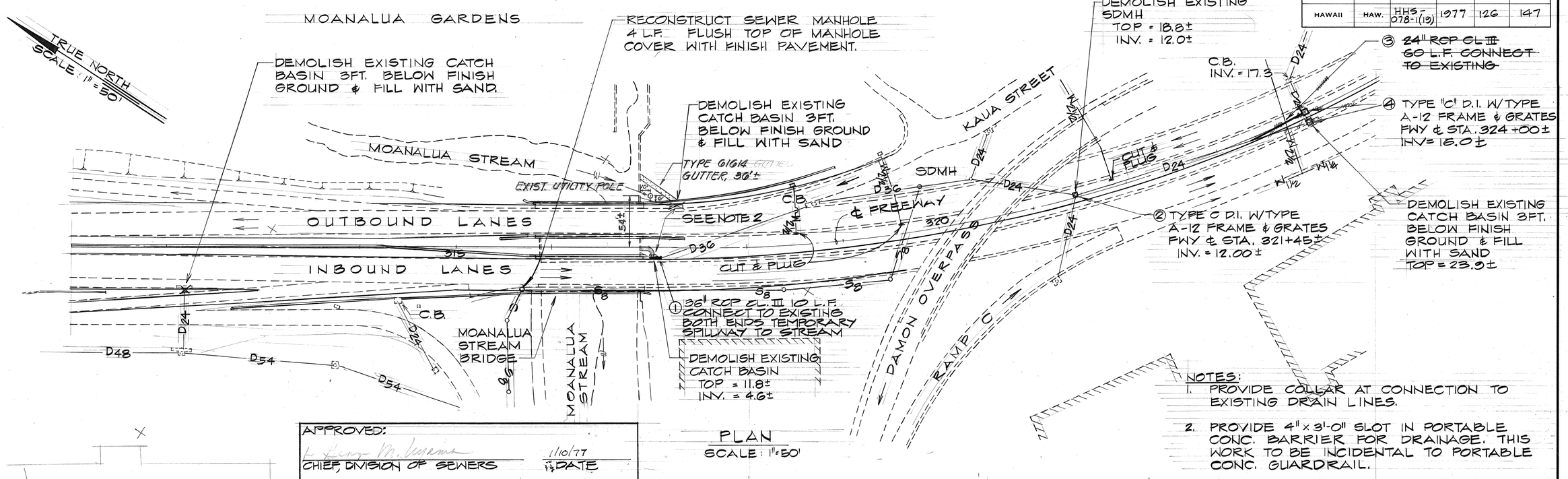
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HHS-078-1(19)	1977	126	147

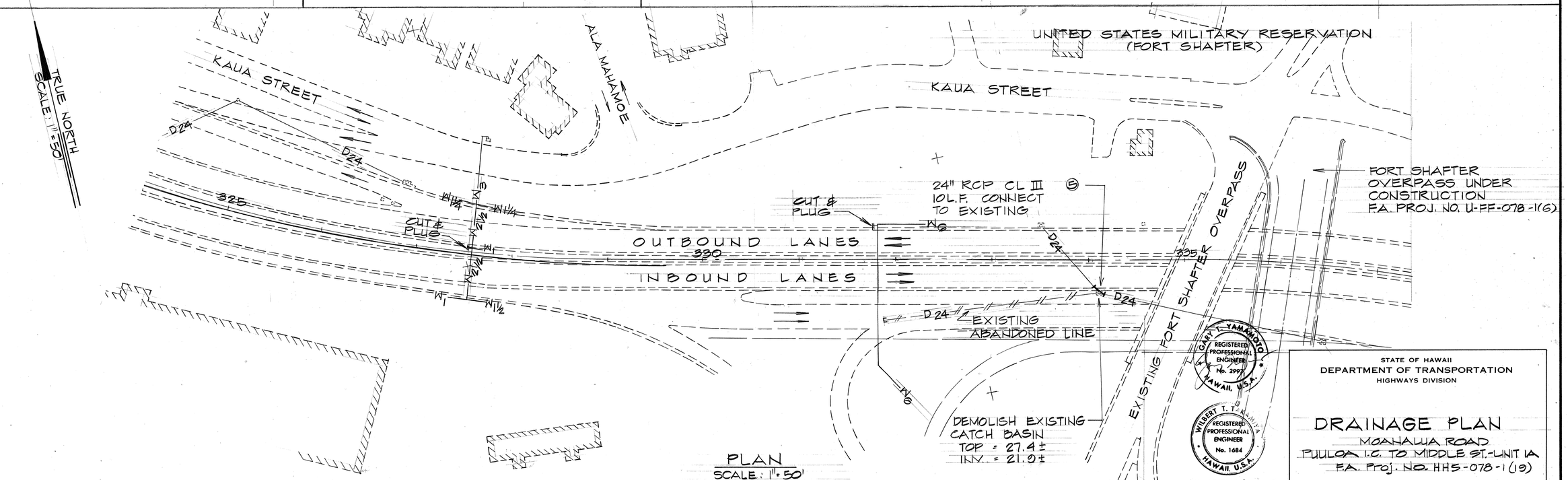


APPROVED:

CHIEF, DIVISION OF SEWERS — 1/10/77 DATE

PLAN
SCALE: 1" = 50'

NOTES:
1. PROVIDE COLLAR AT CONNECTION TO EXISTING DRAIN LINES.
2. PROVIDE 4" x 3'-0" SLOT IN PORTABLE CONC. BARRIER FOR DRAINAGE. THIS WORK TO BE INCIDENTAL TO PORTABLE CONC. GUARDRAIL.



PLAN
SCALE: 1" = 50'

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

GARY T. YAMAMOTO — REGISTERED PROFESSIONAL ENGINEER No. 2997 — HAWAII, U.S.A.
WILBERT T. TAKAMIYA — REGISTERED PROFESSIONAL ENGINEER No. 1684 — HAWAII, U.S.A.

Wilbert T. Takamiya
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE PLAN

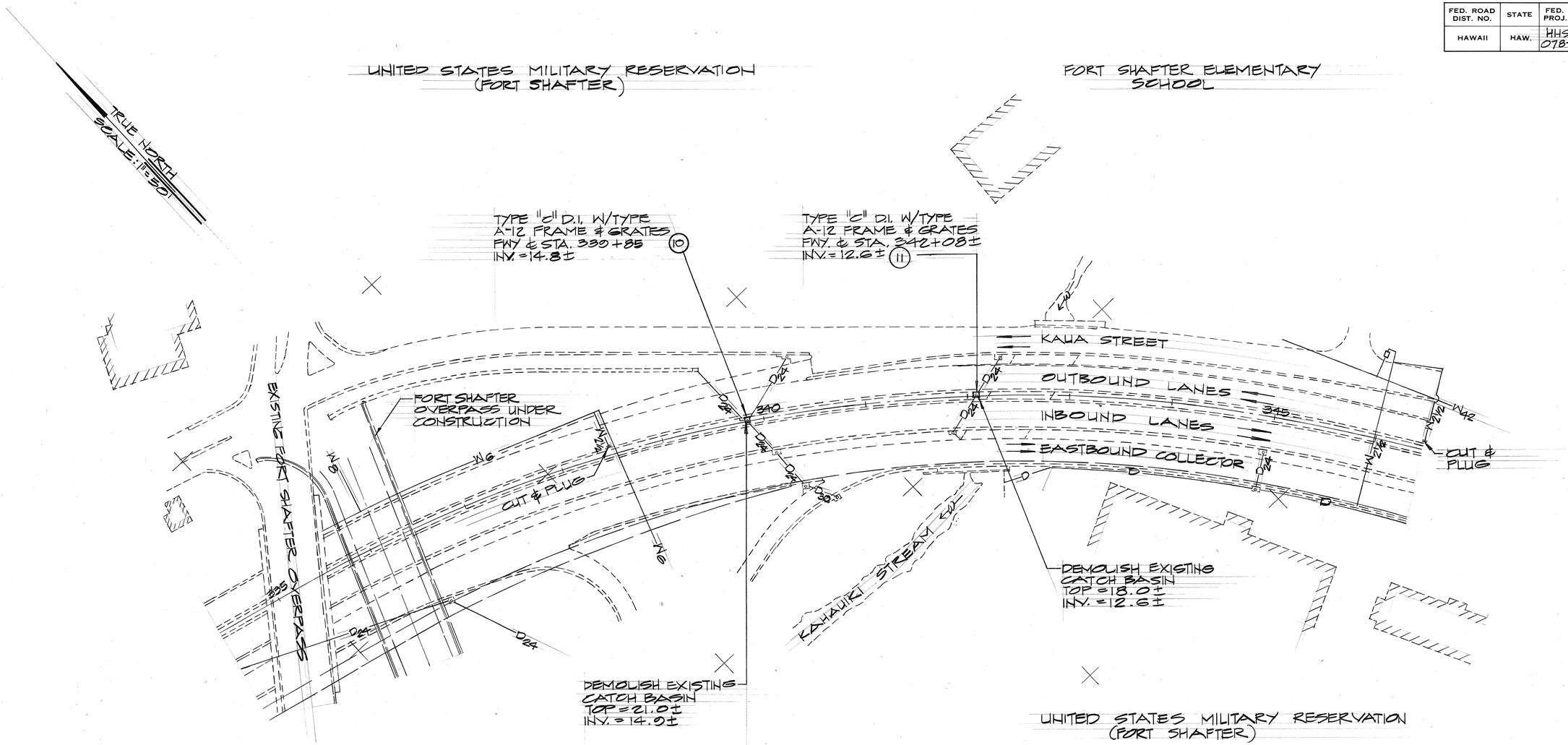
MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST.-UNIT IA
F.A. Proj. NO. HHS-078-1(19)

SCALE: AS SHOWN DATE: DEC. 17, 1976

SHEET No. 1 OF 2 SHEETS

126

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HHS-078-1(16)	1977	127	147



PLAN
SCALE: 1"=50'

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

GARY T. YAMAMOTO
REGISTERED PROFESSIONAL ENGINEER
No. 2997
HAWAII, U.S.A.

WILBERT T. TAKAMIYA
REGISTERED PROFESSIONAL ENGINEER
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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE PLAN

MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST.-UNIT IA
F.A. Proj. No. HHS-078-1(19)

SCALE: AS SHOWN DATE: DEC. 17, 1976

SHEET No. 2 OF 2 SHEETS

DRAINAGE SUMMARY

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HHS-078-(10)	1977	128	147

STRUCTURES — ESTIMATED QUANTITIES

DRAINAGE SHEET ITEM NUMBER		ITEM NO.	206	206	.	503	503		602	603	603	603	603	603	603	603	603	603	603	603	603	603	603	604		604			604	604	604	604	604	604	605	612	ITEM NUMBER	DRAINAGE SHEET
		TYPE	.02	.80		.002	.201		.103	.1014	.0010	.1010	.1054	.2068	.2002	.6062	.7200	.7260	.5050	.7440	.7500	.2061	.2066	.036		.201			.218	.230	.231	.232	.237	.300	.417	.200	.01		
		UNIT	STRUCTURE EXCAVATION FOR DRAINAGE SYSTEM CU YD	FILTER MATERIAL CU YD		CONCRETE FOR DRAINAGE SYSTEM CU YD	CLASS B CONCRETE OTHER THAN IN BRIDGES CU YD		REINFORCING STEEL FOR DRAINAGE SYSTEM LB	36-INCH RCP, CLASS III LIN FT	BED COURSE MATERIAL FOR CULVERT CU YD	24-INCH RCP, CLASS III LIN FT	42-INCH RCP, CLASS IV LIN FT	30-INCH CMP, SHEET THICKNESS, 0.079 INCH LIN FT	6-INCH PERFORATED CMP, SHEET THICKNESS 0.064 INCH LIN FT	48-INCH CMP, SHEET THICKNESS, 0.109 INCH OR 42-INCH RCP, CLASS IV LIN FT	24-INCH CMP, SHEET THICKNESS, 0.079 INCH OR 24-INCH RCP, CLASS III OR 24-INCH ACP, CLASS III LIN FT	36-INCH CMP, SHEET THICKNESS, 0.079 INCH OR 24-INCH RCP, CLASS III OR 24-INCH ACP, CLASS III LIN FT	30-INCH RCP, CLASS III OR 30-INCH ACP, CLASS III LIN FT	36-INCH CMP, SHEET THICKNESS, 0.109 INCH OR 36-INCH RCP, CLASS III OR 36-INCH ACP, CLASS III LIN FT	42-INCH CMP, SHEET THICKNESS, 0.109 INCH OR 36-INCH RCP, CLASS III OR 36-INCH ACP, CLASS III LIN FT	12-INCH CMP SHEET THICKNESS 0.079 INCH LIN FT	24-INCH CMP SHEET THICKNESS 0.079 INCH LIN FT	CONCRETE WALL FOR STORM DRAIN MANHOLE LIN FT		TYPE A CAST IRON FRAME AND COVER EACH			TYPE P CAST IRON FRAME AND COVER EACH	TYPE T STEEL FRAME AND GRATE EACH	TYPE T-2 STEEL FRAME AND GRATE EACH	TYPE A-12 STEEL FRAME AND GRATE EACH	TYPE G1614 STEEL FRAME AND GRATE EACH	INSTALLING SALVAGED CAST IRON FRAME AND COVERS EACH	MODIFYING EXISTING STORM DRAIN MANHOLE EACH	CLEANOUT EACH	GROUTED RUBBLE PAVING CU YD		
126	1	DRAINLINE	15							10	2																									1	126
	2	"C" D.I.	8				3.0		11																						1					2	
	3	DRAINLINE	45								6	60																								3	
	4	"C" D.I.	8				3.8		11																						1					4	
126	5	DRAINLINE	8								1	10																								5	126
124	6	SUBDRAIN	44	27											96																					6	124
124	7	"A-1" D.M.H.	11			.6																		8									1			7	124
125	8	G1614 D.I.	10			3.5			32																							2				8	125
125	9	G1614 D.I.	8			3.3			32																							2				9	125
127	10	"C" D.I.	8				3.0		11																						1					10	127
127	11	"C" D.I.	8				3.8		11																						1					11	127
		TOTAL	173	27		7.4	13.6		108	10	9	70			96									8							4	4	1				

GARY T. YAMAMOTO REGISTERED PROFESSIONAL ENGINEER No. 2997 HAWAII, U.S.A.

WILBERT T. TAKAHATA REGISTERED PROFESSIONAL ENGINEER No. 1684 HAWAII, U.S.A.

Wilbert T. Takahata

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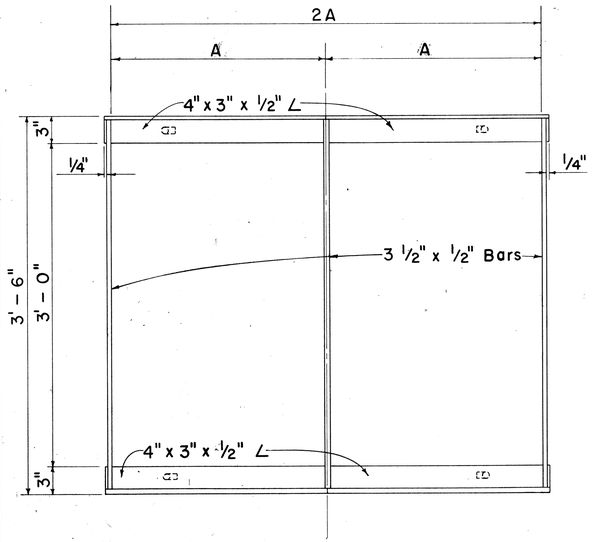
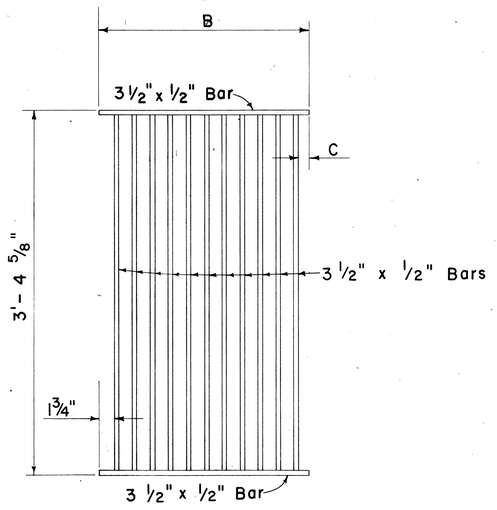
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HHS-078-1(19)	1977	129	147



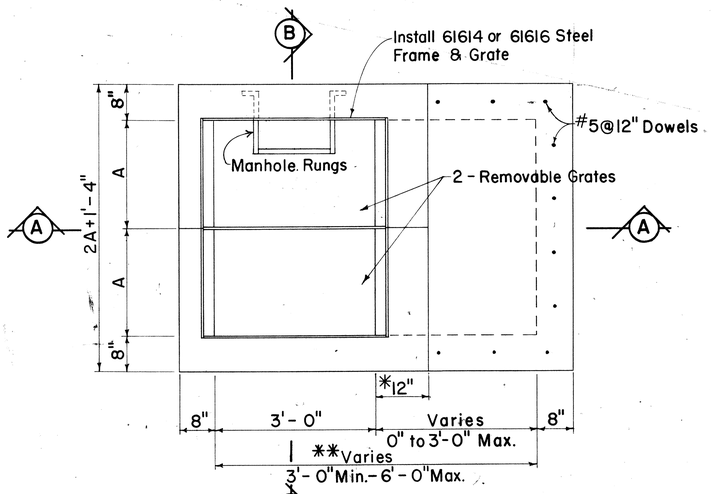
PLAN

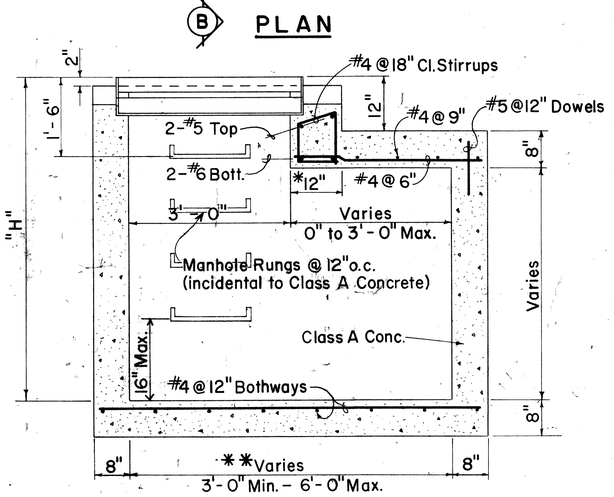
Scale: 1 1/2" = 1'-0"



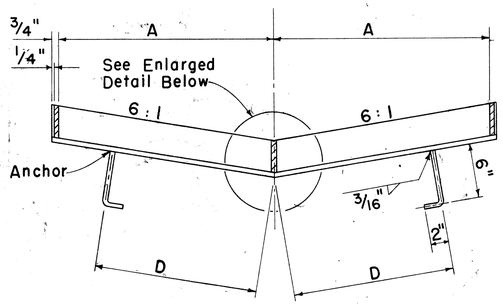
PLAN

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



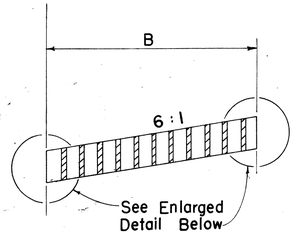


SECTION A - A



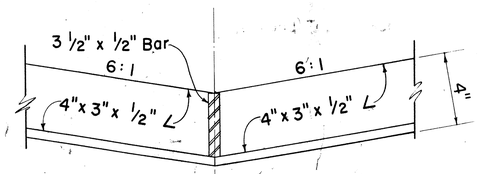
SECTION

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



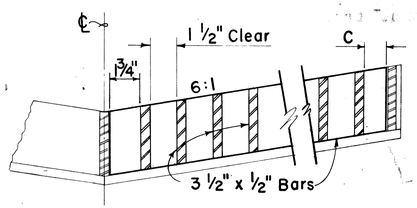
SECTION

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



FRAME

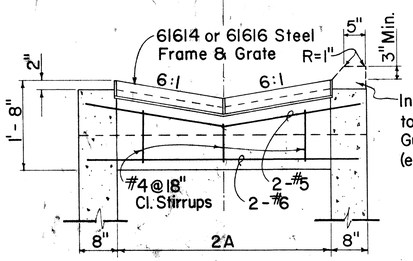
Scale: 3" = 1'-0"



GRATE

Scale: 3" = 1'-0"

DETAILS OF TYPE 61614 OR 61616 STEEL FRAME AND GRATE



SECTION B - B

Install curb when Drop Intake is used to drain Top of Fill Gutters. Provide Gutter Transitions of 25 ft. (entering and leaving D.I.)

DETAILS OF 61614 OR 61616 DROP INTAKE

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

*For Minimum size box of 3'-0", use 8" and eliminate reinforcing steel shown in the top portion.

**For Culverts larger than 30", the minimum dimension shall be D'

GENERAL NOTES

1. Grates and Frames shall be hot dip galvanized after fabrication, see specifications.
2. All welds 3/8" unless otherwise noted.
3. Refer to "Spacing Table" for Types 61614 & 61616 Drop Intake and Frame & Grates dimensions.
4. The Frame & Grate materials shall conform to the specifications of ASTM Designation Structural Steel A283, Grade D and the Standard Specifications.
5. 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.
6. Manhole Rungs (12" o.c.) are required when "H" is greater than 4 feet 6 inches. Only one rung (16 inches from the bottom) is required if "H" is 4 feet 6 inches or less. Manhole Rungs may be placed at any location as ordered by the Engineer.

SPACING TABLE

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"	1/8"	2'- 0"

NO.	REVISION	APPROVED BY	DATE
1	Curb for Top of Fill Gutters	HH	6-5-71
2	Spacing on manhole rungs to conform to OSHA.	HH	12-21-15

APPROVAL RECOMMENDED:

HYDRAULIC DESIGN ENGINEER — DATE 12-17-69

APPROVED:

ASSISTANT CHIEF, ENGINEERING — DATE 12-11-69

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS

TYPE 61614 & 61616 GRATED DROP INTAKES

Scales: As Noted — Date: Feb. 1969

SHEET No. OF SHEETS DH 8

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