FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	(H-1)(5)8	1969	C.O.24	181

Revised: Oct. 22, 1971

H-1 Outbound to H-2 Outbound
℄ Sta. 438+38 (Lt.)
Construct INLET A (Special)
Install 912 L.F. 60" CGMP, 8 Ga.
ESTIMATED QUANTITIES

Structure Excavation	= 2147	C.Y.
CRM	= 82	C.Y.
60" CGMP, 8 Ga.	= 912	L.F.
Untreated Base	= 160	C.Y.

H-2 Inbound to H-2 Inbound
℄ Sta. 438+98 (Rt.)
Construct OUTLET A (Special)
ESTIMATED QUANTITIES

Structure Excavation	= 46	C.Y.
CRM	= 56	C.Y.

H-1 Outbound to H-2 Outbound
℄ Sta. 440+00 (Lt.)
Construct INLET #1 (G1612 D.I.)
Install 65 L.F. 24" CGMP, 14Ga. or ~~24" RCCP, Cl. III~~
ESTIMATED QUANTITIES

Structure Excavation	= 49	C.Y.
Class "A-1" Concrete	= 2	C.Y.
Reinforcing Steel	= 83	Lbs
Frame and Grates	= 1	Ea.
24" CGMP, 14 Ga. or ~~24" RCCP, Cl. III~~	= 65	L.F.
Untreated Base	= 6	C.Y.

H-1 Outbound to H-2 Outbound
℄ Sta. 433+65 (Lt.)
Construct Inlet #24-A (G1612 D.I.)
Install 68 L.F. 24" CGMP, 14 Ga. or ~~24" RCCP, Cl. III~~
Estimated Quantities

Structure Excavation	= 46	c.y.
Class "A-1" Concrete	= 2	c.y.
Reinforcing Steel	= 27	Lbs.
Frame & Grates	= 1	ea.
24" CGMP, 14 Ga. or ~~24" RCCP, Cl. III~~	= 68	L.F.

H-1 Outbound to H-2 Outbound
℄ Sta. 740+00 (Rt.)
Construct INLET #2 (G1613 D.I.)
Install 132 L.F. 24" CGMP, 14 Ga. or ~~24" RCCP, Cl. III~~
ESTIMATED QUANTITIES

Structure Excavation	= 101	C.Y.
Class "A-1" Concrete	= 3	C.Y.
Reinforcing Steel	= 142	Lbs
Frame & Grates	= 1	Ea.
24" CGMP, 14 Ga.		
24" RCCP, Cl. IV	= 132	L.F.
Untreated Base	= 14	C.Y.

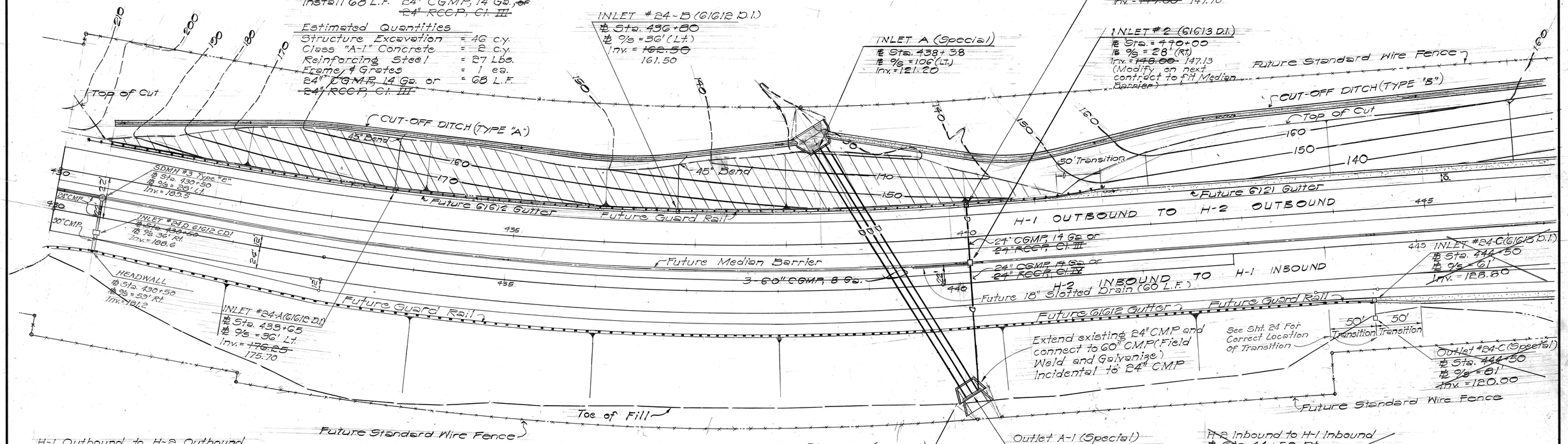
H-1 Outbound to H-2 Outbound
℄ Sta. 430+50 to 438+10 (Lt.)
Construct CUT-OFF DITCH (Type "A")
ESTIMATED QUANTITIES

Ditch Excavation	= 290	C.Y.
Class "B-1" Concrete or Shotcrete	= 76	C.Y.

H-1 Outbound to H-2 Outbound
℄ Sta. 438+50 to 457+55 (Lt.)
Construct CUT-OFF DITCH (Type "B")
ESTIMATED QUANTITIES

Ditch Excavation	= 183	C.Y.
Class "B-1" Concrete or Shotcrete	= 770	C.Y.

True North
Scale: 1"=50'



OUTLET A (Special)
℄ Sta. 439+98
℄ % = 125' (Rt.)
Inv. = 116.40

Outlet A-1 (Special)
Extend Existing Culvert 16 L.F. (Use Internal Collars) and Construct New Outlet A
Estimated Quantities

Struc. Exc.	= 46	c.y.
CRM	= 56	c.y.
60" CMP, 10 Ga.	= 48	L.F.
~~24" CMP, 14 Ga.~~	= 12	L.F.

H-2 Inbound to H-1 Inbound
℄ Sta. 44+50 Rt.
Construct Outlet #24-C (Similar to Outlets C, D & E)
Estimated Quantities

Structure Exc.	= 6	c.y.
Class A-1 Conc.	= 2	c.y.
Reinforcing Steel	= 135	lbs.

H-1 Outbound to H-2 Outbound
℄ Sta. 436+80 (Lt.)
Construct Inlet #24-B (G1612 D.I.)
Install 62 L.F. 24" CGMP, 14 Ga. or ~~24" RCCP, Cl. III~~
Estimated Quantities

Structure Excavation	= 43	c.y.
Class "A-1" Concrete	= 2	c.y.
Reinforcing Steel	= 27	Lbs.
Frame & Grates	= 1	ea.
24" CGMP, 14 Ga. or ~~24" RCCP, Cl. III~~	= 62	L.F.

H-2 Inbound to H-1 Inbound
℄ Sta. 444+50 (Rt.)
Construct Inlet #24-C (G1613 D.I.)
Install 64 L.F. 24" CGMP, 14 Ga. or ~~24" RCCP, Cl. III~~
Estimated Quantities

Structure Excavation	= 27	c.y.
Class "A-1" Concrete	= 3	c.y.
Reinforcing Steel	= 37	Lbs.
Frame & Grates	= 1	ea.
24" CGMP, 14 Ga. or ~~24" RCCP, Cl. III~~	= 24	L.F.

LEGEND:

--130--	Existing Contour Line
—140—	Finish Contour Line
	Future Metal Guard Rail With Steel Post
	Fill Slope to be Seeded by Hydro-mulching

GENERAL NOTES:

1. Whenever connections to existing lines are shown on the plans, the Contractor shall expose the existing lines to verify their locations and depths prior to excavating trenches for new lines.
2. Plugging ends of culverts with brick and mortar shall be considered incidental to the various contract items of work.
3. All Gutters except 6121 on Cane Haul Road "A" to be installed on future contract.
4. All Guard Rail shown to be installed on future contract.
5. Grade to drain into inlets to prevent ponding, as directed by the Engineer.

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

BEN TAGUCHI
REGISTERED PROFESSIONAL ENGINEER
No. 1030
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

GRADING & DRAINAGE

WAIAWA INTERCHANGE
F.A.I. Proj. No. I-HI-1(75)-8

Scale: As shown Date: JUNE, 1969

SHEET No. 1 OF 21 SHEETS

November 29, 1971

C.O. 24

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(75)-8	1969	25	181

Revised: Oct. 22, 1971

Cane Haul Road "A"
℄ Sta. 9+38 % 22' Lt.
Construct SDMH (Type A-1)
Install 80 L.F. 42" CGMP 12 Ga. or
~~42" RCCP, Cl. III~~

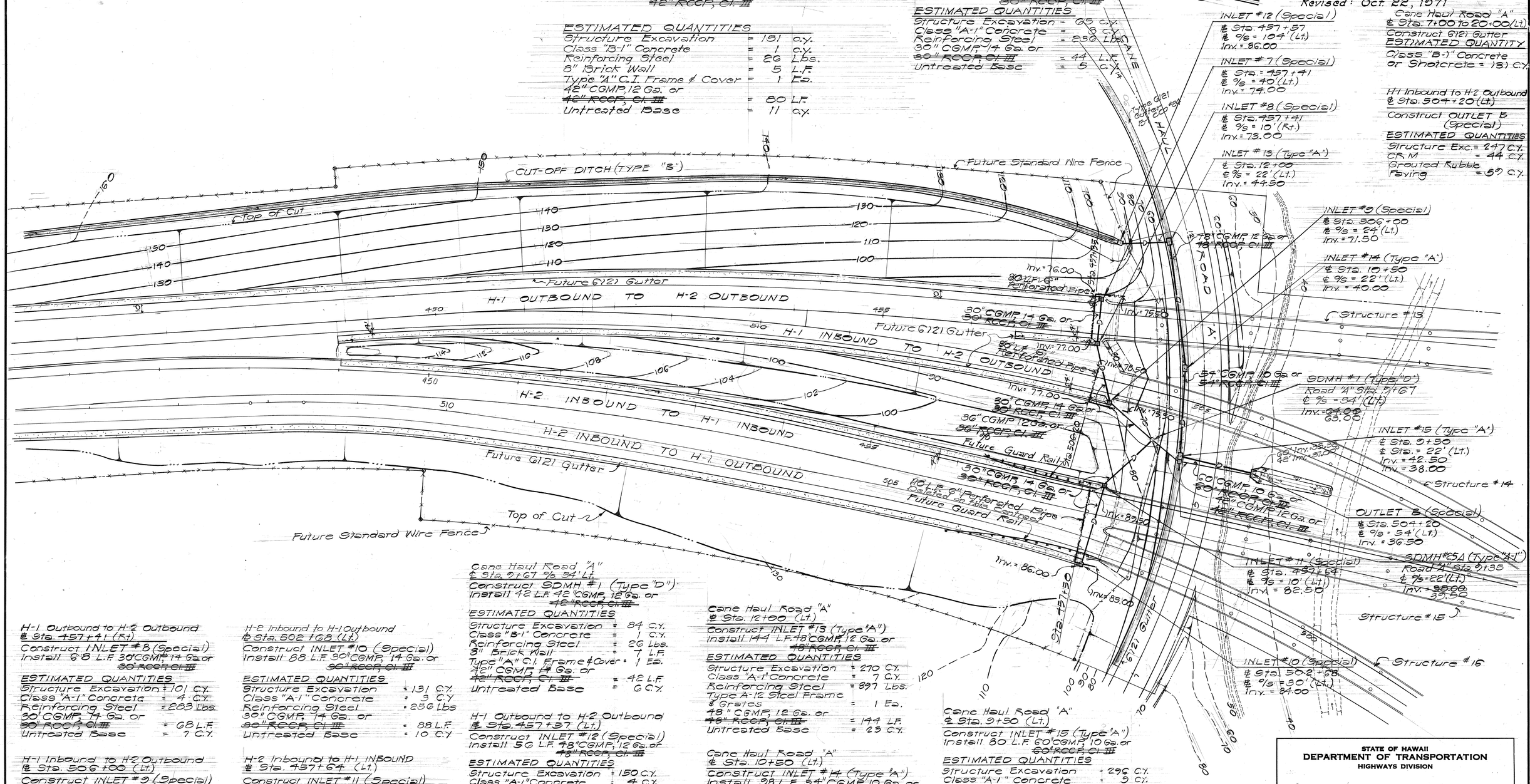
ESTIMATED QUANTITIES

Structure Excavation	= 151	c.y.
Class "B-1" Concrete	= 1	c.y.
Reinforcing Steel	= 26	Lbs.
8" Brick Wall	= 5	L.F.
Type "A" C.I. Frame & Cover	= 1	Ea.
42" CGMP 12 Ga. or		
~~42" RCCP, Cl. III~~	= 80	L.F.
Untreated Base	= 11	c.y.

H-1 Outbound to H-2 Outbound
℄ Sta. 457+41 (Lt.)
Construct INLET #7 (Special)
Install 44 L.F. 30" CGMP, 14 Ga. or
~~30" RCCP, Cl. III~~

ESTIMATED QUANTITIES

Structure Excavation	= 65	c.y.
Class "A-1" Concrete	= 5	c.y.
Reinforcing Steel	= 230	Lbs.
30" CGMP 14 Ga. or		
~~30" RCCP Cl. III~~	= 44	L.F.
Untreated Base	= 5	c.y.



INLET #12 (Special)
℄ Sta. 457+57
℄ % = 104' (Lt.)
Inv. = 86.00

INLET #7 (Special)
℄ Sta. = 457+41
℄ % = 40' (Lt.)
Inv. = 74.00

INLET #8 (Special)
℄ Sta. 457+41
℄ % = 10' (Rt.)
Inv. = 78.00

INLET #13 (Type "A")
℄ Sta. 12+00
℄ % = 22' (Lt.)
Inv. = 44.50

INLET #9 (Special)
℄ Sta. 506+00
℄ % = 24' (Lt.)
Inv. = 71.50

INLET #14 (Type "A")
℄ Sta. 10+50
℄ % = 22' (Lt.)
Inv. = 40.00

SDMH #1 (Type "D")
Road "A" Sta. 5+67
℄ % = 54' (Lt.)
Inv. = 84.08
83.08

INLET #15 (Type "A")
℄ Sta. 9+50
℄ Sta. = 22' (Lt.)
Inv. = 42.50
Inv. = 38.00

INLET #11 (Special)
℄ Sta. 457+64
℄ % = 10' (Lt.)
Inv. = 82.50

SDMH #2A (Type "A-1")
Road "A" Sta. 9+38
℄ % = 22' (Lt.)
Inv. = ~~38.00~~
38.50

INLET #10 (Special)
℄ Sta. 502+68
℄ % = 30' (Lt.)
Inv. = 84.00

Cane Haul Road "A"
℄ Sta. 7+00 to 20+00 (Lt.)
Construct G121 Gutter
ESTIMATED QUANTITY
Class "B-1" Concrete or Shotcrete = 131 c.y.

H-1 Inbound to H-2 Outbound
℄ Sta. 504+20 (Lt.)
Construct OUTLET B (Special)
ESTIMATED QUANTITIES

Structure Exc. =	247 c.y.
CR M =	44 c.y.
Grouted Rubble Paving =	50 c.y.

H-1 Outbound to H-2 Outbound
℄ Sta. 457+41 (Rt.)
Construct INLET #8 (Special)
Install 68 L.F. 30" CGMP, 14 Ga. or
~~30" RCCP, Cl. III~~

ESTIMATED QUANTITIES

Structure Excavation	= 101	c.y.
Class "A-1" Concrete	= 4	c.y.
Reinforcing Steel	= 283	Lbs.
30" CGMP, 14 Ga. or		
~~30" RCCP, Cl. III~~	= 68	L.F.
Untreated Base	= 7	c.y.

H-1 Inbound to H-2 Outbound
℄ Sta. 506+00 (Lt.)
Construct INLET #9 (Special)
Install 60 L.F. 36" CGMP, 12 Ga. or
~~36" RCCP, Cl. III~~

ESTIMATED QUANTITIES

Structure Excavation	= 91	c.y.
Class "A-1" Concrete	= 4	c.y.
Reinforcing Steel	= 290	Lbs
36" CGMP, 12 Ga. or		
~~36" RCCP, Cl. III~~	= 60	L.F.
Untreated Base	= 7	c.y.

H-2 Inbound to H-1 Outbound
℄ Sta. 502+68 (Lt.)
Construct INLET #10 (Special)
Install 88 L.F. 30" CGMP, 14 Ga. or
~~30" RCCP, Cl. III~~

ESTIMATED QUANTITIES

Structure Excavation	= 131	c.y.
Class "A-1" Concrete	= 3	c.y.
Reinforcing Steel	= 256	Lbs
30" CGMP, 14 Ga. or		
~~30" RCCP, Cl. III~~	= 88	L.F.
Untreated Base	= 10	c.y.

H-2 Inbound to H-1 INBOUND
℄ Sta. 457+64 (Lt.)
Construct INLET #11 (Special)
Install 74 L.F. 30" CGMP, 14 Ga. or
~~30" RCCP, Cl. III~~

ESTIMATED QUANTITIES

Structure Excavation	= 116	c.y.
Class "A-1" Concrete	= 5	c.y.
Reinforcing Steel	= 361	Lbs
30" CGMP, 14 Ga. or		
~~30" RCCP, Cl. III~~	= 74	L.F.
Untreated Base	= 9	c.y.

Cane Haul Road "A"
℄ Sta. 9+67 % 54' Lt.
Construct SDMH #1 (Type "D")
Install 42 L.F. 42" CGMP, 12 Ga. or
~~42" RCCP, Cl. III~~

ESTIMATED QUANTITIES

Structure Excavation	= 84	c.y.
Class "B-1" Concrete	= 1	c.y.
Reinforcing Steel	= 26	Lbs.
8" Brick Wall	= 7	L.F.
Type "A" C.I. Frame & Cover	= 1	Ea.
42" CGMP, 14 Ga. or		
~~42" RCCP, Cl. III~~	= 42	L.F.
Untreated Base	= 6	c.y.

H-1 Outbound to H-2 Outbound
℄ Sta. 457+57 (Lt.)
Construct INLET #12 (Special)
Install 50 L.F. 48" CGMP, 12 Ga. or
~~48" RCCP, Cl. III~~

ESTIMATED QUANTITIES

Structure Excavation	= 150	c.y.
Class "A-1" Concrete	= 4	c.y.
Reinforcing Steel	= 341	Lbs
48" CGMP, 12 Ga. or		
~~48" RCCP, Cl. III~~	= 56	L.F.
Untreated Base	= 8	c.y.

Cane Haul Road "A"
℄ Sta. 12+00 (Lt.)
Construct INLET #13 (Type "A")
Install 144 L.F. 48" CGMP, 12 Ga. or
~~48" RCCP, Cl. III~~

ESTIMATED QUANTITIES

Structure Excavation	= 270	c.y.
Class "A-1" Concrete	= 7	c.y.
Reinforcing Steel	= 897	Lbs.
Type A-12 Steel Frame & Grates	= 1	Ea.
48" CGMP, 12 Ga. or		
~~48" RCCP, Cl. III~~	= 144	L.F.
Untreated Base	= 23	c.y.

Cane Haul Road "A"
℄ Sta. 10+50 (Lt.)
Construct INLET #14 (Type "A")
Install 98 L.F. 54" CGMP, 10 Ga. or
~~54" RCCP, Cl. III~~

ESTIMATED QUANTITIES

Structure Excavation	= 264	c.y.
Class "A-1" Concrete	= 6	c.y.
Reinforcing Steel	= 800	Lbs.
Type "A-12" Steel Frame & Grates	= 1	Ea.
54" CGMP, 10 Ga. or		
~~54" RCCP, Cl. III~~	= 98	L.F.
Untreated Base	= 16	c.y.

Cane Haul Road "A"
℄ Sta. 9+50 (Lt.)
Construct INLET #15 (Type "A")
Install 80 L.F. 60" CGMP, 10 Ga. or
~~60" RCCP, Cl. III~~

ESTIMATED QUANTITIES

Structure Excavation	= 296	c.y.
Class "A-1" Concrete	= 9	c.y.
Reinforcing Steel	= 1420	Lbs.
Type "A-12" Steel Frame & Grates	= 1	Ea.
60" CGMP, 10 Ga. or		
~~60" RCCP, Cl. III~~	= 80	L.F.
Untreated Base	= 15	c.y.

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

GRADING & DRAINAGE

WAIAWA INTERCHANGE
F.A.I. Proj. No. I-HI-1(75):8

Scale: As shown Date: JUNE, 1969

SHEET No. 2 OF 21 SHEETS

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

November 29, 1971

CO. 25

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(75)8	1060	26	181

Ramp "N"
℄ Sta. 11+00 (Lt.)
Construct INLET # 16 (G1612 D.I.)
Install 10 L.F. 24" CGMP, 14 Ga. or ~~24" RCCP, Cl. III~~

ESTIMATED QUANTITIES

Structure Excavation	= 13 C.Y.
Class "A-1 Concrete	= 2 C.Y.
Reinforcing Steel	= 83 Lbs
Frame & Grates	= 1 Ea.
24" CGMP, 14 Ga. or ~~24" RCCP, Cl. III~~	= 10 L.F.
Untreated Base	= 1 C.Y.

Ramp "N"
℄ Sta. 11+00 (Lt.)
Construct OUTLET C (Special)

ESTIMATED QUANTITIES

Structure Excavation	= 8 C.Y.
Class "A-1" Concrete	= 2 C.Y.
Reinforcing Steel	= 137 Lbs.

H-1 Outbound to H-2 Outbound
℄ Sta. 471+70 (Lt.)
Construct INLET # 17 (G1612 D.I.)
Install 87 L.F. 24" CGMP, 14 Ga. or ~~24" RCCP, Cl. III~~

ESTIMATED QUANTITIES

Structure Excavation	= 99 C.Y.
Class "A-1" Concrete	= 2 C.Y.
Reinforcing Steel	= 83 Lbs.
Frame & Grates	= 1 Ea.
24" CGMP, 14 Ga. or ~~24" RCCP, Cl. III~~	= 87 L.F.
Untreated Base	= 9 C.Y.

H-2 Inbound to H-1 INBOUND
℄ Sta. 471+15 (Lt.)
Construct INLET # 18 (G1612 D.I.)
Install 40 L.F. 24" CGMP, 14 Ga. or ~~24" RCCP, Cl. III~~

ESTIMATED QUANTITIES

Structure Excavation	= 45 C.Y.
Class "A-1" Concrete	= 2 C.Y.
Reinforcing Steel	= 83 Lbs.
Frame & Grates	= 1 Ea.
24" CGMP, 14 Ga. or ~~24" RCCP, Cl. III~~	= 40 L.F.
Untreated Base	= 4 C.Y.

H-2 Inbound to H-1 Inbound
℄ Sta. 471+15 (Lt.)
Construct OUTLET D (Special)

ESTIMATED QUANTITIES

Structure Excavation	= 8 C.Y.
Class "A-1" Concrete	= 2 C.Y.
Reinforcing Steel	= 137 Lbs.

H-1 Outbound to H-2 Outbound
℄ Sta. 462+85 (Rt.)
Construct INLET #19 (Special)
Install 30 L.F. 24" CGMP, 14 Ga. or 24" RCCP, Cl. III

ESTIMATED QUANTITIES

Structure Excavation	= 38 C.Y.
Class "A-1" Concrete	= 4 C.Y.
Reinforcing Steel	= 196 Lbs.
24" CGMP, 14 Ga. or 24" RCCP, Cl. III	= 30 L.F.
Untreated Base	= 3 C.Y.

H-1 Outbound to H-2 Outbound
℄ Sta. 462+55 (Rt.)
Construct OUTLET E (Special)

ESTIMATED QUANTITIES

Structure Excavation	= 8 C.Y.
Class "A-1" Concrete	= 2 C.Y.
Reinforcing Steel	= 137 Lbs

Install Settlement Platform at H-1 Outb. to H-2 Outb. ℄ Sta. 463+40

Install Settlement Platform at H-2 Inb. to H-1 Outb. ℄ Sta. 500+35

Install Settlement Platform at H-2 Inb. to H-1 Inb. ℄ Sta. 465+75

INLET #19 (Special) ℄ Sta. 462+85 Inv. = 40.00

OUTLET E ℄ Sta. 462+55 Inv. = 37.00

24" CGMP, 14 Ga. or ~~24" RCCP, Cl. III~~

INLET # 17 (G1612 D.I.)
℄ Sta. 471+70
℄ % = 42' (Lt.)
Inv. = 59.50

OUTLET D
℄ Sta. 471+15
℄ % = 76' (Lt.)
Inv. = ~~58.00~~ 70.00

INLET # 18 (G1612 D.I.)
℄ Sta. 471+15
℄ % 6' (Lt.)
Inv. = 81.50

OUTLET C (Special)
℄ Sta. 111+00
℄ % = ~~24~~' (Lt.) 35'
Inv. = 25.00

INLET # 16 (G1612 D.I.)
℄ Sta. ~~#00~~ 10+85
℄ % = ~~24~~ (Lt.) 85'
Inv. = 27.00

Structure #19 · Structure #14 · Structure #15 · Structure #16 · Structure #18 · Structure #17 · Existing Structure

Lenakeupu Stream · Waiawa Stream

Future Standard Wire Fence

H-1 OUTBOUND TO H-2 OUTBOUND

H-2 INBOUND TO H-1 INBOUND

RAMP "N" · RAMP "M"

Future G1612 Gutter · Future 6'-6" Gutter

Toe of Fill

CHANNEL A

24" CGMP, 14 Ga. or ~~24" RCCP, Cl. III~~

Existing Inlet

Existing 6' High Chain Link Fence to remain

H-1 OUTBOUND

True North
Scale: 1" = 50'

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

BEN TAGUCHI
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DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

GRADING & DRAINAGE

WAIAWA INTERCHANGE
F.A.I. Proj. No. I-HI-1(75):8

Scale: As shown Date: JUNE, 1969

SHEET No. 3 OF 21 SHEETS

26

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-I(75):8	1969	27	181

H-2 Inbound to H-1 Outbound
℄ Sta. 486+83 (Lt.)
Construct INLET #21 (Type "B")
Install 275 L.F. 24" CGMP, 14 Ga. or
~~24" RCCP, Cl. III~~

ESTIMATED QUANTITIES

Structure Excavation	=	210 C.Y.
Class "A-1" Concrete	=	4 C.Y.
Reinforcing Steel	=	369 C.Y.
Type A-12 Steel Frame & Grates	=	1 Ea.
24" CGMP, 14 Ga. or ~~24" RCCP, Cl. III~~	=	275 L.F.
Untreated Base	=	29 C.Y.

H-2 Inbound to H-1 Outbound
℄ Sta. 498+50 (Rt.)
Construct INLET #22 (G121 D.I.)
Install 152 L.F. 24" CGMP, 14 Ga. or
~~24" RCCP, Cl. III~~

ESTIMATED QUANTITIES

Structure Excavation	=	158 C.Y.
Class "A-1" Concrete	=	2 C.Y.
Reinforcing Steel	=	201 Lbs.
Frame & Grates	=	1 Ea.
24" CGMP, 14 Ga. or ~~24" RCCP, Cl. III~~	=	152 L.F.
Untreated Base	=	16 C.Y.

Ramp "M"
℄ Sta. 11+50 (Lt.)
Construct INLET #23 (Special)
Install 39 L.F. 24" CGMP, 14 Ga. or
~~24" RCCP, Cl. III~~

ESTIMATED QUANTITIES

Structure Excavation	=	50 C.Y.
Class "A-1" Concrete	=	4 C.Y.
Reinforcing Steel	=	224 Lbs.
24" CGMP, 14 Ga. or ~~24" RCCP, Cl. III~~	=	39 L.F.
Untreated Base	=	3 C.Y.

Ramp "M"
℄ Sta. 11+50 (Lt.)
Construct INLET #24 (G121 D.I.)
Install 82 L.F. 24" CGMP, 14 Ga. or
~~24" RCCP, Cl. III~~

ESTIMATED QUANTITIES

Structure Excavation	=	83 C.Y.
Class "A-1" Concrete	=	2 C.Y.
Reinforcing Steel	=	133 Lbs.
Frame & Grates	=	1 Ea.
24" CGMP, 14 Ga. or ~~24" RCCP, Cl. III~~	=	82 L.F.
Untreated Base	=	8 C.Y.

H-2 Inbound to H-1 Outbound
℄ Sta. 401+00 (Rt.)
Construct SDMH #2 (Type "E")
Install 153 L.F. 30" CGMP, 14 Ga. or
~~30" RCCP, Cl. III~~

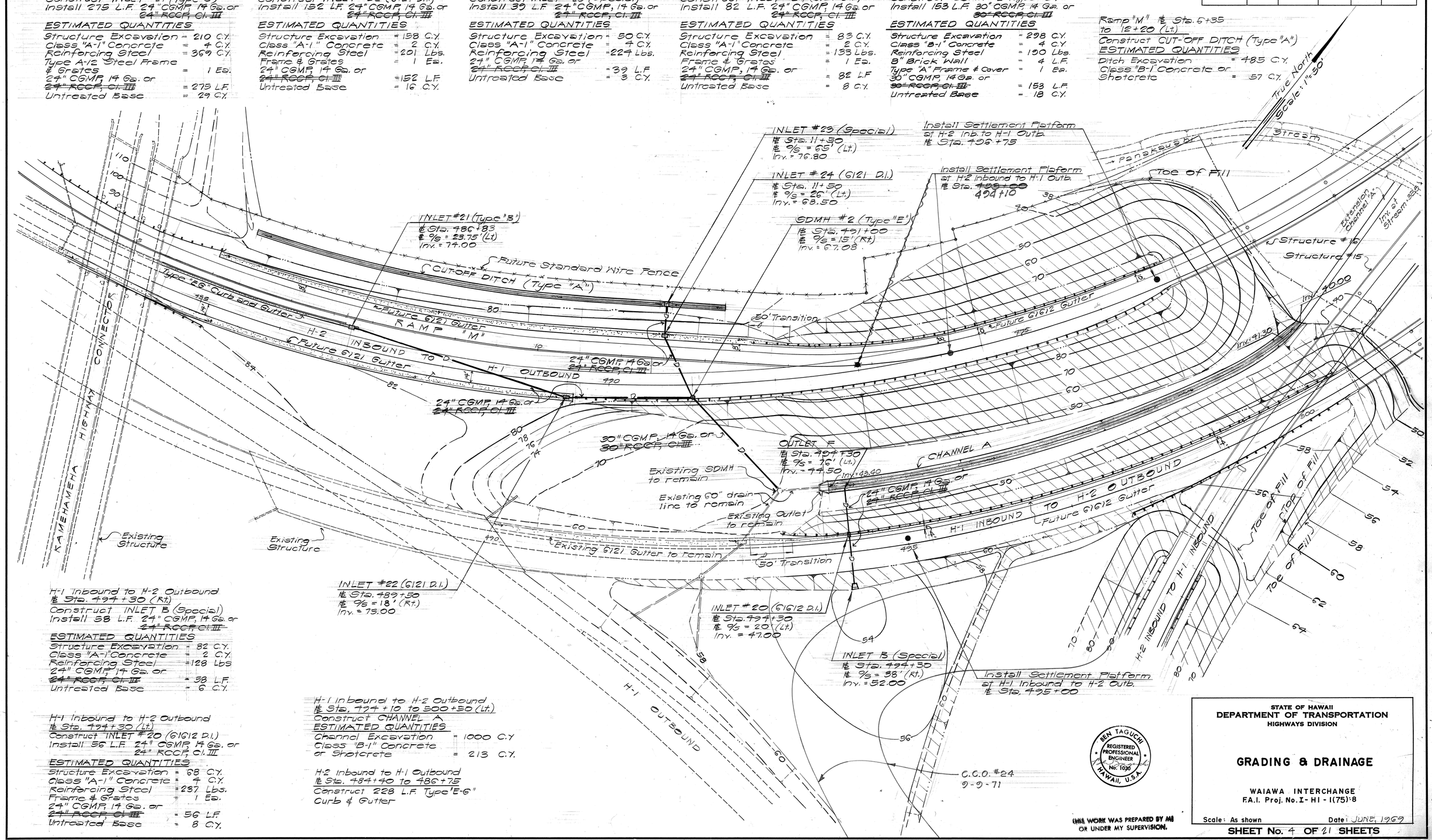
ESTIMATED QUANTITIES

Structure Excavation	=	298 C.Y.
Class "B-1" Concrete	=	4 C.Y.
Reinforcing Steel	=	190 Lbs.
8" Brick Wall	=	4 L.F.
Type "A" Frame & Cover	=	1 Ea.
30" CGMP, 14 Ga. or ~~30" RCCP, Cl. III~~	=	153 L.F.
Untreated Base	=	18 C.Y.

Ramp "M" ℄ Sta. 6+35 to 12+20 (Lt.)
Construct CUT-OFF DITCH (Type "A")

ESTIMATED QUANTITIES

Ditch Excavation	=	485 C.Y.
Class "B-1" Concrete or Shotcrete	=	57 C.Y.



H-1 Inbound to H-2 Outbound
℄ Sta. 494+30 (Rt.)
Construct INLET B (Special)
Install 58 L.F. 24" CGMP, 14 Ga. or
~~24" RCCP, Cl. III~~

ESTIMATED QUANTITIES

Structure Excavation	=	82 C.Y.
Class "A-1" Concrete	=	2 C.Y.
Reinforcing Steel	=	128 Lbs.
24" CGMP, 14 Ga. or ~~24" RCCP, Cl. III~~	=	58 L.F.
Untreated Base	=	6 C.Y.

H-1 Inbound to H-2 Outbound
℄ Sta. 494+30 (Lt.)
Construct INLET #20 (G1612 D.I.)
Install 56 L.F. 24" CGMP, 14 Ga. or
24" RCCP, Cl. III

ESTIMATED QUANTITIES

Structure Excavation	=	68 C.Y.
Class "A-1" Concrete	=	4 C.Y.
Reinforcing Steel	=	237 Lbs.
Frame & Grates	=	1 Ea.
24" CGMP, 14 Ga. or ~~24" RCCP, Cl. III~~	=	56 L.F.
Untreated Base	=	8 C.Y.

H-1 Inbound to H-2 Outbound
℄ Sta. 494+10 to 500+30 (Lt.)
Construct CHANNEL A

ESTIMATED QUANTITIES

Channel Excavation	=	1000 C.Y.
Class "B-1" Concrete or Shotcrete	=	213 C.Y.

H-2 Inbound to H-1 Outbound
℄ Sta. 484+40 to 486+75
Construct 228 L.F. Type "E-6" Curb & Gutter

C.C.O. #24
9-9-71

BEN TAGUCHI
REGISTERED PROFESSIONAL ENGINEER
No. 1020
HAWAII, U.S.A.

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

GRADING & DRAINAGE

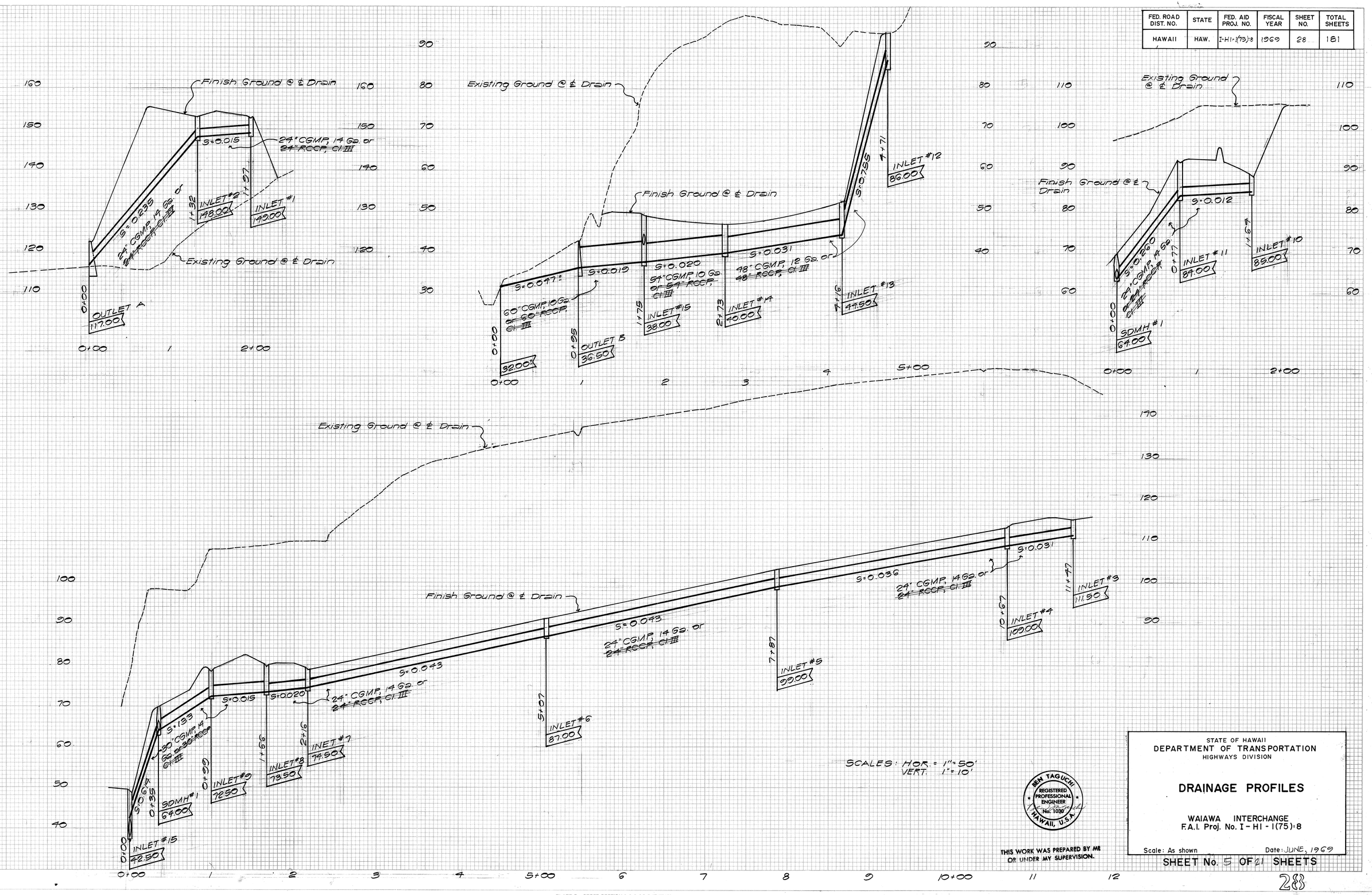
WAIAWA INTERCHANGE
F.A.I. Proj. No. I-HI-I(75):8

Scale: As shown Date: JUNE, 1969

SHEET No. 4 OF 21 SHEETS

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.	I-HI-1(75)8	1969	28	181



BEN TAGUCHI
REGISTERED PROFESSIONAL ENGINEER
No. 1030
HAWAII, U.S.A.

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE PROFILES

WAIAWA INTERCHANGE
F.A.I. Proj. No. I - HI - 1(75)·8

Scale: As shown Date: JUNE, 1969

SHEET No. 5 OF 21 SHEETS

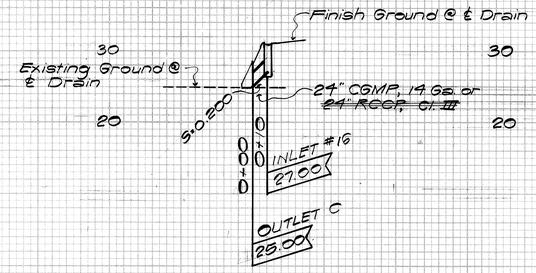
28

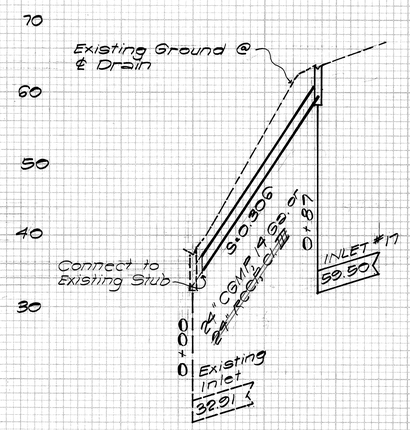
FINAL SURVEY — SURVEYED, PLOTTED, TEMPLATE, AREAS, NOTE BOOK, PAGE, NO., BY, DATE, AREAS CHECKED

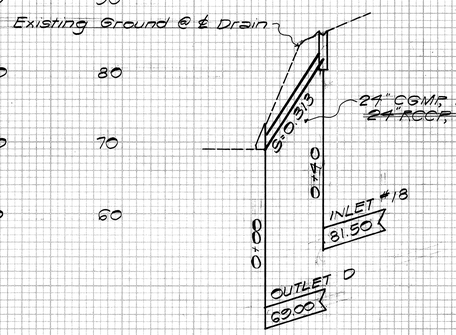
ORIGINAL SURVEY — SURVEYED, PLOTTED, TEMPLATE, AREAS, NOTE BOOK, PAGE, NO., BY, DATE, AREAS CHECKED

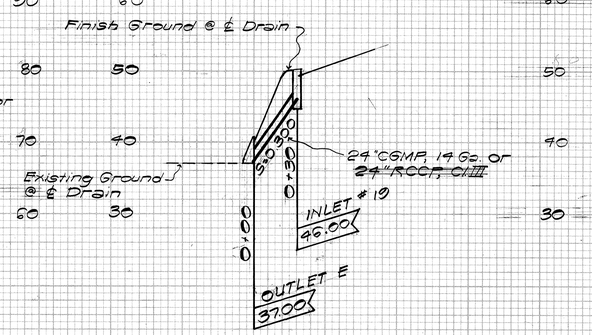
PLATE 3 —CROSS SECTION O. P. R. & R. E. STANDARD
THE FREDERICK POST CO., CHICAGO

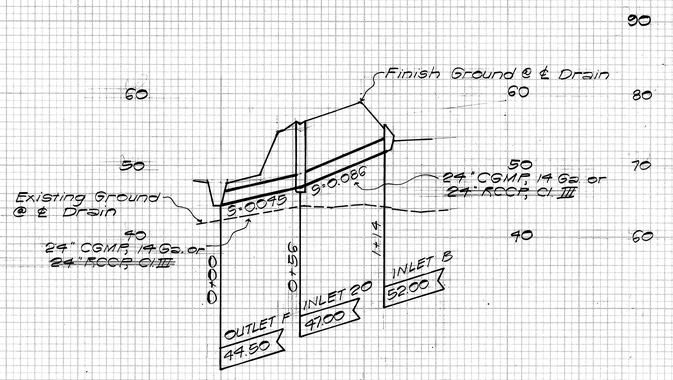
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(75)8	1969	29	181

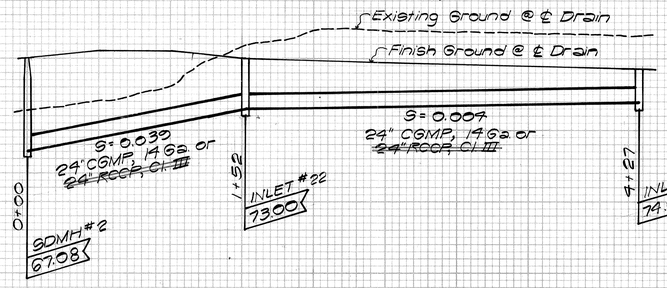


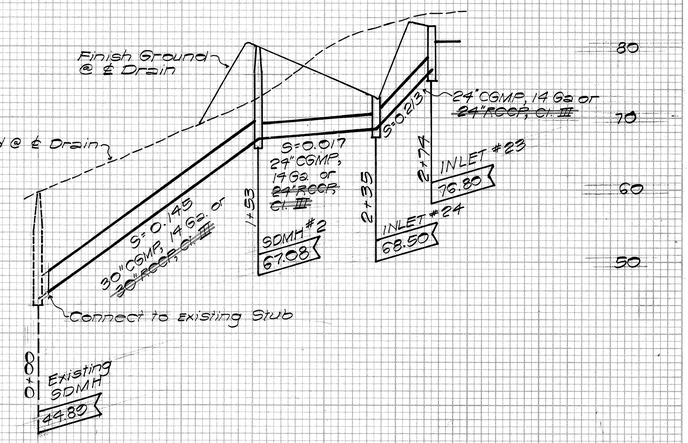












SCALES: HOR. = 1"=50'
VERT. = 1"=10'

HEN TAGUCHI
REGISTERED PROFESSIONAL ENGINEER
No. 1030
HAWAII, U.S.A.

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE PROFILES

WAIAWA INTERCHANGE
F.A.I. Proj. No. I - HI - 1(75)8

Scale: As shown Date: JUNE, 1969

SHEET No. 6 OF 21 SHEETS

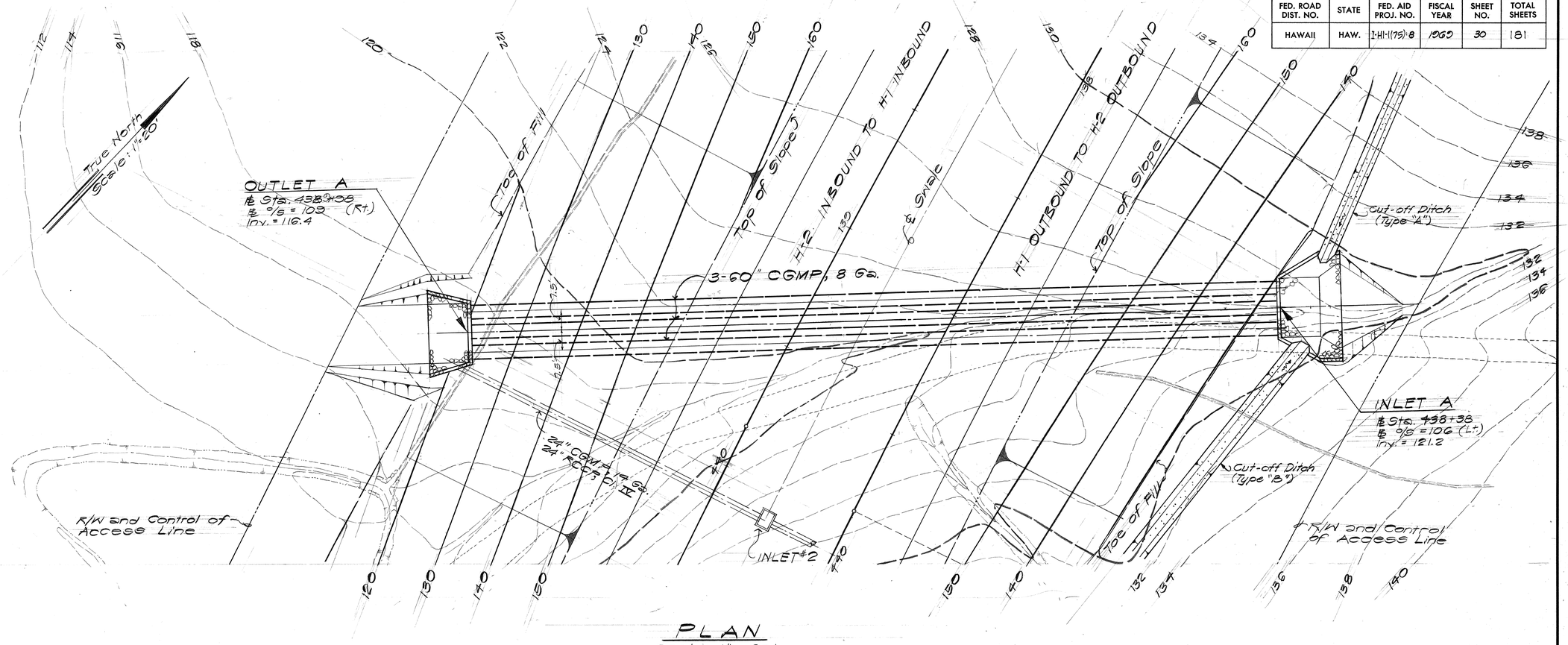
29

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

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

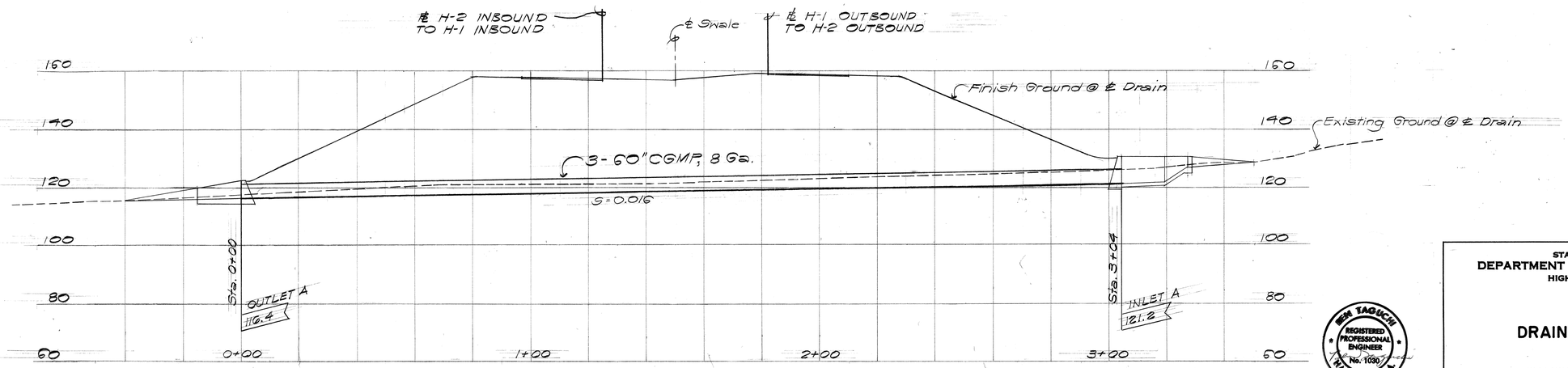
PLATE 3 —CROSS SECTION O. P. R. & R. E. STANDARD
THE FREDERICK POST CO., CHICAGO

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(75):8	1969	30	181



PLAN
Scale: 1" = 20'

See Sheet C.O. 24 for extension of Outlet A.



PROFILE
Scale: 1" = 20'

BEN TAGUCHI
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No. 1030
HAWAII, U.S.A.

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS

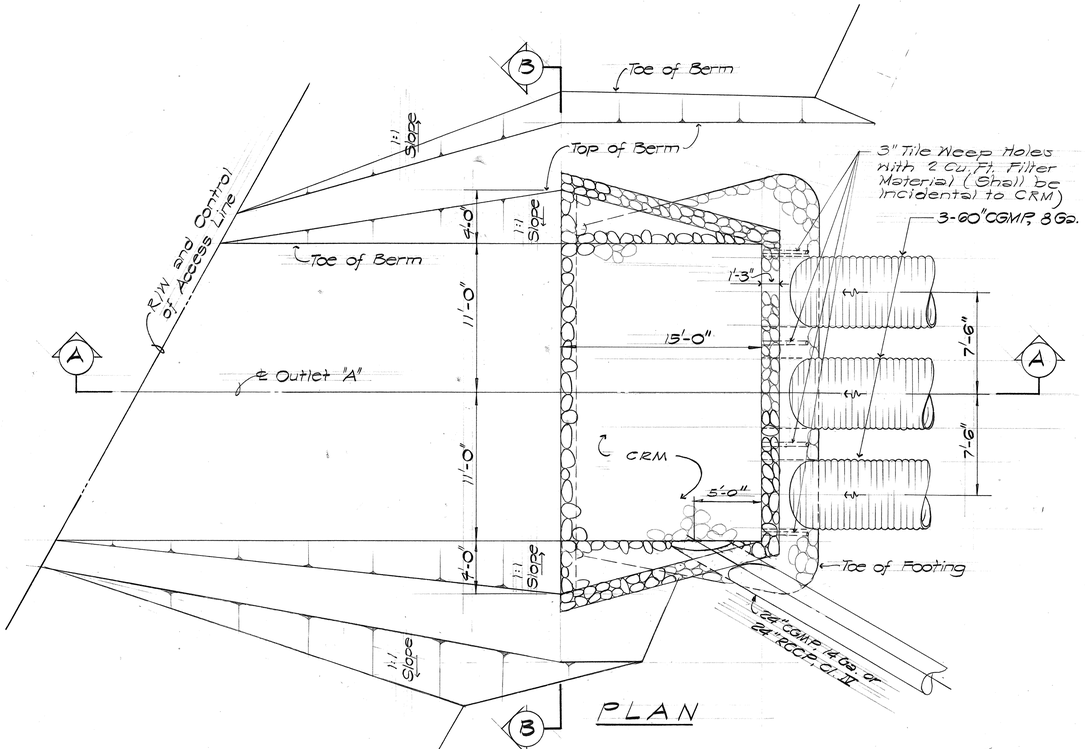
WAIAWA INTERCHANGE
F.A.I. Proj. No. I - HI - 1(75):8

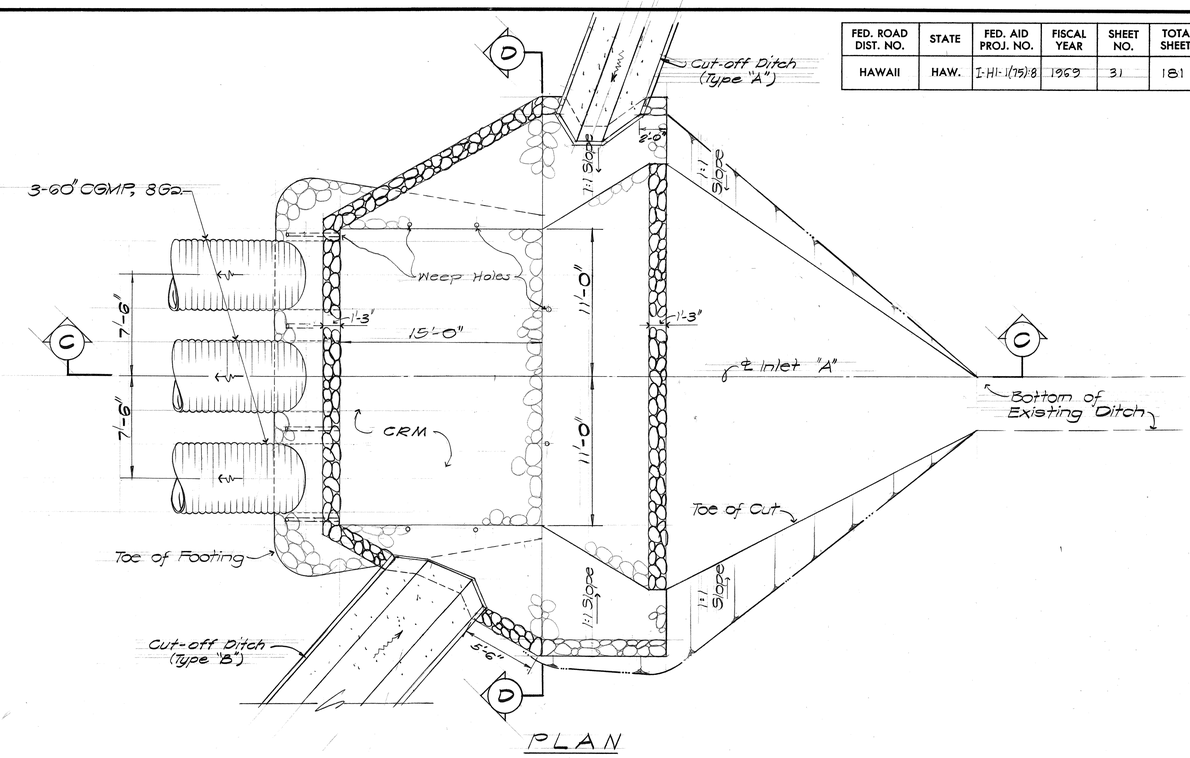
Scale: As shown Date: JUNE, 1969

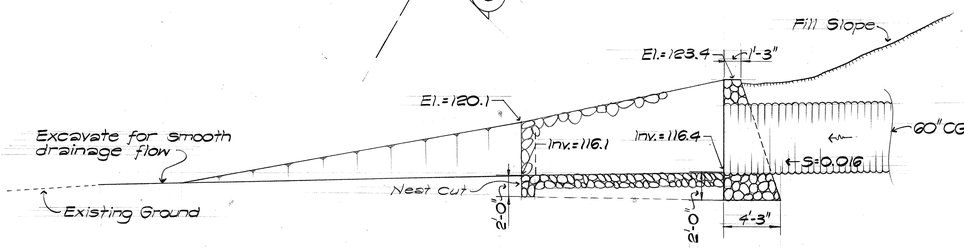
SHEET No. 7 OF 21 SHEETS

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

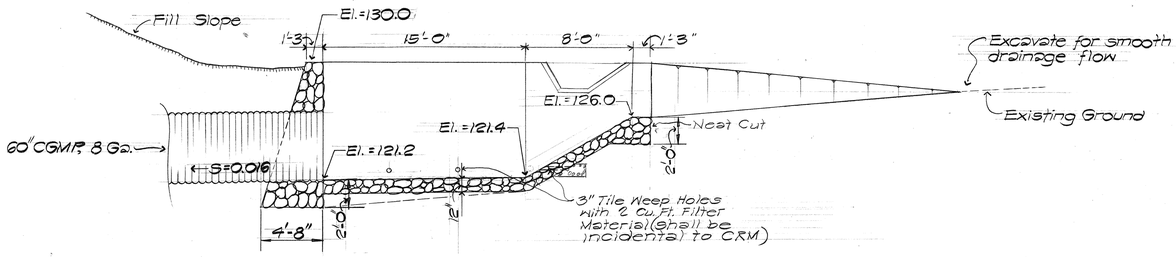
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(75)8	1969	31	181







SECTION "A-A"



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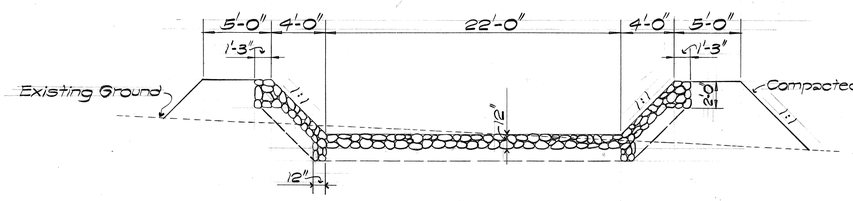
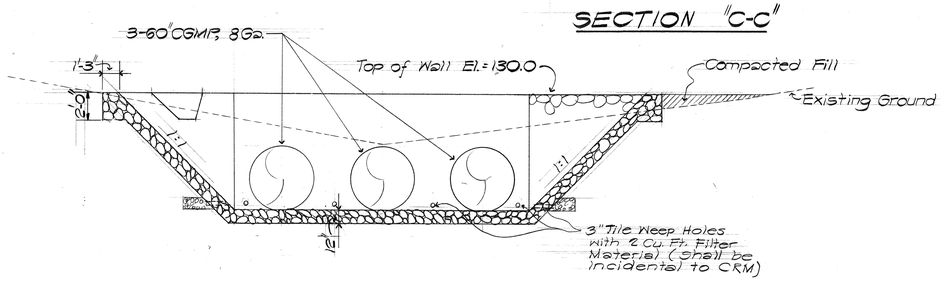


SECTION "B-B"



SECTION "D-D"

OUTLET "A" DETAILS

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

INLET "A" DETAILS

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

ORIGINAL PLAN

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

BEN TAGUCHI
REGISTERED PROFESSIONAL ENGINEER
No. 1030
HAWAII, U.S.A.

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

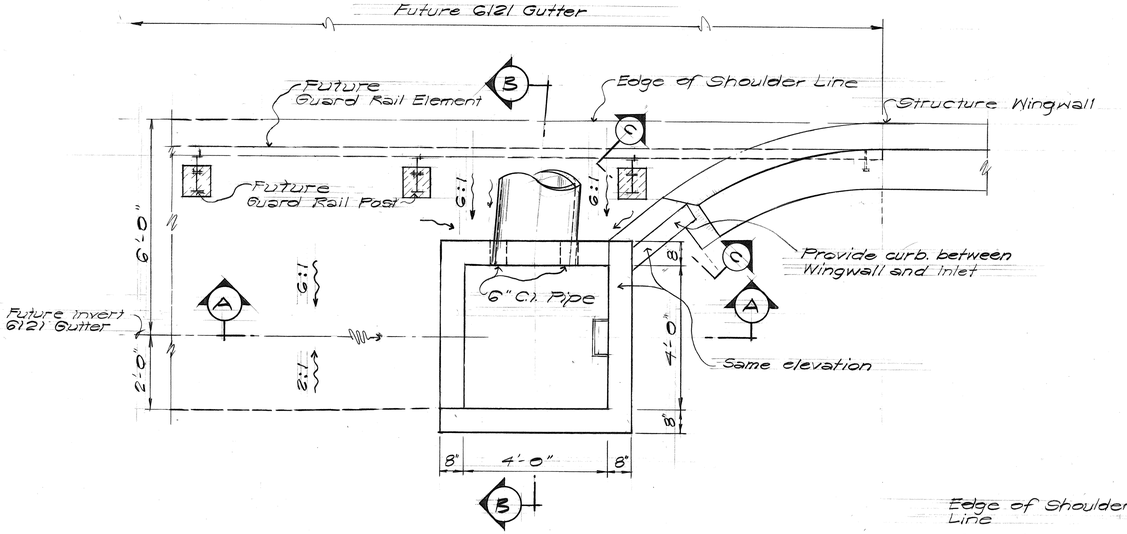
DRAINAGE DETAILS

WAIAWA INTERCHANGE
F.A.I. Proj. No. I - HI - 1(75)8

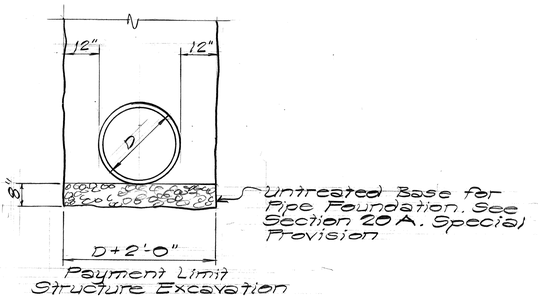
Scale: As shown — Date: JUNE, 1969

SHEET No. 8 OF 21 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(75):8	1969	C.O.32	181



PLAN

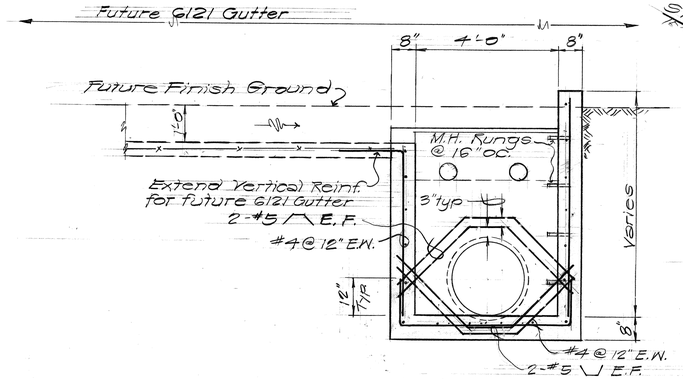


TYPICAL TRENCH BEDDING

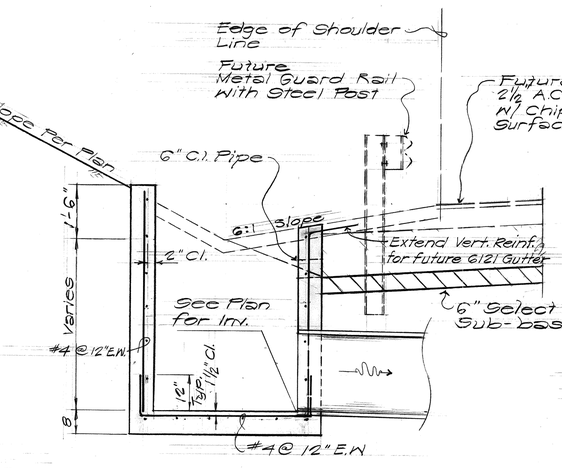
Scale: 1/2"=1'-0"

GENERAL NOTES:

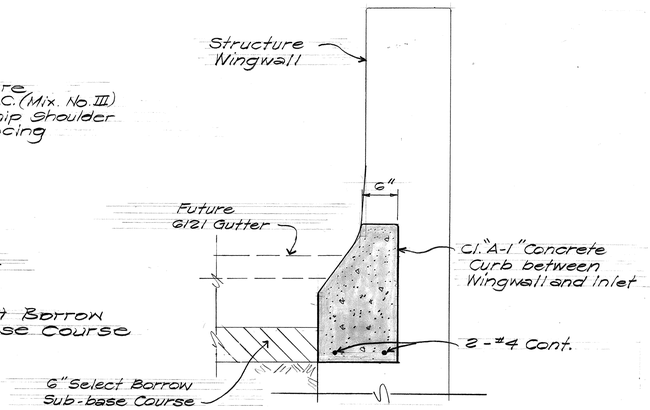
1. Unless otherwise noted, all concrete for drainage improvements shall be Class "A-1".
2. The final location of manhole rungs shall be determined by the Engineer.
3. Manhole rungs and wire mesh reinforcing shall be incidental to the concrete item involved.
4. Provide 2-#5 ⋁ bars around culvert pipes for all inlets as shown in Section "A-A" of Inlet #7.
5. Fillet (Grout) all bottom corners and edges.
6. The lateral limits for payment of structure excavation for drainage structures shall be vertical surfaces one foot outside the exterior face of walls.
7. Grade to drain into inlets and provide 6" C.I. pipe as directed by the Engineer.



SECTION "A-A"



SECTION "B-B"



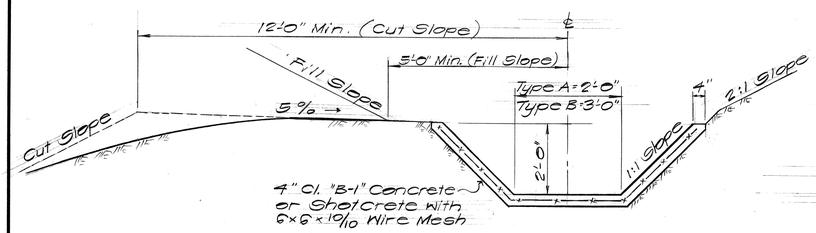
SECTION "C-C"

TYPICAL CONCRETE CURB BETWEEN WINGWALL & INLET

Scale: 1" = 1'-0"

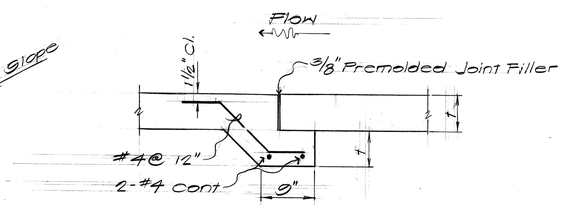
DETAILS ~ INLETS #~~7~~, #8, #9, #~~10~~ & #11

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



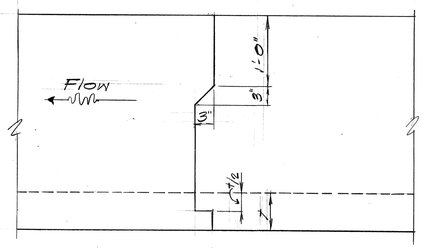
CUT-OFF DITCH SECTION TYPE A & B

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



TYPICAL EXPANSION JOINT @ 90'oc. FOR CUT-OFF DITCH & CHANNEL

Scale: 1"=1'-0"



ELEVATION VIEW

TYPICAL CONSTRUCTION JOINT @ 30'oc. FOR CUT-OFF DITCH & CHANNEL

Scale: 1"=1'-0"

NOTE:
For details of Inlets #7 & 10 see Sheet No. C.O.32A

BEN TAGUCHI
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HAWAII, U.S.A.

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS

WAIAWA INTERCHANGE
F.A.I. Proj. No. I - HI -1(75):8

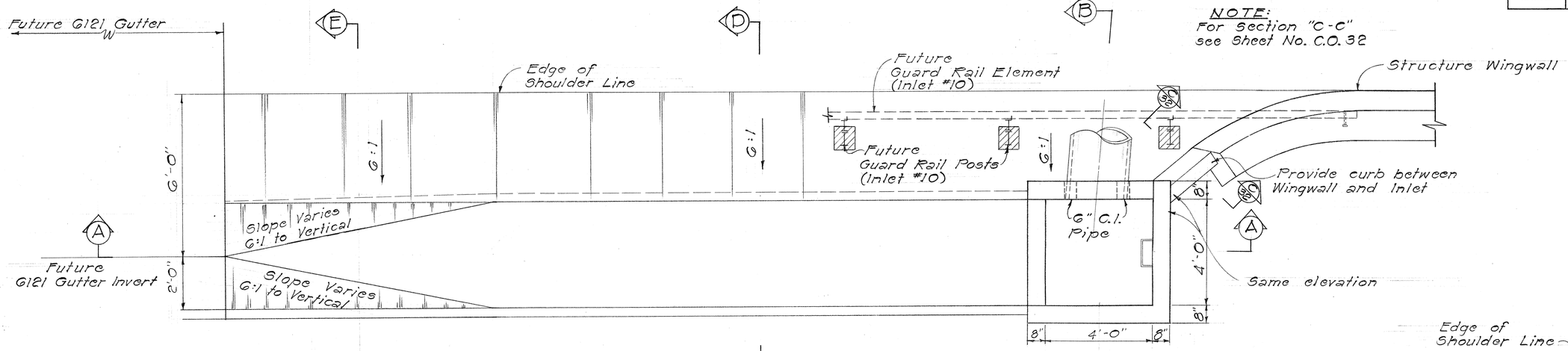
Scale: As shown Date: JUNE, 1969

SHEET No. 9 OF 21 SHEETS

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

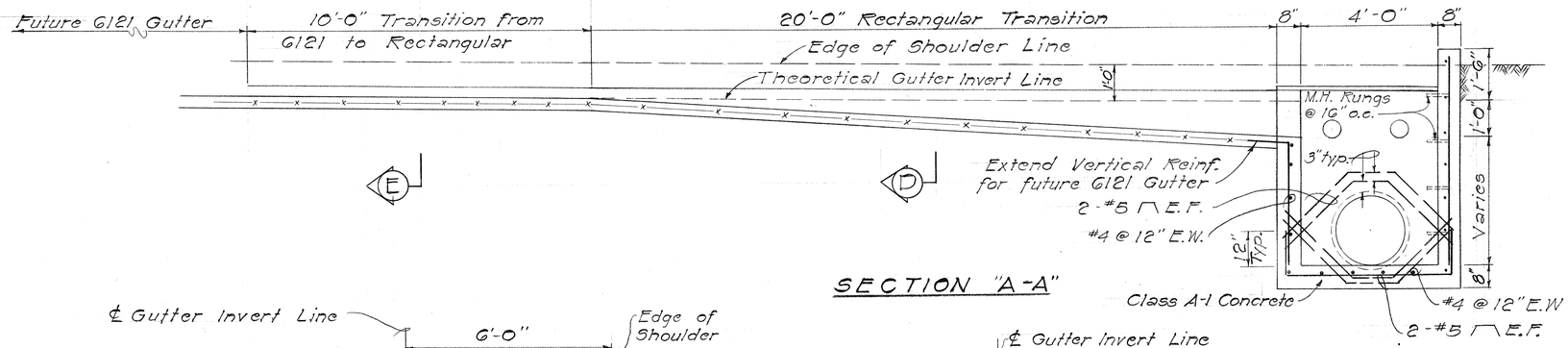
November 29, 1971 C.O.32

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(75):8	19	C.O.32A	181

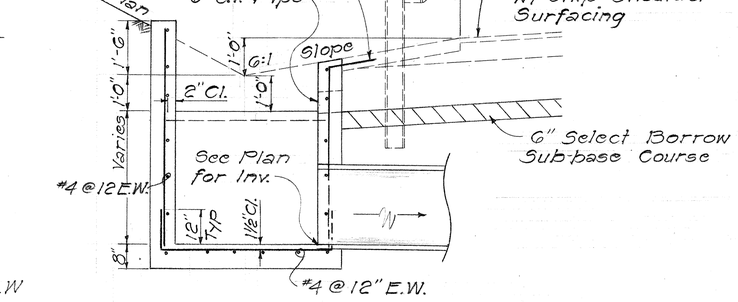


NOTE:
For Section "C-C" see Sheet No. C.O. 32

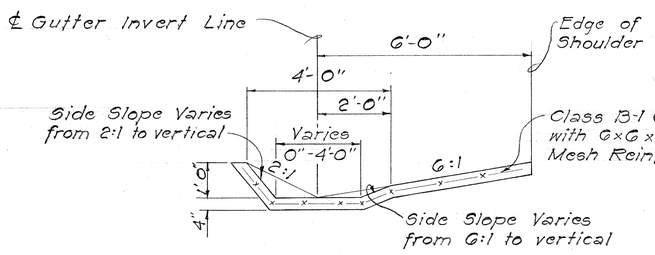
PLAN



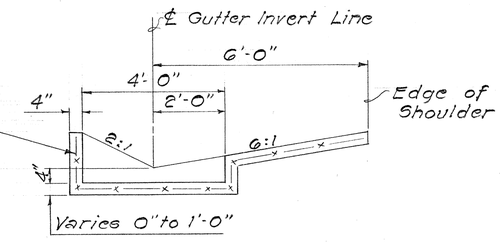
SECTION "A-A"



SECTION "B-B"



SECTION "E-E"
(TRANSITION FROM G121 TO RECTANGULAR)



SECTION "D-D"
(RECTANGULAR TRANSITION)

DETAILS - INLETS #7 & #10

Scale: ½" = 1'-0"

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS

WAIAWA INTERCHANGE
F.A.I. Proj. No. I-HI-1(75):8

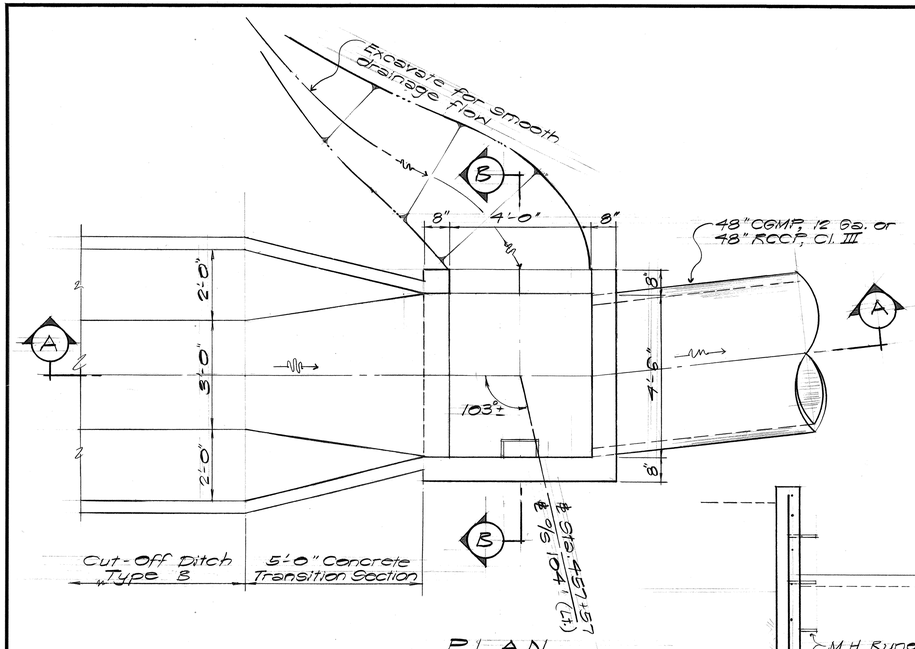
Scale: As Shown Date: Nov. 1971

SHEET No. OF SHEETS

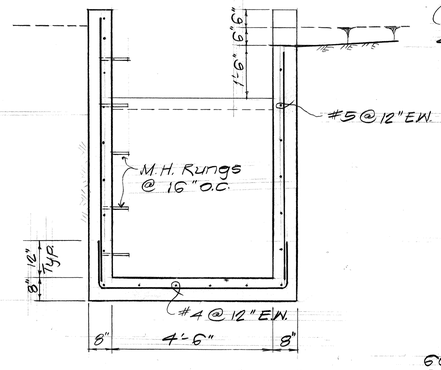
November 29, 1971 C.O. 32A

K&E CRYSTALENE® LA 3888 TRACING PAPER

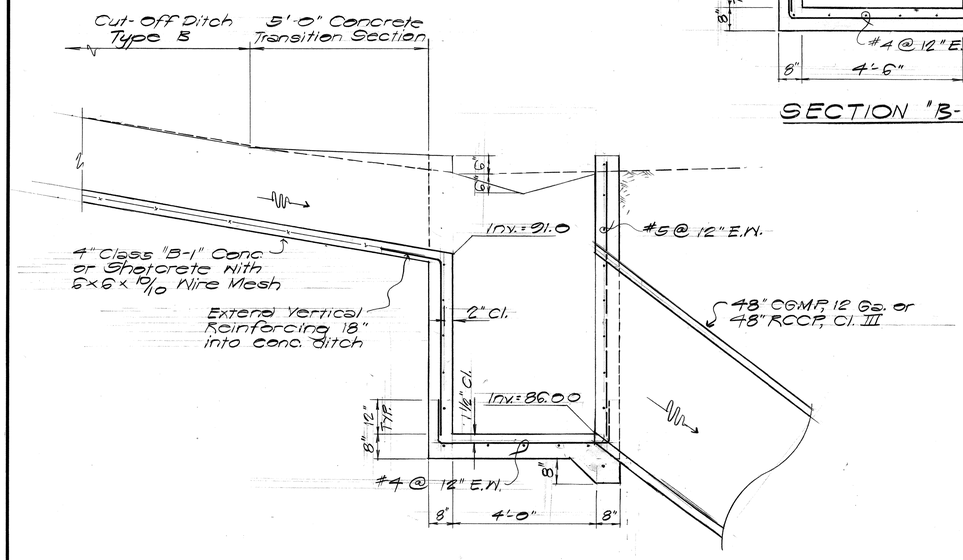
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(75)8	1969	33	181



PLAN



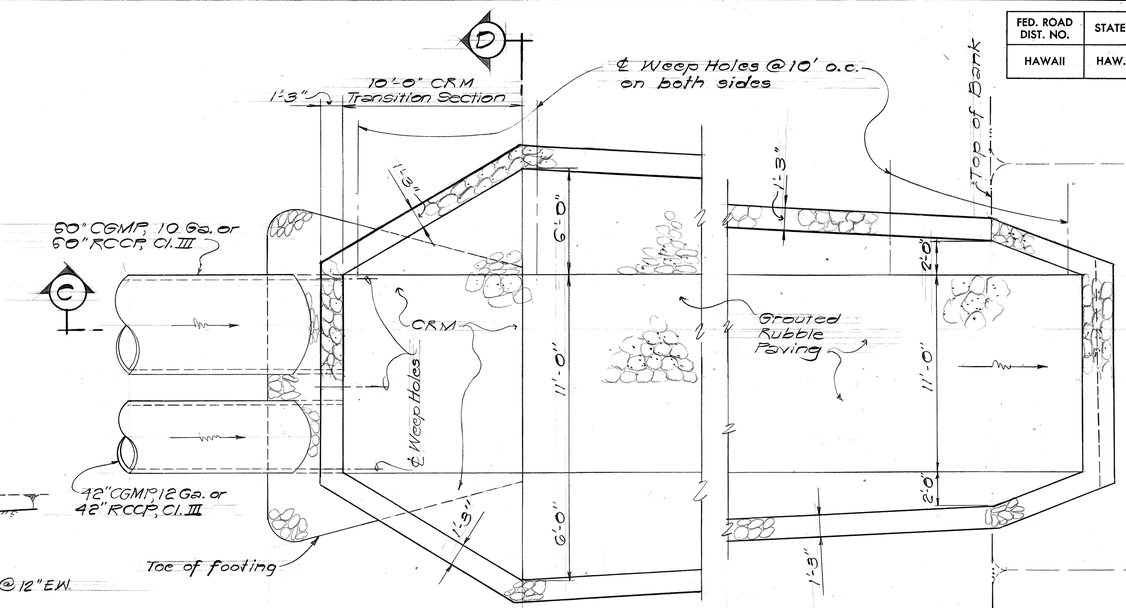
SECTION "B-B"



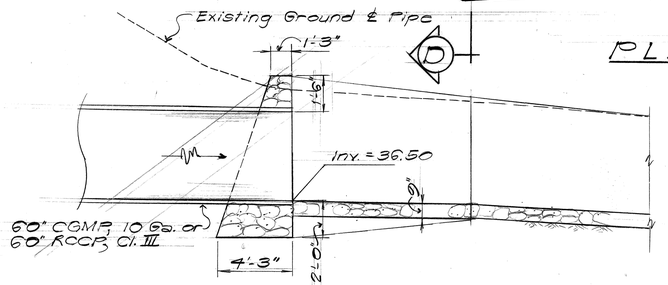
SECTION "A-A"

DETAILS ~ INLET #12

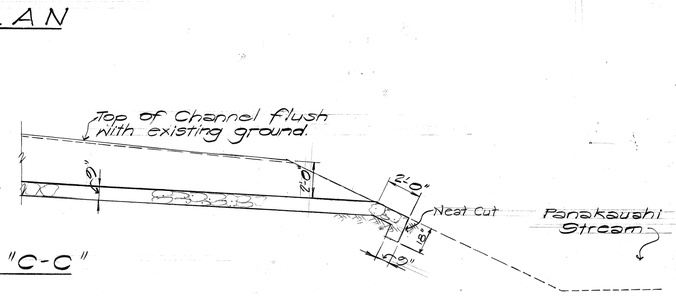
Scale: ½" = 1'-0"

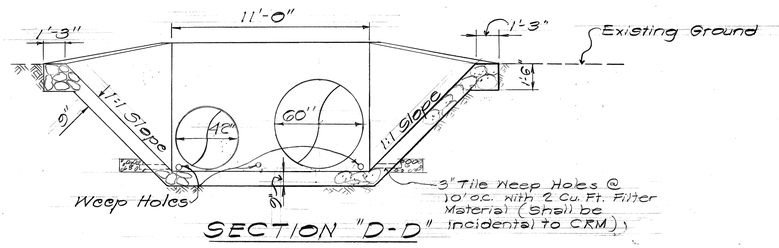


PLAN



SECTION "C-C"





SECTION "D-D"

DETAILS ~ OUTLET B

Scale: ¼" = 1'-0"

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

BEN TAGUCHI REGISTERED PROFESSIONAL ENGINEER No. 1030 HAWAII, U.S.A.

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS

WAIAWA INTERCHANGE
F.A.I. Proj. No. I - HI-1(75):8

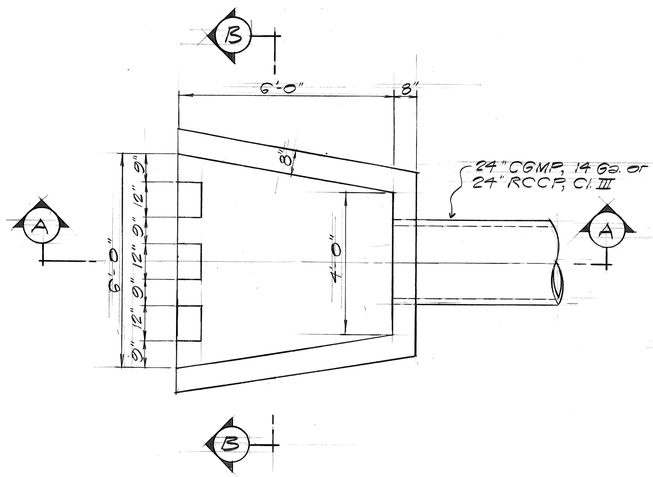
Scale: As shown Date: JUNE, 1969

SHEET No. 10 OF 21 SHEETS

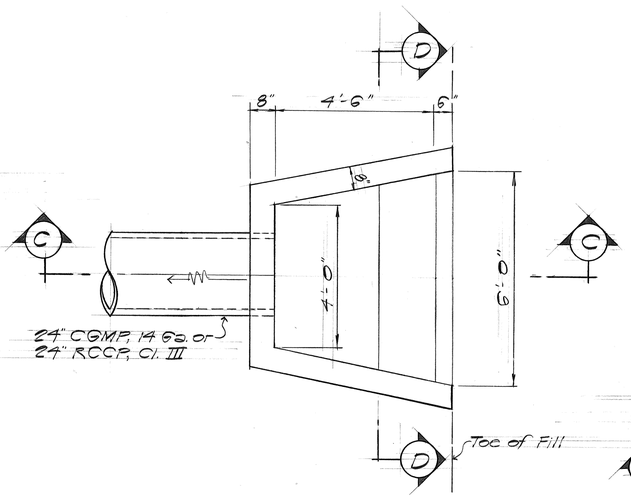
November 29, 1971

C.0.33

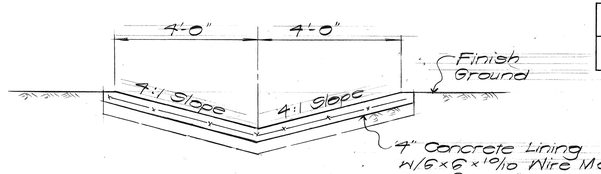
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(75)8	1969	34	181



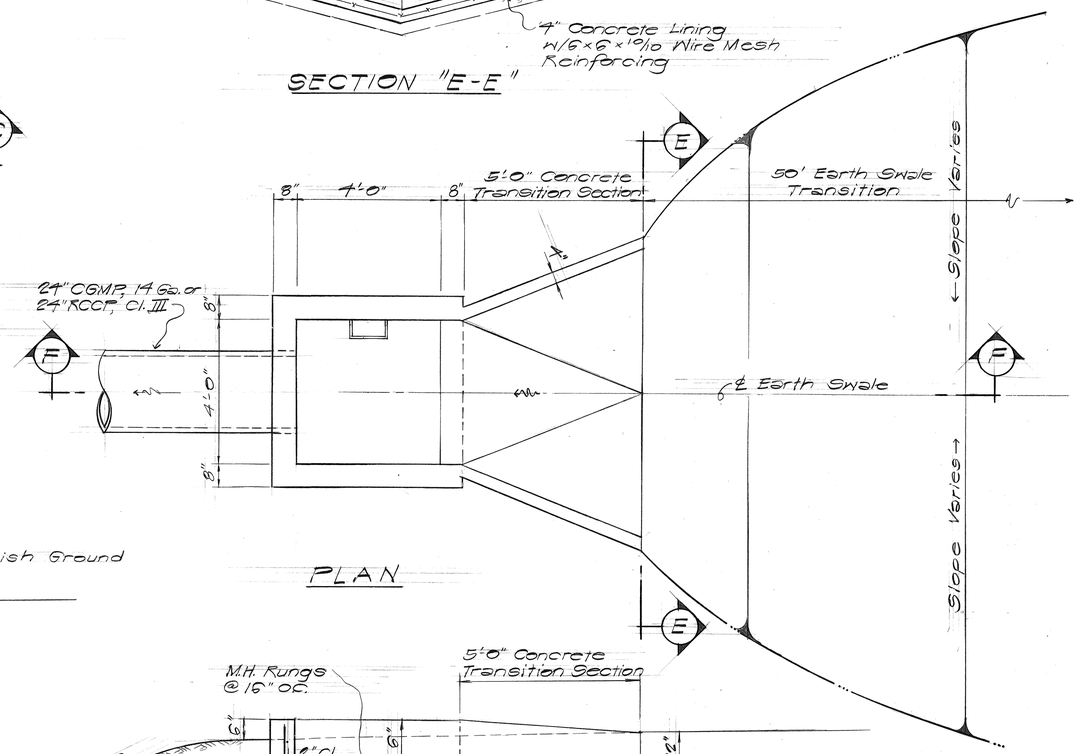
PLAN



PLAN



SECTION "E-E"

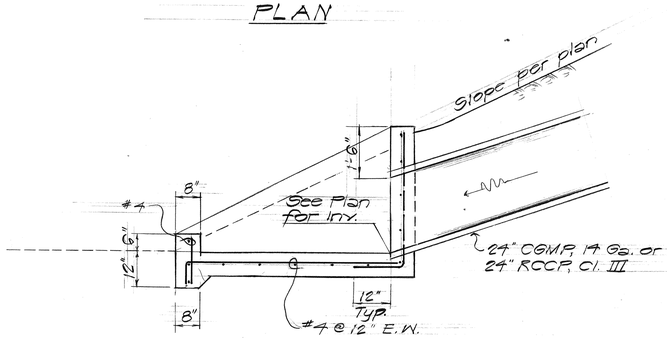


PLAN

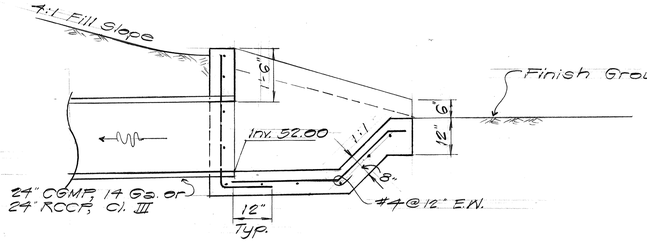
SECTION "F-F"

DETAILS ~ INLET #19

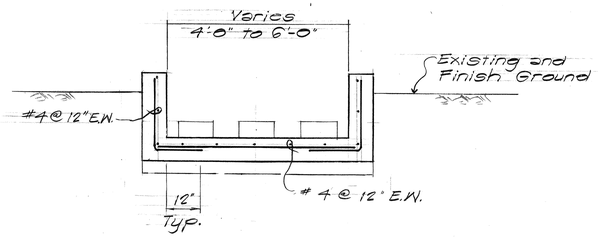
Scale: ½"=1'-0"



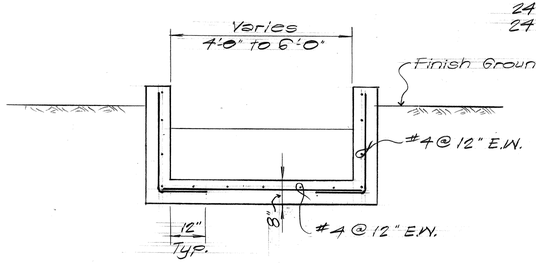
SECTION "A-A"



SECTION "C-C"



SECTION "B-B"



SECTION "D-D

DETAILS ~ OUTLETS "C", D" & "E"

Scale: ½"=1'-0"

DETAILS ~ INLET "B"

Scale: ½"=1'-0"

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

BEN TAGUCHI
REGISTERED PROFESSIONAL ENGINEER
No. 1030
HAWAII, U.S.A.

"THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION."

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS

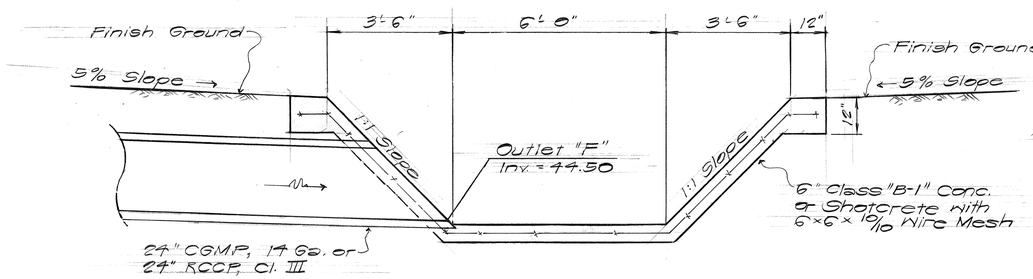
WAIAWA INTERCHANGE
F.A.I. Proj. No. I - HI -1(75)-8

Scale: As shown Date: JUNE, 1969

SHEET No. 11 OF 21 SHEETS

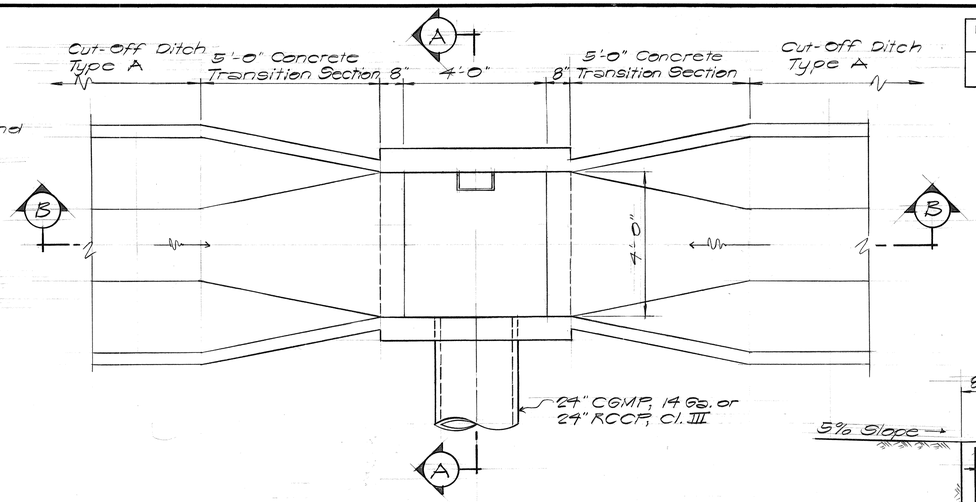
34

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-I(75):8	1969	35	181

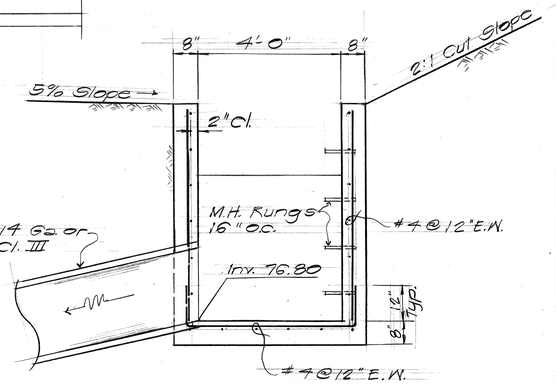


TYPICAL SECTION CHANNEL "A"

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



PLAN



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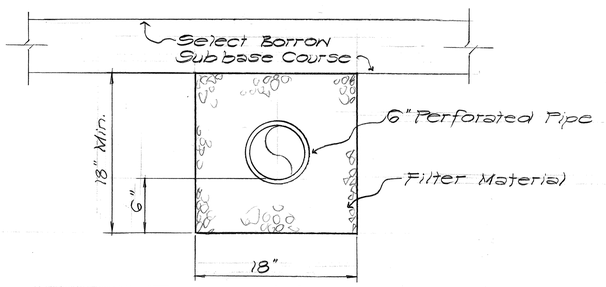
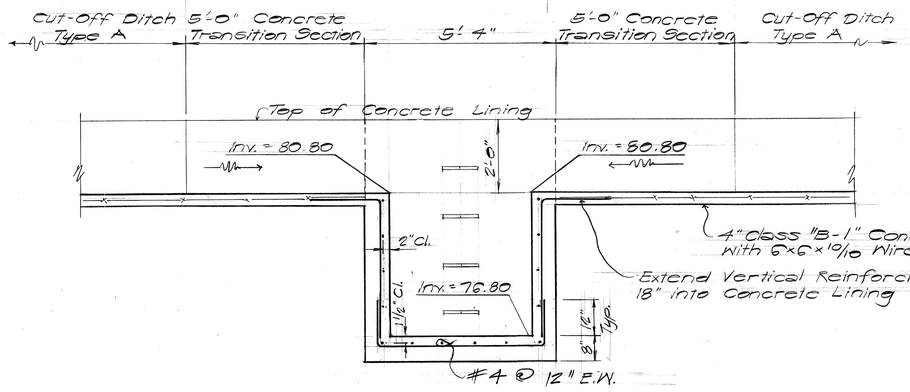
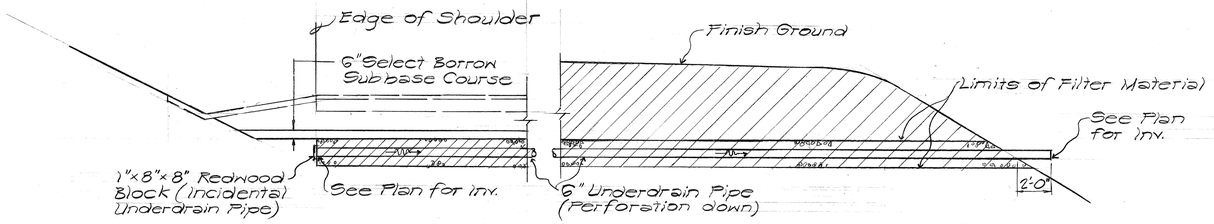


TYPICAL UNDERDRAIN DETAIL

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



SECTION "B-B"



NOTE:

Hatched Areas denote limit of Structure Excavation Payline

TYPICAL UNDERDRAIN PROFILE

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

DETAILS ~ INLET #23

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

BEN TAGUCHI
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No. 1030
HAWAII, U.S.A.

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS

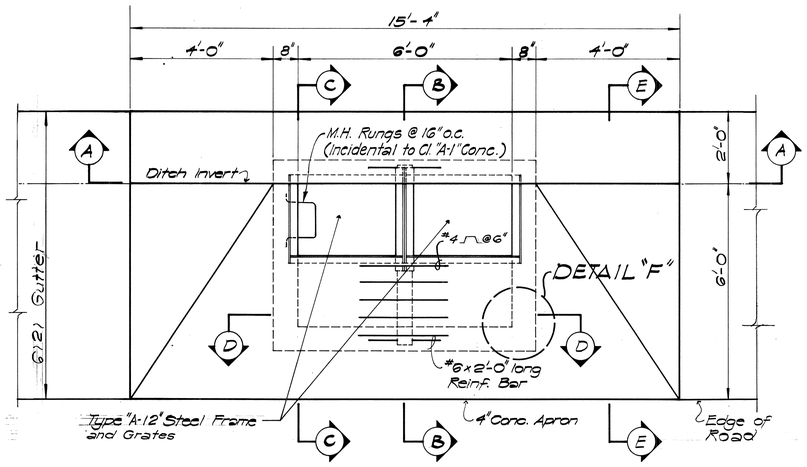
WAIAWA INTERCHANGE
F.A.I. Proj. No. I - HI - 1(75):8

Scale: As shown Date: JUNE, 1969

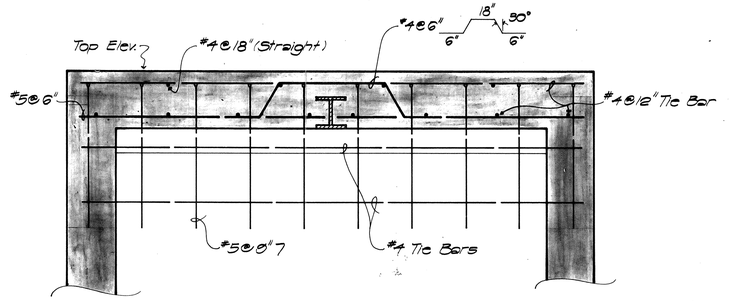
SHEET No. 12 OF 21 SHEETS

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

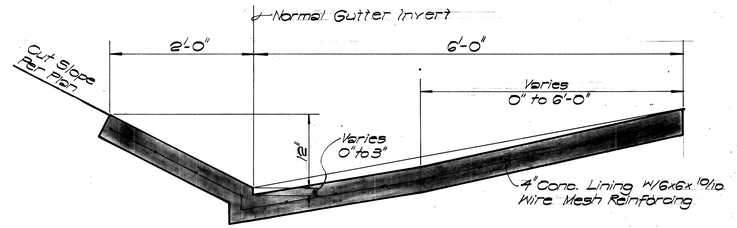
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	~~I-HI-1(75)-8~~	~~1969~~	36	181



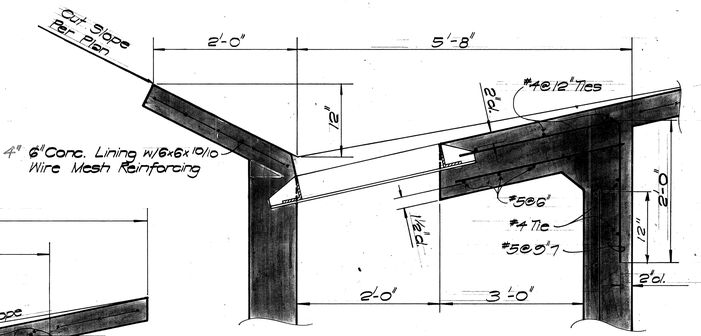
PLAN
Not to Scale



SECTION "D-D"
Scale: 1" = 1'-0"



SECTION "E-E"
Scale: 1" = 1'-0"



SECTION "C-C"
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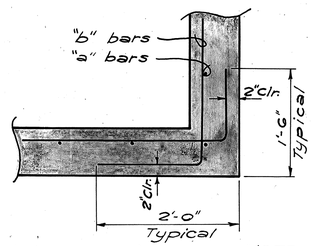
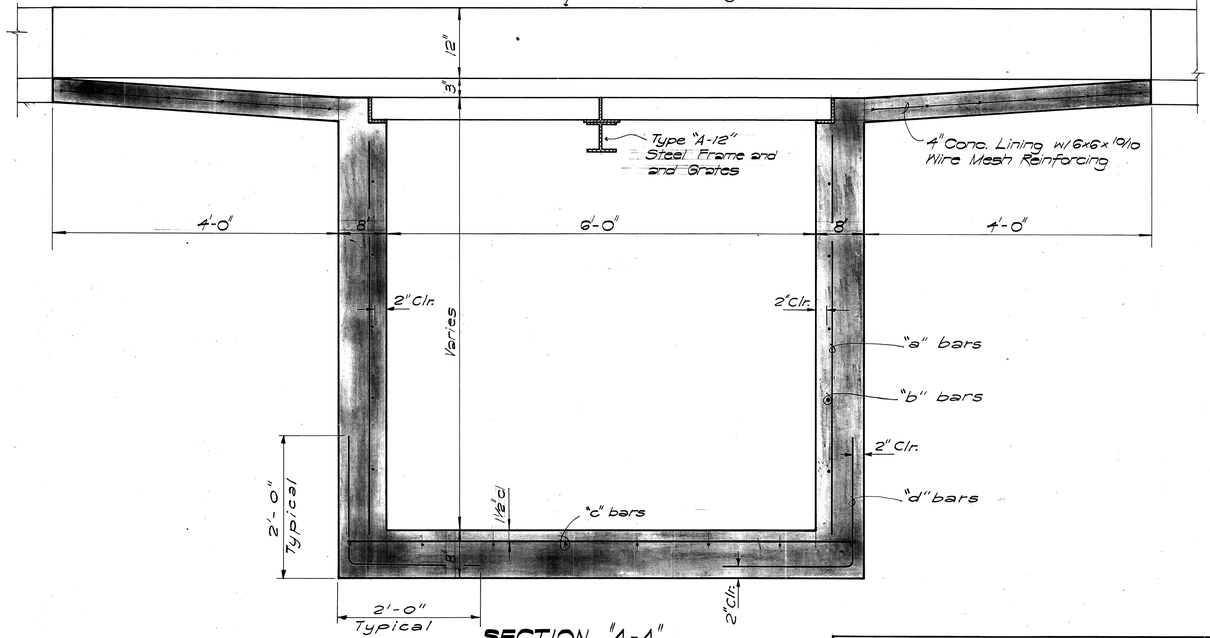
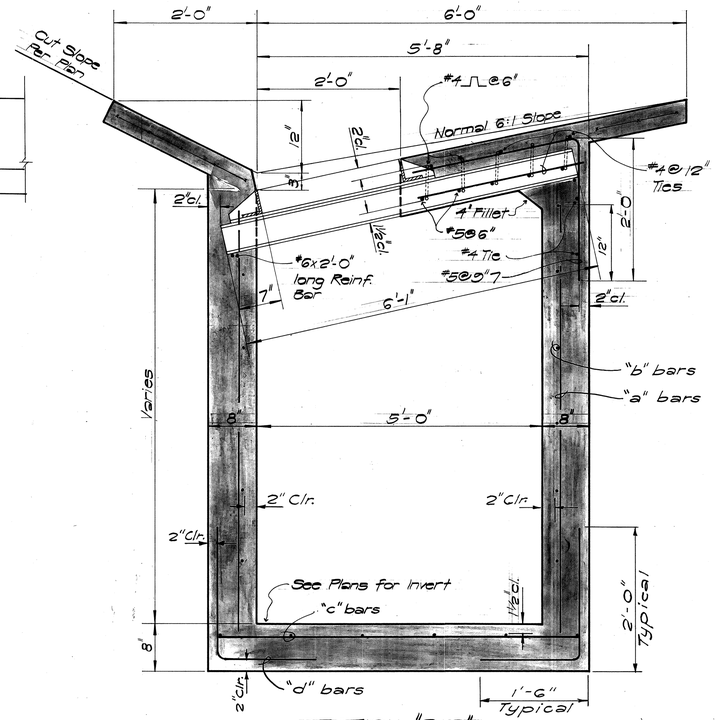


DETAIL "F"
Scale: 1" = 1'-0"

NOTE: Typical at all Corners.



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



SECTION "B-B"
Not to Scale

REINFORCEMENT STEEL SCHEDULE

INLET	"a" bars	"b" bars	"c" bars	"d" bars
13 & 14	#5 @ 12"	#5 @ 12"	#5 @ 12" Bothways	#5 @ 12"
15	#5 @ 6"	#5 @ 12"	#5 @ 12" Bothways	#5 @ 12"

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STATE OF HAWAII
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HIGHWAYS DIVISION

DRAINAGE DETAILS (TYPE "A" INLET)

WAIAWA INTERCHANGE
F.A.I. Proj. NO I-HI-1(75):8

Scale As shown Date: JUNE, 1969

SHEET No. 13 OF 21 SHEETS

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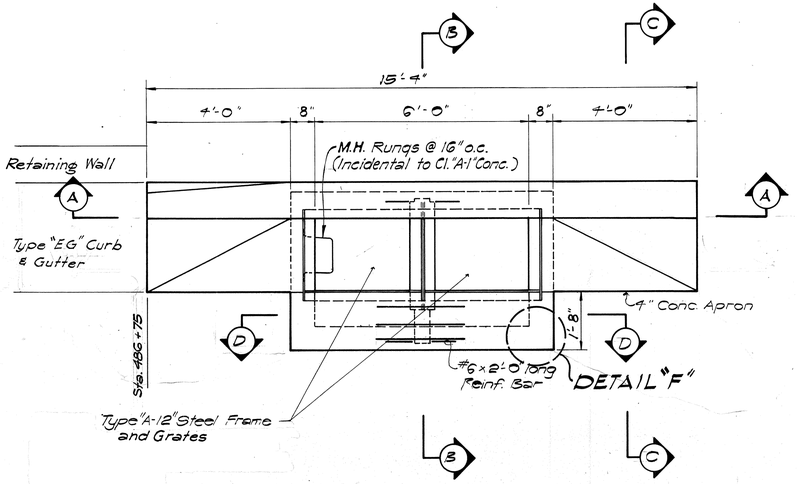
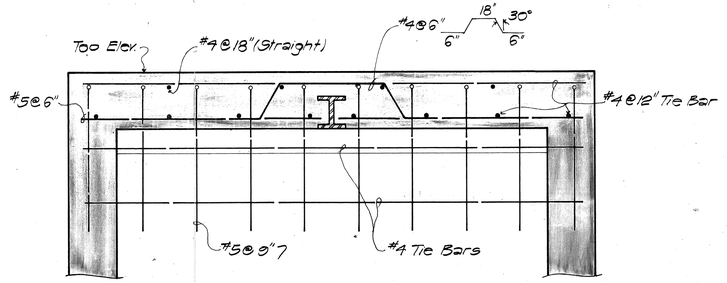
NOTE BOOK	QUANTITIES BY	
No.	CHECKED BY	

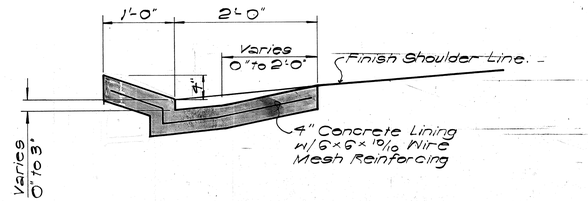
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	~~FHI-1(75)8~~	~~1969~~	37	181



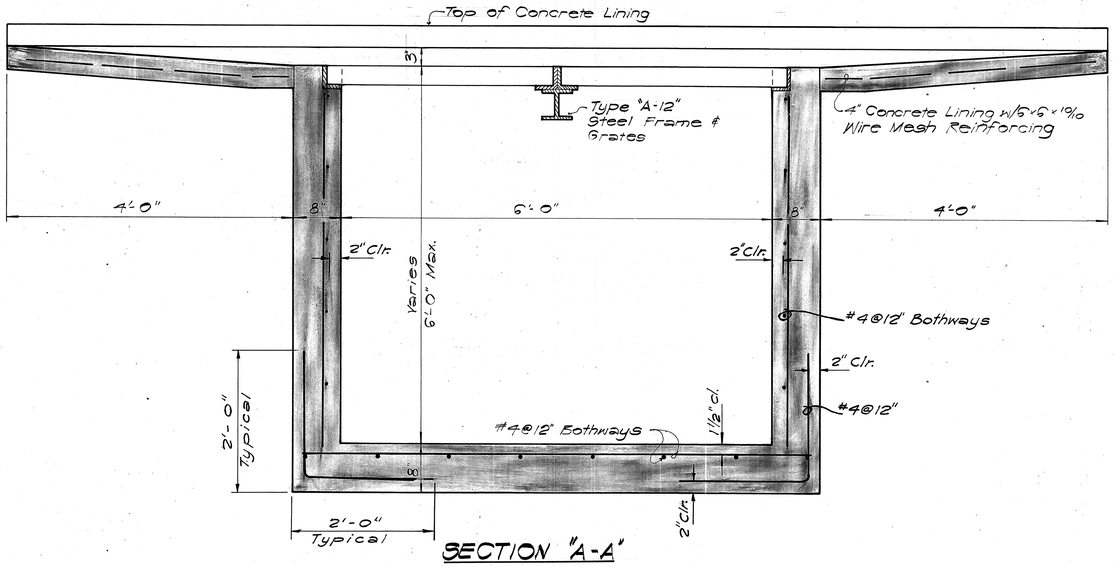
PLAN
Scale: 1/2" = 1'-0"



SECTION "D-D"
Scale: 1" = 1'-0"



SECTION "C-C"
Scale: 1" = 1'-0"



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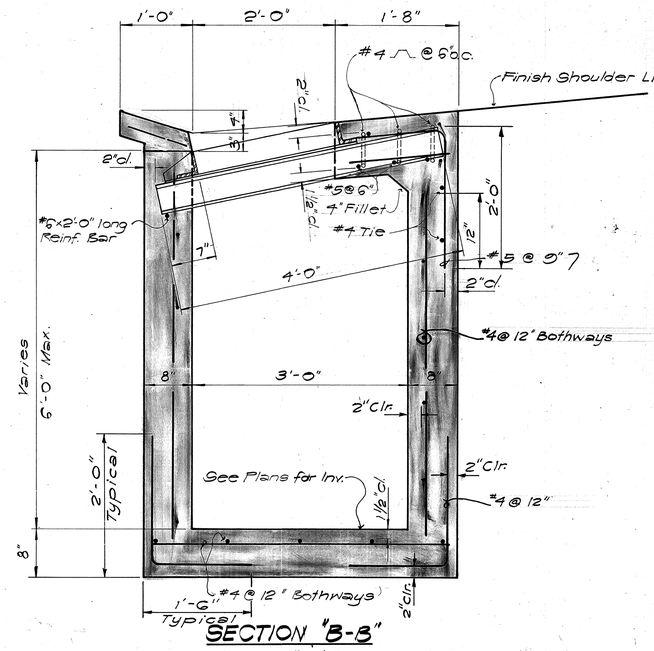

SECTION "B-B"
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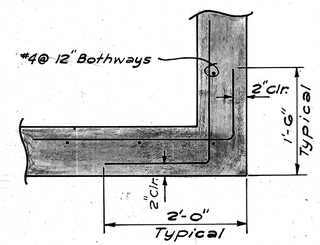

DETAIL "F"
Scale: 1" = 1'-0"

NOTE: Typical at all Corners.

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

BEN TAGUCHI
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STATE OF HAWAII
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HIGHWAYS DIVISION

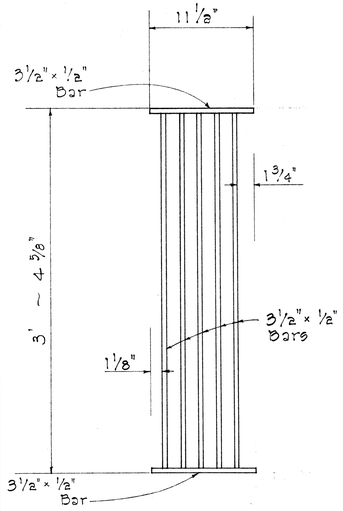
DRAINAGE DETAILS
(TYPE "B" INLET)

WAIAWA INTERCHANGE
F.A.I. Proj. No. I - HI - 1(75):8

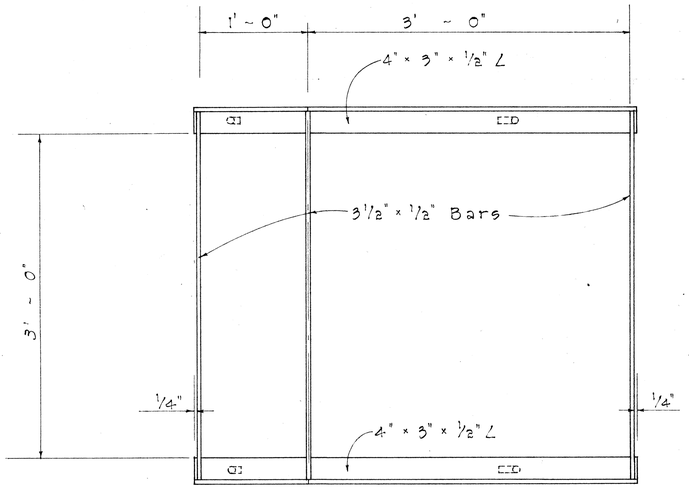
Scale: As shown Date JUNE, 1969

SHEET No. 14 OF 21 SHEETS

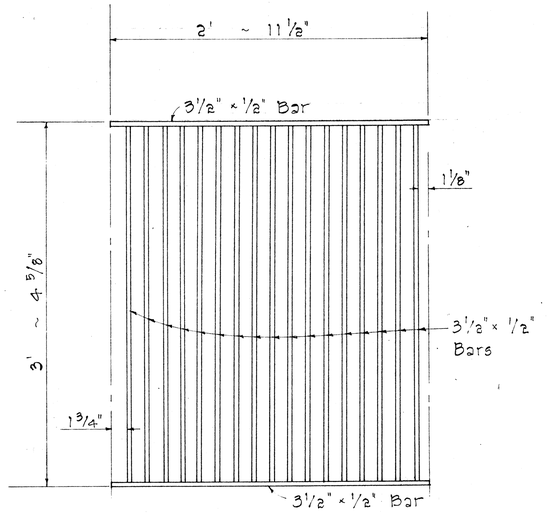
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(75)8	1969	38	181



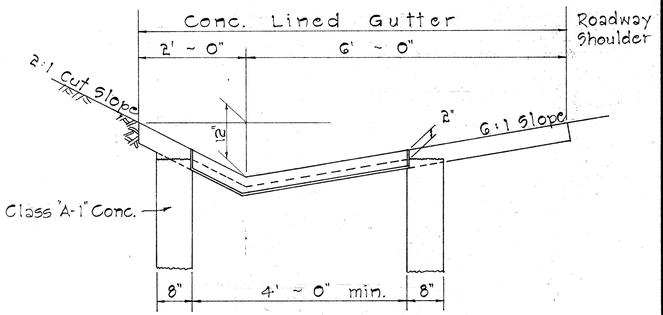
PLAN
Scale: 1 1/2" = 1'-0"



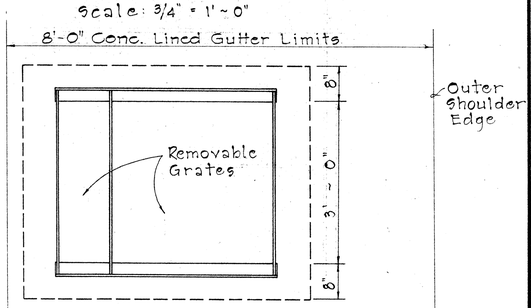
PLAN
Scale: 1 1/2" = 1'-0"



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



SECTION VIEW
Scale: 3/4" = 1'~0"

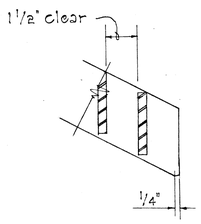


PLAN VIEW
Scale: 3/4" = 1'~0"

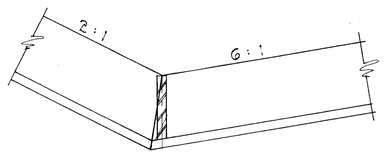
SECTION
Scale: 1 1/2" = 1'-0"

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

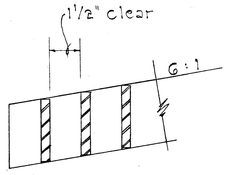
SECTION
Scale: 1 1/2" = 1'-0"



GRATE
ON 2:1 SLOPE
Scale: 3" = 1'-0"



FRAME
Scale: 3" = 1'-0"



GRATE
ON 6:1 SLOPE
Scale: 3" = 1'-0"

GENERAL NOTES

1. Contractor has the option of using welded steel grate.
2. Grates and Frames shall be hot dip galvanized after fabrication, see specifications.
3. All welds 3/8" unless otherwise noted.
4. The various materials shall conform to the specifications of ASTM as listed in the following tabulation and the Standard Specifications.

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

DETAIL OF TYPE 6121 STEEL FRAME AND GRATE

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS

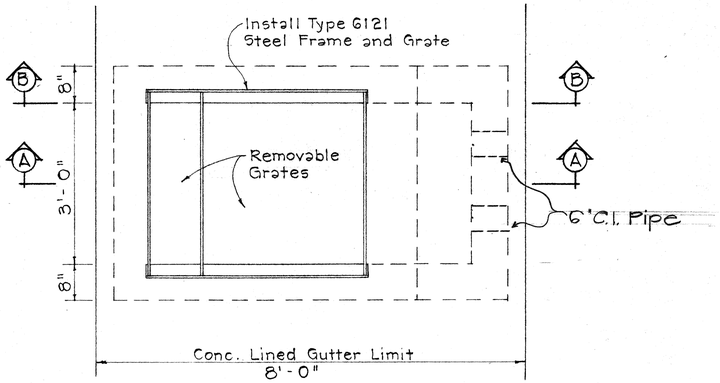
FOR TYPE 6121 GRATED CONC. DROP INTAKE

Scale: As Shown Date: JUNE, 1969

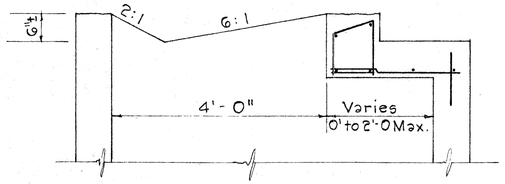
SHEET No. 15 OF 21 SHEETS

PRINTED ON NO. 1000H CLEARPRINT

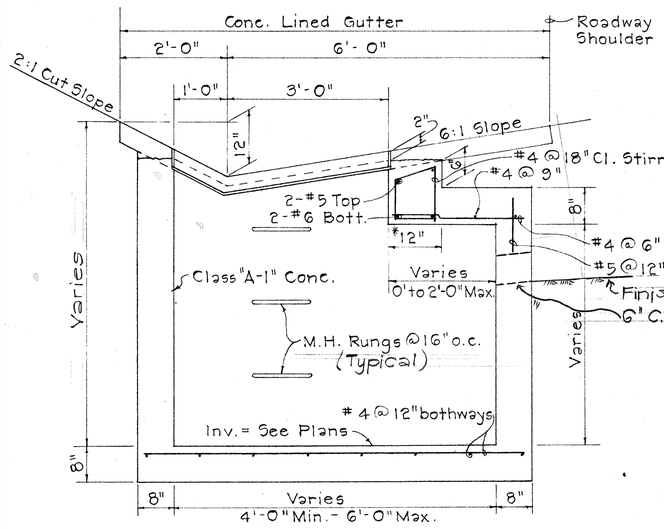
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(75)8	1969	39	181



PLAN



SECTION "B-B"
(OPPOSITE WALL SIMILAR)



SECTION "A-A"

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

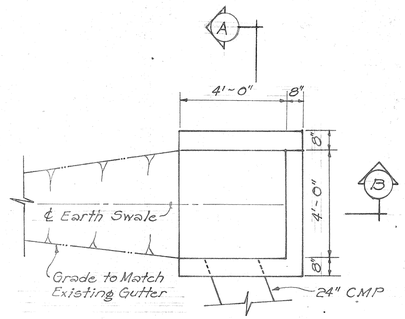
NOTES:

1. Culvert shall leave C.D.I. from any position and any direction indicated by plans or ordered by the Engineer. Culvert may both enter and leave C.D.I. so that C.D.I. will act as manhole.
2. Use minimum size box of 3'-0" x 4'-0" for this project.
3. Add reinforcing bars #4 @ 12" bothways in vertical walls of Inlet #22.
4. Grade to drain into inlets and provide 6" C.I. pipe as directed by the Engineer.

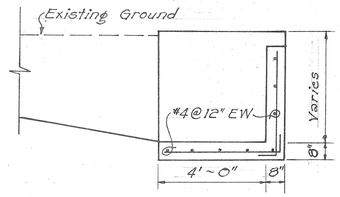
DETAILS OF CONCRETE DROP INTAKE FOR TYPE 6121 STEEL FRAME & GRATE

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

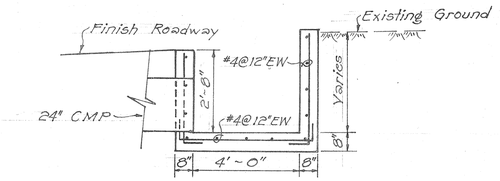
ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	
	TRACED BY	
NOTE BOOK	DESIGNED BY	
No.	QUANTITIES BY	
	CHECKED BY	



PLAN

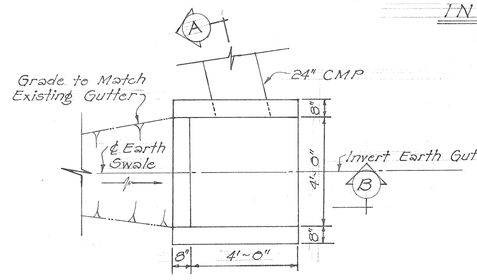


SECTION B

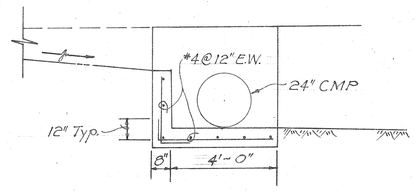


SECTION A

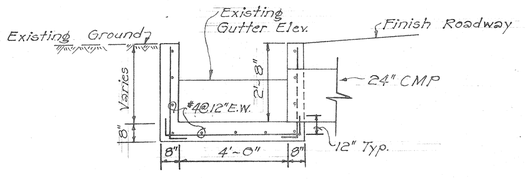
INLET DETAIL



PLAN



SECTION B



SECTION A

OUTLET DETAIL

F.A.I.P. No. I-HI-1(14):8
C.C.O. No. 42
Not to Scale

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

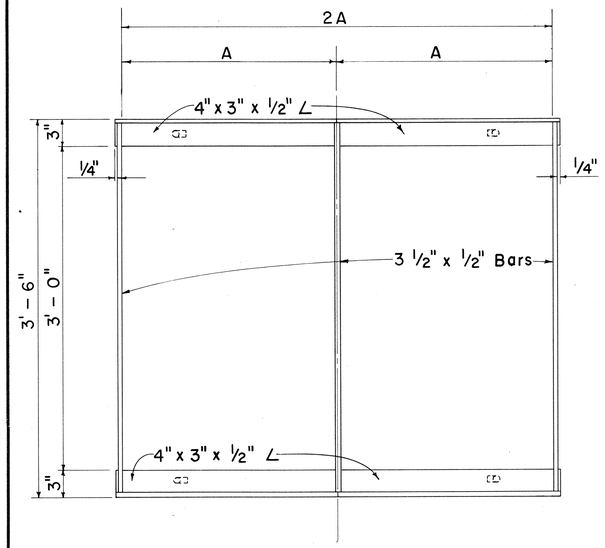
DETAIL OF
CONCRETE DROP INTAKE
FOR
TYPE 6121 STEEL FRAME AND GRATE

Scale: As Shown Date: Jan. 1969

SHEET No. 16 OF 21 SHEETS

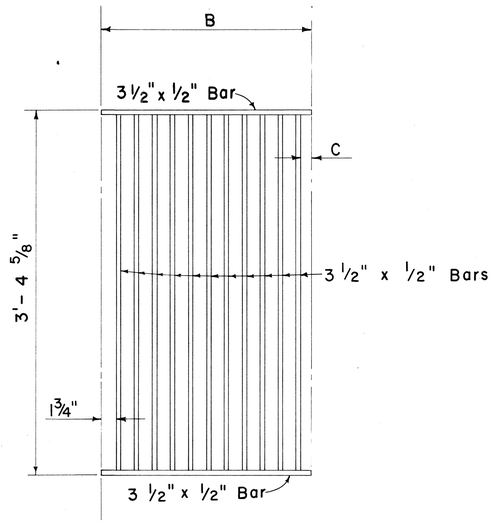
PRINTED ON NO. 1000H CLEARPRINT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(75)18	1969	40	181



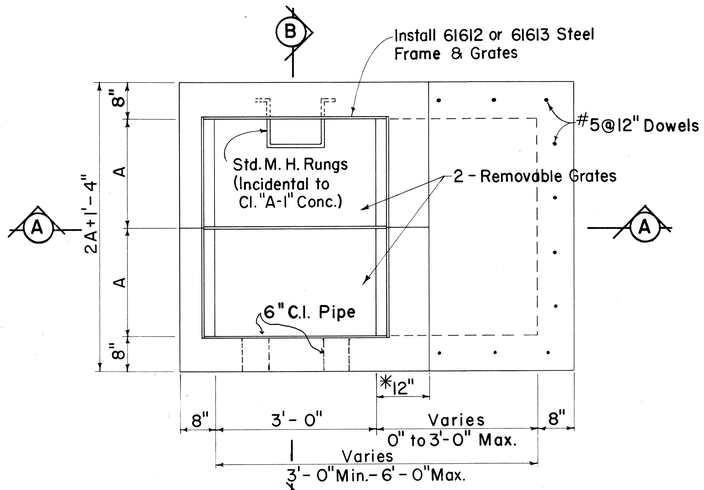
PLAN

Scale: 1½" = 1'-0"

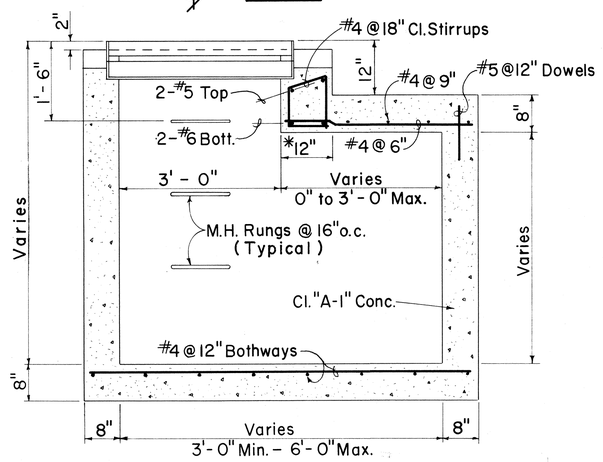


PLAN

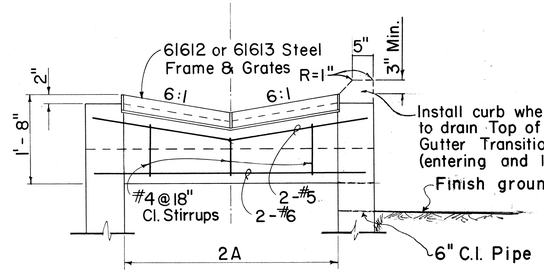
Scale: 1½" = 1'-0"



B PLAN



SECTION A-A



SECTION B-B

DETAIL OF 61612 OR 61613 DROP INTAKE

Scale: ¾" = 1'-0"

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

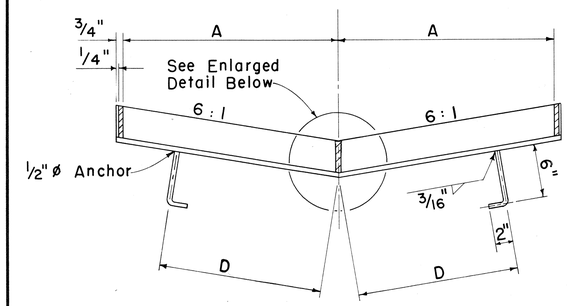
GENERAL NOTES

1. Grates and Frames shall be hot dip galvanized after fabrication, see specifications.
2. All welds ⅜" unless otherwise noted.
3. Refer to "Spacing Table" for Types 61612 & 61613 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.

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

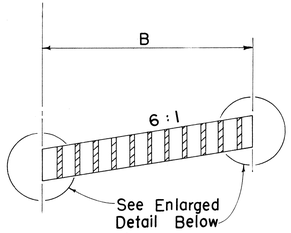
NOTES:

1. Use minimum size box of 3'-0" for this project.
2. Add reinforcing bars #4 at 12" both-ways in vertical walls of Inlet # 20.
3. Grade to drain into Inlets and provide 6" C. I. pipe as directed by the Engineer.



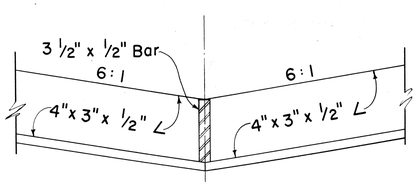
SECTION

Scale: 1½" = 1'-0"



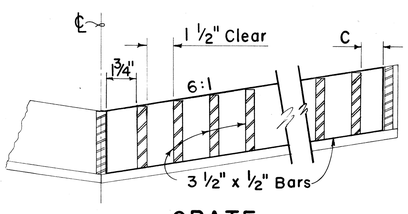
SECTION

Scale: 1½" = 1'-0"



FRAME

Scale: 3" = 1'-0"



GRATE

Scale: 3" = 1'-0"

DETAILS OF TYPE 61612 OR 61613 STEEL FRAME AND GRATES

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

DRAINAGE DETAIL

DETAILS OF 61612 & 61613 DROP INTAKE

Scales: As Noted — Date: Feb. 1969

SHEET No. 17 OF 21 SHEETS

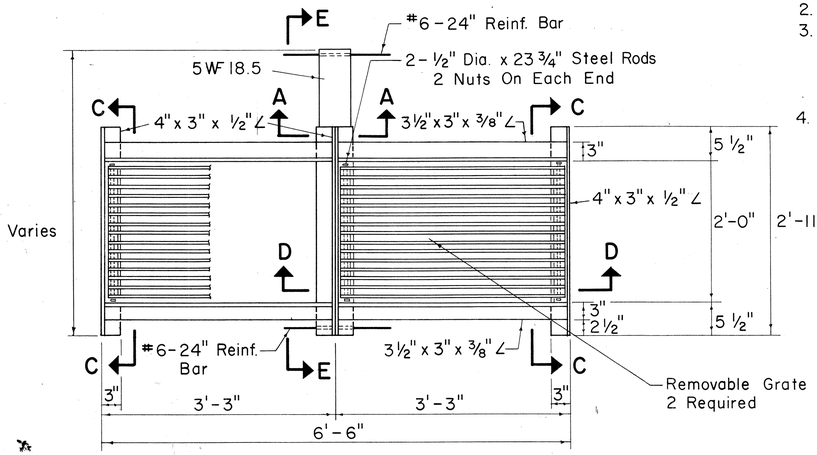
November 29, 1971

C. O. 40

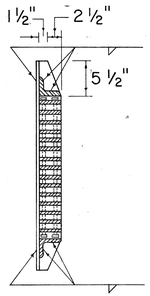
FED. ROAD DIST. NO.	STATE	FED. AID. PROJECT	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	I-HI-1(75)8	1968	41	181

Revised: Jan. 25, 1967

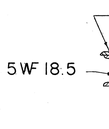
NOTE:
1. All welds 3/8" unless otherwise noted.
2. All steel shall be structural grade.
3. Grates and Frame shall be hot dip galvanized after fabrication in accordance with Section 44(H) of the Standard Specifications.
4. Detail of Types "A-1" and "A-2" Steel Frame and Grates are identical except for the thickness of end spacers and number of grate bars. See Table of End Spacer Thickness.



PLAN



SECTION C-C



SECTION A-A

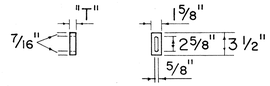
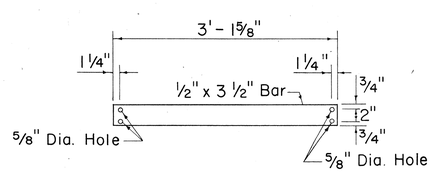
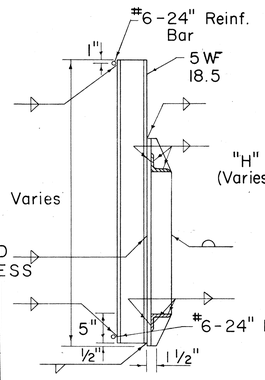


TABLE OF END SPACER THICKNESS	
TYPE FRAME & GRATES	"T" (in.)
A-1	1
A-2	1⅜

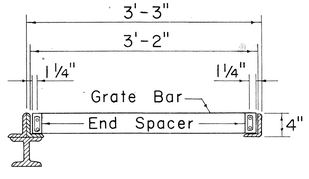
END SPACER



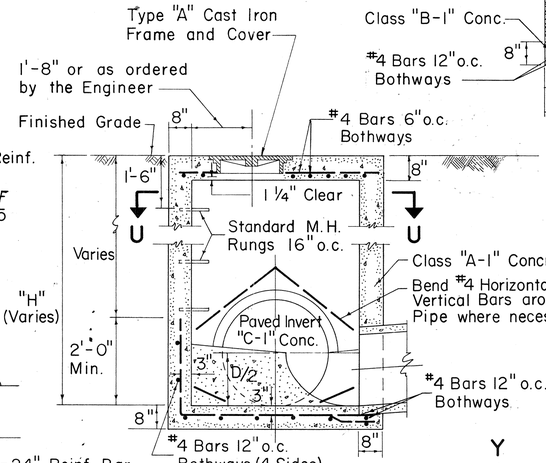
GRATE BARS



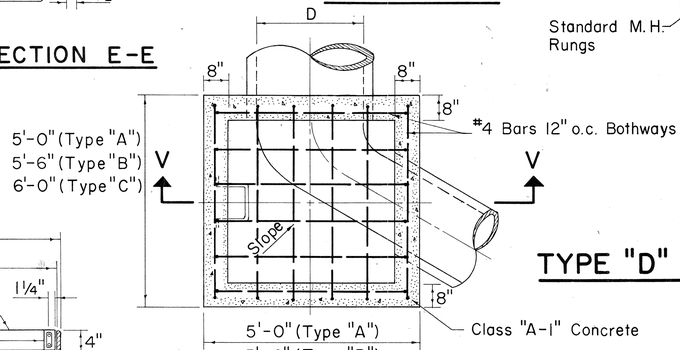
SECTION E-E



SECTION D-D



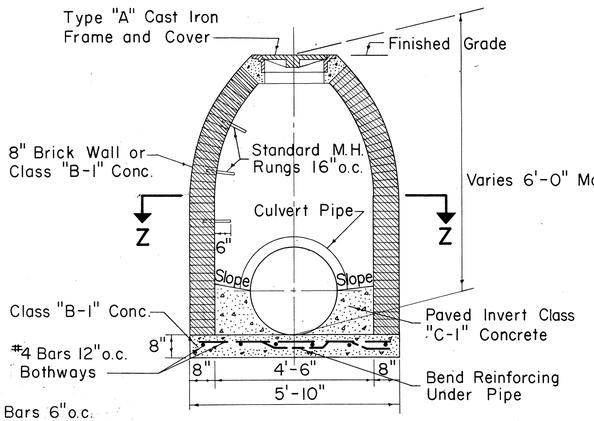
SECTION V-V



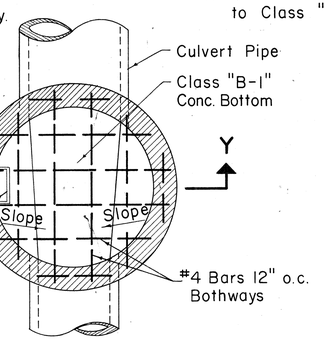
SECTION U-U

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

Scale: ½"= 1'-0"



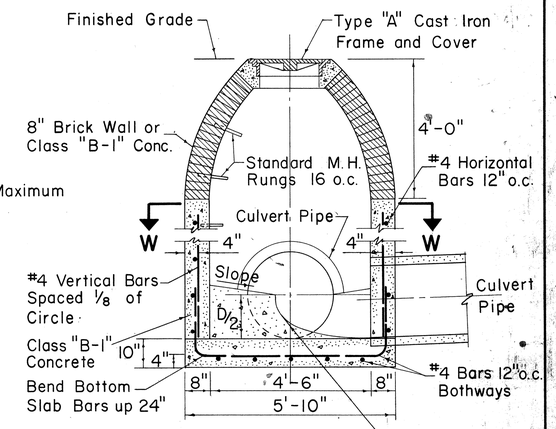
SECTION Y-Y



SECTION Z-Z

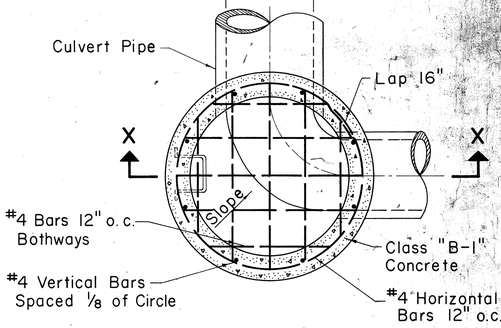
TYPE "D" STORM DRAIN MANHOLE

Scale: ½"= 1'-0"



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 pipes at manhole to be as shown on plans.
3. Paved invert not required at drop manholes.
4. All Class "C-1" Concrete to be incidental to Class "B-1" Concrete.

SECTION X-X



SECTION W-W

TYPE "E" STORM DRAIN MANHOLE

Scale: ½"= 1'-0"

DETAIL OF TYPE "A-1" & "A-2" STEEL FRAME AND GRATES

Scale: 1"= 1'-0"

APPROVED:

DIRECTOR OF TRANSPORTATION DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS

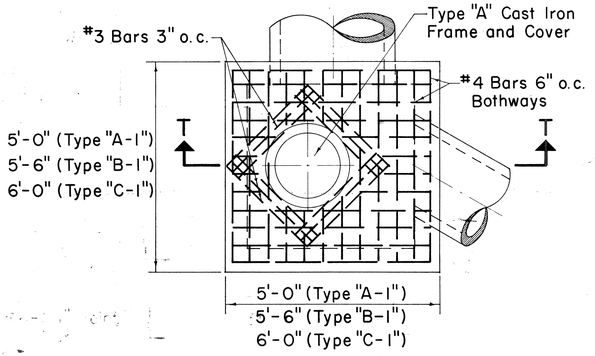
STEEL FRAME AND GRATES AND STORM DRAIN MANHOLES

Scales: As Noted Date JUNE, 1965

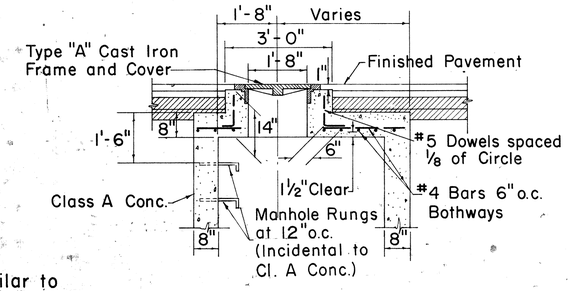
SHEET NO. 18 OF 21 SHEETS

LIETZ 1103 ARKWRIGHT TRACING CLOTH 10-60 200P

FED. ROAD DIST. NO.	STATE	FED. AID. PROJECT	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	I-HI-1(17)5	1969	CO.415-I	181



PLAN

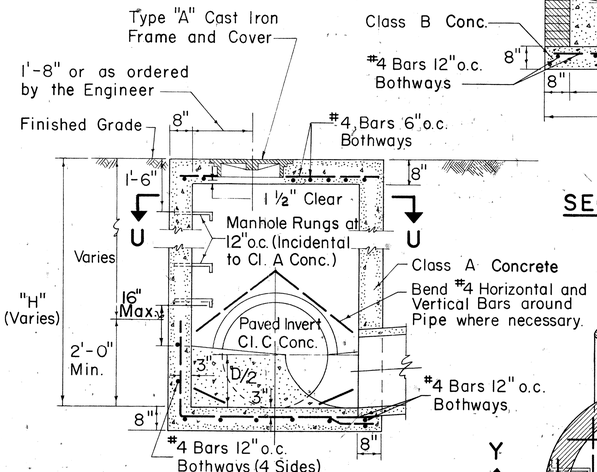


Note:
Bottom detail similar to Type "A", "B", & "C".

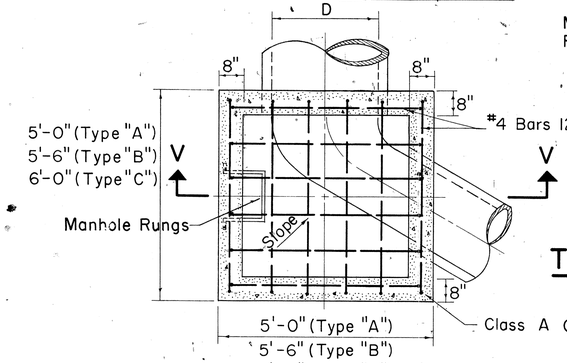
SECTION T-T

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

Scale: ½" = 1'-0"



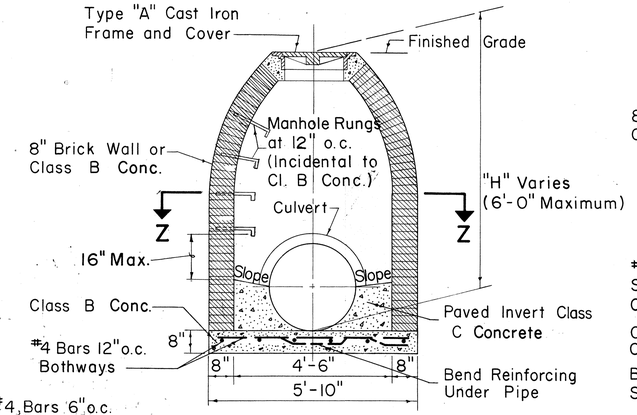
SECTION V-V



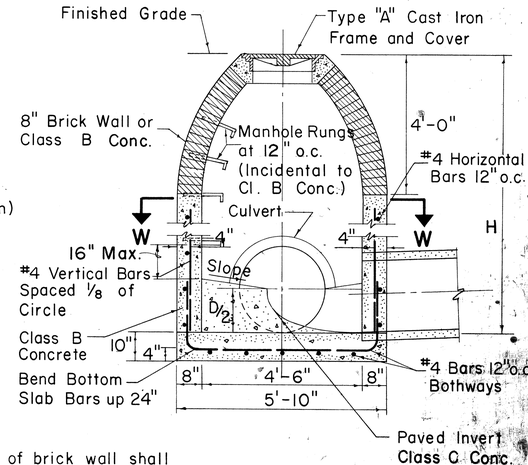
SECTION U-U

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

Scale: ½" = 1'-0"

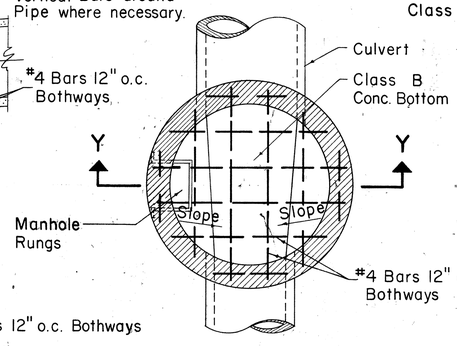


SECTION Y-Y



SECTION X-X

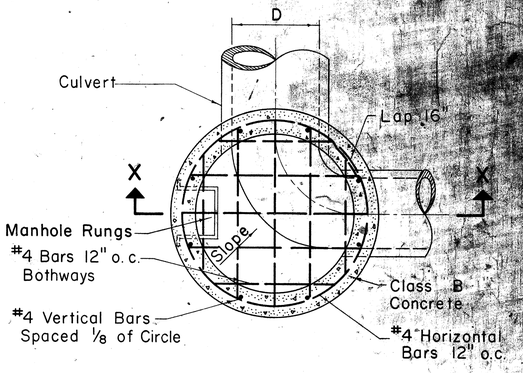
NOTE:
1. Exterior surface of brick wall shall be plastered with 1" thickness of 1:2 Cement Mortar.
2. Number, size and direction of culvert at manhole to be as shown on plans.
3. Paved invert not required at drop manholes.
4. All Class C Concrete to be incidental to Class B Concrete.



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

APPROVED:
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

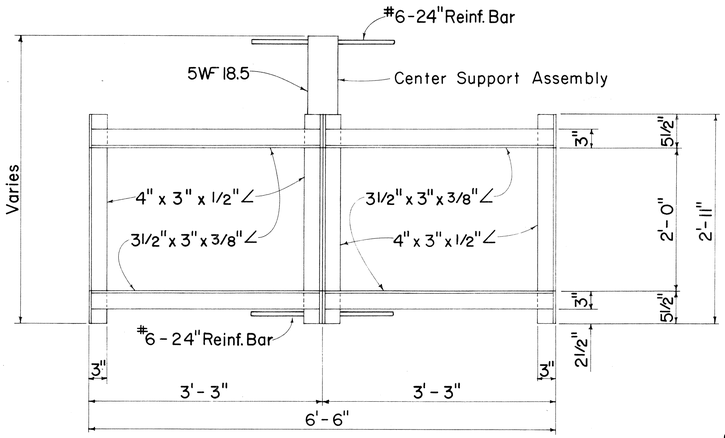
Scales: As Noted — Date: July, 1969

SHEET NO. 78A OF 21 SHEETS DH 5.

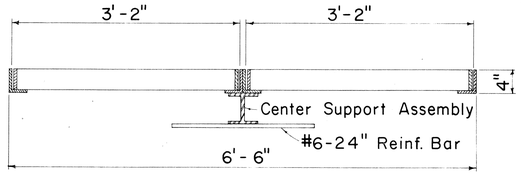
C.0.415-I

LIETZ 1103 ARKWRIGHT TRACING CLOTH 10-60 200P

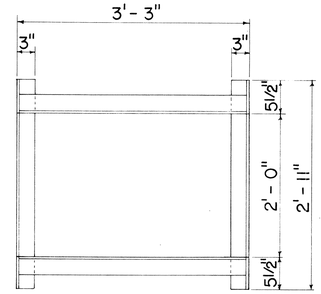
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(75)3	1969	42	181



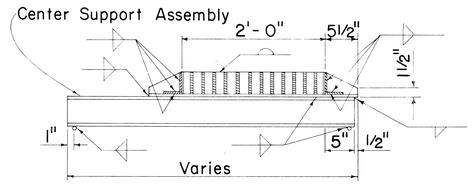
PLAN
(Two or More Grates)



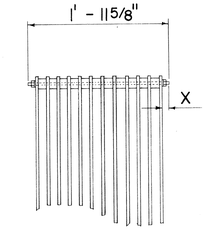
LONGITUDINAL SECTION
(Thru Frame & Grate)



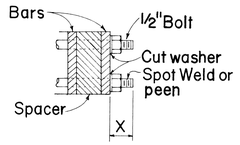
PLAN
(Single Grate)



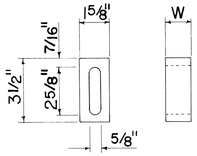
CROSS SECTION
(Thru Frame & Grate)



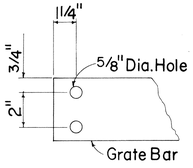
BOLTED END BLOCK
Scale: 1"= 1'-0"



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

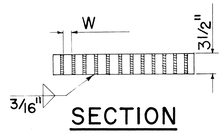


BAR SPACER
Scale: 3"= 1'-0"

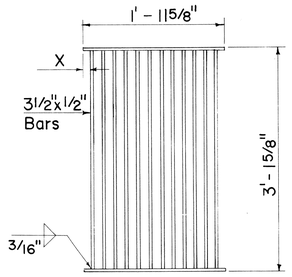


END OF BAR
Scale: 3"= 1'-0"

ALTERNATIVE BOLTED GRATE



SECTION



PLAN

GENERAL NOTES

1. Contractor has the option of using cast malleable iron, cast steel, welded, bolted or cast steel end block grate.
2. Grates and Frames shall be hot dip galvanized after fabrication, see specifications.
3. All welds 3/8" 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.

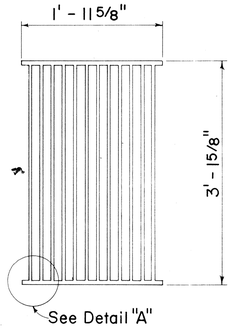
Material	ASTM Designation
Structural Steel	A283, Grade D
Cast Steel	A27, Grade 65-35
Malleable Iron Casting	A47, Gr. No. 35018

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"

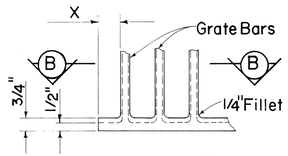
NOTE:
1. Type A-9 – Use in locations off the roadbed on all types of highways.
2. Type A-12 – Use within the roadbed on all types of highways.

FRAME DETAILS

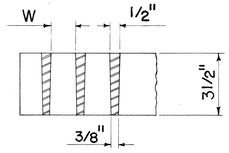
Scale: 1"= 1'-0"



PLAN
Scale: 1"= 1'-0"

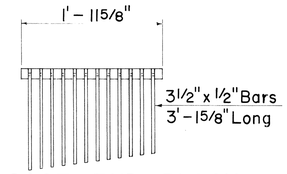


DETAIL "A"
Scale: 3"= 1'-0"

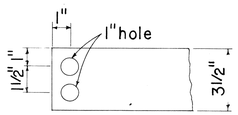


SECTION "B-B"
Scale: 3"= 1'-0"

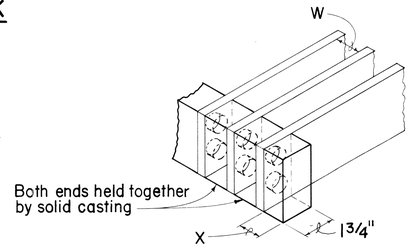
ALTERNATIVE CAST MALLEABLE IRON OR CAST STEEL GRATE



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



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



ALTERNATIVE CAST MALLEABLE IRON OR CAST STEEL END BLOCK GRATE

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

ORIGINAL PLAN	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
	QUANTITIES BY H.K.M.	"
No.	CHECKED BY H.K.M.	8/68

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS

TYPES A-9 AND A-12
FRAMES AND GRATES

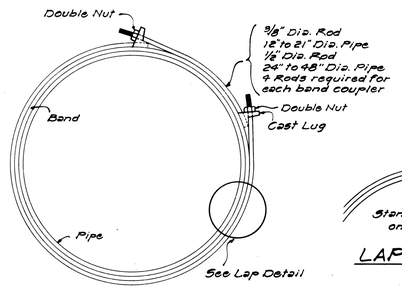
Scales: As Noted Date: Aug. 1968

SHEET No. 12 OF 21 SHEETS

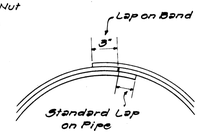
42

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	I-HI-1(76)-8	1969	43	181

Revised : Oct. 1966

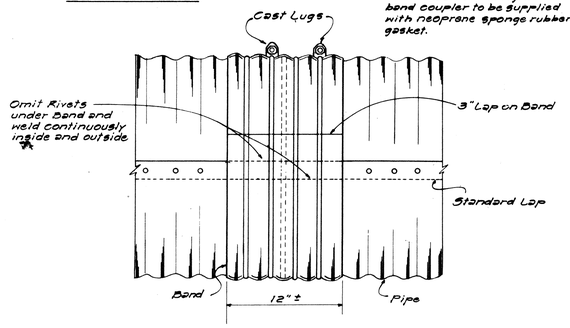


END VIEW



LAP DETAIL

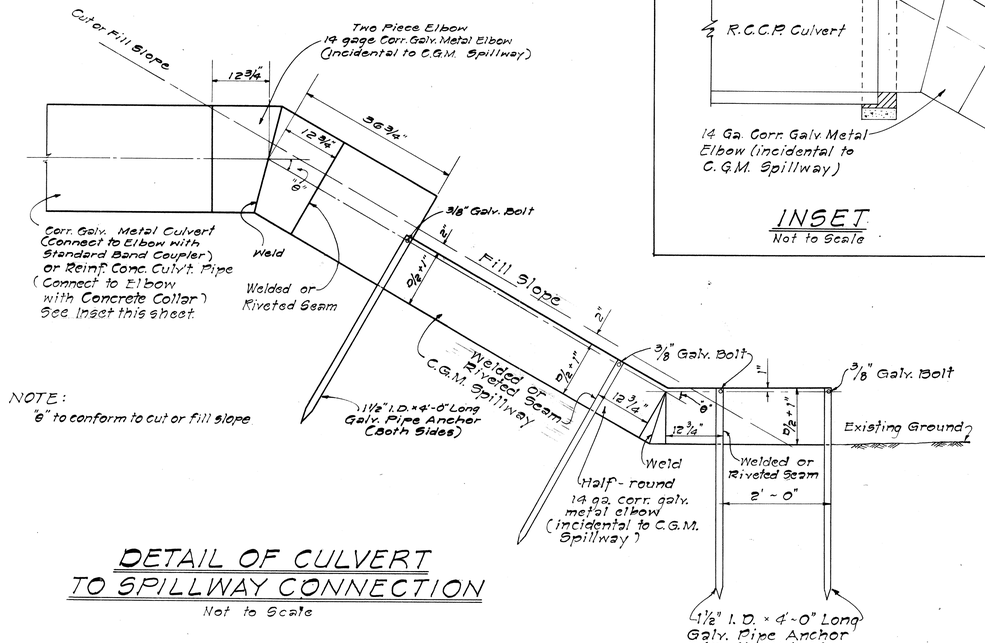
NOTE:
Each watertight band coupler to be supplied with neoprene sponge rubber gasket.



SIDE VIEW

DETAIL OF WATERTIGHT BAND COUPLER

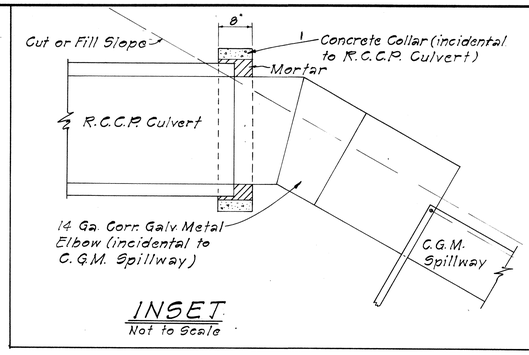
NOT TO SCALE



NOTE:
"B" to conform to cut or fill slope

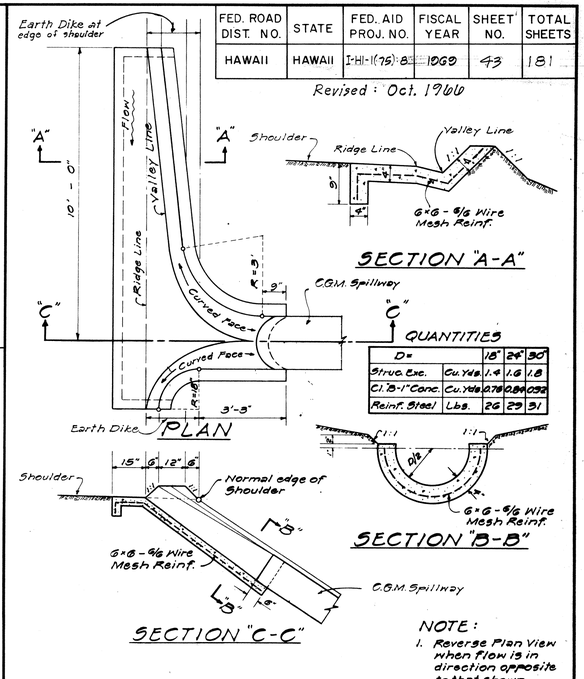
DETAIL OF CULVERT TO SPILLWAY CONNECTION

Not to Scale



INSET

Not to Scale



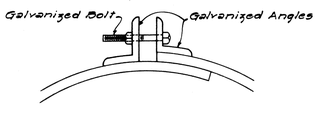
QUANTITIES

D=		18"	24"	30"
Struc. Exc.	Cu. Yds.	1.4	1.6	1.8
Cl. B-1" Conc.	Cu. Yds.	0.78	0.84	0.92
Reinf. Steel	Lbs.	26	29	31

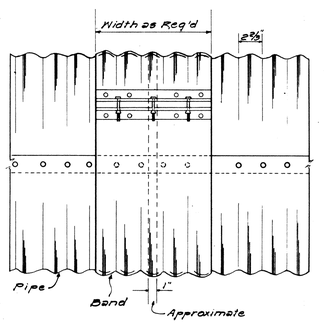
NOTE:
1. Reverse Plan View when Flow is in direction opposite to that shown.
2. All Conc. to be cl. B-1"

DETAIL OF SPILLWAY INLET

NOT TO SCALE



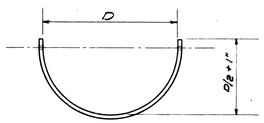
BAND DETAIL



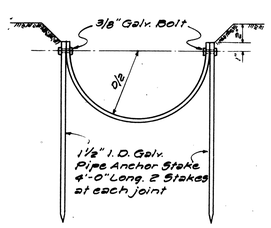
SIDE VIEW

DETAIL OF STANDARD BAND COUPLER

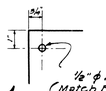
NOT TO SCALE



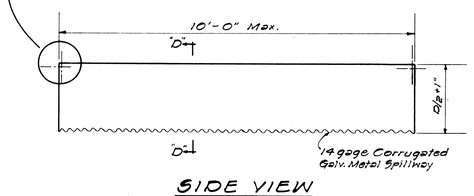
SECTION "D-D"



END VIEW



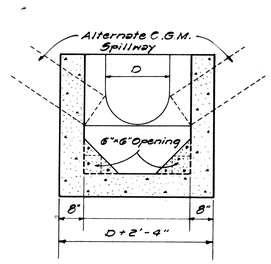
NOTE:
Pipe Anchors to be incidental to C.G.M. Spillway



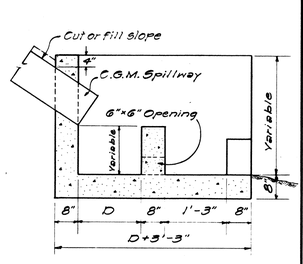
SIDE VIEW

C.G.M. SPILLWAY

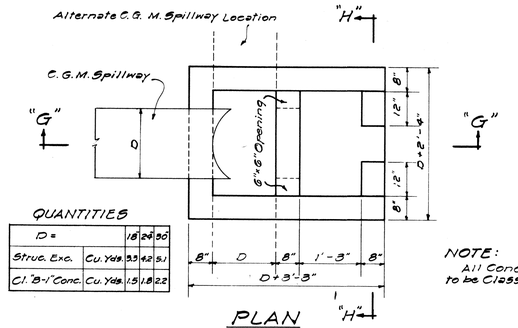
NOT TO SCALE



SECTION "H-H"



SECTION "G-G"



QUANTITIES

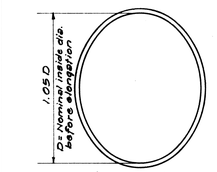
D=		18"	24"	30"
Struc. Exc.	Cu. Yds.	3.3	4.2	5.1
Cl. "B-1" Conc.	Cu. Yds.	1.5	1.8	2.2

NOTE:
All Concrete to be Class "B-1"

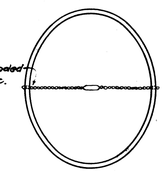
PLAN

DETAILS OF CONC. DROP BOX AT OUTLET OF C.G.M. SPILLWAY

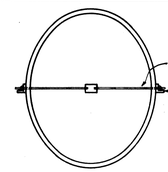
NOT TO SCALE



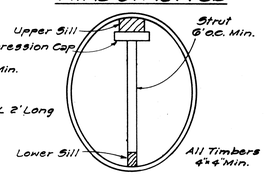
SPECIAL ELLIPTICAL FACTORY SHAPE (WITHOUT STRUTS)



ELONGATED AND WIRE STRUTTED



ELONGATED WITH ROD AND TURNBUCKLE



ELONGATED WITH TIMBER STRUT

METHOD OF ELONGATING AND STRUTTING CORRUGATED PIPE

NOT TO SCALE

APPROVED: DATE 8-14-69

DIRECTOR OF TRANSPORTATION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS

CORRUGATED GALVANIZED METAL CULVERTS, SPILLWAYS, AND SPECIAL DETAILS

SCALES AS NOTED

SHEET Nº 20 OF 21 SHEETS

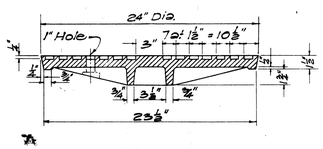
ORIGINAL PLAN	SURVEY PLOTTED BY	R.Y.	DATE 5-22-69
	DRAWN BY	R.Y.	
	TRACED BY	R.Y.	
NOTE BOOK	DESIGNED BY	O.M.	5-26-69
No.	QUANTITIES BY		
	CHECKED BY		

2/17/59
8/12/59

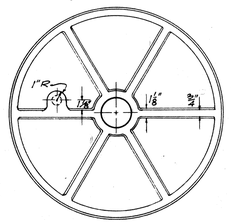
FED. ROAD DIST. NO.	STATE	PROJECT NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(75)8	1959	99	181

August 1957

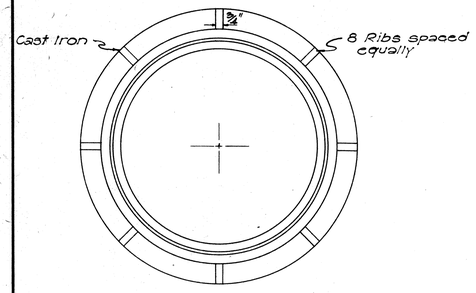
TOP VIEW OF COVER



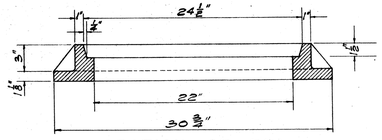
SECTION



BOTTOM VIEW OF COVER



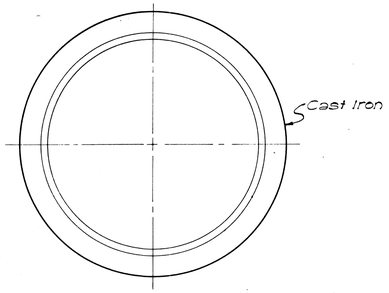
PLAN OF RIM



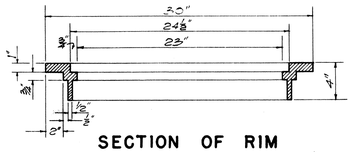
SECTION OF RIM

DETAILS OF TYPE "S" CAST IRON FRAME AND COVER

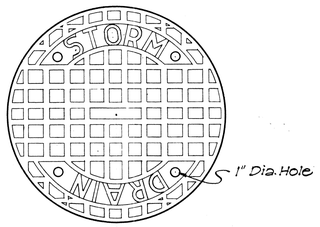
SCALE: 1-1/2" = 1'-0"



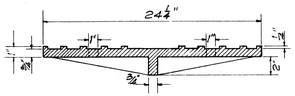
PLAN OF RIM



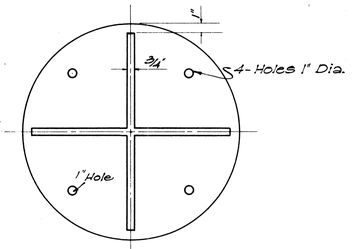
SECTION OF RIM



TOP VIEW OF COVER



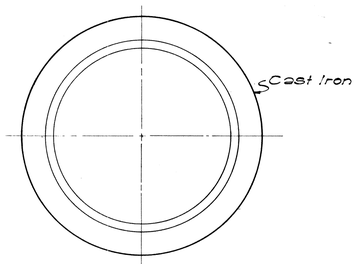
SECTION



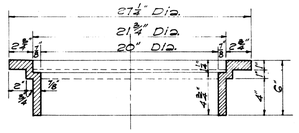
BOTTOM VIEW OF COVER

DETAILS OF TYPE "B" CAST IRON FRAME AND COVER

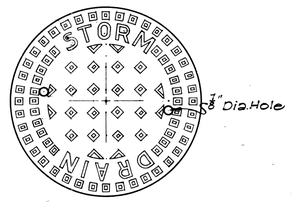
SCALE: 1-1/2" = 1'-0"



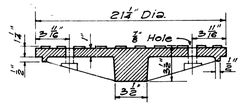
PLAN OF RIM



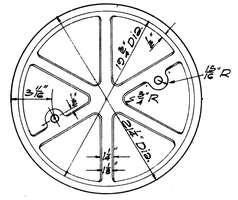
SECTION OF RIM



TOP VIEW OF COVER



SECTION

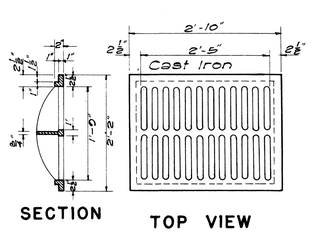


BOTTOM VIEW OF COVER

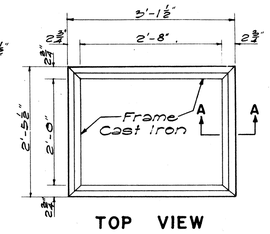
DETAILS OF TYPE "A" CAST IRON FRAME AND COVER

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

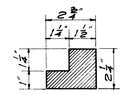
NOTE: Stock Pattern From Novelty Foundry ~ Honolulu



SECTION TOP VIEW



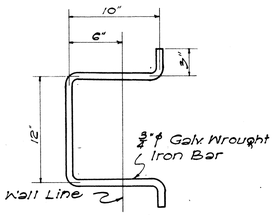
TOP VIEW



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

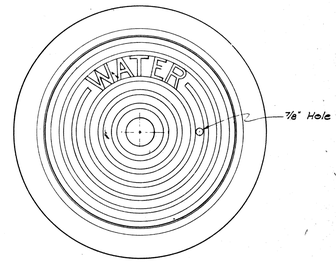
TYPE C C.I. FRAME AND GRATING

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

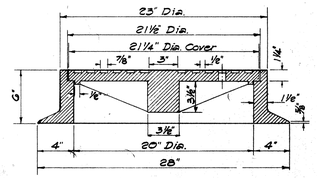


MANHOLE RUNG

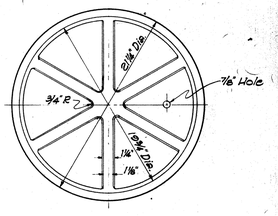
SCALE: 1-1/2" = 1'-0"



PLAN OF FRAME AND COVER



SECTION OF FRAME AND COVER



BOTTOM VIEW OF COVER

DETAILS OF TYPE "W" CAST IRON FRAME AND COVER

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

NOTE:

THE TYPE "S" CAST IRON FRAME AND COVER SHOWN ON THIS SHEET IS EQUIVALENT TO THE CITY AND COUNTY OF HONOLULU, DIVISION OF SEWERS' TYPE "SA" CAST IRON MANHOLE FRAME AND COVER.

THE TYPE "W" CAST IRON FRAME AND COVER SHOWN ON THIS SHEET IS EQUIVALENT TO THE CITY AND COUNTY OF HONOLULU, BOARD OF WATER SUPPLY'S CAST IRON MANHOLE FRAME AND COVER, 20" SIZE.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

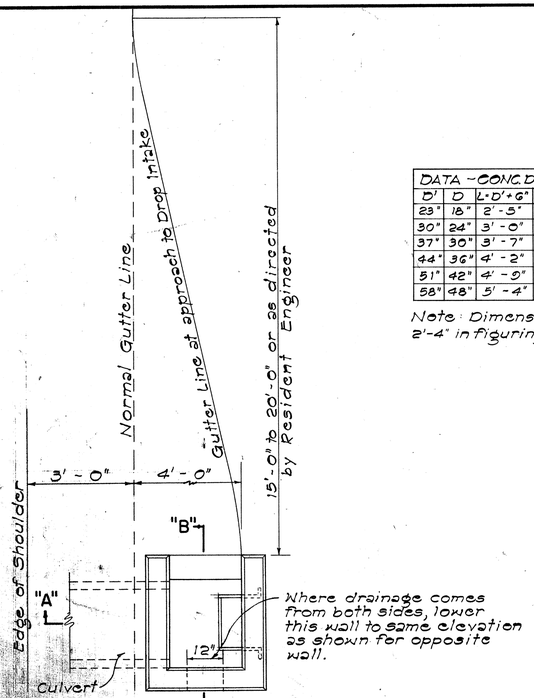
STANDARD DETAILS
CATCH BASIN AND MANHOLE CASTINGS
SCALES AS NOTED

SHEET NO 21 OF 21 SHEETS

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

TRACING CLOTH

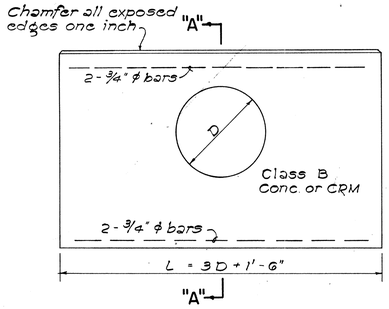
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	[illegible]	1969	[illegible]	181



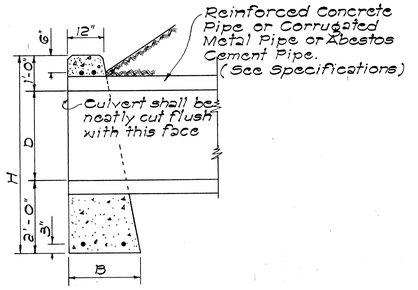
PLAN

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"

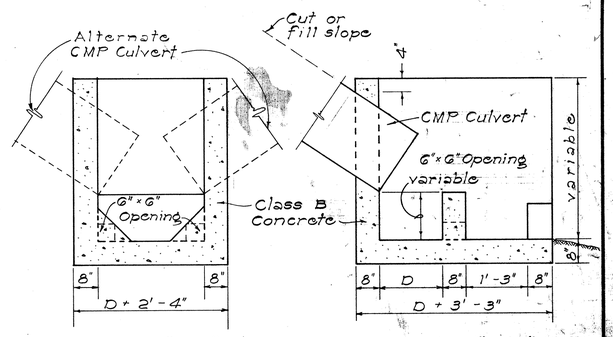
Note: Dimension "X" is assumed as 2'-4" in figuring the above quantities.



ELEVATION

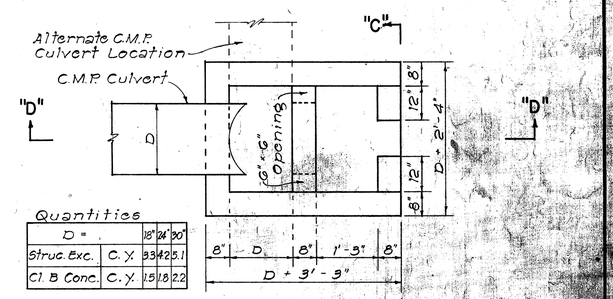


SECTION "A-A"



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	3/4" ϕ	5'-6"	33
24"	1'-6"	7'-6"	5'-0"	1.52	1.60	4	3/4" ϕ	7'-0"	42
30"	2'-0"	9'-0"	5'-6"	2.32	2.42	4	3/4" ϕ	8'-6"	51
36"	2'-0"	10'-6"	6'-0"	2.84	3.13	4	3/4" ϕ	10'-0"	60
42"	2'-6"	12'-0"	6'-6"	4.19	4.47	4	3/4" ϕ	11'-6"	69
48"	2'-6"	13'-6"	7'-0"	5.01	5.36	4	3/4" ϕ	13'-0"	78



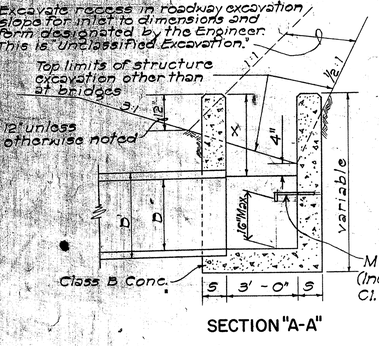
Quantities

D =		18"	24"	30"
Struc. Exc.	C.Y.	33	42	51
Cl. B Conc.	C.Y.	15	18	22

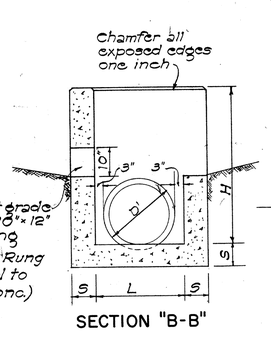
PLAN

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"	1.89	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: 1/2" = 1'-0"



SECTION "A-A"



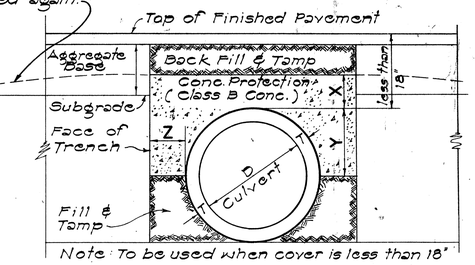
SECTION "B-B"

DETAIL OF CONCRETE DROP INTAKE
Scale: 1/2" = 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.

Note: When subgrade is below top of jacket, it shall be fully compacted to this line and then re-excavated (struc. exc.) to proper subgrade. This surface shall be rolled again.



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

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
7" for 24" D		
8" for 30" D		Minimum = X
9" for 36" D		
10" for 42" D		Maximum pay quantity will be Z = 12"
11" for 48" D		
12 for 54" D		

SECT. OF CULVERT WITH CONC. PROTECTION
Scale: 1" = 1'-0"

DETAILS OF CONC. DROP BOX AT OUTLET OF CULVERT PIPE

NOT TO SCALE

APPROVAL RECOMMENDED:
[signature] 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.T.	1-21-15

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS

DROP INTAKE, HEADWALL & CONCRETE PROTECTION

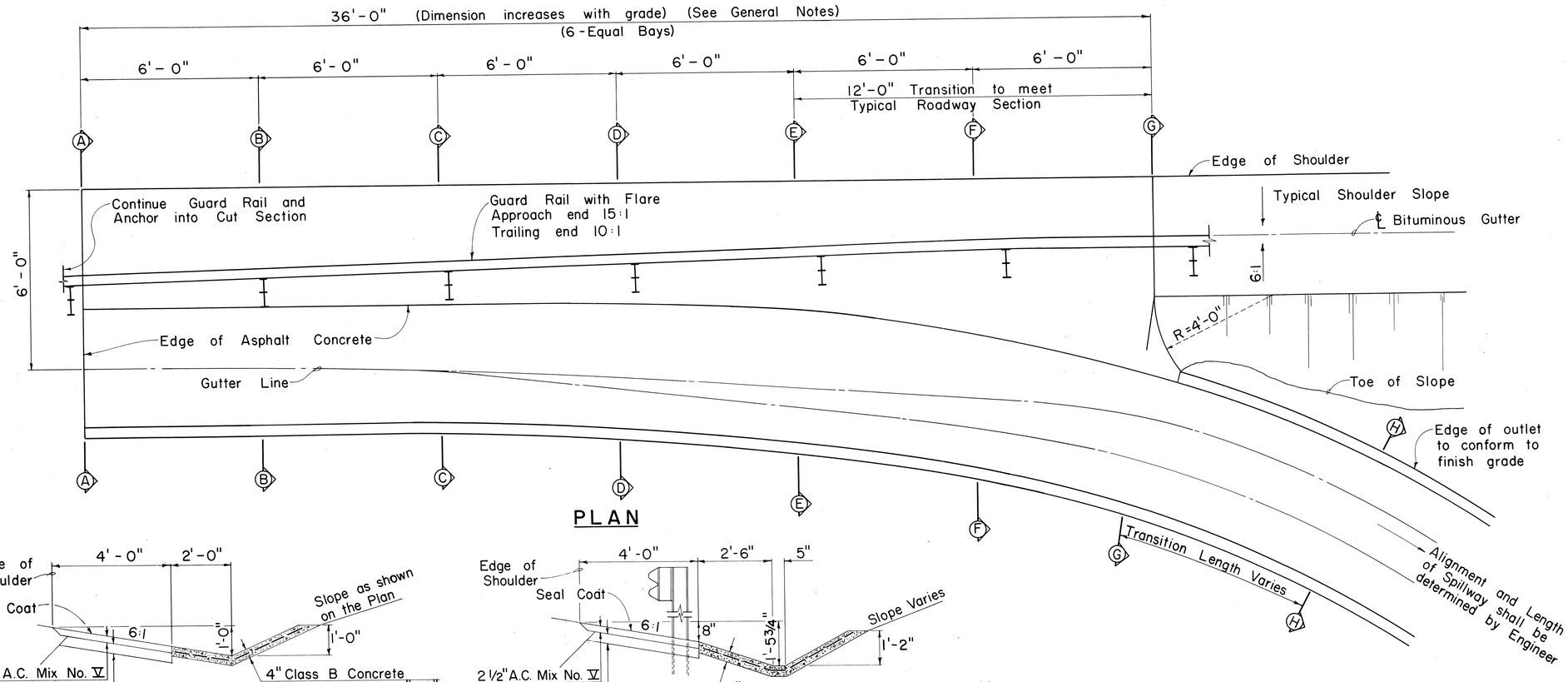
Scale: As Noted. Date: Aug. 1967

SHEET No. 21A OF 21 SHEETS DH 10

C.0.44S-1

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

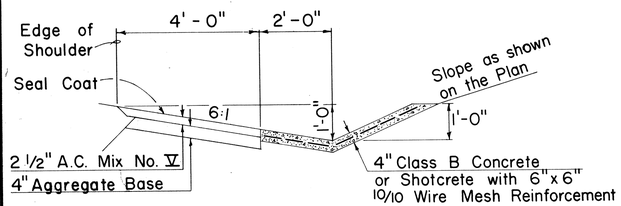
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(75)-8	1969	C0445-1	181



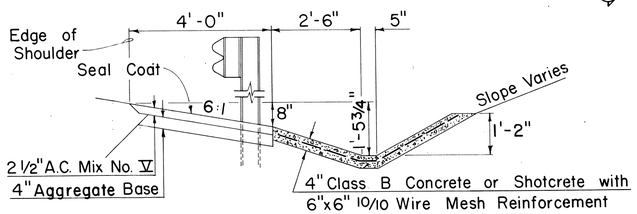
PLAN

GENERAL NOTES

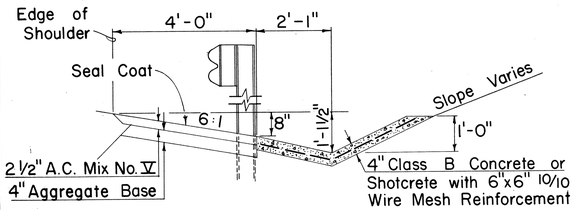
1. If the average grade of pavement for the distance from Section A-A to Section G-G exceeds 2% this distance shall be increased 6' for each 1% increase in grade.
2. Wire Mesh Reinforcement to be incidental to Class B Concrete or Shotcrete.
3. The gutter will be paid for at the contract unit price per linear foot for Asphalt Concrete Gutter, Type 7.
4. 4" Aggregate Base to be incidental to Asphalt Concrete Gutter.
5. Section "A" to outlet of spillway will be paid for as lined drainage ditch.



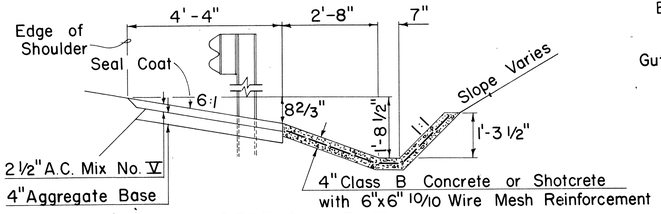
SECTION A-A



SECTION D-D



SECTION B-B



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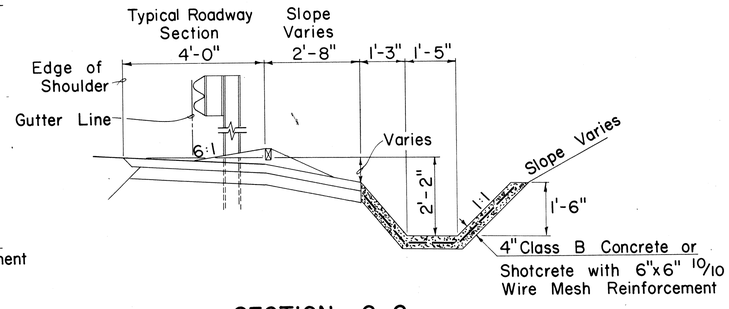
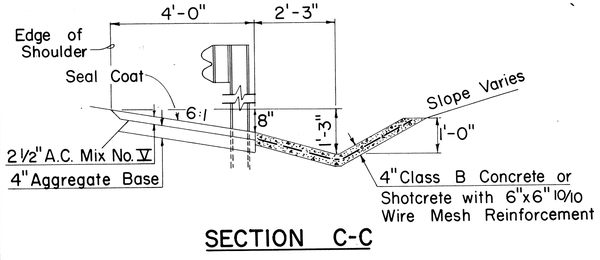
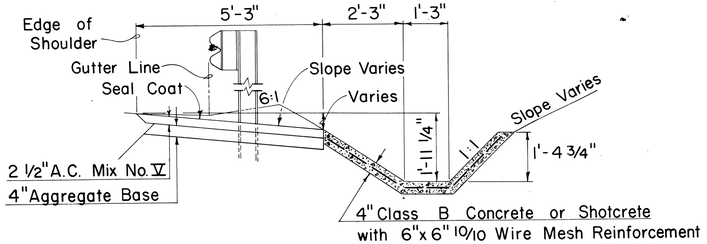


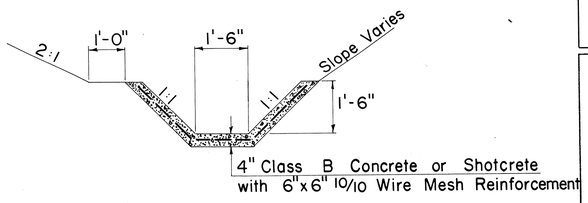
SECTION G-G



SECTION C-C



SECTION F-F



SECTION H-H

APPROVAL RECOMMENDED:
HYDRAULIC DESIGN ENGINEER — DATE 2-2-71

APPROVED:
ASSISTANT CHIEF, ENGINEERING — DATE 2-25-71

NO.	REVISION	APPROVED BY	DATE
1	Payment for Lined Spillway.	H.T.	9-25-73

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS

CONCRETE SPILLWAY INLET

Scale: 1/2" = 1'-0" Date: January, 1971

SHEET No. 21B OF 21 SHEETS DH 20

C.0.44S-2

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