DRAINAGE SUMMARY

DATE	REVISION
1-10-79	Corrected quantities on Item Nos. 503.0020, .2020, 603.1088, .6300, .6340, .7260, & .7380.

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	M-7600(1)	1978	22	198

STRUCTURES			CULVERTS		ESTIMATED QUANTITIES																	
DRAINAGE SHEET	STRUCTURE NUMBER	TYPE	FROM STRUCTURE NO.	TO STRUCTURE NO.	ITEM NO.	206.	503.	503.	602.	603.	~~603.~~	603.	603.	603.	603.	604.	604.	604.	604.	604.	604.	603.
						2020	0020	2020	1020	0010	~~1088~~	6300	6340	7260	7380	2150	2160	2320	2330	2340	2350	1089
					DRAINLINE NO.	STRUCTURE EXCAVTION FOR DRAINAGE SYSTEM	CLASS A CONCRETE FOR DRAINAGE SYSTEM	CLASS B CONCRETE FOR DRAINAGE SYSTEM	REINFORCING STEEL FOR DRAINAGE SYSTEM	BED COURSE MATERIAL FOR CULVERTS	~~24-INCH RCP, CLASS II~~	60-INCH CMP-0.138 INCH OR 54-INCH RCP, CLASS III	60-INCH CMP-0.138 INCH 60-INCH RCP, CLASS III	30-INCH CMP-0.079 INCH OR 24-INCH RCP, CLASS III OR 24-INCH ACP, CLASS III	36-INCH CMP-0.079 INCH OR 30-INCH RCP, CLASS III OR 30-INCH ACP, CLASS III	TYPE A CAST IRON FRAME & COVER	TYPE B CAST IRON FRAME & COVER	TYPE A-12 STEEL FRAME & GRATE	TYPE G1614 STEEL FRAME & GRATE	TYPE G1616 STEEL FRAME & GRATE	TYPE G1214 STEEL FRAME & GRATE	30-INCH RCP, CLASS V
					UNIT	C.Y.	C.Y.	C.Y.	LB.	C.Y.	~~L.F.~~	L.F.	L.F.	L.F.	L.F.	EA.	EA.	EA.	EA.	EA.	EA.	L.F.
24	1	DI TYPE G1616	1	–	1	39.3	5.5		75	3.9				16						1		
25	2	DI TYPE G1616	2	4	2	66.1	3.5		75	18.1				74						1		
25	3	DI TYPE G1616	3	4	2	67.2	3.8		75	18.1				74						1		
25	4	DI TYPE G1616	4	5	2	138.0	3.5		75	18.1				74						1		
25	5	DI TYPE G1214	5	6	2	50.1	1.9		35	12.7				52							1	
25	6	SPECIAL MANHOLE	6	6b	2	350.6	3.9		240	22.0			392			1						
25	7	DI TYPE G1614	7	8	3	9.2	2.7		65	1.5				6					1			
25	8	HALF HEADWALL	–	–	3	2.0	0.4		20													
25	9	DI TYPE D	9	10	3	37.5	1.8		35	8.8				36				1				
25	10	DI TYPE G1214	10	11	3	160.5	1.9		35	36.2					148						1	
25	11	HALF HEADWALL	–	–	3	3.0	0.4		25													
25	12	HEADWALL	12	13	4	246.2	1.2		33	109.1	~~320~~											370
25	13	SPECIAL MANHOLE	13	13a	4	579.3	4.5		260	256			148			1						
25	13a	OUTFALL THRU RET. WALL	–	–																		
26	14	DI TYPE G1616	14	15	5	216.5	4.3		43	72.5				296						1		
26	15	DI TYPE G1614	15	16	5	300.5	2.4		31	95.0				398					1			
26	16	DI TYPE G1614	16	17	5	80.6	3.0		31	15.6				65					1			
26	17	DI TYPE G1214	17	18	5	304.7	3.9		30	52.8				220							1	
26	18	DI TYPE G1614	18	19a	5	362.7	3.8		35	51.8				108					1			
26	19	CB TYPE D	19	19a	5	26.0	4.9		77	4.3				20			1					
26	19a	TYPE A MANHOLE	19a	20	5	24.3	5.0		75	25				104		1						
26	19b	RECONSTRUCT EXIST. D.I.	–	–	5	9	1.25		15													
26	20	TYPE A MANHOLE	–	–	5	25.7	5.0		75							1						
26	21	DI TYPE G1214	21	22	6	88.9	2.4		32	37.4				156							1	
26	22	OUTFALL	–	–	6																	
		Sub - Total				3,187.9	70.95	0	1,492	628.5	~~320~~	0	540	1,699	148	4	1	1	4	5	4	370

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

ORIGINAL PLAN
NOTE BOOK
No.

ADD. 22

DRAINAGE SUMMARY

DATE	REVISION
1-10-79	Corrected quantities on Item Nos. 206.2020, 603.1088, .6300, .6340, .7260, and posted sub-total and total figures.

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	M-7600(7)	1978	22A	108

STRUCTURES			CULVERTS		ESTIMATED QUANTITIES																	
DRAINAGE SHEET	STRUCTURE NUMBER	TYPE	FROM STRUCTURE NO.	TO STRUCTURE NO.	ITEM NO.	206. 2020	503. 0020	503. 2020	602. 1020	603. 0010	~~603. 1088~~	603. 6300	603. 6340	603. 7260	603. 7380	604. 2150	604. 2160	604. 2320	604. 2330	604. 2340	604. 2350	603. 1089
					DRAINLINE NO.	STRUCTURE EXCAVATION FOR DRAINAGE SYSTEM	CLASS A CONCRETE FOR DRAINAGE SYSTEM	CLASS B CONCRETE FOR DRAINAGE SYSTEM	REINFORCING STEEL FOR DRAINAGE SYSTEM	BED COURSE MATERIAL FOR CULVERTS	~~24-INCH RCP, CLASS II~~	60-INCH CMP-0.138 INCH OR 54-INCH RCP, CLASS III	60-INCH CMP-0.138 INCH OR 60-INCH RCP, CLASS III	30-INCH CMP-0.079 INCH OR 24-INCH RCP, CLASS III OR 24-INCH ACP, CLASS III	36-INCH CMP-0.079 INCH OR 30-INCH RCP, CLASS III OR 30-INCH ACP, CLASS III	TYPE A CAST IRON FRAME & COVER	TYPE B CAST IRON FRAME & COVER	TYPE A-12 STEEL FRAME & GRATE	TYPE G1G14 STEEL FRAME & GRATE	TYPE G1G16 STEEL FRAME & GRATE	TYPE G1214 STEEL FRAME & GRATE	30-INCH RCP, CLASS V
					UNIT	C.Y.	C.Y.	C.Y.	LB.	C.Y.	~~L.F.~~	L.F.	L.F.	L.F.	L.F.	EA.	EA.	EA.	EA.	EA.	EA.	L.F.
24	1a	SPECIAL DI	1a	1b	CHANNEL REPL.	114.6	3.0		51	35.5		214							1			
24	1b	SPECIAL DI	1b	1c	CHANNEL REPL.	215.7	3.0		51			~~430~~							1			
25	~~1c~~	~~HEADWALL~~	—	—	~~CHANNEL REPL.~~	—	~~.25~~		—										~~1~~			
24	1d	RECONSTRUCT EXIST. D.I.	—	—	CHANNEL REPL.	9	1.50		15											1		
25	6a	DI TYPE G1G14	6a	6b	CHANNEL REPL.	8.0	2.4		31	1.0				4					1			
25	6b	SPECIAL MANHOLE	—	—	CHANNEL REPL.	20.5	3.9		240				40			1						
	19a	MANHOLE TYPE A	19a	20	5	24.3	5.0		75	25				104		1						
		Sub-Total sheet No. 22				3,187.9	70.95	0	1,492	628.5	~~320~~	0	540	1,699	148	4	1	1	4	5	4	370
		Sub-Total this Sheet				392.1	~~19.80~~ ~~19.05~~	0	463	61.5	~~0~~	~~214~~ ~~644~~	40	108	0	2	0	0	~~3~~ ~~4~~	1	0	0
		TOTAL				3,580.0	~~90.75~~ ~~90.0~~	0	1,955	690.0	~~320~~	~~214~~ ~~644~~	580	1,807	148	6	1	1	~~7~~ ~~8~~	6	4	370

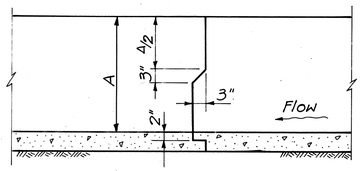
ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK No.	DRAWN BY	"
	TRACED BY	"
	DESIGNED BY	"
	QUANTITIES BY	"
	CHECKED BY	"

ADD. 22 A

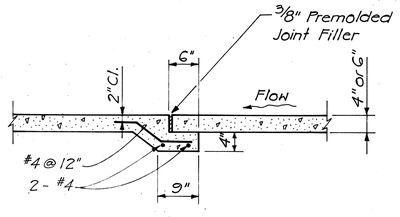
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	M-7600(1)	1978	23	198

SCHEDULE OF ROADWAY LINED SWALES & DITCHES

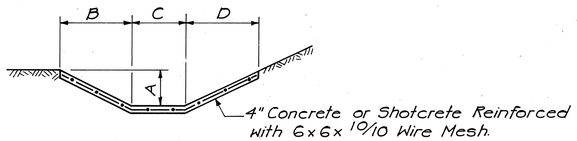
LOCATION		TYPE	CLASS B CONCRETE OR SHOTCRETE: GUTTER, TYPE 2 (61218)	GUTTER, TYPE 2 (61214)	LINED DITCHES TYPE 1	LINED DITCHES TYPE 2	LINED DITCHES TYPE 3	DITCH AND CHANNEL EXCAVATION	REINFORCING STEEL
	ITEM		609.2218	609.2614	640.0010	640.0020	640.0030	207.01	
	UNIT		L.F.	L.F.	L.F.	L.F.	L.F.	C.Y.	lb.
FWR Sta. 69+50 to Ramp D Sta. 17+85		1			1250			100	1192
FWR Sta. 69+75 to Ramp D Sta. 20+40		61614		1435					
Ramp D Sta. 17+95 to Ramp D Sta. 18+95		2				100		19	125
FWR Sta. 84+27 to FWR Sta. 87+93		61614		366					
Ramp B Sta. 10+46 to Ramp B Sta. 17+50		61614		704					
Ramp B Sta. 17+50 to Farrington Hwy. Sta. 44+70		61218	820						
FWR Sta. 84+25		3					25	6	31
TOTAL			820	2505	1250	100	25	125	1348
	ITEM NO.		609.2218	609.2614	640.010	640.020	640.030	207.01	



TYPICAL CONSTRUCTION JOINT AT 30' O.C.
FOR DITCHES WITH DEPTH A ≤ 2'-0"
AND CONCRETE GUTTERS AT 25' O.C.
Scale: 3/4" = 1'-0"



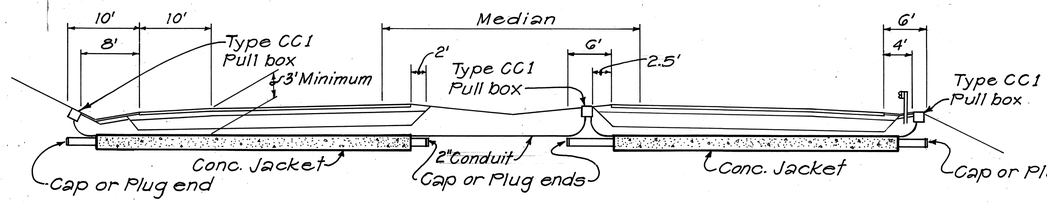
TYPICAL EXPANSION JOINT AT 90' O.C.
FOR DITCHES WITH DEPTH A ≤ 2'-0"
AND CONCRETE GUTTERS AT 75' O.C.
Scale: 3/4" = 1'-0"



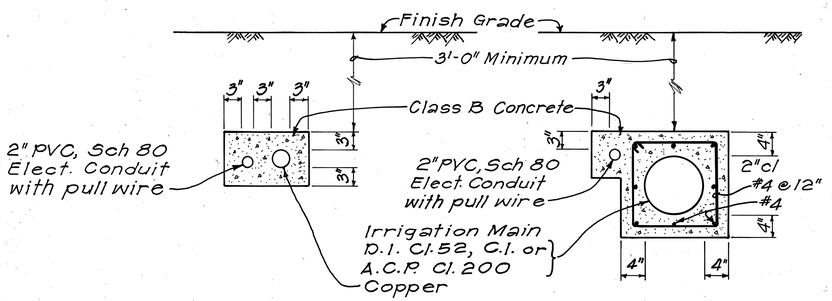
TYPE	A	B	C	D	CONCRETE	REINFORCING	EXCAVATION
1	1	2	0	2	0.0605 C.Y./L.F.	0.9534 LB/L.F.	0.0802 C.Y./L.F.
2	1.5	3	0	3	0.0743 C.Y./L.F.	1.2488 LB/L.F.	0.1867 C.Y./L.F.
3	1	1	3	1	0.0752 C.Y./L.F.	1.2199 LB/L.F.	0.2233 C.Y./L.F.

NOTES:

1. Contractor may substitute Lined Ditches of other Shapes and of equal or greater Capacity if approved by the Engineer. Payment will be on the original Ditch as shown on the Plans.
2. Ditch Transitions shall be paid under the adjacent downstream Ditch Type.
3. For details of dowels @ construction joints, see sheet No. DD 609.1



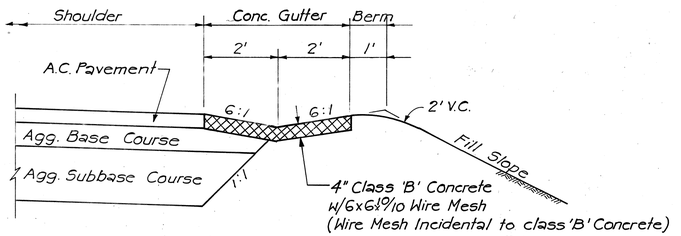
TYPICAL IRRIGATION MAIN & ELECTRICAL CONDUIT ROADWAY CROSSING
Scale: 1" = 10'



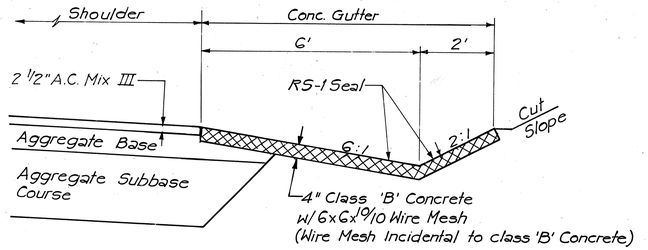
3" AND SMALLER

4" AND LARGER SIZES

TYPICAL SECTION OF CONCRETE JACKET
Scale: 1" = 1'-0"
Note: Pressure test irrigation main for leaks prior to jacketing.



TYPE 61614 CONCRETE GUTTER
Scale: 1/2" = 1'-0"



TYPE 61218 CONCRETE GUTTER
Scale: 1/2" = 1'-0"

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

ANTHONY R. D'ALESSIO REGISTERED PROFESSIONAL ENGINEER No. 2934 HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

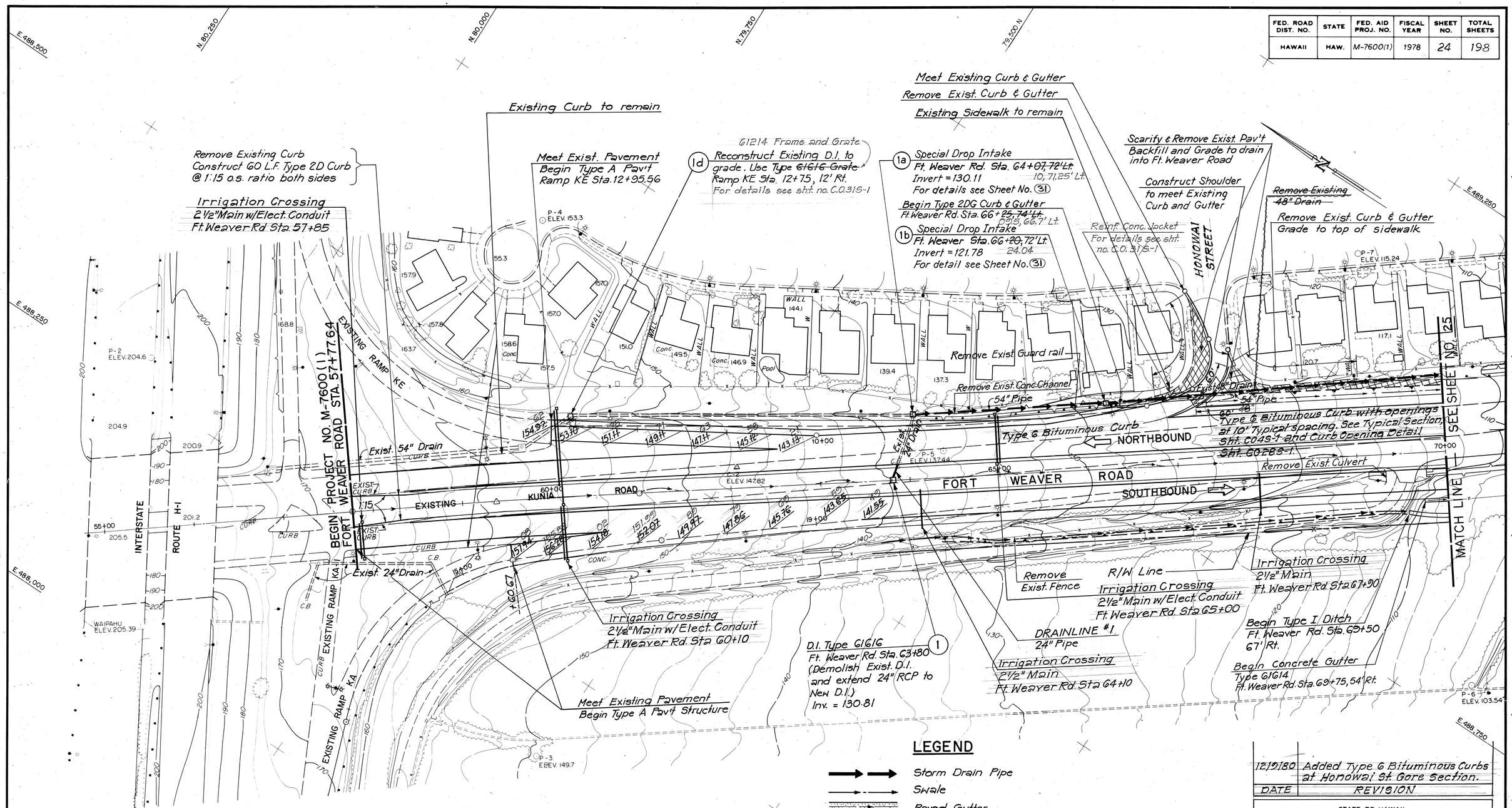
DRAINAGE DETAILS

FORT WEAVER ROAD
ROUTE H-1 TO SOUTH OF
FARRINGTON HIGHWAY

SCALE: AS SHOWN DATE: AUG. 1978

SHEET No. 1 OF 1 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	M-7600(1)	1978	24	198



LEGEND

- Storm Drain Pipe
- Swale
- Paved Gutter
- Concrete Ditch
- Existing Concrete Ditch Lining
- Scarify and Remove Existing Pavement
- Irrigation Main
- Irrigation Elect. Conduit

NOTES :

1. In all areas the right-of-way will be the Hydro Mulch Seeding limits unless the area between the slope limit & right-of-way line is not disturbed, then the slope limit will be the limit.
2. Pipe sizes shown are for Reinforced Concrete or Asbestos Cement Pipe. For Corrugated Metal Pipe add 6" except for channel replacement where maximum diameter is 60".

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

DATE	REVISION
12/19/80	Added Type G Bituminous Curbs at Honowai St. Gore Section.

ANTHONY R. D'ALESSIO
REGISTERED PROFESSIONAL ENGINEER
No. 2934
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

GRADING, DRAINAGE & CONSTRUCTION PLAN
FORT WEAVER ROAD
STA. 57+77.64 TO STA. 70+00.00

FORT WEAVER ROAD
ROUTE H-1 TO SOUTH OF FARRINGTON HIGHWAY

SCALE : 1" = 50' DATE : AUG. 1978

SHEET No. 1 OF 5 SHEETS

C024

FT. WEAVER ROAD #1

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	M-7600(1)	1978	25	198

Begin 4' Chain Link Fence
Ft. Weaver Rd. Sta. 70+40, 90' Lt.

1c ~~Standard Headwall DH11~~
~~Ft. Weaver Rd. Sta. 70+45, 86' Lt.~~
Deleted by C.C.O. 33 - 1st Supl.

Scarify & Remove Exist. Pavement, Backfill and Grade to Drain.

4' Chain Link Fence

Exist. Curb to remain

Meet Exist. Pavement

Remove Existing D.I. and Plug Exist. 30" Drain

End 4' Chain Link Fence
Ramp E Sta. 27+30, 50' Lt.

Begin Type B Pav't Structure

Irrigation Crossing
2½" Main w/Elect Conduit
Ramp E Sta. 24+00

Type G Flare
End Guardrail
Type 3, Single
Ft. Weaver Rd.
Sta. ~~78+50~~ 76+50

6 Special Manhole
Ramp E Sta. 23+20,
45' Rt., Inv. = 61.80, 24"
Inv. = ~~59.37, 60"~~ 57.20, 54"
For detail see Sheet
No. 31
C.O. 315-7

5 D.I. Type 61214
Ft. Weaver Rd.
Sta. 79+95, TC' Lt.
Inv. = ~~63.00~~ 64.80

D.I. Type 61614 6a
Ramp E
Sta. 21+90, 35' Rt.
Inv. = 60.06

Connect to Existing ~~60"~~ 54" Pipe
For Connection detail
see Sheet No. C.O. 315-6

13 Spec. Manhole
Ramp E Sta. ~~20+40, 52' Rt.~~ 19+74± 63' Rt.
Inv. = ~~47.34~~ 42.50
For details see Sheet
No. 31 C.O. 315-7

Channel Transition - For
Details see Sheet No. 57
and C.O. 315-3

Retaining Wall "A"
For Details see Sheet
No. 57

Outfall thru
Retaining Wall 13a
Ramp E Sta. 19+00, 75 Rt.
Inv. = 38.10

Type G Flare
End Guardrail
Type 3, Single
Ramp E Sta. 20+60
54"

60" Pipe

Reconstruct C.D.I.
For details see
sht. no. C.O. 315-2 & C.O. 315-3

Scarify & Remove Exist. Pavement, Backfill & Grade to Drain to Meet Edge of Prop. Shoulder.

Remove Existing Channel Lining & replace with 60" Pipe 54"

Connect to Existing
60" Pipe
54"

Exist. Conc. Ditch to be removed and Install New 54" Drain For details see Sht. No. C.O. 315-6

Meet Exist. Pavement

Special Manhole 6b
Ramp E Sta. 21+90,
45' Rt., Inv. = 54.55
For details see Sht.
No. 31 C.O. 315-7

Exist. Curb & Sidewalk to remain

Exist. 60" Drain

Remove Guard Rail

Remove Exist. C.B. & Pipes

Exist. 24" Drain

Paved Ditch Type 3

Begin Gutter
Type 61614
Ft. Weaver Rd.
Sta. 84+27,
54' Rt.

24" Pipe

Reinf. Conc. Jacket
For details see sht. no. C.O. 315-2

Exist. 48" 54" Pipe

Existing 25' x 5'-5" Box Culvert

Exist. 60" Drain

2"x4" Redwood Header Board (Typ.)

24" Pipe
Inv. @ 6b = 50.15

DRAINLINE #2
24" Pipe

Gore Area Pavement
See Typical Section,
Sheet 2045-1

Begin Type 'C' Pavement Structure

Gore Area Pavement

Begin Concrete Gutter
Type 61614
Ramp D Sta. 10+30, 8' Rt.

End Concrete Gutter
Type 61614
Ramp D Sta. 14+85, 12' Rt.

Type 1 Ditch

25' Spillway
For Details See
Sheet No. ~~49~~ 48

Begin Conc. Gutter
Type 61614
Ramp D Sta. 15+10,
8' Rt.

Begin Ditch Type I
Ramp D Sta. 15+10, 15' Rt.

Breakaway Cable Terminal
Begin Guardrail Type 3, Single
Ramp D Sta. 13+00 For detail of metal post in concrete gutter see sht. no. C.O. 315-5

Irrigation Crossing
8" Main w/Elect. Conduit
Ft. Weaver Rd. Sta. 79+00

2 D.I. Type 61616
Fort Weaver Rd.
Sta. 79+20
Inv. = 71.00

D.I. Type 61616 4
Fort Weaver Rd.
Sta. 79+95
Inv. = 70.30

Breakaway Cable Terminal
Begin Guardrail Type 3, Single
Ft. Weaver Rd. Sta. 80+50

3 D.I. Type 61616
Fort Weaver Rd.
Sta. 80+70
Inv. = 71.00

Paved Entrance
10' long, 2' bottom
2:1 Slopes, 2' Deep
Details See Sht. 31

End Ditch Type 1
Ramp D Sta. 17+85
44' Rt.

12 Standard Headwall DH-11
Fort Weaver Rd. Sta. 81+55
142' 136' Rt.
Inv. = ~~54.00~~ 49.00

Irrigation Crossing
2½" Main w/Elect. Conduit
Ramp D Sta. 18+25

DRAINLINE #4
24" RCP CL. V
30"

End Ditch Type 2
Ramp D Sta. 17+95
44' Rt.

End Conc. Gutter
Type 61614

DRAINLINE #3
30" Pipe

11 Std. Half-Headwall
Ramp D Sta. 18+95
32' Rt.
Inv. = 61.49

Begin Ditch Type 2
Ramp D Sta. 18+95, 32' Rt.

7 D.I. Type 61614
Ft. Weaver Rd.
Sta. 84+25, 54' Rt.
Inv. = 79.0

8 Outfall
Ft. Weaver Rd.
Sta. 84+25, 62' Rt.
Inv. = 78.9

9 D.I. Type D
Ramp D Sta. 20+40
25' Lt.
Inv. = 63.4

10 D.I. Type 61214
Ramp D Sta. 20+40
12' Rt.
Inv. = 62.6

R/W Line
Irrigation Crossing
2½" Main w/Elect. Conduit
Ft. Weaver Rd. Sta. 71+80
Type 1 Ditch

Irrigation Crossing
2½" Main
Ft. Weaver Rd. Sta. 70+40

Irrigation Crossing
2½" Main w/Elect. Conduit
Ft. Weaver Rd. Sta. 74+50

Irrigation Crossing
2½" Main
Ft. Weaver Rd Sta. 75+70

Irrigation Crossing
4" Main w/Elect. Conduit
Ft. Weaver Rd. Sta. 77+00

End Concrete Gutter Type 61614
Ramp D Sta. 11+00, 8' Rt.

25' Spillway
For Details See
Sheet No. 48

P-6 ELEV. 103.54
P-9 ELEV. 78.05
P-12 ELEV. 73.47

E 489,250
E 489,000
E 488,750
N 78,800
N 78,500
N 78,250
N 78,000
N 77,750
N 77,500

SEE SHEET NO. 24
SEE SHEET NO. 26
MATCH LINE
MATCH LINE

EXISTING KUNIA ROAD
NORTHBOUND
SOUTHBOUND
FORT WEAVER ROAD
RAMP D
WAIPAHU STREET
LEOLUA STREET
SIGN P-8 ELEV. 94.55
C-4 ELEV. 74.24

12-9-80	Extended End of Guardrail along Ramp E. Added Gore Area Pavements at Ramps D and E.
3-6-80	Added Guardrail along Ramp E Rt. south of Leolua Street.
1-12-79	Revised Drainage Struct. 13A description and invert of Drainage Struct. 11 as per Addendum No. 1.
Date	Revision

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

ANTHONY R. D'ALESSIO
REGISTERED PROFESSIONAL ENGINEER
No. 2934
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

GRADING, DRAINAGE & CONTRUCTION PLAN
FORT WEAVER ROAD
STA. 70+00.00 TO STA. 85+00.00
FORT WEAVER ROAD
ROUTE H-1 TO SOUTH OF
FARRINGTON HIGHWAY

SCALE : 1" = 50' DATE : AUG. 1978

SHEET No. 2 OF 5 SHEETS

CO 25R

Date	REVISION	DATE	REVISION
3/6/80	Added Guardrail along Ramps E/E-1 Right. Relocated Type G Guardrail Flare at Farr. Hwy. Sta. 48+50	9/7/79	Deleted Bikeway. Added Reference Note for New Bikeway Construction.
		5/7/79	Provided earth berm protection at Pole HE-105X

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	M-7600(1)	1978	26	198

MATCH LINE-SHEET NO.27

SEE SHEET NO. 25

MATCH LINE-SEE SHEET NO. 28

R/W Line

Irrigation Crossing
10" Main w/Elect. Conduit
Farrington Highway
Sta. 42+85

D.I. Type G1G16
Farrington Highway
Inbound Sta. 37+75
36' 28" Lt.
Inv. = 71.51 72.01

End Type C
Pavement Structure

D.I. Type G1G14
Sta. 40+70, ℄
Inv. = 68.57 69.07

End Gutter Type G1G14
Ft. Weaver Rd. Sta. 87+93
66' Rt.

End Guardrail Type 3, Single
Ft. Weaver Rd. Sta. 90+00
Meet Bridge Parapet

DRAINLINE #5
24" Pipe
For profile and details see sht. no. C.O. 315-4

STRUCTURE NO. 1
Remove Exist. C.B. and Pipe

Type G Flare
End Guardrail
Type 3, Single
Ramp D Sta. 21+75

For Cushion Barrier & Back Up Block Details, see Sht. No. 138

Guardrail
Type 3, Single
For details of metal post in concrete gutter see R/W Line sht. no. C.O. 315-4

Irrigation Crossing
2½" Main w/Elect. Conduit
Ramp E Sta. 15+00

Guardrail
Type 3, Single
Remove Exist. Guardrail

Remove Exist. D.I. & Pipes

Type A Flare
Begin Guardrail
Type 3, Single
Ramp E Sta. 15+50

21 D.I. Type G1214
Ramp E Sta. 16+00, 12' Lt.
Inv. = 50.22

End Guardrail Type 3, Single
Ft. Weaver Rd. Sta. 89+95
Meet Bridge Parapet

22 Outfall
Ramp E Sta. 16+80, 126' Rt.
Inv. = 48.77 ~~50.5~~

DRAINLINE #6
24" Pipe
Irrigation Crossing
2½" Main w/Elect. Conduit
Farrington Highway Sta. 47+90

19a Type A Manhole
Farr. Hwy Sta. 47+05, 54' Rt
Inv. = 38.96 ~~55.5~~

Type G Flare
Begin Guardrail Type 3, Single
Farrington Hwy. Sta. 48+50

19b D.I. Type G1G14
Reconstruct Exist. D.I. to grade. Use type G1G14 Grate
Farrington Hwy. Sta. 49+00, ℄
For details see sht. Remove no. C.O. 315-5

Remove Exist. Guardrail

Remove Exist. Trees

Remove Exist. C.B. & Plug Pipe

Scarify & Remove Exist. Pavement

Remove Exist. C.B. & Pipe

Exist. 24" Drain to remain

Exist. Energy Corridor Easement

Scarify & Remove Exist. Pavement
Irrigation Crossing
2½" Main w/Elect. Conduit
Farrington Highway
Inbound Sta. 37+50

Construct Slab over Exist. 16" Gas Main, 110 L.F., See Det. "A" this Sheet

Remove Exist. 24" Drain

S.D.M.H. Type A-1
Farr. Hwy Sta. 42+65, 26' Rt.

Plug Pipe

Abandon

Remove

End Slab
Farr. Sta. 40+60, 85' ± Rt.

Begin Slab
Farr. Sta. 39+50, 85' ± Rt.

Begin Gutter Type G1218
Ramp B Sta. 18+00, 12' Rt.

BORING B-1-50
N 77,087.21
E 490,026.39
FORT WEAVER RD. ℄ STA. 90+52.60, 23.41' RIGHT

50' Transition

End Gutter Type G1G14
Ramp B Sta. 17+50
18' Rt.

Irrigation Crossing
4" Main w/Elect. Conduit
Ramp B Sta. 18+00

Begin Type C
Pavement Structure

Type G Flare
End Guardrail Type 3, Single
Ramp B Sta. 13+50

End Type C
Pavement Structure

Begin Gutter Type G1G14
Fort. Weaver Rd.
Sta. 10+46, 12' Rt.

Begin Guardrail
Type 3, Single
Ramp B Sta. 10+45
Meet Bridge Parapet

For detail of metal post in concrete gutter see sht. no. C.O. 315-5

Conc. Gd. Rail & Cushion Barrier. For Details see Structure Plan S-13

Approach Slab-See Struct. Details Sht. 58

End Conc. Gd. Rail

Sta. 92+49
Begin Conc. Gd. Rail

FORT WEAVER RD.

SOUTHBOUND Sta. 86+26 Begin Conc. Gd. Rail

End Conc. Gd. Rail

Approach Slab-See Structure Details Sht. 58

NORTHBOUND

Pole HE-105X

Sprinkler Heads
End Gutter Type G1218
Farrington Hwy.
Sta. 44+70

Begin Curb and Gutter Type 2DG at Sta. 25+28.20

17 D.I. Type G1214 ~~G1216~~
Farrington Hwy.
Sta. 44+65, 60' Rt.
Inv. = 52.50

19 C.B. Type D
Ramp A Sta. 25+10
8' Rt.
Inv. 39.96

18 D.I. Type G1G14
Farrington Hwy.
Sta. 46+85, 54' Rt.
Inv. = 44.25

20 Type A-1 Manhole
Farrington Hwy. Sta. 49+00, 52' Rt.
Inv. = ~~34.04~~ 32.9 ±
(Construct over exist. 24" Drain

16 D.I. Type G1G14
Farrington Hwy.
Sta. 44+65, 8' Lt.
Inv. 56.00

NOTE:
See Sheet C.O. 28 S-1 for Bikeway Construction

Cut & Plug exist. sprinkler system as required at R/W Line. Maintain Service to all sprinkler heads outside of R/W Line

Begin Guardrail Type 3, Single
Ft. Weaver Rd. Sta. 90+70
Meet Bridge Parapet

End Guardrail Type 3, Single
Ft. Weaver Rd. Sta. 93+50
Future Continuation (By Others)

End Type A Pavement Structure

Irrigation Crossing
2" Elect. Conduit
Ramp B Sta. 13+10
Provide Anchor Block for Future Installation of Type A Flare

STOCKPILE AREA

END PROJECT NO. M-7600 (1) FORT WEAVER RD. STA. 94+50.00

E 490,250

E 490,500

N 78,000

Type G Flare
End Guardrail
Type 3, Single
Ramp B Sta. 14+75

Type A Flare
Begin Guardrail
Type 3, Single
Ramp B Sta. 12+35

RAMP A (Future)
RAMP B
RAMP C (Future)
RAMP C1 (Future)
RAMP D
RAMP E
RAMP E-1

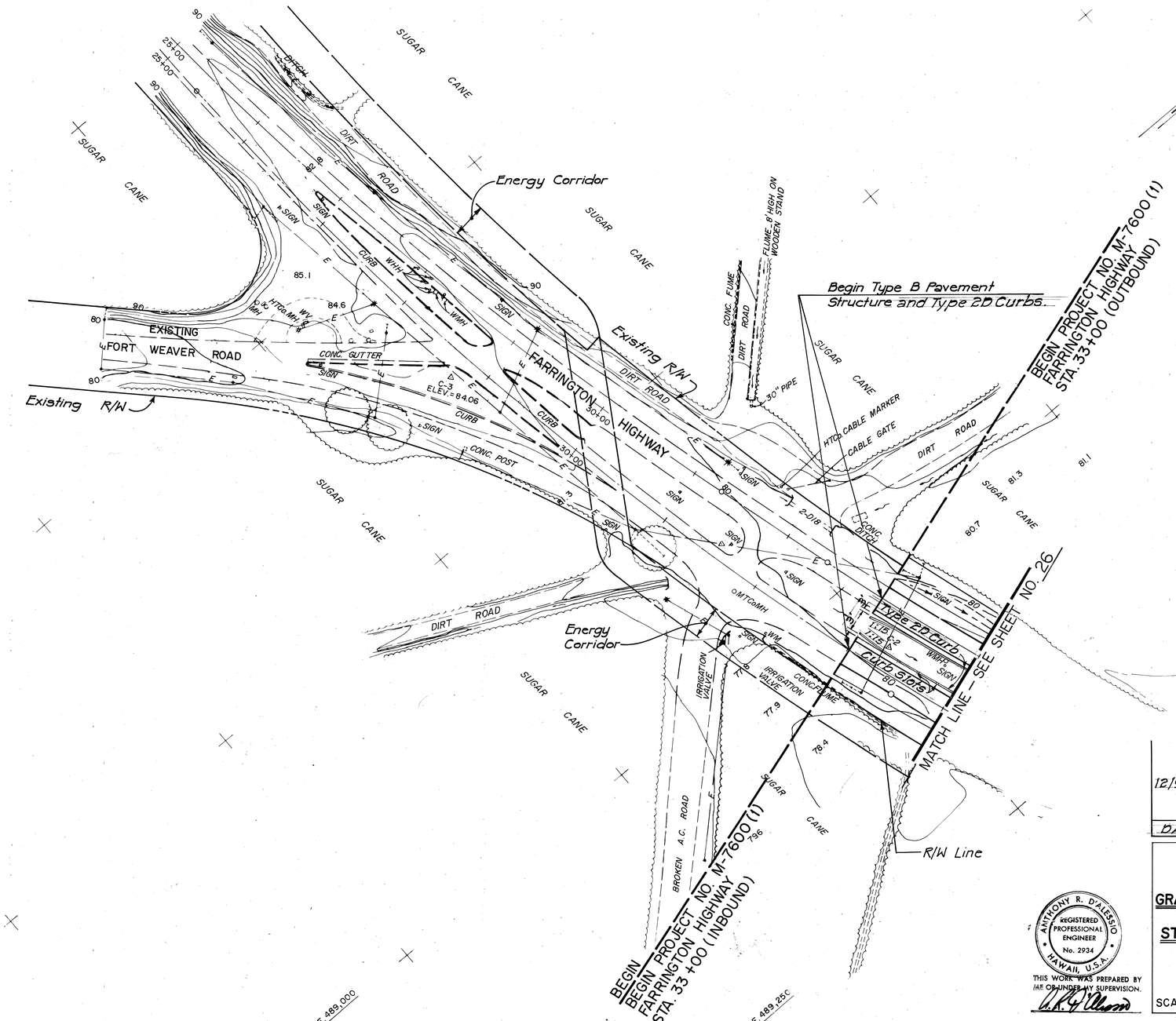
Sta. 25+28.20 Begin Curb and Gutter Type 2DG

Shale to Drain

Sta. 25+28.20 End Curb and Gutter Type 2DG

Sta. 25+28.20 Begin Curb and Gutter Type 2DG

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	M-7600(1)	1978	27	198



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

DATE	REVISION
12/0/80	Added Type 2D Curbs to Farr. Hwy. Median from Sta. 33+00 to Sta. 34+00.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

GRADING, DRAINAGE & CONSTRUCTION PLAN

FARRINGTON HIGHWAY
STA. 33+00.00 TO STA. 34+00.00

FORT WEAVER ROAD
ROUTE H-1 TO SOUTH OF
FARRINGTON HIGHWAY

SCALE: 1" = 50' DATE: AUG, 1978

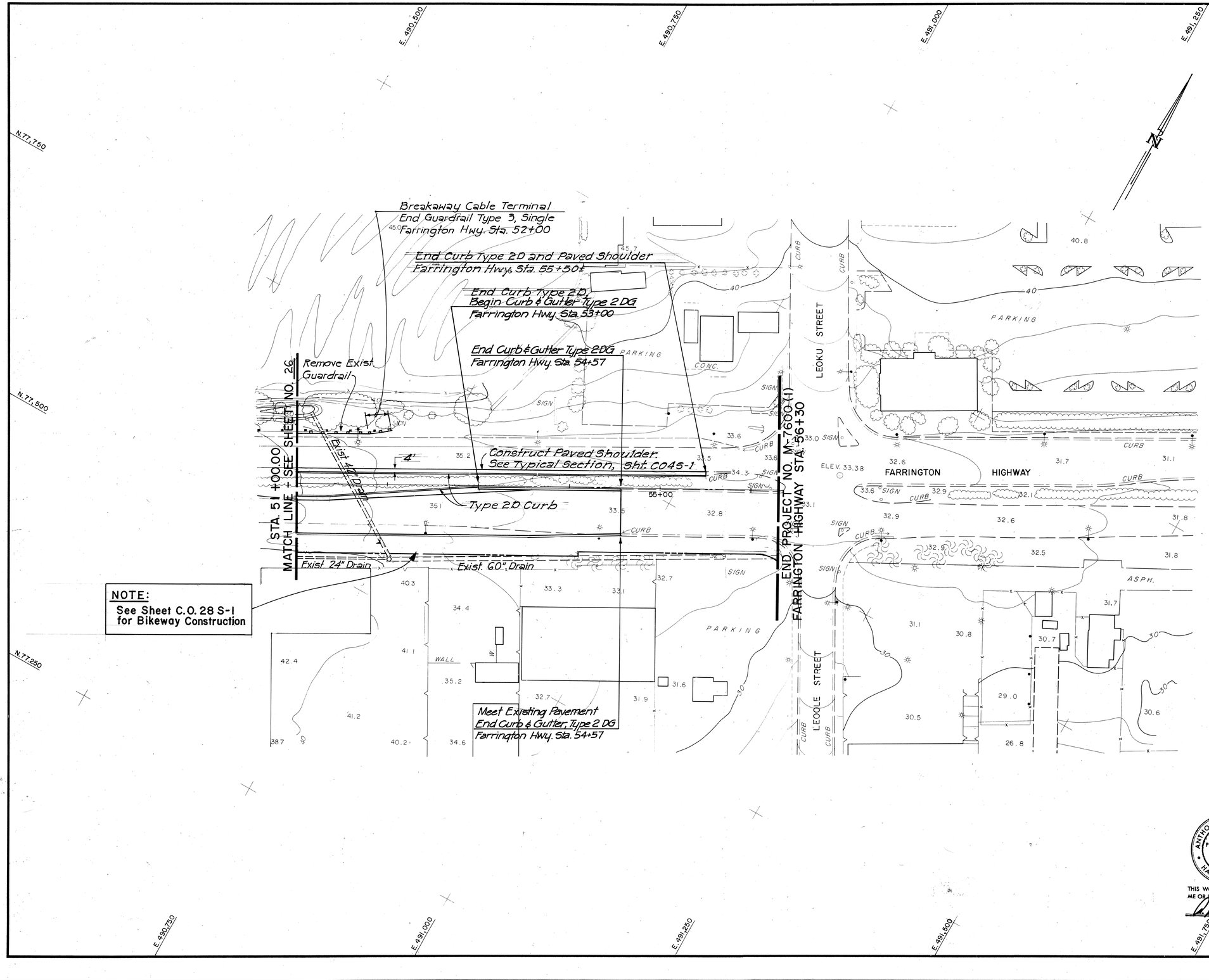
ANTHONY R. D'ALESSIO
REGISTERED PROFESSIONAL ENGINEER
No. 2934
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

SHEET No. 4 OF 5 SHEETS

C027

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	M-7600(1)	1978	28	198



DATE	REVISION
12/10/80	Added Type 2D Curbs to Farr. Hwy. Median. Added Paved Median Shoulder to Farr. Hwy. Outbound Lanes.
9/7/79	Deleted Bikeway. Added Reference Note for New Bikeway Construction.

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

GRADING, DRAINAGE & CONSTRUCTION PLAN
FARRINGTON HIGHWAY
STA. 51+00.00 TO STA. 56+30.00

FORT WEAVER ROAD
ROUTE H-1 TO SOUTH OF
FARRINGTON HIGHWAY

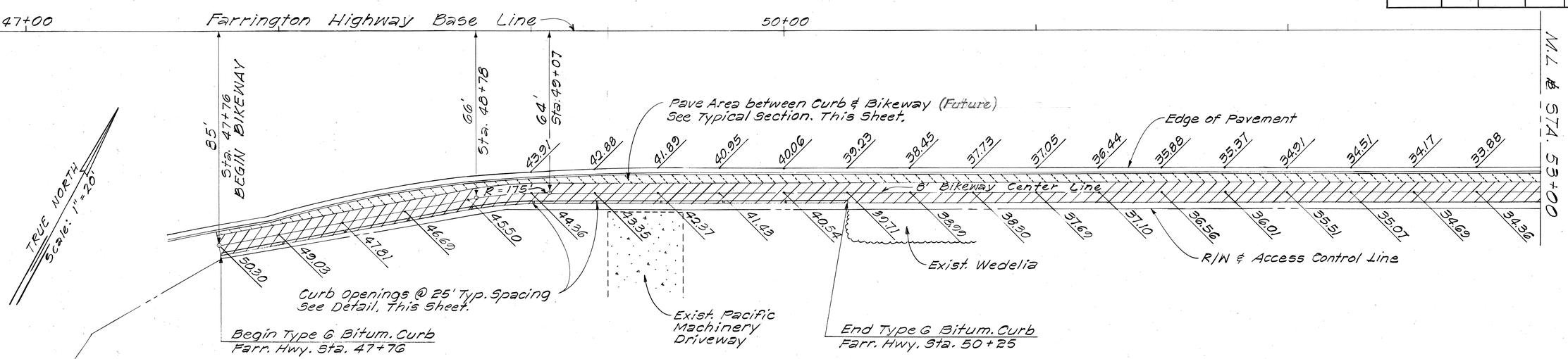
SCALE: 1" = 50' DATE: AUG. 1978

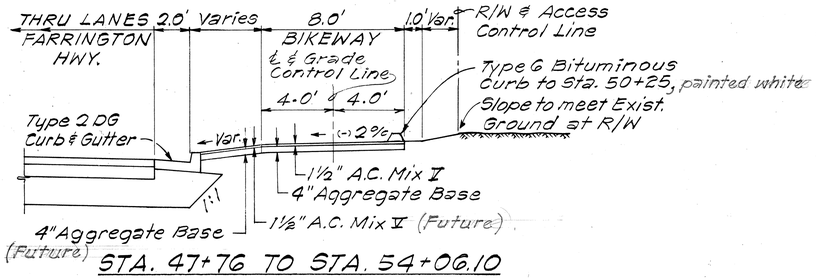
SHEET No. 5 OF 5 SHEETS

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

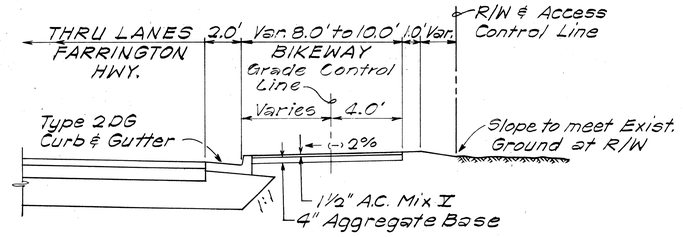
C028

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	M-7600(1)	1978	CO 28 S-1	108





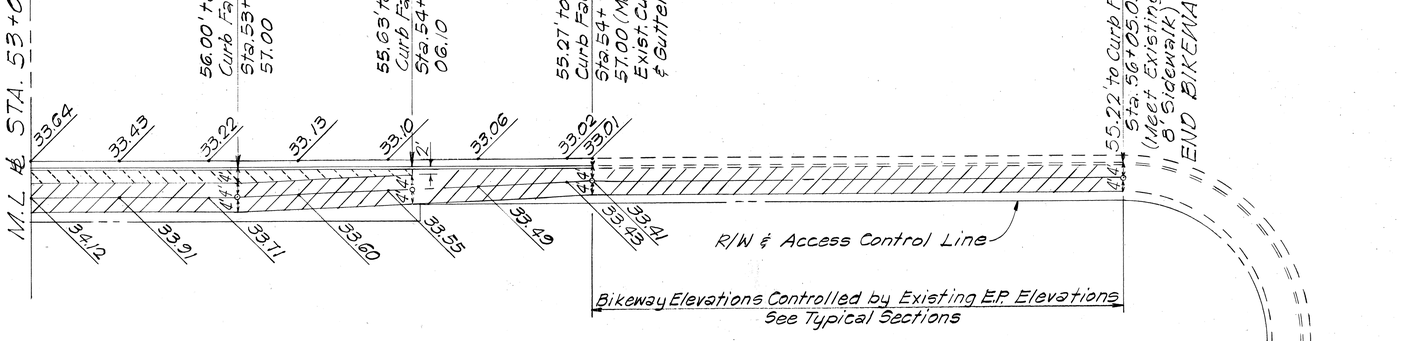
STA. 47+76 TO STA. 54+06.10

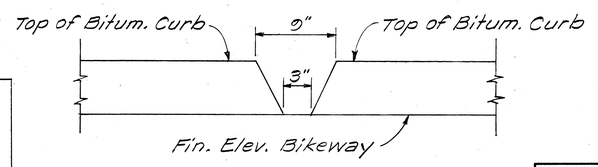


STA. 54+06.10 TO STA. 56+05.05

TYPICAL SECTIONS
BIKEWAY ALONG FARRINGTON HWY.

Scale: ¼"=1'-0"





DETAIL OF CURB OPENING

Scale: 1½"=1'-0"

NOTE: Elevations, Unless Otherwise Indicated, are Referenced to 25-Foot Station Points along Farrington Highway Base Line.

DATE	REVISION
12/9/80	Added Bituminous Curb along Edge of Bikeway. ~~Added~~ Paving between Farr. Hwy. Curb and Bikeway, (Future)

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
HIGHWAYS DIVISION

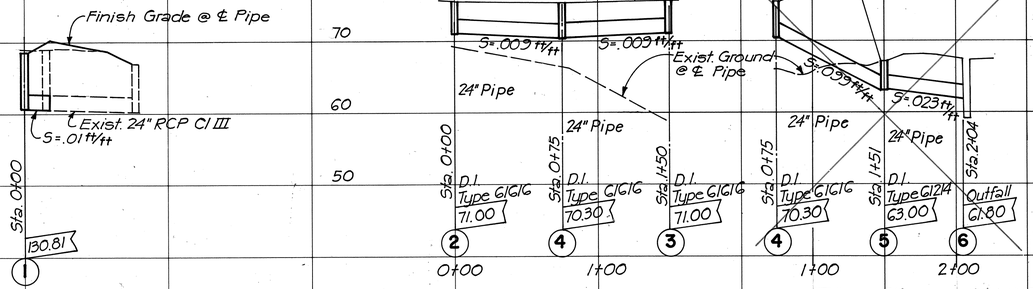
BIKEWAY PLAN
FORT WEAVER ROAD ROUTE H-1 TO SOUTH OF FARRINGTON HIGHWAY

Scale: As Shown Date: Oct., 1979

SHEET No. OF SHEETS

CO 28 S-1

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	M-7600(1)	1978	29	198



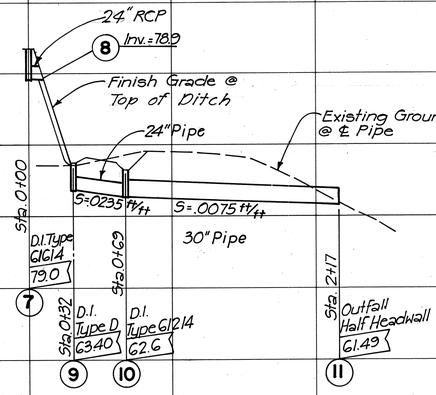
DRAINLINE #1

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

For profile see sht. no. C.O.315-7

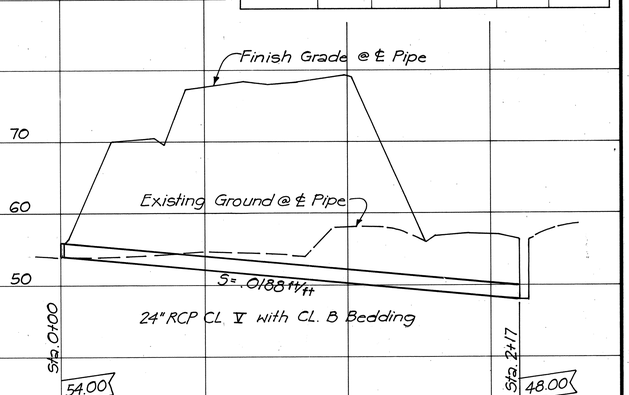
DRAINLINE #2

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



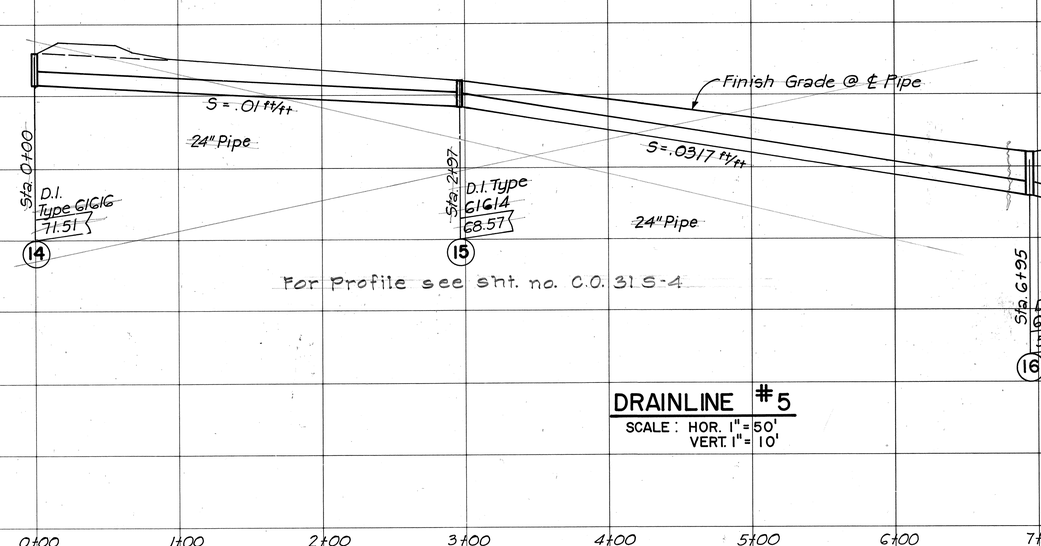
DRAINLINE #3

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



DRAINLINE #4

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



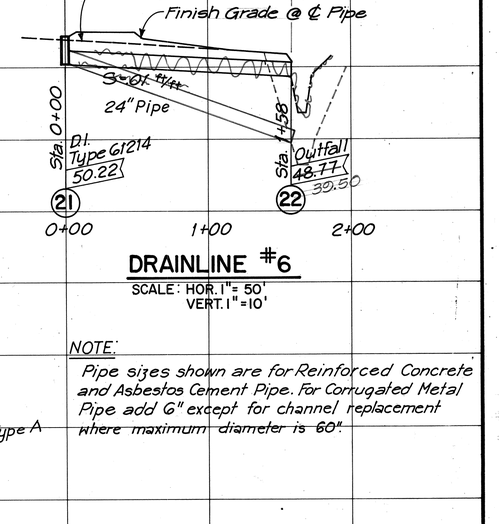
For Profile see sht. no. C.O.315-4

DRAINLINE #5

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

Ramp E Sta. 16+00
0% 5' Lt.

Ramp E Sta. 16+80
0% 12.6' Rt.



DRAINLINE #6

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

NOTE:
Pipe sizes shown are for Reinforced Concrete and Asbestos Cement Pipe. For Corrugated Metal Pipe add 6" except for channel replacement where maximum diameter is 60".

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

Date	Revision
1-12-79	Revised Notes on Drainline #3 as per Addendum No. 1.

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REGISTERED PROFESSIONAL ENGINEER
No. 2934
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINLINE PROFILES

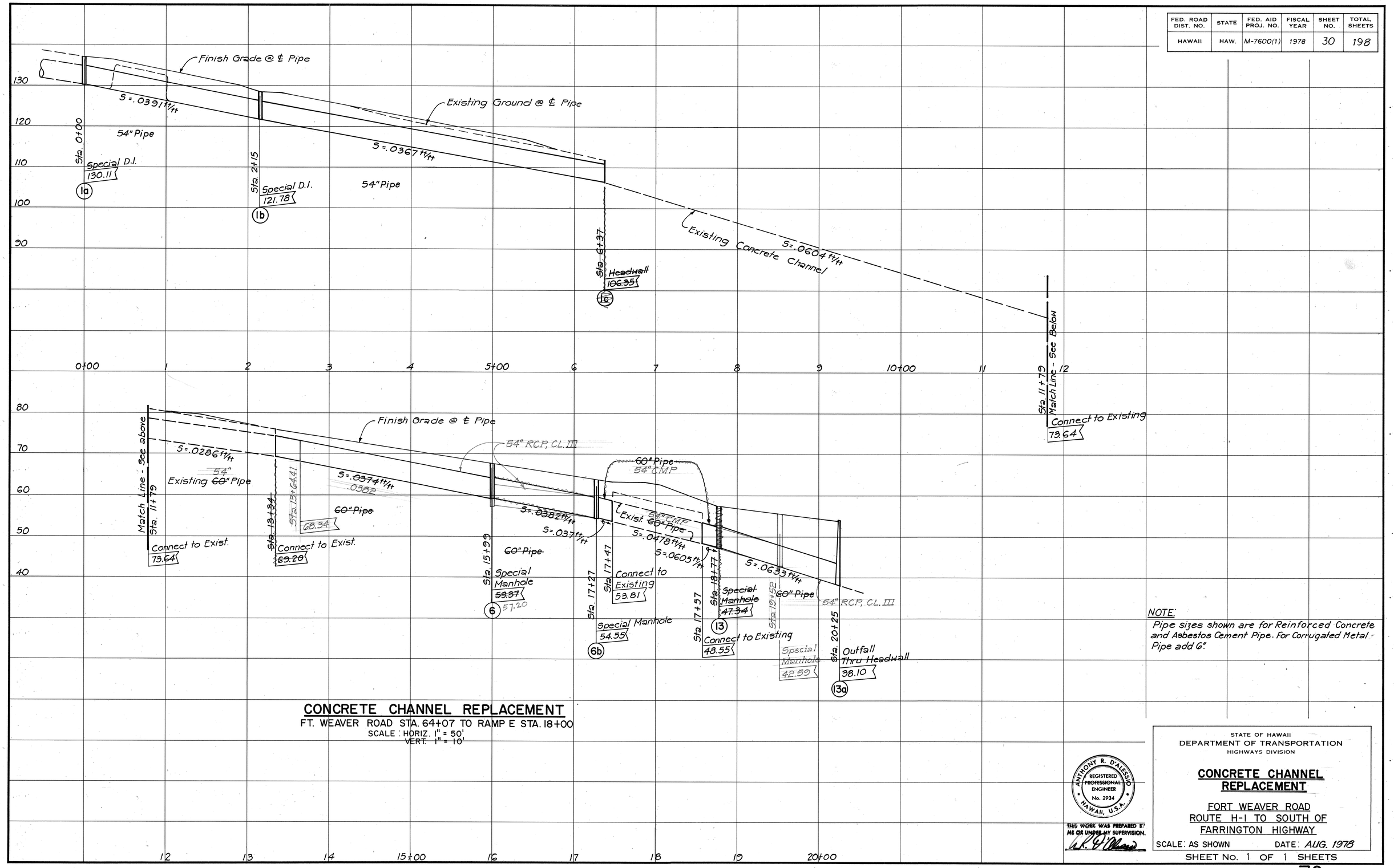
FORT WEAVER ROAD
ROUTE H-1 TO SOUTH OF-
FARRINGTON HIGHWAY

SCALE : AS SHOWN DATE : AUG. 1978

SHEET No. 1 OF 1 SHEETS

29R

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	M-7600(1)	1978	30	198



CONCRETE CHANNEL REPLACEMENT

FT. WEAVER ROAD STA. 64+07 TO RAMP E STA. 18+00

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

NOTE:
Pipe sizes shown are for Reinforced Concrete and Asbestos Cement Pipe. For Corrugated Metal Pipe add 6".

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

ANTHONY R. D'ALESSIO
REGISTERED PROFESSIONAL ENGINEER
No. 2934
HAWAII, U.S.A.

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

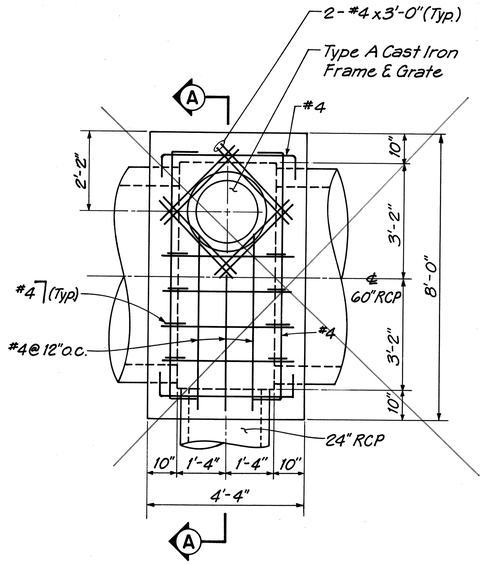
CONCRETE CHANNEL REPLACEMENT

FORT WEAVER ROAD
ROUTE H-1 TO SOUTH OF
FARRINGTON HIGHWAY

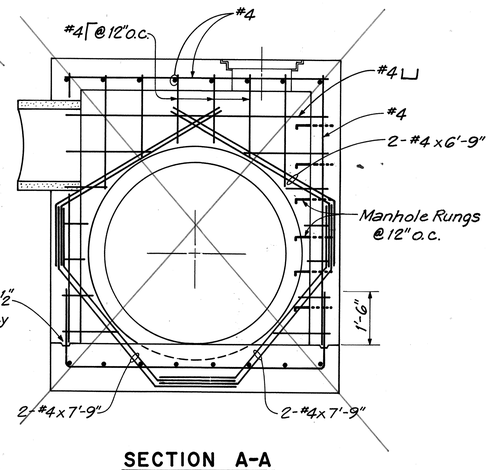
SCALE: AS SHOWN DATE: AUG. 1978

SHEET No. 1 OF 1 SHEETS

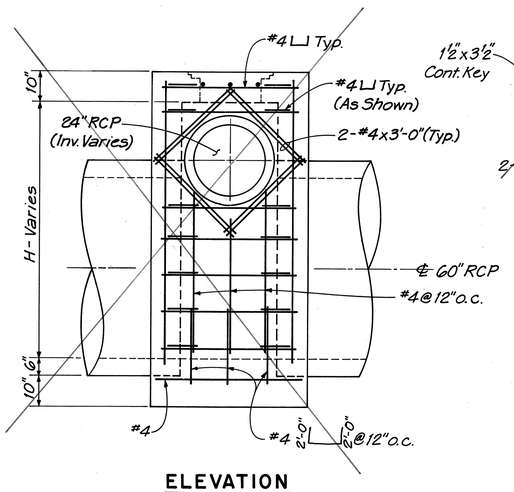
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	M-7600(1)	1978	31	198



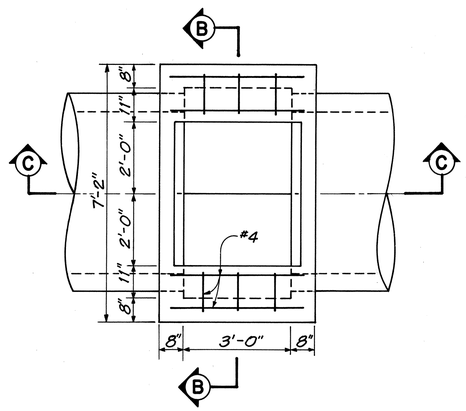
PLAN



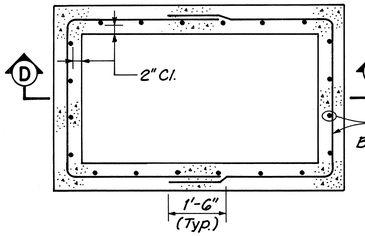
SECTION A-A



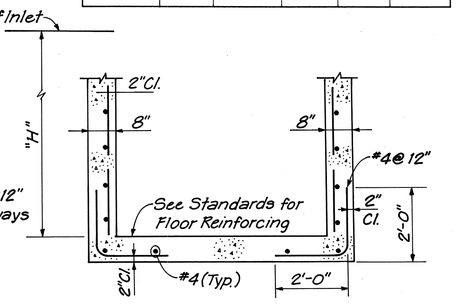
ELEVATION



PLAN



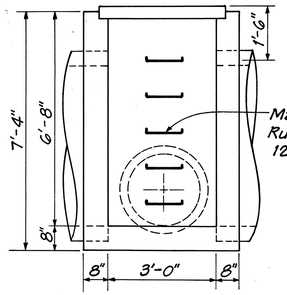
PLAN SECTION



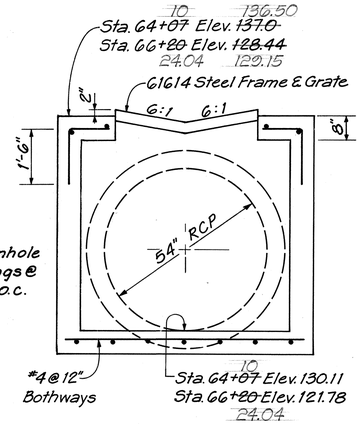
SECTION D-D

TYPICAL WALL REINFORCING FOR CATCH BASINS AND DROP INTAKES WHEN "H" EXCEEDS 6'-0"

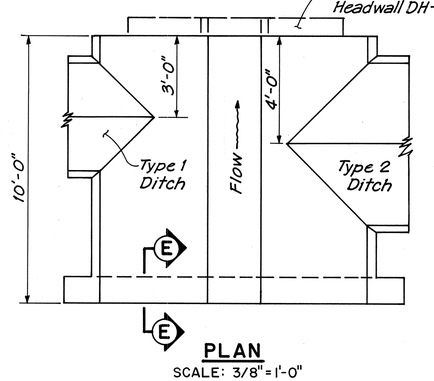
SCALE: 1/2"=1'-0"



SECTION C-C



SECTION B-B



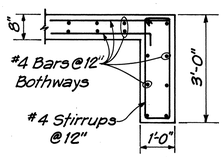
PLAN

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

SPECIAL GRATED DROP INTAKE

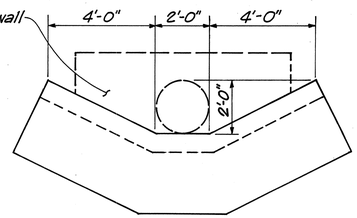
FT. WEAVER ROAD STA. 64+~~07~~10, ~~72~~ LT. 71.25'
STA. 66+~~20~~24.04, 72' LT.

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



SECTION E-E

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



ELEVATION

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

PAVED CULVERT ENTRANCE

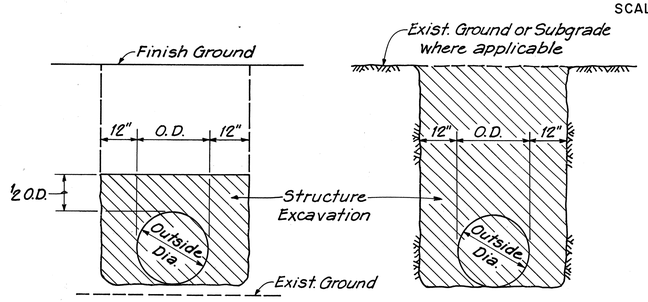
FT. WEAVER ROAD STA. 81+55

~~SPECIAL MANHOLES~~

~~RAMP E STA. 20+40, 52' RT.~~
~~STA. 21+90, 45' RT.~~
~~STA. 23+20, 45' RT.~~

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

For details of special manholes see sht no. C.O.315-7



FILL SECTION CUT SECTION

TRENCH EXCAVATION PAY LIMIT

N.T.S.

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

ANTHONY R. D'ALESSIO REGISTERED PROFESSIONAL ENGINEER No. 2934 HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

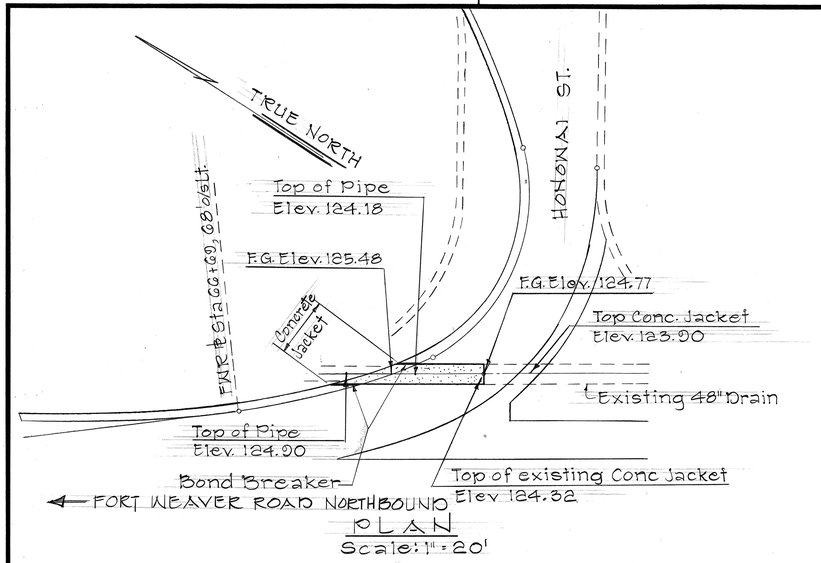
DRAINAGE DETAILS

FORT WEAVER ROAD
ROUTE H-1 TO SOUTH OF
FARRINGTON HIGHWAY

SCALE: AS SHOWN DATE: AUG. 1978

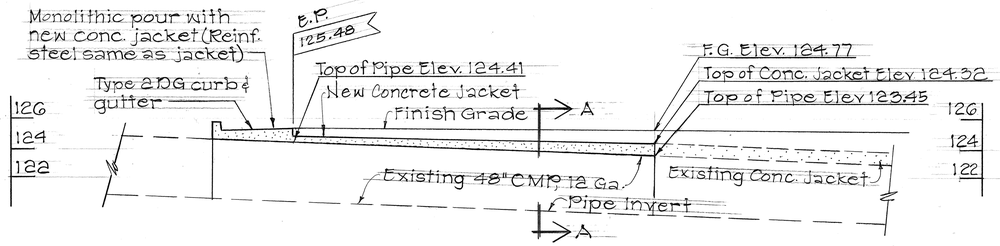
SHEET No. 1 OF 1 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	M-7600(1)	1982	C0315-1	



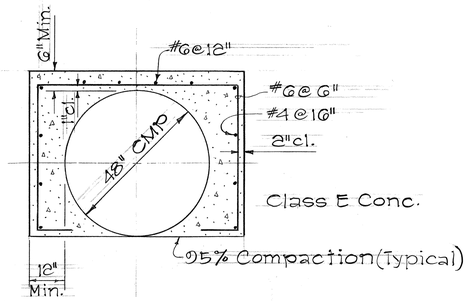
PLAN

Scale: 1" = 20'



PROFILE OF 48" CMP AT HONOWAI STREET

Scale: 1" = 5'



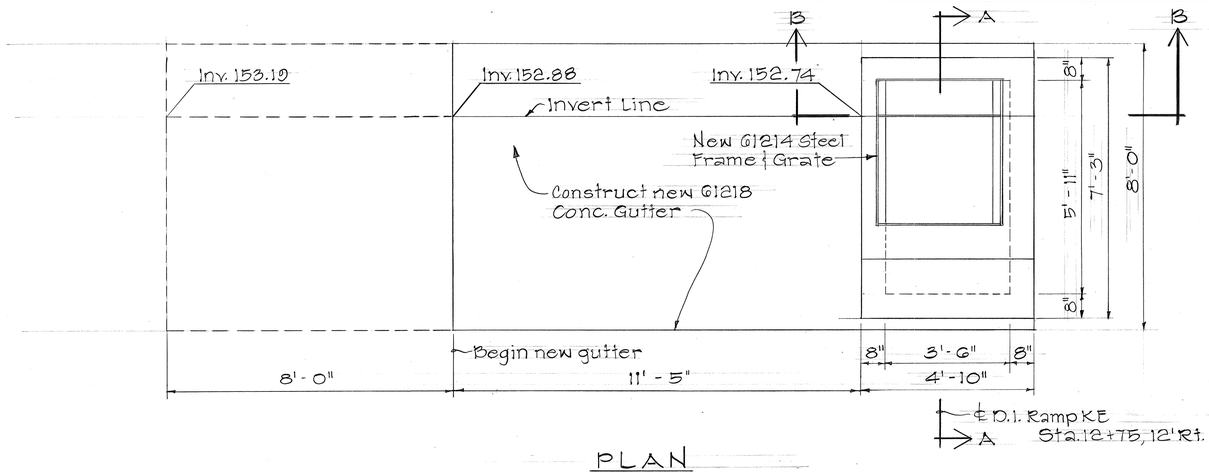
SECTION "A-A"

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

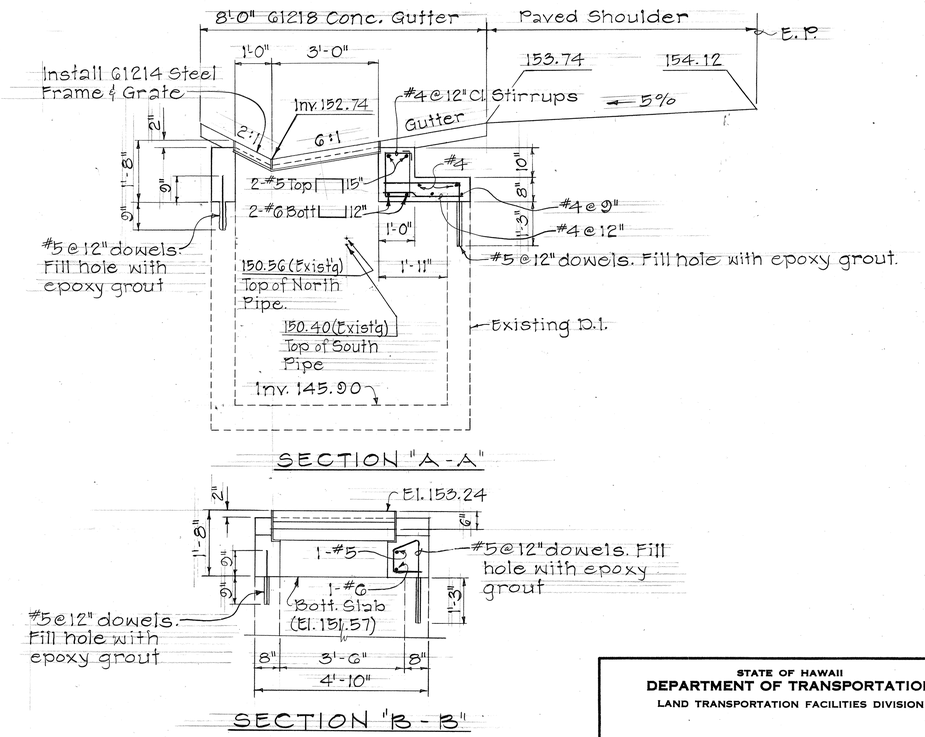
NOTES:

1. Payment for Class E Concrete shall be made under Contract Item No. 503.0020
2. Portion of curb & gutter poured monolithic with concrete jacket shall be paid under Contract Item No. 503.0020.

CONCRETE JACKET AT HONOWAI STREET



PLAN



SECTION "A-A"

SECTION "B-B"

RECONSTRUCTED DROP INTAKE AT RAMP KE STA. 12+75, 12' RT.

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION

DRAINAGE DETAILS

FORT WEAVER ROAD
ROUTE H-1 TO SOUTH OF FARRINGTON HIGHWAY

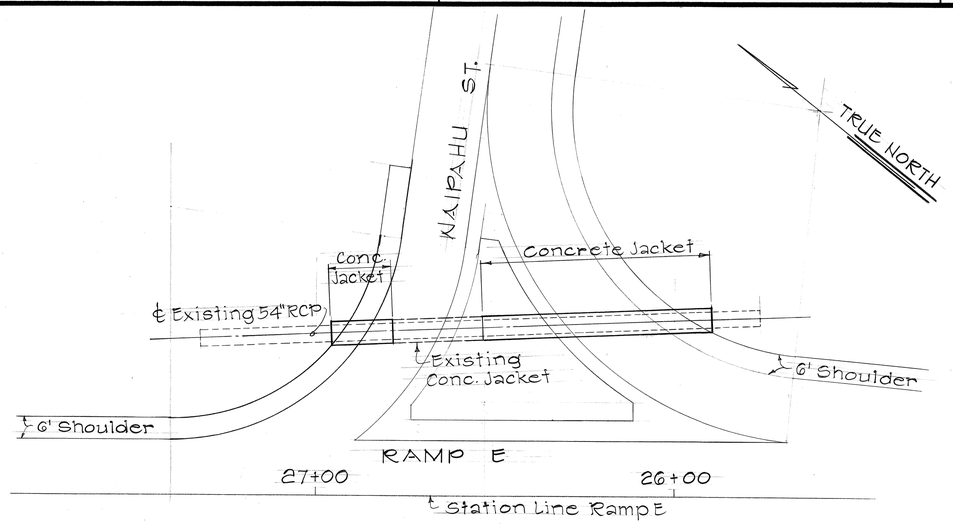
SCALE: AS SHOWN DATE: OCT. 1981

SHEET No. OF SHEETS

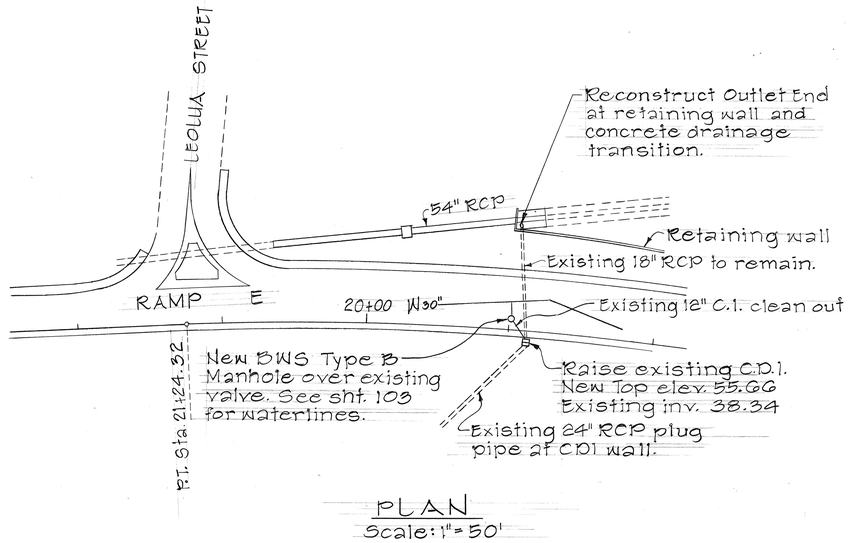
C.O. 31 S-1

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

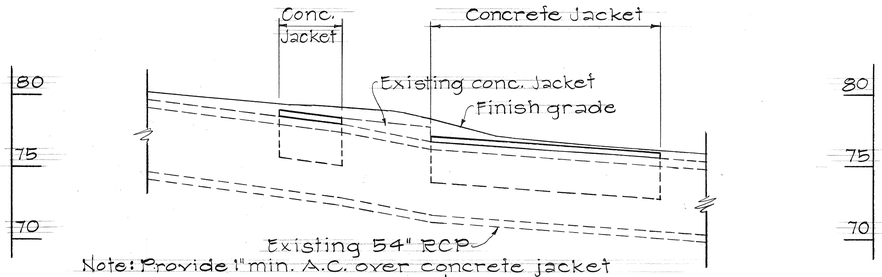
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	M-7600 (1)	1982	C0315-2	



PLAN
Scale: 1" = 20'

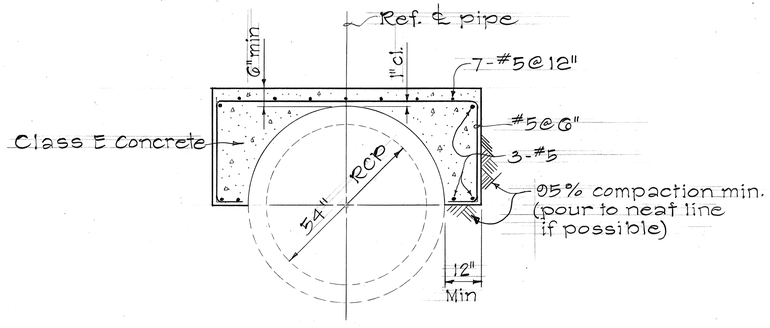


PLAN
Scale: 1" = 50'



Note: Provide 1" min. A.C. over concrete jacket

PROFILE ALONG ℄ 54" RCP
Scale: Hor. 1" = 20'
Vert. 1" = 5'



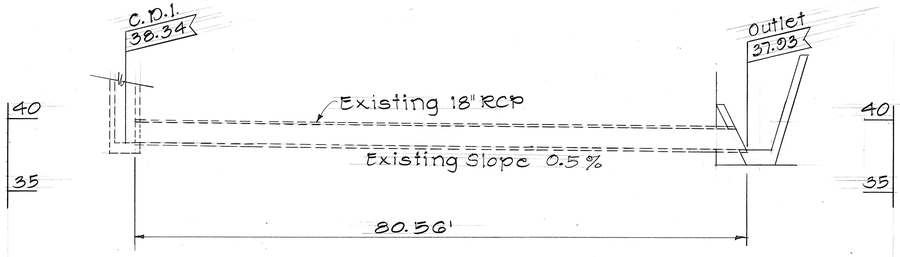
DETAIL OF CONCRETE JACKET
Scale: 1/2" = 1'-0"

CONCRETE JACKET AT WAIPAHU STREET

NOTES:

1. Delete Note in Contract Plan Sht. 25 "Remove existing CB and pipes."
2. Plug existing 24" RCP in CDI wall with Class A Concrete.
3. Remove and dispose existing CDI frame and grate. Use new ©1614 frame and grate.
4. Expose existing reinforcing 1'-6" from top of existing CDI and add new reinforcing as shown in C.D.I. detail sht. no. CO 31 S-3.
5. Raise existing CDI as shown in C.D.I. detail sht. no. CO 31 S-3.
6. Delete Note in Contract Plan Sht. 57 "Existing 18" CMP to be cut and plugged at both ends prior to wall construction."
7. Existing 18" RCP will remain, cut outlet end as required and modify outlet at retaining wall and concrete drainage transition as shown in 18" Pipe Outlet detail sht. no. CO 31 S-3.
8. Construct new Type B Manhole over existing control valve. Use BWS Water System Standards Fig. C, 7 & 8.
9. Refer to Notes in Contract Plan Sheets 100 and 101.

WATER VALVE CLEANOUT PIPE REVISION



℄ PROFILE OF EXISTING 18" RCP
Scale: Hor. 1" = 10'
Vert. 1" = 5'

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION

DRAINAGE DETAILS

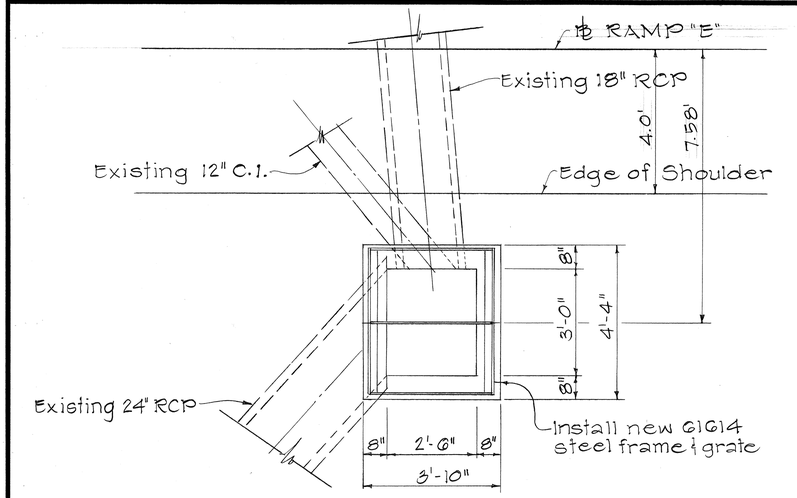
FORT WEAVER ROAD
ROUTE H-1 TO SOUTH OF FARRINGTON HIGHWAY

SCALE: AS SHOWN DATE: OCT. 1981

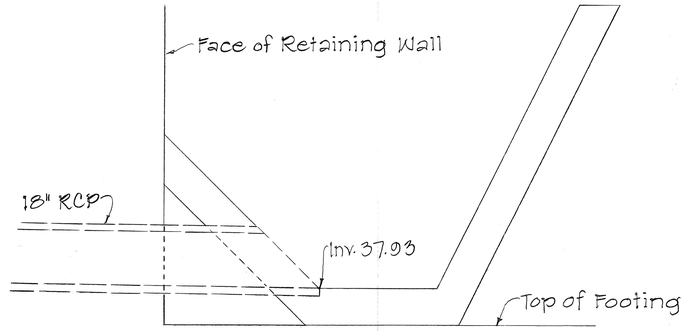
SHEET No. OF SHEETS

C.O. 31 S-2

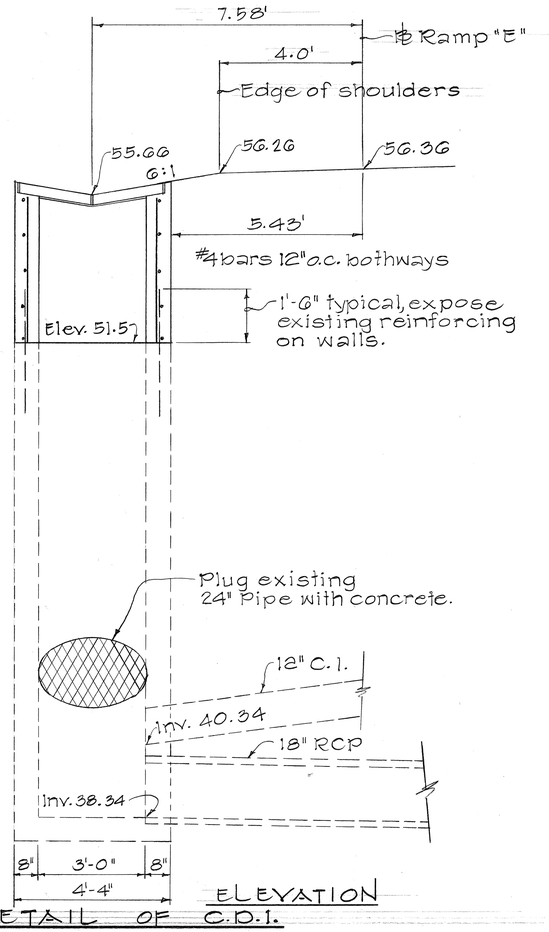
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	M-7600(1)	1982	C0315-3	



PLAN

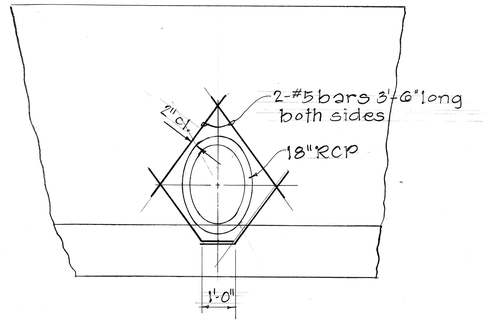


SECTION AT PIPE OUTLET



ELEVATION

DETAIL OF C.D.I.



REINFORCING AROUND PIPE

18" PIPE THRU CHANNEL LINING

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

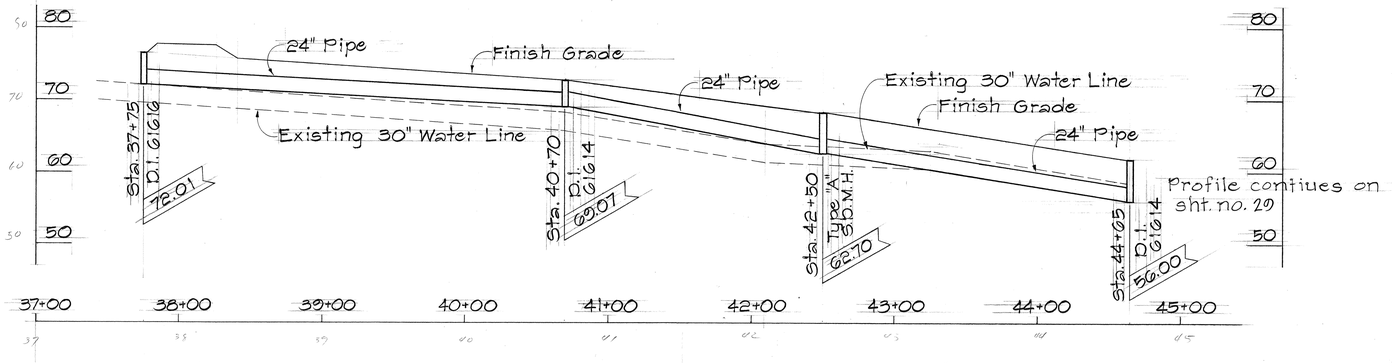
FORT WEAVER ROAD
ROUTE H-1 TO SOUTH OF
FARRINGTON HIGHWAY

SCALE: 1/2" = 1'-0" DATE: OCT. 1981

SHEET No. OF SHEETS

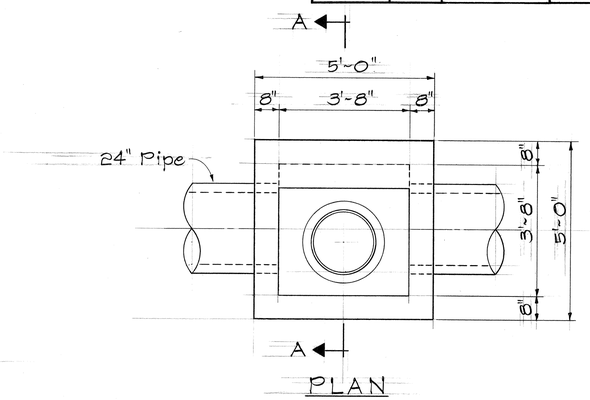
C.0.31 S-3

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	M-7600 (1)	1982	C0313-4	

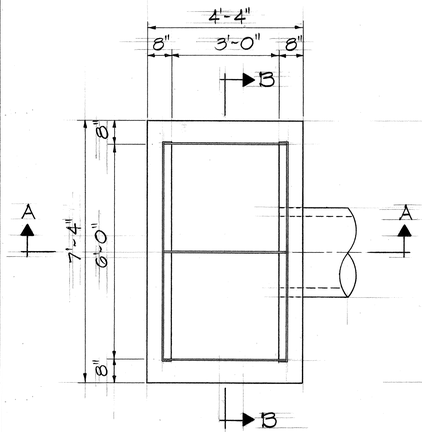


PROFILE - DRAINLINE #5

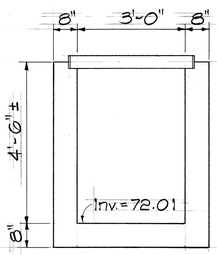
Scale: Horiz. 1" = 50'
Vert. 1" = 10'



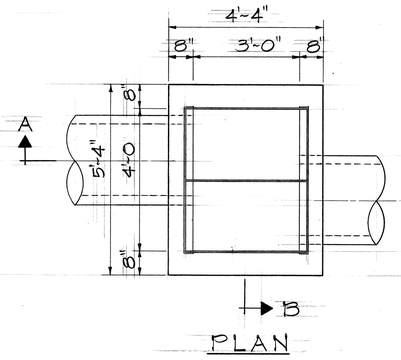
PLAN



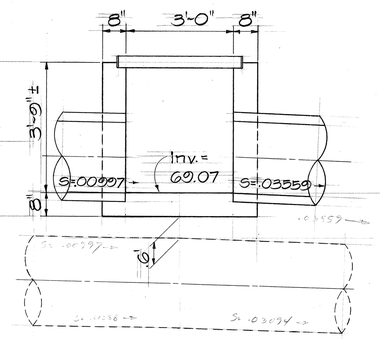
PLAN



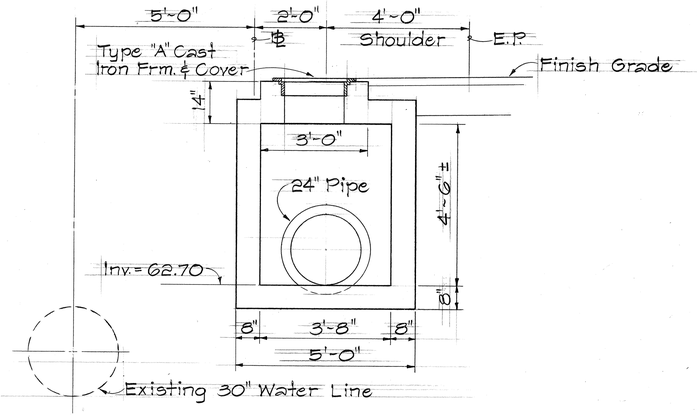
SECTION "A-A"



PLAN

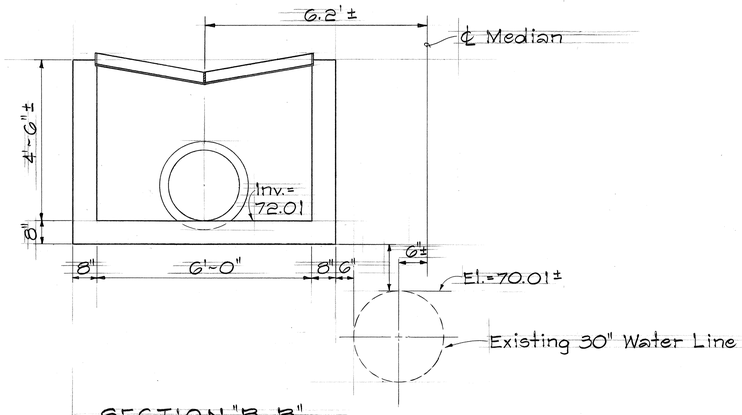


SECTION "A-A"



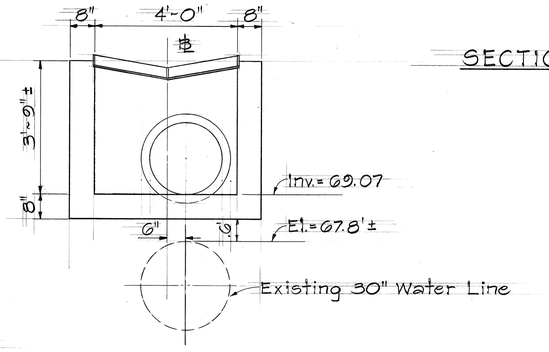
SECTION "A-A"

TYPE "A-1" S.D.M.H. AT
FARRINGTON HWY. STA. 42+50
Scale: ½" = 1'-0"



SECTION "B-B"

61616 DROP INTAKE AT
FARRINGTON HWY. STA. 37+75
Scale: ½" = 1'-0"



SECTION "B-B"

61614 DROP INTAKE AT
FARRINGTON HWY. STA. 40+70
Scale: ½" = 1'-0"

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
HIGHWAYS DIVISION

DRAINAGE DETAILS

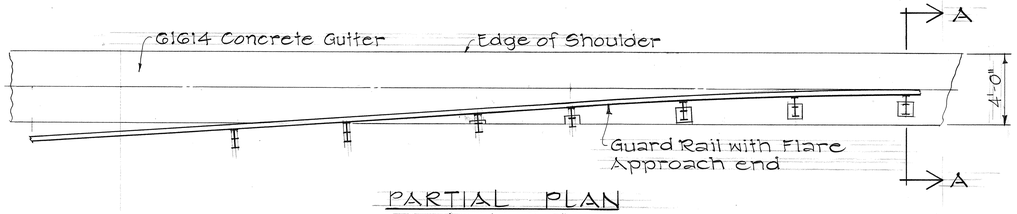
FORT WEAVER ROAD
ROUTE H-1 TO SOUTH OF
FARRINGTON HIGHWAY

SCALE: AS SHOWN DATE: OCT. 1981

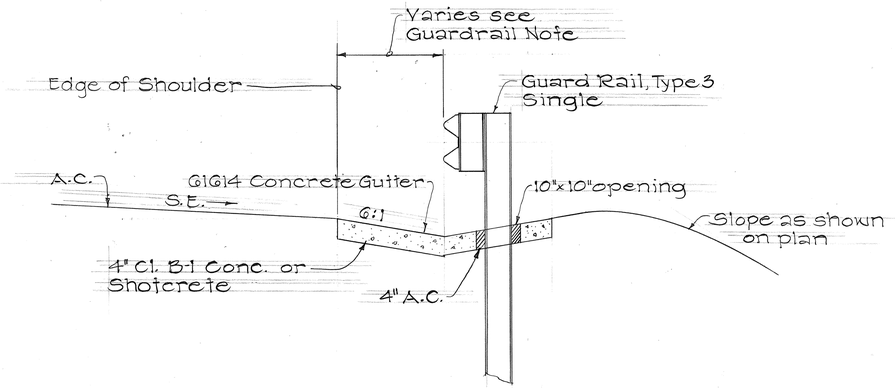
SHEET No. OF SHEETS

C.O.31 S-4

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	M-7600(1)	1982	C0316-5	



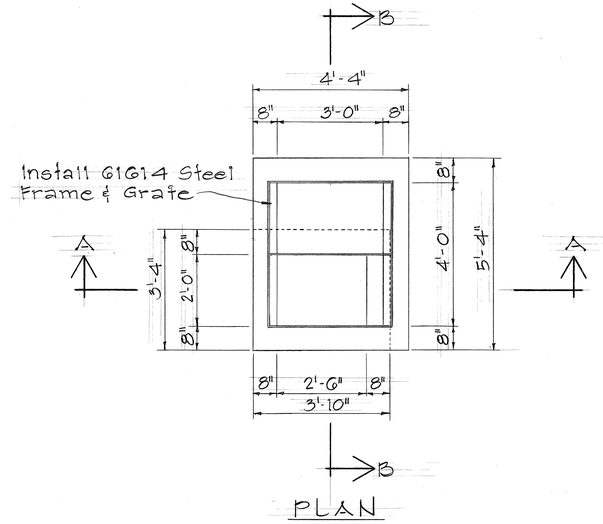
PARTIAL PLAN
Scale: 1/4" = 1'-0"



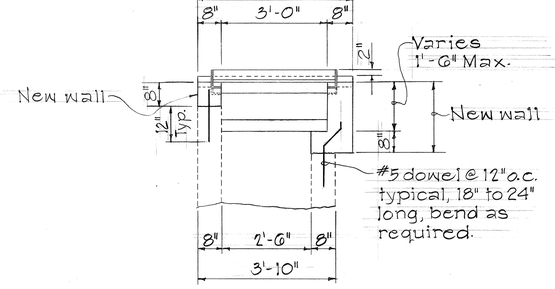
SECTION "A-A"
Scale: 3/4" = 1'-0"

GUARD RAIL POST IN CONCRETE GUTTER

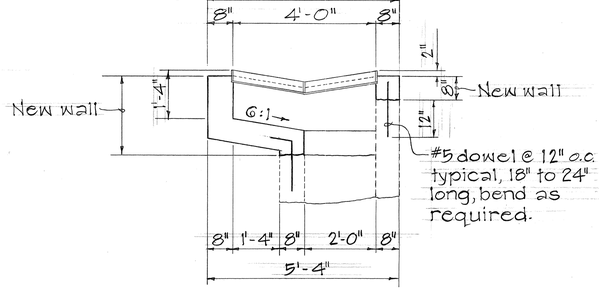
NOTE: 10"x10" opening occurs at the following locations:
1) Ramp D Sta. 13+00 to 20+40 Rt.
2) Ramp B Sta. 10+45 to 14+50 Rt.
3) Fort Weaver Road Sta 84+27 to 87+30 Rt.



PLAN



SECTION "A-A"



SECTION "B-B"

DRAINAGE STRUCTURE 10B FARRINGTON HWY. STA. 40+00 ℄

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

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION

DRAINAGE DETAILS

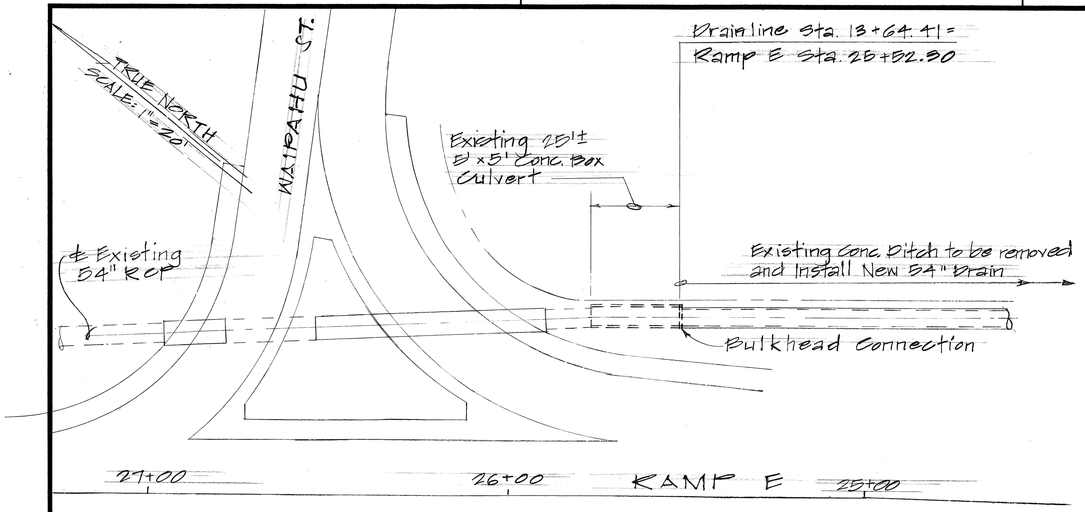
FORT WEAVER ROAD
ROUTE H-1 TO SOUTH OF
FARRINGTON HIGHWAY

SCALE: AS SHOWN DATE: OCT. 1981

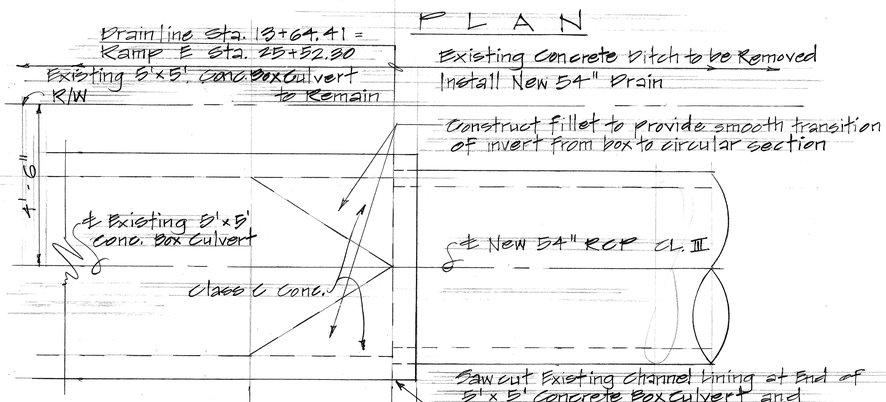
SHEET No. OF SHEETS

C.O. 31 S-5

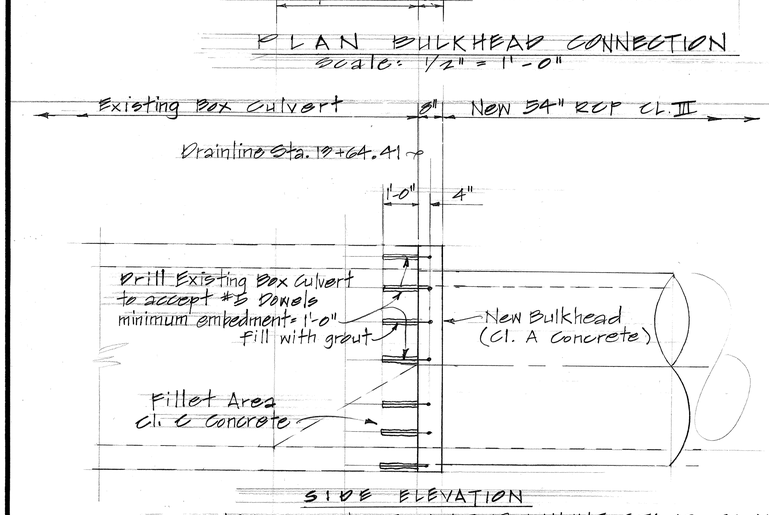
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	M-7600(1)	1982	C0315b	



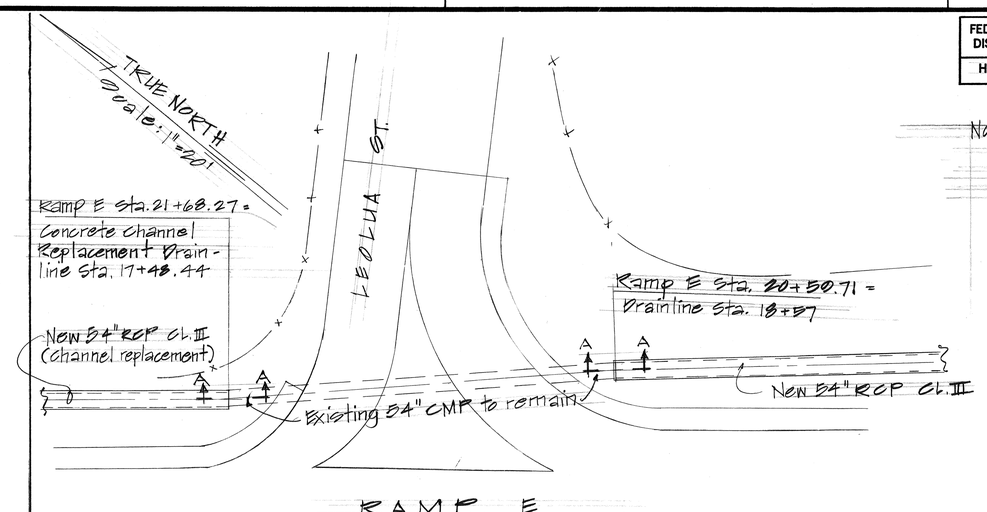
PLAN



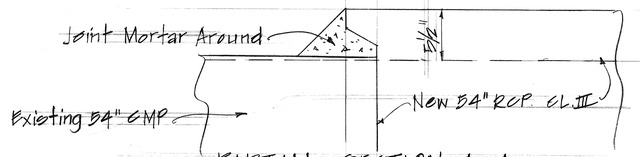
PLAN BULKHEAD CONNECTION
Scale: 1/2" = 1'-0"



SIDE ELEVATION
BULKHEAD CONNECTION AT DRAINLINE STA. 13+64.41
Scale: 1/2" = 1'-0"



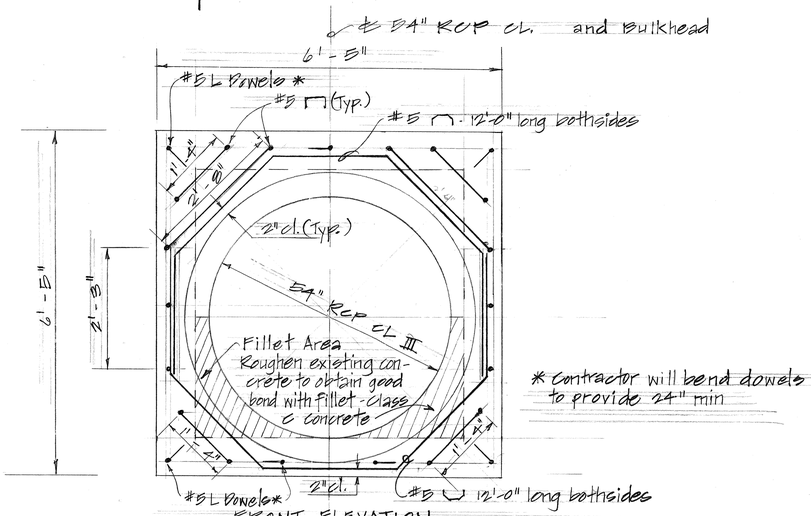
PLAN - 54-INCH RCP AND CMP CONNECTION



PARTIAL SECTION A-A
CONNECTION DETAIL AT DRAINLINE STA. 17+48.44 AND 18+57
Scale: 1 1/2" = 1'-0"

NOTES:

1. Joint Mortar shall be in accordance with Section 705.02 of the standard specifications.
2. The work is incidental to Item No. 603.6300 60-inch Corrugated Metal Pipe, sheet thickness 0.138 inch, or 54-inch Reinforced Concrete Pipe Class III.



FRONT ELEVATION
BULKHEAD CONNECTION AT DRAINLINE STA. 13+64.41
Scale: 3/4" = 1'-0"

* Contractor will bend dowels to provide 24" min

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

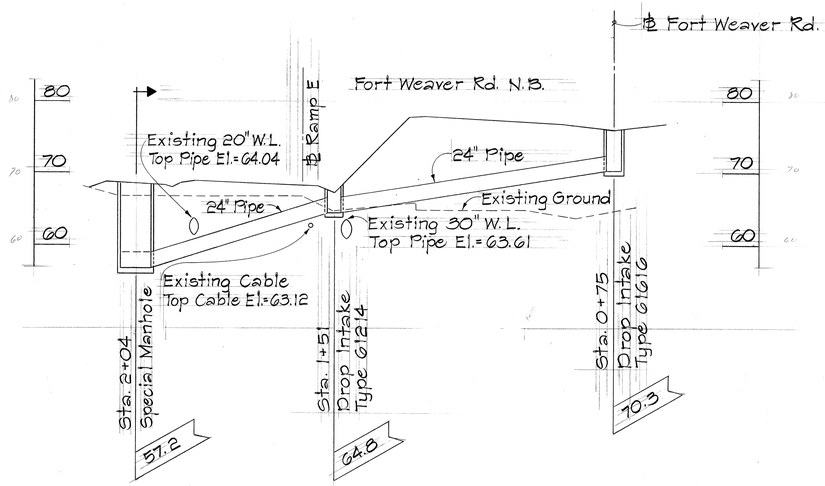
FORT WEAVER ROAD
ROUTE H-1 TO SOUTH OF FARRINGTON HIGHWAY

SCALE: AS SHOWN DATE: OCT. 1981

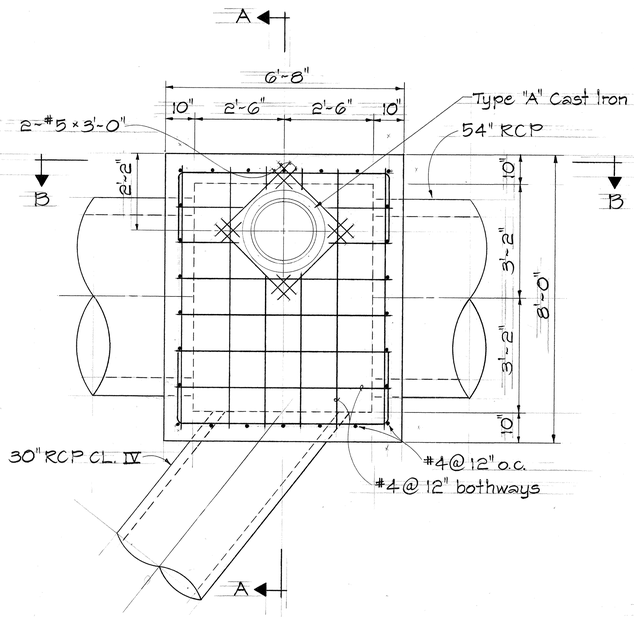
SHEET No. OF SHEETS

C.O. 31 S-6

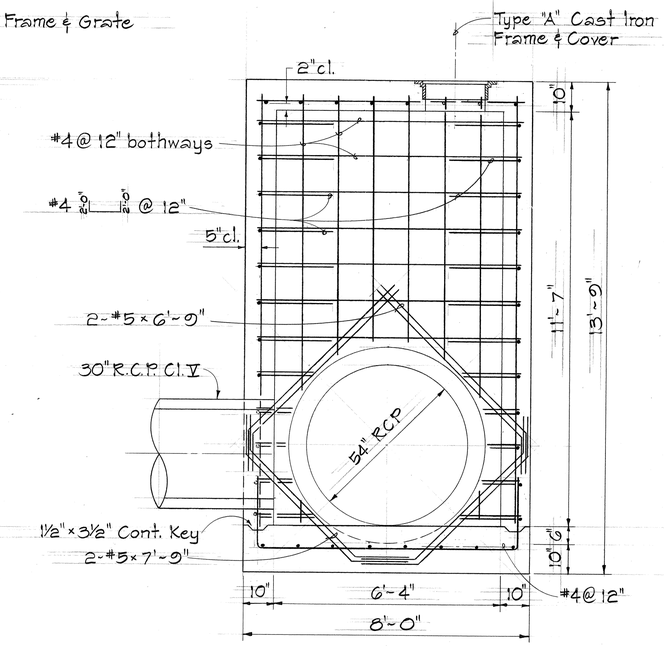
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	M-7600(1)	1982	C0315-7	



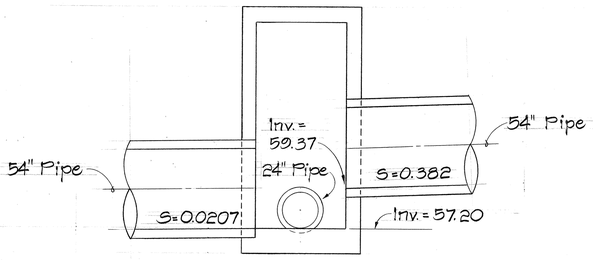
PROFILE
DRAINLINE #2
Not to Scale



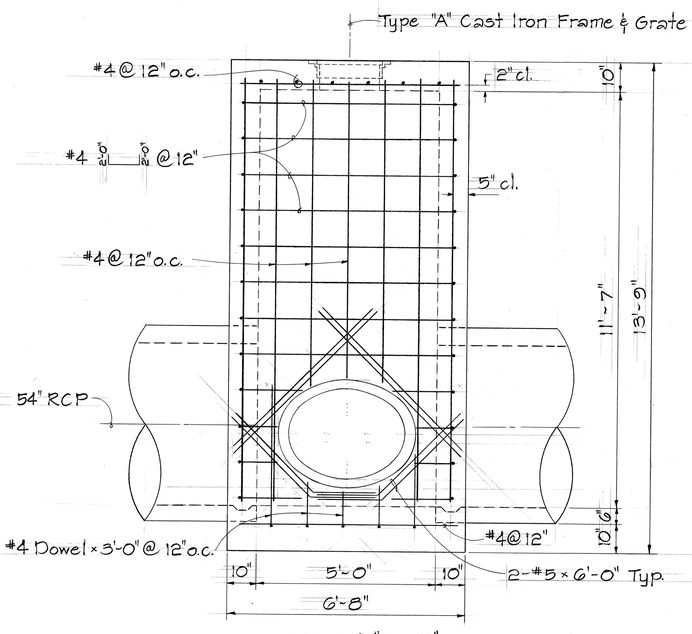
PLAN
Scale: ½"=1'-0"



SECTION "A-A"
Scale: ½"=1'-0"



SECTION "A"
Not to Scale



SECTION "B-B"
Scale: ½"=1'-0"

SPECIAL MANHOLES
RAMP E STA. 19+74 ± % 63' RT.
STA. 21+90 % 45' RT.
STA. 23+20 % 45' RT.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS

FORT WEAVER ROAD
ROUTE H-1 TO SOUTH OF
FARRINGTON HIGHWAY

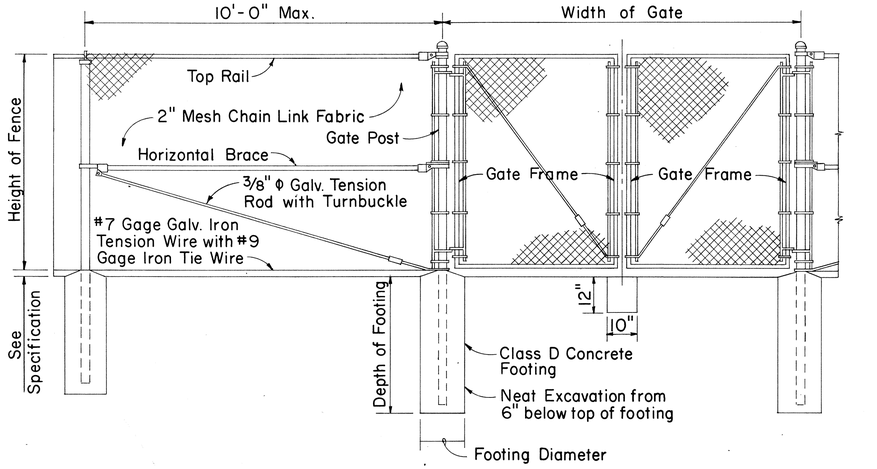
SCALE: AS SHOWN DATE: OCT. 1981

SHEET No. OF SHEETS

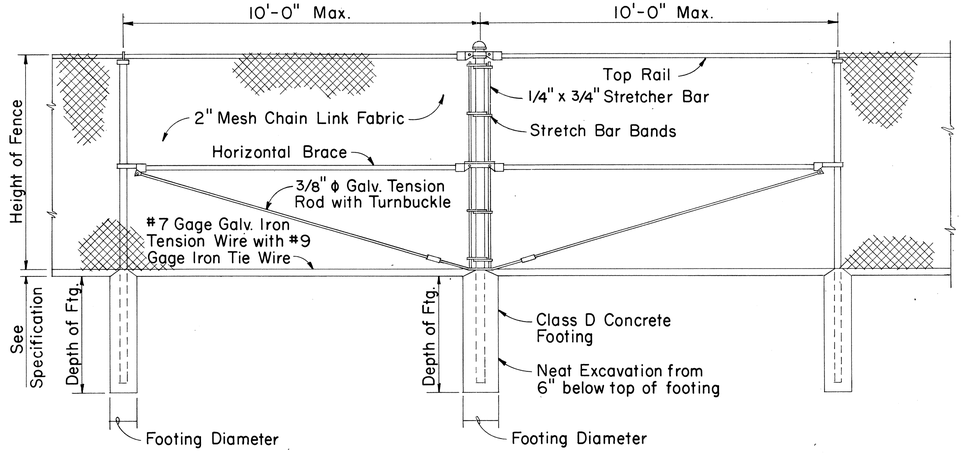
C.0.31 S-7

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

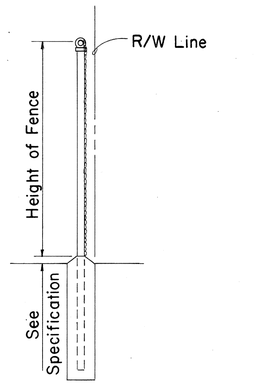
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	M-7600(1)	1978	32	198



LINE POST GATE POST GATE POST



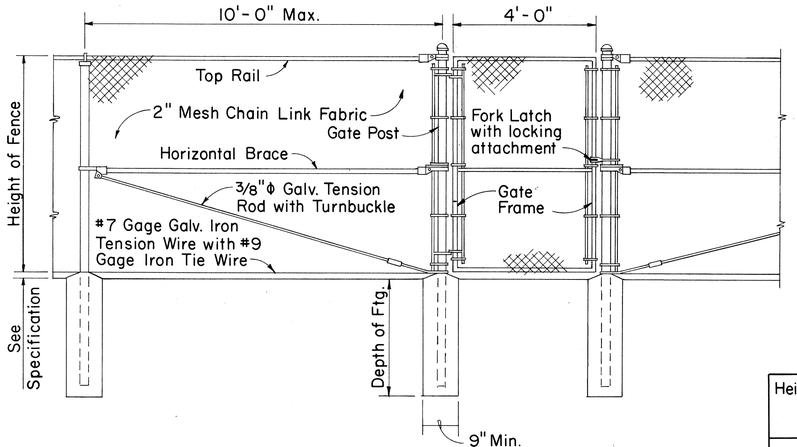
LINE POST PULL POST LINE POST



TYPICAL SECTION
(WITH CONCRETE FOOTING)

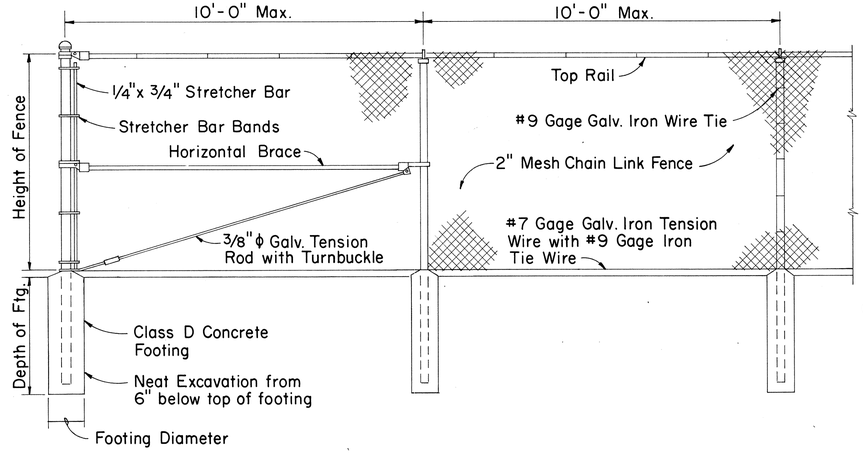
DETAIL OF CHAIN LINK GATE

NOTE:
1. Gate fork latch and lock, flush plate and anchor, and plunger shall be installed with Gates, and shall be considered as incidental to Chain Link Fence Gate.
2. Gate frames shall be mitered and welded at corners.
3. Fence detail not shown shall be in accordance with the Standard Specifications.

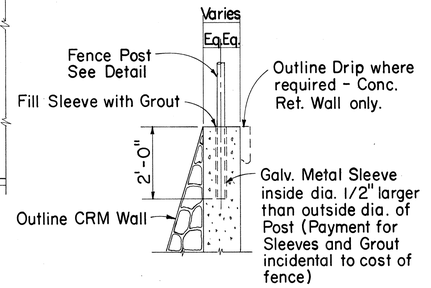


LINE POST GATE POST GATE POST

DETAIL OF 4 FT. CHAIN LINK GATE



END POST LINE POST LINE POST



TYPICAL SECTION
(ON CRM & CONC. RET. WALL)

CHAIN LINK FENCE DETAILS

Height of Fence	Minimum Depth of Footing		Minimum Footing Diameter	
	Line Post	Corner, Pull, End and Gate Posts	Line Post	Corner, Pull and End Posts
3'	2'-0"	2'-6"	8"	8"
4'	2'-6"	2'-6"	8"	8"
5'	3'-0"	3'-0"	8"	8"
6'	3'-0"	3'-0"	8"	9"

APPROVAL RECOMMENDED:
M. Hirano — HIGHWAY DESIGN ENGINEER — 12-4-69 DATE

APPROVED:
Walter E. Schaefer — ASSISTANT CHIEF, ENGINEERING — 12-10-69 DATE

NO.	REVISION	APPROVED BY	DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION

STANDARD DETAILS

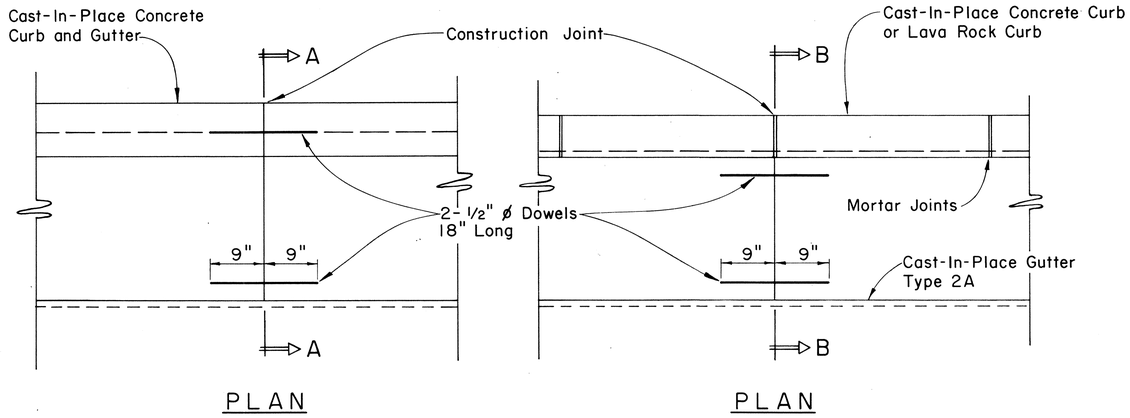
CHAIN LINK FENCE
(WITH TOPRAIL)

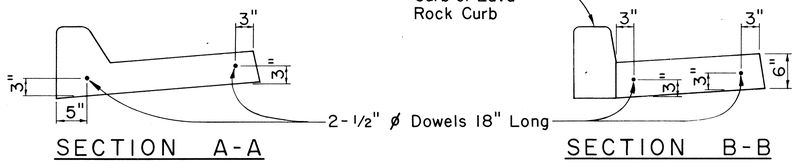
Scale: 1/2" = 1'-0" Date:

SHEET No. 1 OF 1 SHEETS | DD 607.1

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

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	M-7600(1)	1978	33	198



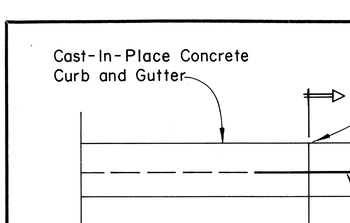


CAST-IN-PLACE CURB & GUTTER

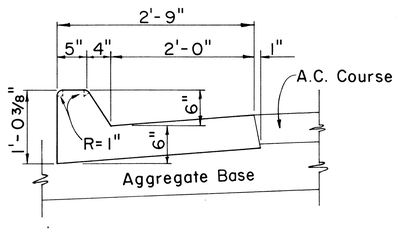
CAST-IN-PLACE GUTTER

CONSTRUCTION JOINT DETAIL

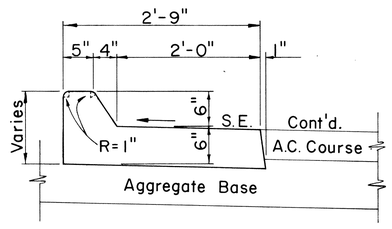
Scale: 1" = 1'-0"



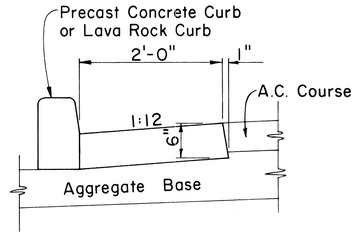
CURB, TYPE 2A



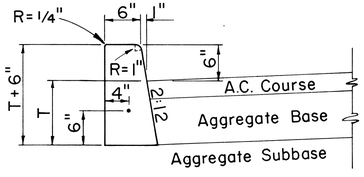
CURB & GUTTER, TYPE 2AG



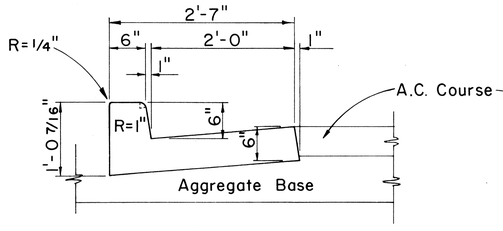
CURB & GUTTER, TYPE 2AGM



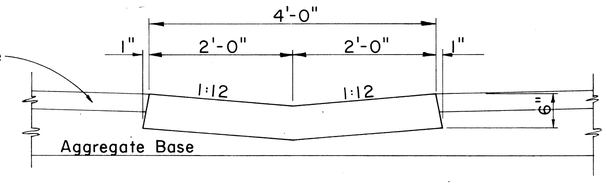
GUTTER, TYPE 2A



CURB, TYPE 2D



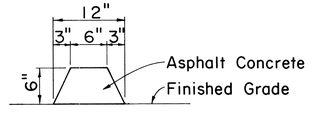
CURB & GUTTER, TYPE 2DG



GUTTER, TYPE 2G

CAST-IN-PLACE CONCRETE CURBS AND/OR GUTTERS

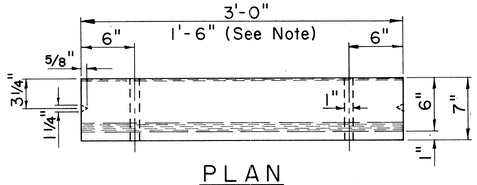
Scale: 1" = 1'-0"



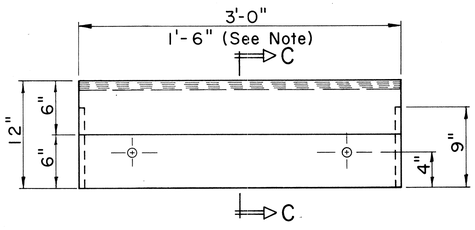
CURB, TYPE 6

BITUMINOUS CURB

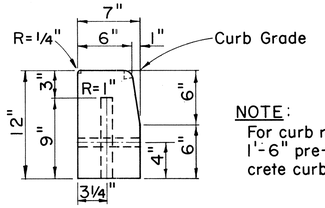
Scale: 1 1/2" = 1'-0"



PLAN



ELEVATION



NOTE:
For curb returns use 1'-6" pre-cast concrete curbs.

SECTION C-C

CURB, TYPE 3D

PRE-CAST CONC. CURB

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

APPROVAL RECOMMENDED:

M. Hirozawa — HIGHWAY DESIGN ENGINEER — 12-4-69 DATE

APPROVED:

Hubert G. Badaine — ASSISTANT CHIEF, ENGINEERING — 12-10-69 DATE

NO.	REVISION	APPROVED BY	DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION

STANDARD DETAILS

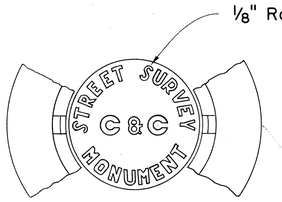
TYPICAL DETAILS OF CURB AND/OR GUTTERS

Scale: As Shown

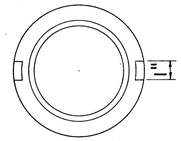
SHEET No. 1 OF 1 SHEETS | DD 609.1

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

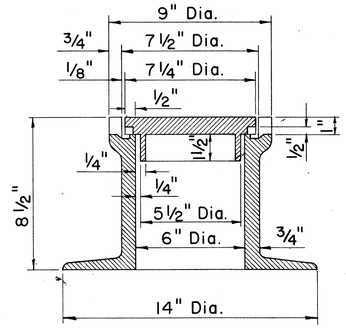
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	M-7600(1)	1978	34	198



TOP VIEW OF COVER AND PORTION OF FRAME



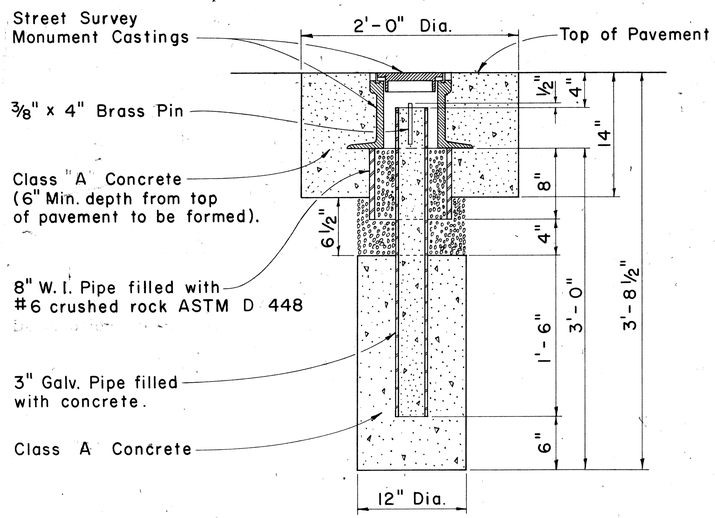
BOTTOM OF COVER



SECTIONAL VIEW OF FRAME AND COVER

STREET SURVEY MONUMENT CASTINGS

Scale: 3" = 1'-0"

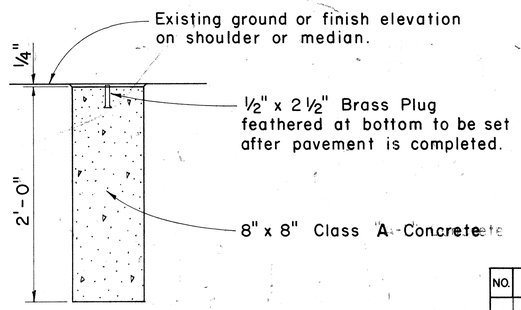


NOTE:

Where the excavation extends into solid rock the depth may be decreased if approved by the Engineer.

STREET SURVEY MONUMENT

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



DETAIL FOR ℄ AND REFERENCE SURVEY MONUMENT

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

APPROVAL RECOMMENDED:

HIGHWAY DESIGN ENGINEER — DATE 12-4-69

APPROVED:

ASSISTANT CHIEF, ENGINEERING — DATE 12-10-69

NO.	REVISION	APPROVED BY	DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION

STANDARD DETAILS

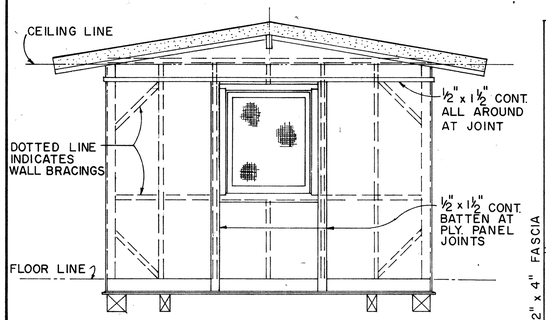
CENTERLINE, REFERENCE SURVEY AND C & C STREET SURVEY MONUMENTS

Scale: As Shown

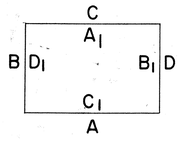
SHEET No. 1 OF 1 SHEETS | DD 613.1

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

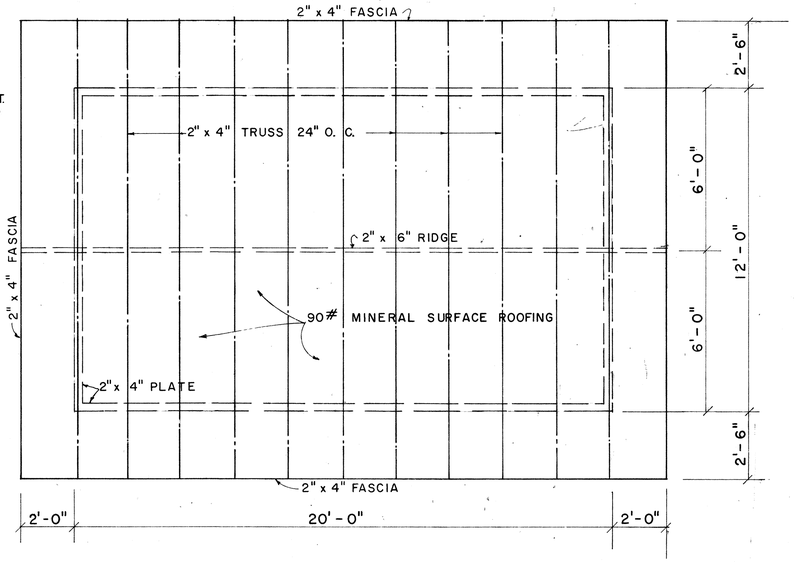
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	M-7600(1)	1978	35	198



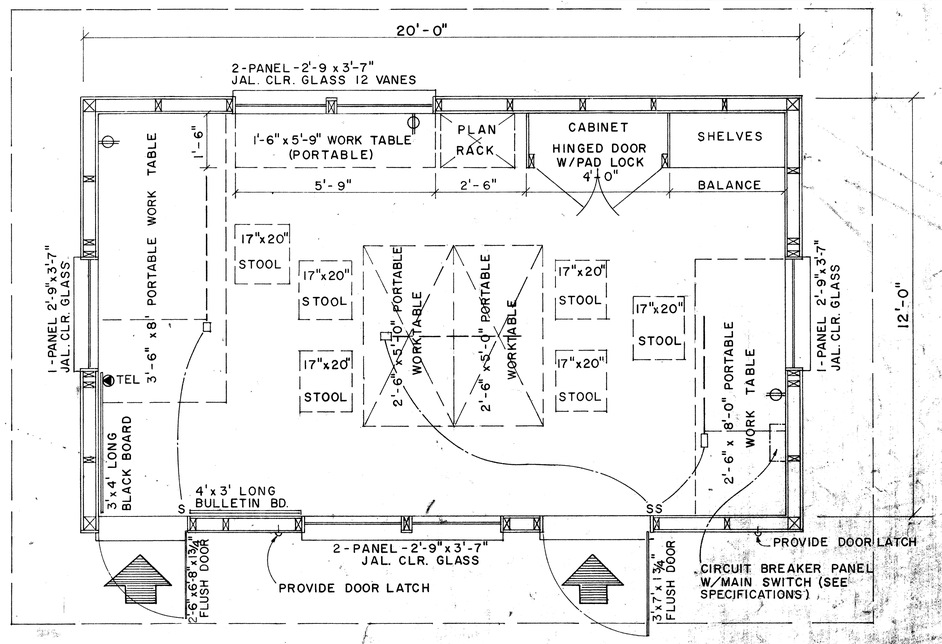
ELEVATION (B)
ELEVATION (D) SIMILAR
SCALE: 3/8" = 1'-0"



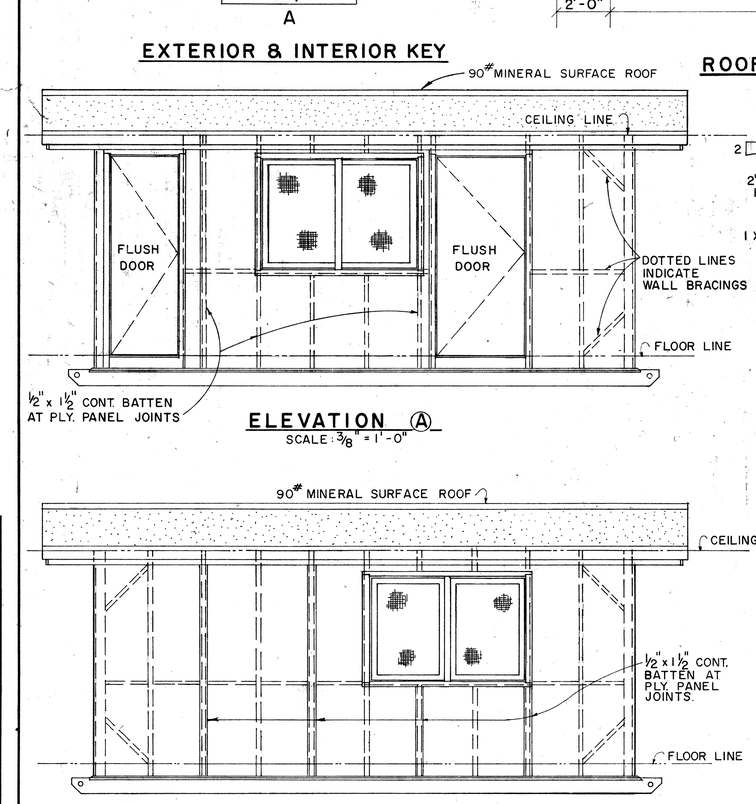
EXTERIOR & INTERIOR KEY



ROOF FRAMING PLAN
SCALE: 3/8" = 1'-0"

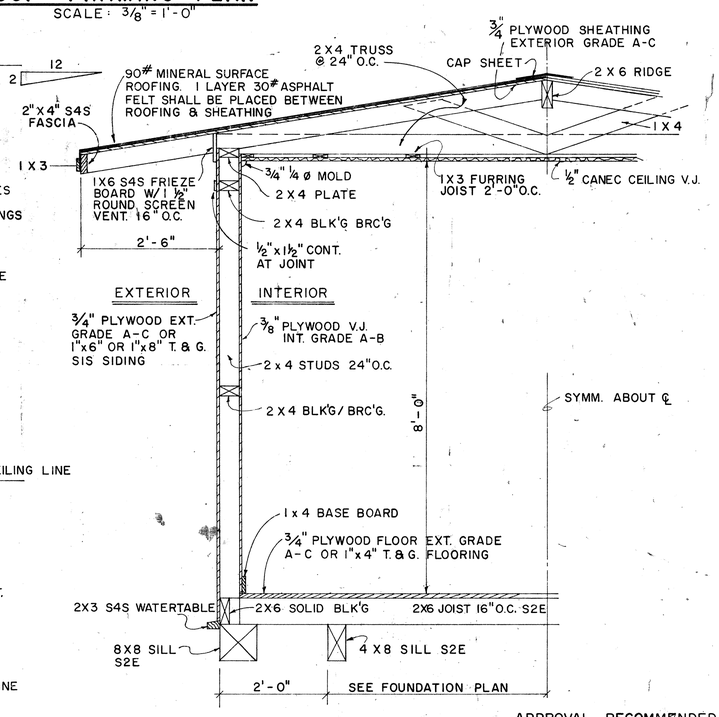


FLOOR PLAN
SCALE: ½" = 1'-0"

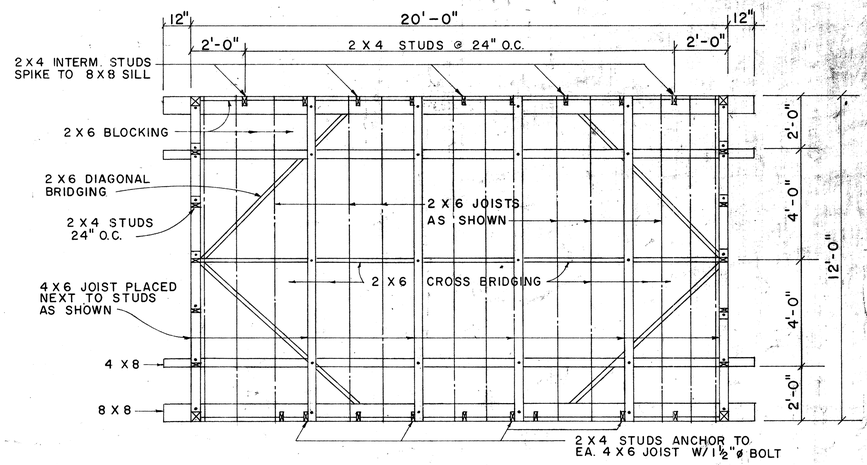


ELEVATION (A)
SCALE: 3/8" = 1'-0"

ELEVATION (C)
SCALE: 3/8" = 1'-0"



TYPICAL WALL SECTION
SCALE: ¾" = 1'-0"



FOUNDATION FRAMING PLAN
SCALE: 3/8" = 1'-0"

APPROVAL RECOMMENDED:
M. Hirozawa — HIGHWAY DESIGN ENGINEER — 12-4-69 DATE

APPROVED:
Harlow D. Godsha — ASSISTANT CHIEF, ENGINEERING — 12-10-69 DATE

NO.	REVISION	APPROVED BY	DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION

FIELD OFFICE

Scale : As Noted

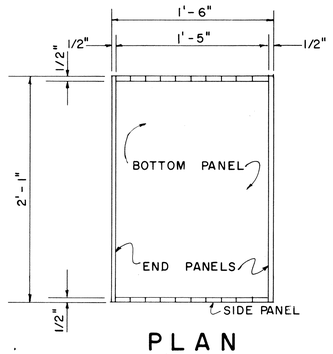
SHEET Nº 1 OF 2 SHEETS DD 636 I

35

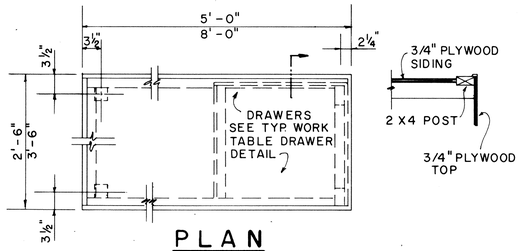
ORIGINAL PLAN | SURVEY PLOTTED BY | DRAWN BY | TRACED BY | DESIGNED BY | QUANTITIES BY | CHECKED BY | DATE
NOTE BOOK | No.

LIETZ 1103 ARKWRIGHT TRACING CLOTH 10-60 200P

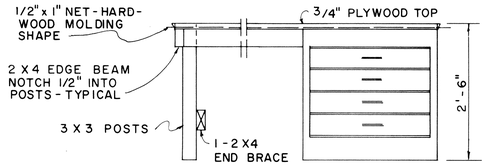
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	M-7600(1)	1978	36	198



PLAN



PLAN

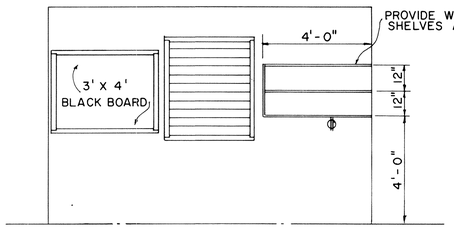


ELEVATION

2'-6" x 5'-0"	2 REQ'D.
3'-6" x 8'-0"	1 REQ'D
2'-6" x 8'-0"	1 REQ'D

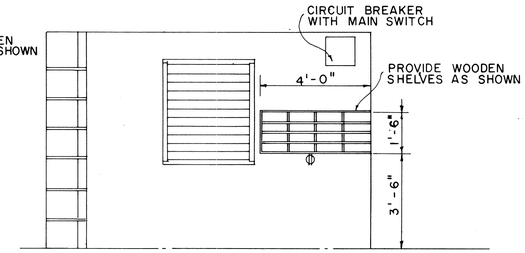
PORTABLE WORK TABLE DETAIL

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



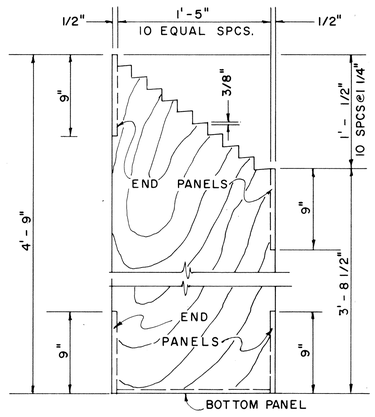
ELEVATION (D1)

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



ELEVATION (B1)

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

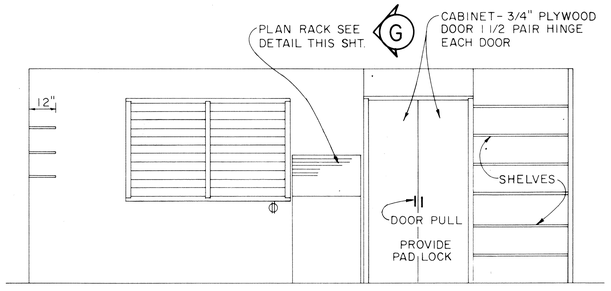


END ELEVATION

PLAN RACK DETAIL

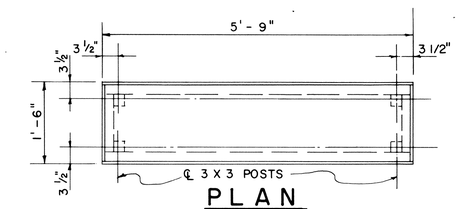
SCALE: 1 1/2" = 1'-0"

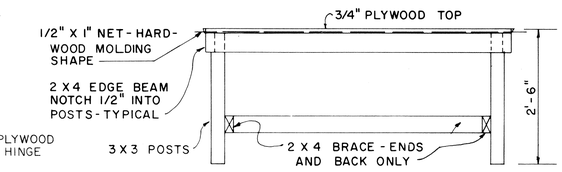
(ONE REQUIRED)



ELEVATION (A1)

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

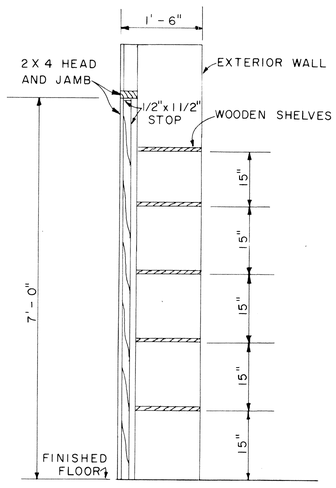




ELEVATION

1'-6" x 5'-9" PORTABLE WORK TABLE DETAIL

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



SECTION (G)

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

APPROVAL RECOMMENDED:

M. Hirozawa — 12-9-69

HIGHWAY DESIGN ENGINEER — DATE

APPROVED:

Walter E. Zadoian — 12-10-69

ASSISTANT CHIEF, ENGINEERING — DATE

NO.	REVISION	APPROVED BY	DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION

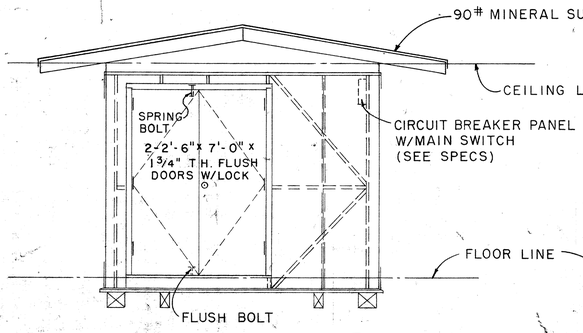
FIELD OFFICE

Scale: As Noted

SHEET No. 2 OF 2 SHEETS | DD 636.2

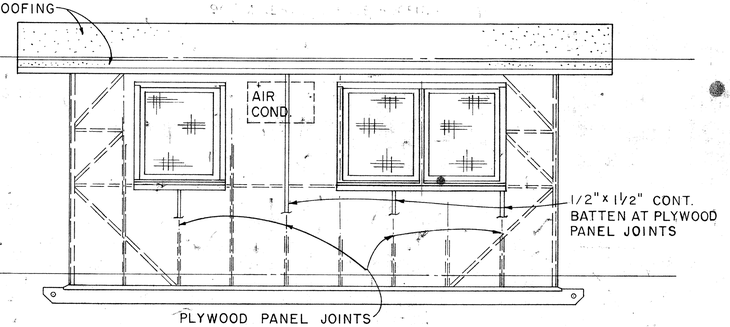
ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	"
	TRACED BY	"
NOTE BOOK	DESIGNED BY	"
No.	QUANTITIES BY	"
	CHECKED BY	"

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	M-7600(1)	1978	37	198



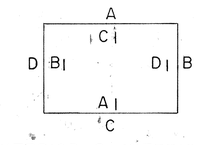
ELEVATION (B)

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

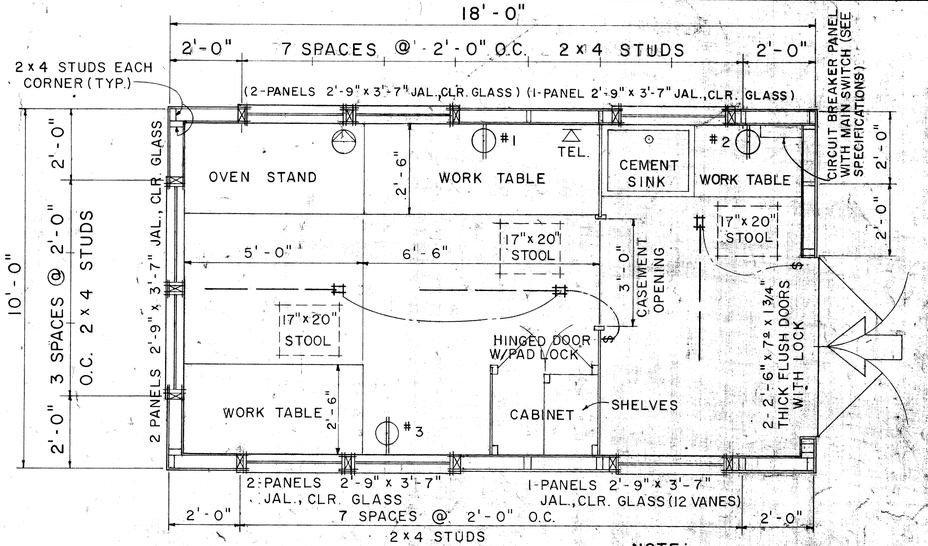


ELEVATION (A)

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



EXTERIOR & INTERIOR KEY



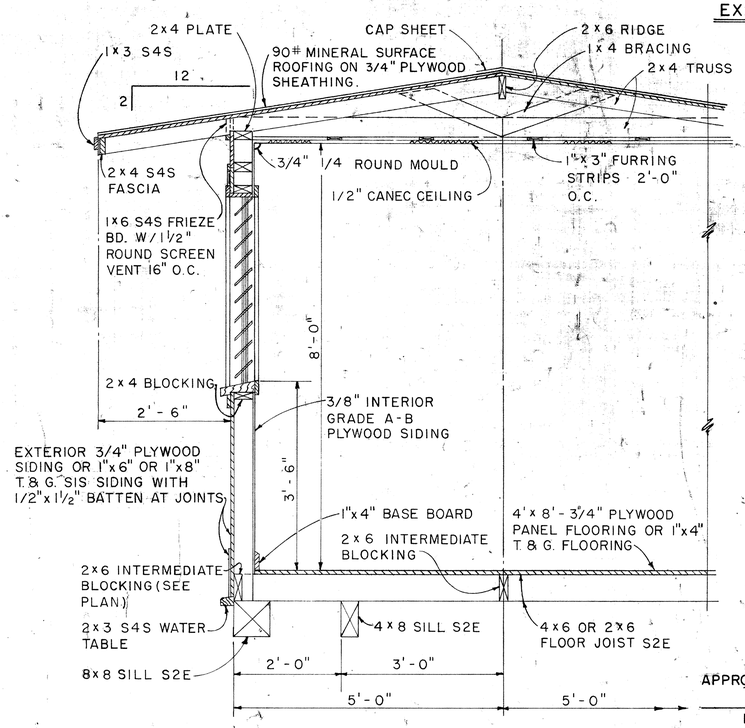
FLOOR PLAN

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

NOTE:

1. FLUORESCENT FIXTURE SHALL BE 48", 2 LAMP, 40 WATT, RAPID START.
2. TELEPHONE AND WALL OUTLET 4'-0" ABOVE FLOOR.

1-LAYER 30# ASPHALT FELT SHALL BE PLACED BETWEEN ROOFING AND SHEATHING.

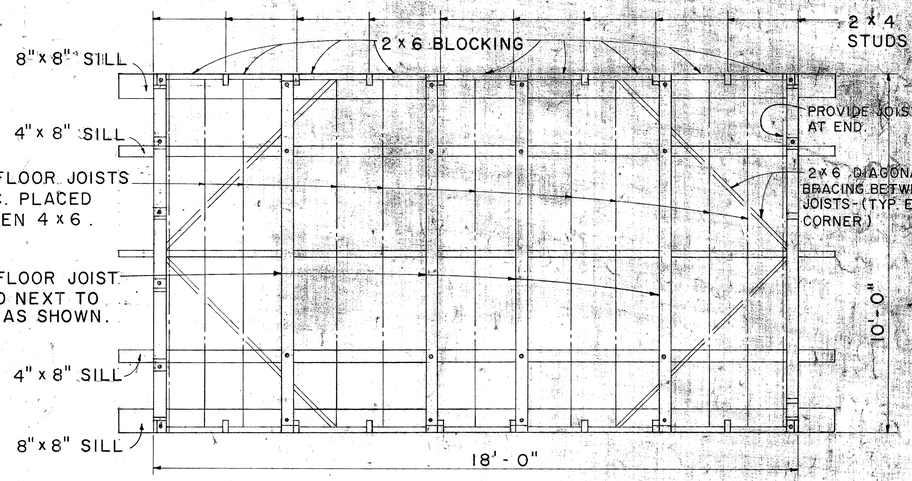


TYPICAL SECTION

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

NOTE:

ALL 3/4" PLYWOOD SHALL BE EXTERIOR GRADE A-C OR BETTER.



FLOOR FRAMING PLAN

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

APPROVAL RECOMMENDED:

M. Hirozawa — HIGHWAY DESIGN ENGINEER — 12-4-69 DATE

APPROVED:

Walter S. Baldwin — ASSISTANT CHIEF, ENGINEERING — 12-10-69 DATE

NO.	REVISION	APPROVED BY	DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION

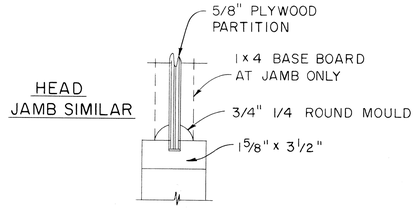
PROJECT SITE LABORATORY

Scale As Noted

SHEET No. 1 OF 2 SHEETS | DD 636.3

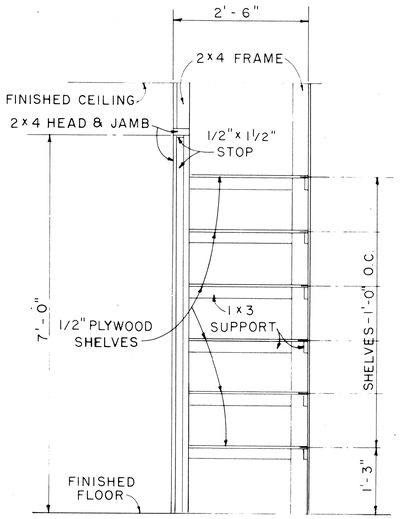
ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	
NOTE BOOK	TRACED BY	
	DESIGNED BY	
	QUANTITIES BY	
No.	CHECKED BY	

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	M-7600(1)	1978	38	198



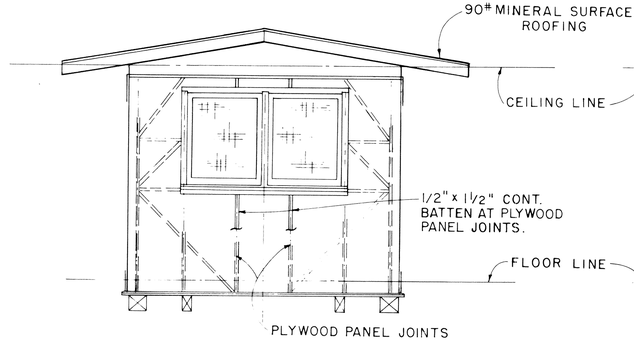
CASEMENT DETAIL

SCALE: 3" = 1'-0"



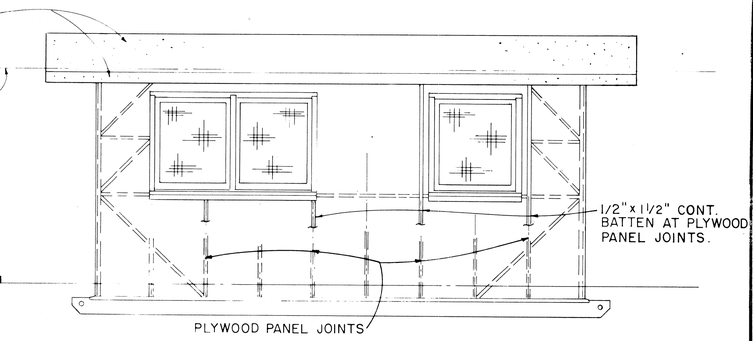
CABINET DETAIL

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



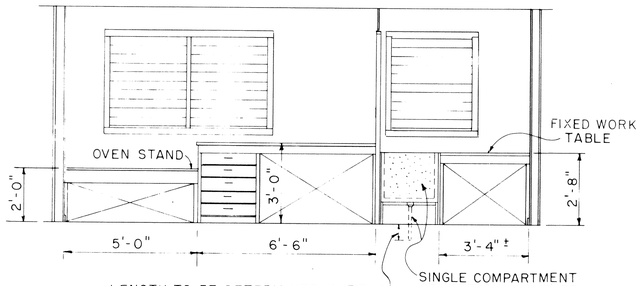
ELEVATION (D)

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



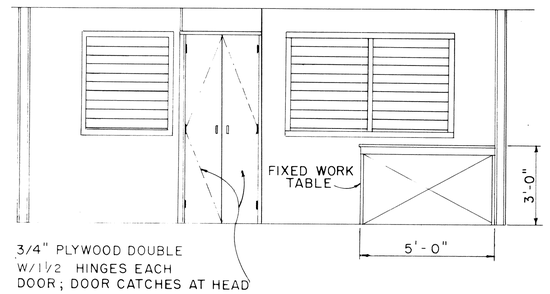
ELEVATION (C)

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



ELEVATION (C1)

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



ELEVATION (A1)

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

APPROVAL RECOMMENDED:

HIGHWAY DESIGN ENGINEER — DATE 12-4-69

APPROVED:

ASSISTANT CHIEF, ENGINEERING — DATE 12-10-69

NO.	REVISION	APPROVED BY	DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION

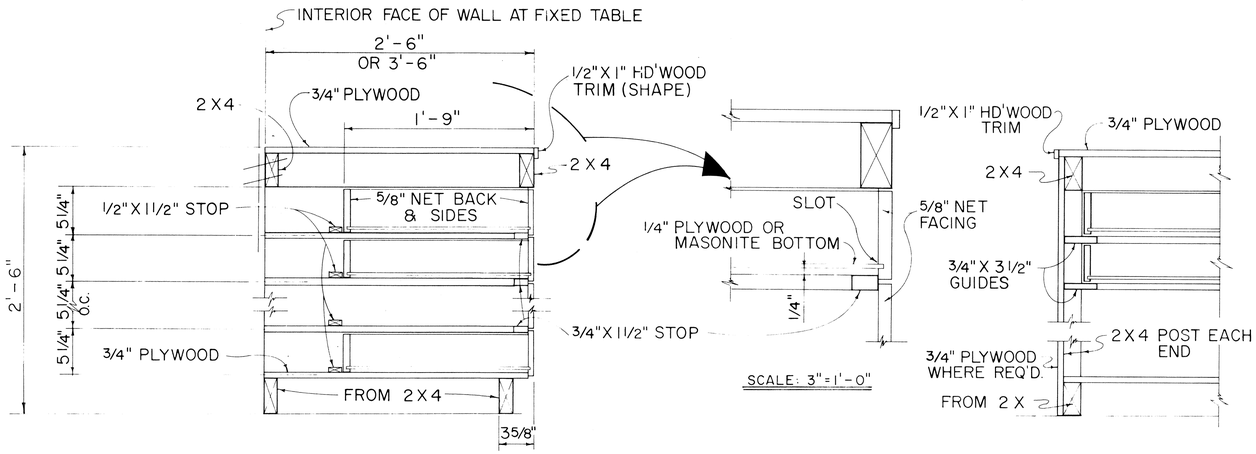
PROJECT SITE LABORATORY

Scale: As Noted

SHEET No. 2 OF 2 SHEETS | DD 636.4

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

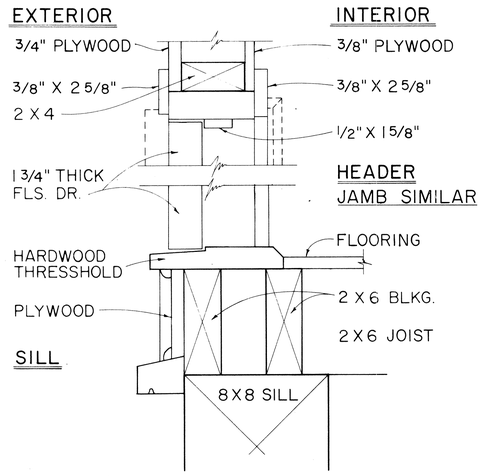
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	M-7600(1)	1978	39	198



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

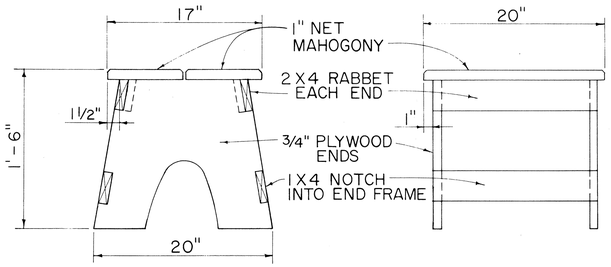
END SECTION
SCALE: 1 1/2" = 1'-0"

TYPICAL WORK TABLE DRAWER DETAIL



TYP. SWING OUT DOOR

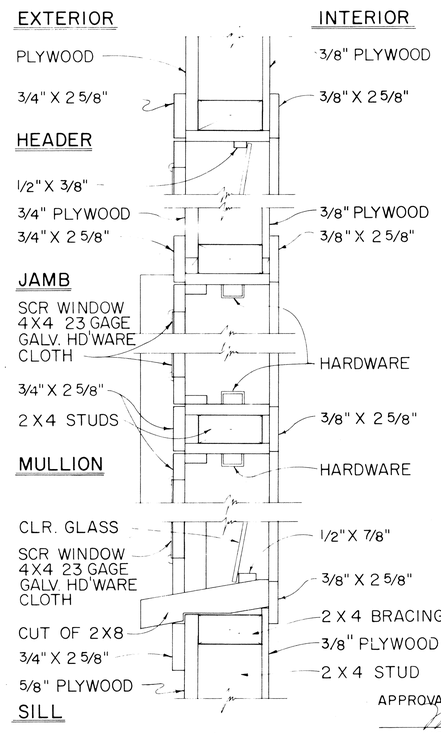
TYPICAL SINGLE OR DOUBLE EXTERIOR DOOR DETAIL



TYPICAL STOOL DETAIL

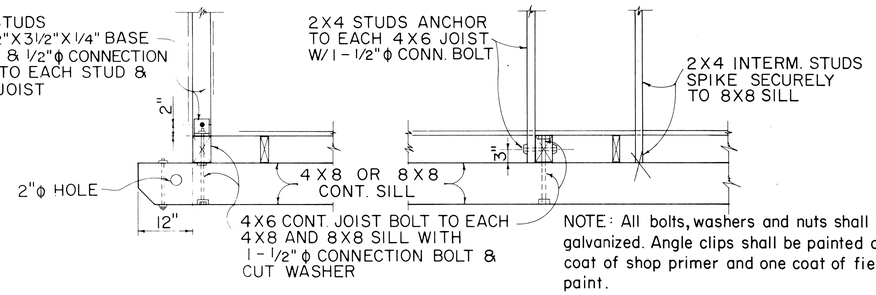
SCALE: 1 1/2" = 1'-0"

NOTE: CONTRACTOR MAY WITH THE APPROVAL OF THE ENGINEER FURNISH THE FIELD OFFICE OR PROJECT SITE LABORATORY WITH STOOLS OTHER THAN THE TYPE SHOWN IN THE DETAIL.



TYPICAL DETAIL JALOUSIES WINDOWS

SCALE: 3" = 1'-0"



AT ENDS OF BLDG. ALONG SIDES OF BLDG.

TYPICAL 2 X 4 STUD & 4 X 6 FLOOR JOIST BASE CONNECTION DETAILS

APPROVAL RECOMMENDED:
HIGHWAY DESIGN ENGINEER — DATE 12-4-69

APPROVED:
ASSISTANT CHIEF, ENGINEERING — DATE 12-10-69

NO.	REVISION	APPROVED BY	DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION

FIELD OFFICE
&
PROJECT SITE LABORATORY

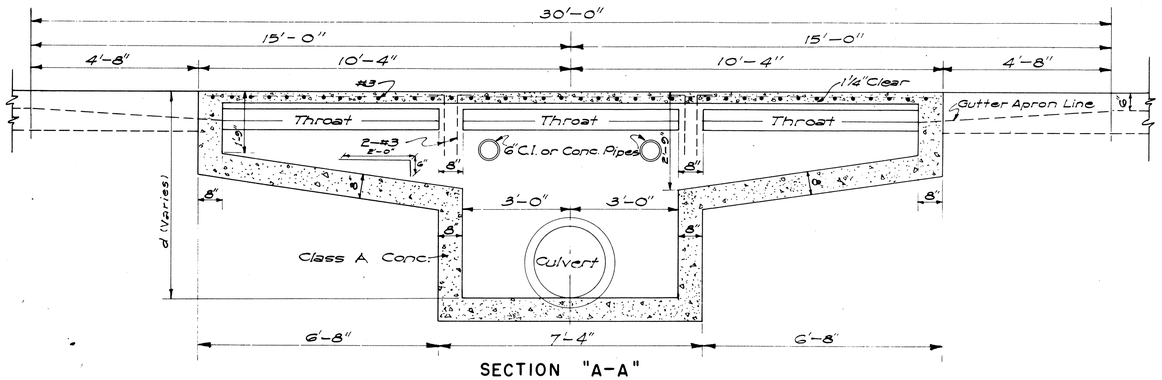
Scale As Noted

SHEET No. 1 OF 1 SHEETS | DD 636.5

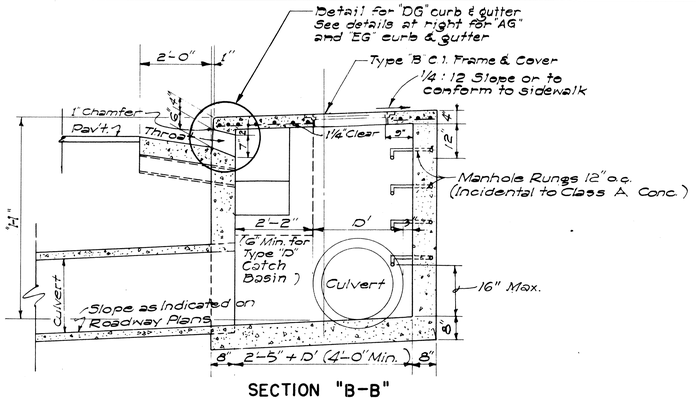
ORIGINAL PLANS — PLANS PLOTTED BY — DATE
DRAWN BY
TRACED BY
CHECKED BY
QUANTITIES BY
APPD. FOR OE — APPROVED BY
DATE
No. — REVISIONS — DATE

2/17/70

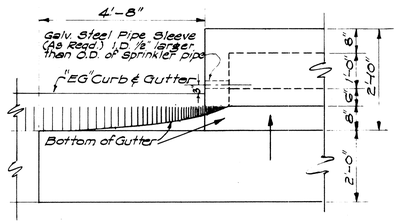
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	M-7600(1)	1978	40	198



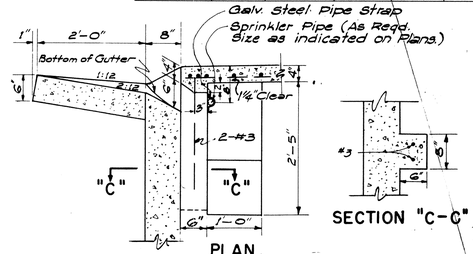
SECTION "A-A"



SECTION "B-B"



DETAIL OF CATCH BASIN WITH "EG" CURB & GUTTER

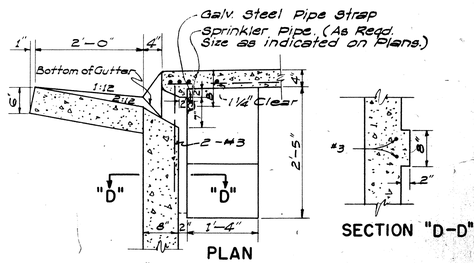


SECTION "C-C"

PLAN

THROAT DETAIL FOR "EG" CURB & GUTTER

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

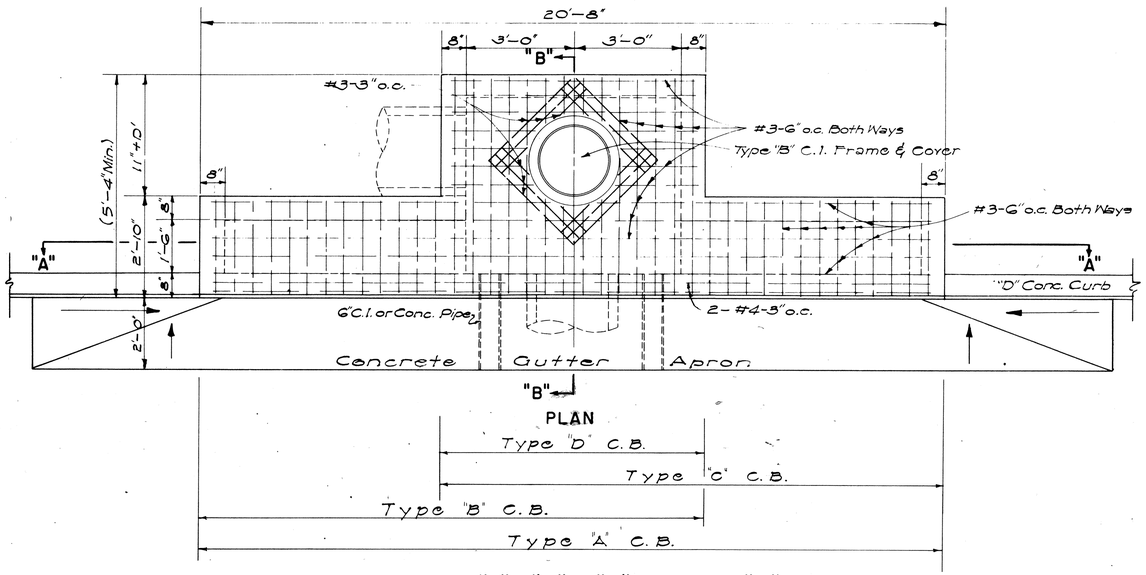


SECTION "D-D"

PLAN

THROAT DETAIL FOR "AG" CURB & GUTTER

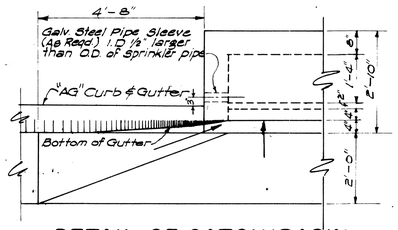
SCALE: 3/4" = 1'-0"



PLAN

DETAILS OF TYPES "A", "B", "C" AND "D" CATCH BASINS

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



DETAIL OF CATCH BASIN WITH "AG" CURB & GUTTER

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

GENERAL NOTES

1. Quantities based on d' = 5.75' and D' = 30".
2. Quantities do not include Concrete for Gutter Apron.
3. The Contractor shall install two 6" Cast Iron or Concrete Pipes as incidental to Class A Concrete for Construction Drainage. The Engineer shall determine the exact location in the field.
4. Culvert shall have C.B. from any position and any direction indicated by plans or ordered by the Engineer. Culvert may both enter and leave C.B. so that C.B. will also act as Manhole.
5. The Contractor shall install Galvanized Steel Pipe Sleeves and Straps as incidental to Sprinkler System.
6. The type of curb and/or gutter (Type 1, 2, 3, etc.) shall conform to the type specified on the roadway plans.
7. 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. Type "B" Cast Iron Frame and Cover and Manhole Rungs may be placed at any location as ordered by the Engineer.

ESTIMATED QUANTITIES

Type	Class A Conc	Struct. Exc.	Reinf. Steel	Gutter Length
"A"	7.5 c.y.	24.7 c.y.	145 lb.	30'-0"
"B"	6.0 c.y.	21.5 c.y.	108 lb.	23'-4"
"C"	6.0 c.y.	21.5 c.y.	108 lb.	23'-4"
"D"	4.9 c.y.	16.5 c.y.	77 lb.	16'-8"

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

NO.	REVISION	APPROVED BY	DATE
1	Spacing on Manhole Rungs to conform to OSHA.	H.T.	1-21-75

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

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
STANDARD DETAILS

CATCH BASINS

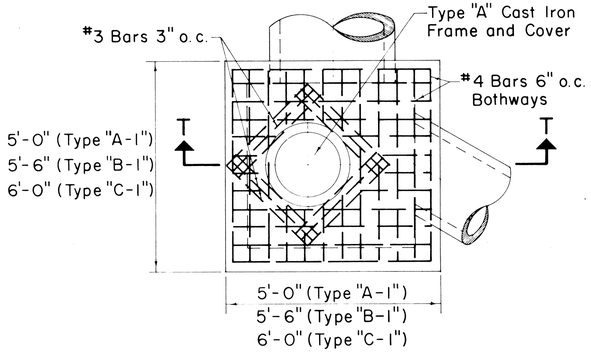
Scale: As Noted — Date: July, 1969

SHEET Nº 1 OF 1 SHEETS DH 1

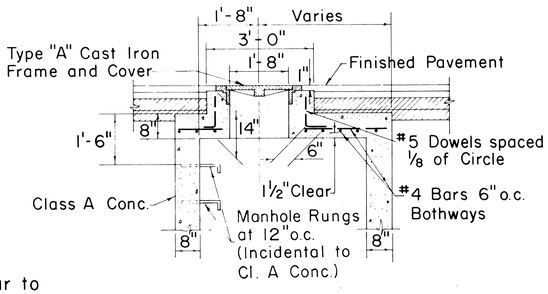
40

AB ARKWRIGHT 18408

FED. ROAD DIST. NO.	STATE	FED. AID. PROJECT	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	M-7600(1)	1978	ADD.4051	198



PLAN

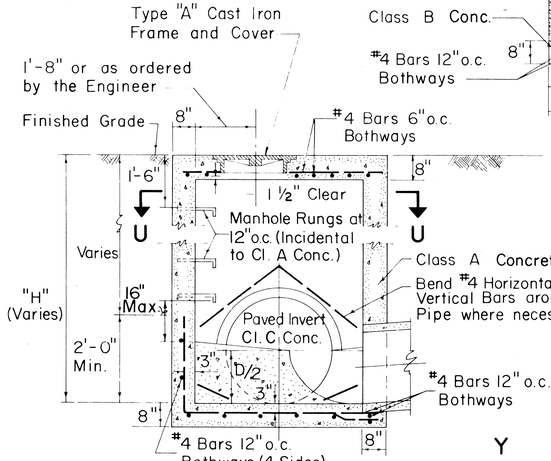


SECTION T-T

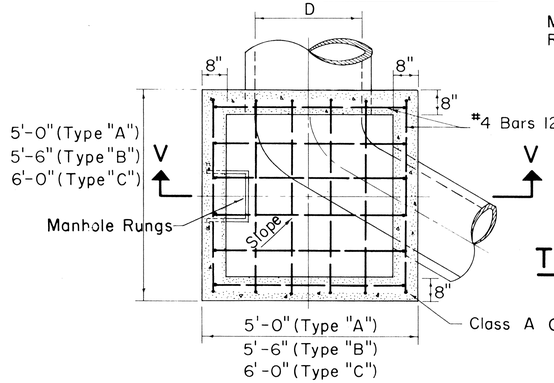
Note:
Bottom detail similar to Type "A", "B", & "C".

TYPE "A-1", "B-1", & "C-1" STORM DRAIN MANHOLE TOP DETAIL UNDER PAVEMENT

Scale: ½" = 1'-0"



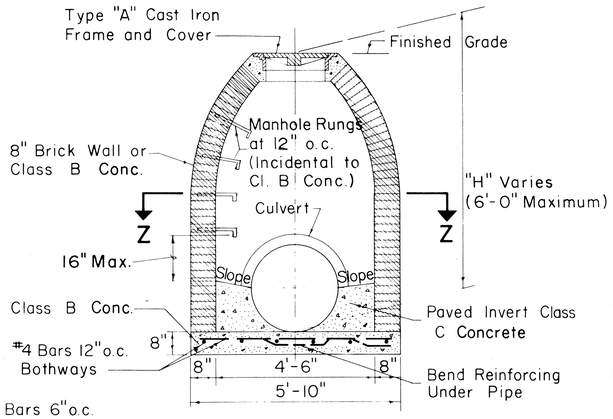
SECTION V-V



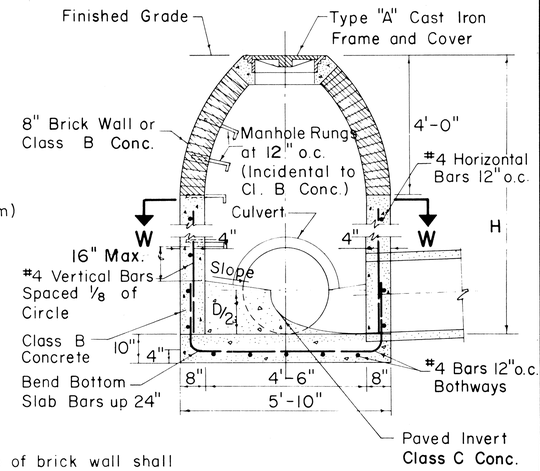
SECTION U-U

TYPE "A", "B", & "C" S.D.M.H.

Scale: ½" = 1'-0"



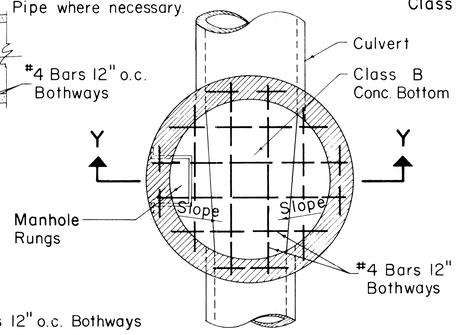
SECTION Y-Y



SECTION X-X

NOTE:

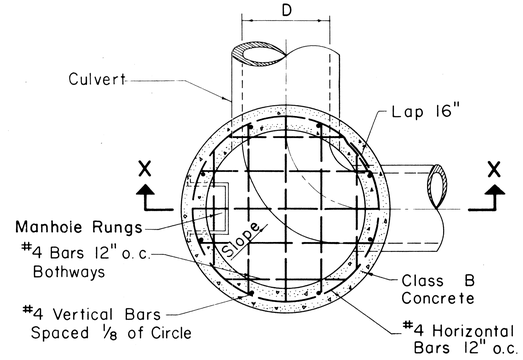
1. Exterior surface of brick wall shall be plastered with 1" thickness of 1:2 Cement Mortar.
2. Number, size and direction of culvert at manhole to be as shown on plans.
3. Paved invert not required at drop manholes.
4. All Class C Concrete to be incidental to Class B Concrete.



SECTION Z-Z

TYPE "D" STORM DRAIN MANHOLE

Scale: ½" = 1'-0"



SECTION W-W

TYPE "E" STORM DRAIN MANHOLE

Scale: ½" = 1'-0"

GENERAL NOTES

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

APPROVAL RECOMMENDED:
Y. Takano — HYDRAULIC DESIGN ENGINEER — 12-17-69 DATE

APPROVED:
[signature] — ASS'T. CHIEF, ENGINEERING — 12-17-69 DATE

NO.	REVISION	APPROVED BY	DATE
1	Spacing on Manhole Rungs to conform to OSHA.	H.T.	1-21-75

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS

STORM DRAIN MANHOLES

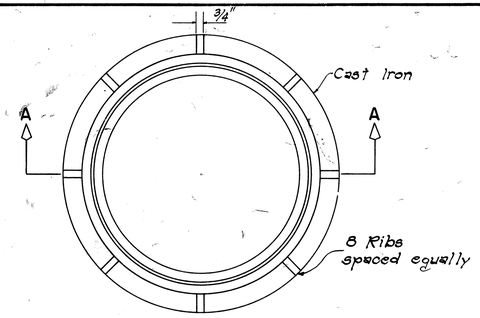
Scales: As Noted — Date: July, 1969

SHEET NO. 1 OF 1 SHEETS DH 5

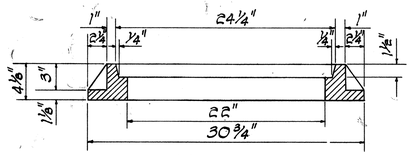
ADD.40 S-1

LIETZ 1103 ARKWRIGHT TRACING CLOTH 10-60 200P

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	M-7600(1)	1978	41	198

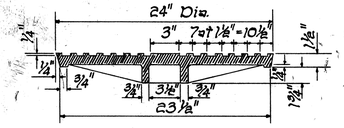


PLAN

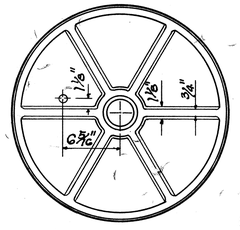


SECTION A-A

PLAN



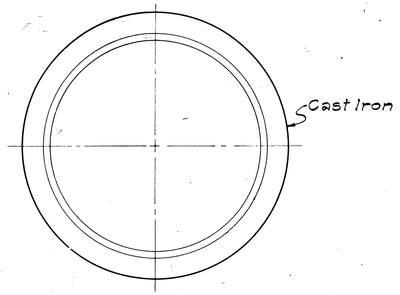
SECTION A-A



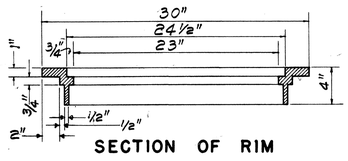
BOTTOM VIEW OF COVER

DETAILS OF TYPE "P" CAST IRON FRAME AND COVER

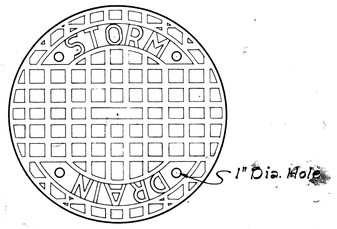
SCALE: 1-1/2" = 1'-0"



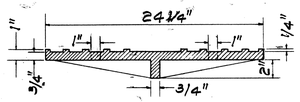
PLAN OF RIM



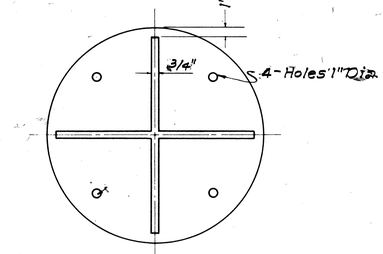
SECTION OF RIM



TOP VIEW OF COVER



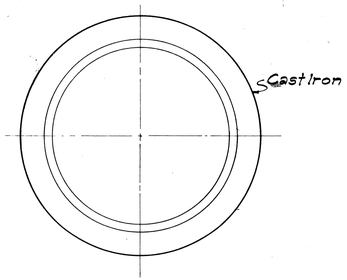
SECTION



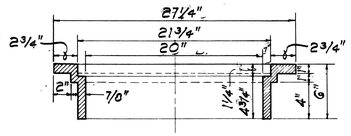
BOTTOM VIEW OF COVER

DETAILS OF TYPE "B" CAST IRON FRAME AND COVER

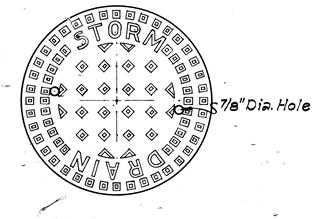
SCALE: 1-1/2" = 1'-0"



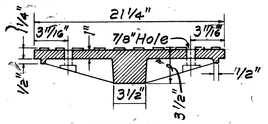
PLAN OF RIM



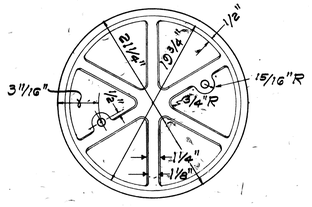
SECTION OF RIM



TOP VIEW OF COVER



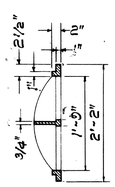
SECTION



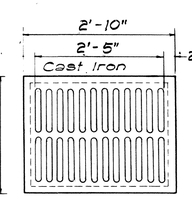
BOTTOM VIEW OF COVER

DETAILS OF TYPE "A" CAST IRON FRAME AND COVER

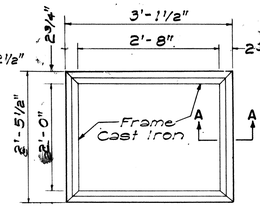
SCALE: 1-1/2" = 1'-0"



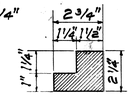
SECTION



TOP VIEW



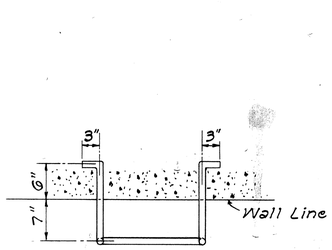
TOP VIEW



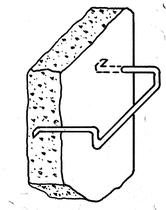
SECTION "A-A"
SCALE 3" = 1'-0"

TYPE C C.I. FRAME AND GRATE

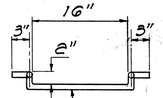
SCALE: 3/4" = 1'-0"



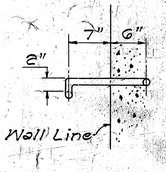
PLAN



PICTORIAL VIEW
NOT TO SCALE



FRONT VIEW



SIDE VIEW

DETAILS OF MANHOLE RUNG

SCALE: 1" = 1'-0"

APPROVAL RECOMMENDED:
G. Takano — 12-17-69
HYDRAULIC DESIGN ENGINEER — DATE

APPROVED:
Richard R. Rodrigues — 12-17-69
ASSISTANT CHIEF, ENGINEERING — DATE

NO.	REVISION	APPROVED BY	DATE
1.	Detail of Type "P" Cast Iron Frame and Cover	H.T.	1-6-71
2	Details of Manhole Rungs to conform to O.S.H.A.	H.T.	1-21-75
3	Option for Manhole Rungs	H.T.	1-13-76

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS
CATCH BASIN AND MANHOLE CASTINGS

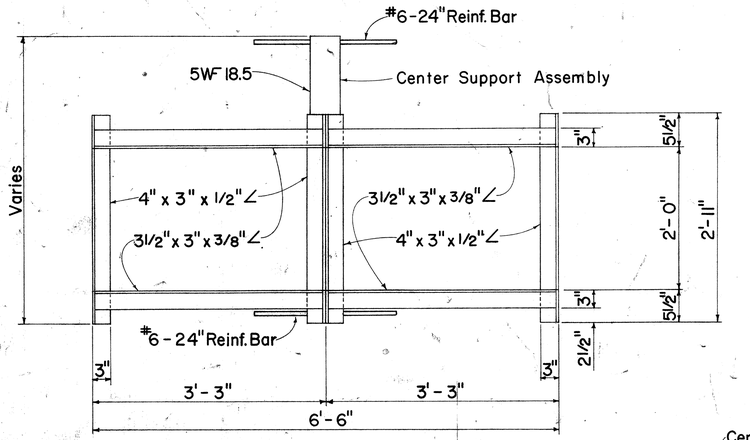
Scale: As Noted — Date: July, 1969

SHEET NO. 1 OF 1 SHEETS DH 6

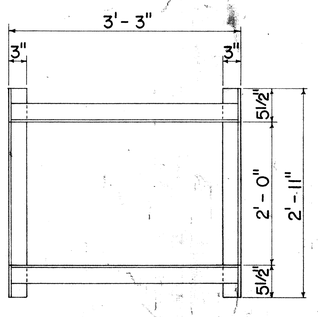
41

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

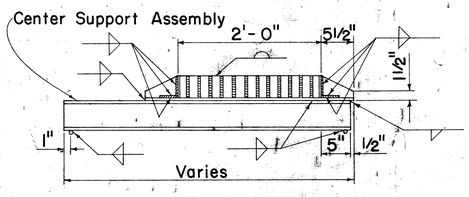
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	M-7600(1)	1976	42	198



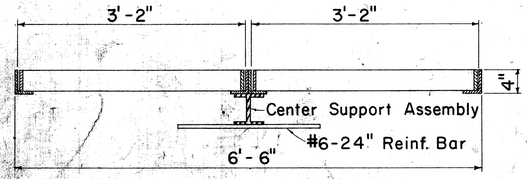
PLAN
(Two or More Grates)



PLAN
(Single Grate)

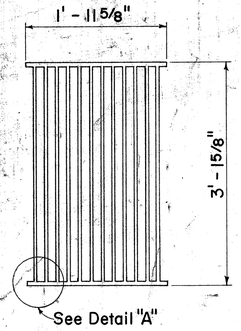


CROSS SECTION
(Thru Frame & Grate)

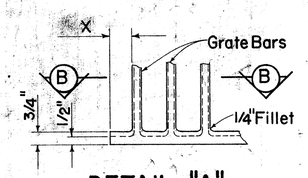


LONGITUDINAL SECTION
(Thru Frame & Grate)

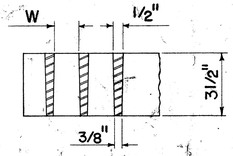
FRAME DETAILS
Scale: 1"= 1'-0"



PLAN
Scale: 1"=1'-0"

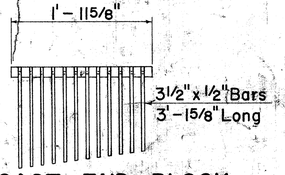


DETAIL "A"
Scale: 3"= 1'-0"

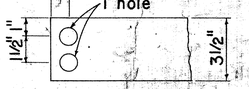


SECTION "B-B"
Scale: 3"= 1'-0"

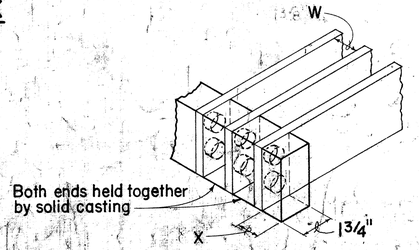
ALTERNATIVE CAST MALLEABLE IRON OR CAST STEEL GRATE



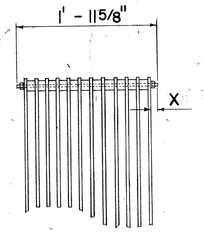
CAST END BLOCK
Scale: 1"= 1'-0"



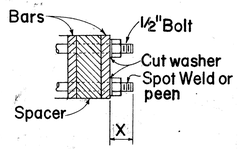
END OF BAR
Scale: 3"= 1'-0"



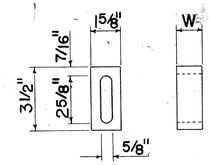
ALTERNATIVE CAST MALLEABLE IRON OR CAST STEEL END BLOCK GRATE



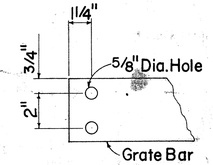
BOLTED END BLOCK
Scale: 1"= 1'-0"



BOLTING DETAIL
Scale: 3"= 1'-0"

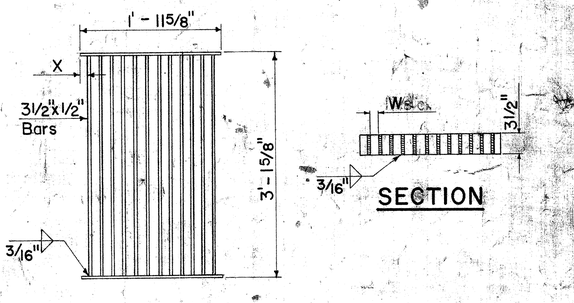


BAR SPACER
Scale: 3"= 1'-0"



END OF BAR
Scale: 3"= 1'-0"

ALTERNATIVE BOLTED GRATE



PLAN
SECTION

ALTERNATIVE WELDED GRATE
Scale: 1"=1'-0"

GENERAL NOTES

1. Contractor has the option of using cast malleable iron, cast steel, welded, bolted, cast malleable iron end block or cast steel end block grate.
2. Grates and Frames shall be hot dip galvanized after fabrication, see specifications.
3. All welds ⅜" unless otherwise noted.
4. Center support assembly shall be used when two or more grates are specified. Incidental to Types A-9 or A-12 Frame and Grates.
5. Refer to "Grate Bar Spacing Table" for Types A-9 and A-12 Grate dimensions.
6. The various materials shall conform to the specifications of ASTM as listed in the following tabulation and the Std. Specifications.

Material	ASTM Designation
Structural Steel	A283, Grade D
Cast Steel	A27, Grade 65-35
Malleable Iron Casting	A47, Gr. No. 35018

GRATE BAR SPACING TABLE			
TYPE	NO. BARS	CLEAR BAR SPACING W	X
A-9	9	2"	1 9/16"
A-12	12	1 3/8"	1 1/4"

NOTE:
1. Type A-9 – Use in locations off the roadbed on all types of highways.
2. Type A-12 – Use within the roadbed on all types of highways.

APPROVAL RECOMMENDED:
HYDRAULIC DESIGN ENGINEER — DATE 12-7-67

APPROVED:
ASSISTANT CHIEF, ENGINEERING — DATE 12-11-67

NO.	REVISION	APPROVED BY	DATE

Scale 1"=1'-0"

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS

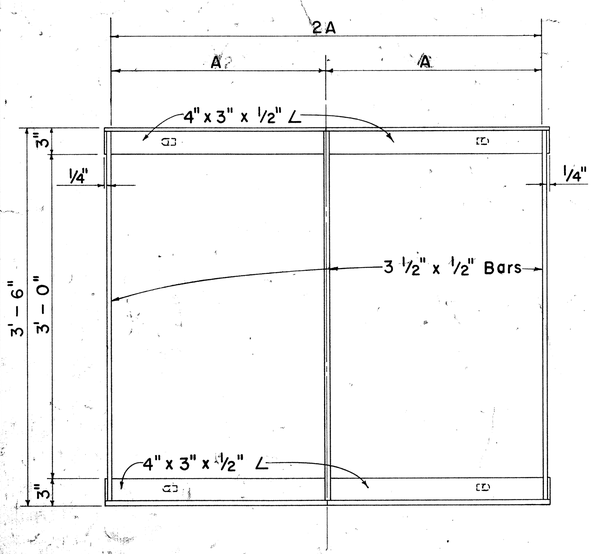
TYPE A-9 AND A-12
FRAMES AND GRATES

Scales: As Noted — Date: Aug. 1968

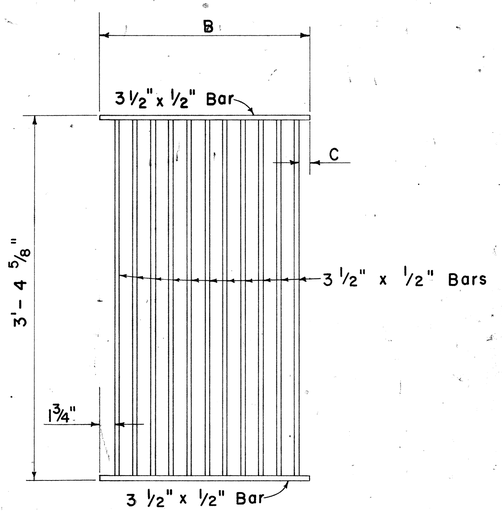
SHEET No. 1 OF 1 SHEETS

ORIGINAL PLANS	SURVEY PLOTTED BY		DATE
	DRAWN BY L.C.L.M.		7/68
	TRACED BY L.C.L.M.		8/68
NOTE BOOK	DESIGNED BY H.K.M.		7/68
No.	QUANTITIES BY		
	CHECKED BY H.K.M.		8/68

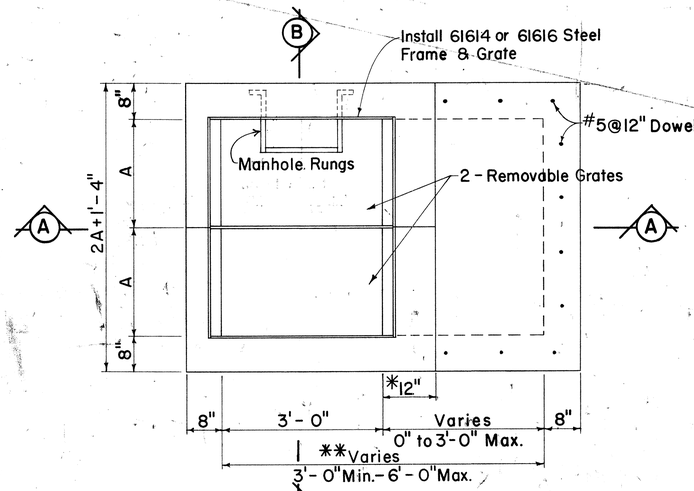
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	M-7600(1)	1978	43	198

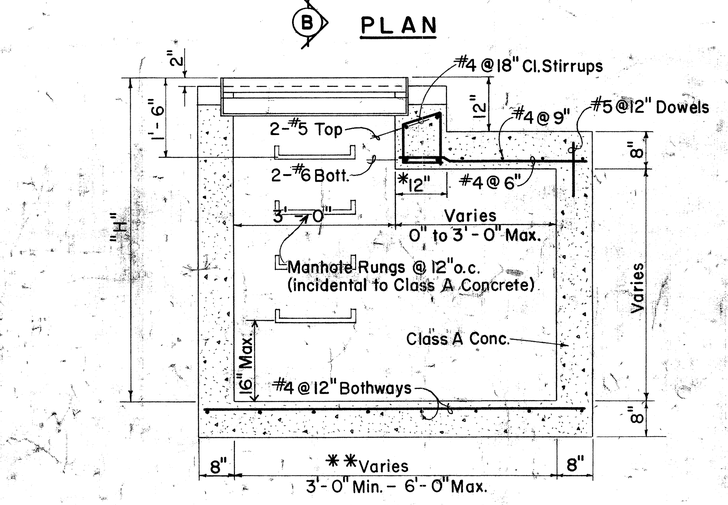


PLAN
Scale: 1 1/2" = 1'-0"

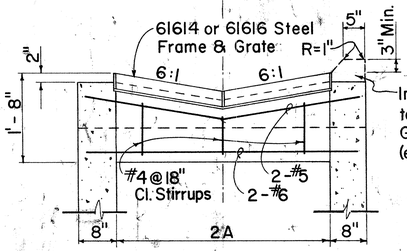


PLAN
Scale: 1 1/2" = 1'-0"





SECTION A-A



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

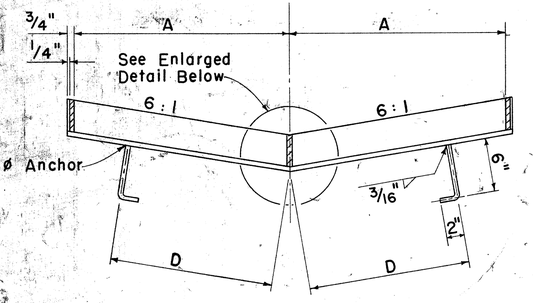
SECTION B-B

DETAILS OF 61614 OR 61616 DROP INTAKE

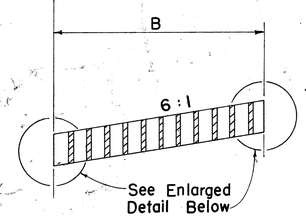
Scale: 3/4" = 1'-0"

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

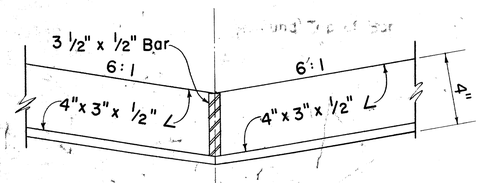
**For Culverts larger than 30", the minimum dimension shall be D'



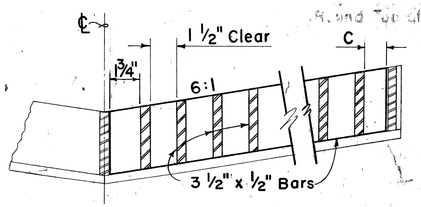
SECTION
Scale: 1 1/2" = 1'-0"



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

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'-11/2"	1/4"	1'-6"
61616	17	3'-0"	2'-1 3/16"	1/8"	2'-6"

NO.	REVISION	APPROVED BY	DATE
1	Curb for Top of Fill Gutters	HY	6-5-69
2	Spacing on manhole rungs to conform to OSHA	HY	12-15-69

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

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS

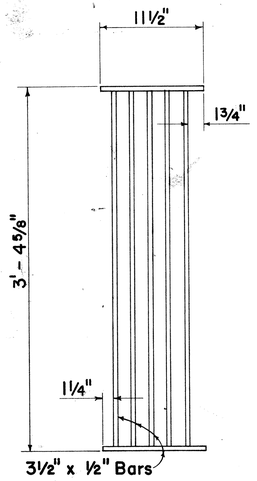
TYPE 61614 & 61616 GRATED DROP INTAKES

Scales: As Noted — Date: Feb. 1969

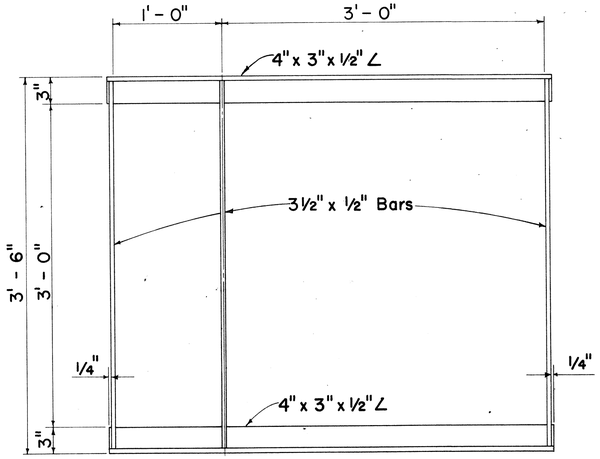
SHEET No. 1 OF 1 SHEETS DH 8

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

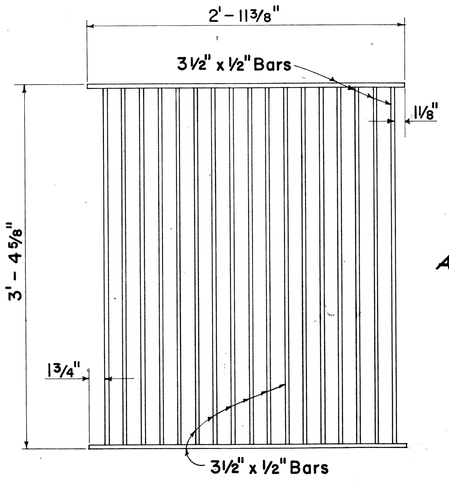
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	M-7600(1)	1978	44	198



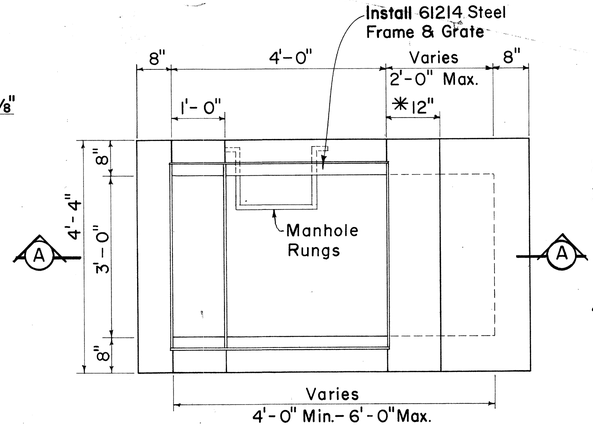
PLAN
Scale: 1½" = 1' - 0"



PLAN
Scale: 1½" = 1' - 0"



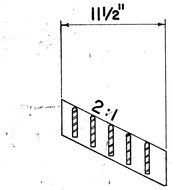
PLAN
Scale: 1½" = 1' - 0"



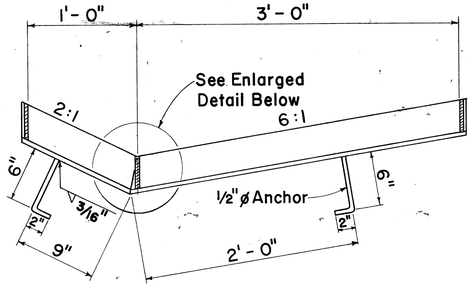
PLAN

GENERAL NOTES

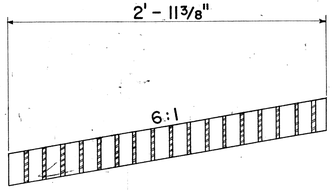
1. Grates and Frames shall be hot dip galvanized after fabrication, see specifications.
2. All welds ⅜" unless otherwise noted.
3. The Frame & Grate materials shall conform to the specifications of ASTM Designation Structural Steel A283, Grade D and the Standard Specifications.
4. Culvert shall leave 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.
5. Manhole Rungs (12"o.c.) are required when "H" is greater than 4 feet 6inches. Only one rung (16 inches from the bottom) is required if "H" is 4 feet 6 inches or less. The Manhole Rungs may be placed at any location as ordered by the Engineer.



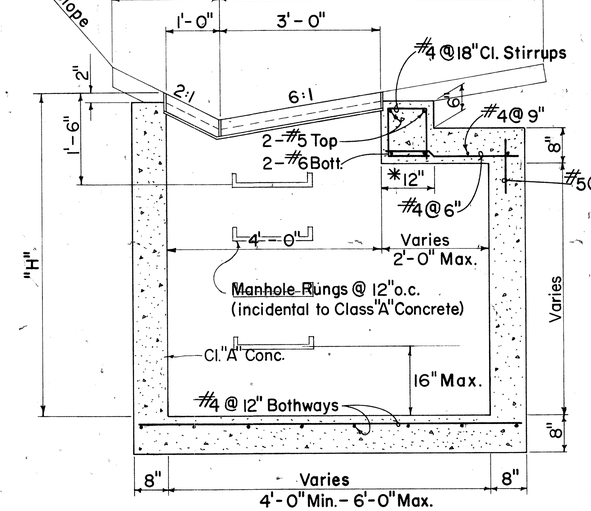
SECTION
Scale: 1½" = 1' - 0"



SECTION
Scale: 1½" = 1' - 0"



SECTION
Scale: 1½" = 1' - 0"



SECTION A - A

DETAIL OF 61214 DROP INTAKE

Scale: ¾" = 1' - 0"

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

NO.	REVISION	APPROVED BY	DATE
1.	Spacing on Manhole Rungs to conform to OSHA.	H-T	1-21-15

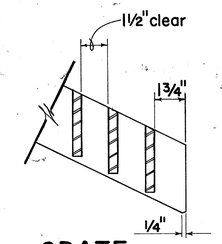
APPROVAL RECOMMENDED:
G. Takano — 12-17-69
HYDRAULIC DESIGN ENGINEER — DATE

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

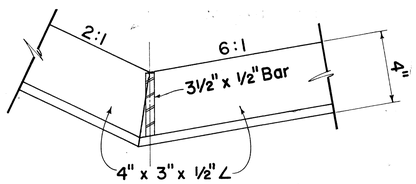
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
STANDARD DETAILS
TYPE 61214
GRATED DROP INTAKE

Scales: As Noted — Date: July 1969

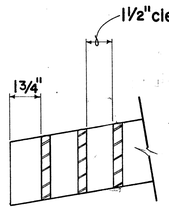
SHEET No. 1 OF 1 SHEETS DH 9



GRATE
Scale: 3" = 1' - 0"



FRAME
Scale: 3" = 1' - 0"

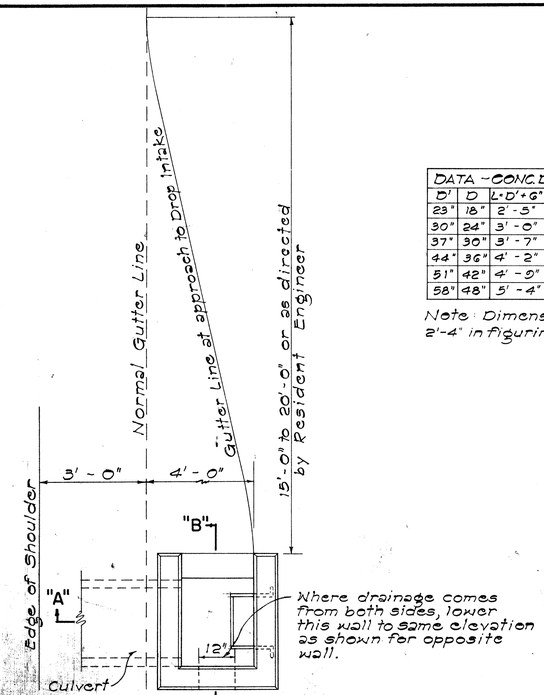


GRATE
Scale: 3" = 1' - 0"

DETAILS OF TYPE 61214 STEEL FRAME AND GRATES

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

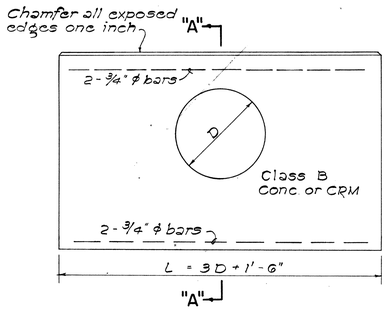
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	M-7600(1)	1978	45	198



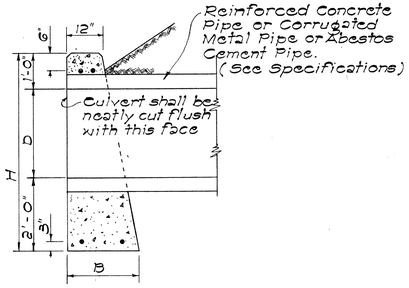
PLAN

DATA - CONC. DROP INTAKE					Where Variable Equals
D'	D	L=D'+6"	S	Cu. Yds.	
23"	18"	2'-5"	8"	1.41	4'-6"
30"	24"	3'-0"	8"	1.72	5'-0"
37"	30"	3'-7"	9"	2.32	5'-6"
44"	36"	4'-2"	9"	2.73	6'-0"
51"	42"	4'-9"	10"	3.54	6'-6"
58"	48"	5'-4"	10"	4.01	7'-0"

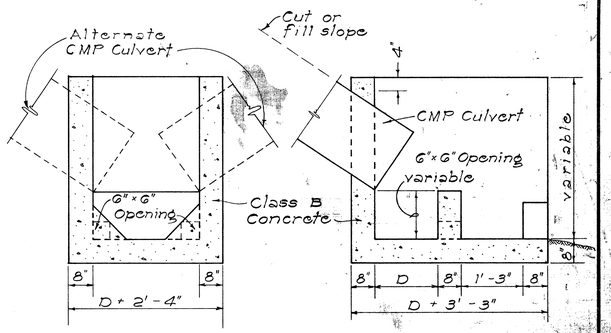
Note: Dimension "X" is assumed as 2'-4" in figuring the above quantities.



ELEVATION



SECTION "A-A"



SECTION "C-C"

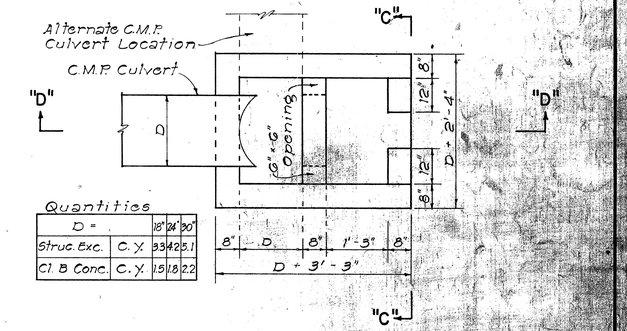
SECTION "D-D"

DATA FOR CONC. HEADWALL				Cl. B CONC. FOR R C P	Cl. B CONC. FOR C M P	Steel For One Headwall			
D	B	L	H	Cu. Yd.	Cu. Yd.	No. of Bars	Size	Length	Lbs.
18"	1'-6"	6'-0"	4'-6"	1.12	1.17	4	¾" ϕ	5'-6"	33
24"	1'-6"	7'-6"	5'-0"	1.52	1.60	4	¾" ϕ	7'-0"	42
30"	2'-0"	9'-0"	5'-6"	2.36	2.49	4	¾" ϕ	8'-6"	51
36"	2'-0"	10'-6"	6'-0"	2.94	3.13	4	¾" ϕ	10'-0"	60
42"	2'-6"	12'-0"	6'-6"	4.19	4.47	4	¾" ϕ	11'-6"	69
48"	2'-6"	13'-6"	7'-0"	5.01	5.36	4	¾" ϕ	13'-0"	78

DATA - MASONRY HEADWALL				CRM FOR R C P	CRM FOR C M P
D	B	L	H	Cu. Yd.	Cu. Yd.
18"	1'-9"	6'-0"	4'-6"	1.24	1.29
24"	2'-0"	7'-6"	5'-0"	1.83	1.92
30"	2'-3"	9'-0"	5'-6"	2.56	2.70
36"	2'-6"	10'-6"	6'-0"	3.45	3.66

DETAIL OF HEADWALL

Scale: ½" = 1'-0"

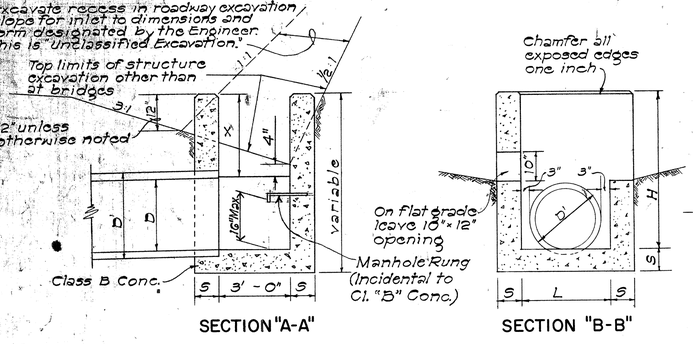


Quantities		
D =	18"	24" 30"
Struc. Exc. C.Y.	93	42 5.1
Cl. B Conc. C.Y.	15	18 22

PLAN

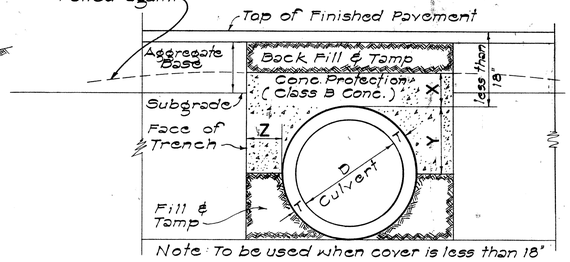
DETAILS OF CONC. DROP BOX AT OUTLET OF CULVERT PIPE

NOT TO SCALE



SECTION "A-A"

SECTION "B-B"



Note: To be used when cover is less than 18"

DETAIL OF CONCRETE DROP INTAKE

Scale: ½" = 1'-0"

GENERAL NOTES

1. Culvert shall enter and leave Drop Intake from any position and in the direction indicated by the plans or ordered by the Engineer.
2. D' shall be the maximum outside dimension of the culvert at the Drop Intake wall.
3. 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 maybe placed at any location as ordered by the Engineer.

DATA FOR CONCRETE PROTECTION OVER CULVERTS		
X	Y	Z
6" for 18" D	$\frac{D}{2}$ + T	Z must be from pipe to face of trench. Minimum = X. Maximum pay quantity will be Z = 12".
7" for 24" D		
8" for 30" D		
9" for 36" D		
10" for 42" D		
11" for 48" D		
12 for 54" D		

SECT. OF CULVERT WITH CONC. PROTECTION

Scale: 1" = 1'-0"

APPROVAL RECOMMENDED:

HYDRAULIC DESIGN ENGINEER — DATE 12-17-69

APPROVED:

ASSISTANT CHIEF, ENGINEERING — DATE 12-17-69

NO.	REVISION	APPROVED BY	DATE
1	Spacing on Manhole Rungs to conform to OSHA.	H.F.	1-21-15

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS

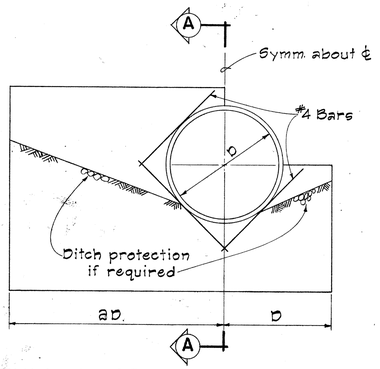
DROP INTAKE, HEADWALL & CONCRETE PROTECTION

Scale: As Noted. Date: Aug. 1967

SHEET No. 1 OF 1 SHEETS DH.10

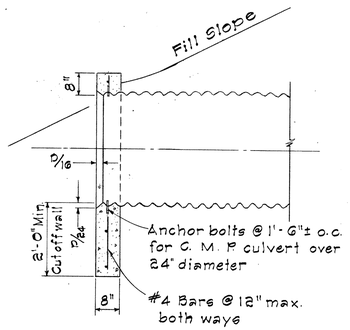
ORIGINAL PLAN | SURVEY PLOTTED BY | DRAWN BY | TRACED BY | DESIGNED BY | NOTE BOOK | CHECKED BY | DATE | No.

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	M-7600(1)	1978	46	198

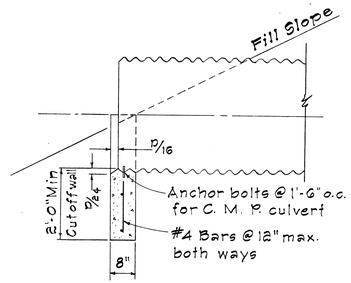


FULL HEADWALL HALF HEADWALL

HALF ELEVATION



FULL HEADWALL



HALF HEADWALL

SECTION A-A

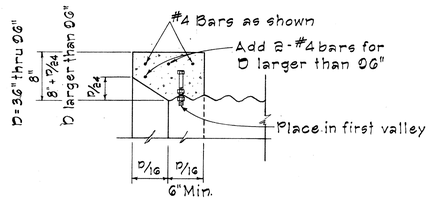
SUMMARY OF QUANTITIES				
Culvert Dia. (inches)	Full Headwall Concrete (Cu. Yd.)	Full Headwall Reinf. Steel (Lbs.)	Half Headwall Concrete (Cu. Yd.)	Half Headwall Reinf. Steel (Lbs.)
18	0.57	45	0.18	15
24	0.85	65	0.26	20
30	1.15	85	0.34	25
36	1.50	115	0.43	35

Note: Quantities shown are for C.M.P. culvert.

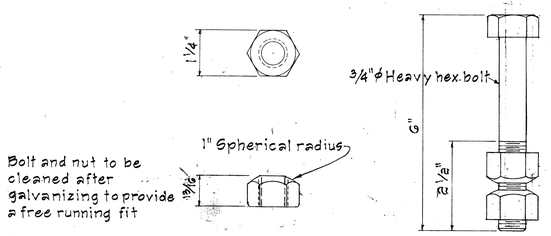
GENERAL NOTES

1. Concrete: All concrete shall be Class A.
2. Cutoff Wall: The depth of wall shown on the plan may be reduced if rock is encountered at a higher elevation.
3. Multiple Pipe Installations: To permit careful placing and tamping of back fill material, clear spacing for multiple pipe installations shall be not less than one-half the diameter of the larger pipe between sides of adjacent pipes, but not required to exceed three feet, and in no case less than one foot.
4. Anchor Bolts: Anchor bolts are not required for concrete pipe.

INLET STRUCTURES FOR CULVERT SIZES 18 IN. TO 36 IN. DIAMETER



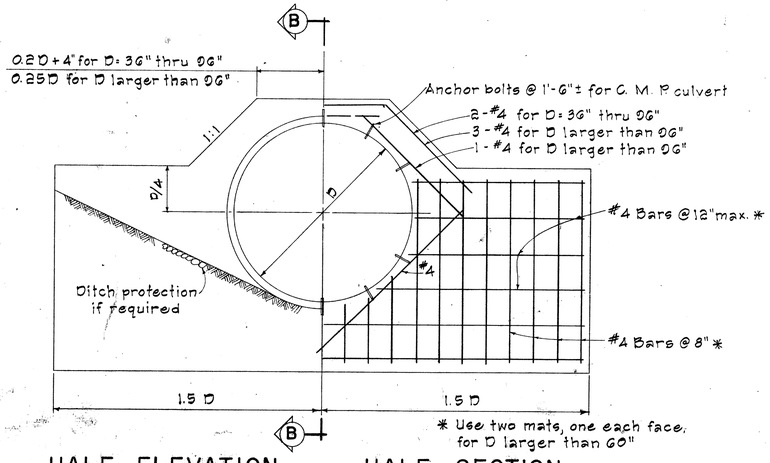
DETAIL C



ANCHOR BOLT DETAIL

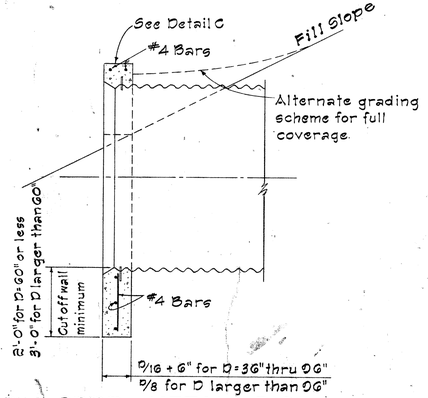
SUMMARY OF QUANTITIES		
Culvert Dia. (inches)	Concrete (Cu. Yd.)	Reinf. Steel (Lbs.)
36	1.0	75
42	1.3	90
48	1.5	105
54	2.0	125
60	2.4	145
72	4.1	435
84	5.6	535
96	6.8	640
108	9.8	795
120	12.4	955
144	20.1	1255
180	37.6	1820

Note: Quantities shown are for C.M.P. culvert.

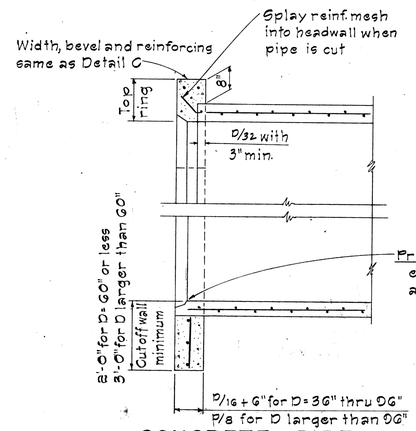


HALF ELEVATION HALF SECTION

SECTION B-B



CORR. METAL PIPE



CONCRETE PIPE

Preferred: Incorporate groove end of pipe into headwall and omit top ring.

INLET STRUCTURE FOR CULVERT SIZES 36 IN. TO 180 IN. DIAMETER

NO.	REVISION	APPROVED BY	DATE

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

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS

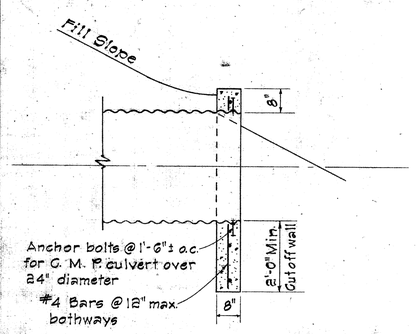
INLET STRUCTURES

Not To Scale — Date: July, 1969

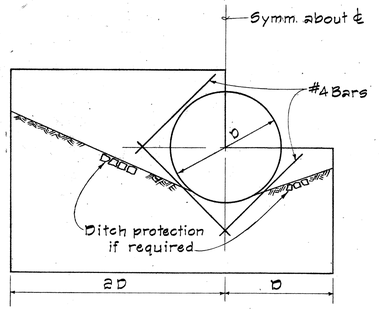
SHEET No. 1 OF 1 SHEETS DH-11

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

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	M-7600(1)	1978	47	198

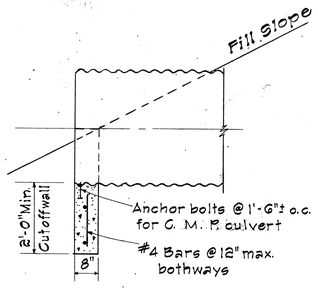


SECTION



HALF ELEVATION

FULL HEADWALL



HALF ELEVATION

SECTION

HALF HEADWALL

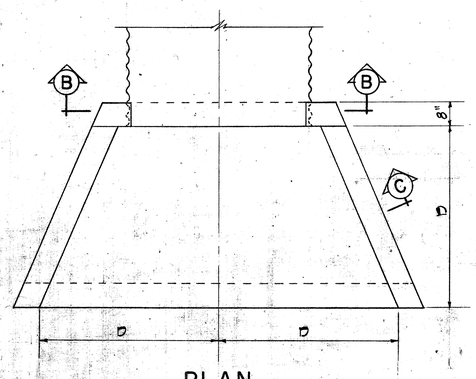
SUMMARY OF QUANTITIES				
Culvert Dia. (inches)	Full Headwall		Half Headwall	
	Concrete (Cu. Yd)	Reinf. Steel (Lbs)	Concrete (Cu. Yd)	Reinf. Steel (Lbs)
18	0.57	45	0.18	15
24	0.85	65	0.26	20
30	1.15	85	0.34	25
36	1.50	115	0.43	35

Note: Quantities shown are for C.M.P. culvert.

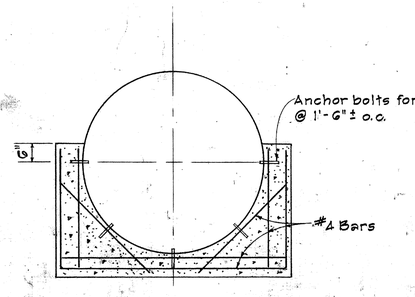
GENERAL NOTES

1. Concrete: All concrete shall be Class A.
2. Cutoff Wall: The depth of wall shown on the plan may be reduced if rock is encountered at a higher elevation.
3. Multiple Pipe Installations: To permit careful placing and tamping of back fill material, clear spacing for multiple pipe installations shall be not less than one-half the diameter of the larger pipe between sides of adjacent pipes, but not required to exceed three feet, and in no case less than one foot.
4. Anchor Bolts: Anchor Bolts are not required for concrete pipe.

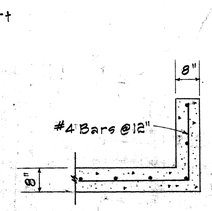
OUTLET STRUCTURE FOR CULVERT SIZES 18 IN. TO 36 IN. DIAMETER



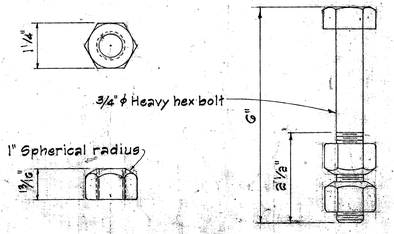
PLAN



SECTION B-B

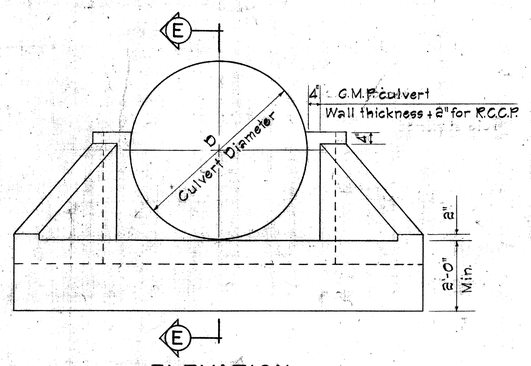


PARTIAL SECTION C

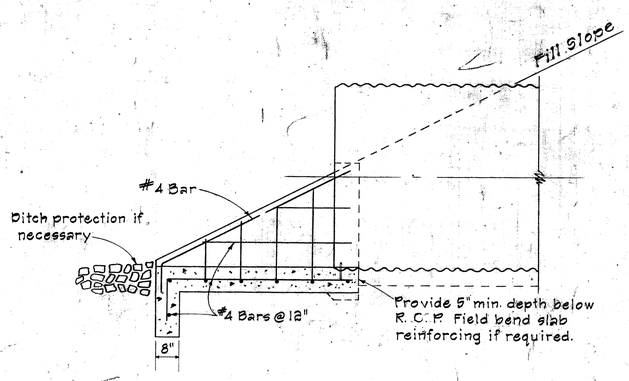


Bolt and nut to be cleaned after galvanizing to provide a free running fit

ANCHOR BOLT DETAIL



ELEVATION



SECTION E-E

SUMMARY OF QUANTITIES		
Culvert Dia. (inches)	Concrete (Cu. Yd.)	Reinf. Steel (Lbs.)
36	1.0	70
42	1.2	90
48	1.5	100
54	1.7	135
60	2.1	140

Note: Quantities shown are for C.M.P. culvert.

OUTLET STRUCTURE FOR CULVERT SIZES 36 IN. TO 60 IN. DIAMETER

NO.	REVISION	APPROVED BY	DATE

APPROVAL RECOMMENDED:

P. Takano — HYDRAULIC DESIGN ENGINEER — 12-17-69 DATE

APPROVED:

Blaine B. Bolan — ASSISTANT CHIEF, ENGINEERING — 12-17-69 DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS

OUTLET STRUCTURES

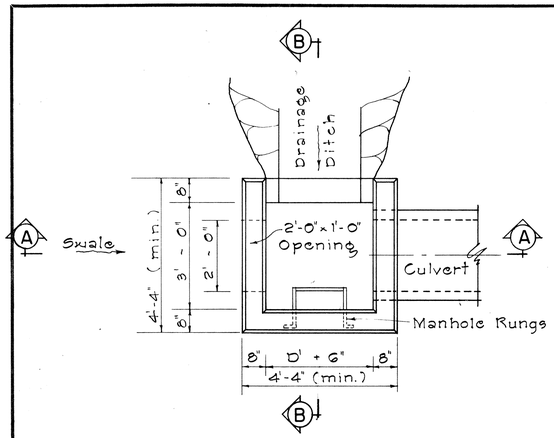
OUTLET STRUCTURES FOR CULVERT SIZES 18" TO 60" DIAMETER

Not To Scale — Date: July, 1969

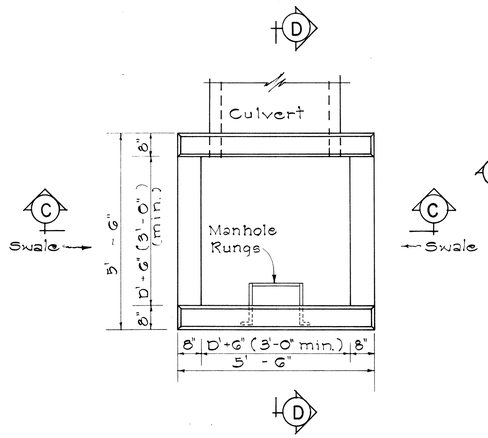
SHEET No. 1 OF 1 SHEETS DH 14

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	
	TRACED BY	
	QUANTITIES BY	
NEXT ROUTE	CHECKED BY	
No.		

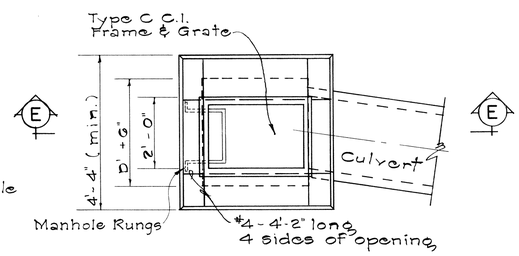
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	M-7600(1)	1978	ADD.475	198



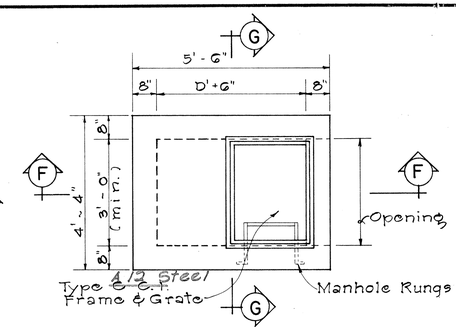
PLAN



PLAN



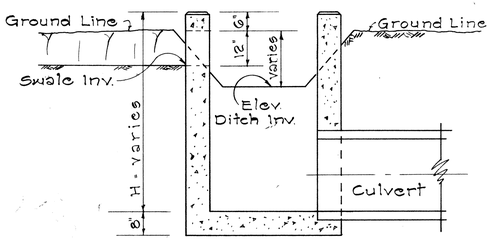
PLAN



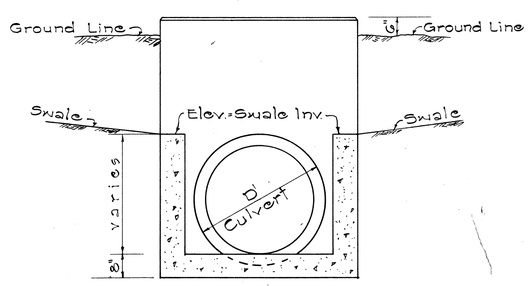
PLAN

GENERAL NOTES

1. All concrete shall be Class "B" unless otherwise noted.
2. Exposed edges of all drainage structures shall be chamfered one inch.
3. Culvert shall enter and leave Drop Intake from any position and in the direction indicated by the plans or ordered by the Engineer.
4. Manhole Rungs (12"o.c.) are req'd. when "H" is greater than 4'-6". Only one rung (16 inches from the bottom) is required if "H" is 4'-6" or less. Manhole Rungs maybe placed at any location as ordered by the Engineer.



SECTION "A-A"



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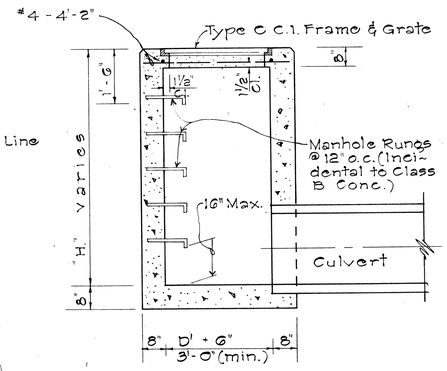
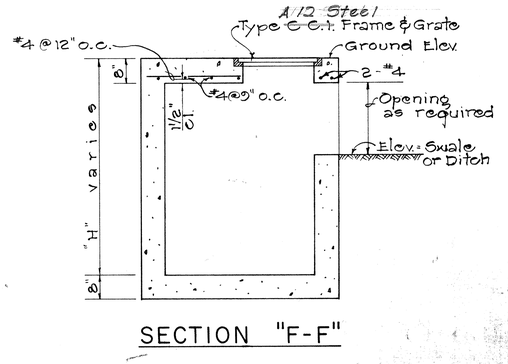


SECTION "E-E"

TYPE "C" GRATED CONCRETE DROP INTAKE

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



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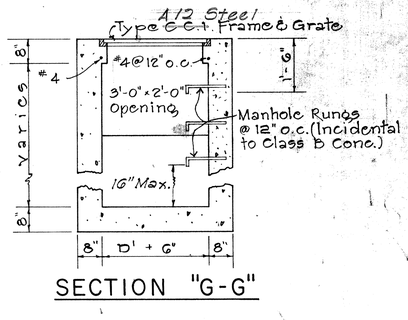

SECTION "G-G"

TYPE "D" GRATED CONCRETE DROP INTAKE

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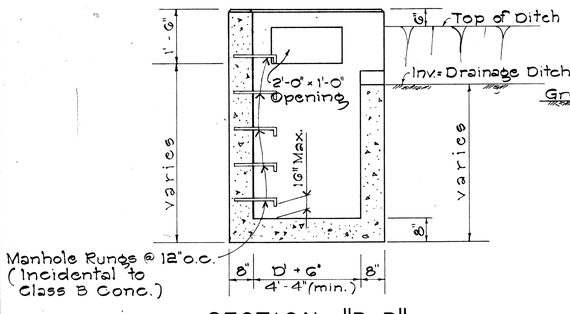
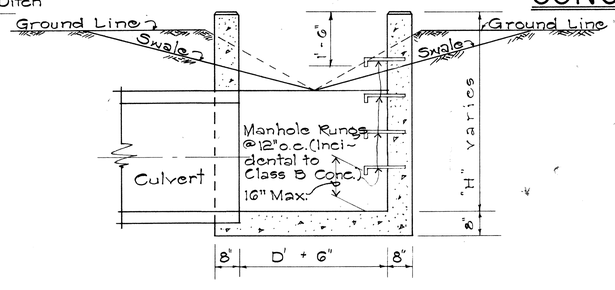


SECTION "B-B"



SECTION "D-D"

TYPE "A" CONCRETE DROP INTAKE

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

TYPE "B" CONCRETE DROP INTAKE

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

APPROVAL RECOMMENDED:
T. Takano — HYDRAULIC DESIGN ENGINEER — 12-17-69 DATE

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

NO.	REVISION	APPROVED BY	DATE
1	Spacing on Manhole Rungs to conform to OSHA.	H.L.	1-21-75

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
STANDARD DETAILS
TYPE "A", "B", "C", AND "D" CONCRETE DROP INTAKE

Scale: As Noted — Date: July, 1969

SHEET No. 1 OF 1 SHEETS DH 19

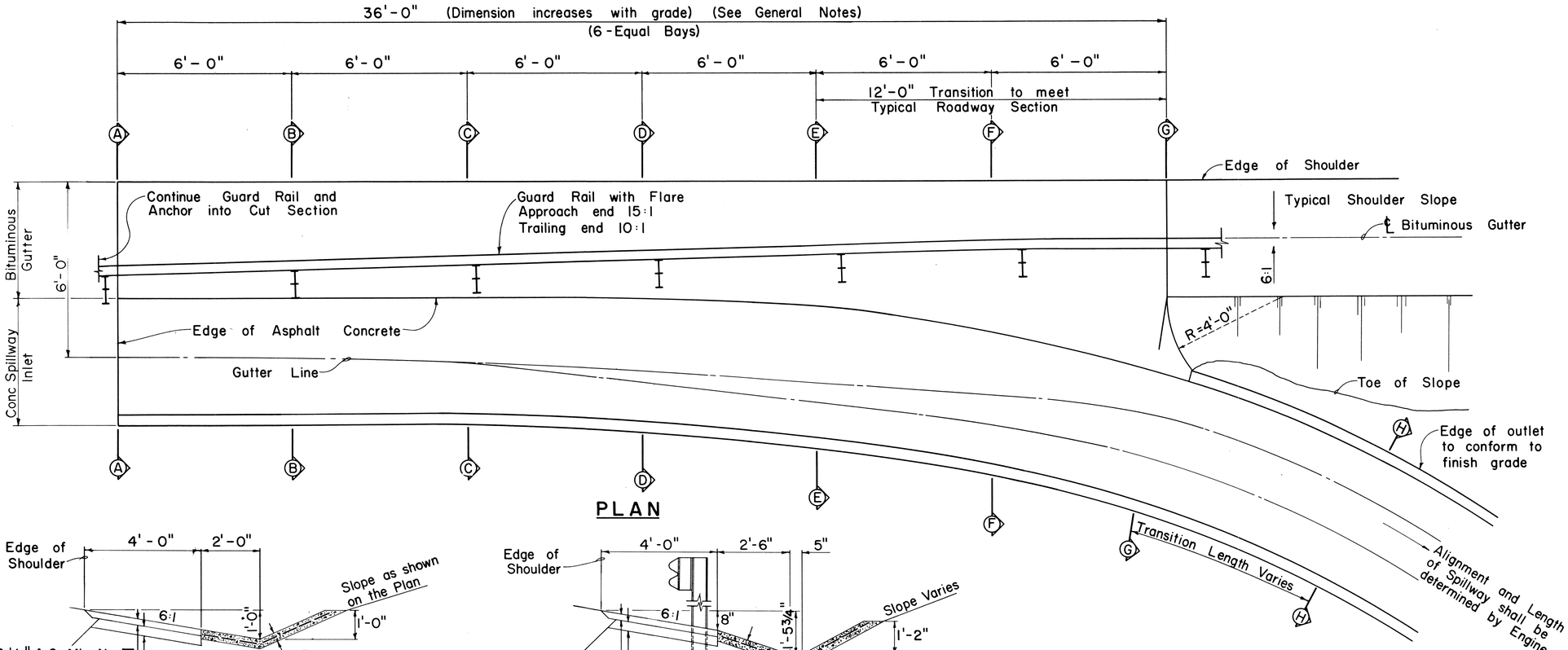
ADD.475-1

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

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	M-7600(1)	1978	48	198

GENERAL NOTES

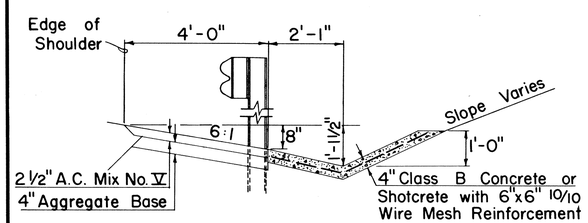
1. If the average grade of pavement for the length from Section A-A to Section G-G exceeds 2%, this length shall be increased in increments of 6' for each 1% increase in average grade of pavement in excess of 2%.



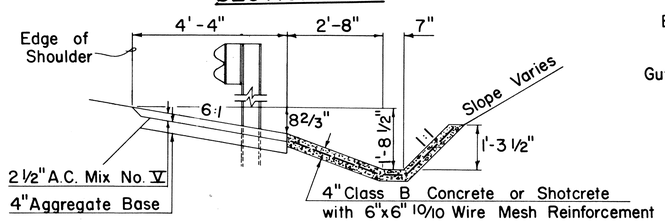
PLAN

SECTION A-A

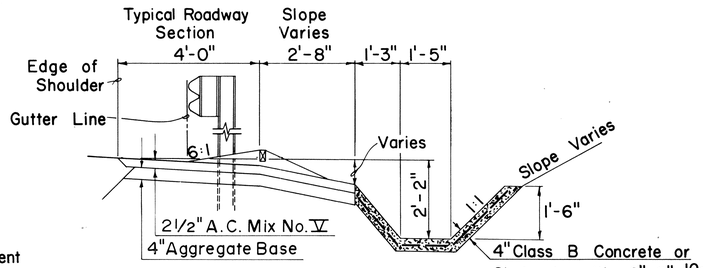
SECTION D-D



SECTION B-B



SECTION E-E



SECTION G-G

SECTION C-C

SECTION F-F

SECTION H-H

NO.	REVISION	APPROVED BY	DATE

APPROVAL RECOMMENDED:

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

APPROVED:

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS

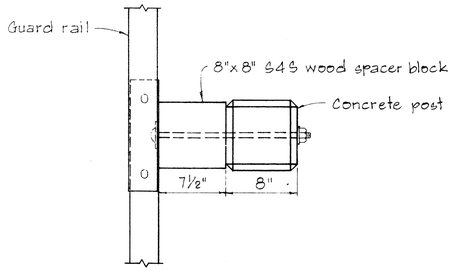
CONCRETE SPILLWAY INLET

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

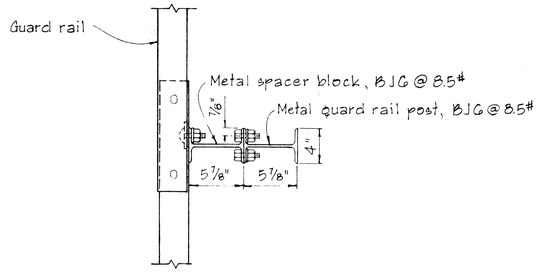
SHEET No. 1 OF 1 SHEETS DH 20

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

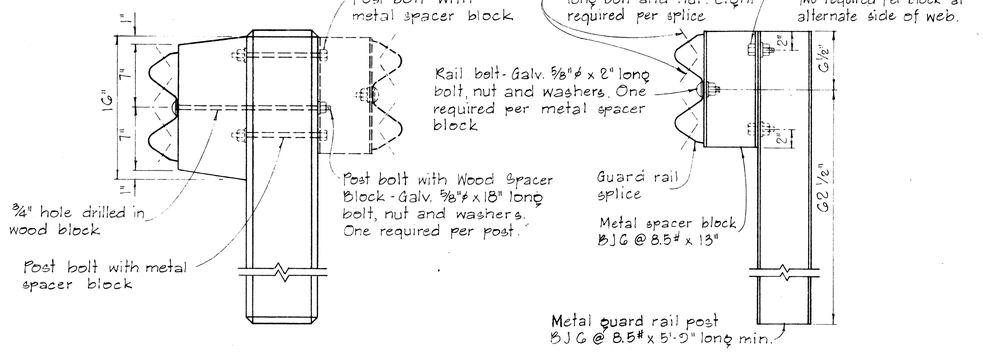
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	M-7600(1)	1978	49	198



PLAN

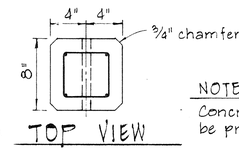


PLAN



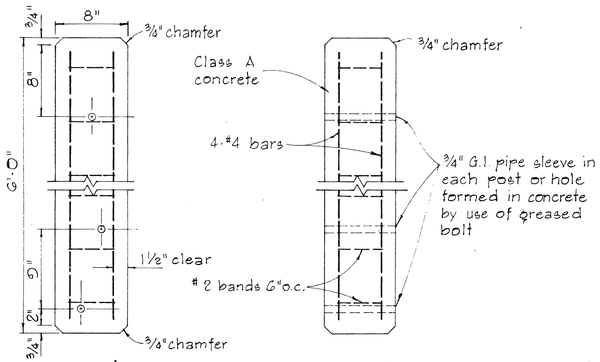
SINGLE METAL GUARD RAIL ON METAL POST WITH METAL SPACER BLOCK

SCALE: 1½" = 1'-0"



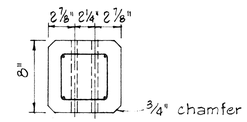
TOP VIEW

NOTE:
Concrete post shall be precast



FRONT VIEW

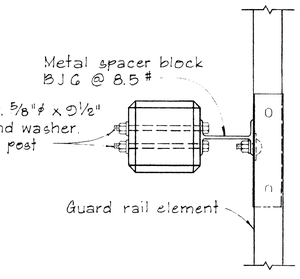
SIDE VIEW



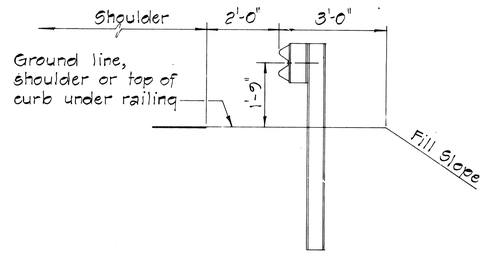
BOTTOM VIEW

DETAIL OF CONCRETE POST

SCALE: 1½" = 1'-0"



PLAN



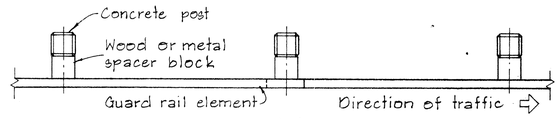
AT SHOULDER SECTION

SINGLE METAL GUARD RAIL ON PRECAST CONCRETE POST WITH WOOD OR METAL SPACER BLOCK

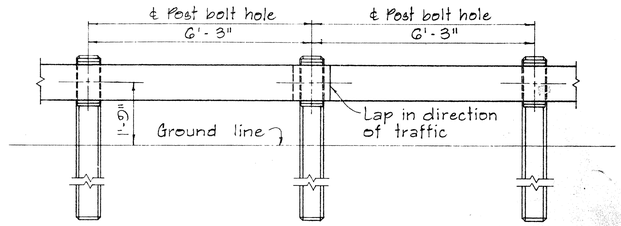
SCALE: 1½" = 1'-0"

TYPICAL METAL GUARD RAIL DETAIL

SCALE: ½" = 1'-0"



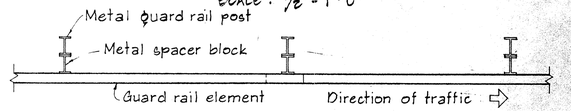
PLAN



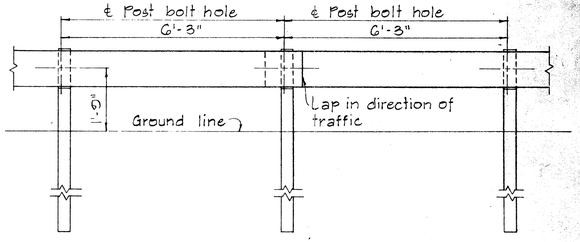
ELEVATION

METAL GUARD RAIL ON CONCRETE POST WITH WOOD OR METAL SPACER BLOCK

SCALE: ½" = 1'-0"



PLAN



ELEVATION

METAL GUARD RAIL ON METAL POST WITH METAL SPACER BLOCK

SCALE: ½" = 1'-0"

APPROVAL RECOMMENDED:
Eiichi Tanaka — TRAFFIC ENGINEER — 12/23/69 DATE

APPROVED:
Hubert S. Schrock — ASSISTANT CHIEF, ENGINEERING — 12-30-69 DATE

NO.	REVISION	APPROVED BY	DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION

STANDARD DETAILS

METAL GUARD RAIL

SCALE: AS SHOWN — NOV. 1968

SHEET No. 1 OF 1 SHEETS | DT 500

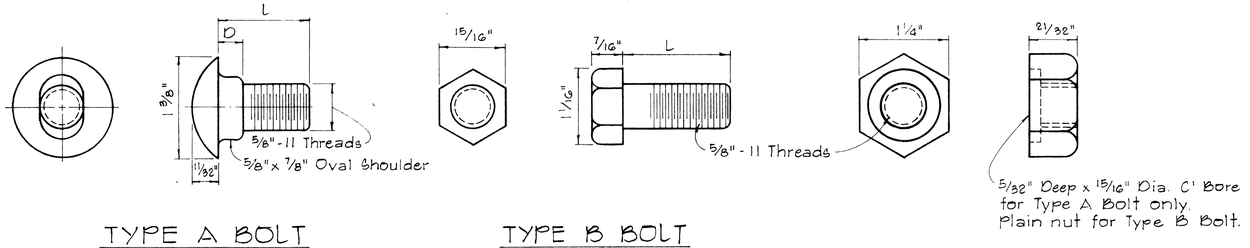
ORIGINAL PLAN
SURVEY PLOTTED BY
DRAWN BY
TRACED BY
DESIGNED BY
QUANTITIES BY
CHECKED BY
DATE
NOTE BOOK
No.

PRINTED ON NO. 1000H CLEARPRINT

BOLT DIMENSIONS		
TYPE A BOLT	D	L
Splice Bolt	5/16"	1 1/4"
Post Bolt for Conc. Post w/ Double Wood Blocks	3/32"	24"
Post Bolt for Conc. Post w/ Single Wood Block	3/32"	18"
Rail Bolt for Metal Block	3/32"	2"

BOLT DIMENSIONS	
TYPE B BOLT	L
Post Bolt for Conc. Post w/ Metal Blocks	9 1/2"
Post Bolt for Metal Post w/ Metal Block	1 3/4"

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	M-7600(1)	1978	50	198



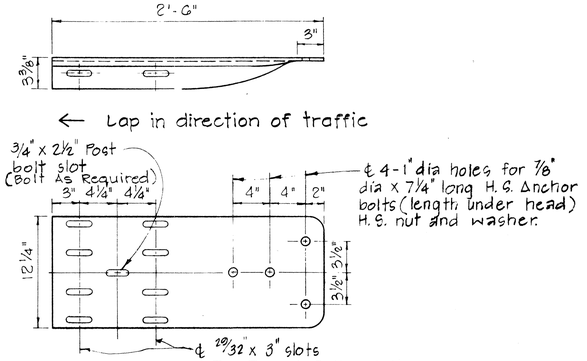
TYPE A BOLT TYPE B BOLT

SPLICE RAIL AND POST BOLTS

Scale : Full Size

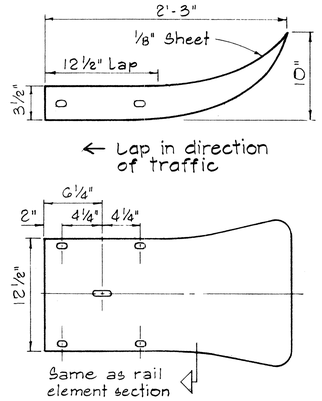
HEXAGON NUT

Scale: Full Size



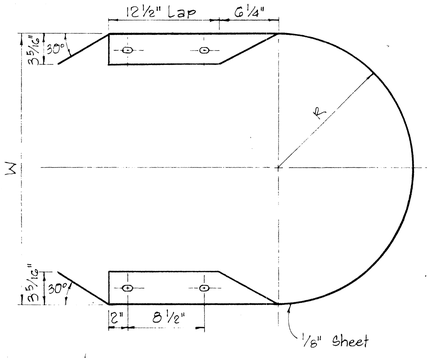
SPECIAL END SHOE

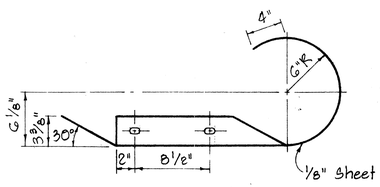
Scale : 1 1/2" = 1'-0"

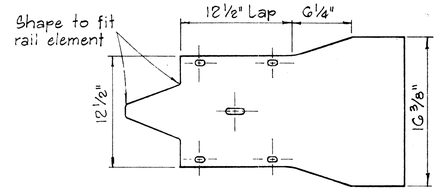


FLARED END

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

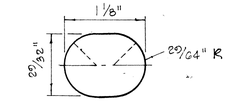




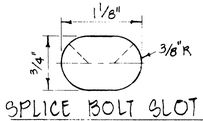


CURVED END

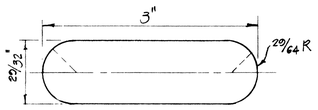
Scale: 1 1/2" = 1'-0"



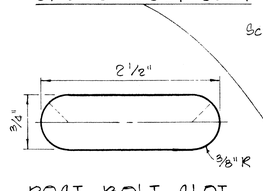
SPLICE BOLT SLOT



SPLICE BOLT SLOT FOR ALL ENDS

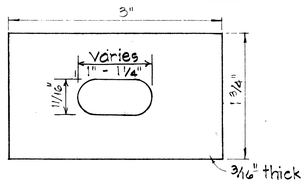


SPLICE BOLT SLOT FOR SPECIAL END SHOE

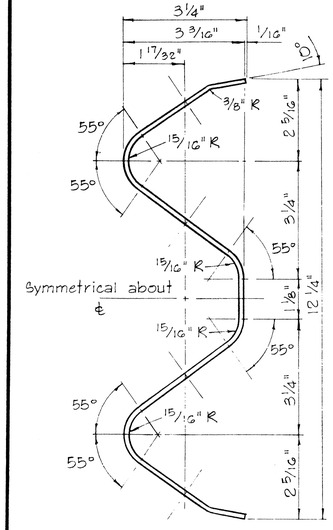


POST BOLT SLOT

Scale: Full Size

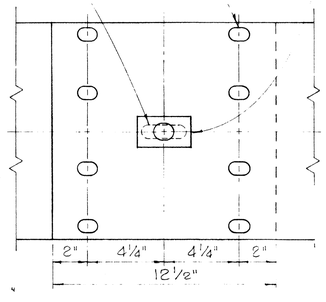


RAIL WASHER



RAIL ELEMENT SECTION

Scale: 6"=1'-0"

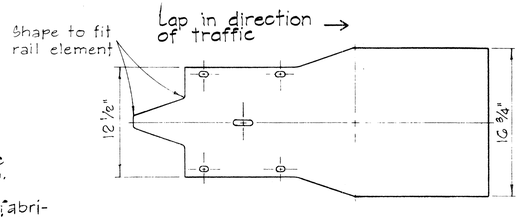


RAIL SPLICE

Scale: 3"=1'-0"

NOTES:

1. H.S. Bolts shall conform to the requirements of ASTM A 325.
2. Special End Shoe shall be fabricated from 10 Gage steel conforming to the requirements of AASHO M180.



MEDIAN END

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

MEDIAN END DIMENSIONS		
TYPE OF POST AND BLOCK	W	R
Double Metal Guard Rail on Concrete Post with Wood Blocks	29 3/4"	14 7/8"
Double Metal Guard Rail on Concrete Post with Metal Blocks (BJG)	26 1/2"	13 1/4"
Double Metal Guard Rail on Metal Post with Metal Blocks (BJG)	24 3/8"	12 3/16"

NO.	REVISION	APPROVED BY	DATE
1	Revised Hole Size for Rectangular Rail Washer	H.T.	8/10/77

APPROVAL RECOMMENDED:
Eiichi Tanaka — TRAFFIC ENGINEER — 12/29/69 DATE

APPROVED:
Hideo Sato — ASSISTANT CHIEF, ENGINEERING — 12-30-69 DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION

STANDARD DETAILS
METAL GUARD RAIL

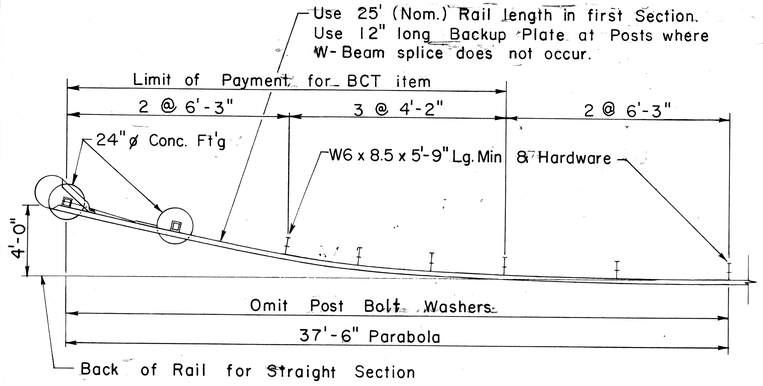
Scale: As Noted — August, 1968

SHEET No. 1 OF 1 SHEETS | DT 501

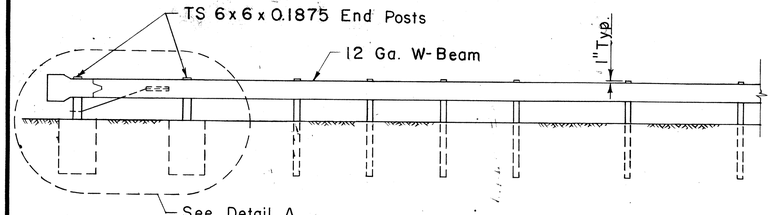
ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	
No.	TRACED BY	
	DESIGNED BY	
	QUANTITIES BY	
	CHECKED BY	

PRINTED ON NO. 1000H CLEARPRINT

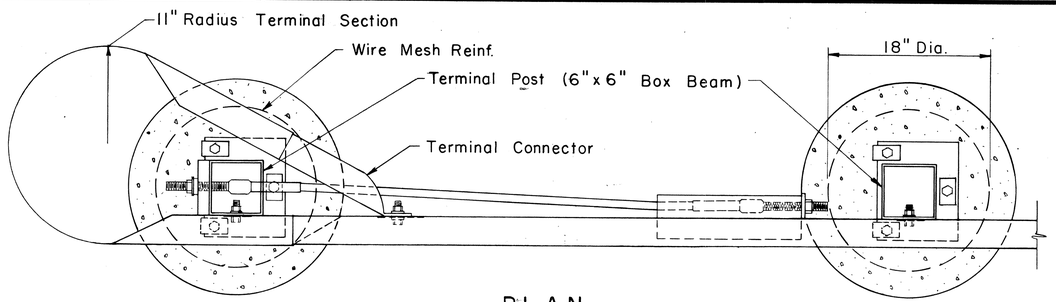
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	M-7600(1)	1978	51	198



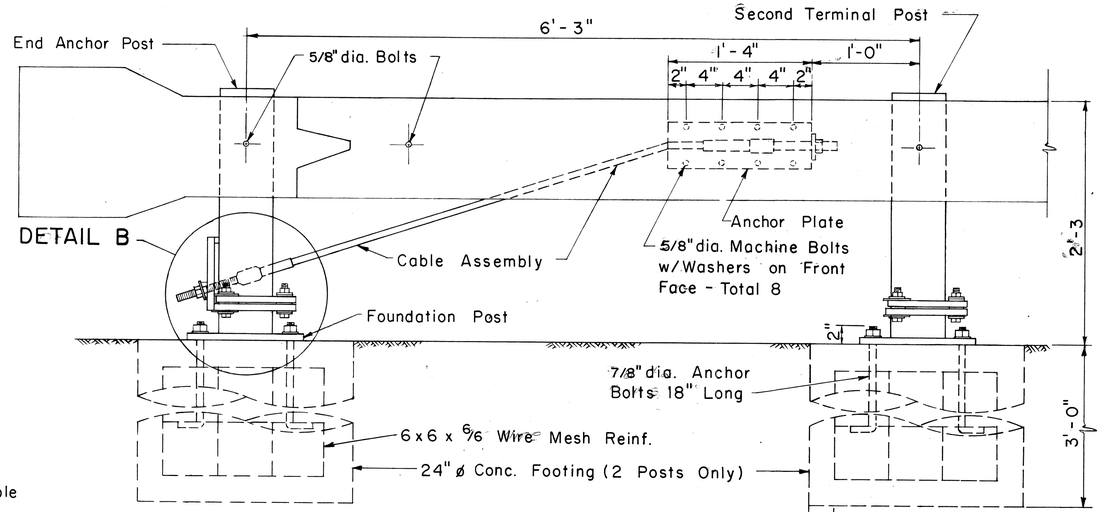
PLAN
Scale: 1/4" = 1'-0"



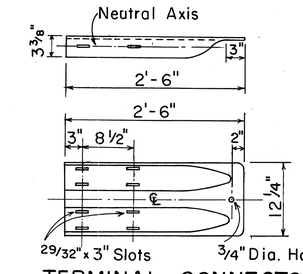
ELEVATION
Scale: 1/4" = 1'-0"



PLAN



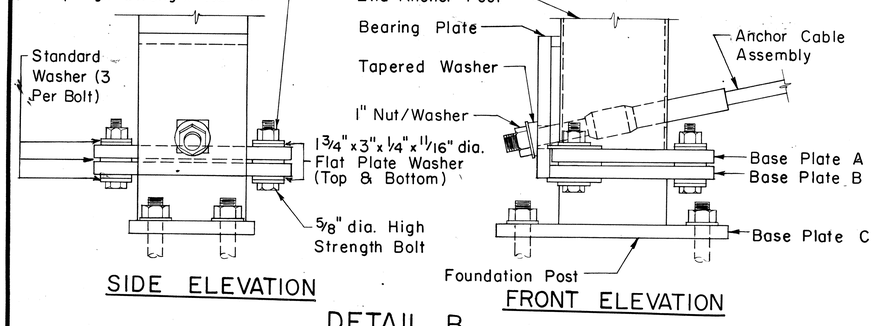
ELEVATION
DETAIL A
Scale: 1 1/2" = 1'-0"



TERMINAL CONNECTOR
Scale: 1" = 1'-0"

NOTES:

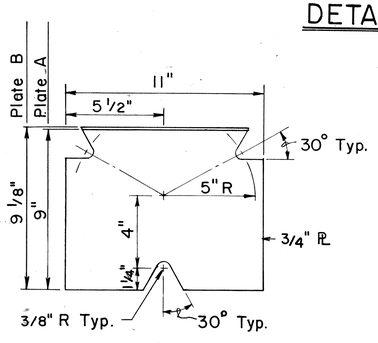
1. Anchor Plate and Anchor Cable Assembly (Standard Swaged Fitting and Stud). See Standard Detail Sheet No. DT 520.
2. Other Anchor Cable Assemblies may be used. Minimum breaking strength of assembly should be 40,000 lbs.
3. Second Terminal Post does not require holes to accomodate Anchor Cable.
4. Slip Base Load shall be controlled with a Calibrated Torque Wrench - Torque 155 - 170 ft. lbs.
5. Concrete shall be Class A.



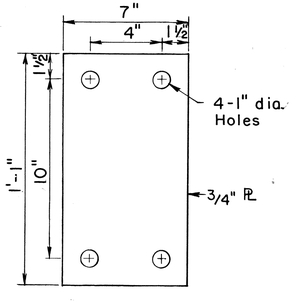
SIDE ELEVATION

FRONT ELEVATION

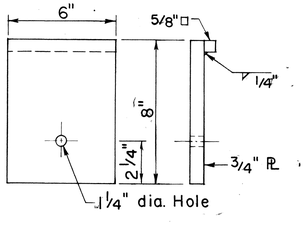
DETAIL B



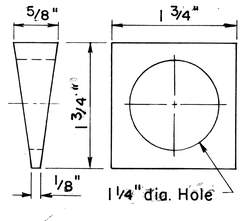
BASE PLATES A & B
Scale: 3" = 1'-0"



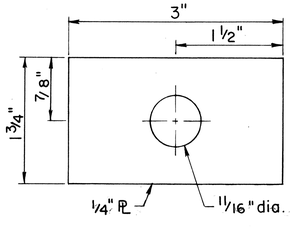
BASE PLATE C
Scale: 3" = 1'-0"



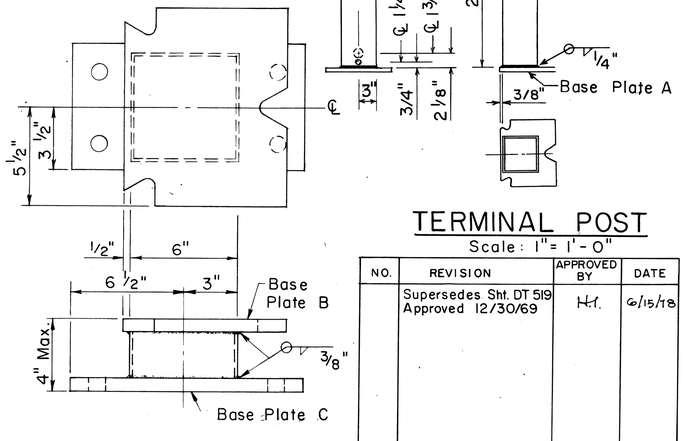
BEARING PLATE
Scale: 3" = 1'-0"



TAPERED WASHER
Scale: Full Size



FLAT PLATE WASHER
Scale: Full Size



FOUNDATION POST
Scale: 3" = 1'-0"

TERMINAL POST
Scale: 1" = 1'-0"

APPROVAL RECOMMENDED:

Eiichi Tanaka — TRAFFIC ENGINEER — 6/14/78 DATE

APPROVED:

Theodore Zaleski — ASSISTANT CHIEF, ENGINEERING — 6/15/78 DATE

NO.	REVISION	APPROVED BY	DATE
	Supersedes Sht. DT 519 Approved 12/30/69	H.I.	6/15/78

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION

STANDARD DETAIL

BREAKAWAY CABLE TERMINAL (BCT)

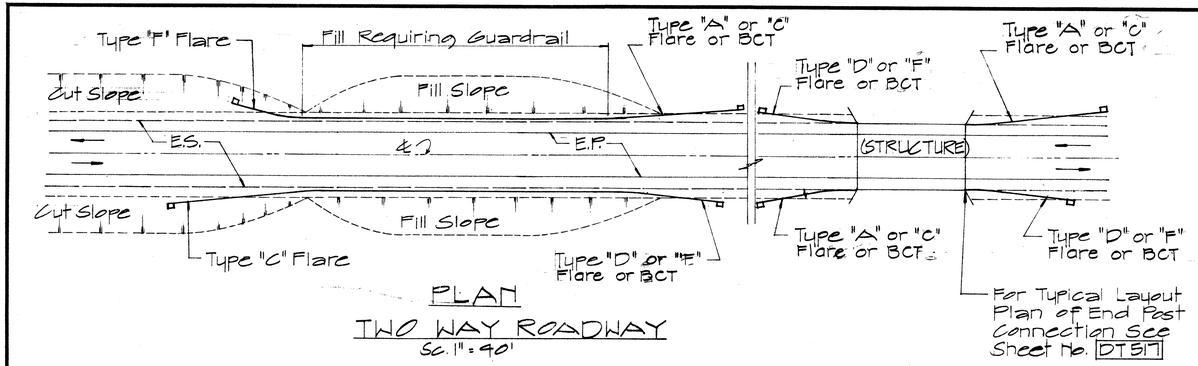
Scale: As Shown — Date: June 1978

SHEET No. OF SHEETS DT 519

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

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	M-7600(1)	1978	52	198

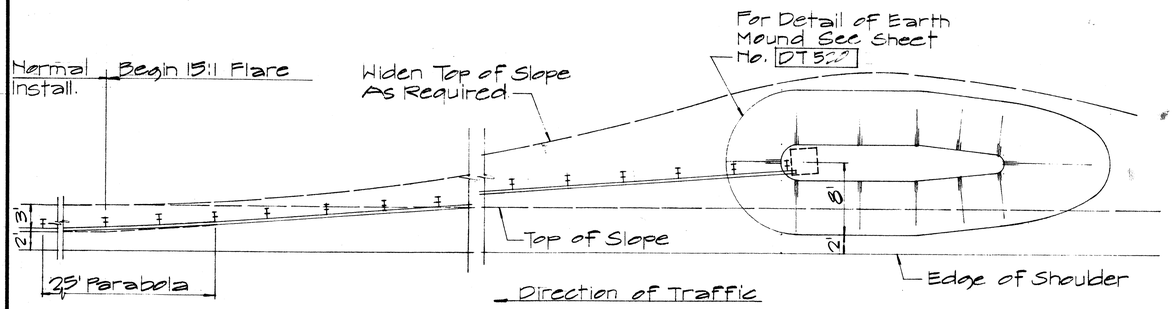
NOTE:
1. Metal guard rail connection to structures requires End Post Connection. See structure plans.
2. For detail of Breakaway Cable Terminal (BCT) See Sheet No. DT 519



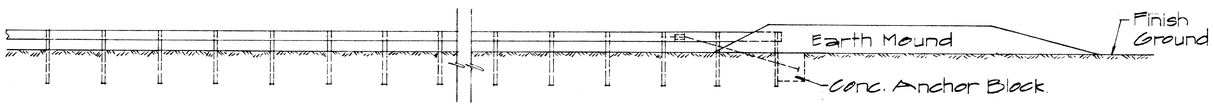
PLAN

TWO WAY ROADWAY

Sc. 1" = 40'



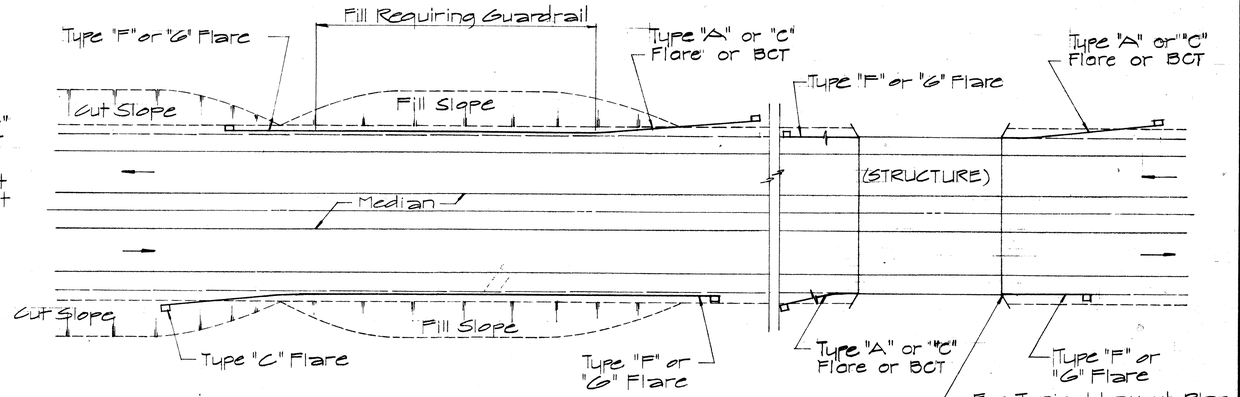
PLAN



ELEVATION

TYPE "A" FLARE

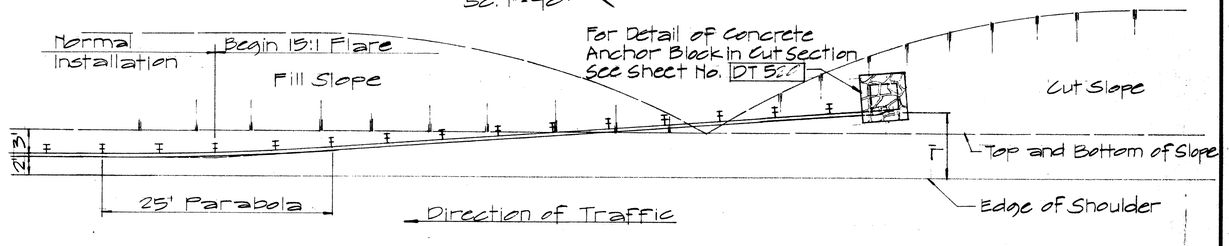
Sc. 1/8" = 1'-0"



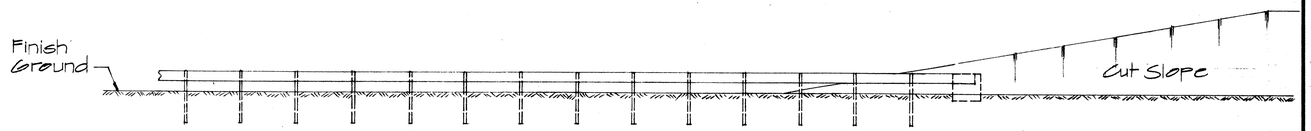
PLAN

ONE WAY ROADWAY (DIVIDED HIGHWAY)

Sc. 1" = 40'



PLAN



ELEVATION

TYPE "C" FLARE

Sc. 1/8" = 1'-0"

APPROVAL RECOMMENDED:
Eiichi Tanaka — TRAFFIC ENGINEER — 12/29/69 DATE

APPROVED:
ASSISTANT CHIEF, ENGINEERING — 12-30-69 DATE

NO.	REVISION	APPROVED BY	DATE
1	Delete Type "B" Flare and Type "E" Flare	H.T.	6/15/78
	"		

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION

STANDARD DETAILS OF APPROACH END FLARE - ONE & TWO WAY ROADWAY

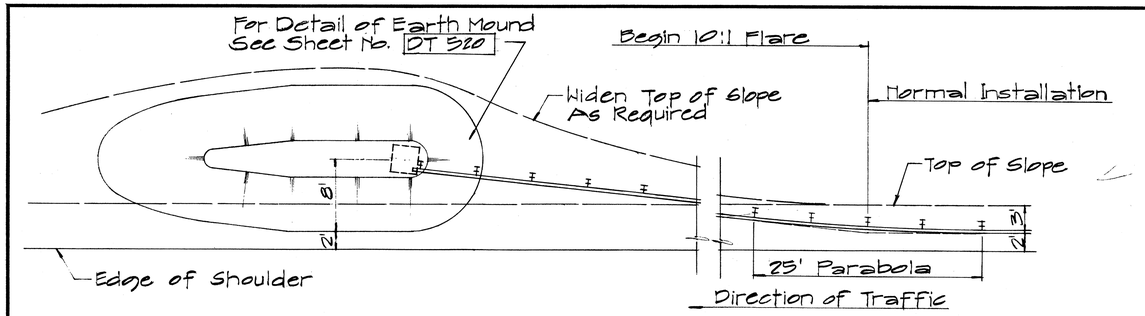
Sc. As Noted — April 1969

SHEET No. OF SHEETS DT 516

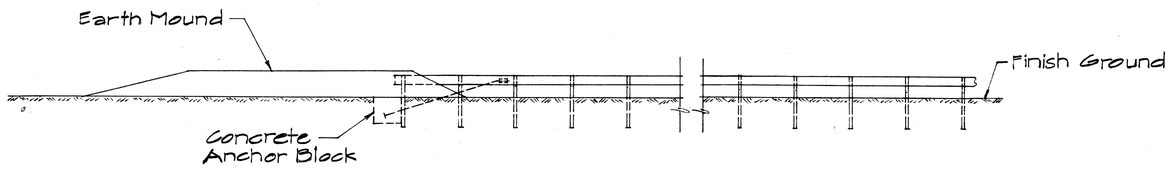
ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	
NOTE BOOK	TRACED BY	
No.	DESIGNED BY	
	QUANTITIES BY	
	CHECKED BY	

PRINTED ON NO. 1000H CLEARPRINT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	M-7600(1)	1978	53	198



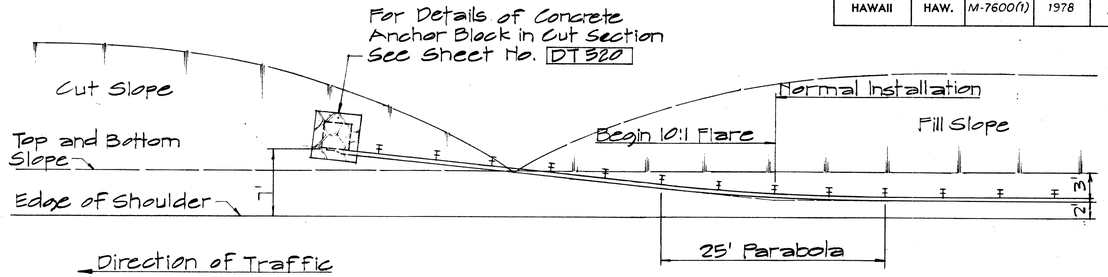
PLAN



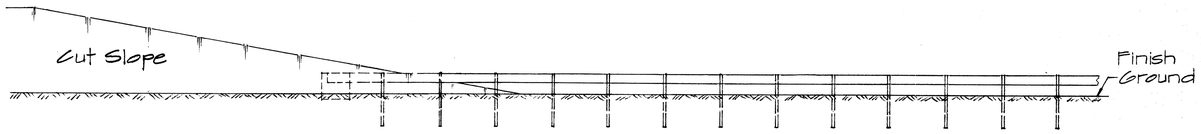
ELEVATION

TYPE "D" FLARE

Sc. 1/8" = 1'-0"



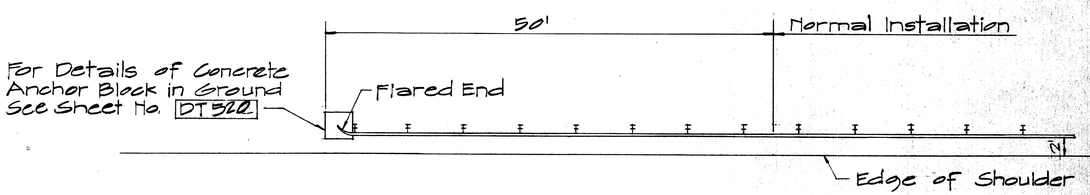
PLAN



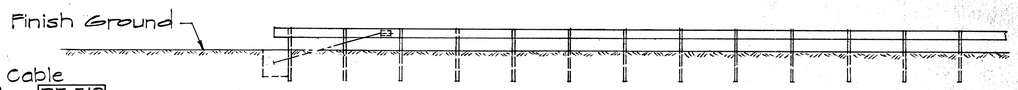
ELEVATION

TYPE "F" FLARE

Sc. 1/8" = 1'-0"



PLAN

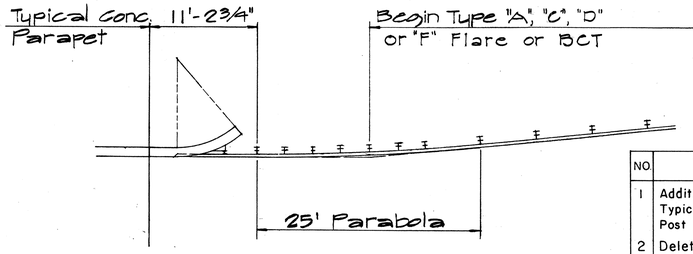


NOTE:
For detail of Breakaway Cable Terminal (BCT) See Sheet No. DT 517

ELEVATION

TYPE "G" FLARE

Sc. 1/8" = 1'-0"



TYPICAL LAYOUT PLAN OF END POST CONNECTION

Sc. 1/8" = 1'-0"

APPROVAL RECOMMENDED:
Eiichi Tanaka — TRAFFIC ENGINEER — 12/29/69 DATE

APPROVED:
[signature] — ASSISTANT CHIEF, ENGINEERING — 12-30-69 DATE

NO.	REVISION	APPROVED BY	DATE
1	Additional Posts Added to Typical Layout Plan Of End Post Connection	H.T.	4-12-72
2	Delete Type "B" Flare and Type "E" Flare	H.T.	6-15-78

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION

STANDARD DETAILS TRAILING END FLARE - ONE & TWO WAY ROADWAY

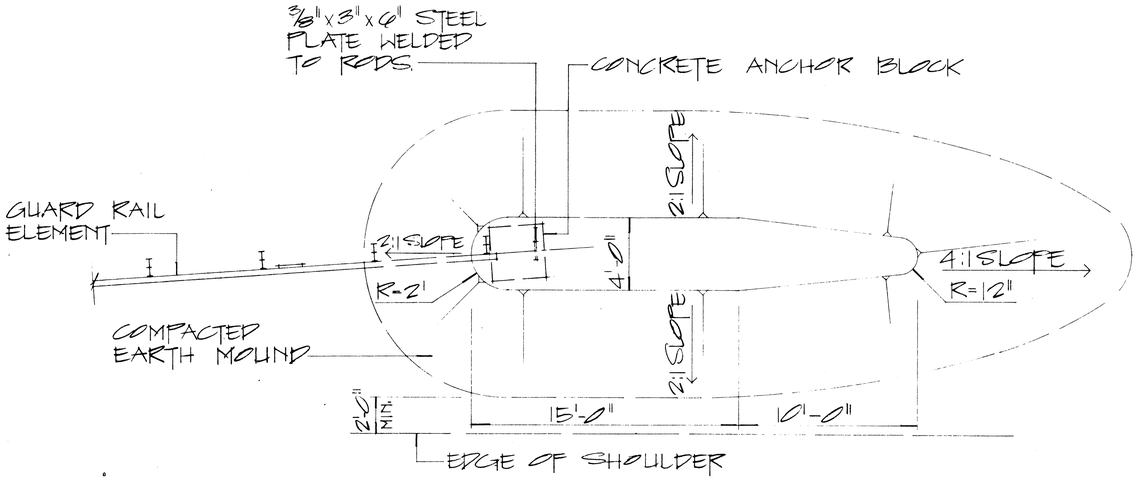
Scale: As Noted — April 1969

SHEET No. OF SHEETS | DT 517

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

PRINTED ON NO. 1000H CLEARPRINT

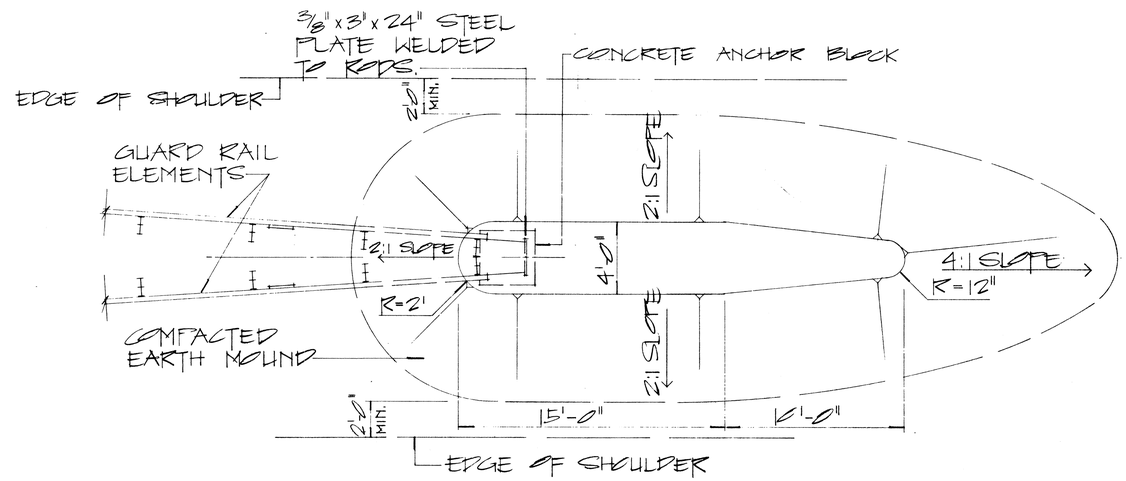
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	M-7600(1)	1978	54	198



PLAN

EARTH MOUND DETAIL (SINGLE GUARD RAIL)

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

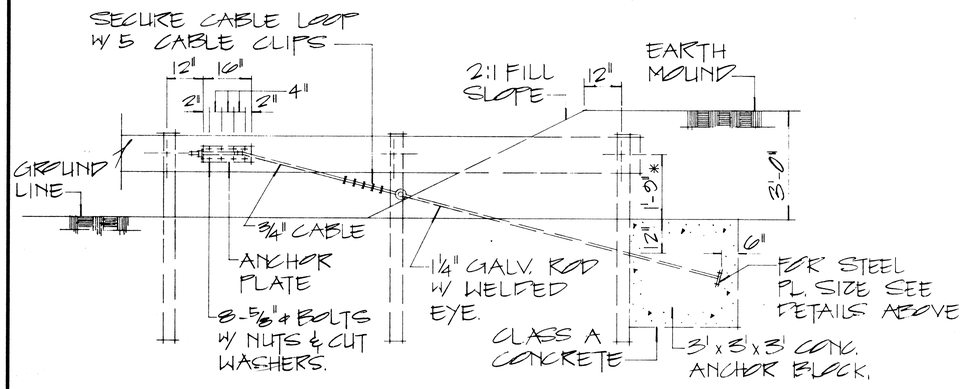


PLAN

EARTH MOUND DETAIL (DOUBLE GUARD RAIL)

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

*NOTE: 2'-0" WHEN INSTALLED WITH RUB RAIL.

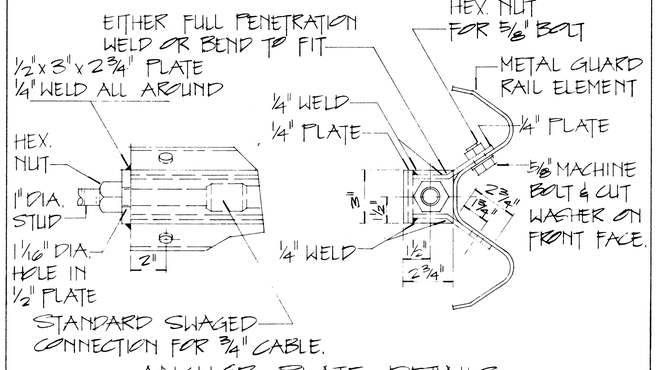


ANCHOR BLOCK DETAIL IN EARTH MOUND

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

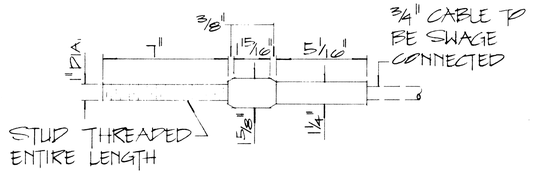
NOTE:

1. GALVANIZED ANCHOR ROD, METAL GUARD RAIL AND POST BURIED IN GROUND SHALL BE COVERED WITH a Min. 20-Mil thickness of Coal TAR ENAMEL, Conforming to AWWA Standard: C 203
2. CONCRETE, GRP., EXCAVATION, EARTH MOUND, ANCHOR RODS AND MISCELLANEOUS APPURTENANCES NECESSARY TO ANCHOR THE GUARD RAIL ENDS SHALL BE INCIDENTAL TO THE METAL GUARD RAIL.



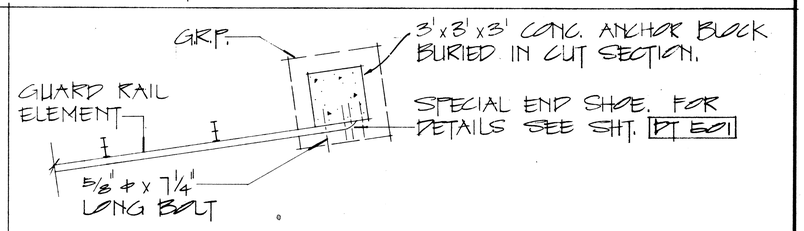
ANCHOR PLATE DETAILS

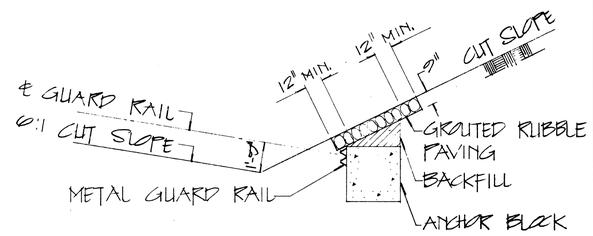
SCALE: 1" = 3"



STANDARD SWAGED FITTING AND STUD

SCALE: 1" = 3"





ANCHOR BLOCK IN CUT SECTION

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

APPROVAL RECOMMENDED:

Eiichi Tanaka — TRAFFIC ENGINEER — 12/23/69 DATE

APPROVED:

[signature] — ASSISTANT CHIEF, ENGINEERING — 12-30-69 DATE

NO.	REVISION	APPROVED BY	DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION

STANDARD DETAILS

EARTH MOUND AND ANCHOR BLOCK DETAILS

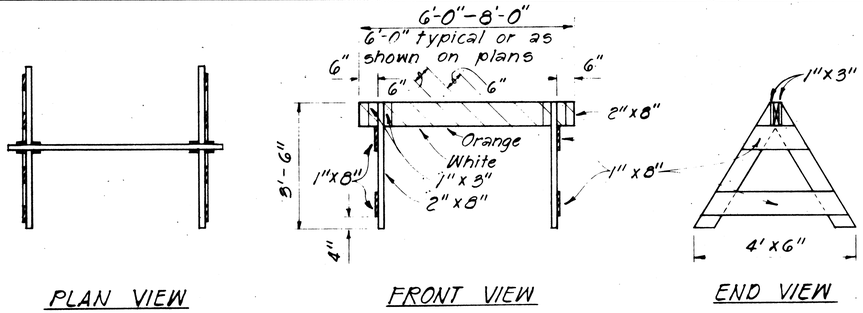
SCALE: AS SHOWN OCT 1969

SHEET No. 1 OF 1 SHEETS PT520

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

K&E CRYSTALENE® LA 2920 TRACING PAPER

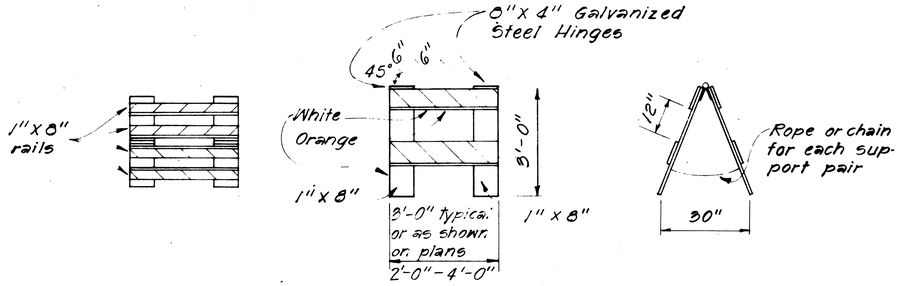
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	M-7600(1)	1978	55	198



PLAN VIEW FRONT VIEW END VIEW

TYPE I BARRICADE

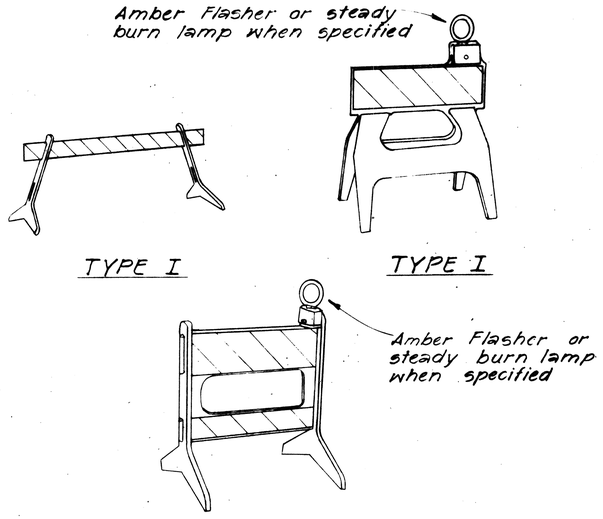
Scale: 1/2" = 1'-0"



PLAN VIEW FRONT VIEW END VIEW

TYPE II BARRICADE

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



PLASTIC MOLDED BARRICADE OPTIONS *

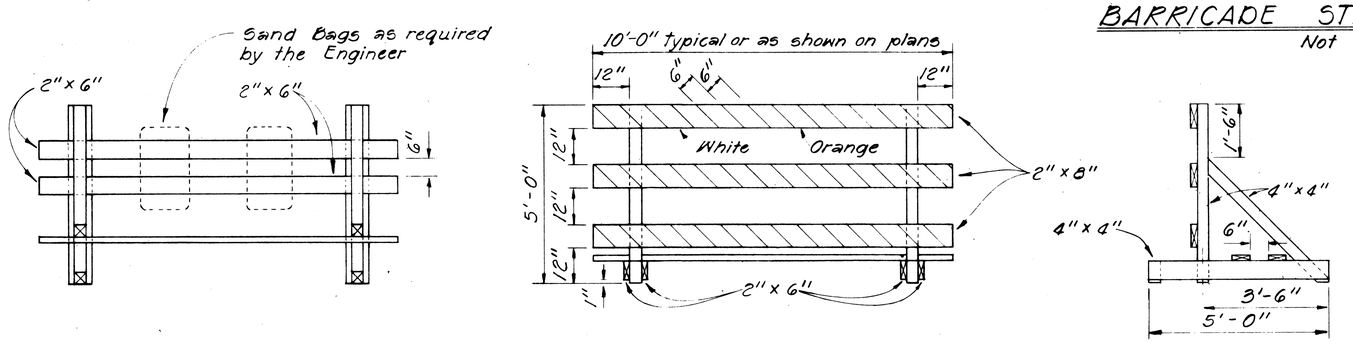
Not to Scale

* Shop Drawings must be submitted for approval.

FRONT FACE BACK FACE

BARRICADE STRIPING DETAILS

Not to Scale



PLAN VIEW FRONT VIEW END VIEW

TYPE III BARRICADE

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

GENERAL NOTES

1. The Contractor shall construct, install and maintain the barricades at the locations shown on the Plans.
2. The barricades shall be left in place or relocated upon completion of the project as ordered by the Engineer and are to become State property, unless otherwise specified.
3. The orange and white stripes shall slant downward toward the side on which traffic is to pass and shall be reflectorized with reflective sheeting.
4. Both faces of the barricade rails shall be striped. See Striping Detail Arrangement.
5. Contractor may submit alternate designs for approval.
6. Barricade details shall conform to the "Manual on Uniform Traffic Control Devices for Streets and Highways," 1971, by the Federal Highway Administration and as amended.
7. If wooden rails are used, 26 ga. galv. steel sheet shall be first tacked on to the rails and then overlayed with reflective sheeting.

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

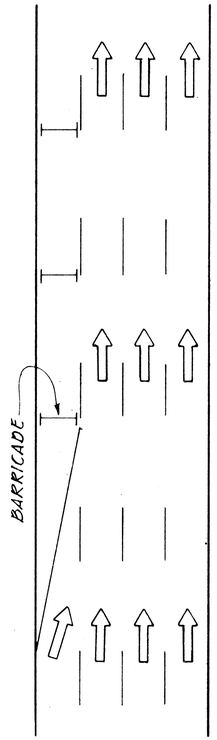
TYPICAL DETAILS

BARRICADES

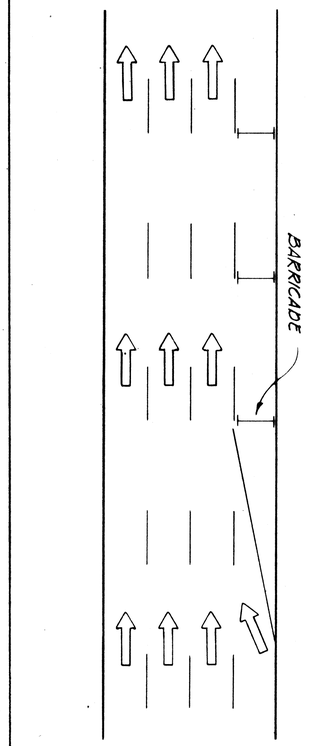
SCALE: As Shown

SHEET No. 1 OF 1 SHEETS

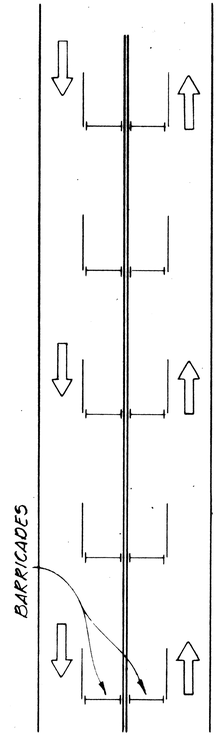
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	M-7600(1)	1978	56	198



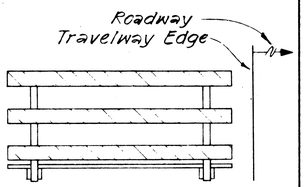
ROADWAY DELINEATION
TO THE RIGHT
NOT TO SCALE



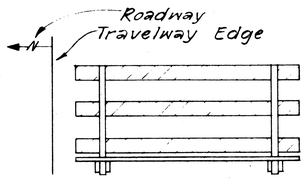
ROADWAY DELINEATION
TO THE LEFT
NOT TO SCALE



ROADWAY DELINEATION
FOR 2-WAY TRAFFIC
NOT TO SCALE

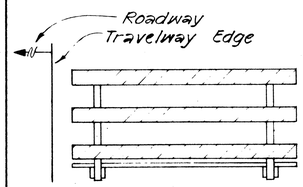


FRONT VIEW

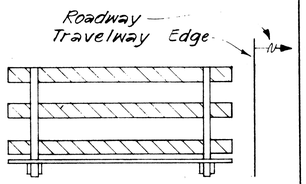


BACK VIEW

BARRICADE STRIPING
ARRANGEMENT
NOT TO SCALE

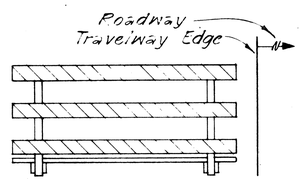


FRONT VIEW

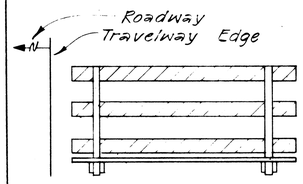


BACK VIEW

BARRICADE STRIPING
ARRANGEMENT
NOT TO SCALE

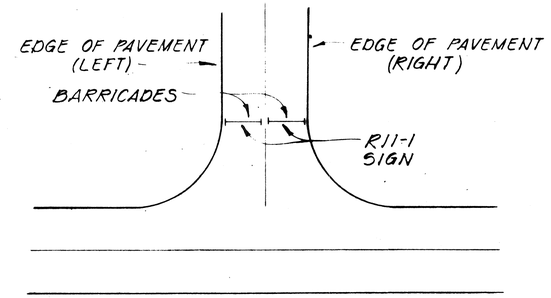


FRONT VIEW

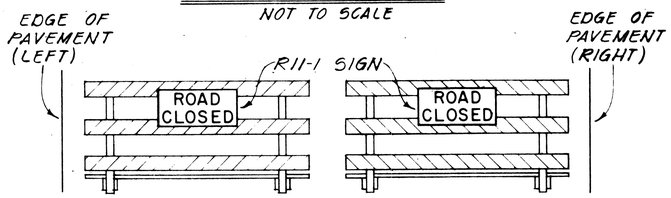


BACK VIEW

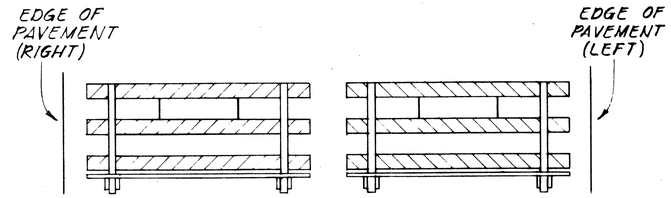
BARRICADE STRIPING
ARRANGEMENT
NOT TO SCALE



ROADWAY CLOSED
NOT TO SCALE



FRONT VIEW



BACK VIEW

BARRICADE STRIPING
ARRANGEMENT
NOT TO SCALE

GENERAL NOTES

1. Barricade Type, Placement, and Arrangement shall be as shown on the Construction Plans.

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
HIGHWAYS DIVISION

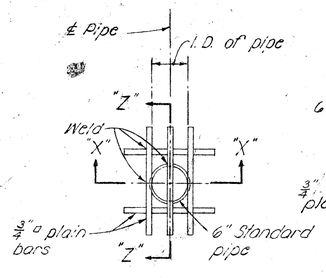
TYPICAL DETAILS

BARRICADE STRIPING DETAILS

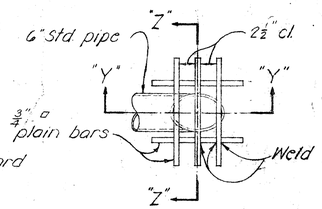
SHEET No. 1 OF 1 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.		1980		108

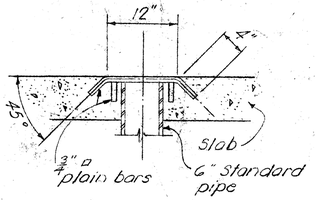
M-7600 CO 56
(1) S-1



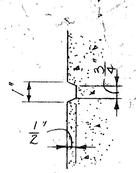
PLAN



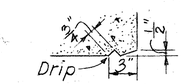
PLAN



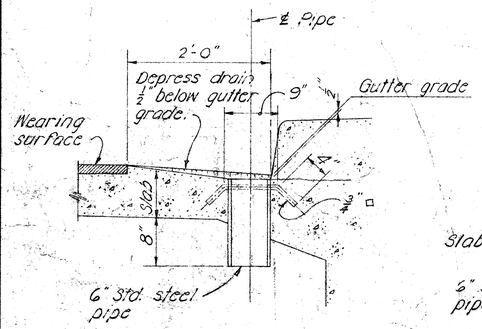
SECTION "Z-Z"



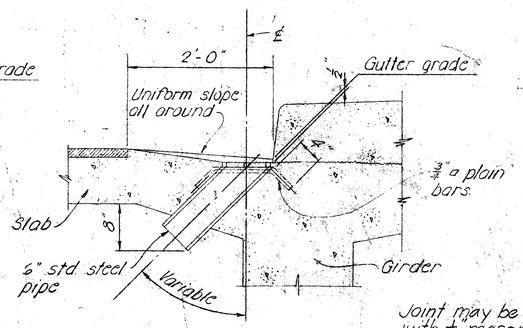
TYPICAL CONCRETE GROOVE DETAIL



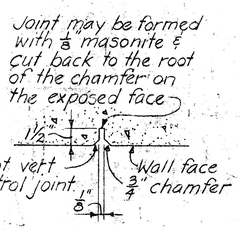
DRIP DETAIL



SECTION "X-X"



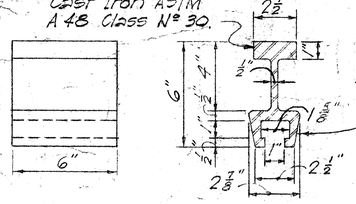
SECTION "Y-Y"



Joint may be formed with ⅛ masonite & cut back to the root of the chamfer on the exposed face

NOTE:
Metal drains shall be considered incidental to Class A Concrete in both concrete and steel bridges and will not be paid for separately.
Assemblage of grillage and pipe shall be hot-dip galvanized after all welding is completed.

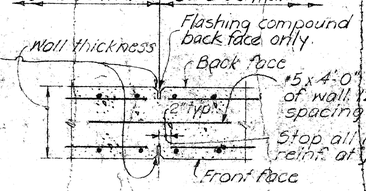
TYPICAL DRAINAGE DETAILS



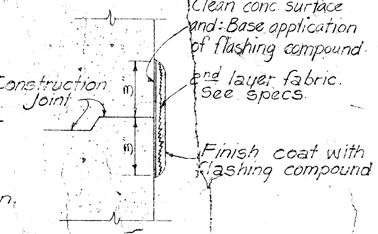
Contractor to take proper precautions to prevent the concrete from flowing into the opening of the inserts.

INSERT DETAIL

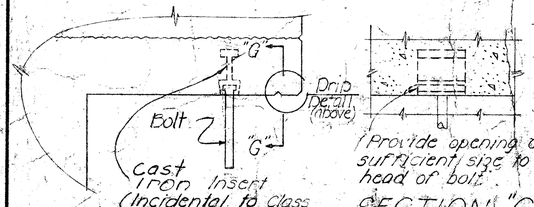
Vert. control joint on each face of wall to top of footing. See above detail and as directed by the Engineer



CONTROL JOINT DETAILS



TYP. FLASHING COMPOUND WATERPROOFING DETAIL



Provide opening of sufficient size to insert head of bolt.

SECTION "G-G"

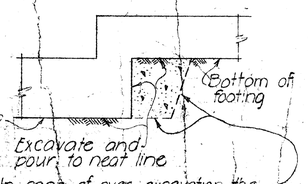
DETAIL of PIPE HANGERS & INSERTS

3"
NAME
DATE

Use correct name of bridge — Date of Year built

NOTE: Refer to corresponding detail drawings for placement of such names & dates at end post.
Exact details & spacing of letters & figures shall be as directed by the Engineer. See Note #12.

TYPICAL DETAIL OF LETTERS & FIGURES AT CONCRETE END POST



Note! In case of over excavation, the contractor shall backfill this area with minimum class D concrete at his own expense.

TYPICAL EXCAVATION FOR CONTINUOUS FOOTING STEP UP

GENERAL NOTES

1 - All concrete shall be Class A unless otherwise noted.
2 - Reinforcing shall be detailed in accordance with A.C.I. Manual of Standard Practice for Detailing Reinforced Concrete Highway Structures unless otherwise noted.
3 - Clearance for reinforcing bars shall be as follows, unless otherwise noted:
  a - 1½" For stirrups of beams & pier caps.
  b - 2" For ties of columns.
  C - 2" For formed walls.
  d - 3" For footings.
4 - Minimum spacing between parallel bars shall be 2½ times the diameter of bars, but in no case shall the clear distance between the bars be less than 1½ times the maximum size of the coarse aggregate.
5 - All dimensions relating to reinforcing are to centers of bars unless otherwise noted.
6 - Reinforcing bars shall be securely tied at all intersections & lap splices & shall be held in place during pouring to maintain their proper locations as shown on plans.
7 - Vertical column bars shall be arranged in such a manner as to miss pier cap bars above as directed by the Engineer.
8 - Except as otherwise noted on drawings, all exterior corners & re-entrant angles in concrete work shall be chamfered ¾"x ¾".
9 - Concrete seats receiving steel plates, leadplates or neoprene pads shall be poured monolithically with supporting structures & top of concrete seats shall be finished with a steel trowel to a smooth level surface at the elevation shown on the plans.
10 - Elastomeric Pads: Bottom of bridge bearing pads shall be secured against displacement with adhesives approved by the Engineer. Pads shall be incidental to concrete and will not be paid for separately.
11 - Forms for all exposed surfaces of separation structures and surfaces of retaining walls visible from a traveled way or from a populated area shall be plywood except that metal forms may permitted provided a surface finish satisfactory to the Engineer can be obtained and the use of such forms is approved in writing by the Engineer. Forms for round columns shall be made of materials that will give a smooth finish and true dimensions as given in the plans. Forms for prestressed concrete members shall be either metal or plywood.
12 - Gothic letters and figures approximating dimensions shown will be acceptable if approved by the Engineer.
13 - The contractor shall verify the location of all existing utility lines and notify the respective owners before commencing work at excavation or driving of piles.
14 - Standard Detail Drawings refer to all structures in general, except for modifications as may be required for special conditions. For such modifications refer to the corresponding detailed drawings.

APPROVAL RECOMMENDED:
Paul T. Yamashita — 1-23-76
BRIDGE DESIGN ENGINEER — DATE

APPROVED
Paul T. Yamashita — 1-28-76
For ASSISTANT CHIEF, ENGINEERING — DATE

NO.	REVISION	APPROVED BY	DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS
NOTES AND MISCELLANEOUS DETAILS

Date: October 1969

SHEET No. 1 OF 2 SHEETS DB-100

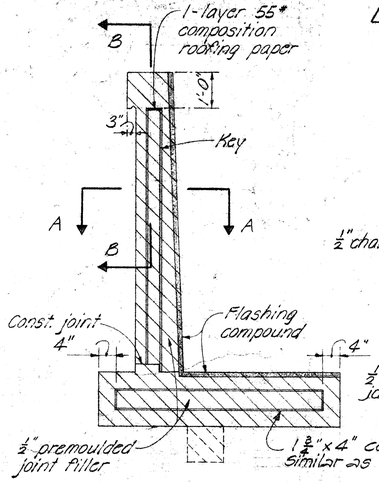
CO 56 S-1

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

PRINTED ON NO. 1000H CLEARPRINT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.		1980		108

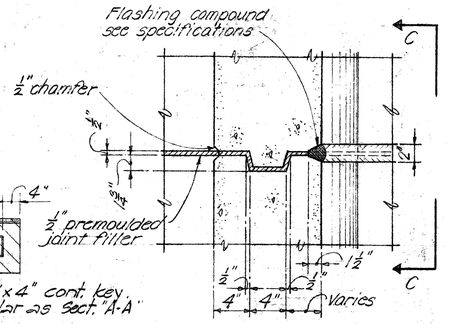
M-7600 (1) CO 56 S-2



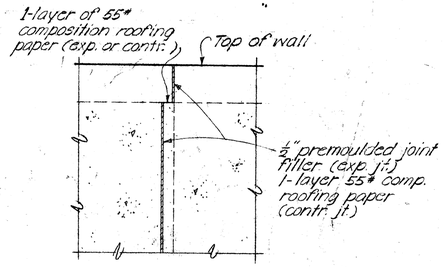
JOINT ELEVATION

NOTE:
Spacing of joints
Expansion = 96'-0" max.
Contraction = 32'-0" max.

For alternate contraction joint and control joint details - See Standard Details Sht # DB-100

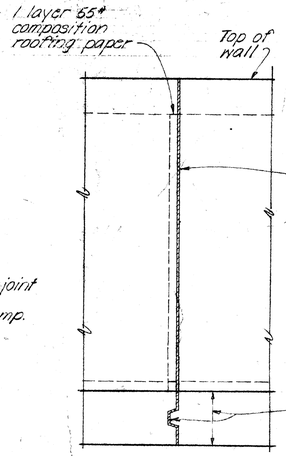


SECTION A-A

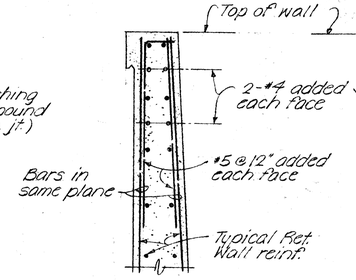


SECTION B-B

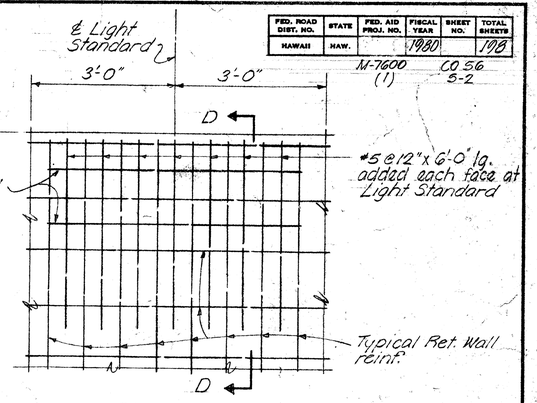
TYPICAL EXPANSION JOINT DETAILS No Scale



SECTION C-C

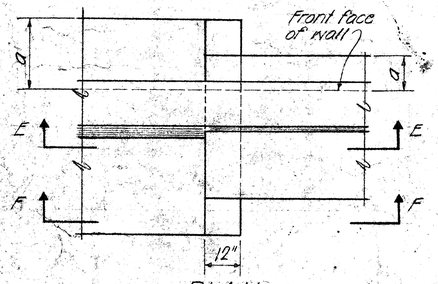


SECTION D-D

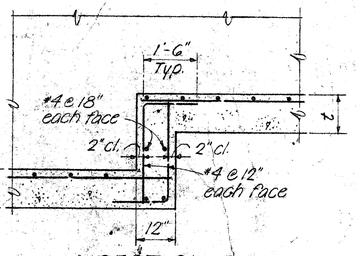


ELEVATION

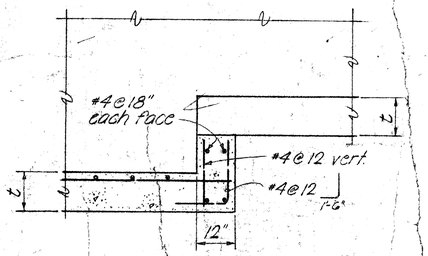
TYPICAL ADDED REINFORCEMENT AT LIGHT STANDARD BASE No Scale



PLAN

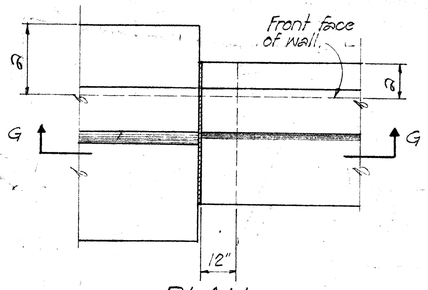


SECTION E-E

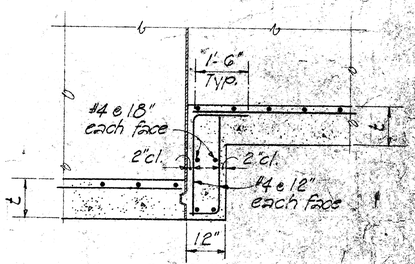


SECTION F-F

AT CONTINUOUS FOOTING



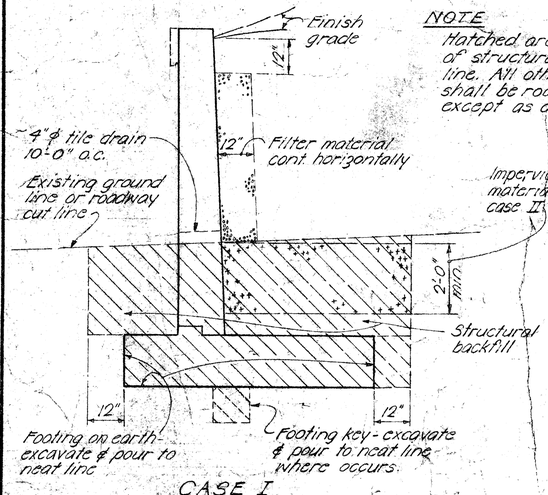
PLAN



SECTION G-G

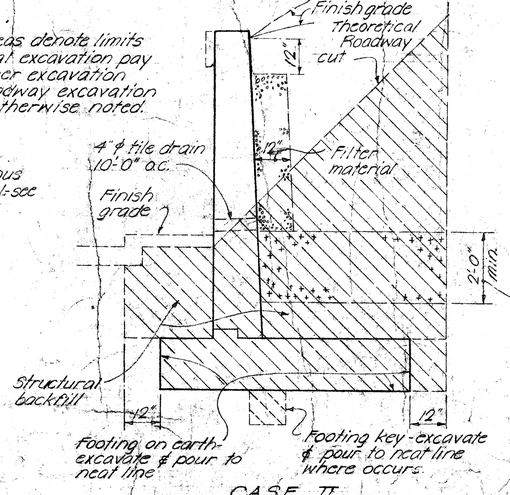
AT EXPANSION JOINT

TYPICAL FOOTING STEP-UP DETAILS No Scale



CASE I

NOTE
Hatched areas denote limits of structural excavation pay line. All other excavation shall be roadway excavation except as otherwise noted.



CASE II

Impervious material as selected by the Engineer incidental to structural excavation.
The subgrade upon which filter material is to be placed shall be made as impervious as possible by pneumatic tamping or other approved methods.
Impervious material shall be incidental to roadway excavation or imported borrow when used in embankment area.

STRUCTURAL EXCAVATION & DRAINAGE DETAILS No Scale

APPROVAL RECOMMENDED:
Paul T. Yamashita 1-23-70
BRIDGE DESIGN ENGINEER DATE

APPROVED
Paul T. Yamashita 1-24-70
For ASSISTANT CHIEF, ENGINEERING DATE

NO	REVISION	APPROVED BY	DATE
1	Change note spacing of joints.	H-f	9-4-72

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS
RETAINING WALL TYPE T-1

SCALE As Noted DATE

SHEET No. 2 OF 2 SHEETS DB-207-2

CO 56 S-2

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

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