = 256.07

Modified G1G14 GD1 # A-5
℄Sta. 0+84.87 Rt. Ramp "G"
Inv. = 240.66

Modified Type B CD1 # A-1
℄Sta. 500+74.50 (113'0/s Rt) H-3
Inv. = 227.00 (48" & 54")
Inv. = 234.00 (24")
Inv. = 233.50 (30")
Swale Inv. = 238.00

Type G1G14 GD1 # A-4
℄Sta. 115+50 Kam
Inv. = 241.00

Type G1G14 GD1
℄Sta 116+25 Rt. Kam
Inv. = 243.5

Modified Type "B" CD1 # A-2
℄Sta. 116+64 (118'0/s Lt) Kam
Swale Inv. = 238.0
Inv. = 234.00 (24")
Inv. = 230.00 (48")

Type G1214 GD1
℄Sta. 119+00 Rt. Kam
Inv. = 254.5

Type G1G14 GD1
℄Sta 122+00 Rt. Kam
Inv. = 270.00

Type G1G14 GD1
℄Sta 125+90 Kam Hwy
Inv. = 279.00

Type G1G14 GD1
Inlet # A-1
℄Sta. 123+40 (61'0/s Rt.) Kam
Inv. = 267.71

Std. Conc. Headwall # K-1
℄Sta. 5+15 (60'0/s) Ramp "H"
Inv. = 230.00

℄Sta. 4+75 Rt. Ramp "H"
Type G1G14 GD1 # Z-3 w/24" culvert and Std. Conc. Headwall # Z-3

Std. Conc. Headwall # Z-3
Inv. = 252.00

Type G1214 GD1 # A-3
℄Sta. 2+80 Ramp "H"
Inv. = 250.93

Type G1G14 GD1 # Z-3
Inv. = 256.00

Concrete Headwall # A-1
℄Sta. 118+82 (124'0/s Lt.) Kam
Inv. = 240.50
Connect pipe to lined drainage ditch @ ℄ Sta. 119+77 Lt. Kam

Lined Drainage Ditch, Type F
Lined Drainage Ditch, Type G
Modified Outlet Structure # A-1
℄Sta. 121+64 (116'0/s Lt.) Kam
Inv. = 252.12

End Lined Drainage Ditch
℄STA. 121+83 (124'0/s Lt.) Kam.
Inv. = 240.50

24" Corrugated Metal End Section Inv. = 260.00

Type G1G14 GD1 # L-1
℄Sta. 123+00 (65'0/s Lt.) Kam
Inv. = 274.00

Std. Conc. Headwall # M-1
℄Sta. 124+88 (75'0/s Lt.)
Inv. = 273.20

Remove exist. headwall and join 24" CMP to exist. pipe culvert

Inv. = 244.00

DRAIN LINE "F"
Remove exist. hdwl. and join 48" CMP sht. "t"=0.100" to exist. pipe culvert

Grade to Drain

Gutter, Type 2 (G1G14)

Plug & abandon exist. 24" CMP & headwall

Type G1G14 GD1 # F-1
℄Sta. 120+00 (72'0/s Lt.) Kam
Inv. = 263.75

24" CMP DRAIN LINE "M"

Exist. 24" CMP

Gutter, Type 2 (G1G14)

NORTHBOUND

SOUTHBOUND

WESTBOUND

EASTBOUND

KAMEHAMEHA HIGHWAY

Demolish exist. Type "A" CD1
6" Perforated Underdrain Pipe

Cleanout

℄Sta. 122+80
42" CMP Culvert (Exist.)

Connect existing pipe to invert of new GD1

Demolish existing GD1

42" Pipe CRM Wall

Gutter, Type 2 (G1218)

Remove existing headwall, connect new 42" CMP to existing pipe culvert

DRAIN LINE "A-3"
℄STA. 115+50 KAM HWY
CONSTRUCT:
Type G1G14 GD1 # A-4

INSTALL:
24" CMP, Sht. "t"=0.100", 24" RCP, CL III or 24" ACP, CL III (See Sht. 21D for Profile)

DRAIN LINE "M"
℄STA. 125+00 (55'0/s Lt.) KAM HWY
CONSTRUCT:
Std. Conc. Headwall # M-1

INSTALL:
24" CMP, Sht. "t"=0.100" (See Sht. 22D for Profile)

℄STA. 3+05 Rt. TO ℄STA. 3+70 Rt. RAMP "G"
CONSTRUCT:
Gutter, Type 2 (G1218) (See Typical Rdwy. Sect. for Detail)

℄STA. 0+85 Rt. TO ℄STA. 3+05 Rt. RAMP "G"
CONSTRUCT:
Gutter, Type 2 (G1G14) (See Typical Rdwy Sect. for Detail)

℄STA. 2+85 Lt. TO ℄STA. 5+00 Lt. RAMP "G"
CONSTRUCT:
Gutter, Type 2 (G1218) (See Typical Roadway Sect. for Det.)

DRAIN LINE "A-3"
℄STA. 0+84.87 Rt. RAMP "G"
CONSTRUCT:
Modified G1G14 GD1 # A-5
INSTALL: (See Sht. 35D for Details)
24" RCP, CL III, 24" ACP, CL III or 24" CMP, Sht. "t"=0.100" (See Sht. 21D for Profile)

DRAIN LINE "K"
℄STA. 511+30 (87'0/s Rt.) H-3
CONSTRUCT:
Type "B" CD1 # K-1
Std. Conc. Headwall # K-1
INSTALL: (See Sht. 38D for Details)
24" RCP, CL III, 24" ACP CL III or 24" CMP, Sht. "t"=0.100" (See Sht. 22D for Profile)

DRAIN LINE "Z-2"
℄STA. 4+75 Rt. RAMP "H"
CONSTRUCT: G1G14 GD1 # Z-3
Standard Conc. Headwall # Z-3
INSTALL: 24" ACP, CL III, 24" RCP, CL III or 24" CMP, Sht. "t"=0.070"
℄STA. 2+85 Lt. RAMP "G"
CONSTRUCT:
Conc. Spillway (See Sht. 39D for Det.)

DRAIN LINE "B"
℄STA. 500+05 H-3
CONSTRUCT:
Type G1G16 GD1 # B-2

INSTALL:
30" RCP, CL. III, 30" ACP, CL III or 30" CMP, Sht. "t"=0.100" (See Sht. 20D for Profile)

DRAIN LINE "B"
℄STA. 500+50 H-3
CONSTRUCT:
Type G1G16 GD1 # B-3

INSTALL:
24" RCP, CL III or 24" ACP, CL III or 30" CMP, Sht. "t"=0.100" (See Sht. 20D for Profile)

DRAIN LINE "B"
℄STA. 500+95 (58'0/s Rt.) H-3
CONSTRUCT:
Type G1G14 GD1 # B-1
INSTALL:
30" RCP, CL III, 30" ACP, CL III or 30" CMP, Sht. "t"=0.109"

DRAIN LINE "A"
℄STA. 118+82 (124'0/s Lt.) Kam.
CONSTRUCT:
Concrete Headwall # A-1 (See Sht. 28D for Detail)
INSTALL: 48" CMP, Sht. "t"=0.100" (See Sht. 20D for Profile)

DRAIN LINE "A"
℄STA. 118+82 (124'0/s Lt.) TO 121+83 KAM
CONSTRUCT:
Lined Drainage Ditch, Type F
Lined Drainage Ditch, Type G (See Sht. 27D for Detail)
DRAIN LINE "A-1"
℄STA. 121+64 (116'0/s Lt.) TO 123+40 (61'0/s Rt.) Kam.
CONSTRUCT: Modified Outlet Structure # A-1 (See Sht. 21D for Details)

INSTALL 42" CMP, Sht. "t"=0.100" (See Sht. 20D for Profile)

DRAIN LINE "A-2"
℄STA. 2+80 Rt. RAMP "H"
CONSTRUCT:
Type G1214 GD1 # A-3
INSTALL: 24" RCP, CL III, 24" ACP CL III or 24" CMP, Sht. "t"=0.070" (See Sht. 21D for Profile)
DRAIN LINE "F"
℄STA. 120+00 (72'0/s Lt.) KAM
CONSTRUCT: Type G1G14 GD1 # F-1
INSTALL: 24" RCP, CL III, 24" ACP, CL III or 24" CMP, Sht. "t"=0.070" (See Sht. 21D for Profile) (See Sht. 27D for Detail)

DRAIN LINE "L"
℄STA. 123+00 (65'0/s Lt.) KAM
CONSTRUCT: Type G1G14 GD1 # L-1
INSTALL: 24" CMP, Sht. "t"=0.070"
24" Corrugated Metal End Section Sht. "t"=0.070" (See Sht. 22D for Profile)

℄STA. 118+40 Lt. TO ℄STA. 115+60 Lt. KAM
CONSTRUCT:
Gutter, Type 2 (G1G14) (See Typ. Rdwy. Sect. for Detail)

℄STA. 127+00 Lt. KAM HWY TO ℄STA. 2+80 Rt. RAMP "H"
CONSTRUCT:
Gutter, Type 2 (G1G14) (See Typ. Rdwy. Sect. for Detail)

℄STA. 2+80 Rt. TO ℄STA 4+75 Rt. RAMP "H"
CONSTRUCT:
Gutter, Type 2 (G1218) (See Typ. Rdwy. Sect. for Detail)

℄STA 126+50 Rt KAM TO ℄STA 127+00 Rt KAM
CONSTRUCT: Gutter, Type 2 (G1218) (See Typ. Rdwy. Sect. for Detail)

℄STA. 125+30 KAM
CONSTRUCT: Type G1G14 GD1

℄STA 121+75 Rt KAM TO ℄STA 126+50 Rt KAM
CONSTRUCT: Gutter, Type 2 (G1614) (See Typ. Rdwy. Sect. for Detail)

℄STA. 116+50 Rt. KAM TO ℄STA. 121+50 Rt. KAM
CONSTRUCT: 2-Underdrain Cleanout
INSTALL: 6" Perforated Underdrain Pipe (See sht. 25D for Details)

℄STA 15+00 Rt. RAMP "A" TO ℄STA 117+25 Rt. KAM
CONSTRUCT: Gutter, Type 2 (G1614) (See Typ. Rdwy. Sect. for Detail)

℄STA 117+25 Rt. KAM TO ℄STA 121+75 Rt. KAM
CONSTRUCT: Gutter, Type 2 (G1218) (See Typ. Rdwy. Sect. for Detail)

℄STA 116+25 Rt. KAM
CONSTRUCT: Type G1G14 GD1
INSTALL: 24" RCP, Cl. III, 24" ACP, Cl. III or 24" CMP, Sht. "t"=0.100"

℄STA. 122+00 Rt. KAM
CONSTRUCT: Type G1G14 GD1
INSTALL: 24" RCP, Cl. III, 24" ACP, Cl. III or 24" CMP, Sht. "t"=0.100"

℄STA 2+85 Lt. RAMP "G" TO ℄STA 5+00 Lt. RAMP "G"
CONSTRUCT: 1-Underdrain Cleanout
INSTALL: 6" Perforated Underdrain Pipe (See sht. 25D for Details)

℄STA 119+00 Rt. KAM
CONSTRUCT: Type G1214 GD1
INSTALL: 24" RCP, Cl. III, 24" ACP, Cl. III or 24" CMP, Sht. "t"=0.109"

℄STA. 2+80 Rt. RAMP "H" TO ℄STA 4+70 Rt. RAMP "H"
CONSTRUCT: 1-Underdrain Cleanout
INSTALL: 6" Perforated Underdrain Pipe (See sht. 25D for Details)

DRAIN LINE "A"
℄STA. 116+64 (118'0/s Lt.) Kam.
CONSTRUCT:
Modified Type "B" Conc. Drop Intake # A-2 (See Sht. 28D for Det.)
INSTALL: 48" CMP, Sht. "t"=0.100" (See Sht. 20D for Profile)

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DETAIL PLAN OF DRAINAGE SYSTEM

HALEKOU INTERCHANGE
F.A.I. Project No. I-H3-1(24):11
Scale: 1" = 50' Date: Oct. 1982

SHEET No. 14D OF 50 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(24):11	1983	86	328

℄STA. 400+20 Lt. TO ℄STA. 400+90 Lt. H-3
CONSTRUCT:
Gutter, Type 2 (61G14)
(See Typical Roadway Section for Details)

DRAIN LINE "N-3"
℄STA. 405+12 Rt. H-3
CONSTRUCT:
Type G1G14 GD1 # N-9
INSTALL:
24" RCP CL III, 24" CMP, Sht. "t"=0.100" or 24" ACP CL III
(See sht. 23D for Profile)

DRAIN LINE "N-1"
℄STA. 3+20 Rt. RAMP "A"
CONSTRUCT:
Type G1G14 GD1 # N-11
INSTALL:
24" RCP, CL III, 24" ACP CL III or 24" CMP, Sht. "t"=0.070"
(See sht. 23D for Profile)

℄STA. 400+00 Lt. H-3
CONSTRUCT:
Conc. Spillway (See sht. 59D for Details)

DRAIN LINE "N-4"
℄STA. 408+75 Rt. H-3
CONSTRUCT:
Type G1G14 GD1 # N-8
INSTALL:
24" RCP, CL III, 24" CMP, Sht. "t"=0.100" or 24" ACP, CL III
(See sht. 23D for Profile)

℄STA. 400+00 Lt. H-3 TO ℄STA. 8+25 Rt. RAMP "C"
CONSTRUCT:
Gutter, Type 2 (61218)
(See Typical Roadway Section for Details)

℄STA. 400+07 Lt. H-3 TO ℄STA. 8+20 Rt. RAMP "C"
CONSTRUCT:
2-Underdrain Cleanouts
INSTALL:
6" Perforated Underdrain Pipe
(For Det. see sht. 25D)

℄STA. 405+55 Lt. H-3 TO STA. 497+35 Lt. H-3
CONSTRUCT:
Gutter, Type 2 (61G14)
(See Typical Roadway Section for Details)

℄STA. 12+15 Lt. RAMP "C" TO ℄STA. 6+20 Lt. RAMP "C"
CONSTRUCT:
Gutter, Type 2 (61218) (See Typical Roadway Sect. for Det.)

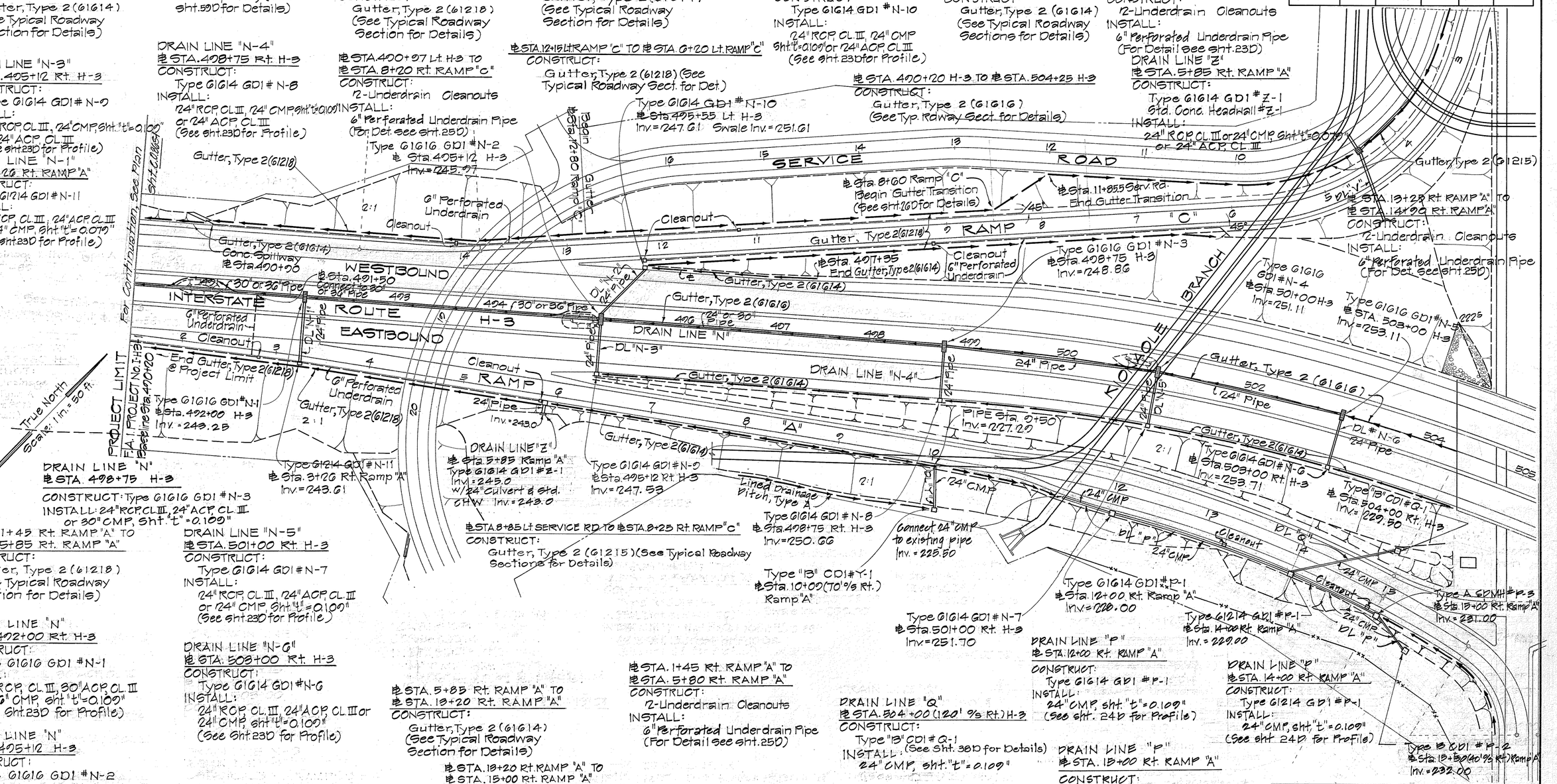
DRAIN LINE "N-2"
℄STA. 405+55 Lt. H-3
CONSTRUCT:
Type G1G14 GD1 # N-10
INSTALL:
24" RCP, CL III, 24" CMP Sht. "t"=0.100" or 24" ACP, CL III
(See sht. 23D for Profile)

℄STA. 405+12 Rt. H-3 TO ℄STA. 504+44 Rt. H-3
CONSTRUCT:
Gutter, Type 2 (61G14)
(See Typical Roadway Sections for Details)

℄STA. 6+10 Lt. RAMP "C" TO ℄STA. 12+20 Lt. RAMP "C"
CONSTRUCT:
2-Underdrain Cleanouts
INSTALL:
6" Perforated Underdrain Pipe
(For Detail see sht. 23D)

DRAIN LINE "Z"
℄STA. 5+85 Rt. RAMP "A"
CONSTRUCT:
Type G1G14 GD1 # Z-1
Std. Conc. Headwall # Z-1
INSTALL:
24" RCP CL III or 24" CMP, Sht. "t"=0.070" or 24" ACP, CL III

℄STA. 400+20 H-3 TO ℄STA. 504+25 H-3
CONSTRUCT:
Gutter, Type 2 (61G16)
(See Typ. Rdway Sect. for Details)



DRAIN LINE "N"
℄STA. 498+75 H-3
CONSTRUCT: Type G1G16 GD1 # N-3
INSTALL: 24" RCP, CL III, 24" ACP, CL III or 30" CMP, Sht. "t" = 0.100"

℄STA. 1+45 Rt. RAMP "A" TO ℄STA. 5+85 Rt. RAMP "A"
CONSTRUCT:
Gutter, Type 2 (61218)
(See Typical Roadway Section for Details)

DRAIN LINE "N"
℄STA. 402+00 Rt. H-3
CONSTRUCT:
Type G1G16 GD1 # N-1
INSTALL:
30" RCP, CL III, 30" ACP, CL III or 30" CMP, Sht. "t"=0.100"
(See Sht. 23D for Profile)

DRAIN LINE "N"
℄STA. 405+12 H-3
CONSTRUCT:
Type G1G16 GD1 # N-2
INSTALL:
30" RCP, CL III, 30" ACP, CL III or 30" CMP, Sht. "t"=0.100"
(See Sht. 23D for Profile)

DRAIN LINE "N"
℄STA. 501+00 & ℄STA. 503+00 H-3
CONSTRUCT:
Type G1G16 GD1 # N-4 & # N-5
INSTALL:
24" RCP, CL III, 24" ACP, CL III or 24" CMP, Sht. "t"=0.100"
(See Sht. 23D for Profile)

DRAIN LINE "N-5"
℄STA. 501+00 Rt. H-3
CONSTRUCT:
Type G1G14 GD1 # N-7
INSTALL:
24" RCP, CL III, 24" ACP, CL III or 24" CMP, Sht. "t"=0.100"
(See sht. 23D for Profile)

DRAIN LINE "N-6"
℄STA. 503+00 Rt. H-3
CONSTRUCT:
Type G1G14 GD1 # N-6
INSTALL:
24" RCP, CL III, 24" ACP, CL III or 24" CMP, Sht. "t"=0.100"
(See sht. 23D for Profile)

℄STA 8+85 Lt SERVICE RD TO ℄STA. 8+25 Rt. RAMP "C"
CONSTRUCT:
Gutter, Type 2 (61215) (See Typical Roadway Sections for Details)

℄STA. 5+85 Rt. RAMP "A" TO ℄STA. 13+20 Rt. RAMP "A"
CONSTRUCT:
Gutter, Type 2 (61G14)
(See Typical Roadway Section for Details)

℄STA. 13+20 Rt. RAMP "A" TO ℄STA. 15+00 Rt. RAMP "A"
CONSTRUCT:
Gutter, Type 2 (61218)
(See Typical Roadway Section for Details)

℄STA. 1+45 Rt. RAMP "A" TO ℄STA. 5+80 Rt. RAMP "A"
CONSTRUCT:
2-Underdrain Cleanouts
INSTALL:
6" Perforated Underdrain Pipe
(For Detail see sht. 25D)

DRAIN LINE "Q"
℄STA. 0+91 (22.5' % Lt.) RAMP "B"
CONSTRUCT:
Type "A" SDMH # Q-1
INSTALL:
24" CMP, Sht. "t"=0.100"

DRAIN LINE "Q"
℄STA. 504+00 (120' % Rt.) H-3
CONSTRUCT:
Type "B" CD1 # Q-1
INSTALL: (See Sht. 38D for Details)
24" CMP, sht. "t"=0.109"

DRAIN LINE "Y"
℄STA. 10+00 (70' % Rt.) RAMP "A"
PIPE STA. 0+50 KIONAOLE BRANCH
CONSTRUCT:
Type "B" CD1 # Y-1
INSTALL: (See Sht. 38D for Details)
24" CMP, sht. "t"=0.109"
(See Sht. 24D for Profile)

DRAIN LINE "P"
℄STA. 12+00 Rt. RAMP "A"
CONSTRUCT:
Type G1614 GD1 # P-1
INSTALL:
24" CMP, sht. "t"=0.109"
(See sht. 24D for Profile)

DRAIN LINE "P"
℄STA. 13+00 Rt. RAMP "A"
CONSTRUCT:
Type "A" SDMH # P-3
INSTALL:
24" CMP, sht. "t"=0.109"
(See sht. 24D for Profile)

DRAIN LINE "P"
℄STA. 14+00 Rt. RAMP "A"
CONSTRUCT:
Type G1214 GD1 # P-1
INSTALL:
24" CMP, sht. "t"=0.109"
(See sht. 24D for Profile)

DRAIN LINE "P"
℄STA. 15+50 (40' % Rt.) RAMP "A"
CONSTRUCT:
Type "B" CD1 # P-2
INSTALL: (See Sht. 38D for Details)
24" CMP, sht. "t"=0.109"
(See sht. 24D for Profile)

DATE	REVISION
11/16/87	Deleted Lined Drainage Ditch, Type A and Earth Ditch at ℄Sta. 498+00 ± to ℄Sta. 502+20

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DETAIL PLAN OF DRAINAGE SYSTEM

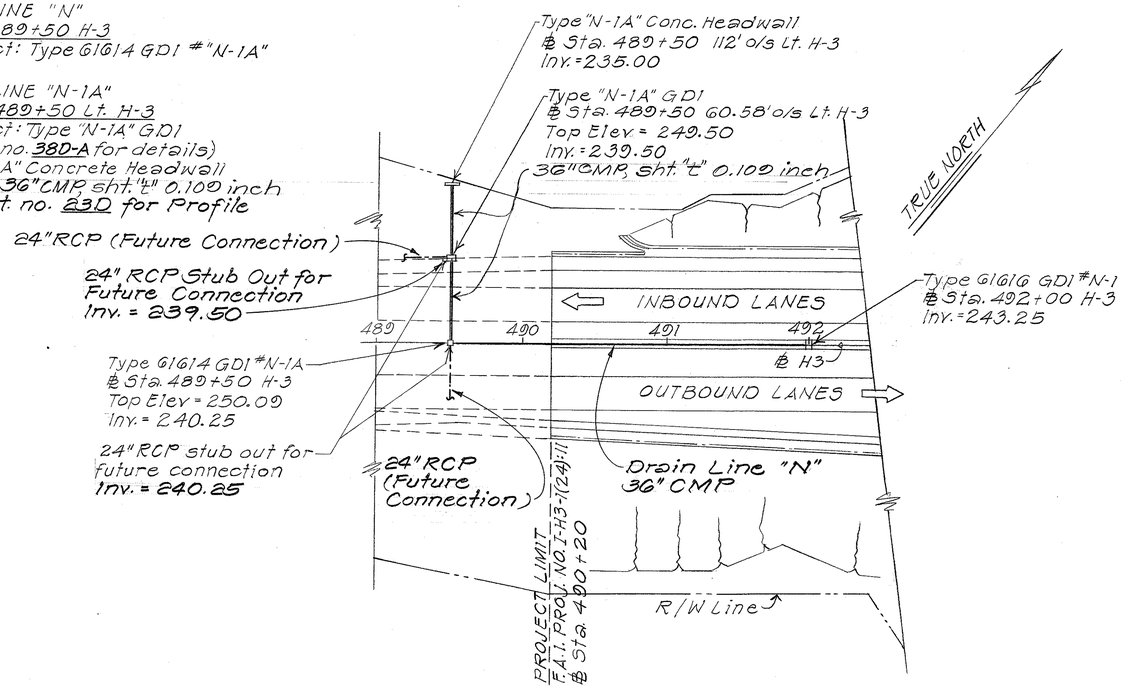
HALEKOU INTERCHANGE
F.A.I. Project No. I-H3-1(24):11
Scale: 1"=50' Date: Oct. 1982

SHEET NO. 15D OF 50 SHEETS

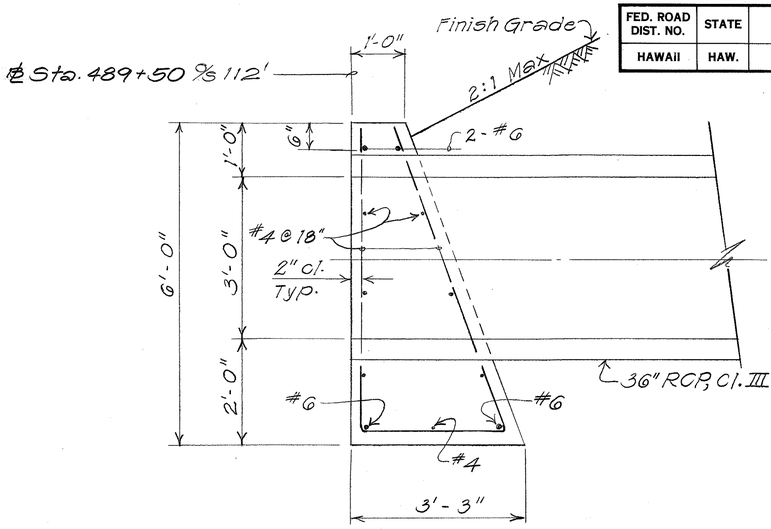
C.O. 86

DRAIN LINE "N"
℄ Sta. 489+50 H-3
Construct: Type G1G14 GD1 #"N-1A"

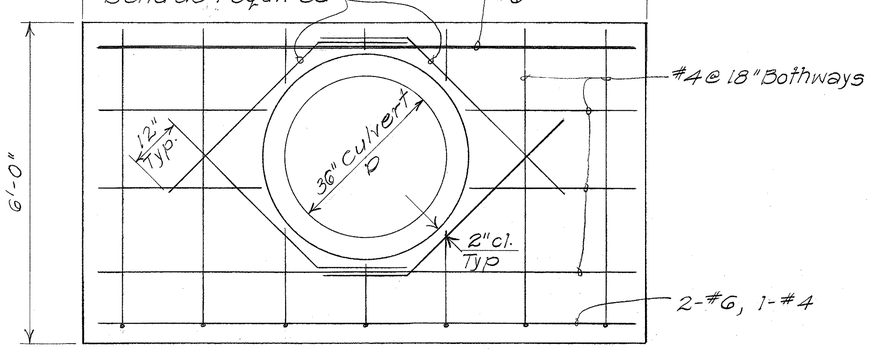
DRAIN LINE "N-1A"
℄ Sta. 489+50 Lt. H-3
Construct: Type "N-1A" GD1
(See sht. no. 38D-A for details)
Type "N-1A" Concrete Headwall
Install: 36" CMP, sht. "t" 0.109 inch
(See sht. no. 23D for Profile



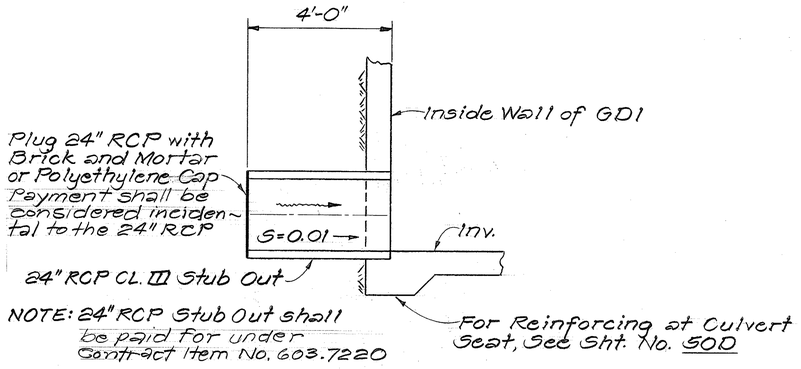
PLAN
Scale: 1" = 50'



SECTION



ELEVATION
DETAIL OF TYPE "N-1A" CONCRETE HEADWALL
Scale: 3/4" = 1'-0"



TYPICAL DETAIL OF 24" RCP STUB OUT
Scale: 1/2" = 1'-0"

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.			15D-A	59

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

DATE	REVISION
11-16-87	Added new sheet to Drainage Plan & Detail.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS

INTERSTATE ROUTE H-3
HALEKOU INTERCHANGE
F.A.I. Proj. No. I-H3-1(24):11
Scale: As Shown Date: Nov. 1987

SHEET No. 15D-A OF 59 SHEETS

C.O. 86 S-1

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HB-1(24):11	1983	87	328

DRAIN LINE "S-1"
℄STA. 15+52 Rt. TO ℄STA. 16+12 Rt. RAMP "D"
CONSTRUCT:
Lined Drainage Ditch, Type E
(See sht. 26D for Typical)

DRAIN LINE "S-1"
℄STA. 16+12 Rt. TO ℄STA. 17+00 Rt. RAMP "D"
CONSTRUCT:
Lined Drainage Ditch, Type D
(See sht. 26D for Typical)

DRAIN LINE "S-2"
℄STA. 16+00 Rt. RAMP "D"
CONSTRUCT:
Type "E" SDMH #S-1
INSTALL:
30" RCP, CL. III (See Sht. 22D for Profile)

DRAIN LINE "S-1"
℄STA. 10G+00 Lt. KAM HWY.
CONSTRUCT:
Type G1214 GD1 #S-1
INSTALL:
24" RCP, CL. III, 24" ACP, CL III or 24" CMP, Sht. "t"=0.079"
(See sht. 22D for Profile)

DRAIN LINE "T"
℄STA. 15+00 Rt. RAMP "D"
CONSTRUCT:
Type G1214 GD1 #T-1
Std. Conc. Headwall
INSTALL:
24" RCP, CL. III, 24" ACP, CL. III or 24" CMP, Sht. "t"=0.109"
(See sht. 22D for Profile)

DRAIN LINE "T"
℄STA. 15+23 Rt. TO ℄STA. 15+52 Rt. RAMP "D"
CONSTRUCT:
Lined Drainage Ditch, Type B
(See sht. 26D for Typical)

Std. Conc. Headwall #T-1
℄Sta. 15+23 (18'% Rt.) Ramp "D"
Inv. = 228.1

DRAIN LINE "T"

Lined Drainage Ditch, Type B
End Lined Drainage Ditch, Type B
Begin Lined Drainage Ditch, Type E
℄Sta. 15+52 (23.5'% Rt.) Ramp "D"

℄Sta. 16+00 Rt. Ramp "D"
Type "E" SDMH #S-1 over exist. 30" RCP
@ from ℄ Ditch Inv. = 226.1±

Exist. 30" RCP to remain

Type "Y" CD1 #S-12
℄Sta. 17+00 (37'% Rt.) Ramp "D"
Inv. = 215.00 (60")
Inv. = 217.30 (24" ℄ Ditch)

DL "S-2"
30" RCP

℄Sta. 16+00 RAMP "D"
Conn. to Lined Drainage Ditch
Inv. = 225.20

Type G1214 GD1 #W-1
℄Sta. 10G+00 Kam Hwy.
Inv. = 226.00

Type G1614 GD1 #E-1
℄Sta. 17+00 Rt. RAMP "D"
Inv. = 225.74

End Lined Drainage Ditch, Type E
Begin Lined Drainage Ditch, Type D
℄Sta. 16+12 Ramp "D"

Type G1214 CD1 #S-1
℄Sta. 10G+00 Lt. Kam Hwy.
Inv. = 228.4

Exist. Top Bank

Type G1214 GD1 #X-1
Inv. = 254.90

Plug Exist. Cleanout

Demolish & remove existing CD1

Oleanout

6" Perforated Underdrain

Gutter, Type 2 (61216)

Oleanout

DL "S" 24" PIPE

Gutter Transition

Abandon Exist. 6" Underdrain

NORTHBOUND

Exist. 42" RCP to remain

Plug end of exist. culvt.

New 12" Water

Abandon exist. 42" RCP

Gutter, Type 2 (61218)

6" Perforated Underdrain

Type G1614 GD1 #X-1

DL "X"

Modified Type "A" SDMH
Inv. = 230.00

SOUTHBOUND

DRAIN LINE "W"

Exist. 12" Water

48" RCP

Lined Drainage Ditch, Type C

Top of Cut

Toe of Fill

Type G1214 GD1 #X-2

Gutter, Type 2 (61215)

24" RCP

SERVICE ROAD

48" RCP

℄Channel Sta. 0+28
Inv. = 207.00

Type G1214 GD1 #W-2
℄Sta. 10G+00 (62'% Rt.) Kam
Inv. = 224.90 (48")
Inv. = 231.00 (24")

℄ CHANNEL

Gutter, Type 2 (61614)

KAMOOALII BRANCH

KIONAOLE BRANCH

Type G1614 G.D.1. #W-3
℄STA. 4+70 Rt. Service Rd.
Inv. = 232.00

Type G1614 G.D.1.
℄STA. 8+60± Rt. Service Rd. Inv. = 216.25

DRAIN LINE "V"
24" CMP,

Connect to structural Plate Pipe Inv. = 218.0±

℄ Pipe Sta. 3+58
connect to Structural Plate Pipe
Inv. = 213.20

Gutter, Type 2 (61215)

Gutter, Type 2 (61614)

Type G1614 GD1 #T-1
℄Sta. 15+00 Rt. Ramp "D"
Inv. = 230.80

Gutter, Type 2 (61614)

Remove exist. SDMH & 30" RCP

Gutter, Type 2 (61614)

Remove exist. Conc. Underdrain

RAMP "E"

RAMP "D"

RAMP "C"

Gutter, Type 2 (61614)

Type "H" Grated CD1 #S-1
℄Sta. 17+08 (65'% Rt.) Ramp "E"
Inv. = 210.46 (24")
Inv. = 213.96 (60")

DL "Z-G"
Std. CHW #Z-7
Inv. = 223.00

℄Sta. 12+57 Rt. Ramp "F"
Type G1614 GD1 #Z-7
Inv. = 224.10

Pipe Sta. 5+55
Connect to concrete channel
Inv. = 200.80

Pipe Sta. 5+56
Inv. = 211.86

Gutter, Type 2 (61614)

DRAIN LINE "S"

KAMEHAMEHA HIGHWAY

Slope Varies

Type G1614 GD1 #S-3
℄Sta. 10B+50 Kam Hwy
Inv. = 225.60

Std. Conc. Headwall #V-1
℄ Sta. 8+02 Lt. Service Rd.
Inv. = 214.80

Type G1214 GD1 #V-1
℄Sta. 8+85 Lt. Service Rd.
Inv. = 214.00

Gutter, Type 2 (61215)

Gutter, Type 2 (61614)

True North
Scale: 1 in. = 50 ft.

℄STA. 15+00 Rt. TO ℄STA. 18+30 Rt. RAMP "D"
CONSTRUCT:
Gutter, Type 2 (61614)
(See Typ. Ramp Section for Detail)

℄STA. 18+30 Rt. RAMP "D" TO ℄STA. 10G+00 Lt. KAM
CONSTRUCT:
Gutter, Type 2 (61218)
(See Typ. Ramp Section for Detail)

℄STA. 13+50 Lt. TO ℄STA. 17+35 Lt. RAMP "E"
CONSTRUCT:
Gutter, Type 2 (61614)
(See Typ. Ramp Section for Detail)

DRAIN LINE "S"
℄STA. 17+00 Rt. RAMP "D"
CONSTRUCT: Type "Y" CD1 #S-2
(See sht. 32D & 33D for Details)
INSTALL:
60" RCP, Cl. III or 60" CMP, sht. "t"=0.138"
(See sht. 22D for Profile)

DRAIN LINE "D"
℄STA. 16+75 Lt. RAMP "E"
CONSTRUCT:
Type G1614 GD1 #D-1
INSTALL:
24" RCP, CL. III, 24" ACP, CL. III or 24" CMP, sht. "t"=0.079"
(See sht. 21D for Profile)

DRAIN LINE "S"
℄STA. 17+08 Rt. RAMP "E"
CONSTRUCT: Type "H" Grated CD1 #S-1
(See sht. 31D for Details)
INSTALL:
60" RCP, CL. III or 60" CMP, Sht. "t"=0.138"
(See sht. 22D for Profile)

DRAIN LINE "E"
℄STA. 17+00 Rt. RAMP "D"
CONSTRUCT:
Type G1614 GD1 #E-1
INSTALL:
24" CMP, sht. "t"=0.079"
(See sht. 32D for Profile)

DRAIN LINE "Z-G"
℄STA. 2+57 Rt. RAMP "F"
CONSTRUCT:
Type G1614 GD1 #Z-7
Standard Conc. Headwall #Z-7
INSTALL:
24" RCP, Cl. III, 24" ACP, CL. III or 24" CMP, Sht. "t"=0.079"

℄STA 0+00 Rt. TO ℄STA. 12+75 Rt. SERVICE RD.
CONSTRUCT:
Gutter, Type 2 (61614)
(See Plan Sheet 5 for Details)

℄STA. 8+60± Rt. SERVICE RD.
CONSTRUCT:
Type G1614 G.D.1.
INSTALL:
24" CMP, Sht. "t"=0.079"

℄STA. 1+20 Lt. TO ℄STA. 4+60 Lt. SERVICE RD.
CONSTRUCT:
Lined Drainage Ditch, Type C
(See sht. 26D for Typical)

DRAIN LINE "S-3"
℄ STA. 10B+50 KAM HWY
CONSTRUCT:
Type G1614 GD1 #S-3
INSTALL:
24" RCP, CL. III, 24" ACP, CL. III or 24" CMP, Sht. "t"=0.109"
(See sht. 22D for Profile)

℄ STA. 102+00 Lt. KAM HWY TO ℄ STA. 17+95 Rt. RAMP "D"
CONSTRUCT:
2 Underdrain Cleanouts
INSTALL:
6" Perforated Underdrain Pipe
(For Detail See sht. 25D)

℄STA. 102+00 Lt. TO ℄STA. 10G+00 Lt. KAM HWY
CONSTRUCT:
Gutter, Type 2 (61216)
(For Detail, See Typical, Roadway Section)

DRAIN LINE "W"
℄STA. 4+70 Rt. SERVICE RD.
CONSTRUCT:
Type G1614 G.D.1. #W-3
INSTALL:
24" RCP, CL. III
(See sht. 22D for Profile)

DRAIN LINE "W"
℄STA. 10G+00 (62'% Rt.) KAM HWY
CONSTRUCT:
Type G1214 GD1 #W-2
INSTALL:
48" RCP, CL. III
(See sht. 22D for Profile)

DRAIN LINE "W"
℄STA. 10G+00 KAM HWY.
CONSTRUCT:
Type G1614 GD1 #W-1
INSTALL:
48" RCP, CL. III (See sht. 22D for Profile)
PLUG:
Exist. 42" RCP @ Invert W/ Brick & mortar

DRAIN LINE "V"
℄STA. 8+85 Lt. SERVICE RD.
CONSTRUCT:
Type G1214 GD1 #V-1
INSTALL:
24" CMP, sht. "t"=0.079" or 24" RCP, Cl. III or 24" ACP, Cl. III
(See sht. 24D for Profile)

℄STA. 4+60 Lt. SERVICE RD. TO ℄STA. 8+25 Rt. Ramp "C"
CONSTRUCT:
Gutter, Type 2 (61215)
(See Typical Roadway Section for Detail)

DRAIN LINE "V"
℄STA. 8+92 Lt. SERVICE RD.
CONSTRUCT:
Std. Conc. Headwall
INSTALL:
24" CMP, sht. "t" = 0.079" or 24" RCP, Cl. III or 24" ACP, Cl. III (See sht. 24D for Profile)

DATE	REVISION
4/1/85	Added Type G1614 G.D.1. and 24 Inch RCP at Sta. 4+70 Rt. Service Road. Added Gutter, Type 2 (61614) along right shoulder of Service Road. Added Type G1614 G.D.1. and 24 Inch C.M.P. at Sta. 8+60± Rt. Service Road

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DETAIL PLAN OF DRAINAGE SYSTEM

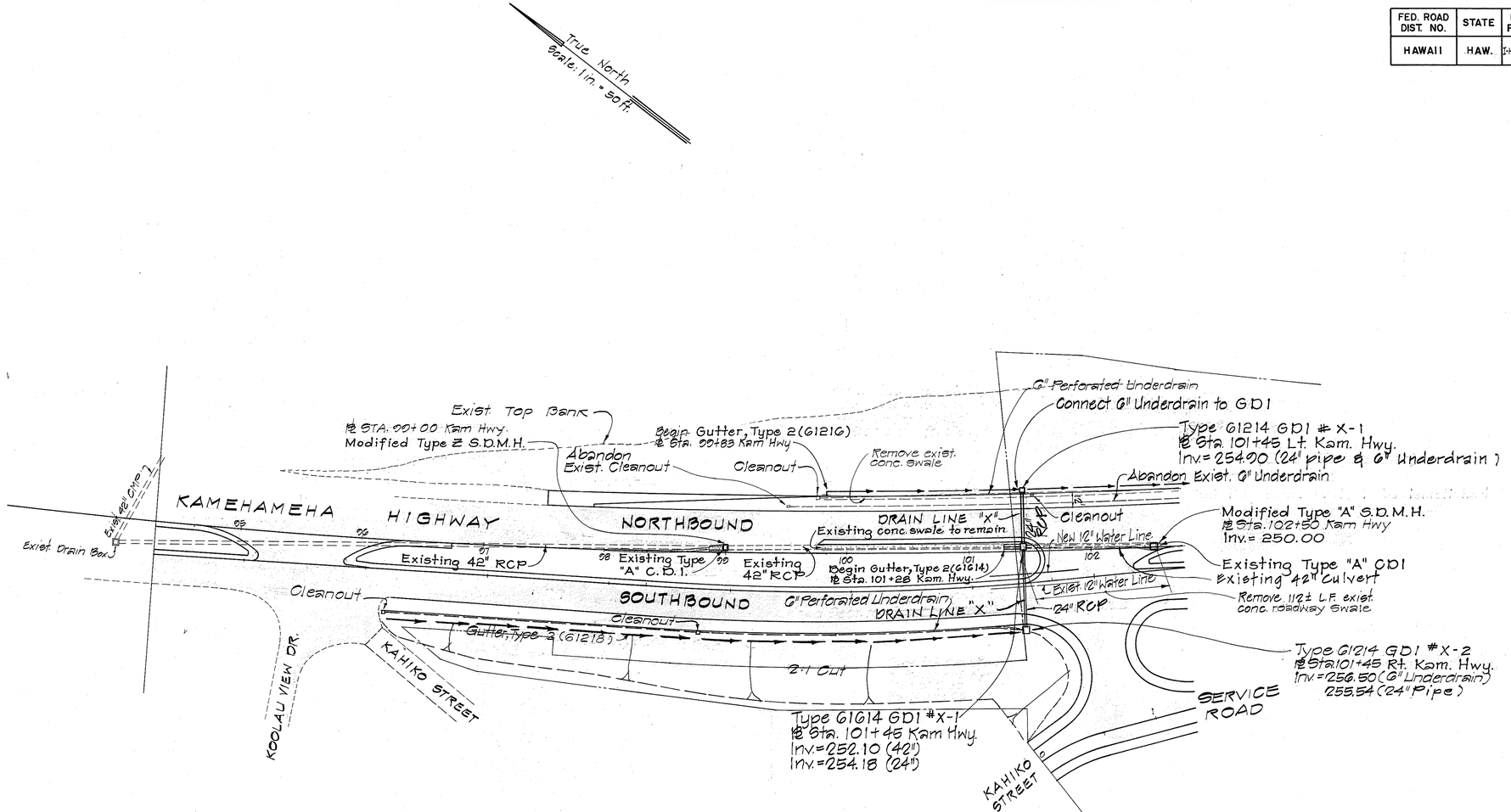
HALEKOU INTERCHANGE
F.A.I. Project No. I-HB-1(24):11
Scale: 1" = 50' Date: Oct. 1982

SHEET NO. 16D OF 50 SHEETS

C.O. 87

D-2-4-5

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HB-1(24):11	1983	88	328



℄ Sta. 00+00 Lt. KAM. HWY.
CONSTRUCT:
Modified Type Z SDMH
(See Sht. 340 for Details)

℄ Sta. 00+75 Lt. to ℄ Sta. 102+00 Lt. KAM. HWY.
CONSTRUCT:
2- Underground Cleanout
INSTALL:
6" Perforated Underdrain Pipe
(For Detail, see Sht. 250)

DRAIN LINE "X"
℄ Sta. 101+45 Lt. KAM. HWY.
CONSTRUCT:
Type 61214 GD1 #X-1

INSTALL:
24" RCP, CL III
(See sht. 220 for Profile)

DRAIN LINE "X"
℄ Sta. 101+45 (66'0% Rt.) KAM. HWY.
CONSTRUCT:
Type 61214 GD1 #X-2

INSTALL:
24" RCP, CL III
(See sht. 220 for Profile)

DRAIN LINE "X"
℄ Sta. 101+45 KAM. HWY.
CONSTRUCT:
Type 61614 GD1 #X-1

℄ Sta. 00+83 Lt. to ℄ Sta. 102+00 Lt. KAM. HWY.
CONSTRUCT:
Gutter, Type 2(61216)
(See Typical Roadway Sections for Details)

℄ Sta. 101+28 to 101+45 KAM. HWY.
CONSTRUCT:
Gutter, Type 2(61614)
(See Typical Roadway Sections for Details)

℄ Sta. 102+50 Lt. KAM HWY.
CONSTRUCT:
Modified Type "A" SDMH
(See Sht. 200 for Details)

℄ Sta. 96+20 Rt. KAM. HWY. to
℄ Sta. 101+45 Rt. KAM. HWY.
CONSTRUCT:
Gutter, Type 2(61218) (See Typ. Ramp Section for Detail)
2-Underdrain Cleanouts
INSTALL:
6" Perforated Underdrain Pipe
(For detail see Sht. 250)

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DETAIL PLAN OF DRAINAGE SYSTEM

HALEKOU INTERCHANGE
F. A. I. Project No. I-HB-1(24):11
Scale: 1" = 50' Date: Oct. 1982

SHEET NO. 170 OF 510 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HB-1(24)11	1983	89	328

℄ Sta. 12+75 Service Road
Conc. Spillway

True North
Scale: 1in. = 50 Ft.

℄ STA. 12+75 SERVICE RD. & ℄ STA. 21+27 SERVICE RD.

CONSTRUCT:
Conc. Spillway
(See sht. 59D for Detail)

℄ STA. 22+16 LT. SERVICE ROAD TO ℄ STA. 10+00 RT. RAMP "A"

CONSTRUCT:
Lined Drainage Ditch, Type A
(See Sht. 26D for Detail)

KIONAOLE ROAD

KIONAOLE BRANCH
2 of 120° Sect. Plate Pipe

Lined Drainage Ditch, Type A

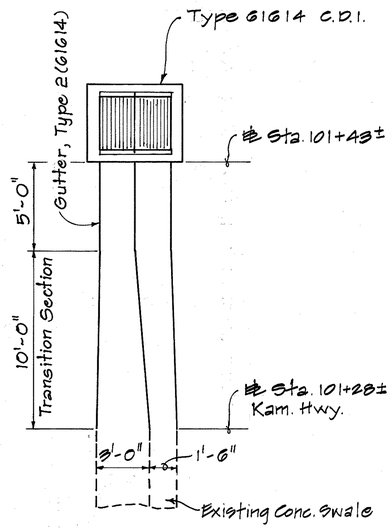
℄ STA. 21+80 Service Road
Concrete Spillway

℄ STA. 20+02 LT. to ℄ STA. 21+80 LT. SERVICE RD.

CONSTRUCT:
Gutter, Type 2 (G1614)
(See Plan Sheet 5 for Details)

℄ STA. 21+80 LT. to ℄ STA. 22+16 LT. SERVICE RD.

CONSTRUCT:
Concrete Spillway
(See Plan Sheet 18D for Details)



PLAN ~ GUTTER TRANSITION
EXISTING CONCRETE SWALE TO GUTTER, TYPE 2 (G1614) AT STA. 101+28± TO STA. 101+43± KAM HWY.
Scale: 1/4"=1'-0"

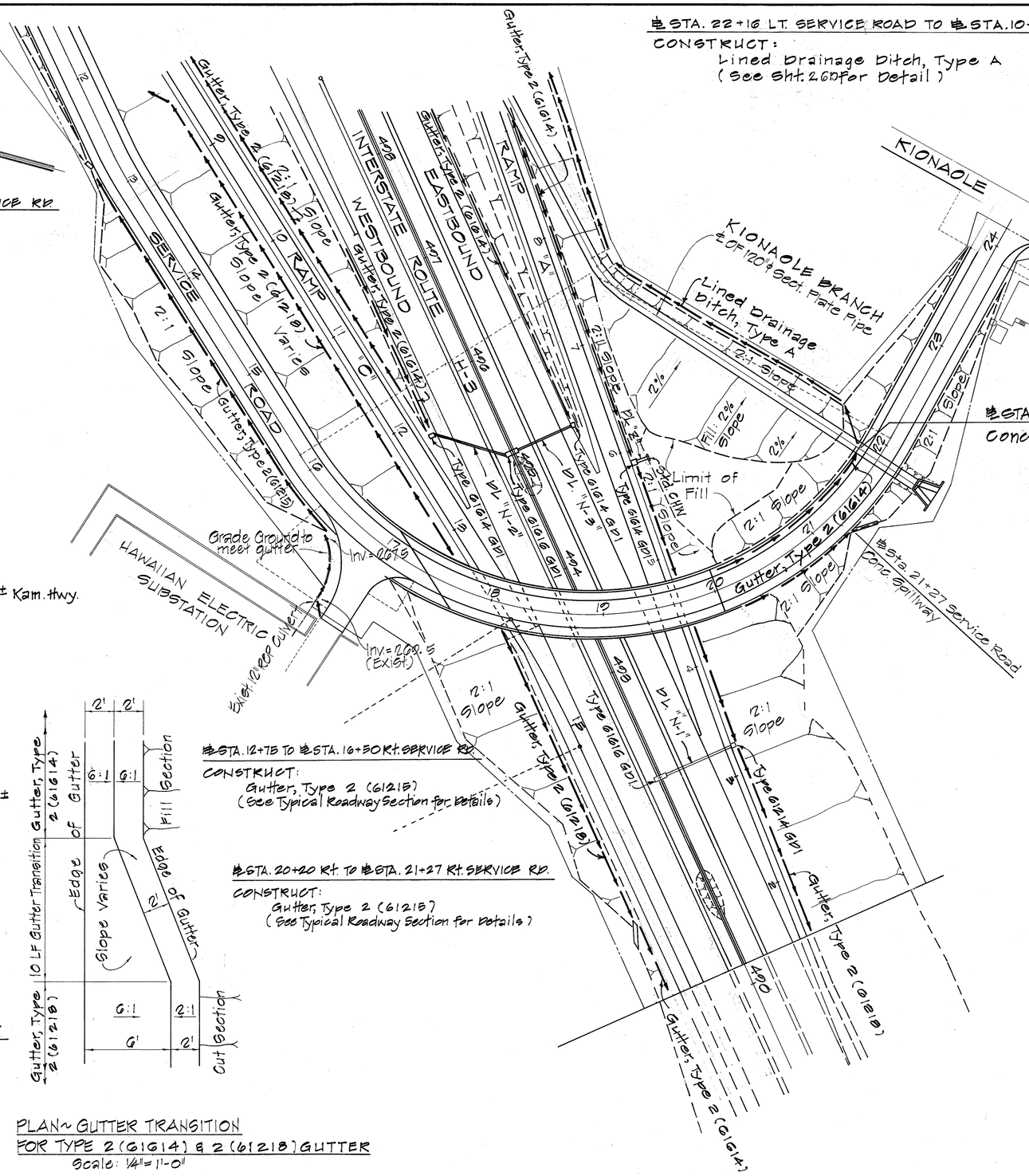
PLAN ~ GUTTER TRANSITION
FOR TYPE 2 (G1614) & 2 (G1218) GUTTER
Scale: 1/4"=1'-0"

℄ STA. 12+75 TO ℄ STA. 16+30 Rt. SERVICE RD.

CONSTRUCT:
Gutter, Type 2 (G1218)
(See Typical Roadway Section for Details)

℄ STA. 20+20 Rt. TO ℄ STA. 21+27 Rt. SERVICE RD.

CONSTRUCT:
Gutter, Type 2 (G1218)
(See Typical Roadway Section for Details)



DATE	REVISION
4/1/85	Added Gutter, Type 2 (G1614) ℄ Sta. 20+02 Lt. to ℄ Sta. 21+80 Lt. Service Rd. Added Concrete Spillway at ℄ Sta. 21+80 Lt. Service Rd.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DETAIL PLAN OF DRAINAGE SYSTEM

HALEKOU INTERCHANGE
F.A.I. Project No. I-HB-1(24):11
Scale: 1"=50' Date: Oct. 1982

SHEET NO. 18D OF 328 SHEETS

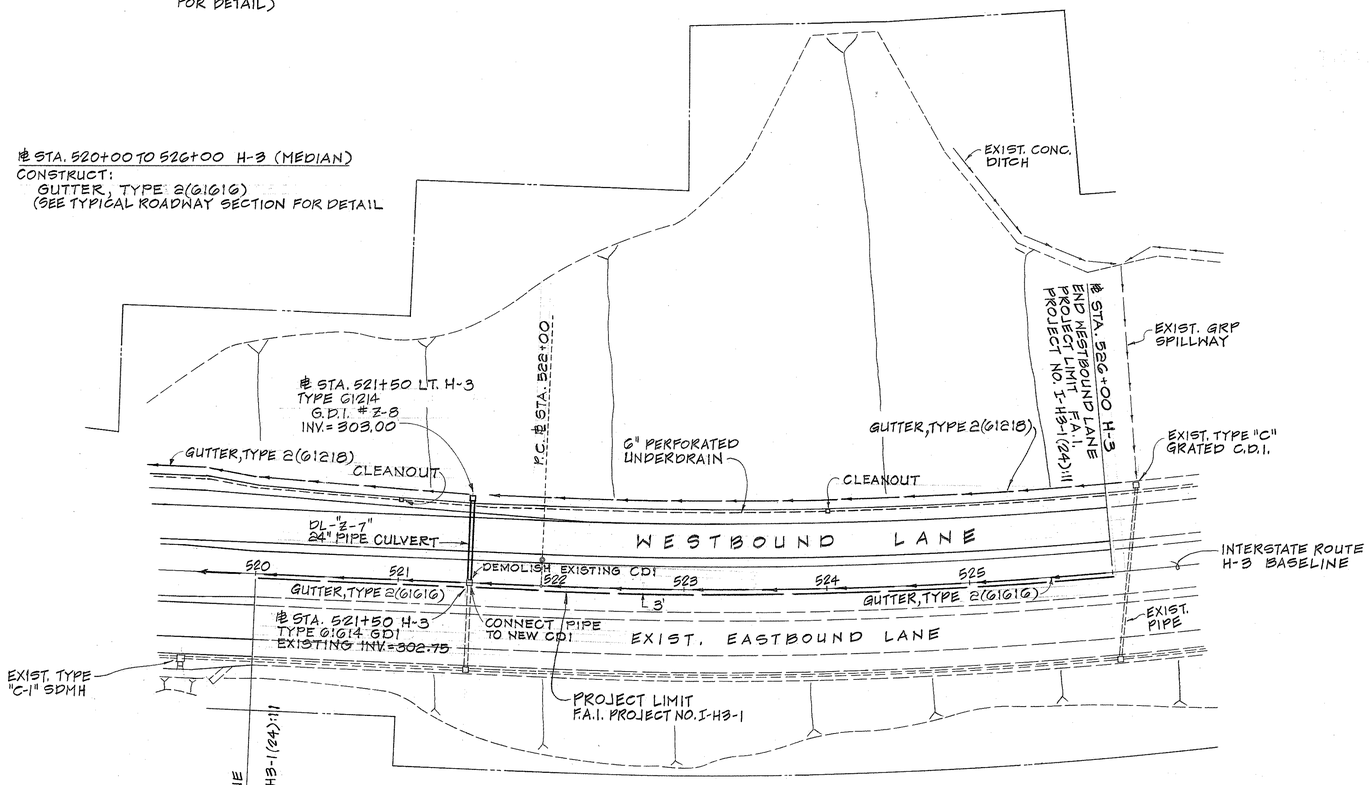
C.O. 89

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-H3-1(24):11	1982	90	328

℄ STA. 518+78 TO ℄ STA. 526+00 LT. H-3
CONSTRUCT:
2- UNDERDRAIN CLEANOUTS
INSTALL:
6" PERFORATED
UNDERDRAIN PIPE
(SEE DETAIL, SHT. 25 D)

℄ STA. 520+00 TO ℄ STA. 526+00 LT H-3
CONSTRUCT:
GUTTER, TYPE 2(6:12:18)
(SEE TYPICAL ROADWAY SECTION
FOR DETAIL)

℄ STA. 520+00 TO 526+00 H-3 (MEDIAN)
CONSTRUCT:
GUTTER, TYPE 2(6:16:6)
(SEE TYPICAL ROADWAY SECTION FOR DETAIL



DRAIN LINE "Z-7"
℄ STA. 521+50 LT. H-3
CONSTRUCT:
TYPE G1214 GDI #Z-8

INSTALL
24" CMP, SHT. "T"= 0.109" OR
24" RCP, CL. III OR
24" ACP, CL. III
(SEE SHT. 24 D FOR PROFILE)

DRAIN LINE "Z-7"
℄ STA. 521+50 H-3
CONSTRUCT:
TYPE G1614 GDI

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

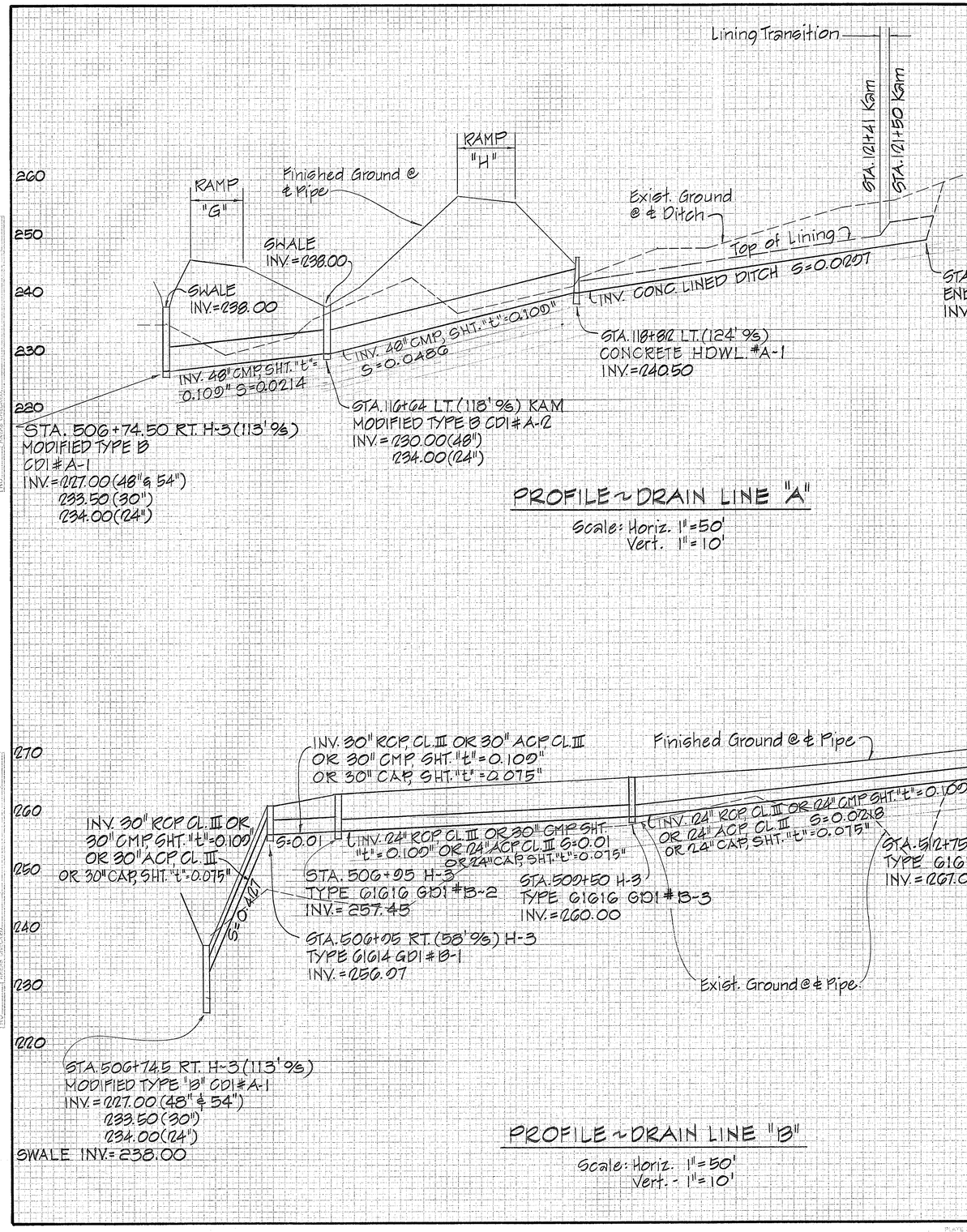
DETAIL PLAN OF DRAINAGE SYSTEM

HALEKOU INTERCHANGE
F.A.I. Project No. I-H3-1(24):11
Scale: 1"=50' Date: Oct. 1982

SHEET No. 190 OF 59 SHEETS

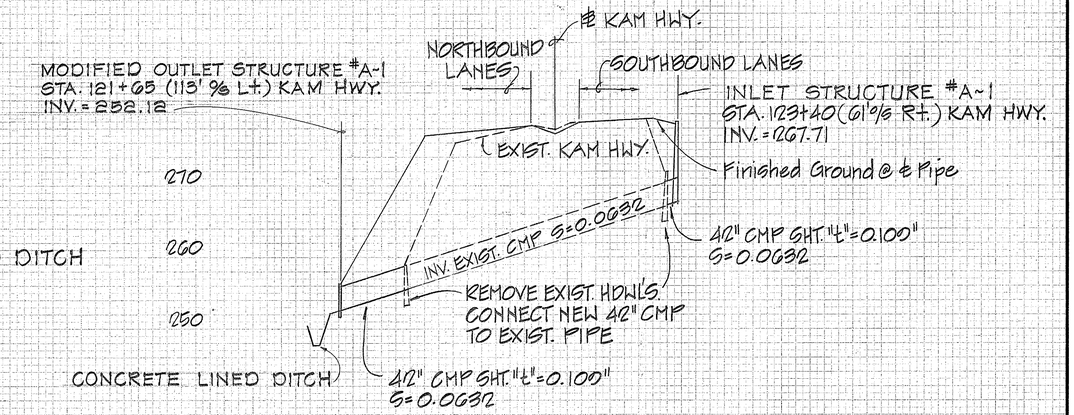
PRINTED ON NO. 1000H CLEARPRINT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(24):11	1983	91	328



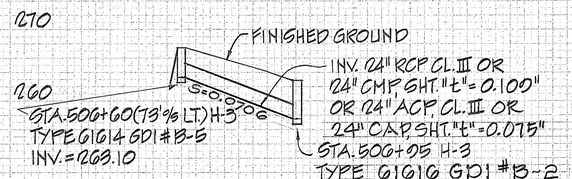
PROFILE ~ DRAIN LINE "A"

Scale: Horiz. 1"=50'
Vert. 1"=10'



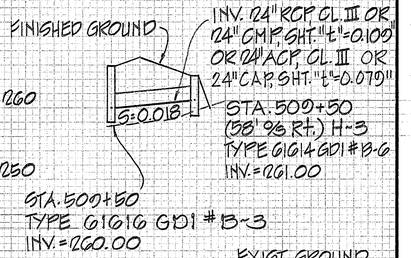
PROFILE ~ DRAIN LINE "A-1"

Scale: Horiz. 1"=50'
Vert. 1"=10'



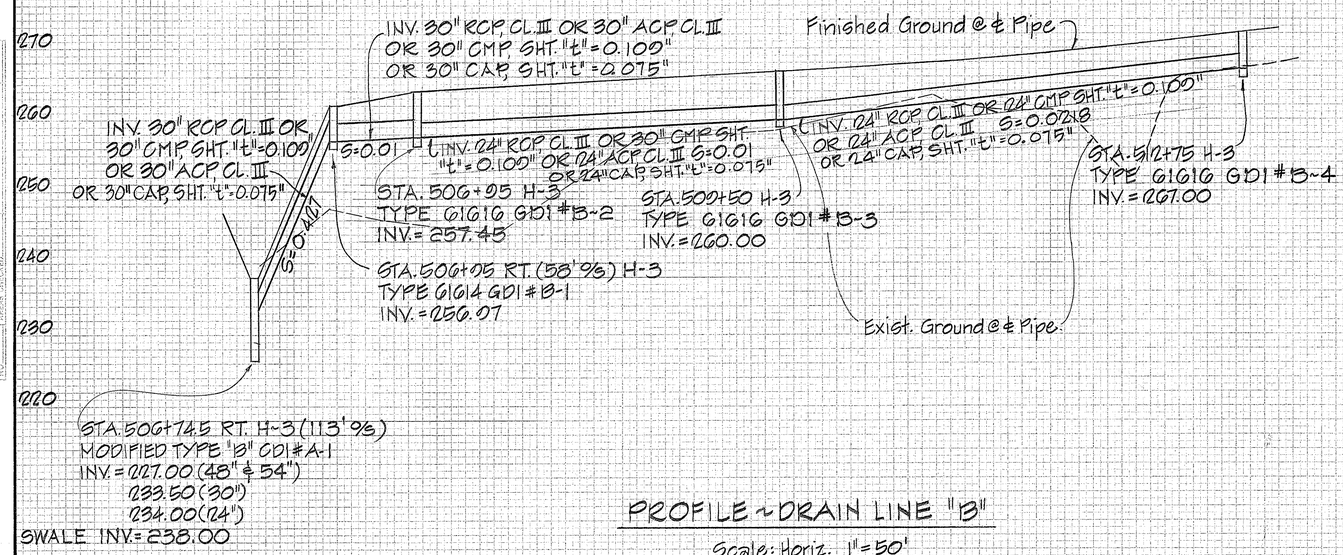
PROFILE ~ DRAIN LINE "B-1"

Scale: Horiz. 1"=50'
Vert. 1"=10'



PROFILE ~ DRAIN LINE "B-2"

Scale: Horiz. 1"=50'
Vert. 1"=10'



PROFILE ~ DRAIN LINE "B"

Scale: Horiz. 1"=50'
Vert. 1"=10'

GEORGE YORITA
REGISTERED PROFESSIONAL ENGINEER
No. 1156
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
George Yorita

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS

INTERSTATE ROUTE H-3
HALEKOU INTERCHANGE
F.A.I. Proj. No. I-H3-(24):11
Scale: As Shown Date: Oct. 1982
SHEET NO. 20D OF 50 SHEETS

FINAL SURVEY / ORIGINAL SURVEY
SURVEYED / PLOTTED / TRACED / NOTE BOOK / TEMPLATE / AREAS / LAYOUT CHECKED / AREAS CHECKED
BY / DATE
PLATE 5 CROSS SECTION
CLEARPRINT PAPER CO., S.F. CAL.

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(24):11	1983	92	328

FINAL SURVEY	NOTE BOOK	NO.
SURVEYED		
PLOTTED		
TEMPLATE		
AREAS		
AREAS CHECKED		

DATE	BY

RAMP "H"

EXIST. GROUND @ ± PIPE

FIN. GROUND

STA. 2+80 RAMP "H"
TYPE G1614 GRATED CI. D1 #A-3
INV.=250.03

STA. 11+64 (11.8% ±) KAM
MODIFIED TYPE B CI. D1 #A-12
INV.=235.00 (48")
234.00 (72")

PROFILE & DRAIN LINE A-2

SCALE: HORIZ. 1"=50'
VERT. 1"=10'

RAMP "G"

KAM HWY. NORTHBOUND

FIN. GRNG.

S=0.0050

INV. 24" RCP CL. III OR 24" ACP CL. III OR 24" CMP SHT. "L"=0.079" OR 24" ACP CL. III OR 24" CAP, SHT. "L"=0.075"

STA. 5+50 KAM
TYPE G1614 GD1 #A-4
INV.=241.05

STA. 0+84.87 Rt. RAMP "G"
MODIFIED G1614 GD1 #A-5
INV.=240.66

EXIST. GROUND

STA. 5+00 (4.50 Rt. H-3 (11.3%))
MODIFIED TYPE B CI. D1 #A-1
INV.=0.07.00 (48" ∉ 54")
235.50 (30")
232.77 (24")

SWALE INV.=238.00

PROFILE & DRAIN LINE A-3

SCALE: HORIZ. 1"=50'
VERT. 1"=10'

STA. 16+75 LT.
RAMP "E"
TYPE G1614
GD1 #D-1
INV.=225.10

S=0.0225

FIN. GROUND

EXIST. GROUND

24" RCP CL. III or
24" ACP CL. III or
24" CMP SHT. "L"=0.079" //
24" CAP SHT. "L"=0.075"
INV.=209.80

CONC. CHANNEL (KAMOOALII BRANCH)

PROFILE & DRAIN LINE D

SCALE: HORIZ. 1"=50'
VERT. 1"=10'

RAMP "I"

EXIST. GROUND @ ± PIPE

FIN. GROUND @ ± PIPE

S=0.0150

STA. 6+80
TYPE G1614 GD1 #C-2
INV.=226.00 (54")
228.05 (DITCH)

EXIST. GROUND @ ± PIPE

INV.=02.48"

INV.=015.33

PROFILE & DRAIN LINE C

SCALE: HORIZ. 1"=50'
VERT. 1"=10'

18" CMP SHT. "L"=0.079"

FIN. GROUND

EXIST. GROUND

FLANGE METAL SECTION W/ TIDE PLATE
INV.=220.00

STA. 11+00 RAMP "D"
TYPE G1614 GD1 #E-1
INV.=225.74

24" CMP SHT. "L"=0.079"
BROWN W/STD SAND COLLER EACH END
INV.=220.10

PROFILE & DRAIN LINE E

SCALE: HORIZ. 1"=10'
VERT. 1"=10'

STA. 10+00.76 (6% Lt.) KAM
TYPE G1614 GD1 #F-1
INV.=263.75

FIN. GROUND

24" CMP SHT. "L"=0.079"

S=0.50

EXIST. GROUND

24" CMP SHT. "L"=0.079" OR
24" CAP SHT. "L"=0.075" OR
24" RCP CL. III OR
24" ACP CL. III

INV.=244.50

INV.=244.00

CONCRETE LINED DITCH

PROFILE & DRAIN LINE F

SCALE: HORIZ. 1"=10'
VERT. 1"=10'

STA. 4+50 (10.5%) RAMP "D"
TYPE G1214 GD1 #C-1
INV.=264.00

EXIST. GROUND @ ± PIPE

INV. 24" RCP CL. III OR 24" ACP CL. III OR 24" CMP SHT. "L"=0.079" OR 24" CAP SHT. "L"=0.075"

S=0.0150

#=1.0'

TOP OF LINING

#=1.0'

STA. 5+00 (9.2%) RAMP D
GD1 #C-1
INV.=240.60

STA. 5+68
INV.=237.79

INV. LINED DRAINAGE DITCH

S=0.1616

S=0.050

S=0.016

S=0.0448

STA. 6+36
INV.=235.00

STA. 6+72
INV.=232.50

STA. 7+00 (8.2% RAMP "D")
END DITCH
INV.=355.70

STA. 7+05
INV.=230.00

STA. 6+80 (8.2% RAMP "D")
GD1 #C-2 (SPECIAL)
INV.=228.05 (DITCH)
226.00 (54")

PROFILE & DRAIN LINE C-1

SCALE: HORIZ. 1"=50'
VERT. 1"=10'

FIN. GROUND

EXIST. GROUND @ ± PIPE

STA. 2+75
END CONC. HDWL. #H-3
INV.=257.00

PROFILE & DRAIN LINE "H"

SCALE: HORIZ. 1"=50'
VERT. 1"=10'

REGISTERED PROFESSIONAL ENGINEER
CERTIFIED PROFESSIONAL ENGINEER
No. 1160
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS

INTERSTATE ROUTE H-3
HALEKOU INTERCHANGE
F.A.I. Proj. No. I-H3-1(24):11
Scale: AS SHOWN Date: Oct. 1982
SHEET NO. 210 OF 50 SHEETS

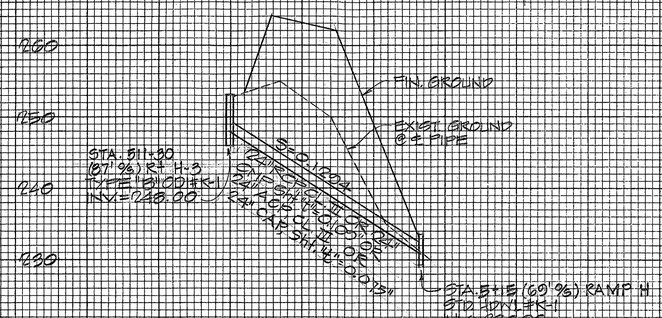
PLATE 3 - CROSS SECTION, F.A.S.
CLEARPRINT PAPER CO., S. F. CAL. NO. 1000H-3

92

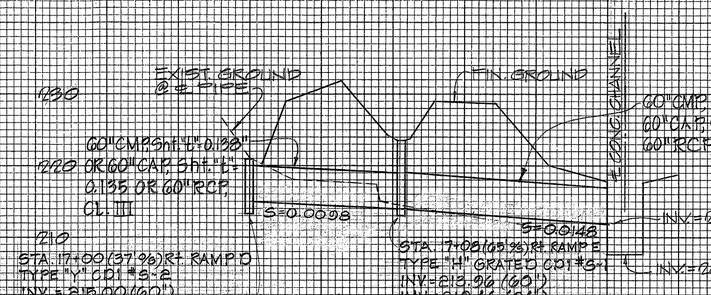
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(24):11	1983	93	328

FINAL SURVEY — SURVEYED, PLOTTED, TEMPLATE, AREAS, AREAS CHECKED — NOTE BOOK — NO. — BY — DATE

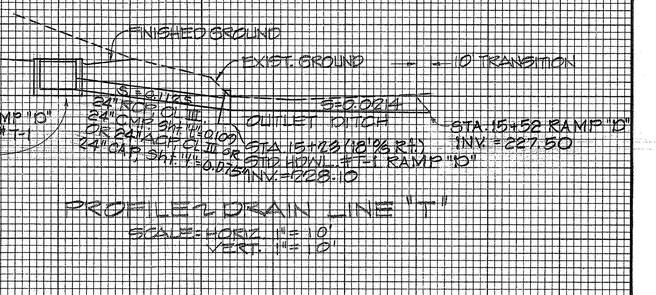
ORIGINAL SURVEY — SURVEYED, PLOTTED, TEMPLATE, AREAS, AREAS CHECKED — NOTE BOOK — NO. — BY — DATE



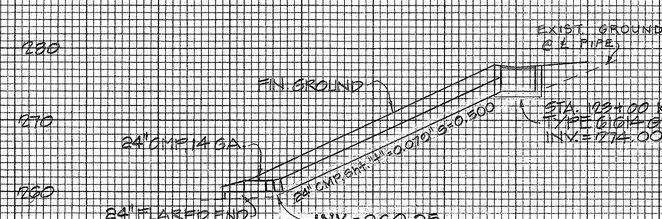
PROFILE ℄ DRAIN LINE "K"
SCALE: HORIZ. 1"=50'
VERT. 1"=10'



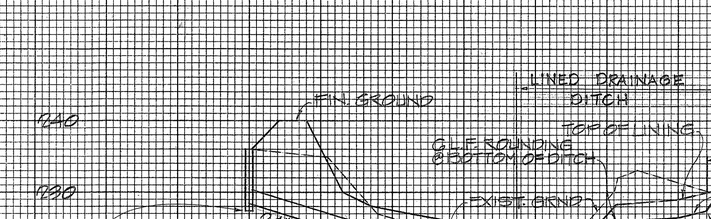
PROFILE ℄ DRAIN LINE "S"
SCALE: HORIZ. 1"=50'
VERT. 1"=10'



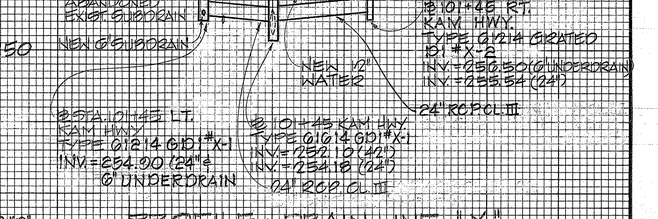
PROFILE ℄ DRAIN LINE "T"
SCALE: HORIZ. 1"=10'
VERT. 1"=10'



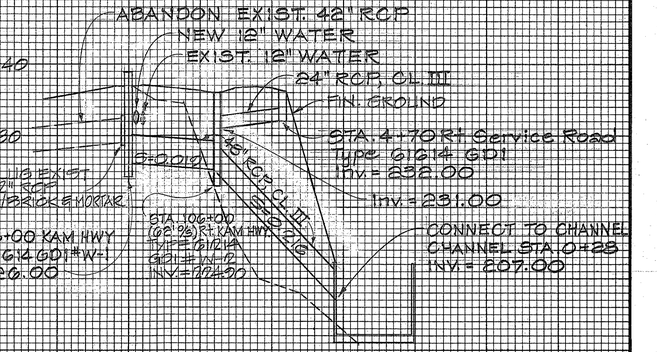
PROFILE ℄ DRAIN LINE "L"
SCALE: HORIZ. 1"=10'
VERT. 1"=10'



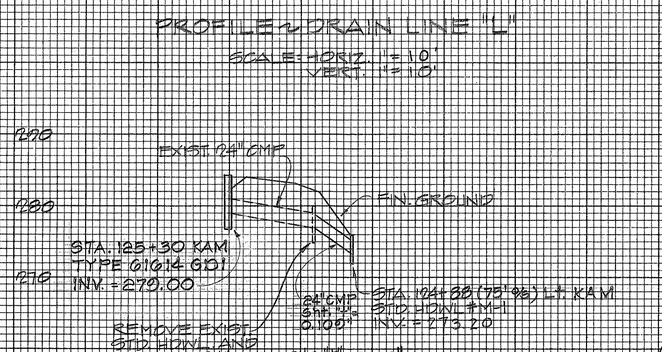
PROFILE ℄ DRAIN LINE "S-1"
SCALE: HORIZ. 1"=50'
VERT. 1"=10'



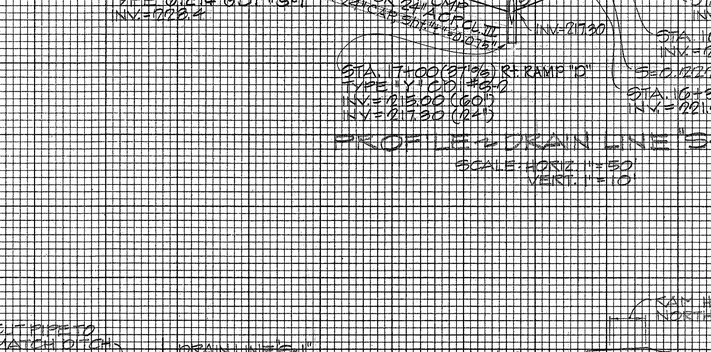
PROFILE ℄ DRAIN LINE "X"
SCALE: HORIZ. 1" = 50'
VERT. 1" = 10'



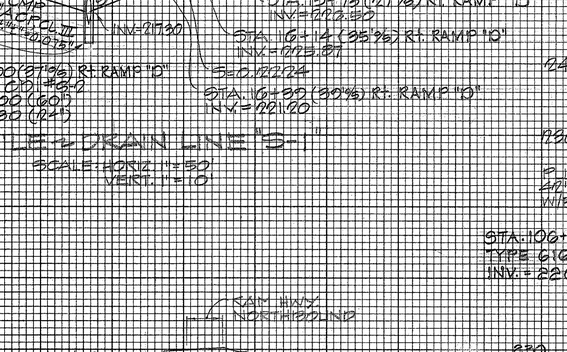
PROFILE ℄ DRAIN LINE "W"
SCALE: HORIZ. 1"=50'
VERT. 1"=10'



PROFILE ℄ DRAIN LINE "M"
SCALE: HORIZ. 1"=50'
VERT. 1"=10'



PROFILE ℄ DRAIN LINE "S-2"
SCALE: HORIZ. 1" = 10'
VERT. 1" = 10'



PROFILE ℄ DRAIN LINE "S-3"
SCALE: HORIZ. 1"=50'
VERT. 1"=10'

DATE	REVISION
4-1-85	Added Type G 16 14 GD1 and 24 inch RCP at Sta. 4+70 Rt. Service Road

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
George Yukita
REGISTERED PROFESSIONAL ENGINEER No. 1164

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS

INTERSTATE ROUTE H-3
HALEKOU INTERCHANGE
F.A. Proj. No. I-H3-1(24):11
Scale: As Shown Date: Oct. 1982
SHEET NO. 220 OF 550 SHEETS

PLATE 3 - CROSS SECTION, F. A. S. CLEARPRINT PAPER CO., S. F. CAL. NO. 1000H-3

C.0.93

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(24):11	1983	94	328

FINAL SURVEY — NOTE BOOK NO.___ — SURVEYED ___ PLOTTED ___ TEMPLATE ___ AREAS ___ AREAS CHECKED ___ — BY ___ DATE ___

ORIGINAL SURVEY — NOTE BOOK NO.___ — SURVEYED ___ PLOTTED ___ TEMPLATE ___ AREAS ___ AREAS CHECKED ___ — BY ___ DATE ___

STA. 490+20 H-3 PROJECT LIMIT

Exist. Ground @ ℄ Pipe

Finished Grade @ ℄ Pipe

24" PIPE (SEE DL "N-1")

24" PIPE (SEE DL "N-2" "N-3")

24" PIPE (SEE DL "N-4")

24" PIPE (SEE DL "N-5")

24" PIPE (SEE DL "N-6")

S=0.012
36"CMP, SHT."L"=0.100"

S=0.009
30"RCP CL III OR 30"ACP CL III OR 30"CMP SHT."L"=0.100"

S=0.008
24"RCP CL III OR 24"ACP CL II OR 30"CMP SHT."L"=0.100"

S=0.010
24"RCP CL III OR 24"CMP SHT."L"=0.100" OR 24"ACP CL III

S=0.010
24"RCP CL III OR 24"CMP SHT."L"=0.100" OR 24" ACP CL III

STA. 489+50 H-3
TYPE G1G14 GD1 #N-1A
INV.=240.25

STA. 490+00 H-3
TYPE G1G16 GD1 #N-1
INV.=243.25

STA. 495+10 H-3
TYPE G1G16 GD1 #N-2
INV.=245.07

STA. 498+75 H-3
TYPE G1G16 GD1 #N-3
INV.=248.56

STA. 501+00 H-3
TYPE G1G16 GD1 #N-4
INV.=251.11

STA. 503+00 H-3
TYPE G1G16 GD1 #N-5
INV.=253.11

PROFILE ~ DRAIN LINE "N"

Scale: Hor. 1"=50'
Vert. 1"=10'

Exist. Ground @ ℄ Pipe

INV. 24"RCP CL III OR 24"CMP SHT."L"=0.100" OR 24"ACP CL II S=0.008

Finished Ground @ ℄ Pipe

STA. 495+55 Lt. H-3
TYPE G1G14 GD1 #N-1D
INV.=247.61

STA. 495+12 Rt. H-3
TYPE G1G14 GD1 #N-1D
INV.=247.53

INV. 24"RCP CL III OR 24" CMP SHT."L"=0.100" OR 24"ACP CL III S=0.0060

STA. 495+12
TYPE G1G16 GD1 #N-2
INV.=245.07

INV. 24"RCP CL III OR 24"CMP SHT."L"=0.100" OR 24"ACP CL III S=0.0058

PROFILE ~ DRAIN LINES "N-2" & "N-3"

STA. 498+75 H-3
TYPE G1G16 GD1 #N-3
INV.=248.56

STA. 498+75 Rt. H-3
TYPE G1G14 GD1 #N-3
INV.=250.66

Exist. Ground @ ℄ Pipe

PROFILE ~ DRAIN LINE "N-4"

STA. 501+00 H-3
TYPE G1G16 GD1 #N-4
INV.=251.11

STA. 501+00 Rt. H-3
TYPE G1G14 GD1 #N-4
INV.=251.70

INV. 24"RCP CL III OR 24" CMP SHT."L"=0.100" OR 24" ACP CL II S=0.0102

Exist. Ground @ ℄ Pipe

PROFILE ~ DRAIN LINE "N-5"

STA. 503+00 H-3
TYPE G1G16 GD1 #N-5
INV.=253.11

STA. 503+00 Rt. H-3
TYPE G1G14 GD1 #N-4
INV.=253.71

INV. 24"RCP CL III OR 24" CMP SHT."L"=0.100" OR 24" ACP CL III S=0.0103

Exist. Ground @ ℄ Pipe

PROFILE ~ DRAIN LINE "N-6"

INV. 24"RCP CL III OR 24" CMP SHT."L"=0.100" OR 24" ACP CL III S=0.005

FIN. GROUND @ ℄ PIPE

STA. 3+26 Rt. RAMP "A"
TYPE G1G14
INV.=245.61

STA. 490+00 H-3
TYPE G1G16 GD1 #N-1
INV.=243.25

PROFILE ~ DRAIN LINE "N-1"

Scale: Hor. 1"=50'
Vert. 1"=10'

Exist. Ground @ ℄ Pipe

Finished Ground @ ℄ Pipe

STA. 489+50 H-3
TYPE N-11A CONC. HEADWALL
INV.=235.00

STA. 489+50
TYPE G1G14 GD1 #N-1A
INV.=240.25

INV. 36" CMP, SHT."L"=0.100" S=0.013

INV. 36" CMP, SHT."L"=0.100" S=0.090

STA. 489+50 60.58' o/s Lt. H-3
TYPE N-11A GD1
INV.=239.50

PROFILE ~ DRAIN LINE "N-11A"

11/16/87 Extend Profile for Drain Line "N" to Sta. 489+50. Added Profile - Drain Line "N-11A"

DATE — REVISION

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

Neeraj Gupta

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS

INTERSTATE ROUTE H-3
HALEKOU INTERCHANGE
F.A.I. Proj. No. I-H3-1(24):11

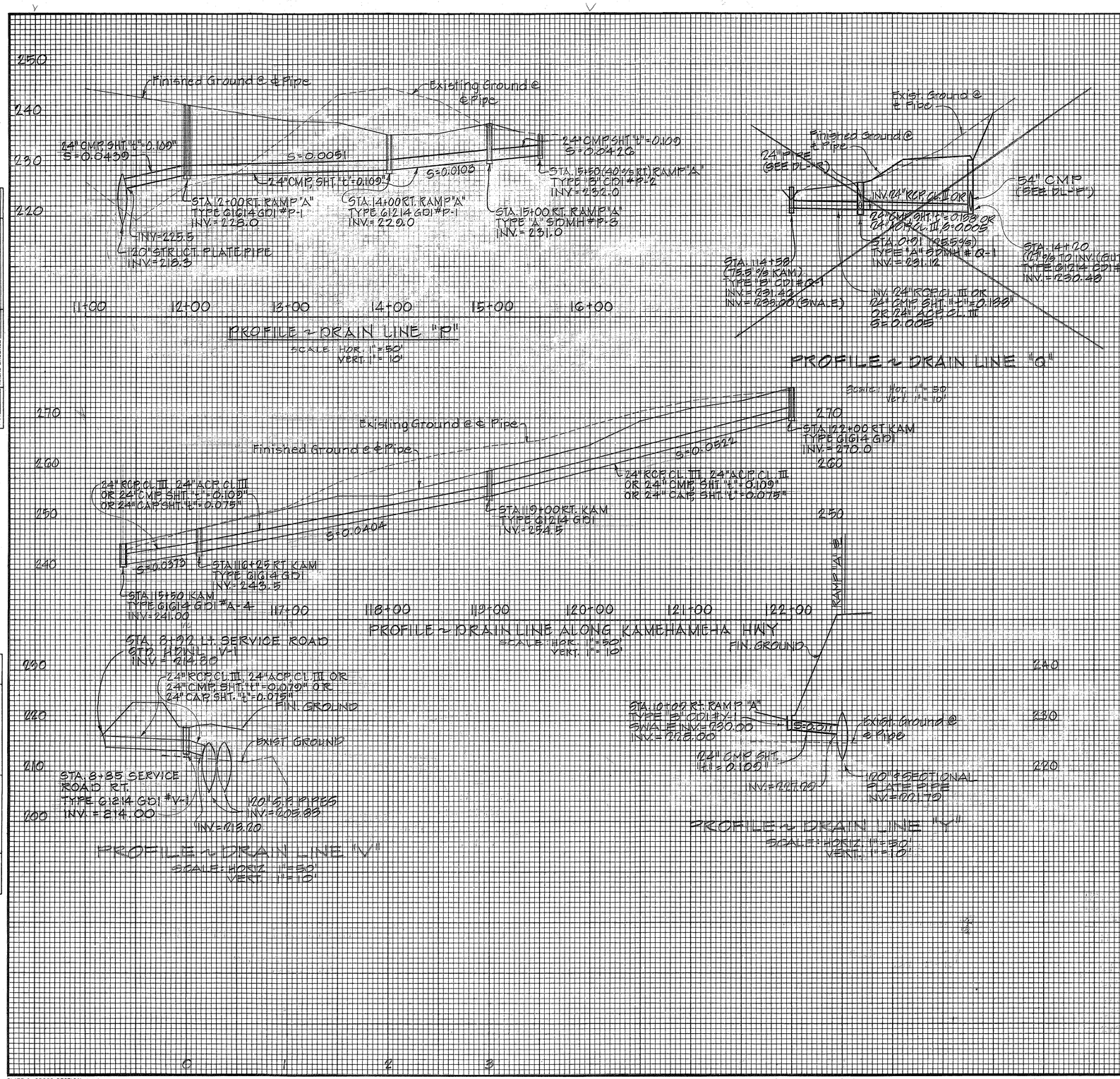
Scale: As Shown — Date: Oct. 1982

SHEET NO. 235 OF 50 SHEETS

C.O. 94

PLATE 3 - CROSS SECTION, F. A. S.
CLEARPRINT PAPER CO., S. F. CAL. NO. 1000H-3

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HB-1(24):11	1983	95	328



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS

INTERSTATE ROUTE H-3
HALEKOU INTERCHANGE
F.A.I. Proj. No. I-H3-1(24):11
Scale: As Shown Date: Oct. 1982
SHEET No. 224 OF 50 SHEETS

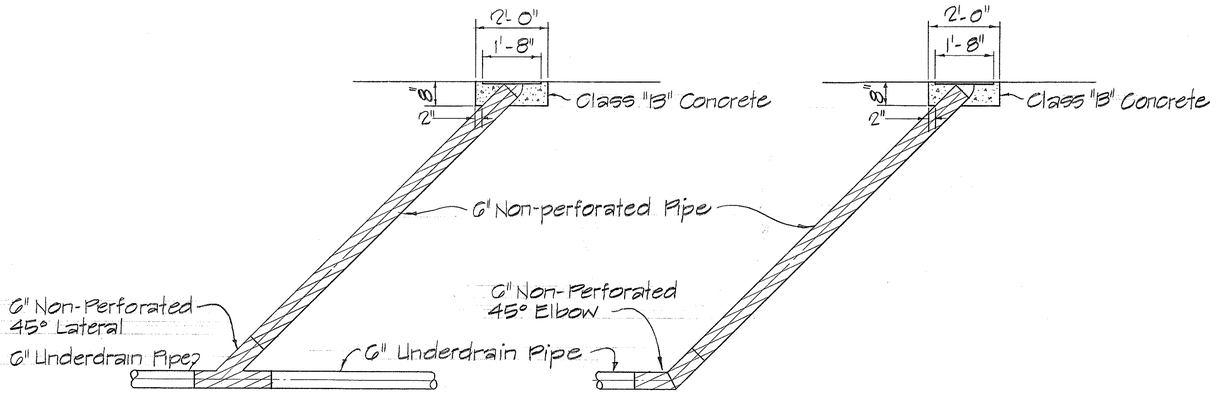
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

FINAL SURVEY — SURVEYED, PLOTTED, TEMPLATE, AREAS CHECKED — NOTE BOOK — NO. — BY — DATE

ORIGINAL SURVEY — SURVEYED, PLOTTED, TEMPLATE, AREAS CHECKED — NOTE BOOK — NO. — BY — DATE

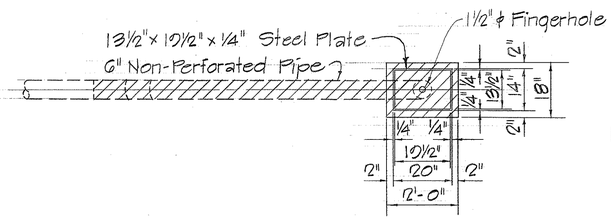
PLATE 3 - CROSS SECTION, F. A. S.
CLEARPRINT PAPER CO., S. F. CAL. NO. 1000H-3

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(24):11	1983	96	328



CLEANOUT AT INTERMEDIATE POINTS CLEANOUT AT END OF PIPE

ELEVATIONS

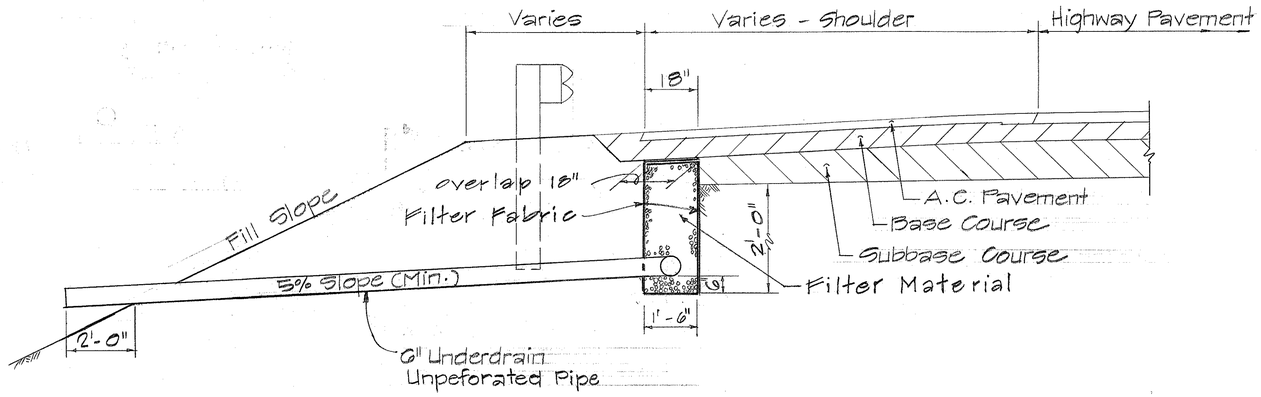


PLAN

NOTE: STEEL PLATE SHALL BE THOROUGHLY CLEANED AND PAINTED WITH ONE COAT OF HIGH GRADE ASPHALTUM.

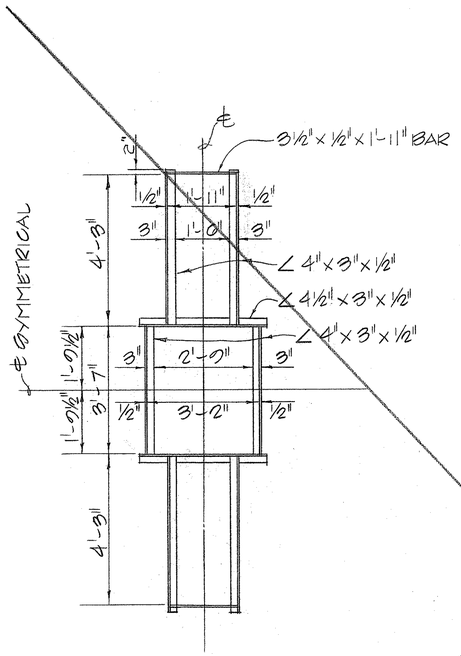
DETAILS OF CLEANOUT AND CONCRETE BLOCKS FOR UNDERDRAIN

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



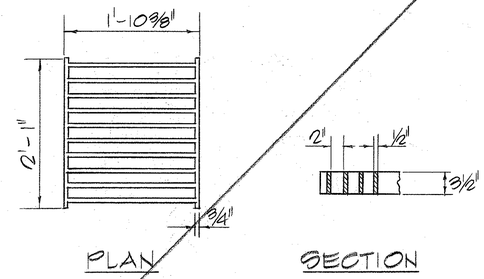
TYPICAL UNDERDRAIN OUTLET SECTION

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



PLAN & FRAME

SCALE: 1½"=1'-0"



PLAN SECTION

TYPE "A" GRATE

SCALE: 1"=1'-0"

NOTES:

1- CONTRACTOR HAS THE OPTION OF USING CAST MALLEABLE IRON, CAST IRON, WELDED, BOLTED, BOLTED CAST MALLEABLE IRON END BLOCK OR CAST STEEL END BLOCK GRATE.
2- GRATES AND FRAMES SHALL BE HOT DIP GALVANIZED AFTER FABRICATION.
3- ALL WELDS ⅜" UNLESS OTHERWISE NOTED.
4- THE VARIOUS MATERIALS SHALL CONFORM TO THE SPECIFICATIONS OF ASTM AS LISTED IN THE FOLLOWING TABULATION AND THE STANDARD SPECIFICATION.

MATERIAL	ASTM DESIGNATION
STRUCTURAL STEEL	A283, GRADE D
CAST IRON	A27, GRADE 65-35
MALLEABLE IRON CASTING	A47, GR. NO 35018

FRAME & TYPE "A" GRATE FOR TYPE "A" GRATED CONCRETE DROP INTAKE

SCALE AS SHOWN

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS

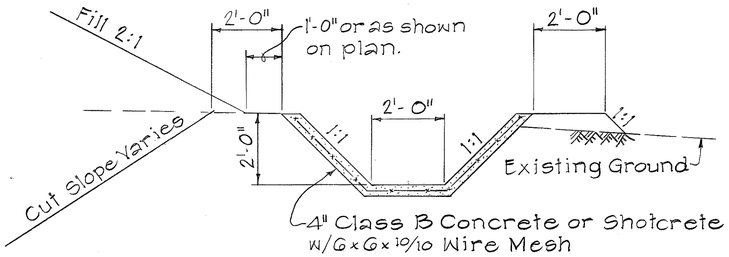
INTERSTATE ROUTE H-3
HALEKOU INTERCHANGE
F.A.I. Proj. No. I-H3-1(24):11
Scale: As Shown Date: Oct. 1982

SHEET No. 250 OF 59 SHEETS

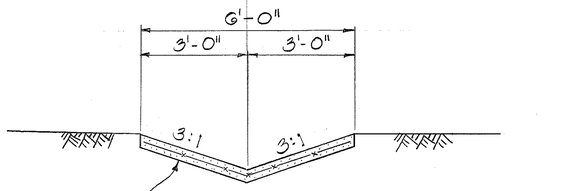
96

PRINTED ON NO. 1000H CLEARPRINT

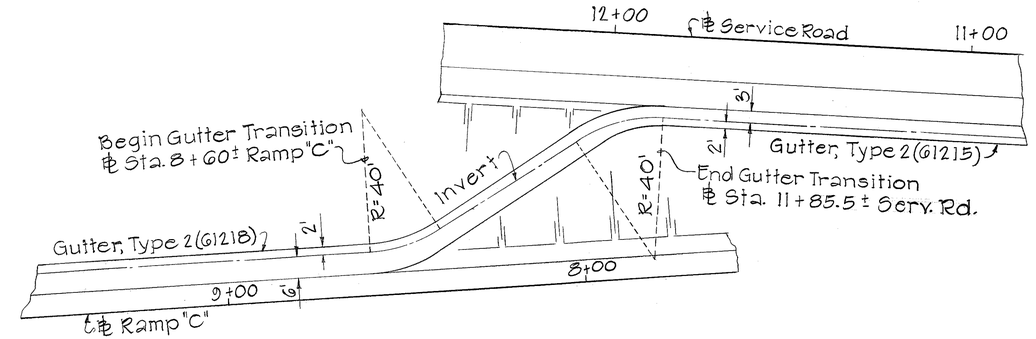
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1 (24):11	1983	97	328



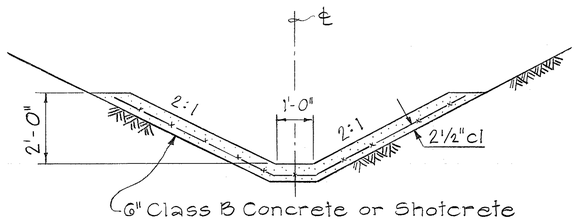
LINED DRAINAGE DITCH TYPE A
Scale: 1/2" = 1'-0"



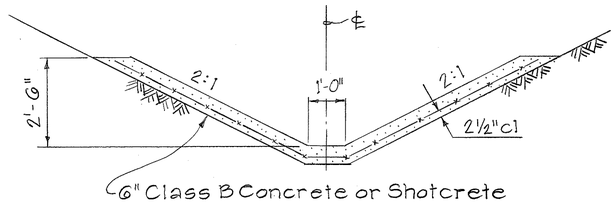
LINED DRAINAGE DITCH TYPE C
Scale: 1/2" = 1'-0"



PLAN - TYPE 2 GUTTER TRANSITION BETWEEN RAMP C & SERVICE RD.
Scale: 1" = 20'
NOTE: For Gutter section, See Typical Roadway Section

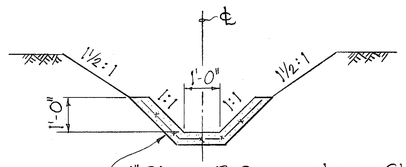


LINED DRAINAGE DITCH TYPE D
STA 16+12±(35'%RT) TO STA 17+00 (37'%RT) RAMP D



LINED DRAINAGE DITCH TYPE E
STA 15+52±(23.5'%RT) TO STA 16+12±(35'%RT) RAMP D

TYPICAL SECTIONS OF LINED DRAINAGE DITCH, DRAIN LINE S-1
Scale: 1/2" = 1'-0"



LINED DRAINAGE DITCH TYPE B
STA 15+23±(18'%RT) TO STA 15+52±(23.5'%RT) RAMP "D"

TYPICAL SECTION LINED DRAINAGE DITCH, DRAIN LINE I
Scale: 1/2" = 1'-0"

Note: Wire Mesh shall be incidental to Class B Concrete or Shotcrete.

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION

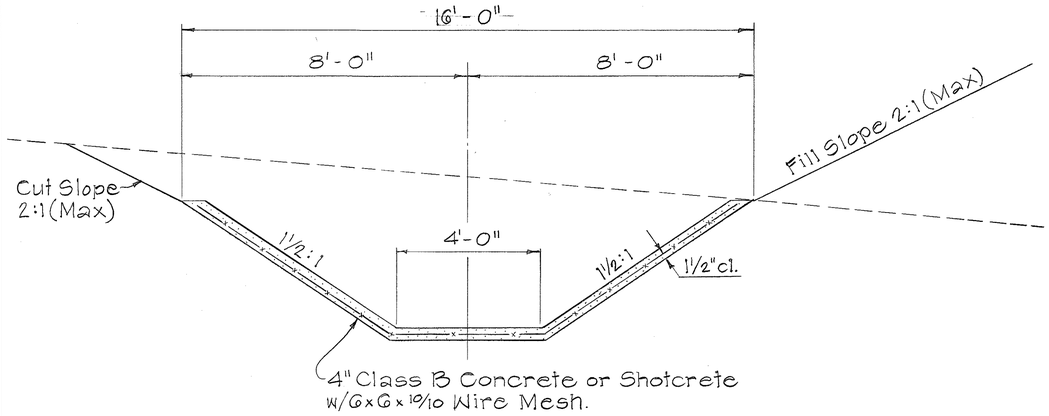
DRAINAGE DETAILS

INTERSTATE ROUTE H-3
HALEKOU INTERCHANGE
F.A.I. Proj. No. I-H3-1(24):11

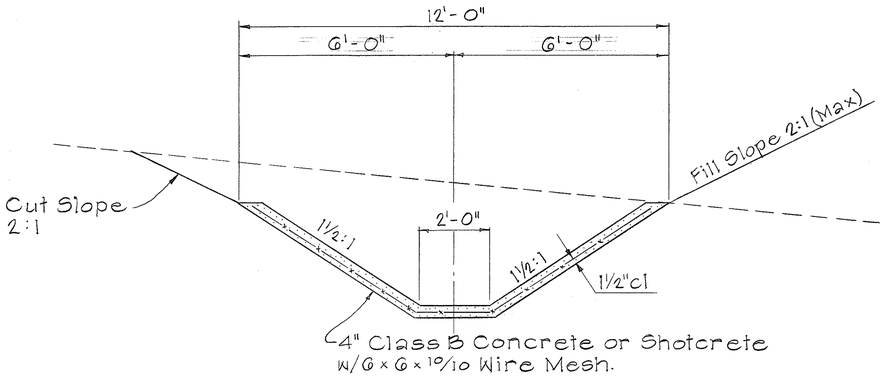
Scale: As Shown Date: Oct. 1982

SHEET No. 26D OF 59 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(24):11	1983	98	328

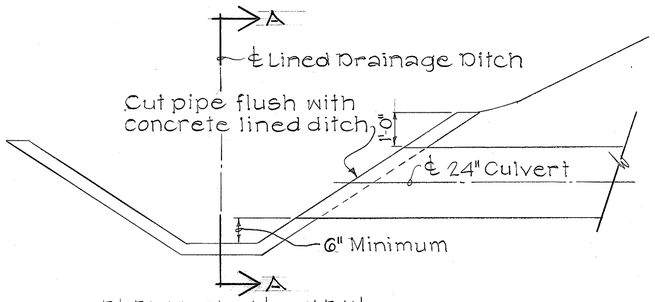


LINED DRAINAGE DITCH TYPE G
STA 121+42±(124'0/s LT) TO STA 121+83±(124'0/s LT) KAM HWY

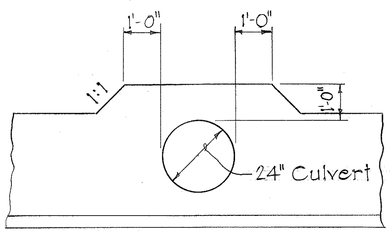


LINED DRAINAGE DITCH TYPE F
STA. 118+82±(124'0/s LT) TO STA 121+42±(124'0/s LT) KAM HWY

TYPICAL SECTIONS OF LINED DRAINAGE DITCH, DRAIN LINE A
Scale: 1/2" = 1'-0"

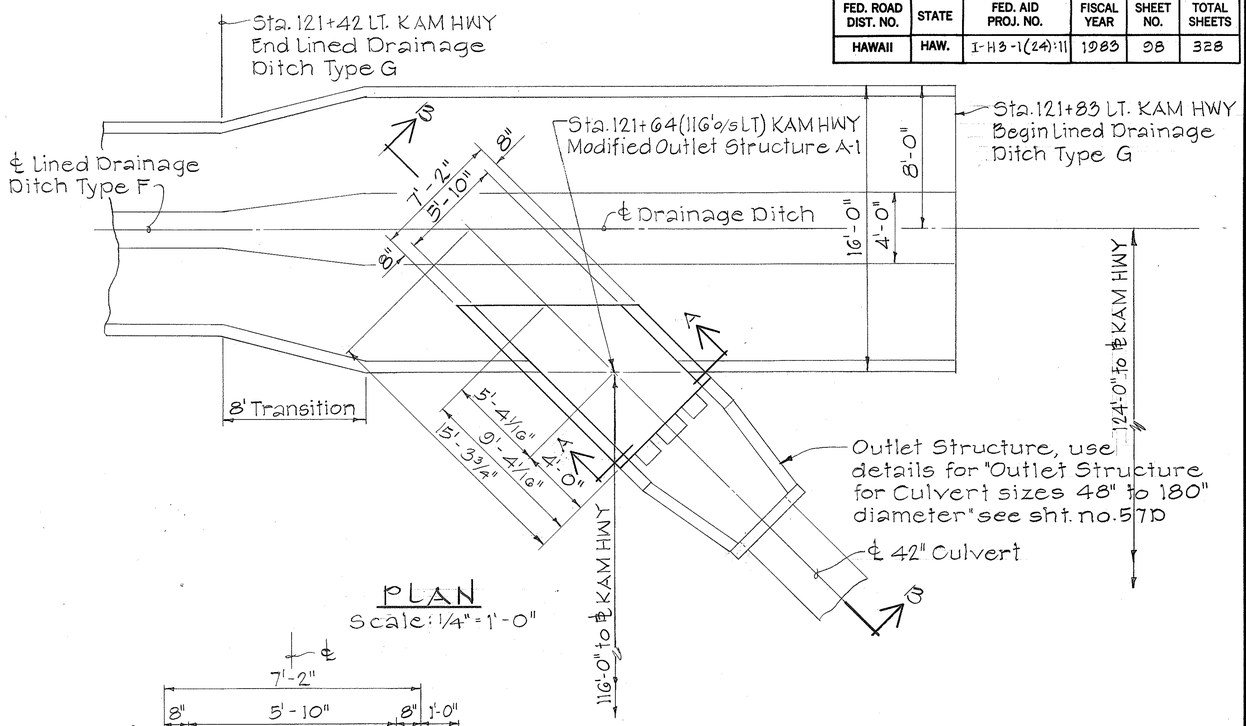


ELEVATION VIEW

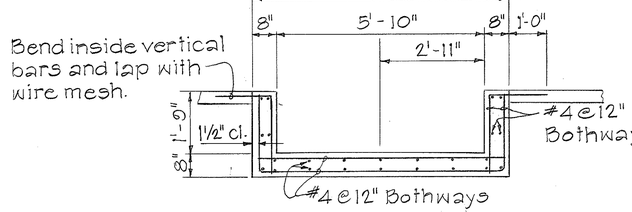


SECTION "A-A"

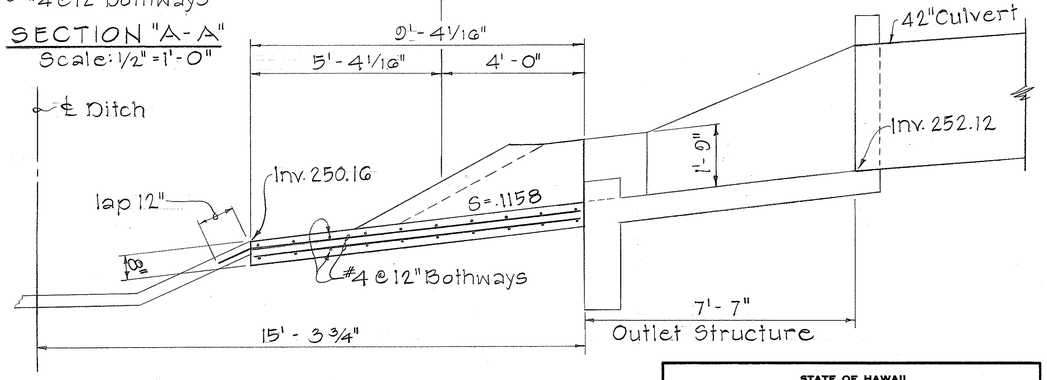
DETAIL OF PIPE OUTLET AT LINED DRAINAGE DITCH
Scale: 1/2" = 1'-0"



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



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



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

DETAIL OF MODIFIED OUTLET STRUCTURE #A-1
STA 121+64 (116'0/s LT) KAM HWY

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION

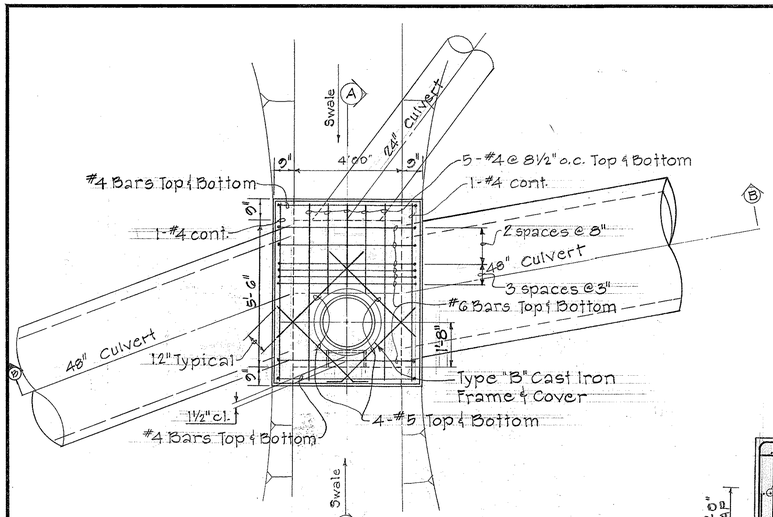
DRAINAGE DETAILS

INTERSTATE ROUTE H-3
HALEKOU INTERCHANGE
F.A.I. Proj. No. I-H3-1(24):11

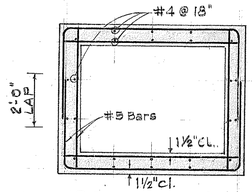
Scale: 1/2" = 1'-0" Date: Oct. 1982

SHEET No. 270 OF 50 SHEETS

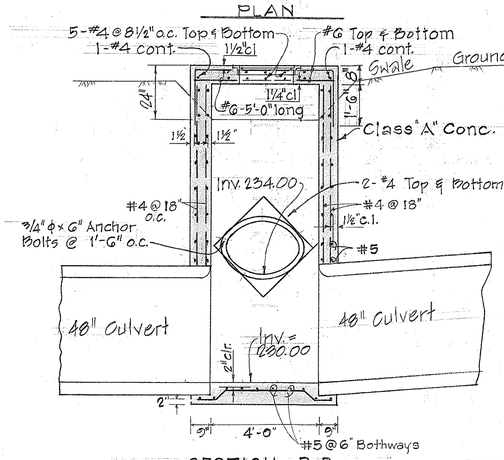
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HB-1(24):11	1983	99	328



PLAN

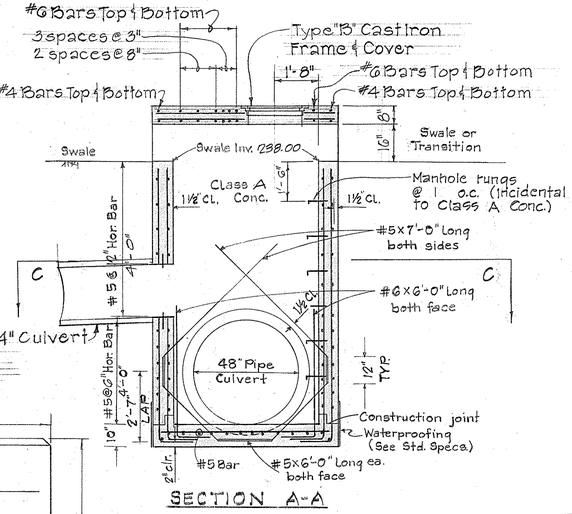


SECTION C-C

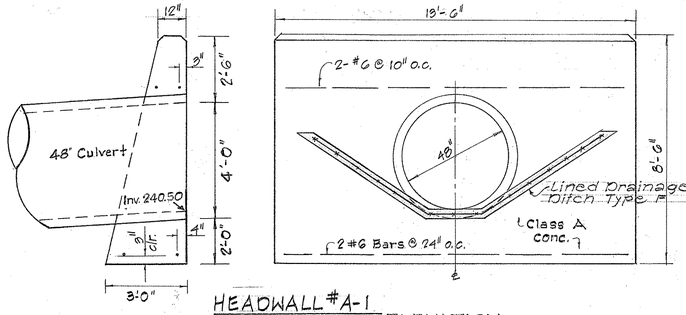


SECTION B-B

MODIFIED TYPE B CONC. DROP INTAKE #A-2
℄ STA. 116+64 (118'o/s Lt.) KAM HIGHWAY
Scale 3/8" = 1'-0"

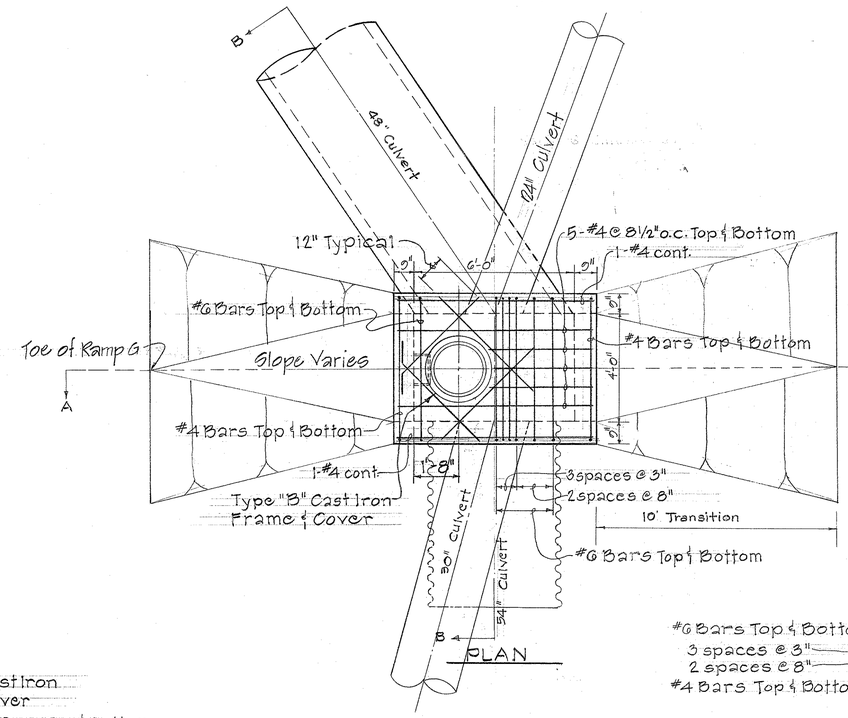


SECTION A-A

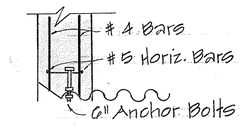


HEADWALL #A-1 ELEVATION

℄ STA. 118+82 (124' o/s Lt.) KAM HIGHWAY
Scale 3/8" = 1'-0"

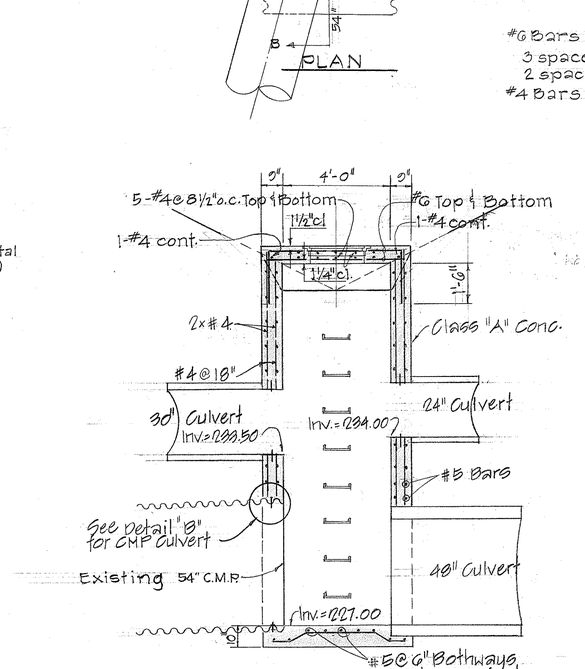


PLAN



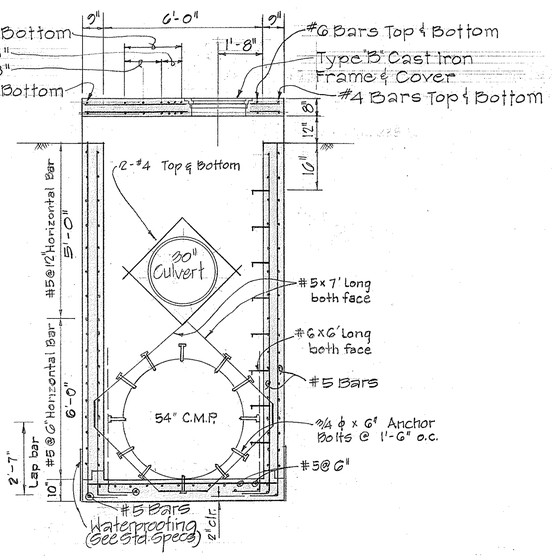
DETAIL B
Scale 1"=1'0"

GENRAL NOTE:
For C.D.I. at ℄ Sta. 116+64 Lt Kam Hwy and ℄ Sta. 506+74.5 Rt H-3 provide 10' Transition Earth Swale. This work shall be considered incidental to the various contract items.



SECTION B-B

MODIFIED TYPE B CONC. DROP INTAKE #A-1
℄ STA. 506+74.50 (113'o/s Rt.) H-3
Scale 3/8" = 1'-0"



SECTION A-A
(Opposite 48" culvert Reinforcing details See C.D.I. #A-2

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

GEORGE YOKOTA
REGISTERED PROFESSIONAL ENGINEER
No. 1156
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
George Yokota

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS

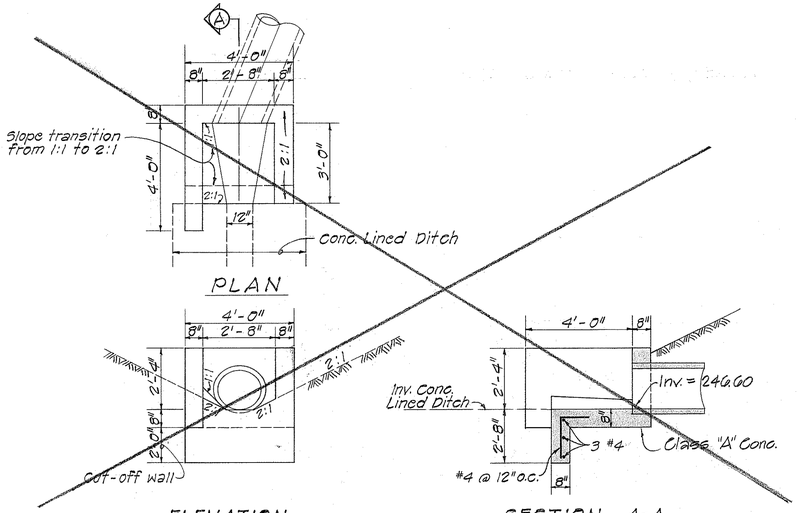
INTERSTATE ROUTE H-3
HALEKOU INTERCHANGE
F.A.I. Proj. No. I-H3-1(24):11

Scale: As Shown Date: Oct. 1982

SHEET No. 280 OF 59 SHEETS

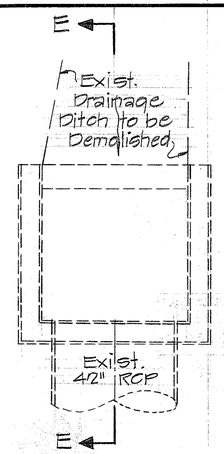
PRINTED ON NO. 1000H CLEARPRINT

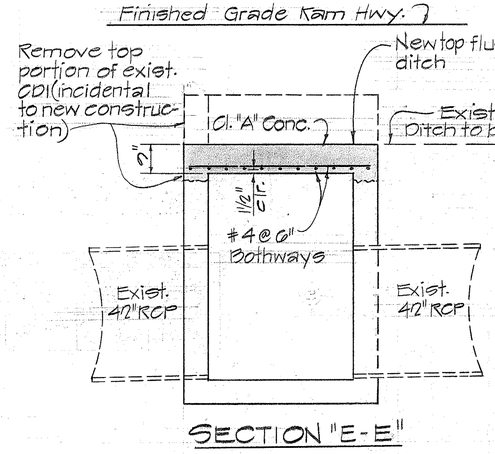
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HB-1(24):11	1983	100	328



OUTLET NO. C-1

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

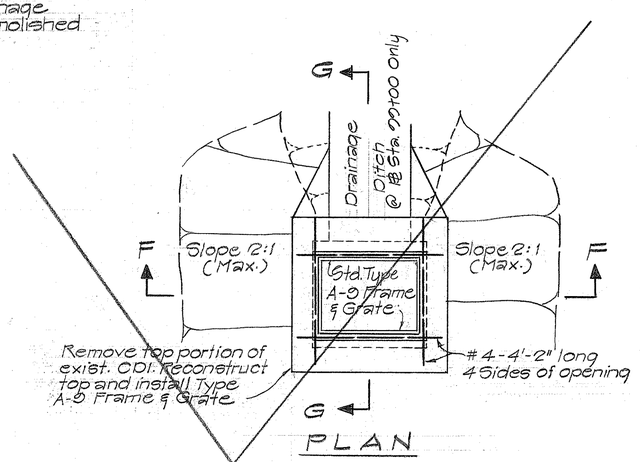




MODIFIED TYPE "A" SDMH

KAM. HWY. @ STA. 102+50

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



MODIFIED TYPE "A" CDI

KAM HWY @ STA. 99+00

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

CONCRETE DROP INTAKE NO. C-2

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

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

GEORGE YOKOTA
REGISTERED PROFESSIONAL ENGINEER
No. 1156
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

George Yokota

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS

INTERSTATE ROUTE H-3
HALEKOU INTERCHANGE
F.A.I. Proj. No. I-H3-1(24):11

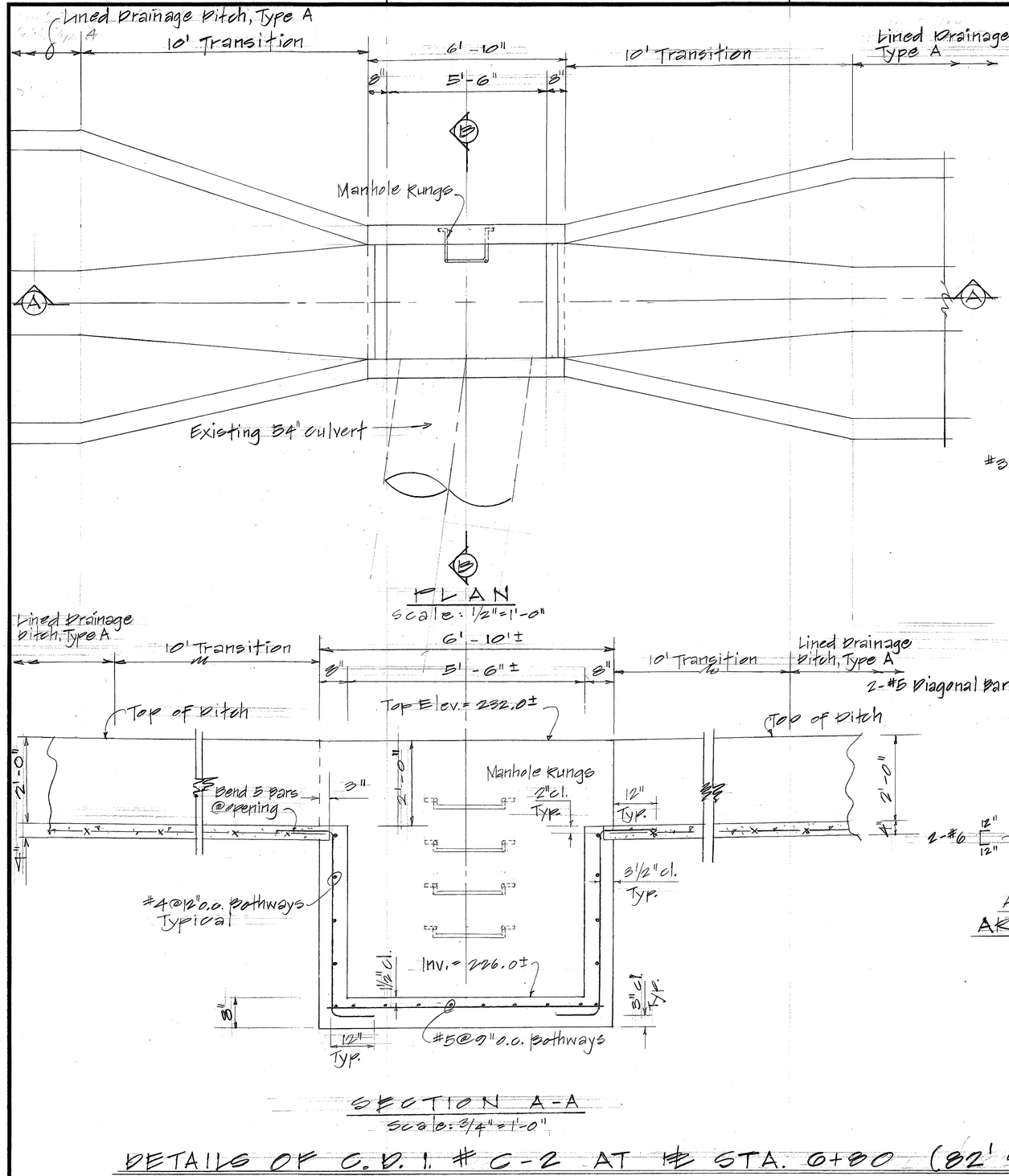
Scale: 1/2" = 1'-0" Date: Oct. 1982

SHEET No. 210 OF 50 SHEETS

100

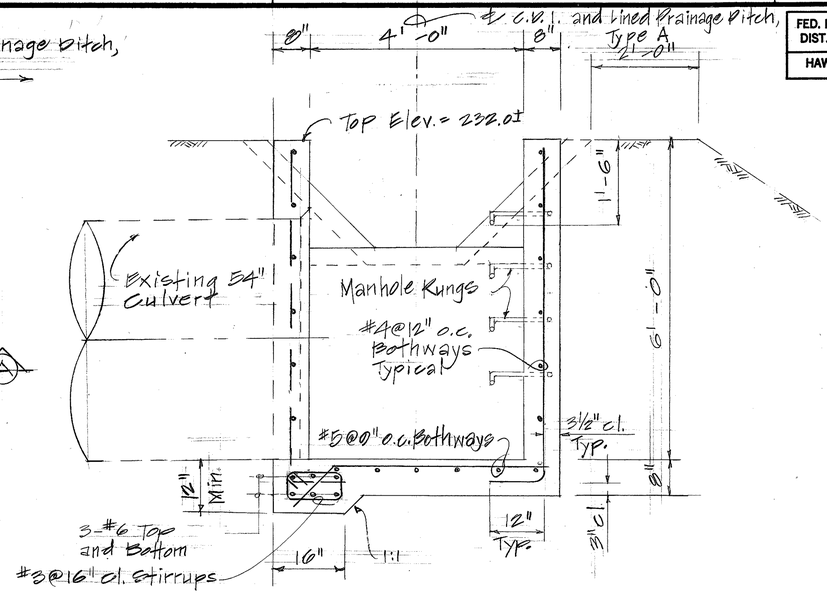
PRINTED ON NO. 1000H CLEARPRINT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(24):11	1983	101	328



PLAN

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

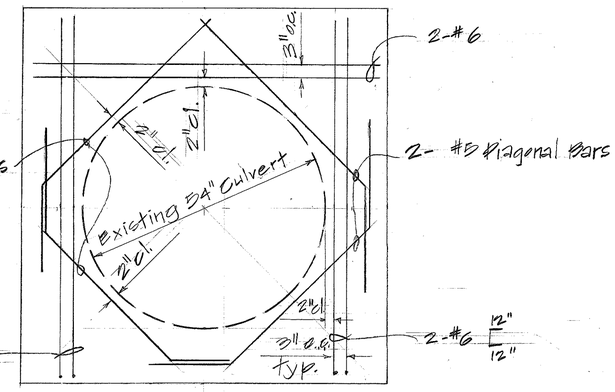


SECTION B-B

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

SECTION A-A

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



ADDITIONAL REINFORCING AROUND CULVERT OPENING

DETAILS OF C.D.I. # C-2 AT ℄ STA. 6+80 (82' 9/6 RT.) RAMP "b"

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

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION

DRAINAGE DETAILS

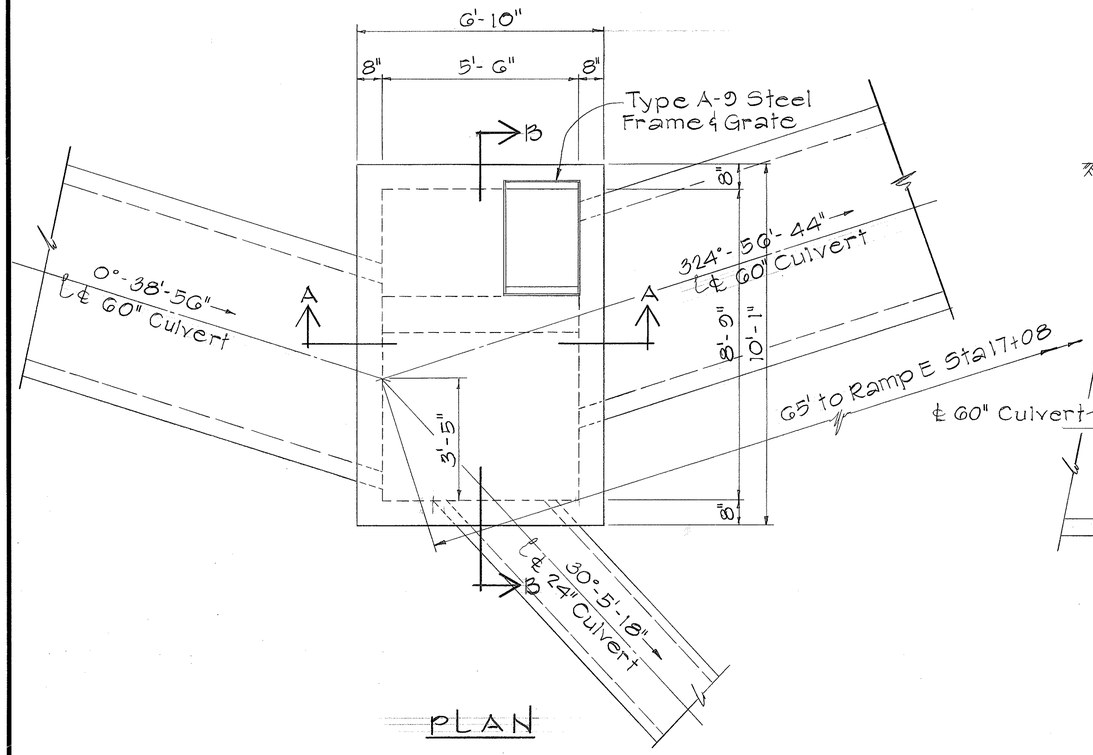
INTERSTATE ROUTE H-3
HALEKOU INTERCHANGE
F.A.I. Proj. No. I-H3-1(24):11

Scale: As Shown Date: Oct. 1982

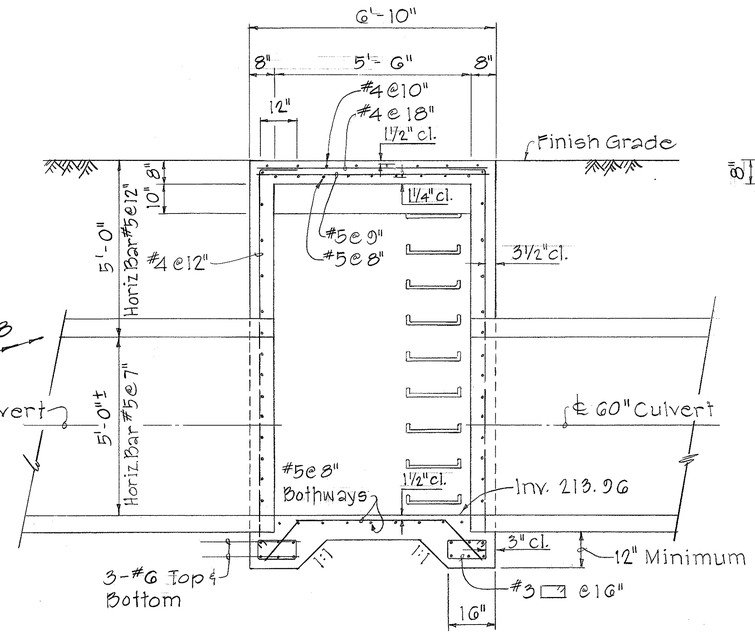
SHEET No. 30D OF 50 SHEETS

101

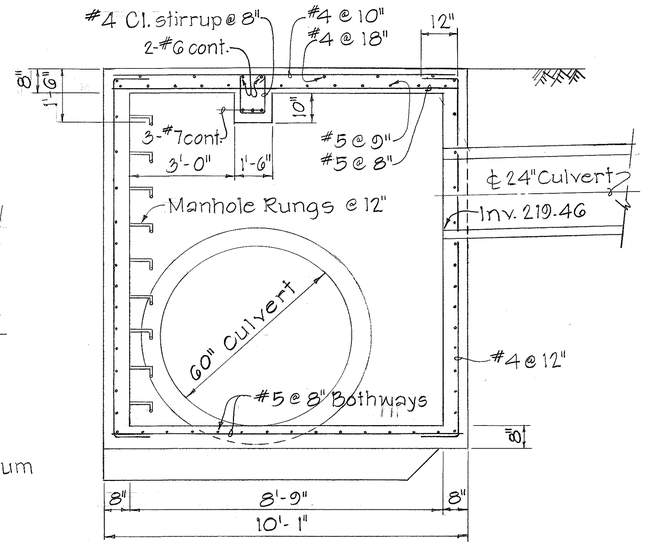
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(24):11	1983	102	328



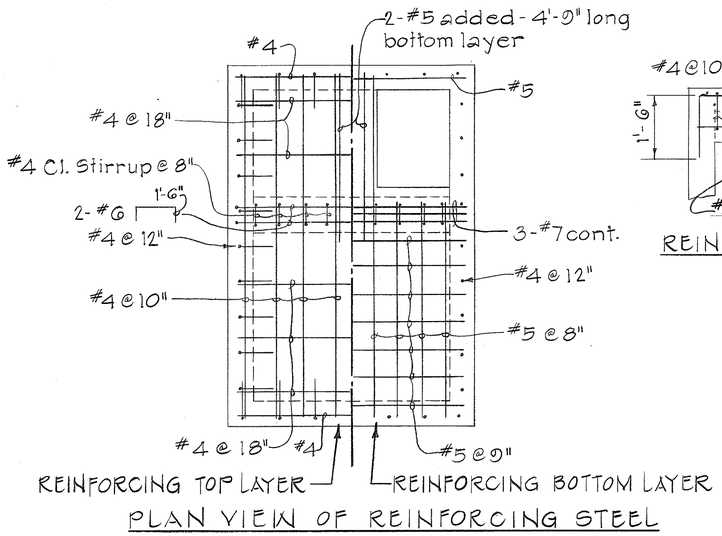
PLAN



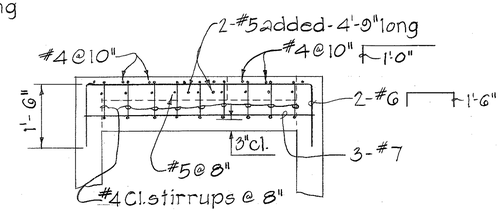
SECTION "A - A"



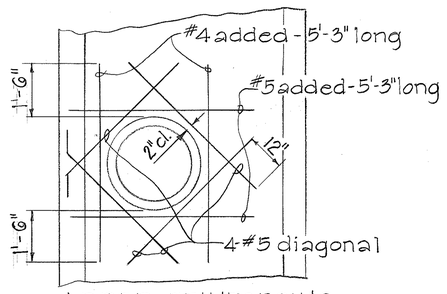
SECTION "B - B"



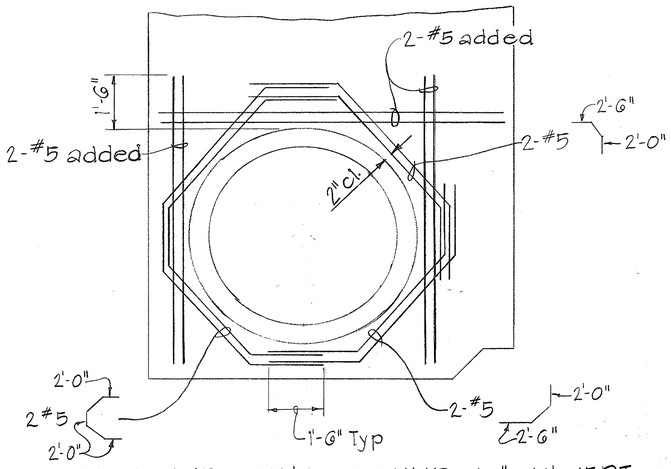
PLAN VIEW OF REINFORCING STEEL



REINFORCING AT BEAM



ADDED REINFORCING AROUND 24" CULVERT



ADDED REINFORCING AROUND 60" CULVERT

DETAILS OF TYPE "H" GRATED CDI #S-1 ℄ STA. 17+08 (65' % RT) RAMP "E"

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

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION

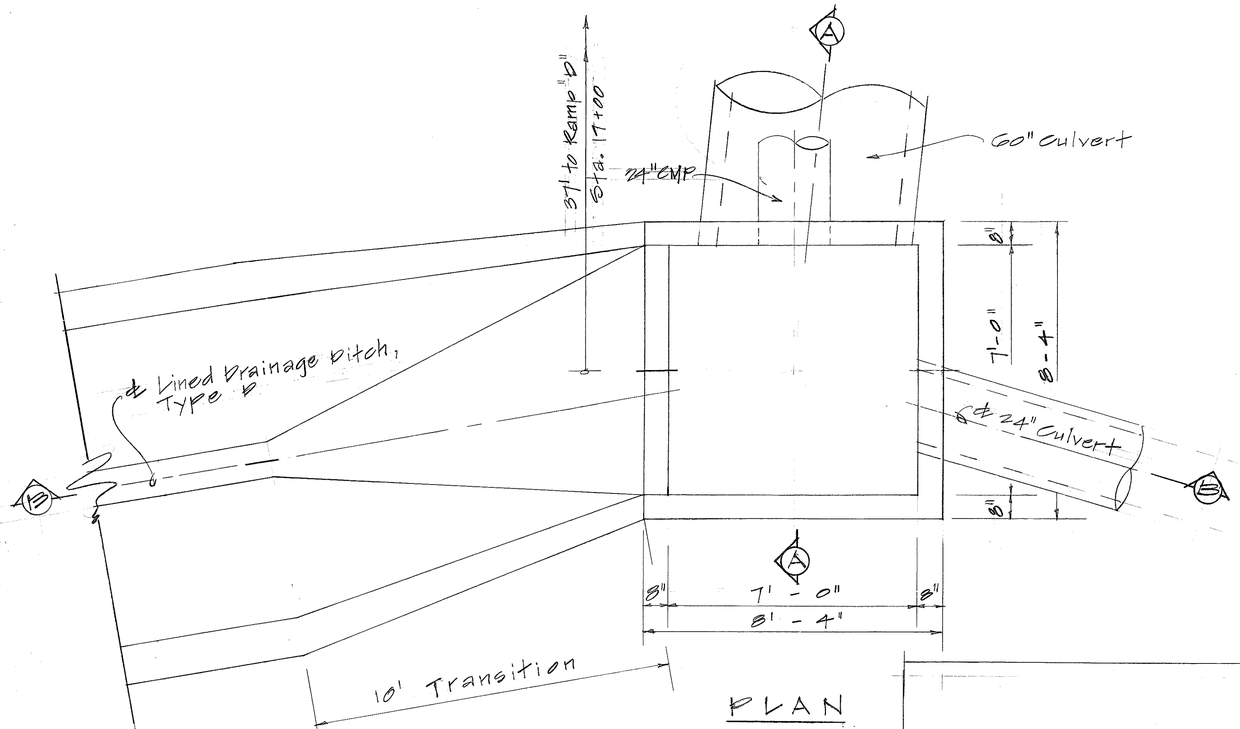
DRAINAGE DETAILS

INTERSTATE ROUTE H-3
HALEKOU INTERCHANGE
F.A.I. Proj. No. I-H3-1(24):11

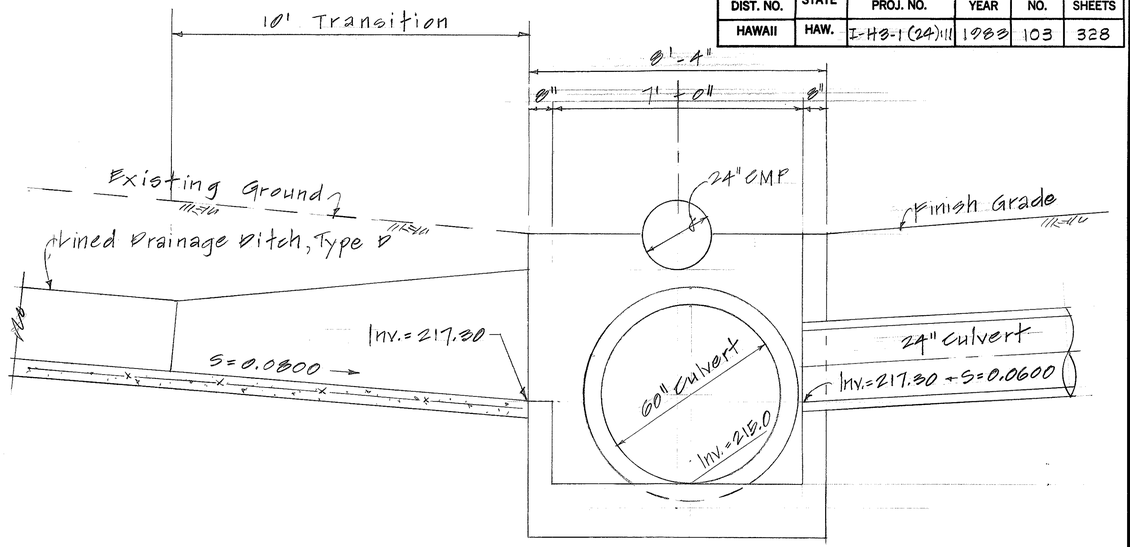
Scale: As Shown Date: Oct. 1982

SHEET No. 310 OF 59 SHEETS

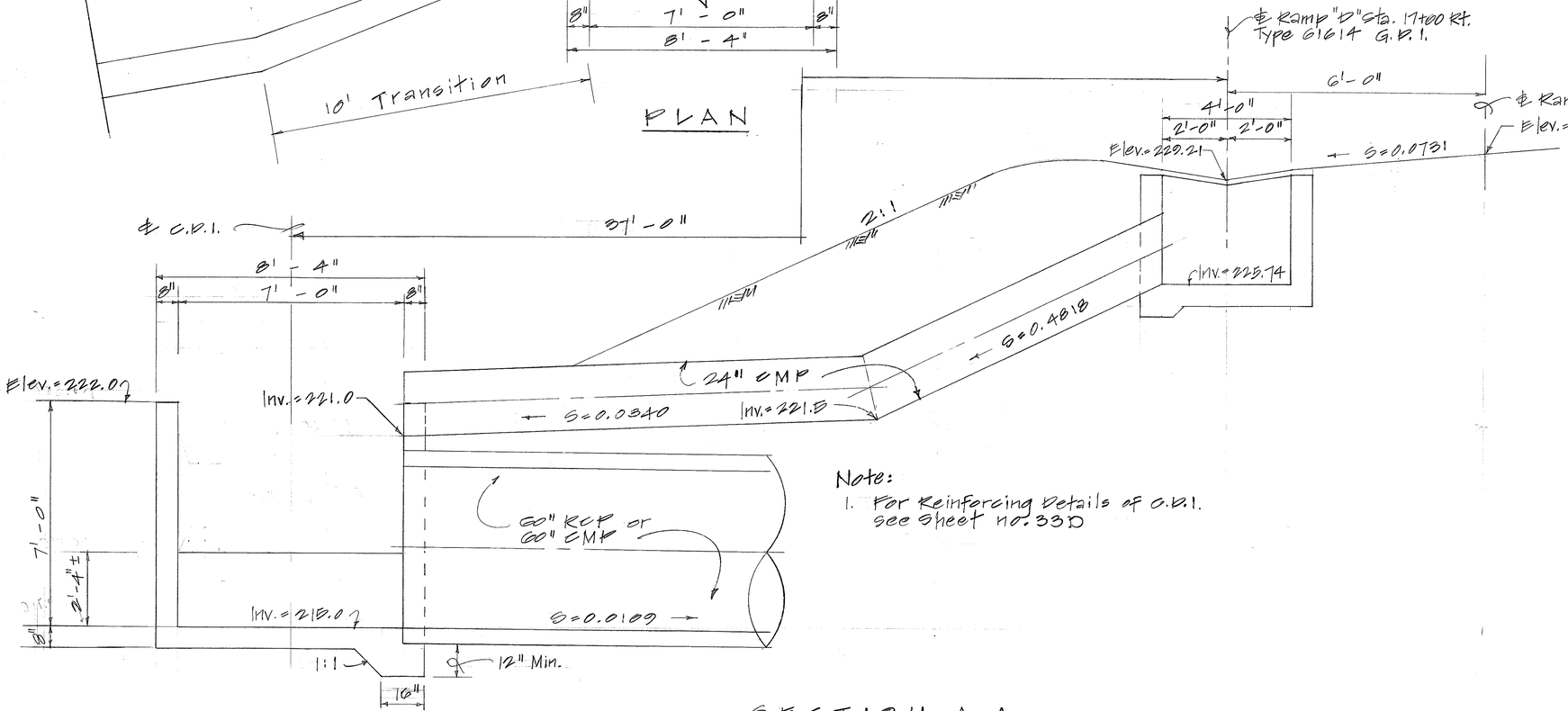
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(24)111	1983	103	328



PLAN



SECTION B-B



SECTION A-A

Note:
1. For Reinforcing Details of C.D.1. see Sheet no. 330

DETAILS FOR TYPE "Y" C.D.1. @ ℄ STA. 17+00 (37' O/S RT.) RAMP "D"

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

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION

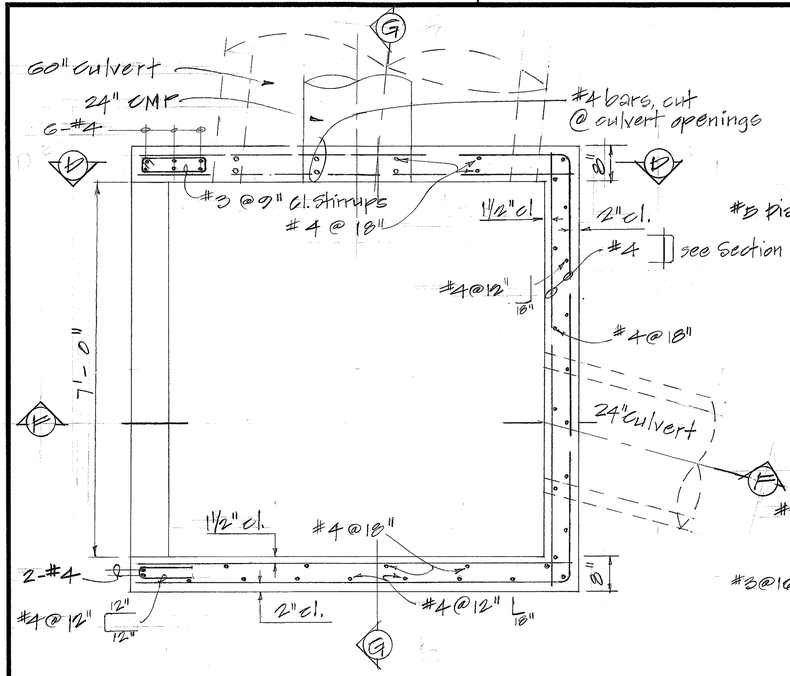
DRAINAGE DETAILS

INTERSTATE ROUTE H-3
HALEKOU INTERCHANGE
F.A.I. Proj. No. I-H3-1(24):11

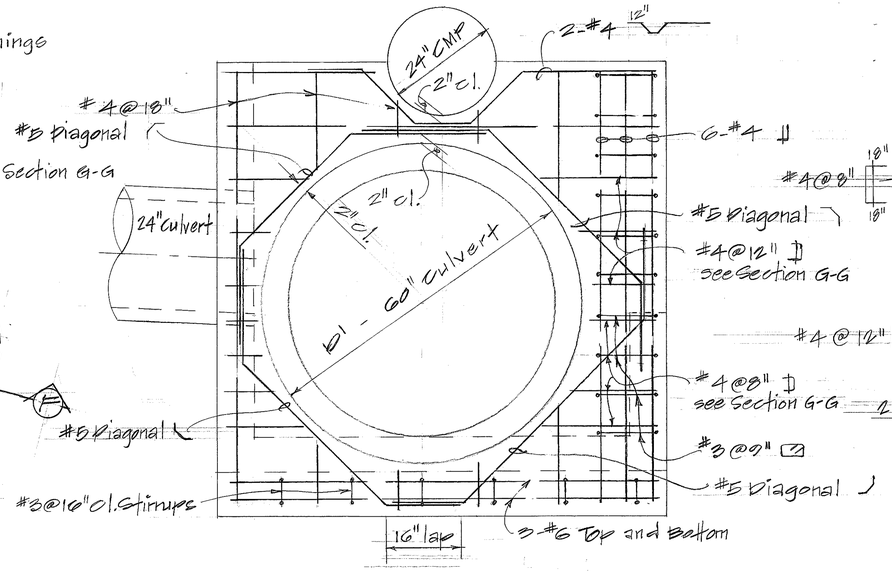
Scale: As Shown Date: Oct. 1982

SHEET No. 32D OF 50 SHEETS

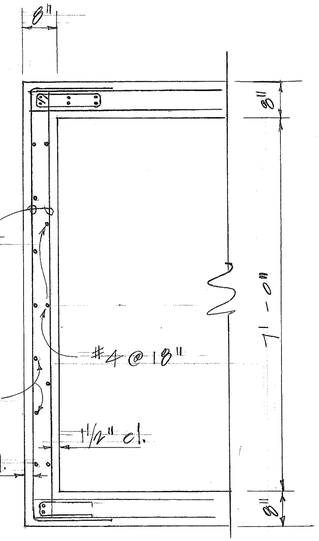
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(24):11	1983	104	328



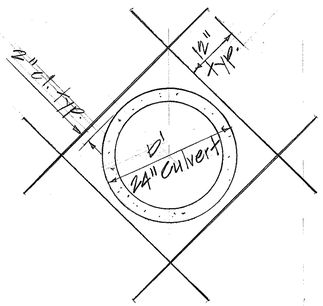
SECTION C-C



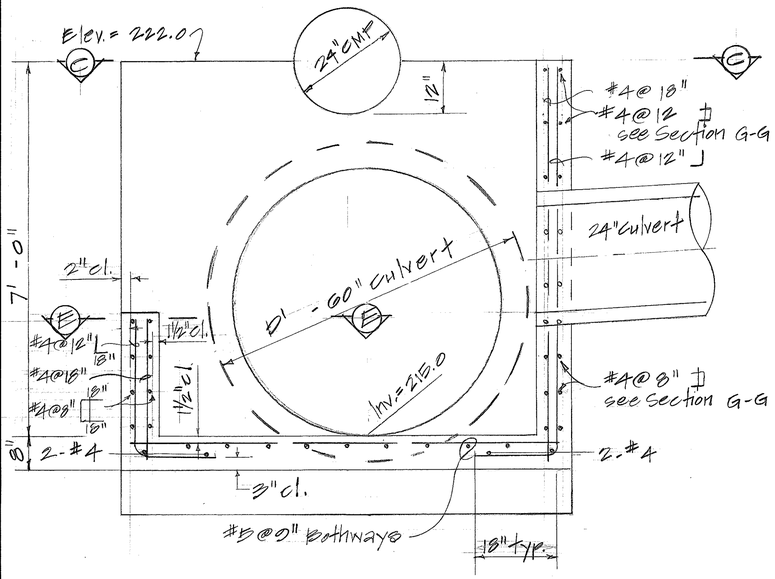
SECTION D-D



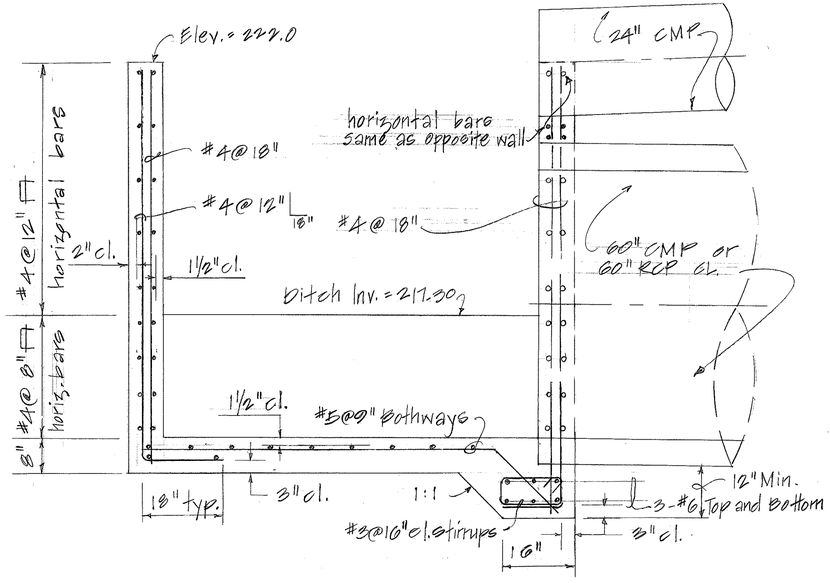
SECTION E-E



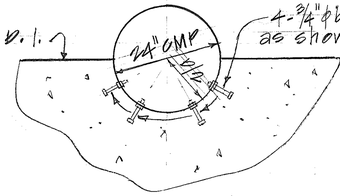
ADDED REINFORCING @ 24 INCH CULVERT OPENING



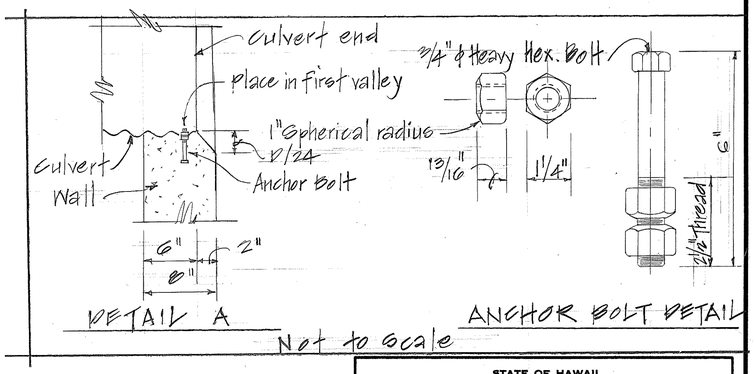
SECTION F-F



SECTION G-G



SPACING FOR ANCHOR BOLTS



DETAIL A

ANCHOR BOLT DETAIL

Not to scale

KEINFORCING DETAILS OF TYPE "Y" C.D.I. @ ℄ STA. 17+00 (37'9⅝ RT.) RAMP "D"

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

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION

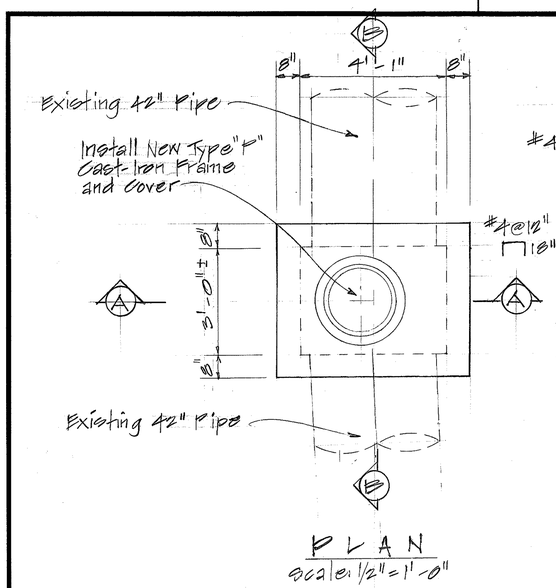
DRAINAGE DETAILS

INTERSTATE ROUTE H-3
HALEKOU INTERCHANGE
F.A.I. Proj. No. I-H3-1(24):11

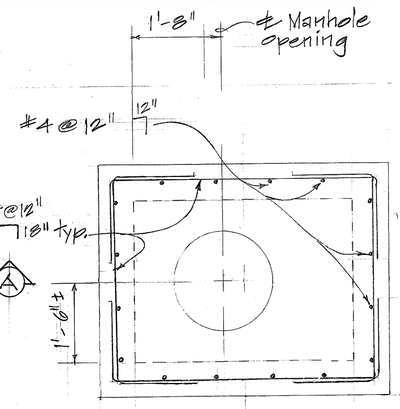
Scale: As Shown Date: Oct. 1982

SHEET No. 330 OF 50 SHEETS

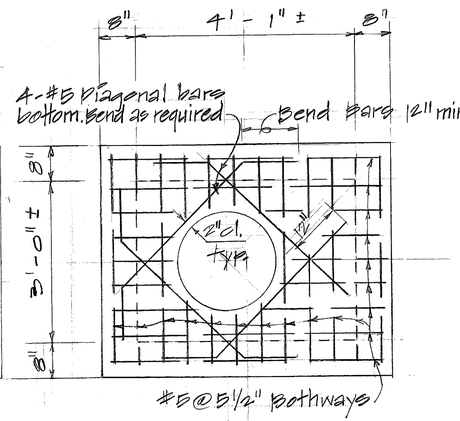
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(24):11	1983	105	328



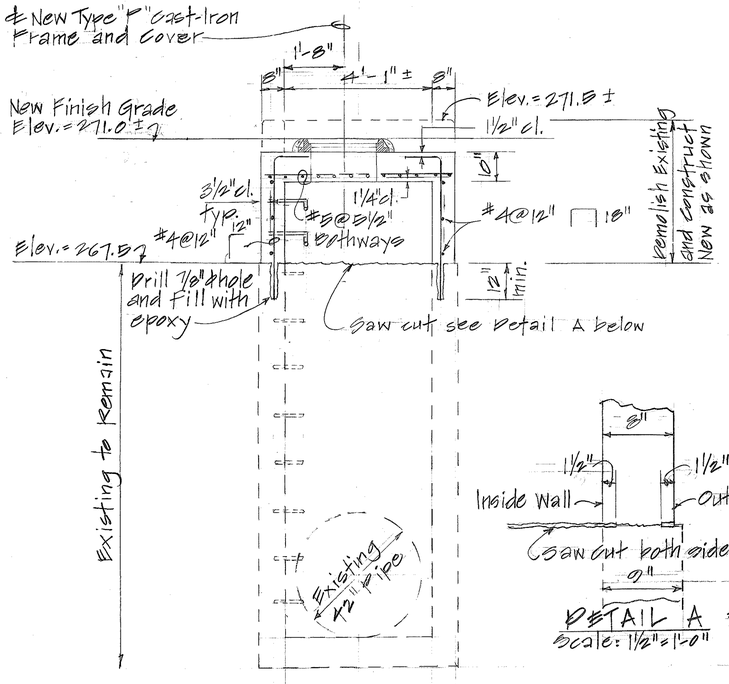
PLAN
Scale: 1/2" = 1'-0"



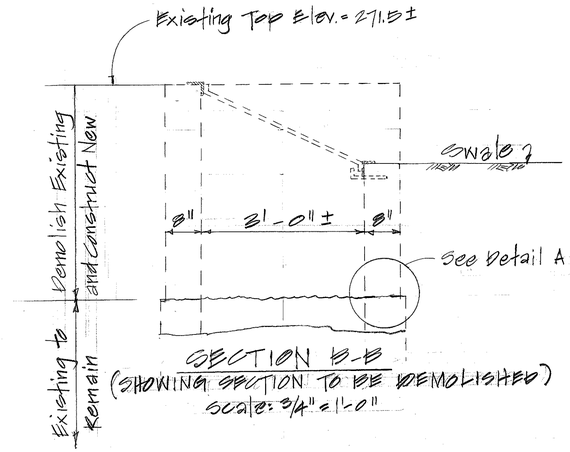
PLAN
(SHOWING REINFORCING)
Scale: 3/4" = 1'-0"



TOP SLAB
(SHOWING REINFORCING)
Scale: 3/4" = 1'-0"

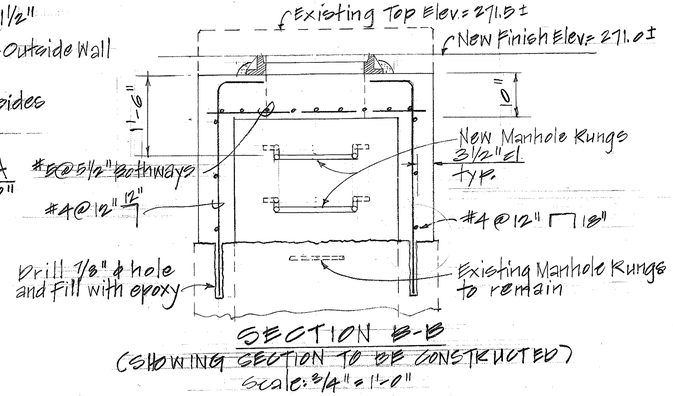


SECTION A-A
Scale: 1/2" = 1'-0"



SECTION B-B
(SHOWING SECTION TO BE DEMOLISHED)
Scale: 3/4" = 1'-0"

DETAIL A
Scale: 1½" = 1'-0"



SECTION B-B
(SHOWING SECTION TO BE CONSTRUCTED)
Scale: 3/4" = 1'-0"

GENERAL NOTES:

1. Demolishing and removing a portion of the existing structure shall not be paid for separately, but shall be considered incidental to the various contract items.
2. Only non-pneumatic type of drill as approved by the Engineer will be permitted for drilling holes in concrete. Where indicated on plans, the approximate diameter of drilled holes for installation of dowels shall be 7/8 inches, after installing reinforcing steel, the voids shall be filled with epoxy grout as directed by the Engineer. Above work shall be considered incidental to the various contract items.

DETAILS OF MODIFIED TYPE Z S.D.M.H. AT ℄ STA. 99+00 KAM HWY.

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

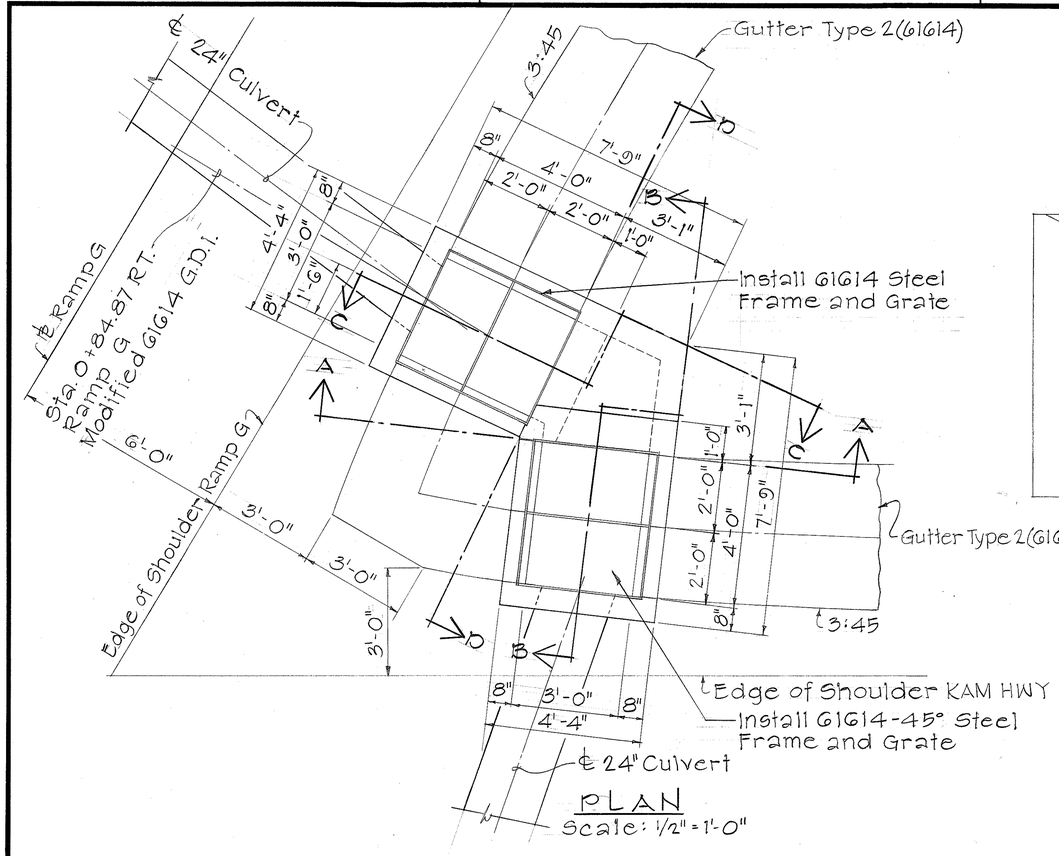
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION
DRAINAGE DETAILS

INTERSTATE ROUTE H-3
HALEKOU INTERCHANGE
F.A.I. Proj. No. I-H3-1(24):11

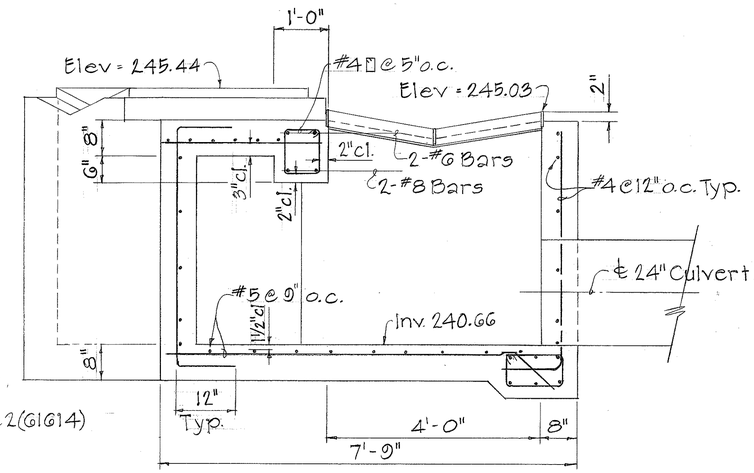
Scale: As Shown Date: Oct. 1982

SHEET No. 340 OF 59 SHEETS

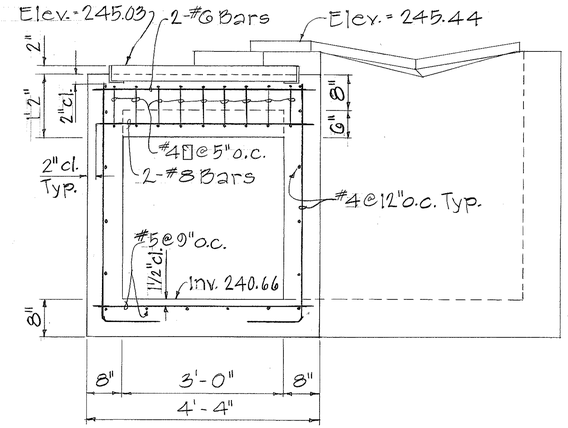
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(24):11	1983	106	328



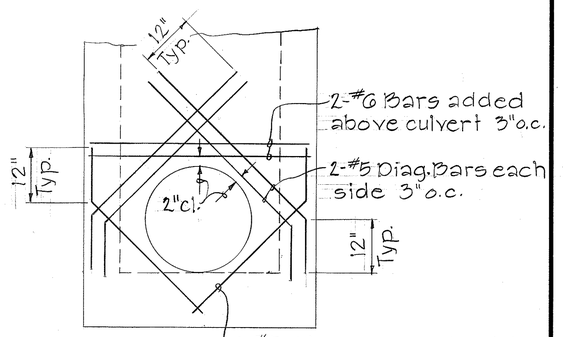
PLAN
Scale: 1/2" = 1'-0"



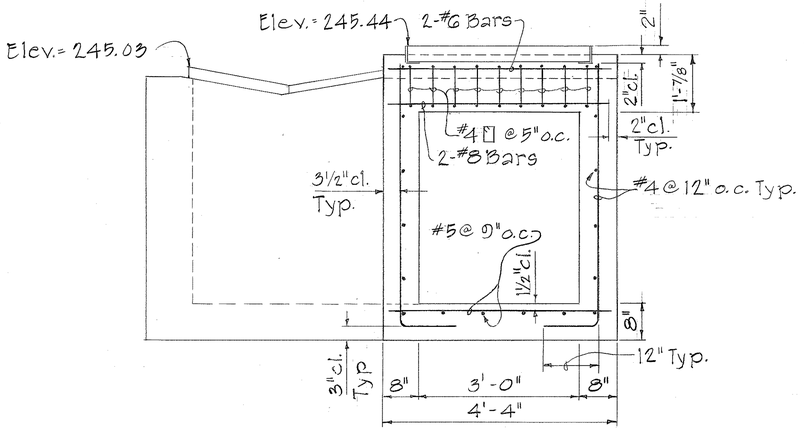
SECTION "C - C"
Scale: 3/4" = 1'-0"



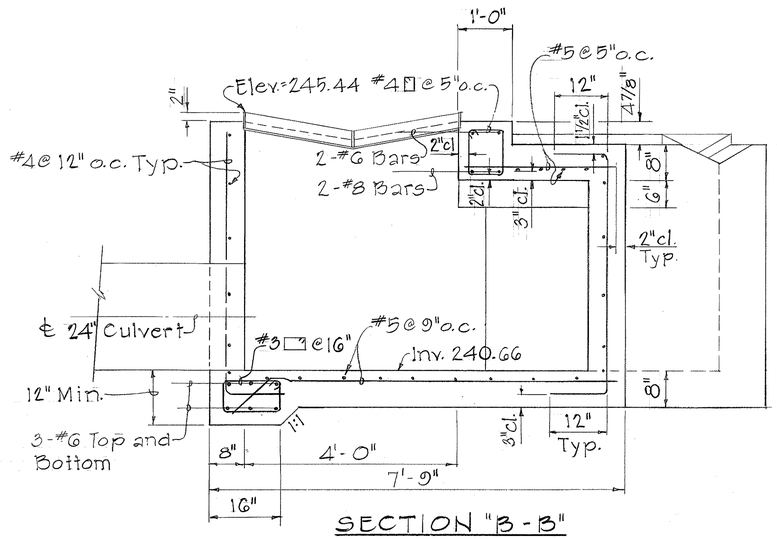
SECTION "D-D"
Scale: 3/4" = 1'-0"



ADDED REINFORCING AROUND 24" CULVERT
Scale: 3/4" = 1'-0"



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



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

MODIFIED G1G14 G.D.I. #A-5 AT STA 0+84.87 RT RAMP G

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION

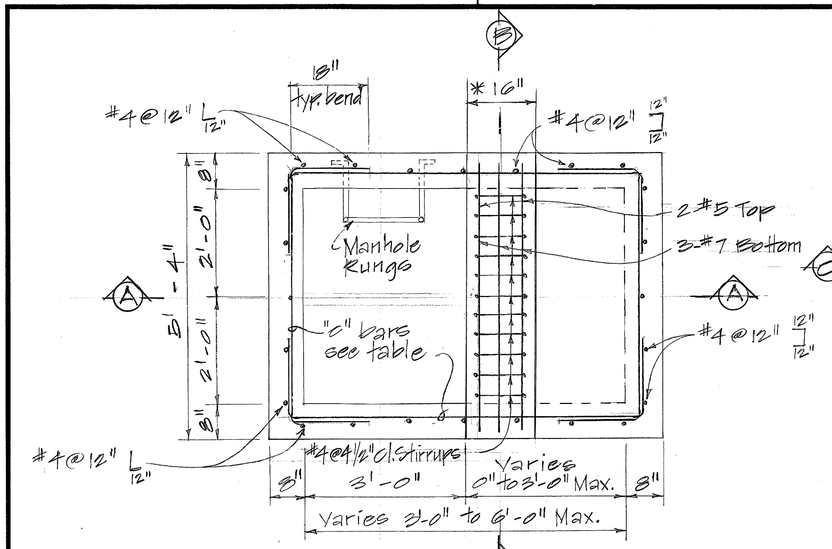
DRAINAGE DETAILS

INTERSTATE ROUTE H-3
HALEKOU INTERCHANGE
F.A.I. Proj. No. I-H3-1(24):11

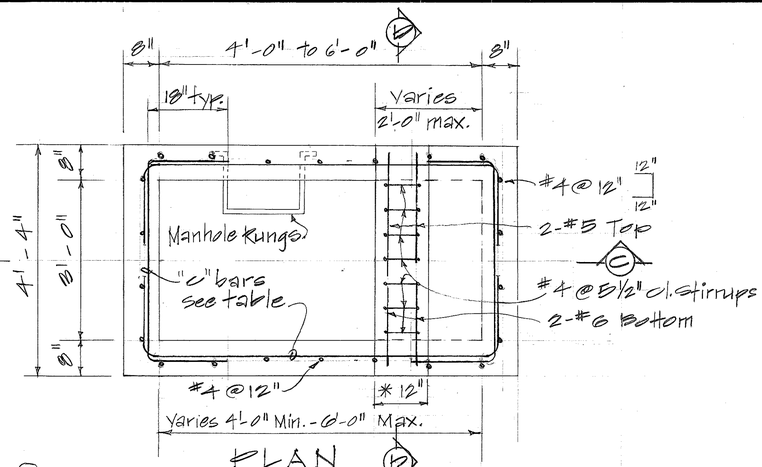
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SHEET No. 35D OF 50 SHEETS

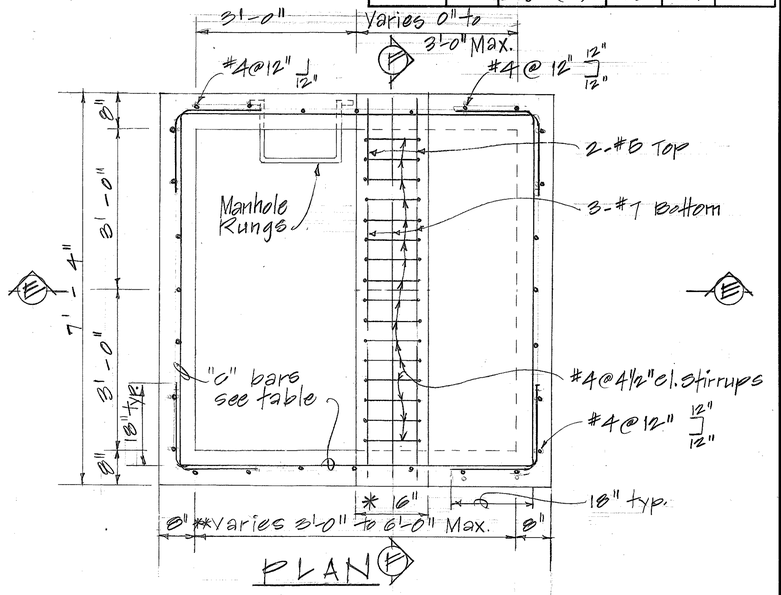
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(24):11	1982	107	328



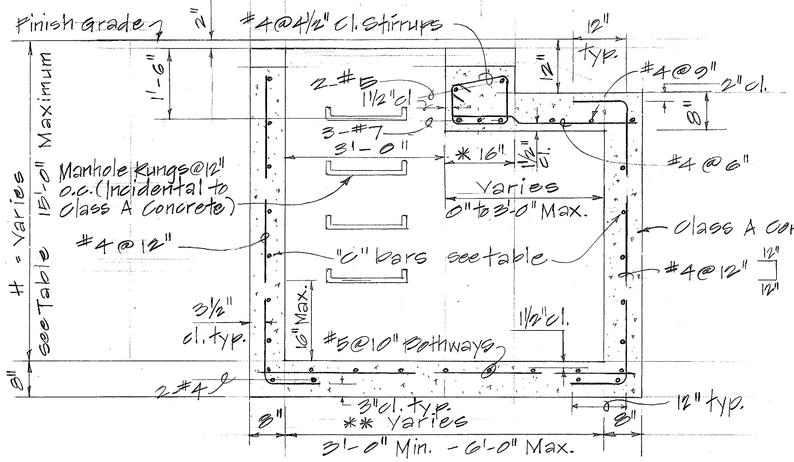
PLAN



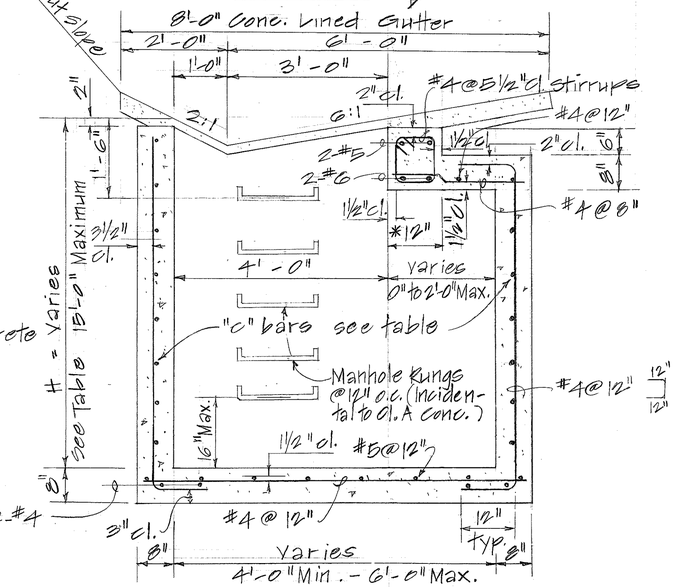
PLAN



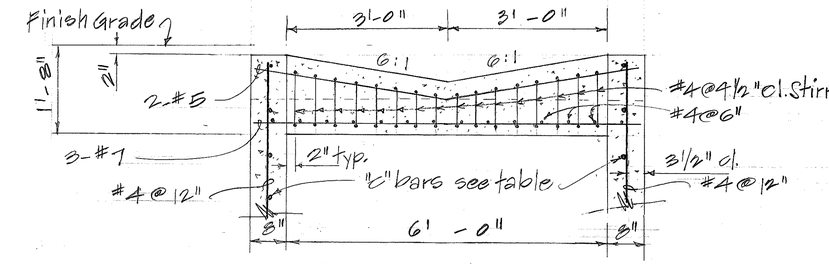
PLAN



SECTION A-A



SECTION C-C



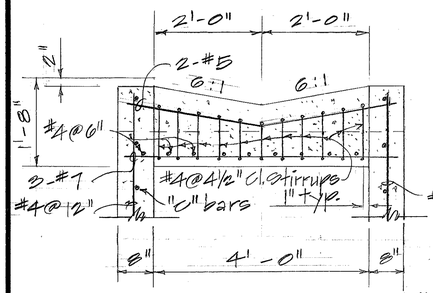
SECTION F-F

* For Minimum size box of 3'-0", eliminate beam and use typical wall and wall reinforcing steel shown in the top portion.
** For Culverts larger than 30", the minimum dimension shall be 6'.
For section E-E see Section A-A for similar view

DETAILS OF 61616 GRATED DROP INTAKE

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

Note:
1. 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.



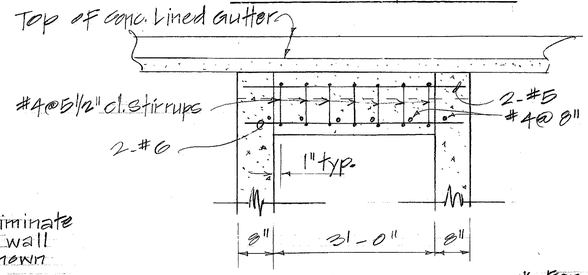
SECTION B-B

TABLE: GRATED DROP INTAKE	
"H"	"C" BARS
5'-0" max.	#4 @ 10" O.C.
10'-0" max.	#5 @ 9" O.C.
15'-0" max.	#5 @ 6" O.C.

* For Minimum size box of 3'-0", eliminate beam and use typical wall and wall reinforcing, reinforcing steel shown in the top portion.
** For Culverts larger than 30", the minimum dimension shall be 6'.

DETAILS OF 61614 GRATED DROP INTAKE

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



SECTION D-D

* For Minimum size box of 4'-0" only, eliminate beam and use typical wall and wall reinforcing.

DETAILS OF 61214 GRATED DROP INTAKE

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

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION

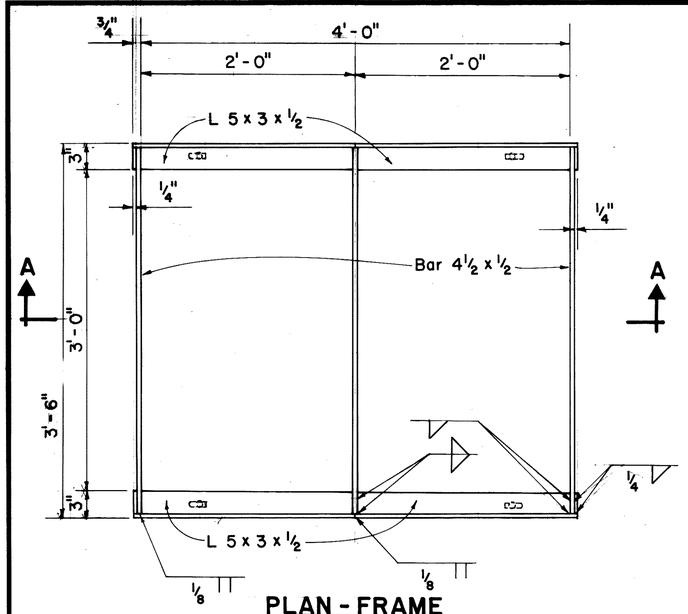
DRAINAGE DETAILS

INTERSTATE ROUTE H-3
HALEKOU INTERCHANGE
F.A.I. Proj. No. I-H3-1(24):11

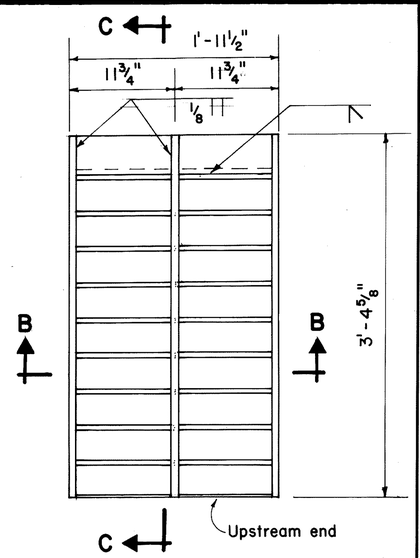
Scale: As Shown Date: Oct. 1982

SHEET No. 360 OF 59 SHEETS

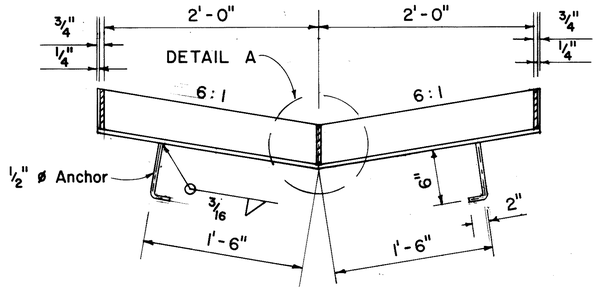
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(24):11	1980	108	328



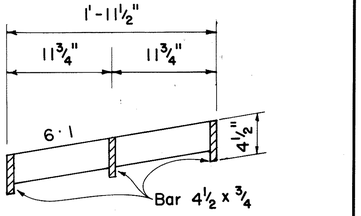
PLAN - FRAME



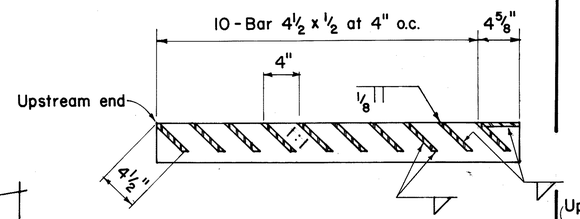
PLAN - GRATE
(61614 - 45°)



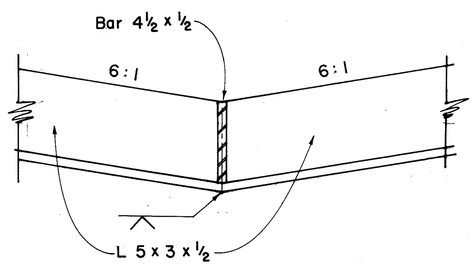
SECTION "A-A"



SECTION "B-B"

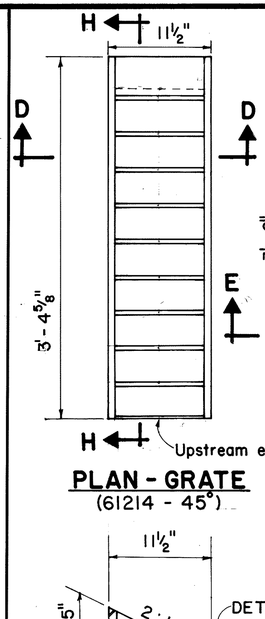


SECTION "C-C"

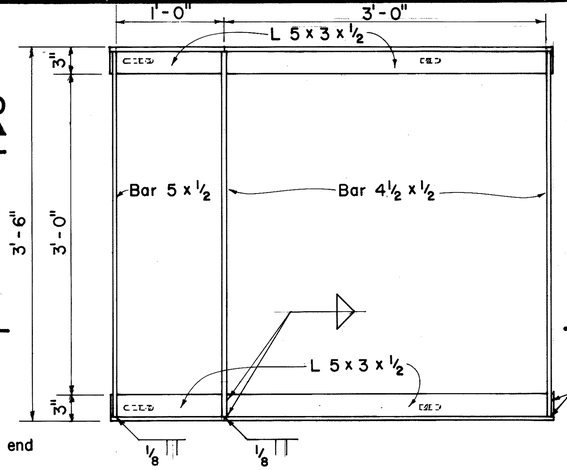


DETAIL A

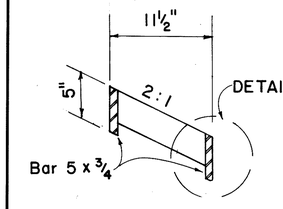
DETAILS OF TYPE 61614-45° FRAME AND GRATES



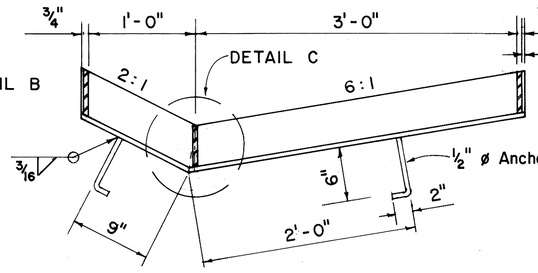
PLAN - GRATE
(61214 - 45°)



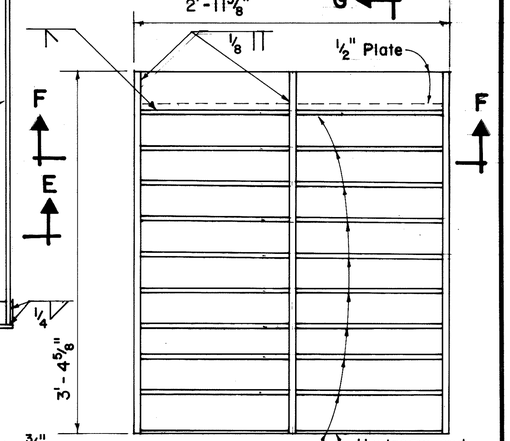
PLAN - FRAME



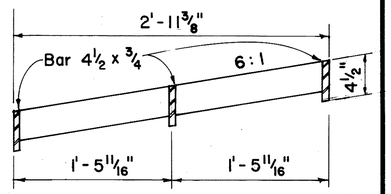
SECTION "D-D"



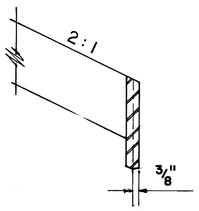
SECTION "E-E"



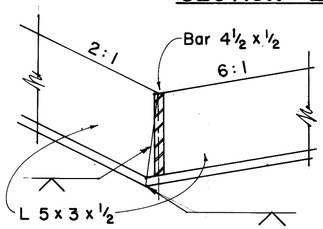
PLAN - GRATE
(61214 - 45°)



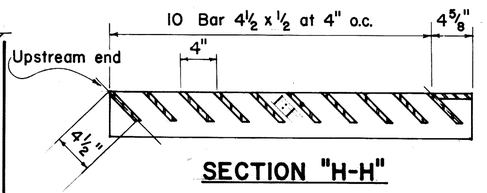
SECTION "F-F"



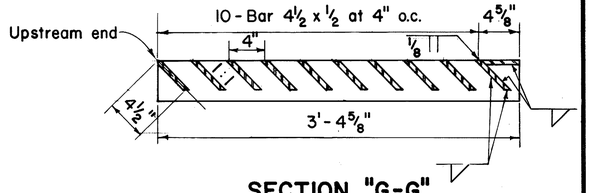
DETAIL B



DETAIL C



SECTION "H-H"



SECTION "G-G"

GENERAL NOTE

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

DETAILS OF TYPE 61214-45° FRAME AND GRATES

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION

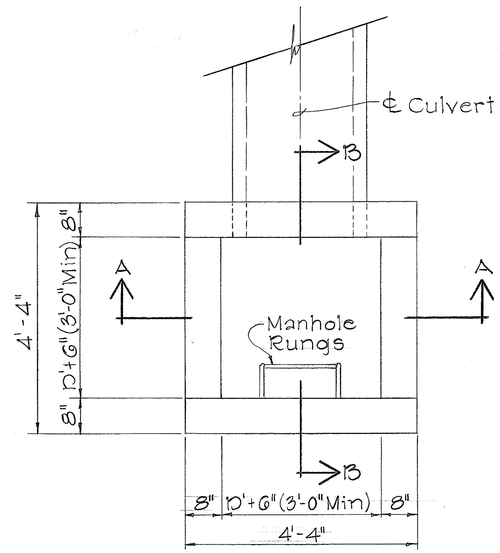
DRAINAGE DETAILS

INTERSTATE ROUTE H-3
HALEKOU INTERCHANGE
F.A.I. Proj. No. I-H3-1(24):11

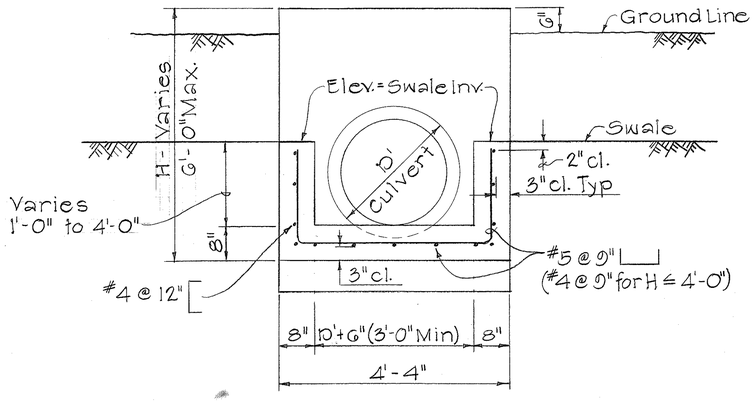
Not to Scale Date: Oct. 1982

SHEET No. 370 OF 59 SHEETS

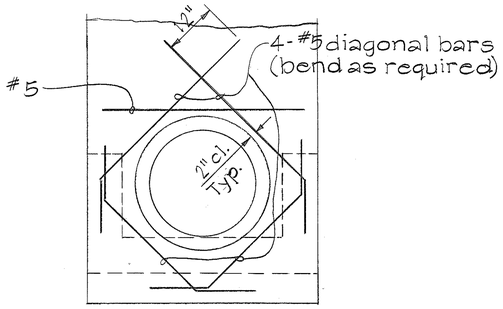
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(24):11	1983	109	328



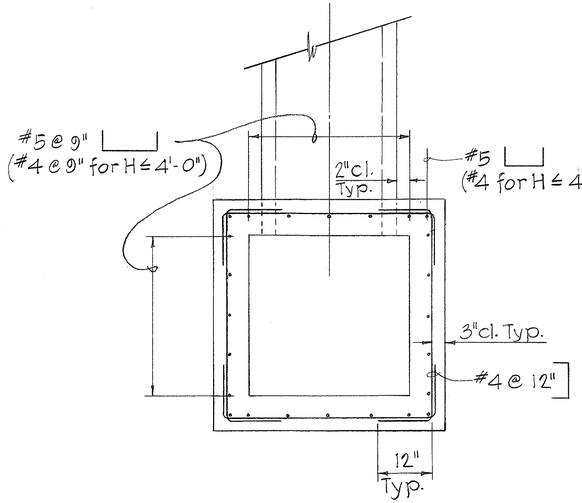
PLAN



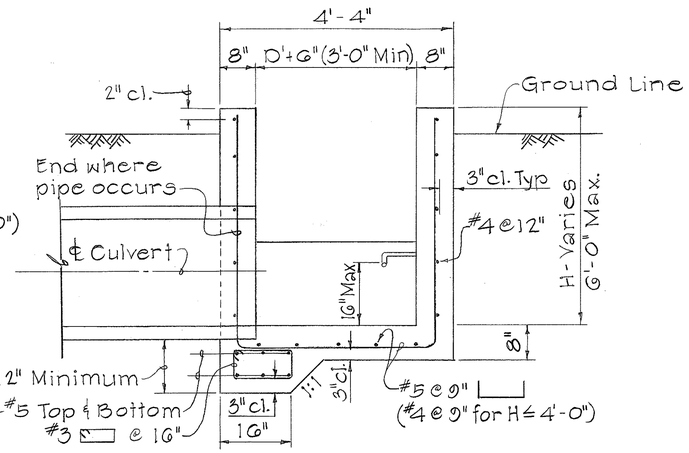
SECTION "A-A"



ADDED REINFORCING FOR CULVERT OPENING



PLAN VIEW OF REINFORCING STEEL



SECTION "B-B"

DETAILS OF TYPE "B" CONCRETE DROP INTAKE

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

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION

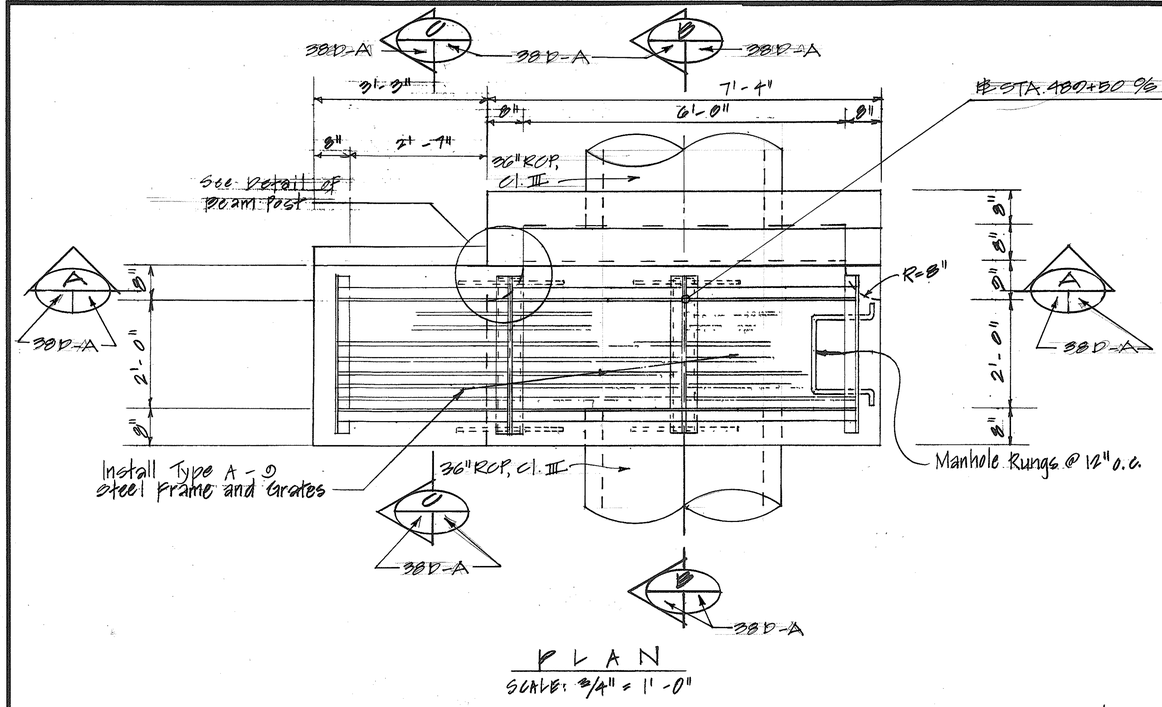
DRAINAGE DETAILS

INTERSTATE ROUTE H-3
HALEKOU INTERCHANGE
F.A.I. Proj. No. I-H3-1(24):11

Scale: As Shown Date: Oct. 1982

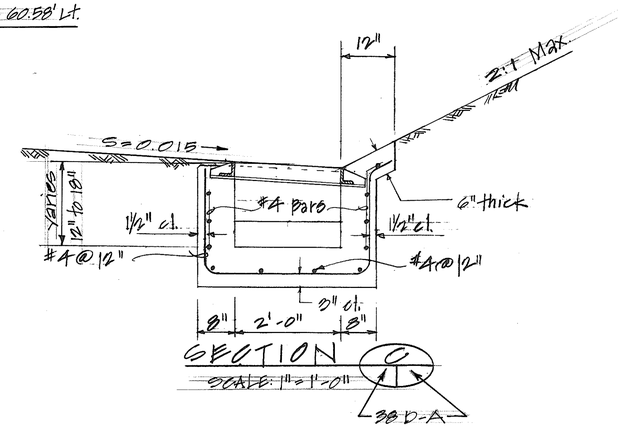
SHEET No. 38D OF 50 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-IR-HD-1(86)	1988		



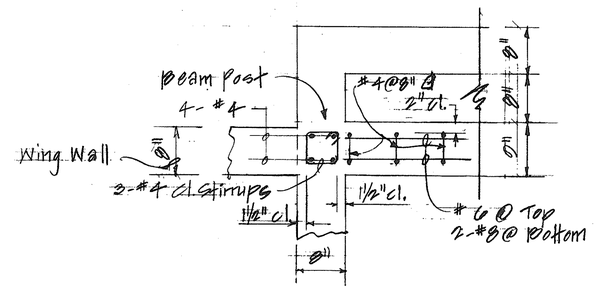
PLAN

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



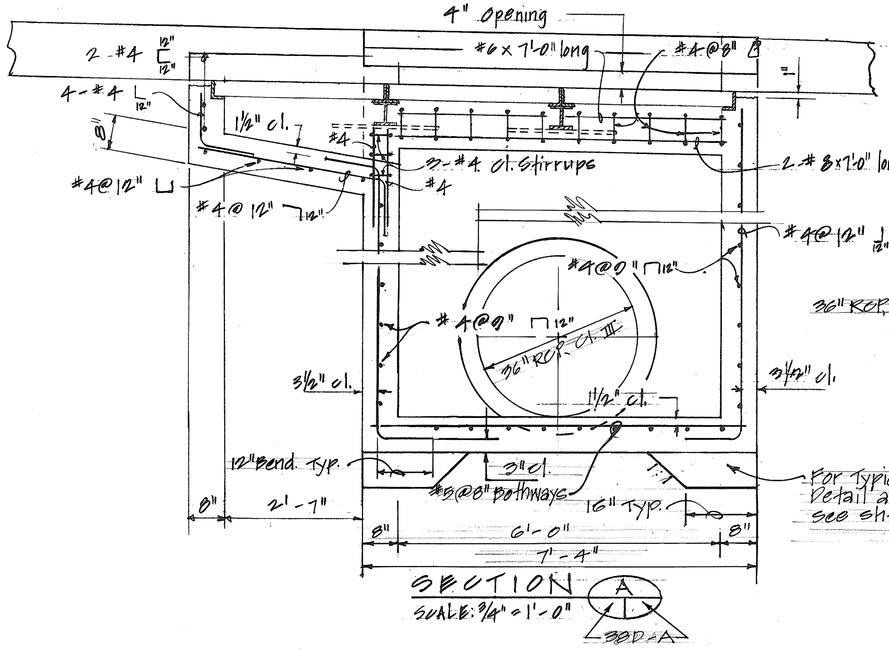
SECTION

SCALE: 1"=1'-0"



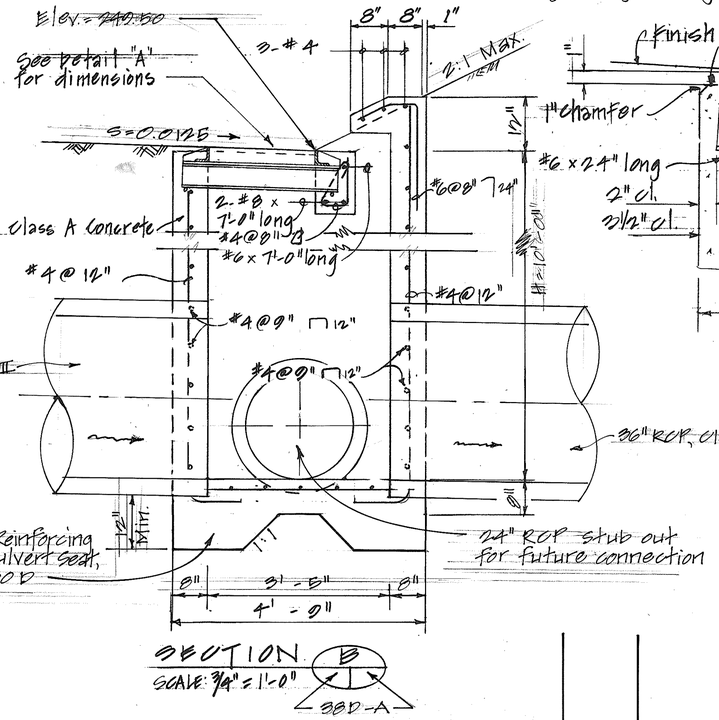
DETAIL OF BEAM POST

SCALE: 1"=1'-0"



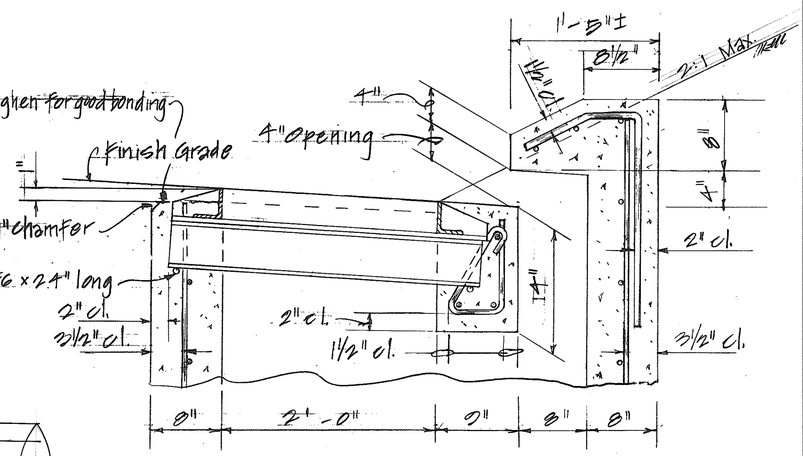
SECTION

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



SECTION

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



DETAIL - "A"

SCALE: 1½" = 1'-0"

DETAILS OF TYPE "N-1A" GRATED DROP INLET

ORIGINAL PLAN

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

DATE	REVISION
11/16/87	Added new sheet to Drainage Details

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION

DRAINAGE DETAILS

INTERSTATE ROUTE H-3
HALEKOU INTERCHANGE
F.A.I. PROJ. NO. I-IR-HD-1(86)111

Scale: As Shown Date: Nov., 1987

SHEET NO 38D-A OF 50 SHEETS

C.O. 109 S-1

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	[illegible]	1983	110	328

℄ PIPE STA. 2+00 TO STA. 3+99.92
INSTALL:
ARMCO Multi-Plate Structure
10 Gage, 219"x141" Elliptical Pipe

℄ PIPE STA. 3+89.92 TO STA. 5+87.74
CONSTRUCT:
Concrete Open Channel
(See Sht. 46D for Details)

Installation of elliptical pipe shall be according to ARMCO'S Installation Guidelines For Multi-Plate Ellipse.

⚠ VECP Open Channel & Drainage Pipe Revised for Elliptical Pipe

PIPE CURVE DATA Δ1
Δ1=177° 25'
Δ1/5=15° 29'
℄R1=120.00
t1 = R1 tan. 1/2 (Δ1/5)
t1 = 16.18
2t1 = 32.36

PIPE CURVE DATA ΔA
ΔA = 7°44'30"
℄R = 120.00
tA = 16.79
2tA = 33.59

NOTE:
See Sht. 40D for Multi-plate pipe galvanizing requirements.

℄ Pipe Sta. 8+05
Inv = 215.80

℄ Pipe Sta. 8+07
CMP Drop Inlet
Connect to existing structural plate pipe

℄ Pipe Sta. 7+20
CMP Drop Inlet
Connect to existing structural plate pipe.

℄ Pipe Sta. 8+75
CMP Drop Inlet
Connect to existing structural plate pipe.

℄ Pipe Sta. 12+05
CMP Drop Inlet
connect to existing 36" CMP

℄ Pipe Sta. 13+05
CMP Drop Inlet
Connect to existing 36" CMP

Existing 54" Pipe

℄ PIPE STA. 7+20, STA. 8+07, STA. 8+75
CONSTRUCT:
CMP Drop Inlets (connect to existing structural plate pipe)
(See Sht. 47D for Detail)

℄ PIPE STA. 12+05 & 13+05
CONSTRUCT:
CMP Drop Inlets
(connect to existing 36" CMP)
(See Sht. 47D for Details)

Remove temp. GRP lining (work to be paid under "Removal of Structures & Obstructions")

Connect to Exist. Pipe

℄ Pipe Sta. 5+86.74 End Channel
Inv = 211.86

Inlet Structure

KAMOOALII BRANCH (EXISTING)
270° 32' — 616.12 (PT. to PC.)

NORTHBOUND
SOUTHBOUND
SERVICE ROAD
KAMEHAMEHA HIGHWAY
INTERSTATE ROUTE H-3
WESTBOUND
EASTBOUND
℄ RAMP "E"
℄ RAMP "F"
℄ RAMP "G"
℄ RAMP "C"
60" PIPE
18" PIPE
Existing 54" Pipe
℄ Pipe Sta. 5+55
Inv = 209.80
℄ Pipe Sta. 2+37.89
℄ Pipe Sta. 4+00.00
℄ Pipe Sta. 3+99.92
℄ Pipe Sta. 2+10
MATCH LINE STA. 2+10 (See Sht. 40D for Continuation)
KIONAOLE BRANCH
303°35'29"
288°01'29"
273°37'29"
93°08'29"
24°39'29"
319°04'29"
Sta. 100+81.13 ℄ Kam Hwy. = 4+68.34 ℄ Ditch
Begin Channel

PROFILE
SURVEYED
PLOTTED
GRADES CHECKED
R. R.'S NOTED
STRUCTURE NOTATIONS CHKD.
NOTE BOOK
NO.
BY
DATE

Sta. 1+07.08 Service Road
Pipe Sta. 1+01.47
Sta. 2+15.07
Pipe Sta. 2+11.86
Pipe Sta. 3+99.92 Begin Channel
Sta. 4+68.34 ℄ Ditch
SOUTHBOUND KAM HIGHWAY BRIDGE
Sta. 4+81.18 ℄ Kam Hwy.
Pipe Sta. 4+68.34
NORTHBOUND KAM HIGHWAY BRIDGE
Pipe Sta. 5+86.74 End Channel
Correct to Existing Structural Plate Pipe
Sta. 6+22.88 Ramp "E"
Pipe Sta. 6+80.18
Finished Grade ℄
Existing Ground ℄
HGL
MATCH LINE STA. 2+10
60" ℄ Pipe Inv = 211.80 (Inlet Left)
18" ℄ Pipe Inv = 209.80 (Inlet Left)
Exist. Double 132" ℄ Structural Plate Pipe
℄ Pipe Sta. 7+20 CMP Drop Inlet (Inlet Right)
℄ Pipe Sta. 8+07 CMP Drop Inlet (Inlet Left)
℄ Pipe Sta. 8+75 CMP Drop Inlet (Inlet Right)
Exist. 54" ℄ Pipe Inlet Right
℄ Pipe Sta. 12+05 CMP Drop Inlet (Exist.)
℄ Pipe Sta. 13+05 CMP Drop Inlet (Exist.)
Exist. Double 132" Structural Plate Pipe Culvert
HGL (Lt & Rt Culvert)
Exist 54" ℄ Pipe Inlet Right
Q50 = 1216 cfs
D50 = 8.47'
Q100 = 1516 cfs
D100 = 9.57'
240
230
220
210
200
250
3
4
5+00
6
7
8
9
10+00
11
12
13
14
15+00
16
17

Scale: Horiz. 1" = 50'
Vert. 1" = 10'

SSFM Engineers, Inc.
Consulting Structural Engineers
1210 West Ave., Honolulu, HI 96814
HOWARD N. FURUYA
REGISTERED PROFESSIONAL ENGINEER
No. 1343
HAWAII, U.S.A.
For VECP Revision ⚠ Items Only
Open Channel & Drainage Pipe Alignment Revised to Accomodate VECP Revision to Elliptical Drainage Pipes.

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY SUPERVISION.
Dennis Yokota
LICENSED PROFESSIONAL ENGINEER
No. 7698
HAWAII, U.S.A.

NO.	DATE	REVISION
⚠2	11/9/83	AS-BUILT CONDITIONS
⚠1	7/27/83	VECP - DRAINAGE PIPES

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
KAMOOALII BRANCH
219"X141" ELLIPTICAL MULTI-PLATE CULVERT ⚠1
HALEKOU INTERCHANGE
F.A.I. Project No. I-IR-H3-1(24):11
Scale: As Shown Date: Oct. 1982

SHEET NO. 39D OF 50 SHEETS

C.O. 110

PLATE I—PLAN PROFILE B. P. R. STANDARD
THE FREDERICK POST CO., CHICAGO

FED ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IIR-H3-1(24):11	1983	111	328

TRUE NORTH
Scale: 1" = 50'

Location of Channel & Drainage Pipe revised to reflect As-Built Condition. (2)

KAMEHAMEHA HIGHWAY
SERVICE ROAD 6
KAMOOALII BRANCH
KIONAOLE BRANCH
INTERSTATE ROUTE H3
WESTBOUND
EASTBOUND
RAMP "C"
RAMP "A"
KIONAOLE ROAD

MATCH LINE STA. 2+00 KAMOOALII BRANCH
MATCH LINE STA. 11+00 SEE SHT. 41D FOR CONTINUATION

℄ Pipe Sta. 3+59.41
Inv. = 219.20
24" CMP
342°32'09"
32°48'19"
℄ 354°16' — 513.52' (P.T. to OSE PI)
℄ 354°16' — 308.27' (P.T. to P.C.)
P.C. Sta. 3+51.47
P.T. Sta. 7+60.14
R = 200.00'

See Sht. 43DA for Transition Structure Details (1)

24" Pipe
℄ Pipe Sta. 8+49.91
Inv. = 225.5
14°16'00" Angle Pt. to End Pipe
26.75'
For Inlet Structure See sht. 48D
Sta. 7+26.41
Sta. 8+06.41 End Pipe
Sta. 8+29.66 20° Defl.
Garage
House
Hot House
Sta. 7+51.41
Inv. = 227.20

PIPE CURVE DATA Δ5
Δ5 = 53°19'00"
Δ5/4 = 13°19'45"
℄ R = 100'
t5 = R5 tan 1/2 (Δ5/4)
t5 = 11.61'
2t5 = 23.22'

PIPE CURVE DATA Δ4
Δ4 = 35°11'31"
Δ4/3 = 11°43'50"
℄ R = 100'
t4 = R4 tan 1/2 (Δ4/3)
t4 = 10.27
2t4 = 20.54

℄ Elliptical (61"x91" Multi-Plate Pipe
315°04'29" — 329.12' (P.C. to P.T.)
℄ Elliptical (61"x91") Multi-Plate Pipe
For Grades see this sht.
KIONAOLE BRANCH

Backfill up to 2 ft. above top of pipes.

⚠ VECP Outlet Structure & Drainage Pipe Revised

Installation of elliptical pipe shall be according to ARMCO's Installation Guide Lines For Multi-Plate Ellipse. ⚠

GALVANIZING FOR MULTI-PLATE PIPE
10 Gage ——— 2 oz. per sq. ft.
⚠ 7 Gage & thicker — 3 oz. per sq. ft.

℄ CHANNEL STA. 0+00 TO STA. 2+54.64
CONSTRUCT:
Conc. Headwall
Conc. Channel
Conc. Apron
(For Details see sht. 43DA & 44D)

KAMOOALII BR.- PIPE STA. 0+00 TO STA. 2+00
INSTALL: ⚠
ARMCO Multi-Plate 63E27-10 Gage
KIONAOLE BR-PIPE STA. 0+00 TO STA. 5+41
INSTALL:
ARMCO Multi-Plate 63E21-10 Gage
KIONAOLE BR.-PIPE STA. 5+41 TO STA. 5+71 & STA. 7+31 TO STA. 7+66.1
INSTALL:
ARMCO Multi-Plate 63E21-7 Gage
KIONAOLE BR.- PIPE STA. 5+71 TO STA. 5+91 & STA. 6+49 TO STA. 7+31
INSTALL:
ARMCO Multi-Plate 63E21-5 Gage
KIONAOLE BR.-PIPE STA. 5+91 TO STA. 6+49
INSTALL:
ARMCO Multi-Plate 63E21-3 Gage
KIONAOLE BR.-LEFT PIPE STA. 7+72.77 TO STA. 9+06.41
RIGHT PIPE STA. 7+72.77 TO STA. 11+00
INSTALL:
120" ℄ Structural Plate Pipe No. 10 Gage 5% Vertical Elongated. 120" ℄ CMP (3x1 corrugation) maybe substituted for the sht. t=.138" portion only.
CONSTRUCT:
Inlet Structure @ Left Pipe STA. 9+06.41
For Details See Sheet 48D.

⚠
SSFM Engineers, Inc.
Consulting Structural Engineers
1210 1st Ave. Honolulu, HI 96814
REGISTERED PROFESSIONAL ENGINEER No. 1348 HAWAII, U.S.A.
Howard Y. Fukeda
For VECP Revision ⚠ Items Only. Outlet Structure & Drainage Pipe Alignment Revised to Accomodate VECP Revision to Elliptical Drainage Pipes.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
Howard Y. Fukeda

NO.	DATE	REVISION
⚠	11/9/83	As-Built Conditions
⚠	7/27/83	VECP-DRAINAGE PIPES

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

KIONAOLE BRANCH
211" X 125" ELLIPTICAL MULTI-PLATE CULVERT

HALEKOU INTERCHANGE
F. A. I. Project No. I-IR-H3-1(24):11
Scale: As Shown Date: Oct. 1983

SHEET NO. 40D OF 50 SHEETS

PLAN: SURVEYED ... BY ... DATE; PLOTTED ... CHECKED ... ALIGNMENT CHECKED ... FIL. OF MAT. CHECKED ... NOTE BOOK ... NO. ... STRUCTURE ROYAL'KC CI'KO.

PROFILE: SURVEYED ... BY ... DATE; PLOTTED ... CHECKED ... ELEVATIONS ... B. M.'s NOTED ... NOTE BOOK ... NO. ... STRUCTURE ROYAL'KC CI'KO.

Sta 2+89.64
Sta 3+45
End Channel Sta. 2+04.64
Begin Transition
End Transition Sta 2+54.64
35' Rock Riprap Ungrouted
See Sht. 43D & 43DA for Details
Backfill top of ℄ CHANNEL
℄ CHANNEL Sta 0+28
℄ CHANNEL Inv. = 207.00
45.00'
Slope 1:1.5
Slope 1:1.0
3
2
1
220.00
200.00
New Stream Bank
℄ CHANNEL

STRUCTURAL PLATE PIPE
STA. 0+10 KAMOOALII BRANCH
STA. 0+00 KIONAOLE BRANCH
R = 395'
Δ6 = 35°00'
Δ6/2 = 17°30'
R = 335'
T = 105.02
C = 201.47
LC = 204.64

Channel ℄ Sta 0+00
Begin Conc Channel
Pipe Stations
0+10 (Kamoalii)
0+00 (Kionaole)
Concrete Headwall
214.75 Top
207.75 Inv

Scale: Horiz. 1" = 50'
Vert. 1" = 10'

℄ Channel Station
Structural Plate Pipe Sta.
See sht. 39D for Continuation of Elliptical (61"x91") Structural Plate Pipe.
Finished Grade ℄ of Elliptical Pipe
Channel Wall Transition
Top Transition Wall
Top Channel Wall
Out off Wall
Channel Sta. 2+04.64 End Wall Transition
Channel Sta. 2+04.64 Begin Wall Transition
℄ Sta. Conc Channel
200.50
201.29
INVERT L=204.64 S=0.005
48" Pipe Inv=201.00
INVERT L=450' S=0.010
219" x 141" Elliptical Plate
211" x 125" Elliptical Plate
HGL
Sta 4+50
200.75
84" Pipe Inv=213.20 (Inlet left)
Sta 4+60.59
Pipe Sta. 4460.59
Sta. 3+85.77 Ramp "C"
Sta 3+74.97 Service Rd.
℄ Sta. 5+00 Pipe Sta. 5+02.79
Pipe Sta. 4+85.69
℄ Ramp "A"
MATCH LINE STA. 11+00
℄ Right Culvert
Sta 7+64.4
215.80
Existing Ground ℄ of Elliptical Pipe
L=314.61' S=0.0200
INVERT L=335.59
HGL (Rt. Culvert) S=0.0517
24" ℄ Pipe Inv=227.29
℄ Sta. 11+35.07 Ramp "A" Pipe Sta. 8+44.30
Finished Grade ℄ ℄ Pipe
24" Pipe Invert = 225.5
Q50=525 cfs D50=4.23'
Q100=656 cfs D100=4.88'
Existing Ground ℄ Pipe
Existing Stream Bed
HGL (Lt. Culvert)
INVERT L=115.25'
S=0.0201
S=0.0701 L=70.75
Sta 7+64.4 Left Culvert
Sta 8+79.66 Def. El.
End 120" Left Culvert Sta. 8+94.41
Inlet Structure
230.91 Top
224.00 Inv.
215.80
224.27
230
220
210
200
190
10+00

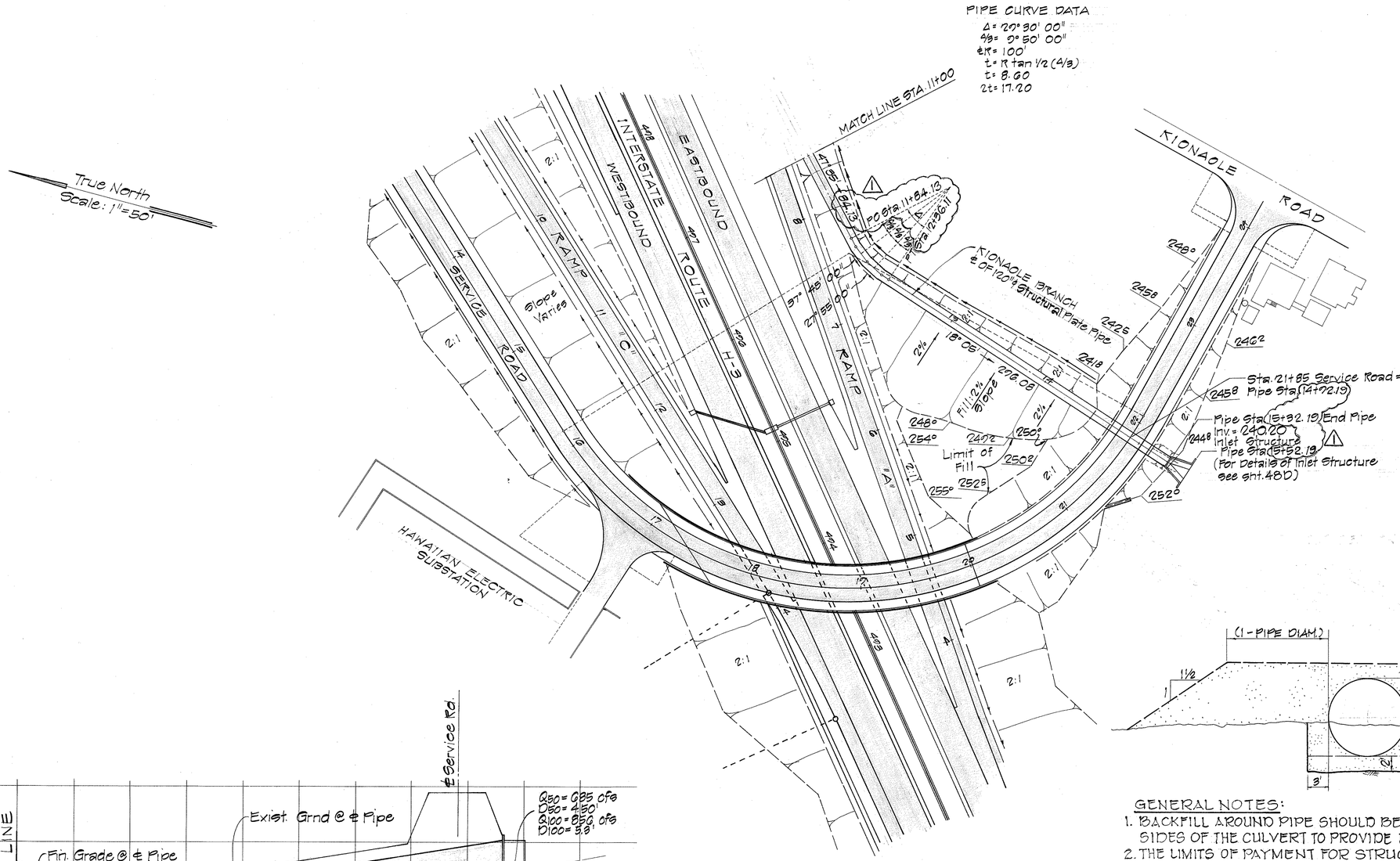
0+10 (Kamoalii) 1+10 2+10 3+10
0+00 (Kionaole) 1+00 2+00 3+00 4 5+00 6 7

PLATE 1—PLAN PROFILE B. P. R. STANDARD THE FREDERICK POST CO., CHICAGO

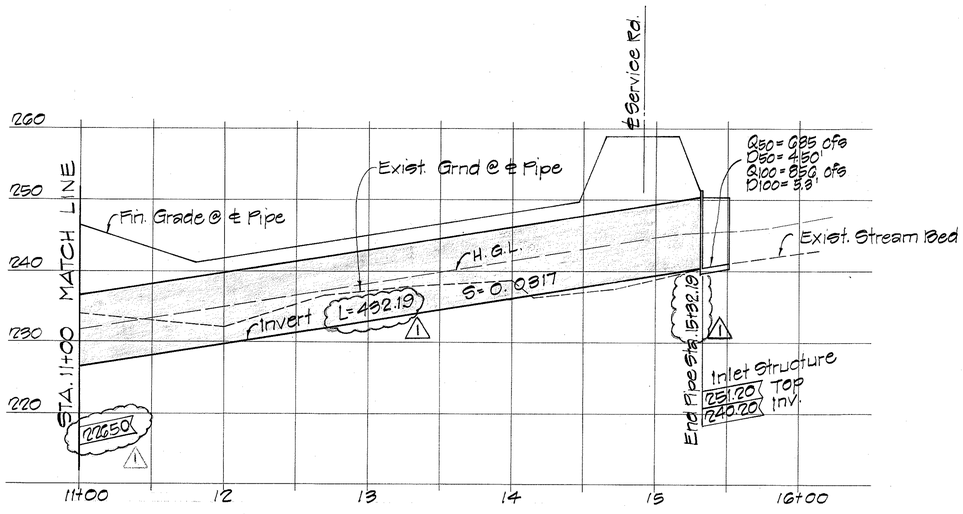
C.O. #13

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-IR-H3-1(24):11	1983	112	328

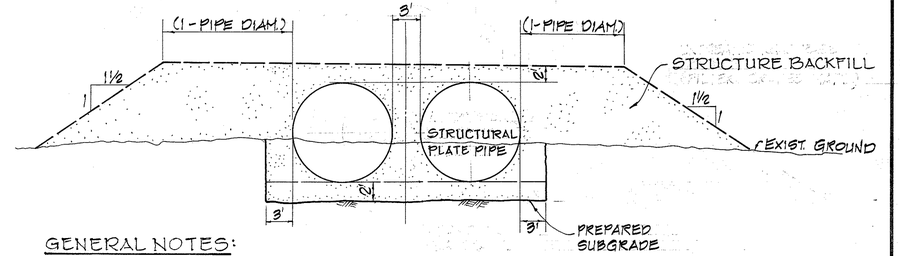
PIPE CURVE DATA
Δ = 20° 30' 00"
Φ/2 = 5° 50' 00"
℄R = 100'
t = R tan 1/2 (Δ/2)
t = 8.60
2t = 17.20



KIONAOLE BRANCH (RIGHT CULVERT)
PIPE STA. 11+00 TO STA. 15+32.19 ⚠1
CONSTRUCT:
Inlet Structure (For Details, see sht. 480)
INSTALL:
120" ϕ Structural Plate Pipe, No. 10 Gage
5% Vert. Elongated



PROFILE
Scale: Horiz. 1" = 50'
Vert. 1" = 10'



GENERAL NOTES:
1. BACKFILL AROUND PIPE SHOULD BE PLACED EVENLY IN COMPACTED LAYERS ON BOTH SIDES OF THE CULVERT TO PROVIDE UNIFORM SUPPORT DURING CONSTRUCTION.
2. THE LIMITS OF PAYMENT FOR STRUCTURE BACKFILL FOR THE STRUCTURAL PLATE PIPES SHALL BE AS SHOWN ON THE PLANS. THE VOLUME OCCUPIED BY THE STRUCTURAL PLATE CULVERTS WITHIN THE LIMITS OF PAYMENTS FOR STRUCTURE BACKFILL FOR STRUCTURAL PLATE CULVERTS SHALL BE DEDUCTED FROM THE PAY QUANTITIES OF STRUCTURE BACKFILL.

LIMITS OF PAYMENT FOR STRUCTURAL BACKFILL & BEDDING DETAIL

⚠1

SSFM Engineers, Inc.
Consulting Structural Engineers
1210 Ward Ave., Honolulu, HI 96814

HOWARD Y. FUKUDA
REGISTERED PROFESSIONAL ENGINEER
No. 1343
HAWAII, U.S.A.

Howard Y. Fukuda

For VECP Revision ⚠1 Items Only.
Drainage Pipe Revised to Accomodate VECP Revision to Elliptical Drainage Pipes.

GEORGE YOKOTA
REGISTERED PROFESSIONAL ENGINEER
No. 1156
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

George Yokota

NO.	DATE	REVISION
⚠1	7/27/83	VECP- DRAINAGE PIPES

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

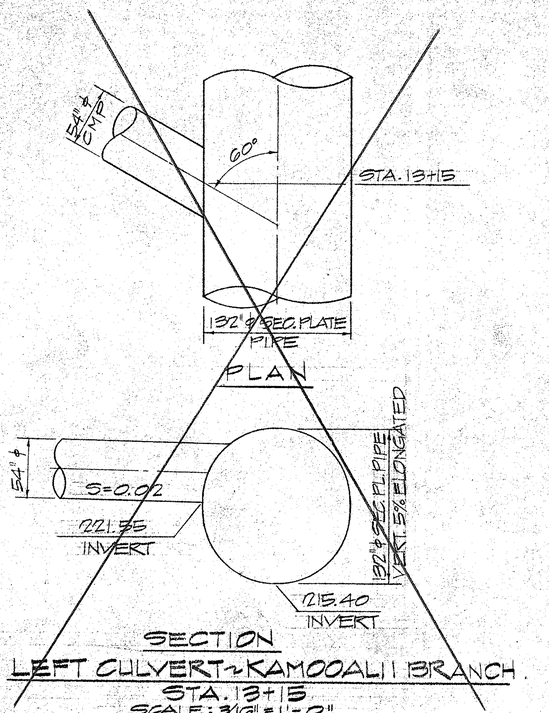
KIONAOLE BRANCH 120" ϕ STRUCTURAL PLATE CULVERT

HALEKOU INTERCHANGE
F.A.I. Project No. I-IR-H3-1(24):11
Scale 1" = 50' Date: Oct. 1982

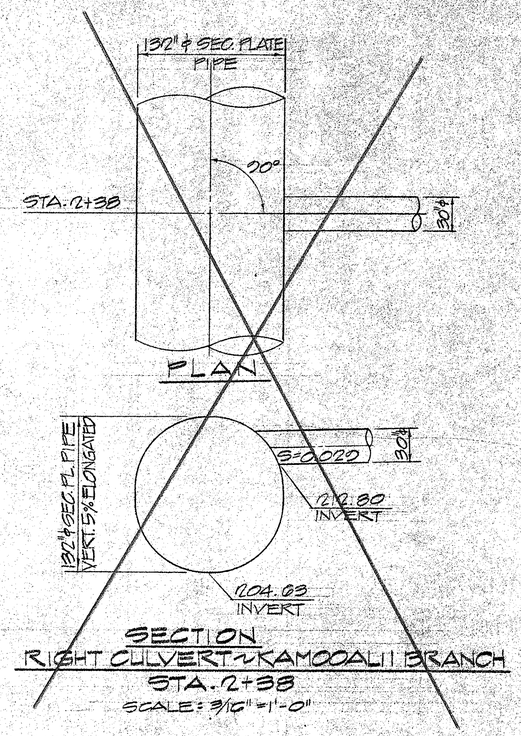
SHEET NO. 479 OF 50 SHEETS

C.O. 112

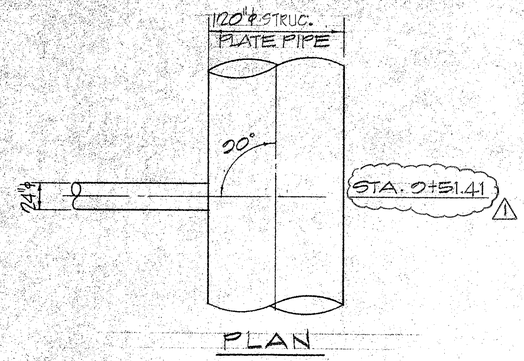
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	FIR-HB-1(24):11	1983	113	328



LEFT CULVERT ~ KAMOOALII BRANCH
STA. 13+15
SCALE: 3/16" = 1'-0"

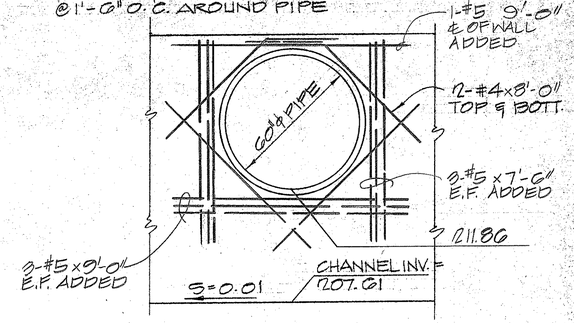


RIGHT CULVERT ~ KAMOOALII BRANCH
STA. 2+38
SCALE: 3/16" = 1'-0"



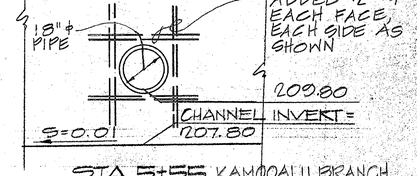
RIGHT CULVERT ~ KIONAOLE BRANCH
STA. 0+51.41 ⚠
SCALE: 3/16" = 1'-0"

NOTE:
FOR CMP ADD 3/4"ϕ 0" ANCHOR BOLTS @ 1'-0" O.C. AROUND PIPE

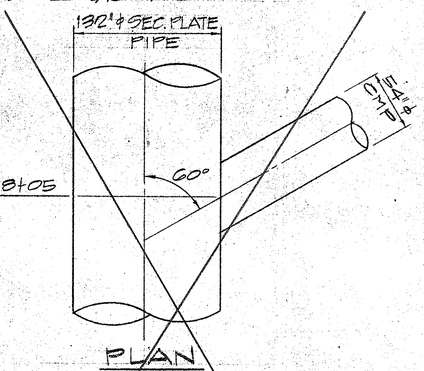


STA. 5+36 KAMOOALII BRANCH
60"ϕ PIPE TO CHANNEL CONNECTION
SCALE: 3/8" = 1'-0"

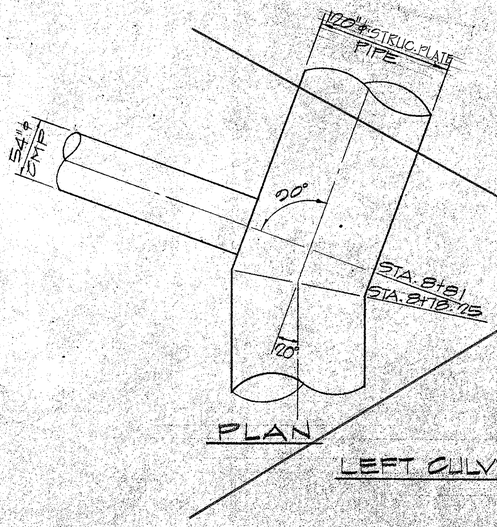
NOTE:
FOR CMP ADD 3/4"ϕ 0" ANCHOR BOLTS @ 1'-0" O.C. AROUND PIPE

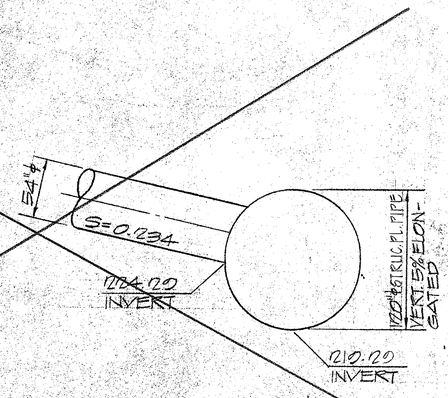


STA. 5+55 KAMOOALII BRANCH
18"ϕ PIPE TO CHANNEL CONNECTION
SCALE: 3/8" = 1'-0"



RIGHT CULVERT ~ KAMOOALII BRANCH
STA. 8+05
SCALE: 3/16" = 1'-0"





LEFT CULVERT ~ KIONAOLE BRANCH STA. 8+81
SCALE: 3/16" = 1'-0"

⚠

SSFM Engineers, Inc.
Consulting Structural Engineers
1210 Ward Ave., Honolulu, HI 96814

HOWARD Y. KINOSHITA
REGISTERED PROFESSIONAL ENGINEER
No. 1343
HAWAII, U.S.A.

For VECP Revision ⚠ Items Only. Drainage Pipe Revised to Accomodate VECP Revision to Elliptical Drainage Pipes.

GEORGE YOKOTA
REGISTERED PROFESSIONAL ENGINEER
No. 1156
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

NO	DATE	REVISION
⚠	7/27/83	VECP - DRAINAGE PIPES

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CONNECTION DETAILS

HALEKOU INTERCHANGE
F.A.I. Project No. I-IR-H3-1(24):11
Scale: 3/16" = 1'-0" Date: Oct. 1982

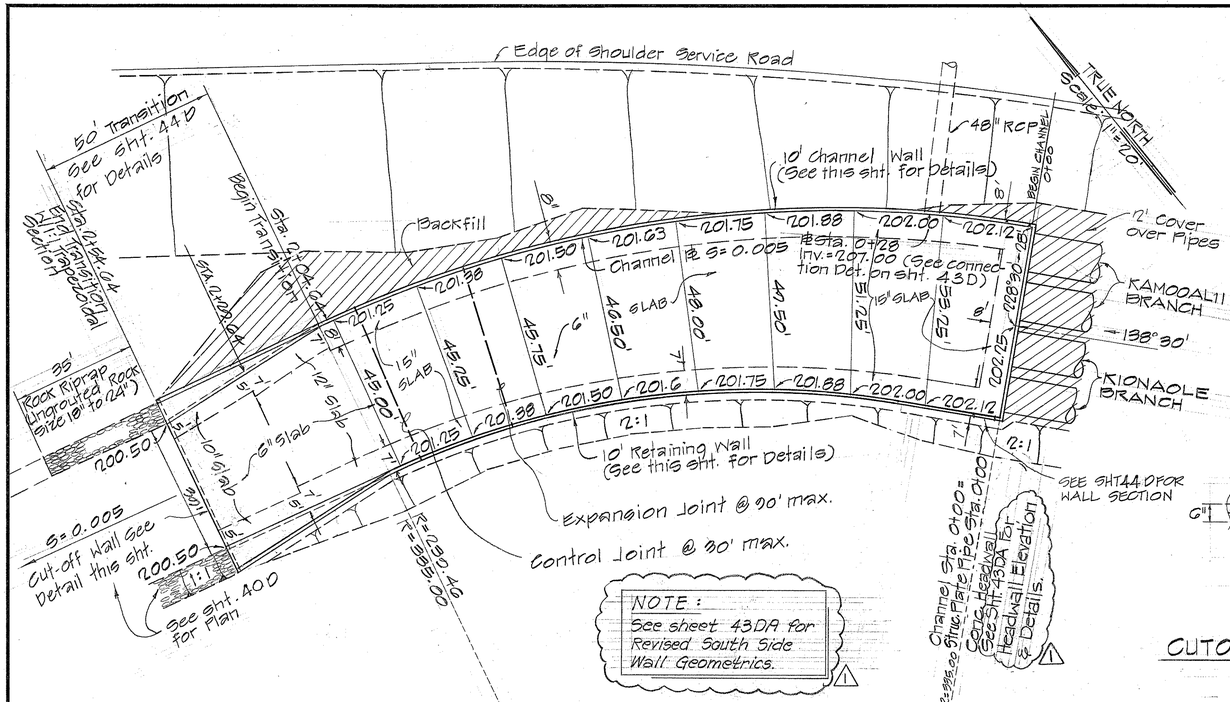
SHEET No. 420 OF 59 SHEETS

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

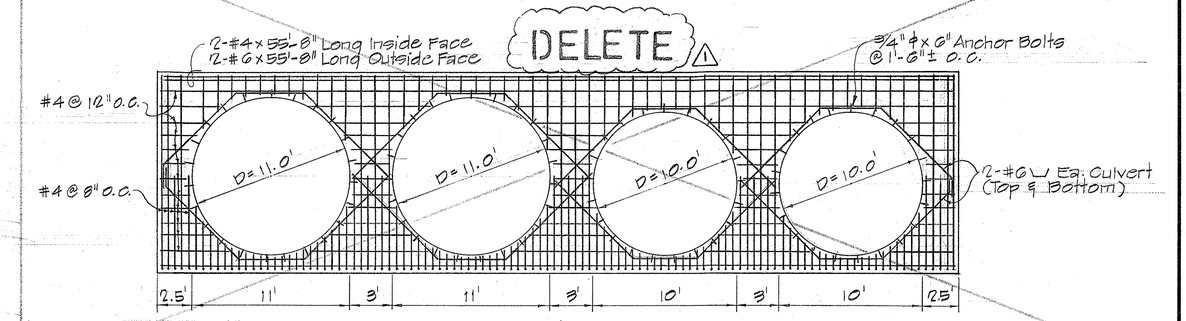
PRINTED ON NO. 1000H CLEARPRINT

C.O. 113

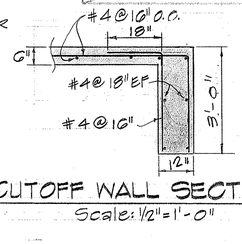
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-IR-H3-1(24):11	1983	114	328



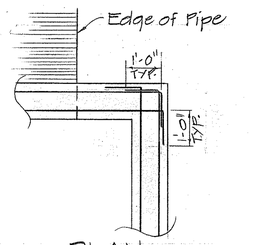
DRAINAGE OUTLET STRUCTURE AND CHANNEL
CHANNEL ℄ STA. 0+00 TO 2+54.64
Scale: 1"=20'



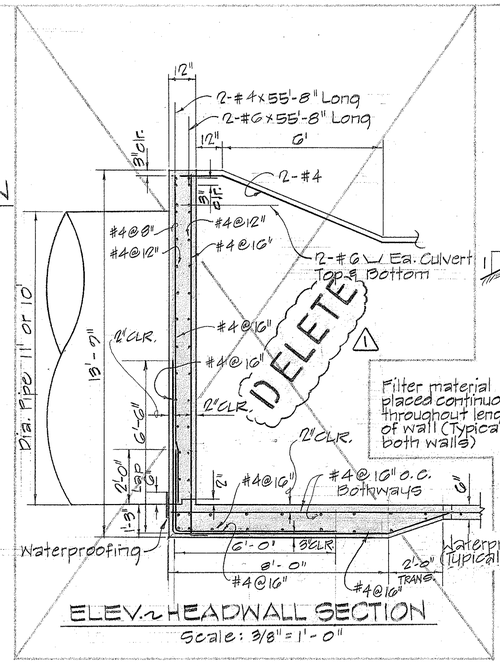
OUTLET HEADWALL ELEVATION
Scale: 1"=5'



CUTOFF WALL SECTION
Scale: 1/2"=1'-0"

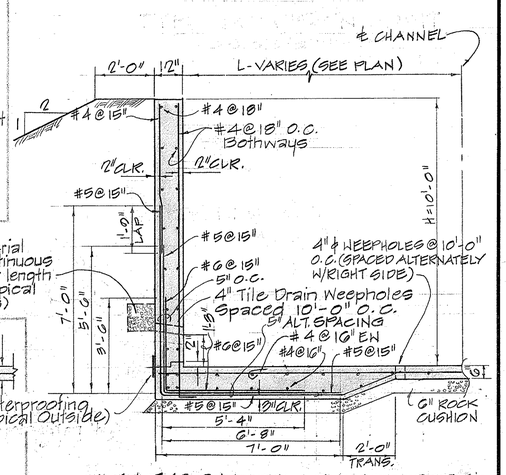


PLAN HEADWALL CORNER
Scale: 1/2"=1'-0"

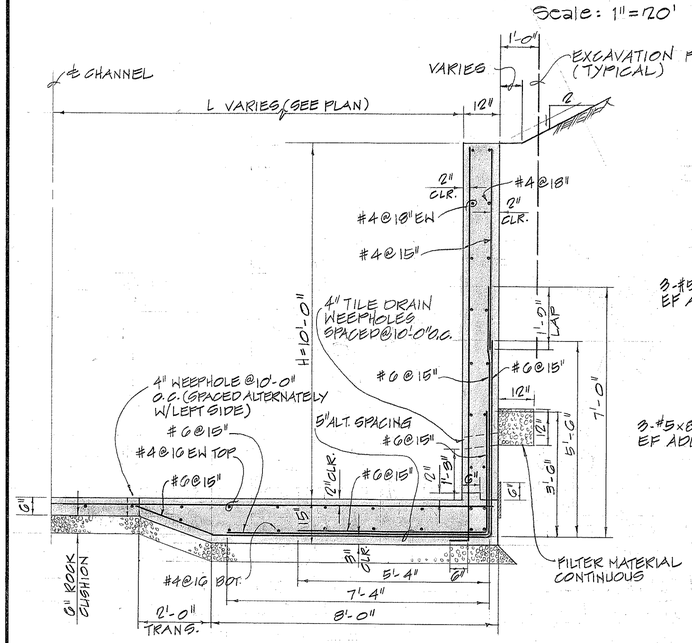


ELEV.-HEADWALL SECTION
Scale: 3/8"=1'-0"

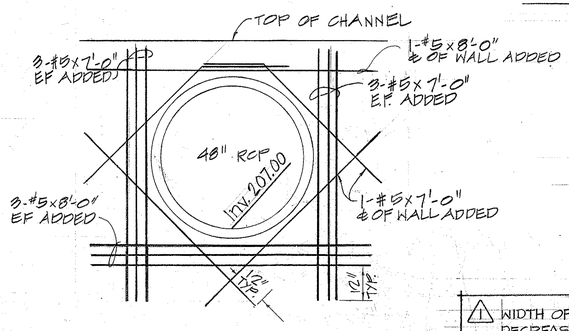
NOTE: See sheet 43DA for Revised Headwall Elevation & Section



ELEV.-TYP. CHANNEL LT. WALL SECT.
STA. 0+07 TO 2+04.64
SCALE: 3/8"=1'-0"



TYPICAL HALF SECTION ~ RIGHT SIDE CHANNEL WALL
STA. 0+07 TO 2+04.64
SCALE: 1/2"=1'-0"



PIPE CONNECTION TO CHANNEL WALL
SCALE: 1/2"=1'-0"

OUTLET HEADWALL AND CHANNEL RETAINING WALL DETAILS
Scale: As Shown

NOTES:
1- ALL CONCRETE SHALL BE CLASS "A"
2- EXPANSION JOINTS SPACED AT 90'-0" MAX.
3- CONTROL JOINTS SPACED AT 30'-0" MAX. (SEE SHT. 44D FOR DETAILS)

⚠1 WIDTH OF OUTLET STRUCTURE DECREASED & HEADWALL REVISED TO ACCOMODATE CHANGE FROM 2-11'-0" ϕ & 2-10'-0" ϕ PIPES TO 1-219" X 141" ELLIPSE & 1-211" X 124" ELLIPSE.

TIT KWONG CHAN — REGISTERED PROFESSIONAL ENGINEER — No. 2147 — HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

GEORGE YOKOTA — REGISTERED PROFESSIONAL ENGINEER — No. 1156 — HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

⚠	7/27/83	VECP - DRAINAGE PIPES
NO.	DATE	REVISION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE OUTLET STRUCTURE AND CHANNEL DETAILS

HALEKOU INTERCHANGE
F.A.I. Project No. I-IR-H3-1(24):11
Scale: As Shown Date: Oct. 1982

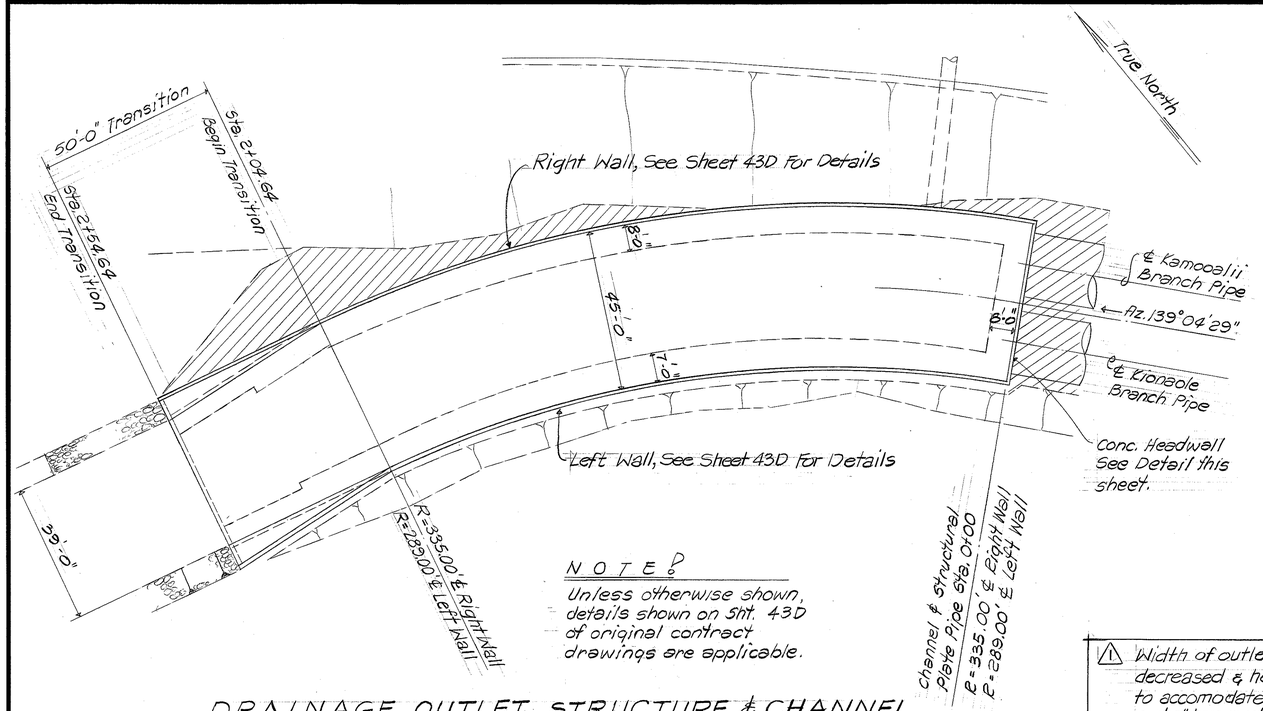
SHEET No. 43D OF 59 SHEETS

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

PRINTED ON NO. 1000H CLEARPRINT

C.O. 114

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-IR-H3-1(24):11	1983		

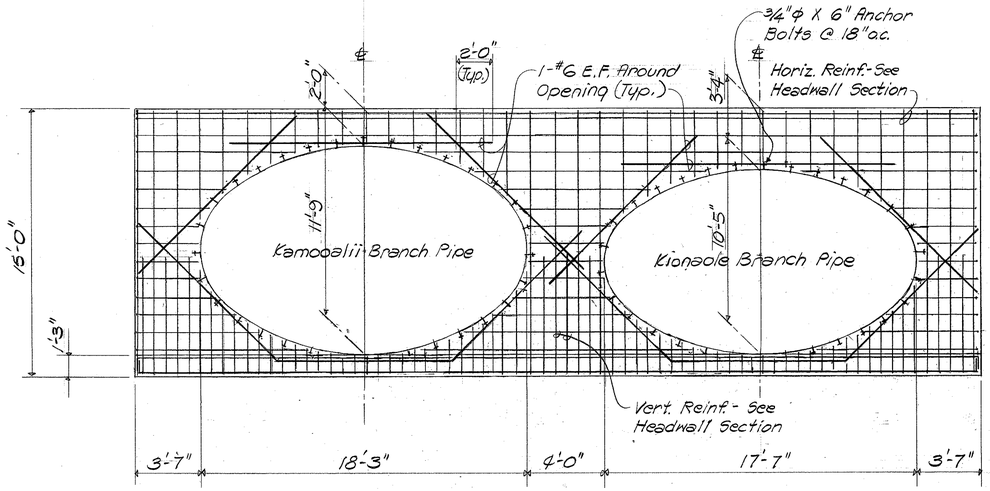


NOTE:
Unless otherwise shown, details shown on Sht. 43D of original contract drawings are applicable.

DRAINAGE OUTLET STRUCTURE & CHANNEL CHANNEL ℄ STA. 0+00 TO 2+54.64

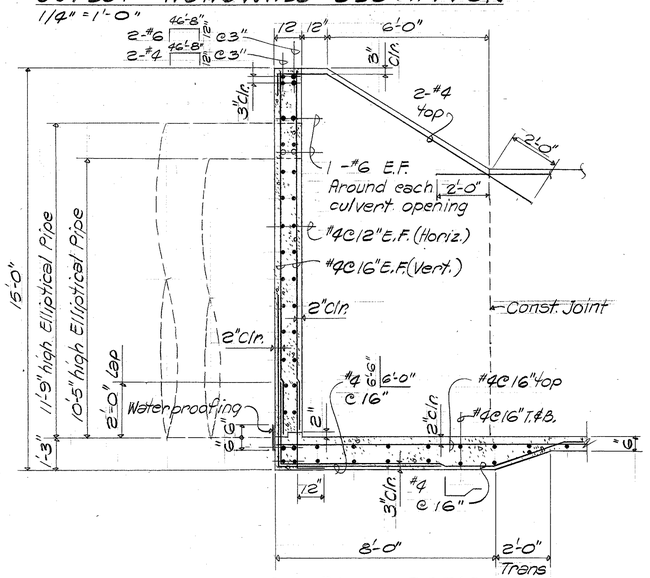
1" = 20'-0"

⚠ Width of outlet structure decreased & headwall revised to accomodate change from 2-11'-0"ϕ & 2-10'-0"ϕ pipes to 1-219"x141" ellipse & 1-211"x124" ellipse.



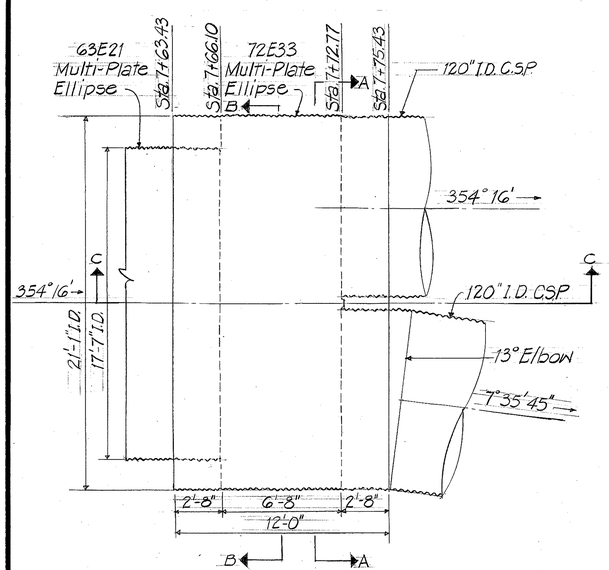
OUTLET HEADWALL ELEVATION

1/4" = 1'-0"

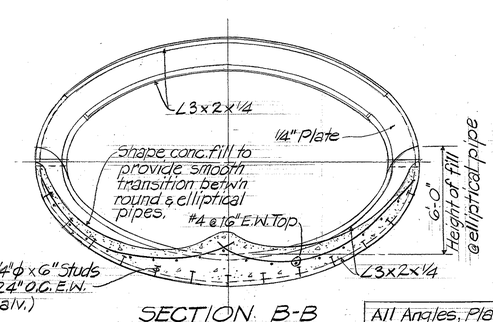


HEADWALL SECTION

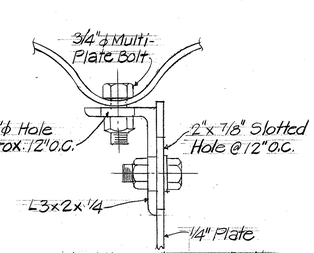
3/8" = 1'-0"



PLAN



SECTION B-B

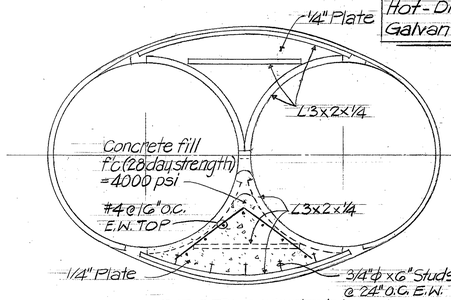


Galv. All Members & Bolts

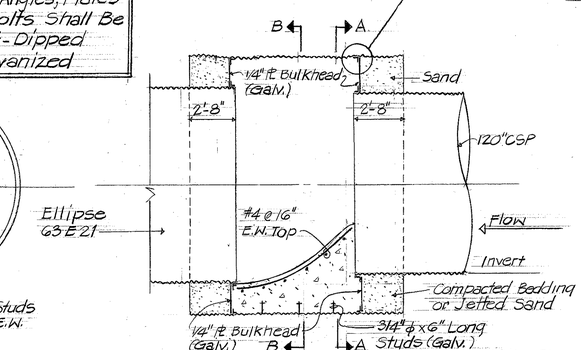
TYP. CONN. DETAIL

1/2" = 1'-0"

All Angles, Plates & Bolts Shall Be Hot-Dipped Galvanized



SECTION A-A



SECTION C-C

TRANSITION STRUCTURE

1/4" = 1'-0"

⚠ Details Shown On This Sheet Supersede Those On Sht. 43D.

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

CCES Engineers, Inc.
Consulting Structural Engineers
1210 Ward Ave., Honolulu, HI 96814

MICHAEL PAUL MATSUMOTO
REGISTERED PROFESSIONAL ENGINEER
No. 2974
HAWAII, U.S.A.

This work was prepared by me or under my supervision.
Michael P. Matsumoto
7/12/83

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION

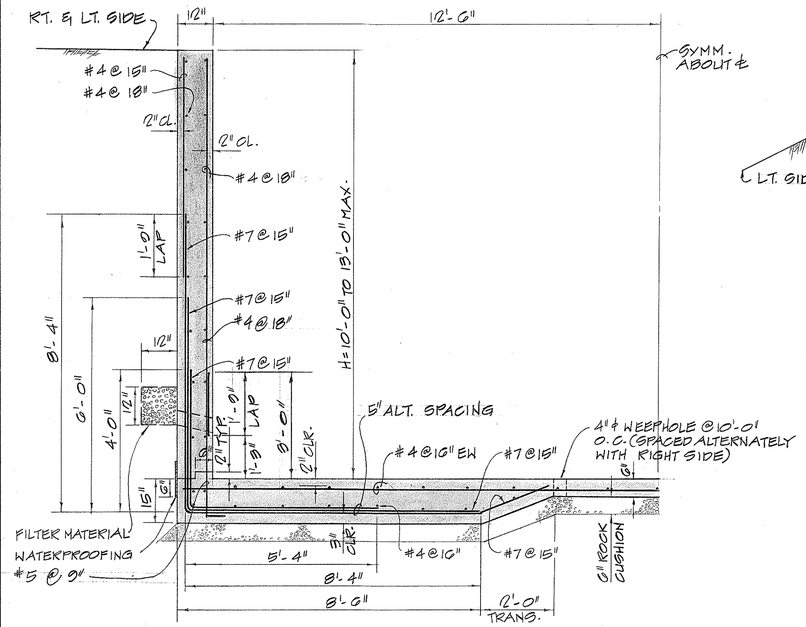
DRAINAGE OUTLET STRUCTURE & CHANNEL REVISIONS

HALEKOU INTERCHANGE
F.A.I. Project No. I-IR-H3-1(24):11
Scale: As Shown Date: JULY 1983

SHEET No. 43A OF SHEETS

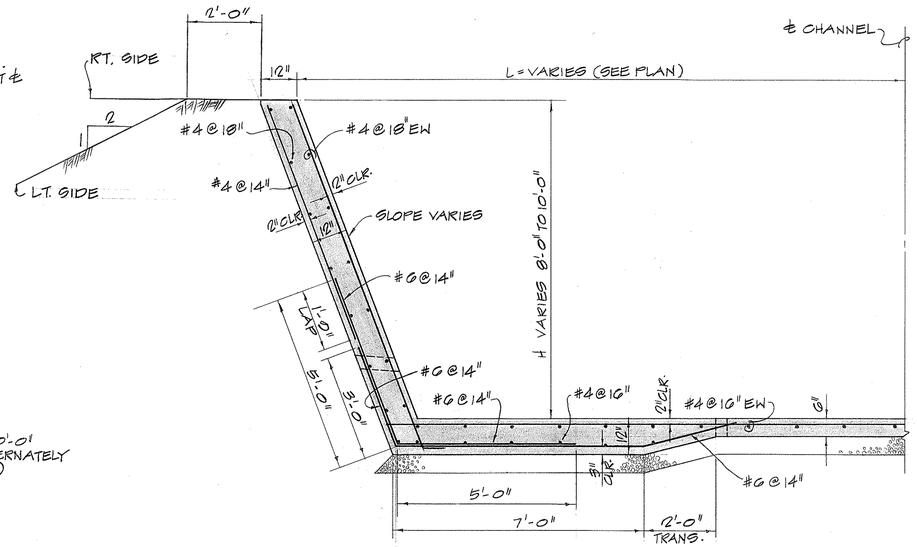
C.O. 114 S-1

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HR-H3-1(24)-11	1983	115	328



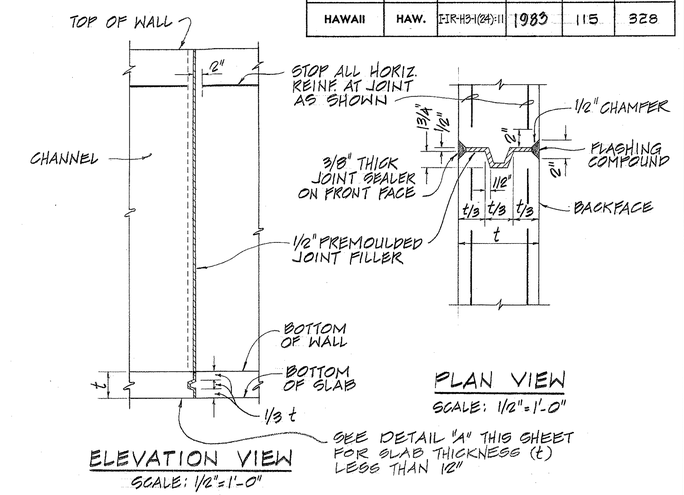
HALF SECTION - OPEN CHANNEL
KAMOOALII BRANCH STA. 5+52.74 TO STA. 5+87.74

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



TYPICAL HALF SECTION ~ ℄ CHANNEL OUTLET TRANSITION
STA. 12+04.64 TO 12+29.64

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



ELEVATION VIEW

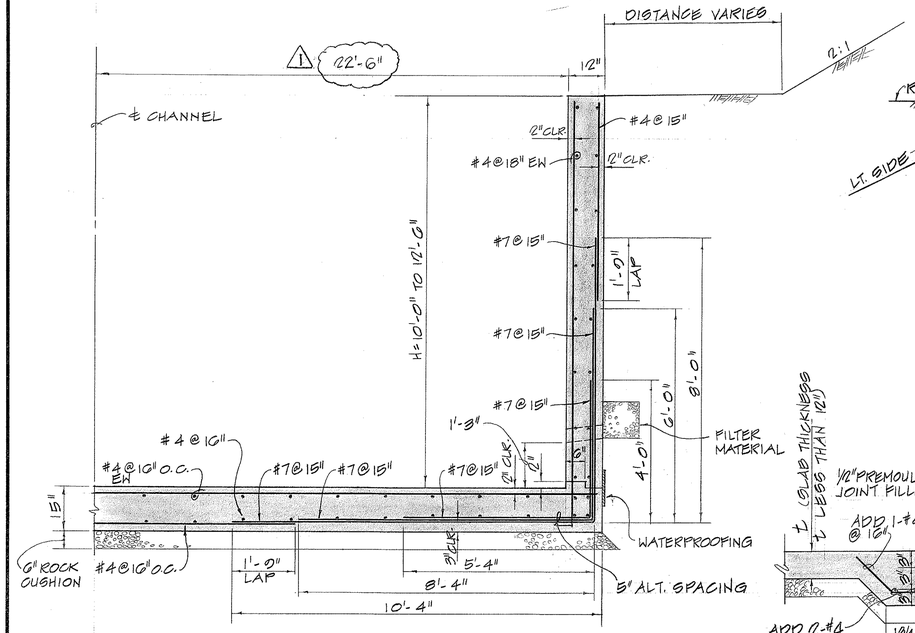
SCALE: 1/2" = 1'-0"

PLAN VIEW

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

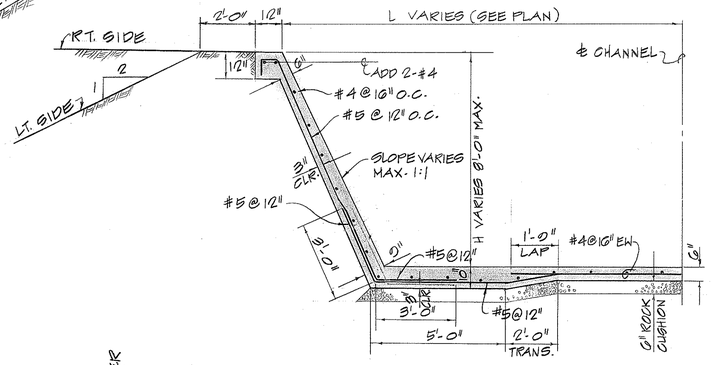
EXPANSION JOINT DETAILS

MAX SPACING = 90'-0"



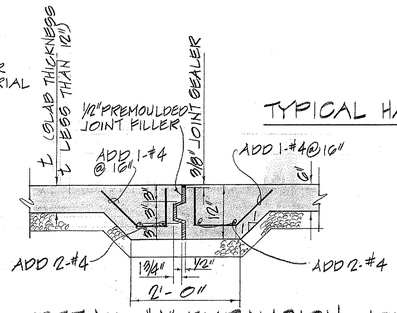
HALF SECTION ~ RIGHT SIDE CHANNEL WALL TRANSITION
STA. 0+00 TO 0+07 (LEFT SIDE CHANNEL WALL SIMILAR)

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



TYPICAL HALF SECTION ~ CHANNEL OUTLET TRANSITION
STA. 12+20.64 TO 12+54.64

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



DETAIL "A" EXPANSION JOINT
CHANNEL BOTTOM SLAB (℄ 12")

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

ELEVATION VIEW
VERTICAL CONTROL JOINT

NOT TO SCALE (MAX. SPACING = 30'-0")

CONTROL JOINT DETAIL

MAX. SPACING = 30'-0"

NOT TO SCALE

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

SSFM Engineers, Inc.
Consulting Structural Engineers
1210 Ward Ave., Honolulu, HI 96814

HOWARD Y. FUKUDA — REGISTERED PROFESSIONAL ENGINEER No. 1343 — HAWAII, U.S.A.

FOR VECP REVISION 1
ITEMS ONLY. DRAINAGE PIPE REVISED TO ACCOMODATE VECP REVISION TO ELLIPTICAL DRAINAGE PIPES.

FIK KWONG CHUN — REGISTERED PROFESSIONAL ENGINEER No. 2147 — HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

NO.	DATE	REVISION
1	7/27/83	VECP - DRAINAGE PIPES

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE STRUCTURE AND CHANNEL DETAILS

HALEKOU INTERCHANGE
F.A.I. Project No. IIR-H3-1(24):11
Scale: As Shown Date: Oct 1982

SHEET No. 44D OF 59 SHEETS

C.O. 115

PRINTED ON NO. 1000H CLEARPRINT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-IR-H3-1(24):11	1983	116	328

FINAL SURVEY		BY	DATE
NOTE BOOK	SURVEYED		
NO.	PLOTTED		
	HEIGHT OF AREAS		
	AREAS CHECKED		

ORIGINAL SURVEY		BY	DATE
NOTE BOOK	SURVEYED		
NO.	PLOTTED		
	HEIGHT OF AREAS		
	AREAS CHECKED		

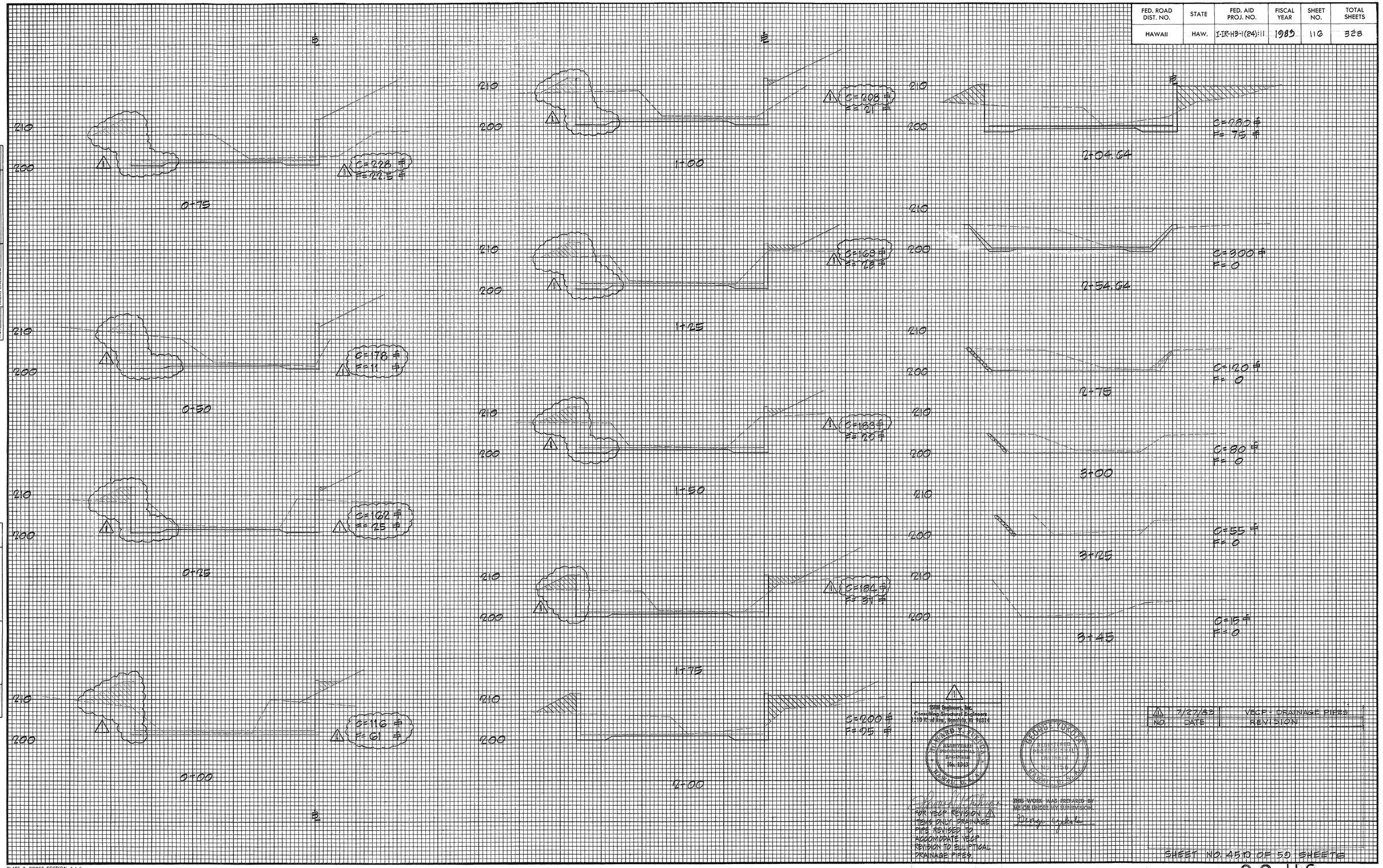


PLATE 3 - CROSS SECTION, F.A.S.
CLEARPRINT PAPER CO., S. F. CAL. NO. 1000H-3

SSFM Engineers, Inc.
Consulting Structural Engineers
1210 Nimitz Ave, Honolulu, HI 96814

REGISTERED PROFESSIONAL ENGINEER No. 8243

FOR VECP REVISION ⚠1 ITEMS ONLY: DRAINAGE PIPE REVISED TO ACCOMODATE VECP REVISION TO ELLIPTICAL DRAINAGE PIPES.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

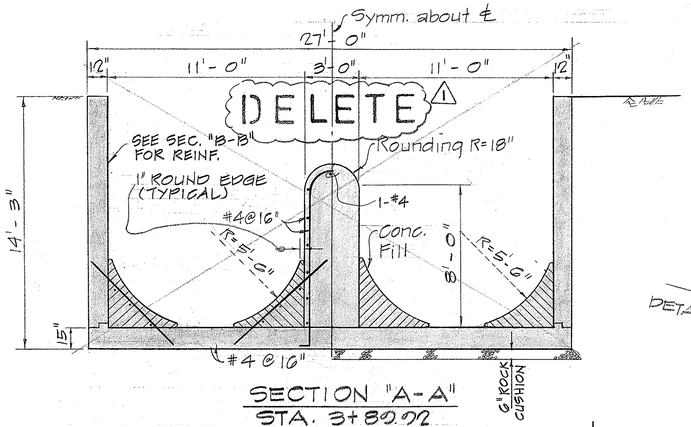
REGISTERED PROFESSIONAL ENGINEER

NO.	DATE	
⚠1	7/27/82	VECP: DRAINAGE PIPES REVISION

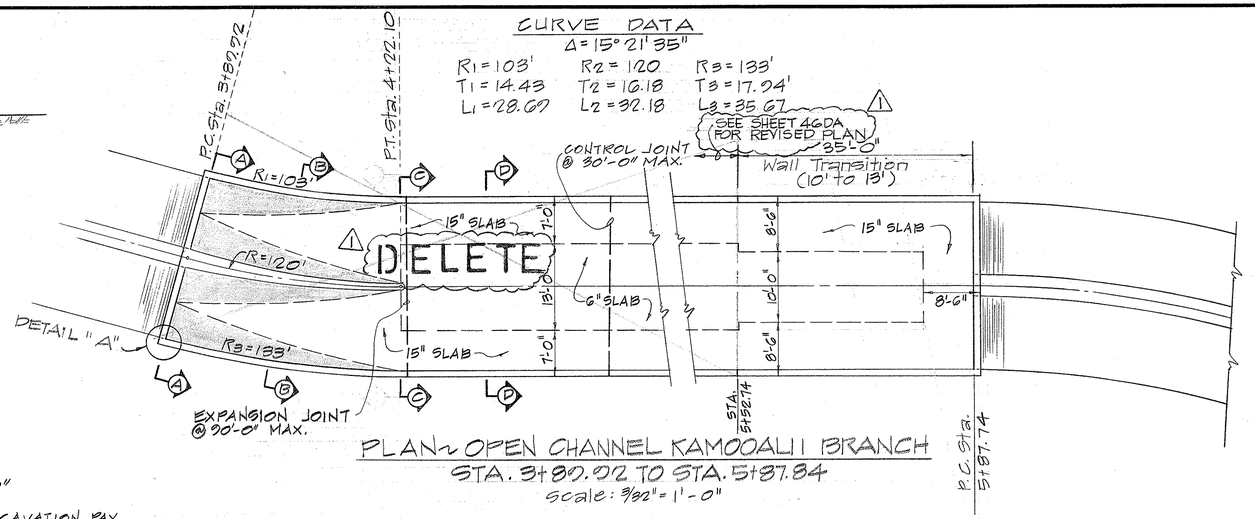
SHEET NO. 4510 OF 50 SHEETS

C.O. 116

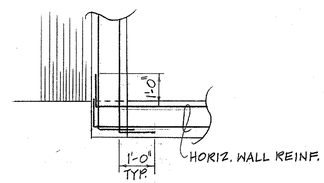
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-IR-H3-1(24)11	1983	117	328



SECTION "A-A"
STA. 3+80.02

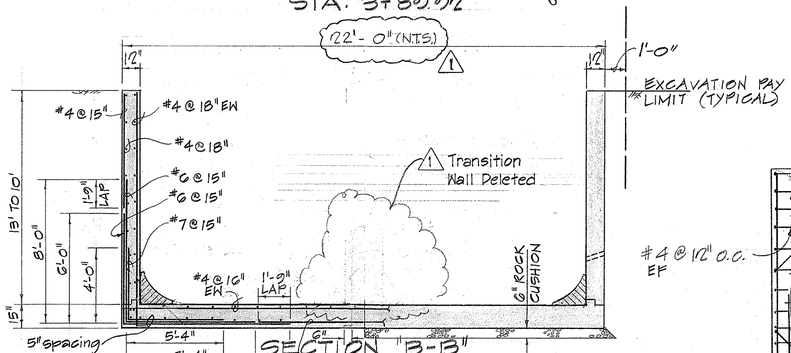


PLAN ~ OPEN CHANNEL KAMOOALII BRANCH
STA. 3+80.02 TO STA. 5+87.84
Scale: 3/32" = 1'-0"

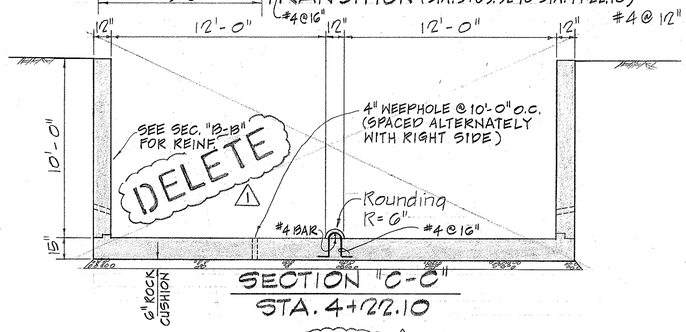


DETAIL "A"
Scale: 1/2" = 1'-0"

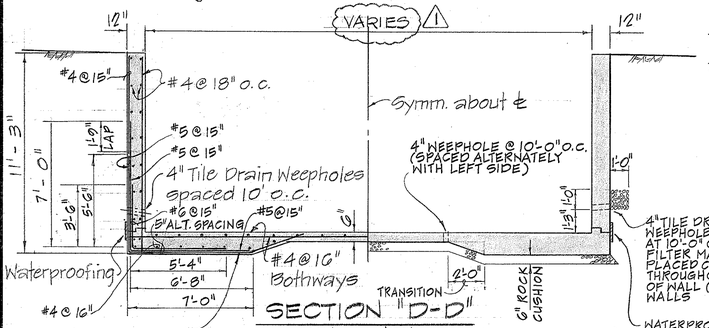
NOTE:
1- All concrete shall be Class "A"
2- Expansion Joints spaced @ 90'-0" Max. Control Joints spaced @ 30'-0" Max. (For details, see sht. 44D)
3- See sht. 42D for pipe connection to Channel Detail



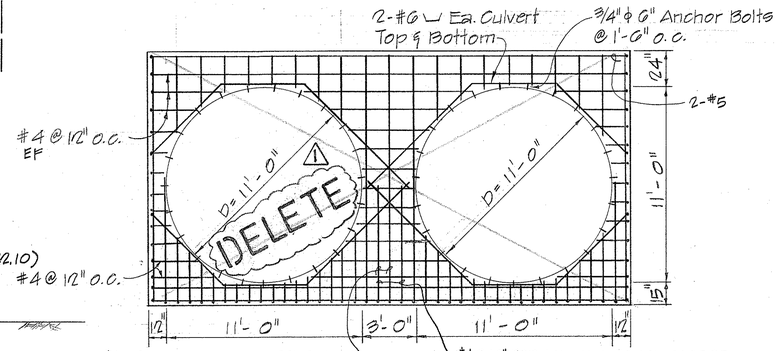
SECTION "B-B"
TRANSITION (STA. 3+89.92 TO STA. 4+22.10)



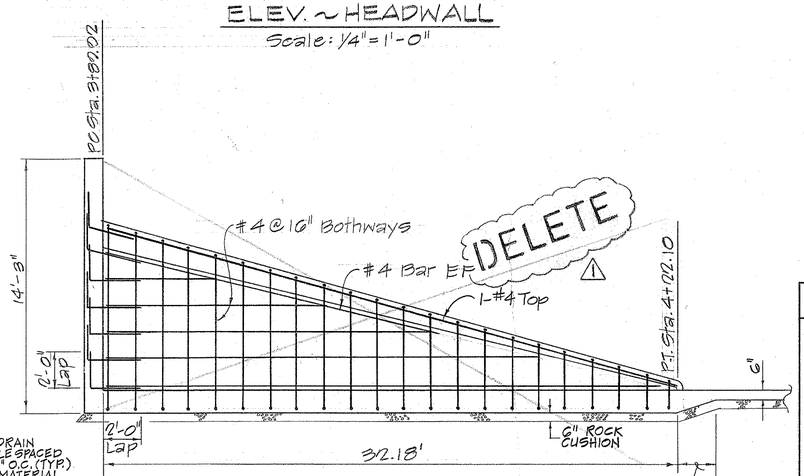
SECTION "C-C"
STA. 4+22.10



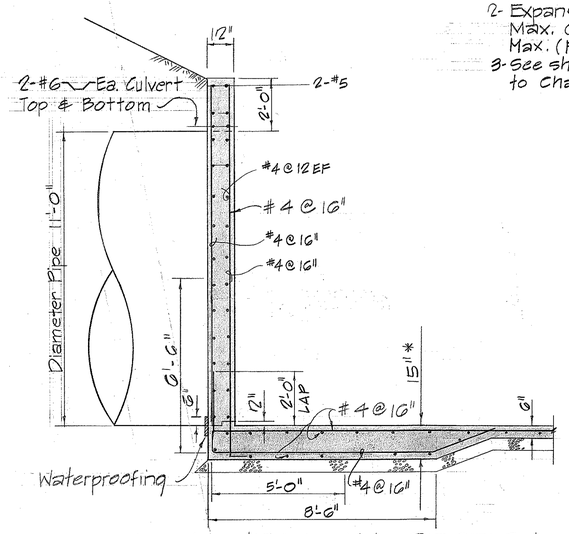
SECTION "D-D"
CHANNEL (STA. 4+22.10 TO STA. 5+52.14)
SCALE: SECT. "A-A" - "D-D" 1/4" = 1'-0"



ELEV. ~ HEADWALL
Scale: 1/4" = 1'-0"



ELEV. ~ MIDDLE TRANSITION WALL
Scale: 1/4" = 1'-0"



ELEV. ~ HEADWALL SECTION
Scale: 3/8" = 1'-0"

* 1'-3" Continuous for Headwall Sta. 3+80.02 TO 4+22.10 See sheet 46DA for Revised Headwall Section.

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

1
SSFH Engineers, Inc.
Consulting Structural Engineers
1210 Wilder Ave., Honolulu, HI 96814

HOWARD Y. FUKUDA — REGISTERED PROFESSIONAL ENGINEER — No. 1343 — HAWAII, U.S.A.

FOR VECP REVISION 1 ITEMS ONLY. OPEN CHANNEL REVISED TO ACCOMODATE VECP REVISION TO ELLIPTICAL DRAINAGE PIPE. SEE SHT. 46DA.

TIT KWONG CHUN — REGISTERED PROFESSIONAL ENGINEER — No. 2147 — HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

GEORGE YOKOTA — REGISTERED PROFESSIONAL ENGINEER — No. 1156 — HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

NO.	DATE	REVISION
1	7/27/83	VECP - DRAINAGE PIPES

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

KAMOOALII BRANCH
OPEN CHANNEL
STA. 3+80.02 TO STA. 5+87.74

HALEKOU INTERCHANGE
F.A.I. Project No. I-IR-H3-1(24):11

Scale: As Shown Date: Oct. 1982

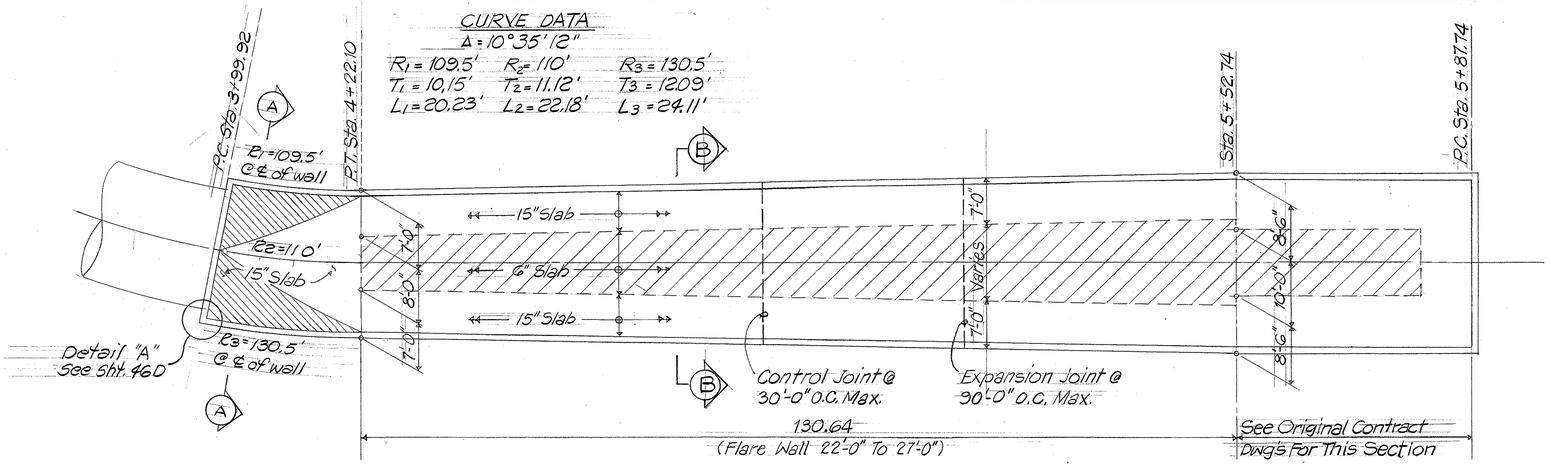
SHEET No. 46D OF 50 SHEETS

C.O. 117

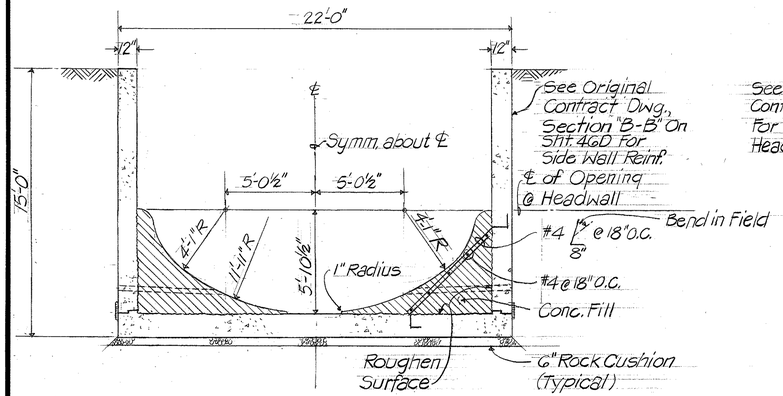
PRINTED ON NO. 1000H CLEARPRINT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-IR-H3-1(24):11	1983		

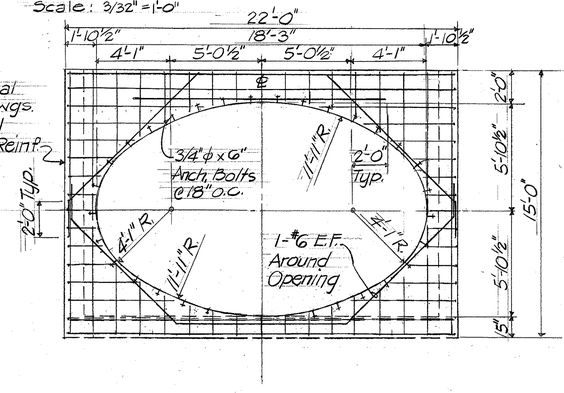
CURVE DATA
Δ = 10°35'12"
R_1 = 109.5' R_2 = 110' R_3 = 130.5'
T_1 = 10.15' T_2 = 11.12' T_3 = 12.09'
L_1 = 20.23' L_2 = 22.18' L_3 = 24.11'



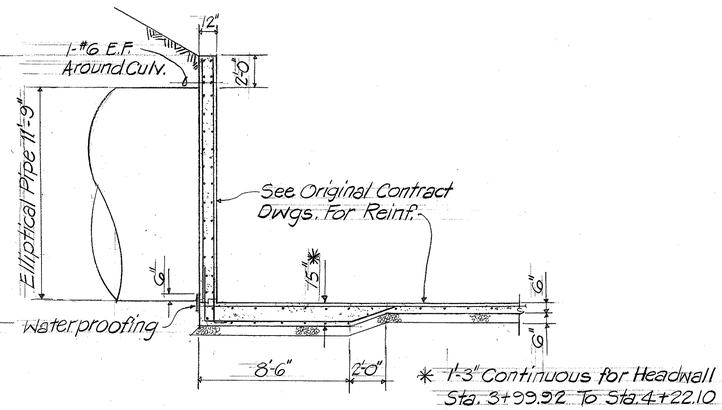
PLAN ~ OPEN CHANNEL KAMOOALII BRANCH
STA. 3+99.92 TO STA. 5+87.74
Scale: 3/32" = 1'-0"



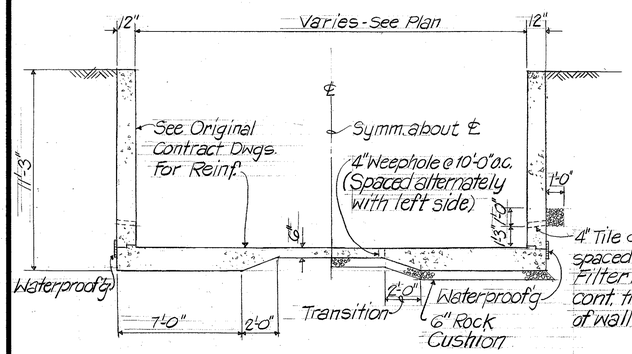
SECTION "A-A" (STA. 3+99.92)
Scale: 1/4" = 1'-0"



HEADWALL ELEVATION
STA. 3+99.92 Scale: 1/4" = 1'-0"



HEADWALL SECTION
Scale: 1/4" = 1'-0"



SECTION "B-B" (AT TRANSITION)
Scale: 1/4" = 1'-0"

NOTE:
Unless otherwise shown details shown on Sht. 46D of original contract drawings are applicable.

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

VECP REVISION ⚠1
Open Channel Revised to Accomodate Revision to Elliptical Drainage Pipes. Details Shown On This Sheet Supersede Those On Sht. 46D.

SSFM Engineers, Inc.
Consulting Structural Engineers
1210 Ward Ave., Honolulu, HI 96814

MICHAEL PAUL MATSUMOTO
REGISTERED PROFESSIONAL ENGINEER
No. 2974
HAWAII, U.S.A.

This work was prepared by me or under my supervision.
Michael O. Matsumoto

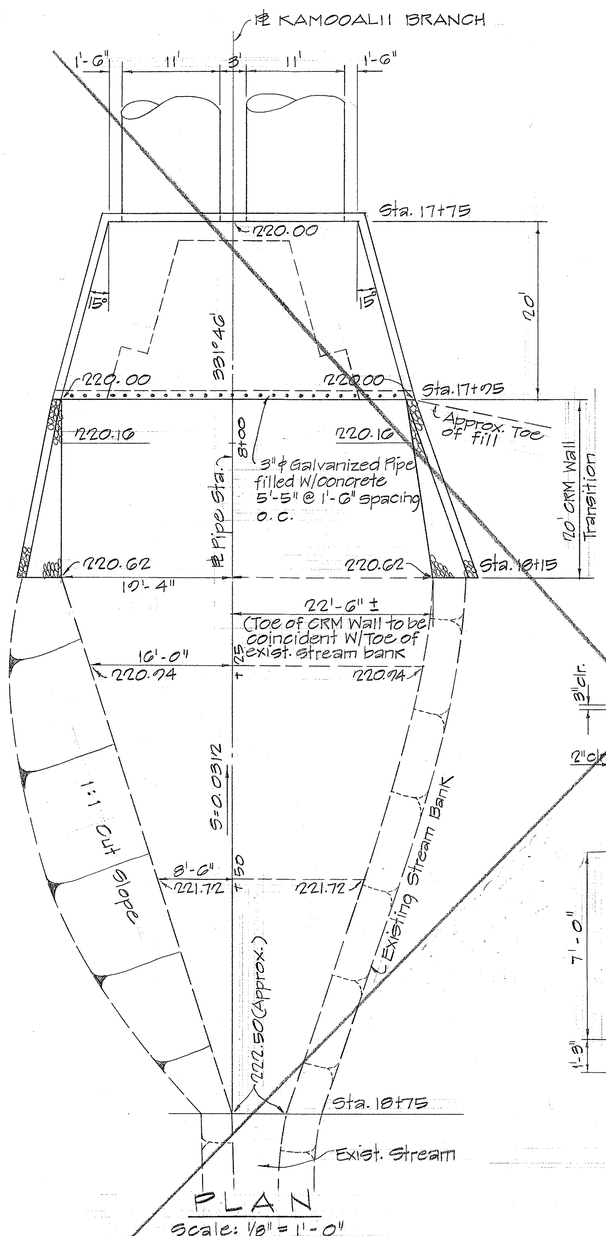
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION

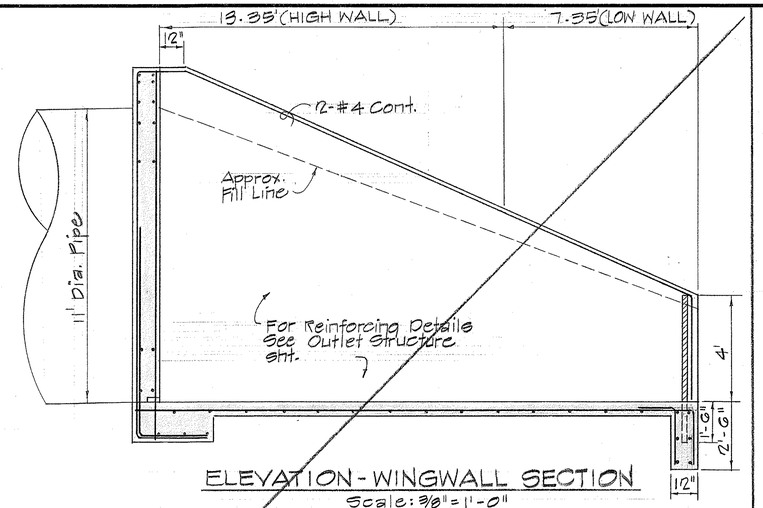
KAMOOALII BRANCH
OPEN CHANNEL
STA. 3+99.92 TO STA. 5+87.74
HALEKOU INTERCHANGE
F.A.I. Project No. I-IR-H3-1(24):11
Scale: As Shown Date: July 1983

SHEET No. 46DA OF SHEETS

C0.117 S-1

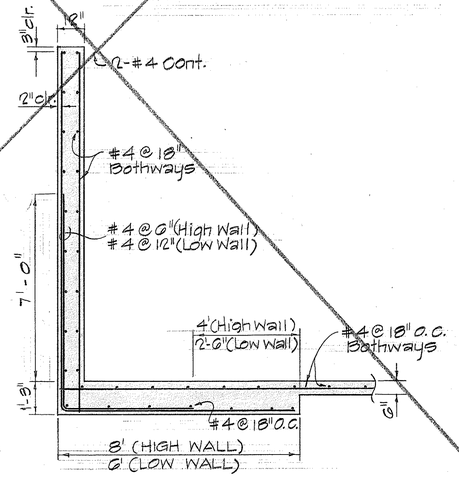
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HB-1(24):11	1983	118	328



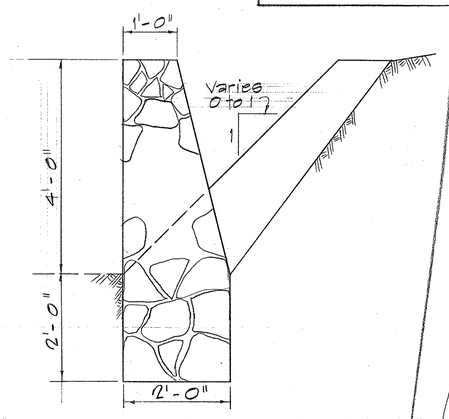


ELEVATION - WINGWALL SECTION
Scale: 3/8" = 1'-0"

NOTES:
1- For Reinforcing Schedule of Headwall, Headwall Corner, Apron & Cutoff Wall, see Reinforcing of Outlet Structure sheet No. 85
2- All concrete shall be Class "A"
3- Fill slope to be contoured to cover exposed portions of Wall & Pipe
4- Area surrounding Inlet shall be graded to drain.

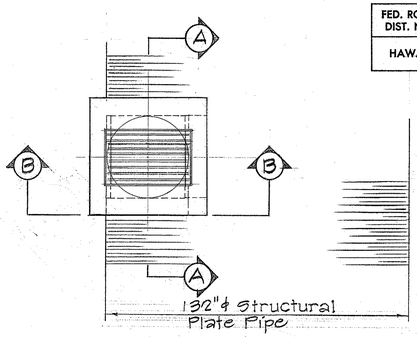


WINGWALL SECTION
Scale: 3/8" = 1'-0"

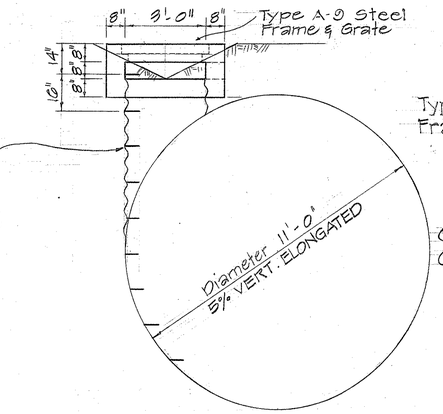


TYPICAL CRM TRANSITION
Scale: 3/4" = 1'-0"

INLET STRUCTURE DETAILS @ & PIPE STA. 17+75 TO STA. 18+15
Scale: As Shown

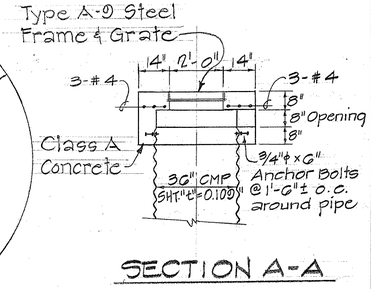


PLAN



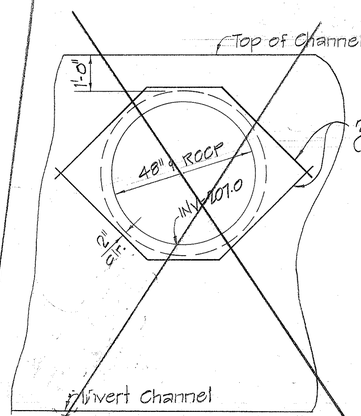
NOTE:
Standard Manhole rungs to be cut off at the wall line before welding.

SECTION B-B



SECTION A-A

CMP DROP INLET
Scale: 3/8" = 1'-0"



℄ CHANNEL STA. 0+28
CONNECTION DETAIL OF PIPE TO CHANNEL
Scale: 1/2" = 1'-0"

GEORGE YOKOTA
REGISTERED PROFESSIONAL ENGINEER
No. 1156
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
George Yokota

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

KAMOOALII BRANCH
INLET STRUCTURE DETAILS, CMP DROP INLET

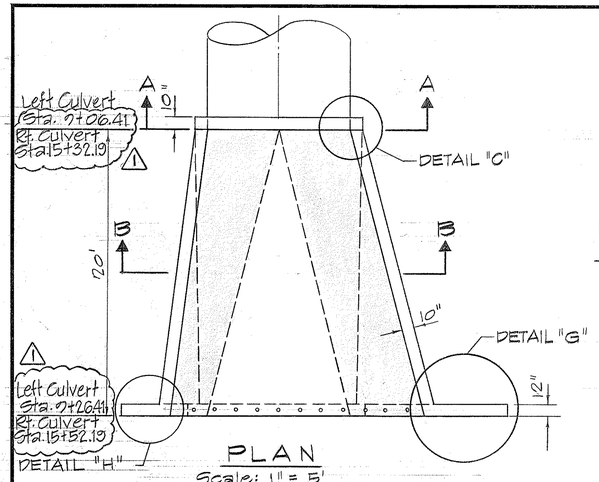
HALEKOU INTERCHANGE
F.A.I. Project No. I-HB-1(24):11
Scale: As Shown Date: Oct. 1982

SHEET No. 47D OF 59 SHEETS

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

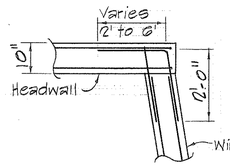
PRINTED ON NO. 1000H CLEARPRINT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-IR-H3-1(24):11	1983	119	328



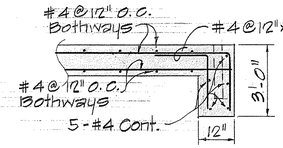
PLAN

Scale: 1" = 5'



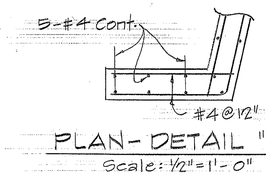
PLAN - HEADWALL CORNER DETAIL "C"

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



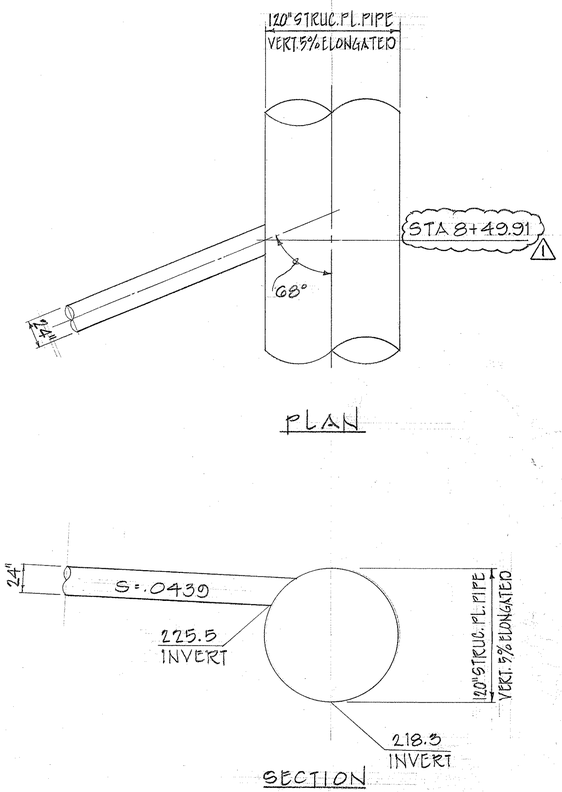
SECTIONS "D-D", "E-E" & "F-F"

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

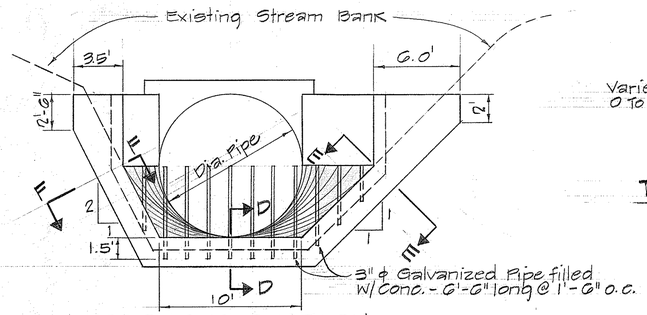


PLAN - DETAIL "H"

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

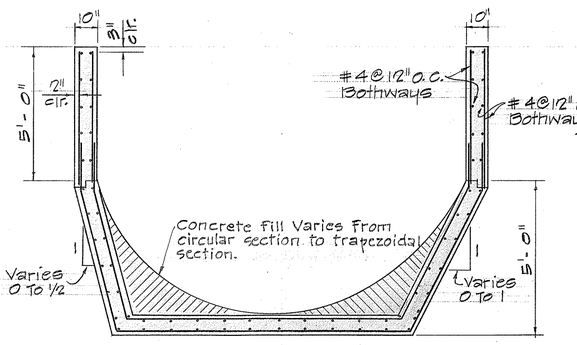


PLAN



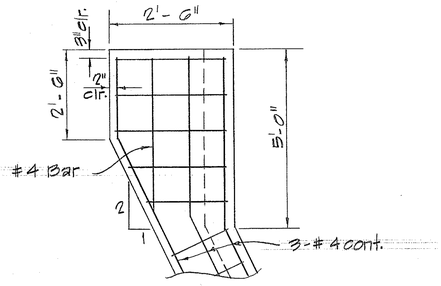
FRONT ELEVATION

Scale: 1" = 5'



TYPICAL WINGWALL SECTION "B-B"

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



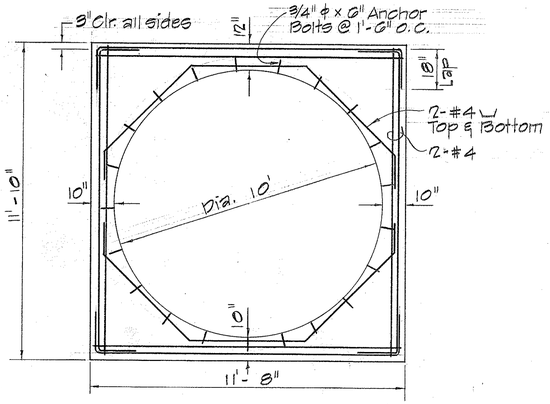
ELEV. - DETAIL "H"

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

SECTION

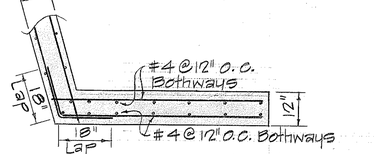
LEFT CULVERT ~ KIONAOLE BRANCH STA. 8+49.91

SCALE: 3/16" = 1'-0"



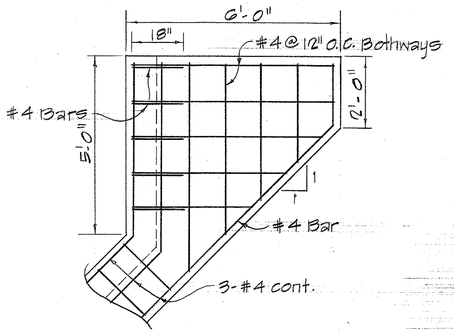
ELEVATION HEADWALL SECTION "A-A"

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



PLAN - DETAIL "G"

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



ELEV. - DETAIL "G"

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

NOTE:

1- Details as shown on this sheet for left culvert inlet structure @ Sta. 9+06.41

2- For right culvert inlet structure @ Sta. 15+32.19 Use above details except both wingwalls to transition to 1:1 slope.

INLET STRUCTURE DETAILS @ ℄ LEFT PIPE STA. 9+06.41 TO 9+26.41 & ℄ RIGHT PIPE STA. 15+32.19 TO 15+52.19

Scale: As Shown Scale: As Shown

1

SSFM Engineers, Inc.
Consulting Structural Engineers
1210 9th Ave., Honolulu, HI 96816

REGISTERED PROFESSIONAL ENGINEER
HOWARD Y. FUKUDA
No. 1343
HAWAII, U.S.A.

For VECP Revision 1 Items Only. Drainage Pipe Stations Revised to Accomodate VECP Revision to Elliptical Drainage Pipes.

REGISTERED PROFESSIONAL ENGINEER
GEORGE YOKOTA
No. 1156
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

NO.	DATE	REVISION
1	7/27/83	VECP - DRAINAGE PIPES

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

KIONAOLE BRANCH INLET STRUCTURE DETAILS

HALEKOU INTERCHANGE
F.A.I. Project No. I-IR-H3-1(24):11
Scale: As Shown Date: Oct. 1982

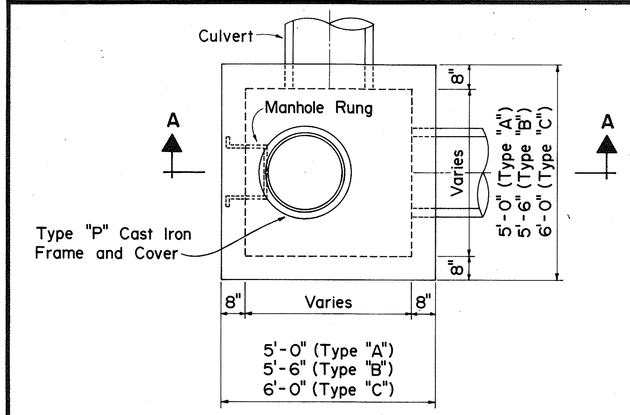
SHEET No. 48 OF 59 SHEETS

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

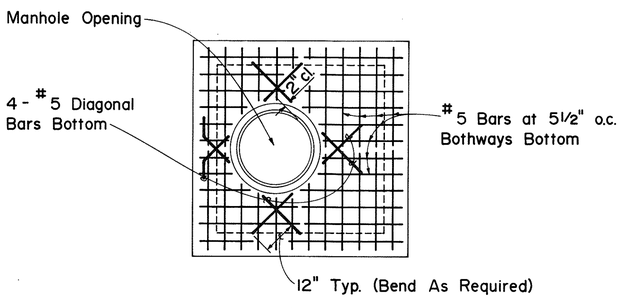
PRINTED ON NO. 1000N CLEARPRINT

C.O. 119

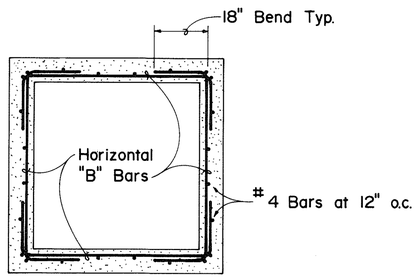
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(24)11	1985	120	328



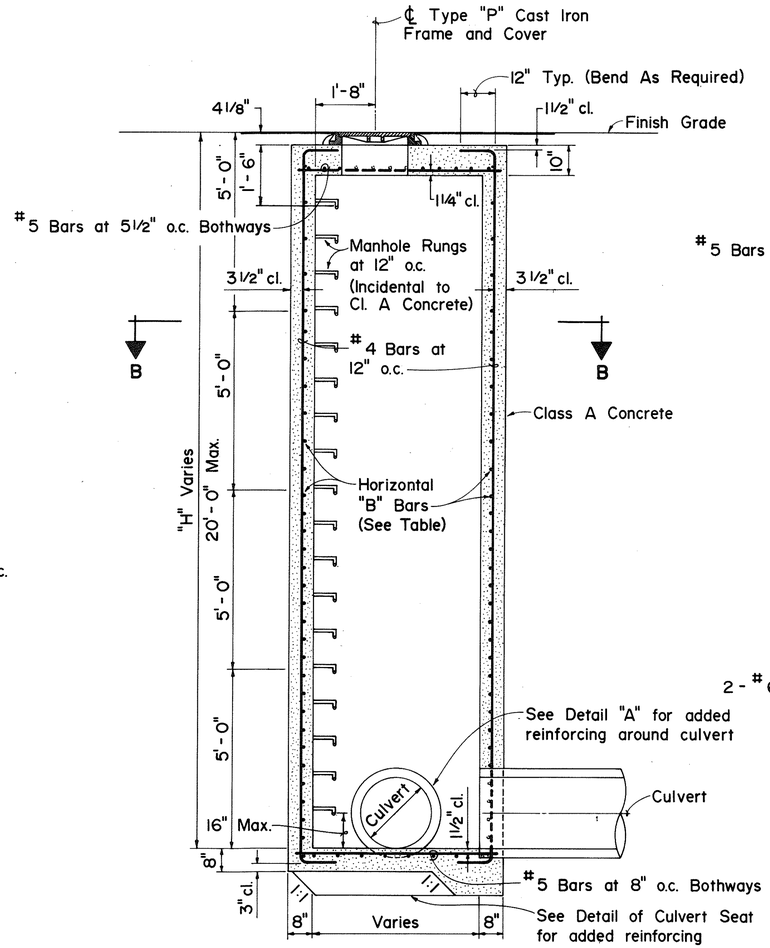
PLAN



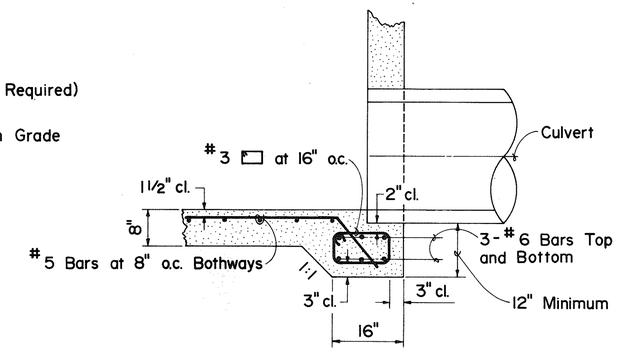
PLAN
(Top Slab Reinforcing)



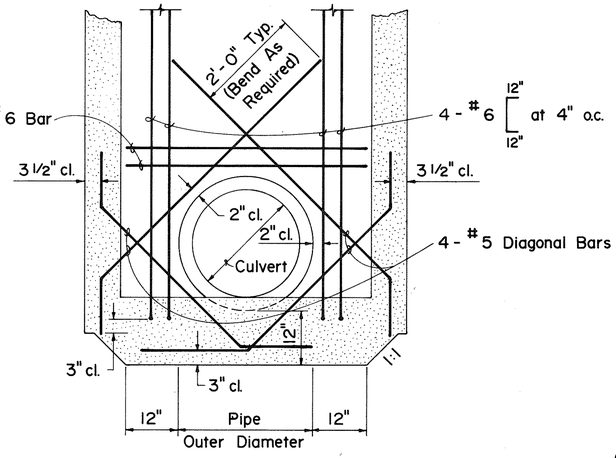
SECTION "B-B"



SECTION "A-A"



TYPICAL DETAIL OF CULVERT SEAT



DETAIL "A"

"H" MAX. (FT.)	HORIZONTAL "B" BARS
0'-0" to 5'-0"	#4 at 12" o.c.
5'-1" to 10'-0"	#4 at 9" o.c.
10'-1" to 15'-0"	#4 at 6" o.c.
15'-1" to 20'-0"	#5 at 6" o.c.

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

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

APPROVED:
Herbert Zaleski — 8-20-80
ASSISTANT CHIEF, ENGINEERING — DATE

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS

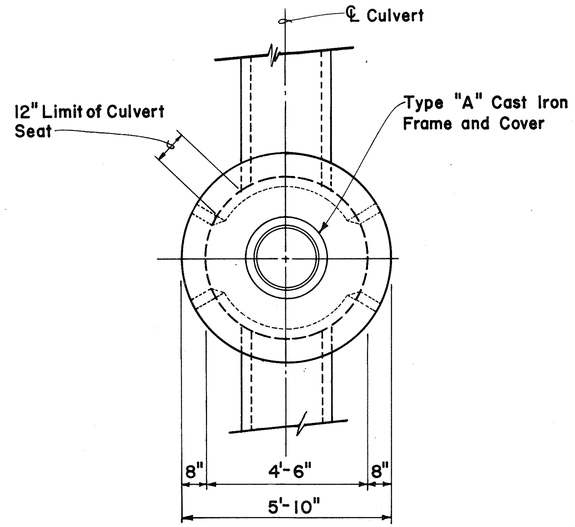
TYPE A, B, AND C
STORM DRAIN MANHOLE

Not To Scale — Date: August 1980

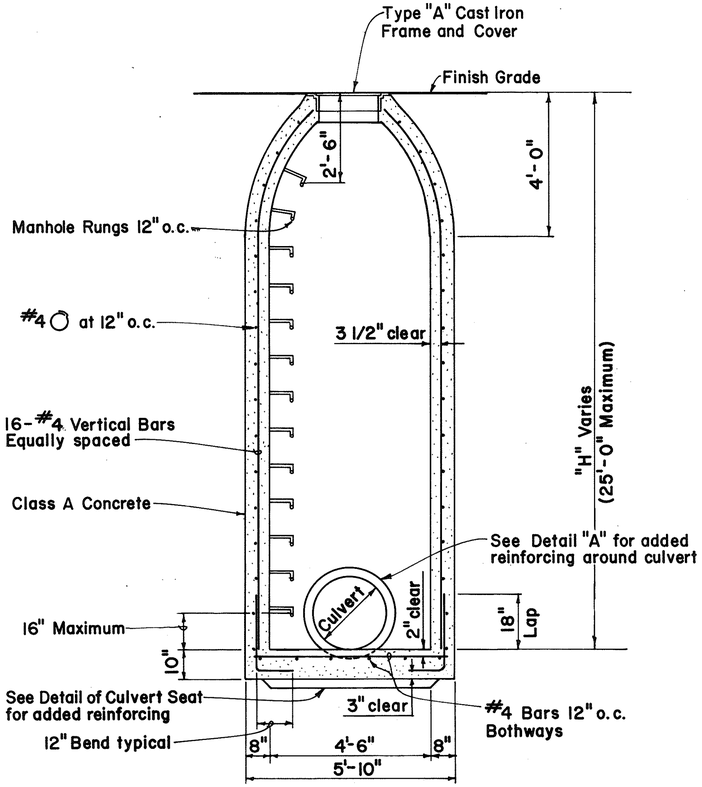
SHEET NO. 49 OF 59 SHEETS DH5

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

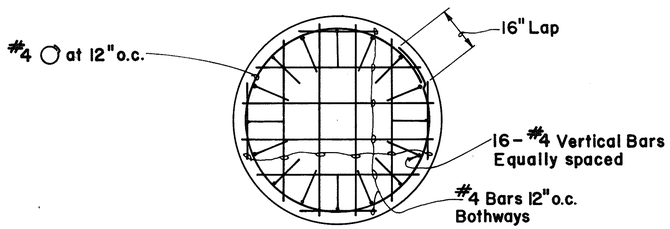
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(24)-11	1983	121	328



PLAN TYPE "D" OR "E" STORM DRAIN MANHOLE

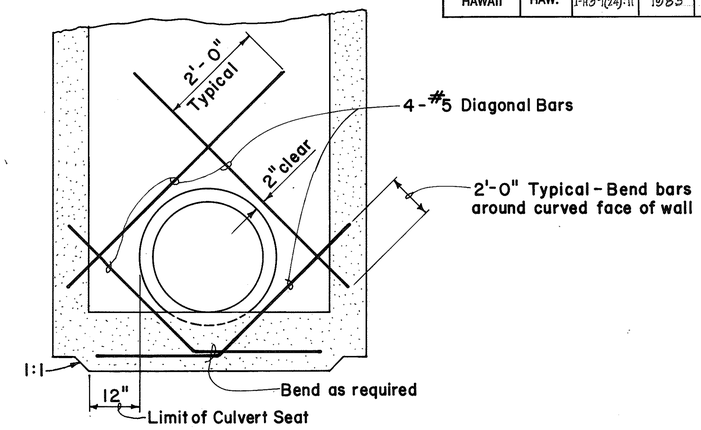


ELEVATION

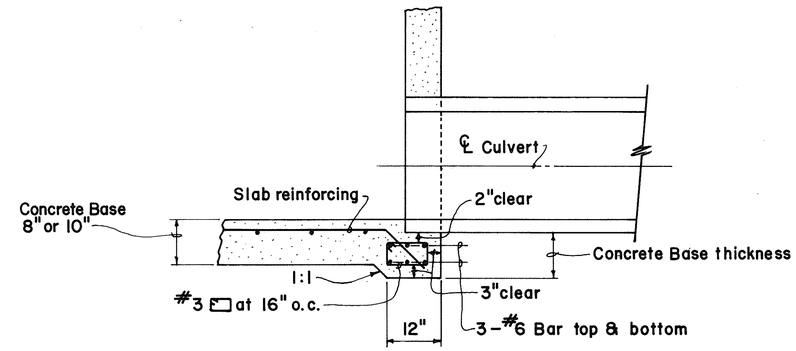


PLAN-CONCRETE BASE

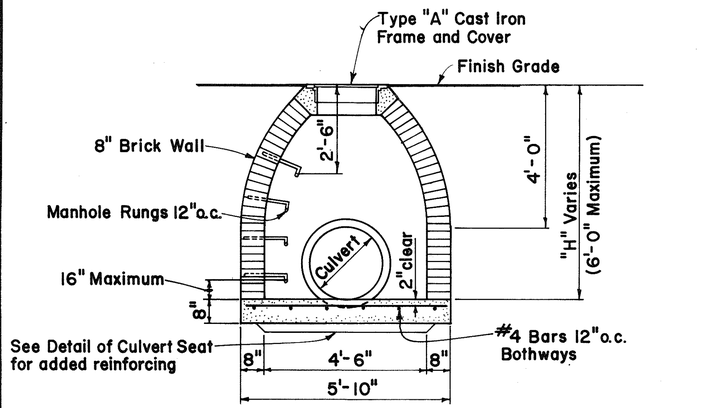
TYPE "E" STORM DRAIN MANHOLE



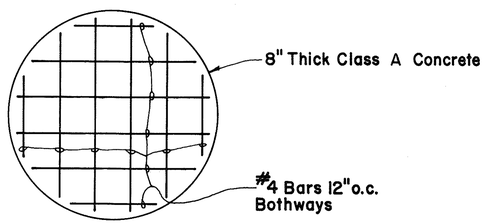
DETAIL "A"



DETAIL OF CULVERT SEAT



ELEVATION



PLAN-CONCRETE BASE

TYPE "D" STORM DRAIN MANHOLE

APPROVAL RECOMMENDED:

T. Takano — 8-20-80

HYDRAULIC DESIGN ENGINEER — DATE

APPROVED:

Herbert Zafeiah — 8-20-80

ASSISTANT CHIEF, ENGINEERING — DATE

NO.	REVISION	APPROVED BY	DATE
1.	Supersedes Sht. DH 5 approved 12-17-69	H.T.	8/20/80
2.	Change Class of concrete	H.T.	12/4/80

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS

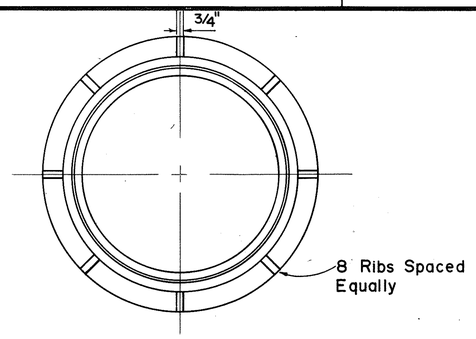
TYPE D AND E
STORM DRAIN MANHOLE

Not To Scale — Date: August 1980

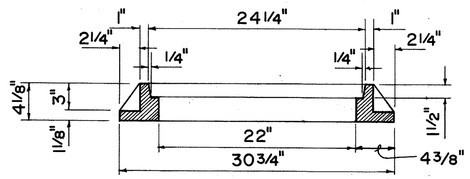
SHEET No. 50 OF 59 SHEETS DH 5A

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

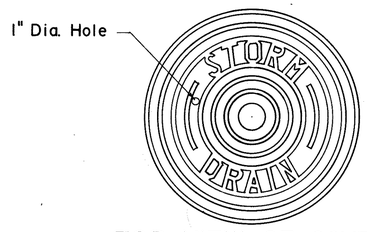
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HB-1(24)-11	1983	122	328



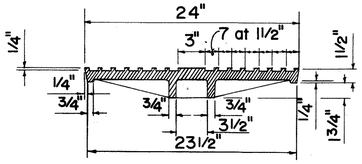
PLAN OF FRAME



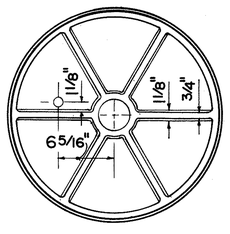
SECTION OF FRAME



TOP VIEW OF COVER

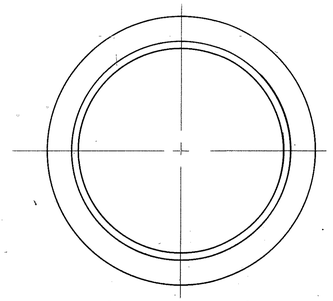


SECTION

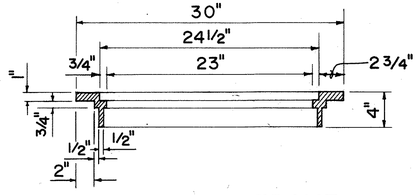


BOTTOM VIEW OF COVER

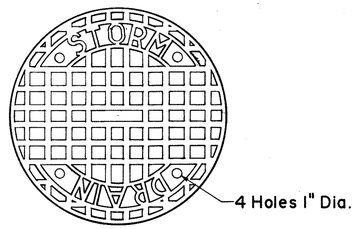
TYPE "P" CAST IRON FRAME AND COVER



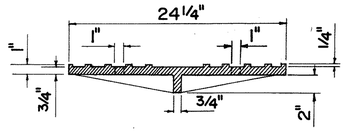
PLAN OF FRAME



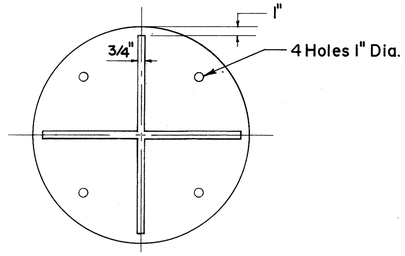
SECTION OF FRAME



TOP VIEW OF COVER

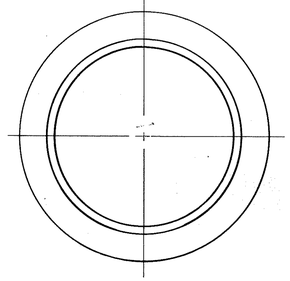


SECTION

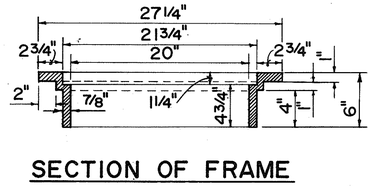


BOTTOM VIEW OF COVER

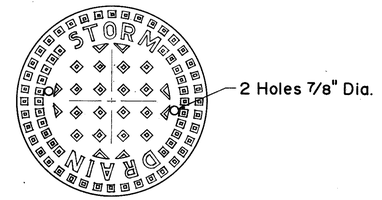
TYPE "B" CAST IRON FRAME AND COVER



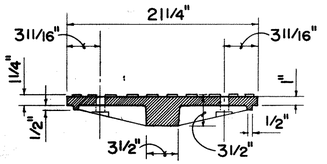
PLAN OF FRAME



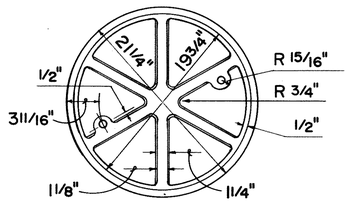
SECTION OF FRAME



TOP VIEW OF COVER

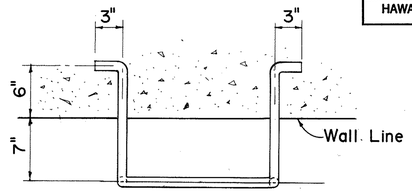


SECTION

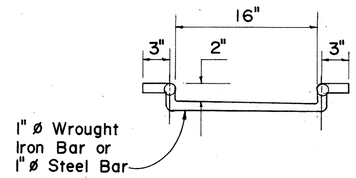


BOTTOM VIEW OF COVER

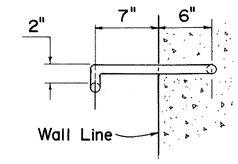
TYPE "A" CAST IRON FRAME AND COVER



PLAN



FRONT VIEW



SIDE VIEW

MANHOLE RUNG

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

APPROVAL RECOMMENDED:
T. Takano — HYDRAULIC DESIGN ENGINEER — 6-19-79 DATE

APPROVED:
Herbert Takeishi — ASSISTANT CHIEF, ENGINEERING — 6-22-79 DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS

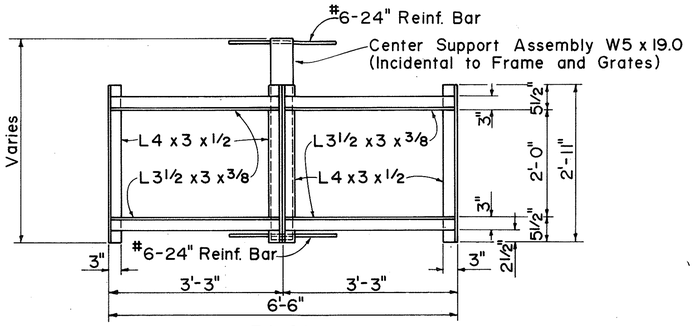
CATCH BASIN AND MANHOLE CASTINGS

Not To Scale — Date: Dec. 1977

SHEET No. 51D OF 59 SHEETS DH 6

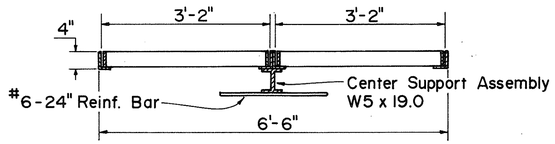
ORIGINAL PLAN | NOTE BOOK | No. | DATE
SURVEY PLOTTED BY
DRAWN BY
TRACED BY
DESIGNED BY
QUANTITIES BY
CHECKED BY

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(24):11	1983	123	328



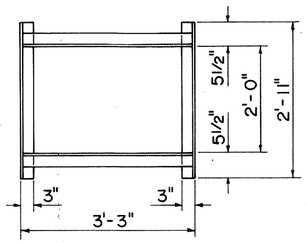
PLAN

(Two or More Grates)



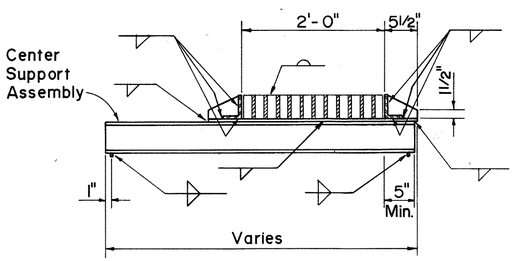
LONGITUDINAL SECTION

(Thru Frame & Grate)



PLAN

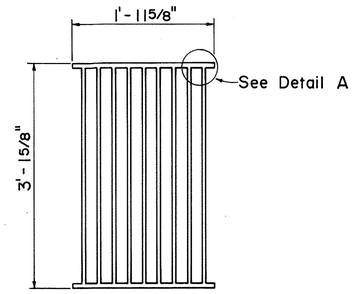
(Single Grate)



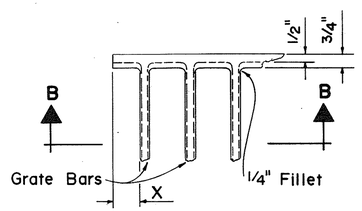
CROSS SECTION

(Thru Frame & Grate)

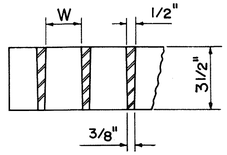
FRAME DETAILS



PLAN

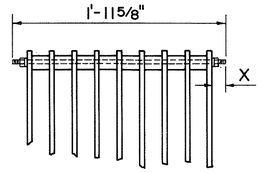


DETAIL A

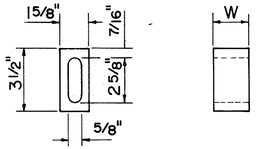


SECTION B-B

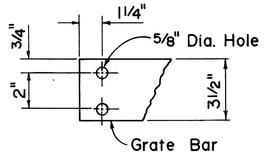
ALTERNATIVE CAST MALLEABLE IRON OR CAST STEEL GRATE



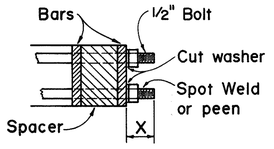
BOLTED END BLOCK



BAR SPACER

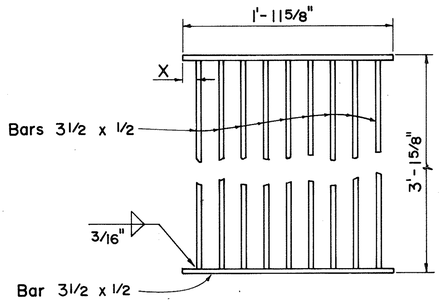


END OF BAR

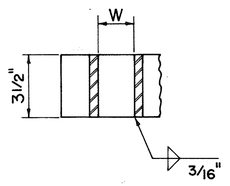


BOLTING DETAIL

ALTERNATIVE BOLTED GRATE



PLAN



SECTION

ALTERNATIVE WELDED GRATE

GENERAL NOTES

1. Contractor has the option of using cast malleable iron, cast steel, welded, or bolted grate.
2. All welds 3/8" unless otherwise noted.
3. Type A-9 – Use in locations off the roadbed on all types of highways.
4. Type A-12 – Use within the roadbed on all types of highways.

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"

APPROVAL RECOMMENDED:

T. Takano — 6-19-79

HYDRAULIC DESIGN ENGINEER — DATE

APPROVED:

Herbert Takeishi — 6-22-79

ASSISTANT CHIEF, ENGINEERING — DATE

NO.	REVISION	APPROVED BY	DATE
1.	Supersedes Sht. DH 7 approved 12-17-69	H.T.	6/22/79
2.	Revise standard nomenclature for rolled steel shapes.	H.T.	4/27/82

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS

TYPE A-9 AND A-12 FRAMES AND GRATES

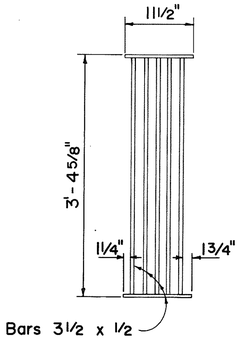
Not To Scale — Date: Dec. 1977

SHEET NO. 52D OF 59 SHEETS DH 7

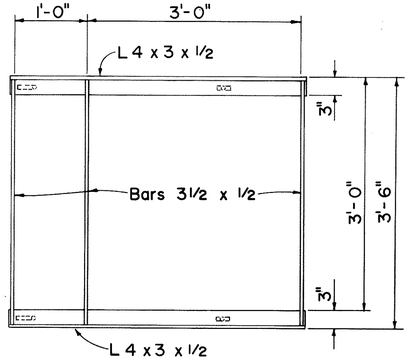
ORIGINAL PLAN | SURVEY PLOTTED BY | DRAWN BY | TRACED BY | DESIGNED BY | QUANTITIES BY | CHECKED BY | DATE | NOTE BOOK | No.

123

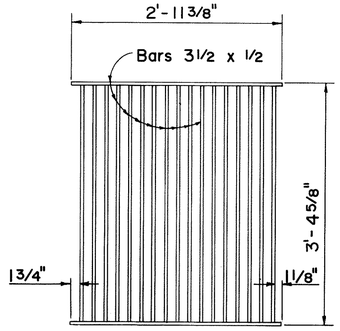
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(24)11	1983	124	328



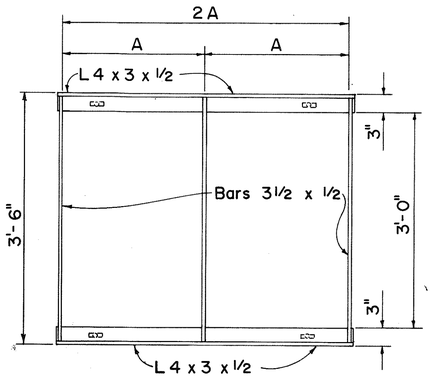
PLAN



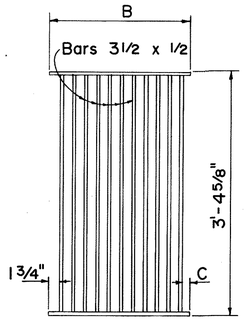
PLAN



PLAN



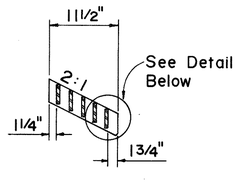
PLAN



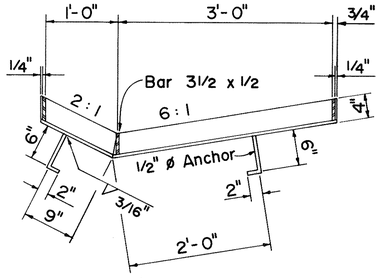
PLAN

GENERAL NOTE

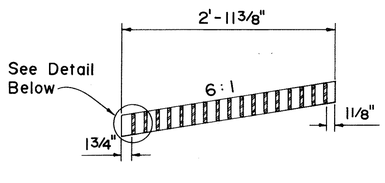
1. All welds 3/8" unless otherwise noted.



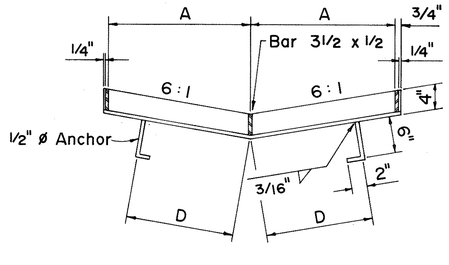
SECTION



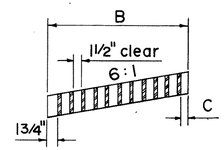
SECTION



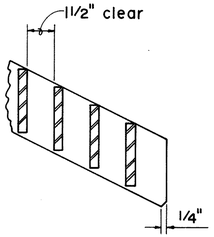
SECTION



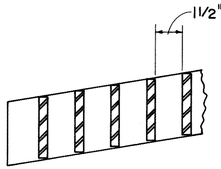
SECTION



SECTION



GRATE



GRATE

FRAME

61214 STEEL FRAME AND GRATES

61614 OR 61616 STEEL FRAME AND GRATE

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

APPROVAL RECOMMENDED:
T. Takano — HYDRAULIC DESIGN ENGINEER — 6-19-79 DATE

APPROVED:
Herbert Kaleishi — ASSISTANT CHIEF, ENGINEERING — 6-22-79 DATE

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS

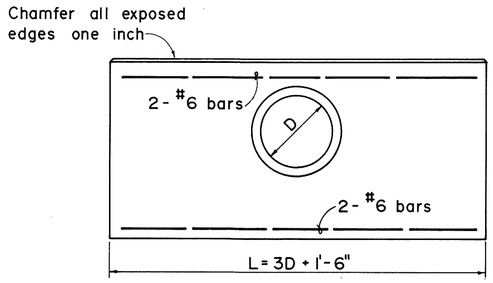
61214, 61614 & 61616
STEEL FRAMES AND GRATES

Not To Scale — Date: Dec. 1977

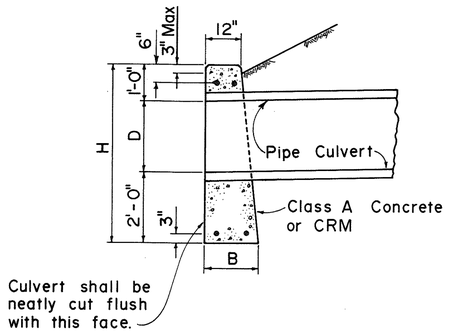
SHEET No. 330 OF 50 SHEETS DH 8

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

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H9-1(24):11	1980	125	328



ELEVATION



SECTION

DATA FOR CONC. HDWL.			
D	B	L	H
18"	1'-6"	6'-0"	4'-6"
24"	1'-6"	7'-6"	5'-0"
30"	2'-0"	9'-0"	5'-6"
36"	2'-0"	10'-6"	6'-0"
42"	2'-6"	12'-0"	6'-6"
48"	2'-6"	13'-6"	7'-0"

DATA FOR CRM HDWL.			
D	B	L	H
18"	1'-9"	6'-0"	4'-6"
24"	2'-0"	7'-6"	5'-0"
30"	2'-3"	9'-0"	5'-6"
36"	2'-6"	10'-6"	6'-0"

CONCRETE OR CRM HEADWALL

APPROVAL RECOMMENDED:
T. Takano — HYDRAULIC DESIGN ENGINEER — 6-19-79 DATE

APPROVED:
Herbert Takeishi — ASSISTANT CHIEF, ENGINEERING — 6-22-79 DATE

NO.	REVISION	APPROVED BY	DATE
1.	Supersedes Sht. DH 10 approved 12-17-69	H.T.	6/22/79
2.	Change Class of concrete	H.T.	12/4/80

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS

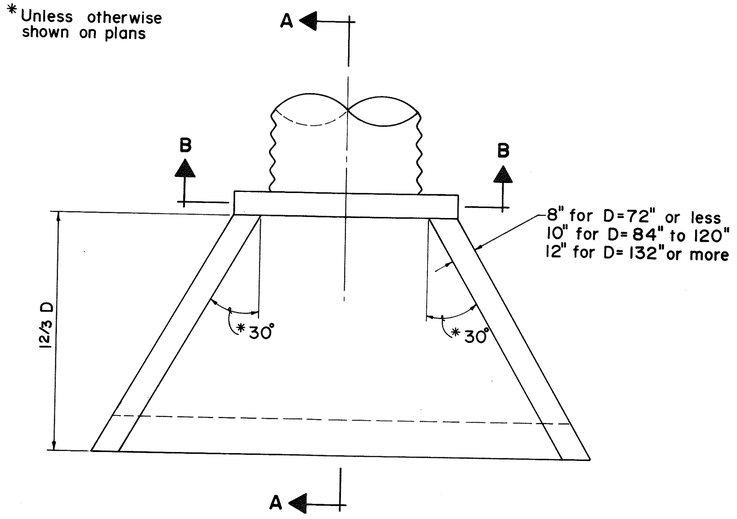
CONCRETE OR CEMENT RUBBLE MASONRY HEADWALLS

Not To Scale — Date: June 1979

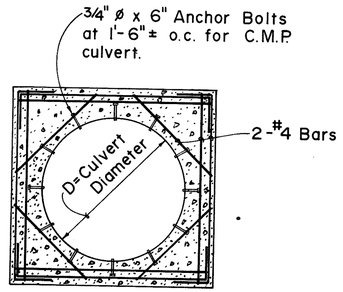
SHEET No. 54 OF 59 SHEETS DH 10

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

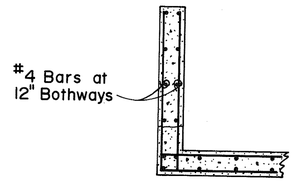
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(24)11	1983	126	328



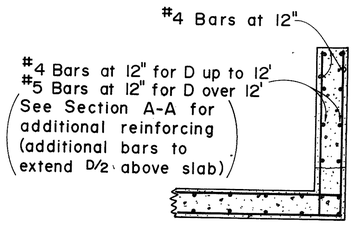
PLAN



SECTION B-B

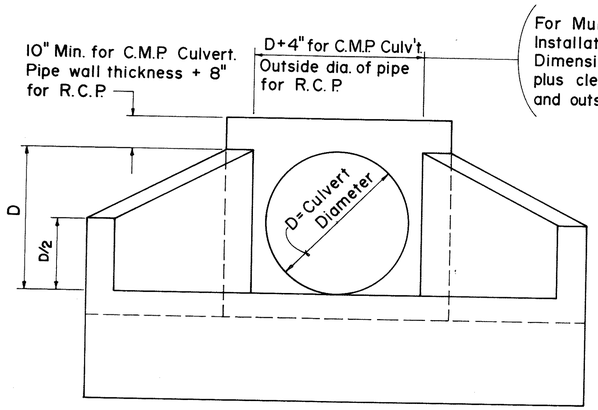


8" WING WALL

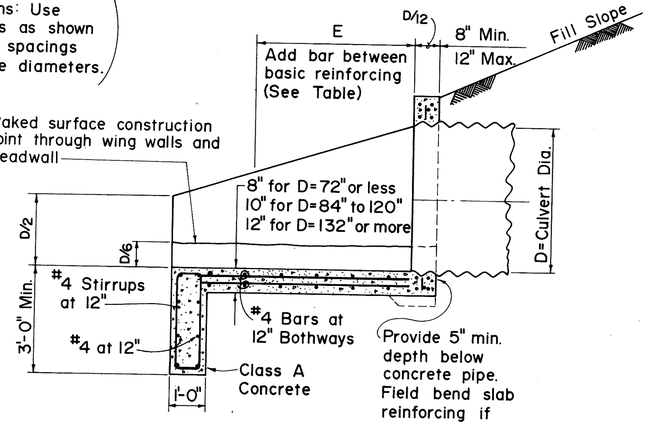


10" TO 12" WING WALLS

TYPICAL WING WALL REINFORCING



FRONT ELEVATION



SECTION A-A

CULVERT DIA. (INCHES)	ADD BAR SIZE	E (FEET)
108	#4	3
120	#4	5
144	#5	8
180	#7	11

ADDITIONAL REINFORCING

INLET STRUCTURE FOR CULVERT SIZES 48 IN. TO 180 IN. DIAMETER

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

APPROVAL RECOMMENDED:
T. Takano — HYDRAULIC DESIGN ENGINEER — 6-19-79 DATE

APPROVED:
Herbert Zaleski — ASSISTANT CHIEF, ENGINEERING — 6-22-79 DATE

NO.	REVISION	APPROVED BY	DATE
1.	Supersedes Sht. DH 13 approved 12-17-69	HF	6/22/79

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

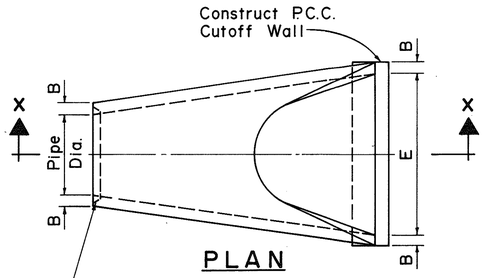
STANDARD DETAILS

INLET STRUCTURES

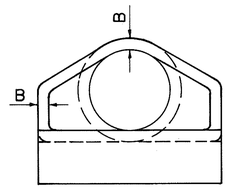
Not To Scale — Date: Dec. 1977

SHEET NO. 55 OF 59 SHEETS DH 13

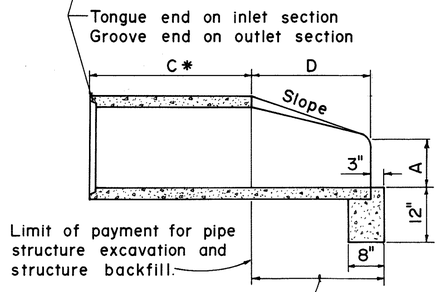
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(24)111	1985	127	328



PLAN



END VIEW

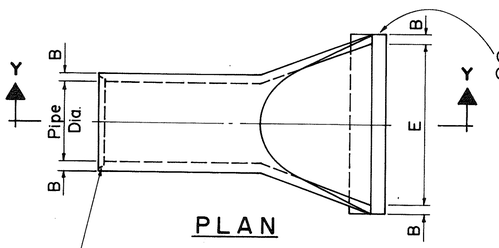


SECTION X-X

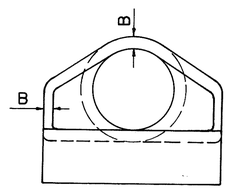
*C dimension shall be as desired by manufacturer and will be paid for at the price paid for concrete pipe.

MINIMUM DIMENSIONS						
PIPE DIA.	A	B	C*	D	E	SLOPE
12"	4"	2"		2'-0"	2'-0"	2:1 or Flatter
18"	9"	2½"		2'-3"	3'-0"	
24"	9½"	3"		3'-7½"	4'-0"	
30"	1'-0"	3½"		4'-6"	5'-0"	
36"	1'-3"	4"		5'-3"	6'-0"	
42"	1'-9"	4½"		5'-3"	6'-6"	
48"	2'-0"	5"		6'-0"	7'-0"	
54"	2'-3"	5½"		5'-5"	7'-6"	

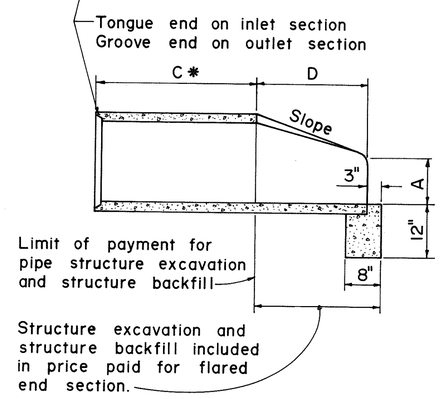
PRECAST CONCRETE FLARED END SECTION TYPE A



PLAN



END VIEW

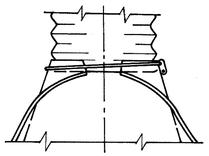


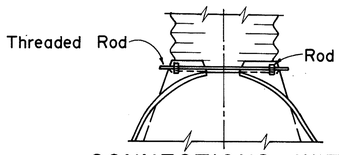
SECTION Y-Y

*C dimension shall be as desired by manufacturer and will be paid for at the price paid for concrete pipe.

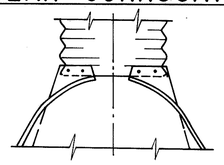
MINIMUM DIMENSIONS						
PIPE DIA.	A	B	C*	D	E	SLOPE
12"	4"	1¾"		1'-10"	2'-0"	2:1 or Flatter
18"	9"	2"		2'-1"	3'-0"	
24"	9½"	2½"		3'-6"	4'-0"	
30"	1'-0"	3"		4'-5"	5'-0"	
36"	1'-3"	3⅜"		5'-2"	6'-0"	
42"	1'-9"	3¾"		5'-3"	6'-6"	
48"	2'-0"	4¼"		6'-0"	7'-0"	
54"	2'-3"	4⅝"		5'-6"	6'-10"	

PRECAST CONCRETE FLARED END SECTION TYPE B



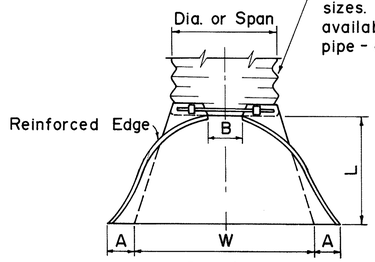


CONNECTIONS WITH ANNULAR CORRUGATIONS

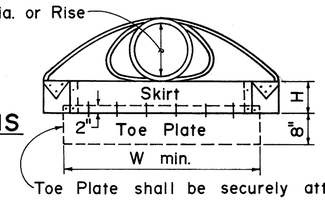


ALTERNATIVE CONNECTIONS

12" Connector Section available for all sizes. This is the only connection available for 64" x 43" thru 83" x 57" pipe - arch.

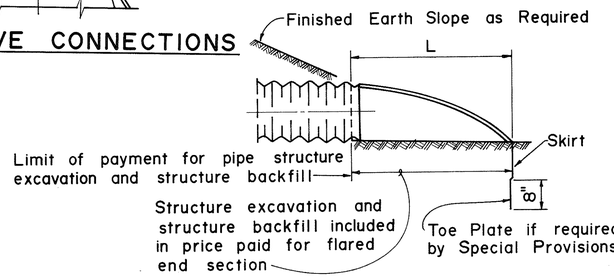


PLAN



Toe Plate shall be securely attached to the skirt

ELEVATION



TYPICAL CROSS-SECTION

GENERAL NOTES

1. All 3pc. bodies to have 0.109" thick sides and 0.138" thick center panels. Width of center panels to be greater than 20% of the pipe periphery. Multiple panel bodies to have lap seams which are to be tightly joint by 3/8" galvanized rivets or bolts.
2. Reinforced edges to be supplemented with galvanized stiffener angles for the 60" thru 84" round, 77" x 52" and 83" x 57" pipe - arch sizes. The angles will be 2" x 2" x 1/4" for the 60" thru 72" round, 77" x 52" and 83" x 57" pipe - arch sizes and 2½" x 2½" x 1/4" for 78" and 84" round. The angles to be attached by 3/8" galvanized nuts and bolts.
3. Angle reinforcement will be placed under the center panel seams on the 77" x 52" and 83" x 57" pipe - arch sizes.
4. Galvanized toe plate to be available as an accessory when specified.
5. End of pipe to be finished with annular corrugations to conform to flared end section so that no leakage results from the connection. Other designs may be used with approval of the Engineer.
6. Contractor has the option of using either Type A or B "Precast Concrete Flared End Section".

CIRCULAR PIPES							
PIPE DIA.	THICKNESS	DIMENSIONS-INCHES A ±	B MAX.	H ±	L 1½±	W 2 ±
12"	0.064"	6	6	6	21	24
15"	0.064"	7	8	6	26	30
18"	0.064"	8	10	6	31	36
21"	0.064"	9	12	6	36	42
24"	0.064"	10	13	6	41	48
30"	0.079"	12	16	8	51	60
36"	0.079"	14	19	9	60	72
42"	0.109"	16	22	11	69	84
48"	0.109"	18	27	12	78	90
54"	0.109"	18	30	12	84	102
60"	0.109"	18	33	12	87	114
66"	0.109"	18	36	12	87	120
72"	0.109"	18	39	12	87	126
78"	0.109"	18	42	12	87	132
84"	0.109"	18	45	12	87	138

PIPE - ARCHES								
INCHES SPAN	INCHES RISE	THICKNESS	DIMENSIONS-INCHES A 1 ±	B MAX.	H 1 ±	L 1½±	W 2 ±
21	15	0.064"	7	10	6	23	36
24	18	0.064"	8	12	6	28	42
28	20	0.064"	9	14	6	32	48
35	24	0.079"	10	16	6	39	60
42	29	0.079"	12	18	8	46	75
49	33	0.102"	13	21	9	53	85
57	38	0.102"	18	26	12	63	90
64	43	0.102"	18	30	12	70	102
71	47	0.102"	18	33	12	77	114
77	52	0.102"	18	36	12	77	126
83	57	0.102"	18	39	12	77	138

NO.	REVISION	APPROVED BY	DATE
1.	Replaces Sht. DH 14 approved 12-17-69	H.T.	6/22/79

APPROVAL RECOMMENDED:
T. Takane — 6-19-79
HYDRAULIC DESIGN ENGINEER — DATE

APPROVED:
Theodore Zaleski — 6-22-79
ASSISTANT CHIEF, ENGINEERING — DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS

FLARED END SECTION FOR CULVERTS

Not To Scale — Date June 1979

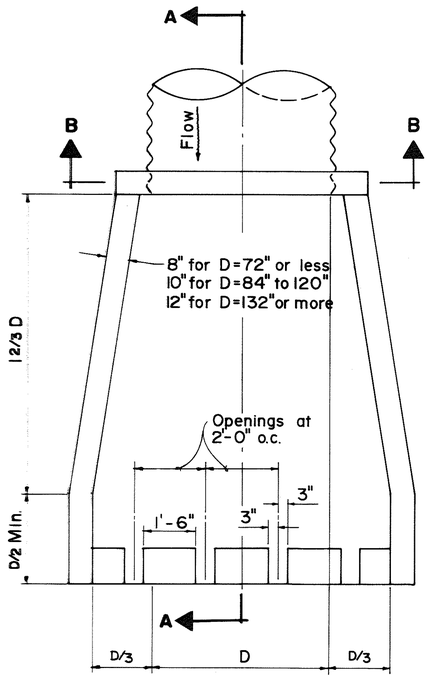
SHEET No. 56 OF 59 SHEETS DH 14

FLARED END SECTIONS FOR C.M.P. CULVERTS

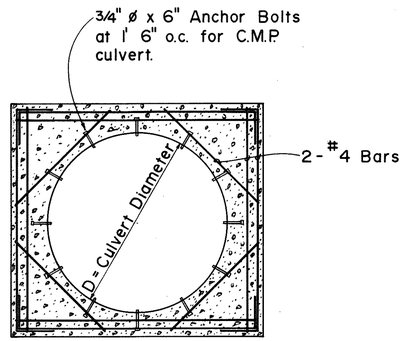
ORIGINAL PLAN	SURVEY PLOTTED BY	DRAWN BY	TRACED BY	DESIGNED BY	QUANTITIES BY	CHECKED BY	DATE
NOTE BOOK							
No.							

127

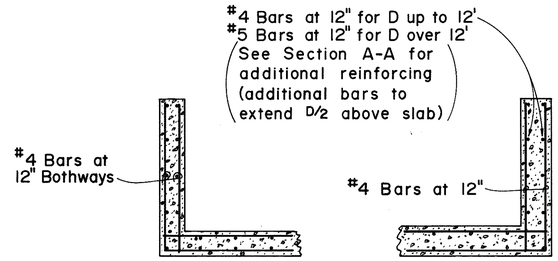
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI3-1(24):11	1983	128	328



PLAN

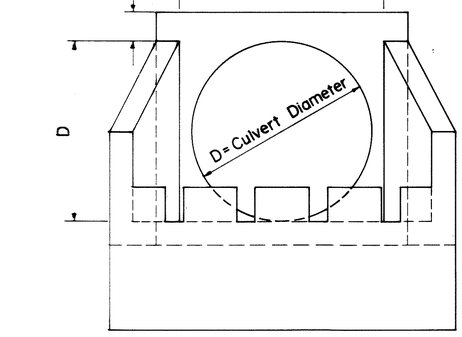


SECTION B-B

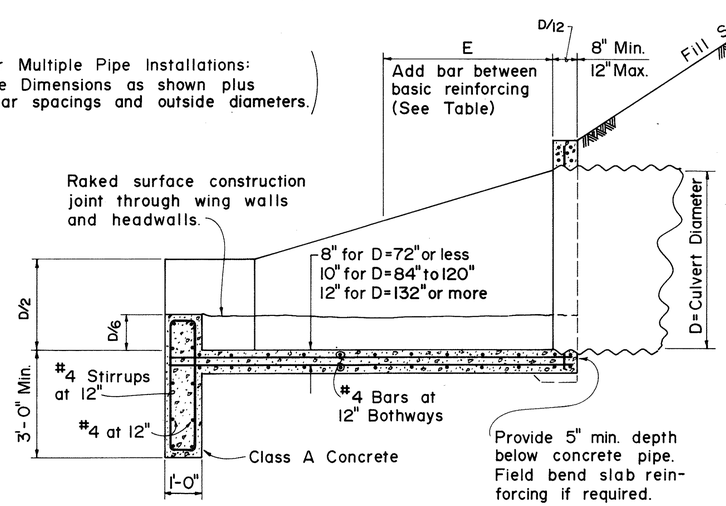


8" WING WALL 10" TO 12" WING WALLS

TYPICAL WING WALL REINFORCING



FRONT ELEVATION



SECTION A-A

CULVERT DIA. (INCHES)	ADD BAR SIZE	E (FEET)
108	#4	3
120	#4	5
144	#5	8
180	#7	11

ADDITIONAL REINFORCING

APPROVAL RECOMMENDED:
T. Takano
HYDRAULIC DESIGN ENGINEER 6-19-79 DATE

APPROVED:
Herbert Zaleski
ASSISTANT CHIEF, ENGINEERING 6-22-79 DATE

NO.	REVISION	APPROVED BY	DATE
1.	Supersedes Sht. DH 15 approved 12-17-69	H.F.	6/22/79

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS

OUTLET STRUCTURE

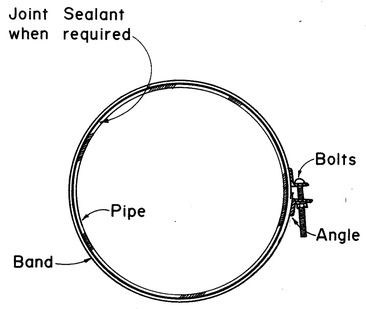
Not To Scale Date: Dec. 1977

SHEET No. 57 OF 59 SHEETS DH 15

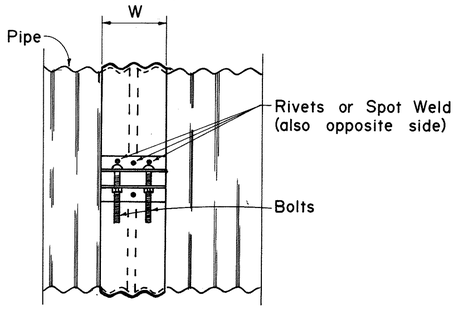
OUTLET STRUCTURE FOR CULVERT SIZES 48 IN. TO 180 IN. DIAMETER

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

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI3-1(24)11	1983	129	328

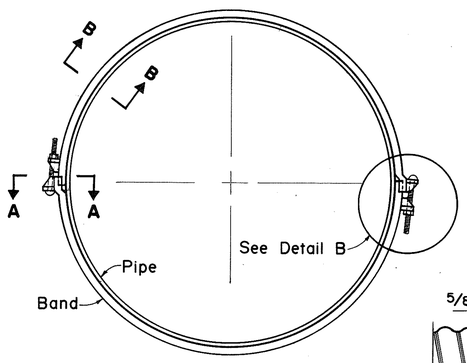


END VIEW

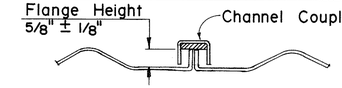


SIDE VIEW

ANNULAR COUPLING BAND

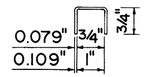


END VIEW

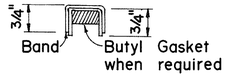


SECTION B-B

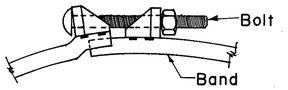
BOX END LUG CONNECTOR



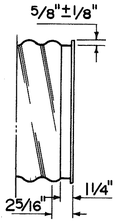
CHANNEL BAND



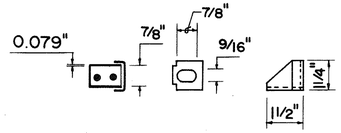
SECTION A-A



DETAIL B



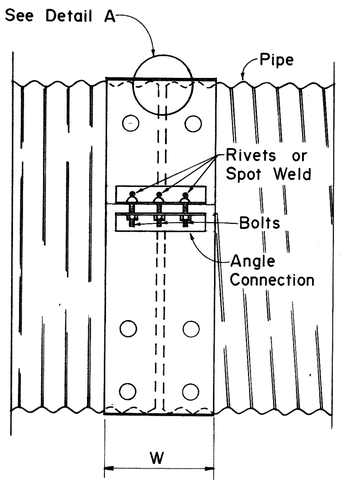
REFORMED END

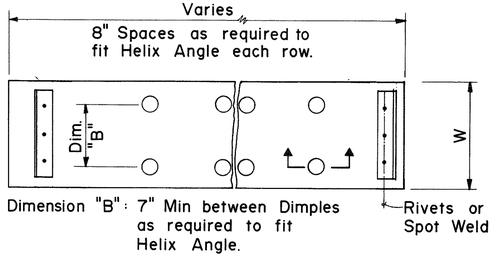


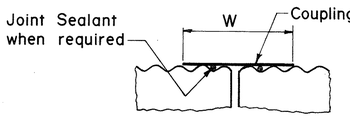
DETAIL LUG

GENERAL NOTES

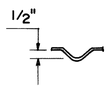
1. All coupling band connection hardware shall be galvanized or electro plated in accordance with Standard Specifications.
2. For pipe arches use same width band as for round pipe of same periphery.
3. Two pieces band required for pipe greater than 48" diameter.
4. Fillet welds of equivalent strengths may be substituted for spot welds or rivets.
5. Dimensions and thickness shown are in inches and are nominal.
6. Band thickness shall be not more than 2 standard thicknesses lighter than the thickness of the pipe; and, in no case shall be lighter than 0.079 inch.





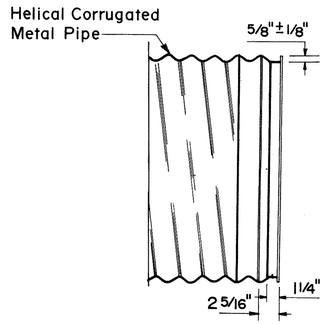


DETAIL A

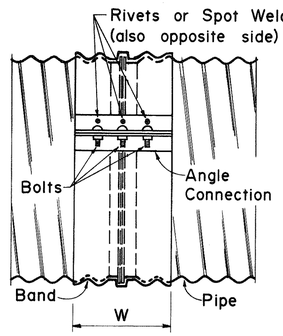


SECTION THRU DIMPLES

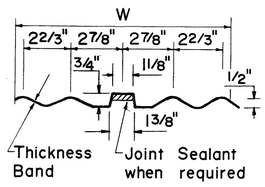
CHANNEL COUPLING BAND FOR USE ON REFORMED END C.M.P.



REFORMED END



SIDE VIEW



SECTION

UNIVERSAL COUPLING BAND ANGLE CONNECTION

COUPLING TYPE	CORRUGATION	PIPE SIZE	W	PIPE WALL THICKNESS	ANGLE CONNECTIONS-QUANTITIES PER CONNECTION DIMENSIONS	BOLTS	RIVETS	SPOT WELD
UNIVERSAL	22/3 x 1/2	12 - 36	10 1/2	0.079-0.138	2ea 2x2x3/16 x 7	2 ea 1/2 x 6	3ea 3/8	3ea 1/2
		42- 60	16 1/2	0.168	2ea 2x2x3/16x12	3 ea 1/2 x 6	4ea 3/8	5ea 1/2
		66-84	16 1/2	0.168	2ea 2x2x3/16x12	3 ea 1/2 x 6	4ea 3/8	
	3 x 1	36-72	10 1/2	0.079-0.138	2ea 2x2x3/16 x 7	2 ea 1/2 x 6	3ea 3/8	
		78-120	16 1/2	0.079-0.138	2ea 2x2x3/16x12	3 ea 1/2 x 6	4ea 3/8	
ANNULAR	22/3 x 1/2	12 - 36	7	0.079-0.138	2ea 2x2x3/16 x 7	2 ea 1/2 x 6	3ea 3/8	3ea 1/2
		42-72	12	0.079-0.168	2ea 2x2x3/16x12	3 ea 1/2 x 6	4ea 3/8	5ea 1/2
		78-84	12	0.168	2ea 2x2x3/16x12	3 ea 1/2 x 6	4ea 3/8	5ea 1/2
	3 x 1	36-42	14	0.079-0.109	2ea 2x2x3/16x12	3 ea 1/2 x 6	4ea 3/8	
		48-84	14	0.079-0.109	2ea 2x2x3/16x12	3 ea 1/2 x 6	4ea 3/8	5ea 1/2
		90-120	14	0.079-0.109	2ea 2x2x3/16x12	3 ea 1/2 x 6	4ea 3/8	

WING CHANNEL COUPLING BAND FOR REFORMED END H.C.M.P.

COUPLING TYPE	CORRUGATION	PIPE SIZE	W	PIPE WALL THICKNESS	LUG TYPE CONNECTORS-QUANTITIES PER CONNECTION DIMENSIONS	BOLTS	SPOT WELD
CHANNEL	22/3 x 1/2	12 - 72		0.079-0.138	2 ea Lugs	1 ea 1/2 x 6	4 ea 1/2
	3 x 1	36- 72		0.079-0.138	2 ea Lugs	1 ea 1/2 x 6	4 ea 1/2
WING	22/3 x 1/2	12 - 72	12	0.079-0.138	6 ea Lugs	3 ea 1/2 x 6	12 ea 1/2
		78-84	12	0.168	6 ea Lugs	3 ea 1/2 x 6	12 ea 1/2
	3 x 1	36-120	12	0.079-0.109	6 ea Lugs	3 ea 1/2 x 6	12 ea 1/2

APPROVAL RECOMMENDED:

D. Takaoka — 9-7-79

HYDRAULIC DESIGN ENGINEER — DATE

APPROVED:

Herbert S. Sakioka — 9-14-79

ASSISTANT CHIEF, ENGINEERING — DATE

NO.	REVISION	APPROVED BY	DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS

C.M.P. COUPLING DETAILS
STANDARD JOINT

Not To Scale — Date: Sept. 1979

SHEET NO. 58 OF 50 SHEETS DH 18

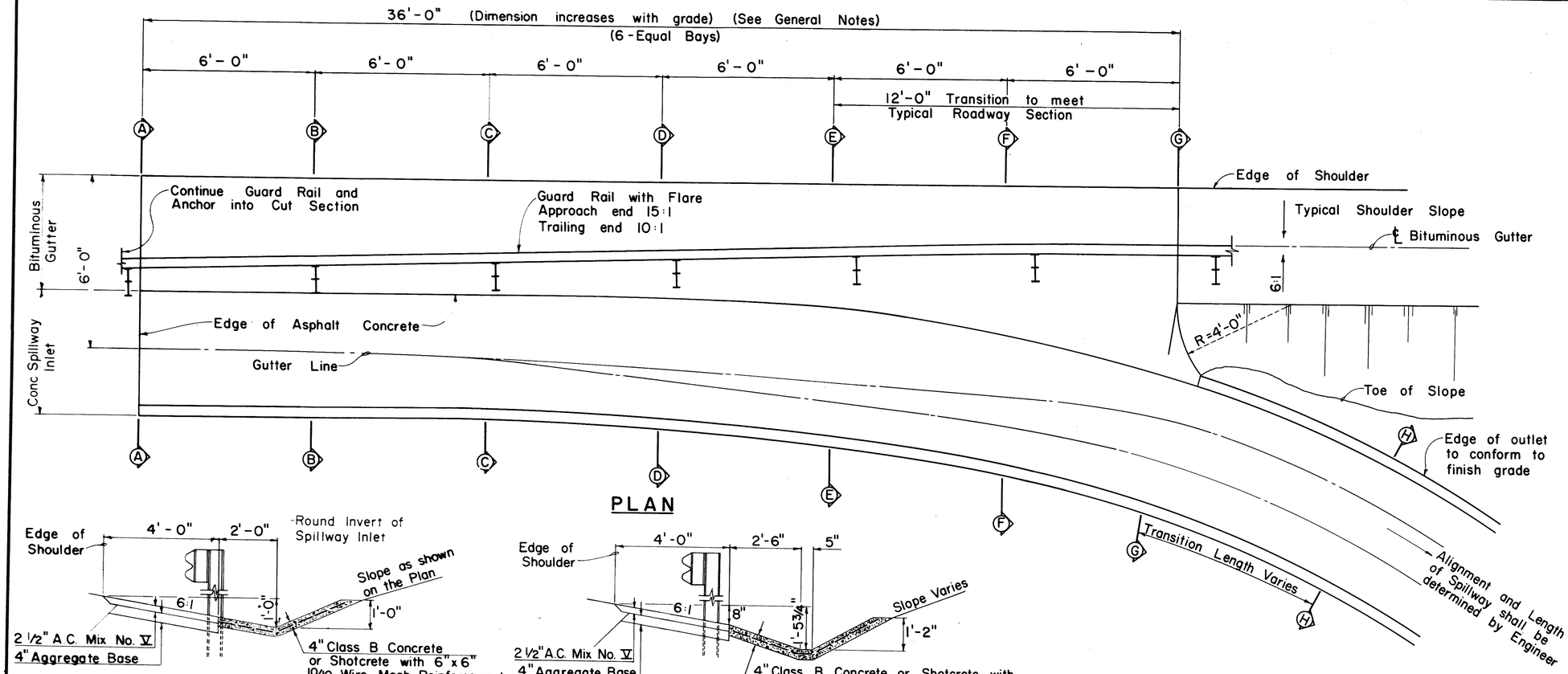
SURVEY PLOTTED BY — DATE
DRAWN BY
TRACED BY
DESIGNED BY
QUANTITIES BY
CHECKED BY

ORIGINAL PLAN
NOTE BOOK
No.

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(24)11	1983	130	328

GENERAL NOTES

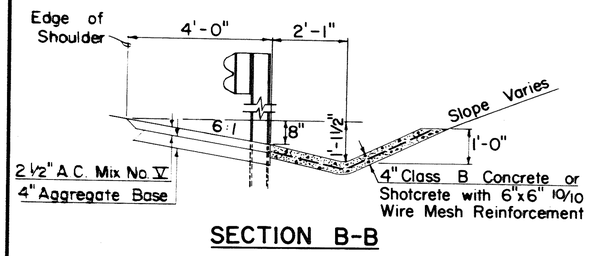
1. If the average grade of pavement for the length from Section A-A to Section G-G exceeds 2%, this length shall be increased in increments of 6' for each 1% increase in average grade of pavement in excess of 2%.



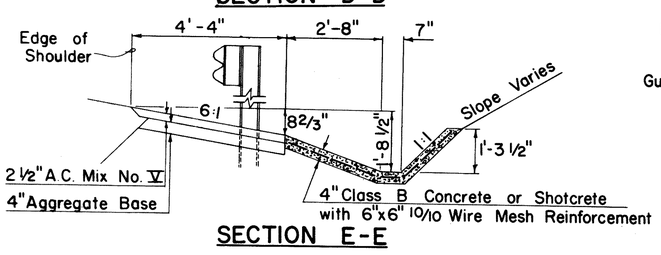
PLAN

SECTION A-A

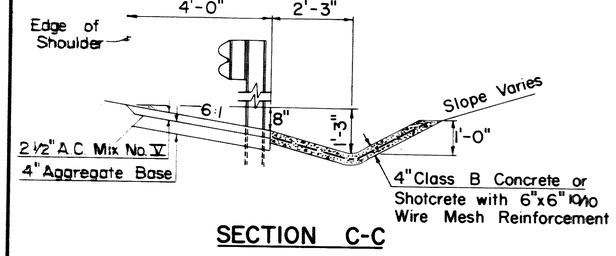
SECTION D-D



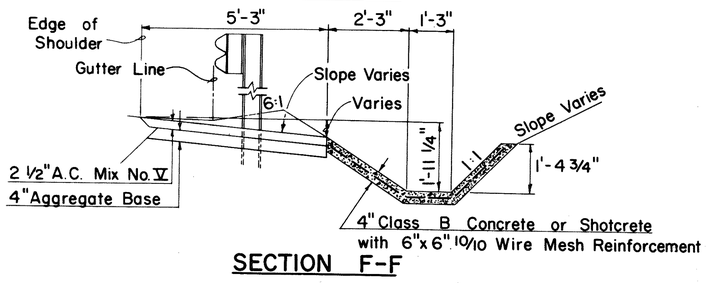
SECTION B-B



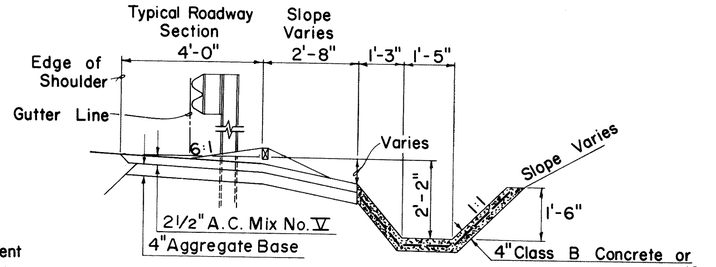
SECTION E-E



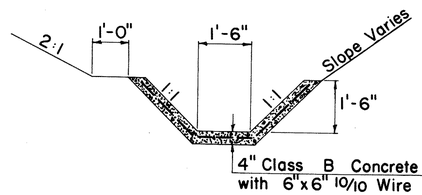
SECTION C-C



SECTION F-F



SECTION G-G



SECTION H-H

NO.	REVISION	APPROVED BY	DATE
1.	Round invert of spillway inlet.	H.T.	6/22/79

APPROVAL RECOMMENDED:

G. Takano — 10-13-76
HYDRAULIC DESIGN ENGINEER — DATE

APPROVED:

Herbert S. Takeshita — 10-14-76
ASSISTANT CHIEF, ENGINEERING — DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS
CONCRETE SPILLWAY INLET

Scale: 1/2" = 1'-0" Date: October, 1976

SHEET No. 59D OF 59 SHEETS DH 20

130

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